Smarter. Greener. Together.

Industrial Automation Headquarters

Delta Electronics, Inc.
Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 330477, Taiwan
TEL: +886-3-362-6301 / FAX: +886-3-371-6301

Asia

China: Delta Electronics (Shanghai) Co., Ltd.
No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: +86-21-6872-3988 / FAX: +86-21-6872-3996
Customer Service: 400-820-9595

Japan: Delta Electronics (Japan), Inc.
Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: +81-3-5733-1155 / FAX: +81-3-5733-1255

Korea: Delta Electronics (Korea), Inc.
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: +82-2-515-5305 / FAX: +82-2-515-5302

Singapore: Delta Energy Systems (Singapore) Pte Ltd.
4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: +65-6747-5155 / FAX: +65-6744-9228

India: Delta Electronics (India) Pvt. Ltd.
Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: +91-124-4874900 / FAX: +91-124-4874945

Thailand: Delta Electronics (Thailand) PCL.
909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: +66-2709-2800 / FAX: +66-2709-2827

Australia: Delta Electronics (Australia) Pty Ltd.
Unit 2, Building A, 18-24 Ricketts Road,
Mount Waverley, Victoria 3149 Australia
Mail: IA.au@deltaww.com
TEL: +61-1300-335-823 / +61-3-9543-3720

Americas

USA: Delta Electronics (Americas) Ltd.
5101 Davis Drive, Research Triangle Park, NC 27709, U.S.A.
TEL: +1-919-767-3813 / FAX: +1-919-767-3969

Brazil: Delta Electronics Brazil Ltd.
Estrada Velha Rio-São Paulo, 5300 Eugênio de
Melo - São José dos Campos CEP: 12247-004 - SP - Brazil
TEL: +55-12-3932-2300 / FAX: +55-12-3932-237

Mexico: Delta Electronics International Mexico S.A. de C.V.
Gustavo Baz No. 309 Edificio E PB 103
Colonia La Loma, CP 54060
Tlalnepantla, Estado de México
TEL: +52-55-3603-9200

EMEA

EMEA Headquarters: Delta Electronics (Netherlands) B.V.
Sales: Sales.IA.EMEA@deltaww.com
Marketing: Marketing.IA.EMEA@deltaww.com
Technical Support: iatechnicalsupport@deltaww.com
Customer Support: Customer-Support@deltaww.com
Service: Service.IA.emea@deltaww.com
TEL: +31(0)40 800 3900

BENELUX: Delta Electronics (Netherlands) B.V.
Automotive Campus 260, 5708 JZ Helmond, The Netherlands
Mail: Sales.IA.Benelux@deltaww.com
TEL: +31(0)40 800 3900

DACH: Delta Electronics (Netherlands) B.V.
Coesterweg 45,D-59494 Soest,Germany
Mail: Sales.IA.DACH@deltaww.com
TEL: +49 2921 987 238

France: Delta Electronics (France) S.A.
ZI du bois Challand 2,15 rue des Pyrénées,
Lisses, 91090 Evry Cedex, France
Mail: Sales.IA.FR@deltaww.com
TEL: +33(0)1 69 77 82 60

Iberia: Delta Electronics Solutions (Spain) S.L.U
Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
TEL: +34(0)91 223 74 20

Carrer Llacuna 166, 08018 Barcelona, Spain
Mail: Sales.IA.Iberia@deltaww.com

Italy: Delta Electronics (Italy) S.r.l.
Via Meda 2–22060 Novedrate(CO)
Piazza Grazioli 18 00186 Roma Italy
Mail: Sales.IA.Italy@deltaww.com
TEL: +39 039 8900365

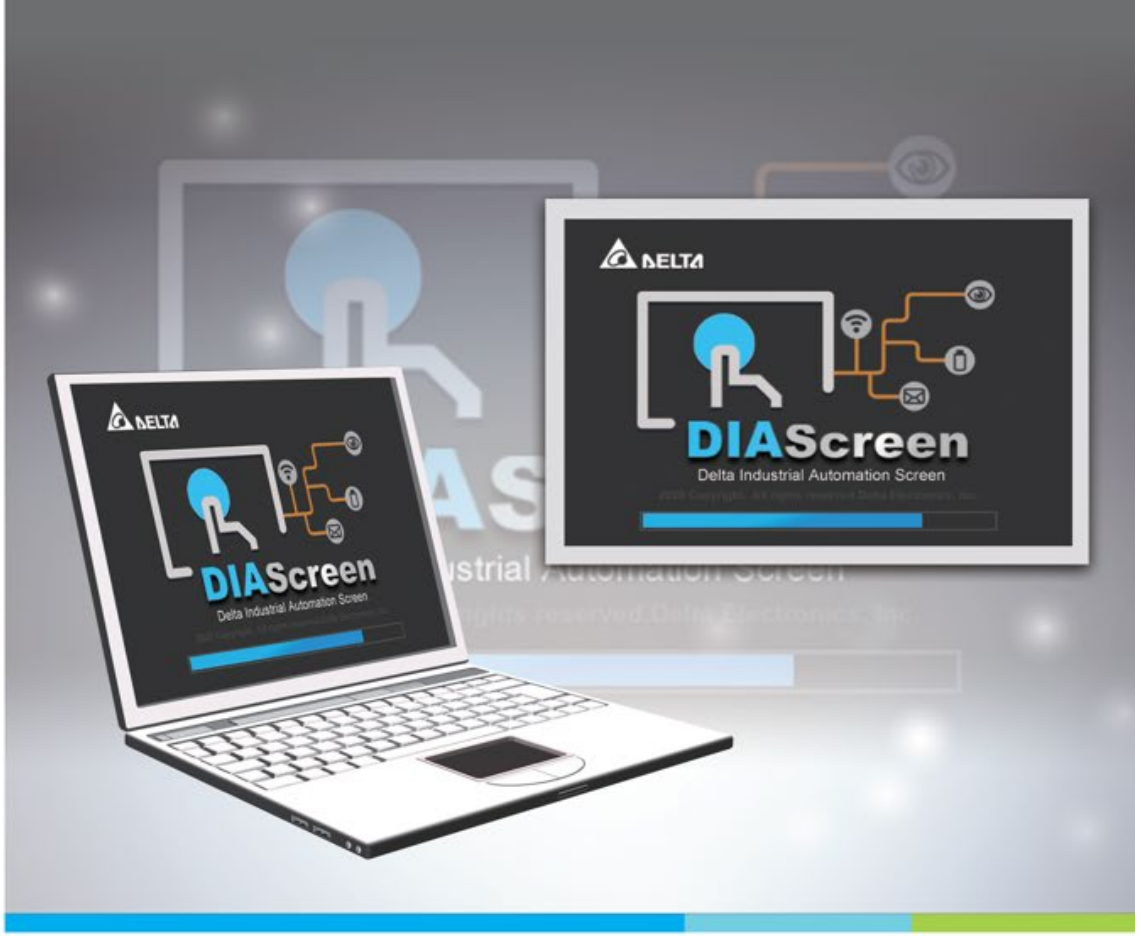
Russia: Delta Energy System LLC
Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow Russia
Mail: Sales.IA.RU@deltaww.com
TEL: +7 495 644 3240

Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)
Şerifali Mah. Hendem Cad. Kule Sok. No:16-A
34775 Ümraniye – İstanbul
Mail: Sales.IA.Turkey@deltaww.com
TEL: + 90 216 499 9910

MEA: Eltek Dubai (Eltek MEA DMCC)
OFFICE 2504, 25th Floor, Saba Tower 1,
Jumeirah Lakes Towers, Dubai, UAE
Mail: Sales.IA.MEA@deltaww.com
TEL: +971(0)4 2690148

*We reserve the right to change the information in this manual without prior notice.

2023/06/20



Digitized Automation for a Changing World

DIAScreen Software User Manual

www.deltaww.com

Copyright Notice

©Delta Electronics, Inc. All rights reserved.

All information contained in this user manual is the exclusive property of Delta Electronics Inc. (hereinafter referred to as "Delta") and is protected by copyright law and all other laws. Delta retains the exclusive rights of this user manual in accordance with the copyright law and all other laws. No parts in this manual may be reproduced, transmitted, transcribed, translated or used in any other ways without the prior consent of Delta.

Limitation of Liability

The contents of this user manual are only for the use of the DIAStudio manufactured by Delta. Except as defined in special mandatory laws, Delta provides this user manual “as is” and does not offer any kind of warranty through this user manual for using the product, either express or implied, including but not limited to the following:

(i) this product will meet your needs or expectations;

(ii) the information contained in the product is current and correct;

(iii) the product does not infringe any rights of any other person. Use the product at your own risk.

In no event shall Delta, its subsidiaries, affiliates, managers, employees, agents, partners and licensors be liable for any direct, indirect, incidental, special, derivative or consequential damages (including but not limited to the damages for loss of profits, goodwill, use or other intangible losses) unless the laws contains special mandatory provisions to the contrary.

Delta reserves the right to make changes to the user manual and the products described in the user manual without prior notice and afterwards.

Related Documents

Document Name	Document ID
DIAInstaller User Manual	DIAS-Manual-0005-EN
DIADesigner Manual	DIAS-Manual-0003-EN

Revision History

Version	Issue Date	Revision
1st	2020/12/08	The first version was published.
2nd	2021/09/30	Added Chapter 2 ~ Chapter 30: Added description of DOP series/AX series/IMP series/DXMC series.
3rd	2021/12/30	1. Update Section 2.2.2.1: Update the description of Clipboard. 2. Update Section 2.2.2.7: Update Select All instructions. 3. Update Section 24.3: Update the description of macro instructions. 4. Update Section 28.6: Add descriptions of new functions of the Text Bank. 5. Added Section 29.2.3: Added OPC UA variable setting function.
4th	2022/09/30	1. Update the overall manual structure in response to software UI adjustments. 2. Update Section 2.1.1: Added description of DIAScreen startup screen. 3. Added Section 2.1.1.1: Added Update Manager.
5th	2022/12/22	Standalone TP series user manual.

Contents

Chapter 1: Overview 12
1.1 DIAStudio Overview 13
1.1.1 DIAStudio Key Software 14
1.2 DIAScreen Overview 14
1.3 System Requirements 15
1.4 List of Supported Models 15
1.5 Install, Uninstall, and Update DIAScreen 16
Chapter 2: Basic Operation 19
2.1 How to Create a Project 20
2.1.1 DIAScreen Startup 20
2.1.2 Create a Project Flowchart 25
2.2 Windows Menu 46
2.2.1 DIAScreen Start Menu 50
2.2.2 General Toolbar 75
2.2.3 Project 186
2.2.4 Elements 227
2.2.5 Data Management 229
2.2.6 IIoT 233
2.2.7 View 233
2.2.8 Tools 240
Chapter 3: Internal Memory 250
3.1 Internal Register ($) 252
3.2 Non-volatile Internal Register ($M) 253
3.3 Indirect Address Register (*$) 253
3.4 Internal Parameter 255
3.5 DXMC Series Internal Memory Address 267
Chapter 4: Control Status Block 270
4.1 Control Block 275

4.2 Status Block 290

Chapter 5: Button 302

5.1 Set to On / Set to Off / Maintained / Momentary / Checkbox 303

5.2 Multistate 326

5.3 Set Value 350

5.4 Set Constant 373

5.5 Increment / Decrement 391

5.6 Goto Screen 412

5.7 Other Elements 435

5.7.1 System Date and Time 436

5.7.2 Password Table 436

5.7.3 Enter Password 437

5.7.4 Contrast Brightness 438

5.7.5 Set Low Security 438

5.7.6 System Menu 438

5.7.7 Print Output 439

5.7.8 Report List 439

5.7.9 Screen Capture 439

5.7.10 Remove Storage 440

5.7.11 Import/Export Recipe 441

5.7.12 Calibration 442

5.7.13 Language Change 442

5.7.14 Import/Export FileSlot 443

5.7.15 Other Shared Properties of Elements 444

5.7.16 Multiple Actions 452

5.7.17 SMTP Server 475

5.7.18 FTP Server 475

5.7.19 Select File 475

Chapter 6: Meter 479
6.1 Meter(1) / Meter(2) / Meter(3) / Meter(4) 480

Chapter 7: Bar 499
7.1 Normal Bar 500

7.2 Differential Bar 511

Chapter 8: Pipe 522
8.1 Pipe(1) / Pipe(2) 523

8.2 Pipe(3) / Pipe(4) / Pipe(5) 534

8.3 Pipe(6) / Pipe(7) 536

Chapter 9: Pie 541
9.1 Pie(1) / Pie(2) / Pie(3) / Pie(4) 542

Chapter 10: Indicator 556
10.1 Multistate Indicator 557

10.2 Range Indicator 575

10.3 Simple Indicator 593

Chapter 11: Data Display 605
11.1 Numeric Display 606

11.2 Character Display 632

11.3 Date Display / Time Display / Week Display 643

11.3.1 Date Display 644

11.3.2 Time Display 651

11.3.3 Week Display 657

11.4 General Message Display 667

11.5 Moving Sign Display 684

11.6 QR Code Display 699

11.7 Barcode Display 707

Chapter 12: Graphic 713
12.1 State Graphic 714

12.2 Animated Graphic 730

12.3 Real-time Image 742

Chapter 13: Input 757
13.1 Numeric Entry 758
13.2 Character Entry 791
13.3 Barcode Input 815
13.4 Multi-language Input 833
13.5 Multi-line Text Input 851
Chapter 14: Curve 876
14.1 Trend Graph 877
14.2 X-Y Chart 894
14.3 X-Y Distribution 916
14.4 Curve Input 928
14.5 Mold Thickness Control Curve 939
Chapter 15: Sampling 951
15.1 History Buffer 952
15.2 Historical Trend Graph 992
15.3 Historical Data Table 1020
15.4 Historical Event Table 1037
15.5 Historical Overview Table 1053
15.6 Operation Log Setup 1079
Chapter 16: Alarm 1094
16.1 Alarm Setting 1095
16.2 Alarm Function 1126
16.3 Alarm History Table 1129
16.4 Active Alarm List 1145
16.5 Alarm Frequency Table 1162
16.6 Alarm Moving Sign 1179
Chapter 17: Keypad 1193
17.1 Keypad(1) 1194
17.2 Keypad(2) 1204

17.3 Keypad(3) 1214

Chapter 18: Analog 1226
18.1 Slider 1227

Chapter 19: List 1242
19.1 ComboBox 1243
19.2 Drop-down Menu 1264
19.3 ListBox 1286
19.4 GridBox 1308
19.5 PDF Viewer 1349
19.6 Text Viewer 1364
19.7 Recipe Viewer 1381
19.8 FTP File List 1390
19.9 FTP File Setting 1400
19.10 Text List 1411

Chapter 20: Frame and Multimedia 1436
20.1 Embedded Subscreen 1437
20.2 Camera Display 1445
20.3 VGA Display 1457
20.4 Video Play 1463
20.5 Event Trigger 1478

Chapter 21: Basic Shape 1483
21.1 Rhombus 1485
21.2 Right Triangle 1490
21.3 Pentagon 1498
21.4 Pie Chart 1503
21.5 Arc 1508
21.6 Hexagon 1513
21.7 Star Shape 1518
21.8 Triangle 1523

21.9 Hollow Circle 1529
21.10 Stop Circle 1534
21.11 1/4 Arc 1539
Chapter 22: Drawing 1545
22.1 Line 1546
22.2 Rectangle 1554
22.3 Circle 1569
22.4 Polygon 1582
22.5 Text 1590
22.6 Scale 1603
22.7 Table 1612
Chapter 23: Recipe 1620
23.1 16-Bit Recipe 1621
23.2 32-Bit Recipe 1638
23.3 Indirect Recipe Index Register (*RCP) 1657
23.4 Enhanced Recipe 1660
23.5 Enhanced Indirect Recipe Index Register (*ENRCP) 1684
Chapter 24: Macro 1688
24.1 Types of Macro 1689
24.1.1 On Macro / Off Macro 1690
24.1.2 Before Execute Macro 1691
24.1.3 After Execute Macro 1692
24.1.4 Screen Open Macro 1693
24.1.5 Screen Close Macro 1694
24.1.6 Screen Cycle Macro 1695
24.1.7 Screen Cycle Macro Manager 1697
24.1.8 Submacro 1698
24.1.9 Initial Macro 1706
24.1.10 Background Macro 1707

24.1.11 Clock Macro 1709
24.2 Macro Edit Window 1711
24.3 Macro Commands 1717
24.3.1 Arithmetic 1728
24.3.2 Logical Operation 1751
24.3.3 Data Transfer 1758
24.3.4 Data Conversion 1768
24.3.5 Comparison 1785
24.3.6 FlowControl 1831
24.3.7 Bit Setting 1837
24.3.8 Communication 1841
24.3.9 Drawing 1872
24.3.10 File Access 1877
24.3.11 Others 1890
24.4 Macro Error Codes 1931
Chapter 25: Multi-language 1941
25.1 Multi-language Settings 1942
25.1.1 System Language Settings 1947
25.2 Multi-language Input Method Settings 1948
Chapter 26: Print Settings 1950
26.1 Print Settings 1951
26.2 ePrinter 1957
26.2.1 PrnServer 1958
26.2.2 HMI Connection Settings 1960
26.3 Printer Error Codes 1965
26.4 Template Print 1966
Chapter 27: Parameter Settings 1973
27.1 Communication Settings 1974
27.2 Change Model 1987

27.3 Environment 1988

Chapter 28: Advanced Settings 2000

28.1 Tag Table 2001

28.2 HMI Identifier 2011

28.3 FileSlot Management 2013

28.4 Device Table 2020

28.5 Picture Bank 2024

28.6 Text Bank 2028

28.7 Multi-Lang Input Character Count Calculation 2035

28.8 Custom Keypad 2036

28.8.1 Create Keypad Screen 2039

28.8.2 Delete Keypad Screen 2045

28.9 Sound Settings 2052

28.10 Modbus TCP Mapping Table 2062

28.11 Font Management 2067

Chapter 29: Variable Sharing 2068

29.1 Tag Sharing with DIAStudio Programs 2069

29.1.1 DIA Tag File Import Function (with ISPSoft) 2069

29.1.2 DIA Tag Synchronization (with DIADesigner) 2074

29.1.3 DIA Tag One-to-Many Synchronization 2079

29.2 OPC UA Client Communication 2082

29.2.1 Import OPC UA Tag from File 2082

29.2.2 Import OPC UA Tag via Network Connection 2087

29.2.3 OPC UA Server Configuration 2091

29.3 Import CODESYS Tag 2094

29.3.1 CODESYS Settings 2104

29.4 Tag Keyword Filtering Function 2106

29.5 Beckhoff Tag Import Function 2109

Chapter 30: LUA 2114
30.1 Password Protection for LUA Programs 2115

Chapter 31: MQTT Configuration 2118
31.1 MQTT Settings 2119

31.1.1 Broker information 2119

31.1.2 Publisher / Subscriber Information 2121

31.1.3 HMI Broker Settings 2122

31.1.4 MQTT HMI Screen Display 2123

Appendix A: System Screen 2125
A.1 System Screen Overview 2126

A.2 System Setting 2133

A.3 Up/Download 2148

A.4 System Info 2157

A.5 HMI Doctor 2158

Appendix B: Multi-Drop 2164
B.1 Multi-Drop Example 2165

Appendix C: Communication Error Code List 2175
C.1 Communication Error Code List 2176

Appendix D: Write and Read Offset Address 2182
D.1 Write and Read Offset Address 2183

Chapter 1: Overview

1.1 DIAStudio Overview

DIAStudio is an all-in-one integrated engineering platform to efficiently develop machinery systems, from product selection, programming, to exporting. It simplifies the process, and saves time and cost for building machinery systems.



Figure 1 - 1: DIAStudio Features

For the design data generated by users in different stages of designing industrial machinery and equipment, DIAStudio integrates the functions of Model selection, Programming, Parameter setting, Machine tuning, and HMI screen planning of Delta's full range of products on a single platform, and integrates the data transfer between software, and the design data can be reused continuously, by reducing the working hours of users and improving design efficiency.

DIAStudio supports efficient and flexible data transmission between software. It also facilitates for tag sharing between software.

1.1.1 DIAStudio Key Software

The DIAStudio comprises following key software:

- **DIASelector:** Quick, easy, smart selection tool
- **DIADesigner:** Integrated development and engineering software
- **DIAScreen:** Intuitive visualization software
- **DIAInstaller:** System installation and update management
- **COMMGR:** Communication management
- **DIADesigner-AX:** Motion control programming software

1.2 DIAScreen Overview

The DIAScreen application is a part of DIAStudio software suite. DIAScreen allows users to configure Delta DOP series, TP series, and AX series controller soft-HMIs.

The key features of DIAScreen are as follows:

- Tag sharing with the variables of DIADesigner and DIADesigner-AX
- Convenient User Interface, and rich 3D image library
- Smoother display for Meter and other elements
- Enhanced software download speed
- Clear output results
- Supports various control elements and functions including Recipe and Macros
- Supported languages - English, Traditional Chinese and Simplified Chinese
- Enhanced security, providing passwords, and permission levels

1.3 System Requirements

The following table provides the specifications for the DIAScreen operating system.

Item	System Requirements
Operating System	Windows 10 (32 / 64 bit) or compatible system environment
CPU	Intel Core i5 M520 2.4 GHz (min.) or above with similar performance
Memory	4 GB or above
Hard Disk Drive	15 GB or above
Monitor	Resolution: 1024 x 768 Pixels, 1920 x 1080 Pixels
Keyboard/Mouse	General Keyboard Mouse or Windows compatible device
Printer	Windows 10 with Compatible Printer
USB	Used in Connection with the device
Ethernet	Used in Connection with the device
Software Requirement	Need to install Micosoft.Net Framework 4.6.2

1.4 List of Supported Models

DIAScreen supports the following HMIs.

HMI Series	Description
AX series	AX series controller soft-HMI
DOP-100 series	Touch type high color HMI series
DOP-H Series (Handheld)	Handheld high color HMI
DXMC series	Motion Controller with integrated HMI
IMP series	Motion Control development platform integrating HMI
TP series	Text Panel (TP) HMI series

NOTE:

1. *DIAScreen supports AX / IMP series soft-HMI planning functions. Refer to AX series products manual and IMP manual for detail.*
2. *DIAScreen supports DOP-100 and DOP-H series soft-HMI planning functions. Refer to HMI product manual for detail.*
3. *DIAScreen supports DXMC series HMI planning functions. Refer to DXMC-P product manual.*
4. *DIAScreen supports TP series HMI planning functions. Refer to TP series operation manual.*

1.5 Install, Uninstall, and Update DIAScreen

DIAScreen application should be installed in the computer with specification mentioned in *Section 1.3 System Requirements* and DIAInstaller application runs normally in the system.

DIAInstaller is a program to manage all Delta IA software. Check for download, install, and update for Delta IA software in DIAInstaller with simple steps.

Download DIAStudio software from the following website:

https://diastudio.deltaww.com/.

Refer to DIAInstaller Manual to complete DIAScreen installation.

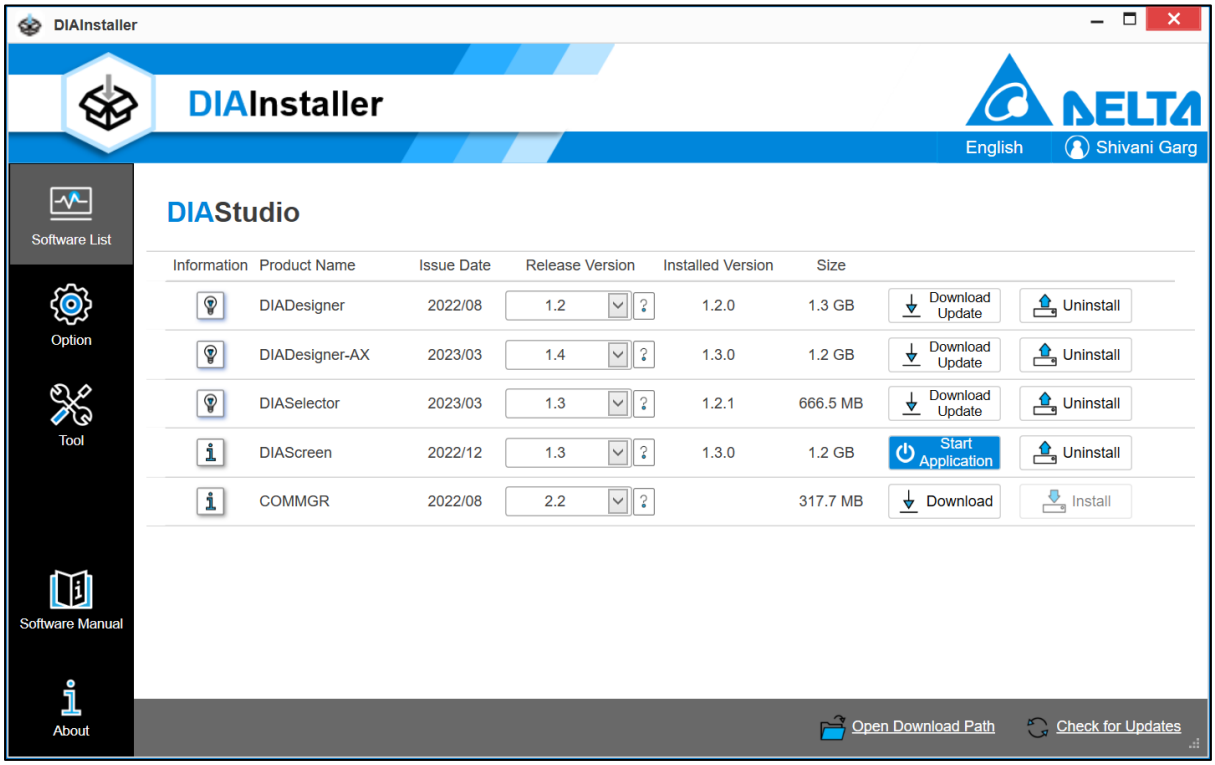


Figure 1 - 2: DIAInstaller

After the installation is complete, double-click the DIAScreen desktop shortcut to start DIAScreen, as shown in the following figure.

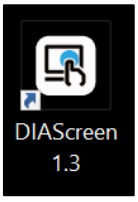


Figure 1 - 3: DIAScreen shortcut

DIAScreen application opens, as shown in the following figure.

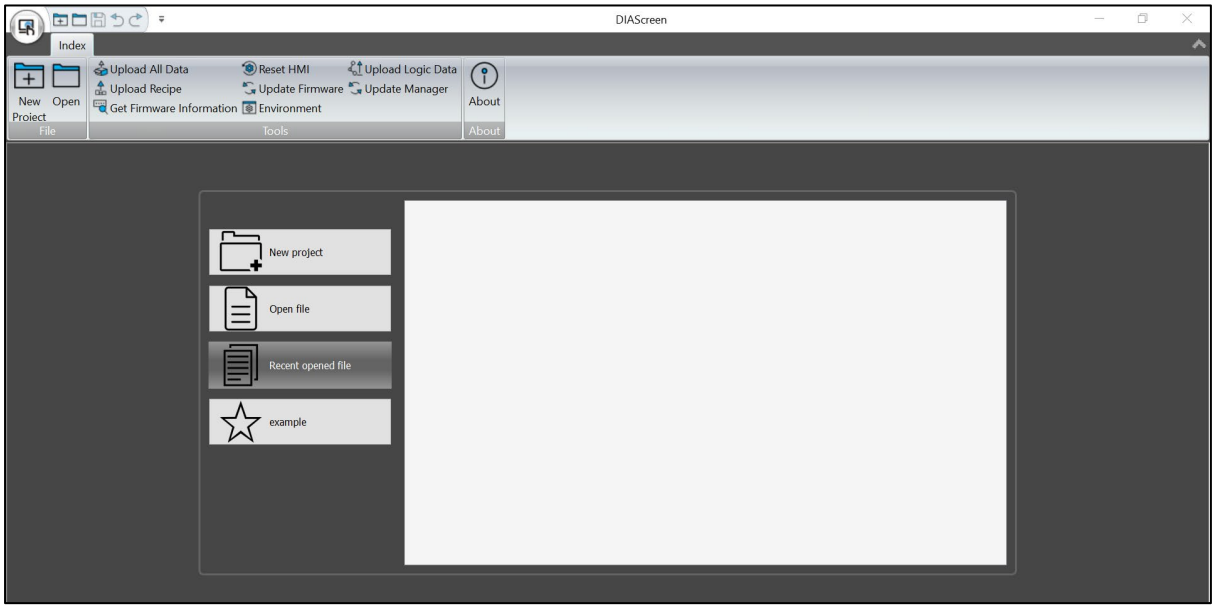


Figure 1 - 4: DIAScreen on launch

Chapter 2: Basic Operation

2.1 How to Create a Project

The following describes the DIAScreen startup screen and how to create a project, with a simple example.

2.1.1 DIAScreen Startup

The DIAScreen startup screen includes Menu bar and sample selection window, as shown in the following figure.

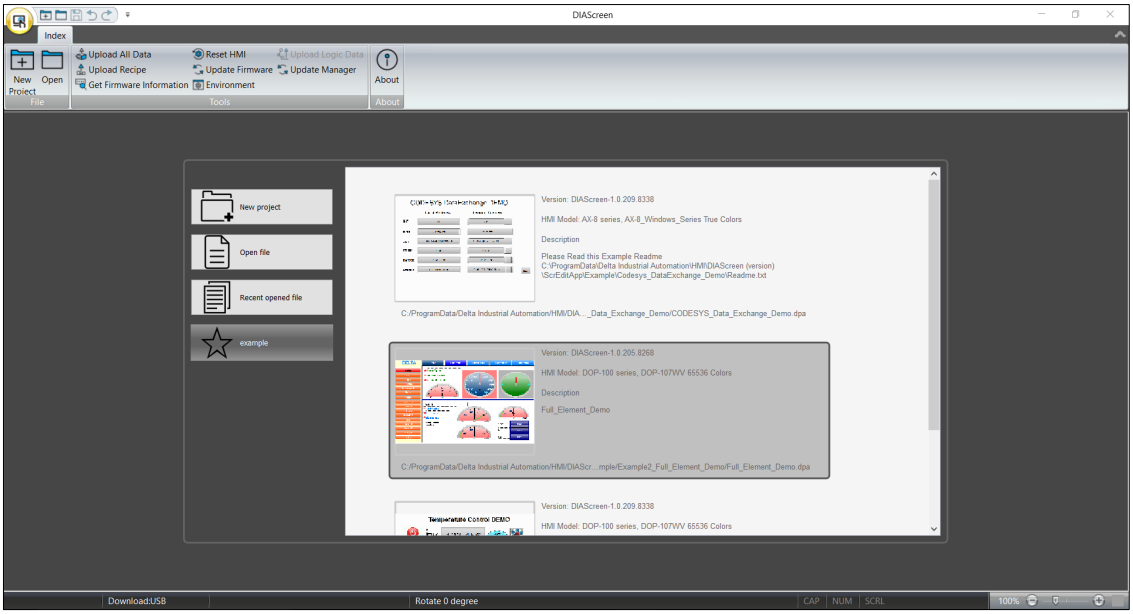
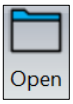
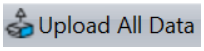
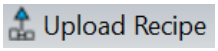
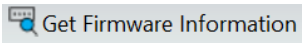
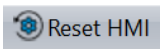
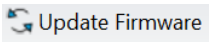
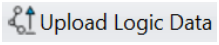
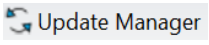
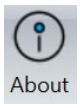
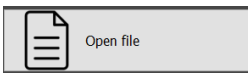
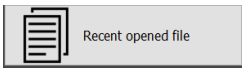


Figure 2 - 1: DIAScreen start up screen

The following table describes the **DIAScreen startup screen** function.

Icon	Description
	Click  icon to open a new **Project Wizard** window. Refer to *Section 2.2.1.1 New Project*.

Icon	Description
	Click  to open a saved Project file. Refer to *Section 2.2.1.2 Open*.
	Upload Project content from the HMI. Refer to *Section 2.2.3.5 Upload All Data*.
	Upload Recipe from the HMI. Refer to *Section 2.2.3.8 Upload Recipe*.
	This function provides information about current HMI firmware version. Refer to *Section 2.2.3.12 Get Firmware Information*.
	Restore HMI to the original factory settings. Refer to *Section 2.2.3.13 Reset HMI*.
	Update firmware version of the HMI. Refer to *Section 2.2.3.11 Update Firmware*.
	Refer to *Section 27.3 Environment*.
	Upload logic data to a computer for editing. Refer to *Section 2.2.3.15 Upload Logic Data*.
	Upload, download, and install HMI using the Update Manager. Refer to *Section 2.1.1.1 Update Manager*.
	Click  icon to display application version information and supported models. Refer to *Section 2.2.3.25 About*.
	Click  icon to add a new project. Refer to *Section 2.2.1.1 New Project*.
	Click  icon to open file. Refer to *Section 2.2.1.2 Open*.
	Refer to *Section 2.1.1.2 Recent Opened File*.
	Refer to *Section 2.1.1.3 Example*.

2.1.1.1 Update Manager

Download, install, and update various series of HMI firmware using **Update Manager**.

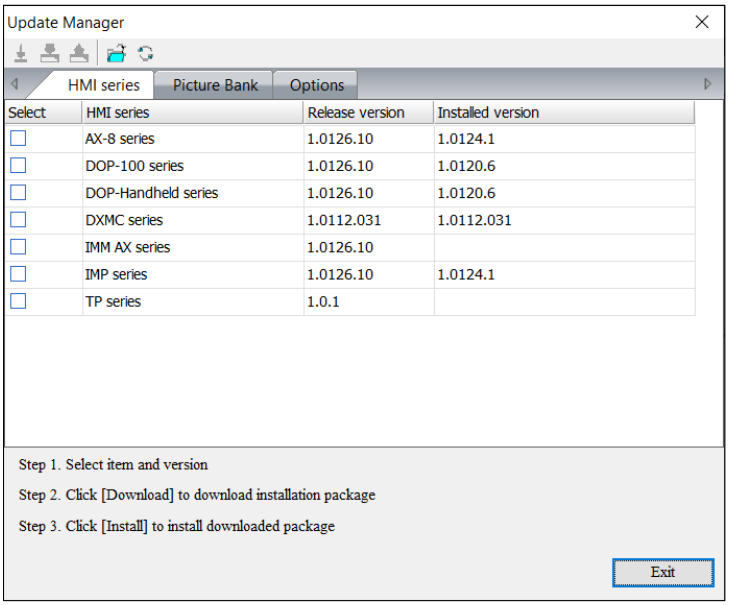


Figure 2 - 2: Update Manager

The following table describes the **Update Manager** icons.

Icon	Description
	Download the selected HMI series.
	Install the selected HMI series.
	Uninstall the selected HMI series.
	Open the Download folder.
	Check for Updates.

Follow the steps to download and install the HMI firmware.

1. Click Update Manager icon in the Toolbar to launch the **Update Manager** window. After selecting the required HMI series in the window, click icon to download. Once completed, the dialog box appears as follows.

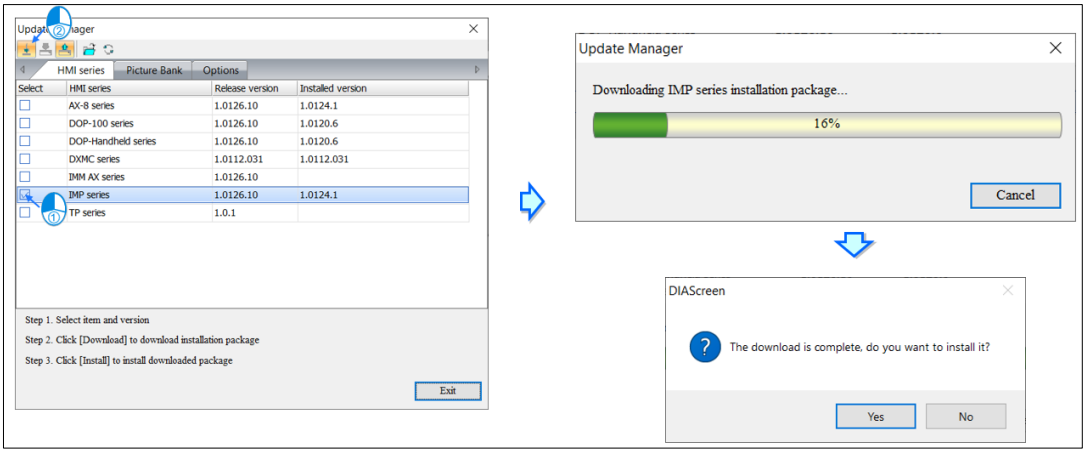


Figure 2 - 3: Update Manager process

2. Click icon to display the installation progress bar as shown in the following figure.

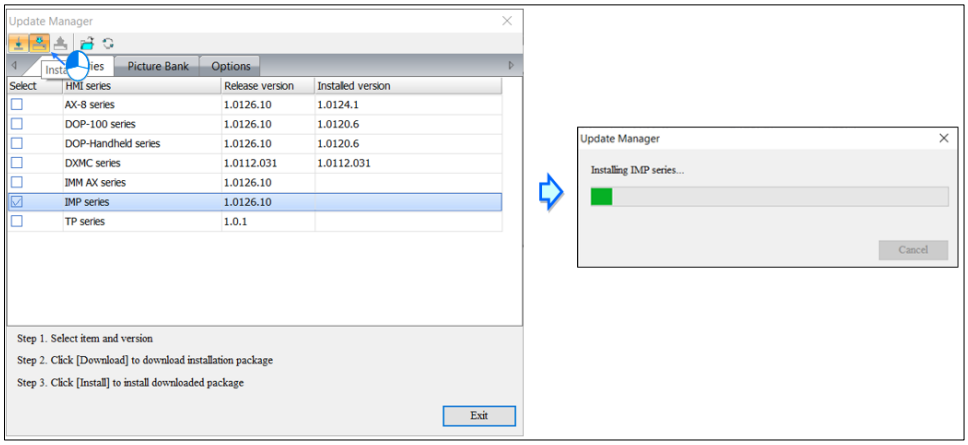


Figure 2 - 4: Install Firmware

3. After the firmware installation is complete, it appears in the **Installed Version** (column name).

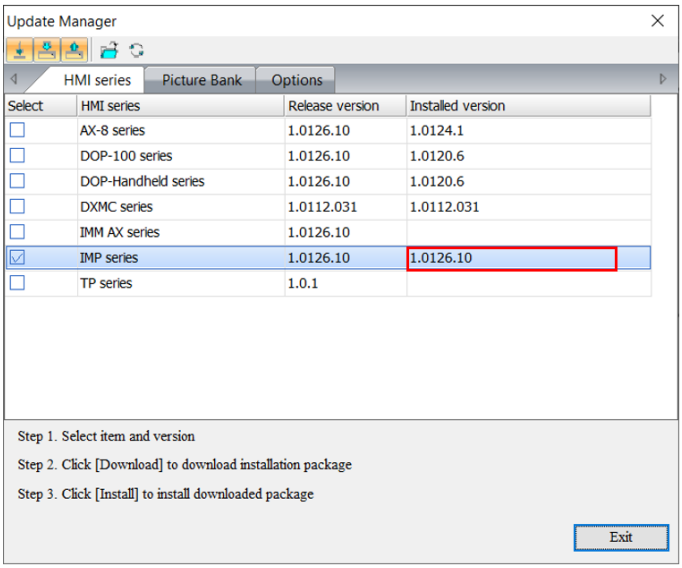


Figure 2 - 5: Firmware installation is complete

4. Click **Exit** or Close button to exit the **Update Manager** window.

2.1.1.2 Recent Opened File

The recently opened projects by the users are shown here.



Figure 2 - 6: Recent opened file window

2.1.1.3 Example

Access three project samples in **example** as shown in the following figure. Users can also edit and save this as a project.

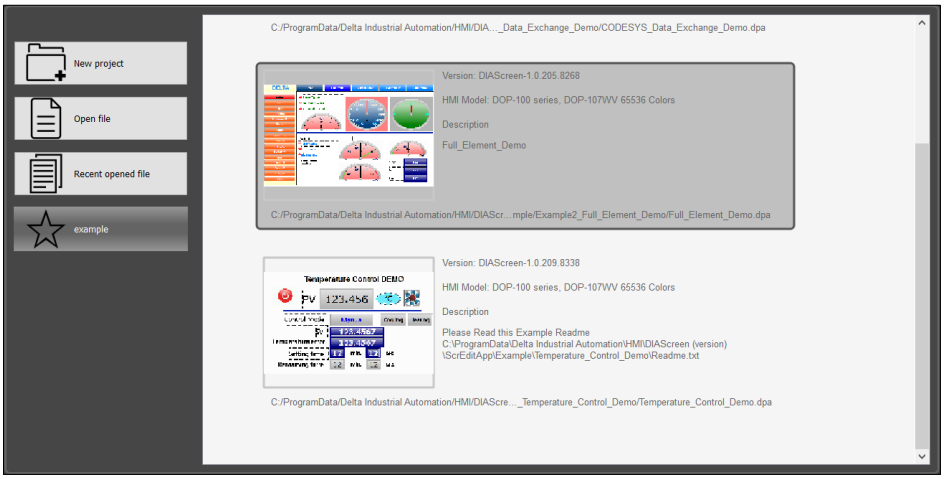


Figure 2 - 7: Project Example window

2.1.2 Create a Project Flowchart

The following flowchart explains the basic steps to create a project.

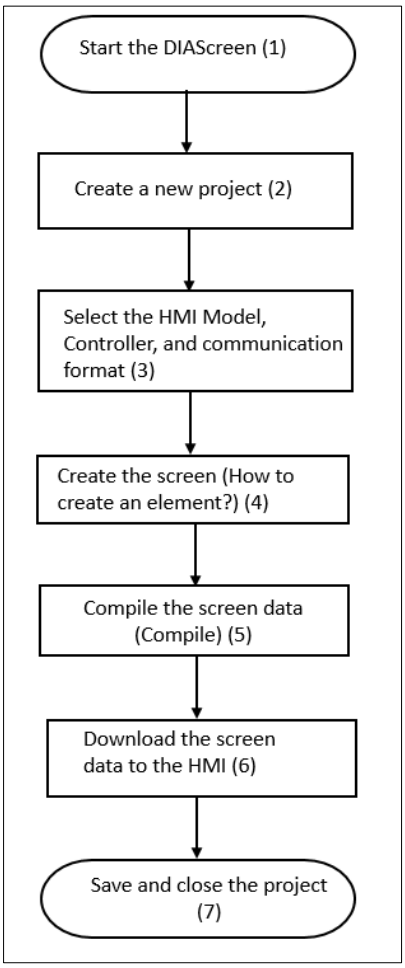


Figure 2 - 8: Flowchart to create a project

The steps are described as follows.

1. Launch DIAScreen application using the following steps:

   a. Go to desktop and double-click 

icon.

   Or

   b. Click **Start** > **All Programs** > **Delta Industrial Automation** > **DIAScreen**.

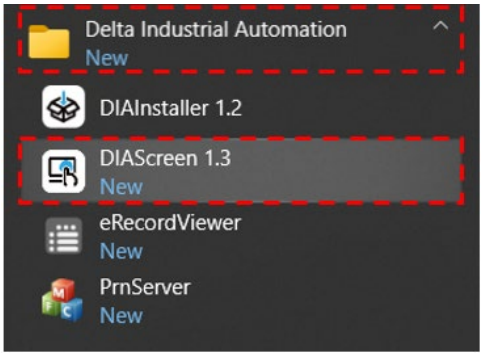


Figure 2 - 9: Open DIAScreen application

2. Create a **New Project**.

   a. After the application opens, click  icon in Quick Access Toolbar to create **New Project**.

   Or

   b. Click **Index** > **File** >  icon to add a **New Project**.

   Or

   c. Click **Start Menu**  > **New Project** to create a new project.

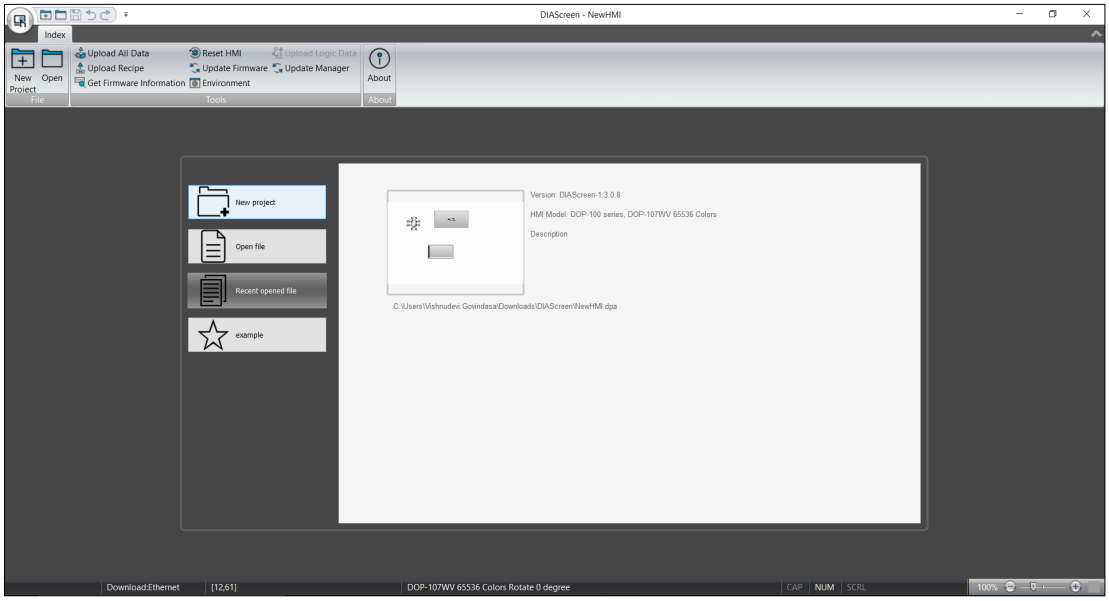


Figure 2 - 10: Create - New Project

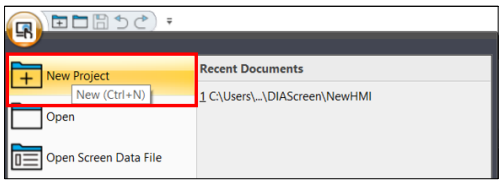


Figure 2 - 11: New Project

Result: A **Project Wizard** window appears to guide users.

3. Select HMI model, Controller, and Communication Format.

   a. Select the **HMI Model Type** such as **DOP-110WS** and name the project **Test** as an example in the **Project Wizard** window. Then proceed as follows:

      i. Select **HMI series**.

      ii. Select **HMI List**.

      iii. Enter the **Project Name**.

      iv. Click **Next**.

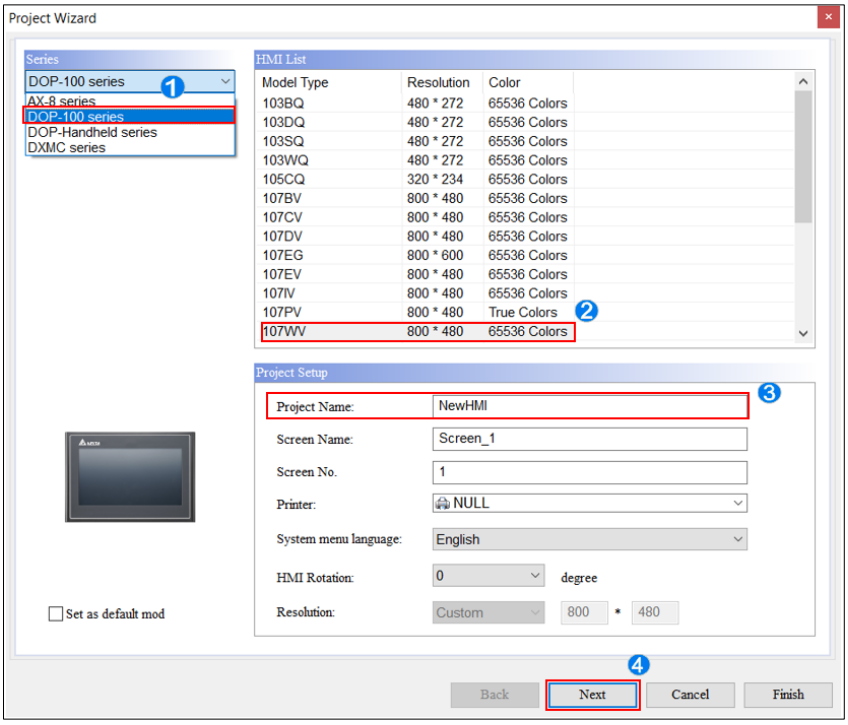


Figure 2 - 12: Select HMI Model Type and set up Project Name

b. Select the Communication port, Controller, and Communication format. Also select the required port COM1, COM2 or COM3 using the up and down arrows in the upper left corner. The following figure is an example to select **COM2** and the controller is **Delta DVP PLC**.

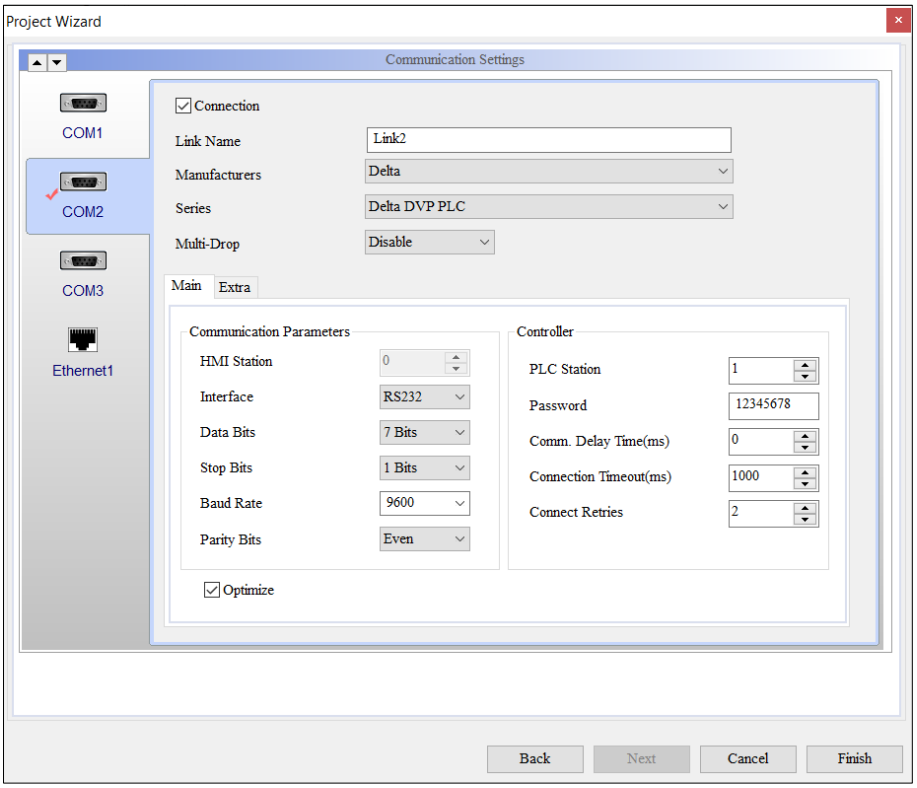


Figure 2 - 13: Select Port, Controller and Communication format

4. Creating the screen (how to create an element)

   a. Follow the **Project Wizard** window to create a **New Project**. Then edit the screen and create elements also.

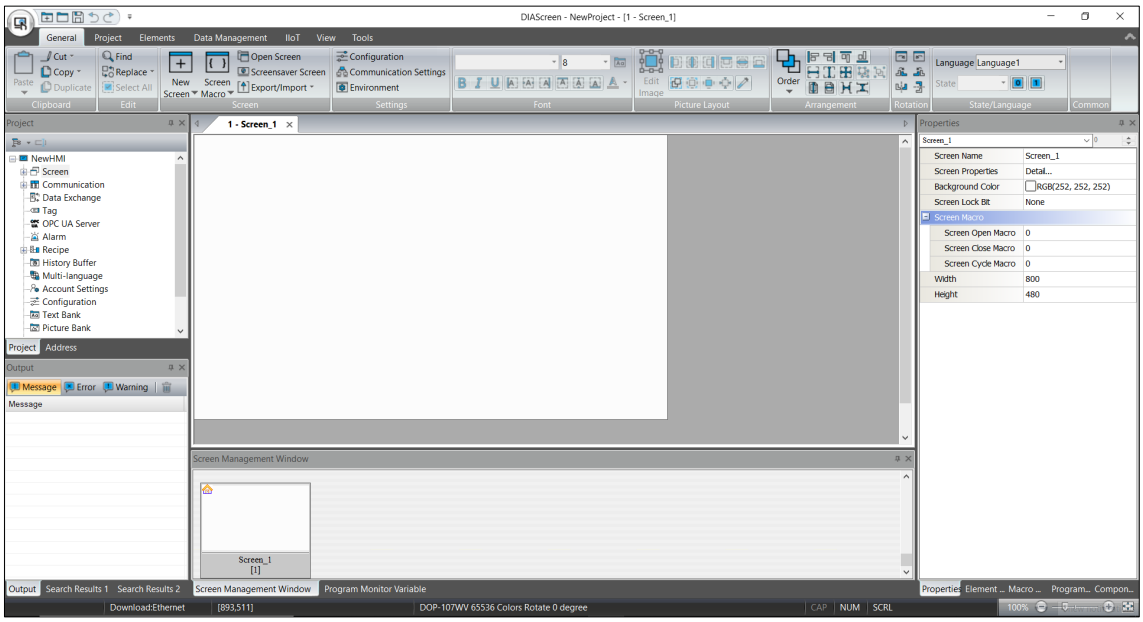


Figure 2 - 14: Edit screen

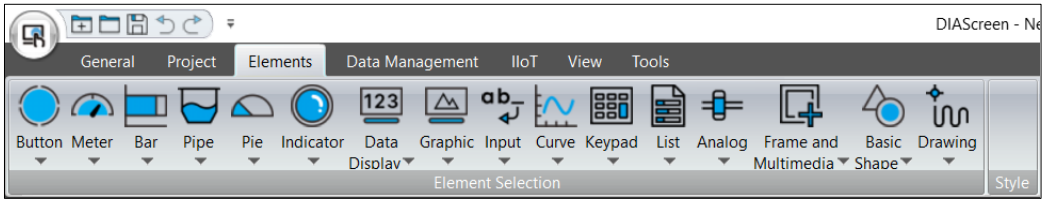
In the Menu bar, click **Elements** > **Button** > **Set to On**, **Set to Off**, **Momentary** and **Maintained Button** elements.

Or

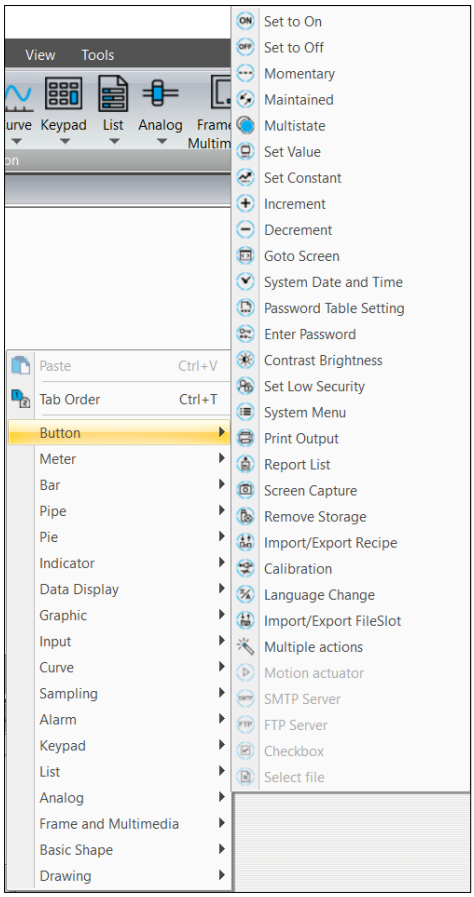
Right-click **Screen** > **Button** > **Set to On Button** element.

The following table describes **Menu bar** with the figures.

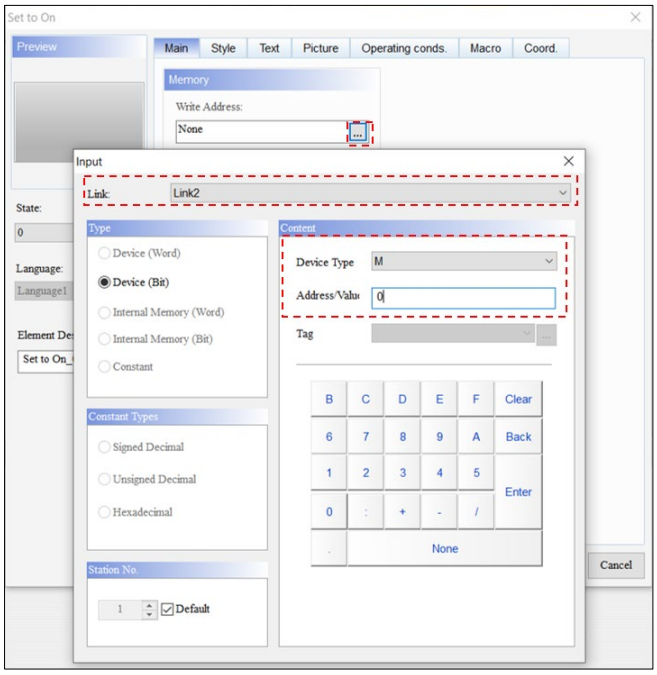
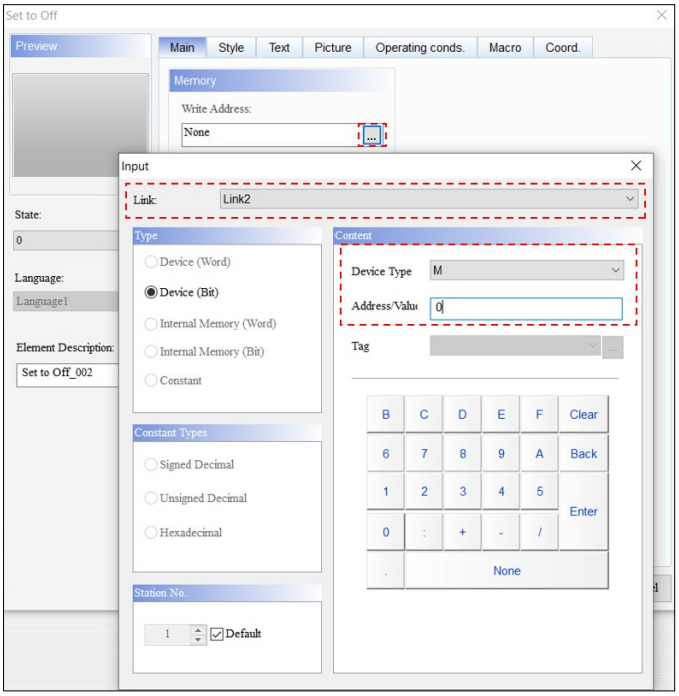
Method 1: Menu Bar



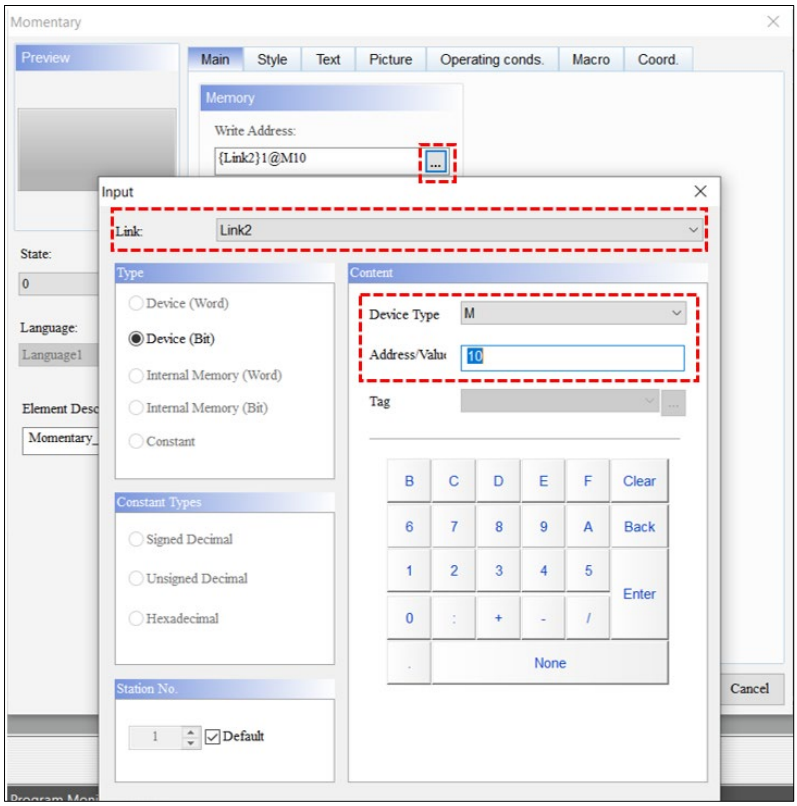
Method 2: Right-click in the Editing Screen

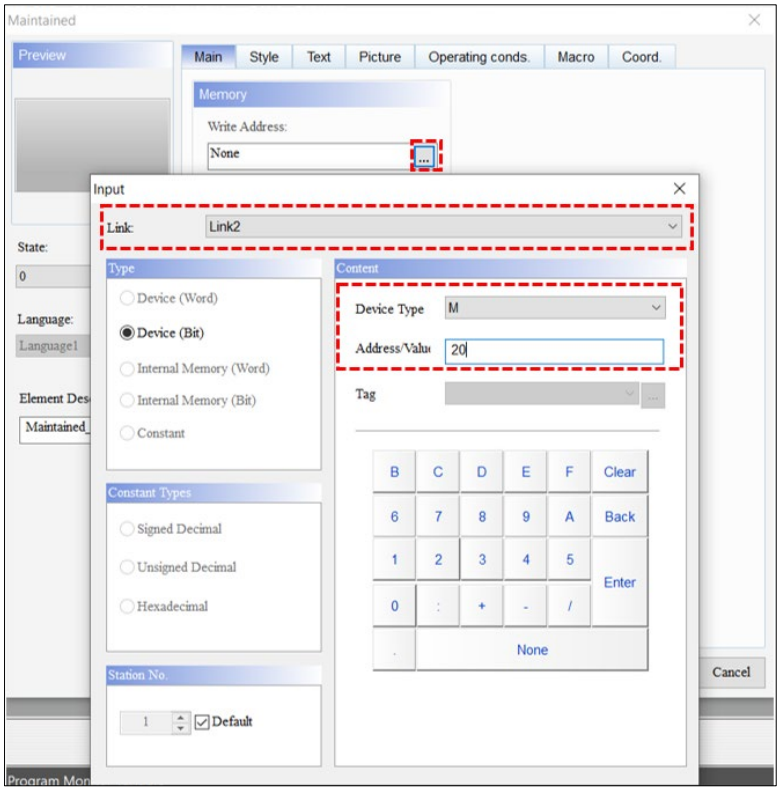


b. Create **Buttons** through the menu bar list **Set to On**, **Set to Off**, **Momentary**, **Maintained** and **Multistate Indicator Button** elements, and enter the memory address for all the **Button** elements. The following table describes the steps to create the **Button** element.

Steps to Create Button Element	
Step 1	● Click **Elements** > **Button**. Select **Set to On**, **Set to Off**, **Momentary**, and **Maintained Button** elements. ● Double-click **Button** element to set the memory address with the **Properties** window on the right. Set the **Write Address** of **Set to On** and **Set to Off** to M0; the **Momentary Button** element to M10; the **Maintained Button** element to M20.  

Steps to Create Button Element

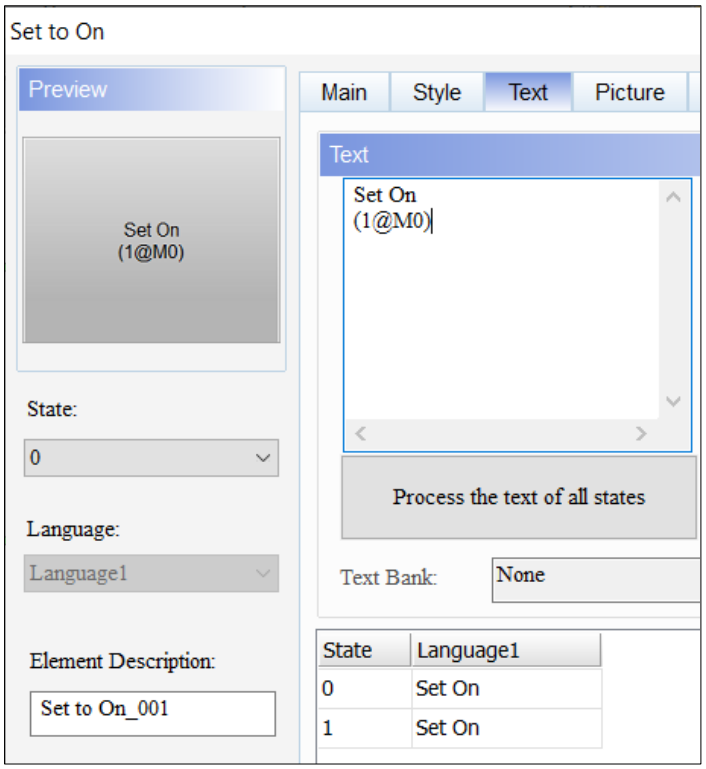




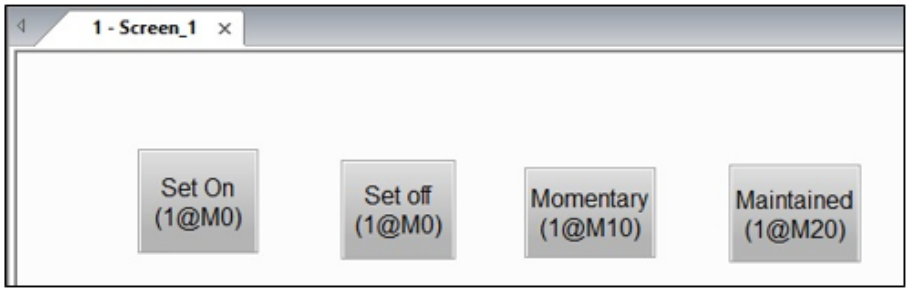
- Double-click **Button** element, and go to **Text** property page to enter the required text. Enter Set On (1@M0) in both State 0 and State 1 of **Set to On Button** element. Enter Set Off (1@M0) in both State 0

Steps to Create Button Element

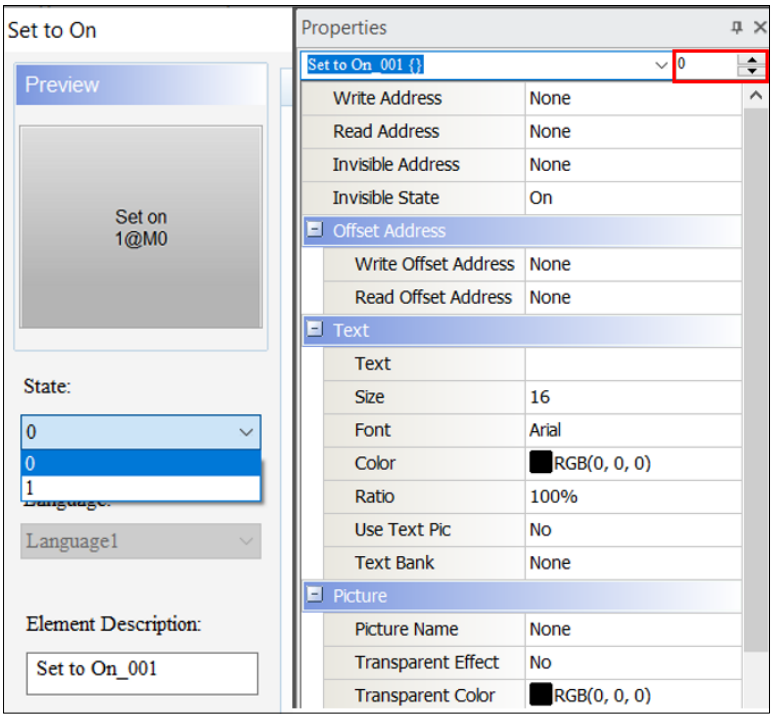
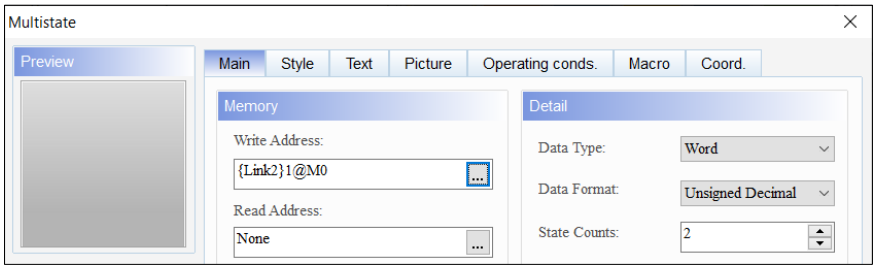
and State1 of **Set to Off Button** element. Enter Momentary (1@M10) in both State 0 and State 1 of **Momentary Button** element. Enter Maintained (1@M20) in both State 0 and State 1 of **Maintained Button** element.



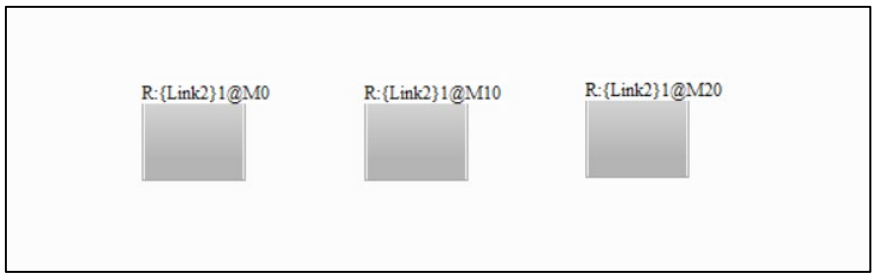
- **Set to On**, **Set to Off**, **Momentary**, and **Maintained Button** elements appear on screen as shown in the following figure.



***NOTE**: **Set to On**, **Set to Off**, **Momentary**, and **Maintained Button** elements all have the actions of State 0 and State 1. Double-click element to enter State 0 and State 1 or use the upper right corner of the **Properties** window to view State 0 or State 1.*

Steps to Create Button Element	
	
Step 2	● Click **Elements** > **Indicator** > **Multistate Indicator**. Users need to create three **Multistate Indicator** elements corresponding to **Write Address** of **Set to On**, **Set to Off**, **Momentary** and **Maintained Button** elements. ● Double-click elements. Use the **Properties** window to set the memory address. The memory setting method is the same as the **Button** elements, and the **Data Type** is set to Bit and the **State Counts** is set to 2. a. Set the **Write Address** of the **Multistate Indicator** element, 1. M0 to correspond to Set to On and Set to Off. 2. M10 to correspond to the Momentary. 3. M20 to correspond to the Maintained. 

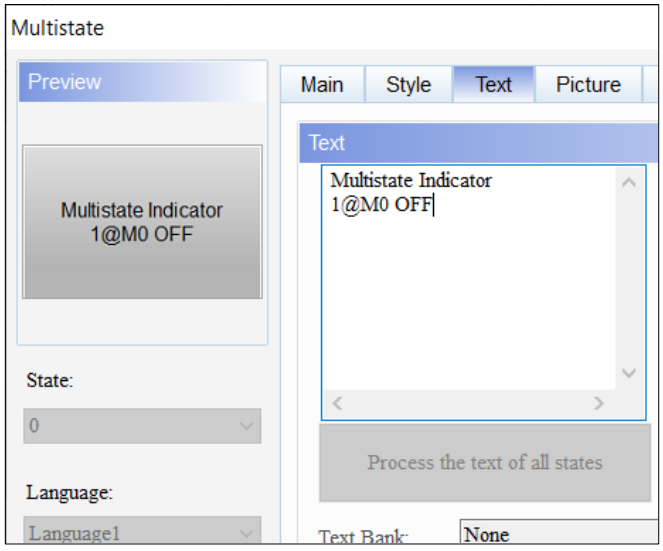
Steps to Create Button Element



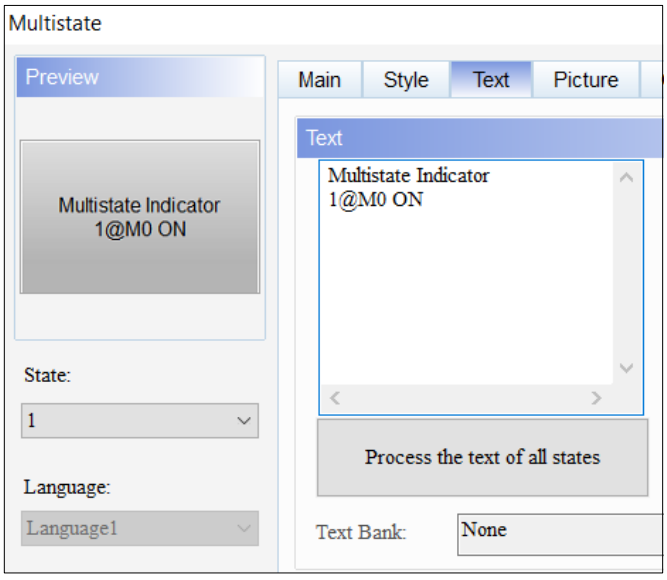
- Double-click element, go to the **Text** property page to enter the required text.

1. Enter the input Multistate Indicator (1@M0) OFF for State 0, the input Multistate Indicator (1@M0) ON for State 1.

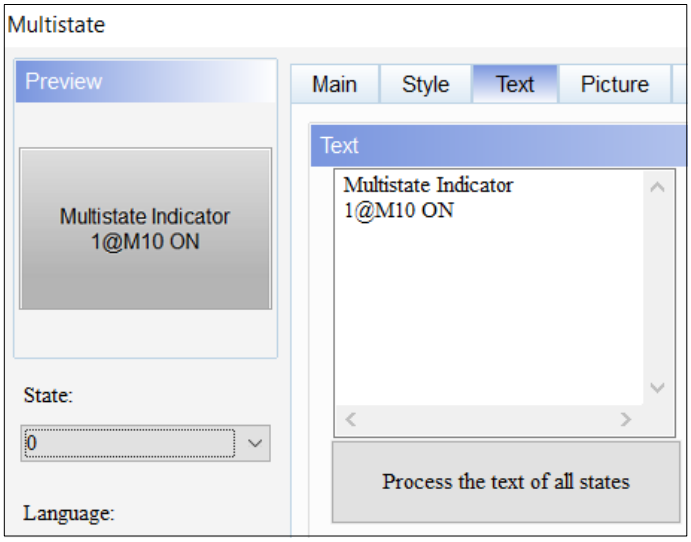
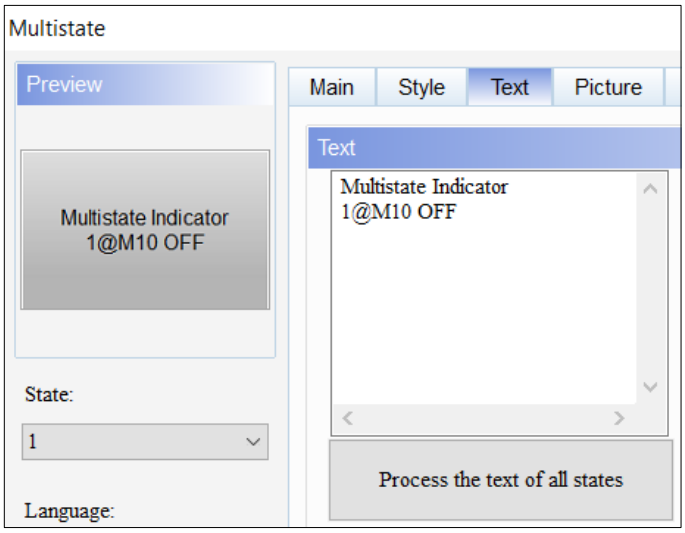
State 0

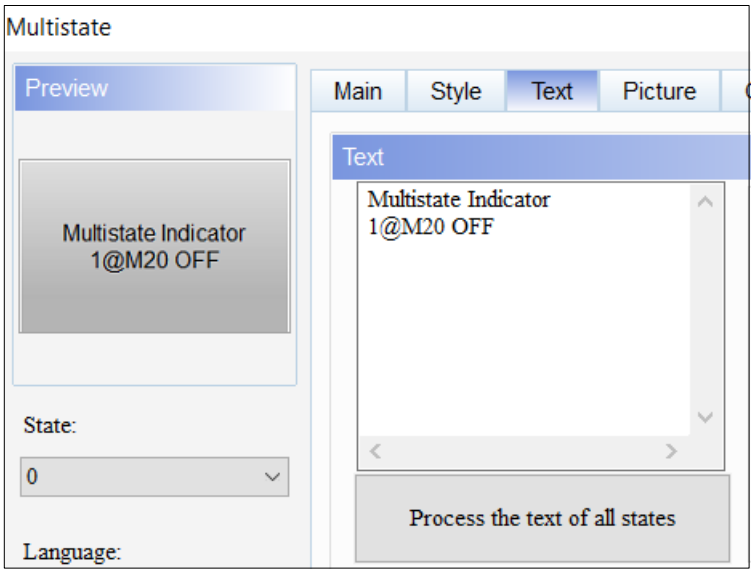
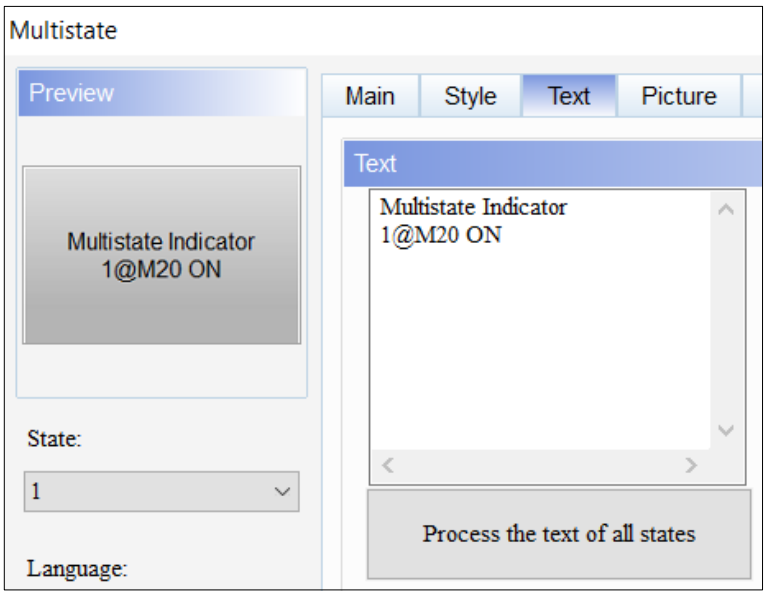


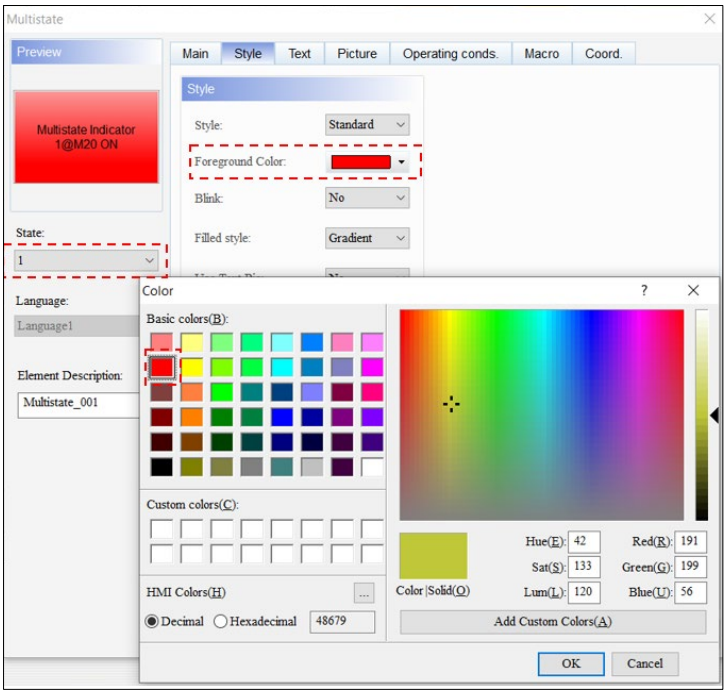
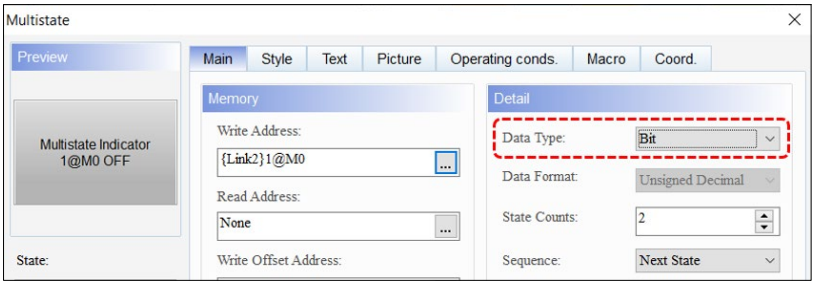
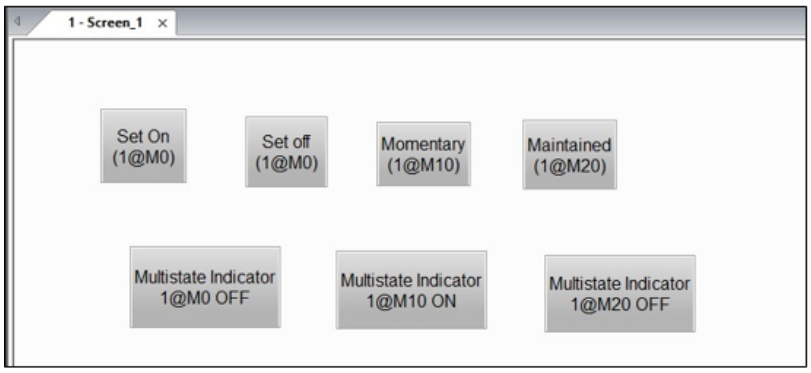
State 1



2. Enter the input Multistate Indicator (1@M10) ON for State 0; the input Multistate Indicator (1@M10) OFF for State 1.

Steps to Create Button Element		
	State 0	
	State 1	
	3. Enter the input Multistate Indicator (1@M20) OFF is State 0; the input Multistate Indicator (1@M20) in State 1 is ON.	

Steps to Create Button Element		
	State 0	
	State 1	
	Double-click three **Multistate Indicator** elements, and go to **Style** property page to change the **Foreground Color** of the element of State 1 to red, to show the difference between State 0 and State 1.	

Steps to Create Button Element	
	 ***NOTE**: The **Multistate Indicator** element changes its state value according to the **State Counts**. In order to correspond to **Set to On**, **Set to Off**, **Momentary**, and **Maintained**, there are two states (State 0 and State 1). Double-click element to set the **State Counts** in the **Main** property page.* 
Step 3	After creating elements, the screen appears as shown in the following figure. 

5. Compile the Screen data (Compile)

   After creating all elements, **Compile** elements on the screen to check for errors. The compilation screen is to make sure that the input memory address and memory format used are correct. Go to **Project** > **Compile All** in the Menu bar.

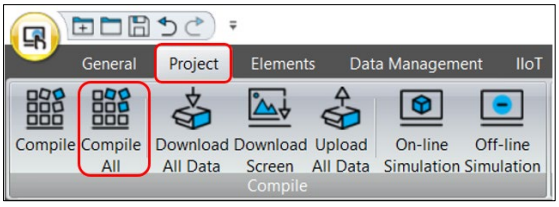


Figure 2 - 15: Compile All

After compiling, the following message appears.

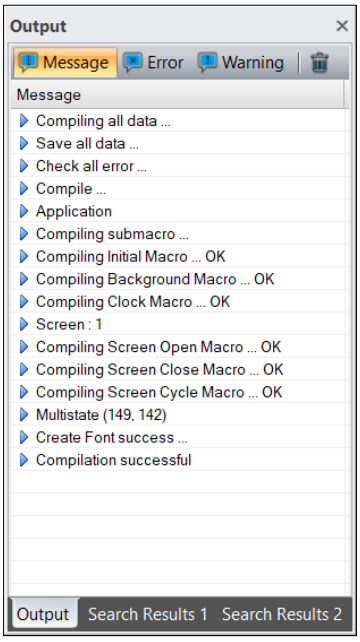


Figure 2 - 16: Output window

6. Download screen data to the HMI

   When the compilation and display are successful, it means that the screen has no errors, and users can start downloading the screen data to the HMI. There are two ways to download screen data, as follows:

Method 1: Go to **Menu bar** > **Project** > **Download All Data**.

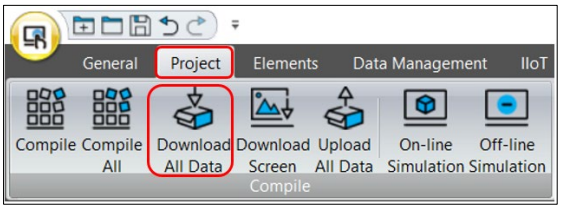


Figure 2 - 17: Download All Data

Method 2: Press **Ctrl** + **F8** on the keyboard.

Make sure the USB cable is connected between the HMI and PC and the PLC communication cable is connected to COM2. Start downloading screen data to the HMI. Then, the application displays the downloading progress, as shown in the following figure.

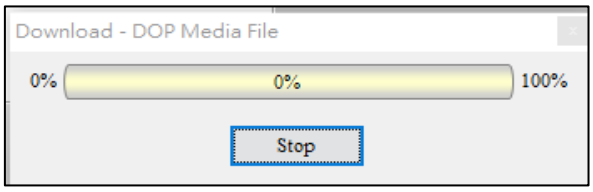
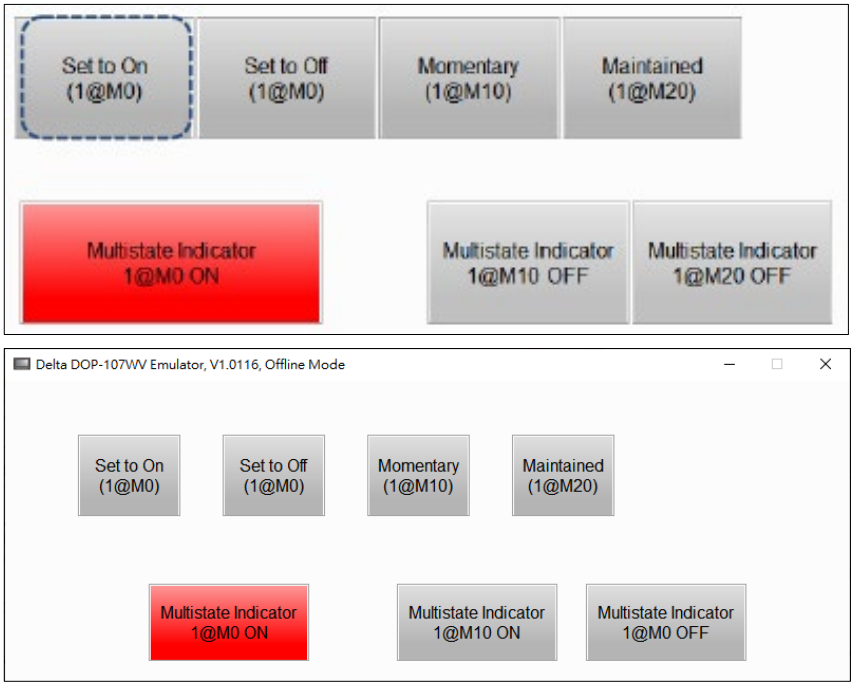
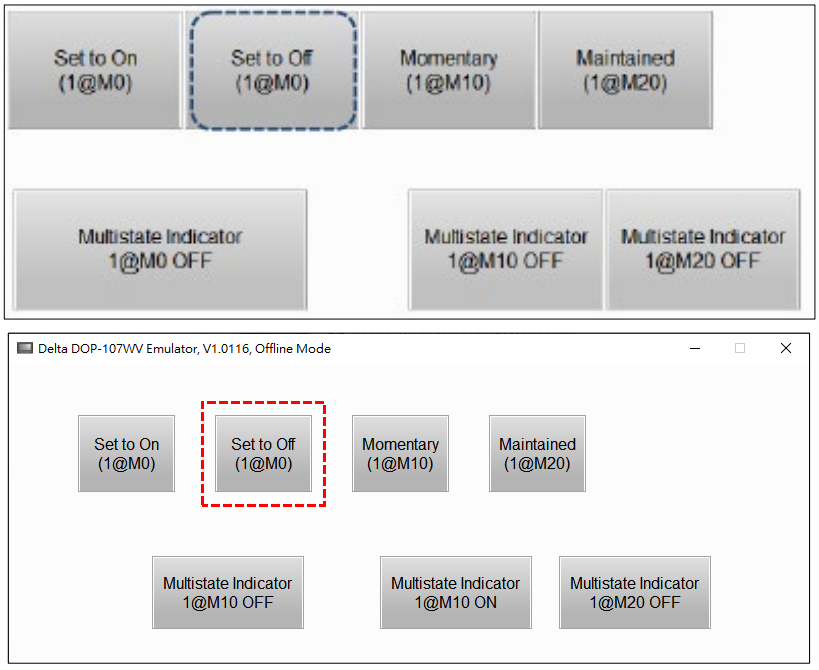
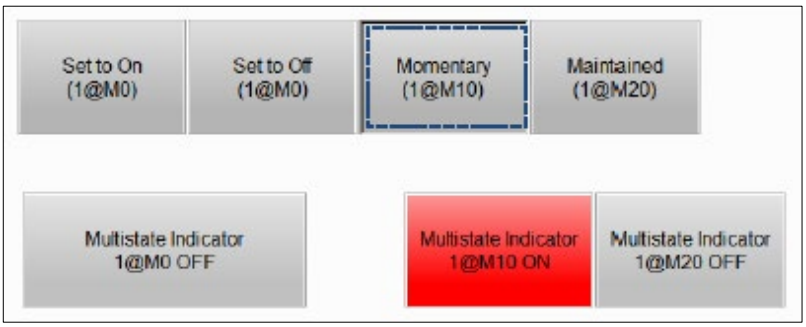
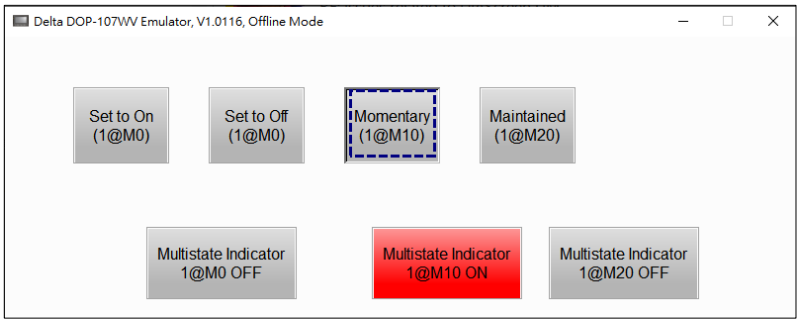
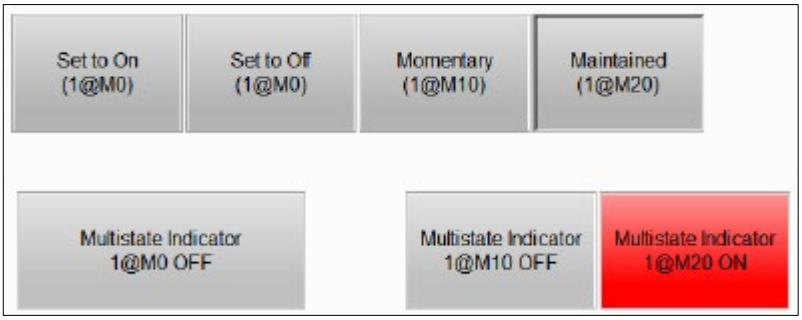
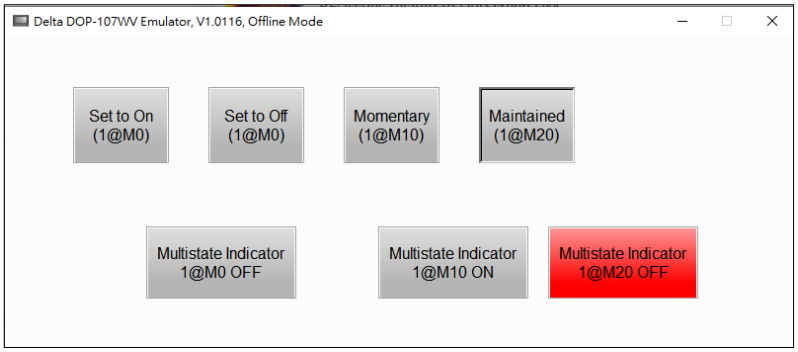


Figure 2 - 18: Download screen data

a. After downloading the screen data, check the screen is the same as the screen edited on the computer and there are any error messages on the HMI.

b. Following table describes the actions of Button elements.

Button Elements	
Item	**Description**
Set to On	Press the **Set to On Button** element, the Multistate Indicator 1@M0 displays ON. 
Set to Off	Press the **Set to Off Button** element, the Multistate Indicator 1@M0 displays OFF. 

Button Elements	
Item	**Description**
Momentary	If users press the **Momentary Button** element, the Multistate Indicator 1@M10 displays ON. Once users release the **Button** element, the Multistate Indicator 1@M10 displays OFF.  
Maintained	Press the **Maintained Button** element, the Multistate Indicator 1@M20 continues to display ON. To cancel the ON state, press the **Maintained Button** element again.  

7. **Save** and **Close** the project.

Users need to save the edited screen before closing the project. There are following three methods to save projects:

Method 1: Go to **Menu bar** > **Save**.

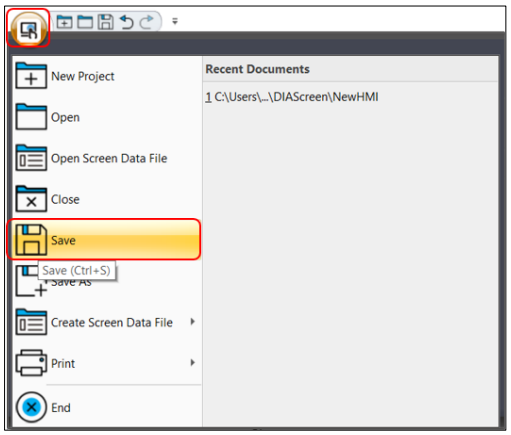


Figure 2 - 19: File Save icon

Method 2: Use the quick toolbar  and select  icon.

Method 3: Press **Ctrl** + **S** on the keyboard.

Once users save the project, the application prompts to select the path to save and enter the file name. If users follow the project wizard to create a project, the default project name is **Test**, so the file name remains Test after users click **Save**. Users can also change the file name and this action does not affect the operation of the project.

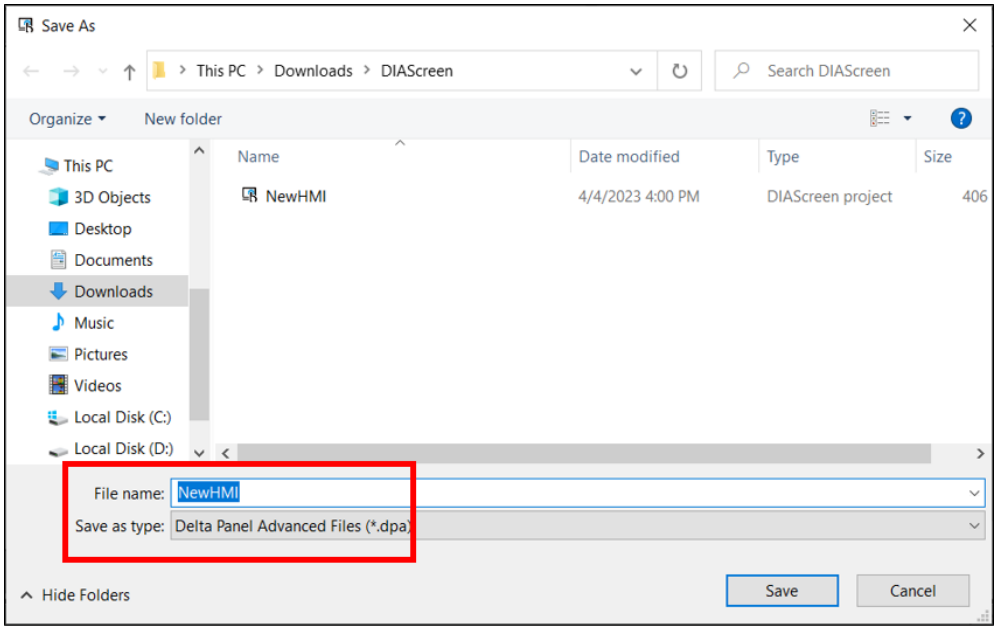


Figure 2 - 20: Save As window

After saving, go to the saved path to check whether the project file is saved. To re-open it again, double-click file, or directly launch the DIAScreen program, and **File** > **Open**, as shown in the following figure.

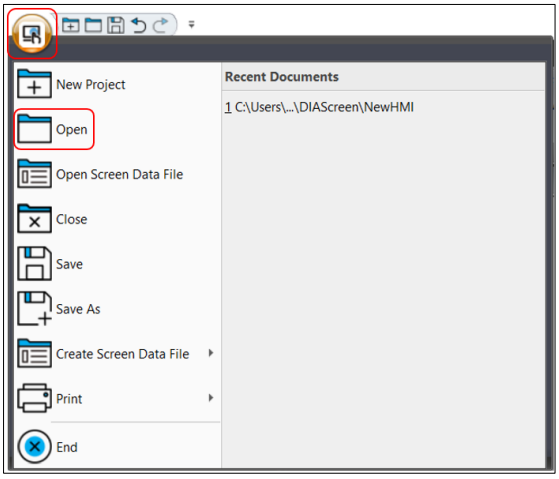


Figure 2 - 21: Open file

Click  icon on the quick toolbar  to open an existing file.

2.2 Windows Menu

DIAScreen editing window has seven different functions: Menu bar, General, Project, Elements, Data Management, IIoT, View and Tools. These functions are described as follows.

- Menu bar

  DIAScreen application provides seven menus in Menu bar as shown in the following figure.

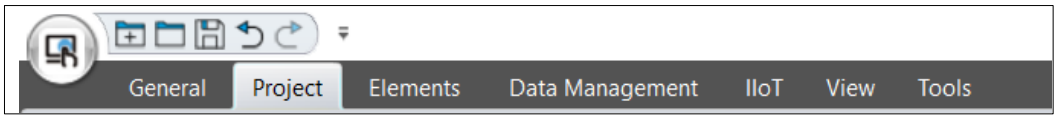


Figure 2 - 22: DIAScreen Menu bar

- Element Bank window

  The **Element Bank** window contains the **Element library** to store the edited elements. Save the edited elements in the **Element Bank**, and to reuse it next time, just drag and drop it to the screen editing window.

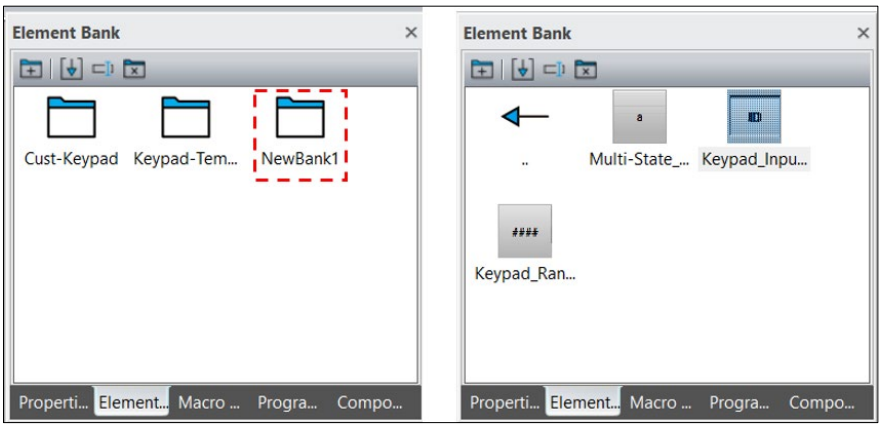


Figure 2 - 23: Element Bank

Follow these steps to create an **Element Bank**:

1. Click  icon to **Element Bank** page first.
2. Click  icon to create a new element bank.
3. Create an element.
4. Click  icon to **Import** the elements.

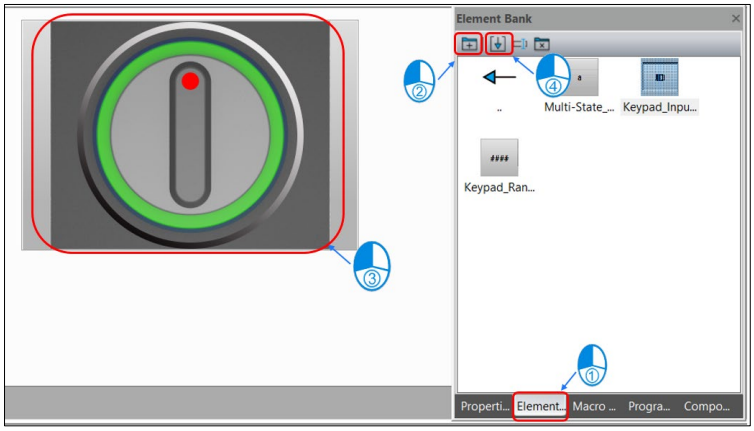


Figure 2 - 24: Steps to create Element Bank

- Properties window

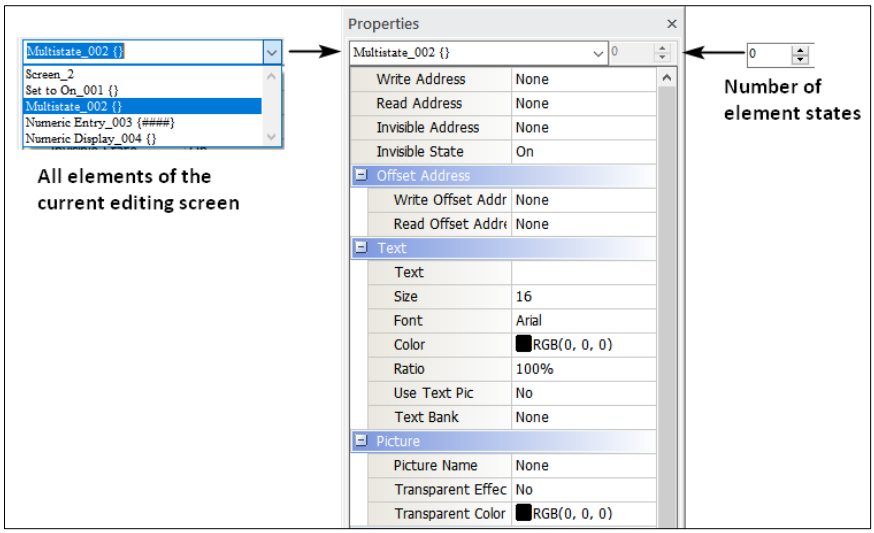


Figure 2 - 25: Properties window

- Output window

  Record the data edited by users and the output information after the screen is compiled. Once users select the **Compile All**. DIAScreen compiles the program. After the compilation is completed, view the error, warning and messages in the **Output** window. The **Message** displays all compiled data; the **Error** displays only the error message; the **Warning** displays only the warning message, as shown in the following figure. After clicking the error message, it takes to the screen having error element to debugging.

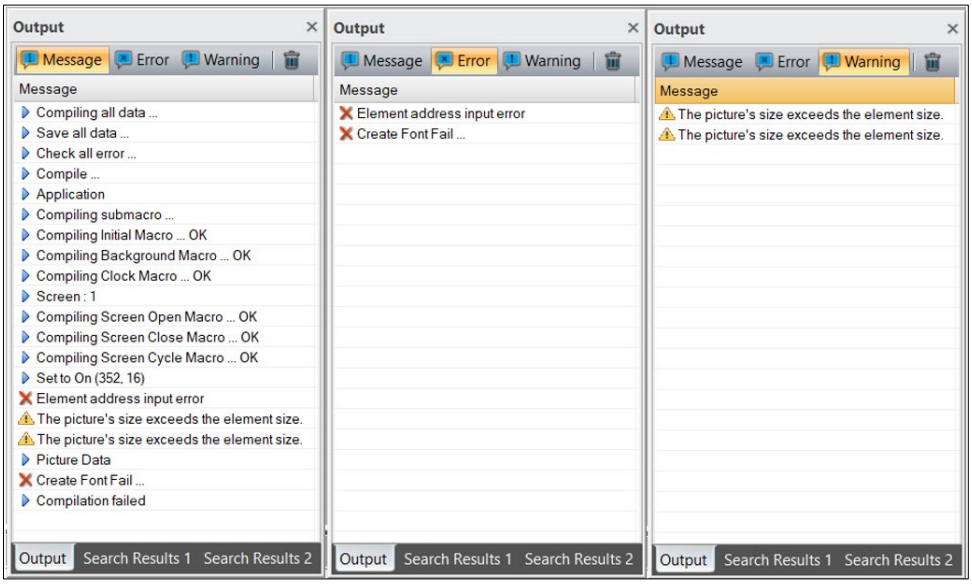


Figure 2 - 26: Output window

- Screen Management window

  Use the **Screen Management Window** to preview multiple screens. It allows to check the elements in the screen without actually switching to this screen. Double-click screen to review in the window and then quickly switch to the particular screen.

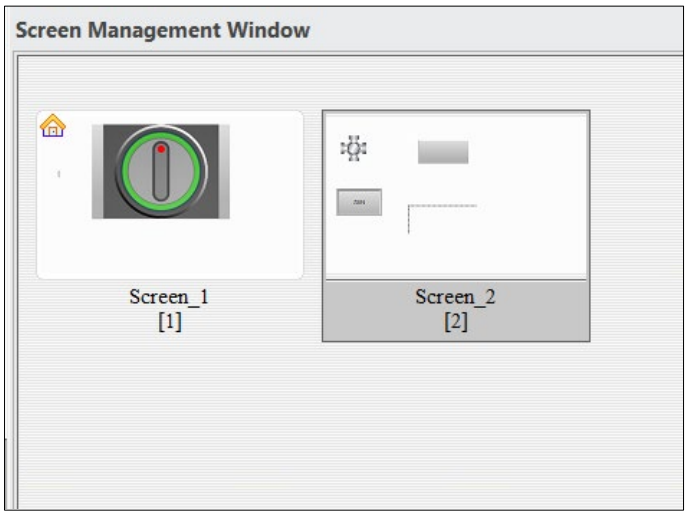


Figure 2 - 27: Screen Management Window

- Status bar

  The **Status bar** at the bottom of the DIAScreen window displays the current editing status, as shown in the following figure.

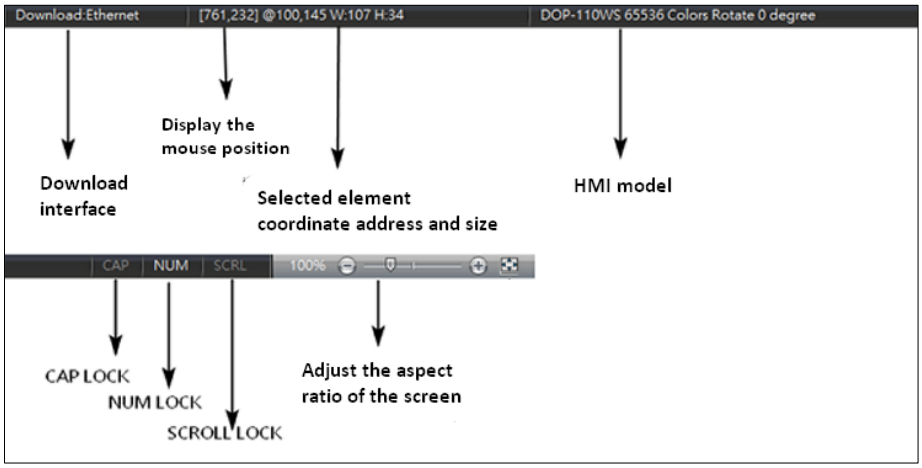


Figure 2 - 28: Status bar

- Screen editing area

  Select the necessary **Screen editing area** using the HMI.

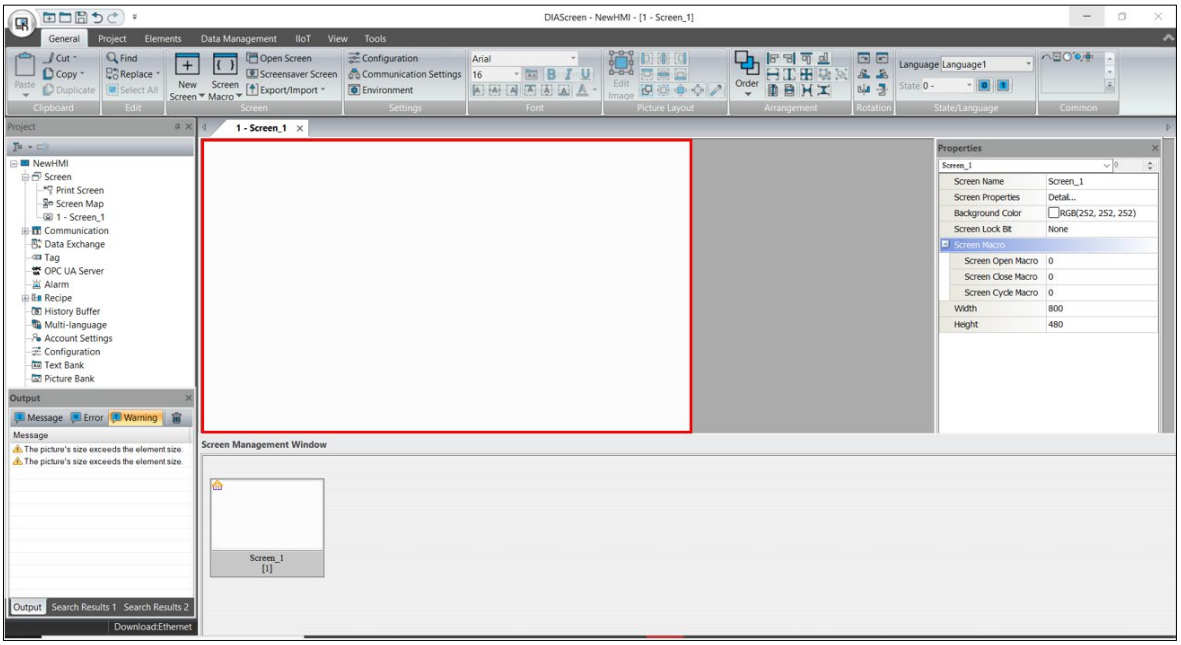


Figure 2 - 29: Screen editing area

The following are the basic Menu bar provided by DIAScreen application, such as General, Project, Elements, Data Management, IIoT, View, Tools, etc.



Figure 2 - 30: Basic Menu bar

2.2.1 DIAScreen Start Menu

DIAScreen Start Menu includes functions such as creating a new file, opening a file, etc. This chapter describes about the Start Menu functions in detail.

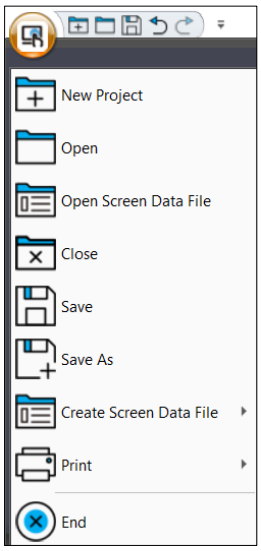


Figure 2 - 31: Start Menu

2.2.1.1 New Project

Click  icon on quick access toolbar.

Or

Press **Ctrl** + **N** on the keyboard to add a new project.

A **Project Wizard** opens displaying Series, HMI List and Project Setup. Select the necessary Model or Printer, and edit the Project Name, Screen Name, etc. After completing the basic project settings, click **Next** to configure the communication.

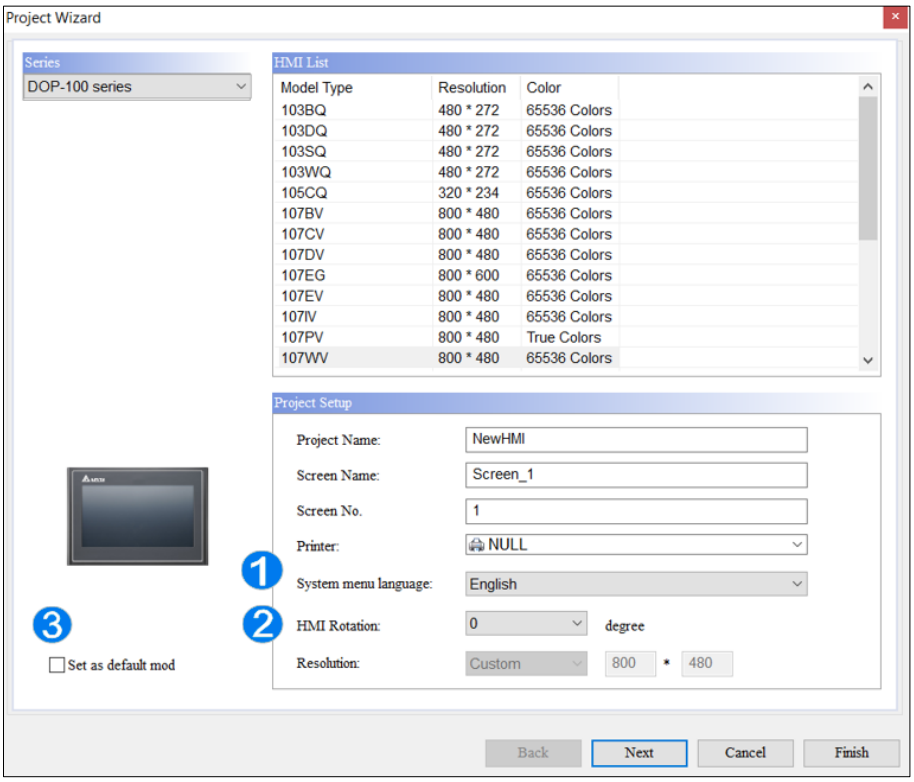


Figure 2 - 32: Project Wizard

No.	Function	Description
1	System menu language	The **System menu language** can be selected as English (English), French (French), Russian (Russian), Simplified Chinese (Simplified Chinese), Spanish (Spanish), Traditional Chinese (Traditional Chinese), Turkish (Turkish).
2	HMI Rotation	The angle of **HMI Rotation** can be selected as 0 degree, 90 degree, 180 degree, and 270 degree.
3	Set as default mod	Once the option is selected, the default display model displays directly every time a new file is opened.

In the **Communication Settings**, set the **Controller Model**, the **COM Port** or **Ethernet** to be communicated, and also set the communication parameters between the HMI and the controller. Refer to *Section 27.1 Communication Settings*.

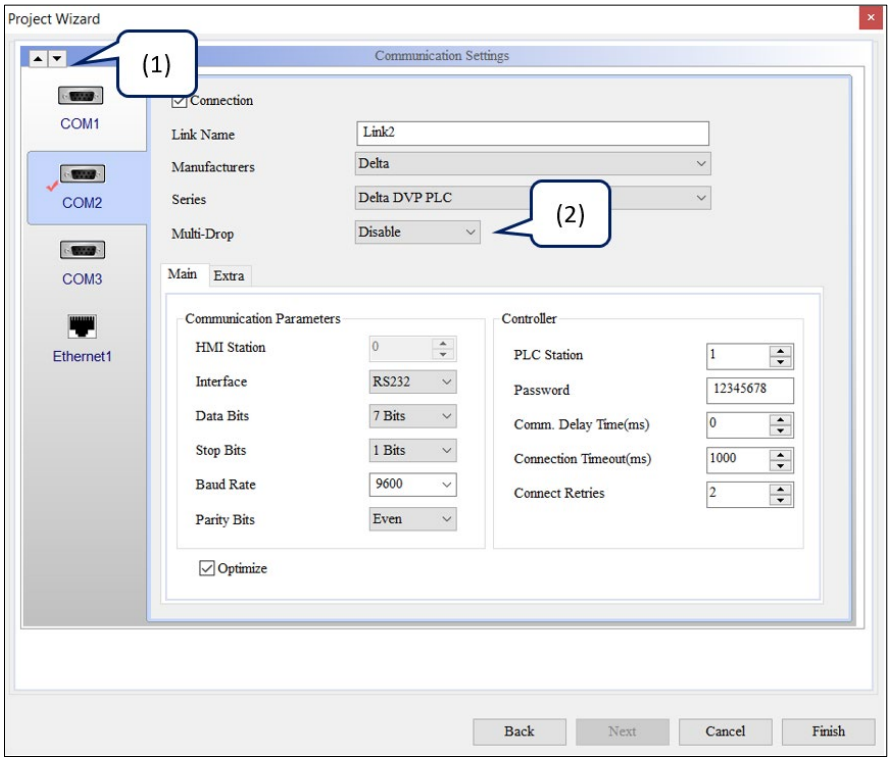


Figure 2 - 33: Project Wizard - Communication Settings

No.	Function	Description
(1)		Use up and down arrows to switch between the COM and Ethernet ports.
(2)	Multi-Drop	Enable / disable the Multi-Drop communication set up.

If the communication is **Ethernet**, click 

icon to enter the network **Controller** parameter setting, click  icon to add an Ethernet Link on the **Device** page, and set the Controller Model, Controller IP address, Communication Delay Time, Connection Timeout, parameters such as the Connect Retries.

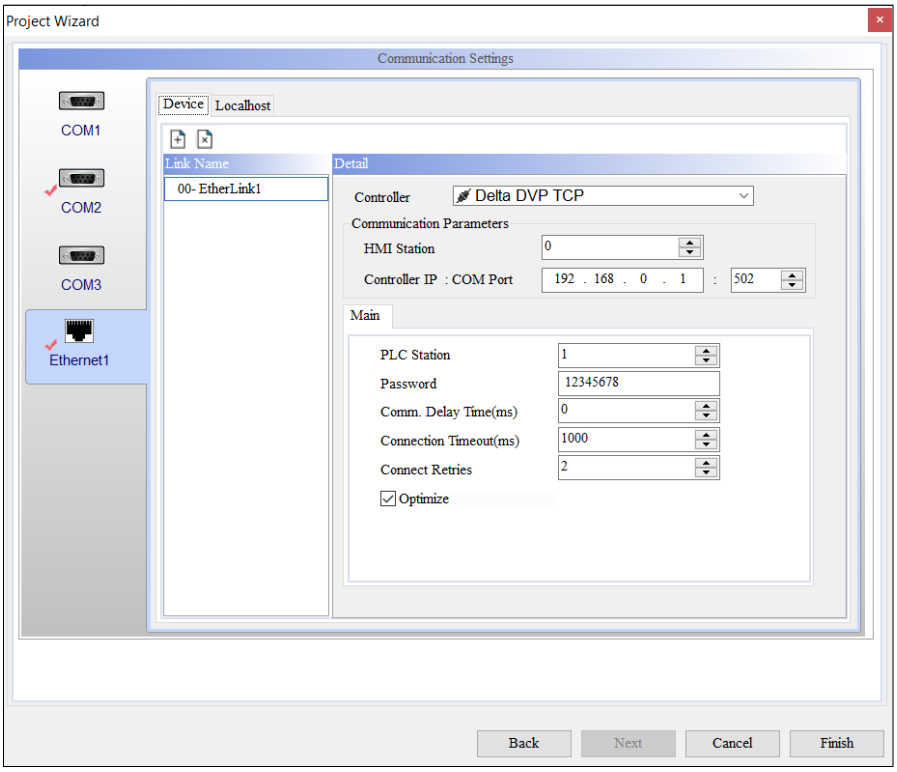


Figure 2 - 34: Project Wizard – Ethernet Communication Settings

Users account password of AX series and IMP series controllers can also be connected on this Ethernet device page. The steps are as follows.

- Models with Ethernet Port

1. Select CODESYS from the Controller drop-down menu.

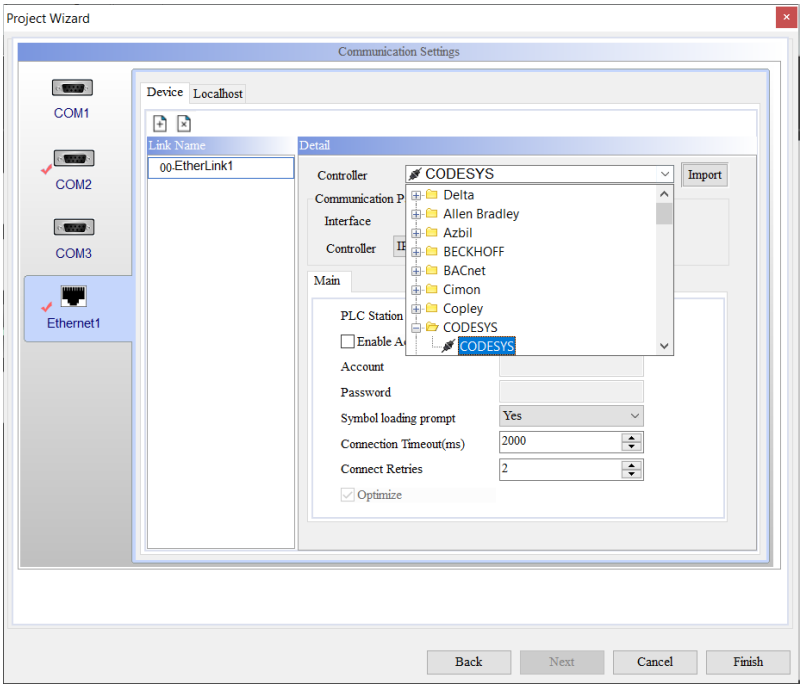


Figure 2 - 35: Communication Settings Ethernet Controller

2. After checking the **Enable Account and Password** option, enter the account and password to log in to the controller and download it to the DOP-100 series.

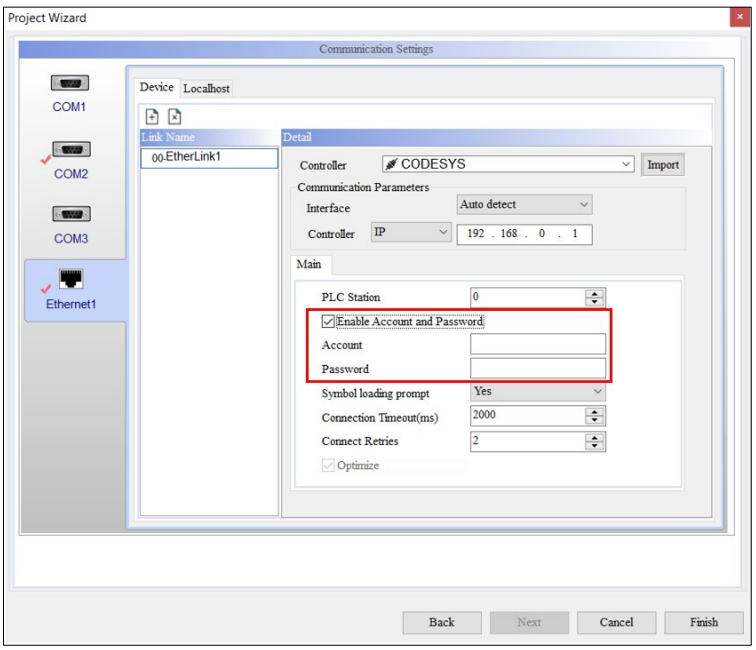


Figure 2 - 36: Enable Account and Password

- AX series / IMP series built-in HMI

1. Double-click **Built-In PLC** in the **Project** tree.

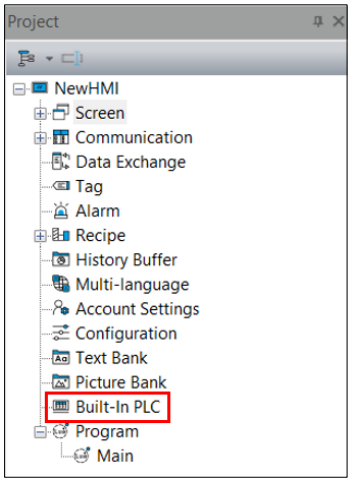


Figure 2 - 37: Project tree > Built-In PLC

2. Click icon at the top of the **Built-In PLC** tab to open the **Built-In PLC Settings** window, enter the account and password to log in to the controller and download it to the HMI.

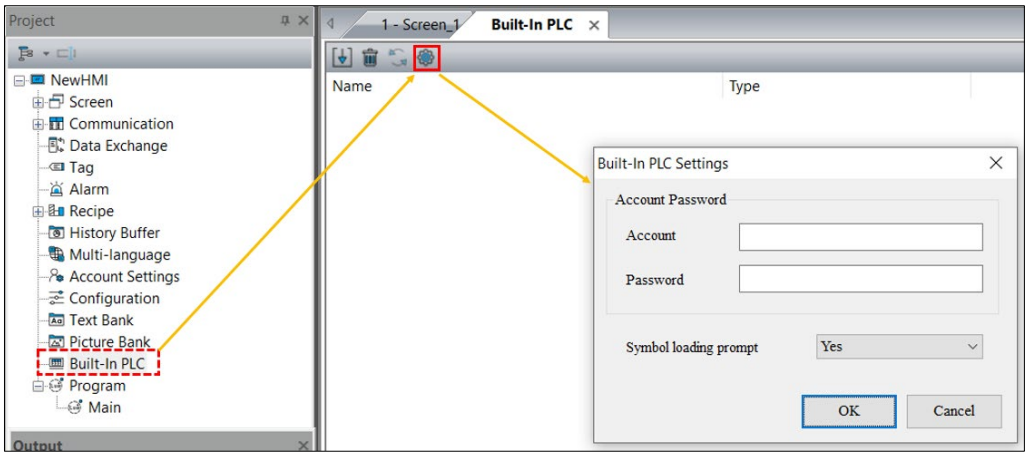


Figure 2 - 38: Built-In PLC Account Setting

Switch the page to the **Localhost** to set the IP address of the HMI and start the network application.

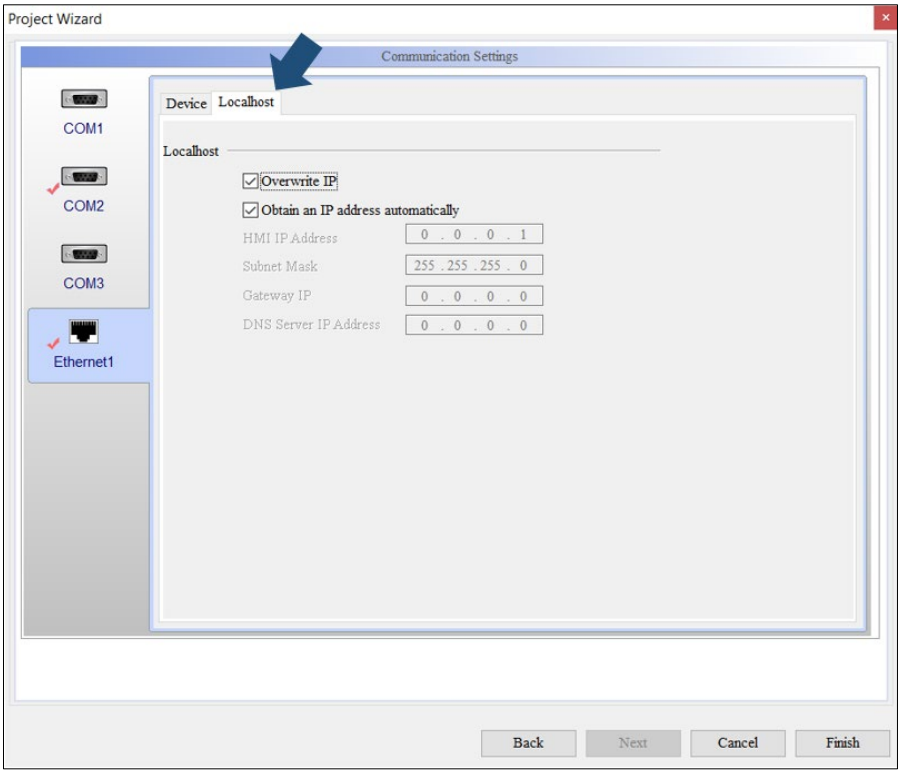


Figure 2 - 39: Communication Settings > Ethernet > Localhost window.

Description

HMI Localhost represents the HMI's local IP address, which can be divided into self-setting IP address and automatic IP address acquisition.

- Uncheck **Obtain an IP address automatically**:

  If unchecked, the HMI use the default IP address, and the default IP address of the HMI is 0.0.0.1.

  If users want to write the IP from the application, go to **Configuration** > **Network Settings** on the system screen to change the IP address.

- Check the **Overwrite IP**:

  In this case, set the HMI IP address and name.

- Check the **Overwrite IP** and **obtain an IP address automatically**:

If both are checked, it means that the HMI obtains the IP address through DHCP mode. To know the current IP address, go to **Configuration** > **Network Setting** on the system screen to view it.

After completing all settings, click **Finish** to open the DIAScreen project editing screen.

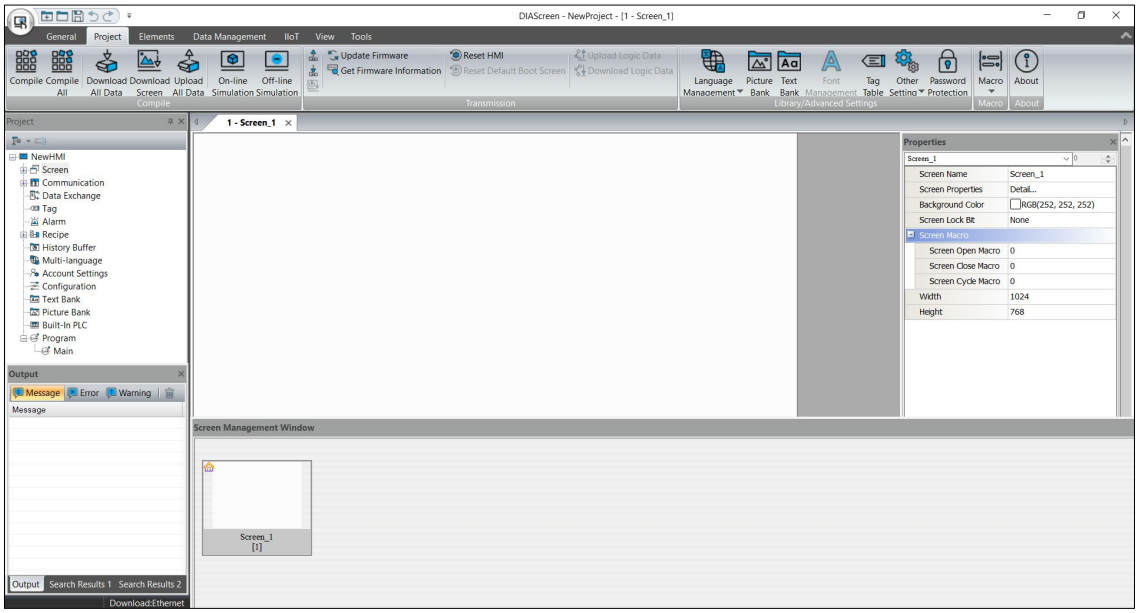


Figure 2 - 40: DIAScreen – Screen window

2.2.1.2 Open

Click  icon > **Open**.

Or

Click  icon in the toolbar.

Or

Press **Ctrl** + **O** on the keyboard.

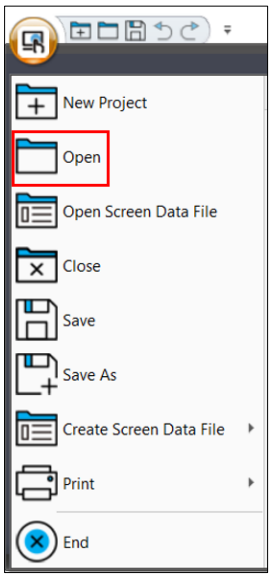


Figure 2 - 41: Open

If users modified the current project without saving, the DIAScreen displays a confirmation window to save or discard the changes for the current project as shown in the figure. If the project is saved, click **Open** to open file, the application informs that the program has been modified and ask users to save the file.

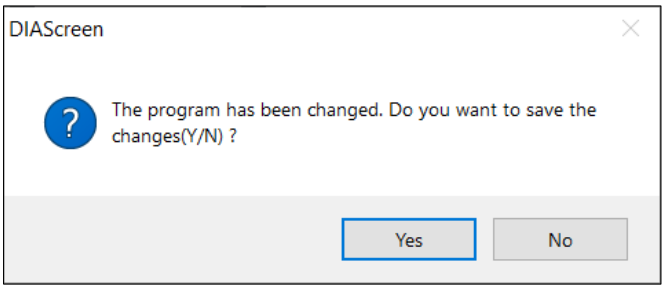


Figure 2 - 42: Confirmation to save the current project

If users select **Yes**, the current project saves and closes or select **No** the current project closes without changes and the old project opens directly.

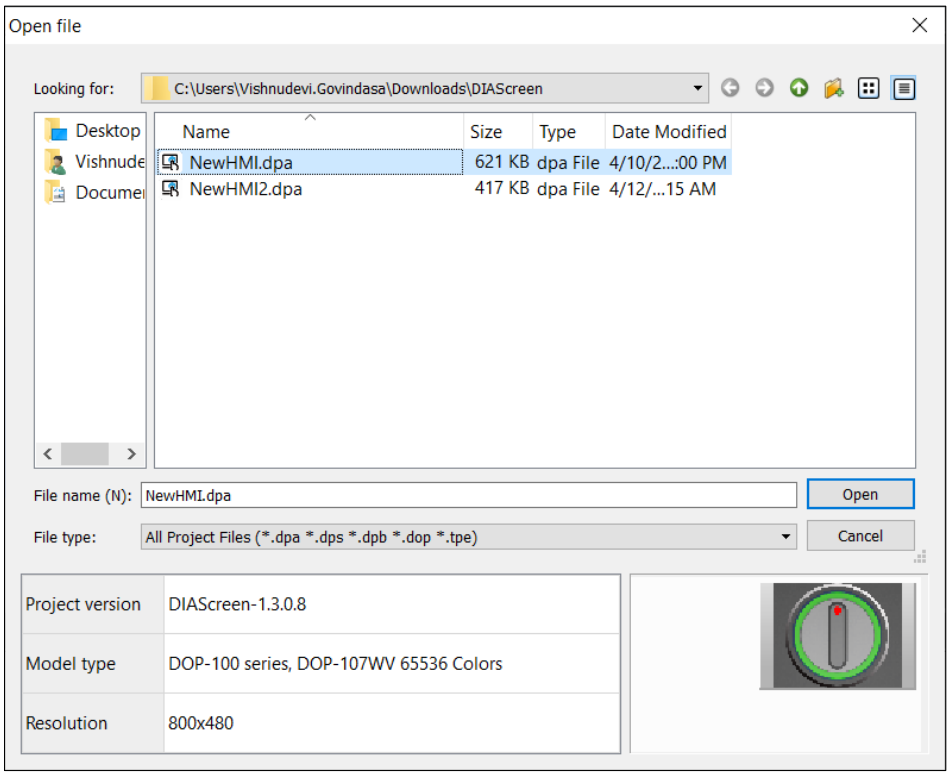


Figure 2 - 43: Open file

2.2.1.3 Open Screen Data File

Once users click to **Open Screen Data File**, the dialog box appears which allows users to select the path directory where the screen data file is stored.

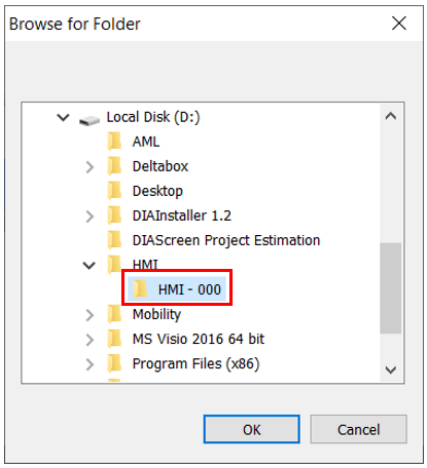


Figure 2 - 44: Select Screen Data file

After selecting the screen data file to be opened, the application again asks users whether to rename and save the opened screen data file.

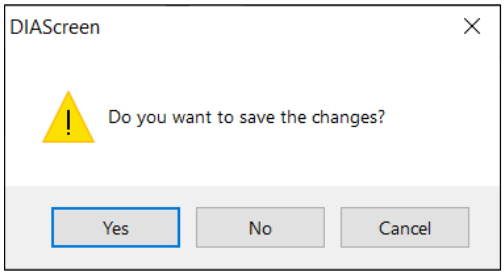


Figure 2 - 45: Confirmation dialog - Save project

2.2.1.4 Close

Close function closes the currently open project. To close the file, go to  > **Close**. After the file is closed, if there are unsaved projects in the window, a window pops up to check whether users want to save this project. Click **Yes** to save the changes before closing the project. Click **No** to discard the changes and directly close the project; or click **Cancel** to cancel the action of closing the project.

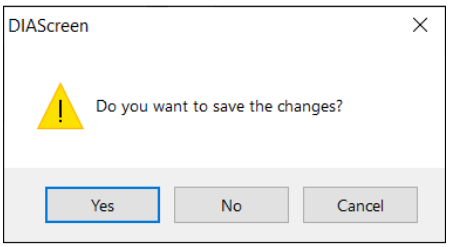


Figure 2 - 46: Confirmation dialog - Close project

2.2.1.5 Save

Save a project in DIAScreen, either from Menu bar, or Toolbar, or using keyboard shortcuts.

1. Click  > **Save** on DIAScreen Start Menu.

   Or

   Click  icon on the Quick Access Toolbar.

   Or

   Press **Ctrl** + **S** on the keyboard.

2. DIAScreen detects whether the current project file is newly created or existing. If it is a newly created project file, the software prompts a **Save As** window asking users to save the current project file, as shown in following figure. If it is an existing project file and users click **Save**, the current project file is saved without any window popping up.

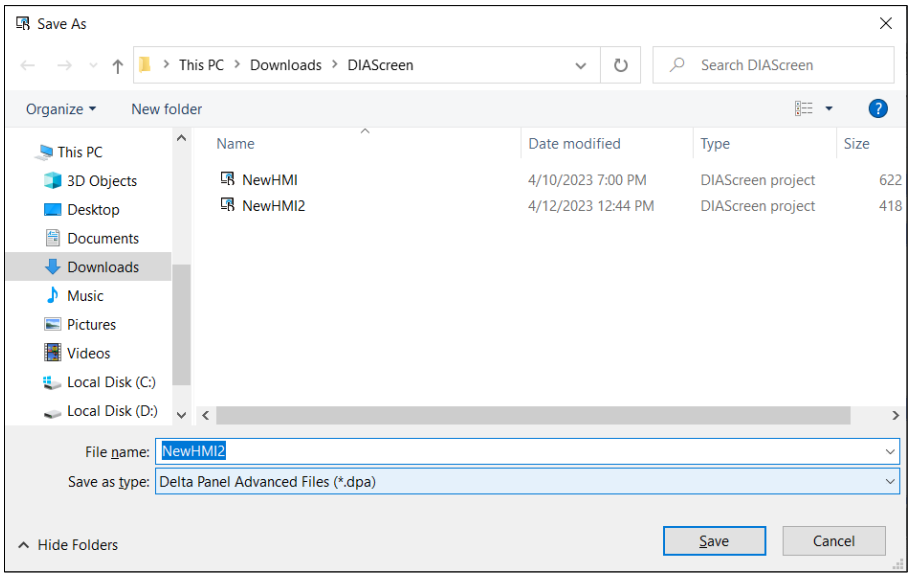


Figure 2 - 47: Save file

2.2.1.6 Save As

Click **File** > **Save As**. The **Save As** dialog box opens, select the location, enter the **File name** and click **Save**.

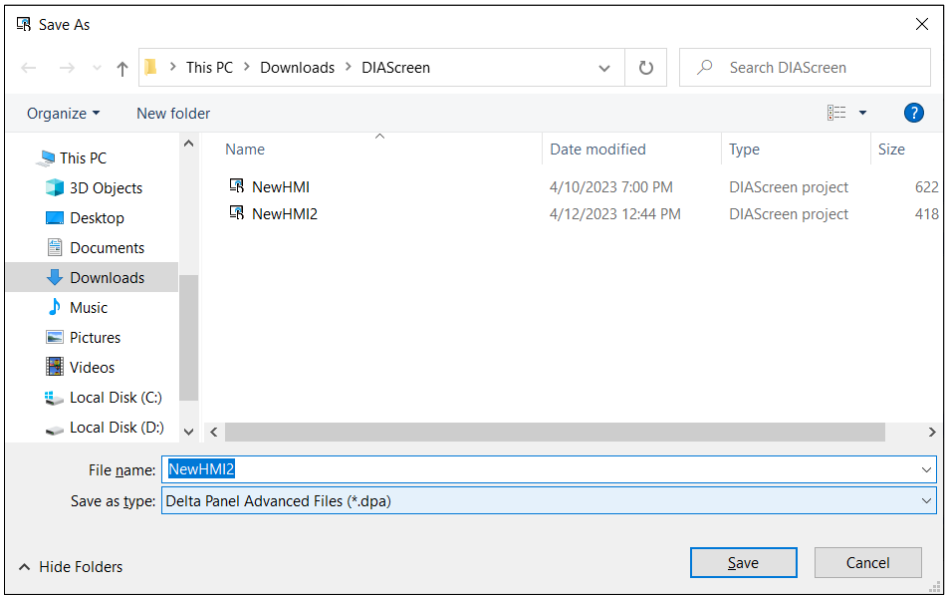


Figure 2 - 48: Save As

2.2.1.7 Create Screen Data File

Click  icon > **Create Screen Data File** > **Create Screen Data File**. Once users created the screen data file, the DIAScreen application automatically compile the current screen data. In previous version, users need to manually compile the function before creating a screen data file. After compiling, the dialog box opens to select the storage directory path. If users select **Enable Protection**, it means that when copying files, users are asked to enter the password, which is **12345678** by default.

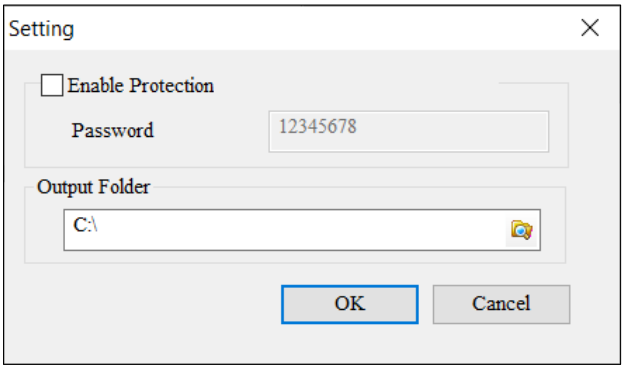


Figure 2 - 49: Create Screen Data File – Setting

After selecting the directory, DIAScreen copies the compiled screen data to the specified directory, which is usually in the SD Card or USB Drive, as shown in following figure. Insert the SD Card or USB Drive and start the HMI. Go to the system screen and click **System Setting** > **File Manager** to use the functions of Format, File Copy, and Firmware Update. Refer to *Appendix A System Screen* for more information.

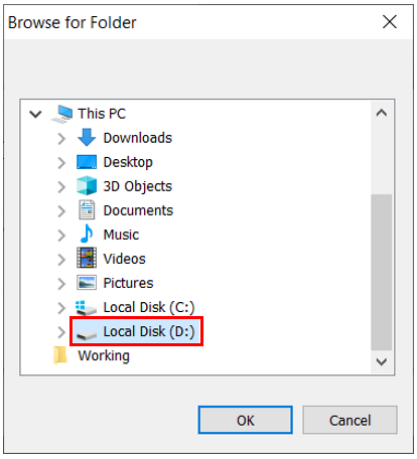


Figure 2 - 50: Create Screen Data File Location

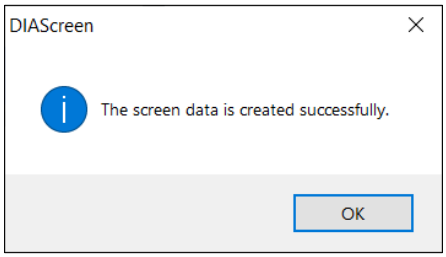


Figure 2 - 51: Create screen data completed

Create Auto Update Data File

After executing the **Auto Update Data File**, DIAScreen application automatically compiles the current screen data. After compiling, the dialog box opens to select the storage directory path. When the HMI detects an external device and there is an automatic update file, the automatic update displays firmware screen to update the HMI project.

1.  > **Create Screen Data File** > **Create Auto Update Data File**.

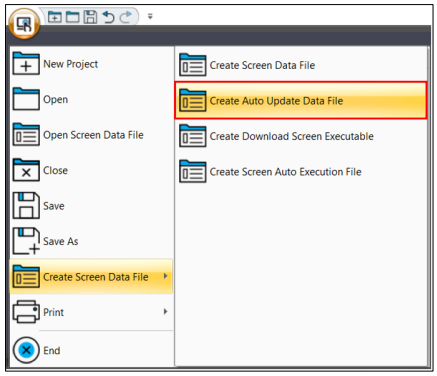


Figure 2 - 52: Create Auto Update Data file

2. Screen update settings.

   If users select **Enable Protection**, it means that when copying files, users are asked to enter the password, which is **12345678** by default.

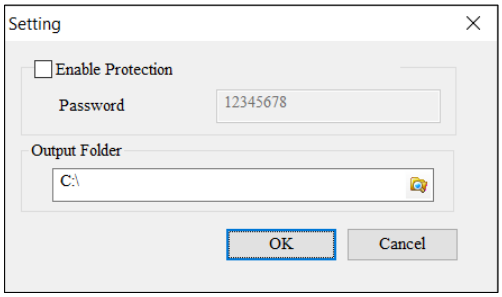


Figure 2 - 53: Create Auto Update Data File

Function	Description
Enable Protection	Enable password protection.
Password	Enter the password protection. ***NOTE:** By default, the password value is **12345678**.*
Output Folder	The path to the folder where the update files are stored.

After clicking the directory to be saved, the application copies the compiled screen data file to the specified directory, usually the directory is SD card or USB flash drive.

The difference between this function and creating a screen data file is that before the HMI is powered on or before returning to the HMI screen from the system directory, insert an external USB Disk, and the HMI automatically detects whether the external device has an automatic update file (Disk Auto Update Check), if it is detected, it displays the message window of **whether to execute the automatic update**. If users select **OK**, the HMI automatically updates the firmware and screen. If users select **Cancel**, the HMI does not do anything.

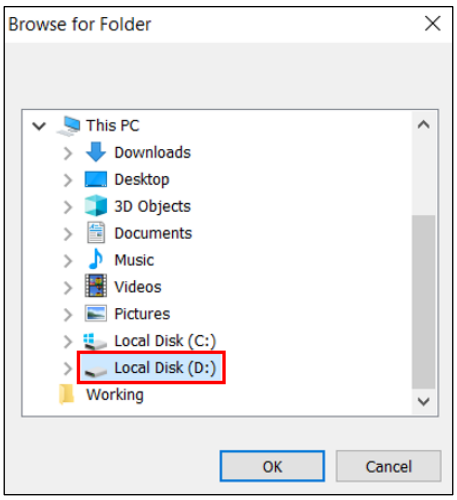


Figure 2 - 54: Create Screen Data File Location

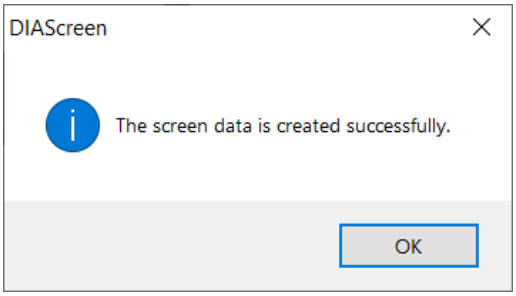


Figure 2 - 55: Screen Data created successfully

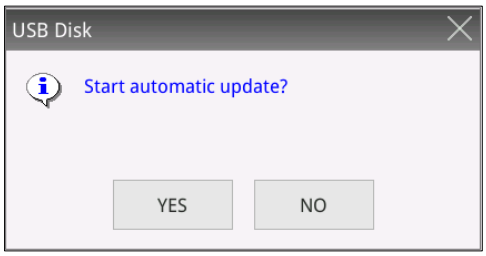


Figure 2 - 56: Whether to execute automatic update message HMI

After the automatic screen update file is created, a HMI_AutoUP folder is stored in the external device.

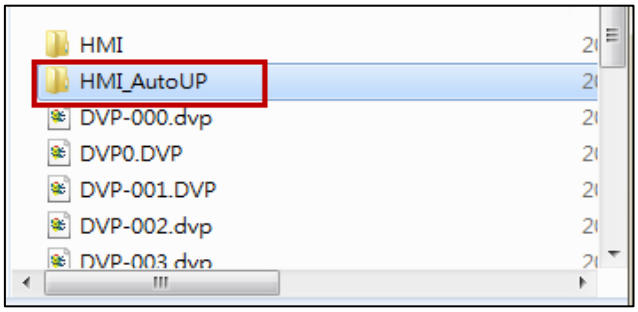


Figure 2 - 57: Create a folder directory generated by the automatic update file of the production screen

NOTE: *If the external device USB Disk and SD Card both have this HMI_AutoUP folder and want to update the firmware and screen files, the HMI first performs the update in the USB Disk, and then performs the SD Card update.*

3. After the setting is completed, the project will be automatically updated in the specified external path.

The rest of the functions are the same as creating a screen data file. Insert the SD card or USB flash drive into the HMI. After starting the HMI, go to **System Setting** > **File Manager** on the system screen to do Copy File, F/W Update and Multi-Screen

File function. Refer to *Appendix A System Screen* for more information of three functions.

If the model of the project is **DXMC series**, after creating the project, set the file path and execute the **Compile**. The DIAScreen application automatically creates a folder with the same name as the project under the project path, and store the current screen data update file in this folder. Import update file into **DXMC model application** – **DMARS** (**DELTA Motion and Robot Application**) to display update.

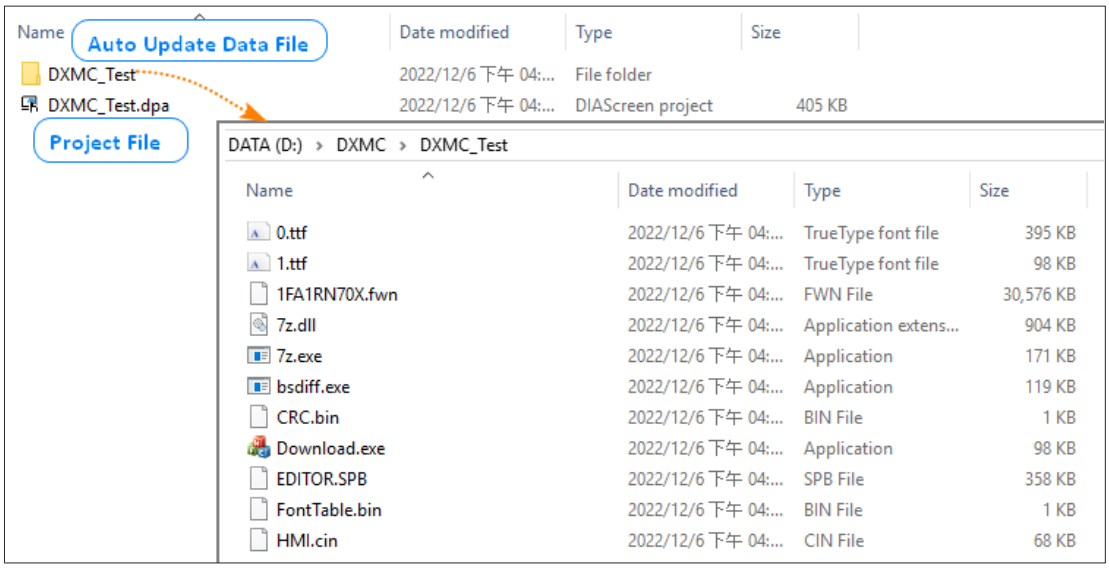


Figure 2 - 58: Automatic Screen Update

Create Download Screen Exe. File

This function is mainly used to generate the executable file. If DIAScreen application is not installed, download the screen project to the HMI. After clicking on the production screen to download the executable file, the application pops up the path directory for users to save the production screen to download the executable file.

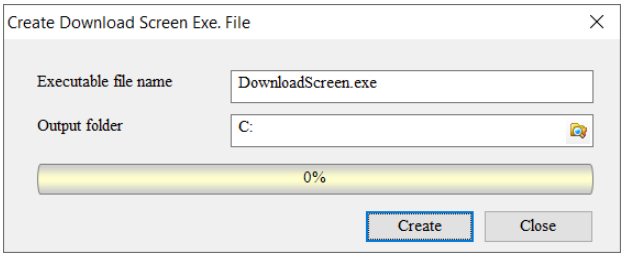


Figure 2 - 59: Create Download Screen Executable File

Enter executable file name in **Executable file name** and select the location in **Output folder**. Users can change the output folder.

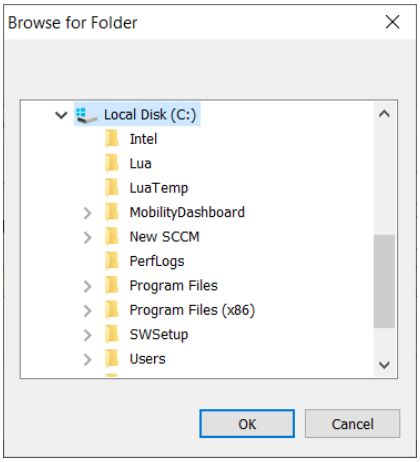


Figure 2 - 60: Select the location of the Output Folder

Click **Create** to start the download executable file.

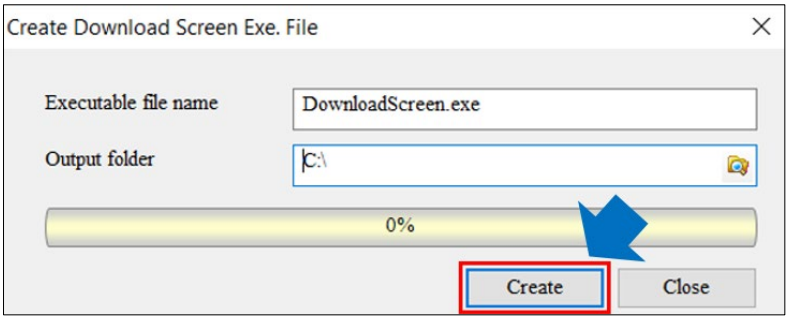


Figure 2 - 61: Create Download Screen Executable File

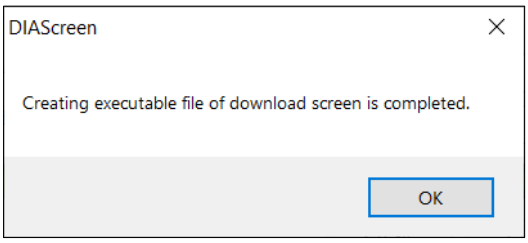


Figure 2 - 62: Create and download executable file completed

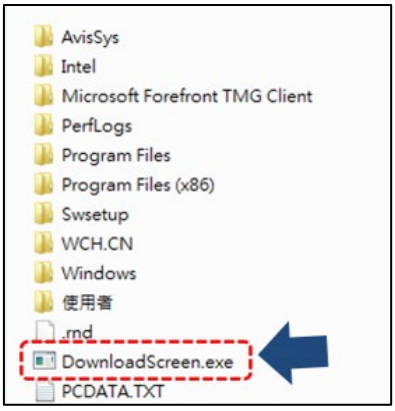


Figure 2 - 63: Create Download Screen Executable File

The DownloadScreen.exe executable file appears in the output folder. Double-click it to execute. Computers without DIAScreen application can use this executable file to download the screen project to the HMI.

After clicking the DownloadScreen.exe executable file, the screen is as follows.

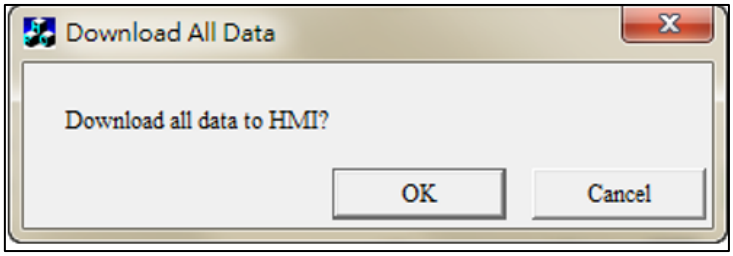


Figure 2 - 64: Download All Data

Select **OK** to download the screen project to the HMI.

Create Screen Auto-Execution File

This function is mainly used to generate the executable file, so the designed screen can be opened even if the DIAScreen software is not installed. After clicking the **Create Screen Auto-Execution File**, the software pop ups the path directory for users to save the automatic execution file of the production screen.

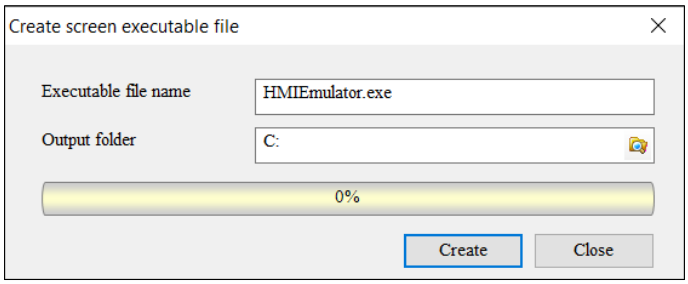


Figure 2 - 65: Select Output folder

Select the **Output folder** and **Executable file name**. Users can change the output folder.

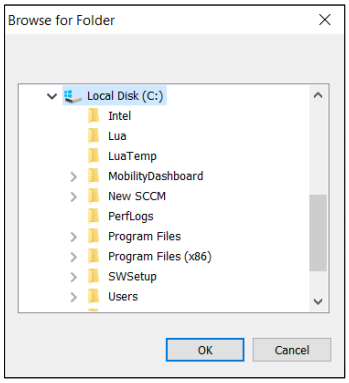


Figure 2 - 66: Select the location

Click **Create** to start making the autoexec.

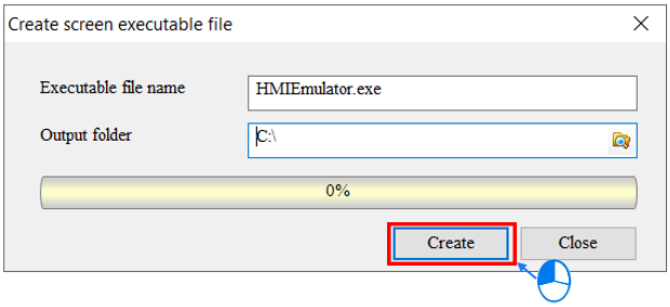


Figure 2 - 67: Create Screen Executable File

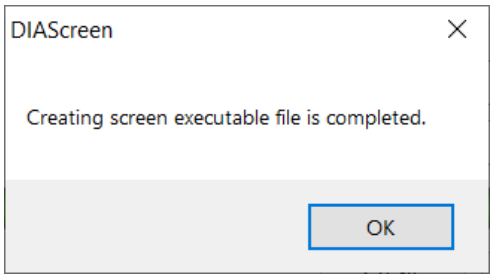


Figure 2 - 68: Create download executable file completed

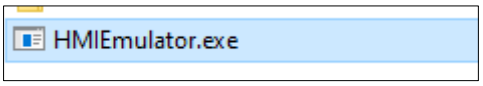


Figure 2 - 69: HMIEmulator executable file

The HMIEmulator.exe executable file appears in the output folder. Double-click to execute it. Computers without DIAScreen software can use this executable file to directly execute the screen.

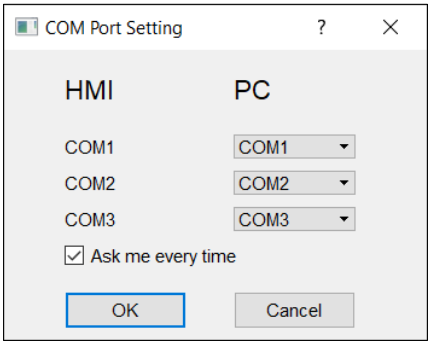


Figure 2 - 70: COM Port setting

After selecting the corresponding communication port, click **OK** to execute the screen on the computer.



Figure 2 - 71: HMI Emulator window

2.2.1.8 Print

Print function is to print the screen.

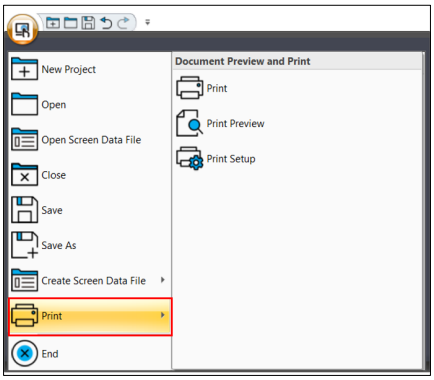
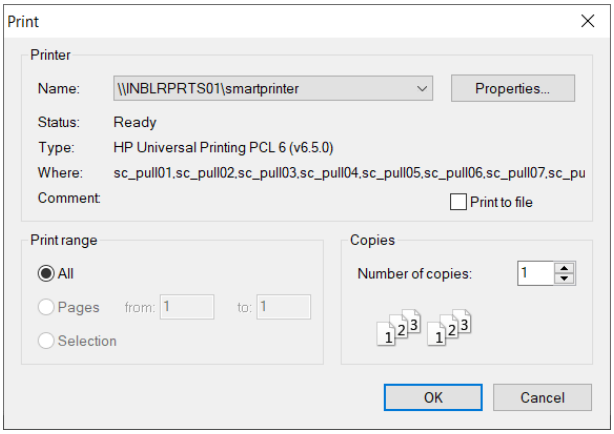
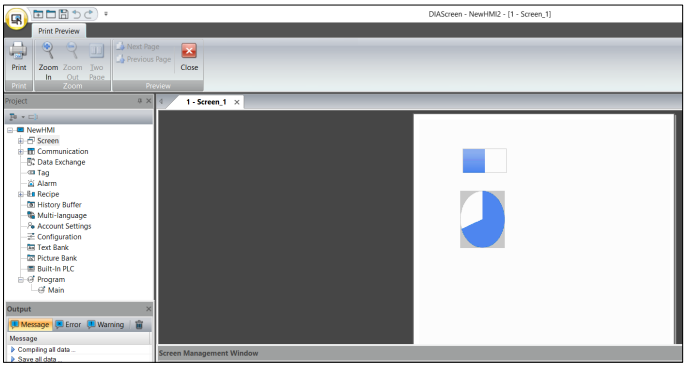
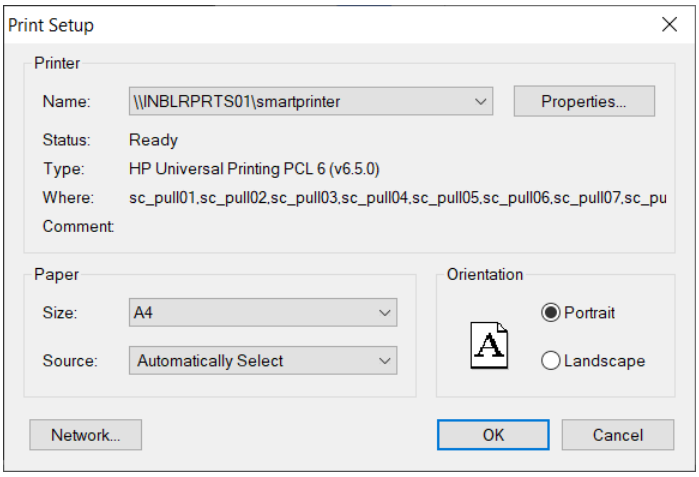


Figure 2 - 72: Print

The following table describes the **Print** function.

Function	Description
Print	Click icon > **Print** to enter the **Print** window, select the printer, print range and number of copies, and click **OK** to print. 
Print Preview	Preview the print screen. 
Print Setup	Adjust the required print format using **Print Setup**. 

2.2.1.9 End

Click  >  to close the DIAScreen application. If there is any content to be saved, the system pops up a confirmation window to remind users whether to save the changed item.

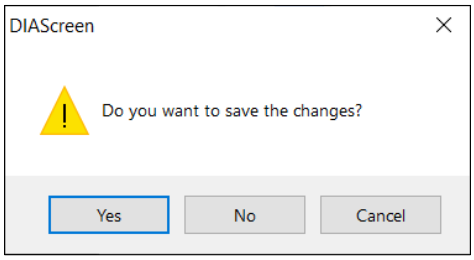


Figure 2 - 73: Confirmation window to save the changes

2.2.2 General Toolbar

The General Toolbar includes functions such as Clipboard, Edit, Screen, Settings, Font, Picture Layout, Arrangement, Rotation, State/Language and Common. These functions are described in the following sections.

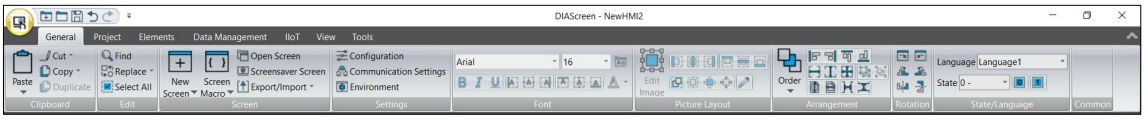


Figure 2 - 74: General Toolbar

2.2.2.1 Clipboard

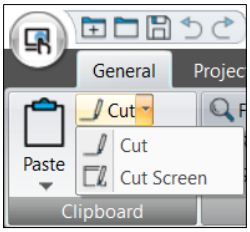


Figure 2 - 75: Clipboard

Clipboard includes **Cut**, **Copy**, **Paste**, and **Duplicate** pictures, which are explained as follows:

Cut

To cut the selected element on the edit page,

Click **General** > **Clipboard** > **Cut**.

Or

Press **Ctrl** + **X** on the keyboard.

Result: The selected element is cut on the screen.

Cut Screen

Cutting the screen is same as cut of general text editing. Cut the screen and paste it on the screen. To cut the screen,

Select **General** > **Clipboard** > **Cut** > **Cut Screen**.

Or

Press **Shift** + **T** on the keyboard.

***NOTE**: After the screen is cut, it cannot be restored using the restore action.*

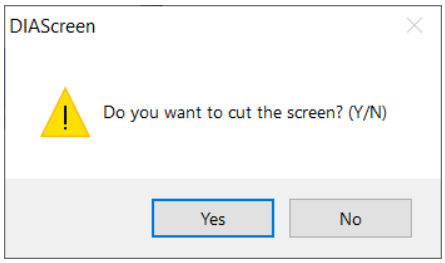


Figure 2 - 76: Confirmation window for screen cut

2.2.2.2 Copy

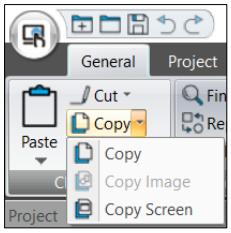


Figure 2 - 77: Copy function

Copy function includes **Copy**, **Copy Image**, and **Copy Screen**, which are explained as follows:

Copy

Click **General** > **Clipboard** > **Copy** to copy the selected element on the editing page.

Or

Press **Ctrl** + **C** on the keyboard.

Result: The selected element is copied on the screen.

Copy Screen

Click **General** > **Clipboard** > **Copy** > **Copy Screen**, or **Shift** + **C**, to copy the screen. After copying the screen, if users click **Paste Screen** again, the copied screen is pasted, similar to copying text editing.

2.2.2.3 Duplicate

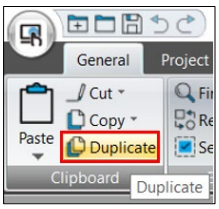


Figure 2 - 78: Duplicate function

The **Duplicate** function can directly select a certain element. Right-click the **Button** element to execute multiple copying or select a certain element, and automatically increase or decrease the address according to the requirements, reducing the time for manually repeating the address of the element. Click **General** > **Clipboard** > **Duplicate** to execute this function.

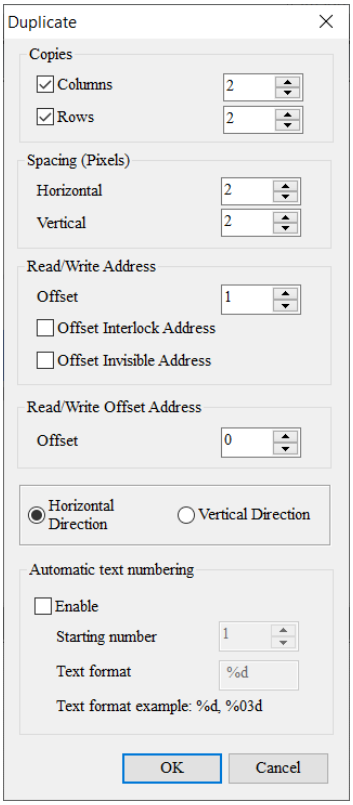
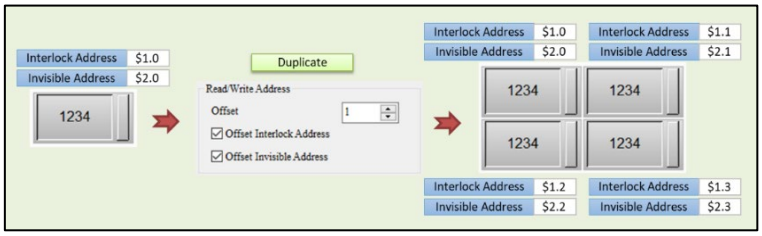
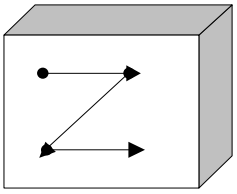
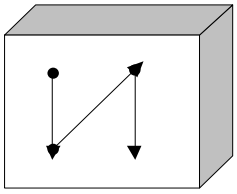


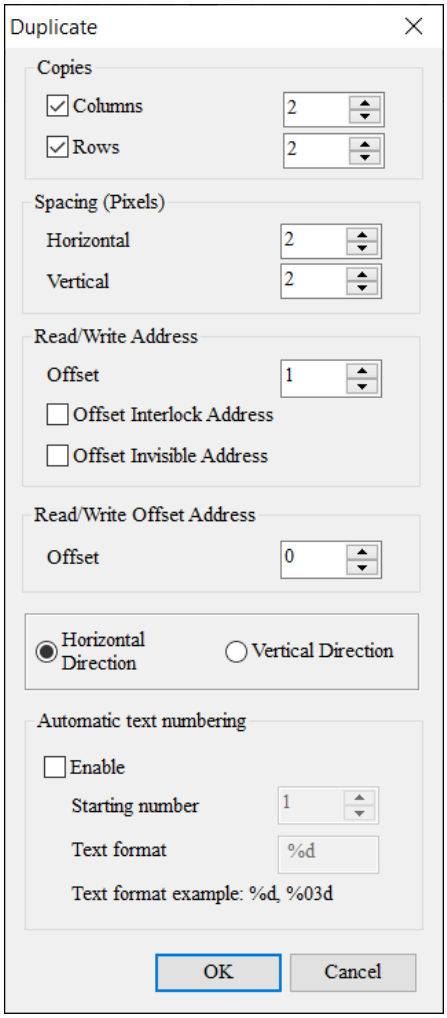
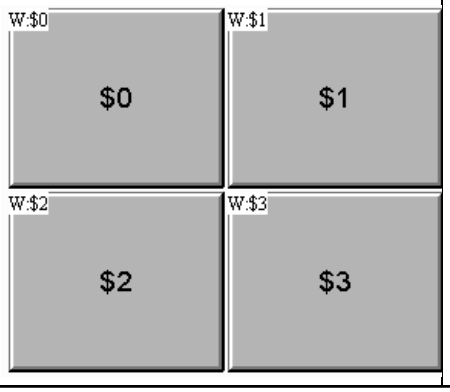
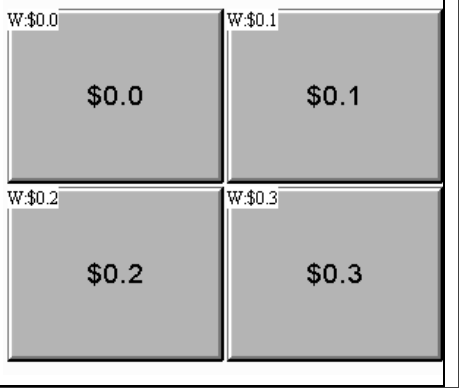
Figure 2 - 79: Duplicate

The following table describes the **Duplicate** function, including the number of copies, interval, and offset address.

Copies	Rows	Select the horizontal number (X) and the vertical number (Y) above the number of **Copies** to get the total number of elements X * Y. To single-select horizontal or vertical copying, use the previous tick option to enable or disable it.
	Columns	
Spacing (pixels)	Horizontal	The **Spacing (Pixels)** is to enter the interval between each element. After input, it is automatically separated according to the setting after the new element is copied.
	Vertical	
Read/Write Address	Offset	Set the amount by which **Read/Write Address** are automatically accumulated.

<table>
<tr><td></td><td>Offset Interlock Address / Offset Invisible Address</td><td>When checked, the effective bits/invisible address is automatically accumulated with the amount set by the offset address.
 
</td></tr>
<tr><td rowspan="3">Read/Write Offset Address</td><td>Offset</td><td>Set the amount by which Read/Write Offset Address are automatically accumulated.</td></tr>
<tr><td>Horizontal Direction</td><td rowspan="2">For the Offset Address, first set the number of addresses to be increased (positive number) or decreased (negative number), and then make multiple copies according to the horizontal or vertical direction. If the element is in Word, the increase/decrease are calculated in Word; otherwise, if the element is in Bit, the increase/decrease are calculated in Bit.
<table><tr><th>Horizontal Direction</th><th>Vertical Direction</th></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
<tr><td>Vertical Direction</td></tr>
<tr><td rowspan="2">Automatic text numbering</td><td>Starting number</td><td>When enabled, set the starting value of the number displayed on the element.</td></tr>
<tr><td>Text format</td><td>When enabled, set the text format of the number displayed on the element.</td></tr>
</table>

The following table describes the **Duplicate** settings example.

<table>
<tr><th colspan="3">Duplicate</th></tr>
<tr><td rowspan="2">Element address</td><td>Word</td><td>Bit</td></tr>
<tr><td>$0</td><td>$0.0</td></tr>
<tr><td>Copies
Spacing (Pixels)
Read/Write Address
Read/Write Offset Address
Automatic text numbering</td><td colspan="2"> 
</td></tr>
<tr><td>Result</td><td>Word
 
</td><td>Bit
 
</td></tr>
</table>

2.2.2.4 Paste

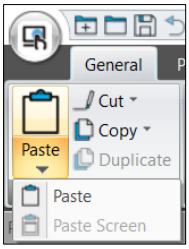


Figure 2 - 80: Paste

The **Paste** function includes **Paste** and **Paste Screen**, which are explained as follows:

Paste

Paste the copied or cut elements to the editing page. Click **General** > **Clipboard** > **Paste**.

Or

Press **Ctrl** + **V** on the keyboard.

Result: The selected element is pasted on the screen.

Paste Screen

Click **General** > **Clipboard** > **Paste** > **Paste Screen** to paste the screen.

Or

Press **Shift** + **P** on the keyboard.

Paste Screen is suitable for cutting screen and copying screen. After pasting the screen, the application automatically assigns its screen number.

2.2.2.5 Find

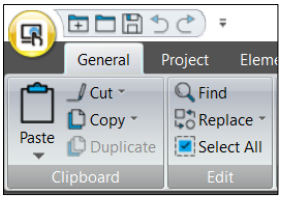


Figure 2 - 81: Edit - Find function

To search for the specified text and address,

Click **General** > **Edit** > **Find**.

Or

Press **Ctrl** + **F** on the keyboard.

This feature allows to quickly search for content. The **Find** function has added **Data Type** settings to get results more accurately, and sort the search results in the result window. Click **Find** function, enter the search content first, and then select the current screen or all screens in the search option. Select Find **Type** to search for the Text of the Element read address, Element write address, and All Address; select **Data Type** to search for Bit, Word or DWord.

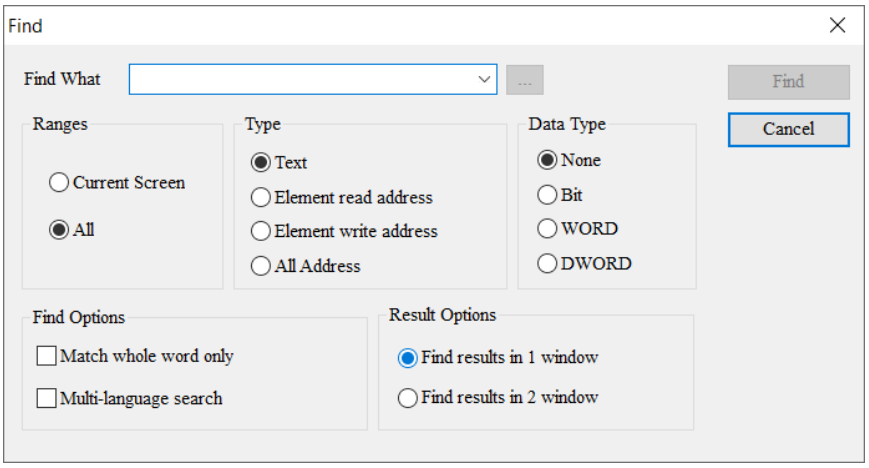


Figure 2 - 82: Find

Set the Find **Type** and **Data Type** and select the output result in Window 1 or Window 2, and then click **Find**. The system starts to search for the matching content according to its settings. After it is found, it will output the found element to the **Search Results** window. Click the option in the output column, and the cursor automatically selects this element.

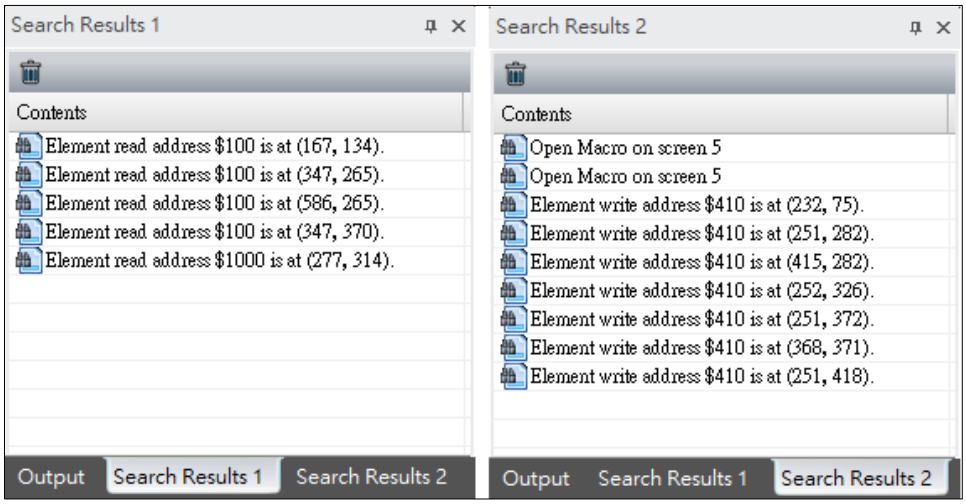


Figure 2 - 83: Search Results - Output window

The following table describes **Find** functions.

Find		
Find What	Enter the content to be searched	
Ranges	Current screen	During the search process, only the currently edited screen is searched, and all elements of the current screen are compared. The results that match appears in the window of the output column. Double-click **Search Results** window to find the searched elements.
	All screen	During the search process, all screens are searched, and all elements in all screens are compared. The results that match appears in the window of the output column. Double-click Search Results window to find the searched elements.
Type	Text	Compare the **Text** entered by the element.

Find		
	Element read address	Compare the **Read Address** of the element.
	Element write address	Compare the **Write Address** of the element.
	All address	Compare the **Read Address** and **Write Address** of elements.
Data Type	None	Select **None** to search for memory addresses, but not for a specific numeric format.
	Bit	If **Bit** is selected, it means to search for the address of Bit.
	WORD	Selecting **WORD** means to search for the address of WORD.
	DWORD	Selecting **DWORD** means to search for the address of DWORD.
Find Options	Match whole word only	All input is compared when searching. If it is not checked, it means that only the input content is partially matched. If it is checked, it means that the input content needs to be all matched to be considered consistent.
	Multi-language search	Only works if the search type is text. If it is not checked, the comparison method only searches for the matching text for the current language family; on the contrary, if it is checked, the comparison method not limited to the text of the current editing language family, but the text of all language families are compared.
Result Options	Find results in 1 window	Search results can be output to different windows.
	Find results in 2 window	Search results can be output to different windows.

2.2.2.6 Replace

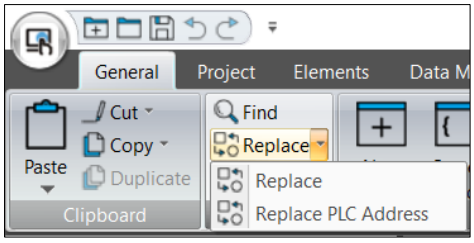


Figure 2 - 84: Replace function

The **Replace** function includes **Replace** and **Replace PLC Address**, which are explained as follows.

Replace

Select **General** > **Edit** > **Replace** or press **Ctrl** + **R** on the keyboard, to replace the specified text or address, enter the text to find in **Find What** and enter the text to replace in **Replace With**, then select **Current Screen** or **All** in **Ranges**. Select Replacement **Type** to replace Text, Read Address, Write Address, and All Address. The **Data Type** is selected only if the **Type** value are Read Address, Write Address, or All Address. The available options for **Data Type** are: None (all value types), Bit, WORD, DWORD, and QWORD.

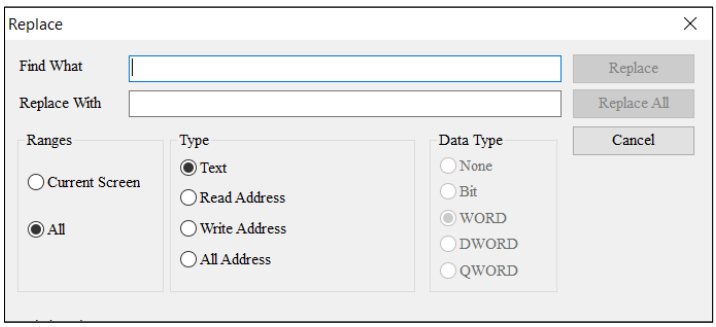
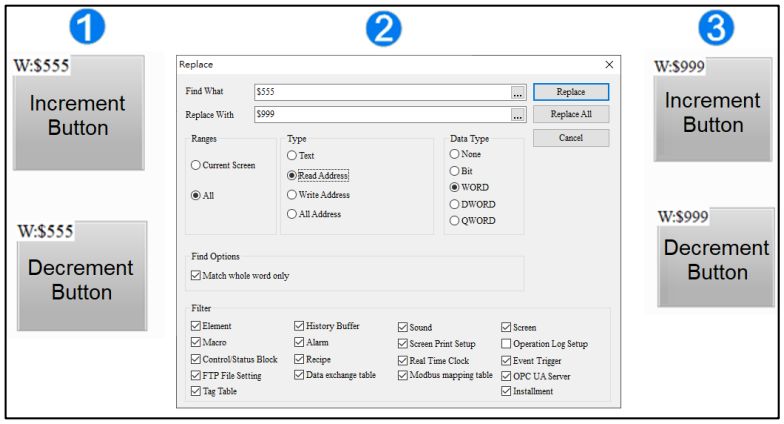


Figure 2 - 85: Replace

The following table describes the setting screen of the **Replace** function.

Replace		
Find What	Enter the data content to be searched	
Replace With	Enter the data content to be replaced	
Ranges	Current screen	During the search process, only the currently edited screen is searched, and all elements of this screen are compared, and those matching the results are replaced in sequence.
	All screen	During the search process, all screens are searched, and all elements in all screens are compared, and those matching the results are replaced in sequence.
Type	Text	Replace those found that match the **Text** criteria.
	Read Address	Replace the one found that matches the **Read Address**.
	Write Address	Replace those found to match the **Write Address**.
	All Address	Replace those found to match the **Read Address** and **Write Address**.
Data Type	None	The **Data Type** is enabled only when the substitution type is **Read Address** or **Write Address**. Select None (all value types), Bit, WORD, DWORD or QWORD or None (all numeric types), Bit, WORD, DWORD, or QWORD depending on the **Data Format** of elements being sought.
	Bit	
	WORD	
	DWORD	
	QWORD	
Find Options	The **Find Options** is enabled when the Replacement **Type** is Read Address, Write Address, or All Address. Users can choose to match all search contents or not. After checking it, first determine whether the search address is correct, and then replace it after confirming that it is correct.	
Filter	The filter condition is to open when the Replacement **Type** is Read Address, Write Address or All Address. Users can select Elements, Macros, Control Area and Multistate Area, History Buffer, Alarm, Recipe, Sound, Printing, etc.	
Example	1. Set the **Write Address** of **Increment** / **Decrement Button** element to $555. 2. Execute the **Replace** function, enter the **Find What** as $555, and **Replace With** as $999. **Increment** / **Decrement Button** element addresses are set to the memory to be written, so select the **Write Address** instead of the **Type**. The **Data Type** set by the plus and minus buttons is Word, so users need to select **Word**. 3. After clicking **Replace All** on the No. (2) screen, the $555 of the	

Replace	
	Increment / Decrement Button element has been replaced by $999.



Replace PLC Address

Click General > Edit > Replace > Replace PLC Address to change the address of PLC. This function allows to quickly find the outgoing station number value and replace it with the new station number value, and can also select its connection name and replacement type. If there are multiple connections in the project file, select other connection names to replace the station number.

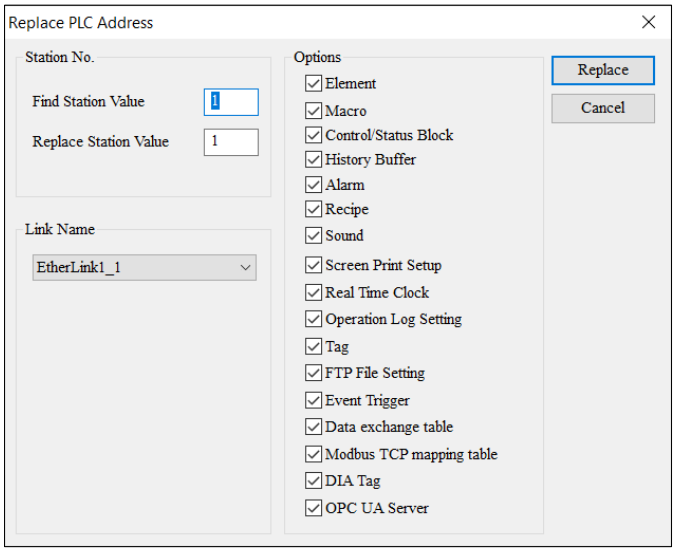
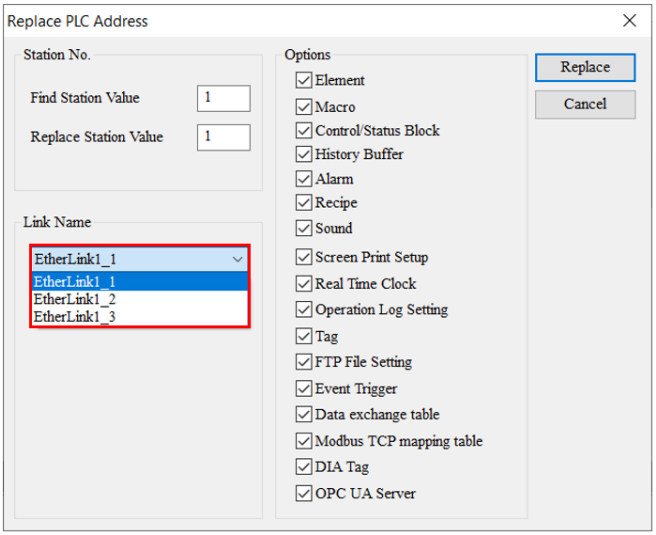
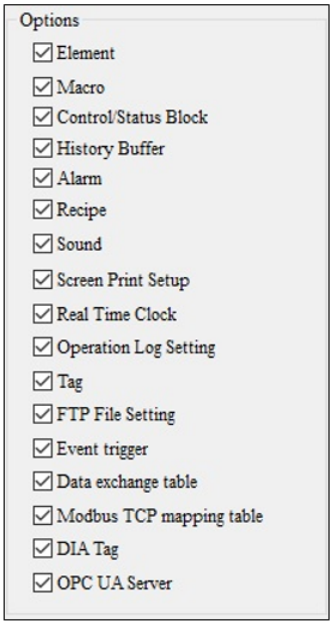
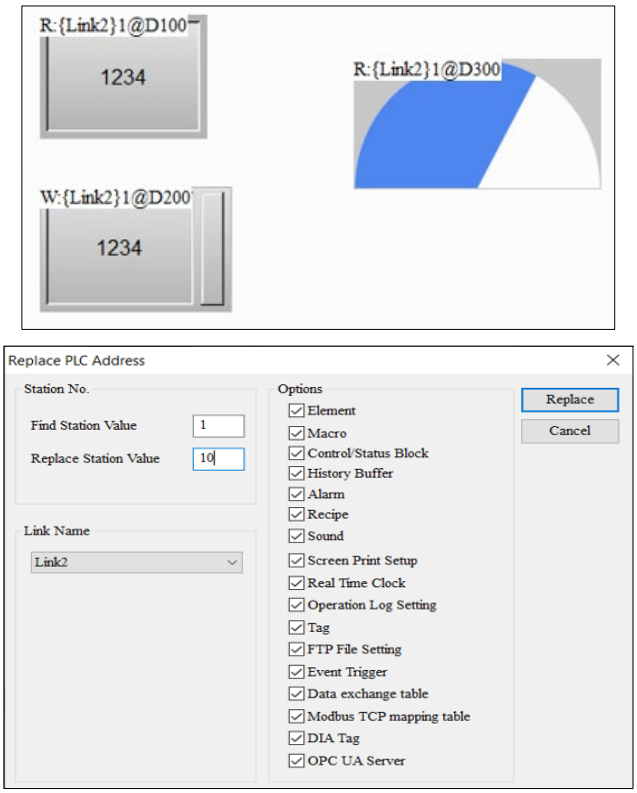
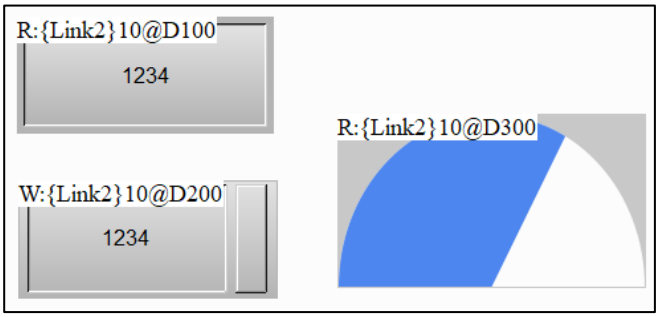


Figure 2 - 86: Replace PLC Address

Replace PLC Address	
Find Station Value	Enter the content of the data to be searched
Replace Station Value	Enter the data content to be replaced
Link Name	The name of the connection to be replaced can be determined according to the Base Port created by users, as shown in the following figure. 
Options	Replacement category provides the following categories to freely select the category to be replaced. The Ten categories are shown in the following figure. 

<table>
<tr><th colspan="3">Replace PLC Address</th></tr>
<tr><td rowspan="2">Example</td><td>Before Replacing Station No.</td><td> 
</td></tr>
<tr><td>After Replacing Station No.</td><td>After pressing Replace, {Link2}1 is replaced by {Link2}10
 
</td></tr>
</table>

2.2.2.7 Select All

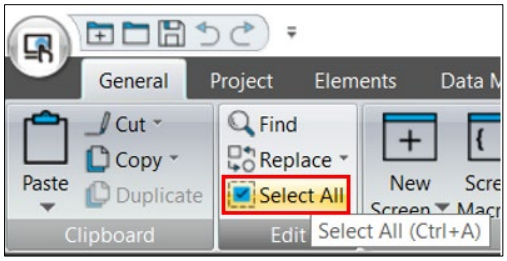


Figure 2 - 87: Select All function

Click **General** > **Edit** > **Select All** to select all objects in the current editing screen.

Or

Press **Ctrl** + **A** on the keyboard.

2.2.2.8 New Screen

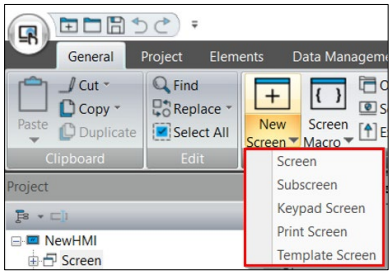


Figure 2 - 88: New Screen function

Click **General** > **Screen** > **New Screen**, to add another screen or press **Shift** + **N** on the keyboard. After adding a screen, customize the **Screen Name**, **Screen Number**, and select the **Screen Type** to be created. The available options for **Screen Type** are: Screen, Sub Screen, Keypad Screen, Print Screen, and Template Screen.

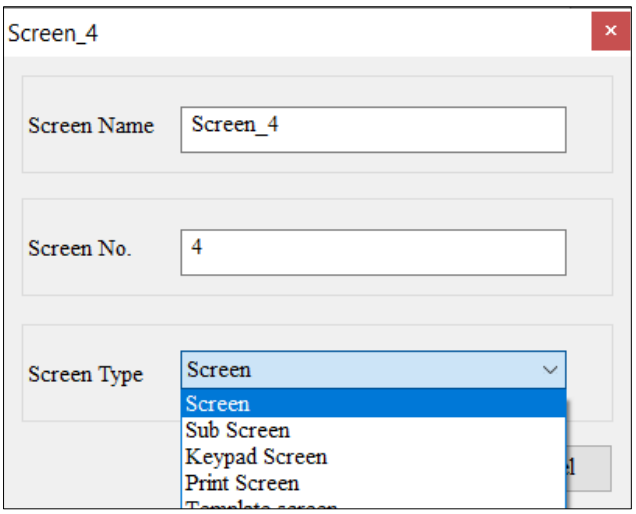


Figure 2 - 89: Add screen

2.2.2.9 Screen Macro

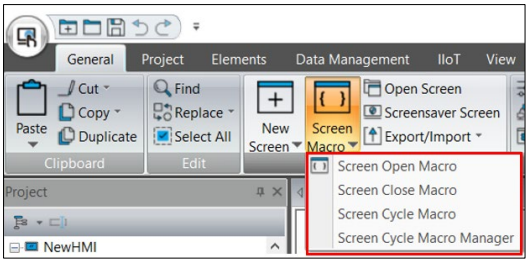


Figure 2 - 90: Screen Macro function

***NOTE**: This function is applicable to TP05G and TP08G models.*

It is used to set a Macro program for any screen. When switching to this screen, the TP HMI executes the set program periodically.

Refer to the following steps to configure the **Screen Macro** settings:

1. Click **General** > **Screen** > **Screen Macro**.

   Result: The **Screen Macro** window appears as follows.

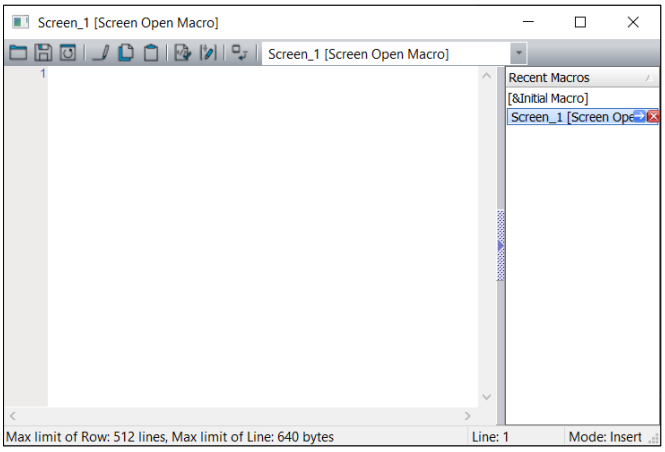
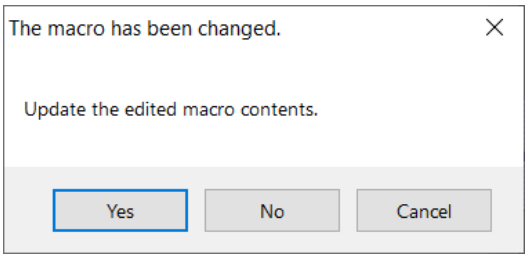
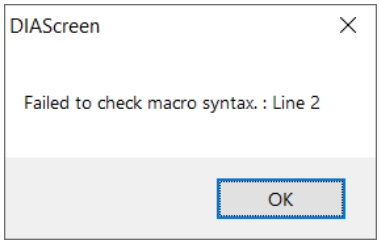
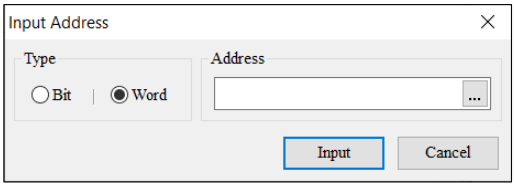


Figure 2 - 91: Screen Macro settings window

The following table describes the **Screen Macro** window function.

Icon	Function	Description
	Open file	**Open** the Macro (*.mrc) file, the opening function is equivalent to the import action. Import the edited macro to reduce time of repeated editing.
	Save File	**Save** Macro commands as .mrc files, and the archiving function is equivalent to exporting. Save the edited macro commands as backup or for other screens.
	Update	The **Update** function is to update the macro content that has been modified, and it also checks whether the macro syntax is correct. If the **Update** is not executed, click close to leave the macro editing window, and the application informs users that the current content has been changed.  If the **Update** is executed, it checks whether the current syntax is correct, and if the syntax is wrong, the following message appears. 
	Cut	The functions of **Cut**, **Copy**, and **Paste** are the same as those of Office. Users can also execute through shortcut keys. ***NOTE**: Cut (Ctrl + X); Copy (Ctrl + C); Paste (Ctrl + V).*
	Copy	
	Paste	
	Syntax check	The **Syntax check** function is to check whether the macro instruction is correct, and if the check is wrong, an error message appears. ***NOTE**: If there are multiple errors, only the first error message appears.*
	Macro wizard	The Macro wizard function provides users with simple and easy input of macro commands.
	Input Address	Click ... icon to select the associated device address to enter in **Input Address** window.

Icon	Function	Description
		

2. Click  to open the **Macro Command** window, as shown in the following figure.

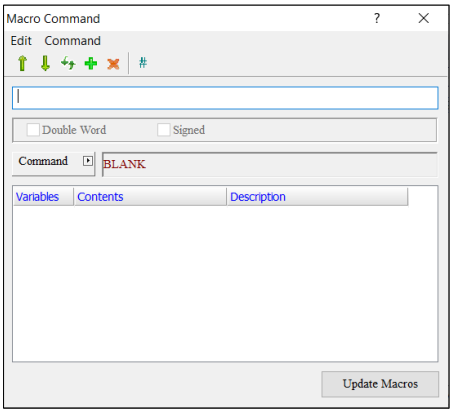
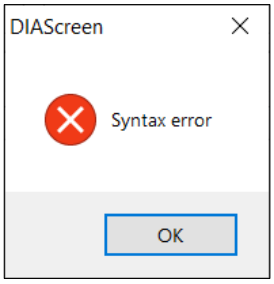


Figure 2 - 92: Macro Command window

The following table describes the **Macro Command** window property setting.

Function	Description
Edit - Up 	Move the Macro instruction cursor up one line.
Edit - Down 	Move the Macro instruction cursor down one line.
Edit - Update 	Perform the **Update**, check the Macro command syntax is correct and write the command into the macro edit window. If there is an error in the check, a message appears to notify users that this is incorrect input.

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Edit - Insert</td><td>Insert the add-line macro instruction into a two-line macro. Its action is to replace the macro instruction where the cursor is located and move the macro down.</td></tr>
<tr><td>Edit - Delete</td><td>Delete the macro instruction where the cursor is to be deleted. If there are other macro detail under the deleted macro instruction, it will be automatically supplemented up.</td></tr>
<tr><td>Double Word</td><td>If Double Word is checked, the instruction in this line is operated with 32-bit; if Double Word is not checked, it is operated with 16-bit.</td></tr>
<tr><td>Signed</td><td>If Signed is checked, it means that the instruction in this line is operated with signed numbers; if Signed is not checked, it is operated with unsigned numbers.</td></tr>
<tr><td>Command - Arithmetic</td><td>The detail supported by the four Arithmetic operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>+</td><td>Var1 = Var2 + Var3</td><td>Addition operation</td></tr>
<tr><td>-</td><td>Var1 = Var2 - Var3</td><td>Subtraction operation</td></tr>
<tr><td>*</td><td>Var1 = Var2 * Var3</td><td>Multiplication operation</td></tr>
<tr><td>/</td><td>Var1 = Var2 / Var3</td><td>Division operation</td></tr>
<tr><td>%</td><td>Var1 = Var2 % Var3</td><td>Remainder operation</td></tr>
<tr><td>+-*/</td><td>Var1 = Var2</td><td>Custom Four Arithmetic Operations</td></tr>
<tr><td>MUL64</td><td>Var1 = MUL64(Var2, Var3) (Signed DW)</td><td>64-bit Multiplication</td></tr>
<tr><td>ADDSUMW</td><td>Var1 = ADDSUMW(Var2, Var3)</td><td>cumulative operation</td></tr>
<tr><td>FADD</td><td>Var1 = FADD(Var2, Var3) (Signed DW)</td><td>Floating-point addition</td></tr>
</table></td></tr>
</table>

Function	Description		
	FSUB	Var1 = FSUB(Var2, Var3) (Signed DW)	Floating-point subtraction
	FMUL	Var1 = FMUL(Var2, Var3) (Signed DW)	Floating point multiplication
	FDIV	Var1 = FDIV(Var2, Var3) (Signed DW)	Floating-point division operation
	FMOD	Var1 = FMOD(Var2, Var3) (Signed DW)	Floating-point remainder operation
	QADD	Var1 = QADD(Var2, Var3)	Quadruple word addition
	QSUB	Var1 = QSUB(Var2, Var3)	Quadruple Subtraction
	QMUL	Var1 = QMUL(Var2, Var3)	Quadruple multiplication
	QDIV	Var1 = QDIV(Var2, Var3)	Quadruple division operation
	QMOD	Var1 = QMOD(Var2, Var3)	Quadruple word remainder operation
	SIN	Var1 = SIN(Var2) (Signed DW)	Sine function operation
	COS	Var1 = COS(Var2) (Signed DW)	cosine function operation
	TAN	Var1 = TAN(Var2) (Signed DW)	Tangent function operation
	COT	Var1 = COT(Var2) (Signed DW)	cotangent function operation
	SEC	Var1 = SEC(Var2) (Signed DW)	secant function operation
	CSC	Var1 = CSC(Var2) (Signed DW)	Cosecant operation
	FSQRT	Var1 = FSQRT(Var2) (Signed DW)	Floating-point square root operation
	FCOS	Var1 = FCOS(Var2) (Signed DW)	Floating-point number cosine function operation

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>FSIN</td><td>Var1 = FSIN(Var2) (Signed DW)</td><td>Floating-point number sine function operation</td></tr>
<tr><td>FATAN2</td><td>Var1 = FATAN2(Var2,Var3) (Signed DW)</td><td>Floating-point inverse tangent function operation</td></tr>
</table>
</td></tr>
<tr><td>Command - Logical Operation</td><td>Detail supported by Logical Operation include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>AND</td><td>Var3 = Var1 & Var2</td><td>AND logic operation</td></tr>
<tr><td>OR</td><td>Var3 = Var1 | Var2</td><td>OR logic operation</td></tr>
<tr><td>XOR</td><td>Var3 = Var1 ^ Var2</td><td>XOR logic operation</td></tr>
<tr><td>NOT</td><td>Var3 = NOT Var1</td><td>NOT logical operation</td></tr>
<tr><td>SHR</td><td>Var3 = Var1 >> Var2</td><td>Right shift logical operation</td></tr>
<tr><td>SHL</td><td>Var3 = Var1 <<Var2</td><td>Left shift logical operation</td></tr>
</table>
</td></tr>
<tr><td>Command - Data Transfer</td><td>Commands supported by Data Transfer operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>MOV</td><td>Var1 -> Var3</td><td>Data Specified Operand</td></tr>
<tr><td>BMOV</td><td>Var1(Var2 bytes)-> Var3(Var2 bytes)</td><td>Copy Block</td></tr>
<tr><td>ArrayCopy</td><td>Var1 = ArrayCopy(Var2, Var3, Var4, Var5, Var6)</td><td>Copy Array</td></tr>
<tr><td>FILL</td><td>FILL(Var1, Var2, Var3)</td><td>Fill Block</td></tr>
<tr><td>FILLASC</td><td>FILLASC(Var1, " ")</td><td>Convert text to ASCII</td></tr>
<tr><td>STRCAT</td><td>Var1 = STRCAT(Var2, Var3, Var4)</td><td>Connection String</td></tr>
<tr><td>FMOV</td><td>Var1 = FMOV(Var2) (Signed DW)</td><td>Specify Floating-Point Number Data</td></tr>
<tr><td>QMOV</td><td>Var1 = QMOV(Var2)</td><td>Quadruple word data designation</td></tr>
</table>
</td></tr>
<tr><td>Command - Data Conversion</td><td>Commands supported by Data Conversion operations include:</td></tr>
</table>

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>BCD</td><td>Var1 = BCD(Var2)</td><td>Convert Decimal Values to BCD values</td></tr>
<tr><td>BIN</td><td>Var1 = BIN(Var2)</td><td>Convert BCD Values to Decimal Values</td></tr>
<tr><td>TODWORD</td><td>Var1 = TODWORD(Var2)</td><td>Convert Values from Word to Double Word</td></tr>
<tr><td>TOWORD</td><td>Var1 = TOWORD(Var2, Var3)</td><td>Convert Values from Byte to Word</td></tr>
<tr><td>TOBYTE</td><td>Var1 = TOBYTE(Var2, Var3)</td><td>Convert Values from Word to Byte</td></tr>
<tr><td>SWAP</td><td>SWAP(Var1, Var2, Var3)</td><td>Swap High and Low Bytes of Word</td></tr>
<tr><td>XCHG</td><td>XCHG(Var1, Var2, Var3)</td><td>Exchange Value Data</td></tr>
<tr><td>MAX</td><td>Var1 = MAX(Var2, Var3)</td><td>Get Maximum</td></tr>
<tr><td>MIN</td><td>Var1 = MIN(Var2, Var3)</td><td>Get Minimum</td></tr>
<tr><td>TOHEX</td><td>Var1 = TOHEX(Var2)</td><td>Convert 4 ASCII Characters to HEX</td></tr>
<tr><td>TOASC</td><td>Var1 = TOASC(Var2)</td><td>Convert HEX to 4 ASCII Characters of Word</td></tr>
<tr><td>FCNV</td><td>Var1 = FCNV(Var2) (Signed DW)</td><td>Convert Integer to Floating-Point Number</td></tr>
<tr><td>ICNV</td><td>Var1 = ICNV(Var2) (Signed DW)</td><td>Convert Floating-Point Number to Integer</td></tr>
<tr><td>SPRINTF</td><td>Var1 = SPRINTF(Var2, "%u", Var4)</td><td>Format String</td></tr>
</table>
</td></tr>
<tr><td>Command - Comparison</td><td>Commands supported by the Comparison operations include:
<table>
<tr><th>Command</th><th>Formula</th></tr>
<tr><td>IF ==</td><td>IF Var1 == Var2</td></tr>
<tr><td>IF !=</td><td>IF Var1 != Var2</td></tr>
<tr><td>IF ></td><td>IF Var1 > Var2</td></tr>
<tr><td>IF >=</td><td>IF Var1 >= Var2</td></tr>
<tr><td>IF <</td><td>IF Var1 < Var2</td></tr>
<tr><td>IF <=</td><td>IF Var1 <= Var2</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>ELSEIF ==</td><td>ELSEIF Var1 ==Var2</td></tr>
<tr><td>ELSEIF !=</td><td>ELSEIF Var1 !=Var2</td></tr>
<tr><td>ELSEIF ></td><td>ELSEIF Var1 >Var2</td></tr>
<tr><td>ELSEIF >=</td><td>ELSEIF Var1 >=Var2</td></tr>
<tr><td>ELSEIF <</td><td>ELSEIF Var1 <Var2</td></tr>
<tr><td>ELSEIF <=</td><td>ELSEIF Var1 <=Var2</td></tr>
<tr><td>IF AND ==0</td><td>IF (Var1 & Var2)== 0</td></tr>
<tr><td>IF AND !=0</td><td>IF (Var1 & Var2)!= 0</td></tr>
<tr><td>IF ==ON</td><td>IF Var1 == ON</td></tr>
<tr><td>IF ==OFF</td><td>IF Var1 == OFF</td></tr>
<tr><td>ELSEIF AND ==0</td><td>ELSEIF (Var1 & Var2) == 0</td></tr>
<tr><td>ELSEIF AND !=</td><td>ELSEIF (Var1 & Var2) != 0</td></tr>
<tr><td>ELSEIF ==ON</td><td>ELSEIF Var1 == ON</td></tr>
<tr><td>ELSEIF ==OFF</td><td>ELSEIF Var1 == OFF</td></tr>
<tr><td>ELSE</td><td>ELSE</td></tr>
<tr><td>ENDIF</td><td>ENDIF</td></tr>
</table>
</td></tr>
<tr><td>Command - FlowControl</td><td>Commands supported by the FlowControl operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>GOTO</td><td>GOTO LABEL Var1</td><td>Unconditionally execute a Label Name</td></tr>
<tr><td>LABEL</td><td>LABEL Var1</td><td>Label name</td></tr>
<tr><td>CALL</td><td>CALL Var1</td><td>Call Submacro</td></tr>
<tr><td>RET</td><td>RET</td><td>Call Submacro</td></tr>
<tr><td>FOR</td><td>FOR Var1</td><td rowspan="2">Program loop</td></tr>
<tr><td>NEXT</td><td>NEXT</td></tr>
<tr><td>END</td><td>END</td><td>End Macro Program</td></tr>
</table>
</td></tr>
<tr><td>Command – Bit Setting</td><td>Commands supported by the Bit Setting operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>BITON</td><td>BITON Var1</td><td>Set Bit as On</td></tr>
<tr><td>BITOFF</td><td>BITOFF Var1</td><td>Set bit as Off</td></tr>
<tr><td>BITNOT</td><td>BITNOT Var1</td><td>Inverse Bit, ON→OFF, OFF→ON</td></tr>
<tr><td>GETB</td><td>Var1 = GETB Var2</td><td>Get Bit Value</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>Command – Communication</td><td>Commands supported by the Bit Setting operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>INITCOM</td><td>Var1 = INITCOM(Var2, Var3, Var4, Var5, Var6, Var7, Var8)</td><td>COM Port Initialization</td></tr>
<tr><td>ADDSUM</td><td>Var1 = ADDSUM(Var2, Var3)</td><td>Get CHECKSUM through Addition</td></tr>
<tr><td>XORSUM</td><td>Var1 = XORSUM(Var2, Var3)</td><td>Get CHECKSUM through XOR</td></tr>
<tr><td>PUTCHARS</td><td>Var1 = PUTCHARS(Var2, Var3, Var4)</td><td>Output Characters via the Communication Port</td></tr>
<tr><td>GETCHARS</td><td>Var1 = GETCHARS(Var2, Var3, Var4)</td><td>Get Characters via the COM Port</td></tr>
<tr><td>SELECTCOM</td><td>SELECTCOM(Var1)</td><td>Select COM Port</td></tr>
<tr><td>CLEARCOMBUFFER</td><td>CLEARCOMBUFFER(Var1, Var2)</td><td>Clear Buffer of COM Port</td></tr>
<tr><td>CHRCHKSUM</td><td>Var1 = CHRCHKSUM("Var2", Var3, Var4)</td><td>Calculate the Length and CHECKSUM Value of the String</td></tr>
<tr><td>LOCKCOM</td><td>Var1 = LOCKCOM(Var2, Var3)</td><td>Lock COM Port</td></tr>
<tr><td>UNLOCKCOM</td><td>UNLOCKCOM(Var1)</td><td>Unlock COM Port</td></tr>
<tr><td>STATIONCHK</td><td>Var1 = STATIONCHK(Var2, Var3)</td><td>Check COM Connection Status</td></tr>
<tr><td>STATIONON</td><td>STATIONON(Var1, Var2)</td><td>Station ON</td></tr>
<tr><td>STATIONOFF</td><td>STATIONOFF(Var1, Var2)</td><td>Station OFF</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>IPON</td><td>Var1 = IPON(Var2, Var3, Var4, Var5, Var6)</td><td>Activate IP address</td></tr>
<tr><td>IPOFF</td><td>Var1 = IPOFF(Var2, Var3, Var4, Var5, Var6)</td><td>Disable IP address</td></tr>
<tr><td>IPCHANGE</td><td>Var1 = IPCHANGE(Var2, Var3, Var4, Var5, Var6, Var7)</td><td>Change the Connection IP and Communication Port of the Connection Controller</td></tr>
<tr><td>COMLINKSTATUS</td><td>Var1 = COMLINKSTATUS(Var2)</td><td>Communication Port Connection Status</td></tr>
<tr><td>NETLINKSTATUS</td><td>Var1 = NETLINKSTATUS(Var2)</td><td>Network Connection Status</td></tr>
<tr><td>CLOSECOM</td><td>Var1 = CLOSECOM(Var2)</td><td>Disable the Communication Port</td></tr>
</table>
</td></tr>
<tr><td>Command – Drawing</td><td>Commands supported by the Drawing operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>RECTANGLE</td><td>RECTANGLE(Var1)</td><td>Rectangle</td></tr>
<tr><td>LINE</td><td>LINE(Var1)</td><td>Line</td></tr>
<tr><td>POINT</td><td>POINT(Var1)</td><td>Point</td></tr>
<tr><td>CIRCLE</td><td>CIRCLE(Var1)</td><td>Circle</td></tr>
</table>
</td></tr>
<tr><td>Command – File Access</td><td>Commands supported by the File Access operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>FileSlotRead</td><td>Var1 = FileSlotRead(Var2, Var3, Var4, Var5)</td><td>Read the file</td></tr>
<tr><td>FileSlotWrite</td><td>Var1 = FileSlotWrite(Var2, Var3, Var4, Var5)</td><td>Write the file</td></tr>
<tr><td>FileSlotRemove</td><td>Var1 = FileSlotRemove(Var2)</td><td>Remove the file</td></tr>
<tr><td>FileSlotGetLength</td><td>Var1 = FileSlotGetLength(Var2, Var3)</td><td>Read the file length</td></tr>
<tr><td>FileSlotExport</td><td>Var1 = FileSlotEXPORT(Var2, Var3, Var4, Var5)</td><td>Export the file</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>FileSlotImport</td><td>Var1 = FileSlotIMPORT(Var2, Var3, Var4, Var5)</td><td>Import the file</td></tr>
<tr><td>FileSlotGetName</td><td>Var1 = FileSlotGetName(Var2, Var3, Var4)</td><td>Get the filename</td></tr>
<tr><td>FileSlotSetName</td><td>Var1 = FileSlotSetName(Var2, Var3, Var4)</td><td>Set the filename</td></tr>
<tr><td>FileSlotGetID</td><td>Var1 = FileSlotGetID(Var2, Var3, Var4)</td><td>Get the file ID</td></tr>
</table>
</td></tr>
<tr><td>Command – Others</td><td>
Commands supported by the Others operations include:
<table>
<tr><th>Command</th><th>Formula</th><th>Description</th></tr>
<tr><td>Time Tick</td><td>Var1 = TIMETICK</td><td>Get the Time from the start of the system up to now</td></tr>
<tr><td>GETLASTERROR</td><td>Var1 = GETLASTERROR</td><td>Get Error Value of Previous Command</td></tr>
<tr><td>Comment</td><td>#</td><td>Comments</td></tr>
<tr><td>Delay</td><td>Delay(Var1)</td><td>Delay</td></tr>
<tr><td>GETSYSTEMTIME</td><td>Var1 = GETSYSTEMTIME</td><td>Get System Time</td></tr>
<tr><td>SETSYSTEMTIME</td><td>SETSYSTEMTIME(Var1)</td><td>Set System Time</td></tr>
<tr><td>GETHISTORY</td><td>Var1 = GETHISTORY(Var2, Var3, Var4, Var5, Var6)</td><td>Get History Data</td></tr>
<tr><td>EXPORT</td><td>EXPORT</td><td>Export Data</td></tr>
<tr><td>EXRCP16</td><td>EXRCP16</td><td>Export 16-bit Recipe</td></tr>
<tr><td>IMRCP16</td><td>IMRCP16</td><td>Import 16-bit Recipe</td></tr>
<tr><td>EXRCP32</td><td>Var1 = EXRCP32(Var2, Var3)</td><td>Export 32-bit Recipe</td></tr>
<tr><td>IMRCP32</td><td>Var1 = IMRCP32(Var2, Var3)</td><td>Import 32-bit Recipe</td></tr>
<tr><td>EXENRCP</td><td>Var1 = EXENRCP(Var2, Var3)</td><td>Export Enhanced Recipe</td></tr>
<tr><td>IMENRCP</td><td>Var1 = IMENRCP(Var2, Var3)</td><td>Import Enhanced Recipe</td></tr>
<tr><td>EXHISTORY</td><td>Var1 = EXHISTORY(Var2, Var3, Var4)</td><td>Export History Data</td></tr>
</table>
</td></tr>
</table>

Function	Description		
	EXALARM	Var1 = EXALARM(Var2, Var3)	Export Alarm Data
	EXALARM GROUP	Var1 = EXALARMGROUP(Var 2, Var3, Var4)	Export Group Data Specified by Alarm
	DISKFOR MAT	Var1 = DISKFORMAT(Var2)	Disk Format
	BMPCAPT URE	Var1 = BMPCAPTURE(Var2)	Screen Capture
	PLCDOW NLOAD	Var1 = PLCDOWNLOAD(Var2, Var3, Var4, Var5, Var6)	Download DVP or ISP files to PLC via HMI
	OPENSCR EEN	OPENSCREEN(Var1)	● Open the screen ● Cannot be used in **Screen On Macro** / **Screen Off Macro** / **Screen Cycle Macro**
	CLOSESU BSCREEN	CLOSESUBSCREEN(Var1)	● Close the sub-screen. ● Cannot be used in **Screen On Macro** / **Screen Off Macro** / **Screen Cycle Macro**.
	GetCircleC enter	Var1 = GetCircleCenter(Var2, Var3)	Calculate the coordinates of the center of the circle
	VAR	VAR Var1	Variable

3. Click **Command**, select the command, and click  icon in the contents column to select the address or constant of the associated device to be calculated, as shown in the following figure.

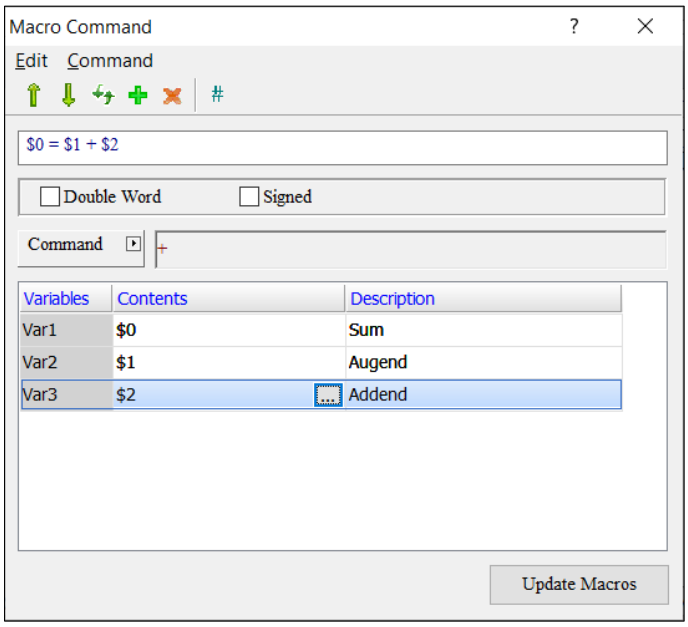


Figure 2 - 93: Macro Command window

4. Click **Update Macro**, and the macro command gets updated to the position of the line number selected in the macro setting window.

2.2.2.10 Open Screen

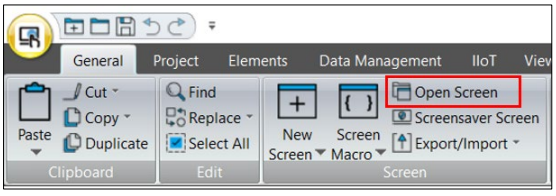


Figure 2 - 94: Open Screen

Click **General** > **Screen** > **Open Screen**, or press **Shift** + **O** to select the required screen to open. Users can view all the elements on preview screen.

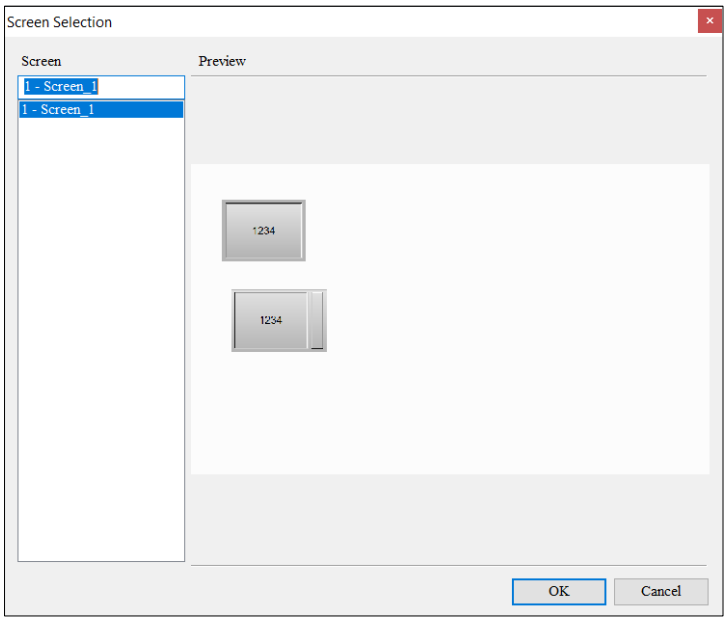


Figure 2 - 95: Select Screen

2.2.2.11 Screensaver Screen

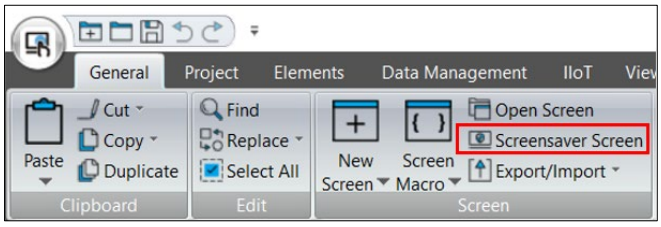


Figure 2 - 96: Screensaver Screen

DIAScreen sets the **Screensaver Screen** using the usual windows operation. Select the screen to set the screensaver, and drag it to the **Screensaver Screen** window to set the screensaver screen. Follow these steps to proceed:

1. Click **General** > **Screen** > **Screensaver Screen** to open **Screensaver Setup** window.

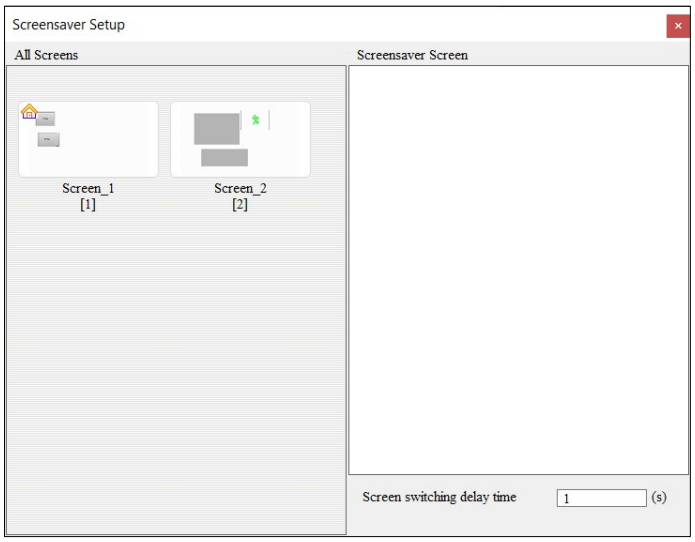


Figure 2 - 97: Edit Screensaver Setup

2. Click the screen to set as the screensaver screen, then double-click. A green arrow appears to drag the prompt symbol.

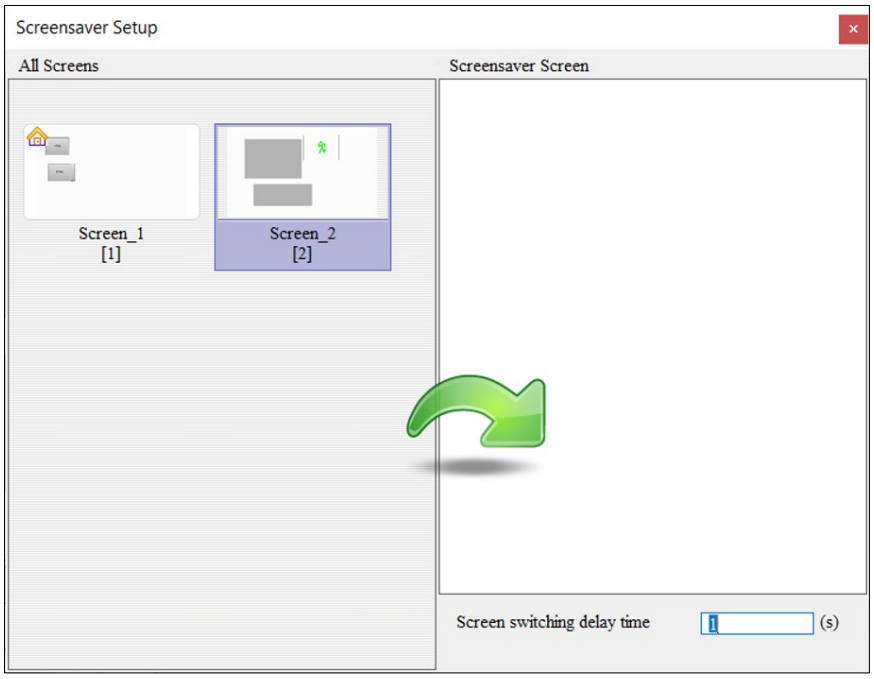


Figure 2 - 98: Green drag Symbol

3. The following figure shows the screen number 2 that has been dragged to the Screensaver Screen.

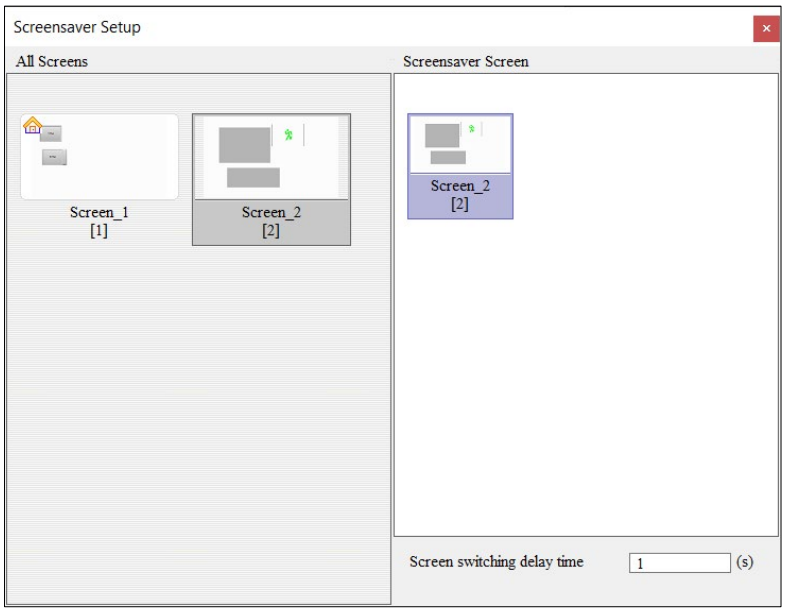


Figure 2 - 99: No. 2 Screen in the Screensaver Screen

4. If users want to delete the screensaver, drag the screensaver users want to delete back to all the screens on the left, a cross appears, and release the left mouse button.

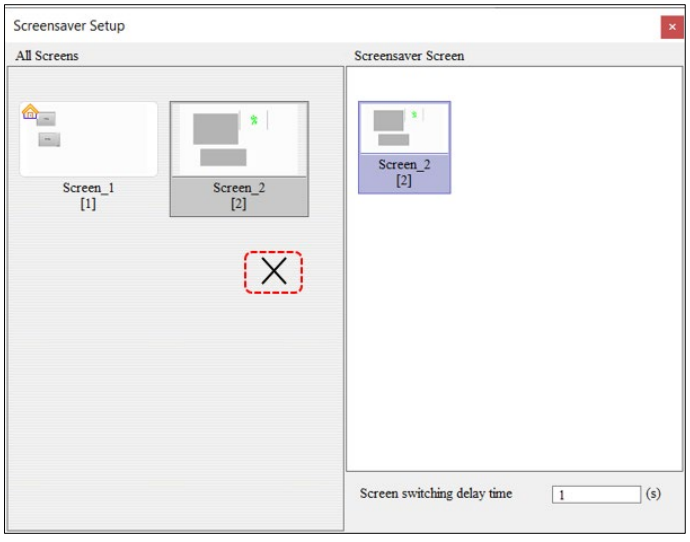


Figure 2 - 100: Black X symbol delete Screensaver

5. Check **Enable screensaver** to set the **Screen switching delay time**. The screen switching delay time is the interval time for switching between screens,

the time range is 1 ~ 255 seconds (s), and the preset time is 1 second (s).

2.2.2.12 Export/Import

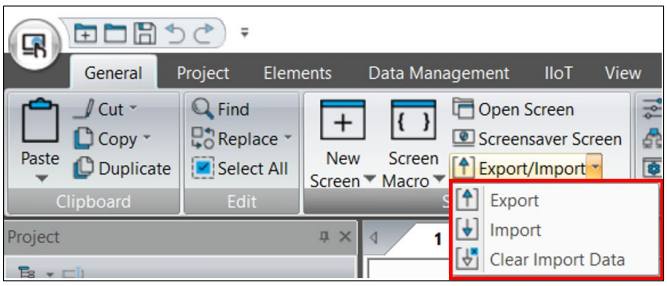


Figure 2 - 101: Export/ Import functions

Export/Import includes Export, Import and Clear Import Data, which are explained as follows.

Export

Save the currently edited screen data to disk in graphic format (.bmp file). Click **General** > **Screen** > **Export/Import** > **Export**.

Or

Press **Shift** + **E** on the keyboard.

After the export is executed, users will be asked whether to display the border on the exported screen.

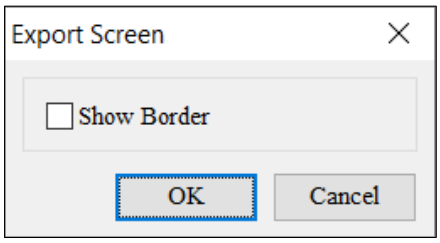


Figure 2 - 102: Export

Click **OK**. The default file name is NewHMI, and its file name format is .bmp file.

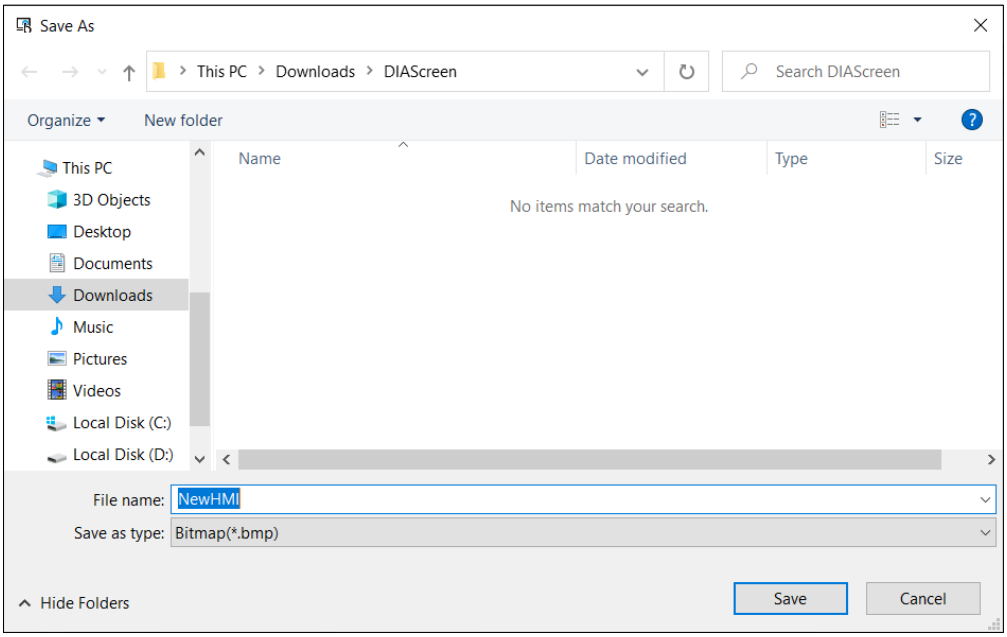


Figure 2 - 103: Export Archive

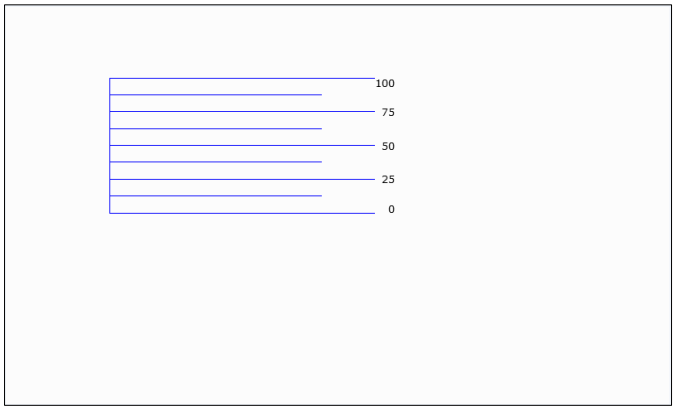


Figure 2 - 104: Exported Image format

If users select **Show Border**, there will be a bold black frame around the picture to surround the picture.

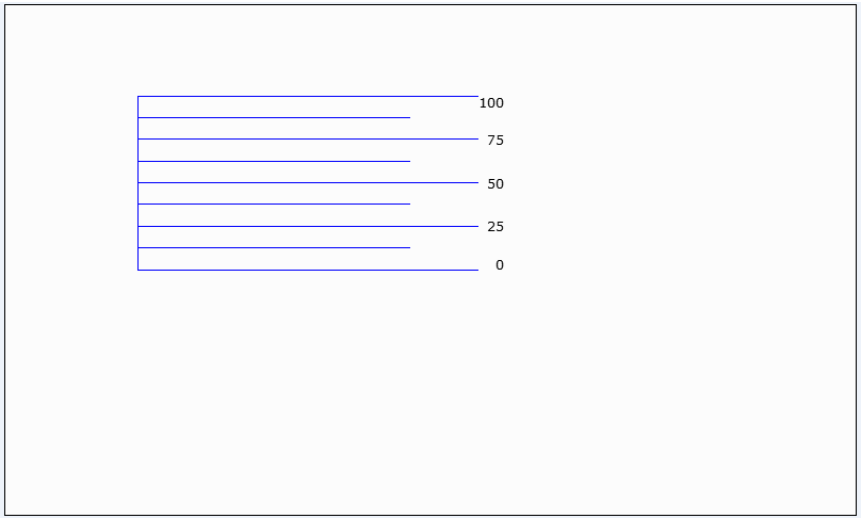


Figure 2 - 105: Picture format shown in black box

Import

Load any image from the file as the basemap of the editing screen. The supported Import image formats include bmp, jpg, gif, ico, png. Click **General** > **Screen** > **Export/Import** > **Import**.

Or

Press **Shift** + **I** on the keyboard.

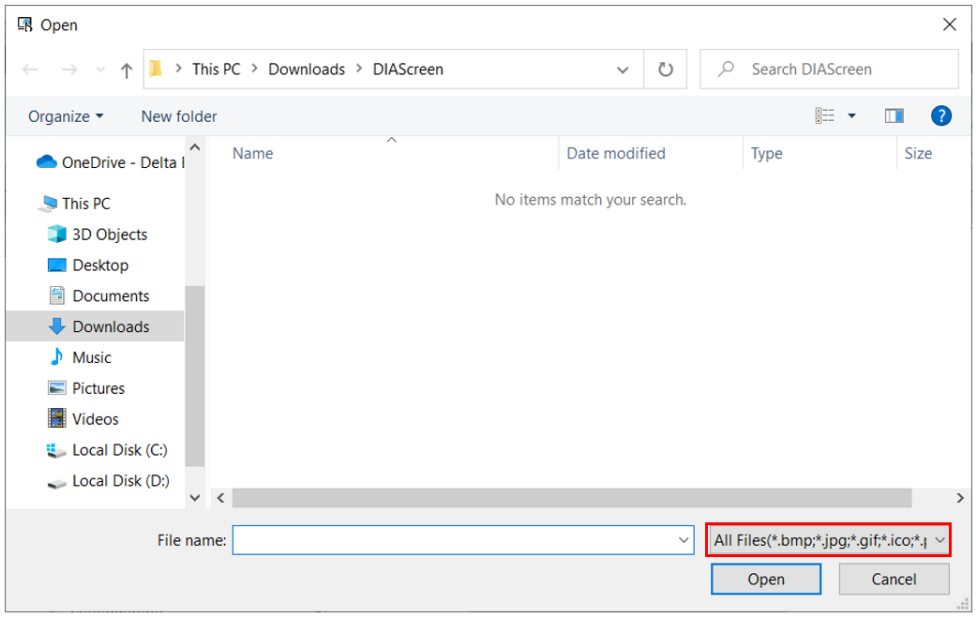


Figure 2 - 106: Import supported formats

NOTE: *The base image of the imported screen has different meanings than the base image. The imported graphic data is not treated as an element, but the base screen exists in the editing screen in the form of an element after compiling.*

Clear Import Data

Click **General** > **Screen** > **Export/Import** > **Clear Import Data** to clear the basemap of the external graphics used in the current editing screen.

2.2.2.13 Configuration

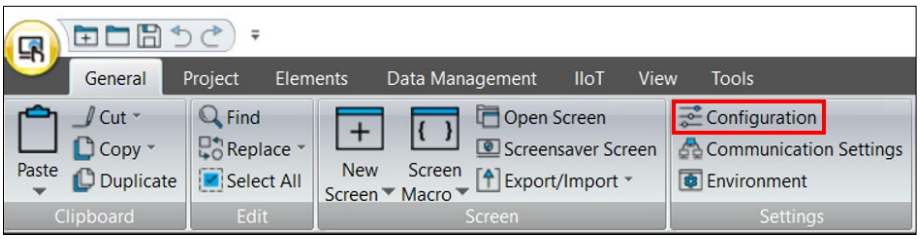


Figure 2 - 107: Configuration

Go to **General** > **Settings** > **Configuration** to open the **Configuration** window. It comprises Main, Control Status Block, Real Time Clock, Print, Default, Network Settings, Multi-language and Industry Application.

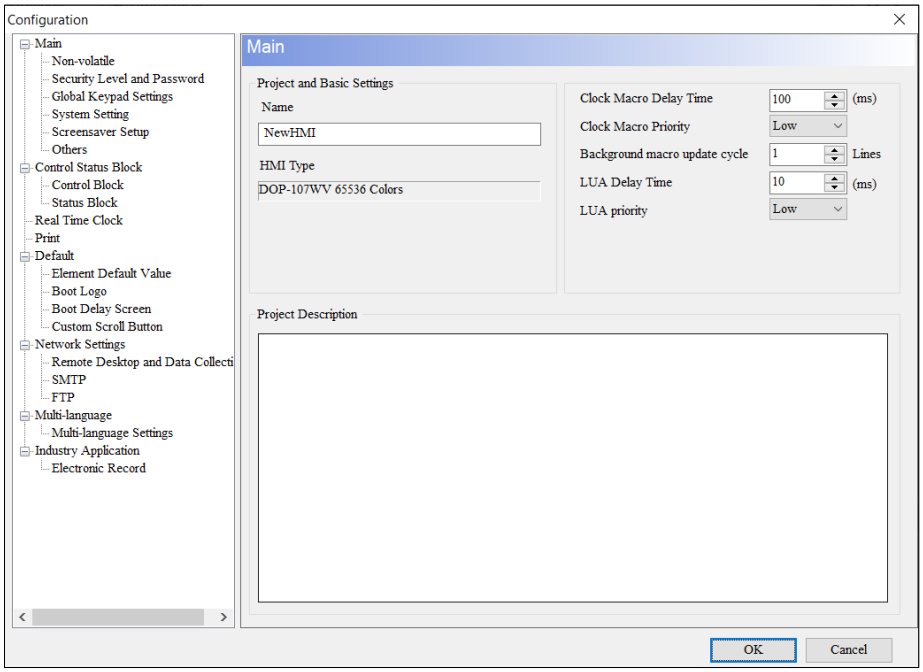
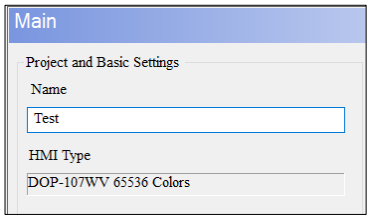
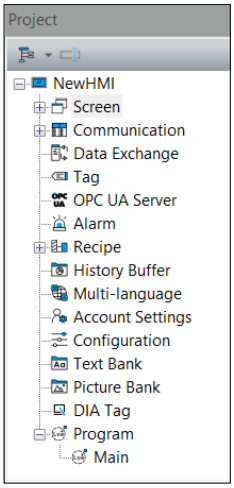
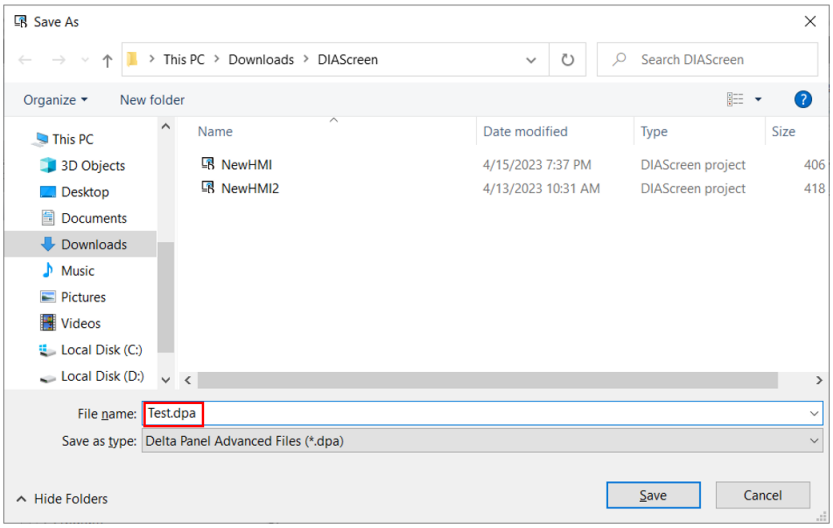
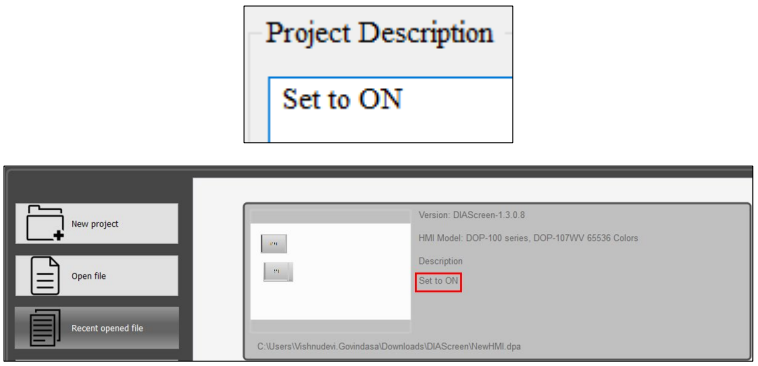


Figure 2 - 108: Configuration window

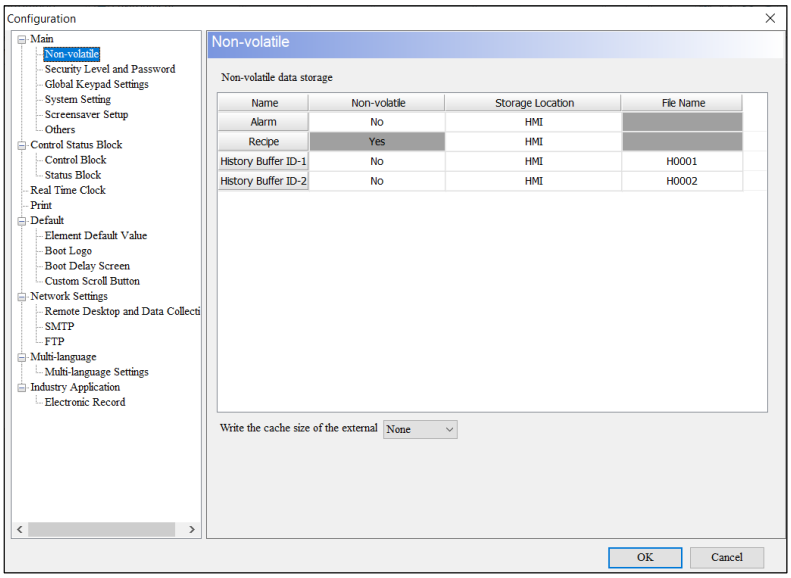
2.2.2.13.1 Main

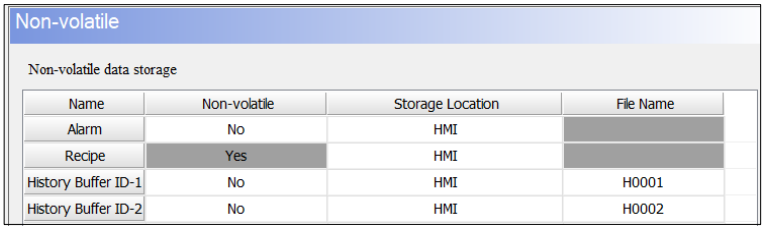
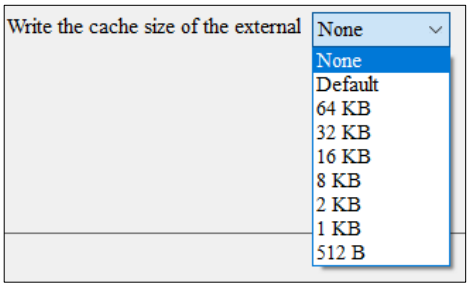
Function	Description
Name	● Change the **Name** of Project, and it displays on the left **Project** tree. 

Function	Description
	 ● Use the default name, while saving the project. 
HMI Type	Display the currently edited HMI model.
Clock Macro Delay Time	**Clock Macro Delay Time**, the range is 50 ~ 65535 ms. This time is the interval time after each execution of Clock and macro. The default value is **100** ms.
Clock Macro Priority	● The available options for **Clock Macro Priority** are: Low, Medium and High. The default value is **Low**. ● Set the priority of the Clock macro execution. The higher the priority, the more accurate the **Clock Macro Delay Time**.
Background macro update cycle	Set the number of lines executed per cycle of the background macro. The set number of lines ranges from 1 ~ 512.The default value is **1**.
LUA Delay Time	**LUA Delay Time** is how long the interval is after each execution of LUA. The range is 0 ~ 10 ms. The default value is **10** ms.

Function	Description
LUA priority	Set the priority of LUA execution. The available options for **LUA priority** are: Low, Medium, and High. The higher the priority, the clearer the LUA delay time. The default value is **Low**.
Project Description	Describe the purpose of Project. After running the application, select the project again to see the purpose of the project. 

Non - volatile

Function	Description
Non - volatile	 ● Non-volatile data storage location: one is the **Alarm**, the other is the **Recipe**, and the third is the **Historical Buffer Zone**. ● The part of historical data will be determined according to whether the customer has established a Historical Buffer.

Function	Description
	 ● If users have used the data of these three parts, users can select location to store the data. Storage locations include HMI, USB Disk, and SD Card. ● Click the **Storage Location** to set the storage location of the non-volatile storage data in the alarm, recipe, and history buffer.
Write the cache size of the external	● External storage devices include USB Disk and SD Card. ● The data written by the HMI to the external storage device will be temporarily placed in the cache area. However, the external storage device cache write setting value is for the amount of data in the cache area. If the cache write setting value is not reached, the data not actually written to the external storage device. This method can prevent the external storage device from being damaged due to continuous writing. ● Assuming that the amount of data to be accessed by users is less than the capacity of the buffer, or unexpected power failure may result in partial data loss, in order to avoid this situation, the bit of the general control flag of the control area can be forcibly triggered at regular intervals. Write data to external storage device to ensure the existence of data. 

Security Level and Password

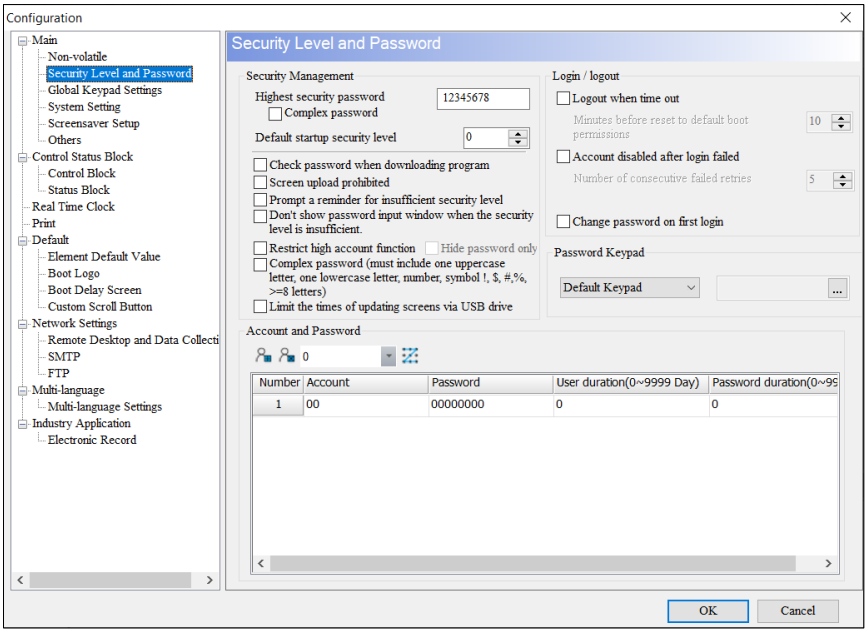
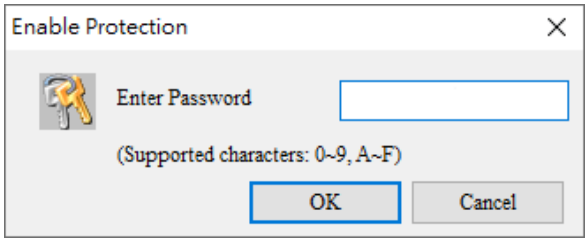
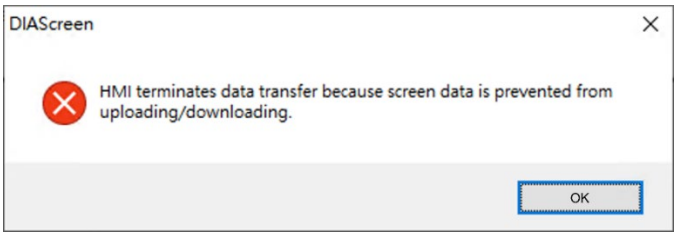
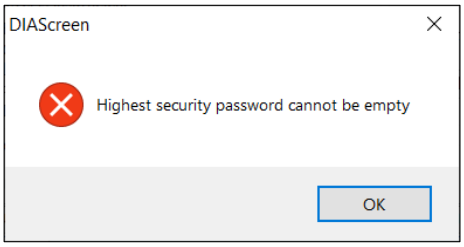


Figure 2 - 109: **Security Level and Password**

Function	Description
Highest security password	The **Highest security password** is the password with the highest security level of HMI, which means level 8. The default value of the highest security password is **12345678**. This password is used to control upload screen data and recipes, download screen data and recipes (users need to check the download password verification first), password protection, execute system formatting, system file encryption and copy file functions (users need to check **screen update first number of checks**). The password text format is Hexadecimal unit from 0 to F.
Default start up security level	● If users want to use the default security permission, use it together with users' permission of each security level. ● The default power-on security is the security level when the HMI is turned on, ranging from **level 0** to **level 8**.
Check password when downloading program	● If users select this option, users must first download the settings to the HMI, and then execute the second download of screen data and recipes, the application ask users to enter the highest-security password.

Function	Description
	 ● The screen can be downloaded to the HMI normally only after the password is entered successfully; if the password is failed, a warning message appears to notify users that the entered password is incorrect and cannot be downloaded.
Screen upload prohibited	The function of **Screen upload prohibited** is to let users (1) download the screen data to the HMI, and then (2) upload all the data, DIAScreen displays the following message to notify users that the data cannot be uploaded. 
Prompt a reminder for insufficient security level	Assuming that users permission set by the element is higher than the default boot permission, and users select this option, after downloading to the HMI, the element displays  that indicates that users current permission level is insufficient.
Don't show password input window, when the security level is insufficient	When users' current permission level is insufficient, the password input window does not display.
Restrict high account function	The functions of high-level accounts are restricted, and no operations can be performed on low-level accounts.
Complex password	When this option is activated, the password must contain an uppercase letter, a lowercase letter, a number, a symbol (!, $, #, %), and more than (inclusive) 8 characters.
Limit the times of updating screens via USB drive	The screen update frequency check is mainly for the function of file encryption and copying of files. Therefore, users can encrypt the screen data files and set a limit on the number of times of copying, so as to provide customers with a secure and flexible file protection mechanism.

Function	Description
Logout when time out	When users select this function, users can return to the default power-on privilege after the number of minutes selected by users.
Account disabled after login failed	If checked, the account will be disabled according to the number of failed logins selected by users, and the account will be deactivated after consecutive login failures.
Change password on first login	If checked, the HMI forces users to change the password after logging in for the first time.
Account and Password	● The **Password Table Setting** is mainly used to distinguish the permission level of HMI. The permission level is divided into 0 ~ 7, a total of eight levels, each level has a preset password. DOP-100 series HMI also provides multiple accounts and passwords so that multiple users can log in at the same time. ***NOTE:*** *1. Password must not be blank.*  *2. Within the same permission level, the account names cannot be the same, but the passwords can be the same.* *3. The length of the account and password is limited to 24 characters.* *4. The account number and password are not case-sensitive and will only be displayed in uppercase.* ➢ *Permission level 0: no protection function, anyone can operate.* ➢ *Permission level 1 ~ 7: Users need to enter the corresponding password or a higher permission level to operate.* ➢ *Permission Level 8: The highest permission password. Password higher than permission level 1 ~ 7, this password is also the protection password after project storage, download password verification, format system file, etc.* ➢ *When users add the same account within the same permission level, the machine displays the message*

Function	Description
	that the account is duplicated.  ● Change the password and account content through the button element setting password table. Or enter the system screen, select **System Settings** > **User Password Level Settings** to change the password and account content. ● The account supports Unicode input, and the login user security is combined with multi-language input elements.

Global Keypad Settings

Global Keypad Settings provide Decimal, Hexadecimal, Binary and ASCII keyboards for user-defined styles. This function can be applied to multiple numerical input or text / digital input elements on the editing screen. Set the styles of the Decimal, Hexadecimal, Binary and ASCII keyboards through the Global Keypad, and then execute the application to combine the system keypad together to update custom keypad format. Users should know the keypad styles in the multiple numeric input or text/number input on the old screen cannot be applied. The global keypad setting provides the function of applying to all, replacing the old existing keypad styles with the new style. If it is a new element, we also provide the function of applying to the new addition, which only applies to newly created keypad. Users can easily and quickly apply whether users are new or old to update custom keypad format.

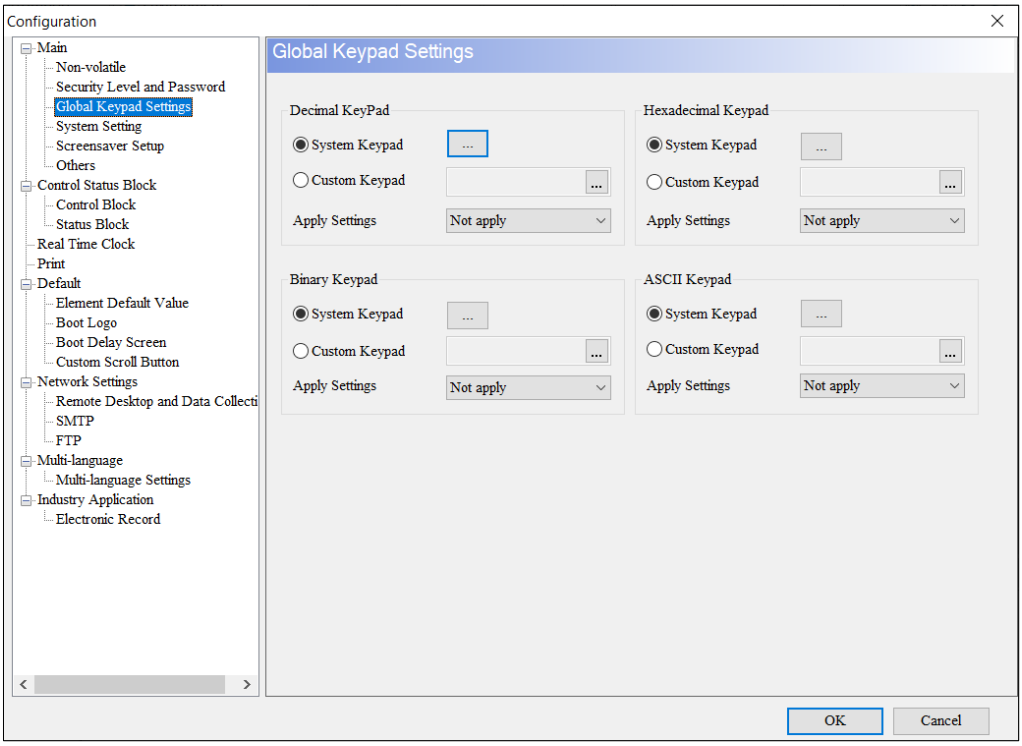
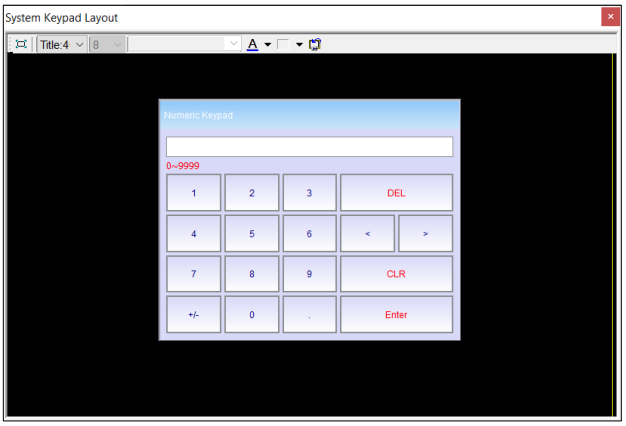
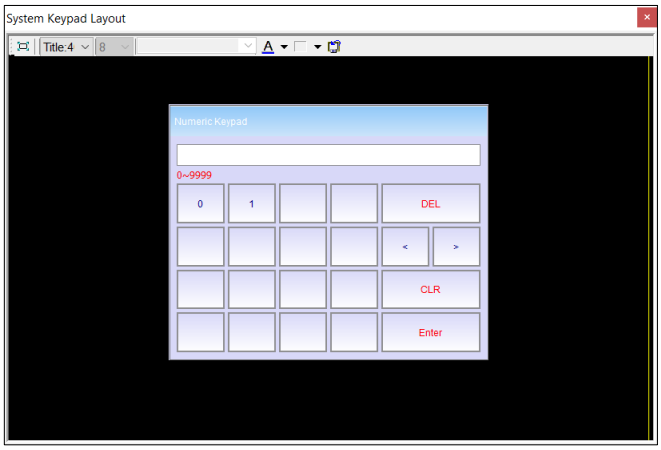
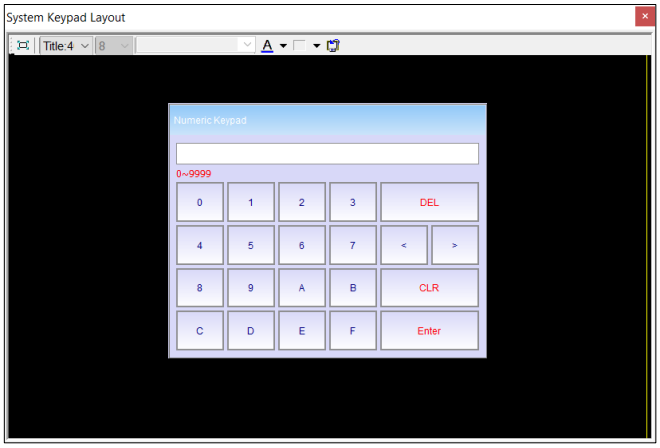
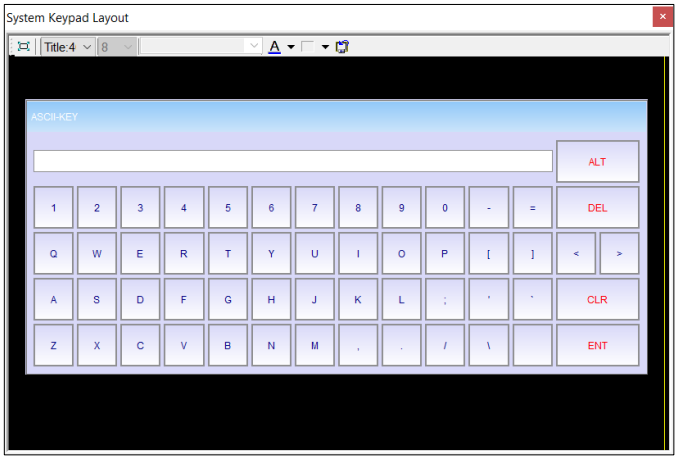


Figure 2 - 110: Global Keypad Settings

Function	Description		
Decimal Keypad	System Keypad	Customizable Numeric Keypad style. 	
	Apply settings	Not apply	Even if the keypad style is customized, the old or new keypad will maintain the original style of the system keypad.
		Apply to All	Replace the old keypad style with the new style.
		Apply to new	Only applies to newly created keypads.

<table>
<tr><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="3">Binary Keypad</td><td rowspan="1">System Keypad</td><td colspan="2">Customizable Binary Keypad style.
 
</td></tr>
<tr><td rowspan="2">Apply settings</td><td>Not apply</td><td>Even if the keypad style is customized, the old or new keypad will maintain the original style of the system keypad.</td></tr>
<tr><td>Apply to all</td><td>Replace the old keypad style with the new style.</td></tr>
<tr><td rowspan="3">Hexadecimal Keypad</td><td rowspan="1">System Keypad</td><td colspan="2">Customizable Hexadecimal Keypad style.
 
</td></tr>
<tr><td rowspan="2">Apply settings</td><td>Not apply</td><td>Even if the keypad style is customized, the old or new keypad will maintain the original style of the system keypad.</td></tr>
<tr><td>Apply to all</td><td>Replace the old keypad style with the new style.</td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4">ASCII keypad</td><td rowspan="1">System Keypad</td><td colspan="2">Customizable ASCII Keypad style.
 
</td></tr>
<tr><td rowspan="3">Apply settings</td><td>Not apply</td><td>Even if the keypad style is customized, the old or new keypad will maintain the original style of the system keypad.</td></tr>
<tr><td>Apply to all</td><td>Replace the old keypad style with the new style.</td></tr>
<tr><td>Apply to New</td><td>Only applies to newly created keypads.</td></tr>
</table>

System Setting

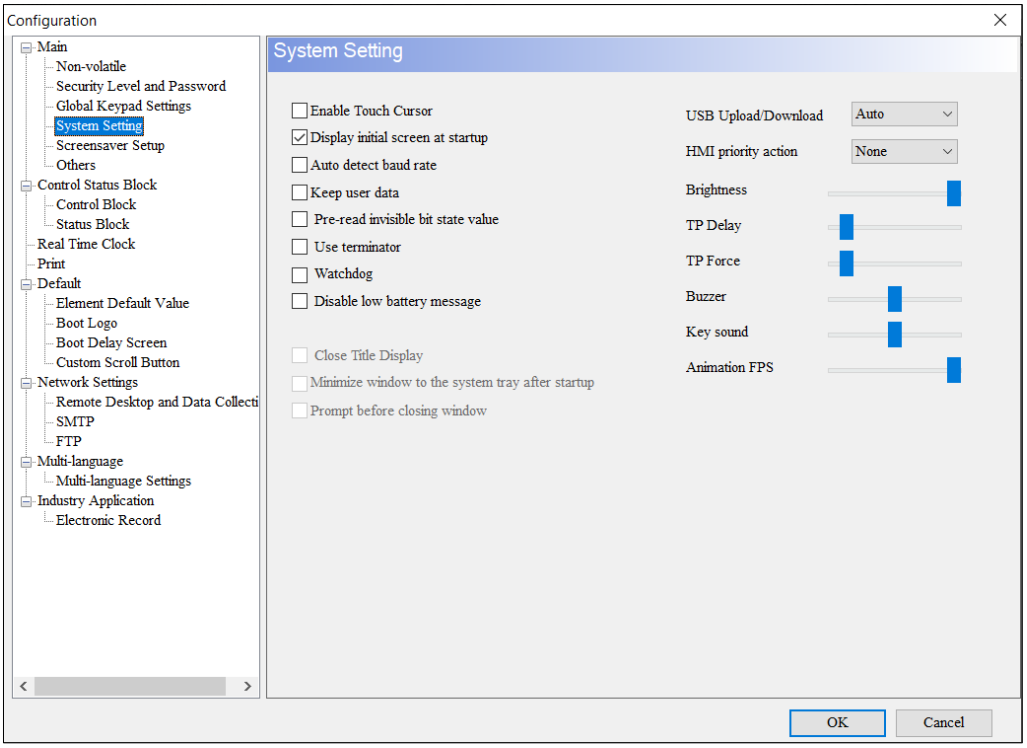
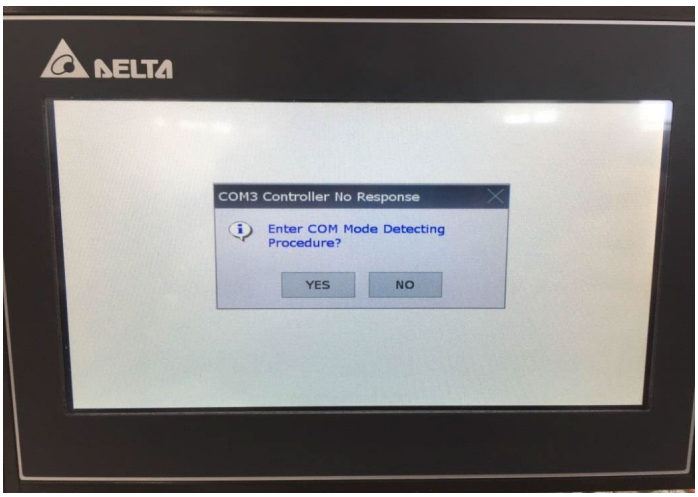
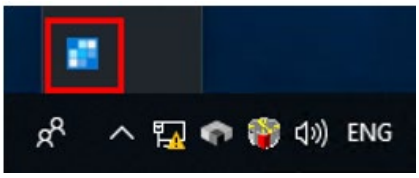
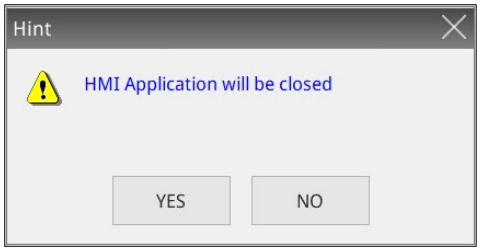
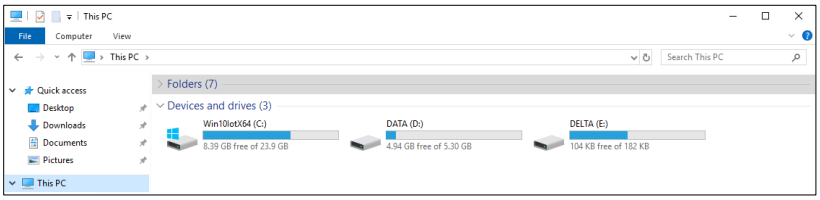
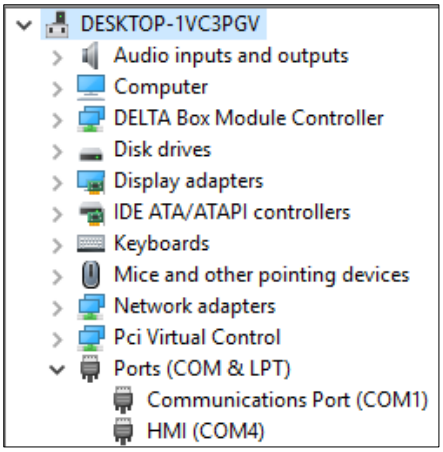


Figure 2 - 111: System Setting

Function	Description
Enable Touch Cursor	● The HMI provides the same mouse pointer as the Windows system. When the HMI screen is pressed, the icon of the mouse pointer appears. ● HMI supports wireless mouse with Unifying receiver.
Display initial screen at startup	Select to **Display initial screen at startup**. It means that the HMI displays the initial screen every time it is powered on, as shown in the following figure. 

Function	Description
Auto detect baud rate	After this function is enabled, the baud rate of the HMI will be automatically adjusted to be the same as that of the PLC.  The adjustment condition is when the HMI baud rate is different from the PLC baud rate.
Keep user data	Check this function, the files generated by users through LUA are deleted while downloading, formatting, or restoring factory defaults.
Pre-read Invisible Address state value	Check this function, when the Invisible Address is set to the PLC address, switching the screen can avoid the transient state of the element display, but it affects the screen display speed.
Use terminator	Check this function, alphanumeric display/input, historical data display, historical data CSV storage, the end character '\0' can be applied.
Watchdog	Check this function, if the HMI crashes, it automatically restarts.
Disable low battery message	Check this function, when the HMI is initializing, it does not display the low battery message.
Close Title Display	Check this function, the HMI screen does not display the title bar.  ***NOTE**: This function is only available on AX-8 Windows and IMP Series models.*

Function	Description
Minimize window to the system tray after startup	Check this function, the HMI screen will be minimized to the system tray when it starts  ***NOTE**: This function is only available on AX-8 Windows and IMP Series models.*
Prompt before closing window	Check this function, and the following message appears when the HMI screen is closed.  ***NOTE:** This function is only available on AX-8 Windows and IMP Series models.*
USB Upload/Download	**AUTO** ● The AUTO mode will be based on the USB upload and download mode of the HMI. ● If the USB upload and download mode is set to **AUTO**, after downloading the project, the HMI will maintain the currently set USB upload and download mode. If the current USB is downloaded through Disk mode (USBCommMode is 1), after the project is downloaded, the HMI will still use Disk mode to download; if the current USB is downloaded through CDC mode (USBCommMode is 2), after the project is downloaded, the HMI will still download with CDC mode. ● Except for B05S100, B05S101, B07S201, and B07S211, the factory default value of other HMIs is **AUTO**.

Function	Description
	Disk Disk is equivalent to USBCommMode 1. When set to Disk, after downloading to HMI, view a detachable storage device named **DELTA** in My Computer. 
	CDC CDC is equivalent to USBCommMode 2. When it is set to CDC, after downloading to the HMI, go to **My Computer** > **Content** > **Device Manager** to check whether there is a **device** named **HMI** in the port. 
HMI priority action	If **Touch** is selected, the HMI receives the touch action first, and then process the system operation.
Brightness	Adjust the brightness of the HMI backlight.
TP Delay	Set the delay time for the HMI to process Press and move messages. Set the delay to the right to decrease, which means the speed is faster; set the delay to the left to increase the speed, which means the speed is slower.
TP Force	Set the force of the HMI to press the screen. If the force is set to the left, it becomes smaller, which means that the HMI considers that the trigger force is smaller, so it becomes easier to Press; if the force is set to the right, it becomes larger, which means it is more difficult to press.
Buzzer	Adjust the buzzer volume of the panel. The lower the volume is set to the left, the higher the volume is set to the right.
Key sound	Adjust the sound when the HMI is pressed. The lower the volume is set to the left, the higher the volume is set to the right.

Function	Description
Animation FPS	This setting adjusts the update speed of the animation element setting frequency.

Screensaver Setup

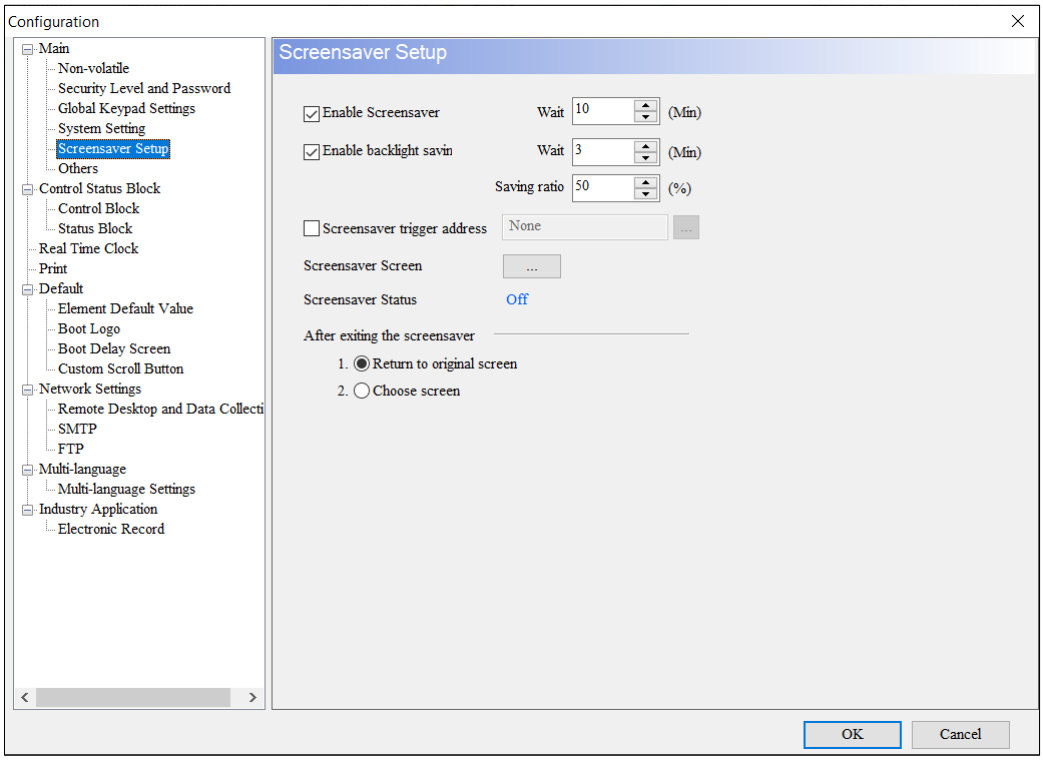
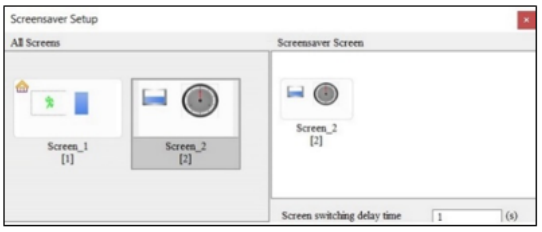


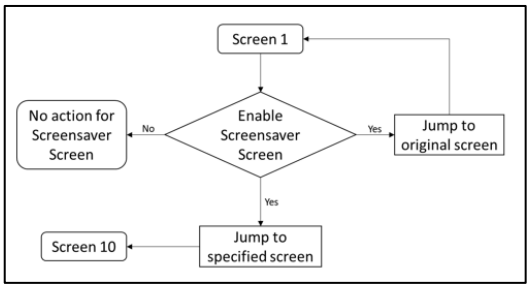
Figure 2 - 112: Screensaver Setup

Function	Description
Enable Screensaver	● After starting the screensaver, just press the display panel again to end the screen saver. ● If users select **Enable Screensaver**, go to **General** > **Screen** > **Screensaver Screen** but there is no screen saver to be activated, the screen saver will be displayed on the HMI in a completely black state. ● If **Enable Screensaver** is not checked, but the desired screen saver has been edited in **General** > **Screen** > **Screen saver Screen**, the screen saver will not be activated. ● Select **Enable screensaver** to set how long the

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td colspan="2">display will not be pressed before entering the screen saver screen. The time range is 1 ~ 100 min, and the default value is 10 min.</td></tr>
<tr><td>Enable backlight saving</td><td colspan="2">Check Enable backlight saving to set how long the HMI will not be pressed before enabling the backlight saving function. The time range is 1 ~ 10 min, the default value is 3 min.
Saving ratio 1~99%, the default value is 50%.</td></tr>
<tr><td>Screensaver trigger address</td><td colspan="2">Set Word starting address, 0 is to turn off the screen saver, 1 is to turn on the screen saver.</td></tr>
<tr><td rowspan="2">After existing the screensaver</td><td>Return to original screen</td><td rowspan="2">● Check Enable Screensaver to select the screen to be displayed after the screen saver ends. Jumping to the original screen means that after the screen saver is over, it will jump to the original screen before starting the screen saver.
● Select Enable Screensaver and also the screen number to be displayed after the screen saver ends. The designated screen means that users can specify the screen number, so that the designated screen will be displayed after the screen saver ends.

NOTE: If users want to use the specified screen, be sure to create a screen saver screen.
 

● The following figure is the flow chart of the screen saver screen.</td></tr>
<tr><td>Choose screen</td></tr>
</table>

Function	Description	
		

Others

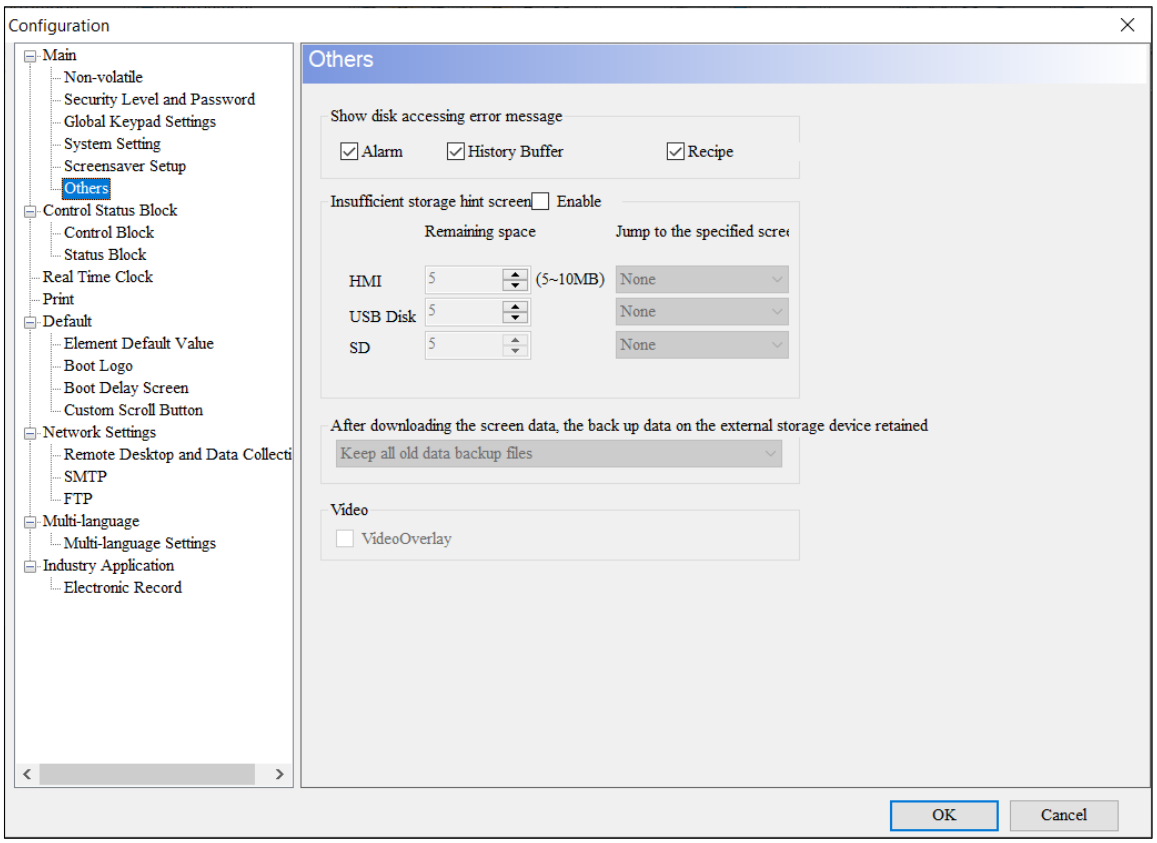


Figure 2 - 113: Others

Function	Description
Show disk accessing error message	Since alarms, history buffers and recipes can be set to save data as USB Disk or SD Card, if the external disk access fails, use this option to decide whether to display the warning message. The disk access failure means that if the history buffer sets the data location to the USB Disk when the power is turned off, but the HMI cannot detect the existence of the USB Disk after powering on, and cannot write data, this is considered a magnetic disk. Disk access failed. Therefore, if the **Display Disk Access Failure Warning Message** is not checked, when the HMI cannot detect the existence of the USB Disk and cannot write data to the USB Disk, no error message will pop up to inform users.
Insufficient storage hint screen	Specify three storage spaces: HMI, USB DISK, SD. When the storage space is less than the set MB, the HMI screen jumps to the specified screen.
Video Overlay	Check this function, the VGA or Camera element will be superimposed on the element, and the display will be triggered through the invisible bit.

2.2.2.13.2 Real Time Clock

Some PLC controllers do not have a built-in real-time clock (RTC), so they cannot be used in operations related to time setting, such as daily timed switch machines, access control management, etc. If the PLC controller has a built-in RTC, the HMI provides a synchronization function, allowing users to synchronize the HMI RTC time to the PLC or the PLC RTC time to the HMI. To use the real time clock update settings, users must select **Enable RTC Updates.** The Real time clock update setting includes two parts: **PLC Link Settings** and **Time Field Setting.**

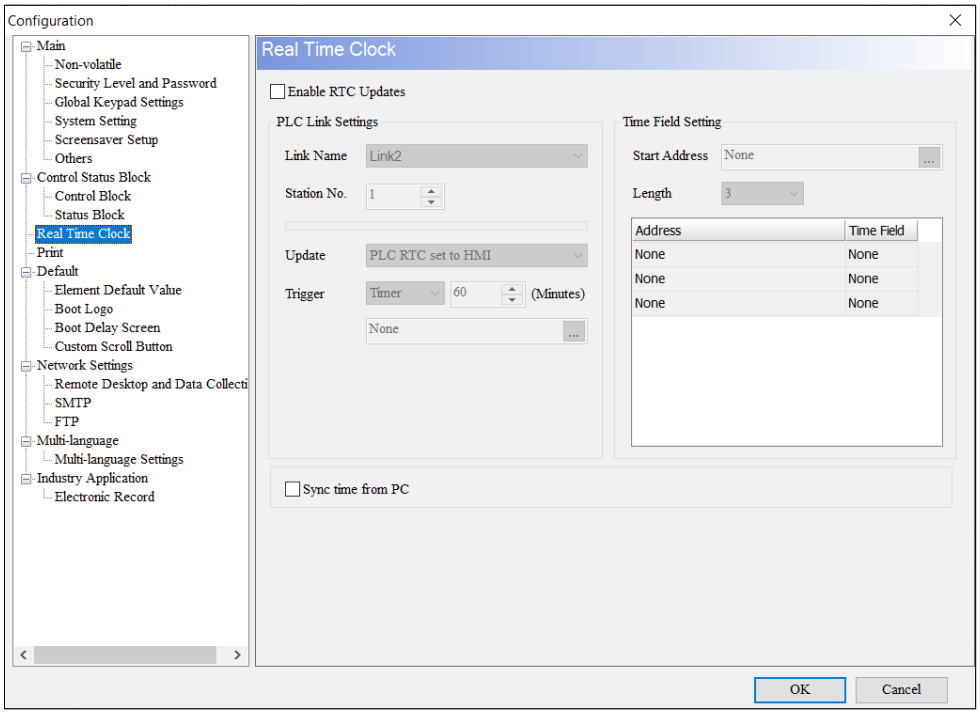
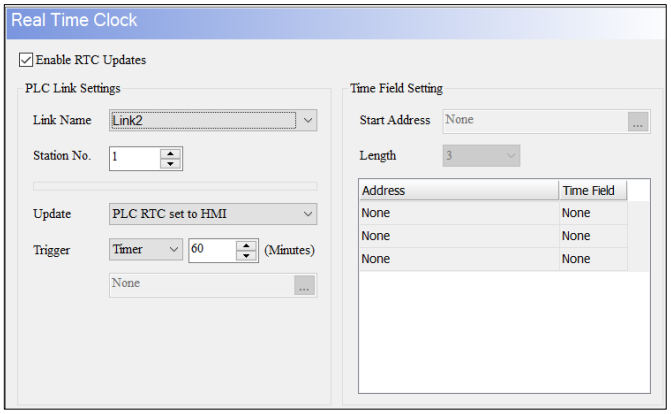
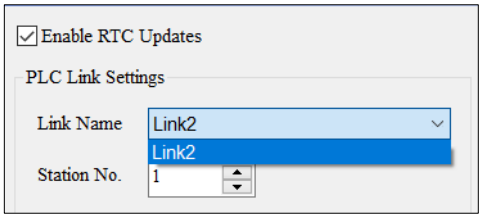
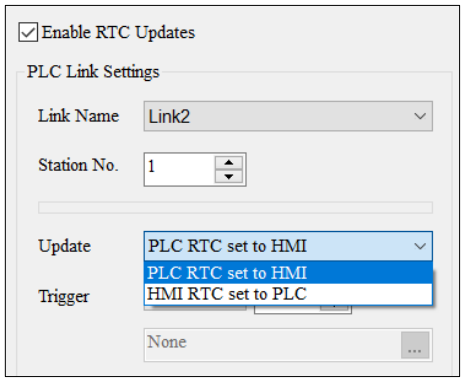


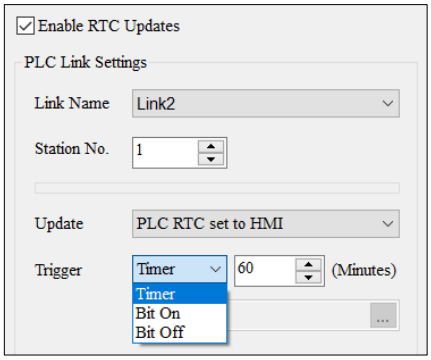
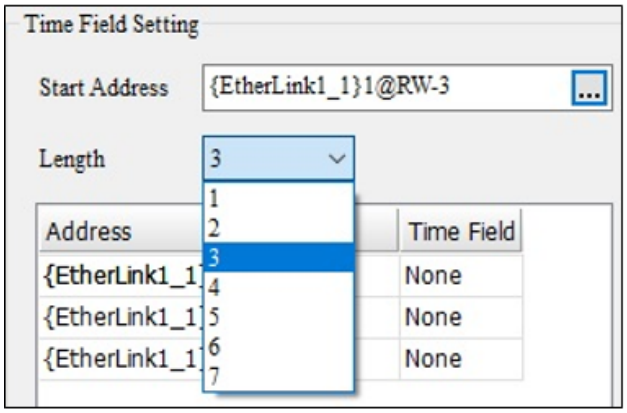
Figure 2 - 114: Real Time Clock

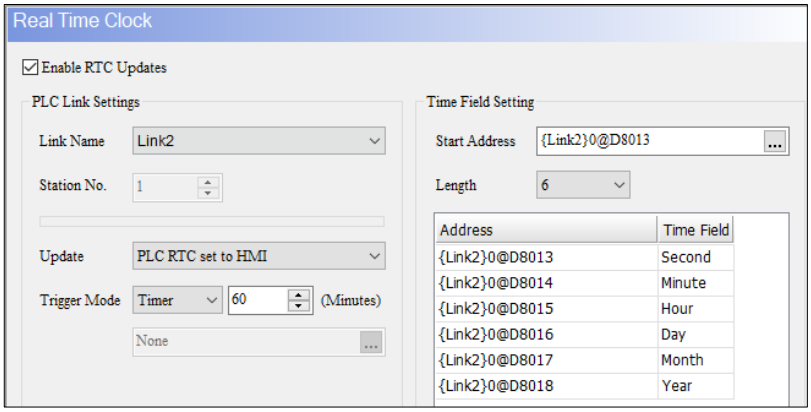
NOTE:

1. *If the controller is a Delta PLC product, there is no need to set additional time fields. The DIAScreen application will show that the time field cannot be set, and set this field to the special registers D1319 ~ D1313 of the real time clock of Delta PLC.*
2. *Some old Delta PLC models (ES / SS / EC) do not support real time clock update.*

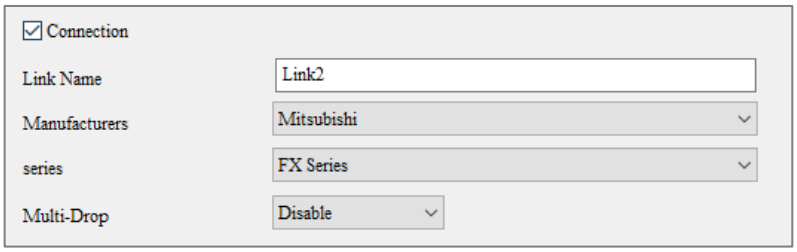
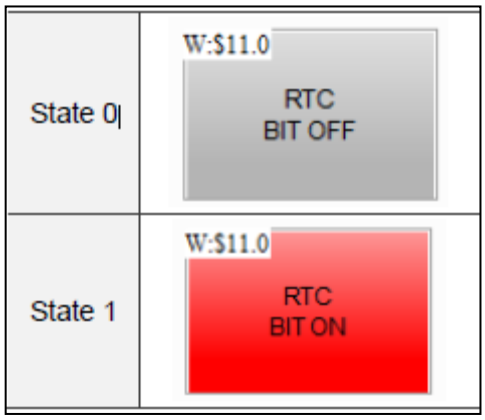
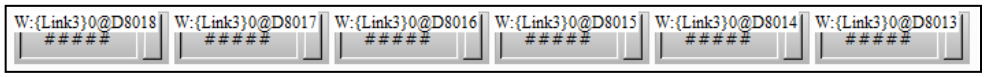
PLC Link Settings	
Enable RTC Updates	Check the **Enable RTC Updates** setting.

PLC Link Settings	
	
Link Name	A **Link Name** can be chosen arbitrarily, whether the controller belongs to COM1 / COM2 / COM3 or Ethernet. 
Station No.	The **Station No.** of the controller that users want to update the time can be set. If the selected controller does not support station number setting, this option cannot be set.
Update	There are two modes for users to choose from: 1. HMI RTC time is set to PLC. 2. PLC RTC time is set to HMI. 
Trigger Mode	The available options for **Trigger Mode** are: Timer, Bit On, and Bit Off. The default value is **Timer**.

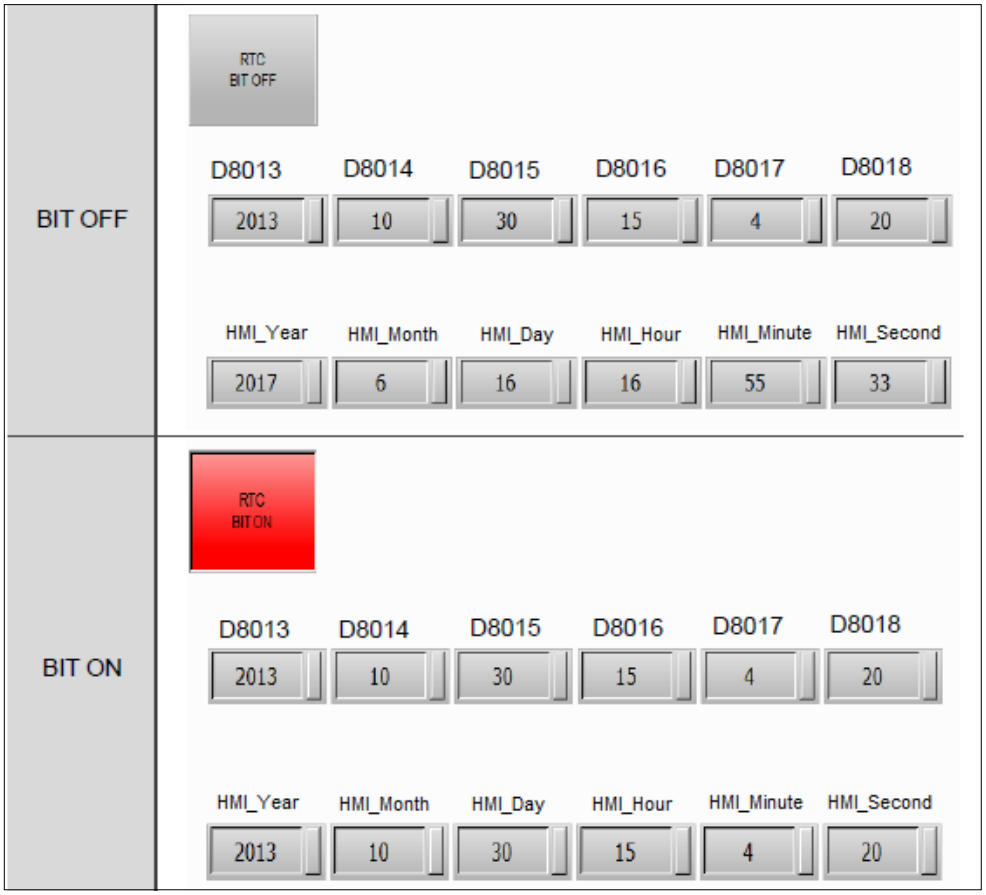
PLC Link Settings	
	 ■ Select **Timer** to set how often to perform automatic update. The minimum is 1 minute; the maximum is 1440 minutes (1 day), and the system defaults to **60** minutes. ■ If **Bit On** is selected, it means that when the Bit is ON, it will trigger to update the settings. ■ If **Bit Off** is selected, it means that when the Bit is OFF, it will trigger to update the settings. ■ If **Bit On** or **Bit Off** is selected, the trigger address must be additionally set. The trigger address can be the Internal Memory or the controller register address.
Time Field Setting	
Start Address	■ Set the controller register address for RTC time synchronization.  ■ If users are using Deltas PLC products, set ting the **Start Address** is not required.
Length	■ Select the **Length** according to the number of time fields to synchronize. The minimum length is 1 and the maximum is 7. The default value is **3**.  ■ If users are using Deltas PLC products, set ting the **Length** is not required.

<table>
<tr><th colspan="2">PLC Link Settings</th></tr>
<tr><td colspan="2">Example</td></tr>
<tr><td>Real Time Clock
Update Setting Steps</td><td>
Step 1: General > Configuration > Real Time Clock.
Step 2: Set Properties related to Real Time Clock update.
1. Select Enable RTC Updates.
2. Select the Connection Name Link3 (Mitsubishi – FX3U and FX3G CPU Port).
3. Update Setting Select PLC RTC time to set to HMI.
4. Trigger Mode Bit On.
5. The Trigger Address is set to $11.0.
6. The Start Address is set to {Link3}1@D8013.
7. Length selection 6.
8. Select Second in the Time Field corresponding to {Link3}1@D8013.
9. Select Minute for the Time Field corresponding to {Link3}1@D8014.
10. Select Hour in the Time Field corresponding to {Link3}1@D8015.
11. Select Day in the Time Field corresponding to {Link3}1@D8016.
12. Select Month for the Time Field corresponding to {Link3}1@D8017.
13. Select Year for the corresponding Time Field of {Link3}1@D8018.
Step 3: After the setting is completed, click OK to leave the real time clock update setting, refer to the following figure.
Since the Mitsubishi-FX3U controller does not require station number setting, it is also not necessary to set the station number in the real time clock update setting.


</td></tr>
</table>

<table>
<tr><th colspan="2">PLC Link Settings</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Create Maintained Button element</td><td>Step 1: Create a Maintained Button element and set its Write Address to $11.0.
Step 2: Edit the Maintained Button element State 0 text as RTC BIT OFF, State 1 text as an element of RTC BIT ON, and the foreground color is red, representing the state that is triggered to be ON.
 
</td></tr>
<tr><td>Build value input element</td><td>Step 1: Create 6 Numeric Entry input elements, and set the address as {Link3}1@D8013 ~ {Link3}1@D8018.
Step 2: Create 6 more Numeric Entry input elements, and set the internal system parameters as TIME_YEAR, TIME_MONTH, TIME_DAY, TIME_HOUR, TIME_MINUTE, TIME_SECOND in order.
PLC Address
 

Internal System Parameters
 
</td></tr>
<tr><td>Result</td><td>After completing the creation of all elements, execute the compilation and download to the HMI. When the RTC alternate button (BITON) is triggered, the system will set the RTC time of the PLC to the HMI, so the HMI internal system parameters TIME_YEAR, TIME_MONTH, TIME_DAY, TIME_HOUR, TIME_MINUTE, TIME_SECOND will be synchronized with the RTC of the PLC.</td></tr>
</table>

PLC Link Settings	
	
Sync time from PC	When checked, the project download will be executed, and the HMI time will be synchronized with the PC.

2.2.2.13.3 Print

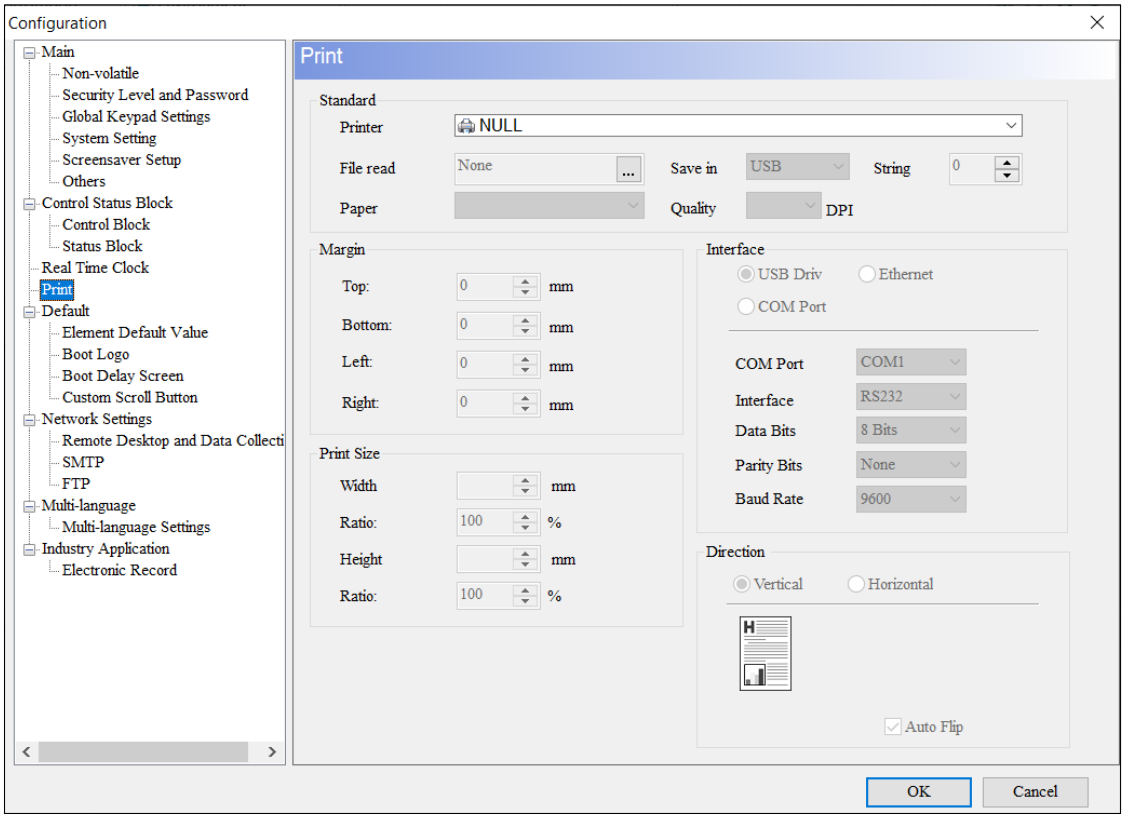
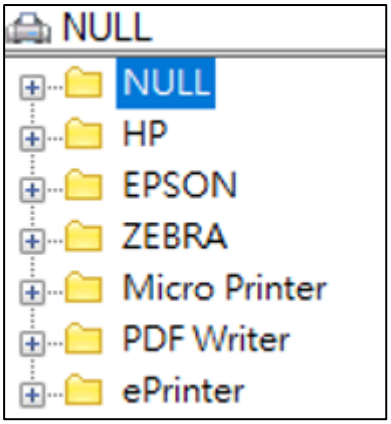


Figure 2 - 115: Print

The following table describes the **Print** function settings.

Function	Description
Printer	DOP-100 series models support printers of various brands, including HP, EPSON, ZEBRA, Micro Printer, PDF Writer and ePrinter. 

Function	Description
Paper	The paper varies depending on the selected printer. It can be roughly summarized as A4, Letter, Report, Custom, and other settings.
Quality	● Quality is the resolution printed by the printer. ● According to different printers, users can choose between 72 and 203 DPI.
Margin	● Set the upper, lower, left and right boundaries of the paper as the reserved area during printing, which means that it is displayed as blank and not printed. ● The unit of the boundary range is mm, and the range value is 0 ~ 550 mm. The default value is **0** mm.
Print Size	Set the scaling ratio of width and height. The maximum scaling is 400%, the minimum scaling is 10%, and the default value is **100%**.
Interface	● Provide USB or Ethernet transmission interface according to the selected DOP model. ● If users choose ePrinter to print, users need to fill in the PC IP address and printer port 85 to be used.
Direction	The available options for printing **Direction** are: direct printing and horizontal printing.
Auto Flip	**Auto Flip** means that the printer will automatically return the paper and help users to change the form to print. If checked, the printer will automatically change to the next paper to continue printing after the printing of one sheet of paper is completed; action.

2.2.2.13.4 Default

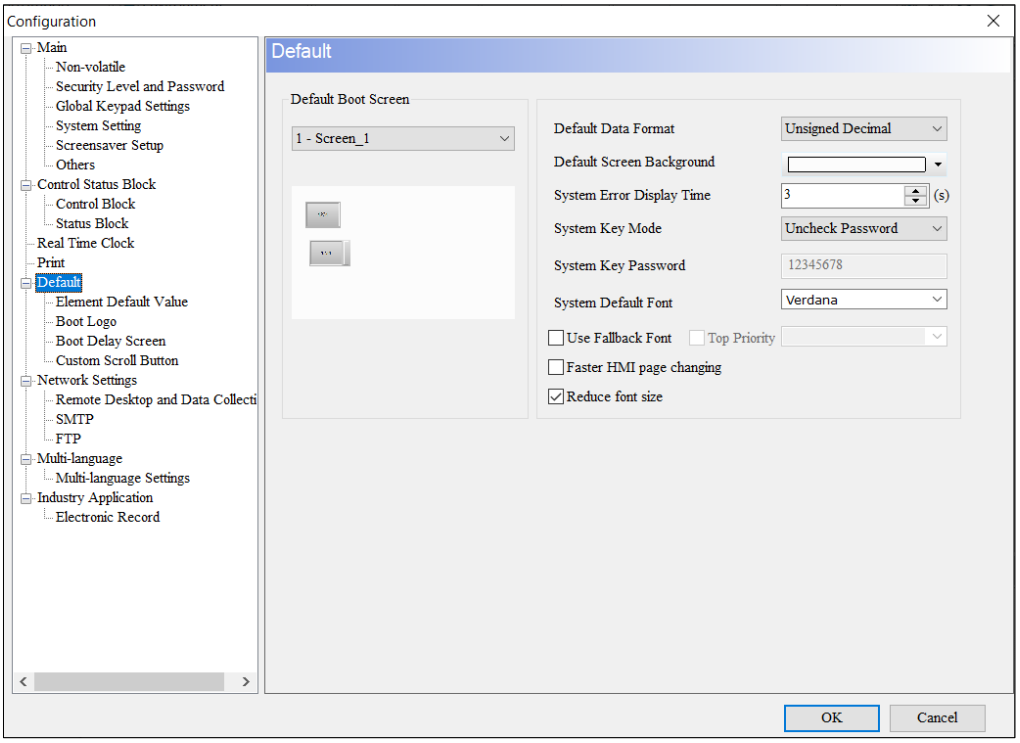
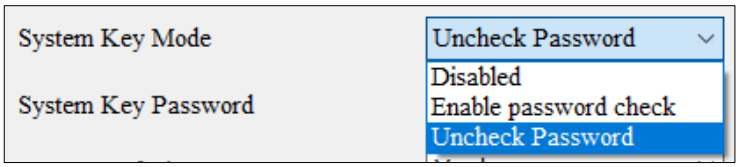


Figure 2 - 116: Default

Function	Description
Default Boot Screen	**Default Boot Screen** is the initial screen when the HMI is turned on. Users can choose another screen to set as the initial screen, and the default is **1-Screen_1**.
Default Data Format	The **Default Data Format** value when creating an element. The default value is **Unsigned Decimal**.
Default Screen Background	The background color of the panel editing screen. The default is .
System Error Display Time	The time the message stays when an error message is generated. The default value is **3** seconds, and the range value is 0 ~ 5 seconds. ***NOTE**: When it is set to 0 seconds, if there is any error in the system, no message will be displayed on the HMI.*

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>System Key Mode</td><td>The System Key Mode represents the response the HMI should have when pressing the system key. The available options for System Key Mode are: Disabled, Enable password check, and Uncheck Password. The default value is Uncheck Password.
 

<table>
<tr><td>Disabled</td><td>If the system key is set to be invalid, it means that pressing the system key cannot enter the HMI screen.</td></tr>
<tr><td>Enable password check</td><td>If set to password check, it means that after pressing the system key, the panel will ask users to enter the system key password.</td></tr>
<tr><td>Uncheck Password</td><td>If it is set to disable the password check, it means that after pressing the system key, users can enter the HMI screen without entering the system key password.</td></tr>
</table></td></tr>
<tr><td>System Key Password</td><td>The System Key Password is the password that must be entered when the system key usage mode is set to password check. Users can change their system key passwords. The default value is 12345678.</td></tr>
<tr><td>System Default Font</td><td>The System Default Font is Verdana, and users can change the font display.
 
</td></tr>
<tr><td>Use Fallback Font</td><td>● Since the text used in the DOP-100 series is to download real fonts to the HMI display, it is different from the previous DOP-B series text that uses textures. Because of this, when the operating system encounters a lack of fonts Set to On Button elements, it will make the computer unable to display the text normally after downloading, so the firmware will load a set of default fonts. Setting fonts still cannot solve the problem of missing characters on the HMI. The HMI will refer to whether the option of the application is checked. If the option to enable backup fonts is checked, when the firmware pre-installed fonts fail, the application backup will be enabled font.
● If the first priority is checked, it means that the priority of enabling backup fonts of the application will be higher than the default fonts of the firmware.</td></tr>
</table>

Function	Description
Faster HMI page changing	● After enabling the page feed acceleration function, it will speed up the page switching speed, but it will increase the memory space used by the project screen. ● This function is mainly used to speed up the display speed when switching pages when there are a lot of graphics and static text on the screen.
Reduce font size	● Check this function, when the project is downloaded to the HMI, only the fonts used in the project will be downloaded.

Element Default Value

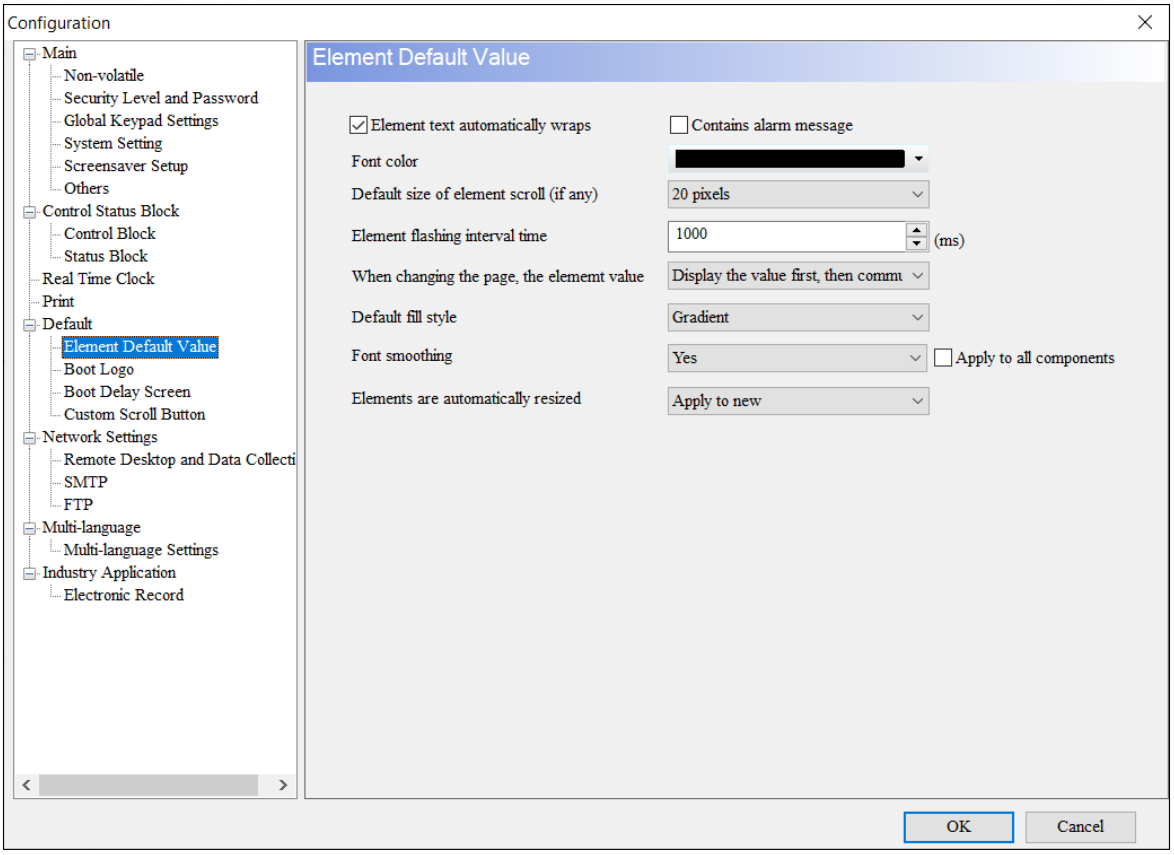
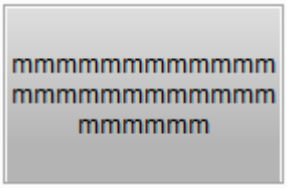
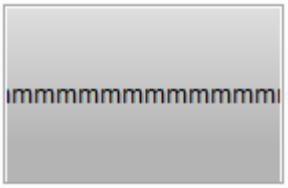
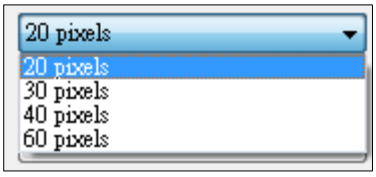
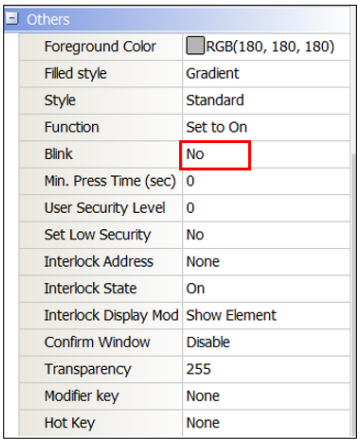
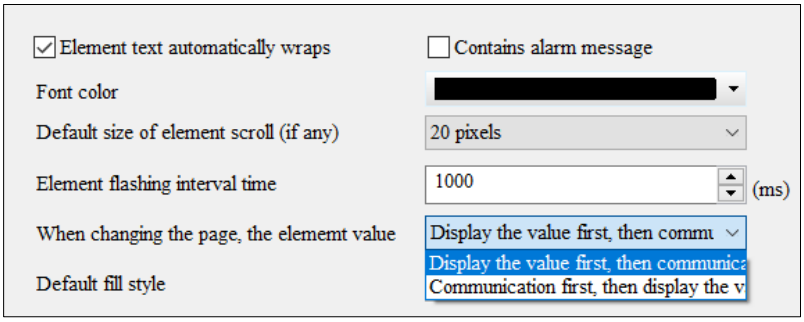
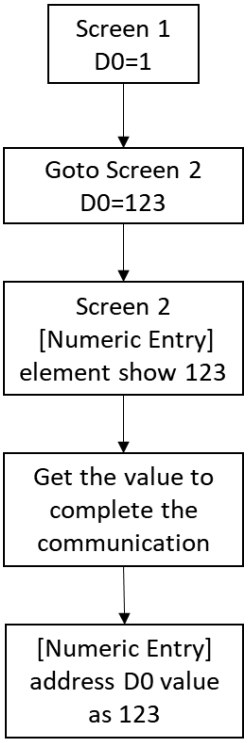


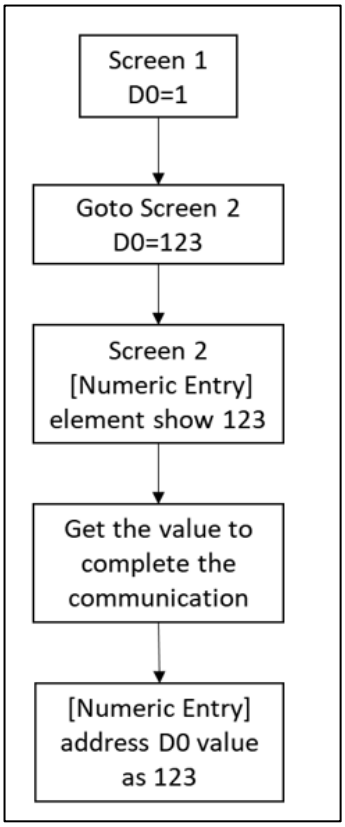
Figure 2 - 117: Element Default value

Function	Description
Element text automatically wraps	● If the **Element text automatically wraps** is checked, when entering text to any element, it will automatically wrap as long as the text encounters the boundary, as shown in the following figure.  ● If the **Element text automatically wraps** is not checked, when the text encounters the boundary, the text will not be automatically wrapped, but the text always be extended, refer to the following figure. 
Font color	When creating an element, the default font color of the element is [redacted].
Default size of element scroll (if any)	For elements with scrolls, such as historical data, alarms and other related tables. The range is 20 ~ 60 pixels. The default value is **20** pixels. 

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>Element flashing interval time</td><td>This function only works if the element has the property of Blink or not.
 

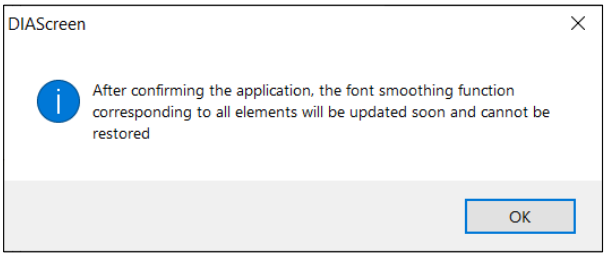
If the blinking is set to Yes, the element flicker interval time will be effective. The default value is 1000 ms, and the range value is 500 ~ 5000 ms.</td></tr>
<tr><td>When changing the page, the element value</td><td>The HMI is multitasking, and sometimes the value may be displayed after the communication is completed because of the busyness. In order to avoid misunderstanding by users, it is provided that users can choose the display order of their numerical values. The available options for When changing the page, the element value are: Display the value first, then communicate, and Communicate first, then display the value. The default value is Display the value first, then communication.
 
</td></tr>
<tr><td>When changing pages, the element value</td><td>Elements that currently support this feature are as follows:
<table>
<tr><td rowspan="3">Input element</td><td>Numeric Entry</td></tr>
<tr><td>Character Entry</td></tr>
<tr><td>Barcode Entry</td></tr>
<tr><td rowspan="4">Button element</td><td>Set to ON Button</td></tr>
<tr><td>Set to Off Button</td></tr>
<tr><td>Momentary Button</td></tr>
<tr><td>Maintained Button</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>Set value</td></tr>
<tr><td rowspan="3">Indicator element</td><td>Multistate Indicator</td></tr>
<tr><td>Range Indicator</td></tr>
<tr><td>Simple Indicator</td></tr>
<tr><td>Meter element</td><td>Meter(1), Meter(2), Meter(3), Meter(4)</td></tr>
<tr><td rowspan="4">Data Display element</td><td>Numerical Display</td></tr>
<tr><td>Character Display</td></tr>
<tr><td>General Message display</td></tr>
<tr><td>Moving Sign</td></tr>
<tr><td rowspan="2">Graphic Display element</td><td>State Graphic</td></tr>
<tr><td>Animated Graphic</td></tr>
<tr><td>Curve element</td><td>Curve Input</td></tr>
<tr><td>Pipe Diagram element</td><td>Pipe Diagram (1), Pipe Diagram (2)</td></tr>
<tr><td>Analog element</td><td>Slider</td></tr>
</table>
The following is the difference between the two.
<table>
<tr><td>Display the value first, then communicate</td><td>If this option is selected, the reading of the values after switching the screen is normal, and will not be affected by the communication.
 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td>Communication first, then display the value</td><td>The Numeric Entry elements of the screen will pause when displaying the numerical value due to the switching of the screen.
 
</td></tr>
<tr><td>Default Filled style</td><td colspan="2">● Set the default filled pattern of HMI, the default value is Gradient.
● The settings of this interface are global. After the filled style is set, the filled style of the elements created later will be based on the attributes here.</td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>Font smoothing</td><td colspan="2">

Set whether the text font of the HMI is smooth, the default is Yes.
When this effect is enabled, the text is rendered anti-aliased.
If it is not checked to Apply to All Elements, it is only applicable to static text elements; if it is checked, it will be applied to all elements, and the following message will be prompted to inform users.



</td></tr>
<tr><td rowspan="3">Elements are automatically resized</td><td>Don’t Apply</td><td>All elements changed to not automatically resize.</td></tr>
<tr><td>Apply to all</td><td>The size of all elements in the project is automatically adjusted.</td></tr>
<tr><td>Apply to new</td><td>Added elements will be automatically resized.</td></tr>
</table>

Boot Logo

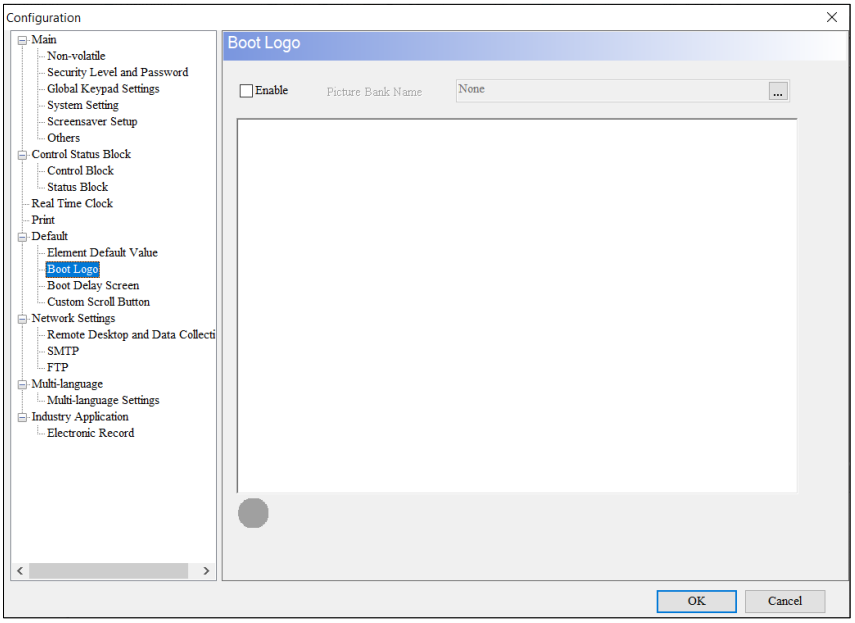


Figure 2 - 118: Boot Logo

Function	Description
Enable	● Check to select the startup screen from the **Picture Bank Name**. ● To use files not in the **Picture Bank Name**, import the picture to the **Picture Bank Name** first. ● When a GIF file is selected, the gray circle at the bottom will be displayed as  , which means that the GIF action can be previewed on the application. ● When the boot screen is enabled, go to **Project** > **Transmission** > **Download the Boot Screen** to replace the HMI boot screen. Or directly use **Project** > **Compile** > **Download Screen** to download the boot screen. ***NOTE:*** *1. After downloading the startup screen, power on the HMI again.* *2. Supported image file formats are BMP, JPG, GIF, ICO, and PNG.* *3. The file size of the boot screen after conversion by the import application should be less than 3 Mbytes.*

Boot Delay Screen

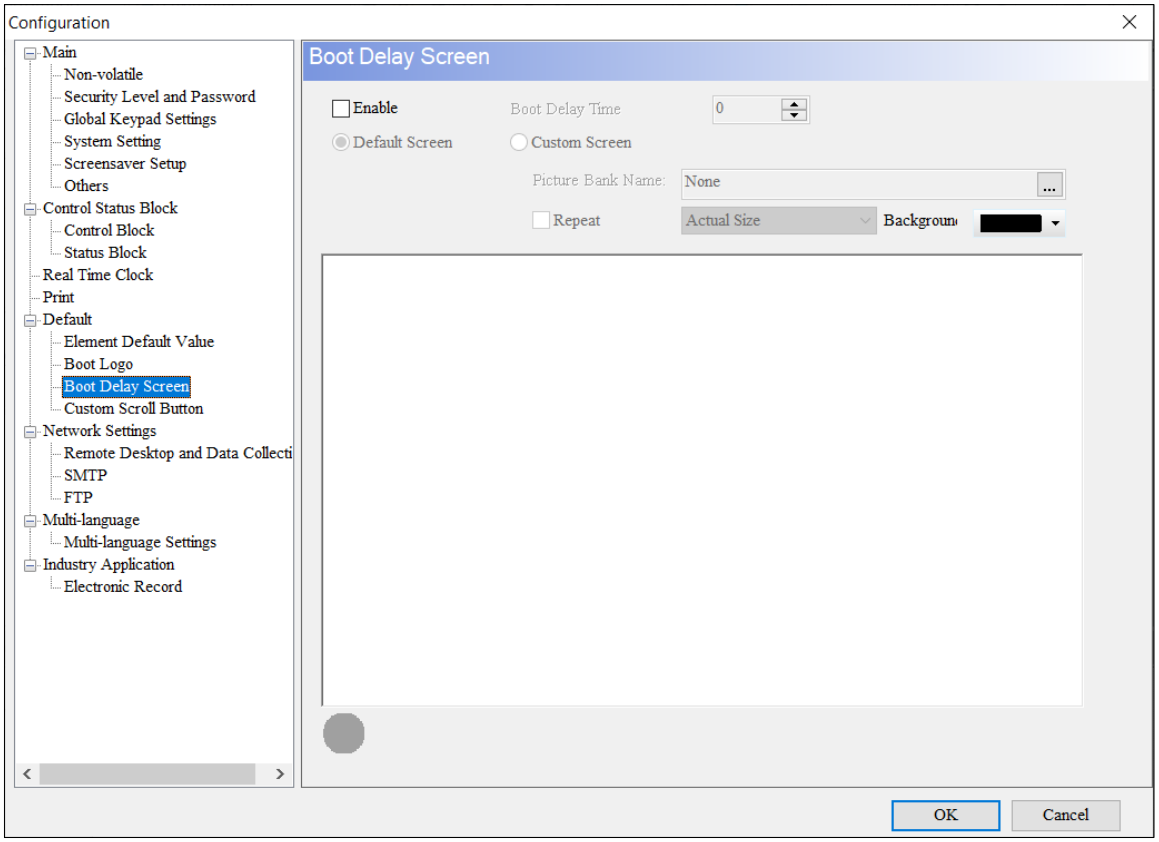
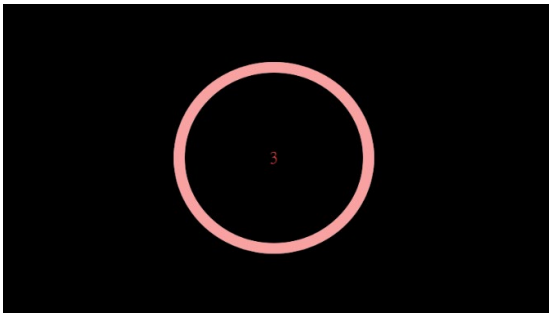
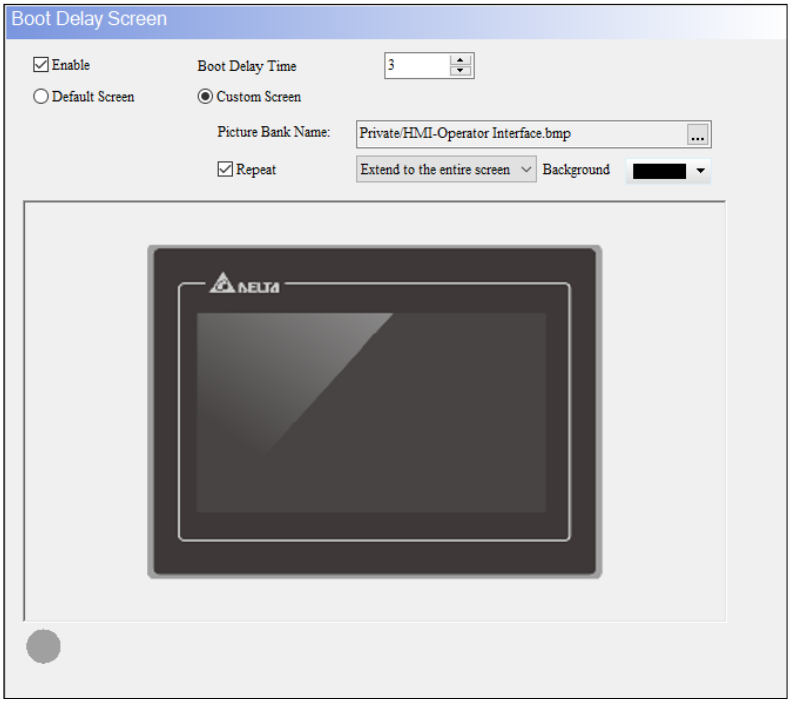


Figure 2 - 119: Boot Delay Screen

Function	Description
Enable	When checked, the **Boot Delay Time** can be set.
Boot Delay Time	Set the power-on delay time to wait for the controller to start. The range is 0 ~ 255 seconds. The default value is **0** seconds.
Default screen	If the **Boot Delay Time** is set to 3 seconds, and the system default boot delay screen is used, after downloading to the HMI, the HMI screen will start counting down from 3 seconds to 0 seconds, as shown in the following figure.

Function	Description
	
Custom Screen	Set the boot delay screen, and set whether to repeat the playback, whether to fill the graphic display with the actual graphic size or extend the graphic to all areas, and adjust the background color. 

2.2.2.13.5 Network Settings

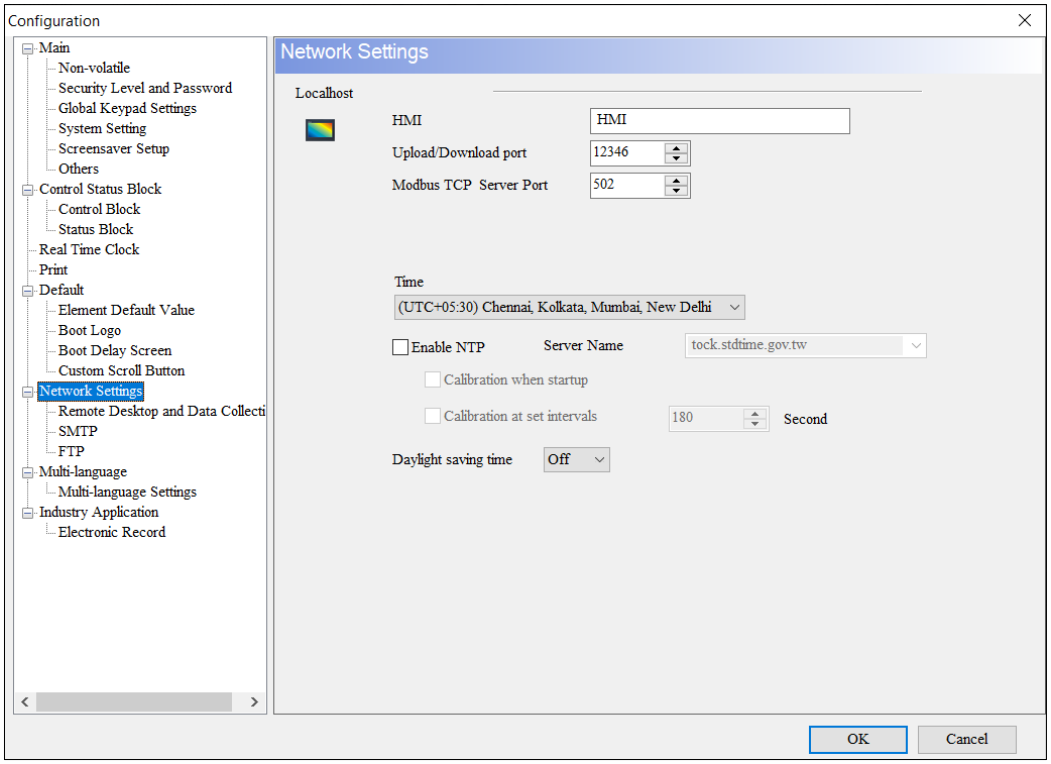


Figure 2 - 120: Network Settings

The following table describes the **Network Settings** window.

Function	Description
HMI	Users can set their own names, which can be used to identify the HMI. When using network remote monitoring or data sampling, the HMI name can be used to quickly identify which HMI is being monitored or access data.
Upload/Download Port	● The communication port is the designated connection address, allowing programs on different computers to communicate. There are a total of 65536 communication ports, and some specific communication ports are reserved for specific programs. ● The default download port on HMI is **12346**.
MODBUS TCP Server port	● The default communication port of MODBUS TCP Server is **502**. ● This communication port must be the same as that of the MODBUS TCP/IP controller.

Function	Description
	● Users can also customize the port number, but make sure that the two settings must be the same. ● If the HMI communicates with the MODBUS application on the PC side, change the communication port here instead of changing **General** > **Configuration** > **Network Settings** > **Device** Controller communication Port.
Time	Select the time to display according to the local time zone of the HMI.
Enable NTP	● If checked, the HMI can correct the time of HMI through the network. ● If NTP is enabled, confirm whether the network environment of the HMI is smooth.
Server Name	Select the server provided in the application, or enter the local NTP server name.
Calibration when startup	When checked, the time to correct the time is when the HMI is turned on.
Calibration at set intervals	● After checking, users need to set the number of seconds. The calibration timing is when the machine is turned on and enters the HMI, the time calibration will be performed after a few seconds. ● The default value is **180** seconds, the minimum is 10 seconds, and the maximum is 99999 seconds.
Daylight saving time	Default is **off**.

Remote Desktop and Data Collection

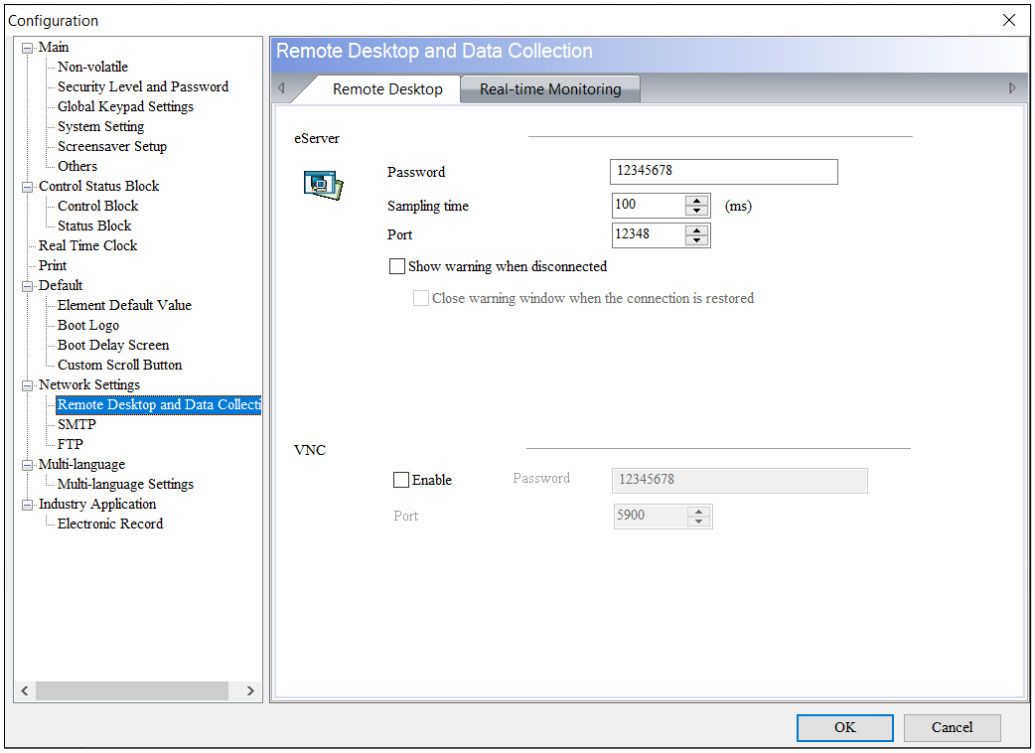


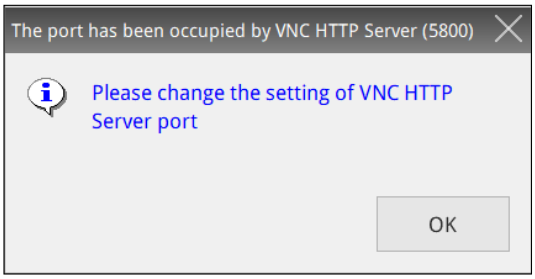
Figure 2 - 121: **Remote Desktop and Data Collection window**

The following table describes the **Remote Desktop and Data Collection** window, the eServer function settings.

Function	Description
Password	● The password can be changed according to users' needs. The default value is **12345678**. ● This password is used to monitor or access data after eServer and eRemote are executed.
Sampling time	The sampling time is how long eServer and eRemote take to perform sampling. The range value is 100 ~ 5000ms, the default value is **100** ms.
Port	The connection port of eServer and eRemote is set to **12348**. The upload and download communication ports of the HMI are different communication ports. The communication ports used by different programs are different.

Function	Description
Show warning when disconnected	● After checking Enable, this option can be enabled. ● When the HMI is disconnected from the eServer or eRemote, the HMI displays a disconnection warning message.
Close warning when the connection is restored	● This option can only be enabled when **Show warning when disconnected** is checked. ● If checked, the representative will keep popping up an error until the connection between the HMI and the eServer or eRemote is restored, and then the error window will be closed. ● If it is not checked, it means that the HMI will only pop up a disconnection error message once.

The **Remote Desktop** VNC (Virtual Network Computing) function is a set of application that can remotely monitor and operate HMI. This application can transmit keyboard and mouse movements and real-time images through the network. When operating VNC using web pages, the browser must support JAVA installation, otherwise it cannot be opened. The VNC function setting description is as follows:

Function	Description
Enable	Check **Enable** to remotely monitor the operator via VNC.
Password	The password can be changed according to users need. The default value is **12345678**.
Port	● The default connection port is **5900**. If the application connection port setting is changed to 5902, the connection port must be changed to 5902 when using VNC Viewer to connect. ● Do not use 5800 when setting the connection port on the application side. If it is set to 5800, after downloading the screen to the HMI, the following message will appear to inform users to change.  ● VNC Viewer provides webpage operation mode. In this

Function	Description
	mode, users only need to enter the IP Address of the HMI into the browser, the port is 5800, and the connection opens. Even if the communication port of the application is not default 5900, enter 5800 connections when connecting to the communication port in the browser operation. Such as http://192.168.123.148:5800.

Real-time Monitoring

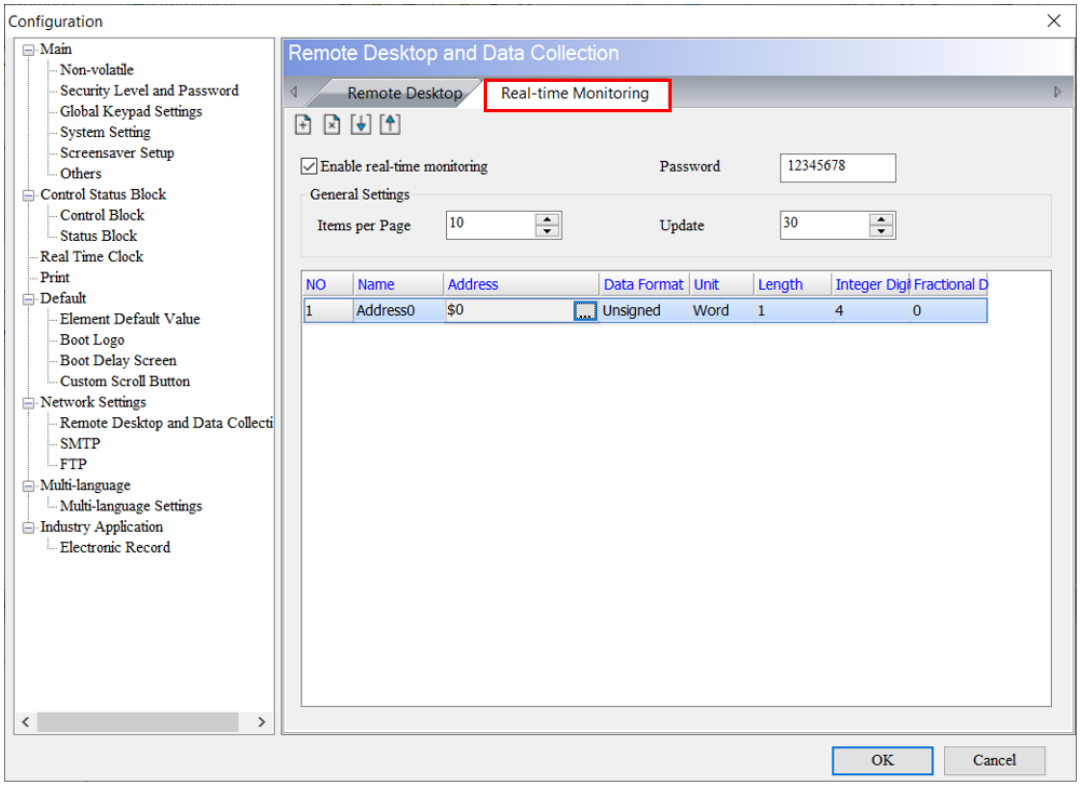
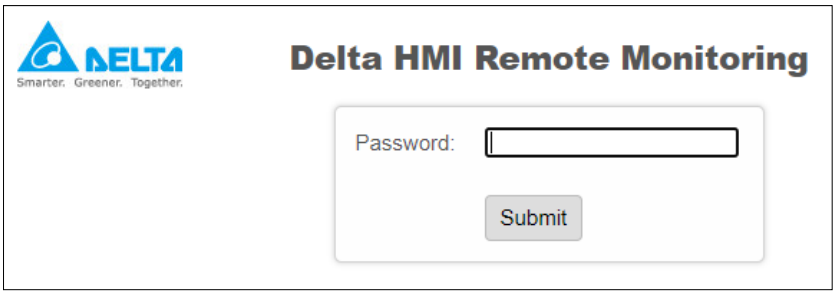


Figure 2 - 122: **Real-time Monitoring window**

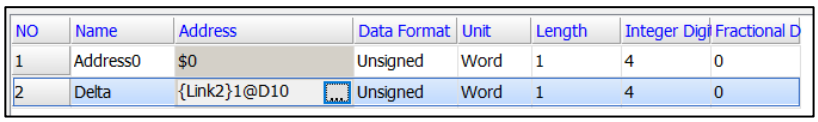
- Network real-time monitoring provides that the HMI can write the value to the HMI on the webpage, or after the HMI writes the value, the change of the value can be monitored by the webpage.
- The **Real-time Monitoring** interface provides a variety of numerical formats for users to use. Supported numeric formats include BCD, Signed Decimal, Unsigned Decimal, Hex, Floating, and Char.
- Data Format can also set its reading length to decide whether to read Word or

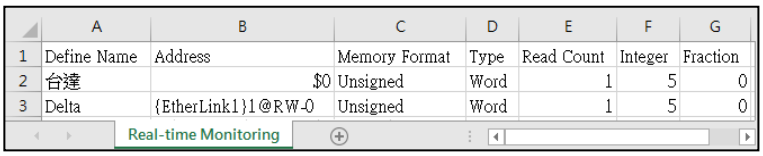
Double Word. When the number of reading strokes is 1, the integer number of digits can be set to 5, which means that the reading is Word; when the number of reading strokes is 2, the integer number of digits can be set to 10, which means that the reading is Double Word.

- Address input provides Word and Bit, which can support Internal Memory address and external PLC address.
- How to use network real-time monitoring? Select **Enable real-time monitoring** on the application side and set the address. Then enter **http://[HMI IP]/RemoteMon/** on the browser. (The two characters R and M must be capital letters, otherwise it will not be able to connect to the HMI through the web page smoothly). After successful, users will see the following login screen, enter the password of the web application to log in.



The following table describes the **Real-time Monitoring** window.

Function	Description
Enable real-time monitoring	Check **Enable real-time monitoring** to add or delete monitoring addresses.
New Monitor Address 	● Click  icon to add monitoring address. ● The name can be named for the input address by users. The name can be up to 30 characters long. 
Delete Monitor Address 	Select the number users want to delete, and then click  icon, The monitoring address can be deleted.

Function	Description
Import CSV filet	After modifying the content of the exported CSV file, click to import the monitoring address parameters.
Export CSV file	Export the monitoring address content to a CSV file. 
Password	● The default password is **12345678**. ● After entering the connection address using the web page, users will be asked to enter this group of passwords.
Items per Page	● The number of monitoring addresses to be displayed on one page can be set. ● The default value is to display **10** items, the minimum is 1 and the maximum is 20.
Update	After updating the value, once the screen is updated. The default value is 30 seconds, the minimum can be 1 second, and the maximum is 30 seconds.

SMTP

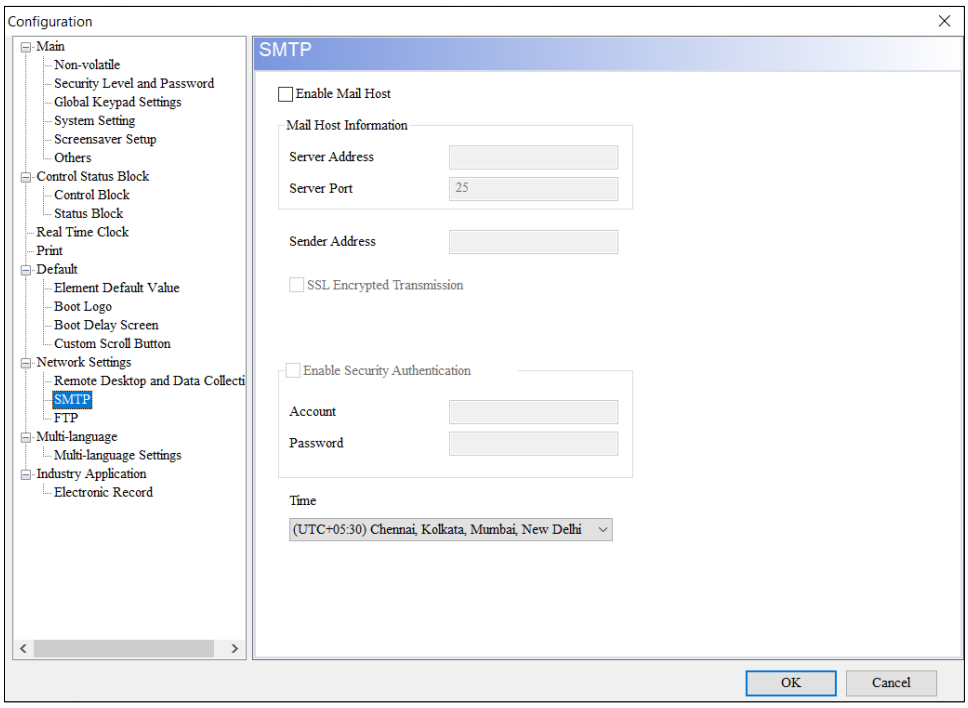


Figure 2 - 123: SMTP

- SMTP stands for **Simple Mail Transport Protocol** (SMTP, Simple Mail Transport Protocol). This server is used to send outgoing mail. SMTP is a set of rules for sending mail from a source address to a destination address, and it controls how mail is relayed.
- DIAScreen application provides SMTP service function, when an alarm occurs. Users need to notify there is an Alarm by receiving a letter.
- After the SMTP parameter setting is completed, users must go to **Data Management** > **Alert Settings**, and fill in the **Recipients Mail** and related alert information in the email information field.

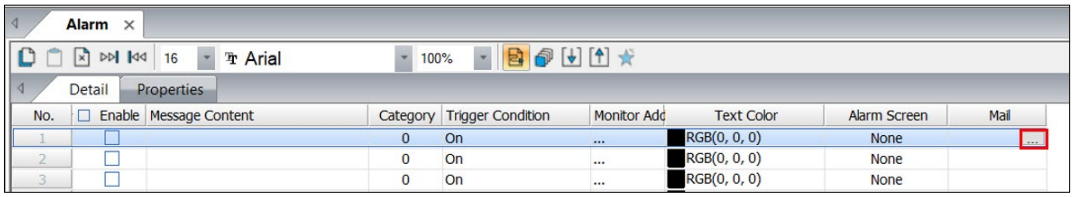


Figure 2 - 124: Alarm window

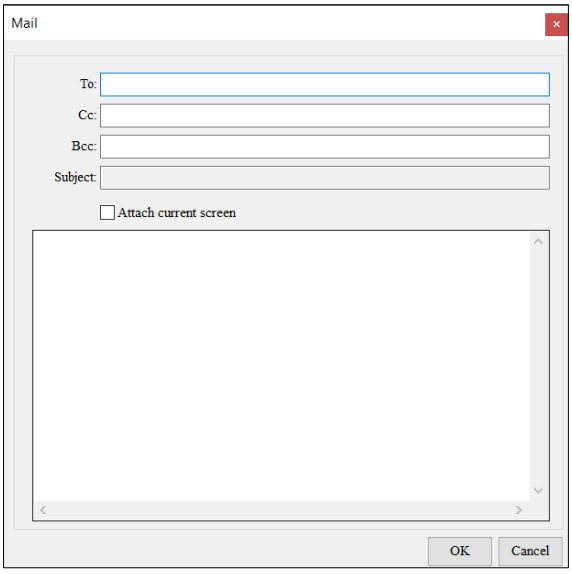
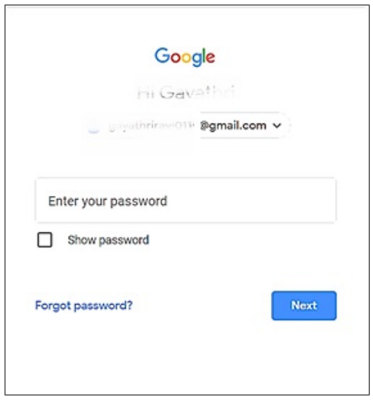
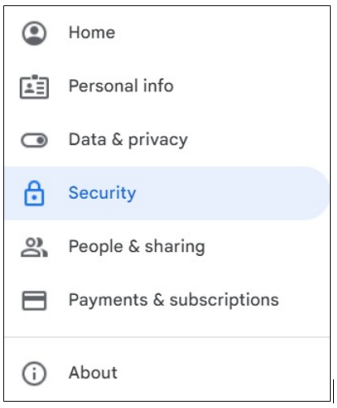
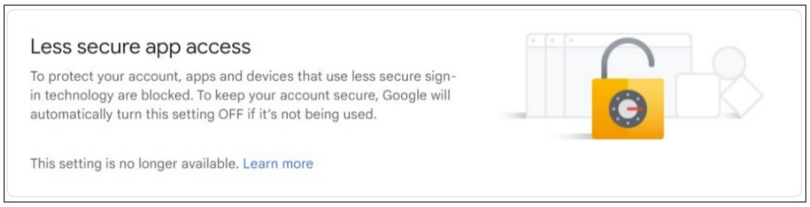


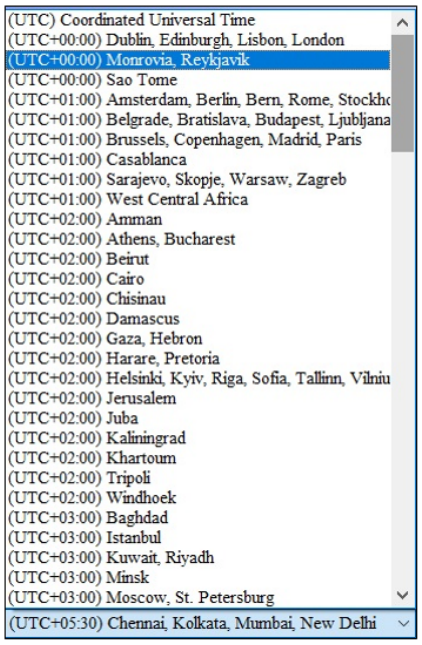
Figure 2 - 125: Mail information

If users want to enable SMTP, select **Enable Mail Host**, and then configure the security verification of their host IP address, host port, account and password.

The following table describes the **SMTP** page function setting.

Function	Description
Server Address	This IP address is the Mail Server IP created by users. Before using the SMTP function, set up a good Mail Server environment, or search for a free Mail Server on the Internet.
Server Port	The default mail host port is **25**, which is the general SMTP communication port.
Sender Address	Fill in the sender's email address.
SSL Encrypted Transmission	● SSL is the abbreviation of Secure Socket Layer, which can provide secret transmission on the network. First proposed by Netscape, the goal of SSL is to ensure the confidentiality and integrity of communication between two applications, as well as to verify the identity of the server. ● To use SSL encrypted transmission, the e-mail needs to support this function. ● Gmail requires SSL encrypted transmission. Set the following settings to mail using Gmail. 1. After logging into users' Gmail mailbox, select **Manage users' google account**.  2. Select **Security**. 

Function	Description
	3. Open **Low Security Application Access** at the bottom of the page.  ● After setting the above 3 points, use Gmail to receive alert letters.
Enable Security Authentication	● Before enabling the account security verification function, users must check the **Enable mail host** function before setting the account and password. ● If the SMTP server is created with an account and password to verify the identity, this option must be checked.
Account	● The account and password must be based on the account and password required by the SMTP server. When setting up the SMTP Mail Server, if the security verification of account and password is checked, users must enter a set of account and password first. This account and password are used to check whether the recipient is a legitimate user of the back-end mail system, so as to prevent uncollected letters from entering the system and occupying resources and causing hidden mail security problems. ***NOTE:*** *The format of the account number will be different due to the format required by each SMTP Mail Server, and users can ask the MIS for its rules first.*
Password	
Time	The HMI provides a time zone function that allows users to select the local time zone, so that the HMI will not have jet lag in various places, and the time to send the alert email will be more accurate.

Function	Description
	

After the SMTP settings are loaded into the HMI, access the settings from the **System Directory** > **System Setting** > **Network App** > **SMTP** tab, as shown in the following figure. Change the SMTP settings from the HMI before uploading to DIAScreen.

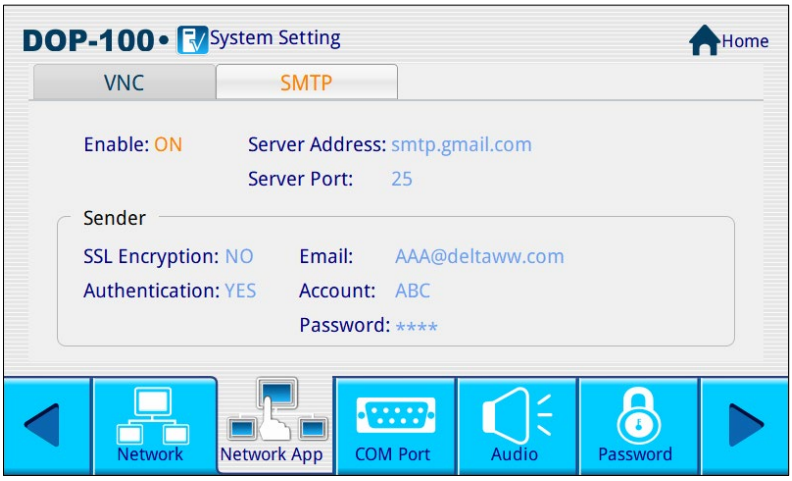


Figure 2 - 126: **SMTP HMI Directory Setting Page**

FTP

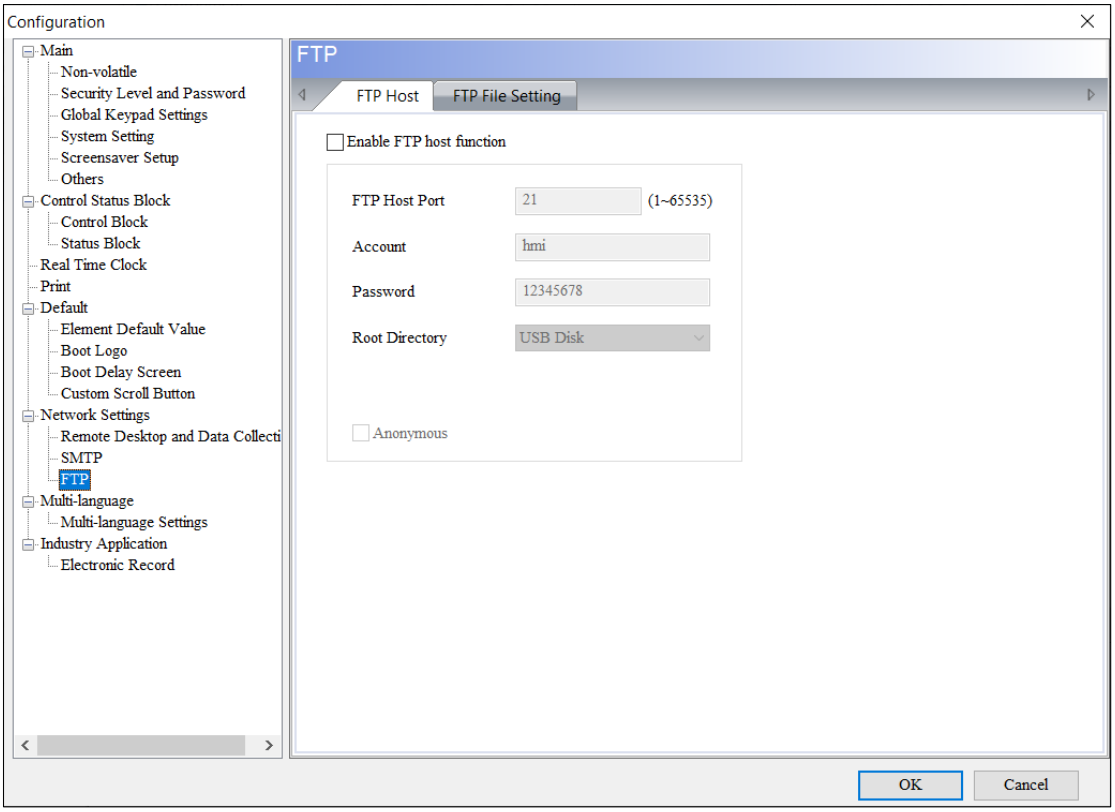


Figure 2 - 127: FTP

The FTP Server function provides users with the ability to download alarms, historical data, recipes, and operation records in the USB Disk, or SD storage device to the PC. It also reviews through the network, and can also upload the files from the PC to the USB Disk or SD storage device.

FTP Function	Description
Supported HMI	Network-based HMI
Supported Connections	File transfer application
	Windows File Explorer
	DOS Command Line
Connection Limit	Up to 3 FTP Clients can be connected at the same time
	Automatically disconnect when idle for more than 90 seconds

FTP Function	Description	
Login method	Anonymous login is supported.	Cannot add directory.
		Could not upload file.
		Unable to download file.
		File cannot be deleted.
		Change of filename is allowed.
	Support account login.	New directories are allowed.
		Allow uploading of files.
		Allow download of archives.
		Allow file deletion.
		Change of filename is allowed.
File transfer rules	Unlimited traffic.	
	Support resume.	
	There is no limit to the size of the file to be sent.	
	The maximum file name length is 260 bytes.	
	Change of filename is allowed.	
	Document name in support.	
	Encryption is not supported.	
	Support active mode/passive mode connection.	
	When FTP transfers, it is possible to enter and exit the system directory.	

FTP supports following three connection methods:

1. File transfer application

   The HMI provides FTP Server, additionally uses FTP Client application to operate file upload and download or use Windows File Explorer or DOS Command line to connect. This example introduces the use of the file transfer application FileZilla, which is free and can be downloaded from:

   https://filezilla-project.org/download.php.

   After installation, open the FileZilla application.

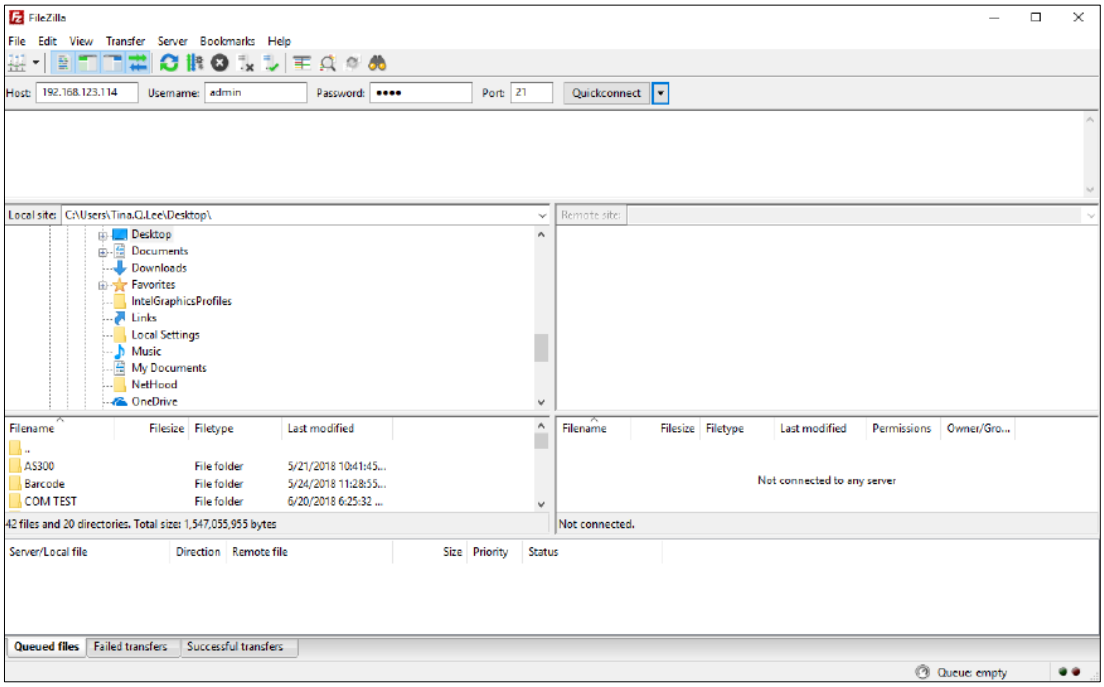


Figure 2 - 128: Transfer application FileZilla

Function	Description
Host	Fill in the HMI IP address, this example is 192.168.123.114.
Username	Fill in the same users name as the application setting as admin.
Password	Fill in the same password as the application setting as 1234.
Port	Fill in the same port as the application setting as 21.
Quickconnect	Before executing this button, complete the required settings from 1 ~ 4.

2. Windows Explorer

Open the file manager. Enter **ftp://192.168.1.7/**, Account, and Password to log in to FTP.

After logging in, all files in the USB storage device will be displayed.

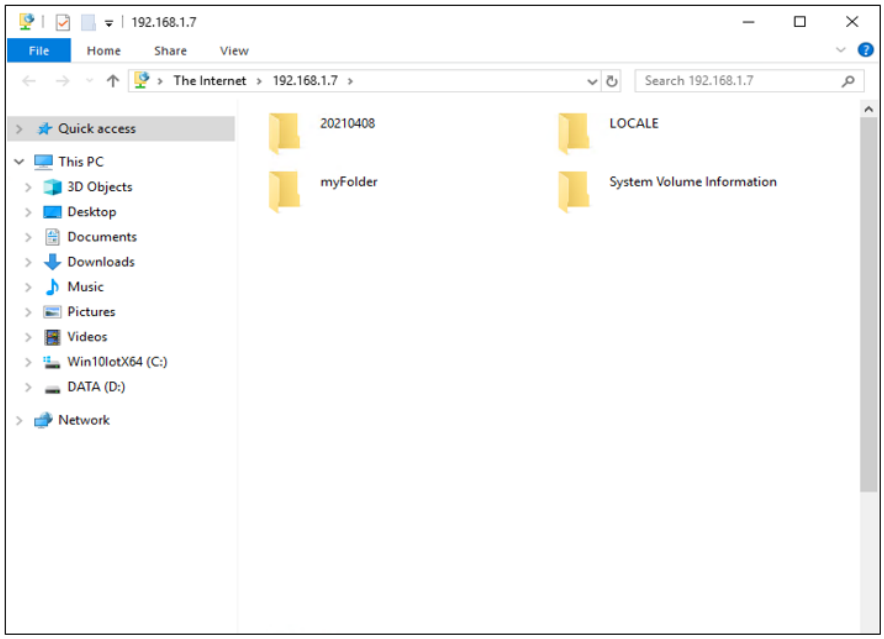


Figure 2 - 129: Files in USB storage

3. DOS Command Line

Enter **ftp 192.168.123.114** in the command prompt, and enter users account **admin** and password **1234** to connect to FTP.

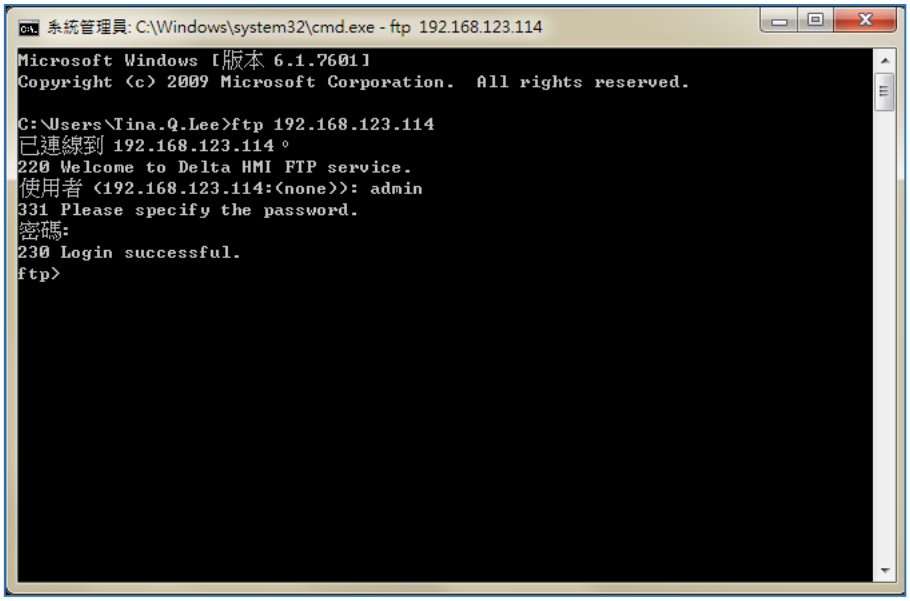


Figure 2 - 130: Connect to FTP

Under the FTP command, use help to view the supported related commands.

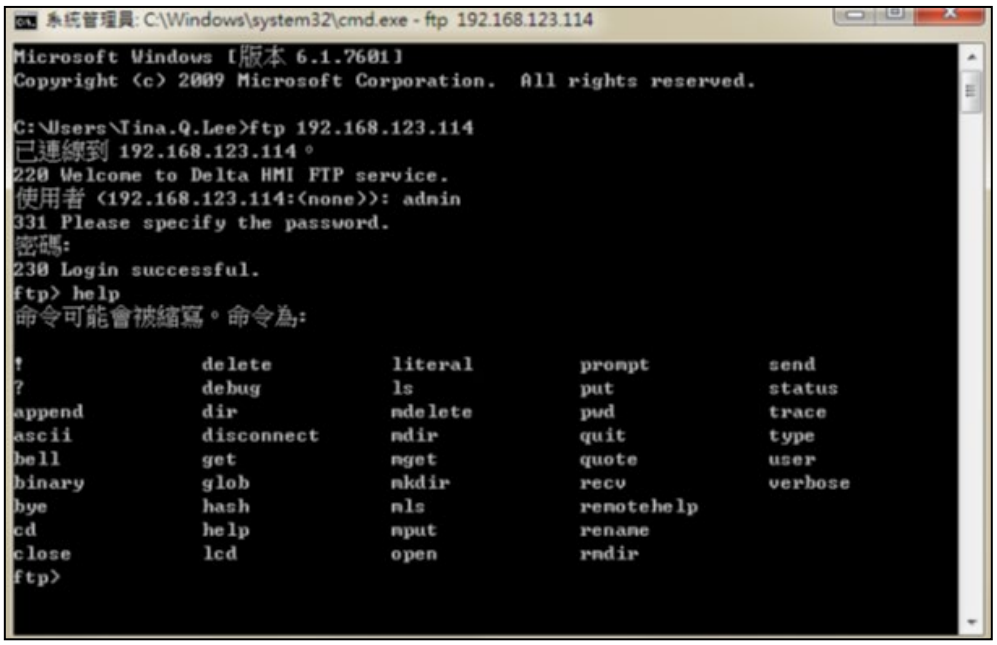


Figure 2 - 131: Supported related commands

Enter the dir command to list all files currently in the USB storage device.

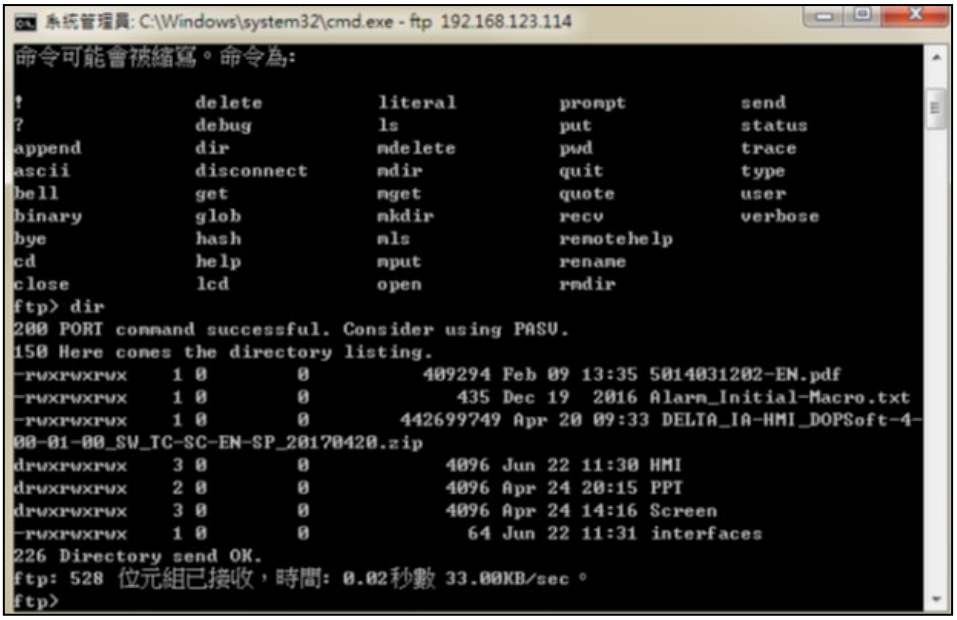


Figure 2 - 132: All current USB files

To download files from a USB Disk or SD Card, use the get command. If users want to upload files from PC to USB Disk or SD Card, it is the put command.

The following table describes the **FTP** page function setting.

Function	Description
Enable FTP host function	After checking this box, the FTP function can be used.
FTP Host Port	The default FTP host port is **21**.
Account	Users can arbitrarily enter the account name.
Password	Users can enter any password.
Root Directory	The root directory is the storage location of HMI files, and the default value is **USB Disk**. Users can also choose SD Card as the storage location.
Anonymous	● If this option is checked, users can log in to FTP without entering an account and password. ● After using an anonymous connection to log in to FTP, users cannot upload, download files, delete files or add new directories.

After the FTP settings are loaded into the HMI, access the settings from the **System Directory** > **System Setting** > **Network App** > **FTP Server** tab, as shown in the following figure. Users can also change the FTP settings from the HMI before uploading to DIAScreen.

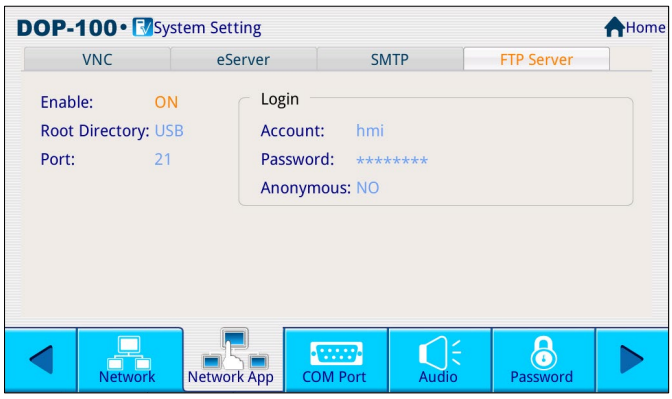


Figure 2 - 133: FTP HMI directory setting page

2.2.2.13.6 Industry Application

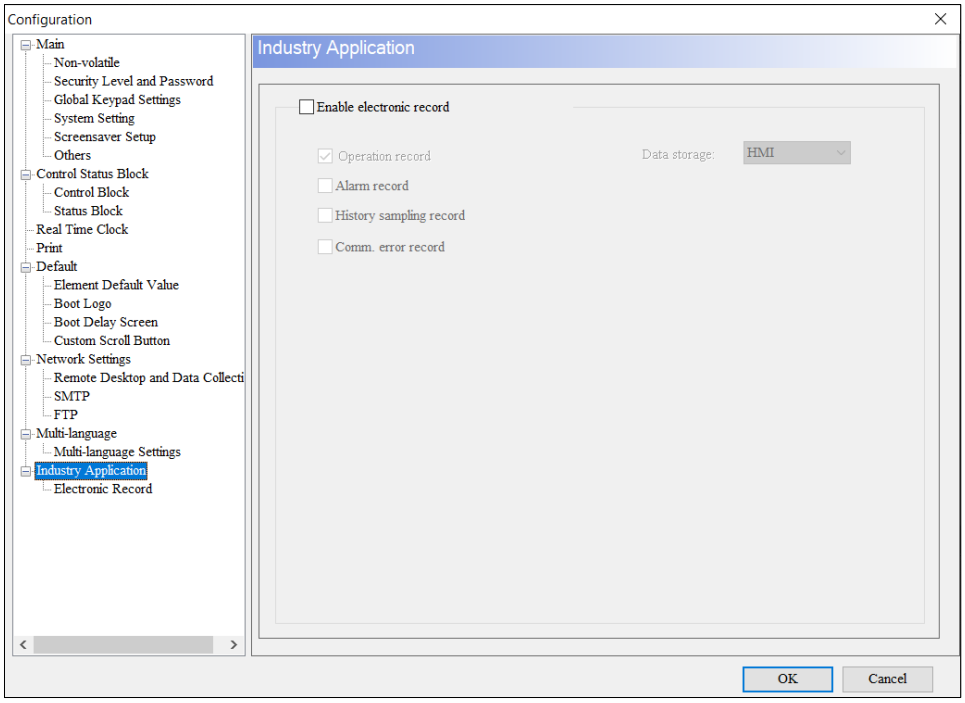
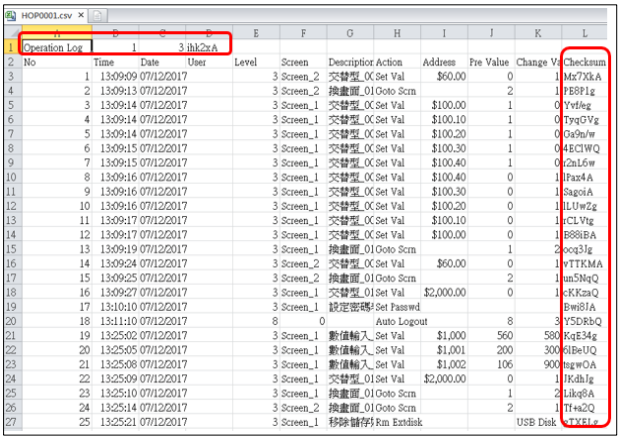
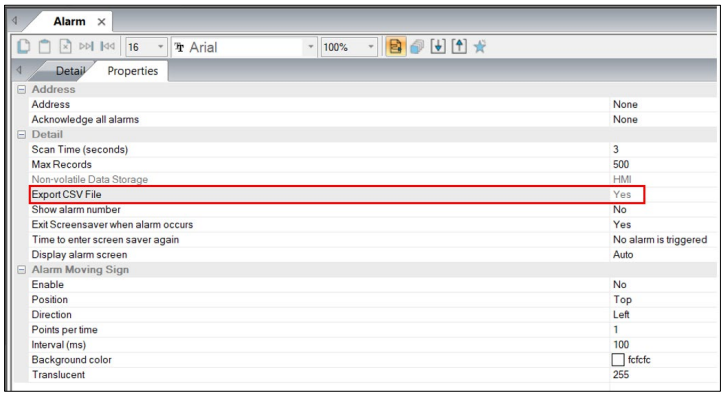
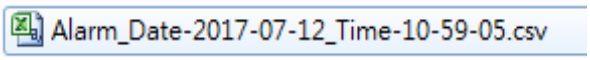
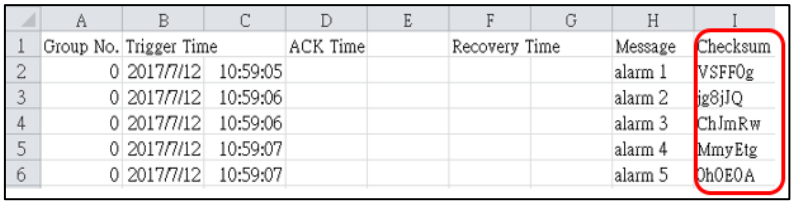
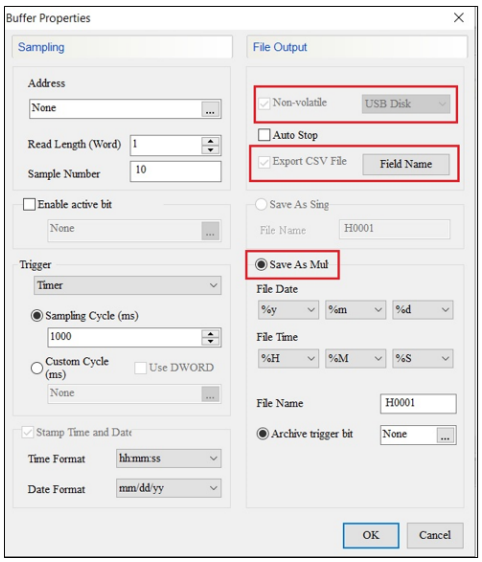
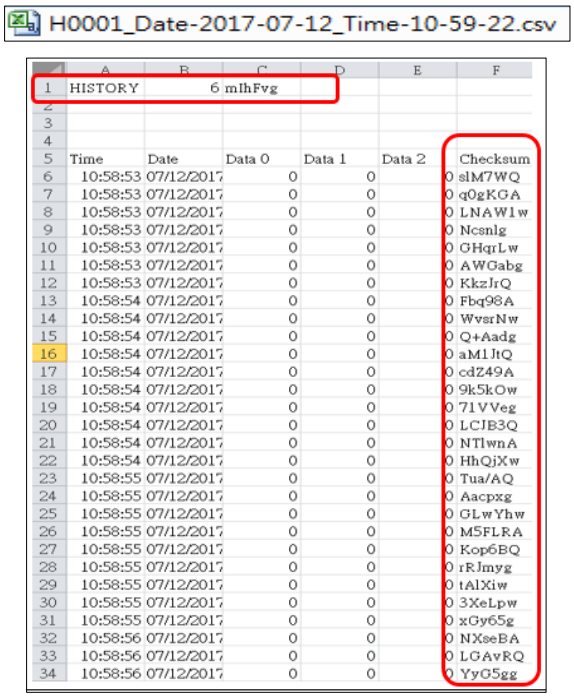
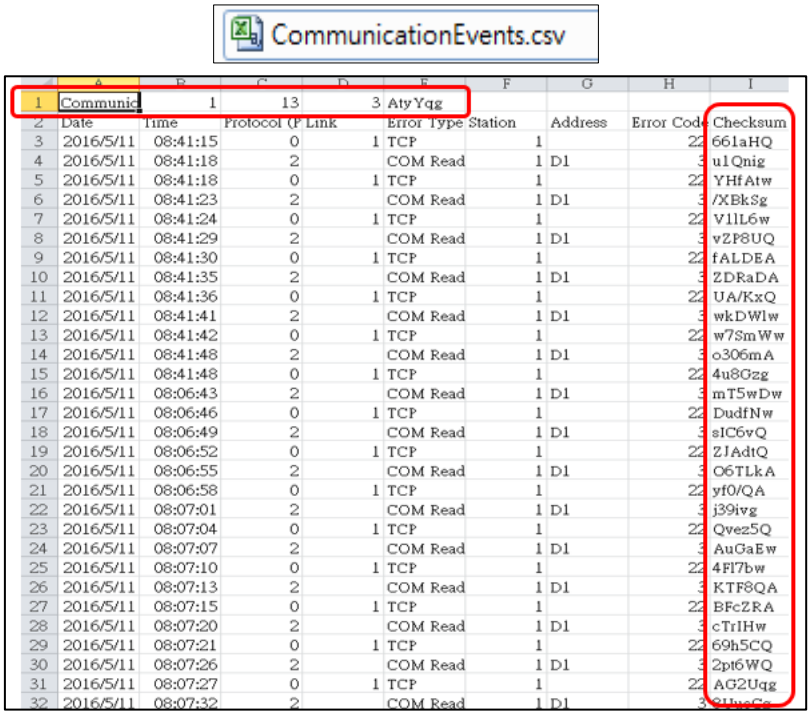


Figure 2 - 134: Electronic Record for Industry Application

Function	Description
Enable electronic record	When enabled, the operation recording function will be enabled forcibly.
Operation record	● Record all operations of HMI, including numerical changes and user level. ● Check sum and Header data are added to the operation record data. 

Function	Description
Alarm record	● Turn on the record HMI alarm data, and the output CSV function will be forced to be set to **Yes**.  ● In order to respond to electronic signatures, the alarm file name will be created according to the year, month, day, hour, minute and second when exporting the alarm data.  ● Add Checksum to every data of the alarm.  ● The timing of generating this file will be based on the maximum number of records set by the alarm.
History sampling record	● Turn on record HMI historical data, the power-off retention of historical data will be forced to be set to USB or SD, and the output CSV function will be forced to be set to Yes, and the file storage will also be forced to be set to file storage. 

	A	B	C	D	E	F	G	H	I
1	Group No.	Trigger Time		ACK Time		Recovery Time		Message	Checksum
2	0	2017/7/12	10:59:05					alarm 1	VSFF0g
3	0	2017/7/12	10:59:06					alarm 2	jg8jJQ
4	0	2017/7/12	10:59:06					alarm 3	ChJmRw
5	0	2017/7/12	10:59:07					alarm 4	MmyEtg
6	0	2017/7/12	10:59:07					alarm 5	0h0E0A

Function	Description
	● The historical data stored in files will be archived according to year, month, day, hour, minute and second, and checksum and header data will be added. 
Communication Error Record	When the **Communication Error Record** is enabled, the HMI will automatically store the communication error data in the HMI, USB or SD, and the storage location is HMI\HMI-000\CommEventLog. 

H0001_Date-2017-07-12_Time-10-59-22.csv

	A	B	C	D	E	F
1	HISTORY		6	mIhFvg		
2						
3						
4						
5	Time	Date	Data 0	Data 1	Data 2	Checksum
6	10:58:53	07/12/2017	0	0		0 slM7WQ
7	10:58:53	07/12/2017	0	0		0 q0gKGA
8	10:58:53	07/12/2017	0	0		0 LNAW1w
9	10:58:53	07/12/2017	0	0		0 Ncsnlg
10	10:58:53	07/12/2017	0	0		0 GHqrLw
11	10:58:53	07/12/2017	0	0		0 AWGabg
12	10:58:53	07/12/2017	0	0		0 KkzJrQ
13	10:58:54	07/12/2017	0	0		0 Fbq98A
14	10:58:54	07/12/2017	0	0		0 WvsrNw
15	10:58:54	07/12/2017	0	0		0 Q+Aadg
16	10:58:54	07/12/2017	0	0		0 aM1JtQ
17	10:58:54	07/12/2017	0	0		0 cdZ49A
18	10:58:54	07/12/2017	0	0		0 9k5kOw
19	10:58:54	07/12/2017	0	0		0 71VVeg
20	10:58:54	07/12/2017	0	0		0 LCJB3Q
21	10:58:54	07/12/2017	0	0		0 NTlwnA
22	10:58:54	07/12/2017	0	0		0 HhQjXw
23	10:58:55	07/12/2017	0	0		0 Tua/AQ
24	10:58:55	07/12/2017	0	0		0 Aacpxg
25	10:58:55	07/12/2017	0	0		0 GLwYhw
26	10:58:55	07/12/2017	0	0		0 M5FLRA
27	10:58:55	07/12/2017	0	0		0 Kop6BQ
28	10:58:55	07/12/2017	0	0		0 rRJmyg
29	10:58:55	07/12/2017	0	0		0 tAlXiw
30	10:58:55	07/12/2017	0	0		0 3XeLpw
31	10:58:55	07/12/2017	0	0		0 xGy65g
32	10:58:56	07/12/2017	0	0		0 NXseBA
33	10:58:56	07/12/2017	0	0		0 LGAvRQ
34	10:58:56	07/12/2017	0	0		0 YyG5gg

CommunicationEvents.csv

	A	B	C	D	E	F	G	H	I
1	Communic	1	13	3	AtyYqg				
2	Date	Time	Protocol (P	Link	Error Type	Station	Address	Error Cod	Checksum
3	2016/5/11	08:41:15	0	1	TCP	1		22	661aHQ
4	2016/5/11	08:41:18	2		COM Read	1	D1	3	u1Qnig
5	2016/5/11	08:41:18	0	1	TCP	1		22	YHfAtw
6	2016/5/11	08:41:23	2		COM Read	1	D1	3	/XBkSg
7	2016/5/11	08:41:24	0	1	TCP	1		22	V1lL6w
8	2016/5/11	08:41:29	2		COM Read	1	D1	3	vZP8UQ
9	2016/5/11	08:41:30	0	1	TCP	1		22	fALDEA
10	2016/5/11	08:41:35	2		COM Read	1	D1	3	ZDRaDA
11	2016/5/11	08:41:36	0	1	TCP	1		22	UA/KxQ
12	2016/5/11	08:41:41	2		COM Read	1	D1	3	wkDWlw
13	2016/5/11	08:41:42	0	1	TCP	1		22	w7SmWw
14	2016/5/11	08:41:48	2		COM Read	1	D1	3	o306mA
15	2016/5/11	08:41:48	0	1	TCP	1		22	4u8Gzg
16	2016/5/11	08:06:43	2		COM Read	1	D1	3	mT5wDw
17	2016/5/11	08:06:46	0	1	TCP	1		22	DudfNw
18	2016/5/11	08:06:49	2		COM Read	1	D1	3	sIC6vQ
19	2016/5/11	08:06:52	0	1	TCP	1		22	ZJAdtQ
20	2016/5/11	08:06:55	2		COM Read	1	D1	3	O6TLkA
21	2016/5/11	08:06:58	0	1	TCP	1		22	yf0/QA
22	2016/5/11	08:07:01	2		COM Read	1	D1	3	j39ivg
23	2016/5/11	08:07:04	0	1	TCP	1		22	Qvez5Q
24	2016/5/11	08:07:07	2		COM Read	1	D1	3	AuGaEw
25	2016/5/11	08:07:10	0	1	TCP	1		22	4Fl7bw
26	2016/5/11	08:07:13	2		COM Read	1	D1	3	KTF8QA
27	2016/5/11	08:07:15	0	1	TCP	1		22	BFcZRA
28	2016/5/11	08:07:20	2		COM Read	1	D1	3	cTrIHw
29	2016/5/11	08:07:21	0	1	TCP	1		22	69h5CQ
30	2016/5/11	08:07:26	2		COM Read	1	D1	3	2pt6WQ
31	2016/5/11	08:07:27	0	1	TCP	1		22	AG2Uqg
32	2016/5/11	08:07:32	2		COM Read	1	D1	3	

Function	Description
Data Storage	Select the storage location of all stored data in electronic records, provide HMI, USB Disk, SD. The default value is **HMI**.

The difference between the above records and the data recorded normally is electronic record function. It is enabled to ensure the consistency of the data and its accuracy which is saved and viewed at any time. Therefore, the produced record data will be added with a checksum mechanism and export to CSV file.

Enabling the electronic record function will also enable the function of secondary confirmation of the account in the confirmation window in the button.

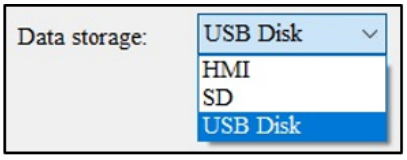
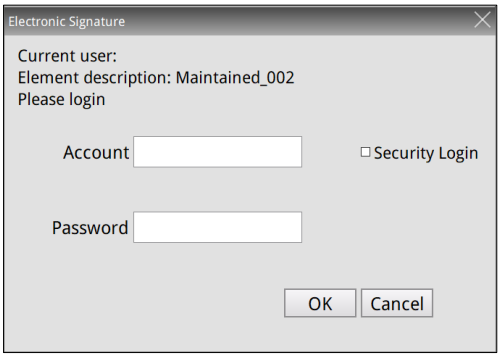


Figure 2 - 135: Data Storage

If the account is set to double confirmation, users will be asked to enter the password twice.



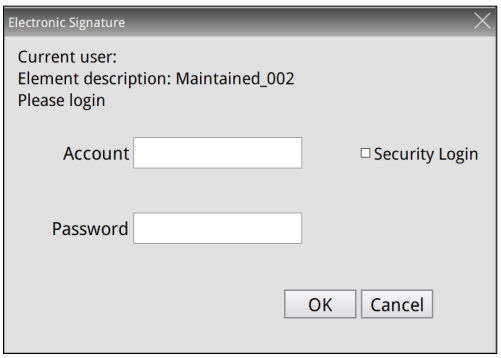


Figure 2 - 136: Enter user password twice

The files generated by the electronic signature can be opened by Excel, or the electronic record viewing tool eRecordViewer can also be used. The storage location is C:\Program Files (x86)\Delta Industrial Automation\DIAStudio\DIAScreen 1.3\Utility\eRecordViewer.

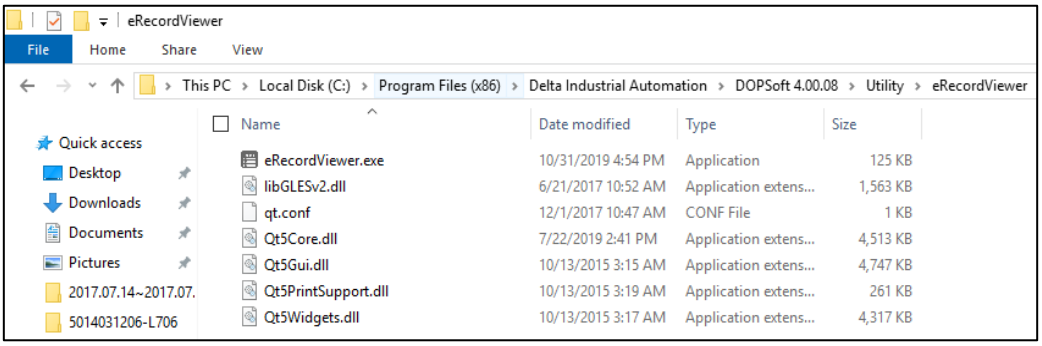
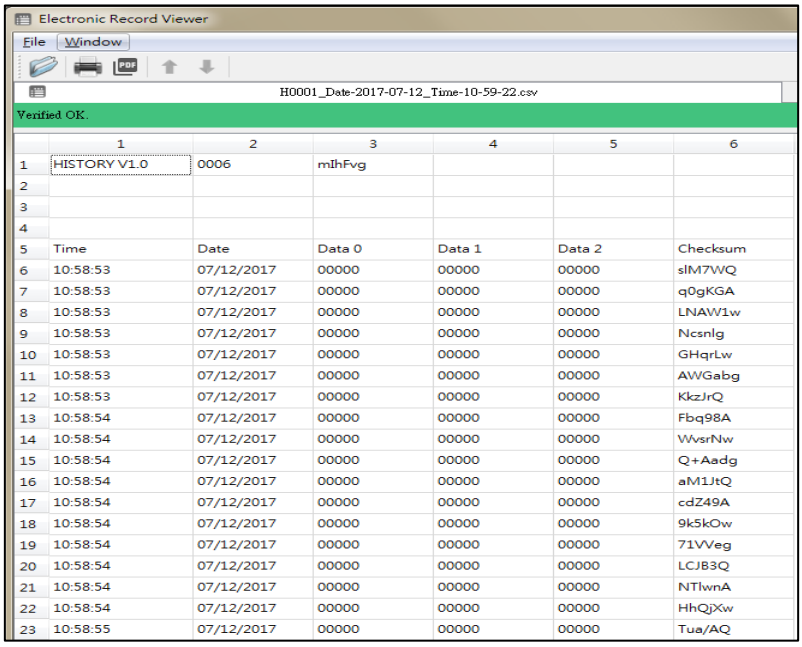


Figure 2 - 137: eRecordViewer

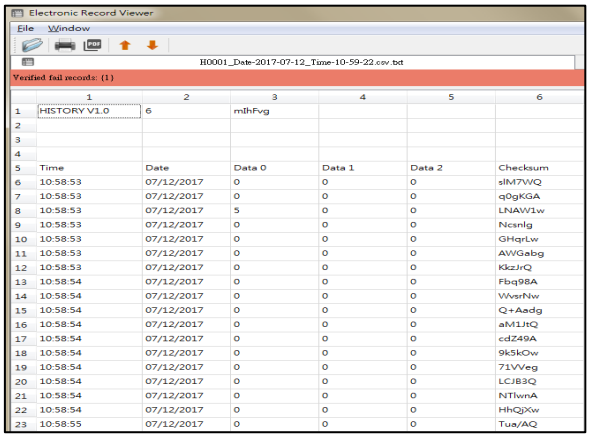
When the loaded data has not been tampered with, eRecordViewer will prompt **Verified OK**.



	1	2	3	4	5	6
1	HISTORY V1.0	0006	mIhFvg			
2						
3						
4						
5	Time	Date	Data 0	Data 1	Data 2	Checksum
6	10:58:53	07/12/2017	00000	00000	00000	slM7WQ
7	10:58:53	07/12/2017	00000	00000	00000	q0gKGA
8	10:58:53	07/12/2017	00000	00000	00000	LNAW1w
9	10:58:53	07/12/2017	00000	00000	00000	Ncsnlg
10	10:58:53	07/12/2017	00000	00000	00000	GHqrLw
11	10:58:53	07/12/2017	00000	00000	00000	AWGabg
12	10:58:53	07/12/2017	00000	00000	00000	KkzJrQ
13	10:58:54	07/12/2017	00000	00000	00000	Fbq98A
14	10:58:54	07/12/2017	00000	00000	00000	WvsrNw
15	10:58:54	07/12/2017	00000	00000	00000	Q+Aadg
16	10:58:54	07/12/2017	00000	00000	00000	aM1JtQ
17	10:58:54	07/12/2017	00000	00000	00000	cdZ49A
18	10:58:54	07/12/2017	00000	00000	00000	9k5kOw
19	10:58:54	07/12/2017	00000	00000	00000	71VVeg
20	10:58:54	07/12/2017	00000	00000	00000	LCJB3Q
21	10:58:54	07/12/2017	00000	00000	00000	NTlwnA
22	10:58:54	07/12/2017	00000	00000	00000	HhQjXw
23	10:58:55	07/12/2017	00000	00000	00000	Tua/AQ

Figure 2 - 138: Verified OK

If the data has been tampered with, for example, eRecordViewer detects that the Checksum of the data in the 8th column of the file does not match, it will display **Verified fail records: {1}**. The number that follows is the total number of incorrect data.



	1	2	3	4	5	6
1	HISTORY V1.0	6	mIhFvg			
2						
3						
4						
5	Time	Date	Data 0	Data 1	Data 2	Checksum
6	10:58:53	07/12/2017	0	0	0	slM7WQ
7	10:58:53	07/12/2017	0	0	0	q0gKGA
8	10:58:53	07/12/2017	5	0	0	LNAW1w
9	10:58:53	07/12/2017	0	0	0	Ncsnlg
10	10:58:53	07/12/2017	0	0	0	GHqrLw
11	10:58:53	07/12/2017	0	0	0	AWGabg
12	10:58:53	07/12/2017	0	0	0	KkzJrQ
13	10:58:54	07/12/2017	0	0	0	Fbq98A
14	10:58:54	07/12/2017	0	0	0	WvsrNw
15	10:58:54	07/12/2017	0	0	0	Q+Aadg
16	10:58:54	07/12/2017	0	0	0	aM1JtQ
17	10:58:54	07/12/2017	0	0	0	cdZ49A
18	10:58:54	07/12/2017	0	0	0	9k5kOw
19	10:58:54	07/12/2017	0	0	0	71VVeg
20	10:58:54	07/12/2017	0	0	0	LCJB3Q
21	10:58:54	07/12/2017	0	0	0	NTlwnA
22	10:58:54	07/12/2017	0	0	0	HhQjXw
23	10:58:55	07/12/2017	0	0	0	Tua/AQ

Figure 2 - 139: Verified fail records {1}

This tool can also save and print electronic records as PDF files.

	1	2	3	4	5	6	7	8	9
1	Communication Events	1	13	3	AtyYqg				
2	Date	Time	Protocol (Port)	Link	Error Type	Station	Address	Error Code	Checksum
3	2016/05/11	08:41:15	0	1	TCP	1		22	661aHQ
4	2016/05/11	08:41:18	2		COM Read	1	D1	3	u1Qnig
5	2016/05/11	08:41:18	0	1	TCP	1		22	YHfAtw
6	2016/05/11	08:41:23	2		COM Read	1	D1	3	/XBkSg
7	2016/05/11	08:41:24	0	1	TCP	1		22	V1lL6w
8	2016/05/11	08:41:29	2		COM Read	1	D1	3	vZP8UQ
9	2016/05/11	08:41:30	0	1	TCP	1		22	fALDEA
10	2016/05/11	08:41:35	2		COM Read	1	D1	3	ZDRaDA
11	2016/05/11	08:41:36	0	1	TCP	1		22	UA/KxQ
12	2016/05/11	08:41:41	2		COM Read	1	D1	3	wkDWlw
13	2016/05/11	08:41:42	0	1	TCP	1		22	w7SmWw
14	2016/05/11	08:41:48	2		COM Read	1	D1	3	o306mA
15	2016/05/11	08:41:48	0	1	TCP	1		22	4u8Gzg
16	2016/05/11	08:06:43	2		COM Read	1	D1	3	mT5wDw
17	2016/05/11	08:06:46	0	1	TCP	1		22	DudfNw
18	2016/05/11	08:06:49	2		COM Read	1	D1	3	sIC6vQ
19	2016/05/11	08:06:52	0	1	TCP	1		22	ZJAdtQ
20	2016/05/11	08:06:55	2		COM Read	1	D1	3	O6TLkA
21	2016/05/11	08:06:58	0	1	TCP	1		22	yf0/QA
22	2016/05/11	08:07:01	2		COM Read	1	D1	3	j39ivg
23	2016/05/11	08:07:04	0	1	TCP	1		22	Qvez5Q
24	2016/05/11	08:07:07	2		COM Read	1	D1	3	AuGaEw
25	2016/05/11	08:07:10	0	1	TCP	1		22	4Fl7bw
26	2016/05/11	08:07:13	2		COM Read	1	D1	3	KTF8QA
27	2016/05/11	08:07:15	0	1	TCP	1		22	BFcZRA
28	2016/05/11	08:07:20	2		COM Read	1	D1	3	cTrIHw
29	2016/05/11	08:07:21	0	1	TCP	1		22	69h5CQ
30	2016/05/11	08:07:26	2		COM Read	1	D1	3	2pt6WQ

Figure 2 - 140: Electronic records are saved as PDF files and printed

2.2.2.14 Communication Settings

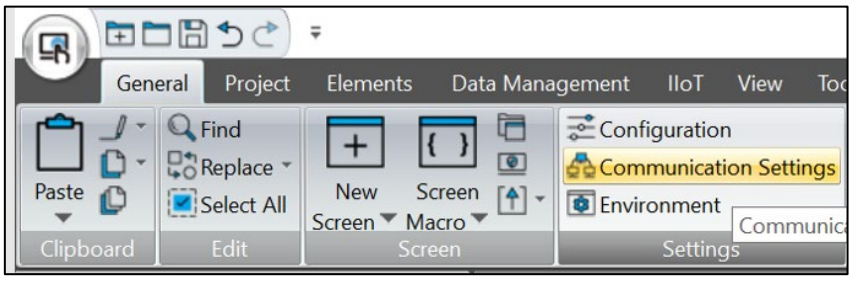


Figure 2 - 141: Communication Settings

Refer to *Section 27.1 Communication Settings*.

2.2.2.15 Environment Settings

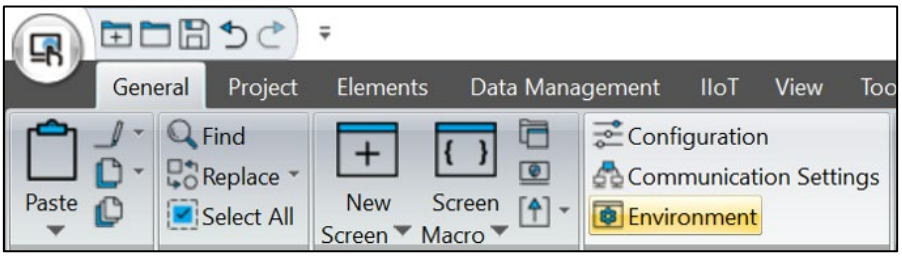


Figure 2 - 142: Environment Settings

Refer to *Section 27.3 Environment*.

2.2.2.16 Font

The **Font** provides adjustments to the alignment, style and size of the text in the content.



Figure 2 - 143: Font

The following table describes the **Font** function.

Function / Icon	Description
16	Font Size
Arial	Font Name
	Import Text
	Align Text to Left

Function / Icon	Description
	Align Text to Horizontal Centre
	Align Text to Right
	Align Text to Top
	Align Text to Vertical Centre
	Align Text to Bottom
	Text Color
	Bold
	Italic
	Underline

2.2.2.17 Picture Layout

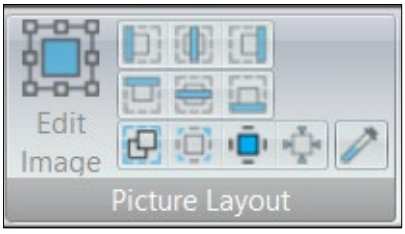
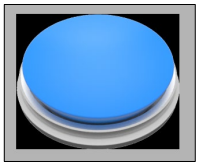
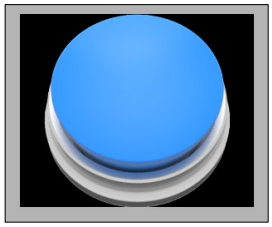
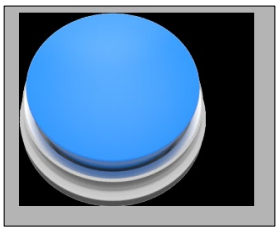
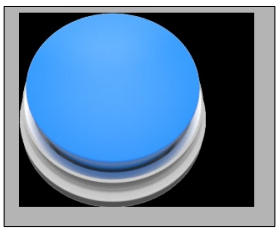
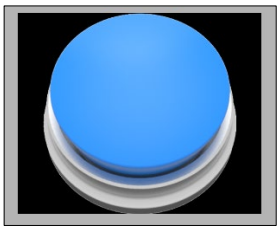
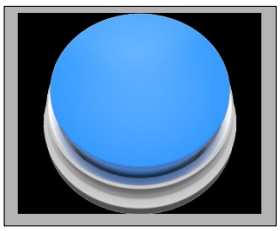
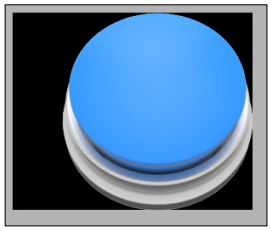


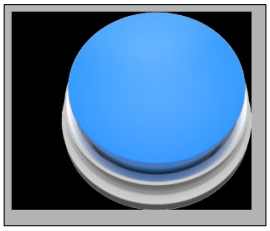
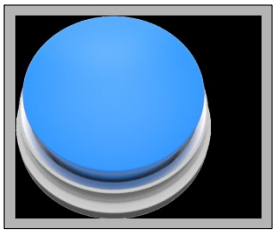
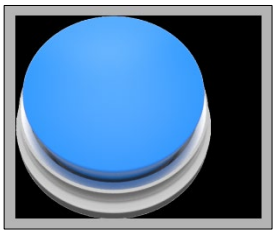
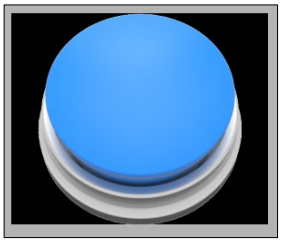
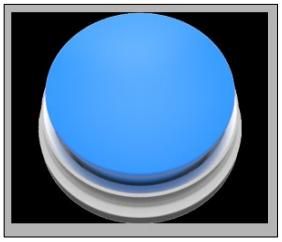
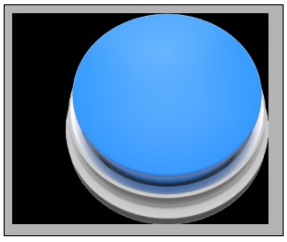
Figure 2 - 144: Picture Layout

Multistate processing can be done for the element graphics, such as aligning the graphics to the left, aligning to the right, and setting them. Users can directly select **General** > **Picture Layout**.

Icon	Function	Description
	Select Transparent color	This function can specify a certain color in the graph and make it transparent. Create an element as shown in the following figure. After importing a picture, use the transparent color icon to select the transparent color of the graphic, click on the place to be changed to a transparent color, and specify the transparent color as, and the selected color will appear transparent.

<table>
<tr><th>Icon</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before Execution</td><td>  </td></tr>
<tr><td>After Execution</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>  </td><td>Process pictures of all states</td><td>If users select Process pictures of all states, and element has multiple state values, the graphics may not extend to the entire area. After this function is checked, all the graphics can be processed instead of going through one by one. It can reduce the time-consuming situation of editing.</td></tr>
<tr><td>  </td><td>Picture Stretch All</td><td rowspan="3">
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means that the graphic will fill the entire element.
  </td><td>Stretch 1:1 means that the graphics will be scaled according to the proportion of the graphics itself, not according to the length, width and height of the element.
  </td><td>Actual Size represents 1:1, the size of the graphic is as large as the graphic displayed on the element.
  </td></tr>
</table>
</td></tr>
<tr><td>  </td><td>Picture Stretch 1:1</td></tr>
<tr><td>  </td><td>Original Picture Size</td></tr>
</table>

Icon	Function	Description	
	Picture Align Left	Before Execution	
		After Execution	
	Picture Horizontal Centering	Before Execution	
		After Execution	
	Picture Align Right	Before Execution	
		After Execution	

Icon	Function	Description	
	Picture Align Top	Before Execution	
		After Execution	
	Picture Vertically Centering	Before Execution	
		After Execution	
	Picture Align Bottom	Before Execution	
		After Execution	

State Graphic

DIAScreen supports copying and pasting multiple graphic.

1. Click **Elements** > **Graphic** > **State Graphic**, and draw the element.

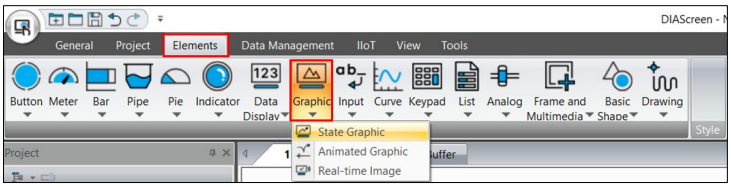


Figure 2 - 145: State Graphic

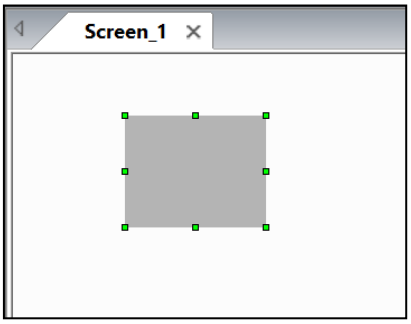


Figure 2 - 146: Create elements

2. Double-click the element and the **State Graphic** property page appears. Select the **Picture** tab and click ... icon to the right of the **Picture Name**.

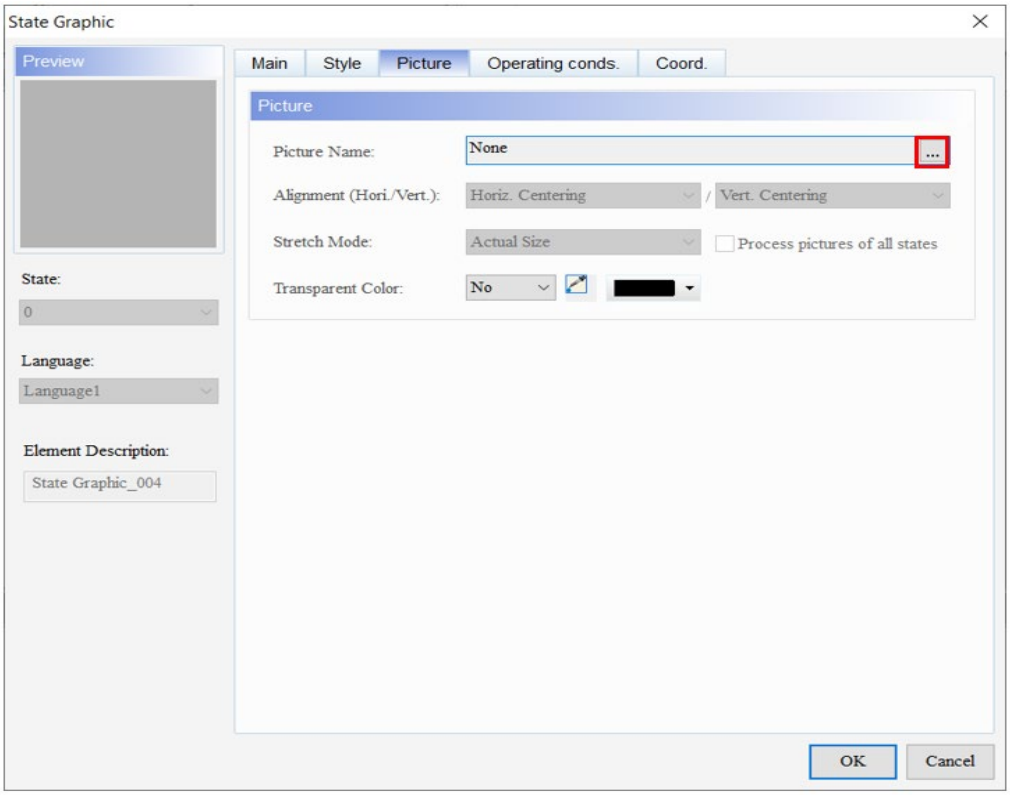


Figure 2 - 147: State Graphic – Picture page

3. Select the particular picture in the **Picture Name** menu.



Figure 2 - 148: Picture Name menu

Result: The screen displays the selected graph, as shown in the following figure.

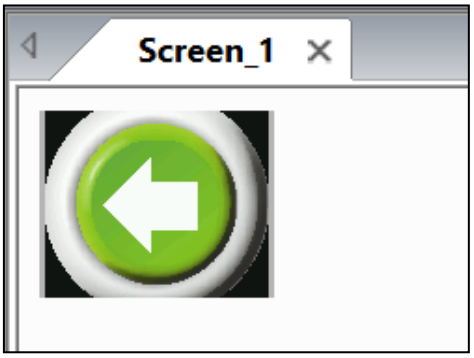


Figure 2 - 149: Graphic

4. After repeating step 1 to draw the elements, right-click copy and paste function to create the required number of elements.
5. Right-click **Graph** and select **Copy Image** from the menu.

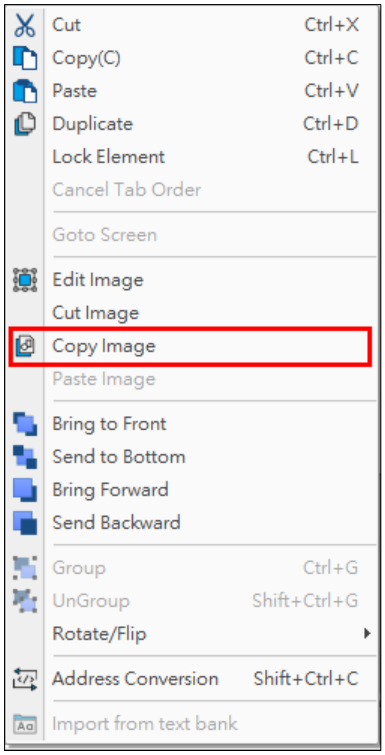


Figure 2 - 150: Copy Image

6. Select all elements, right-click, and select **Paste Image** from the menu.

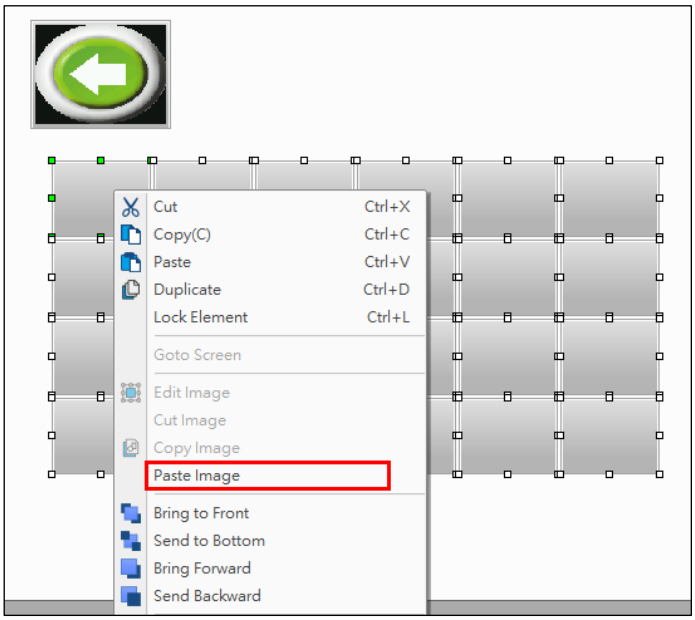


Figure 2 - 151: Paste Image

7. Paste the multiple element graphic.



Figure 2 - 152: Multiple element Graphic

2.2.2.18 Arrangement

The **Arrangement** provides function buttons for adjusting the position and arrangement of elements, so that multi-element can be aligned, moved and moved up and down.

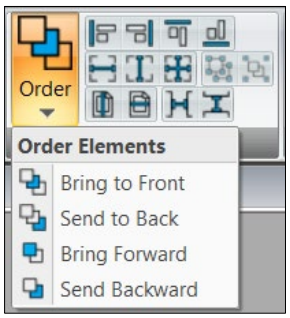


Figure 2 - 153: Arrangement

The following table describes the **Arrangement** function icons.

Function - Icon	Description
	Align Left
	Align Right
	Align Top
	Align Bottom
	Make Same Width
	Make Same Height
	Make Same Size
	Group
	Ungroup
	Vertical Centering
	Horizontal Centering

Function - Icon	Description
	Horizontal Equal Space
	Vertical Equal Space

2.2.2.19 Rotation

Rotation provides function buttons for rotating or flipping elements and screens.



Figure 2 - 154: Rotation

The following table describes the **Rotation** toolbar.

Function / Icon	Description
	CW Rotate Screen 90 degrees
	CCW Rotate Screen 90 degrees
	CW rotate element 90 degrees
	CCW rotate element 90 degrees
	Horizontal Flip
	Vertical Flip

2.2.2.20 State/Language

State/Language provides users to switch the set language or Multistate for quick viewing.

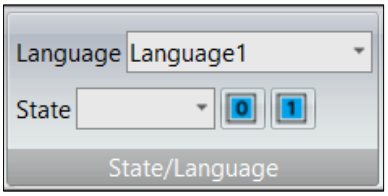
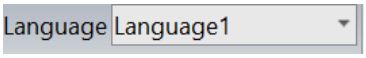


Figure 2 - 155: State/Language

The following table describes **State/Language** functions.

Function / Icon	Description
	Select editing language
	View State 0 ~ 255
	View State 0/OFF
	View State 1/ON

2.2.2.21 Common

Common lists the elements recently used by users, so that users can quickly access.



Figure 2 - 156: Common

2.2.3 Project

The **Project** Toolbar for projects includes Compile, Transport, Libraries/Advanced Settings, Macros and About categories. Details are introduced in this chapter.

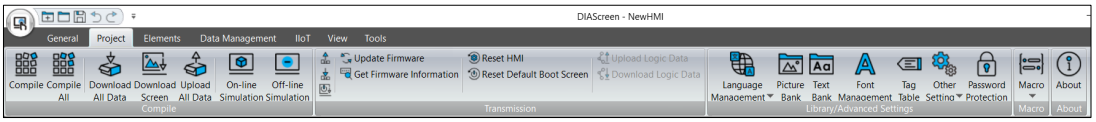


Figure 2 - 157: Project Toolbar

2.2.3.1 Compile

DIAScreen application provides the function of compiling in order to allow users to operate and use more conveniently. The major difference between **Compile** and **Compile All** is that it is assumed that several screens are created, but users only edits and modifies the screen of one of the pages. At this time, users only needs to execute the compiling instead of executing all the compiling, which can save the post-compiling time it takes in the past to wait for all screens to be compiled.

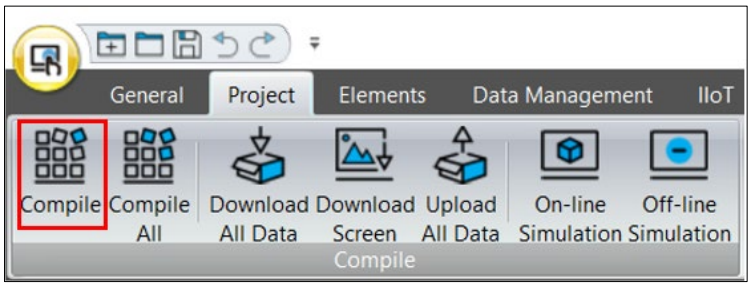


Figure 2 - 158: Compile

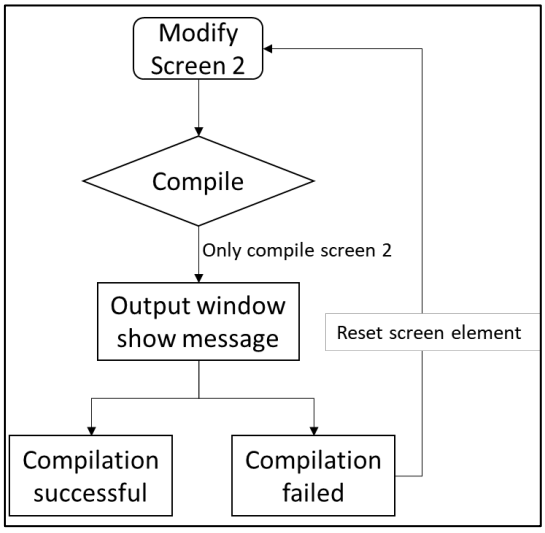


Figure 2 - 159: Compile flow chart

Click **Project** > **Compile**.

Or

Click  icon on the toolbar.

Or

Press **Ctrl** + **F7** on the keyboard.

2.2.3.2 Compile All

The **Compile All** function is the same as the **Compile** function, but **Compile All** compiles for all the pictures. Messages are displayed in the **Output** window during compilation. If an error occurs after the compilation is executed, the error message displays to remind users. Click the message generated in the output window to link to the error element.

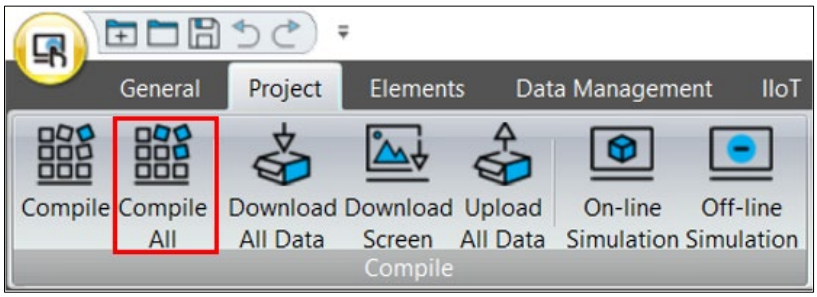


Figure 2 - 160: Compile All

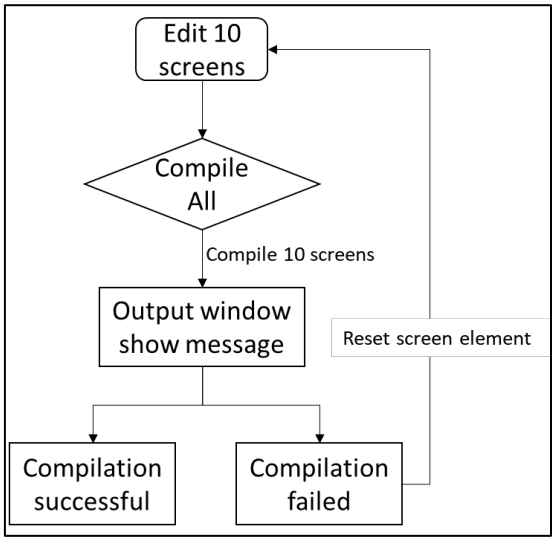


Figure 2 - 161: Compile All flowchart

2.2.3.3 Download All Data

Click **Project** > **Download All Data** to download all data. It downloads screen data and recipes to HMI at the same time. Click  icon in the **Project** toolbar, or press **Ctrl** + **F8** on the keyboard. When users download all the data, the application will detect whether the HMI and the PC are connected. If the transmission interface between users is not opened, an error message pop ups to warn users when downloading all the data.

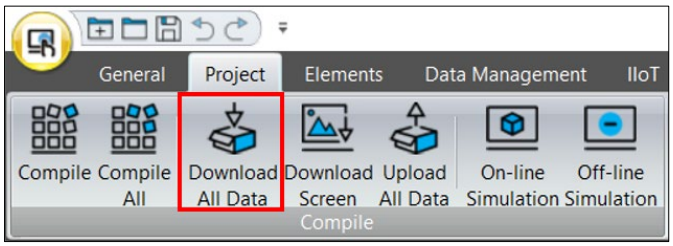


Figure 2 - 162: Download All Data

- Normal transmission

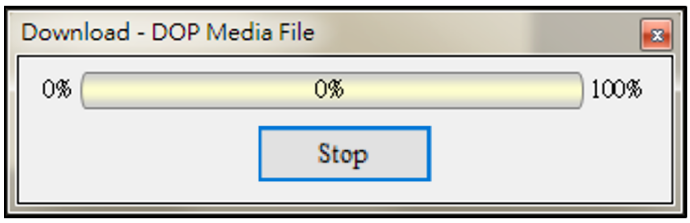
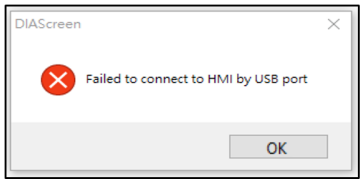
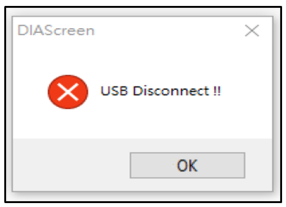
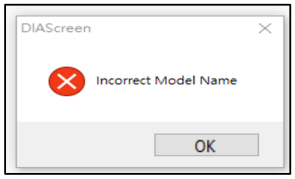


Figure 2 - 163: Download all information

- Abnormal transmission

USB channel check	Error message when USB is turned on incorrectly. 
	Error message that the transmission line is unplugged or the communication is interrupted during the download process. 
Model check	HMI model setting error 

2.2.3.4 Download Screen

Download screen data means only downloading screen data, excluding recipe data. Other download methods are the same as downloading all data. Refer to *Section 2.2.3.3 Download All Data*.

Click **Project** > **Download Screen**.

Or

Click  icon in the **Project** toolbar.

Or

Press **Ctrl** + **F9** on the keyboard.

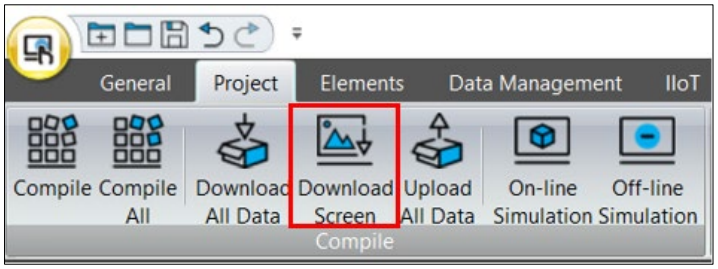


Figure 2 - 164: Download Screen

2.2.3.5 Upload All Data

When users **Upload All Data**, the application asks users to enter a password first. The password entered here is the system default password **12345678**. To set password, go to **General** > **Configuration** > **Security Level and Password**.

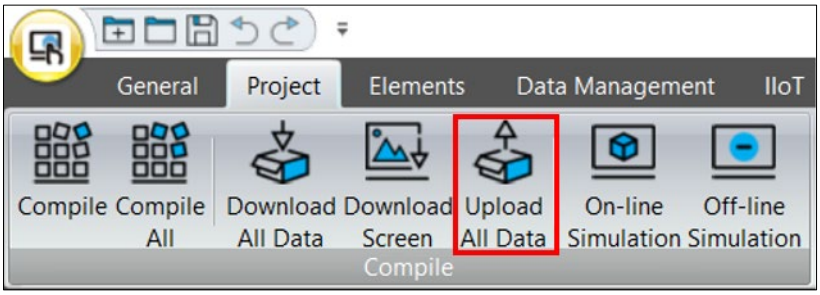


Figure 2 - 165: Upload All Data

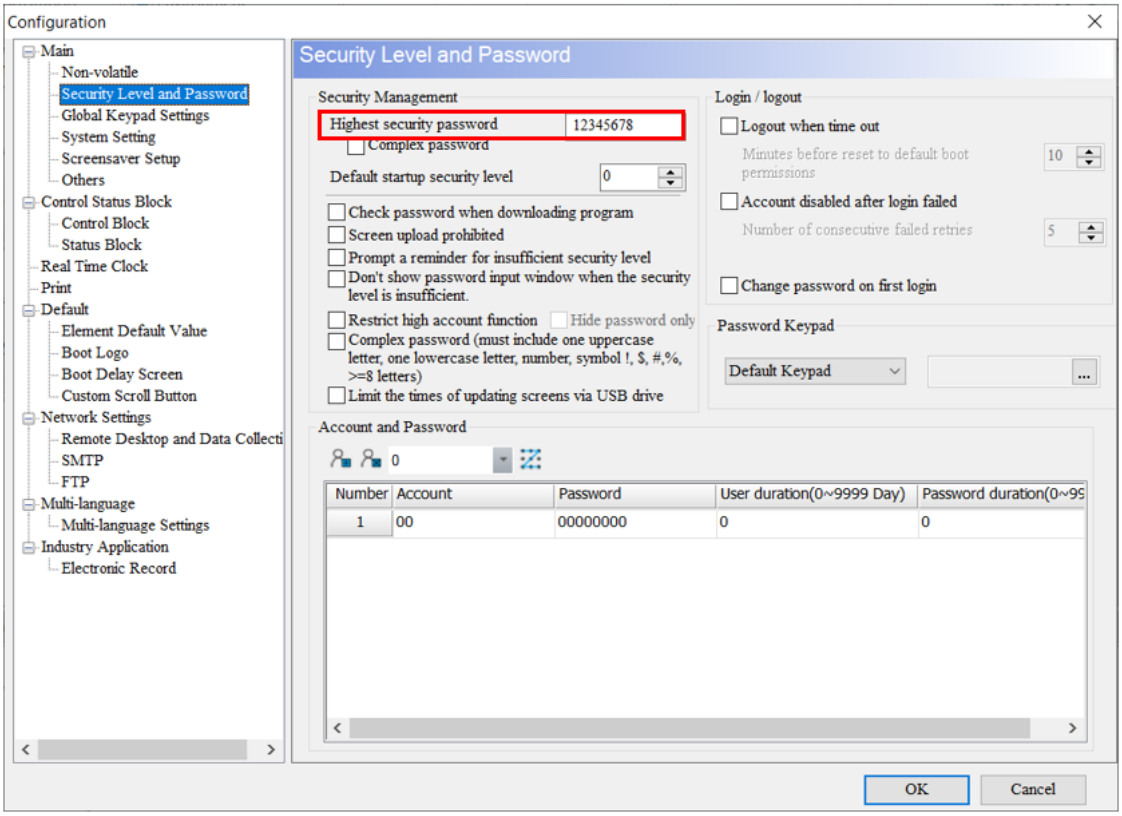


Figure 2 - 166: Security Level and Password

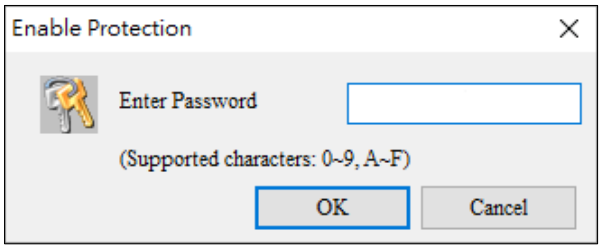


Figure 2 - 167: Enable Protection

After entering the password, the application asks users to **Save** the screen file to be uploaded, as shown in the following figure.

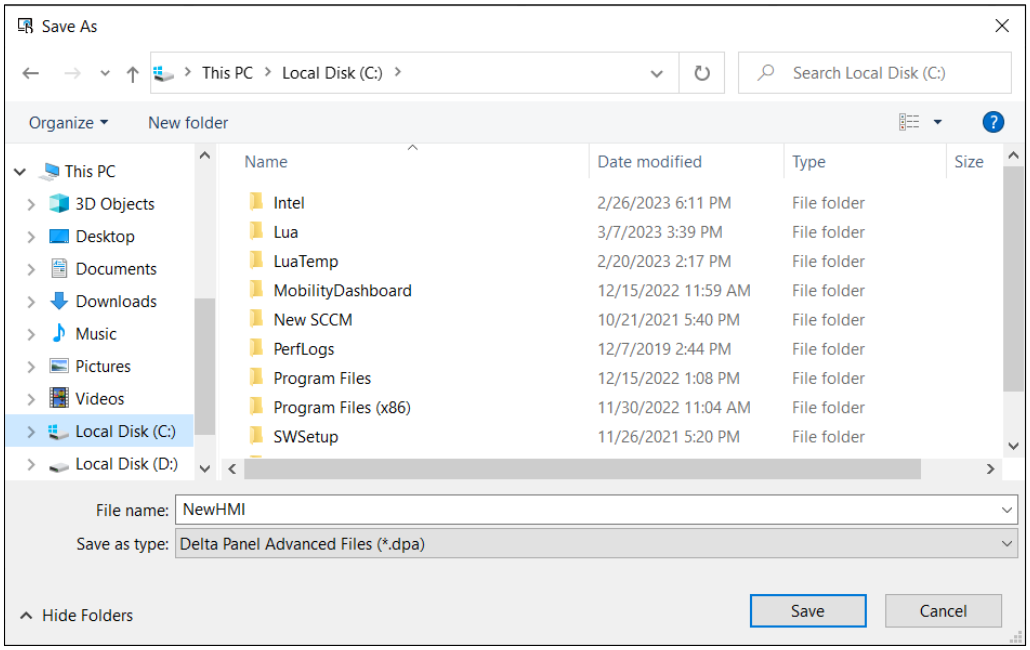


Figure 2 - 168: Upload data Save As new file

After setting the file and path to be saved, the screen data starts to upload until 100%. Users can also click **Stop** to interrupt the uploading process.

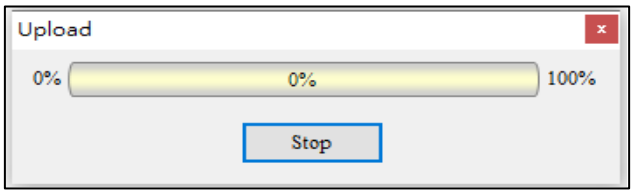


Figure 2 - 169: Uploading Data

In addition to uploading the screen data back to the PC, users can also select whether to return the graphic data when performing the upload action from **General > Environment Settings**.

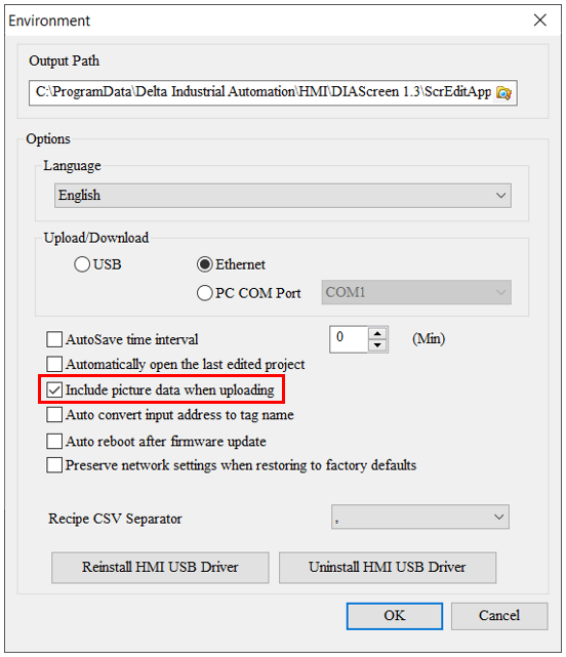


Figure 2 - 170: Upload contains Picture Data

2.2.3.6 On-line Simulation

The **On-line Simulation** is to simulate the communication between the PC and the PLC, and the communication method is to use the COM port of the PC and the PLC as the communication interface for its transmission. If the on-line simulation action is initiated normally, the PC can simulate the action used in the actual operation of the HMI. After the on-line simulation is executed, the application will be compiled first to check whether the screen is correct.

Click **Project** > **On-line Simulation**.

Or

Click 

icon in the **Project** toolbar.

Or

Press **Ctrl** + **F4** on the keyboard.

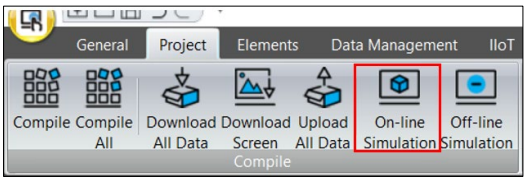


Figure 2 - 171: On-line Simulation

- On-line Simulation process

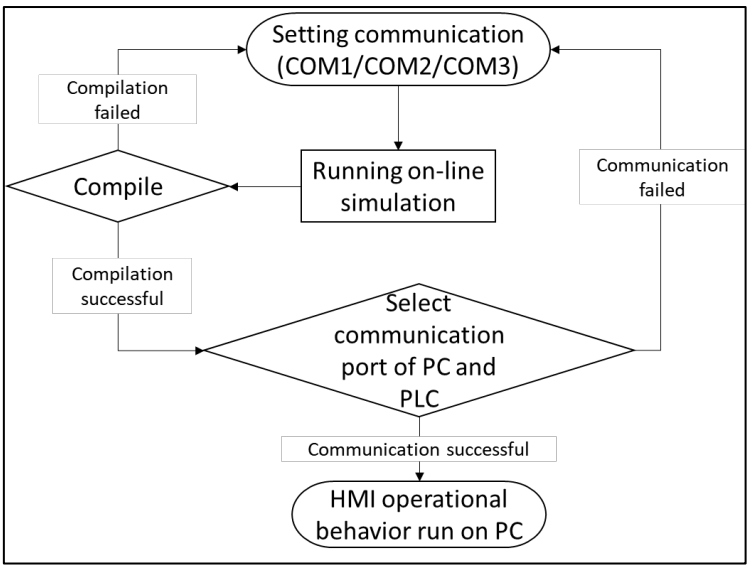


Figure 2 - 172: On-line Simulation flowchart

After users perform the **On-line Simulation**, the application asks to set the PC port communication port number corresponding to the HMI, as shown in the following figure.

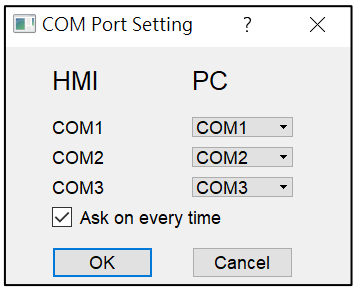


Figure 2 - 173: COM Port Setting

When all settings are correct, the On-line simulation can represent the communication operation between the HMI and the PLC.

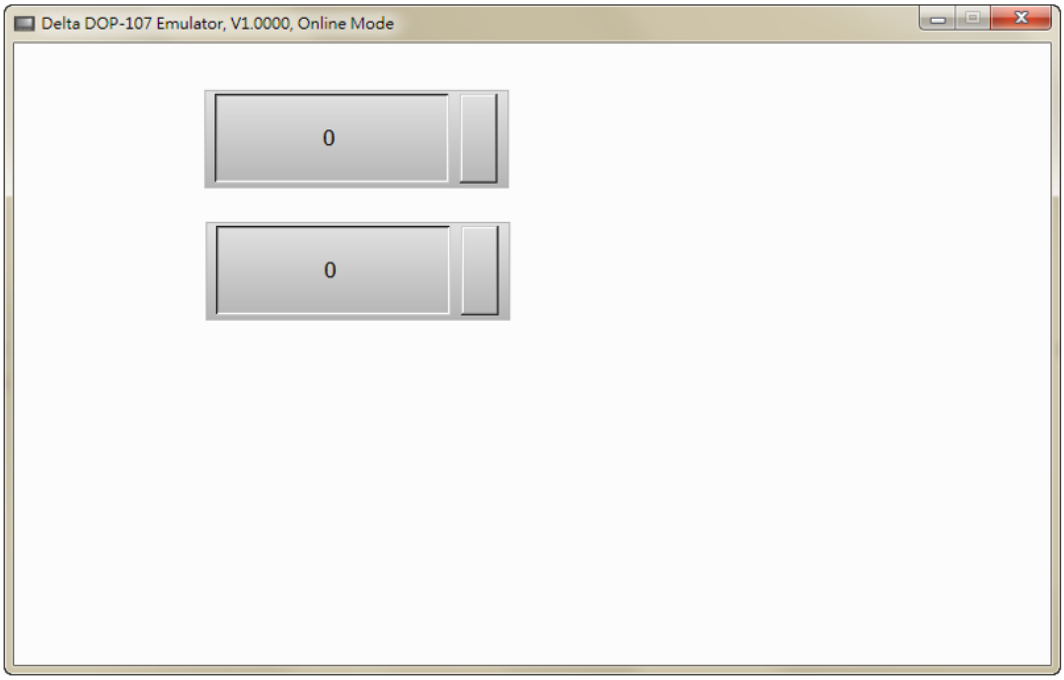


Figure 2 - 174: Emulator

There is an option **Ask on every time** in the **COM Port Setting** window, this option allows users to decide whether to pop up this **COM Port Setting** window every time the on-line simulation is executed. If **Ask on every time** is not checked, right-click on the on-line simulation screen and select **COM Setting** to display the following window.

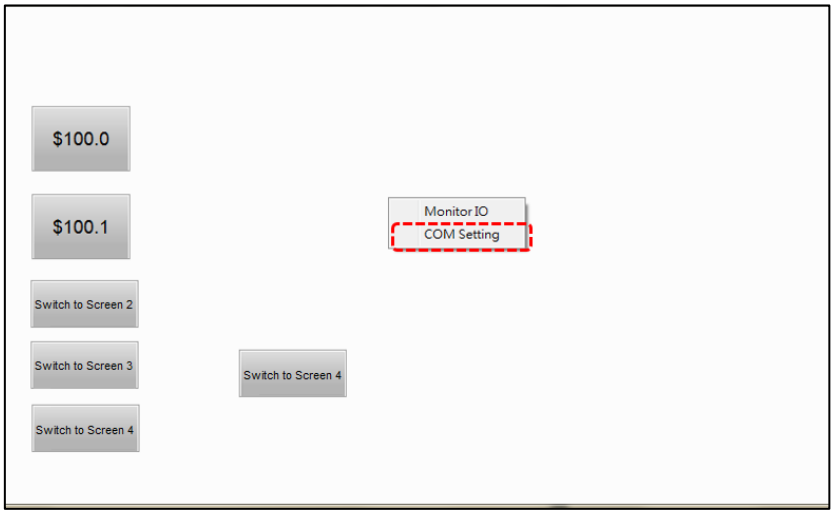


Figure 2 - 175: Right-click to enter COM Setting

The **On-line Simulation** also provides the **Monitor IO** function, which can monitor the content value of the IO device.

Click **On-line Simulation** screen, select **Monitor IO**, and the following window will pop up to set and monitor the IO device.

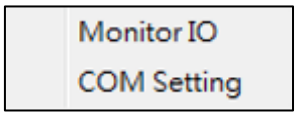


Figure 2 - 176: Right-click to enter Monitor IO

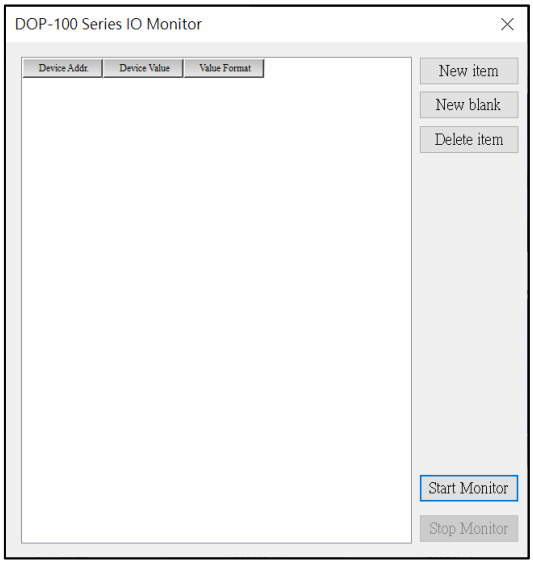
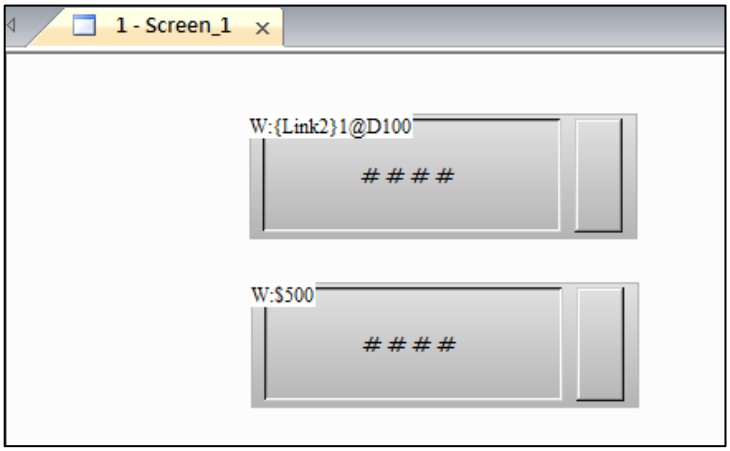
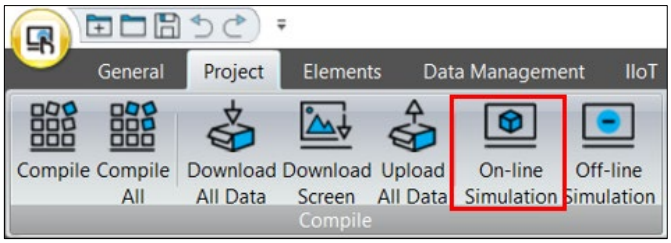
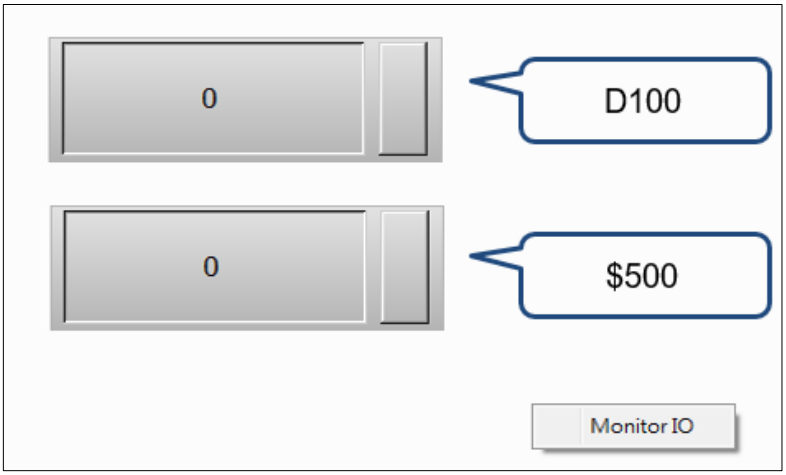
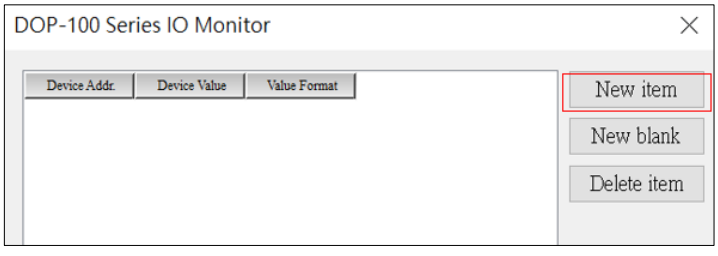
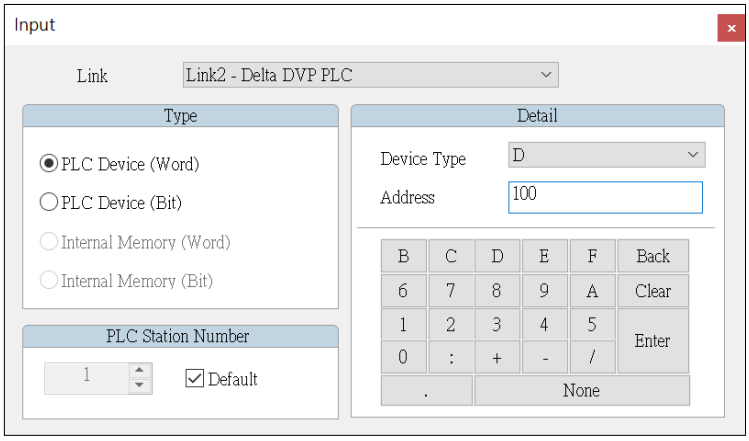
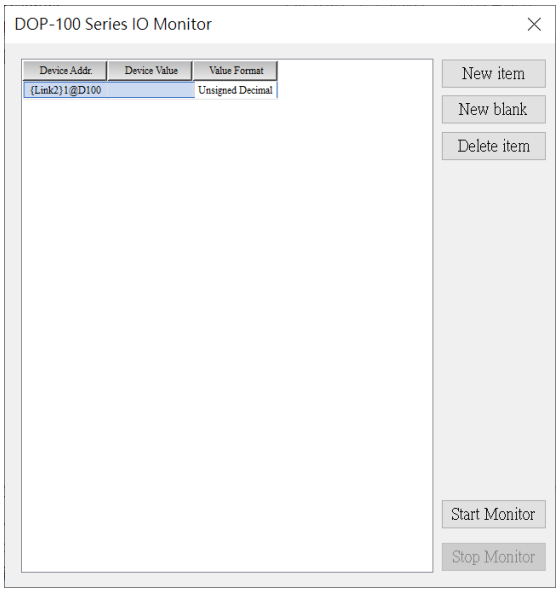
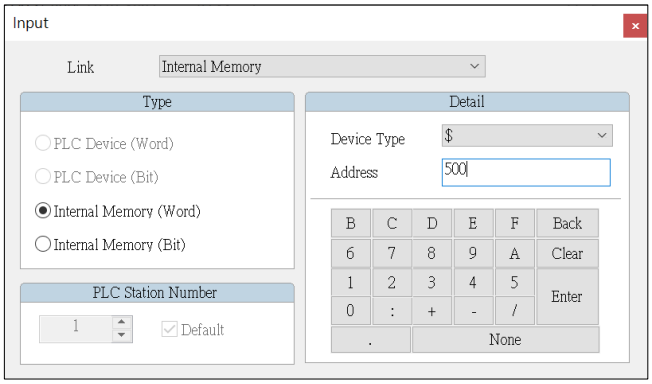


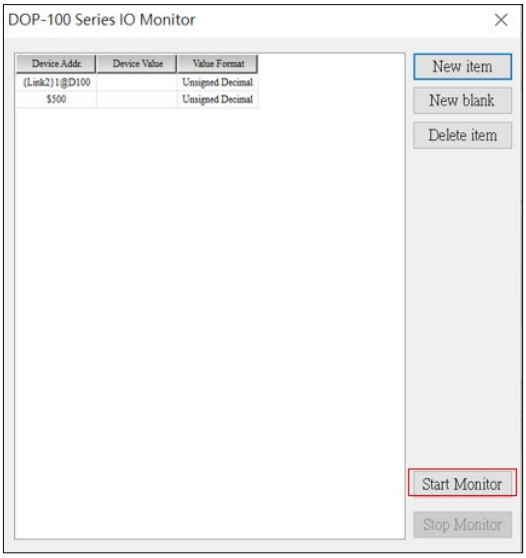
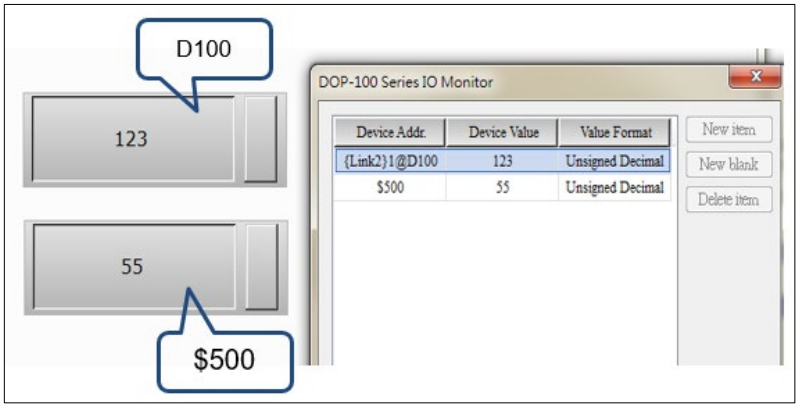
Figure 2 - 177: IO Monitor

IO Monitor	
New item	Use the **Input** window to add an address users want to monitor.
New blank	A new column of monitoring fields can be added. The difference from **New item** is that users do not need to enter the address through the **Input** window, but can directly copy and paste the monitoring address.
Delete item	Selected monitored address can be deleted.
Start Monitor	When this button is pressed, monitoring starts.
Stop Monitor	After pressing this button, monitoring stops.
Device Address	Internal Memory or controller scratchpad address can be selected.
Device Value	Display the content value of the monitored Internal Memory or controller register, and can also change the content value of the device in real time. If users are using Delta PLC products, setting **Length** is not required.
Value Format	The format of the value can be set, including Signed Decimal, Unsigned Decimal, Hexadecimal or Bit.

The following describes the **IO Monitor** example introduction.

IO Monitor	
Create Numeric Entry elements	Create two **Numeric Entry** elements. Set the **Write Address** to $500 and {Link2}2@D100. 
Enter Monitor IO	**Step 1**: Click **Project** > **Compile** > **On-line Simulation**.  **Step 2**: Right-click On-line Simulation screen and select **Monitor IO** 
Set monitor address	**Step 1**: Click **New item** to add a monitor address 

IO Monitor	
Set monitor address	**Step 2**: Select to set monitor address {Link2}2@D100  After the setting is completed, the screen appears as follows. 
Set monitor address	Repeat Steps 1 and 2 to set another monitor address $500: 
Start Monitor	Click the **Start Monitor** button to start monitoring.

IO Monitor	
	
Result	The **Monitor IO** window monitors the set address in time. Users can monitor the content value of {Link2}2@D100 and $500 in the **Device Value** field, and can also modify the content value of the device in the **Monitor IO** window. 

2.2.3.7 Off-line Simulation

The biggest difference between off-line simulation and on-line simulation is that off-line simulation does not need to actually communicate with PLC. Therefore, the off-line mode is mainly used to check whether the edited screen, the memory address of the read and write, and the macro are correct.

Click **Project** > **Off-line Simulation**.

Or

Click  icon in the **Project** Toolbar.

Or

Press **Ctrl** + **F5** on the keyboard.

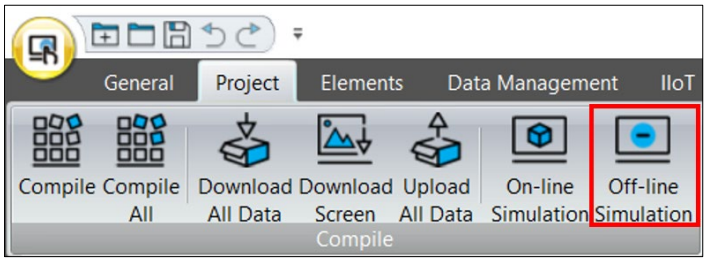


Figure 2 - 178: Off-line Simulation

After the **Off-line Simulation** is executed, the application will also be compiled first, and then enter the Off-line Simulation screen.

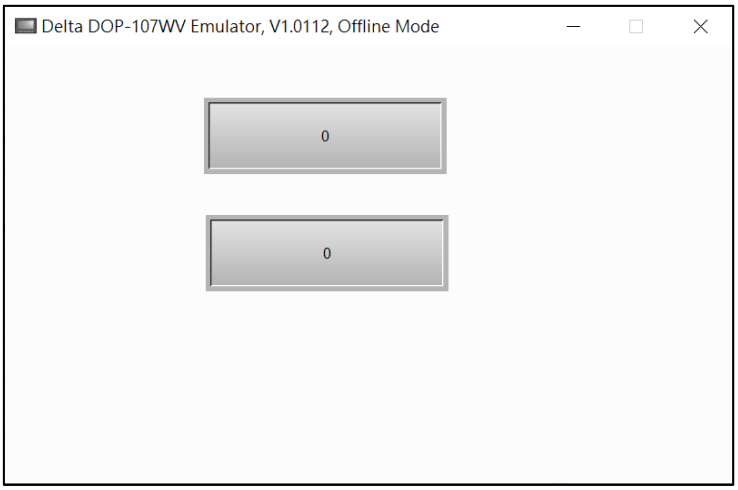


Figure 2 - 179: Off-line Simulation

2.2.3.8 Upload Recipe

If **Upload Recipe** is executed, it is the same as uploading all the data. Users must enter the password before uploading the recipe to the PC. The password setting is the same as the steps described in *Section 2.2.3.5 Upload All Data*.

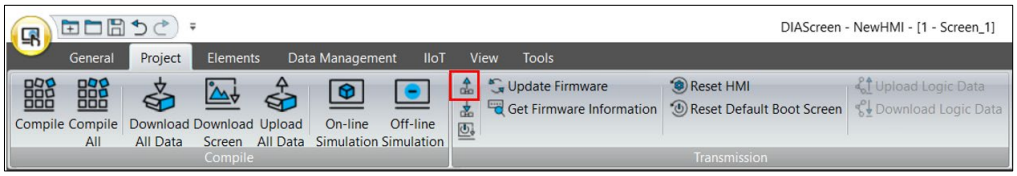


Figure 2 - 180: Upload Recipe tool

2.2.3.9 Download Recipe

To download the recipe data, execute **Download Recipe**. In case users need to modify the recipe, the other screen editing data are not modified, so executing this option can save the time of downloading the screen. After execution, the application asks users to click the recipe file (.rcp) to be downloaded. After selecting the recipe file, the recipe file can be downloaded to the HMI.

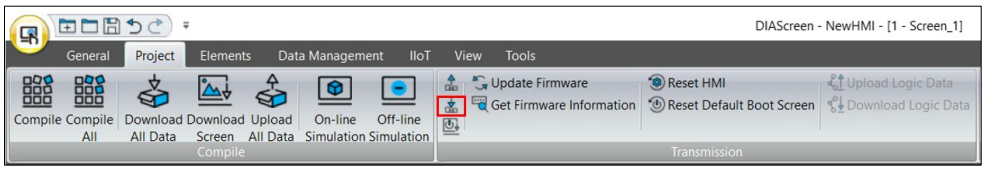


Figure 2 - 181: Download Recipe tool

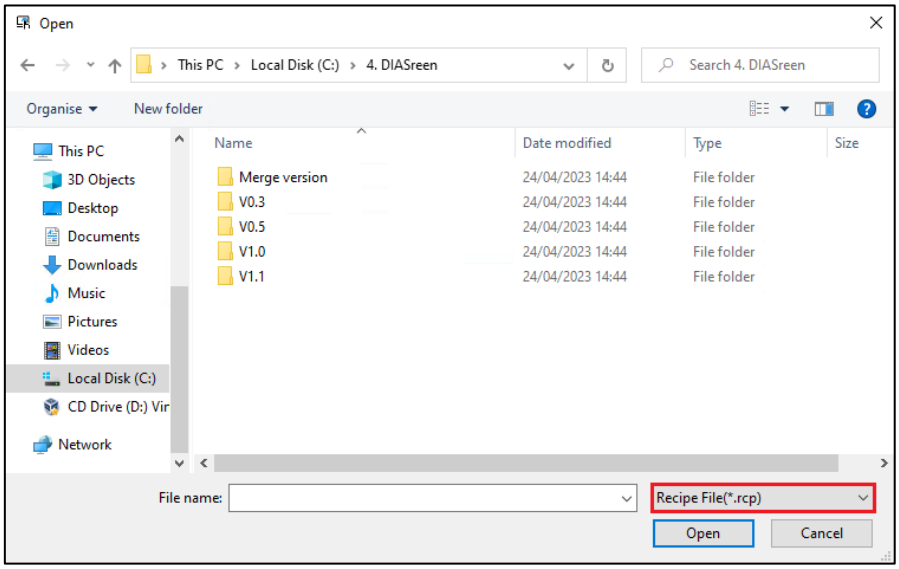


Figure 2 - 182: Select Recipe File

2.2.3.10 Download The Boot Screen

If users only want to **Download Boot Screen**, users can download the boot screen, and then the download Logo window appears.

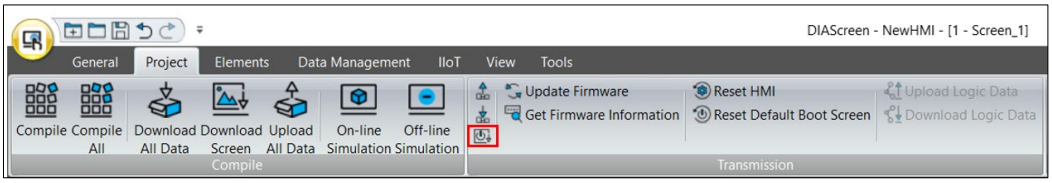


Figure 2 - 183: Download the boot Screen

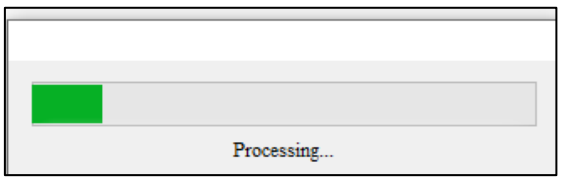


Figure 2 - 184: Download boot screen

When the boot screen function is not enabled (**General** > **Configuration** > **Default** > **Boot Logo** > **Enable**), the following exception will occur when the boot screen is downloaded.

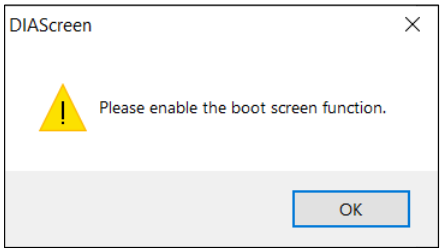


Figure 2 - 185: Enable boot screen feature

When no boot screen is selected, executing the download boot screen will give the following exception.

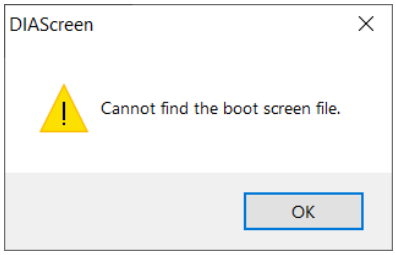


Figure 2 - 186: Can't find the source data for the boot screen

NOTE:

1. *After downloading the boot screen or restoring the default boot screen, power recycle the HMI.*
2. *The startup screen does not support the following models: B04S211, B05S100, B05S101, B07S201, B07S211.*
3. *Supported image file formats are BMP, JPG, GIF, ICO, and PNG.*

2.2.3.11 Update Firmware

The main purpose of updating the firmware is to update the firmware version of the HMI. This can ensure that the HMI firmware version is maintained in the latest state and make the device state more stable. Therefore, before using the DIAScreen application, confirm the application users are using again. Whether the version is the same as the firmware version of the HMI.

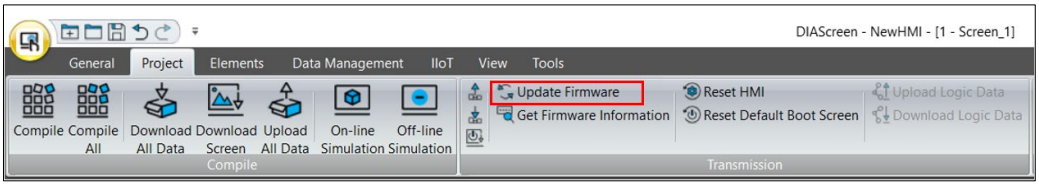


Figure 2 - 187: Update Firmware

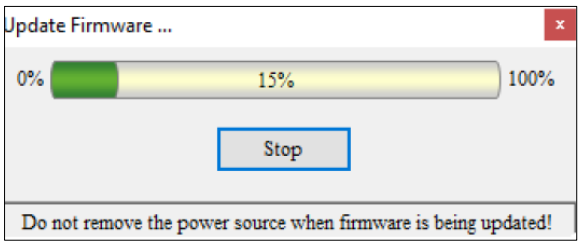
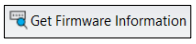


Figure 2 - 188: Update Firmware process

2.2.3.12 Get Firmware Information

Click **Project** > **Transmission** > **Get Firmware Information**. Click 

to get the information about the current HMI firmware version. It shows the current Firmware version.

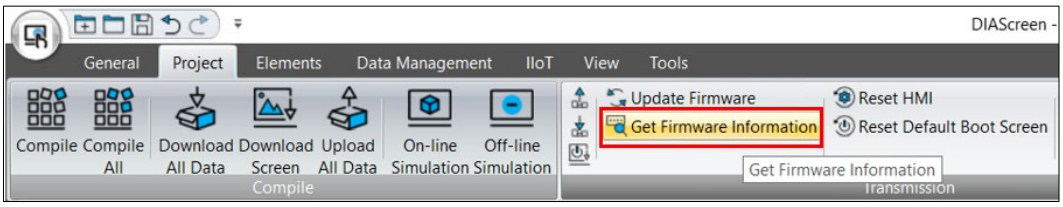


Figure 2 - 189: Get Firmware Information

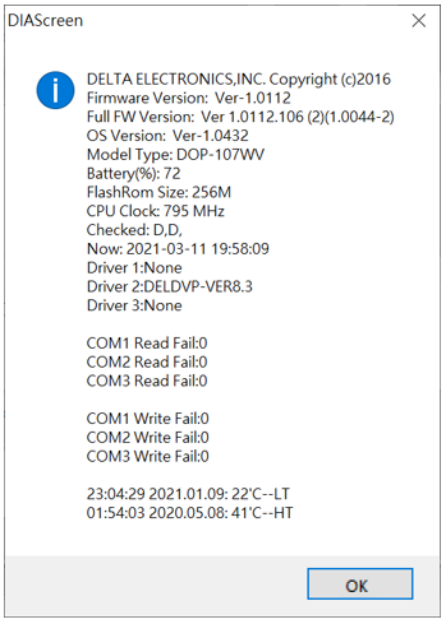


Figure 2 - 190: Current Firmware version

2.2.3.13 Reset HMI

Suppose users forget the **Password with the Highest Security Set**, and the **Download Password Verification** function is checked on the security and password page (**General** > **Configuration** > **Security and Password**). When the application itself uploads all the data back to the PC, it requires a password. If users want to enter the system screen to format the screen, the format also requires password authentication. In such a case, the HMI cannot be uploaded, downloaded, and cannot be formatted. Therefore, the DIAScreen application provides users to restore the HMI to the original factory state by executing the **Reset HMI**, which includes the file format, the screen data is all cleared, the password is cleared, etc. Click **Project** > **Transmission** > **Reset HMI**.

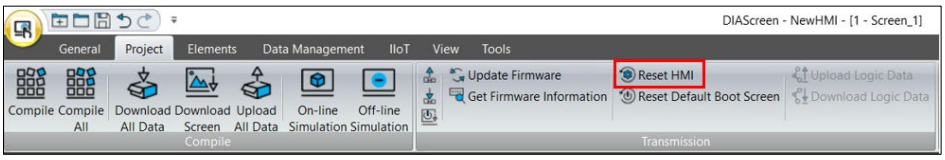


Figure 2 - 191: Reset HMI

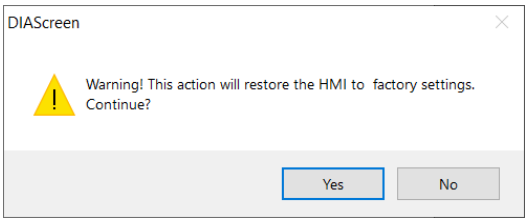


Figure 2 - 192: Restore HMI to factory settings

When the selection is **Yes**, the HMI will immediately execute the action of recovery.

NOTE:

1. *After execution, the HMI will return to the factory default state.*
2. *After execution, all the screen data will be cleared, and the original password-forgotten file cannot be recovered.*

2.2.3.14 Restore Default Boot Screen

To use the default screen of Delta HMI, users only need to use **Reset Default Boot Screen.**

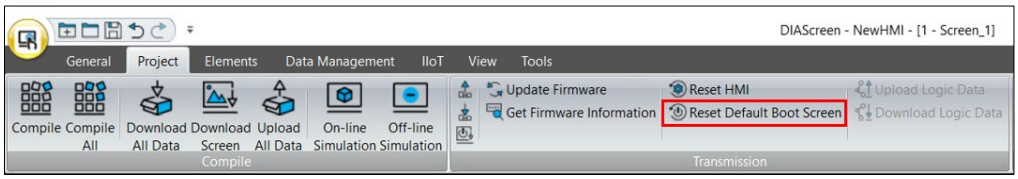


Figure 2 - 193: Reset Default Boot Screen tool

2.2.3.15 Upload Logic Data

Upload Logic Data is the same as uploading all data. Users must enter the password before uploading the recipe to the PC. The password setting is the same as the steps described in *Section 2.2.3.5 Upload All Data*.

2.2.3.16 Download Logic Data

To download the Logic Data, users need to use **Download Logic Data**. Because if only Logic is modified, other screen editing data are not modified, so executing this option can save the time of downloading screen. After execution, the application asks users to click the recipe file (.rcp) to be downloaded. After selecting the recipe file, the recipe file can be downloaded to the HMI.

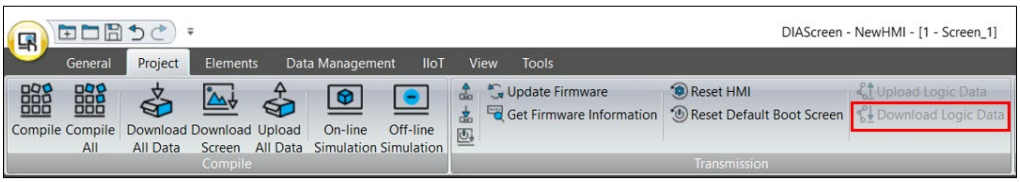


Figure 2 - 194: Download Logic Data

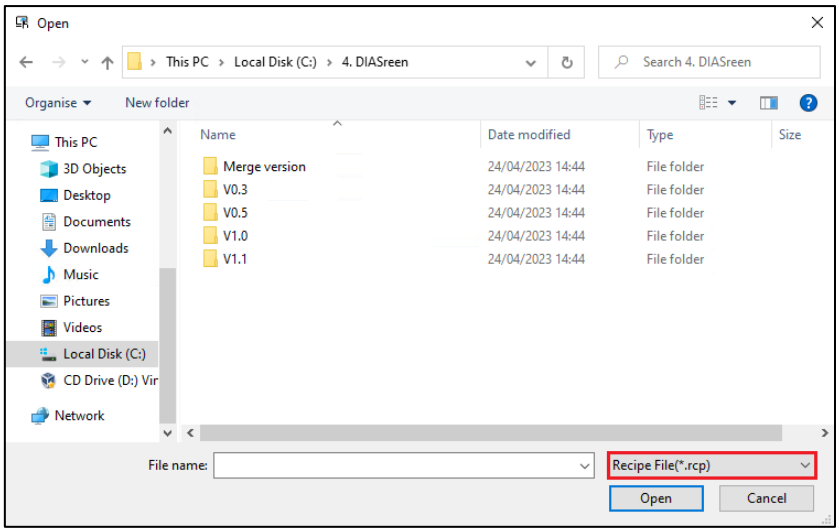


Figure 2 - 195: Select the rcp file

2.2.3.17 Language Management

Locate this function in **Project** > **Library/Advanced Settings** > **Language Management**. It includes **Import Multi-language Text** and **Export Multi-language Text**. These two functions allow users to import or export text more quickly when editing multi-language text data. If there are multiple languages or multiple states that need to be edited, users can use this function at a time. The file formats imported or exported are all .xlsx files, which are used in Excel. The exported or imported file contains the text language data of all elements in the display screen.

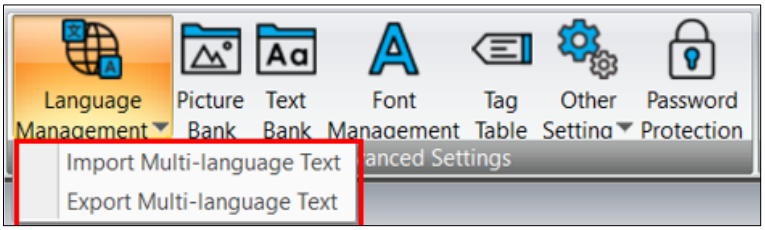


Figure 2 - 196: Language Management

- Multi-language Text

After users execute the **Export Multi-language Text**, the application asks users to save the file to be exported.

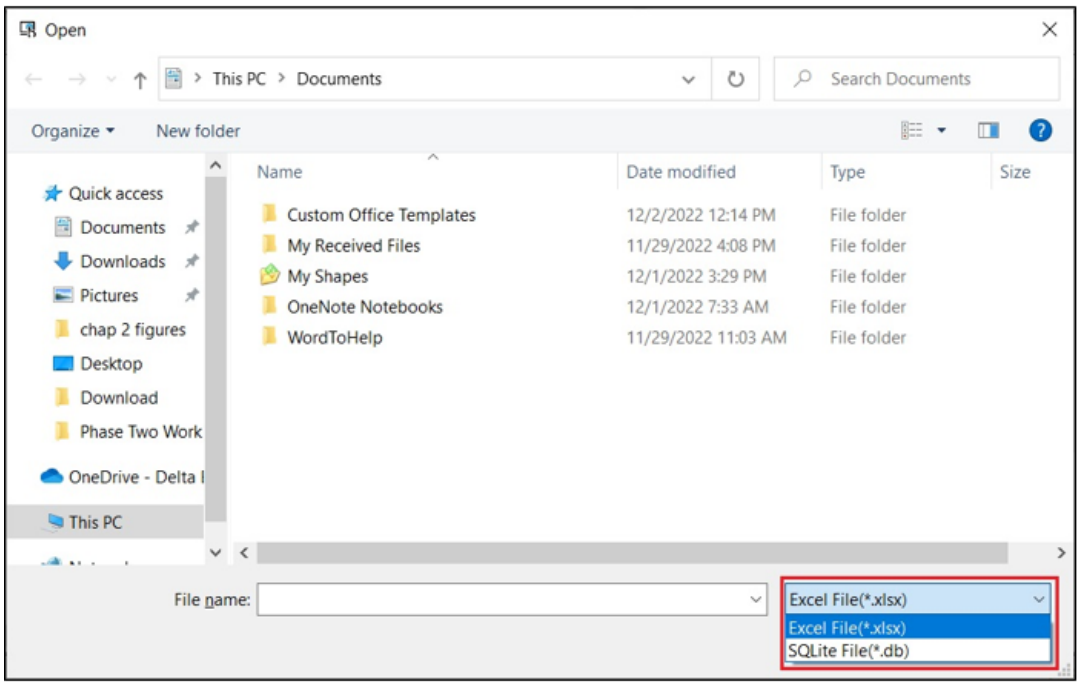


Figure 2 - 197: Export and save files in Excel

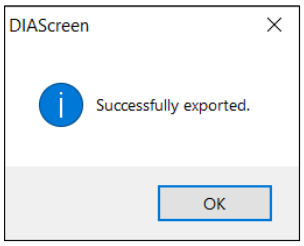


Figure 2 - 198: File Exported

After saving, open the file in the saved path, and users will find that the multi-language text data of all elements in the current project file will be displayed in the file, as shown in the following figure.



tina.xls

	D	E
1	Chinese	English
2		
3		
4		
5	$0.0	
6		
7		
8	換畫面	change screen
9		
10	回前頁	go back
11		
12	系統時間日期	system time and date
13		
14	系統目錄	system menu
15		
16	設定密碼表	set password table
17		
18	調整對比亮度	contrass
19		
20	設為最低權限	level 0
21		
22	輸出報表	report list
23		
24	擷取畫面	capture
25		
26	移除儲存媒體	remove storage
27		
28	匯出配方	Export Recipe
29		
30	匯入配方	Import Recipe
31		
32	觸碰校正	Calibrate
33		
34	語系切換至英文	change language to EN
35		

Figure 2 - 199: Export file content in Multi Languages

- Import Multi-Language Text

  Modify the text information in the exported multi-language text data, and then execute the **Import** action. The following figure is an example, modify the Chinese language $0.0 in line 5 to set the ON button, and add the English language ON Button message.

tina.xls *

	D	E
1	Chinese	English
2		
3		
4		
5	設ON按鈕	ON Button
6		
7		
8	換畫面	change screen
9		
10	回前頁	go back
11		
12	系統時間日期	system time and date
13		
14	系統目錄	system menu
15		
16	設定密碼表	set password table
17		
18	調整對比亮度	contrass
19		
20	設為最低權限	level 0
21		
22	輸出報表	report list
23		
24	擷取畫面	capture
25		
26	移除儲存媒體	remove storage
27		
28	匯出配方	Export Recipe
29		
30	匯入配方	Import Recipe
31		
32	觸碰校正	Calibrate
33		
34	語系切換至英文	change language to EN
35		

Figure 2 - 200: Multi-language Text Import File Content

After users execute **Import Multi-language Text**, the application asks users to select the file to be imported.

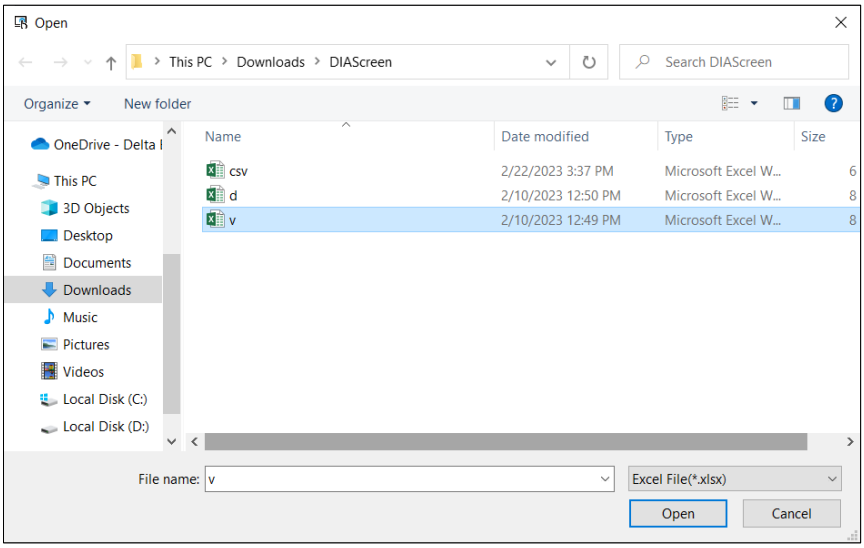


Figure 2 - 201: Select Import Files

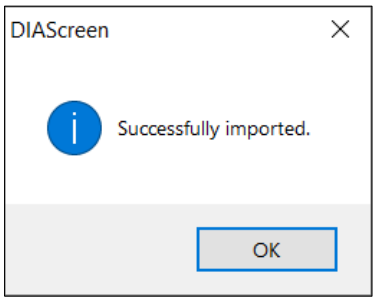
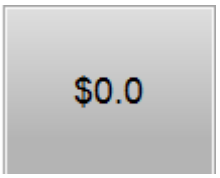
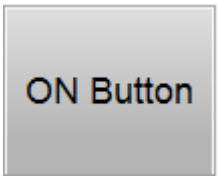


Figure 2 - 202: File Import

After importing the multi-language text file, check whether the edited data has been imported completely.

	Chinese	English
Before Import		
	Chinese	**English**
After Import		

Refer to *Section 25.1 Multi-language Settings*.

2.2.3.18 Picture Bank

Manage pictures through the **Picture Bank**. Click **Project** > **Library/Advanced Settings** > **Picture Bank**. Refer to *Section 28.5 Picture Bank*.

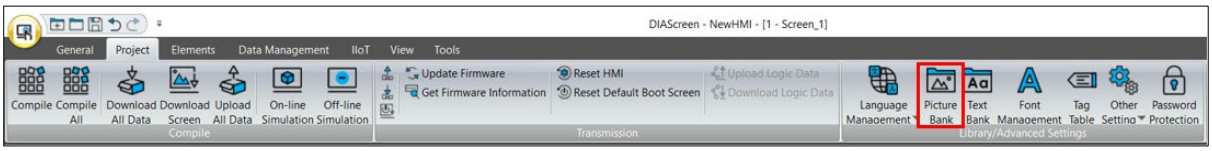


Figure 2 - 203: Picture Bank

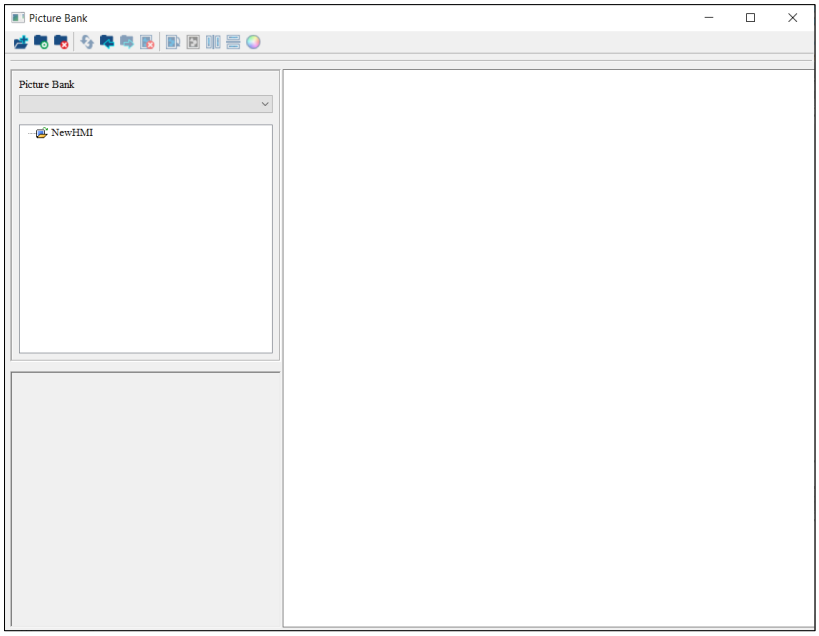


Figure 2 - 204: Picture Bank window

2.2.3.19 Text Bank

Manage text through the **Text Bank**. Click **Project** > **Library /Advanced Settings** > **Text Bank**. Refer to *Section 28.6 Text Bank*.

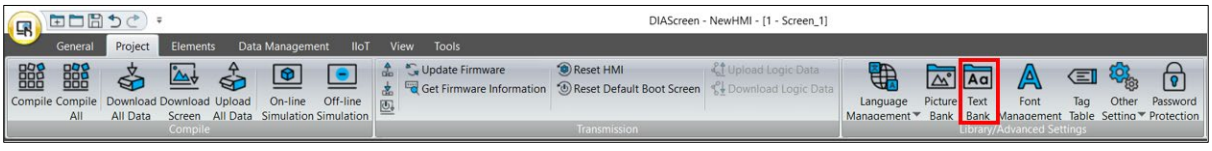


Figure 2 - 205: Text Bank

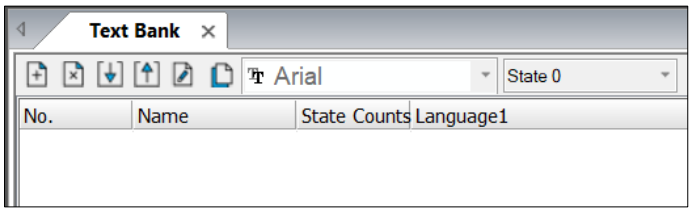


Figure 2 - 206: Text Bank window

2.2.3.20 Font Management

Manage the existing fonts through the Font Management. Click **Project** > **Library/Advanced Settings** > **Font Management**. Refer to *Section 28.11 Font Management*.

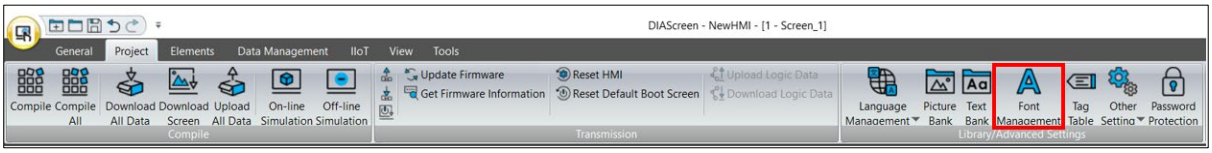


Figure 2 - 207: Font Management

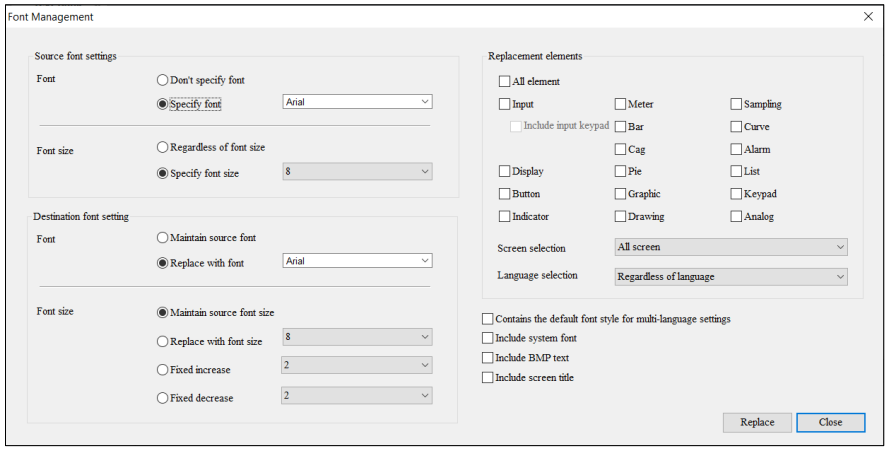


Figure 2 - 208: Font Management window

2.2.3.21 Tag Table

Manage the code through the **Tag Table**. Click **Project** > **Library/Advanced Settings** > **Tag Table**. Refer to *Section 28.1 Tag Table*.

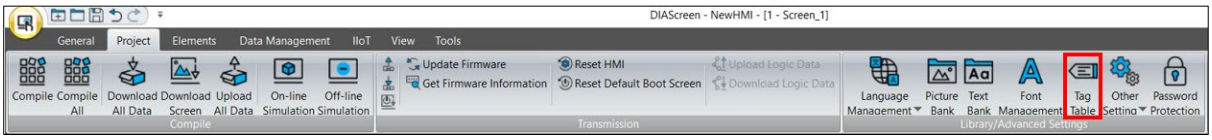


Figure 2 - 209: Tag Table

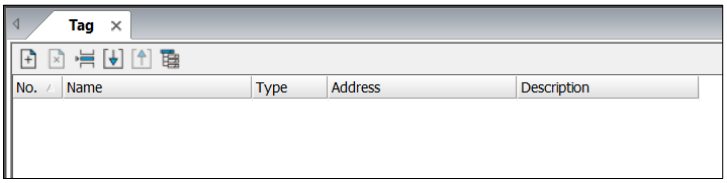


Figure 2 - 210: Tag window

2.2.3.22 Other Setting

Other Setting include Camera Device, Event Trigger, Sound Settings, HMI Identifier Setting, Modbus TCP Mapping Table, Data Exchange Table, FileSlot File Management, Device Table, Text Bitmap Apply, Edit Logic Data, and Scheduler.

Click **Project** > **Library/Advanced Settings** > **Other Setting**.

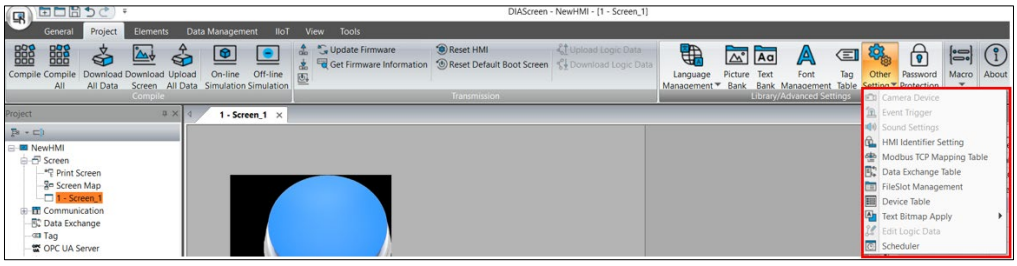


Figure 2 - 211: Other Setting

The following table describes the **Other Setting** function.

Function	Reference Chapter
Camera Device	Refer to *Section 20.2 Camera Display*.
Event Trigger	Refer to *Section 20.5 Event Trigger*.
Sound Settings	Refer to *Section 28.9 Sound Settings*.

Function	Reference Chapter
HMI Identifier Setting	Refer to *Section 28.2 HMI Identifier*.
Modbus TCP Mapping Table	Refer to *Section 28.10 Modbus TCP Mapping Table*.
Fileslot Management	Refer to *Section 28.3 FileSlot Management*.
Device Table	Refer to *Section 28.4 Device Table*.

Data Exchange Table

NOTE: *Data Exchange Table only supports reading from remote address to local address.*

DIAScreen application provides the **Data Exchange Table** function. Double-click the **Data Exchange Table** from the project tree to open the setting page. This function is used for mapping the remote device address to the HMI internal address. Set the connection between the remote address and the local address through this table tool. For example, to write the value of the remote address D0 into the local address $100, refer to the following figure.

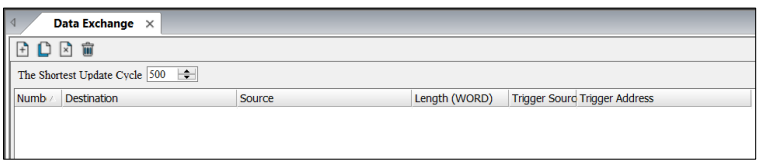


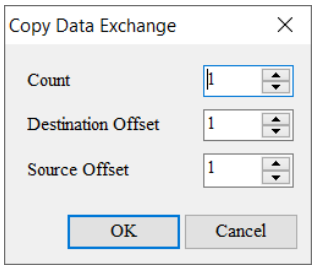
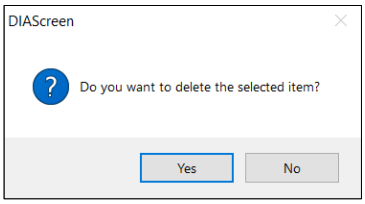
Figure 2 - 212: **Data Exchange Table**

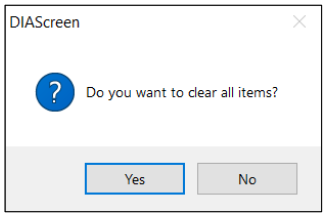
Data Exchange Table provides WORD type data exchange, and the entire data exchange table can set up to 200 pieces of data. Its fields are described as follows:

Function	Description
Local Address	● Enter the address of the internal scratchpad. ● The internal register provided by the HMI is 16 bits. If the set remote address data type is Double Word, it will be read from 2 internal registers, and 2 should be entered in

Function	Description
	the length field.
Remote Address	Enter the device address of the currently selected communication item.
Length	Data exchange length, the maximum value is 100.

The following table describes the **Data Exchange Table** icons.

Function	Description
Add	Select the connection users want to add in the connection tree, and then click icon to **Add** it in the last column of the data exchange table.
Copy	● Select the data row to be copied, and click icon to jump out of the data exchange and **Copy** window, as shown in the following figure.  ● Enter the number of copies to be copied, the local offset address, and the remote offset address. After confirmation, add the set data in the last column of the data exchange table.
Delete	● Select the data row to be deleted, click icon to pop out the deletion confirmation window, as shown in the following figure, and select **Yes** to delete the selected data row.  ● To delete multiple data, select the data row to be deleted, and then click icon to delete the selected data row. ● To delete multiple records in a row, click the first row to be deleted, Use **Shift** key and click the last row to be deleted, and then click to delete multiple rows of data.

Function	Description
Delete all	Click icon to pop out the clear confirmation window, as shown in the following figure, select **Yes** to clear all data columns of the connection. 
The shortest Update cycle	**The shortest Update cycle** allows users to set the data update time, the default value is **50** ms, which means that the data will be updated every 50ms. The minimum update period is 50ms; the maximum update period is 6000ms.

Text Bitmap Apply

Go to **Project** > **Library/Advanced Settings** > **Other Setting** > **Text Bitmap Apply** to make batch adjustments to the functional elements that support text images.

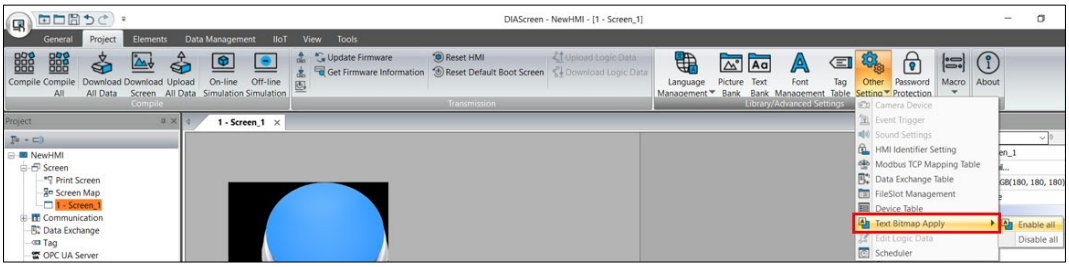


Figure 2 - 213: **Text Bitmap**

NOTE: *Supports text image features: button, general message display, static text.*

Edit Logic Data

Go to **Project** > **Library/Advanced Settings** > **Other Setting** > **Edit Logic Data** to edit the Ladder program in the project.

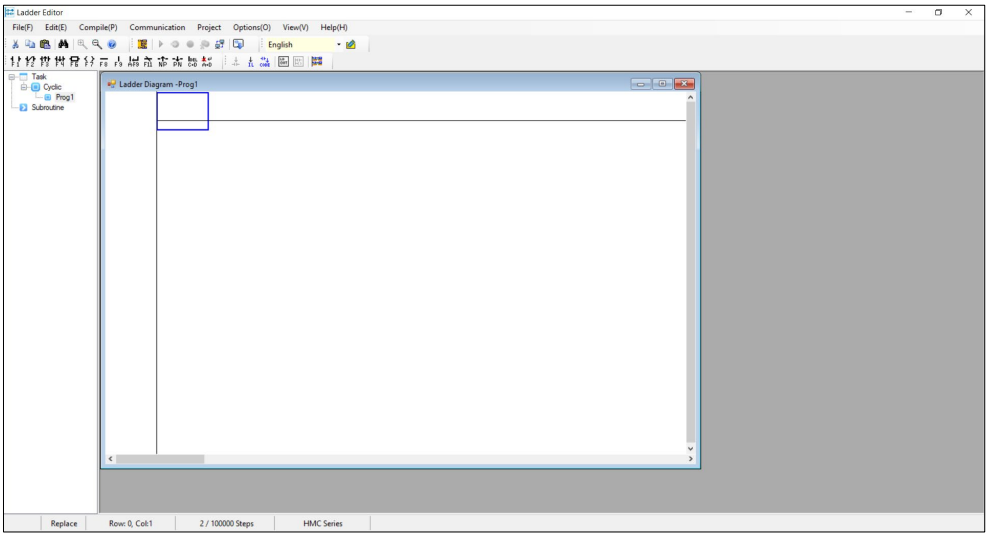


Figure 2 - 214: **Ladder Editor**

NOTE: *Edit Logic Data only supports IMP models. If users choose a non-IMP model, this option is disabled (grayed out).*

Scheduler

Go to **Project** > **Library/Advanced Settings** > **Other Setting** > **Scheduler** to set the value to write to the specific address at the specified time.

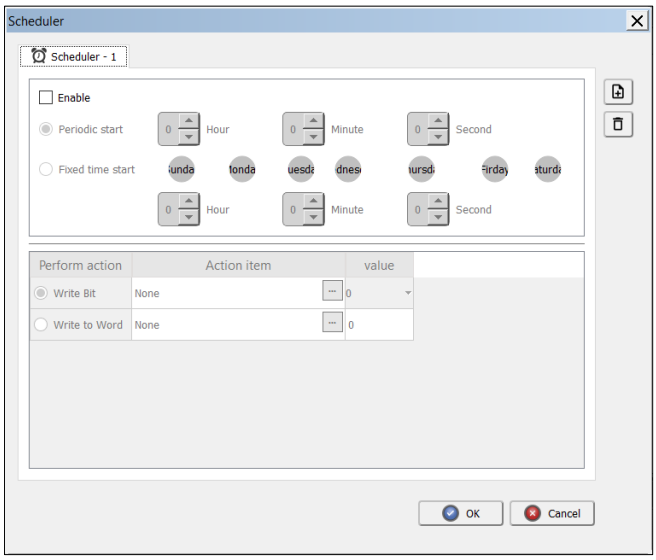


Figure 2 - 215: Scheduler window

2.2.3.23 Password Protection

To implement **Password Protection**, click **Project Library/Advanced Settings** > **Password Protection**. When users click **Password Protection**, the application displays a notification message that the password protection is currently activated.

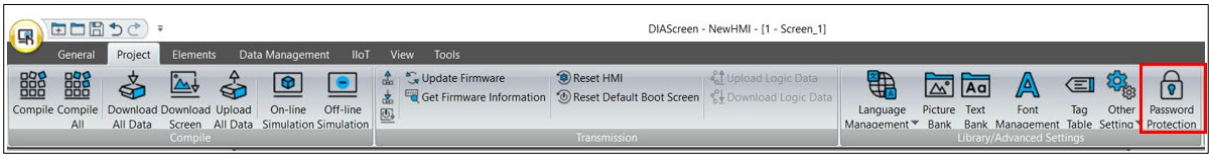


Figure 2 - 216: Password Protection

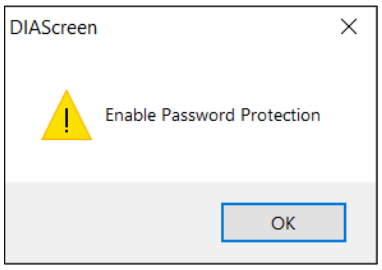


Figure 2 - 217: Password Protection enabled

Go to **Project** > **Library/Advanced Settings** > **Password Protection** again to check whether the password protection function is currently enabled for this project file.

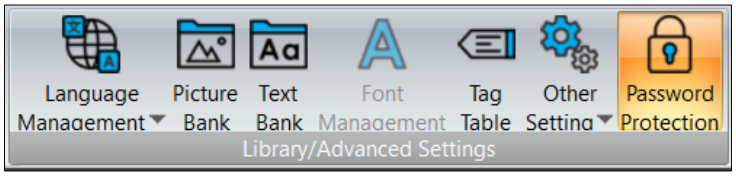


Figure 2 - 218: Enable Password Protection

After enabling the Password Protection function, change password. The password can be changed from the default highest-security password **12345678** from **General** > **Configuration** > **Main** > **Security Level and Password**.

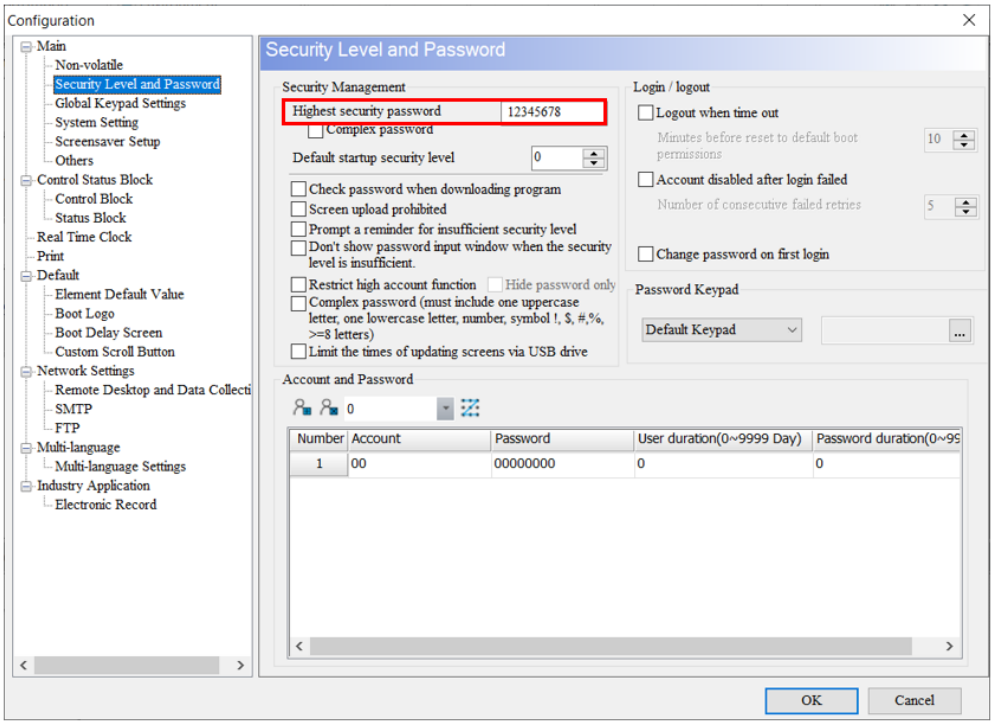


Figure 2 - 219: Password setting

The **Highest security password** is set, save, and close the project. The next time the project is opened, users will be asked to enter a password to open the protected file.

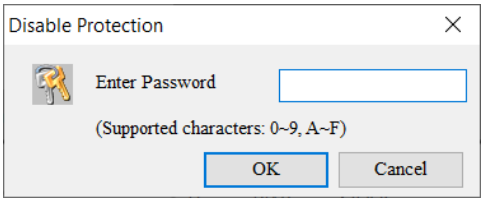


Figure 2 - 220: Enter Password

If the wrong password is entered, the application displays the error message window.

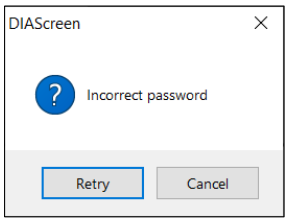


Figure 2 - 221: Confirmation window - Incorrect Password

Click **Retry** to re-enter the password, and **Cancel** to leave the window for entering the password. If the correct password is entered, the password-protected project file will open.

If users want to cancel the password protection function, users must also click **Project** > **Library/Advanced Settings** > **Password Protection** to disable this function. At this time, the application will also inform users that the current password protection has been cancelled.

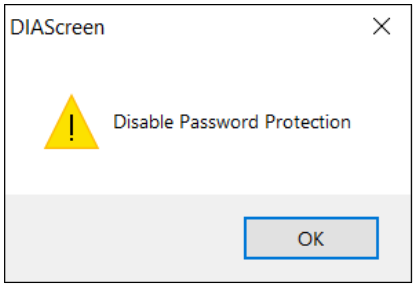


Figure 2 - 222: Disable Password Protection

Click **Project** > **Library/Advanced Settings** > **Password Protection** again to check whether the password protection function has been disabled for the current project file. If disabled successfully, the icon displays as shown in the following figure.

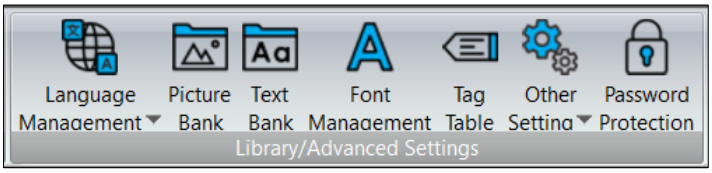
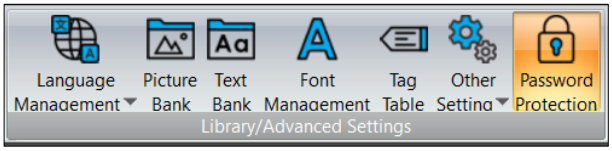
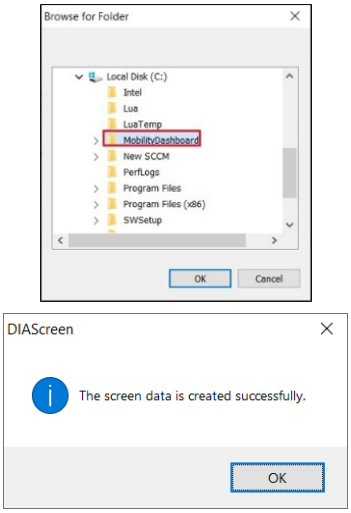


Figure 2 - 223: Password Protection - Disabled

After removing password protection, **Save** and **End** the project. When the project is opened next time, users can open the project without entering a password for verification.

Password protection can also be used in connection with creating a screen data file. This function mainly allows users to set whether to enter a password or not to decide whether to require password verification when copying files from an external device to the HMI. The following is an example description of this function.

Password Protection	
Check Password Protection	Click **Project** > **Library/Advanced Settings** > **Password Protection**. 
Create screen data file	Then select the external device users want to save, and enter the system screen of the HMI when the screen data is created.

Password Protection	
	
Result	Insert an external storage device into the HMI, go to **System Setting** > **File Manager**, and copy files from the external device to the HMI. Users don't need to enter a password for verification, and users can copy files.

2.2.3.24 Macro

Macro options include Submacro, Initial Macro, Background Macro, and Clock Macro.

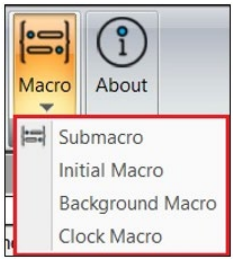


Figure 2 - 224: Macro

The following table describes the **Macro** function.

Function	Reference Chapter
Submacro	Refer to *Section 24.1.8 Submacro*.
Initial Macro	Refer to *Section 24.1.9 Initial Macro*.
Background Macro	Refer to *Chapter 24.1.10 Background Macro*.
Clock Macro	Refer to *Chapter 24.1.11 Clock Macro*.

2.2.3.25 About

Displays application version information and supported models.



Figure 2 - 225: About

Click **Project** > **About**.

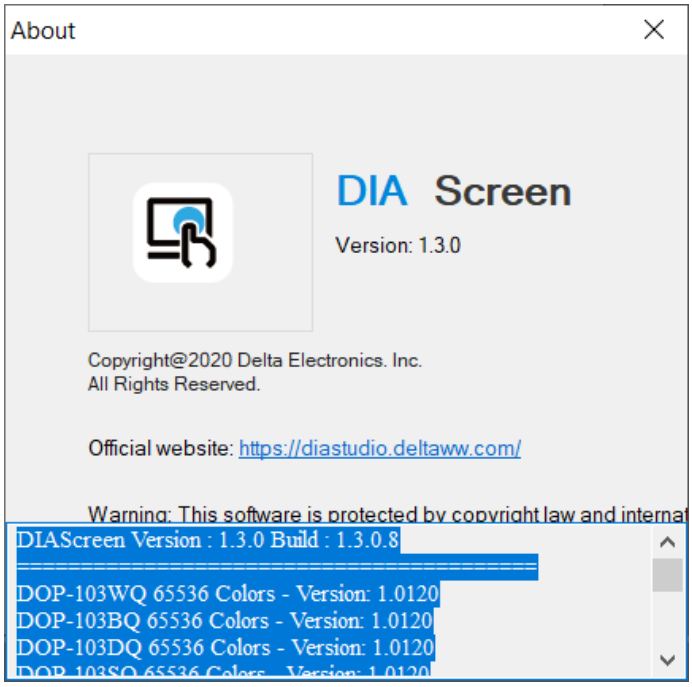


Figure 2 - 226: About

2.2.4 Elements

Elements tools include Button, Meter, Bar, Pipe, Pie, Indicator, Data Display, Graphic, Input, Curve, Keypad, List, Analog, Frame and Multimedia, Basic Shape, and Drawing.

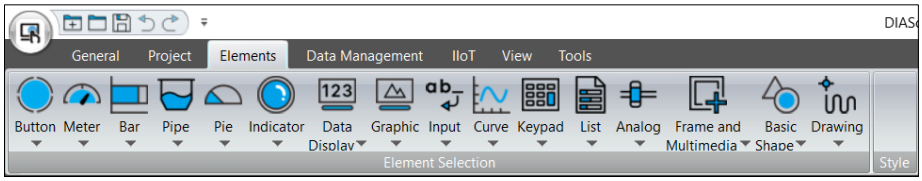


Figure 2 - 227: Elements

The following table provides detail of the **Elements** function.

Function	Reference Chapter
Button	Refer to *Chapter 5 Buttons*.

Function	Reference Chapter
Meter	Refer to *Chapter 6 Meter*.
Bar	Refer to *Chapter 7 Bar*.
Pipe	Refer to *Chapter 8 Pipe*.
Pie	Refer to *Chapter 9 Pie*.
Indicator	Refer to *Chapter 10 Indicator*.
Data Display	Refer to *Chapter 11 Data Display*.
Graphic	Refer to *Chapter 12 Graphic*.
Input	Refer to *Chapter 13 Input*.
Curve	Refer to *Chapter 14 Curve*.
Keypad	Refer to *Chapter 17 Keypad*.
List	Refer to *Chapter 19 List*.
Analog	Refer to *Chapter 18 Analog*.
Frame and Multimedia	Refer to *Chapter 20 Frame and Multimedia*.
Basic Shape	Refer to *Chapter 21 Basic Shape*.
Drawing	Refer to *Chapter 22 Drawing*.

2.2.4.1 Style

Click **Elements** > **Style** to select the default **Style** of the element. Depending on the selected element, there are different styles to choose from.

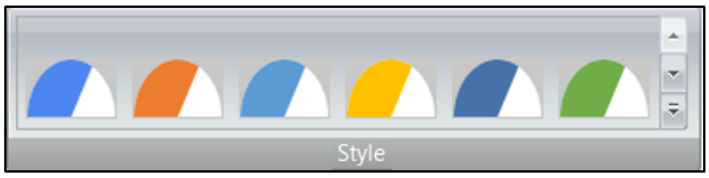


Figure 2 - 228: Style toolbar



Figure 2 - 229: Indicator Style tool

2.2.5 Data Management

The **Data Management** toolbar includes Alarm, Data Sampling, Recipe, and Operation Log.

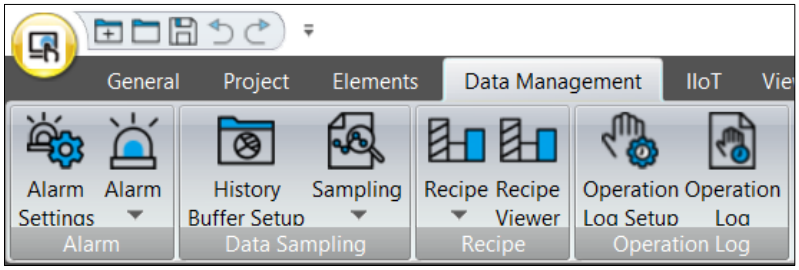


Figure 2 - 230: Data Management

2.2.5.1 Alarm Settings

Go to **Data Management** > **Alarm** > **Alarm Settings** to set Alarm trigger conditions and alarm related properties. Refer to *Section 16.1 Alarm Settings*.

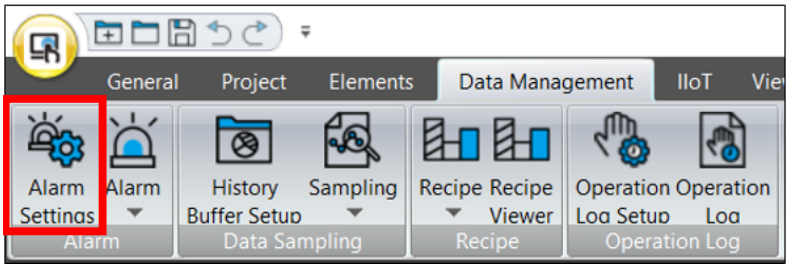


Figure 2 - 231: Alarm Settings

2.2.5.2 Alarm

The **Alarm** function provides four types of Alarm elements to allow users to easily check the alarm: **Alarm History Table**, **Active Alarm List**, **Alarm Frequency Table**, and **Alarm Moving Sign**.

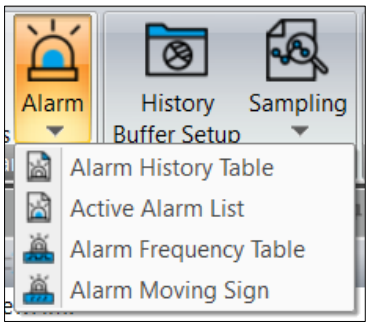


Figure 2 - 232: Alarm

The following table describes the detail of **Alarm** function.

Function	Reference Chapter
Alarm History Table	Refer to *Section 16.3 Alarm History Table*.
Active Alarm List	Refer to *Section 16.4 Active Alarm List*.
Alarm Frequency Table	Refer to *Section 16.5 Alarm Frequency Table*.
Alarm Moving Sign	Refer to *Section 16.6 Alarm Moving Sign*.

2.2.5.3 History Buffer Setup

Go to **Data Management** > **Data Sampling** > **History Buffer Setup** for History Buffer and file output settings. Refer to *Section 15.1 History Buffer*.

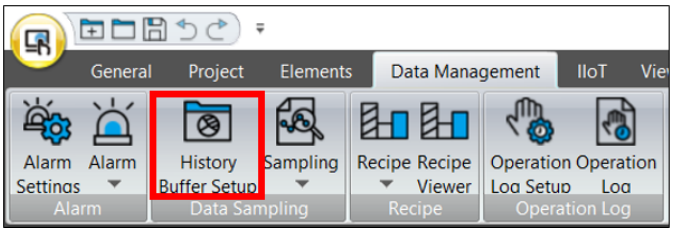


Figure 2 - 233: History Buffer Setup

2.2.5.4 Sampling

Sampling has four elements to view the historical data: **Historical Trend Graph**, **Historical Data Table**, **Historical Event Table**, and **Historical Overview Table**.

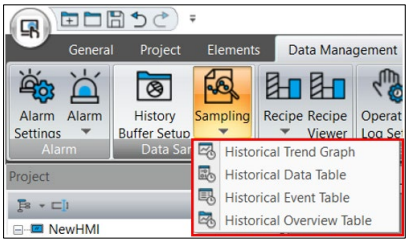


Figure 2 - 234: Sampling

The following table describes the details of **Sampling** function.

Function	Reference Chapter
Historical Trend Graph	Refer to *Section 15.2 Historical Trend Graph*.
Historical Data Table	Refer to *Section 15.3 Historical Data Table*.
Historical Event Table	Refer to *Section 15.4 Historical Event Table*.
Historical Overview Table	Refer to *Section 15.5 Historical Overview Table*.

2.2.5.5 Recipe

Go to **Data Management** > **Recipe**. It provides four formula types to users. Refer to *Chapter 23 Recipe*.

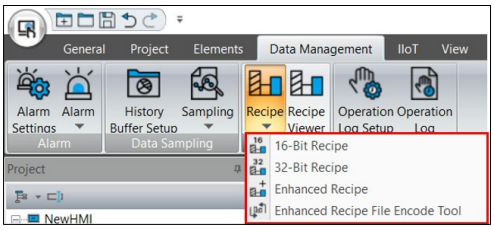


Figure 2 - 235: Recipe

The following table describes the details of **Recipe** function.

Function	Reference Chapter
16-Bit Recipe	Refer to *Section 23.1 16-Bit Recipe*.
32-Bit Recipe	Refer to *Section 23.2 32-Bit Recipe*.
Enhanced Recipe	Refer to *Section 23.4 Enhanced Recipe*.

2.2.5.6 Recipe Viewer

Go to **Data Management** > **Recipe** > **Recipe Viewer** to manage recipes through the Recipe Viewer. Refer to *Section 19.7 Recipe Viewer*.

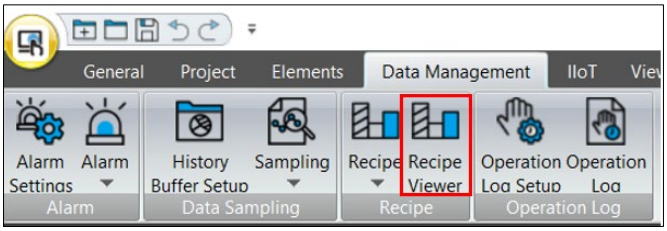


Figure 2 - 236: Recipe Viewer tool

2.2.5.7 Operation Log Setup and Operation Log

Go to **Data Management** > **Operation Log**. The **Operation Log Setup** is used to record the operation of each element and the time point of the operation of the element after users enter the HMI screen. Refer to *Section 15.6 Operation Log Setup*.

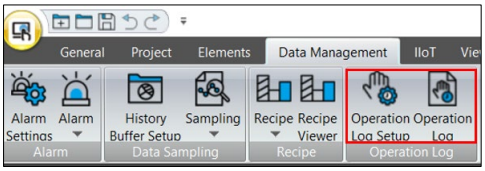


Figure 2 - 237: Operation Log

2.2.6 IIoT

The **IIoT** toolbar includes OPC UA Server, MQTT Settings, and DIACloud functions.

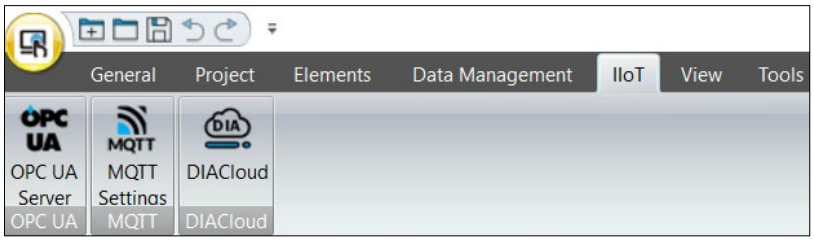


Figure 2 - 238: IIoT

2.2.6.1 OPC UA Server

The HMI provides the **OPC UA Server** function. Set the communication address as an OPC UA variable through the setting interface. Refer to *Section 29.2.3 OPC UA Server Configuration*.

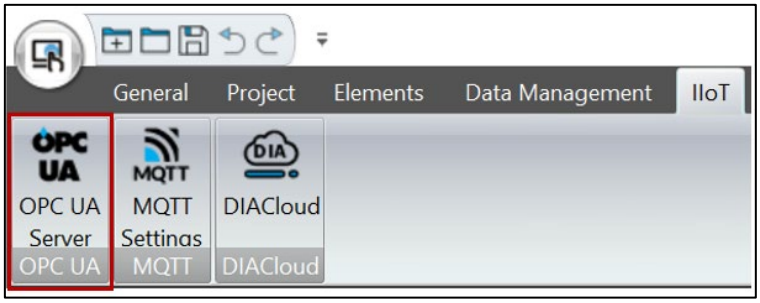


Figure 2 - 239: OPC UA Server

2.2.7 View

The **View** toolbar contains Window, Grid, List, and Element Assistant.

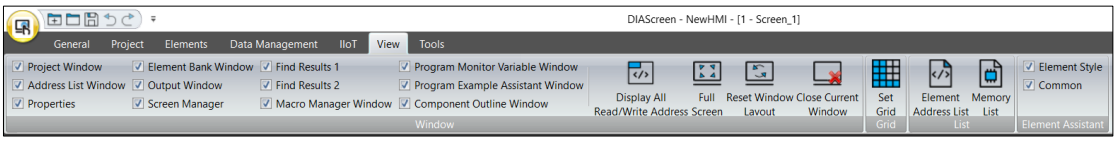


Figure 2 - 240: View

2.2.7.1 Window

Display or hide the window by checking or unchecking **Window** function.

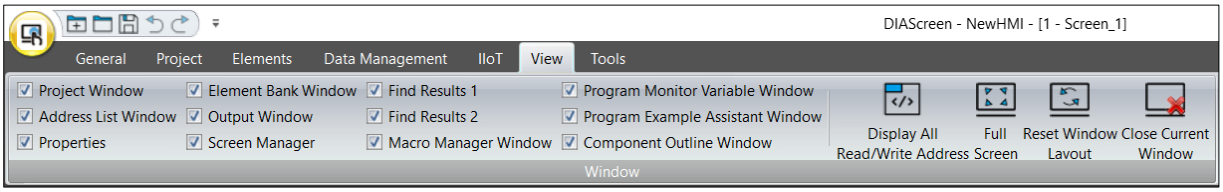


Figure 2 - 241: Window

2.2.7.2 Display All Read/Write Address

To show or hide the address information set by each object, go to **View** > **Display All Read/Write Address**. The upper left corner of all elements displays the address information, as shown in the following figure.

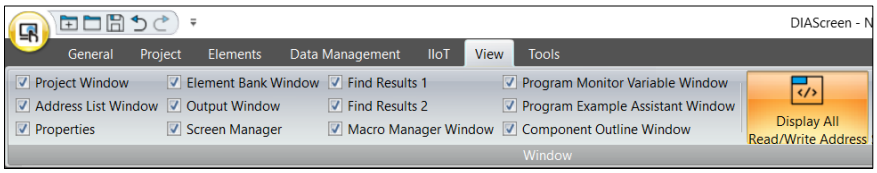


Figure 2 - 242: Display All Read/Write Address



Figure 2 - 243: Display All Read/Write Address - Example

2.2.7.3 Full Screen

Make the screen display **Full Screen**. Click the page to exit full screen mode.

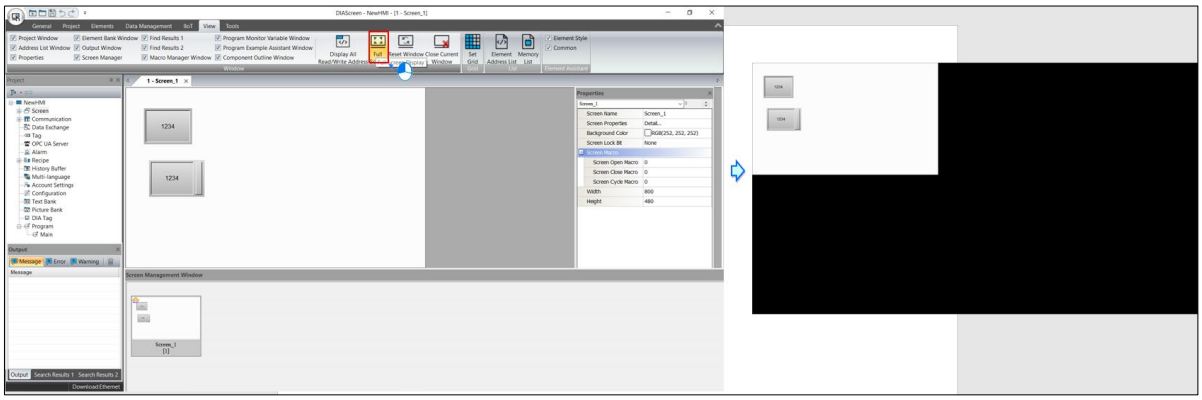


Figure 2 - 244: Full Screen display

2.2.7.4 Reset Window Layout

Reset the configuration of all windows on the screen. Go to **View** > **Window** > **Reset Window Layout**.

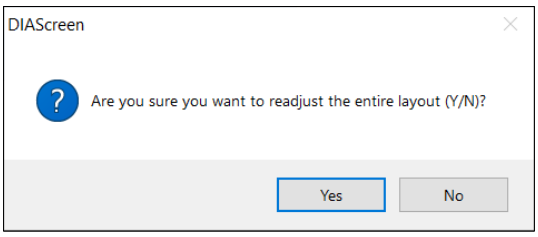


Figure 2 - 245: Reset Window Layout

Select **Yes** to **Reset Window Layout**, DIAScreen will be closed and restarted.

2.2.7.5 Close Current Window

The current window can be closed in the following ways:

- Click the icon in the upper right corner of the current window, as shown in the following figure.



Figure 2 - 246: Close current window

- Go to **View** > **Window** > **Close Current Window**.

NOTE: *If there is no open window, the* ***Close Current Window*** *option will be disabled (grayed out).*

2.2.7.6 Grid

Go to **View** > **Grid** > **Set Grid**. The available options for **Grid Settings** are: **Show Grid** and **Snap to Grid**. When users select **Show Grid**, the grid appears on the editing screen. **Snap to Grid** helps users to align the elements more easily when moving the elements. In addition, users can set the spacing between the grid points, the range is an integer between 4 and 50. The default value of **Spacing Width** and **Spacing Height** is **4**.

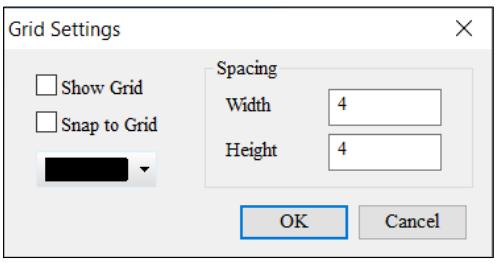
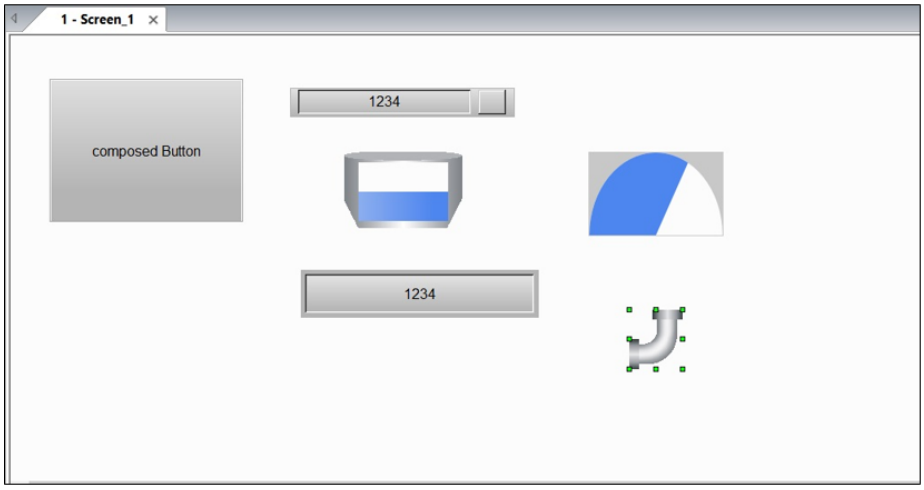
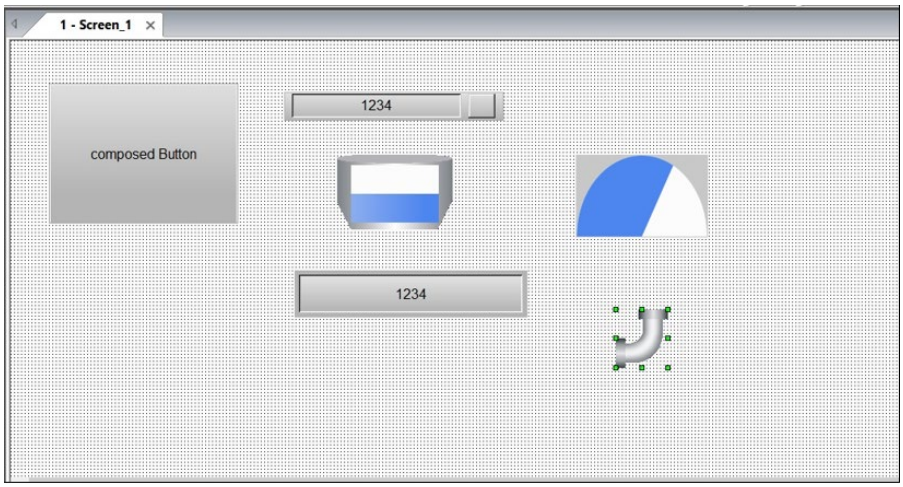
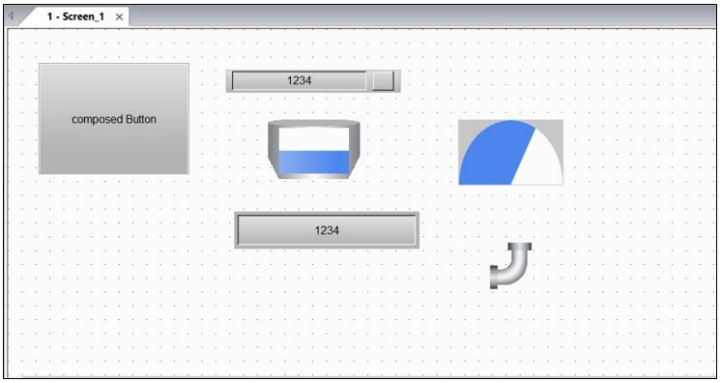


Figure 2 - 247: Grid Settings window

Show Grid Not selected	
Check Show Grid	
Spacing	Both the horizontal and vertical spacing are set to 20. 

2.2.7.7 Element Address List

Go to **View** > **List** > **Element Address List** to classify the elements of all screens according to the screen number and select the type or address of the element through the **Element Address List**. Each property of the element is listed in this list

according to the type of classification, including Element Name, Describe, Write Address, Address, Trigger Address, Trigger Mode, Interlock Address, Interlock State, Data Type, Data Format, element Coordinates, Width and Height.

- Sort by Element

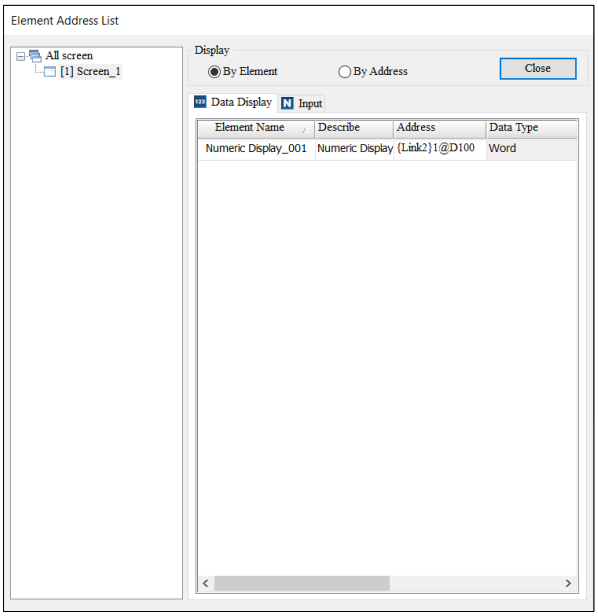


Figure 2 - 248: Element Address List - Element

- Sort By Address

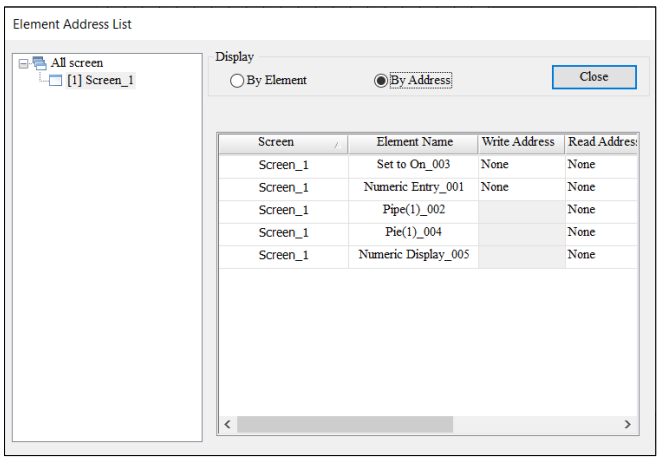
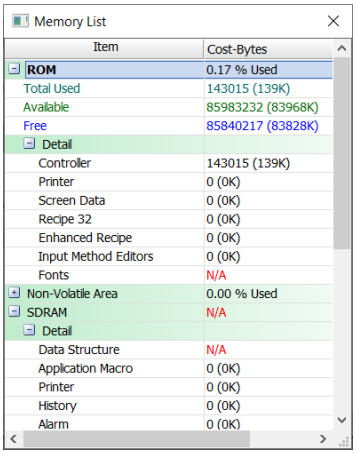
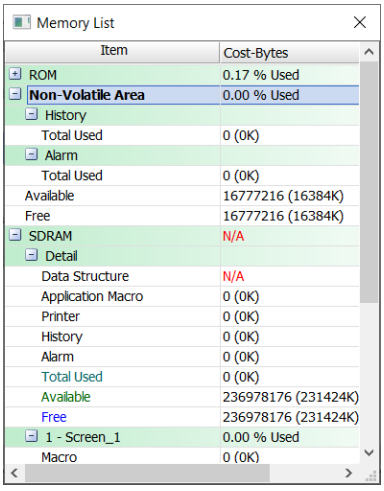
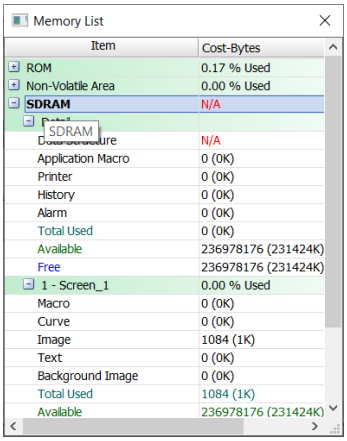


Figure 2 - 249: Element Address List – Address

2.2.7.8 Memory List

Go to **View** > **List** > **Memory List** to collect the information about the consumption and remaining memory capacity of the designed HMI. Create and compile the project before getting this information. The list comprises four parts: ROM, Non-Volatile Area, SDRAM, and External Storage.

ROM	The file space occupied by the actual download screen to the HMI (including recipes, screen data, printer data, etc.). 
Non-Volatile Area	The storage location of the power-off retention data is preset to be stored in the power-off retention memory. When the project file edited by users has created its history, alarm and other data, the space usage multistate can be checked in this area. 

SDRAM	Displays the SDRAM space required to execute each screen. The SDRAM usage is calculated by page. If the project has two screens, the SDRAM displays the information of the two screens. 
External Storage	Refers to the space used by external memory. When the data storage location of the power-off retention area is set to an external storage device, such as a USB Disk or SD card, the data blocks originally stored in the power-off retention memory (SRAM) will be moved to the external storage device for storage.

2.2.8 Tools

The **Tools** tab includes Print Settings, Tab Order, Change Model, Address Conversion, Screen Map, Function Key, Multi-Lang Input Character Count Calculation, and Multi-language Editor.

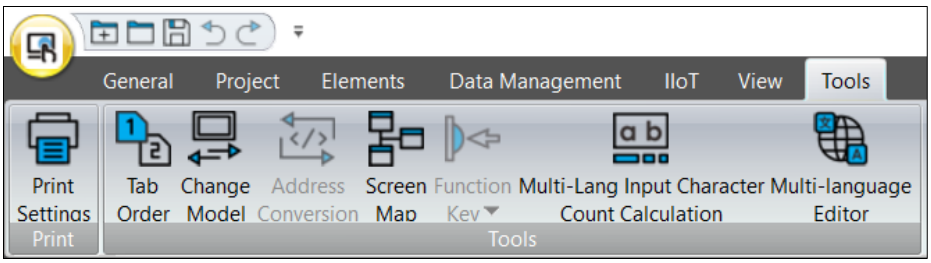


Figure 2 - 250: Tools

2.2.8.1 Print Settings

Layout printing allows users to print multiple pages, and can plan the layout to be printed and print history data. Refer to *Section 26.1 Print Settings*.

2.2.8.2 Tab Order

Click 

icon on the toolbar to control and select the elements of the HMI. If users want to use the Tab sequence function, create two or more elements first. After execution, the sequence number appears on the elements. At this time, users can click the blue number in the lower left to change the sequence numbering.

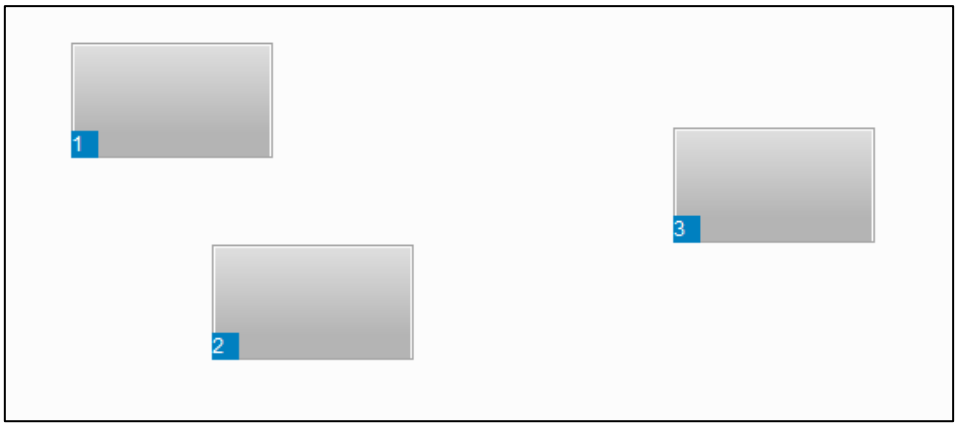


Figure 2 - 251: Tab Order

After downloading to the HMI, use the Tab key on the keyboard to select the element to be executed, and the outer frame of the selected element appears light green.

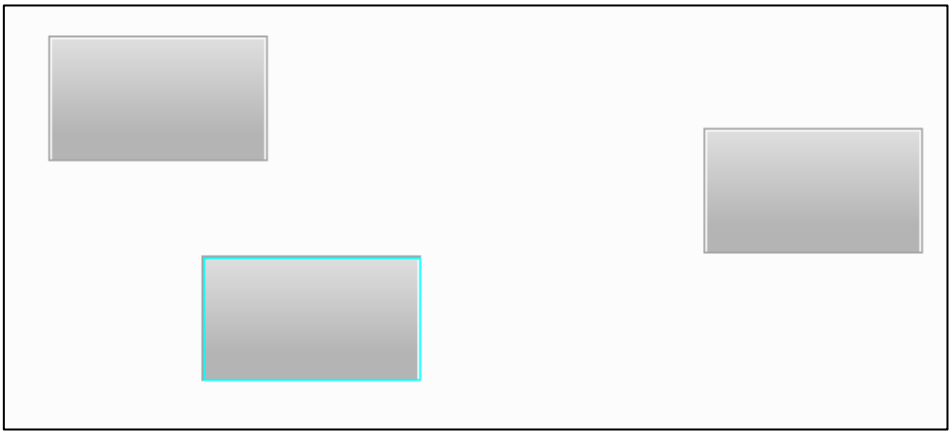


Figure 2 - 252: Execute the action of the Tab key

2.2.8.3 Change Model

After performing model conversion, use this interface to convert to models of other sizes. Refer to *Section 27.2 Change Model*.

2.2.8.4 Address Conversion

This function is to convert the address of the element whose address has been set. The address is set first, and then the element is selected before the address conversion is performed. When adding a communication connection or modifying a communication connection, the address management and setting are carried out more conveniently.

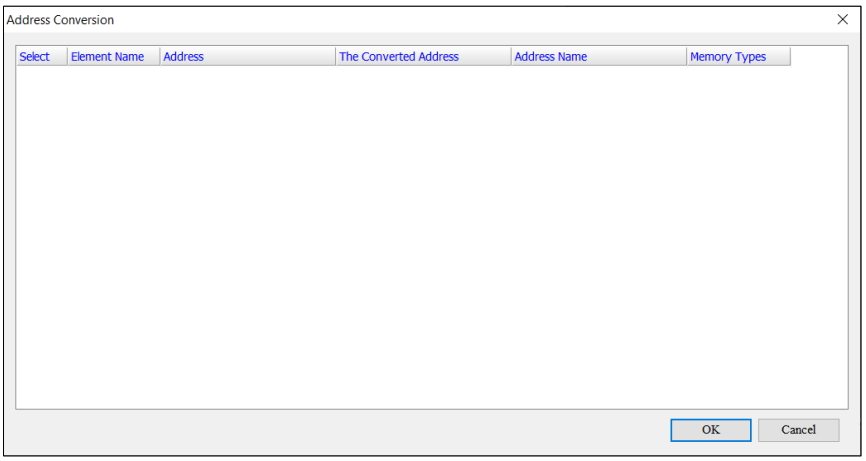
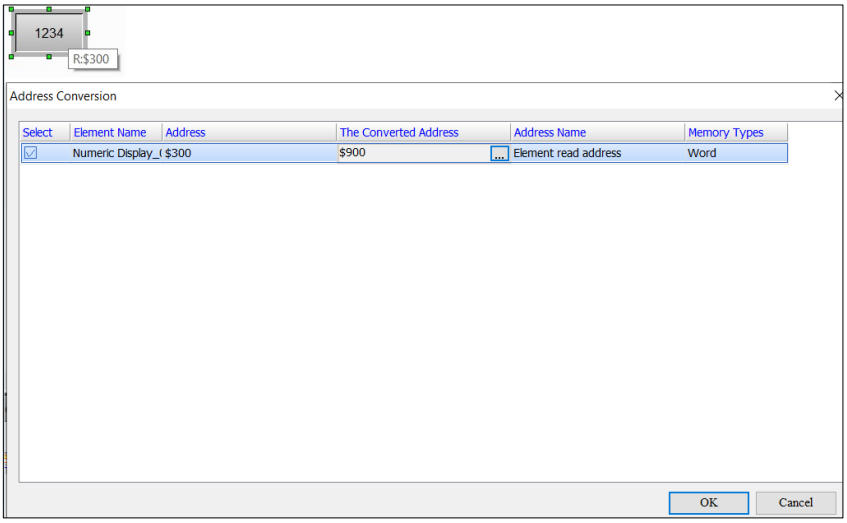
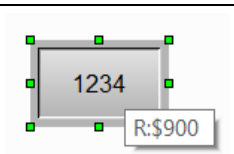


Figure 2 - 253: Address Conversion

As long as the converted address is set to the address to be modified or the newly added address, and then select **OK**, the address can be converted.

Before Conversion	
After Conversion	

2.2.8.5 Screen Map

Go to **Tools** > **Screen Map**. It provides users with convenient observation of the map between each screen and also allows them to directly modify the screen number to be replaced through the correlation diagram.

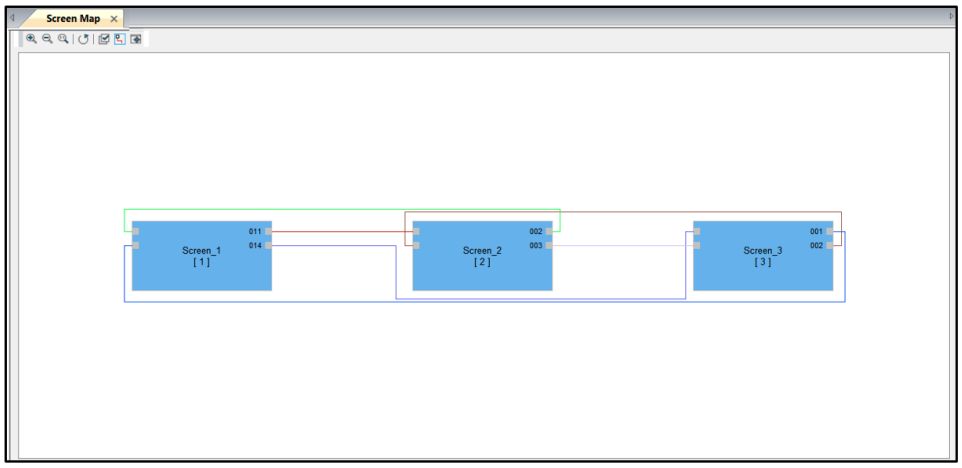
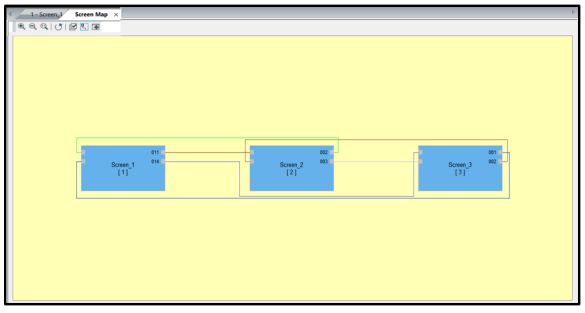
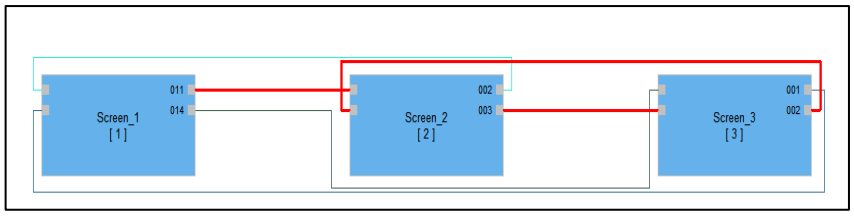
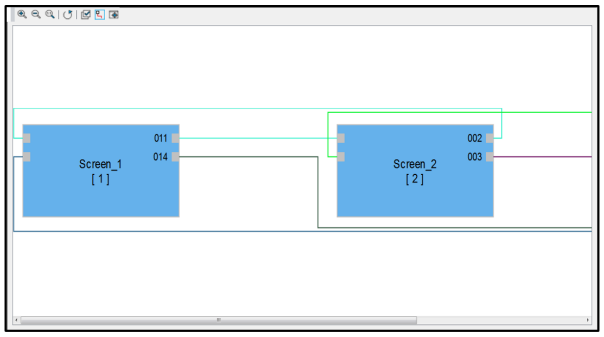
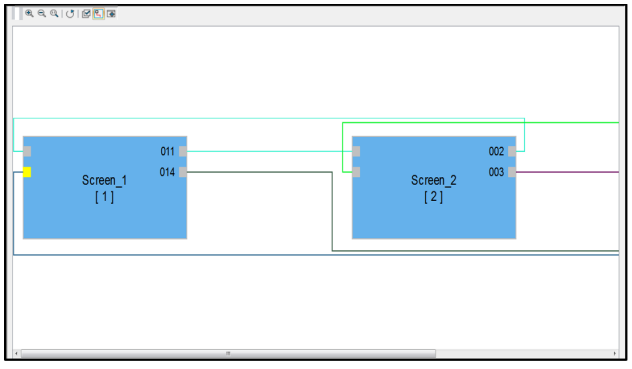
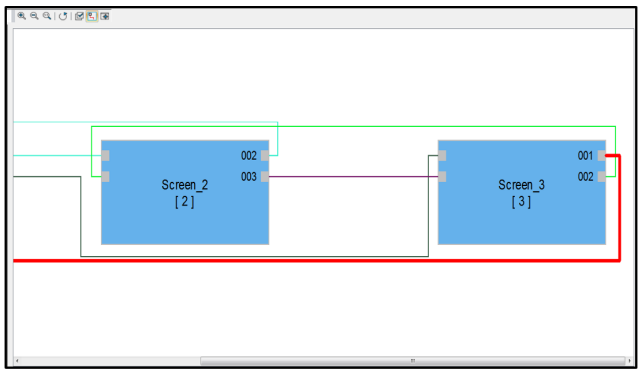
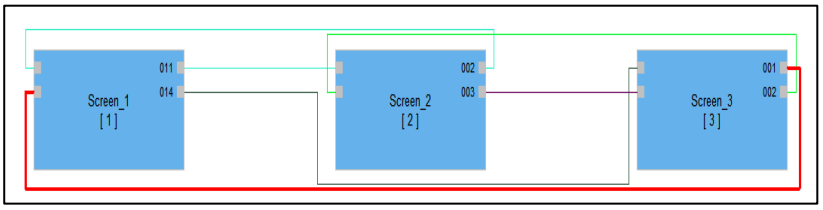
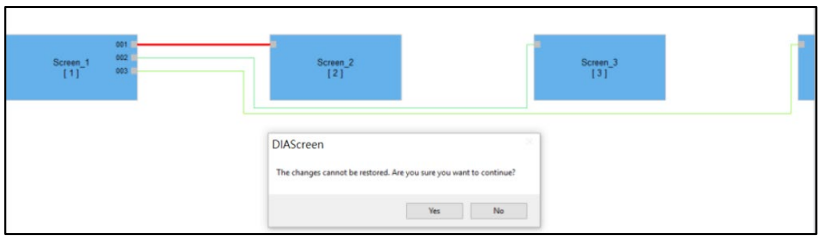
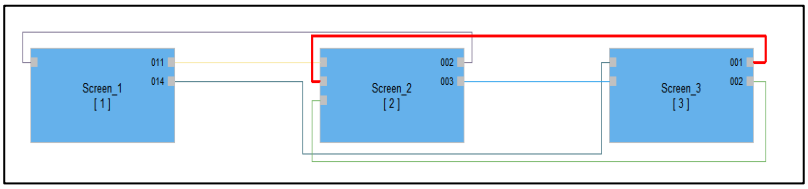


Figure 2 - 254: Screen Map

The following table describes the **Screen Map** function.

Icon	Function	Description
	Zoom In	This function can be used to zoom in on the correlation graph.
	Zoom Out	This function can be used to shrink the correlation graph.
	1:1	This feature provides the association graph at its original size.
	Update	When the Goto Screen Button is added, modified or deleted, after opening the screen correlation diagram, the background color will be light yellow, which means that the connection between the screens has been updated. 

Icon	Function	Description
	Multiple Selection	Multiple selection can be used to select the related lines of multiple groups of pictures, the selected related lines will be displayed in red. 
	Display key nodes on the screen after selection	When the associated graph is zoomed in to the point where it is impossible to identify the number of the screen to be switched, click the node through this button and jump to the linked screen number. 1. Zoom in on the screen correlation diagram.  2. Click  icon to select the yellow node of Screen_1.  3. The association graph jumps to another screen number linked by the yellow node of Screen_1.

Icon	Function	Description
		
	Select Target Screen	This function can directly change the originally linked screen number to another screen number on the screen association diagram. 1. Select node 001 of Screen_1.  2. Click  icon to select Screen_2. A message window appears that cannot be restored after the change. Clicking **Yes** changes the 001 node of Screen_1, which is originally a connection to Screen_3, to switch to Screen_2.  3. The screen number connected to node 001 has been changed to Screen_2. 

2.2.8.6 Function Key

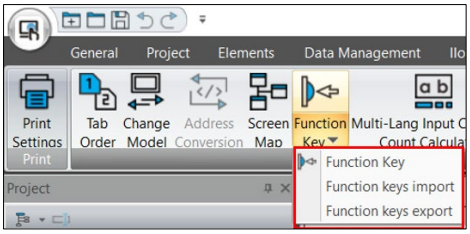


Figure 2 - 255: Function Key

In this version, DOP-Handheld series and P series of DXMC series support auxiliary keys. If an HMI other than the above-mentioned models is selected, the **Tools** > **Function Key** will be grayed out. If the above-mentioned models are selected, it becomes available for click.

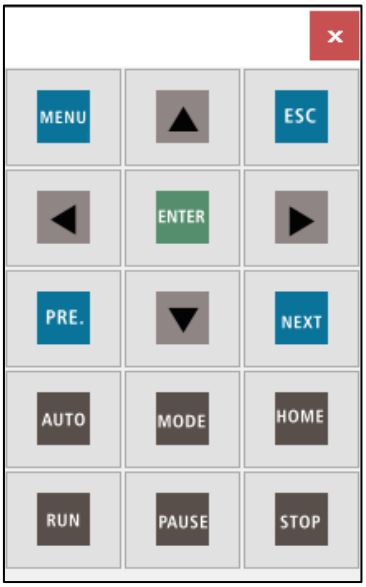


Figure 2 - 256: Function Key

There are two types of auxiliary keys, Global and Local. After executing the auxiliary key, click **Function Key** button to display the Local and Global options for selection.

NOTE: *If Local and Global are set at the same time, the application will be based on the Global setting.*



Figure 2 - 257: Local and Global

- Global

  When users set F1 as the **System Directory** and set it as **Global**, it means that if there are ten screens, no matter which screen users switches to, when F1 is executed, the actions of the **System Directory** will be executed.

- Local

  When users set F1 as the **System Directory** and ***Local*** on the first screen, it means that only when users switch to the first screen and executes F1, the action of the **System Directory** will be executed.

2.2.8.7 Multi-Lang Input Character Count Calculation

The application provides this function to allow users to know the bytes of characters entered. In addition, the number of bytes represented by the characters of each national language is inconsistent, and there may be errors in the calculation length. Therefore, this function is provided. It allows users to calculate the correct number of

bytes for Unicode. Refer to *Section 28.7 Multi-Lang Input Character Count Calculation*.

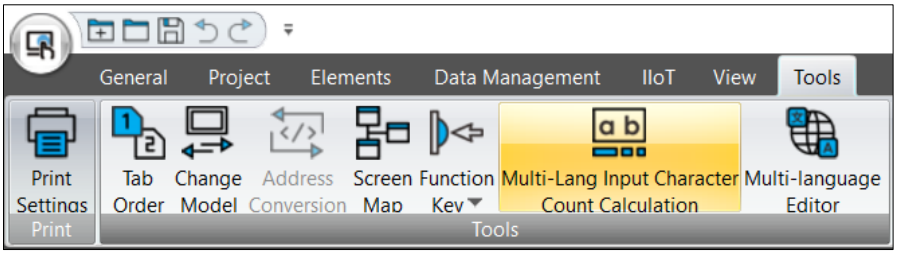


Figure 2 - 258: Multi-Lang Input Character Count Calculation

Chapter 3: Internal Memory

Delta’s HMI has registers of twelve different functions, which are as follows:

1. Internal register ($)
2. Non-volatile internal register($M)
3. Indirect address register (*$)
4. Recipe register (RCP)
5. Recipe number register (RCPNO)
6. Recipe group register (RCPG)
7. Recipe indirect address register (*RCP)
8. Enhanced recipe register (ENRCP)
9. Enhanced recipe number register (ENRCPNO)
10. Enhanced recipe group register (ENRCPG)
11. Enhanced recipe group name register (ENRCPGNAME)
12. Enhanced recipe indirect address register (*ENRCP)

The fourth to twelfth recipes will be introduced and explained in *Chapter 23 Recipe*.

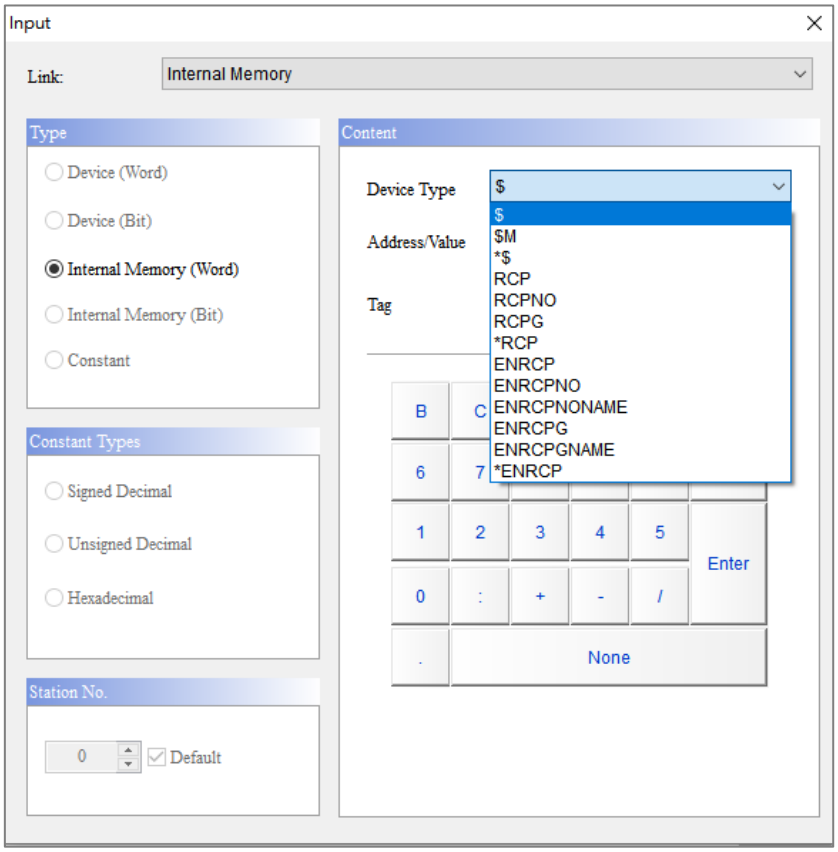


Figure 3 - 1: HMI Internal Memory

3.1 Internal Register ($)

The Internal Register is the HMI internal memory that freely reads data and supports all kinds of configurations, such as the element communication address. This internal register is volatile so the data in the temporary register is not maintained when the power is off. The HMI provides 200,000 sets of 16-bit internal registers.

Access Type	Device Type	Storage Range
Word	$n	$0 ~ $199999
Bit	$n.b	$0.0 ~ $199999.15

NOTE: *n is Word (0 - 199999); b is Bit (0 - 15).*

3.2 Non-volatile Internal Register ($M)

This register is a non-volatile register. The data in the register is maintained when the power is off so that users can record important data in this register. The HMI provides 1024 sets of 16-bit non-volatile internal registers ($M0.0 - $M1023.15).

Access Type	Device Type	Access Range
Word	$Mn	$0 ~ $1023
Bit	$Mn.b	$0.0 ~ $1023.15

NOTE: *n is Word (0 - 1023); b is Bit (0-15).*

3.3 Indirect Address Register (*$)

The Indirect Address Register is volatile so the data in the register is not maintained when the power is off.

Access Type	Device Type	Storage Range
Word	*$n	$0 ~ $65535

NOTE: *n is Word (0 - 65535).*

The indirect address register (*$n) obtains the value from $n, sets the value as a new address, and then accesses the value from the new address. For example, $10 = 101, $101 = 55, then *$10 = 55, as shown in the following figure.

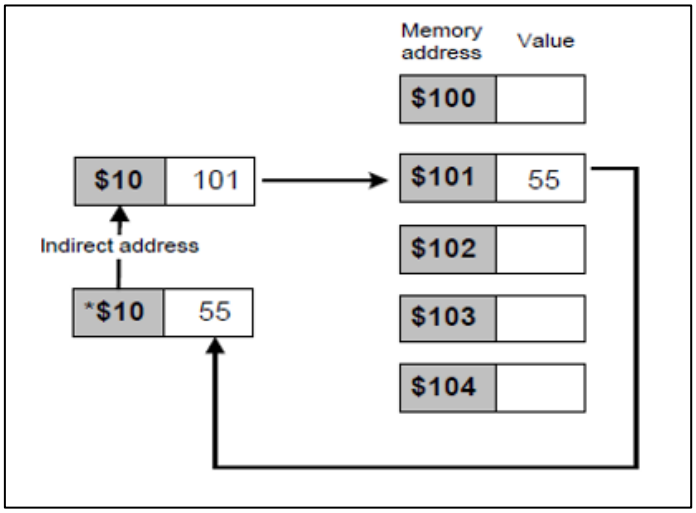


Figure 3 - 2: Flowchart of indirect address

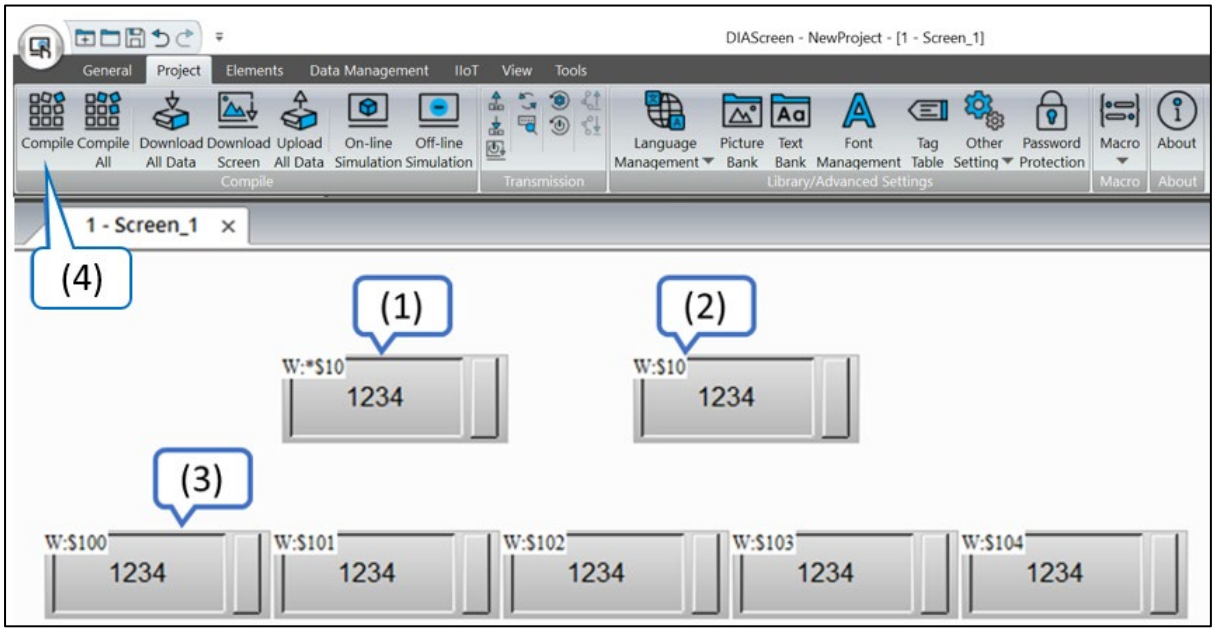


Figure 3 - 3: Example of indirect address register

Function Element	Step	Description
Indirect Address Register	1	Create a **Numeric Entry** element and set the **Write Address** to *$10.
	2	Create a **Numeric Entry** element and set the **Write Address** to $10.
	3	Create a **Numeric Entry** element and set the **Write Address** to $101.
	4	Compile and download the data to HMI. Firstly, input 101 to the element $10; next, input any value to the element $101; and then *$10 automatically generates the value input to $101.

3.4 Internal Parameter

The HMI provides the **Internal Parameter** aside from the twelve kinds of Internal Memory. The Internal Parameter enables to check the HMI internal state values through these parameters, including system time value (such as TIME_YEAR and TIME_MONTH), external storage device status (SD_STATUS and USB_STATUS), touch X / Y coordinate (TP_X and TP_Y), touch status (TP_STATUS), remaining battery voltage in percentage (BATTERY_VOLTAGE), network parameter (such as NET1_IP1 and SUBMASK_IP1), firmware version (FW_VERSION1 and FW_VERSION2), and so on.

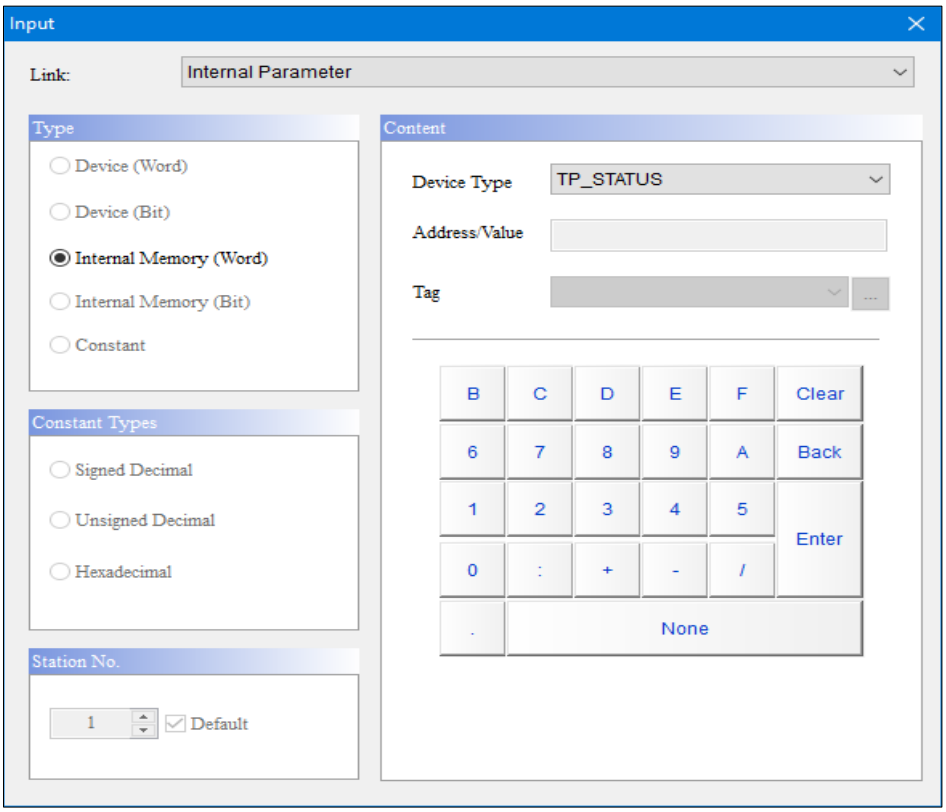


Figure 3 - 4: Internal Parameter

NOTE:

Internal Parameter is available only for Word elements. Users are unable to select this function if they create Bit elements.

When using word elements to set the memory address, select Internal Parameter in the **Link** to select a variety of 24 internal parameters available on the HMI.



Figure 3 - 5: Select Internal Parameter

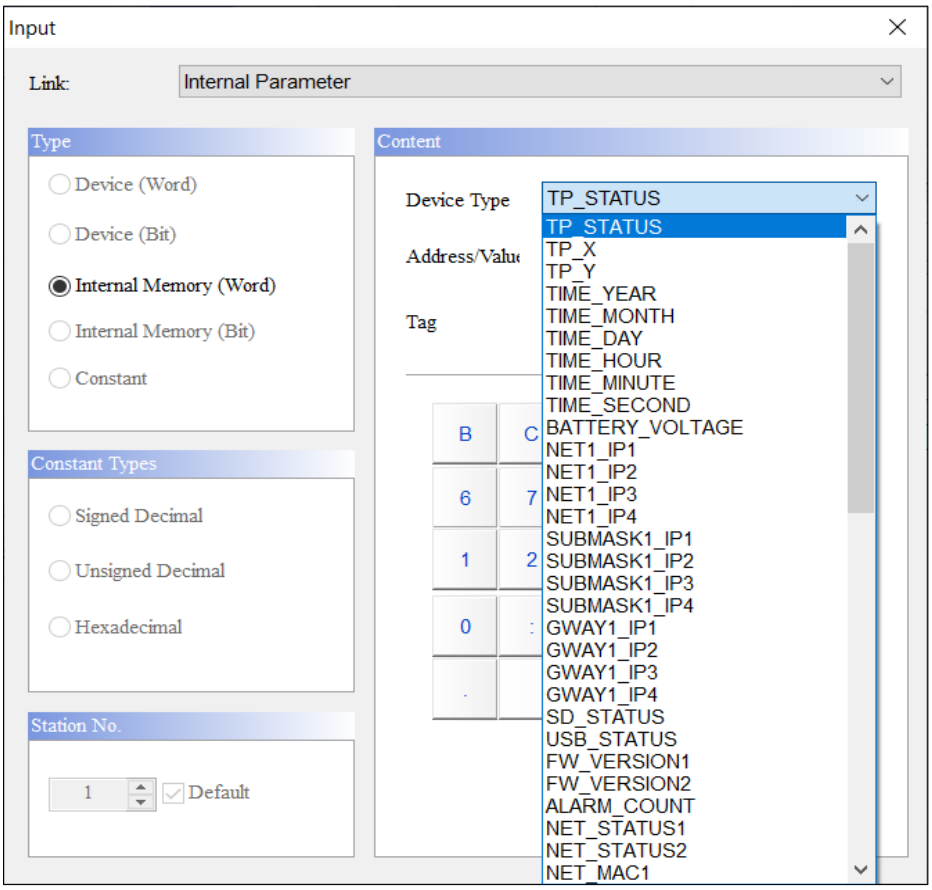
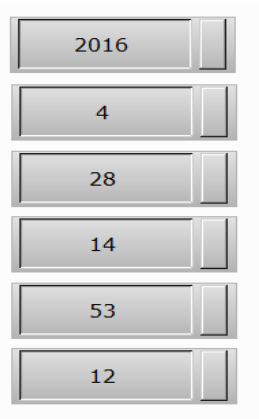


Figure 3 - 6: Internal Parameter

<table>
<tr><th colspan="2">Internal Parameter</th></tr>
<tr><td>TP_STATUS</td><td>Display the HMI panel state value
<table>
<tr><th>State Value</th><th>Result</th></tr>
<tr><td>0</td><td>Panel not touched, 0.</td></tr>
<tr><td>1</td><td>Panel touched, 1.</td></tr>
</table></td></tr>
<tr><td>TP_X</td><td rowspan="2">Display the X and Y coordinates when the panel is touched.
<table>
<tr><th>Coordinate</th><th>Result</th></tr>
<tr><td>X</td><td rowspan="2"> 
</td></tr>
<tr><td>Y</td></tr>
</table></td></tr>
<tr><td>TP_Y</td></tr>
<tr><td>TIME_YEAR</td><td rowspan="2">Display the HMI system time, including year / month / day / hour / minute / second.</td></tr>
<tr><td>TIME_MONTH</td></tr>
</table>

<table>
<tr><th colspan="3">Internal Parameter</th></tr>
<tr><td rowspan="6">TIME_DAY
TIME_HOUR
TIME_MINUTE
TIME_SECOND</td><td>Time Value</td><td>Result</td></tr>
<tr><td>TIME_YEAR (yyyy)</td><td rowspan="6"> 
</td></tr>
<tr><td>TIME_MONTH (mm)</td></tr>
<tr><td>TIME_DAY (dd)</td></tr>
<tr><td>TIME_HOUR (hr)</td></tr>
<tr><td>TIME_MINUTE (min)</td></tr>
<tr><td>TIME_SECOND (sec)</td></tr>
<tr><td>BATTERY _ VOLTAGE</td><td colspan="2">Display the remaining battery voltage in percentage (%).
 
</td></tr>
<tr><td colspan="3">Some DOP-100 series HMI models have two Ethernet ports, so the network parameters are named as:
● NET1_IP1 to NET1_IP4, SUBMASK1_IP1 to SUBMASK1_IP4, GWAY1_IP1 to GWAY1_IP4
● NET2_IP1 to NET2_IP4, SUBMASK2_IP1 to SUBMASK2_IP4, GWAY2_IP1 to GWAY2_IP4.
For the DOP-100 models to be compatible with the DOP-B projects, the network parameters NET_IP1 to NET_IP4, SUBMASK_IP1 to SUBMASK_IP4, and GWAY_IP1 to GWAY_IP4 are added.</td></tr>
<tr><td rowspan="4">NET_IP1
NET1_IP1
NET_IP2
NET1_IP2
NET_IP3
NET1_IP3
NET_IP4
NET1_IP4</td><td colspan="2">Display the IP address of the HMI. Take 192.168.123.62 as an example.
<table><tr><th>NET_IP</th><th>Result</th></tr><tr><td>NET_IP1
NET1_IP1</td><td rowspan="4"> 
</td></tr><tr><td>NET_IP2
NET1_IP2</td></tr><tr><td>NET_IP3
NET1_IP3</td></tr><tr><td>NET_IP4
NET1_IP4</td></tr></table></td></tr>
<tr><td>SUBMASK_IP1
SUBMASK1_IP1</td><td colspan="2">Display the SUBMASK_IP address of the HMI. Take 255.255.255.0 as an example.</td></tr>
</table>

<table>
<tr><th colspan="2">Internal Parameter</th></tr>
<tr><td>SUBMASK_IP2
SUBMASK1_IP2

SUBMASK_IP3
SUBMASK1_IP3

SUBMASK_IP4
SUBMASK1_IP4</td><td>
<table>
<tr><th>SUBMASK_IP</th><th>Result</th></tr>
<tr><td>SUBMASK_IP1
SUBMASK1_IP1

SUBMASK_IP2
SUBMASK1_IP2

SUBMASK_IP3
SUBMASK1_IP3

SUBMASK_IP4
SUBMASK1_IP4</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>GWAY_IP1
GWAY1_IP1

GWAY_IP2
GWAY1_IP2

GWAY_IP3
GWAY1_IP3

GWAY_IP4
GWAY1_IP4</td><td>Display the GATEWAY_IP address of the HMI. Take 192.168.123.254 as an example.
<table>
<tr><th>GWAY_IP</th><th>Result</th></tr>
<tr><td>GWAY _IP1
GWAY1_IP1

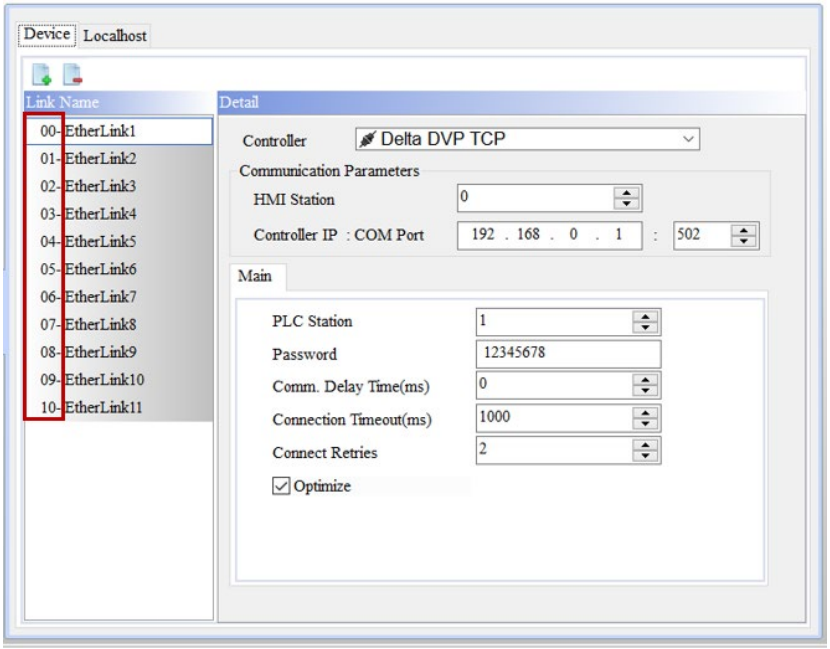
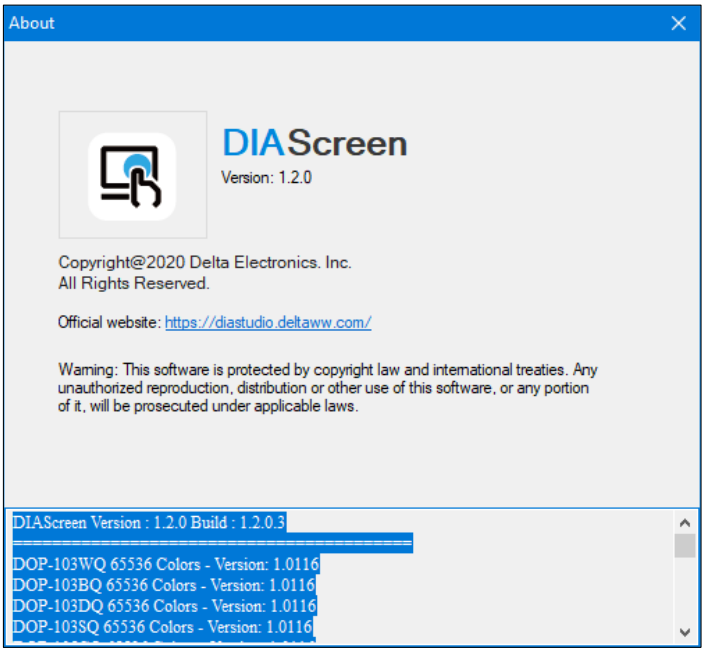
GWAY _IP2
GWAY1_IP2

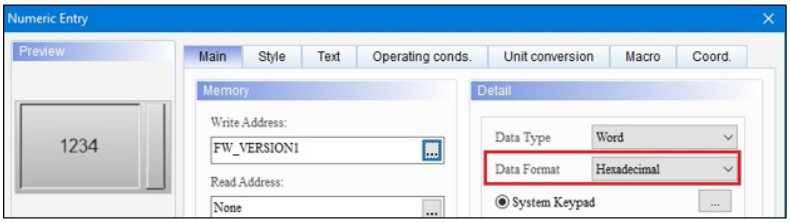
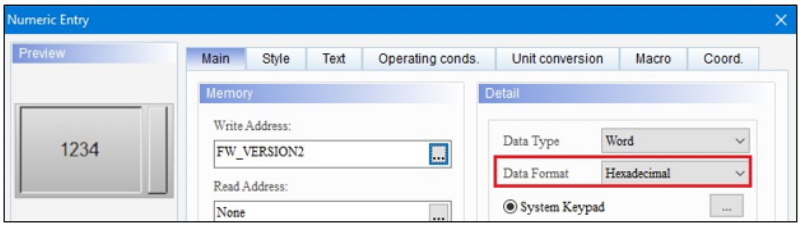
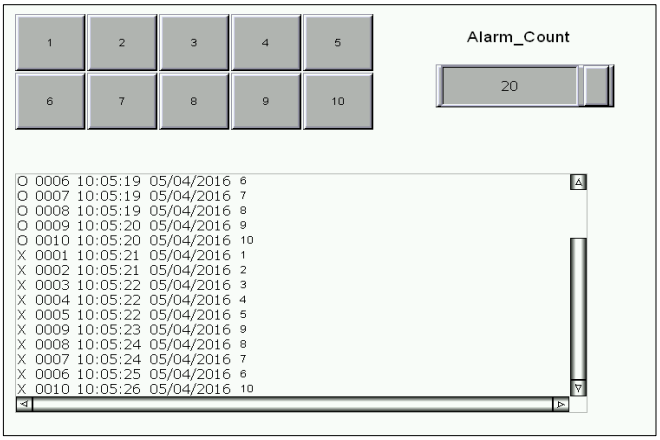
GWAY _IP3
GWAY1_IP3

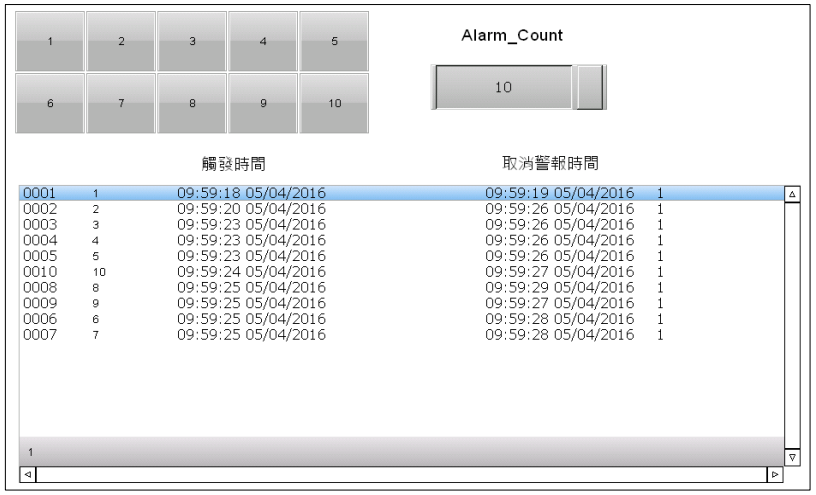
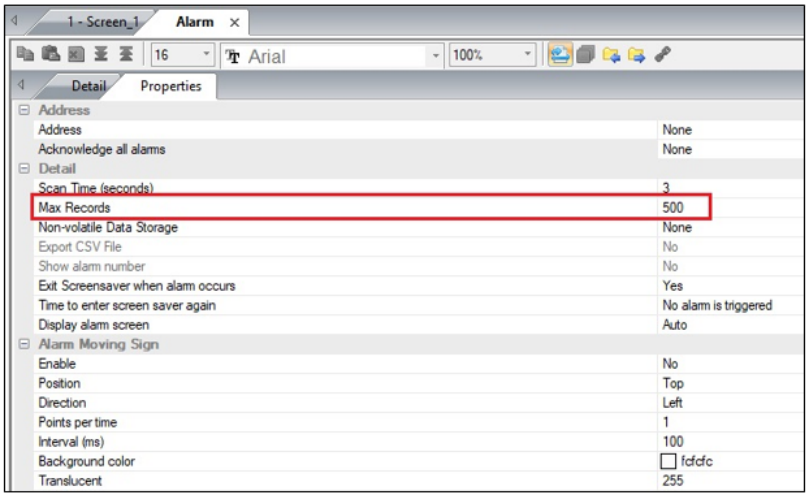
GWAY _IP4
GWAY1_IP4</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>SD_STATUS</td><td>Display the state value of whether an SD card is inserted.
<table>
<tr><th>State Value</th><th>Result</th></tr>
<tr><td>0</td><td>SD card not inserted, 0.</td></tr>
<tr><td>1</td><td>SD card inserted, 1.</td></tr>
</table>
</td></tr>
<tr><td>USB_STATUS</td><td>Display the state value of whether a USB disk is inserted.
<table>
<tr><th>State Value</th><th>Result</th></tr>
<tr><td>0</td><td>USB disk not inserted, 0.</td></tr>
<tr><td>1</td><td>USB disk inserted, 1.</td></tr>
</table>
</td></tr>
<tr><td>NET_STATUS1
NET_STATUS2</td><td>

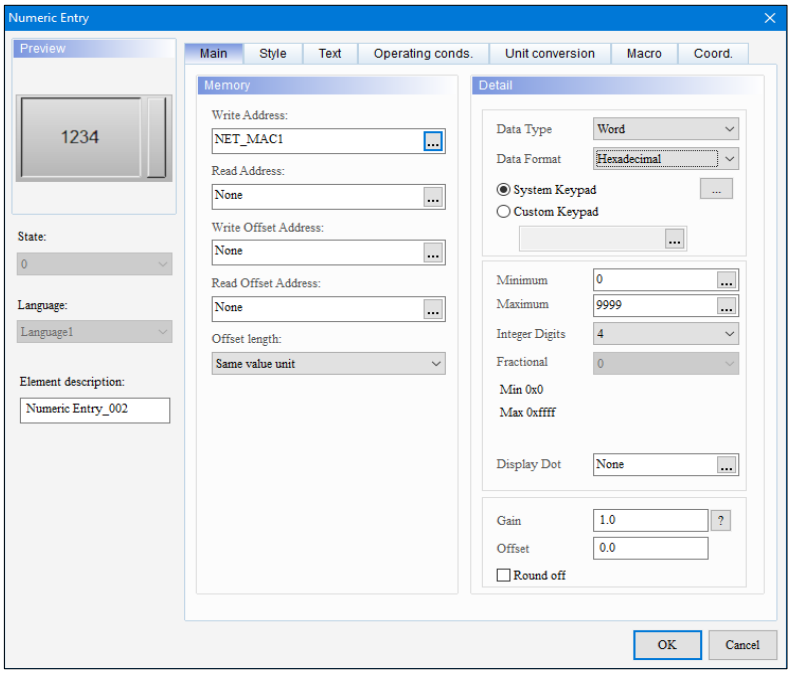
Display the HMI network connection status.
The parameter function sorts the newly-added EthernetLink device numbers in sequence. If the device is connected, the parameter value is 1; not connected, 0.

</td></tr>
</table>

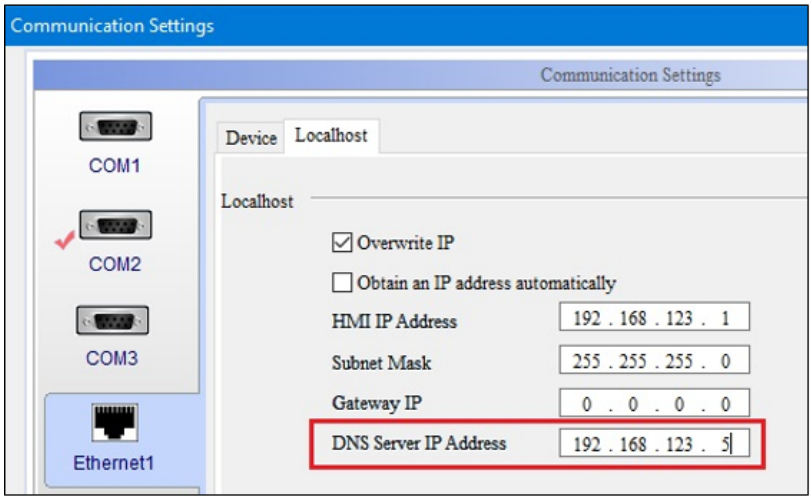
Internal Parameter	
	● NET_STATUS1 represents the 16 connections of the first protocol; NET_STATUS2 is the 16 connections of the second protocol. ● Set the **Data Format** as Binary when setting these internal parameters. 
FW_ VERSION1	

Internal Parameter	
	
FW_ VERSION1	● Display the main version of the HMI firmware. ● Set the **Data Format** as Hexadecimal when setting these internal parameters. 
FW_ VERSION2	● Display the sub-version of the HMI firmware. ● Set the **Data Format** as Hexadecimal when setting these internal parameters. 
ALARM_ COUNT	● Display the total number of alarms triggered, including the triggered and canceled ones. ● The DOP-B, DOP-H, and HMC series models record the triggered and canceled alarms separately. As a result, Alarm_Count displays 20 when there are ten alarms. 

Internal Parameter	
	● The DOP-W and DOP-100 series models record the triggered and canceled alarms within one set of data. As a result, Alarm_Count displays 10 when there are ten alarms.  ● This function reminds users to export the alarm data in case the initial alarm message contents are removed when the data reach the set maximum. 
NET_MAC1 NET_MAC2	● Represent the MAC number of the HMI port. ● Set the **Data Format** as Hexadecimal.

<table>
<tr><th colspan="2">Internal Parameter</th></tr>
<tr><td>NET_MAC3</td><td> 

The data is displayed with the high and low values swapped. If the value is 1800, it is displayed as 00:18.</td></tr>
<tr><td>REMO_
COUNT</td><td>Display the number of remote devices currently connected to the HMI. Remote devices include: eServer, VNC, and LUA online debugging programs.</td></tr>
<tr><td>ACCOUNT</td><td>Display the currently logged-in account.
If account contains English letters and numbers, use the Character Display element; if account contains non-ASCII characters, use the Multi-language Input element.</td></tr>
<tr><td>PROGRAM_STATUS</td><td>Display the current state value of LUA operations.
<table>
<tr><th>State Value</th><th>State Description</th></tr>
<tr><td>0</td><td>Stop</td></tr>
<tr><td>1</td><td>Run</td></tr>
<tr><td>2</td><td>Breakpoint</td></tr>
<tr><td>3</td><td>Pause</td></tr>
</table></td></tr>
<tr><td>PROGRAM_INFO</td><td>If an error occurs during LUA operation, the current error message can be displayed through this system parameter.</td></tr>
<tr><td>KEY_CHAR</td><td>When the HMI is connected to an external keypad, the characters can be directly input through the keypad and displayed through this parameter.</td></tr>
</table>

<table>
<tr><th colspan="2">Internal Parameter</th></tr>
<tr><td></td><td>● It is recommended to use Character Entry or Character Display elements.</td></tr>
<tr><td>DNS1_IP1
DNS1_IP2
DNS1_IP3
DNS1_IP4</td><td>Display the IP address of the HMI DNS Server.
 
</td></tr>
<tr><td>SMTP_
STATUS

SMTP_
INFO</td><td>Display the current SMTP connection status.
<table>
<tr><th>State Value</th><th>State Description</th><th>Corresponding Message in SMTP_ INFO</th></tr>
<tr><td>0</td><td>Status unknown</td><td>Unknown</td></tr>
<tr><td>1</td><td>Connection success</td><td>Message Sent</td></tr>
<tr><td>-100</td><td>Connection failed</td><td>Unable to connect to Host</td></tr>
<tr><td>-101</td><td>System disconnected</td><td>The displayed message changes according to the system.</td></tr>
<tr><td>-102</td><td>Authentication required</td><td>530 SMTP Authentication is required.</td></tr>
<tr><td>-103</td><td>Authentication failed</td><td>Fail to send message due to Authentication Fail</td></tr>
<tr><td>-999</td><td>SMTP error</td><td>Fail to send message</td></tr>
</table></td></tr>
<tr><td>TP_FORCE</td><td>Display the value of the pressing force applied to the HMI screen in percentage.</td></tr>
<tr><td>TP_DELAY</td><td>Display the delay time of pressing the HMI screen in percentage.</td></tr>
<tr><td>EMS_
STATUS</td><td>● This function is only available for DOP-H series HMI.
● This parameter displays the current state of the emergency stop switch.</td></tr>
</table>

<table>
<tr><th colspan="2">Internal Parameter</th></tr>
<tr><td></td><td>
<table>
<tr><th>State Value</th><th>Result</th></tr>
<tr><td>0</td><td>Emergency stop switch not pressed, 0.</td></tr>
<tr><td>1</td><td>Emergency stop switch pressed, 1.</td></tr>
</table>
</td></tr>
<tr><td>LSWITCH_
STATUS</td><td>

This function is only available for DOP-H series HMI.
This parameter displays the current state of the enabling switch.

<table>
<tr><th>State Value</th><th>Result</th></tr>
<tr><td>0</td><td>Enabling switch not pressed, 0.</td></tr>
<tr><td>1</td><td>Enabling switch pressed, 1.</td></tr>
</table>
</td></tr>
<tr><td>HANDWHEEL_
COUNTER</td><td>

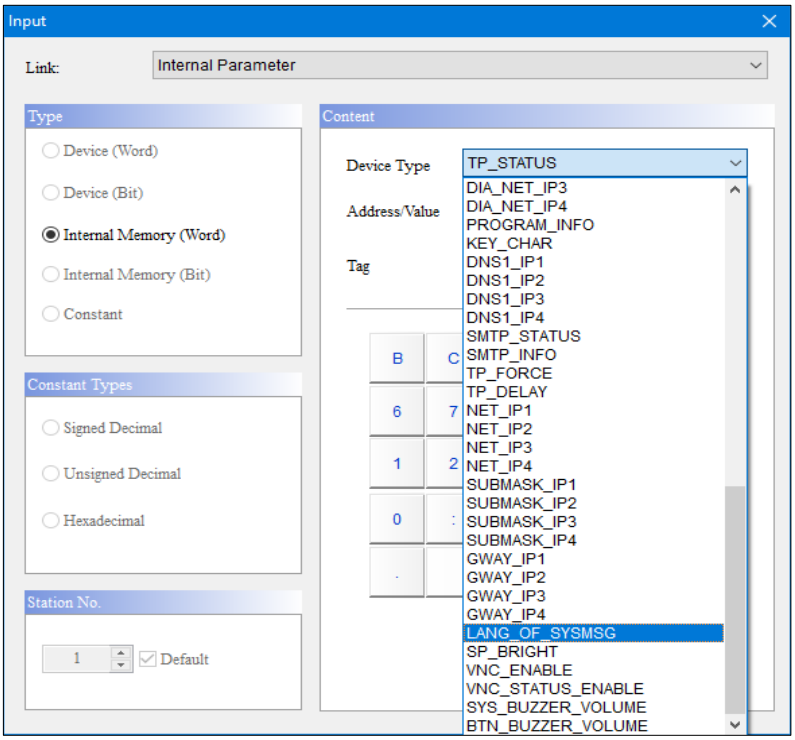
This function is only available for DOP-H series HMI.
This parameter displays the currently accumulated number of rotations of the handwheel.
Rotate to the right, the value increases by 1; rotate to the left, the value decreases by 1.

</td></tr>
<tr><td>LANG_OF_SYSMSG</td><td>

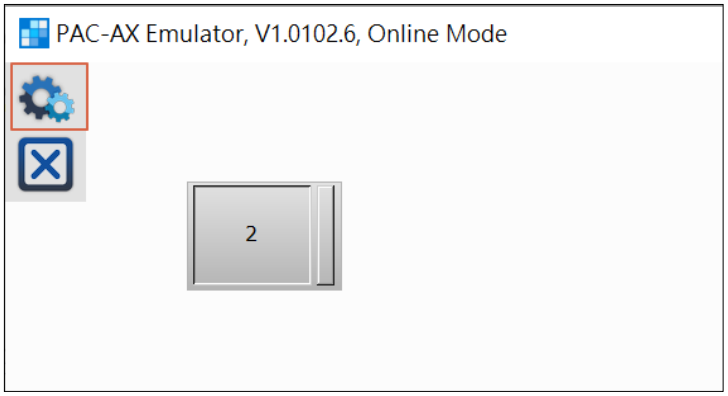
Set the display language of the HMI directory.
The definitions of language family numbers are as follows:
0: English (英文)
1: Traditional Chinese (繁中)
2: Simplified Chinese (簡中)
3: Spanish (西班牙文)
4: French (法文)
5: Russian (俄文)
6: Turkish (土耳其語)
System directory language setting operation example
1. Create elements such as Numeric Entry element.
2. Set the element Write Address. Select Link name as Internal Parameter, and the Device Type as LANG_OF_SYSMSG.

</td></tr>
</table>

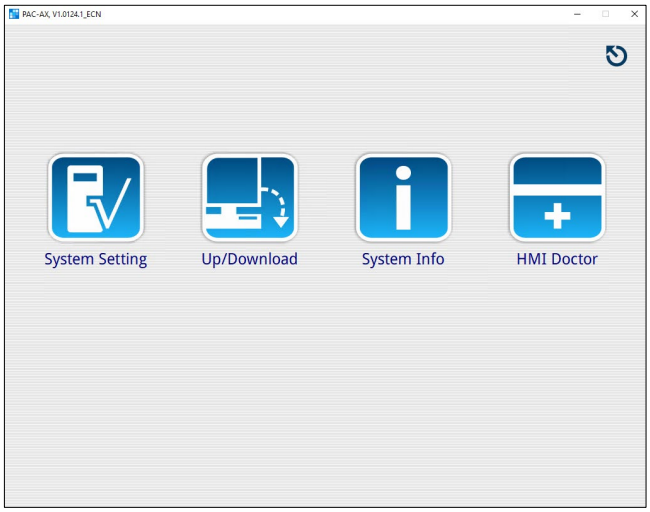
Internal Parameter



3. After the setting is completed, download the data to the real machine. After entering the screen, change the value of the element, press and hold the screen for 2 seconds, and the system catalog button pops up on the top left of the screen, as shown in the following figure.



4. Enter the system directory to see the display language change.

Internal Parameter	
	
SP_ BRIGHT	Display the backlight brightness of the HMI in percentage.

3.5 DXMC Series Internal Memory Address

The following table lists the Internal Memory address ranges of Word elements.

Type of Register	Symbol Format Word No. (n)	Read and Write Address Range	Data Length	Note
X_Register	Xn	X0 - X1FFFFF	Word	Hexadecimal
Y_Register	Yn	Y0 - Y1FFFFF	Word	Hexadecimal
DV_Register	DVn	DV0 - DV262143	Word	Even addressing
DH_Register	DHn	● DXMC-1H08AD-70, DXMC-1H08CD-7S, DXMC-1H08ED-7S: DH1000000 - DH1061439 ● DXMC-1P08NE-4S/70/7S, DXMC-1P04NE-7S, DXMC-1FA1RN-70F: DH1000000 - DH1024575 ● DXMC-1FA2RN-70F: DH1000000 - DH1049151	Word	Even addressing

Type of Register	Symbol Format Word No. (n)	Read and Write Address Range	Data Length	Note
SDV_Register	SDVn	SDV3000000 - SDV3065535	Word	Even addressing
SDH_Register	SDHn	● DXMC-1H08AD-70, DXMC-1H08CD-7S, DXMC-1H08ED-7S: SDH6000000 - SDH6065535 ● DXMC-1P08NE-4S/70/7S, DXMC-1P04NE-7S, DXMC-1FA1RN-70F: SDH6000000 - SDH6004095 ● DXMC-1FA2RN-70F: SDH6000000 - SDH6008191	Word	Even addressing
RP_Register	RPn	RP0 - RP7FFFFF	Word	Hexadecimal
Controller	CRn	CR0 - CR14FFFFF	Word	Hexadecimal
MW_Register	MWn	MW0 - MW67108863	Word	Even addressing
MD_Register	MDn	MD0 - MD67108863	Word	Even addressing
ML_Register	MLn	ML0 - ML67108863	Word	Even addressing

The following table lists the Internal Memory address range of the Bit elements.

Contact Type	Symbol Format Byte No. (n) Bit No. (b)	Read and Write Address Range	Note
X_Coil	Xn.b	X0.0 - X1FFFFF.15	Hexadecimal
Y_Coil	Yn.b	Y0.0 - Y1FFFFF.15	Hexadecimal
DV_Coil	DVn.b	DV0.0 - DV262143.7	-

Contact Type	Symbol Format Byte No. (n) Bit No. (b)	Read and Write Address Range	Note
DH_Coil	DHn.b	● DXMC-1H08AD-70, DXMC-1H08CD-7S, DXMC-1H08ED-7S: DH1000000.0 - DH1061439.7 ● DXMC-1P08NE-4S/70/7S, DXMC-1P04NE-7S, DXMC-1FA1RN-70F: DH1000000.0 - DH1024575.7 ● DXMC-1FA2RN-70F: DH1000000.0 - DH1049151.7	-
SDV_Coil	SDVn.b	SDV3000000.0 - SDV3065535.7	-
SDH_Coil	SDHn.b	● DXMC-1H08AD-70, DXMC-1H08CD-7S, DXMC-1H08ED-7S: SDH6000000.0 - SDH6065535.7 ● DXMC-1P08NE-4S/70/7S, DXMC-1P04NE-7S, DXMC-1FA1RN-70F: SDH6000000.0 - SDH6004095.7 ● DXMC-1FA2RN-70F: SDH6000000.0 - SDH6008191.7	-
SM_Coil	SMn.b	SM0.0 - SM8191.15	-
MX_Coil	MXn.b	MX0.0 - MX67108863.7	-
MW_Coil	MWn.b	MW0.0 - MW67108863.7	-

Chapter 4: Control Status Block

DIAScreen software provides **Control Block** and **Status Block** functions to execute or monitor the part of the system operation or status. To set the memory start address of the Control Block and Status Block, go to **General** > **Configuration** > **Control Status Block**.

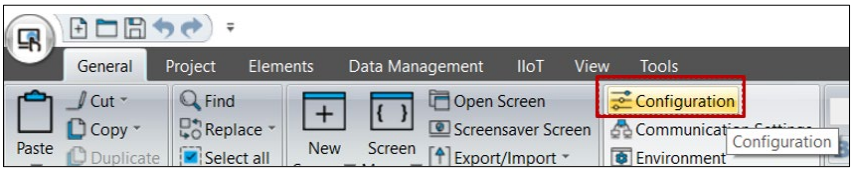


Figure 4 - 1: Configuration

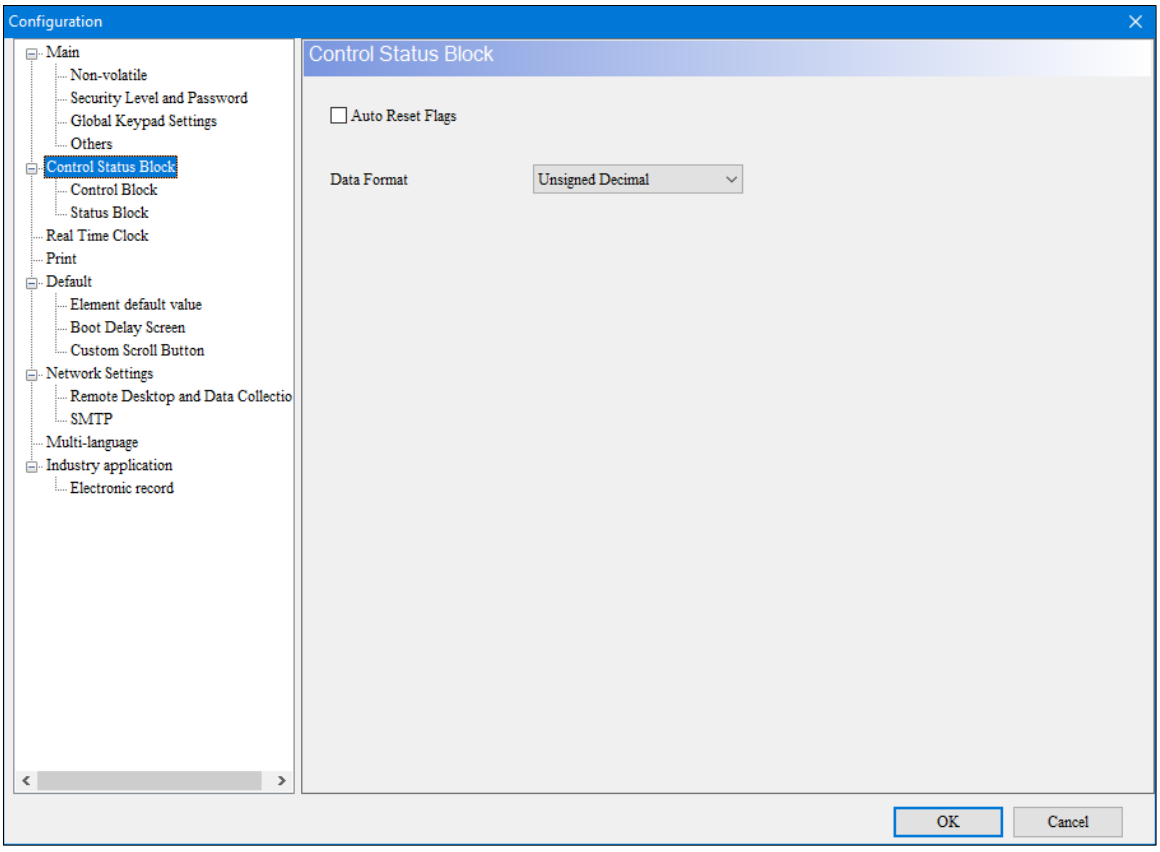


Figure 4 - 2: Control Status Block

DIAScreen provides **Control Block** and **Status Block** configurations to select the functions as required. For example, in **Control Block**, select the checkboxes of **Screen No.** and **Recipe Group Number**, and the **Control Block** automatically

configures the addresses in continuous form and enables the applications of screen switch and recipe number control, as shown in the following figure.

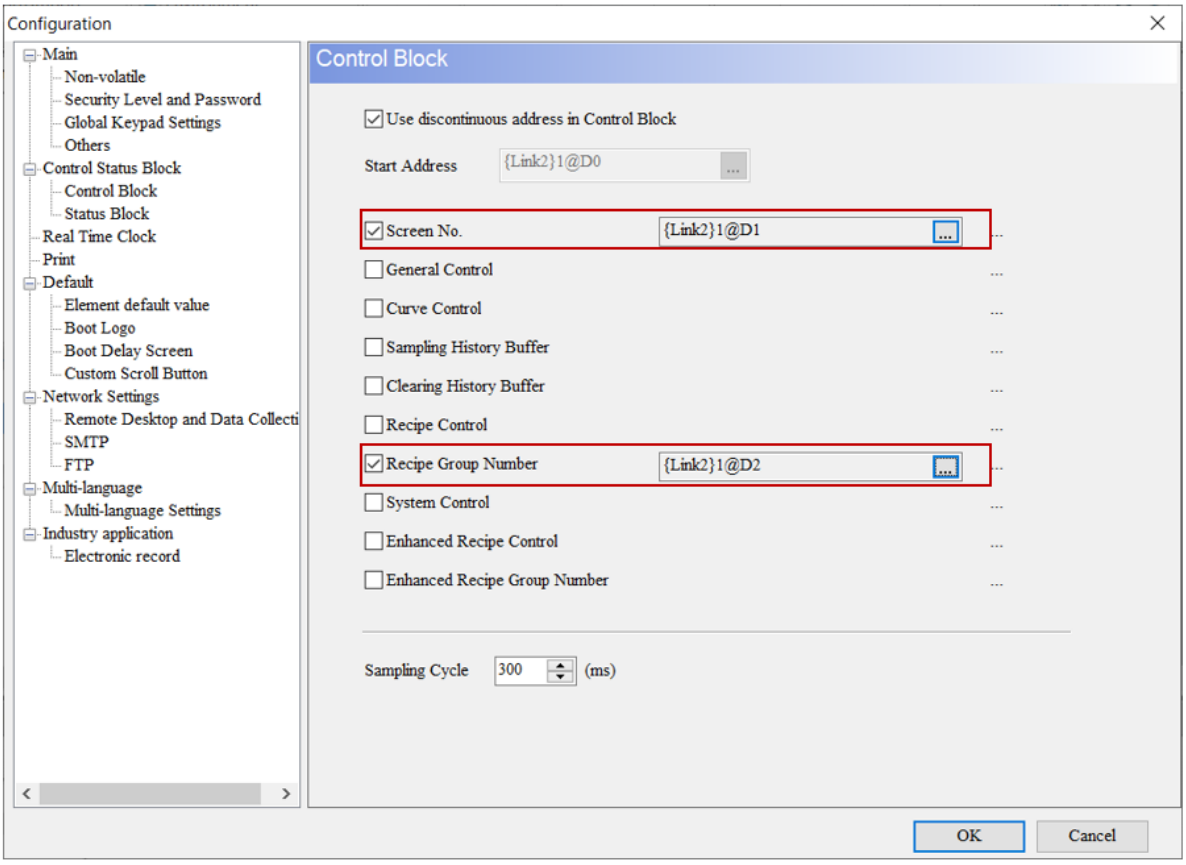


Figure 4 - 3: Control Block

If users select an additional function, such as **General Control**, the memory addresses are arranged in continuous sequence from top to bottom, as shown in the following figure.

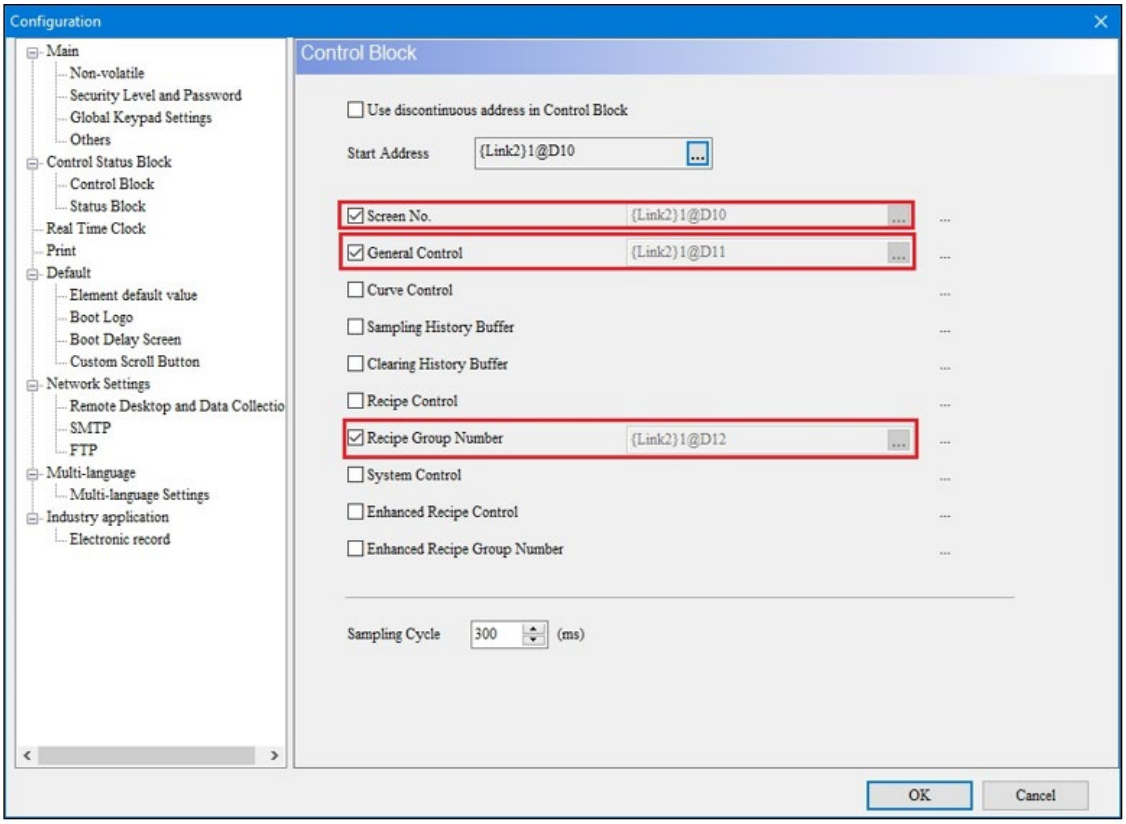


Figure 4 - 4: Control Block configuration

- Sampling Cycle

The **Sampling Cycle** allows users to flexibly control the sampling time. The default sampling cycle time is 300 ms, which means that the sampling action will be performed every 300 ms. The minimum sampling period is 200 ms; the maximum sampling period is 1000 ms.



Figure 4 - 5: Sampling Cycle

- Auto Reset Flags

To reactivate some functions in the **Control Block**, turn the corresponding flags OFF and then ON again. Select the checkbox of **Auto Reset Flags** and the HMI automatically resets the flags.

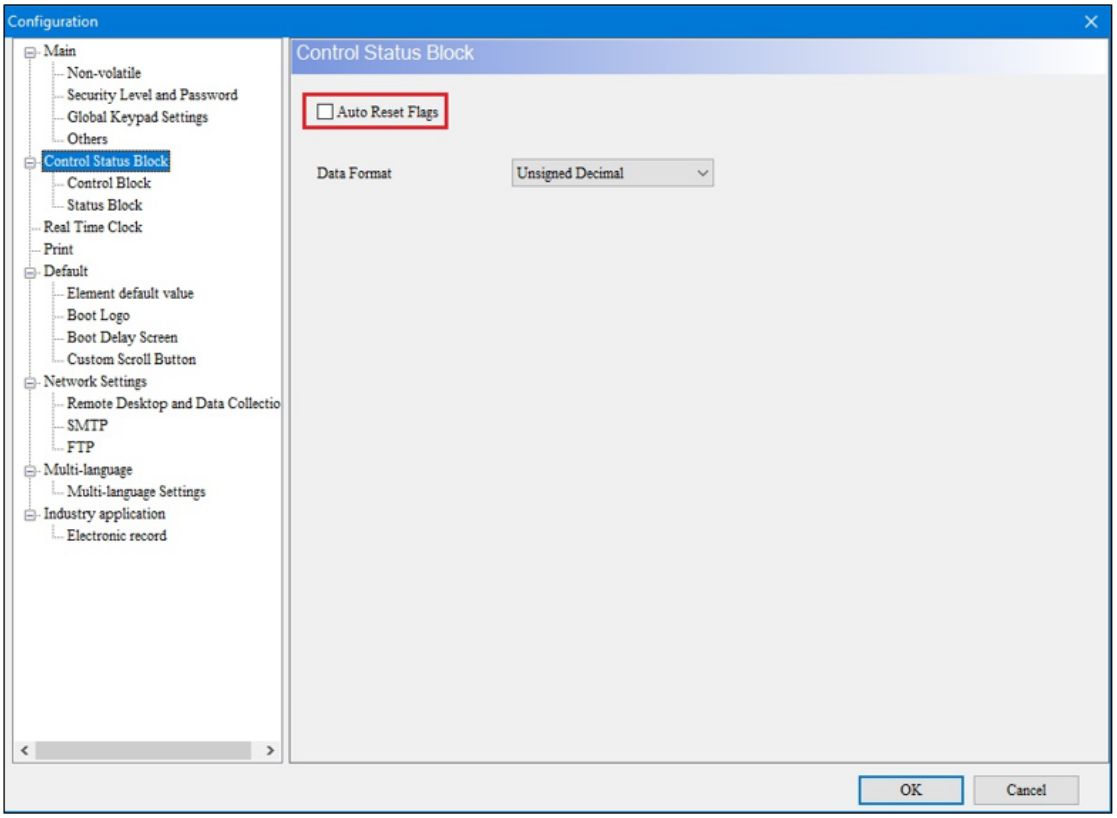


Figure 4 - 6: Auto Reset Flags

- Data Format

Set **Data Format** to either BCD or Unsigned Decimal.

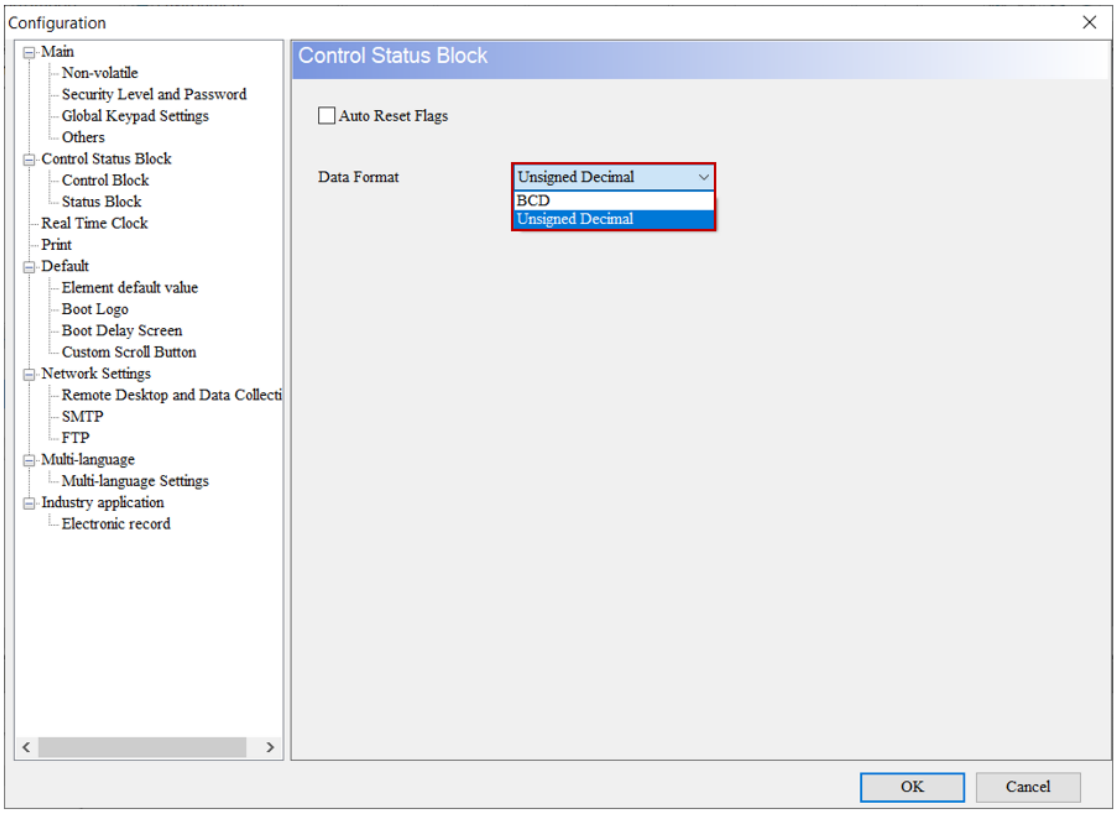


Figure 4 - 7: Control Status Block - Data Format

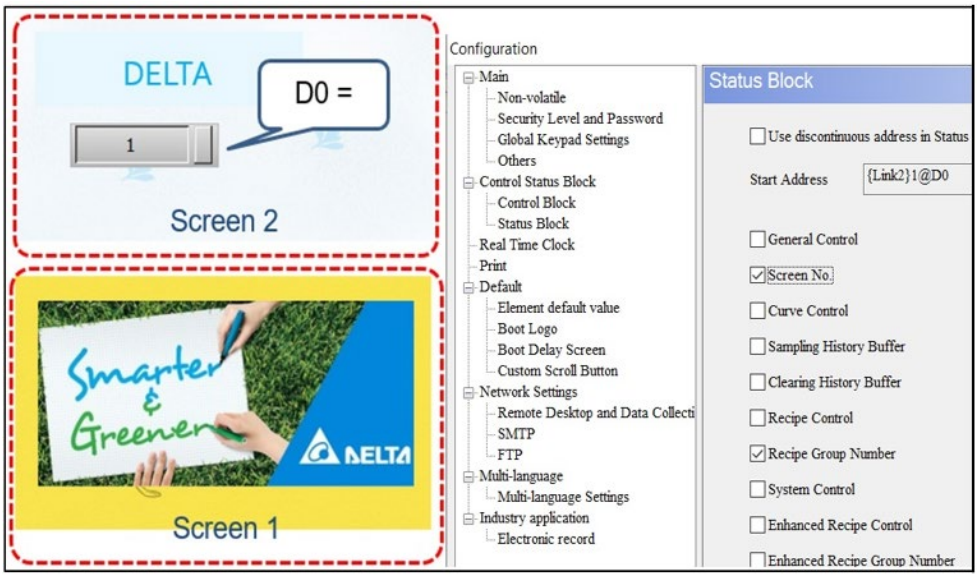
4.1 Control Block

Define the register addresses of the **Control Block** in the controller or the HMI Internal Memory. The HMI operation behaviors can be configured with the **Control Block** settings, such as screen switch, backlight disabling, security settings, curve and history buffer sampling or clearing, recipe control, enhanced recipe control, multi-language settings, and printing. The **Control Block** is a continuous data block in units of Word.

Control Block Register Type	Controller Register		Internal Memory	
	Register (D)	Example	Register ($)	Example
Screen No.	Dn	D0	$n	$15
General Control	Dn+1	D1	$n+1	$16

Control Block Register Type	Controller Register		Internal Memory	
	Register (D)	Example	Register ($)	Example
Curve Control	Dn+2	D2	$n+2	$17
History Buffer Sampling	Dn+3	D3	$n+3	$18
History Buffer Clearing	Dn+4	D4	$n+4	$19
Recipe Control	Dn+5	D5	$n+5	$20
Recipe Group Number	Dn+6	D6	$n+6	$21
System Control	Dn+7	D7	$n+7	$22
Enhanced Recipe Control	Dn+8	D8	$n+8	$23
Enhanced Recipe Group Number	Dn+9	D9	$n+9	$24

- Screen No. Register

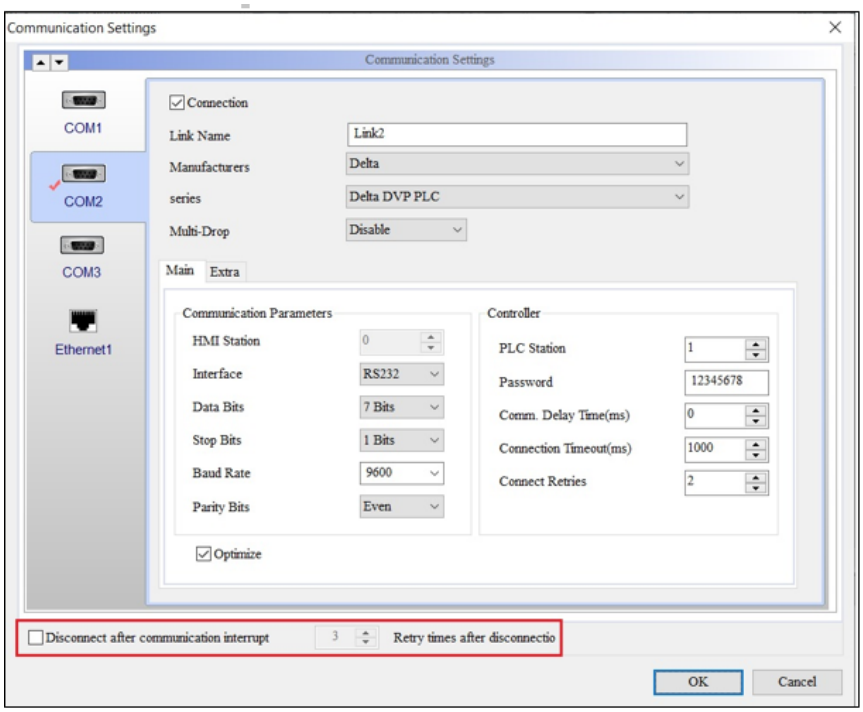
Screen No. Register	
b0 ~ b15 – Screen No.	● Write the designated screen number into this register, and the HMI switches to the designated screen. ● As shown in the following example, if a **Numeric Entry** element is set to D0 and the input value is 1, the HMI switches to the first screen. 

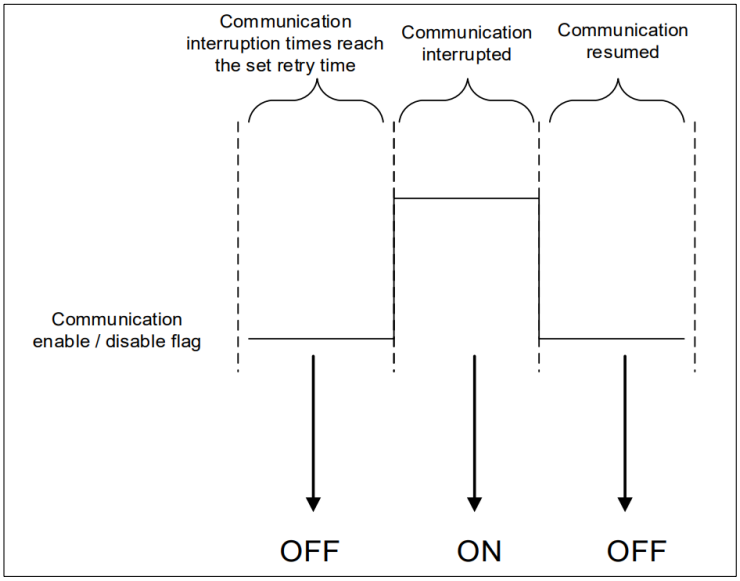
- General Control Register

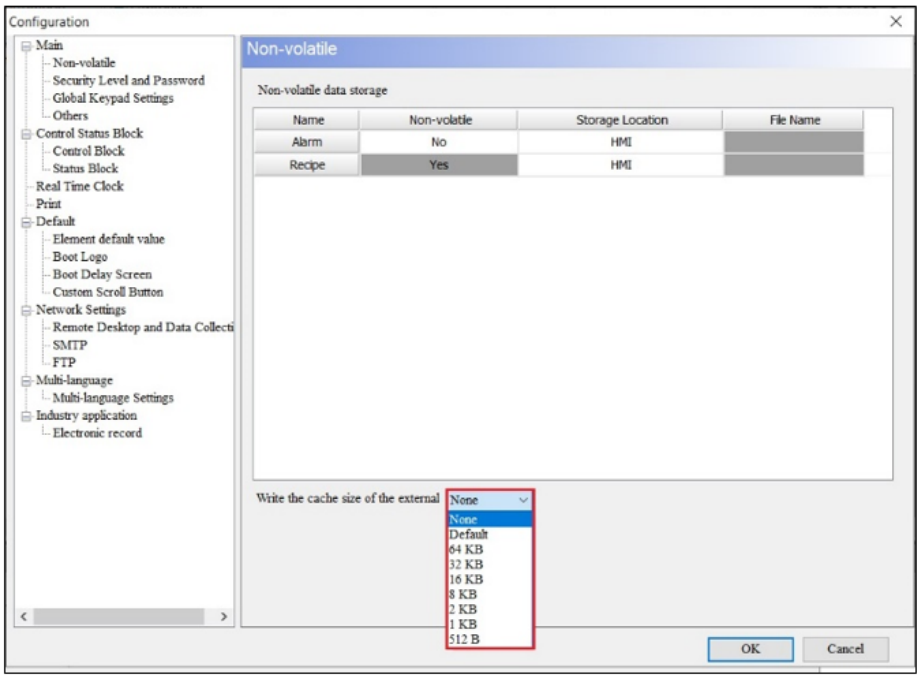
General Control Register

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
(10)				(9)				(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)

(1) b0 Communication enable / disable flag
(2) b1 Backlight enable / disable flag
(3) b2 Buzzer enable / disable flag
(4) b3 Alarm buffer clear flag
(5) b4 Alarm counter clear flag
(6) b5 External storage device cache write flag
(7) b6 Remote control lock
(8) b7 Reserved
(9) b8 ~ b11 Set User Security Level
(10) b12 ~ b15 Reserved

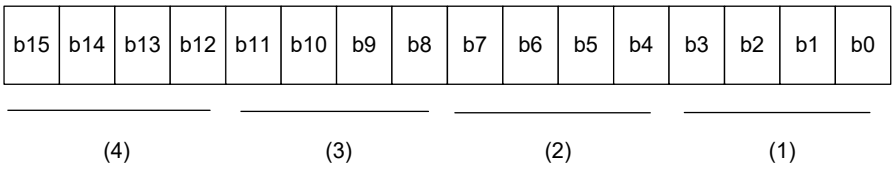
b0 – Communication enable / disable flag	● Enable / disable the HMI communication. To use communication enable / disable flag, click **General** > **Communication Settings**. Select **Disconnect after communication interrupt** and set the **Retry times after disconnection**, as shown in the following figure. 

General Control Register	
	● When the HMI communicates with the controller, the HMI automatically stops the communication with the controller and turns the flag ON after the number of interruption times reaches the set retry times without the communication error message (this does not affect the communication between the HMI and other controllers). Restore the communication between the HMI and controller by turning the flag OFF.  ● This flag is only for restoring the communication when it is automatically stopped. It is not possible to directly stop the communication between the HMI and any controller by turning the flag ON. ● The **Auto Reset Flags** function is not applicable to this flag.
b1 – Backlight enable / disable flag	● Enable / disable the HMI backlight. When the flag is ON, the HMI backlight is disabled. When the flag is OFF, the HMI backlight is enabled. ● The **Auto Reset Flags** function is not applicable to this flag.
b2 – Buzzer enable / disable flag	● Enable / disable the HMI buzzer. When the flag is ON, the HMI buzzer is enabled. When the flag is OFF, the HMI buzzer is disabled. ● The **Auto Reset Flags** function is not applicable to this flag.
b3 – Alarm buffer clear flag	Clear the HMI alarm buffer. When the flag is turned ON, the HMI clears the alarm buffer. To reactivate the function, turn the flag OFF and then ON again.
b4 – Alarm counter clear flag	Clear the HMI Alarm Frequency Table. When the flag is turned ON, the data in the Alarm Frequency Table is cleared. To reactivate the function, turn the flag OFF and then ON again.

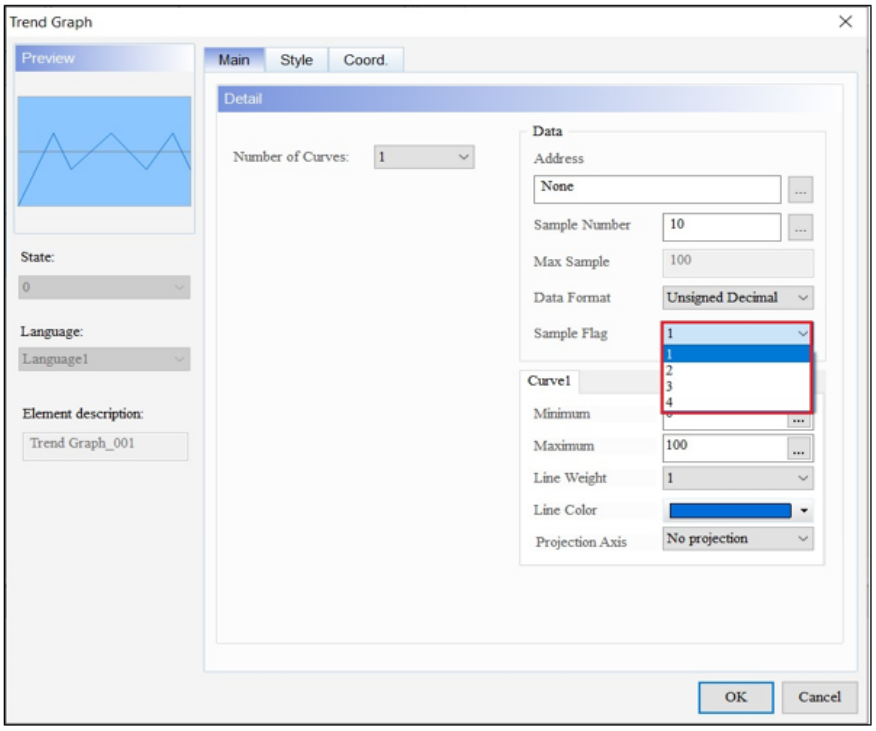
General Control Register	
b5 – External storage device cache write flag	● Update the HMI cache data into a USB Disk or an SD Card in real time. If the alarm buffer, history buffer, or recipe function is activated, and the non-volatile storage location is set to a USB Disk or an SD Card, when the flag is turned ON, the HMI updates the data temporarily stored in the cache into a USB Disk or an SD Card in real time. To reactivate the function, turn the flag OFF and then ON again. ● The data written into a USB Disk or an SD Card by the HMI is temporarily stored in the cache first. Before the cache data size reaches the set limit (as shown in the following figure), the data is not written into a USB Disk or an SD Card. This is to prevent the USB Disk or SD Card from being damaged by frequent overwriting. However, if the data volume accessed is less than the buffer capacity or the power is cut off unexpectedly, part of the data may be lost. To keep the data, turn ON the flag in a cyclic pattern to write the data into the USB Disk or SD Card. 
b6 – Remote control lock	● Enable / disable the operation: ○ When the flag is ON, eRemote can only monitor and cannot operate. ○ When the flag is OFF, eRemote can operate normally. ● The **Auto Reset Flags** function is not applicable to this flag.
b8, b9, b10, b11 – Set User Security Level	● Change the current **User Security Level** of the HMI by triggering the four flags of Bit 8, Bit 9, Bit 10 and Bit 11 provided by the **General Control** register. The HMI internal security level includes:

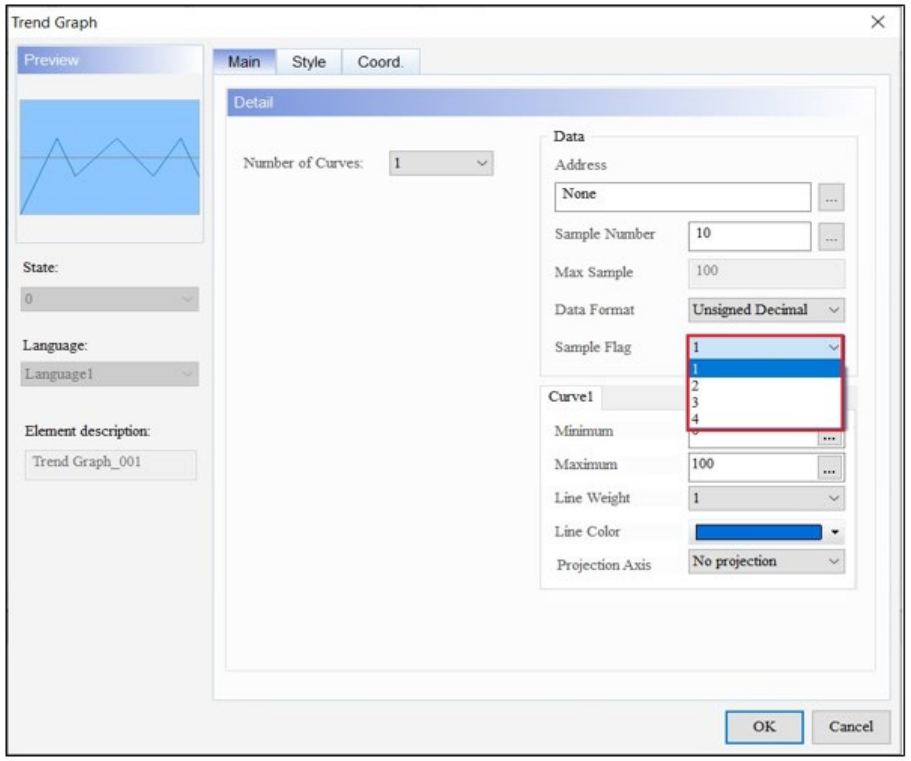
<table>
<tr><th colspan="2">General Control Register</th></tr>
<tr><td></td><td>
a. Security level 0 ~ 7: refers to the lowest security level. Levels 0 - 7 can be controlled by Bit 8, Bit 9, and Bit 10 flags.
b. Highest security level: can be controlled by Bit 11 flag.
● Set security levels 0 ~ 7 with the Bit 8, Bit 9 and Bit 10 flags. Refer to the following table for more details on settings.
<table>
<tr><th rowspan="2">Security Level</th><th colspan="3">Flag Control</th></tr>
<tr><th>Bit 10</th><th>Bit 9</th><th>Bit 8</th></tr>
<tr><td>Security level 0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Security level 1</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>Security level 2</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>Security level 3</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>Security level 4</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>Security level 5</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>Security level 6</td><td>1</td><td>1</td><td>0</td></tr>
<tr><td>Security level 7</td><td>1</td><td>1</td><td>1</td></tr>
</table>
</td></tr>
</table>

● Curve Control Register

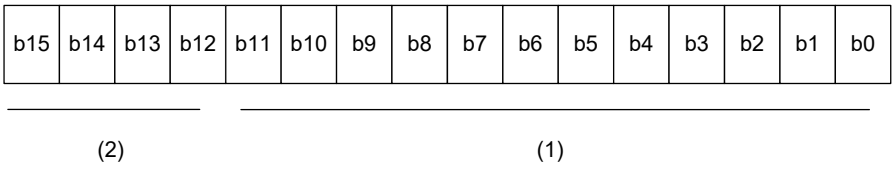
<table>
<tr><th colspan="2">Curve Control Register</th></tr>
<tr><td colspan="2">


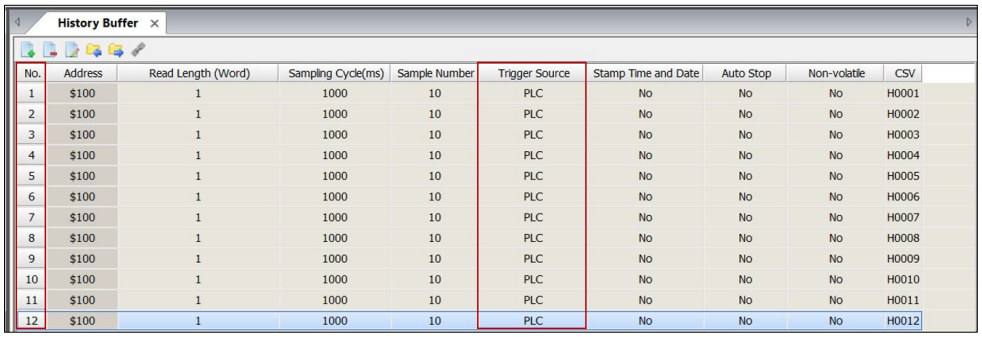
(1) b0 ~ b3 Curve sampling flags 1 ~ 4
(2) b4 ~ b7 Reserved
(3) b8 ~ b11 Curve clear flags 1 ~ 4
(4) b12 ~ 15 Reserved
</td></tr>
<tr><td>b0 ~ b3 – Curve sampling flags (1 ~ 4)</td><td>
● DIAScreen provides four curve sampling flags. The curves include the Trend Graph and X-Y Chart of which the curve drawing action is controlled by the curve sampling flags.
● If the flag is turned ON, the corresponding curve element samples and draws the curve. To reactivate the function, turn the flag OFF and then ON again.
● The sampling flag 1 of the Trend Graph element corresponds to the curve sampling flag 1; the sampling flag 2 of the Trend Graph element corresponds to the curve
</td></tr>
</table>

Curve Control Register	
	sampling flag 2, and so on. 
b8 ~ b11 – Curve clear flags (1 ~ 4)	● DIAScreen provides four curve clear flags. The curves include the Trend Graph and X-Y Chart of which the curve clearing action is controlled by the curve clear flags. ● If the flag is turned ON, the corresponding curve element clears the curve. To reactivate the function, turn the flag OFF and then ON again. ● The curve element sampling flag 1 corresponds to the curve clear flag 1; the curve element sampling flag 2 corresponds to the curve clear flag 2, and so forth.

Curve Control Register	
	

- History Buffer Sampling Register

History Buffer Sampling Register	
 (1) b0 ~ b11 History buffer sampling flags 1 ~ 12 (b0 refers to flag 1, and so on) (2) b12 ~ b15 Reserved	
b0 ~ b11 – History buffer sampling flags (1 ~ 12)	● The history buffer sampling register can record up to twelve sets of history buffer data. Each buffer corresponds to a history buffer sampling flag. To execute sampling with the history buffer sampling flags of the **Control Block**, set PLC for **Trigger Source** of the history buffer.

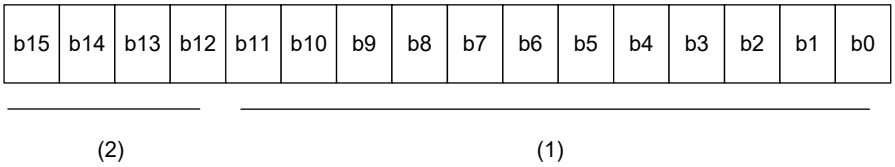
History Buffer Sampling Register	
	

History Buffer

No.	Address	Read Length (Word)	Sampling Cycle(ms)	Sample Number	Trigger Source	Stamp Time and Date	Auto Stop	Non-volatile	CSV
1	$100	1	1000	10	PLC	No	No	No	H0001
2	$100	1	1000	10	PLC	No	No	No	H0002
3	$100	1	1000	10	PLC	No	No	No	H0003
4	$100	1	1000	10	PLC	No	No	No	H0004
5	$100	1	1000	10	PLC	No	No	No	H0005
6	$100	1	1000	10	PLC	No	No	No	H0006
7	$100	1	1000	10	PLC	No	No	No	H0007
8	$100	1	1000	10	PLC	No	No	No	H0008
9	$100	1	1000	10	PLC	No	No	No	H0009
10	$100	1	1000	10	PLC	No	No	No	H0010
11	$100	1	1000	10	PLC	No	No	No	H0011
12	$100	1	1000	10	PLC	No	No	No	H0012

- Determine the sampling timing by triggering the history buffer sampling flag. When the history buffer sampling flag is turned ON, the register samples one time. To reactivate the function, turn the flag OFF and then ON again.

- History Buffer Clearing Register

History Buffer Clearing Register	
	

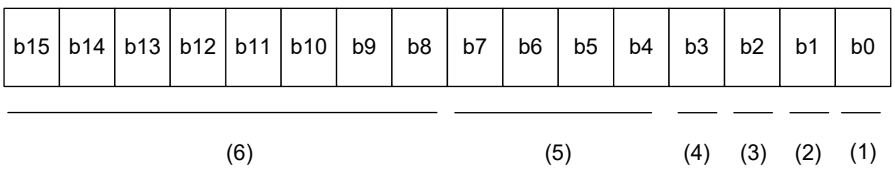
b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
(2)				(1)											

(1) b0 ~ b11 History buffer clear flag 1 ~ 12 (b0 refers to flag 1, and so on)

(2) b12 ~ b15 Reserved

b0 ~ b11 – History buffer clear flag (1~12)	Clear the buffer by triggering the history buffer clear flags. When the history buffer clear flag is ON, the HMI clears the buffer. To reactivate the function, turn the flag OFF and then ON again.

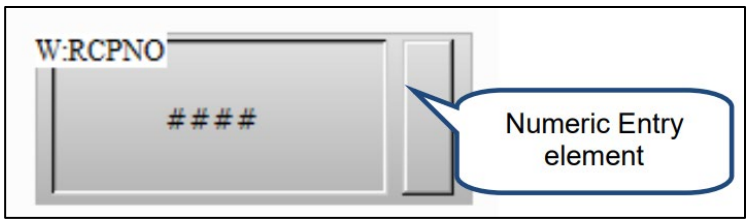
- Recipe Control Register

Recipe Control Register	
	

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
(6)								(5)				(4)	(3)	(2)	(1)

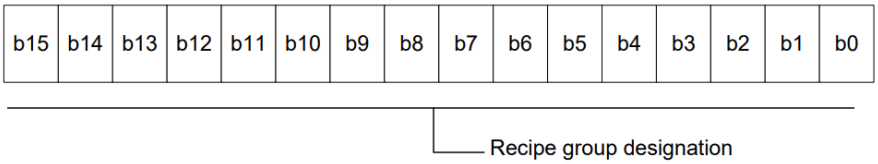
(1) b0 Recipe number change flag

(2) b1 Recipe read flag (PLC → HMI)

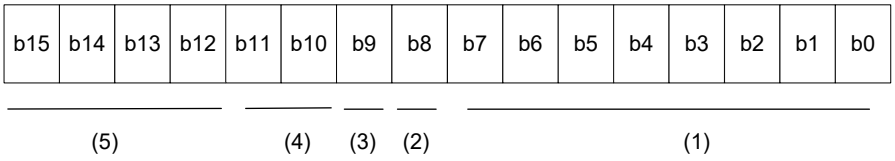
Recipe Control Register	
(3) b2 Recipe write flag (HMI → PLC) (4) b3 Recipe group change flag (5) b4 ~ b7 Reserved (6) b8 ~ b15 Designate recipe group to be changed.	
b0 – Recipe number change flag	● This is applicable to 16-Bit recipes. ● There are two ways to call or change the recipe number: a. Use the HMI internal register RCPNO.  b. Use the recipe number change flag. ● To change the HMI recipe number with this flag, write the recipe number to be changed into the recipe number control register and then trigger the recipe number change flag. ● When the recipe number change flag is turned ON, the recipe number is changed according to the value defined in the recipe number control register, and the number of RCPNO internal register is changed automatically. To reactivate the function, turn the flag OFF and then ON again.
b1 – Recipe read flag (PLC → HMI)	When the recipe read flag is turned ON, the HMI reads the controller recipe data and writes the data into the designated recipe data register. To reactivate the function, turn the flag OFF and then ON again.
b2 – Recipe write flag (HMI → PLC)	When the recipe write flag is turned ON, the HMI writes the designated recipe data into the controller register. To reactivate the function, turn the flag OFF and then ON again.
b3 – Recipe group change flag	● This is applicable to for 32-Bit recipes. ● There are two ways to call and change the recipe group: a. Use the HMI internal register RCPG.  b. Use the recipe group change flag. ● When the recipe group change flag is turned ON, the recipe group is changed according to the value defined in the recipe group change bits (b8 ~ b15), and the number of the RCPG

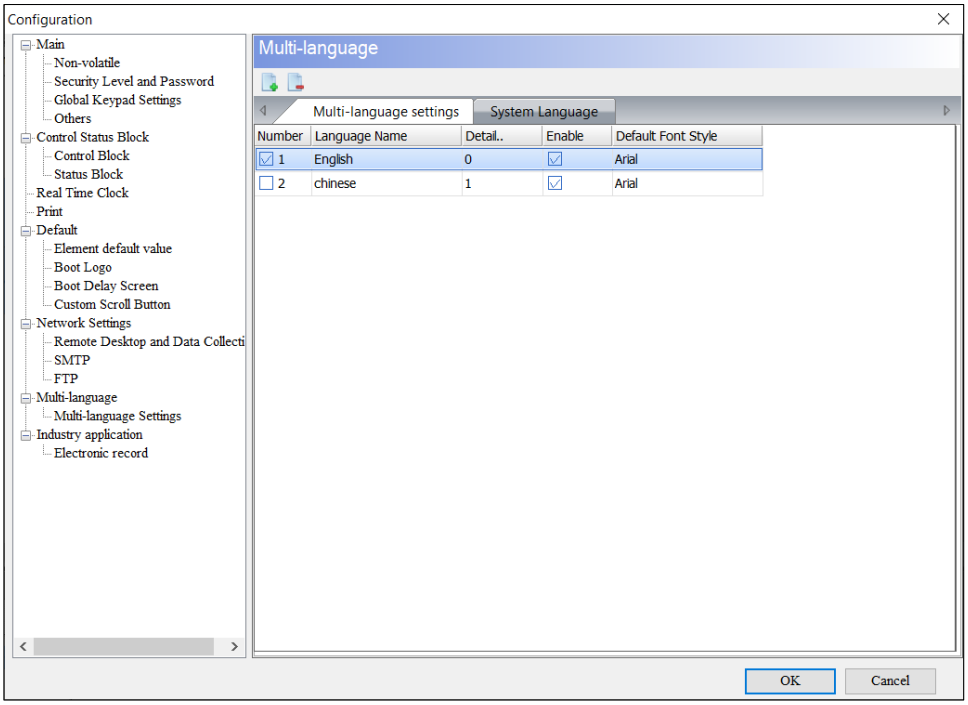
Recipe Control Register	
	internal register is changed automatically. To reactivate the function, turn the flag OFF and then ON again.
b8 ~ b15 – Designate recipe group to be changed	Designate the recipe group to be changed with the high byte (Bits 8 ~ 15) from the recipe control register. By activating the recipe group change flag, the HMI changes the number of the RCPG internal register, thus changing the recipe group.

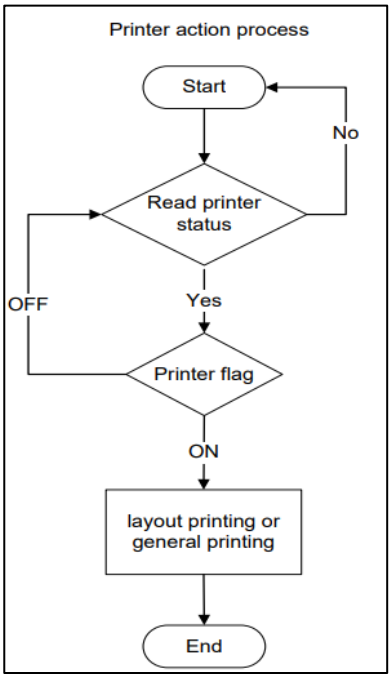
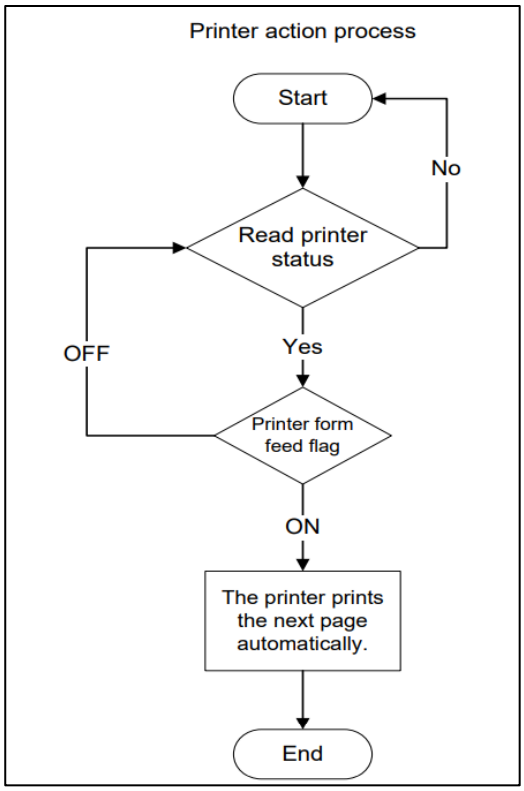
- Recipe Group Number Register

Recipe Group Number Register	
	
b0 ~ b15 – Recipe group designation	Specify the group number of the recipe group to be changed through the recipe group number register. By activating the recipe group change flag, the HMI automatically changes the number of the RCPG internal register, thus changing the recipe group.

- System Control Register

System Control Register

(1) b0 ~ b7 Multi-language setting values (2) b8 Printer flag (3) b9 Printer form feed flags (4) b10 ~ b11 Retrieve ethernet address (If using DOP-112 and DOP-115 models, b10 is for LAN1m control, b11 is for LAN2 control) (5) b12 ~ b15 Reserved.

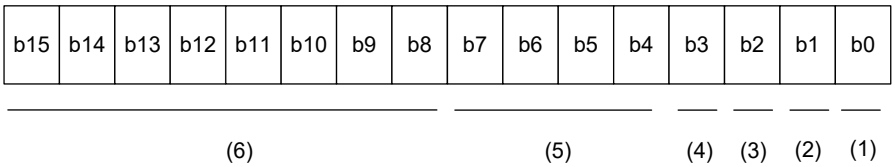
System Control Register	
b0 ~ b7 – Multi-language setting values	The system supports 32 languages. Change the **Multi-language settings** to switch languages. Click **General** > **Configuration** > **Multi-language** to edit the **Multi-language settings**, as shown in the following figure. 
b8 – Printer flag	● DIAScreen provides two print functions: general printing and Screen Print Setup. ● Note that only one option is enabled at a time. The Screen Print Setup is prioritized. ● When the printer flag is turned ON, the printing task runs according to the set mode: general printing or Screen Print Setup; when the printer flag is OFF, the printer function is idled.

System Control Register	
	
b9 - Printer form feed flag	When the printer form feed flag is turned ON, the printer retracts the paper and aligns the paper for the next run automatically; when the flag is OFF, the printer form feed function is idled. 

System Control Register	
b10 – Retrieve Ethernet Address	When the HMI fails to obtain the IP address assigned by the DHCP server, trigger this bit to retrieve the IP address. If using DOP-112 or DOP-115 models, b10 is for getting the IP address with LAN1 and b11 is for getting the IP address with LAN2.

- Enhanced Recipe Control Register

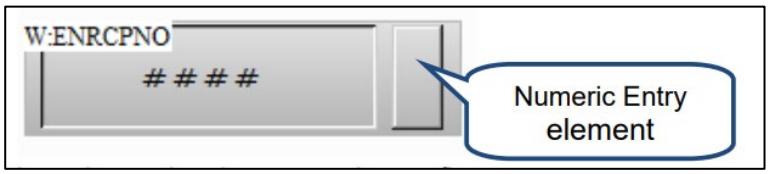
Enhanced Recipe Control Register



(1) b0 Enhanced recipe number change flag
(2) b1 Enhanced recipe read flag (PLC → HMI)
(3) b2 Enhanced recipe write flag (HMI → PLC)
(4) b3 Enhanced recipe group change flag
(5) b4 ~ b7 Reserved
(6) b8 ~ b15 Designate enhanced recipe group to be changed

b0 – Enhanced recipe number change flag

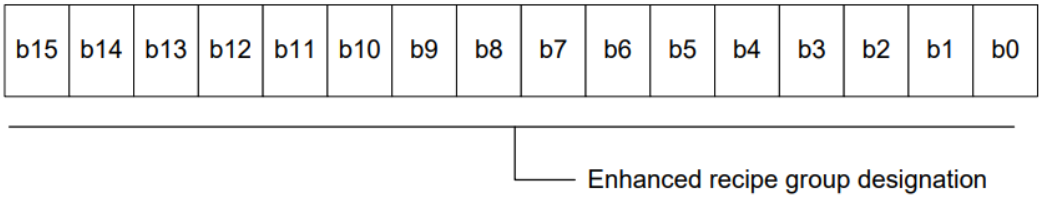
- This is applicable to Enhanced recipes.
- There are two ways to call or change the enhanced recipe number:
  a. Use the HMI internal register ENRCPNO.



  b. Use enhanced recipe number change flag.
- To change the HMI enhanced recipe number with this flag, write the enhanced recipe number to be changed into the recipe number control register and then trigger the enhanced recipe number change flag.
- When the enhanced recipe number change flag is turned ON, the enhanced recipe number is changed according to the number defined in the enhanced recipe number control register, and the number in the internal register ENRCPNO is changed automatically. To reactivate the function, turn the flag OFF and then ON again.

Enhanced Recipe Control Register	
b1 – Enhanced recipe read flag (PLC → HMI)	When the enhanced recipe read flag is turned ON, the HMI reads the controller enhanced recipe data and writes it into the designated enhanced recipe data register. To reactivate the function, turn the flag OFF and then ON again.
b2 – Enhanced recipe write flag (HMI → PLC)	When the enhanced recipe write flag is turned ON, the HMI writes the designated enhanced recipe data into the controller register. To reactivate the function, turn the flag OFF and then ON again.
b3 – Enhanced recipe group change flag	● This is applicable to Enhanced recipes. ● There are two ways to call or change the enhanced recipe group: a. Use the HMI internal register ENRCPG.  b. Use enhanced recipe group change flag. ● When the enhanced recipe group change flag is turned ON, the enhanced recipe group is changed according to the value defined in the enhanced recipe group change bits (b8 ~ b15), and the number in the internal register ENRCPG is changed automatically. To reactivate the function, turn the flag OFF and then ON again.
b8 ~ b15 – Designate enhanced recipe group to be changed	Designate the enhanced recipe group to be changed with the high byte (Bits 8 ~ 15) from the enhanced recipe control register. By activating the enhanced recipe group change flag, the HMI changes the number in the internal register ENRCPG, thus changing the enhanced recipe group.

- Enhanced Recipe Group Number Register

Enhanced Recipe Group Number Register	
	
b0 ~ b15 – Enhanced recipe group designation	Designate the group number to be changed with the enhanced recipe group number register. By activating the enhanced recipe group change flag, the HMI changes the number of ENRCPNO internal register, thus changing the enhanced recipe group.

4.2 Status Block

Define the register addresses of the controller or the HMI internal memory with the **Status Block**. Users can view the present HMI status with the **Status Block** settings, such as current screen number, current security level, curves and history buffer sampling status, recipe control, enhanced recipe control, multi-language settings, and printing. The **Status Block** is a continuous data block in units of Word.

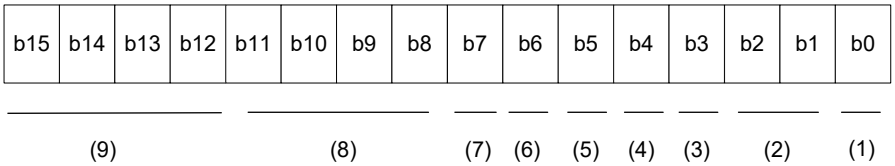
***NOTE**: If the **Control Block** is not set, the **Status Block** cannot monitor the status. Moreover, the addresses of the **Control Block** and **Status Block** must not be same.*

Status Block Register Type	Controller Register		Internal Memory	
	Register(D)	Example	Register ($)	Example
General Control status	Dn	D10	$n	$25
Screen No. status	Dn+1	D11	$n+1	$26
Curve Control status	Dn+2	D12	$n+2	$27
History Buffer Sampling status	Dn+3	D13	$n+3	$28

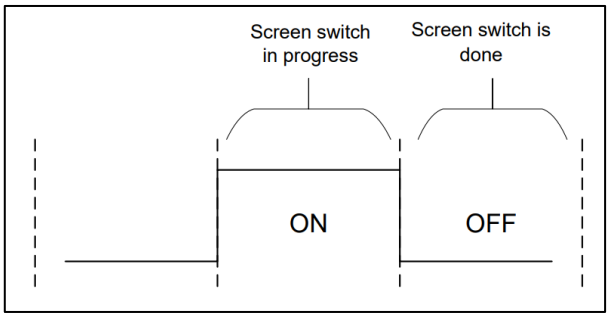
Status Block Register Type	Controller Register		Internal Memory	
	Register(D)	Example	Register ($)	Example
History Buffer Clearing status	Dn+4	D14	$n+4	$29
Recipe Control status	Dn+5	D15	$n+5	$30
Recipe Group Number status	Dn+6	D16	$n+6	$31
System Control status	Dn+7	D17	$n+7	$32
Enhanced Recipe Control status	Dn+8	D18	$n+8	$33
Enhanced Recipe Group Number status	Dn+9	D19	$n+9	$34

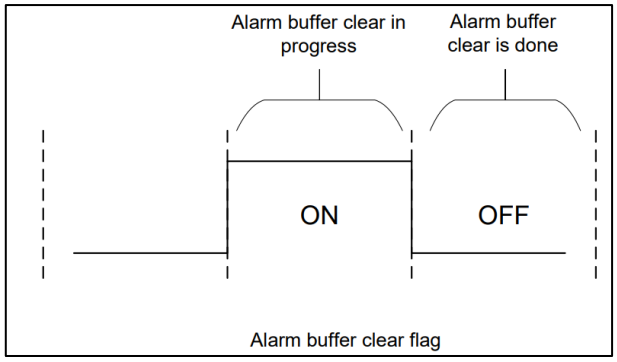
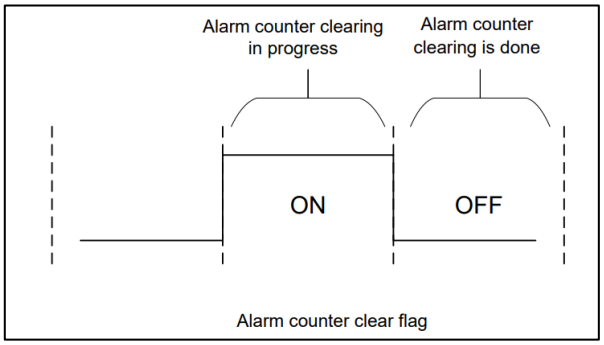
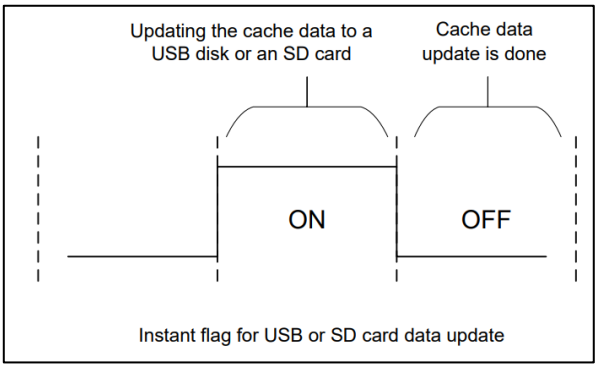
- General Control Status Register

General Control Status Register



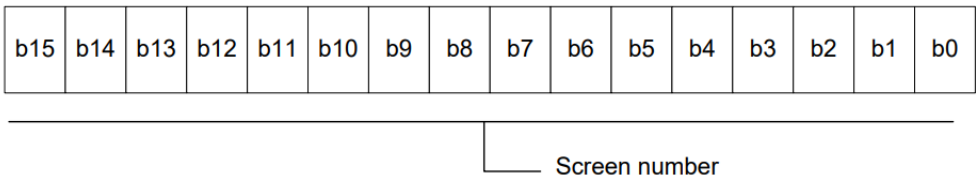
(1) b0 Screen switch flag
(2) b1 ~ b2 Reserved
(3) b3 Alarm buffer clear flag
(4) b4 Alarm counter clear flag
(6) b5 External storage device cache write flag
(5) b6 Remote control lock flag
(7) b7 Reserved
(8) b8 ~ b11 Flags for User Security Level settings
(9) b12 ~ b15 Reserved

b0 – Screen switch flag	• When the screen is switched, the flag is turned ON, • When the screen switch is complete, the flag is turned OFF. 

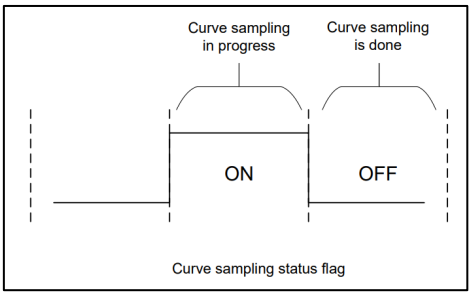
General Control Status Register	
b3 - Alarm buffer clear flag	● When the HMI is clearing the alarm buffer, the flag is turned ON. ● When the alarm buffer is cleared, the flag is turned OFF. 
b4 – Alarm counter clear flag	● When the HMI clears the alarm counter, the flag is turned ON. ● When the alarm counter is cleared, the flag is turned OFF. 
b5 – External storage device cache write flag	● When the HMI is updating the cache data into the USB flash drive or SD card, the flag is turned ON. ● When data update is completed, the flag is turned OFF. 
b6 – Remote control lock flag	● This flag indicates whether VNC is operable. ● When this flag is turned ON, VNC is not operable but can be monitored. ● When this flag is turned OFF, VNC is operable. ***NOTE***: *The **Auto Reset Flags** function is not applicable to this flag.*

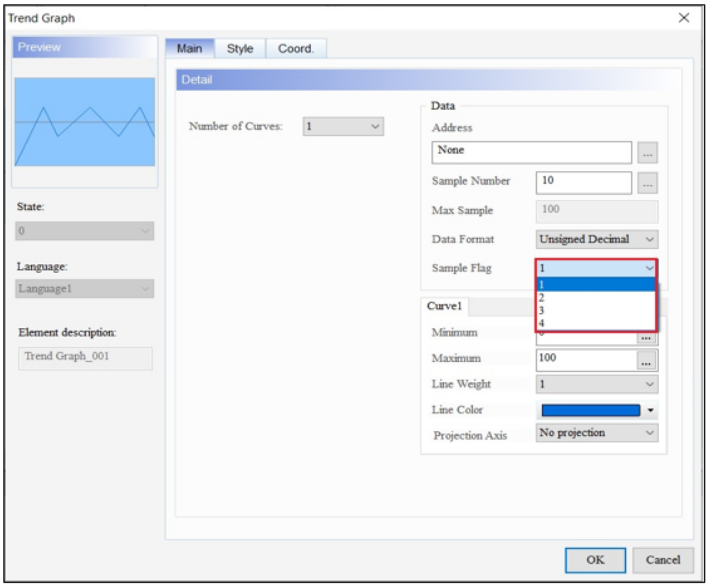
<table>
<tr><th colspan="2">General Control Status Register</th></tr>
<tr><td>b8 ~ b11 – for User Security Level settings</td><td>Users can find the current HMI operator security level from Bit 8, Bit 9, and Bit 10. Bit 11 is the highest security level.
<table>
<tr><th rowspan="2">Security Level</th><th colspan="4">Flag Control</th></tr>
<tr><th>Bit 11</th><th>Bit 10</th><th>Bit 9</th><th>Bit 8</th></tr>
<tr><td>Security level 0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Security level 1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>Security level 2</td><td>0</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>Security level 3</td><td>0</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>Security level 4</td><td>0</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>Security level 5</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>Security level 6</td><td>0</td><td>1</td><td>1</td><td>0</td></tr>
<tr><td>Security level 7</td><td>0</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>Highest security level</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
</table></td></tr>
</table>

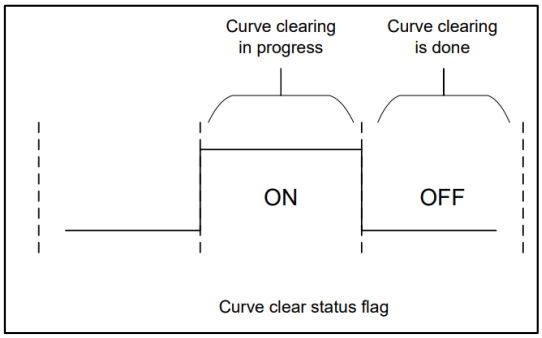
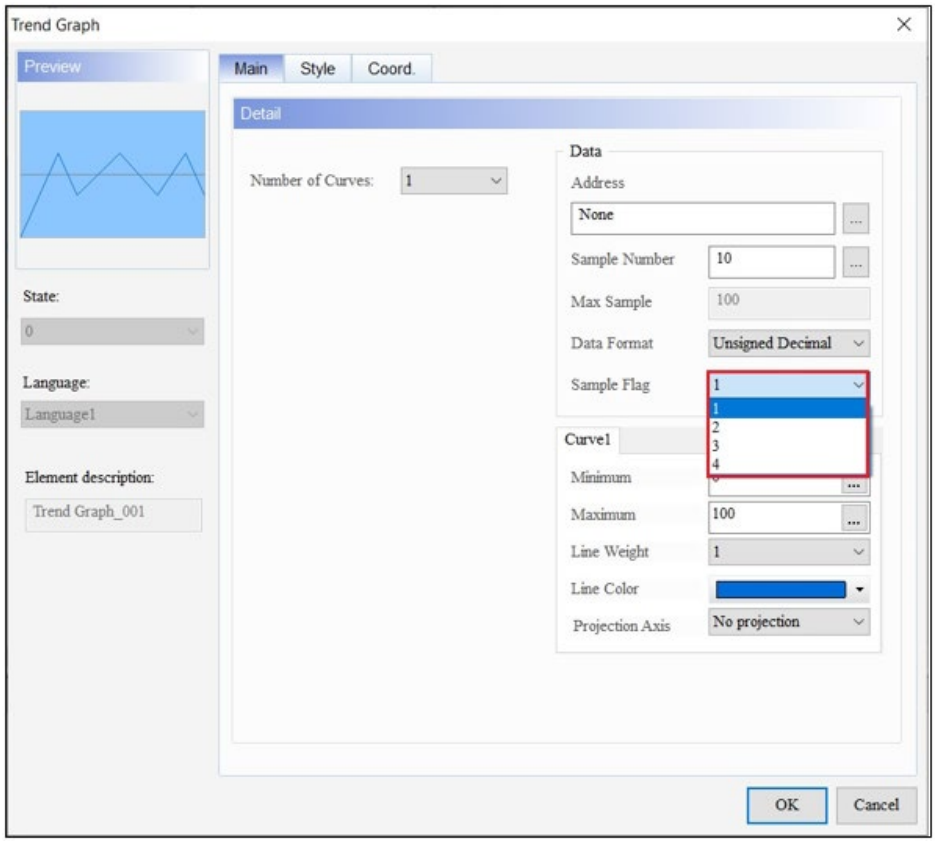
- Screen No. Status Register

<table>
<tr><th colspan="2">Screen No. Status Register</th></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td>b0 ~ b15 – Screen No. status</td><td>Check the last opened screen number with this status register.</td></tr>
</table>

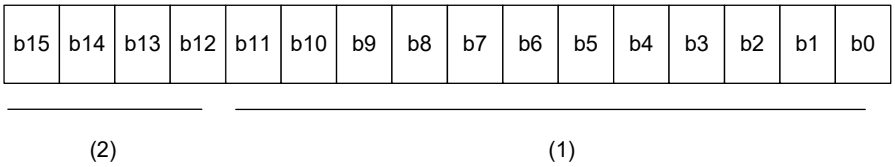
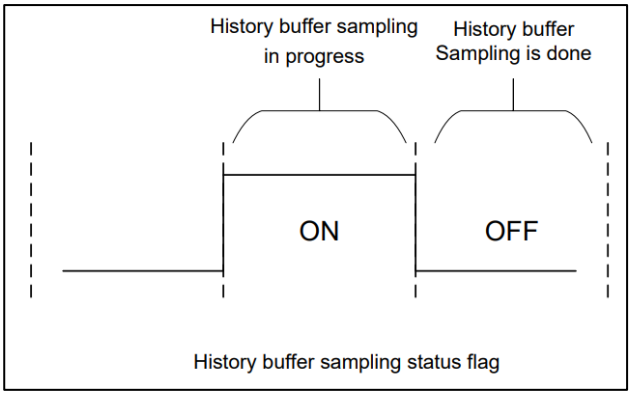
- Curve Control Status Register

<table>
<tr><th colspan="2">Curve Control Status Register</th></tr>
<tr><td colspan="2">
<table>
<tr><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr>
<tr><td colspan="4">(4)</td><td colspan="4">(3)</td><td colspan="4">(2)</td><td colspan="4">(1)</td></tr>
</table>
(1) b0 ~ b3 Curve sampling status flags 1 ~ 4 (b0 refers to flag 1, and so on)
(2) b4 ~ b7 Reserved
(3) b8 ~ b11 Curve clear status flags 1 ~ 4 (b8 refers to flag 1, and so on)
(4) b12 ~ b15 Reserved
</td></tr>
<tr><td>b0 ~ b3
–
Curve sampling status flags
(1 ~ 4)</td><td>When the Trend Graph or X-Y Chart elements sample the data, the HMI turns the corresponding curve sampling status flag ON. When the sampling is complete, the curve sampling status flag is turned OFF.
 

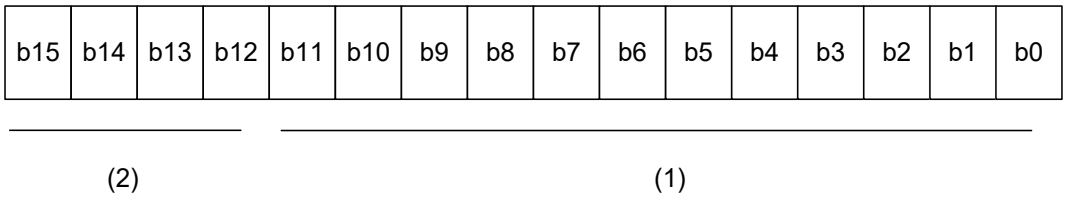
The sampling flag 1 of the Trend Graph element corresponds to the curve sampling status flag 1; the sampling flag 2 of the Trend Graph element corresponds to the curve sampling status flag 2, and so on.

</td></tr>
</table>

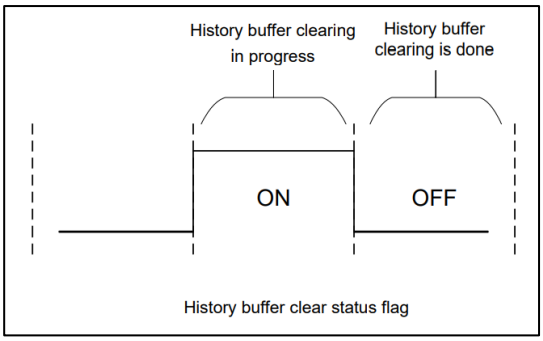
Curve Control Status Register	
b8 ~ b11 – Curve clear status flags (1 ~ 4)	When the **Trend Graph** or **X-Y Chart** elements clear the data, the HMI turns the corresponding curve clear status flag ON. When the clearing is complete, the curve clear status flag is turned OFF.  The clear flag 1 of the **Trend Graph** element corresponds to the curve clear status flag 1; the clear flag 2 of the **Trend Graph** element corresponds to the curve clear flag 2, and so on. 

- History Buffer Sampling Status Register

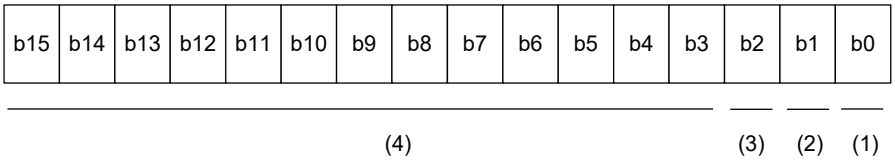
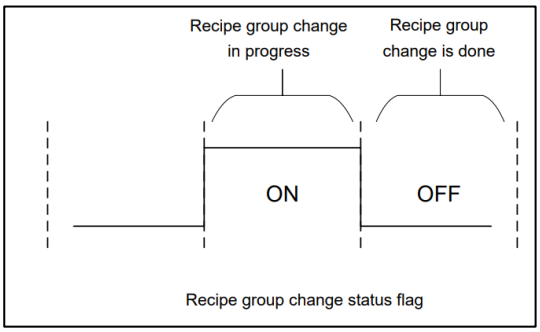
History Buffer Sampling Status Register	
 (1) b0 ~ b11 History buffer sampling flags 1 ~ 12 (b0 refers to flag 1, and so on) (2) b12 ~ b15 Reserved	
b0 ~ b11 – History Buffer Sampling status flags (1 ~ 12)	When the HMI samples the history buffer, it turns the corresponding history buffer sampling status flag ON. After the sampling is complete, the history buffer sampling status flag is turned OFF. 

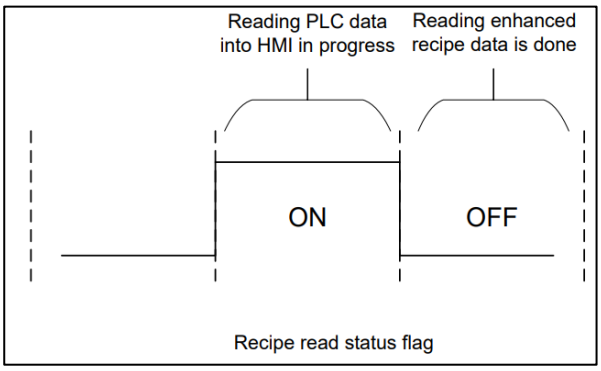
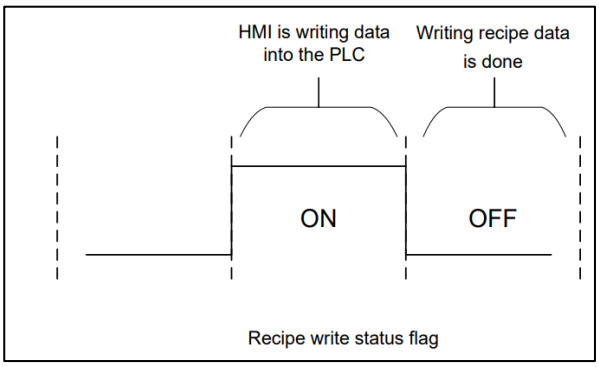
- History Buffer Clearing Status Register

History Buffer Clearing Status Register
 (1) b0 ~ b11 History buffer clear status flags 1 ~ 12 (b0 refers to flag 1, and so on) (2) b12 ~ b15 Reserved

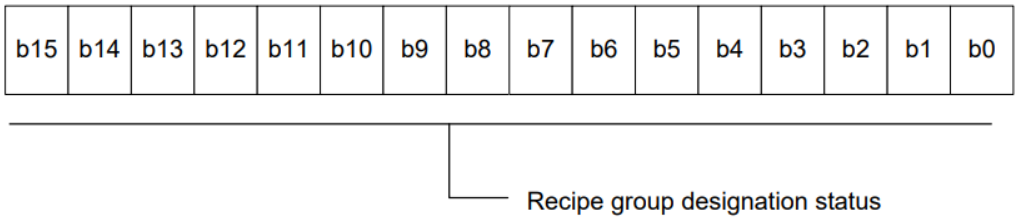
History Buffer Clearing Status Register	
b0 ~ b11 - History Buffer Clear Status flags (1 ~ 12)	When the HMI clears the history buffer, it turns the corresponding history buffer clear status flag ON. After the clearing is complete, the history buffer clear status flag is turned OFF. 

- Recipe Control Status Register

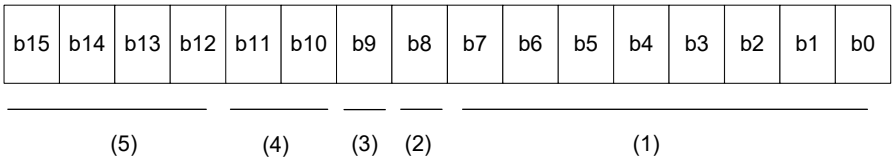
Recipe Control Status Register	
 (1) b0 Recipe group change status flag (2) b1 Recipe read status flag (PLC → HMI) (3) b2 Recipe write status flag (HMI → PLC) (4) b3 ~ b15 Reserved	
b0 – Recipe group change status flag	When the control recipe group in the **Control Block** is changed, the recipe group change status flag is turned ON; when the HMI changes the recipe group and completes updating the RCPNO number, the recipe group change status flag is turned OFF. 
b1 – Recipe read status flag	When the HMI reads back one set of recipe data from the Control Block, the recipe read status flag is turned ON; when the HMI completes reading and saving the recipe through the **Control Block**, the recipe read status flag is turned OFF.

Recipe Control Status Register	
	
b2 – Recipe write status flag	When the HMI sends one set of designated recipe data to the **Control Block**, the recipe write status flag is turned ON; when the HMI completes writing the recipe into the **Control Block**, the recipe write status flag is turned OFF. 

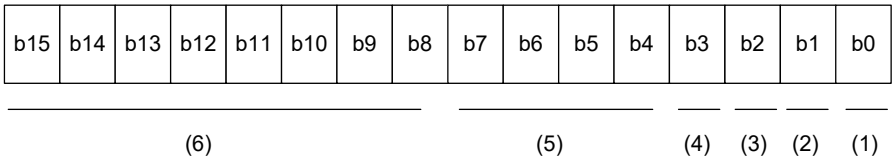
- Recipe Group Number Status Register

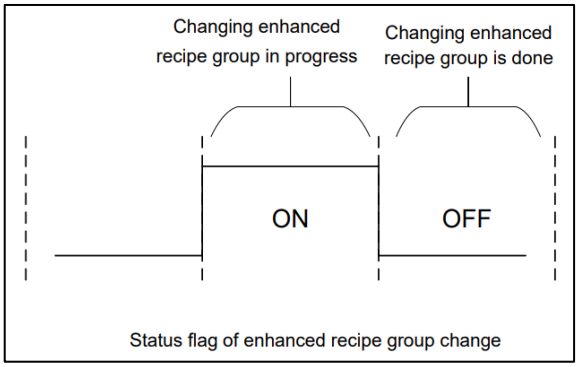
Recipe Group Number Status Register	
	
b0 ~ b15 – Recipe group number designation status	• Whether users designate the recipe number by using the recipe group number change flag of the **Control Block** or by the RCPNO register, the recipe group number status register updates its value as soon as the recipe group number changes. • This recipe group designation flag must work with the recipe group change flag.

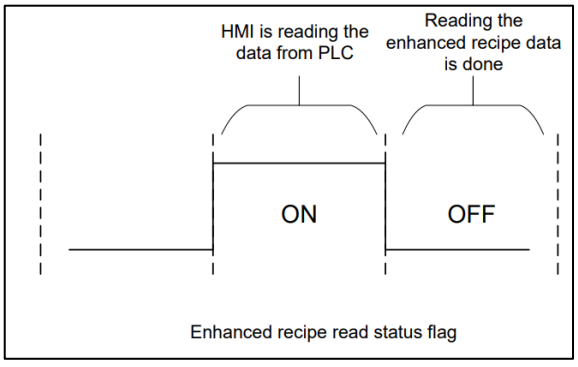
- System Control Status Register

System Control Status Register	
 (1) b0 ~ b7 Multi-language status value (2) b8 Printer status flag (3) b9 Printer form feed status flag (4) b10 ~ b11 Retrieve the Ethernet address (if using DOP-112 and DOP-115 models, b10 is for LAN1m control, b11 is for LAN2 control) (5) b12 ~ b15 Reserved	
b0 ~ b7 – Multi-language status value	Display the corresponding status value of the language in use.
b8 – Printer status flag	When the print status flag is turned ON, the printer prints the display screen or the edited screen of the HMI; when the printer status flag is turned OFF, the printer is idled.
b9 – Printer form feed status flag	When the printer form feed status flag is turned ON, the printer retracts the paper and aligns the paper for the next run automatically; when the flag is OFF, the printer is idled.
b10 ~ b11 – Retrieve ethernet address status value	Display whether the status value of the Ethernet network is retrieved.

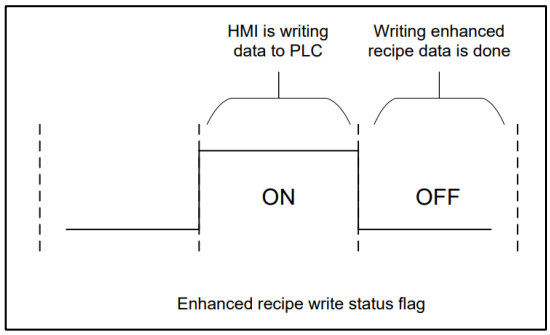
- Enhanced Recipe Control Status Register

<table>
<tr><th colspan="2">Enhanced Recipe Control Status Register</th></tr>
<tr><td colspan="2">


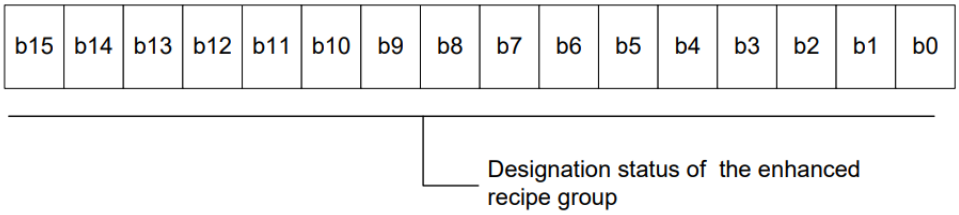
(1) b0 Enhanced recipe group change status flag
(2) b1 Enhanced passive read status flag (PLC → HMI)
(3) b2 Enhanced recipe write status flag (HMI → PLC)
(4) b3 Enhanced recipe group category change
(5) b4 ~ b7 Reserved
(6) b8 ~ b15 Designation status of the enhanced recipe group number to be changed
</td></tr>
<tr><td>b0 – Enhanced recipe group change status flag</td><td>When the control-enhanced recipe group in the Control Block is changed, the recipe group change status flag is turned ON. When the HMI group is changed and the RCPNO number is updated, the recipe group change status flag is turned OFF.


</td></tr>
<tr><td>b1 – Enhanced recipe read status flag</td><td>When the HMI reads one set of recipe data through the Control Block, the enhanced recipe read status flag is turned ON; when the reading and saving of the enhanced recipe via the Control Block is complete, the enhanced recipe read status flag is turned OFF.


</td></tr>
</table>

Enhanced Recipe Control Status Register	
b2 - Enhanced recipe write status flag	When the HMI sends one set of designated enhanced recipe data through the **Control Block**, the recipe write status flag is turned ON; after the enhanced recipe is written through the **Control Block**, the enhanced recipe write status flag is turned OFF. 

- Enhanced Recipe Group Control Status Register

Enhanced Recipe Group Control Status Register	
	
b0 ~ b15 – Enhanced Recipe group designation status	• Whether users designate the enhanced group number by using the enhanced recipe group change flag of the **Control Block** or by the ENRCPNO register, the enhanced recipe group status register updates its value as soon as the value changes. Thus, the **Control Block** accesses the recipe group with this register. • The enhanced recipe group designation status flag must work with the enhanced recipe group change status flag.

Chapter 5: Button

Create Button elements through **Elements** > **Button**.

Or

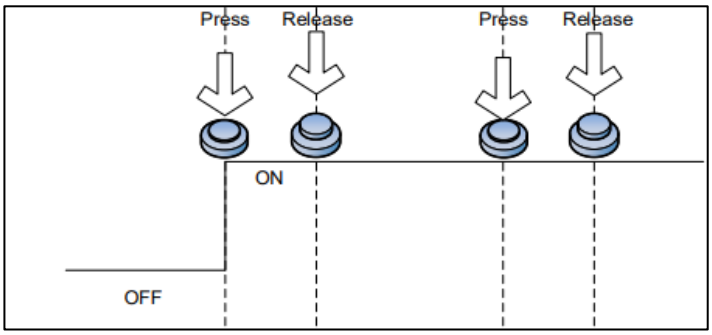
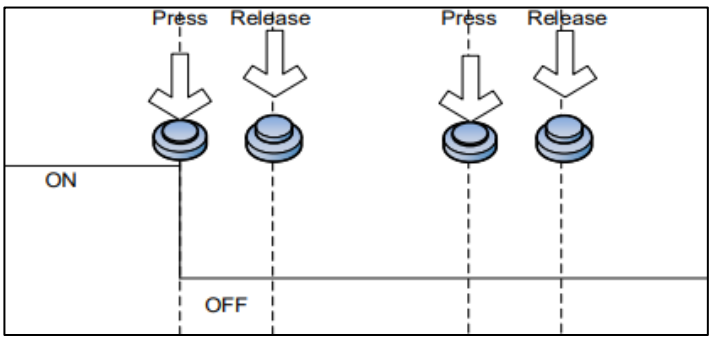
Button icons provided in the **Elements** toolbar.

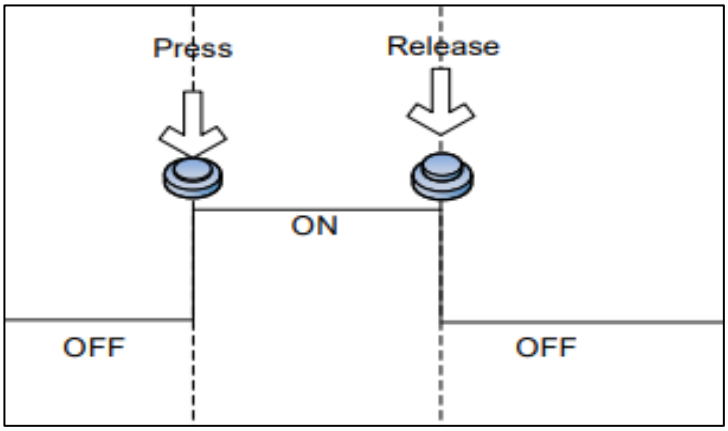
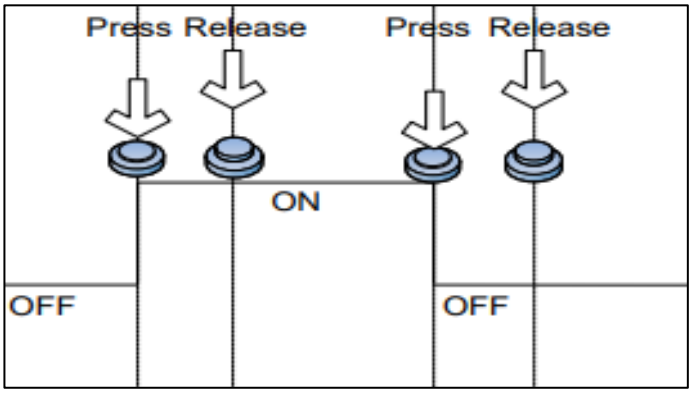
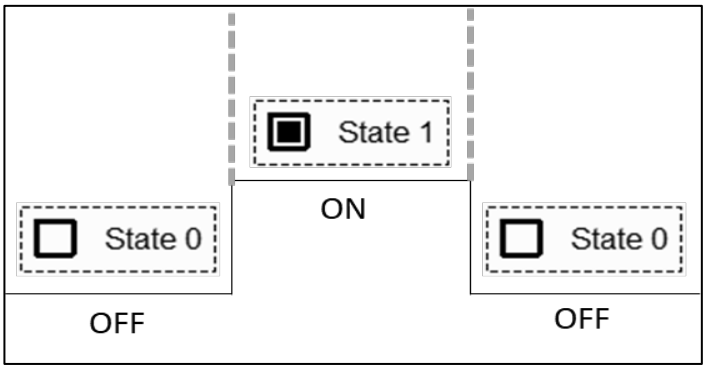
Or

By right-clicking the screen to select the **Button** elements.

5.1 Set to On / Set to Off / Maintained / Momentary / Checkbox

Set to On / **Set to Off** / **Maintained** / **Momentary Button** elements switch the specified communication address to ON / OFF by touching the buttons or running the macros.

Element / Icon	Description
Set to On Button 	 The specified communication address switches to ON when users press the **Set to On Button** element. Users cannot switch the state to OFF by pressing the **Set to On Button** element again.
Set to Off Button 	 The specified communication address switches to OFF when users press the **Set to Off Button** element. Users cannot switch the state to ON by pressing the **Set to Off Button** element again.

Element / Icon	Description
Momentary Button	 The **Momentary Button** element allows users to reverse the specified communication address values. When the **Momentary Button** element is released, the communication address recovers to its original state. To keep the communication address values reversed, users must continuously press the button element.
Maintained Button	 The **Maintained Button** element allows users to reverse the specified communication address values. The **Maintained Button** element differs from the **Momentary Button** element in a way that when the **Maintained Button** element is pressed, the specified communication address values stay reversed. Users need to press the **Maintained Button** element again for the specified communication address to recover to its original state.
Checkbox Button	 The **Checkbox Button** element allows users to reverse the specified communication address values. When the **Checkbox Button**

Element / Icon	Description
	element is released, the specified communication address value remains in the reverse state. When the **Checkbox Button** element is again pressed, the original state of the specified communication address will be restored.

DIAScreen also provides convenient programming tools to double-click the elements to set their properties and thus edit the application screens easily.

On double-clicking the **Set to On** / **Set to Off** / **Maintained** / **Momentary** / **Checkbox Button** elements, the property page appears as follows.

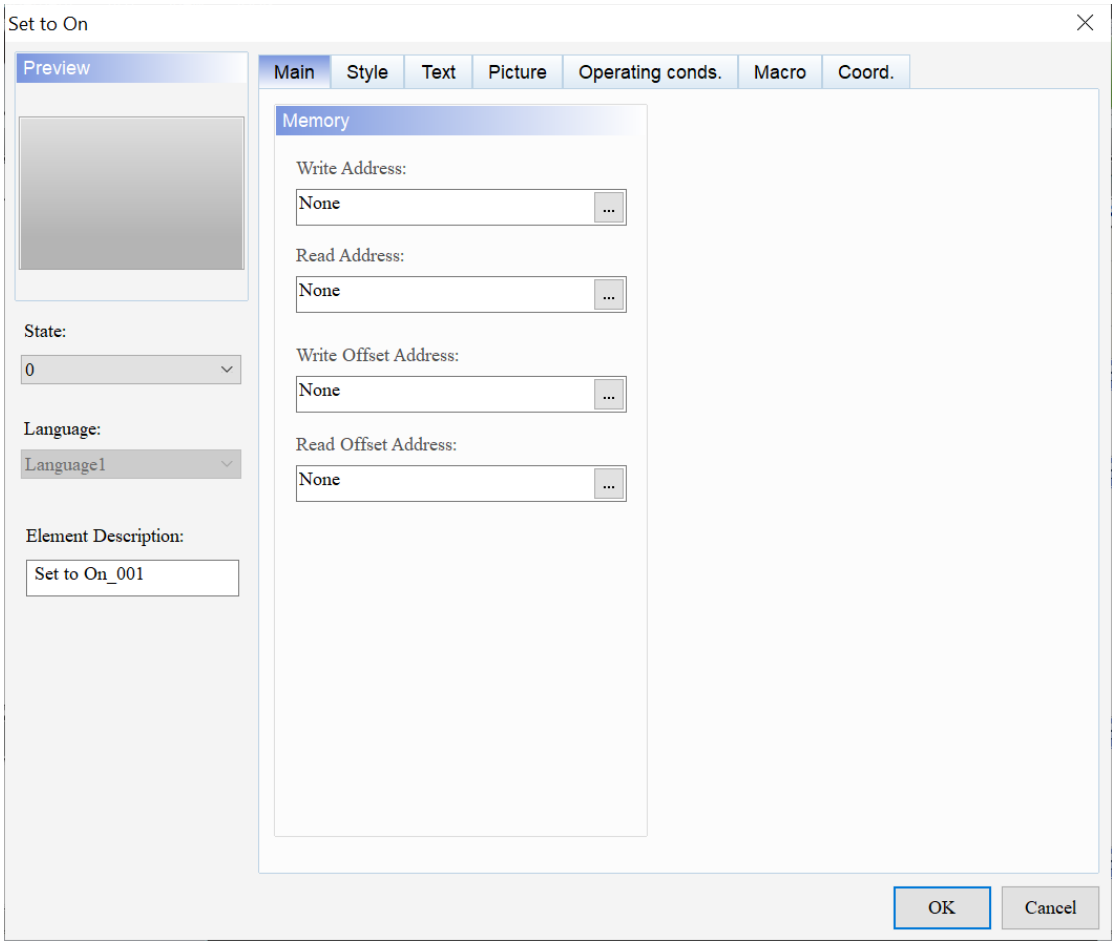


Figure 5 - 1: Set to On / Set to Off / Momentary / Maintained / Checkbox Button element property page

Function	Description
Preview	View the status 0 or 1 of the element and display data in multiple languages.
Main	Set the Write Address, Read Address, Write Offset Address, and Read Offset Address.
Style	Set the Style, Foreground Color, Blink, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set the Interlock Address, Interlock State, Interlock Display Mode, Invisible Address, Invisible State, User Security Level, Set Low Security, Min. Press Time, Confirm Window, and Modifier + Hot Key.
Macro	Set On Macro, Off Macro, Before Execute Macro, and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

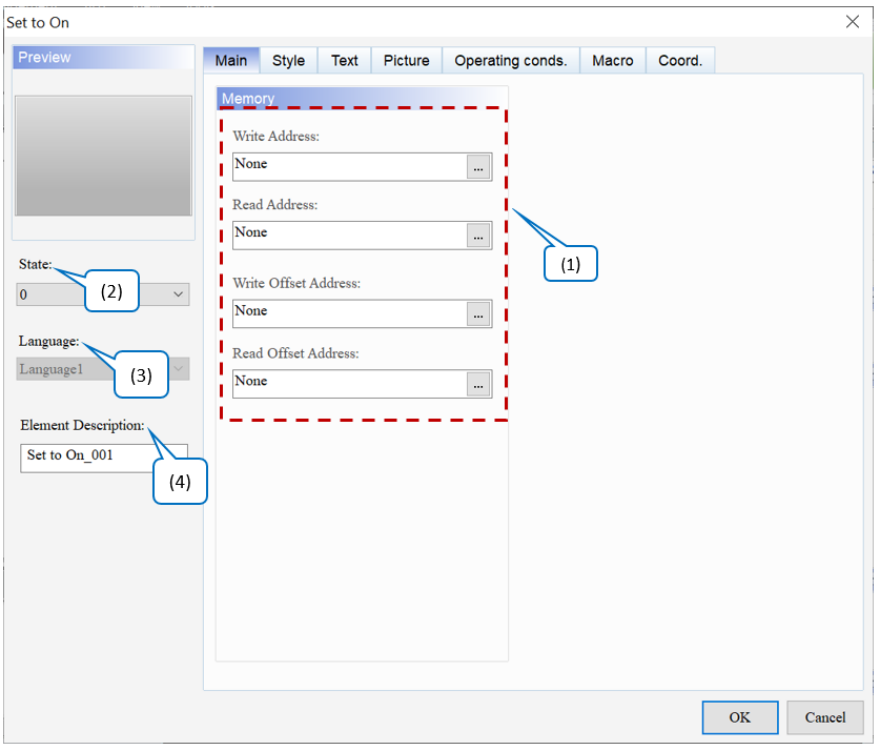
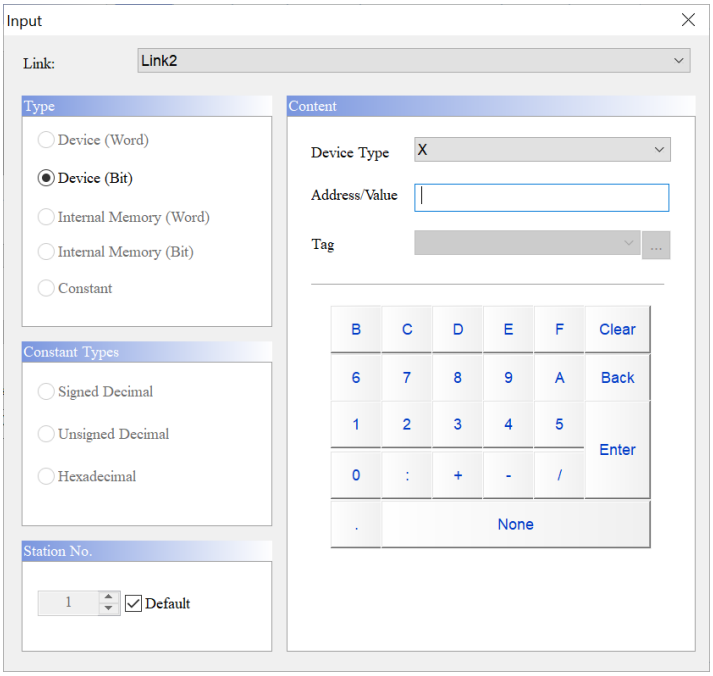
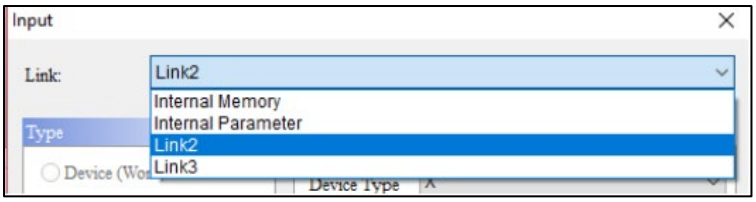
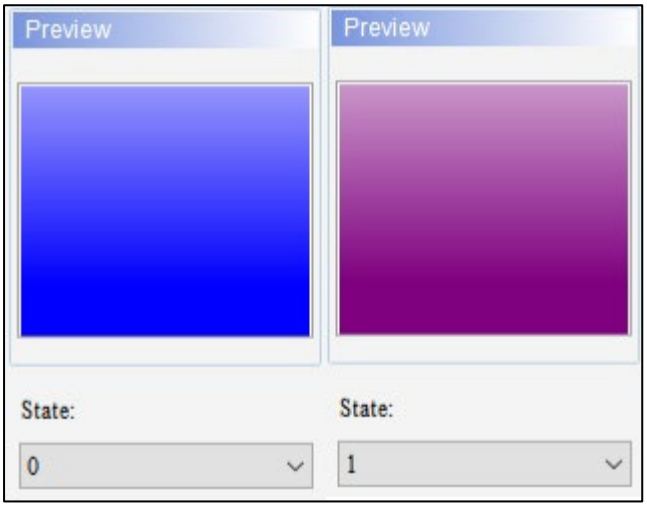
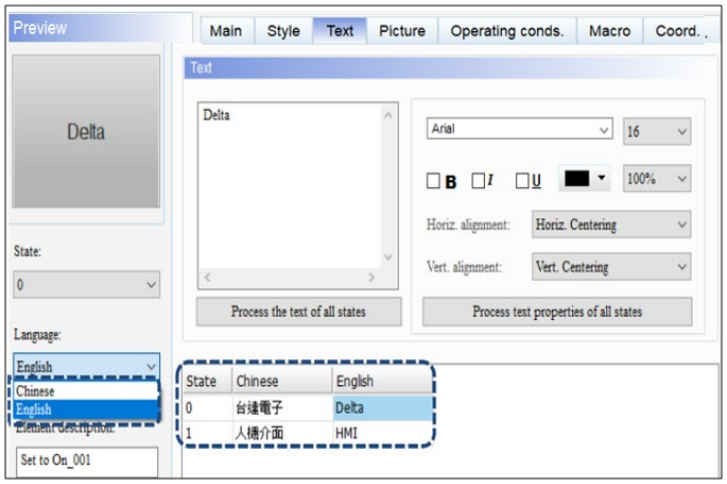
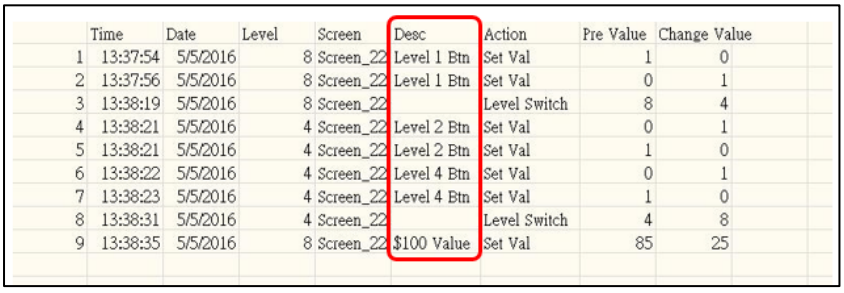


Figure 5 - 2: Set to On / Set to Off / Momentary / Maintained / Checkbox Button element Main property page

No.	Function	Description
(1)	Memory	● **Write Address** 1. Select Internal Memory or controller register address. If only the **Write Address** is set but the **Read Address** is not set, the HMI will automatically read the value written to the memory address.  2. Select the link for different communication devices from the **Link**. It displays the quantity of the set links. If multiple communication devices are there, select the required link from the drop-down list box. The available options for **Link** are: Link2, Link3, Internal Memory, and Internal Parameter.  3. Select the **Link** and **Device Type**, enter correct address in **Address/Value** field in the **Input** window, and click **OK**. The selected element records the corresponding data. ● **Read Address**: Select the Internal Memory or the controller register address. Other settings are the same as that of **Write Address**. ● **Write Offset Address** and **Read Offset Address**: Refer to the instructions in *Appendix D Write and Read Offset Address*.

No.	Function	Description
(2)	State	Preview or change the setting parameters of each state of the element by switching the **State**. 
(3)	Language	If users set the language data, the properties of the displayed text can be edited with the **Language** setting of the element. 
(4)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that the users can easily know the performed actions. 

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

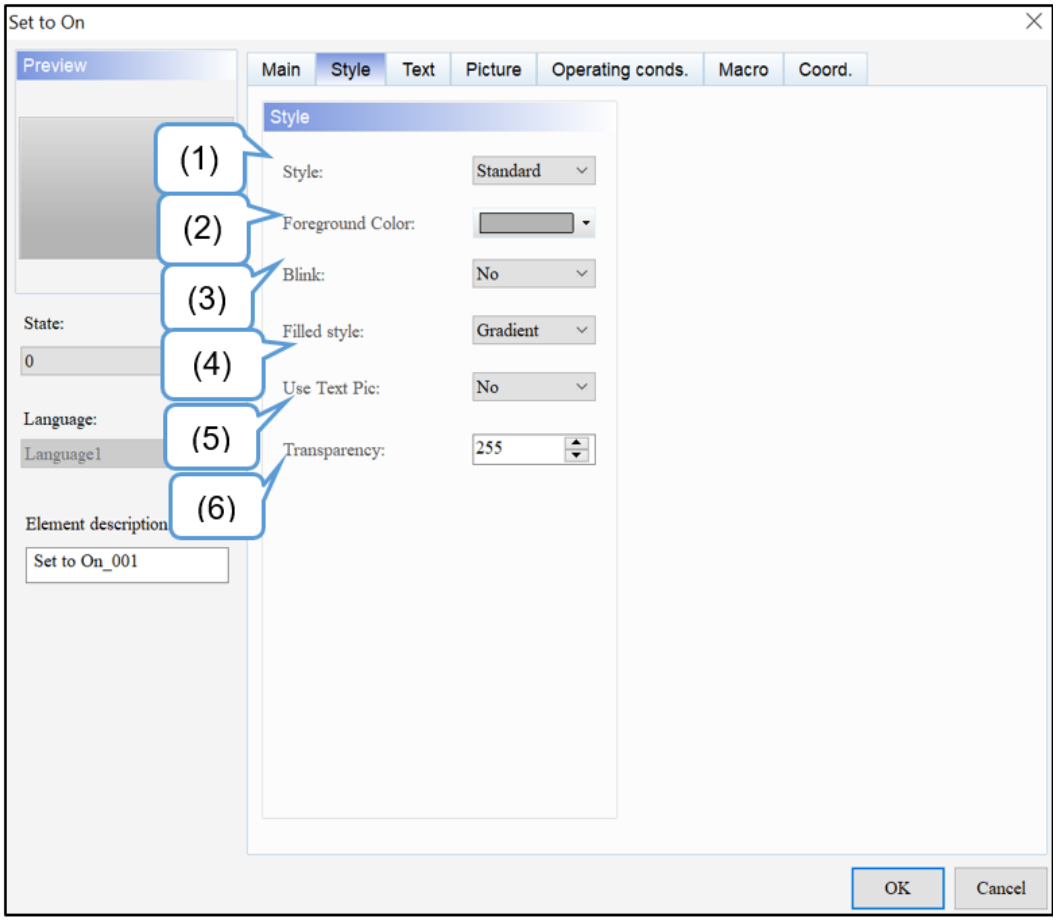
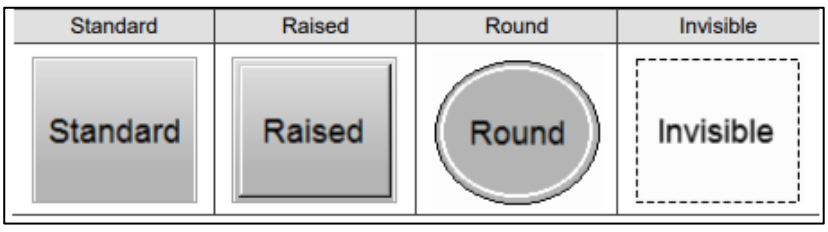
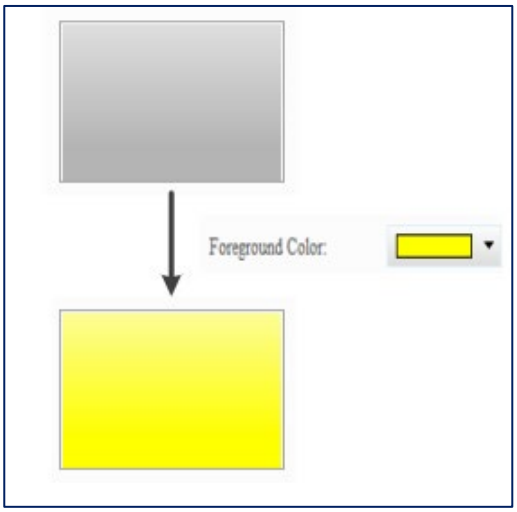
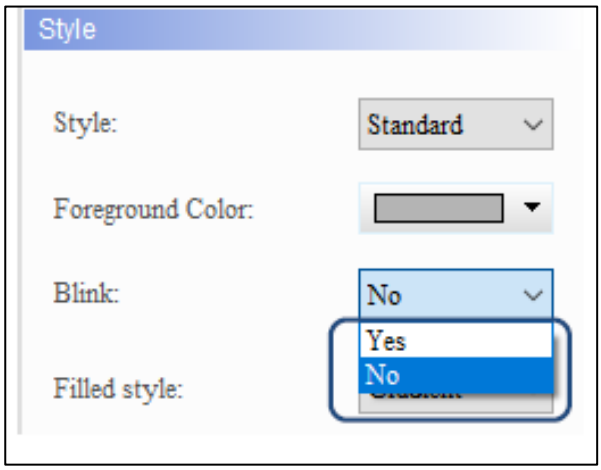
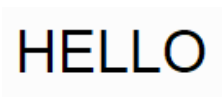


Figure 5 - 3: Set to On / Set to Off / Momentary / Maintained / Checkbox Button element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Round, and Invisible. The default value is **Standard**. 
(2)	Foreground Color	● Set the foreground color of the element. The default is  .

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

When the Style is set to Invisible, the Foreground Color setting is invalid.</td></tr>
<tr><td>(3)</td><td>Blink</td><td>Set the blink prompt of the element when it changes states. The Blink color is the opposite color of the foreground color. The default value is No.
 
</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
When the DOP-B project is opened on a DOP-100 series model, the elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.
<table>
<tr><td>Gradient</td><td>  </td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Fixed  </td></tr>
<tr><td>(5)</td><td>Use Text Pic</td><td>
Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
Refer to the following example.
<table>
<tr><th>Use Text Pic is Yes</th><th>Use Text Pic is No</th></tr>
<tr><td>  </td><td>  </td></tr>
</table>
NOTE: If users use DIAScreen to open the DOP-B project, the Use Text Pic function will be set to Yes by default; if users add a new DOP-100 project, the Use Text Pic function will be set to No by default.
</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

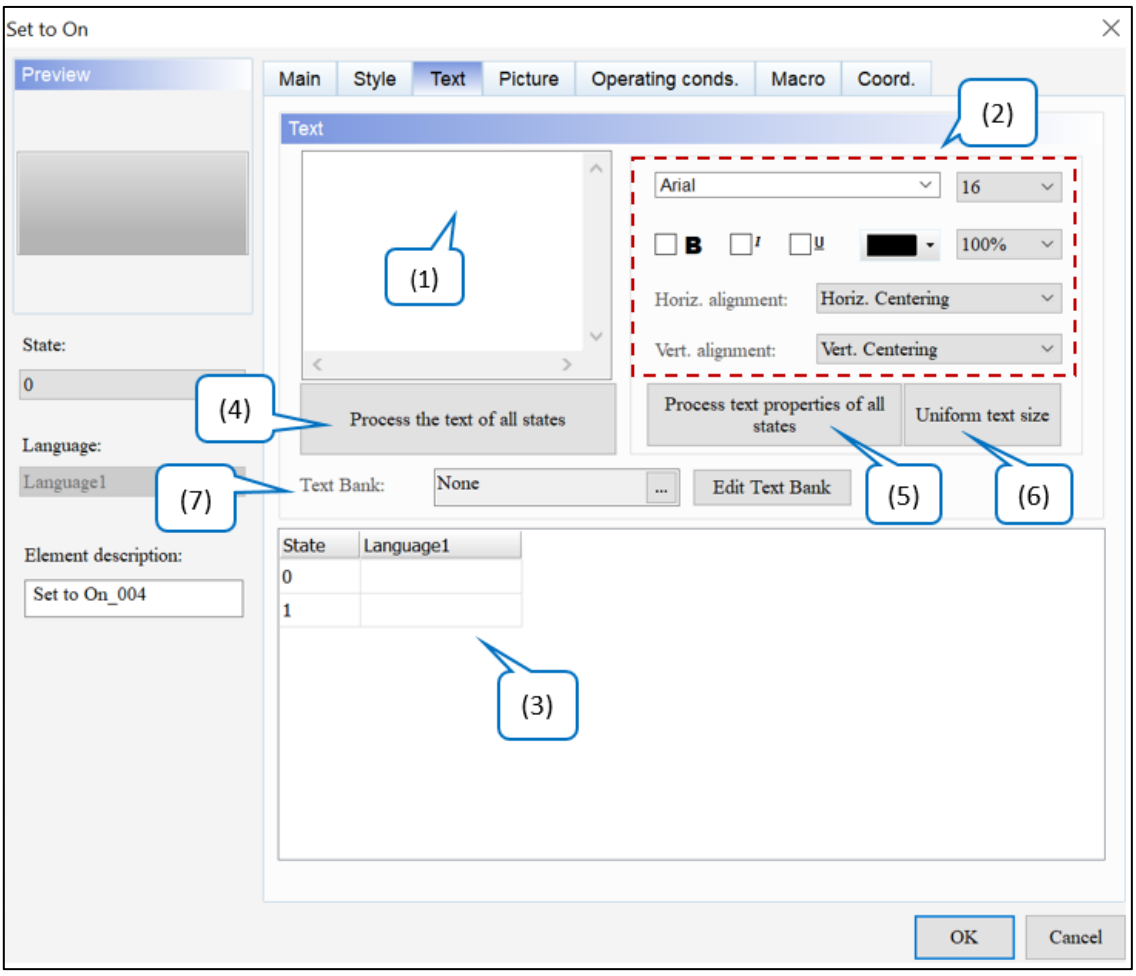
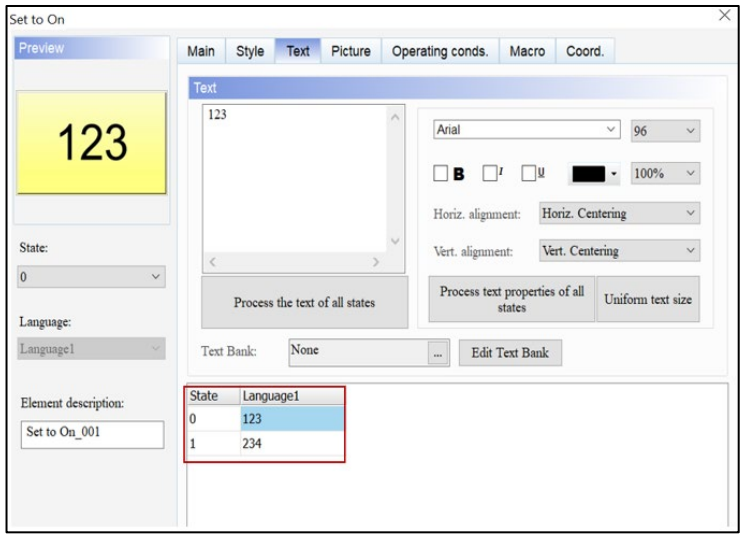
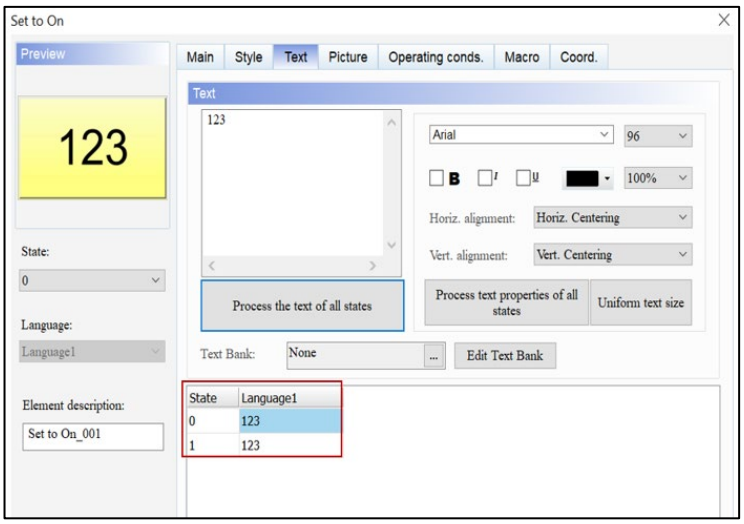
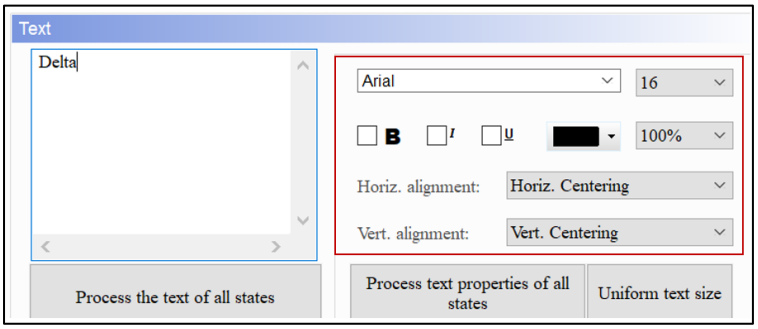
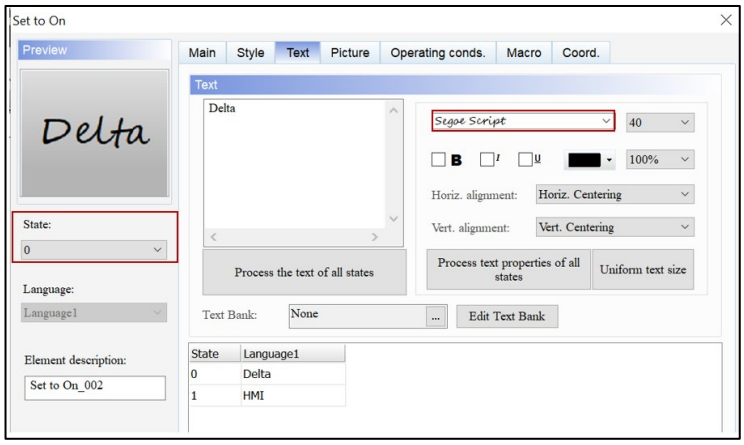
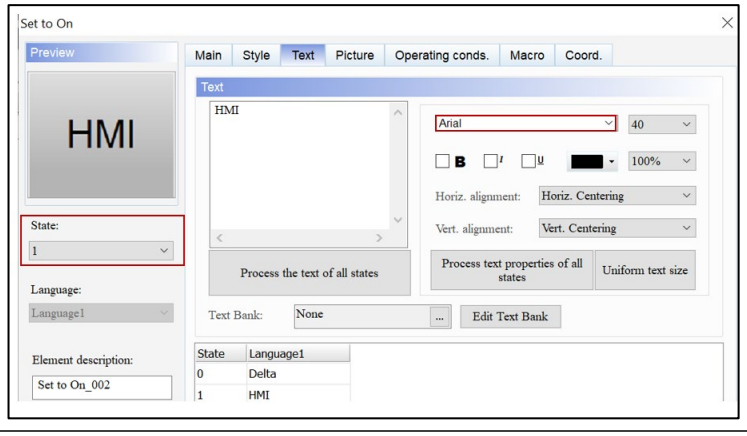
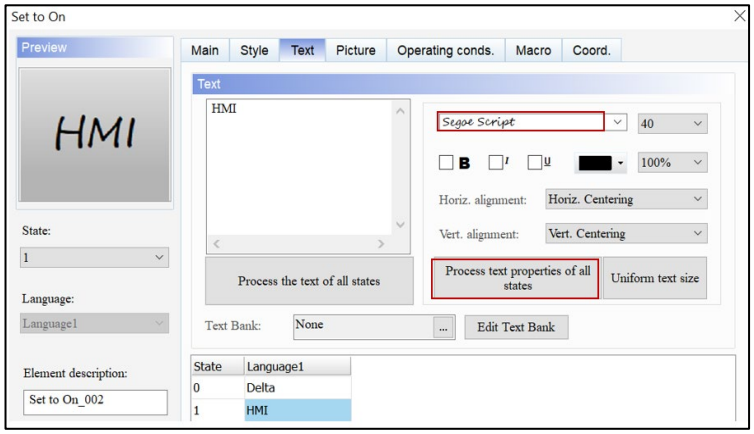


Figure 5 - 4: Set to On / Set to Off / Momentary / Maintained / Checkbox Button element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text-related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit Multi-language text	If users add multi-language data, the **Text** page allows to edit multi-language text data. As shown in the **Text** property page, users can enter English text in the **English** column.

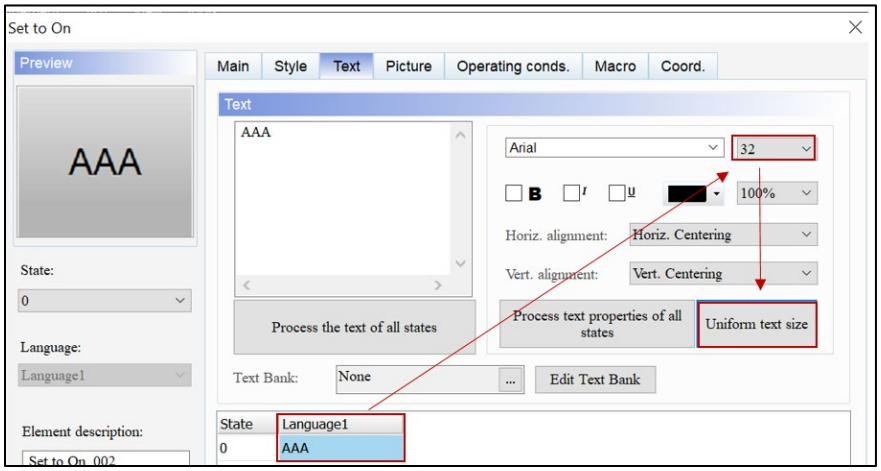
No.	Function	Description
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state users select. ● The following illustrates the steps: 1. Input *123* to State 0, and *234* to State 1. 2. Click State 0. 3. Click **Process the text of all states**, and State 1 text changes to *123*. Before Change  After Change 
(5)	Process text properties of all states	● This function changes all the text properties based on the state users select. Items included in the text property are shown in the following figure.

No.	Function	Description
		 ● The following is an example description: 1. Input *Delta* to State 0, and set the font to Segoe Script; input *HMI* to State 1, and set the font to Arial. 2. Click State 0. 3. Click **Process text properties of all states**, and State 1 font changes to Segoe Script. Before Change  

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>After Change
 
</td></tr>
<tr><td>(6)</td><td>Uniform text size</td><td>

This function is for all language texts, and changes the size of all texts at one time according to the currently selected state.
The following is an example description and steps:

To configure multiple languages, refer to <u>Section 25.1 Multi-language Settings</u>.
Select the state to change the text size.
Execute the Uniform text size, and the text size of all languages will be changed to the set size.



</td></tr>
<tr><td>(7)</td><td>Text Bank</td><td>Refer to <u>Section 28.6 Text Bank</u>.</td></tr>
</table>

- Picture

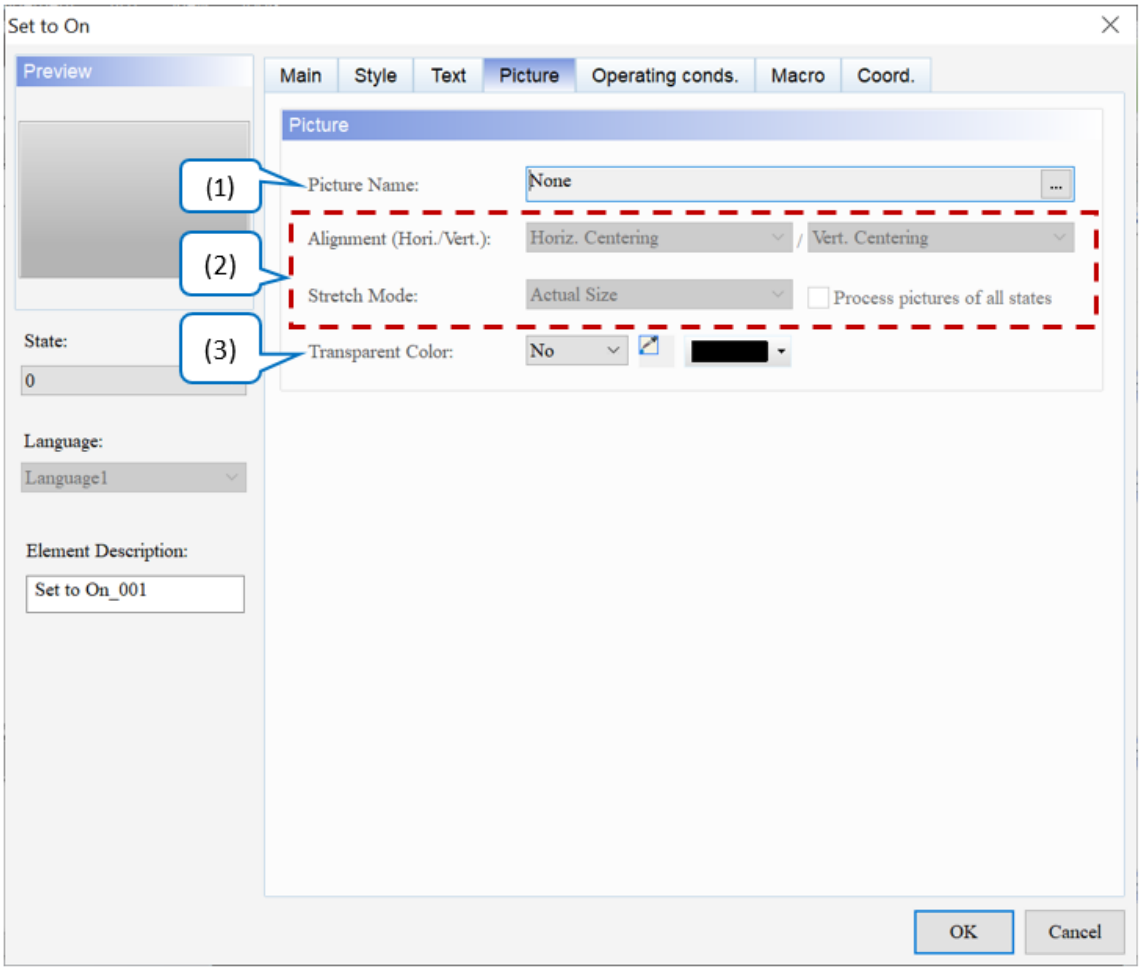
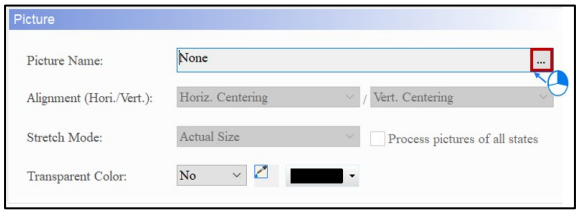
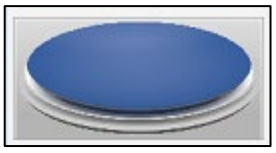


Figure 5 - 5: Set to ON / Set to OFF / Momentary / Maintained / Checkbox Button element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and makes it transparent, which becomes identical to the</td></tr>
</table>

No.	Function	Description
		Foreground Color of the element. 

- Operating conds.

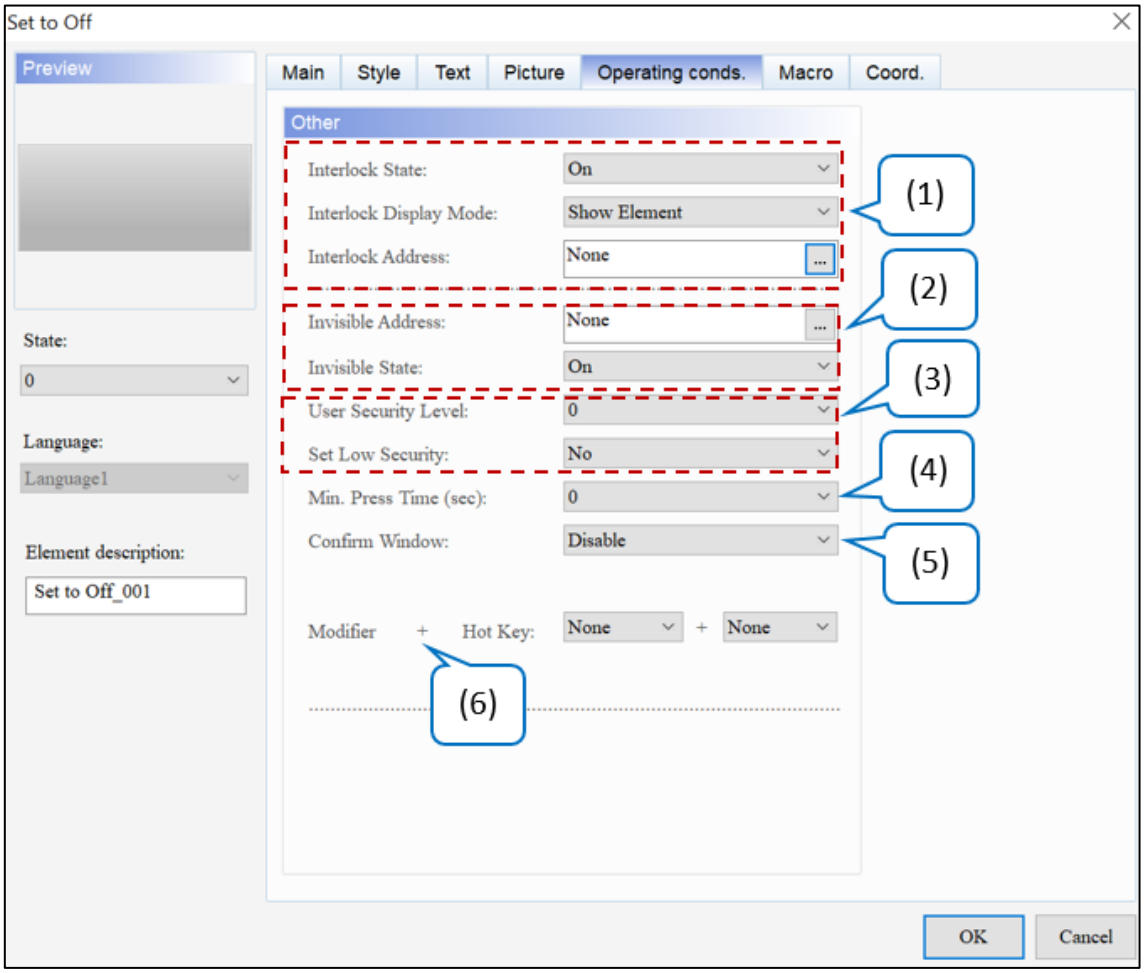
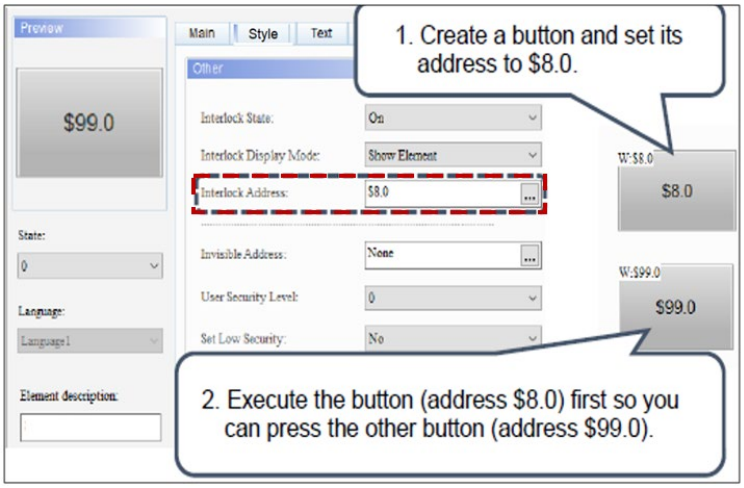


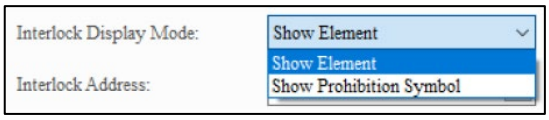
Figure 5 - 6: Set to ON / Set to OFF / Momentary / Maintained / Checkbox Button element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="4">(1)</td><td>Interlock State</td><td>

The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The following describes how it works:

Create a button and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element whose address is $99.0.
For $99.0 to work, first press the $8.0 before the $99.0 action takes effect.



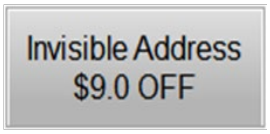
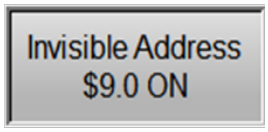
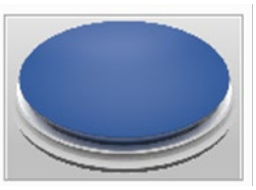
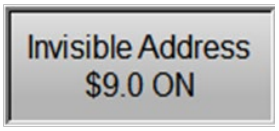
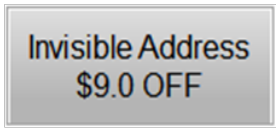
</td></tr>
<tr><td>Interlock Address</td><td></td></tr>
<tr><td rowspan="3">Interlock Display Mode</td><td>
The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.


</td></tr>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>

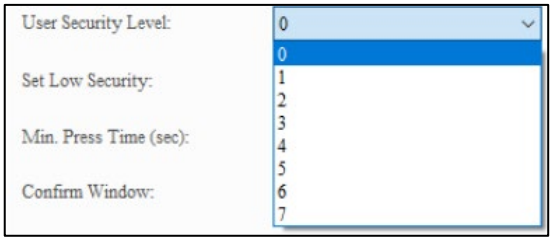
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Invisible Address</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

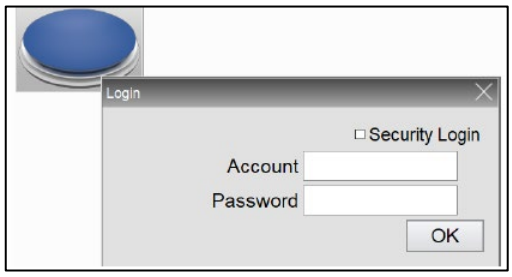
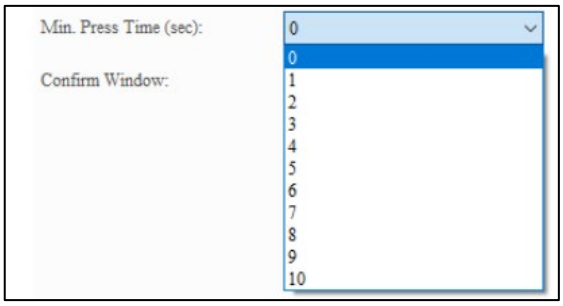
<table>
<tr><td>Invisible State is On</td><td>  </td><td> 
</td></tr>
<tr><td></td><td>Element disappear</td><td> 
</td></tr>
<tr><td>Invisible State is Off</td><td>  </td><td> 
</td></tr>
<tr><td></td><td>Element disappear</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td></tr>
<tr><td rowspan="2">(3)</td><td>User Security Level</td><td rowspan="2">

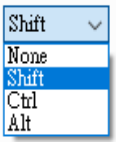
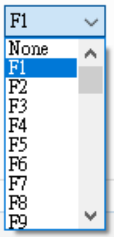
This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level.
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).



If users set the Set Low Security to Yes, each time

</td></tr>
<tr><td>Set Low Security</td></tr>
</table>

No.	Function	Description
		users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**. 
(4)	Min. Press Time	• Set how long it takes for the element to be pressed before it will act. When the pressing exceeds the set time, the element acts, so as to avoid the occurrence of error by users. • The range can be set from 0 ~ 10 seconds. The default value is **0**. 
(5)	Confirm Window	• The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. • Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 
(6)	Read after writing	When the R/W IO settings are different, after triggering the writing of IO_Addr1, skip read optimization, wait 0 ~ 5 ms, and directly read IO_Addr2. ***NOTE**: This function is available for **Maintained Button**, **Momentary Button**, and **Checkbox Button** elements.*

No.	Function	Description
(6)	Modifier + Hot Key	● Allows users to connect the external keyboard to execute buttons through shortcut keys. ● The **Modifier** keys include None, Shift, Ctrl, and Alt.  ● The available **Hot Key** options are: F1 ~ F12, English letters A ~ Z, and number keys 0 ~ 9. 

- Macro

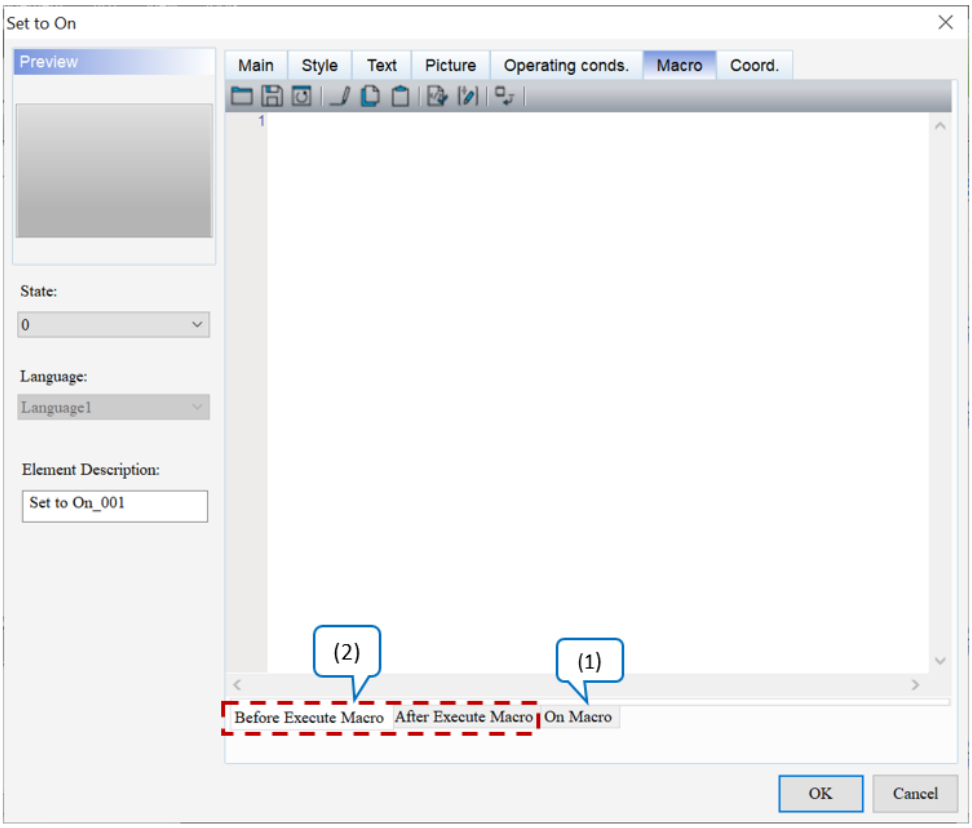
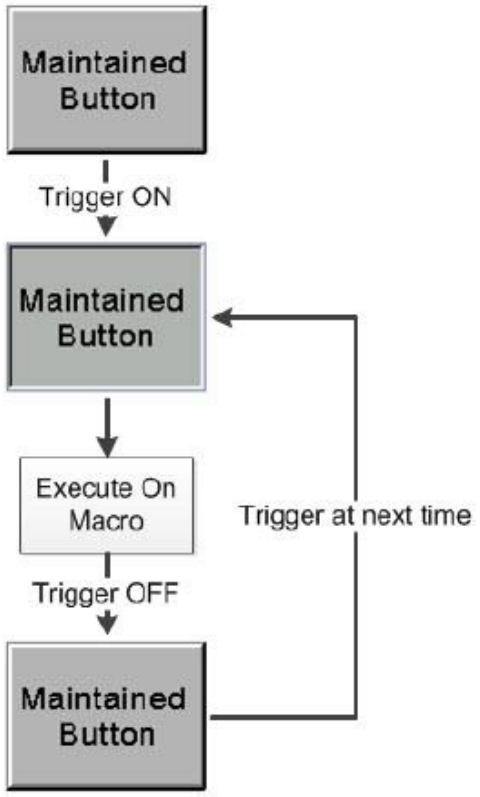
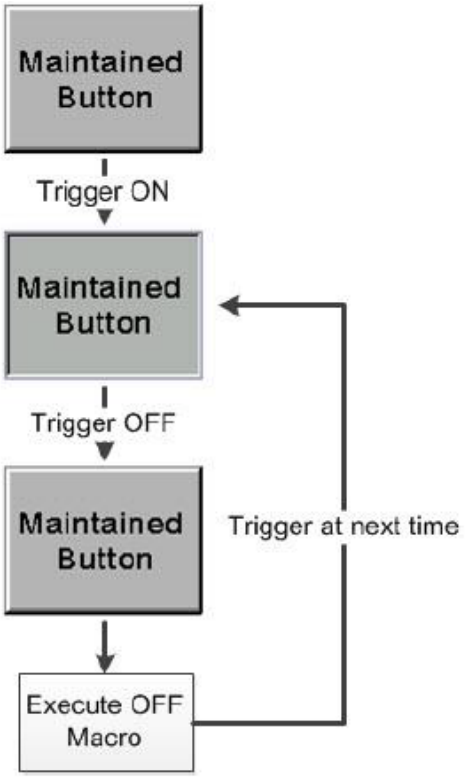
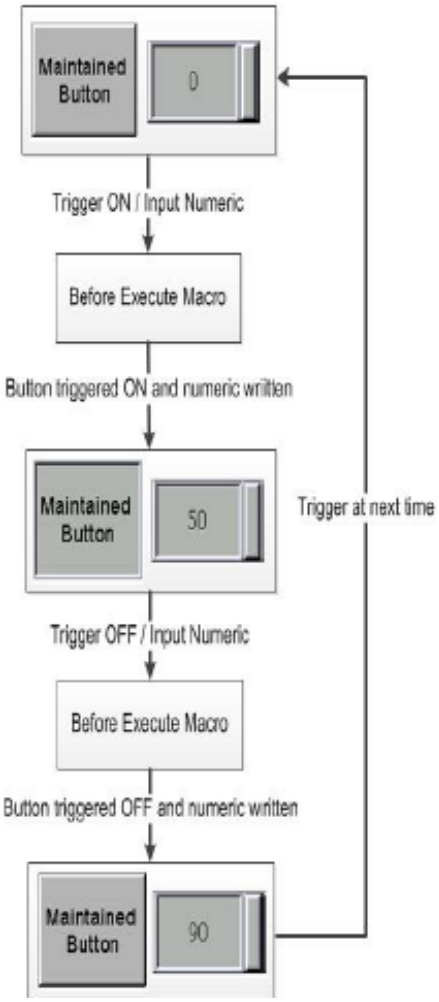
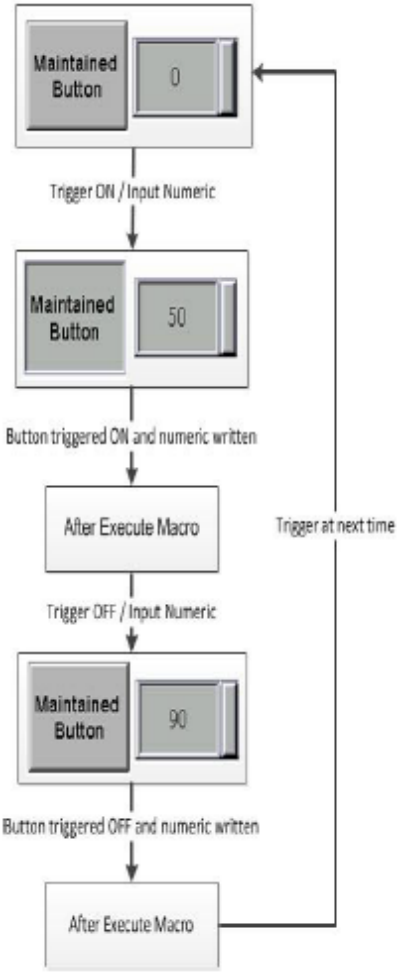


Figure 5 - 7: Set to ON / Set to OFF / Maintained / Momentary / Checkbox Button element Macro property page

<table>
<tr><th>No.</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3">(1)</td><td>On Macro</td><td>Off Macro</td></tr>
<tr><td>Flowchart of On Macro:
 
</td><td>Flowchart of Off Macro:
 
</td></tr>
<tr><td colspan="2">When users switch the state to On by pressing the Button, the HMI executes the On Macro commands. When users switch the state to Off by pressing the Button, the HMI executes the Off Macro commands. However, the On Macro / Off Macro commands will not be executed if the Button states are not changed with the Button touch (using external controller commands or other macros instead).
Each time the ON / OFF state is triggered, the On Macro / Off Macro will only be executed once and will not be executed repeatedly.</td></tr>
</table>

No.	Description	
	Before Execute Macro	After Execute Macro
(2)	Flowchart of **Before Execute Macro**:  When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.	Flowchart of **After Execute Macro**:  When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

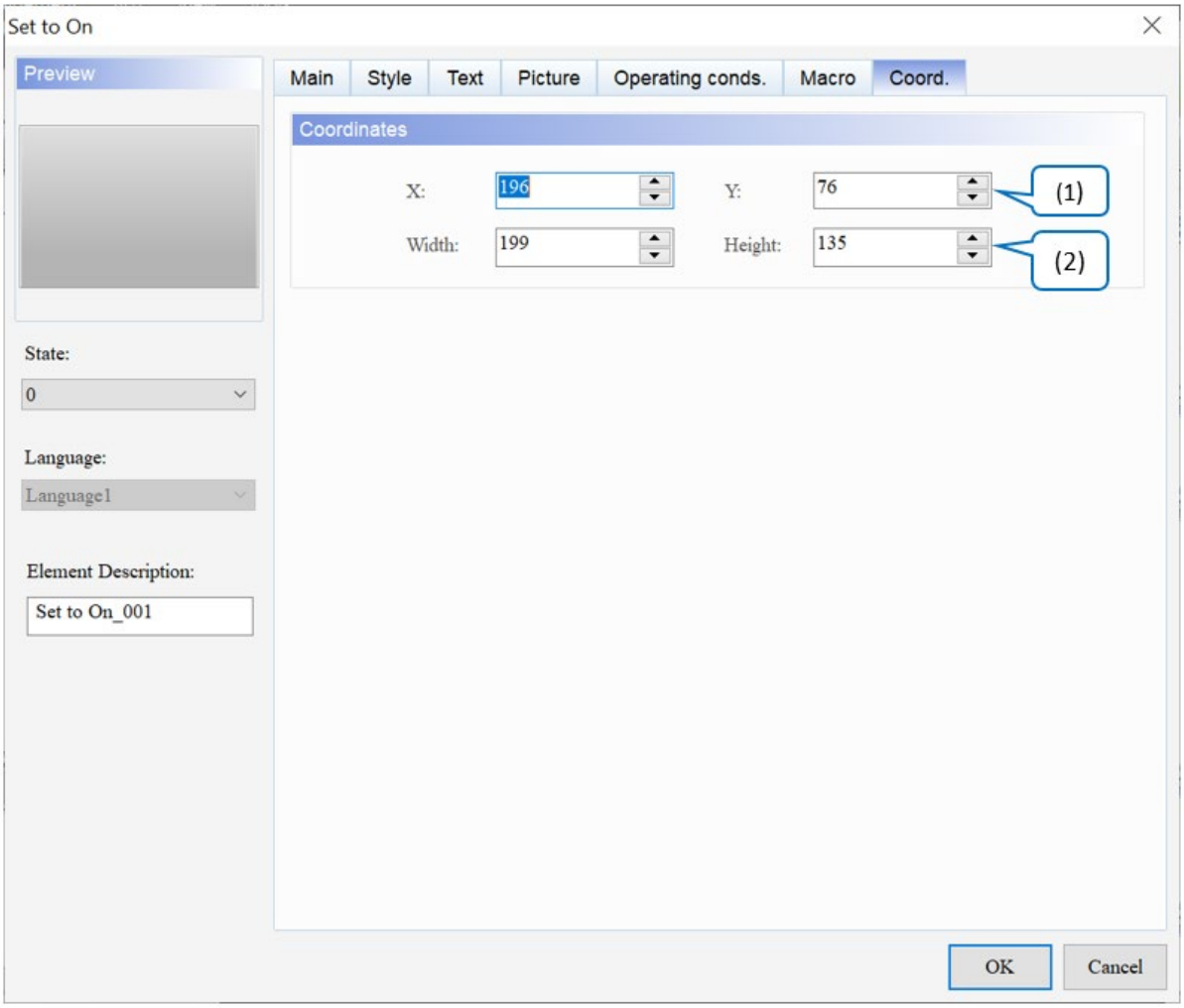


Figure 5 - 8: Set to ON / Set to OFF / Maintained / Momentary / Checkbox Button element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

5.2 Multistate

Multistate Button element is used to display multiple different state pictures or state values. If users set the memory address of the complex state as D100, the value unit is set to Word, and the total number of states is set to 4. When the value of D100 is changed, the complex state element switches states according to the switching sequence set by users. Refer to the following figure that shows an example of the Multistate.

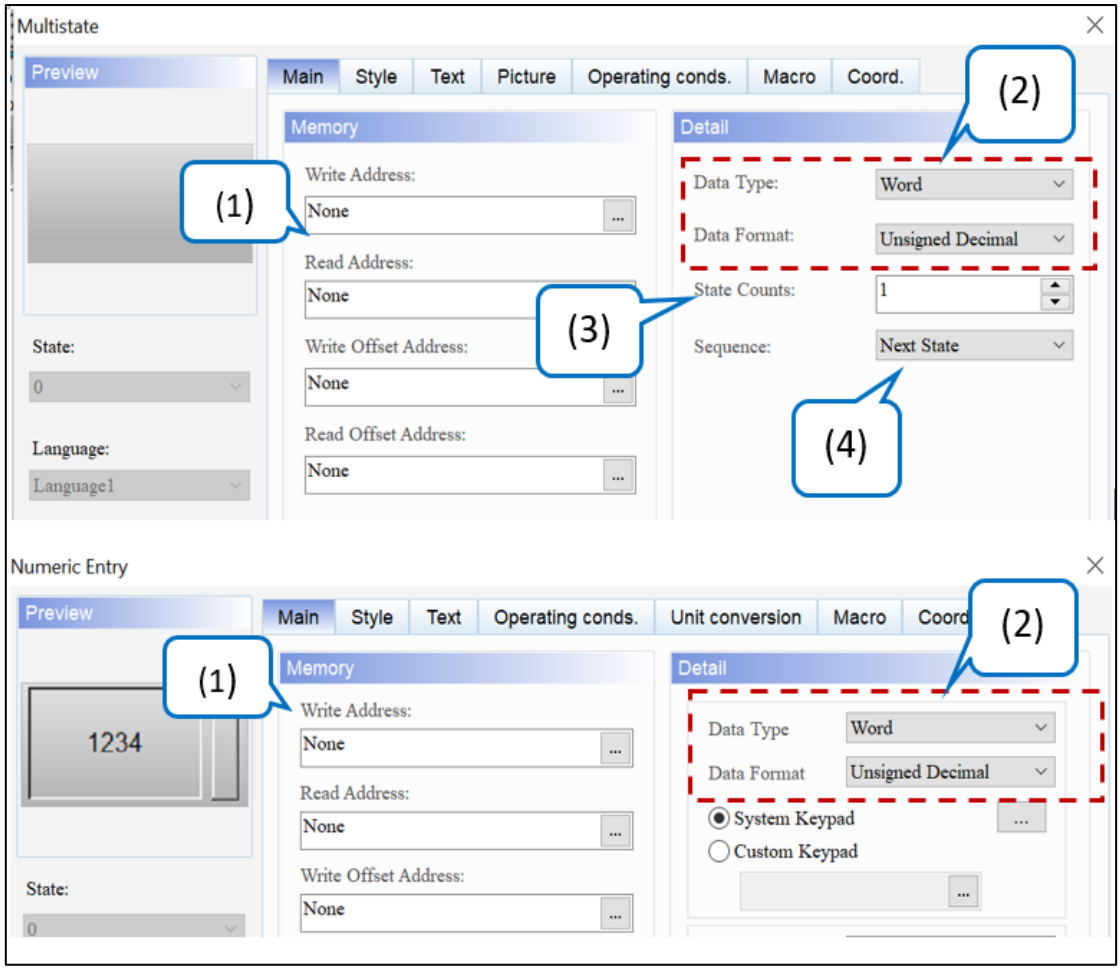


Figure 5 - 9: Multistate example – 1

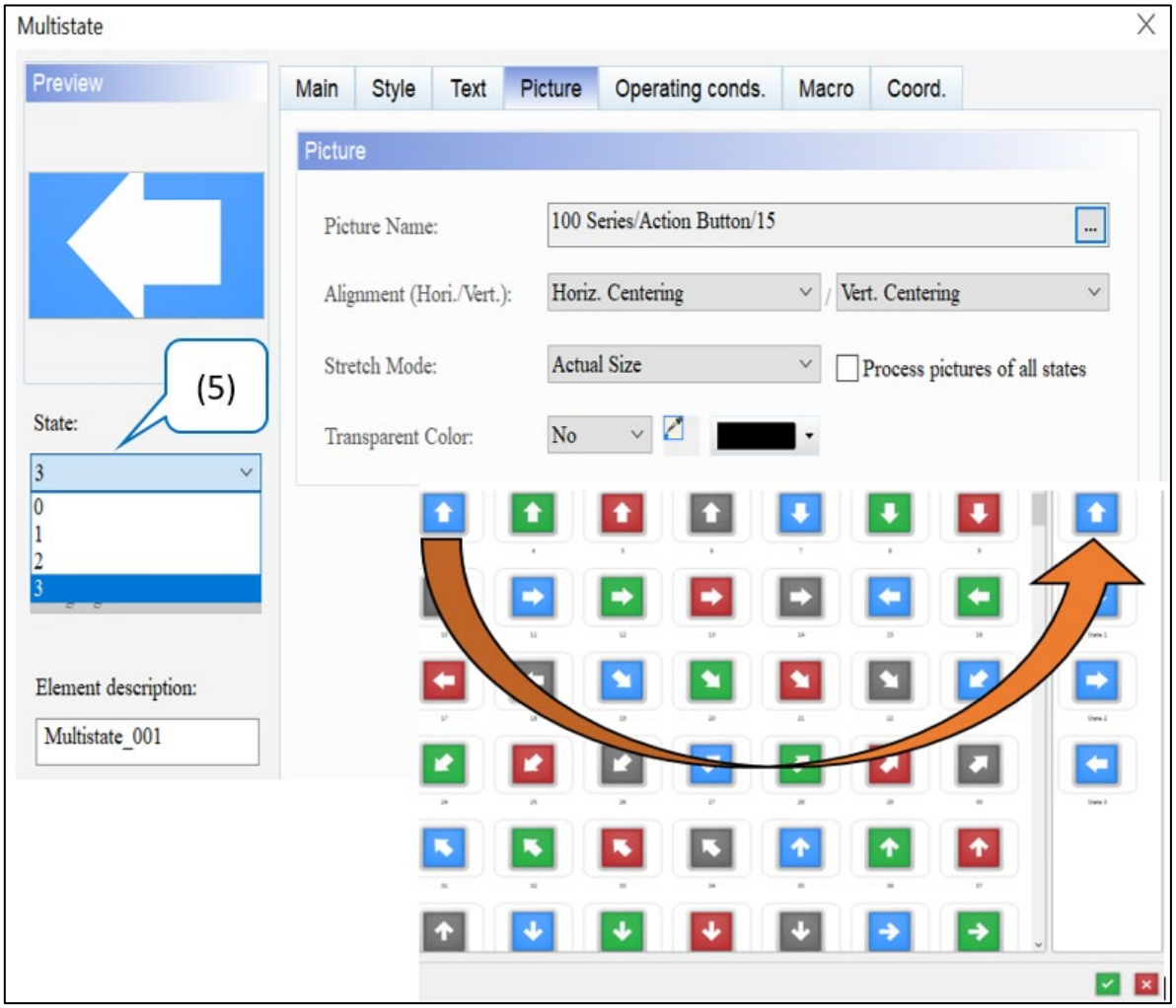
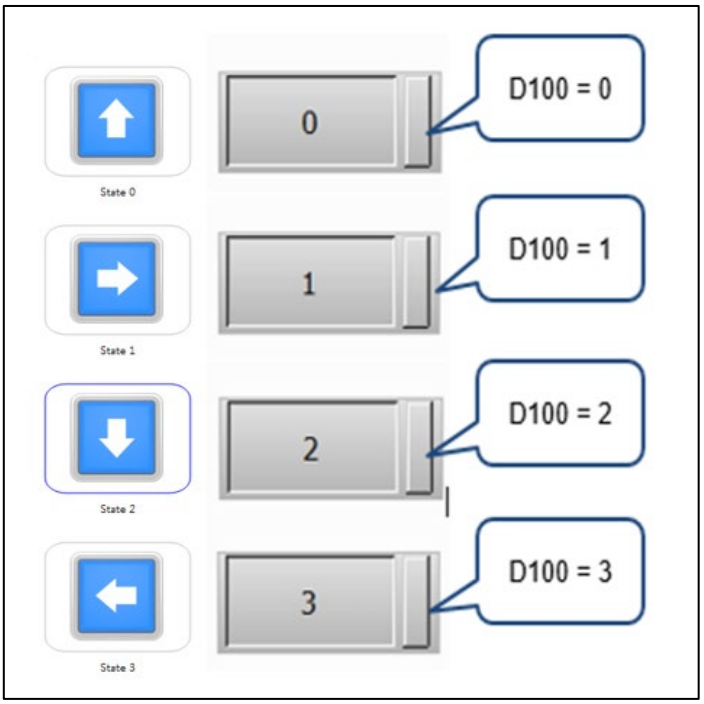
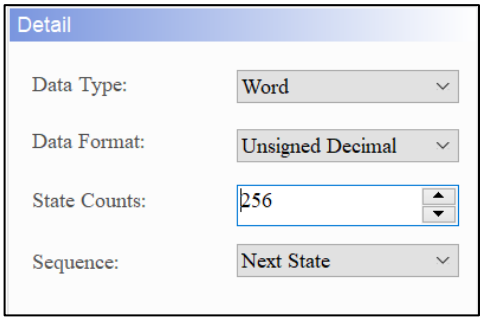


Figure 5 - 10: Multistate example – 2

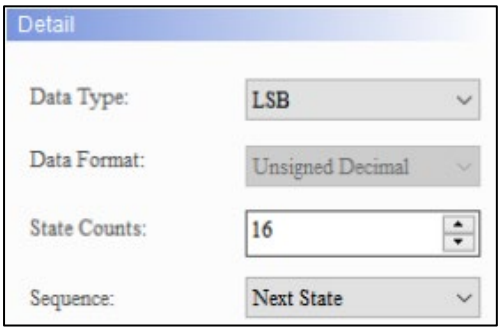
No.	Function	Description
(1)	Write Address	Create a **Multistate Button** element and a **Numeric Entry** element and set the **Write Address** to D100.
(2)	Data Type / Data Format	Set the **Data Type** to Word and **Data Format** to Unsigned Decimal for the **Multistate Button** and **Numeric Entry** elements.
(3)	State Counts	Set the **State Counts** of the **Multistate Button** element to 4.
(4)	Sequence	Set the **Sequence** of the **Multistate Button** element to Next State.
(5)	Set State pictures	Set the pictures for States 0 ~ 3.
(6)	Execution result	Set D100 = 0 ~ D100 = 3, the **Multistate Button** element picture changes accordingly.

No.	Function	Description
		

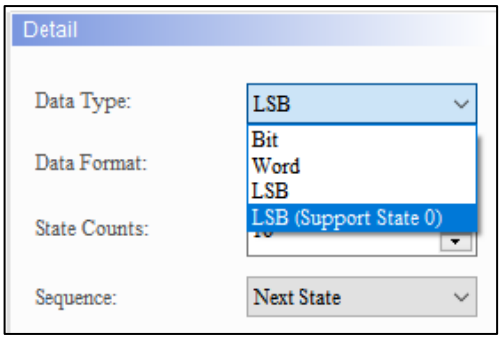
The **Multistate Button** element supports four types of **Data Type**. The detailed description is given in the following table. To add or delete the state counts, increase or decrease the **State Counts** in the **Main** property page.

Multistate Button	
Data Type	State Counts
Word	If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states. 
LSB / LSB (Support 0 State)	● When the **Data Type** is set to LSB, the register data is first converted to binary data. And then, the current object state is defined by using the lowest non-zero bit. ● If the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states except for State 0.

Multistate Button	
Data Type	State Counts



- To display State 0, select LSB (Support State function) for **Data Type**.

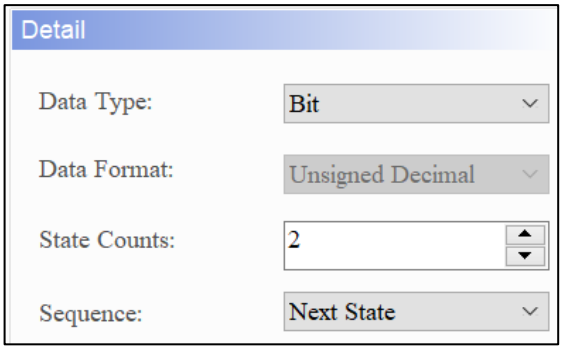


- If users select LSB, when the state is 0, the element displays black.



- If the **Data Type** is LSB or LSB (Support State 0), the memory address is also in Word as the unit.
- The following table illustrates the use of the least significant non-zero bit to determine its state value after converting from decimal to binary. For example, when the decimal values are 3 and 7, how will the DIAScreen determine the lowest bit to determine the displayed status value?

Decimal	Binary	State Value
0	**0000000000000000**	**State = 0 when all bits are 0. Select LSB (Support State 0).**
1	0000000000000001	The lowest non-zero bit is bit 0, State = 1.
2	0000000000000010	The lowest non-zero bit is bit 1, State = 2.
3	**0000000000000011**	**The lowest non-zero bit is bit 0, State = 1.**
4	0000000000000100	The lowest non-zero bit is bit 2, State = 3.
7	**0000000000000111**	**The lowest non-zero bit is bit 0,**

<table>
<tr><th colspan="4">Multistate Button</th></tr>
<tr><td>Data Type</td><td colspan="3">State Counts</td></tr>
<tr><td rowspan="15"></td><td></td><td></td><td><u>State = 1.</u></td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The lowest non-zero bit is bit 3, State = 4.</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non-zero bit is bit 4, State = 5.</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The lowest non-zero bit is bit 5, State = 6.</td></tr>
<tr><td>64</td><td>0000000001000000</td><td>The lowest non-zero bit is bit 6, State = 7.</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The lowest non-zero bit is bit 7, State = 8.</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The lowest non-zero bit is bit 8, State = 9.</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The lowest non-zero bit is bit 9, State = 10.</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The lowest non-zero bit is bit 10, State = 11</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The lowest non-zero bit is bit 11, State = 12.</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The lowest non-zero bit is bit 12, State = 13.</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non-zero bit is bit 13, State = 14.</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non-zero bit is bit 14, State = 15.</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non-zero bit is bit 15, State = 16.</td></tr>
<tr><td>Bit</td><td colspan="3">If the Data Type is set to Bit, State Counts can be set to 2 only.
 
</td></tr>
</table>

On double-clicking the **Multistate Button** element, the property page appears as follows.

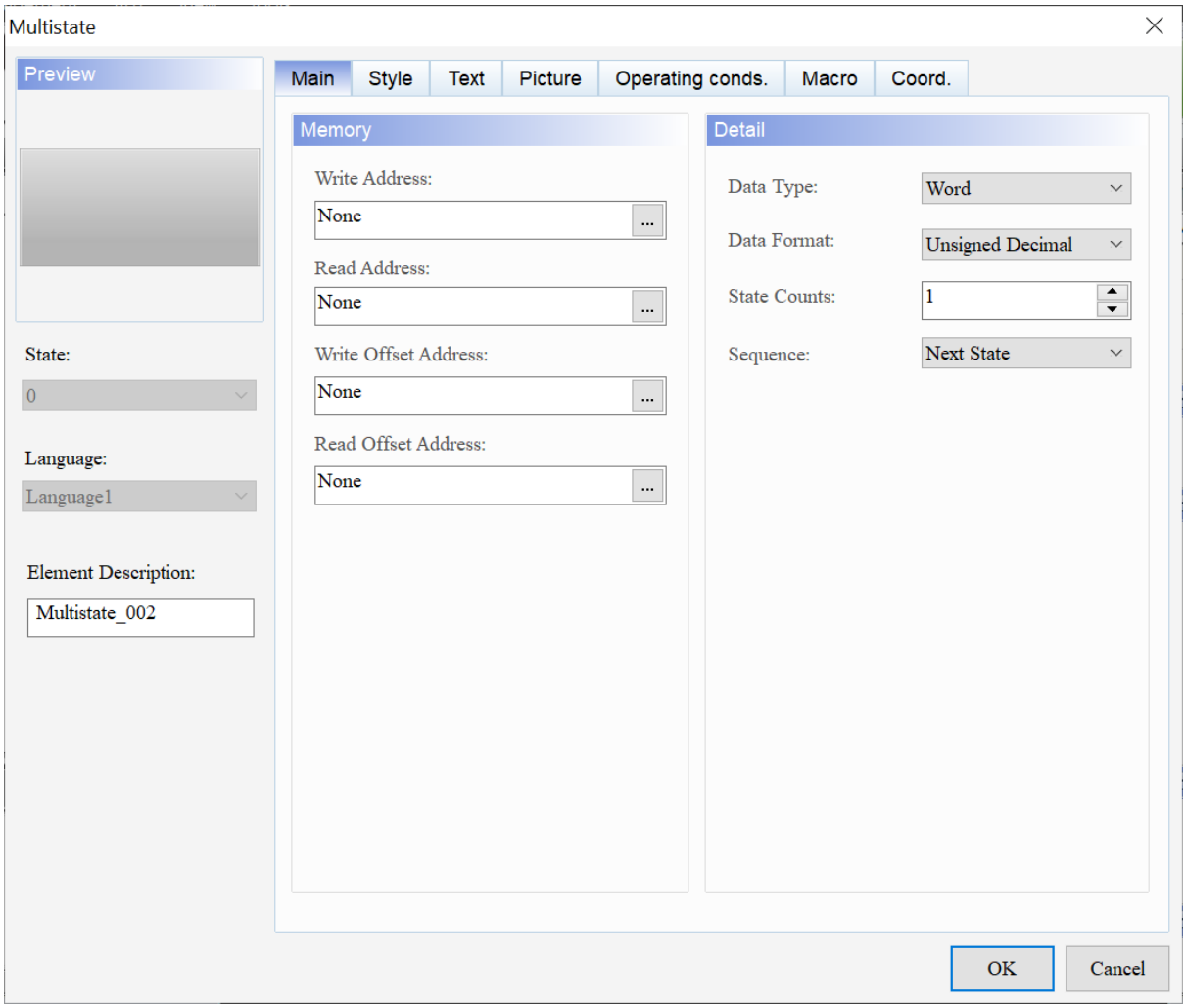


Figure 5 - 11: Multistate Button element property page

Multistate Button	
Function	**Description**
Preview	View the element multi-state value and multi-language display data of the element.
Main	Set Write Address, Read Address, Write Offset Address, Read Offset Address, Data Type, Data Format, State Counts, and Sequence of Multistate.
Style	Set the Style, Foreground Color, Blink, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating Conds.	Set the Interlock Address, Interlock Display Mode, Interlock State, Invisible Address, Invisible State, User Security Level, Set Low Security, Confirm Window, and Modifier + Hot Key.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

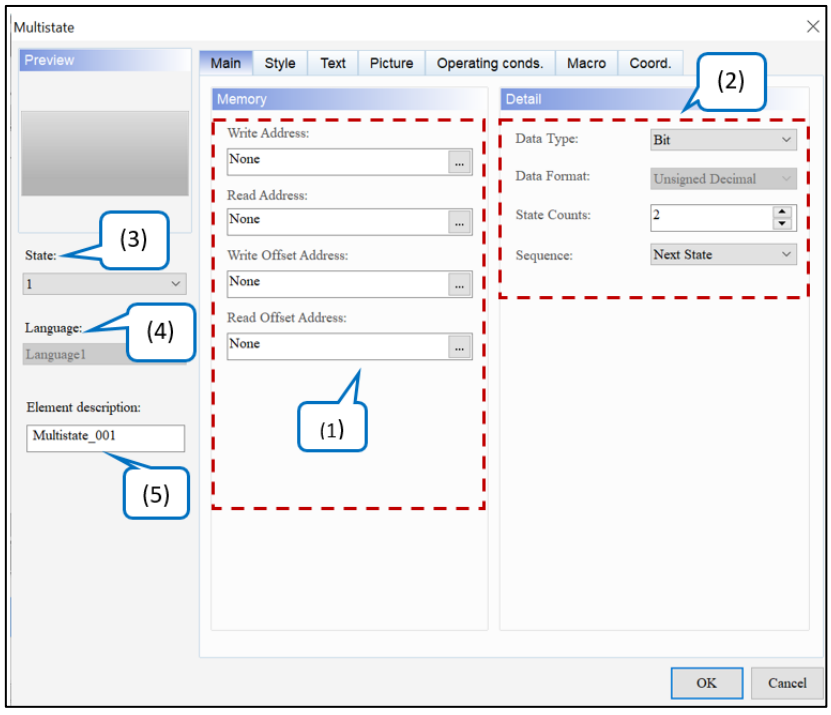
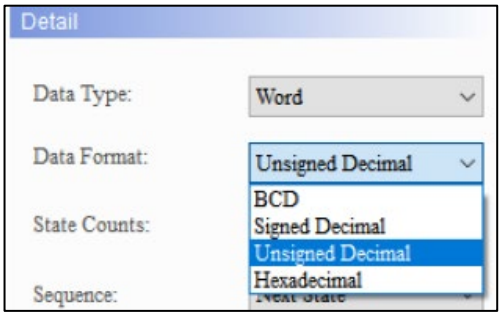
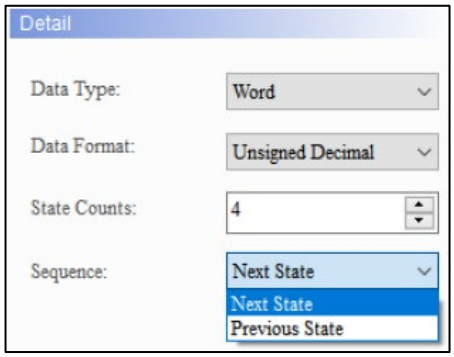
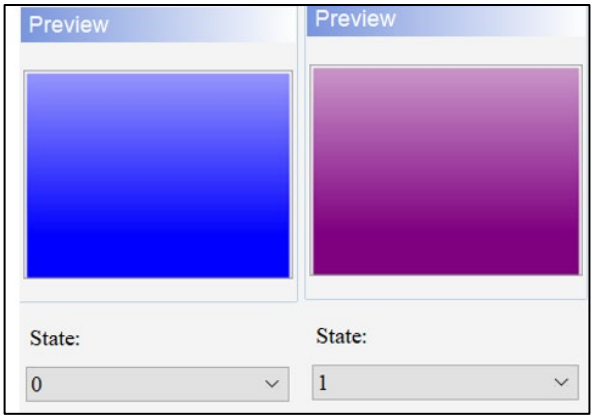
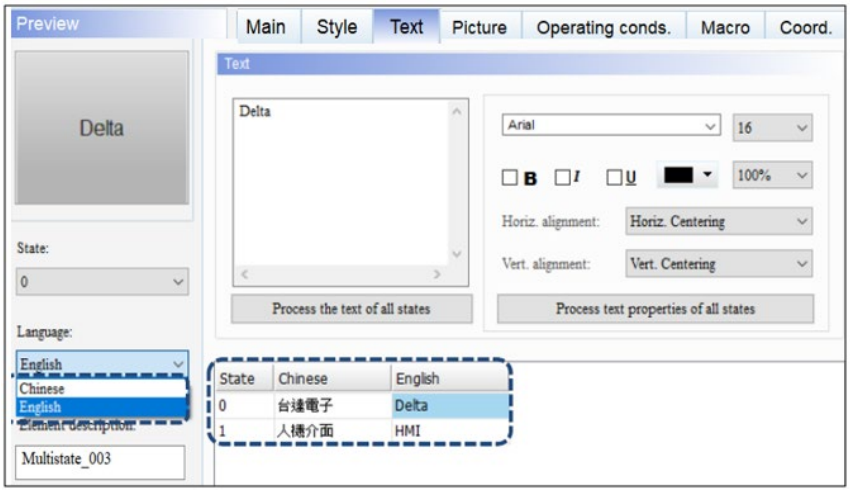
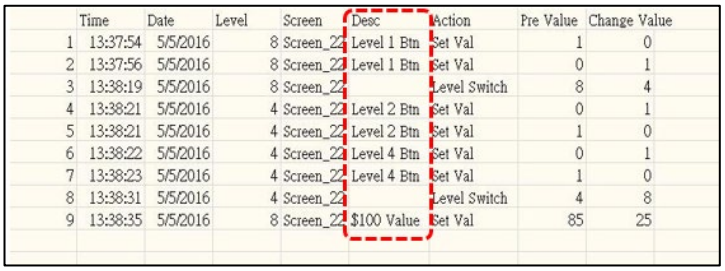


Figure 5 - 12: Multistate Button element Main property page

No.	Function	Description
(1)	Write Address Read Address	● Select Internal Memory or controller register address. The **Input** memory **Type** varies depending on the **Data Type** such as Word, LSB or Bit. If users set **Write Address** without setting **Read Address**, the HMI automatically reads **Write Address** value. ● Select **Link** name and **Device Type**. Refer to *Memory Settings*.
	Write Offset Address Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0). The default value is **Word**.
	Data Format	● Users can only select the **Data Format** when the **Data Type** is Word. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
	State Counts	● Set the **State Counts** of the **Multistate Button** element. The default value is **1**. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.
	Sequence	● Set the sequence of switching states of the **Multistate Button** element. The available options for **Sequence** are: Next State and Previous State. The default value is **Next State**. ● Next State: When changing states, it changes the state in ascending order. ● Previous State: When changing states, it changes the state in descending order.

No.	Function	Description
		
(3)	State	The **Multistate Button** element determines its state number according to the total number of states created by users to view its multiple states through **State**. 
(4)	Language	When users set language data, they can edit the text attributes to be displayed through the **Language** setting of the element. 
(5)	Element description	Record the button actions to be executed. The record is written into the CSV file of the Operation Log Table so that users know what actions have been done.

No.	Function	Description
		

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

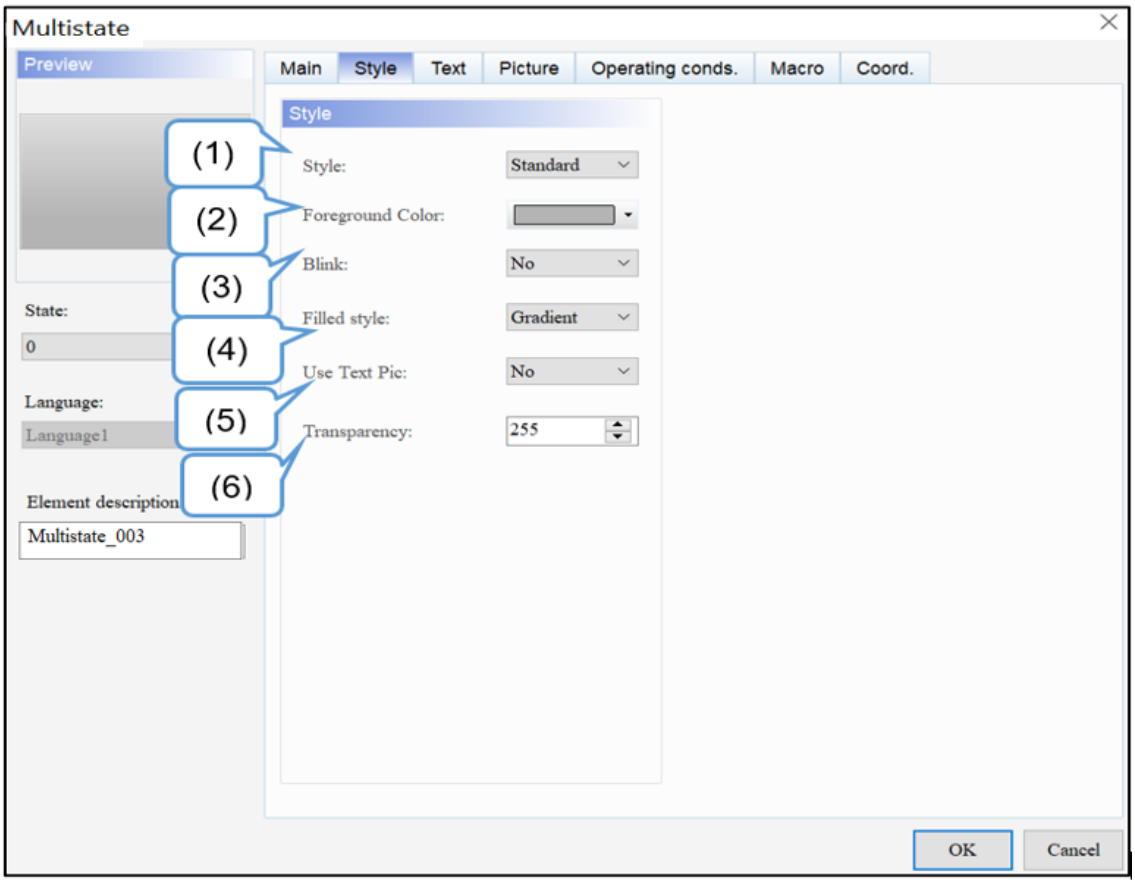
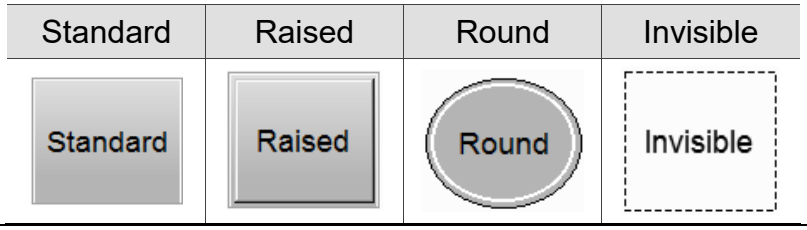
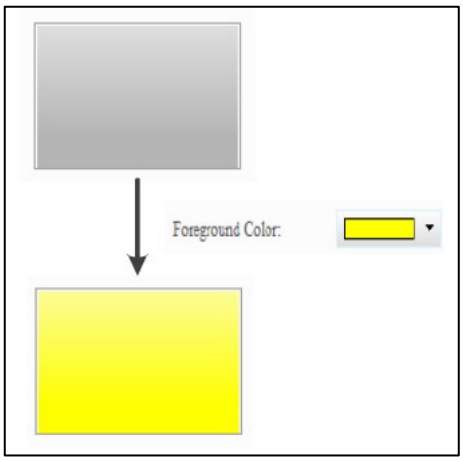
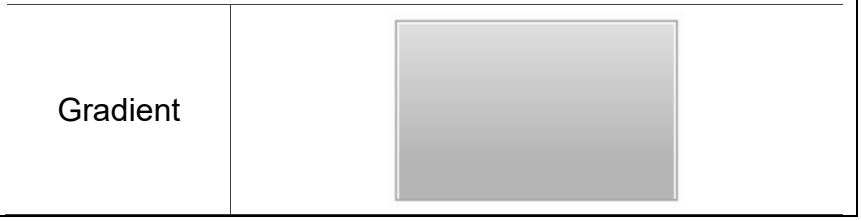
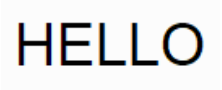


Figure 5 - 13: Multistate Button element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>It allows users to change the appearance of the elements. The available options for Style are: Standard, Raised, Round, and Invisible. The default value is Standard.
 
</td></tr>
<tr><td>(2)</td><td>Foreground Color</td><td>● Set the foreground color of the element. The default is .
● When users set the Style to Invisible, the Foreground Color setting is invalid.
 
</td></tr>
<tr><td>(3)</td><td>Blink</td><td>Set the blink prompt of the element when it changes states. The Blink color is the opposite color of the foreground color. The default value is No.</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>● The available options for Filled style of the elements on the DOP-100 series models are: Gradient and Fixed. The default value is Gradient.
● When users open the DOP-B project on a DOP-100 series model, the elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.
 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td>Fixed (Solid)</td><td>  </td></tr>
<tr><td>(5)</td><td>Use Text Pic</td><td colspan="2">Since DOP-B series HMIs use pictures to present all texts, the DOP-100 series HMIs use text. Therefore, if the language used for the element is not yet supported by the PC, it is possible to cause missing characters and garbled texts when the element is displayed on the HMI. To have the text display effect be the same as that on the DOP-B models, the Use Text Pic function is added for the Text, Button, and General Message Display elements. The default value is No.
<table>
<tr><th>With Use Text Pic</th><th>Without Use Text Pic</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
NOTE: If users use DIAScreen to open the DOP-B project, the Use Text Pic function will be set to Yes by default; if users add a new DOP-100 project, the Use Text Pic function will be set to No by default.</td></tr>
<tr><td>(6)</td><td>Transparency</td><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

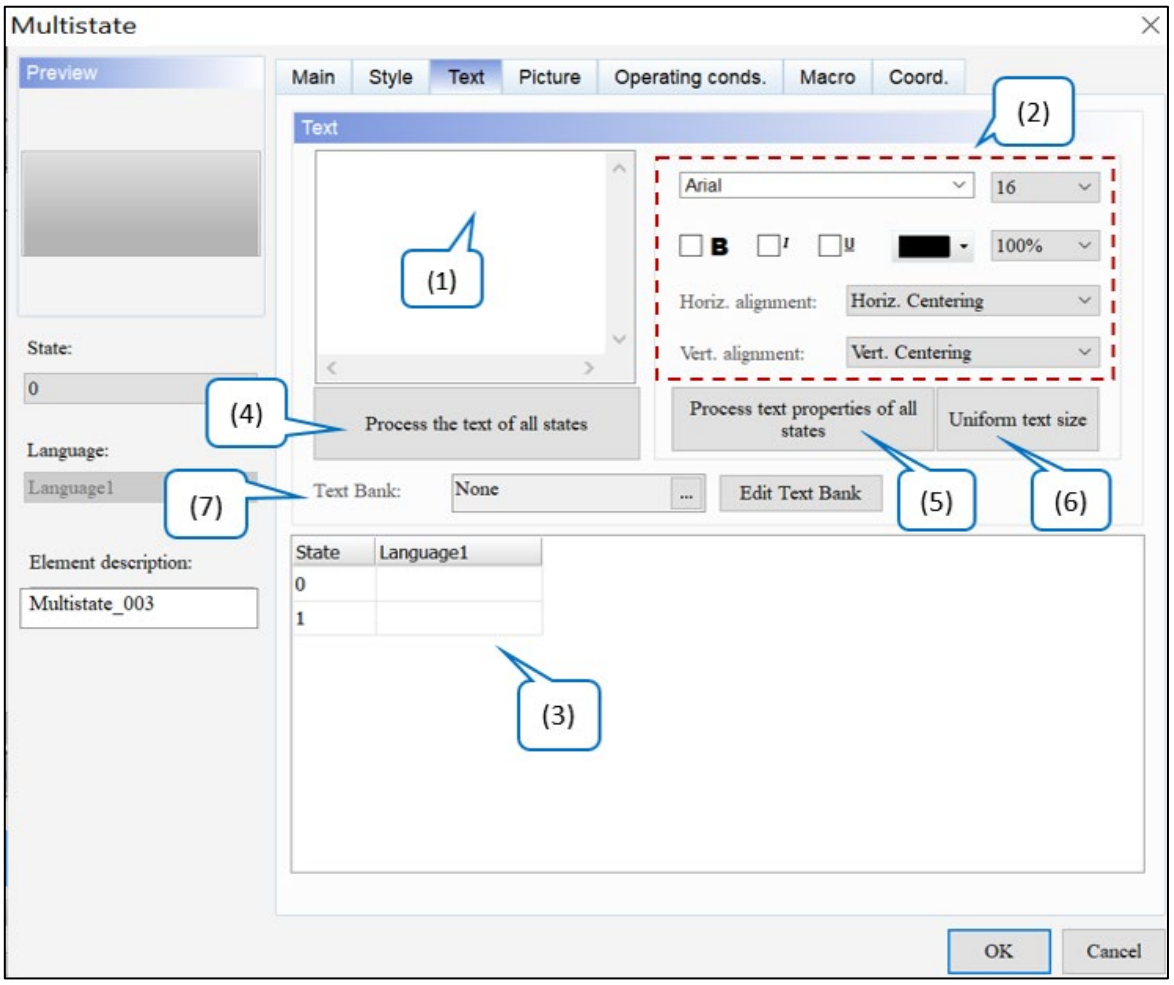
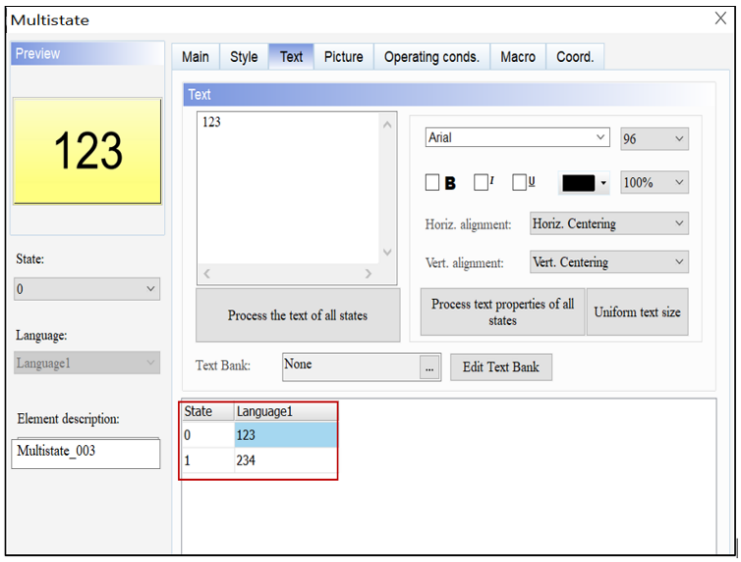
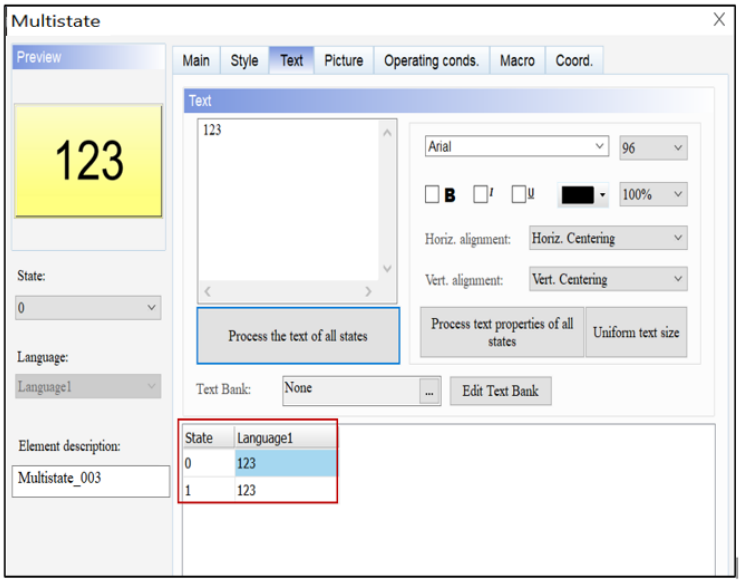
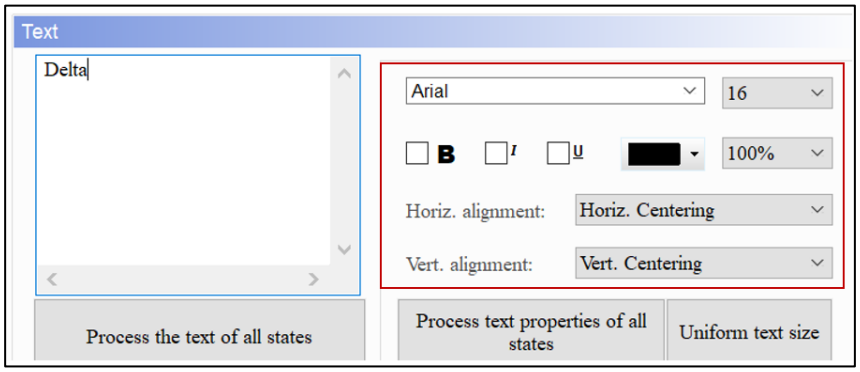


Figure 5 - 14: Multistate Button element Text property page

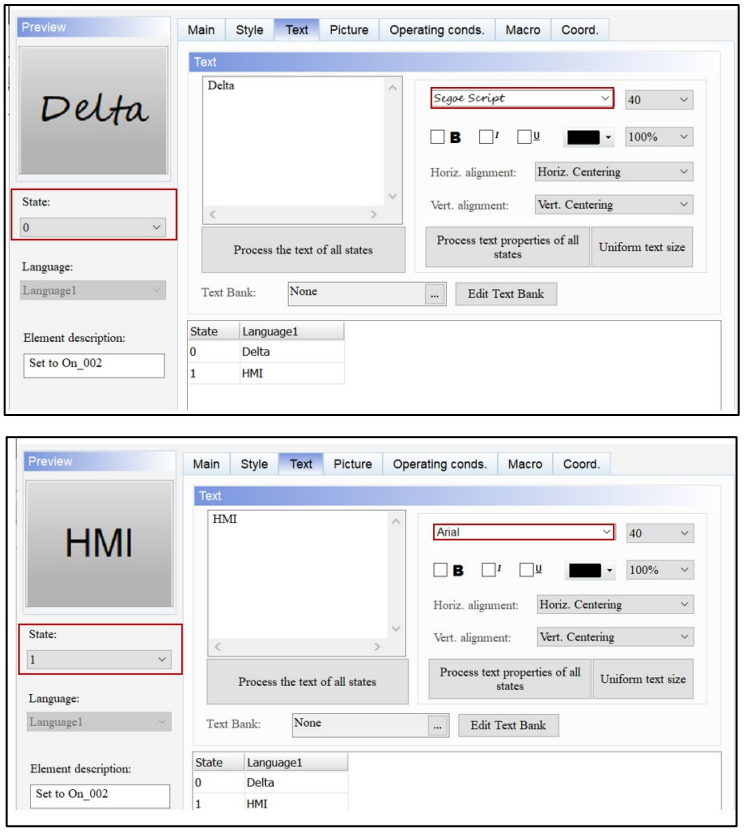
No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text Property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit Multi-language Text	If users have added multi-language text, the **Text** page allows them to edit multi-language data. As shown in **Text** property page, they can enter English words in the **English** column.
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state selected. ● The following illustrates the steps:

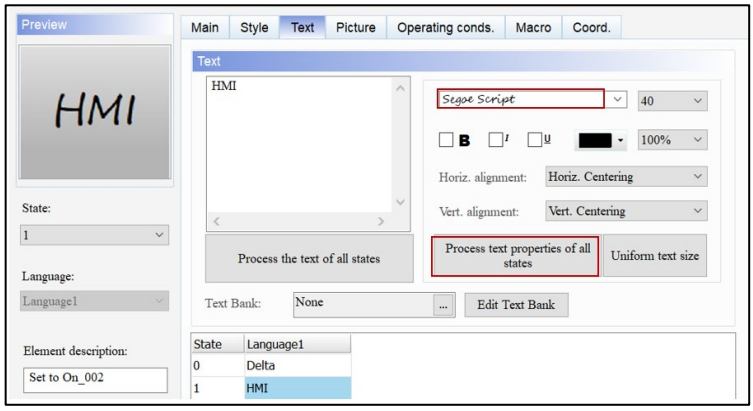
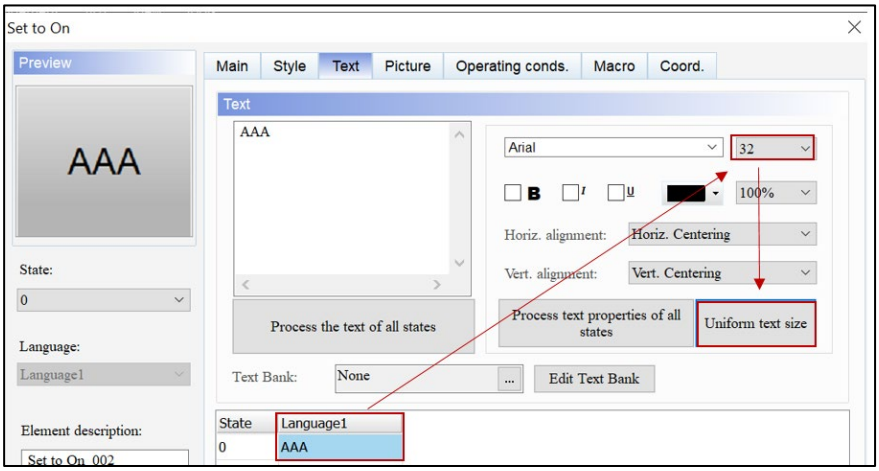
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
1. Input 123 to State 0, and 234 to State 1.
2. Click State 0.
3. Click Process the text of all states, and State 1 text changes to 123.
<table>
<tr><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Process text properties of all states</td><td>● This function changes all the text properties based on the state users select. Items included in the text property are shown in the following figure.</td></tr>
</table>

No.	Function	Description
		

- The following illustrates the steps:
  1. Input *Delta* to State 0, and set the font to Segoe Script; input *HMI* to State 1, and set the font to Arial.
  2. Click State 0.
  3. Click **Process text properties of all states**, and State 1 font changes to Segoe Script.

Before Change



No.	Function	Description
		After Change 
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

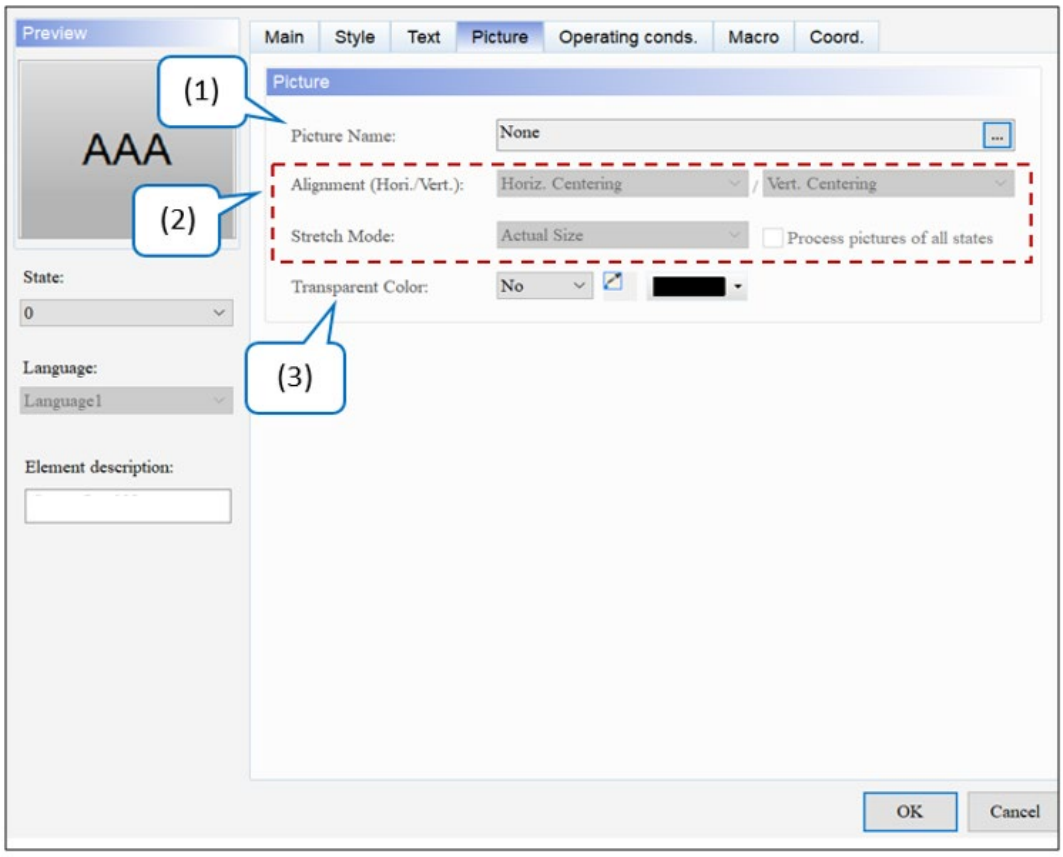
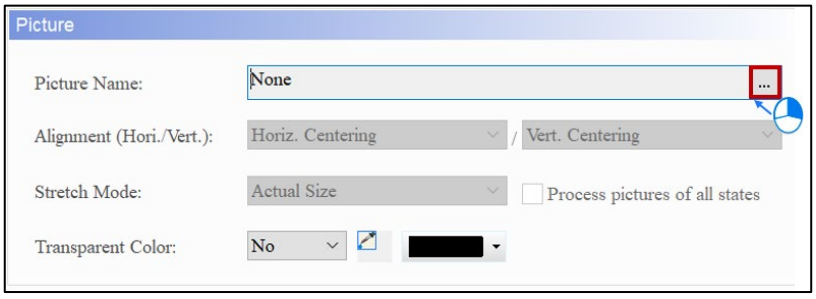
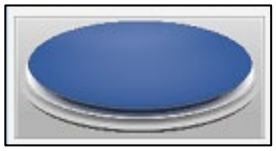


Figure 5 - 15: Multistate Button element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and makes it transparent, which becomes identical to the Foreground</td></tr>
</table>

No.	Function	Description
		Color of the element. 

- Operating conds.

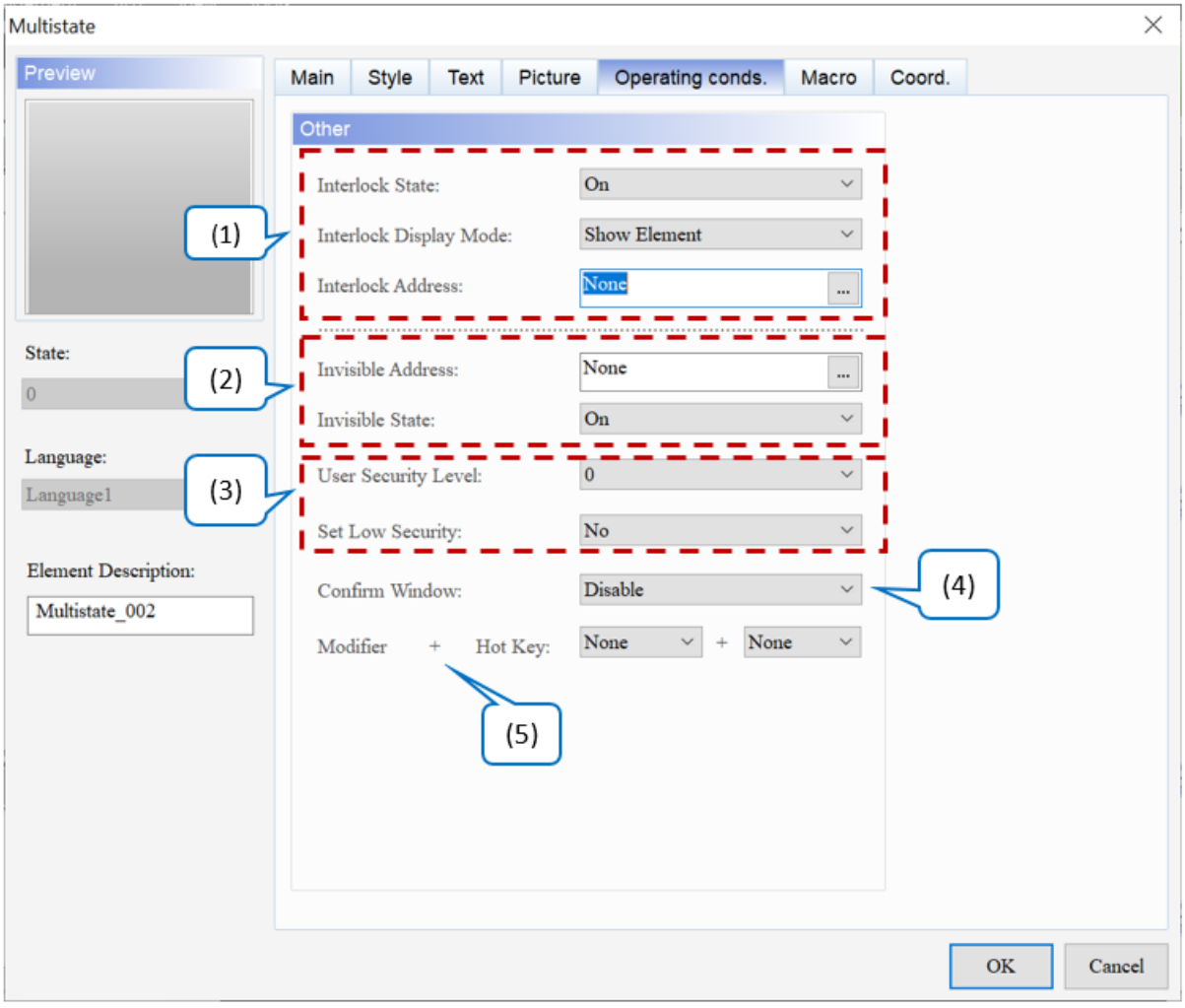
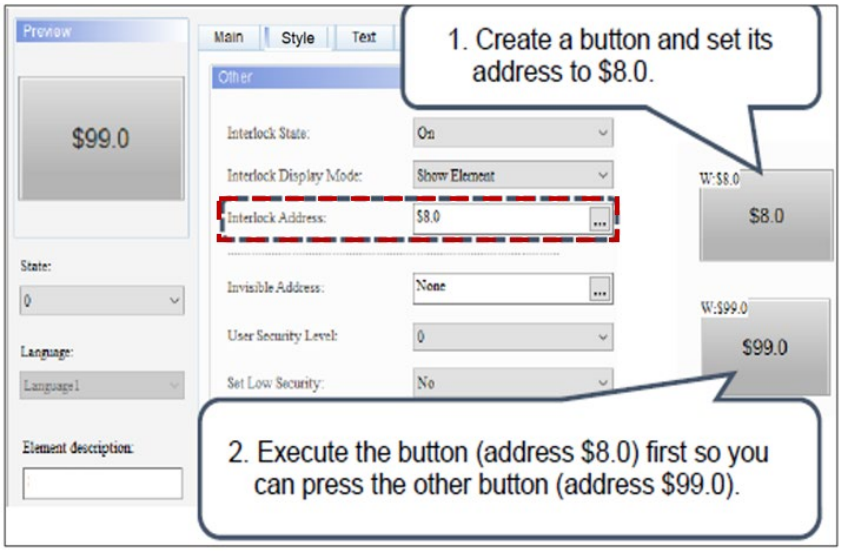


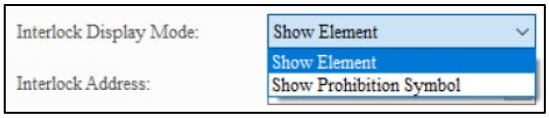
Figure 5 - 16: Multistate Button element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">(1)</td><td>Interlock State</td><td>

The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is No.
The following describes its working:

Create a button and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element with address $99.0.
Before operating the element with address $99.0, press the button with address $8.0.



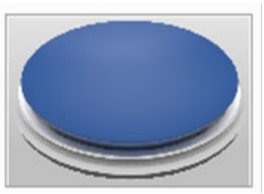
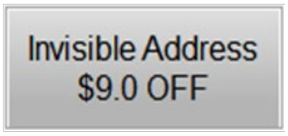
</td></tr>
<tr><td>Interlock Address</td><td></td></tr>
<tr><td>Interlock Display Mode</td><td>
The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.


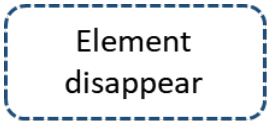
<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
</table>

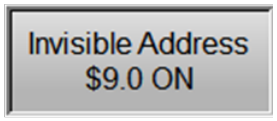
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Invisible Address</td><td>

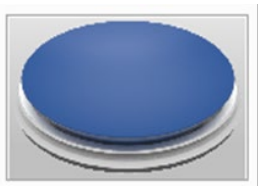
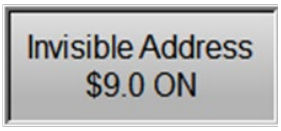
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value of Invisible State is On.
The following example explains Invisible Address usage:

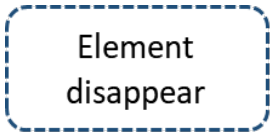
Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

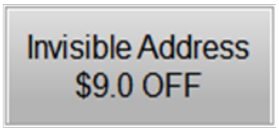
Invisible State is On







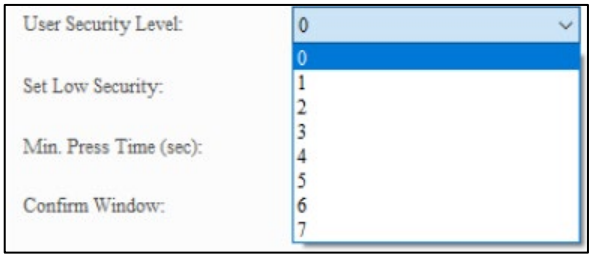
</td></tr>
<tr><td>Invisible State</td><td>
Invisible State is Off







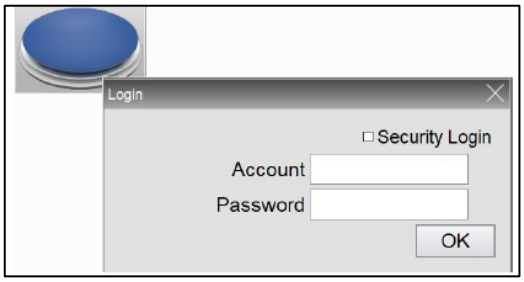
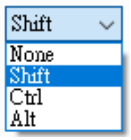
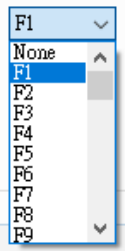
</td></tr>
<tr><td>(3)</td><td>User Security Level</td><td>

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to <u>Section 5.7.2 Password Table</u>).



If users specify Set Low Security to Yes, each time users input the password, the HMI sets the security level to the

</td></tr>
</table>

No.	Function	Description
	Set Low Security	lowest. The next time users press the element, the HMI asks to input the password for the corresponding security level. The default value is **No**. 
(4)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 
(5)	Modifier + Hot Key	● Allows to use the hot keys on the external keyboard to execute the button. ● The available options for **Modifier** are: None, Shift, Ctrl, and Alt.  ● The available options for **Hot Key** are: F1 ~ F12 English letters A ~ Z and number keys 0 ~ 9. 

- Macro

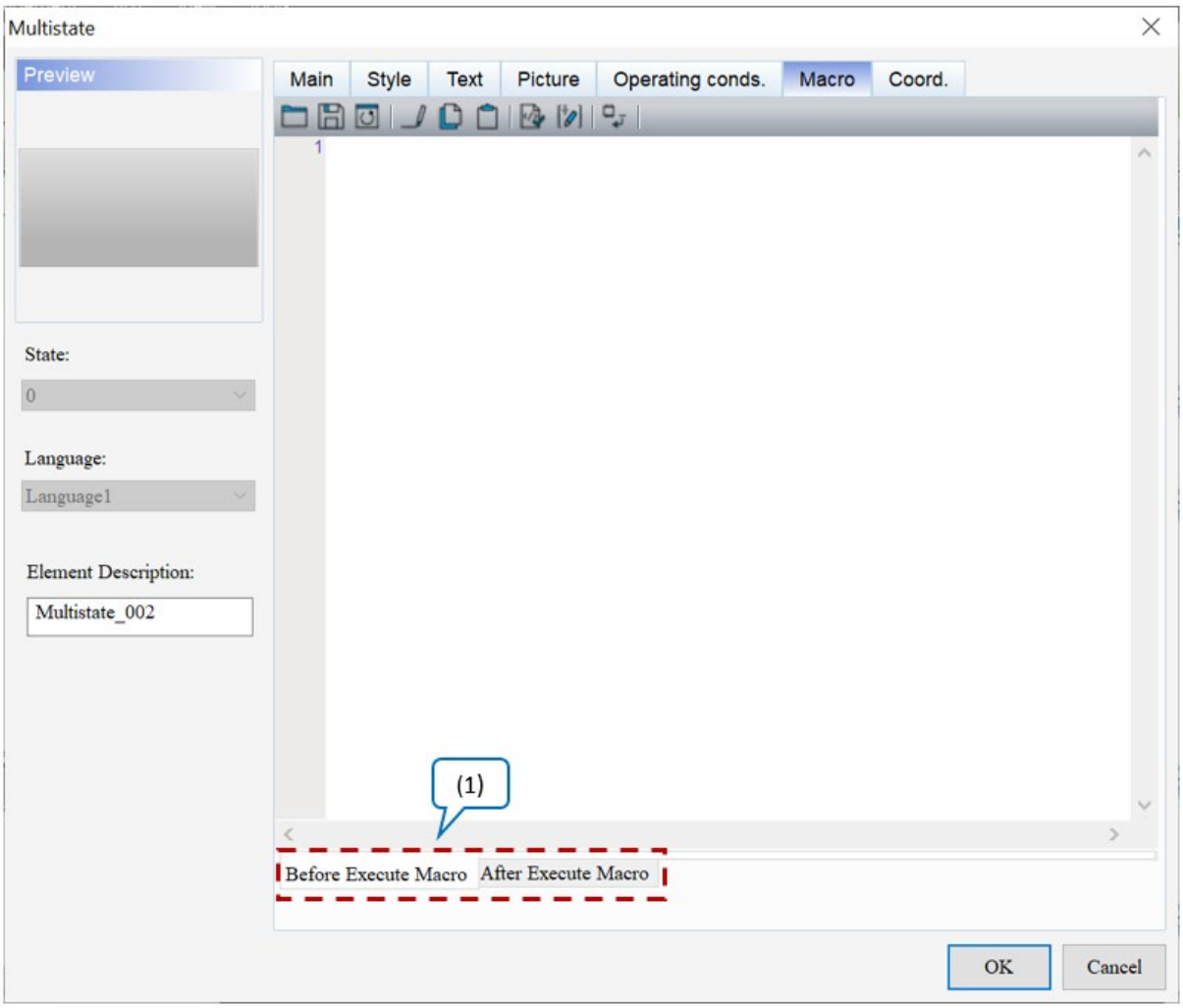
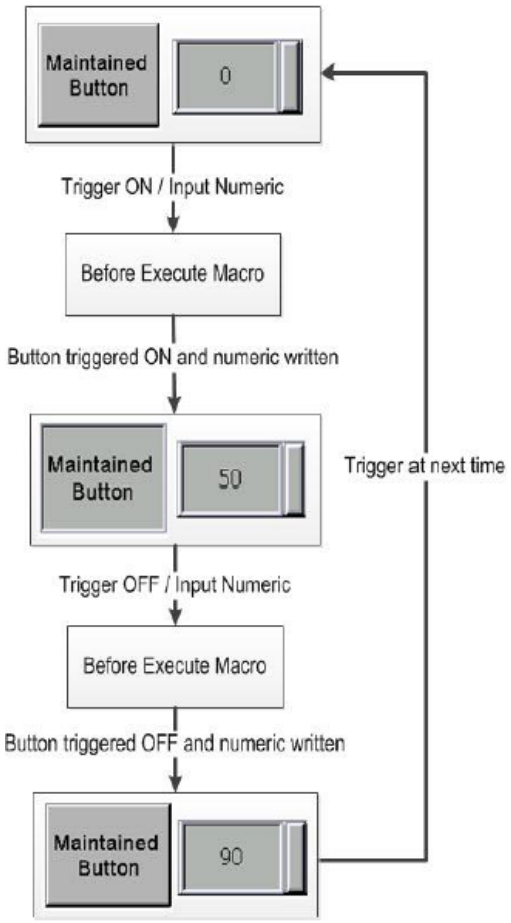
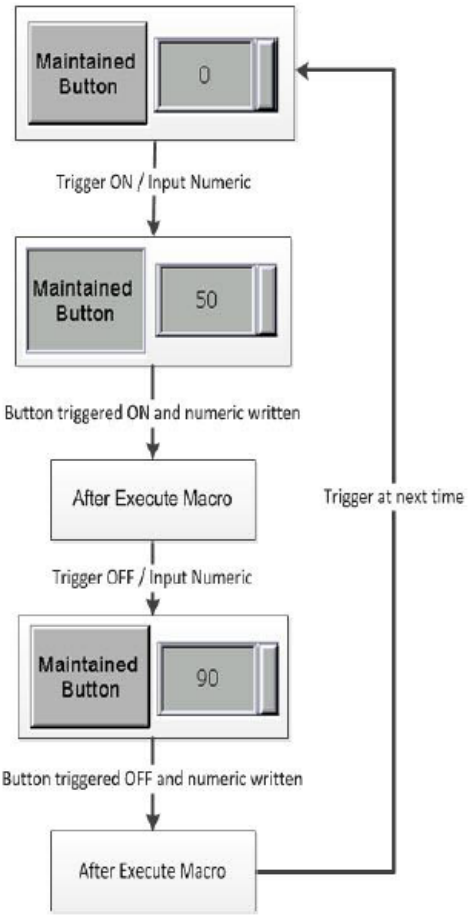


Figure 5 - 17: Multistate Button element Macro property page

No.	Description	
	Before Execute Macro	After Execute Macro
(1)	Flowchart of **Before Execute Macro**:  When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.	Flowchart of **After Execute Macro**:  When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

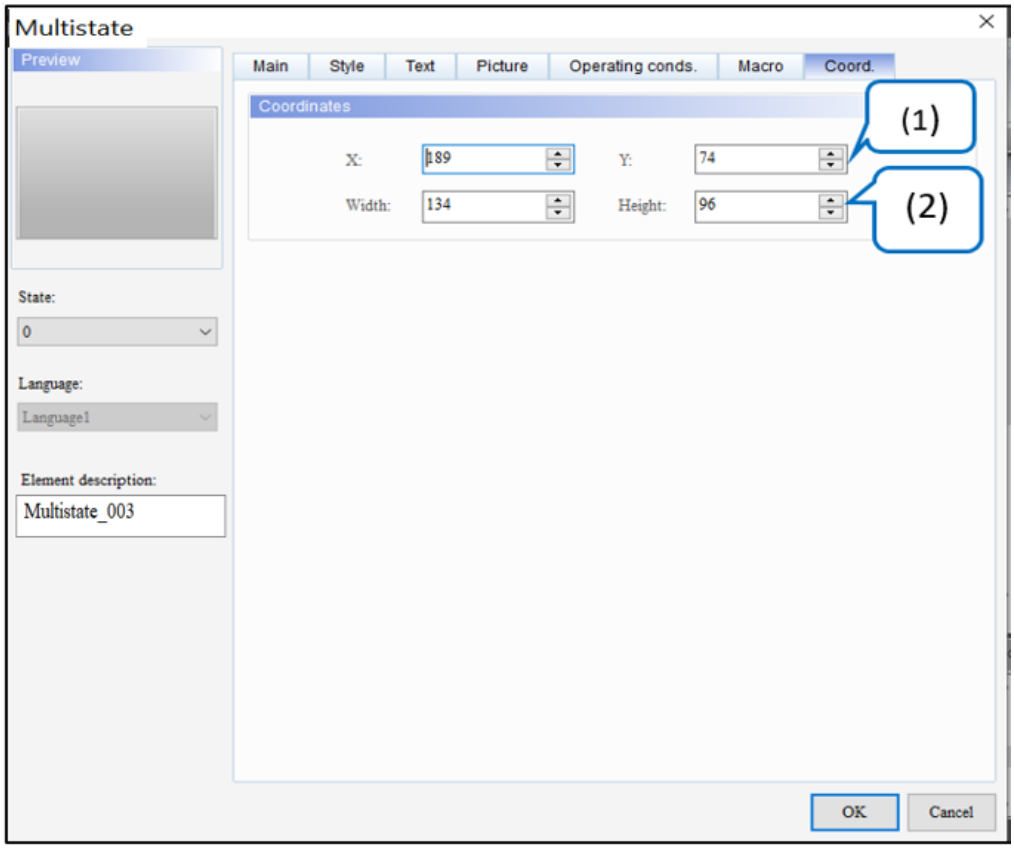


Figure 5 - 18: Multistate Button element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

5.3 Set Value

When users touch **Set Value Button** element on the HMI, the built-in **Numeric Keypad** window appears on the screen to input values. After pressing ENT, the HMI sends the values to the corresponding register. Set the **Maximum, Minimum,** and

Trigger Mode, such as triggering the specified controller Bit address before or after writing.

***NOTE**: The **Custom Keypad** for the **Set Value Button** element does not support DOP-H series HMIs.*

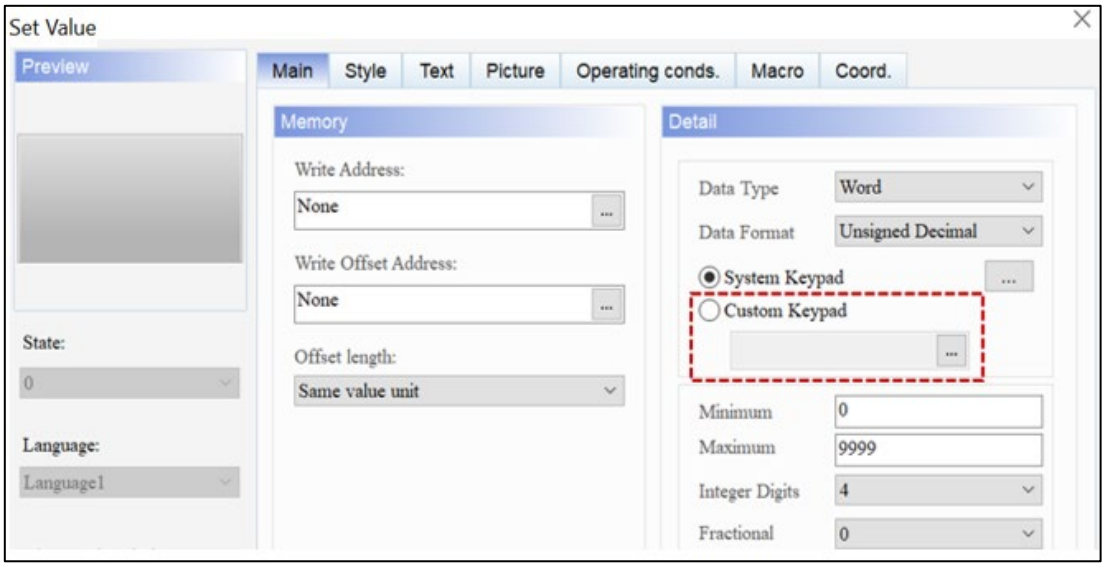
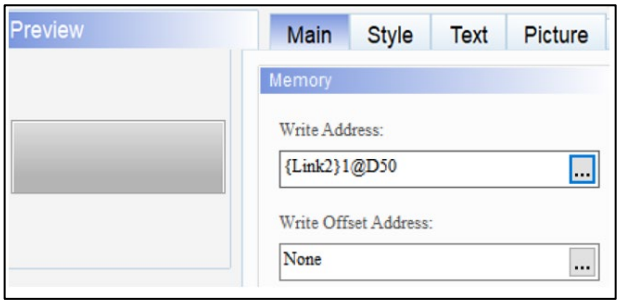
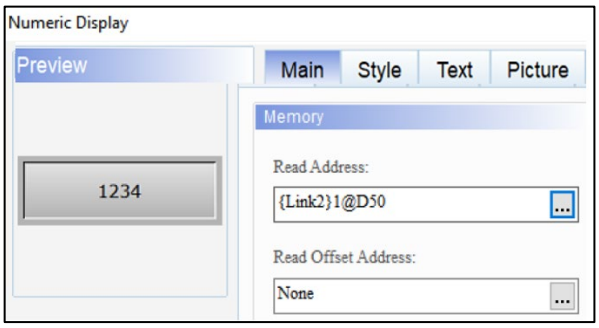
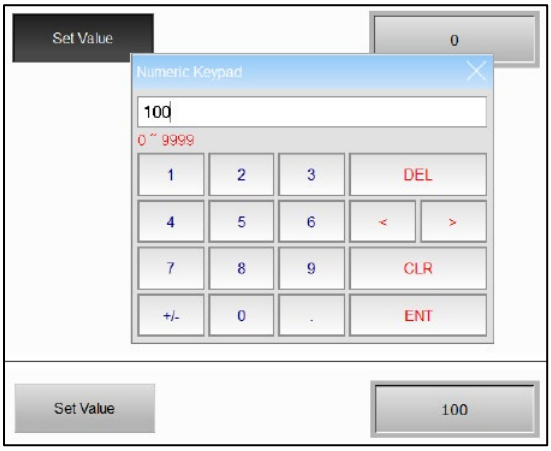


Figure 5 - 19: Set Value Button element property page

Set Value	
Write Address	● Create a **Set Value Button** element and set the **Write Address** to D50. ● Create a **Numeric Display** element and set the **Read Address** to D50. 

<table>
<tr><th colspan="3">Set Value</th></tr>
<tr><td></td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Execution result</td><td>Before Set Value</td><td> 
</td></tr>
<tr><td>After Set Value</td><td> 
</td></tr>
<tr><td colspan="2">Click Set Value, enter 100, and the Numeric Display element displays 100.</td></tr>
</table>

On double-clicking the **Set Value Button** element, the property page appears as follows.

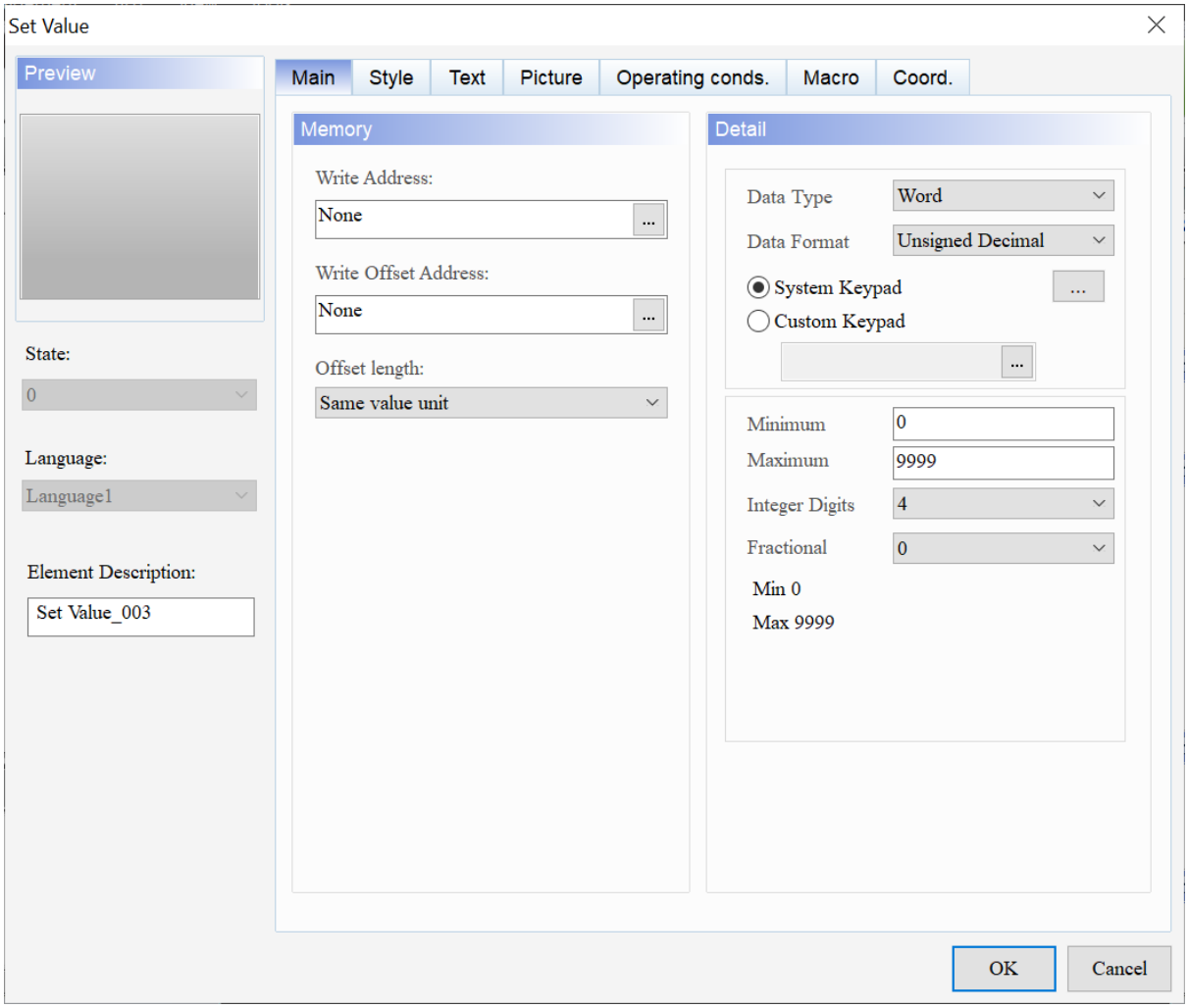


Figure 5 - 20: Set Value Button element property page

Set Value Button	
Function	**Description**
Preview	The **Set Value Button** element can only view multi-language data display since the multi-state property is not available for this element.
Main	Set the Write Address, Write Offset Address, and Offset length. Set the Data Type, Data Format, keypad style, Minimum / Maximum, Integer Digits, and Fractional of the Set Value element.
Style	Set Style, Foreground Color, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.

Set Value Button	
Function	**Description**
Operating conds.	Set the Interlock Address, Interlock State, Interlock Display Mode, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Set Low Security, Mark as Asterisk (*), Confirm Window, Show overrange message, and Modifier + Hot Key.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

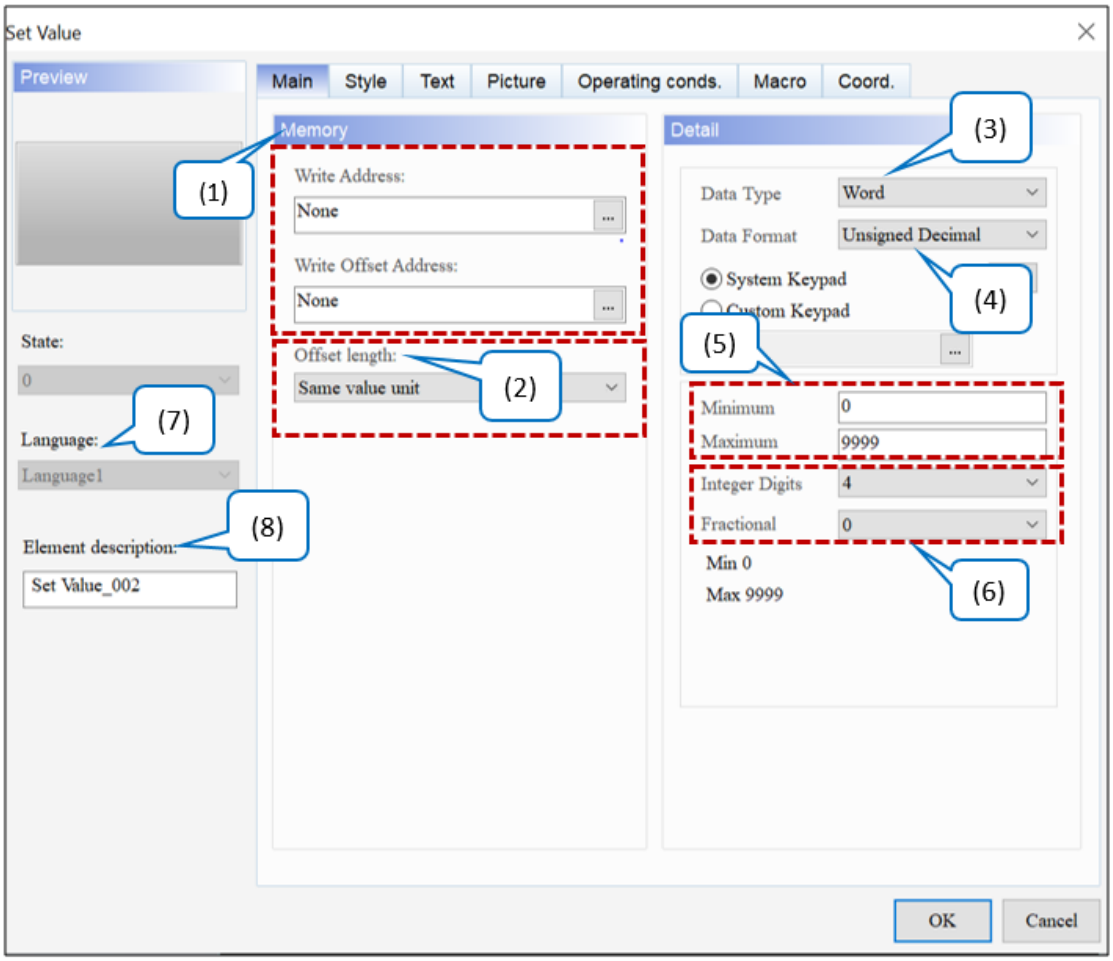
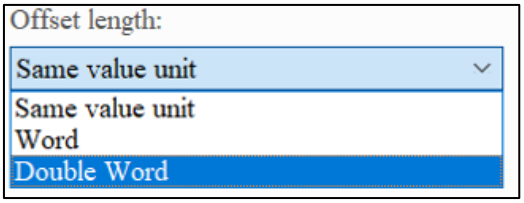
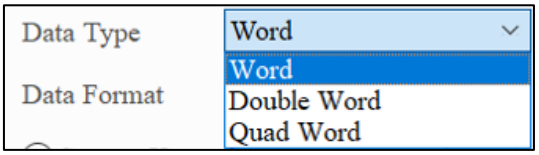
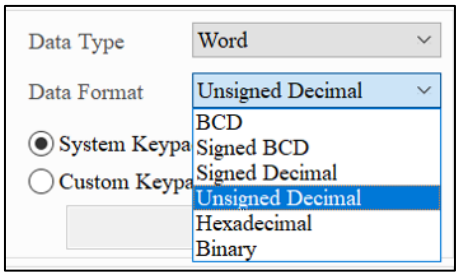
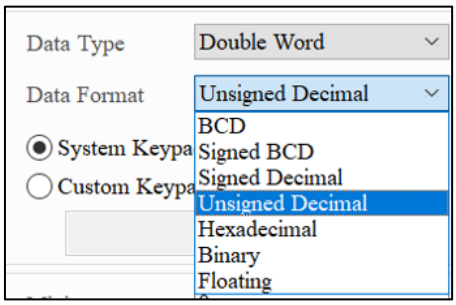
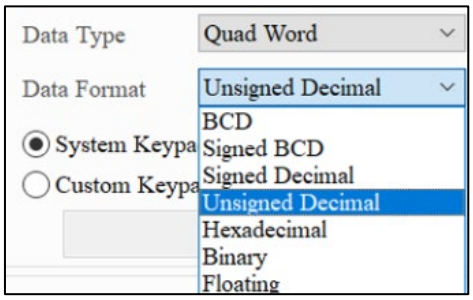


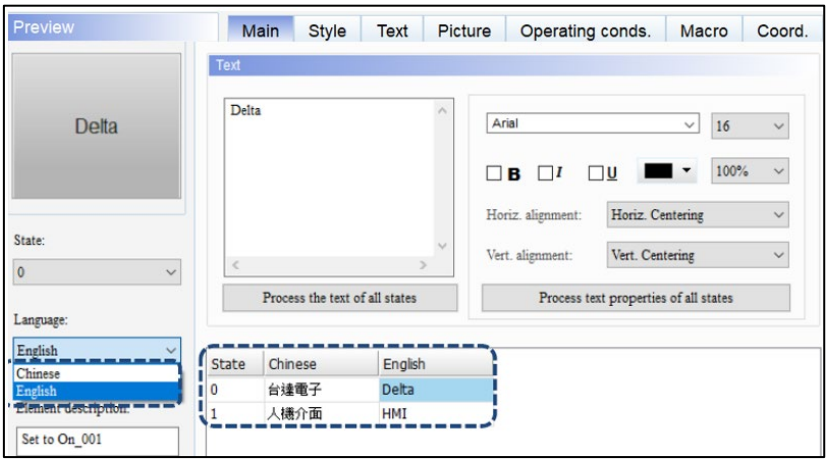
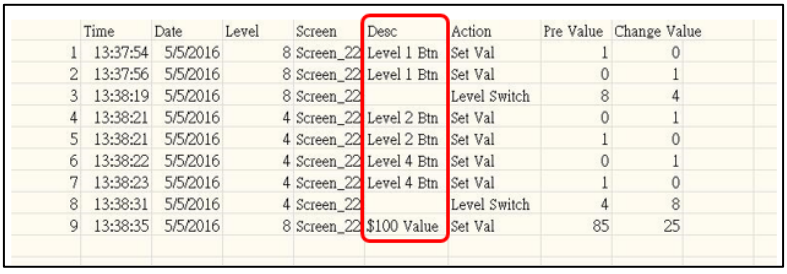
Figure 5 - 21: Set Value Button element Main property page

No.	Function	Description
(1)	Write Address	● Select the Internal Memory or the controller register address. The **Input** memory **Type** must be Word. ● Select **Link** name and **Device Type**. Refer to *Memory Settings*.
	Write Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Offset length	The available options for **Offset length** are: Same value unit, Word, and Double Word. The default value is **Same value unit**. 
(3)	Data Type	● The available options for **Data Type** are: Word, Double Word, and Quad Word. The default value is **Word**. 
(4)	Data Format	● The available options for **Data Format** are: BCD, Signed BCD, Signed Decimal, Unsigned Decimal, Hexadecimal, Binary, and Floating. The default value is **Unsigned Decimal**. ● When the **Data Type** is Word, the supported **Data Format** is as follows.  ● When the **Data Type** is Double Word, the supported **Data Format** is as follows.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>


When the Data Type is Quad Word, the supported Data Format is as follows.


</td></tr>
<tr><td>(5)</td><td>Minimum / Maximum</td><td>
The permissible range for the minimum and maximum values are based on the selected Data Type and Data Format.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td>Binary</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="6">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Binary</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="7"></td><td rowspan="7"></td><td rowspan="7">Quad Word</td><td>BCD</td><td>0 ~ 9999999999999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999999999999 ~ +9999999999999999</td></tr>
<tr><td>Signed Decimal</td><td>-9223372036854775808 ~ +9223372036854775807</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 18446744073709551615</td></tr>
<tr><td>Hex</td><td>0 ~ 0xffffffffffffffff</td></tr>
<tr><td>Binary</td><td>0 ~ 0xffffffffffffffff</td></tr>
<tr><td>Floating</td><td>0 ~ 999999999999999</td></tr>
<tr><td>(6)</td><td>Integer Digits / Fractional</td><td colspan="3">Set the number of integer digits and decimal digits. The default value of Integer Digits is 5 and Fractional is 0.</td></tr>
<tr><td>(7)</td><td>Language</td><td colspan="3">If users have set the language data, the properties of the displayed text can be edited with the Language setting of the element.
 
</td></tr>
<tr><td>(8)</td><td>Element description</td><td colspan="3">It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that users can easily know the performed actions.
 
</td></tr>
</table>

- Style

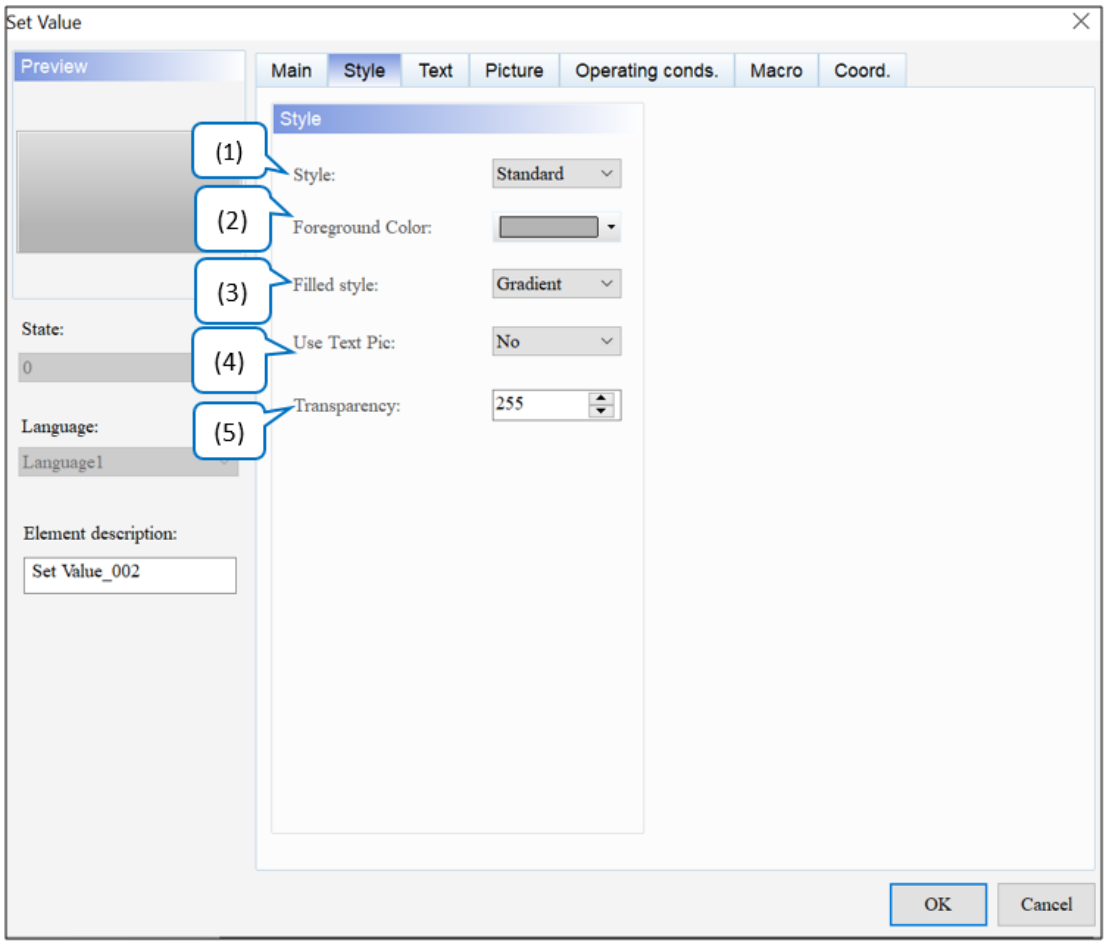
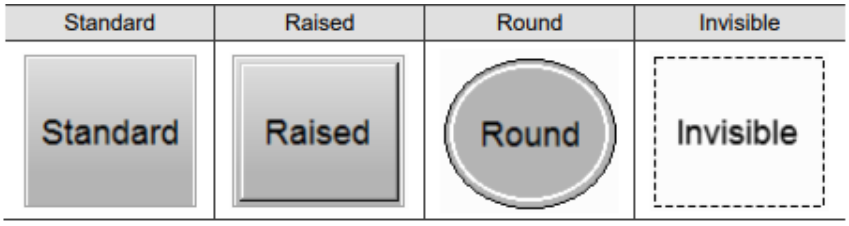
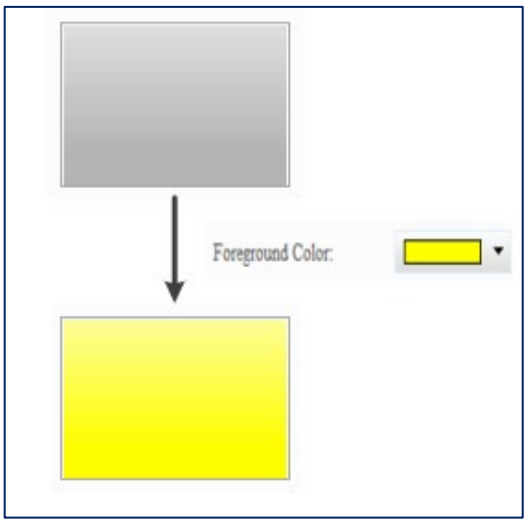


Figure 5 - 22: Set Value Button element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Round, and Invisible. The default value is **Standard**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Foreground Color</td><td>

Set the foreground color of the element. The default is  .
When users set the Style to Invisible, the Foreground Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>Use Text Pic</td><td>

Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
Refer to the following example:

</td></tr>
</table>

No.	Function	Description
		Use Text Pic is Yes: HELLO Use Text Pic is No: HELLO ***NOTE***: *If users use DIAScreen to open the DOP-B project, the **Use Text Pic** function will be set to Yes by default; if users add a new DOP-100 project, the **Use Text Pic** function will be set to No by default.*
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Text

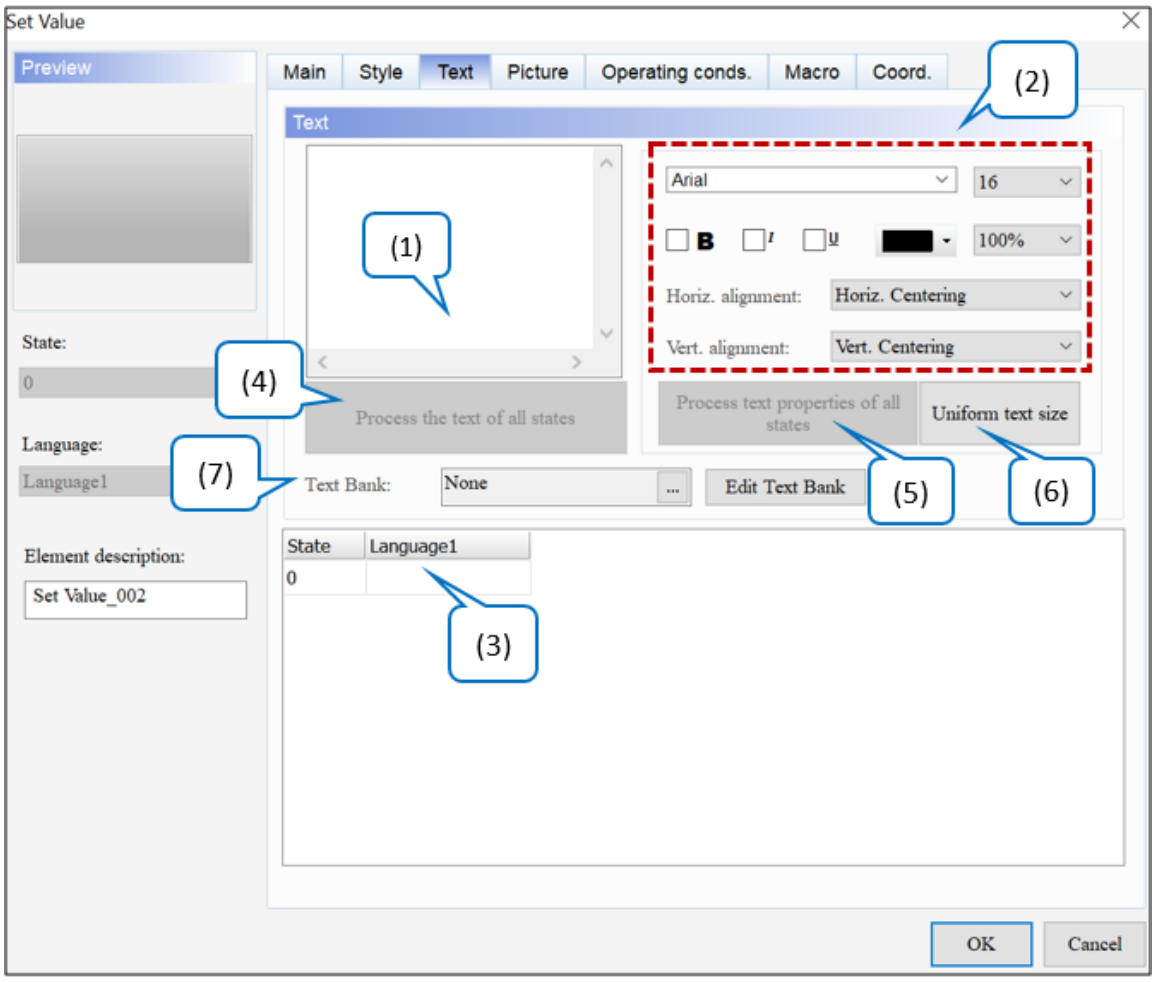
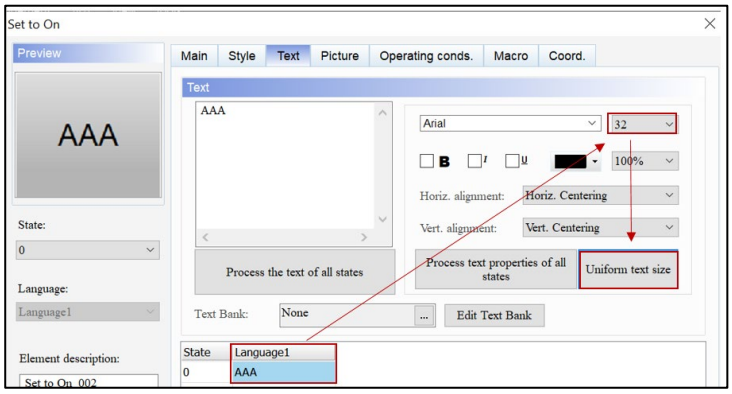


Figure 5 - 23: Set Value Button element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text-related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit Multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English text in the **English** column.
(4)	Process the text of all states	The **Set Value Button** element has no multi-state, and this function has no effect.
(5)	Process text properties of all states	The **Set Value Button** element has no multi-state, and this function has no effect.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

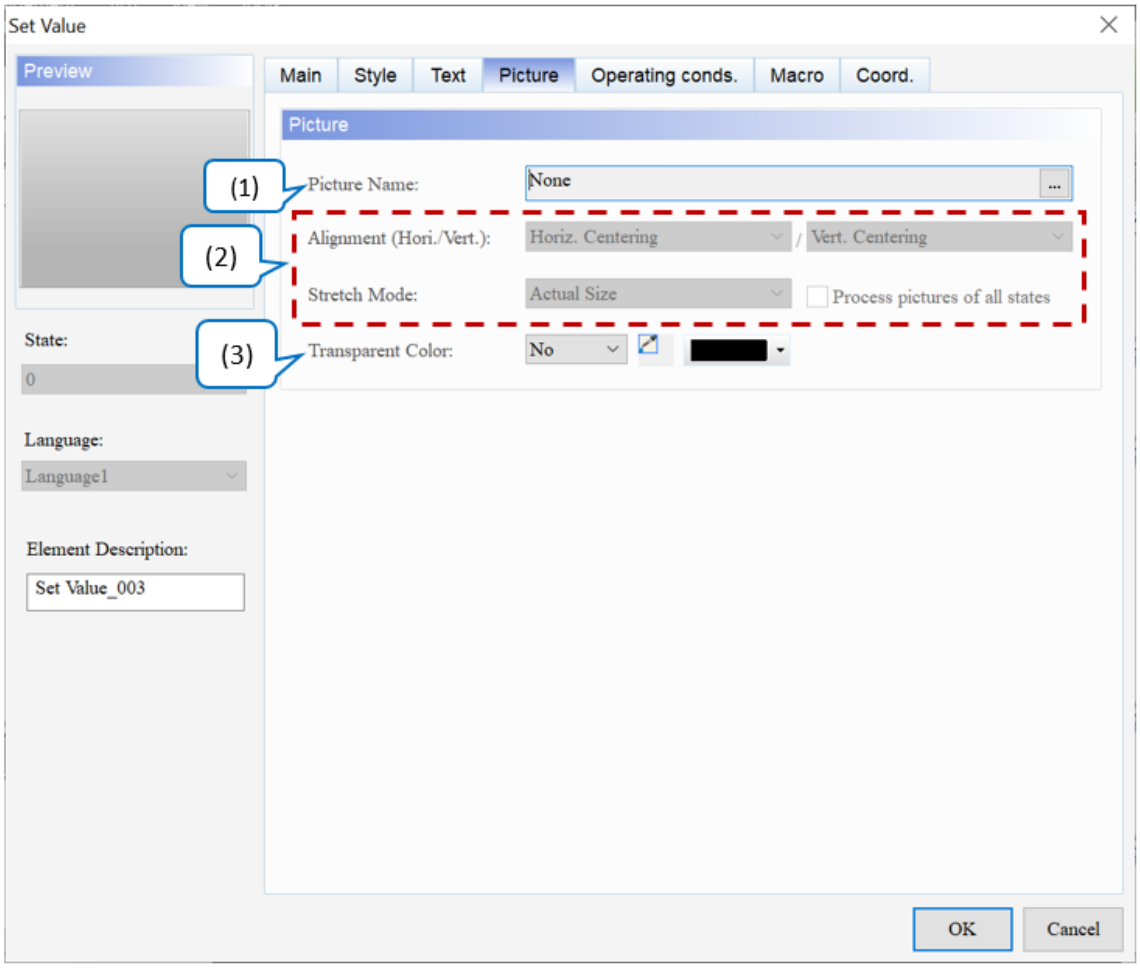
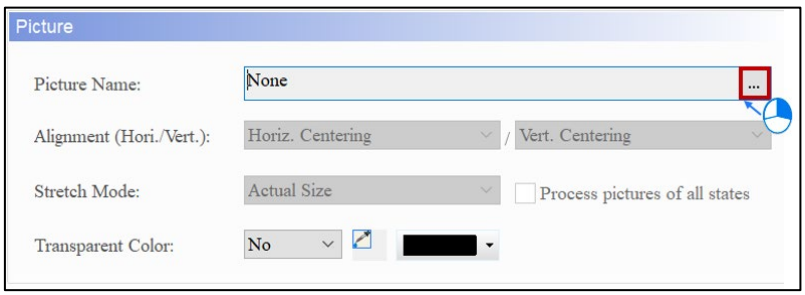
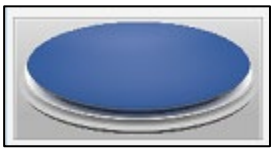


Figure 5 - 24: Set Value Button element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the</td></tr>
</table>

No.	Function	Description
		Foreground Color of the element. 

- Operating conds.

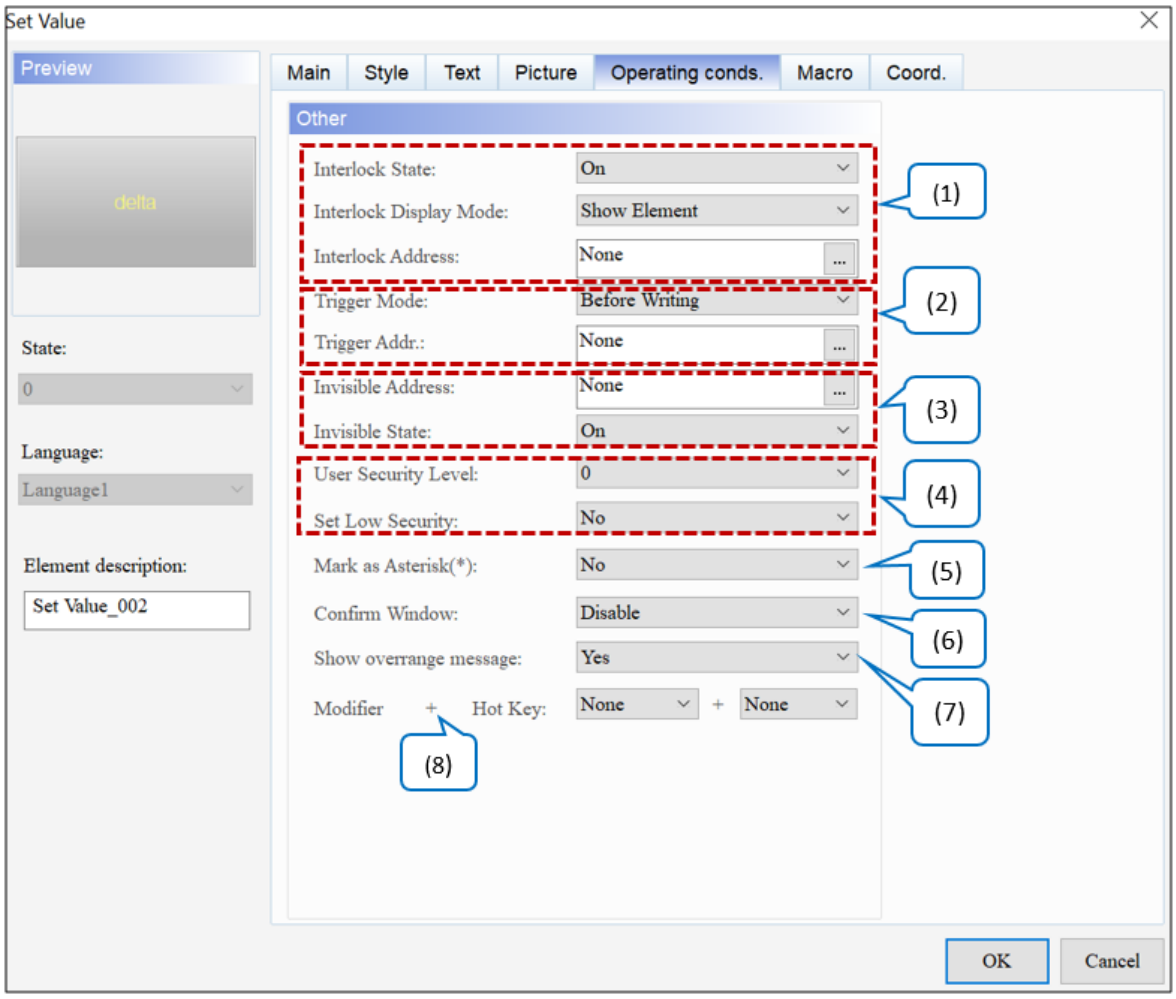
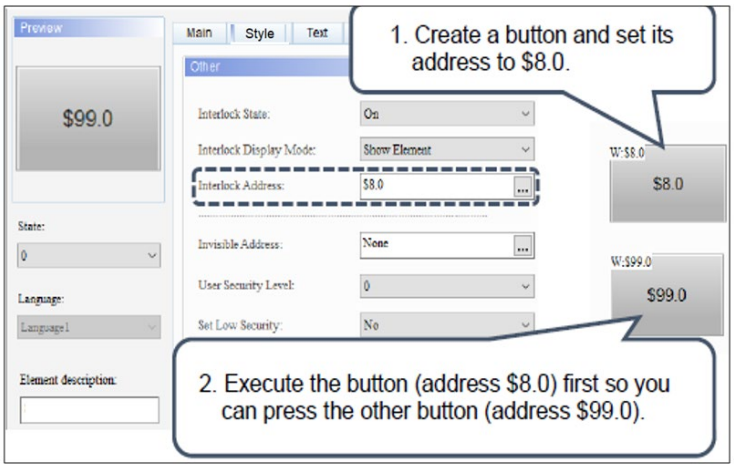


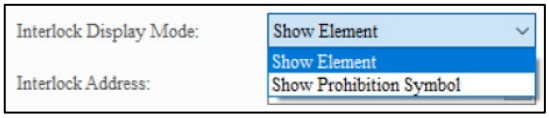
Figure 5 - 25: Set Value Button element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">(1)</td><td>Interlock State</td><td rowspan="3">

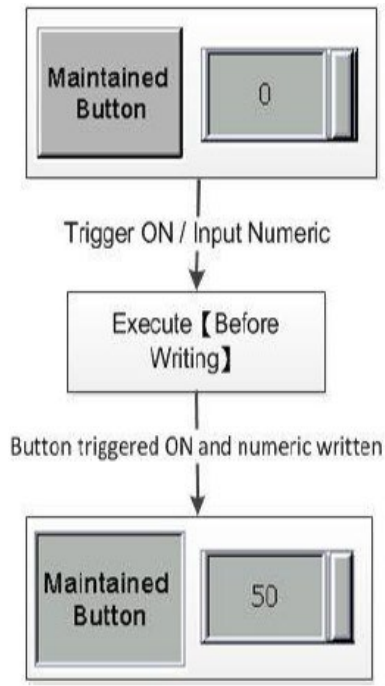
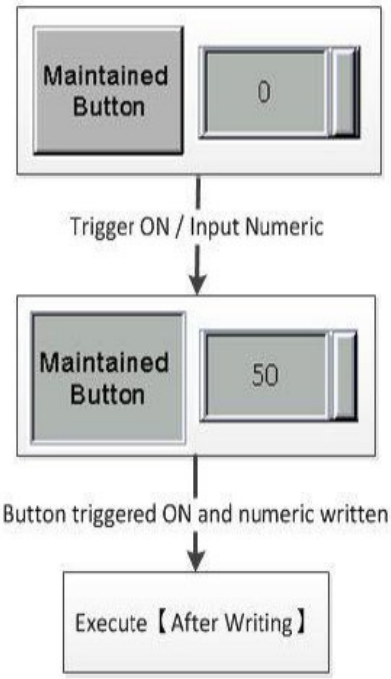
The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The behavior is as follows:

Create a button and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element with address $99.0.
Before having the element with address $99.0 to operate, press the button with address $8.0 to validate the button action (address $99.0).



The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.


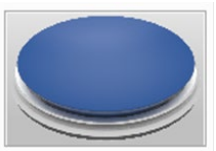
<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>Interlock Address</td></tr>
<tr><td>Interlock Display Mode</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Trigger Mode / Trigger Addr.</td><td>
The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><td rowspan="2">Trigger type</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>
Because the trigger function only sets the set trigger address to ON, users need to clear the trigger address to OFF if they need to trigger again.
<table>
<tr><th>Trigger Flowchart of Before Writing</th><th>Trigger Flowchart of After Writing</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
</table>

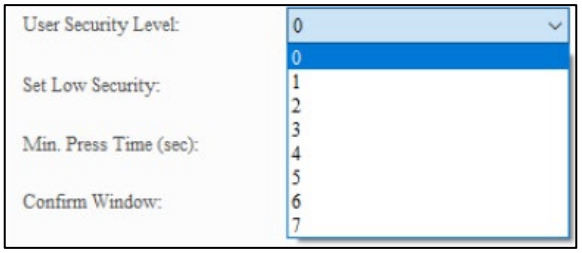
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(3)</td><td>Invisible Address</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

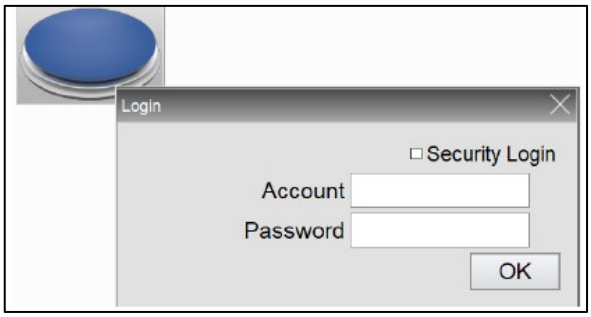
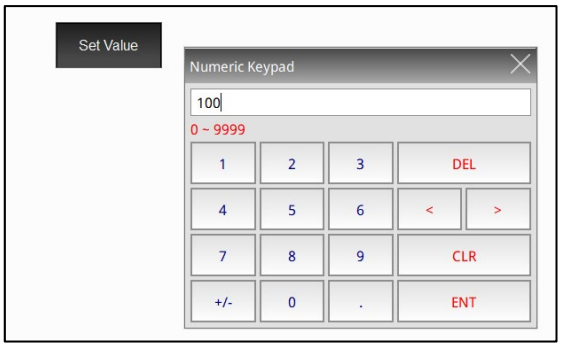
<table>
<tr><td rowspan="2">Invisible State is On</td><td>  </td><td>Invisible Address
$9.0 OFF</td></tr>
<tr><td>Element disappear</td><td>Invisible Address
$9.0 ON</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td>  </td><td>Invisible Address
$9.0 ON</td></tr>
<tr><td>Element disappear</td><td>Invisible Address
$9.0 OFF</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td><td></td></tr>
<tr><td>(4)</td><td>User Security Level</td><td>

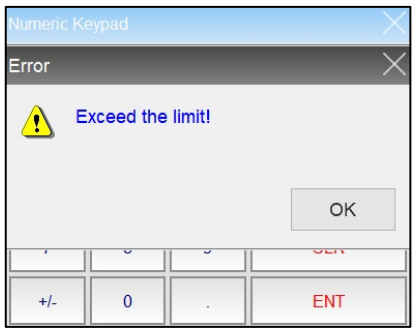
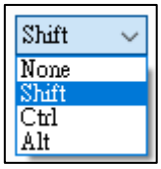
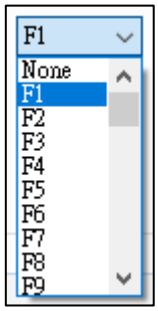
This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).



If users set the Set Low Security to Yes, each time users enter the password, the HMI sets the security

</td></tr>
</table>

No.	Function	Description
	Set Low Security	level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**. 
(5)	Mark as Asterisk (*)	If this function is set to Yes, when entering a value in the **Numeric Keypad** window, the displayed value appears as *, as shown in the following figure. The default value is **No**. 
(6)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation, and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 

No.	Function	Description
(7)	Show overrange message	If users set this function to Yes, when the input value is larger than the set value range, an error message appears to prompt users, as shown in the following figure. The default value is **No**. 
(8)	Modifier + Hot Key	● Allows to use the hot keys on the external keyboard to execute the buttons. ● The available options of **Modifier** are: None, Shift, Ctrl, and Alt keys.  ● The available options of **Hot Key** are: F1 ~ F12, English letters A ~ Z, and number keys 0 ~ 9. 

- Macro

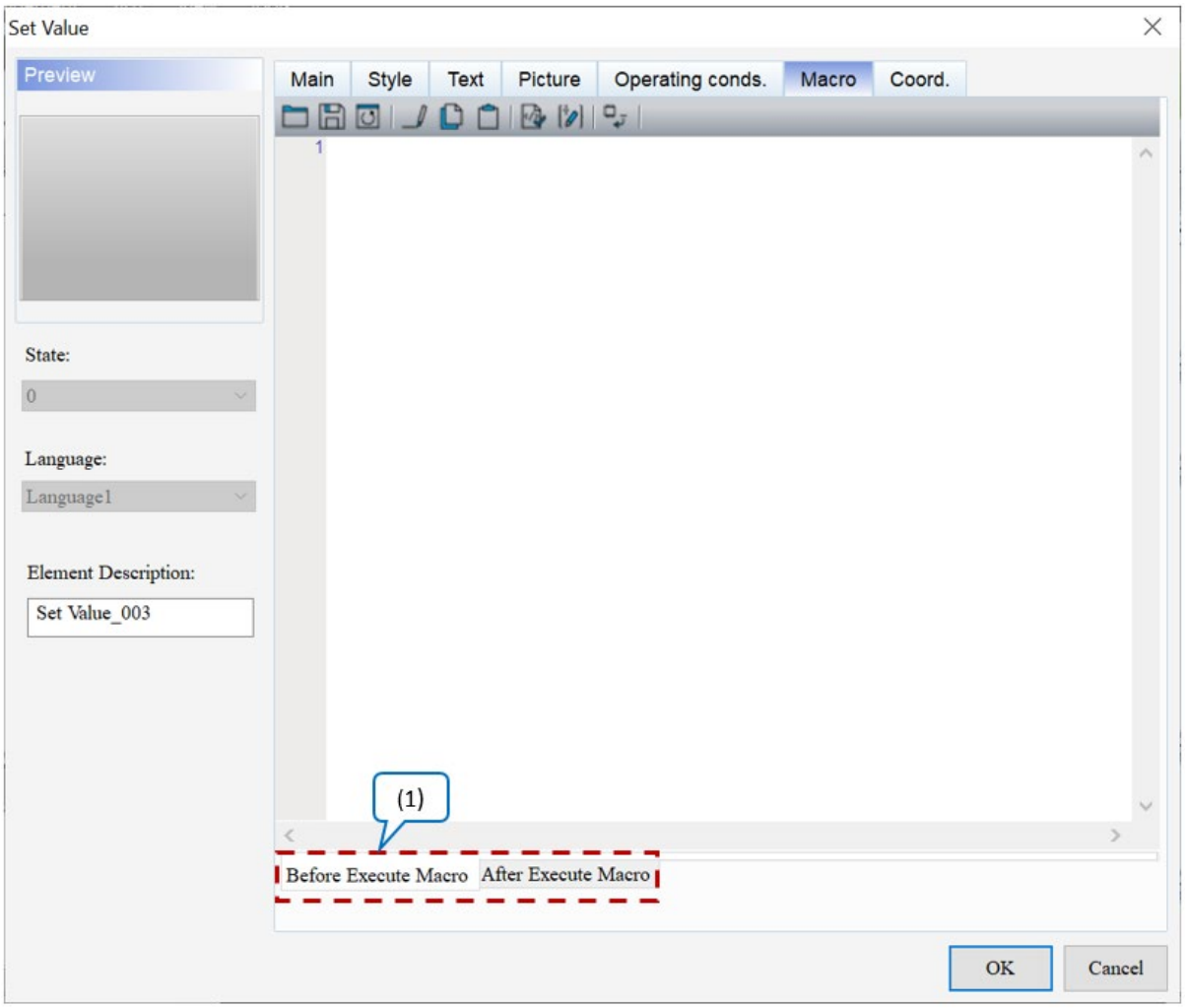
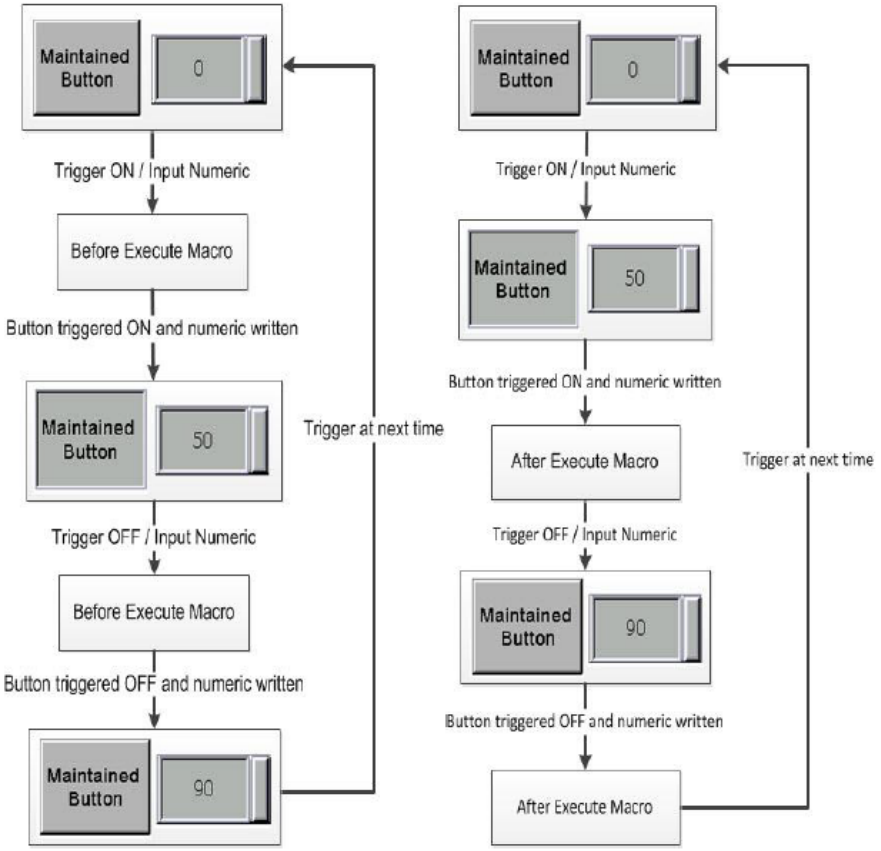


Figure 5 - 26: Set Value Button element Macro property page

No.	Function	Description
(1)	Flowcharts of **Before Execute Macro** / **After Execute Macro**: 	
	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

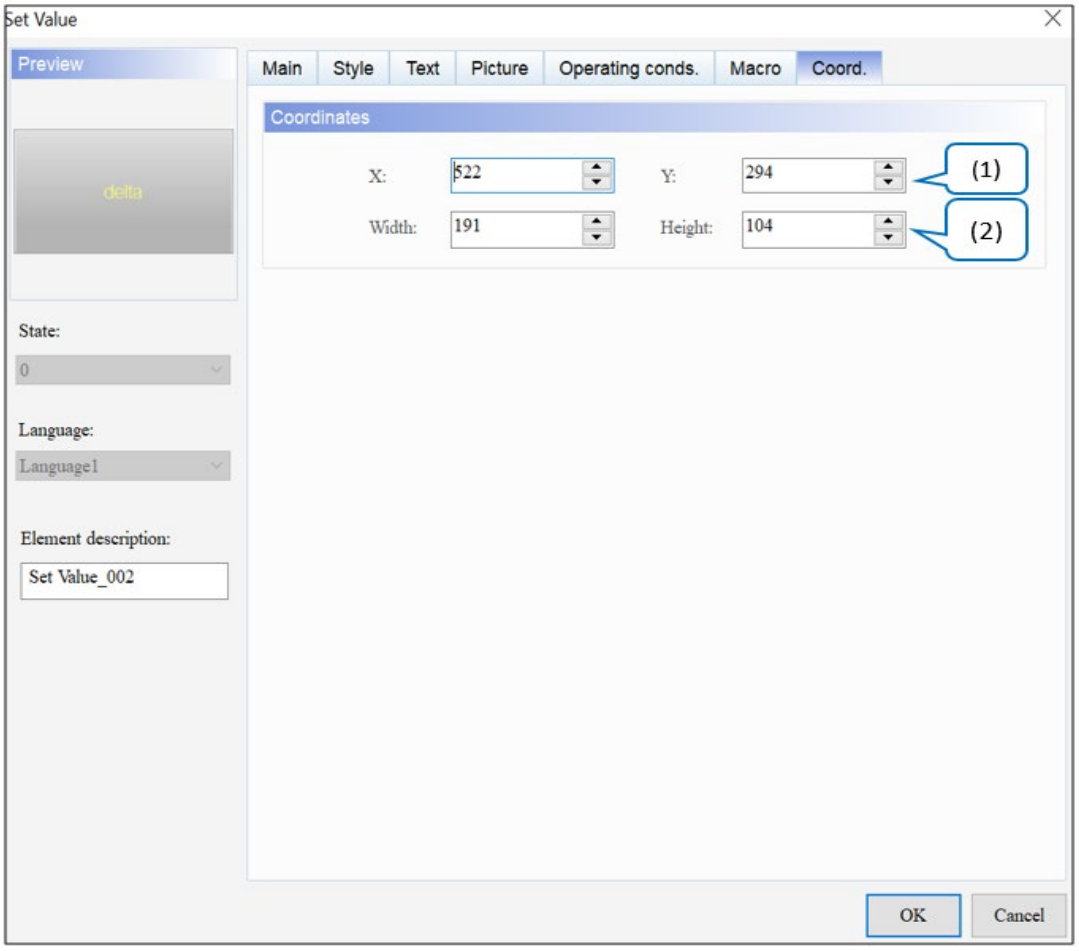
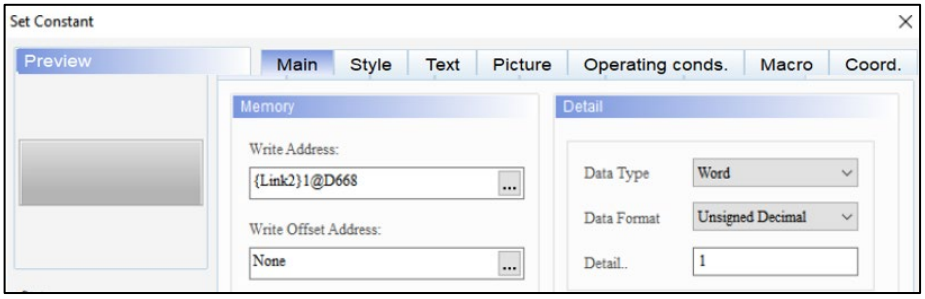
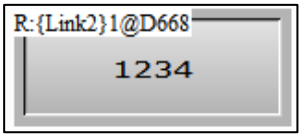


Figure 5 - 27: Set Value Button element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

5.4 Set Constant

When users touch **Set Constant Button** element on the HMI, the HMI changes the register data into the specified Set Constant.

Set Constant	
Memory Address of the Set Constant Button element Detail of the Set Constant Button element	
Memory Address of Numeric Display element	Set the **Numeric Display** element address to D668. 
Data Type	Word
Execution result	Press **Set Constant Button** element to write 1 into the **Numeric Display** element. 

On double-clicking the **Set Constant Button** element, the property page appears as follows.

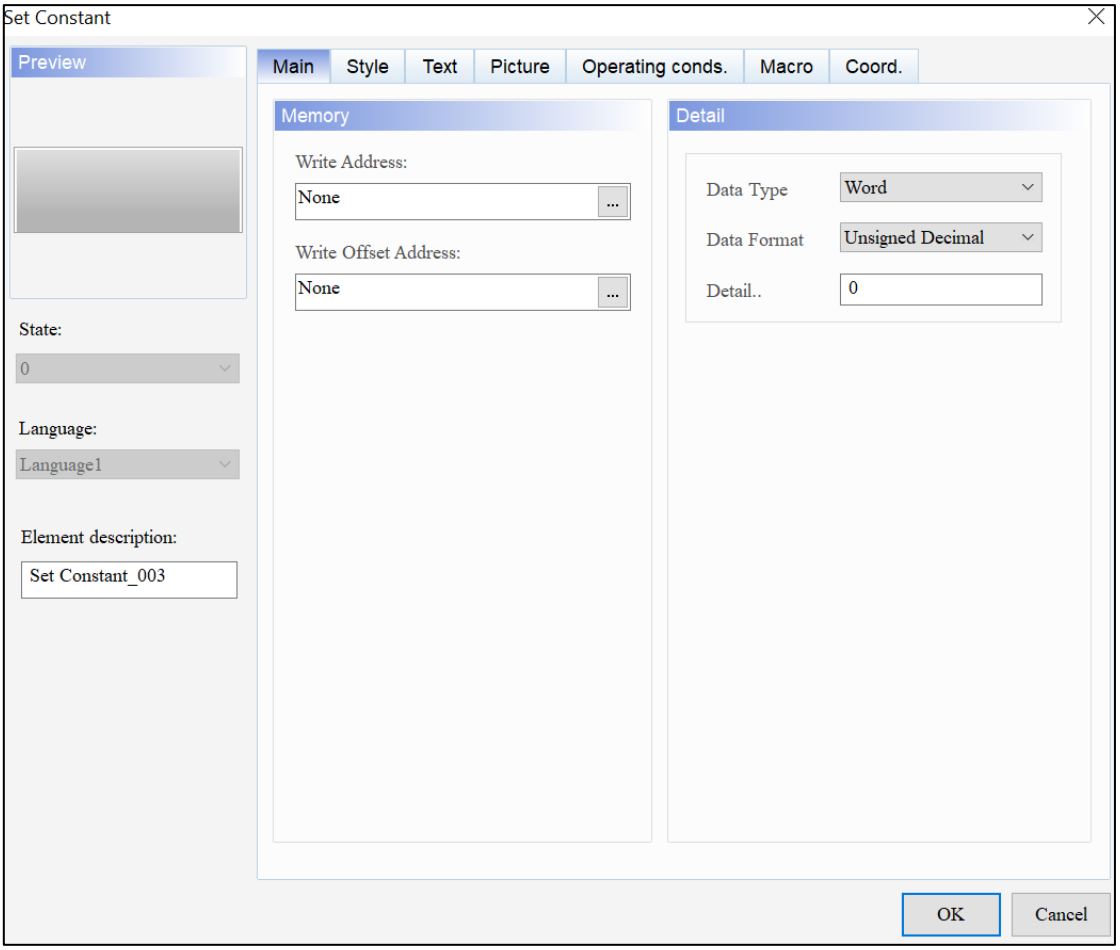


Figure 5 - 28: Set Constant Button element properties

Set Constant	
Function	**Description**
Preview	The **Set Constant Button** element can only view multi-language data display since the multistate property is not available for this element.
Main	Set the Write Address and Write Offset Address. Set the Data Type, Data Format, and Detail for the Set Constant element.
Style	Set the element Style, Foreground Color, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.

Set Constant	
Function	**Description**
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color options.
Operating Conds.	Set the Interlock Address, Interlock State, Interlock Display Mode, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Set Low Security, Confirm Window, and Modifier + Hot Key.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

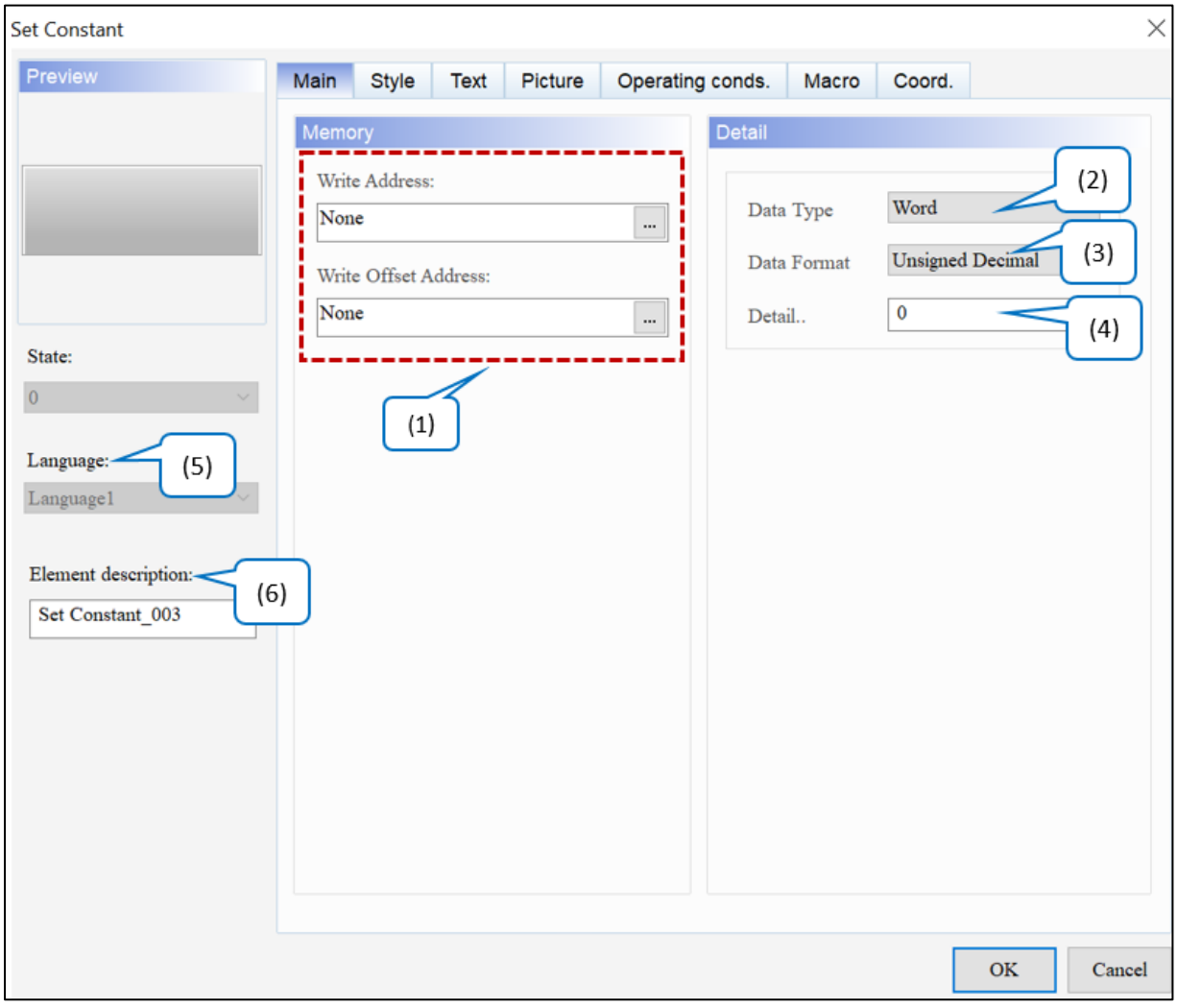
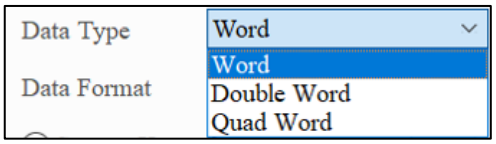
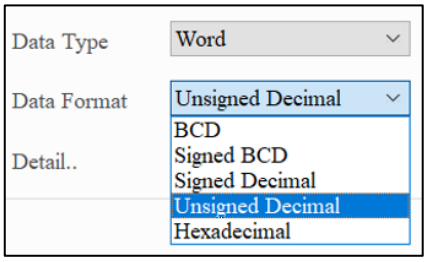
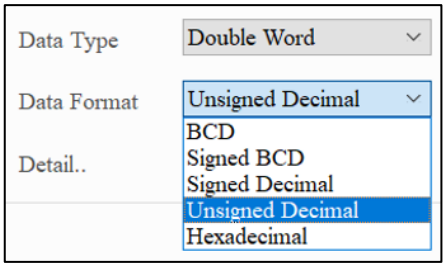
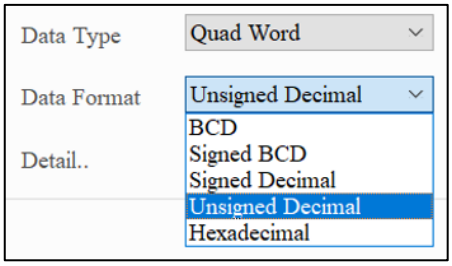
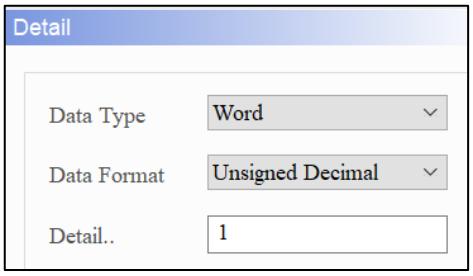
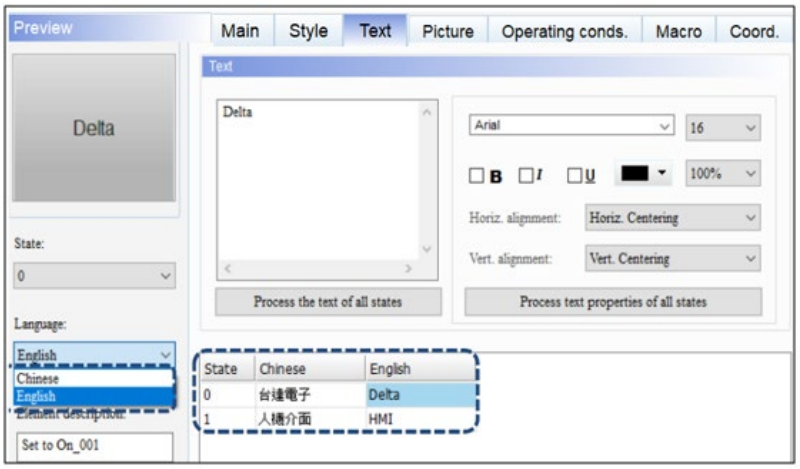
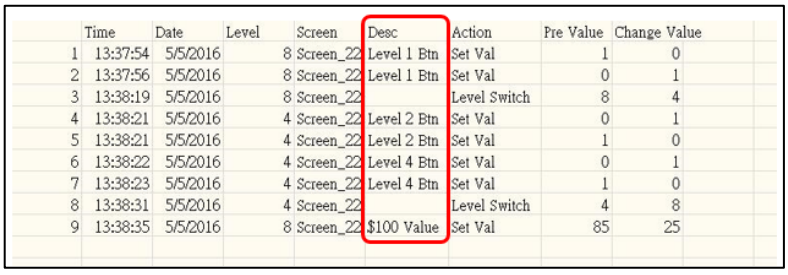


Figure 5 - 29: Set Constant Button element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Write Address</td><td>● Select the Internal Memory or the controller register address. The Input memory Type has to be Word.
● Select Link name and Device Type. Refer to Memory Settings.</td></tr>
<tr><td>Write Offset Address</td><td>Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>(2)</td><td>Data Type</td><td>The available options for Data Type are: Word, Double Word and Quad Word. The default value is Word.
 
</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>● The available options for Data Format are: BCD, Signed BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is Unsigned Decimal.
● When the Data Type is Word, the supported Data Format is as follows.
 

● When the Data Type is Double Word, the supported Data Format is as follows.
 

● When the Data Type is Quad Word, the supported Data Format is as follows.
 
</td></tr>
</table>

No.	Function	Description
(4)	Detail..	Determine the constant value to input. 
(5)	Language	If users have set the language data, the properties of the displayed text with the **Language** setting of the element can be edited by them. 
(6)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that users can easily know the performed actions. 

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

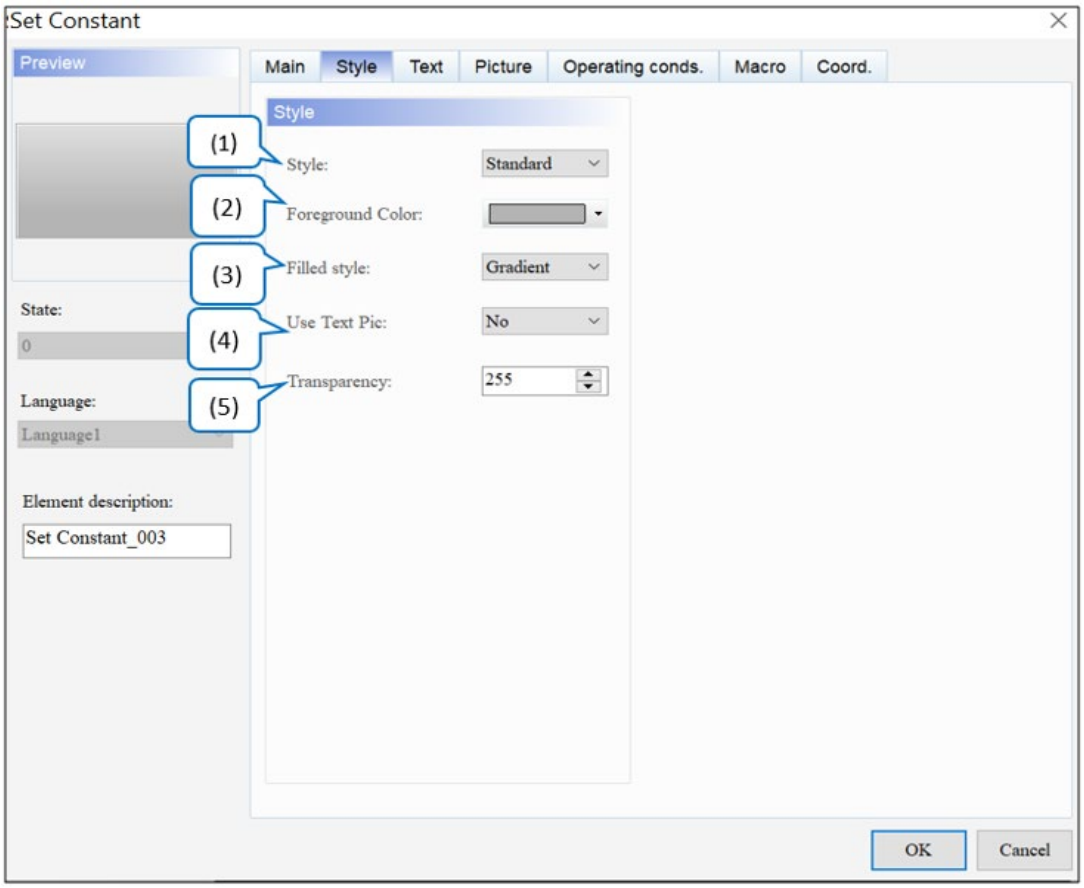
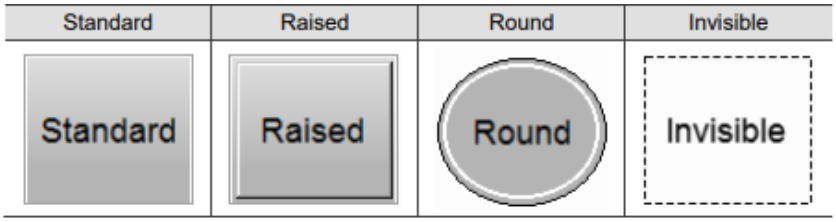
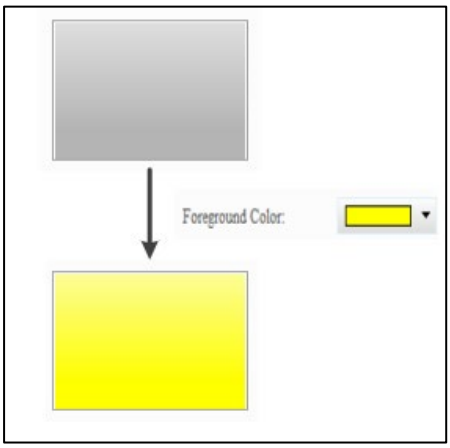


Figure 5 - 30: Set Constant Button element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Round, and Invisible. The default value is **Standard**. 
(2)	Foreground Color	● Set the foreground color of the element. The default is  . ● When users set the **Style** to Invisible, the **Foreground Color** setting is invalid.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(3)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>Use Text Pic</td><td>

Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
Refer to the following example:

<table>
<tr><th>Use Text Pic is Yes</th><th>Use Text Pic is No</th></tr>
<tr><td>HELLO</td><td>HELLO</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
		NOTE: *If users use DIAScreen to open the DOP-B project, the* ***Use Text Pic*** *function will be set to Yes by default; if users add a new DOP-100 project, the* ***Use Text Pic*** *function will be set to No by default.*
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Text

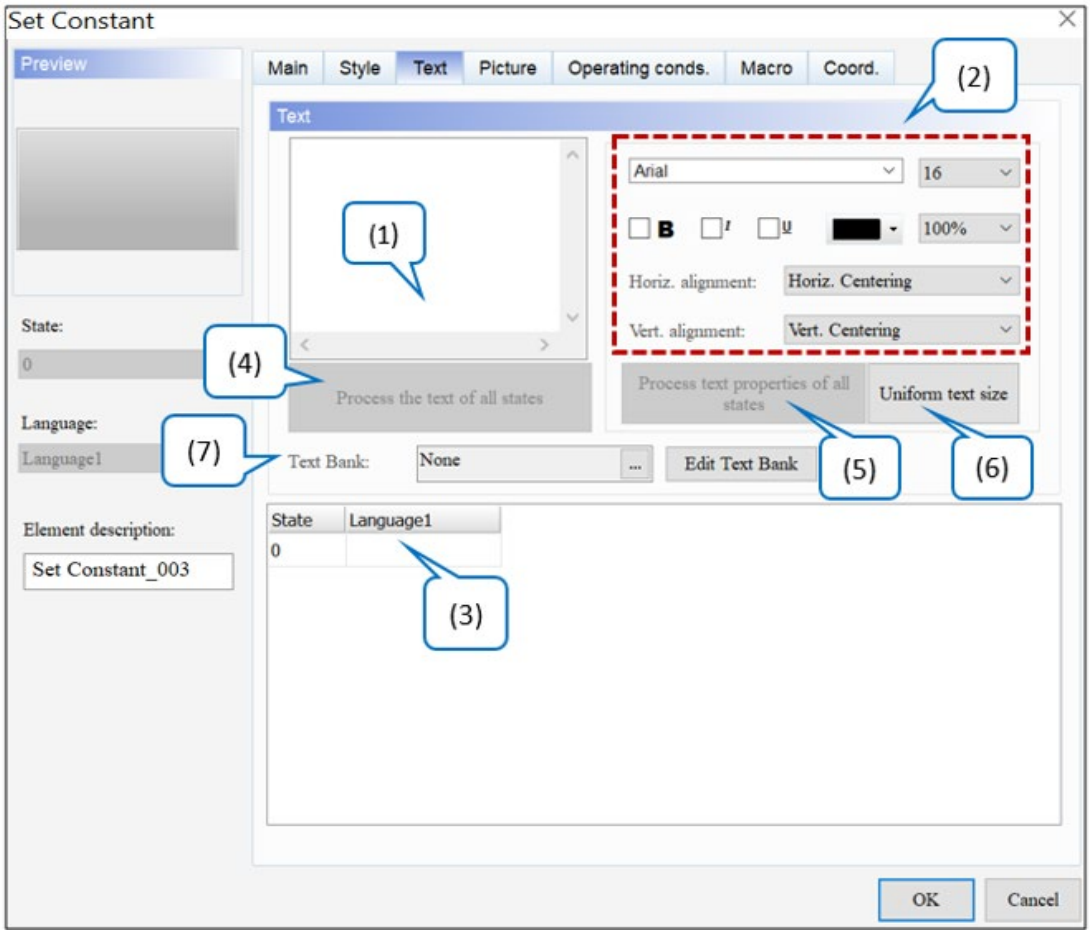
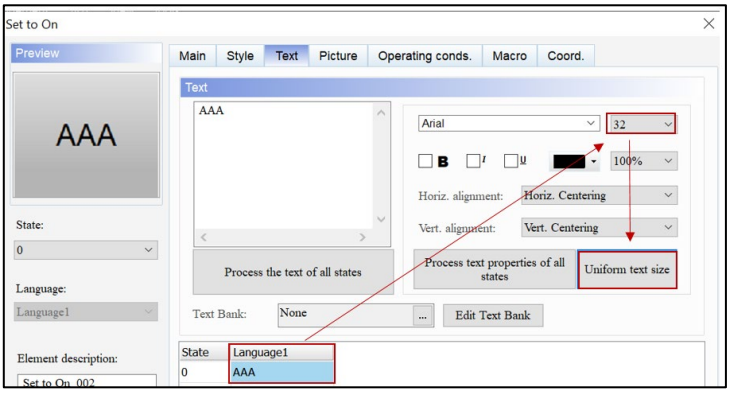


Figure 5 - 31: Set Constant Button element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text-related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit Multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English text in the **English** column.
(4)	Process the text of all states	The **Set Constant Button** element has no multi-state, and this function has no effect.
(5)	Process text properties of all states	The **Set Constant Button** element has no multi-state, and this function has no effect.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

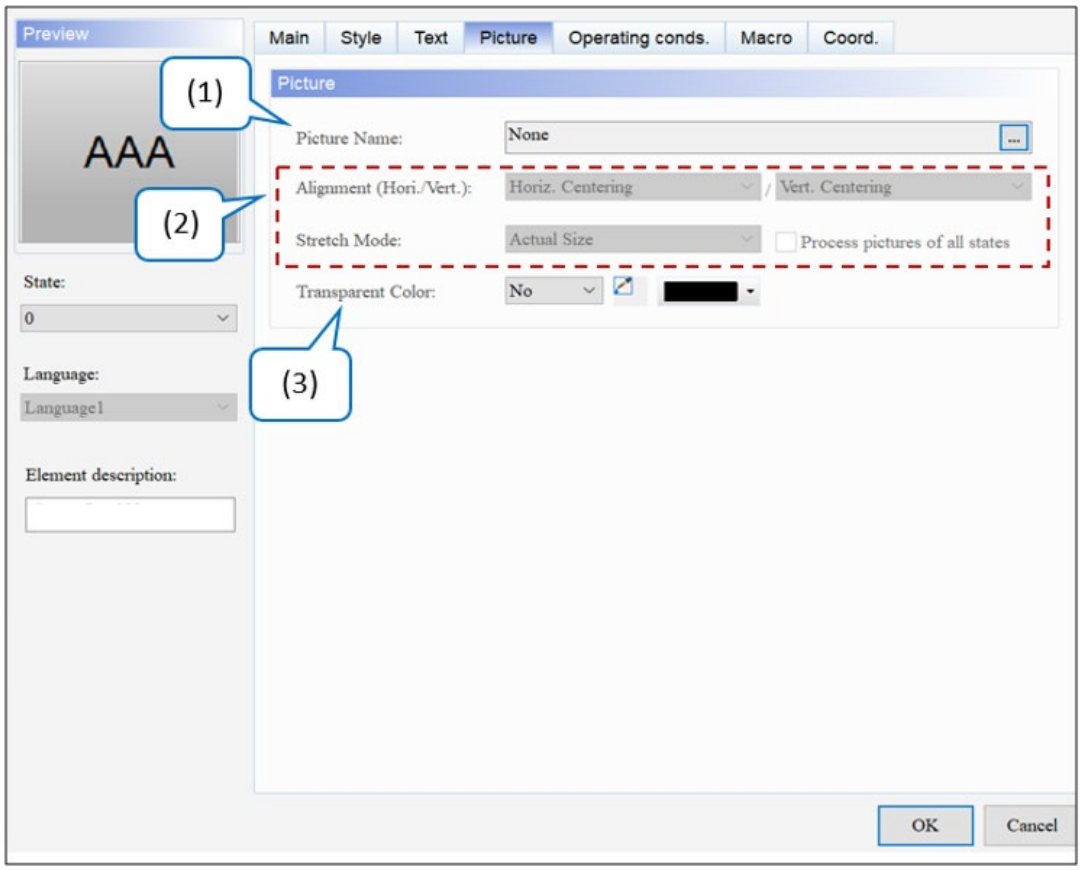
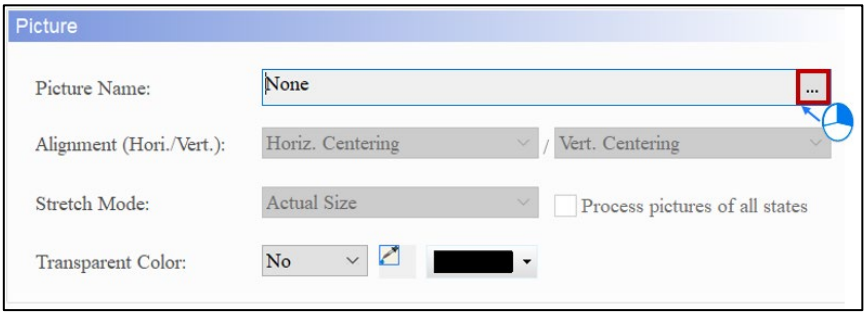
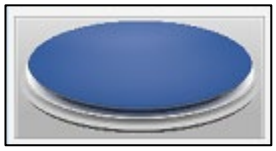


Figure 5 - 32: Set Constant Button element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar. DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the Foreground</td></tr>
</table>

No.	Function	Description
		Color of the element. 

- Operating conds.

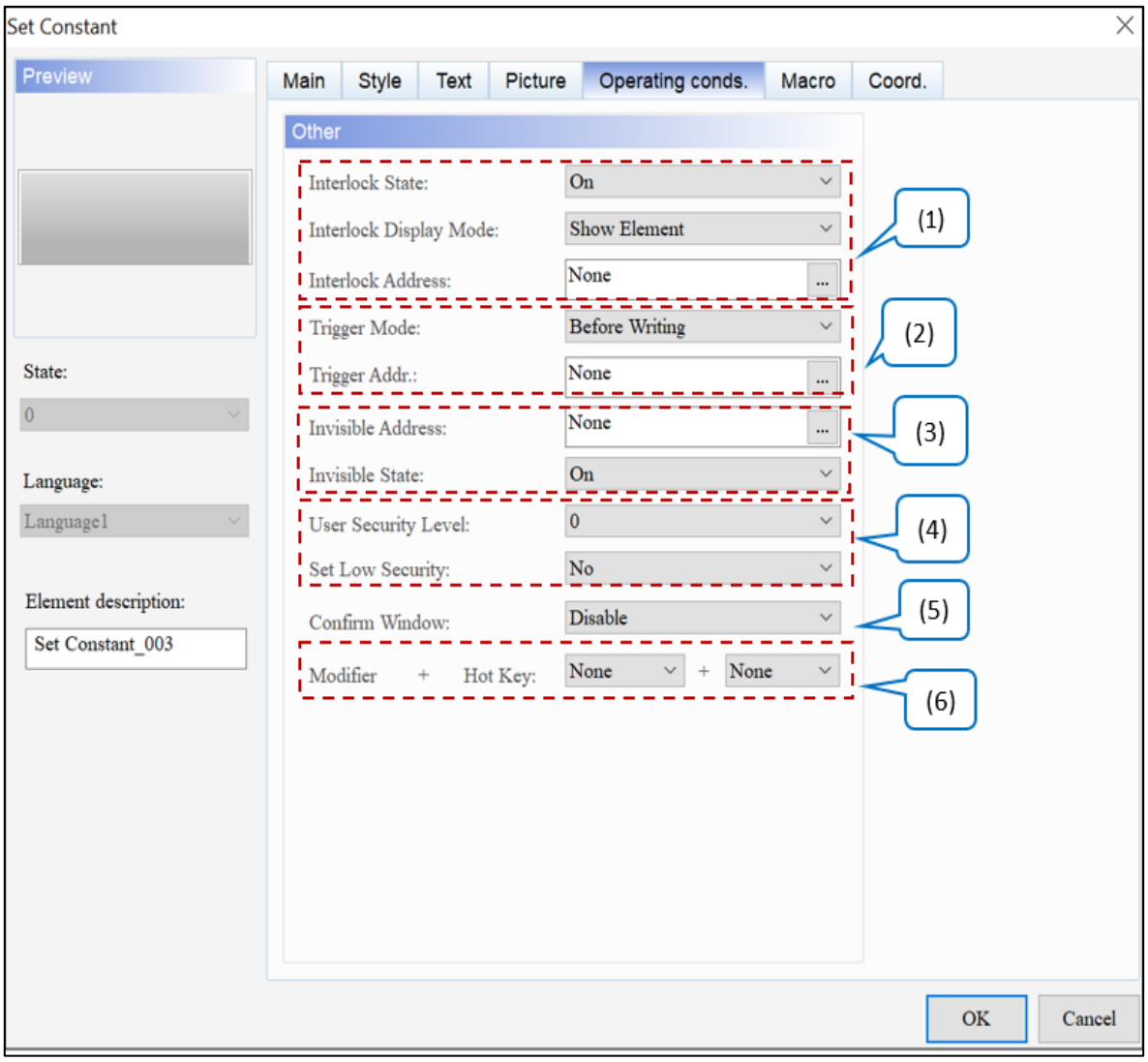
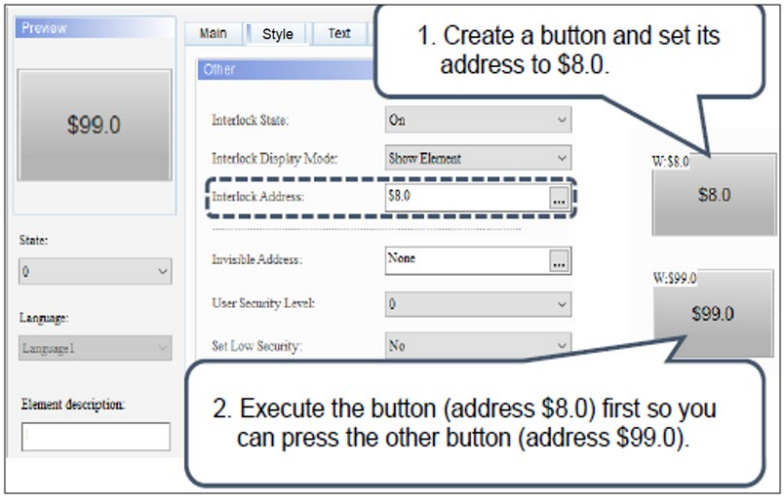


Figure 5 - 33: Set Constant Button element Operating conds. property page

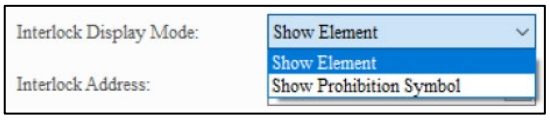
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Interlock State</td><td>

The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The behavior is as follows:

Create a button and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element with address $99.0.
Before having the element with address $99.0 to operate, press the button with address $8.0 to validate the button action (address $99.0).



The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.



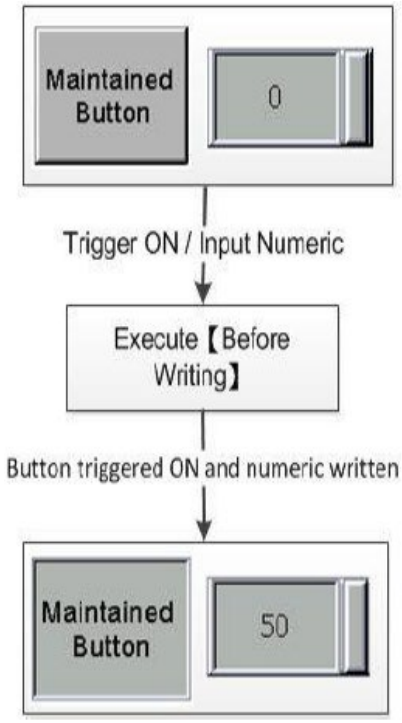
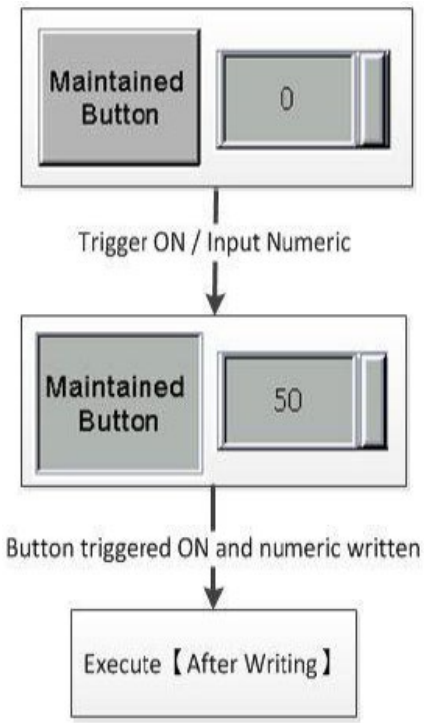
<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Trigger Mode / Trigger Addr.</td><td>

The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.

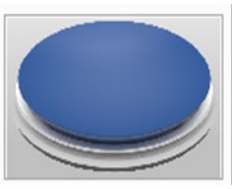
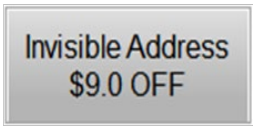
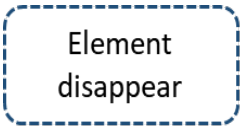
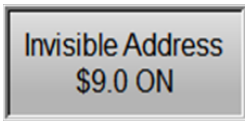
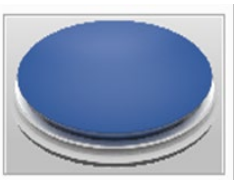
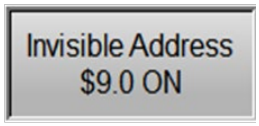
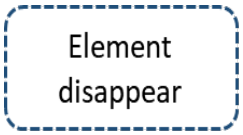
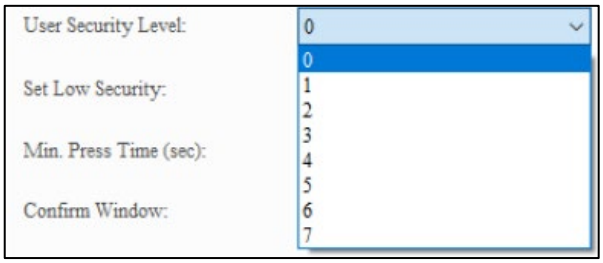
<table>
<tr><td rowspan="2">Trigger Type</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>

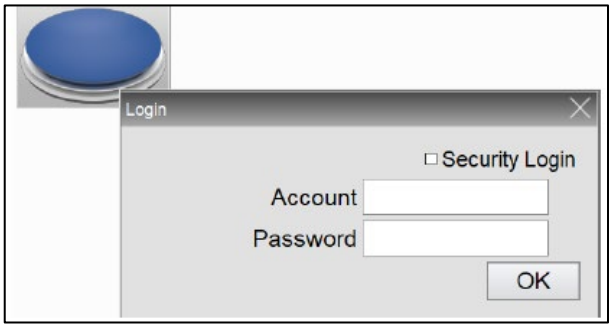
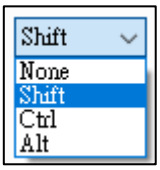
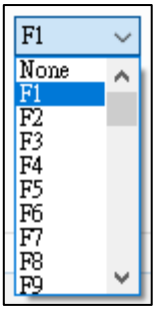
Because the trigger function only sets the set trigger address to ON, users need to clear the trigger address to OFF if they need to trigger again.

<table>
<tr><th>Trigger Flowchart of Before Writing</th><th>Trigger Flowchart of After Writing</th></tr>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Invisible Address / Invisible State</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:
1. Create a button and set its address to $9.0, then set the

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Invisible Address of the element to be hidden to $9.0.
2. To hide the element, first press the $9.0 button.
<table><tr><td rowspan="2">Invisible State is On</td><td>  </td><td>  </td></tr><tr><td>  </td><td>  </td></tr><tr><td rowspan="2">Invisible State is Off</td><td>  </td><td>  </td></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
<tr><td rowspan="2">(4)</td><td>User Security Level</td><td>● This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
● If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).
  </td></tr>
<tr><td>Set Low Security</td><td>● If users set the Set Low Security to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security</td></tr>
</table>

No.	Function	Description
		level again. The default value is **No**. 
(5)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 
(6)	Modifier + Hot Key	● Allows to use the hot keys on the external keyboard to execute the buttons. ● The available options for **Modifier** are: None, Shift, Ctrl, and Alt keys.  ● The available options for **Hot Key** are: F1 ~ F12, English letters A ~ Z, and number keys 0 ~ 9. 

- Macro

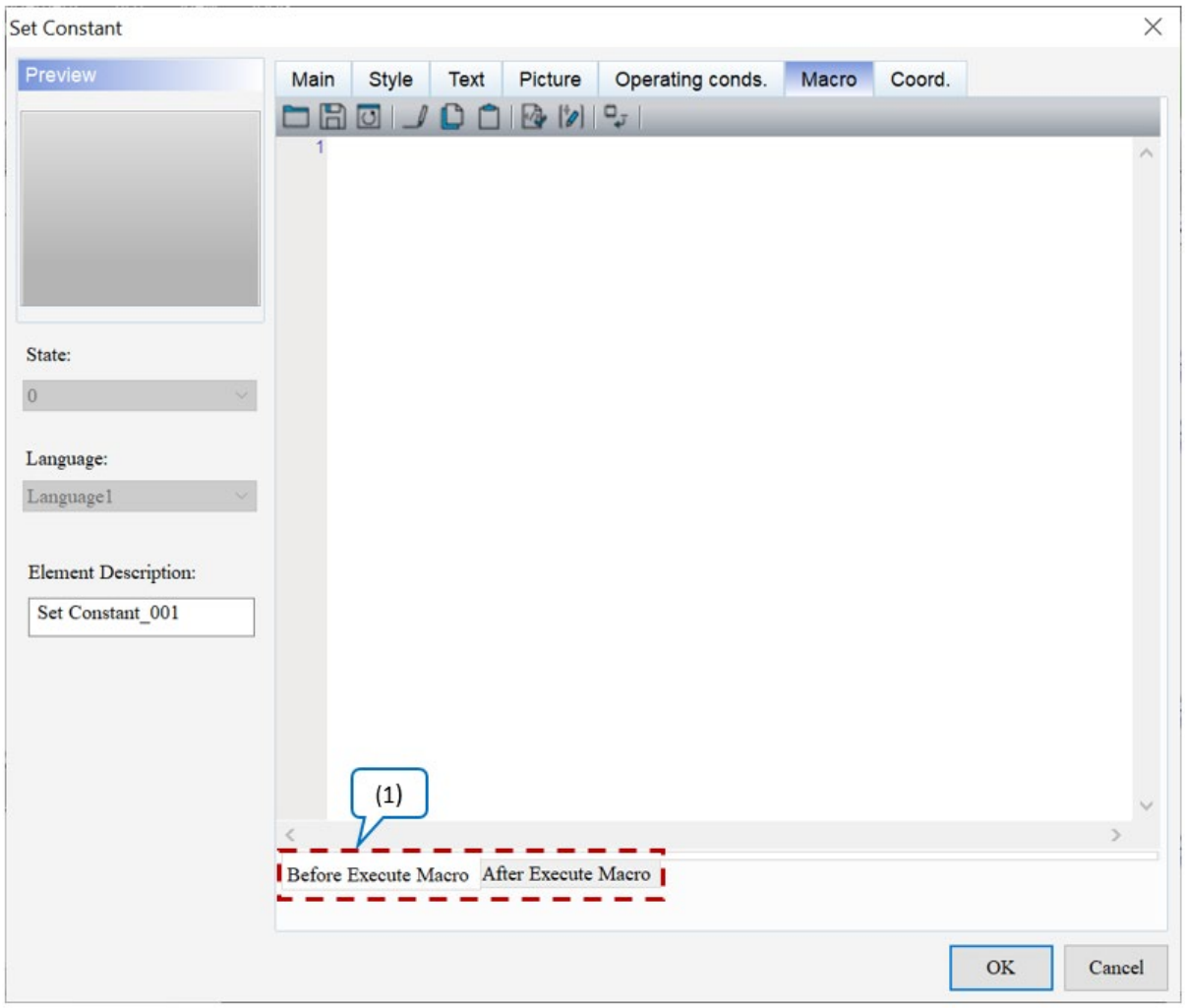
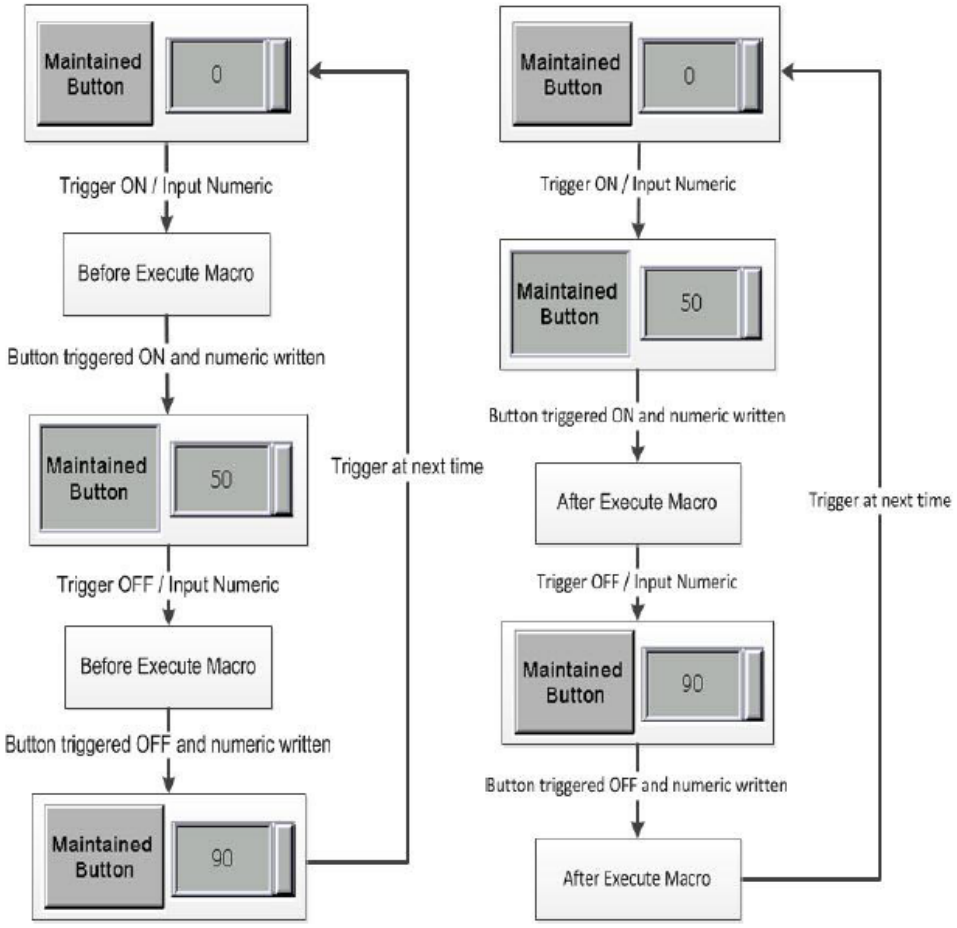


Figure 5 - 34: Set Constant Button element Macro property page

No.	Function	Description
(1)	Flowcharts of **Before Execute Macro** / **After Execute Macro**: 	
	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

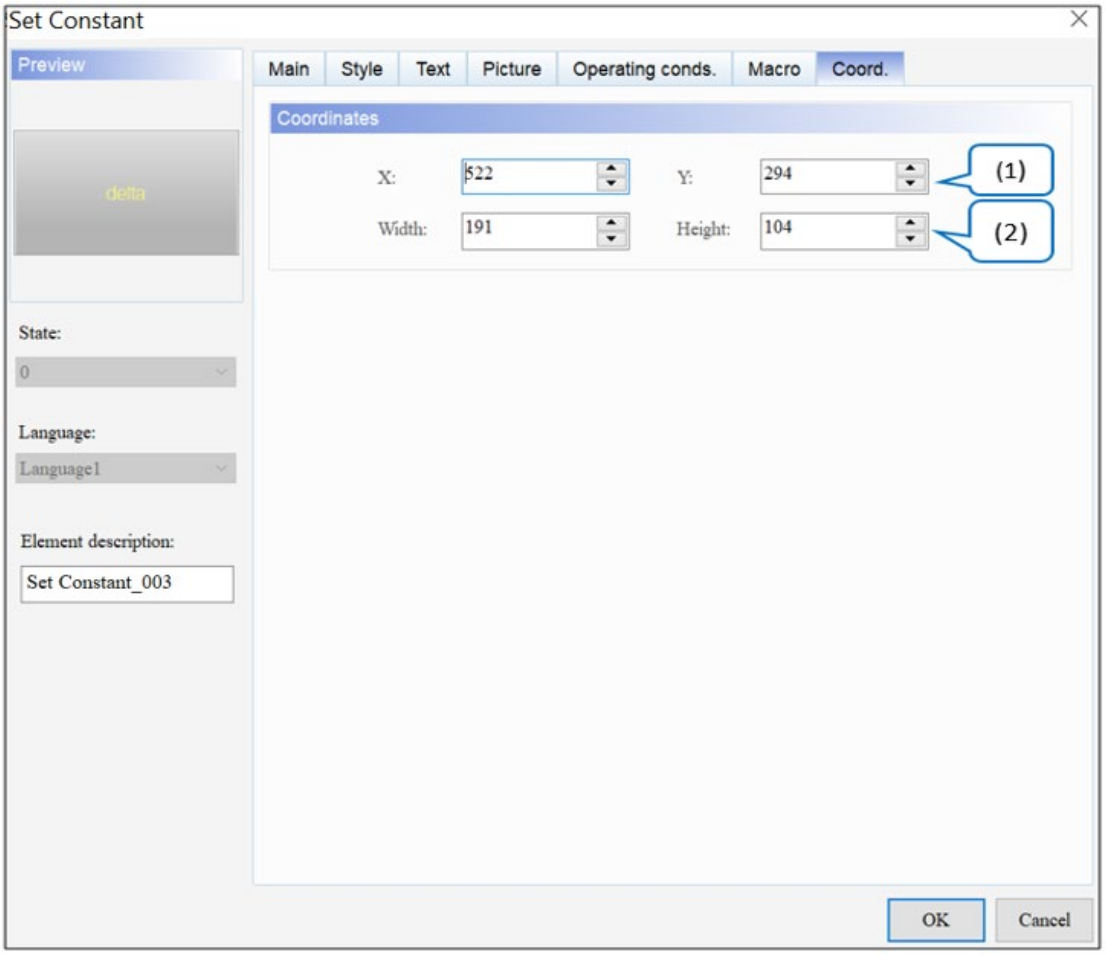


Figure 5 - 35: Set Constant Button element Coord. property page

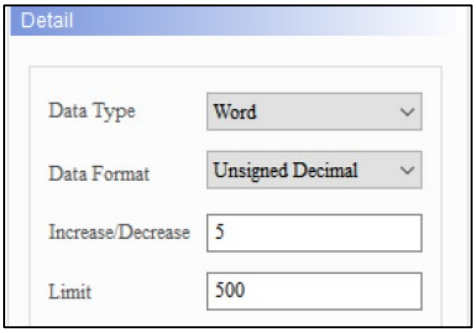
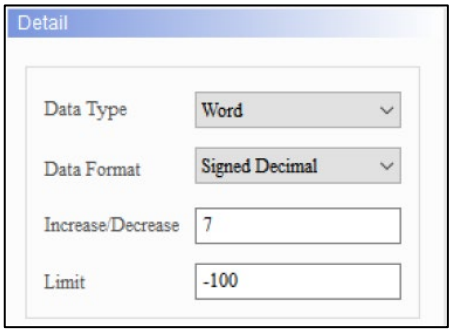
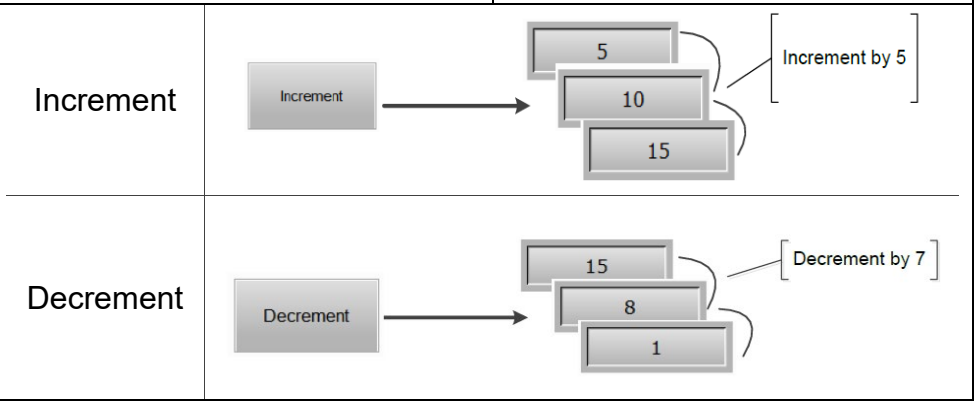
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

5.5 Increment / Decrement

When users touch the **Increment** / **Decrement Button** element on the HMI, the HMI reads the register data, adds or deducts the set increase or decrease, and then

writes the results into the corresponding register. If the increased or decreased value exceeds the set upper or lower limit, the **Increment** / **Decrement Button** element maintains the upper / lower limit value in the corresponding register.

NOTE: *If users press and hold the* ***Increment*** */* ***Decrement Button*** *element, the value continues to increase or decrease.*

<table>
<tr><th colspan="3">Increment / Decrement</th></tr>
<tr><td>Memory Address</td><td colspan="2">● Increment Button element Write Address: $555
● Decrement Button element Write Address: $555
● Numeric Display element Read Address: $555</td></tr>
<tr><td rowspan="3">Increment / Decrement setting values</td><td>Increment</td><td>Decrement</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td>Execution result</td><td>Increment</td><td></td></tr>
<tr><td></td><td>Decrement</td><td></td></tr>
</table>

On double-clicking the **Increment** / **Decrement Button** element, the property page appears as follows.

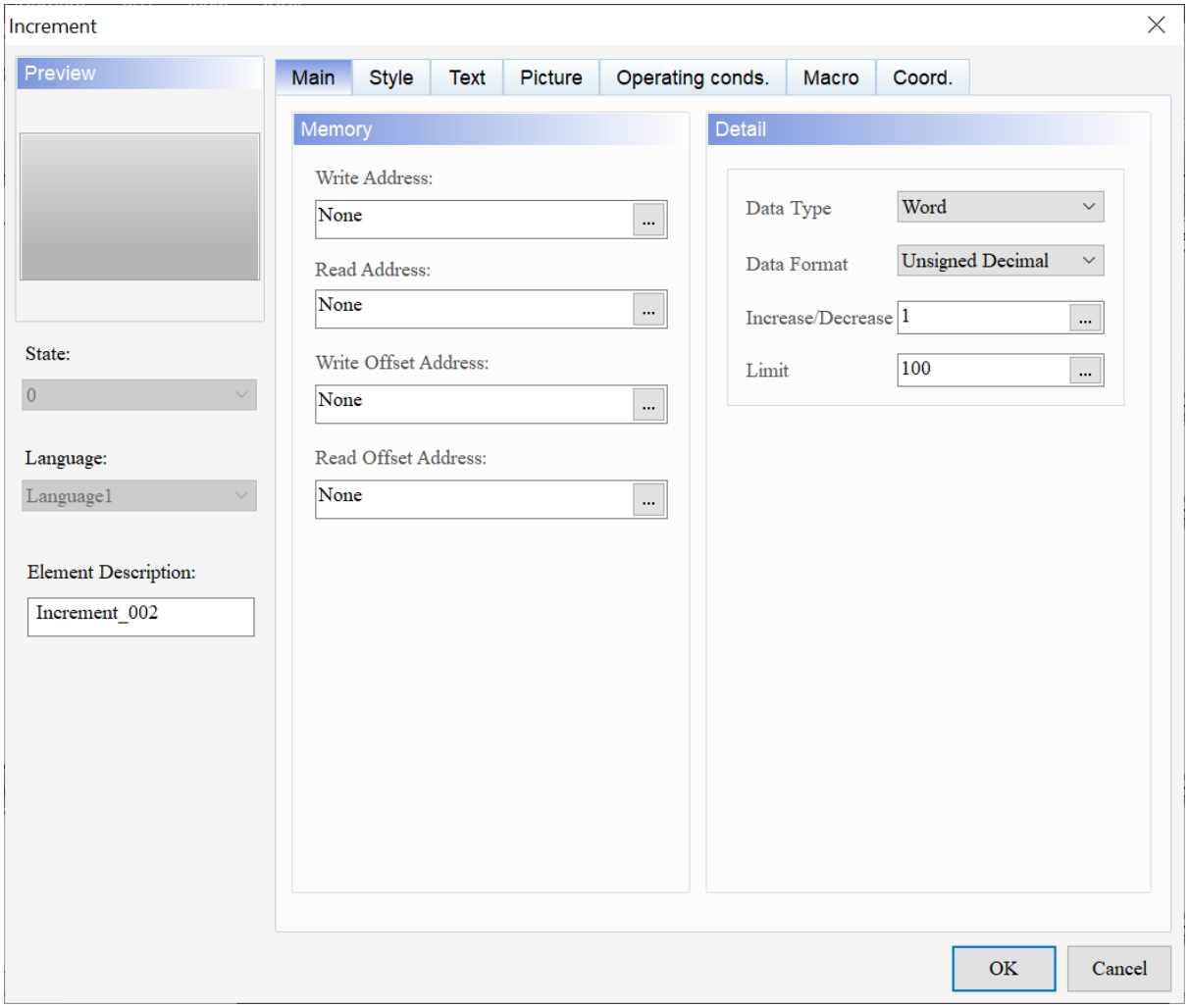


Figure 5 - 36: Increment / Decrement Button element property page

Increment / Decrement	
Function	**Description**
Preview	The **Increment** / **Decrement Button** element is only for viewing multi-language data display since the multistate property is not available for the element.
Main	Set Write Address, Read Address, Write Offset Address, Read Offset Address. Set the Data Type, Data Format, Increase/Decrease values, and Limit for the Increment / Decrement elements.
Style	Set element Style, Foreground Color, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.

Increment / Decrement	
Function	**Description**
Operating conds.	Set the Interlock Address, Interlock State, Interlock Display Mode, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Set Low Security, Confirm Window, and Modifier + Hot Key.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the button element.

- Main

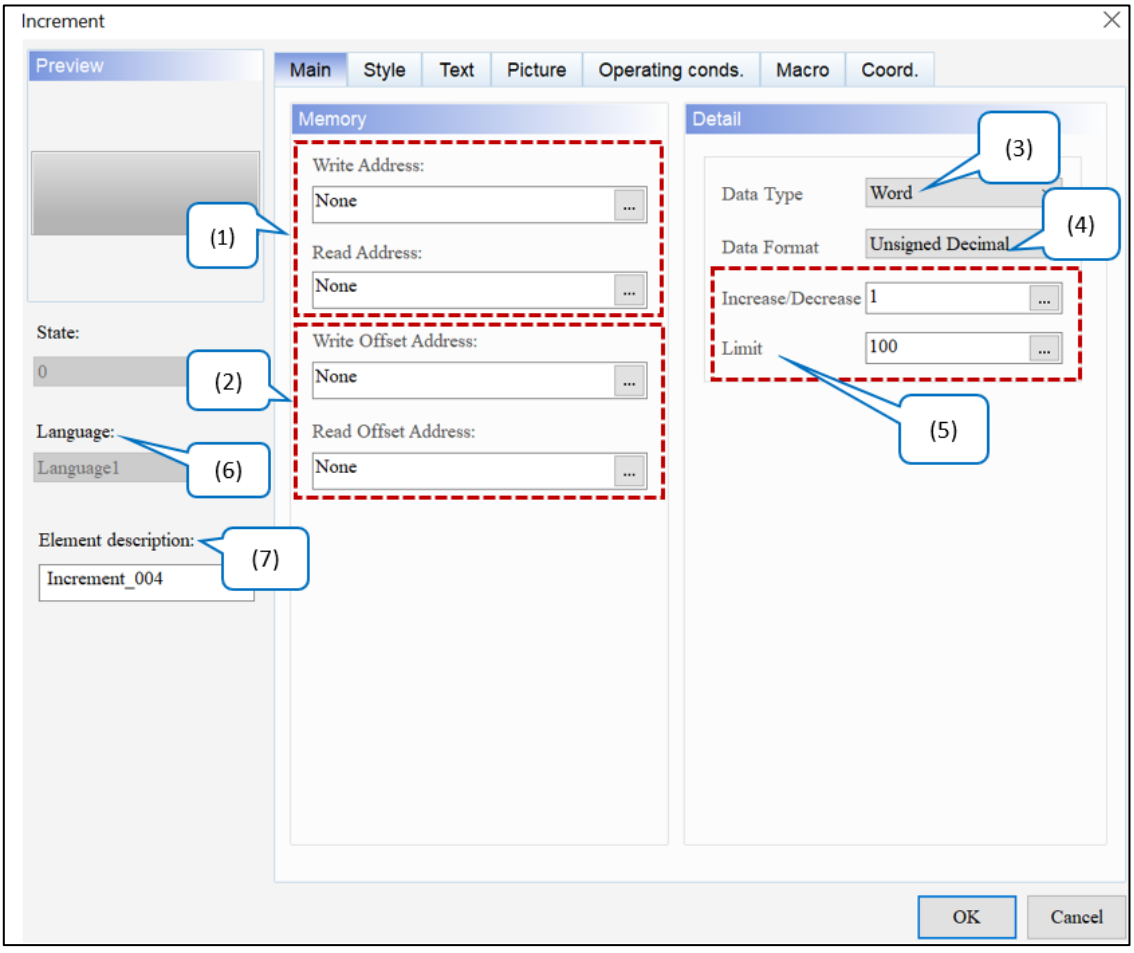
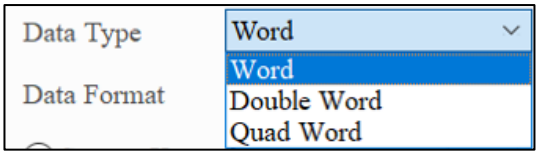
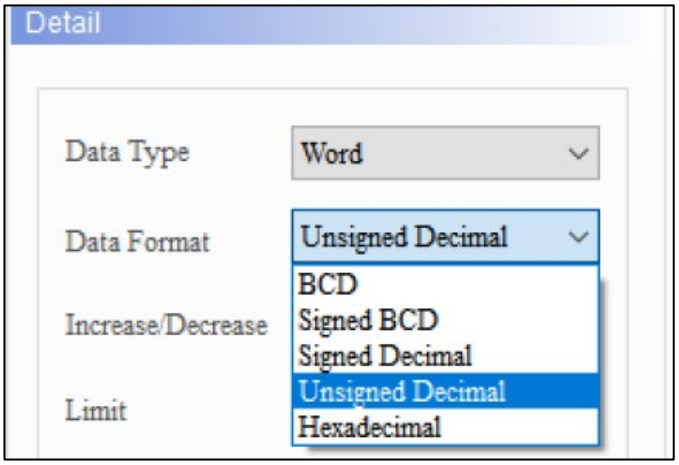
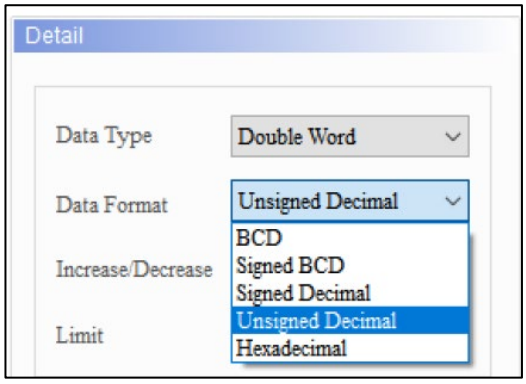
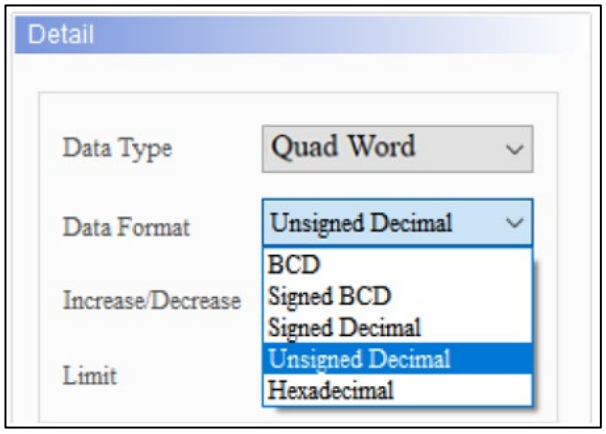
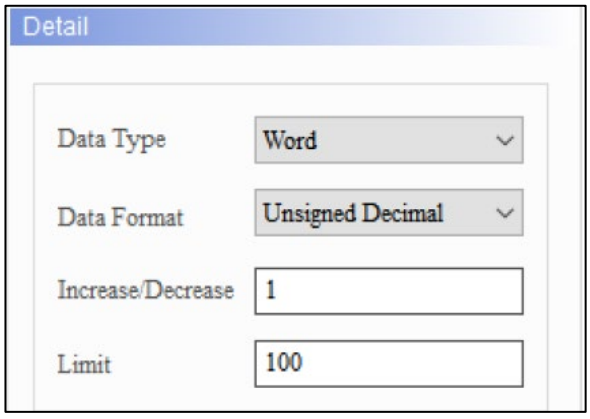
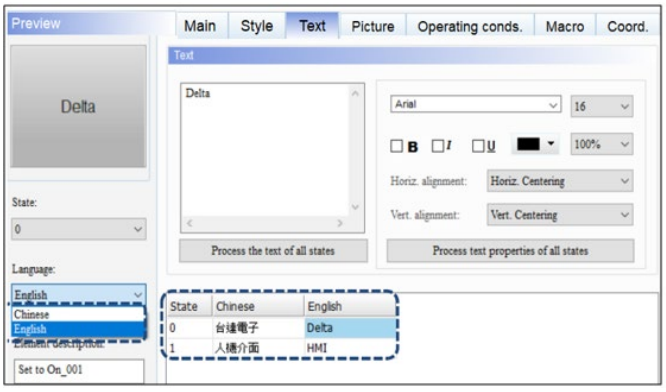


Figure 5 - 37: Increment / Decrement Button element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Write Address
Read Address</td><td>● Select the Internal Memory or the controller register address. The Input memory Type has to be Word.
● Select Link name and Device Type. Refer to Memory Settings.</td></tr>
<tr><td rowspan="2">(2)</td><td>Write Offset Address
Read Offset Address</td><td>Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>(3)</td><td>Data Type</td><td>The available options for Data Type are: Word, Double Word, and Quad Word. The default value is Word.
 
</td></tr>
<tr><td>(4)</td><td>Data Format</td><td>● When the Data Type is set to Word, the supported Data Format is as follows.
 

● When the Data Type is set to Double Word, the supported Data Format is as follows.
 

● When the Data Type is Quad Word, the supported Data</td></tr>
</table>

No.	Function	Description
		Format is as follows. 
(5)	Increase/ Decrease	● The **Increase/Decrease** refers to the increase or decrease values when users touch the **Increment** / **Decrement Button** element. The default value is **1**. ● **Limit** refers to the increasing or decreasing value range. The default value is **100**. ● After clicking **OK**, DIAScreen checks the value range of the entered **Increase/Decrease** values and **Limit** values according to the selected **Data Type** and **Data Format**. 
	Limit	
(6)	Language	If users have set the language data, they can edit the properties of the displayed text with the **Language** setting of the element. 

No.	Function	Description
(7)	Element description	It can be used to record the actions executed by element. The record is written in the CSV file of the Operation Log Table so that users can understand the performed actions.

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

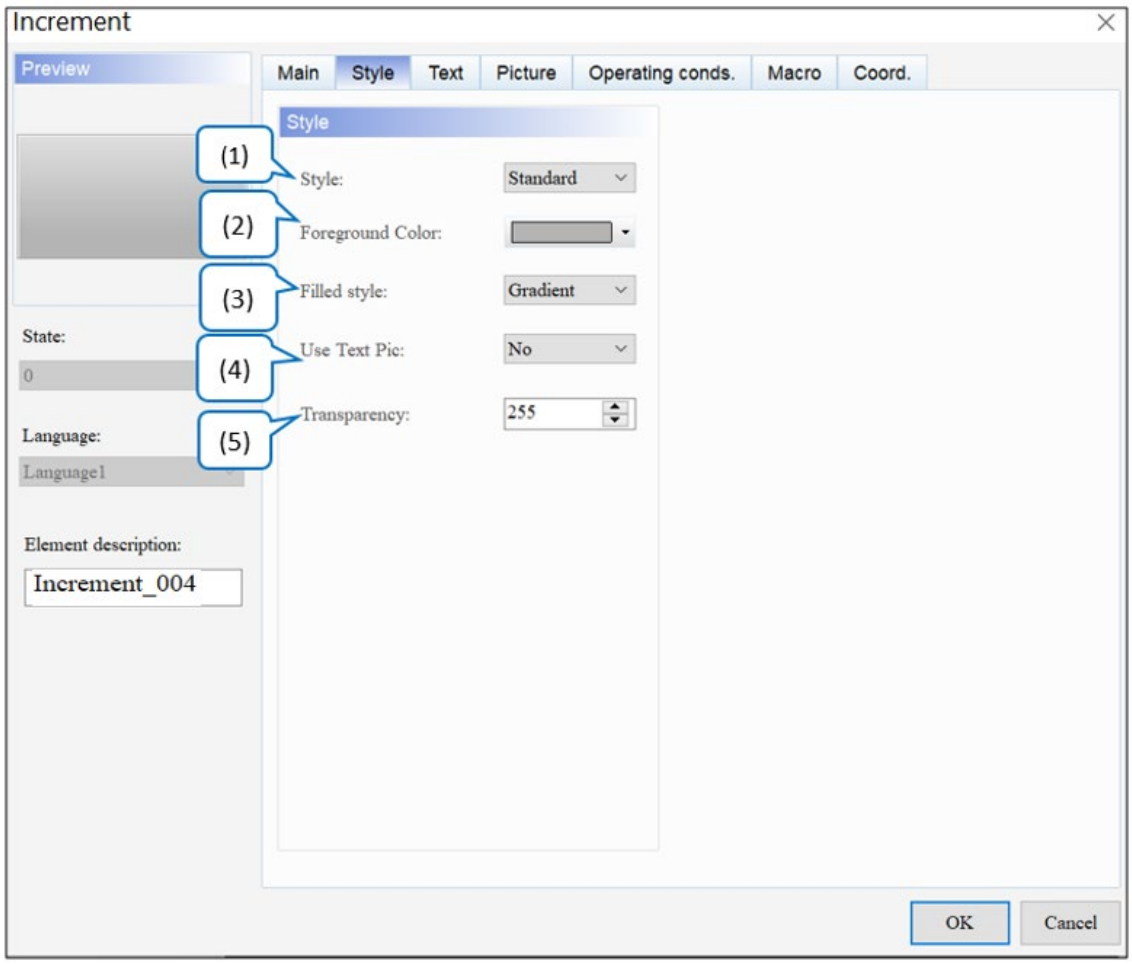
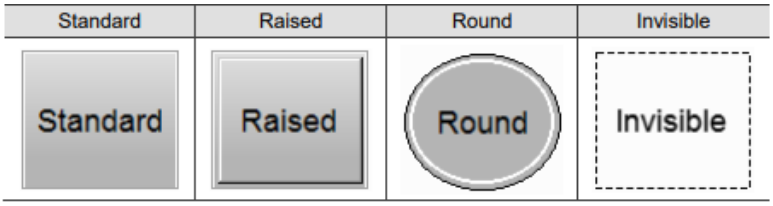
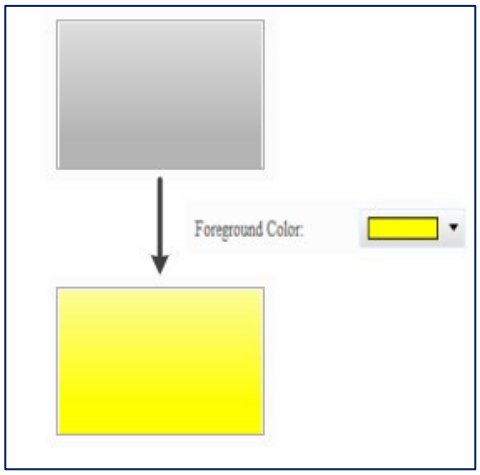
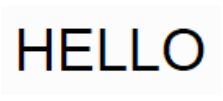


Figure 5 - 38: Increment / Decrement Button element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Raised, Round, and Invisible. The default value is Standard.
 
</td></tr>
<tr><td>(2)</td><td>Foreground Color</td><td>● Set the foreground color of the element. The default value is  .
● When users set the Style to Invisible, the Foreground Color setting is invalid.
 
</td></tr>
<tr><td>(3)</td><td>Filled style</td><td>● The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
● Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.
<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="4">(4)</td><td rowspan="4">Use Text Pic</td><td colspan="2">● Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
● Refer to the following example.</td></tr>
<tr><td>Use Text Pic is Yes</td><td>Use Text Pic is No</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">NOTE: If users use DIAScreen to open the DOP-B project, the Use Text Pic function will be set to Yes by default; if users add a new DOP-100 project, the Use Text Pic function will be set to No by default.</td></tr>
<tr><td>(5)</td><td>Transparency</td><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

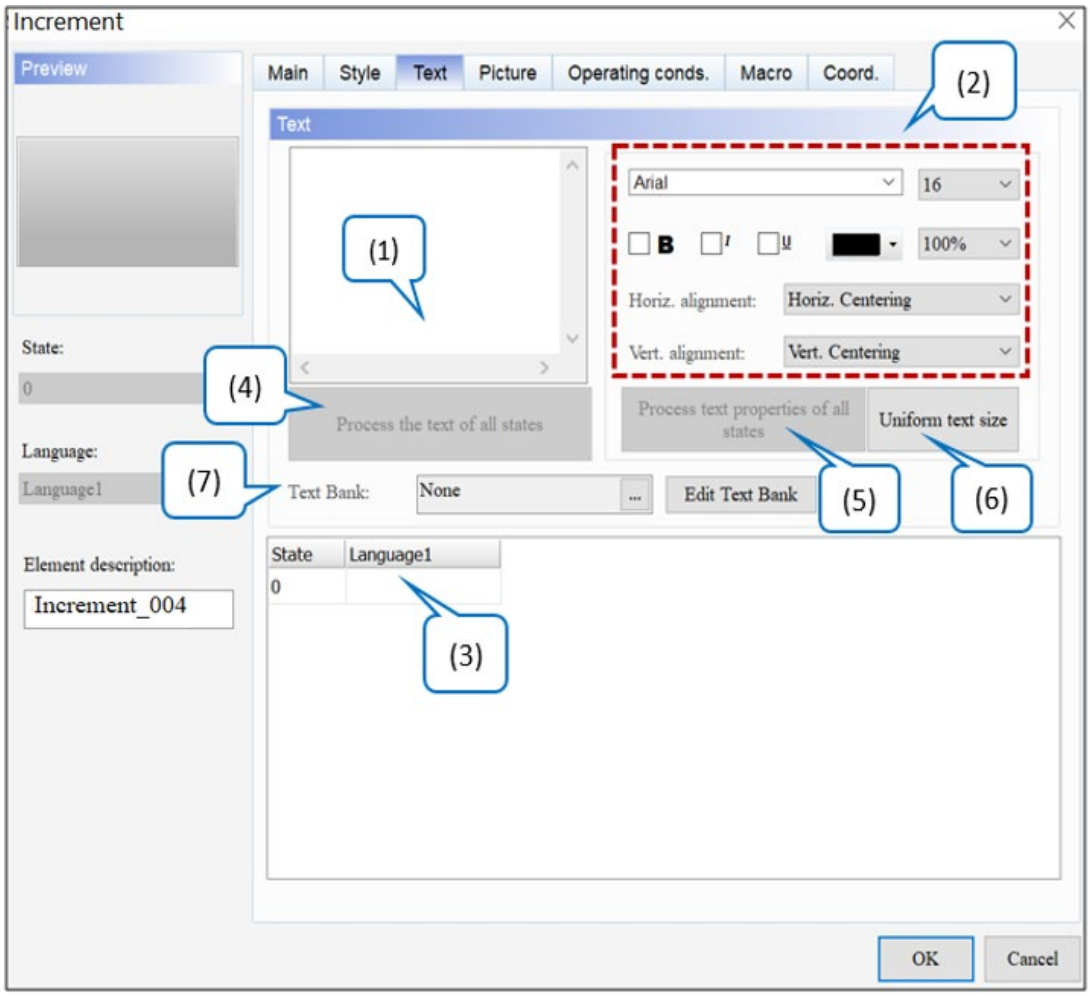
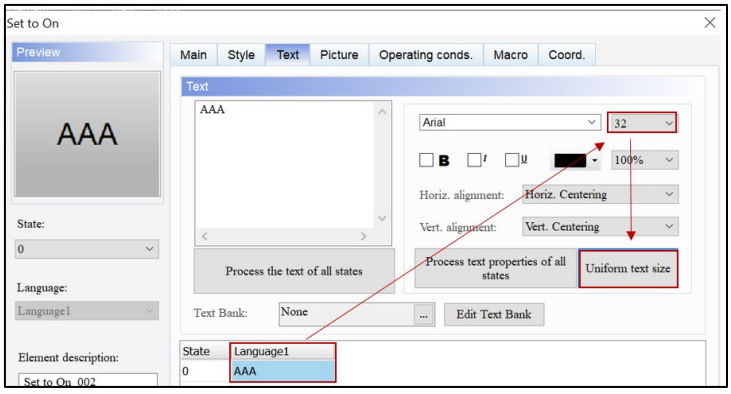


Figure 5 - 39: Increment / Decrement Button element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text-related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** page allows users to edit multi-language text data. As shown in the **Text** property page, they can enter English words in the **English** column.
(4)	Process the text of all states	The **Increment** / **Decrement Button** element has no multi-state, and this function has no effect.
(5)	Process text properties of all states	The **Increment** / **Decrement Button** element has no multi-state, and this function has no effect.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

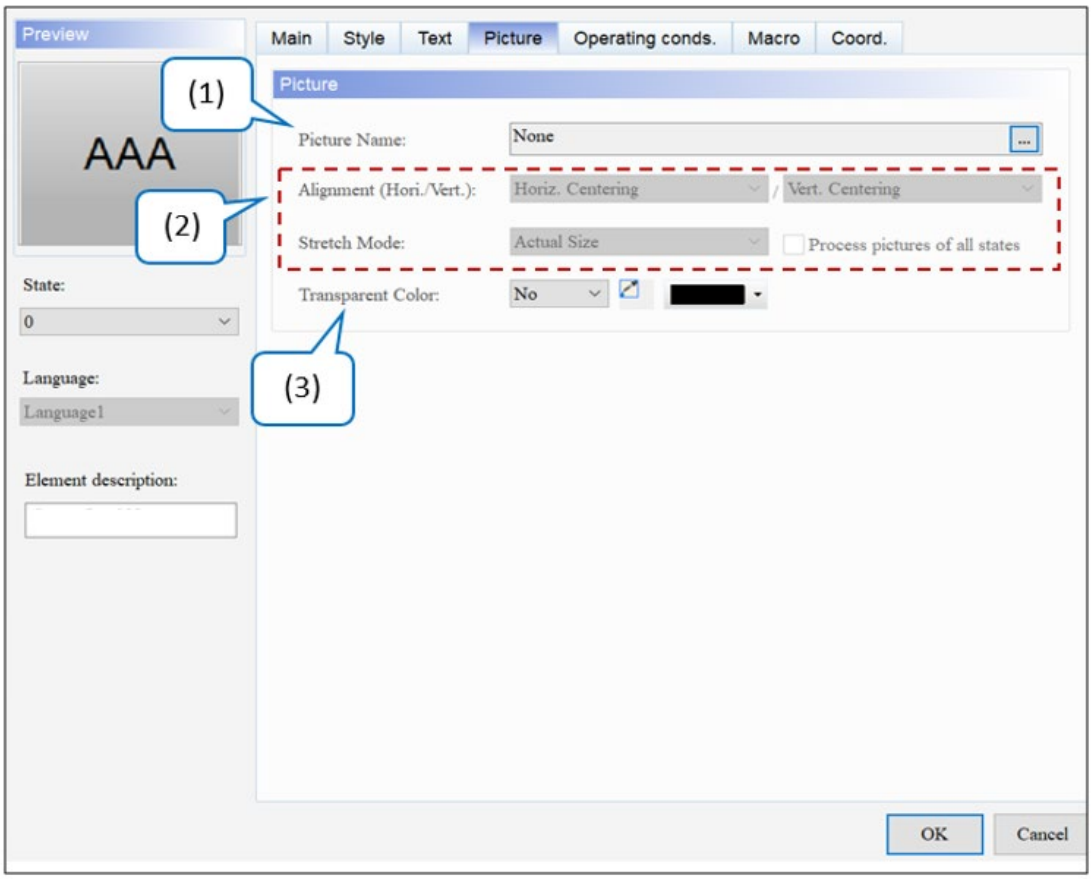
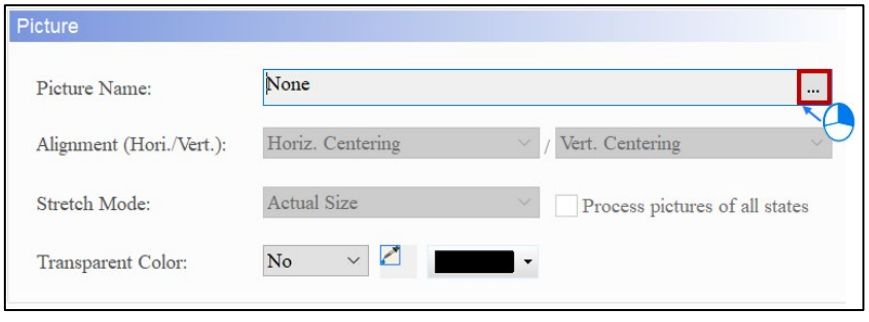
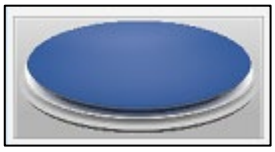


Figure 5 - 40: Increment / Decrement Button element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the</td></tr>
</table>

No.	Function	Description
		Foreground Color of the element. 

- Operating conds.

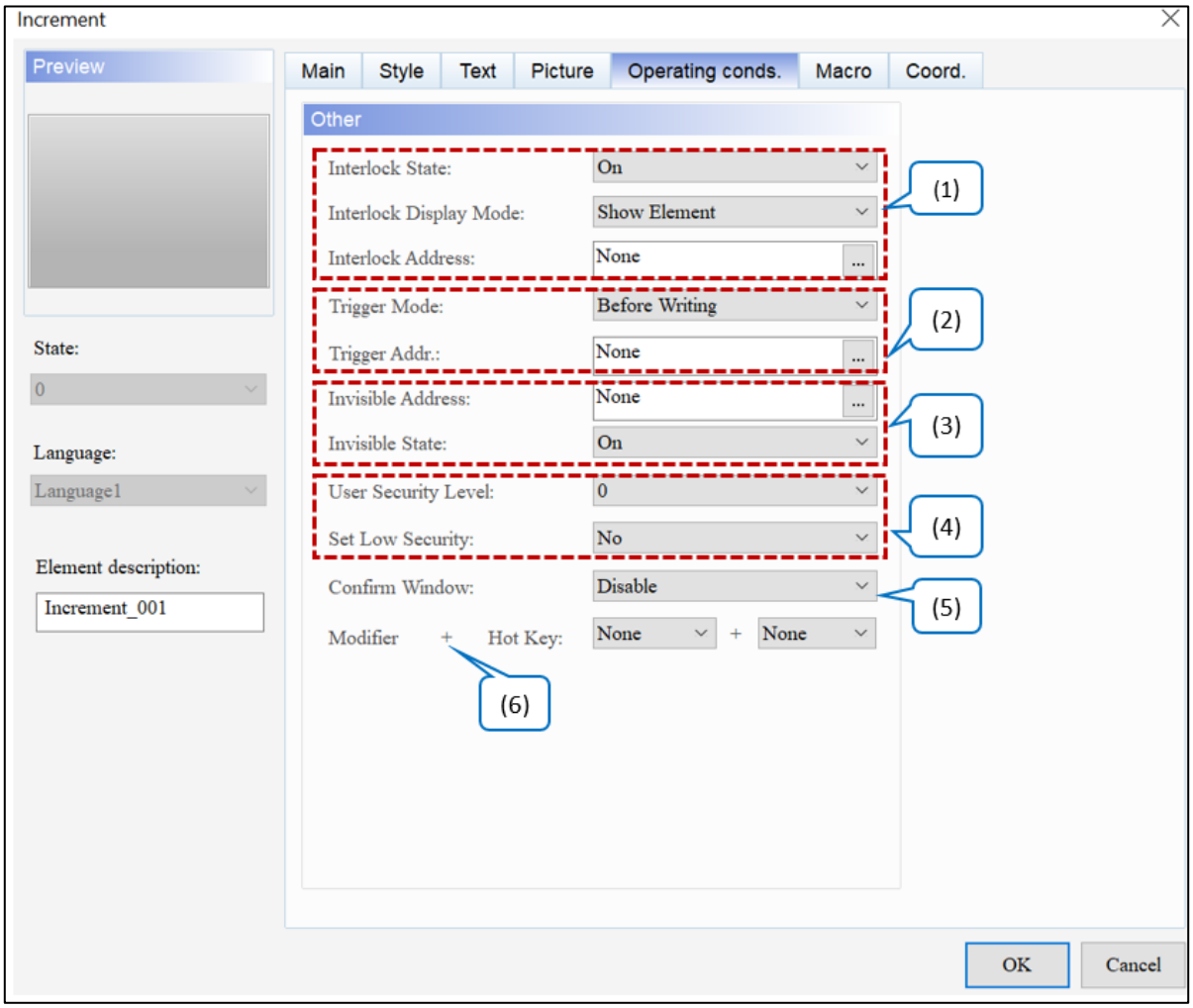
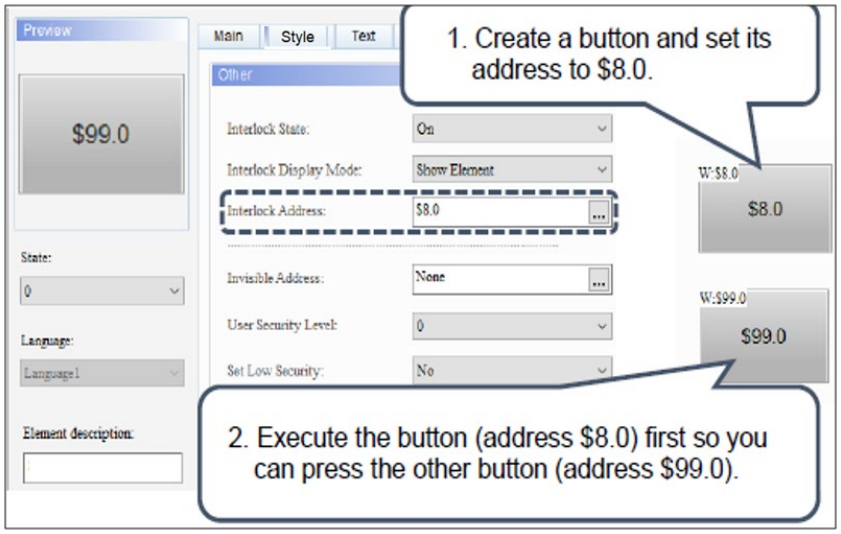


Figure 5 - 41: Increment / Decrement Button element Operating conds. property page

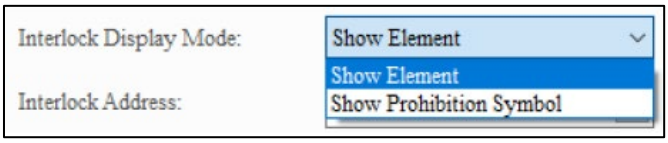
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Interlock State</td><td>

The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The behavior is as follows:

Create a button and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element with address $99.0.
Before having the element with address $99.0 to operate, press the button with address $8.0 to validate the button action (address $99.0).



The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.



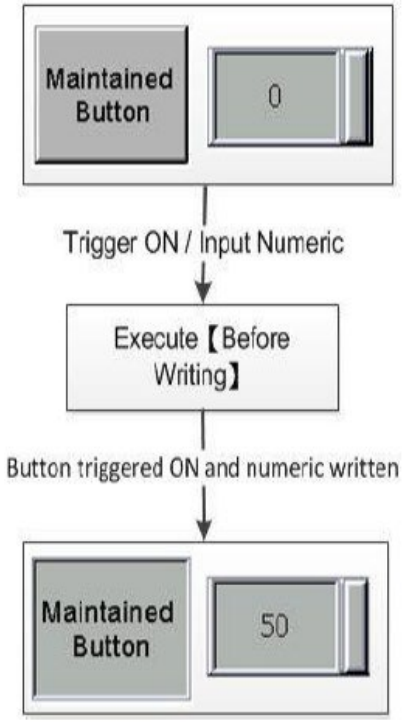
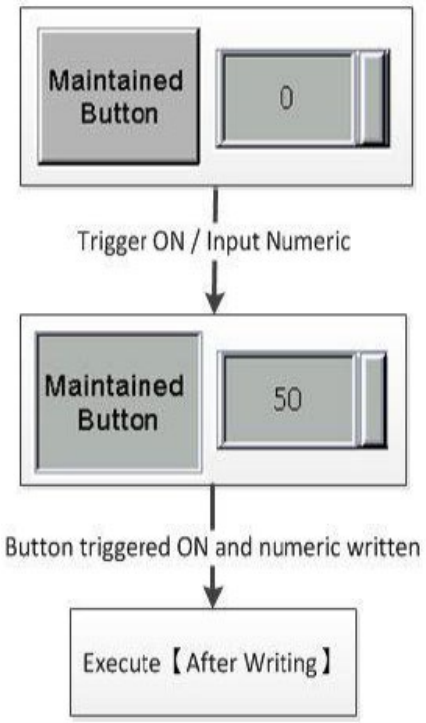
<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Trigger Mode / Trigger Addr.</td><td>

The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.

<table>
<tr><td rowspan="2">Trigger Type</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>

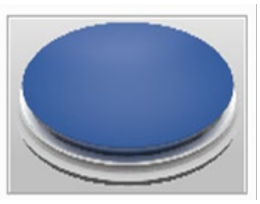
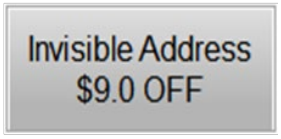
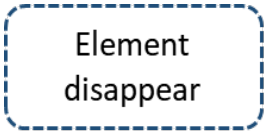
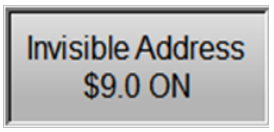
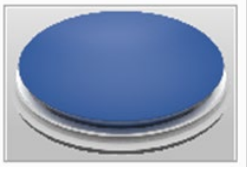
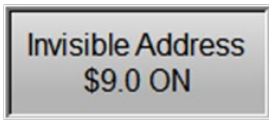
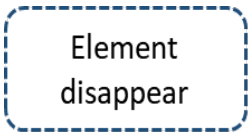
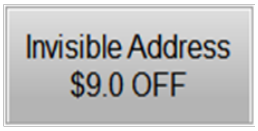
Because the trigger function only sets the set trigger address to ON, users need to clear the trigger address to OFF if they need to trigger again.

<table>
<tr><th>Trigger Flowchart of Before Writing</th><th>Trigger Flowchart of After Writing</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
</table>

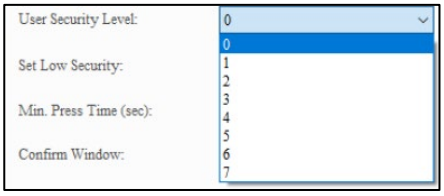
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Invisible Address / Invisible State</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

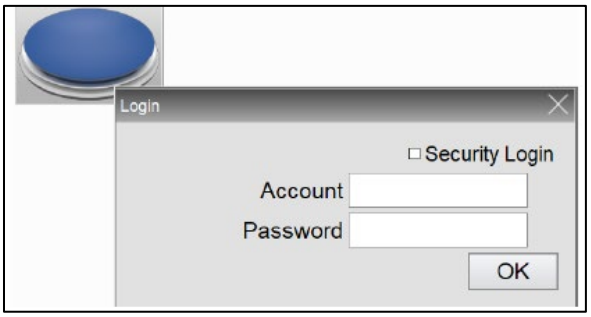
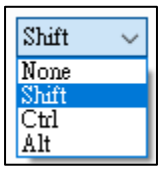
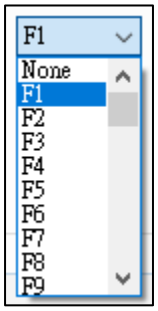
<table>
<tr><td rowspan="2">Invisible State is On</td><td>  </td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td>  </td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>User Security Level</td><td>

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).



If users set the Set Low Security to Yes, each time users

</td></tr>
</table>

No.	Function	Description
	Set Low Security	enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**. 
(5)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 
(6)	Modifier + Hot Key	● Allow to use the hot keys on the external keyboard to execute the buttons. ● The available options for **Modifier** are: None, Shift, Ctrl, and Alt keys.  ● The available options for **Hot Key** are: F1 ~ F12, English letters A ~ Z, and number keys 0 ~ 9. 

- Macro

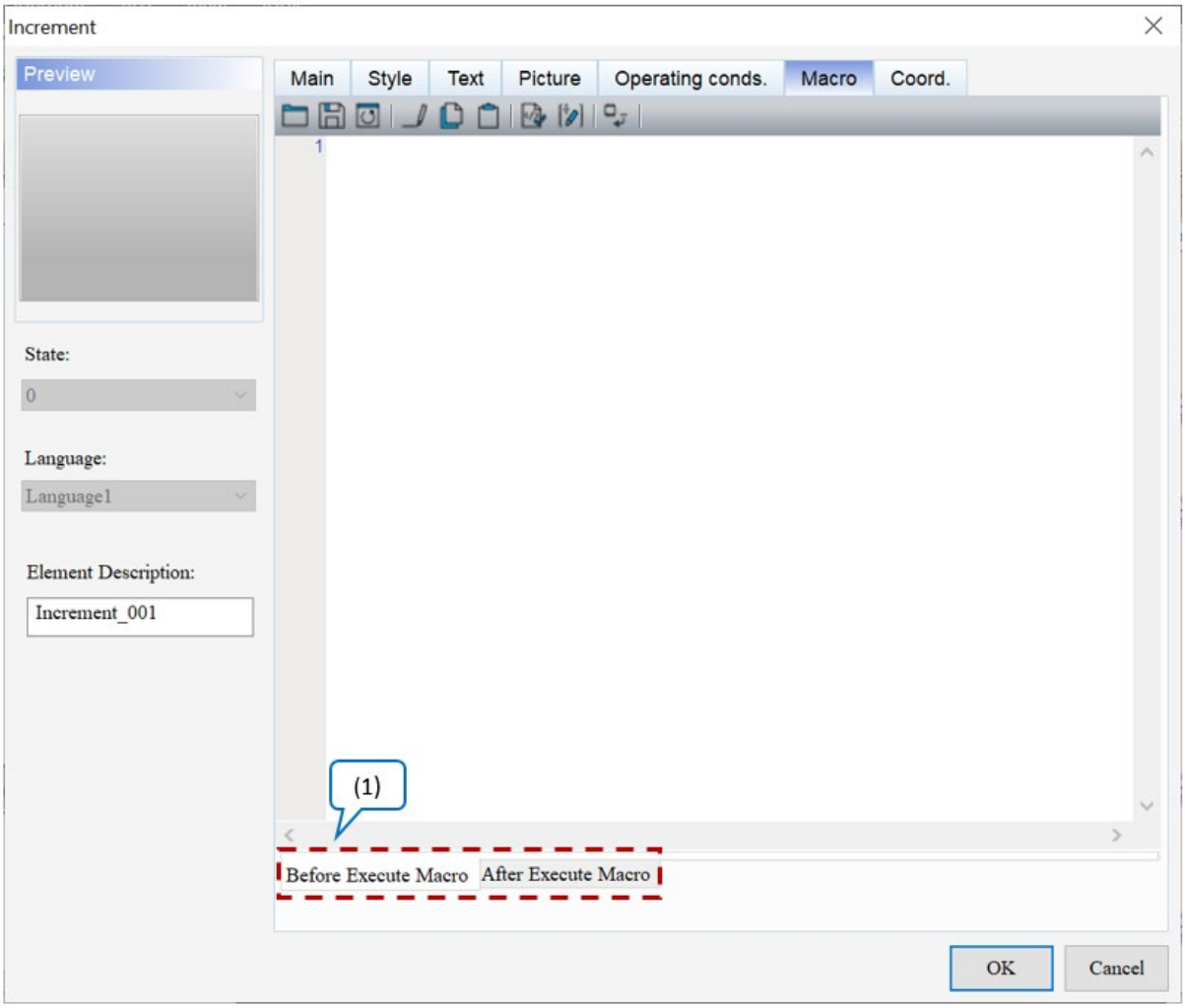
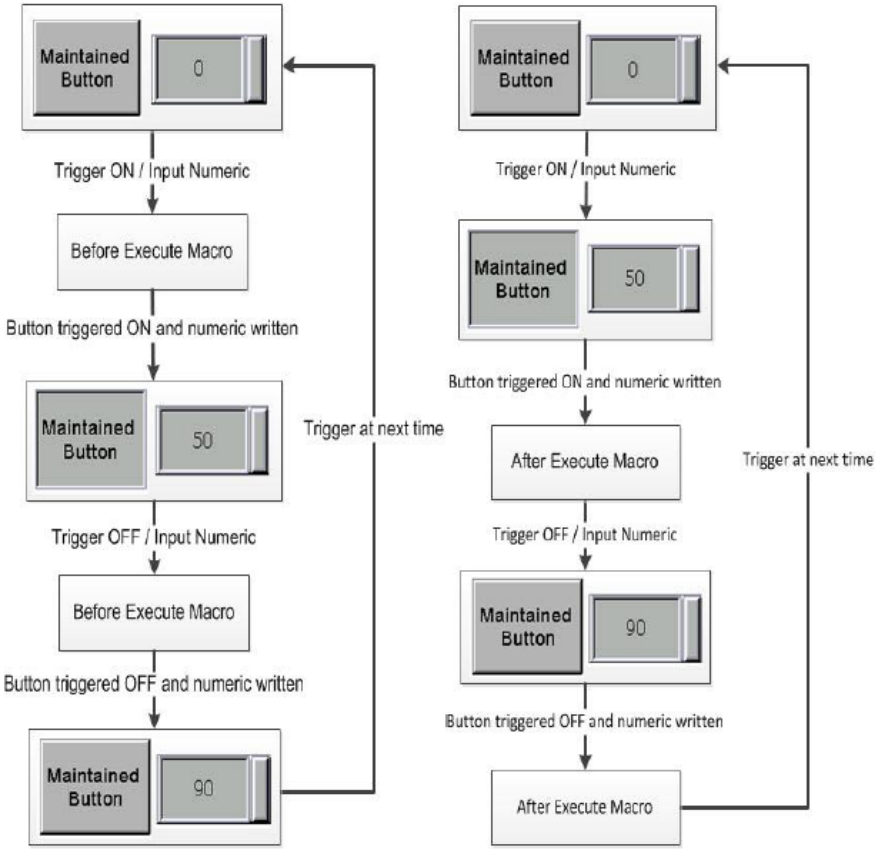


Figure 5 - 42: Increment / Decrement Button element Macro property page

No.	Function	Description
(1)	Flowcharts of **Before Execute Macro** / **After Execute Macro**: 	
	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

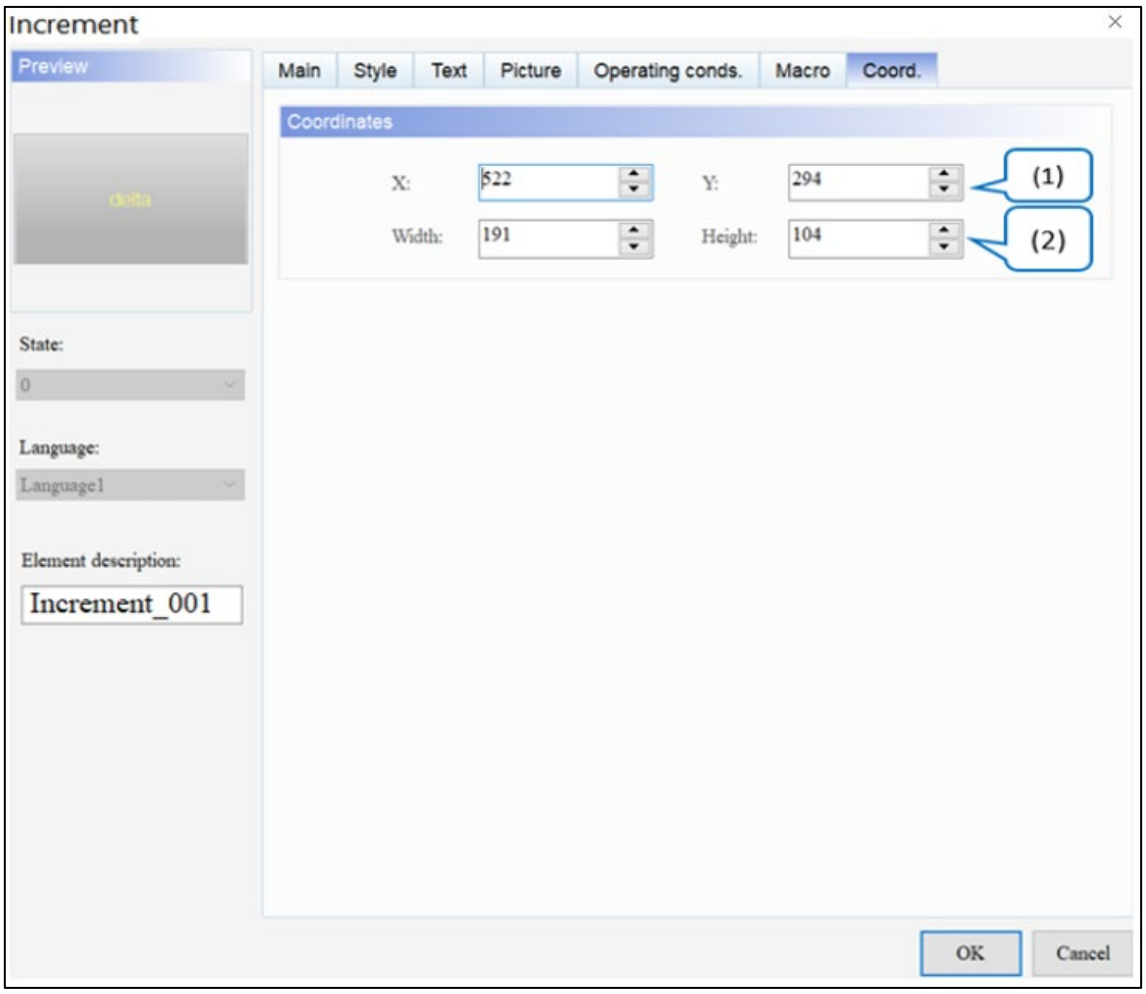


Figure 5 - 43: Increment / Decrement elements Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

5.6 Goto Screen

The **Goto Screen Button** element enables to right-click the button and select **Goto Screen** to go to the screen of the set number.

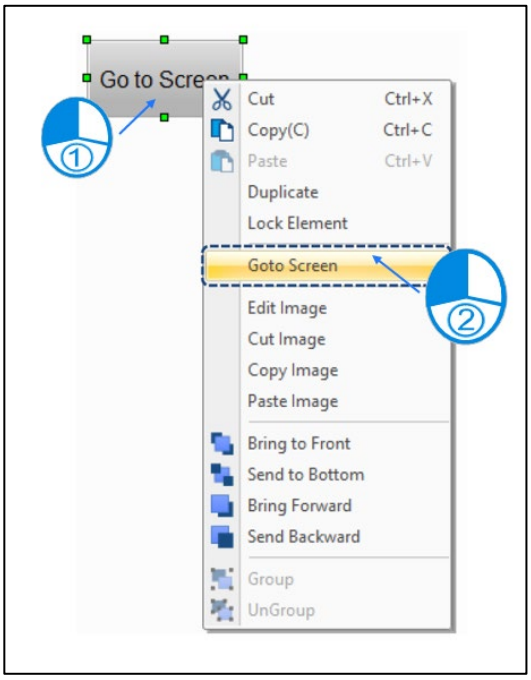


Figure 5 - 44: Goto Screen

The DIAScreen software has three options for **Goto Screen Button** element:

- **Goto Screen**: When users touch the Goto Screen button on the HMI, the HMI switches to the set screen.
- **Previous Page**: When users touch the Previous Page button on the HMI, the HMI switches to the previously displayed screen.
- **Page Up**: When users touch the Page Up button on the HMI, the HMI will record the sequence of the previous screen change, such as Screen 1 > Screen 3 > Screen 2, and when the Page Up button is again touched, the screen switching sequence is Screen 2 > Screen 3 > Screen 1.

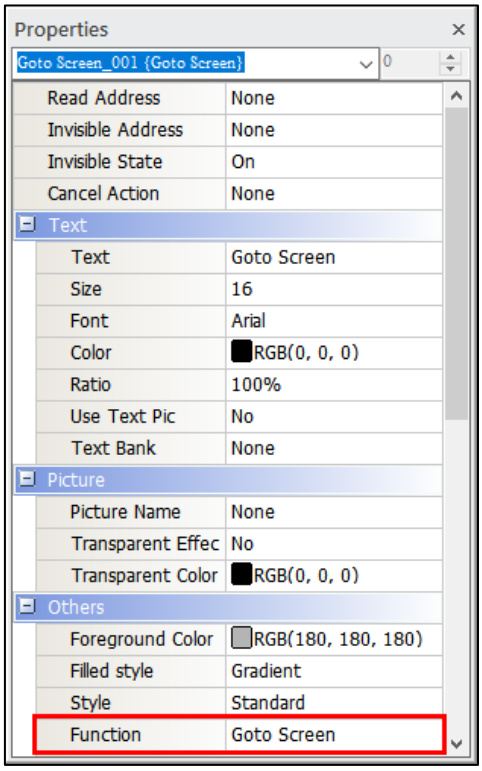
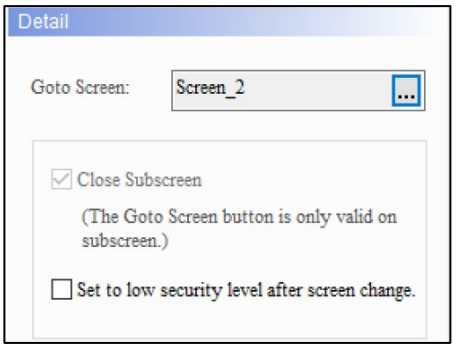
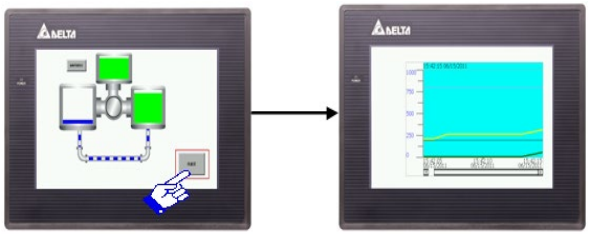
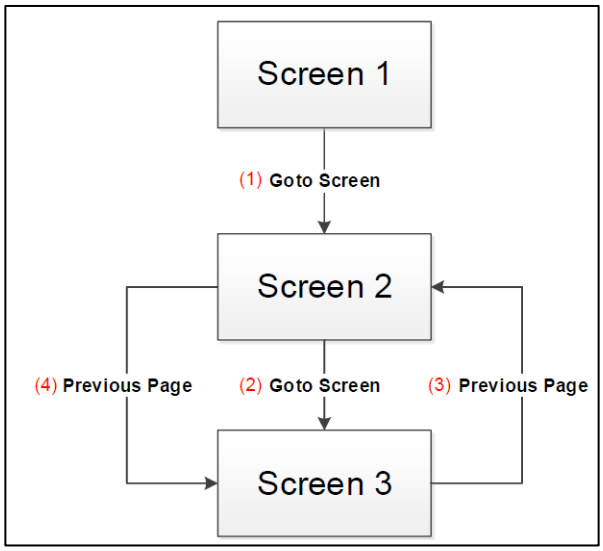
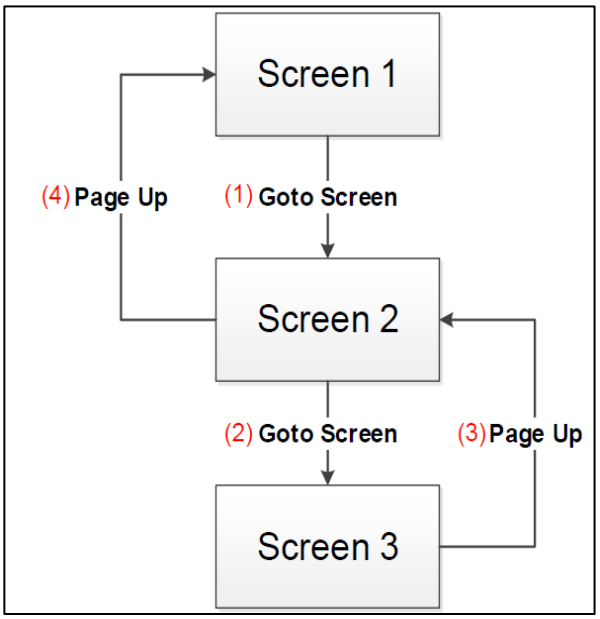


Figure 5 - 45: Properties of Goto Screen

Goto Screen	
Goto Screen item in the Goto Screen element	
Execution result	● Press **Goto Screen Button** element, the HMI switches to the specified screen.  ● Press Previous Page, the HMI switches to the previously displayed screen.

Goto Screen	
	 ● The HMI records the screen switching sequence, e.g. Screen 1 > Screen 2 > Screen 3. When users execute the Page Up button function, the screen switching sequence is Screen 3 > Screen 2 > Screen 1. 

On double-clicking the **Goto Screen Button** element, the property page appears as follows.

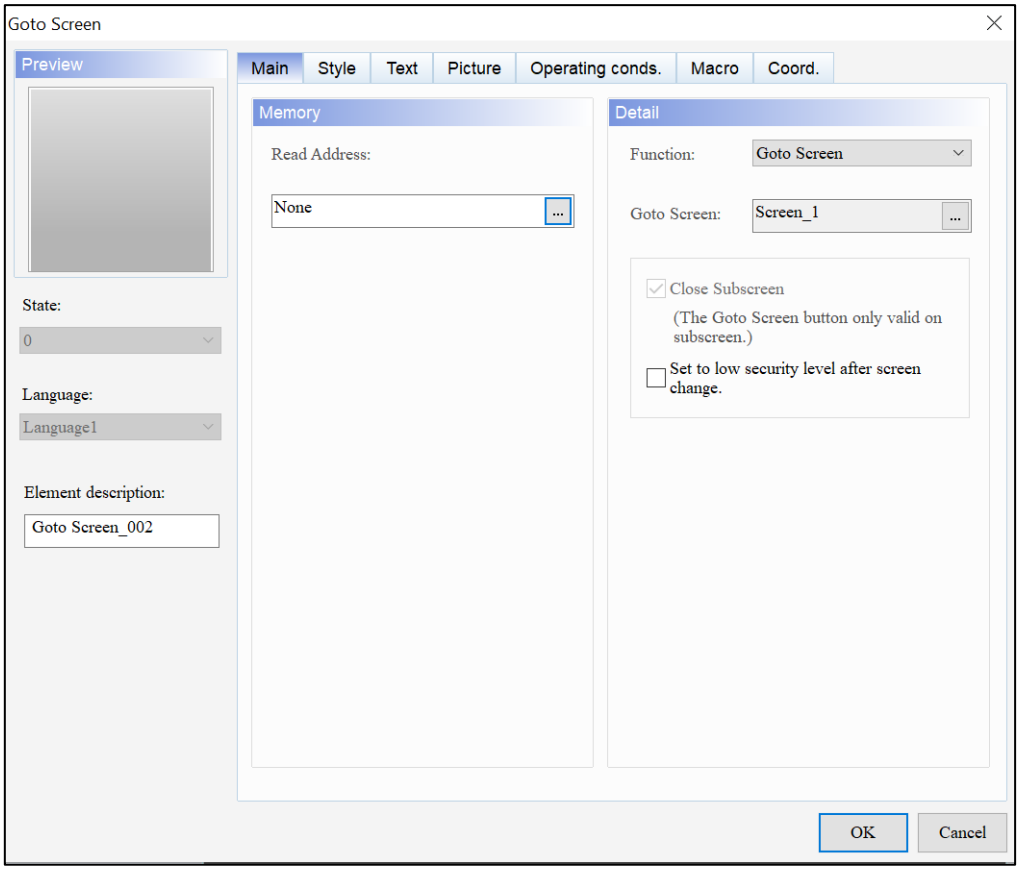


Figure 5 - 46: Goto Screen Button element property page

Goto Screen	
Function	**Description**
Preview	The **Goto Screen Button** element can only view multi-language data display since the multistate property is not available for this element.
Main	Set the Read Address, Element description, Goto Screen, Close Subscreen, and Set to low security level after screen change of the Goto Screen element.
Style	Set the Style, Foreground Color, Filled style, Use Text Pic, and Transparency for the element.
Text	Set the text content, font, size, color, format, zoom, and alignment options.

Goto Screen	
Function	**Description**
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set the Interlock State, Interlock Display Mode, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Confirm Window, Set Low Security, Cancel Action, and Modifier + Hot Key.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the button element.

- Main

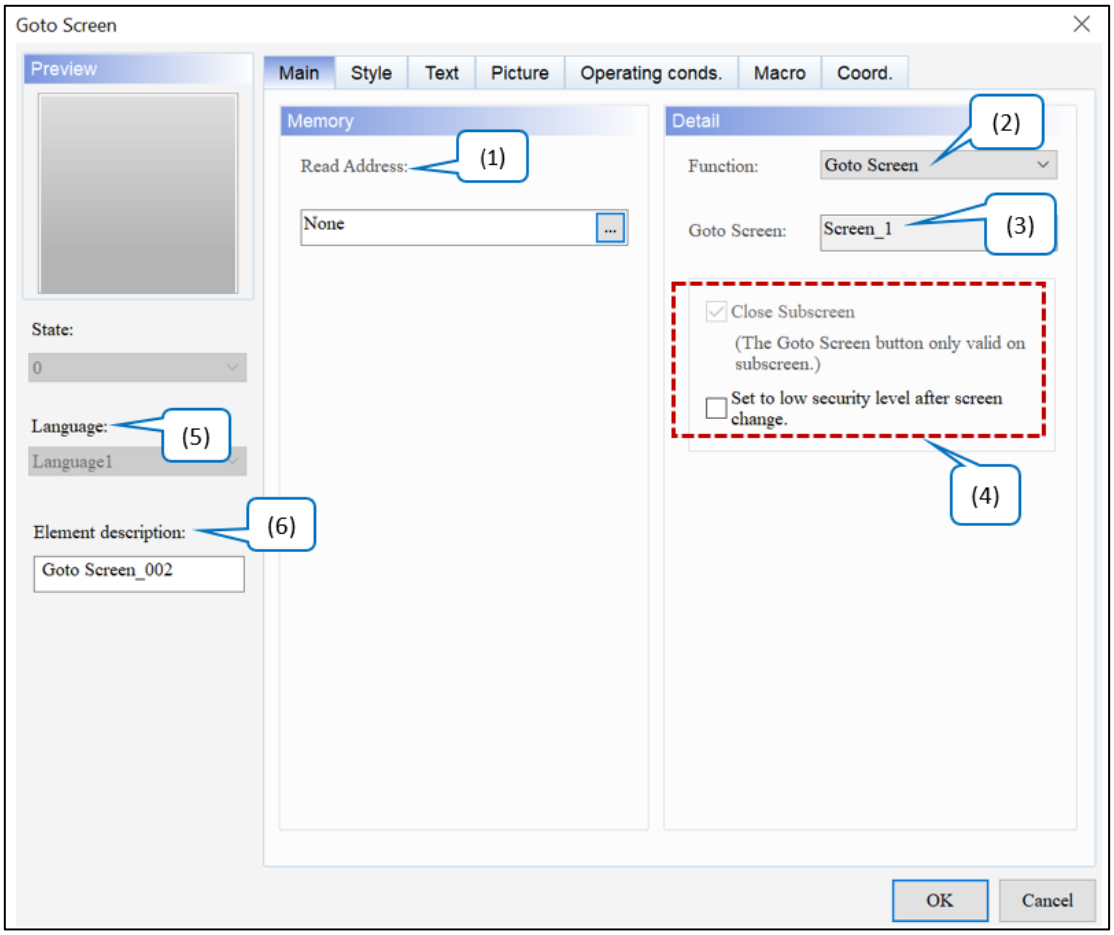
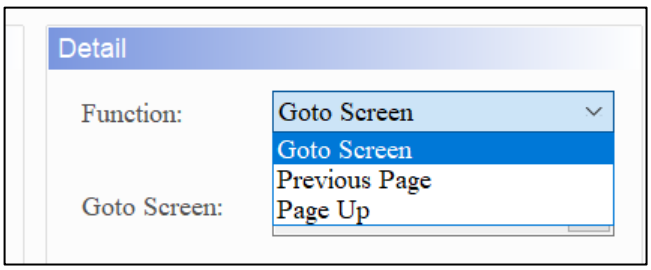
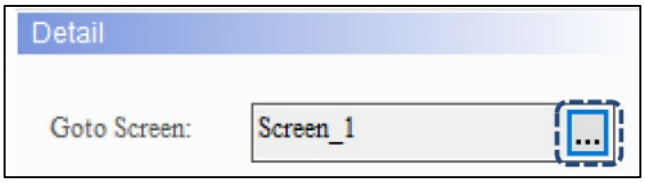
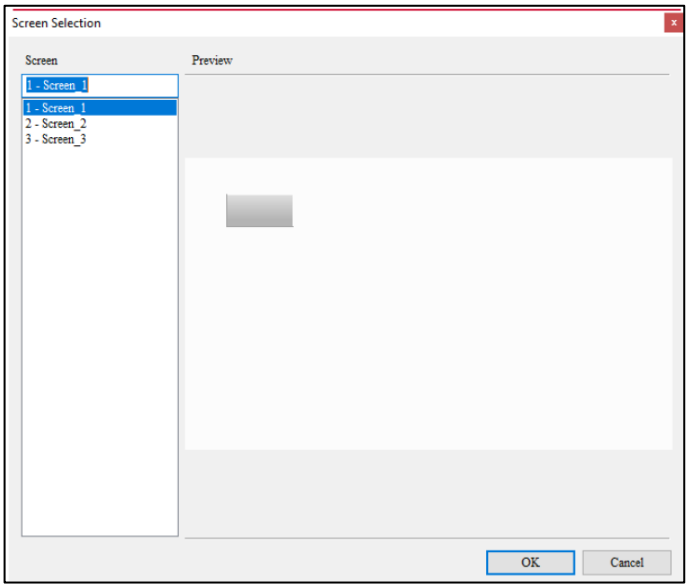
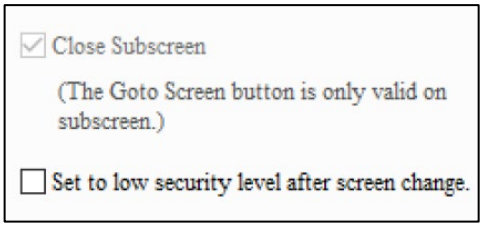


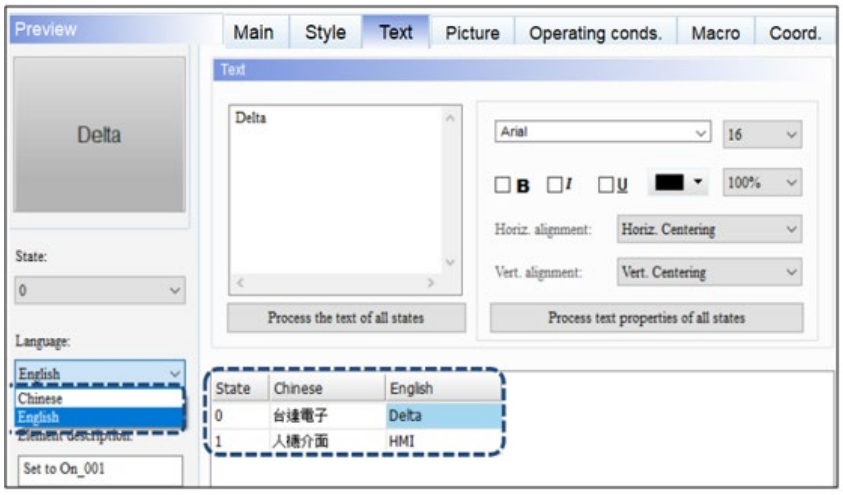
Figure 5 - 47: Goto Screen Button element Main property page

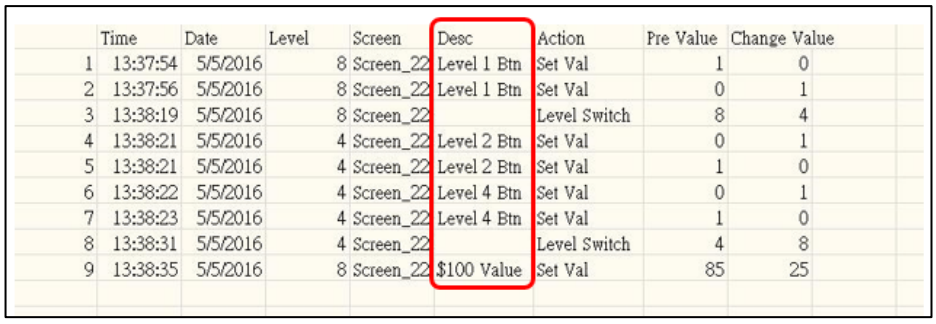
No.	Function	Description
(1)	Read Address	When the **Function** is selected to change the screen, the Internal Memory address can be set.
(2)	Function	● It can be used to determine the type of screen changer. The default value is **Goto Screen**.  ● **Goto Screen**: When users touch the Goto Screen button on the HMI, the HMI switches to the set screen. ● **Previous Page**: When users touch the Previous Page button on the HMI, the HMI switches to the previously displayed screen. ● **Page Up**: When users touch the Page Up button on the HMI, the HMI will record the sequence of the previous screen change, such as Screen 1 > Screen 3 > Screen 2, and when the Page Up button is again touched, the screen switching sequence is Screen 2 > Screen 3 > Screen 1.
(3)	Goto Screen	● The **Screen Selection** window appears after clicking … as shown in the following figure.  ● Select the screen to be changed, as follows. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(4)</td><td>Close Subscreen</td><td rowspan="2">

When the Goto Screen Button element is created in the Subscreen, the Close Subscreen option will be enabled. When users press Goto Screen, the current Subscreen closes.
The Set to low security level after screen change function forces to set the current User Security Level to the lowest after the Goto Screen Button element is pressed, which can prevent the element from being accidentally operated.



</td></tr>
<tr><td>Set to low Security level after screen change</td></tr>
<tr><td>(5)</td><td>Language</td><td>When the users have set language data, they can edit the text attributes to be displayed through the Language setting of the element.


</td></tr>
<tr><td>(6)</td><td>Element description</td><td>It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that users can easily know the performed actions.


</td></tr>
</table>

- Style

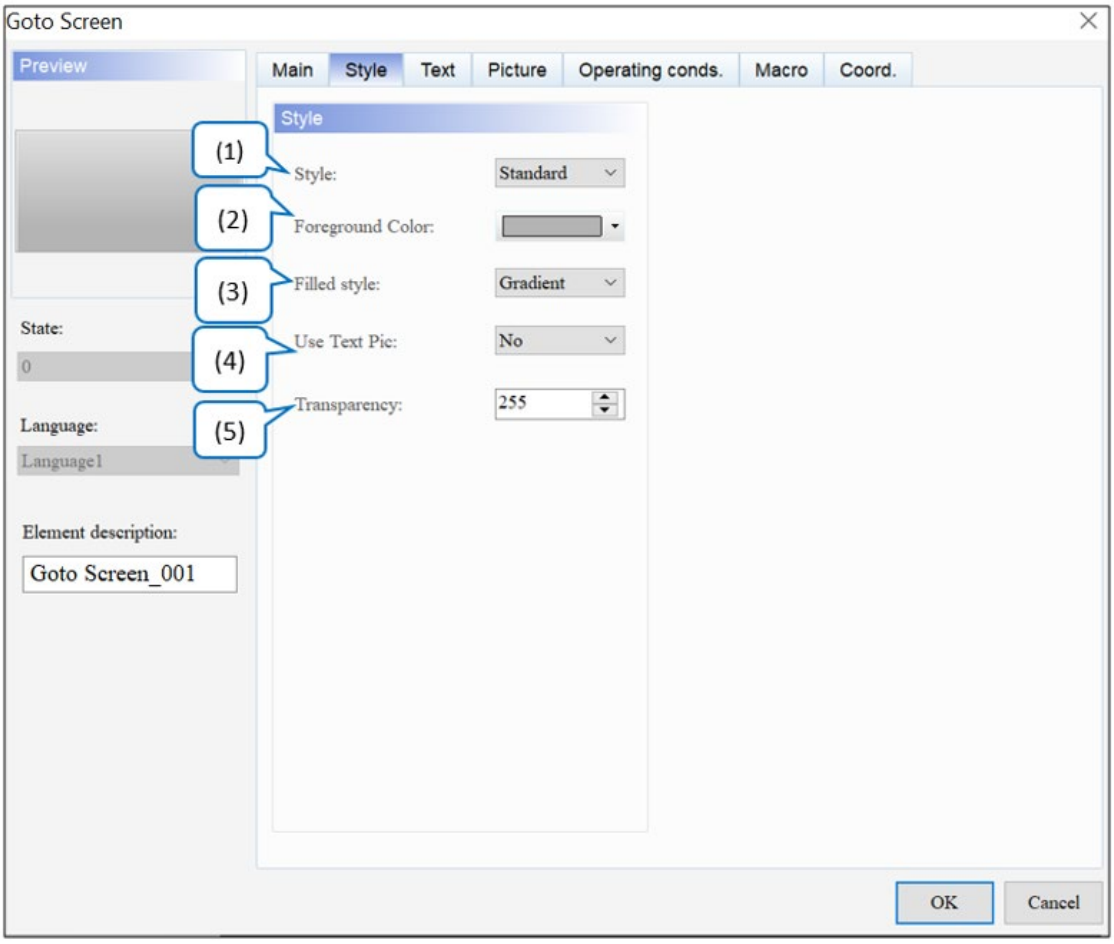
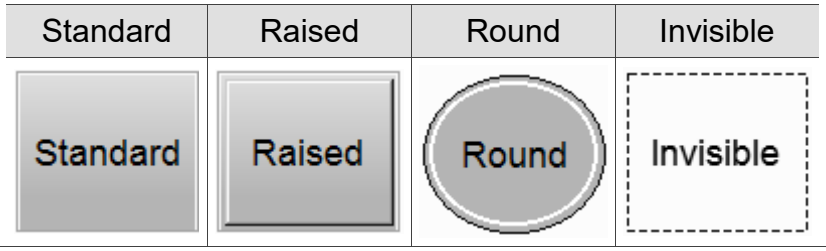


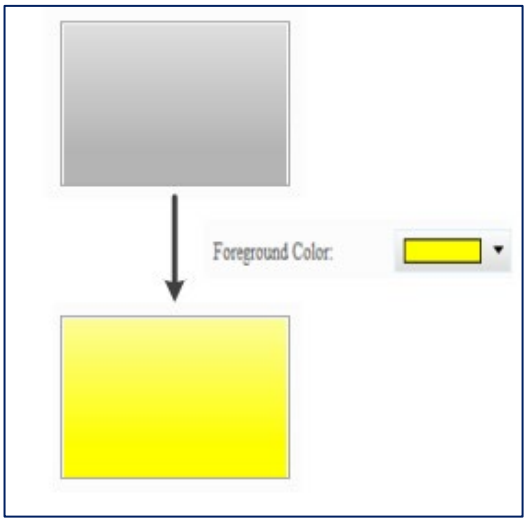
Figure 5 - 48: Goto Screen Button element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Round, and Invisible. The default value is **Standard**.



<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Foreground Color</td><td>

Set the foreground color of the element. The default is  .
When users set the Style to Invisible, the Foreground Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 series models are: Gradient and Fixed. The default value is Gradient.
When users open the DOP-B project on a DOP-100 series model, the elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>Use Text Pic</td><td>

Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.

</td></tr>
</table>

No.	Function	Description
		● Refer to the following example. Use Text Pic is Yes: HELLO Use Text Pic is No: HELLO ***NOTE***: *If users use DIAScreen to open the DOP-B project, the **Use Text Pic** function will be set to Yes by default; if users add a new DOP-100 project, the **Use Text Pic** function will be set to No by default.*
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

● Text

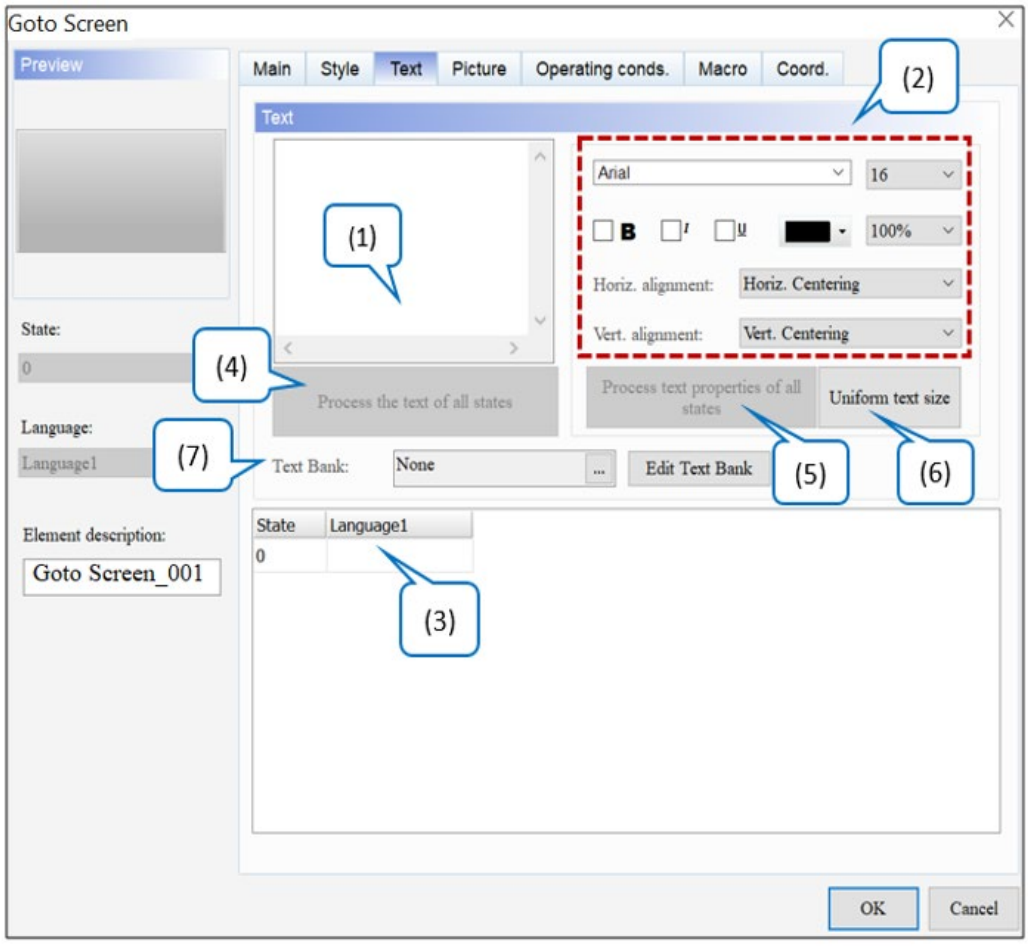
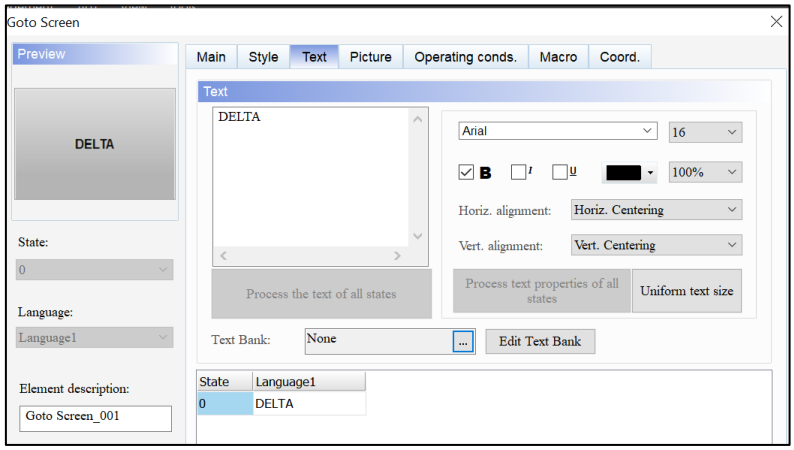
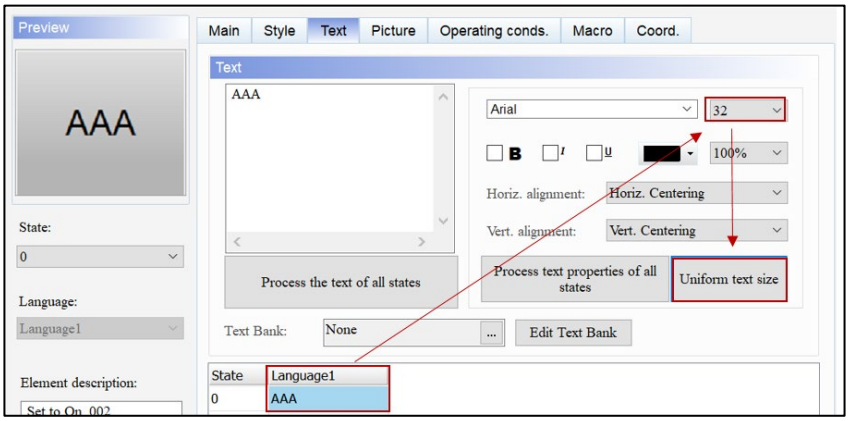


Figure 5 - 49: Goto Screen Button element Text property page

No.	Function	Description
(1)	Text	● Enter the text to be displayed in the text box  ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text-related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English text in the **English** column.
(4)	Process the text of all states	There are no multi-states for **Goto Screen Button** element, and this function is disabled.
(5)	Process text properties of all states	There are no multi-states for **Goto Screen Button** element, and this function is disabled.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

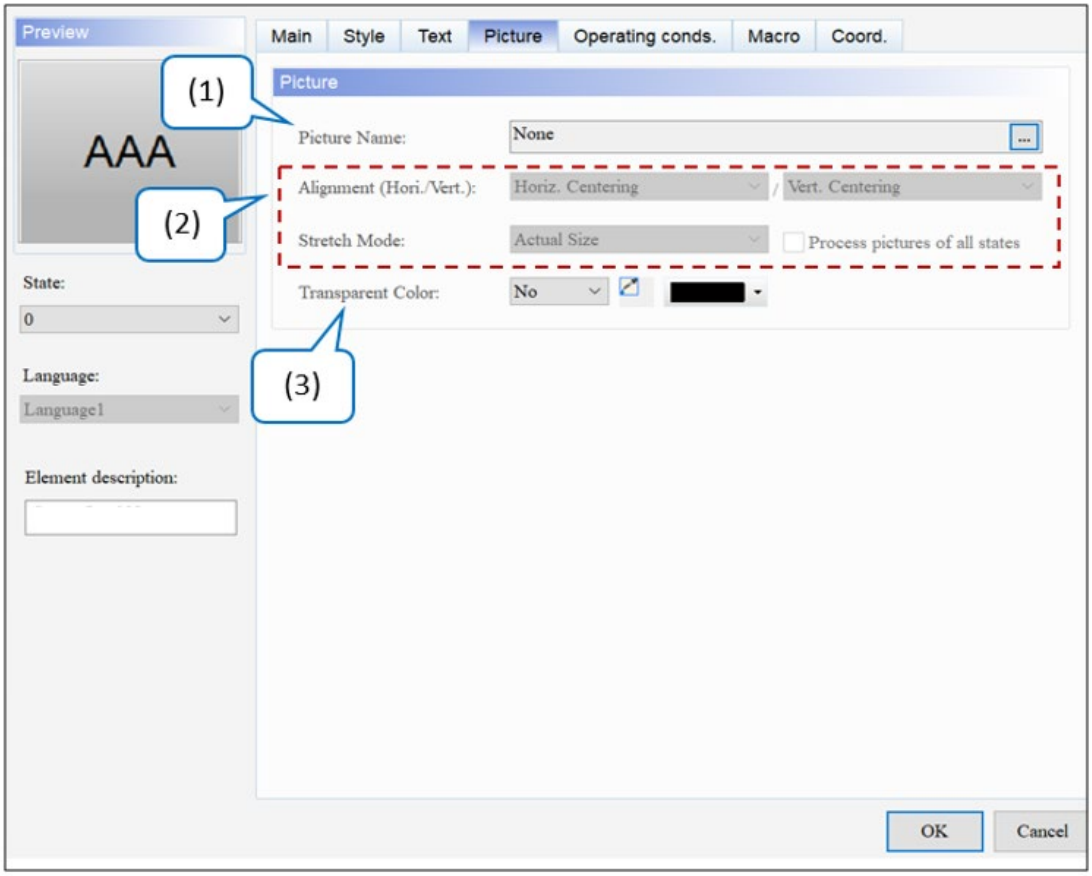
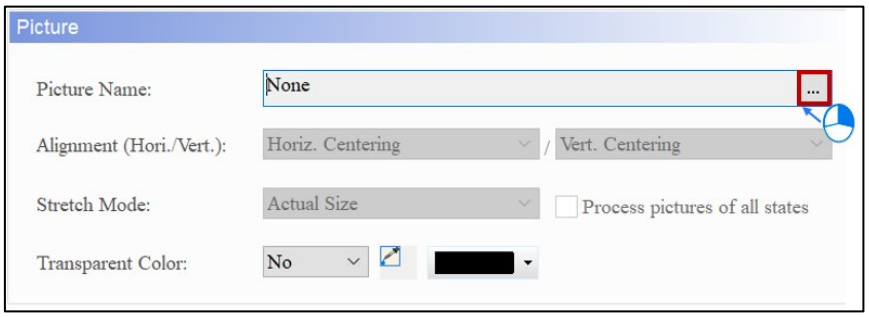


Figure 5 - 50: Goto Screen Button element Picture property page

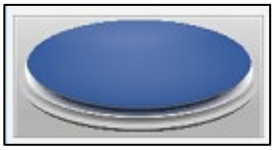
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Picture Name</td><td>

To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.





To configure other pictures, refer to Section 28.5 Picture Bank.

</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size,
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="2"></td><td></td><td></td><td></td><td>element display area.
  </td></tr>
<tr><td>Process pictures of all states</td><td colspan="3">If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td colspan="3">● This function specifies a color in the picture and make it transparent. The default values No.
● Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the Foreground Color of the element.
 
</td></tr>
</table>

- Operating conds.

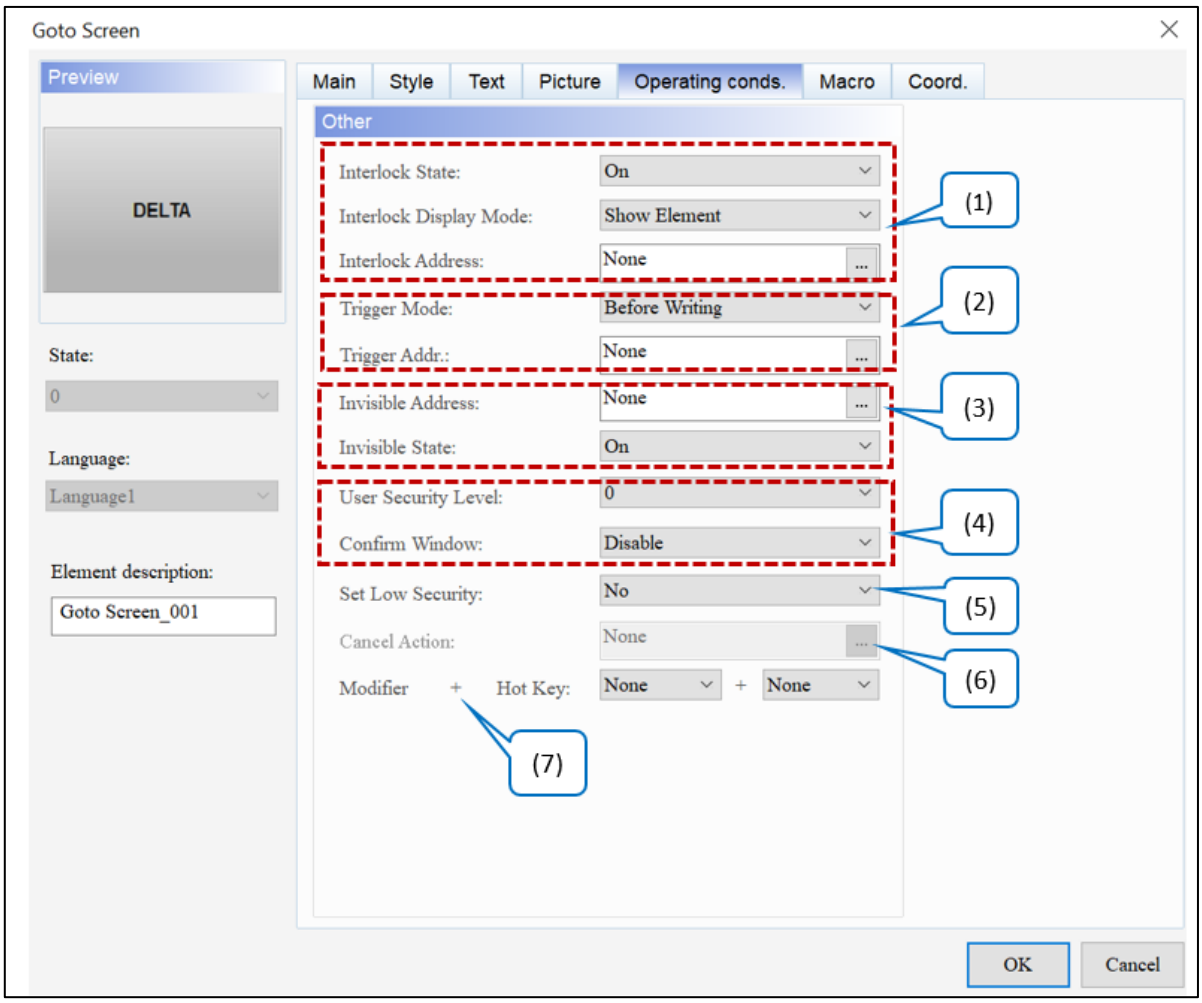
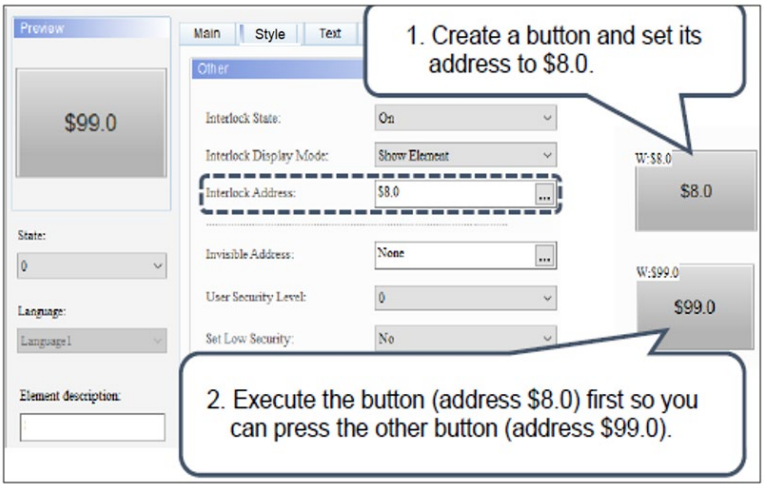


Figure 5 - 51: Goto Screen Button element Operating conds. property page

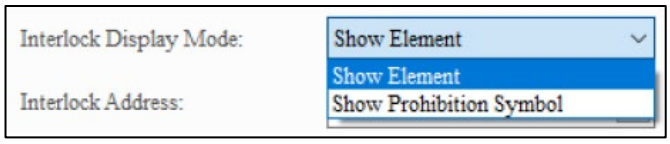
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">(1)</td><td>Interlock State</td><td rowspan="3">

The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The following describes how it works:

Create an element and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element whose address is $99.0.
For $99.0 to work, first press the $8.0 element before the $99.0 action takes effect.



The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.



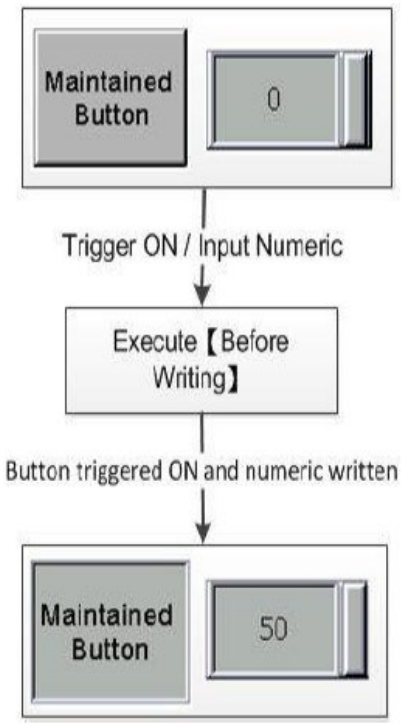
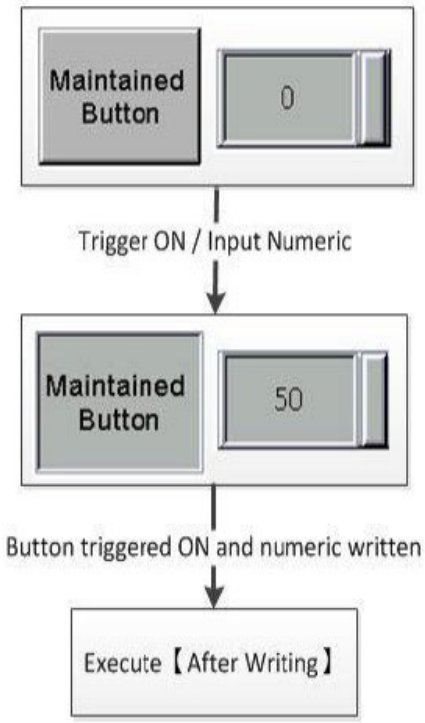
<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>Interlock Address</td></tr>
<tr><td>Interlock Display Mode</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Trigger Mode / Trigger Addr.</td><td>

The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.

<table>
<tr><td rowspan="2">Trigger Mode</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>

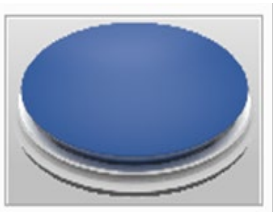
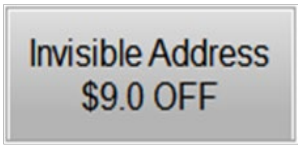
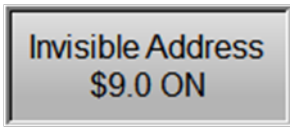
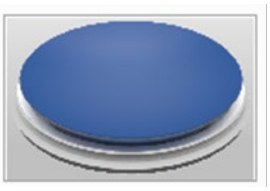
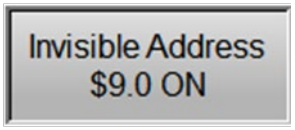
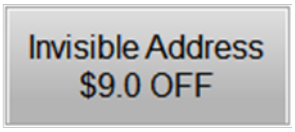
Create an element and set the address, and then select Before Writing or After Writing to trigger the specified controller Bit address to ON .
Because the trigger function only sets the set trigger address to ON, users need to clear the trigger address to OFF if they need to trigger again.

<table>
<tr><th>Trigger Flowchart Before Writing</th><th>Trigger Flowchart After Writing</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(3)</td><td>Invisible Address</td><td>

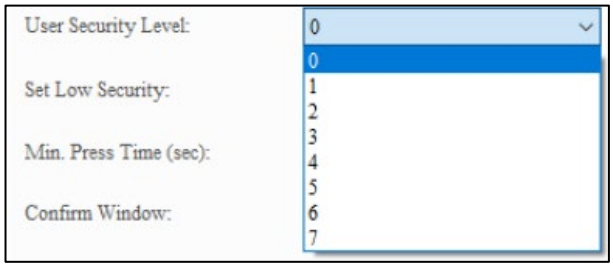
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

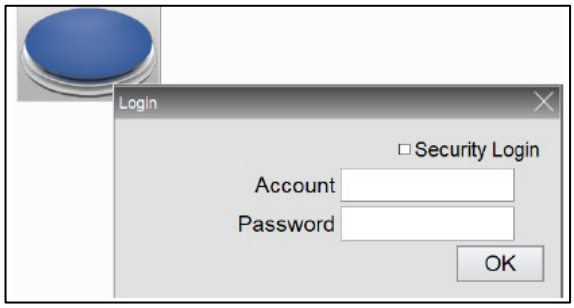
<table>
<tr><td>Invisible State is On</td><td>  </td><td> 
</td></tr>
<tr><td></td><td>Element disappear</td><td> 
</td></tr>
<tr><td>Invisible State is Off</td><td>  </td><td> 
</td></tr>
<tr><td></td><td>Element disappear</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td><td></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(4)</td><td>User Security Level</td><td>

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).



If users set the Set Low Security to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is No.



</td></tr>
<tr><td>Set Low Security</td></tr>
<tr><td>(5)</td><td>Confirm Window</td><td>

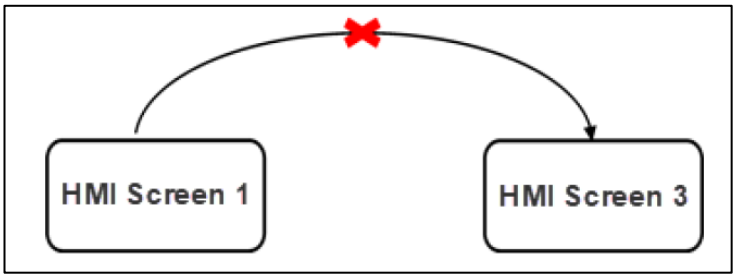
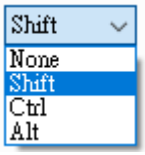
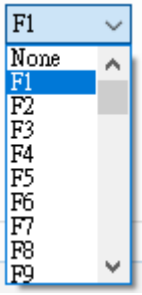
The available options for Confirm Window are: Disable, Confirmation and Second confirmation of account. The default value is Disable.
Except for Disable, selecting the rest two options opens the Confirmation Dialog window.



.
</td></tr>
<tr><td>(6)</td><td>Cancel Action</td><td>

Cancel Action enables users to pause or cancel the Goto Screen action.
When the Cancel Action is set to ON, the Goto Screen

</td></tr>
</table>

No.	Function	Description
		Button function is invalid; on the other hand, if the **Cancel Action** is set to OFF, the Goto Screen Button is valid. ***NOTE**: The **Goto Screen** function is available after the **Interlock Address** is activated. **Cancel Action** enables to cancel the **Goto Screen** action during its operation. If **Cancel Action** is set to ON continuously, users cannot change the screen even if the **Interlock Address** is set to ON.* 
(7)	Modifier + Hot Key	● Allows users to connect the external keyboard to execute buttons through shortcut keys. ● The available options for **Modifier** keys are: None, Shift, Ctrl, and Alt keys.  ● The available options for **Hot Key** are: F1 ~ F12, English letters A ~ Z, and number keys 0 ~ 9. 

- Macro

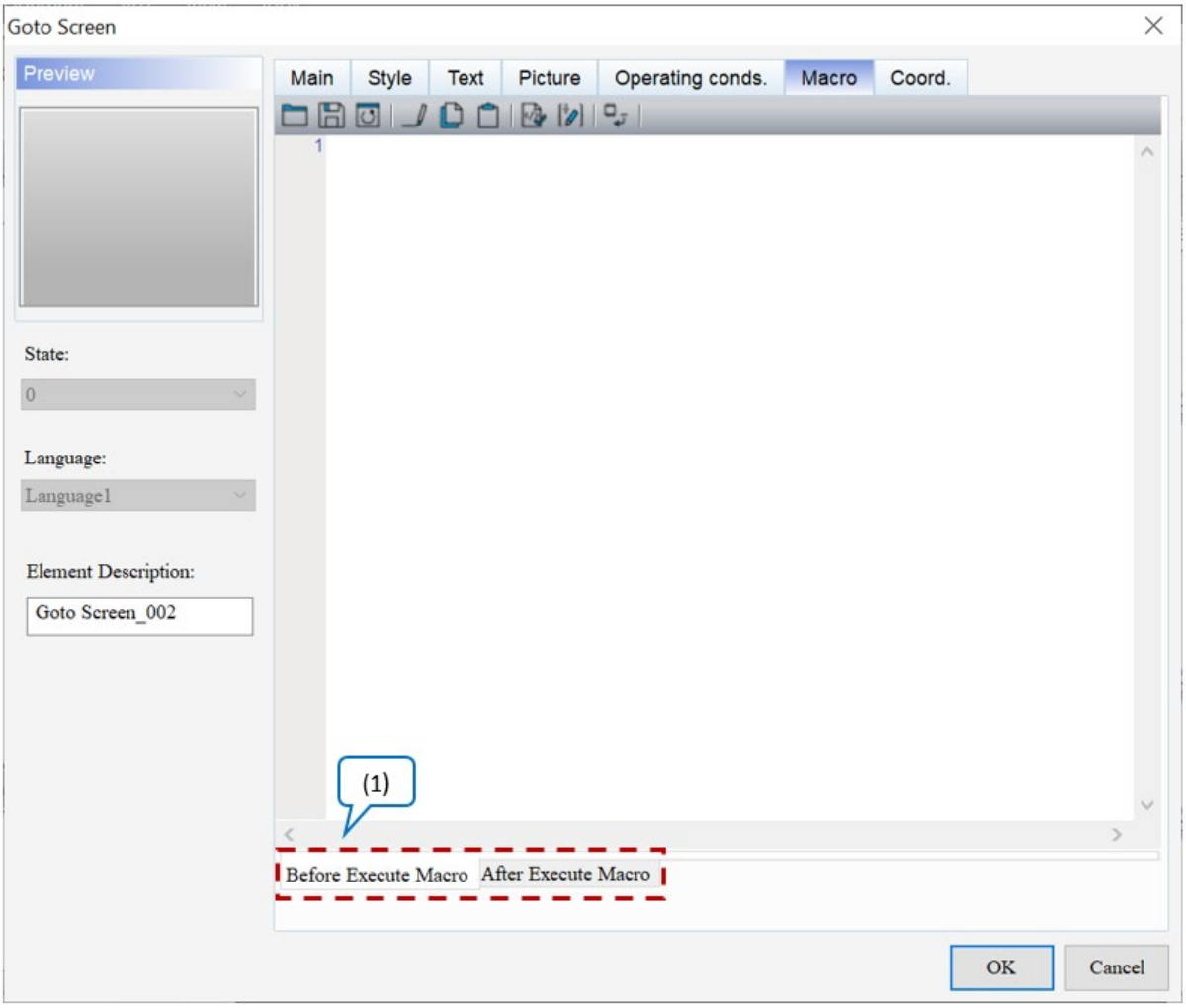
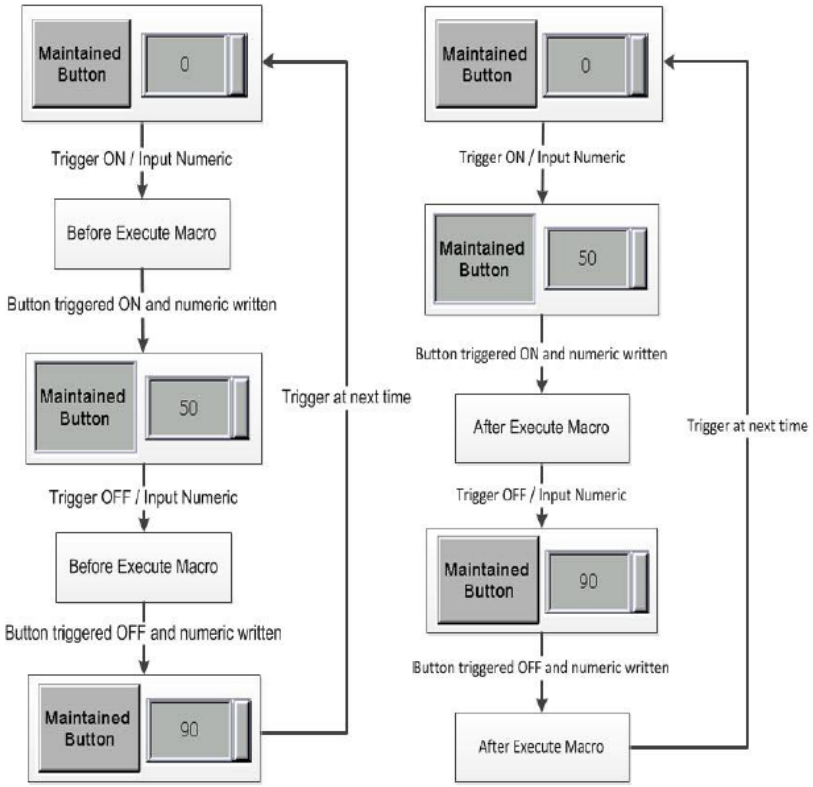


Figure 5 - 52: Goto Screen Button element Macro property page

No.	Function	Description
(1)	Flowcharts of **Before Execute Macro** / **After Execute Macro**: 	
	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

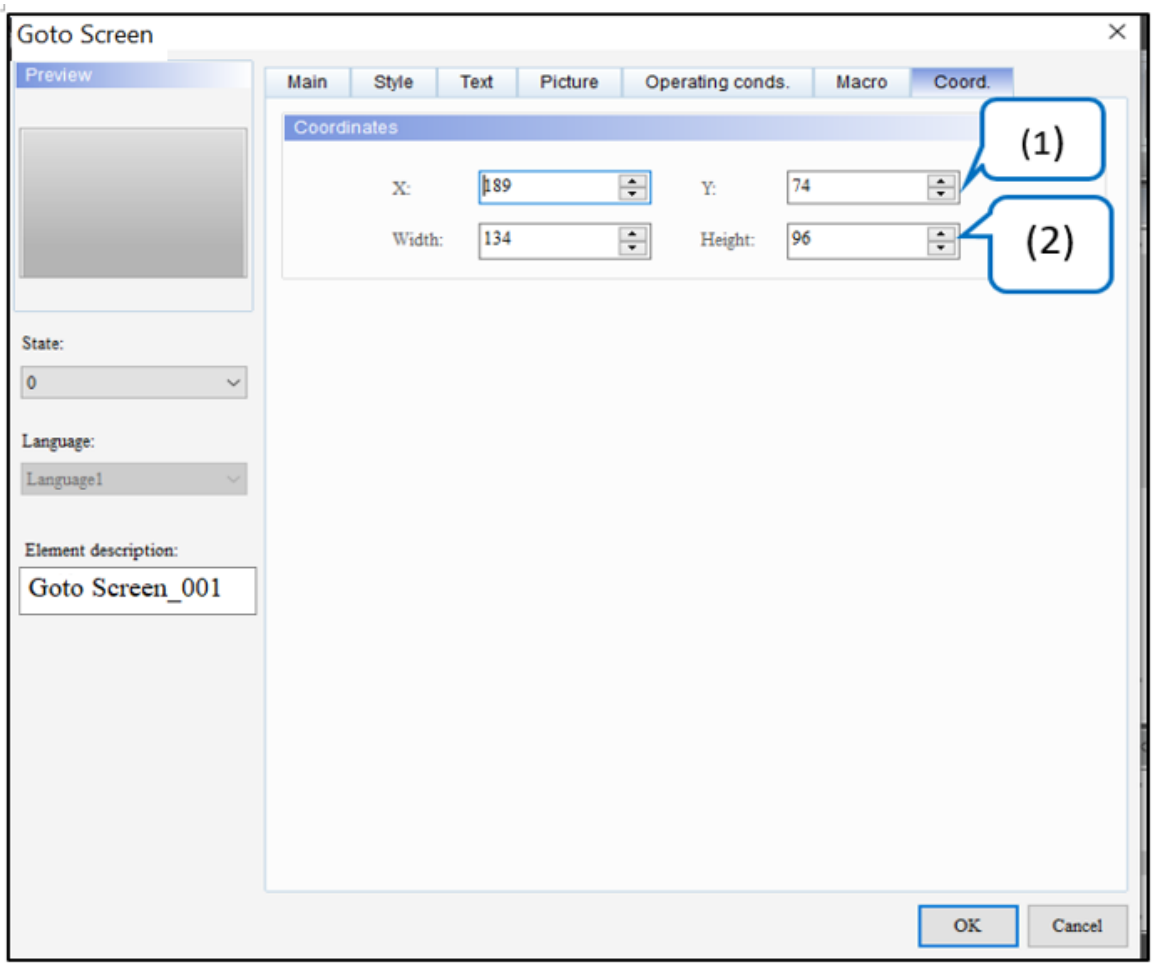


Figure 5 - 53: Goto Screen Button element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

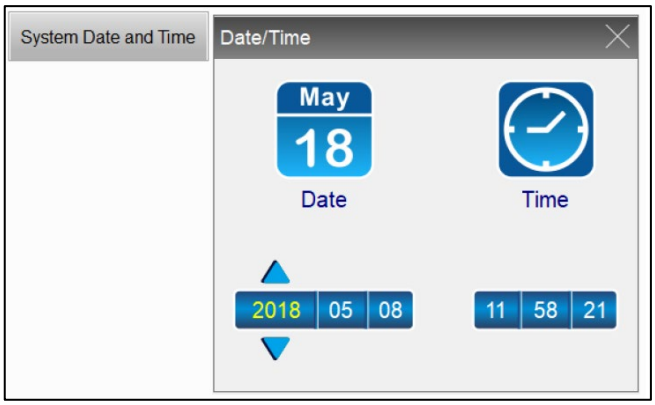
5.7 Other Elements

Other Button elements include:

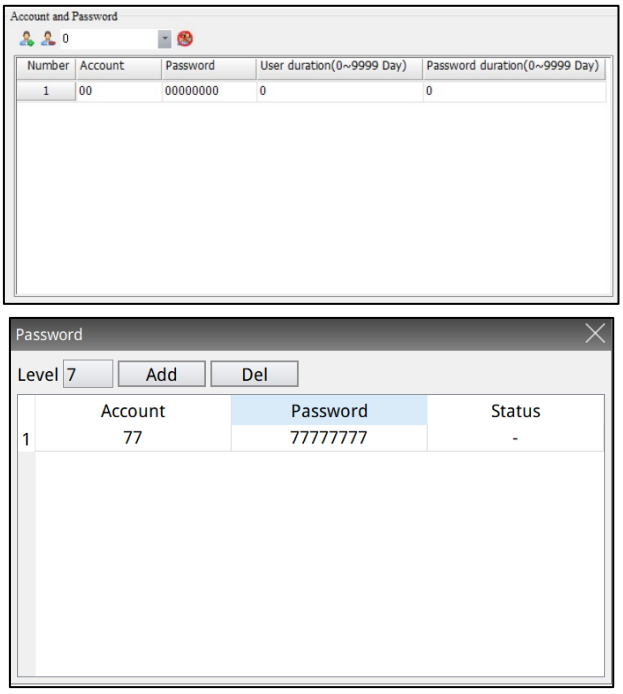
- System Date and Time
- Password Table
- Enter Password
- Contrast Brightness
- Set Low Security
- System Menu
- Print Output
- Report List
- Screen Capture
- Remove Storage
- Import / Export Recipe
- Calibration
- Language Change
- Import / Export FileSlot
- Multiple Actions
- Action implementation (IMP series)
- SMTP Server
- FTP Server

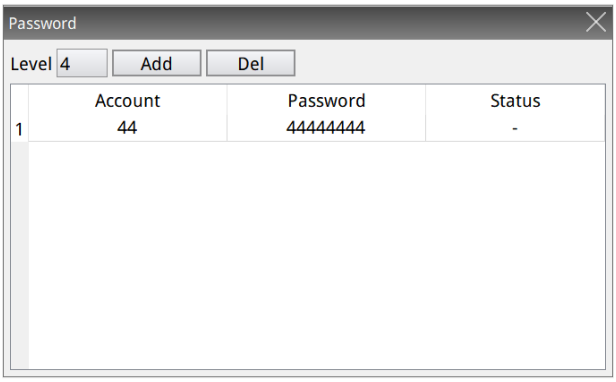
The main characteristics of each element are described separately in the following sections.

5.7.1 System Date and Time

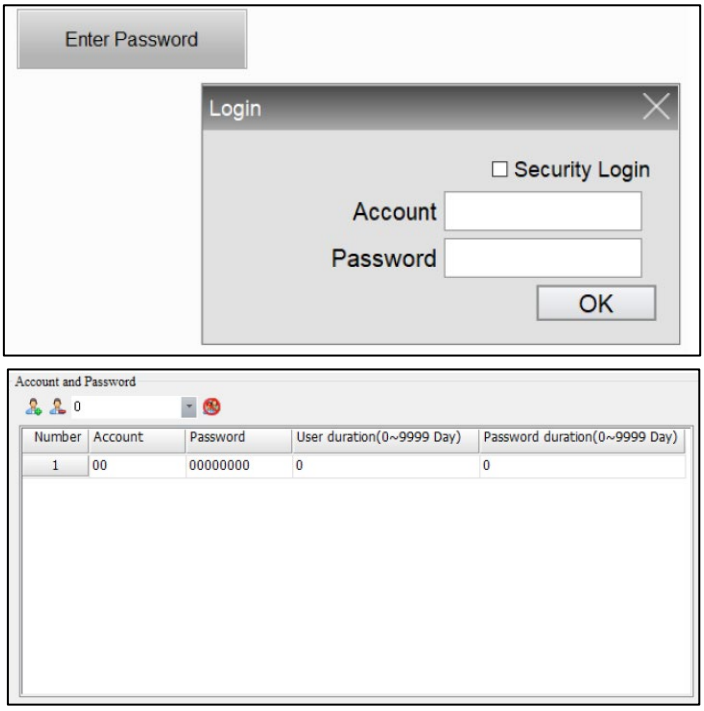
Function	Illustration
● Set the system date and time on the HMI with the **System Date and Time Button** element. ● This function is the same as that of the Date/Time on the HMI screen.	

5.7.2 Password Table

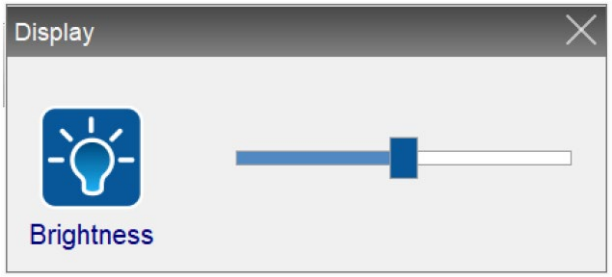
Function	Illustration
● For the password table, go to **General** > **Configuration** > **Security Level and Password** from the drop-down menu. This function displays the settings of the passwords for each security level. After the settings are completed, download the data to the HMI. ● To change the password table during HMI operation, use the **Password Table Button** element, and the system determines the corresponding level according to the **User Security Level** defined in the password table. ● When the **User Security Level** is lower than the **Set Security Level**, the password table does not open, and the **Password** window appears.	 High security

Function	Illustration
● Whether users can open the **Password Table Button** element depends on if the entered password level is greater than or equal to the **User Security Level**. After entering the Password Table Button element, users can only modify the password less than or equal to the current **User Security Level**. For a password higher than the current **User Security Level**, the password cannot be modified or viewed.	 Security level = 4

5.7.3 Enter Password

Function	Illustration
● The **Enter Password Button** element provides the interface to enter passwords on the HMI. ● Users enter their Account and Password to log in to the corresponding level they belong to according to the password table in **General** > **Configuration** > **Security Level and Password**.	

5.7.4 Contrast Brightness

Function	Illustration
Adjust the HMI contrast Brightness.	

5.7.5 Set Low Security

Function
Set the **User Security Level** to the lowest. The **User Security Level** for all the software elements can be set so that the system parameters can be protected from being tampered or manipulated resulting in system errors.

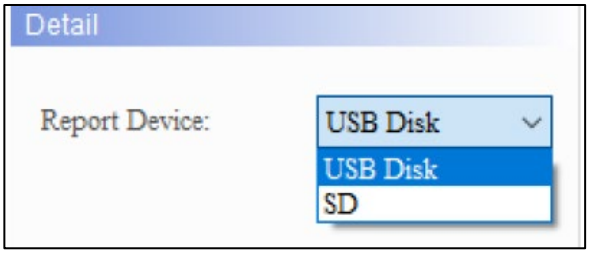
5.7.6 System Menu

Function	Illustration
When users press the **System Menu Button** element, the HMI switches to the System Menu screen, as shown at the right-hand side. Just tap the upper-right corner of the System Menu screen or press and hold the **System Menu Button** element at the back of the HMI for three seconds to return to the general HMI execution screen.	

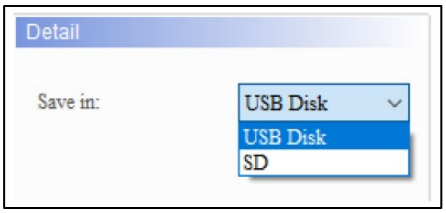
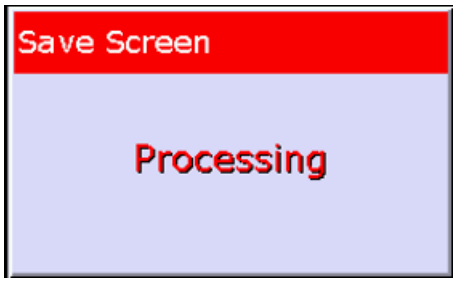
5.7.7 Print Output

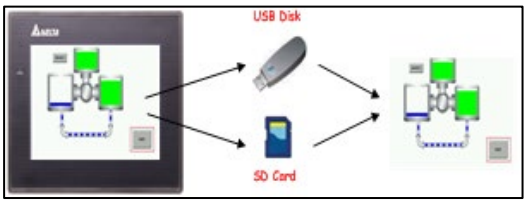
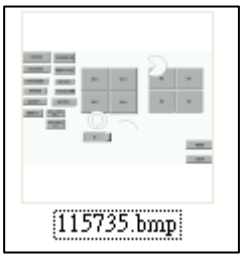
Function
When the HMI project has set up a printer, the print action can be executed through the **Print Output Button** element.

5.7.8 Report List

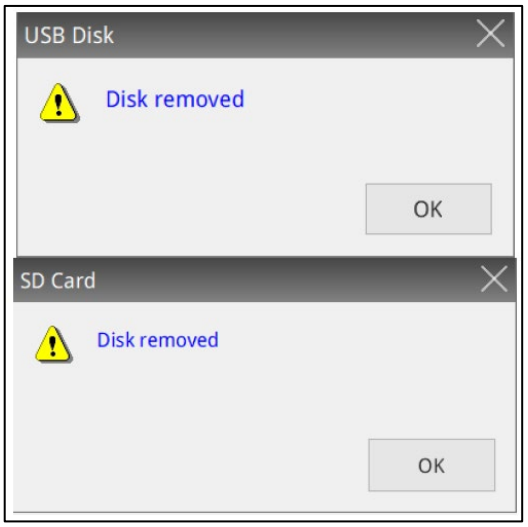
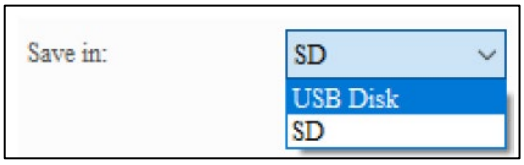
Function	Illustration
● There are two storage devices for the **Report List Button** element: USB Disk and SD. ● Select the desired device to export the Report List. Press the **Report List Button** element to output the data to the specified storage device.	

5.7.9 Screen Capture

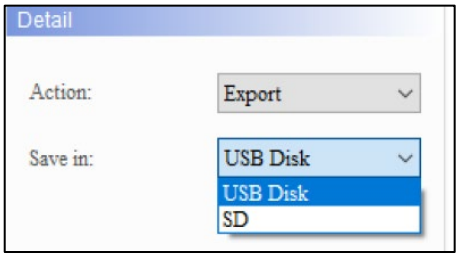
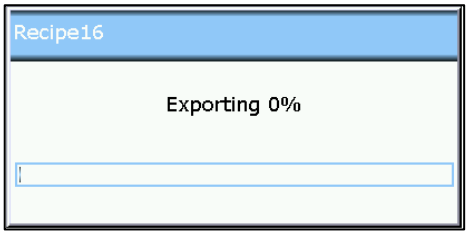
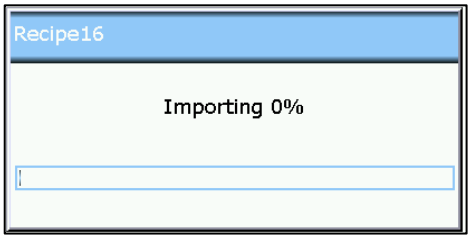
Function	Illustration
● The **Screen Capture Button** element enables users to capture the current HMI screen and store it in an external storage device, including USB Disk and SD as shown in Figure (1). ● After touching the **Screen Capture Button** element, the **Save Screen** window appears on the HMI to inform users that the current screen is being saved to an external storage device, as shown in Figure (2). ● After saving, check the files in the external devices. The HMI stores the file folders by date (yyyy / mm / dd) and the screen files by time (hh / mm / ss). ● The output picture format is .bmp,	 (1)  (2)

Function	Illustration
as shown in Figure (4).	 (3)  (4)

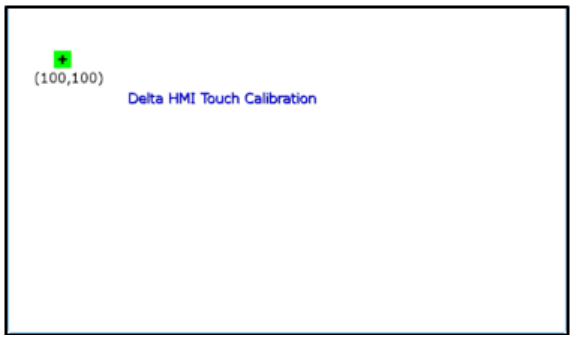
5.7.10 Remove Storage

Function	Illustration
● Prevent data loss of the storage device connected to the HMI. Ensure to execute **Remove Storage Button** element before turning off the HMI, replacing or removing the storage device. ● After executing **Remove Storage Button** element, HMI informs users that the storage device has been removed with an **OK** message, as shown in Figure (1). ● The HMI supports two types of storage devices: USB Disk and SD, as shown in Figure (2).	 (1)  (2)

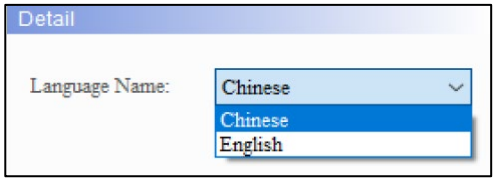
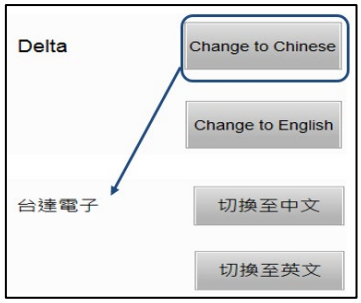
5.7.11 Import/Export Recipe

Function	Illustration
● If the users want to use the **Import/Export Recipe Button** element, the recipe must be edited and opened first, otherwise the action will be invalid when this element is executed. ● The **Import/Export Recipe Button** element can set its **Action** to import or export, as shown in Figure (1). ● Users can also set the access type, including USB Disk and SD, as shown in Figure (2). ● The HMI informs users that the data importing / exporting is in progress after users touch the **Import/Export Recipe Button** element, as shown in Figure (3). ● The exported file format is .CSV, and HMI stores files in the default folder HMI-000.	 (1)  (2)   (3)

5.7.12 Calibration

Function	Illustration
● The **Calibration Button** element enables users to perform 5-point calibration. ● After pressing the **Calibration Button** element, the HMI immediately enters the Calibration screen, as shown in the figure on the right-hand side.	

5.7.13 Language Change

Function	Illustration
● The **Language Change Button** element allows users to quickly switch between multiple languages through this button. ● Set the displaying language to Chinese or English, as shown in Figure (1) on the right-hand side. As shown in Figure (2), when users execute the **Language Change Button** element, the HMI displays the data in English when users press (Change to English); the HMI displays the data in Chinese when users press Change to Chinese, as shown in Figure (3). ● Activate the Multi-language function before using the **Language Change Button** element. Refer to *Chapter 25 Multi-language* for more details on the Multi-language function.	 (1)  (2)  (3)

5.7.14 Import/Export FileSlot

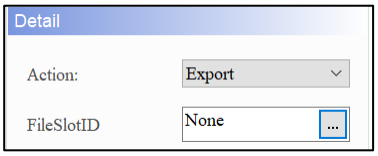
<table>
<tr><th>Function</th><th>Illustration</th></tr>
<tr><td>

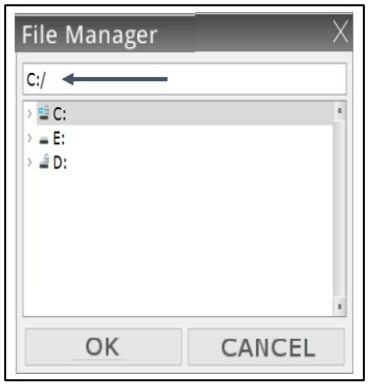
- If users want to use the **Import/Export FileSlot Button** element, the count and size of the FileSlot must be planned first, otherwise the action will be invalid when the element is pressed.
- The **Action** for **Import/Export FileSlot Button** element can be set to Import or Export, as shown in Figure (1) on the right-hand side.
- The **FileSlot ID** of **Import/Export FileSlot Button** element needs to be defined, as shown in Figure (2). The **FileSlotID** can be a memory address or a constant value.

<table>
<tr><th colspan="4">Memory Usage</th></tr>
<tr><th>Variables</th><th>Internal Memory</th><th>PLC Register</th><th>Constant</th></tr>
<tr><td>FileSlot ID</td><td>◎</td><td>◎</td><td>◎</td></tr>
</table>

- After pressing the **Import/Export FileSlot Button** element, the **File Manager** window appears to select the location to be imported / exported, as shown in Figure (3) on the right-hand side. Select the external storage device, and then click where the arrow points and enter the filename.
- Run the macro **FileSlotRead** to read the file data into the register after importing FileSlot.

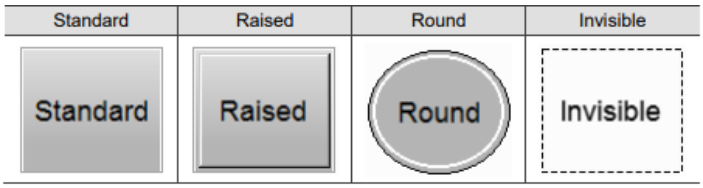
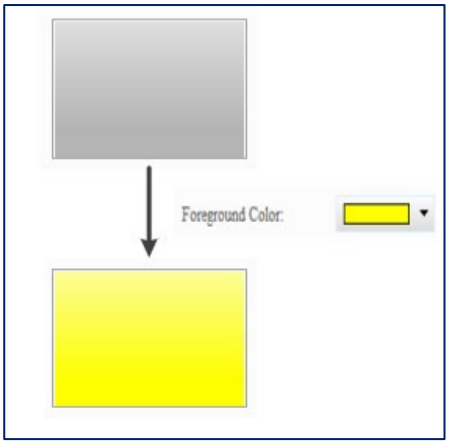
</td><td>

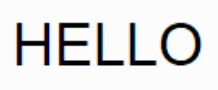
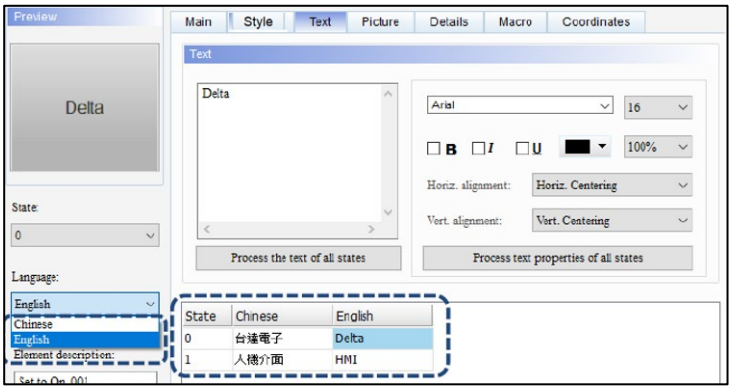

(1)


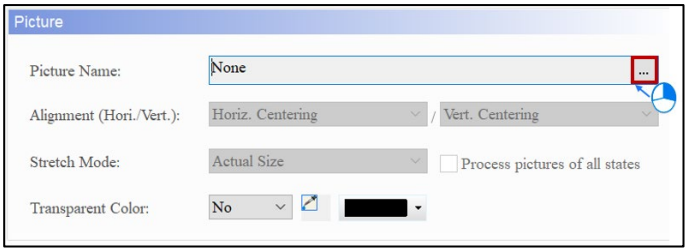
(2)



(3)
</td></tr>
</table>

5.7.15 Other Shared Properties of Elements

<table>
<tr><th>Property</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">Main</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Raised, Round, and Invisible. The default value is Standard.
 
</td></tr>
<tr><td>Foreground Color</td><td>● Set the foreground color of the element. The default is .
● When users set the Style to Invisible, the Foreground Color setting is invalid.
 
</td></tr>
<tr><td>Filled style</td><td>● The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
● Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.
<table><tr><td>Gradient</td><td>  </td></tr></table></td></tr>
</table>

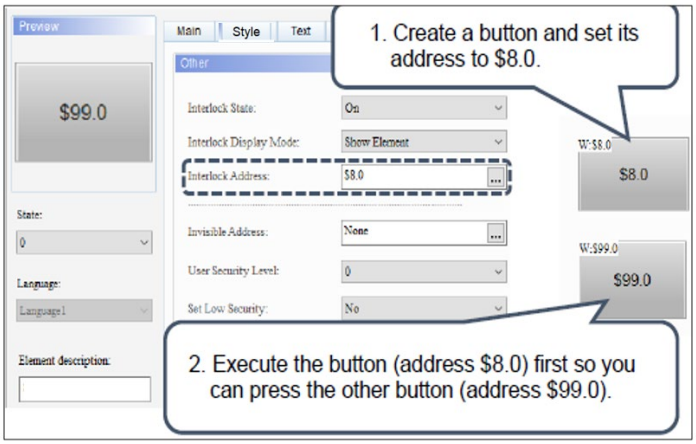
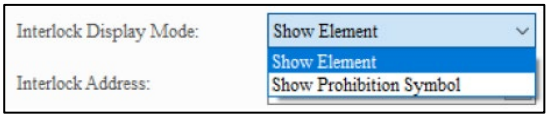
<table>
<tr><th>Property</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">Text</td><td></td><td>Fixed  </td></tr>
<tr><td>Use Text Pic</td><td>● Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
● Refer to the following example.
<table>
<tr><th>Use Text Pic is Yes</th><th>Use Text Pic is No</th></tr>
<tr><td>  </td><td>  </td></tr>
</table>
NOTE: If users use DIAScreen to open the DOP-B project, the Use Text Pic function will be set to Yes by default; if users add a new DOP-100 project, the Use Text Pic function will be set to No by default.</td></tr>
<tr><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td rowspan="2">Text</td><td>Text</td><td>Enter the text message to be displayed in the text box.
 
</td></tr>
<tr><td>Text related properties</td><td>Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.</td></tr>
</table>

<table>
<tr><th>Property</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Edit Multi-language text</td><td>If users have added multi-language data, the Text page allows them to edit multi-language text data. As shown in the Text property page, they can enter English text in the English column.</td></tr>
<tr><td rowspan="4">Picture</td><td>Picture Name</td><td>● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.
 



● To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td rowspan="2">Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.</td></tr>
<tr><td><table><tr><td>Stretch All</td><td>Stretch 1.1</td><td>Actual Size</td></tr></table></td></tr>
</table>

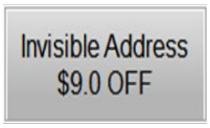
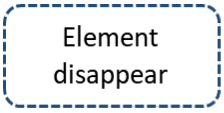
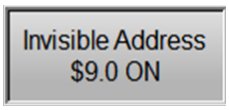
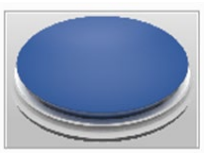
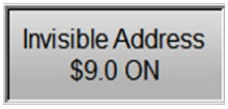
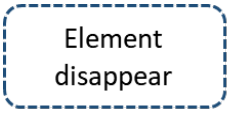
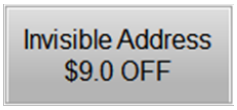
<table>
<tr><th>Property</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="3"></td><td></td><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
<tr><td>Process pictures of all states</td><td colspan="3">If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>Transparent Color</td><td colspan="3">● This function specifies a color in the picture and make it transparent. The default value is No.
● Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the Foreground Color of the element.
  </td></tr>
<tr><td>Operating conds.</td><td>Interlock State</td><td colspan="3">● The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
● If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default</td></tr>
</table>

<table>
<tr><th>Property</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="4"></td><td rowspan="2">Interlock Address</td><td>value is On.
● The behavior is as follows:
1. Create an element and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element with address $99.0.
2. Before having the element with address $99.0 to operate, press the element with address $8.0 to validate the button action (address $99.0).
 
</td></tr>
<tr><td rowspan="3">Interlock Display Mode</td><td>● The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 
</td></tr>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>

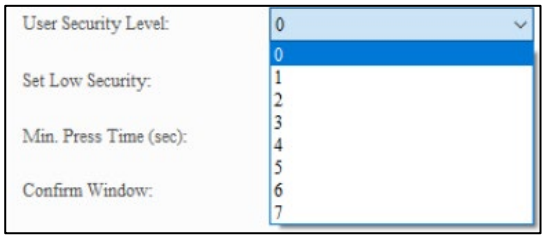
<table>
<tr><th>Property</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3"></td><td>Invisible Address</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

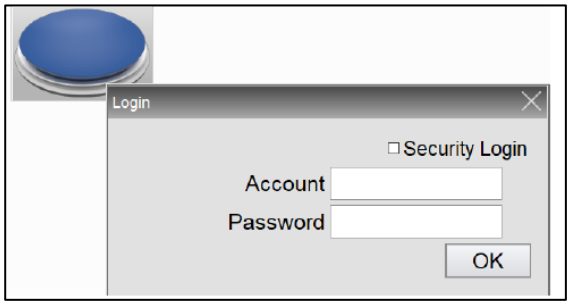
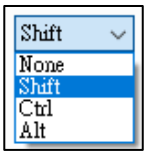
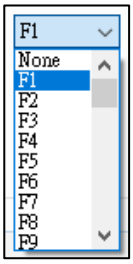
<table>
<tr><td rowspan="2">Invisible State is On</td><td>  </td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td>  </td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td><td></td></tr>
<tr><td>User Security Level</td><td>

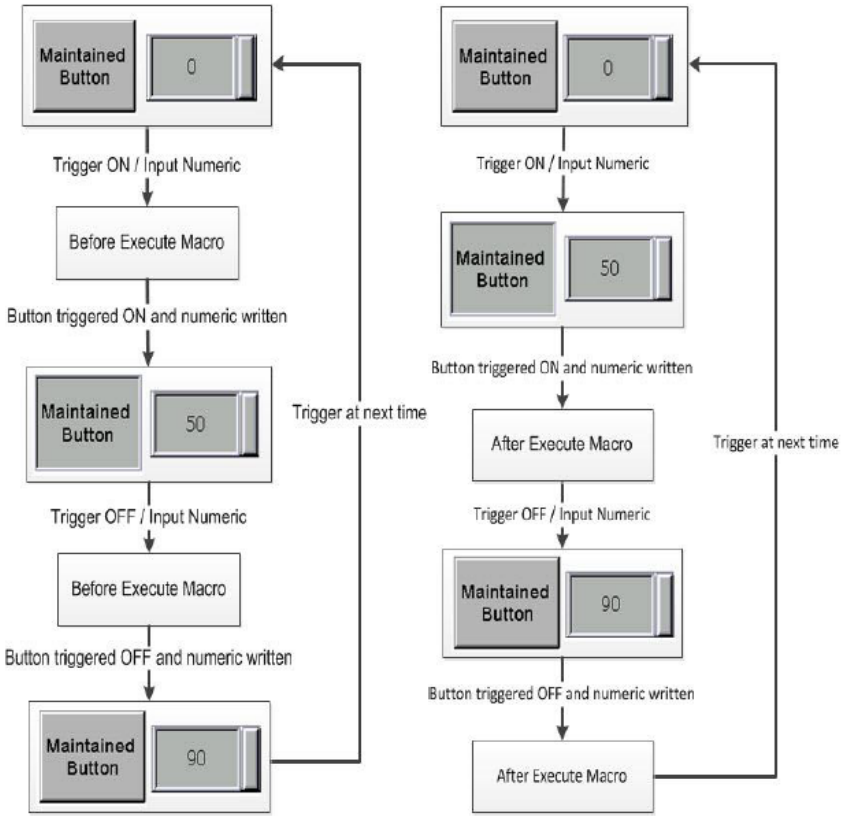
This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.



If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting.

</td></tr>
</table>

Property	Function	Description
		Refer to *Section 5.7.2 Password Table*). 
	Confirm Window	• The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. • Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 
	Modifier + Hot Key	• Allows to use the hot keys on the external keyboard to execute the buttons. • The available options for **Modifier** are: None, Shift, Ctrl, and Alt keys.  • The available options for **Hot Key** are: F1 ~ F12, English letters A ~ Z, and number keys 0 ~ 9. 

Property	Function	Description
Macro	Flowcharts of **Before Execute Macro** / **After Execute Macro**: 	
	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
Coord.	X value and Y value	Set the upper left X coordinate and Y coordinate of the element.
	Width and Height	Set the width and height of the element.

5.7.16 Multiple Actions

The **Multiple Actions Button** element allows to execute multiple actions with one single button. Define the actions to execute when they press, release, or long press the button. Use this function to replace the complicated programming process of the macro to trigger the button action.

The button actions provided by the **Multiple Actions Button** element include the following:

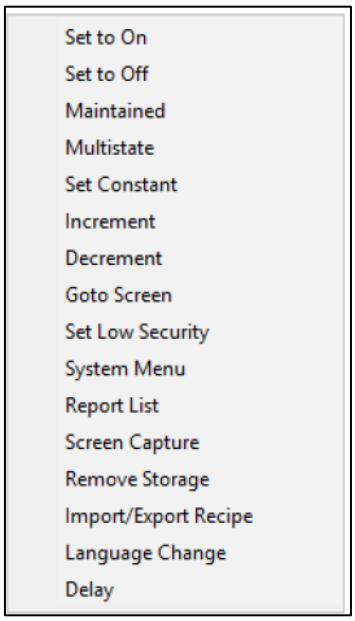


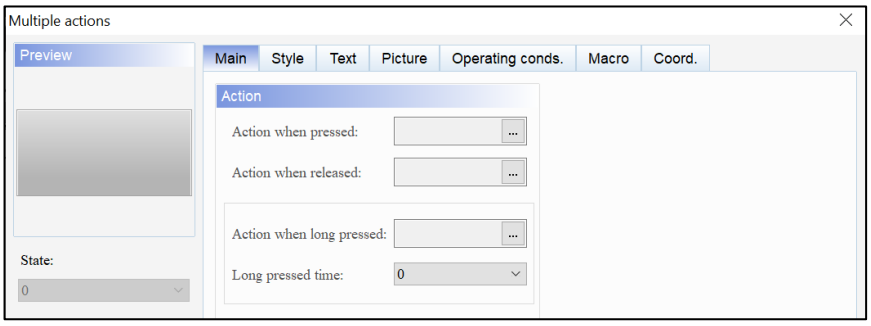
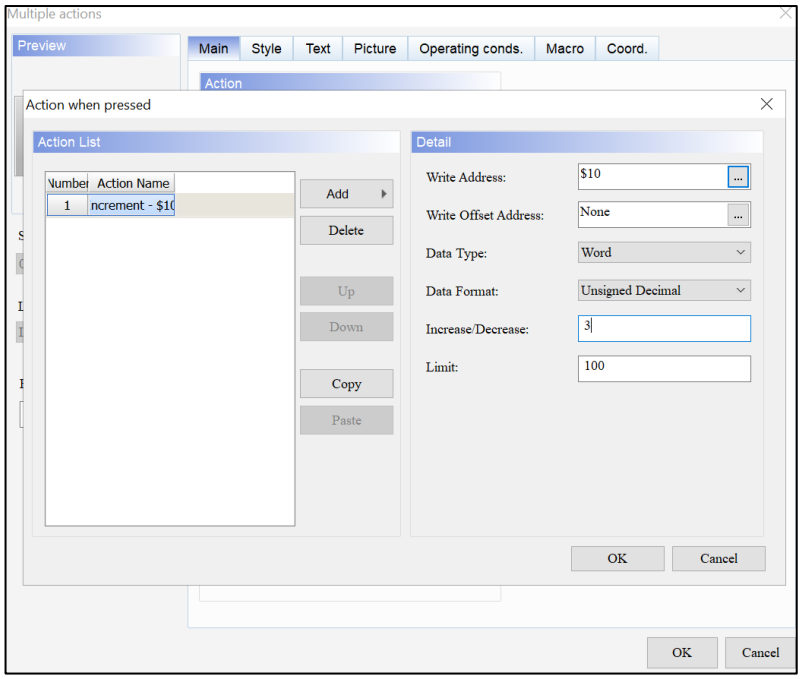
Figure 5 - 54: Button actions available for Multiple Actions Button element

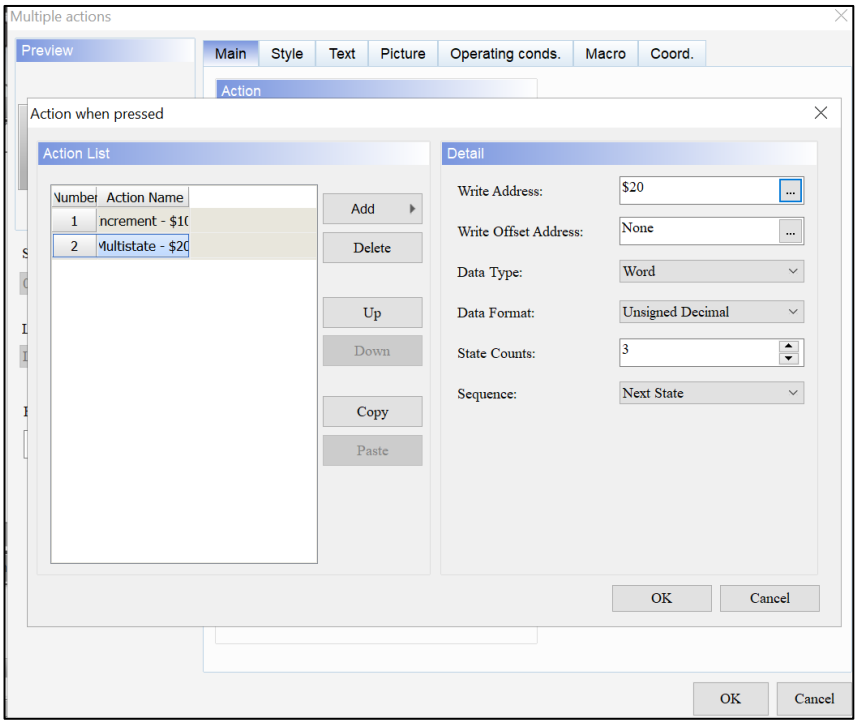
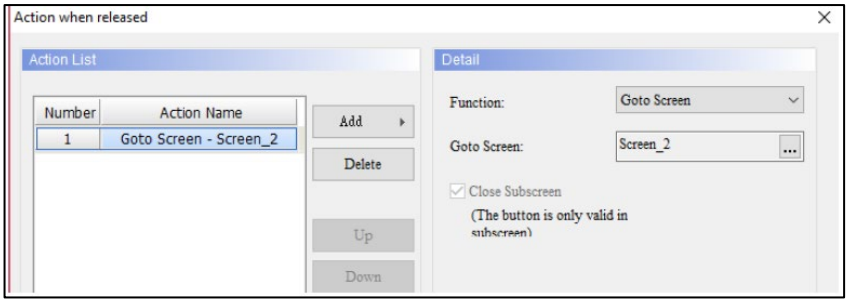
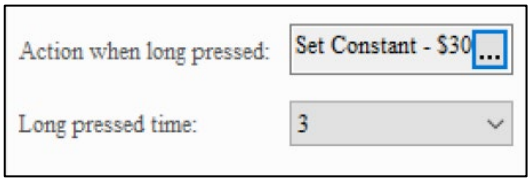
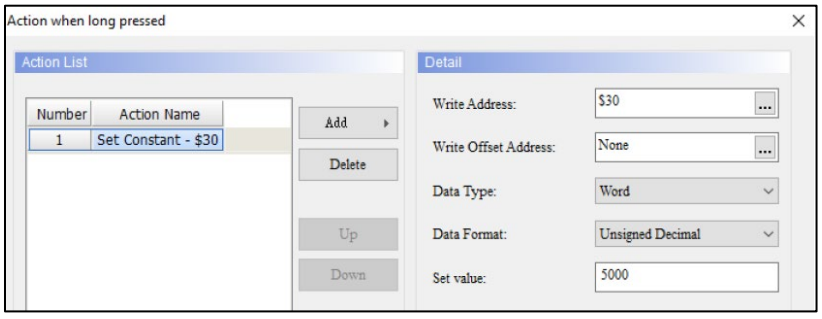
NOTE:

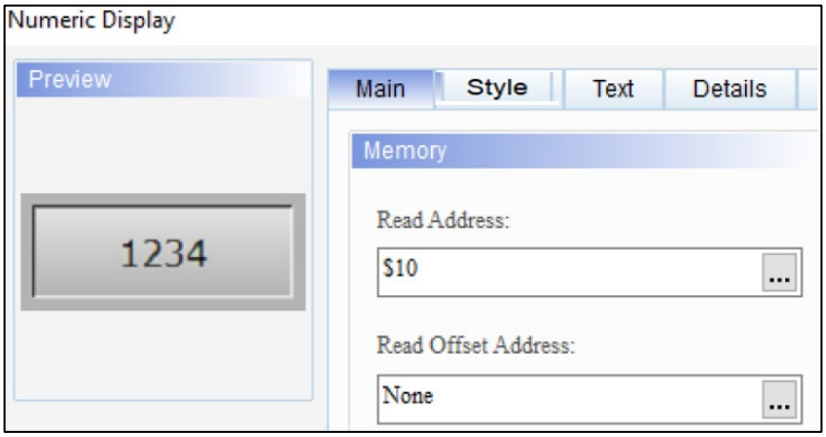
1. *Users can set up to 32 actions for each press, release, and long press, so one **Multiple Actions Button** element can execute up to 32*3 actions.*
2. *The System Menu can only be the last action, meaning users cannot add any actions following the System Menu.*
3. *One **Multiple Actions Button** element can only have one page change action, including Goto Screen and Previous Page.*

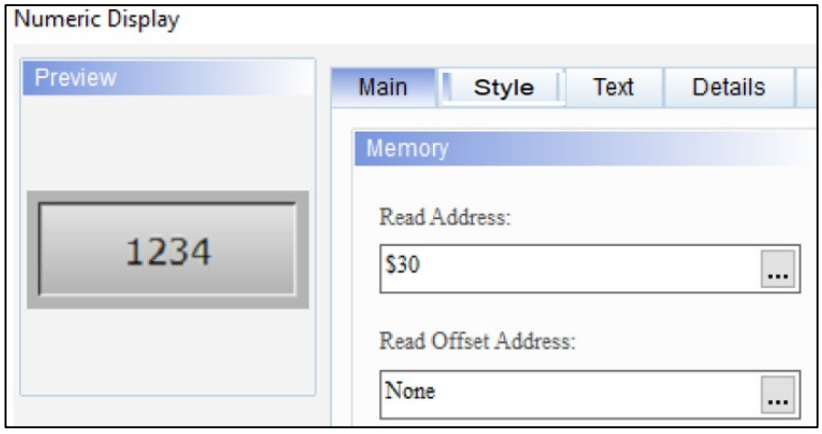
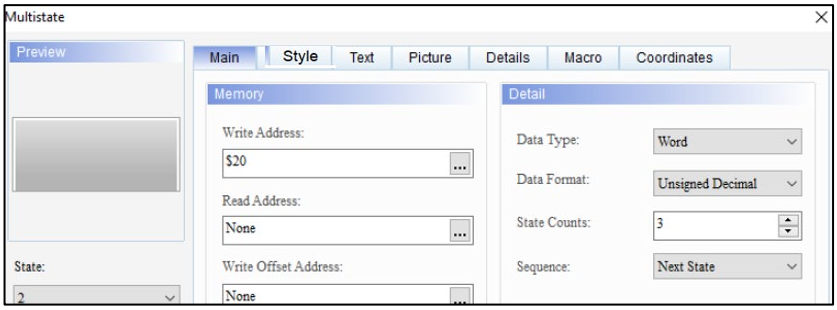
4. If the button action is set with a macro, the execution of the macro is invalid.

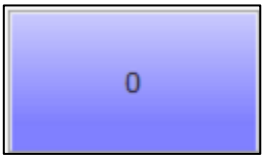
The following are examples of **Multiple Actions Button** element.

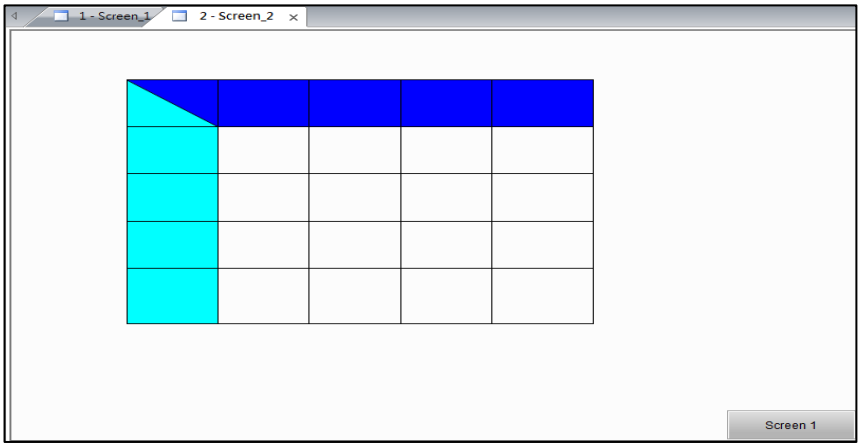
Multiple Actions Button	
Set Multiple Actions	● Create a **Multiple Actions Button** element. Go to **Elements** > **Button** > **Multiple Actions**.  ● Set the **Action when pressed** with Number 1 as **Increment**. Then, set the **Write Address** to $10, the **Increase/Decrease** value to 3, and the **Limit** to 100.  ● Set the **Action when pressed** with Number 2 as **Multistate** and the **Write Address** to $20. The **State Counts** is set to 3. For the other settings, refer to the following figure.

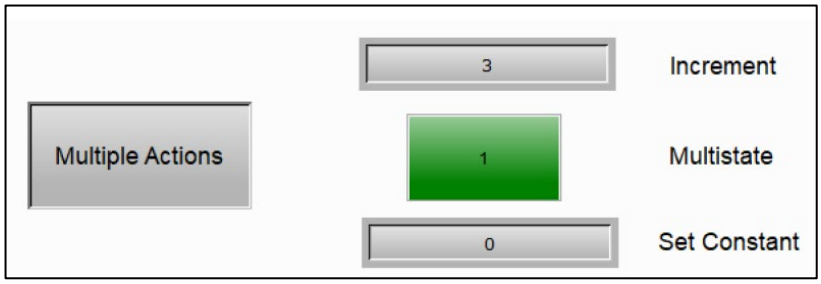
Multiple Actions Button	
	 ● Set the **Action when released** to **Goto Screen - Screen_2**.  ● Set the **Action when long pressed** to Set Constant and the **Long pressed time** to 3 seconds. Set the **Write Address** to $30 and the **Set value** to 5000.  
Set Numeric	● Create a **Numeric Display** element (**Elements** > **Data Display** > **Numeric Display**) and set the **Read Address** to $10 for

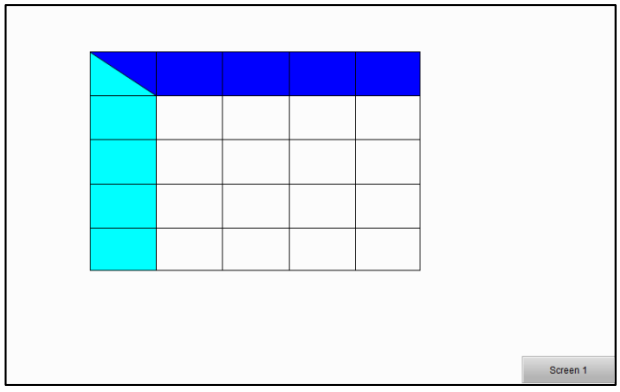
<table>
<tr><th colspan="2">Multiple Actions Button</th></tr>
<tr><td>Display element</td><td>displaying the changed value after the increment action is executed.
 

Create a Numeric Display element and set Read Address to $30 for displaying the changed value after the Set Constant action is executed.

</td></tr>
<tr><td>Set Multistate</td><td>Create a Multistate Button element. Set the Write Address to $20, State Counts to 3, and the switching sequence (Sequence) to Next State.


Set the Foreground Color for States 0, 1, and 2.
<table>
<tr><th>State</th><th>Foreground Color</th></tr>
<tr><td>0</td><td> 
</td></tr>
</table></td></tr>
</table>

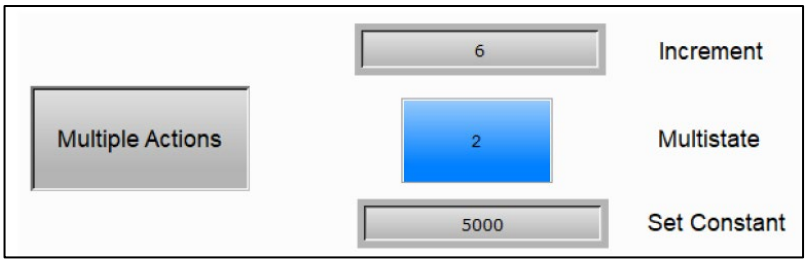
<table>
<tr><th colspan="2">Multiple Actions Button</th></tr>
<tr><td></td><td>
<table>
<tr><td>1</td><td> 
</td></tr>
<tr><td>2</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>New Screen</td><td>Add a new screen Screen_2. Create a Table element and a Goto Screen Button element which is set to switch to Screen_1.
 
</td></tr>
<tr><td>Execution result</td><td>

Press the Multiple Actions Button element, the Increment and Multistate actions are executed.
 

If users release the Multiple Actions Button element, the Goto Screen action is executed and the HMI screen changes to Screen_2.
 

</td></tr>
</table>

Multiple Actions Button	
	● When users change the screen to Screen_1 and long press the **Multiple Actions Button** element for 3 seconds, the Set Constant action is executed. Apart from long pressing the button for 3 seconds, the press action is also executed, so the HMI executes both the **Increment** and **Multistate** actions.



On double-clicking the **Multiple Actions Button** element, the property page appears as follows.

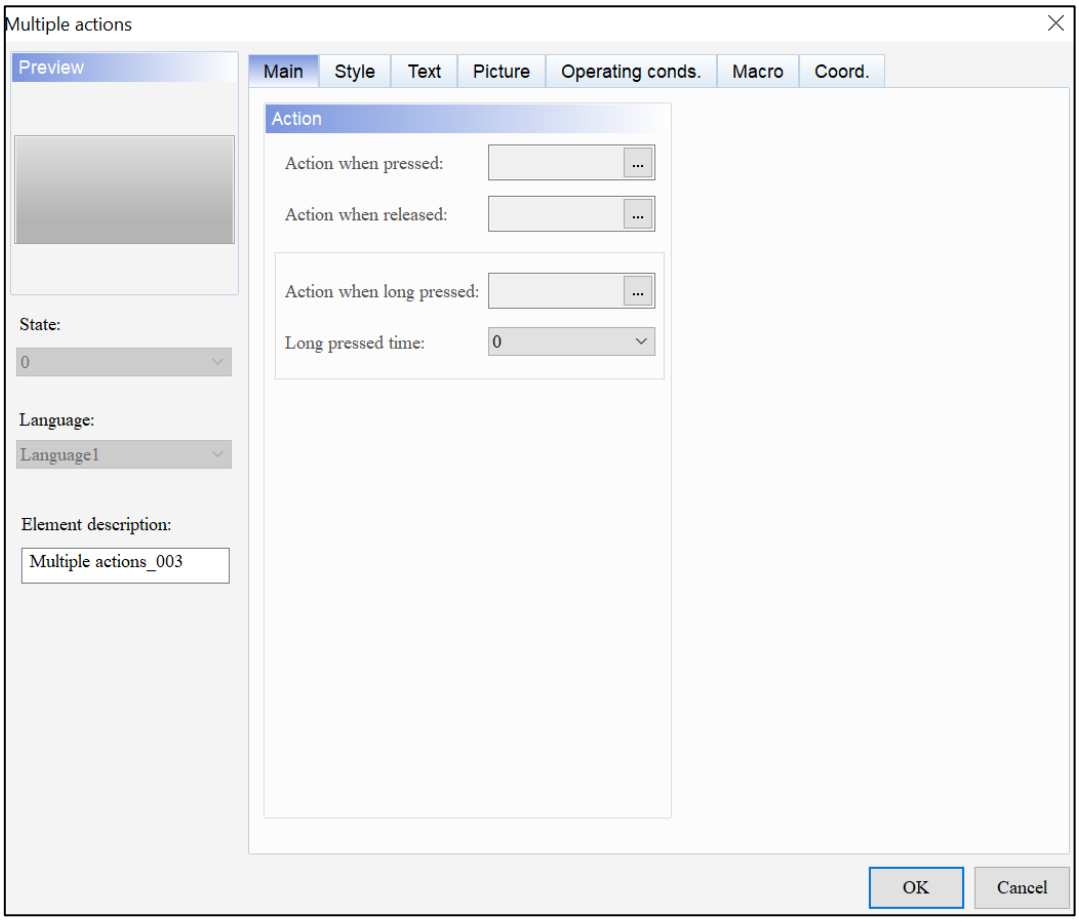


Figure 5 - 55: Multiple Actions Button element property page

Multiple Actions Button	
Function	**Description**
Preview	The **Multiple Actions Button** element can only view multi-language data display since the multistate property is not available for this element.
Main	Set Action when pressed, Action when released, Action when long pressed, and Long pressed time.
Style	Set the element Style, Foreground Color, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set the Interlock State, Interlock Display Mode, Interlock Address, Invisible Address, Invisible State, User Security Level, and Set Low Security.
Macro	Set the Before Execute Macro and After Execute Macro
Coord.	Set the X and Y coordinates, Width, and Height of the button element.

- Main

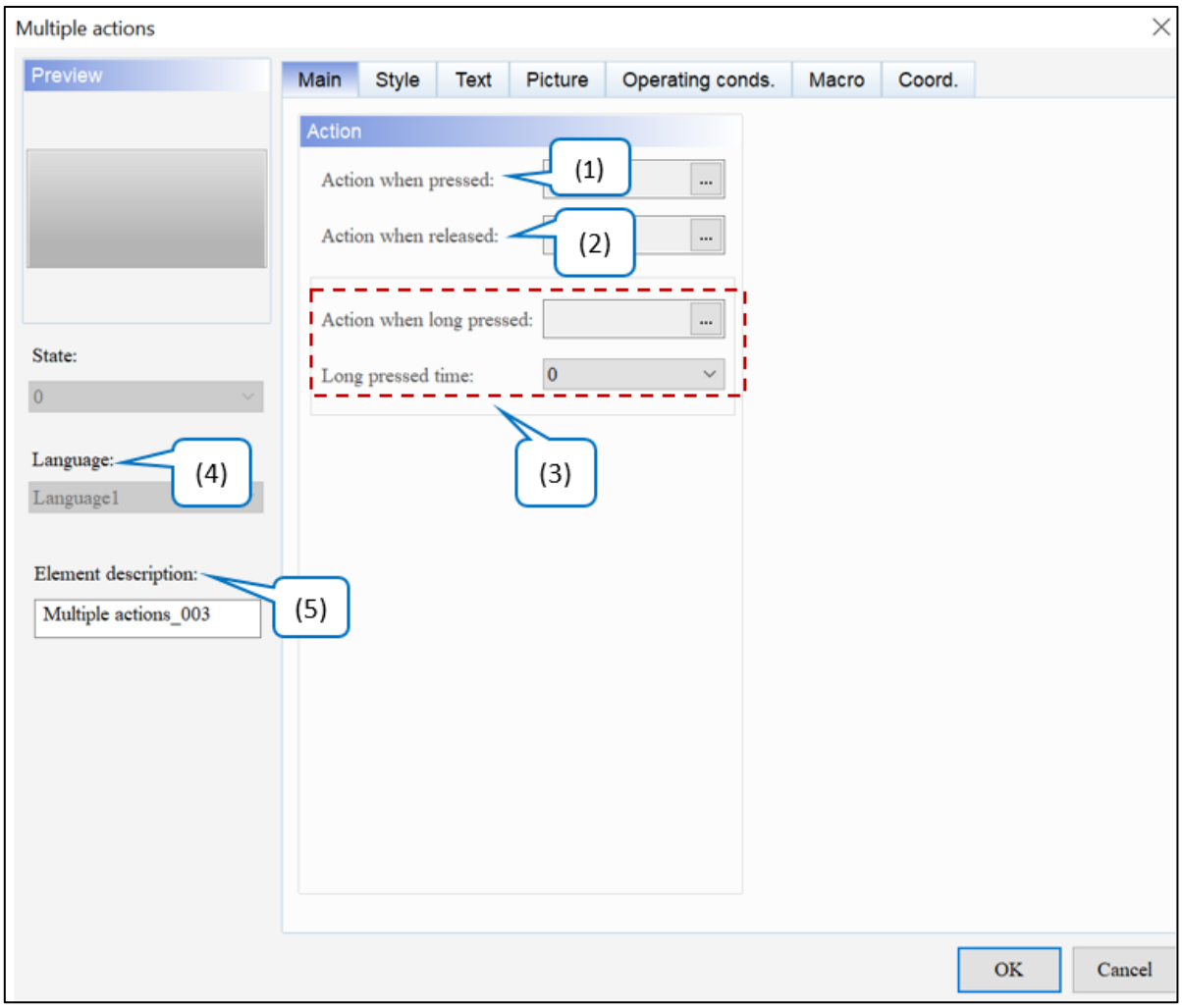
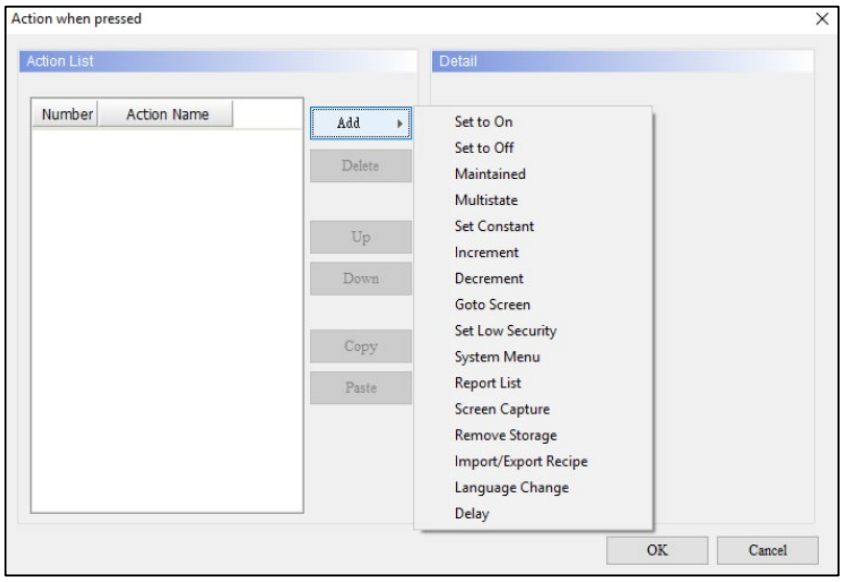
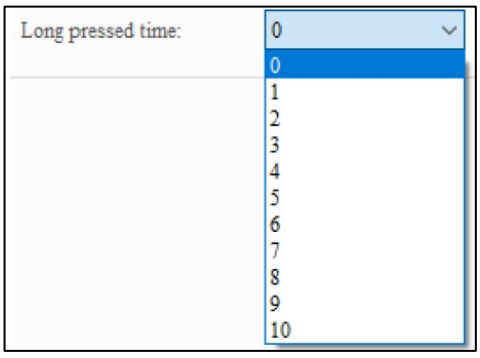
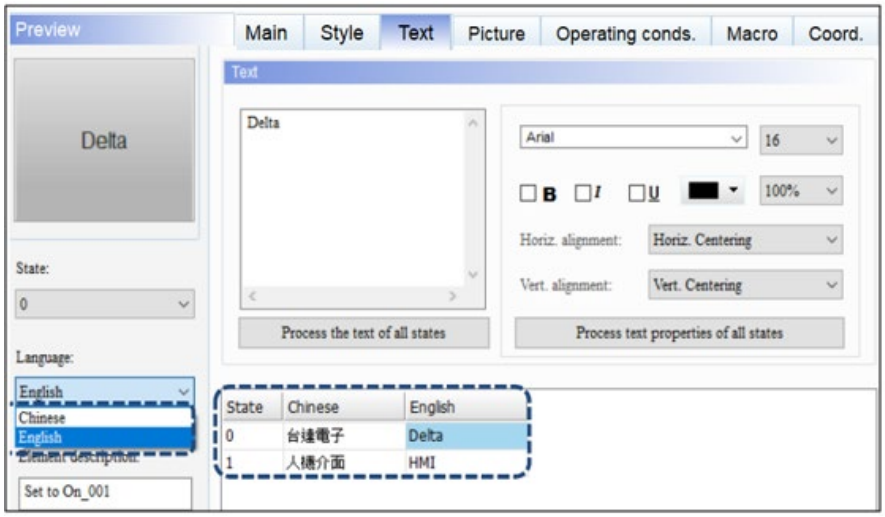
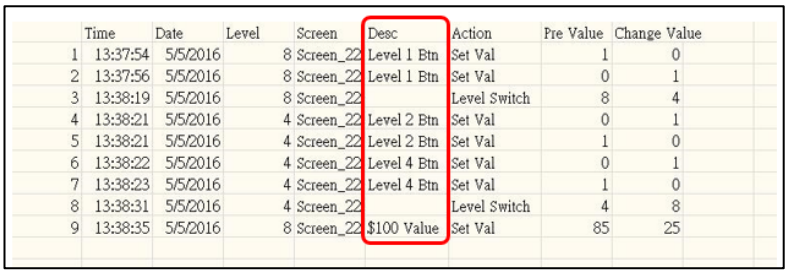


Figure 5 - 56: Multiple Actions Button element Main property page

No.	Function	Description
(1)	Action when pressed	● It means the action to be executed after pressing the **Multiple Actions Button** element. ● The supported button actions after the button is pressed are shown in the following figure.

No.	Function	Description
		
(2)	Action when released	● It means the action to be executed after releasing the **Multiple Actions Button** element. ● The supported button actions are the same as that of the **Action when pressed**.
(3)	Action when long pressed	● It means the action to be executed after pressing and holding the **Multiple Actions Button** element. ● The **Long pressed time** should be set for the long pressed button action to work. ● The supported button actions are the same as that of the **Action when pressed** and **Action when released**.
	Long pressed time	**Long pressed time** can be set from 0 ~ 10 seconds. The default value is **0**. 
(4)	Language	When the users have set language data, they can edit the text attributes to be displayed through the **Language** setting of the element.

No.	Function	Description
		
(5)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that users can easily know the performed actions. 

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

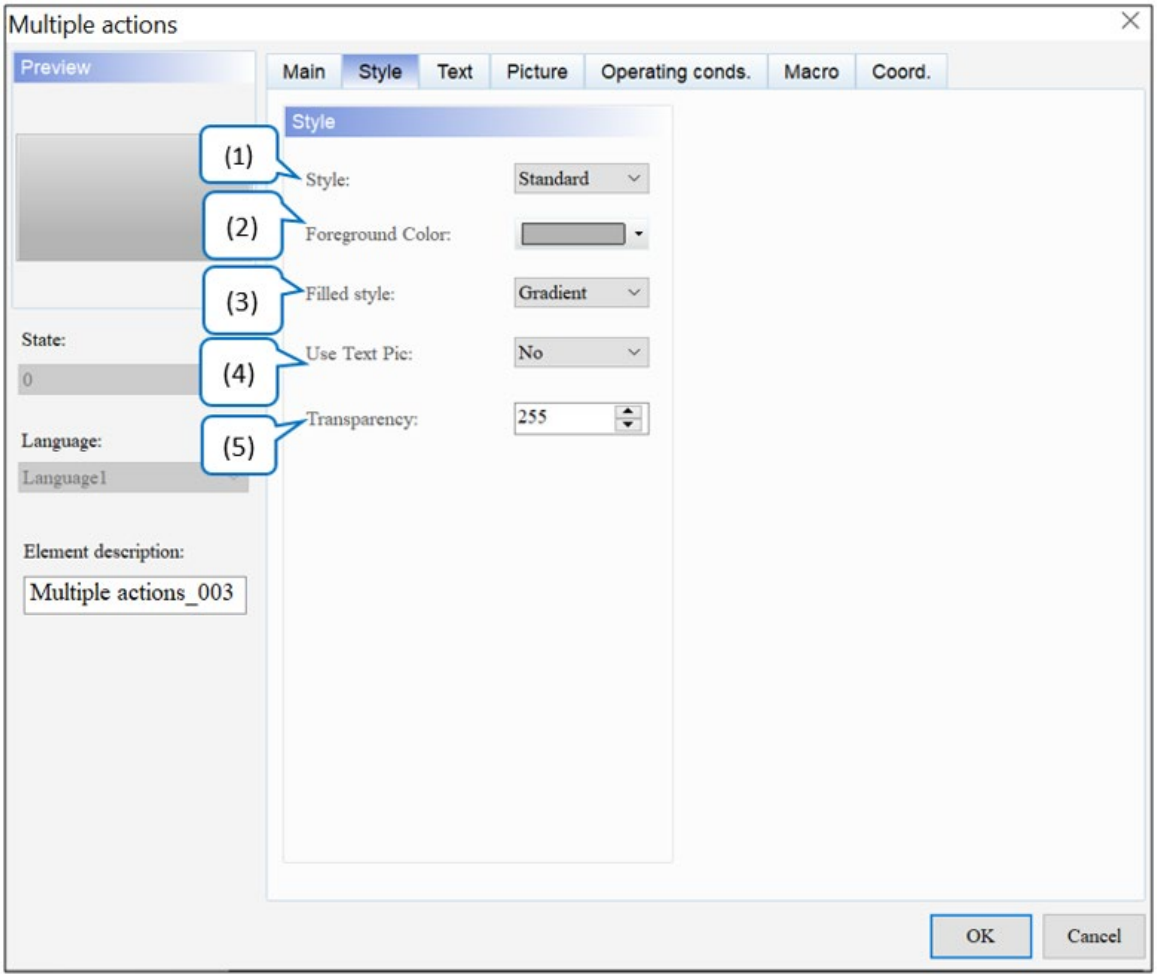
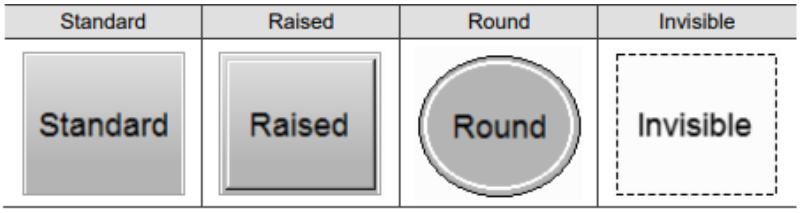
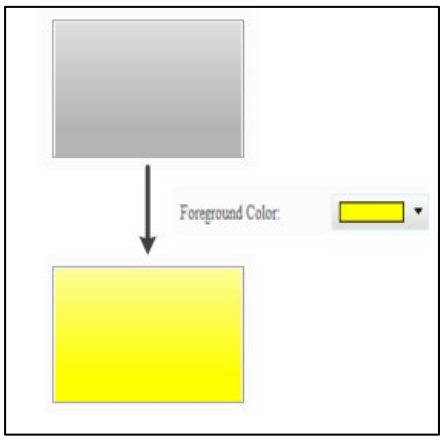


Figure 5 - 57: Multiple Actions Button element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the element. The available options for **Style** are: Standard, Raised, Round, and Invisible. The default value is **Standard**. 

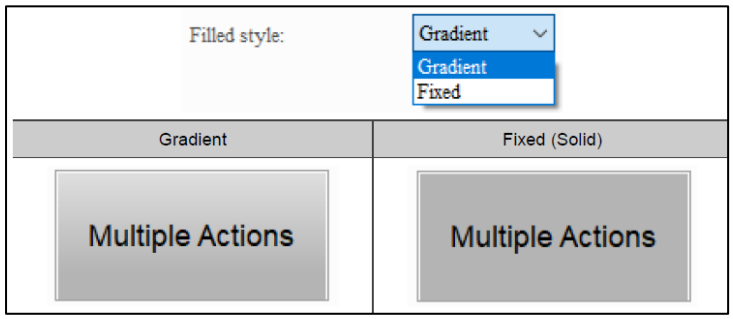
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Foreground Color</td><td>

Set the foreground color of the element. The default is  .
When users set the Style to Invisible, the Foreground Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Filled style</td><td>

Set the Filled style to Gradient or Fixed. The default value is Gradient.

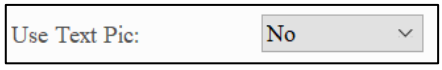


</td></tr>
<tr><td>(4)</td><td>Use Text Pic</td><td>

Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
Refer to the following example.

<table>
<tr><th colspan="2">Use Text Pic</th></tr>
<tr><td>Create button element</td><td>

Create a button element, and set Use Text Pic in the Style tab.



NOTE: If users use DIAScreen to open the DOP-B project, the Use Text Pic function will be set to Yes by default; if users add a new DOP-100 project, the Use Text Pic function
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td>will be set to No by default.
● In the Text tab, set any text and font.</td></tr>
<tr><td></td><td></td><td>Execution result</td><td>● After creating the element, download it to the HMI.
● The following table is the comparison table that shows the results of using and not using the Use Text Pic function.<table><tr><th>Use Text Pic is Yes</th><th>Use Text Pic is No</th></tr><tr><td>HELLO</td><td>HELLO</td></tr></table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

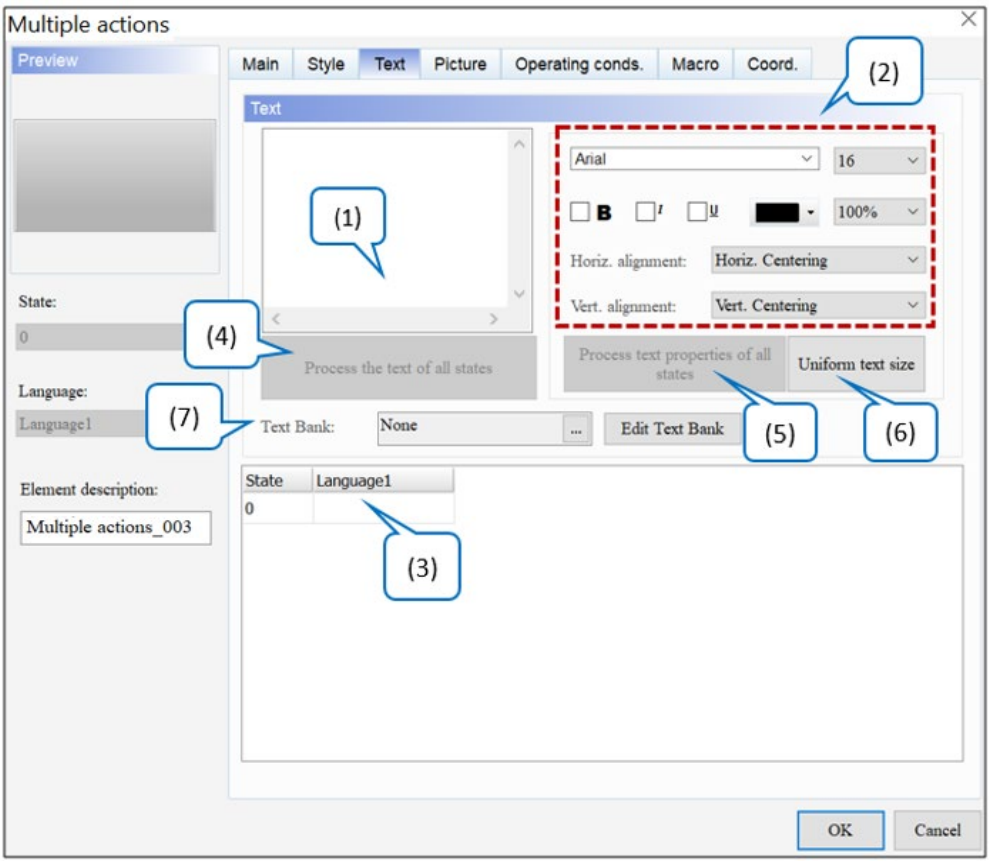
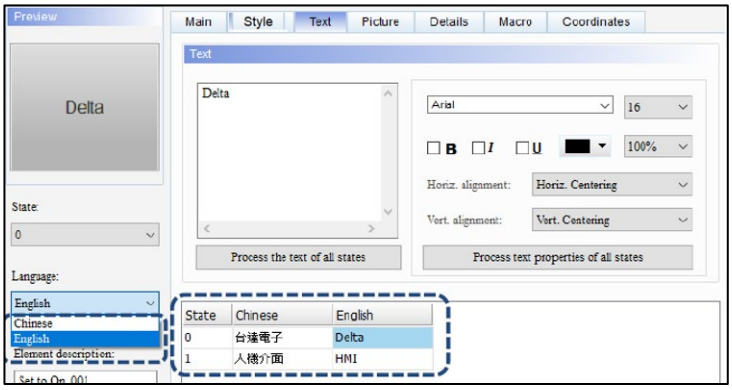
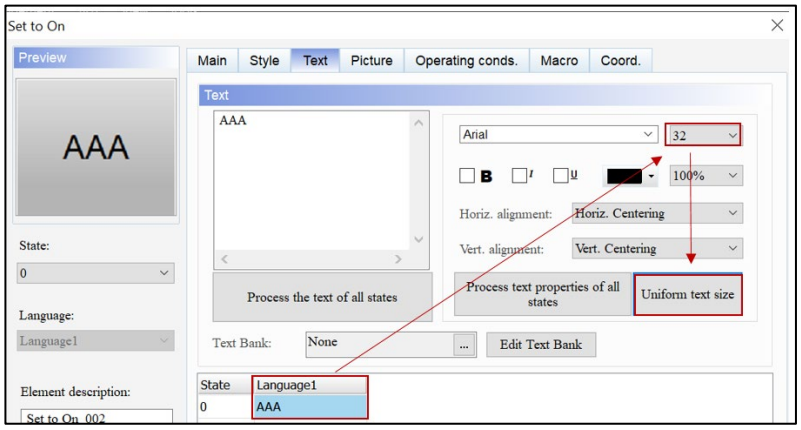


Figure 5 - 58: Multiple Actions Button element Text property page

No.	Function	Description
(1)	Text	● Enter the text to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit Multi-language Text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English words in the **English** column.
(4)	Process the text of all states	This function is not supported as this element does not have multiple states.
(5)	Process text properties of all states	This function is not supported as this element does not have multiple states.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

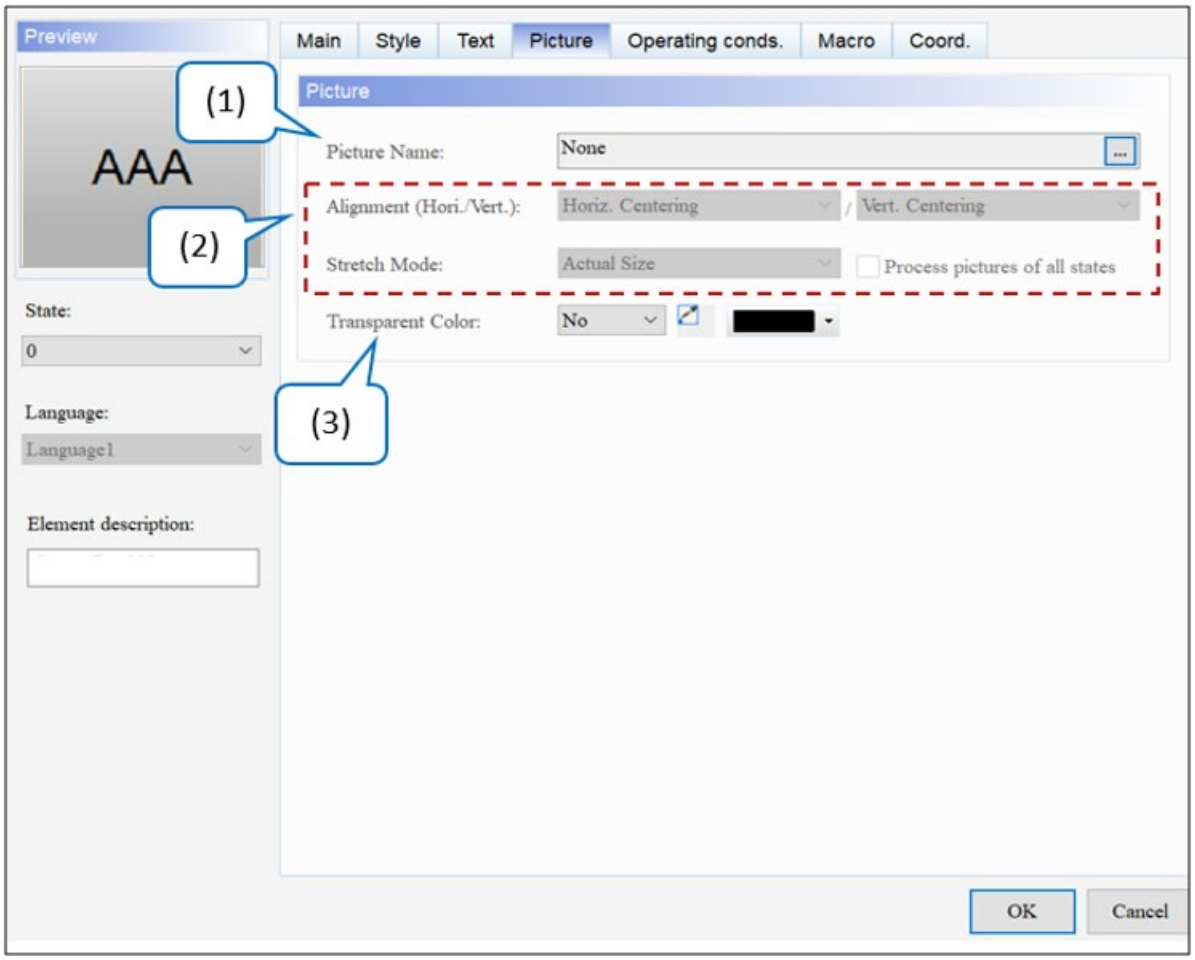
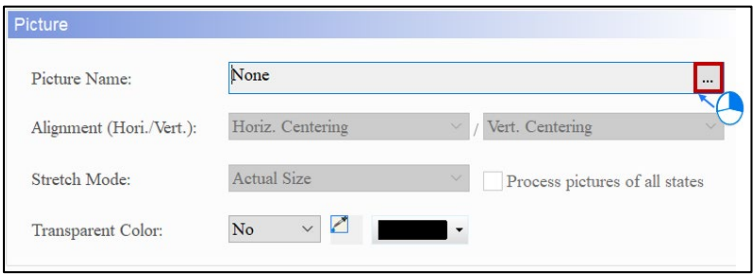


Figure 5 - 59: Multiple Actions Button element Picture property page

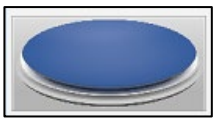
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Picture Name</td><td>

To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.





To configure other pictures, refer to Section 28.5 Picture Bank.

</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
	Process pictures of all states	If users select the checkbox for **Process pictures of all states**, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.
(3)	Transparent Color	This function specifies a color in the picture and make it transparent. The default value is **No**. Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the **Foreground Color** of the element. 

- Operating conds.

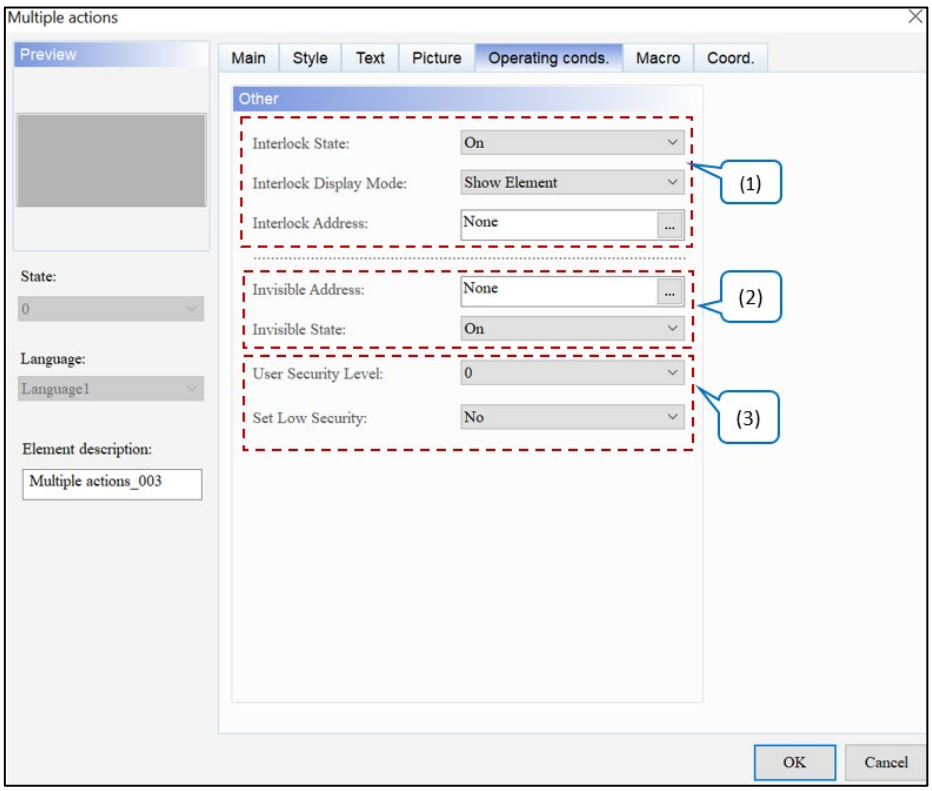
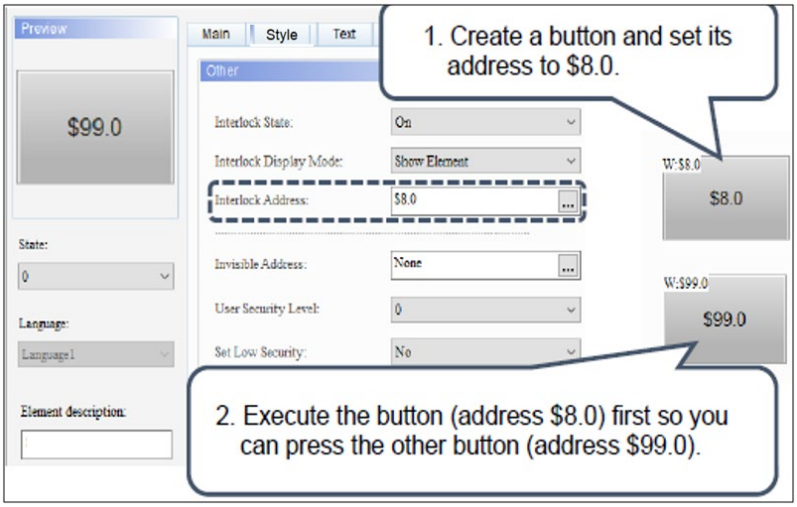


Figure 5 - 60: Multiple Actions Button element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">(1)</td><td>Interlock State</td><td>

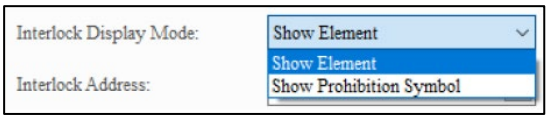
The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The behavior is as follows:

Create an element and set its address to $8.0. Then, set the Interlock Address to $8.0 for the element with address $99.0.
Before having the element with address $99.0 to operate, press the element with address $8.0 to validate the button action (address $99.0).

</td></tr>
<tr><td>Interlock Address</td><td>


</td></tr>
<tr><td>Interlock Display Mode</td><td>

The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.

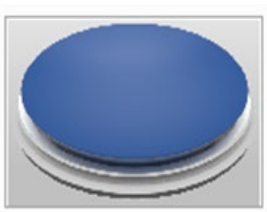
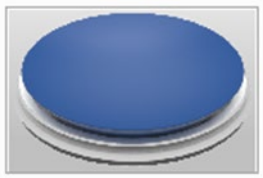


<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Invisible Address</td><td>

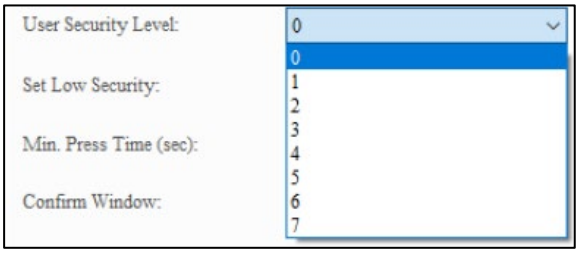
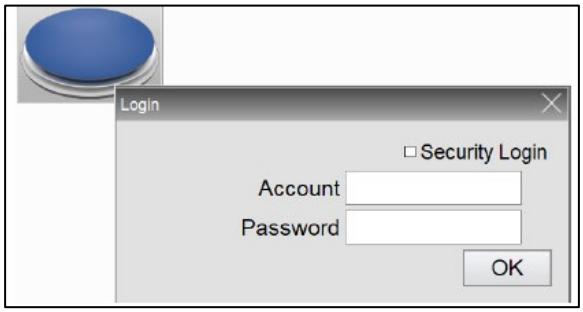
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td rowspan="2">Invisible State is On</td><td>  </td><td>Invisible Address
$9.0 OFF</td></tr>
<tr><td>Element disappear</td><td>Invisible Address
$9.0 ON</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td>  </td><td>Invisible Address
$9.0 ON</td></tr>
<tr><td>Element disappear</td><td>Invisible Address
$9.0 OFF</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td><td></td></tr>
<tr><td rowspan="2">(3)</td><td>User Security Level</td><td rowspan="2">

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table

</td></tr>
<tr><td>Set Low Security</td></tr>
</table>

No.	Function	Description
		Setting. Refer to *Section 5.7.2 Password Table*).  ● If users set the Set Low Security to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is No. 

● Macro

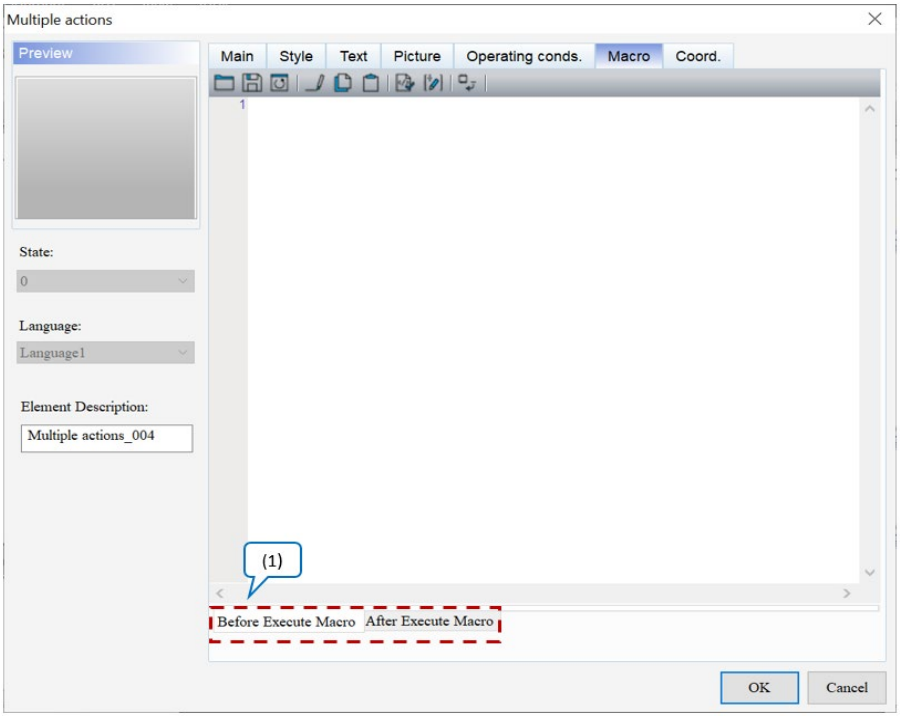
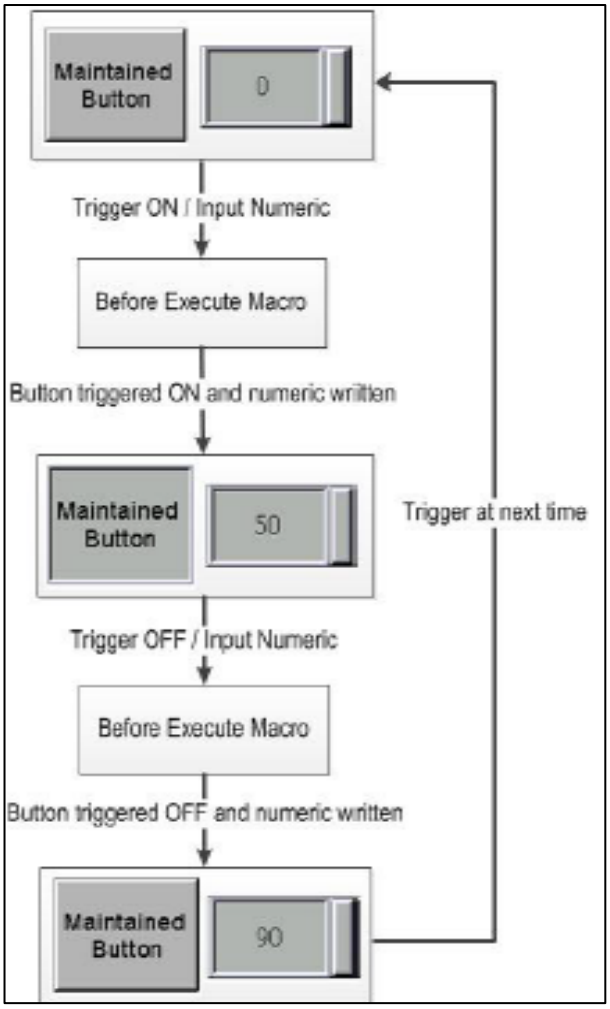
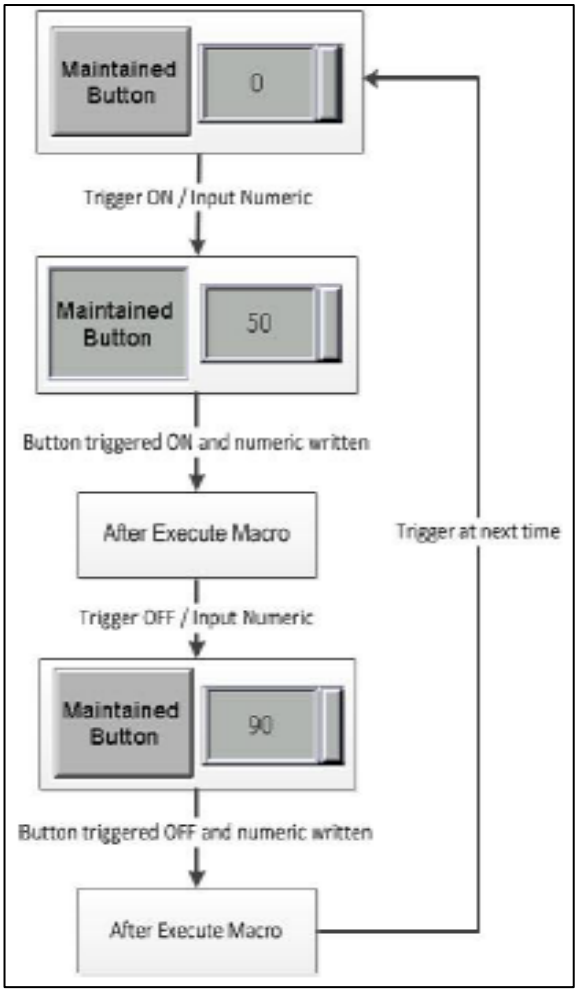


Figure 5 - 61: Multiple Actions Button element Macro property page

Function	Description
Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands. 

Function	Description
After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands. 

- Coord.

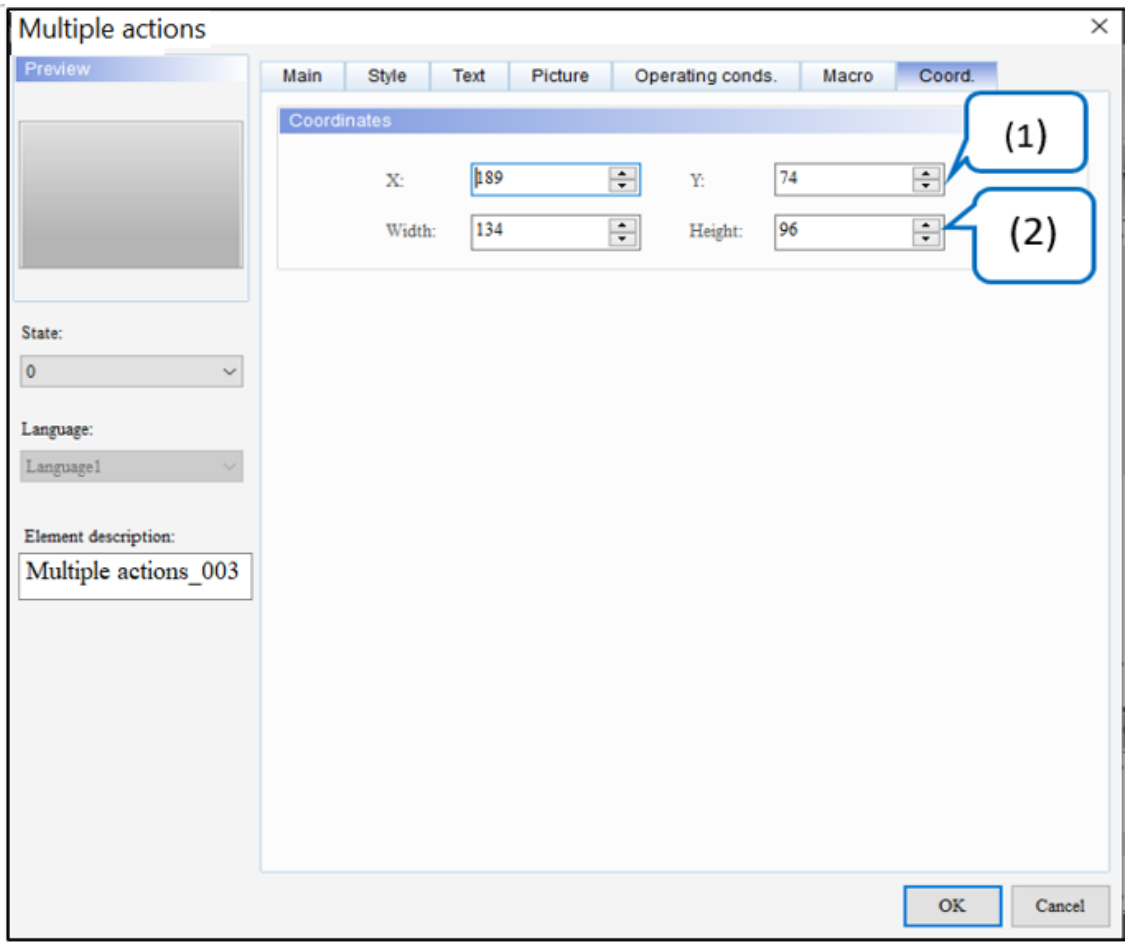
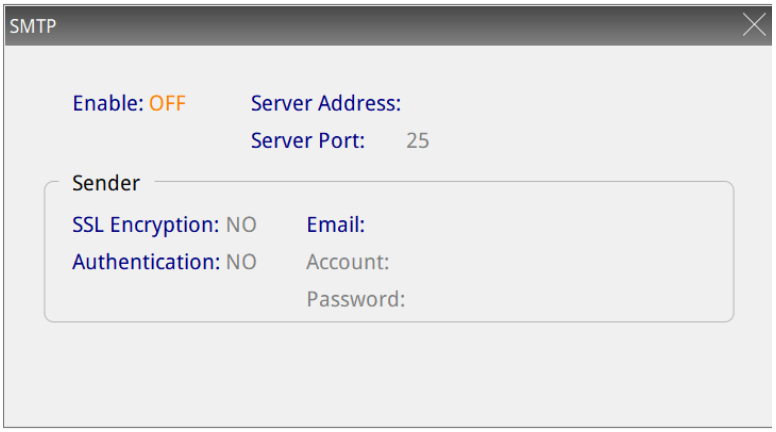


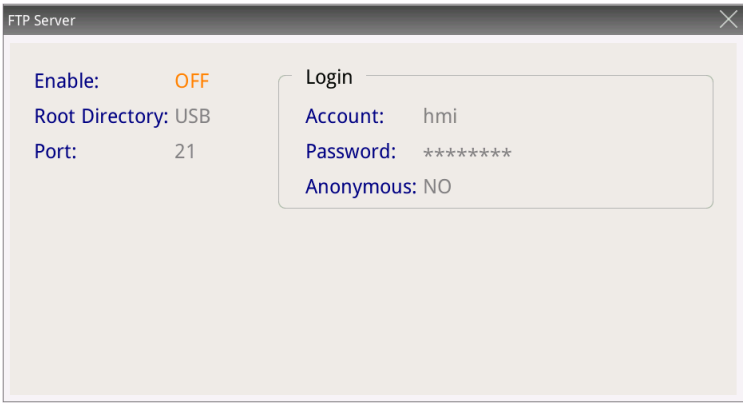
Figure 5 - 62: Multiple Actions Button element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

5.7.17 SMTP Server

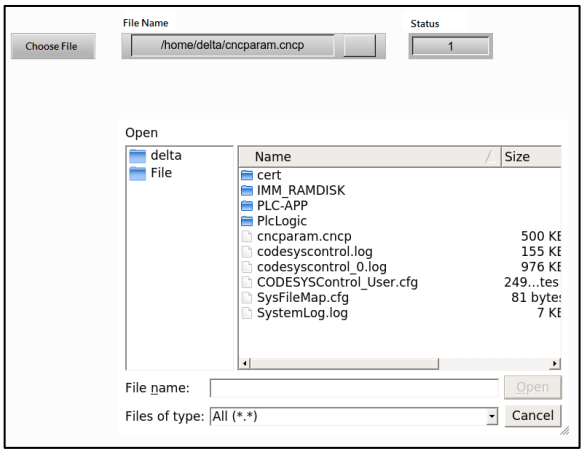
Element Characteristics	Illustration
● The **SMTP Server Button** element allows users to set SMTP parameters on the screen ● As shown on the right-hand side, click the **SMTP Server Button** element to open the SMTP setting screen.	

5.7.18 FTP Server

Element Characteristics	Illustration
● The **FTP Server Button** element allows users to set FTP parameters on the screen ● As shown on the right-hand side, click the **FTP Server Button** element to open the FTP Server setting screen.	

5.7.19 Select File

NOTE: *This function supports AX series and IMP series.*

Function	Description
• The **Select file Button** element provides the file path for reading the files on the HMI. • As shown in the figure on the right-hand side, after clicking the **Select file Button** element, the **Open** window appears, and the file path will be returned to the file name address after the file is selected.	

On double-clicking the **Select file Button** element, the property page appears as follows.

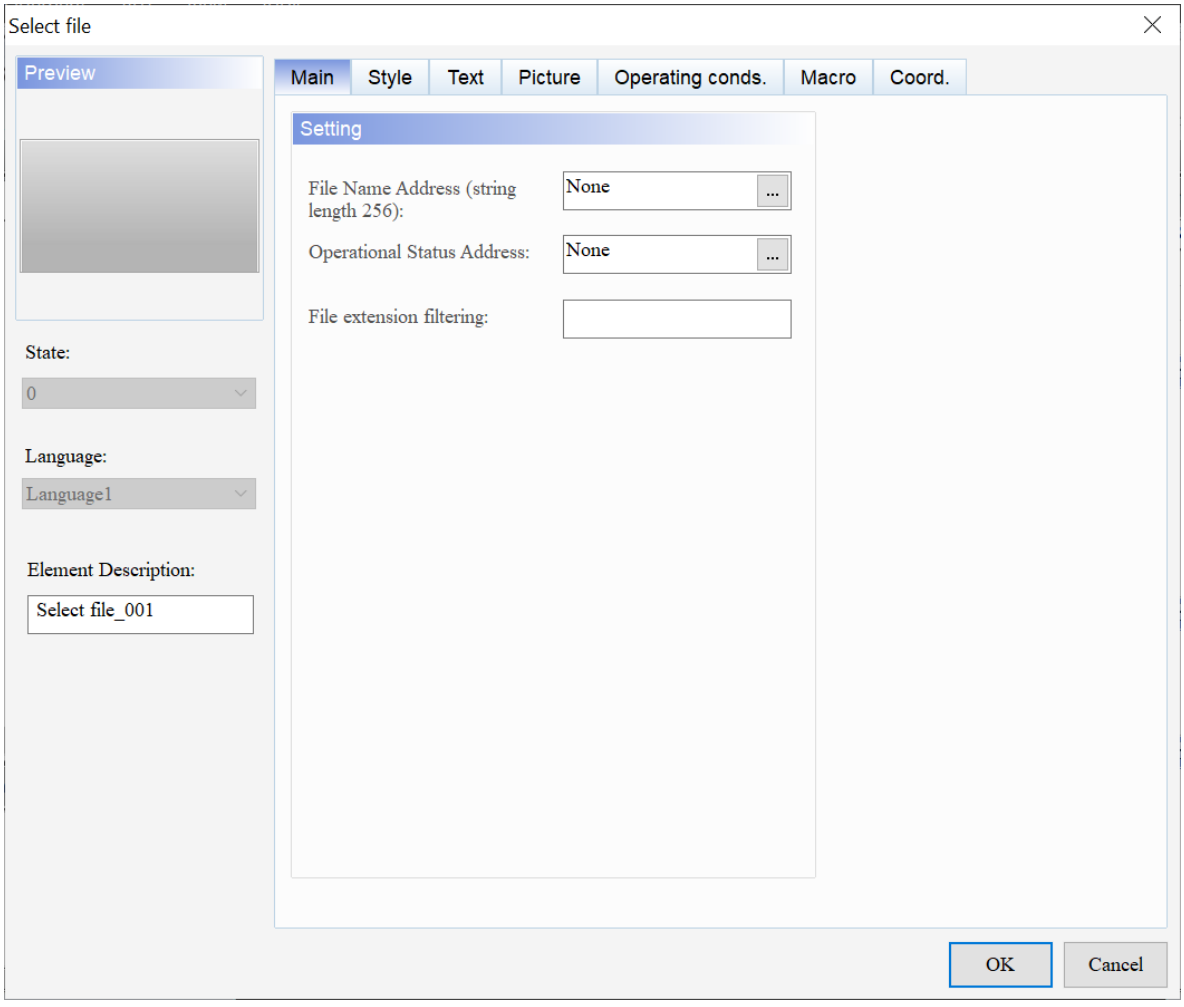


Figure 5 - 63: Select file Button element property page

Select file	
Function	**Description**
Preview	The **Select file Button** element can only view multi-language data display since the multistate property is not available for this element.
Main	Set the File Name Address (string length 256), Operational Status Address, and File extension filtering.
Style	Set the Style, Foreground Color, Filled style, Use Text Pic, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating Conds.	Set the Interlock Address, Interlock State, Interlock Display Mode, Invisible Address, Invisible State, User Security Level, Confirm Window, and Modifier + Hot Key.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

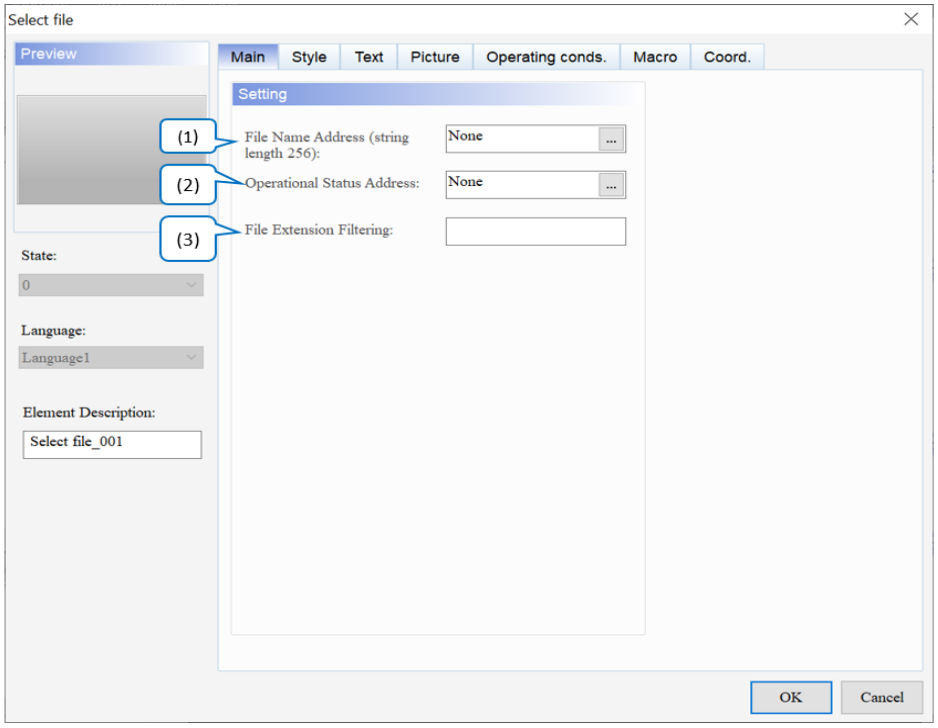


Figure 6 - 64: Select file Button element Main property page

No.	Function	Description
(1)	File Name Address	After selecting a file, return the address of the file path.
(2)	Operating Status Address	Select the address where the file operation status is returned. Return value: 0 means no action, 1 means action, 2 means canceled, 3 means completed, 4 means failed
(3)	File extension filtering	Input the selected auxiliary file type, and the file selection window will be displayed according to the set auxiliary file type.

NOTE: For other properties of **Select file Button** element, refer to *Section 5.7.15 Other Shared Properties of Elements*.

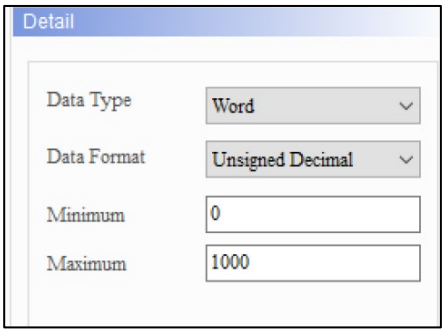
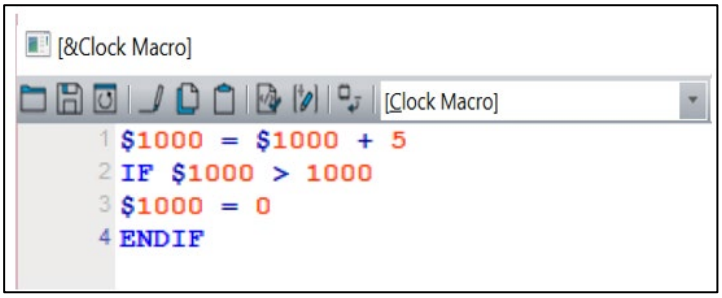
Chapter 6: Meter

6.1 Meter(1) / Meter(2) / Meter(3) / Meter(4)

To create a **Meter** element, go to **Elements** > **Meter** and click the desired **Meter** element. DIAScreen provides four styles of **Meter** element, which are used to display the measurement value of the set memory addresses, and can display whether it exceeds the upper limit or lower limit and the target value. In addition, users can customize the memory addresses of the target value and the high and low limit values, so that its functions can be used more flexibly, and at the same time meet the needs of users. Different colors can also be used to distinguish the low limit, high limit, and target value so that the users can more clearly distinguish what the set display color is. In addition, **Smooth Animation** and **Anti-aliasing** functions are also supported by **Meter** elements, which make the display effect of the elements smoother and improves the refinement of the picture.

Please refer to the following examples.

<table>
<tr><th colspan="5">Meter(1) / Meter(2) / Meter(3) / Meter(4)</th></tr>
<tr><td>Read Address</td><td colspan="4">Create Meter(1), Meter(2), Meter(3), and Meter(4) elements and set their Read Address to $1000.
 
</td></tr>
<tr><td>Detail settings</td><td>Data Type</td><td>Data Format</td><td>Minimum</td><td>Maximum</td></tr>
<tr><td></td><td>Word</td><td>Unsigned Decimal</td><td>0</td><td>1000</td></tr>
</table>

<table>
<tr><th colspan="5">Meter(1) / Meter(2) / Meter(3) / Meter(4)</th></tr>
<tr><td></td><td colspan="4"> 
</td></tr>
<tr><td rowspan="2">Range</td><td colspan="2">Low Limit Property</td><td colspan="2">High Limit Property</td></tr>
<tr><td>Low Range Color</td><td>Low Range Value</td><td>High Range Color</td><td>High Range Value</td></tr>
<tr><td></td><td></td><td>300</td><td></td><td>800</td></tr>
<tr><td>Clock Macro</td><td colspan="4"> 
</td></tr>
<tr><td>Execution result</td><td colspan="4">Download the edited screen to the HMI, the HMI executes the program in the Clock Macro, and the result is displayed in the accumulation process corresponding to the memory address set by the Meter element.
 
</td></tr>
</table>

The difference between **Meter(1)**, **Meter(2)**, **Meter(3)**, and **Meter(4)** elements is only in the different styles, but the functions are the same. Therefore, **Meter(1)** element is introduced as follows.

On double-clicking the **Meter** element, the property page appears as follows.

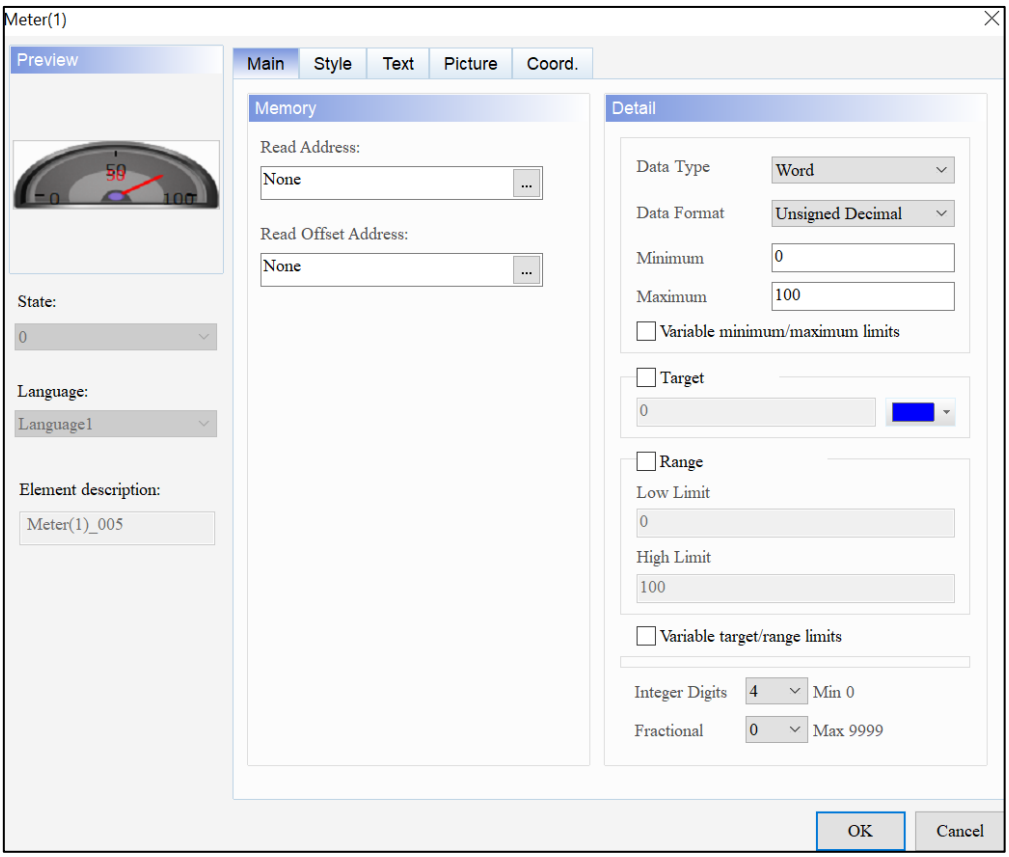


Figure 6 - 1: Meter element property page

Meter(1) / Meter(2) / Meter(3) / Meter(4)	
Function	**Description**
Preview	**Meter** elements are only for viewing multi-language data display but do not support multiple states.
Main	Set the Read Address and Read Offset Address, Data Type, Data Format, Minimum / Maximum input value of the element, and select the checkbox for Variable minimum/maximum limits. Set whether to display the target value and its color, select the checkboxes for Range and Variable target/range limits, and set the Integer Digits and Fractional.
Style	Set the element Style, Foreground Color, Background Color, Transparency, Smooth animation, Anti-aliasing, Limit Ranges Transparent, Target Value Transparent, and Value Color. Set Scale size, Mark Number, Subscale Mark Number, Minify the scale,

Meter(1) / Meter(2) / Meter(3) / Meter(4)	
Function	**Description**
	Pointer Color, Mark Color, Scale Color, Border Color, Low Range Color, High Range Color, and Numeric Display.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set Picture Bank Mode or Template Pattern.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

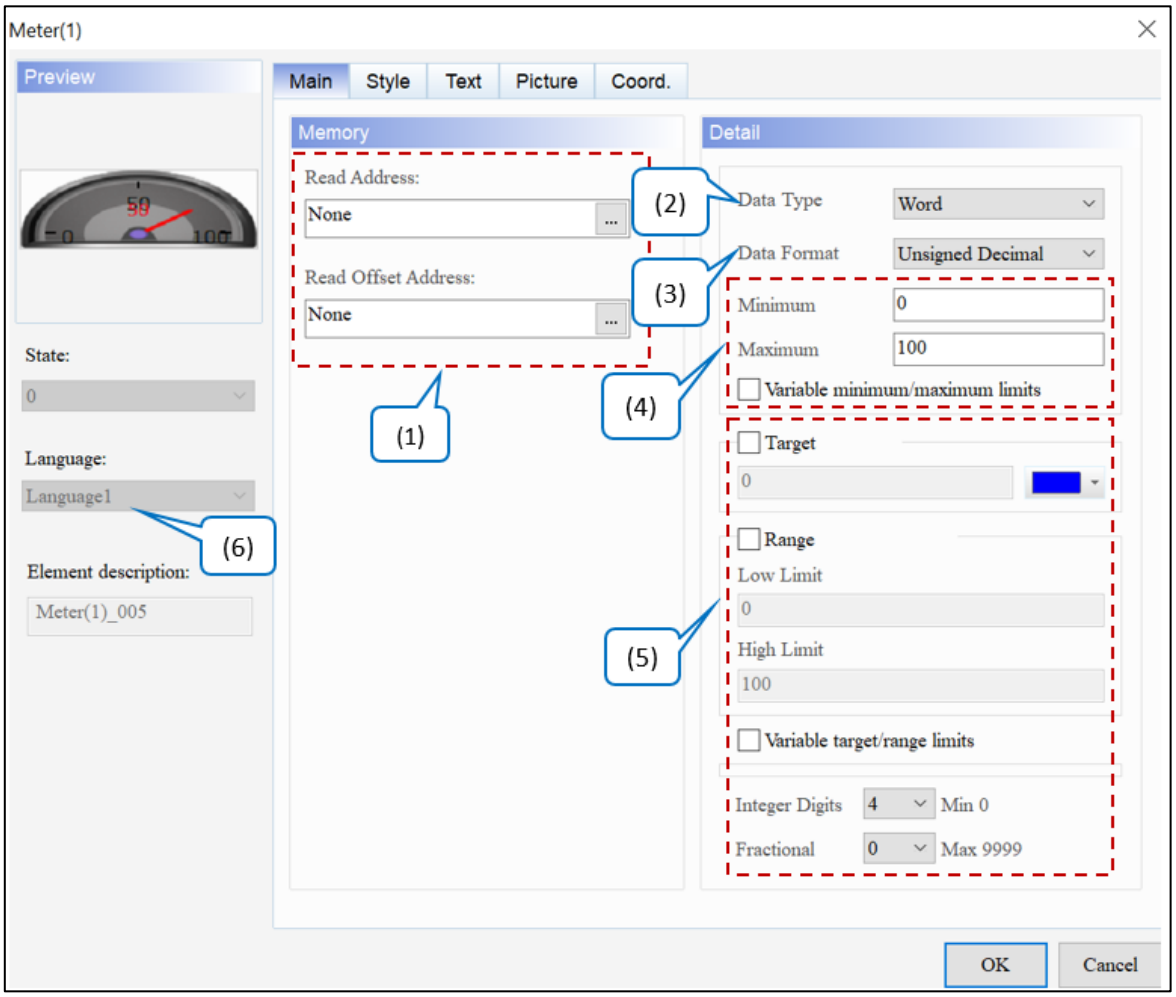
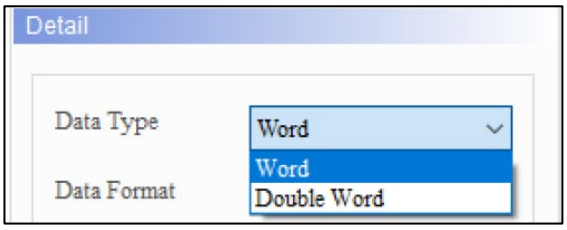
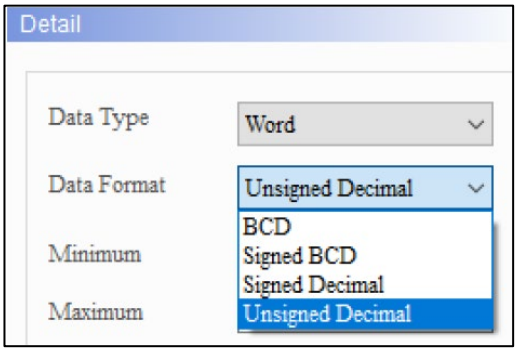
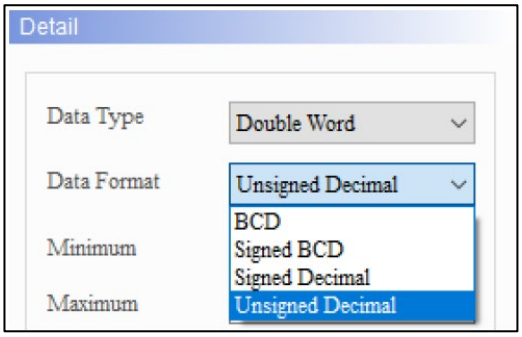
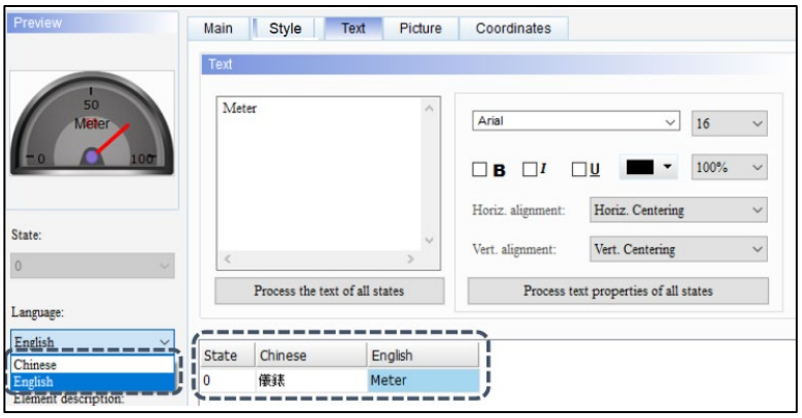


Figure 6 - 2: Meter element Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. The **Input** memory **Type** must be Word. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Word and Double Word. The default value is **Word**. 
(3)	Data Format	● When the **Data Type** is Word, the supported **Data Format** is as follows. The default value is **Unsigned Decimal**.  ● When the **Data Type** is Double Word, the supported **Data Format** is as follows. The default value is **Unsigned Decimal**. 

<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="2">(4)</td><td>Minimum / Maximum input value</td><td colspan="3">The permissible range for the Minimum and Maximum values is subject to change based on the selected Data Type and Data Format. The default value for Minimum is 0 and Maximum is 100.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="4">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ +9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ +32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td rowspan="4">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ +99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ +2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
</table></td></tr>
<tr><td>Variable minimum/ maximum limits</td><td colspan="3">● When this checkbox is selected, define the memory addresses to dynamically change the displayed maximum and minimum values.
● When this checkbox is not selected, enter only constant values in the Minimum and Maximum fields to define the maximum and minimum values for the Meter element.</td></tr>
<tr><td rowspan="5">(5)</td><td rowspan="5">Display Format</td><td>Target</td><td colspan="2">If the Variable target/range limits checkbox is not selected, enter only a constant value to define the target display value on the meter. Users can also specify the display color.</td></tr>
<tr><td>Range</td><td colspan="2">The Range includes the lower and upper limits. Like the case of the Target display, if the Variable target/range limits checkbox is not selected, enter only constant value to define the low and high limits of the meter. The default value of Low Limit is 0 and High Limit is 100.</td></tr>
<tr><td>Variable target/range limits</td><td colspan="2">If it is selected, define the memory addresses to dynamically change the displaying target value, and the low and high limit values.</td></tr>
<tr><td>Integer Digits</td><td colspan="2" rowspan="2">Set the number of integer digits and decimal digits to be displayed. The default value of Integer Digits is 5 and Fractional is 0.</td></tr>
<tr><td>Fractional</td></tr>
</table>

No.	Function	Description
(6)	Language	When users set the language data, they can edit the properties of the displayed text with the **Language** setting of the element. 

- Style

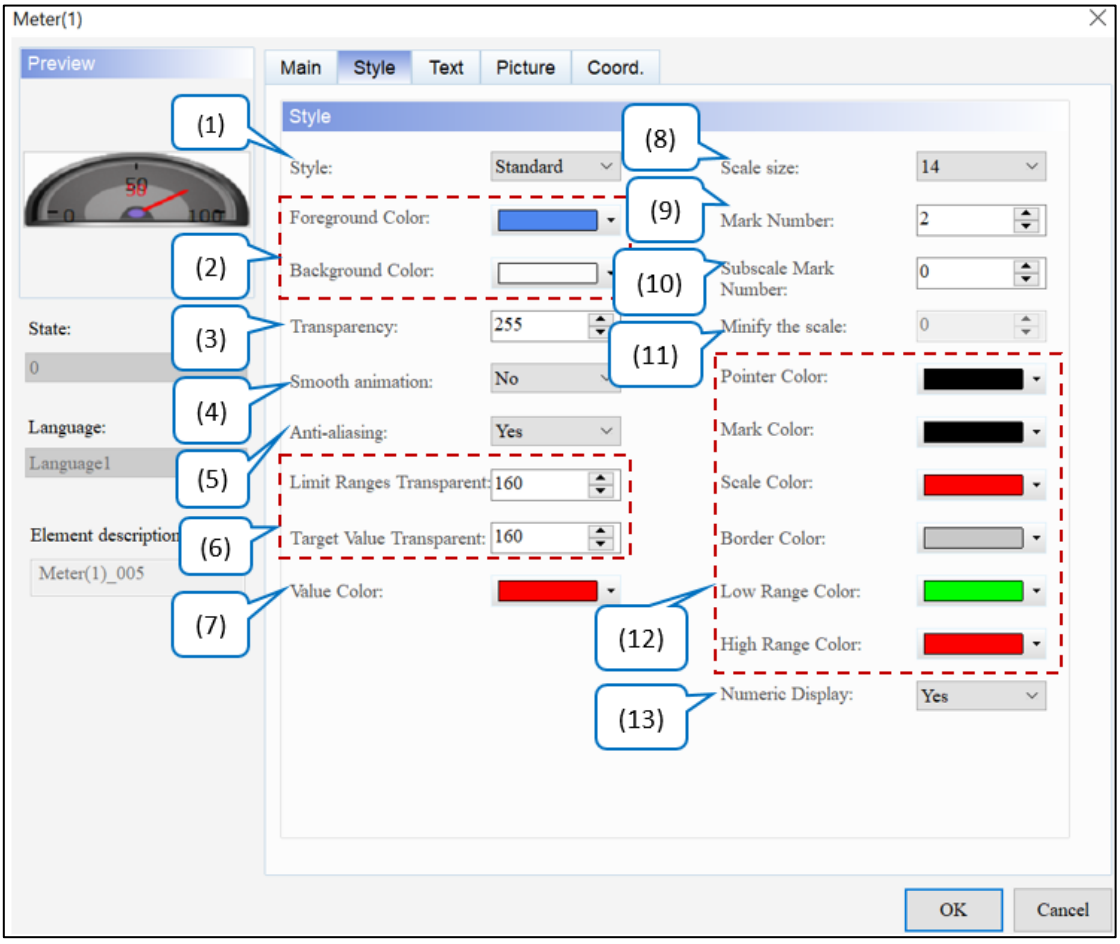
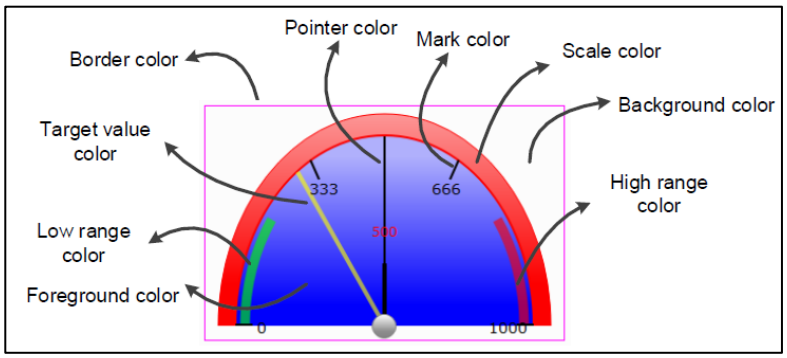


Figure 6 - 3: Meter element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of elements. The available options for element Style are: Standard, Raised, Sunken, and Transparent. The default value is Standard.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Foreground Color and Background Color</td><td>

Set the element foreground and background colors. The default foreground color is , and the background color is .
The element Foreground Color setting is only available for the Picture Bank Mode of the Picture property page.



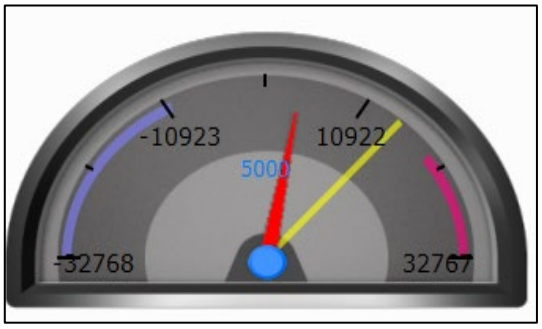
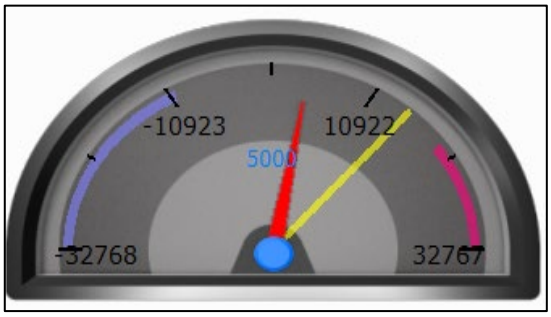
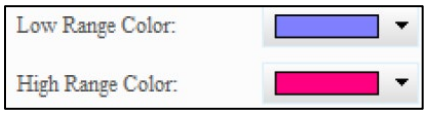
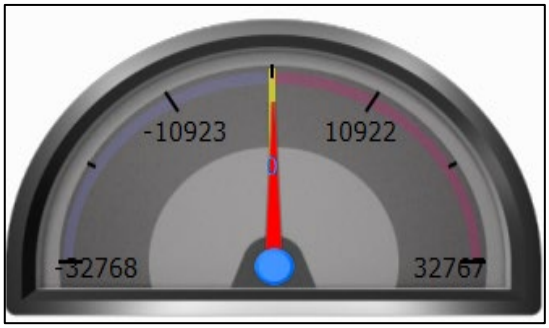
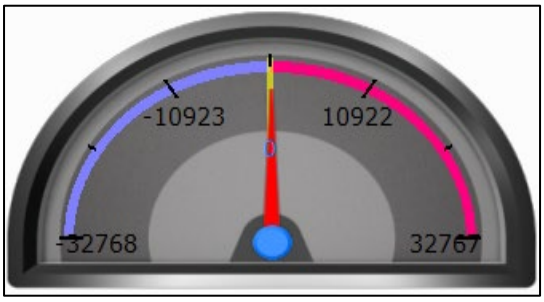
</td></tr>
<tr><td>(3)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(4)</td><td>Smooth animation</td><td>

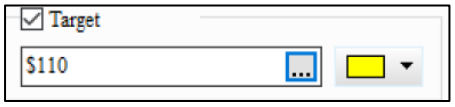
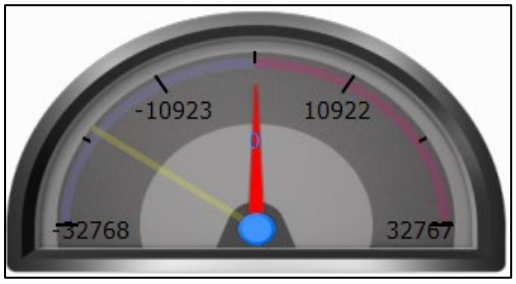
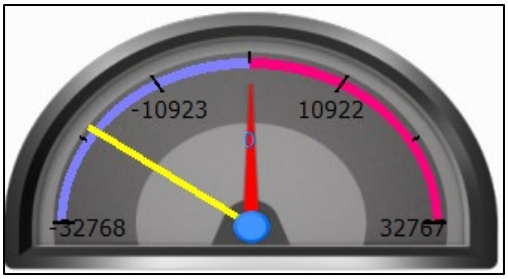
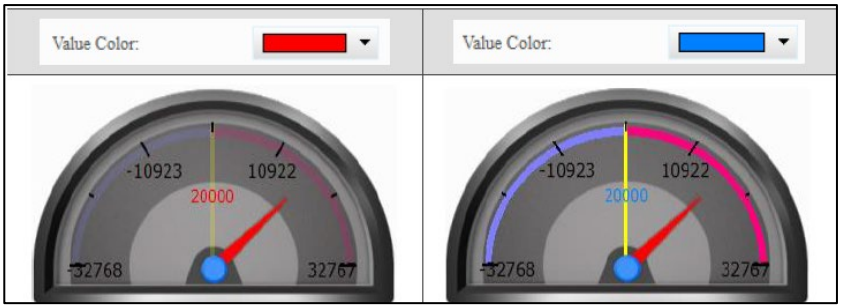
The Smooth animation function is available for Meter elements. The default value is No.
When this function is enabled, the pointer motion becomes smoother.

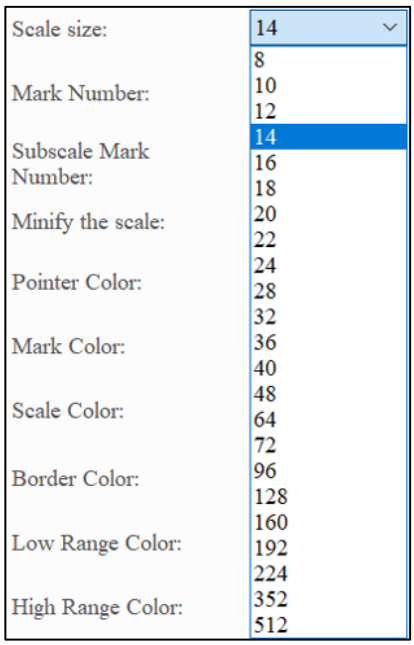
</td></tr>
<tr><td>(5)</td><td>Anti-aliasing</td><td>

The Anti-aliasing function is available for Meter elements. The default value is Yes.
When this function is enabled, the element display becomes more delicate without aliasing.

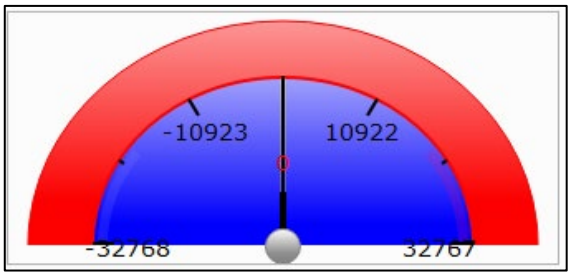
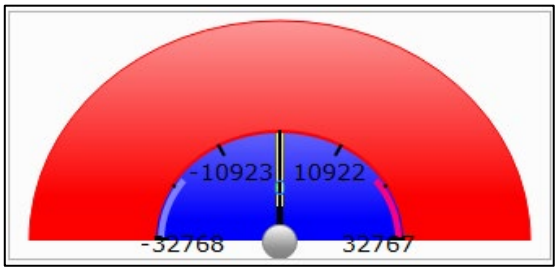
</td></tr>
</table>

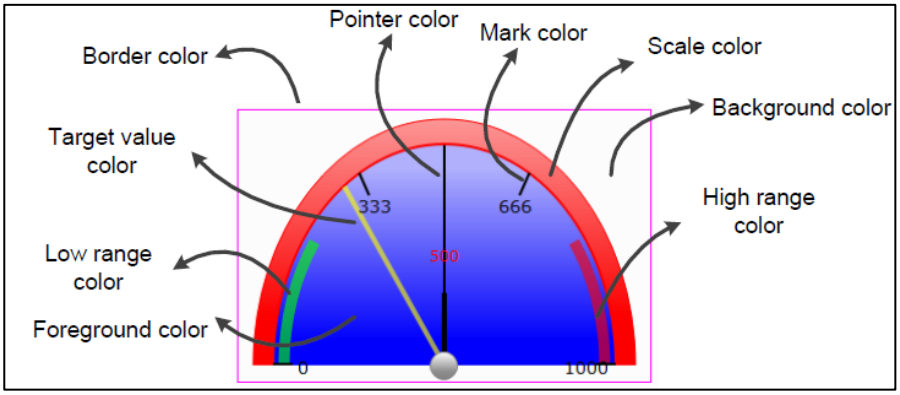
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td>Anti-aliasing is set to Yes</td><td> 
</td></tr>
<tr><td>Anti-aliasing is set to No</td><td> 
</td></tr>
<tr><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td rowspan="4">(6)</td><td rowspan="3">Limit Ranges Transparent</td><td>Limit Range Color</td><td> 
</td></tr>
<tr><td>Limit Ranges Transparent is set to 50</td><td> 
</td></tr>
<tr><td>Limit Ranges Transparent is set to 255</td><td> 
</td></tr>
<tr><td>Target Value Transparent</td><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

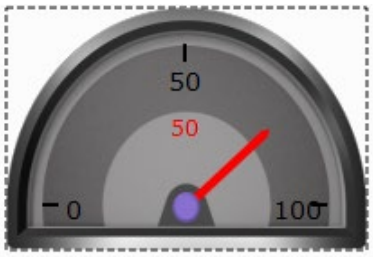
No.	Function	Description	
		Target Value Color	
		Target Value Transparent is set to 50	
		Target Value Transparent is set to 255	
(7)	Value Color	When the **Value Color** property is set with a color, the display value is shown in that color, e.g. Red, Blue, etc. 	
(8)	Scale size	The size of the numbers displayed on the scale, providing 8 ~ 512 font sizes for users to choose. The default value is **14**.	

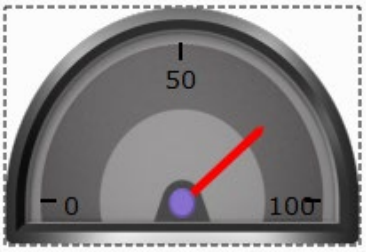
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(9)</td><td>Mark Number</td><td>The minimum mark number can only be 1, and the maximum can be set up to 10. The default value is 2.</td></tr>
<tr><td>(10)</td><td>Subscale Mark Number</td><td>The minimum subscale number can be 0 and the maximum is up to 99. The default value is 1.</td></tr>
<tr><td>(11)</td><td>Minify the scale</td><td>

This function is only available for the Picture Bank Mode in the Picture property page.
The greater the value, the longer the distance from the scale mark to the meter edge.
The Minify the scale setting range is 0 ~ 8. The default value is 0.

<table>
<tr><td>Minify the scale is set to 3</td><td> 
</td></tr>
<tr><td>Minify the scale is set to 8</td><td> 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(12)</td><td>Meter color</td><td>


<table>
<tr><td>Pointer Color</td><td>● Set the pointer color to display. The default is .
● Pointer Color setting is only available for the Picture Bank Mode of the Picture property page.</td></tr>
<tr><td>Mark Color</td><td>Set the mark color to display. The default is .</td></tr>
<tr><td>Scale Color</td><td>● Set the scale color to display. The default is .
● Scale Color setting is only available for the Picture Bank Mode of the Picture property page.</td></tr>
<tr><td>Border Color</td><td>Set the border color to display. The default is .</td></tr>
<tr><td>Low Range Color</td><td>Set the low range color to display. The default is .</td></tr>
<tr><td>High Range Color</td><td>Set the high range color to display. The default is .</td></tr>
</table>
</td></tr>
<tr><td>(13)</td><td>Numeric Display</td><td>Display the current value obtained by the meter. The default value is Yes.
<table>
<tr><td>Numeric Display is set to Yes</td><td> 
</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description	
		Numeric Display is set to No	

- Text

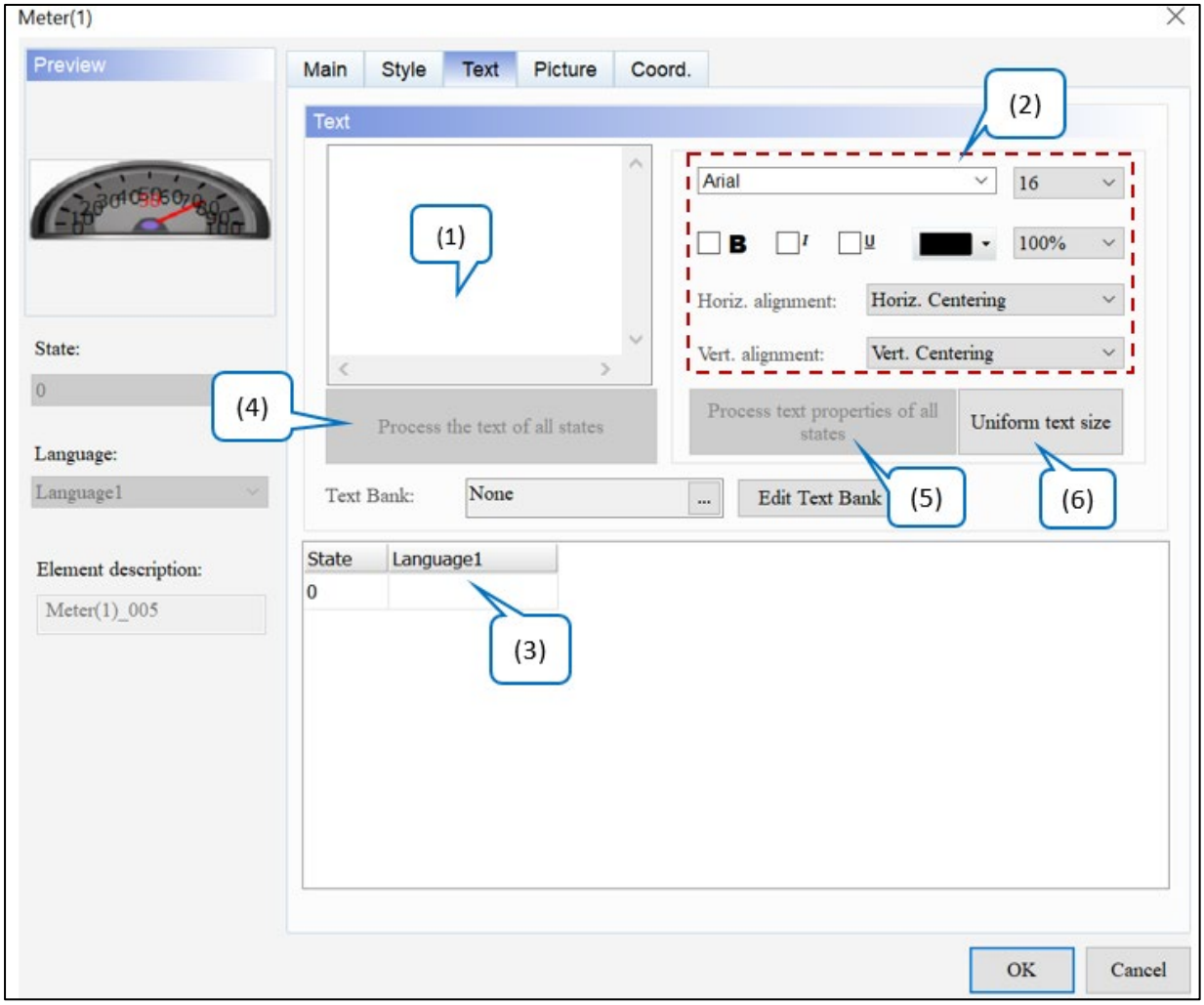
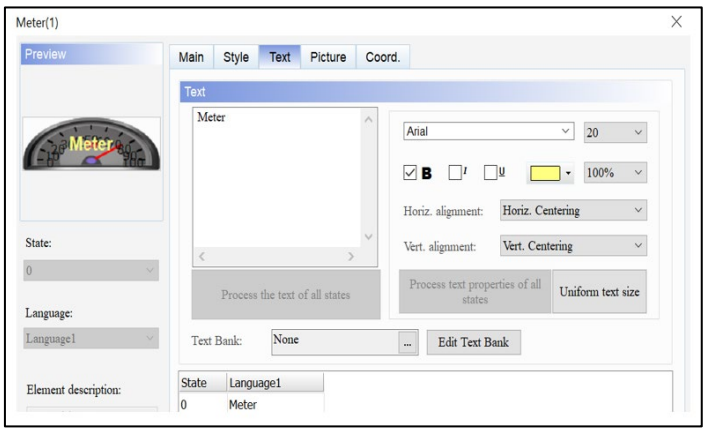
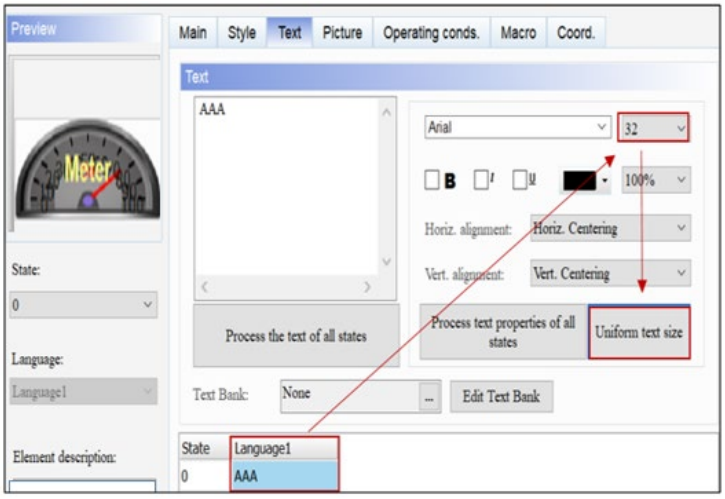


Figure 6 - 4: Meter element Text property page

No.	Function	Description
(1)	Text	● Enter the text to be displayed in this text box.  ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to start editing and entering the text.
(2)	Text related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** page allows them to edit Multi-language data. As shown in the **Text** property page, users can enter English words in the **English** column.
(4)	Process the text of all states	The **Meter** element has no multi-state, and this function is disabled.
(5)	Process text properties of all states	The **Meter** element has no multi-state, and this function is disabled.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description with steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		

- Picture

The **Picture** property page contains two modes: Template Pattern and Picture Bank Mode. When users create meter elements, the default is the **Template Pattern** mode, but users can select the Picture Bank Mode as required.

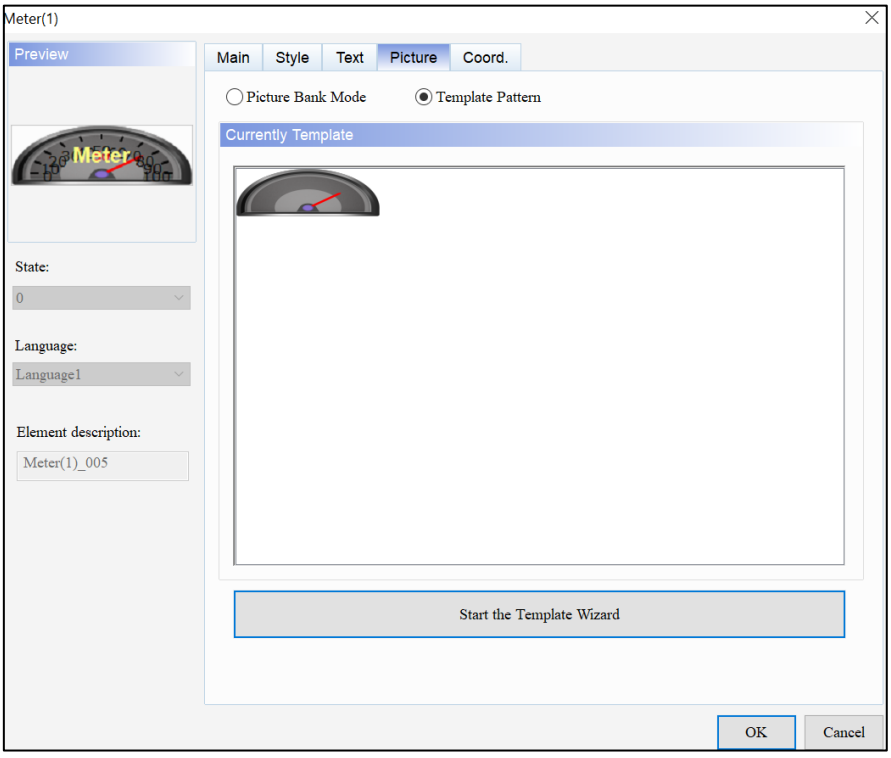


Figure 6 - 5: Meter element Picture property page – Template Pattern

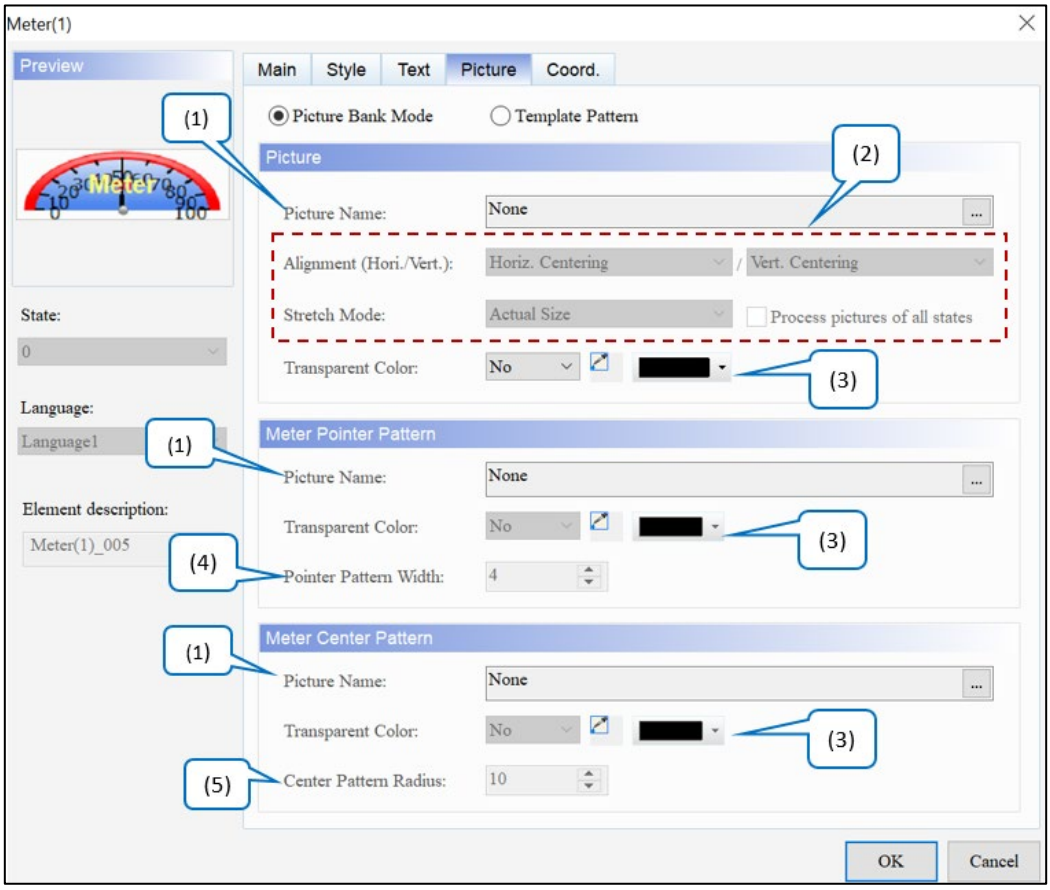


Figure 6 - 6: Meter element Picture property page – Picture Bank Mode

In **Template Pattern** mode, use the Template Wizard to define the meter template.

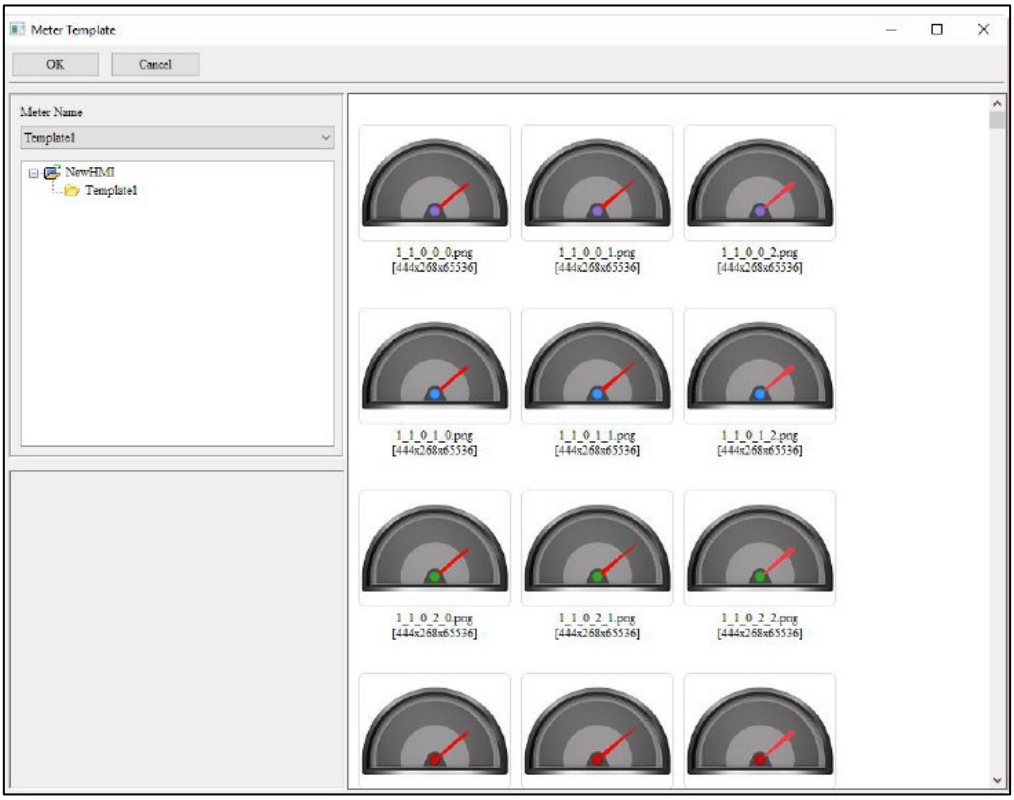
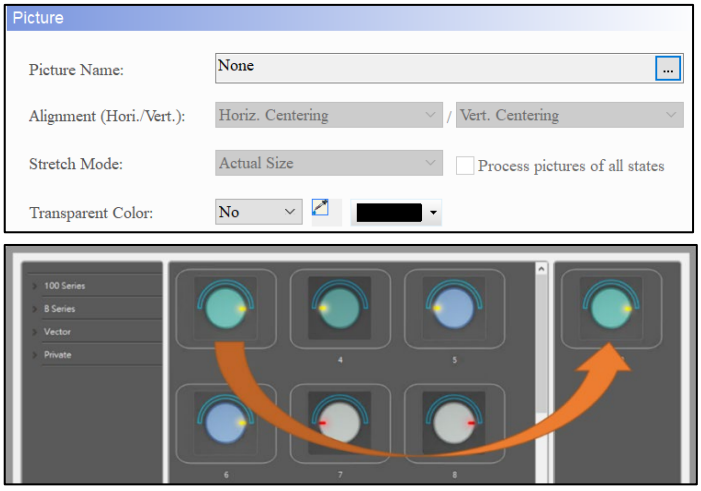
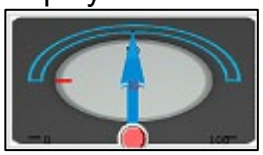
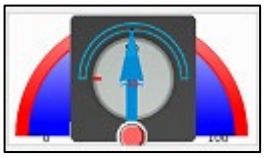


Figure 6 - 7: Meter element patterns - Template Wizard

No.	Function	Description
(1)	Picture Name	● To set the picture display, use the drop-down list box to view the picture bank and then select the desired pictures. The default value is **None**. ● The Meter provides patterns of meters, meter pointers, and meter centers that can be chosen from the picture bank 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the pictures through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>Stretch All represents that the picture fills the full element display area.
  </td><td>Keeping the ratio means that the picture will be scaled according to the aspect ratio of the component.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td colspan="2">Assuming that the element has multiple states and some pictures do not fill the full element display area, if users select the checkbox for Process pictures of all states, use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td colspan="2">● Specify a color in the picture and turn this color into transparent. The default value is No.
● Select icon, and click the white part on the calendar, DIAScreen changes the white part into transparent, which becomes identical to the element Foreground Color.
 
</td></tr>
<tr><td>(4)</td><td>Pointer Pattern Width</td><td colspan="2">The default pointer width is 4. The range that can be set is 1 ~ 21.</td></tr>
<tr><td>(5)</td><td>Center Pattern Radius</td><td colspan="2">The default center display radius is 10. The range that can be set is 1 ~ 53.</td></tr>
</table>

- Coord.

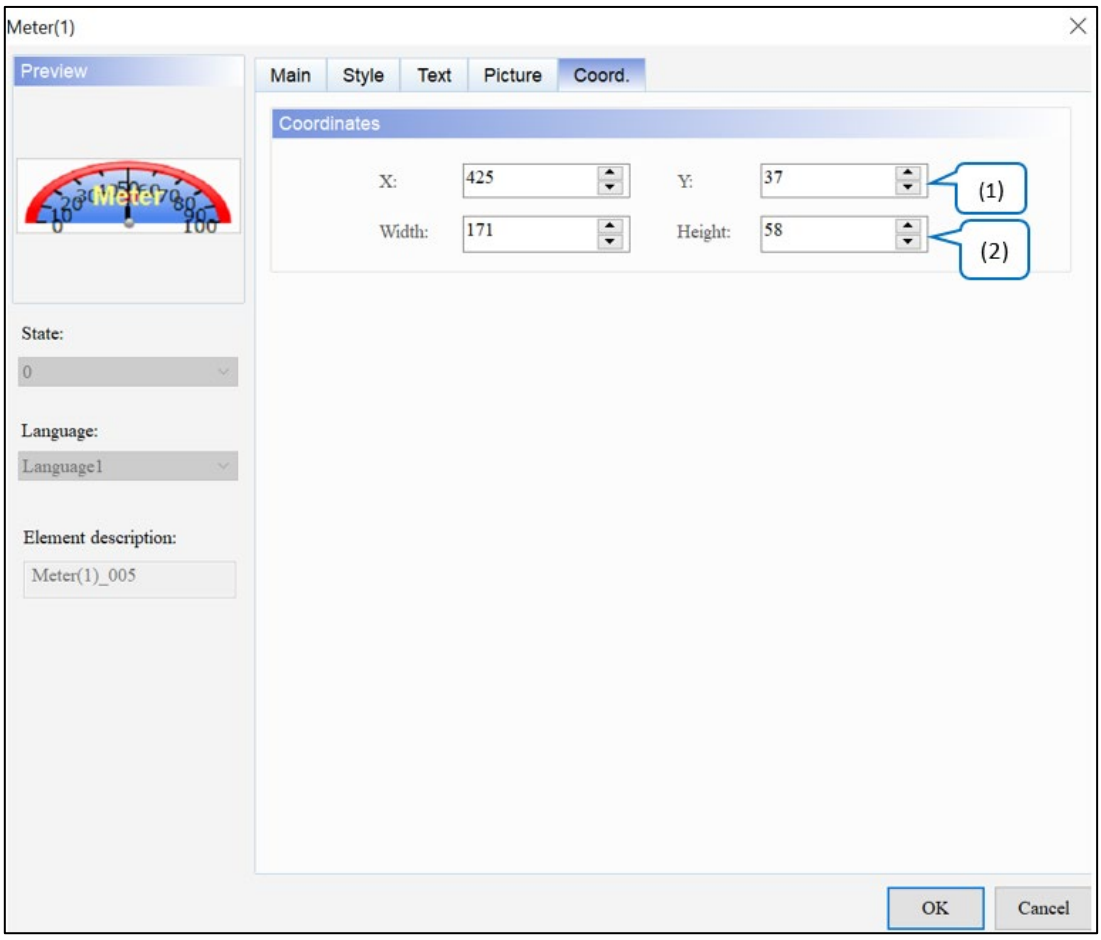


Figure 6 - 8: Meter element Coord. property page

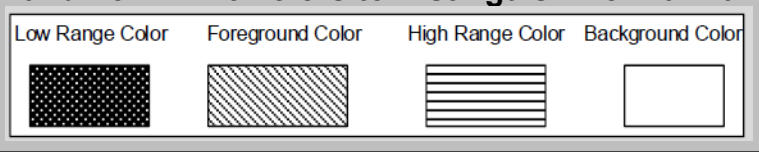
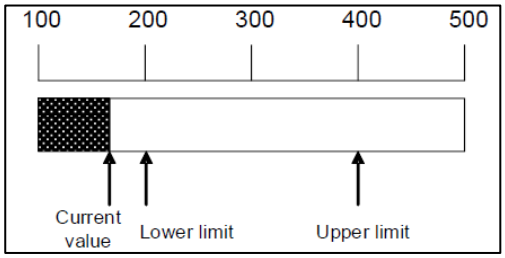
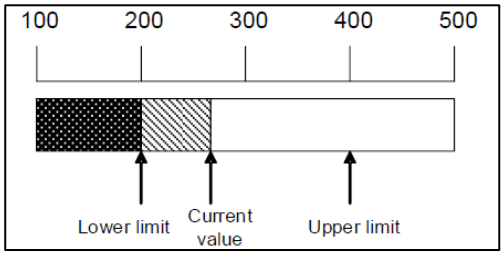
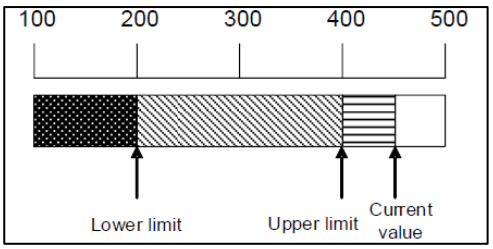
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

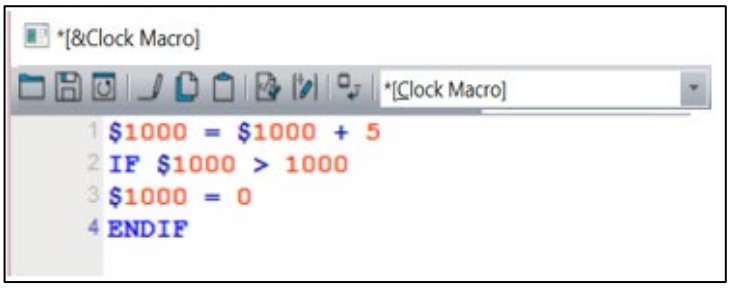
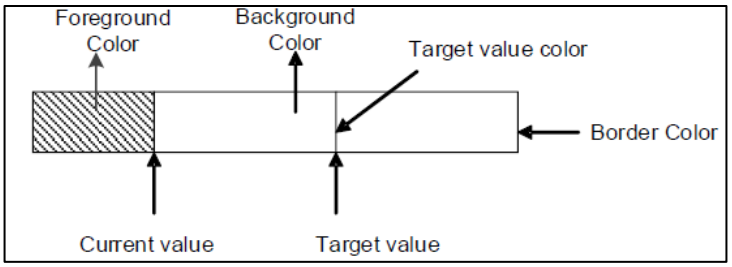
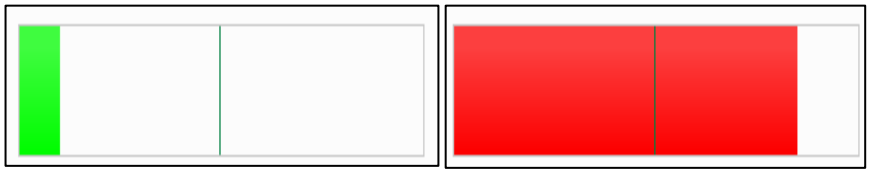
Chapter 7: Bar

To create a **Bar** element, go to **Elements** > **Bar**, and click the desired **Bar** element.

7.1 Normal Bar

The **Normal Bar** element displays the register values corresponding to the read addresses on the HMI in the form of a bar graph from the minimum value to the maximum value. Like the case of **Meter** elements, define the memory addresses for the target value, and the upper and lower limits of the **Normal Bar** element, making the application more flexible and meet users' requirements. Users can also set the colors for the lower limit, upper limit, and target values to easily identify them with the set colors, as shown in the following table.

Use High and Low Limit Colors to Distinguish Normal Bar Element	
	
(1)	
(2)	
(3)	

<table>
<tr><th colspan="5">Normal Bar</th></tr>
<tr><td>Read Address</td><td colspan="4">$1000</td></tr>
<tr><td>Detail settings</td><td colspan="4"><table>
<tr><th>Data Type</th><th>Data Format</th><th>Minimum</th><th>Maximum</th></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>0</td><td>1000</td></tr>
</table></td></tr>
<tr><td>Target</td><td colspan="4"><table>
<tr><th>Target Color</th><th>Target Value</th></tr>
<tr><td></td><td>500</td></tr>
</table></td></tr>
<tr><td>Range</td><td colspan="4"><table>
<tr><th colspan="2">Low Limit Property</th><th colspan="2">High Limit Property</th></tr>
<tr><th>Low Range Color</th><th>Low Range Value</th><th>High Range Color</th><th>High Range Value</th></tr>
<tr><td></td><td>300</td><td></td><td>800</td></tr>
</table></td></tr>
<tr><td>Clock Macro</td><td colspan="4"> 
</td></tr>
<tr><td>Normal Bar element</td><td colspan="4"> 
</td></tr>
<tr><td>Execution result</td><td colspan="4">● After editing the screen, download it to the HMI. Next, the HMI executes the program in the Clock Macro and displays the result on the Normal Bar element with the corresponding addresses.
● Displays in green when the value is less than 300 and displays in red when value is greater than 800.
  </td></tr>
</table>

On double-clicking the Normal Bar element, the property page appears as follows.

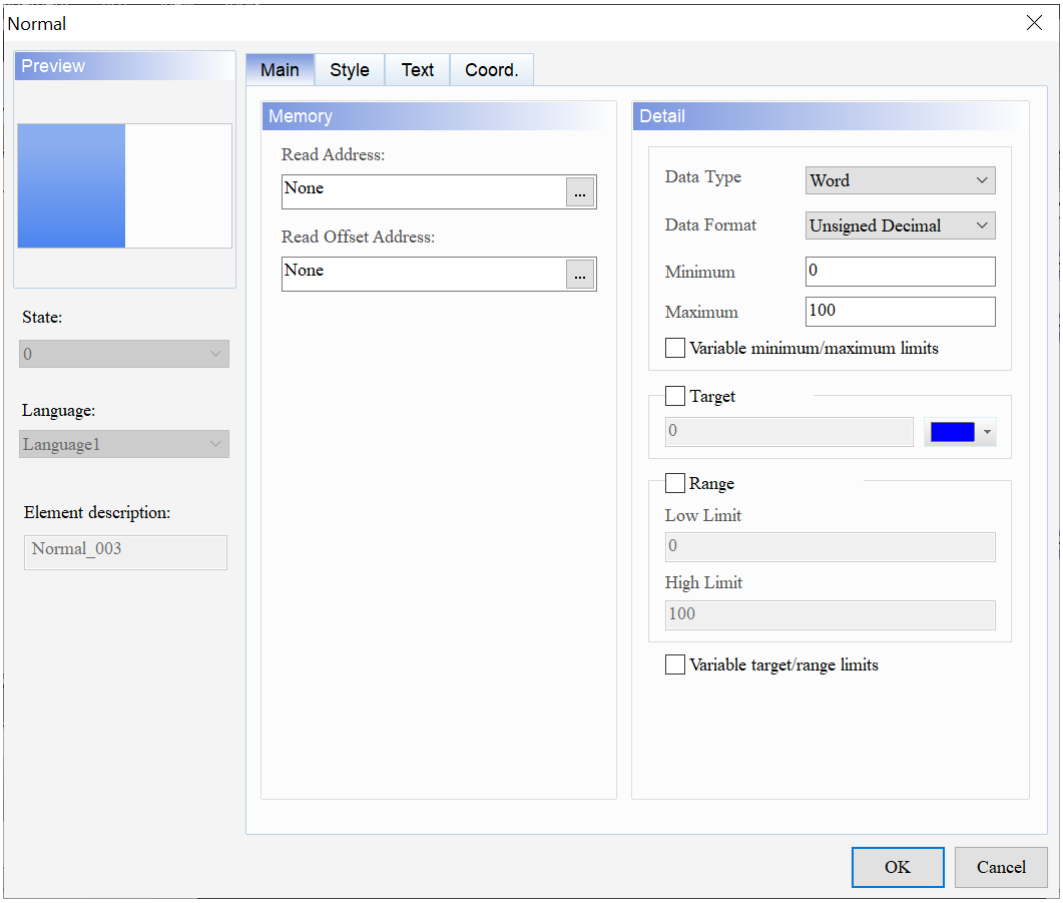


Figure 7 - 1: Normal Bar element property page

Normal Bar	
Function	**Description**
Preview	**Normal Bar** element can only view multi-language data display and do not support multiple states.
Main	Set the Read Address and Read Offset Address, Data Type, Data Format, and Minimum / Maximum input value of the element, and select the checkbox for Variable minimum/maximum limits. Set whether to display the target value and select the checkboxes for Range and Variable target/range limits.
Style	Set the Style, Foreground Color, Background Color, and Filled style. Set the Transparent, Smooth animation, and Target Value Style. Set the Data Format, Border Color, Low Range Color, and High Range Color.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

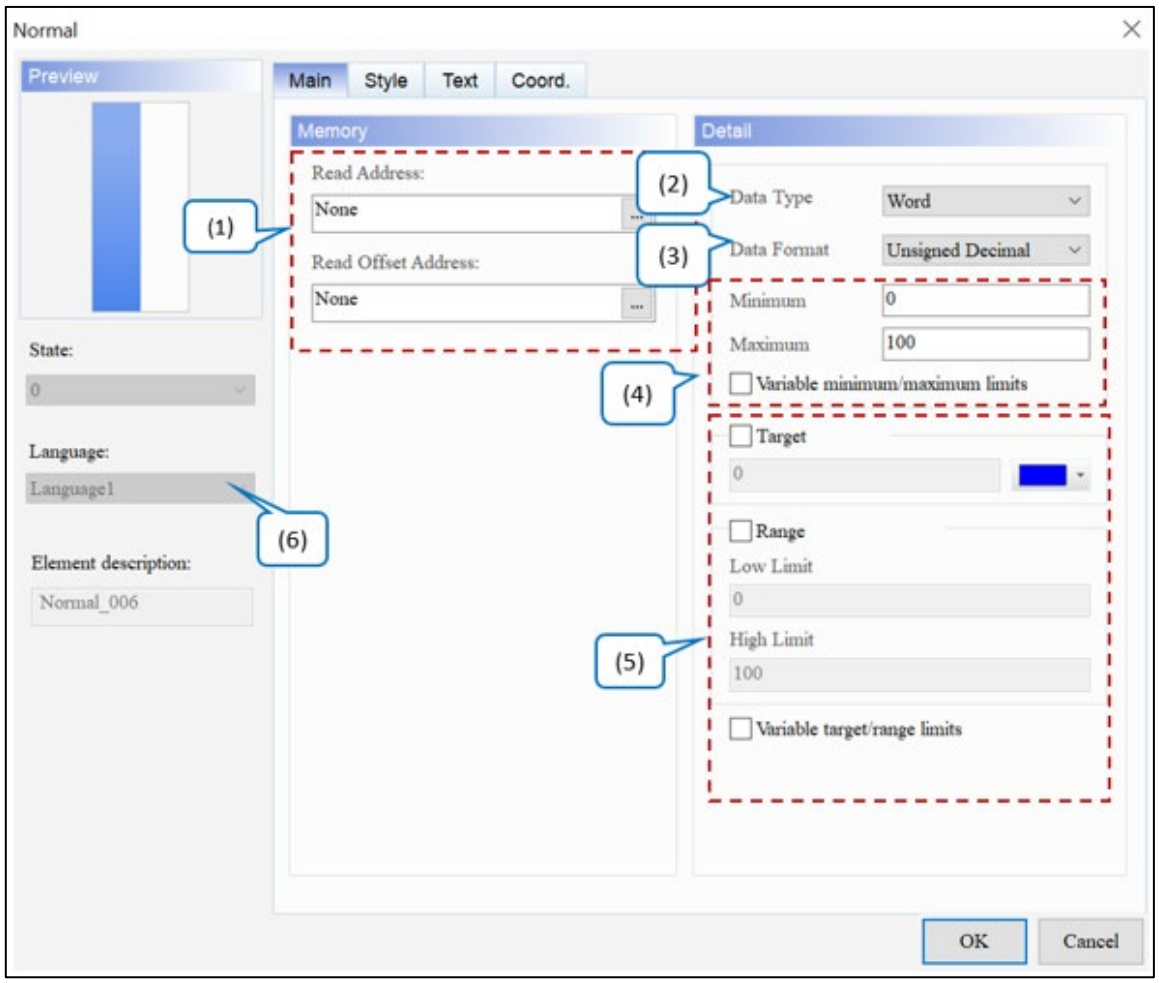
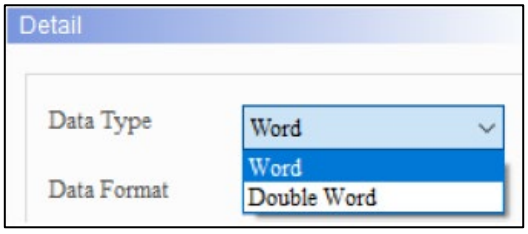
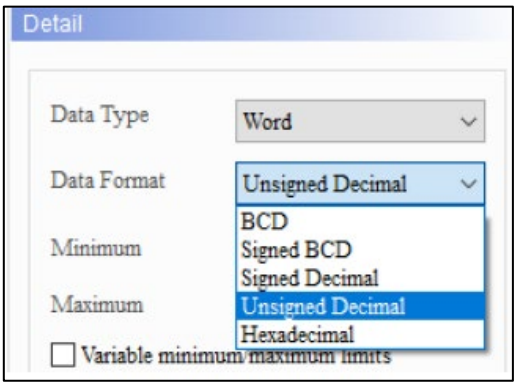
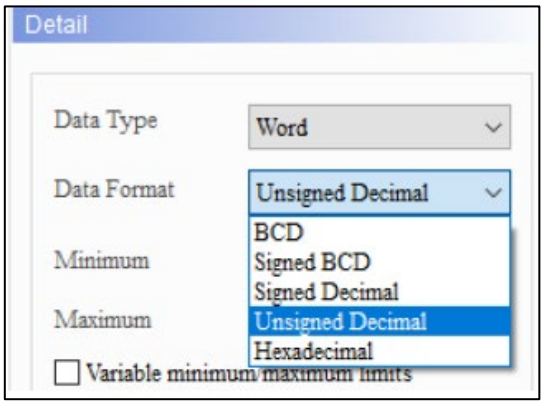
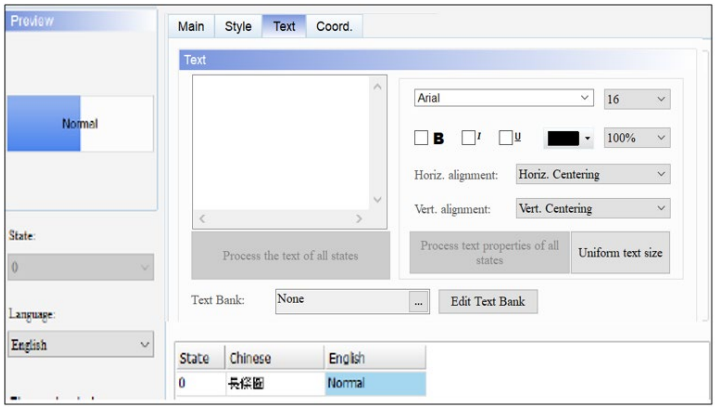


Figure 7 - 2: Normal Bar element Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. The **Input** memory **Type** must be Word. ● Select **Link Name** or **Device Type**. Refer to *Memory Settings* for details.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Data Type</td><td>The available options for Data Type are: Word and Double Word. The default value is Word.
 
</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>● If the Data Type is Word, the supported Data Format is as follows.
 

● If the Data Type is Double Word, the supported Data Format is as follows.
 
</td></tr>
<tr><td>(4)</td><td>Minimum / Maximum input value</td><td>The permissible range for the Minimum and Maximum values is subject to change based on the selected Data Type and Data Format. The default value for Minimum is 0 and Maximum is 100.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="4">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ +9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ +32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="2"></td><td></td><td colspan="3"><table>
<tr><td></td><td>Signed BCD</td><td>-9999999 ~ +99999999</td></tr>
<tr><td></td><td>Signed Decimal</td><td>-2147483648 ~ +2147483647</td></tr>
<tr><td></td><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
</table></td></tr>
<tr><td>Variable minimum/ maximum limits</td><td colspan="3">After checking it, customize the memory address, and determine the minimum and maximum values by entering the values.</td></tr>
<tr><td rowspan="3">(5)</td><td rowspan="3">Display Format</td><td>Target</td><td>If the Variable target/range limits checkbox is not selected, enter only a constant value to define the target display value on the Normal Bar element. Users can also specify the display color.</td></tr>
<tr><td>Range</td><td>The Range includes the lower and upper limits. Like the case of the Target display, if the Variable target/range limits checkbox is not selected, enter only constant value to define the lower and upper limits of the Normal Bar element. The default Low Limit is 0 and High Limit is 100.</td></tr>
<tr><td>Variable target/range limits</td><td>If low and high limit values are selected, define the memory addresses to dynamically change the displaying target value, and the low and high limit values.</td></tr>
<tr><td>(6)</td><td>Language</td><td colspan="3">When users set the language data, they can edit the properties of the displayed text with the Language setting of the element.
 
</td></tr>
</table>

- Style

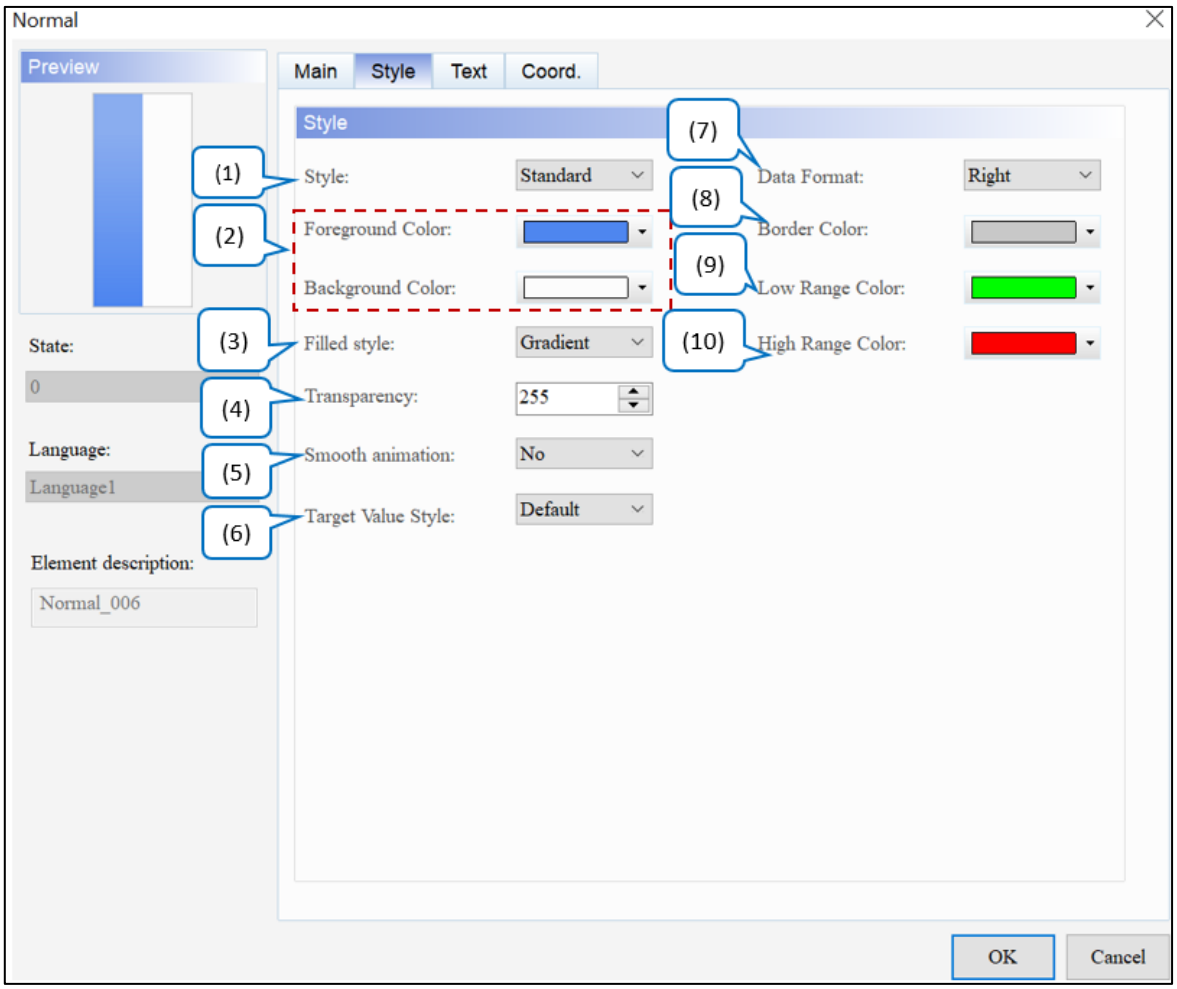
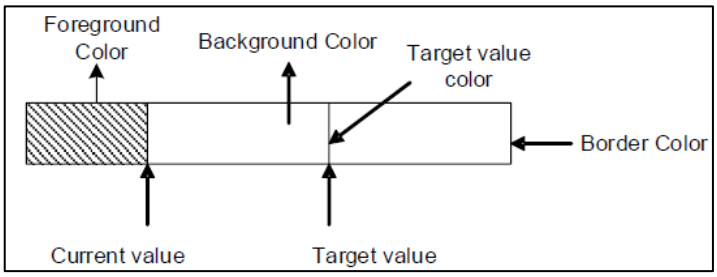
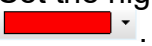


Figure 7 - 3: Normal Bar element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for element **Style** are: Standard, Raised, and Sunken. The default value is **Standard**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Foreground Color and Background Color</td><td>Set the foreground color and background color of the element. The default foreground color is , and the default background color is .
 
</td></tr>
<tr><td>(3)</td><td>Filled style</td><td>● The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
● If the DOP-B project is opened, the elements will be displayed in Fixed, and the effect is similar to that of DOP-B.
Gradient 
Fixed  </td></tr>
<tr><td>(4)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(5)</td><td>Smooth animation</td><td>The Smooth animation function is available for Normal Bar element. When this function is enabled, the element display becomes smoother. The default value is No.</td></tr>
<tr><td>(6)</td><td>Target Value Style</td><td>The available options for display styles of the target value are: Default and Style 1. The default value is Default.
Default 
Style 1  </td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(7)</td><td>Data Format</td><td>The available options for Data Format are: Left, Right, Top, and Bottom. The default value is Right.
<table>
<tr><th>Left</th><th>Right</th><th>Top</th><th>Bottom</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td>(8)</td><td>Border Color</td><td>Set the border color to be displayed. The default is  .</td></tr>
<tr><td>(9)</td><td>Low Range Color</td><td>Set the low range color to be displayed. The default is  .</td></tr>
<tr><td>(10)</td><td>High Range Color</td><td>Set the high range color to be displayed. The default is  .</td></tr>
</table>

- Text

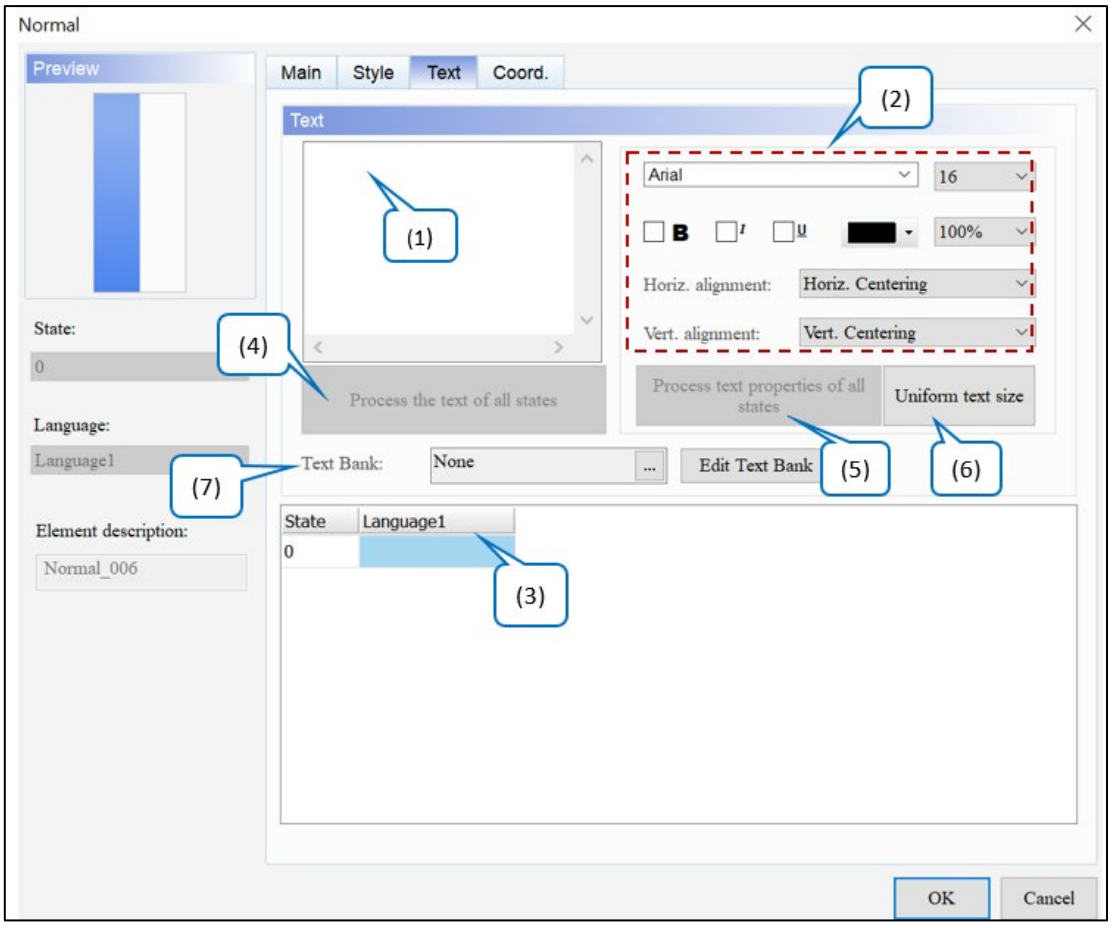
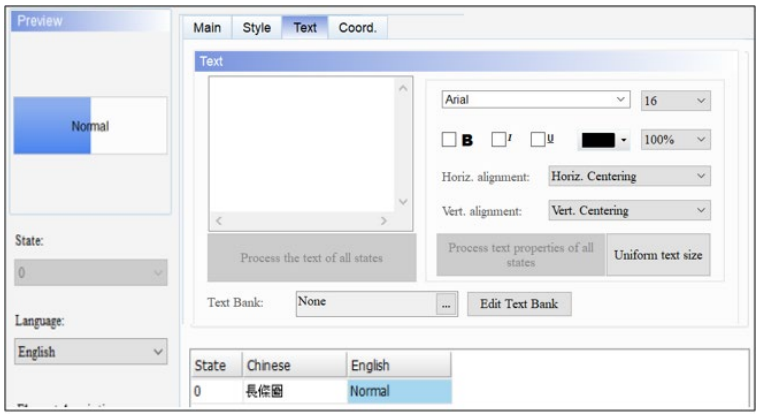
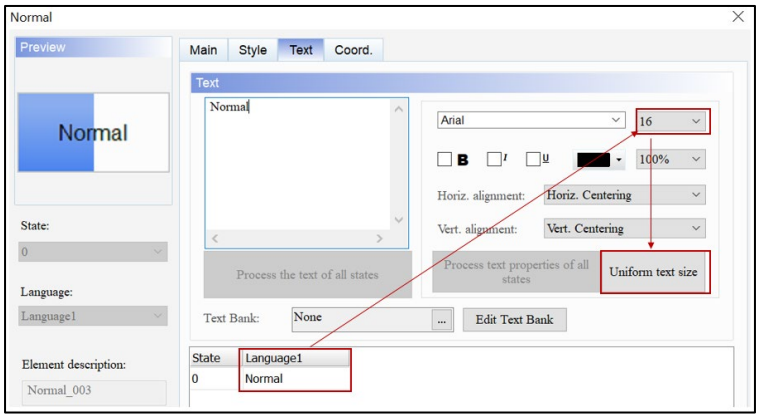


Figure 7 - 4: Normal Bar element Text property page

No.	Function	Description
(1)	Text	● Enter the text to be displayed in this text box.  ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to start editing and entering the text.
(2)	Text related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** page allows them to edit Multi-language data. As shown in the text property image, they can enter English words in the **English** column.
(4)	Process the text of all states	The **Normal Bar** element has no multi-state, and this function is disabled.
(5)	Process text properties of all states	The **Normal Bar** element has no multi-state, and this function is disabled.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Coord.

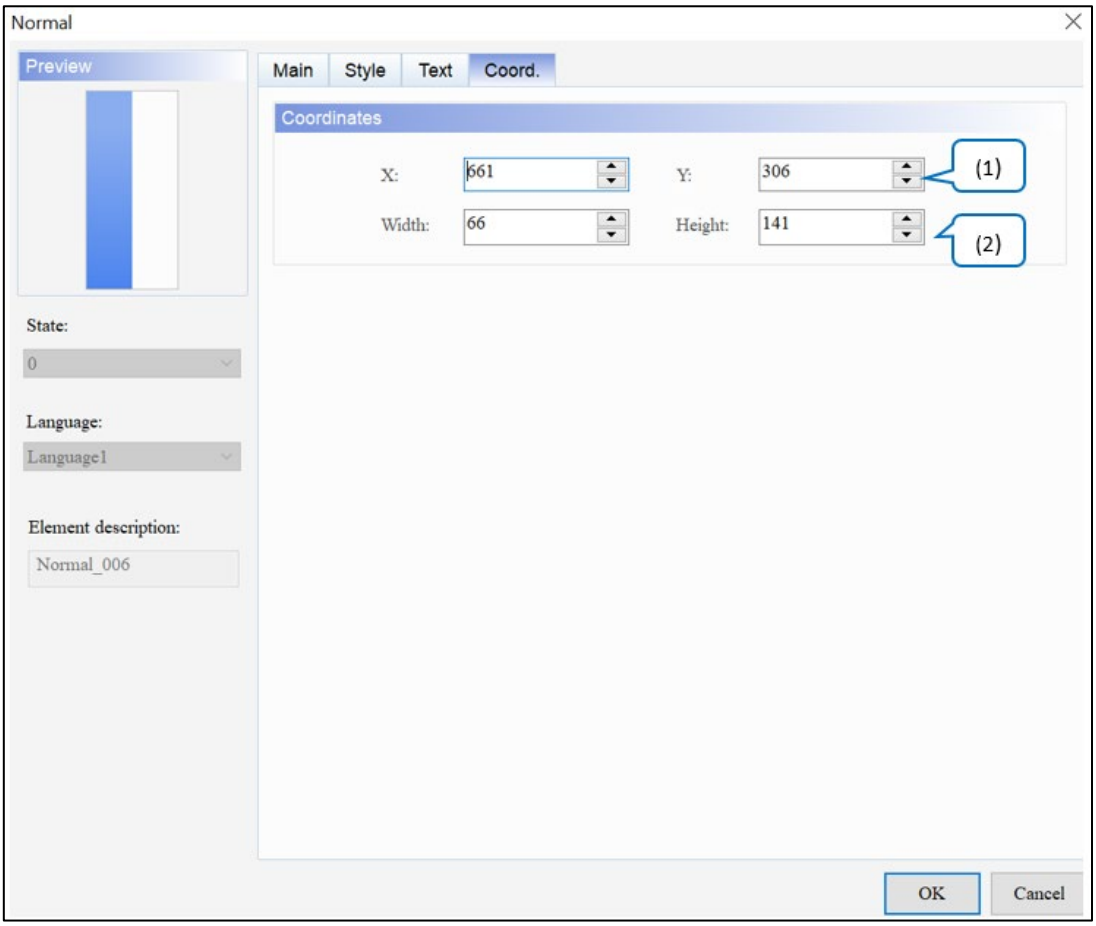
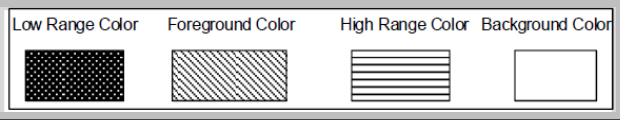
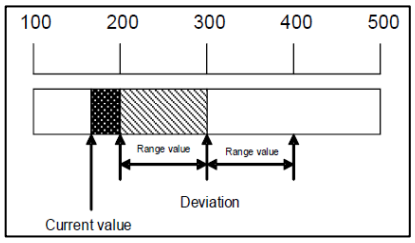
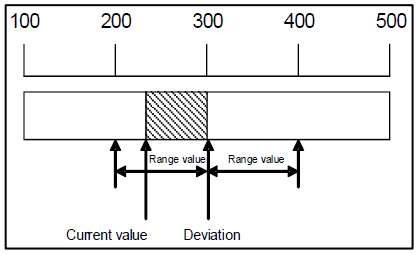
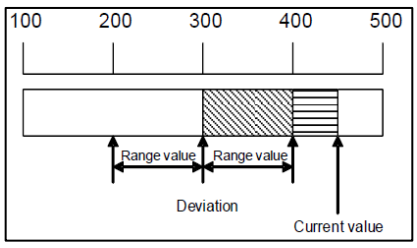


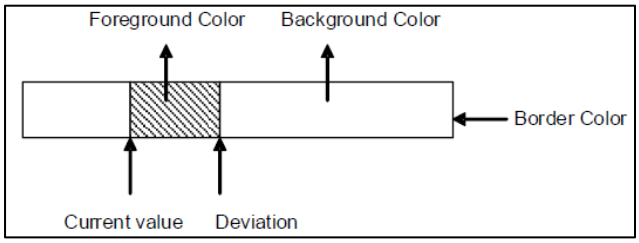
Figure 7 - 5: Normal Bar element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

7.2 Differential Bar

The **Differential Bar** element displays the deviation between the value of the **Read Address** and the set target value on the HMI. Like the case of **Normal Bar** element, define the memory addresses for the target value, and the upper and lower limits of the **Differential Bar** element, making the application more flexible and meet users' requirements, as shown in the following table.

Use High and Low Limit Colors to Distinguish Differential Bar Element	
	
(1)	
(2)	
(3)	

<table>
<tr><td>Read Address</td><td>
<table>
<tr><th colspan="2">Differential Bar Element</th><th colspan="2">Numeric Entry Element</th></tr>
<tr><td>Read Address</td><td>$444</td><td>Write Address</td><td>$444</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Minimum Value</th><th>Maximum Value</th></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>0</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Display Deviation</td><td>
<table>
<tr><th>Deviation Color</th><th>Deviation Value</th><th>Target Value</th></tr>
<tr><td></td><td>25</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Differential Bar element</td><td> 
</td></tr>
<tr><td>Execution result</td><td>Compile and download the edited screen to the HMI. Then, enter the deviation value to the Numeric Entry element, and the Differential Bar element displays the deviation according to the input value.
<table>
<tr><td>When the value is within the range of ±25, it displays in brown-red.</td><td> 
</td></tr>
<tr><td>When the value is out of the range of ±25, it displays in the foreground color.</td><td> 
</td></tr>
</table>
</td></tr>
</table>

On double-clicking the **Differential Bar** element, the property page appears as follows.

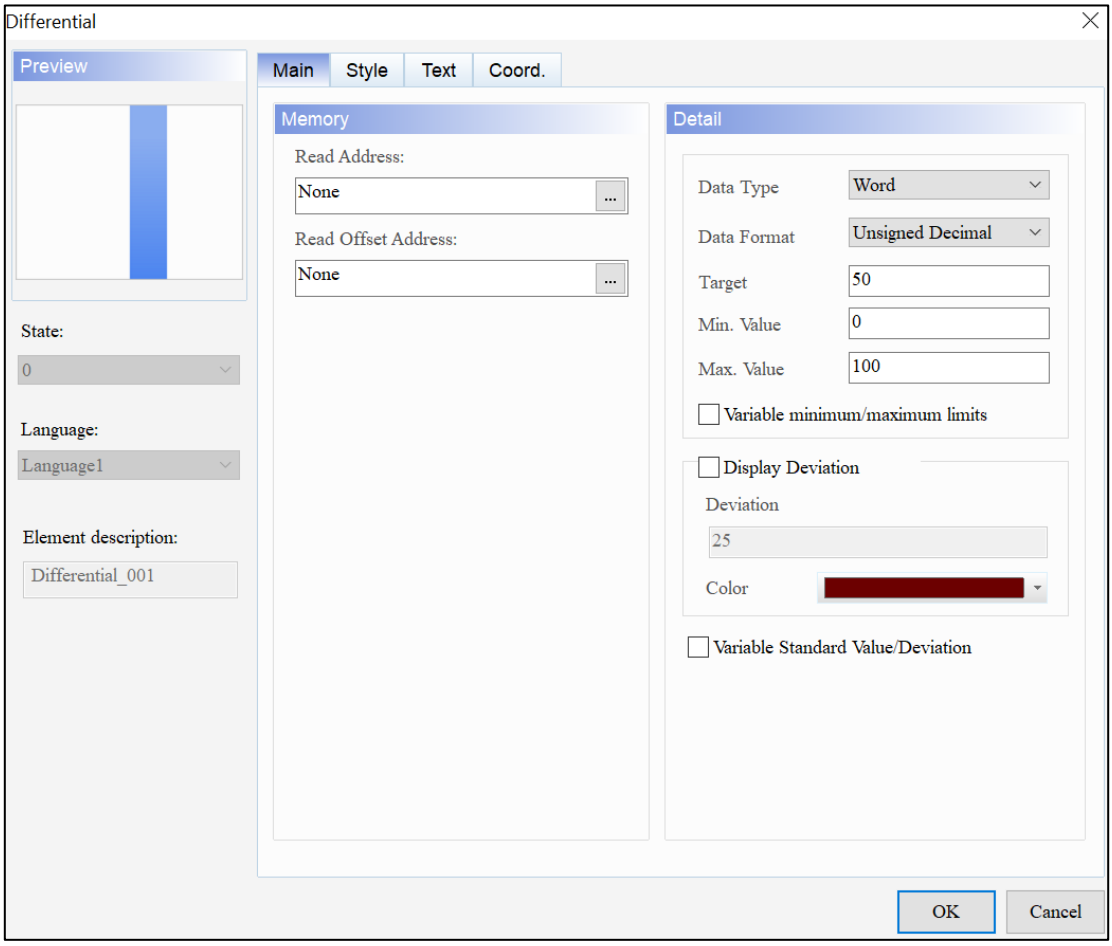


Figure 7 - 6: Differential Bar element property page

Differential Bar	
Function	**Description**
Preview	**Differential Bar** element can only view multi-language data display and do not support multiple states.
Main	Set the Read Address and Read Offset Address. Set the Data Type, Data Format, Target value and Minimum / Maximum input value of the element, and select the checkbox for Variable minimum/maximum limits. Set whether to display the deviation value and its color, and select the checkbox for Variable Standard Value/Deviation.
Style	Set the Style, Foreground Color, Background Color, Filled style, Transparency, Smooth animation, Data Format, and Border Color.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

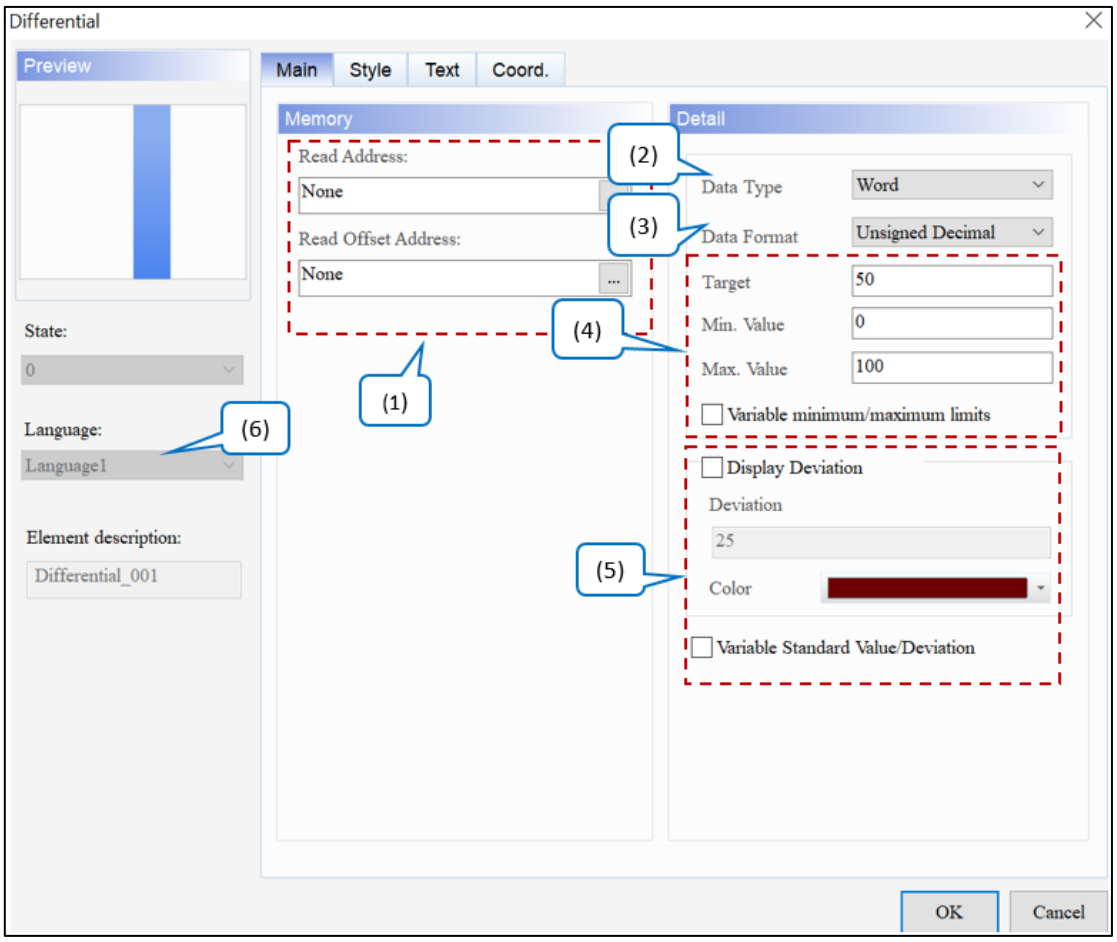
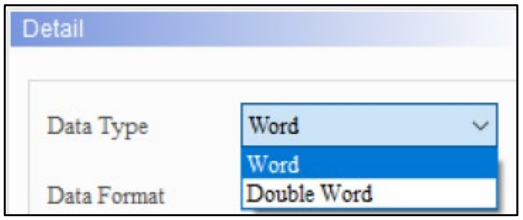
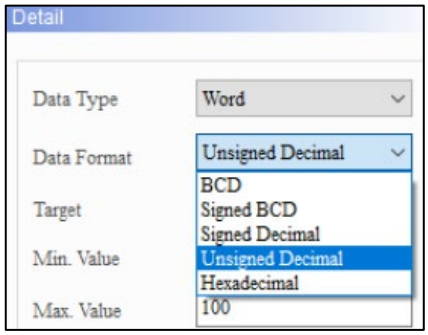
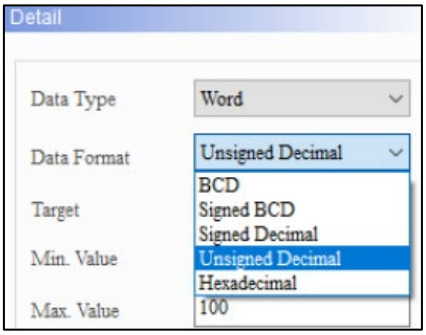
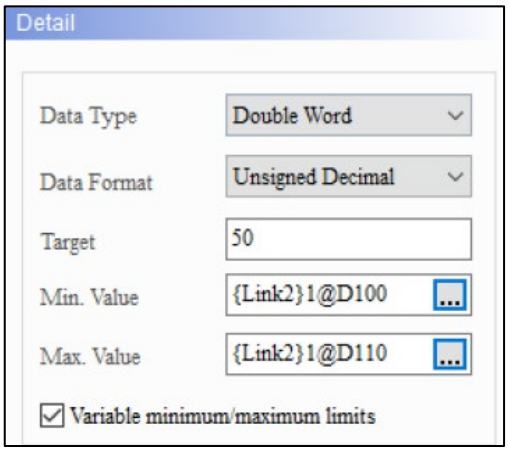
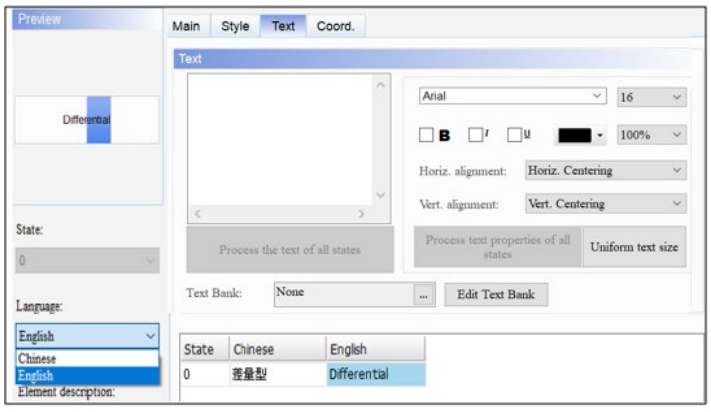


Figure 7 - 7: Differential Bar element Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. The **Input** memory **Type** must be Word. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Data Type</td><td>The available options for Data Type are: Word and Double Word. The default value is Word.
 
</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>● When the Data Type is Word, the supported Data Format is as follows.
 

● When the Data Type is Double Word, the supported Data Format is as follows.
 
</td></tr>
<tr><td>(4)</td><td>Min. Value / Max. Value</td><td>The permissible range for Min. Value and Max. Value is subject to change based on the selected Data Type and Data Format. The default Min. Value is 0 and Max. Value is 100.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ +9999</td></tr>
<tr><td>Signed Decimal</td><td>-3278 ~ +32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hexadecimal</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="3">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ +99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ +2147483647</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="2"></td><td></td><td rowspan="2"></td><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td></td><td>Hexadecimal</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td></td><td>Variable minimum/ maximum limits</td><td colspan="3">Select this checkbox to set the addresses for the Minimum Value and Maximum Value. Then, write the required values to the addresses.
 
</td></tr>
<tr><td rowspan="2">(5)</td><td rowspan="2">Display Deviation</td><td>Deviation</td><td colspan="2">● If the Variable Standard Value / Deviation checkbox is not selected, enter only a constant value to define the deviation value of the Differential Bar element. The default Deviation is 25.
● Set the displaying color of the deviation which lies within the range. The default color is .</td></tr>
<tr><td>Variable Standard Value / Deviation</td><td colspan="2">If it is selected, define the memory addresses to dynamically change the displaying target value and deviation value.</td></tr>
<tr><td>(6)</td><td>Language</td><td colspan="3">When users set the language data, they can edit the properties of the text to be displayed with the Language setting of the element.
 
</td></tr>
</table>

- Style

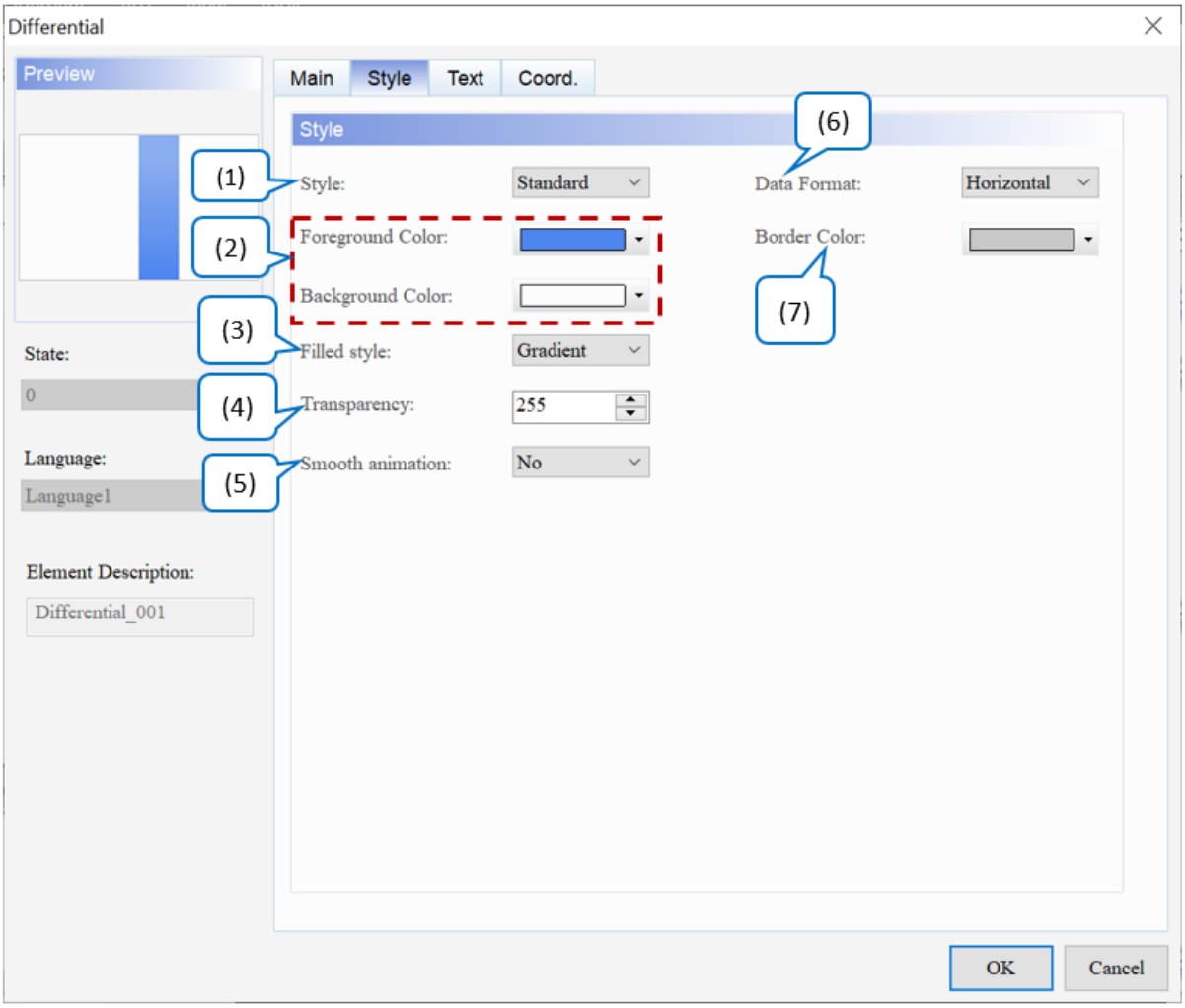
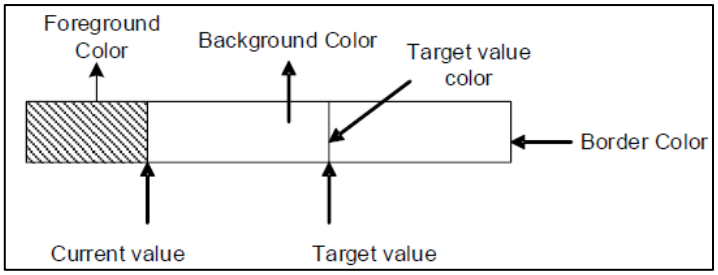
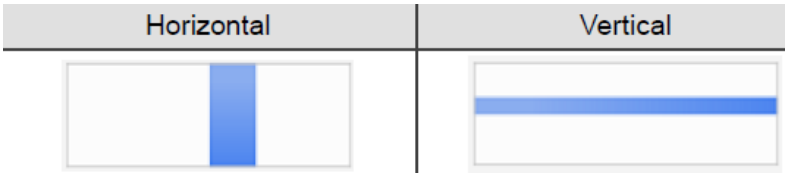


Figure 7 - 8: Differential Bar element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for element **Style** are: Standard, Raised, and Sunken. The default value is **Standard**. 

No.	Function	Description
(2)	Foreground Color and Background Color	Set the foreground color and background color of the element. The default foreground color is , and the default background color is . 
(3)	Filled style	● The available options for **Filled style** of the elements on the DOP-100 models are: Gradient and Fixed. The default value is **Gradient**. ● If the DOP-B project is opened, the elements will be displayed in Fixed, and the effect is similar to that of DOP-B. Gradient  Fixed 
(4)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(5)	Smooth animation	The **Smooth animation** function is available for **Differential Bar** element. When this function is enabled, the element display becomes smoother. The default value is **No**.
(6)	Data Format	The available options for **Data Format** are: Horizontal and Vertical. The default value is **Horizontal**. 
(7)	Border Color	Set the border color to be displayed. The default is .

- Text

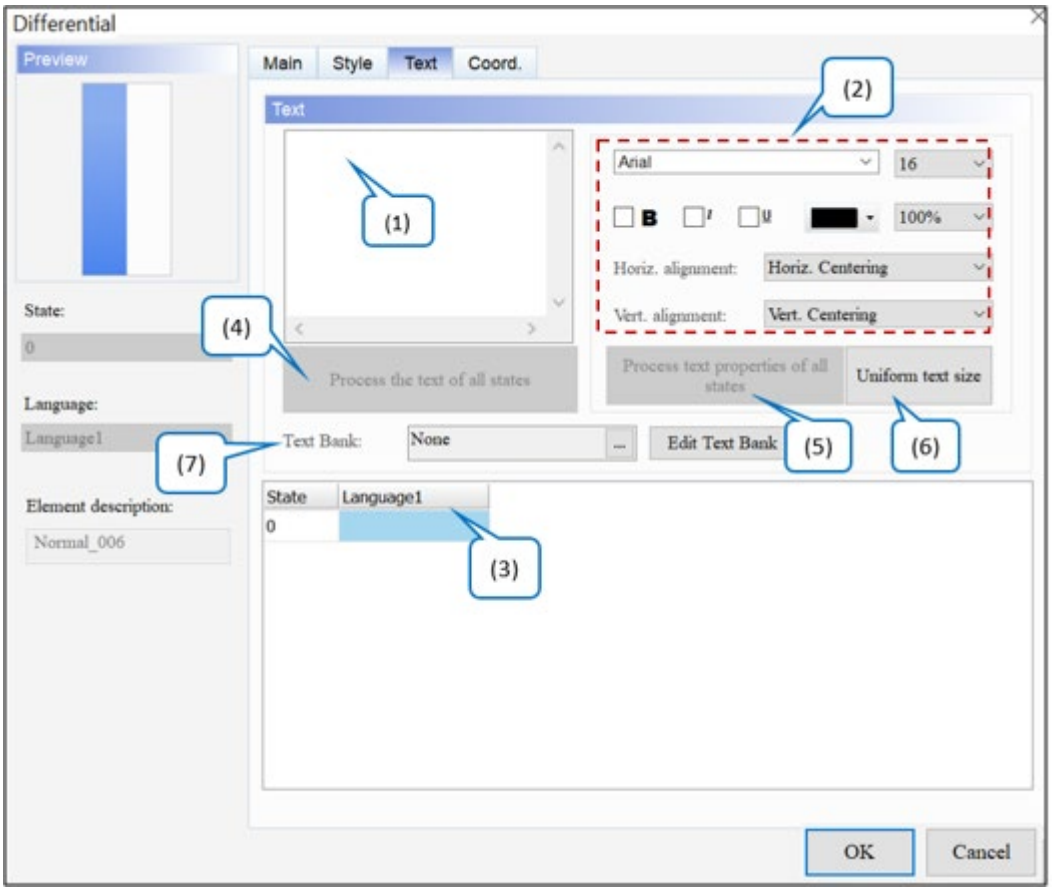
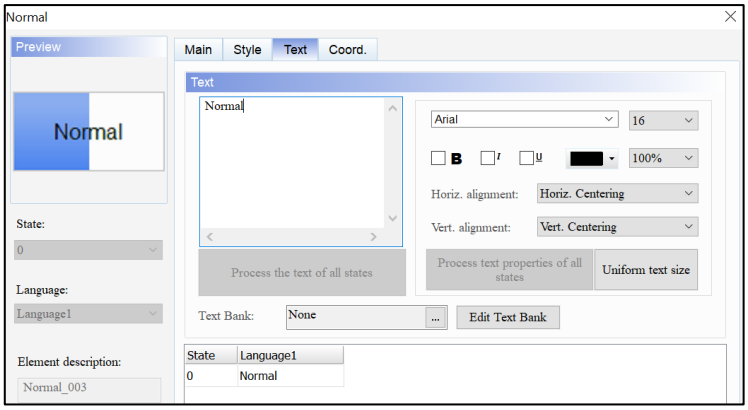
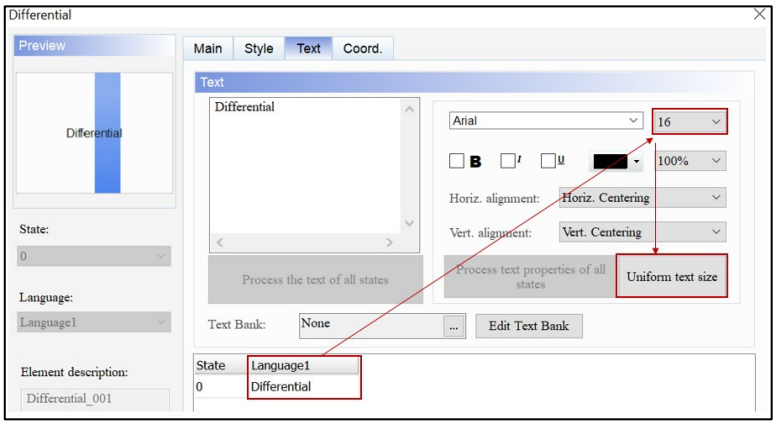


Figure 7 - 9: Differential Bar element Text property page

No.	Function	Description
(1)	Text	● Enter the text to be displayed in this text box.  ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to start editing and entering the text.

No.	Function	Description
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** page allows them to edit Multi-language data. As shown in the text property image, they can enter English words in the **English** column.
(4)	Process the text of all states	The **Differential Bar** element has no multi-state, and this function is disabled.
(5)	Process text properties of all states	The **Differential Bar** element has no multi-state, and this function is disabled.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Coord.

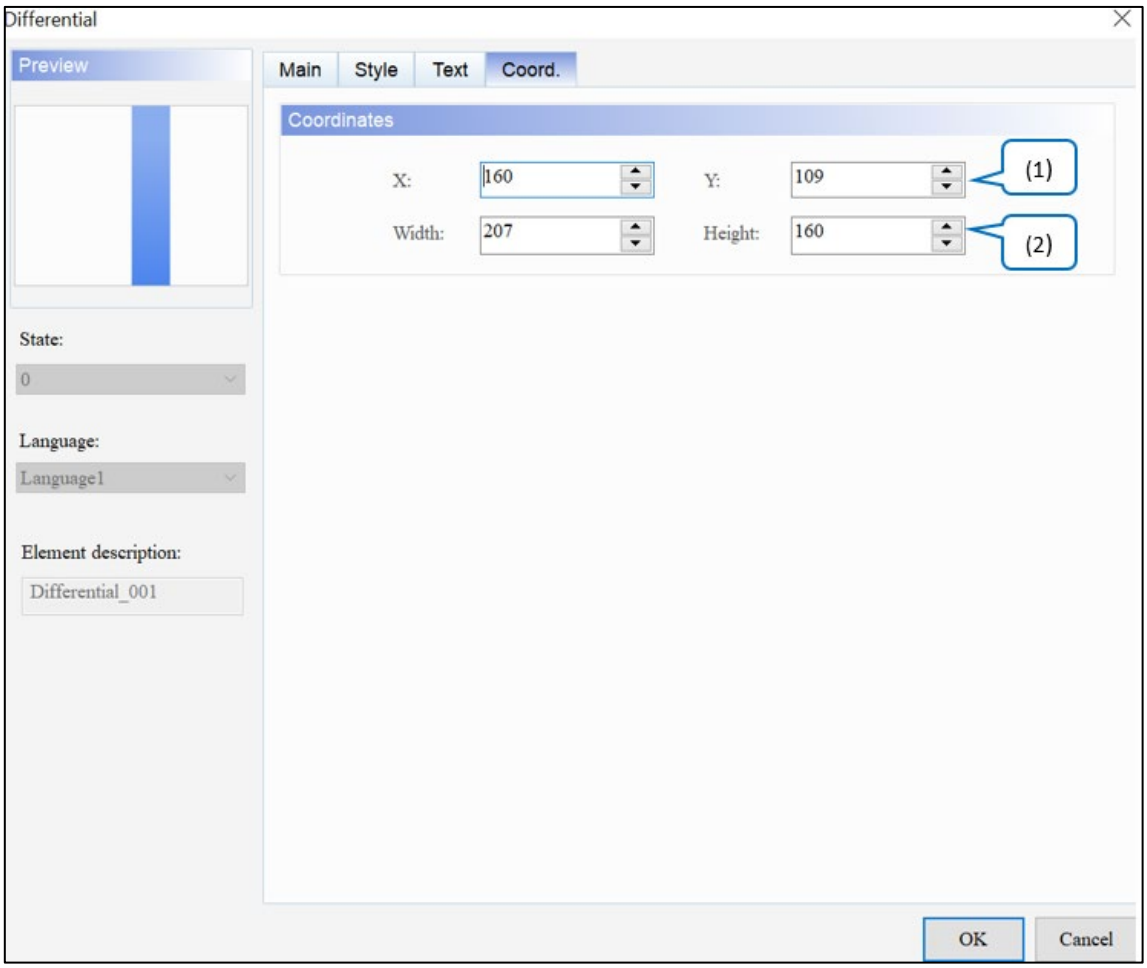


Figure 7 - 10: Differential Bar element Coord. property page

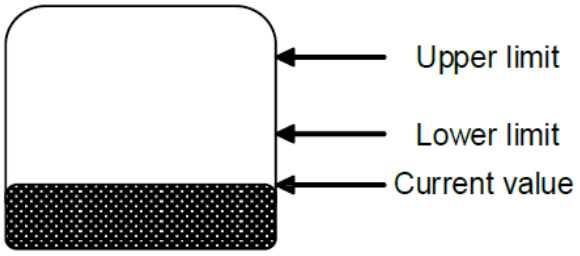
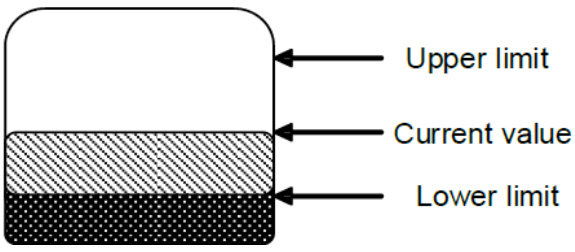
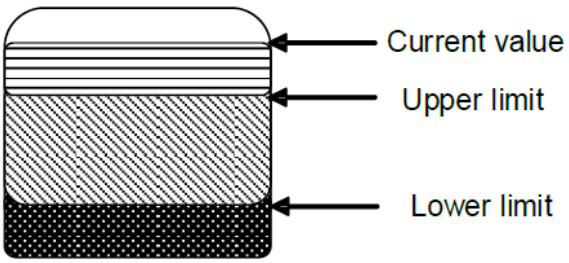
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

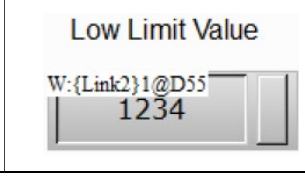
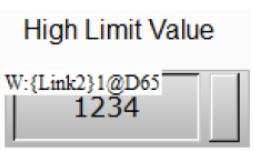
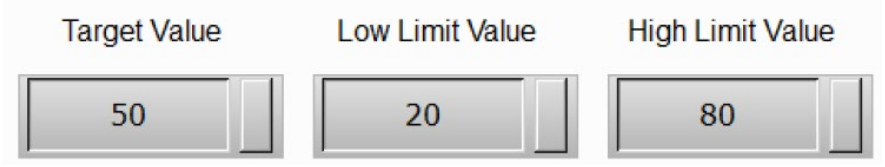
Chapter 8: Pipe

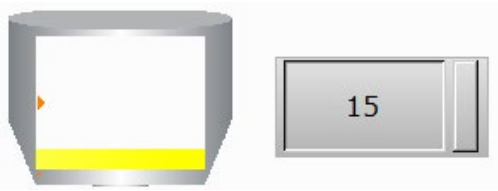
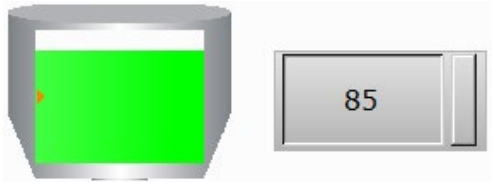
To create a **Pipe** element, go to **Elements** > **Pipe** and click the desired **Pipe** element.

8.1 Pipe(1) / Pipe(2)

Pipe(1) and **Pipe(2)** elements differ in shapes but are same in functions. The introduction of **Pipe(1)** is as follows. DIAScreen displays the target value, lower limit, and upper limit values set in the register corresponding to the read address on the **Pipe** element. Like **Bar** elements, the memory addresses for the target value, lower and upper limits of **Pipe(1)** element can be defined, so that its functions can be used more flexibly and meet users' requirements too, as shown in the following table. Set different colors for the lower limit, upper limit, and target value so that they can easily identify them with the set colors.

Using Color to Identify Upper and Lower Limits	
Low Range Color Water Level Color High Range Color Cylinder Color	
(1)	
(2)	
(3)	

<table>
<tr><th colspan="5">Pipe(1)</th></tr>
<tr><td rowspan="3">Read Address</td><td colspan="2">Pipe(1) Element</td><td colspan="2">Numeric Entry Element</td></tr>
<tr><td>Read Address</td><td>$444</td><td>Write Address</td><td>$444</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="2">Detail settings</td><td>Data Type</td><td>Data Format</td><td>Minimum</td><td>Maximum</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>0</td><td>100</td></tr>
<tr><td rowspan="4">Select the checkboxes for Target, Range, and Variable target/range limits</td><td colspan="2">Target Color</td><td colspan="2">Target Value</td></tr>
<tr><td colspan="2"></td><td colspan="2">{Link2}1@D50</td></tr>
<tr><td colspan="2">Low Limit Property</td><td colspan="2">High Limit Property</td></tr>
<tr><td>Low Range Color</td><td>Low Range Value</td><td>High Range Color</td><td>High Range Value</td></tr>
<tr><td></td><td>{Link2}1@D55</td><td></td><td>{Link2}1@D65</td></tr>
<tr><td rowspan="3">Create Numeric Entry elements</td><td colspan="2">Numeric Entry Element</td><td colspan="2">Numeric Entry Element</td><td colspan="2">Numeric Entry Element</td></tr>
<tr><td>Write Address</td><td>{Link2}1 @D50</td><td>Write Address</td><td>{Link2}1 @D55</td><td>Write Address</td><td>{Link2}1 @D65</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="2">Execution result</td><td colspan="6"> 
</td></tr>
<tr><td>Target</td><td colspan="5">Enter a target value of 50, and the displaying color is orange.
  </td></tr>
</table>

Pipe(1)		
	Low Limit	Enter a value of 15 at $444, which is less than the low limit value of 20, and is displayed in yellow. 
	High Limit	Enter a value of 85 at $444, which is greater than the high limit value of 80, and is displayed in green. 

On double-clicking **Pipe(1)** element, the property page appears as follows.

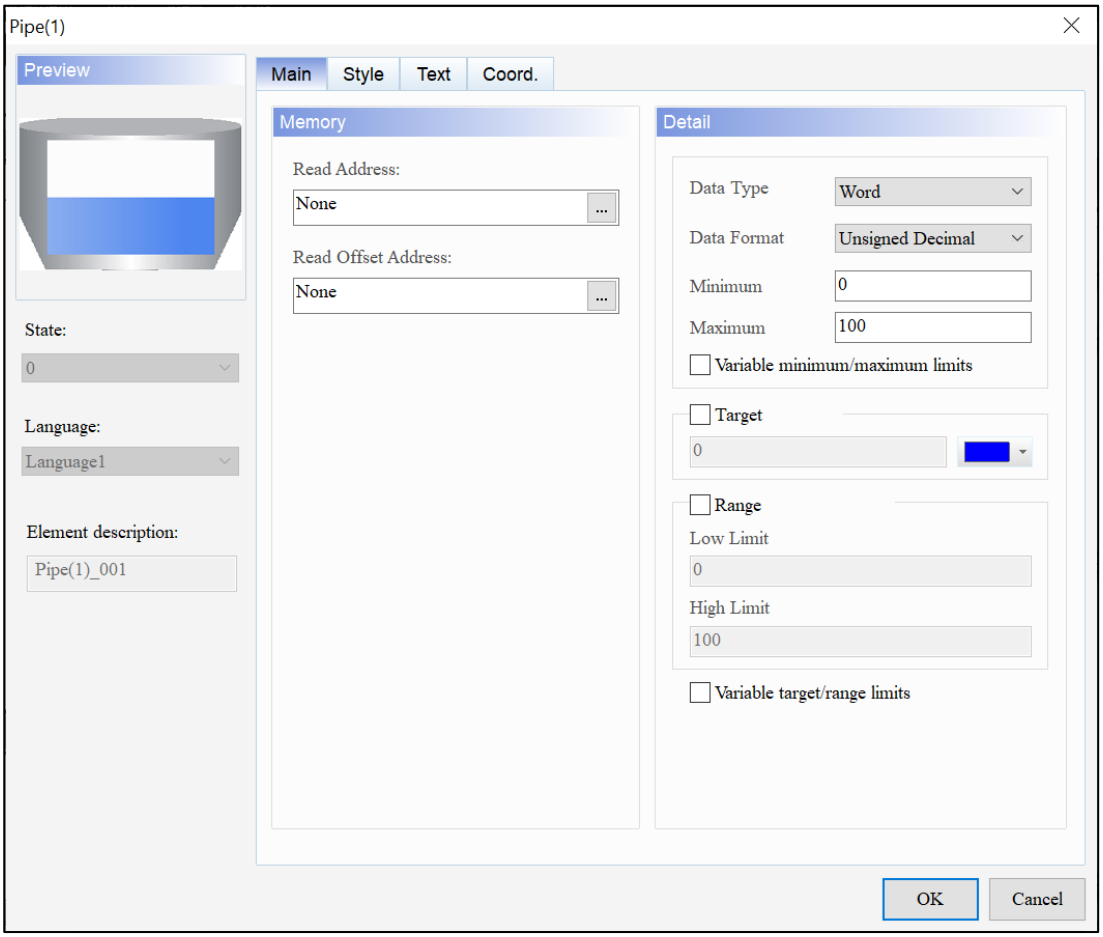


Figure 8 - 1: Pipe(1) element property page

Pipe(1)	
Function	**Description**
Preview	**Pipe** elements are only for viewing multi-language data display and do not support multiple states.
Main	Set the Read Address and Read Offset Address. Set the Data Type, Data Format, Minimum / Maximum input value for the element, and select the checkbox for Variable minimum/maximum limits. Set whether to display the target value and its color, and select the checkboxes for Range and Variable target/range limits.
Style	Set the Style, Water Level Color, Cylinder Color, Filled Style, Transparency, Target Value Style, Low Range Color and High Range Color.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

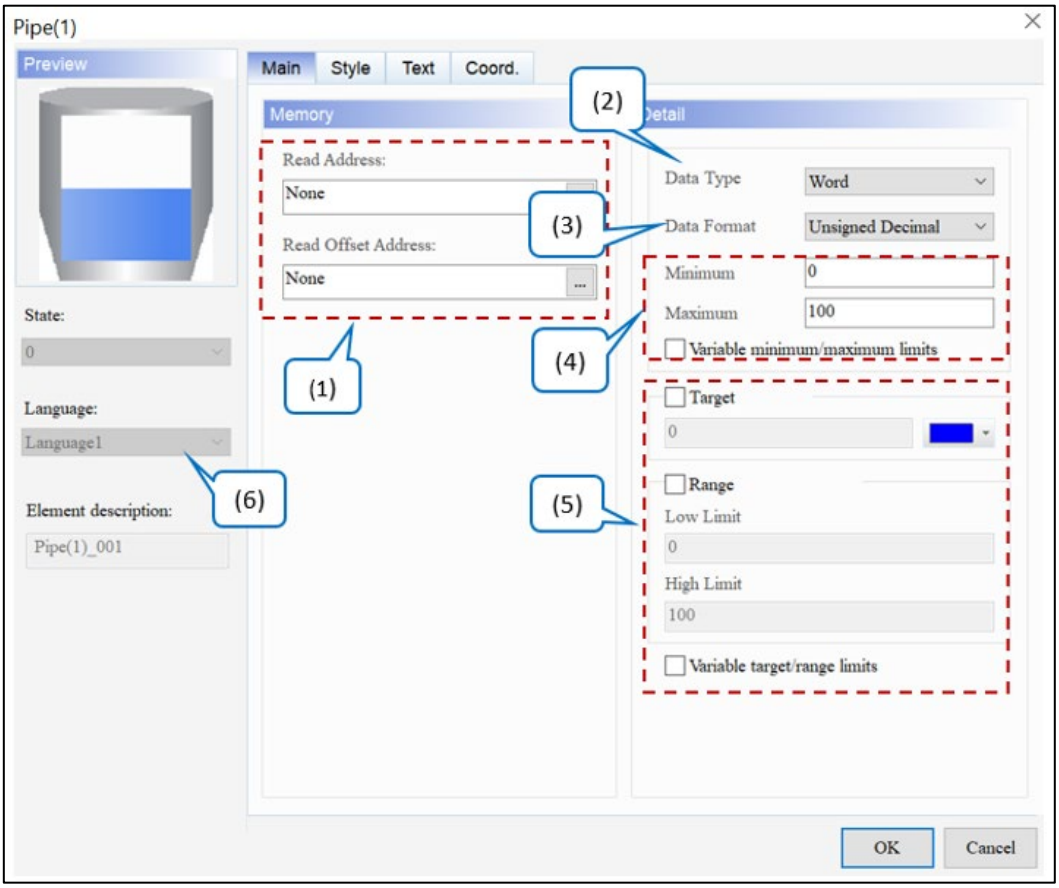
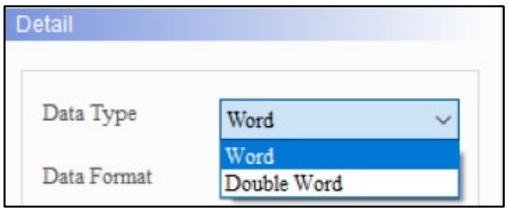
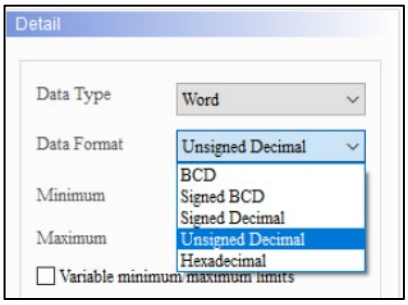
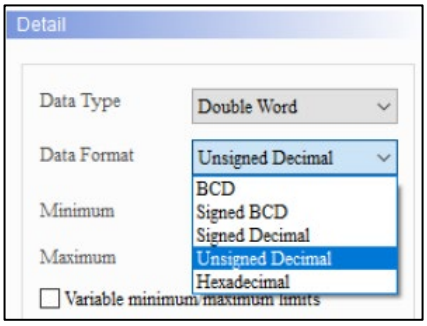
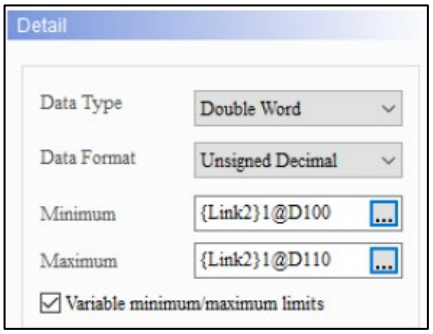
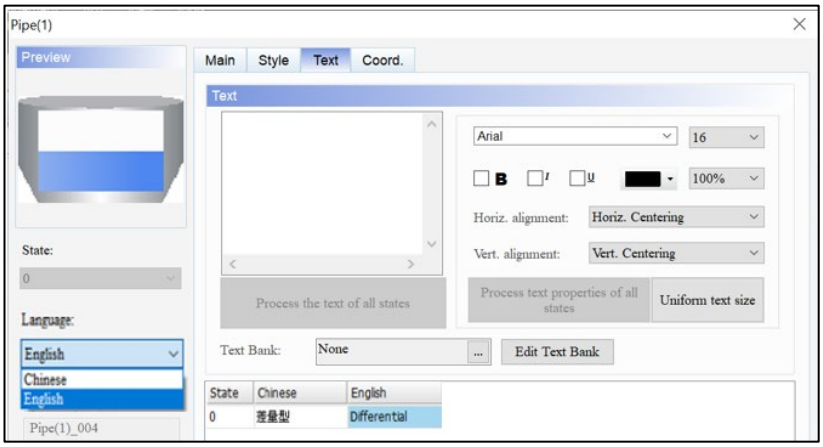


Figure 8 - 2: Pipe(1) element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Read Address</td><td>● Select the Internal Memory or the controller register address. The Input memory Type must be Word.
● Select Link name or Device Type. Refer to Memory Settings.</td></tr>
<tr><td>Read Offset Address</td><td>Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>(2)</td><td>Data Type</td><td>The available options for Data Type are: Word and Double Word. The default value is Word.
 
</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>● When the Data Type is Word, the supported Data Format is as follows.
 

● When the Data Type is Double Word, the supported Data Format is as follows.
 
</td></tr>
<tr><td>(4)</td><td>Minimum / Maximum</td><td>The permissible range for the Minimum and Maximum is subject to change based on the selected Data Type and Data Format. The default Minimum is 0 and default Maximum is 100.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="2">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ +9999</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="7"></td><td rowspan="6"></td><td rowspan="3"></td><td>Signed Decimal</td><td>-32768 ~ +32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hexadecimal</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="4">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ +99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ +2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
<tr><td>Hexadecimal</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Variable minimum/ maximum limits</td><td colspan="3">Select this checkbox to set the memory addresses for the Minimum and Maximum. Then, write the required values to the addresses.
 
</td></tr>
<tr><td rowspan="3">(5)</td><td rowspan="3">Display Format</td><td>Target</td><td colspan="2">● If the Variable target/range limits checkbox is not selected, enter only a constant value to define the target display value of the Pipe element. The default value is 0.
● Users can also specify the display color. The default color is .</td></tr>
<tr><td>Range</td><td colspan="2">● The Range includes Low Limit and High Limit. The default Low Limit is 0 and High Limit is 100.
● Like the case of the Target display, if the Variable target/range limits checkbox is not selected, enter only constant values to define the lower and upper limits of the Pipe element.</td></tr>
<tr><td>Variable target/ range limits</td><td colspan="2">If the values are selected, define the memory addresses to dynamically change the displaying target value, and the lower and upper limit values.</td></tr>
<tr><td>(6)</td><td>Language</td><td colspan="3">When the users set language, they can edit the text properties to be displayed through the Language setting of the element.</td></tr>
</table>

No.	Function	Description
		

- Style

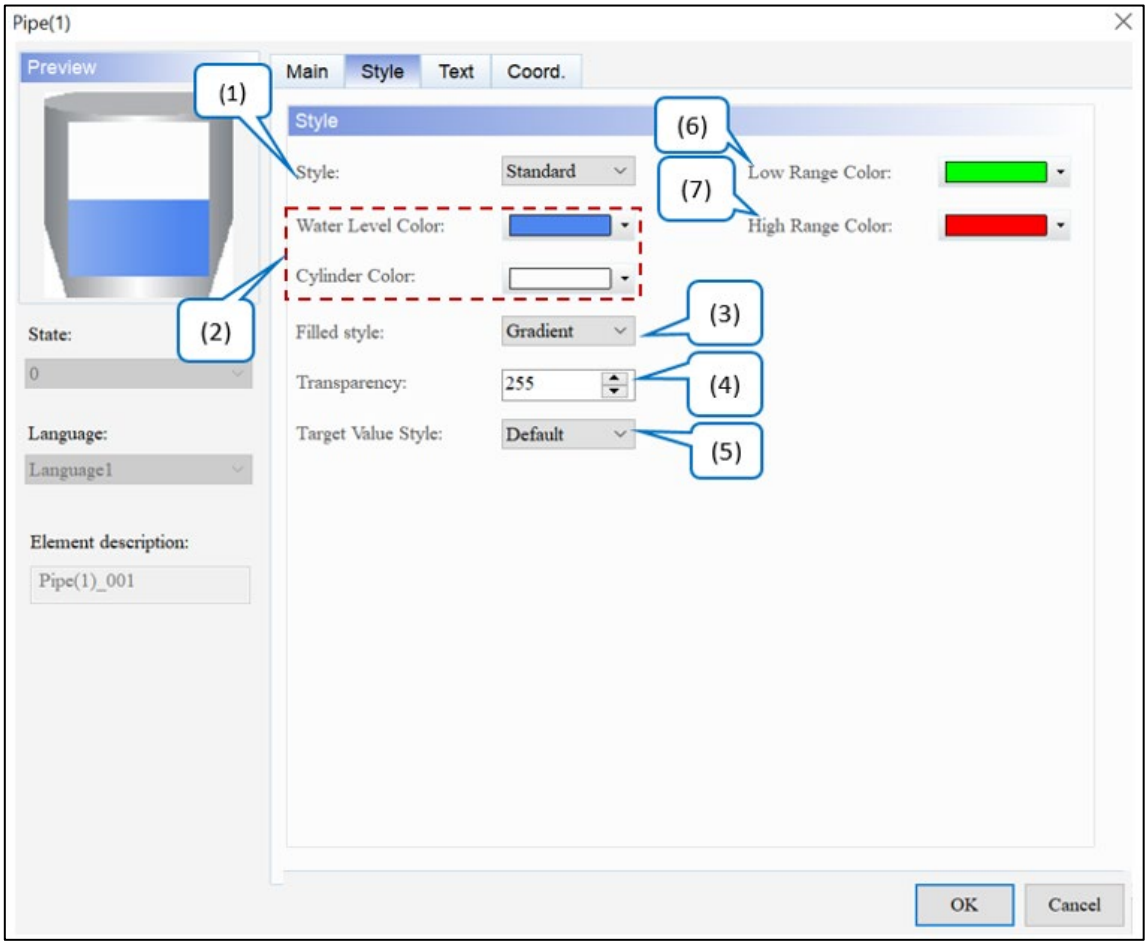
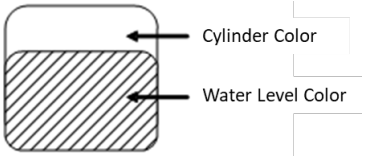
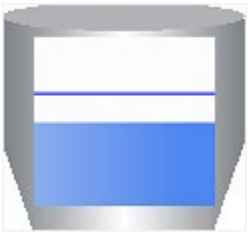
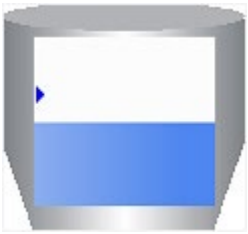


Figure 8 - 3: Pipe(1) element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of element. The available options for Style are: Standard and Rotation 180. The default value is Standard.
<table><tr><th>Standard</th><th>Rotation 180</th></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
<tr><td>(2)</td><td>Color</td><td> 

<table><tr><td>Water Level Color</td><td>Set the Water Level Color to display. The default is .</td></tr><tr><td>Cylinder Color</td><td>Set the Cylinder Color to display. The default is .</td></tr></table></td></tr>
<tr><td>(3)</td><td>Filled style</td><td>● The available options for Filled style of the element of DOP-100 are: Gradient and Fixed. The default value is Gradient.
● If the DOP-B project is opened, the elements will be displayed in Fixed, and the effect is similar to that of DOP-B.
<table><tr><td>Gradient</td><td>  </td></tr><tr><td>Fixed</td><td>  </td></tr></table></td></tr>
<tr><td>(4)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(5)</td><td>Target Value Style</td><td>The available options for display styles of the target value are: Default and Style 1. The default value is Default.</td></tr>
</table>

No.	Function	Description	
		Default	
		Style 1	
(6)	Low Range Color	Set the low range color to be displayed. The default is .	
(7)	High Range Color	Set the high range color to be displayed. The default is .	

- Text

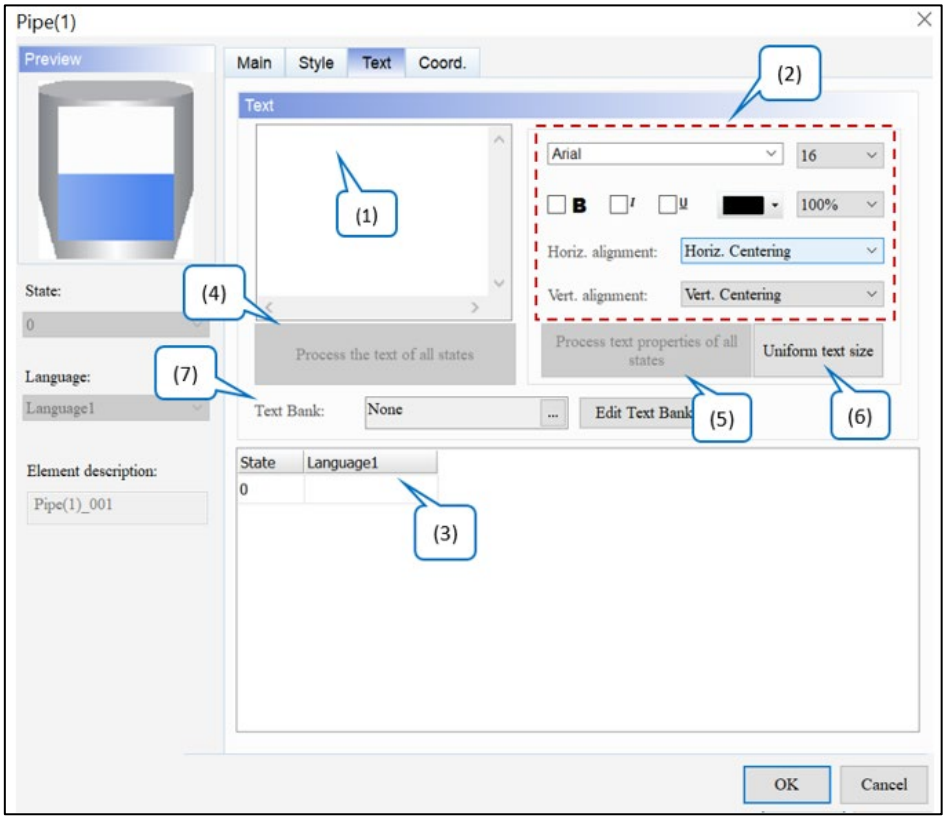
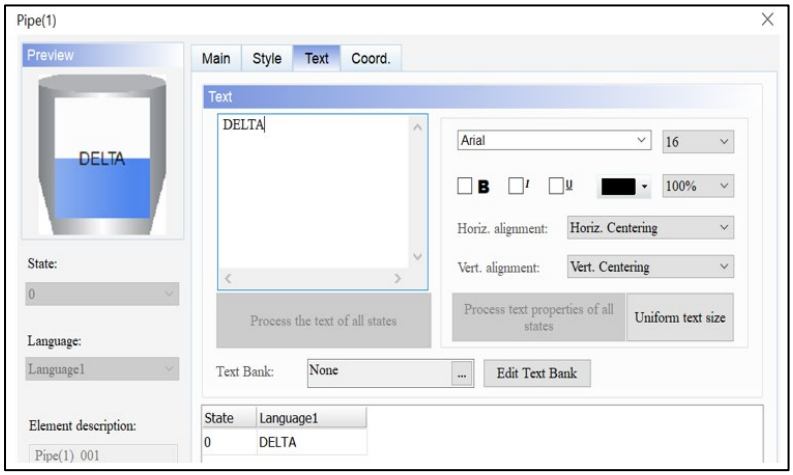
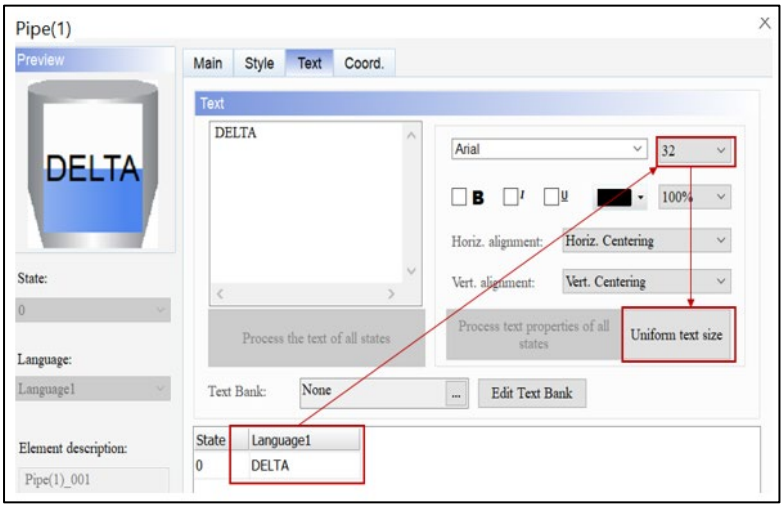


Figure 8 - 4: Pipe(1) element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key to start editing and entering the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text. Refer to the above figure for the text property setting results.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** property page allows to edit multi-language text data. As shown in the Text property image, users can enter English words in the **English** column.
(4)	Process text for all states	**Pipe(1) / Pipe(2)** elements have no multi-state, and this function is disabled.
(5)	Process text properties of all states	**Pipe(1) / Pipe(2)** elements have no multi-state, and this function is disabled.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Coord.

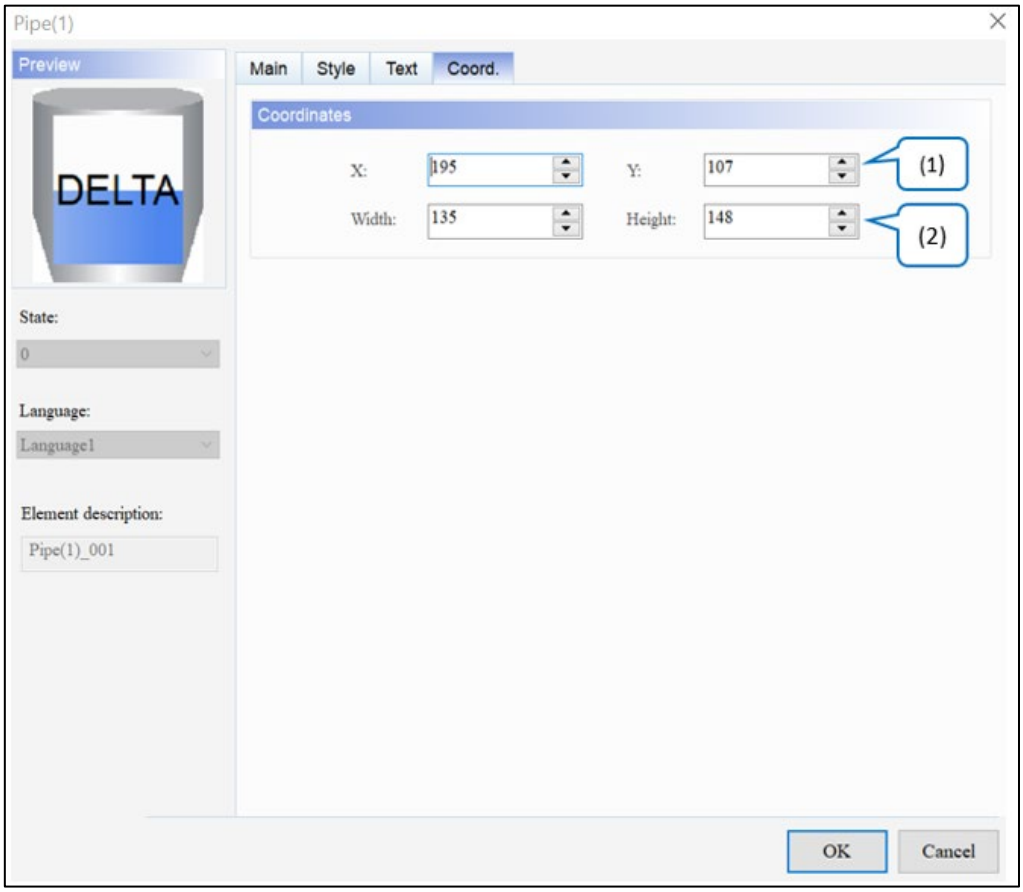


Figure 8 - 5: Pipe(1) element Coord. property page

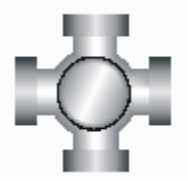
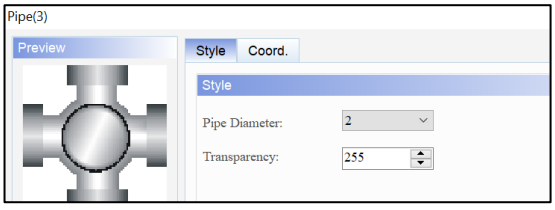
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

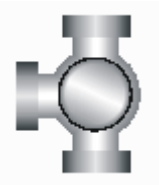
8.2 Pipe(3) / Pipe(4) / Pipe(5)

Pipe(3) / **Pipe(4)** / **Pipe(5)** elements are mainly used for connecting **Pipe(1)** / **Pipe(2)** / **Pipe(6)** / **Pipe(7)** elements. Therefore, these three **Pipe** elements have no parameters for **Read** / **Write Address** or numeric value setting. Users can only set the displaying pipe diameter and rotation angle.

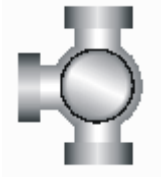
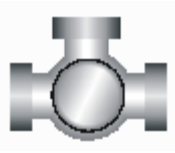
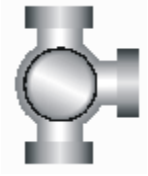
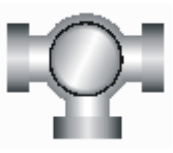
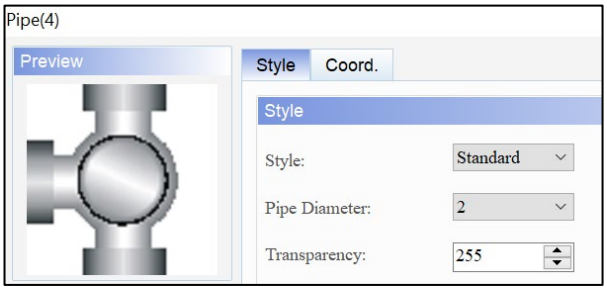
Pipe(3) / Pipe(4) / Pipe(5)	
Function	**Description**
Preview	These three elements are mainly used to connect other pipes, so there is no multi-state, and no multi-language data can be edited.
Style	Set the Pipe Diameter, Style, and Transparency.
Coord.	Set the X and Y coordinates of the element.

- Style

Pipe(3) / Pipe(4) / Pipe(5)	
Pipe(3) 	• The **Pipe Diameter** ranges from 1 ~ 5 and 0.5. The default value is **2**.  • Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

<table>
<tr><th colspan="2">Pipe(3) / Pipe(4) / Pipe(5)</th></tr>
<tr><td>Pipe(4)
  </td><td>

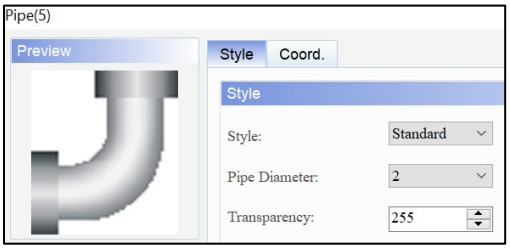
The Pipe Diameter ranges from 1 ~ 5 & 0.5. The default value is 2.
This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Rotation 90, Rotation 180, and Rotation 270. The default value is Standard.

<table>
<tr><th>Standard</th><th>Rotation 90</th><th>Rotation 180</th><th>Rotation 270</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table>


Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.

</td></tr>
<tr><td>Pipe(5)
  </td><td>

The Pipe Diameter ranges from 1 ~ 5 and 0.5. The default value is 2.
This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Rotation 90, Rotation 180, and Rotation 270. The default value is Standard.

<table>
<tr><th>Standard</th><th>Rotation 90</th><th>Rotation 180</th><th>Rotation 270</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table>


Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.

</td></tr>
</table>

- Coord.

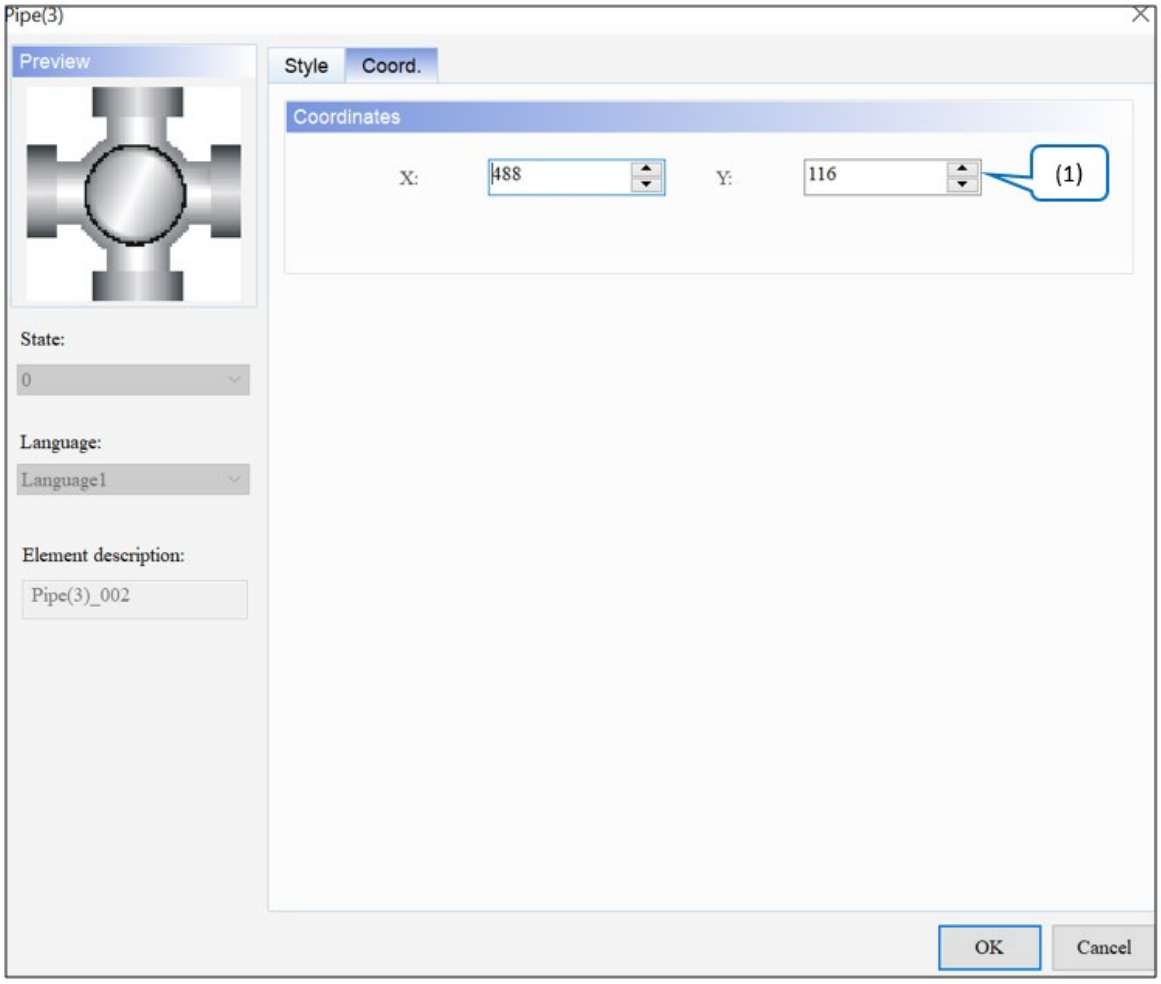


Figure 8 - 6: Pipe(3) / Pipe(4) / Pipe(5) element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

8.3 Pipe(6) / Pipe(7)

Pipe(6) / Pipe (7) elements can be used as a water pipe diagram, and can also display the water flow and set the water flow direction and cursor color, so users can set its read memory address.

Pipe(6) / Pipe(7)	
Function	**Description**
Preview	**Pipe(6)** / **Pipe(7)** elements are mainly used to control the direction of water flow, and there are no multi-state and multi-language data editable.
Main	Set Read Address and Read Offset Address.
Style	Set Pipe Diameter, Variable Color, Flow Cursor Color, Transparency, Smooth animation, and Flow Cursor Type.
Coord.	Set the X and Y coordinates of the element.

- Main

Pipe(6) / Pipe(7)

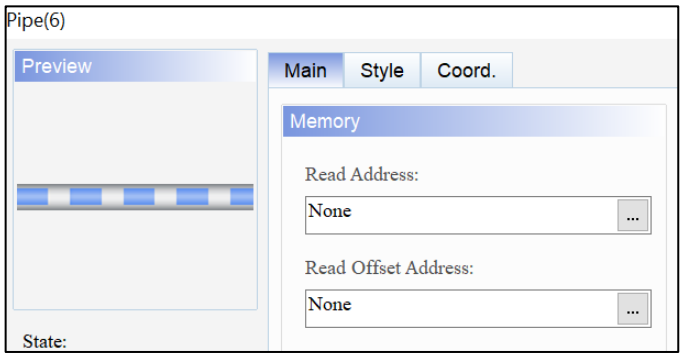
Pipe(6)



Pipe(7)



- Set **Read Address** and the direction of water flow with this address.



Pipe(6)		
Water Flow Direction	Right → Left	Read Address = 1
	Left → Right	Read Address = 2
Pipe(7)		
Water Flow Direction	Top → Bottom	Read Address = 2
	Bottom → Top	Read Address = 1

- Style

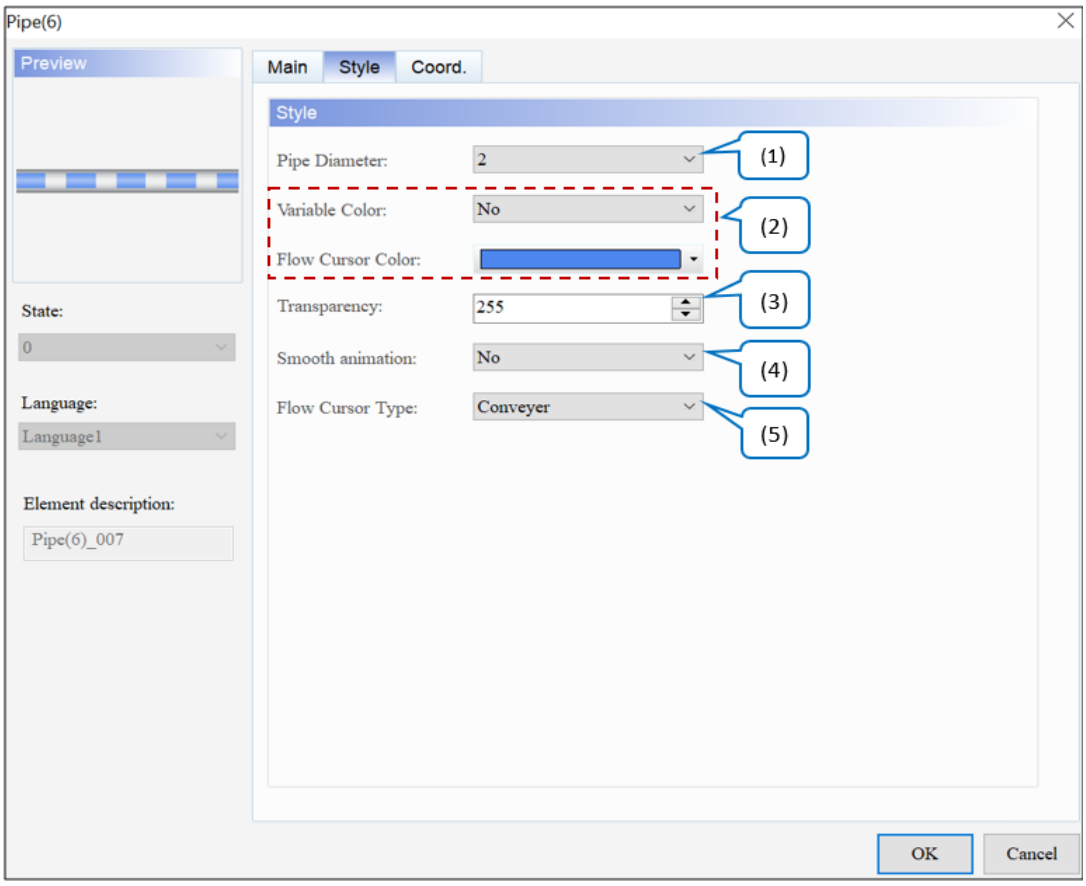
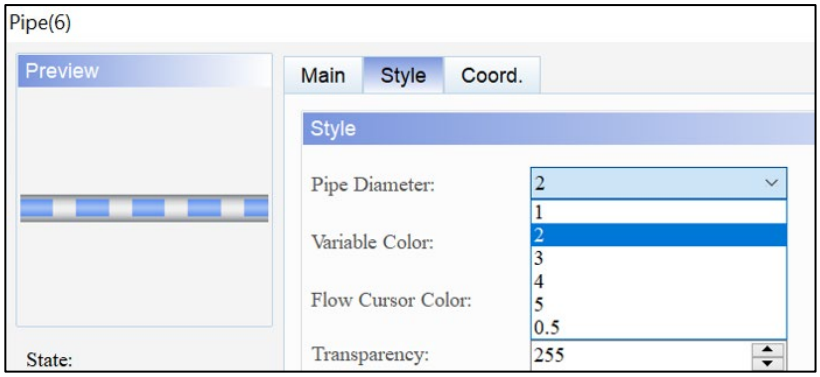
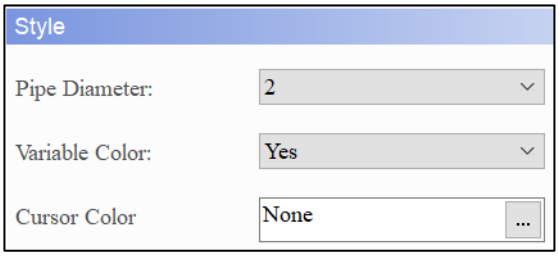
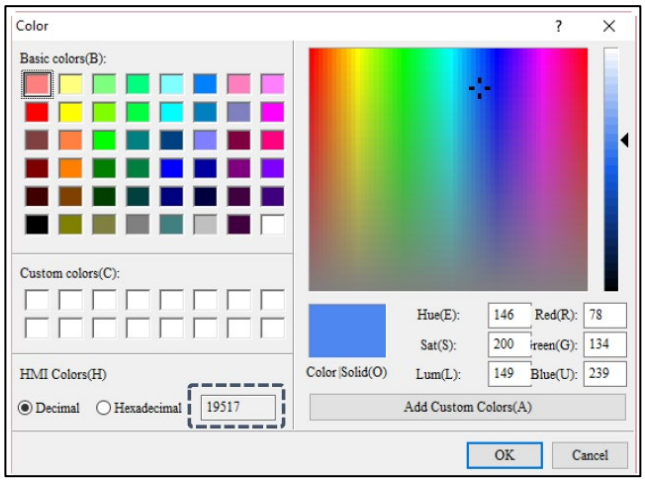
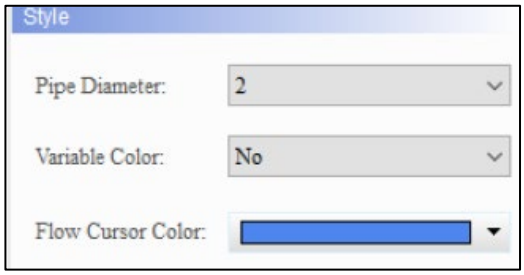


Figure 8 - 7: Pipe(6) / Pipe(7) element Style property page

No.	Function	Description	
(1)	Pipe Diameter	The **Pipe Diameter** ranges from 1 ~ 5 and 0.5. The default value is **2**. 	
(2)	Flow Cursor Color	Variable Color is set to Yes	● When set to Yes, it means the **Cursor Color** address is a variable, which can be changed dynamically. The default value is

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td></td><td>No.
 

Refer to the following figure for the display color corresponding to the value.

</td></tr>
<tr><td>Variable Color is set to No</td><td>When set to No, it means the Flow Cursor Color address is fixed. The default is  .
 
</td></tr>
<tr><td>(3)</td><td>Transparency</td><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(4)</td><td>Smooth animation</td><td colspan="2">It enables Smooth animation function. The default value is No.
When this function is enabled, the element display becomes smoother.</td></tr>
<tr><td>(5)</td><td>Flow Cursor Type</td><td colspan="2">The available options for Flow Cursor Type are: Conveyer, Bubble, and Arrow. The default value is Conveyer.
<table><tr><td>Conveyer</td><td>  </td></tr></table></td></tr>
</table>

No.	Function	Description	
		Bubble	
		Arrow	

- Coord.

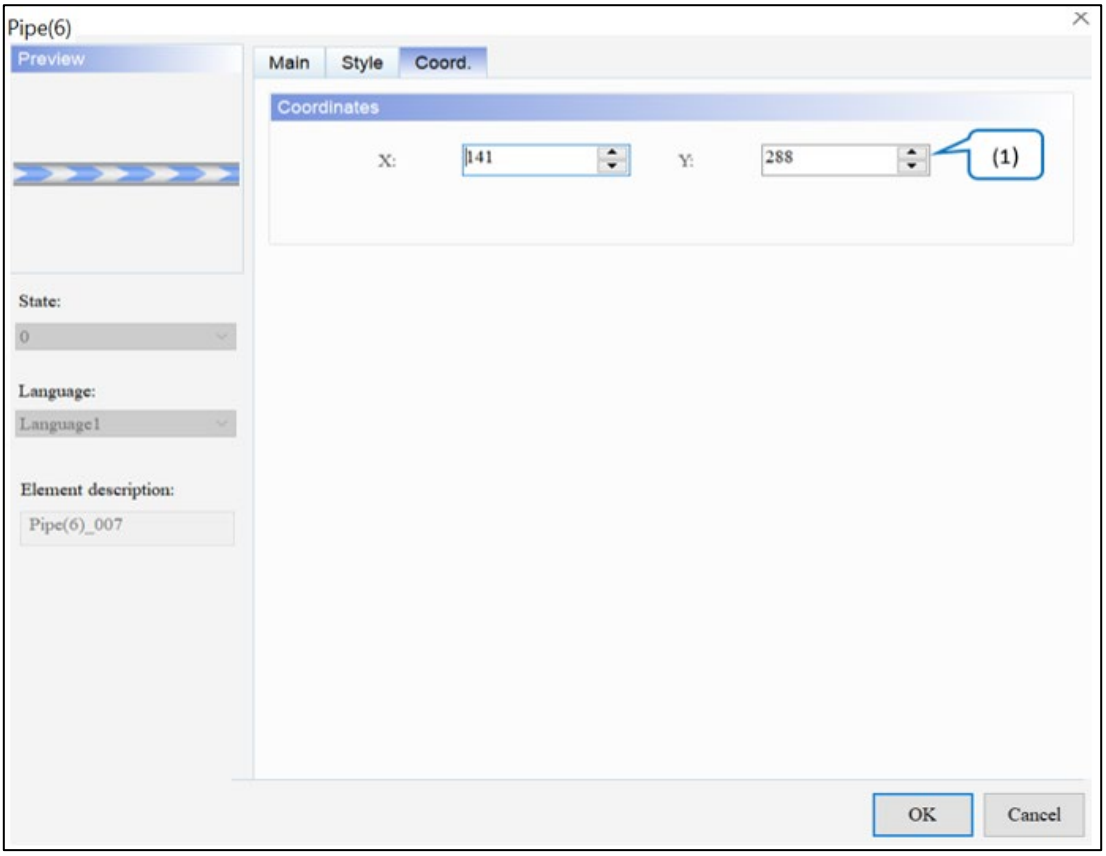


Figure 8 - 8: Pipe(6) / Pipe(7) element Coord. property page

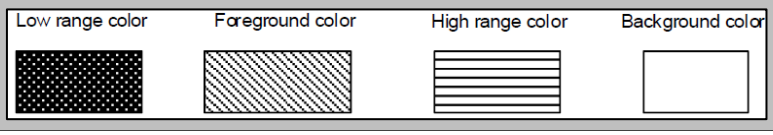
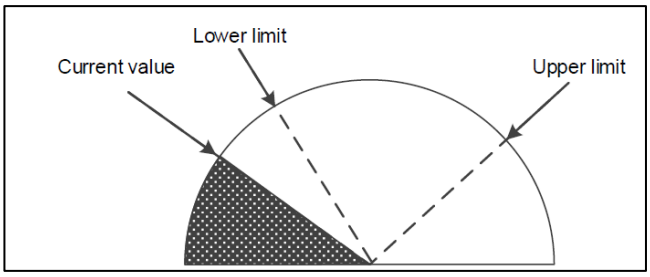
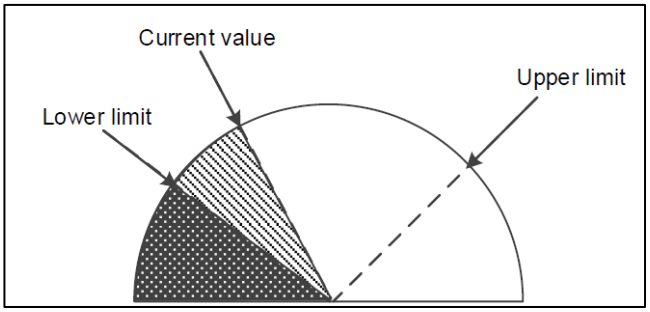
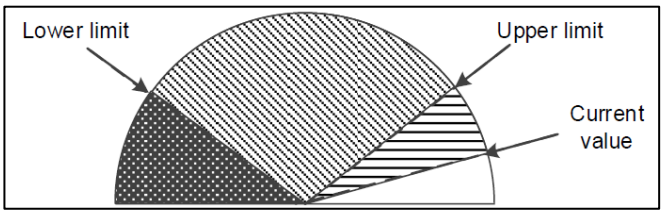
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

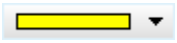
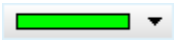
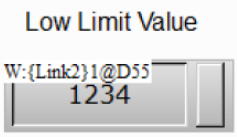
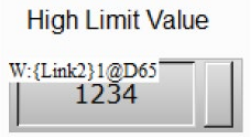
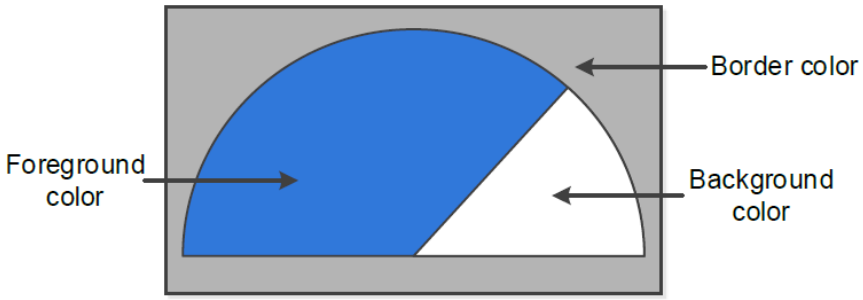
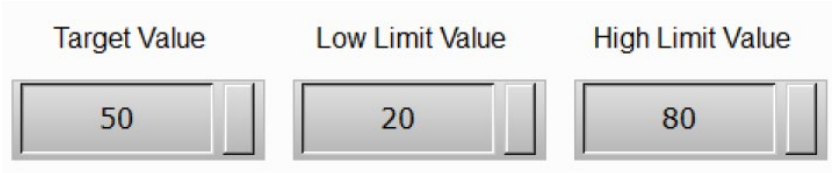
Chapter 9: Pie

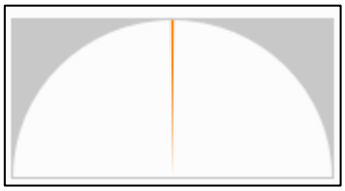
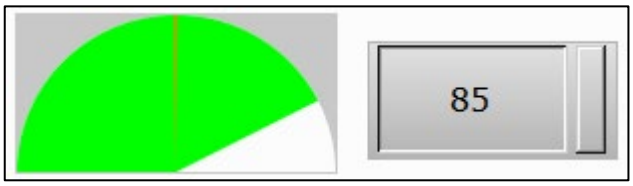
To create a **Pie** element, go to **Elements** > **Pie** and click the desired **Pie** element.

9.1 Pie(1) / Pie(2) / Pie(3) / Pie(4)

The only difference among **Pie(1)**, **Pie(2)**, **Pie(3)**, and **Pie(4)** elements is the shape. All other functions are the same. The introduction for **Pie(1)** is as follows. DIAScreen displays the target value, lower limit, and upper limit set in the register corresponding to the read address on the **Pie** element. **Pie** elements are the same as the **Meter** elements; users can define the memory address for the target value and upper / lower limits to make the application more flexible so it meets users' requirements. Users can also set the colors for the lower limit, upper limit, and target for easier identification and viewing, as shown in the following table.

Use High and Low Limit Colors to Distinguish Pie Elements 	
(1)	
(2)	
(3)	

<table>
<tr><th colspan="5">Pie(1)</th></tr>
<tr><td>Read Address</td><td colspan="2">Pie(1) Element
Read Address $444
  </td><td colspan="2">Numeric Entry Element
Write Address $444
  </td></tr>
<tr><td>Detail settings</td><td>Data Type
Word</td><td>Data Format
Unsigned Decimal</td><td>Minimum
0</td><td>Maximum
100</td></tr>
<tr><td>Select the checkboxes for Target, Range, and Variable target/range limits</td><td colspan="2">Target Value Color
 
Low Limit Property
Low Range Color
 
Low Range Value
{Link2}1@D55</td><td colspan="2">Target Value
{Link2}1@D50
High Limit Property
High Range Color
 
High Range Value
{Link2}1@D65</td></tr>
<tr><td>Create Numeric Entry elements</td><td colspan="2">Numeric Entry Element
Write Address {Link2}1 @D50
  </td><td>Numeric Entry Element
Write Address {Link2}1 @D55
  </td><td colspan="2">Numeric Entry Element
Write Address {Link2}1 @D65
  </td></tr>
<tr><td>Pie(1) element diagram</td><td colspan="4">  </td></tr>
<tr><td>Execution result</td><td colspan="4"> 
Target: Enter a target value of 50, and it is displayed in orange.</td></tr>
</table>

<table>
<tr><th colspan="3">Pie(1)</th></tr>
<tr><td rowspan="3"></td><td></td><td>  </td></tr>
<tr><td>Low Limit</td><td>Enter a value of 15 at $444, which is less than the low limit value of 20, and is displayed in yellow.
 
</td></tr>
<tr><td>High Limit</td><td>Enter a value of 85 at $444, which is greater than the high limit value of 80, and is displayed in green.
 
</td></tr>
</table>

On double-clicking **Pie(1)** element, the property page appears as follows.

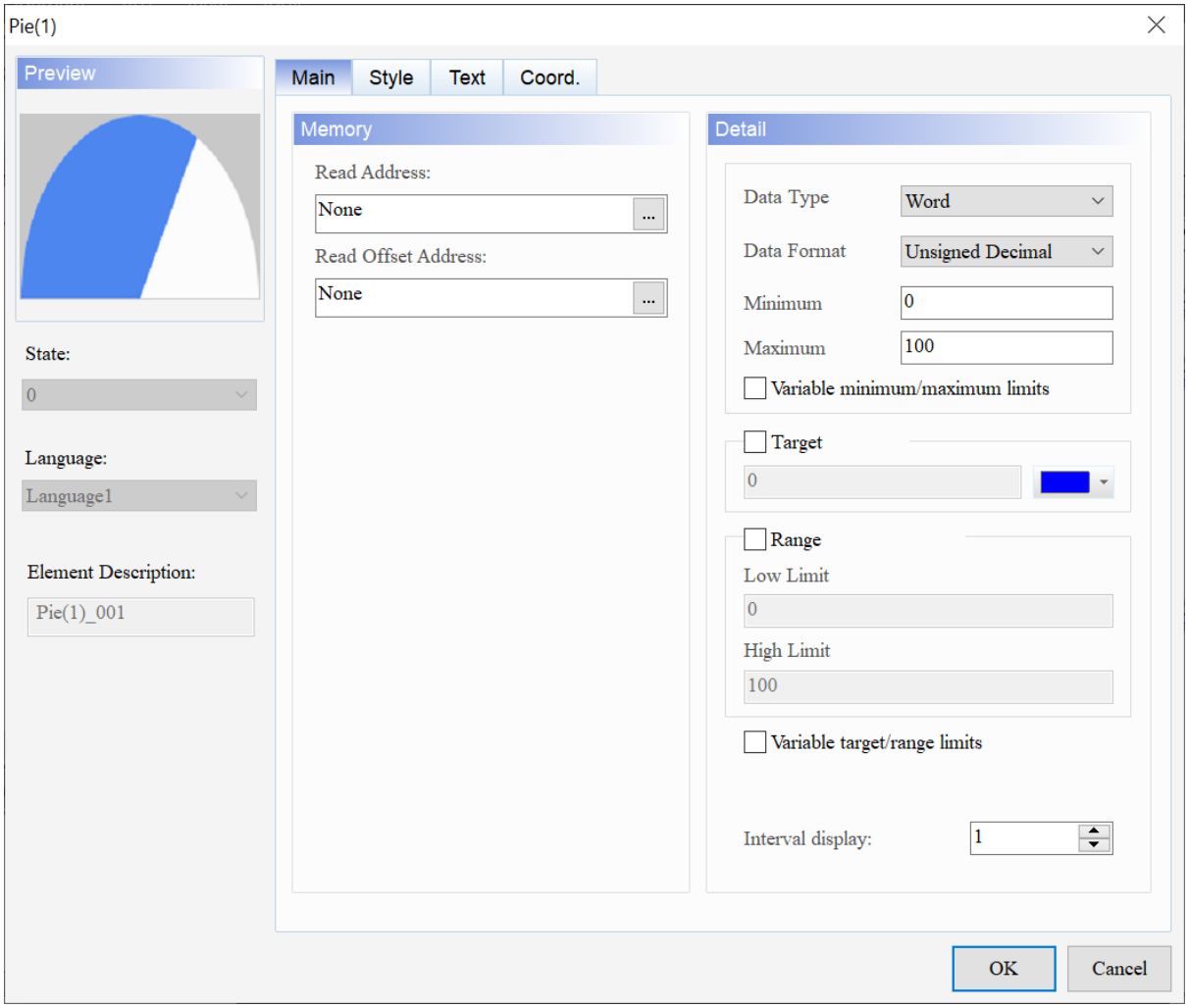


Figure 9 - 1: Pie(1) element property page

Pie(1)	
Function	**Description**
Preview	Pie elements are only for viewing multi-language data display and do not support multiple states.
Main	Set the Read Address and Read Offset Address. Set the Data Type, Data Format, Minimum / Maximum input value, and select the checkbox for Variable minimum/maximum limits. Set whether to display the target value and its color, and select the checkboxes for Range and Variable target/range limits. Set the Interval display.
Style	Set the Border Color, Low Range Color, High Range Color, element Style, Foreground Color, Background Color, and Display the color of each. Set Transparency, Smooth animation, Anti-aliasing, and Target Value Style.

Pie(1)	
Function	**Description**
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

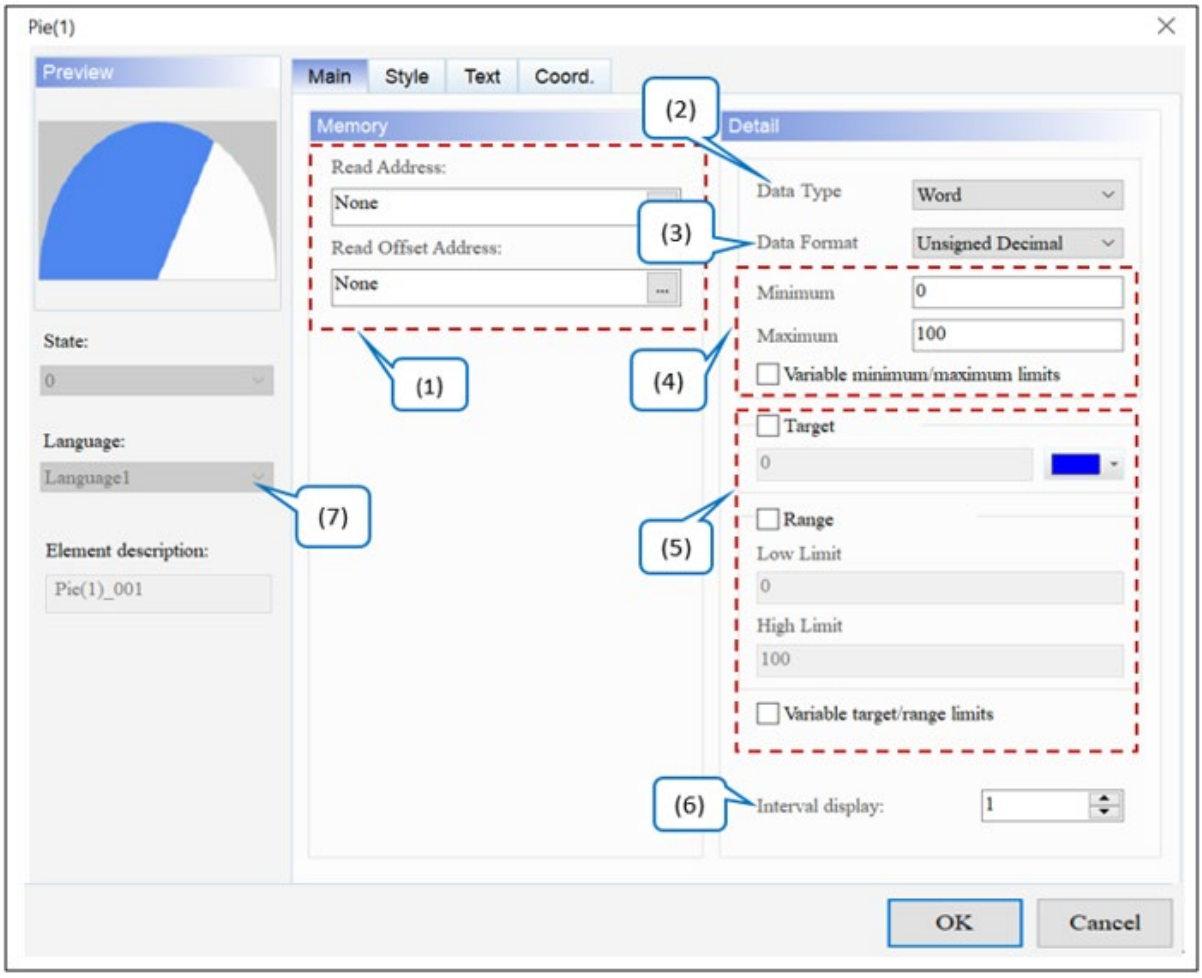
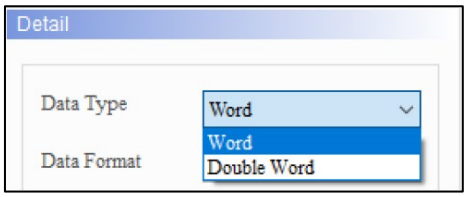
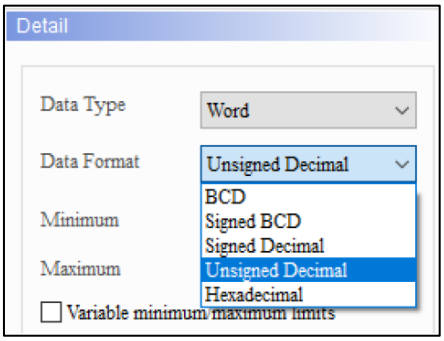
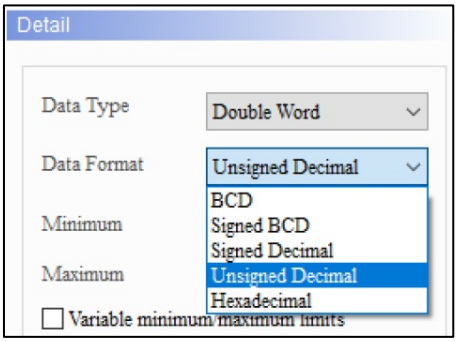
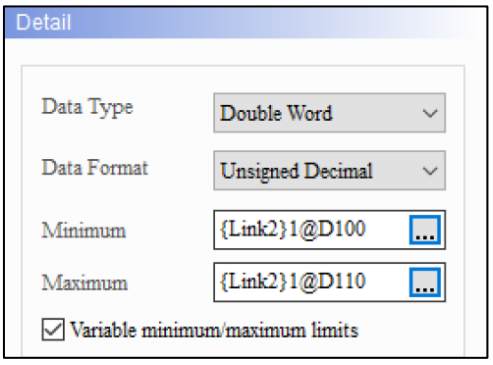
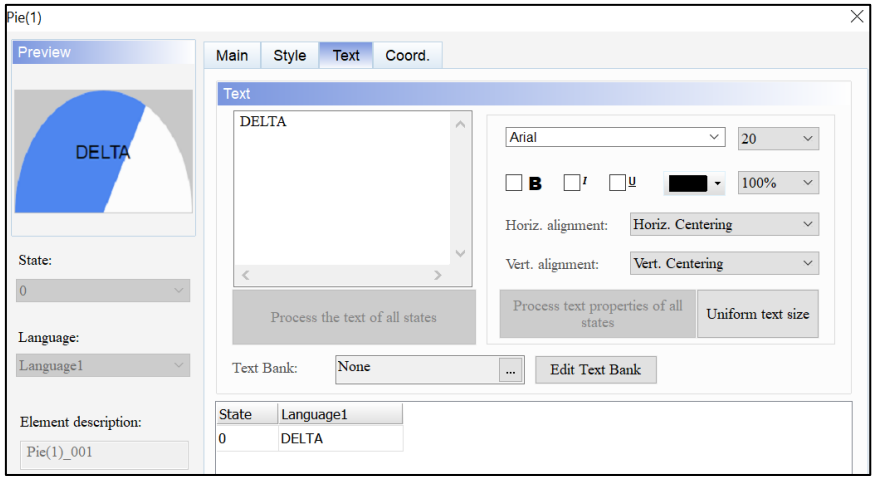


Figure 9 - 2: Pie(1) element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Read Address</td><td>● Select the Internal Memory or the controller register address. The Input memory Type must be Word.
● Select Link name or Device Type. Refer to <u>Memory Settings</u>.</td></tr>
<tr><td>Read Offset Address</td><td>Refer to <u>Appendix D Write and Read Offset Address</u>.</td></tr>
<tr><td>(2)</td><td>Data Type</td><td>The available options for Data Type are: Word and Double Word. The default value is Word.
 
</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>● When the Data Type is Word, the supported Data Format is as follows.
 

● When the Data Type is Double Word, the supported Data Format is as follows.
 
</td></tr>
<tr><td>(4)</td><td>Minimum / Maximum</td><td>● The permissible range for the Minimum and Maximum values is subject to change based on the selected Data Type and Data Format. The default Minimum is 0 and Maximum is 100.
● Refer to the following table.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td>Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2"></td><td></td><td>
<table>
<tr><td rowspan="4"></td><td>Signed BCD</td><td>-999 ~ +9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ +32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hexadecimal</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="5">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ +99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ +2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
<tr><td>Hexadecimal</td><td>0 ~ 0xFFFFFFFF</td></tr>
</table>
</td></tr>
<tr><td>Variable minimum/ maximum limits</td><td>Select this checkbox to set the memory addresses for the Minimum and Maximum values. Then, write the required values to the addresses.
 
</td></tr>
<tr><td rowspan="3">(5)</td><td rowspan="3">Display Format</td><td>Target</td><td>● If the Variable target/range limits checkbox is not selected, enter only a constant value to define the target display value of the Pie element. The default value is 0.
● Specify the display color. The default is .</td></tr>
<tr><td>Range</td><td>● The Range includes Low Limit and High Limit. The default Low Limit is 0 and High Limit is 100.
● Like the case of the Target display, if the Variable target/range limits checkbox is not selected, enter only constant values to define the lower and upper limits of the Pie element.</td></tr>
<tr><td>Variable target/range limits</td><td>If values are selected, define the memory addresses to dynamically change the displaying target value, lower and upper limit values.</td></tr>
</table>

No.	Function	Description
(6)	Interval display	● The minimum **Interval display** is 1, and the maximum is 100, which can be adjusted by users. The default value is **1**. ● The value displayed in the interval needs to be divided by the difference between the maximum value and the minimum value to have an effect. ● For example, if the minimum value is 0, the maximum value is 100, the interval display value is 20, the value is 0~19, no scale is displayed, the value is 20~39, the scale is 20, the value is 40~59, the scale is 40, and so on.
(7)	Language	When the users have set language, they can edit the text properties to be displayed through the **Language** setting of the element. 

- Style

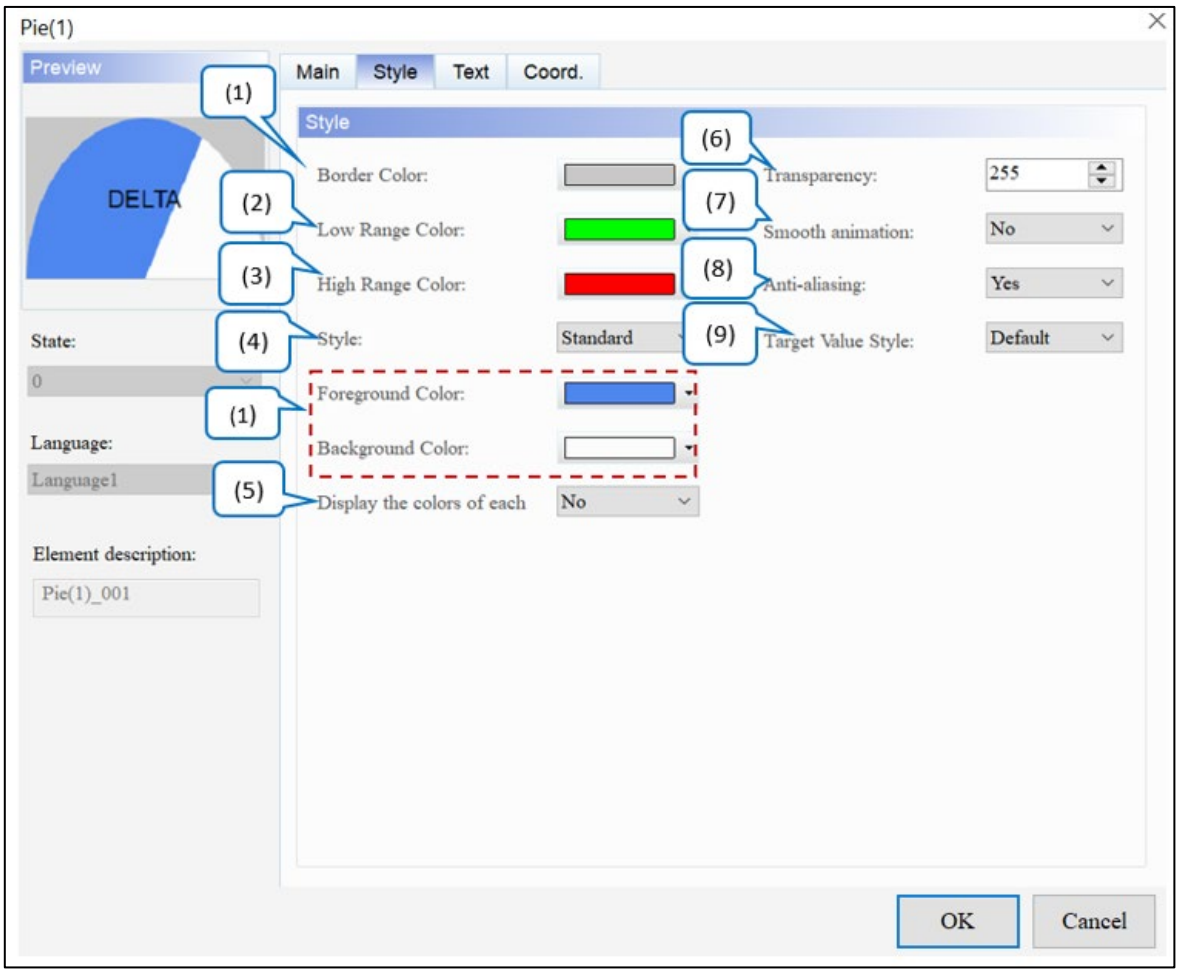
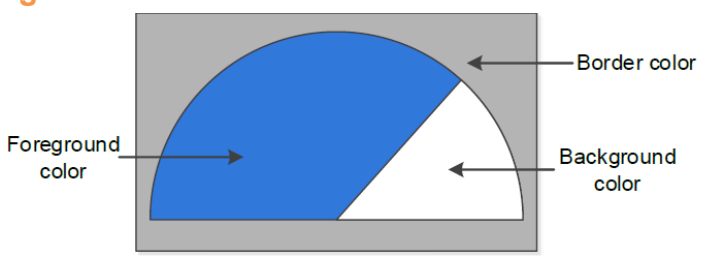
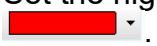
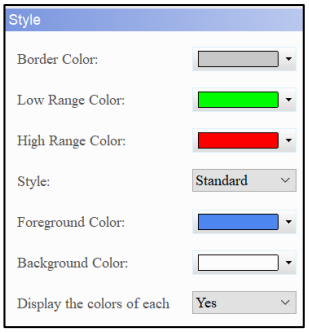
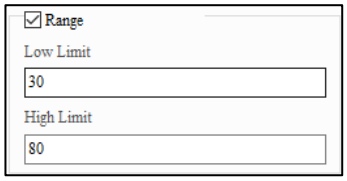
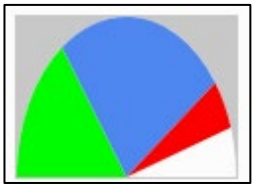


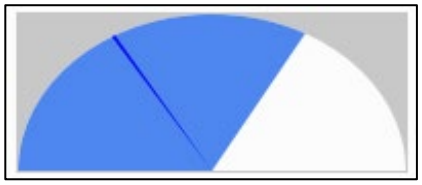
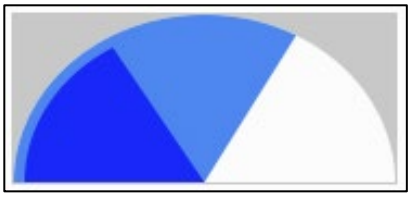
Figure 9 - 3: Pie(1) element Style property page

No.	Function	Description
(1)	Border Color / Foreground Color / Background Color	Set the border color, foreground color and background color of the element. The default **Border Color** is , **Foreground Color** is , and the **Background Color** is . 

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>(2)</td><td>Low Range Color</td><td colspan="2">Set the low range color to display. The default is  .</td></tr>
<tr><td>(3)</td><td>High Range Color</td><td colspan="2">Set the high range color to display. The default is  .</td></tr>
<tr><td>(4)</td><td>Style</td><td colspan="2">This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Raised, Sunken, and Transparent. The default value is Standard.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td rowspan="2">(5)</td><td rowspan="2">Display the colors of each</td><td>No</td><td>Set to No, no matter what the value is, only the Foreground Color will be displayed.
  </td></tr>
<tr><td>Yes</td><td>Set to Yes, with the Low Range Color and the input value of the permissible range, it can represent different colors of each stage.
 



According to the preceding settings, Pie(1) element is displayed as follows.
  </td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 to 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(7)</td><td>Smooth animation</td><td>● The Smooth animation function is available for this element. The default value is No.
● When this function is enabled, the element display becomes smoother.</td></tr>
<tr><td>(8)</td><td>Anti-aliasing</td><td>● Anti-aliasing function is available for this element. The default value is Yes.
● When the anti-aliasing is enabled, the display of the elements will be more delicate, and there will be no aliasing.
Set Anti-aliasing to Yes 
Set Anti-aliasing to No  </td></tr>
<tr><td>(9)</td><td>Target Value Style</td><td>The available options for display styles of the target value are: Default and Style 1. The default value is Default.
Default 
Style 1  </td></tr>
</table>

- Text

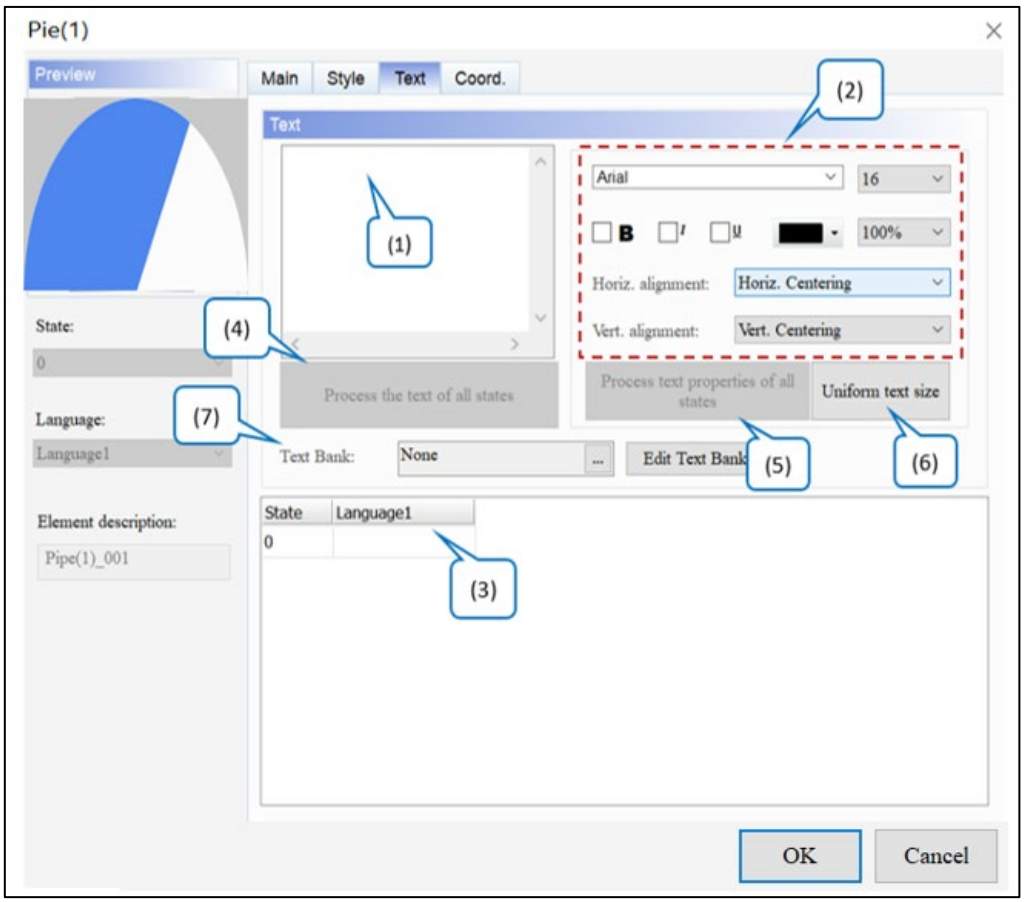
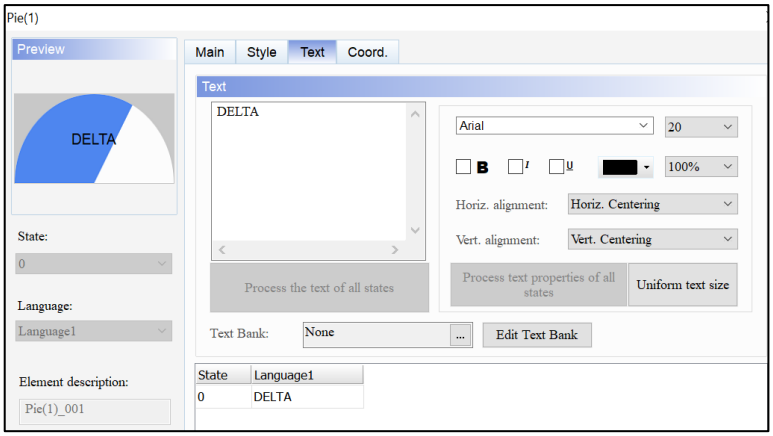
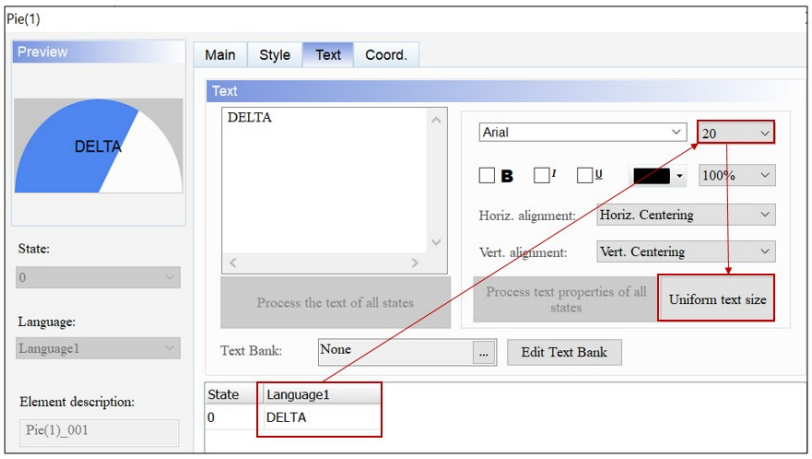


Figure 9 - 4: Pie(1) element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key to start

No.	Function	Description
		editing and entering the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows to edit multi-language text data. As shown in the **Text** property image, users can enter English words in the **English** column.
(4)	Process text for all states	**Pie element** has no multi-state, and this function is disabled.
(5)	Process text properties of all states	**Pie element** has no multi-state, and this function is disabled.
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Coord.

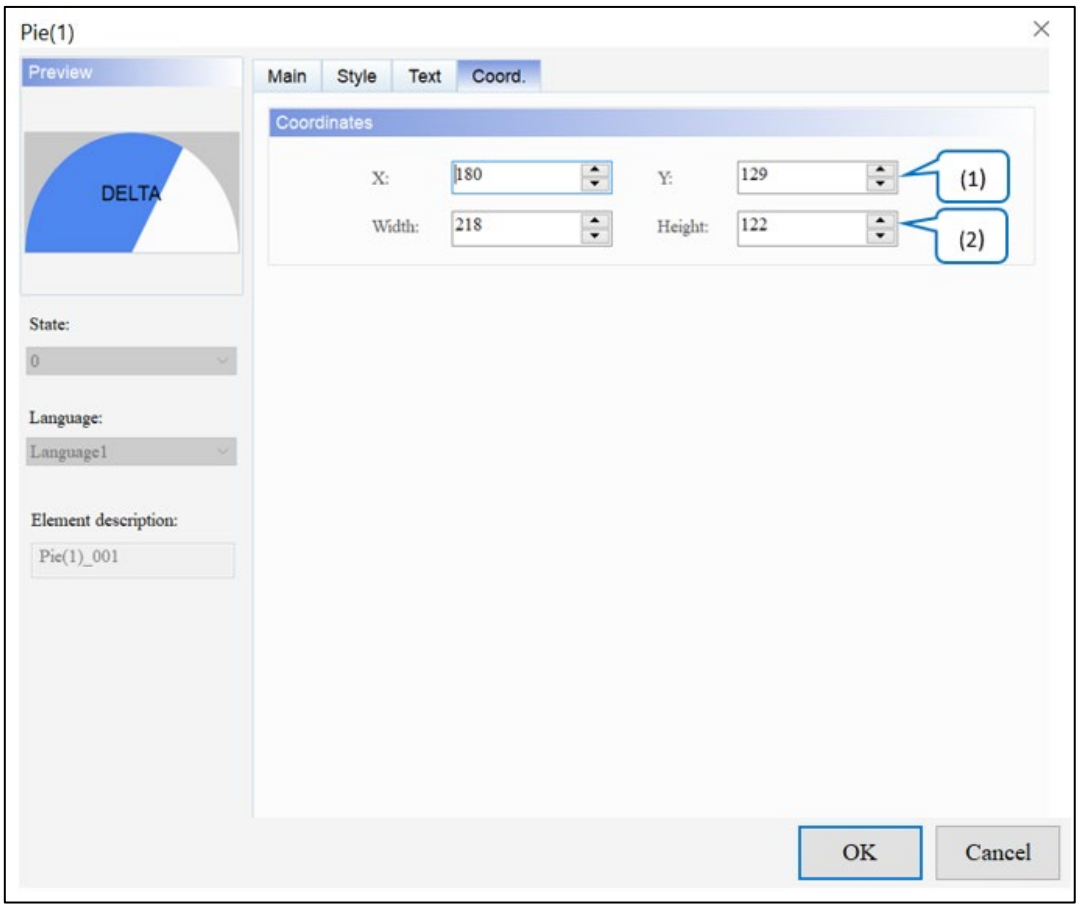


Figure 9 - 5: Pie(1) element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 10: Indicator

To create an **Indicator** element, go to **Elements** > **Indicator** and click the desired **Indicator** element.

10.1 Multistate Indicator

The **Multistate Indicator** element displays the state of a given address. No matter the element uses Bit, LSB, or Word as the Data Type, once the HMI reads the memory address, the indicator prompts a change of state. Users can also use different settings to have the **Multistate Indicator** element change its light or display the corresponding messages to notify the users about the change of state value. With such notifications, checking the message for each state becomes easier. The indicator can set to display ON and OFF states.

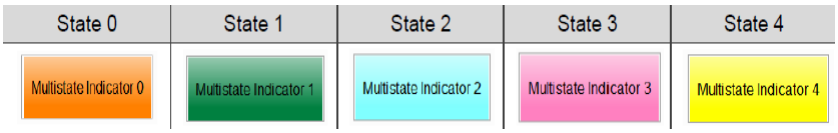
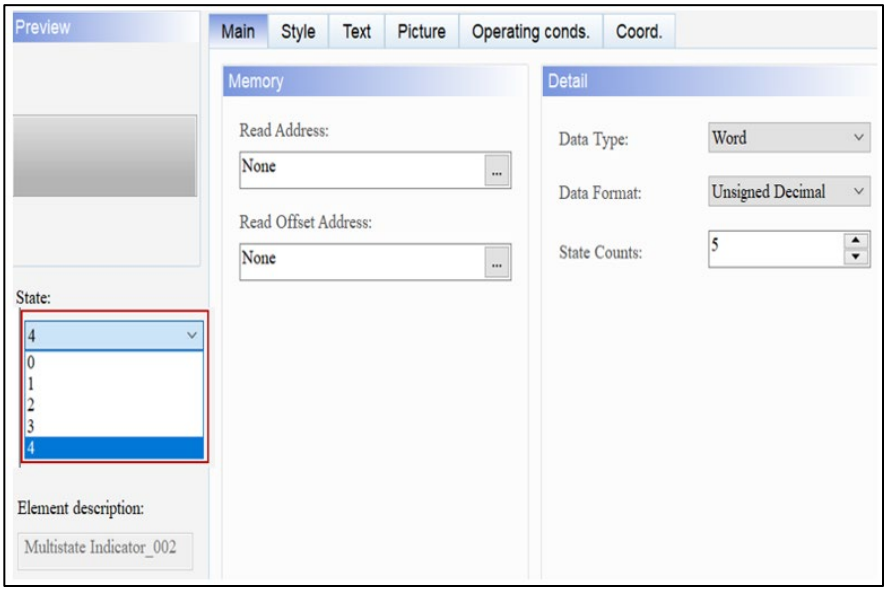
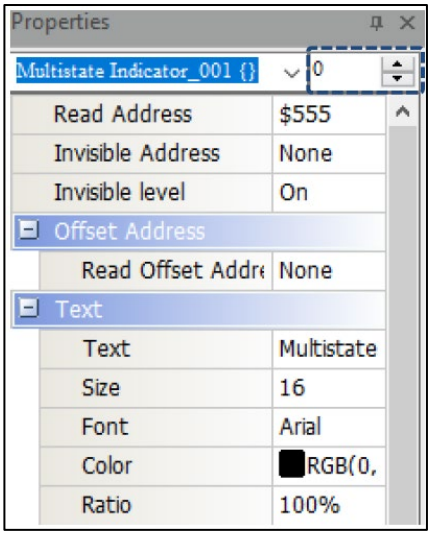


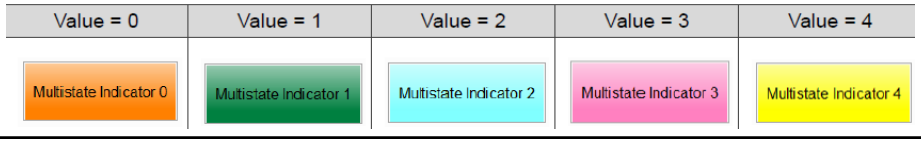
Pictures and colors can also be used to display the change of each state.



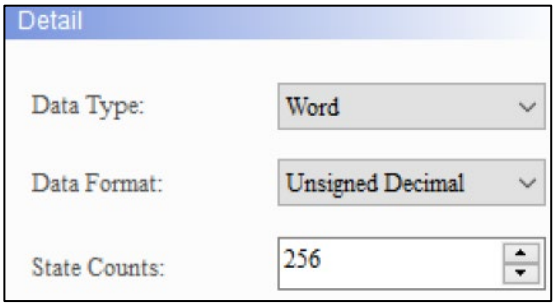
The following table describes the **Multistate Indicator** element example.

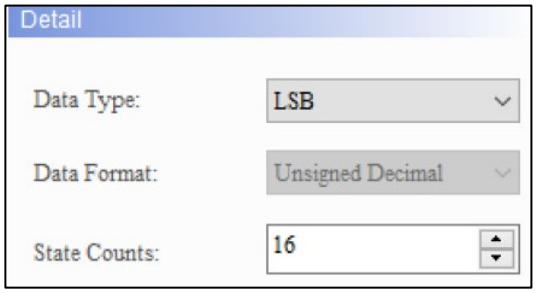
Multistate Indicator				
Read Address	Multistate Indicator Element		Numeric Entry Element	
	Read Address	$555	Write Address	$555
	R:$555 Multistate Indicator		W:$555 # # # #	

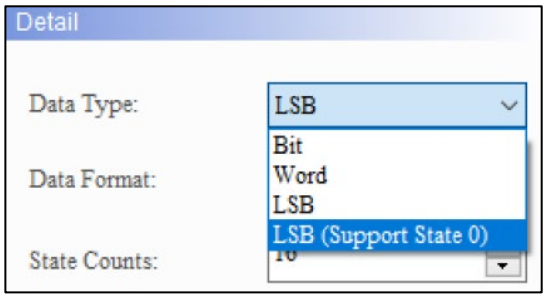
Multistate Indicator	
Detail settings	Data Type: Word Data Format: Unsigned Decimal State Counts: 5
Set Foreground Color	
Multistate Indicator	● Double-click the element to view the diagram of each state. In this example, the **State Counts** is set to 5, so the state values are 0 ~ 4, as shown in the following figure.  ● Go to the upper right corner in the **Properties** window of the element to switch the state. 

Multistate Indicator	
Execution result	● After downloading the screen, the **Multistate Indicator** initial state is 0. Next, enter a value to the **Numeric Entry** element.  ● Input the values 0 ~ 4 in sequence to see the results. 

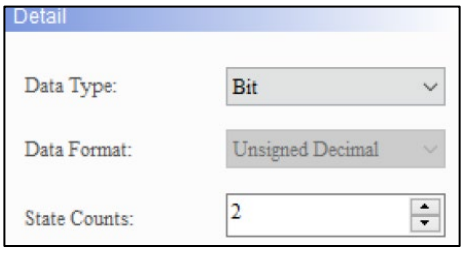
The **Multistate Indicator** element supports four types of **Data Type**, as shown in the following table. To add or reduce the number of states, simply increase or decrease the number of **State Counts** in **Detail** settings in **Main** property page.

Multistate Indicator		
Data Type	State Counts	Memory Address
Word	If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states. 	If the **Data Type** is Word, the memory address is in units of Word.

<table>
<tr><th colspan="3">Multistate Indicator</th></tr>
<tr><th>Data Type</th><th>State Counts</th><th>Memory Address</th></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>LSB is to first convert the data in the register to binary data, and then use the Least Significant Bit (LSB) to determine the current state of the object. If the Data Type is LSB, users can set 1 ~ 16 states except for State 0.
 

To display State 0, select LSB (Support State 0) for the Data Type.
 

If users select LSB, when the state is 0, the element is in black state.
  </td><td>The Data Type is in two formats, LSB and LSB (Support State 0), and the memory address is in Word.</td></tr>
<tr><td></td><td>The following table illustrates the use of the lowest non-zero bit to determine its state value after converting from decimal to binary. For example, when the decimal values are 3 and 7, how will DIAScreen determine the lowest bit to determine the displayed status value?
<table>
<tr><th>Decimal</th><th>Binary</th><th>State Value</th></tr>
<tr><td>0</td><td>0000000000000000</td><td>State = 0 when all bits are 0.
NOTE: LSB (Support State 0) must be selected.</td></tr>
<tr><td>1</td><td>0000000000000001</td><td>The least significant bit that is not 0 is bit 0, showing state 1</td></tr>
<tr><td>2</td><td>0000000000000010</td><td>The least significant bit that is not 0 is bit 1, showing state 2</td></tr>
<tr><td>3</td><td>0000000000000011</td><td>The least significant bit that is not 0 is bit 0, showing state 1</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th colspan="4">Multistate Indicator</th></tr>
<tr><th>Data Type</th><th colspan="2">State Counts</th><th>Memory Address</th></tr>
<tr><td rowspan="17"></td><td>4</td><td>0000000000000100</td><td>The least significant bit that is not 0 is bit 2, showing state 3</td></tr>
<tr><td>7</td><td>0000000000000111</td><td>The least significant bit that is not 0 is bit 0, showing state 1</td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The least significant bit that is not 0 is bit 3, showing state 4</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The least significant bit that is not 0 is bit 4, showing state 5</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The least significant bit that is not 0 is bit 5, showing state 6</td></tr>
<tr><td>64</td><td>0000000001000000</td><td>The least significant bit that is not 0 is bit 6, showing status 7</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The least significant bit that is not 0 is bit 7, showing status 8</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The least significant bit that is not 0 is bit 8, showing status 9</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The least significant bit that is not 0 is bit 9, showing status 10</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The least significant bit that is not 0 is bit 10, showing state 11</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The least significant bit that is not 0 is bit 11, showing state 12</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The least significant bit that is not 0 is bit 12, showing state 13</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The least significant bit that is not 0 is bit 13, showing state 14</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The least significant bit that is not 0 is bit 14, showing state 15</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The least significant bit that is not 0 is bit 15, showing state 16</td></tr>
<tr><td>Bit</td><td colspan="2">If the Data Type is Bit, only 2 states can be set.
 
</td><td>If the Data Type is Bit, the memory address is in units of Bit.</td></tr>
</table>

On double-clicking the **Multistate Indicator** element, the property page appears as follows.

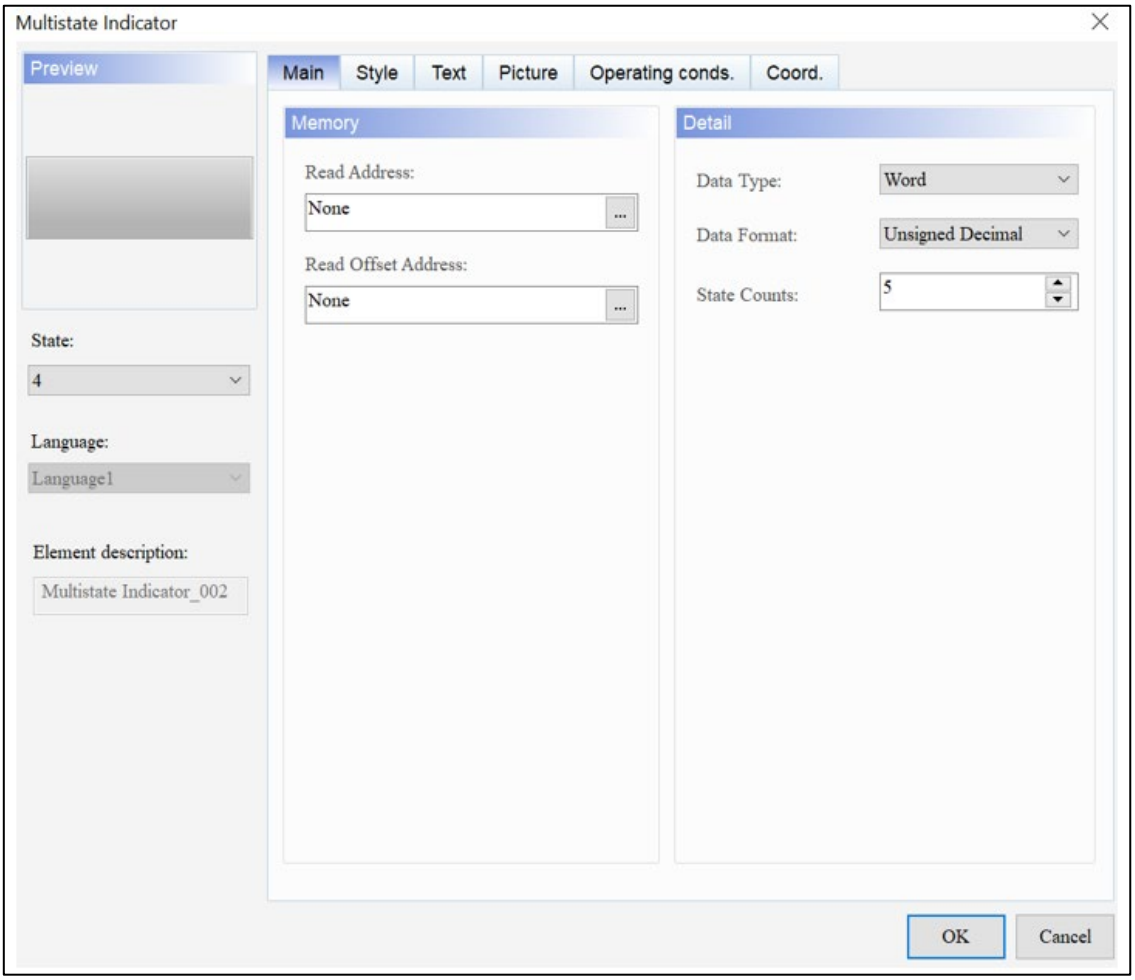


Figure 10 - 1: Multistate Indicator property page

Multistate Indicator	
Function	**Description**
Preview	View the multi-state values of elements and display data in multiple languages.
Main	Set the Read Address and Read Offset Address. Set the Data Type, Data Format, and State Counts.
Style	Set Style, Foreground Color, Blink, Filled style, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.

Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

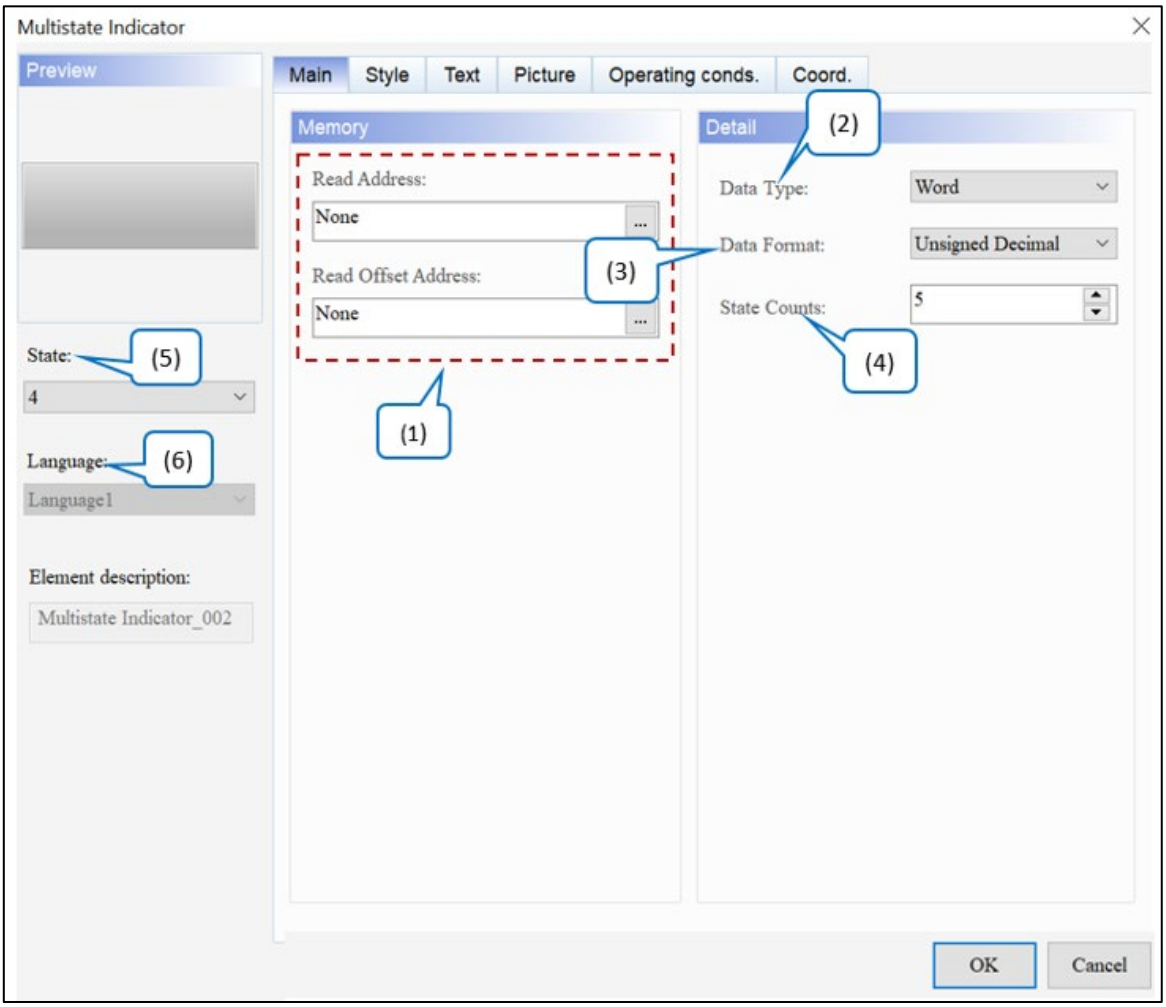
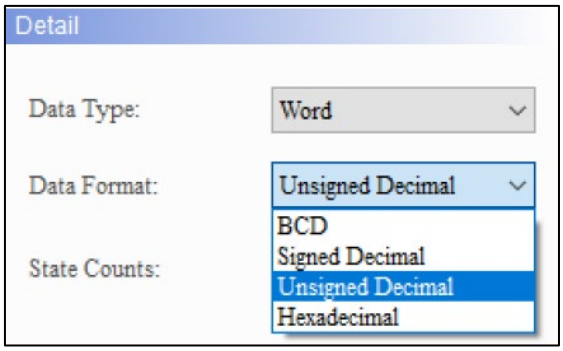
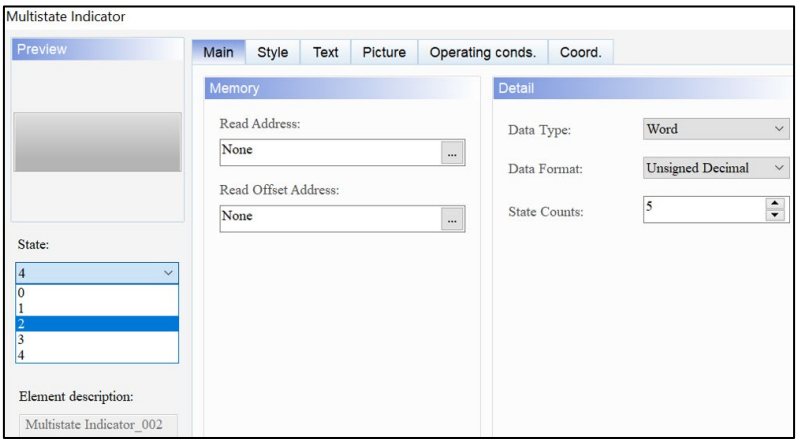
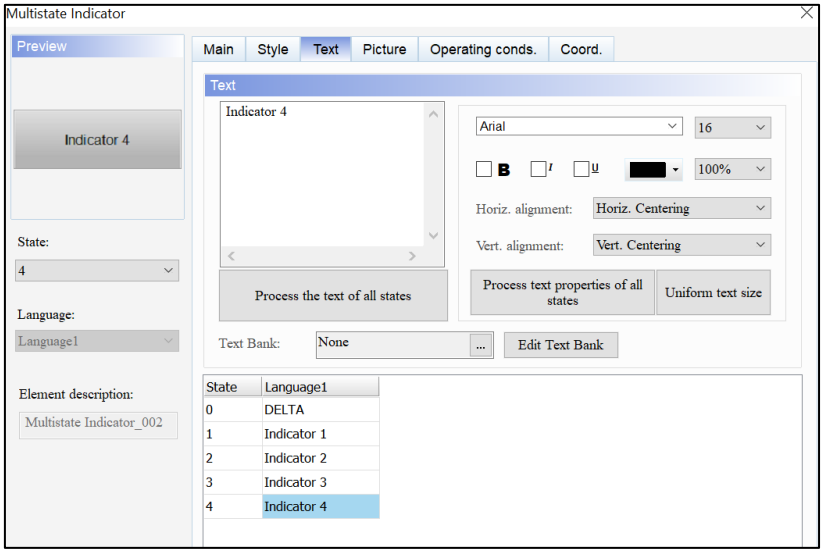


Figure 10 - 2: Multistate Indicator element Main property page

No.	Function	Description
(1)	Read Address	● Select Internal Memory or controller register address. The **Input** memory **Type** will be different according to the **Data Type** selected: Word, LSB or Bit. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.

No.	Function	Description
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0). The default value is **Bit**.
(3)	Data Format	● Select **Data Format** when the **Data Type** is Word. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(4)	State Counts	● Set the total number of states of the **Multistate Indicator** element. The default value is **2**. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.
(5)	State	Preview or change the setting parameters of each state of the element by switching **State**. 

No.	Function	Description
(6)	Language	When the users set language, they can edit the text property to be displayed through the **Language** setting of the element. 

- Style

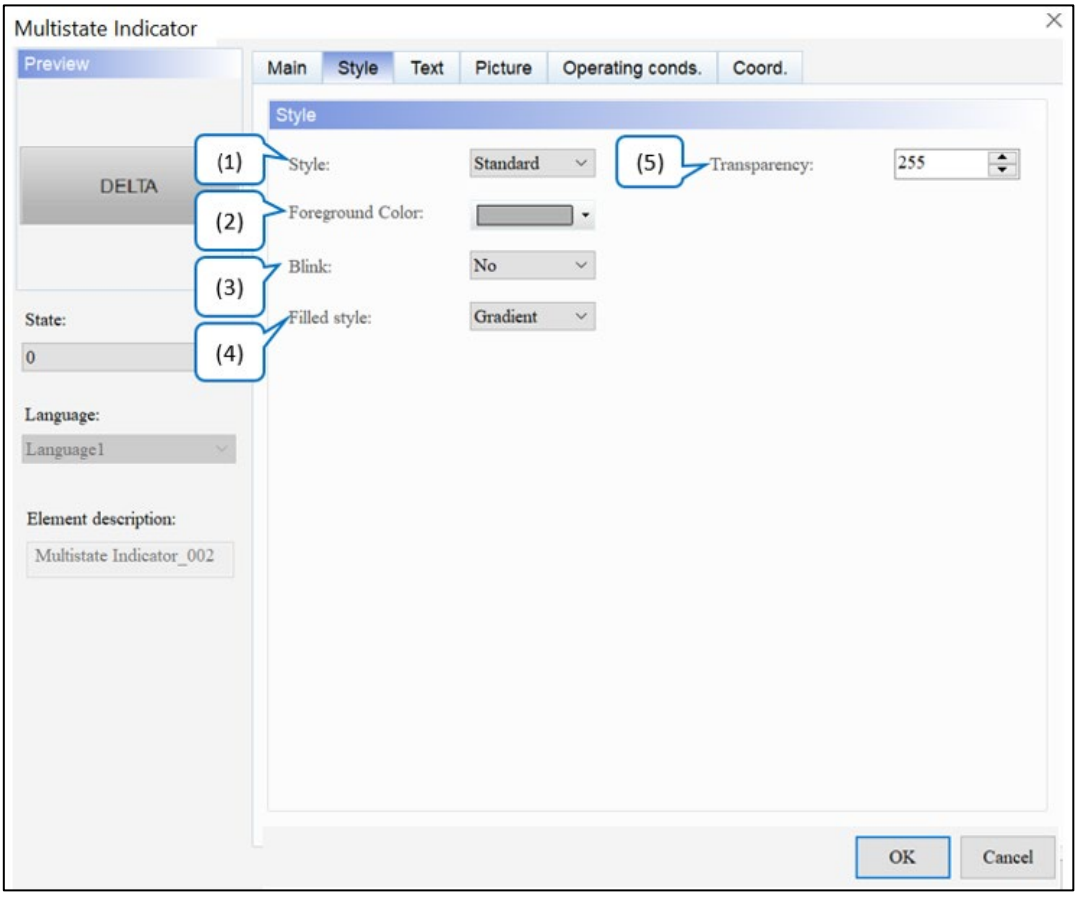
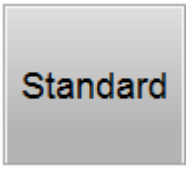
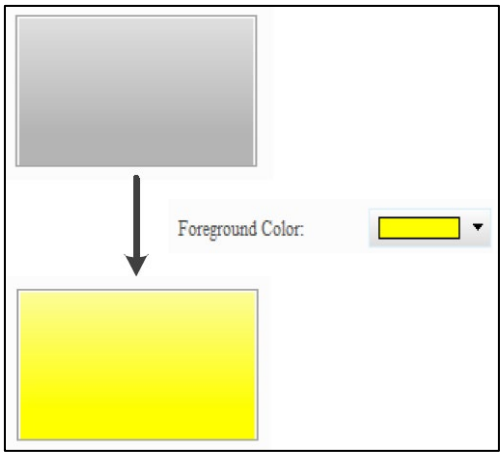
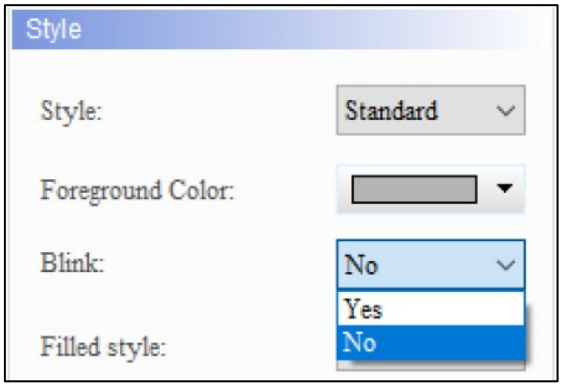


Figure 10 - 3: Multistate Indicator element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of elements. The available options for Style are: Standard, Raised, Round, and Invisible. The default value is Standard.
<table>
<tr><th>Standard</th><th>Raised</th><th>Round</th><th>Invisible</th></tr>
<tr><td> 
</td><td> 
</td><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Foreground Color</td><td>

Set the foreground color of the element. The default is  .
When users set Style to Invisible, the Foreground Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Blink</td><td>Set whether the indicator blinks when it switches between states, The Blink color is the contrast color of the element foreground color. The default Blink is No.


</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 series models are: Gradient and Fixed. The default value is Gradient.
If DOP-B project is opened, the elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

</td></tr>
</table>

No.	Function	Description	
		Gradient	
		Fixed	
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency value of the element.	

- Text

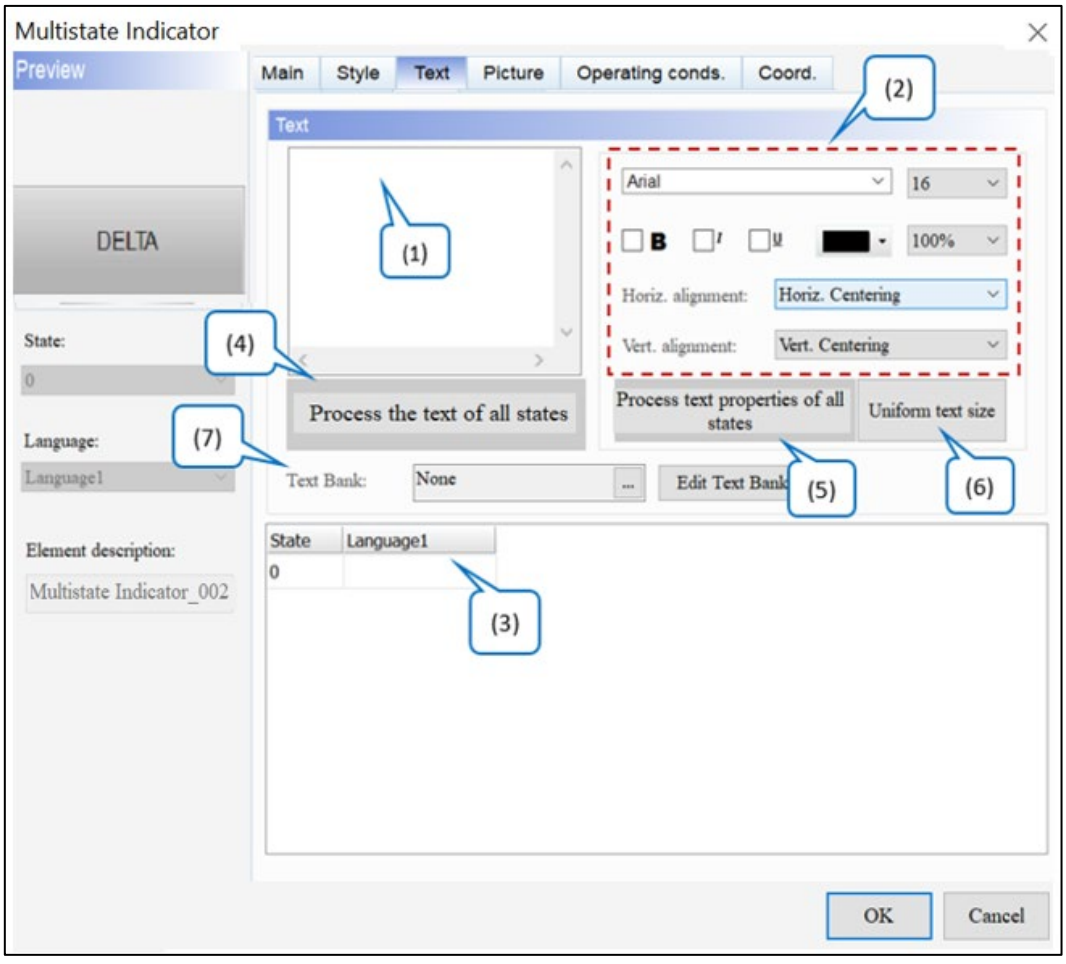
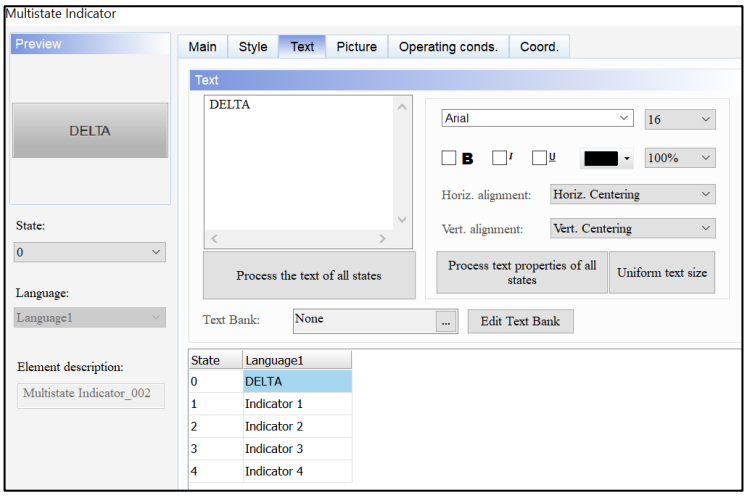
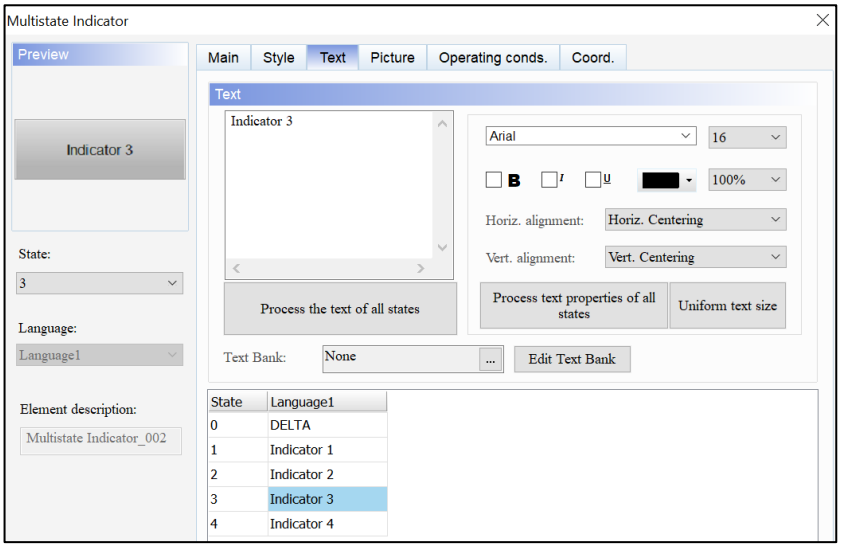
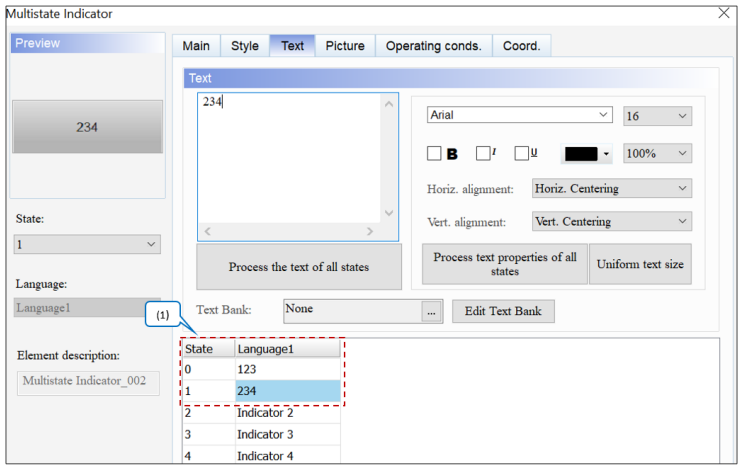
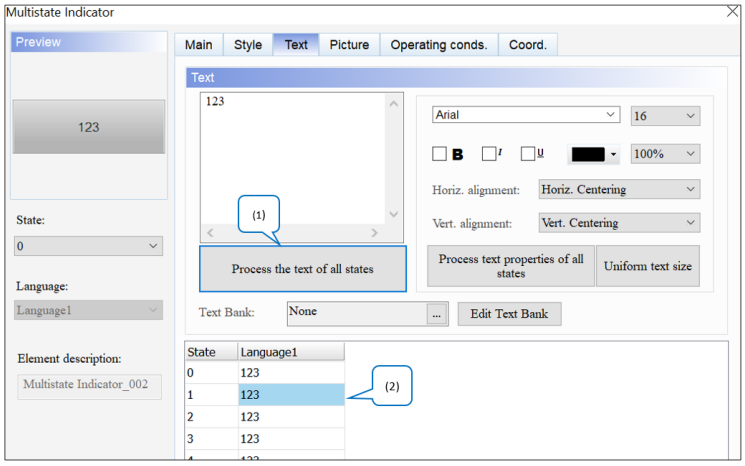
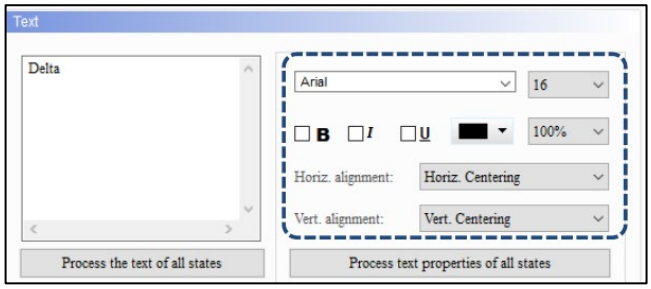


Figure 10 - 4: Multistate Indicator element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key to start editing and entering the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** page allows to edit multi-language data. As shown in the **Text** property image, users can enter English words in the **English** column. 
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state users select. ● The following illustrates the steps: 1. Input *123* to State 0, and *234* to State 1. 2. Click State 0. 3. Click **Process the text of all states**, and State 1 text changes to *123*.

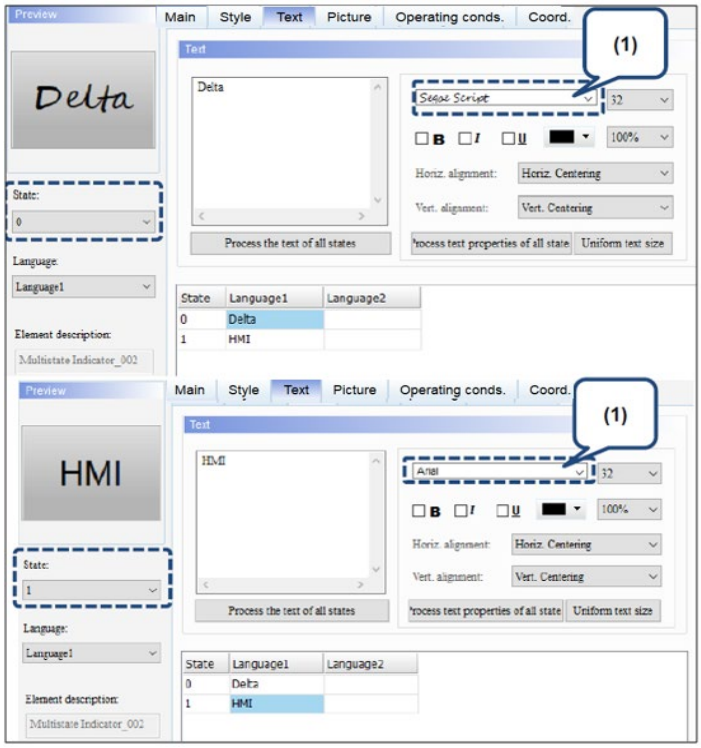
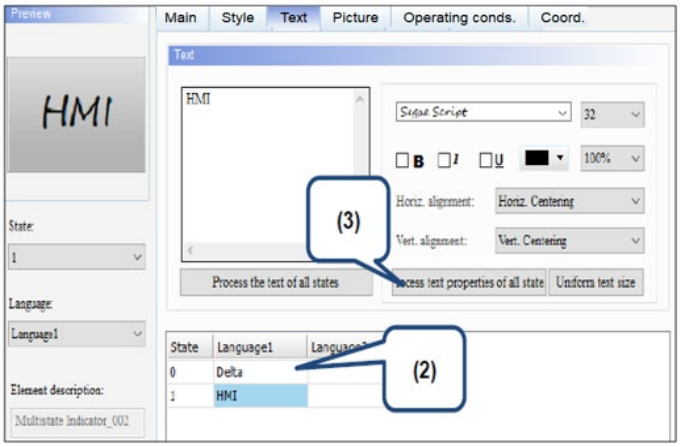
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
<tr><td>(5)</td><td>Process text properties of all states</td><td colspan="2">

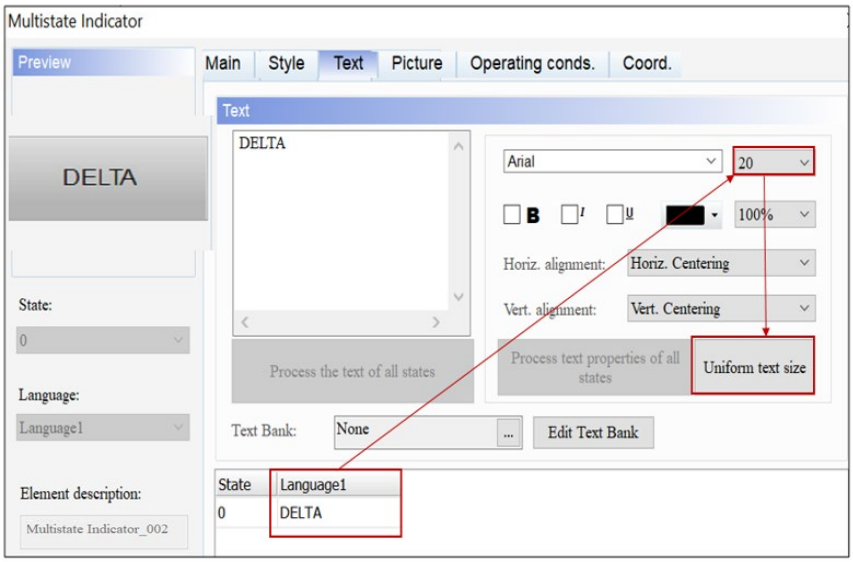
This function changes all the text properties based on the state users select. Items included in the Text property page are shown in the following figure.


The following is an example description:

Input Delta to State 0, and set the font to Segoe Script; input HMI to State 1, and set the font to Arial.
Click State 0.
Click Process text properties of all states, and State 1 font changes to Segoe Script.

</td></tr>
</table>

No.	Function	Description
		Before Change  After Change 
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

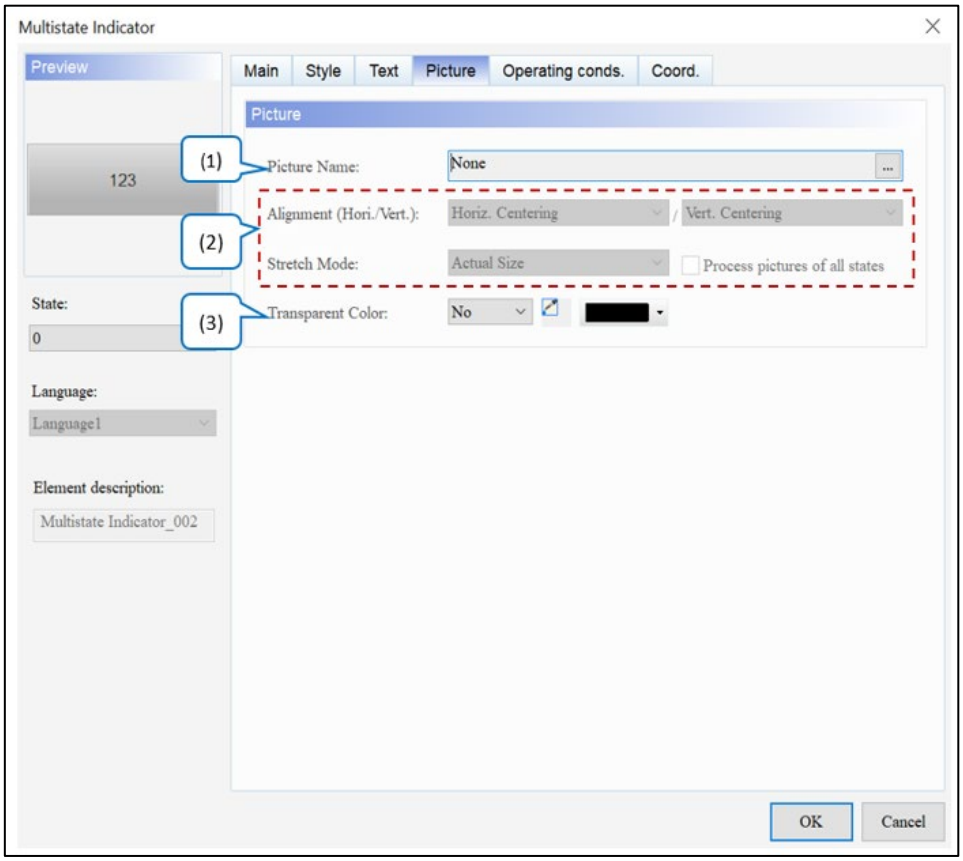
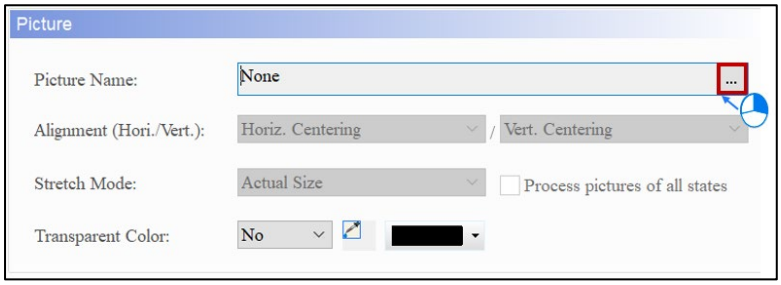
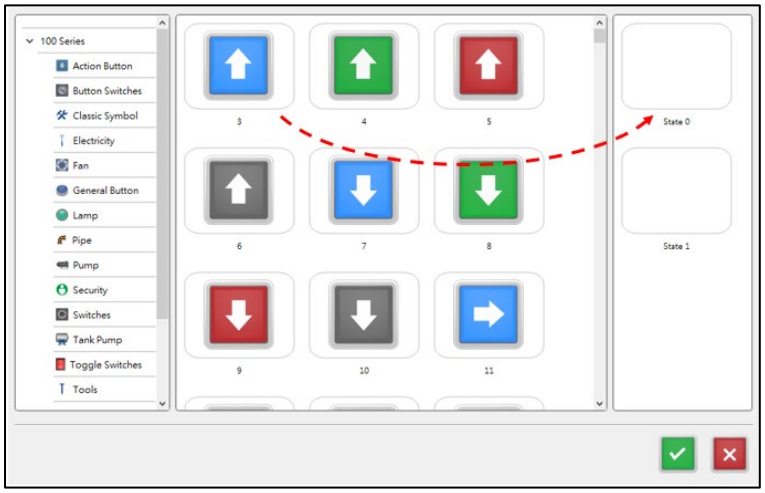
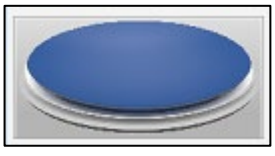


Figure 10 - 5: Multistate Indicator element Picture property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">(1)</td><td rowspan="3">Picture Name</td><td>To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.
 



● To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td>Alignment</td><td>Set the alignment of the pictures through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>Stretch 1:1 means that the picture will be scaled according to the aspect ratio of the element.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
</table>

No.	Function	Description
	Process picture of all states	Assuming that the elements have multiple states and some pictures do not fill the full element display area, if users select the **Process pictures of all states** checkbox, use this function to process all pictures instead of setting them one by one, which saves the editing time.
(3)	Transparent Color	● This function specifies a color in the picture and make it transparent. The default value is **No**. ● Select icon and click white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the **Foreground Color** of the element. 

● Operating conds.

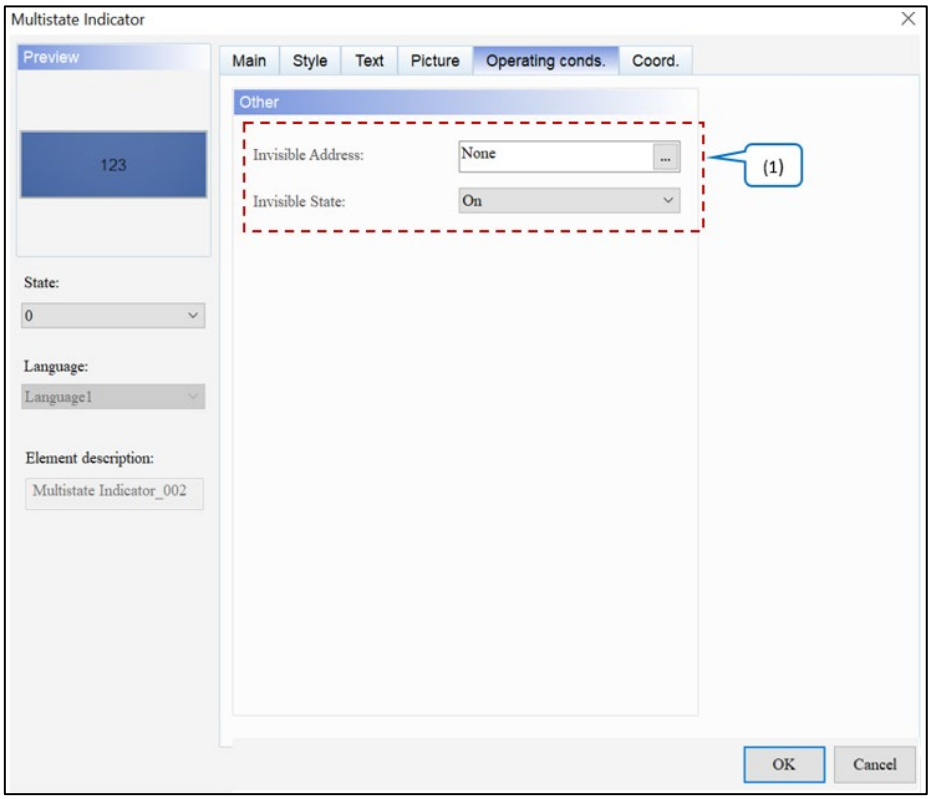


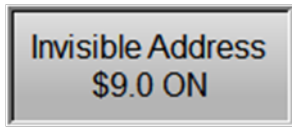
Figure 10 - 6: Multistate Indicator element Operating conds. property page

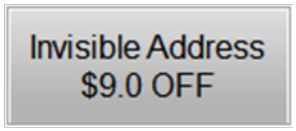
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="5">(1)</td><td rowspan="2">Invisible Address</td><td colspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

</td></tr>
<tr><td rowspan="4">Invisible State</td><td>Invisible State is On</td><td> 

Element disappear
 
</td></tr>
<tr><td>Invisible State is Off</td><td> 

Element disappear
 
</td></tr>
</table>

- Coord.

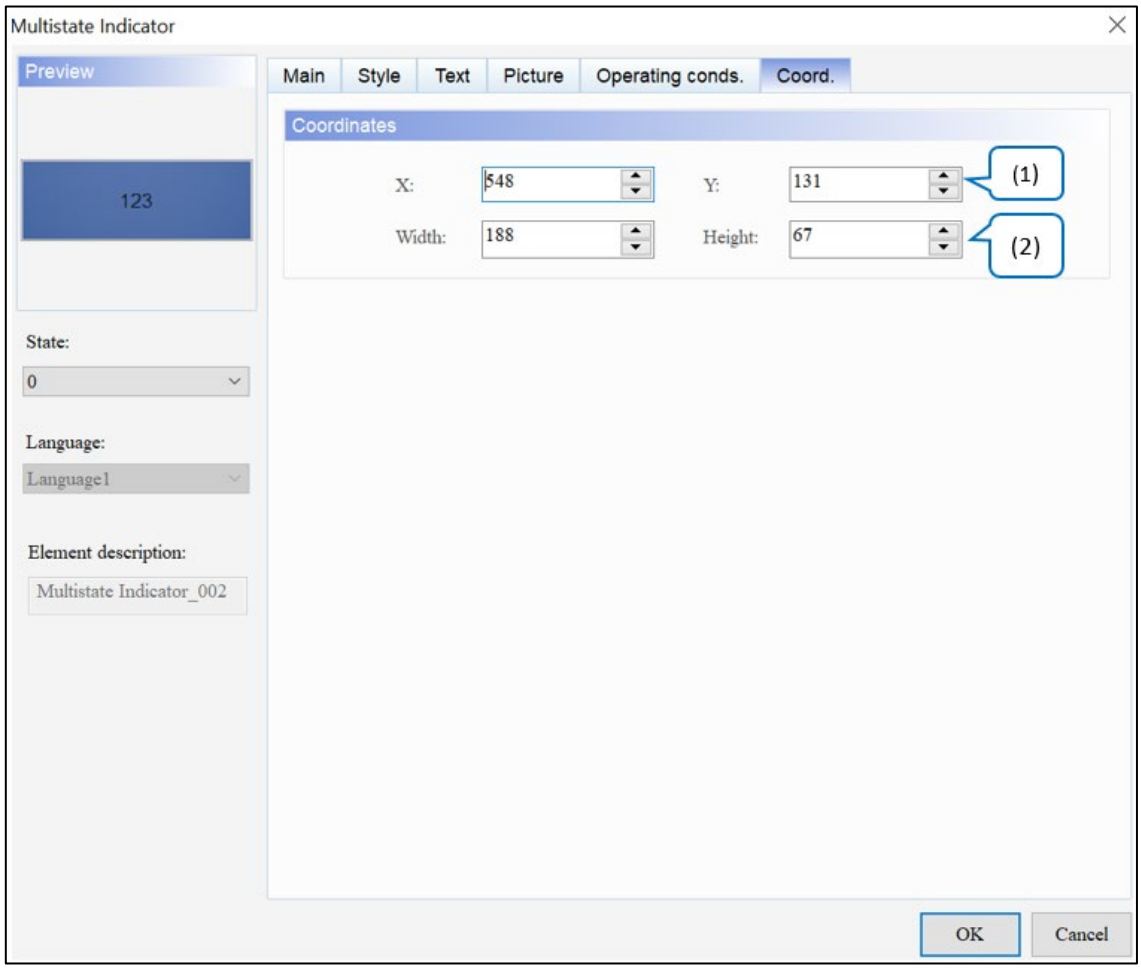


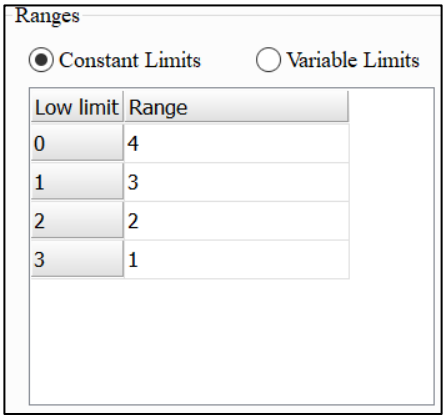
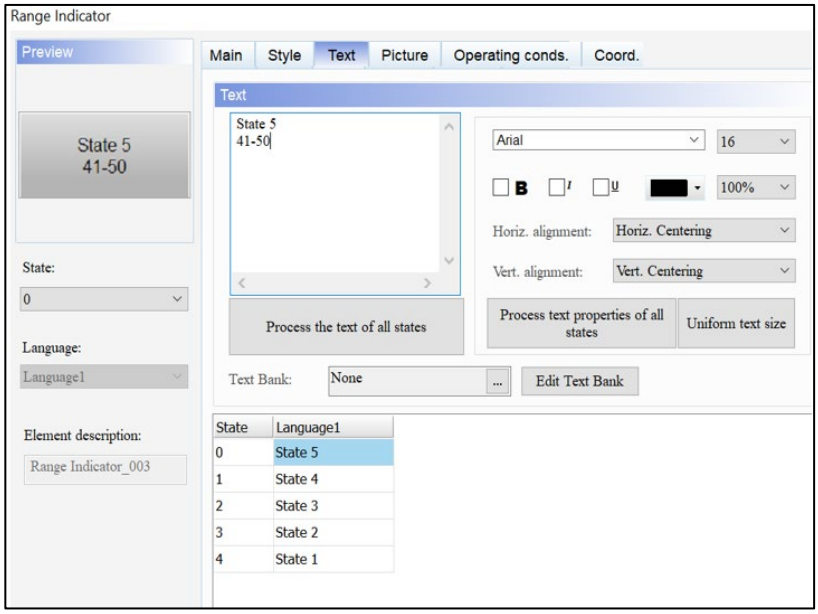
Figure 10 - 7: Multistate Indicator element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

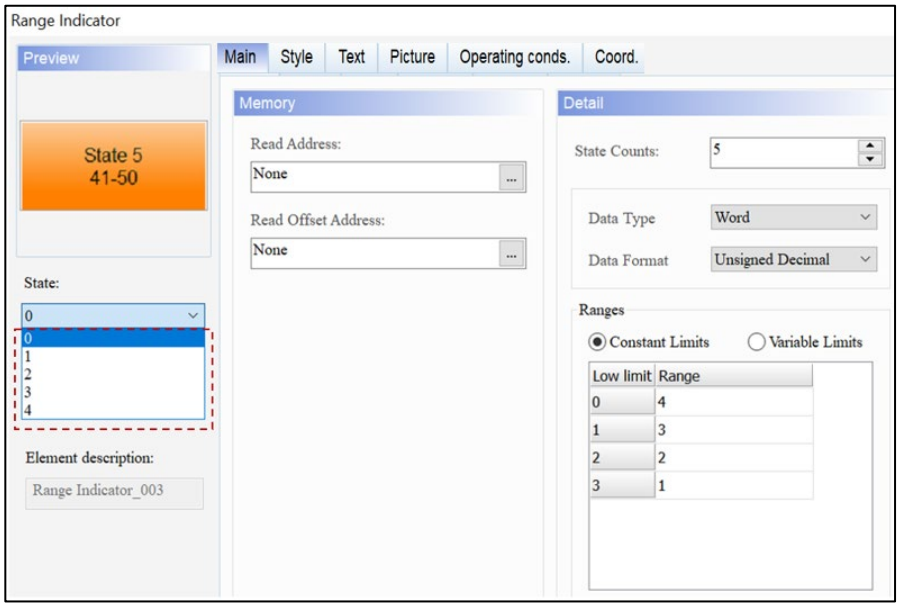
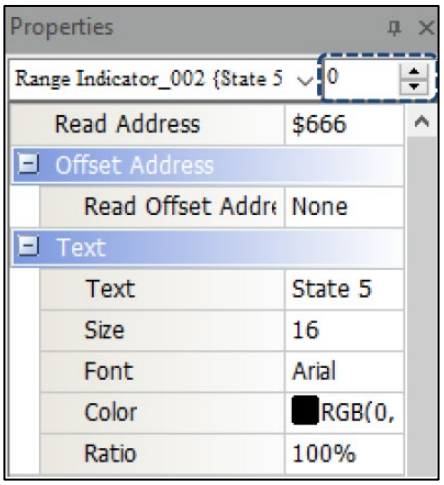
10.2 Range Indicator

The **Range Indicator** element is the same as the **Multistate Indicator** element. Both are used to display the state of a given address. The HMI matches the value of

the read memory address with the set range value, and displays different states according to the range values. Refer to the following table for example descriptions of **Range Indicator** element.

<table>
<tr><th colspan="2">Range Indicator</th></tr>
<tr><td>Read Address</td><td>
<table>
<tr><td>Read Address</td><td>$666</td></tr>
<tr><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>Data Type: Word
Data Format: Unsigned Decimal
State Counts: 5</td></tr>
<tr><td>Ranges</td><td> 
</td></tr>
<tr><td>Input text in Text property page</td><td> 

<table>
<tr><th colspan="5">Set the Text to Display for Each State</th></tr>
<tr><td>State 0</td><td>State 1</td><td>State 2</td><td>State 3</td><td>State 4</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="6">Range Indicator</th></tr>
<tr><td></td><td>State 5
41~50</td><td>State 4
31~40</td><td>State 3
21~30</td><td>State 2
11~20</td><td>State 1
1~10</td></tr>
<tr><td>Foreground Color</td><td colspan="5">Set the Foreground Color for Each State
State 0 | State 1 | State 2 | State 3 | State 4</td></tr>
<tr><td>Range Indicator</td><td colspan="5">Double-click the element to view each state. In this example, the State Counts is set to 5, so the state values are 0 ~ 4, as shown in the following figure.
 
</td></tr>
<tr><td></td><td colspan="5">Go to the upper right corner in the Properties window of the element to switch the state.
 
</td></tr>
<tr><td>Execution result</td><td colspan="5">After compiling and downloading the screen data to the HMI, the Range Indicator element displays the value range of each state on the element based on the range value set in the read address.
Execution Result of Each State
State 0 | State 1 | State 2 | State 3 | State 4</td></tr>
</table>

Range Indicator					
	State 5 41~50	State 4 31~40	State 3 21~30	State 2 11~20	State 1 1~10

On double-clicking the **Range Indicator** element, the property page appears as follows.

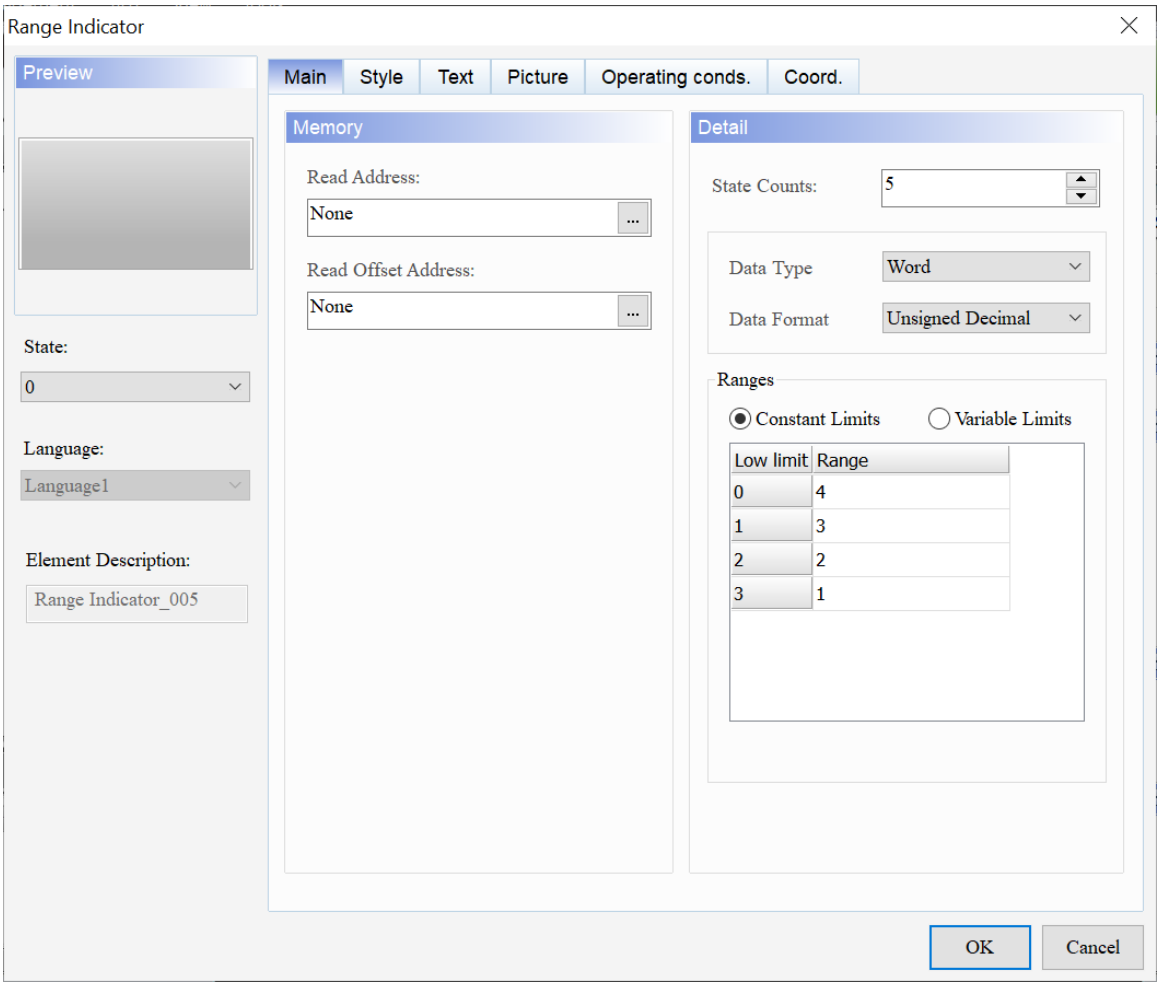


Figure 10 - 8: Range Indicator property page

Range Indicator	
Function	**Description**
Preview	View the multistate values and multi-language display data of the element.

Range Indicator	
Function	**Description**
Main	Set the Read Address and Read Offset Address. Set the State Counts, Data type, Data Format, Ranges (Constant Limits or Variable Limits), and select the Continuous Address checkbox.
Style	Set the Style, Foreground Color, Blink, Filled style, and Transparency of the element.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

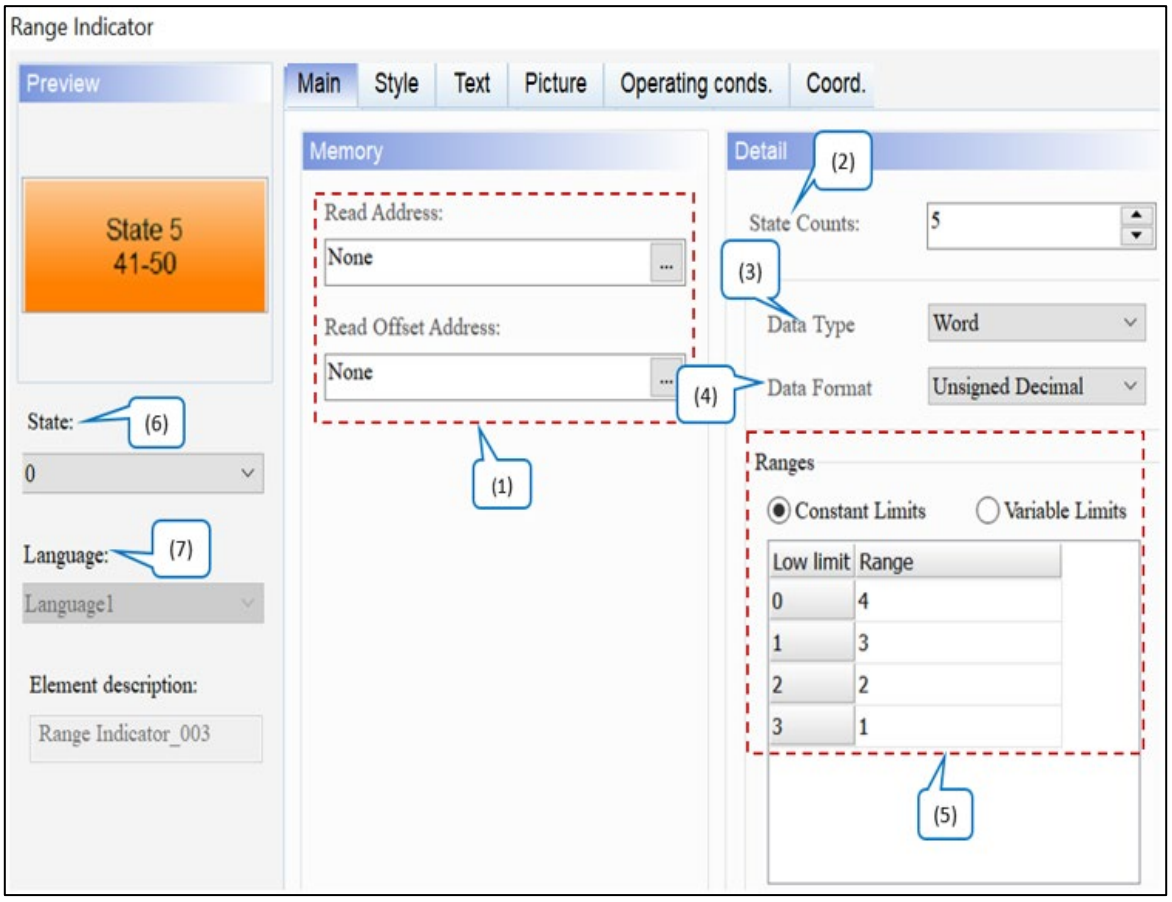
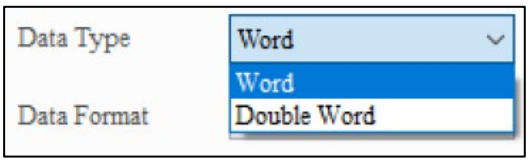
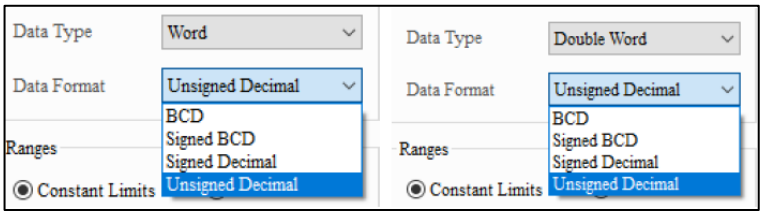
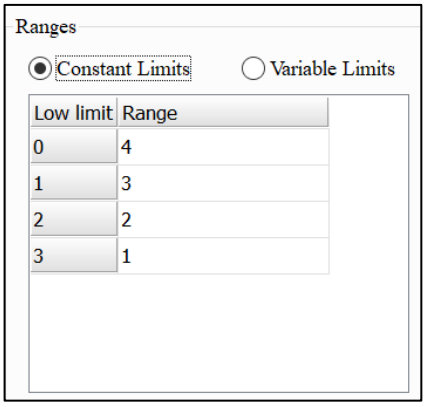
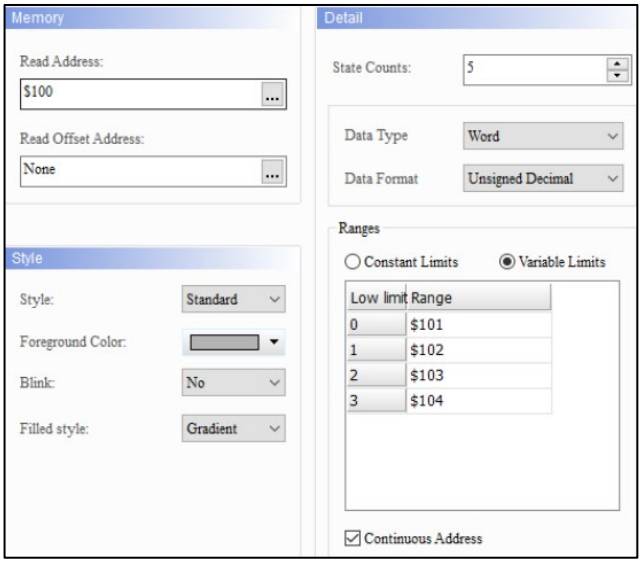
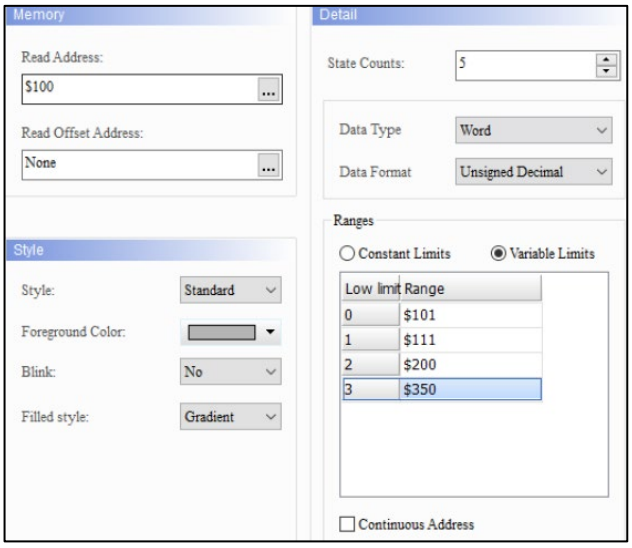
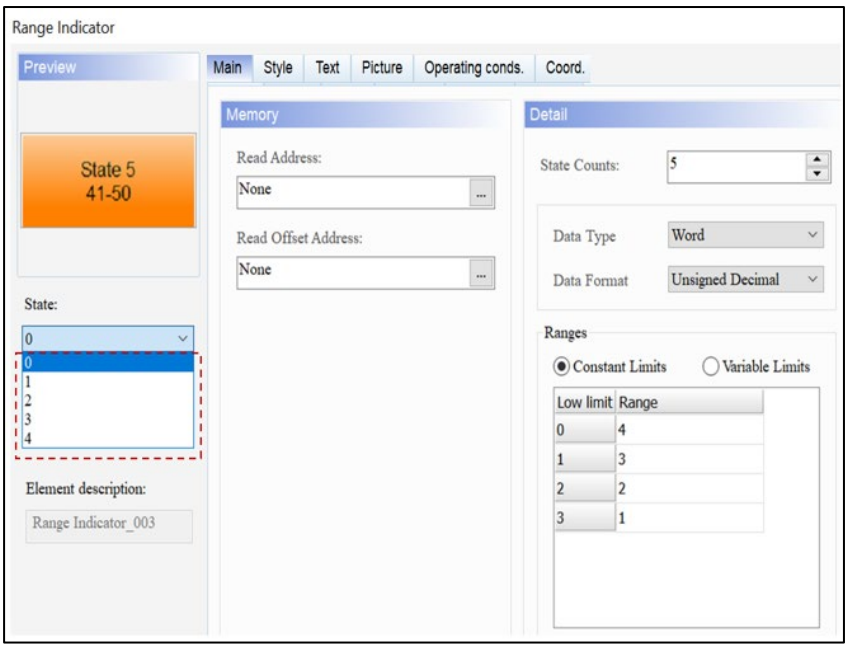
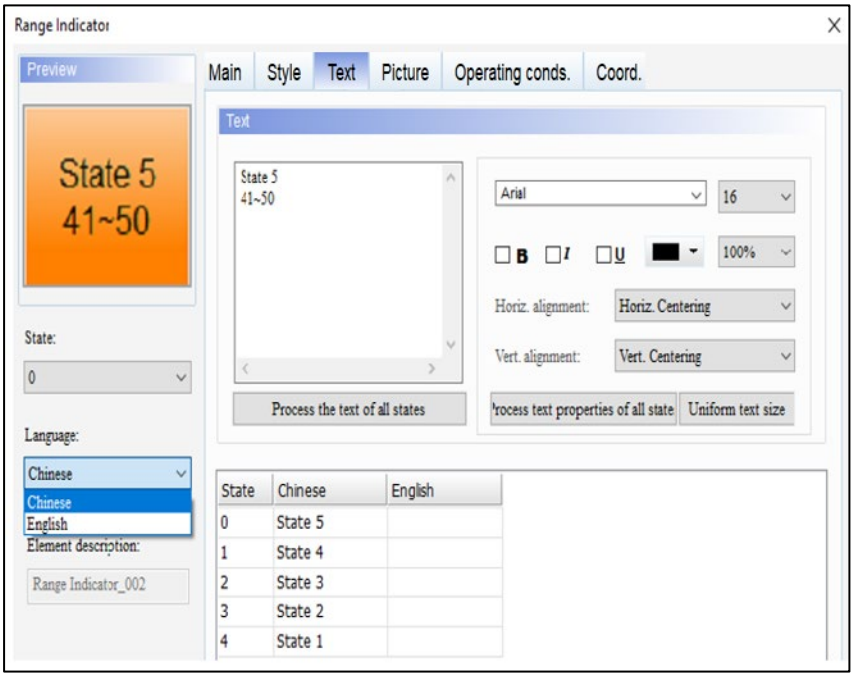


Figure 10 - 9: Range Indicator element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Read Address</td><td>● Select Internal Memory or controller register address. The Input memory Type will be different according to the Data Type selected: Word, LSB or Bit.
● Select Link name or Device Type. Refer to Memory Settings.</td></tr>
<tr><td>Read Offset Address</td><td>Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>(2)</td><td>State Counts</td><td>● Set the State Counts for the Range Indicator element. The default value is 5.
● If the Data Type is Word or Double Word, State Counts can be set from 1 ~ 256 states.</td></tr>
<tr><td>(3)</td><td>Data Type</td><td>The available options for Data Type are: Word and Double Word. The default value is Word.
 
</td></tr>
<tr><td>(4)</td><td>Data Format</td><td>When the Data Type is either Word or Double Word, the Data Formats include BCD, Signed BCD, Signed Decimal, and Unsigned Decimal. The default value is Unsigned Decimal.
 
</td></tr>
<tr><td>(5)</td><td>Ranges</td><td>● The value range indicator can set the value to constant and variable.
● Under Ranges, if users click Constant Limits, it means the input value is a constant; if users click Variable Limits, they can define the value with a memory address.
● If users click Variable Limits, then users can set whether it should be a continuous address. Once users select the Continuous Address checkbox, DIAScreen automatically calculates the address range based on the Read Address and Data Type set for the Range Indicator.
● After selecting the Continuous Address checkbox, users cannot enter the memory address.
<table>
<tr><td>Constant Limits</td><td>Input constants in descending order from top to bottom. Whether the Continuous Address checkbox is selected does not influence the input constants.</td></tr>
</table></td></tr>
</table>

No.	Function	Description	
			
		Variable Limits with Continuous Address selected	Set $100 for the **Read Address**. Select the **Continuous Address** checkbox, then DIAScreen automatically calculates the continuous addresses, $100 ~ $104. 
		Variable Limits with Continuous Address not selected	

No.	Function	Description
(6)	State	View its state value through **State**. 
(7)	Language	If users have set the language data, they can edit the properties of the text to be displayed with the **Language** setting of the element. 

- Style

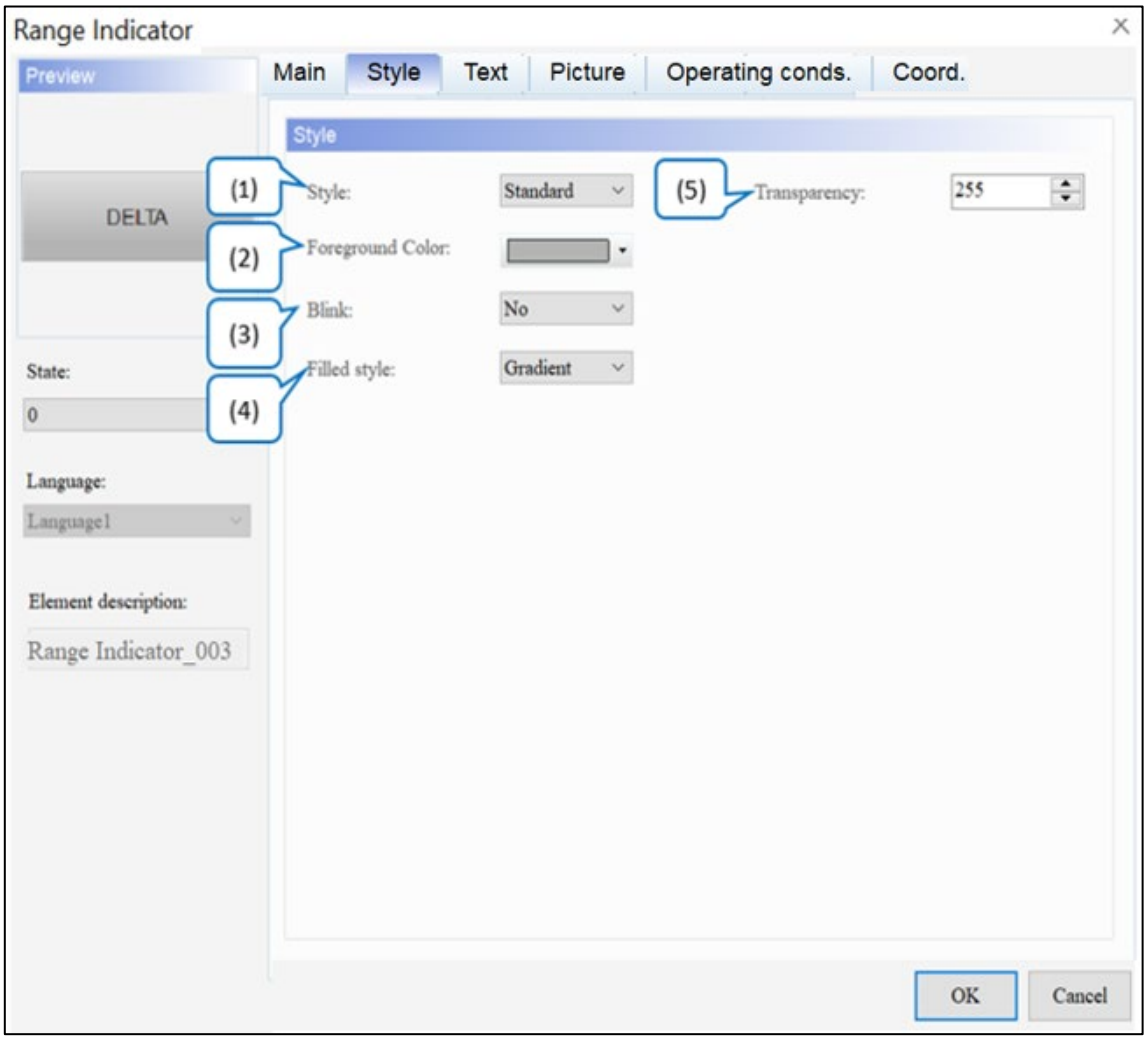
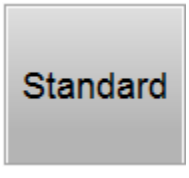
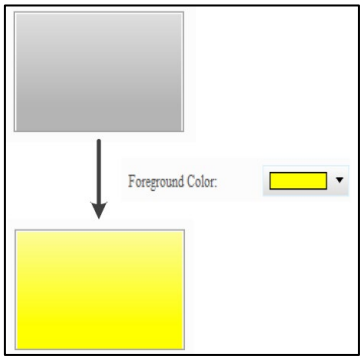


Figure 10 - 10: Range Indicator element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Round, and Invisible. The default value is **Standard**.

Standard	Raised	Round	Invisible
			

No.	Function	Description
(2)	Foreground Color	● Set the foreground color of the element. The default is  . ● When users set the **Style** to Invisible, the **Foreground Color** setting is invalid. 
(3)	Blink	Set whether the indicator blinks when it switches between states; the **Blink** color is the contrast color of the element foreground color. The default value is **No**. 
(4)	Filled style	● The available options for **Filled style** of the elements on the DOP-100 series models are: Gradient and Fixed. The default value is **Gradient**. ● If the DOP-B project is opened, the button will be displayed in Fixed, and the effect is similar to that of DOP-B. Gradient:  Fixed: 
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Text

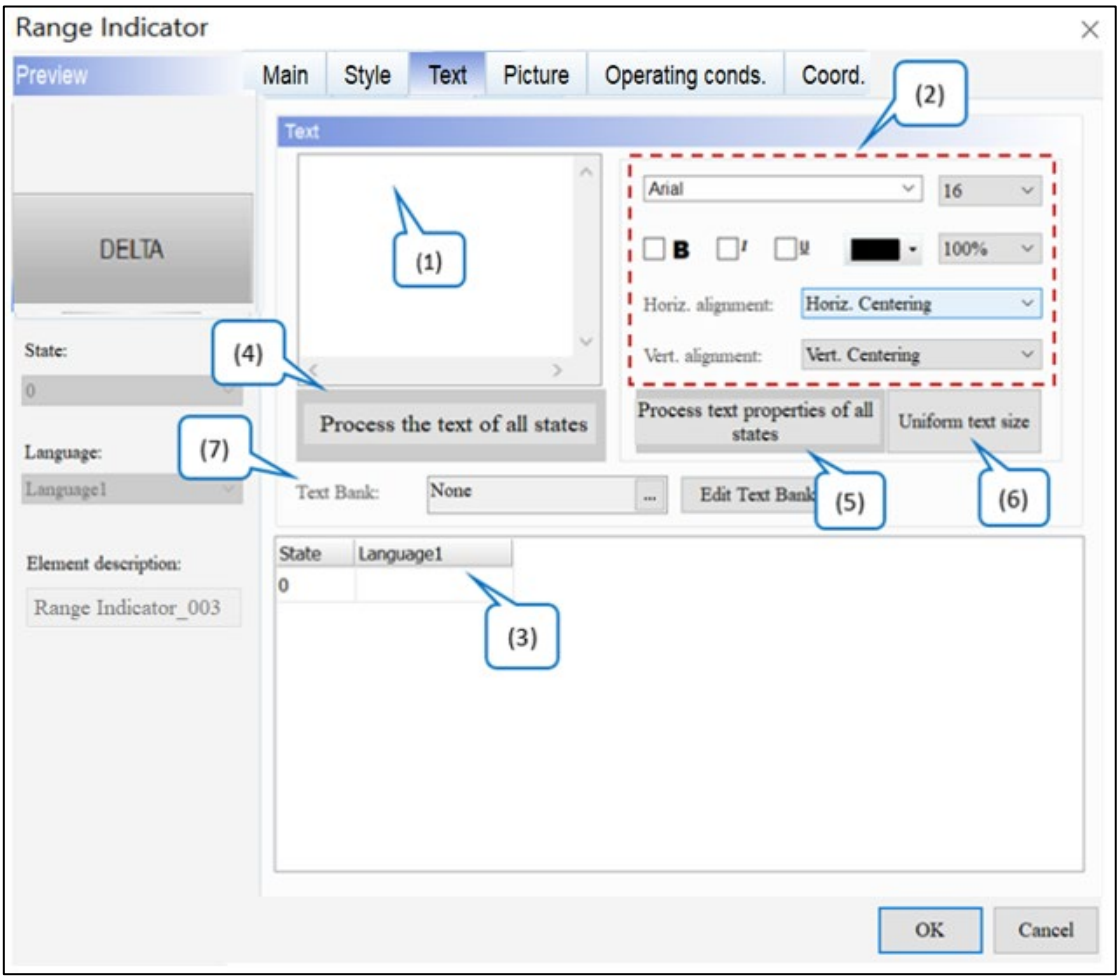
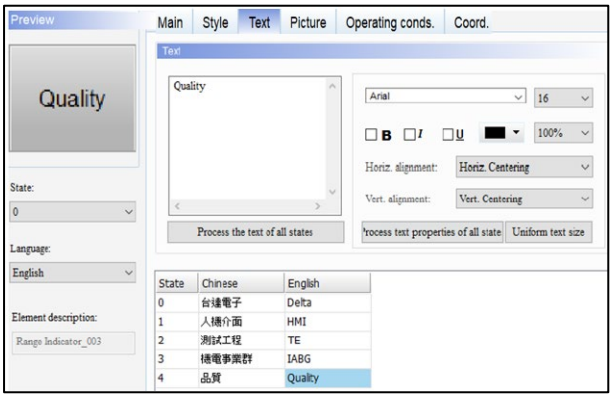
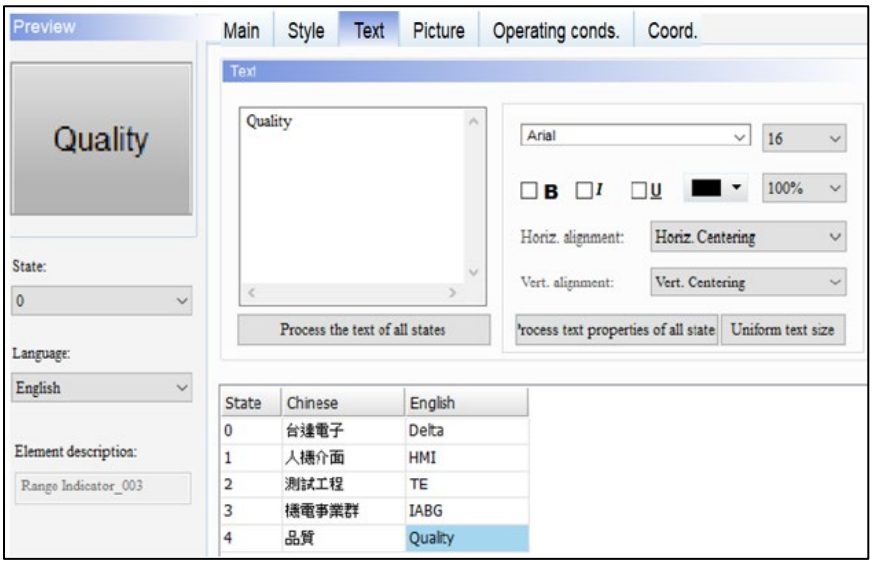
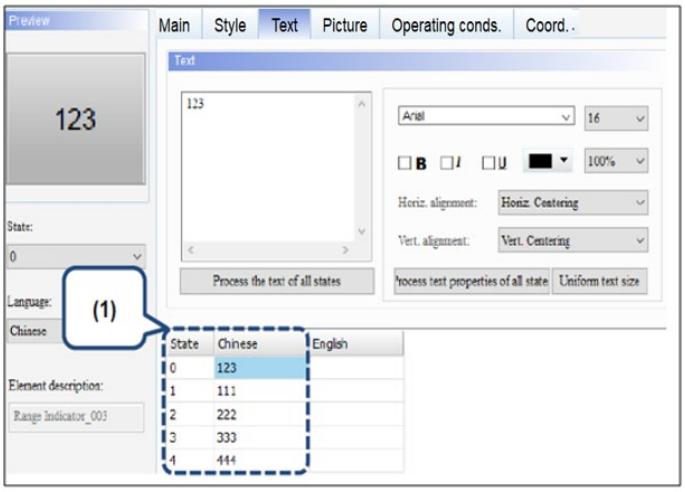
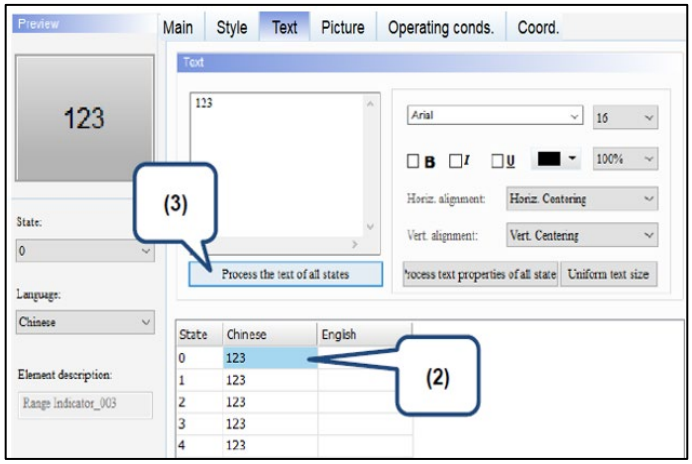
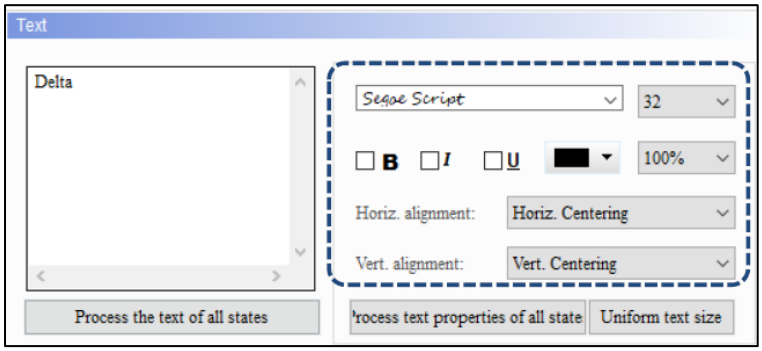
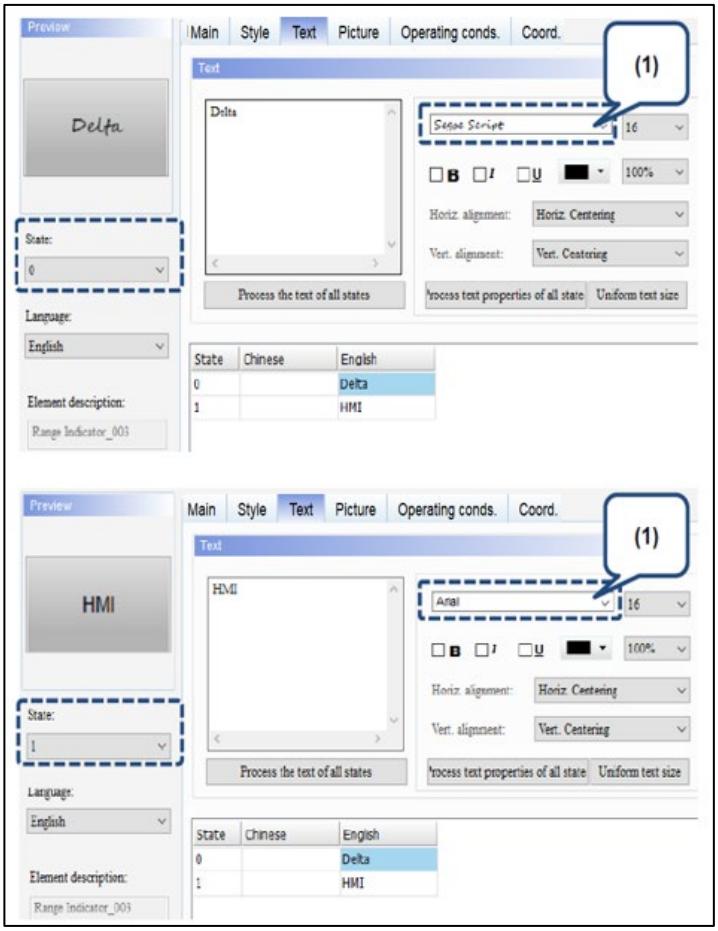
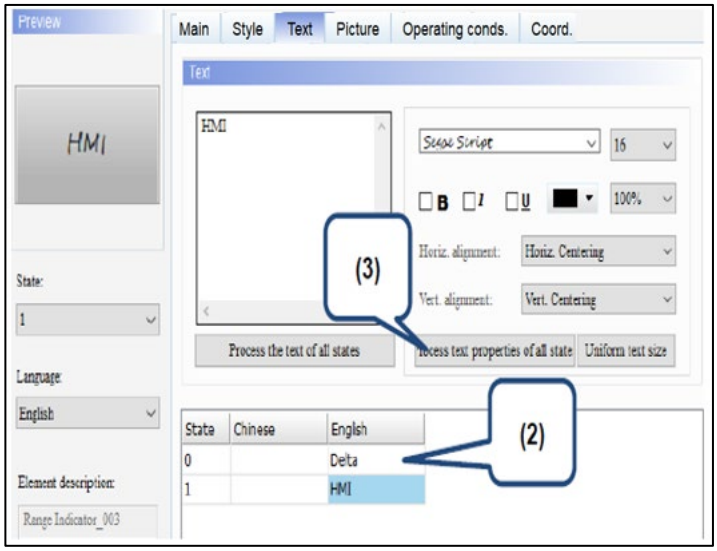


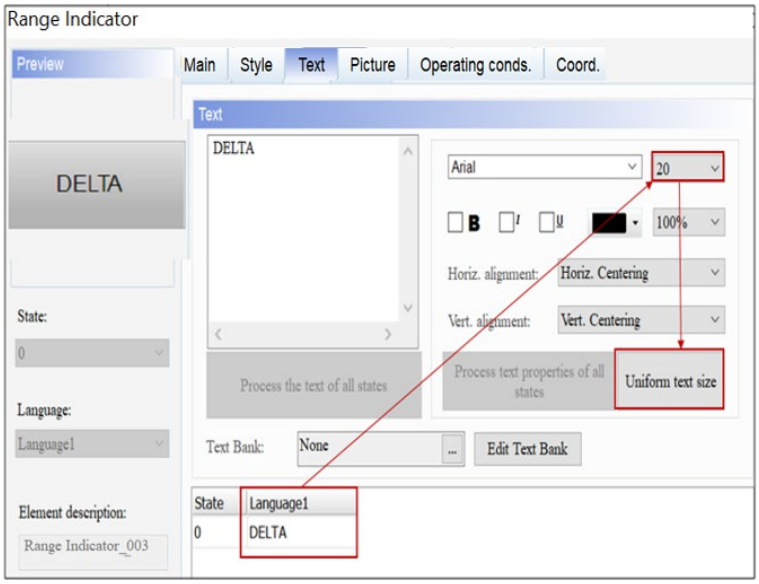
Figure 10 - 11: Range Indicator element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key to start editing and

No.	Function	Description
		entering the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the following figure, they can enter English words in the **English** column. 
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state selected. ● The example and setting steps are as follows: 1. Enter the text for State 0 to State 4. 2. Select State 0. 3. Execute **Process the text of all states** and the texts of State 0 to State 4 will be consistent. Before Change 

No.	Function	Description
		After Change 
(5)	Process text properties of all states	● This function changes all the text properties based on the state selected. Items included in the **Text** property page are shown in the following figure.  ● The following is an example description with steps: 1. Enter the text *Delta* for State 0 and *HMI* for State 1. Select Segoe Script for the text font of State 0 and Arial for the text font of State 1. 2. Select State 0. 3. Execute **Process text properties of all states** and the text font of State 1 will be changed to Segoe Script.

No.	Function	Description
		Before Change 
		After Change 
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description with steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all

No.	Function	Description
		languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

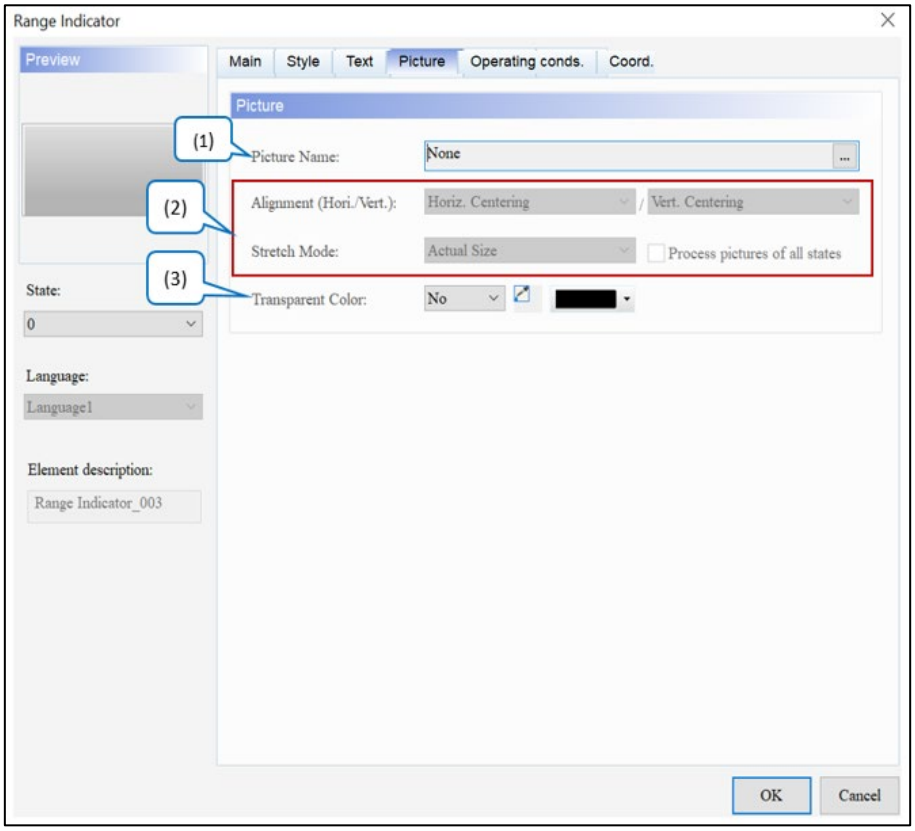
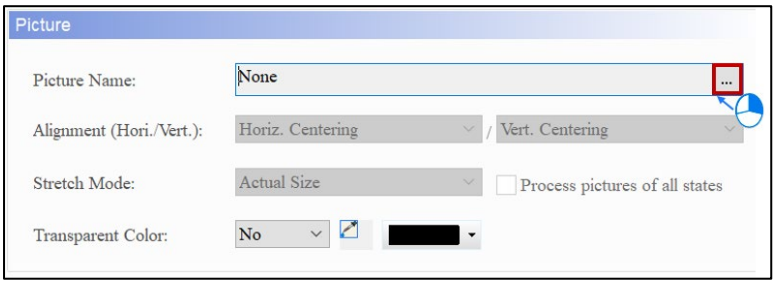
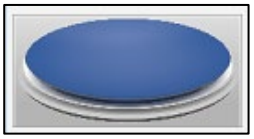


Figure 10 - 12: Range Indicator element Picture property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Picture Name</td><td>To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.
 



● To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the pictures through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>Stretch 1:1 means that the picture will be scaled according to the aspect ratio of the element.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
</table>

No.	Function	Description
	Process pictures of all states	Assuming that the elements have multiple states and some pictures do not fill the full element display area, if users select the **Process pictures of all states** checkbox, they can use this function to process all pictures instead of setting them one by one, which saves the editing time.
(3)	Transparent Color	● This function specifies a color in the picture and make it transparent. The default value is **No**. ● Select icon and click white part of the calendar, DIAScreen ignores the white part of the picture and makes it transparent, which becomes identical to the **Foreground Color** of the element. 

● Operating conds.

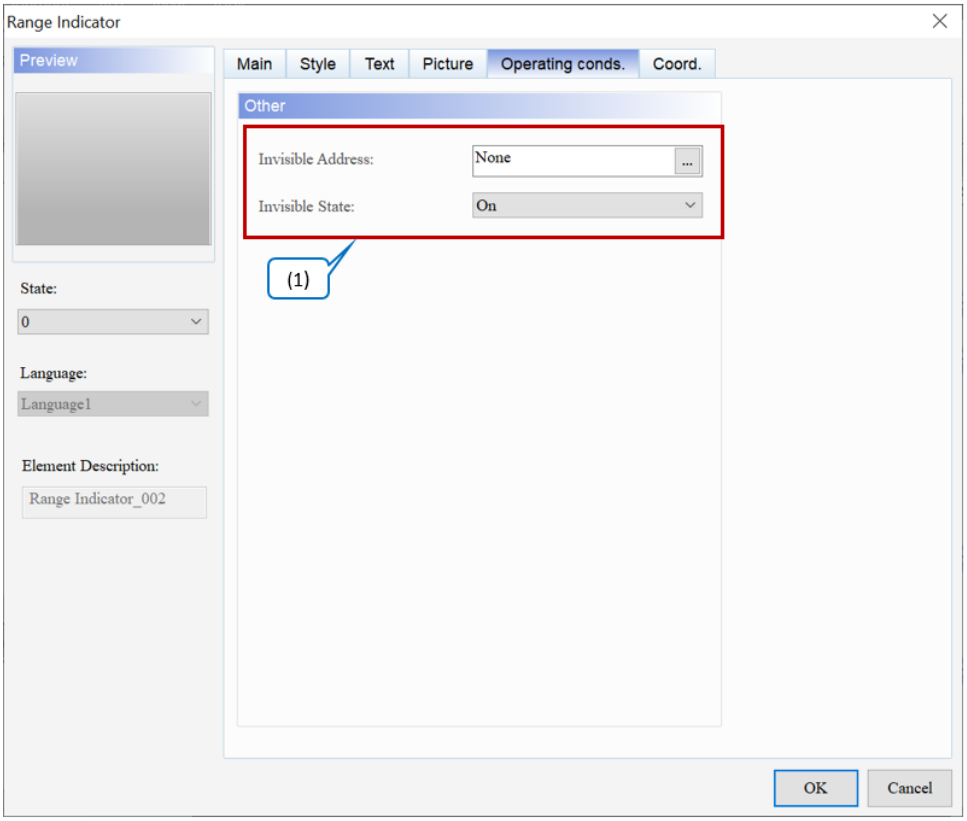
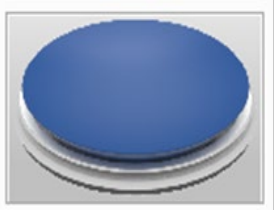
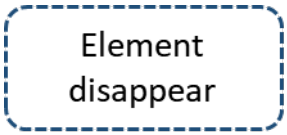
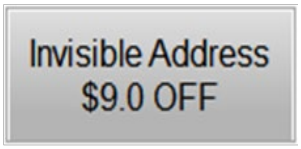
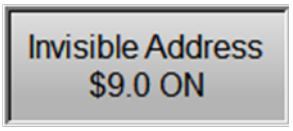
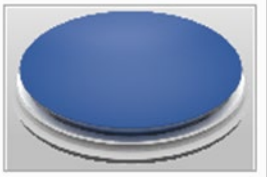
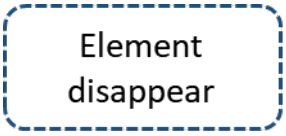
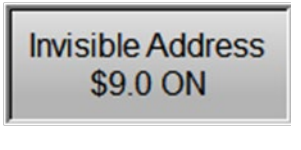
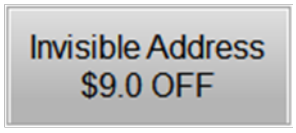


Figure 10 - 13: Range Indicator element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Invisible Address</td><td colspan="2">● The Invisible Address mainly allows users to hide an element through this address.
● If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
● The following example explains Invisible Address usage:
1. Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
2. To hide the element, first press the $9.0 button.</td></tr>
<tr><td>Invisible State</td><td>Invisible State is On</td><td> 
 
 
  </td></tr>
<tr><td></td><td>Invisible State is Off</td><td> 
 
 
  </td></tr>
</table>

- Coord.

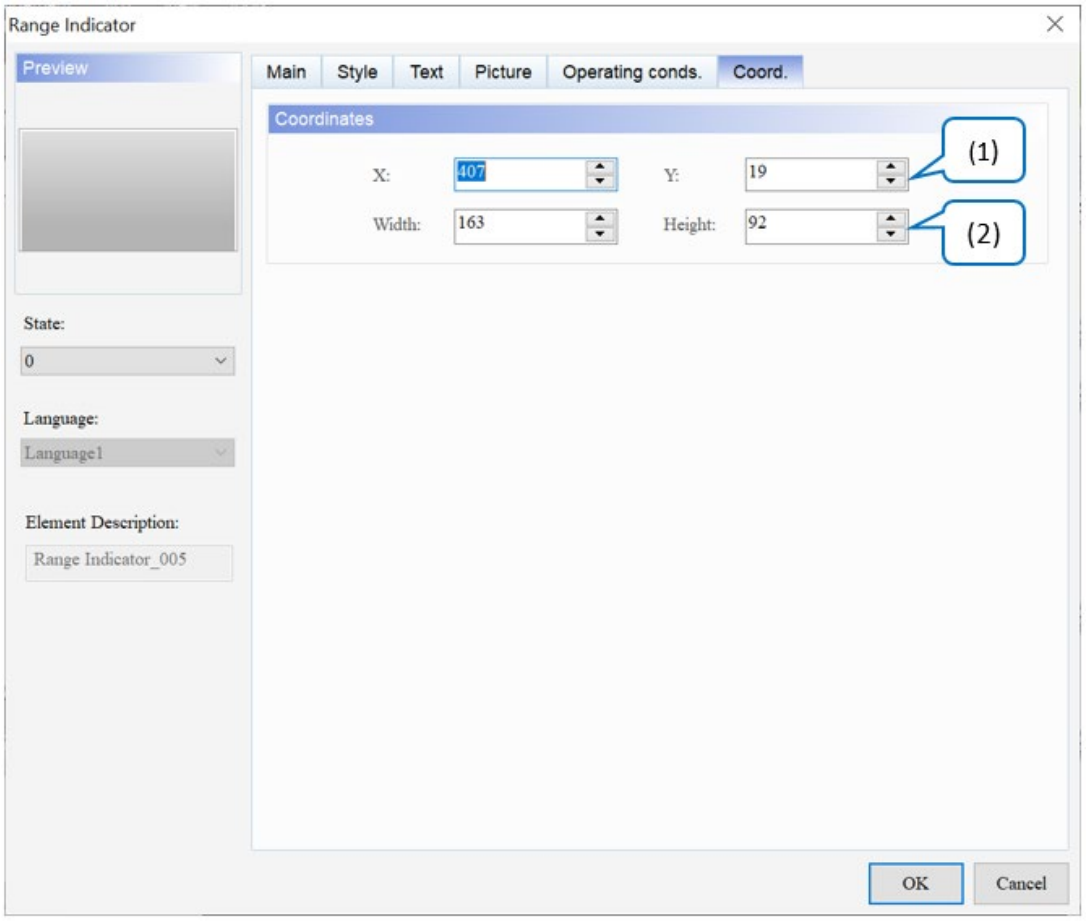


Figure 10 - 14: Range Indicator element Coord. property page

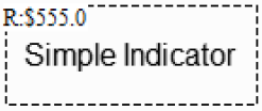
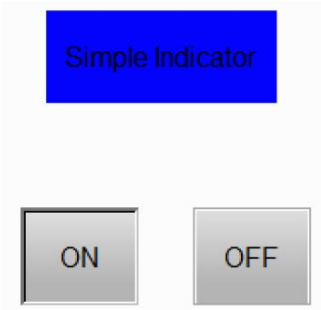
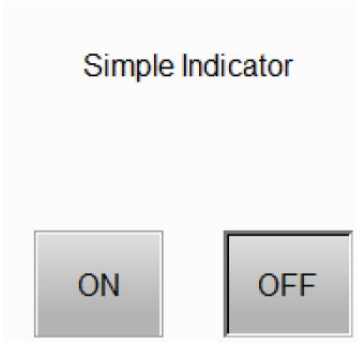
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

10.3 Simple Indicator

The **Simple Indicator** element provides two states: ON and OFF. It allows the users to change the XOR color according to the switching of the state. Users can set ON

and OFF with **Button** elements, switch the state of the **Simple Indicator** element and distinguish it by color.

Refer to the following table for **Simple Indicator** element examples.

<table>
<tr><th colspan="3">Simple Indicator</th></tr>
<tr><td>Read Address</td><td colspan="2"><table>
<tr><th>Set to On / Set to Off Element</th><th colspan="2">Simple Indicator Element</th></tr>
<tr><td>Write Address</td><td>$555.0</td><td>Read Address</td><td>$555.0</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table></td></tr>
<tr><td>Detail setting</td><td colspan="2"><table>
<tr><th>XOR Color</th><th>Redraw</th></tr>
<tr><td>  </td><td>NO</td></tr>
</table></td></tr>
<tr><td>Execution result</td><td colspan="2">After compiling and downloading the screen to the HMI, the Simple Indicator element switches to On or Off state according to the read memory address. If users press ON, the Simple Indicator element switches to State 1; if users press OFF, the Simple Indicator element switches to State 0.<table>
<tr><th>State 0</th><th>State 1</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table></td></tr>
</table>

On double-clicking the **Simple Indicator** element, the property page appears as follows.

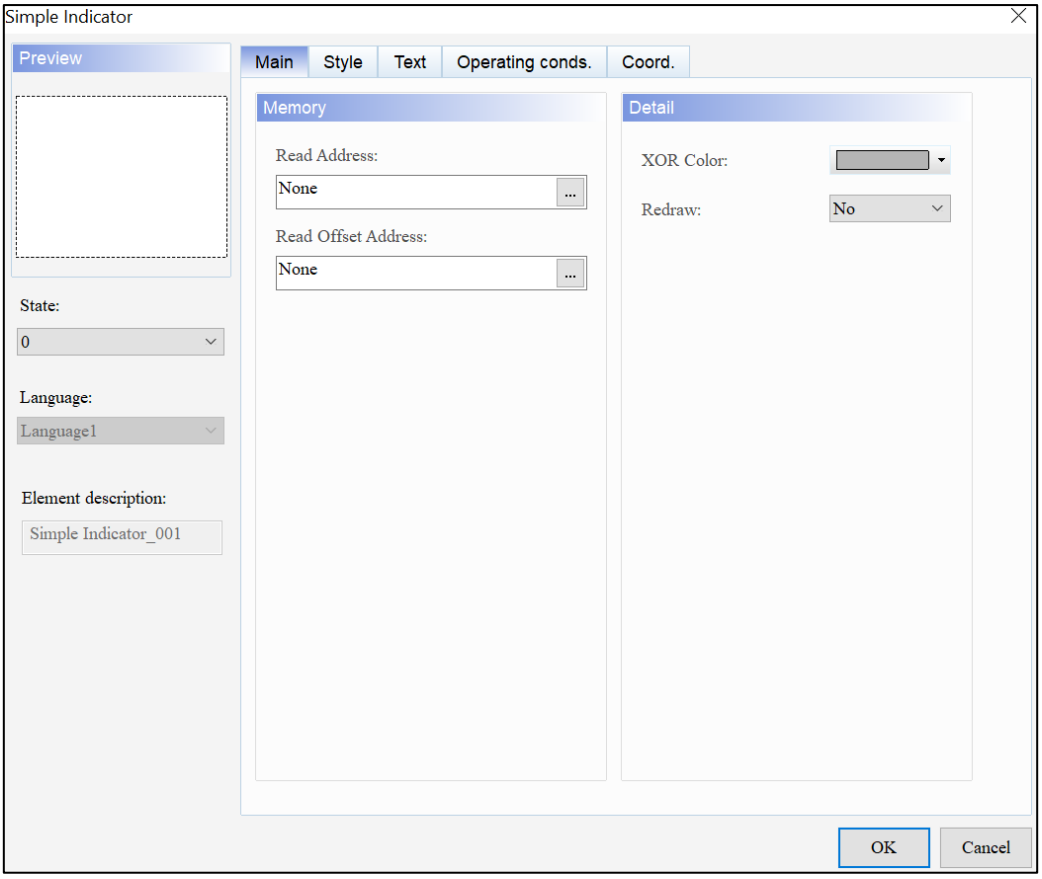


Figure 10 - 15: Simple Indicator element property page

Simple Indicator	
Function	**Description**
Preview	View the state values and multi-language display data of the element.
Main	Set the Read Address, Read Offset Address, XOR Color, and Redraw.
Style	Set Transparency.
Text	Set the text content, font, size, color, format, alignment type, and state text.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

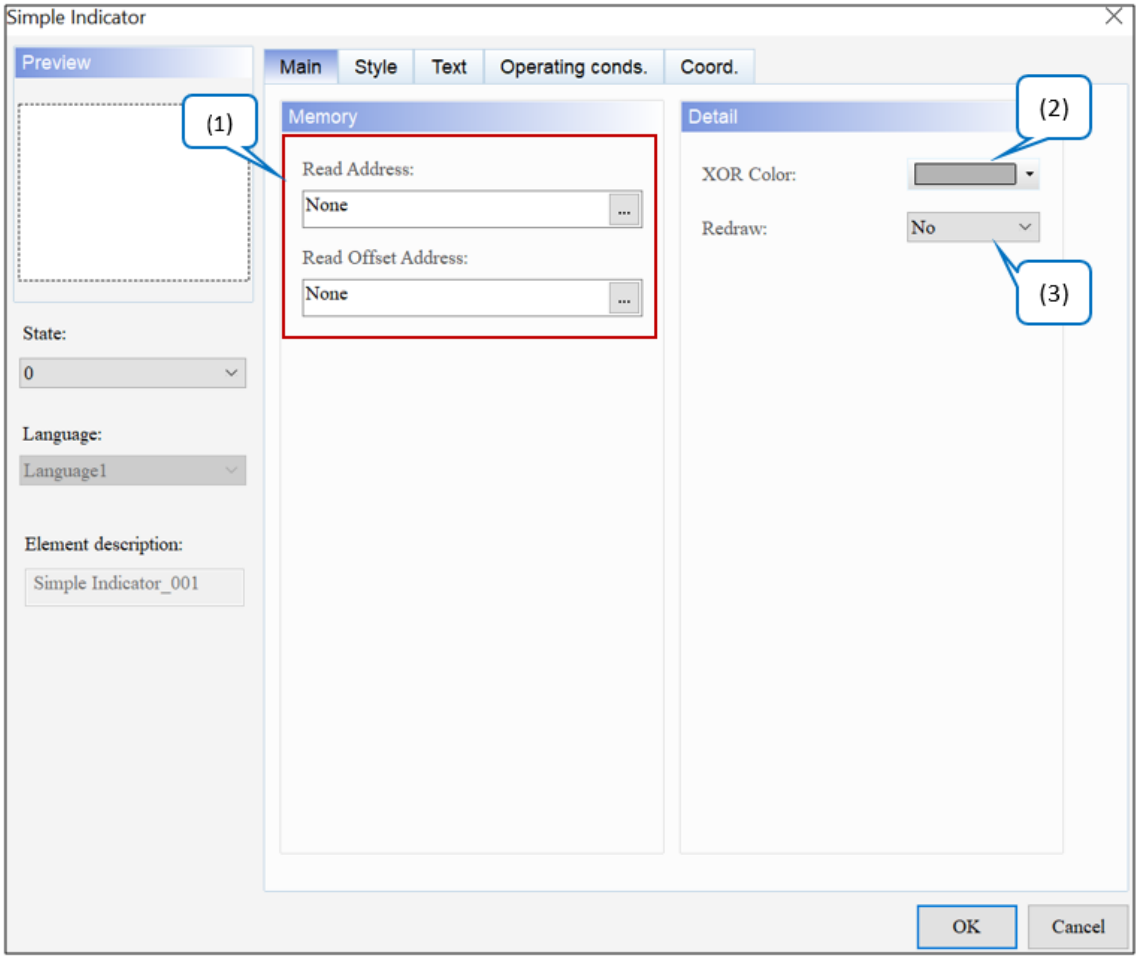
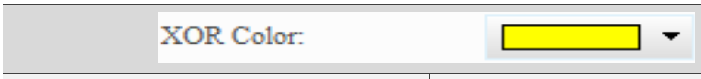
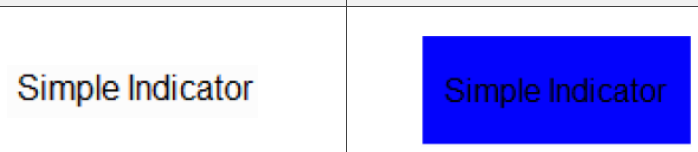


Figure 10 - 16: Simple Indicator element Main property page

No.	Function	Description
(1)	Read Address	● The **Simple Indicator** element only supports Bit format, and the address of Internal Memory or controller register can be selected. ● Select **Link** name or **Device Type**. Refer to the *Memory Settings*.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.

No.	Function	Description
(2)	XOR Color	Specify the **XOR Color**. The default is  .  Before XOR / After XOR 
(3)	Redraw	● When users select Yes and overlap the **Simple Indicator** element on the dynamic element, users can successfully read the data. If users select No, then the data of the dynamic element does not display. The default value is **No**.

- Style

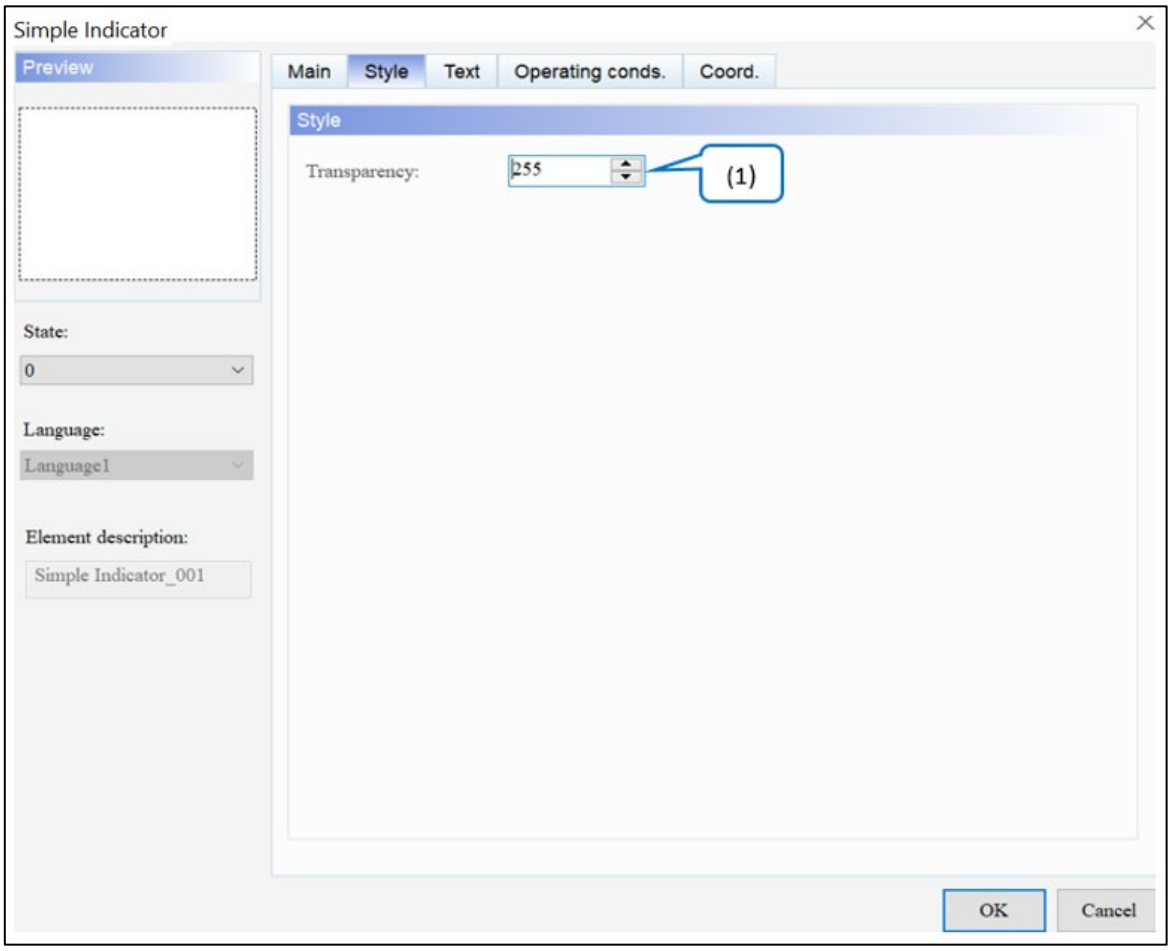


Figure 10 - 17: Simple Indicator element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.

- Text

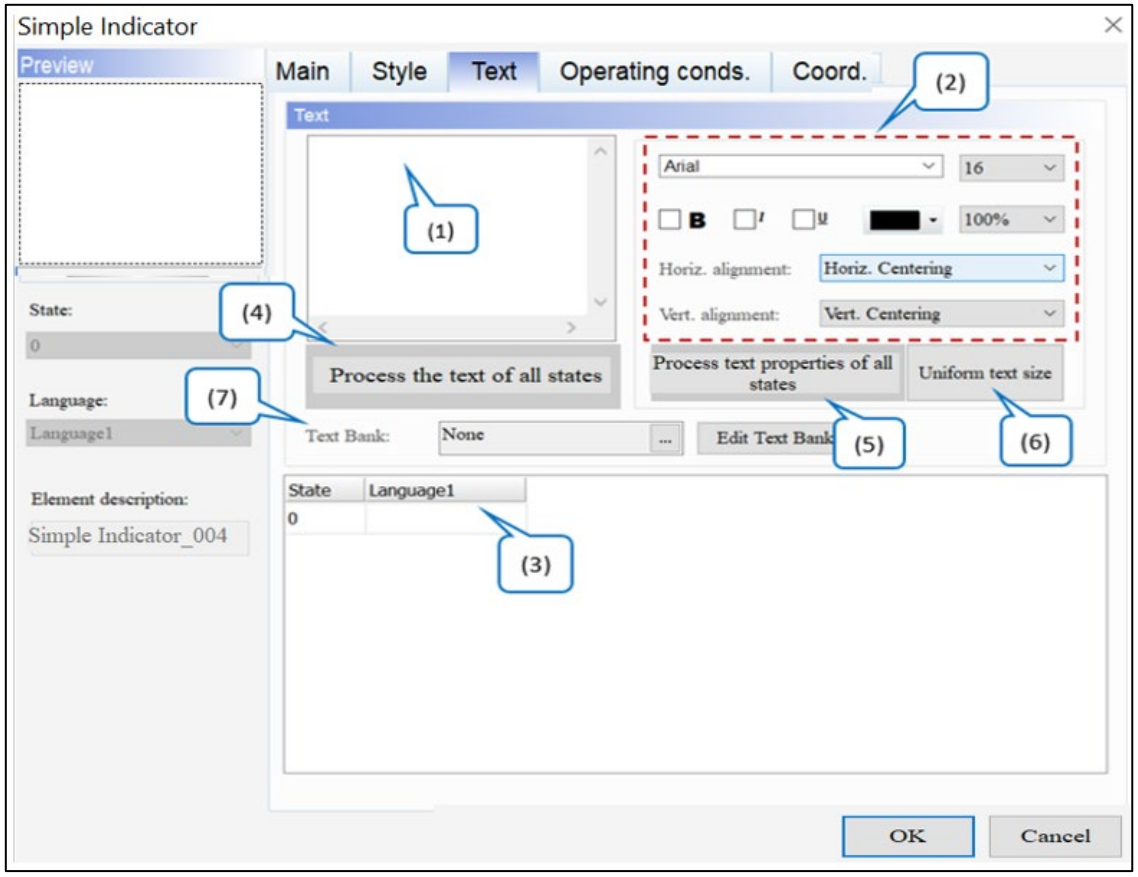
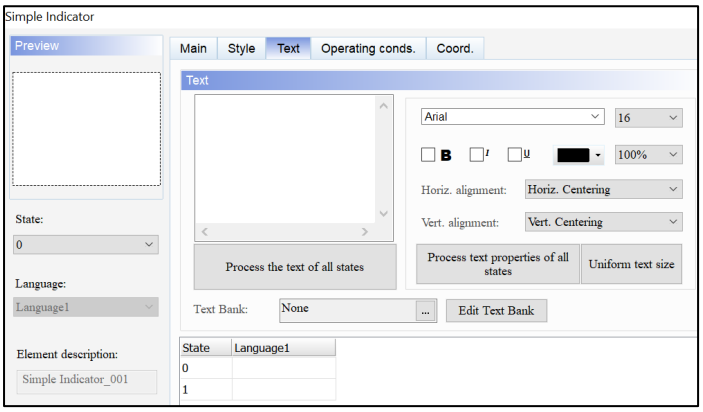
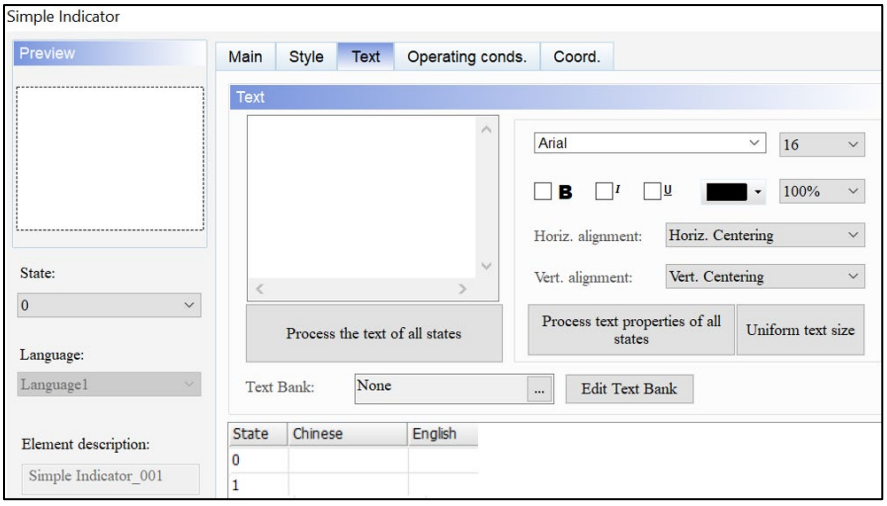
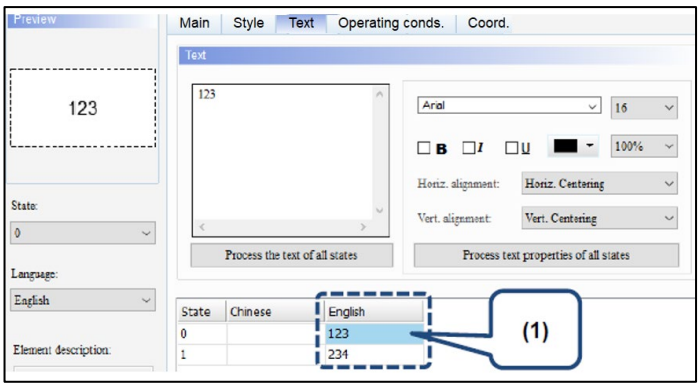
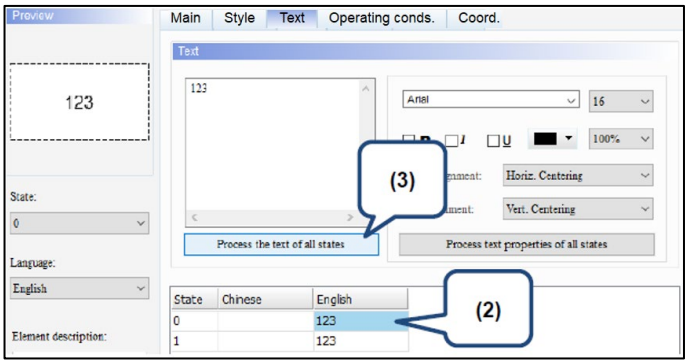
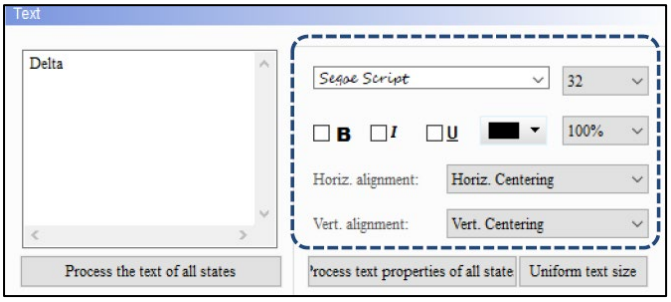


Figure 10 - 18: Simple Indicator element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key to start editing and entering the text.
(2)	Text related property	Set text-related properties, including setting the text font, text size, text color, zoom, alignment of the text, and whether the text is bold / italic / underlined.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows users to edit multi-language text data, as shown in the following figure. They can enter English words in the **English** column. 
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state selected. ● The example and setting steps are as follows: 1. Enter the text *123* for State 0 and *234* for State 1. 2. Select State 0. 3. Execute **Process the text of all states** and the text of State 1 is changed to *123*.

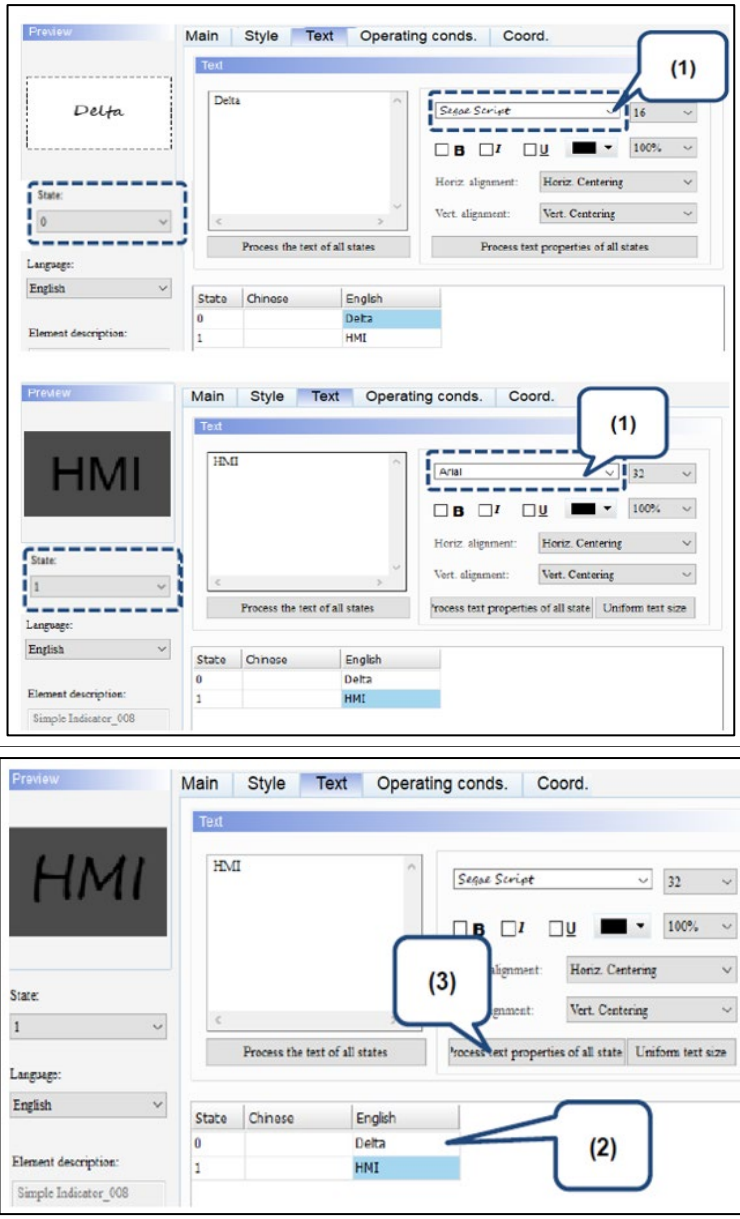
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
<tr><td>(5)</td><td>Process text properties of all states</td><td colspan="2">

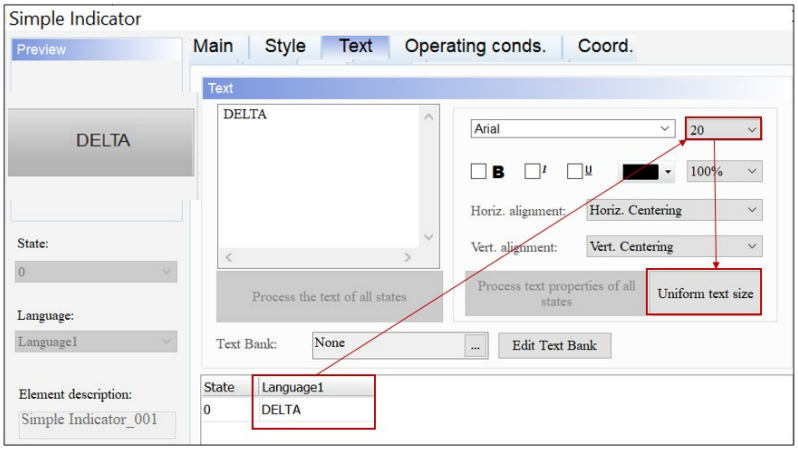
This function changes all the text properties based on the state selected. Items included in the text property are shown in the following figure.
 

The example and setting steps are as follows:

Enter the text Delta for State 0 and HMI for State 1. Select Segoe Script for the text font of State 0 and Arial for the text font of State 1.
Select State 0.
Execute Process text properties of all states and the text font of State 1 is changed to Segoe Script.

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>Before Change</td><td rowspan="2"> 
</td></tr>
<tr><td>After Change</td></tr>
<tr><td>(6)</td><td>Uniform text size</td><td colspan="2">This function is for all language texts, and will change the size of texts at one time according to the selected state.
The following is an example description with steps:
To configure multiple languages, refer to <u>Section 25.1 Multi-language Settings</u>.
Select the state to change the text size.
Execute the Uniform text size, and the text size of all languages will be changed to the set size.</td></tr>
</table>

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Operating conds.

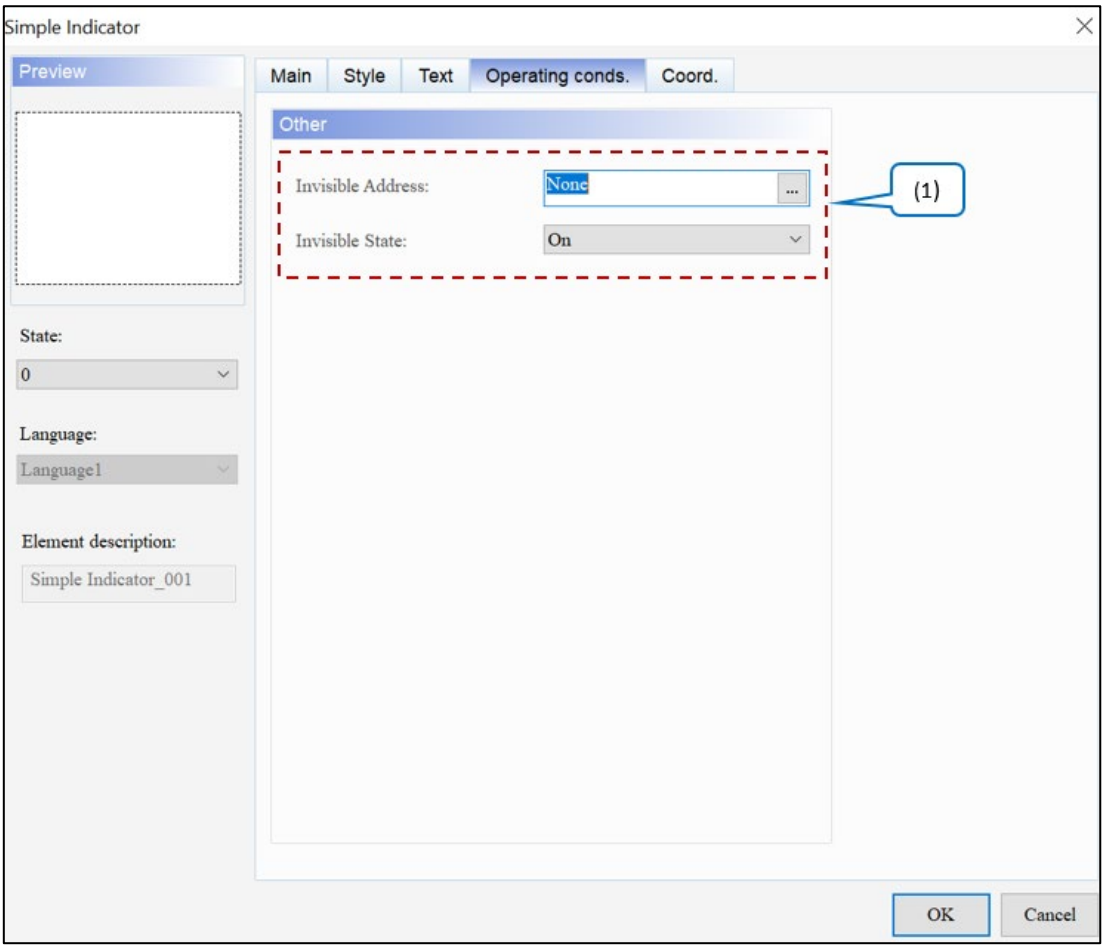
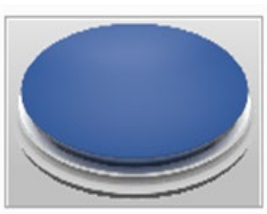
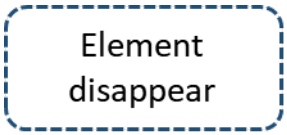
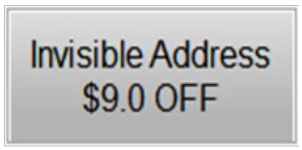
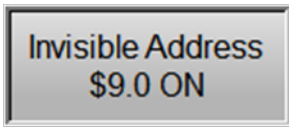
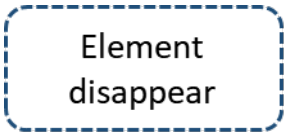
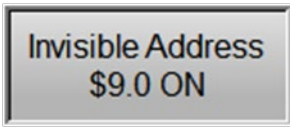
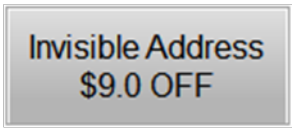


Figure 10 - 19: Simple Indicator element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Invisible Address</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
  </td><td> 
  </td></tr>
<tr><td>Invisible State is Off</td><td> 
  </td><td> 
  </td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td></tr>
</table>

- Coord.

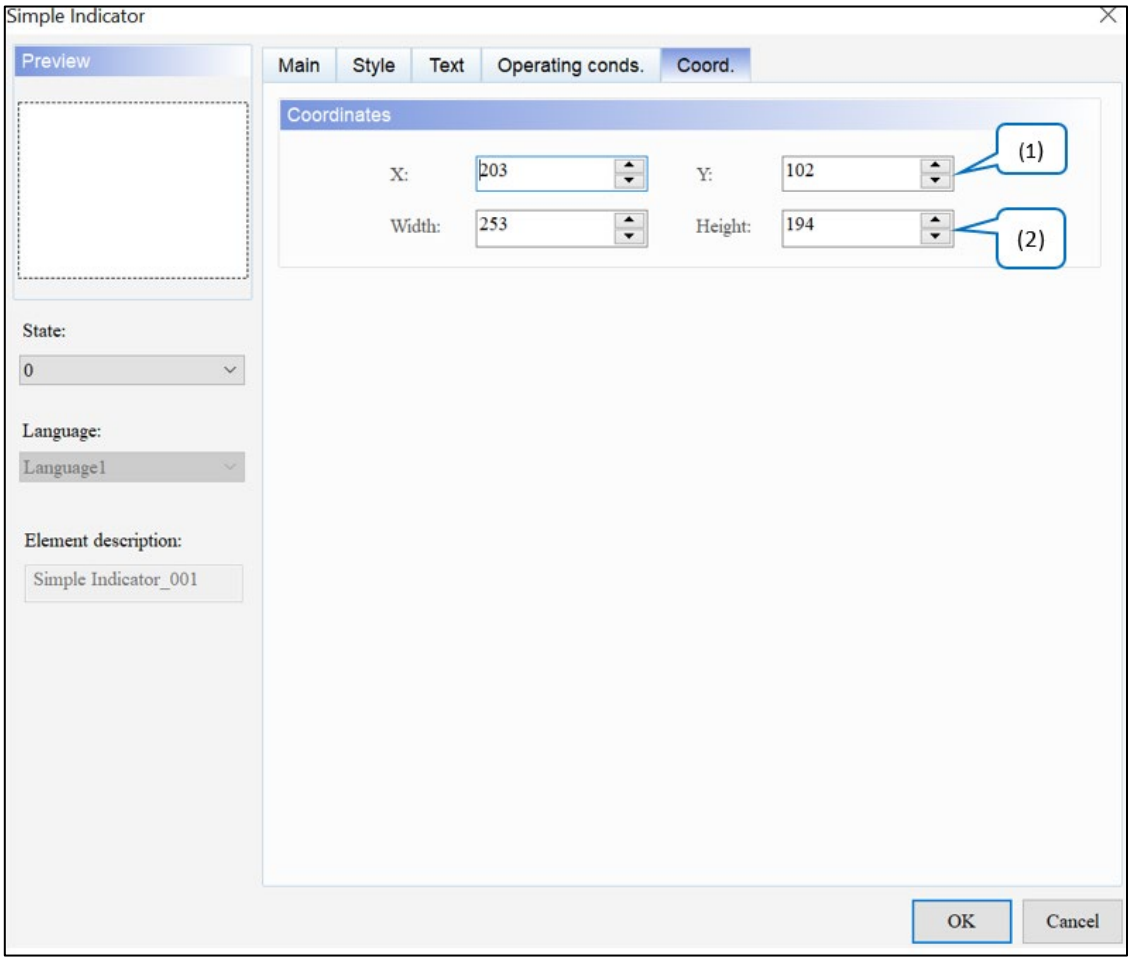


Figure 10 - 20: Simple Indicator element Coord. property page

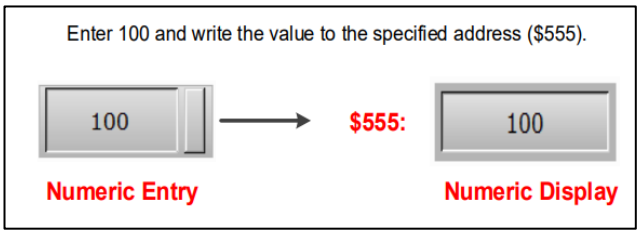
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 11: Data Display

To create a **Data Display** element, go to **Elements** > **Data Display** and click the desired **Data Display** element.

11.1 Numeric Display

The main function of the **Numeric Display** element is to read the value of its memory address and display the value of the element. The **Numeric Display** element also displays the status return values of other elements, such as 0 or 1.

<table>
<tr><th colspan="5">Numeric Display</th></tr>
<tr><td rowspan="3">Read Address</td><td colspan="2">Numeric Display Element</td><td colspan="2">Numeric Entry Element</td></tr>
<tr><td>Read Address</td><td>$555</td><td>Write Address</td><td>$555</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="2">Detail settings</td><td>Data Type</td><td>Data Format</td><td>Integer Digits</td><td>Fractional</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>4</td><td>0</td></tr>
<tr><td>Execution result</td><td colspan="4">After creating the elements, compile and download the data to the HMI. Next, enter 100 with the Numeric Entry element and the Numeric Display element displays the value.
 
</td></tr>
</table>

The **Numeric Display** element supports three types of **Data Type**: Word, Double Word, and Quad Word. The permissible range is described in the following table.

Numeric Display		
Word	Data Format	Permissible Range
	BCD	0 ~ 9999
	Signed BCD	-999 ~ +9999
	Signed Decimal	-32768 ~ +32767
	Unsigned Decimal	0 ~ 65535
	Hex	0 ~ 0xFFFF
	Binary	0 ~ 0xFFFF
Double Word	Data Format	Permissible Range
	BCD	0 ~ 99999999
	Signed BCD	-9999999 ~ +99999999
	Signed Decimal	-2147483648 ~ +2147483647
	Unsigned Decimal	0 ~ 4294697295
	Hex	0 ~ 0xFFFFFFFF
	Binary	0 ~ 0xFFFFFFFF
	Floating	0 ~ 9999999
Quad Word	Data Format	Permissible Range
	BCD	0 ~ 9999999999999999
	Signed BCD	-9999999999999999 ~ +9999999999999999
	Signed Decimal	-9223372036854775808 ~ +9223372036854775807
	Unsigned Decimal	0 ~ 18446744073709551615
	Hex	0 ~ 0xffffffffffffffff
	Binary	0 ~ 0xffffffffffffffff
	Floating	0 ~ 999999999999999

On double-clicking the **Numeric Display** element, the property page appears as follows.

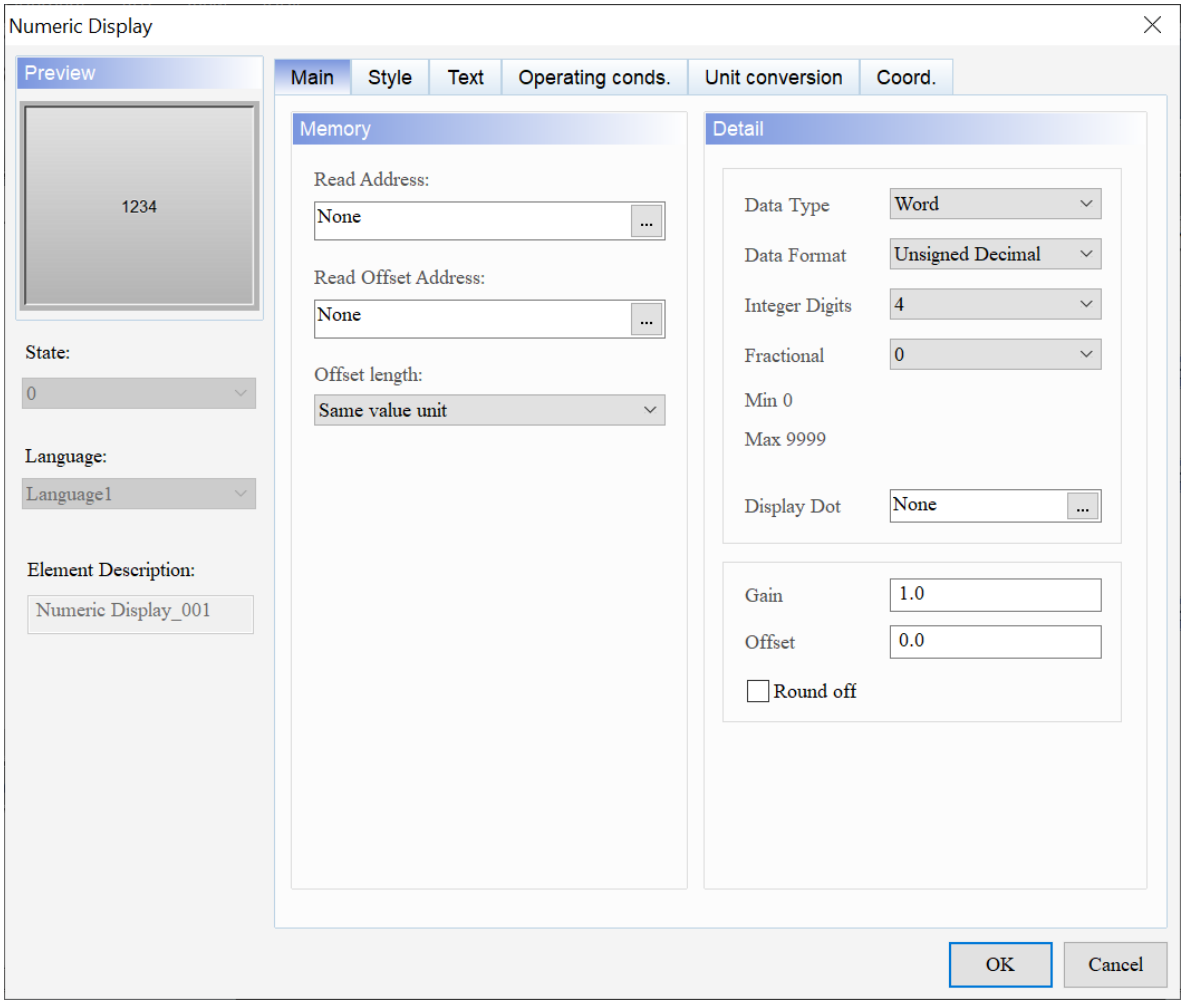


Figure 11 - 1: Numeric Display element property page

Numeric Display	
Function	**Description**
Preview	**Numeric Display** elements do not support multiple state values and multi-language data display.
Main	Set the Read Address, Read Offset Address, Offset length, Data Type, Data Format, Integer Digits, Fractional, Display Dot, Gain, Offset, and Round off.
Style	Set the Style, Border Color, Background Color, Filled style, Show shadow, Offset X, Offset Y, Shadow color, Shadow blur radius, and Transparency.
Text	Set the displaying text font, size, color and alignment.
Operating conds.	Set the Prefix Zero, Invisible Address, Invisible State, and Word arrangement.
Unit conversion	Set Type of unit, the unit of Source and Display, Custom formula, and Percentage interface.

Numeric Display	
Coord.	Set the X and Y coordinates, Width and Height of the elements.

- Main

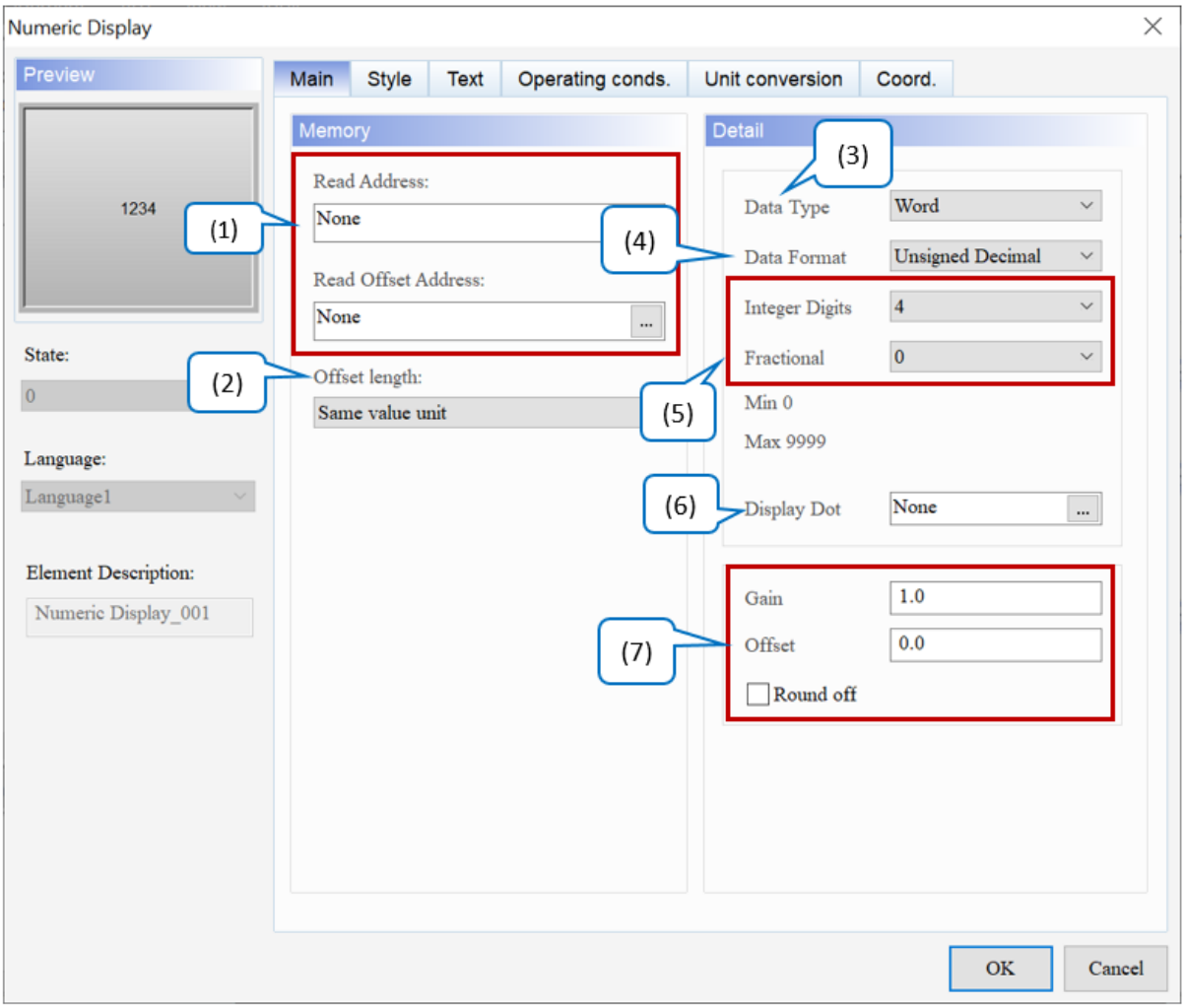
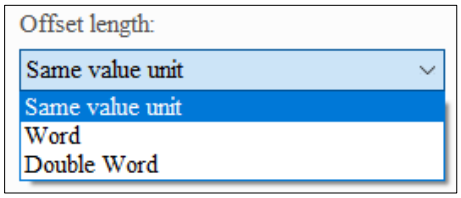
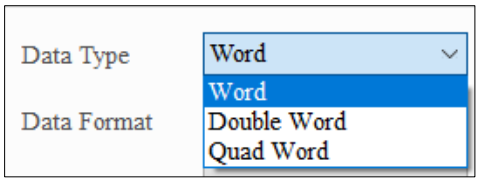


Figure 11 - 2: Numeric Display element Main property page

No.	Function	Description
(1)	Read Address	• Select the Internal Memory or controller register address. • Select **Link** name or **Device Type**. Refer to *Memory Settings*.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Offset length</td><td>Select the Offset length as required. The available options for Offset length are: Same value unit, Word, and Double Word. The default value is Same value unit.
 
</td></tr>
<tr><td>(3)</td><td>Data Type</td><td>

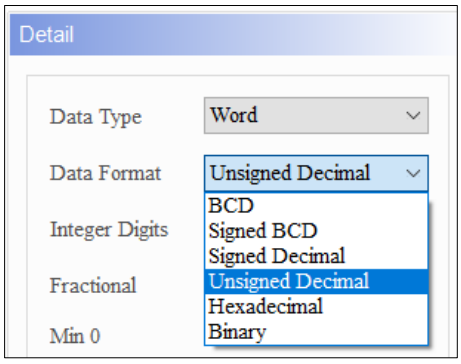
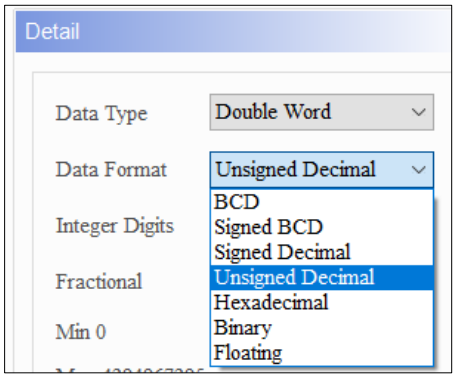
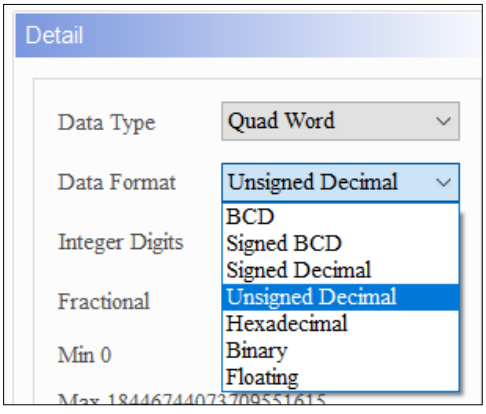
The available options for Data Type are: Word, Double Word, and Quad Word. The default value is Word.
 

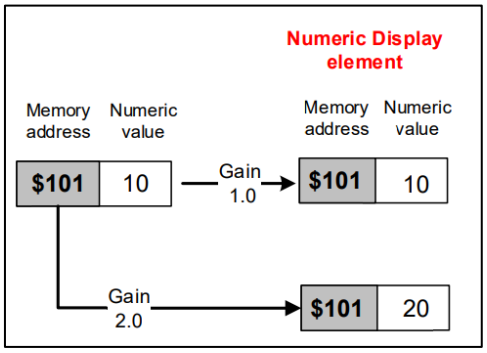
When the Data Type is Quad Word, only Internal Memory and some PLC brands are supported, as shown in the following table.

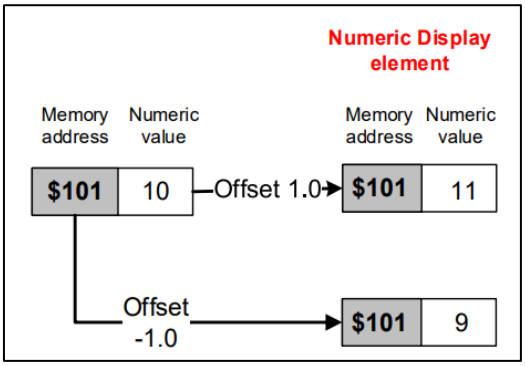
<table>
<tr><th>Label</th><th>Model</th></tr>
<tr><td rowspan="3">Delta</td><td>15MC</td></tr>
<tr><td>15MC TCP</td></tr>
<tr><td>10EMC</td></tr>
<tr><td rowspan="2">Omron</td><td>NJ FINS TCP</td></tr>
<tr><td>NJ/NX FINS UDP</td></tr>
<tr><td>Beckhoff</td><td>TWINCAT TCP</td></tr>
<tr><td rowspan="2">SIEMENS</td><td>S7-1200</td></tr>
<tr><td>S7-1500</td></tr>
</table>

The Internal Memory only supports the address range ($0 ~ $199999). When the Quad Word value unit is selected, the Internal Memory can be expanded to 200,000.

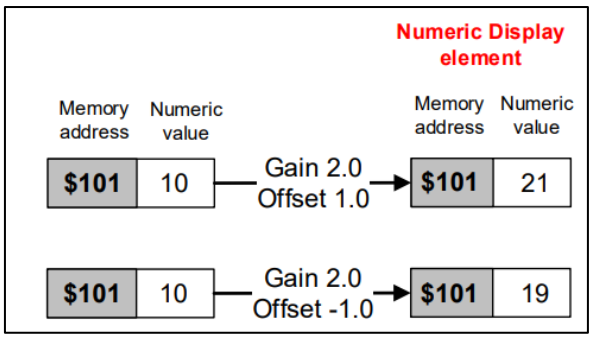
<table>
<tr><th>Access Type</th><th>Element Type</th><th>Access Range</th></tr>
<tr><td>Word</td><td>$n</td><td>$0 ~ $199999</td></tr>
<tr><td>Bit</td><td>$n.b</td><td>$0.0 ~ $199999.15</td></tr>
</table>
NOTE: n is Word (0 ~ 199999); b is Bit (0 ~ 15).
</td></tr>
</table>

No.	Function	Description
(4)	Data Format	● When **Data Type** is Word, the supported **Data Format** is as follows.  ● When **Data Type** is Double Word / Quad Word, the supported **Data Format** are as follows.   ● When the **Data Type** is Double Word and the **Data Format** is Floating, the total number of **Integer Digits** and **Fractional** can only support 7 digits. If it exceeds 7 digits, DIAScreen displays a warning message to remind users. ● When the **Data Type** is Quad Word and the **Data Format** is Floating, the total number of **Integer Digits** and **Fractional** can only support 15 digits. If it exceeds 15 digits, DIAScreen displays a warning message to remind users.
(5)	Integer Digits / Fractional	● Set the number of **Integer Digits** and **Fractional** to be displayed. The default **Integer Digits** is **4** and

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Fractional is 0.
● The number of decimal places here is not a real decimal value, but the display format. Only when Floating is selected for the Data Format, it is a real decimal.</td></tr>
<tr><td>(6)</td><td>Display Dot</td><td>Add new setting for display digits.</td></tr>
<tr><td>(7)</td><td>Gain / Offset</td><td>● The formula for Gain and Offset is y = (a)x + (b).
<table>
<tr><th>y</th><th>a</th><th>x</th><th>b</th></tr>
<tr><td>Element display value</td><td>Gain</td><td>Actual Register Value</td><td>Offset</td></tr>
</table>
● The Numeric Display element multiplies the actual value of the register by the set Gain value, and then display it on the HMI screen, and the gain is preset to 1.0. If the gain is set to 2.0, when the element reads the register value of 10, the actual value displayed on the element is 20.


● The Numeric Display element adds the actual value of the register to the set Offset value, and then displays it on the HMI. The Offset is preset to 0.0. If the Offset is set to 1.0, when the element reads the register value of 10, the value actually displayed on the element is 11; on the contrary, when the Offset is set to -1.0, when the element reads the register value to 10, then the value actually displayed on the element is 9.


● The following is a schematic figure of setting Gain 2.0,</td></tr>
</table>

No.	Function	Description
		Offset 1.0 and **Gain** 2.0 and **Offset** -1.0.  ● If users check **Round off**, the calculation results are rounded off before displayed on the element.

- Style

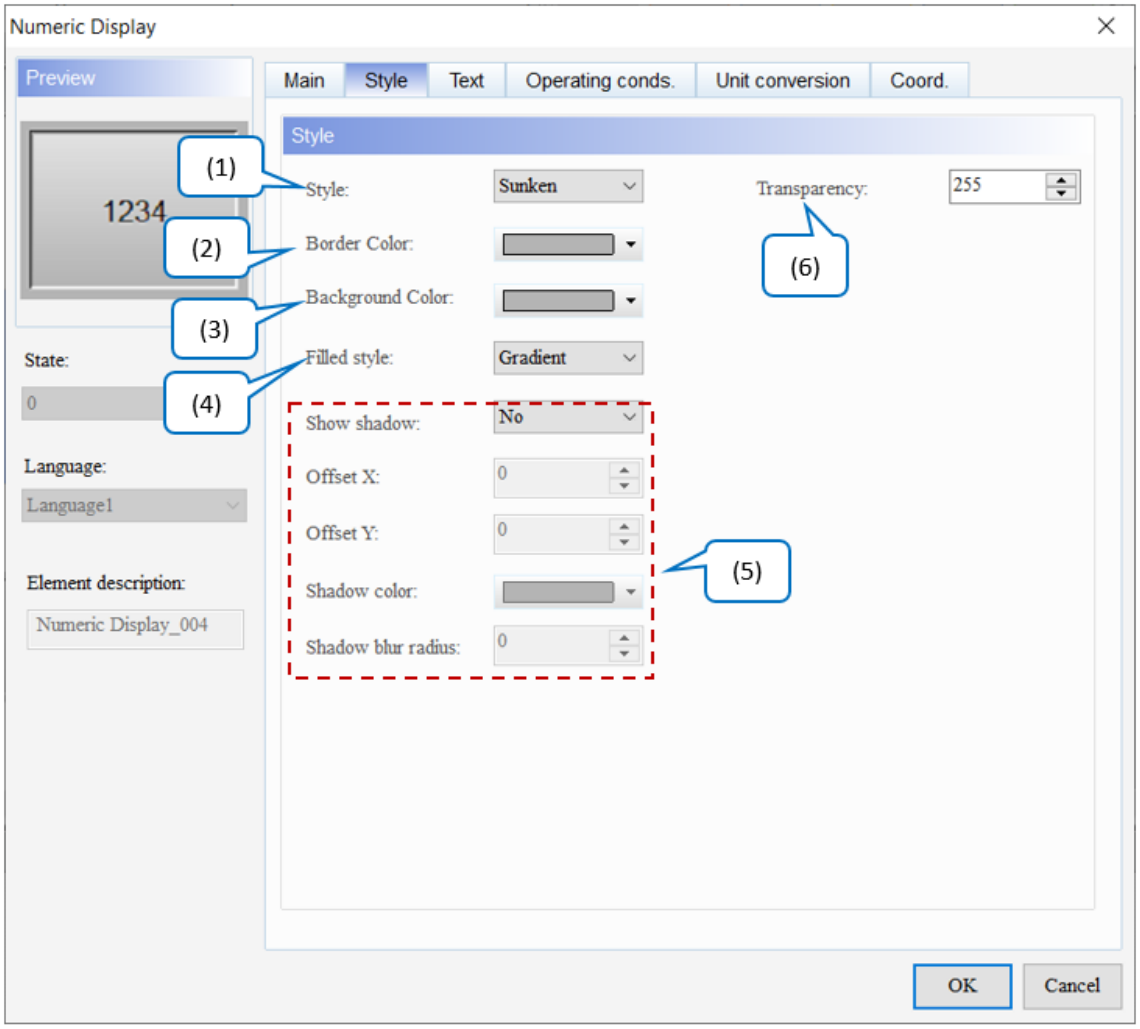
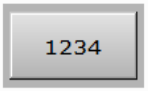
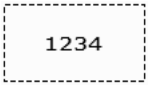
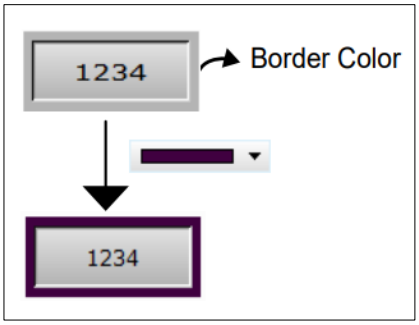
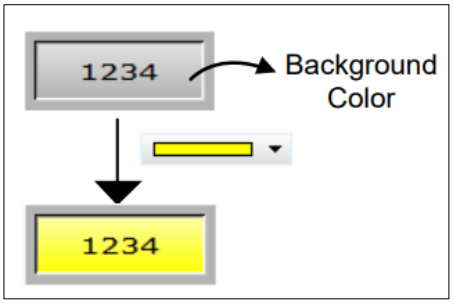


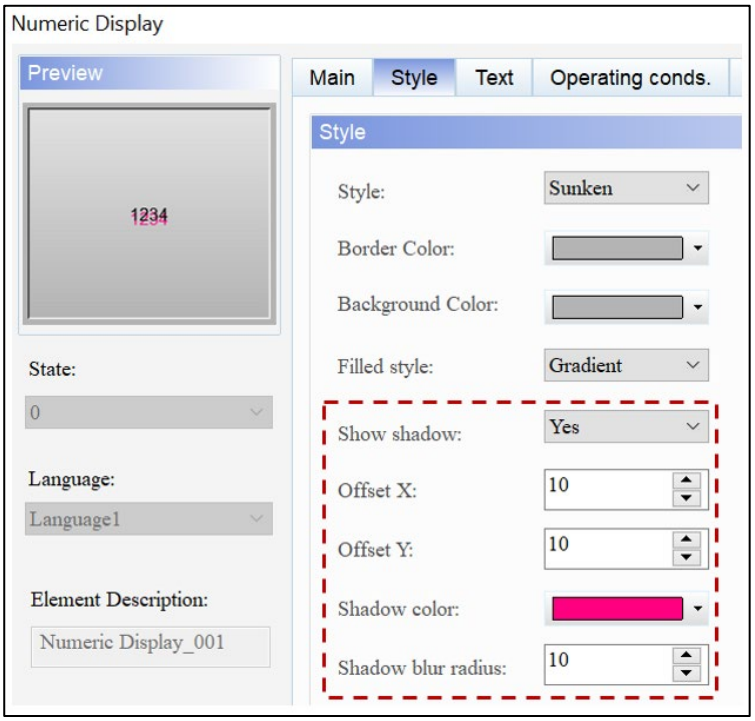
Figure 11 - 3: Numeric Display element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of elements. The available options for Style are: Standard, Raised, Sunken, and Transparent. The default value is Sunken.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td> 
</td><td> 
</td><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Border Color</td><td>● Set the border color. The default is .
● When users set the Style to Transparent, the Border Color setting is invalid
 
</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>● Set the background color of the element. The default is .
● When users set the Style to Transparent, the Background Color setting is invalid
 
</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>● The available options for Filled style of the elements on the DOP-100 series models are: Gradient and Fixed. The default value is Gradient.
● If the DOP-B project is turned on, the element will be displayed in Fixed, and the effect is the same as that of DOP-B.
<table>
<tr><td>Gradient</td><td>  </td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Shadow setting</td><td>

Set whether the text on the element should show shadow. The default value is No.
Select Yes for Show shadow to adjust the following shadow settings.

<table>
<tr><td>Offset X</td><td>Enter an integer from -100 ~ 100. The default value is 0.
If users enter a negative number, the shadow appears on the left side of the text, and if users enter a positive number, the shadow appears on the right side.</td></tr>
<tr><td>Offset Y</td><td>Enter an integer from -100 ~ 100. The default value is 0.
If users enter a negative number, the shadow appears above the text, and if users enter a positive number, the shadow appears as shown in the following figure.</td></tr>
<tr><td>Shadow color</td><td>Set the color of the text shadow.</td></tr>
<tr><td>Shadow blur radius</td><td>Enter an integer from 0 ~ 100. The default value is 0. The larger the value, the higher the blurring of the shadow.</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
		
(6)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Text

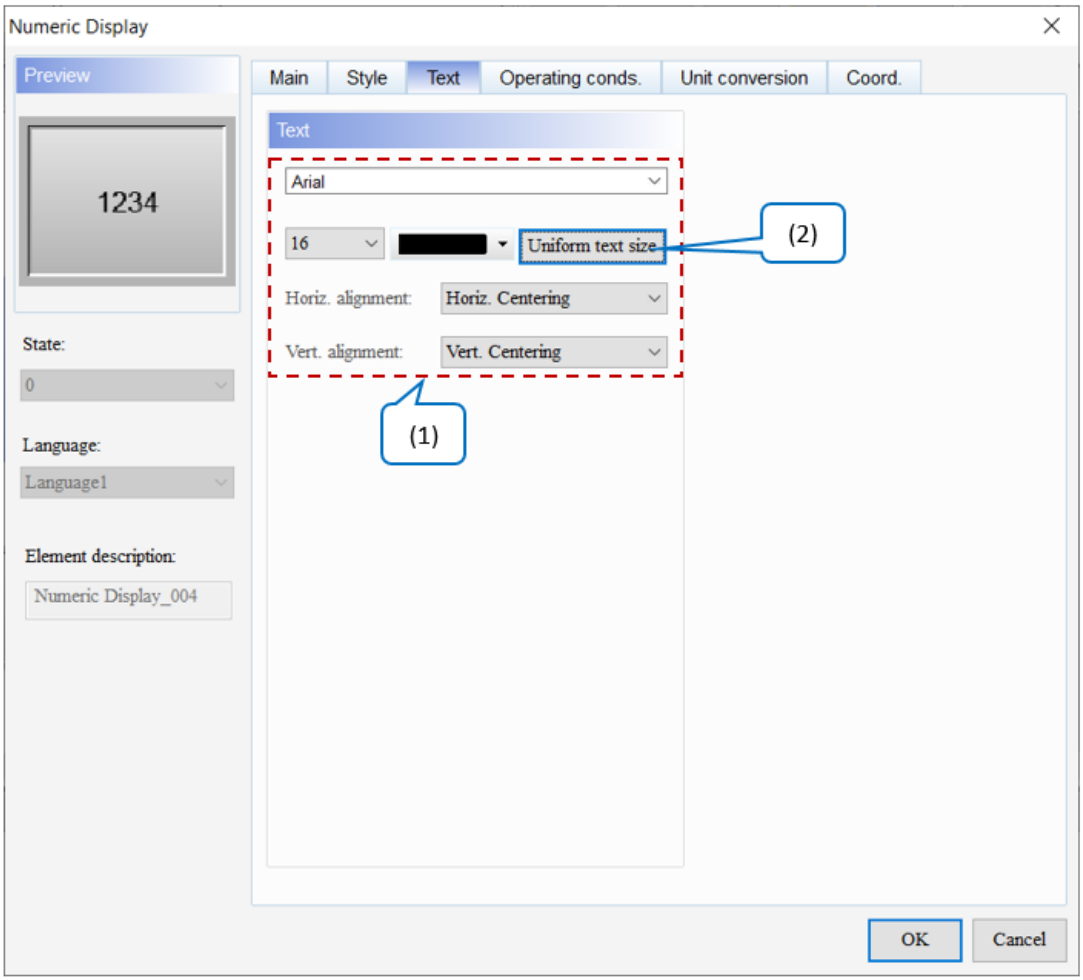


Figure 11 - 4: Numeric Display element Text property page

No.	Function	Description
(1)	Text	Set the text properties, including the font, size, color and alignment.
(2)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

- Operating conds.

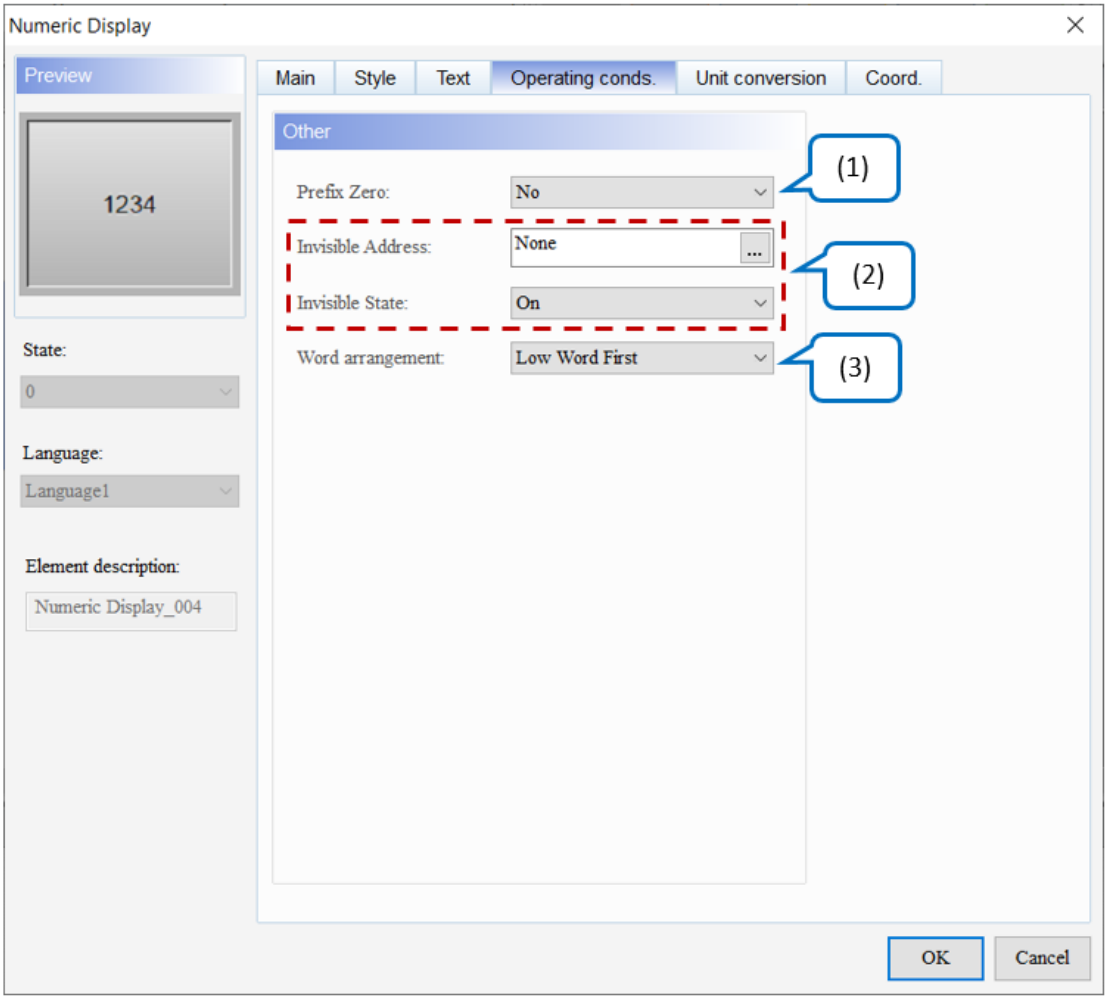


Figure 11 - 5: Numeric Display element Operating conds. property page

No.	Function	Description	
(1)	Prefix Zero	● The zero-filling of the previous value determines the number of digits to be filled according to the set **Integer Digits**. The default value is **No**. ● If the **Integer Digits** is 5, the result appears as follows.	
		Prefix Zero is Yes	00050
		Prefix Zero is No	50

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Invisible Address

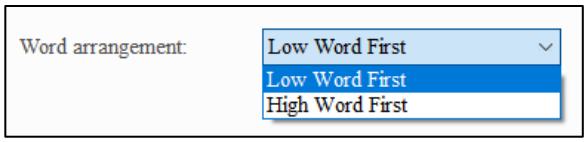
Invisible State</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element, and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 


</td></tr>
<tr><td>Invisible State is Off</td><td> 


</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Word arrangement</td><td>This function is used to switch high and low characters. The available options for Word arrangement are: Low Word First and High Word First. The default value is Low Word First.
 
</td></tr>
</table>

- Unit conversion

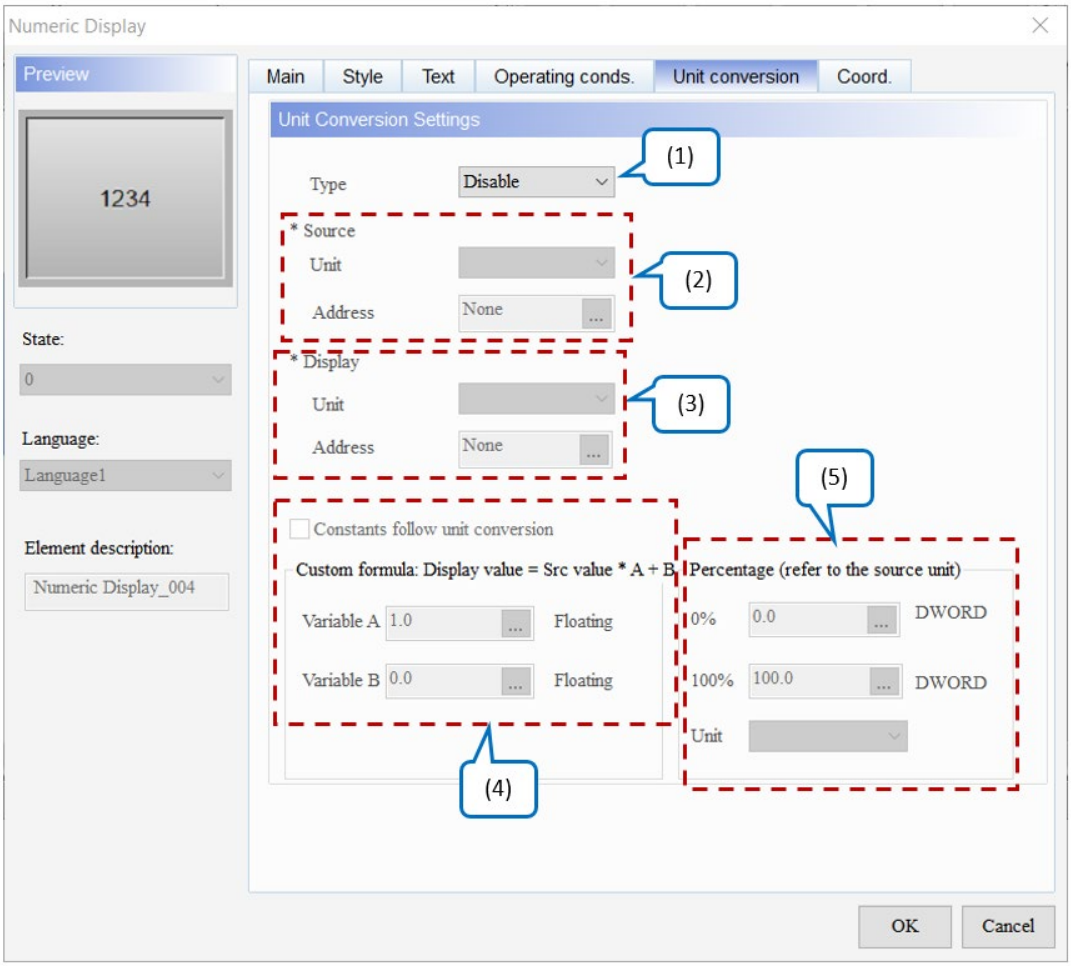
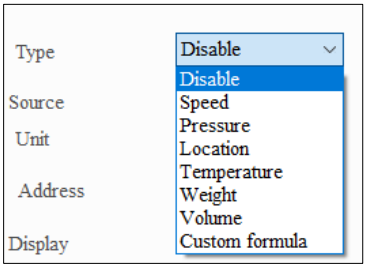
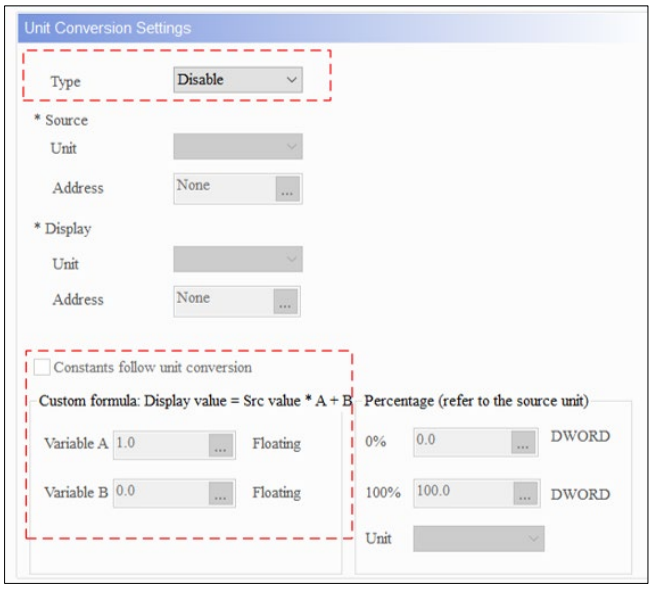


Figure 11 - 6: Numeric Display element Unit conversion property page

No.	Function	Description
(1)	Type	● Select the **Type** to be converted, as follows: Speed, Pressure, Position, Temperature, Weight, Volume and Custom formula. The default value is **Disable**.  ● If users select Disable for **Type**, it means that the value does not need unit conversion. ● When selecting a Custom formula for the **Type**, input the

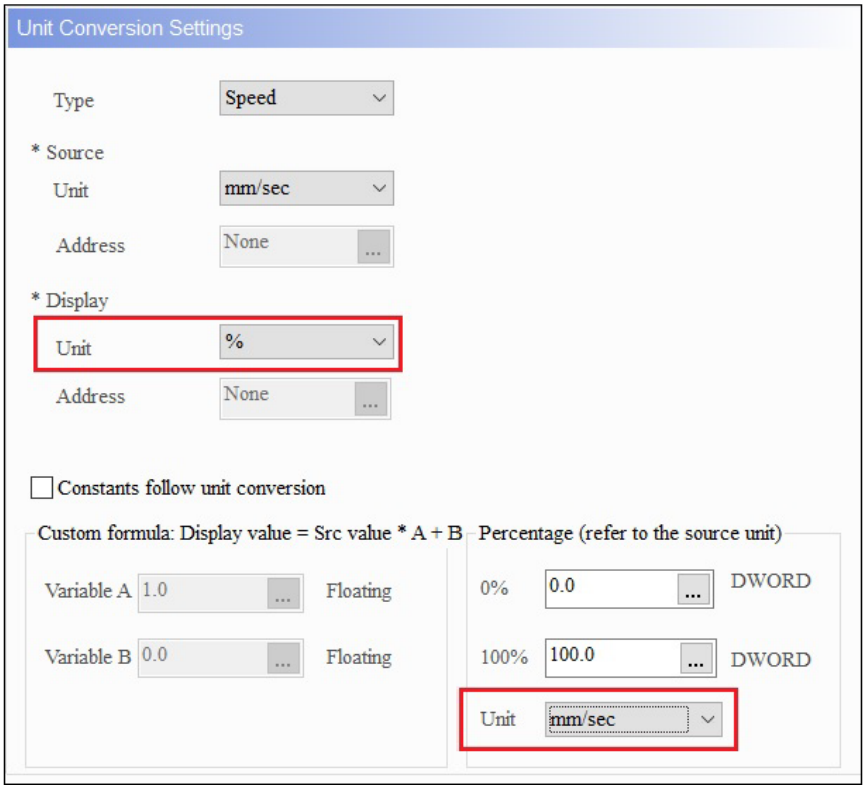
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>values of Variable A and Variable B. The unit is Floating, and the formula is Display Value = Src value * A + B.
 
</td></tr>
<tr><td>(2)</td><td>Source</td><td>● The unit depends on the Type selected. The following table shows the unit corresponding to the type.
<table>
<tr><th>Type</th><th>Unit</th></tr>
<tr><td rowspan="4">Speed</td><td>mm/sec</td></tr>
<tr><td>inch/sec</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
<tr><td rowspan="6">Pressure</td><td>kg/cm^2</td></tr>
<tr><td>bar</td></tr>
<tr><td>MPa</td></tr>
<tr><td>psi</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
<tr><td rowspan="4">Location</td><td>mm</td></tr>
<tr><td>inch</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
<tr><td rowspan="4">Temperature</td><td>°F</td></tr>
<tr><td>°C</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
</table></td></tr>
</table>

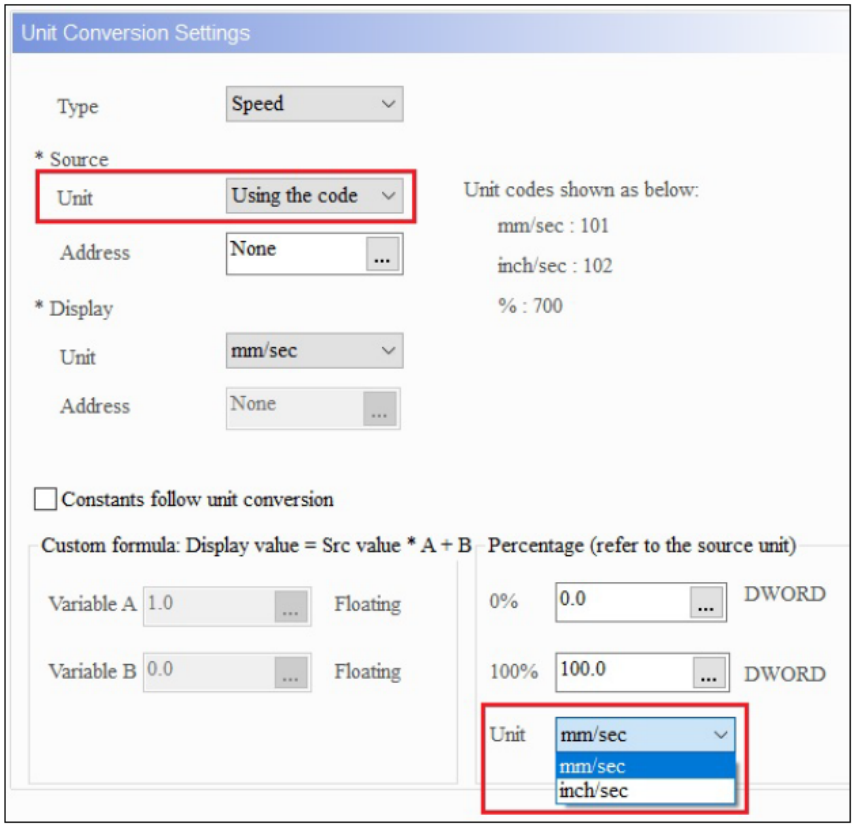
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td colspan="2">
<table>
<tr><td rowspan="8">Weight

NOTE: kg and lb are supported by AX-8 and IMP series models</td><td>T</td></tr>
<tr><td>kN</td></tr>
<tr><td>g</td></tr>
<tr><td>oz</td></tr>
<tr><td>kg</td></tr>
<tr><td>lb</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
<tr><td rowspan="5">Volume</td><td>L</td></tr>
<tr><td>ml</td></tr>
<tr><td>kL</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
<tr><td rowspan="5">Force

NOTE: This unit conversion is supported by AX-8 and IMP series models</td><td>kN</td></tr>
<tr><td>tonf</td></tr>
<tr><td>us-tonf</td></tr>
<tr><td>%</td></tr>
<tr><td>Using the code</td></tr>
</table>
When the Unit of either the Source or the Display is selected as % or Using the code, the Percentage setting interface will be enabled. When the Percentage setting interface can be input, users need to customize the 0% value and 100% value, and the Unit is the unit setting of the reference source.
</td></tr>
</table>

No.	Function	Description





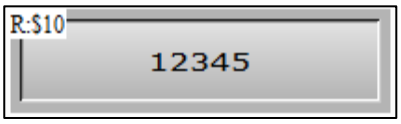
- When the **Unit** is selected as Using the code, it means that the Unit code of the **Source** terminal and the **Display** terminal can be input through the variable, and the Unit code of the **Source** terminal and the display terminal can be input by the **Unit** substitution variable. The Unit code is

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>arranged as follows:
<table>
<tr><th>Type</th><th>Unit</th><th>Code</th></tr>
<tr><td rowspan="3">Speed</td><td>mm/sec</td><td>101</td></tr>
<tr><td>inch/sec</td><td>102</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="5">Pressure</td><td>kg/cm^2</td><td>201</td></tr>
<tr><td>bar</td><td>202</td></tr>
<tr><td>MPa</td><td>203</td></tr>
<tr><td>psi</td><td>204</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="3">Location</td><td>mm</td><td>301</td></tr>
<tr><td>inch</td><td>302</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="3">Temperature</td><td>°F</td><td>401</td></tr>
<tr><td>°C</td><td>402</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="5">Weight</td><td>t</td><td>501</td></tr>
<tr><td>kN</td><td>502</td></tr>
<tr><td>g</td><td>503</td></tr>
<tr><td>oz</td><td>504</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="4">Volume</td><td>L</td><td>601</td></tr>
<tr><td>ml</td><td>602</td></tr>
<tr><td>kL</td><td>603</td></tr>
<tr><td>%</td><td>700</td></tr>
</table>

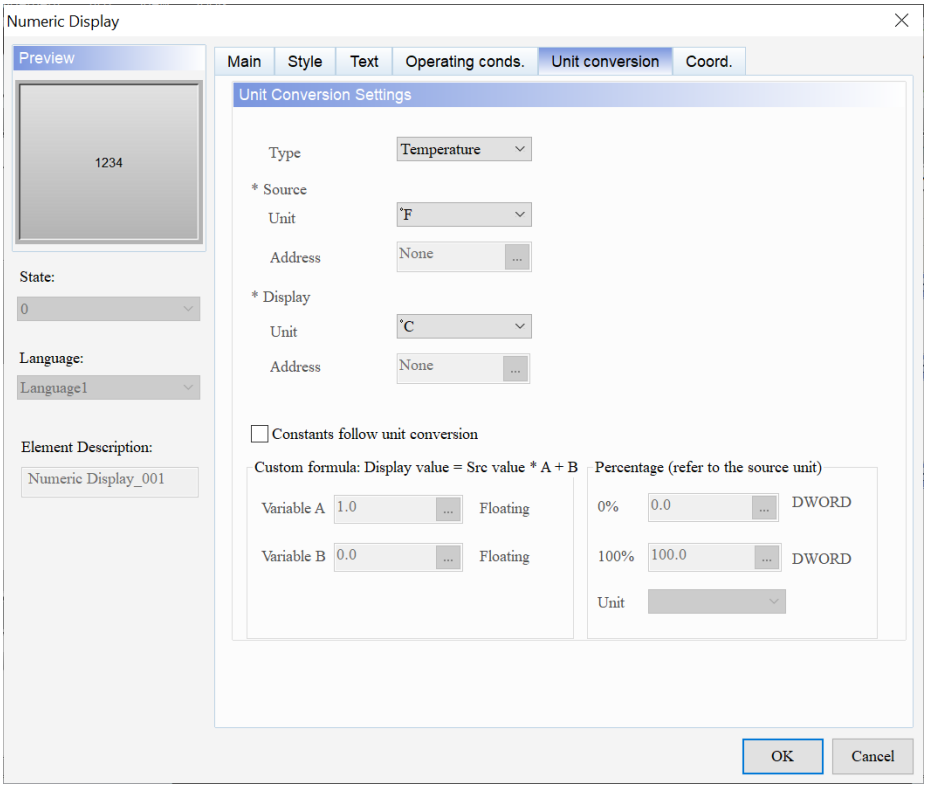
The address can be customized only when the Unit chooses to Using the code.
Do not use the same address if both the Source and Display are selected to Using the code.
</td></tr>
<tr><td>(3)</td><td>Display</td><td>
Refer to the Source description for the Unit.
The address can be customized only if the Unit chooses to Using the code.
If both the Source and Display are selected to Using the code, do not use the same address.
</td></tr>
</table>

No.	Function	Description
(4)	Custom formula	● **Variable A** and **Variable B** support the input of external and Internal Memory addresses and constants. ● When choosing a Custom formula for the **Type**, users need to input the values of **Variable A** and **Variable B**. The unit is Floating, and the formula is **Display Value = Src value * A + B**.
(5)	Percentage settings	● **0%** and **100%** support input of external and Internal Memory addresses and constants. ● When the **Unit** of either the **Source** or the **Display** is selected as % or Using the code, the **Percentage** setting interface will be enabled. ● The **Unit** will be changed with reference to the **Unit** of the **Source**. In terms of Speed, if users select % or Using the code as the **Source**, users can select mm/sec or inch/sec from the drop-down menu for the **Percentage** setting **Unit**; if users select mm/sec, the **Percentage** setting **Unit** is only mm/sec.

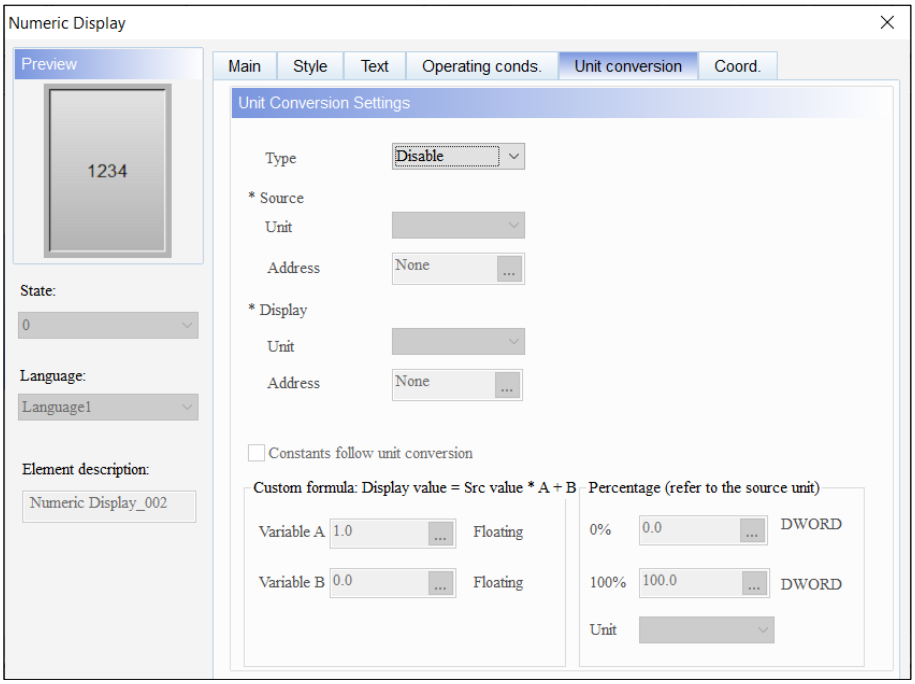
Refer to the following table for unit conversion examples.

<table>
<tr><th colspan="6">Unit Conversion (Unit fixed)</th></tr>
<tr><td rowspan="3">Address settings</td><td colspan="3">Numeric Display Element (Display)</td><td colspan="2">Numeric Entry Element (Source)</td></tr>
<tr><td>Read Address</td><td>$10</td><td>Write Address</td><td>$10</td></tr>
<tr><td colspan="3"> 
</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Detail settings</td><td colspan="5">Numeric Display / Numeric Entry Element</td></tr>
<tr><td>Data Type</td><td>Data Format</td><td>Integer Digits</td><td>Fractional</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>5</td><td>0</td></tr>
<tr><td>Unit settings</td><td colspan="5">● Double-click the Numeric Display element and go to Unit conversion property page. Select Temperature for Type, °F for Source Unit, and °C for Display Unit.</td></tr>
</table>

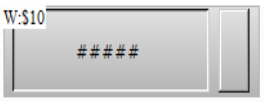
Unit Conversion (Unit fixed)

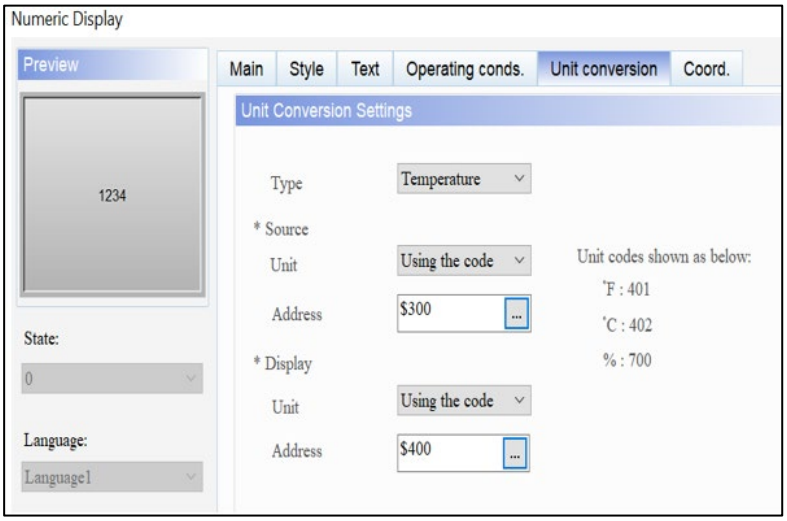


- Since the **Numeric Entry** element does not need unit conversion, set **Type** to Disable.



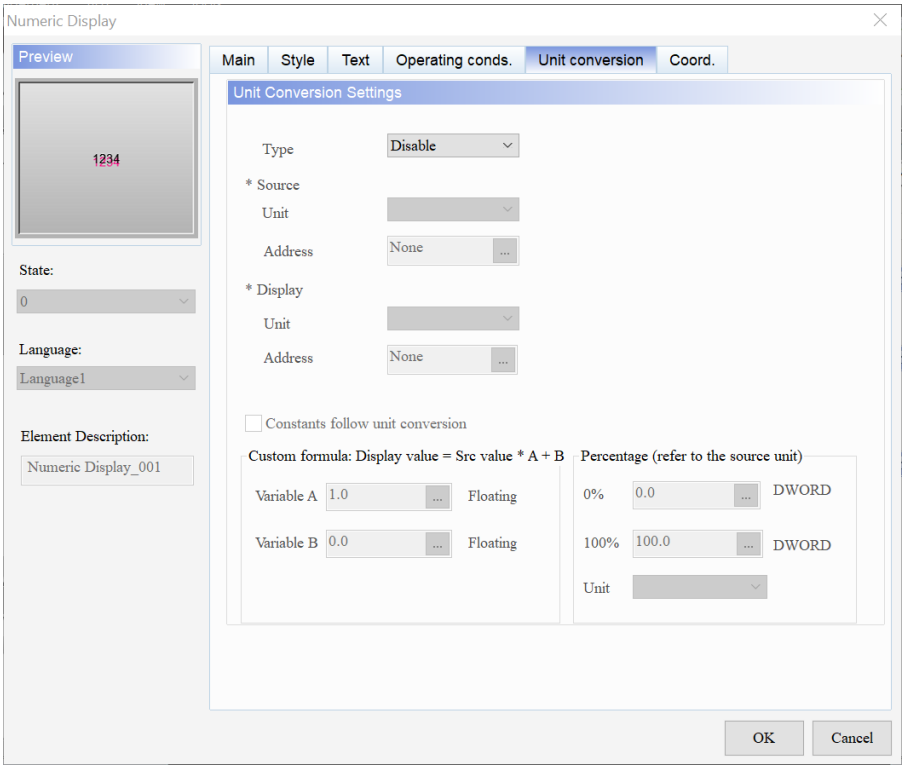
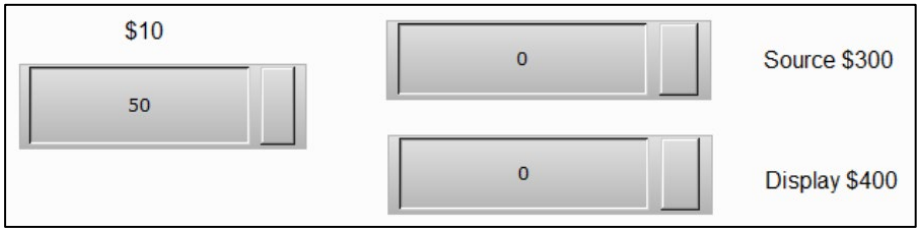
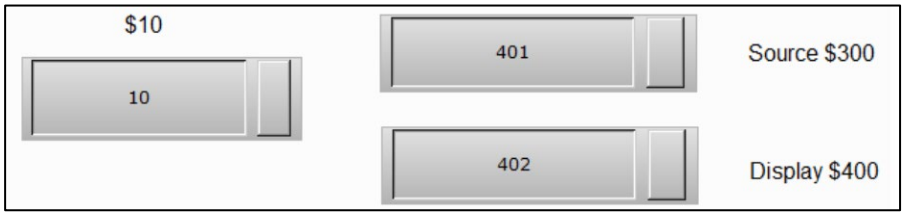
<table>
<tr><th colspan="2">Unit Conversion (Unit fixed)</th></tr>
<tr><td>Execution result</td><td>After creating the elements, compile and download the data to the HMI, then enter 50 (°F) with the Numeric Entry element, and the Numeric Display element converts the temperature to 10 (°C).
 
</td></tr>
</table>

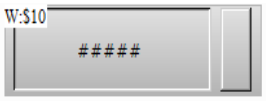
<table>
<tr><th colspan="2">Unit Conversion (Using the code)</th></tr>
<tr><td>Address settings</td><td>
<table>
<tr><th colspan="2">Numeric Entry Element</th><th colspan="2">Numeric Entry Element (Source)</th><th colspan="2">Numeric Entry Element (Display)</th></tr>
<tr><td>Read Address</td><td>$10</td><td>Write Address</td><td>$300</td><td>Write Address</td><td>$400</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>
<table>
<tr><th colspan="4">Numeric Entry Element</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Integer Digits</th><th>Fractional</th></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>5</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Unit settings</td><td>

Double-click the Numeric Entry element of $10 and go to Unit conversion property page. Select Temperature for Type. For Source settings, select Using the code for Unit and set $300 for Address; for Display settings, select Using the code for Unit and set $400 for Address.
 

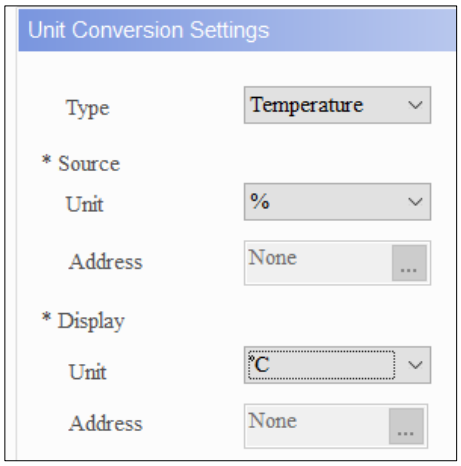
Since the Numeric Entry elements of $300 and $400 do not need unit conversion, set Type to Disable.

</td></tr>
</table>

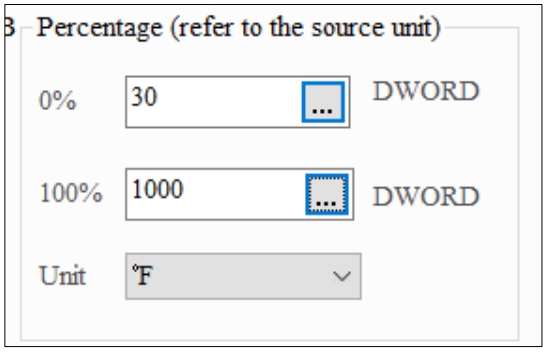
Unit Conversion (Using the code)	
	
Execution result	● After creating the elements, compile and download the data to the HMI, and then enter 50 for $10.  ● Enter 401 (°F) for $300 and 402 (°C) for $400, and then $10 converts the value to 10 (°C). 

<table>
<tr><th colspan="3">Unit Conversion (%)</th></tr>
<tr><td>Address settings</td><td colspan="2"><table>
<tr><th colspan="2">Numeric Display Element (Display)</th><th colspan="2">Numeric Entry Element (Source)</th></tr>
<tr><td>Read Address</td><td>$10</td><td>Write Address</td><td>$10</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table></td></tr>
<tr><td>Detail settings</td><td colspan="2"><table>
<tr><th colspan="4">Numeric Display / Numeric Entry Element</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Integer Digits</th><th>Fractional</th></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>5</td><td>0</td></tr>
</table></td></tr>
<tr><td>Unit settings</td><td colspan="2">

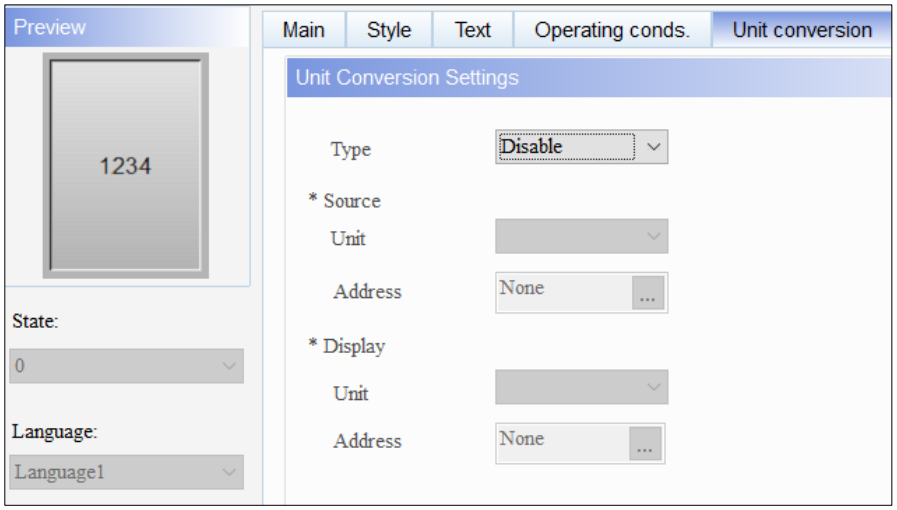
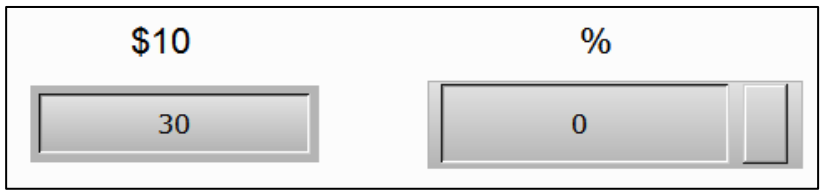
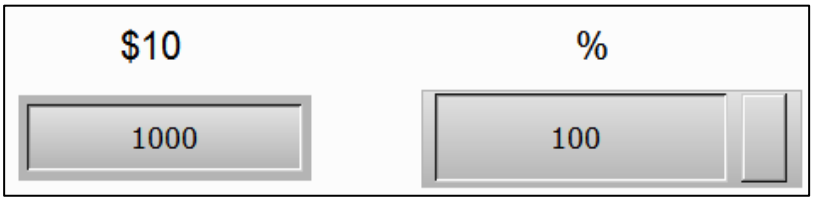
Double-click the Numeric Display element of $10. Go to Unit conversion property page. Select Temperature for Type. Set Source Unit to % and Display Unit to °C.



In the Percentage setting, set 0% to 30.0, and 100% to 1000.0.
Since the Source Unit is %, the Percentage setting unit is °F or °C. In this example, °F is used as the unit.



</td></tr>
</table>

Unit Conversion (%)	
	Since the **Numeric Entry** element of $10 does not need unit conversion, set **Type** to Disable. 
Execution result	● After creating the elements, compile download the data to the HMI. The value for the **Numeric Entry** element of $10 is 0, so the **Numeric Display** element displays 30, which means the value for 0% is 30.  ● If users set $10 to 100, the **Numeric Display** element displays 1000, which means the value for 100% is 1000. 

- Coord.

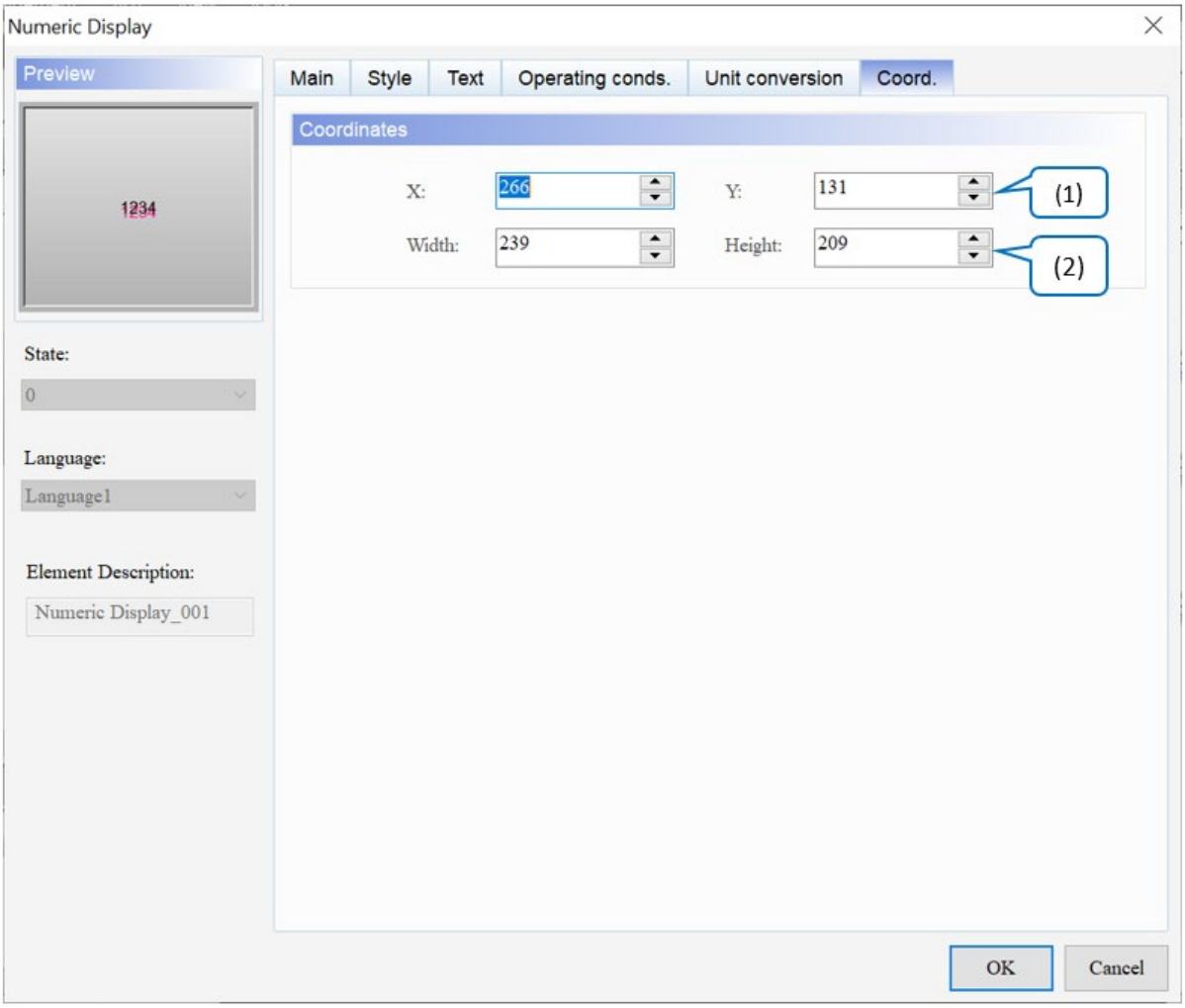
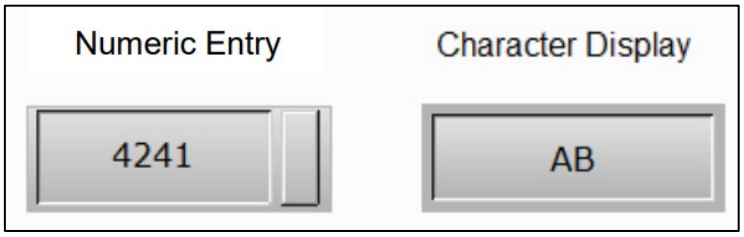


Figure 11 - 7: Numeric Display element Coord. property page

No.	Function	Description
(1)	X value, Y value	Set the upper left X coordinate and Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

11.2 Character Display

The **Character Display** element is for displaying characters, so the input value must be readable ASCII codes. DIAScreen converts the ASCII codes into characters and displays them on the **Character Display** element. The Character Display is an element reading byte data and the default data type of the Numeric Entry element is Word, which consists of double byte, so one word represents two bytes. Then, the high and low bytes of the value read by the **Character Display** element swaps, and this result will be the actual characters displayed. For example, if $0 is 4241 (Hex), it is displayed as “AB” after the high and low bytes are swapped.



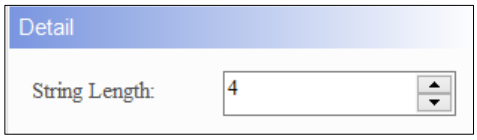
The following conversion table shows the conversion between data formats and characters from A to G. The remaining characters can be deduced with the same pattern.

Unsigned Decimal	Hexadecimal	Character
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G

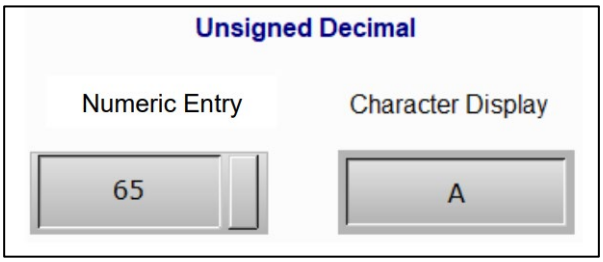
Refer to the following table for **Character Display** element example.

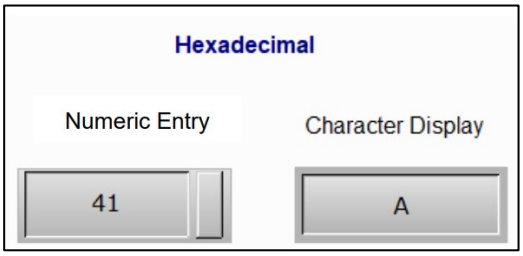
<table>
<tr><th colspan="2">Character Display</th></tr>
<tr><td>Address settings</td><td>
<table>
<tr><th colspan="2">Character Display Element</th><th colspan="2">Numeric Entry Element</th></tr>
<tr><td>Read Address</td><td>$555</td><td>Write Address</td><td>$555</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>

Set the String Length to 4 for the Character Display element.



The characters of Character Display element displays the corresponding value depending on the Data Format.

<table>
<tr><th colspan="3">Numeric Entry Element</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Integer Digits</th></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>4</td></tr>
<tr><th colspan="3">Numeric Entry Element</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Integer Digits</th></tr>
<tr><td>Word</td><td>Hexadecimal</td><td>4</td></tr>
</table>
</td></tr>
<tr><td>Execution result</td><td>Compile and download the screen data to the HMI, and then the Character Display element displays the corresponding characters based on the value of the Read Address and the set Data Format.



</td></tr>
</table>

On double-clicking the **Character Display** element, the property page appears as follows.

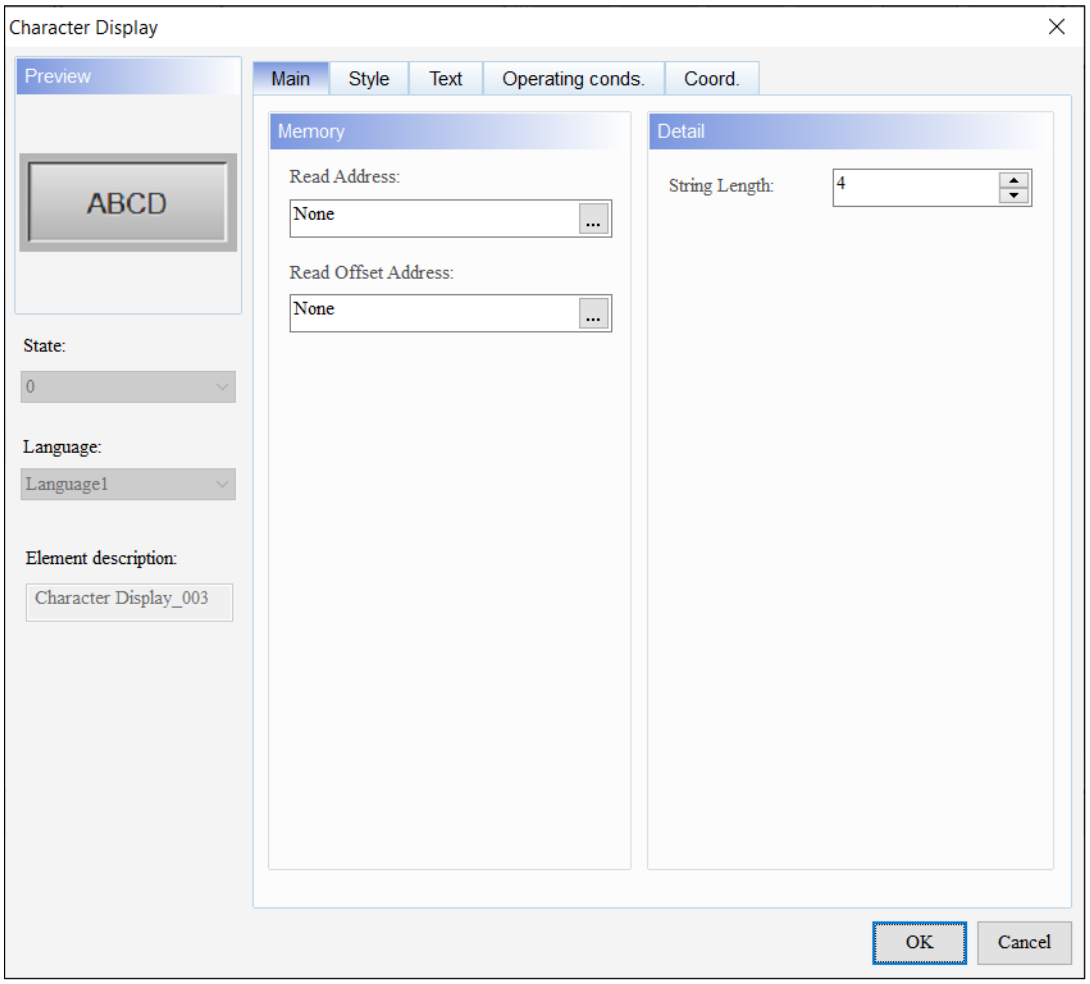


Figure 11 - 8: Character Display element property page

Character Display	
Function	**Description**
Preview	**Character Display** elements do not support multiple state values and multi-language data display.
Main	Set Read Address, Read Offset Address, and String Length.
Style	Set the Style, Border Color, Background Color, Filled style, Show shadow, Offset X, Offset Y, Shadow color, Shadow blur radius, and Transparency.
Text	Set the displaying text font, size, color, alignment options, and Uniform text size.
Operating conds.	Set the Invisible Address, Invisible State, Insufficient string length zero, and Reference order.
Coord.	Set the X and Y coordinates, Width and Height of the elements.

- Main

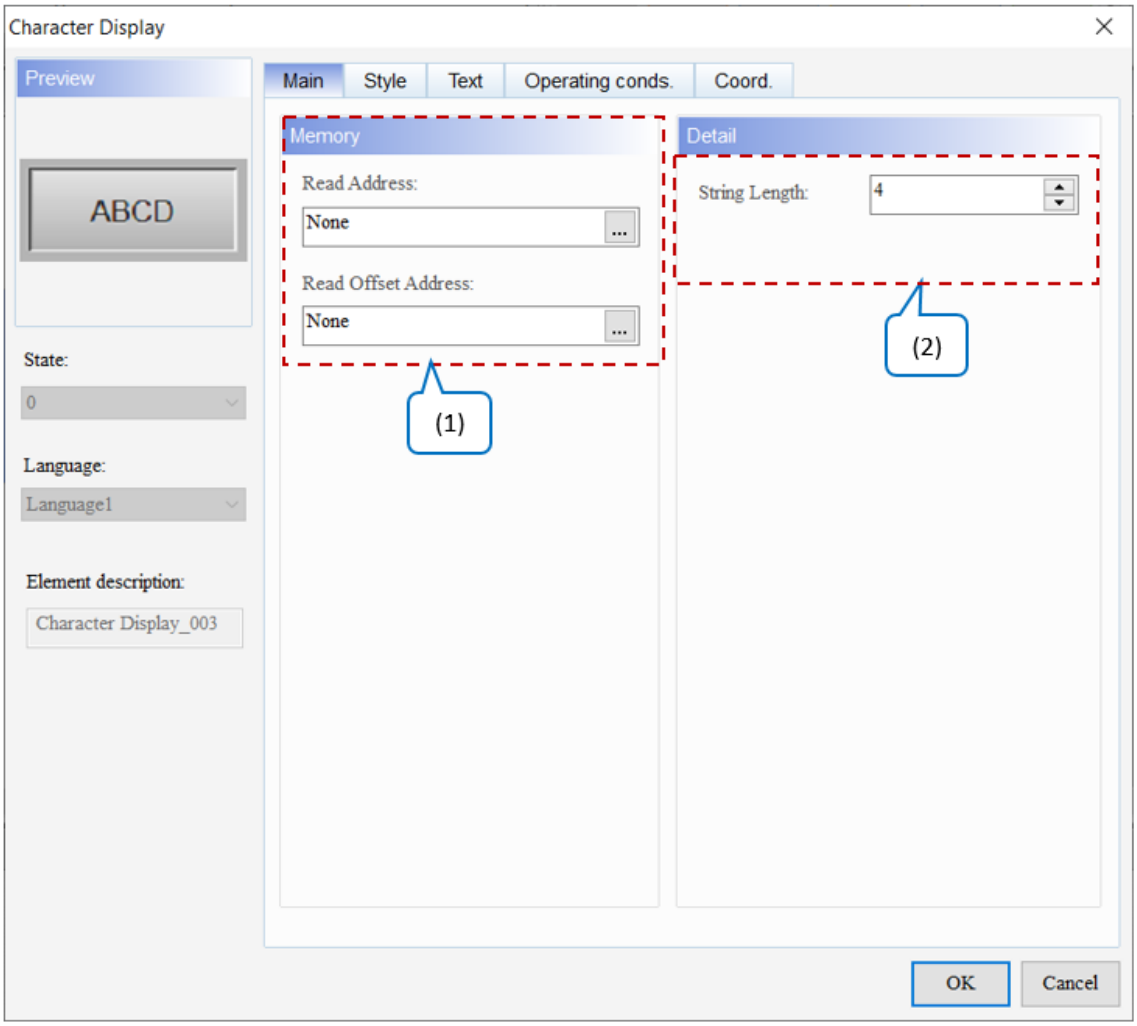


Figure 11 - 9: Character Display element Main property page

No.	Function	Description
(1)	Read Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	String Length	The **String Length** ranges from 1 ~ 256. The default value is **4**.

- Style

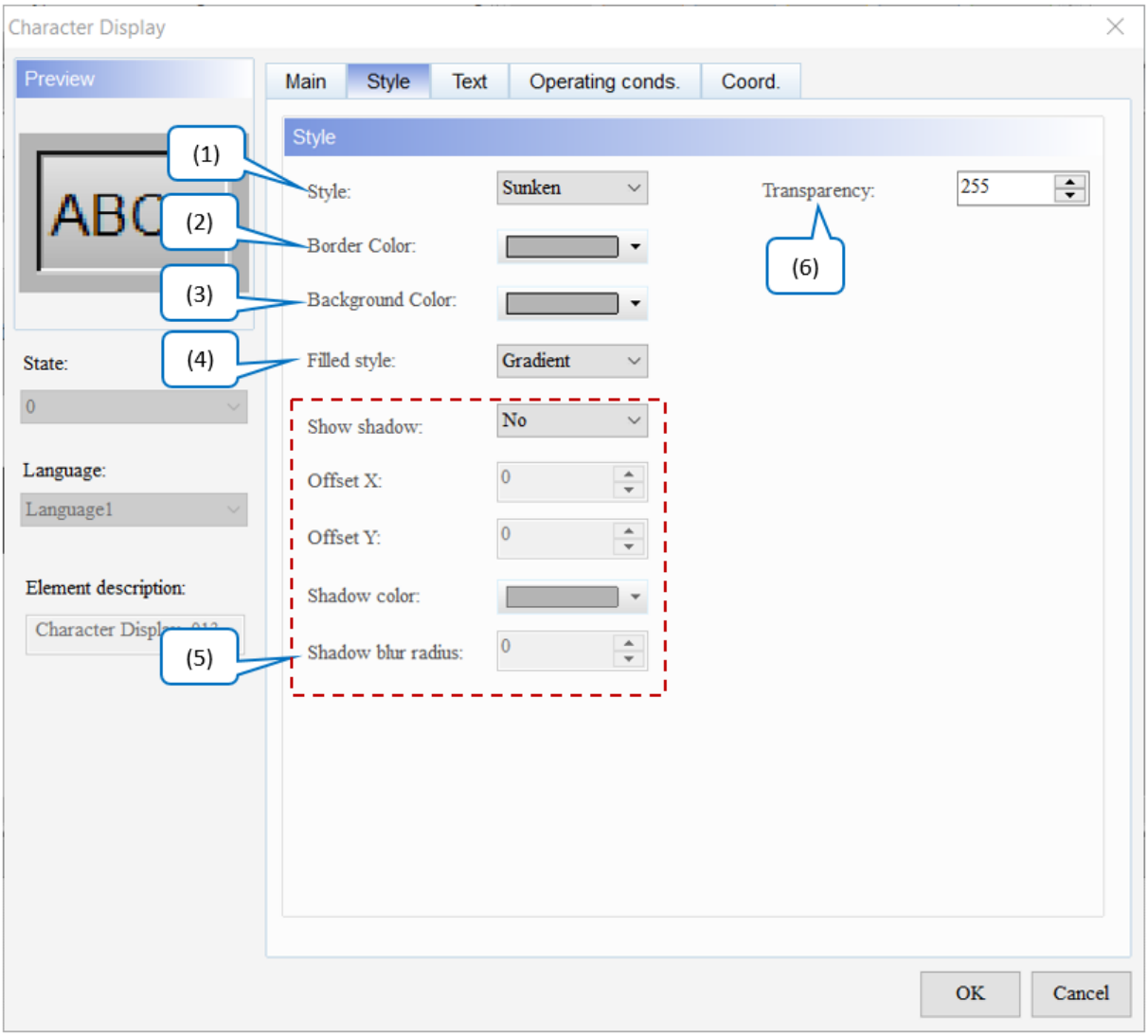


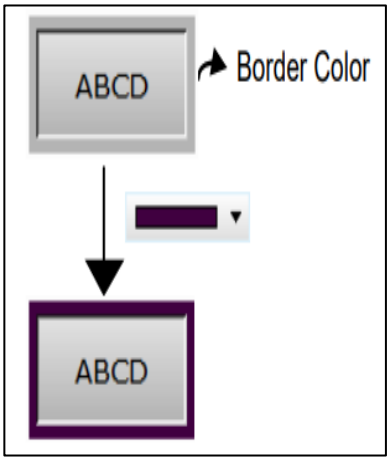
Figure 11 - 10: Character Display element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Sunken, and Transparent. The default value is **Sunken**.

Standard	Raised	Sunken	Transparent
ABCD	ABCD	ABCD	ABCD

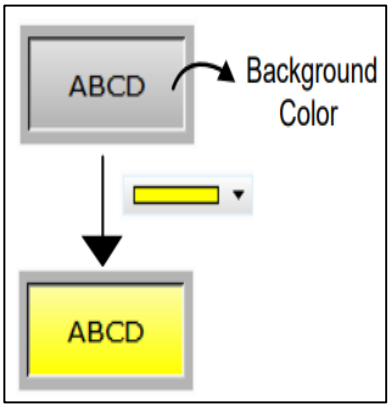
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is  .
When users set the Style to Transparent, the Border Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is  .
When users set the Style to Transparent, the Background Color setting is invalid.



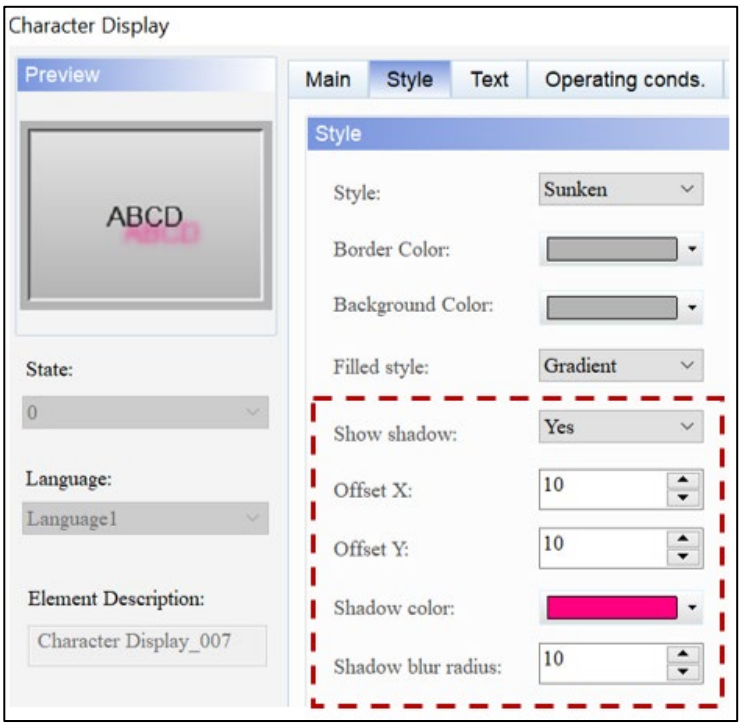
</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td> 
</td></tr>
<tr><td>Fixed</td><td> 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(5)</td><td>Shadow settings</td><td>

Set whether the text on the element should show shadow. The default value is No.
Select Yes for Show shadow to adjust the following shadow settings.

<table>
<tr><td>Offset X</td><td>Enter an integer from -100 ~ 100. The default value is 0.
If users enter a negative number, the shadow appears on the left side of the text, and if users enter a positive number, the shadow appears on the right side.</td></tr>
<tr><td>Offset Y</td><td>Enter an integer from -100 ~ 100. The default value is 0.
If users enter a negative number, the shadow appears above the text, and if users enter a positive number, the shadow appears as shown in the following figure.</td></tr>
<tr><td>Shadow color</td><td>Set the color of the text shadow.</td></tr>
<tr><td>Shadow blur radius</td><td>Enter an integer from 0 ~ 100. The default value is 0. The larger the value, the higher the blurring of the shadow.</td></tr>
</table>


</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

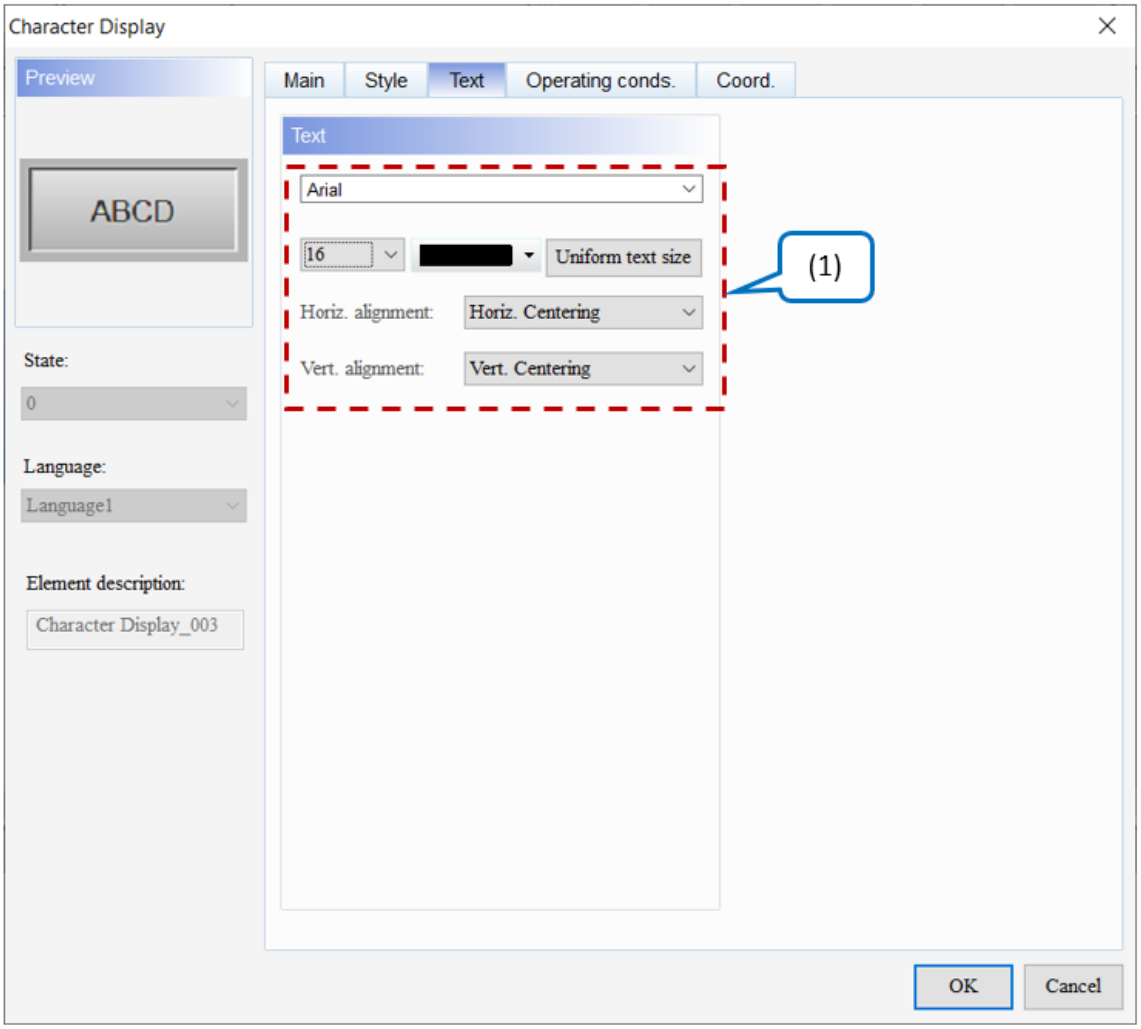


Figure 11 - 11: Character Display element Text property page

No.	Function	Description
(1)	Text	Set the text properties, including the font, size, color, and alignment.
(2)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

- Operating conds.

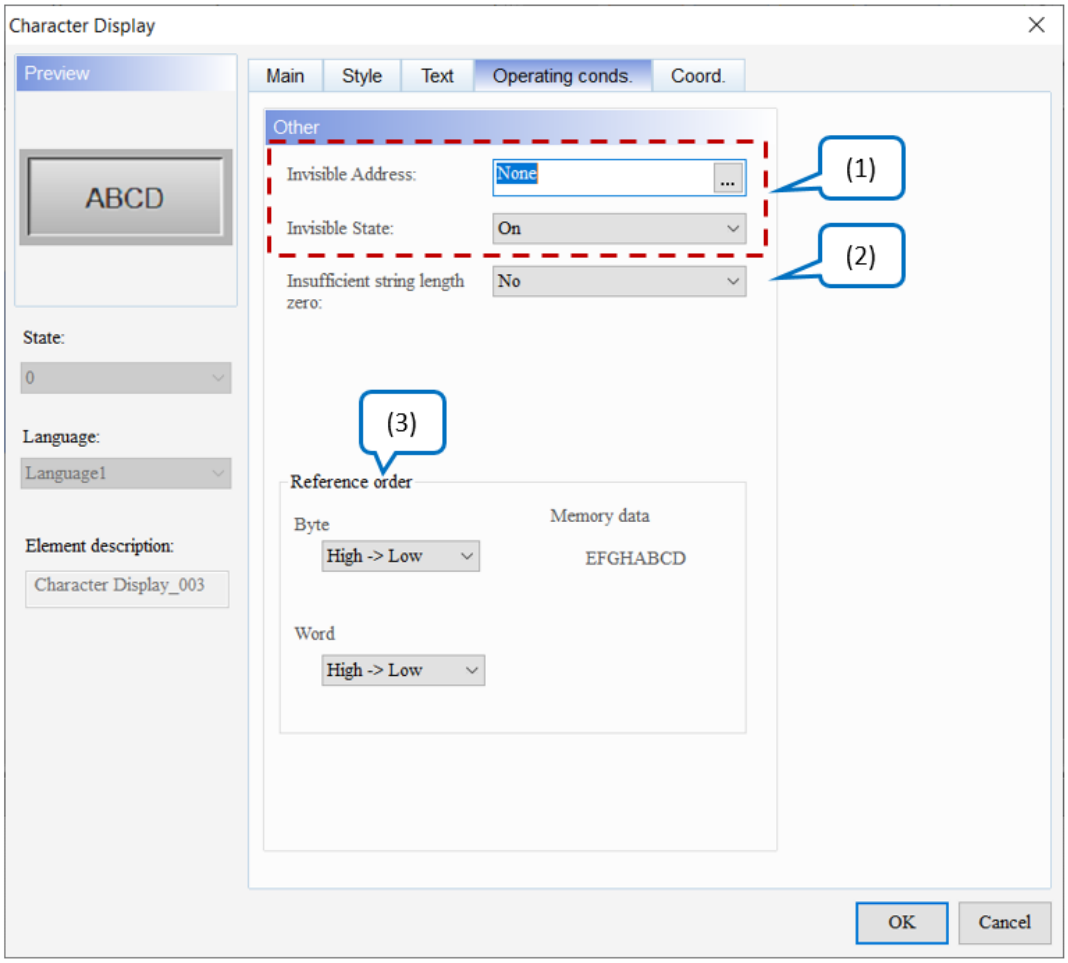
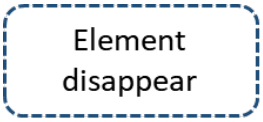
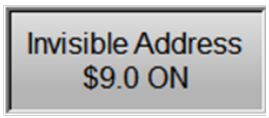
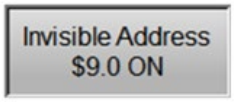
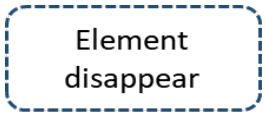
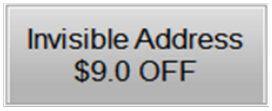
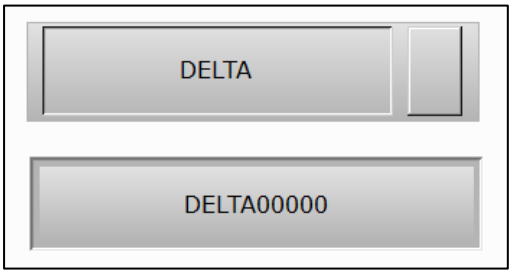
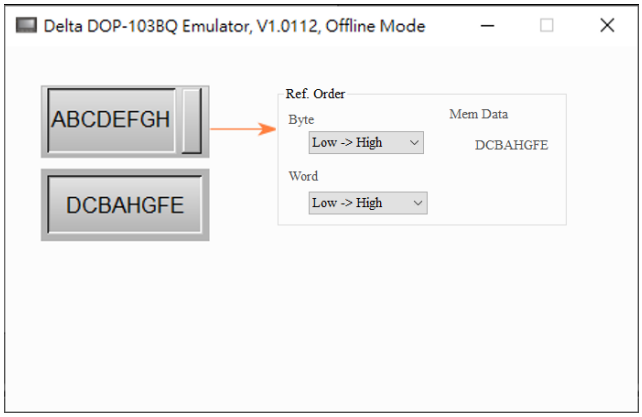
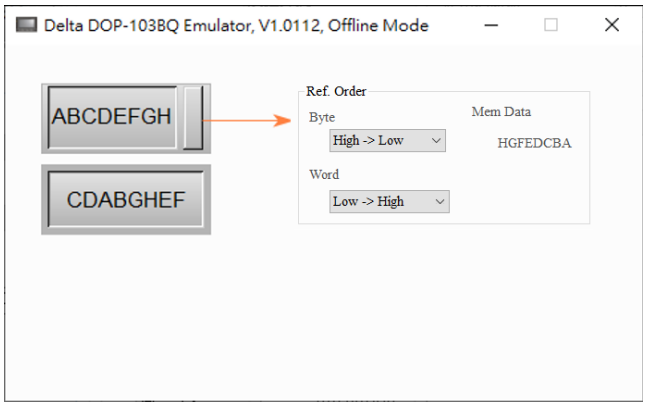


Figure 11 - 12: Character Display element Operating conds. property page

No.	Function	Description
(1)	Invisible Address	● The **Invisible Address** mainly allows users to hide an element through this address. ● If the **Invisible State** is set to On/Off, the element is hidden through the address defined in the **Invisible Address** field. The default value is **On**. ● The following example explains **Invisible Address** usage: 1. Create an element and set its address to $9.0, then set the **Invisible Address** of the element to be hidden

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Invisible State</td><td>to $9.0.
2. To hide the element, first press the $9.0 button.
<table>
<tr><td rowspan="2">Invisible State is On</td><td> 
</td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
</td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Insufficient string length zero</td><td>When the length of the input string is less than the set String Length, the remaining characters is filled in with zeros for display. The default value is No.
 
</td></tr>
<tr><td>(3)</td><td>Reference order</td><td>● The Reference order is used to set the display mode of the read memory. DIAScreen provides two swap modes: Byte and Word. Both can be used at the same time, but use Byte first and then Word. The default value is High→Low.
● The following two settings are provided for swap display results.
<table>
<tr><td>Reference order Byte is Low→High</td><td>Input ABCDEFGH in the Character Entry element, and the result of writing to the memory after reading the swap by the Character Display element is DCBAHGFE.</td></tr>
</table></td></tr>
</table>

No.	Function	Description
		
	Reference order Word is High→Low	Enter **ABCDEFGH** in the **Character Entry** element, and the result of writing to the memory after reading the swap by the **Character Display** element is CDABGHEF. 

- Coord.

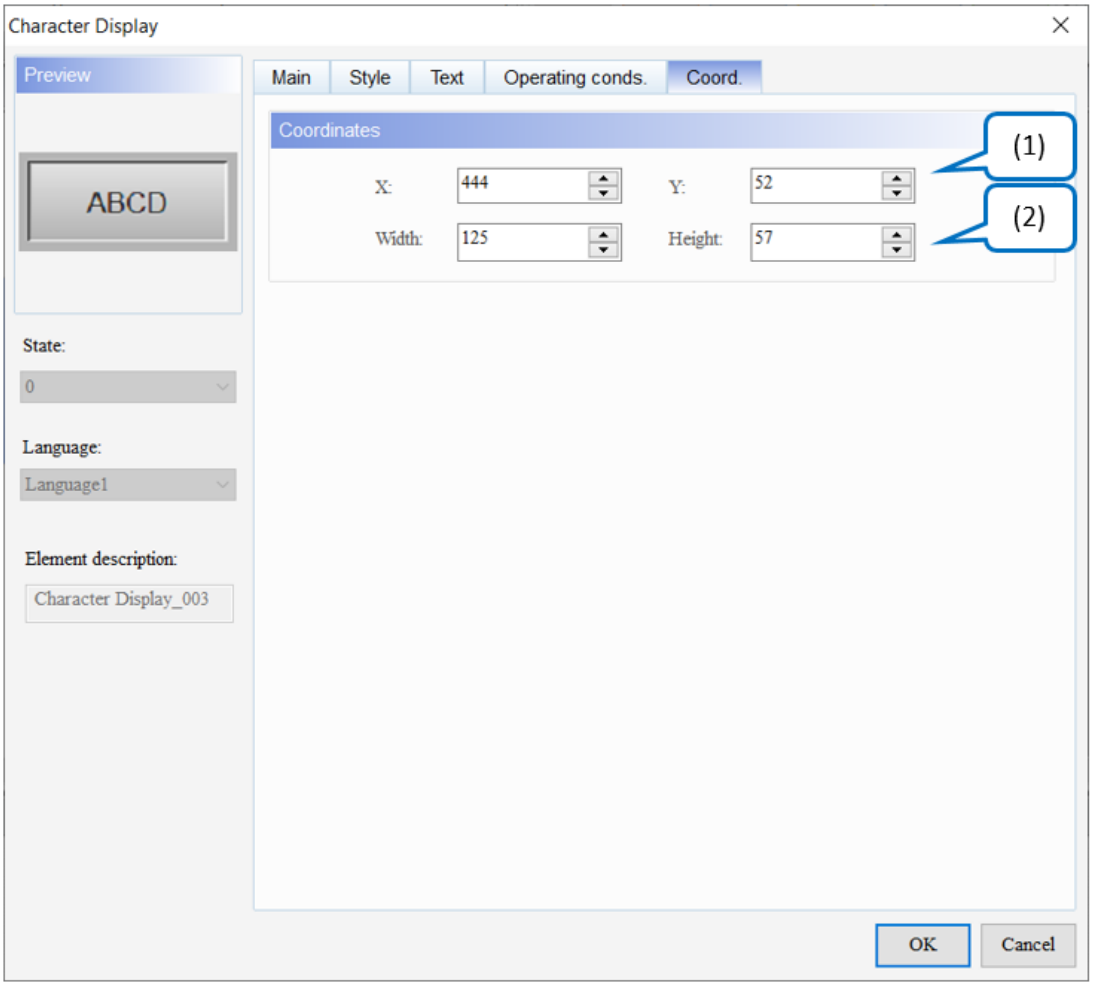


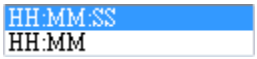
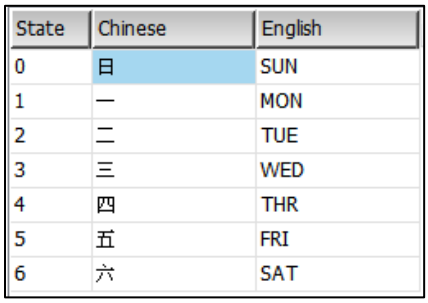
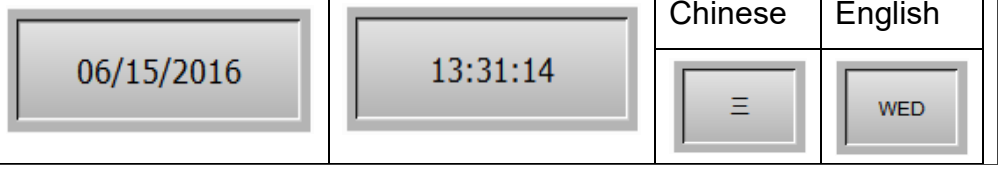
Figure 11 - 13: Character Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

11.3 Date Display / Time Display / Week Display

The main purpose of **Date Display**, **Time Display**, and **Week Display** elements is to display the date, time and week of the HMI. Users can set the format of both the

Date Display element and **Time Display** element, and use the multi-language editing for the **Week Display** element. Refer to the following table for **Date Display** / **Time Display** / **Week Display** example.

<table>
<tr><th colspan="4">Date Display / Time Display / Day Display</th></tr>
<tr><td rowspan="2">Date Display</td><td colspan="2">Date Display Element</td><td>Date Format</td></tr>
<tr><td>Format</td><td>mm/dd/yy</td><td> 
</td></tr>
<tr><td rowspan="2">Time Display</td><td colspan="2">Time Display Element</td><td>Time Format</td></tr>
<tr><td>Format</td><td>HH:MM:SS</td><td> 
</td></tr>
<tr><td>Week Display</td><td colspan="3">If users have set the multi-language data, then they can edit the multi-language data of the element.
 
</td></tr>
<tr><td>Execution result</td><td colspan="3">Compile and download the screen to the HMI, and the HMI displays the element as follows.
 
</td></tr>
</table>

11.3.1 Date Display

On double-clicking the **Date Display** element, the property page appears as follows.

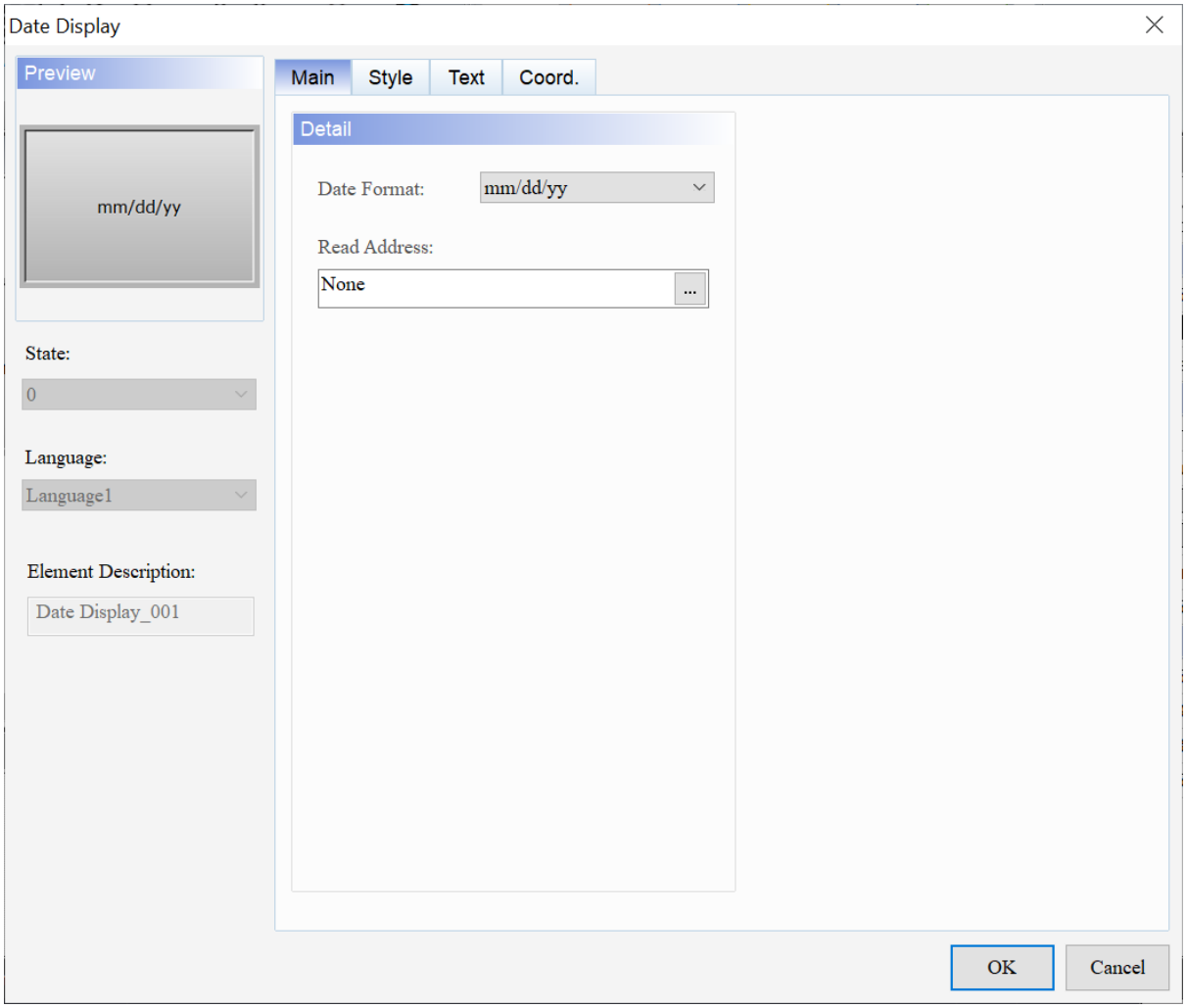


Figure 11 - 14: Date Display element Main property page

Date Display	
Function	**Description**
Preview	The **Date Display** element displays the HMI system date. This element does not support multiple state values and multi-language display.
Main	Set the Date Format and Read Address.
Style	Set the Style, Border Color, Background Color, Filled style, and Transparency.
Text	Set the text content, font, size, color, alignment to be displayed.
Coord.	Set the X and Y coordinates, Width and Height of the element.

- Main

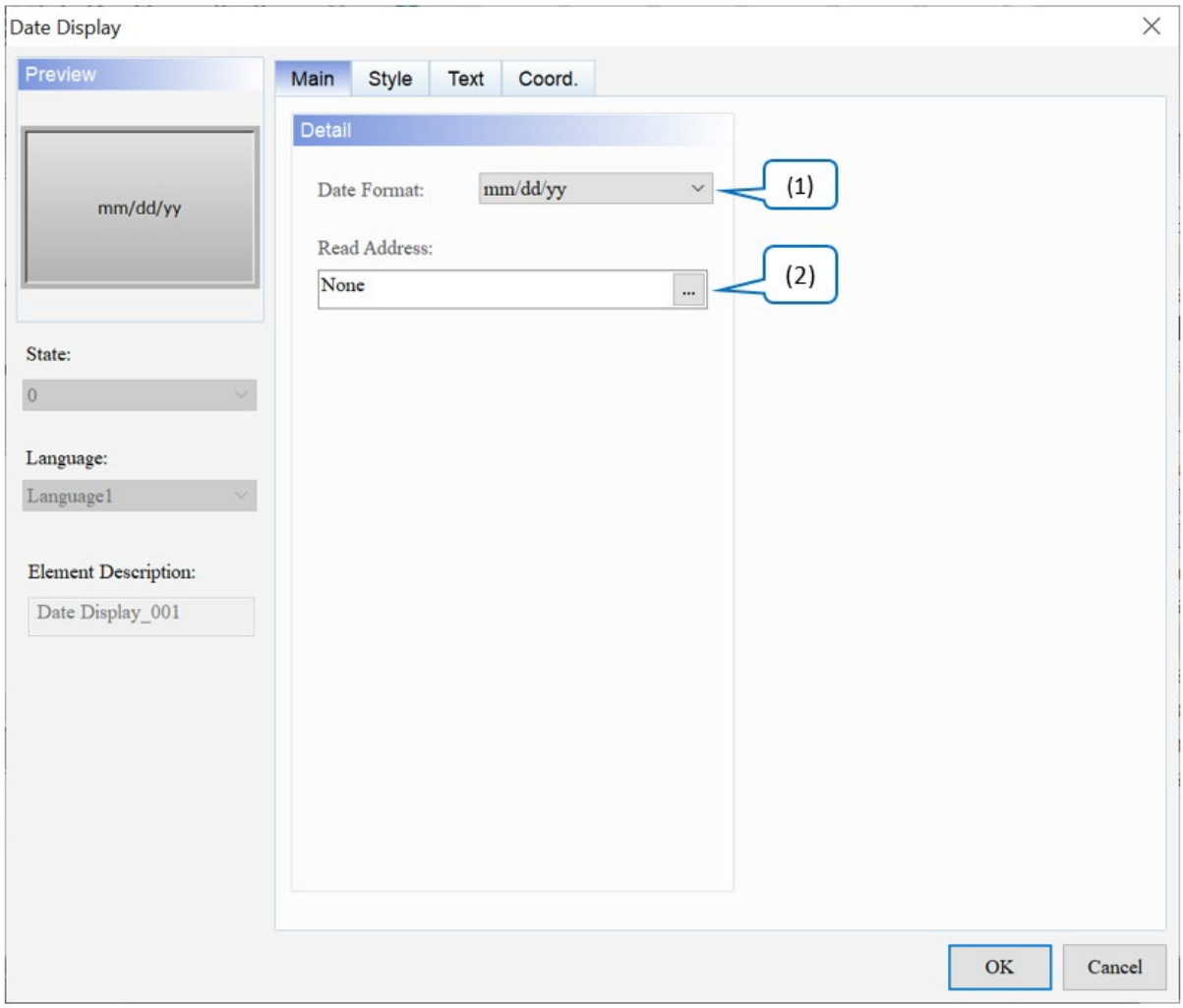
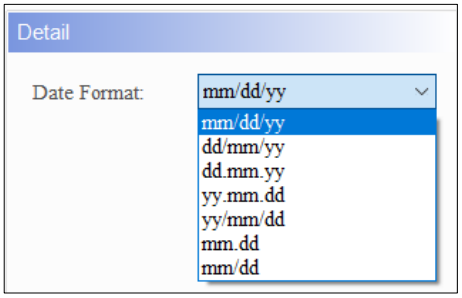


Figure 11 - 15: Date Display element Main property page

No.	Function	Description
(1)	Date Format	The available options for **Date Format** are shown in the following figure. The default value is **mm/dd/yy**. 

No.	Function	Description
(2)	Read Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*

- Style

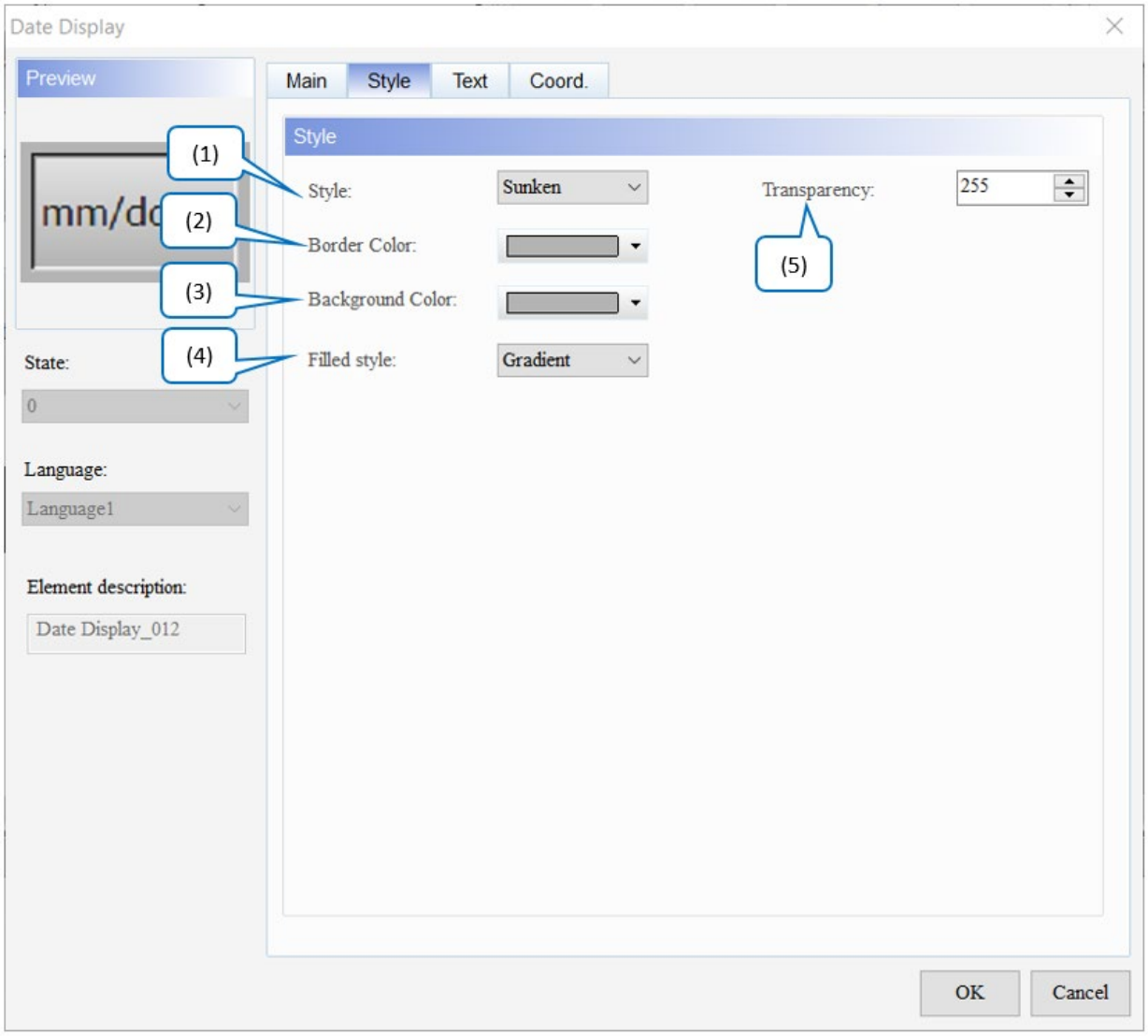
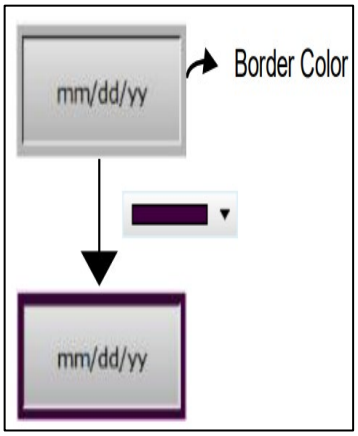


Figure 11 - 16: Date Display element Style property page

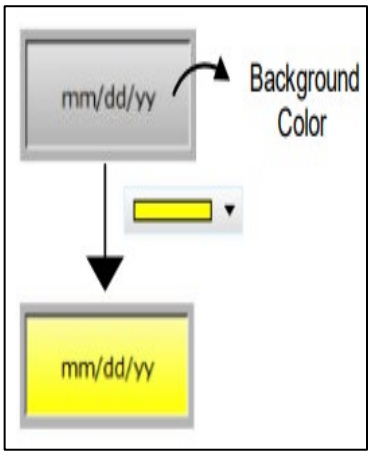
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for the Style are: Standard, Raised, Sunken, and Transparent. The default value is Sunken.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td>mm/dd/yy</td><td>mm/dd/yy</td><td>mm/dd/yy</td><td>mm/dd/yy</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is .
When users set the Style to Transparent, the Border Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is .
When users set the Style to Transparent, the Background Color setting is invalid.



</td></tr>
</table>

<table>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>mm/dd/yy</td></tr>
<tr><td>Fixed</td><td>mm/dd/yy</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

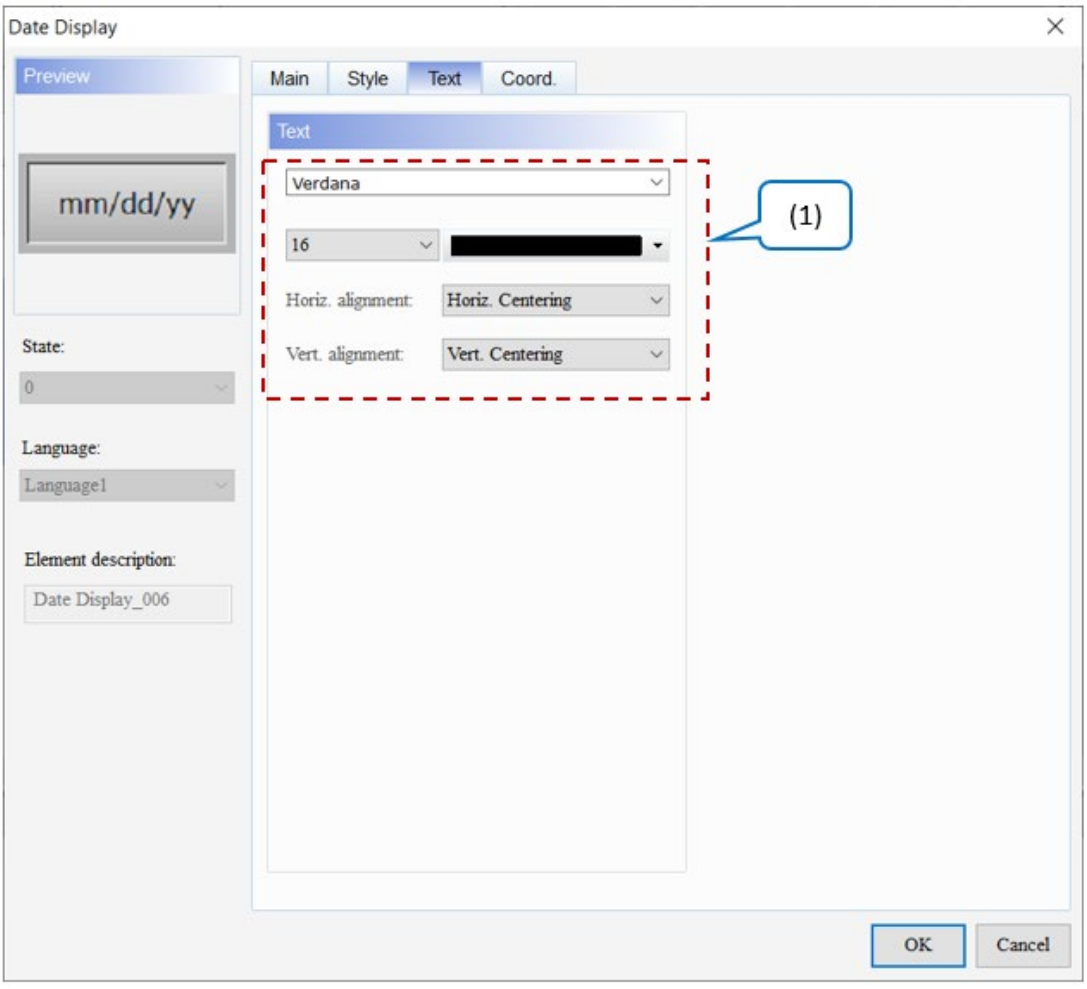


Figure 11 - 17: Date Display element Text property page

No.	Function	Description
(1)	Text	Set text-related properties, including setting the text font, text size, text color, and display alignment.

- Coord.

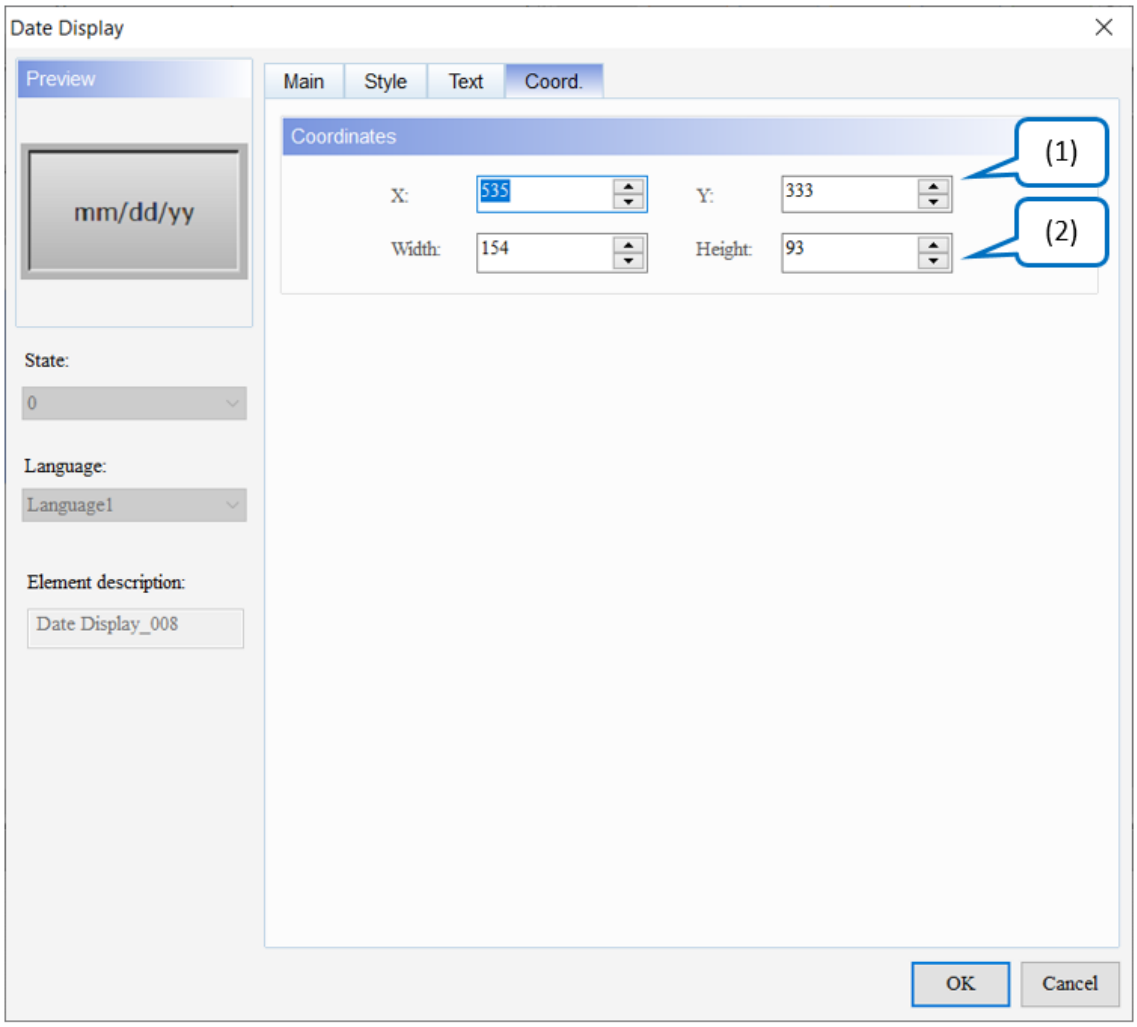


Figure 11 - 18: Date Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

11.3.2 Time Display

On double-clicking the **Time Display** element, the property page appears as follows.

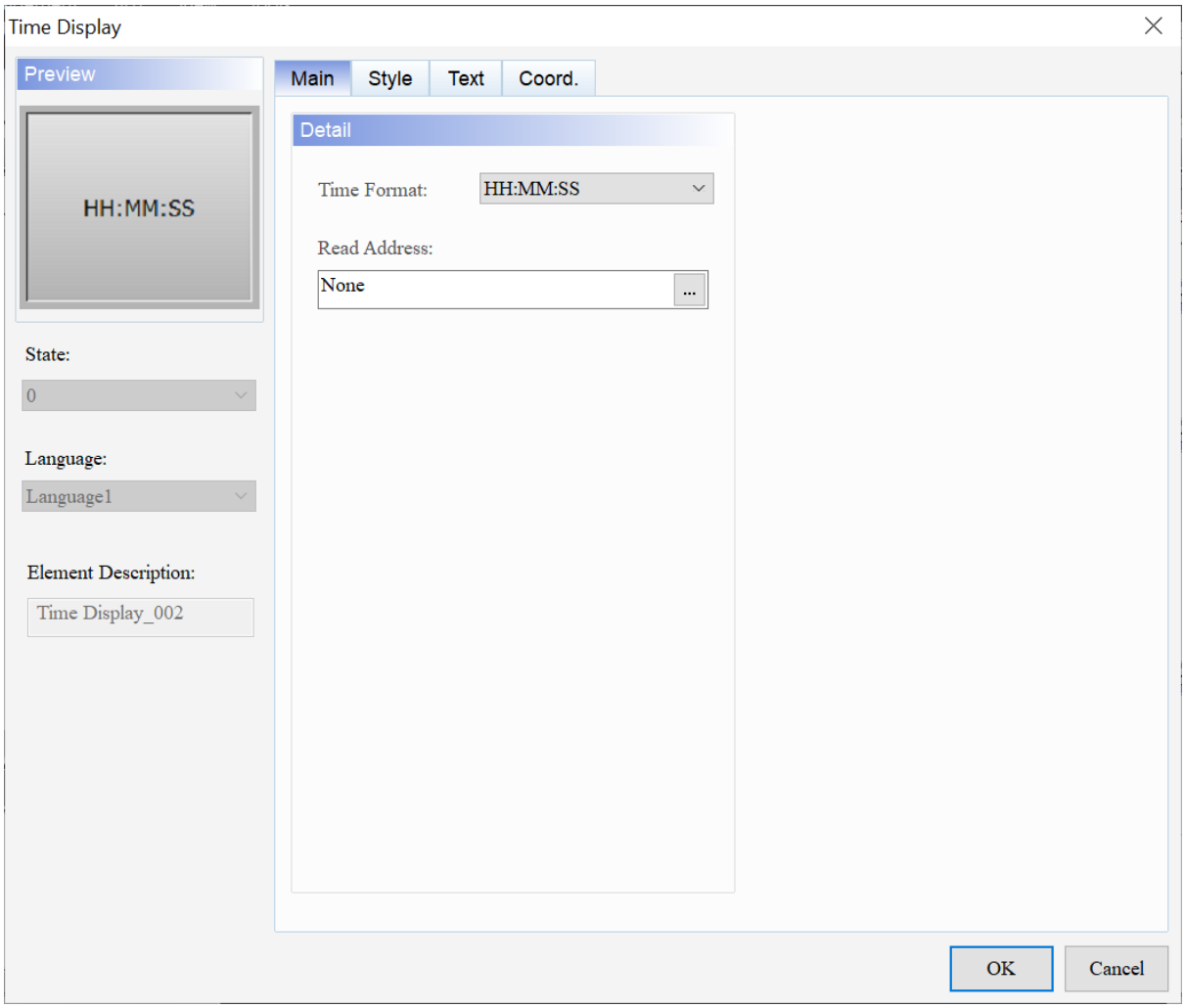


Figure 11 - 19: Time Display element property page

Time Display	
Function	**Description**
Preview	The **Time Display** element is for displaying the HMI system time. This element does not support multiple state values and multi-language display.
Main	Set the Time Format and Read Address.
Style	Set the Style, Border Color, Background Color, Filled style, and Transparency.

Text	Set the text content, font, size, color, alignment to be displayed.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

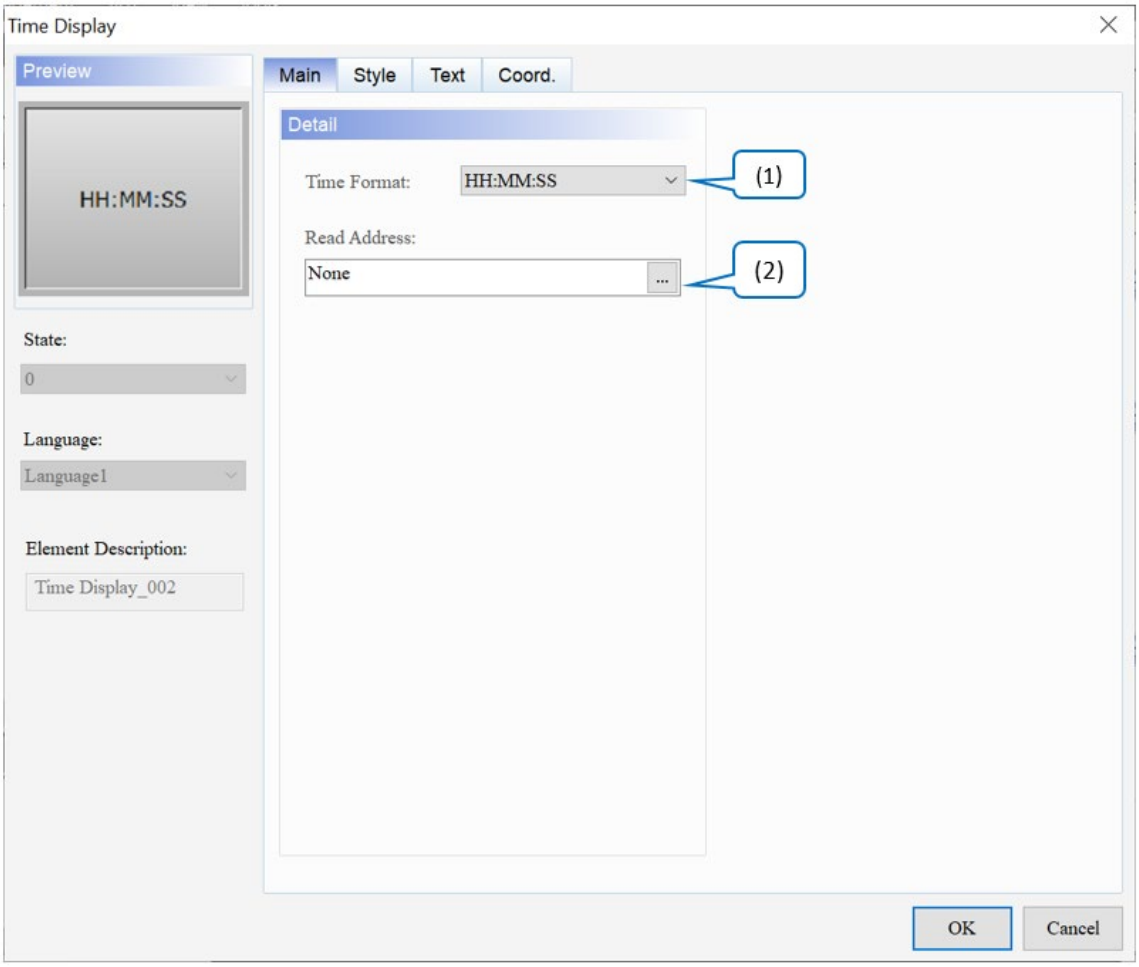
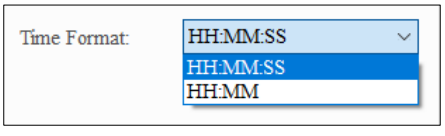


Figure 11 - 20: Time Display element Main property page

No.	Function	Description
(1)	Time Format	The available options for **Time Format** are shown in the following figure. The default value is **HH:MM:SS**. 
(2)	Read Address	• Select Internal Memory or controller register address. • Select **Link** name or **Device Type**. Refer to *Memory Settings*

- Style

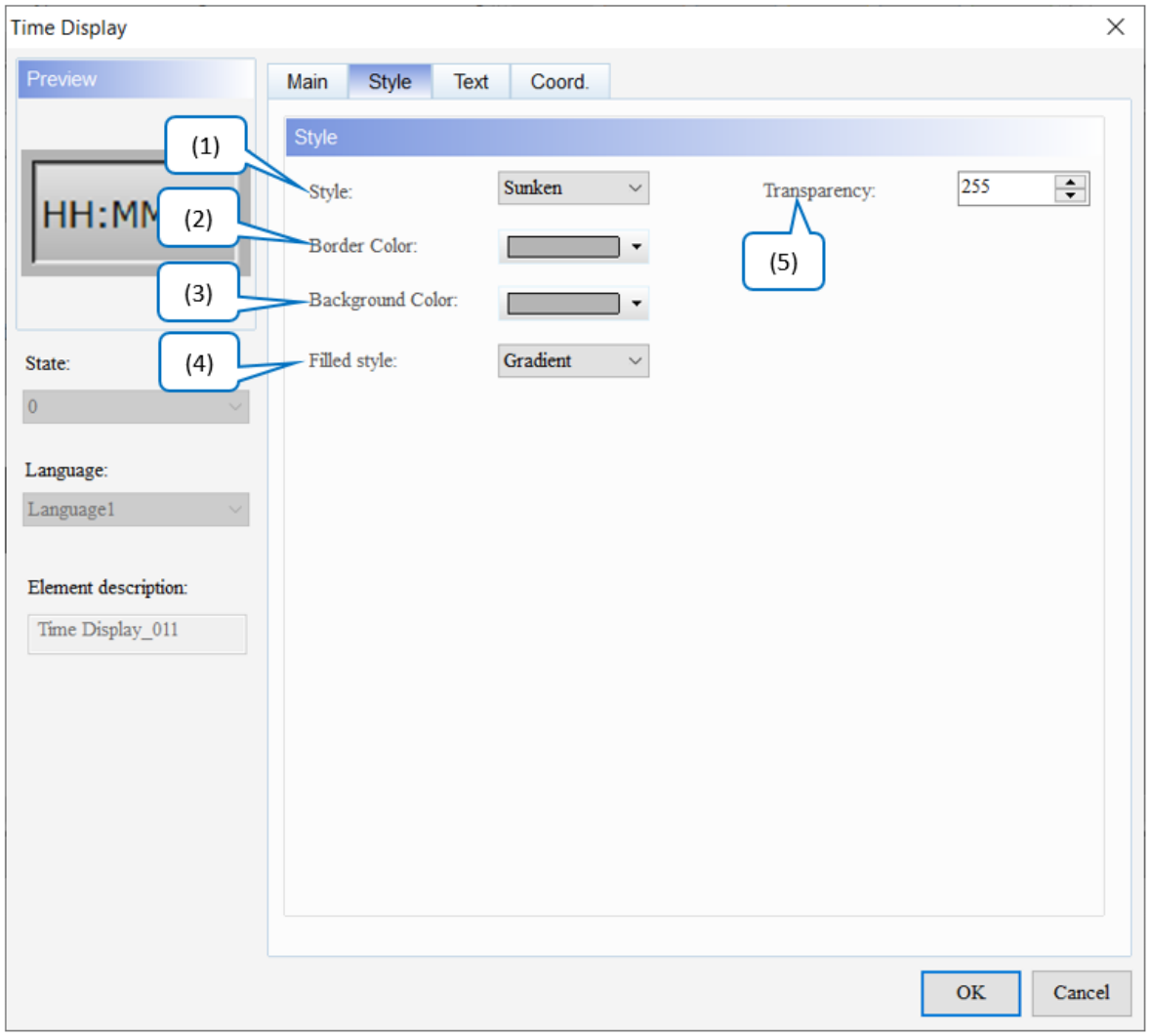
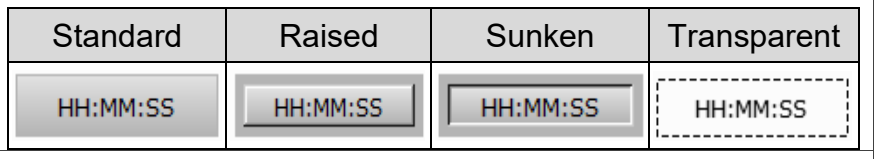
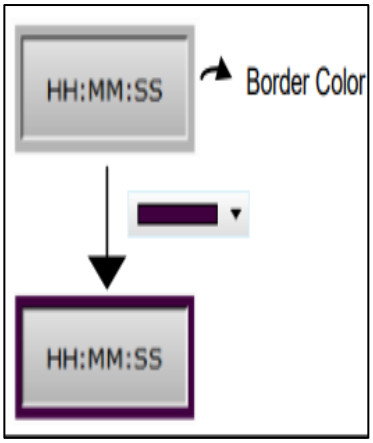
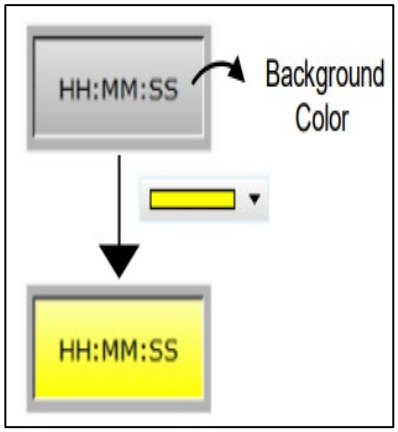


Figure 11 - 21: Time Display element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Sunken, and Transparent. The default value is **Sunken**. 
(2)	Border Color	● Set the border color. The default is . ● When users set the **Style** to Transparent, the **Border Color** setting is invalid. 
(3)	Background Color	● Set the background color of the element. The default is . ● When users set the **Style** to Transparent, the **Background Color** setting is invalid. 
(4)	Filled style	● The available options for **Filled style** of the elements on the DOP-100 models are: Gradient and Fixed. The default value is **Gradient**. ● Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

No.	Function	Description
		Gradient  Fixed 
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Text

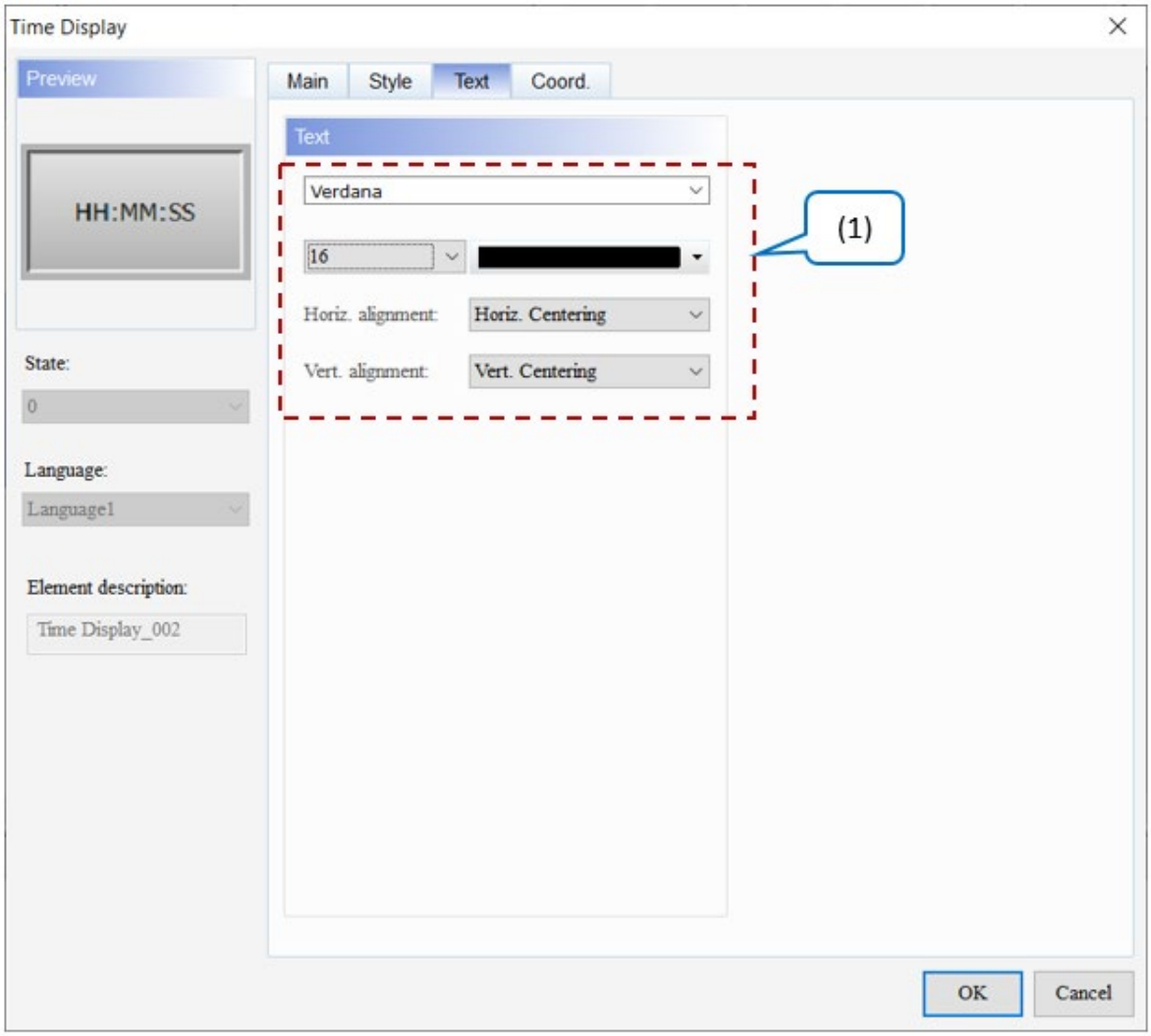


Figure 11 - 22: Time Display element Text property page

No.	Function	Description
(1)	Text	Set text-related properties, including setting the font, size, color, and alignment.

- Coord.

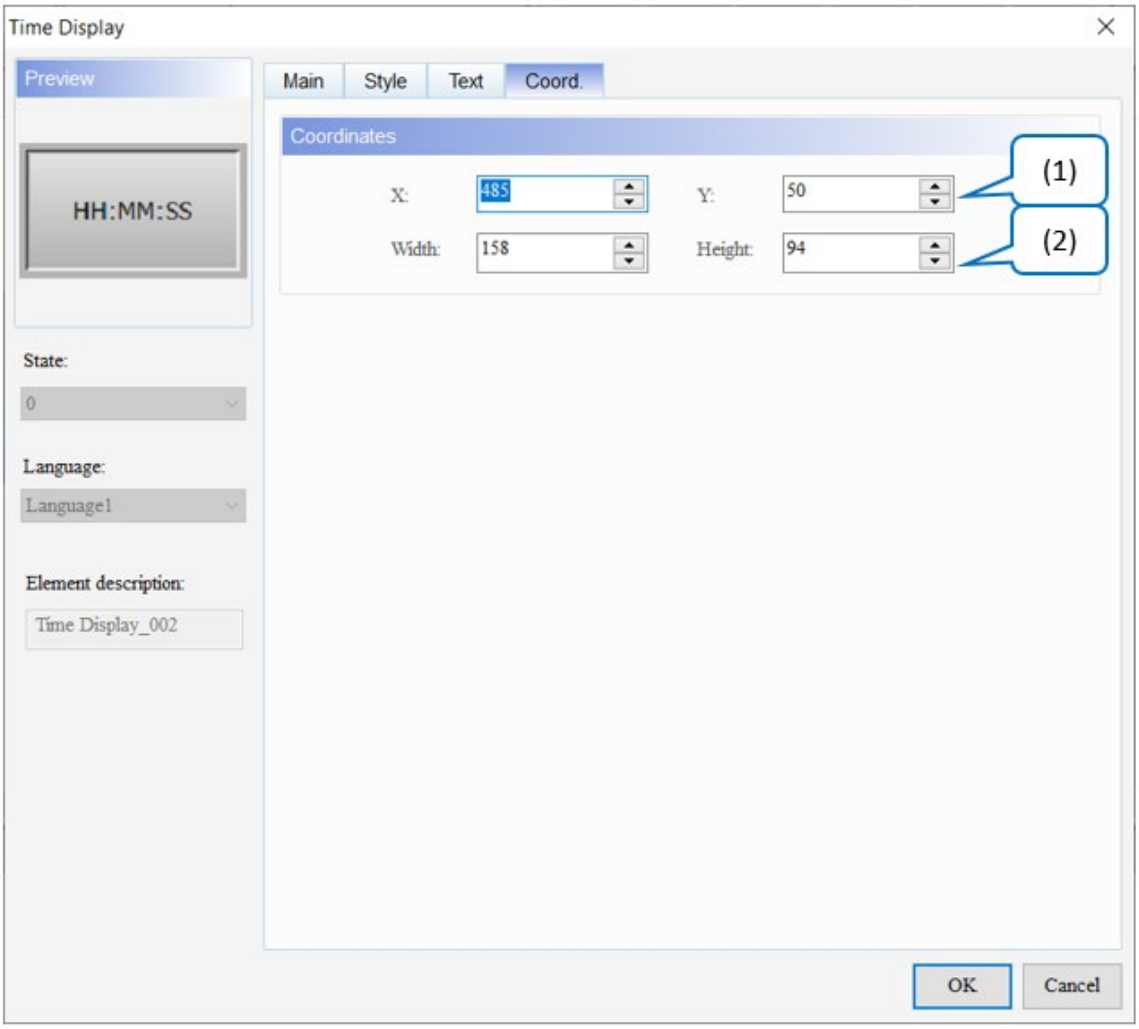


Figure 11 - 23: Time Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

11.3.3 Week Display

On double-clicking the **Week Display** element, the property page appears as follows.

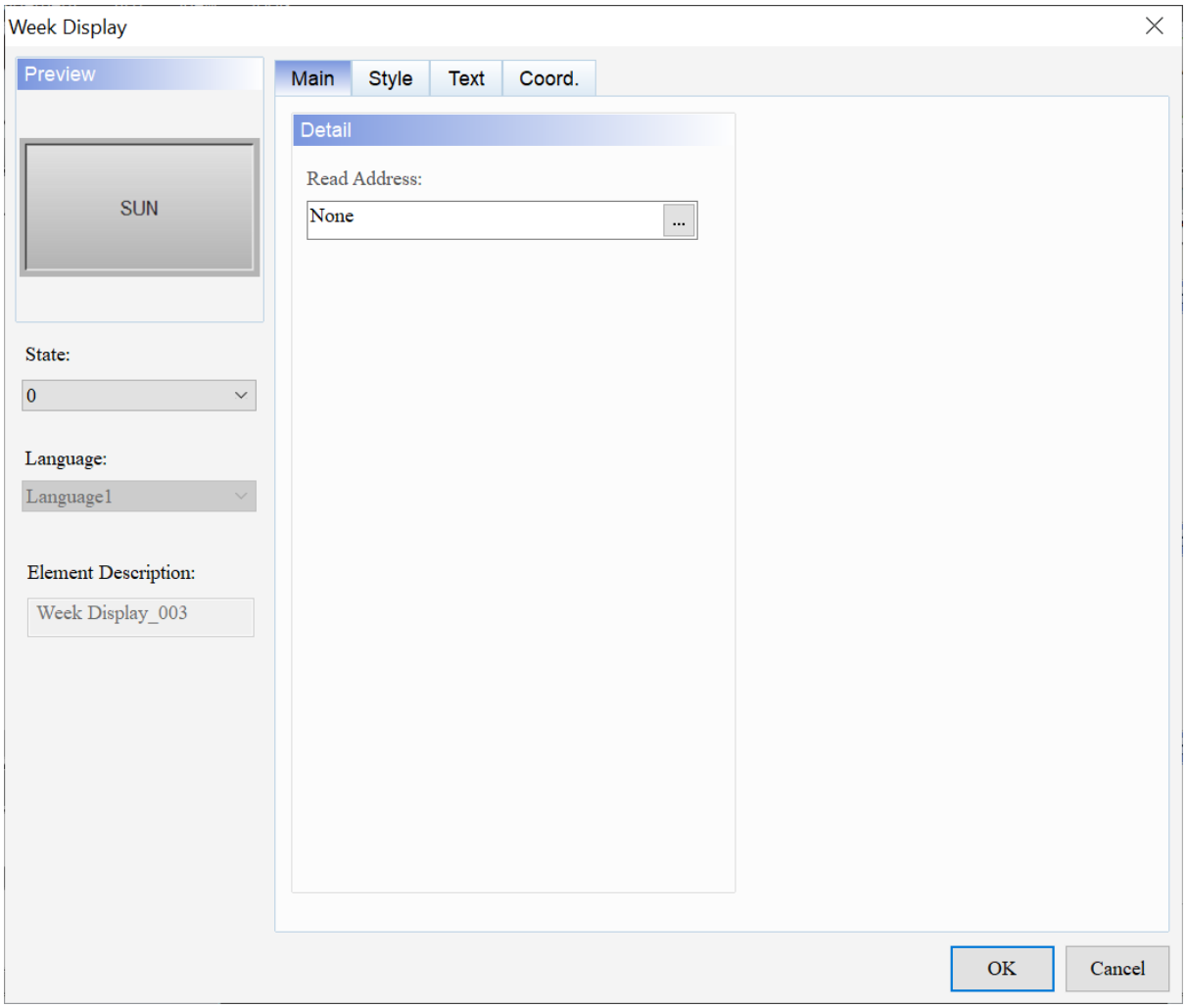


Figure 11 - 24: Week Display element property page

Week Display	
Function	**Description**
Preview	In addition to displaying the HMI system week, Week Display supports multiple state values and multi-language display.
Main	Set Read Address.
Style	Set the Style, Border Color, Background Color, Filled style, and Transparency.

Week Display	
Function	**Description**
Text	Set the text content, font, size, color, format, zoom, and alignment. Edit the texts for the Week Display. If users have set multi-language data, they can edit data in other languages.
Coord.	Set the X and Y coordinates, Width and Height of the elements.

- Main

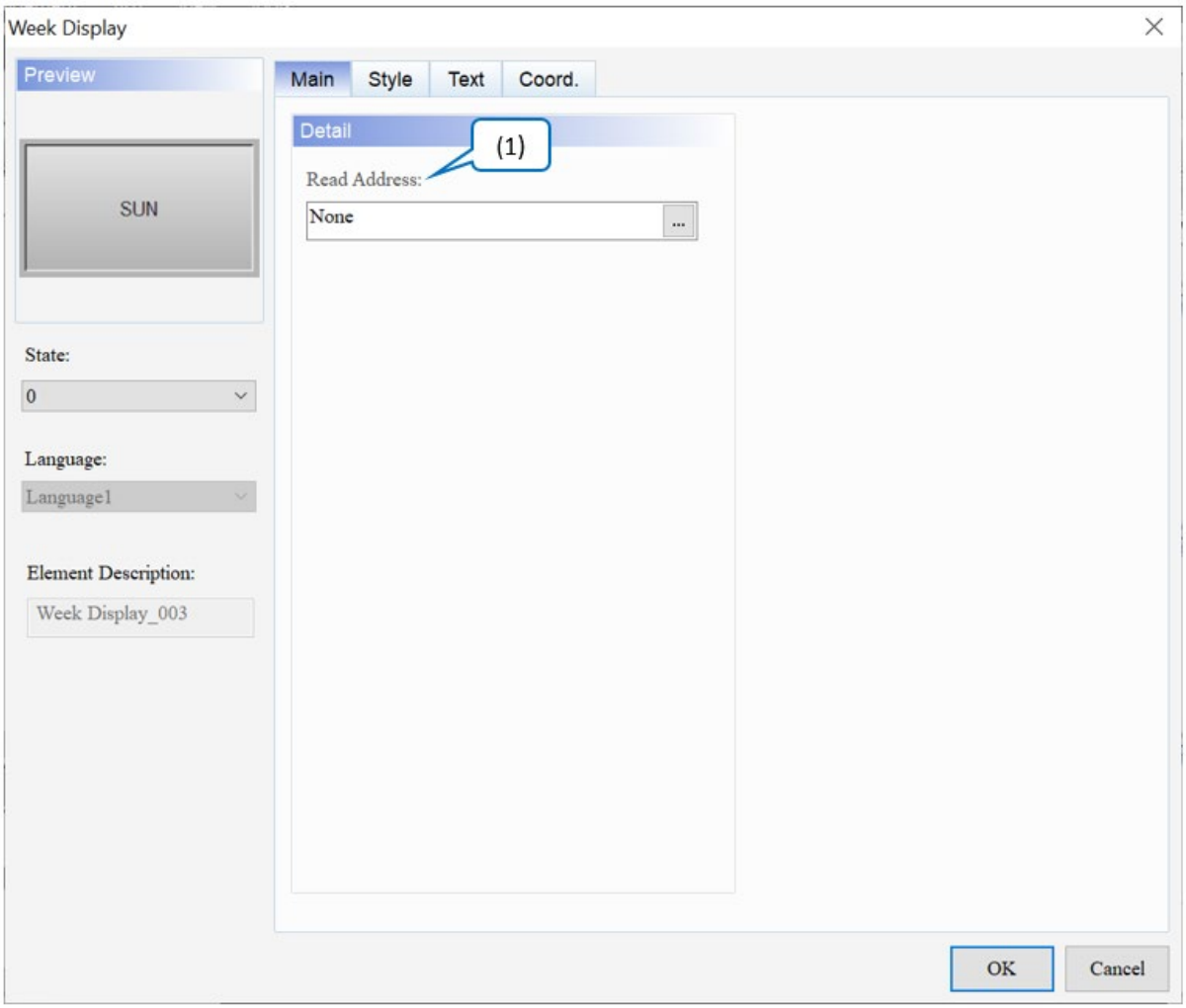


Figure 11 - 25: Week Display element Main property page

No.	Function	Description
(1)	Read Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*

- Style

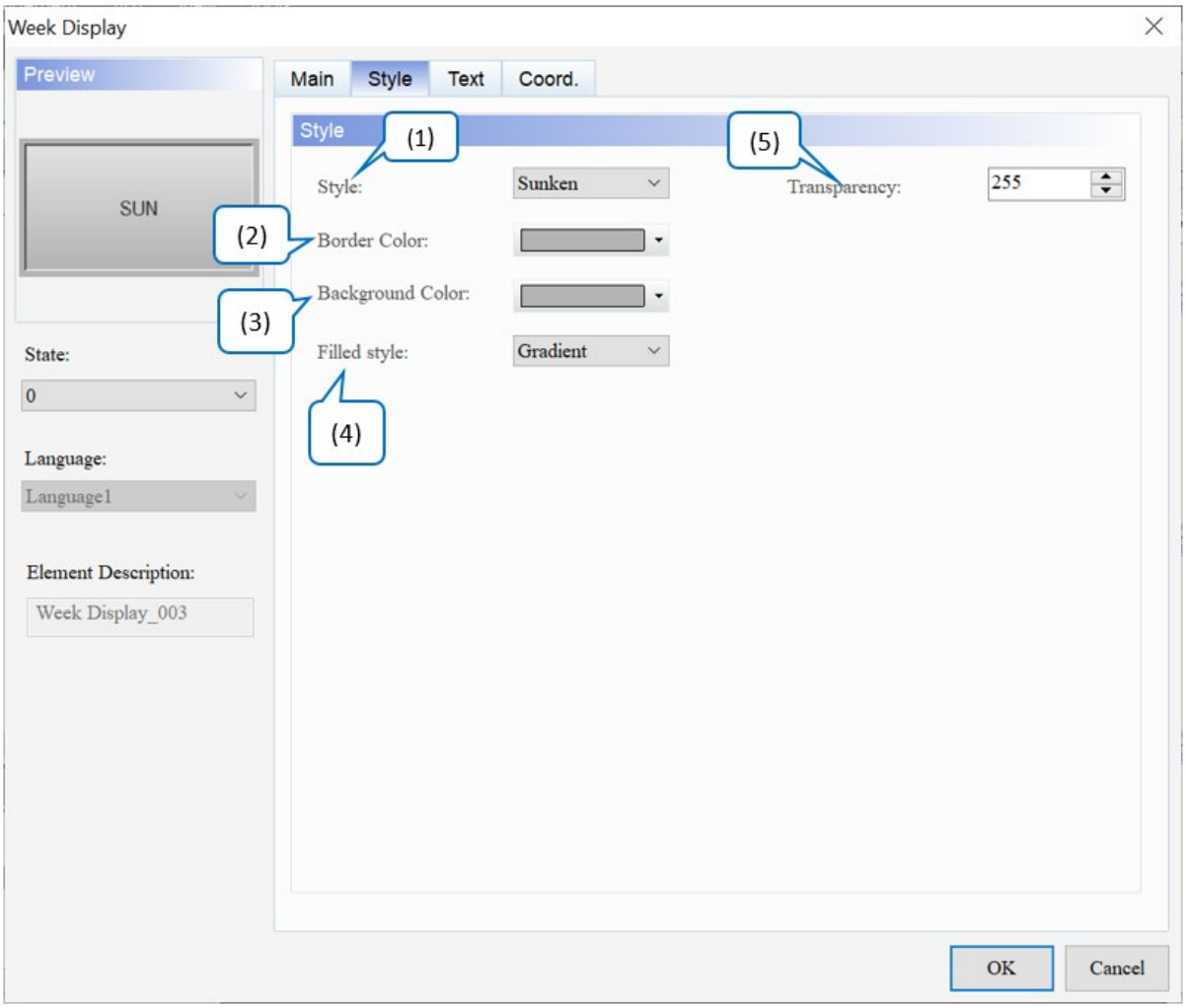
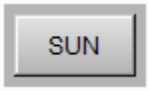
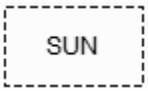
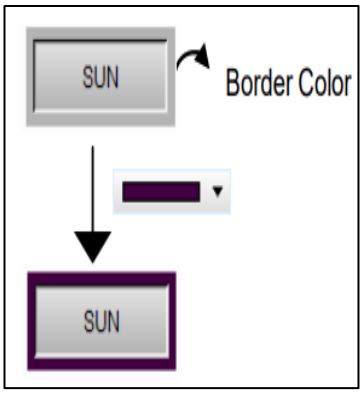
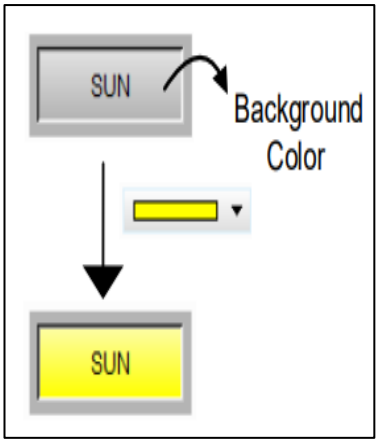


Figure 11 - 26: Week Display element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options of Style are: Standard, Raised, Sunken, and Transparent. The default value is Sunken.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td> 
</td><td> 
</td><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Border Color</td><td>● Set the border color of the element. The default is  .
● When users set the Style to Transparent, the Border Color setting is invalid.
 
</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>● Set the background color of the element. The default is  .
● When users set the Style to Transparent, the Background Color setting is invalid.
 
</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>● The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
● Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.</td></tr>
</table>

No.	Function	Description	
		Gradient	
		Fixed	
(5)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.	

- Text

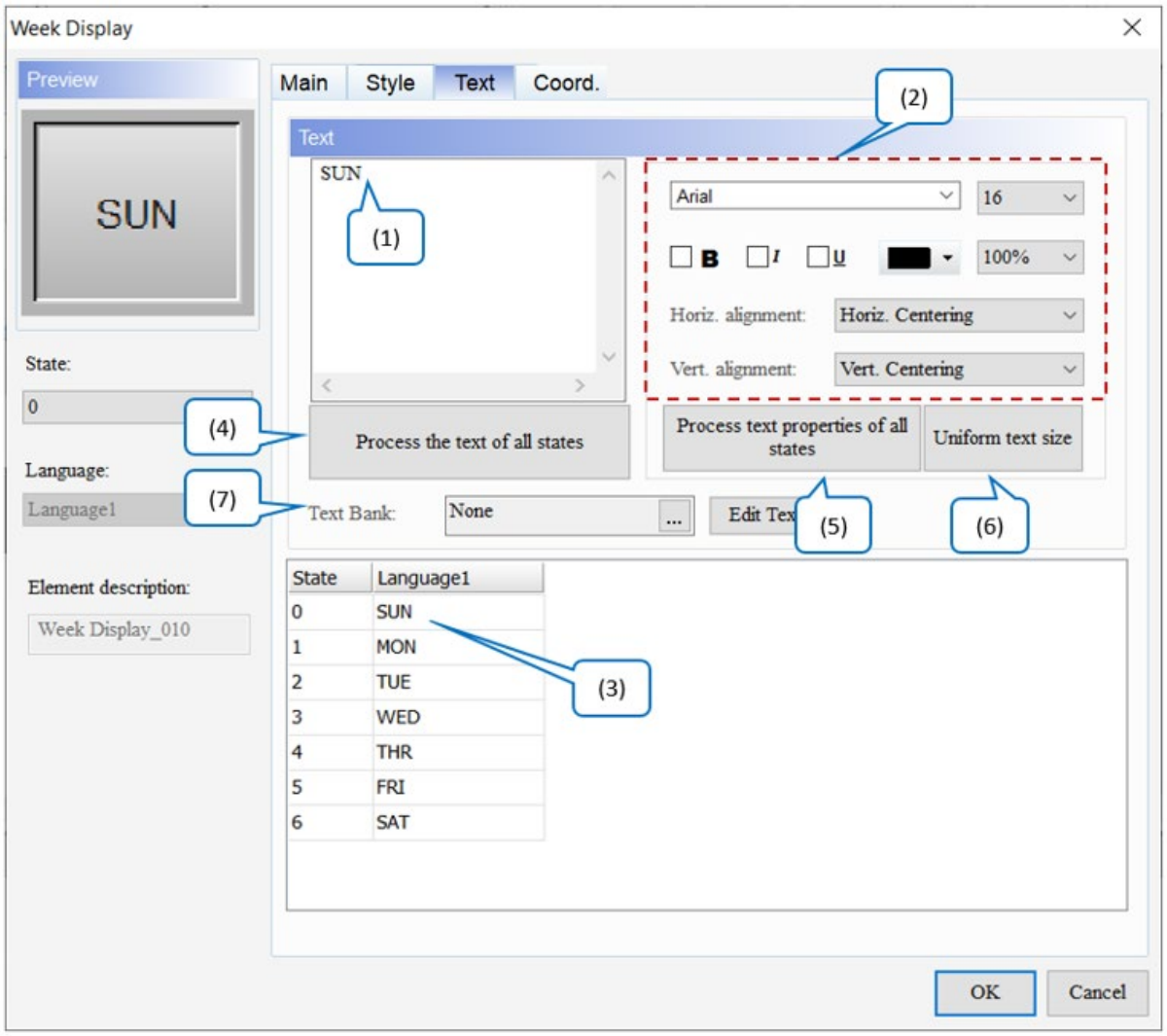
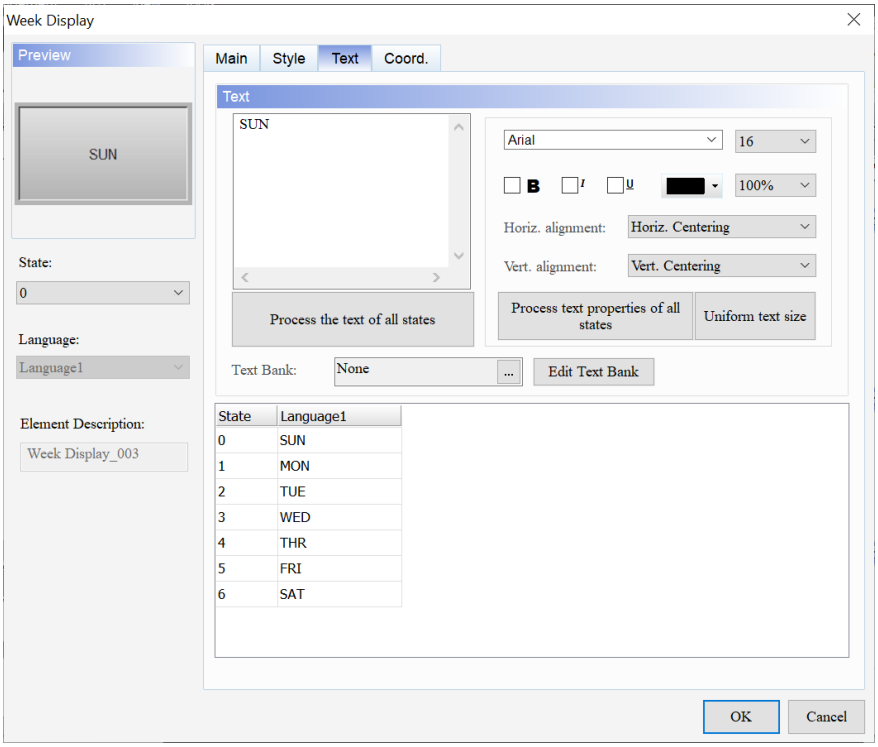
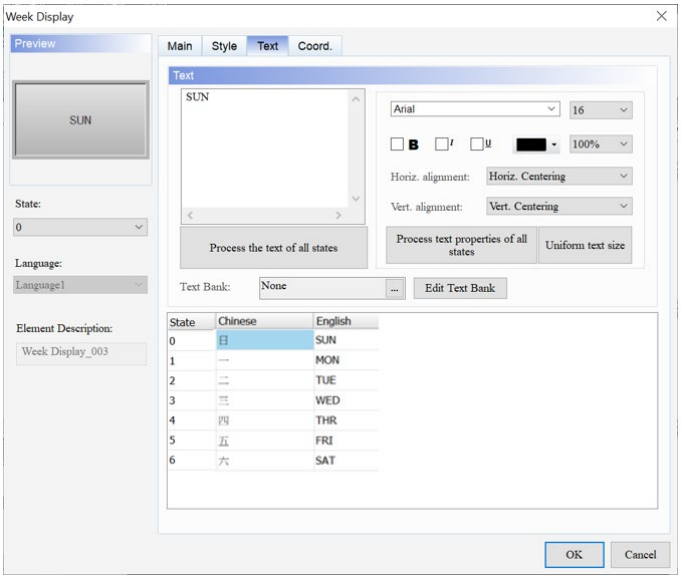


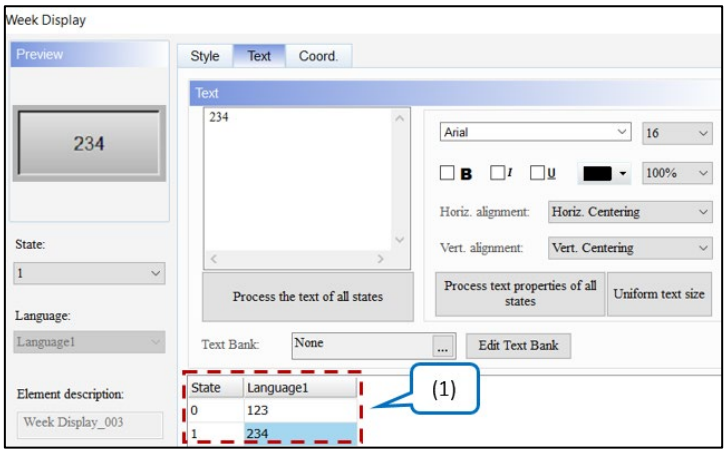
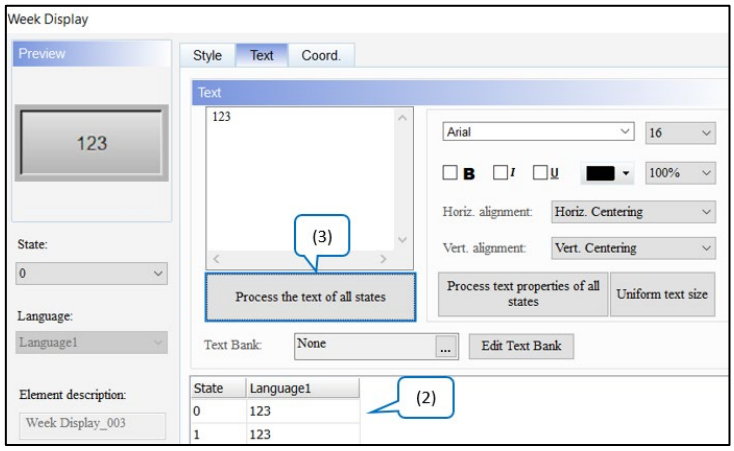
Figure 11 - 27: Week Display element Text property page

No.	Function	Description
(1)	Text	Enter the text message to be displayed in the text box.  ● As long as the element allows texts input, click the element and press the space key to start editing the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English text in the **English** column. 

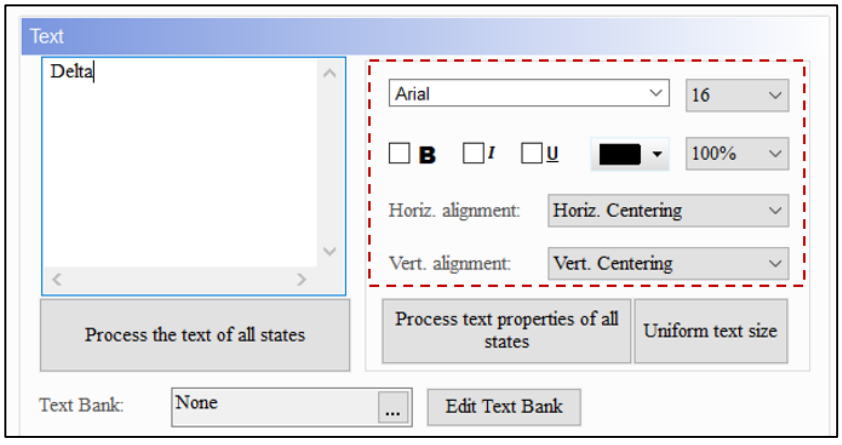
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(4)</td><td>Process the text of all states</td><td>

This function changes all the texts into the text contents of the state users select.
The following illustrates the steps:

Input 123 to State 0, and 234 to State 1.
Click State 0.
Click Process the text of all states, and State 1 text changes to 123.

<table>
<tr><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Process text properties of all states</td><td>

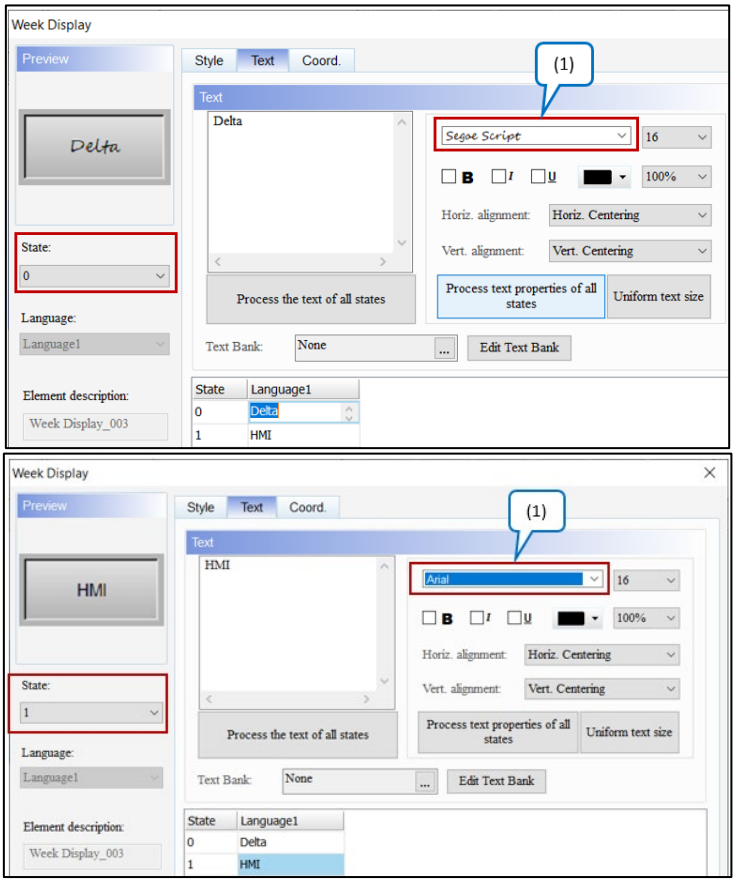
This function changes all the text properties based on the state users select. Items included in the text property are shown in the following figure.



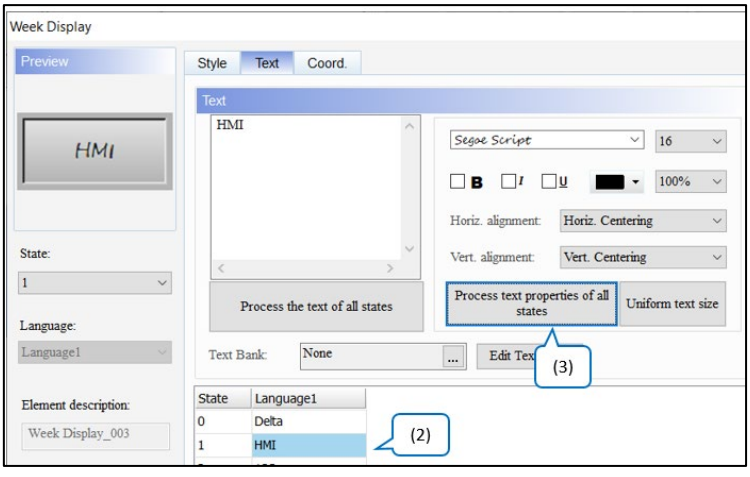
</td></tr>
</table>

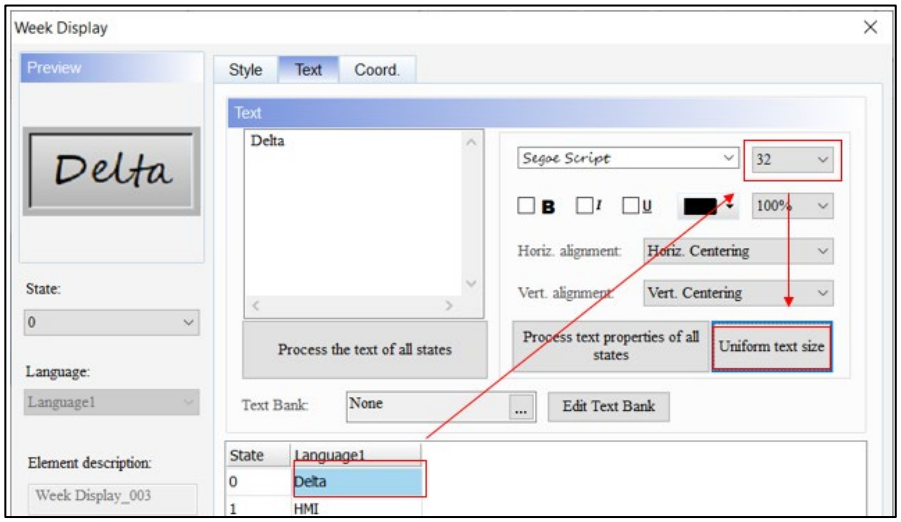
No.	Function	Description
		● The following is an example description: 1. Input *Delta* to State 0, and set the font to Segoe Script; input *HMI* to State 1, and set the font to Arial. 2. Click State 0. 3. Click **Process text properties of all states**, and State 1 font changes to Segoe Script.

Before Change



After Change



No.	Function	Description
(6)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Coord.

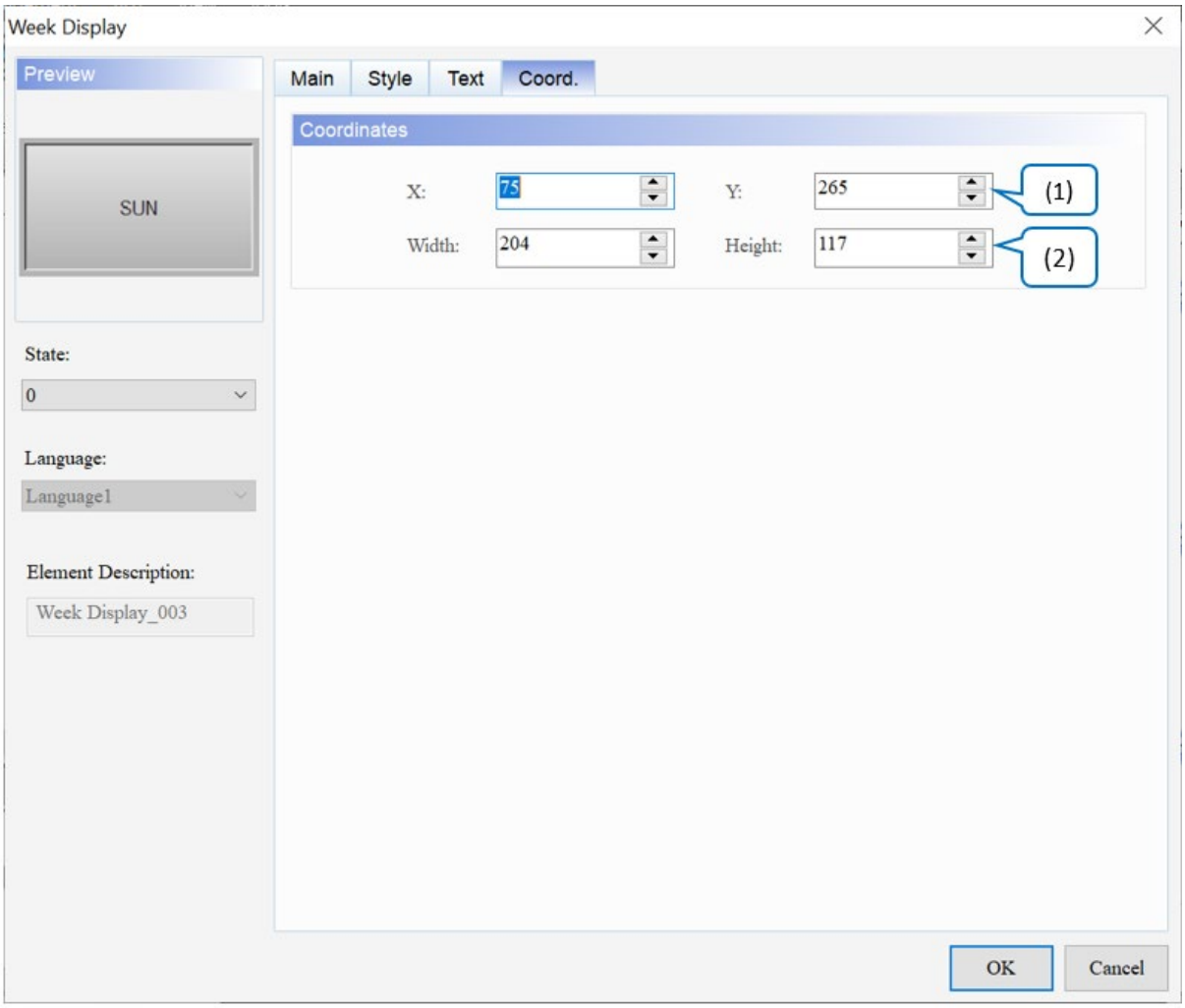
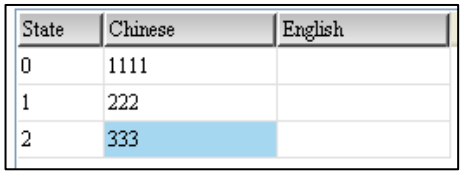
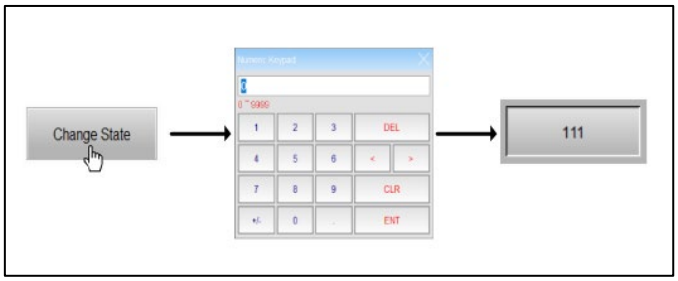


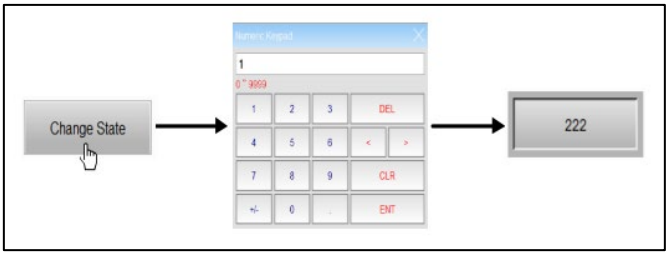
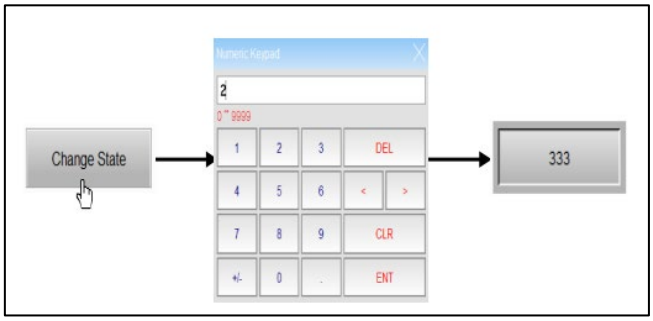
Figure 11 - 28: Week Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

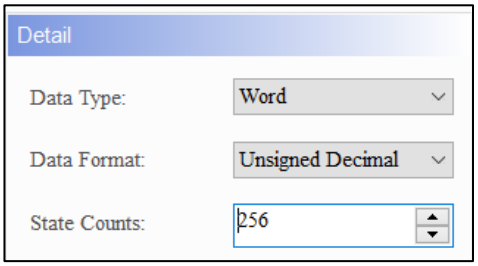
11.4 General Message Display

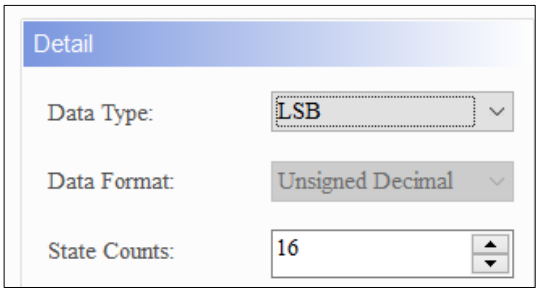
Use the **General Message Display** element to display the state text message to switch, and this element reads the corresponding state text based on the set memory address. Refer to the following table for the **General Message Display** example.

<table>
<tr><th colspan="3">General Message Display</th></tr>
<tr><td>Address settings</td><td colspan="2"><table>
<tr><td colspan="2">General Message Display Element</td><td colspan="2">Set Value Button Element</td></tr>
<tr><td>Read Address</td><td>$13</td><td>Write Address</td><td>$13</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table></td></tr>
<tr><td>Detail settings</td><td><table>
<tr><td colspan="3">General Message Display element</td></tr>
<tr><td>Data Type</td><td>Data Format</td><td>State Count</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>3</td></tr>
</table></td></tr>
<tr><td>State displaying text</td><td>Double-click the General Message Display element to go to Text property page and edit the text to display.
 
</td></tr>
<tr><td>Execution result</td><td>After creating the elements, compile and download the data to the HMI. Then, enter 0, 1, and 2 with the Set Value Button element in sequence and the General Message Display element displays the corresponding text.<table>
<tr><td>Input 0 with Set Value Button element</td><td> 
</td></tr>
</table></td></tr>
</table>

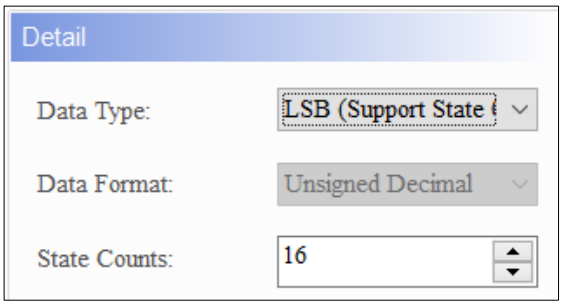
General Message Display		
	Input 1 with Set Value Button element	
	Input 2 with Set Value Button element	

The **General Message Display** element supports four types of **Data Type**, as shown in the following table. To add or reduce the number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

General Message Display	
Data Type	State Counts
Word	● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states.  ● If the **Data Type** is Word, the memory address is in units of Word.
LSB / LSB (Support State 0)	● LSB is to first convert the data in the register to binary data, and then use the lowest non-zero bit to determine the current state of the object. ● If the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states except for State 0.



- To display State 0, select LSB (Support State 0) for the **Data Type**.



- If users select LSB, the element is black when the state is 0.

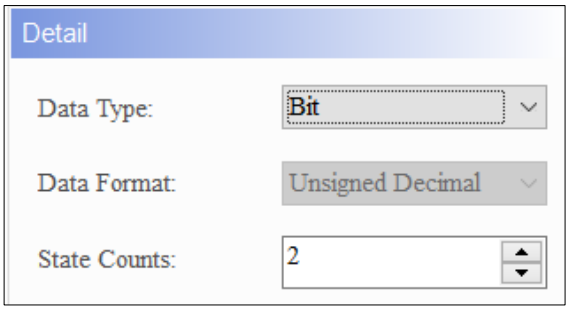


- When the **Data Type** is either LSB or LSB (Support State 0), the memory address is in units of Word.
- The examples in the following table show how the state value is determined with the lowest non-zero bit of the binary value converted from a decimal value. There are also examples demonstrating how the software determines the displaying state value with the lowest bit when the decimal values are 3 and 7.

Decimal	Binary	State Value
0	0000000000000000	State = 0 when all bits are 0. ***NOTE***: LSB (Support State 0) must be selected.
1	0000000000000001	The lowest non zero bit is bit 0, State = 1
2	0000000000000010	The lowest non zero bit is bit 1, State = 2
3	0000000000000011	The lowest non zero bit is bit 0, State = 1
4	0000000000000100	The lowest non zero bit is bit 2, State = 3
7	0000000000000111	The lowest non zero bit is bit 0, State = 1
8	0000000000001000	The lowest non zero bit is bit 3, State = 4

<table>
<tr><th colspan="4">General Message Display</th></tr>
<tr><td>Data Type</td><td colspan="3">State Counts</td></tr>
<tr><td></td><td colspan="3"><table>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non zero bit is bit 4, State = 5</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The lowest non zero bit is bit 5, State = 6</td></tr>
<tr><td>64</td><td>0000000001000000</td><td>The lowest non zero bit is bit 6, State = 7</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The lowest non zero bit is bit 7, State = 8</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The lowest non zero bit is bit 8, State = 9</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The lowest non zero bit is bit 9, State = 10</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The lowest non zero bit is bit 10, State = 11</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The lowest non zero bit is bit 11, State = 12</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The lowest non zero bit is bit 12, State = 13</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non zero bit is bit 13, State = 14</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non zero bit is bit 14, State = 15</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non zero bit is bit 15, State = 16</td></tr>
</table></td></tr>
<tr><td>Bit</td><td colspan="3">

If the Data Type is Bit, users can set only 2 states.



If the Data Type is Bit, the memory address is in units of Bit.

</td></tr>
</table>

On double-clicking the **General Message Display** element, the property page appears as follows.

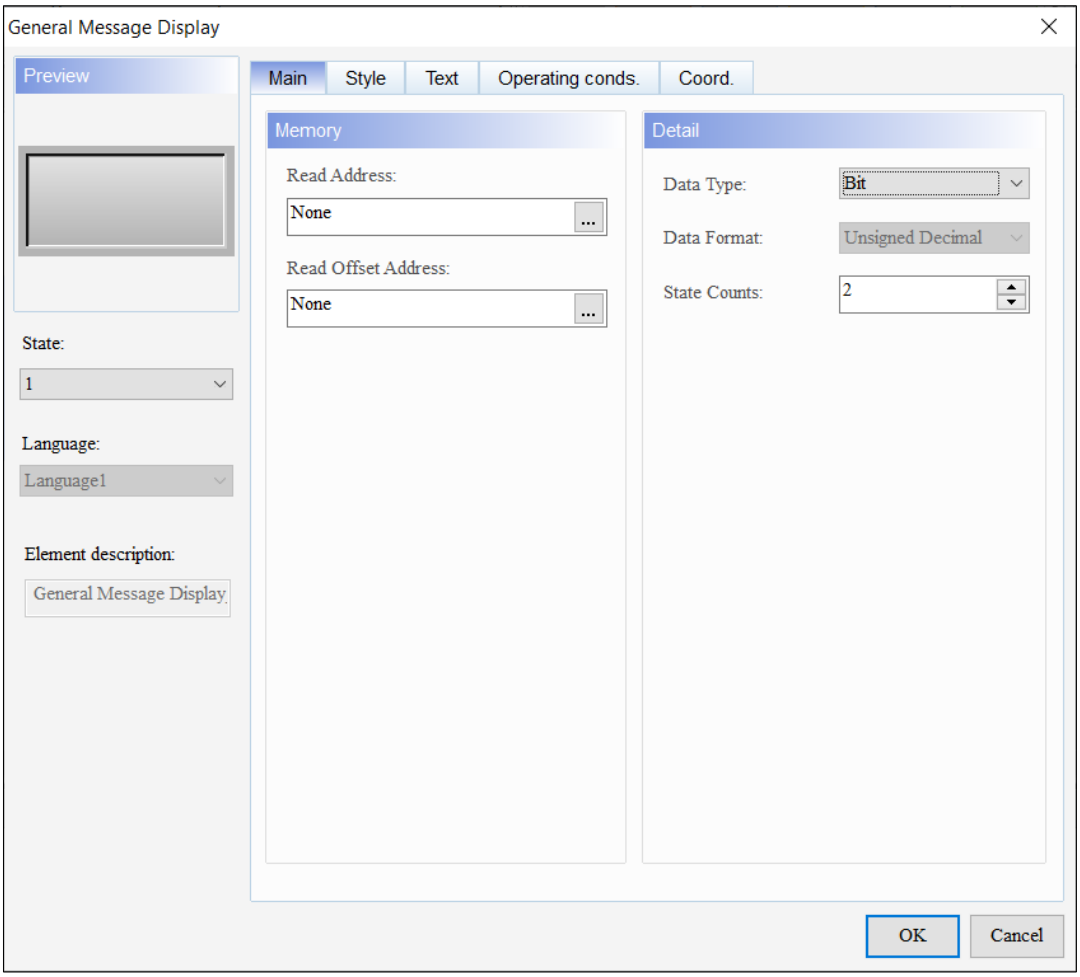


Figure 11 - 29: General Message Display element property page

General Message Display	
Function	**Description**
Preview	General Message Display element can view multiple status values and multi-language data display.
Main	Set Read Address, Read Offset Address, Data Type, Data Format, and State Counts.
Style	Set Style, Background Color, Border Color, Filled style, Use Text Pic, and Transparency.
Text	Set the font, size, color, format, scale, and alignment.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinate, Width and Height of the elements.

- Main

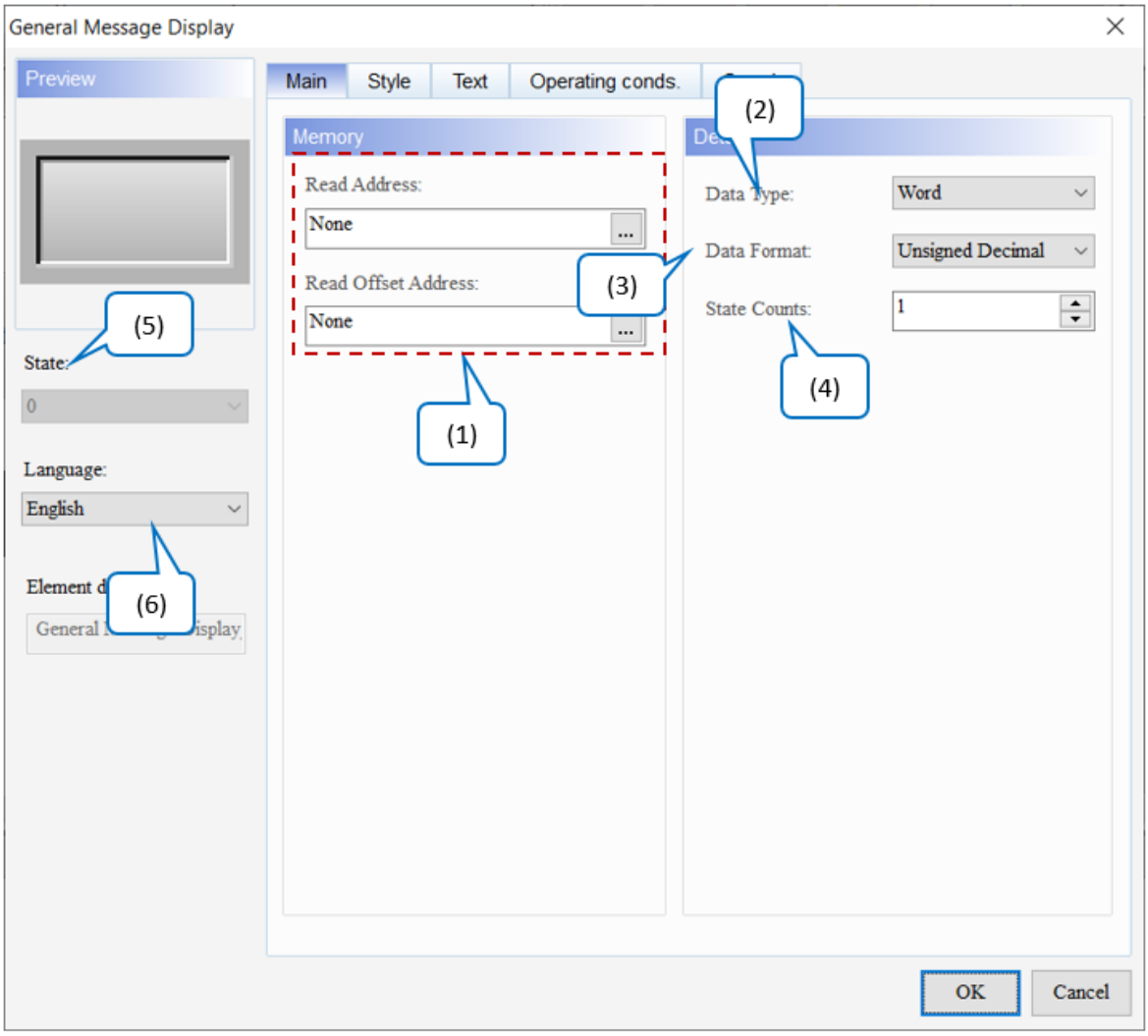
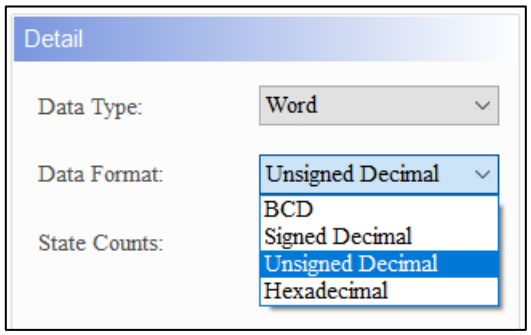
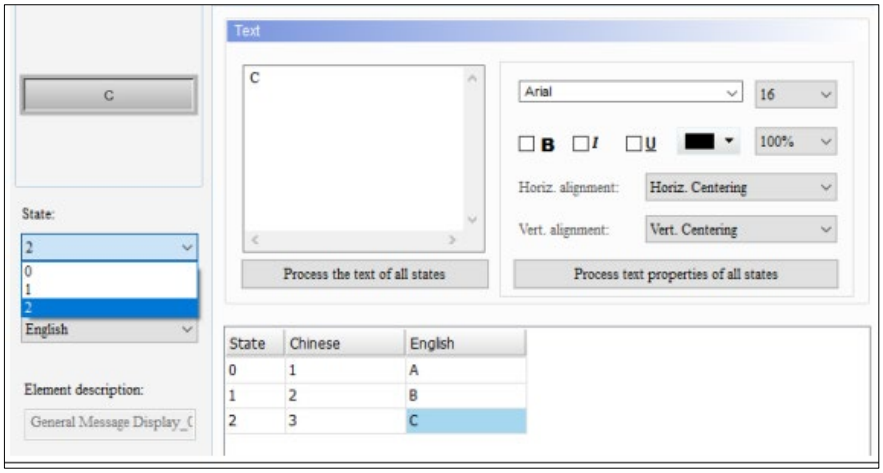
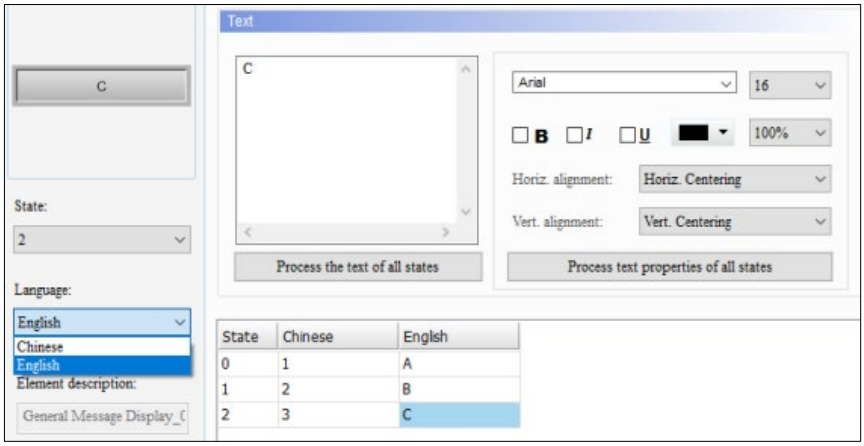


Figure 11 - 30: General Message Display element Main property page

No.	Function	Description
(1)	Read Address	• Select the Internal Memory or controller register address. The **Input** memory **Type** varies depending on the selected **Data Type** including Word, LSB or Bit. • Select **Link** name or **Device Type**. Refer to *Memory Settings*.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0). The default value is **Word**.

No.	Function	Description
(3)	Data Format	● The **Data Format** can be selected only when the **Data Type** is Word. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(4)	State Counts	● Set the **State Counts** of the **General Message Display** element. The default value is **1**. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.
(5)	State	Preview or change the settings of each state of the element by switching **State**. 

No.	Function	Description
(6)	Language	If users have set the language data, they can edit the properties of the text to be displayed with the **Language** setting of the element. 

- Style

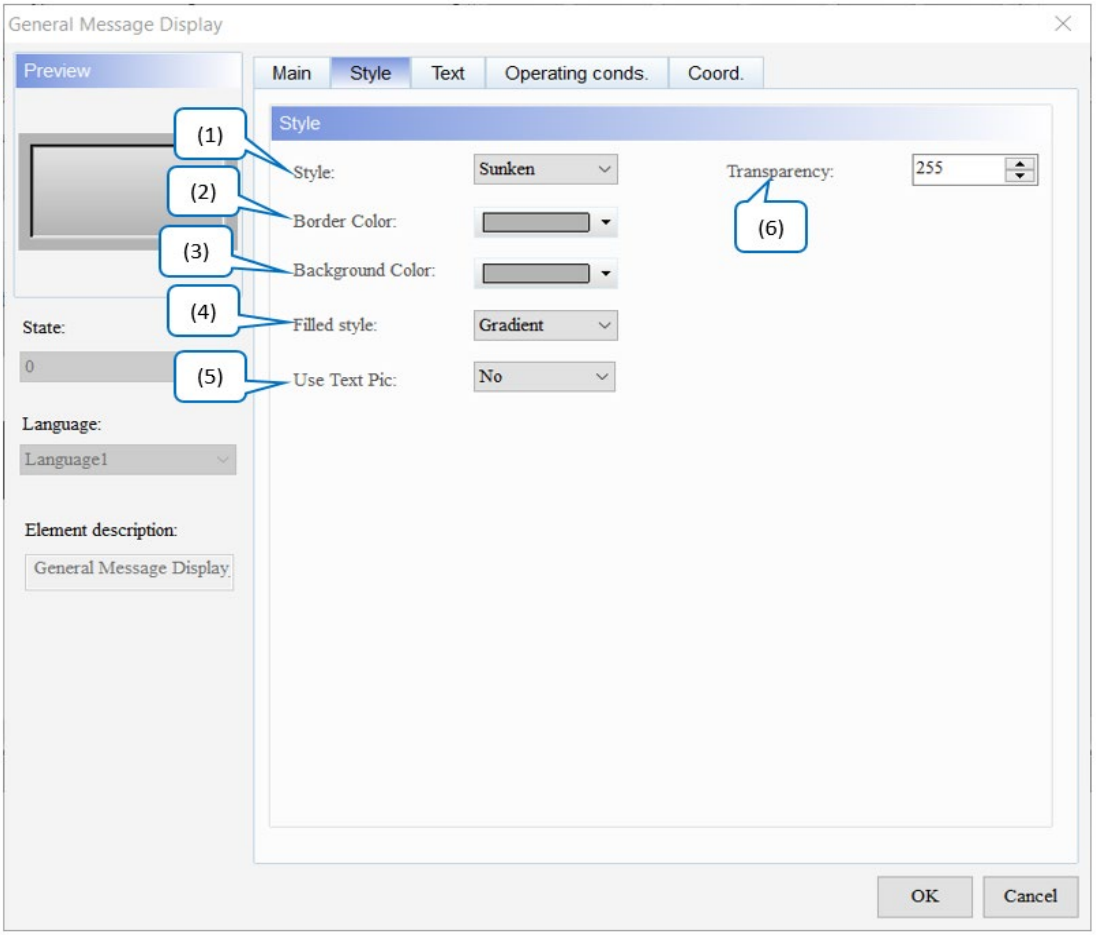
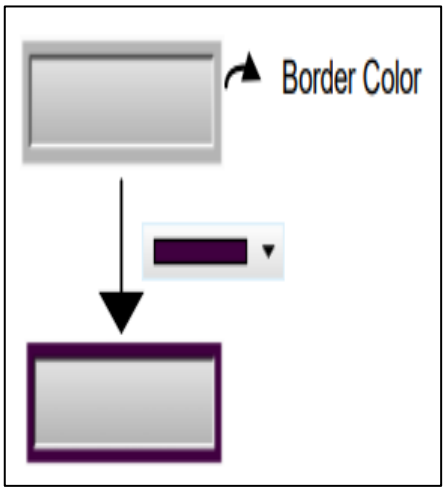


Figure 11 - 31: General Message Display element Style property page

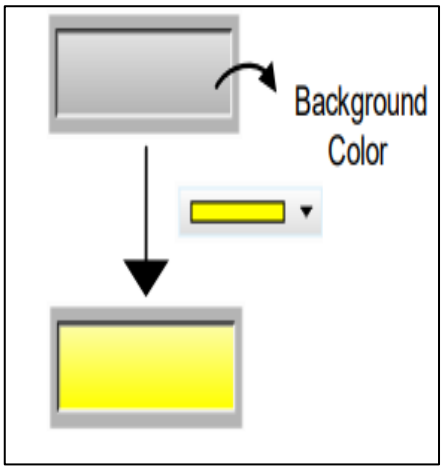
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Raised, Sunken, and Transparent. The default value is Sunken.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is .
When users set the Style to Transparent, the Border Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is .
When users set the Style to Transparent, the Background Color setting is invalid.



</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model.

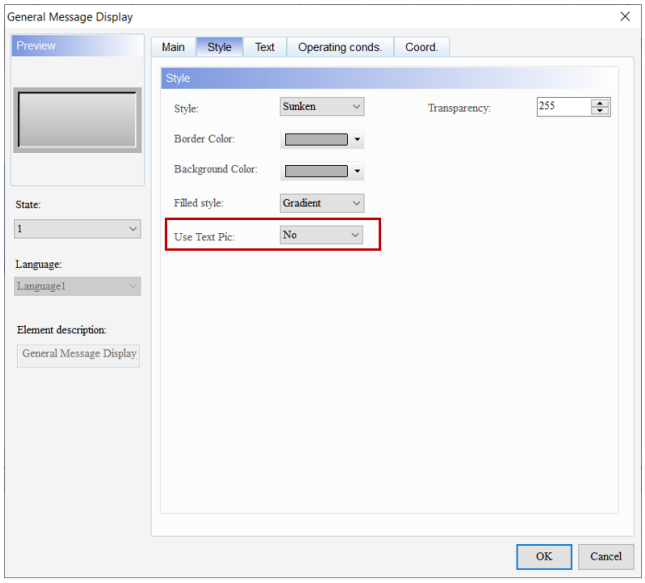
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.
<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Use Text Pic</td><td>

Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
Refer to the following example.

<table>
<tr><th colspan="2">Use Text Pic</th></tr>
<tr><td>Create Text element</td><td>

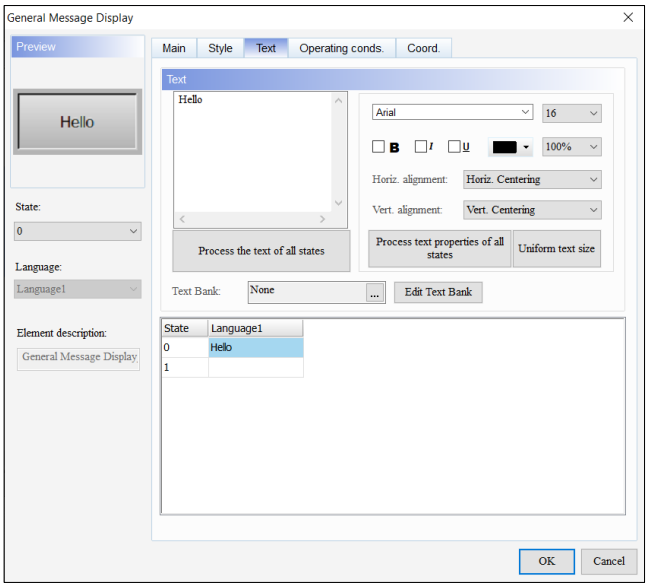
Create a Text element and go to Main property page to set the Use Text Pic function.



NOTE: If users use DIAScreen to open the DOP-B project, the Use Text Pic function will be set to Yes by default; if users add a new DOP-100 project, the Use Text Pic function will be set to No by default.

Go to Text property page, and type the text and set its font.

</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td> 
</td></tr>
<tr><td>Execution result</td><td>

After creating the element, compile and download the data to the HMI.
The following table shows the results of using and not using the Use Text Pic function.

<table>
<tr><th>Use Text Pic is Yes</th><th>Use Text Pic is No</th></tr>
<tr><td>HELLO</td><td>HELLO</td></tr>
</table>
</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

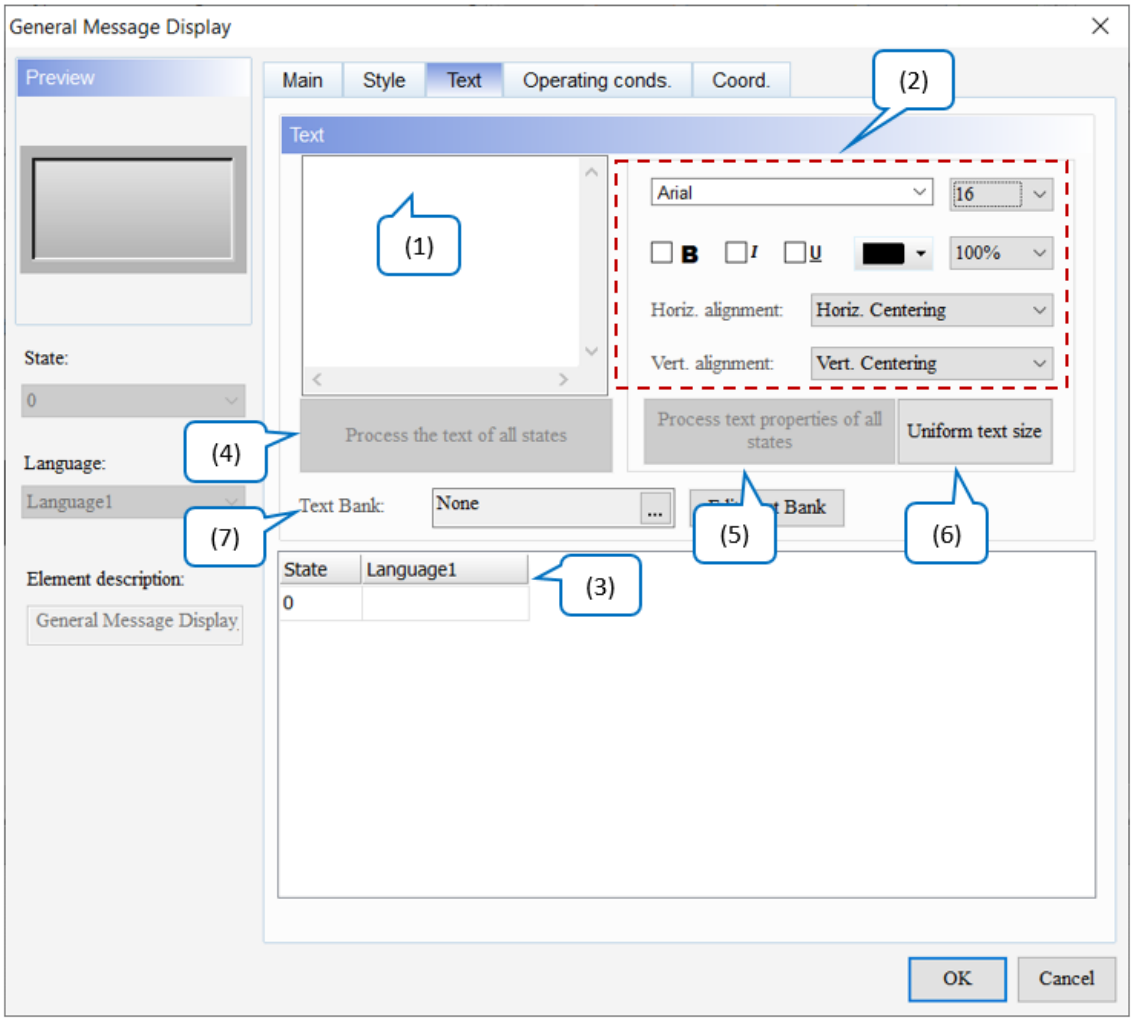
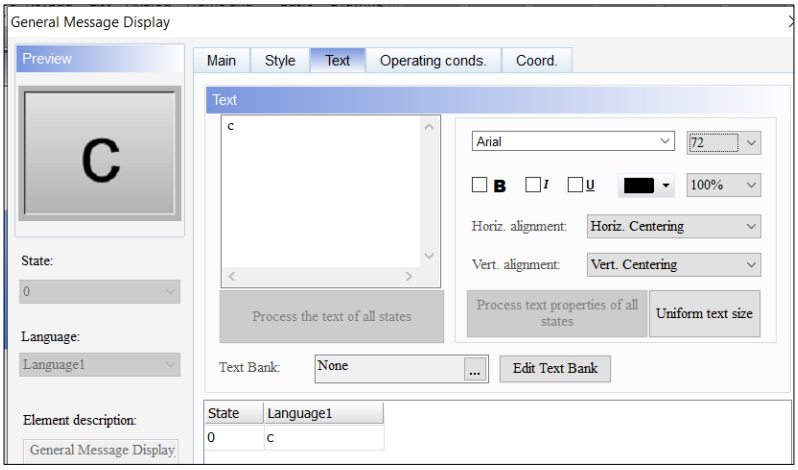


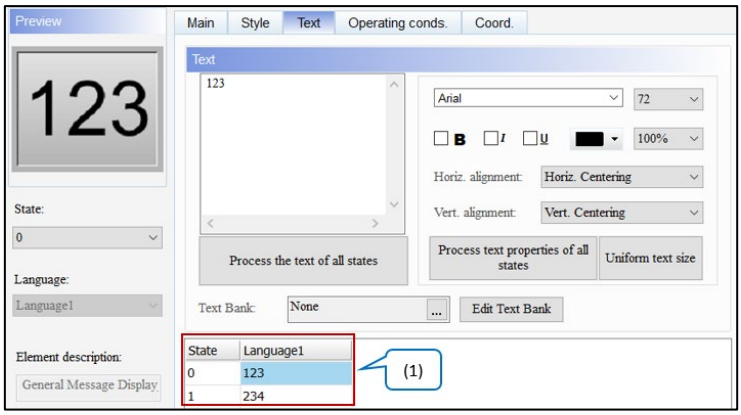
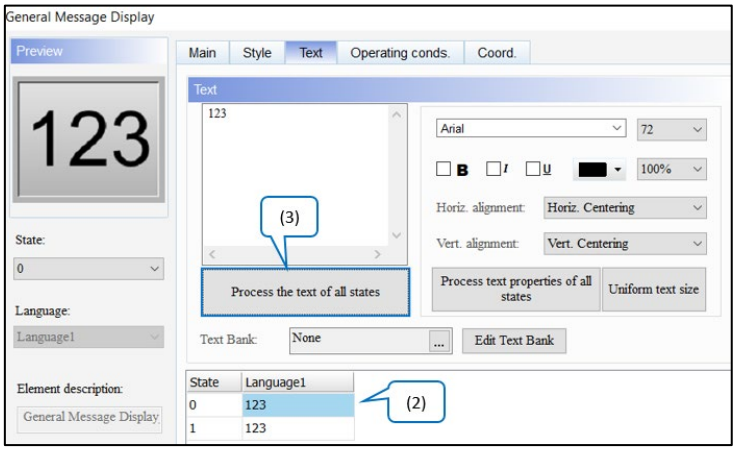
Figure 11 - 32: General Message Display element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. ● As long as the element allows text input, click the element and press the space key to start editing the text.
(2)	Text Property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English text in the **English** column.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(4)</td><td>Process the text of all states</td><td>

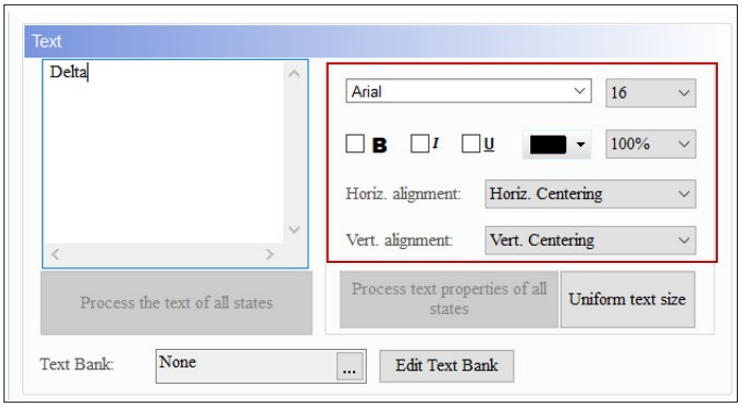
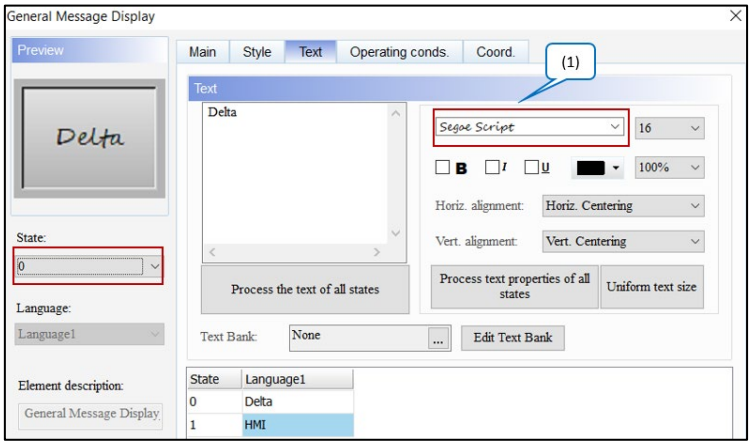
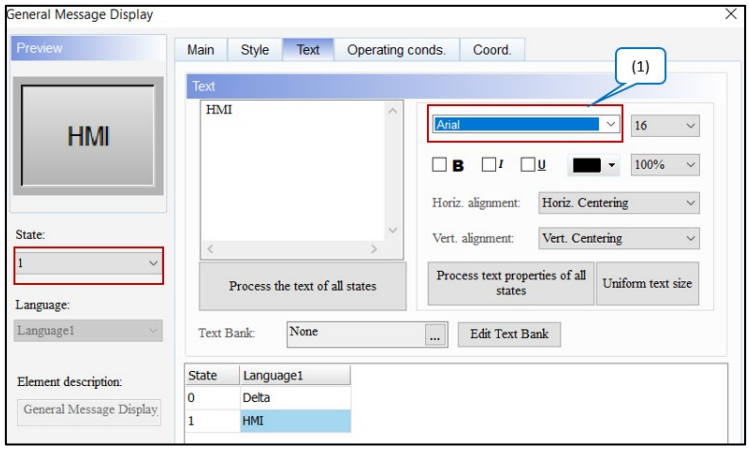
This function changes all the texts into the text contents of the state users select.
The following illustrates the steps:

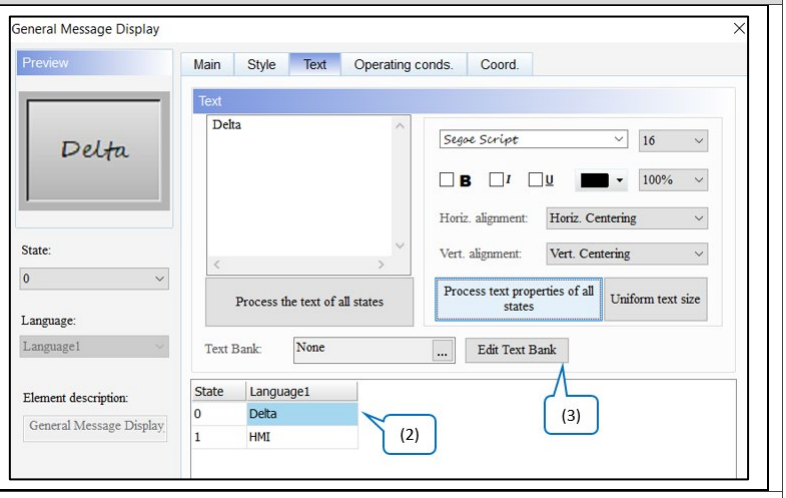
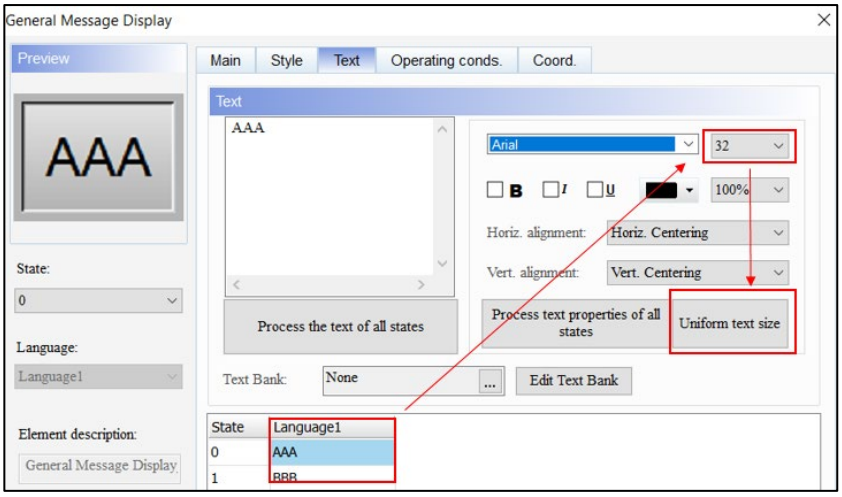
Input 123 to State 0, and 234 to State 1.
Click State 0.
Click Process the text of all states, and State 1 text changes to 123.

<table>
<tr><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Process text properties</td><td>

This function changes all the text properties based on the state users select. Items included in the text property are shown in the following figure.

</td></tr>
</table>

No.	Function	Description
	of all states	 ● The following is an example description: 1. Input *Delta* to State 0, and set the font to Segoe Script; input *HMI* to State 1, and set the font to Arial. 2. Click State 0. 3. Click **Process text properties of all states**, and State 1 font changes to Segoe Script. Before Change  

No.	Function	Description
		After Change 
(6)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Operating conds.

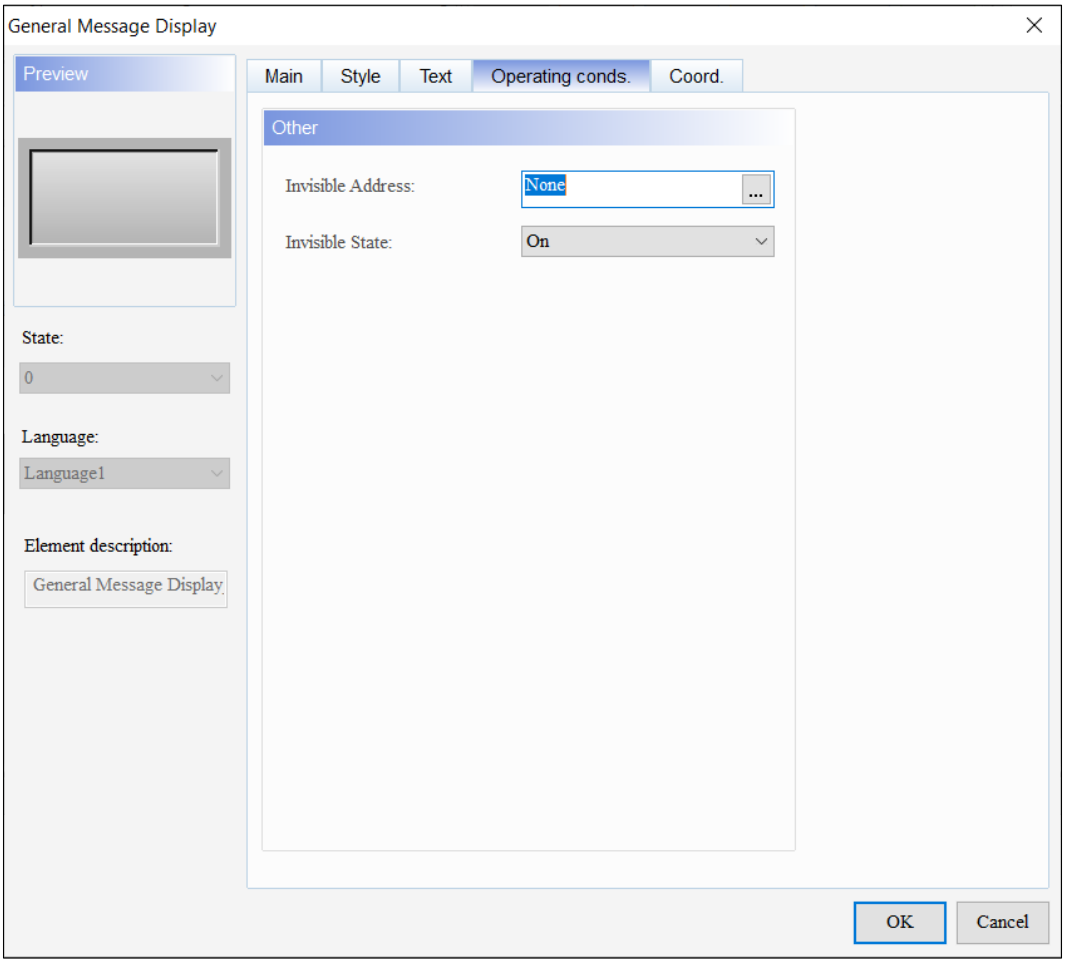
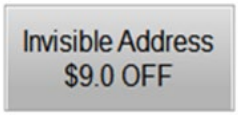
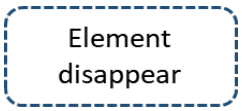
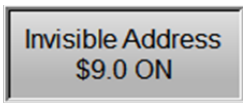
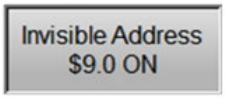
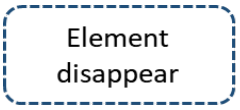
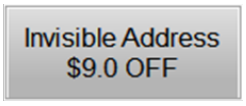


Figure 11 - 33: General Message Display element Operating conds. property page

No.	Function	Description
(1)	Invisible Address Invisible State	● The **Invisible Address** mainly allows users to hide an element through this address. ● If the **Invisible State** is set to On/Off, the element is hidden through the address defined in the **Invisible Address** field. The default value is **On**. ● The following example explains **Invisible Address** usage: 1. Create an element and set its address to $9.0, then set the **Invisible Address** of the element to be hidden

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>to $9.0.
2. To hide the element, first press the $9.0 button.
<table>
<tr><td rowspan="2">Invisible State is On</td><td> 
  </td></tr>
<tr><td> 
  </td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
  </td></tr>
<tr><td> 
  </td></tr>
</table></td></tr>
</table>

- Coord.

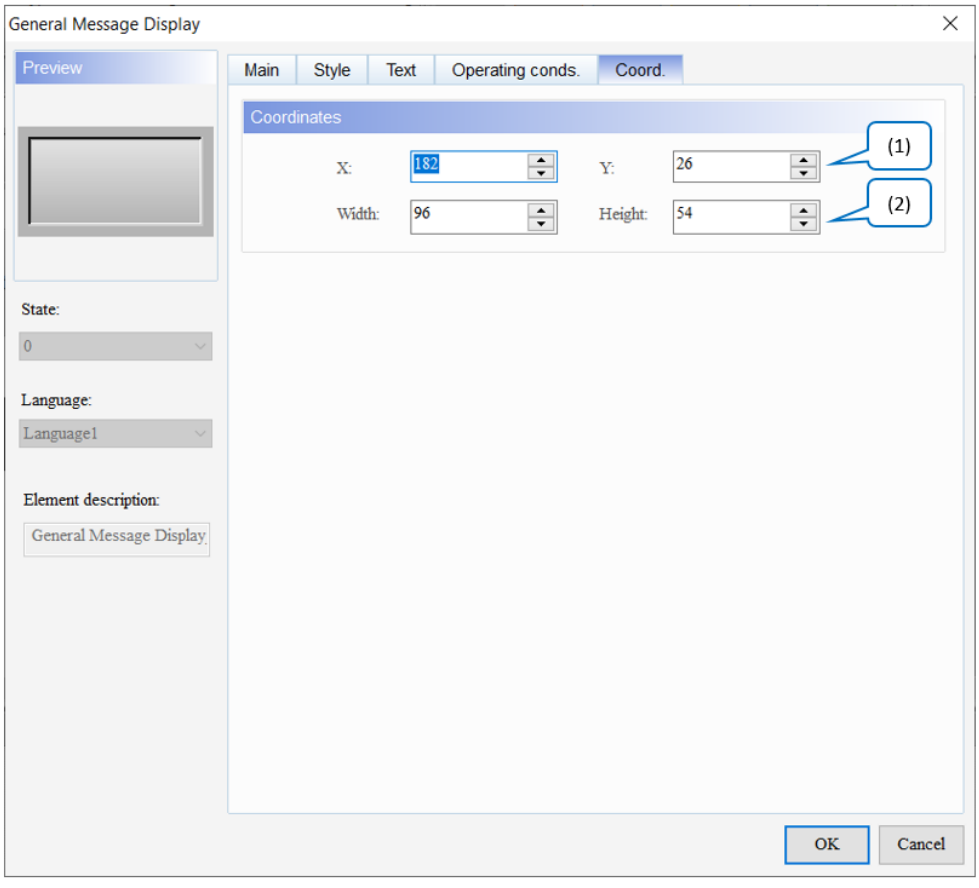
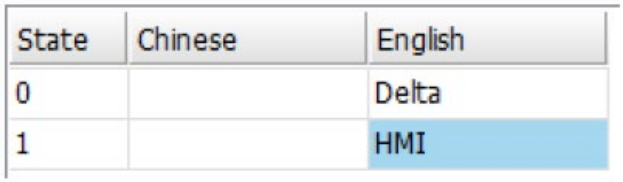


Figure 11 - 34: General Message Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

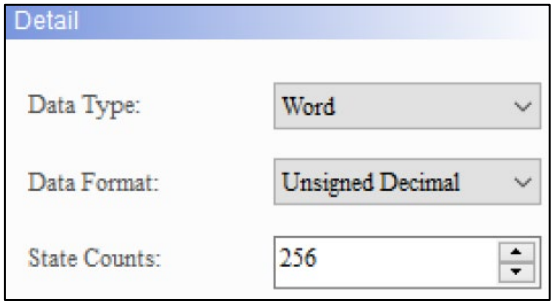
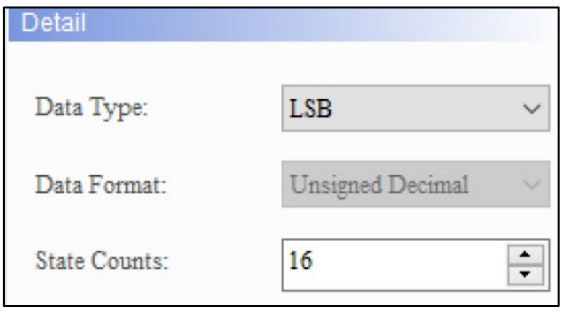
11.5 Moving Sign Display

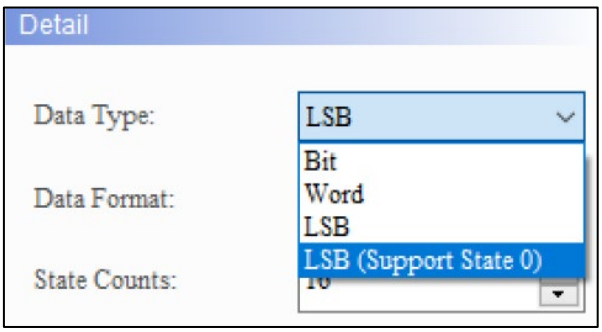
Apart from the **General Message Display** element, users can use the **Moving Sign Display** element to switch the state text messages, as well as adjusting the text displaying direction, moving points per time, and time interval. Refer to the following table for the **Moving Sign Display** example.

<table>
<tr><th colspan="2">Moving Sign Display</th></tr>
<tr><td>Set the Moving Sign element</td><td>
<table>
<tr><td>Data Type</td><td>State Counts</td><td>Direction</td><td>Points per time</td><td>Interval</td></tr>
<tr><td>Bit</td><td>2</td><td>Left</td><td>1</td><td>100 (ms)</td></tr>
</table>
</td></tr>
<tr><td>Address settings</td><td>
<table>
<tr><td colspan="2">Moving Sign Display Element</td><td colspan="2">Maintained Button Element</td></tr>
<tr><td>Read Address</td><td>$55.0</td><td>Write Address</td><td>$55.0</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>State displaying text</td><td>Double-click the Moving Sign Display element to go to Text property page and edit the text to display.

<table>
<tr><td>State</td><td>Chinese</td><td>English</td></tr>
<tr><td>0</td><td></td><td>Delta</td></tr>
<tr><td>1</td><td></td><td>HMI</td></tr>
</table>
</td></tr>
<tr><td>Execution result</td><td>After creating the elements, compile and download the data to the HMI. Next, use the Maintained Button element to switch between State 0 and State 1, and the Moving Sign Display element displays the corresponding state text.
<table>
<tr><td>State 0</td><td> 
</td></tr>
</table>
</td></tr>
</table>

Moving Sign Display		
	State 1	

The **Moving Sign Display** element supports four types of **Data Type**, as shown in the following table. To add or reduce the number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

Moving Sign Display	
Data Type	**State Counts**
Word	● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states.  ● If the **Data Type** is Word, the memory address is in units of Word.
LSB / LSB (Support State 0)	● LSB is to first convert the data in the register to binary data, and then use the lowest non-zero bit to determine the current state of the object. ● If the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states except for State 0.  ● To display State 0, select LSB (Support State 0) for the **Data Type**.

<table>
<tr><th colspan="2">Moving Sign Display</th></tr>
<tr><td>Data Type</td><td>State Counts</td></tr>
<tr><td></td><td>


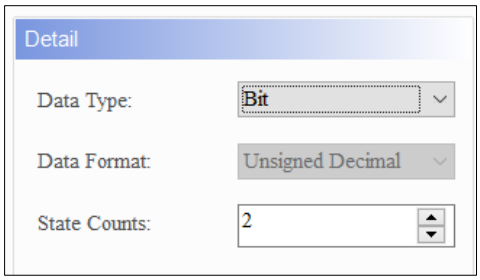
If users select LSB, the element is black when the state is 0.



When the Data Type is either LSB or LSB (Support State 0), the memory address is in units of Word.

</td></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>
The examples in the following table show how the state value is determined with the lowest non-zero bit of the binary value converted from a decimal value. There are also examples demonstrating how the software determines the displaying state value with the lowest bit when the decimal values are 3 and 7.
<table>
<tr><th>Decimal</th><th>Binary</th><th>State Value</th></tr>
<tr><td>0</td><td>0000000000000000</td><td>State = 0 when all bits are 0.

NOTE: LSB (Support State 0) must be selected.</td></tr>
<tr><td>1</td><td>0000000000000001</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>2</td><td>0000000000000010</td><td>The lowest non-zero bit is bit 1, State = 2.</td></tr>
<tr><td>3</td><td>0000000000000011</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>4</td><td>0000000000000100</td><td>The lowest non-zero bit is bit 2, State = 3.</td></tr>
<tr><td>7</td><td>0000000000000111</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The lowest non-zero bit is bit 3, State = 4.</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non-zero bit is bit 4, State = 5.</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The lowest non-zero bit is bit 5, State = 6.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="4">Moving Sign Display</th></tr>
<tr><td>Data Type</td><th colspan="3">State Counts</th></tr>
<tr><td rowspan="11"></td><td>64</td><td>0000000001000000</td><td>The lowest non-zero bit is bit 6, State = 7.</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The lowest non-zero bit is bit 7, State = 8.</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The lowest non-zero bit is bit 8, State = 9.</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The lowest non-zero bit is bit 9, State = 10.</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The lowest non-zero bit is bit 10, State = 11.</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The lowest non-zero bit is bit 11, State = 12.</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The lowest non-zero bit is bit 12, State = 13.</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non-zero bit is bit 13, State = 14.</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non-zero bit is bit 14, State = 15.</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non-zero bit is bit 15, State = 16.</td></tr>
<tr><td>Bit</td><td colspan="3">● If the Data Type is Bit, set only 2 states.
 

● If the Data Type is Bit, the memory address is in units of Bit.</td></tr>
</table>

On double-clicking the **Moving Sign Display** element, the property page appears as follows.

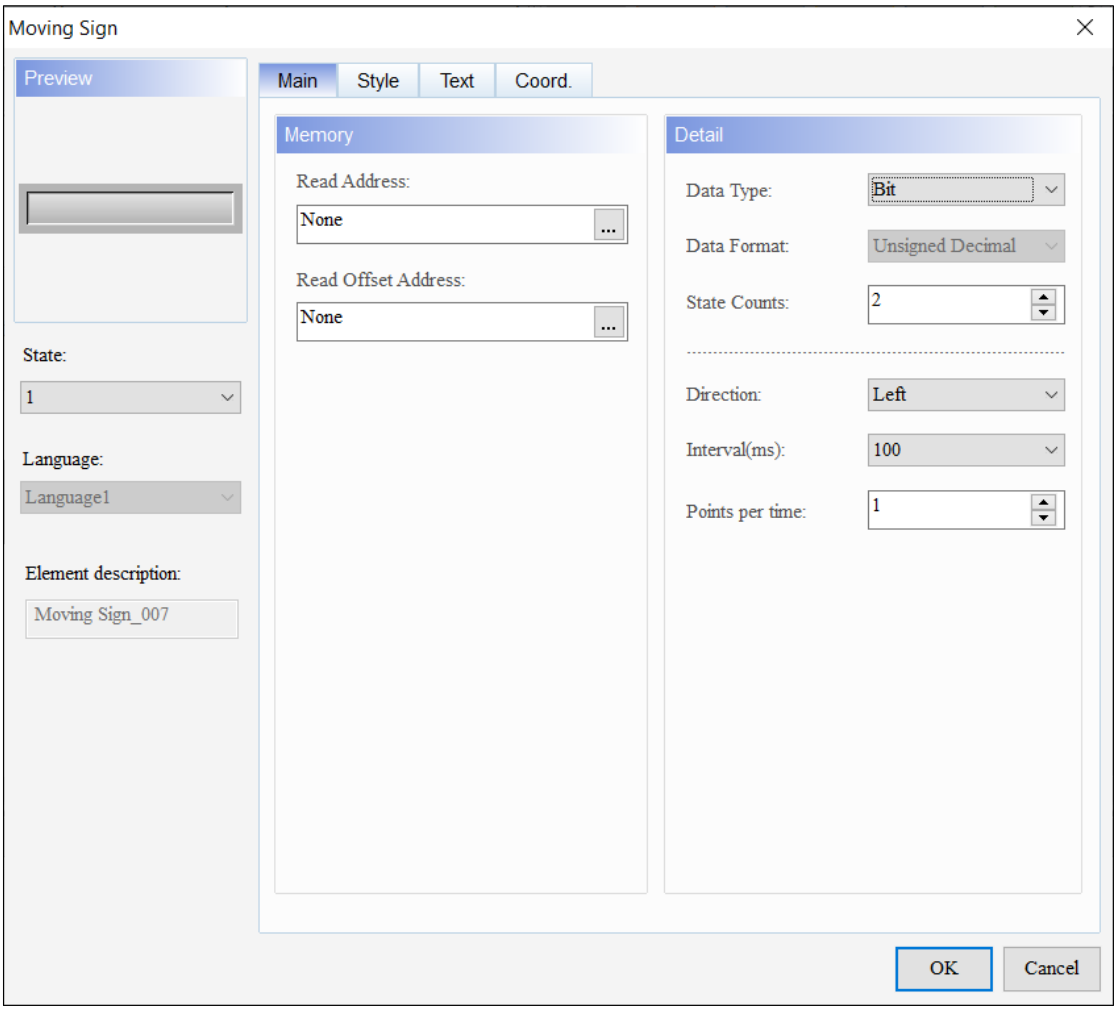


Figure 11 - 35: Moving Sign Display element property page

Moving Sign Display	
Function	**Description**
Preview	The **Moving Sign Display** element can view multiple state values and multi-language data display.
Main	Set the Read Address, Read Offset Address, Data Type, Data Format, State Counts, Direction, Interval (ms), and Points per time.
Style	Set the Style, Border Color, Background Color, Filled style, and Transparency.
Text	Set the text font, size, color, format, zoom, and alignment.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

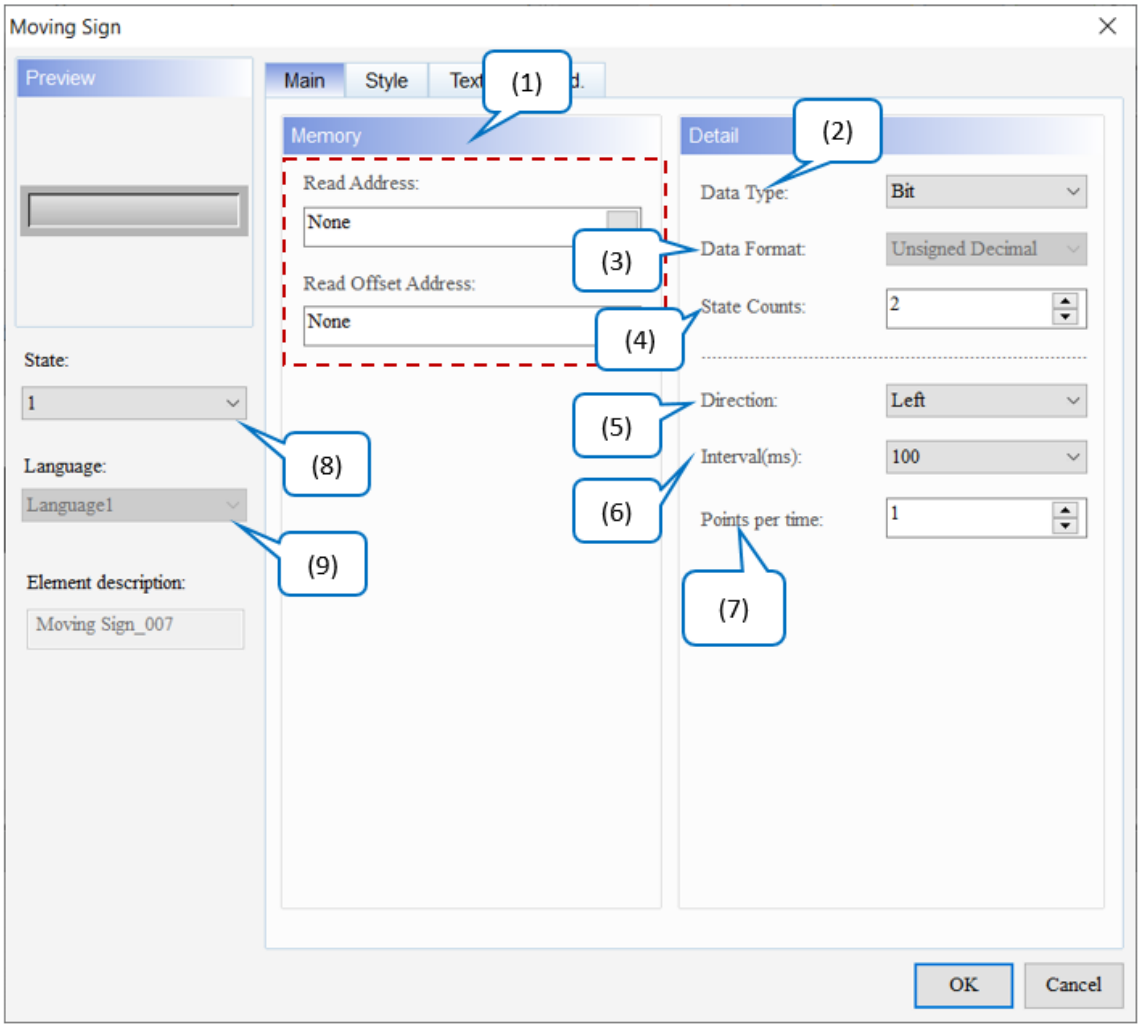
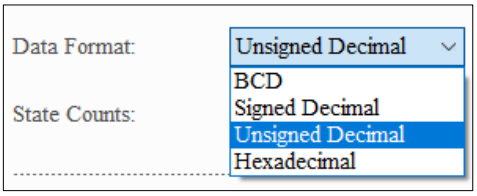


Figure 11 - 36: Moving Sign Display element Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. The **Input** memory **Type** varies depending on the selected **Data Type**, including Word, LSB, or Bit. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0). The default value is **Word**.

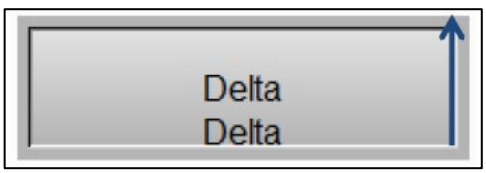
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Data Format</td><td>

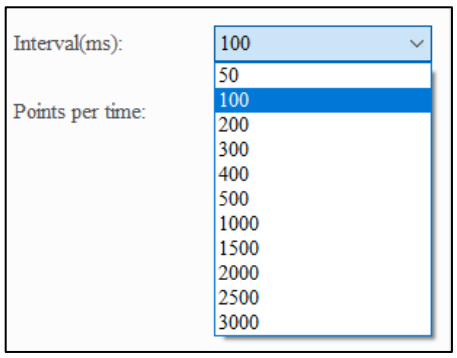
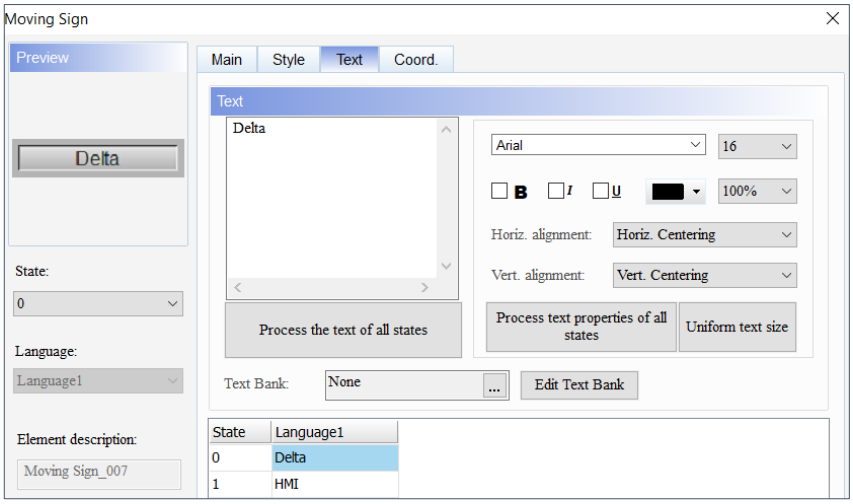
Select the Data Format only when the Data Type is Word.
The available options for Data Format are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is Unsigned Decimal.

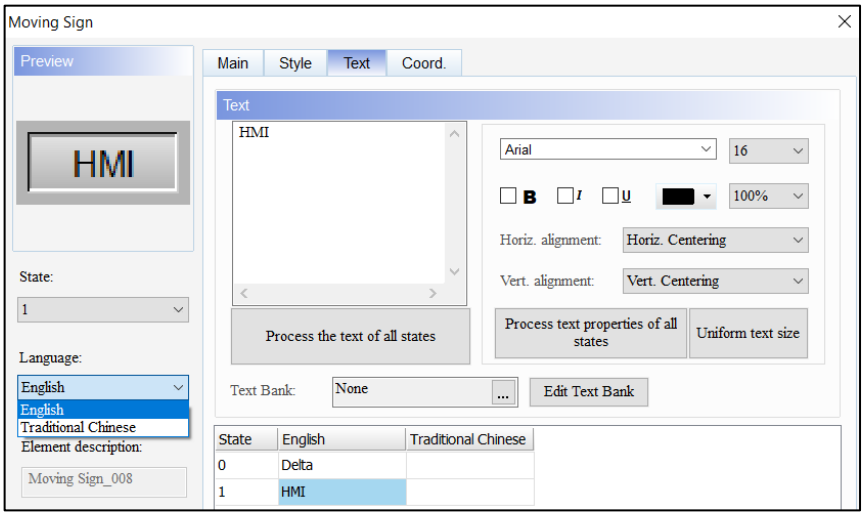


</td></tr>
<tr><td>(4)</td><td>State Counts</td><td>

Set the State Counts of the Moving Sign element. The default value is 1.
If the Data Type is Word, State Counts can be set from 1 ~ 256 states; if the Data Type is LSB, State Counts can be set from 1 ~ 16 states; if the Data Type is LSB (Support State 0), State Counts can be set from 1 ~ 17 states; and if the Data Type is Bit, State Counts can be set to only 2 states.

</td></tr>
<tr><td>(5)</td><td>Direction</td><td>
Select the text moving direction to display. The available options for Direction are: Left, Right, Up, Down. The default value is Left.
<table>
<tr><td>Left</td><td>From right to left
 
</td></tr>
<tr><td>Right</td><td>From left to right
 
</td></tr>
<tr><td>Up</td><td>From bottom to top
 
</td></tr>
<tr><td>Down</td><td>From top to bottom
 
</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
(6)	Interval(ms)	● The **Interval(ms)** defines the interval time (unit: ms) between two message movements of the **Moving Sign Display** element. The default value is **100**. ● The moving distance is determined by the setting of **Points per time**. 
(7)	Points per time	The greater the number of points, the greater the distance each time the text moves. The setting range is 1 ~ 50 pixels. The default value is **1**.
(8)	State	Preview or change the settings of each state of the element by switching the **State**. 

No.	Function	Description
(9)	Language	If users have set the language data, users can edit the properties of the text to be displayed with the **Language** setting of the element. 

- Style

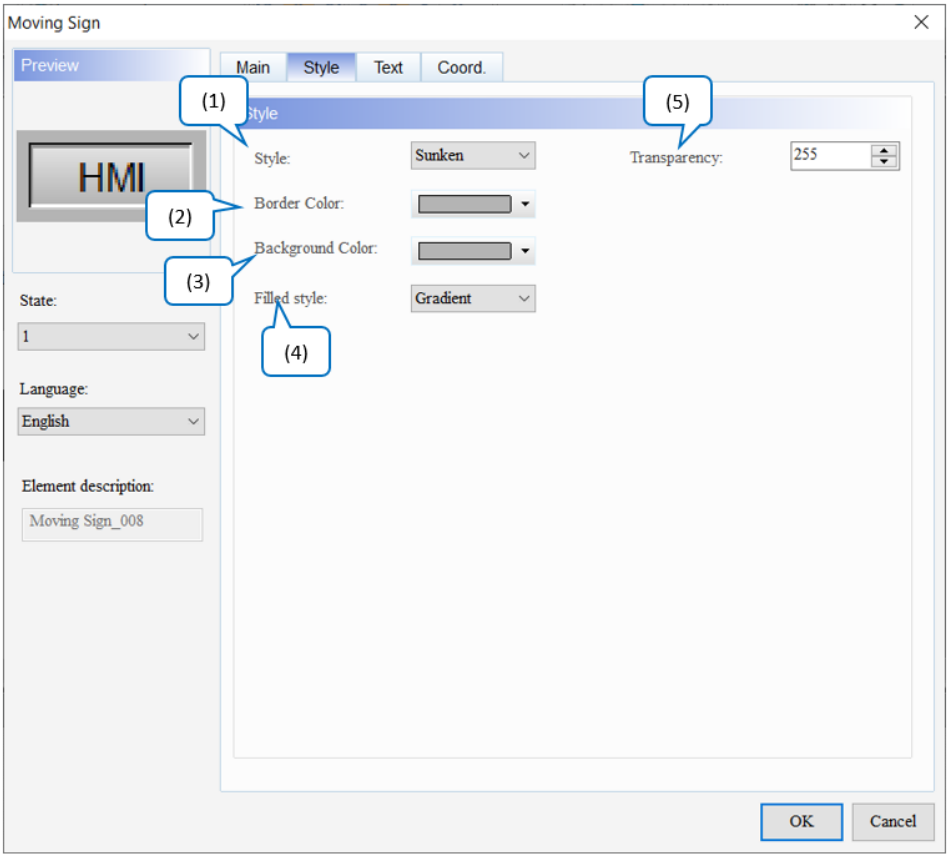
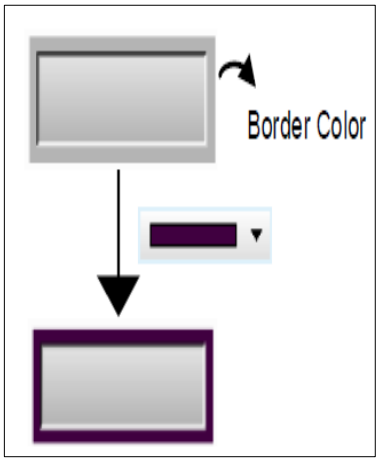


Figure 11 - 37: Moving Sign Display element Style property page

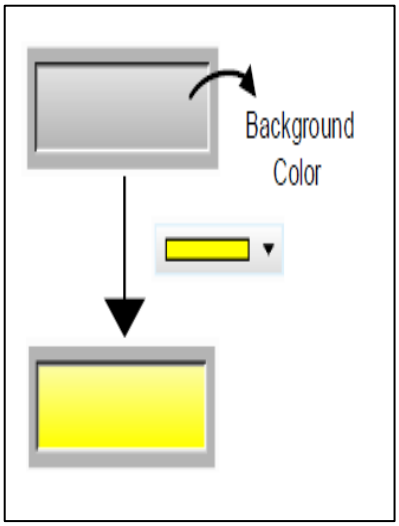
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Raised, Sunken, and Transparent. The default value is Sunken.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is .
When users set the Style to Transparent, the Border Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is .
When users set the Style to Transparent, the Background Color setting is invalid.



</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

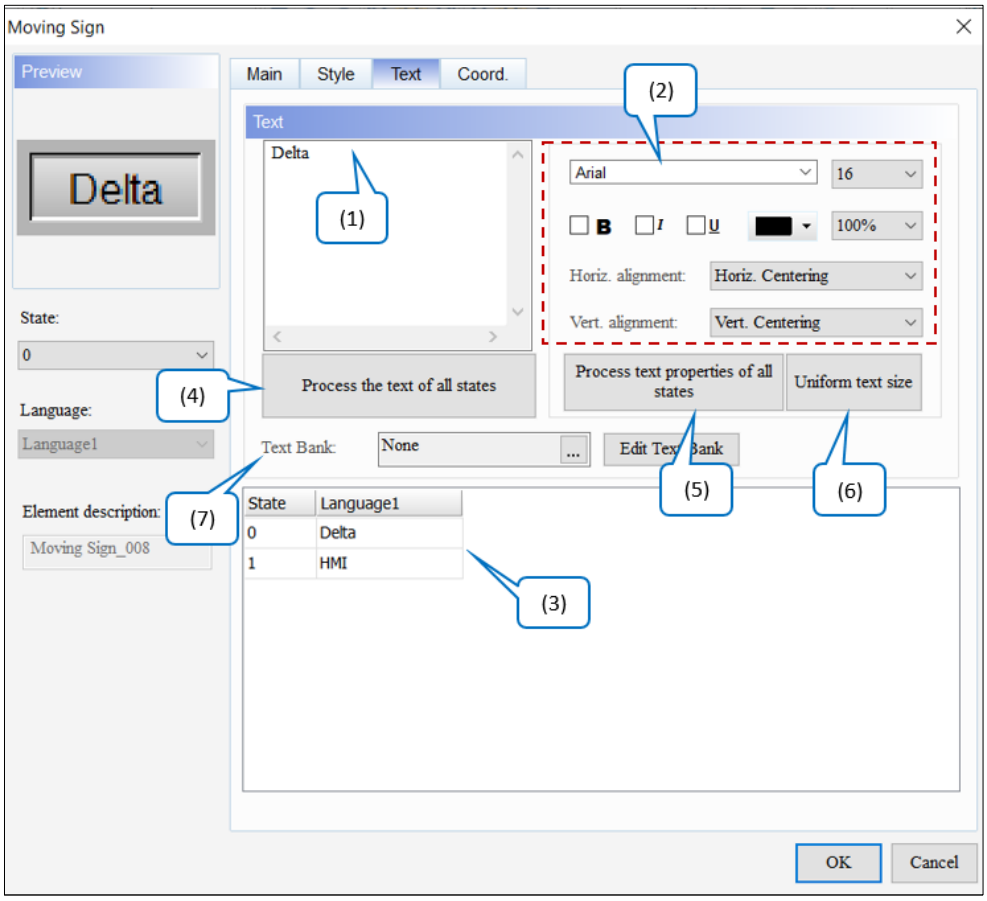
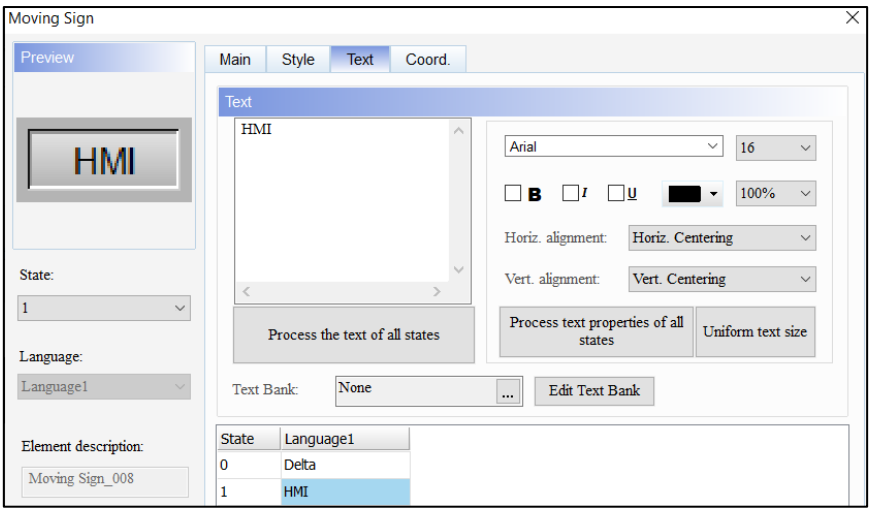
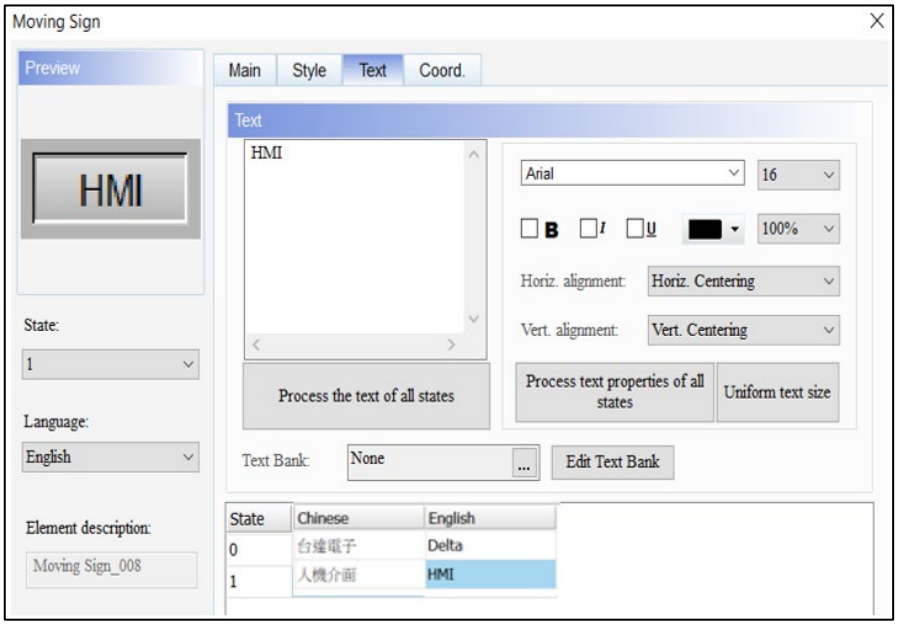
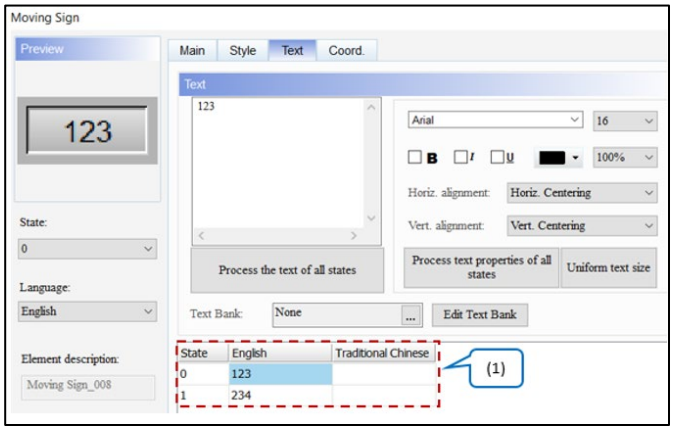
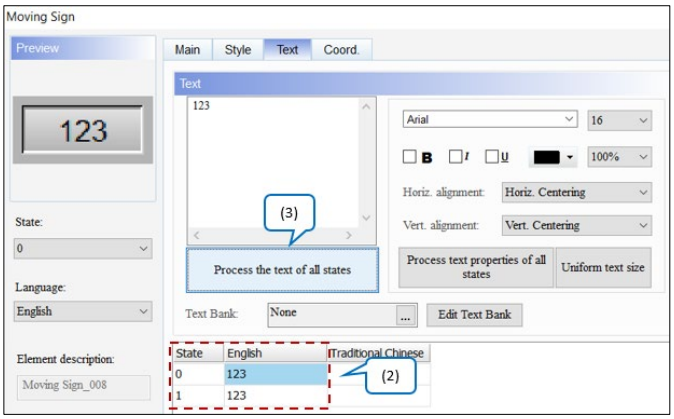
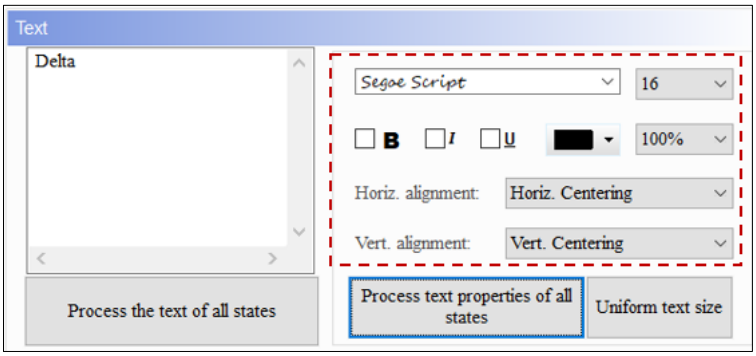


Figure 11 - 38: Moving Sign Display element Text property page

No.	Function	Description
(1)	Text	Enter the text message to be displayed in the box. 
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language data, the **Text** page allows them to edit multi-language text data. As shown in the **Text** property page, they can enter English text in the **English** column. 
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state users select. ● The following illustrates the steps: 1. Input *123* to State 0, and *234* to State 1. 2. Click State 0. 3. Click **Process the text of all states**, and State 1 text changes to *123*.

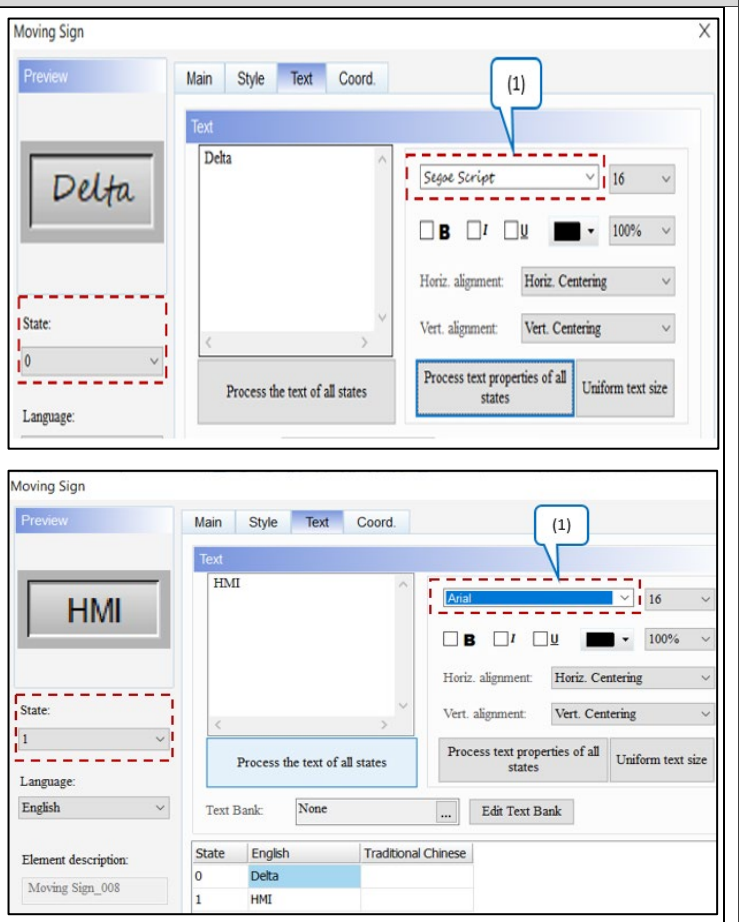
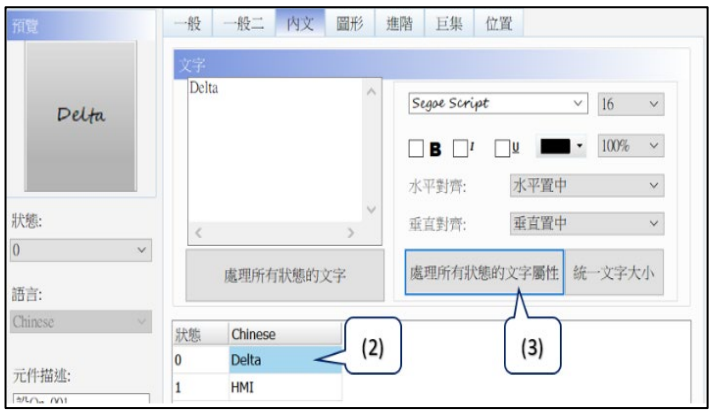
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Process text properties of all states</td><td>

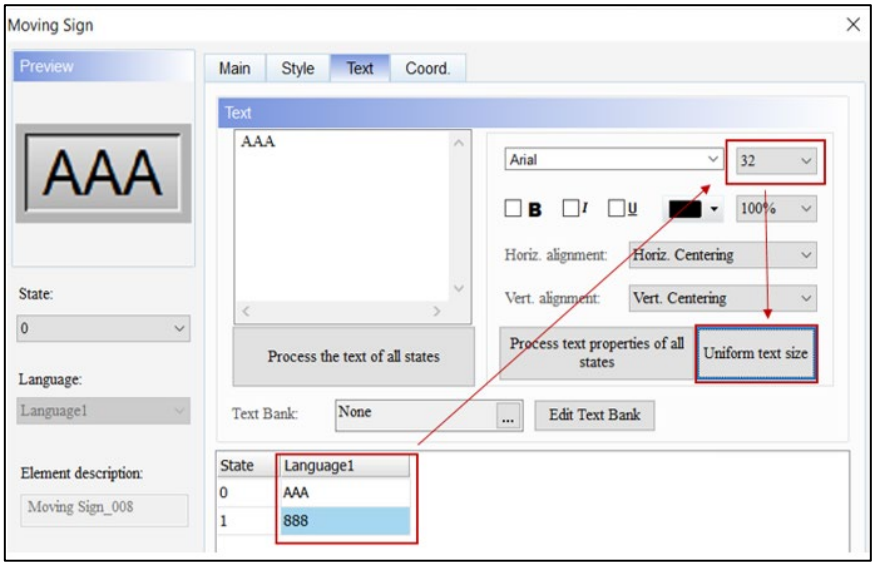
This function changes all the text properties based on the state users select. Items included in the text property are shown in the following figure.


The following is an example description:

Input Delta to State 0, and set the font to Segoe Script; input HMI to State 1, and set the font to Arial.
Click State 0.
Click Process text properties of all states, and State 1 font changes to Segoe Script.

</td></tr>
</table>

No.	Function	Description
		Before Change  After Change 
(6)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Coord.

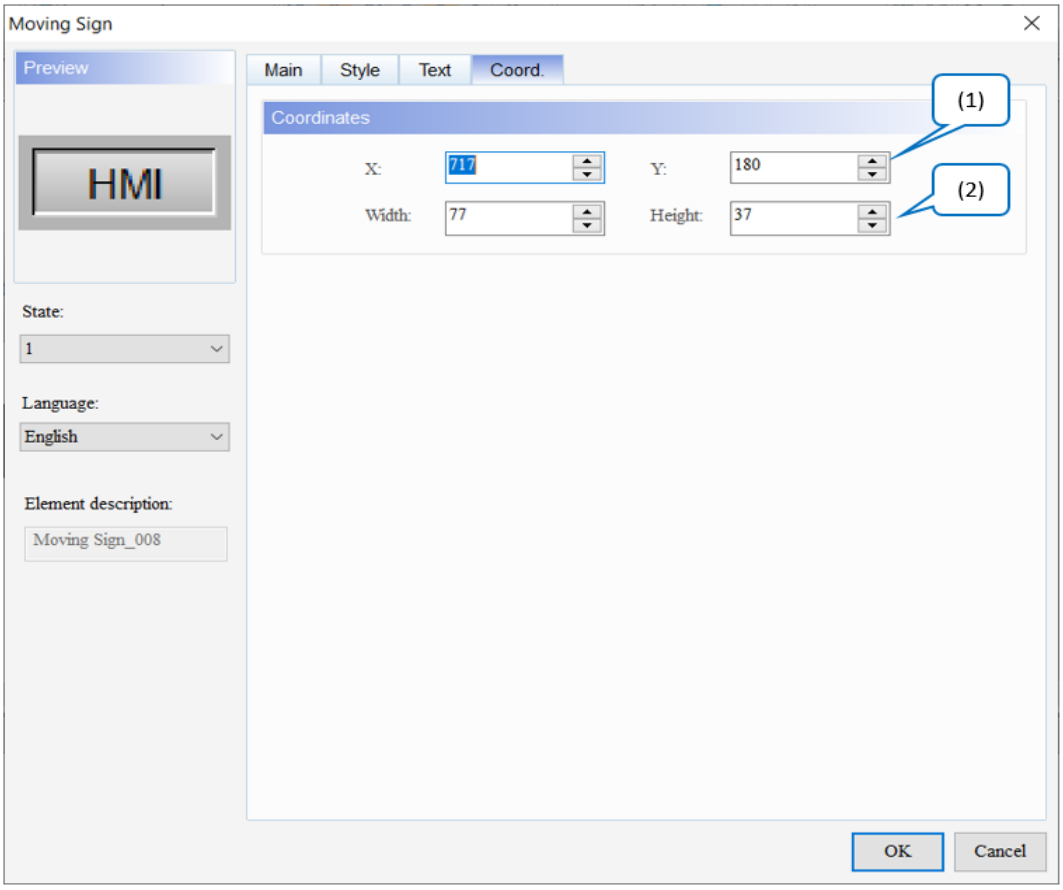


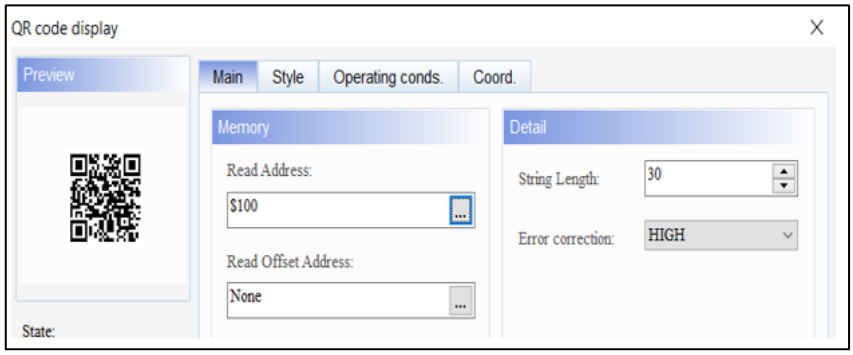
Figure 11 - 39: Moving Sign Display element Coord. property page

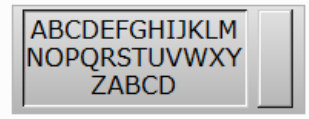
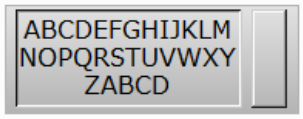
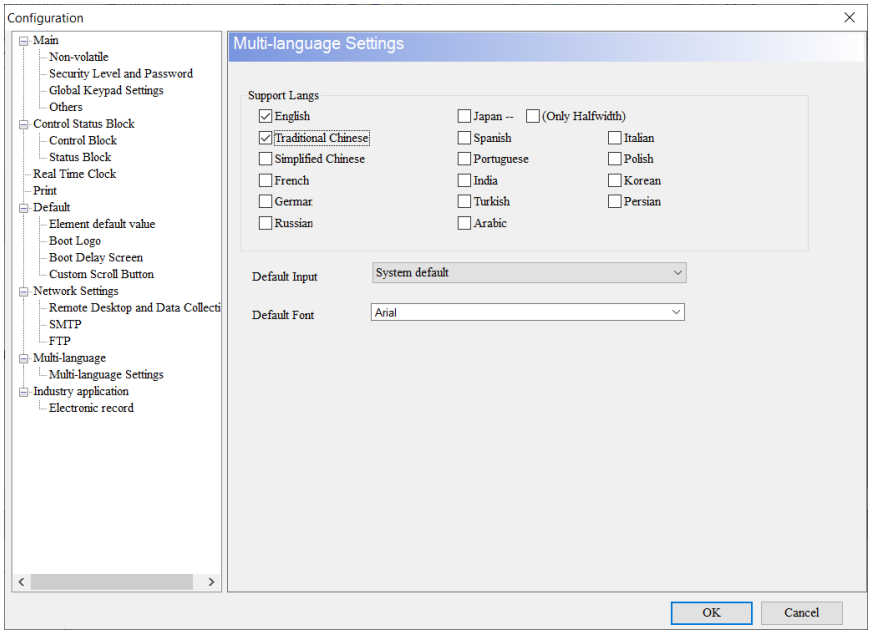
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

11.6 QR Code Display

Quick Response Codes (QR codes) are also known as two-dimensional barcodes or matrix barcodes. The data types stored in a QR code include numbers, letters, binary data, and Kanji. A QR code is a square two-dimensional barcode comprising only two colors, black and white. There are three position markers (a square in a grid) on the three corners of the QR code and another position marker is at a position near the lower right corner. These markers are for identification and positioning, so there is no need to carefully align the code while scanning. The scanning software decodes the code correctly regardless of angle and direction.

The **QR Code Display** element encodes the string to display. Scan the QR code to obtain the string. When the string is a URL, go to the website directly. This element also supports multi-language input. Refer to the following table for **QR Code Display** element example.

QR Code Display	
Create QR Code Display element	Set the **Read Address** and **String Length**. 

<table>
<tr><th colspan="3">QR Code Display</th></tr>
<tr><td>Create Character Entry and Multi-language Input elements</td><td colspan="2"><table>
<tr><th colspan="2">Character Entry Element</th><th colspan="2">Multi-language Input Element</th></tr>
<tr><td>Write Address</td><td>$100</td><td>Write Address</td><td>$100</td></tr>
<tr><td>String Length</td><td>30</td><td>String Length</td><td>30</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table></td></tr>
<tr><td>Select the language</td><td colspan="2">Go to General > Configuration > Multi-language Settings to select the English and Traditional Chinese checkboxes.
 
</td></tr>
<tr><td>Execution result</td><td colspan="2">After creating the elements, compile and download the data to the HMI, and then use the Character Entry element and the Multi-language Input element to enter the strings to generate the QR codes.
<table>
<tr><td>Generate QR code with Character Entry element</td><td>Enter the Delta website URL, and the corresponding QR code is generated.
 

  </td></tr>
<tr><td>Generate QR code with Multi-language</td><td>Enter DELTA, and the corresponding QR code is generated.</td></tr>
</table></td></tr>
</table>

QR Code Display		
	Input element	

On double-clicking the **QR Code Display** element, the property page appears as follows.

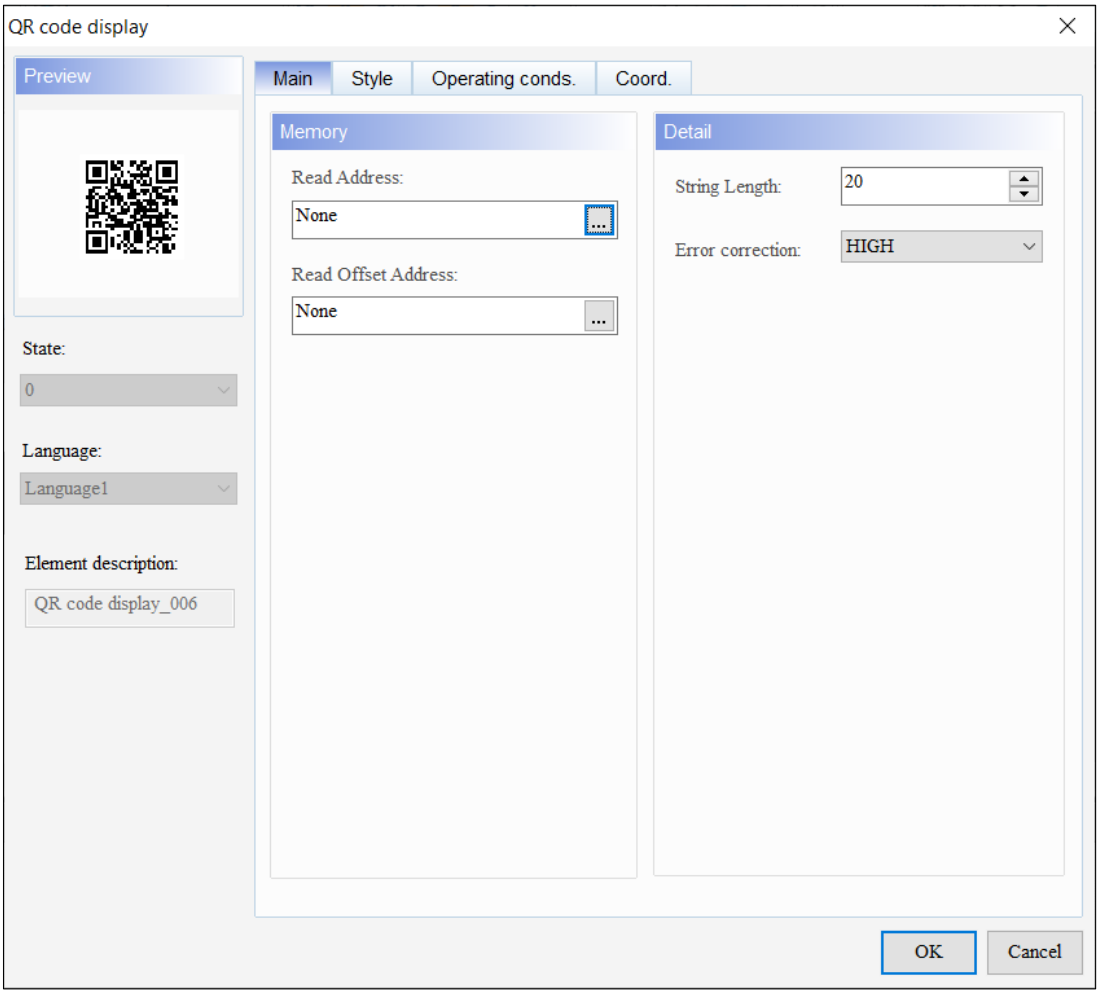


Figure 11 - 40: QR Code Display property page

QR Code Display	
Function	**Description**
Preview	QR Code Display element does not support multiple state values and multi-language data display.
Main	Set Read Address, Read Offset Address, String Length, and Error correction.
Style	Set Background Color.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

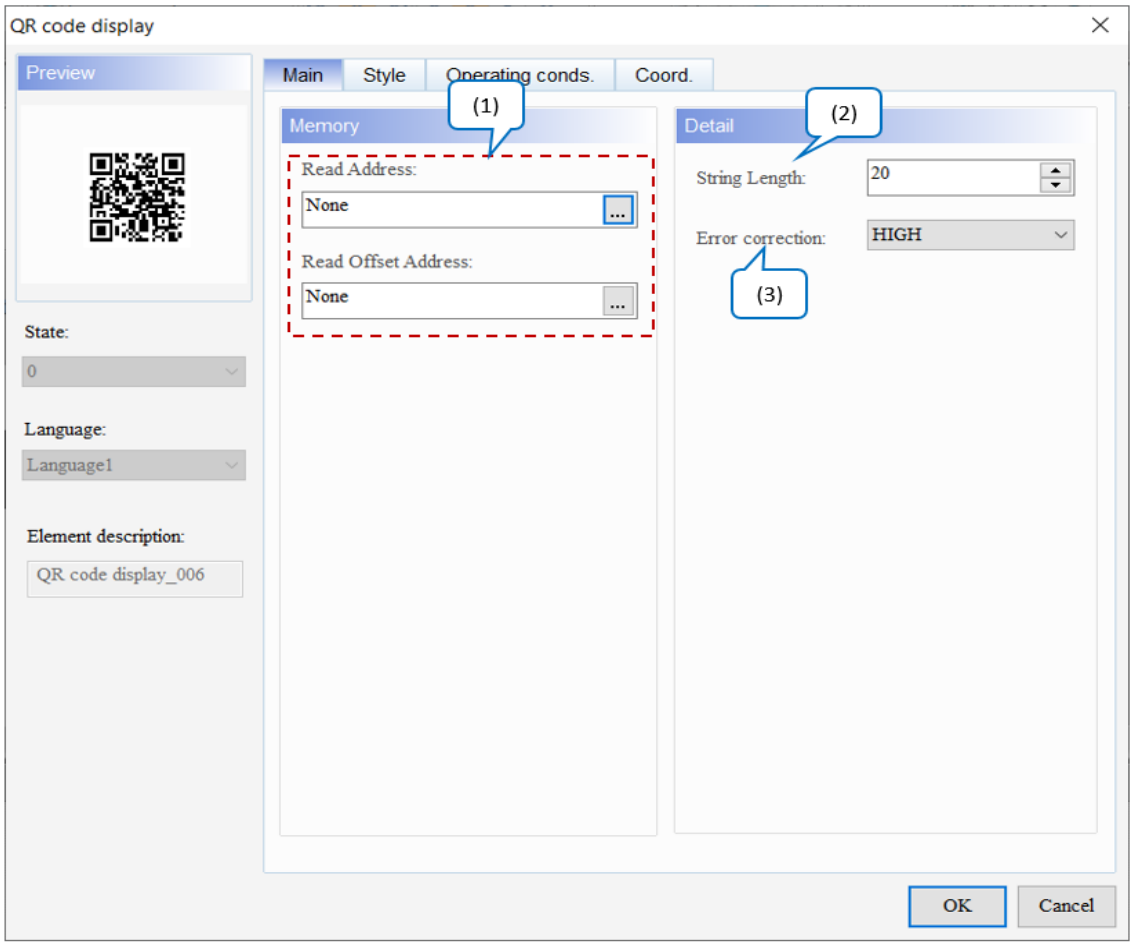
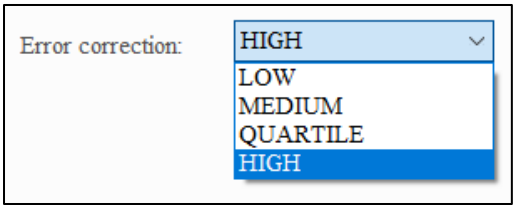


Figure 11 - 41: QR Code Display element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Read Address</td><td>● Select the Internal Memory or the controller register address.
● Select Link name or Device Type. Refer to Memory Settings for details.</td></tr>
<tr><td>Read Offset Address</td><td>Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>(2)</td><td>String Length</td><td>The maximum length of the string is 256 characters. The default value is 20.</td></tr>
<tr><td>(3)</td><td>Error correction</td><td>● QR codes have the capability of correcting errors. The available options for Error correction are: LOW, MEDIUM, QUARTILE, and HIGH, based on the error tolerance capabilities. The default value is High.
 

● Error correction in QR codes is implemented through the Reed-Solomon code method, but the Reed-Solomon codes need twice the storage space of the original data. Therefore, the higher the level of error correction, the less the amount of data can actually be stored. In other words, if there is a graphic or picture in the middle of the QR code, when the graphic or picture is larger, a higher error correction is required to prevent data errors. If there are no graphics or pictures in the middle, select LOW for the Error correction.
● The following is the data restoration rate for each error level.
<table>
<tr><th>Error Correction Level</th><th>Data Restoration Rate</th></tr>
<tr><td>LOW</td><td>7%</td></tr>
<tr><td>MEDIUM</td><td>15%</td></tr>
<tr><td>QUARTILE</td><td>25%</td></tr>
<tr><td>HIGH</td><td>30%</td></tr>
</table>
</td></tr>
</table>

- Style

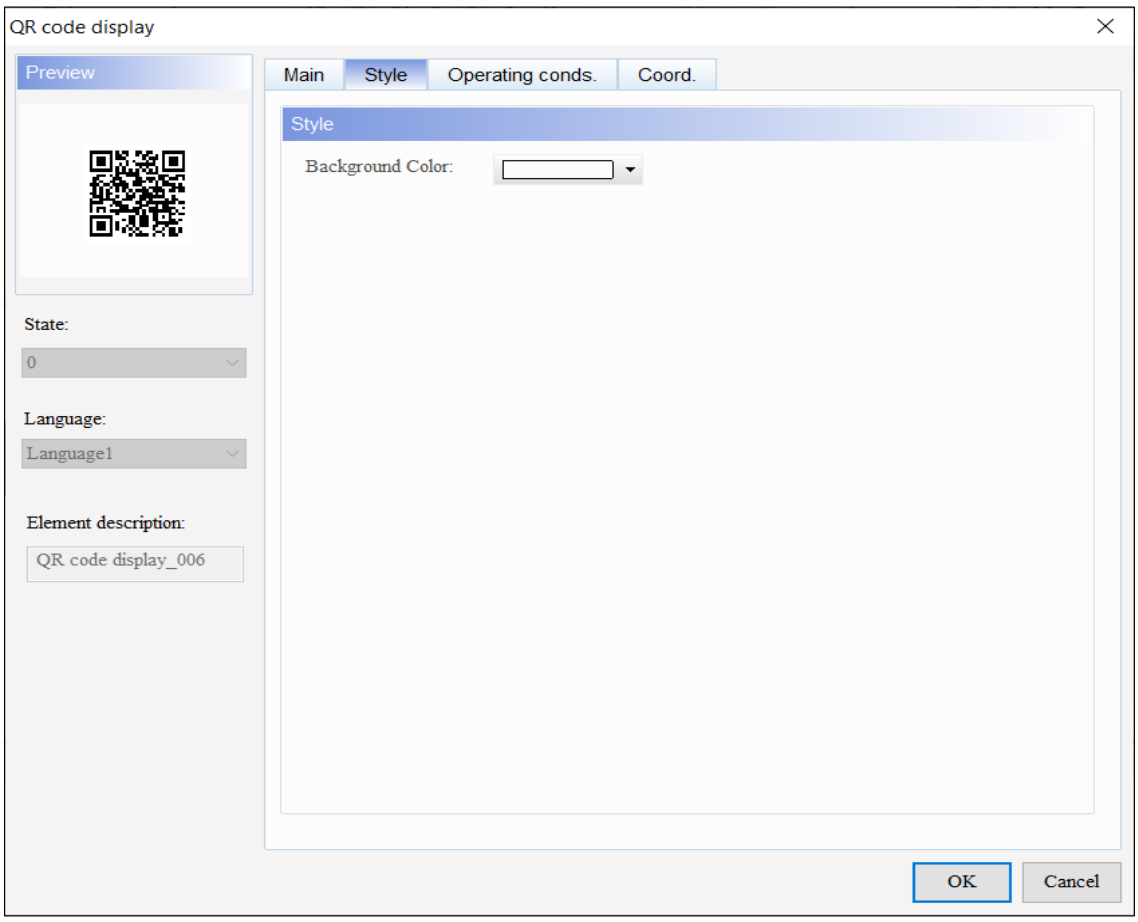
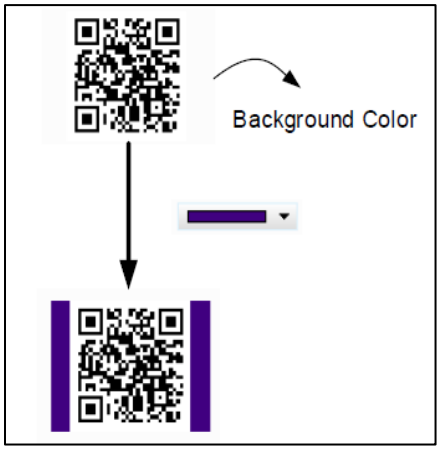


Figure 11 - 42: QR Code Display element Style property page

Function	Description
Background Color	Set the background color of the element. The default is  . 

- Operating conds.

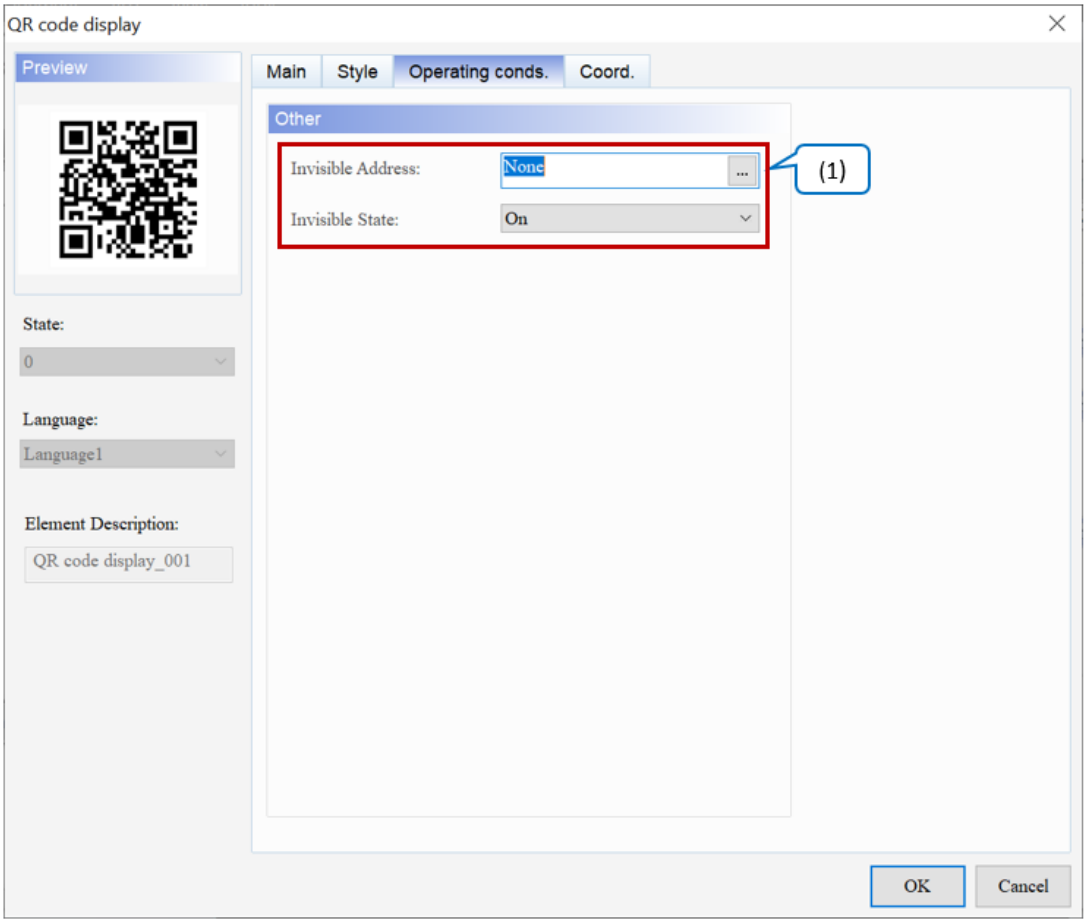
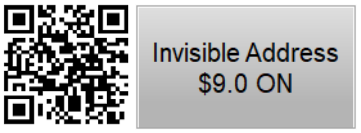


Figure 11 - 43: QR code Display element Operating conds. property page

No.	Function	Description
(1)	Invisible Address	• The **Invisible Address** mainly allows users to hide an element through this address. • If the **Invisible State** is set to On/Off, the element is hidden through the address defined in the **Invisible Address** field. The default value is **On**. • The following example explains **Invisible Address** usage: 1. Create an element, and set its address to $9.0, then set the **Invisible Address** of the element to be hidden to $9.0. 2. To hide the element, first press the $9.0 button.
	Invisible State	

No.	Function	Description	
		Invisible State is On	
			
		Invisible State is Off	
			

- Coord.

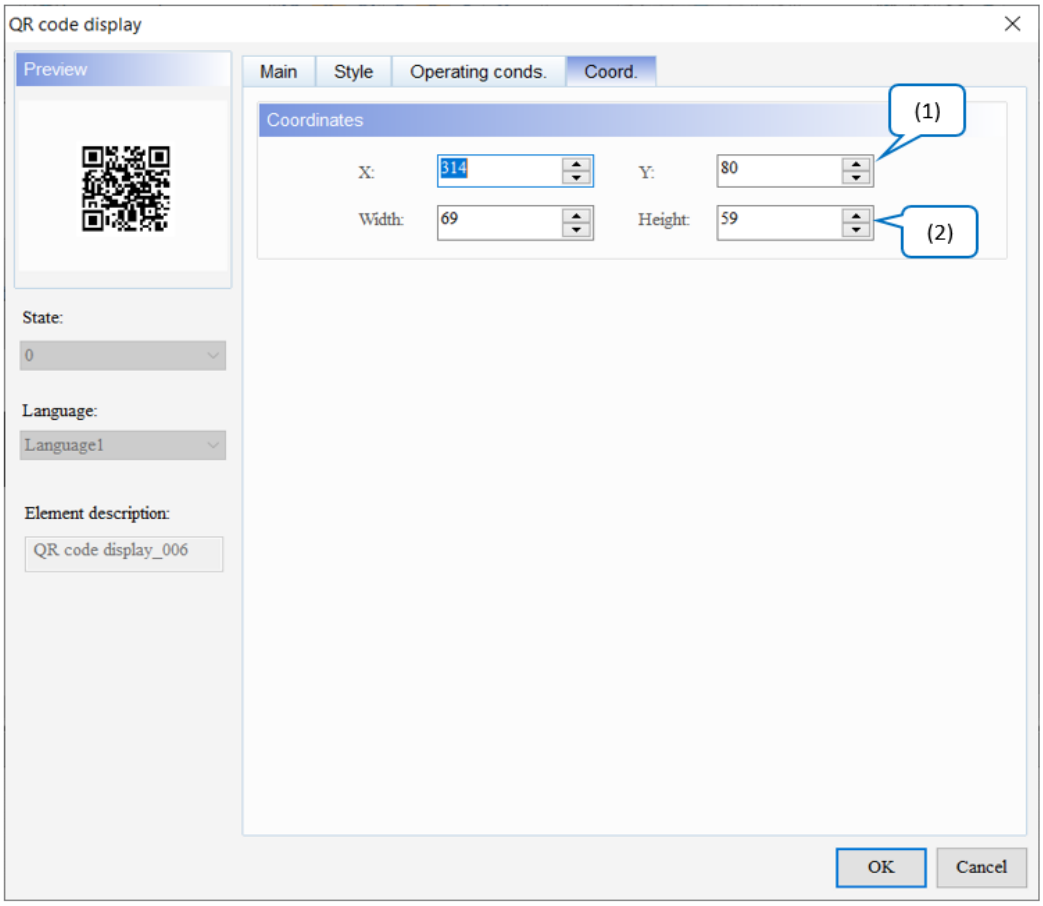
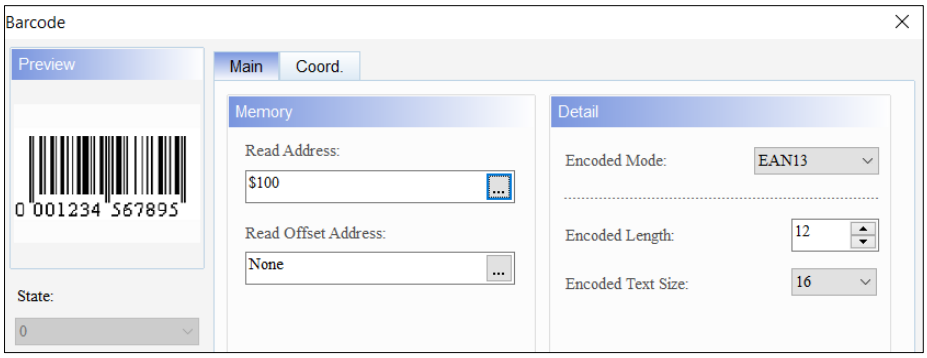
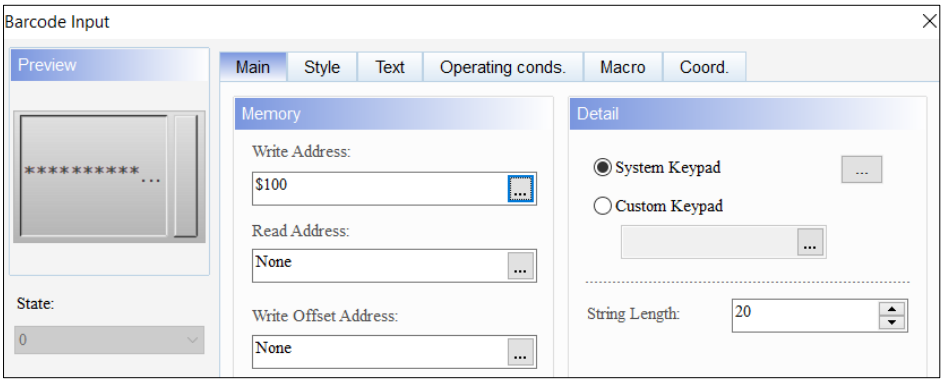


Figure 11 - 44: QR Code display Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

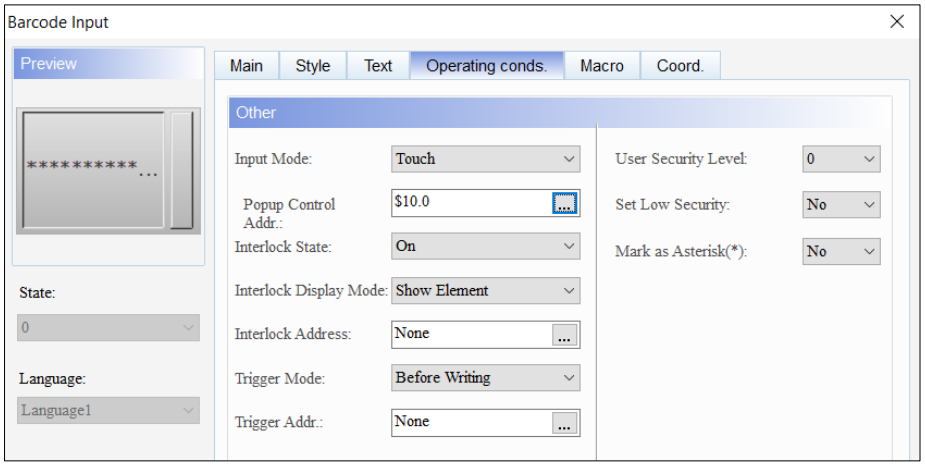
11.7 Barcode Display

The **Barcode Display** element is used to generate barcodes, so it must be used with Barcode Input element. Refer to the following table for the **Barcode Display** example.

<table>
<tr><th colspan="2">Barcode Display</th></tr>
<tr><td>Create Barcode element</td><td>Set the Read Address to $100.
 
</td></tr>
<tr><td>Create Barcode Input element</td><td>● Set the Write Address and String Length.
 

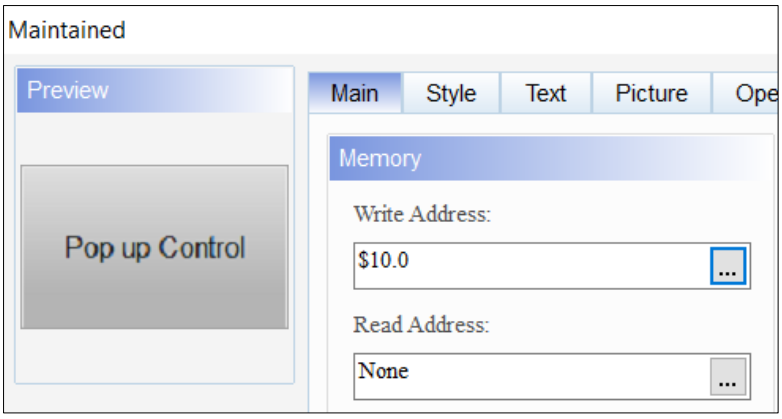
● Set the Input Mode to Touch, and set the Popup Control Addr. to $10.0.</td></tr>
</table>

Barcode Display



Create Maintained Button element

Set the **Write Address** to $10.0

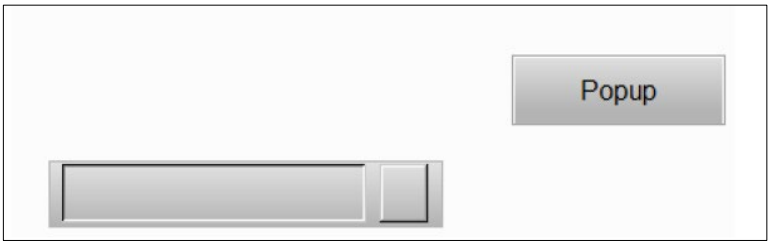


Execution result

After creating the elements, compile and download the data to the HMI.

Step 1

After downloading, the HMI screen appears as follows.



Execute the **Popup Control Addr.** first, then click the **Barcode Input** element, and the input keypad appears.



Barcode Display		
	Step 2	After the keypad is displayed, enter the numbers to generate the barcode. 

On double- clicking the **Barcode Display** element, the property page appears as follows.

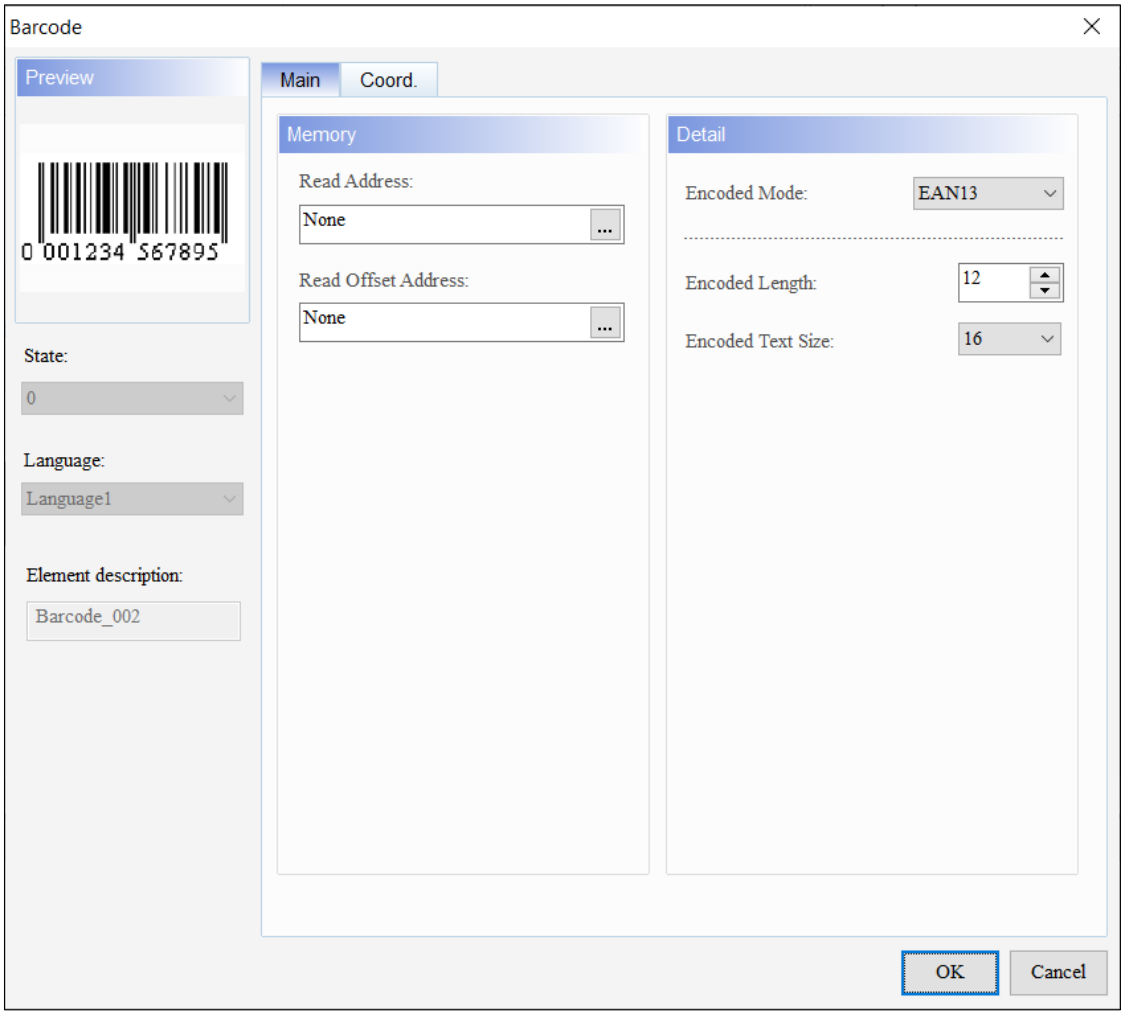


Figure 11 - 45: Barcode Display element property page

Barcode Display	
Function	**Description**
Preview	**Barcode Display** element does not support multiple state values and multi-language data display.
Main	Set the Read Address, Read Offset Address, Encoded Mode, Encoded Length, and Encoded Text Size.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

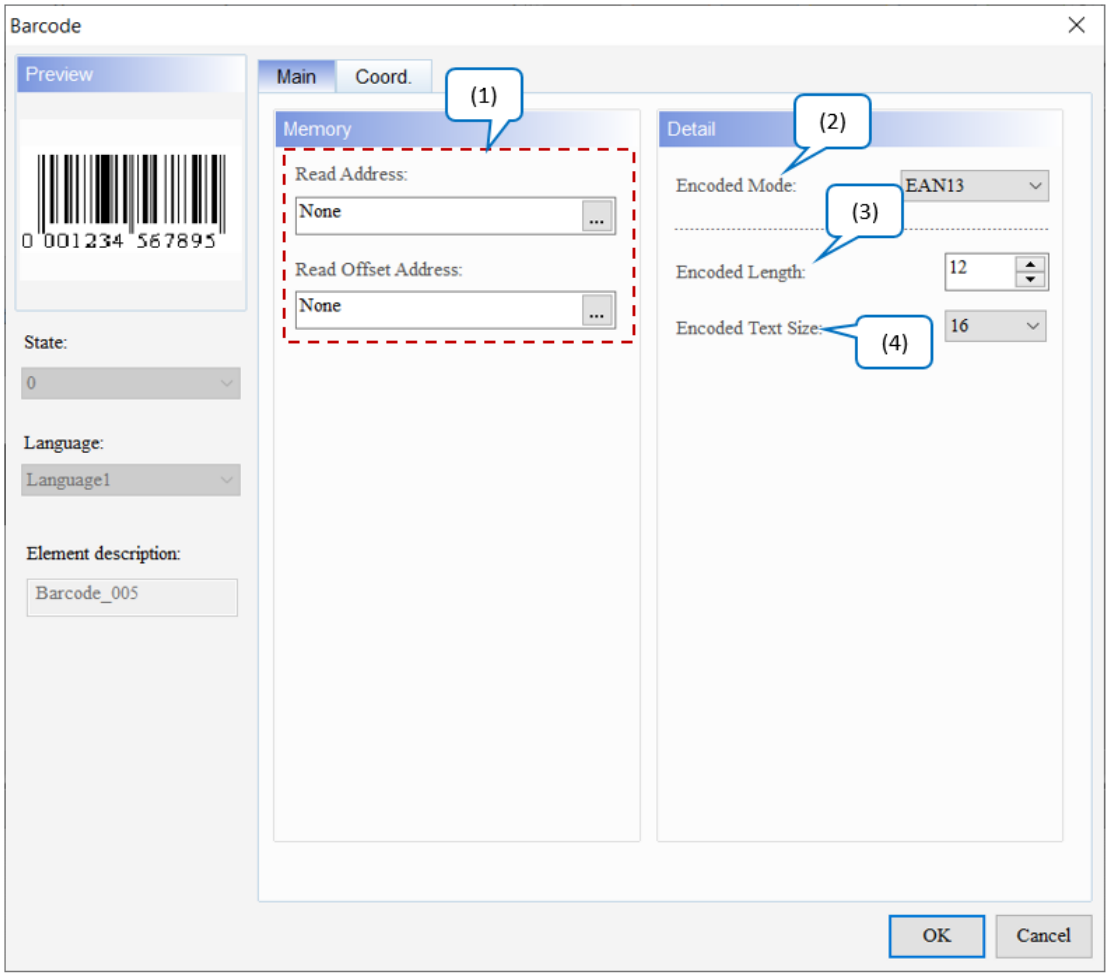
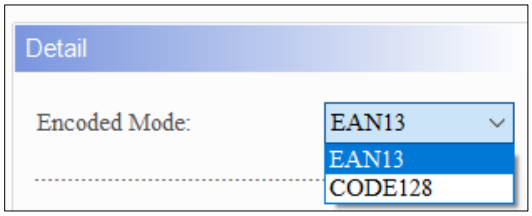
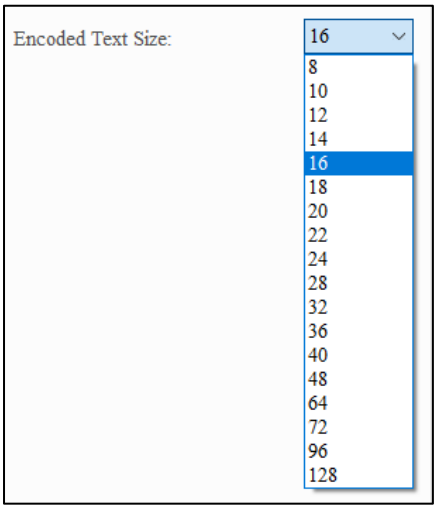


Figure 11 - 46: Barcode Display element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Read Address</td><td>● Select the Internal Memory or the controller register address.
● Select Link name or Device Type. Refer to Memory Settings for details.</td></tr>
<tr><td>Read Offset Address</td><td>Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>(2)</td><td>Encoded Mode</td><td>The available options for Encoded Mode are: EAN13 and CODE128. The default value is EAN13.
 

<table>
<tr><td>EAN13</td><td> 
</td></tr>
<tr><td>CODE128</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(3)</td><td>Encoded Length</td><td>● Encoded Length varies according to the selected Encoded Mode. The default value is 12.
● EAN13 supports lengths of up to 12.
● CODE128 supports lengths of up to 48.</td></tr>
<tr><td>(4)</td><td>Encoded Text Size</td><td>Determine the size of the numbers displayed on the barcode. The default value is 16.
 
</td></tr>
</table>

- Coord.

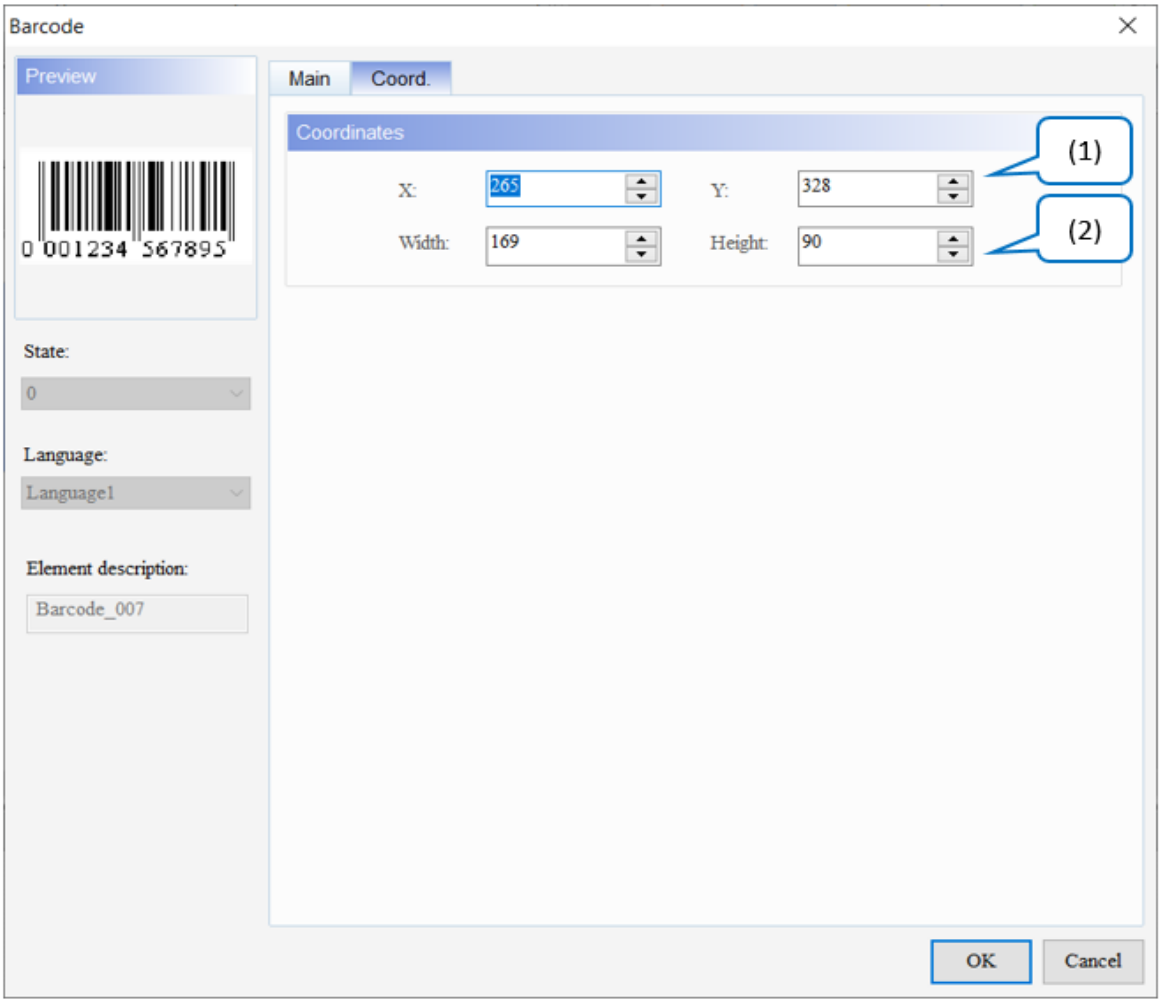


Figure 11 - 47: Barcode Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and the Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

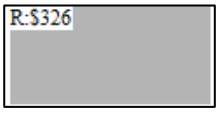
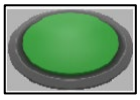
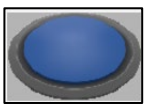
Chapter 12: Graphic

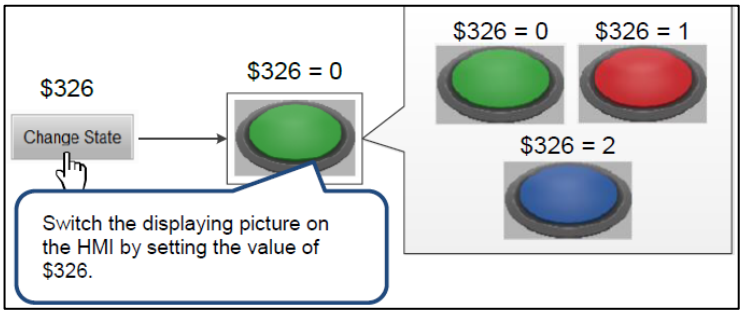
To create a **Graphic** element, go to **Elements** > **Graphic** and click the desired **Graphic** element.

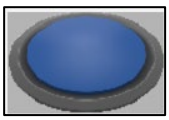
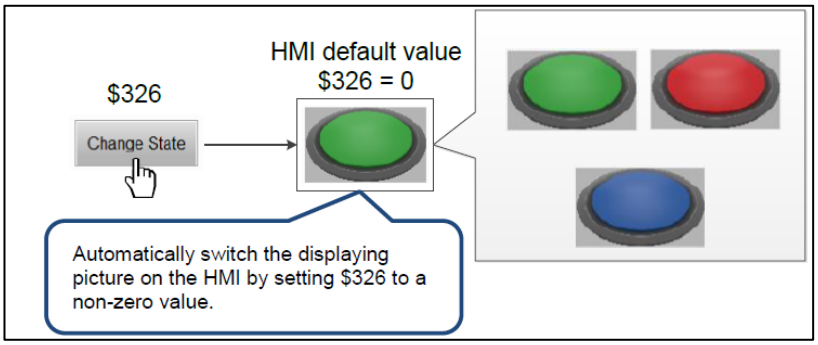
12.1 State Graphic

Create multi-state graphics with the **State Graphic** element. The values read from the set **Read Address** correspond to the state values, and then the set State Graphic is displayed on the HMI.

State Graphic element example is given as follows.

<table>
<tr><th colspan="3">State Graphic Example – Auto Picture Change is Set to No</th></tr>
<tr><td>Read Address</td><td colspan="2"><table>
<tr><td colspan="2">State Graphic Element</td><td colspan="2">Set Value Button Element</td></tr>
<tr><td>Read Address</td><td>$326</td><td>Write Address</td><td>$326</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table></td></tr>
<tr><td>Detail settings</td><td colspan="2"><table>
<tr><td colspan="4">State Graphic Element</td></tr>
<tr><td>Data Type</td><td>Data Format</td><td>State Counts</td><td>Auto Picture Change</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>3</td><td>No</td></tr>
</table></td></tr>
<tr><td>Picture</td><td colspan="2"><table>
<tr><td colspan="3">Set the State Graphic Picture</td></tr>
<tr><td>State 0</td><td>State 1</td><td>State 2</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td>Execution result</td><td colspan="2">After creating elements, compile and download the data to the HMI. Then input a value to the Set Value Button element, and the State Graphic element displays the picture corresponding to the input value.</td></tr>
</table>

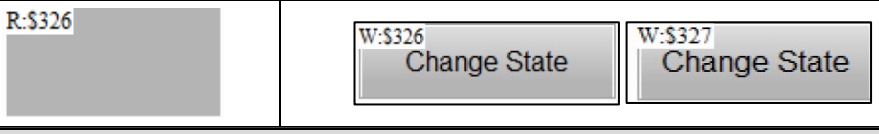


State Graphic Example – Auto Picture Change is Set to Yes				
Read Address	State Graphic Element		Set Value Button Element	
	Read Address	$326	Write Address	$326
	R:$326		W:$326 Change State	
Detail settings	State Graphic Element			
	Data Type	Data Format	State Counts	Auto Picture Change
	Word	Unsigned Decimal	3	Yes
Picture	Set the State Graphic Picture			
	State 0	State 1	State 2	
				
Execution result	After creating elements, compile and download the data to the HMI. When users input a value other than 0 to the **Set Value Button** element, the **State Graphic** element automatically changes to the set picture display according to the set **Change Time (ms)**. If users input 0, the **State Graphic** element resets to the initial state without executing any action. 			

State Graphic Element Example – Auto Picture Change is Set to Variation

Read Address

State Graphic Element		Set Value Button Element		Set Value Button Element	
Read Address	$326	Write Address	$326	Write Address	$327

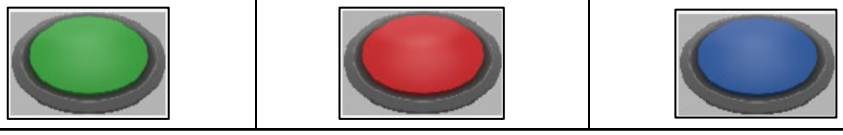


Detail settings

State Graphic Element			
Data Type	Data Format	State Counts	Auto Picture Change
Word	Unsigned Decimal	3	Variation

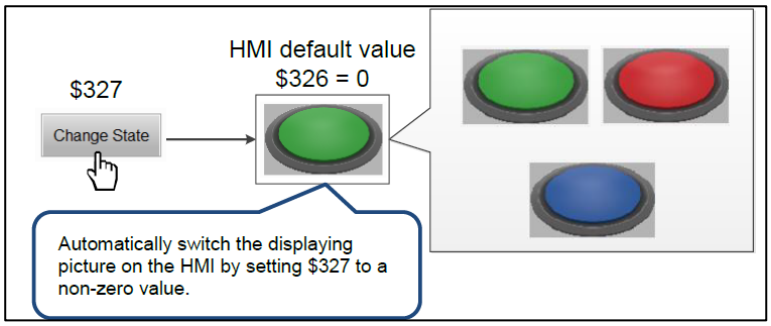
Picture

Set the State Graphic Picture		
State 0	State 1	State 2

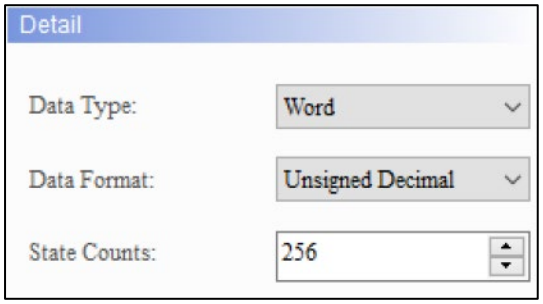


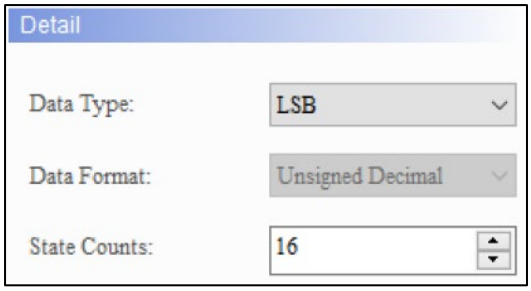
Execution result

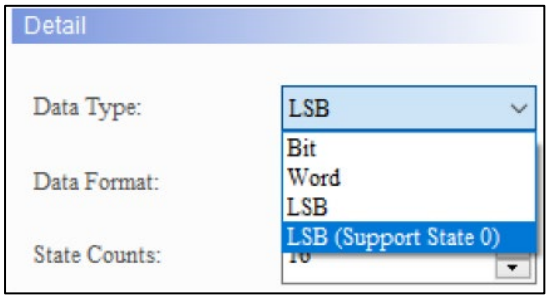
- The **Read Address** of the **State Graphic** element indicates the register for the changing state pictures. **Read Address + 1** is for accessing the register when **Auto Picture Change** is set to Variation.
- After creating elements, compile and download the data to the HMI. Press the **Set Value Button** element of $327 and enter a value other than 0, the **State Graphic** element automatically changes to the set picture display according to the set **Change Time(ms)**. Also press the **Set Value Button** element of $326 to enter the value corresponding to the **State Graphic** element at the same time. If users enter 0 to the **Set Value Button** element of $327, the **State Graphic** element does not automatically change the state pictures.



State Graphic element supports four types of **Data Type** as shown in the following table. To add or reduce the total number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

<table>
<tr><th colspan="2">State Graphic</th></tr>
<tr><th>Data Type</th><th>State Counts</th></tr>
<tr><td>Word</td><td>If the Data Type is Word, State Counts can be set from 1 ~ 256 states.
 
</td></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>

LSB means to convert the data in the register to binary format, and then use the lowest non-zero bit to determine the current state of the object.
If the Data Type is LSB, State Counts can be set from 1 ~ 16 states except for State 0.
 

To display State 0, select LSB (Support State 0) for the Data Type.
 

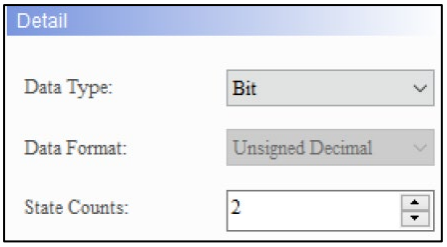
If users select LSB, when the state is 0, the element is black.
 
When the Data Type is LSB or LSB (Support State 0), the memory address is also in Word.

</td></tr>
</table>

State Graphic	
Data Type	**State Counts**

- Following table shows how the state value is determined with the lowest non-zero bit of the binary value converted from a decimal value. It also demonstrates how DIAScreen determines the displaying state value with the lowest bit when the decimal values are 3 and 7.

Decimal	Binary	State Value
0	0000000000000000	State = 0 when all bits are zero. ***NOTE:*** *LSB (Support State 0) should be selected.*
1	0000000000000001	The lowest non-zero bit is bit 0, State = 1.
2	0000000000000010	The lowest non-zero bit is bit 1, State = 2.
3	0000000000000011	The lowest non-zero bit is bit 0, State = 1.
4	0000000000000100	The lowest non-zero bit is bit 2, State = 3.
7	0000000000000111	The lowest non-zero bit is bit 0, State = 1.
8	0000000000001000	The lowest non-zero bit is bit 3, State = 4.
16	0000000000010000	The lowest non-zero bit is bit 4, State = 5.
32	0000000000100000	The lowest non-zero bit is bit 5, State = 6.
64	0000000001000000	The lowest non-zero bit is bit 6, State = 7.
128	0000000010000000	The lowest non-zero bit is bit 7, State = 8.
256	0000000100000000	The lowest non-zero bit is bit 8, State = 9.
512	0000001000000000	The lowest non-zero bit is bit 9, State = 10.
1024	0000010000000000	The lowest non-zero bit is bit 10, State = 11.
2048	0000100000000000	The lowest non-zero bit is bit 11, State = 12.

<table>
<tr><th colspan="4">State Graphic</th></tr>
<tr><th>Data Type</th><th colspan="3">State Counts</th></tr>
<tr><td rowspan="4"></td><td>4096</td><td>0001000000000000</td><td>The lowest non-zero bit is bit 12, State = 13.</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non-zero bit is bit 13, State = 14.</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non-zero bit is bit 14, State = 15.</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non-zero bit is bit 15, State = 16.</td></tr>
<tr><td>Bit</td><td colspan="3">If the Data Type is Bit, only 2 states cn be set.
 
</td></tr>
</table>

On double-clicking the State Graphic element, property page appears as follows.

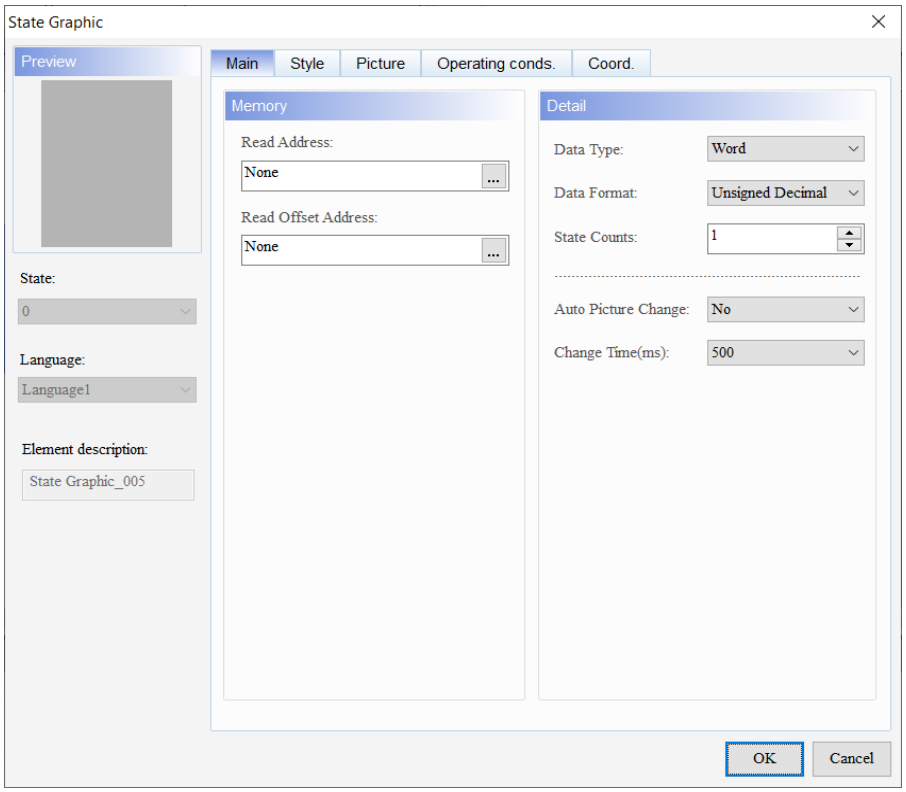


Figure 12 - 1: State Graphic element property page

State Graphic	
Function	**Description**
Preview	State Graphic elements support viewing the multiple state values but do not support the multi-language data display.
Main	Set the Read Address, Read Offset Address, Data Type, Data Format, State Counts, Auto Picture Change, and Change Time(ms).
Style	Set the element Foreground Color, Transparent, and Transparency.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set the Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

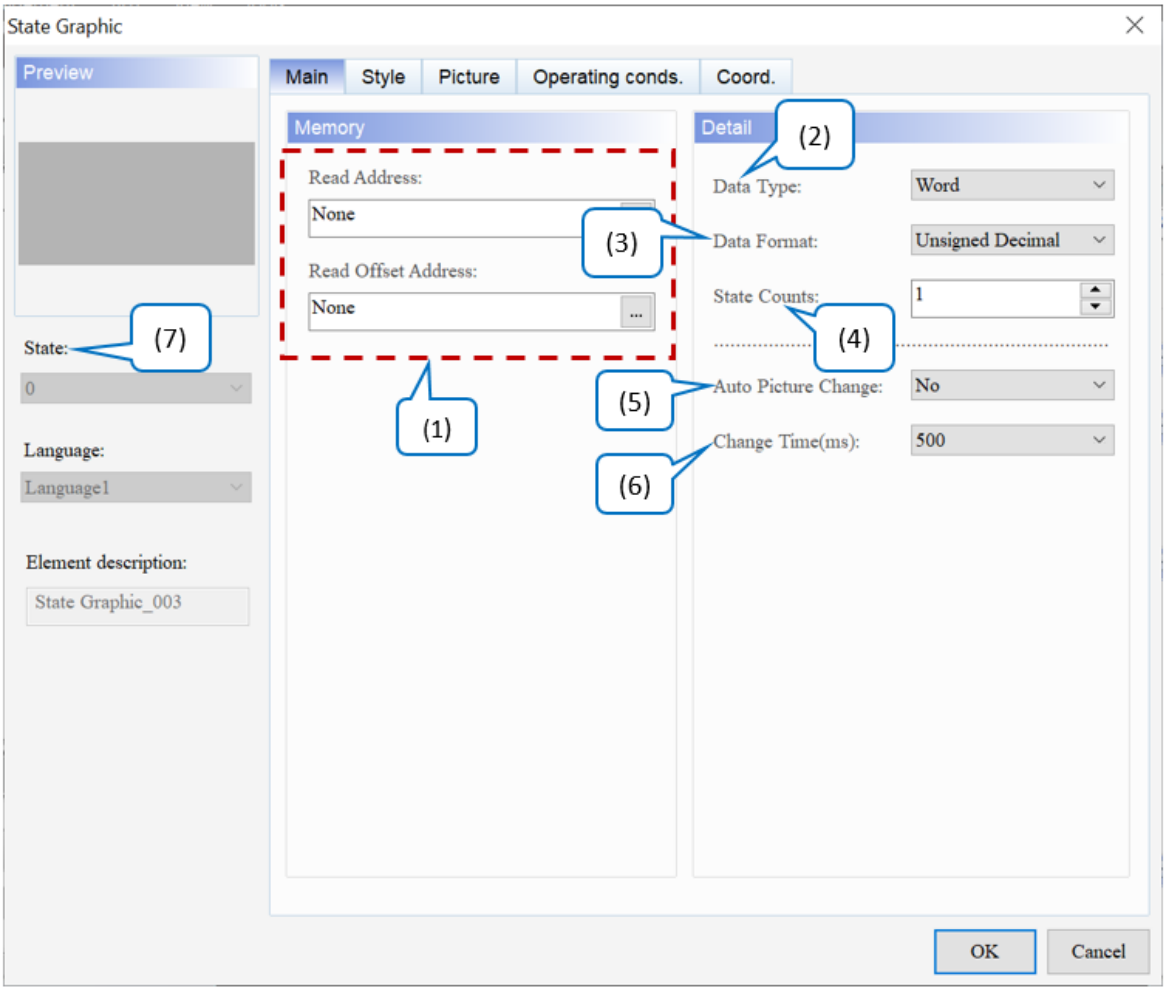
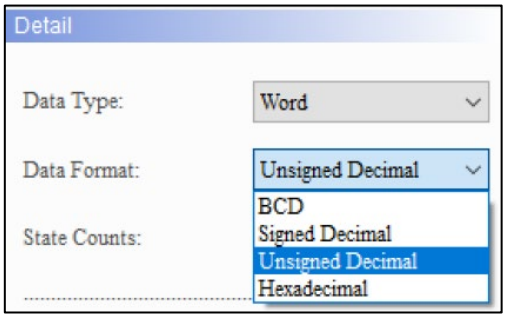
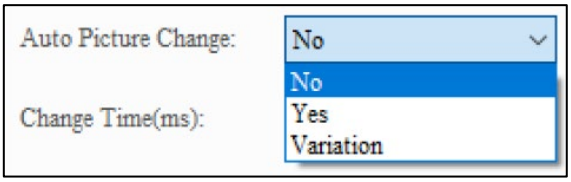
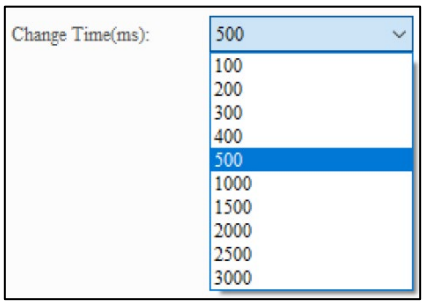
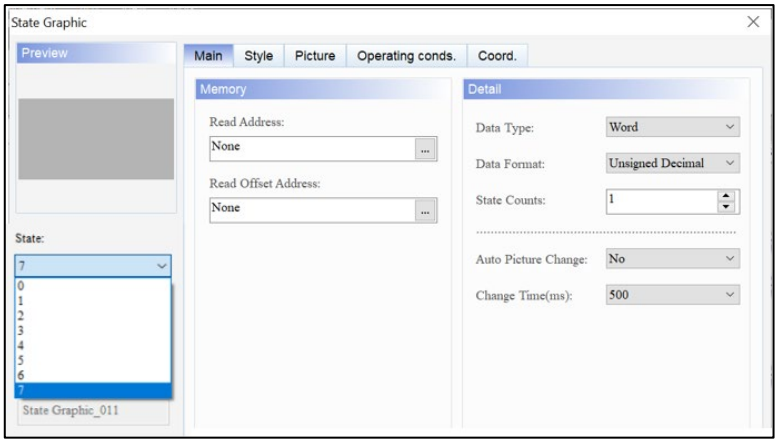


Figure 12 - 2: State Graphic element Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. The **Input** memory **Type** varies depending on the selected **Data Type**, including Word, LSB, or Bit. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0). The default value is **Word**.
(3)	Data Format	● The **Data Format** can be selected only when the **Data Type** is Word. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(4)	State Counts	● Set the **State Counts** for the **State Graphic** element. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states. The default value is **1**.
(5)	Auto Picture Change	The available options for **Auto Picture Change** are: Yes, No, and Variation. The default value is **No**. 

No.	Function	Description
(6)	Change Time (ms)	● The setting range for the picture **Change Time(ms)** is 100 ~ 3000 milliseconds. ● The default value is **500**. 
(7)	State	Preview or change the settings for each state of the element by switching the **State**. 

- Style

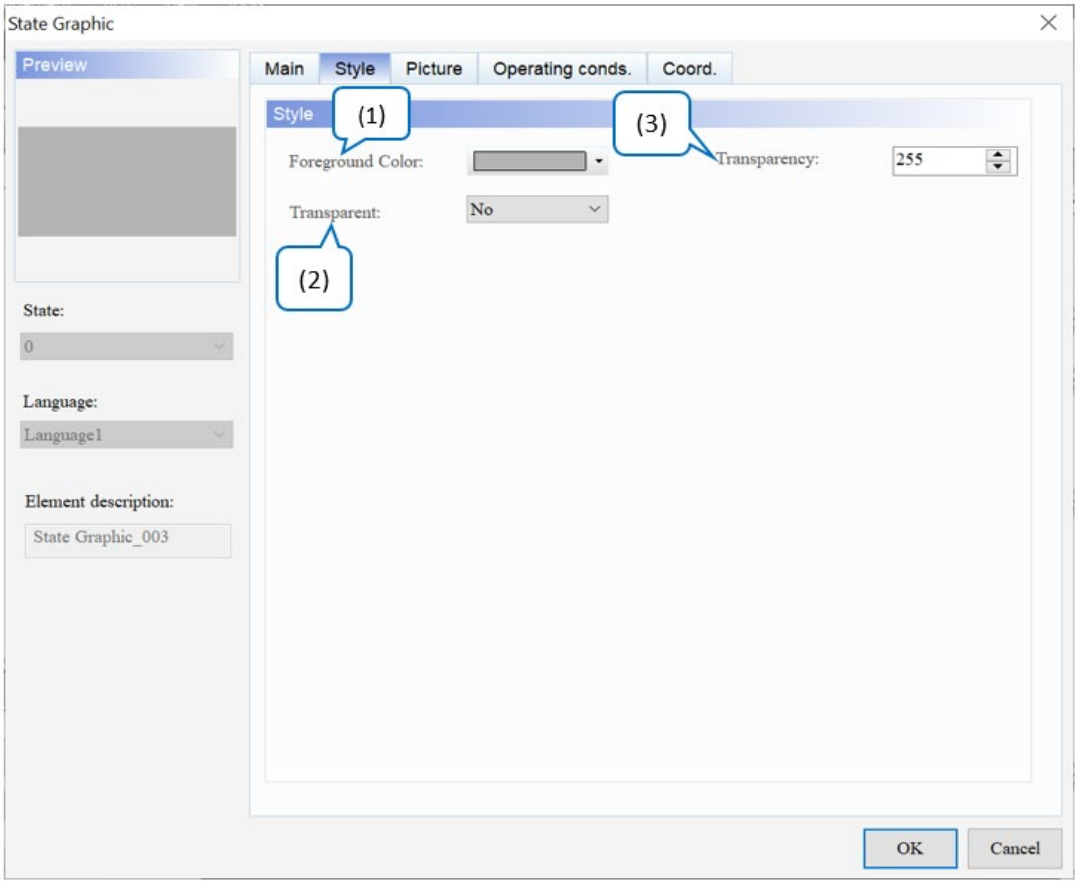
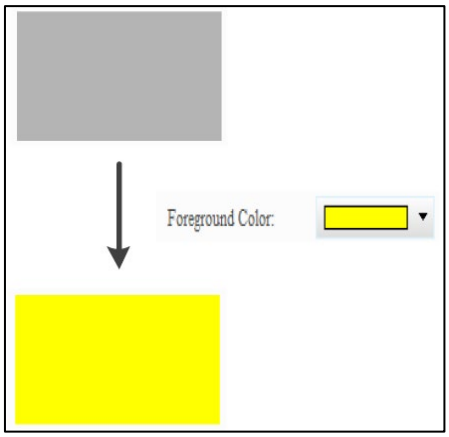


Figure 12 - 3: State Graphic element Style property page

No.	Function	Description
(1)	Foreground Color	● Set the foreground color of the element. The default is  . ● When the **Transparent** is set to Yes, the setting of the **Foreground Color** is invalid. 

No.	Function	Description
(2)	Transparent	● When users select Yes for **Transparent**, the result is as follows.  ● Specify a color in the picture and make it transparent. Click  icon to select **Transparent Color**. Select the black part in the button, DIAScreen changes the black part into transparent as shown in the following figure.   ● If both the element and picture are set to Transparent, the result is as follows. 
(3)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Picture

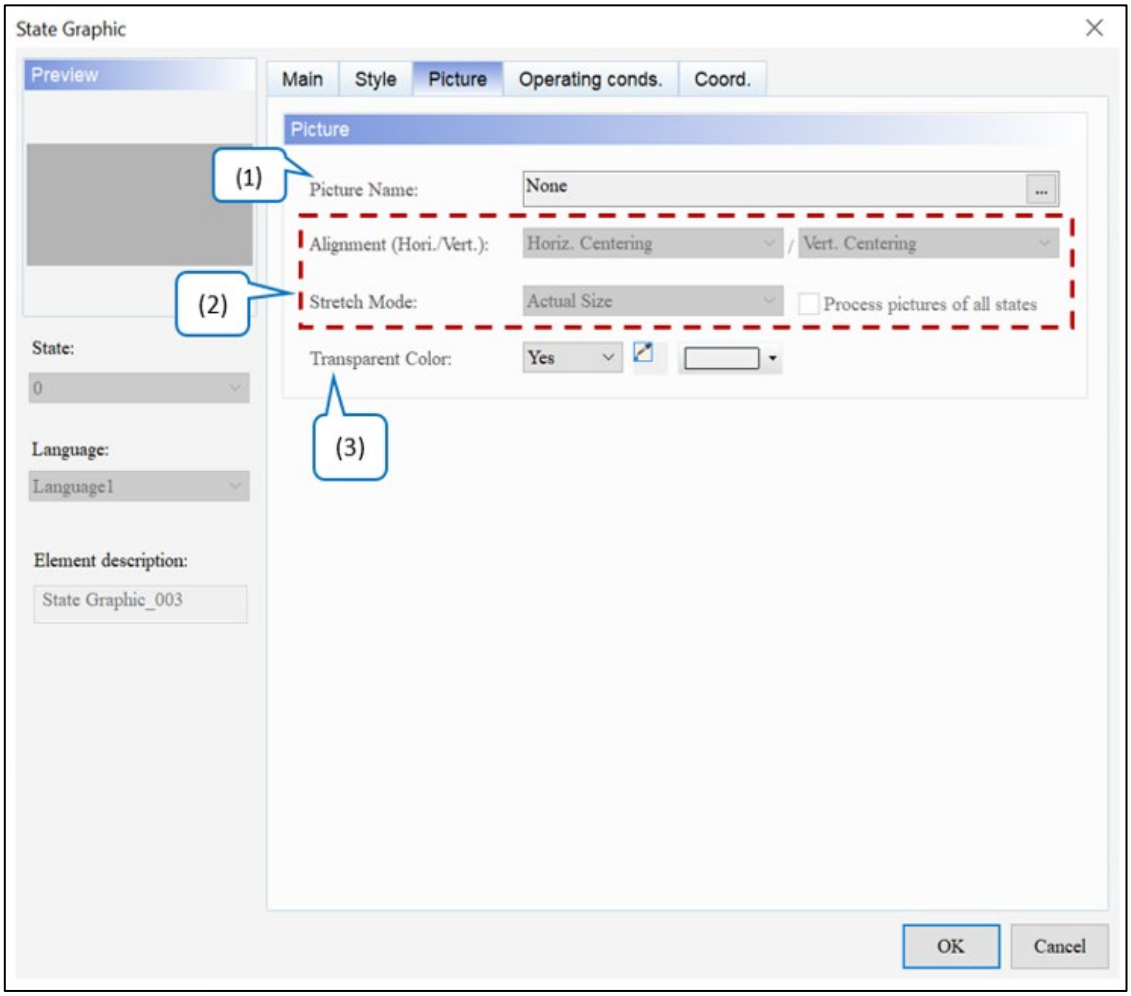
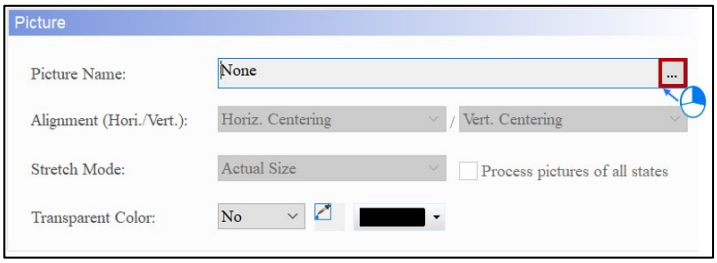


Figure 12 - 4: State Graphic element Picture property page

No.	Function	Description
(1)	Picture Name	To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to Section 28.5 Picture Bank.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. Select  icon, and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the Foreground Color of the element.</td></tr>
</table>

No.	Function	Description
		

- Operating conds.

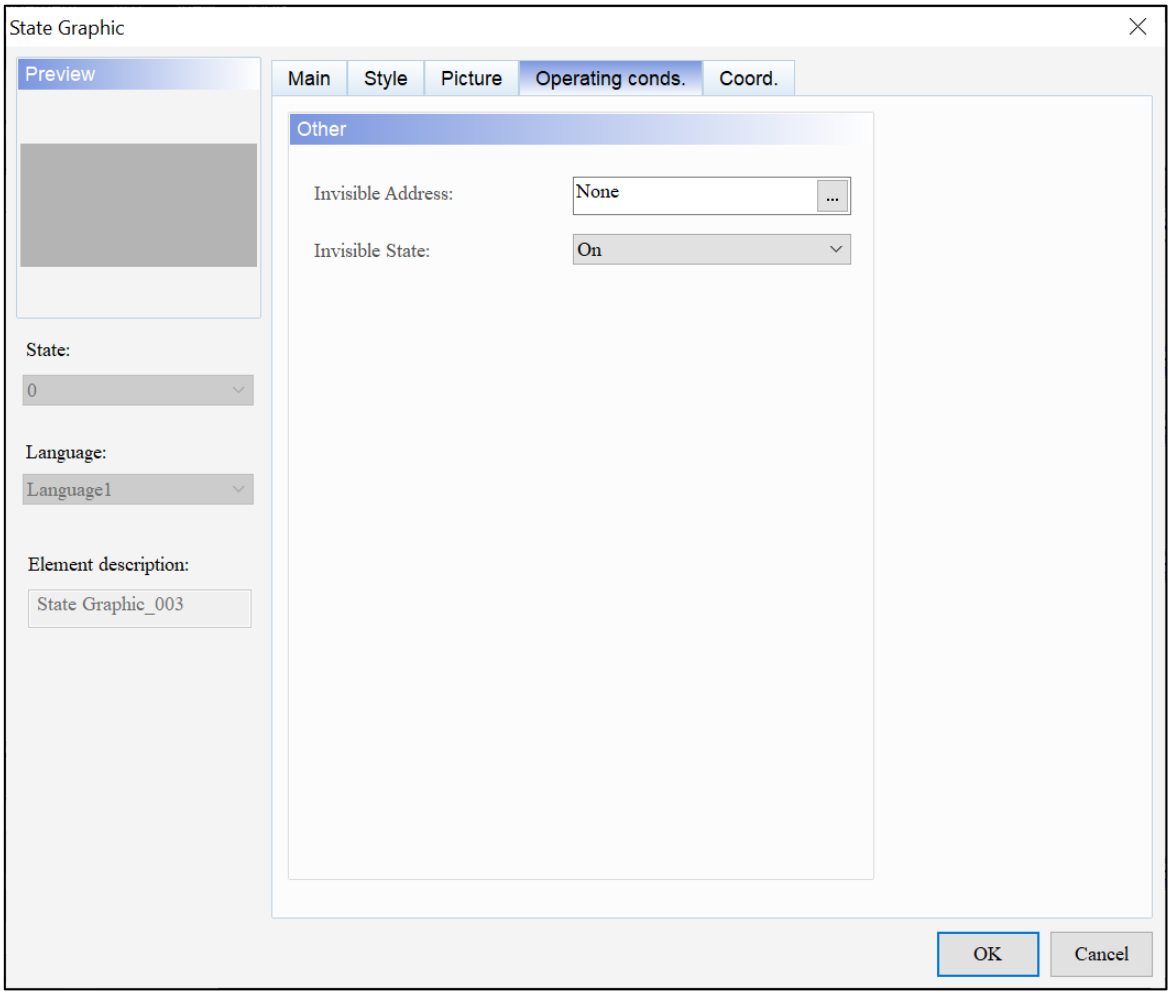
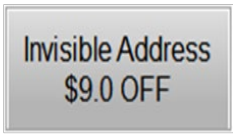


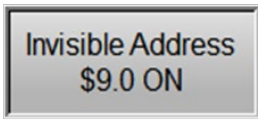
Figure 12 - 5: State Graphic element Operating conds. property page

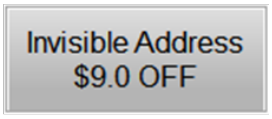
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Invisible Address</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element, and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
 

Element disappear
 
</td></tr>
<tr><td>Invisible State is Off</td><td> 
 

Element disappear
 
</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td><td></td></tr>
</table>

- Coord.

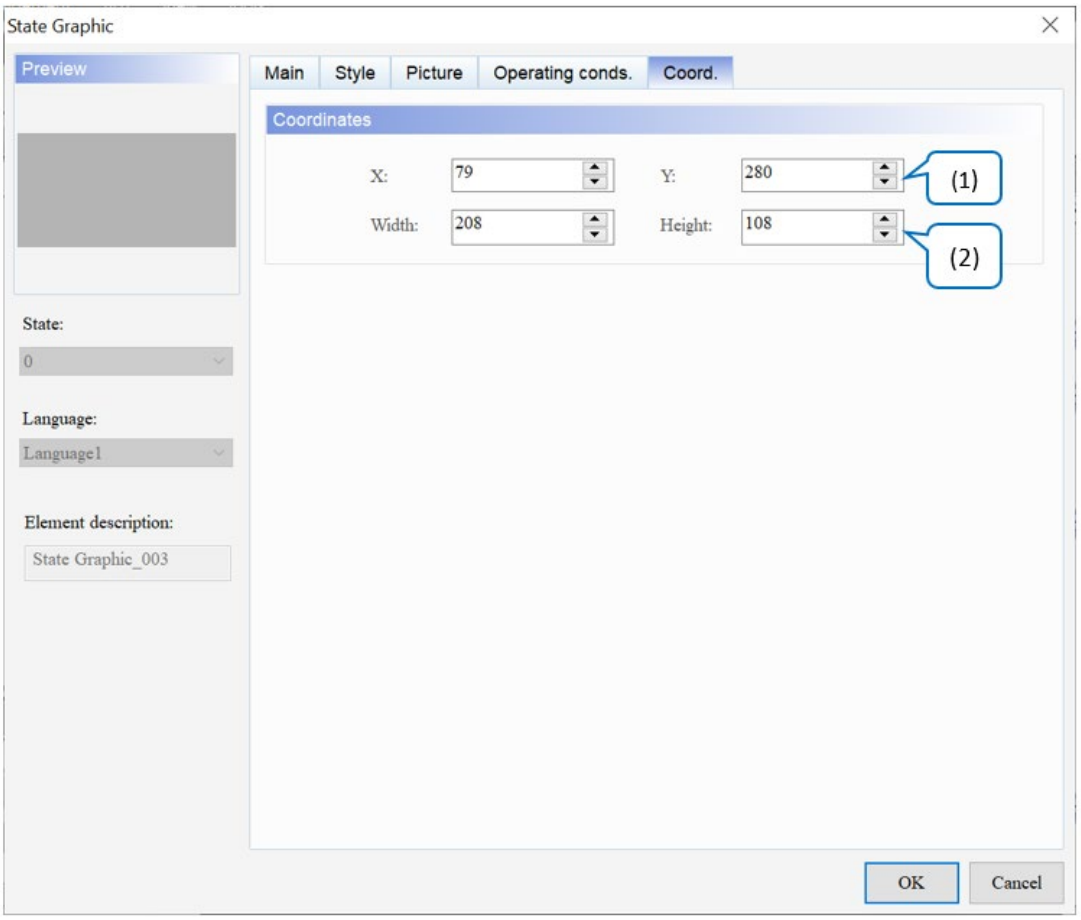


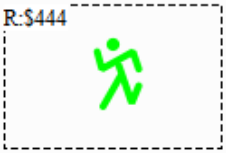
Figure 12 - 6: State Graphic element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

12.2 Animated Graphic

Create multiple state pictures or import GIF images with the **Animated Graphic** element. The previous version of DIAScreen splits a GIF file into multiple images, and then users need to set the corresponding states one by one, which is inconvenient for programming. The new version of DIAScreen has improved the method for importing GIF images, which is one state corresponds to one GIF image.

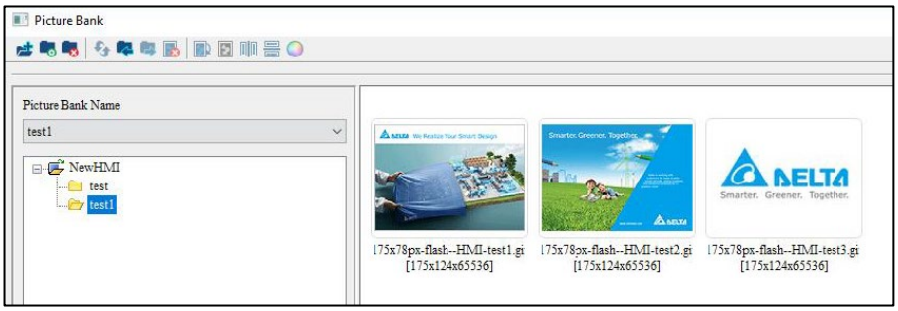
The **Read Address** of the **Animated Graphic** element enables the read values to correspond to the switching graphics set in the **Animated Graphic** element, as well as specifying the target position for the element to move to.

<table>
<tr><th colspan="2">Animated Graphic</th></tr>
<tr><td>Read Address</td><td>
Animated Graphic Element
<table>
<tr><td>Read Address</td><td>$444</td></tr>
<tr><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Set the properties for the Animated Graphic element</td><td>

Set the State Counts to 3, which means importing three GIF images.
Select Yes for Clear Picture; this means the graphic of the previous state does not stay when the HMI switches to the next graphic.

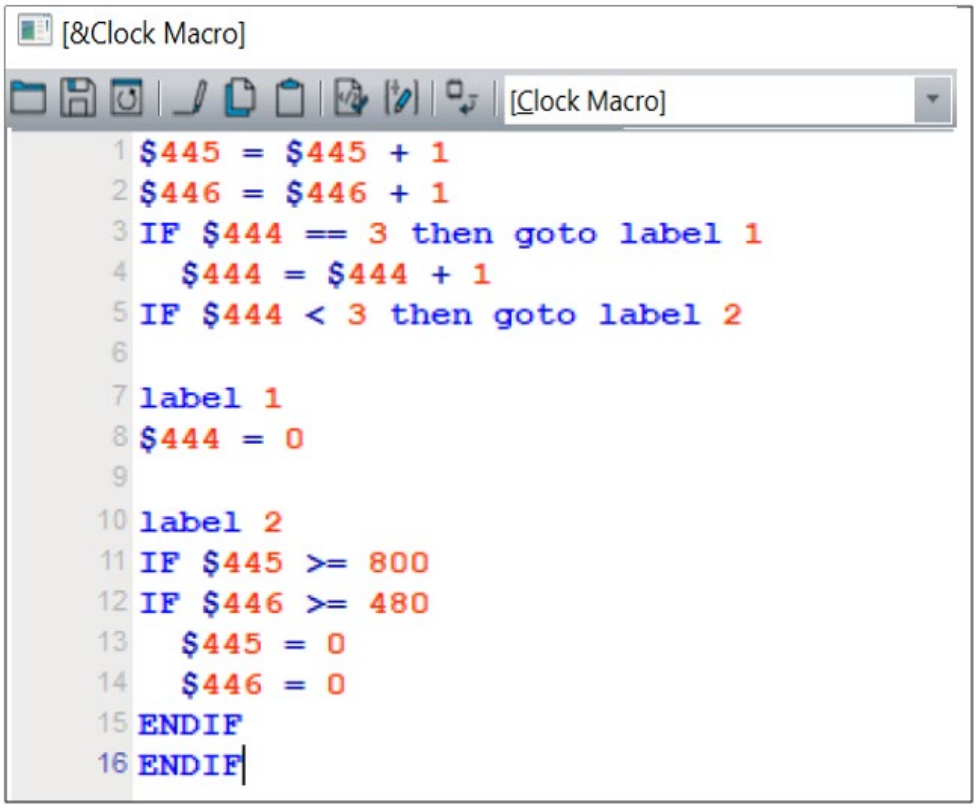
</td></tr>
<tr><td>Import File</td><td>

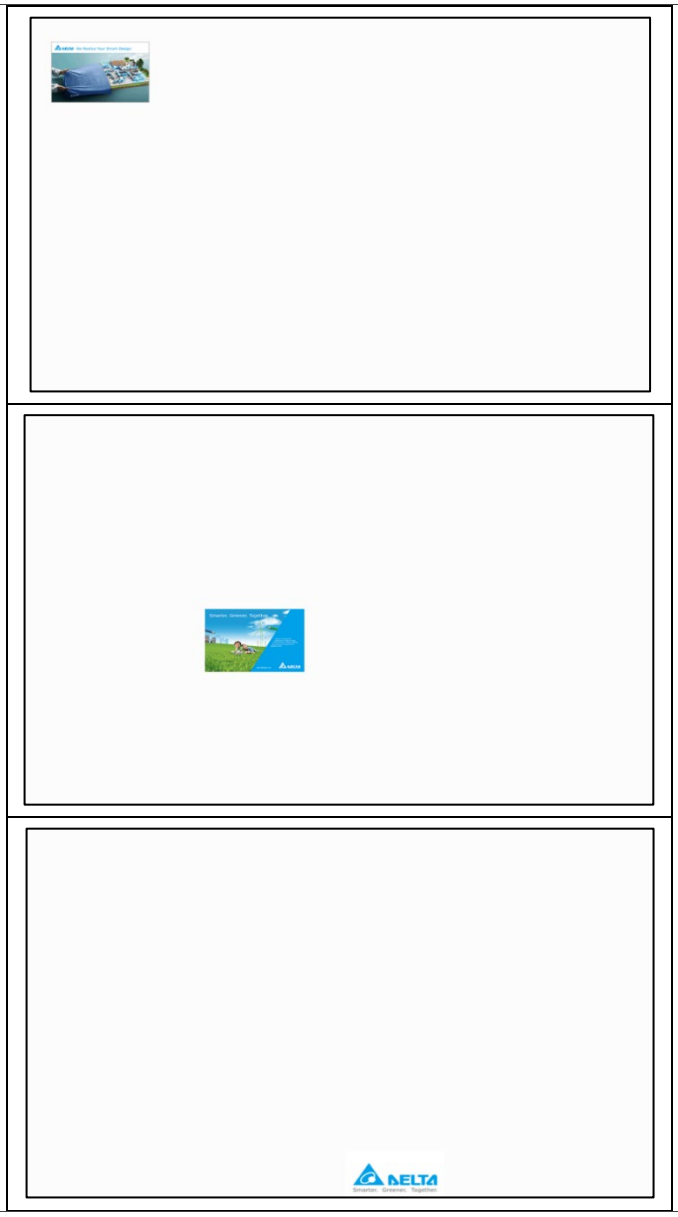
Create a new picture bank named “test1” and import three GIF images.



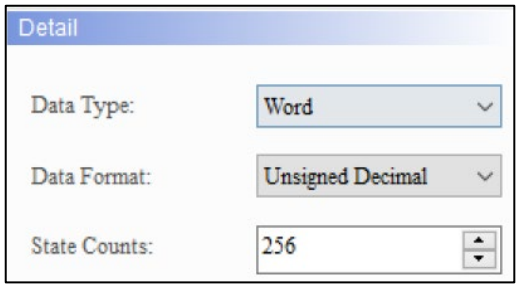
Go to the Picture Bank page of the Animated Graphic element, and import images for State 0, State 1, and State 2 respectively.

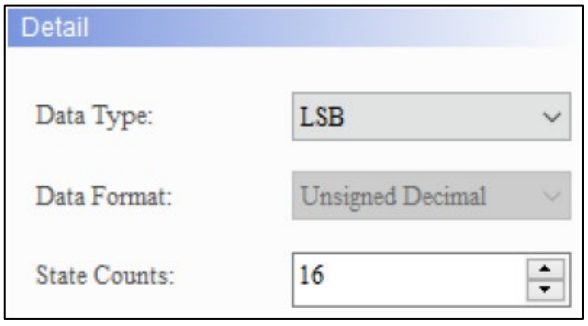
</td></tr>
</table>

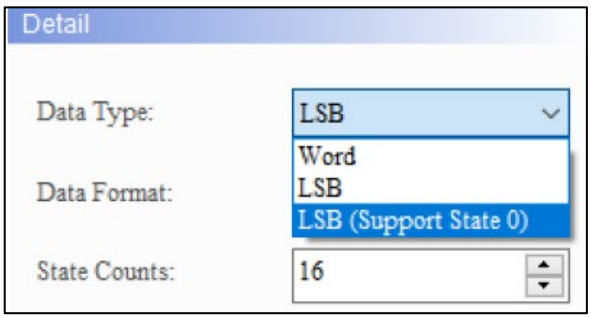
<table>
<tr><th colspan="3">Animated Graphic</th></tr>
<tr><td></td><td>State 0</td><td> 
</td></tr>
<tr><td></td><td>State 1</td><td> 
</td></tr>
<tr><td></td><td>State 2</td><td> 
</td></tr>
<tr><td>Edit Clock Macro</td><td colspan="2">Go to Project > Macro > Clock Macro.
● $445 indicates Read Address + 1 which is the X coordinate (horizontal axis) of the Animated Graphic element.
● $446 indicates Read Address + 2 which is the Y coordinate (vertical axis) of the Animated Graphic element.
 
</td></tr>
</table>

Animated Graphic	
Execution result	After compiling and downloading the screen data to the HMI, these three GIF images keep switching, and the positions are changed according to the memory addresses read by the horizontal and vertical axes as shown in the following figure.
	

Animated Graphic element supports three **Data Type** as shown in the following table. To add or reduce the total number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

<table>
<tr><th colspan="2">Animated Graphic</th></tr>
<tr><th>Data Type</th><th>State Counts</th></tr>
<tr><td>Word</td><td>If the Data Type is Word, State Counts can be set from 1 ~ 256 states.
 
</td></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>

LSB is to first convert the data in the register to binary format, and then use the lowest non-zero bit to determine the current state of the object.
If the Data Type is LSB, State Counts can be set from 1 ~ 16 states except for State 0.
 

To display State 0, select LSB (Support State 0) for the Data Type.
 

If users select LSB, when the state is 0, the element is black.
 
When the Data Type is LSB or LSB (Support State 0), the memory address is also in units of Word.
The following table shows how the state value is determined with the lowest non-zero bit of the binary value converted from a decimal value. It also demonstrates how DIAScreen determines the displaying state value with the lowest bit when the decimal values are 3 and 7.

</td></tr>
</table>

Animated Graphic			
Data Type	State Counts		
	Decimal	Binary	State Value
	0	0000000000000000	State = 0 when all bits are zero. ***NOTE:*** *LSB (Support State 0) should be selected.*
	1	0000000000000001	The lowest non-zero bit is bit 0, State = 1.
	2	0000000000000010	The lowest non-zero bit is bit 1, State = 2.
	3	0000000000000011	The lowest non-zero bit is bit 0, State = 1.
	4	0000000000000100	The lowest non-zero bit is bit 2, State = 3.
	7	0000000000000111	The lowest non-zero bit is bit 0, State = 1.
	8	0000000000001000	The lowest non-zero bit is bit 3, State = 4.
	16	0000000000010000	The lowest non-zero bit is bit 4, State = 5.
	32	0000000000100000	The lowest non-zero bit is bit 5, State = 6.
	64	0000000001000000	The lowest non-zero bit is bit 6, State = 7.
	128	0000000010000000	The lowest non-zero bit is bit 7, State = 8.
	256	0000000100000000	The lowest non-zero bit is bit 8, State = 9.
	512	0000001000000000	The lowest non-zero bit is bit 9, State = 10.
	1024	0000010000000000	The lowest non-zero bit is bit 10, State = 11.
	2048	0000100000000000	The lowest non-zero bit is bit 11, State = 12.
	4096	0001000000000000	The lowest non-zero bit is bit 12, State = 13.
	8192	0010000000000000	The lowest non-zero bit is bit 13, State = 14.

Animated Graphic			
Data Type	State Counts		
	16384	0100000000000000	The lowest non-zero bit is bit 14, State = 15.
	32768	1000000000000000	The lowest non-zero bit is bit 15, State = 16.

On double-clicking the **Animated Graphic** element, the property page appears as follows.

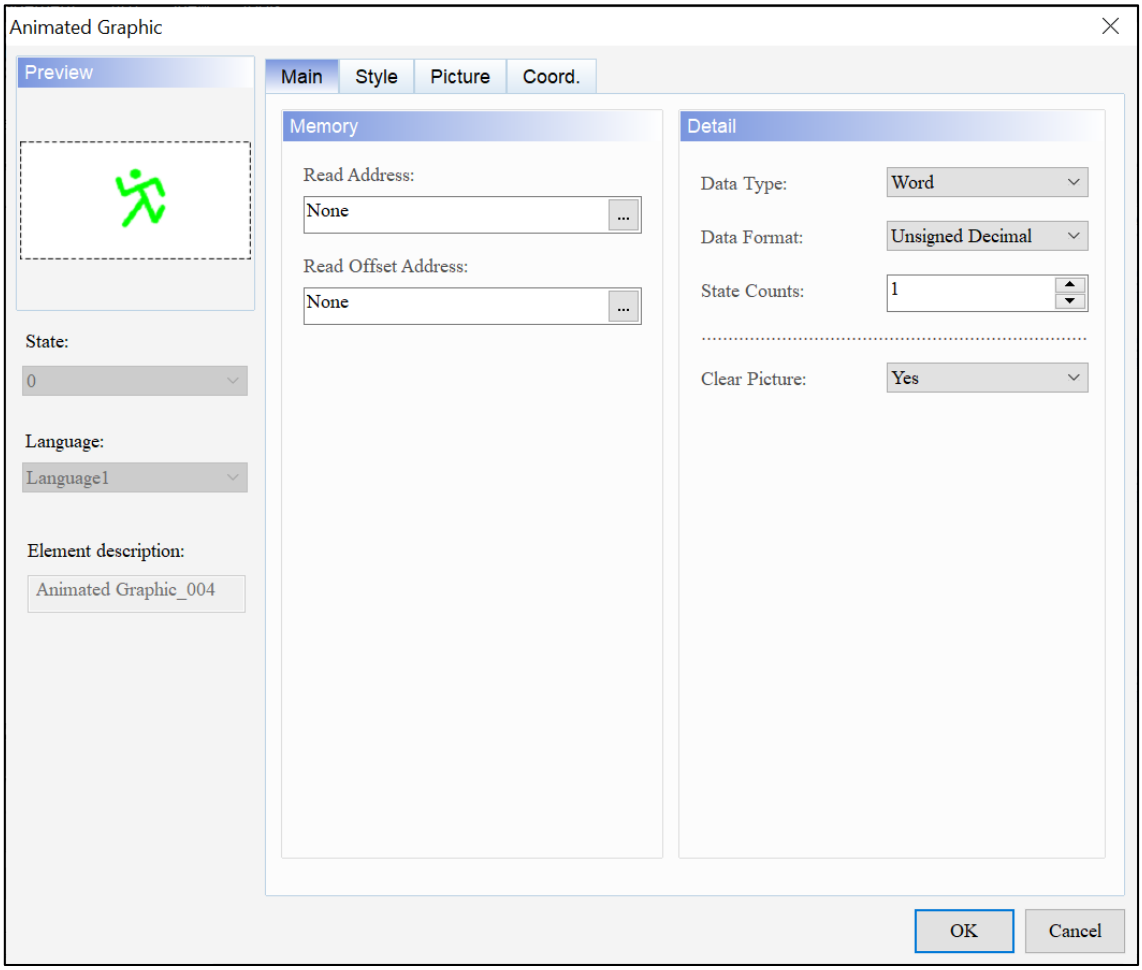


Figure 12 - 7: Animated Graphic element property page

Animated Graphic	
Function	**Description**
Preview	**Animated Graphic** elements support viewing the multiple state values but do not support the multi-language data display.
Main	Set the Read Address, Read Offset Address, Data Type, Data Format, State Counts, and Clear Picture.
Style	Set Transparency.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

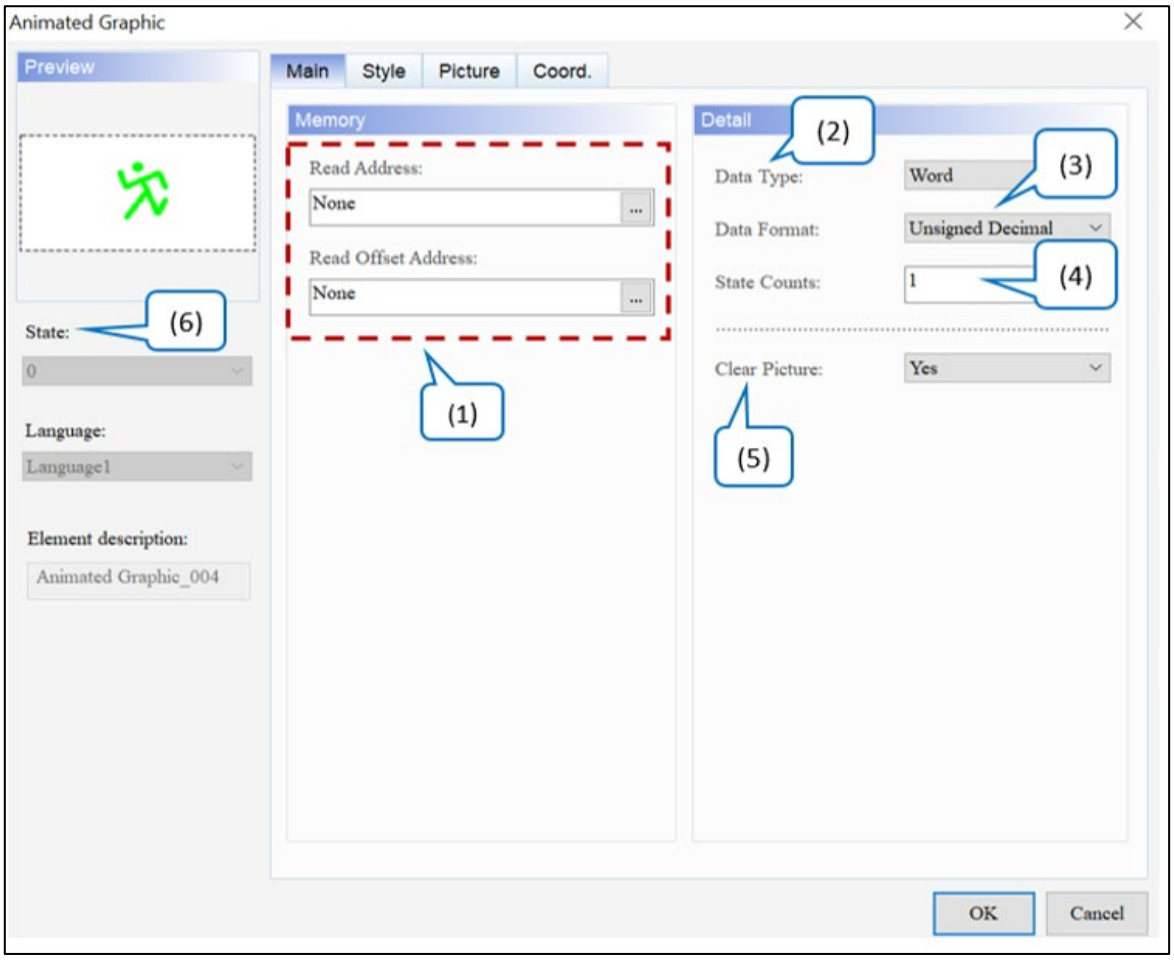
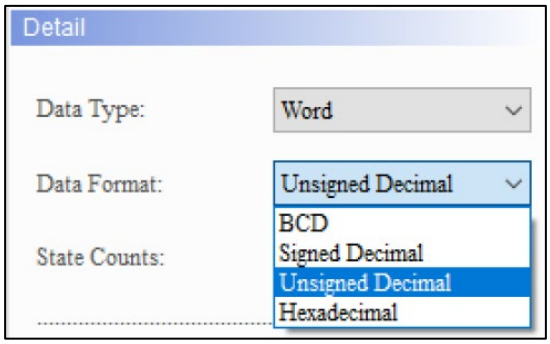
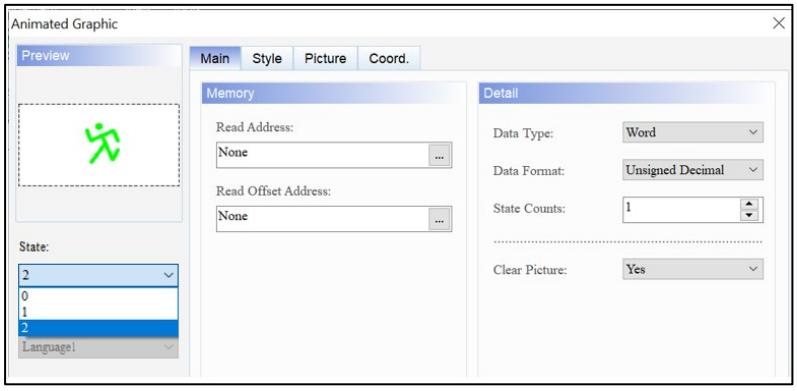


Figure 12 - 8: Animated Graphic element Main property page

No.	Function	Description
(1)	Read Address	● Select Internal Memory or controller register address. ● The **Animated Graphic** element switches according to the value of the **Read Address**. ● **Read Address + 1** is the position where the horizontal axis (X) of the Animated Graphic element moves. ● **Read Address + 2** is the position where the vertical axis (Y) of the Animated Graphic element moves. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Word, LSB, and LSB (Support State 0). The default value is **Word**.
(3)	Data Format	● Select the **Data Format** only when the **Data Type** is Word. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(4)	State Counts	● Set **State Counts** for the **Animated Graphic** element. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.
(5)	Clear Picture	● This function indicates that the HMI clears the graphic of the previous state during animation and when switching the state graphics. The default value is **Yes**. ● If users select No, during the moving process, the HMI displays the graphic of the previous state when switching to the next graphic.

No.	Function	Description
(6)	State	Preview or change the setting for each state of the element by switching **State**. 

- Style

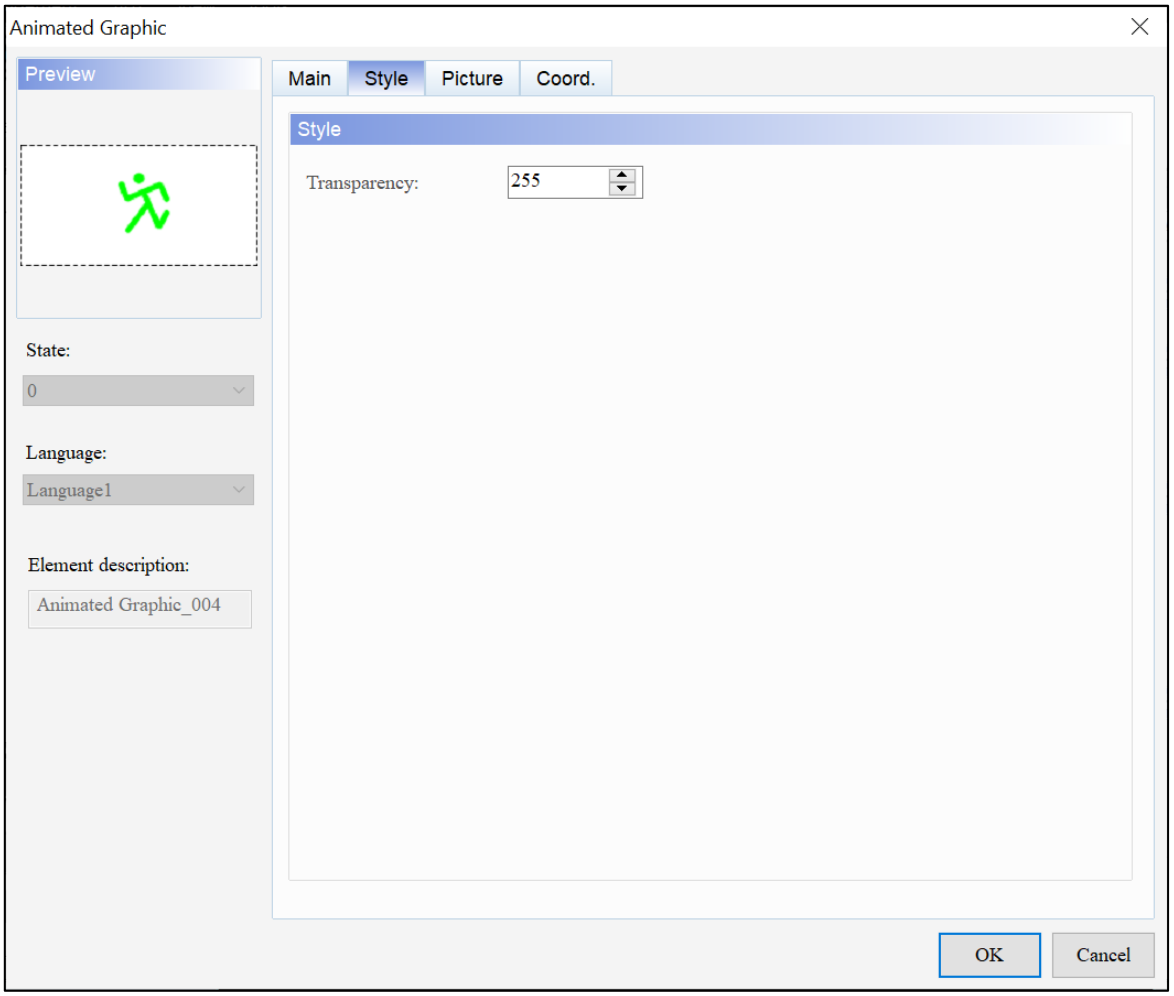


Figure 12 - 9: Animated Graphic element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.

- Picture

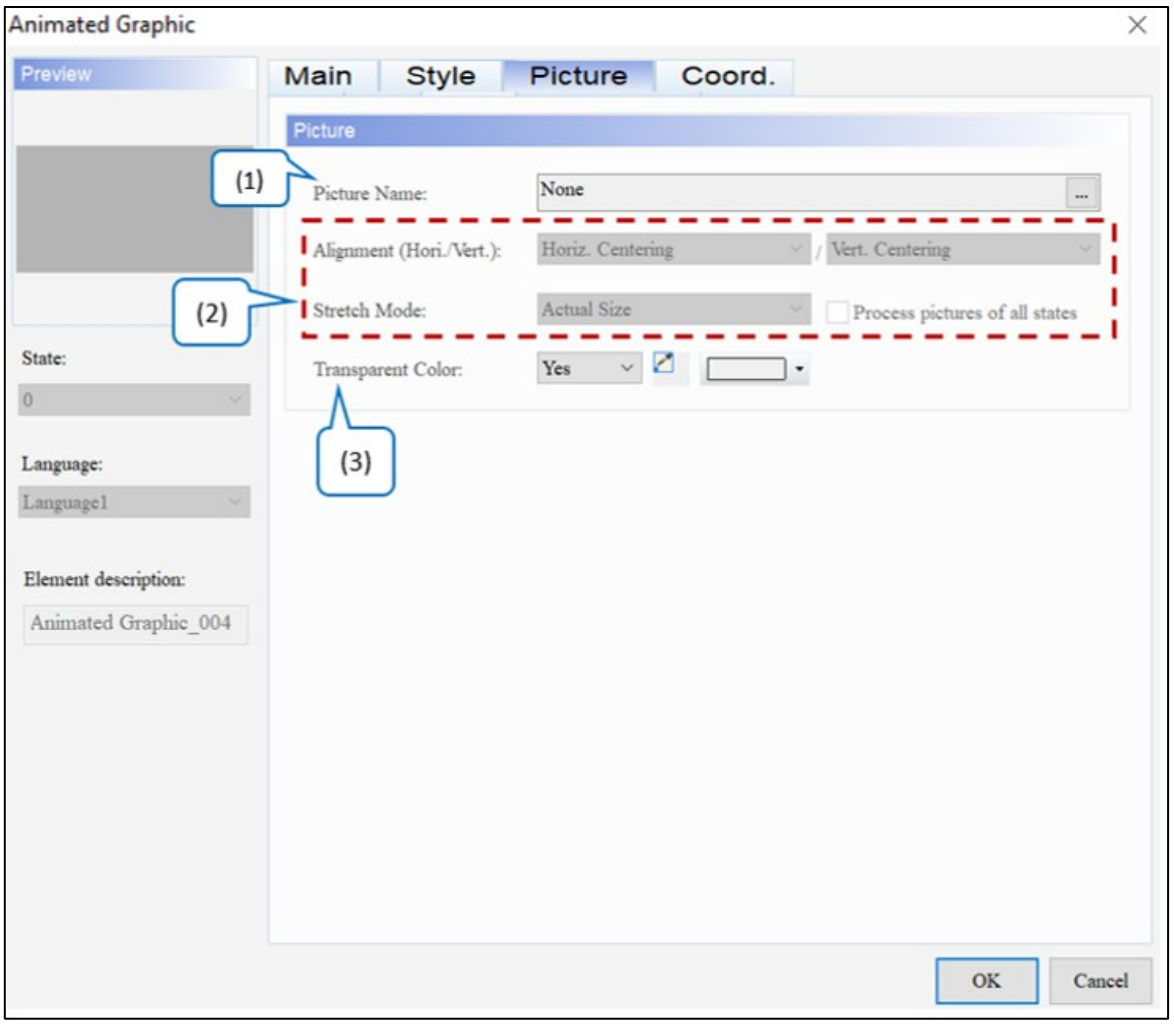
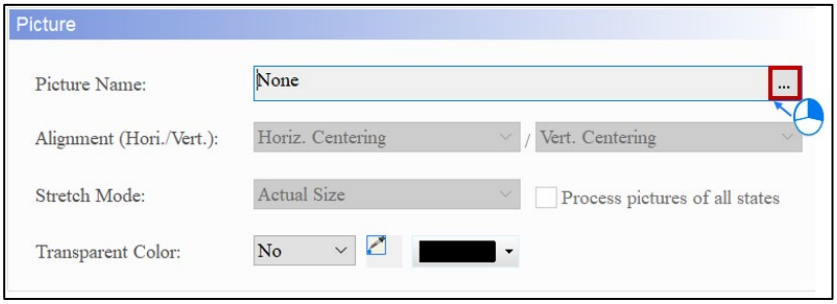
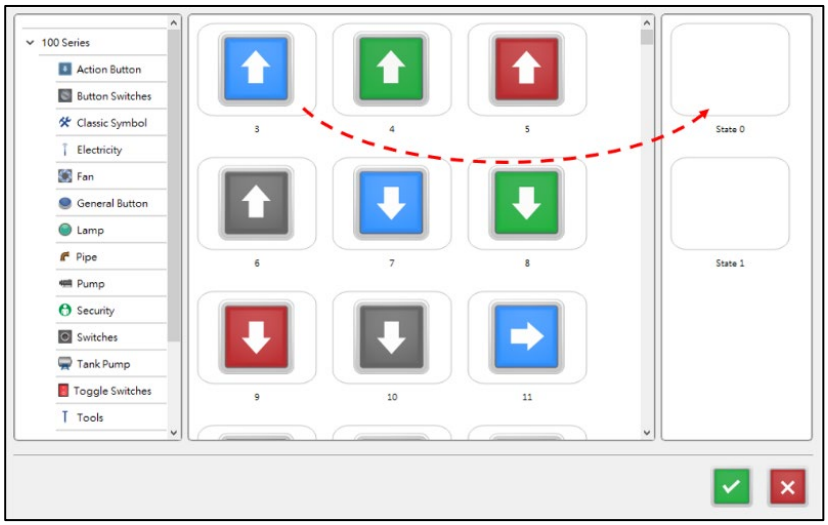
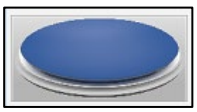


Figure 12 - 10: Animated Graphic element Picture property page

No.	Function	Description
(1)	Picture Name	To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>icon of the element to complete the picture configuration. The default value is None.
 



To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
</table>

No.	Function	Description
	Process pictures of all states	If users select the checkbox for **Process pictures of all states**, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.
(3)	Transparent Color	This function specifies a color in the picture and make it transparent. Select  icon and click the white part of the calendar. DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the **Foreground Color** of the element. 

- Coord.

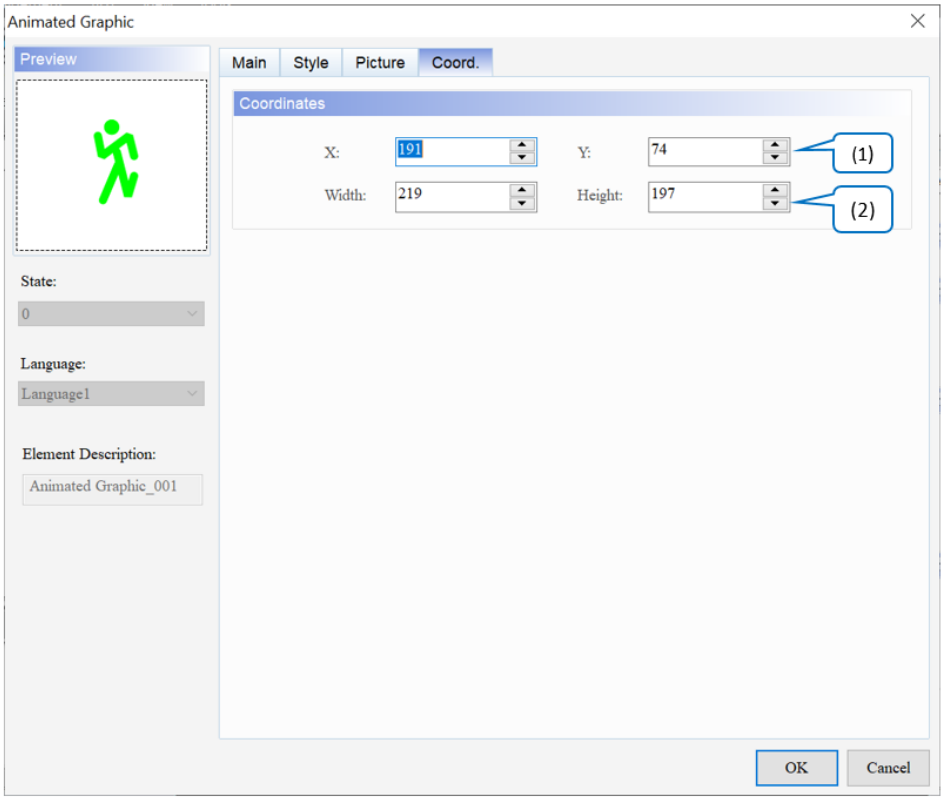


Figure 12 - 11: Animated Graphic element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

12.3 Real-time Image

The **Real-time Image** element mainly allows to use the ImgTrans.dll library provided by DIAScreen to write external applications and upload graphics to the HMI. Multiple **Real-time Image** elements can be displayed in an editing screen, and the software dynamically configures the available memory capacity according to the created **Real-time Image** elements and the size of the graphics to be uploaded.

The following is an example description of the **Real-time Image** element.

1. Data structure definition:

```
typedef struct _ETHER_INFO
{
        char  szIP[32];
        WORD  IPPort;
} ETHER_INFO;
```

Among them, szIP is a string representing the IP address of Ethernet network communication; IPPort is the Port of Ethernet network communication.

```
typedef struct _COMM_INFO
{
        char  szCOM[10];
  unsigned long dwStation
  ETHER_INFO  EtherInfo;
        } COMM_INFO;
```

,szCOM is a string, and the incoming values are COM1, COM2, COM3, ...; if the Ethernet network is used, set this string to "ETHERNET".

,If there is no station number, set dwStation to -1 (for Ethernet network, set it to -1);

if when there is a station number, set dwStation to a function > 0

2. Function list:

(1) int hmOpen(const COMM_INFO* pCommInfo);

(2) int hmSendImageFromFile(LPCTSTR szFileName);

(3) int hmSendImageFromFileByStation(LPCTSTR szFileName, int nStation);

(4) HANDLE hmAsyncSendImageFromFile(LPCTSTR szFileName);

(5) HANDLE hmAsyncSendImageFromFileByStation(LPCTSTR szFileName, int nStation);

(6) int hmSendImage(HBITMAP hbmp);

(7) int hmSendImageByStation(HBITMAP hbmp, int nStation);

(8) HANDLE hmAsyncSendImage(HBITMAP hbmp);

(9) HANDLE hmAsyncSendImageByStation(HBITMAP hbmp, int nStation);

(10) int hmAbortAction();

(11) int hmClose();

3. Function description:

(1) Function: int hmOpen(const COMM_INFO* pCommInfo);

Input value: COMM_INFO structure

Return value: 1 is success; 0 is failure

Description: Enable HMI communication, input COM Port string, such as COM1, COM2, etc.

(2) Function: int SendImageFromFile(LPCTSTR szFileName);

Input value: Graphics filename

Return value: 1 is success; 0 is failure

Description: After converting the input graphic format to the width, height and bits of the element on the HMI, the graphic data starts to be transferred to the HMI. This function is a synchronous function, and it does not return the execution result until the data transfer is complete.

(3) Function: int SendImageFromFileByStation(LPCTSTR szFileName, int nStation);

Input value: graphic file name, HMI station number (must be greater than 0)

Return value: 1 is success, 0 is failure

Description: After converting the incoming graphic format into the width, height and bits value of the elements on HMI, it starts to transmit the graphic data to the HMI with the specified station number. This function is a synchronous function, and it will not return until the data transmission is completed.

(4) Function: HANDLE hmAsyncSendImageFromFile(LPCTSTR szFileName);

Input value: Graphics filename

Return value: 0 is failure, non-zero value is the Thread Handle

Description: After converting the incoming graphic format into the width, height and bits value of the elements on HMI, it starts to transmit the graphic data to the HMI. This function is an asynchronous function, and users can use the Thread Handle that is currently transferring the graphic data to perform related operations.

(5) Function: HANDLE hmAsyncSendImageFromFileByStation(LPCTSTR szFileName,int nStation);

Input value: graphic file name, HMI station number (must be greater than 0)

Return value: 0 is failure, non-zero value is the Thread Handle

Description: After converting the incoming graphic format into the width, height and bits value of the elements on HMI, it starts to transmit the graphic data to the HMI with the specified station number. This function is an asynchronous function to obtain the Thread Handle currently transmitting the graphics data to perform related operations.

(6) Function: int hmSendImage(HBITMAP hbmp);

Input value: HBITMAP Handle in Window

Return value: 1 is success; 0 is failure

Description: After converting the input graphic format to the width, height and bits of the element on the HMI, the graphic data starts to be transferred to the HMI. This function is a synchronous function, and it does not return the execution result until the data transfer is complete.

(7) Function: int hmSendImageByStation(HBITMAP hbmp, int nStation);

Input value: Windows HBITMAP Handle; HMI station number (must be greater than 0)

Return value: 1 is success; 0 is failure

Description: After converting the incoming graphic format into the width, height and bits value of the elements on HMI, it starts to transmit the graphic data to the HMI with the specified station number. This function is a synchronous function, and it will not return until the data transmission is completed.

(8) Function: HANDLE hmAsyncSendImage(HBITMAP hbmp);

Input value: Windows HBITMAP Handle

Return value: 0 is failure, non-zero value is the Thread Handle

Description: After converting the incoming graphic format into the width, height and bits value of the elements on HMI, it starts to transmit the graphic data to the HMI. This function is an asynchronous function, and users can use the

Thread Handle that is currently transferring the graphic data to perform related operations.

(9) Function: HANDLE hmAsyncSendImage(HBITMAP hbmp, int nStation);

Input value: Windows HBITMAP Handle; HMI station number (must be greater than 0)

Return value: 0 is failure, non-zero value is the Thread Handle

Description: After converting the incoming graphic format into the width, height and bits value of the elements on HMI, it starts to transmit the graphic data to the HMI. This function is an asynchronous function, and users can use the Thread Handle that is currently transferring the graphic data to perform related operations.

(10) Function: int hmAbortAction();

Input value: none

Return value: 0 is failure; 1 is success

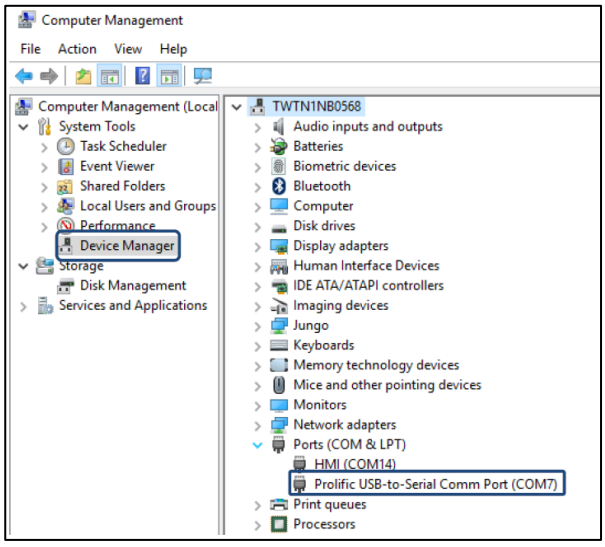
Description: Abort the graphics transfer of the asynchronous function.

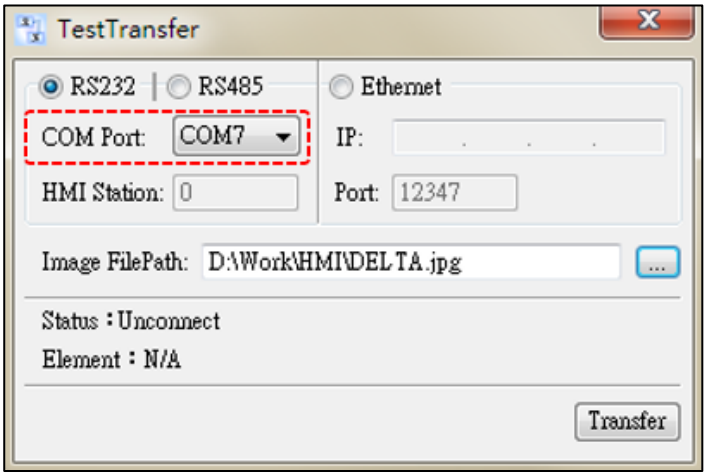
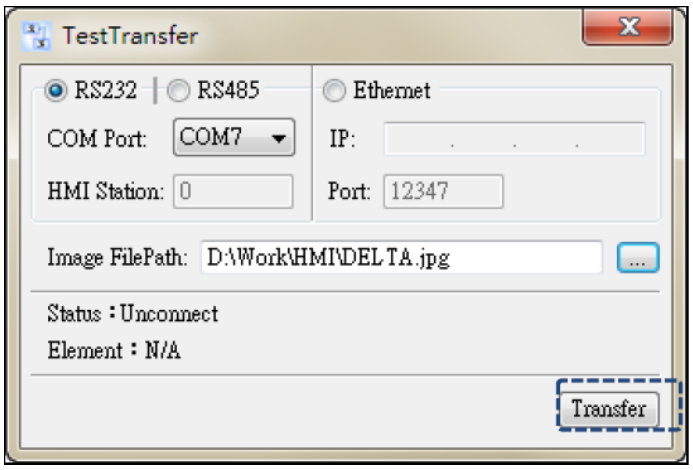
(11) Function: int hmClose();

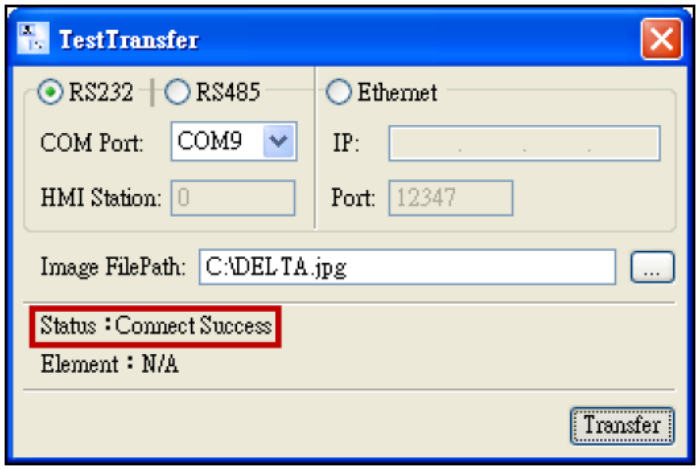
Input value: none

Return value: 0 is failure; 1 is success

Description: Disable the HMI communication. This function is automatically called when ImgTrans.dll ends.

<table>
<tr><th colspan="2">Real-time Image</th></tr>
<tr><td>Create Real-time Image element</td><td>Create a Real-time Image element on the HMI editing screen.
 
</td></tr>
<tr><td>Detail settings</td><td>This is a communication port that connects the HMI to the PC, which is set to COM2 and transmits with the RS232 communication interface.
<table>
<tr><th>HMI Station</th><th>Interface</th><th>COM Port</th></tr>
<tr><td>1</td><td>RS232</td><td>COM2</td></tr>
</table></td></tr>
<tr><td>Compile the screen</td><td>After creating a Real-time Image element and setting its communication interface and port, compile and download the screen data to the HMI.</td></tr>
<tr><td>Execute TestTransfer.exe</td><td>● Use the USB to COM communication cable to connect the PC and the HMI.
● Click Control Panel > System Management Tools > Computer Management > Device Manager > Ports to view the connection port of the PC, as shown in the following figure.
 
</td></tr>
<tr><td>Execute TestTransfer.exe</td><td>● Open This PC.
● Go to the following path:
C:\Program Files (x86)\Delta Industrial Automation\DIAStudio\DIAScreen 1.3\Utility\ImgTrans</td></tr>
</table>

Real-time Image	
	● Select **TestTransfer.exe**. ● Open this tool. Set the **COM Port** for communication between PC and HMI to COM7, and select the image file to be uploaded. In this example, the image file DELTA.jpg located in D:\ is selected. Refer to the following figure.  ● The following picture shows the selected DELTA.jpg file image.  ● After selecting the image file to upload, click **Transfer**. 

Real-time Image	
Execution result	● If the connection is successful, the **Status** displays “Connect Success” message, as shown in the following figure.  ● The **Real-time Image** element on the HMI displays the uploaded image. 

On double-clicking the **Real-time Image** element, the property page appears as follows.

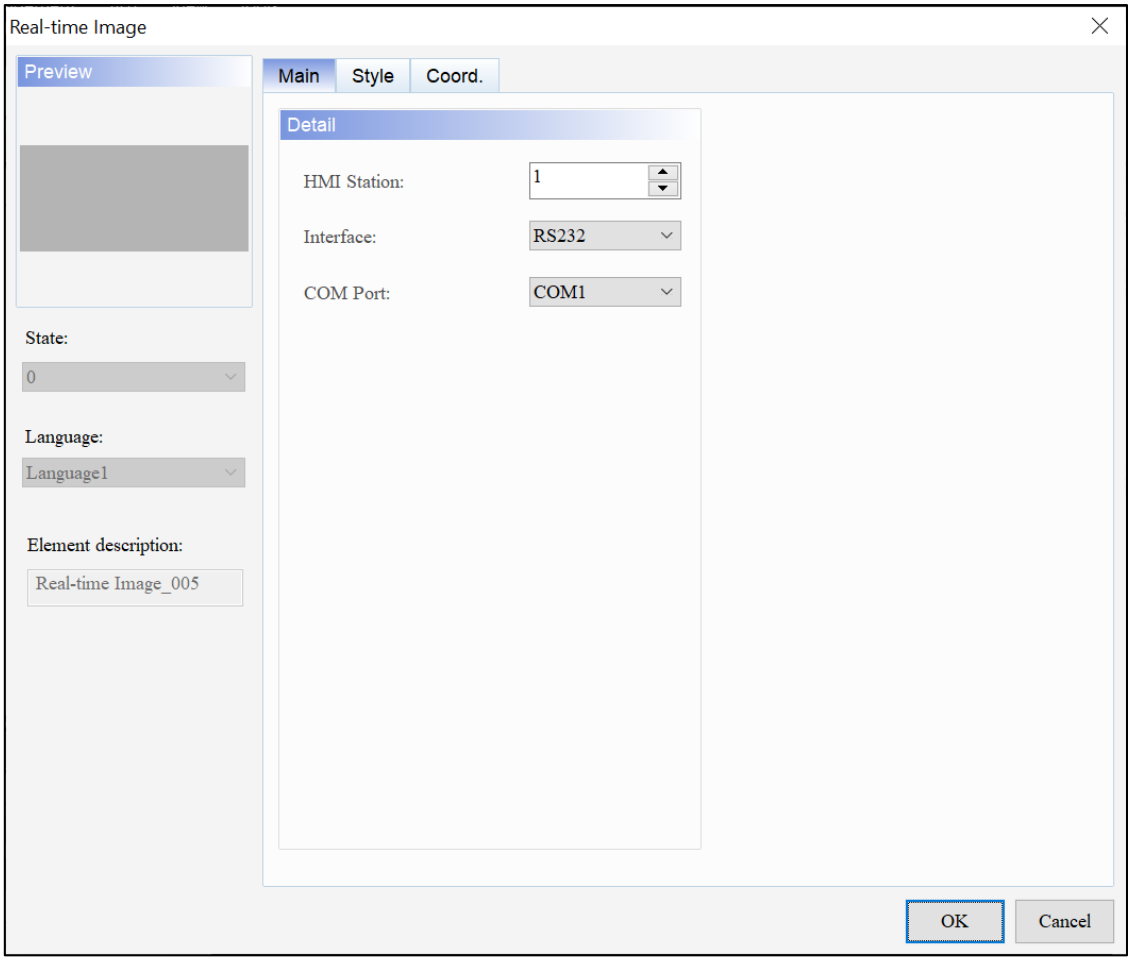


Figure 12 - 12: Real-time Image element property page

Real-time Image	
Function	**Description**
Preview	The **Real-time Image** element does not support multiple state values and multi-language data display.
Main	Set the HMI Station, Interface, and COM Port.
Style	Set the Foreground Color and Transparency.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

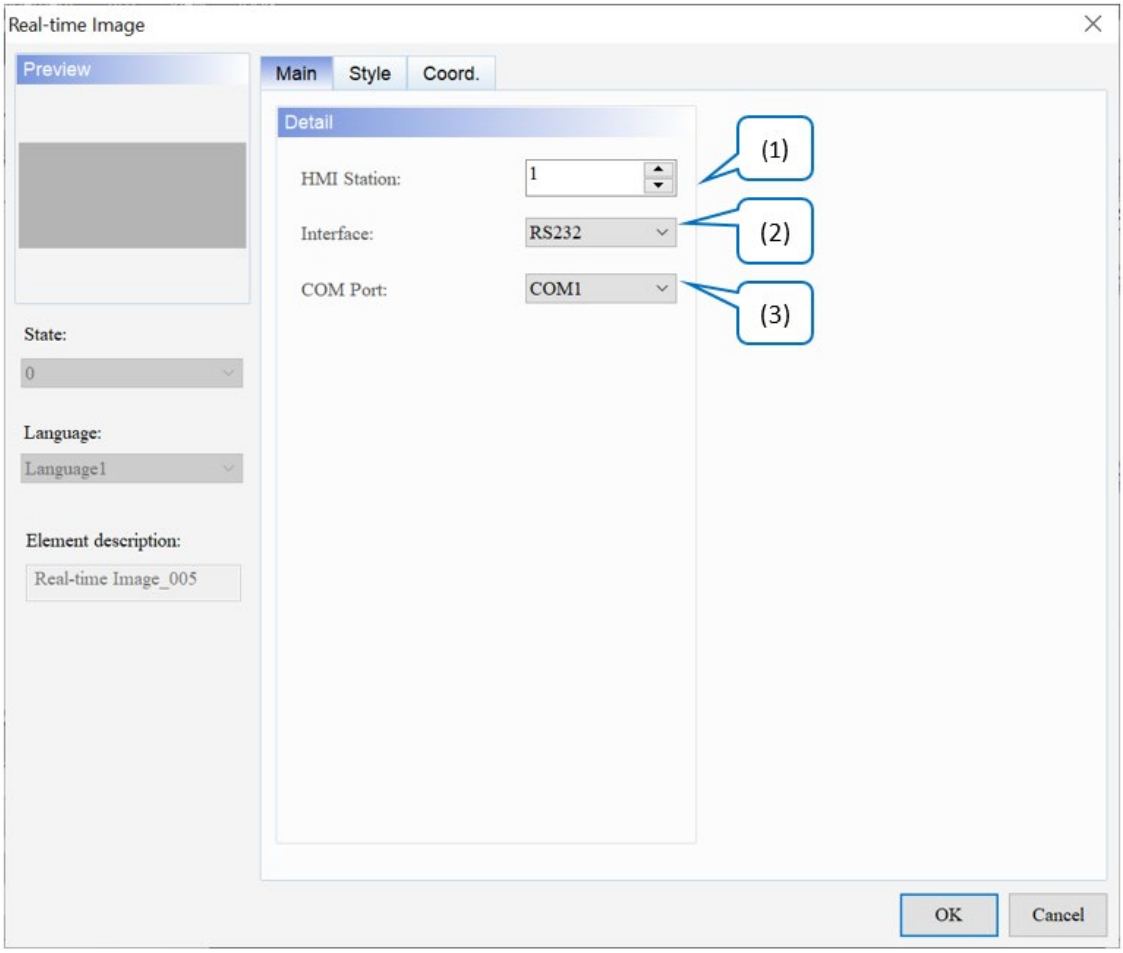
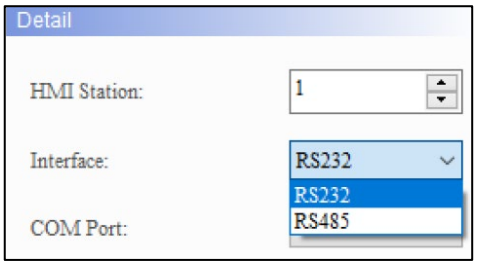
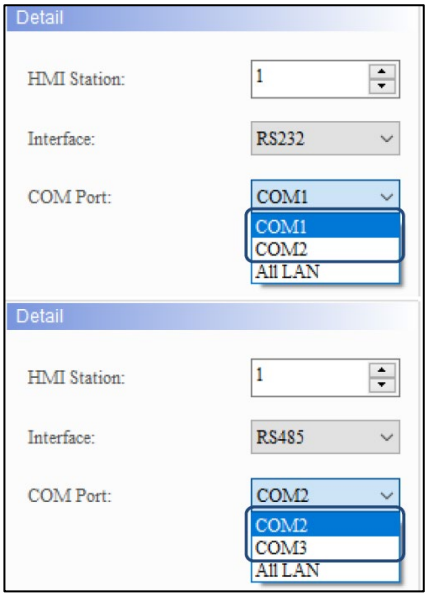
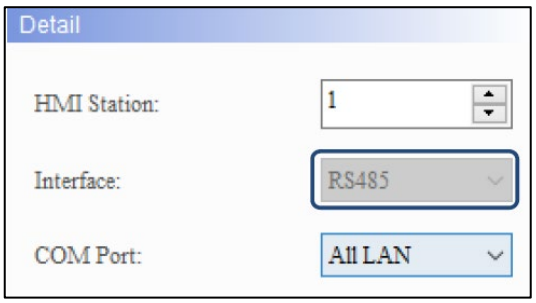


Figure 12 - 13: Real-time Image element Main property page

No.	Function	Description
(1)	HMI Station	● The **HMI Station** number option is mainly provided for the transmission method of RS485. The setting range is 1 ~ 255, and the default value is **1**. ● When users use RS485 to connect multiple HMIs in series, **HMI Station** option is used to distinguish each HMI.
(2)	Interface	● The transmission modes are: RS232 and RS485. The default value is **RS232**. ● The RS232 communication ports are COM1 and COM2. ● The RS485 communication ports are COM2 and COM3.

No.	Function	Description
		
(3)	COM Port	● The available options for **COM Port** are: COM1, COM2, COM3, and All LAN (Ethernet). Different communication ports are available depending on the transmission mode. The default value is **COM1**.  ● Note that the **COM Port** refers to the communication ports on the HMI, so users cannot use the same **COM Port** for transmission and for connecting the PLC. For example, if COM1 is selected for PLC communication, then users can only select COM2 or COM3 for transmission. If COM1 is selected for PLC communication and RS232 is selected as the transmission mode, then users can only select COM2 for transmission. ● If the selected communication port is ALL LAN (Ethernet), the **Interface** option is grayed out and cannot be set. 

- Style

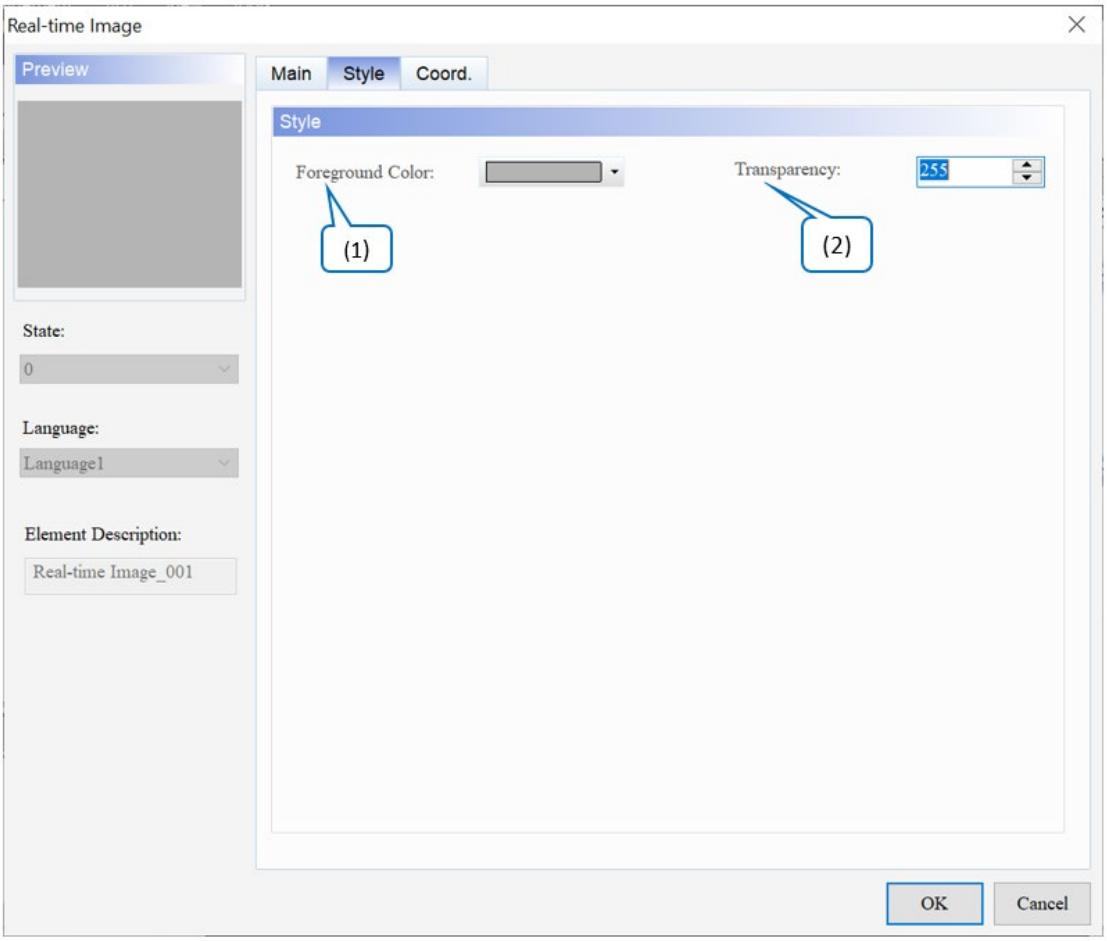
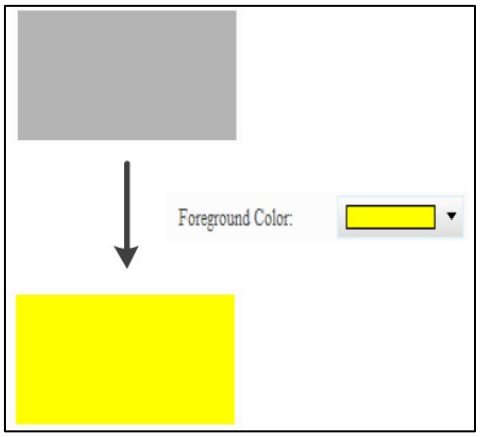


Figure 12 - 14: Real-time Image element Style property page

No.	Function	Description
(1)	Foreground Color	Set the foreground color of the element. The default is  . 

No.	Function	Description
(2)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.

- Coord.

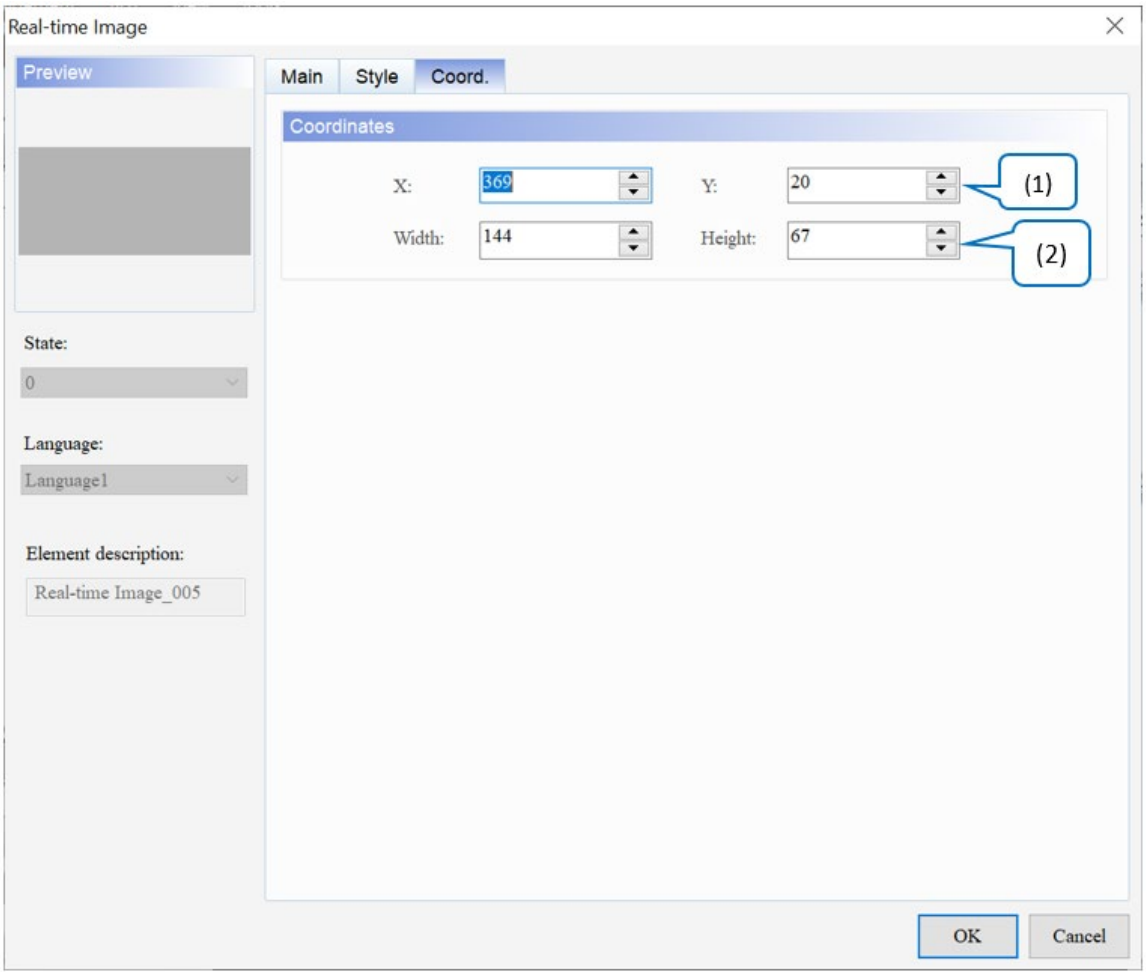


Figure 12 - 15: Real-time Image element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the element.
(2)	Width and Height	Set the width and height of the element.

The following table describes library path and function description.

Library	
Library path	C:\Program Files (x86)\Delta Industrial Automation\DIAStudio\DIAScreen 1.3\Utility\ImgTrans
Library description	● Load ImgTrans.dll ● Data structure definition: typedef struct _COMM_INFO { char szCOM[8]; } COMM_INFO; ,szCOM is a string, and the incoming values are COM1, COM2, COM3…. ● Function list: 1. int hmOpen(const COMM_INFO* pCommInfo); 2. int hmSendImageFromFile(LPCTSTR szFileName); 3. HANDLE hmAsyncSendImageFromFile(LPCTSTR szFileName); 4. int hmSendImage(HBITMAP hbmp); 5. HANDLE hmAsyncSendImage(HBITMAP hbmp); 6. int hmAbortAction(); 7. int hmClose(); ● Function description: (1) Function: int hmOpen(const COMM_INFO* pCommInfo); Input value: COMM_INFO structure Return value: 1 is success; 0 is failure Description: Enable HMI communication, input COM Port string, such as COM1, COM2, etc. (2) Function: int SendImageFromFile(LPCTSTR szFileName); Input value: Graphic file name Return value: 1 is success; 0 is failure Description: After the input graphic format is converted to the width/height and bits of the element on the HMI, the graphic data starts to be transferred to the HMI. This function is a synchronous function, and this function does not return the execution result until the data transfer is complete. (3) Function: HANDLE hmAsyncSendImageFromFile(LPCTSTR szFileName); Input value: Graphic file name Return value: 0 is failure; non-zero value is the Thread Handle Description: After the input graphic format is converted to the

Library	
	width/height and bits of the element on the HMI, the graphic data starts to be transferred to the HMI. This function is an asynchronous function, and users can use the Thread Handle that is currently transferring the graphic data to perform related operations. (4) Function: int hmSendImage(HBITMAP hbmp); Input value: Windows HBITMAP Handle Return value: 1 is success; 0 is failure Description: After the input graphic format is converted to the width/height and bits of the element on the HMI, the graphic data starts to be transferred to the HMI. This function is a synchronous function, and this function does not return the execution result until the data transfer is complete. (5) Function: HANDLE hmAsyncSendImage(HBITMAP hbmp); Input value: Windows HBITMAP Handle Return value: 0 is failure; non-zero value is the Thread Handle

Chapter 13: Input

To create an **Input** element, go to **Elements** > **Input** and click the desired **Input** element.

13.1 Numeric Entry

With the keypad provided in the **Numeric Entry** element, enter the numerical value to set **Write Address**. Read the numerical value through the **Read Address** of the **Numeric Entry** element, and then the value is displayed on the HMI.

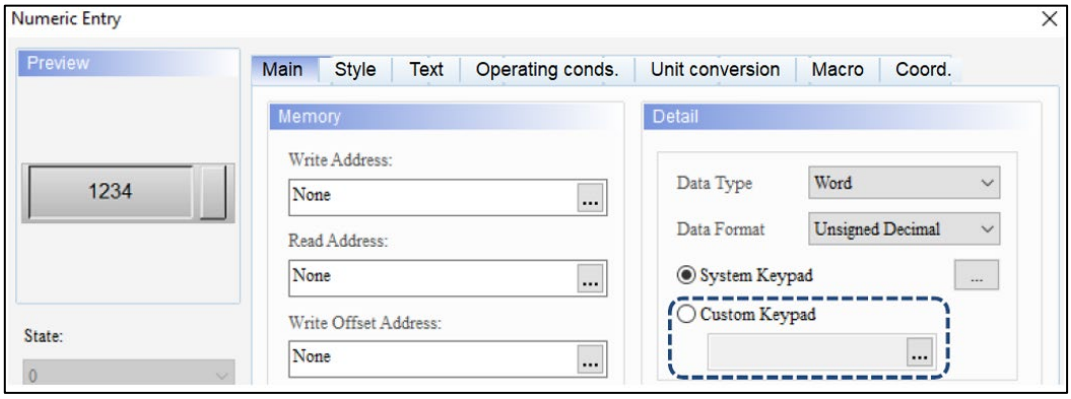


Figure 13 - 1: Numeric Entry element built-in keyboard

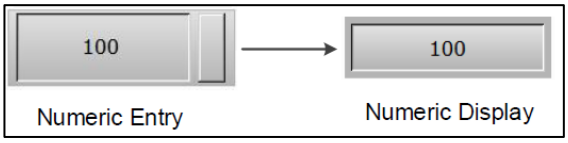
***NOTE**: The **Custom Keypad** provided for the **Numeric Entry**, **Character Entry**, and **Barcode Input** elements does not support DOP-B, DOP-H, and HMC series HMIs.*

Refer to following table for the **Numeric Entry** element example description.

Numeric Entry				
Read Address	Numeric Entry Element		Numeric Display Element	
	Write Address	$555	Read Address	$555
				

<table>
<tr><th colspan="2">Numeric Entry</th></tr>
<tr><td>Detail settings</td><td>
<table>
<tr><th colspan="4">Numeric Entry Element</th></tr>
<tr><td>Data Type</td><td>Data Format</td><td>Integer Digits</td><td>Fractional</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>4</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Execution result</td><td>

After creating the elements, compile and download the elements to the HMI. Next, input 100 with the Numeric Entry element, and then the Numeric Display element displays the input value.
Input a value of 100 and the value is written to the specified address ($555).



</td></tr>
</table>

Numeric Entry element supports three types of **Data Type**: Word, Double Word, and Quad Word. The permissible range of the Numeric Entry value is given in the following table.

Numeric Entry		
Word	Data Format	Permissible Range
	BCD	0 ~ 9999
	Signed BCD	-999 ~ +9999
	Signed Decimal	-32768 ~ +32767
	Unsigned Decimal	0 ~ 65535
	Hex	0 ~ 0xFFFF
	Binary	0 ~ 0xFFFF
Double Word	BCD	0 ~ 99999999
	Signed BCD	-9999999 ~ +99999999
	Signed Decimal	-2147483648 ~ +2147483647
	Unsigned Decimal	0 ~ 4294697295
	Hex	0 ~ 0xFFFFFFFF
	Binary	0 ~ 0xFFFFFFFF
	Floating	0 ~ 9999999
Quad	BCD	0 ~ 9999999999999999

Numeric Entry		
Word	Signed BCD	-9999999999999999 ~ +9999999999999999
	Signed Decimal	-9223372036854775808 ~ +9223372036854775807
	Unsigned Decimal	0 ~ 18446744073709551615
	Hex	0 ~ 0xffffffffffffffff
	Binary	0 ~ 0xffffffffffffffff
	Floating	0 ~ 999999999999999

On double-clicking the **Numeric Entry** element, the property page appears as follows.

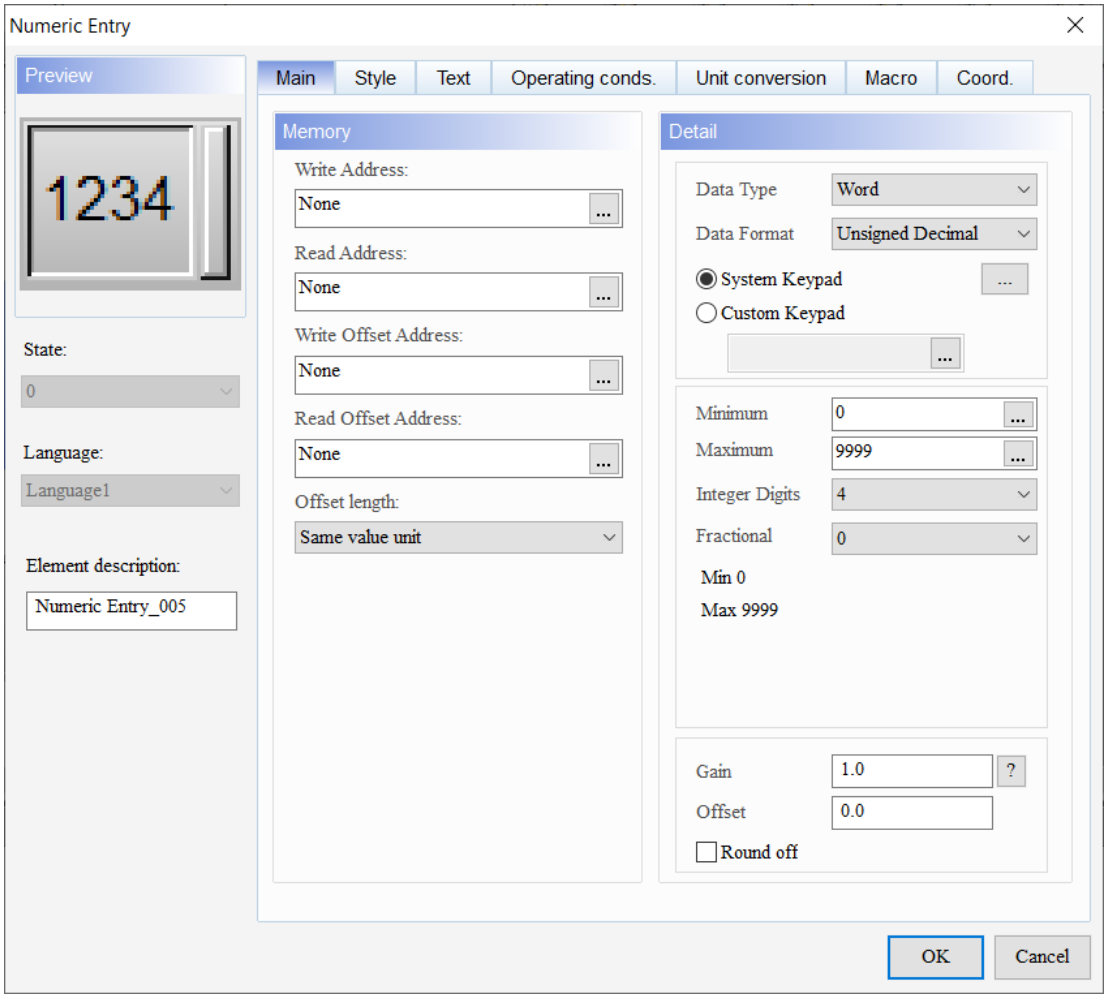


Figure 13 - 2: Numeric Entry element property page

Numeric Entry	
Function	**Description**
Preview	**Numeric Entry** elements do not support multiple state values and multi-language data display.
Main	Set the Read Address, Write Address, Read Offset Address, Write Offset Address, and Offset length. Set the Data Type, Data Format, Integer Digits, Fractional (Digits), Min, Max, Gain, and Offset.
Style	Set the Style, Background Color, Border Color, Filled style, Border Fill Style, and Transparency.
Text	Set the text font, size, color, and alignment options.
Operating conds.	Set the Input Mode, Interlock State, Interlock Display, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, Prefix Zero, Show overrange message, User Security Level, Set Low Security, Mark as Asterisk (*), Show #### when overrange, and Word arrangement.
Unit conversion	Set the Type, Unit and Address for the Source and Display, Custom formula, and Percentage.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

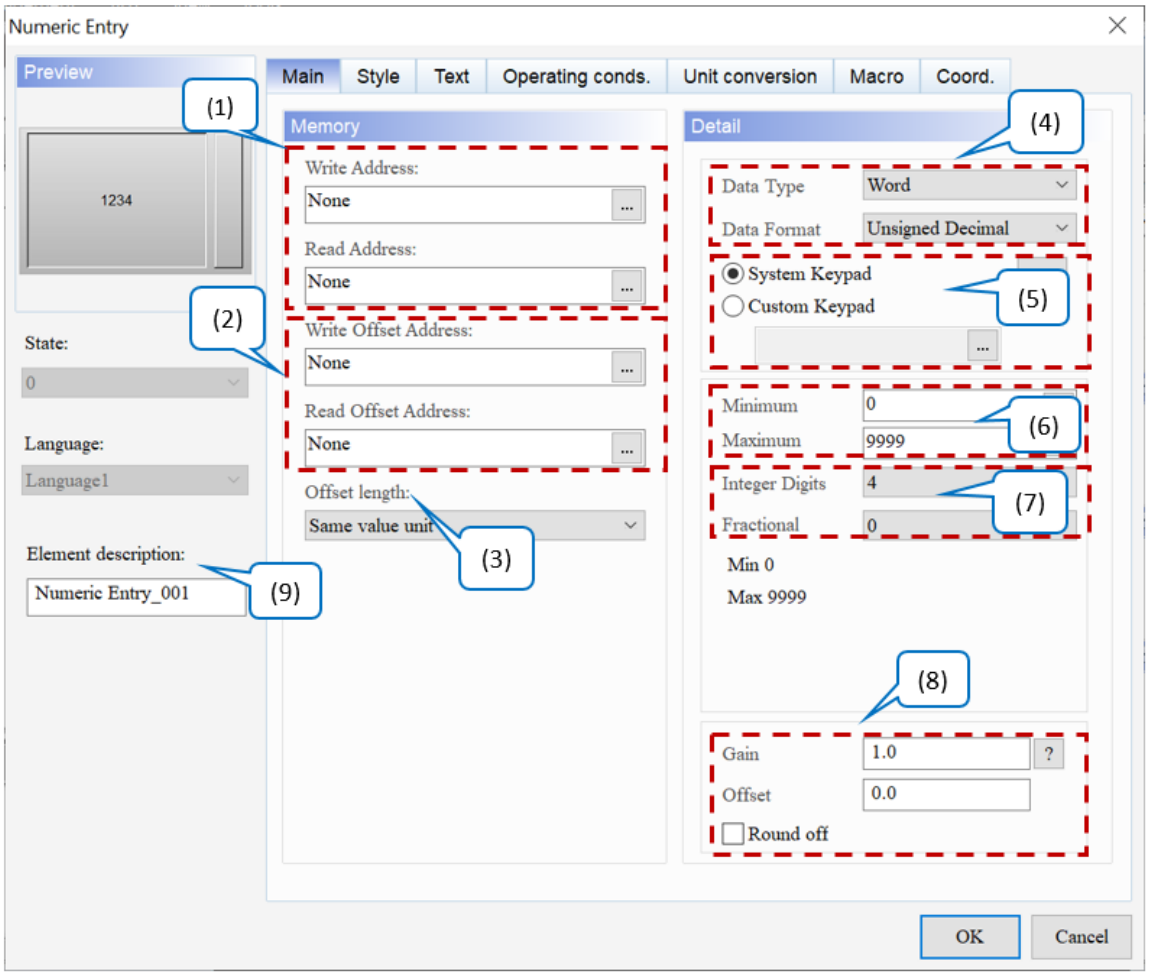
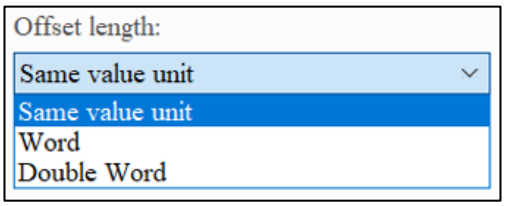
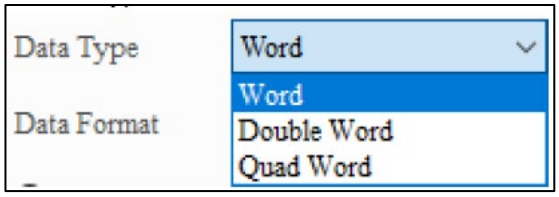


Figure 13 - 3: Numeric Entry element Main property page

No.	Function	Description
(1)	Write Address Read Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to the *Memory Settings*.
(2)	Write Offset Address Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(3)	Offset length	The available options for **Offset length** are: Same value unit, Word, and Double Word. The default value is **Same value unit**.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(4)</td><td>Data Type</td><td>

The available options for Data Type are: Word, Double Word, and Quad Word. The default value is Word.

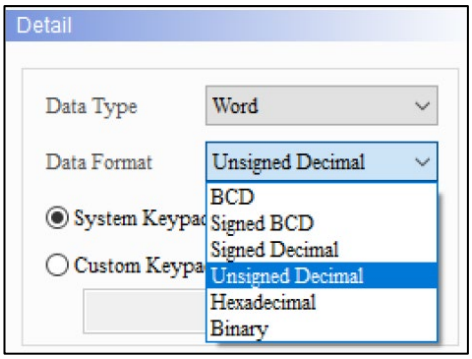
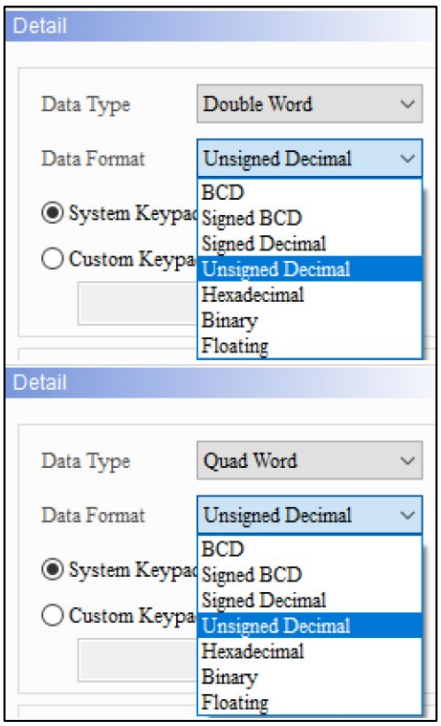


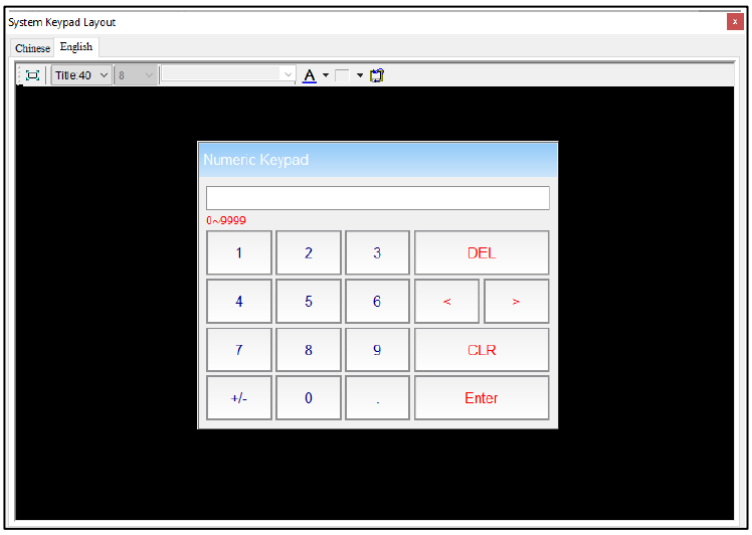
When the Data Type is Quad Word, only Internal Memory and certain PLC brands are supported, as shown in the following table.

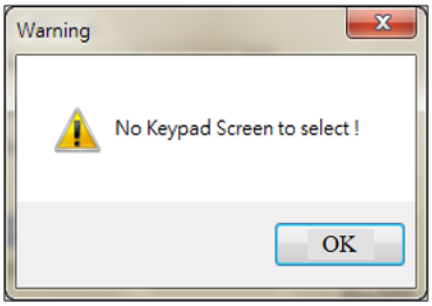
<table>
<tr><th>Brand</th><th>Model Number</th></tr>
<tr><td rowspan="3">Delta</td><td>15MC</td></tr>
<tr><td>15MC TCP</td></tr>
<tr><td>10EMC</td></tr>
<tr><td rowspan="2">Omron</td><td>NJ FINS TCP</td></tr>
<tr><td>NJ/NX FINS UDP</td></tr>
<tr><td>Beckhoff</td><td>TWINCAT TCP</td></tr>
<tr><td rowspan="2">SIEMENS</td><td>S7-1200</td></tr>
<tr><td>S7-1500</td></tr>
</table>

The internal registers can be up to 200000 sets.

<table>
<tr><th>Access Type</th><th>Device Type</th><th>Storage Range</th></tr>
<tr><td>Word</td><td>$n</td><td>$0 ~ $199999</td></tr>
<tr><td>Bit</td><td>$n.b</td><td>$0.0 ~ $199999.15</td></tr>
</table>
NOTE: n is Word (0 ~ 199999); b is Bit (0 ~ 15).
</td></tr>
</table>

No.	Function	Description
	Data Format	● When the **Data Type** is Word, the supported **Data Format** is as follows. The default value is **Unsigned Decimal**.  ● When the **Data Type** is Double Word or Quad Word, the supported **Data Format** is as follows. The default value is **Unsigned Decimal**.  ● When the **Data Type** is Double Word and the **Data Format** is Floating, the **Integer Digits** and **Fractional** support only 7 digits in total. When this limit is exceeded, DIAScreen displays a warning message. ● When the **Data Type** is Quad Word and the **Data Format** is Floating, the **Integer Digits** and **Fractional** support only 15 digits in total. When this limit is exceeded, DIAScreen displays a warning message.
(5)	System Keypad	In the **System Keypad Layout** window, adjust the size of the keypad window, title size, font size / type / color of the numeric display, and the background color of the keypad window.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>


<table>
<tr><td></td><td>Select the size of the System Keypad.</td></tr>
<tr><td>Title:40</td><td>Set the title column height.</td></tr>
<tr><td>10</td><td>Set the font size.</td></tr>
<tr><td>Arial</td><td>Set the font type.</td></tr>
<tr><td>A</td><td>Set the font color.</td></tr>
<tr><td></td><td>Set the background color.</td></tr>
<tr><td></td><td>Default size.</td></tr>
</table>
</td></tr>
<tr><td></td><td>Custom Keypad</td><td>Select the Custom Keypad function only if there is a Keypad Screen in the editing screen. When there is no Keypad Screen, the following message displays.
 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(6)</td><td>Minimum / Maximum</td><td>

The permissible range for the Minimum and Maximum values are subject to change based on the selected Data Type and Data Format.
The default value for Minimum is 0, and Maximum is 9999.

<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="6">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ +9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ +32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td>Binary</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="7">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ +99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ +2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Binary</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
<tr><td rowspan="7">Quad Word</td><td>BCD</td><td>0 ~ 9999999999999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999999999999 ~ +9999999999999999</td></tr>
<tr><td>Signed Decimal</td><td>-9223372036854775808 ~ +9223372036854775807</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 18446744073709551615</td></tr>
<tr><td>Hex</td><td>0 ~ 0xffffffffffffffff</td></tr>
<tr><td>Binary</td><td>0 ~ 0xffffffffffffffff</td></tr>
<tr><td>Floating</td><td>0 ~ 999999999999999</td></tr>
</table>
</td></tr>
<tr><td>(7)</td><td>Integer Digits / Fractional</td><td>

Set the number of Integer Digits and Fractional to display. The default value for Integer Digits is 10 and Fractional is 0.
The number of decimal places here is not a real decimal value, but only the display format. Only when Floating is selected for the Data Format, the

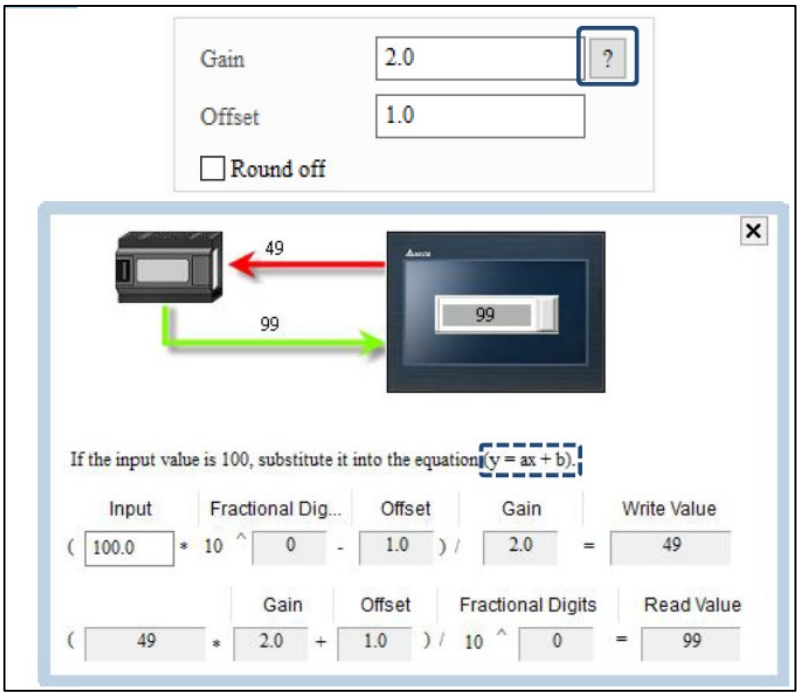
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Fractional setting is the actual decimal.</td></tr>
<tr><td>(8)</td><td>Gain / Offset</td><td>

The formula for Gain and Offset is y = (a)x + (b). The default value for Gain is 1.0 and Offset is 0.0.

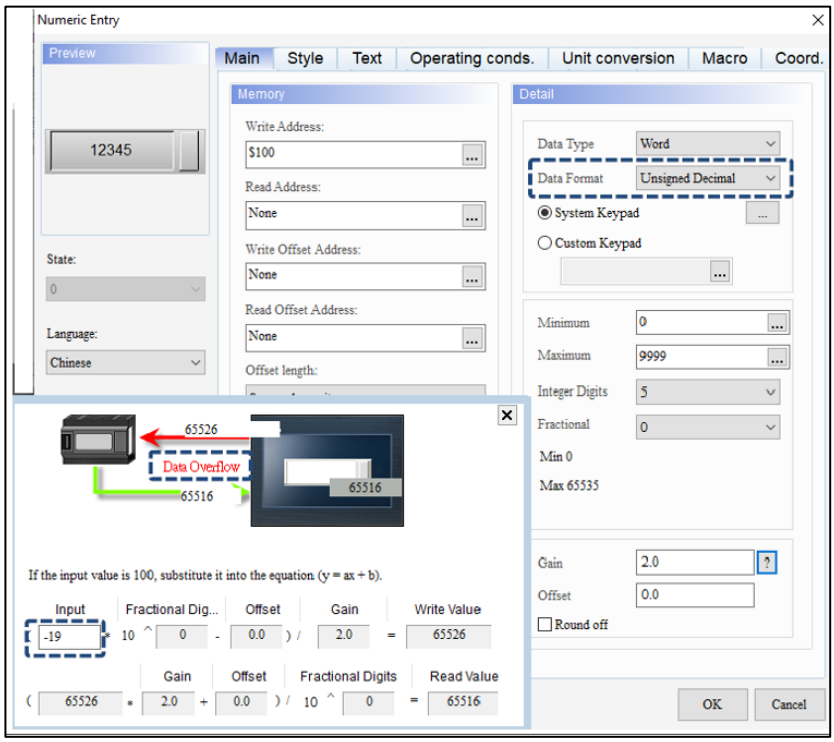
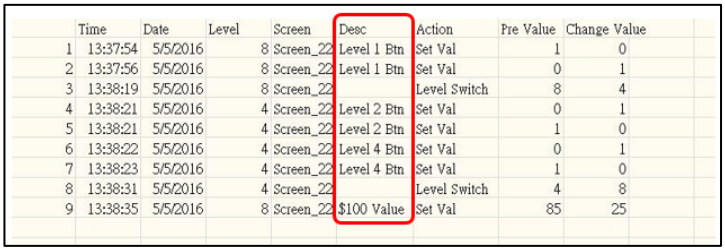
<table>
<tr><th>y</th><th>a</th><th>x</th><th>b</th></tr>
<tr><td>Result</td><td>Gain value</td><td>Input value</td><td>Offset value</td></tr>
</table>

If the set Gain or Offset value is decimal, set the Data Format to Floating.
The Numeric Entry element provides an estimation button to make it easier for users to understand the calculation method of Gain and Offset, as shown in the following figure.



If users select the Round off checkbox, the calculation results are rounded off before displayed on the Numeric Display element.
When the Data Format is Unsigned Decimal, a message “Data Overflow” appears when users input a negative value in the Input field.

</td></tr>
</table>

No.	Function	Description
		
(9)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that the users can easily know the performed actions. 

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

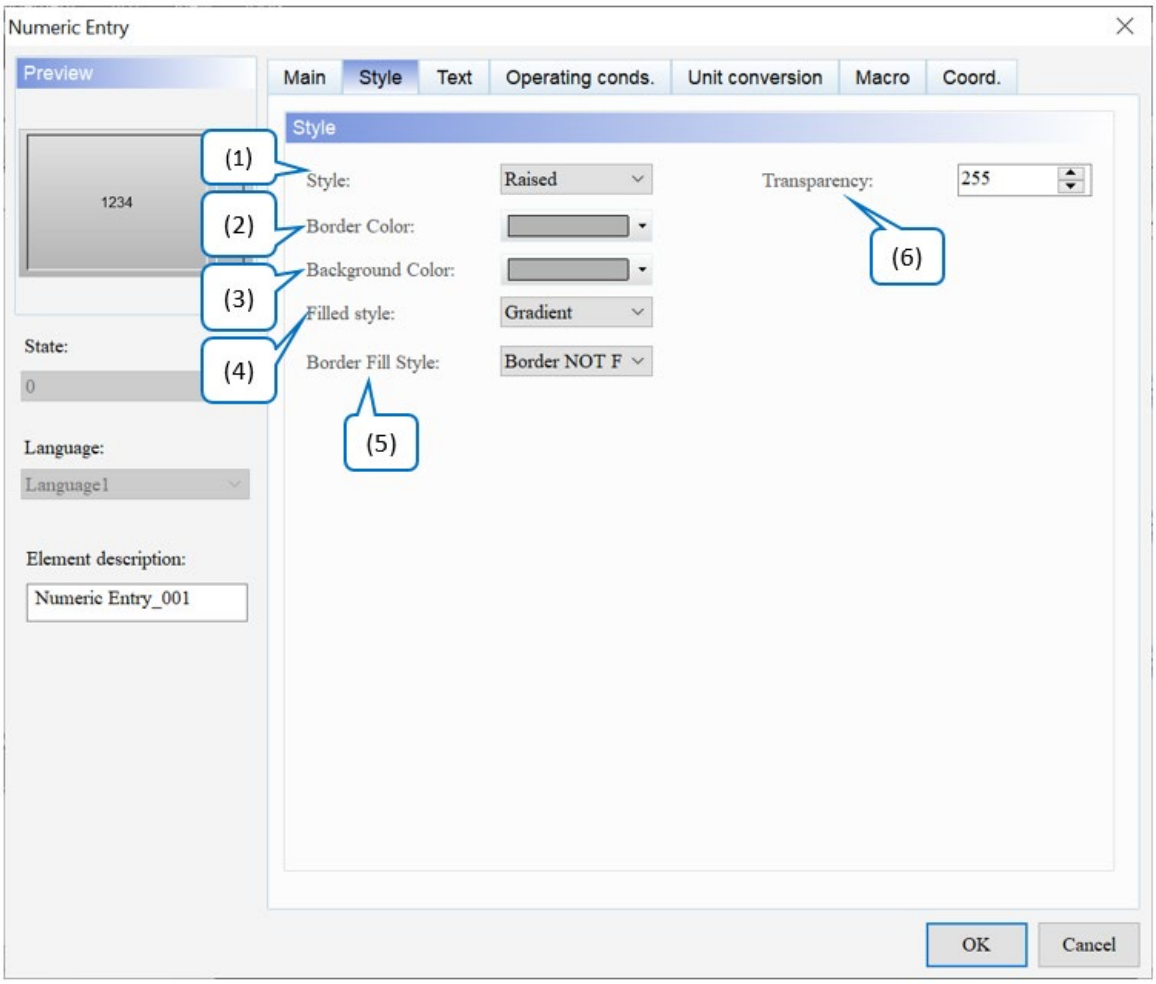


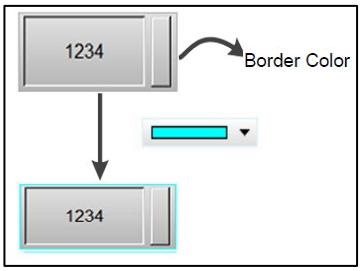
Figure 13 - 4: Numeric Entry element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of elements. The available options for element **Style** are: Standard, Raised, Sunken, and Transparent. The default value is **Raised**.

Standard	Raised	Sunken	Transparent
1234	1234	1234	1234

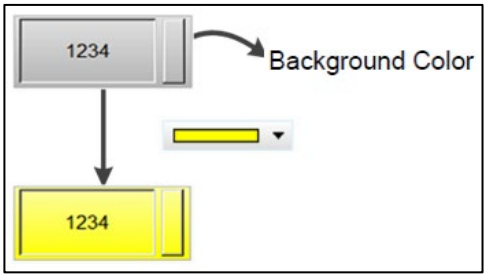
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is  .
When users set the Style to Transparent, the Border Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is  .
When users set the Style to Transparent, the Background Color setting is invalid.



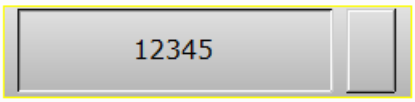
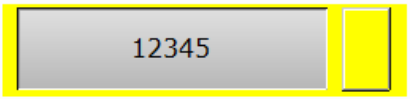
</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td> 
</td></tr>
<tr><td>Fixed</td><td> 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(5)</td><td>Border Fill Style</td><td>

The border display of the elements on the DOP-100 series models is different from that on the DOP-B series models. To have the border display effect be the same as that on the DOP-B series models, when users open the DOP-B project on a DOP-100 series model, the border is displayed with solid color.
The available options for Border Fill Style are: Border NOT Fill and Border Fill.
The default Border Fill Style for the DOP-100 series models is Border NOT Fill, meaning the border of the element is displayed with Gradient.

<table>
<tr><td>Border NOT Fill</td><td> 
</td></tr>
<tr><td>Border Fill</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

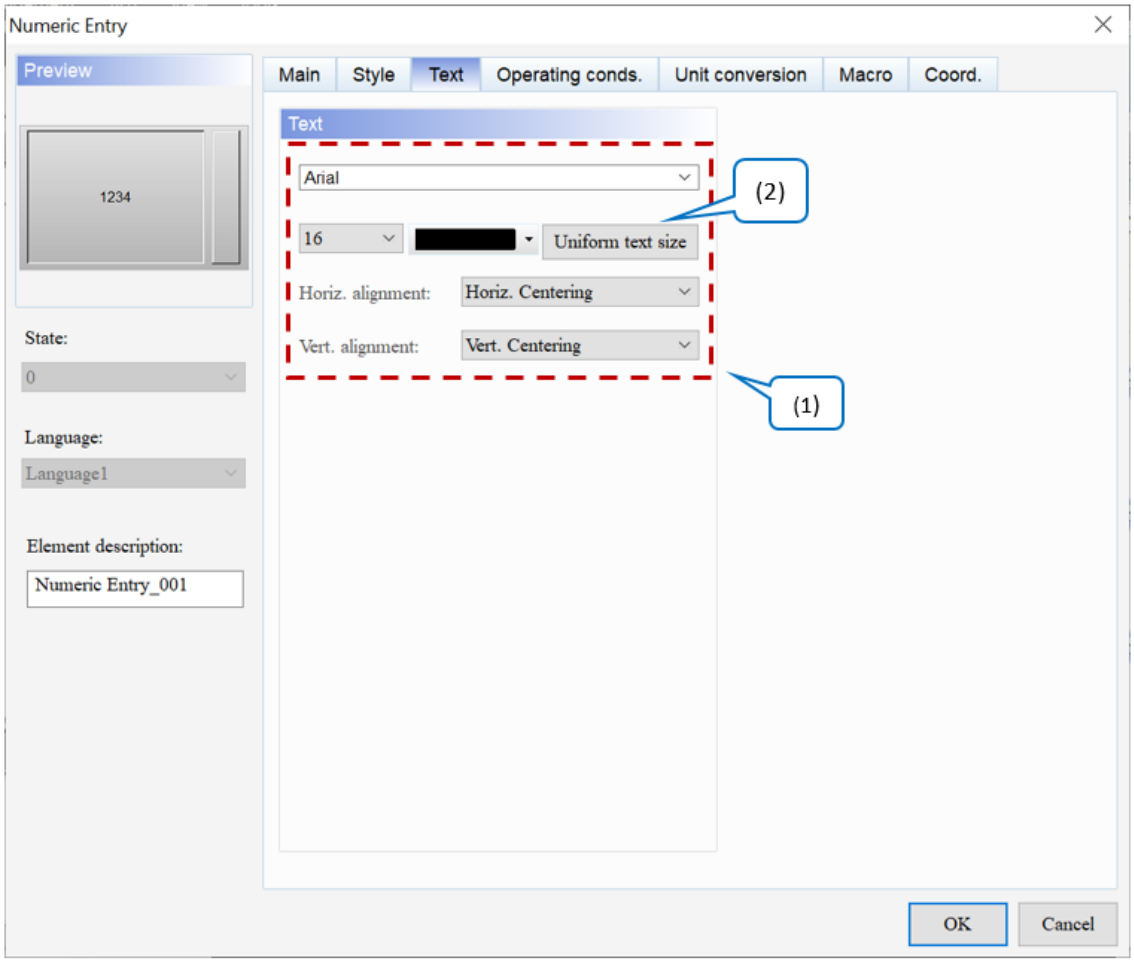


Figure 13 - 5: Numeric Entry element Text property page

No.	Function	Description
(1)	Text related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(2)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

- Operating conds.

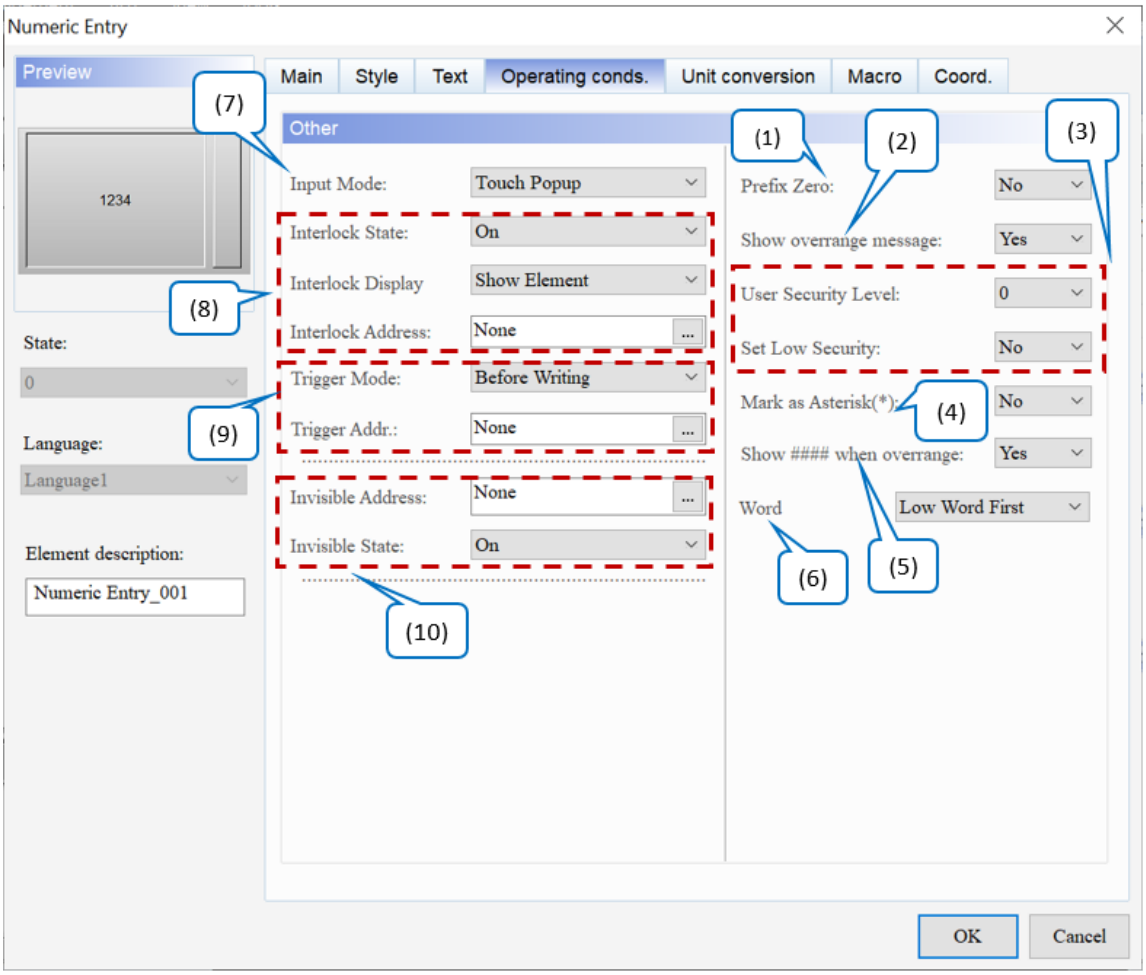
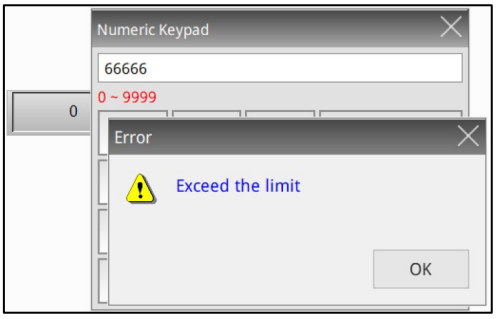
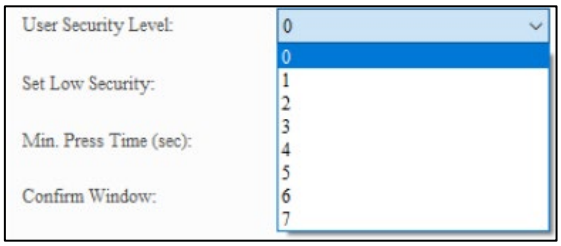
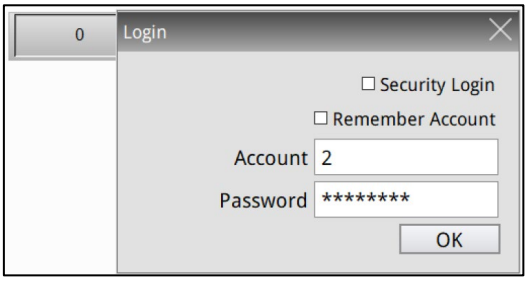
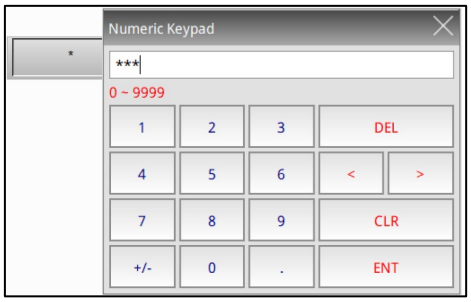
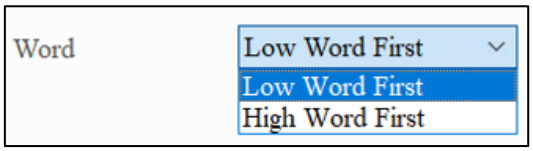
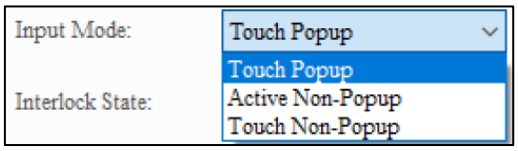
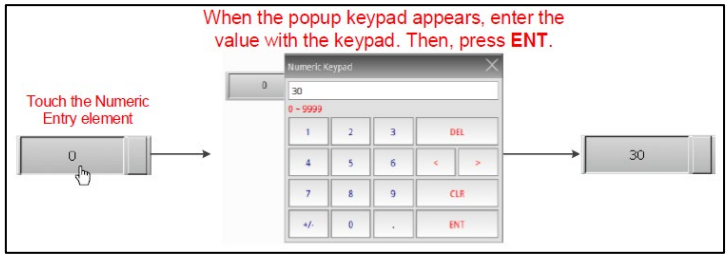
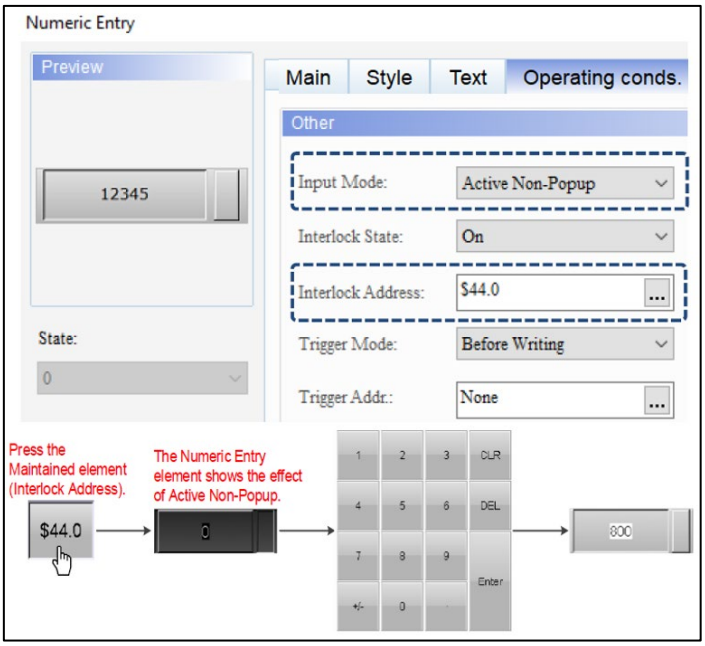
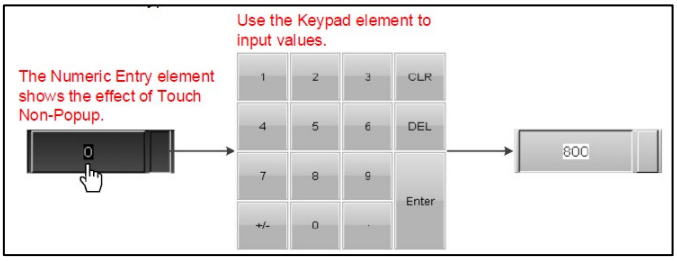


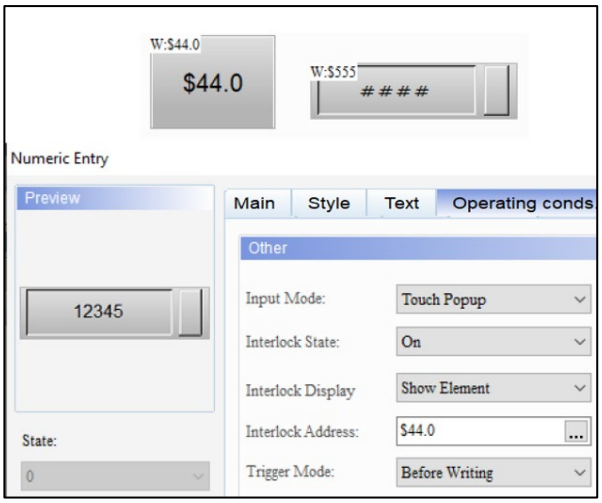
Figure 13 - 6: Numeric Entry element Operating conds. property page

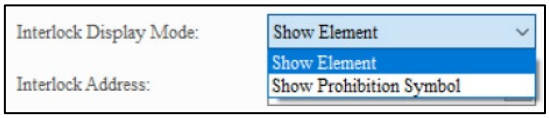
No.	Function	Description
(1)	Prefix Zero	● The **Prefix Zero** function determines how many zeros to add according to the set **Integer Digits**. The default value is **No**. ● Refer to the following example. Prefix Zero is Yes: 00181 Prefix Zero is No: 181

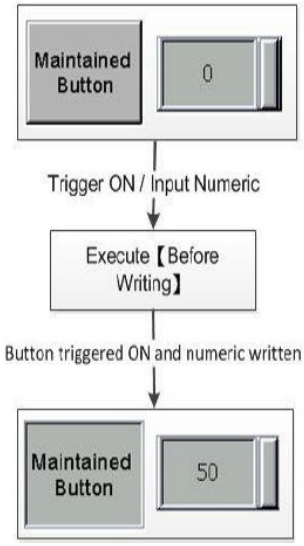
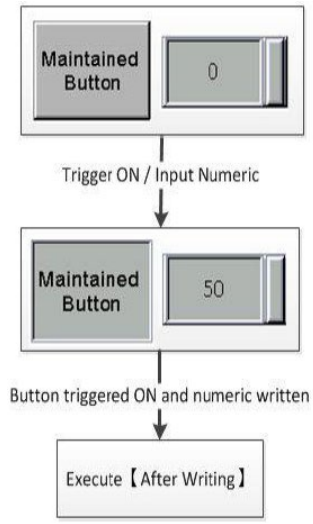
No.	Function	Description
(2)	Show overrange message	If users set **Show overrange message** to Yes, the following error message appears when users input a value exceeding the permissible range. The default value is **Yes**. 
(3)	User Security Level Set Low Security	● This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set **User Security Level**. The default value is **0**.  ● If the **User Security Level** is set, the **Login** window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the **Password Table Setting**. Refer to *Section 5.7.2 Password Table*).  ● If users set the **Set Low Security** to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**.
(4)	Mark as Asterisk (*)	If users specify **Mark as Asterisk (*)** to Yes, the value appears as asterisks when users input a value to the **Numeric Keypad**, as shown in the following figure. The default value is **No**.

No.	Function	Description
		
(5)	Show #### when overrange	● When this option is set to Yes, if the value range is not within the limited minimum and maximum values, it will display ###. The default value is **Yes**. ● When users set the **Minimum** as 10 and the **Maximum** as 50 and enable this function, since the default value of the **Numeric Entry** element is 0 which is not within the set range of 10 ~ 50, the value appears in #. 
(6)	Word	● Switch between high and low words using the **Word** function. ● The available options for **Word** are: Low Word First and High Word First. The default value is **Low Word First**. 
(7)	Input Mode	● The available options for **Input Mode** are: Touch Popup, Active Non-Popup, and Touch Non-Popup. The default value is **Touch Popup**.  ● Touch Popup means that after the **Numeric Entry** element is pressed, the **Numeric Keypad** appears.  ● The **Numeric Keypad** does not appear with the **Input Mode** set as Active Non-Popup or Touch Non-Popup. Users must create an additional Keypad element.

No.	Function	Description
		● Active Non-Popup must be used with **Interlock Address**. Set the **Input Mode** for the **Numeric Entry** element as Active Non-Popup and the **Interlock Address** as $44.0. Then, create a **Maintained Button** element and set its **Write Address** as $44.0.  ● Like the case of Active Non-Popup, the **Numeric Keypad** does not appear when the **Input Mode** is set as Touch Non-Popup, so users must create an additional Keypad element. 
(8)	Interlock State Interlock Address	● The **Interlock Address** enables to operate a certain element from this particular address, which must be operated along with the **Interlock State**. ● If the **Interlock State** is set to Off/On, the **Interlock Address** enables to operate a certain element from this particular address. The default value is **On**. ● The following describes how it works: 1. First, create a **Maintained Button** element and set its **Write Address** as $44.0. Next, set the **Write Address** as $555 and the **Interlock Address** as

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3">Interlock Display Mode</td><td>$44.0 for the Numeric Entry element.
2. In order for the Numeric Entry element $555 to become operable, press the Maintained Button element $44.0 to enable $555.
 

The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 
</td></tr>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
<tr><td>(9)</td><td>Trigger Mode</td><td>● The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><th>Before Writing</th><th>After Writing</th></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>Trigger Addr. turns ON only after changing values.</td></tr>
</table>
● The Trigger Mode function only switches the set Trigger Addr. to ON, users need to set the Trigger Addr. to OFF if they need to trigger again.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Trigger Addr.</td><td>
<table>
<tr><th>Trigger Flowchart Before Writing</th><th>Trigger Flowchart After Writing</th></tr>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
</table>
</td></tr>
<tr><td rowspan="2">(10)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td rowspan="2">Invisible State is On</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
</td></tr>
<tr><td> 
</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td></tr>
</table>

- Unit conversion

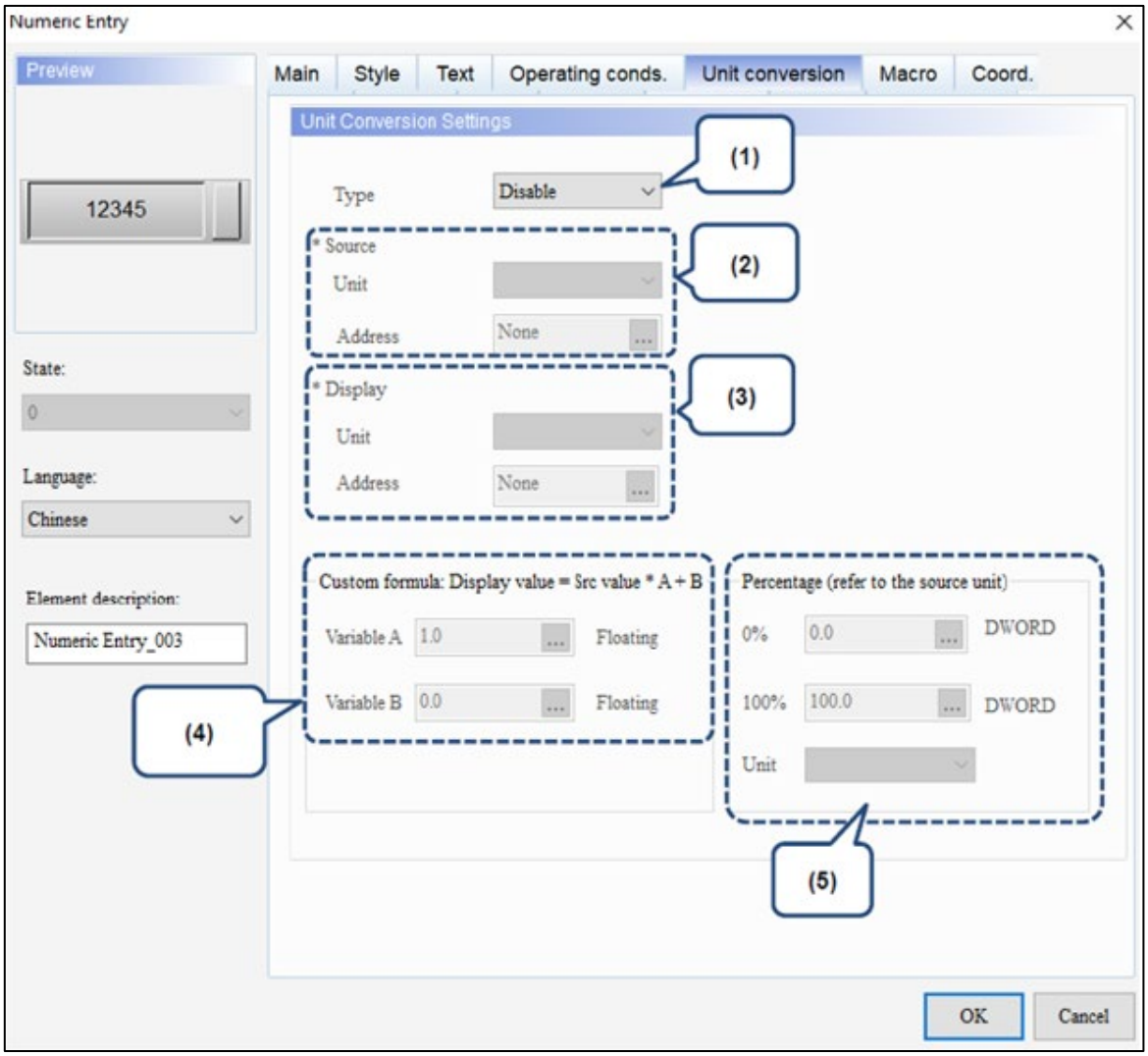
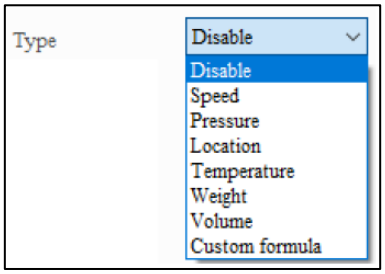
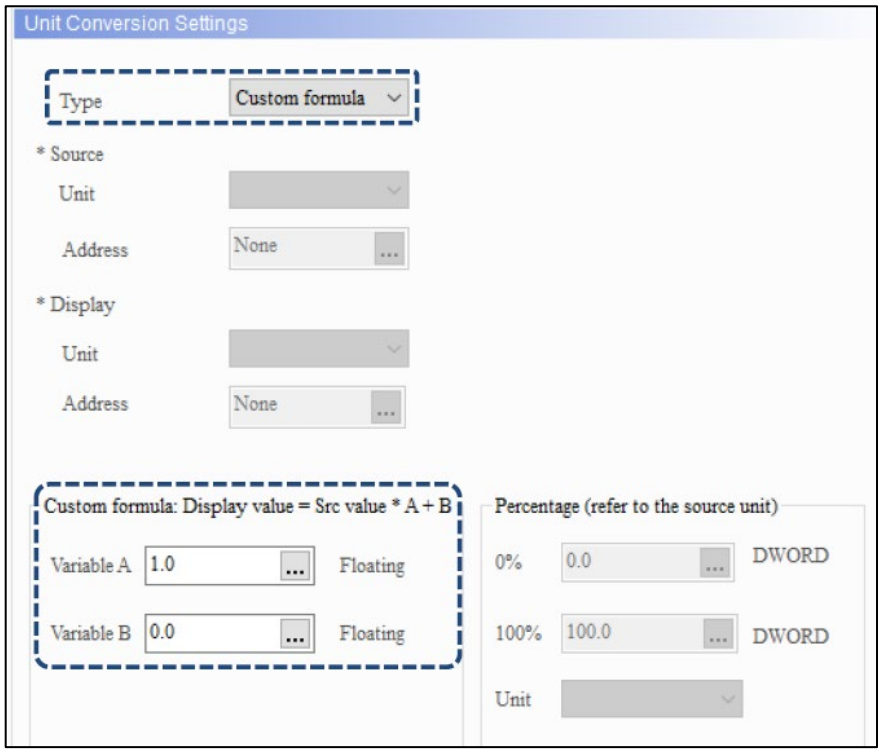


Figure 13 - 7: Numeric Entry element Unit conversion property page

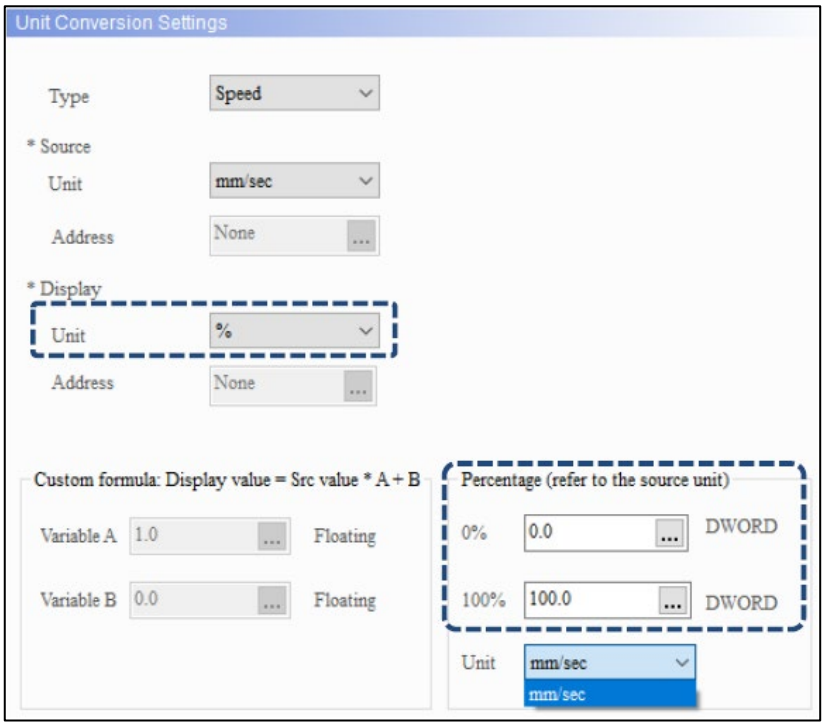
No.	Function	Description
(1)	Type	● Select the conversion **Type** to: Speed, Pressure, Location, Temperature, Weight, Volume, and Custom formula. The default value is **Disable**.  ● If users select Disable, it means that the value does not need Unit conversion. ● When selecting the Custom formula for the **Type**, enter values for **Variable A** and **Variable B**. The unit of **Variable A** and **Variable B** is Floating, and the Custom formula is **Display value = Src value * A + B**. 
(2)	Source	● The **Unit** depends on the **Type** selected. The following table shows the **Unit** corresponding to each **Type**.

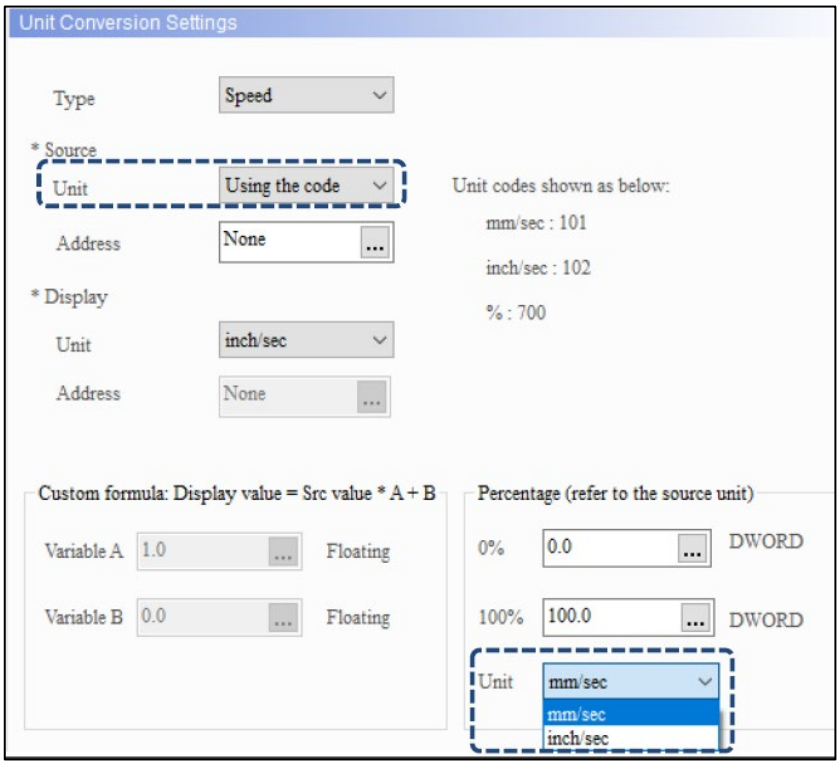
No.	Function	Description

Type	Unit
Speed	mm/sec
	inch/sec
	%
	Using the code
Pressure	kg/cm^2
	bar
	MPa
	psi
	%
	Using the code
Location	mm
	inch
	%
	Using the code
Temperature	°F
	°C
	%
	Using the code
Weight	t (ton)
	kN
	g
	oz
	%
	Using the code
Volume	L
	ml
	kL
	%
	Using the code

- When users select % (Percentage) or Using the code as the **Unit** for either the **Source** or **Display**, the **Percentage** setting section is enabled.

No.	Function	Description
		● When the **Percentage** setting section allows data input, users need to define the values for **0%** and **100%** which **Unit** setting refers to the **Source**.





● When users select Using the code as the **Unit**, it means they can enter variables to specify the unit codes for the **Source** and **Display**. The unit codes are as follows.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Type</th><th>Unit</th><th>Code</th></tr>
<tr><td rowspan="3">Speed</td><td>mm/sec</td><td>101</td></tr>
<tr><td>inch/sec</td><td>102</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="5">Pressure</td><td>kg/cm</td><td>201</td></tr>
<tr><td>bar</td><td>202</td></tr>
<tr><td>MPa</td><td>203</td></tr>
<tr><td>psi</td><td>204</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="3">Location</td><td>mm</td><td>301</td></tr>
<tr><td>inch</td><td>302</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="3">Temperature</td><td>ºF</td><td>401</td></tr>
<tr><td>ºC</td><td>402</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="5">Weight</td><td>ton</td><td>501</td></tr>
<tr><td>kN</td><td>502</td></tr>
<tr><td>g</td><td>503</td></tr>
<tr><td>oz</td><td>504</td></tr>
<tr><td>%</td><td>700</td></tr>
<tr><td rowspan="4">Volume</td><td>L</td><td>601</td></tr>
<tr><td>ml</td><td>602</td></tr>
<tr><td>kL</td><td>603</td></tr>
<tr><td>%</td><td>700</td></tr>
</table>

User-defined address is available only when users select Using the code for the Unit.
If users select Using the code as the Unit for both the Source and Display, do not use the same address.

</td></tr>
<tr><td>(3)</td><td>Display</td><td>

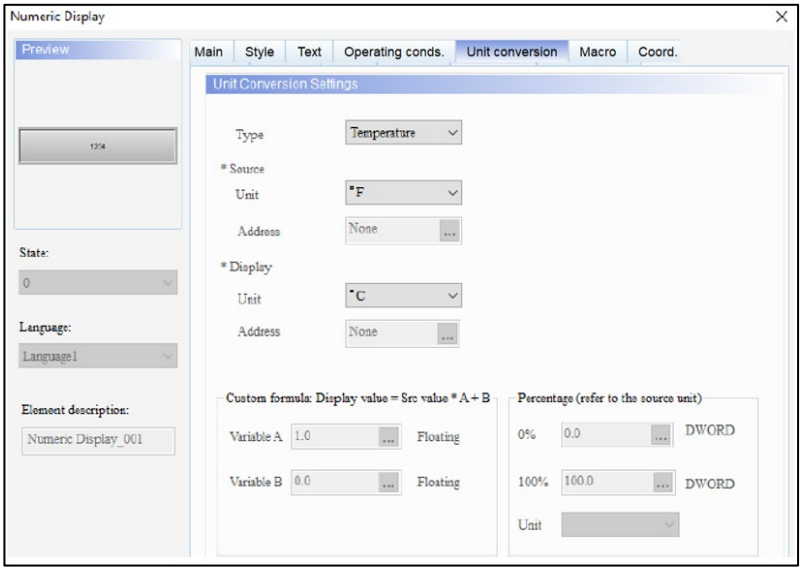
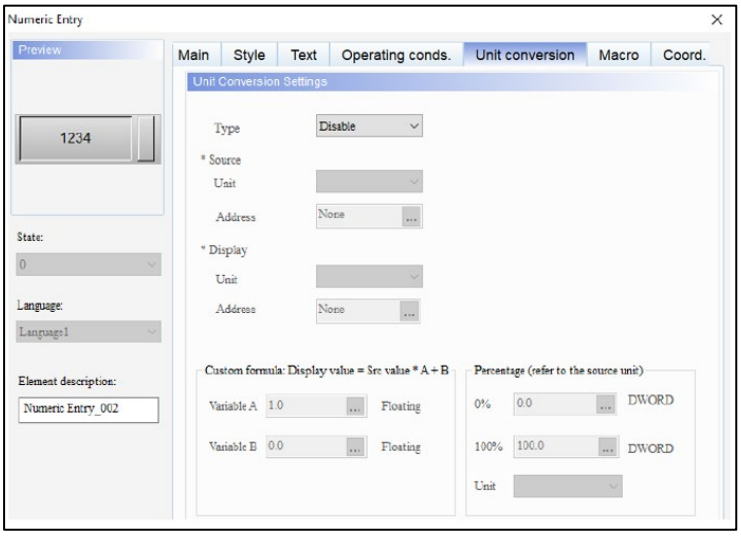
Refer to the Source description for details about the Unit.
User-defined address is available only when users select Using the code for the Unit.
If users select Using the code as the Unit for both the Source and Display, do not use the same address.

</td></tr>
</table>

No.	Function	Description
(4)	Custom formula	● **Variable A** and **Variable B** support input external / Internal Memory addresses and constants. ● When selecting the Custom formula for the **Type**, enter values for **Variable A** and **Variable B**. The unit of **Variable A** and **Variable B** is Floating, and the Custom formula is **Display value = Src value * A + B**.
(5)	Percentage setting	● Enter external / Internal Memory addresses and constants for both setting values of **0%** and **100%**. ● When users select % (Percentage) or Using the code as the **Unit** for either **Source** or **Display**, the **Percentage** setting section is enabled. ● The **Unit** is subject to change based on the **Source** unit setting. Take the Speed setting for example. If users select % (Percentage) or Using the code as the **Source** unit, select mm/sec or inch/sec from the **Unit** drop-down list box in the **Percentage** setting section; if users select mm/sec for the **Source** unit, mm/sec is the only unit available in the **Percentage** setting section.

Refer to the following Unit conversion examples.

<table>
<tr><th colspan="6">Unit Conversion (Unit Fixed)</th></tr>
<tr><td rowspan="3">Address settings</td><td colspan="2">Numerical Display Element (Display)</td><td colspan="3">Numeric Entry Element (Source)</td></tr>
<tr><td>Read Address</td><td>$10</td><td colspan="2">Write Address</td><td>$10</td></tr>
<tr><td colspan="2"> 
</td><td colspan="3"> 
</td></tr>
<tr><td rowspan="3">Detail settings</td><td colspan="5">Numerical Display / Numeric Entry Element</td></tr>
<tr><td>Data Type</td><td>Data Format</td><td>Integer Digits</td><td colspan="2">Fractional</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>5</td><td colspan="2">0</td></tr>
</table>

Unit Conversion (Unit Fixed)	
Unit conversion settings	● Double-click the **Numerical Display** element and go to **Unit conversion** property page. Select Temperature for the **Type**, °F for the **Source Unit**, and °C for the **Display Unit**.  ● Since the **Numeric Entry** element does not need unit conversion, set the **Type** to Disable. 
Execution result	After creating the elements, compile and download the data to the HMI. Then, enter 50 (°F) to the **Numeric Entry** element and the **Numeric Display** element converts the temperature to 10 (°C). 

Unit Conversion (Using the code)

Address settings

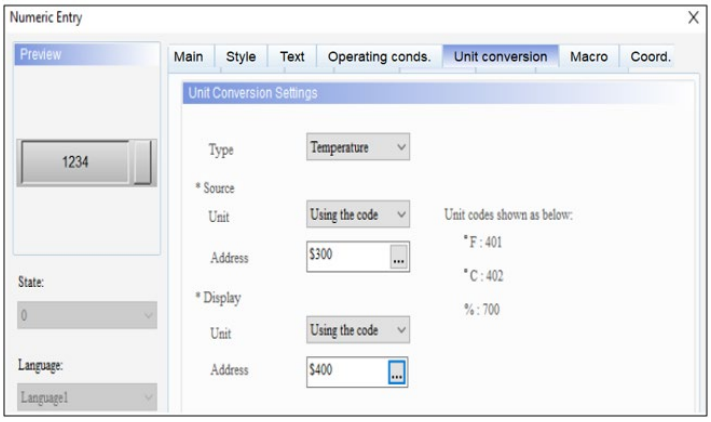
Numeric Entry Element		Numeric Entry Element (Source)		Numeric Entry Element (Display)	
Read Address	$10	Write Address	$300	Write Address	$400
W:$10 #####		W:$300 #####		W:$400 #####	

Detail settings

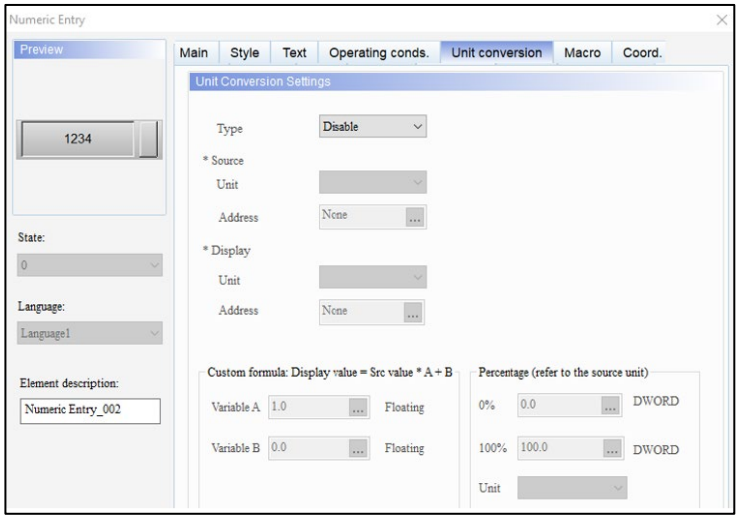
Numeric Entry Element			
Data Type	Data Format	Integer Digits	Fractional
Word	Unsigned decimal	5	0

Unit conversion settings

- Double-click the **Numeric Entry** element of $10 and go to **Unit conversion** property page. Select Temperature for **Type**. For the **Source** settings, select Using the code for the **Unit** and set $300 for **Write Address**; for the **Display** settings, select Using the code for the **Unit** and set $400 for the **Write Address**.

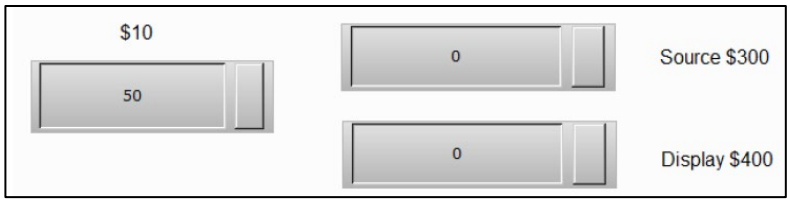


- Since the **Numeric Entry** elements of $300 and $400 do not need unit conversion, select Disable for **Type**.

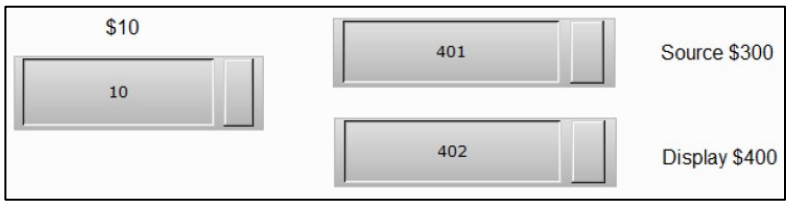


<table>
<tr><th colspan="2">Unit Conversion (Using the code)</th></tr>
<tr><td>Execution result</td><td>

After creating the elements, compile and download the data to the HMI, and then enter 50 for $10.



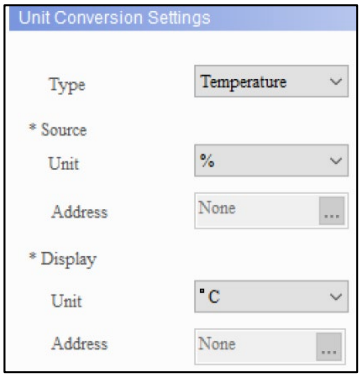
Enter 401 (means °F) for $300 and enter 402 (means °C) for $400, and then $10 converts the value to 10 (°C).



</td></tr>
</table>

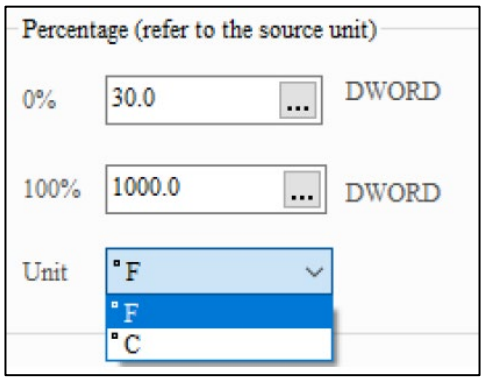
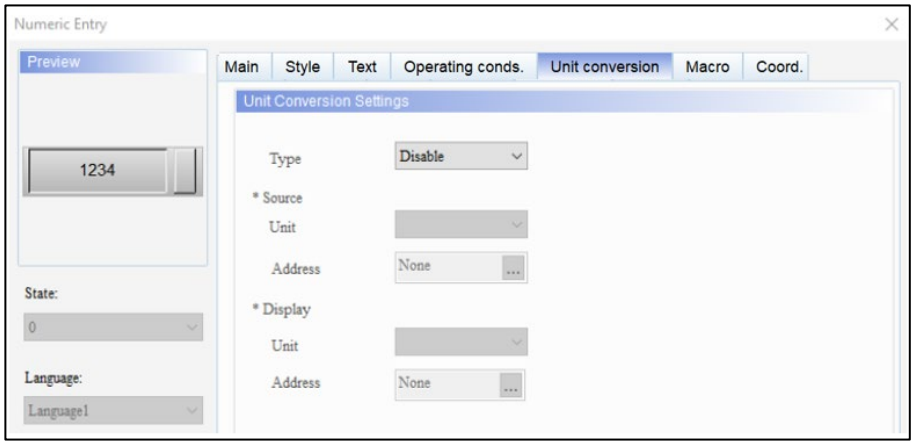
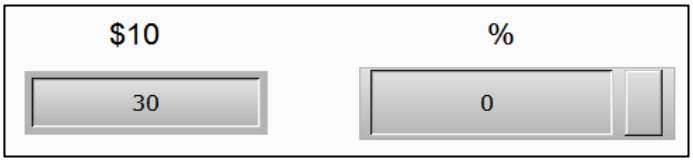
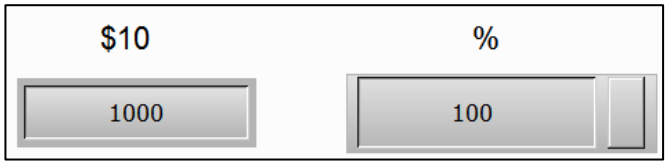
<table>
<tr><th colspan="2">Unit Conversion (%)</th></tr>
<tr><td>Address settings</td><td>
<table>
<tr><th colspan="2">Numerical Display Element (Display)</th><th colspan="2">Numeric Entry Element (Source)</th></tr>
<tr><td>Read Address</td><td>$10</td><td>Write Address</td><td>$10</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>
<table>
<tr><th colspan="4">Numerical Display / Numeric Entry Element</th></tr>
<tr><td>Data Type</td><td>Data Format</td><td>Integer Digits</td><td>Fractional</td></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>5</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Unit conversion settings</td><td>

Double-click the Numeric Display element of $10. Go to the Unit conversion property page, select Temperature for Type, and set the Source unit to % and the Display unit to °C.



For the Percentage setting, set 0% to 30.0 and 100% to 1000.0.
Since the Source unit is %, the Percentage setting unit can be

</td></tr>
</table>

Unit Conversion (%)	
	°F or °C. In this example, °F is used as the **Unit**.  ● Since the **Numeric Entry** element of $10 does not need unit conversion, select Disable for **Type**. 
Execution result	● After creating the elements, compile and download the data to the HMI. The value for the **Numeric Entry** element of $10 is 0, so the **Numeric Display** element displays 30, meaning the value for 0% is 30.  ● Set $10 to 100, the **Numeric Display** element displays 1000, meaning the value for 100% is 1000. 

- Macro

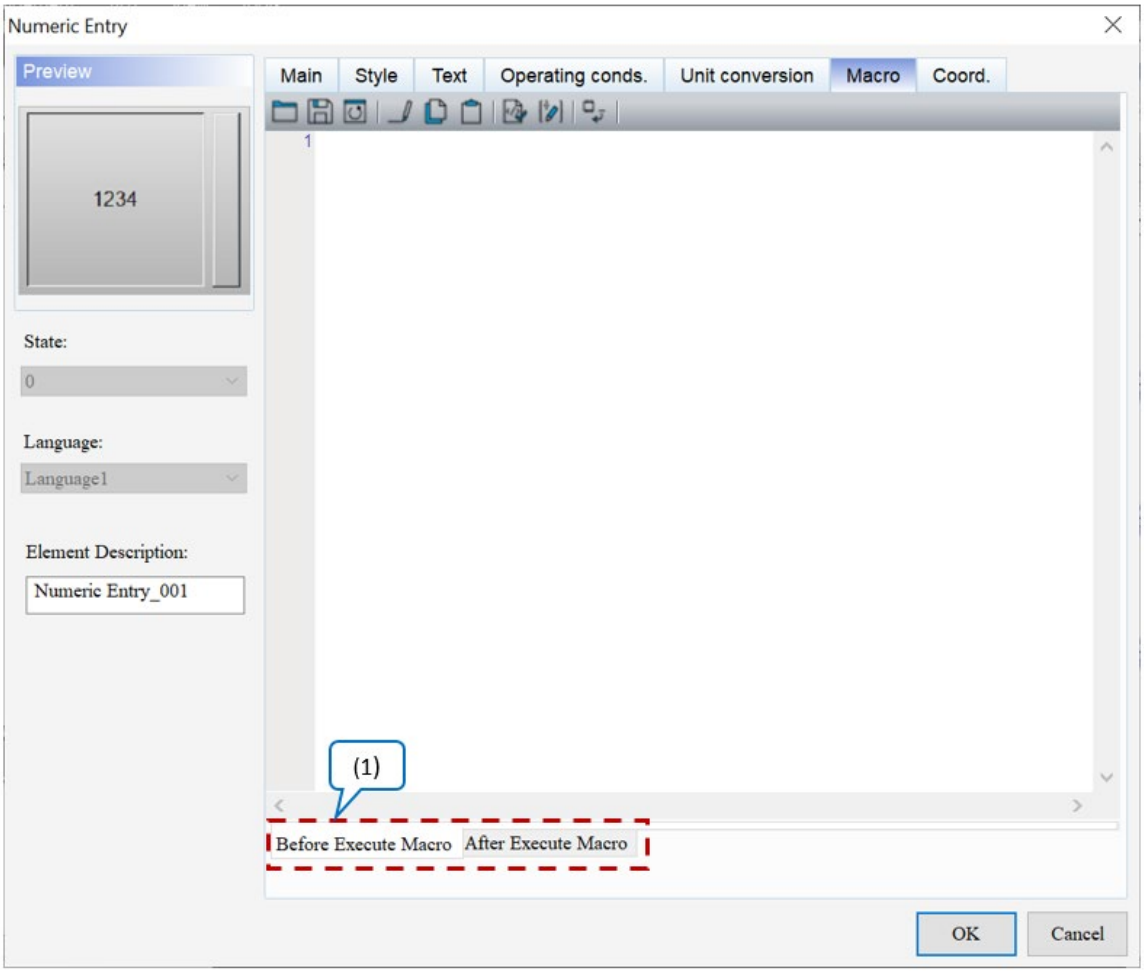
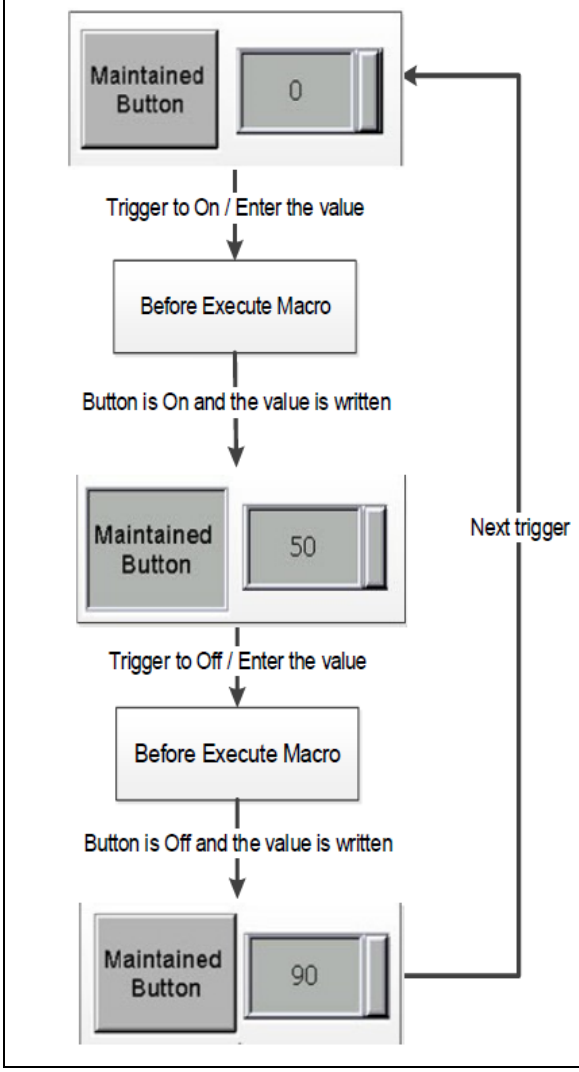
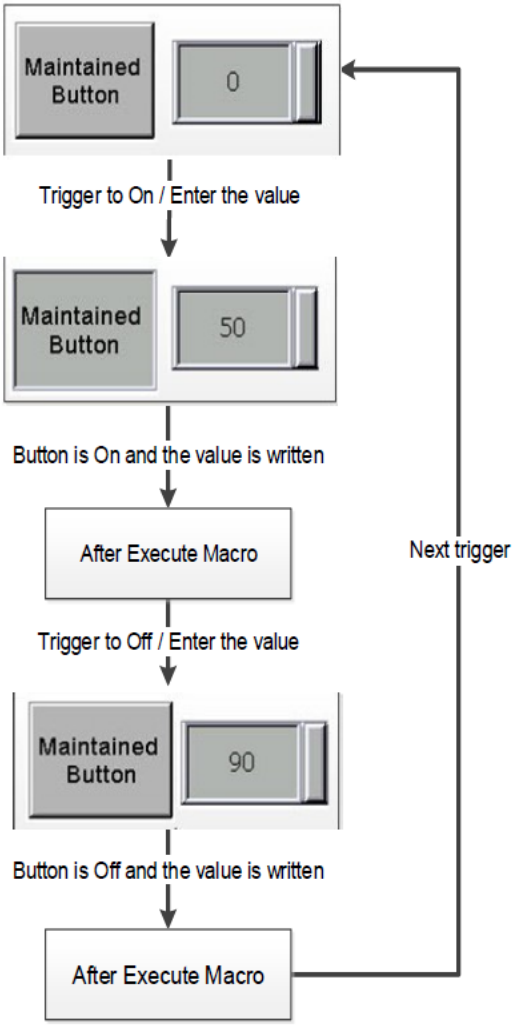


Figure 13 - 8: Numeric Entry element Macro property page

No.	Function	Description
(1)	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

Flowchart of Before Execute Macro	Flowchart of After Execute Macro
	

- Coord.

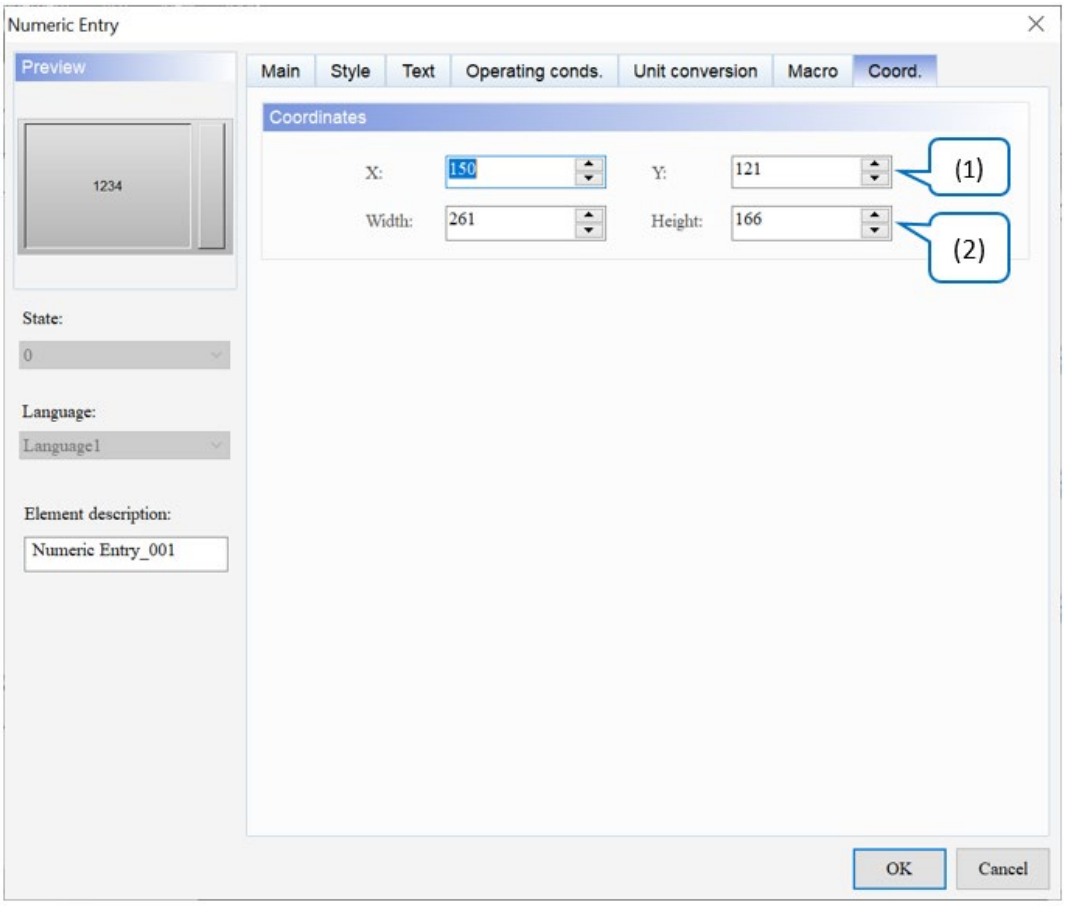


Figure 13 - 9: Numeric Entry element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

13.2 Character Entry

The **Character Entry** element only supports the ASCII code input, so the format of the display and input is character. Switch to the ASCII input mode with the ALT key, as shown in the following figure.



Figure 13 - 10: ASCII keyboard

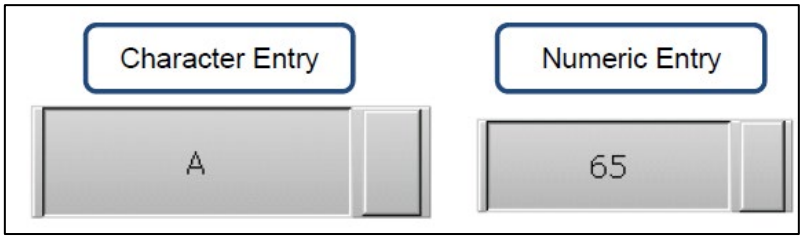


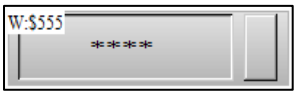
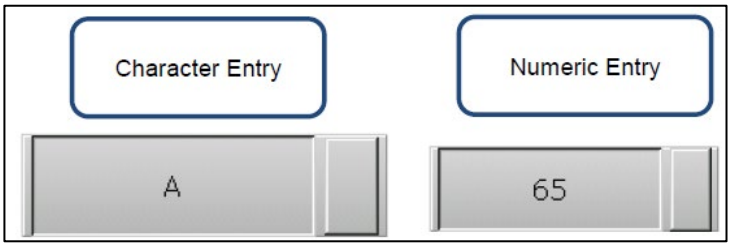
Figure 13 - 11: ASCII keyboard

The following conversion table shows the conversion between Data Formats and characters from A to G. The remaining characters can be deduced with the same pattern.

Unsigned Decimal	Hexadecimal	Character
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G

If users input character A to the **Character Entry** element, the **Numeric Entry** element displays 65 (Unsigned Decimal).



<table>
<tr><th colspan="2">Character Entry</th></tr>
<tr><td>Address settings</td><td>
<table>
<tr><th colspan="2">Character Entry Element</th><th colspan="2">Numeric Entry Element</th></tr>
<tr><td>Write Address</td><td>$555</td><td>Write Address</td><td>$555</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>
<table>
<tr><th colspan="4">Character Entry Element</th></tr>
<tr><td colspan="3">String Length</td><td>4</td></tr>
<tr><th colspan="4">Numeric Entry Element</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Integer Digits</th><th>Fractional</th></tr>
<tr><td>Word</td><td>Unsigned Decimal</td><td>4</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Execution result</td><td>After creating the elements, compile and download the data to the HMI. Input A to the Character Entry element, and then the Numeric Entry element displays 65 which is converted from the corresponding ASCII code.
 
</td></tr>
</table>

On double-clicking the **Character Entry** element, the property page appears as follows.

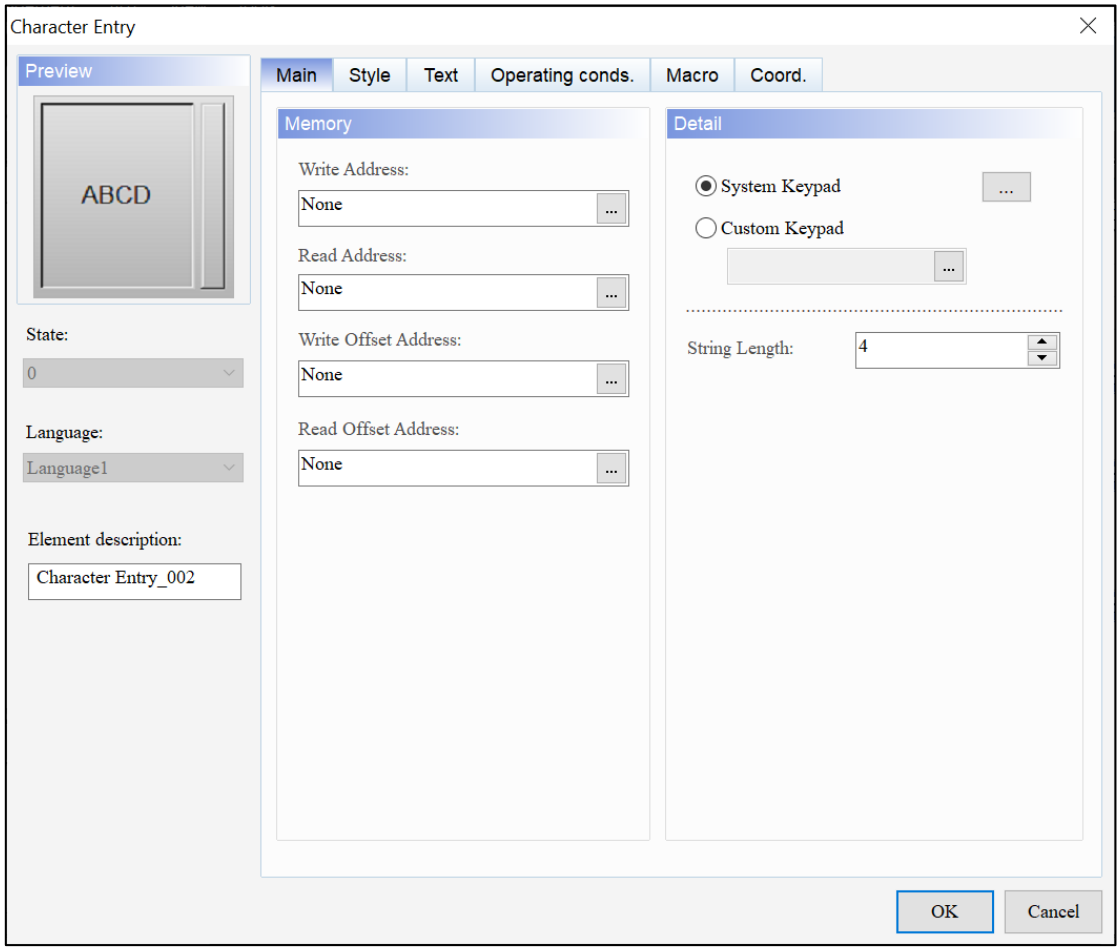


Figure 13 - 12: Character Entry element property page

Character Entry	
Function	**Description**
Preview	There is no multi-state value and multi-language display data for **Character Entry** element.
Main	Set Read Address, Write Address, Read Offset Address, Write Offset Address, System Keypad and String Length.
Style	Set Style, Background Color, Border Color, Filled style, Border Fill Style, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Operating conds.	Set the Input Mode, Interlock State, Interlock Display, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Set Low Security, Mark as Asterisk (*), and Insufficient string length zero.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

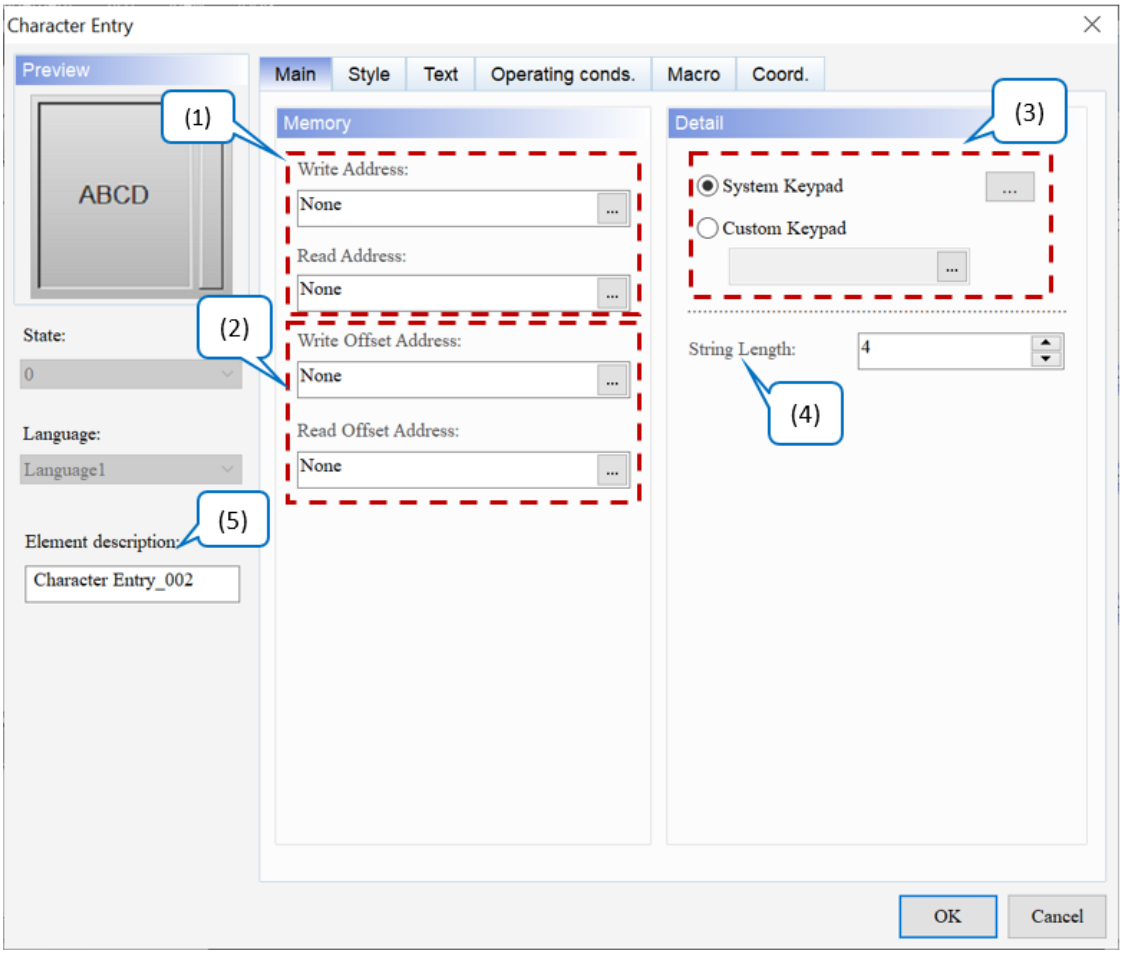
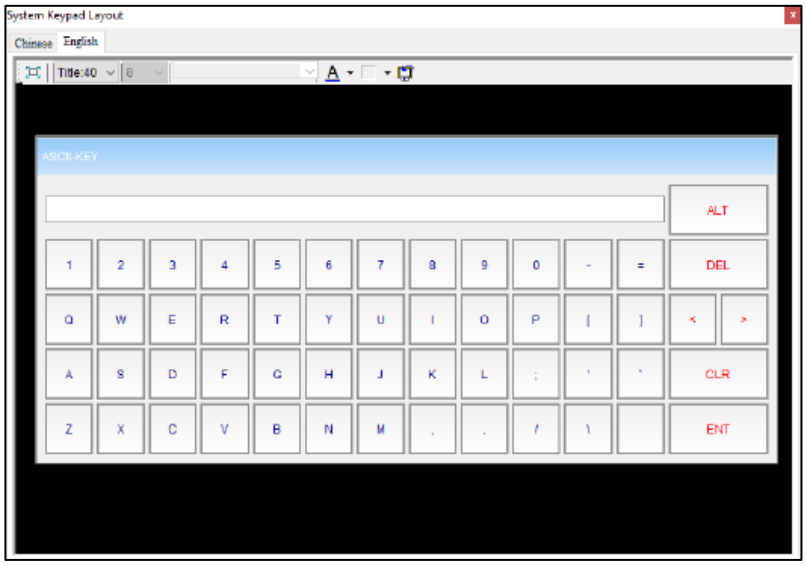
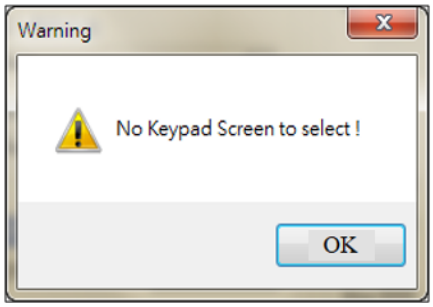


Figure 13 - 13: Character Entry element Main property page

No.	Function	Description
(1)	Write Address Read Address	● Select the Internal Memory or the controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
(2)	Write Offset Address Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(3)	System Keypad	In the **System Keypad Layout** window, adjust the size of the keypad window, title size, font size / type / color of the numeric display, and the background color of the keypad window.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2"></td><td>


<table>
<tr><td></td><td>Select the size of the System Keypad.</td></tr>
<tr><td>Title:40</td><td>Set the title column height.</td></tr>
<tr><td>10</td><td>Set the font size.</td></tr>
<tr><td>Arial</td><td>Set the font type.</td></tr>
<tr><td></td><td>Set the font color.</td></tr>
<tr><td></td><td>Set the background color.</td></tr>
<tr><td></td><td>Default size.</td></tr>
</table>
</td></tr>
<tr><td>Custom Keypad</td><td>Select the Custom Keypad function only if there is a Keypad Screen in the editing screen. When there is no Keypad Screen, the following message displays.
 
</td></tr>
<tr><td>(4)</td><td>String Length</td><td>The String Length ranges from 1 ~ 256. The default value is 4.</td></tr>
</table>

No.	Function	Description
(5)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that the users can easily know the performed actions.

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

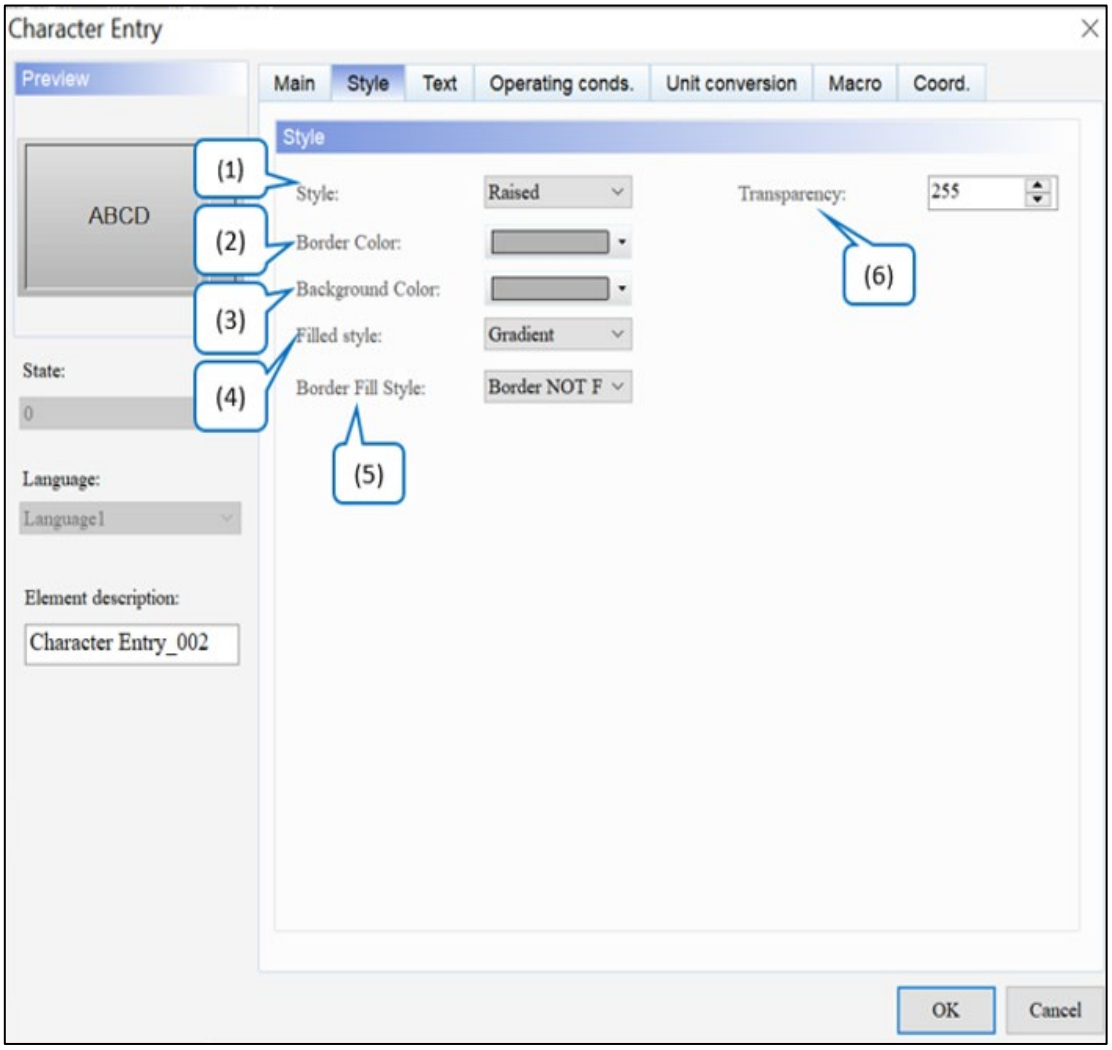
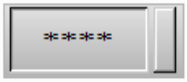
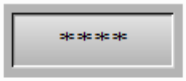
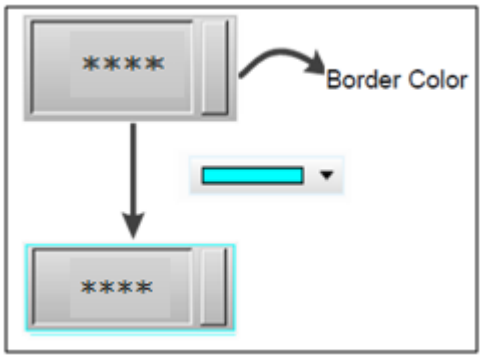


Figure 13 - 14: Character Entry element Style property page

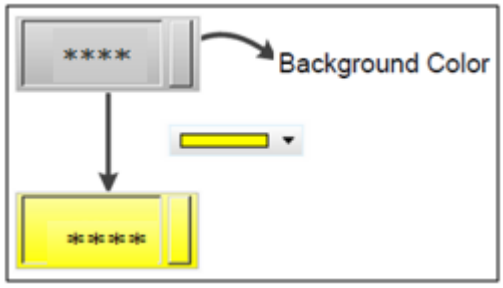
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Style</td><td>This setting allows users to change the appearance of elements. The available options for element Style are: Standard, Raised, Sunken, and Transparent. The default value is Raised.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is  .
When users set the Style to Transparent, the Border Color setting is invalid.



</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is  .
When users set the Style to Transparent, the Background Color setting is invalid.



</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
</table>

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td><table><tr><td>Fixed</td><td> 
</td></tr></table></td></tr>
<tr><td>(5)</td><td>Border Fill Style</td><td>

The border display of the elements on the DOP-100 series models is different from that on the DOP-B series models. To have the border display effect be the same as that on the DOP-B series models, when users open the DOP-B project on a DOP-100 series model, the border is displayed with solid color.
The available options for Border Fill Style are: Border NOT Fill and Border Fill. The default value for the DOP-100 series models is Border NOT Fill, meaning the border of the element is displayed with gradient.

<table>
<tr><td>Border NOT Fill</td><td> 
</td></tr>
<tr><td>Border Fill</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

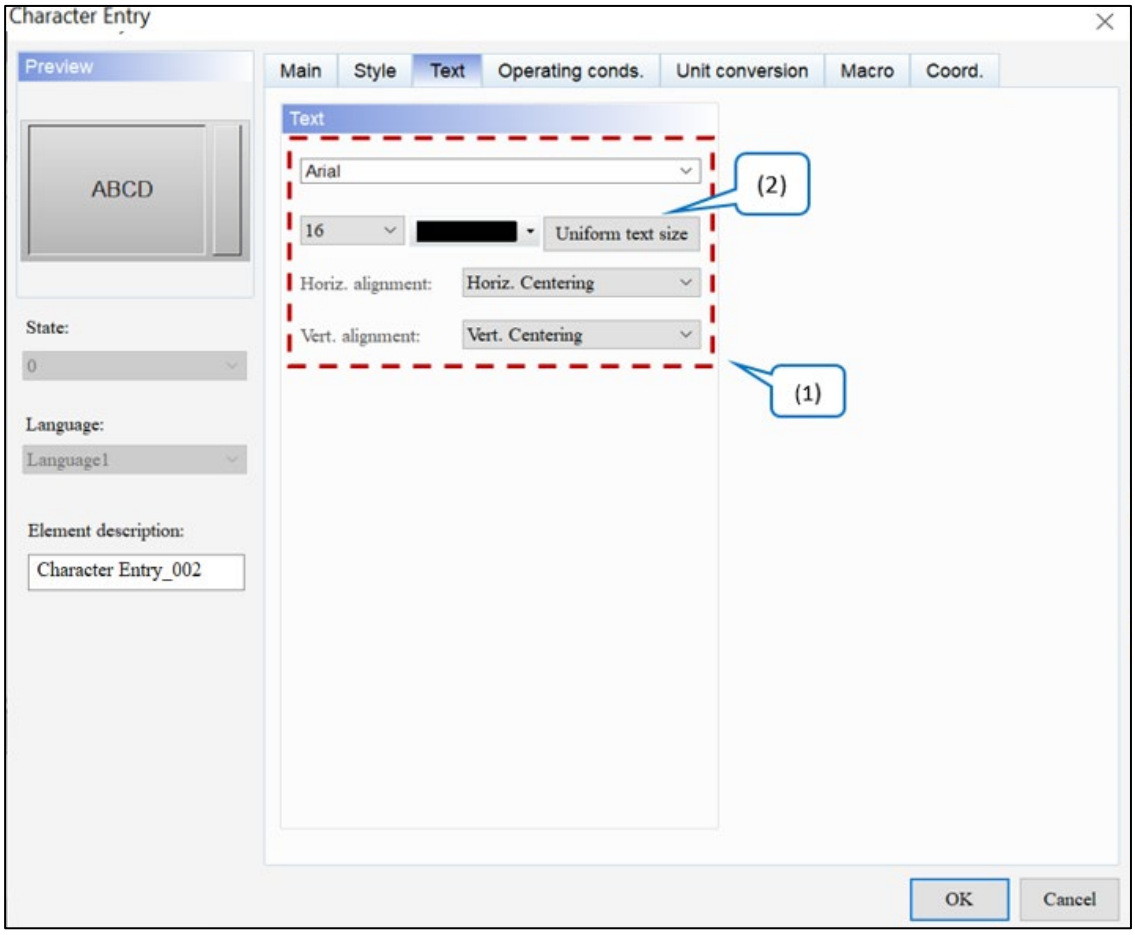


Figure 13 - 15: Character Entry element Text property page

No.	Function	Description
(1)	Text related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(2)	Uniform text size	● This function is for all language texts, and changes the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

- Operating conds.

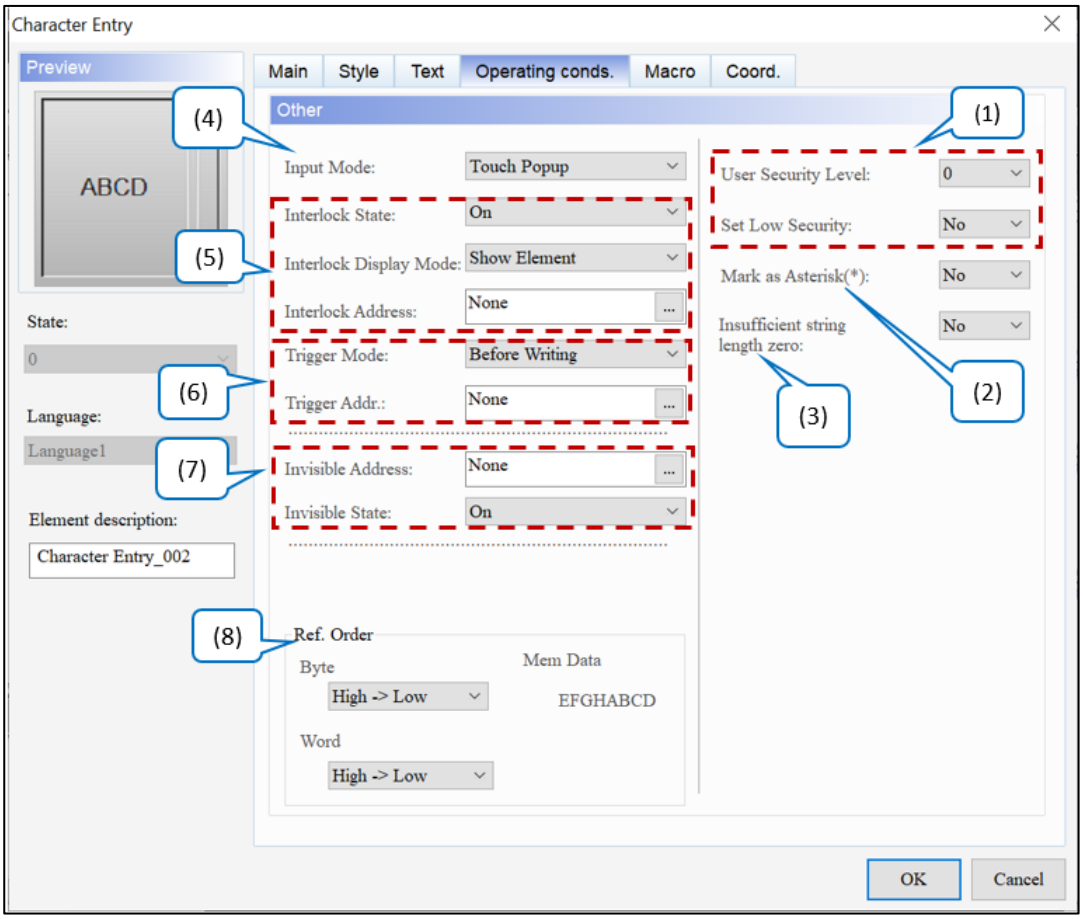
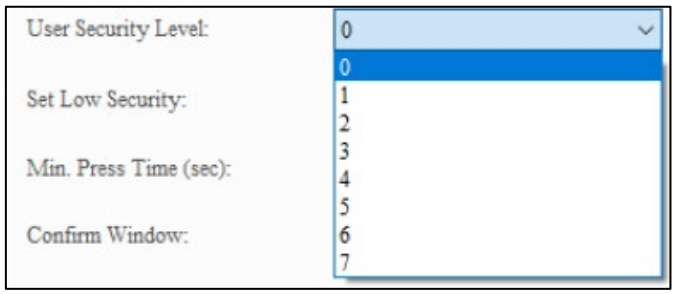
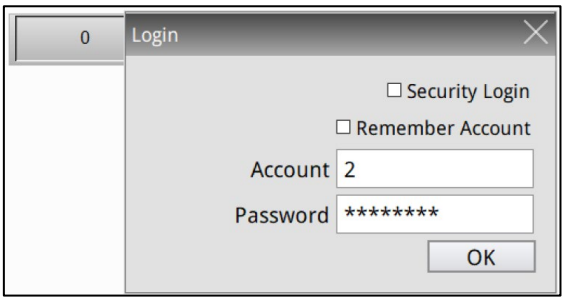
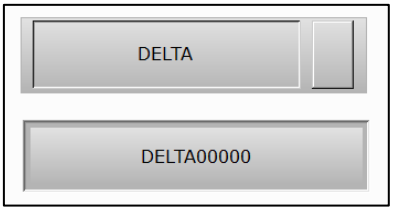
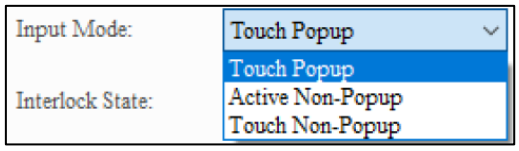


Figure 13 - 16: Character Entry element Operating conds. property page

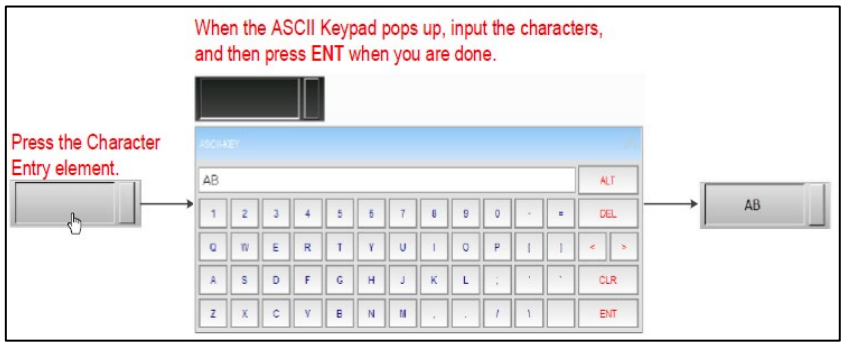
No.	Function	Description
(1)	User Security Level	● This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set **User Security Level**. The default value is **0**.  ● If the **User Security Level** is set, the **Login** window pops up when the element is pressed to confirm whether the

No.	Function	Description
	Set Low Security	security level password is correct (the security level password can be changed by the **Password Table Setting**. Refer to *Section 5.7.2 Password Table*).  ● If users set the **Set Low Security** to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**.
(2)	Mark as Asterisk (*)	If users specify **Mark as Asterisk (*)** to Yes, the value appears as asterisks when users input a value to the ASCII Keypad, as shown in the following figure. The default value is **No**. 
(3)	Insufficient string length zero	When the length of the input string is less than the set length, the remaining characters will be filled in with zeros for display. The default value is **No**. 
(4)	Input Mode	● The available options for **Input Mode** are: Touch Popup, Active Non-Popup, and Touch Non-Popup. The default value is **Touch Popup** for the **Character Entry** element.

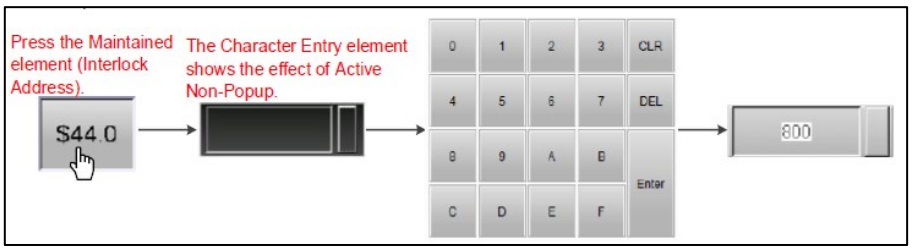
No.	Function	Description



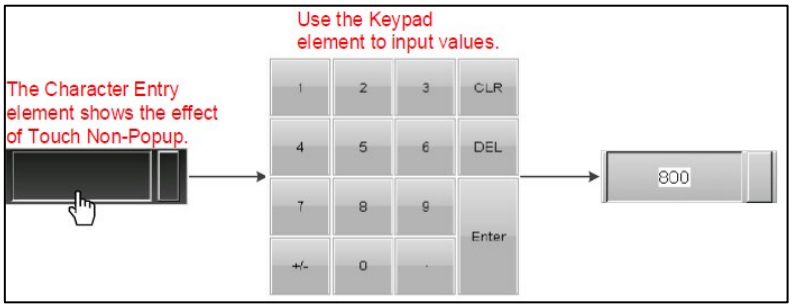
- Touch Popup means that after the **Character Entry** element is pressed, the ASCII Keypad appears.

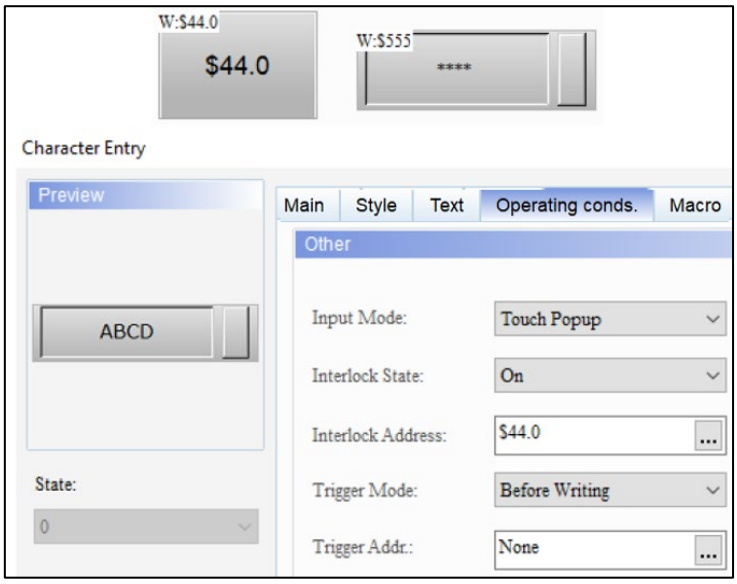


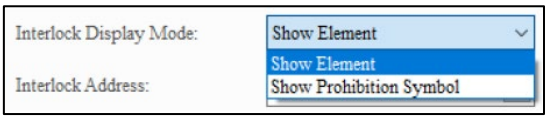
- The ASCII Keypad does not appear with the **Input Mode** set as Active Non-Popup or Touch Non-Popup. Users must create an additional Keypad element.
- Active Non-Popup must be used with **Interlock Address**. Set the **Input Mode** for the **Character Entry** element as Active Non-Popup and the **Interlock Address** as $44.0. Then, create a **Maintained Button** element and set its **Write Address** as $44.0.

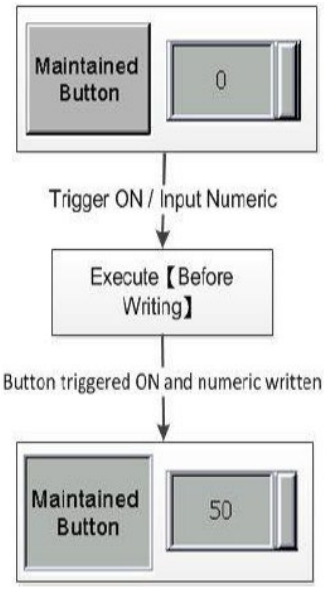
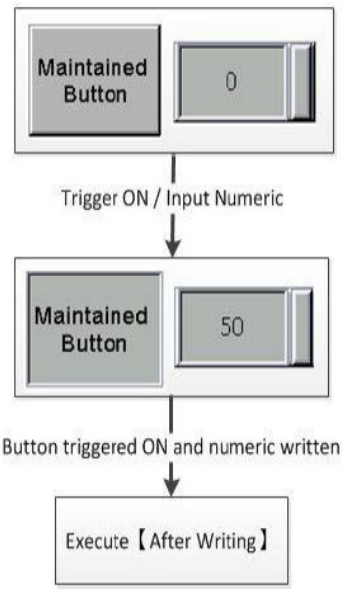


- Like the case of Active Non-Popup, the ASCII Keypad does not appear when the **Input Mode** is set as Touch Non-Popup, so users must create an additional Keypad element.



No.	Function	Description
(5)	Interlock State Interlock Address	● The **Interlock Address** enables to operate a certain element from this particular address, which must be operated along with the **Interlock State**. ● If the **Interlock State** is set to Off/On, the **Interlock Address** enables to operate a certain element from this particular address. The default value is **On**. ● The following describes how it works: 1. First, create a **Maintained Button** and set its **Write Address** as $44.0. Next, set the **Write Address** as $555 and the **Interlock Address** as $44.0 for the **Character Entry** element. 2. In order for the **Character Entry** element $555 to become operable, press the **Maintained Button** $44.0 to enable $555. 

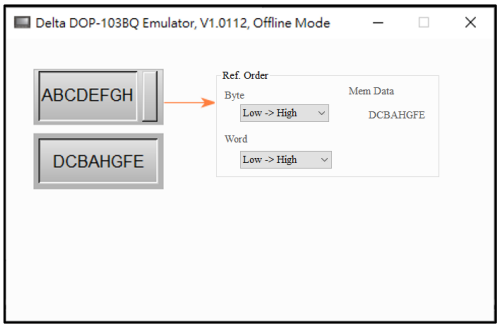
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Interlock Display Mode</td><td>The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 

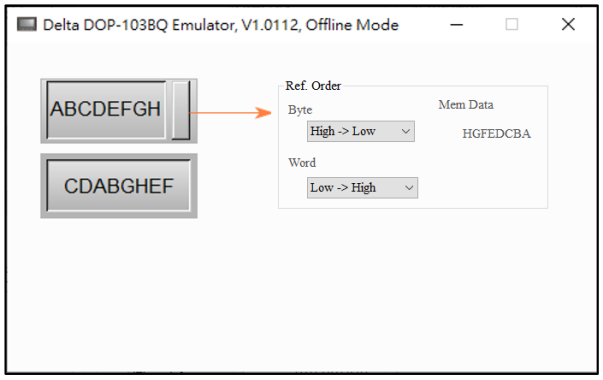
<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table></td></tr>
<tr><td rowspan="2">(6)</td><td>Trigger Mode</td><td>● The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><th>Before Writing</th><th>After Writing</th></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>
● The Trigger Mode function only switches the set Trigger Addr. to ON, users need to set the Trigger Addr. to OFF if they need to trigger again.
<table>
<tr><th>Trigger Flowchart Before Writing</th><th>Trigger Flowchart After Writing</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>Trigger Addr.</td><td></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(7)</td><td>Invisible Address</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

</td></tr>
<tr><td>Invisible State</td><td>
<table>
<tr><td rowspan="2">Invisible State is On</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
</td></tr>
<tr><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(8)</td><td>Ref. Order</td><td>
The Ref. Order is used to set the display mode. DIAScreen provides two modes: Byte and Word. The following two settings are provided for Ref. Order.
<table>
<tr><td>Ref. Order Byte is
Low → High</td><td>Enter ABCDEFGH in the Character Entry element, and the Character Display element reads the swap and writes the result to the memory as DCBAHGFE.
 
</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description	
		Ref. Order Word is Low → High	Input **ABCDEFGH** in the **Character Entry** element, and the result of writing to the memory after reading the swap by the **Character Display** element is CDABGHEF. 

EASCII Instructions for Use

The DOP-100 series support EASCII by default. Enter the contents by simply creating a Keypad Screen or Keypad element. Refer to the following example descriptions for more details:

- The default of this function is Yes meaning the HMI supports Swedish.
- There are IBM and ISO/IEC 8859-1 defined Extended ASCII. The EASCII version is different in every operating system, but most of them follow the characters defined in ISO/IEC 8859-1. Microsoft adopts the definition of ISO/IEC 8859-1, so the HMI also adopts the definition of ISO/IEC 8859-1.

The supported extended symbol table is as follows.

Character						
€	—	¬	¿	Ò	å	ø
‚	˜		À	Ó	æ	ù
ƒ	™	®	Á	Ô	ç	ú
„	š	¯	Â	Õ	è	û
…	›	°	Ã	Ö	é	ü

Character						
†	œ	±	Ä	×	ê	ý
‡	ž	²	Å	Ø	ë	þ
ˆ	Ÿ	³	Æ	Ù	ì	ÿ
‰	¡	´	Ç	Ú	í	
Š	¢	µ	È	Û	î	
‹	£	¶	É	Ü	ï	
Œ	¤	·	Ê	Ý	ð	
Ž	¥	¸	Ë	Þ	ñ	
‘	¦	¹	Ì	ß	ò	
’	§	º	Í	à	ó	
“	¨	»	Î	á	ô	
”	©	¼	Ï	â	õ	
•	ª	½	Ð	ã	ö	
–	«	¾	Ñ	ä	÷	

Method 1: Keypad element

The following describes how the Keypad element works with EASCII.

1. Create a **Character Entry** element. Set the **Write Address** to $100 and **String Length** to 10.

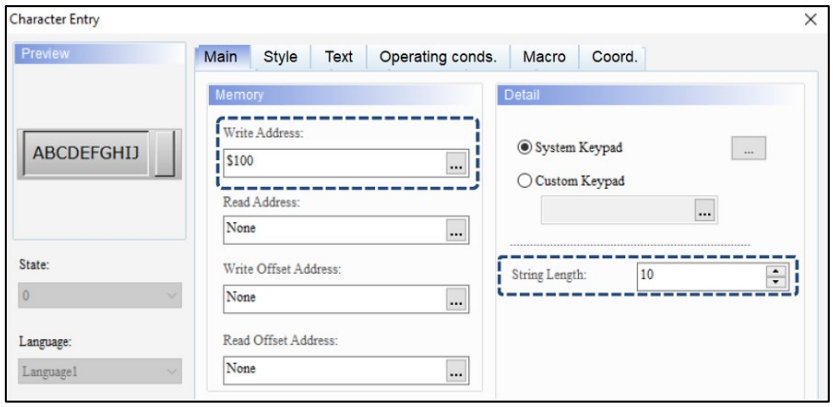


Figure 13 - 17: Setting for Method 1

2. Create a Keypad(2) element:

   a. Enter any of the earlier mentioned extended characters to the **ASCII Display** field.

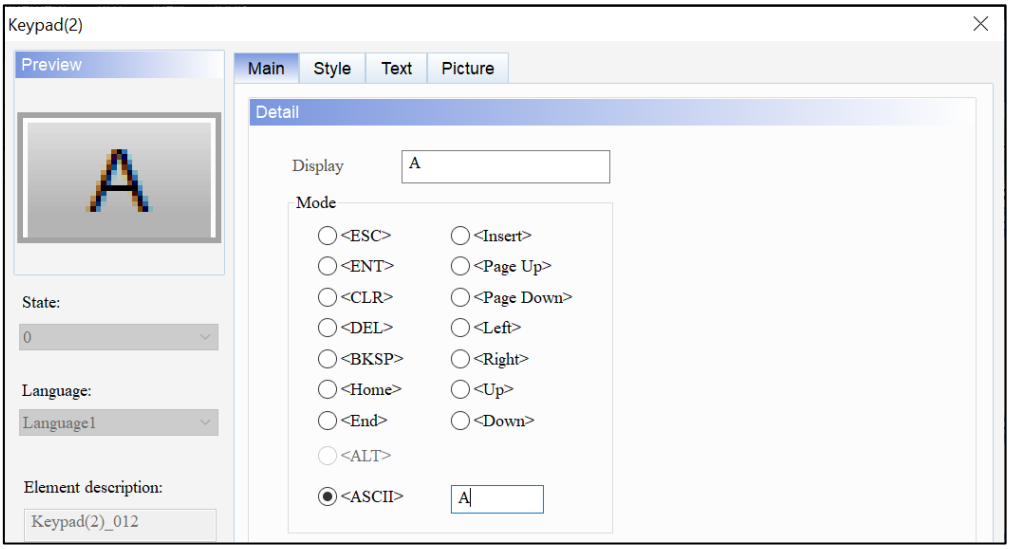


Figure 13 - 18: Keypad(2) element property - ASCII Display

   b. Continue the above steps to complete the setting of all symbols.

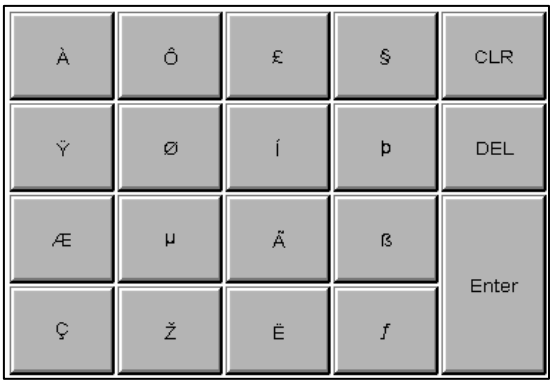


Figure 13 - 19: Set symbol

3. **Compile and download to the HMI**: After completing all settings, compile and download the data to the HMI. First, press the **Character Entry** element, and then extended characters on the keypad. Next, press **Enter**.

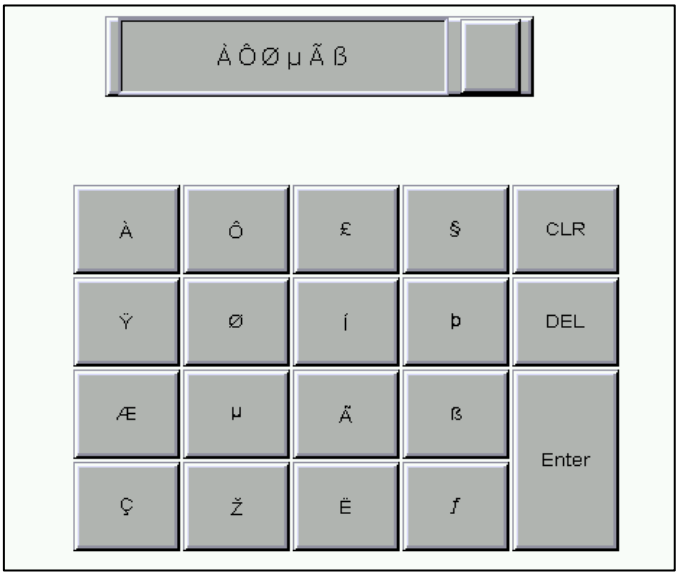


Figure 13 - 20: Execute compile and download to HMI

Method 2: Keypad Screen

The following describes how to create a Keypad Template with the Keypad Screen to work with EASCII.

1. Create a **Character Entry** element. Set the **Write Address** to $100 and **String Length** to 10.

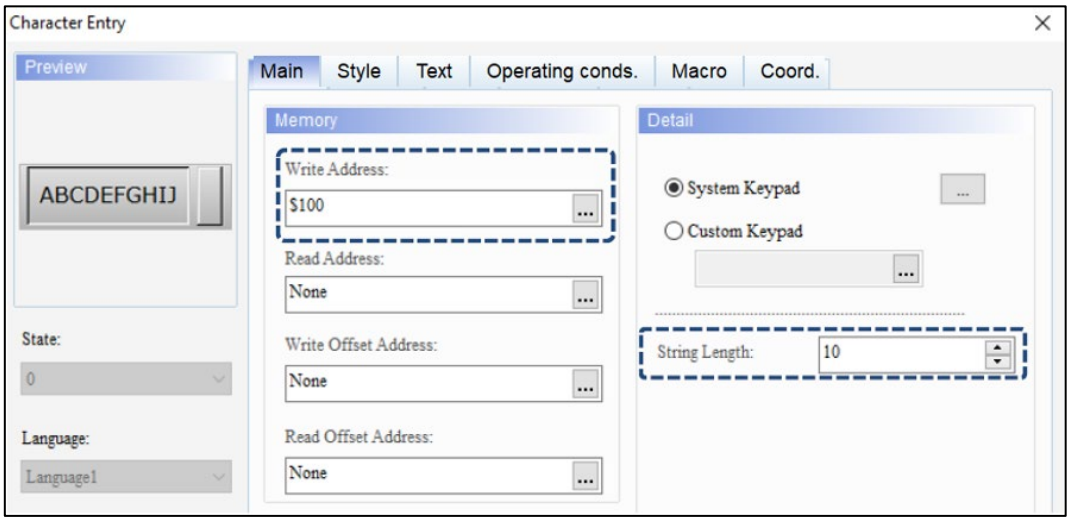


Figure 13 - 21: Setting for Method 2

2. Create a Keypad Screen

   a. Create a new screen and set the **Screen Type** as Keypad Screen.

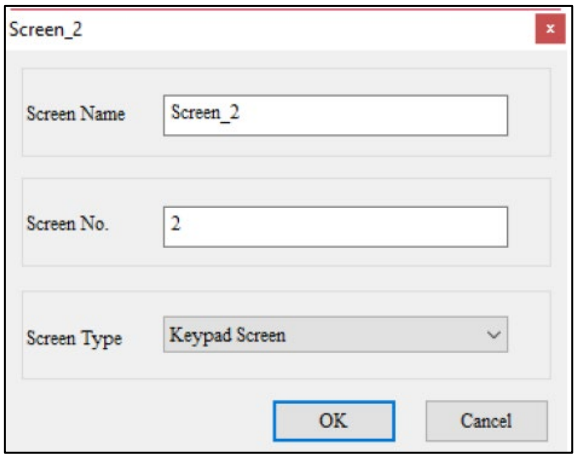


Figure 13 - 22: Create Keypad Screen

   b. Go to **Element Bank**, select **Keypad-Template**, and create an EASCII_Small template keypad.

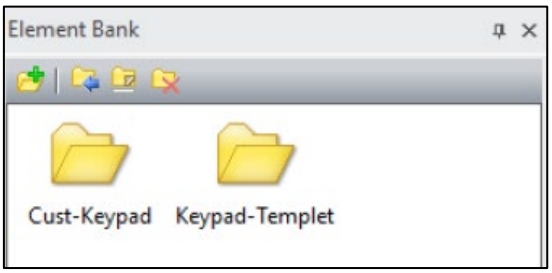


Figure 13 - 23: Select Keypad-Template

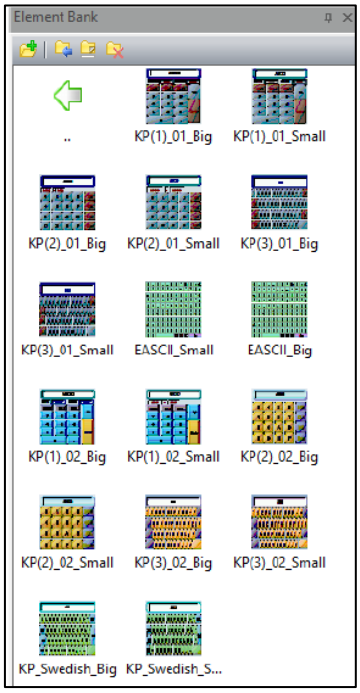


Figure 13 - 24: Create EASCII_Small template keypad

c. The keypad looks like the one shown in the following figure.

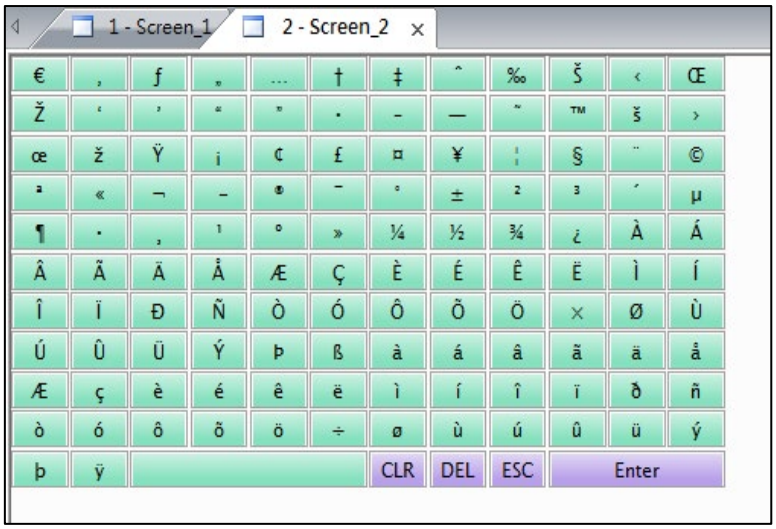


Figure 13 - 25: The keyboard is created

3. Compile and download the data to the HMI: After completing all settings, compile and download the data to the HMI. First, press the **Character Entry** element, then the **Keypad Template** element appears, and then input the

Extended ASCII characters.

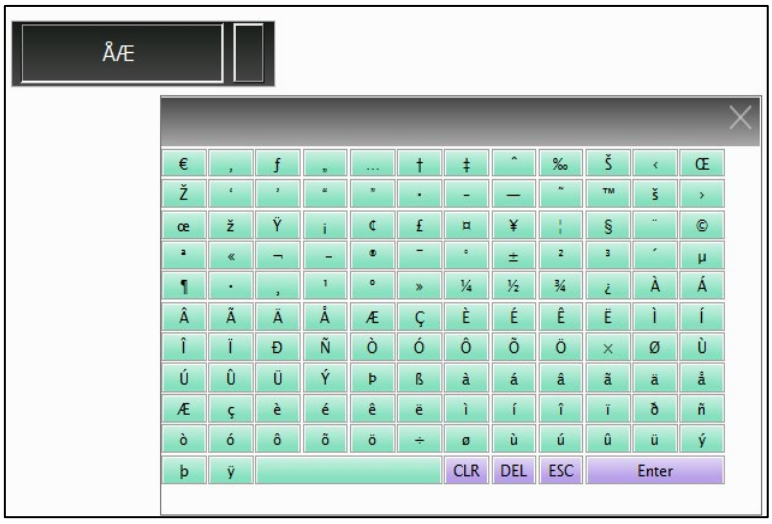


Figure 13 - 26: Execute compile and download to HMI

- Macro

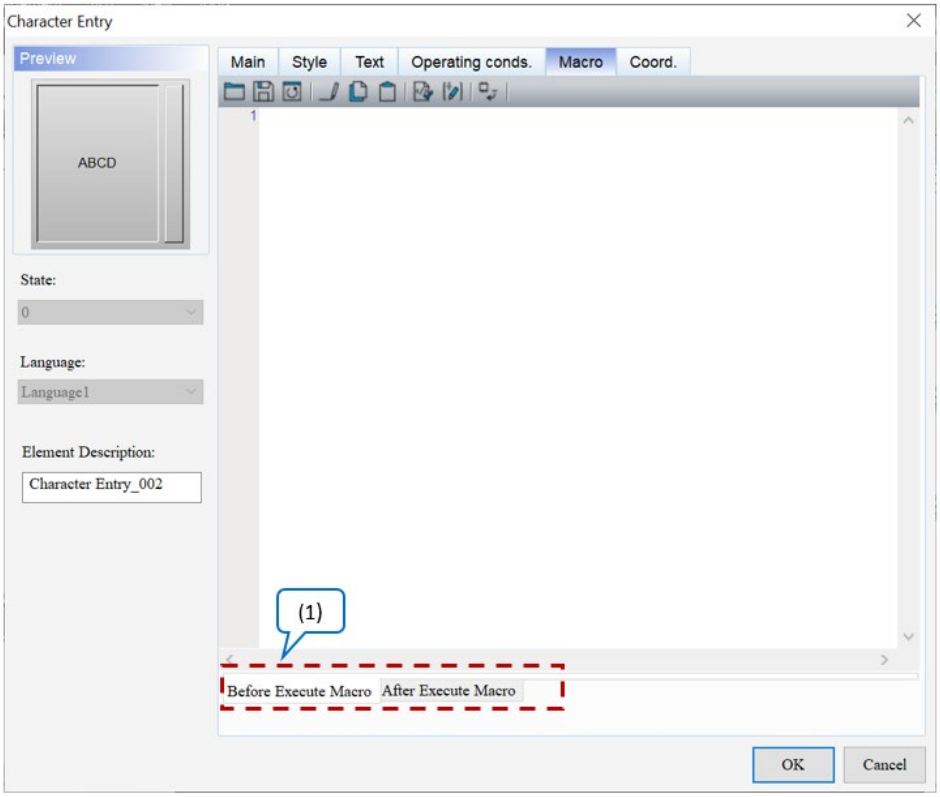
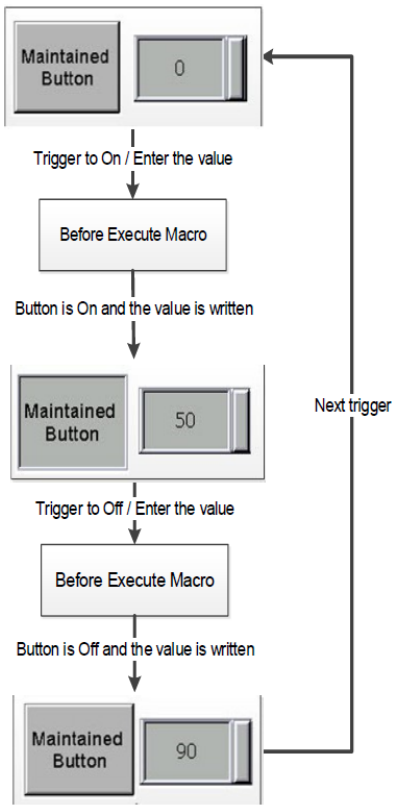
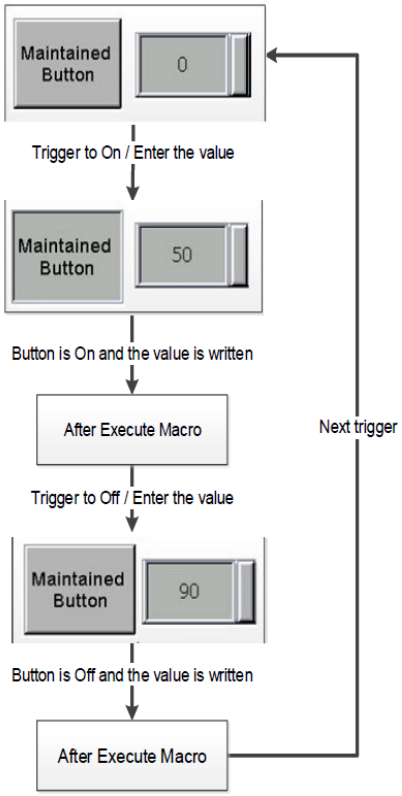


Figure 13 - 27: Character Entry element Macro property page

No.	Function	Description
(1)	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

Flowchart of Before Execute Macro	Flowchart of After Execute Macro
	

- Coord.

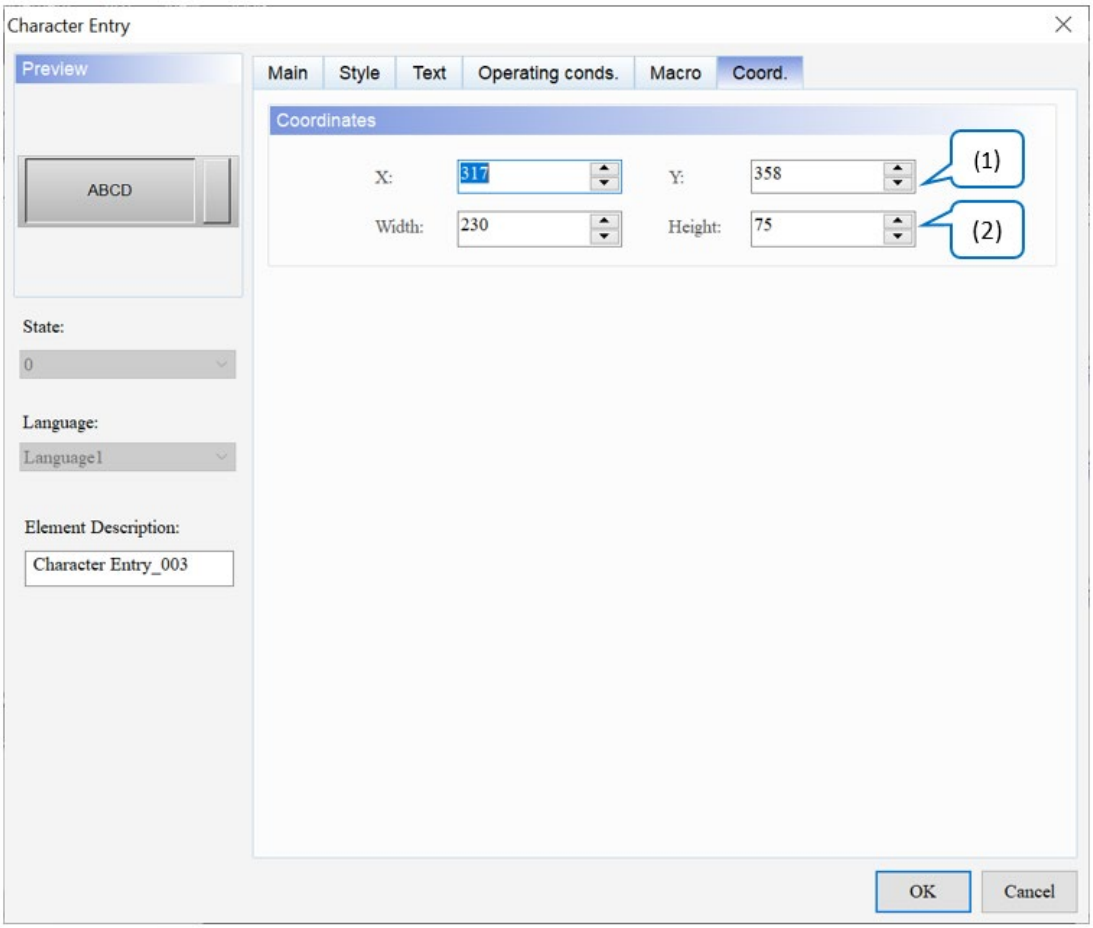


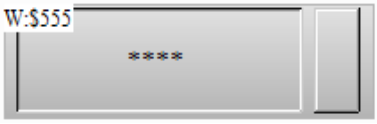
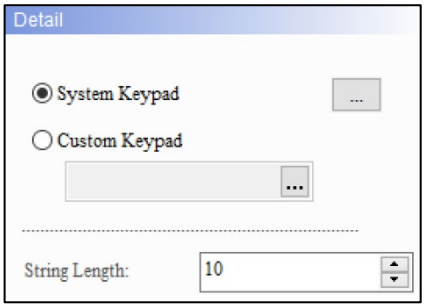
Figure 13 - 28: Character Entry element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

13.3 Barcode Input

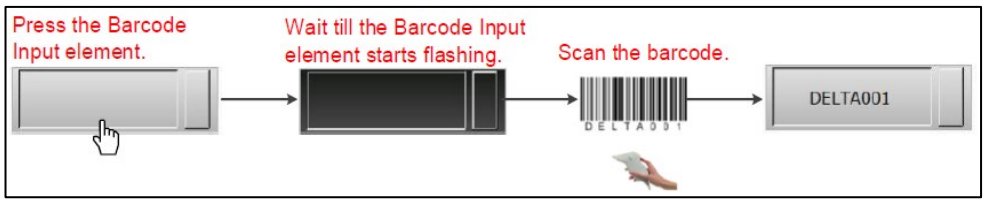
The **Barcode Input** element only supports ASCII one-dimensional barcode input, so the format is character for both the display and input. The barcode reader supported

by the HMI is a scanning device that does not require additional drivers. Refer to the following table for the **Barcode Input** element example.

<table>
<tr><th colspan="2">Barcode Input</th></tr>
<tr><td>Address settings</td><td>
<table>
<tr><th colspan="2">Barcode Input Element</th></tr>
<tr><td>Write Address</td><td>$555</td></tr>
<tr><td colspan="2"> 
</td></tr>
</table>
</td></tr>
<tr><td>Detail settings</td><td>
<table>
<tr><th colspan="2">Barcode Input Element</th></tr>
<tr><td>String Length</td><td>10</td></tr>
</table>


</td></tr>
<tr><td>Execution result</td><td>

After the elements are created, compile and download the data to the HMI, and then connect the barcode reader to HMI. When the HMI recognizes the barcode reader, it beeps once.
Press the Barcode Input element first. When the element starts flashing, scan the barcode, and the codes are displayed on the Barcode Input element.



</td></tr>
</table>

On double-clicking the **Barcode Input** element, the property page appears as follows.

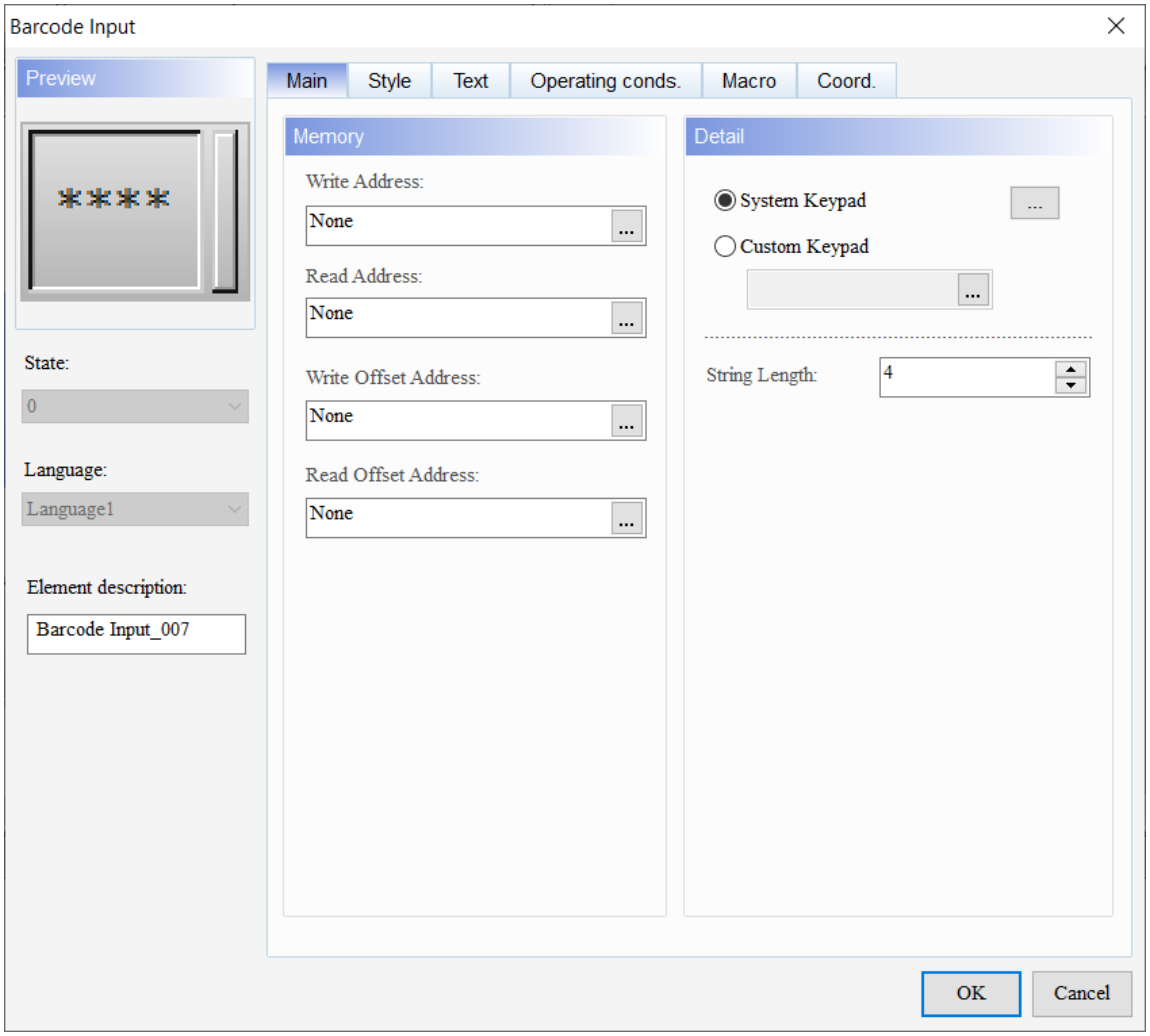


Figure 13 - 29: Barcode Input element property page

Barcode Input	
Function	**Description**
Preview	**Barcode Input** elements do not support multiple state values and display data in multiple languages.
Main	Set Read Address, Write Address, Read Offset Address, Write Offset Address, System Keypad and String Length.
Style	Set Style, Background Color, Border Color, Filled style, Border Fill Style, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Operating conds.	Set the Input Mode, Popup Control Addr., Interlock State, Interlock Display, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Set Low Security, and Mark as Asterisk (*).

Barcode Input	
Function	**Description**
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

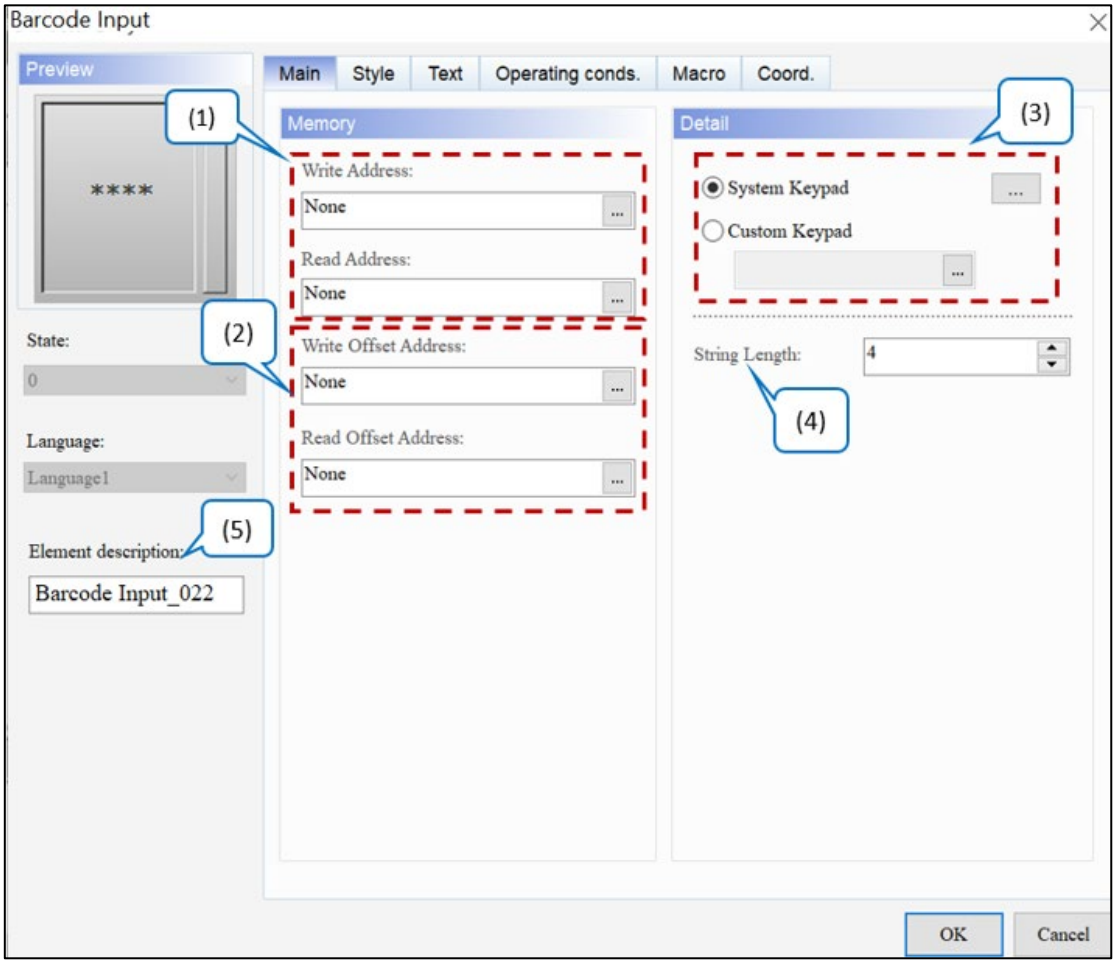
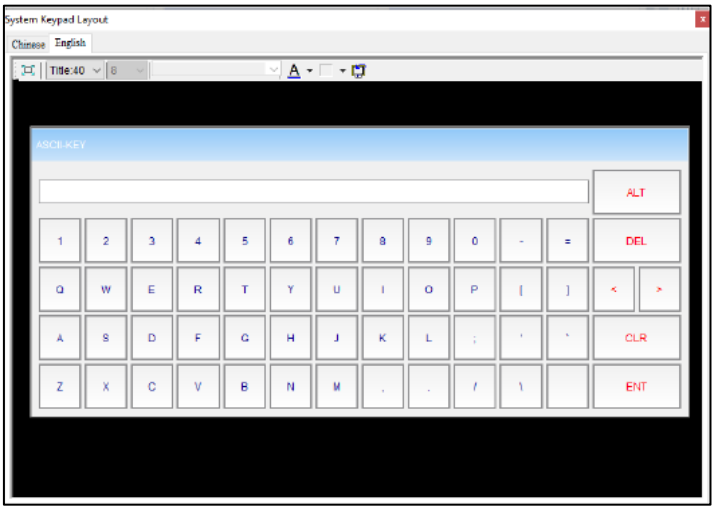
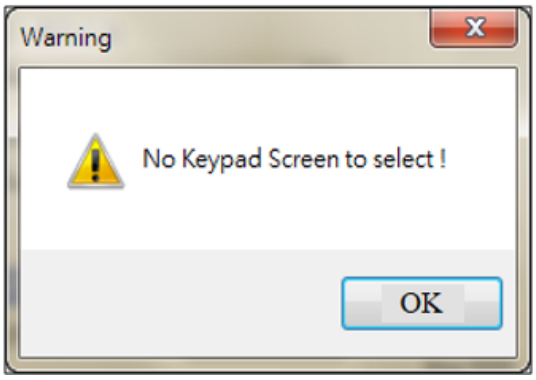
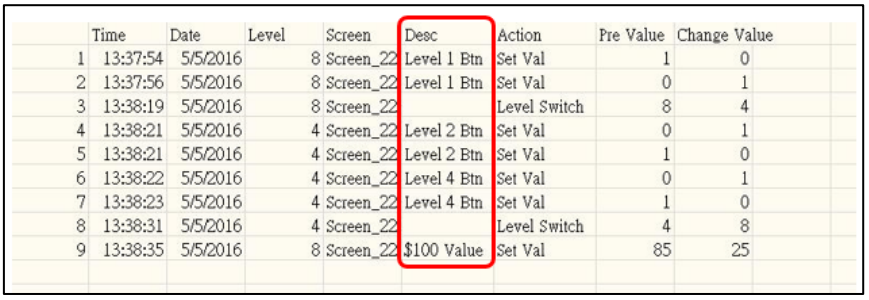


Figure 13 - 30: Barcode Input element Main property page

No.	Function	Description
(1)	Write Address	● Select the Internal Memory or the controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
	Read Address	

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Write Offset Address</td><td rowspan="2">Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>Read Offset Address</td></tr>
<tr><td rowspan="2">(3)</td><td>System Keypad</td><td>In the System Keypad Layout window, adjust the size of the keypad window, title size, font size / type / color of the numeric display, and the background color of the keypad window.
 

<table>
<tr><td></td><td>Select the size of the System Keypad.</td></tr>
<tr><td>Title:40</td><td>Set the title column height.</td></tr>
<tr><td>10</td><td>Set the font size.</td></tr>
<tr><td>Arial</td><td>Set the font type.</td></tr>
<tr><td></td><td>Set the font color.</td></tr>
<tr><td></td><td>Set the background color.</td></tr>
<tr><td></td><td>Default size.</td></tr>
</table></td></tr>
<tr><td>Custom Keypad</td><td>Select the Custom Keypad function only if there is a Keypad Screen in the editing screen. When there is no Keypad Screen, the following message displays.</td></tr>
</table>

No.	Function	Description
		
(4)	String Length	The **String Length** ranges from 1 ~ 256. The default value is **4**.
(5)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that the users can easily know the performed actions. 

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

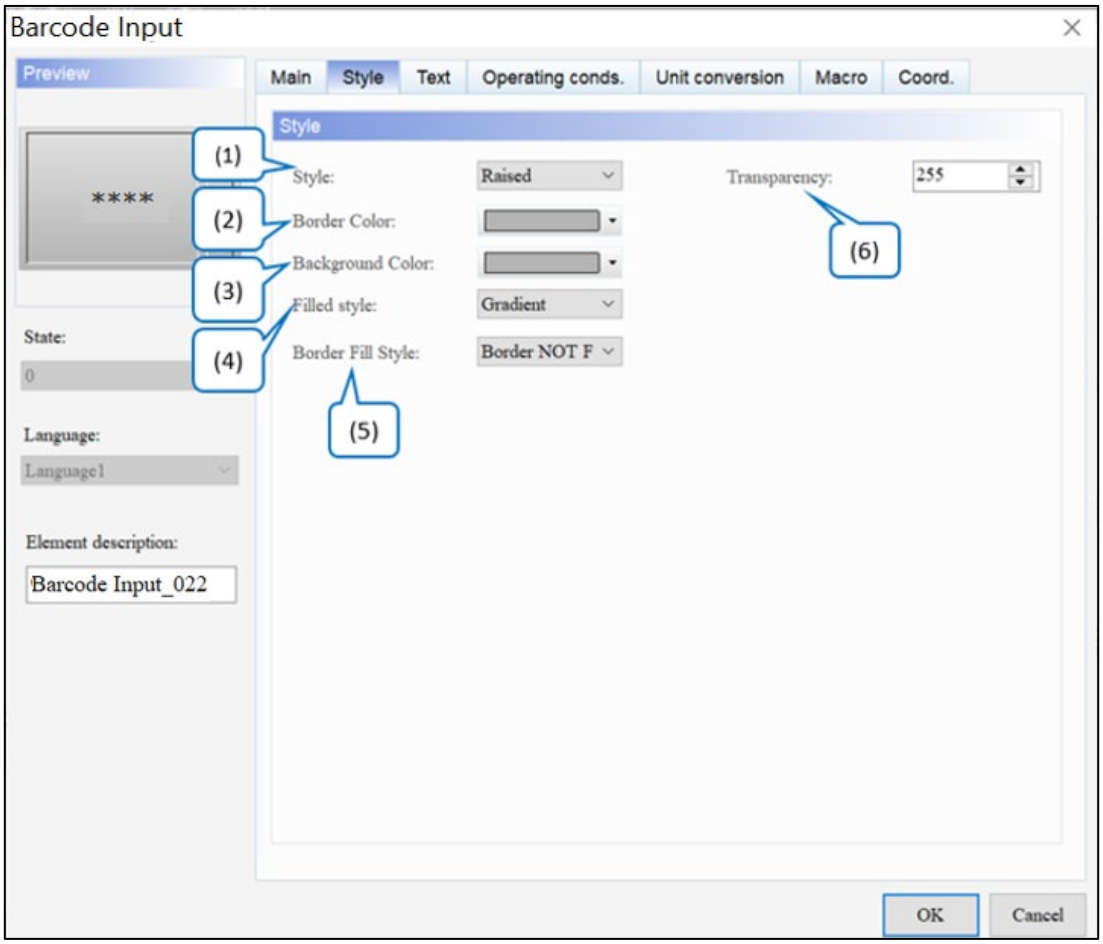


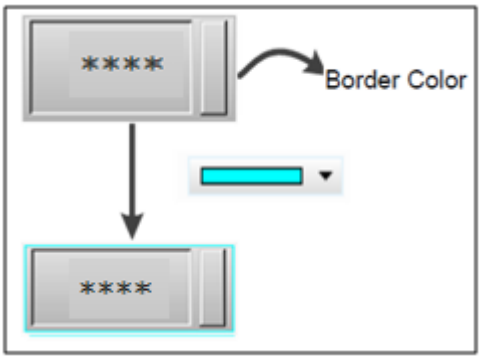
Figure 13 - 31: Barcode Input element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of elements. The available options for element **Style** are: Standard, Raised, Sunken, and Transparent. The default value is **Raised**.

Standard	Raised	Sunken	Transparent
*****	*****	*****	*****

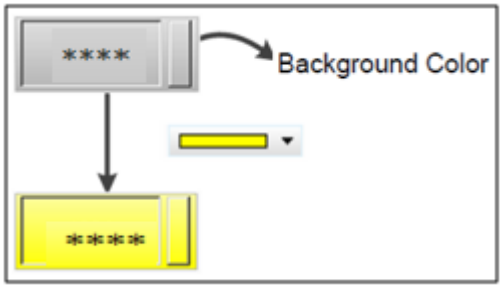
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Border Color</td><td>

Set the border color of the element. The default is .
When users set the Style to Transparent, the Border Color setting is invalid.



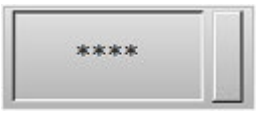
</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

Set the background color of the element. The default is .
When users set the Style to Transparent, the Background Color setting is invalid.



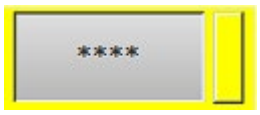
</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Border Fill Style</td><td>

The border display of the elements on the DOP-100 series models is different from that on the DOP-B series models. To have the border display effect be the same as that on the DOP-B series models, when users open the DOP-B project on a DOP-100 series model, the border is displayed with solid color.
The available options for Border Fill Style are: Border

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>NOT Fill and Border Fill. The default value for the DOP-100 series models is Border NOT Fill, meaning the border of the element is displayed with gradient.
<table>
<tr><td>Border NOT Fill</td><td>  </td></tr>
<tr><td>Border Fill</td><td>  </td></tr>
</table></td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

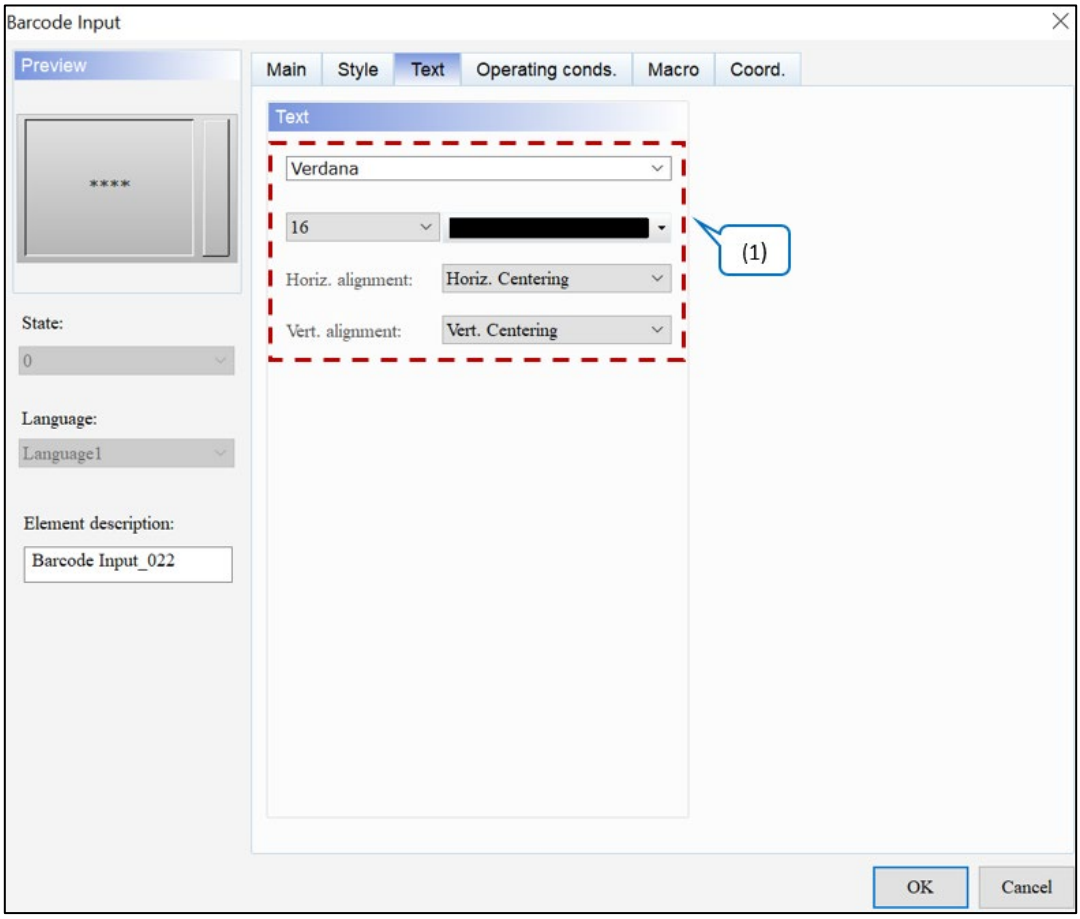


Figure 13 - 32: Barcode input element Text property page

No.	Function	Description
(1)	Text related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.

- Operating conds.

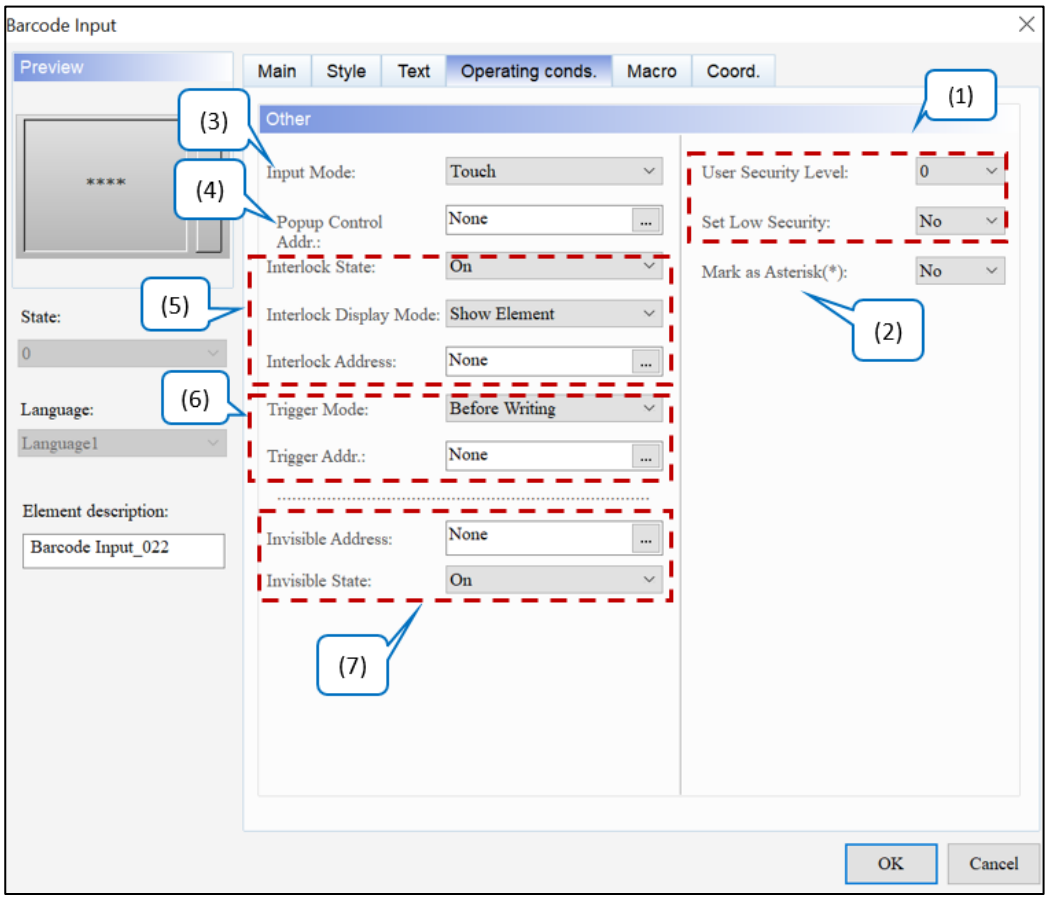
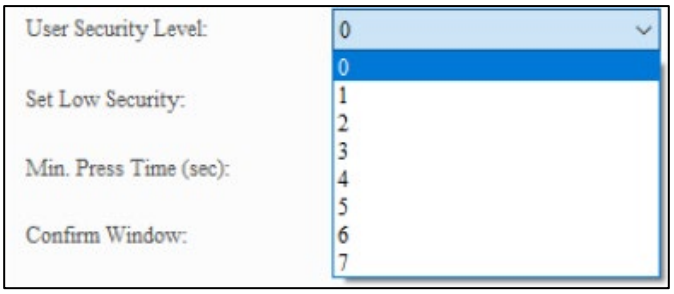
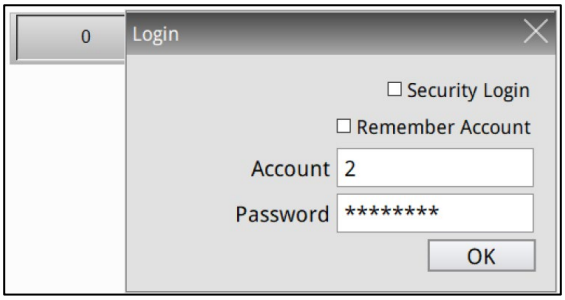


Figure 13 - 33: Barcode Input element Operating conds. property page

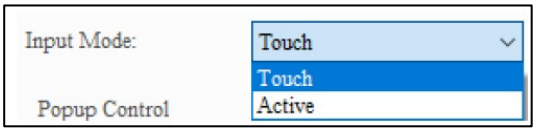
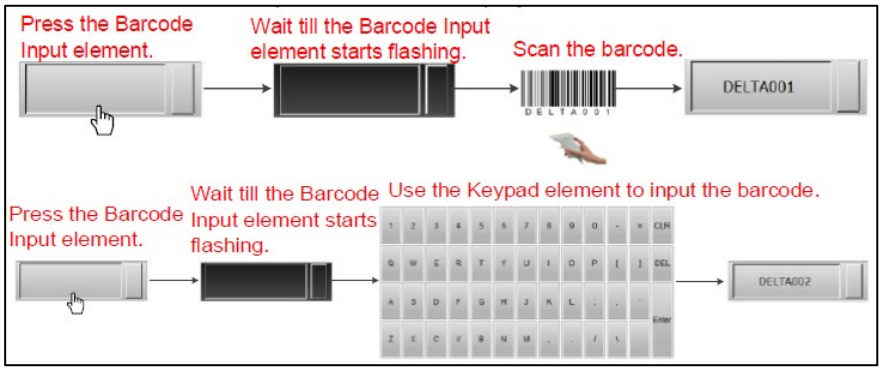
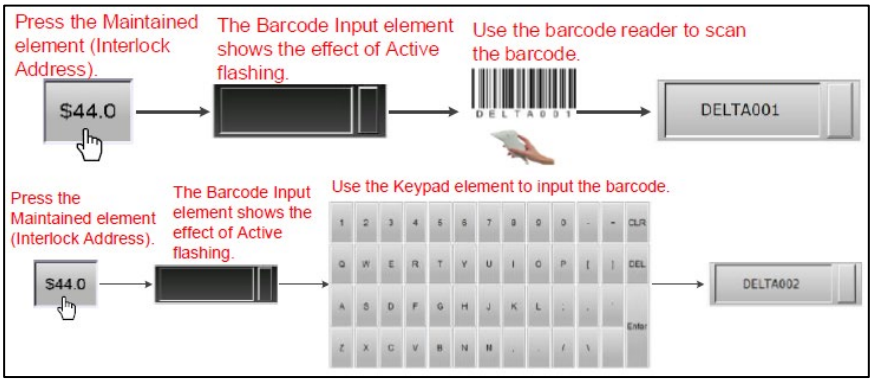
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>User Security Level</td><td rowspan="2">

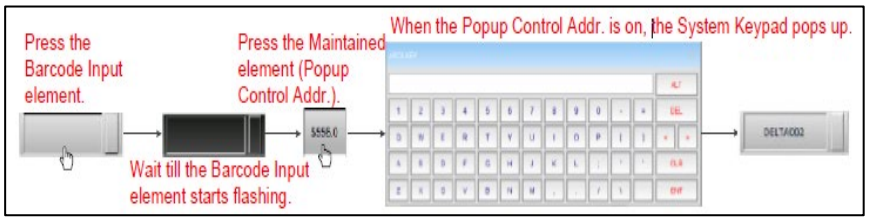
This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
 

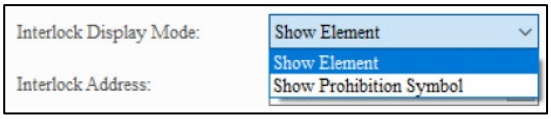
If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).
 

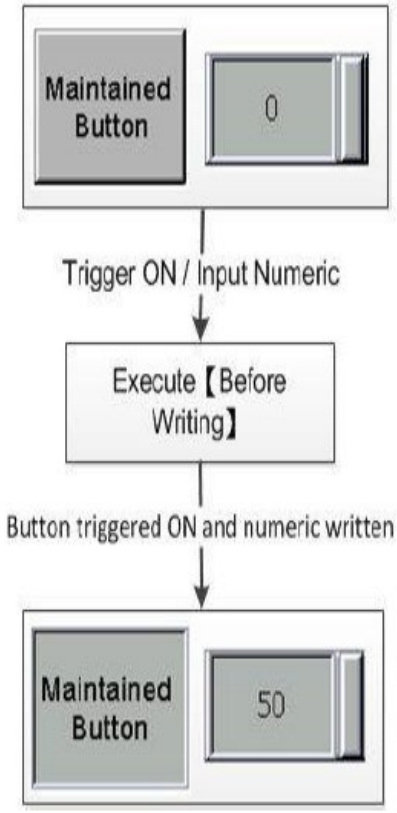
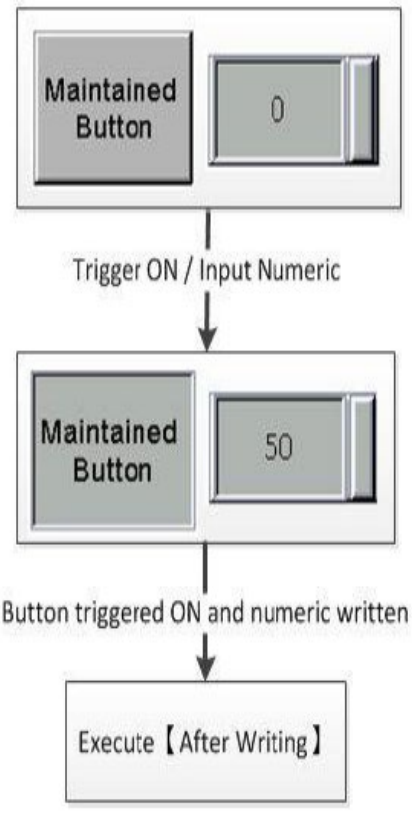
If users set the Set Low Security to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is No.

</td></tr>
<tr><td>Set Low Security</td></tr>
<tr><td>(2)</td><td>Mark as Asterisk (*)</td><td>If users specify Mark as Asterisk (*) to Yes, the value appears as asterisks when users input a value to the ASCII Keypad, as shown in the following figure. The default value is No.
 
</td></tr>
</table>

No.	Function	Description
(3)	Input Mode	● The available options for **Input Mode** are: Touch and Active. The default value is **Touch**.  ● Touch means after the **Barcode Input** element is pressed and then starts to flash, users scan the barcode or input the barcode using the Custom Keypad. Then, the **Barcode Input** element displays the barcode.  ● Active must be used with **Interlock Address**. Set the **Input Mode** as Active and the **Interlock Address** as $44.0 for the **Barcode Input** element. Then, create a **Maintained Button** element and set its **Write Address** as $44.0. ● If the **Input Mode** is set to Active, directly use the barcode reader or Keypad element to input the barcode. 
(4)	Popup Control Addr.	● Set the **Popup Control Addr**. to determine whether to display the System Keypad or not. If the **Popup Control Addr**. is set to On, when users press the **Barcode Input** element, the System Keypad appears on the screen. When the System Keypad appears, the **Popup Control Addr**. is switched to Off. Before users input the barcode next time, the **Popup Control Addr**. must be set to On again. ● The **Popup Control Addr**. setting is valid only when the **Input Mode** is set to Touch. If the **Input Mode** is set to

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Active, it means the System Keypad does not appear, and thus the setting for the Popup Control Addr. is invalid.
● The following example illustrates when the Input Mode is set as Touch. Set the Popup Control Addr. of the Barcode Input element to $556.0. Press the Barcode Input element, and then press the Popup Control Addr., the ASCII Keypad appears on the screen.
 
</td></tr>
<tr><td rowspan="3">(5)</td><td>Interlock State</td><td rowspan="3">● The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
● If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
● The following describes how it works:
1. First, create a Maintained Button and set its Write Address as $44.0. Next, set the Write Address as $555 and the Interlock Address as $44.0 for the Barcode Input element.
2. In order for the Barcode Input element $555 to become operable, press the Maintained Button $44.0 to enable $555.
 

The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 
</td></tr>
<tr><td>Interlock Address</td></tr>
<tr><td>Interlock Display Mode</td></tr>
<tr><td></td><td></td><td><table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(6)</td><td>Trigger Mode</td><td>
The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><th>Before Writing</th><th>After Writing</th></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>
The Trigger Mode function only switches the set Trigger Addr. to ON, users need to set the Trigger Addr. to OFF if they need to trigger again.
</td></tr>
<tr><td>Trigger Addr.</td><td>
<table>
<tr><th>Trigger Flowchart Before Writing</th><th>Trigger Flowchart After Writing</th></tr>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
</table>
</td></tr>
<tr><td rowspan="2">(7)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
The Invisible Address mainly allows users to hide an
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:
Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to

</td></tr>
<tr><td>Invisible State</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>$9.0.
2. To hide the element, first press the $9.0 button.
<table>
<tr><td rowspan="2">Invisible State is On</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
</td></tr>
<tr><td> 
</td></tr>
</table></td></tr>
</table>

- Macro

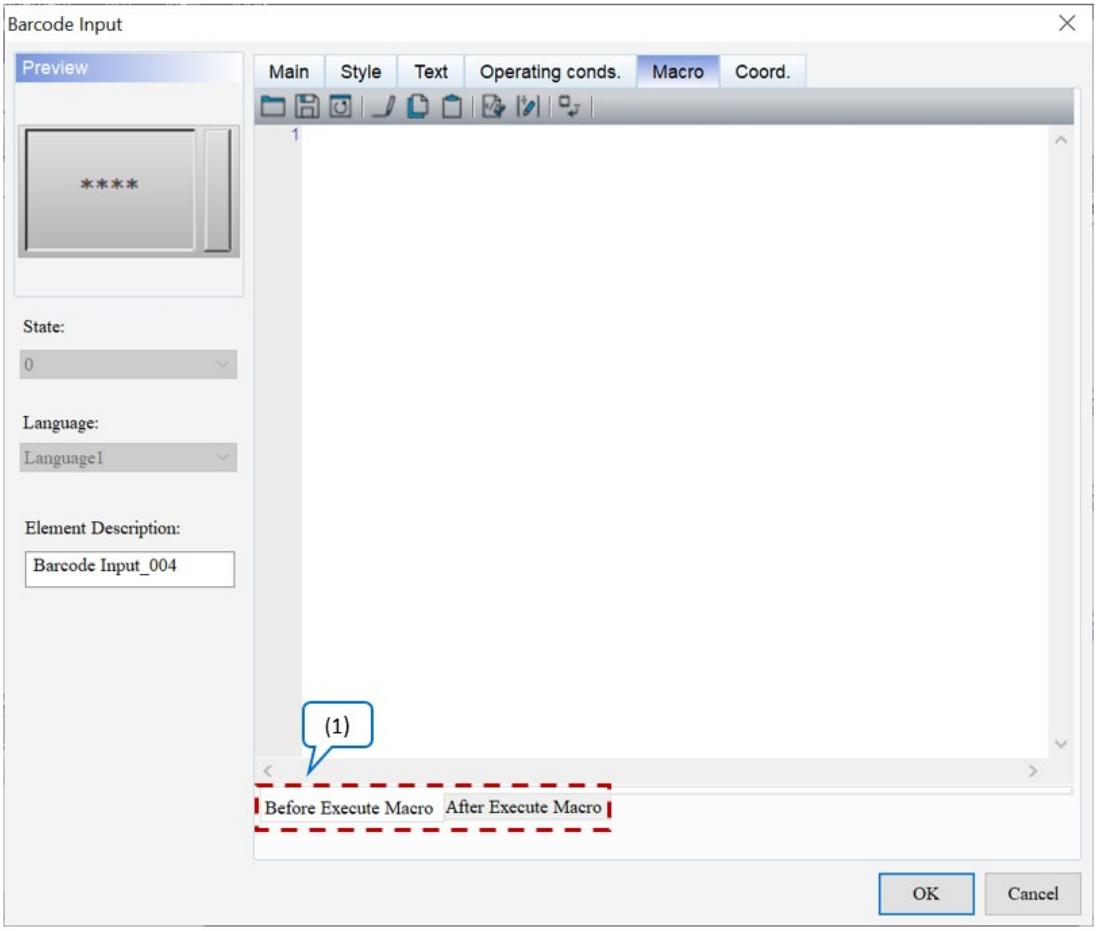
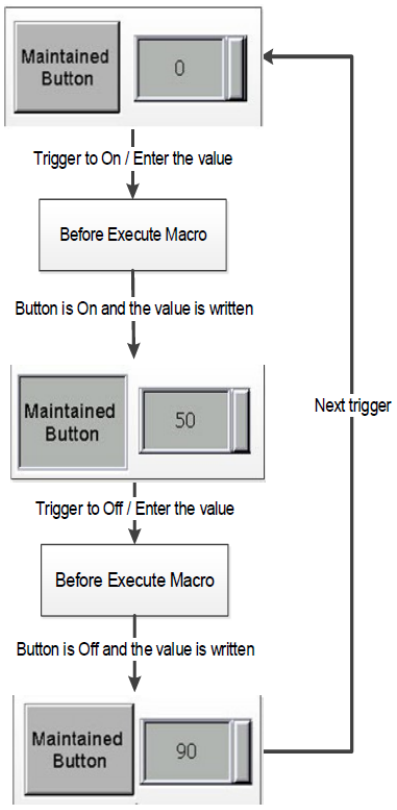
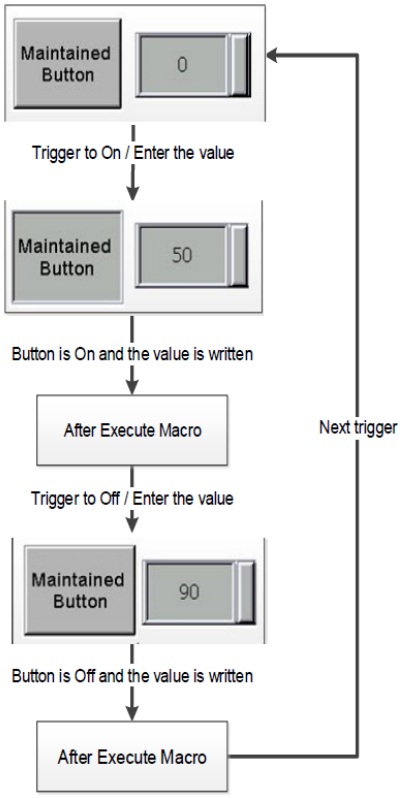


Figure 13 - 34: Barcode Input element Macro property page

No.	Function	Description
(1)	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

Flowchart of Before Execute Macro	Flowchart of After Execute Macro
	

- Coord.

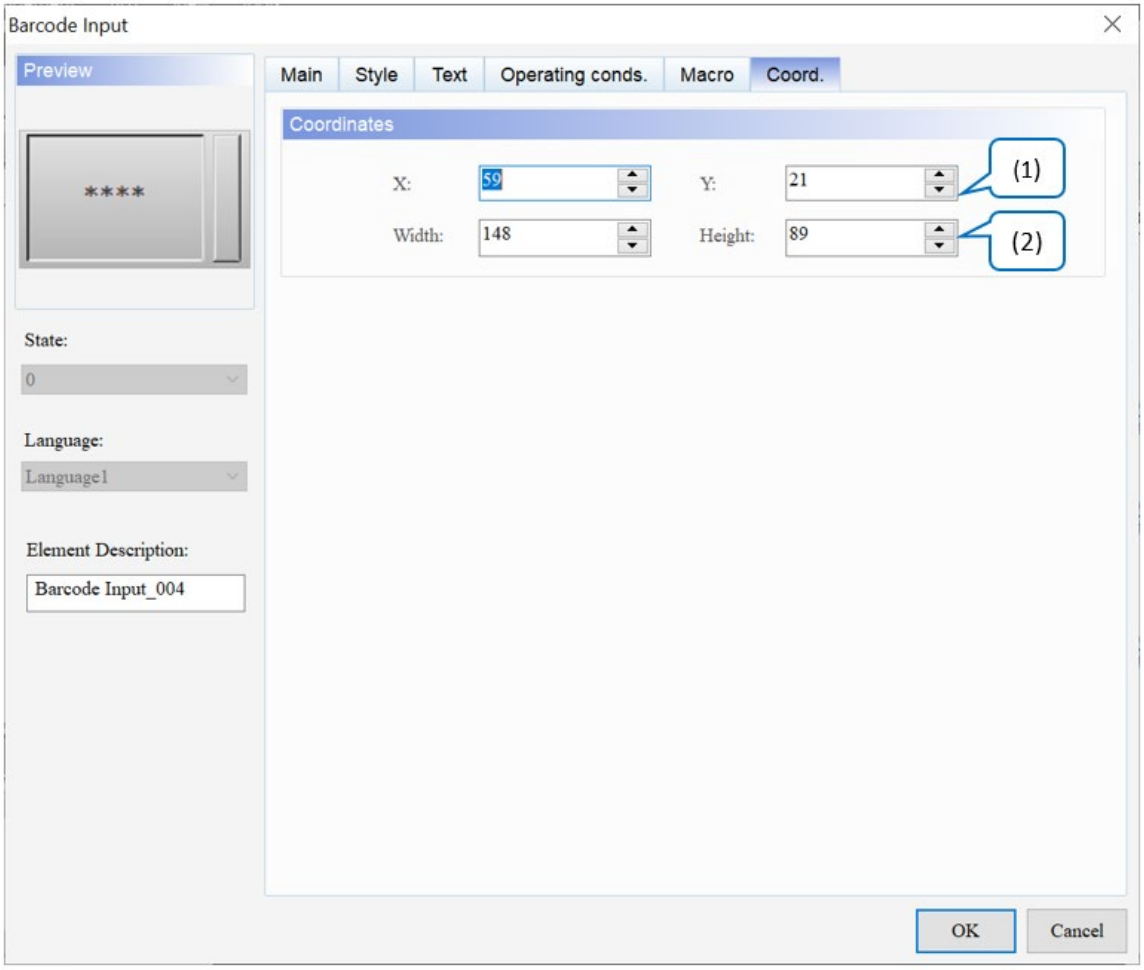


Figure 13 - 35: Barcode Input element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

13.4 Multi-language Input

***NOTE**: **Multi-language Input** element only supports read function in AX series models.*

The **Multi-language Input** element supports up to 16 languages and users can select the languages to edit the display texts.

Go to **General** > **Configuration** > **Multi-language Settings** to select the preferred languages. Then, use the **Multi-language Input** element to enter content in multiple languages.

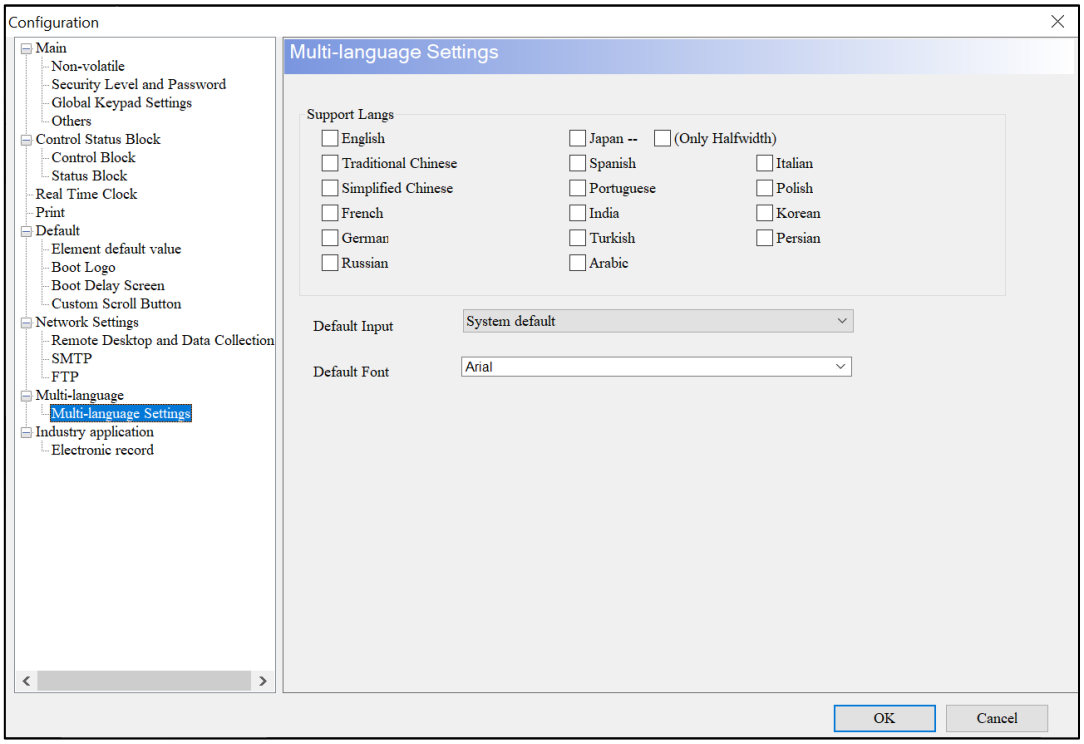


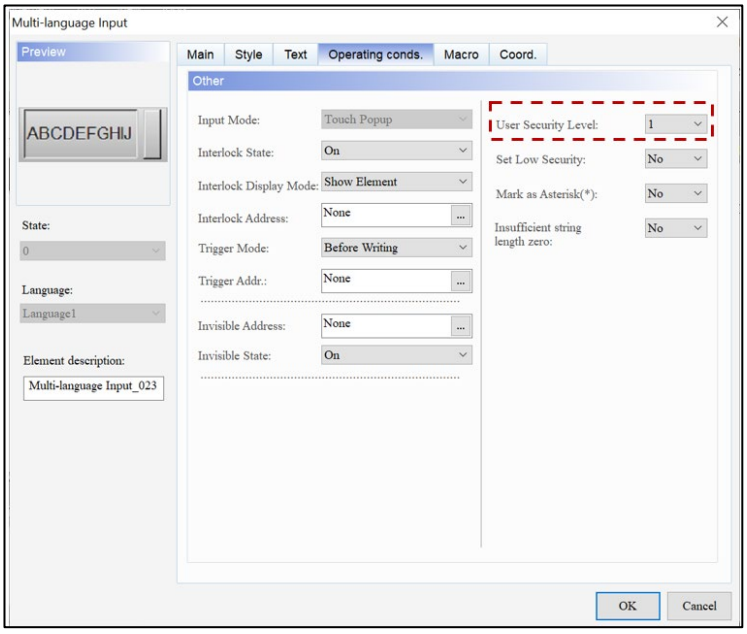
Figure 13 - 36: Configuration > Multi-language Settings

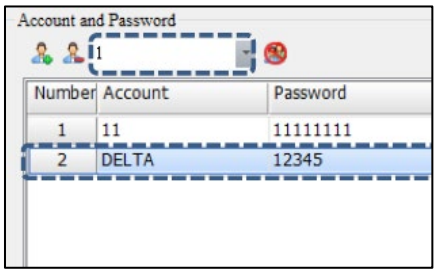
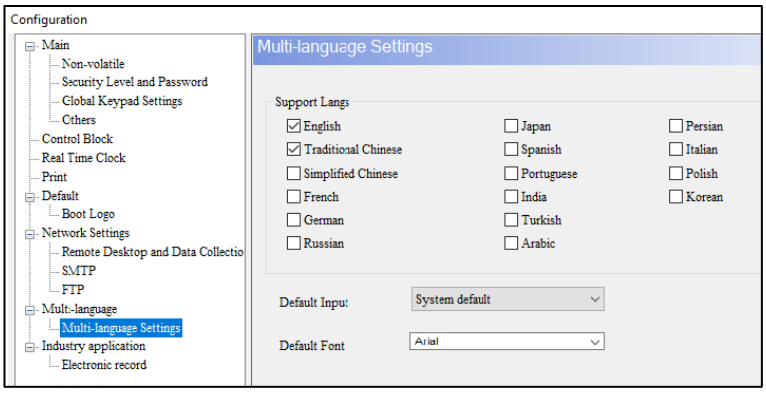
The **Multi-language Input** element on DOP-100 series models provides various functions, including Enhanced Recipe Group naming, Enhanced Recipe Char format,

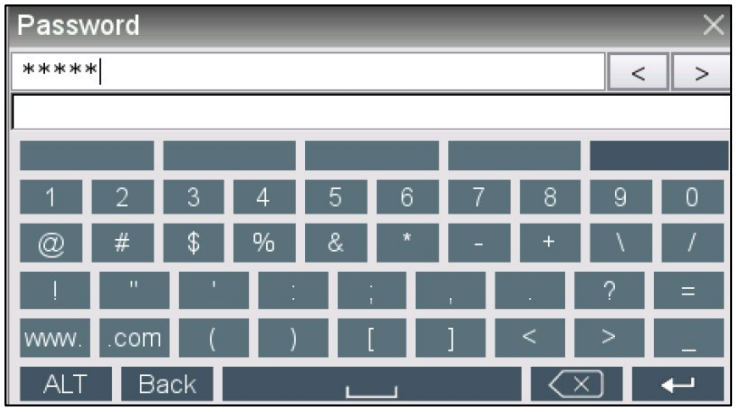
and account input, so that users can input Unicode characters for the names and content.

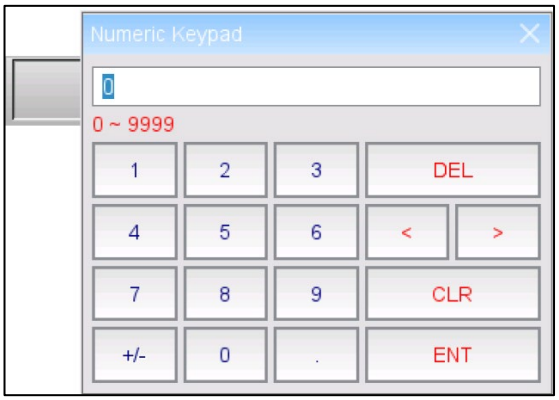
***NOTE**: The **Multi-language Input** element does not support on-line simulation and off-line simulation.*

Refer to the following table for the **Multi-language Input** element example.

Multi-language Input	
Write Address	● Create a **Numeric Entry** element and set the **Write Address** to $10.  ● Set the **User Security Level** to 1. 

Multi-language Input	
Settings	● Go to **General** > **Configuration** > **Security Level and Password** to create a level 1 account as the following.  ● Go to **General** > **Configuration** > **Multi-language Settings** to select the English and Traditional Chinese checkboxes as the following. 
Execution result	● After creating the elements, compile and download the data to the HMI. ● Press the **Numeric Entry** element and the screen displays the following **Login** window.  ● Press the **Account** field and the screen displays the **Multi-language Input** window. Press EN to switch to ZH_TW and

Multi-language Input	
	input DELTA.  ● Click ?123 to switch to the numeric keyboard and input 12345 as the password. 
Execution result	Click **OK** to use the **Numeric Entry** element. 

Multi-language Input	
	

On double-clicking the **Multi-language Input** element, the property page appears as follows.

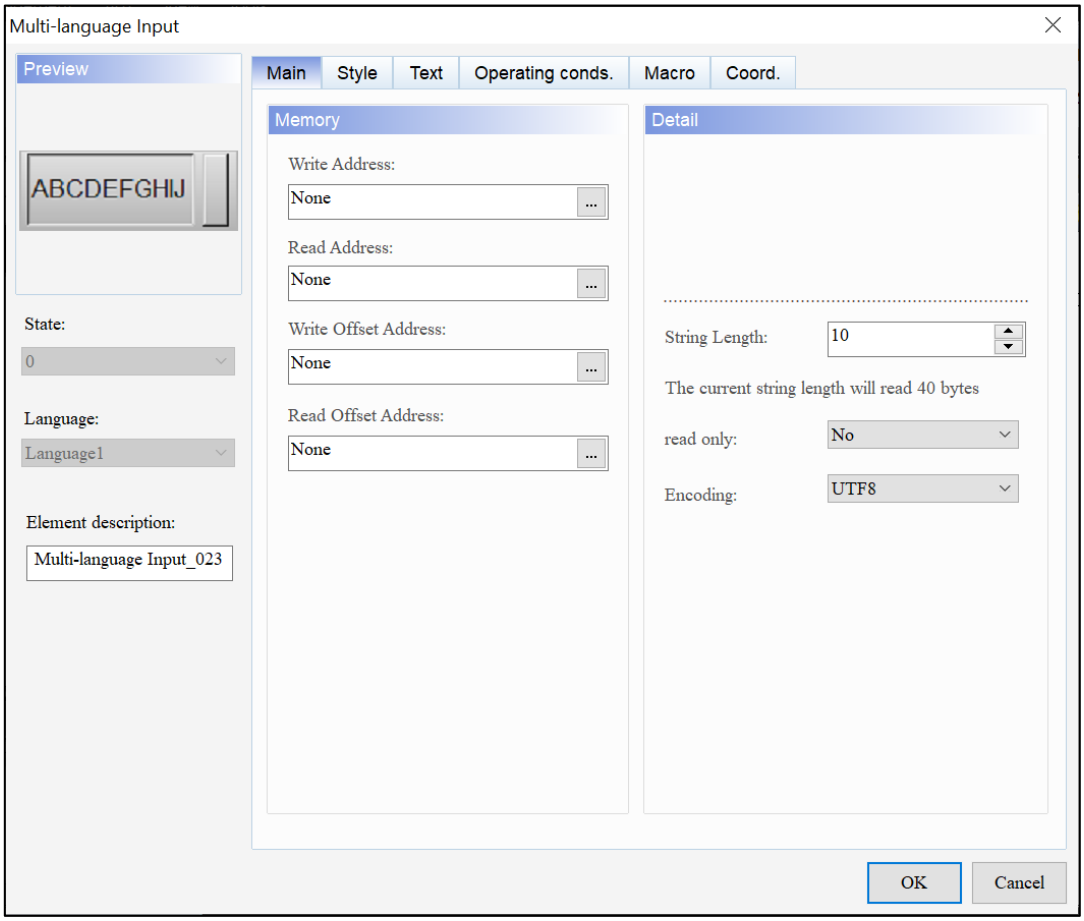


Figure 13 - 37: Multi-language Input element property page

Multi-language Input	
Function	**Description**
Preview	**Multi-language Input** elements do not support multi-state values and multi-language display data.
Main	Set Read Address, Write Address, Read Offset Address, Write Offset Address. Set the String Length, read-only, and Encoding.
Style	Set Style, Background Color, Border Color, Filled style, Border Fill Style, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Operating conds	Set the Input Mode, Interlock State, Interlock Display, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, Invisible State, User Security Level, Set Low Security, Mark as Asterisk (*), and Insufficient string length zero.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the element.

- Main

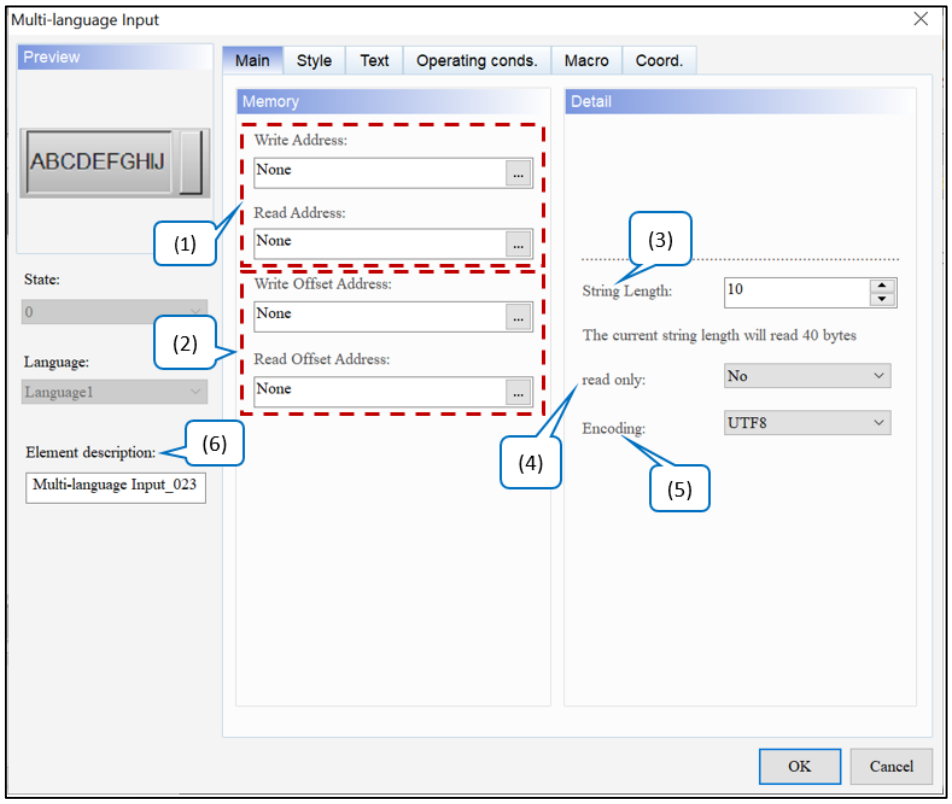
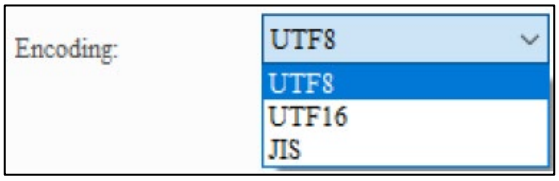
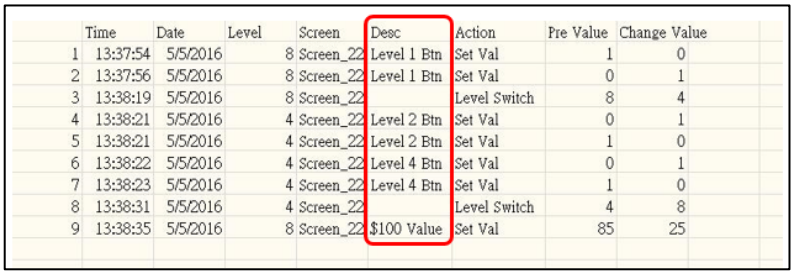


Figure 13 - 38: Multi-language Input element Main property page

No.	Function	Description
(1)	Write Address Read Address	● Select the Internal Memory or the controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details.
(2)	Write Offset Address Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(3)	String Length	● The range of the **String Length** is 1 ~ 256. The default value is **10**. ● After the length is entered, a prompt appears underneath indicating the read length in bytes after conversion.
(4)	Read Only	The default value is **No**. If users select Yes, they can read but cannot write data.
(5)	Encoding	The available options for **Encoding** are: UTF8, UTF16, and JIS. The default value is **UTF8**. 
(6)	Element description	It can be used to record the actions performed by the element, and the description will be written into the CSV file of the Operation Log Table, so that the users can easily know the performed actions. 

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

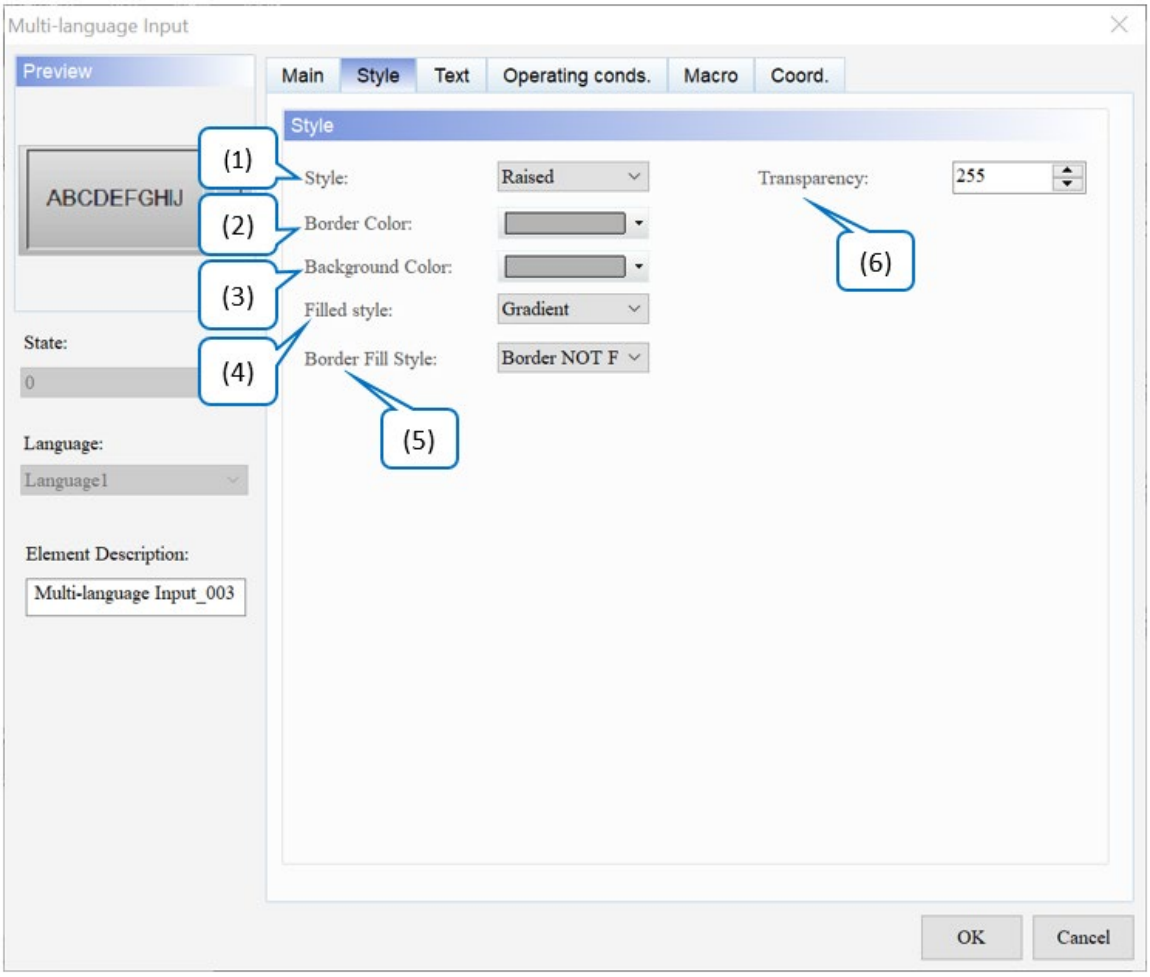
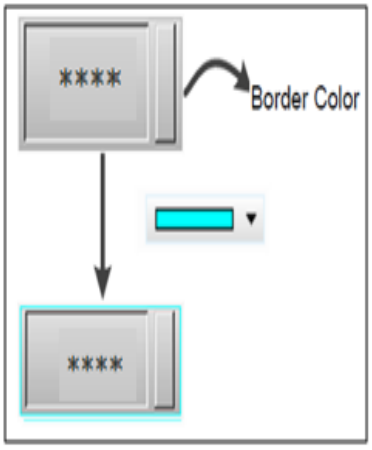
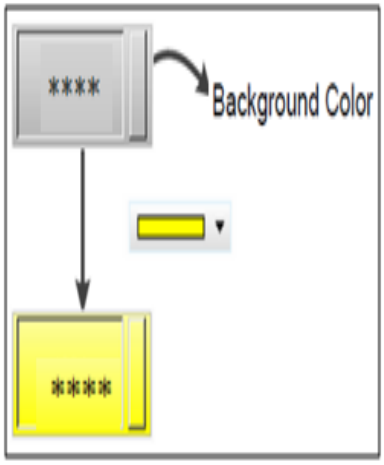


Figure 13 - 39: Multi-language Input element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of elements. The available options for **Style** are: Standard, Raised, Sunken, and Transparent. The default value is **Raised**. Standard / Raised / Sunken / Transparent
(2)	Border Color	● Set the border color of the element. The default is . ● When users set the **Style** to Transparent, the **Border Color** setting is invalid.

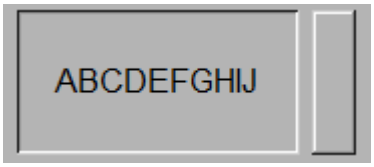
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(3)</td><td>Background Color</td><td>

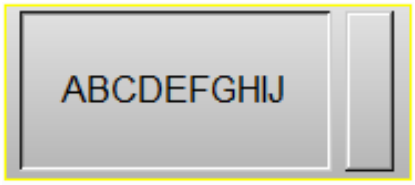
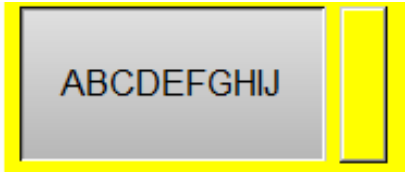
Set the background color of the element. The default is .
When users set the Style to Transparent, the Background Color setting is invalid.



</td></tr>
<tr><td>(4)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td> 
</td></tr>
<tr><td>Fixed</td><td> 
</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
(5)	Border Fill Style	● The border display of the elements on the DOP-100 series models is different from that on the DOP-B series models. To have the border display effect be the same as that on the DOP-B series models, when users open the DOP-B project on a DOP-100 series model, the border is displayed with solid color. ● The available options for **Border Fill Style** are: Border NOT Fill and Border Fill. The default value for the DOP-100 series models is **Border NOT Fill**, meaning the border of the element is displayed with gradient. Border NOT Fill  Border Fill 
(6)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Text

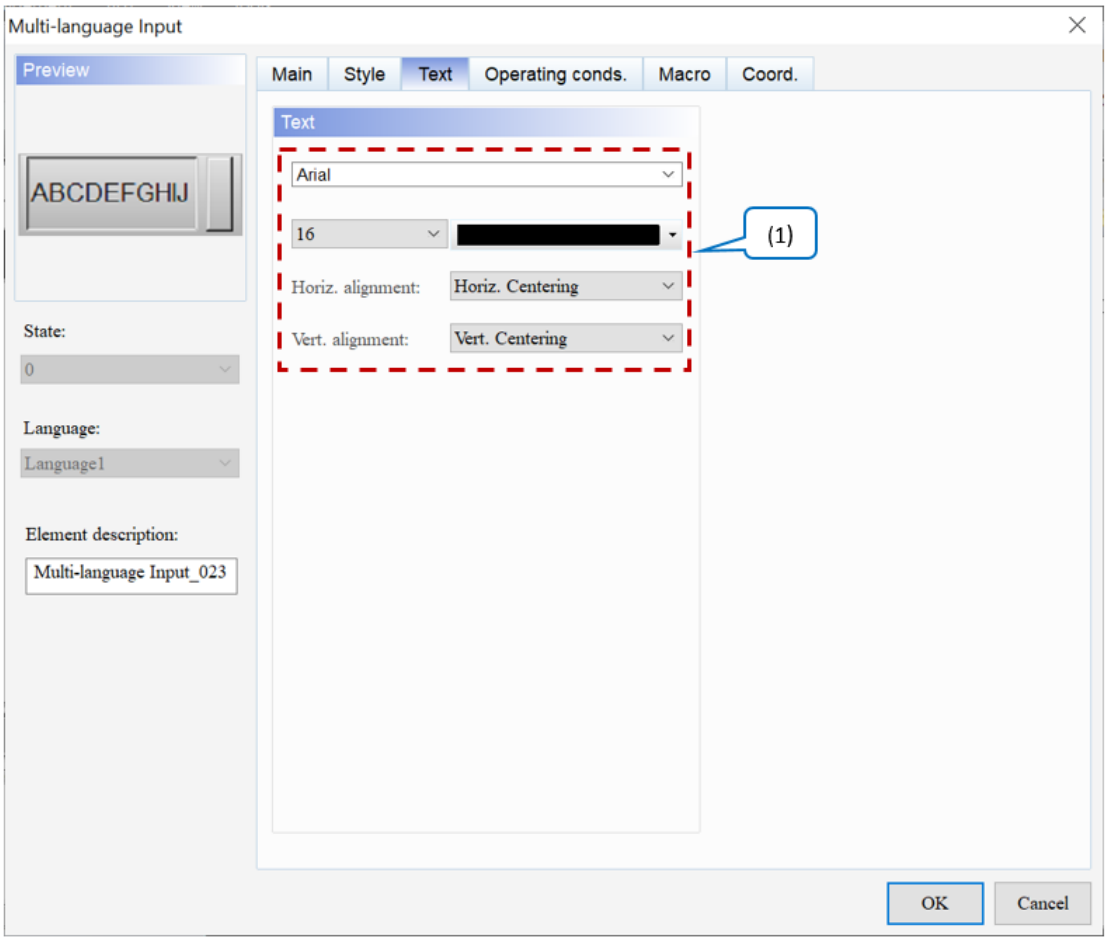


Figure 13 - 40: Multi-language input element Text property page

No.	Function	Description
(1)	Text related properties	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.

- Operating conds.

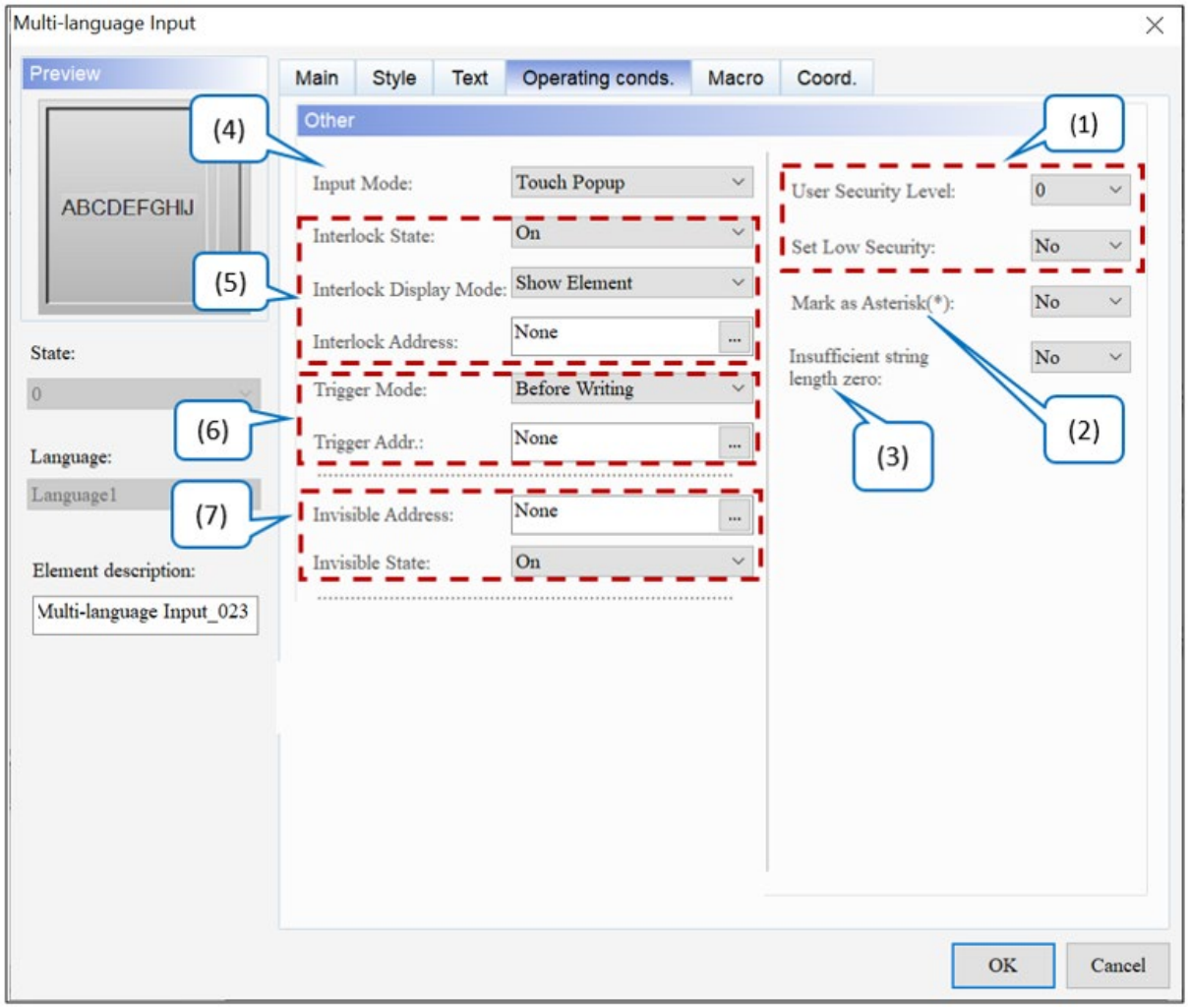
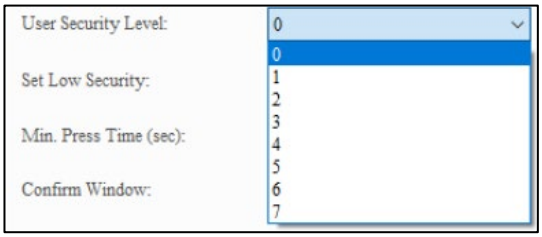
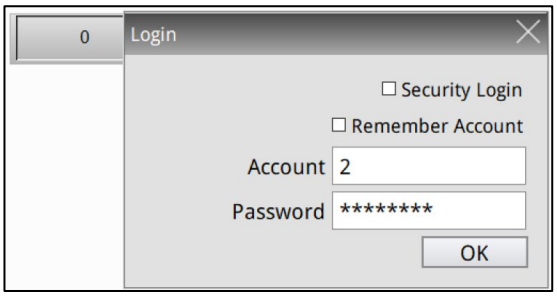
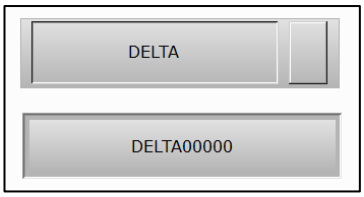
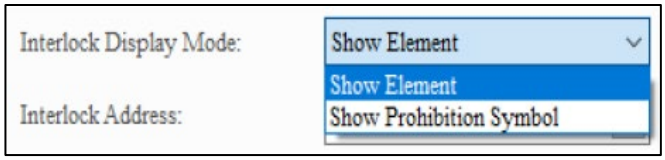


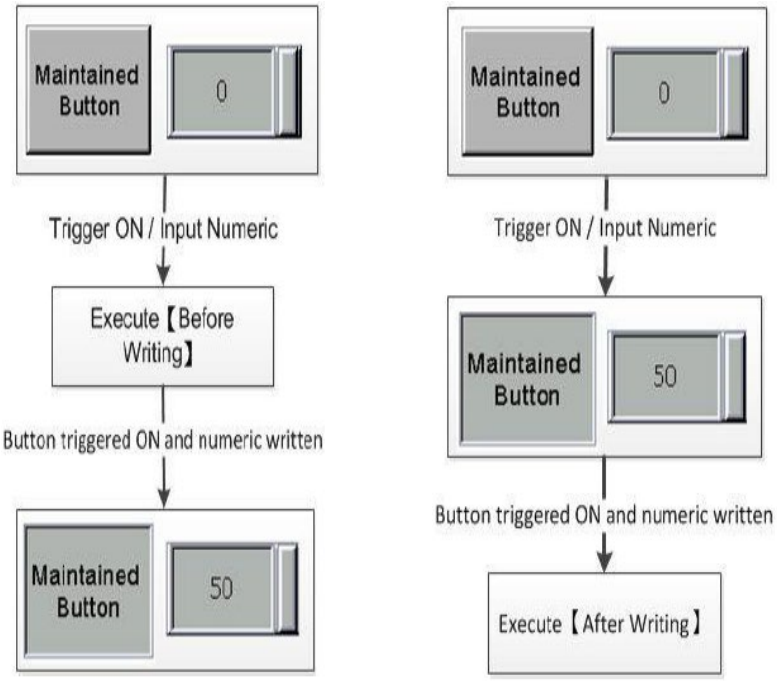
Figure 13 - 41: Multi-language Input element Operating conds. property page

No.	Function	Description
(1)	User Security Level	● This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set **User Security Level**. The default value is **0**.  ● If the **User Security Level** is set, the **Login** window pops

No.	Function	Description
	Set Low Security	up when the element is pressed to confirm whether the security level password is correct.  ● If users set the **Set Low Security** to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**.
(2)	Mark as Asterisk (*)	Specify **Mark as Asterisk (*)** to Yes, the value appears as asterisks when users input characters in the **Multi-language Input** window and press **Enter**, as shown in the following figure. The default value is **No**. 
(3)	Insufficient string length zero	When the length of the input string is less than the set length, the remaining characters will be filled in with zeros for display. The default value is **No**. 
(4)	Input Mode	The **Multi-language Input** element does not support setting the **Input Mode**.
(5)	Interlock State	● The **Interlock Address** enables to operate a certain element from this particular address, which must be operated along with the **Interlock State**. ● If the **Interlock State** is set to Off/On, the **Interlock Address** enables to operate a certain element from this particular address. The default value is **On**. ● The following describes how it works: 1. First, create a **Maintained Button** element and set its

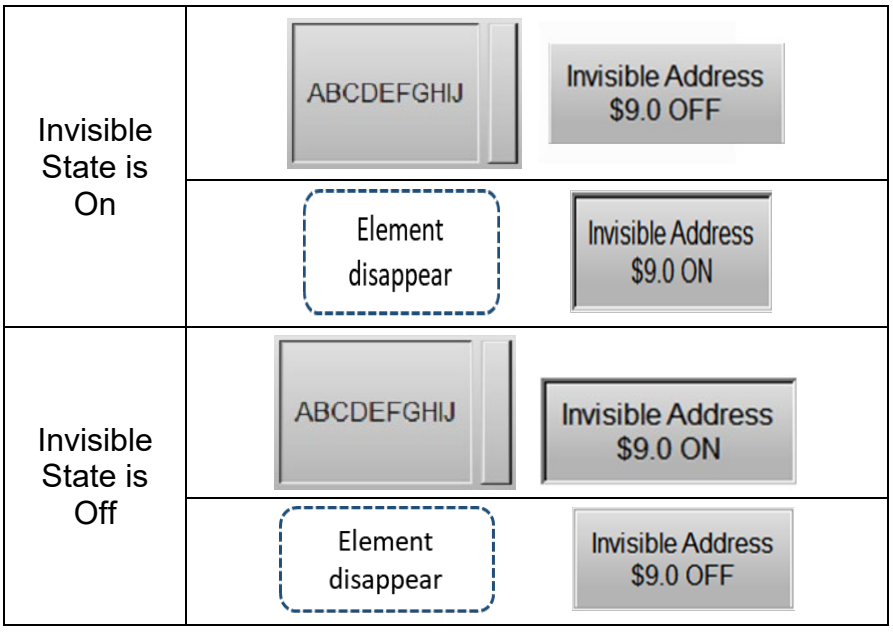
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2"></td><td>Interlock Address</td><td>Write Address as $44.0. Next, set the Write Address as $555 and the Interlock Address as $44.0 for the Multi-language Input element.
2. In order for the Multi-language Input element $555 to become operable, press the Maintained Button element $44.0 to enable $555.
 

The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 
</td></tr>
<tr><td>Interlock Display Mode</td><td><table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table></td></tr>
<tr><td>(6)</td><td>Trigger Mode</td><td>● The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><th>Before Writing</th><th>After Writing</th></tr>
<tr><td>Set Trigger Addr. to ON before changing values.</td><td>The Trigger Addr. turns ON only after changing values.</td></tr>
</table>● The Trigger Mode function only switches the set Trigger Addr. to ON, users need to set the Trigger Addr. to OFF if they need to trigger again.
<table>
<tr><th>Trigger Flowchart Before Writing</th><th>Trigger Flowchart After Writing</th></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Trigger Addr.</td><td> 
</td></tr>
<tr><td rowspan="2">(7)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.



</td></tr>
<tr><td>Invisible State</td></tr>
</table>

- Macro

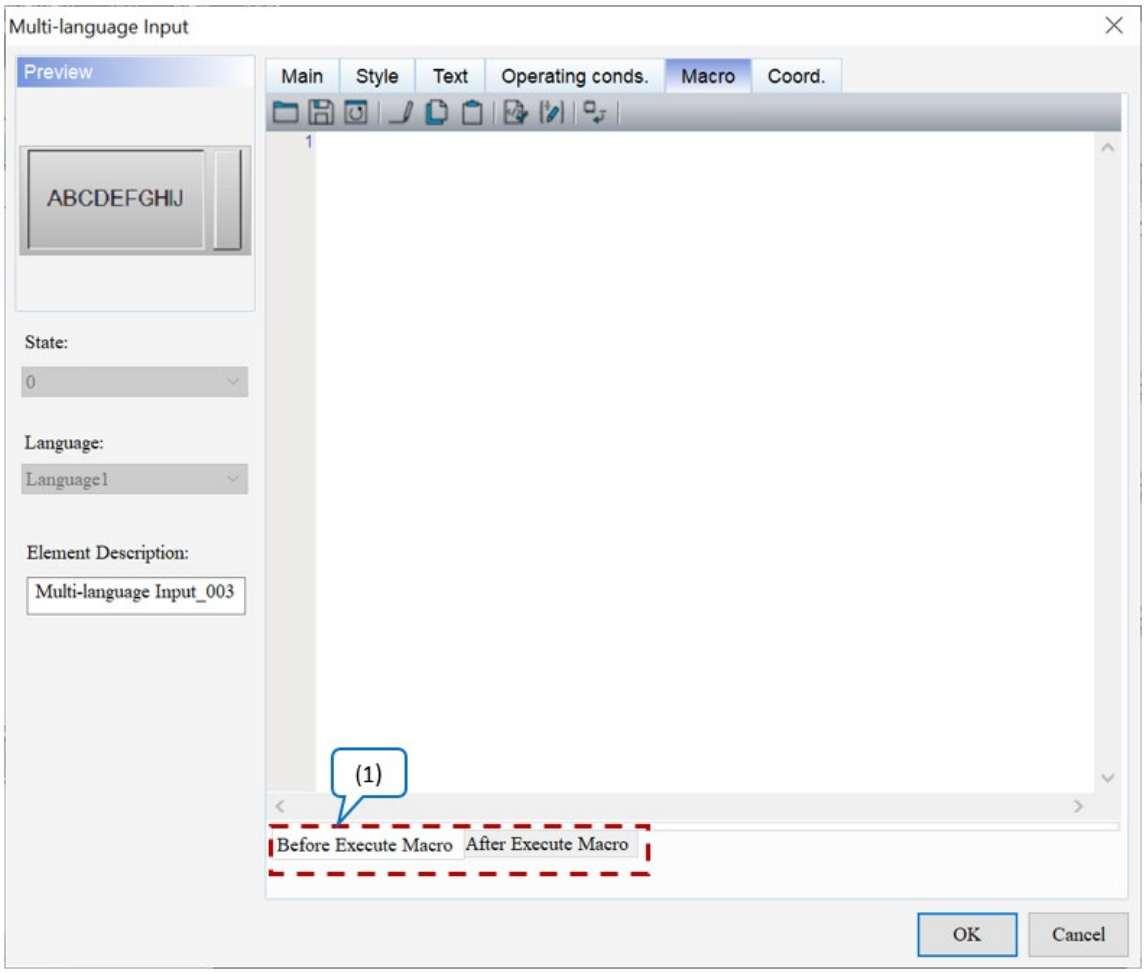
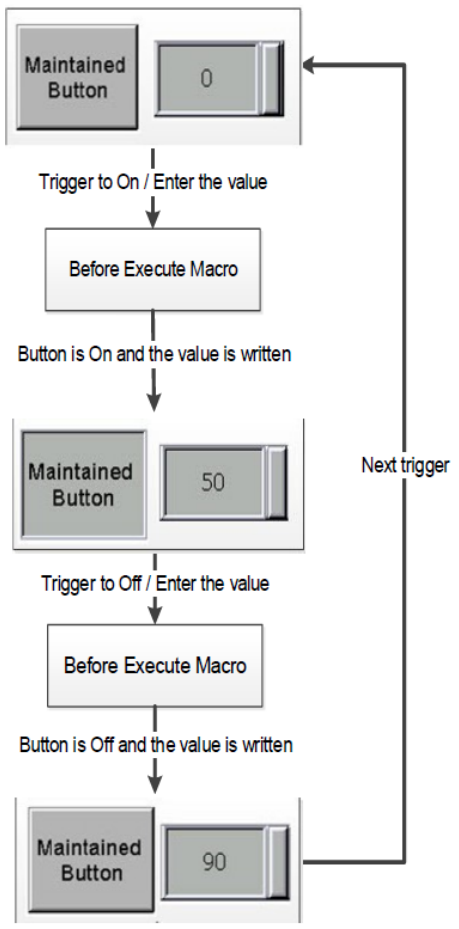
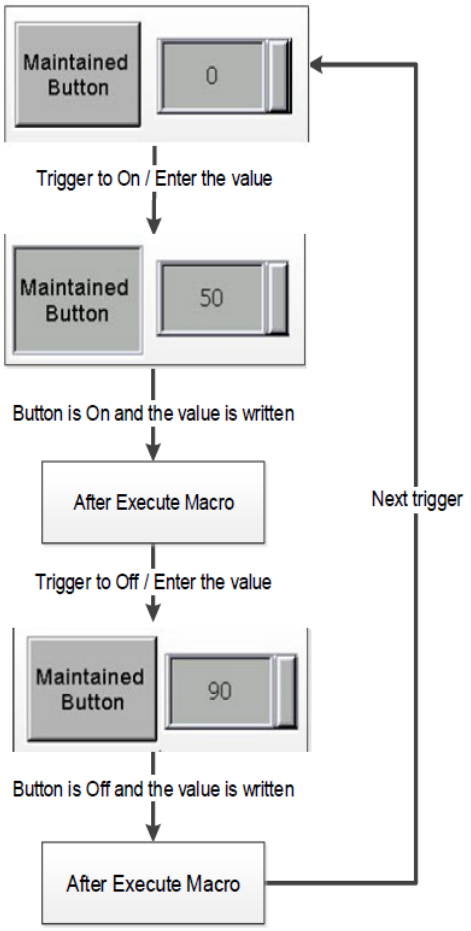


Figure 13 - 42: Multi-language Input element Macro property page

No.	Function	Description
(1)	Before Execute Macro	When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

Flowchart of Before Execute Macro	Flowchart of After Execute Macro
	

- Coord.

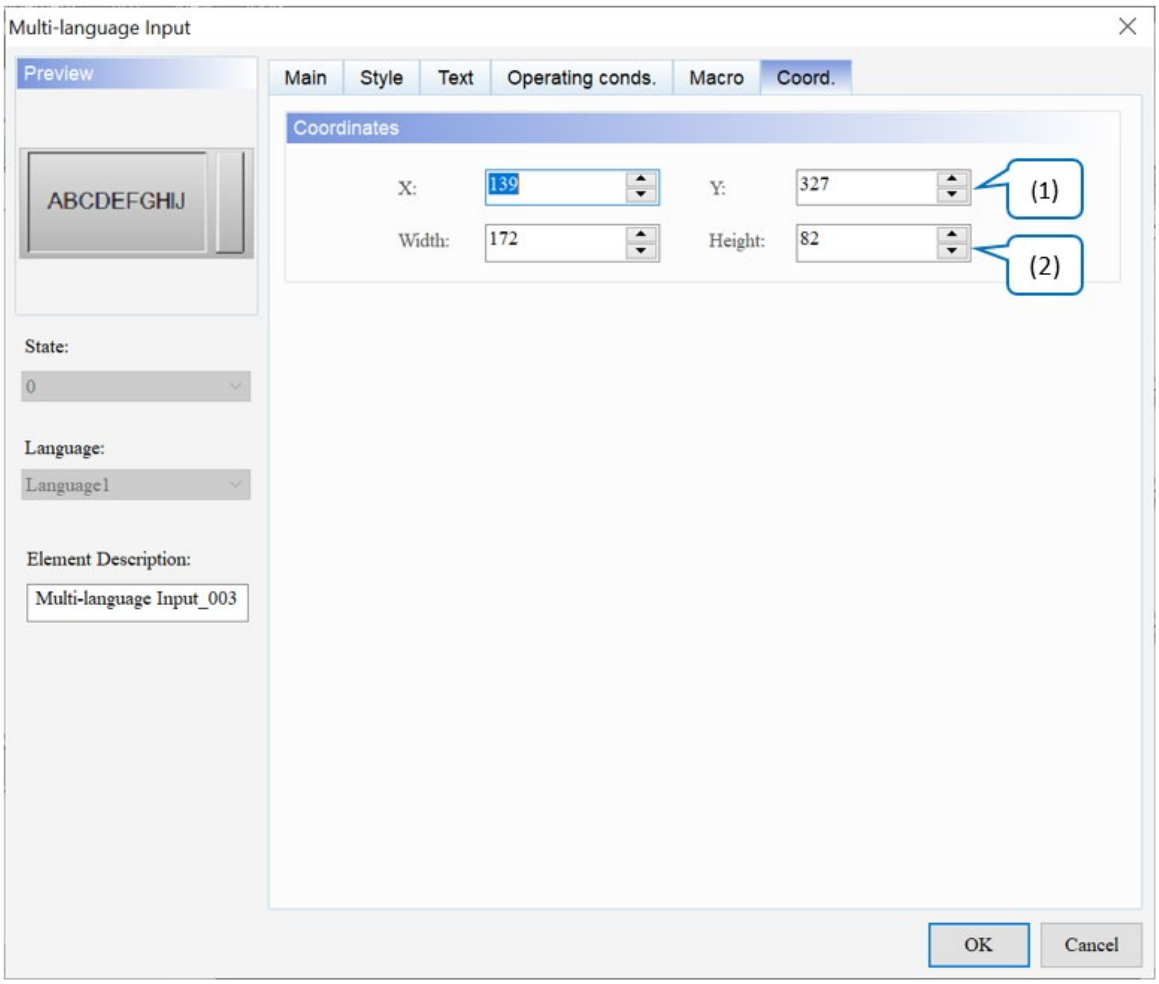
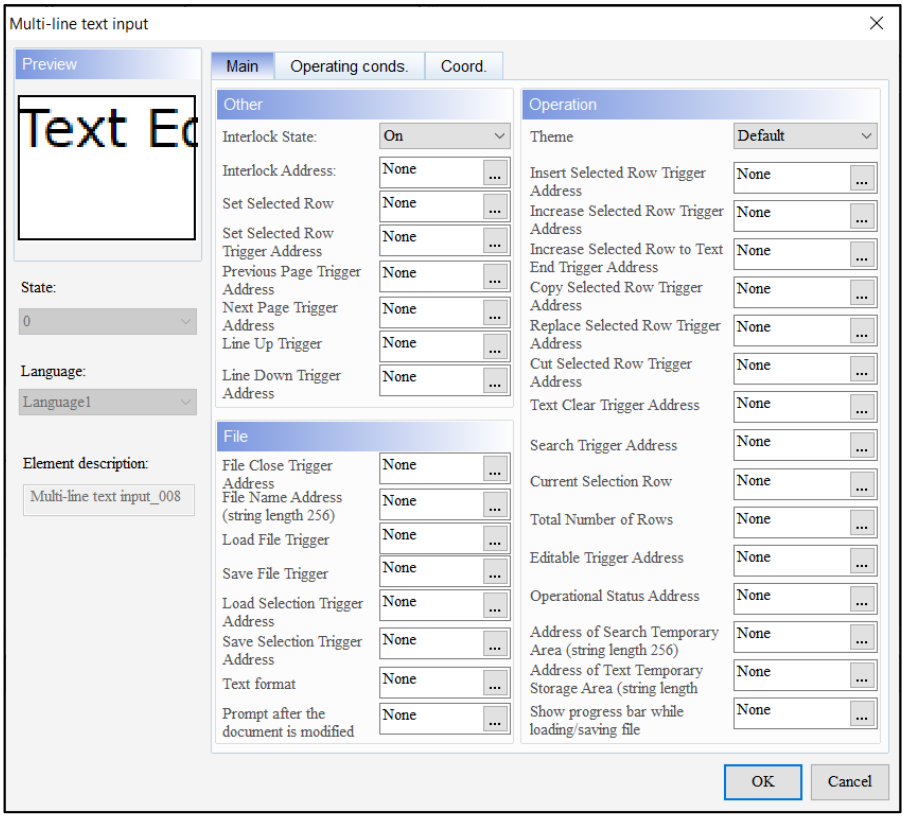


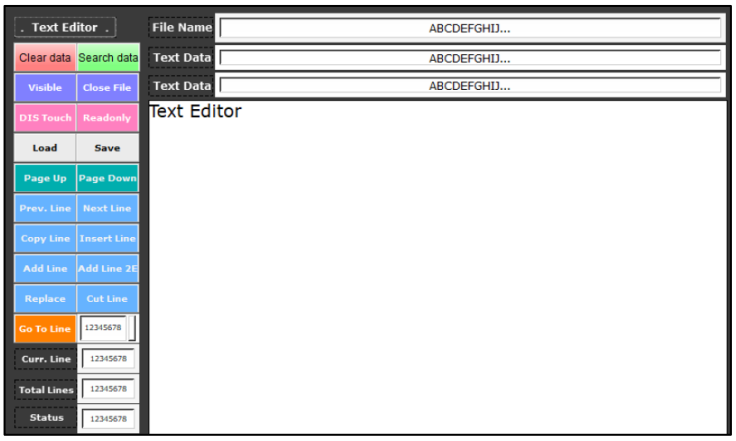
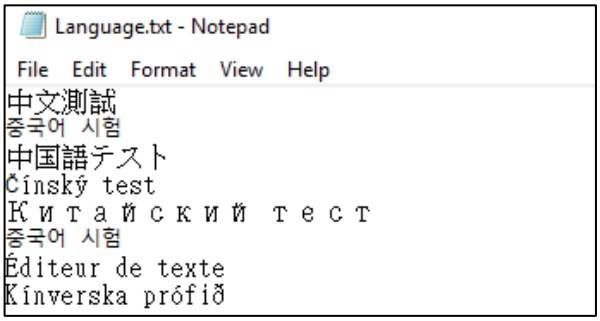
Figure 13 - 43: Multi-language Input element Coord. property page

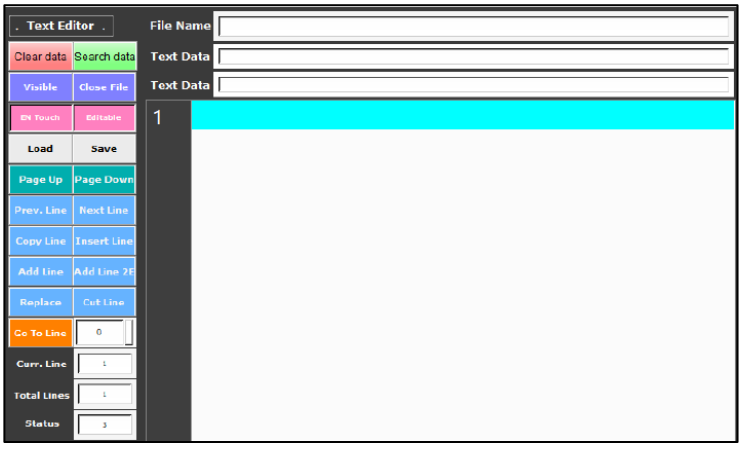
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

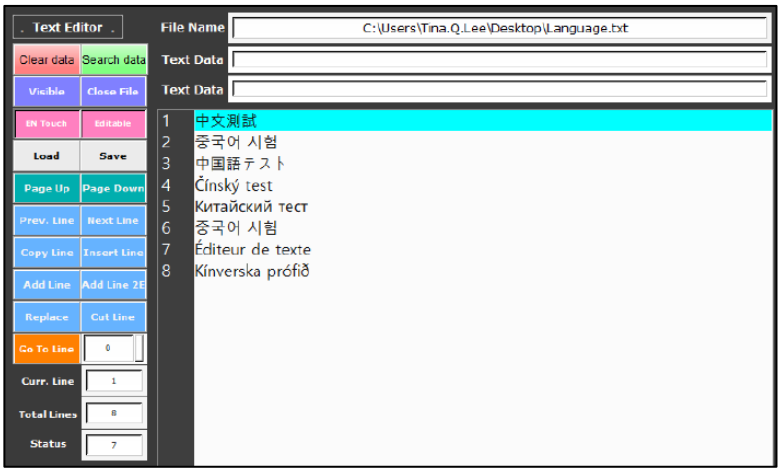
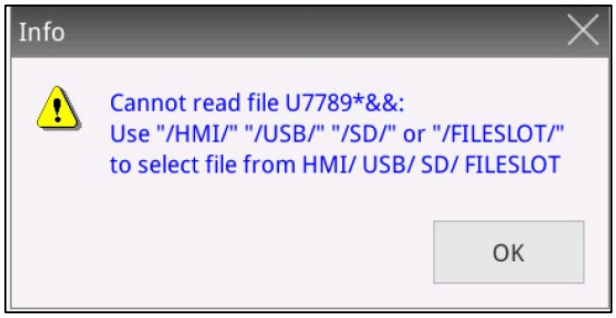
13.5 Multi-line Text Input

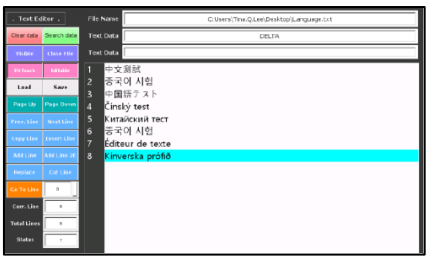
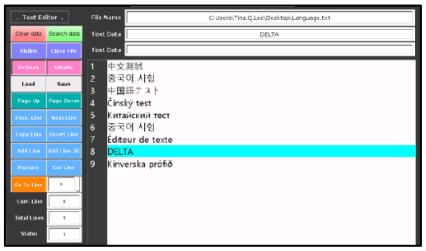
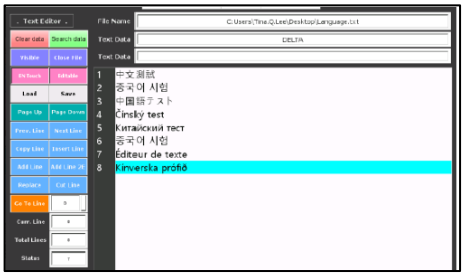
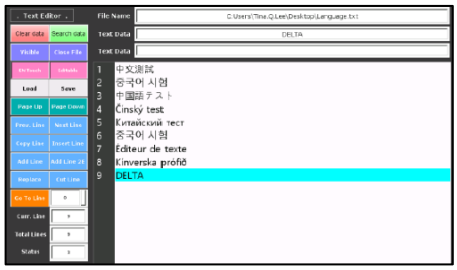
Multi-line Text Input element is used to view and edit text files, G-code files and supports multi-language display. Refer to the following table for the **Multi-line Text Input** element example.

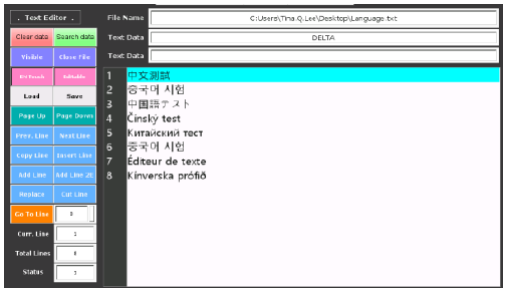
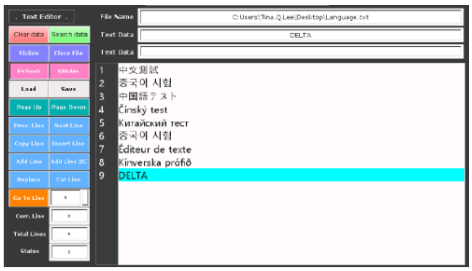
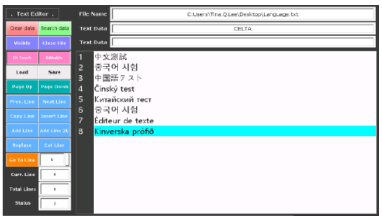
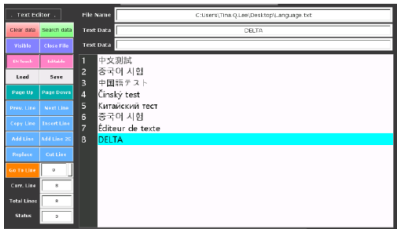
Multi-line Text Input	
Create Multi-line Text Input	Set the memory addresses to be used as shown in the following figure. 
Create elements	Create the elements with the memory addresses set as shown in the preceding figure. The configuration is as follows.

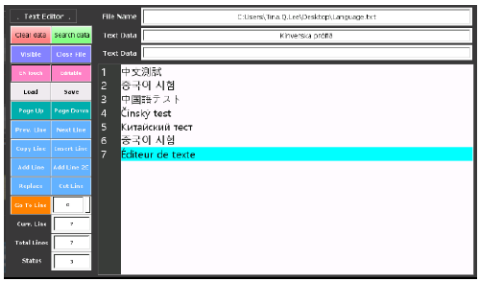
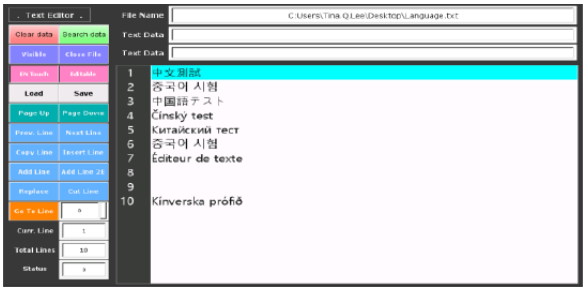
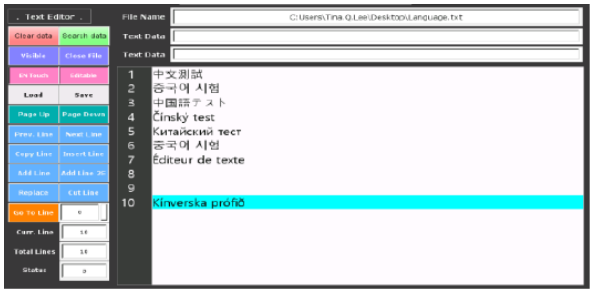
<table>
<tr><th colspan="3">Multi-line Text Input</th></tr>
<tr><td></td><td colspan="2"> 
</td></tr>
<tr><td>Put the complete text file in the directory to be used</td><td colspan="2">● This example is an off-line simulation, so the file is placed in a local directory on the computer. If users want to open a text file stored on a USB drive or SD card, enter /USB/[text file name] or /SD/[text file name] in the File Name field.
● Edit the following text file before putting it in the specific directory.
 

● After completing the edits, put the text file in the following directory:
C:\Users\<username>\Desktop.</td></tr>
<tr><td rowspan="2">Execution result</td><td colspan="2">Compile and download the data to the HMI.</td></tr>
<tr><td>Download Screen</td><td>After downloading, the HMI displays the following.
 
</td></tr>
<tr><td>Open File</td><td>● In the File Name field, enter the path of the text file to be opened:</td></tr>
</table>

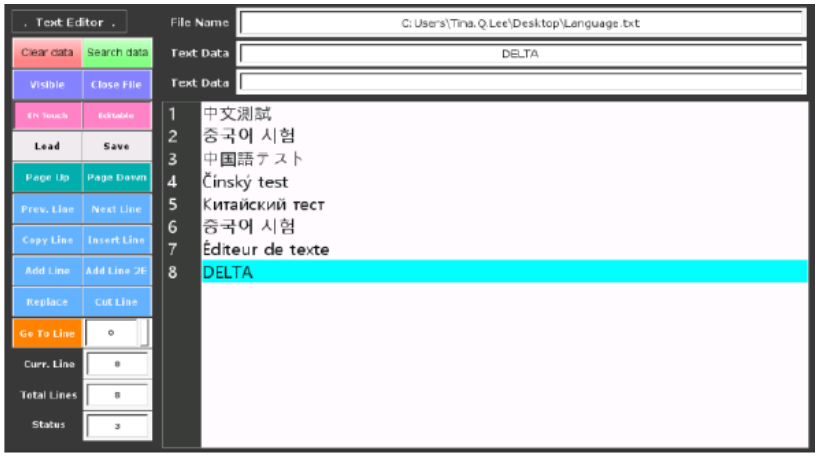
Multi-line Text Input		
		C:\Users\<*username*>\Desktop\Language.txt. ● After entering the path, click **Load**.  ● If the correct path is not entered, the following message appears to prompt users on how to open it. 
	Open File	For example, to open a file saved in a USB drive, the following path should be entered: /USB/Language.txt. 
	Edit Text	Add text strings to the document by entering text data, and then edit the texts using the functions of **Copy Line**, **Insert Line**, **Add Line**, **Add Line 2E**, **Replace**, and **Cut Line**. **Copy Line**: Select the text string to be copied and click **Copy Line**. The selected text string will be copied and displayed in the **Text Data** field.

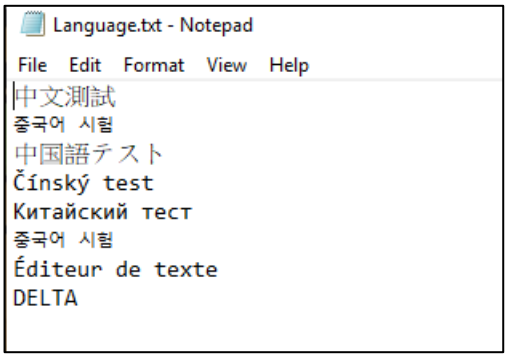
Multi-line Text Input					
			Insert Line	Enter DELTA in the **Text Data** field and click **Insert Line.** The text data will be inserted before the selected line.	
				Before Inserting	Select the 8th line and enter “DELTA” in the **Text Data** field. 
				After Inserting	Click **Insert Line**, and “DELTA” is inserted to the 8th line. 
			Add Line	Enter the text in the **Text Data** field and click **Add Line**. The text data will be added after the selected line.	
				Before Adding	Click the 8th line and enter “DELTA” in the **Text Data** field. 
				After Adding	Click **Add Line**, and “DELTA” is inserted to the 9th line. 

<table>
<tr><th colspan="4">Multi-line Text Input</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td>Add Line 2E</td><td>Enter the text in the Text Data field and click Add Line 2E. The text data will be added to the last line.
<table><tr><td>Before Adding</td><td>Select any line and enter “DELTA” in the Text Data field.
  </td></tr><tr><td>After Adding</td><td>Click Add Line 2E, and “DELTA” is inserted to the last line.
  </td></tr></table></td></tr>
<tr><td>Rep-lace</td><td>Enter the text in the Text Data field and click Replace. The selected string will be replaced with the entered text.
<table><tr><td>Before Replacing</td><td>Select the 8th line and enter “DELTA” in the Text Data field.
  </td></tr><tr><td>After Replacing</td><td>Click Replace, and the 8th line is replaced with “DELTA”.
  </td></tr></table></td></tr>
<tr><td>Cut Line</td><td>Select the line of text to be deleted and click Cut Line, and then the text data is deleted.</td></tr>
</table>

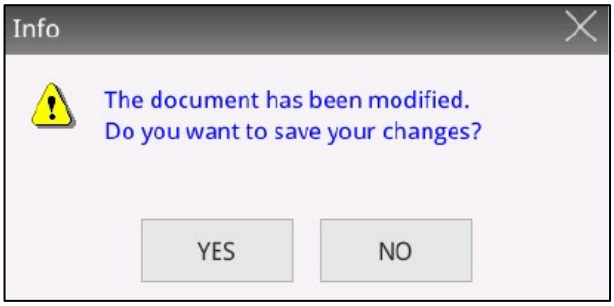
Multi-line Text Input				
			Before Deleting	Select the 8th line. 
			After Deleting	Click **Cut Line**, and the 8th line is deleted. 
	Switch to Line	● Click **Page Up**, **Page Down**, **Prev. Line**, or **Next Line** to switch to the specific line. ● If the text contents are within one page, the first line is selected when on clicking **Page Up** and the last line is selected on clicking **Page Down**.	Page Up	
			Page Down	
	Save	● Enter “DELTA” in the **Text Data** field, click the eighth line of text, and click **Replace**. Then, click **Save** to save the modified text data. Open the file on the computer to check whether the data has been		

modified and saved.

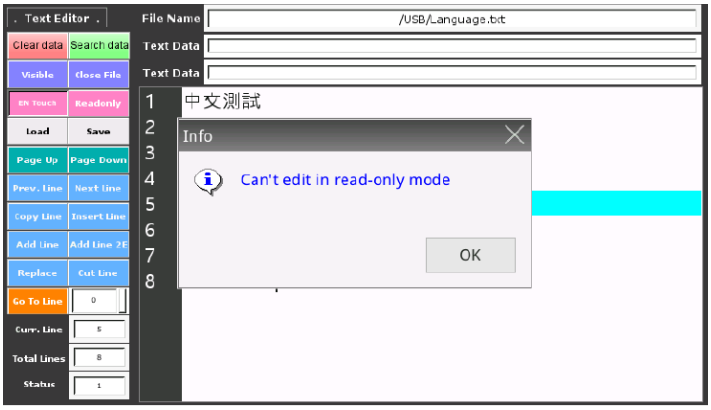
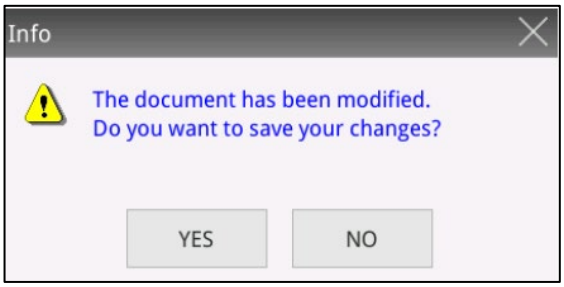




- If the file is not saved after modification and users are opening another file, then the following message appears to remind users to save the modified text before loading another file.



	Write-Protected	When the **Editable Trigger Address** is set to Off, writing to this text file will be prohibited. When users want to write text data, the HMI displays the following message.

Multi-line Text Input		
		
	Invalid Touch	If the **Interlock Address** has been set, when the **Interlock State** is On, click the elements to edit the text data; if the **Interlock State** is Off, the elements are not available.
	Close File	Click **Close File** to close the currently opened file. If the file has been modified before closed, the following window appears. 

On double-clicking the **Multi-line Text Input** element, the property page appears as follows.

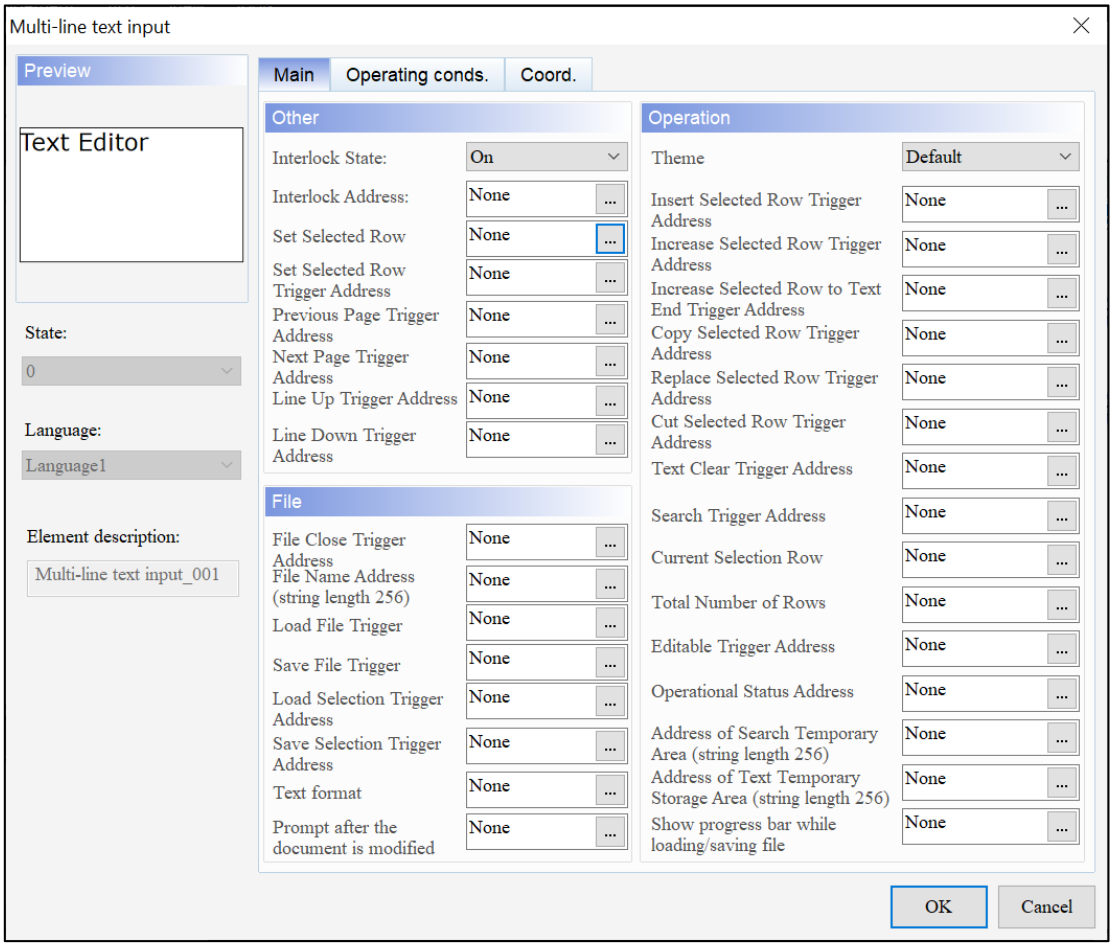


Figure 13 - 44: Multi-line Text Input property page

Multi-line Text Input	
Function	**Description**
Preview	**Multi-line Text Input** element does not support viewing multiple state values and multi-language data display.
Main	The settings include: Other, File, and Operation. ● **Other**: Interlock State, Interlock Address, Set Selected Row Address, Set Selected Row Trigger Address, Previous Page Trigger Address, Next Page Trigger Address, Line Up Trigger Address, and Line Down Trigger Address. ● **File**: File Close Trigger Address, File Name Address, Load File Trigger, Save File Trigger, Load Selection Trigger Address, Save Selection Trigger Address, Text format, and Prompt after the document is modified. ● **Operation**: Theme, Insert Selected Row Trigger Address, Increase Selected Row Trigger Address, Increase Selected Row to Text End Trigger Address, Copy Selected Row Trigger Address, Replace Selected Row Trigger Address, Cut Selected Row Trigger Address, Text Clear Trigger Address, Search Trigger

Multi-line Text Input	
Function	**Description**
	Address, Current Selection Row, Total Number of Rows, Editable Trigger Address, Operational Status Address, Address of Search Temporary Area, Address of Text Temporary Storage Area, and Show progress bar while loading / saving file.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

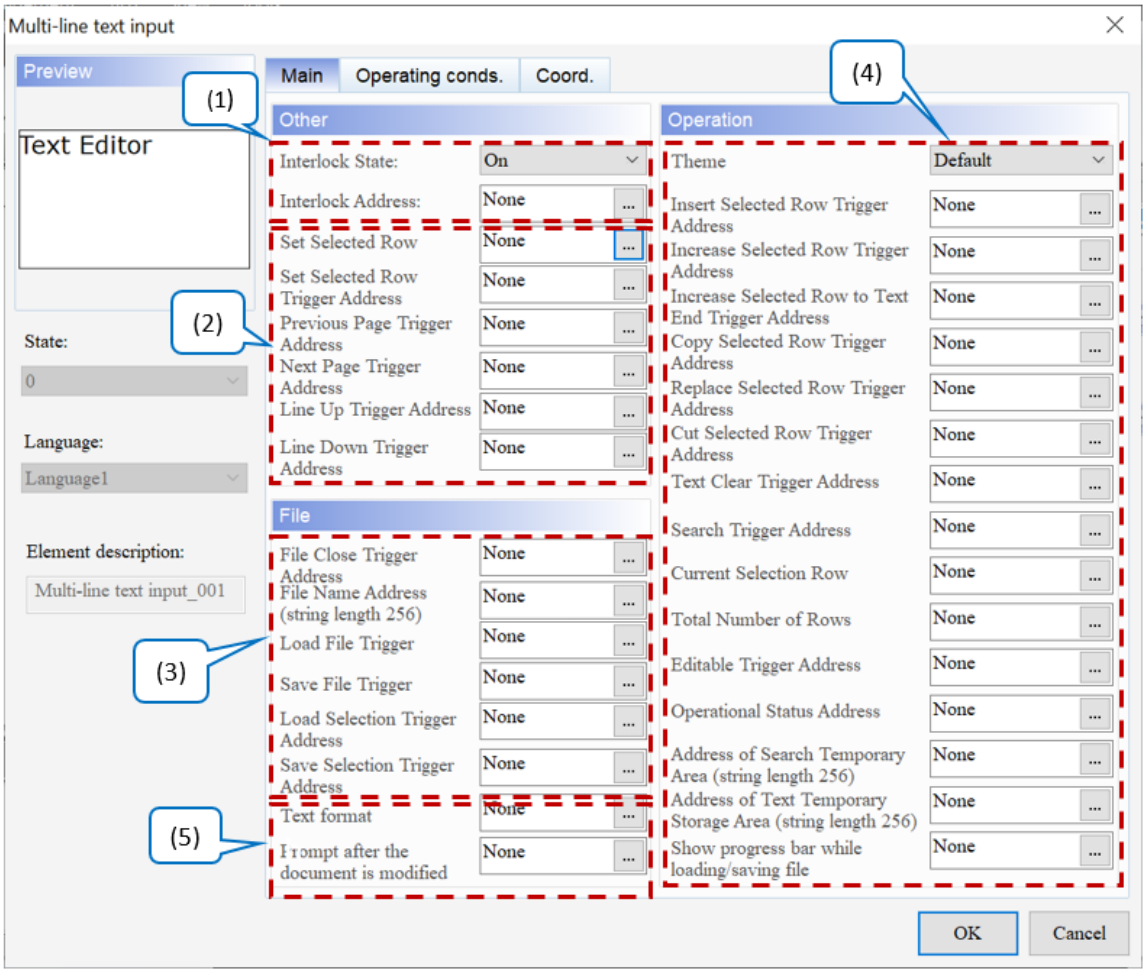
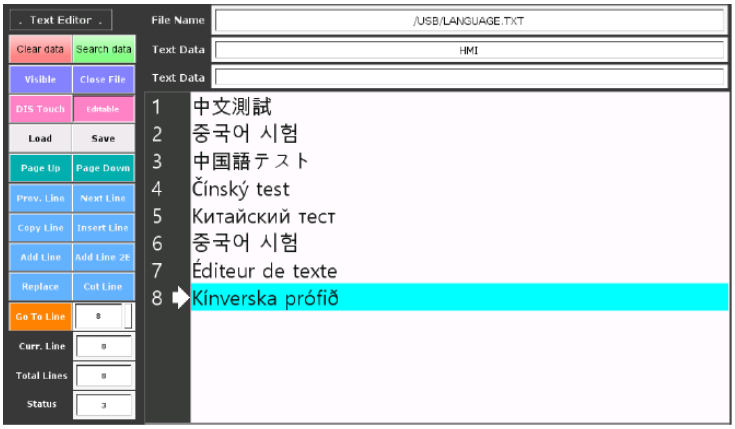
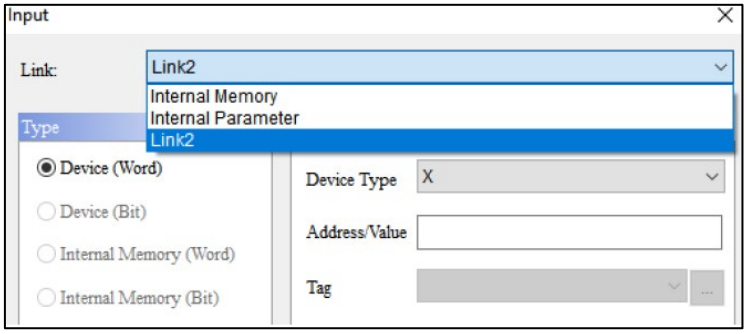
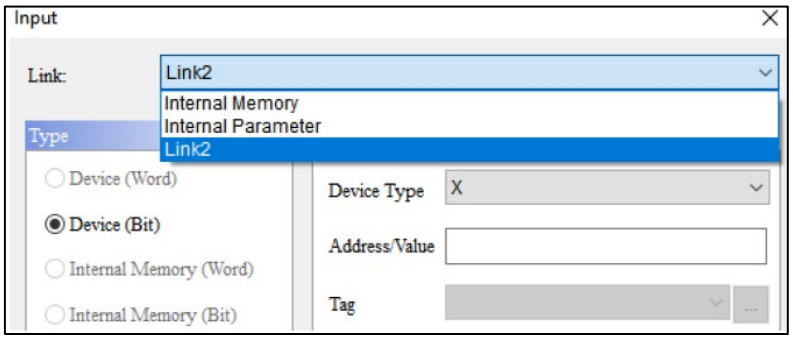
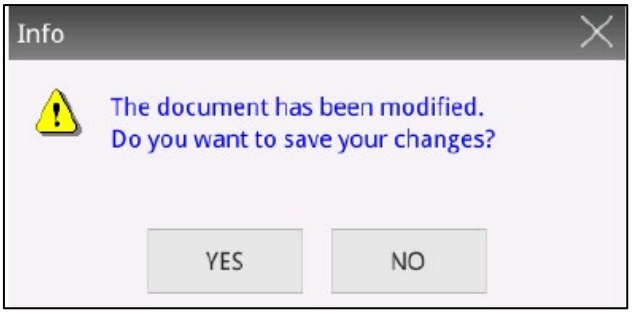
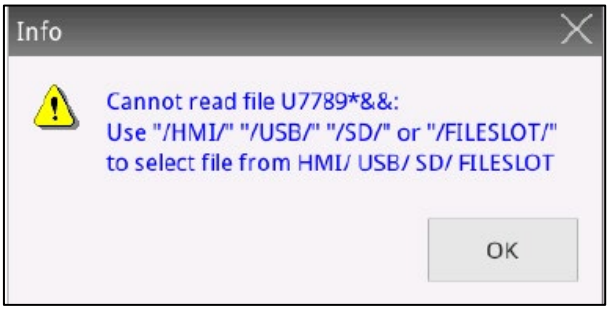


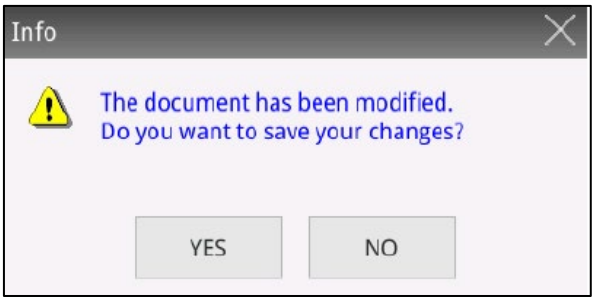
Figure 13 - 45: Multi-line Text Input element Main property page

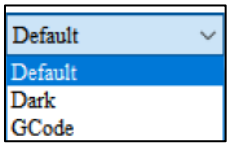
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Interlock State</td><td rowspan="2">● The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
● If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.</td></tr>
<tr><td>Interlock Address</td></tr>
<tr><td rowspan="2">(2)</td><td>Set Selected Row Address</td><td>● Specify the line to select with the Set Select Row Address. Then, set the Set Selected Row Trigger to On, and the element displays the selected item.
● Set to select the eighth row, press the Go To Line button, and the eighth row is selected.
 

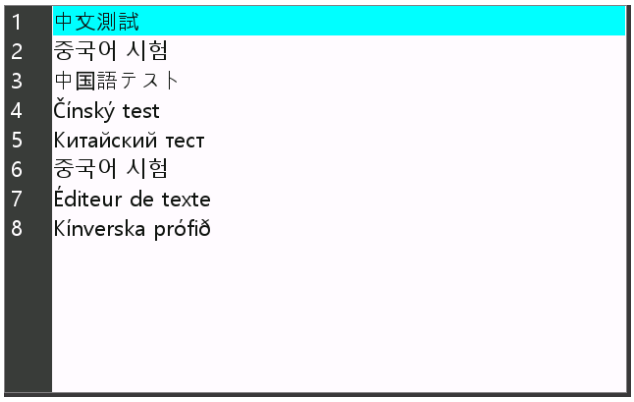
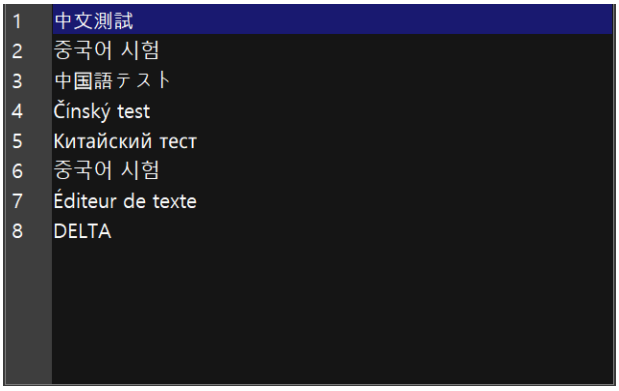
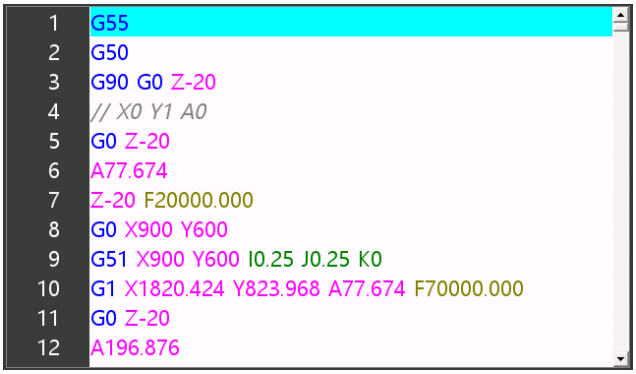
● For the Set Select Row Address, the controller address (Word) and the internal register address (Word) are supported.
 
</td></tr>
<tr><td>Set Selected Row Trigger</td><td>● For the Set Selected Row Trigger, the controller address (Bit) and the internal register address (Bit) are supported.
 
</td></tr>
</table>

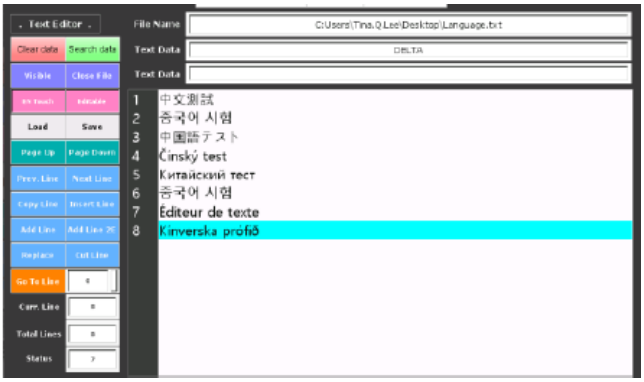
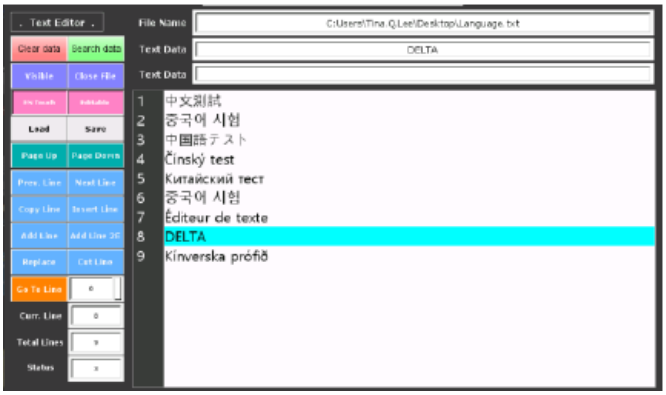
No.	Function	Description
	Previous Page Trigger Address	● When the **Previous Page Trigger Address** bit is on, the element display switches to the previous page and the bit is automatically cleared once the action is complete. ● If the text message does not exceed one page, the first line is selected on clicking **Page Up**. ● For the **Previous Page Trigger Address**, the controller address (Bit) and the internal register address (Bit) are supported.
	Next Page Trigger Address	● When the **Next Page Trigger Address** bit is on, the element display switches to the next page and the bit is automatically cleared once the action is complete. ● If the text message does not exceed one page, the last line is selected on clicking **Page Down**. ● For the **Next Page Trigger Address**, the controller address (Bit) and the internal register address (Bit) are supported.
	Line Up Trigger Address	● When the **Line Up Trigger Address** bit is on, the previous line is selected and the bit is automatically cleared once the action is complete. ● Each time the **Line Up Trigger Address** is executed, the **Curr. Line** decreases by 1 automatically to show how many lines are currently selected. ● For the **Line Up Trigger Address**, the controller address (Bit) and the internal register address (Bit) are supported.
	Line Down Trigger Address	● When the **Line Down Trigger Address** bit is on, the next line is selected and the bit is automatically cleared once the action is complete. ● Each time the **Line Down Trigger Address** is executed, the **Curr. Line** increases by 1 automatically to show how many lines are currently selected. ● For the **Line Down Trigger Address**, the controller address (Bit) and the internal register address (Bit) are supported.

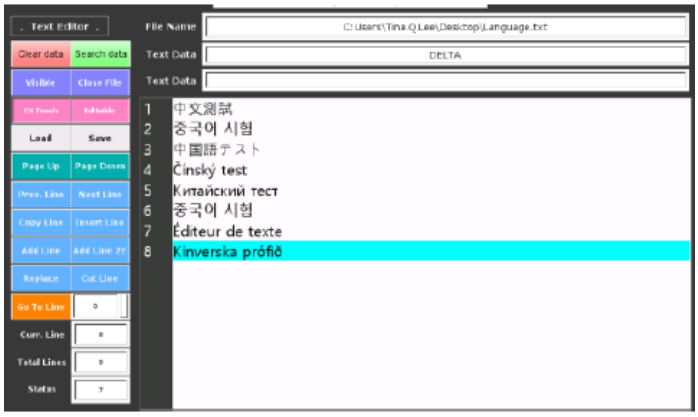
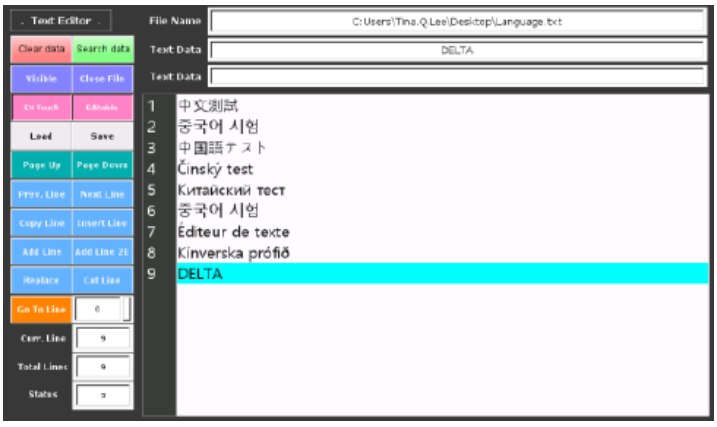
No.	Function	Description
(3)	File Close Trigger Address	● Execute the **File Close Trigger Address** to close the currently opened file. ● If the file has been modified before closed, DIAScreen displays the following message.  ● For the **File Close Trigger Address**, the controller address (Bit) and the internal register address (Bit) are supported.
	File Name Address	● The **File Name Address** is used to input the path and file name of the text file to be opened. ● The maximum length supports up to 256 characters or 512 words. ● For the **File Name Address**, the controller address (Word) and the internal register address (Word) are supported.
	Load File Trigger	● After entering the file name and path, execute the **Load File Trigger** to open the file. ● The size of the text file to be opened should not exceed 20 MB. ● If the entered file path is not correct, the HMI displays the following message to remind users how to enter the correct path.  ● For the **Load File Trigger**, the controller address (Bit) and the internal register address (Bit) are supported.

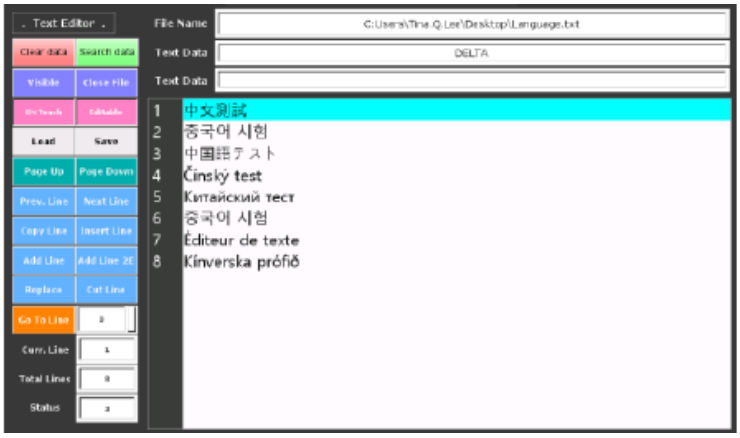
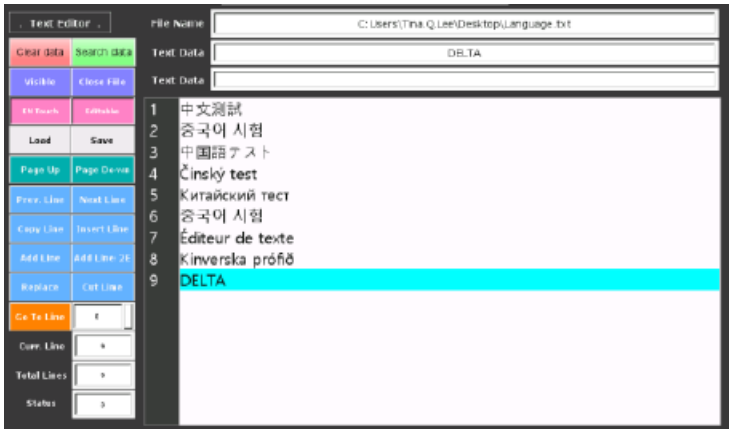
No.	Function	Description
	Save File Trigger	● When the contents of the file undergo any modifications, the modified or added content can be saved through the **Save File Trigger**. ● Execute the **Save File Trigger** before saving the file, the HMI displays the following message.  ● For the **Save File Trigger**, the controller address (Bit) and the internal register address (Bit) are supported.
	Load Selection Trigger Address	● After triggering the address, open the file browsing window, select the file to be read, and then open the file. ● For the **Load Selection Trigger Address**, the controller address (Bit) and the internal register address (Bit) are supported. ***NOTE**: After triggering the address, the file browsing window will be opened. Select the file to be read to open the file.*
	Save Selection Trigger Address	● After triggering the address, open the file browsing window, select the archive address and file name, and then save the text content into the file. ● For the **Save Selection Trigger Address,** the controller address (Bit) and the internal register address (Bit) are supported. ***NOTE**: After triggering the address, the file browsing window will be opened. Select the archive address and file name to save the text content into the file.*

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(4)</td><td>Theme</td><td>
The available options for Theme are: Default, Dark and GCode. The default value is Default.


<table>
<tr><td>Default</td><td> 
</td></tr>
<tr><td>Dark</td><td> 
</td></tr>
<tr><td>GCode</td><td>When users select GCode for the Theme and load an NC file containing GCode, the text appears in color.

</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Insert Selected Row Trigger Address</td><td>
When the Insert Selected Row Trigger Address is On, the text data will be inserted before the selected line and this bit will be automatically cleared once the action is complete.
<table>
<tr><td>Before Inserting</td><td>Select the 8th line and enter “DELTA” to the Text Data field. 
</td></tr>
<tr><td>After Inserting</td><td>Click Insert Line and “DELTA” is inserted to the 8th line. 
</td></tr>
</table>
The controller address (Bit) and internal register address (Bit) are supported.
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Increase Selected Row Trigger Address</td><td>
When the Increase Selected Row Trigger Address is On, the text data will be inserted after the selected line and this bit will be automatically cleared once the action is complete.
<table>
<tr><td>Before Adding</td><td>Select the 8th line and enter “DELTA” to the Text Data field.
 
</td></tr>
<tr><td>After Adding</td><td>Click Add Line and “DELTA” is inserted to the 9th line.
 
</td></tr>
</table>
The controller address (Bit) and the internal register address (Bit) are supported.
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Increase Selected Row to Text End Trigger Address</td><td>
When the Increase Selected Row to Text End Trigger Address is On, the text data will be inserted to the end of the lines and this bit will be automatically cleared once the action is complete.
<table>
<tr><td>Before Adding to the end of file</td><td>Select any line and enter “DELTA” to the Text Data field.
 
</td></tr>
<tr><td>After Adding to the end of file</td><td>Click Add Line 2E, and “DELTA” is inserted to the end of the file.
 
</td></tr>
</table>
The controller address (Bit) and the internal register address (Bit) are supported.
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Copy Selected Row Trigger Address</td><td>

When the Copy Selected Row Trigger Address is On, the current selected line is copied and the bit is automatically cleared once the action is complete.
After the copying is complete, the copied text data will be displayed in the text data buffer field.



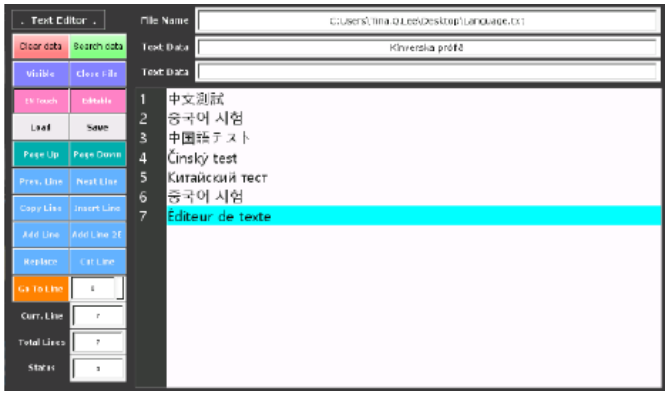
The controller address (Bit) and the internal register address (Bit) are supported.

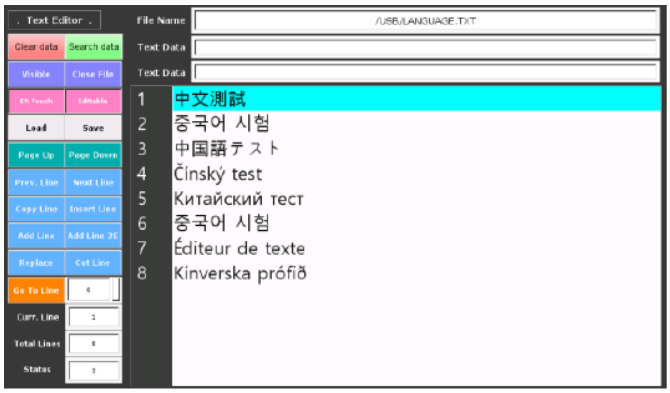
</td></tr>
<tr><td></td><td>Replace Selected Row Trigger Address</td><td>

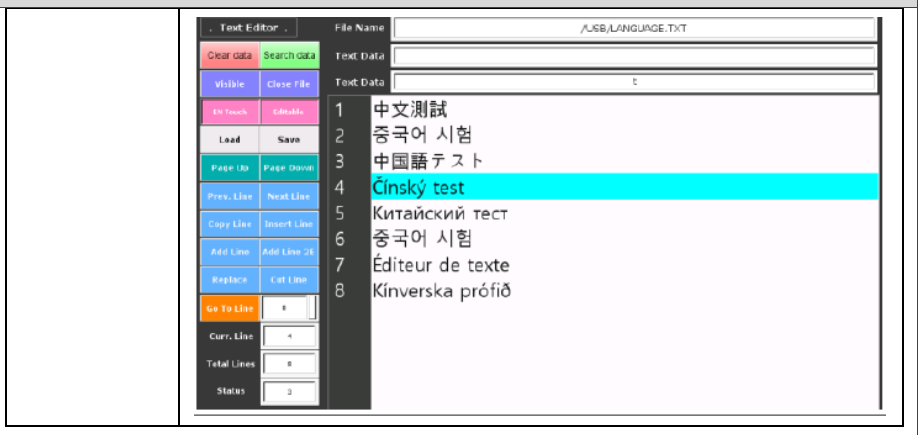
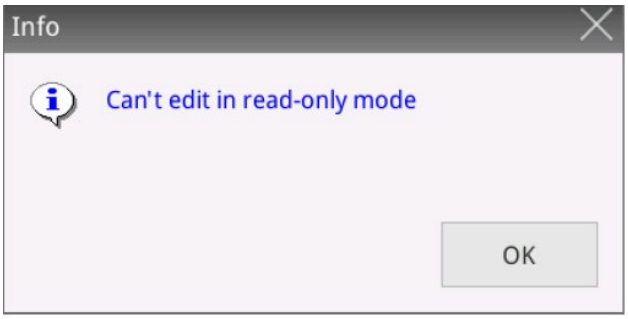
When the Replace Selected Row Trigger Address is On, the selected text will be replaced with the text data and this bit will be automatically cleared once the action is complete.

<table>
<tr><td>Before Replacing</td><td>Select the 8th line and enter “DELTA” to the Text Data field.
 
</td></tr>
<tr><td>After Replacing</td><td>Click Replace to replace the eighth line of text with DELTA.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>


The controller address (Bit) and the internal register address (Bit) are supported.
</td></tr>
<tr><td></td><td>Cut Selected Row Trigger Address</td><td>
When the Cut Selected Row Trigger Address is On, the text data will be deleted and this bit will be automatically cleared once the action is complete.
<table>
<tr><td>Before Deleting</td><td>Select the 8th line.
 
</td></tr>
<tr><td>After Deleting</td><td>Press Cut Line to delete the eighth line of text.
 
</td></tr>
</table>
The controller address (Bit) and the internal register address (Bit) are supported.
</td></tr>
</table>

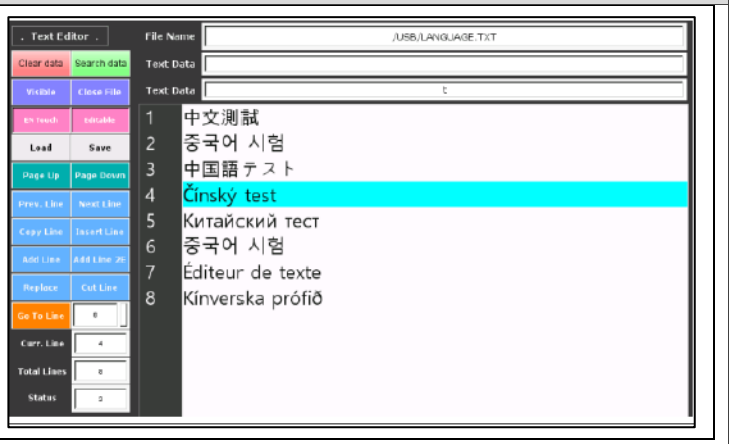
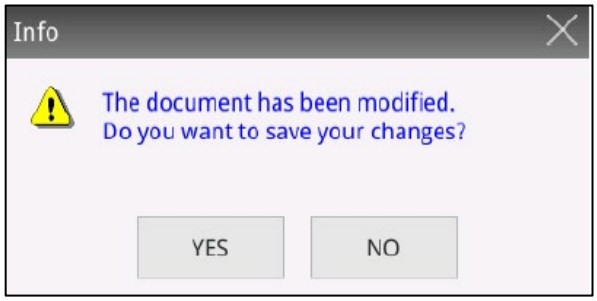
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Text Clear Trigger Address</td><td>
When the Text Clear Trigger Address is On, all text data will be cleared, and this bit will be cleared automatically once the action is complete.
<table>
<tr><td>Before Clearing</td><td> 
</td></tr>
<tr><td>After Clearing</td><td>Click Clear Data to clear all texts.
 
</td></tr>
</table>
The controller address (Bit) and the internal register address (Bit) are supported.
</td></tr>
<tr><td></td><td>Search Trigger Address</td><td>
The Search Trigger Address must be used with the Address of Search Temporary Area.
After a keyword to be searched for is entered in the text search buffer address, the Search Trigger Address is then executed, and the corresponding text line will be displayed.
<table>
<tr><td>Before Searching</td><td> 
</td></tr>
<tr><td>After Searching</td><td>Executing Search Data to search for the entered text, and the corresponding text data is selected.</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
		 ● The controller address (Bit) and the internal register address (Bit) are supported.
	Current Selection Row	● Display the number of currently selected lines. ● The controller address (Word) and the internal register address (Word) are supported.
	Total Number of Rows	● Display the total number of lines in the opened file. ● The controller address (Word) and the internal register address (Word) are supported.
	Editable Trigger Address	● When the **Editable Trigger Address** is On, perform any operation on the texts. ● When the **Editable Trigger Address** is Off, if users attempt to perform any operation on the texts, the following message is displayed.  ● The controller address (Bit) and the internal register address (Bit) are supported.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Operational Status Address</td><td>
Refer to the state value for the current status of the file.
<table>
<tr><th>Status Value</th><th>Description</th></tr>
<tr><td>1</td><td>Operation in progress</td></tr>
<tr><td>2</td><td>Operation canceled</td></tr>
<tr><td>3</td><td>Execution success</td></tr>
<tr><td>4</td><td>Execution failed / execution error</td></tr>
<tr><td>7</td><td>File loading success</td></tr>
<tr><td>8</td><td>File saving success</td></tr>
<tr><td>9</td><td>File is empty</td></tr>
<tr><td>10</td><td>File not found</td></tr>
</table>
The controller address (Word) and the internal register address (Word) are supported.
</td></tr>
<tr><td></td><td>Address of Search Temporary Area</td><td>

The Address of Search Temporary Area must be used with the Search Trigger Address.
The length supports a maximum of 256 characters or 512 words.
After the keyword to be searched for is entered in the text search buffer address, the Search Trigger Address is then executed, and the corresponding text line will be displayed.

<table>
<tr><td>Before Searching</td><td> 
</td></tr>
<tr><td>After Searching</td><td>Executing Search Data to search for the entered text and the corresponding text data is selected.</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
		 ● The controller address (Word) and the internal register address (Word) are supported.
	Address of Text Temporary Storage Area	● The **Address of Text Temporary Storage Area** is used to input the text to be added or modified, and can be used as the buffer for storing the copied text data. ● The length supports a maximum of 256 characters or 512 words.
(5)	Text format	● Set the **Text format**, which is defined as follows: 0: UTF8 1: GBK ● The controller address (Word) and the internal register address (Word) are supported.
	Prompt after document has been modified	● The document modification prompt message is shown in the following figure. The default value is the pop-up prompt message, and the values are defined as follows: 0: do not prompt 1: Prompt to jump out of the prompt dialog pane  ● The controller address (Word) and the internal register address (Word) are supported.

- Coord.

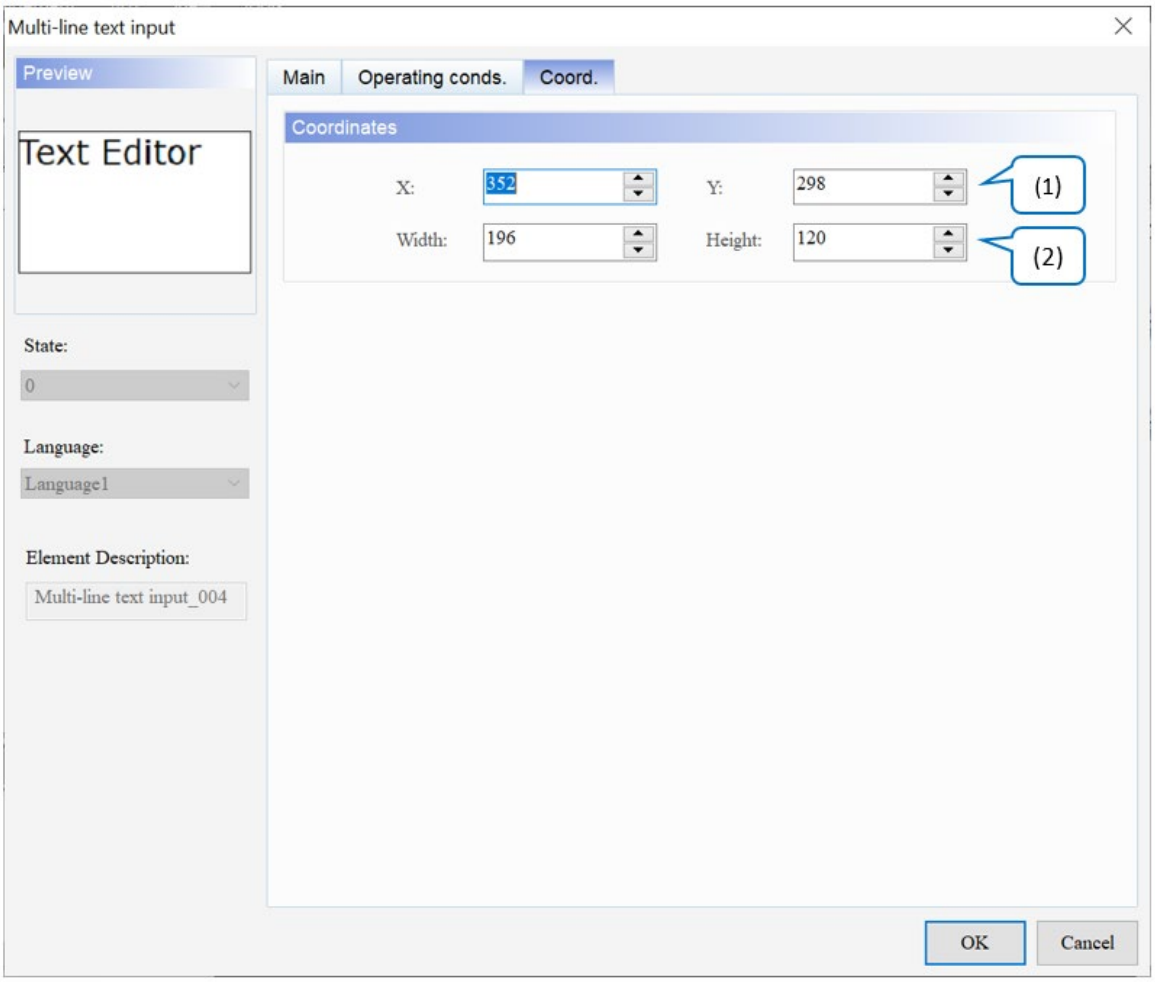


Figure 13 - 46: Multi-line Text Input element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

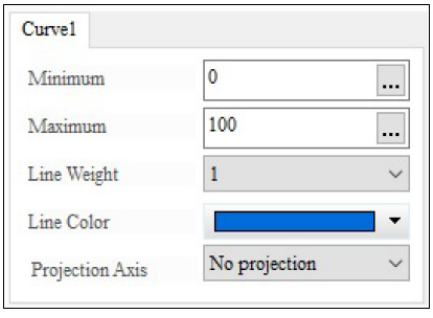
Chapter 14: Curve

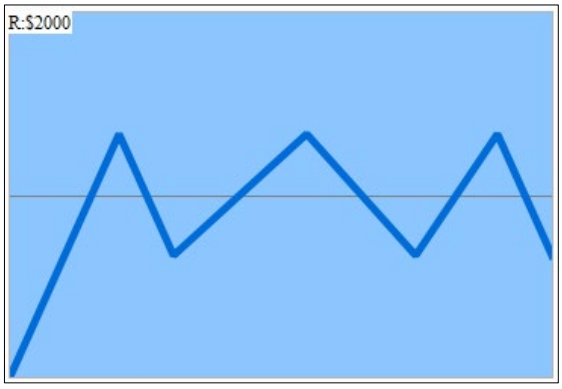
To create a **Curve** element, go to **Elements** > **Curve** and click the desired **Curve** element.

14.1 Trend Graph

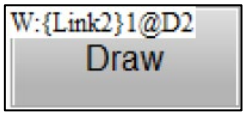
The **Trend Graph** element is drawn according to the set **Read Address**, and the users can define the curve count to display. A **Trend Graph** element supports up to four curves. This element requires using the Curve sampling flag from **General** > **Configuration** > **Control Status Block** > **Control Block** > **Curve Control**. The Curve sampling flags 1 ~ 4 correspond to the **Sample Flag** 1 ~ 4 of the **Trend Graph** element.

Refer to the following table for a **Trend Graph** element example description.

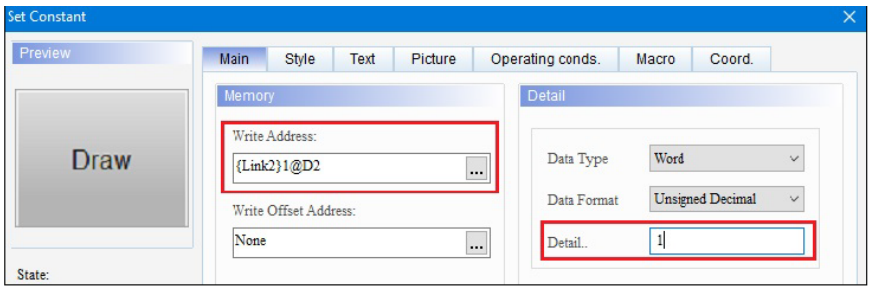
<table>
<tr><th colspan="2">Trend Graph</th></tr>
<tr><td>Trend Graph element</td><td>Create a Trend Graph element and set its parameters.
<table>
<tr><th colspan="2">Trend Graph Element</th></tr>
<tr><td>Read Address</td><td>$2000</td></tr>
<tr><td>Sample Number</td><td>5</td></tr>
<tr><td>Sample Flag</td><td>1</td></tr>
<tr><td>Number of Curves</td><td>1</td></tr>
<tr><td>Minimum / Maximum Line Weight / Line Color / Projection Axis</td><td> 
</td></tr>
</table></td></tr>
</table>

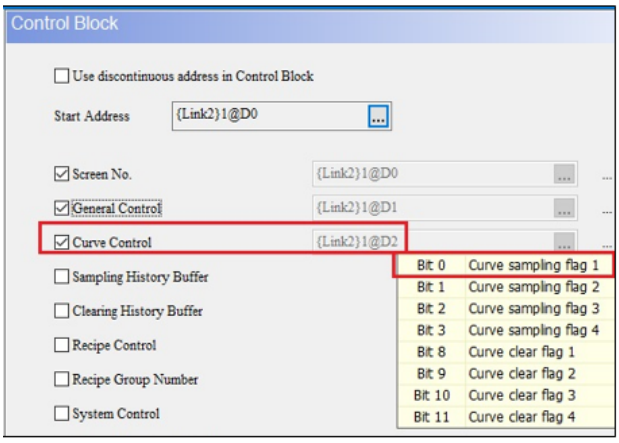
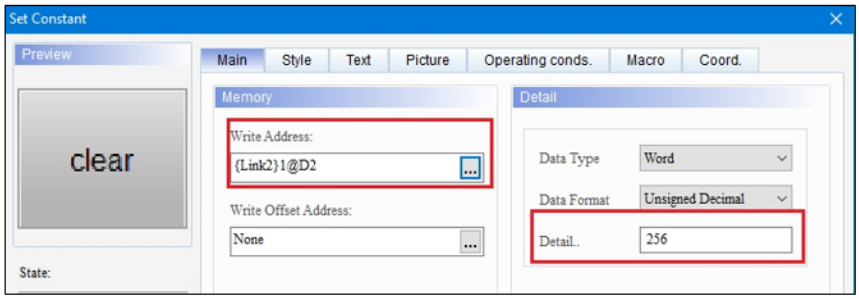
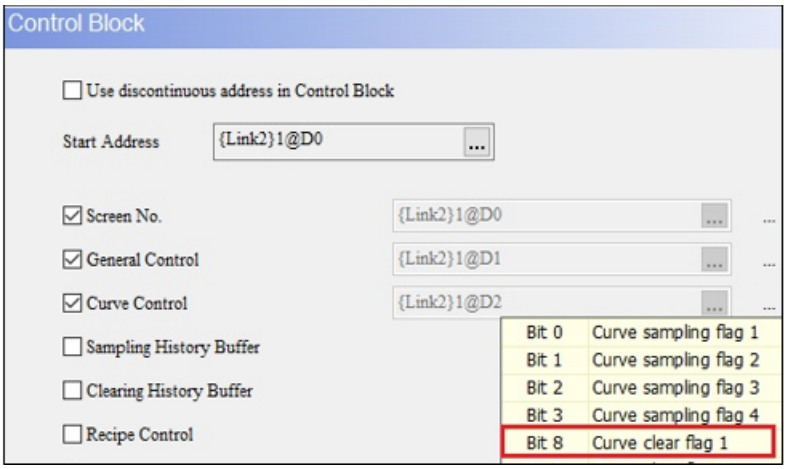
<table>
<tr><th colspan="2">Trend Graph</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Numeric Entry element</td><td>Create five Numeric Entry elements. As the Sample Number of the Trend Graph element is set to 5, it means that 5 sampling points are used to draw a curve. Then, the set Write Address $2000 of the Trend Graph starts reading 5 addresses in sequence, which are $2000, $2001, $2002, $2003, and $2004.
<table>
<tr><th colspan="6">Numeric Entry Element</th></tr>
<tr><td>Write Address</td><td>$2000</td><td>$2001</td><td>$2002</td><td>$2003</td><td>$2004</td></tr>
</table></td></tr>
<tr><td>Set Constant Button element</td><td>

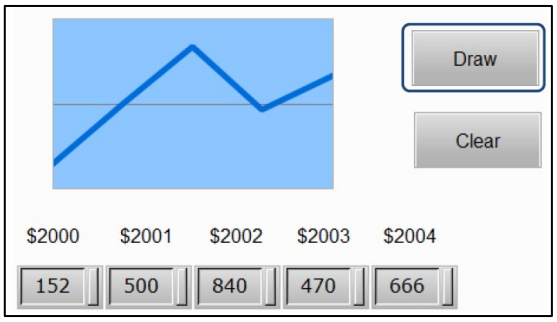
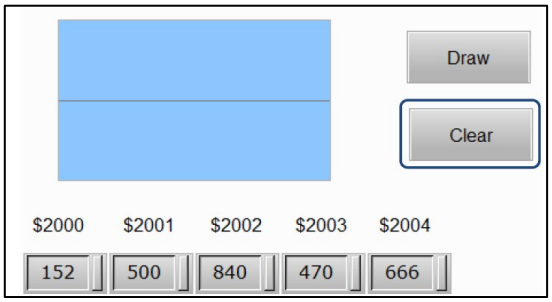
Create a Set Constant Button element and set its Write Address as D2. This D2 address is for the Curve Control flag in the Control Block.



Set the Detail.. of the Set Constant Button element to 1. 1 corresponds to Bit 0 Curve sampling flag 1; 2 corresponds to Bit 1 Curve sampling flag 2; 4 corresponds to Bit 2 Curve sampling flag 3, and so on. Users can also find that the Sample Flag setting of the Trend Graph element is 1 as well.


</td></tr>
</table>

Trend Graph	
	 ● Create another **Set Constant Button** element and set its **Write Address** as D2, and set the **Detail..** as 256. 256 corresponds to **Bit 8 Curve clear flag 1**.   
Execution result	● After creating the elements, compile and download the data to the HMI. Next, enter any values to the **Numeric Entry** elements, and then press **Draw** to draw the curve.

Trend Graph	
	 ● After drawing the curve, press **Clear**, and the HMI clears the drawn curve. 

On double-clicking the **Trend Graph** element, the property page appears as follows.

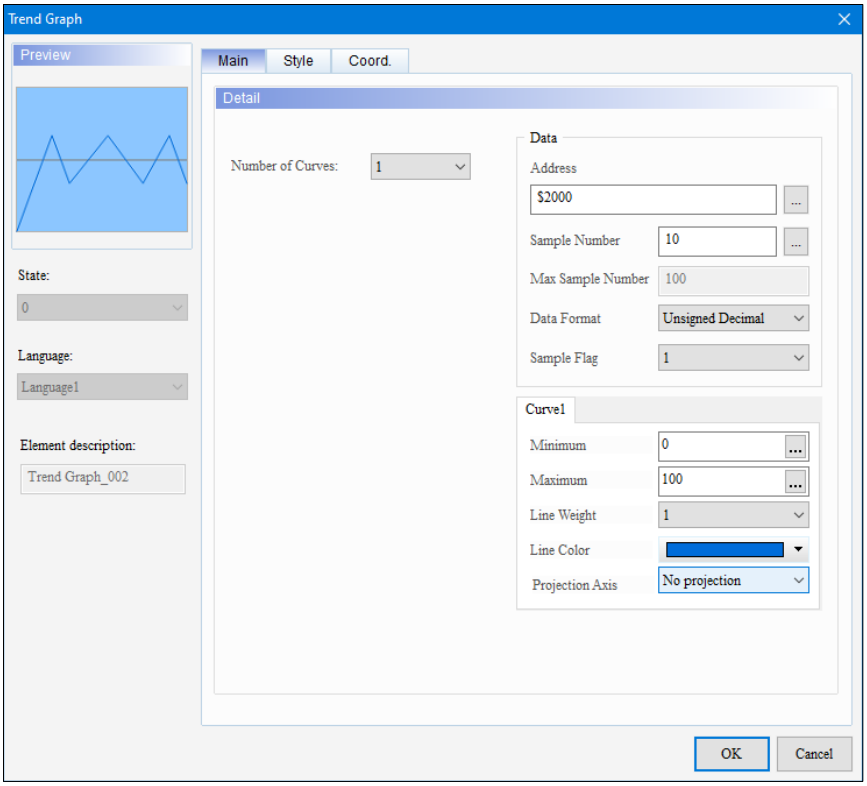


Figure 14 - 1: Trend Graph element property page

Trend Graph	
Function	**Description**
Preview	The **Trend Graph** elements do not support multiple state values and multi-language data display.
Main	Set Address, Sample Number, Max Sample, Data Format, Sample Flag, Minimum, Maximum, Line Weight, Line Color, and Projection Axis.
Style	Set the Border Color, Gridline Color, Horiz. Grid Number, Style, Background Color, Number of Curves, Transparency, Smooth animation and Anti-aliasing.
Coord.	Set the X-Y coordinates, Width and Height of the element.

- Main

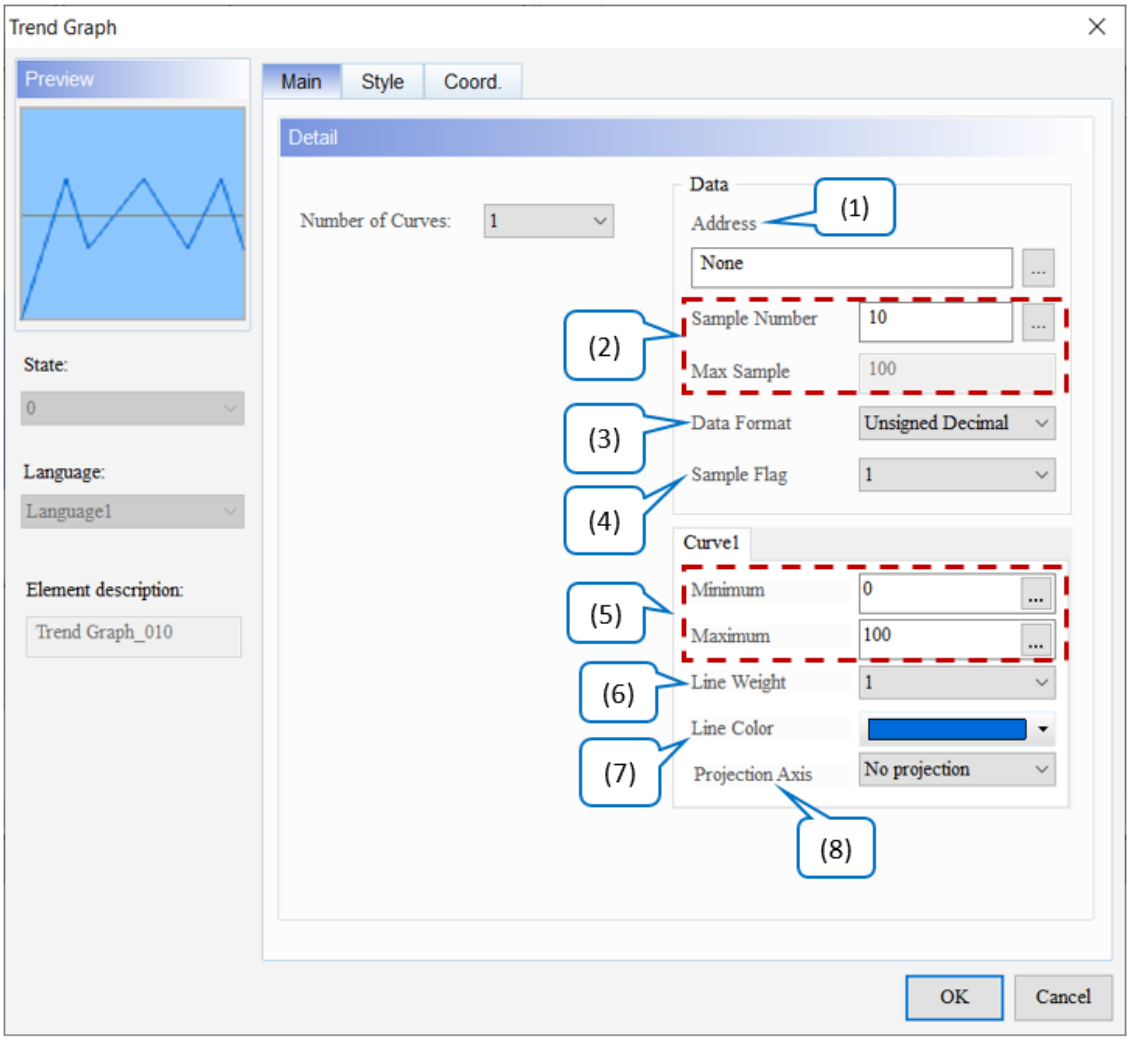
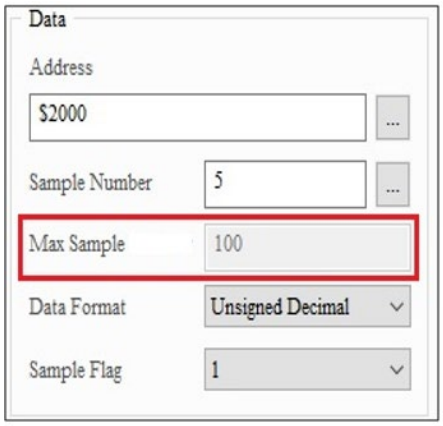
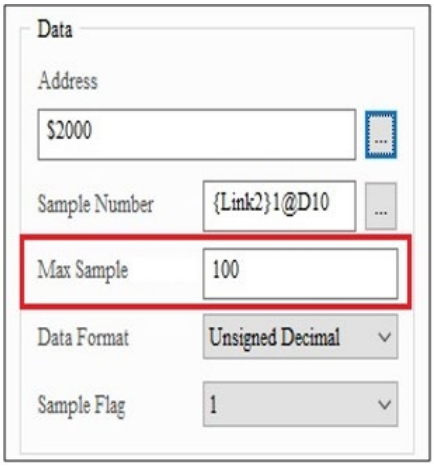
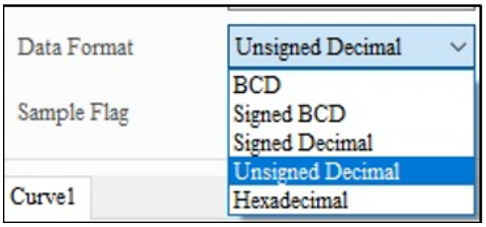
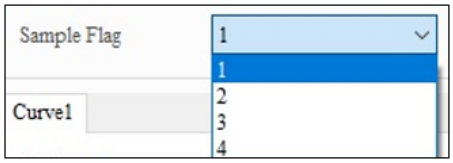
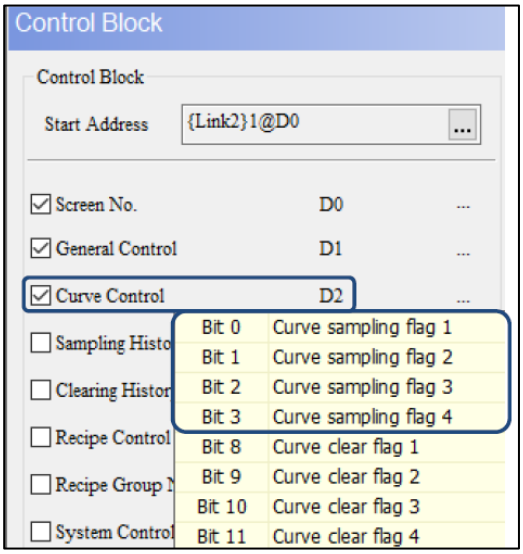


Figure 14 - 2: Trend Graph element Main property page

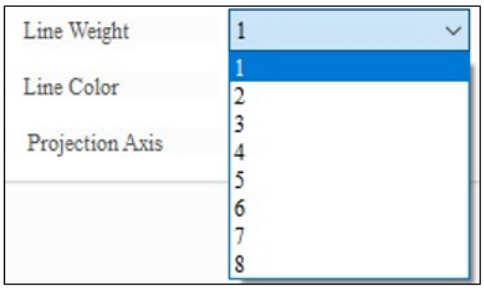
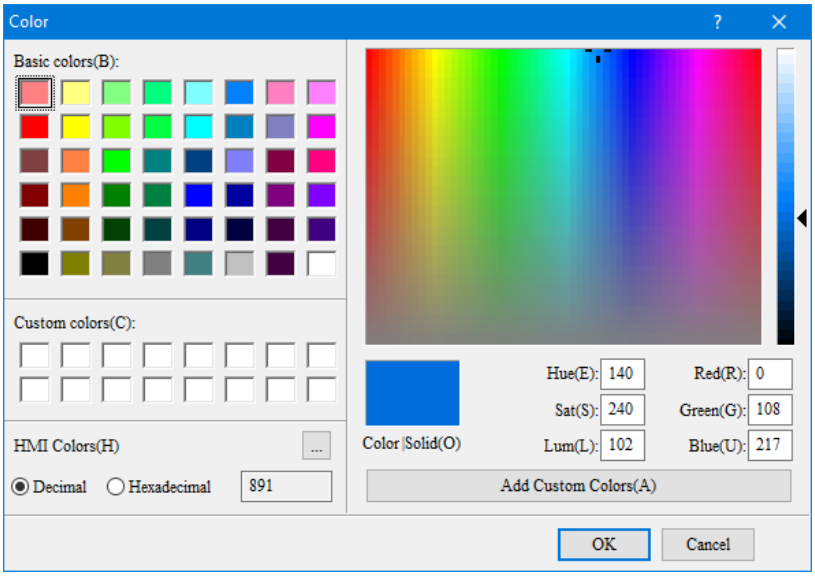
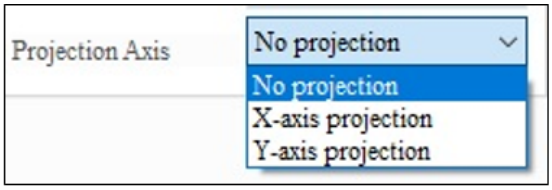
No.	Function	Description
(1)	Address	● Select the Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
(2)	Sample Number / Max Sample	● The number of sampling points is determined by the element width and style. Set the **Style** of the **Trend Graph** element as Standard and its width as 391, then the maximum number of points that can be displayed is 391. But if users set the **Style** of the **Trend Graph** element as Raised or Sunken (border width is 7 points) and its width as 391, then the maximum number of points that can be displayed is 377 (391 - (7*2) = 377). ● **Sample Number** can be set as a constant or a variable. The default value is **10**. ● When users set the **Sample Number** as a constant, the **Max Sample** is disabled (grayed out) and cannot be set.  ● When users set the **Sample Number** as a variable, they can define its **Read Address**. Also, users need to set the **Max Sample**, which is determined by the element width. If the set **Sample Number** is greater than the **Max Sample**, DIAScreen refers to the setting of the **Max Sample**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Data Format</td><td>The available options for Data Format are: BCD, Signed BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is Unsigned Decimal.
 
</td></tr>
<tr><td>(4)</td><td>Sample Flag</td><td>There are 4 Sample Flag corresponding to the Curve sampling flags b0 ~ b3 of the Curve Control in the Control Block respectively. The default value is 1.
 

 
</td></tr>
<tr><td>(5)</td><td>Minimum / Maximum</td><td>

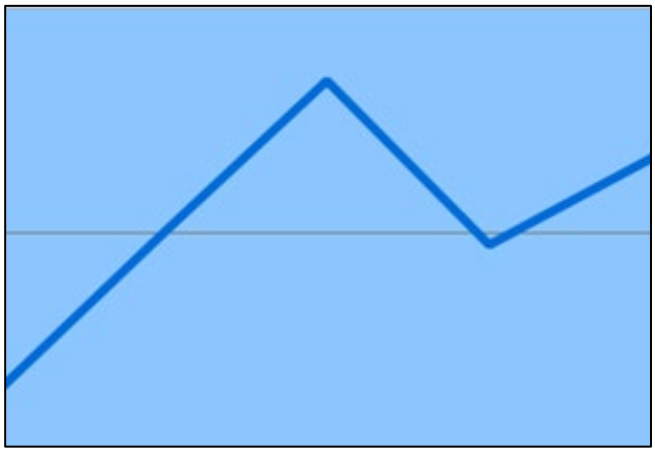
The Minimum and Maximum values can be set as constants or variables. The default value of Minimum is 0 and Maximum is 100.
When the Minimum and Maximum values are variables, the controller address (Word) and the internal register address (Word) are supported.
When the Minimum and Maximum values are constants, the permissible range of their values vary according to the selected Data Type and Data Format.

<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="2">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td></td><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td></td><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Line Weight</td><td>The line width can be set from 1 ~ 8. The default value is 1.
 
</td></tr>
<tr><td>(7)</td><td>Line Color</td><td>Set the line color for the curve. The default is .
 
</td></tr>
<tr><td>(8)</td><td>Projection Axis</td><td>● The available options for Projection Axis are: No projection, X- axis projection, and Y-axis projection. The default value is No projection.
 

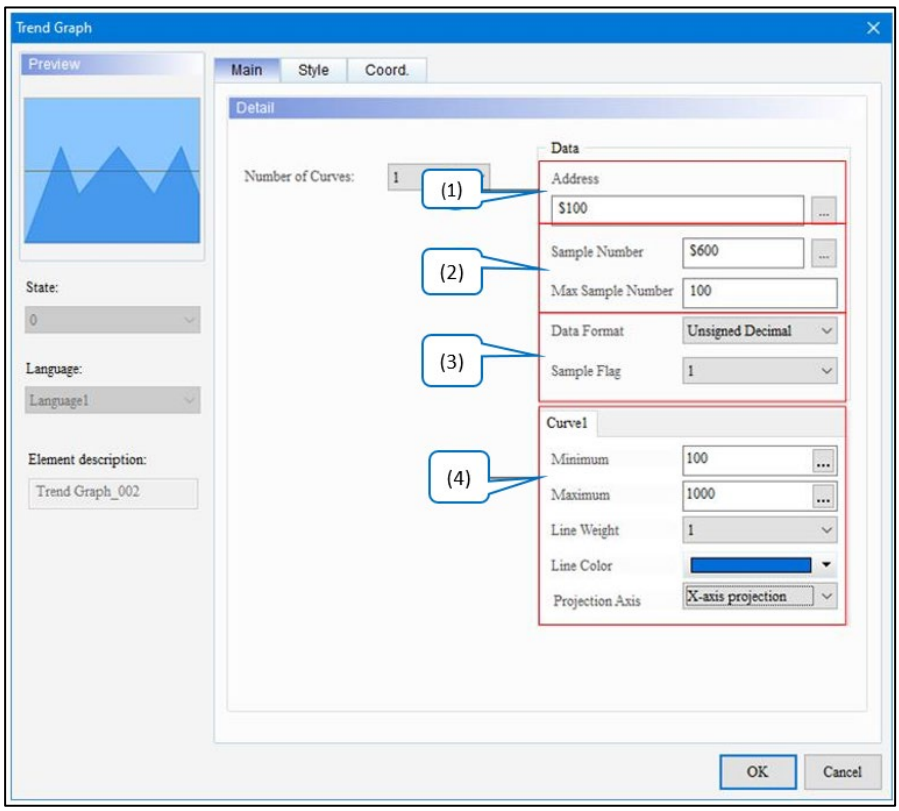
● When the Projection Axis is set to No projection, the setting is the same as the default setting, so only the curve is displayed.</td></tr>
</table>

No.	Function	Description

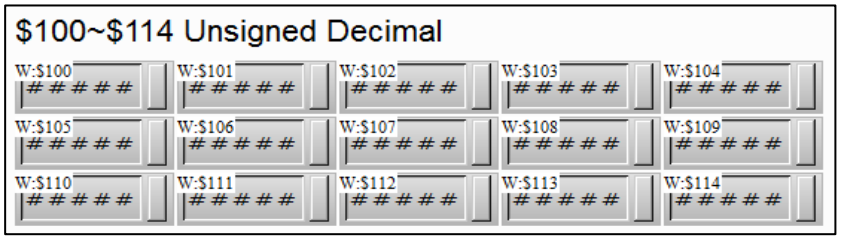
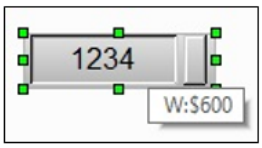
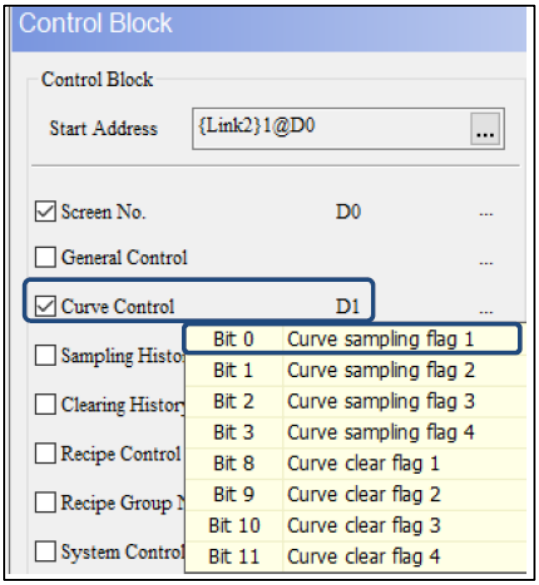
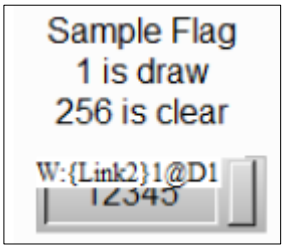


- The following introduces X-axis projection and Y-axis projection respectively.

  X-axis projection

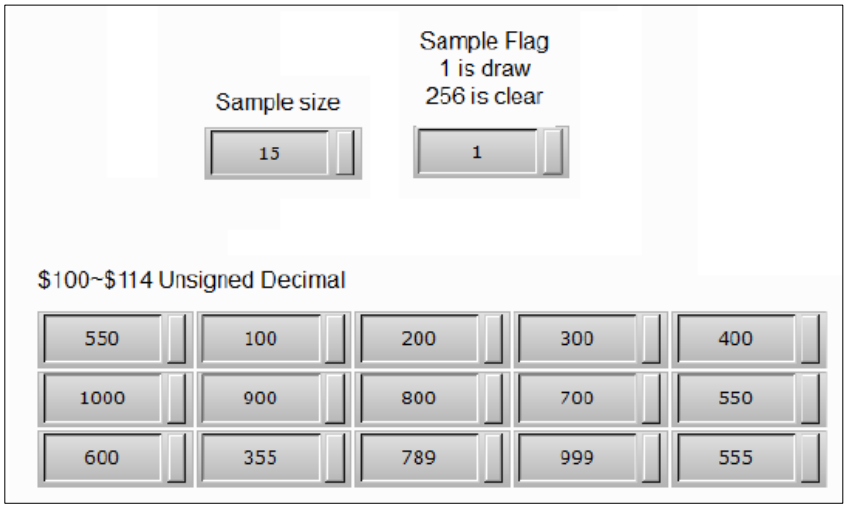


(1)	Set the **Address** to $100.
(2)	Set the **Sample Number** to $600 and the **Max Sample Number** to 100.
(3)	Set the **Data Format** to Unsigned Decimal and the **Sample Flag** to 1.
(4)	Set the **Minimum** as 100 and the **Maximum** as 1000.
	Set the **Projection Axis** to X-axis projection.

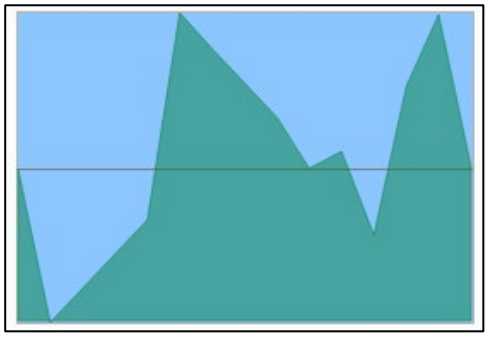
No.	Function	Description
		● Create a **Numeric Entry** element of $100 ~ $114, and set their **Data Format** as Unsigned Decimal.  ● Create a **Numeric Entry** element of $600 to input the **Sample Number**.  ● Go to **General** > **Configuration** > **Control Status Block** > **Control Block**, and select the **Curve Control** checkbox with the address as D1.  ● Create a **Numeric Entry** element with the **Write Address** set as D1.  ● After completing the preceding steps, compile and download the data to the HMI. ● Enter any values to the **Numeric Entry** elements of $100 ~

No.	Function	Description

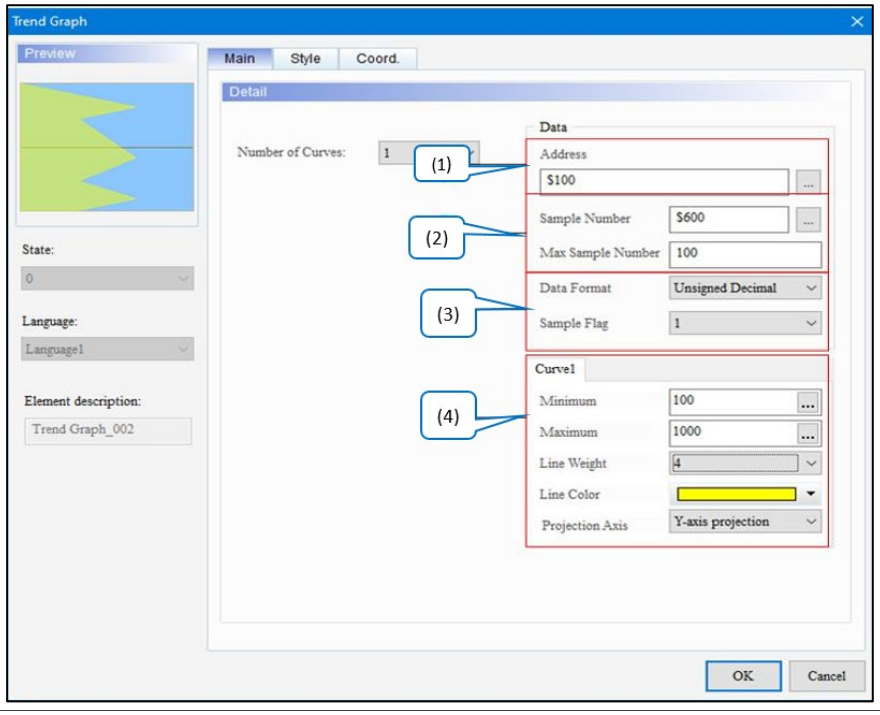
$114, and input 15 to the **Sample Number** and 1 to the **Sample Flag.**

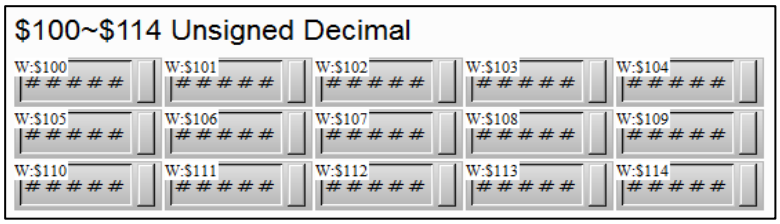
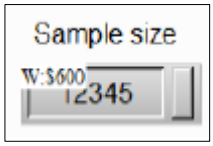
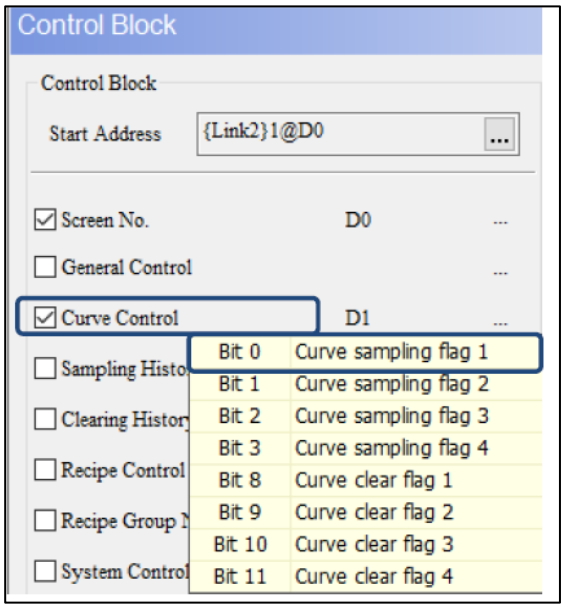


- When users complete entering the values, the Trend Graph is as follows.

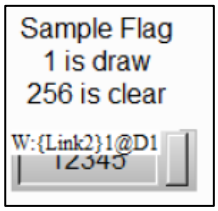


Y-axis projection

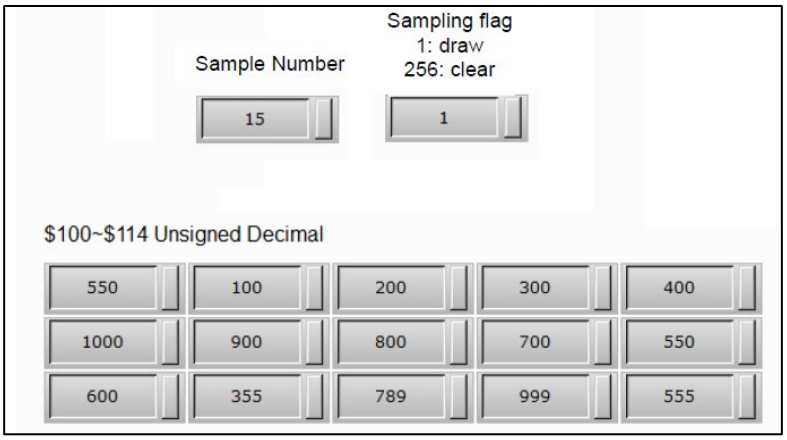


No.	Function	Description
		(1) Set the **Address** to $100. (2) Set the **Sample Number** to $600 and the **Max Sample Number** to 100. (3) Set the **Data Format** to Unsigned Decimal and the **Sample Flag** to 1. (4) Set the **Minimum** as 100 and the **Maximum** as 1000. Set the **Projection Axis** to Y-axis projection. ● Create a **Numeric Entry** element of $100 ~ $114, and set their **Data Format** as Unsigned Decimal.  ● Create a **Numeric Entry** element with **Write Address** $600 to set **Sample Number**.  ● Go to **General** > **Configuration** > **Control Status Block** > **Control Block**. Select the **Curve Control** checkbox with the address as D1.  ● Create a **Numeric Entry** element with the **Write Address** set as D1.

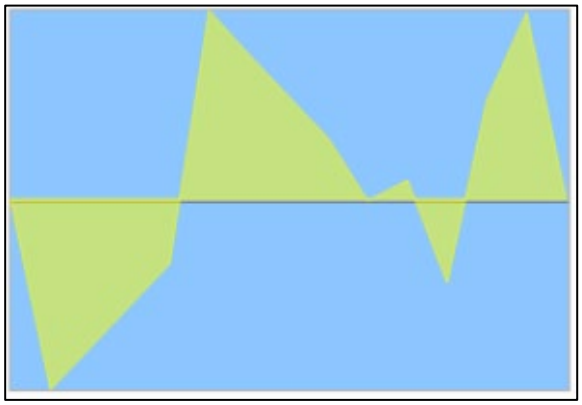
No.	Function	Description



- After completing the preceding steps, compile and download the data to the HMI.
- Enter any values to the **Numeric Entry** elements of $100 ~ $114, and input 15 to the **Sample Number** and 1 to the Sampling flag.



- When users complete entering the values, the Trend Graph is as follows.



***NOTE**: When using the **Projection Axis**, if there is more than one curve displayed on the Trend Graph at the same time, the curve of the greater number covers the curve of the smaller number.*

- Style

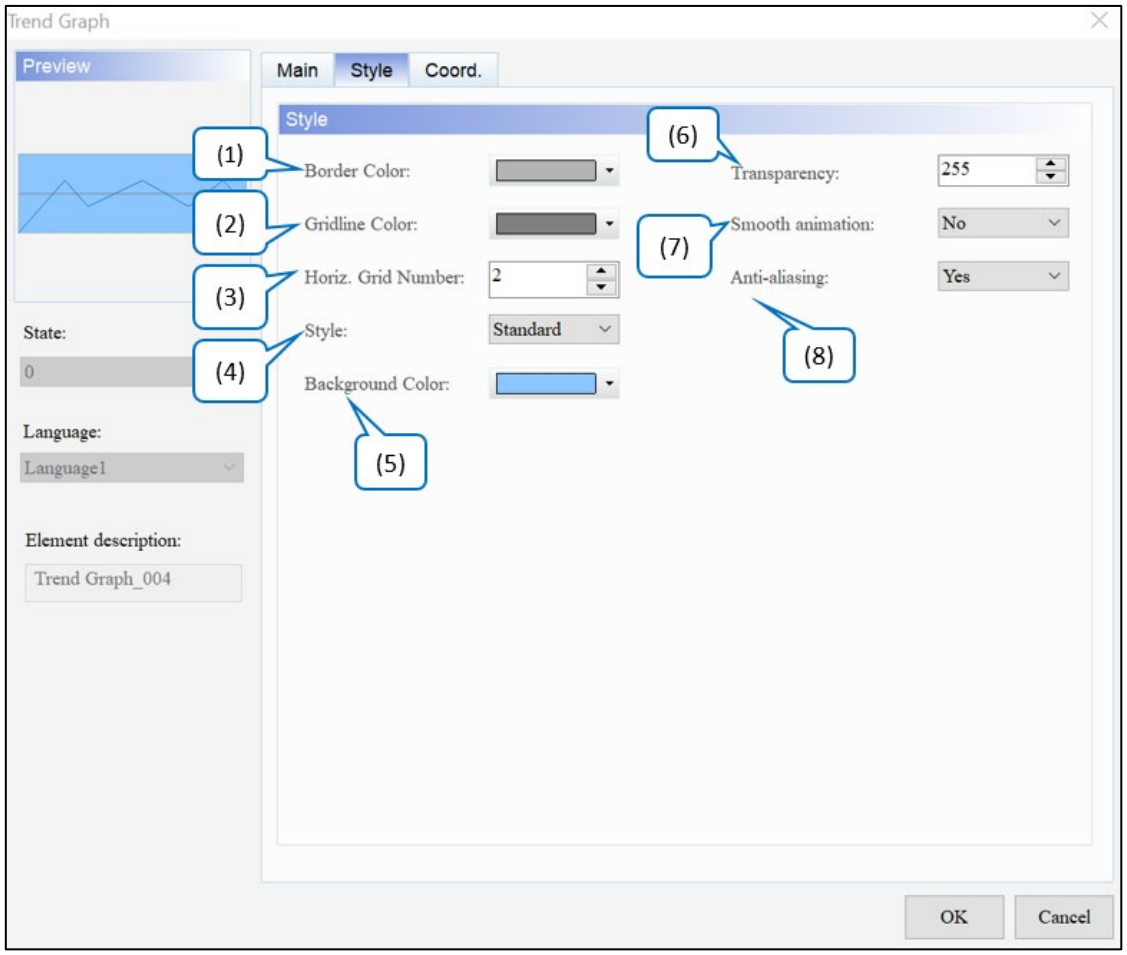
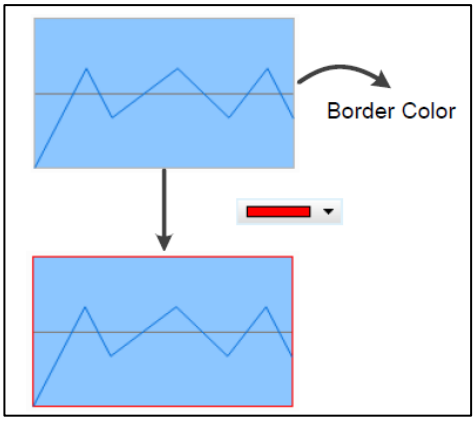
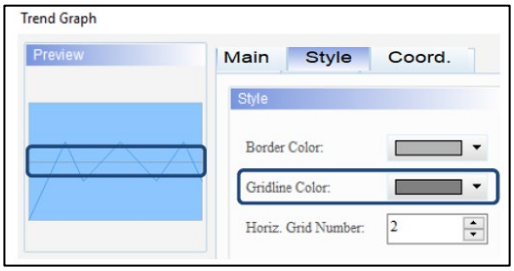
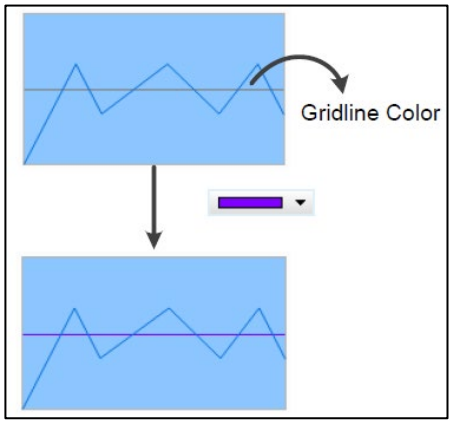
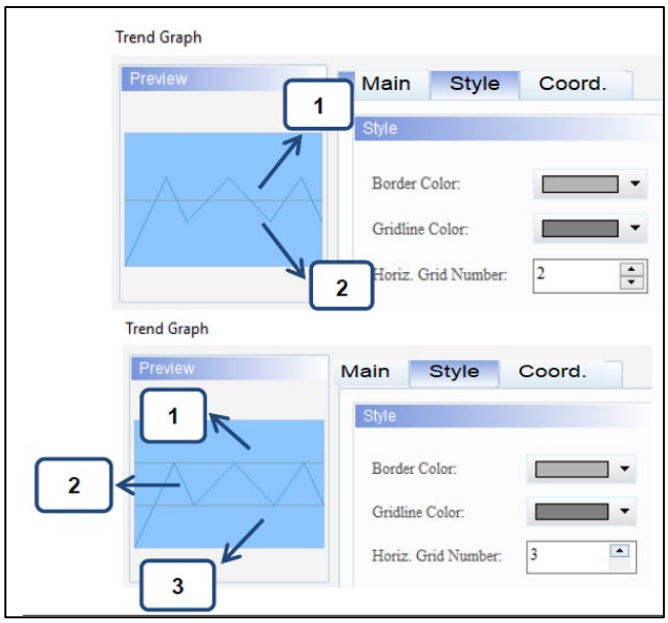
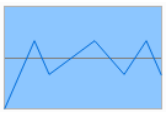
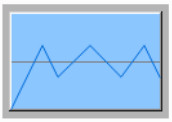
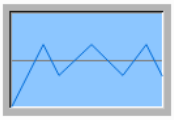
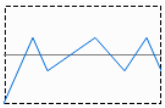
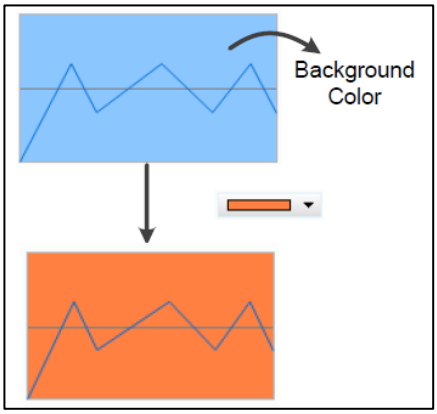


Figure 14 - 3: Trend Graph element Style property page

No.	Function	Description
(1)	Border Color	Set the border color of the element. The default is . 
(2)	Gridline Color	● The **Gridline Color** is the color of the gridline in the

No.	Function	Description
		element. The default is  .  ● Change the color of the gridline. 
(3)	Horiz. Grid Number	● **Horiz. Grid Number** sets the number of zones the **Trend Graph** element is divided into. The default value is **2**, meaning there is one grid line dividing the **Trend Graph** element into two zones. If the **Horiz. Grid Number** is set to 3, there are two grid lines dividing the **Trend Graph** element into 3 zones, and so on. ● The maximum horizontal grid count is 50. 
(4)	Style	This setting allows users to change the appearance of elements. The available options for **Style** are: Standard,

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Raised, Sunken, and Transparent. The default value is Standard.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Background Color</td><td>● Set the background color of the element. The default is  .
 
</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(7)</td><td>Smooth animation</td><td>The Smooth animation function is available for this element. When this function is enabled, the curve display is smoother. The default value is No.</td></tr>
<tr><td>(8)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. When this function is enabled, the element display becomes more delicate without jagged edges. The default value is Yes.</td></tr>
</table>

- Coord.

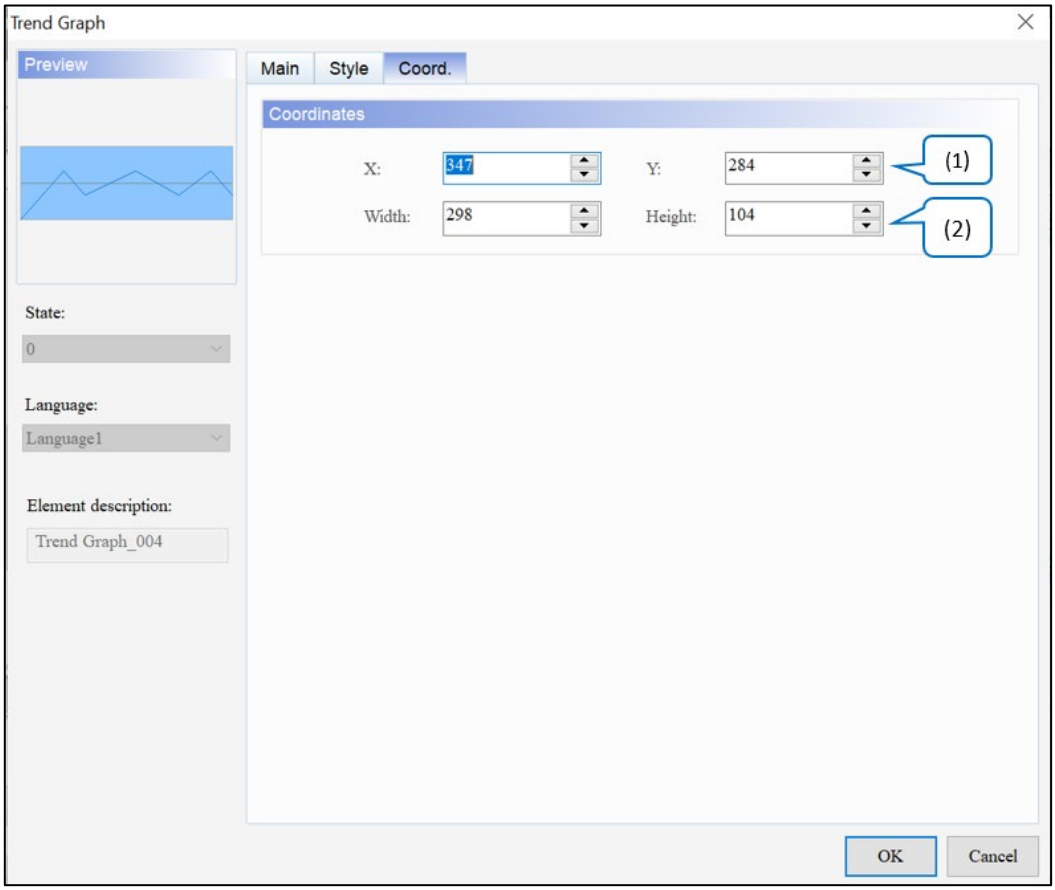


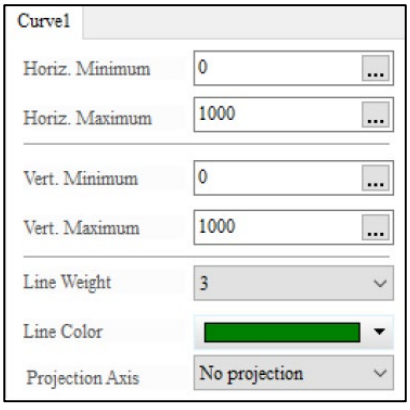
Figure 14 - 4: Trend Graph element Coord. property page

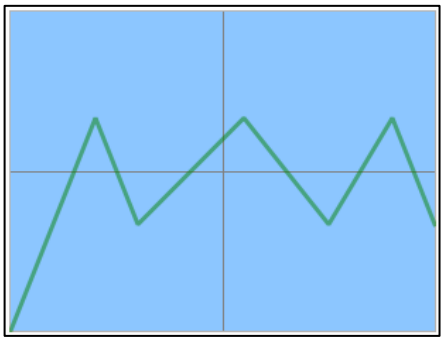
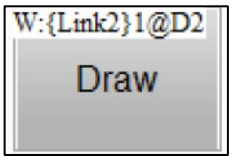
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

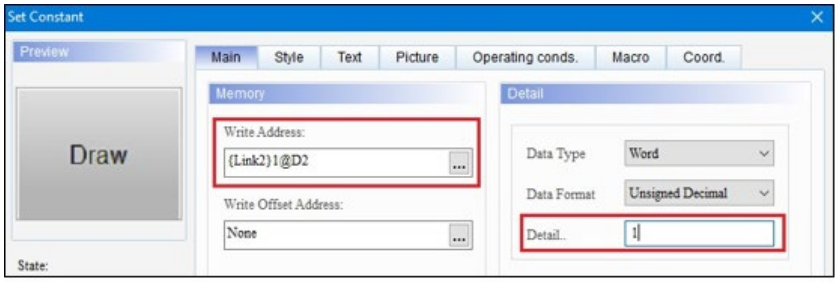
14.2 X-Y Chart

X-Y Chart element is drawn according to the set **Horiz. Read Address** and **Vert. Read Address**. Users can also define the curve count to display, and if X and Y points are connected. An **X-Y Chart** element supports up to 4 curves. This element requires using the Curve sampling flag from **General** > **Configuration** > **Control Status Block** > **Control Block** > **Curve Control** to draw curves. The Curve sampling flags 1 ~ 4 correspond to the **Sample Flag** 1 ~ 4 of the **X-Y Chart** element respectively.

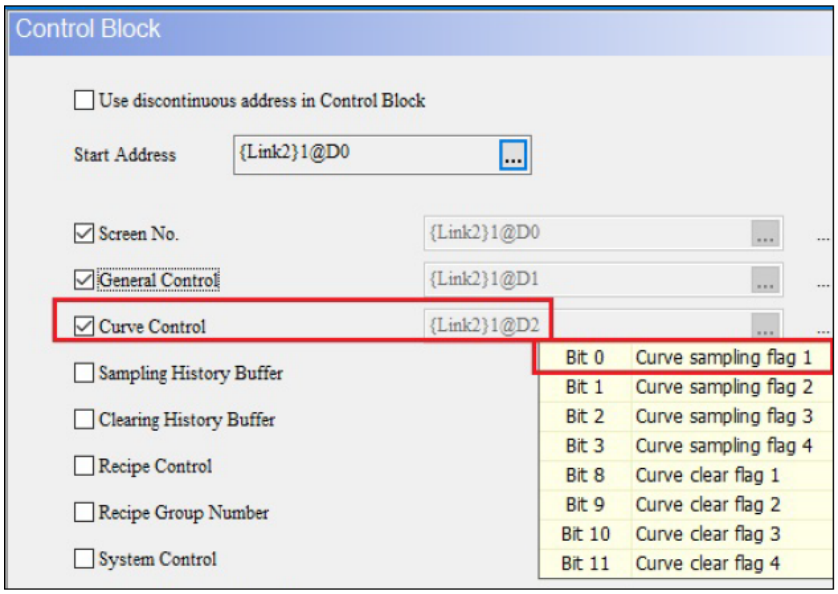
Refer to the following table for the **X-Y Chart** element example.

<table>
<tr><th colspan="2">X-Y Chart</th></tr>
<tr><td>X-Y Chart element</td><td>Create an X-Y Chart element and set its parameters.
<table>
<tr><th colspan="2">X-Y Chart Element</th></tr>
<tr><td>Horiz. Read Address</td><td>$3000</td></tr>
<tr><td>Vert. Read Address</td><td>$4000</td></tr>
<tr><td>Sample Number</td><td>5</td></tr>
<tr><td>Sample Flag</td><td>1</td></tr>
<tr><td>Number of Curves</td><td>1</td></tr>
<tr><td>Connect Adjacent Points</td><td>Yes</td></tr>
<tr><td>Horiz. Minimum / Horiz. Maximum / Vert. Minimum / Vert. Maximum / Line Weight / Line Color / Projection Axis</td><td> 
</td></tr>
</table></td></tr>
</table>

<table>
<tr><th colspan="2">X-Y Chart</th></tr>
<tr><td></td><td>  </td></tr>
<tr><td>Numeric Entry element</td><td>Create five Numeric Entry elements for the Horiz. Read Address and Vert. Read Address respectively. As the Sample Number of the X-Y Chart element is set to 5, the X-axis and Y-axis each samples 5 points to draw the curve. Therefore, the set Horiz. Read Address $3000 of the X-Y Chart element starts reading 5 addresses in sequence, which are $3000, $3001, $3002, $3003, and $3004; the Vert. Read Address $4000 starts reading 5 addresses in sequence, which are $4000, $4001, $4002, $4003, and $4004.
<table>
<tr><th colspan="6">Numeric Entry Element</th></tr>
<tr><td>Write Address</td><td>$3000</td><td>$3001</td><td>$3002</td><td>$3003</td><td>$3004</td></tr>
<tr><td>Write Address</td><td>$4000</td><td>$4001</td><td>$4002</td><td>$4003</td><td>$4004</td></tr>
</table></td></tr>
<tr><td>Set Constant Button element</td><td>Create a Set Constant Button element and set its Write Address as D2. This D2 address is for the Curve Control flag in the Control Block.
 

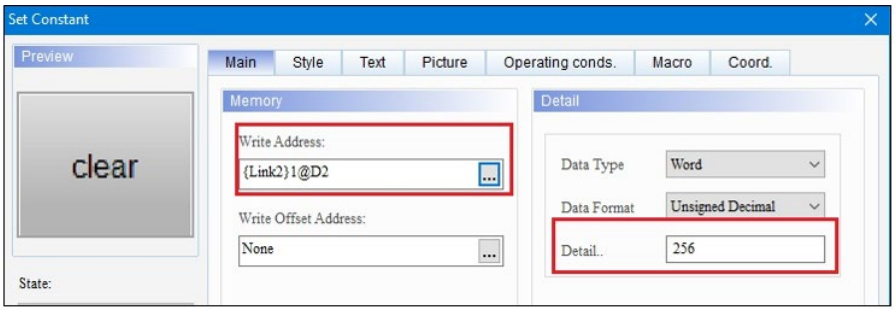
Set the Detail.. of the Set Constant Button element to 1. 1 corresponds to Bit 0 Curve sampling flag 1; 2 corresponds to Bit 1 Curve sampling flag 2; 4 corresponds to Bit 2 Curve sampling flag 3, and so on. Users can also find that the Sample Flag setting of the X-Y Chart element is 1 as well.
 
</td></tr>
</table>

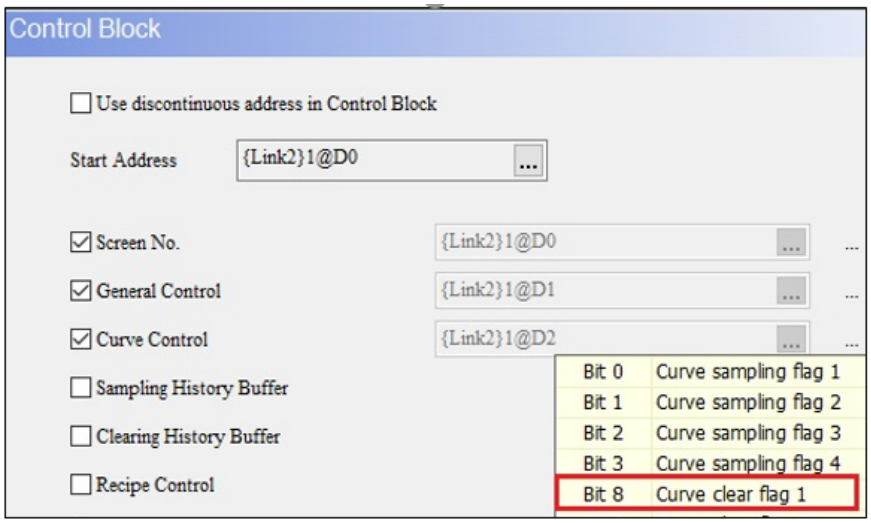
X-Y Chart

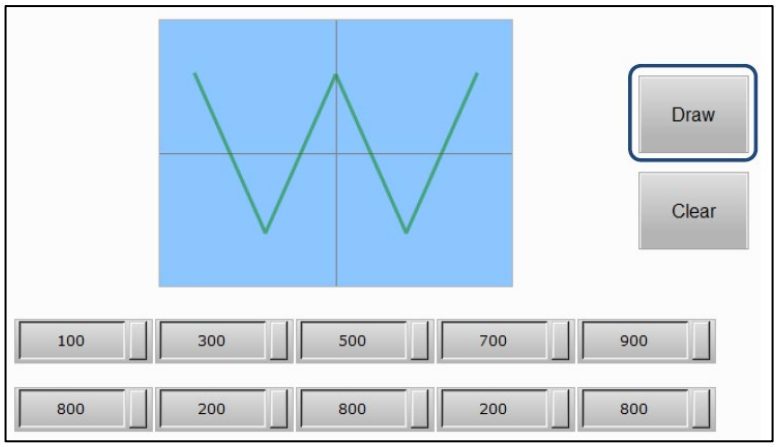
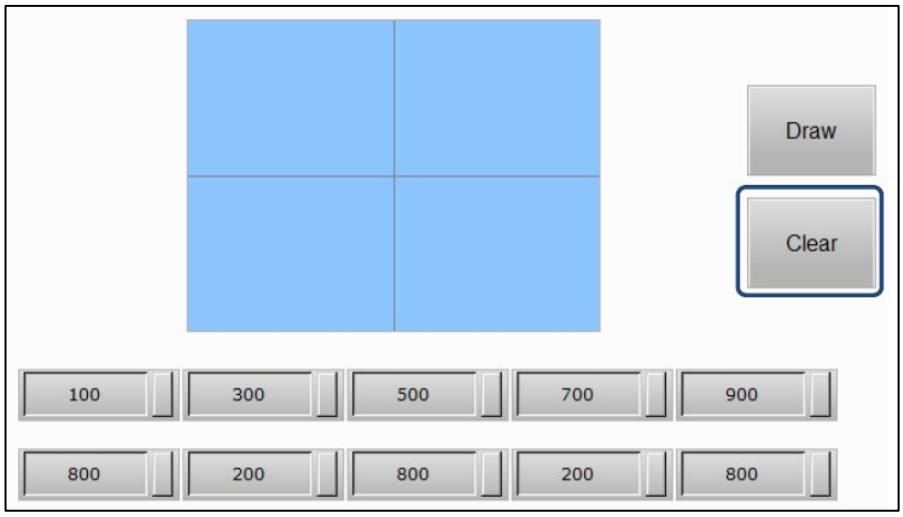


- Create another **Set Constant Button** element and set its **Write Address** as D2, and set the **Detail..** as 256. 256 corresponds to **Bit 8 Curve clear flag 1**.







X-Y Chart	
Execution result	● After creating the elements, compile and download the data to the HMI. Next, enter any values for the X-axis and Y-axis to the **Numeric Entry** elements, then press **Draw** and the **X-Y Chart** draws the curve according to the input values.  ● After drawing the curve, click **Clear**, and the HMI clears the drawn X-Y curve. 

On double-clicking the **X-Y Chart** element, the property page appears as follows.

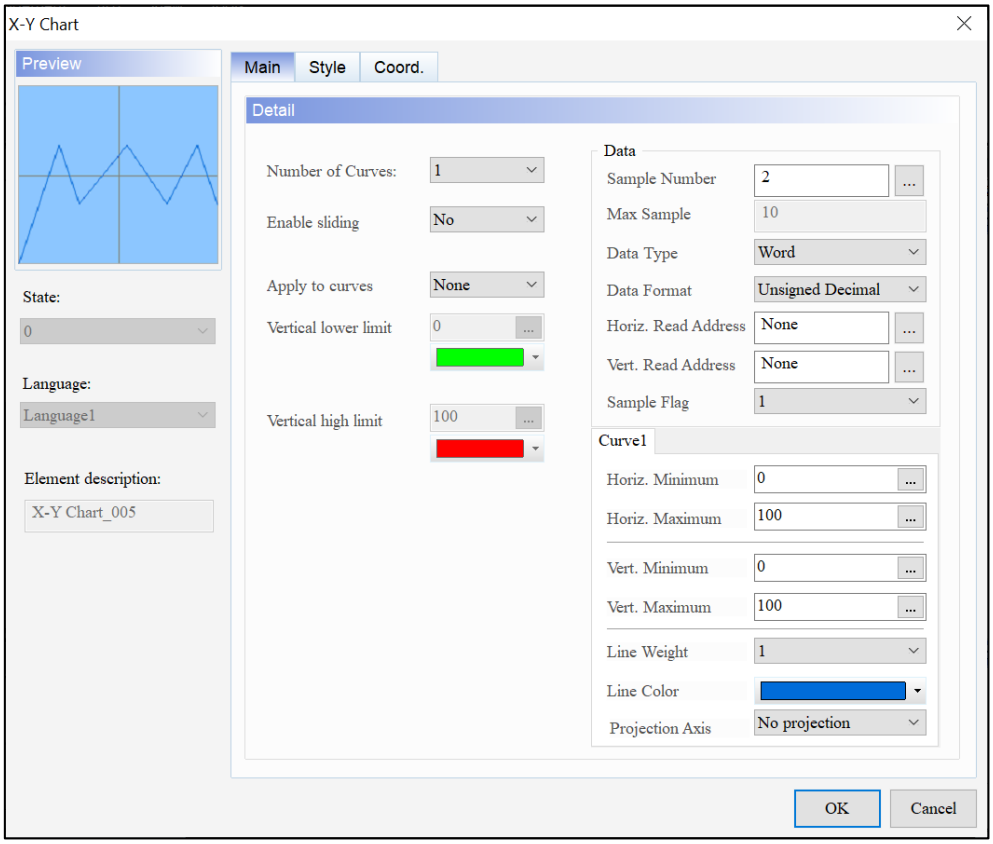


Figure 14 - 5: X-Y Chart element property page

X-Y Chart	
Function	**Description**
Preview	The **X-Y Chart** elements do not support multiple state values and multi-language data display.
Main	Set the Sample Number, Max Sample, Data Type, Data Format, Horiz. Read Address, Vert. Read Address, Sample Flag, Horiz. Minimum, Horiz. Maximum, Vert. Minimum, Vert. Maximum, Line Weight, Line Color, and Projection Axis. Set Number of Curves, Enable sliding, Apply to curves, Vertical lower limit, and Vertical higher limit.
Style	Set the Border Color, Gridline Color, Horiz. Line Number, Vert. Line Number, Connect Adjacent Points, Style, Background Color, Number of Groups, and Translucent. Set Transparency, Smooth animation, and Anti-aliasing.
Coord.	Set the X-Y coordinates, Width and Height of the element.

- Main

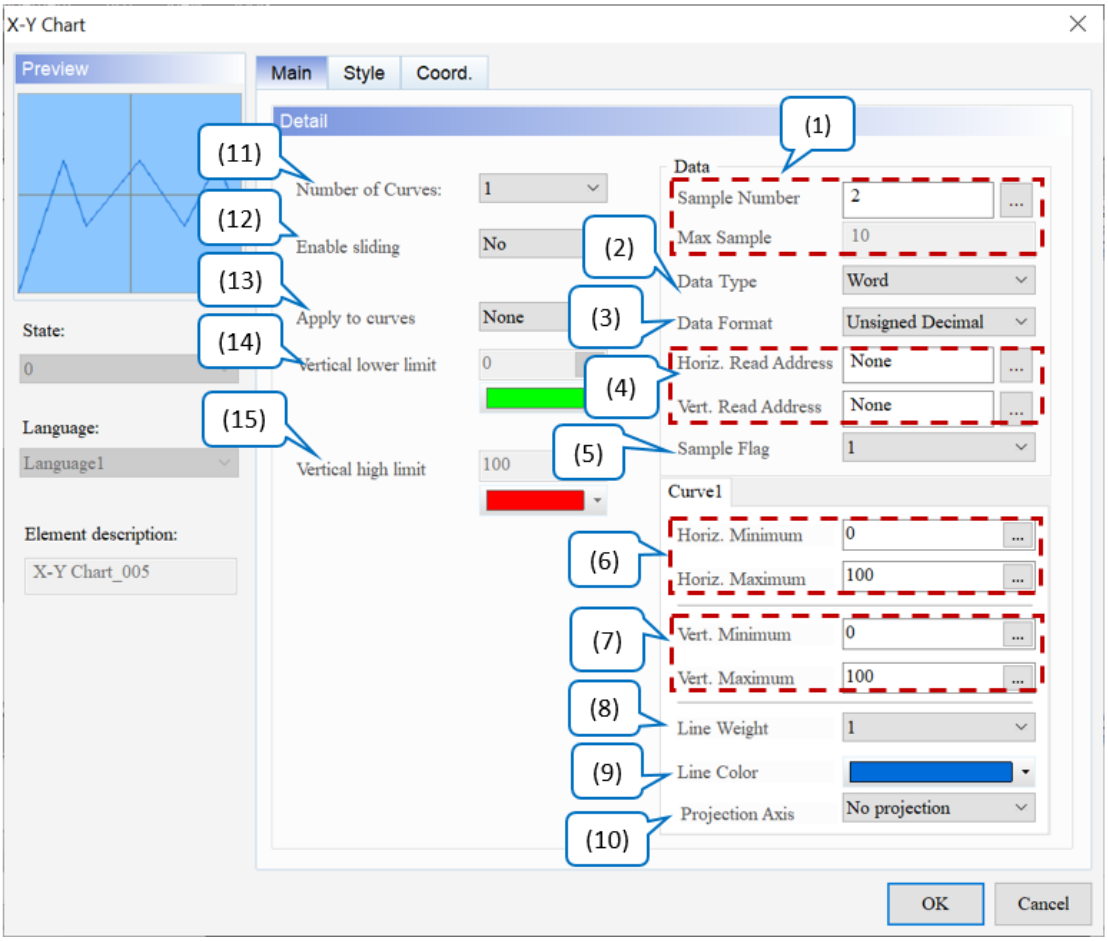
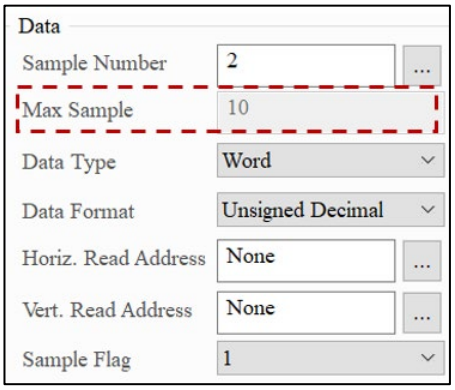
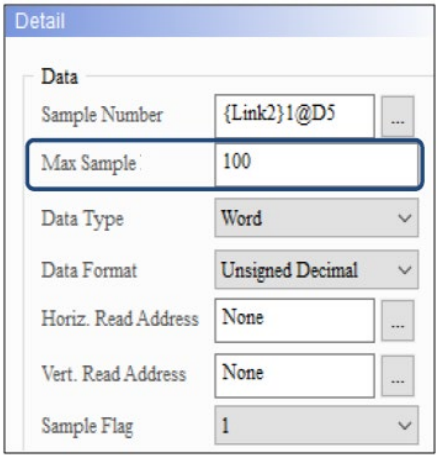
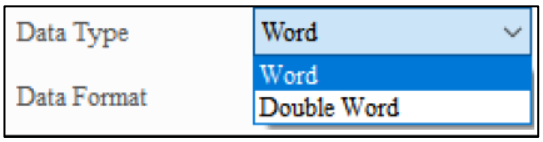
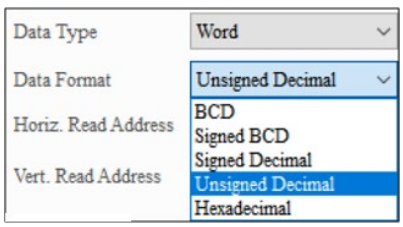
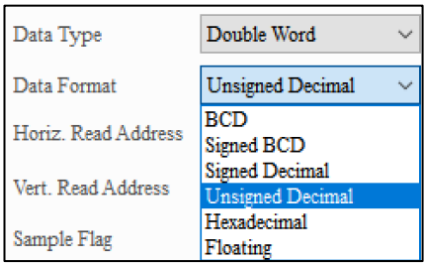
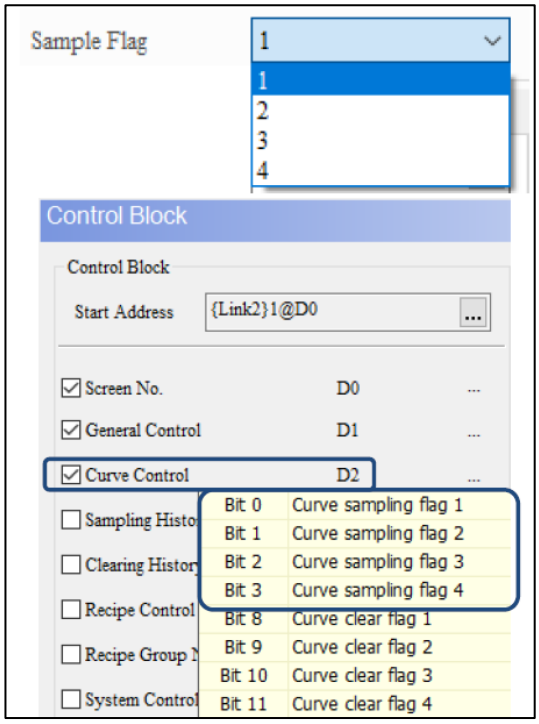


Figure 14 - 6: X-Y Chart element Main property page

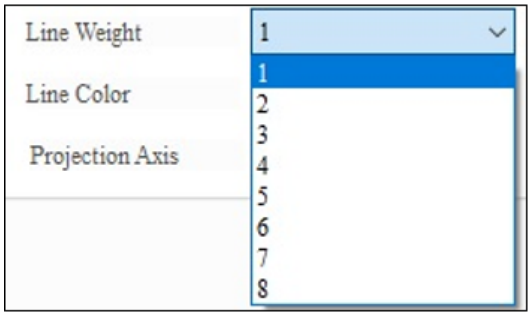
No.	Function	Description
(1)	Sample Number / Max Sample	● The **Sample Number** is determined by the element width / height and style. The default value is **2**. ● Set the **Style** of the **X-Y Chart** element as Standard and set its width as 363 and height as 231, then the maximum number of points that can be displayed is 231 (based on the minimum value of element width and height). But, if users set the **Style** of the **X-Y Chart** element as Raised or Sunken (border width is 7 points) and its width and height as 231, then the maximum number of points that can be displayed is 217 (231 - (7*2) = 217). ● When users set the **Sample Number** as a constant, the

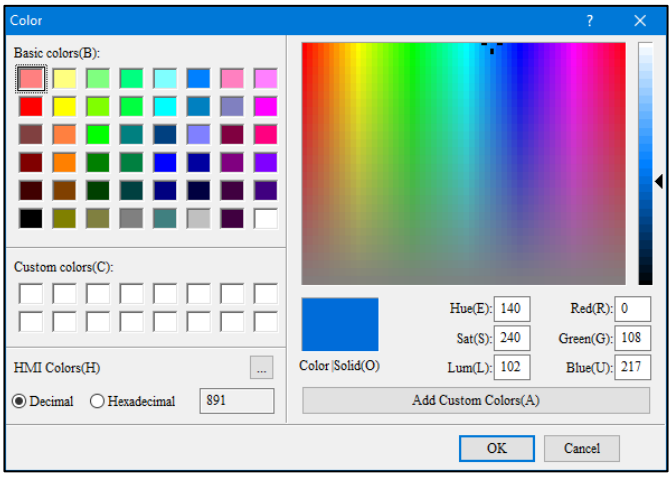
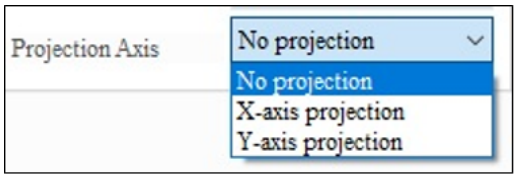
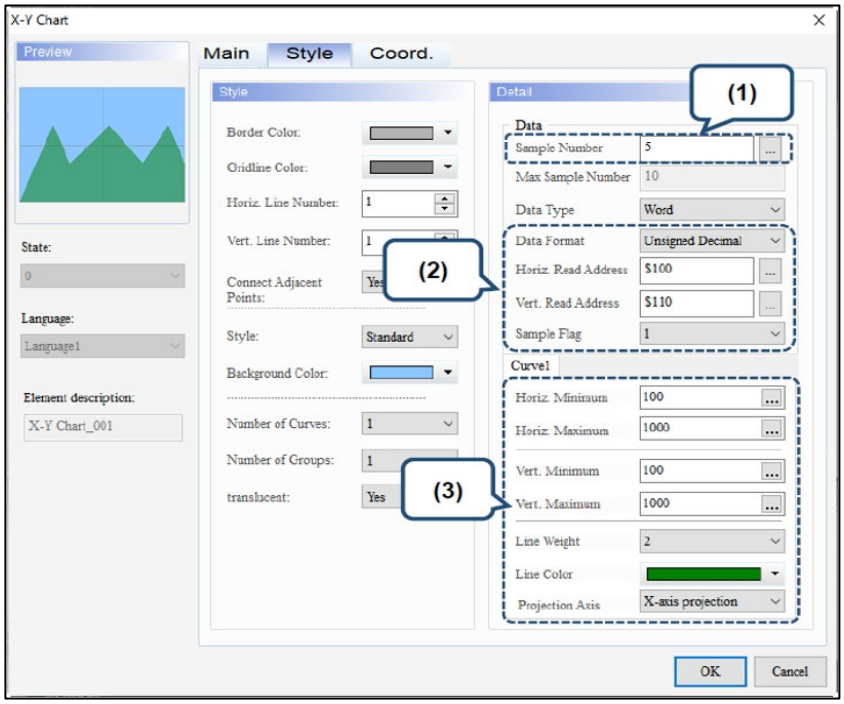
No.	Function	Description
		Max Sample is disabled (grayed out) and cannot be set.  ● When users set the **Sample Number** as a variable, they can define its **Read Address**. Also, users need to set the **Max Sample**, which is determined by the element width. If the set **Sample Number** is greater than the **Max Sample**, DIAScreen refers to the setting of the **Max Sample**. 
(2)	Data Type	The available options for **Data Type** are: Word and Double Word. The default value is **Word**. 
(3)	Data Format	● When the **Data Type** is Word, the supported **Data Format** is as shown in the following figure. The default value is **Unsigned Decimal**.  ● When the **Data Type** is Double Word, the supported **Data Format** is as shown in the following figure. The default value

No.	Function	Description
		is **Unsigned Decimal**. 
(4)	Horiz. Read Address Vert. Read Address	● **Horiz. Read Address** represents the X axis, and the **Vert. Read Address** represents the Y axis. ● Select the Internal Memory or the controller register address for both **Horiz. Read Address** and **Vert. Read Address**. ● Select **Link** name or **Device Type**. Refer to ***Memory Settings***.
(5)	Sample Flag	There are four **Sample Flag** in total, corresponding to Curve sampling flags 1 ~ 4 in the **Control Block**. 
(6)	Horiz. Minimum / Horiz. Maximum	● The **Horiz. Minimum** value and **Horiz. Maximum** value can be set as constants or variables. The default values for **Horiz. Minimum** and **Horiz. Maximum** are **0** and **100** respectively. ● When the **Horiz. Minimum** value and the **Horiz. Maximum** value are variables, the controller address (Word) and the internal register address (Word) are supported. ● When the **Horiz. Minimum** and **Horiz. Maximum** are constants, the permissible ranges for the **Horiz. Minimum** and **Horiz. Maximum** are subject to change based on the

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>selected Data Type and Data Format.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
</table></td></tr>
<tr><td>(7)</td><td>Vert. Minimum / Vert. Maximum</td><td>

The Vert. Minimum value and Vert. Maximum value can be set as constant or variable. The default values for Vert. Minimum and Vert. Maximum are 0 and 100 respectively.
When the Vert. Minimum value and Vert. Maximum value are variables, the controller address (Word) and the internal register address (Word) are supported.
When the Vert. Minimum and Vert. Maximum are constants, the permissible ranges for the Vert. Minimum and Vert. Maximum are subject to change based on the selected Data Type and Data Format.

<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
</table></td></tr>
<tr><td>(8)</td><td>Line Weight</td><td>The line width can be set from 1 ~ 8. The default value is 1.
 
</td></tr>
<tr><td>(9)</td><td>Line Color</td><td>Set the line color for the curve. The default is .</td></tr>
</table>

No.	Function	Description
		
(10)	Projection Axis	● The available options for **Projection Axis** are: No projection, X- axis projection, and Y-axis projection. The default value is **No projection**.  ● When the **Projection Axis** is set to No projection, the setting is the same as the default setting, so only the curve is displayed.
		● The following introduces X-axis projection and Y-axis projection respectively. **X-axis projection** 

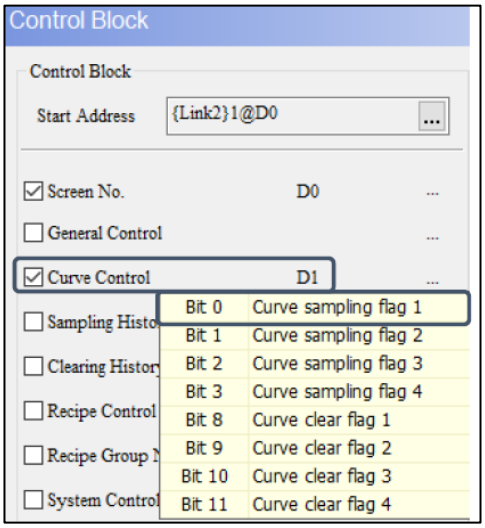
No.	Function	Description

(1)	Set the **Sample Number** to 5.
(2)	Set the **Horiz. Read Address** to $100. Set the **Vert. Read Address** to $110. Set the **Data Format** to Unsigned Decimal and the **Sample Flag** to 1.
(3)	Set the **Horiz. Minimum** to 100 and **Horiz. Maximum** to 1000. Set the **Vert. Minimum** to 100 and **Vert. Maximum** to 1000.
	Set the **Projection Axis** to X-axis projection.

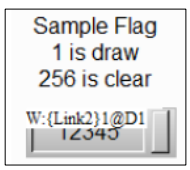
- Create the **Numeric Entry** elements of $100 ~ $104 and $110 ~ $114, and set their **Data Format** as Unsigned Decimal.



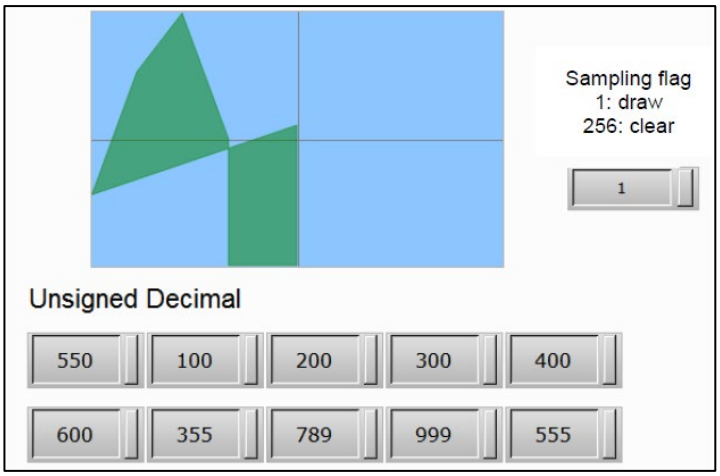
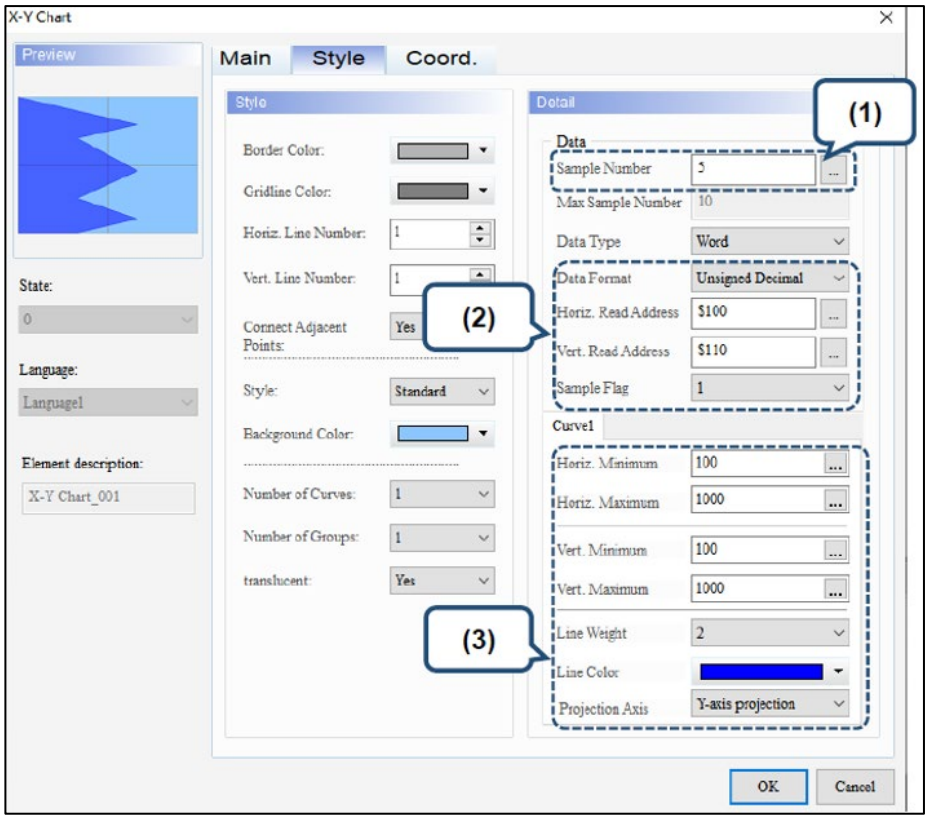
- Go to **General** > **Configuration** > **Control Status Block** > **Control Block**, and select the **Curve Control** checkbox with the address as D1.

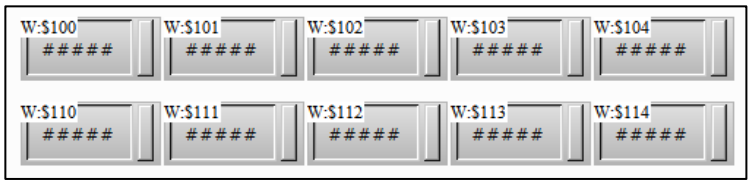
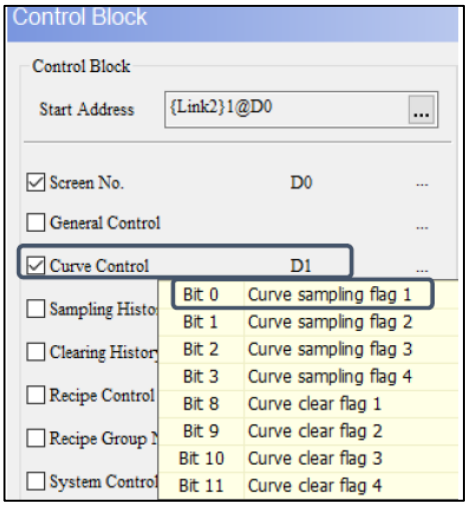
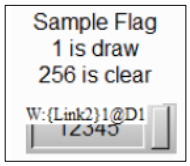


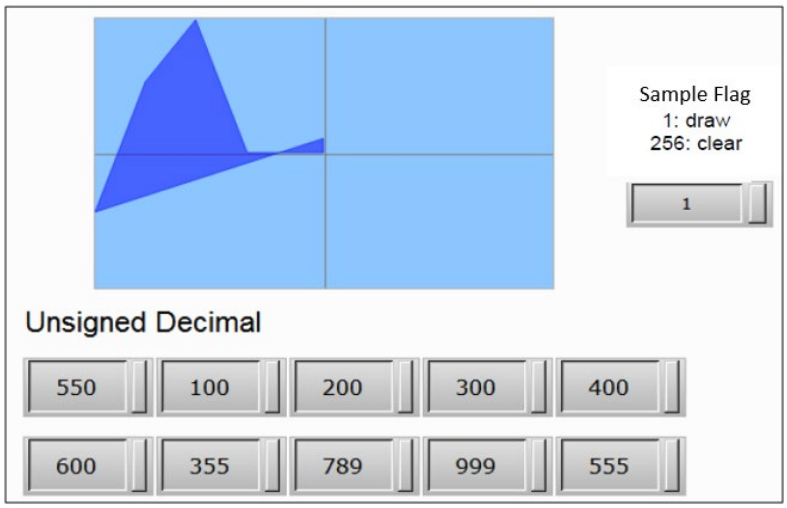
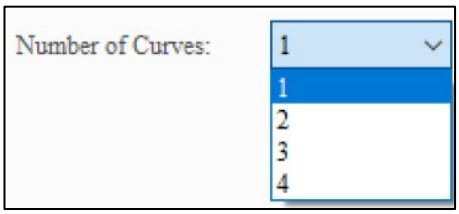
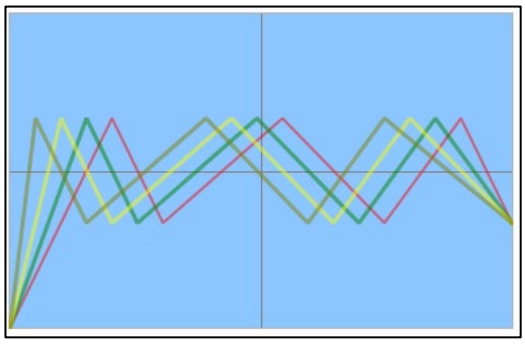
- Create a **Numeric Entry** element with the **Write Address** set as D1.

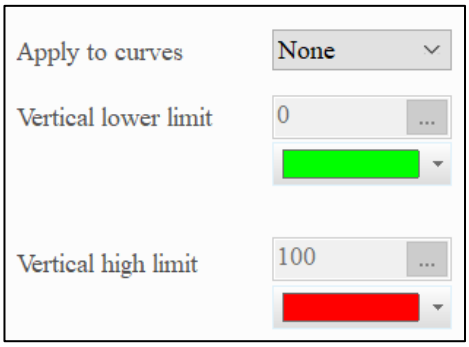
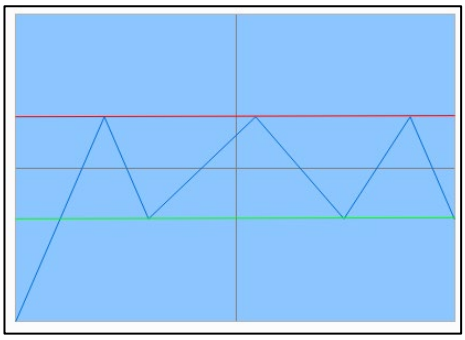
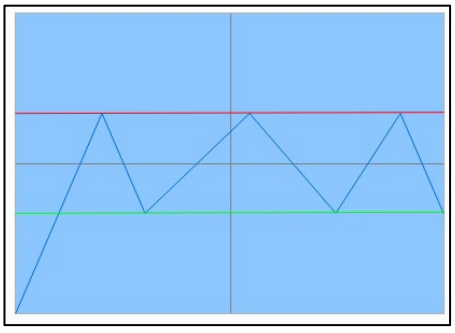


- After completing the preceding steps, compile and download the data to the HMI.

No.	Function	Description
		● Enter any values to the **Numeric Entry** elements of $100 ~ $104 and $110 ~ $114, and input 1 to the **Sample Flag**. ● When users complete entering the values, the **X-Y Chart** is as follows.  **Y-axis projection**  (1) Set the **Sample Number** to 5. (2) Set the **Horiz. Read Address** to $100. Set the **Vert. Read Address** to $110. Set the **Data Format** to Unsigned Decimal and the **Sample Flag** to 1.

No.	Function	Description
		(3) Set the **Horiz. Minimum** to 100 and **Horiz. Maximum** to 1000. Set the **Vert. Minimum** to 100 and **Vert. Maximum** to 1000. Set the **Projection Axis** to Y-axis projection. ● Create the **Numeric Entry** elements of $100 ~ $104 and $110 ~ $114, and set their **Data Format** as Unsigned Decimal.  ● Go to **General** > **Configuration** > **Control Status Block** > **Control Block**, and select the **Curve Control** checkbox with the address as D1.  ● Create a **Numeric Entry** element with the **Write Address** set as D1.  ● After completing the preceding steps, compile and download the data to the HMI. ● Enter any values to the **Numeric Entry** elements of $100 ~ $104 and $110 ~ $114, and input 1 to the **Sample Flag**. ● When users complete entering the values, the **X-Y Chart** is as follows.

No.	Function	Description
		
(11)	Number of Curves	● The **X-Y Chart** element supports up to 4 curves. The default value is **1**.  ● Change the width and color of the curves.  ● If users want to use 4 curves, they only need to set the **Horiz. Read Address** and **Vert. Read Address** as **Continuous Address** for sampling. Assuming the **Horiz. Read Address** is $3000, **Vert. Read Address** is $4000, and the **Sample Number** is 5, then 40 sampling points are required for 4 curves (20 points each for horizontal and vertical). Thus, the **Read Addresses** are $3000 ~ $3019 and $4000 ~ $4019.
(12)	Enable sliding	● If there are multiple sets of data, this function is available only for the set of data which is currently sampled. The default value is **No**. ● When **Enable sliding** is set to Yes, click the curve to display currently sampled value.
(13)	Apply to curves	Select the curve for which the low and high limits of the vertical axis are set.

No.	Function	Description
		
(14)	Vertical lower limit	● Set the value for the low limit of the vertical axis, which can be constants or variables. The default is  . 
(15)	Vertical high limit	● Set the value for the high limit of the vertical axis, which can be constants or variables. The default is  . 

- Style

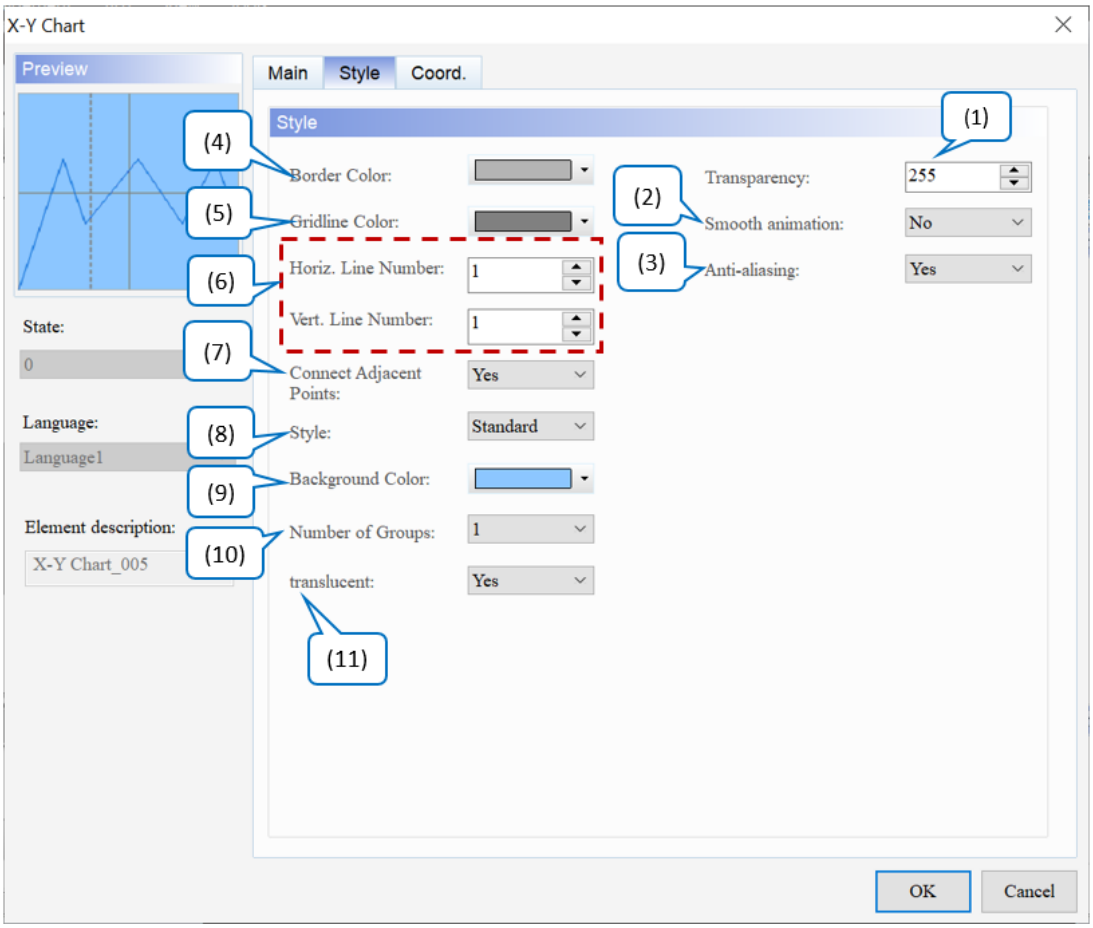
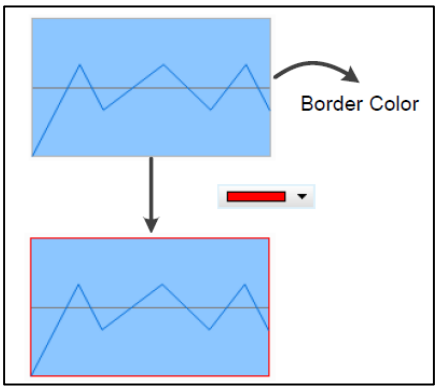
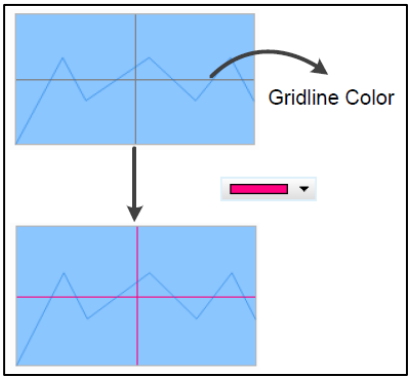
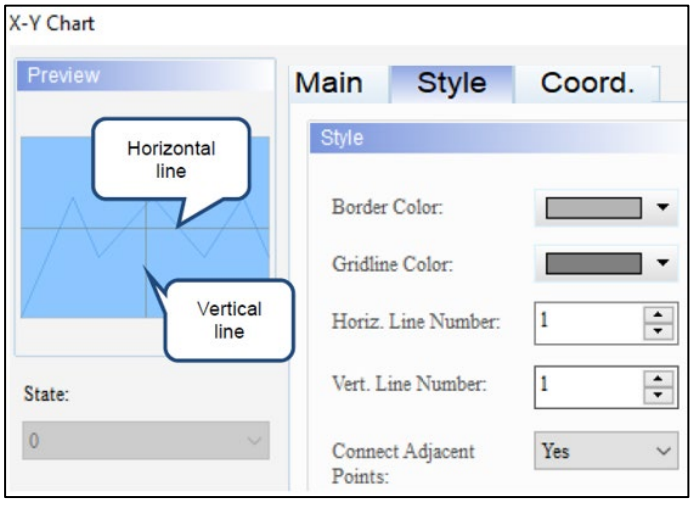


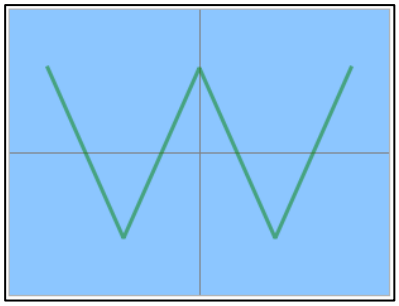
Figure 14 - 7: X-Y Chart element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Smooth animation	The **Smooth animation** function is available for this element. When this function is enabled, the curve display is smoother. The default value is **No**.
(3)	Anti-aliasing	The **Anti-aliasing** function is available for this element. When this function is enabled, the element display becomes more delicate without jagged edges. The default value is **Yes**.

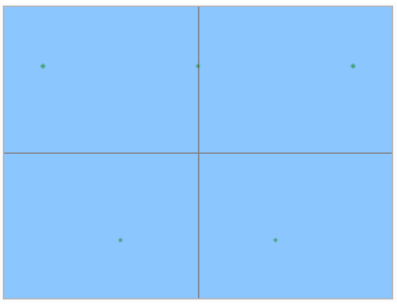
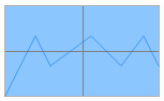
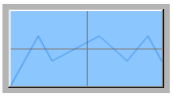
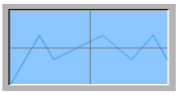
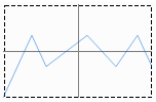
No.	Function	Description
(4)	Border Color	Set the border color of the **X-Y Chart** element. The default is  . 
(5)	Gridline Color	● The **Gridline Color** is the color of the gridline in the **X-Y Chart** element. The default is  . ● Change the color of the gridline. 
(6)	Horiz. Line Number / Vert. Line Number	● **Horiz. Line Number** refers to the number of lines which are parallel to the X-axis and **Vert. Line Number** refers to the number of lines which are parallel to the Y-axis. The default value is **1** for both settings. ● Both **Horiz. Line Number** and **Vert. Line Number** support a maximum of 99 lines. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(7)</td><td>Connect Adjacent Points</td><td>

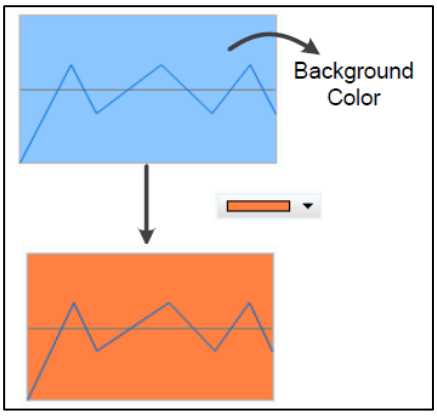
Select Yes or No for Connect Adjacent Points. The default value is Yes.
If users select Yes, the coordinate points are connected with lines to form a curve.



If users select No, the chart displays coordinate points.


</td></tr>
<tr><td>(8)</td><td>Style</td><td>This setting allows users to change the appearance of elements. The available options for Style are: Standard, Raised, Sunken, and Transparent. The default value is Standard.
<table>
<tr><th>Standard</th><th>Raised</th><th>Sunken</th><th>Transparent</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(9)</td><td>Background Color</td><td>

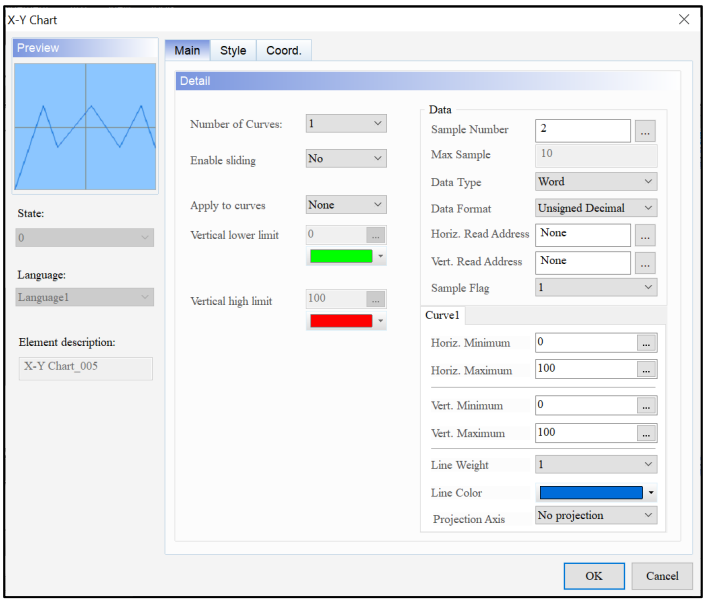
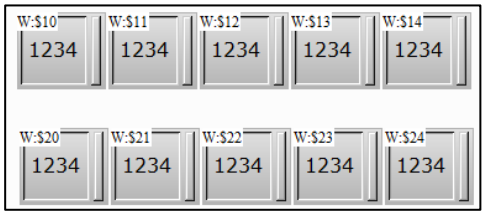
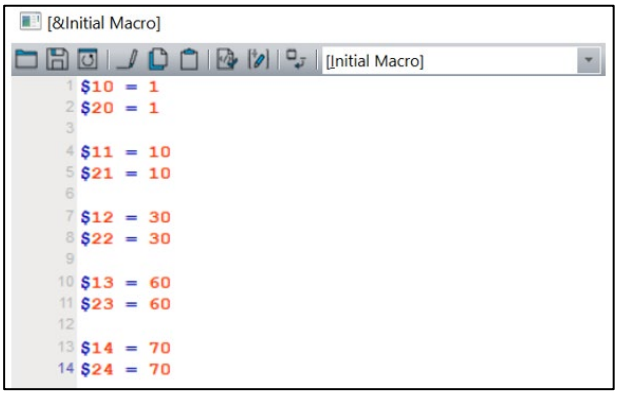
Set the background color of the element. The default is  .

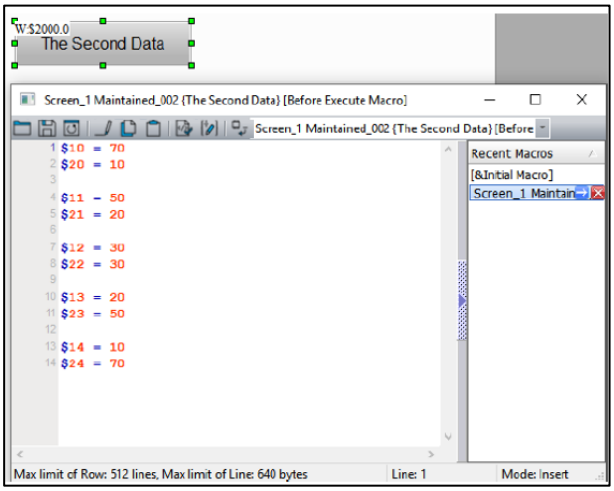
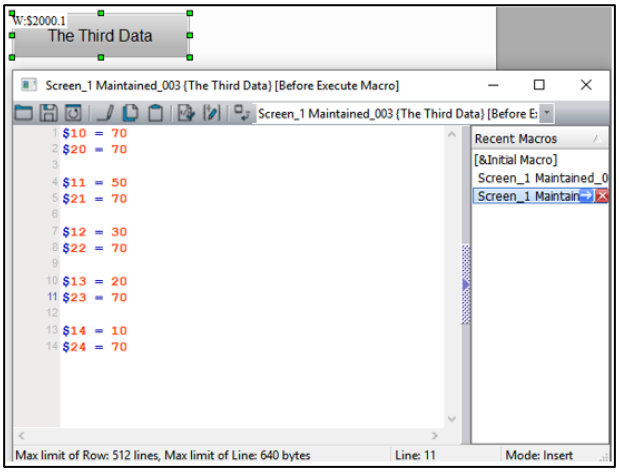
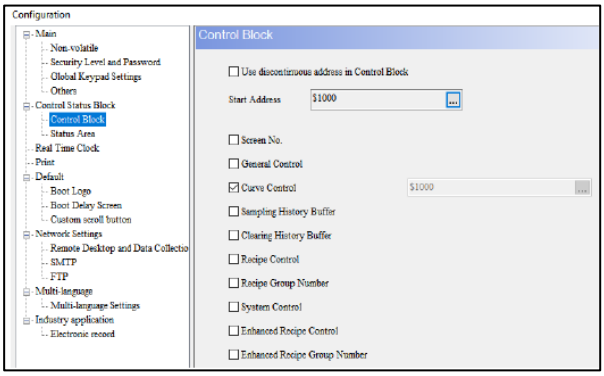


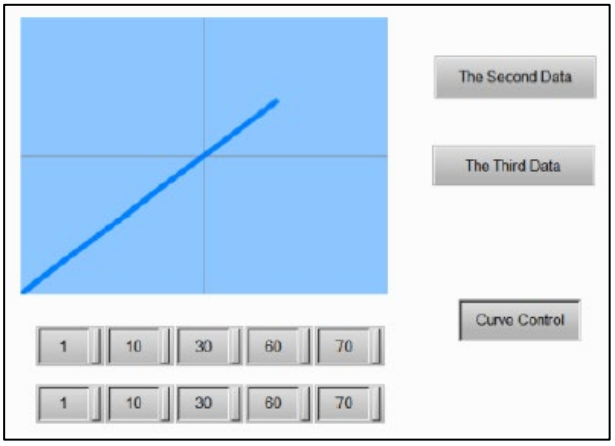
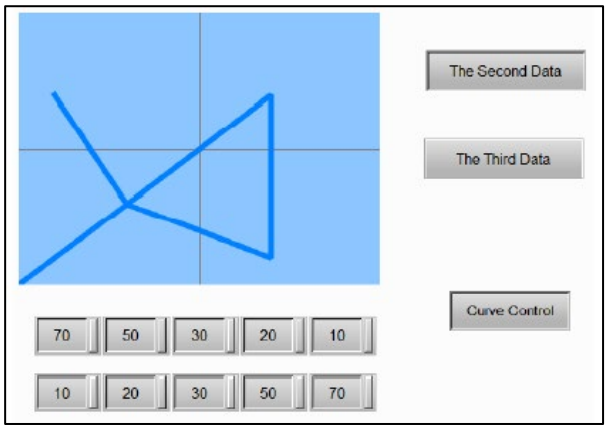
</td></tr>
<tr><td>(10)</td><td>Number of Groups</td><td>

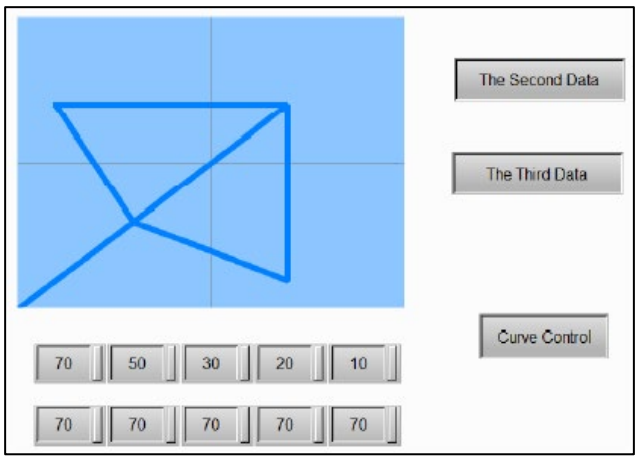
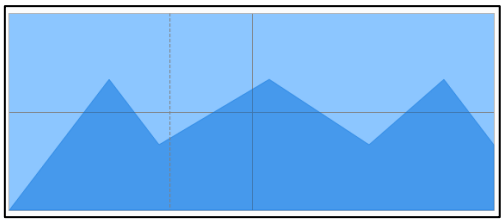
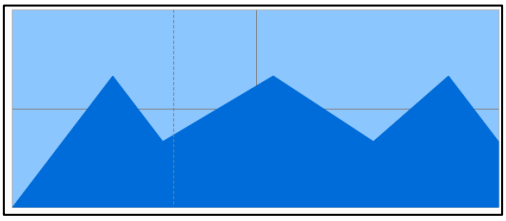
The X-Y Chart element reads one set of point data at a time. To read the next set of point data, enter the values again. Number of Groups allows to record and write

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
multiple sets of parameters, and supports displaying up to ten sets of point data. The default value is 1.
● Refer to the following example.
<table>
<tr><td>Create X-Y Chart</td><td>After creating the X-Y Chart element, set the parameters as follows.
 
</td></tr>
<tr><td>Create Numeric Entry element</td><td>Create the Numeric Entry elements of $10 ~ $14 and $20 ~ $24.
 
</td></tr>
<tr><td>Multiple Sets of Data</td><td>● The Number of Groups of the X-Y Chart is set to 2, meaning that apart from the currently displayed $10 ~ $14 and $20 ~ $24, two more sets of data can be displayed.
● The first set of data is written in the Initial Macro.
 
</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description	
			● The second set of data is written in the **Before Execute Macro** of the **Maintained Button** element.  ● The third set of data is written in the **Before Execute Macro** of the **Maintained Button** element. 
		Control Block – Curve Control	● Enable the **Curve Control** flag.  ● Create a **Maintained Button** element for the **Curve Control** flag with **Write Address** as $1000.0.

No.	Function	Description	
			
		Execution result	● After compiling and downloading the data, the first set of data is loaded at first. Press **Curve Control**, and the curve is drawn as follows.  ● Press **The Second Data Maintained Button** to load the second set of data, then press **Curve Control**, and the curve is drawn as follows.  ● Press **The Third Data Maintained Button** to load the third set of data, then press **Curve Control**, and the curve is drawn as follows.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(11)</td><td>translucent</td><td>The translucent setting is valid only when the Projection Axis is set to X-axis projection or Y-axis projection. The default value is Yes.
<table>
<tr><td>translucent is set to Yes</td><td>  </td></tr>
<tr><td>translucent is set to No</td><td>  </td></tr>
</table></td></tr>
</table>

- Coord.

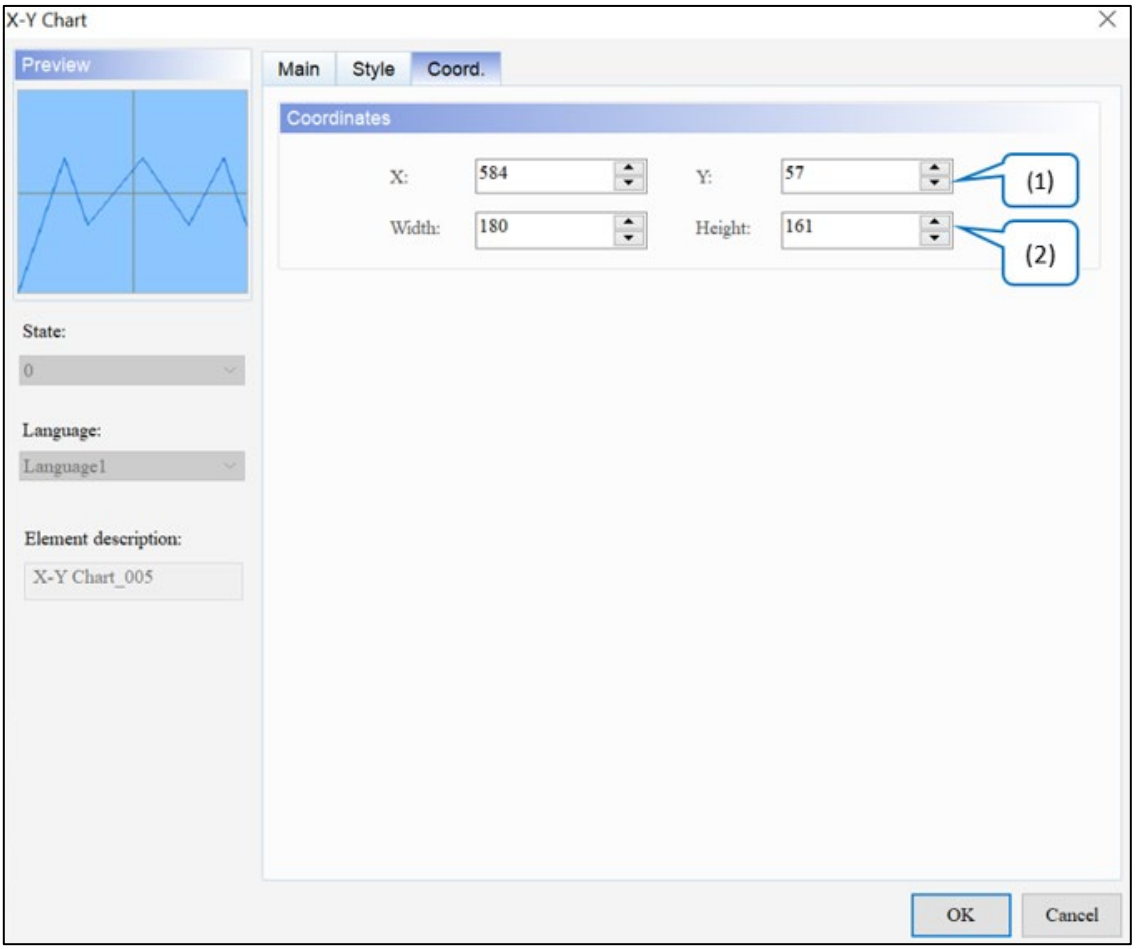


Figure 14 - 8: X-Y Chart element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

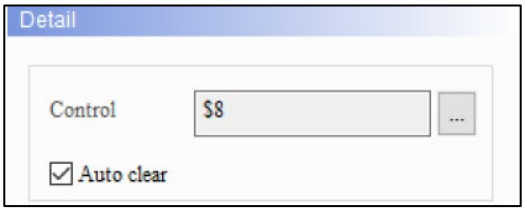
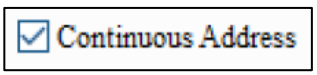
14.3 X-Y Distribution

X-Y Distribution element allows to set the **Address** to read as a **Continuous Address** which can continuously sample points on the X-axis and Y-axis with no

maximum on the number of sampling points. Although **X-Y Chart** also uses **Continuous Address**, its number of sampling points is determined by the style, width, and height of the element. When the **Continuous Address** checkbox is not selected, set the **Read Addresses** for both X and Y, and also define the **Color** and **Connection** as Read Addresses or constants. On the contrary, if the **Continuous Address** checkbox is selected, both X and Y can only be set as continuous addresses, and the **Color** and **Connection** are automatically set as the subsequent addresses of X and Y. In this case, users are unable to change the addresses; they can only reset them to constants.

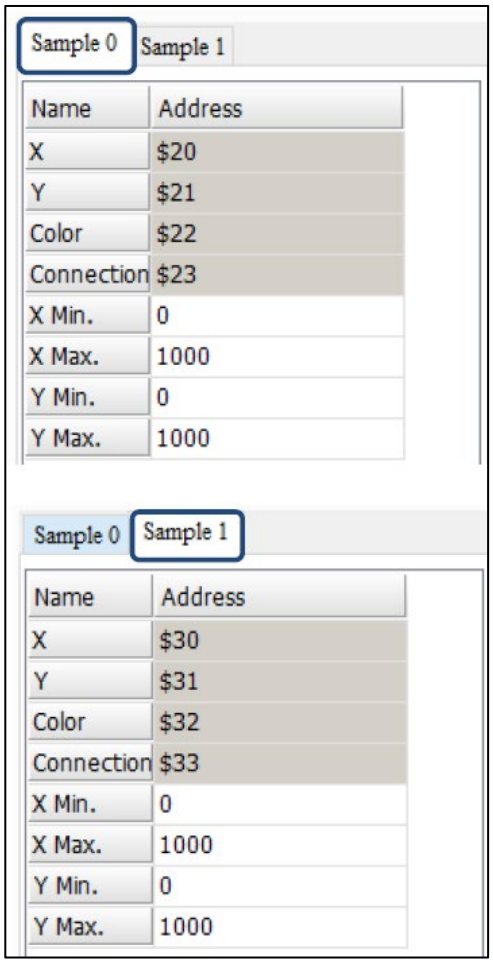
An **X-Y Distribution** element supports up to 4 sets of samples. The main difference between the **X-Y Distribution** element and the **Trend Graph** and **X-Y Chart** elements is that the **X-Y Distribution** element does not require the Curve sampling flag from **General** > **Configuration** > **Control Status Block** > **Control Block** > **Curve Control** to draw curves, instead it has its own Control flags. Bit 0 is for sampling and Bit 1 is for clearing.

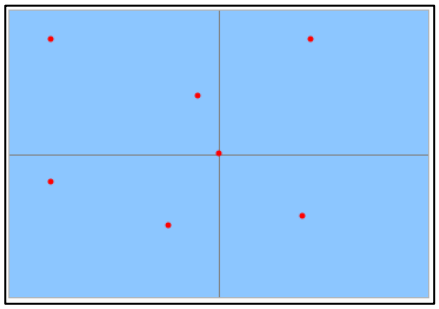
Refer to the following table for the **X-Y Distribution** element example.

<table>
<tr><th colspan="3">X-Y Distribution</th></tr>
<tr><td>X-Y Distribution element</td><td colspan="2">Create X-Y Distribution element and set its parameters.
<table>
<tr><th colspan="2">X-Y Distribution Element</th></tr>
<tr><td>Control</td><td> 
</td></tr>
<tr><td>Continuous Address</td><td> 
</td></tr>
<tr><td>Sample Number</td><td>2</td></tr>
</table></td></tr>
</table>

X-Y Distribution

Sample settings

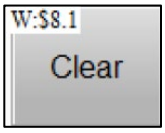
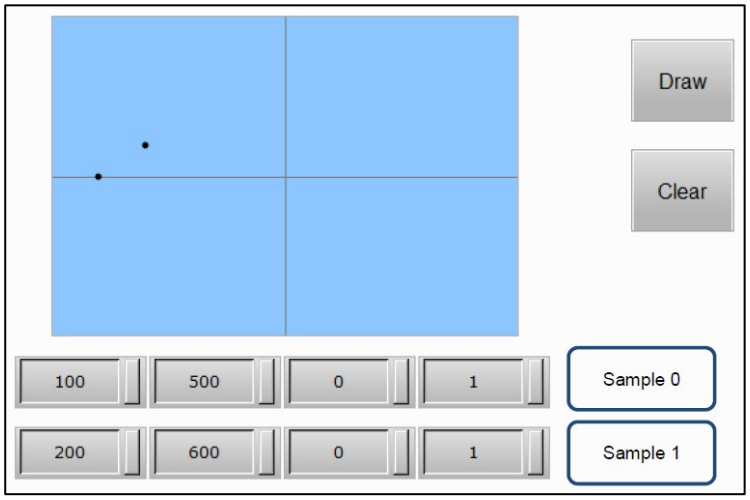
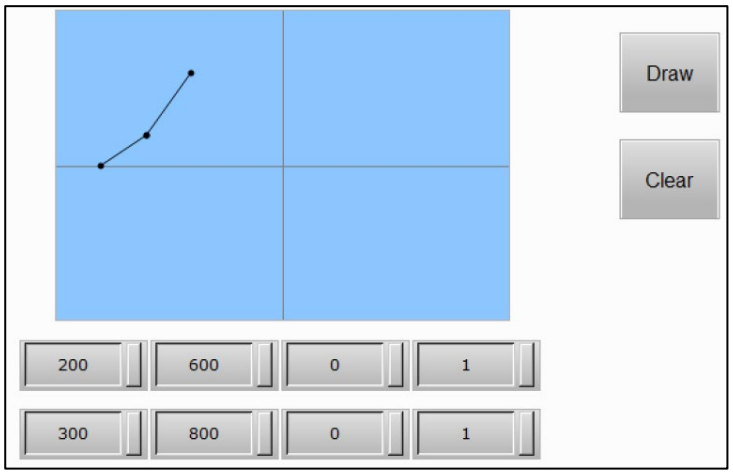




Numeric Entry element

- As the **Sample Number** is set as 2, there will be two sets of settings (Sample 0 and Sample 1).
- Create **Numeric Entry** elements of $20 ~ $23 as the **X**, **Y**, **Color**, and **Connection** of Sample 0.
- Create **Numeric Entry** elements of $30 ~ $33 as the **X**, **Y**, **Color**, and **Connection** of Sample 1.

Sample Number	X	Y	Color	Connection
Sample 0	$20	$21	$22	$23
Sample 1	$30	$31	$32	$33

X-Y Distribution	
Maintained Button element	● Create a **Maintained Button** element and set its **Write Address** as $8.0, meaning the sampling starts when Bit 0 is on.  ● Next, create another **Maintained Button** element and set its **Write Address** as $8.1, meaning the clearing starts when Bit 1 is on. 
Execution result	● After creating the elements, compile and download the data to the HMI. Next, enter any values for the X-axis and Y-axis to the **Numeric Entry** elements, and then the **X-Y Distribution** draws the curve according to the input values. ● For the first input, two points are drawn.  ● For the second input, $23 and $33 are both set to 1, so the dots are connected by the lines. 

On double-clicking the **X-Y Distribution** element, the property page appears as follows.

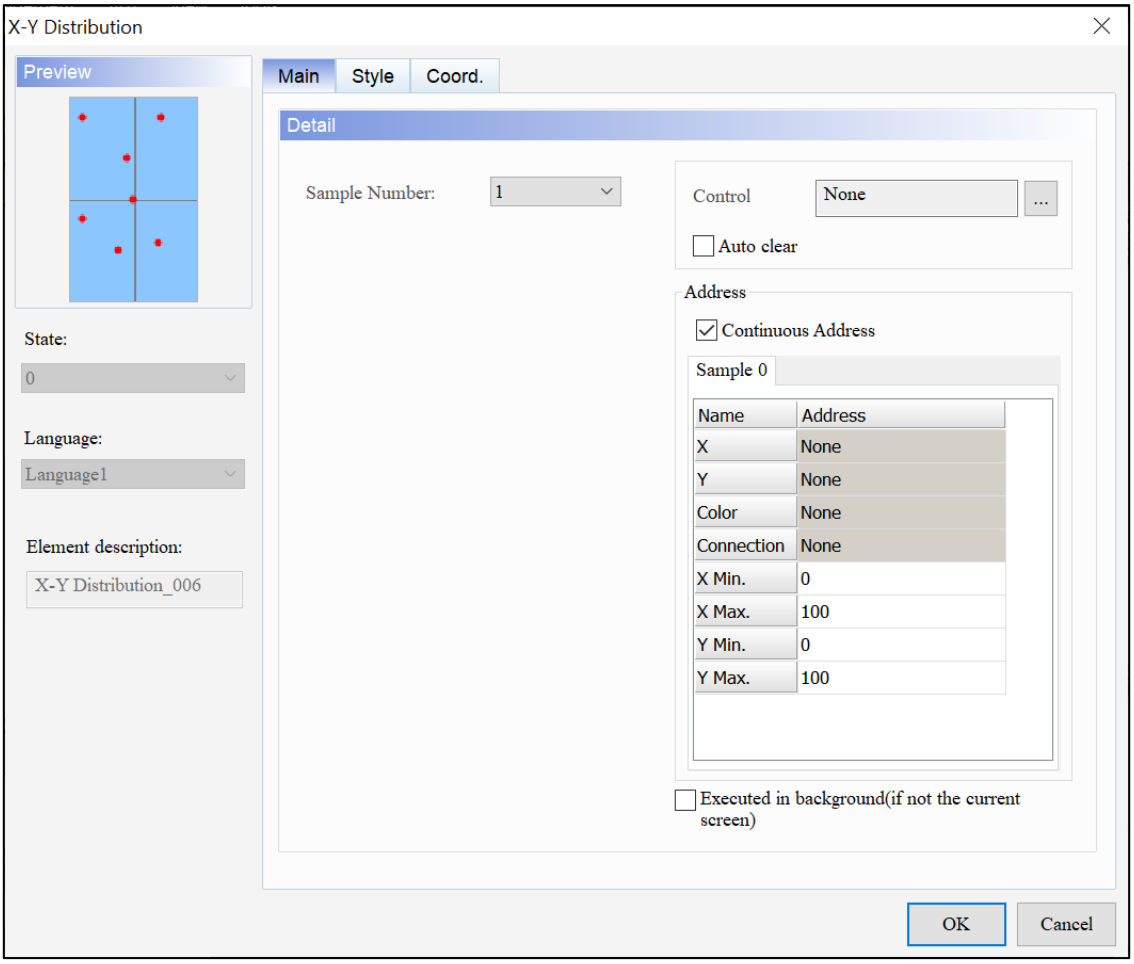


Figure 14 - 9: X-Y Distribution element property page

X-Y Distribution	
Function	**Description**
Preview	The **X-Y Distribution** elements do not support multiple state values and multi-language data display.
Main	Set the Control, Addresses of X, Y, Color, and Connection, X Min., X Max., Y Min., and Y Max. Select Auto clear, Continuous Address, and Executed in background (if not the current screen) checkboxes.
Style	Set the Border Color, Gridline Color, Horiz. Line Number, Vert. Line Number, Style, Background Color, Sample Number, Line Weight, Dot Size, Transparency, and Anti-aliasing.

X-Y Distribution	
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

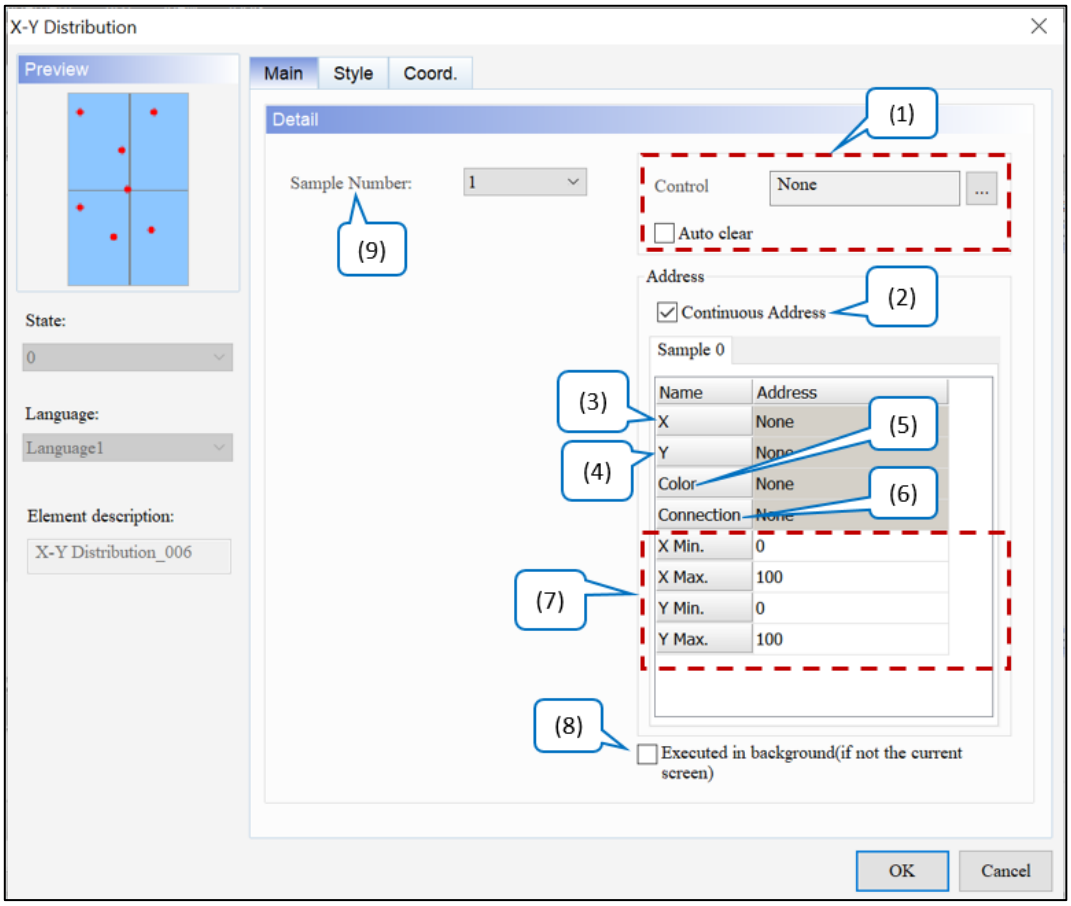
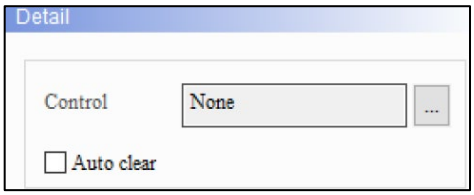
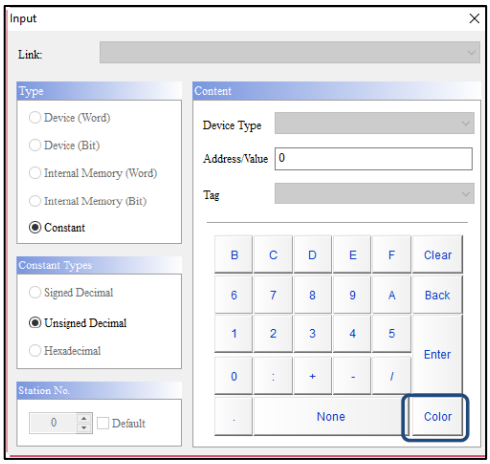
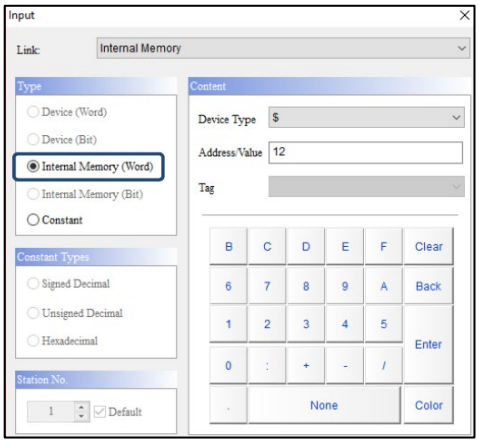


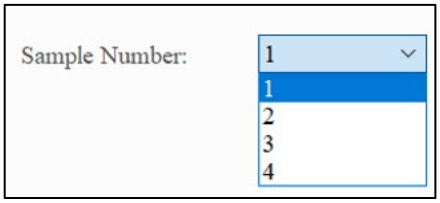
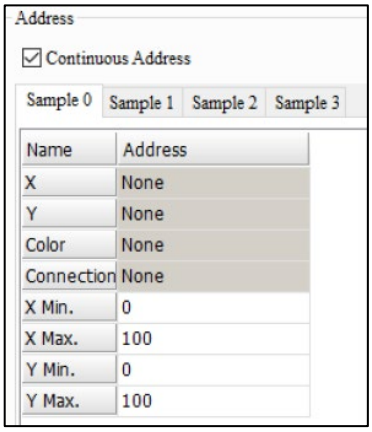
Figure 14 - 10: X-Y Distribution element Main property page

No.	Function	Description
(1)	Control	● **Control** address is the independent **Curve Control** flag of the **X-Y Distribution**. Users do not need to sample data with the **Curve Control** flags in the **Control Block**. Select the Internal Memory or the controller address for this **Control** address. ● Select **Link** name or **Device Type**. Refer to ***Memory Settings***. ● Trigger Bit 0 to draw the sampling points and trigger Bit 1 to clear the sampling points. ● The **X-Y Distribution** element draws only one point

No.	Function	Description
		each time users trigger the **Curve Control** flag. To draw the second point, set this flag to off and then trigger it again. Select the **Auto clear** checkbox to have the HMI automatically clear the flag. 
(2)	Continuous Address	● If the **Continuous Address** checkbox is selected, when users set the address of **X**, the addresses of **Y**, **Color**, and **Connection** are set as the subsequent addresses of **X**. For example, if the **X** address is $1000, then the addresses of **Y**, **Color**, and **Connection** are $1001 ~ $1003. If users need to change the **Read Address** of **X** and **Y**, they can only change the setting of the **X** address. Also, they are unable to change the **Read Address** of the **Color** and **Connection**; they can only set them as constants. ● If the **Continuous Address** checkbox is not selected, the addresses of **X**, **Y**, **Color**, and **Connection** can be discontinuous, and users can define each **Read Address** as needed. Also, users can set the **Color** and **Connection** as **Read Address** or constants.
(3)	X	● Select the Internal Memory or the controller register address for the X coordinate. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
(4)	Y	● Select the Internal Memory or the controller register address for the Y coordinate. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
(5)	Color	● Select the Internal Memory or the controller register address for the **Color** coordinate. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*. ● To set the color with constants, press **Color** and directly select the color for the sampling point.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

Enter the value ranging from 0 ~ 65535 to the Address/Value field.

</td></tr>
<tr><td>(6)</td><td>Connection</td><td>Select the Internal Memory or controller register address.
Select Link name or Device Type. Refer to Memory Settings.
The setting of Connection is to determine if the sampling point connects with the previous sampling point to form a line. Set the Connection as constant 1 to connect and set as 0 for no connection.</td></tr>
<tr><td>(7)</td><td>X Min. /
X Max. /
Y Min. /
Y Max.</td><td>The permissible range for X Min. / Y Min. and X Max. / Y Max. values are subject to change based on the selected Data Type and Data Format.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
</table></td></tr>
</table>

No.	Function	Description
(8)	Executed in background (if not the current screen)	● If users select the checkbox of this function, it means that **X-Y Distribution** can also execute sampling when users are on other screens. For example, assuming that Screen 1 has a set **X-Y Distribution** and Screen 2 does not, if the sampling is executing on Screen 2, but users switch the screen back to Screen 1, **X-Y Distribution** continues to finish the sampling. ***NOTE***: *If users did not select the **Auto clear** checkbox, be sure to set the sampling flag to off after the sampling on other screens is complete.*
(9)	Sample Number	● The **X-Y Distribution** element supports up to 4 sets of samples. The default value is **1**.  ● To use 4 sets of samples, set the X and Y **Read Address** of Sample 0, Sample 1, Sample 2, and Sample 3 for sampling. 

- Style

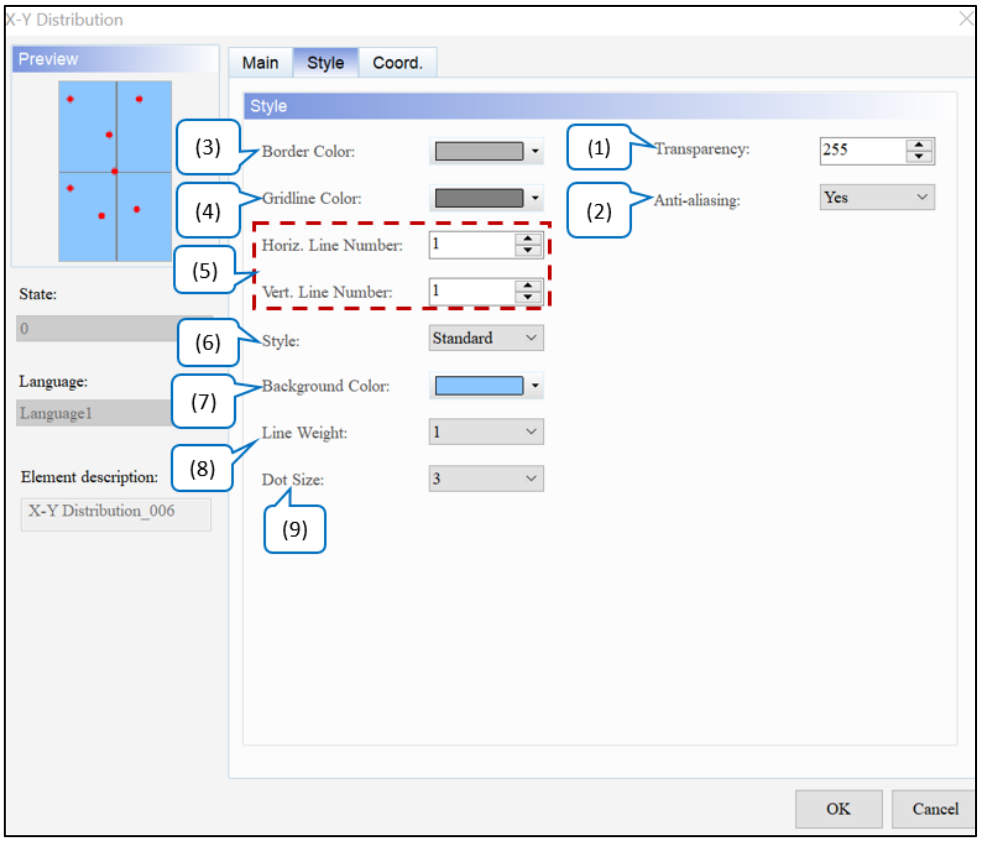
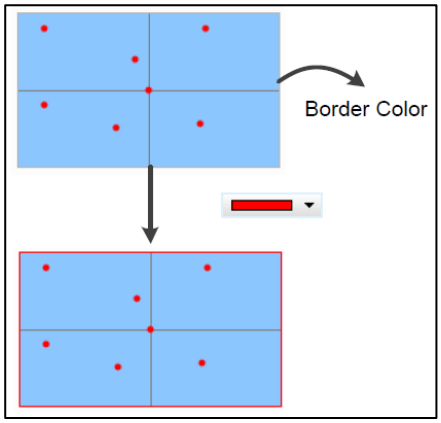
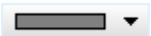
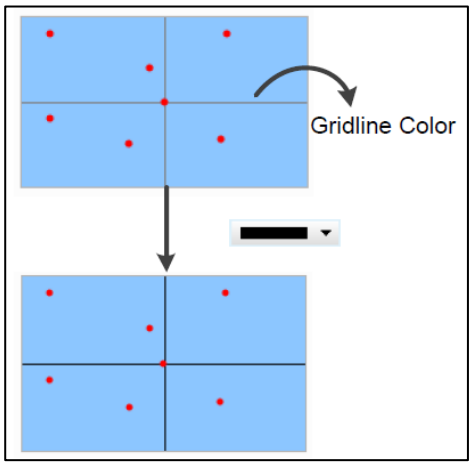
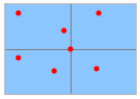
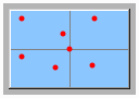
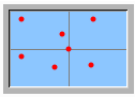
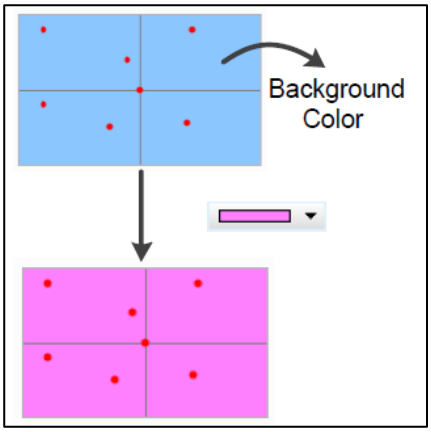
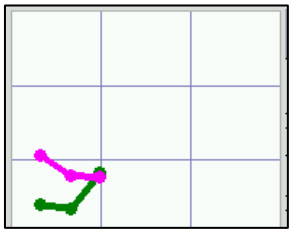
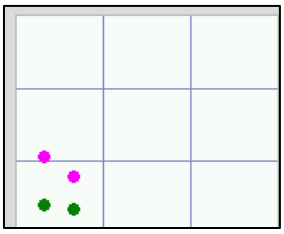
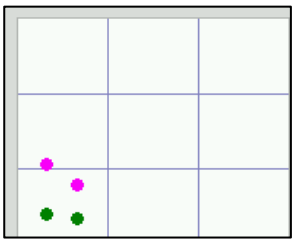


Figure 14 - 11: X-Y Distribution element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Anti-aliasing	The **Anti-aliasing** function is available for this element. When this function is enabled, the element display becomes more delicate without jagged edges. The default value is **Yes**.

No.	Function	Description
(3)	Border Color	Set the border color of the element. The default is  . 
(4)	Gridline Color	● The **Gridline Color** is the color of the grid line in the **X-Y Distribution** element. The default is  . ● Change the color of the gridline. 
(5)	Horiz. Line Number / Vert. Line Number	● **Horiz. Line Number** refers to the number of lines which are parallel to the X-axis and **Vert. Line Number** refers to the number of lines which are parallel to the Y-axis. The default value is **1** for both settings. ● Both **Horiz. Line Number** and **Vert. Line Number** support a maximum of 99 lines.
(6)	Style	This setting allows users to change the appearance of elements. The available options for **Style** are: Standard, Raised, and Sunken. The default value is **Standard**. Standard:  Raised:  Sunken: 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(7)</td><td>Background Color</td><td>Set the background color of the element. The default is  .
 
</td></tr>
<tr><td>(8)</td><td>Line Weight</td><td>● The line width setting ranges from 1 ~ 8. The default value is 1.
● When the Connection is set from 0 ~ 1, the connecting lines are displayed, and this setting is valid in that scenario.
<table>
<tr><td>Connection = 1</td><td>  </td></tr>
<tr><td>Connection = 0</td><td>  </td></tr>
</table></td></tr>
<tr><td>(9)</td><td>Dot Size</td><td>The Dot Size setting ranges from 1 ~ 8. The default value is 3. When it is set to 5, the Dot Size is as follows.
  </td></tr>
</table>

- Coord.

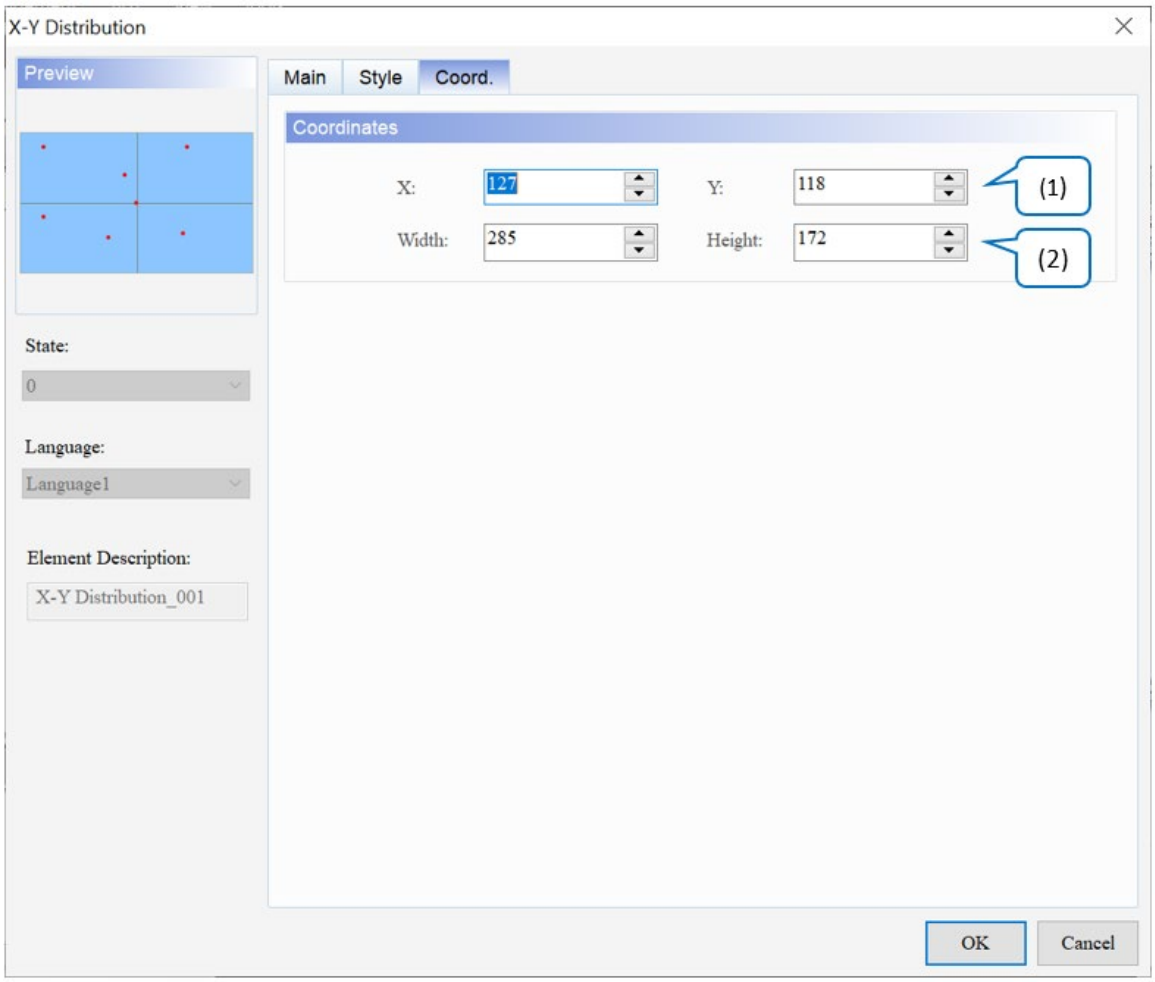


Figure 14 - 12: X-Y Distribution element Coord. property page

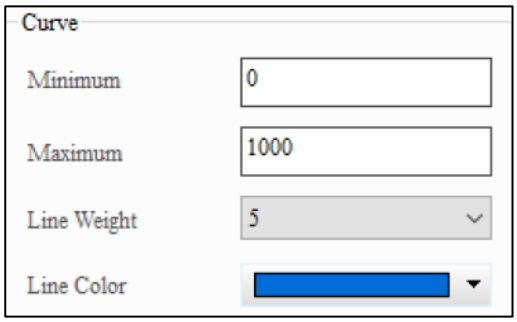
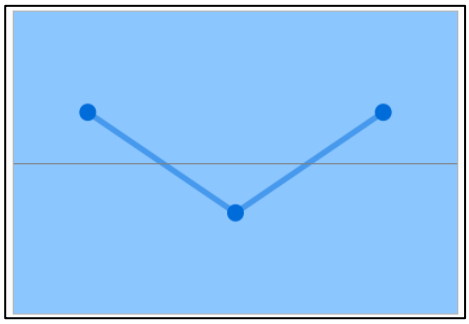
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

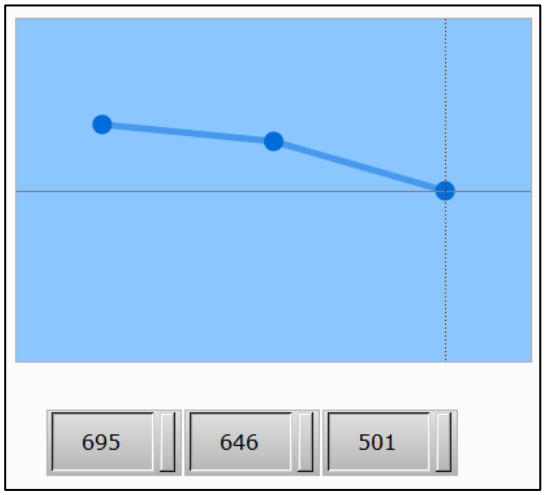
14.4 Curve Input

Curve Input element draws curves according to the continuous sampling by the set **Address**. Users can also press the **Curve Input** element to move the curve to the

required position. **Curve Input** element provides two **Curve Style** options with different effects: Broken line and Block graphs.

Refer to the following table for the **Curve Input** element example.

<table>
<tr><th colspan="2">Curve Input</th></tr>
<tr><td>Curve Input element</td><td>Create a Curve Input element and set its parameters.
<table>
<tr><th colspan="2">Curve Input Element</th></tr>
<tr><td>Address</td><td>$1058</td></tr>
<tr><td>Sample Number</td><td>3</td></tr>
<tr><td>Curve Style</td><td>Broken line</td></tr>
<tr><td>Minimum / Maximum / Line Weight / Line Color</td><td> 
</td></tr>
<tr><td colspan="2">  </td></tr>
</table></td></tr>
<tr><td>Numeric Entry element</td><td>Create three Numeric Entry elements. As the Sample Number of the Curve Input element is set to 3, three sampling points are used to draw a curve. Then, the set Address $1058 of the Curve Input element starts reading three addresses in sequence, which are $1058, $1059, and $1060.
<table>
<tr><th colspan="4">Numeric Entry Element</th></tr>
<tr><td>Write Address</td><td>$1058</td><td>$1059</td><td>$1060</td></tr>
</table></td></tr>
<tr><td>Execution result</td><td>After creating the elements, compile and download the data to the HMI. Next, enter any values to the Numeric Entry elements, and then the Curve Input element draws the curve according to the input</td></tr>
</table>

Curve Input	
	values. Press the **Curve Input** element to move the curve to the required position. 

On double-clicking the **Curve Input** element, the property page appears as follows.

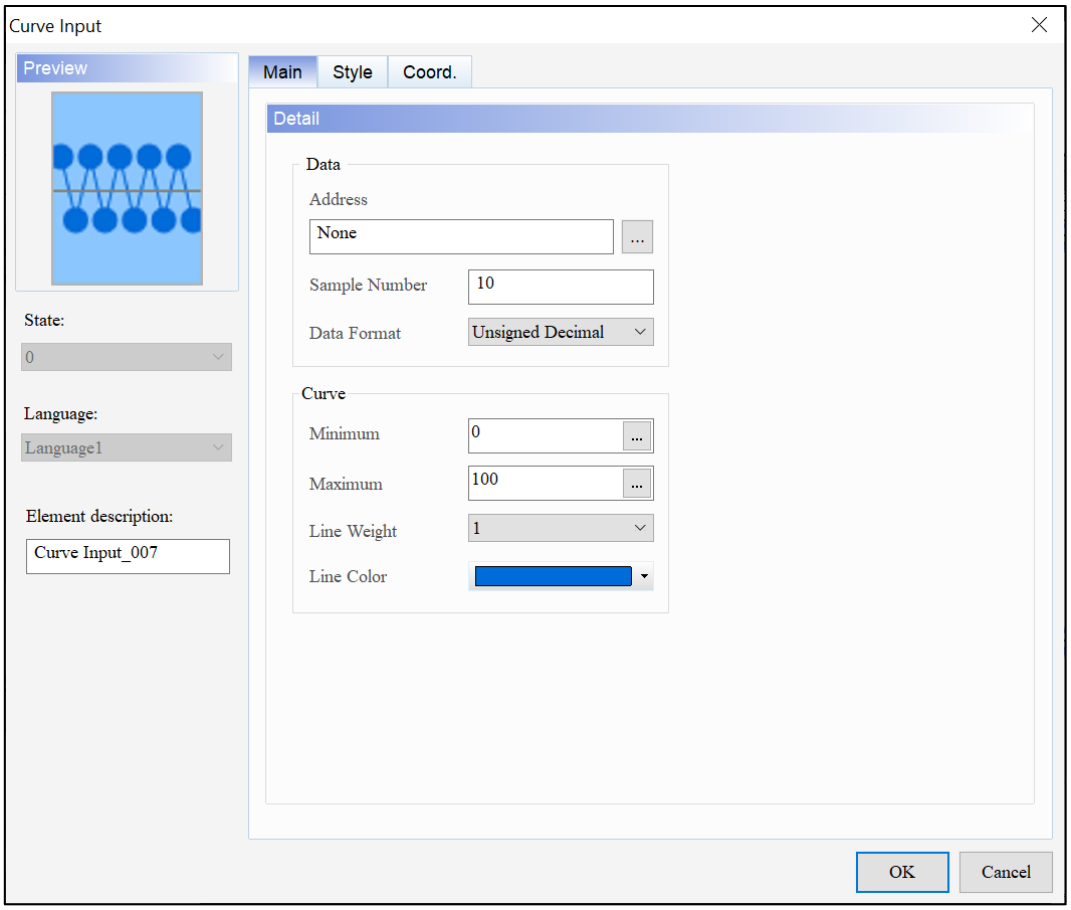


Figure 14 - 13: Curve Input element property page

Curve Input	
Function	**Description**
Preview	**Curve Input** elements do not support multiple state values and multi-language data display.
Main	Set the Address, Sample Number, Data Format, Minimum, Maximum, Line Weight, and Line Color.
Style	Set the Border Color, Gridline Color, Curve Style, Grid Line, Style, Background Color, Horiz. Grid Number, Transparency, Smooth animation, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

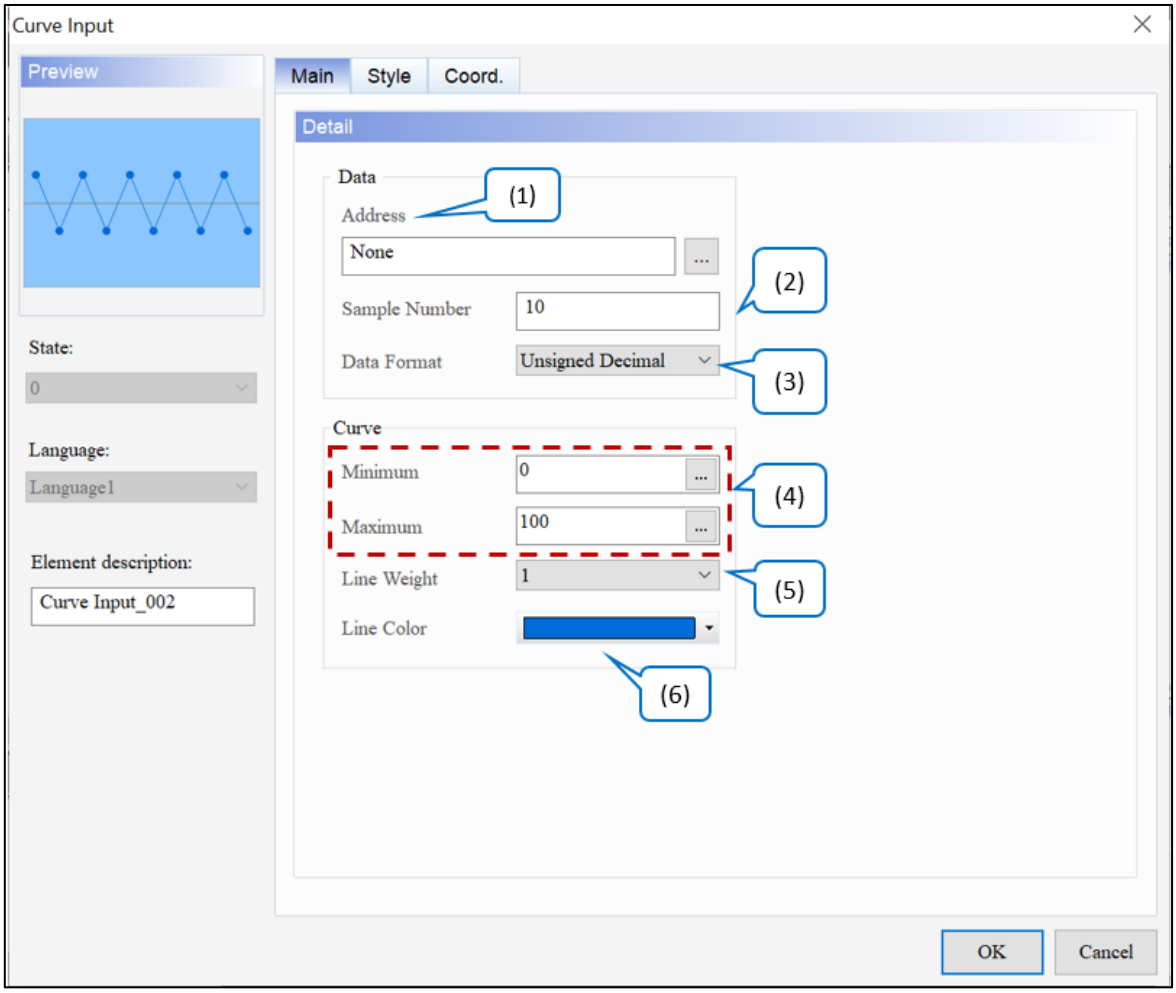
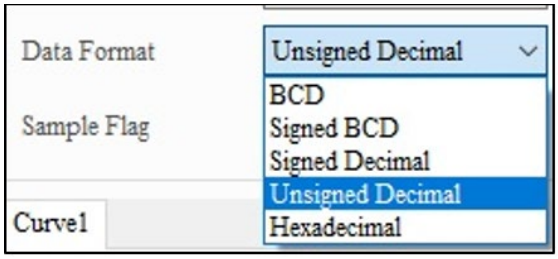
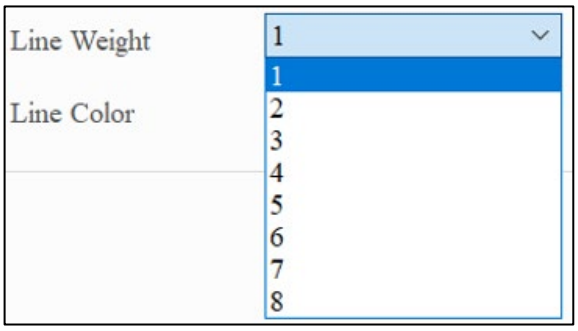
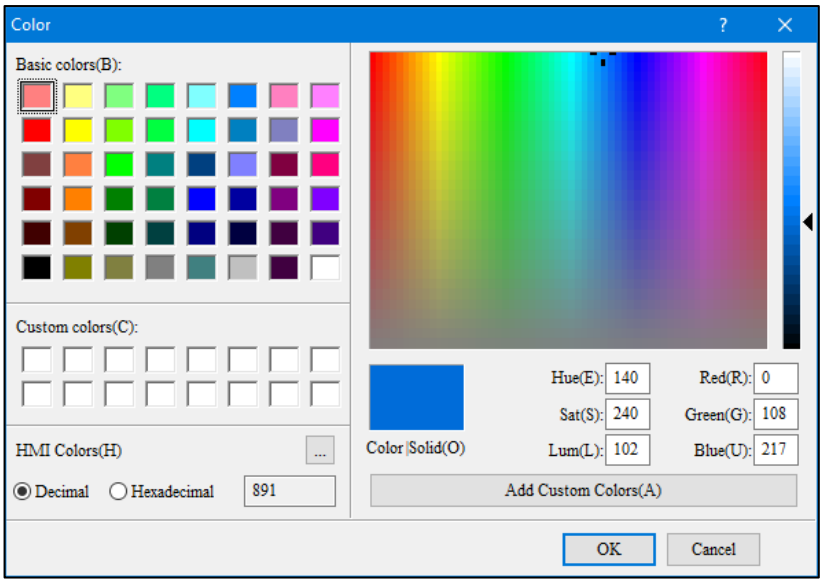


Figure 14 - 14: Curve Input element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Address</td><td>● Select the Internal Memory or controller register address.
● Select Link name or Device Type. Refer to Memory Settings.</td></tr>
<tr><td>(2)</td><td>Sample Number</td><td>● The set value of sampling points must be a constant. The default value is 10.
● The number of sampling points is determined by the element width and style. When users set the Style of the Curve Input element as Standard and its width as 167, then the maximum number of points that can be displayed is 167. But if users set the Style of the Curve Input element as Raised or Sunken (border width is 7 points) and its width as 167, then the maximum number of points that can be displayed is 153 (167 - (7*2) = 153).</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>The available options for Data Format are: BCD, Signed BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is Unsigned Decimal.
 
</td></tr>
<tr><td>(4)</td><td>Minimum / Maximum</td><td>● The Minimum and Maximum values can be set as constants or variables. The default values of Minimum and Maximum are 0 and 1, respectively.
● When the Minimum and Maximum values are variables, the controller address (Word) and the internal register address (Word) are supported.
● When the Minimum and Maximum values are constants, the permissible range of their values vary according to the selected Data Type and Data Format.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
</table></td></tr>
</table>

No.	Function	Description
(5)	Line Weight	The line width can be set from 1 ~ 8. The default value is **1**. 
(6)	Line Color	Set the line color for the curve. The default is  . 

- Style

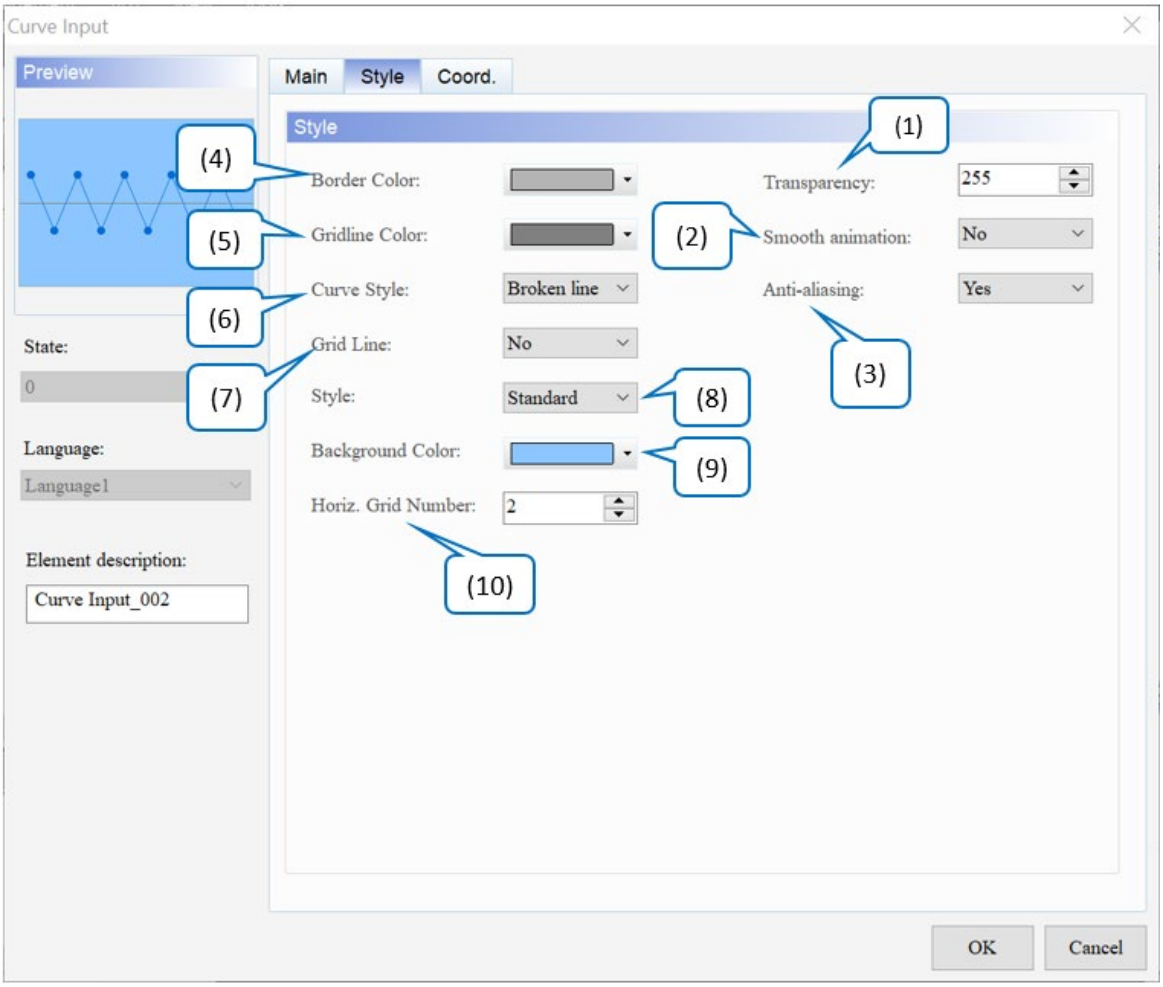
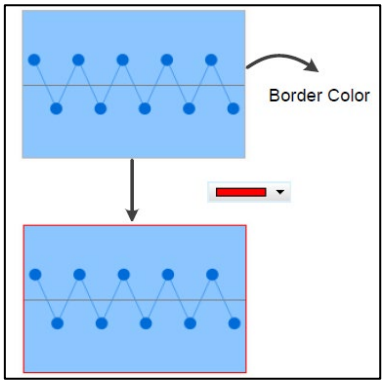
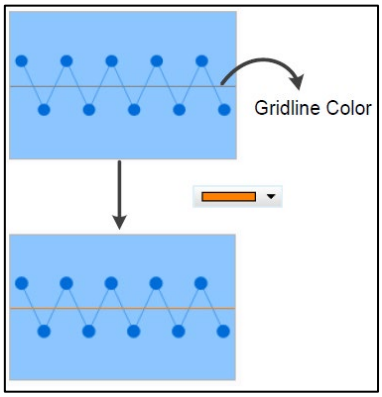
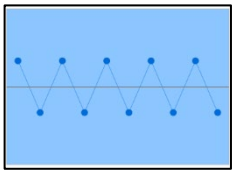
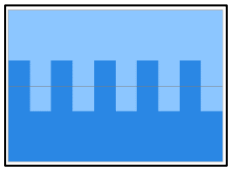
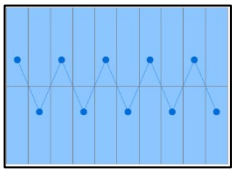
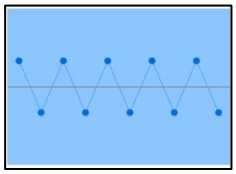
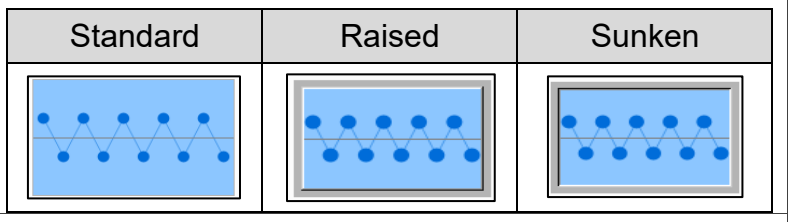
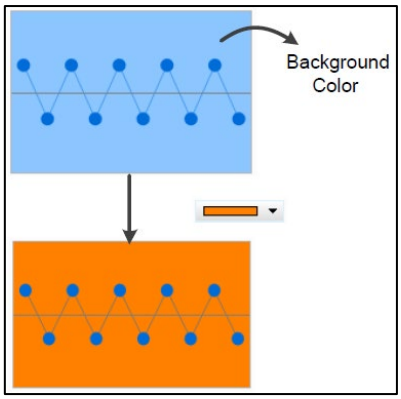
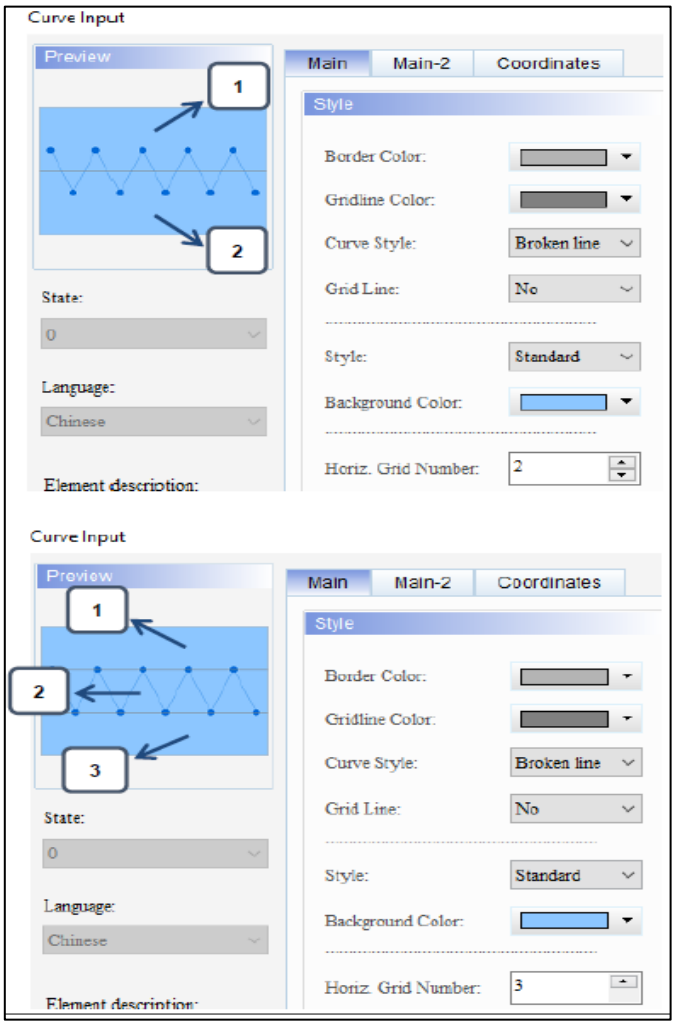


Figure 14 - 15: Curve Input element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Smooth animation	The **Smooth animation** function is available for this element. When this function is enabled, the curve display is smoother. The default value is **No**.
(3)	Anti-aliasing	The **Anti-aliasing** function is available for this element. When this function is enabled, the element display becomes more delicate without jagged edges. The default value is **Yes**.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(4)</td><td>Border Color</td><td>Set the border color of the Curve Input element. The default is .
 
</td></tr>
<tr><td>(5)</td><td>Gridline Color</td><td>● The Gridline Color is the color of the grid line in the Curve Input. The default is .
● Change the color of the grid line.
 
</td></tr>
<tr><td>(6)</td><td>Curve Style</td><td>The available options for Curve Style are: Broken line and Block graphs. The default value is Broken line.
<table>
<tr><th>Broken Line</th><th>Block Graphs</th></tr>
<tr><td>  </td><td>  </td></tr>
</table></td></tr>
<tr><td>(7)</td><td>Grid Line</td><td>Select Yes or No to display Grid Line. The default value is No.
<table>
<tr><th>Yes</th><th>No</th></tr>
<tr><td>  </td><td>  </td></tr>
</table></td></tr>
</table>

No.	Function	Description
(8)	Style	This setting allows users to change the appearance of elements. The available options for **Style** are: Standard. Raised, and Sunken. The default value is **Standard**. 
(9)	Background Color	● Set the background color of the element. The default is  . 
(10)	Horiz. Grid Number	● **Horiz. Grid Number** sets the number of zones the **Curve Input** element is divided into. The default value is **2**, meaning there is one grid line dividing the **Curve Input** element into two zones. If the **Horiz. Grid Number** is set to 3, there are two grid lines dividing the **Curve Input** element into 3 zones, and so on.

No.	Function	Description
		 ● The maximum horizontal grid count is 50.

- Coord.

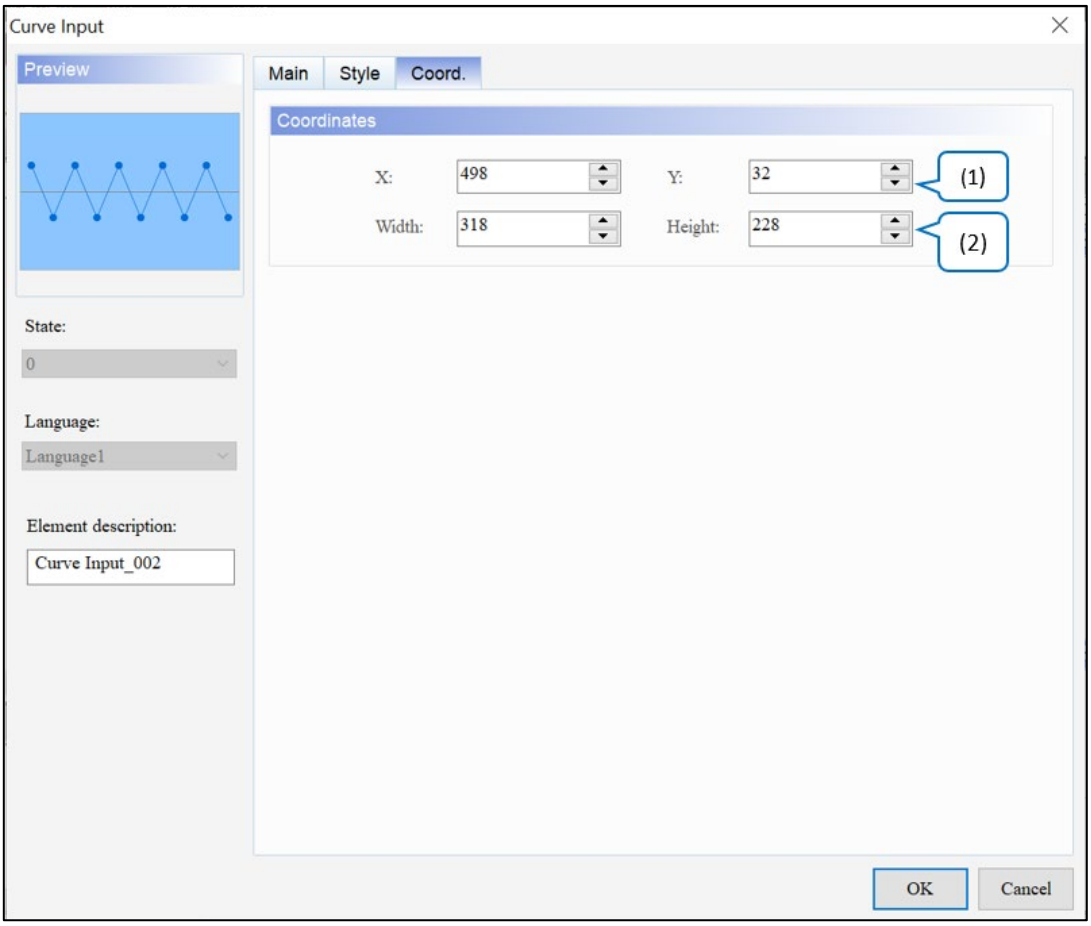


Figure 14 - 16: Curve Input element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

14.5 Mold Thickness Control Curve

***NOTE**: This element (function) is supported only in the AX series and IMP series.*

Mold Thickness Control Curve element is to edit a curve on the HMI and store the data in the address specified by users. DIAScreen draws a feedback line according to the status point data provided by users; after importing the data, the software recalculates the curve according to the current parameters.

On double-clicking the **Mold Thickness Control Curve** element, the property page appears as follows.

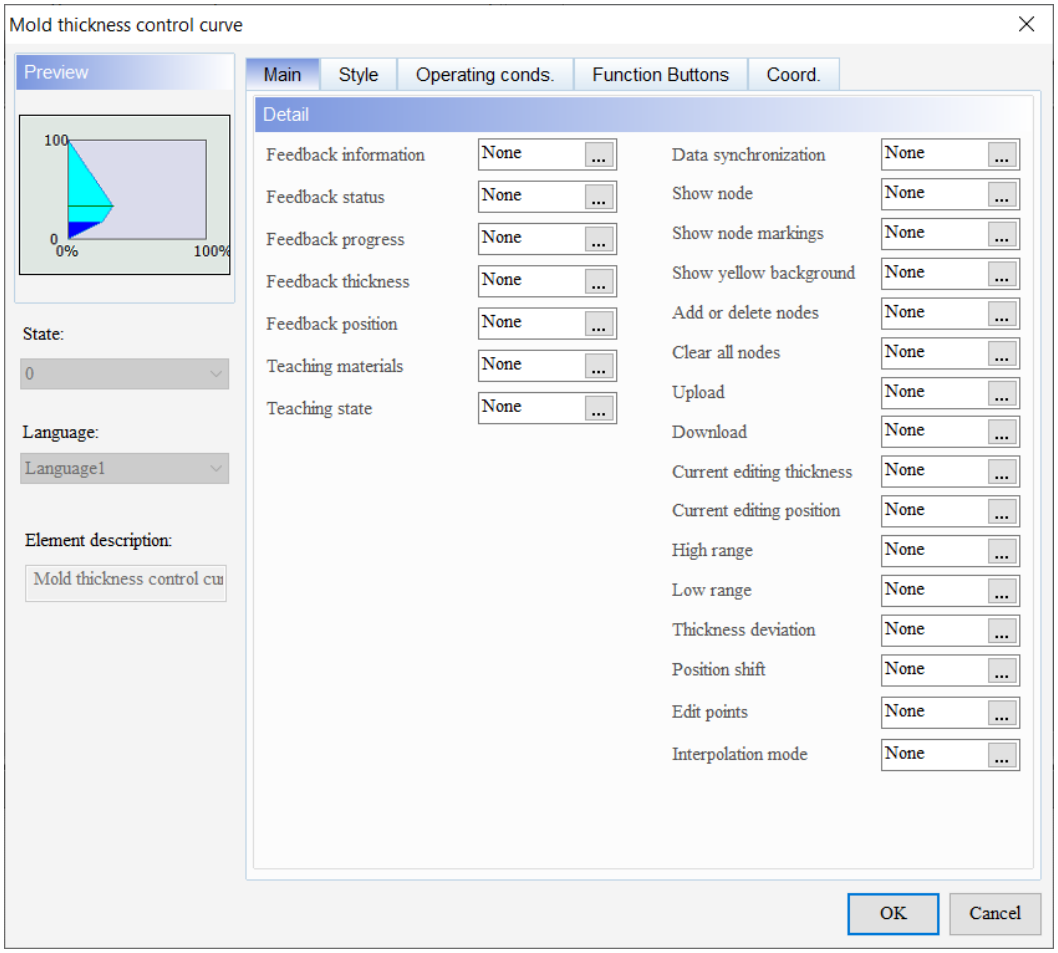


Figure 14 - 17: Mold Thickness Control Curve property page

Mold Thickness Control Curve	
Function	**Description**
Preview	The **Mold Thickness Control Curve** elements do not support multiple state values and multi-language data display.
Main	Set Feedback information / status / progress / thickness / position, and Teaching materials / state. Set Data synchronization, Show node / node markings / yellow background, Add or delete nodes, Clear all nodes, Upload, Download, Current editing thickness / editing position, High / Low range, Thickness deviation, Position shift, Edit points, and Interpolation mode.
Style	Set the element-related Style.
Operating conds.	Set Interlock State, Interlock Address, Invisible Address, Invisible State, User Security Level, and Set Low Security.
Function Buttons	Enable to Search node up / down. Set Button Default Width / Height.
Coord.	Set the X-Y coordinates, Width and Height of the element.

- Main

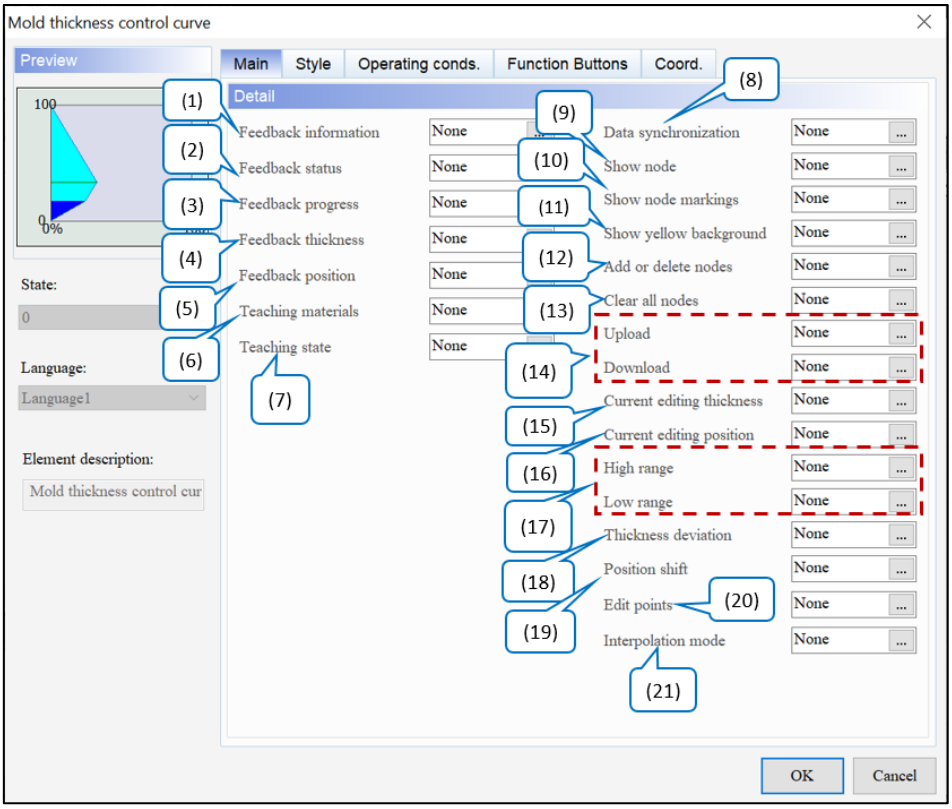
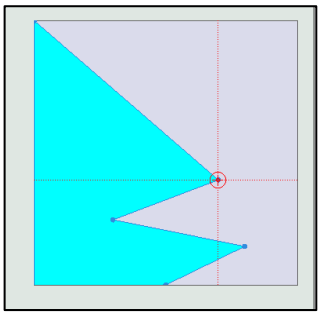
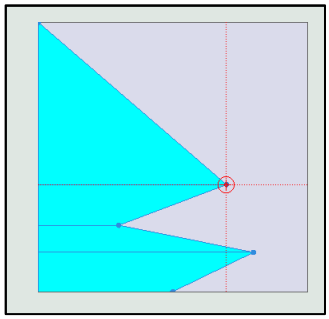
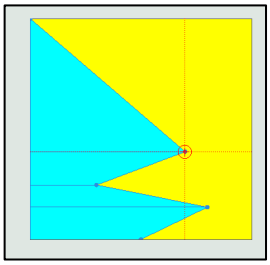


Figure 14 - 18: Mold Thickness Control Curve element Main property page

No.	Function	Description
(1)	Feedback information	The number of feedback is determined by the **Edit points**.
(2)	Feedback status	There are four options for **Feedback status**: Disable, Start, Pause, and Reset.
(3)	Feedback progress	Current **Feedback progress**. Read only.
(4)	Feedback thickness	The thickness of the current feedback.
(5)	Feedback position	Current **Feedback position**.
(6)	Teaching materials	Curves are stored in HMI.
(7)	Teaching state	There are two options for **Teaching state**: In action and Completed.
(8)	Data synchronization	Synchronize element data when the same element is in different screens.
(9)	Show node	Display all nodes set by users. 
(10)	Show node markings	Display the connection between the nodes and the Y axis. 
(11)	Show yellow background	Display a yellow background. It also means that the curve is being edited. 
(12)	Add or delete node	After confirming the current position and thickness, nodes can be added or

No.	Function	Description
		deleted.
(13)	Clear all nodes	Clear all nodes on the curve, and the curve will also be cleared at the same time.
(14)	Upload / Download	**Upload**: Upload data from the **Teaching materials** to the element. **Download**: Download to the **Teaching materials** after editing the curve from the element.
(15)	Current edit thickness	The currently edited thickness.
(16)	Current edit position	The currently edit position.
(17)	High / Low range	**High range**: Set the highest point of the node in the curve, and other nodes will use this point as the reference point. When the node reaches 0 (%), the graph will not change, and it can be greater than 100 (%). **Low range**: Set the lowest point of the node in the curve, and other nodes will use this point as the reference point. When the node reaches 0 (%), the graph will not change, and it can be greater than 100 (%).
(18)	Thickness offset	All nodes increase or decrease thickness together. When the node reaches 0 (%), the graph will not change, it can be greater than 100 (%).
(19)	Position offset	The entire curve graph is shifted up or down.
(20)	Edit points	There are three **Edit points**: 100, 200, and 400.
(21)	Interpolation mode	0: Linear curve. 1: Spline curve.

- Style

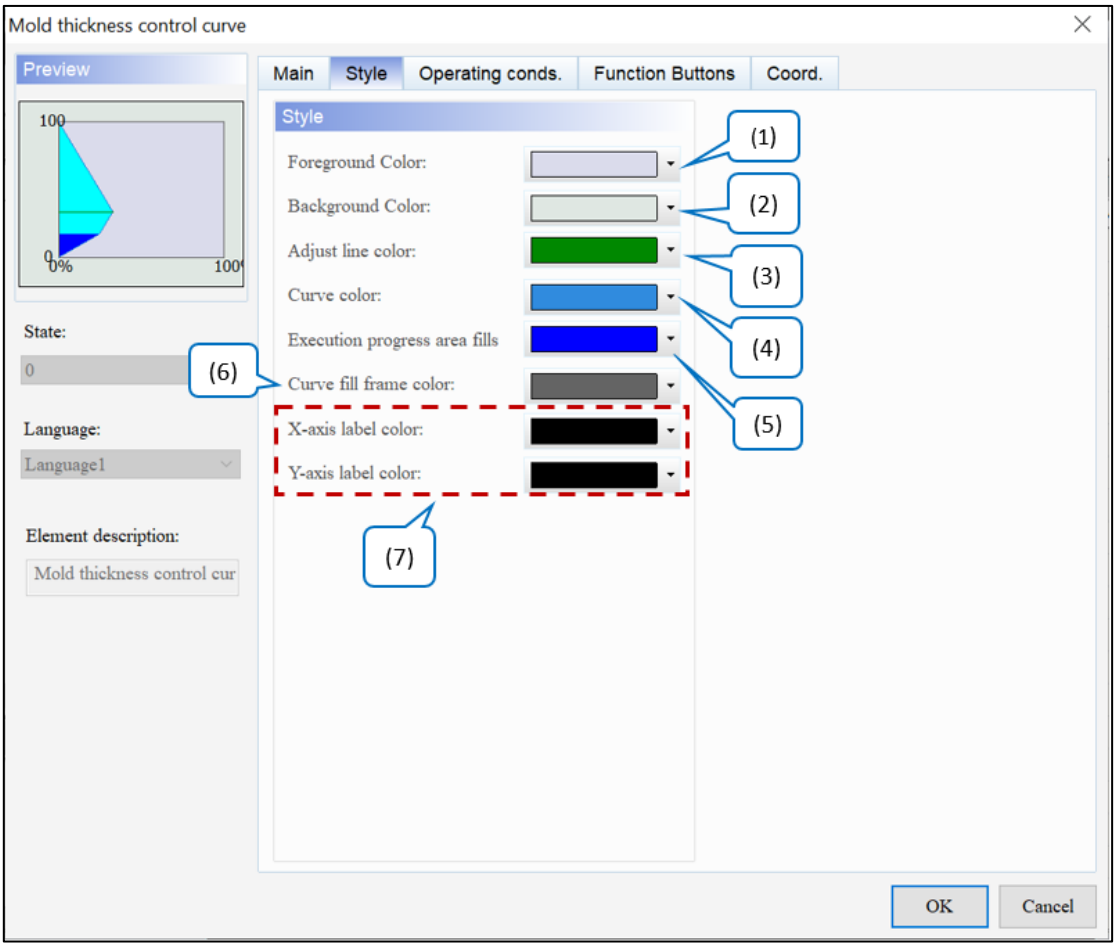
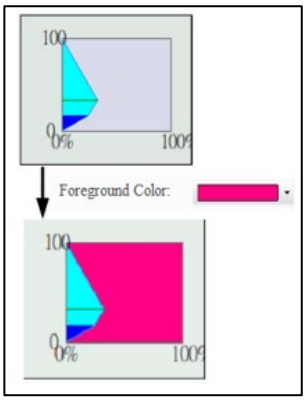
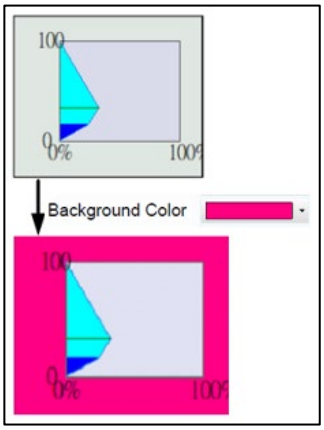
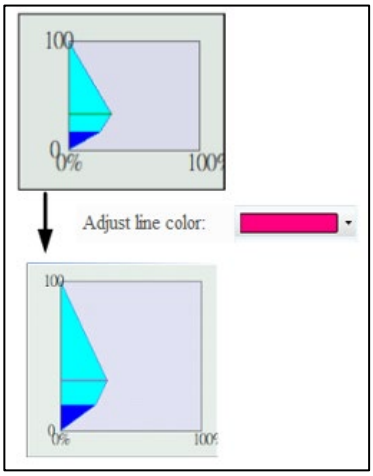
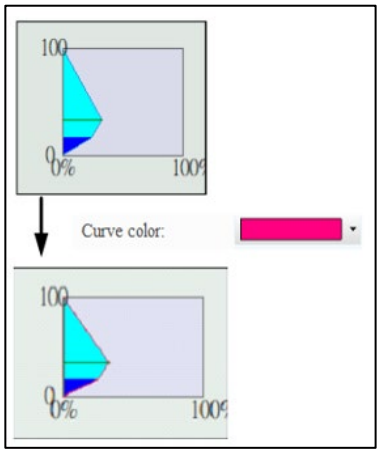
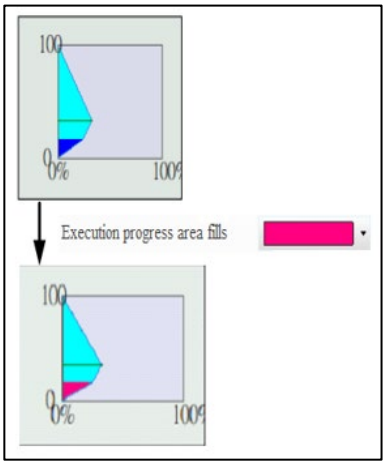
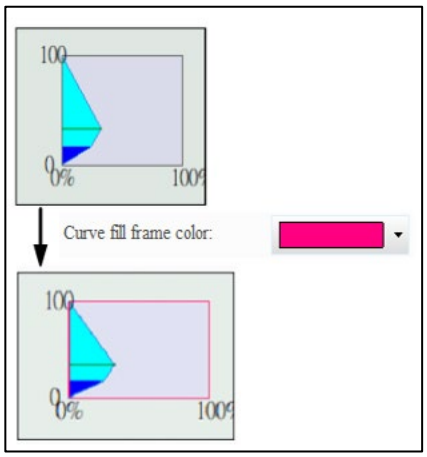
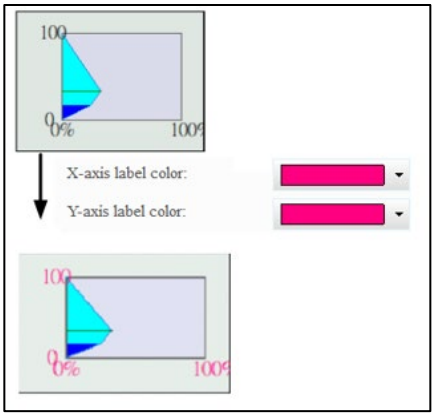


Figure 14 - 19: Mold Thickness Control Curve element Style property page

No.	Function	Description
(1)	Foreground Color	Set the foreground color of the element. The default is  . 

No.	Function	Description
(2)	Background Color	Set the background color of the element. The default is  . 
(3)	Adjust line color	Adjust the color of the element node markings. The default is  . 
(4)	Curve color	Adjust the color of the curves within the element. The default is  . 

No.	Function	Description
(5)	Execution progress area fills	Adjust the color of the fill in the execution progress area. The default is  . 
(6)	Curve fill frame color	Adjust the color of the outline of the curve. The default is  . 
(7)	X- / Y-axis label color	Adjust the label colors of X- / Y-axis. The default is  . 

- Operating conds.

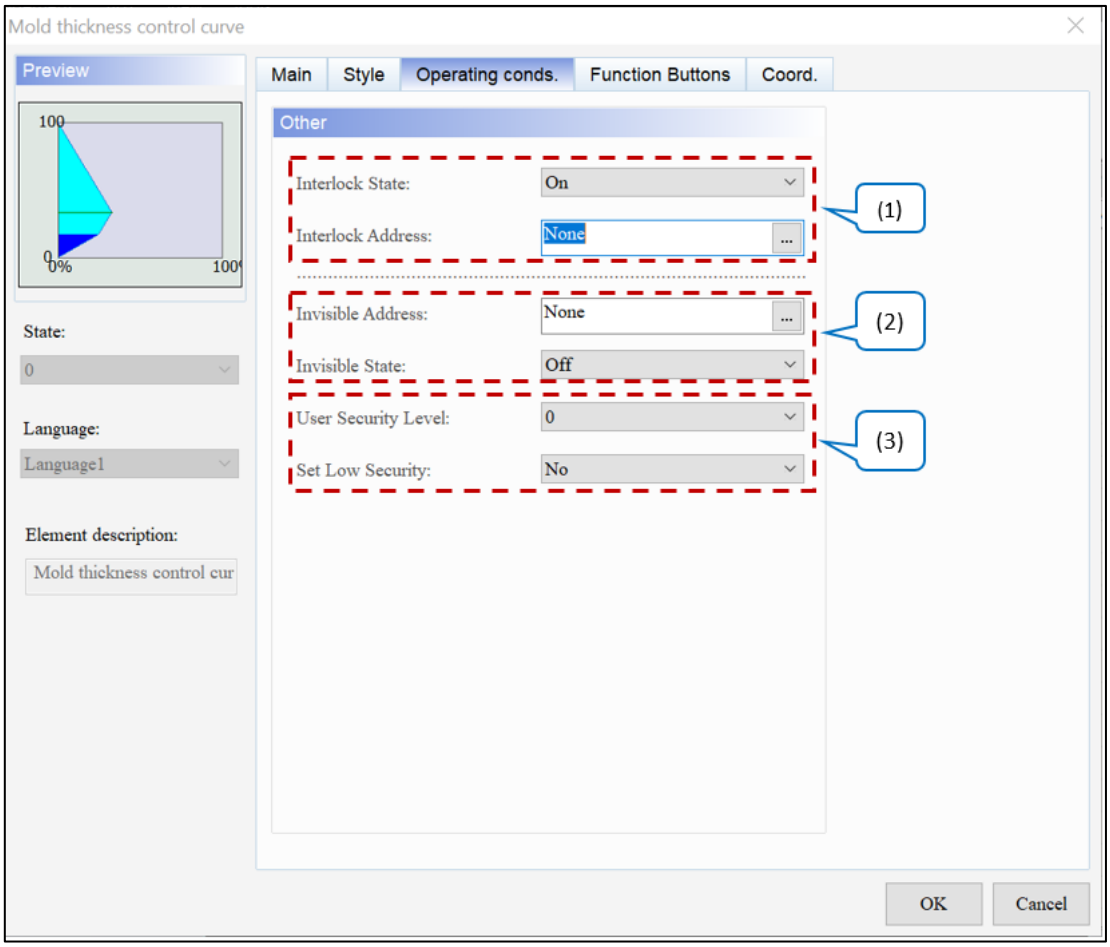


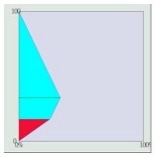
Figure 14 - 20: Mold Thickness Control Curve element Operating conds. property page

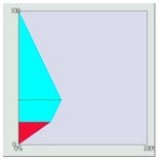
No.	Function	Description
(1)	Interlock State	• The **Interlock Address** enables to operate a certain element from this particular address, which must be operated along with the **Interlock State**. • If the **Interlock State** is set to Off/On, the **Interlock Address** enables to operate a certain element from this particular address. The default value is **On**.
	Interlock Address	

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(2)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

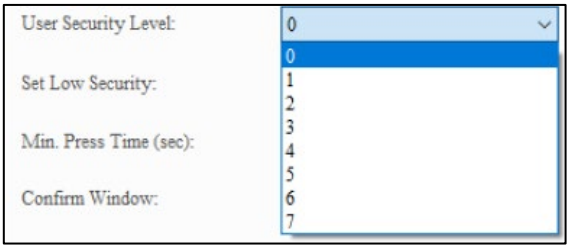
Create an element and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
Invisible Address
$9.0 OFF

Element disappear
Invisible Address
$9.0 ON</td></tr>
<tr><td>Invisible State is Off</td><td> 
Invisible Address
$9.0 ON

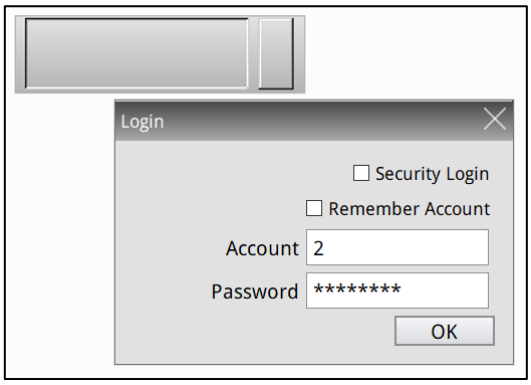
Element disappear
Invisible Address
$9.0 OFF</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td></tr>
<tr><td>(3)</td><td>User Security Level</td><td>

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.



If the User Security Level is set, the Login window

</td></tr>
</table>

No.	Function	Description
	Set Low Security	pops up when the element is pressed to confirm whether the security level password is correct  ● If users set the **Set Low Security** to Yes, each time users enter the password, the HMI sets the security level to the lowest. The next time users press the element, the HMI asks to enter the password for the corresponding security level again. The default value is **No**.

- Function Buttons

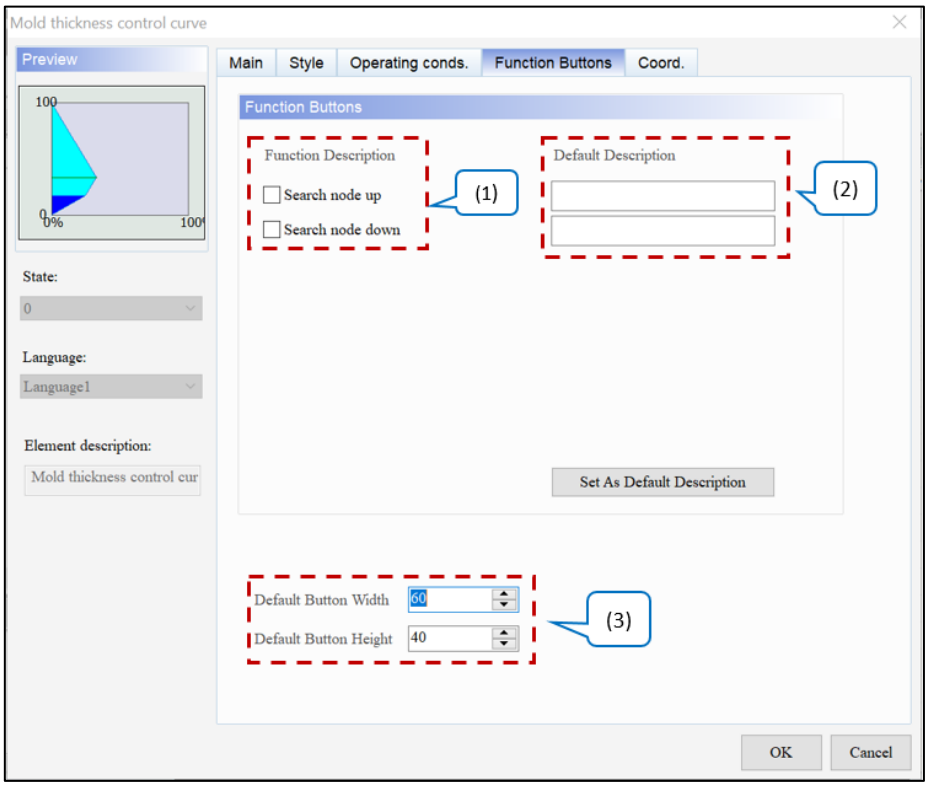


Figure 14 - 21: Mold Thickness Control Curve element Function Buttons property page

No.	Function	Description
(1)	Function Description	When this function is enabled, nodes can be searched up / down.
(2)	Default Description	Customize text for **Search node up / Search node down** function. Click **Set As Default Description** to use the default text.
(3)	Default Button Width / Height	Set the default width and height of the button. The default values for width and height are **60** and **40**, respectively.

- Coord.

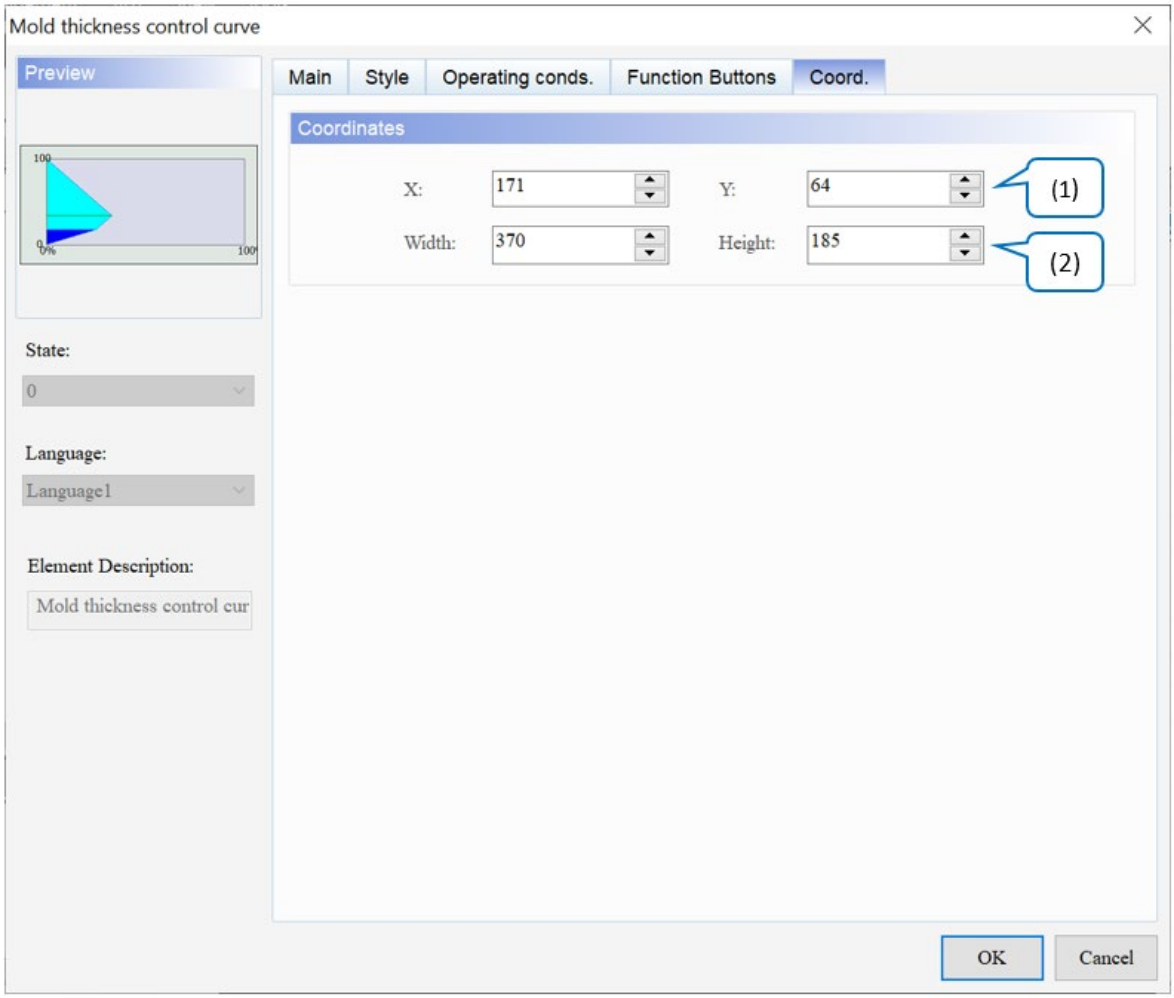


Figure 14 - 22: Mold Thickness Control Curve element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 15: Sampling

15.1 History Buffer

Before introducing the elements relevant to the **Sampling** function, this section first explains how to use the functions in the **History Buffer Setup**. The **History Buffer Setup** is mainly used to define the relevant properties required for setting the **Sampling** function elements, such as read address, data length, sampling points, trigger source, whether to record the time and date, and whether to store the data in an external device or export as a CSV file.

The formula provided by the software computes all the History Buffer relevant data that users have edited. Then, the set non-volatile memory saves these computation results. If the data is saved in the HMI, the History Buffer size is subject to change based on the HMI model. Refer to the hardware specifications for non-volatile memory in the HMI Instruction Sheet. For the data saved in the USB Disk or SD Card, the History Buffer size is determined by the external storage devices.

When users download the history data to the HMI, two log files are generated: one DAT file and one CSV file.

1. Formulas to calculate the DAT file size

Each history data is stored as an Hxxxx.dat file. xxxx indicates the sequence number of the history data record. Each .dat file size is calculated by the following formula.

$$\frac{\{[6\ \text{Bytes(a)} + 2\ \text{Bytes(b)}] \times \text{N(c)}\}}{1024 \times 1024} = \text{Actual file size in MBytes}$$

a: Time and date data

b: Data type

c: Sample number

The size of file header is calculated additionally.

$$\{[8\text{Bytes(a)}]\times \text{N(b)}\} = \text{Actual file size in Bytes}$$

a: File header of each history data.

b: Sample Number

2. Formulas to calculate the CSV file size

The CSV file calculation method is by dynamic configuration, which is calculated based on each character counted as 2 bytes. Each item must be separated by a comma (,) and the comma is also 2 bytes. At the end of each row, a total of 4 bytes for the Newline Command, 0x0D and 0x0A, is also included. The following describes how the CSV file size is calculated.

- Title

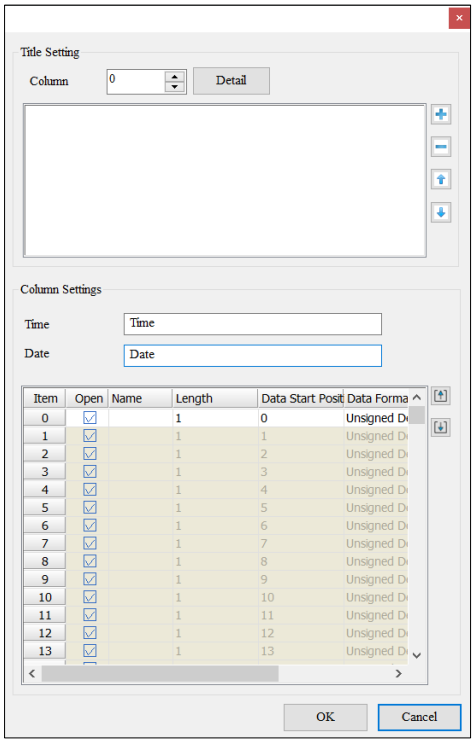


Figure 15 - 1: CSV Fields

The following three examples show how to calculate the data size of the title:

1. Each character is counted as 2 bytes (characters*2 bytes).

File Header	Time Column Setting	Separator	Date Column Setting	Separator	Data Column Setting	Newline Command
	Time	,	Date	,	Data 1	
2 bytes	8 bytes	2 bytes	8 bytes	2 bytes	10 bytes	4 bytes
Total 36 bytes						

2. Each character is counted as 2 bytes (characters*2 bytes).

File Header	Time Column Setting	Separator	Date Column Setting	Separator	Date Column Setting	Newline Command
	Time	,	Date	,	Profile 1	
2 bytes	4 bytes	2 bytes	4 bytes	2 bytes	6 bytes	4 bytes
Total 24 bytes						

3. Each character is counted as 2 bytes (characters*2 bytes)

File Header	Time Column Setting	Separator	Date Column Setting	Separator	Data Column Setting	Data Column Setting	Newline Command
	Time	,	Date	,	Profile 1	Profile 2	
2 bytes	4 bytes	2 bytes	4 bytes	2 bytes	6 bytes	6 bytes	4 bytes
Total 30 bytes							

- Field column

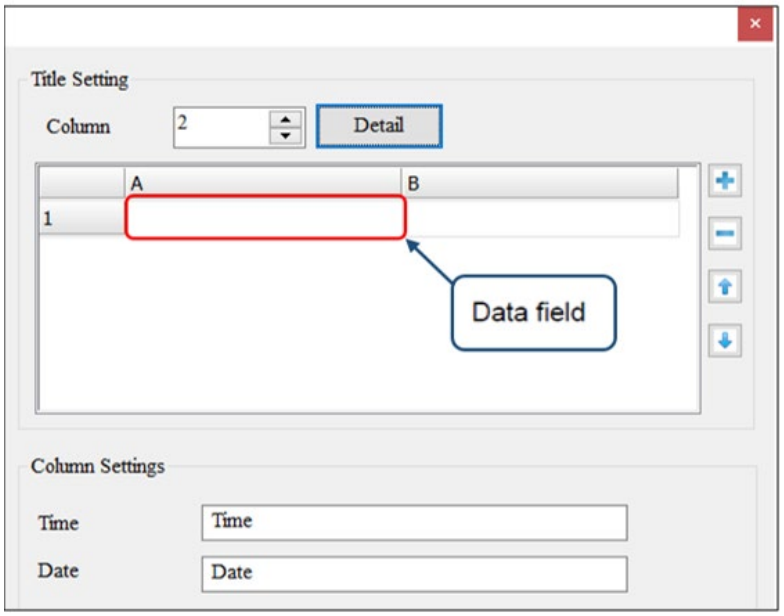


Figure 15 - 2: CSV Fields - Data field

CSV columns can support up to 10 columns * 10 rows.

Each data field can support up to 128 Bytes, and each character counts as 2 bytes.

Each character is counted as 2 bytes (characters*2 bytes). Column*row = 2*2.

A1 Setting	Separator	B1 Setting	Separator	A2 Setting	Separator	B2 Setting	Newline Command
123	,	Delta Electronics	,	abc	,	QWE	
6 bytes	2 bytes	8 bytes	2 bytes	6 bytes	2 bytes	6 bytes	4 bytes
Total 36 bytes							

- Data row

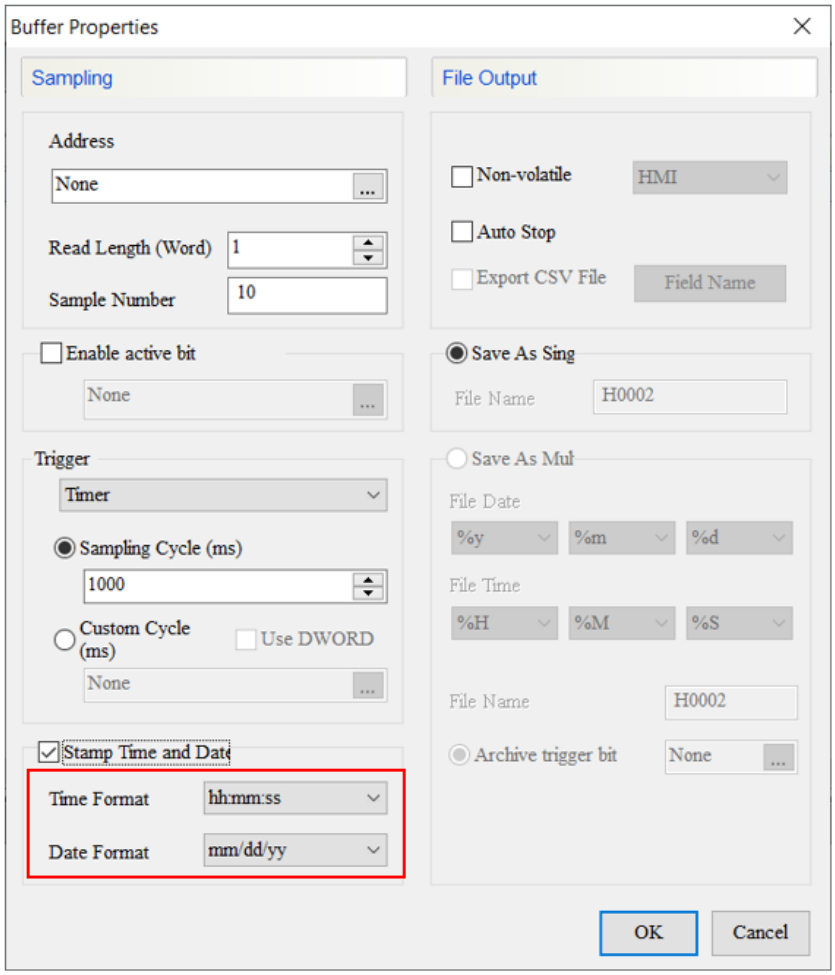


Figure 15 - 3: Buffer Properties window

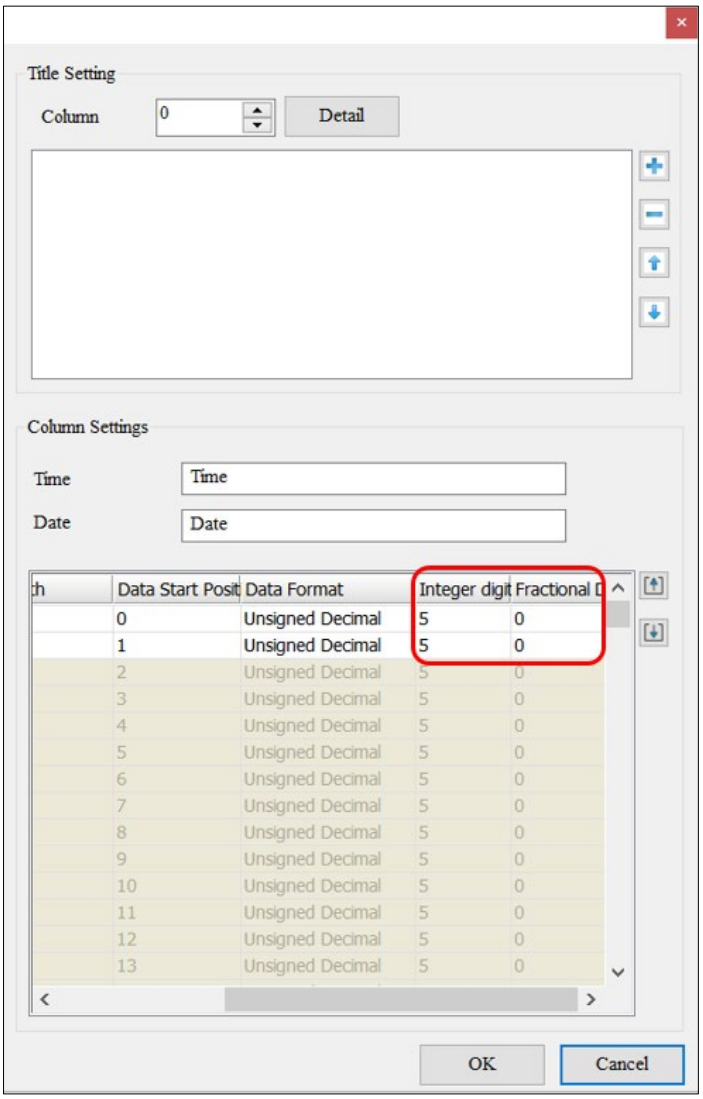


Figure 15 - 4: Integer / Decimal places

The following three examples show how to calculate the data row:

1. Each character is counted as 2 bytes (characters*2 bytes).

Time Format Setting	Separator	Date Format Setting	Separator	Integer Digits Setting	Fractional Digits Setting	Newline Command
hh:mm:ss	,	**mm/dd/yy**	,	**5**	**0**	
16 bytes	2 bytes	20 bytes	2 bytes	10 bytes	0 bytes	4 bytes
Total 54 bytes						

2. Each character is counted as 2 bytes (characters*2 bytes).

Time Format Setting	Separator	Date Format Setting	Separator	Integer Digit Setting	Fractional Digits Setting	Newline Command
hh:mm	,	mm.dd	,	4	1	
10 bytes	2 bytes	10 bytes	2 bytes	8 bytes	2 bytes	4 bytes
Total 38 bytes						

3. Each character is counted as 2 bytes (characters*2 bytes)

Time Format Setting	Separator	Date Format Settings	Separator	Data 1		Data 2		Newline Command
				Integer Digit Setting	Fractional Digits Setting	Integer Digit Setting	Fractional Digit Setting	
N/A	,	N/A	,	4	1	3	2	
0 bytes	2 bytes	0 bytes	2 bytes	8 bytes	8 bytes	6 bytes	4 bytes	4 bytes
Total 34 bytes								

The data size of each of the preceding data row must multiply by the Sample Number N(a). Therefore, Title + Field column + Data row*Sample Number N(a) is the CSV file size exported from the History Buffer. The formula is as follows:

$$\frac{\text{Title data size Bytes} + \text{Field column size Bytes} + \text{Data row size Bytes} \times N(a)}{1024 \times 1024} = \text{Actual file size in MBytes}$$

a: Sample Number

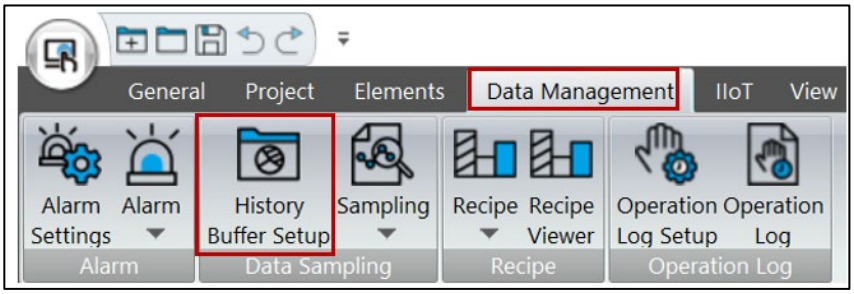
This chapter introduces all element examples used by the sampling function, including History Buffer Setup, Historical Trend Graph, Historical Data Table, Historical Event Table, and Historical Overview Table.

Refer to the following table for the **History Buffer Setup**.

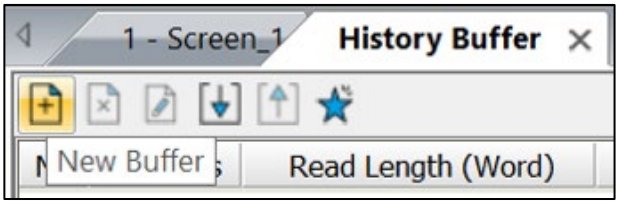
History Buffer Setup

History Buffer Setup steps

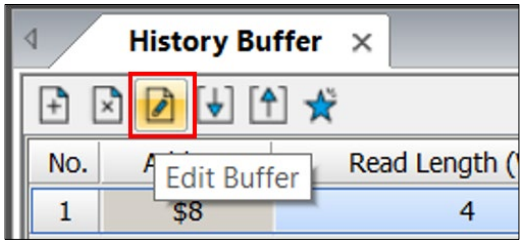
Step 1: Go to **Data Management** > **History Buffer Setup** to set the properties related to historical data.

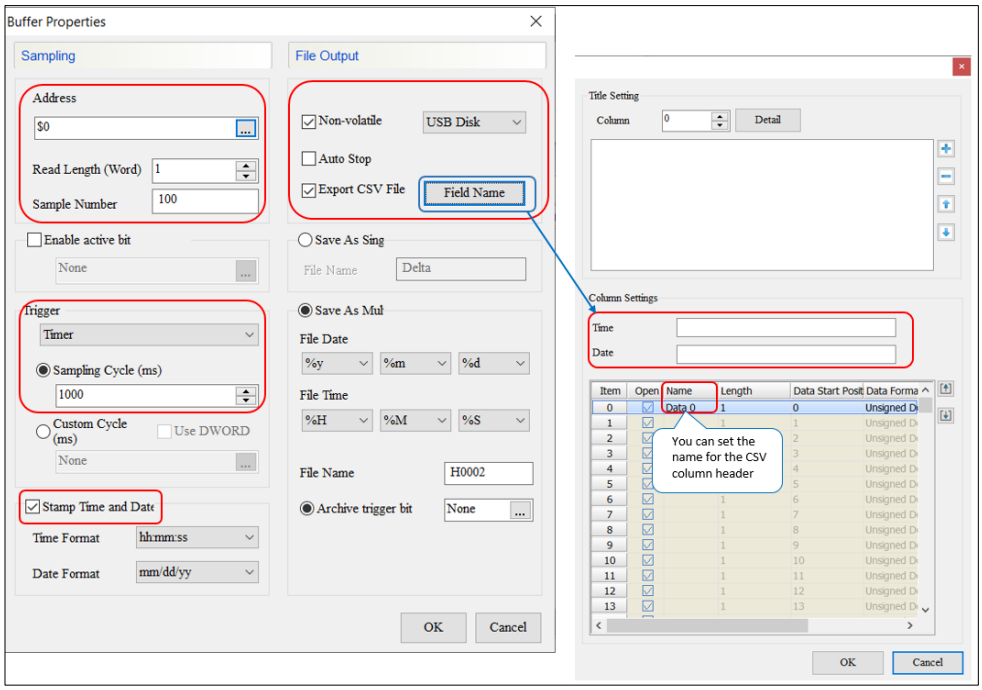


Step 2: Click  icon to add data to the History Buffer.



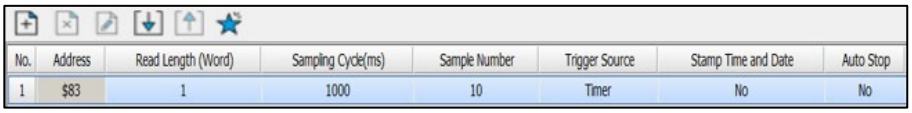
Step 3: Set the Buffer Properties as follows.



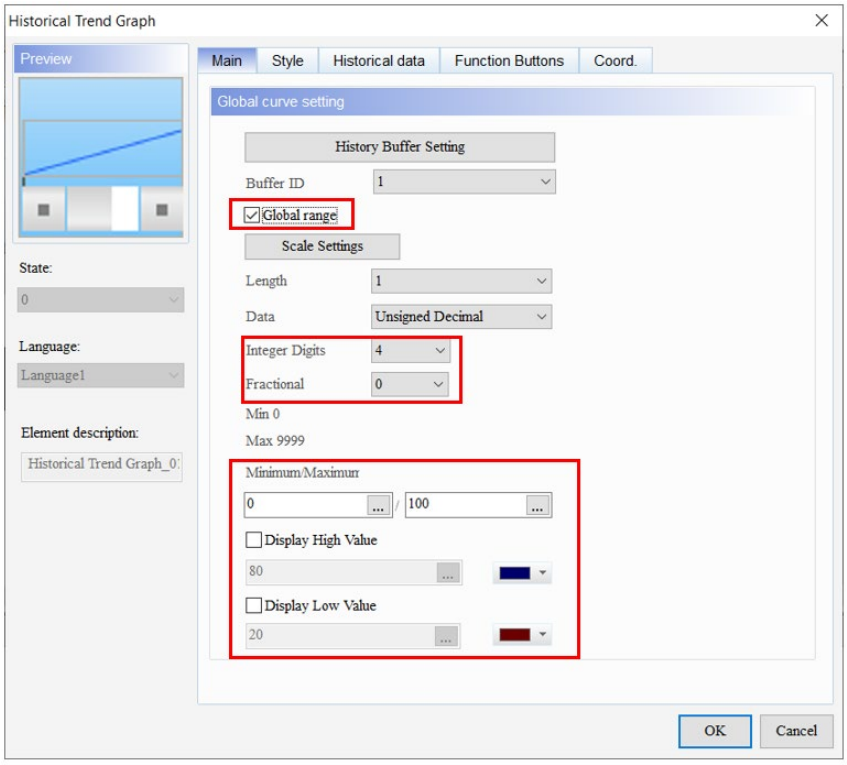


Step 4: After completing the preceding settings, a new row of data is created in the **History Buffer Setup**.

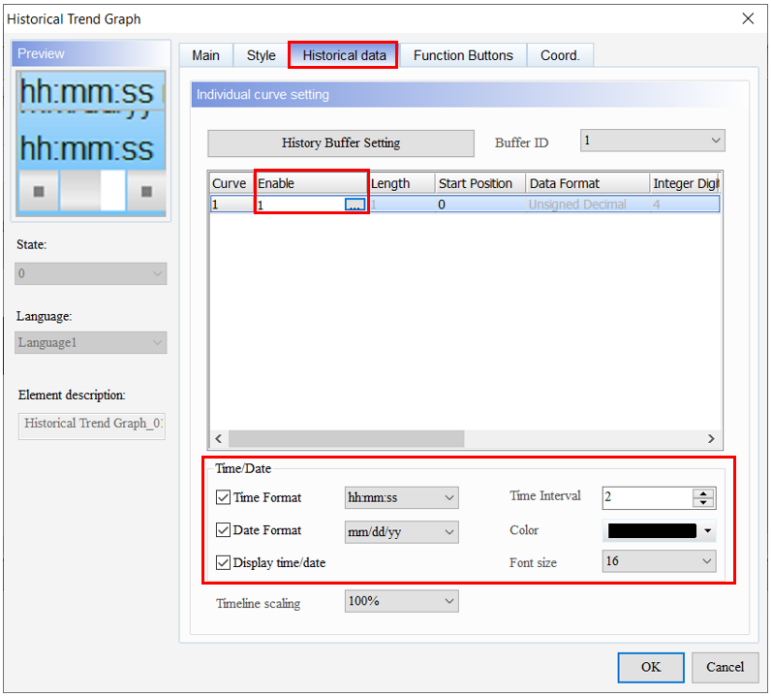
History Buffer Setup



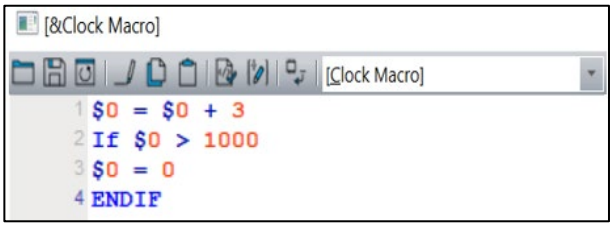
Step 5: Create a **Historical Trend Graph** element and set the properties, such as the display for the time and date, displaying **Integer Digits** and **Fractional**, and whether to select the **Global range** checkbox. Then, go to the **Historical data** property page to set **Curve** 1 to 1 to **Enable** the reading of this data.



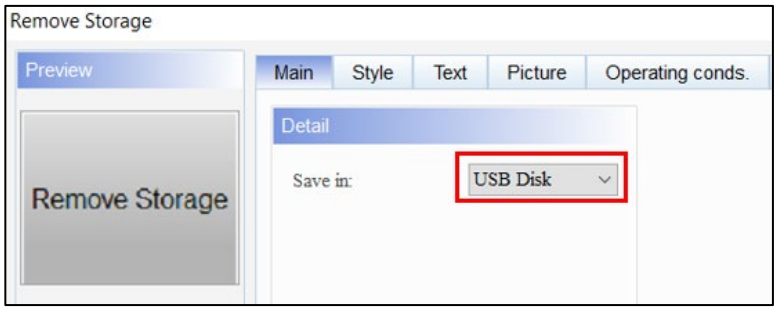
History Buffer Setup

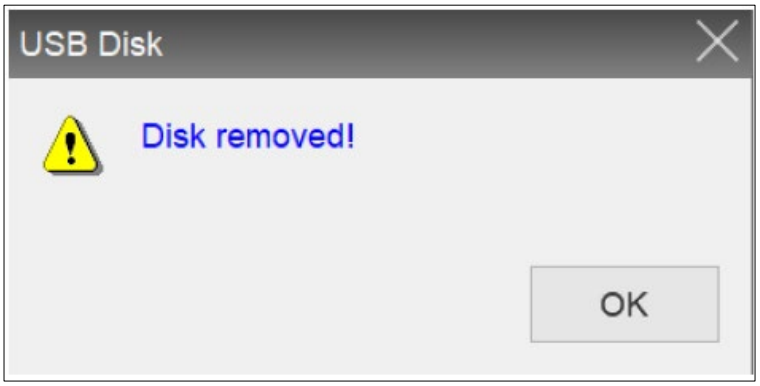


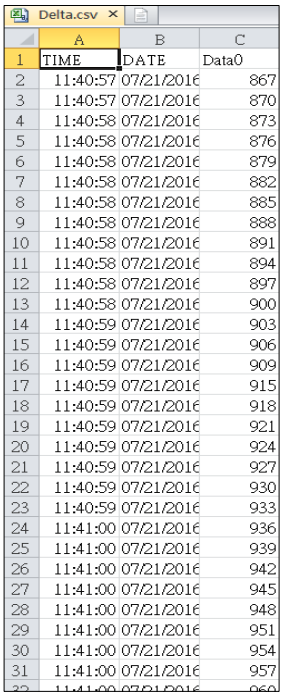
Step 6: Go to the **Project** > **Macro** > **Clock Macro**. Edit the macro to have the $0 increment value automatically.



Step 7: Create a **Remove Storage Button** element and select USB Disk for the **Save in** setting. This ensures that the data is correctly written to the USB Disk. If users do not safely eject the USB Disk before removing it, data read and write errors may occur, leading to the corrupted saved file.



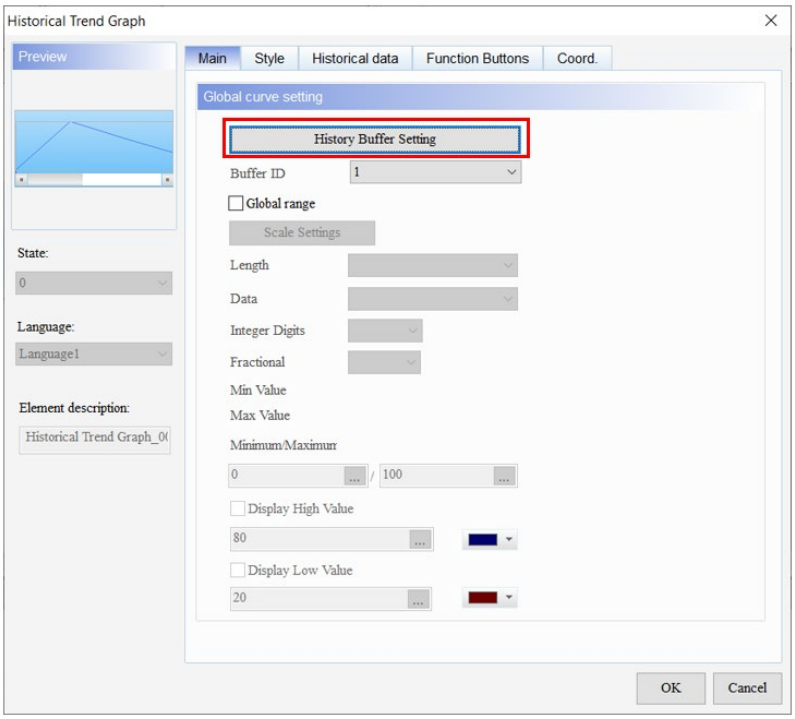
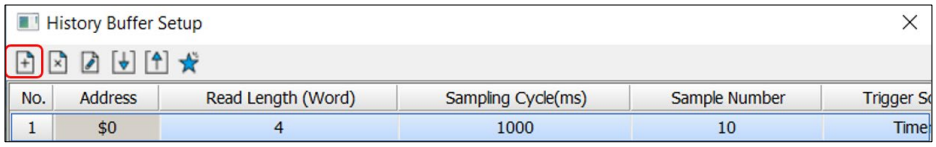
History Buffer Setup	
Execution result	● After setting the **History Buffer Setup** and creating the **Historical Trend Graph** and **Remove Storage Button** elements, compile and download the data to the HMI. The non-volatile memory setting in this example is the USB Disk, so when the HMI reads the screen, the data of H.had and Delta.dat are generated and stored in the USB Disk. Then, the History Buffer executes the command in the **Clock Macro** to change the data, and continues to store the data in the CSV file to the USB Disk. To stop saving the data, press the **Remove Storage Button** element to eject the external device for ensuring the data is saved correctly.  ● Press the **Remove Storage Button** element, and the following message appears to inform users that the USB Disk is ejected.  ● Insert the USB Disk to the PC to read the CSV file and make sure that the data and file name are correct. The file name in this example is Delta, and the path to save all CSV files is HMI\HMI-000\CSV\History\xxxxx.CSV.

History Buffer Setup	
	

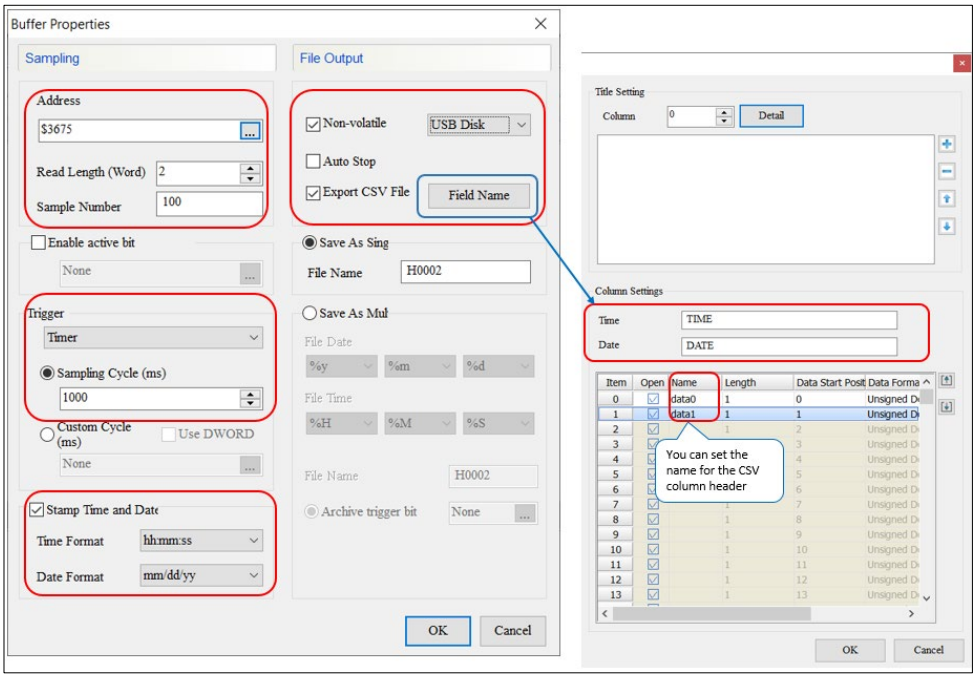
Delta.csv

	A	B	C
1	TIME	DATE	Data0
2	11:40:57	07/21/2016	867
3	11:40:57	07/21/2016	870
4	11:40:58	07/21/2016	873
5	11:40:58	07/21/2016	876
6	11:40:58	07/21/2016	879
7	11:40:58	07/21/2016	882
8	11:40:58	07/21/2016	885
9	11:40:58	07/21/2016	888
10	11:40:58	07/21/2016	891
11	11:40:58	07/21/2016	894
12	11:40:58	07/21/2016	897
13	11:40:58	07/21/2016	900
14	11:40:59	07/21/2016	903
15	11:40:59	07/21/2016	906
16	11:40:59	07/21/2016	909
17	11:40:59	07/21/2016	915
18	11:40:59	07/21/2016	918
19	11:40:59	07/21/2016	921
20	11:40:59	07/21/2016	924
21	11:40:59	07/21/2016	927
22	11:40:59	07/21/2016	930
23	11:40:59	07/21/2016	933
24	11:41:00	07/21/2016	936
25	11:41:00	07/21/2016	939
26	11:41:00	07/21/2016	942
27	11:41:00	07/21/2016	945
28	11:41:00	07/21/2016	948
29	11:41:00	07/21/2016	951
30	11:41:00	07/21/2016	954
31	11:41:00	07/21/2016	957

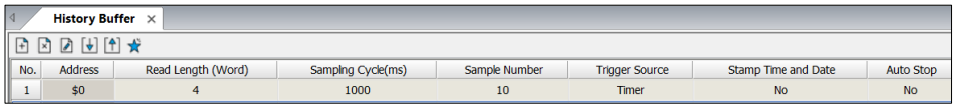
Refer to the following table for examples of **Historical Trend Graph** element.

Historical Trend Graph	
Create Historical Trend Graph element	**Step 1**: Double-click the **Historical Trend Graph** element and click **History Buffer Setting** to set the parameters.  **Step 2**: Click  to add new history data.  **Step 3**: Set the **Address** to $3675, **Read Length (Word)** to 2, **Sample Number** to 100, and select the **Stamp Time and Date** checkbox. Use the default File Name H0001, select USB Disk for the **Non-volatile** memory, select the **Export CSV File** checkbox, set the **Field Name**, and select **Trigger** > **Timer**.

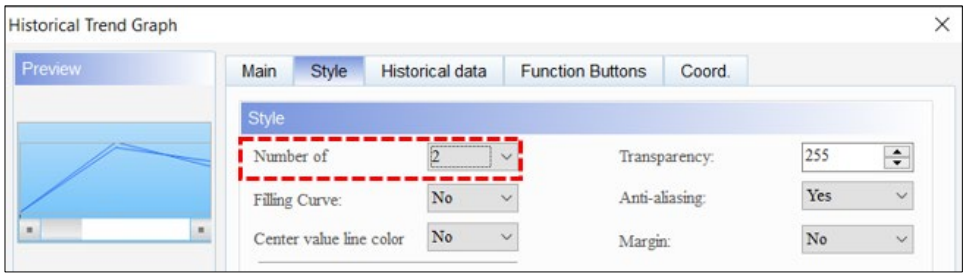
Historical Trend Graph



Result: After the above information is set, the new row is created in the **History Buffer Setup**.

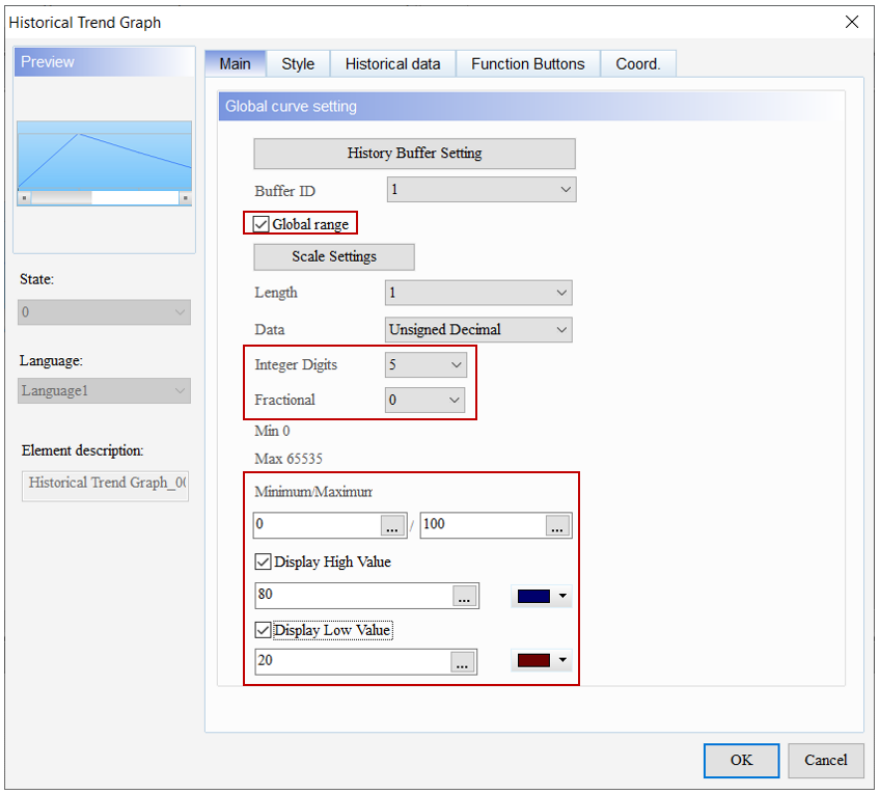


Step 4: Set the **Number of Curves** in the sample **Historical Trend Graph** element **Style** property page.

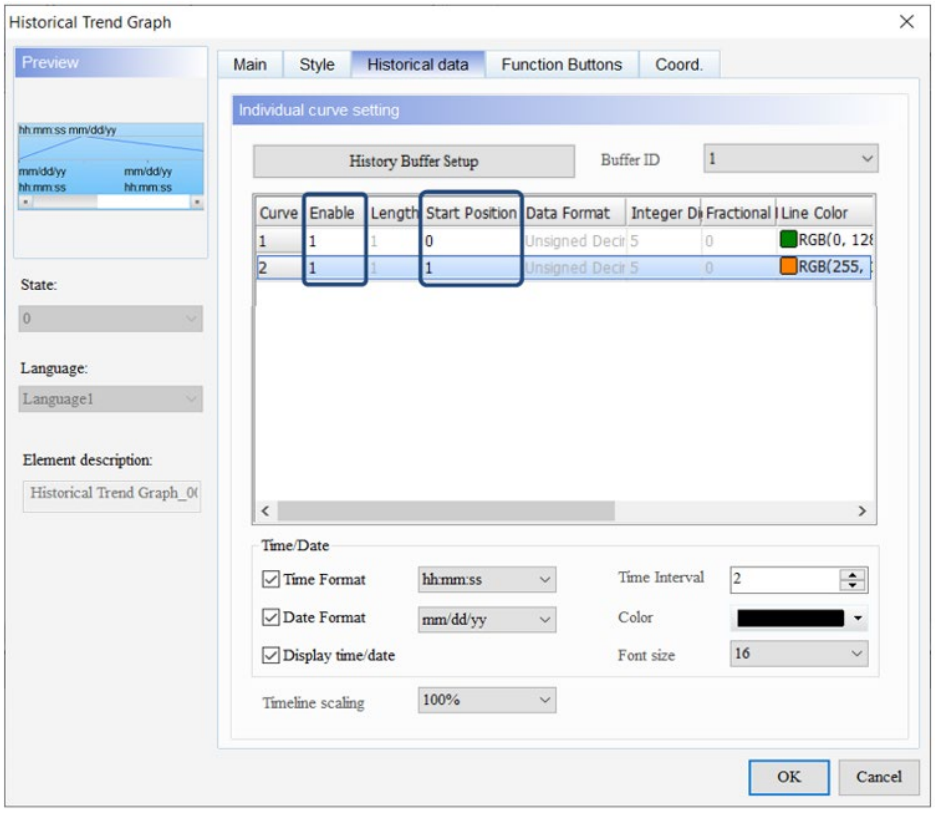


Step 5: Then set the **Historical Trend Graph** element according to the following figure.

Historical Trend Graph

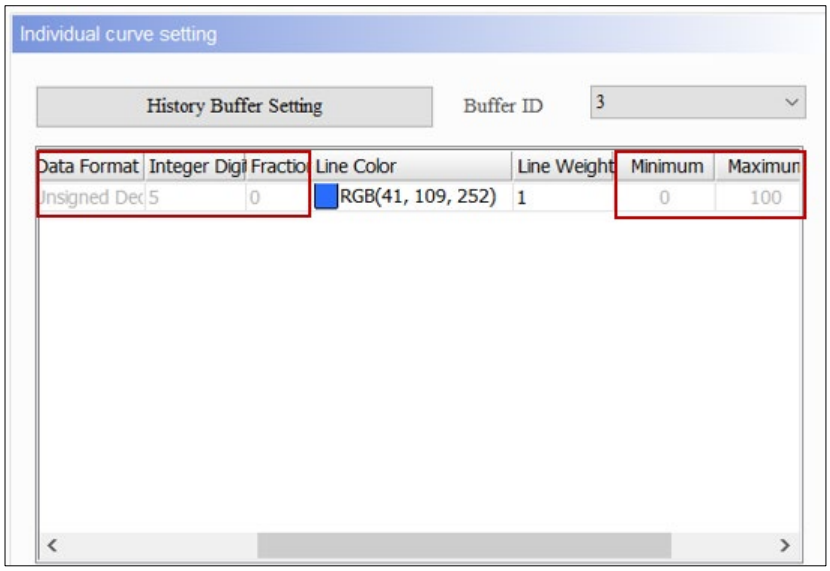


- Go to the **Historical data** property page to set the **Enable** field as 1 to enable the data reading of the **Curve**, and set the **Start Position** of the data for **Curve** 1 and **Curve** 2 to 0 and 1 respectively.

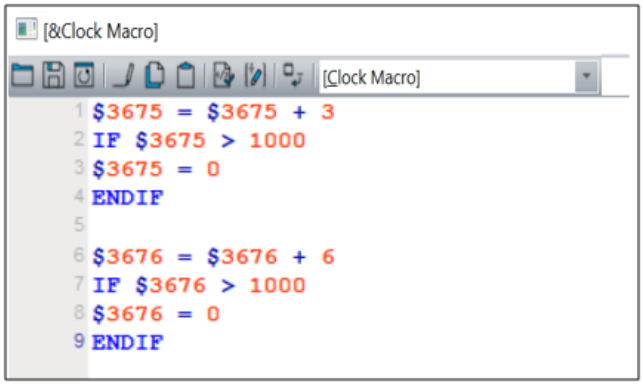


Historical Trend Graph

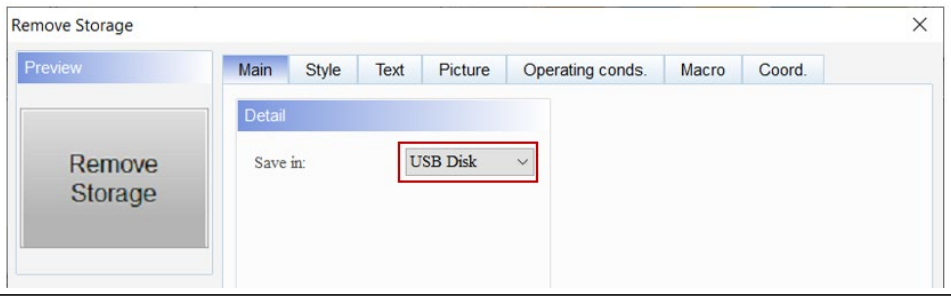
- Since the **Global range** checkbox is selected, users cannot set the **Data Format**, **Integer Digits**, **Fractional Digits**, and **Minimum** / **Maximum** values for each curve.

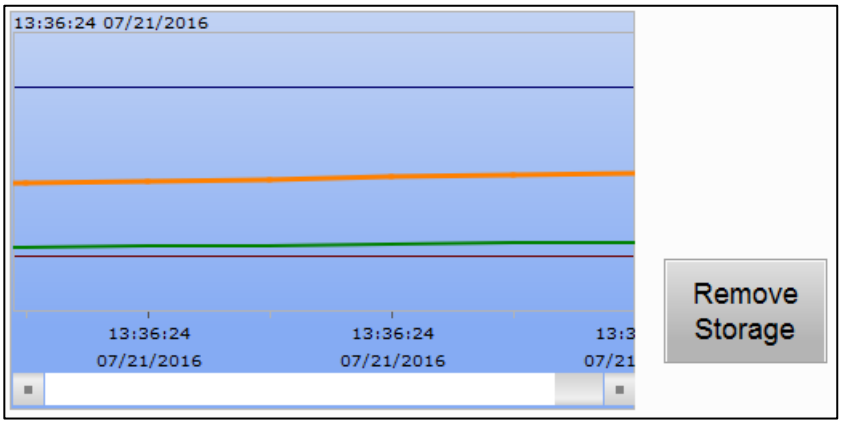
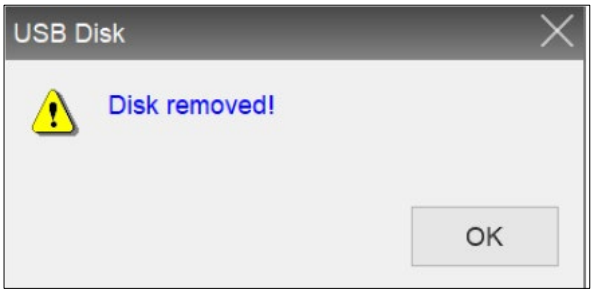


Step 6: Go to the **Project** > **Macro** > **Clock Macro**, edit the macro program to change the data in the **History Buffer** to save the data in USB Disk. Since the **Read Length** is set to read two words, there are two data locations available for access. Thus, in addition to the originally set **Address** $3675, there is a data address $3676 in the macro as well.



Step 7: Create a **Remove Storage Button** element, and set the **Save in** to USB Disk. This is mainly to ensure that the data is written correctly to the USB Disk. If the removal action is not performed, the USB Disk is directly unplugged, which can easily cause data read and write errors and cause the stored file content to be destroyed.



Historical Trend Graph	
Execution results	● After setting the **History Buffer Setup** and creating the **History Trend Graph** element and removing the storage media element, please compile and download it to the HMI. After downloading, since the **Save in** set by the example is a USB Disk, H.had and H0001 data are first generated when the HMI reads the screen.dat stored in the USB Disk. The history buffer then executes instructions in the **Clock Macro** to change the data and continuously stores the data in the CSV file to the USB Disk. To stop storage, press **Remove Storage Button** element to remove the external device for ensure the data saved is correct.  ● Press **Remove Storage Button** element to display a message informing the users that the USB Disk is removed. 

Historical Trend Graph	
Execution result	Insert USB Disks into a PC to read CSV files to ensure that the data and file names are correct. The file name of the sample is H0001, and the stored paths are stored in HMIHMI-000CSV, file name.

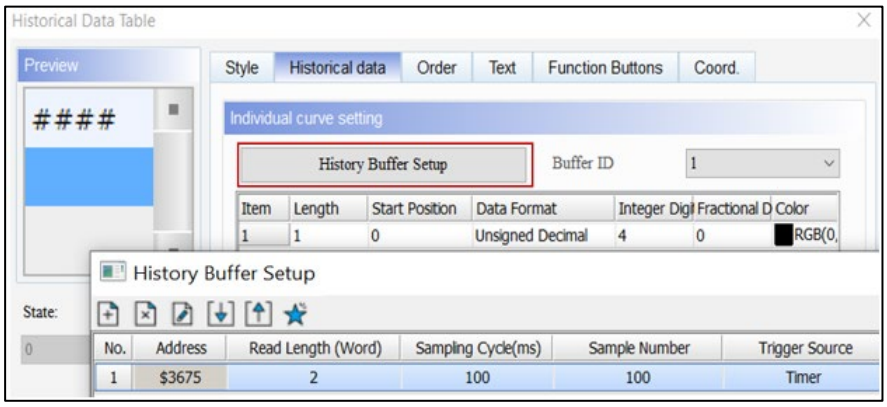
H0001.csv

	A	B	C	D
1	TIME	DATE	data0	data1
2	13:37:29	07/21/2016	723	444
3	13:37:29	07/21/2016	726	450
4	13:37:29	07/21/2016	729	456
5	13:37:29	07/21/2016	732	462
6	13:37:29	07/21/2016	735	468
7	13:37:30	07/21/2016	738	474
8	13:37:30	07/21/2016	741	480
9	13:37:30	07/21/2016	744	486
10	13:37:30	07/21/2016	747	492
11	13:37:30	07/21/2016	750	498
12	13:37:30	07/21/2016	753	504
13	13:37:30	07/21/2016	756	510
14	13:37:30	07/21/2016	759	516
15	13:37:30	07/21/2016	762	522
16	13:37:30	07/21/2016	765	528
17	13:37:31	07/21/2016	768	534
18	13:37:31	07/21/2016	771	540
19	13:37:31	07/21/2016	774	546
20	13:37:31	07/21/2016	777	552
21	13:37:31	07/21/2016	780	558
22	13:37:31	07/21/2016	783	564
23	13:37:31	07/21/2016	786	570
24	13:37:31	07/21/2016	789	576
25	13:37:31	07/21/2016	792	582
26	13:37:31	07/21/2016	795	588
27	13:37:32	07/21/2016	798	594
28	13:37:32	07/21/2016	801	600
29	13:37:32	07/21/2016	804	606
30	13:37:32	07/21/2016	807	612
31	13:37:32	07/21/2016	810	618
32	13:37:32	07/21/2016	813	624
33	13:37:32	07/21/2016	816	630
34	13:37:32	07/21/2016	819	636
35	13:37:32	07/21/2016	822	642

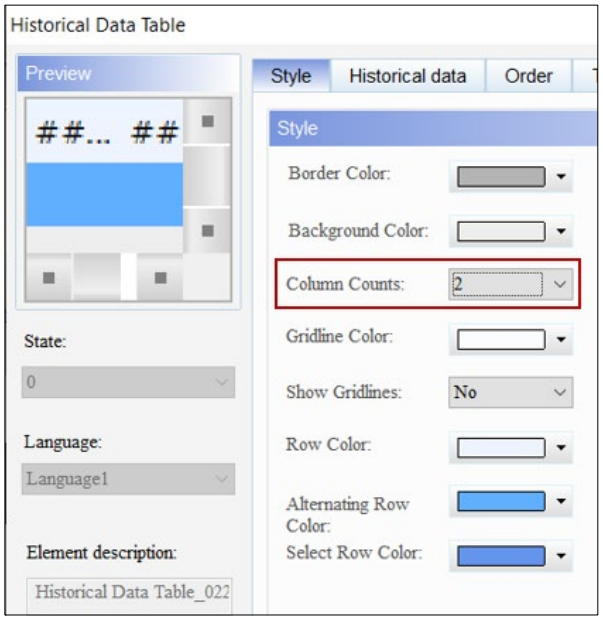
Refer to the following table for examples of **Historical Data Table** element.

Historical Data Table	
Create Historical Data Table element	**Historical Data Table** element should be used with **Historical Trend Graph** element, so users may refer to *Section 15.2 Historical Trend Graph*. Use the previously created **Historical Trend Graph** and then execute the following step. **Step 1**: Double-click the **Historical Data Table** element and click **History Buffer Setup**, and then users can see the data created in the **Historical Trend Graph** element example in the previous table.

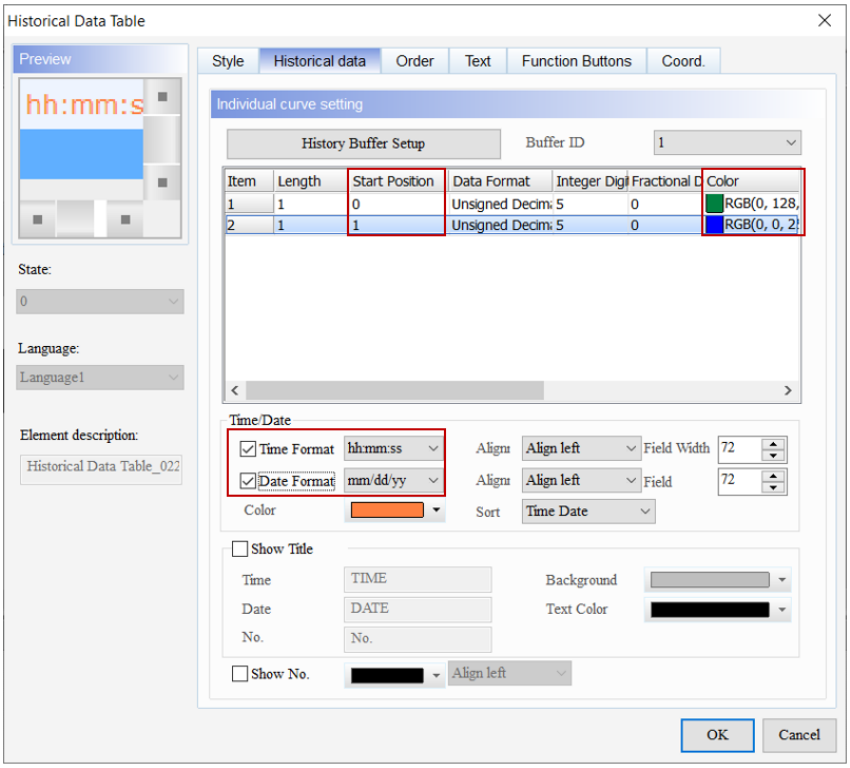
Historical Data Table	



Step 2: Set the **Column Counts** to 2 (corresponding to the set **Read Length** of 2 in the History Buffer). When the **Column Counts** is 2, users need to set the relevant parameters for Data 1 and Data 2. Set the **Start Position** for Data 1 and Data 2 to 0 and 1 respectively. Set the displaying color for the values, and select the **Time Format** and **Date Format** checkboxes to display the time and date.



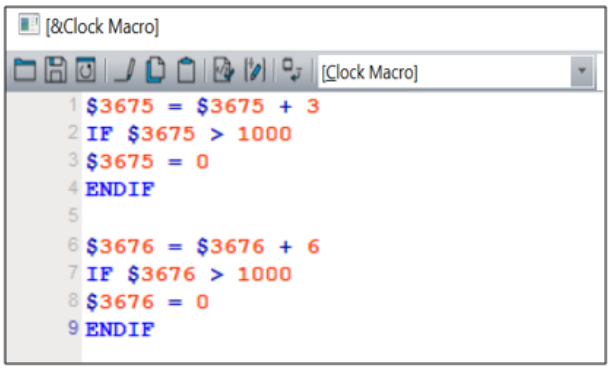
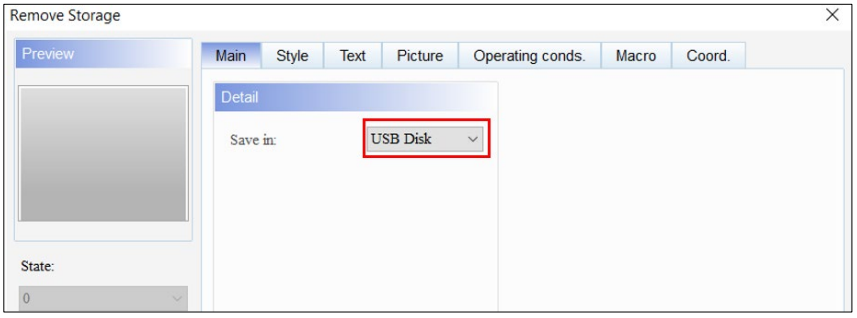
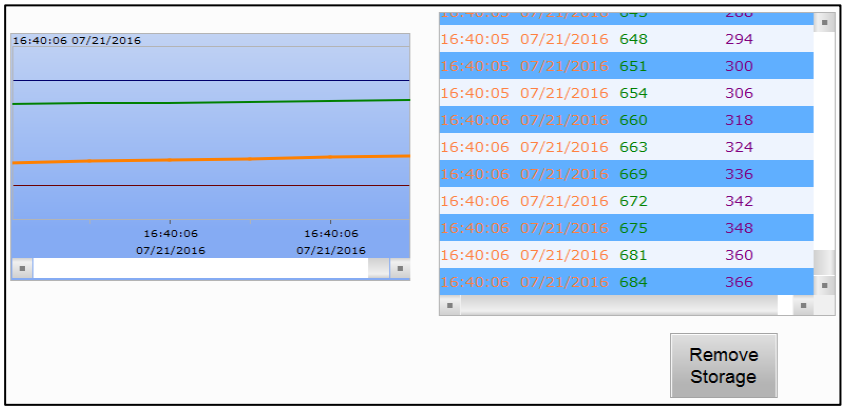
Historical Data Table

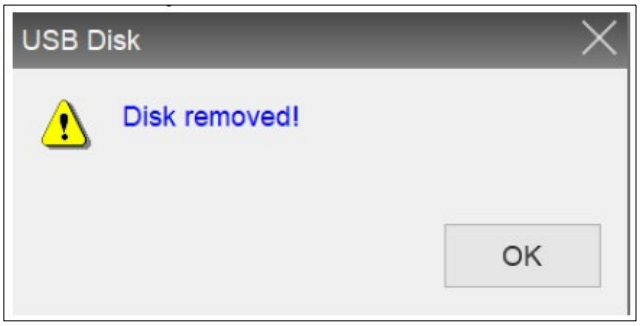


Step 3: After the **Historical Data Table** element is established, the following figure is displayed.

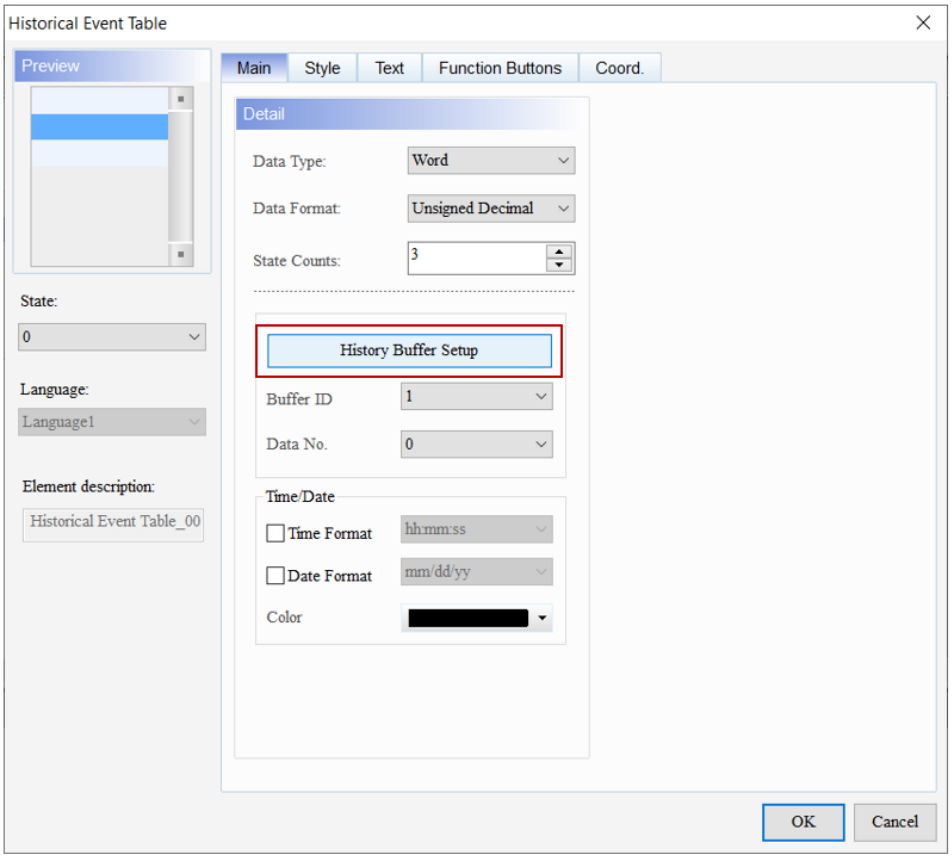


Step 4: Go to the **Project** > **Macro** > **Clock Macro**. Edit the macro program to change the data in the history buffer to store to an external storage device USB Disk. Since the reading unit is two Word and the total number of data fields is 2, the **Historical Data Table** displays two columns reading two data locations.

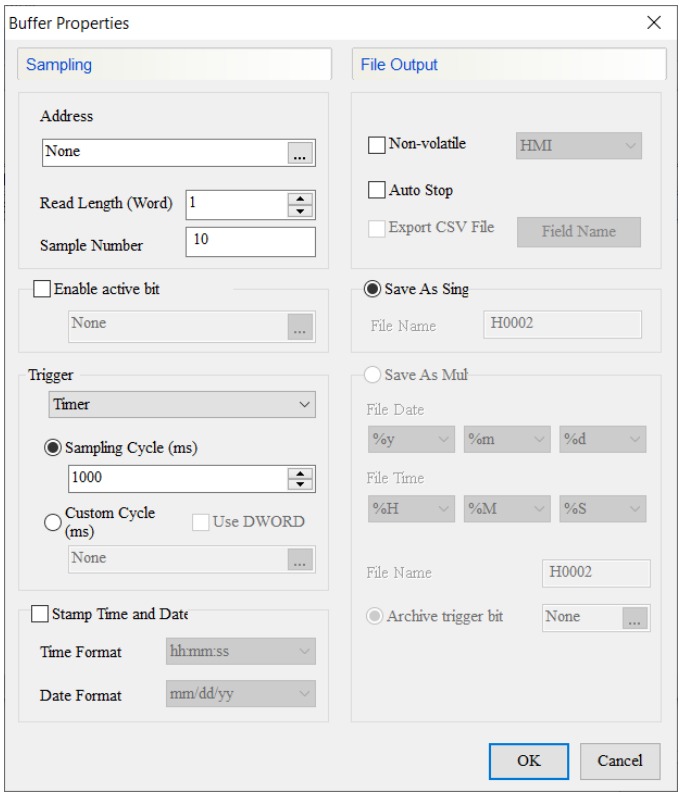
Historical Data Table	
	 **Step 5**: Create a **Remove Storage Button** element, and select USB Disk for the **Save in** setting. This ensures that the data is correctly written to the USB Disk. If users do not safely eject the USB Disk before removing it, data read and write errors may occur, leading to the corruption of the saved file. 
Execution result	● After setting the **History Buffer Setup** and creating the **Historical Data Table** and **Remove Storage Button** elements, compile and download the data to the HMI. The non-volatile memory setting in this example is the USB Disk, so when the HMI reads the screen, the data of H.had and H0001.dat are generated and stored in the USB Disk. Then, the History Buffer executes the command in the **Clock Macro** to change the data, and continues to store the data in the CSV file to the USB Disk. To stop saving the data, press the **Remove Storage Button** element to eject the external device for ensuring the data is saved correctly.  ● Press **Remove Storage Button** element to display a message

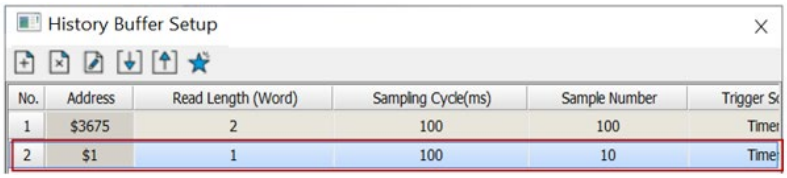
Historical Data Table	
	informing users that the USB Disk is removed. 

Refer to the following table for examples of **Historical Event Table** element.

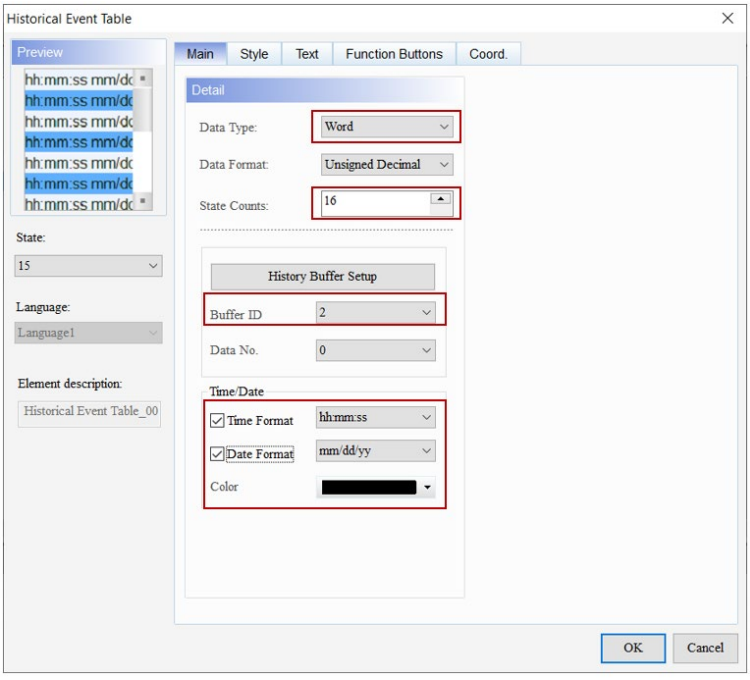
Historical Event Table	
Create Historical Event Table element	**Step 1**: Double-click the **Historical Event Table** element and click **History Buffer Setup** to create a new buffer. Set the **Address** to $1, **Read Length (Word)** to 1, and select HMI for the Non-volatile memory. 

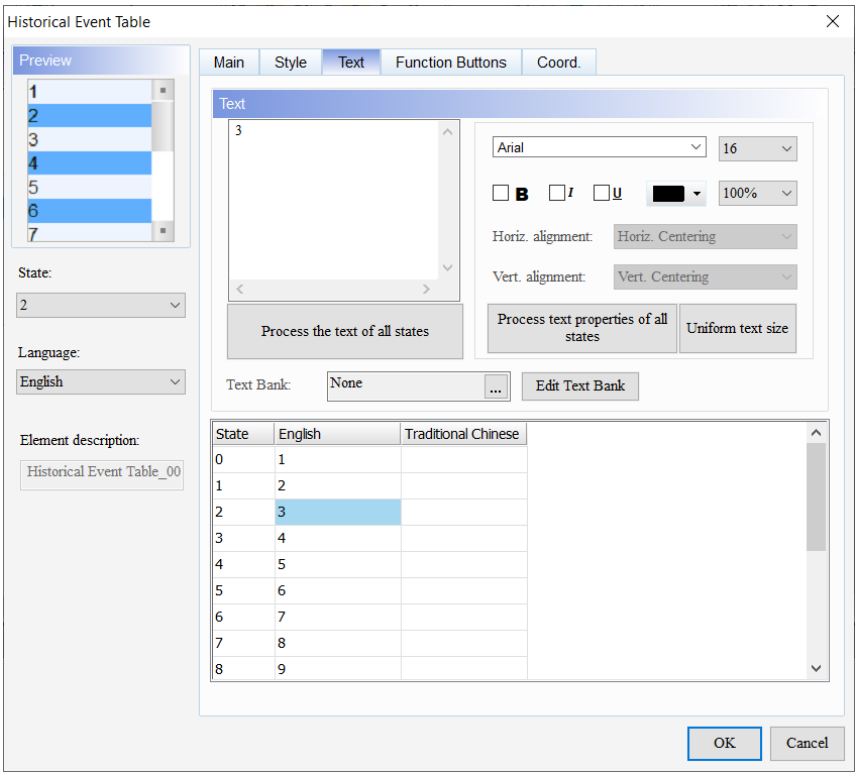
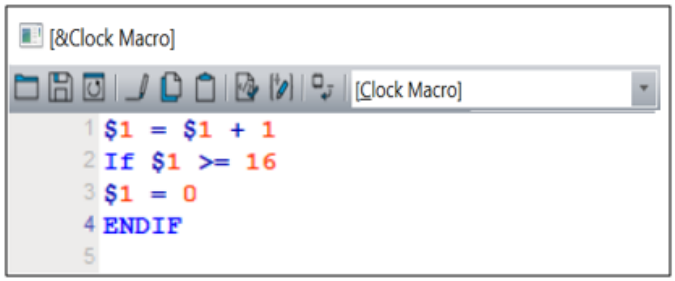
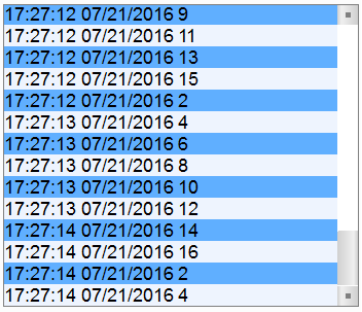
Historical Event Table



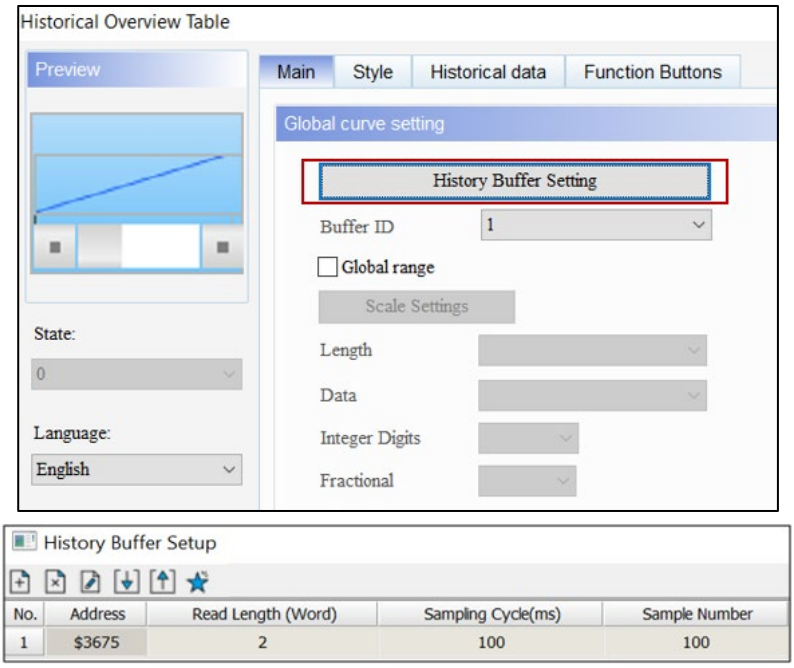


Step 2: Select **Buffer ID** to 2 (corresponding to the number 2 of the History Buffer), set the **Data Type** to Word, the **State Counts** to 16, and select checkboxes of **Time Format** and **Date Format**.



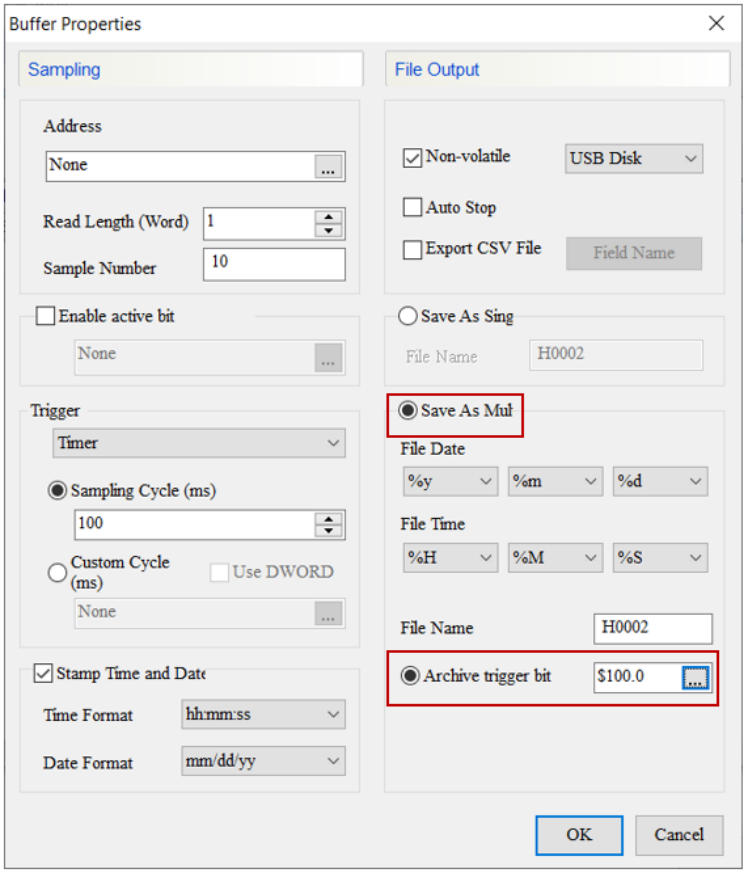
Historical Event Table	
	Step 3: Go to the **Text** property page to edit the text message users want to display.  **Step 4**: Go to the **Project** > **Macro** > **Clock Macro**. Edit the macro program to change the data in the history buffer, and display it in this history message table through the users' customized text message. 
Execution result	After creating the **Historical Event Table** element, compile and download the data to the HMI. Then, the **Historical Event Table** element executes the command in the **Clock Macro** to change the data and display the user-defined text message. 

Refer to the following table for an example of a **Historical Overview Table** element.

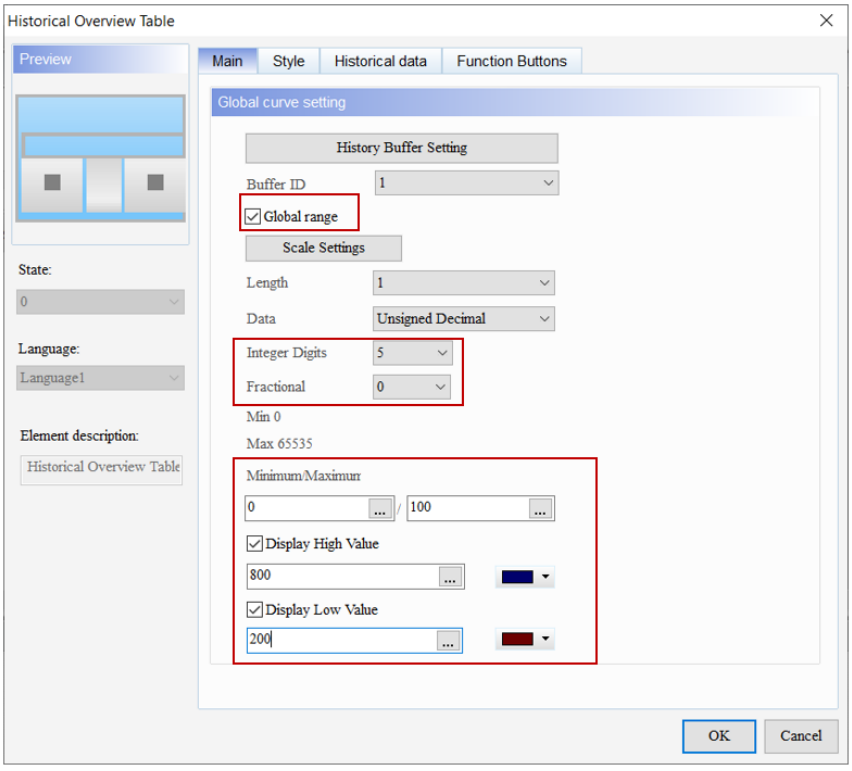
<table>
<tr><th colspan="2">Historical Overview Table</th></tr>
<tr><td>Create Historical Overview Table element</td><td>
Historical Overview Table element should be used with Historical Trend Graph element. Refer to Section 15.2 Historical Trend Graph. Use the previously created Historical Trend Graph element and then execute the following setup procedure.
Step 1: Double-click the Historical Overview Table element and click History Buffer Setting, and then users can see the data created in the Historical Trend Graph element example.


Step 2: Click  icon to modify the History Buffer Setup. Click Save As Mult, and set the Archive trigger bit to $100.0
</td></tr>
</table>

Historical Overview Table

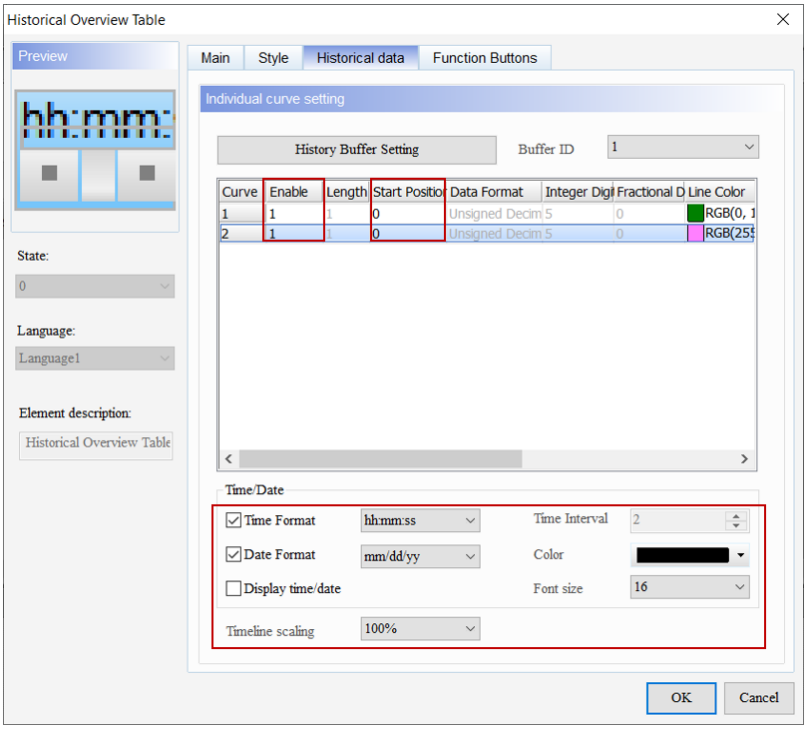


Step 3: Complete other settings for the **Historical Overview Table** element, such as **Time Format**, **Date Format**, **Integer Digits**, and **Fractional**, and select the **Global range** checkbox.

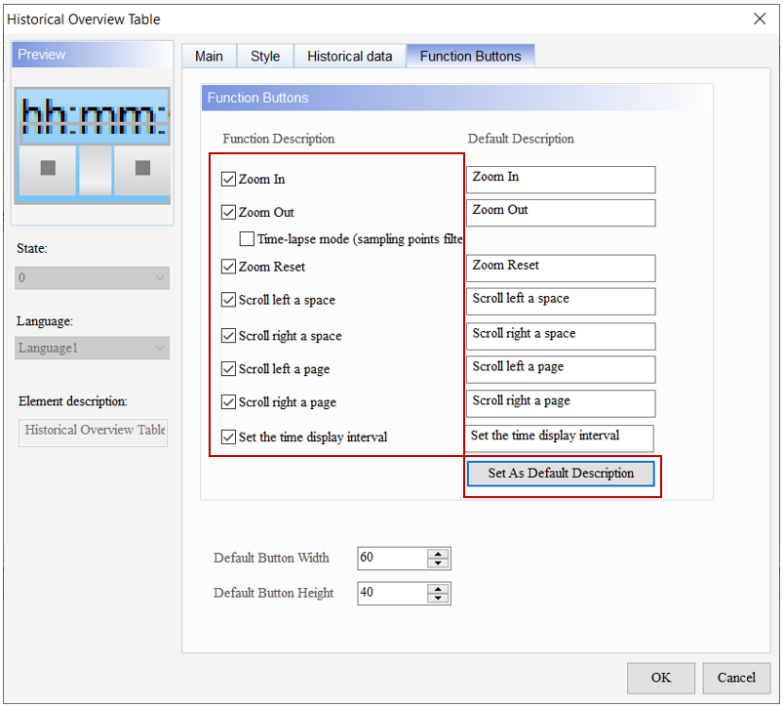


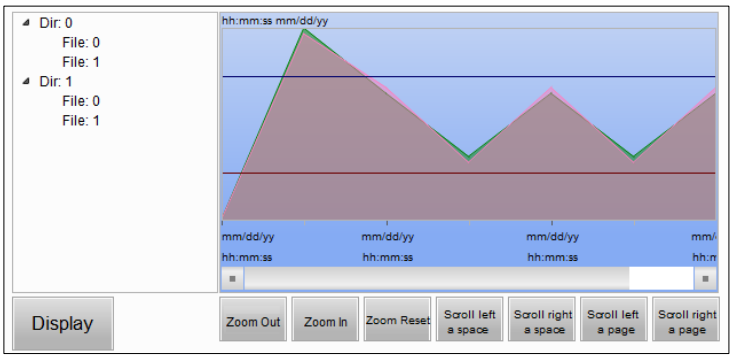
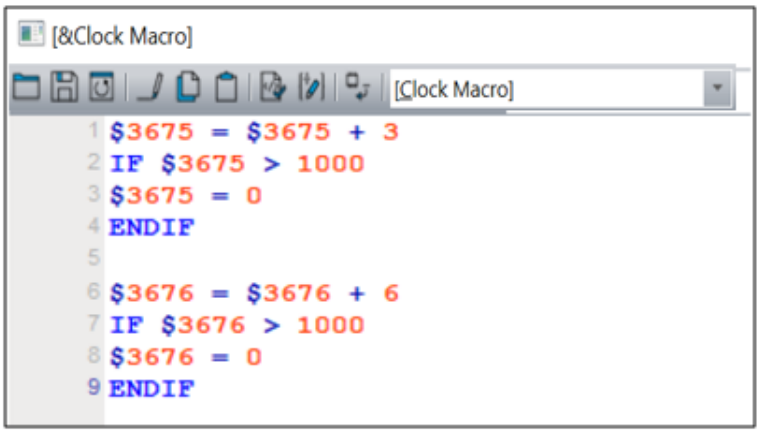
Historical Overview Table

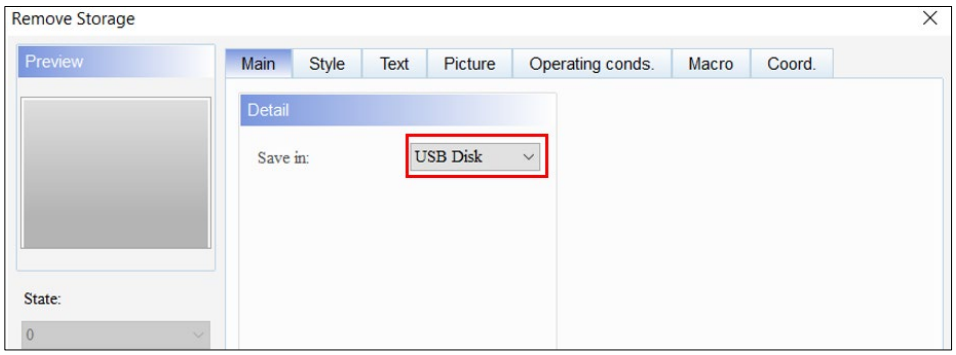
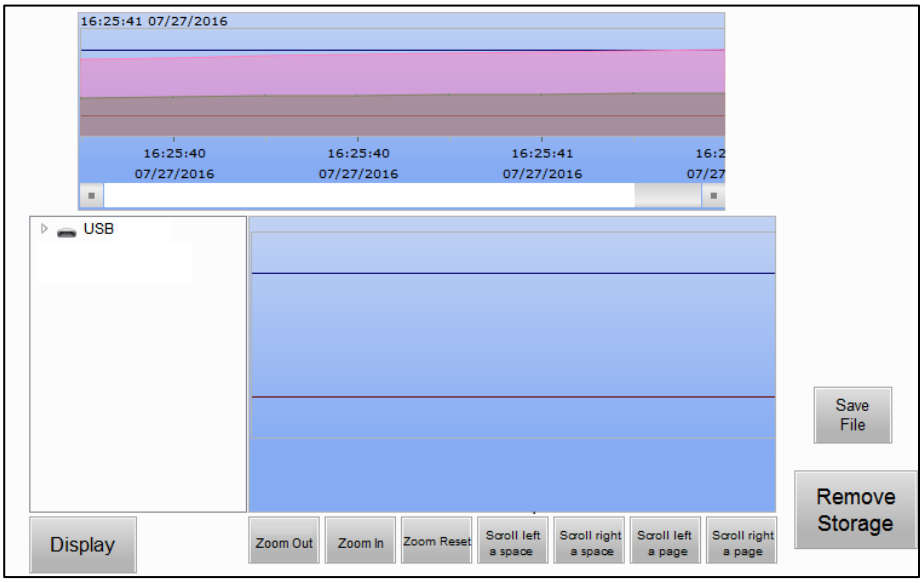
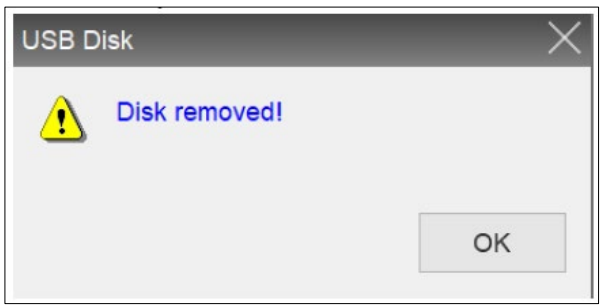
Step 4: Go to the **Historical data** property page to set the **Enable** field as 1 to enable the data reading of the curves, and set the **Start Position** of the data for Curve 1 and Curve 2 to 0 and 1 respectively. Since the **Global range** checkbox is selected, users cannot set the **Minimum** and **Maximum** values for each curve.



Step 5: Go to the **Function Buttons** property page to select the checkbox for the functions to display, and click **Set As Default Description**.

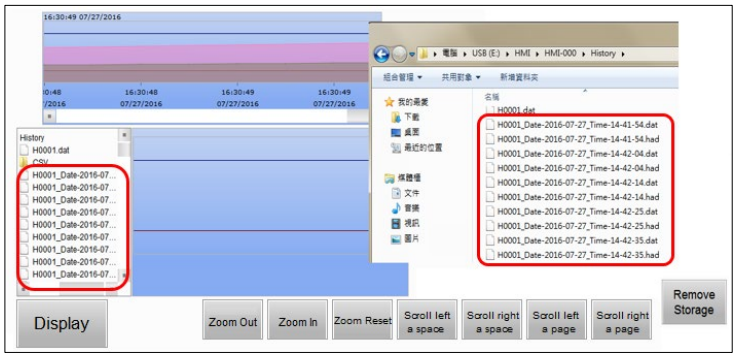


Historical Overview Table	
	Once the setting is complete, the **Historical Overview Table** element is as shown in the following figure.  **Step 6**: Go to the **Project** > **Macro** > **Clock Macro**. Edit the macro program to change the data in the history buffer to store to an external storage device USB Disk. Since the read length is two Word, there will be two data locations that can be accessed, so in addition to the originally set **Read Address** of $3675, there will also be a data address of $3676.  **Step 7**: Create a **Maintained Button** element, and set its address as $100.0. Execute this element to immediately save the data of the History Buffer without having to wait for the set **Sample Number** to be reached. **Step 8**: Create a **Remove Storage Button** element, and select USB Disk for the **Save in** setting. This ensures that the data is correctly written to the USB Disk. If users do not safely eject the USB Disk before removing it, data read and write errors may occur, leading to the corrupted saved file.

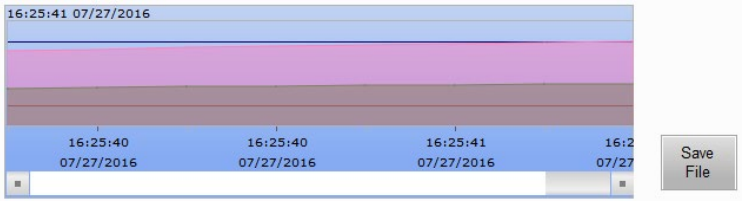
Historical Overview Table	
	
Execution result	● After **History Buffer Setup** and creating **Historical Trend Graph**, **Historical Overview Table**, and **Remove Storage Button** elements, compile and download the data to the HMI. After downloading, since the power-off hold set by the example is USB Disk, H.had and H0001 data are first generated when the HMI reads the screen.dat stored in the USB Disk. The history buffer then executes instructions in the **Clock Macro** to change the data and continuously stores the data in the CSV file to the USB Disk. To stop storage, press **Remove Storage Button** element to remove the external appliance to ensure data correctness.  ● Press **Remove Storage Button** element to display a message informing users that the USB Disk is removed. 

Historical Overview Table	

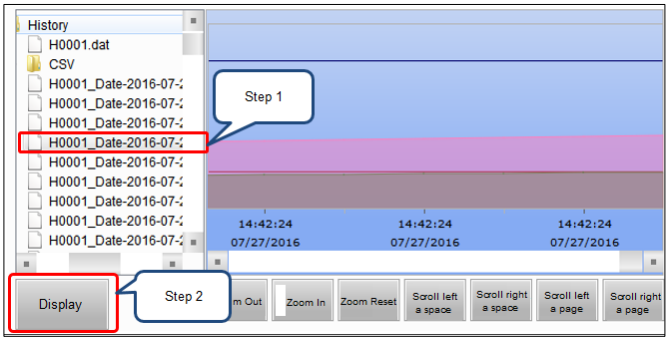
- When the sampling point is full or the trigger element triggers the archive, the file will be stored in the USB according to the settings stored in the BIN to the HMIHMI-000History folder under the USB directory, and a new file will be created to continue sampling. Stored archives can be viewed through the **Historical Overview Table**.



- Clicking the **Archive Trigger** immediately stores the current history buffer data.

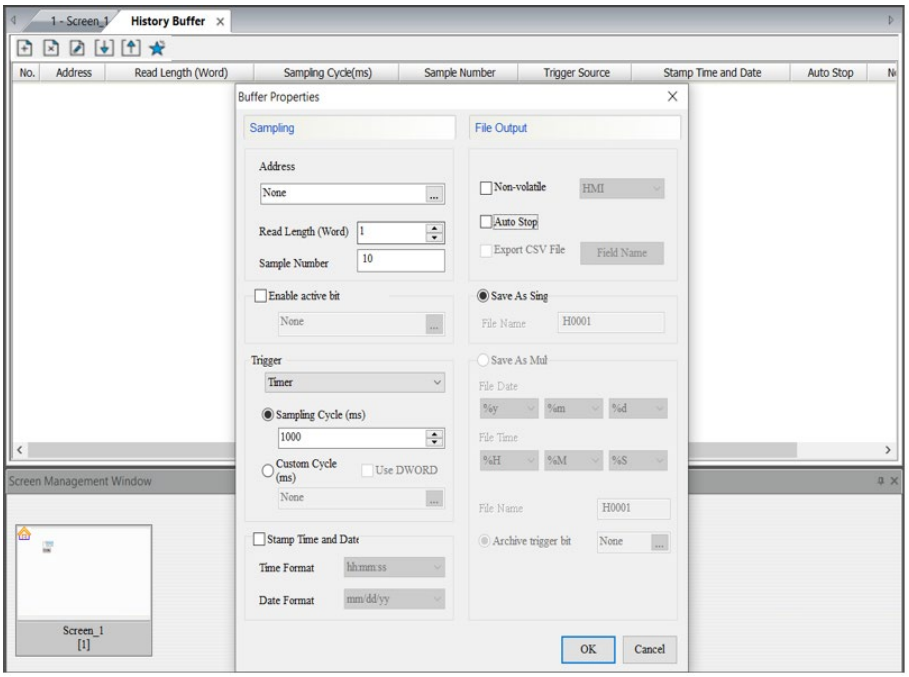


- Click USB Disk on the left side of the File Browser in the **Historical Overview Table**. Select the previously stored file, click **Save**, and users can see the stored **Historical Trend Graph** on the right side.



After describing all the samples of the sampling features, the following table provides a detailed description of the features for setting the **History Buffer** properties.

History Buffer Properties

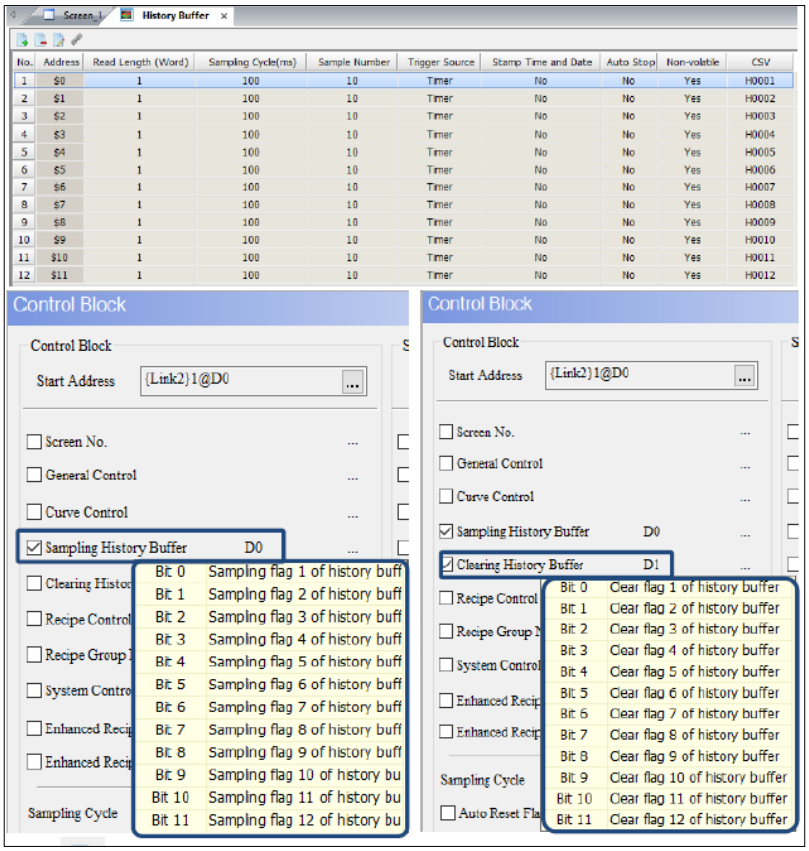


New

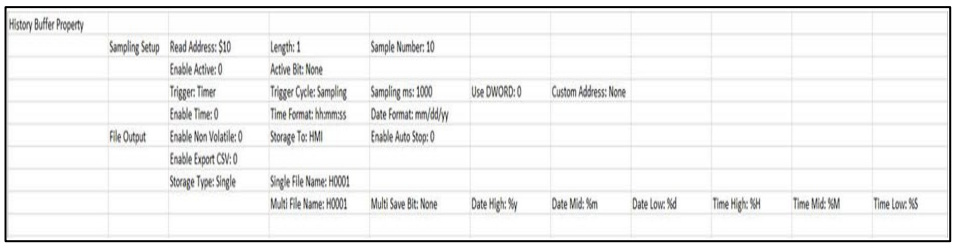
Delete

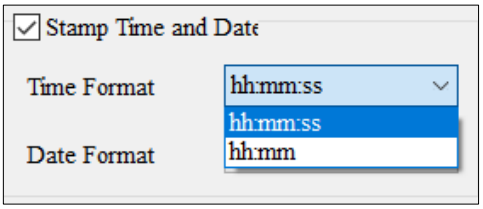
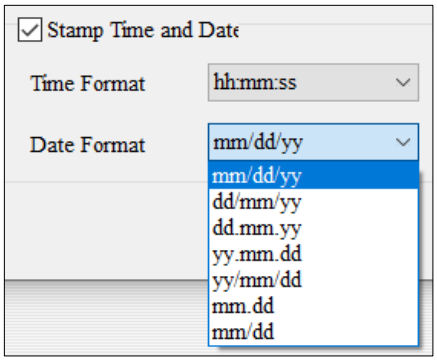
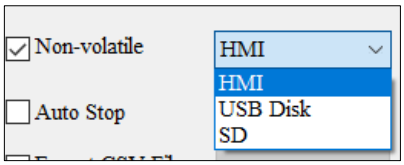
Edit

- Click icon to increase data buffers, up to 12 groups of buffers. These 12 sets of buffer data correspond to the history buffer sampling flags 1~12 and the history buffer clearing flag 1~12 to the control command area, respectively.



- Click icon to delete a data buffer.

History Buffer Properties	
	● Click  icon to enter the **Buffer Properties** window to change the relevant settings.
Import History Buffer Data Table 	Edit the historical buffer settings in Excel, save them as xlsx files, and then click  icon to import them into DIAScreen.
Export History Buffer Data Table 	Click  icon to export the edited historical buffer settings as xlsx files. 
Enable history buffer read optimization 	● It is recommended to enable optimization when the address set by multiple buffers is not continuous. ● If multiple buffer addresses are continuous, enabling this optimization may slow down the read speed.
Address	● Select the Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
Read Length (Word)	The **Read Length (Word)** defines the number of words to be sampled, which indicates the data length and supports up to 30 consecutive words. The default value is **1**.
Sample Number	● **Sample Number** is the number of data to be recorded and is usually used with the **Auto Stop** function. The default value is **10**. ● If the **Auto Stop** checkbox is selected, the recording stops automatically when it reaches the set **Sample Number**. If the **Auto Stop** checkbox is not selected, the recording does not stop when it reaches the set **Sample Number**. Instead, the recording restarts from the first record and overwrites the previous data. ● **Sample Number** supports up to 9,999,999 sampling points.
Enable active bit	● If **Trigger** is set to Timer for historical data sampling, the HMI immediately records the sampling data as soon as it starts up. ● **Enable active bit** function allows to determine when to start sampling. It is available when **Trigger** is set to Timer or PLC.

<table>
<tr><th colspan="3">History Buffer Properties</th></tr>
<tr><td rowspan="2">Stamp Time and Date</td><td>Time Format</td><td>The available options for Time Format are: hh:mm:ss and hh:mm. The default value is hh:mm:ss.
 
</td></tr>
<tr><td>Date Format</td><td>The available options for Date Format are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is mm/dd/yy.
 
</td></tr>
<tr><td>Non - volatile</td><td>Saving location</td><td>● The available options for storage location are: HMI, USB Disk, and SD card. The default value is HMI.
 

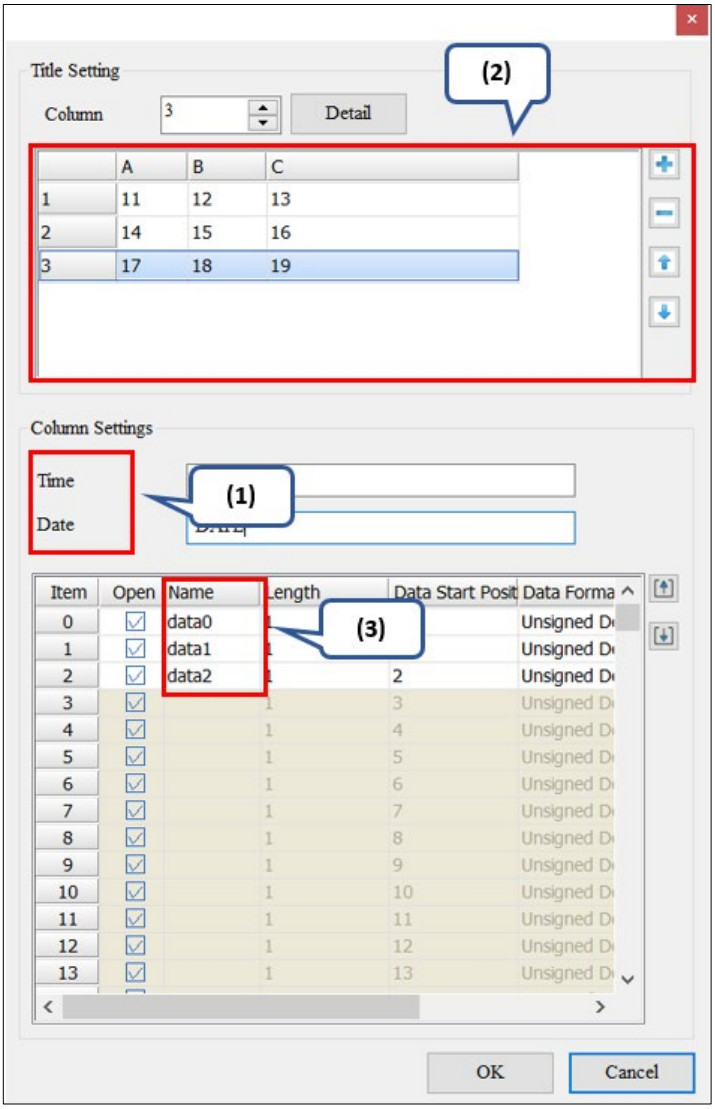
● If users choose to store in the HMI, it means that when the power is cut, the data is saved in the HMI.
● If the Export CSV file checkbox is selected, set the Non-volatile memory to USB Disk.</td></tr>
<tr><td>Auto Stop</td><td colspan="2">● The Auto Stop function determines whether the recording stops automatically when the set Sample Number is reached.
● If the Auto Stop checkbox is selected, the recording stops automatically when the setting in the Sample Number field is reached. If the Auto Stop checkbox is not selected, the recording does not stop when the setting in the Sample Number field is reached; instead, the recording restarts from the first record and overwrites the previous data.</td></tr>
<tr><td>Export CSV file</td><td>Date Format</td><td>● When the Read Length is 1 (Word) or 2 (Words), the supported data format are different. The supported data formats are as follows.
● For the Char format, if the Read Length is 1, it represents 2 Chars; if the Read Length is 2, it represents 4 Chars, and so on. When the Read</td></tr>
</table>

<table>
<tr><th colspan="3">History Buffer Properties</th></tr>
<tr><td></td><td></td><td>
Length is 3 or above, Char is the only supported format.
<table>
<tr><th colspan="3">Read Length is 1</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="6">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td>Char</td><td>2 characters</td></tr>
<tr><th colspan="3">Read Length is 2</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="7">DWord</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Char</td><td>4 words</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table>
</td></tr>
<tr><td></td><td>Field Name</td><td>
Input the field names to display on the exported CSV file, including the time, date, and data name.

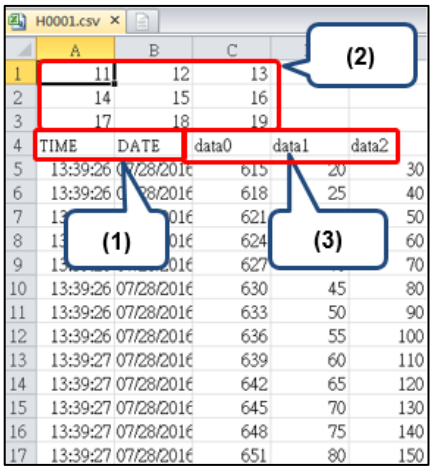
Define the Time and Date fields (1), Column field (2), and Name field (3). The naming format supports multi-languages.
The maximum number of columns and rows is 10 x 10. Users can set the displaying name for the title column.

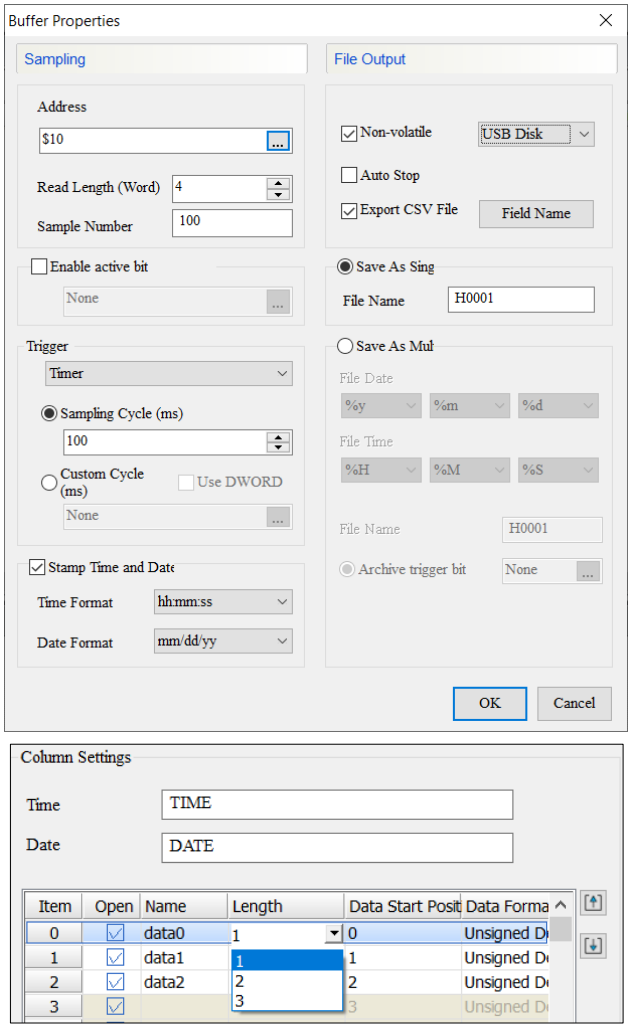
</td></tr>
</table>

History Buffer Properties

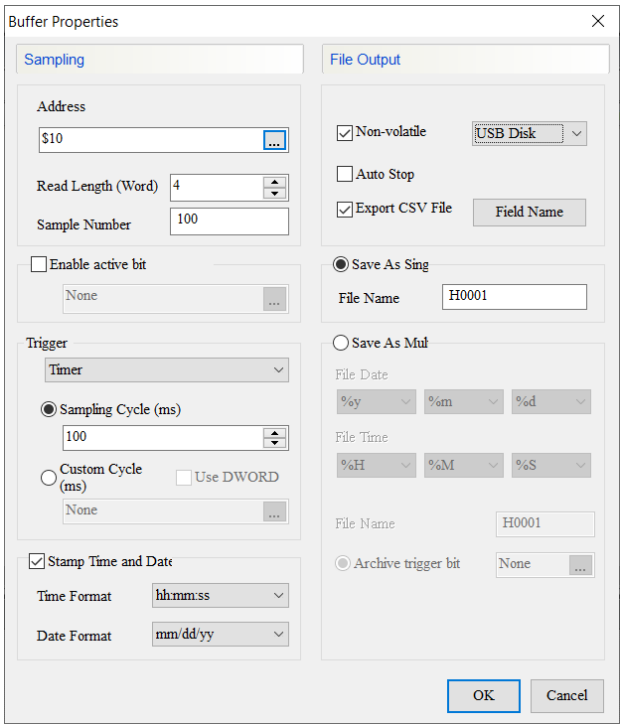


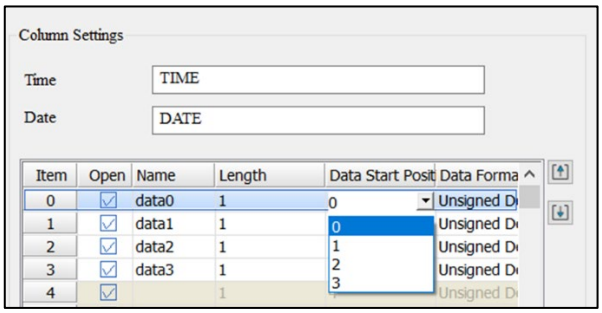
- The actual exported CSV file is the same as the one set in DIAScreen, as shown in the following figure.

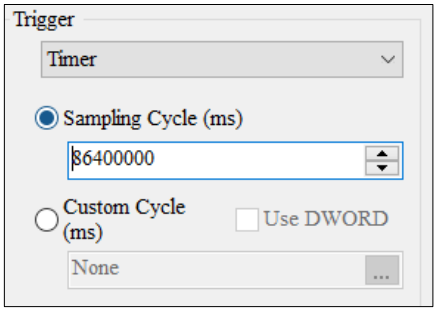
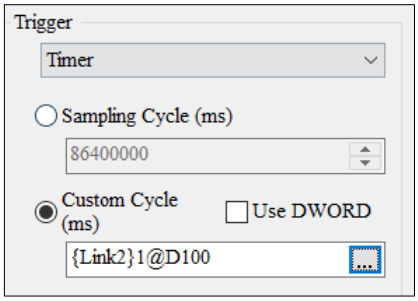
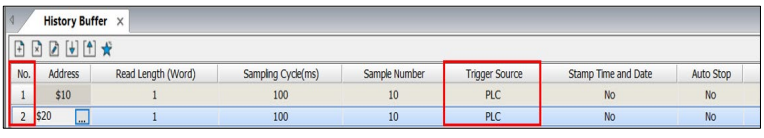


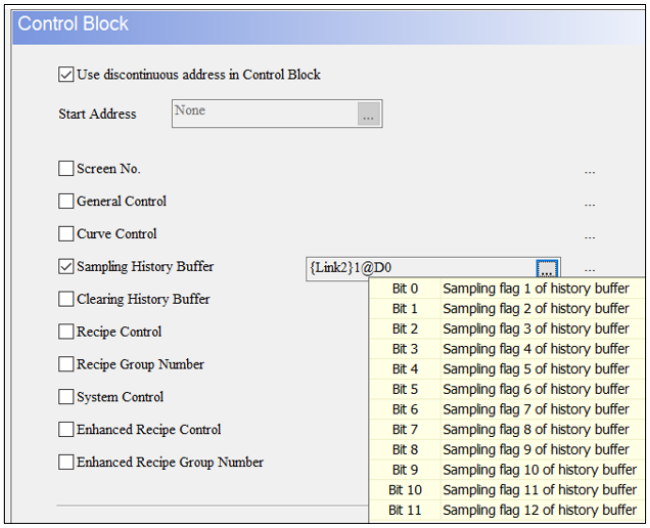
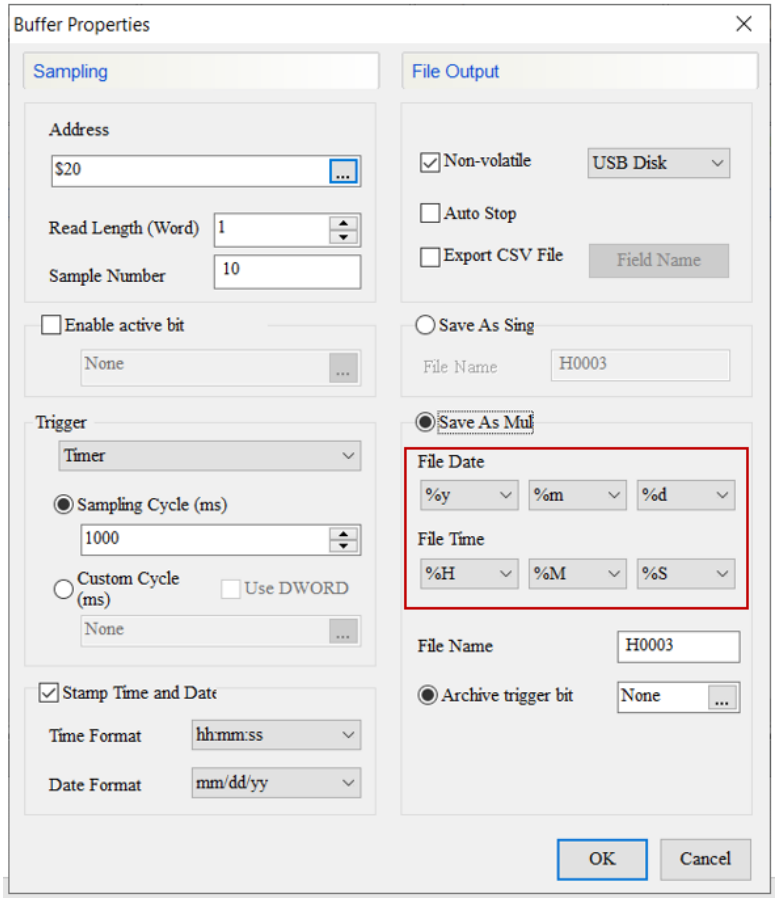
<table>
<tr><th colspan="4">History Buffer Properties</th></tr>
<tr><td rowspan="2">Export CSV File</td><td>Field Name</td><td>Length</td><td>The Length corresponds to the Read Length (Word) setting. If the Read Length (Word) is 4, the Length ranges from 1 ~ 4.
 

</td></tr>
<tr><td>Field Name</td><td>Data Start Position</td><td>● The Data Start Position corresponds to the Read Length (Word).
● If the Read Length (Word) is 4, the Data Start Position ranges from 0 to 3.</td></tr>
</table>

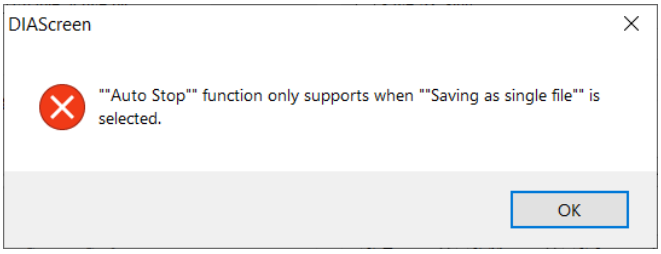
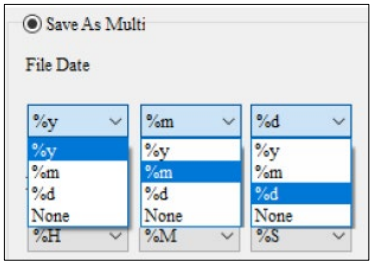
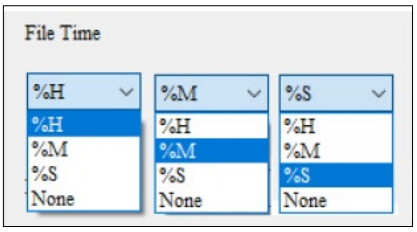
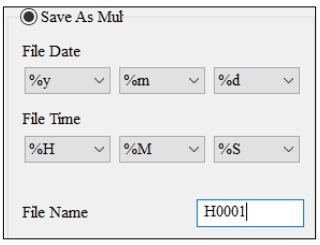
<table>
<tr><th colspan="4">History Buffer Properties</th></tr>
<tr><td></td><td></td><td></td><td> 


</td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>Integer digits</td><td rowspan="2">● Set the integer and fractional digits according to the required format.
● When the Length is 1, the total number of digits of the Integer digits and Fractional Digits is 5. When the Length is 2, the total number of digits of the Integer digits and Fractional Digits is 10.</td></tr>
<tr><td>Fractional Digits</td></tr>
<tr><td>Trigger</td><td>Timer</td><td colspan="2">● When Timer is the Trigger source, the available options for Sampling Cycle (ms) are as follows:
○ Fixed sampling cycle: The minimum is 100 ms, and the maximum is 86400000 ms.</td></tr>
</table>

History Buffer Properties		
		 ○ Dynamic sampling cycle: The sampling action is triggered by the users dynamically changing the **Sampling Cycle (ms)** time through the specified memory address. The **Data Type** of DWORD is supported. 
Trigger	PLC	● When the PLC is the **Trigger Source**, the sampling action is triggered by using the history buffer flags in the **Control Block**. The sampling action is performed when the corresponding Bit is on, and thus it is irrelevant to the sampling cycle time. ● The **Enable active bit** function is added to allow flexible sampling time. ● Assume that there are two sets of **History Buffer**, the **Trigger Source** PLC of the first set corresponds to sampling flag 1 of history buffer and the **Trigger Source** PLC of the second set corresponds to sampling flag 2 of history buffer, and so on. 

History Buffer Properties		
		
Save As Single	The default for **File Name** is **H0001**, but users can change it according to their preference. The **File Name** supports alphabetical and numeric characters with the length up to 8 characters.	
Save As Multi		

- If users click **Save As Multi**, when the set **History Buffer Sample Number** is reached or the **Archive trigger bit** is triggered, the current data is saved and the sampling continues.
- The file name of the data file that is currently sampling is the set **File Name**, such as H0001.dat. And when users click **Save**

History Buffer Properties		
		as Multi to save the file, the date and time when it was saved is added to the file name, for example, H0001_Date-2015-06-26_Time-12-02-30.dat. ● If users click **Save As Multi**, the **Auto Stop** function is unavailable. And when users click **OK** in the **Buffer Properties** window, the HMI displays the following warning message. 
	File Date	● Arrange the display order of the year, month, and day in the file name with the **File Date** setting, or can also choose not to display the date. The default value is **%y%m%d**. 
	File Time	● Arrange the display order of the hour, minute, and second in the file name with the **File Time** setting, or can also choose not to display the time. The default value is **%H%M%S**. 
	File Name	● If the **File Time**, **File Date**, and **File Name** are set as follows, and the set **Sample Number** is reached at the time of 2015/6/26 12:02:30, then the file name for this file is: H0001_Date-2015-06-26_Time-12-02-30. 

History Buffer Properties		
	Archive trigger bit	● In addition to waiting for the set **Sample Number** to be reached, users can also trigger the **Archive trigger bit** to execute the **Save As Multi** function. ● The controller address (Bit) and the internal register address (Bit) are supported.

15.2 Historical Trend Graph

The **Historical Trend Graph** element is for storing and displaying address values read during a specific time period. This element can display up to 60 curves and read up to 60 Words. Users can save the data displayed on the **Historical Trend Graph** element to the external storage devices that the HMI supports, including USB Disk and SD Card.

On double-clicking the **Historical Trend Graph** element, the property page appears as follows.

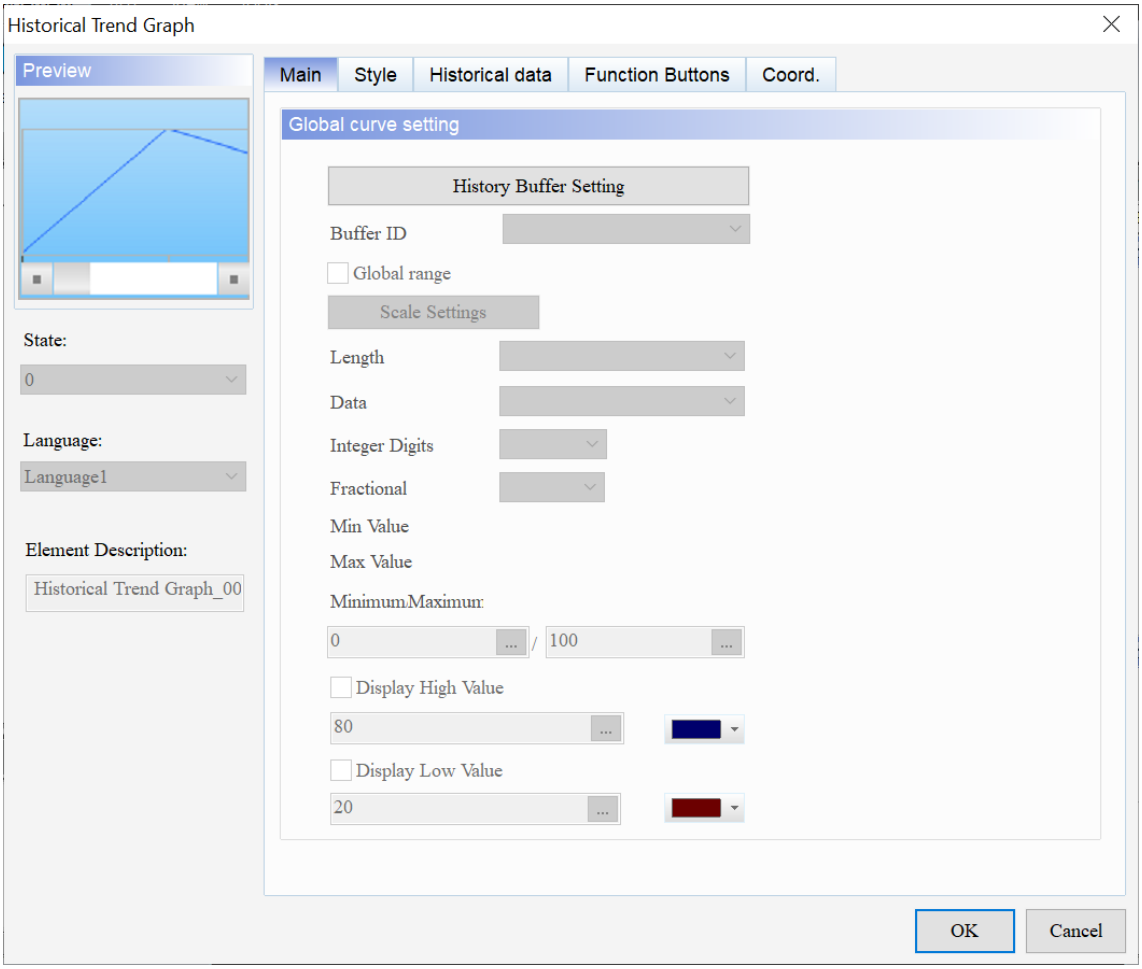


Figure 15 - 5: Historical Trend Graph element property page

Historical Trend Graph		
Function	**Description**	
Preview	The **Historical Trend Graph** element does not support multiple state values and multi-language data display.	
Main	Data	Set the Buffer ID.
	Global range	Set the Scale Settings, Length, Data, Integer Digits, Fractional, Minimum/Maximum, Display High Value, Display Low Value, High Value color, and Low Value color.
	Scale Settings	Set the Display scale, Display mark, Font size, Text Color, Mark Color, Scale Mark No., Subscale Mark No., and Scale Width.
Style	Set the Number of Curves, Filling Curve, Center value line color, Horiz. Grid Number, Gridline Color, Border Color, Background Color, Filled style, Transparency, Anti-aliasing, and Margin.	

Historical Trend Graph		
Function	**Description**	
Historical data	Individual curve setting	Set whether to enable the curve and set the Length, Start Position, Data Format, Integer Digits, Fractional Digits, Line Weight and Color, Minimum, and Maximum.
	Time/Date	Set the Time Format, date Format, Display time/date, Time Interval, Color, Font size, and Timeline scaling.
Function Buttons	Select the function buttons to enable and set the width and height of the buttons.	
Coord.	Set the X and Y coordinates, Width, and Height of the elements.	

- Main

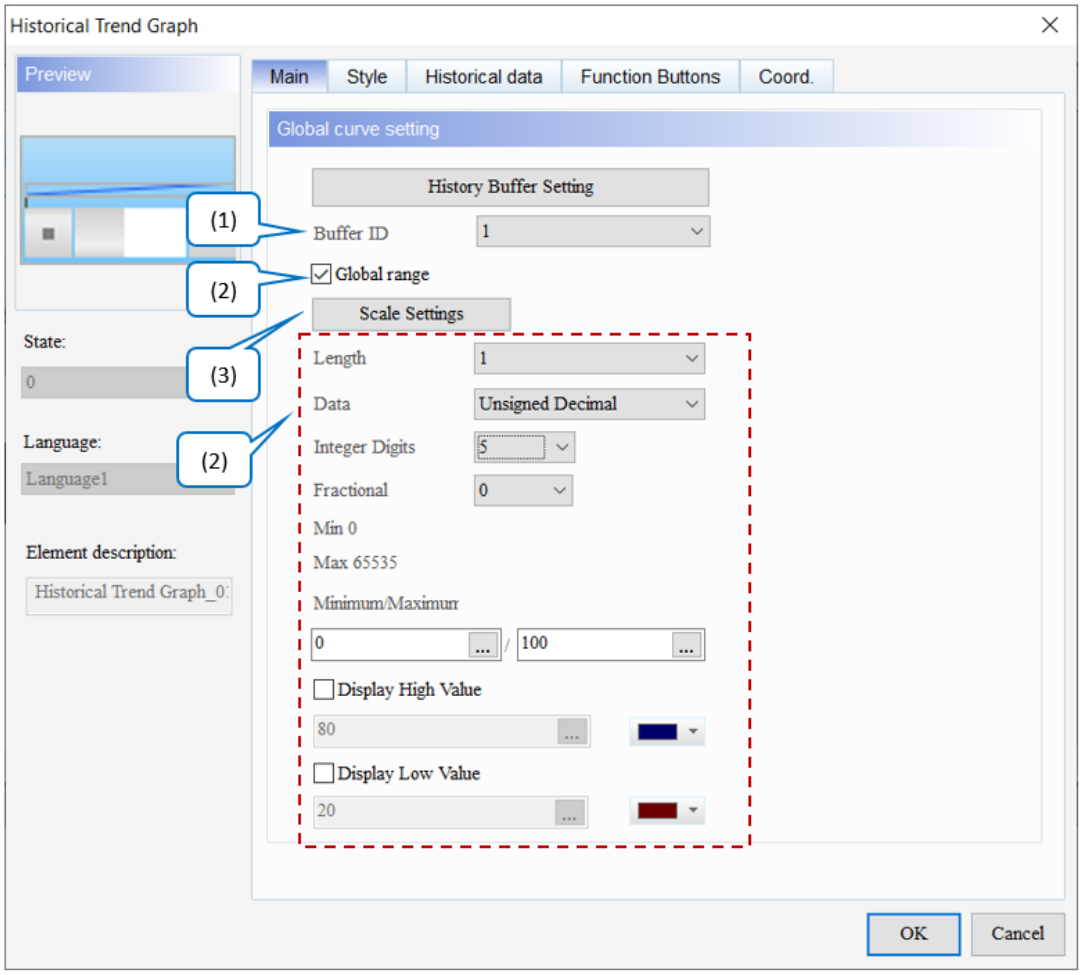
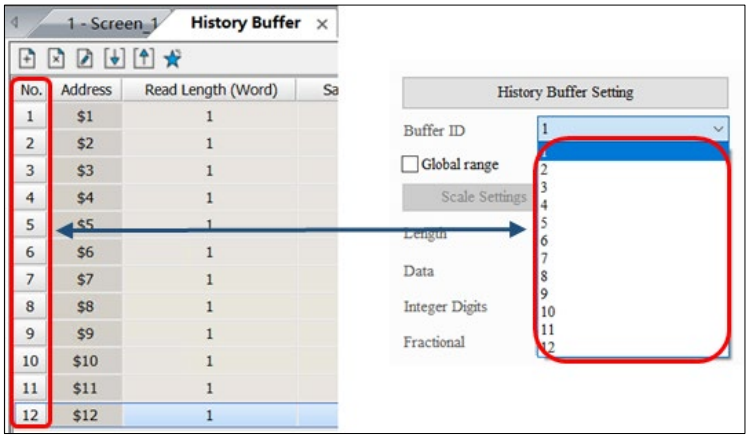
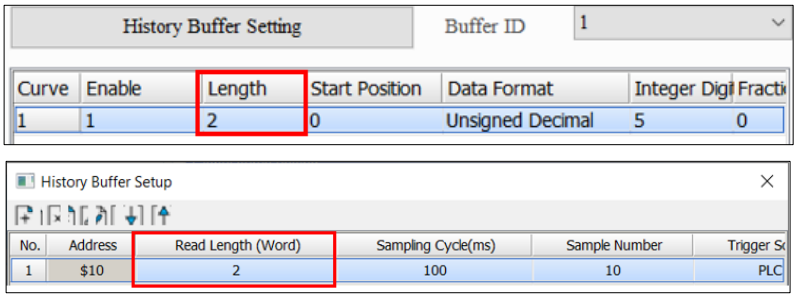
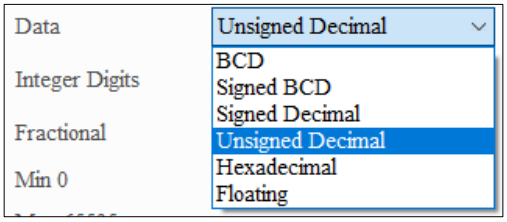


Figure 15 - 6: Historical Trend Graph element Main property page

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>(1)</td><td>Buffer ID</td><td colspan="2">The Buffer ID is the data number that corresponds to the History Buffer Setting. The History Buffer Setup can increase the number of history data pens up to 12, so buffer numbers are supported up to 12 groups.
 
</td></tr>
<tr><td rowspan="3">(2)</td><td rowspan="3">Global range</td><td>Length</td><td>● The Length can be set to 1 or 2.
● When the Length is 1, it means that the length of the data read is 1 Word; When the Length is 2, it means that the length of the data read is 2 Word.

NOTE: When Length is 2, the Read Length (Word) must be more than 2 values.
 

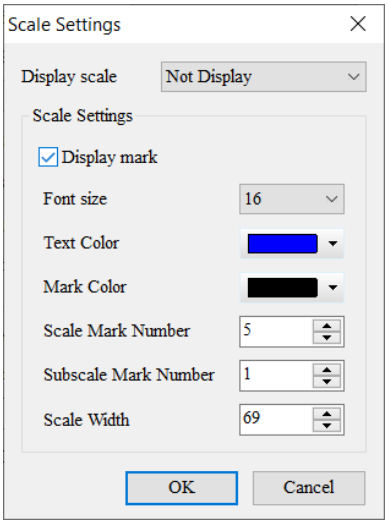
</td></tr>
<tr><td>Data Format</td><td>● The supported Data Format for Historical Trend Graph is as follows:
 

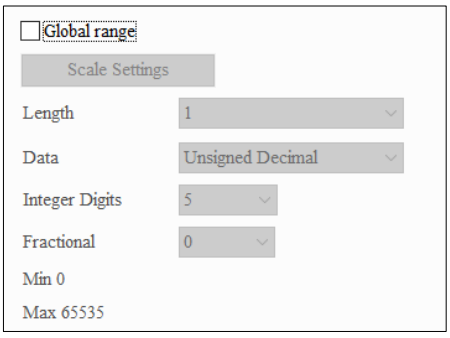
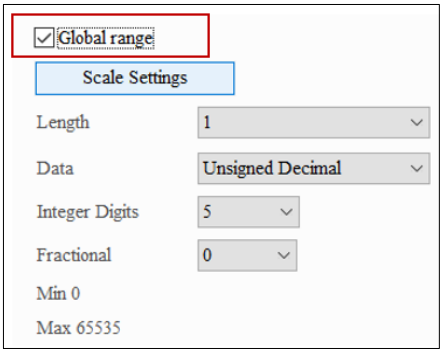
● Floating can only be used if the Length is 2.</td></tr>
<tr><td>Integer Digits / Fractional</td><td>Set the displaying number of integer digits and the number of decimal places.</td></tr>
</table>

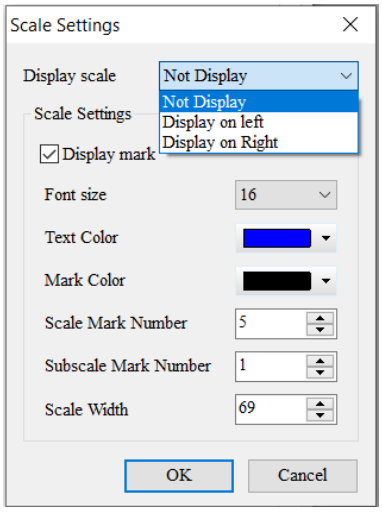
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td>Minimum / Maximum</td><td>

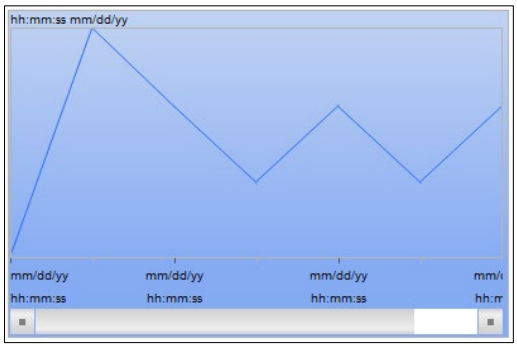
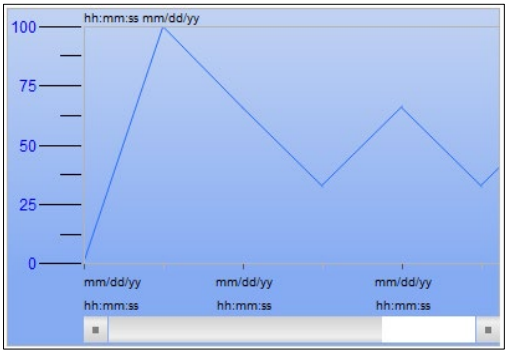
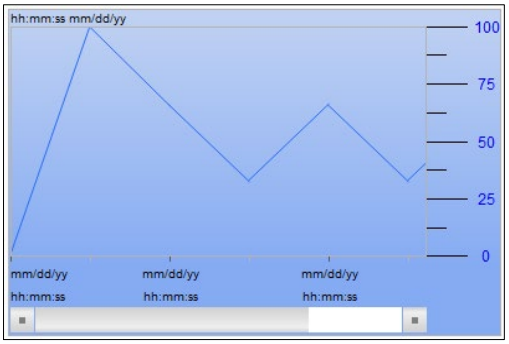
If the Global range is checked, the minimum and maximum values of the curve in the advanced page cannot be set, and the minimum and maximum values of the global will be the main value; conversely, if the Global range is not checked, the minimum and maximum values of the curves in the advanced page can be set.
The Minimum and Maximum values can be set as constants or variables.
When the minimum and maximum values are variables, users can support picking the controller address (Word) and the internal register address.
When the minimum and maximum values are constant, the legal range of values varies depending on the selected Data Type and Data Format.

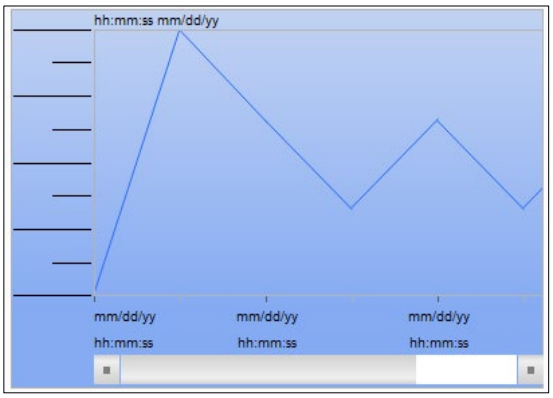
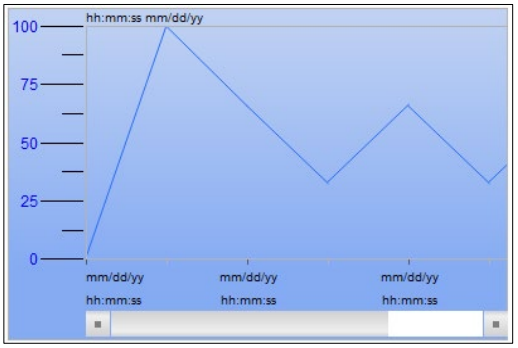
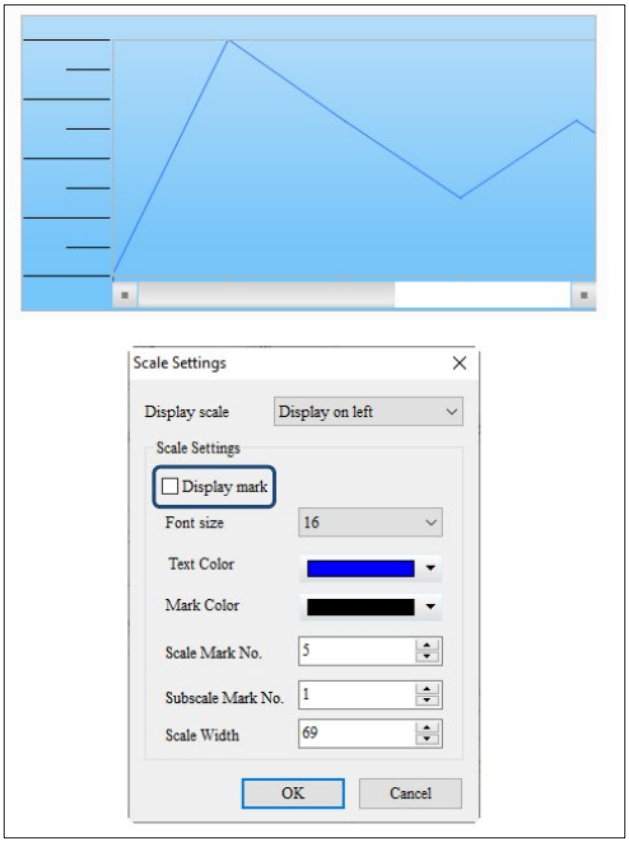
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="5">DWord</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td>Display High Value / Display Low Value</td><td>Display High Value / Display Low Value are available on the Historical Trend Graph. Set the Display High / Low Values with constants or using the Internal Memory or controller register address (Word). Also, users can set the displaying colors for Display High / Low Values.</td></tr>
</table>

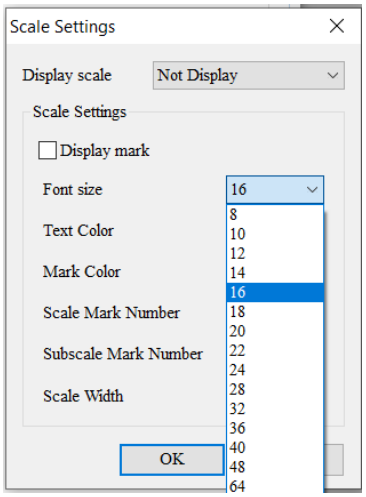
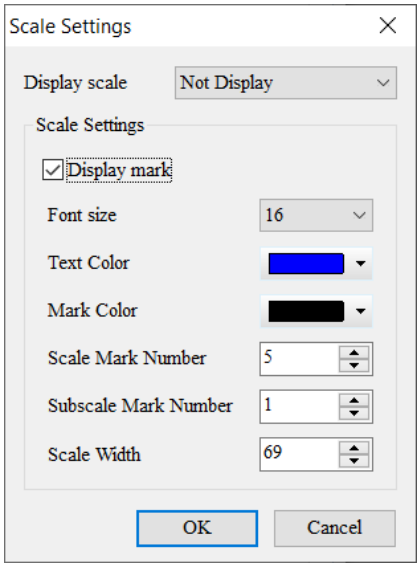
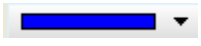
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Scale Settings</td><td>


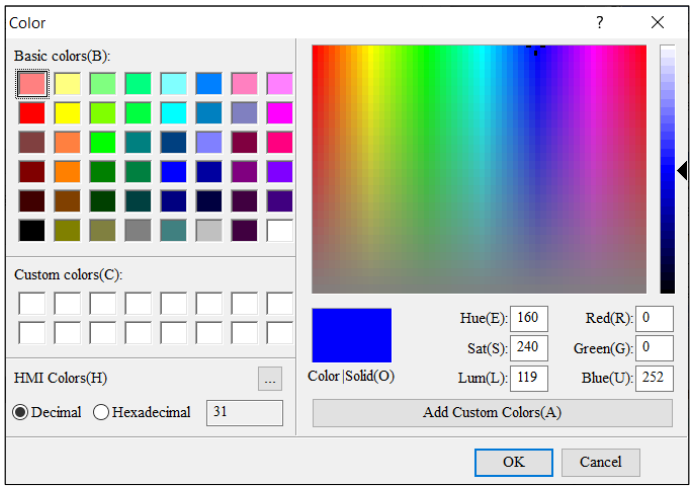
Scale Settings is available only when the Global range checkbox is selected.
<table>
<tr><td>Uncheck</td><td> 
</td></tr>
<tr><td>Check</td><td> 
</td></tr>
</table>
</td></tr>
</table>

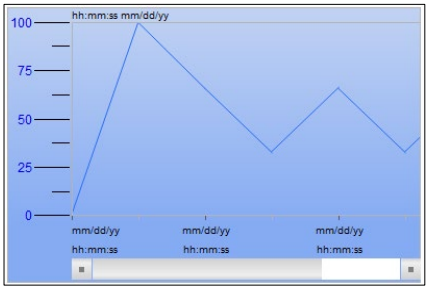
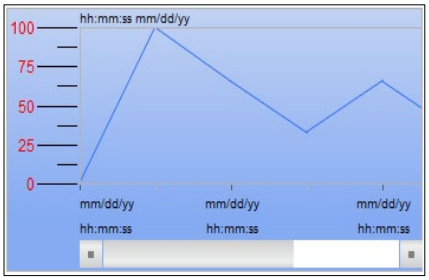
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td>Display scale</td><td>


The available options for Display scale are: Not Display, Display on left, and Display on Right. The default value is Not Display.
<table>
<tr><td>Not Display</td><td> 
</td></tr>
<tr><td>Display on Left</td><td> 
</td></tr>
<tr><td>Display on Right</td><td> 
</td></tr>
</table>
</td></tr>
</table>

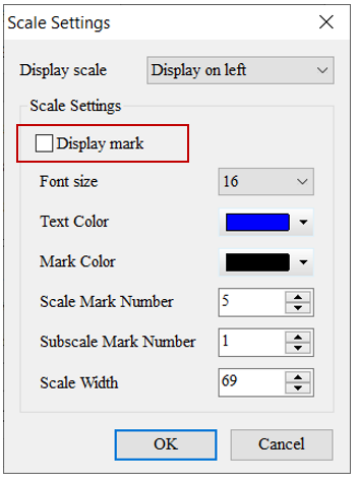
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>Display mark</td><td>Select to display the scale numbers or not.
<table><tr><td>Not selected</td><td>  </td></tr><tr><td>Selected</td><td>  </td></tr></table></td></tr>
<tr><td>Font size</td><td>The Font size setting is valid only when Display mark is selected.
  </td></tr>
</table>

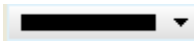
No.	Function	Description	
			The **Font size** is the size of the number displayed on the scale, and the font size of 8 ~ 512 is available for users to choose. The default value is **16**. 
		Text Color	● The **Text Color** setting is valid only when **Display mark** is selected.  ● Set the text color to display. The default is  .

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td></td><td>


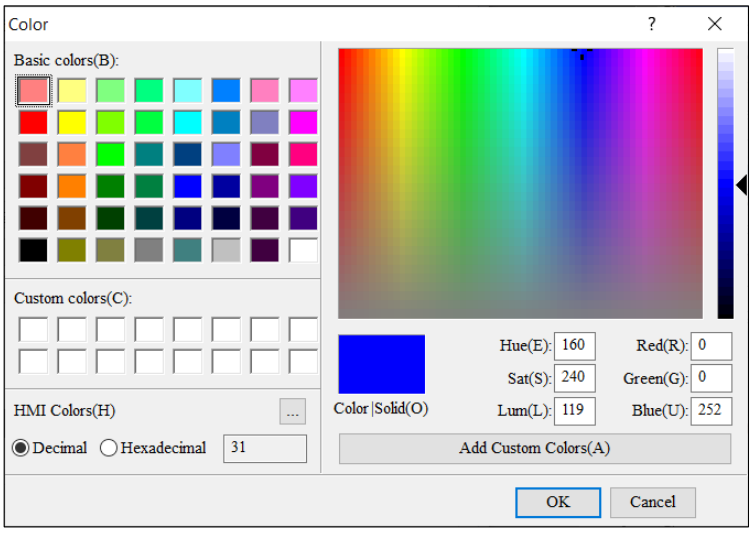
<table>
<tr><td>Before</td><td>  </td></tr>
<tr><td>After</td><td>  </td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td>Mark Color</td><td>

The Mark Color setting is valid even if Display mark is not selected.



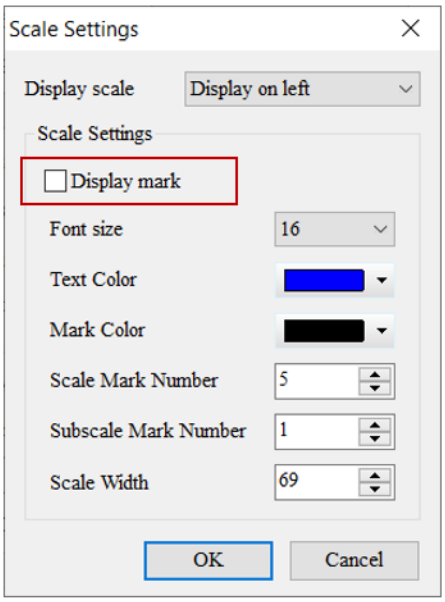
Set the color of the mark to display. The default is  .

</td></tr>
</table>

No.	Function	Description
		 

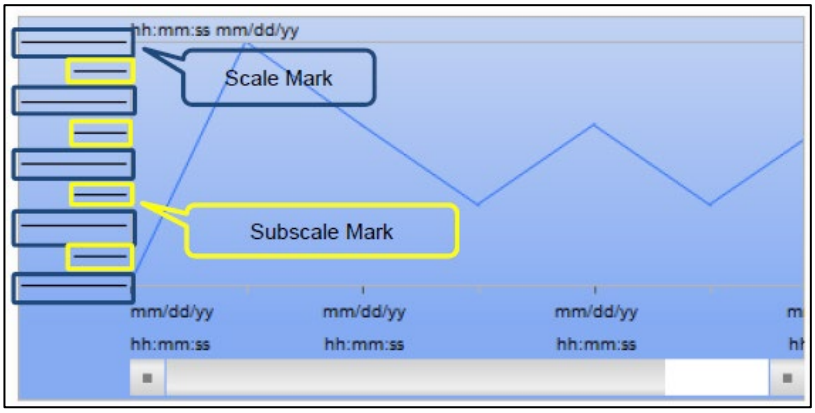
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td>Scale Mark Number</td><td>

The Scale Mark Number and Subscale Mark Number settings are valid even if Display mark is not selected.



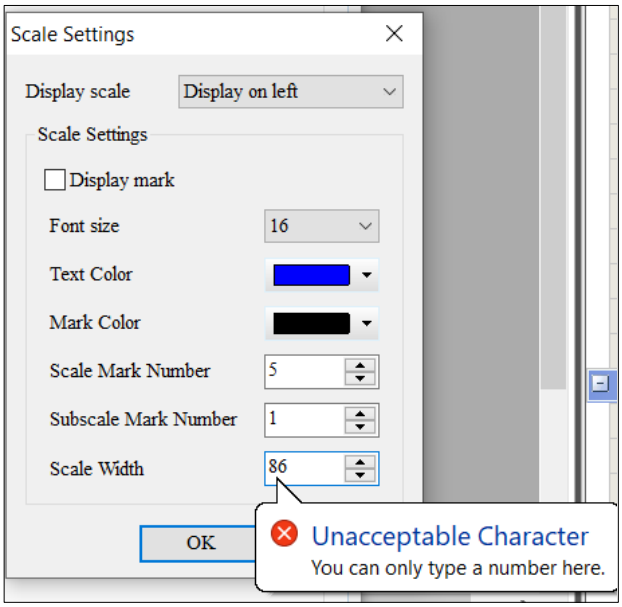
</td></tr>
<tr><td></td><td></td><td>Subscale Mark Number</td><td>

The minimum number of primary and secondary scales is 1, and the maximum is 99.
When the Scale Mark Number is 5 and the Subscale Mark Number is 1, the graph is as follows.



</td></tr>
<tr><td></td><td></td><td>Scale Width</td><td>
When the font size is set too big, adjust the Scale Width to show the text.

NOTE:
1. The Scale Width should be less than the element width.
2. When users drag and drop the Scale Width to the symbol width, the scale is not displayed.
3. When users set the value to make the Scale Width greater than the element width, the Scale Width will immediately change back to the element width -1.
</td></tr>
</table>

No.	Function	Description	
			4. *If users enter non-numeric characters, DIAScreen displays the following error message.* 

- Style

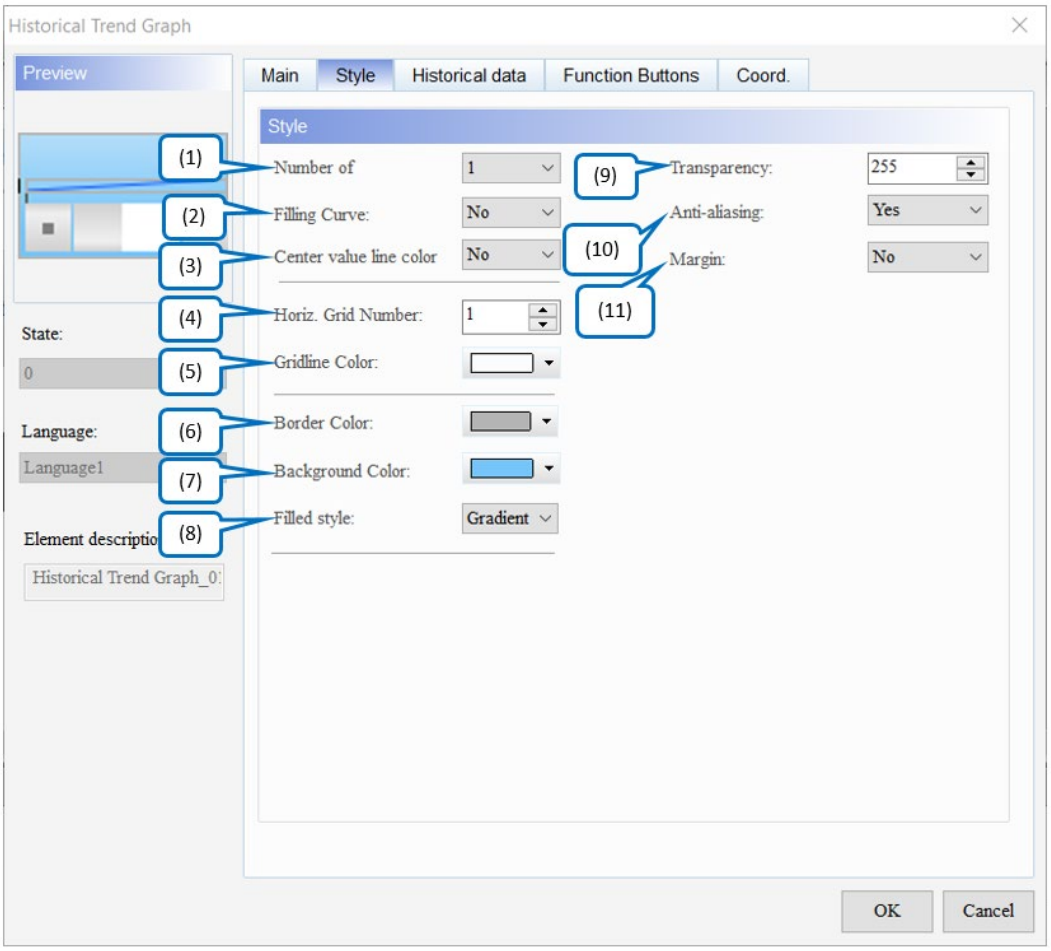
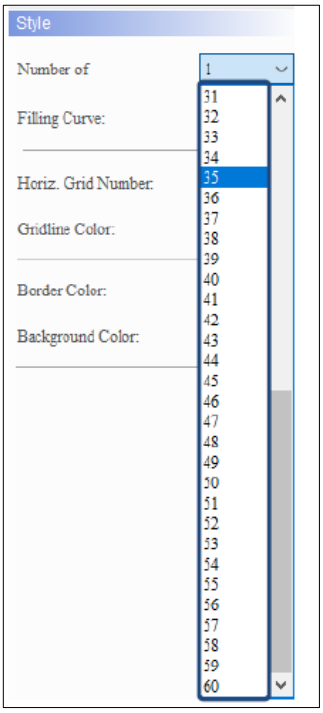
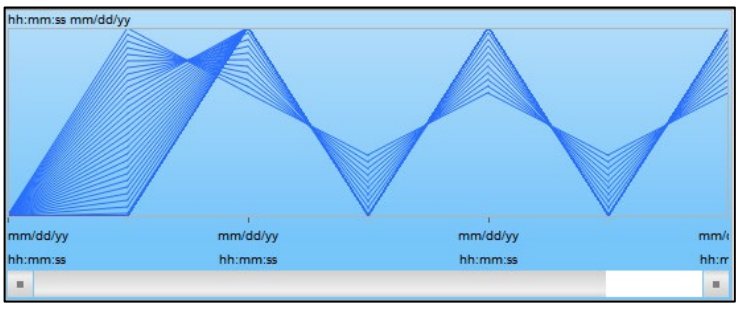
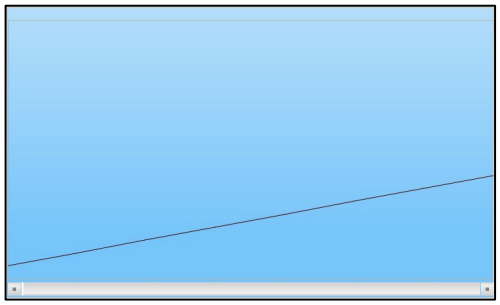
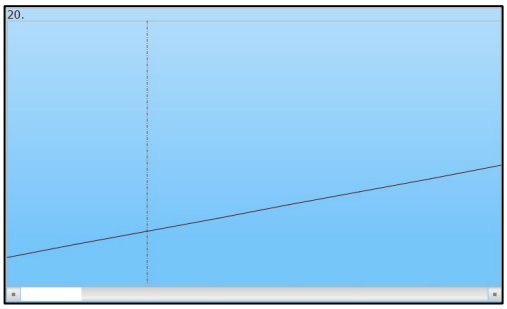
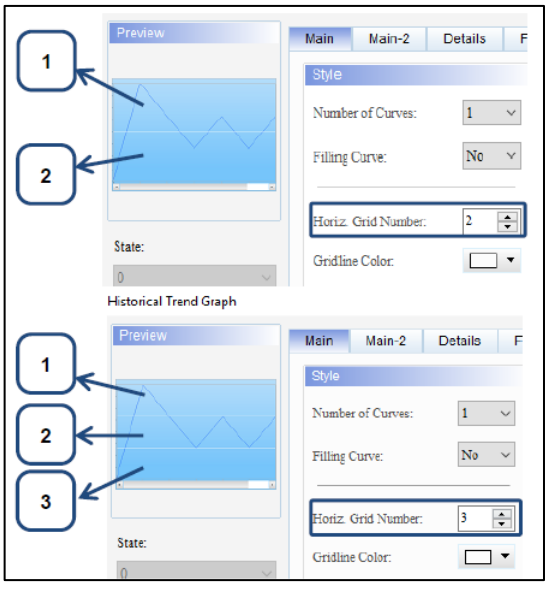


Figure 15 - 7: Historical Trend Graph element Style property page

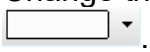
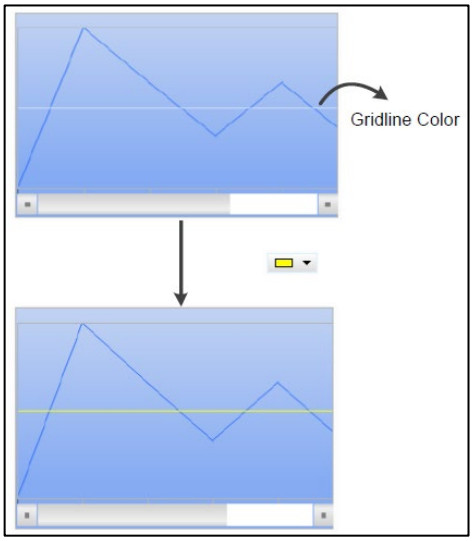
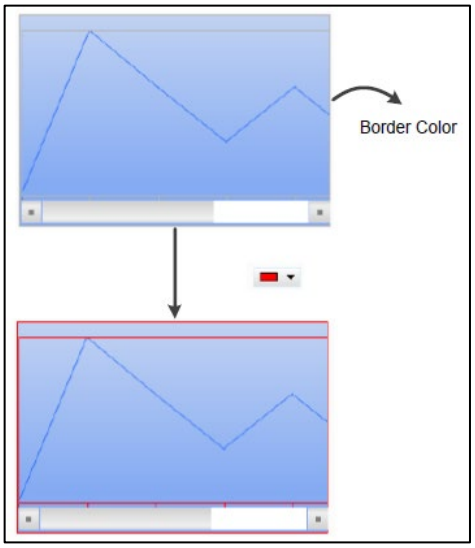
No.	Function	Description
(1)	Number of Curves	● A **Historical Trend Graph** element supports up to 60 curves. The default value is **1**.  ● Select 60 curves, and users can also change the width and color of the lines. 
(2)	Filling Curve	● Set to fill the area under the curve. ● The default value is **No**. If set to Yes, the curve is as follows. 

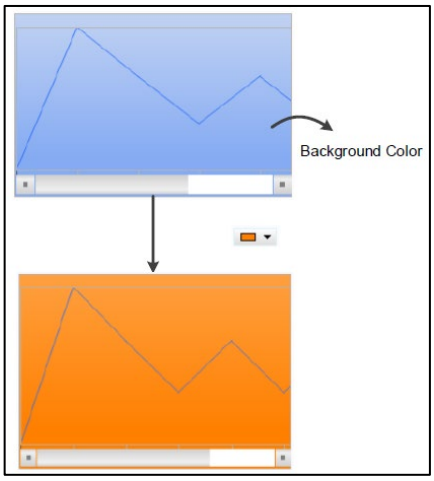
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Centre value line color</td><td>Set whether the Centre value line color on the HMI is maintained on the screen. The default value is No.
<table>
<tr><td>Centre value line color is No</td><td>  </td></tr>
<tr><td>Centre value line color is Yes</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Horiz. Grid Number</td><td>

The number of horizontal grids can be supported up to 50.
The number of horizontal grids is the number of blocks used to separate the elements of the Historical Trend Graph. The default value is 1.
Setting the value to 2 represents that the Historical Trend Graph element has a grid line, so there are two blocks; Setting the value to 3 means that the Historical Trend Graph element has two grids, and therefore three blocks, and so on.

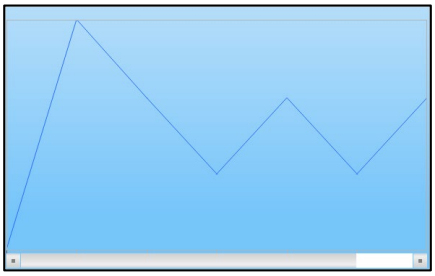
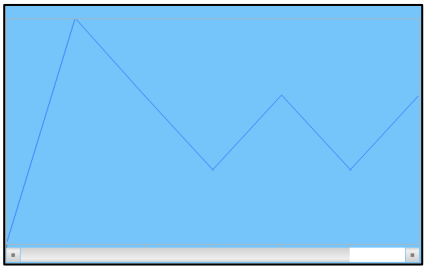


</td></tr>
</table>

No.	Function	Description
(5)	Gridline Color	● The **Gridline Color** is the color of the grid line within the **Historical Trend Graph**.  ● Change the gridline color. The default is  . 
(6)	Border Color	Set the border color of the element. The default is  . 
(7)	Background Color	Set the background color of the element. The default is  .

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(8)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

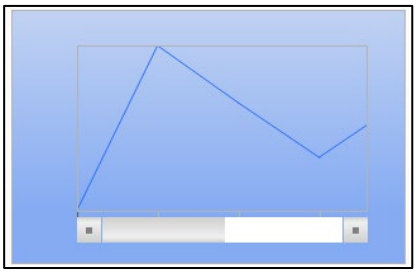
<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(9)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(10)</td><td>Anti-aliasing</td><td>

The Anti-aliasing function is available for this element. The default value is Yes.
When this function is enabled, the element display becomes more delicate without jagged edges.

</td></tr>
<tr><td>(11)</td><td>Margin</td><td>

The Margin function is available for this element. The default value is No.

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
When users select Yes for Margin, the element indents are as shown in the following figure.
<table>
<tr><td>Margin is set to Yes</td><td>  </td></tr>
<tr><td>Margin is set to No</td><td>  </td></tr>
</table>
</td></tr>
</table>

- Historical data

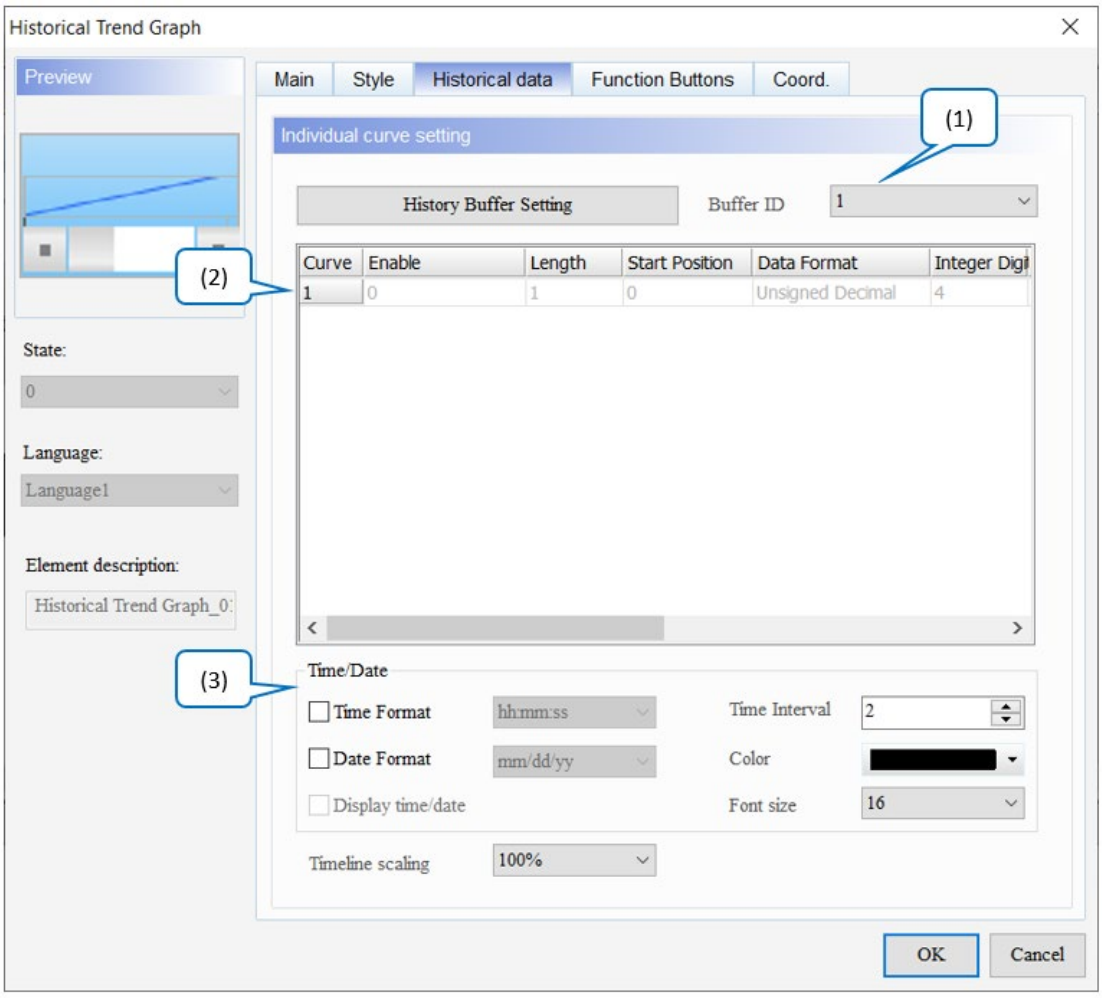
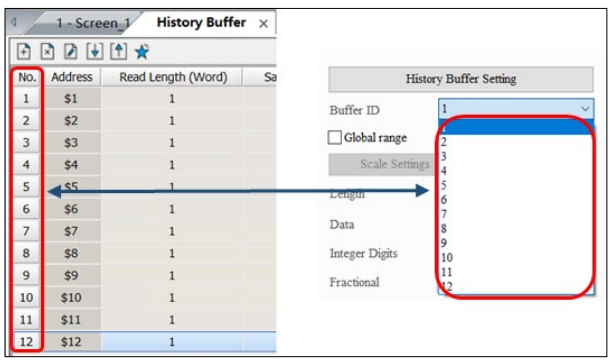
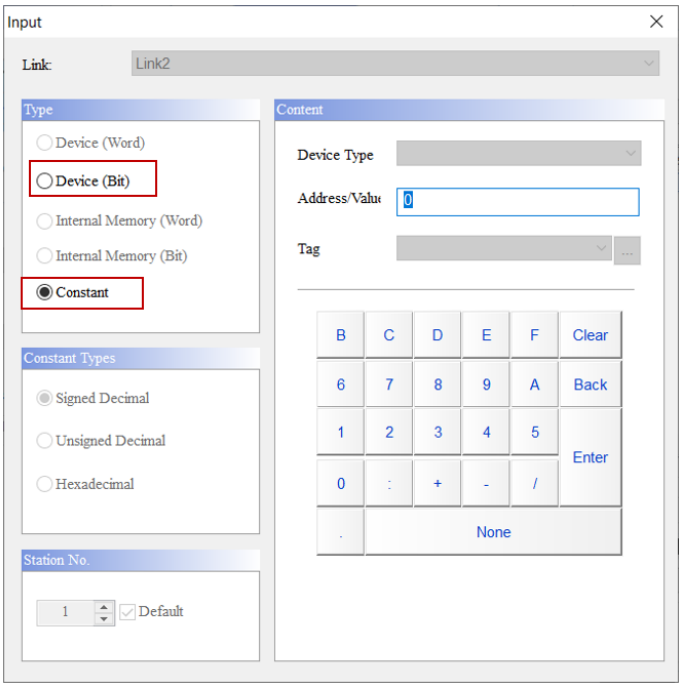
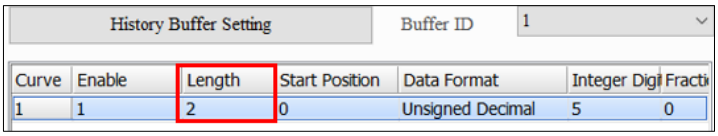
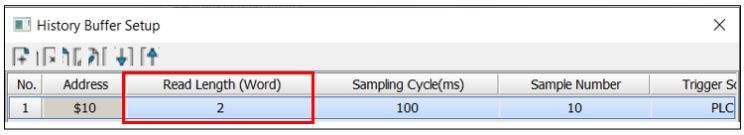
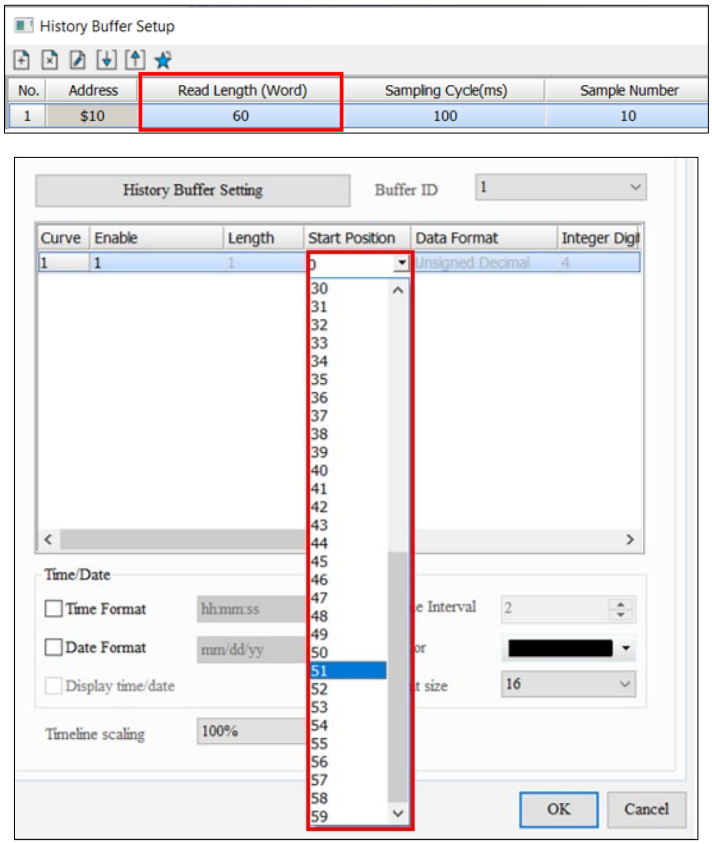
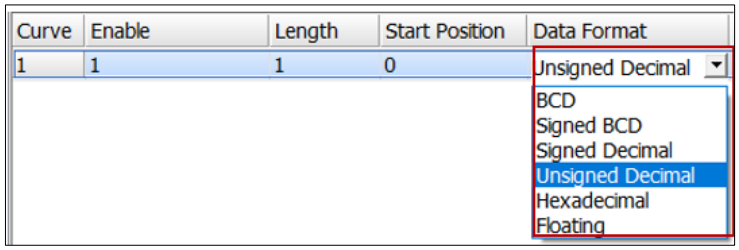
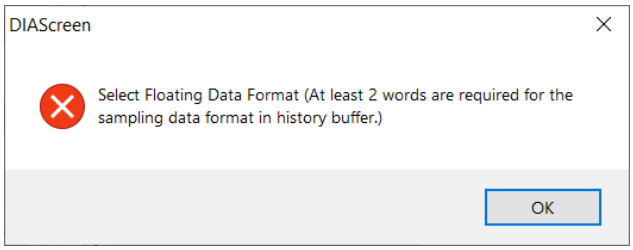
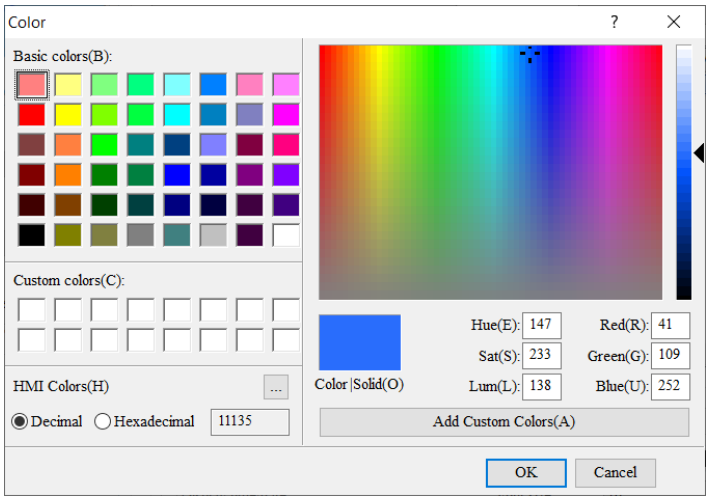
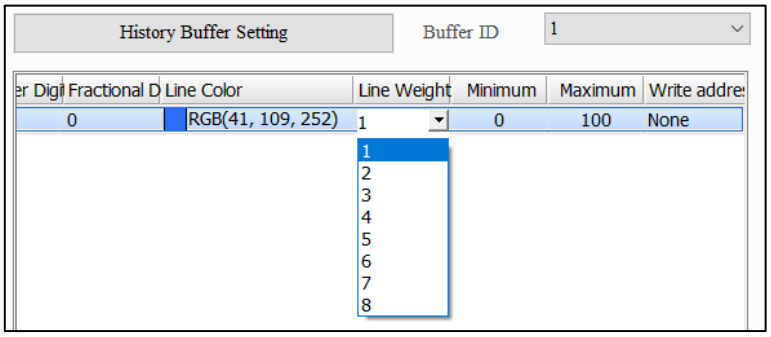


Figure 15 - 8: Historical Trend Graph element Historical data property page

No.	Function	Description
(1)	Buffer ID	The **Buffer ID** corresponds to the set data number in the **History Buffer Setup**. The **History Buffer Setting** can set up to 12 sets of data, so the **Buffer ID** can be up to 12 sets. 

No.	Function	Description	
(2)	Curve Setting	Enable	● Set whether to enable the curve for data reading. ● If Constant is selected for **Type**, then setting the value to 1 indicates to enable and setting to 0 indicates to disable. If Bit is selected for **Type**, then Bit On indicates to enable and Bit Off indicates to disable. ● The **Type** supports the data types of Device (Bit), Internal Memory (Bit), and Constant. 
		Length	● Set the **Length** to 1 or 2. Users can set the **Length** to 2 only when **Read Length (Word)** in the **History Buffer Setting** is set to 2 or above.   ● When **Global range** is checked, this function cannot be set.
(2)	Curve Setting	Start Position	● The data **Start Position** is set depending on the length of the read. ● If the **Read Length (Word)** is 60, the **Start Position** ranges from 0 ~ 59.

No.	Function	Description
		
	Data Format	● The supported **Data Format** is as follows. The default value is **Unsigned Decimal**.  ● When **Global range** is checked, this function cannot be set. ***NOTE**:* *1. If users select Floating as the **Data Format**, set the **Length** to 2.* *2. If users select Floating as the **Data Format**, but set the **Length** to 1 word, DIAScreen displays a message to remind users that they need to set the **Length** to 2 or above.*

No.	Function	Description	
			
		Integer Digits / Fractional Digits	● Set the number of integer digits and decimal places to be displayed as several digits. ● When **Global range** is checked, this function cannot be set.
		Line Color	Set the line color. 
		Line Weight	The line width can be set from 1 ~ 8. The default value is **1**. 
		Minimum / Maximum	● If the **Global range** is checked, the **Minimum** and **Maximum** values in the curve cannot be set, and the minimum and maximum values of the global will be the main value; conversely, if the **Global range** is not checked, the minimum and maximum values in the curve can be set. ● The allowable range of values for minimum and maximum values varies depending on the **Data Type** and **Data Format** chosen.

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="6">DWord</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">(3)</td><td rowspan="2">Time / Date</td><td>Display time / date</td><td>

When users select the Display time/date checkbox, the time scale displays at the bottom of the Historical Trend Graph element; if it is not selected, the time scale does not display.

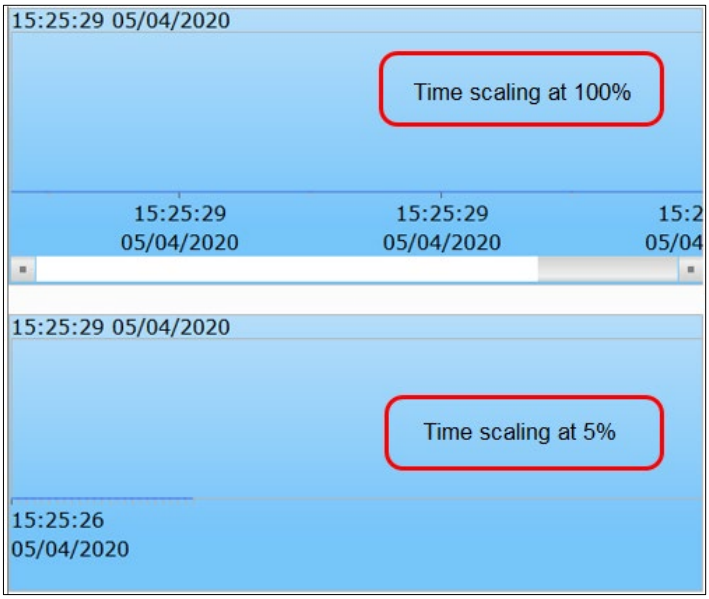
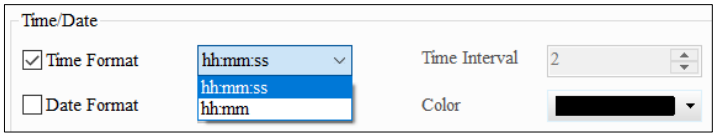
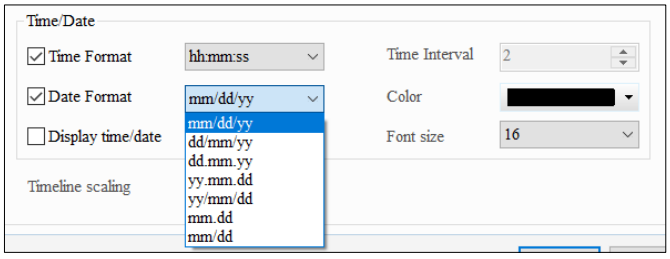
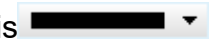


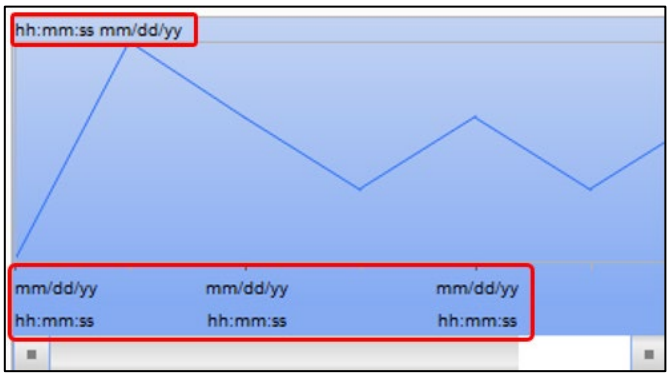
Check the timeline to set its time interval, up to 9999 time intervals can be displayed. The image above shows two time intervals.

</td></tr>
<tr><td>Timeline scaling</td><td>

The default is 100%.
The smaller the set range, the more sampling points can be seen.

</td></tr>
</table>

No.	Function	Description	
			
		Time Format / Date Format	● The available options for **Time Format** are: hh:mm:ss and hh:mm. The default value is **hh:mm:ss**.  ● The available options for **Date Format** are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is **mm/dd/yy**. 
		Color	Change the displaying color of the time and date, including the recorded time and date shown on top of the **Historical Trend Graph** and the time scales. The default is  .

No.	Function	Description	
			

- Function Buttons

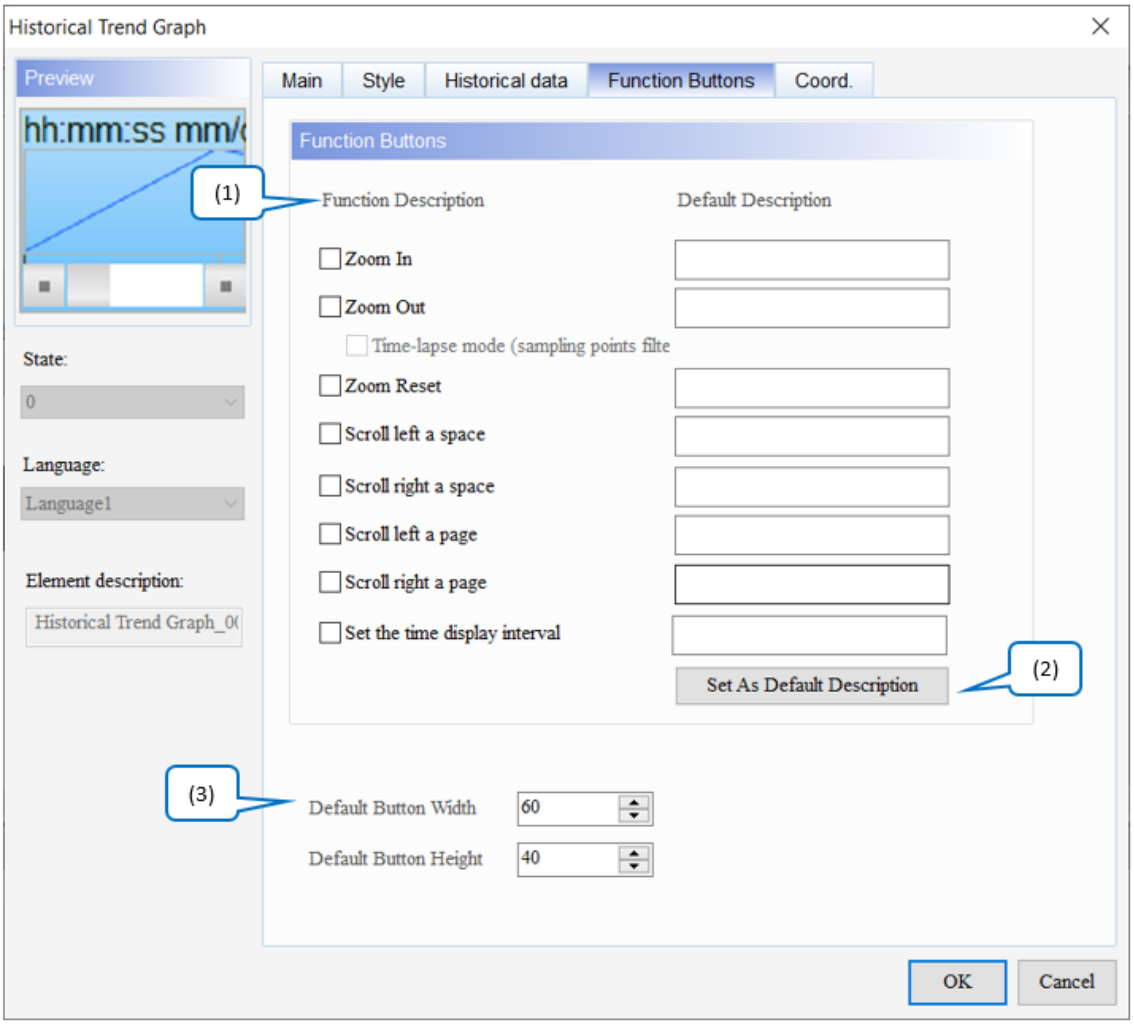
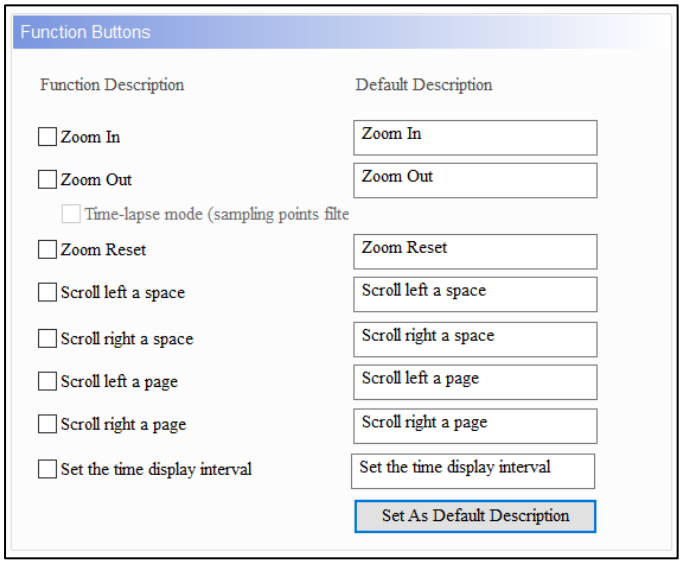


Figure 15 - 9: Historical Trend Graph element Function Buttons property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Function Description</td><td>Select the Function Buttons to display on the Historical Trend Graph element.
<table>
<tr><td>Zoom In</td><td>Zoom in on the history data of X-axis.</td></tr>
<tr><td>Zoom Out</td><td>Zoom out on the history data of X-axis.</td></tr>
<tr><td>Zoom Reset</td><td>Reset the history data of X-axis to the default size.</td></tr>
<tr><td>Scroll left a space</td><td>Scroll to the left a bit.</td></tr>
<tr><td>Scroll right a space</td><td>Scroll to the right a bit.</td></tr>
<tr><td>Scroll left a page</td><td>Scroll to the left for a page.</td></tr>
<tr><td>Scroll right a page</td><td>Scroll to the right for a page.</td></tr>
<tr><td>Set the time display interval</td><td>Display the corresponding data according to the set time interval.</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Set As Default Description</td><td>Select Set As Default Description. The default strings are automatically filled in the Default Description fields.
 
</td></tr>
<tr><td>(3)</td><td>Default Button Width / Height</td><td>Adjust the button width and height. The default values are 60 and 40, respectively.</td></tr>
</table>

- Coord.

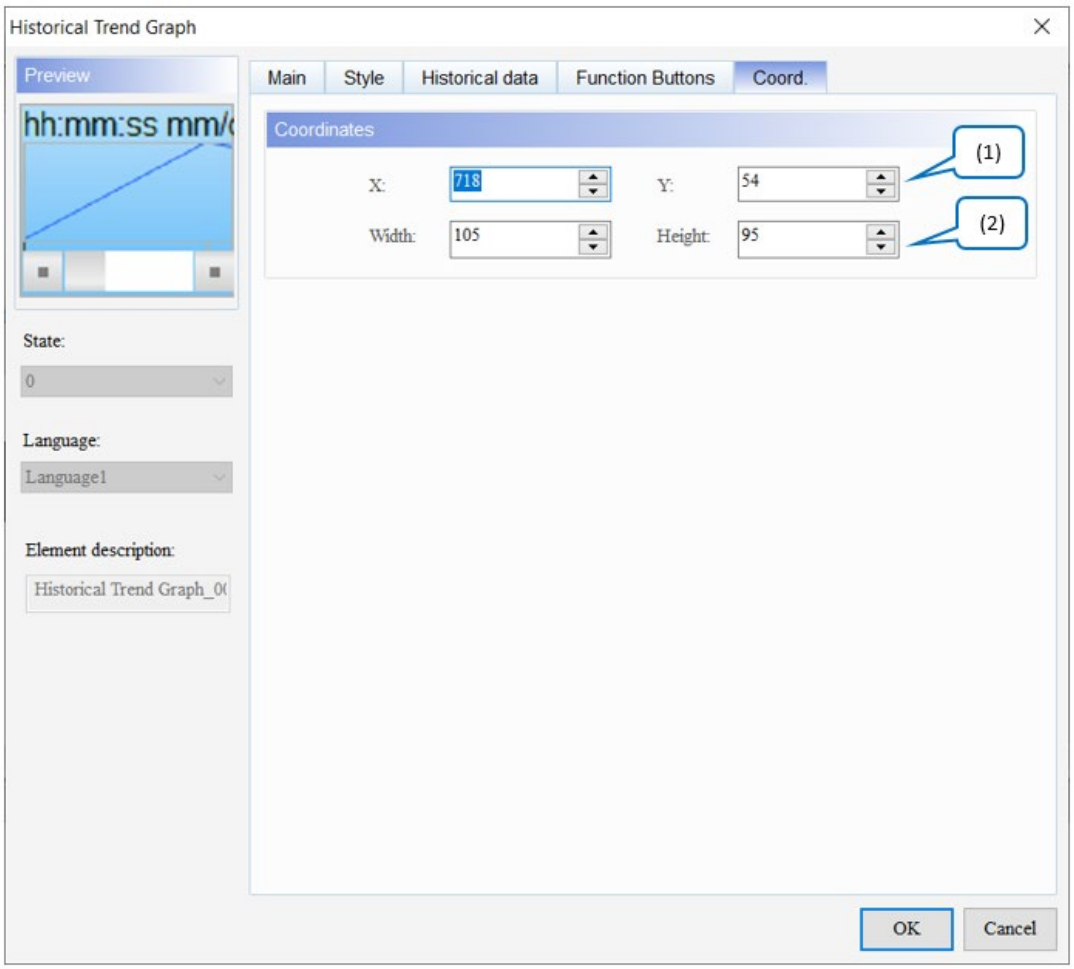


Figure 15 - 10: Historical Trend Graph element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

15.3 Historical Data Table

The **Historical Data Table** displays the numerical values converted from the data read by the History Buffer. The 60 columns of the **Historical Data Table** correspond to the **Read Length** of 60 words in the **Historical Trend Graph**.

On double-clicking the **Historical Data Table** element, the property page appears as follows.

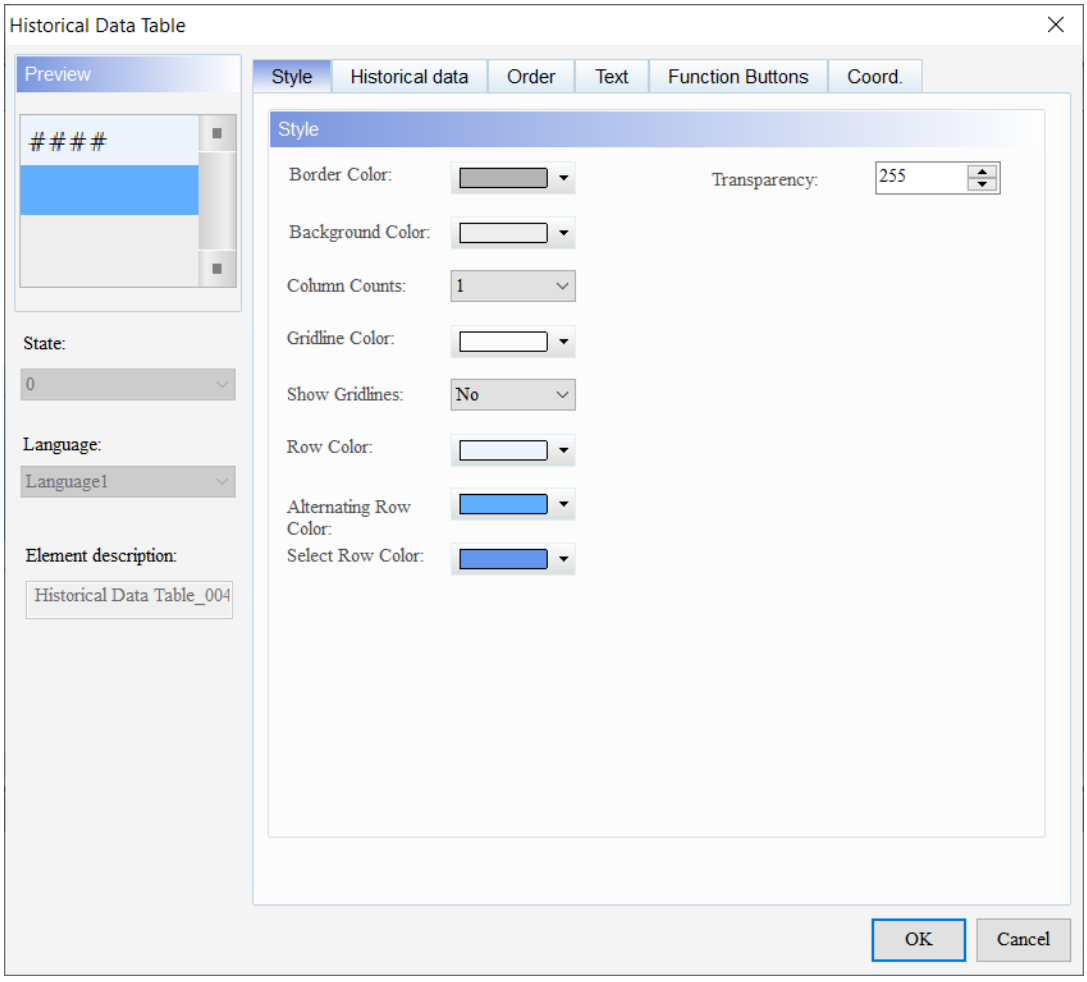


Figure 15 - 11: Historical Data Table element property page

Historical Data Table	
Function	**Description**
Preview	The **Historical Data Table** elements do not support multiple state values and multi-language data display.
Style	Set the Border Color, Background Color, Column Counts, Gridline Color, Show Gridlines, Row Color, Alternating Row Color, Select Row Color, and Transparency.
Historical data	Set the Buffer ID, Time/Date, Length, Start Position, Data Format, Integer Digits, Fractional Digits, Color, Column Width, Prefix Zero, Title, and Field alignment. Select the Show Title checkbox and set the Background Color, Text Color, Time, Date, and No. Select the Show No. checkbox and set its displaying color and alignment.
Order	Set the Sort Method.
Text	Set the text size of the displayed numeric data.
Function Buttons	Set the time display interval. Set the width and height of the function buttons and setting buttons to be enabled.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

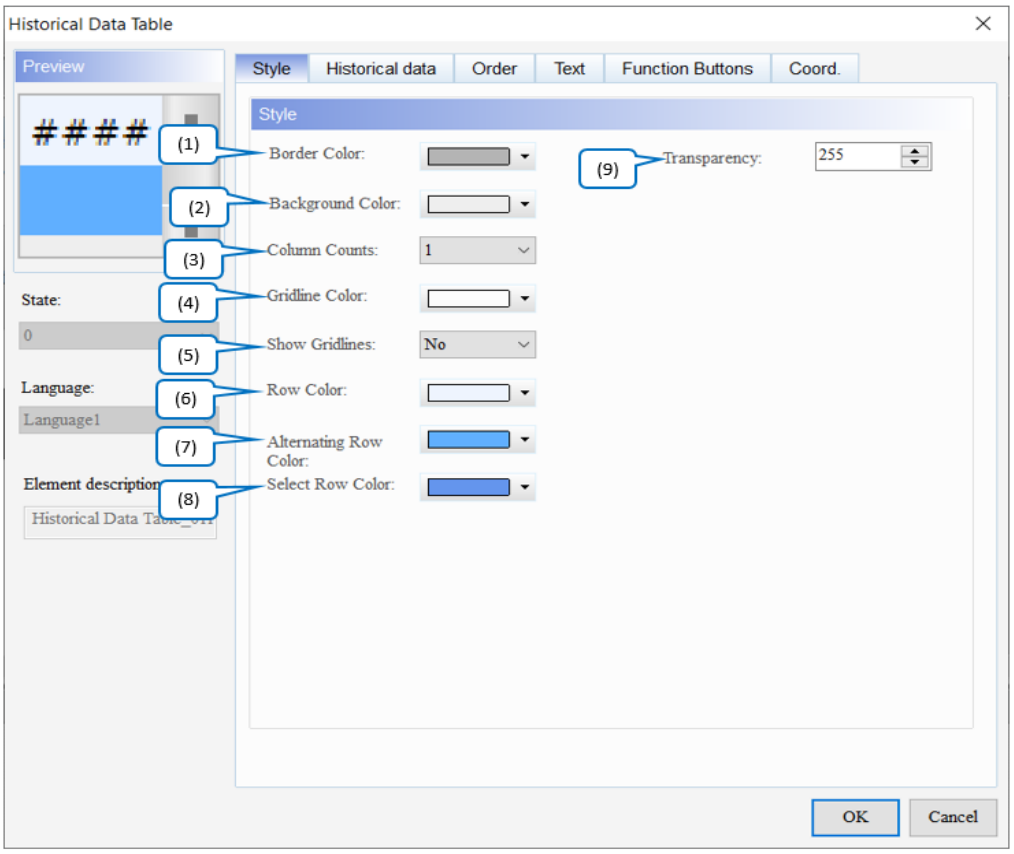
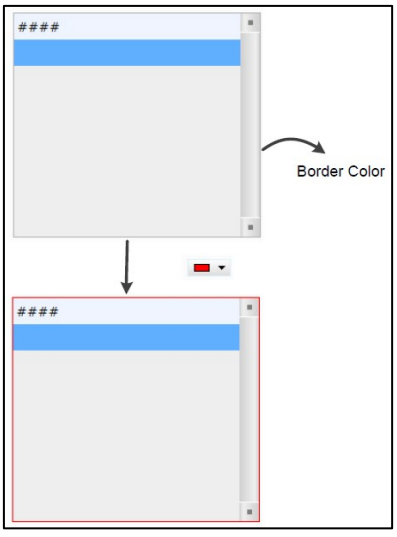
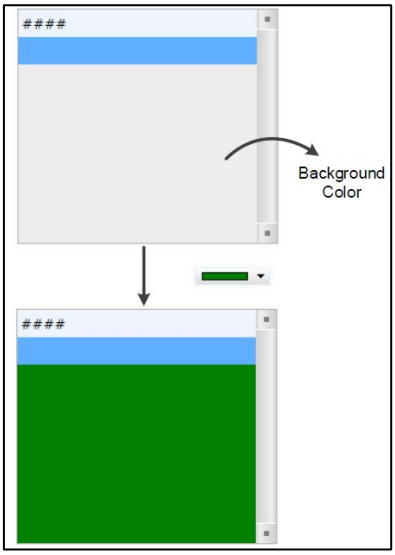
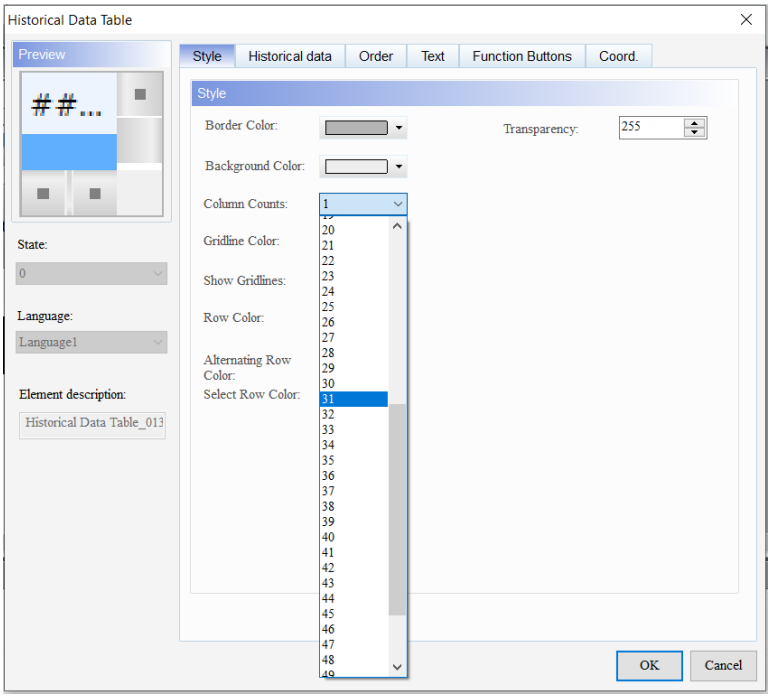
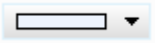
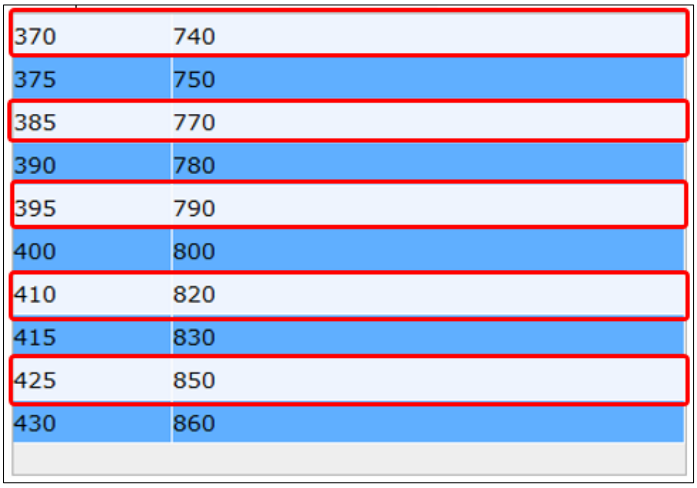
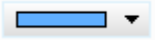
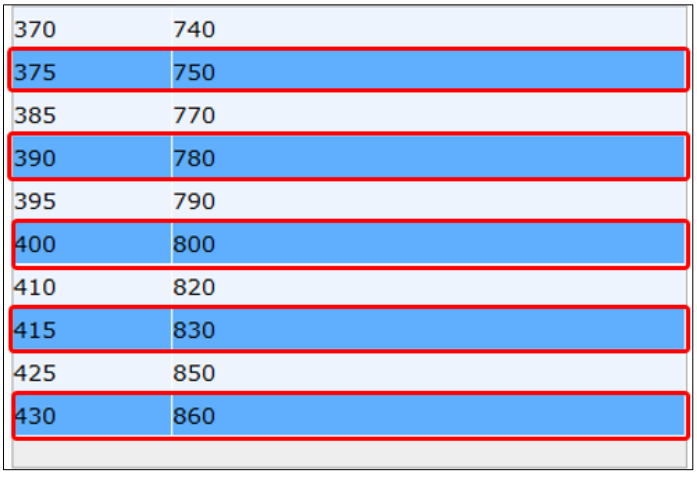
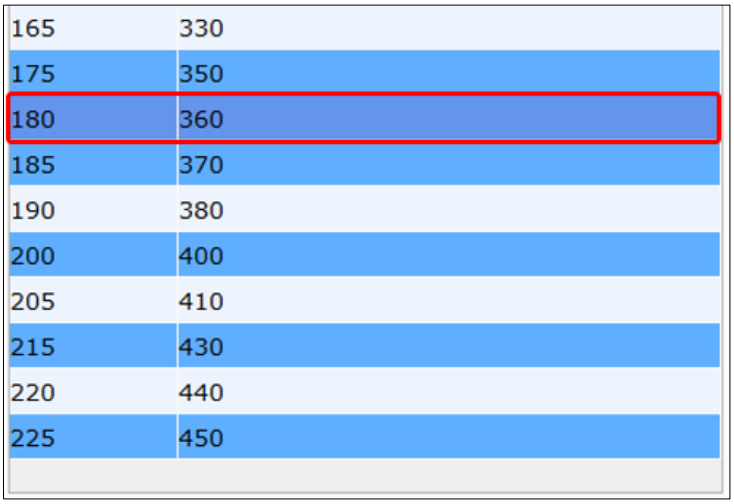


Figure 15 - 12: Historical Data Table element Style property page

No.	Function	Description
(1)	Border Color	Set the border color of the element. The default is  . 

No.	Function	Description
(2)	Background Color	Set the background color of the element. The default is  . 
(3)	Column Counts	The total number of data fields can be supported to 60, which corresponds to the **Read Length (Word)** set by the **History Buffer Setup**. 
(4)	Gridline Color	● Set the gridline color of the element. The default is  . ● The gridline color setting is valid only when **Show Gridlines** is set to Yes and **Column Counts** is set to 2

No.	Function	Description
(5)	Show Gridlines	or above. 
(6)	Row Color	Set the color of the odd rows. The default is  . 
(7)	Alternative Row color	Set the color of the even rows. The default is  . 

No.	Function	Description
(8)	Select Row Color	Select the data rows to view the rows in the color specified in this setting. The default is . 
(9)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Historical data

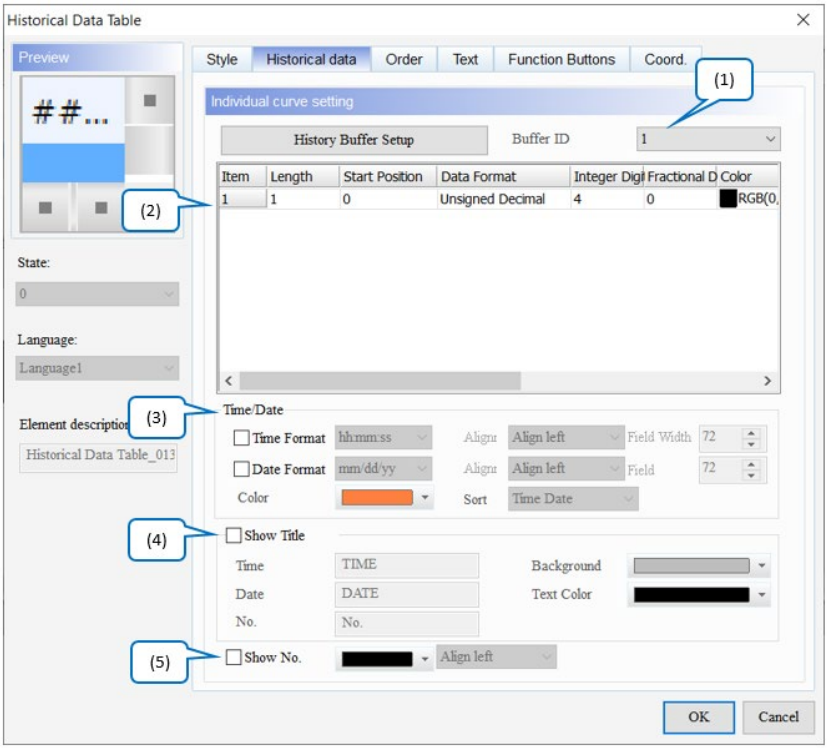
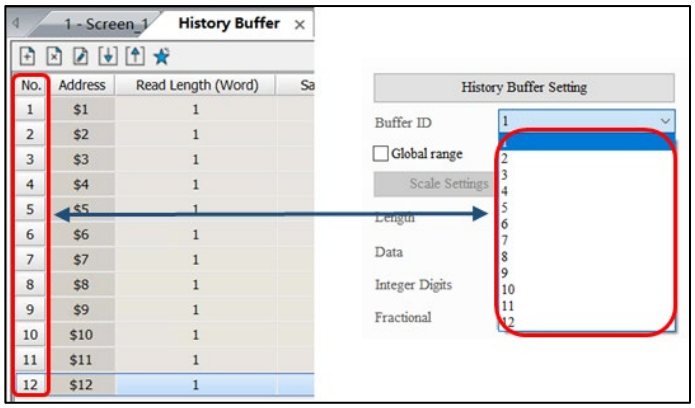
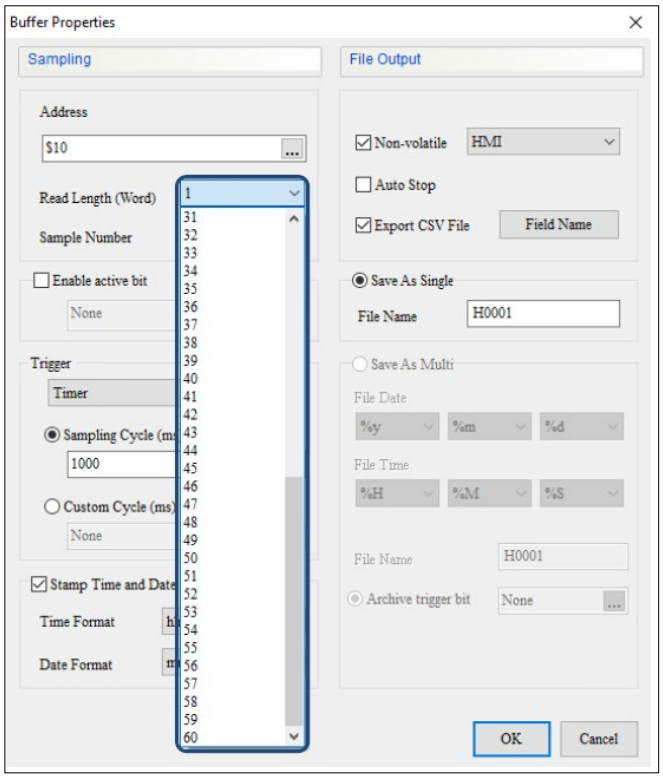
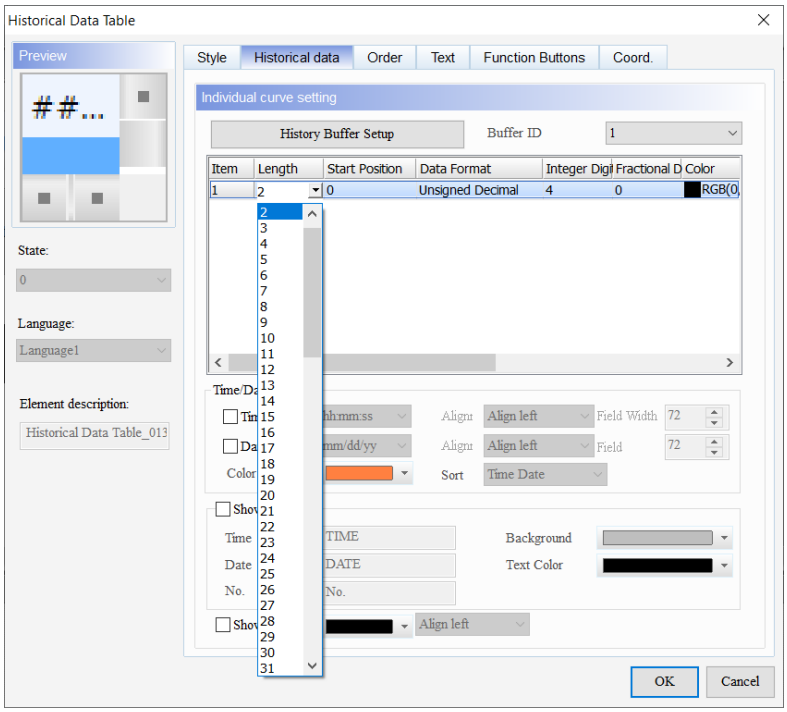
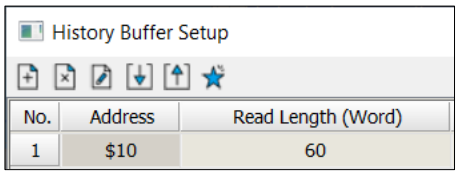
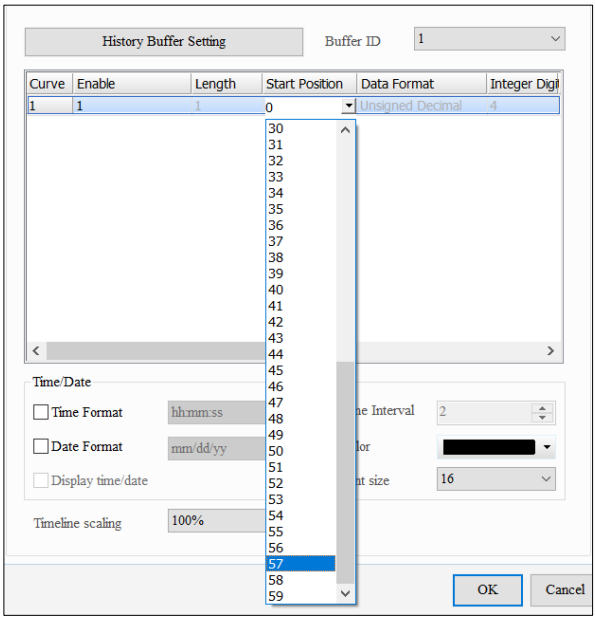


Figure 15 - 13: Historical Data Table element Historical data property page

No.	Function	Description
(1)	Buffer ID	The **Buffer ID** corresponds to the set data number in the **History Buffer Setup**. The **History Buffer Setup** can set up to 12 sets of data, so the **Buffer ID** can be up to 12 sets. 
(2)	Item Setting	Length	● The **Length** corresponds to the **Read Length (Word)** in the **History Buffer Setup**. If the **Read Length (Word)** is 60, the **Length** ranges from 1 ~ 60. 

No.	Function	Description
		
	Start Position	● The **Start Position** setting is determined by the set **Read Length (Word)**. ● If the **Read Length (Word)** is 60, the **Start Position** ranges from 0 ~ 59.  

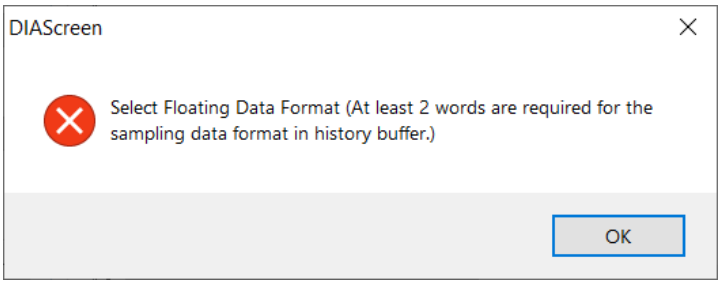
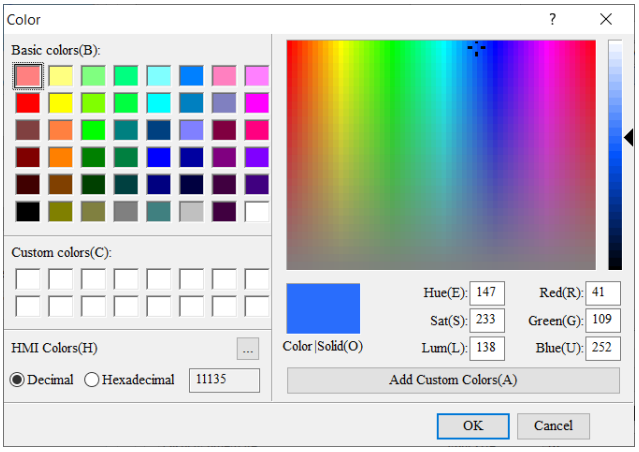
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Data Format</td><td>

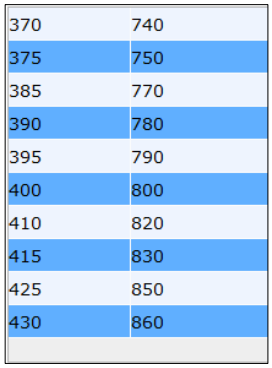
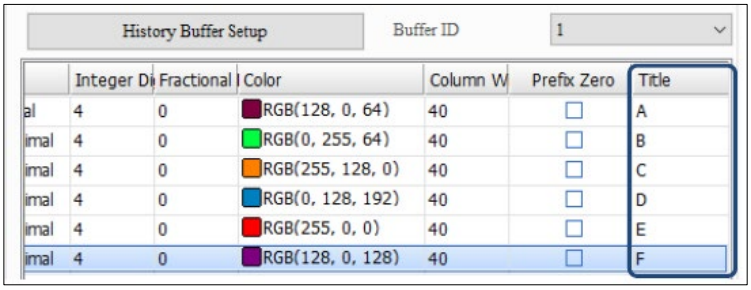
When the Read Length is 1 (Word) or 2 (Words), the supported data formats are different. The supported data formats are as follows.
For the Char format, if the Read Length is 1, it represents 2 Chars; if the Read Length is 2, it represents 4 Chars, and so on.
When the Read Length is 3 or above, Char is the only supported format.

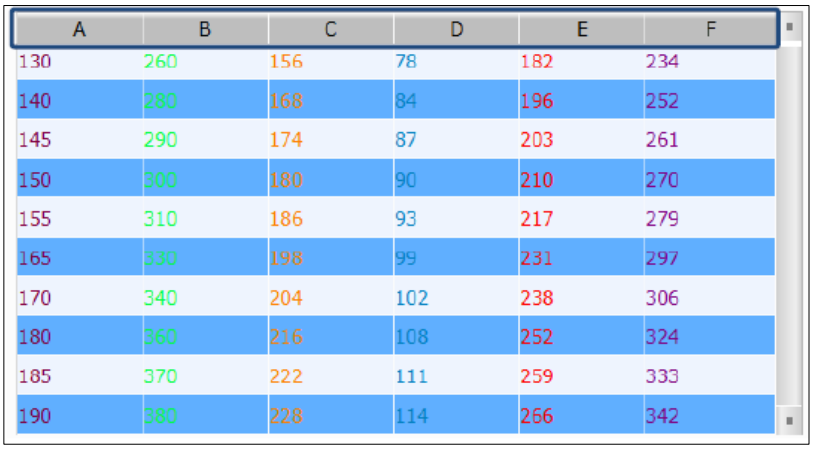
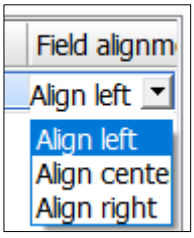
<table>
<tr><th colspan="3">Read Length is 1</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="6">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td>Char</td><td>2 characters</td></tr>
<tr><th colspan="3">Read Length is 2</th></tr>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="7">DWord</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Char</td><td>4 characters</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table>
NOTE:

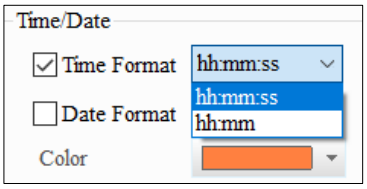
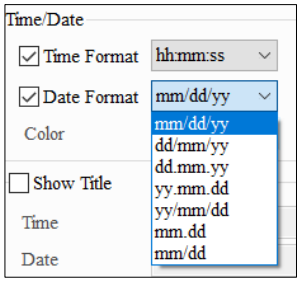
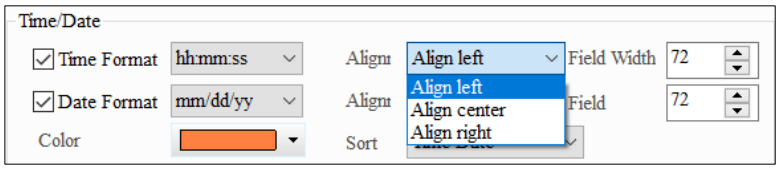
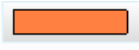
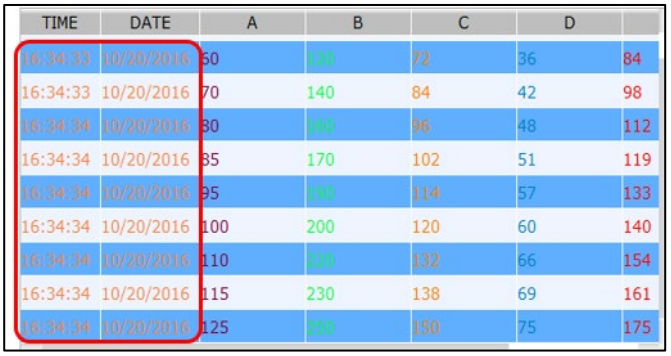
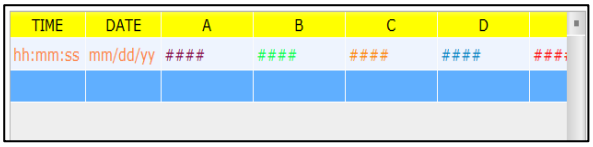
If users select Floating as the Data Format, set the Length to 2.
If users select Floating as the Data Format, but set the Length to 1 Word, DIAScreen displays a message to remind users that they need to set the Length to 2 or above.

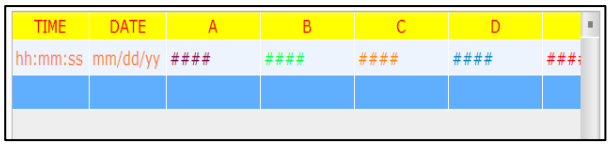
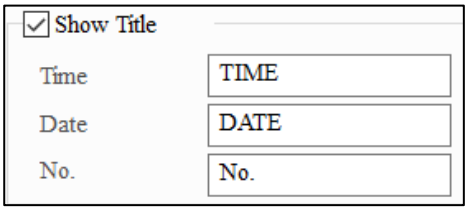
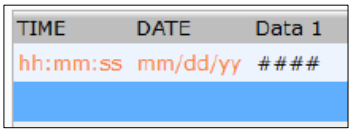
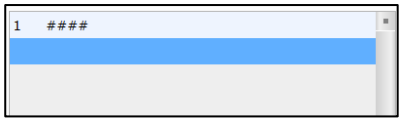
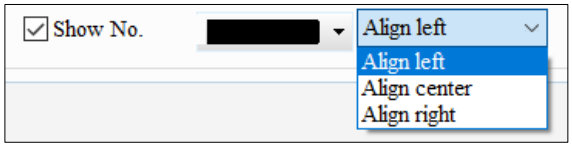
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td> 
</td></tr>
<tr><td></td><td></td><td>Integer Digits / Fractional Digits</td><td>● Set the number of integer digits and decimal places to be displayed as several digits.
● When Global range is checked, this function cannot be set.</td></tr>
<tr><td></td><td></td><td>Color</td><td>● Set the color for the display value.
 
</td></tr>
<tr><td></td><td></td><td>Column Width</td><td>● Column Width is for setting the distance between the numeric data records. For example, if the Column Counts is set to 2 and Column Width is set to 40, then the width between the first and second data records is 40.
● The Column Width is 40 by default and the setting range is 0 ~ 999.</td></tr>
<tr><td></td><td></td><td>Prefix Zero</td><td>The Prefix Zero function determines how many zeros to add to the beginning of the values based on the set number of Integer Digits. The following example shows integers of four digits.
<table>
<tr><td>Selected</td><td>
<table>
<tr><td>0140</td><td>0280</td></tr>
<tr><td>0145</td><td>0290</td></tr>
<tr><td>0150</td><td>0300</td></tr>
<tr><td>0160</td><td>0320</td></tr>
<tr><td>0165</td><td>0330</td></tr>
<tr><td>0175</td><td>0350</td></tr>
<tr><td>0180</td><td>0360</td></tr>
<tr><td>0185</td><td>0370</td></tr>
<tr><td>0195</td><td>0390</td></tr>
<tr><td>0200</td><td>0400</td></tr>
</table>
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td></td><td>Not Selected</td><td> 
</td></tr>
<tr><td>Title</td><td colspan="2">● This function allows to name the titles for the data display.
 


</td></tr>
<tr><td>Field alignment</td><td colspan="2">Set the alignment style for the text in the Title field. The available options for alignment styles are: Align left, Align center, and Align right. The default value is Align left.
 
</td></tr>
<tr><td>(3)</td><td>Time/Date</td><td>Time Format
Date Format</td><td colspan="2">● The available options for Time Format are: hh:mm:ss and hh:mm. The default value is hh:mm:ss.</td></tr>
</table>

No.	Function	Description	
			 ● The available options for **Date Format** are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is **mm/dd/yy**. 
		Alignment	Set the alignment style for **Time/Date**. The available options for alignment styles are: Align left, Align center, and Align right. The default value is **Align left**. 
		Field Width	Set the width for the **Time/Date**. The default value is **72**.
		Color	Set the displaying color of **Time/Date**. The default is  . 
(4)	Show Title	Background	Set the background color of the title column. Default is  . The background color is changed to yellow as shown in the following figure. 

No.	Function	Description	
		Text Color	Set the color of the title text. The default is [redacted]. The text color is changed to red as shown in the following figure. 
		Time Date No.	● The default names are in English.  ● Set the title names for the **Time**, **Date**, and **No.** 
(5)	Show No.	Show No.	When selected, the **No.** column is displayed. 
		Color	Set the text color of the **No.** The default is [redacted].
		Alignment	Set the Alignment style for the **No.** The available options are: Align left, Align center, and Align right. The default value is **Align left**. 

- Order

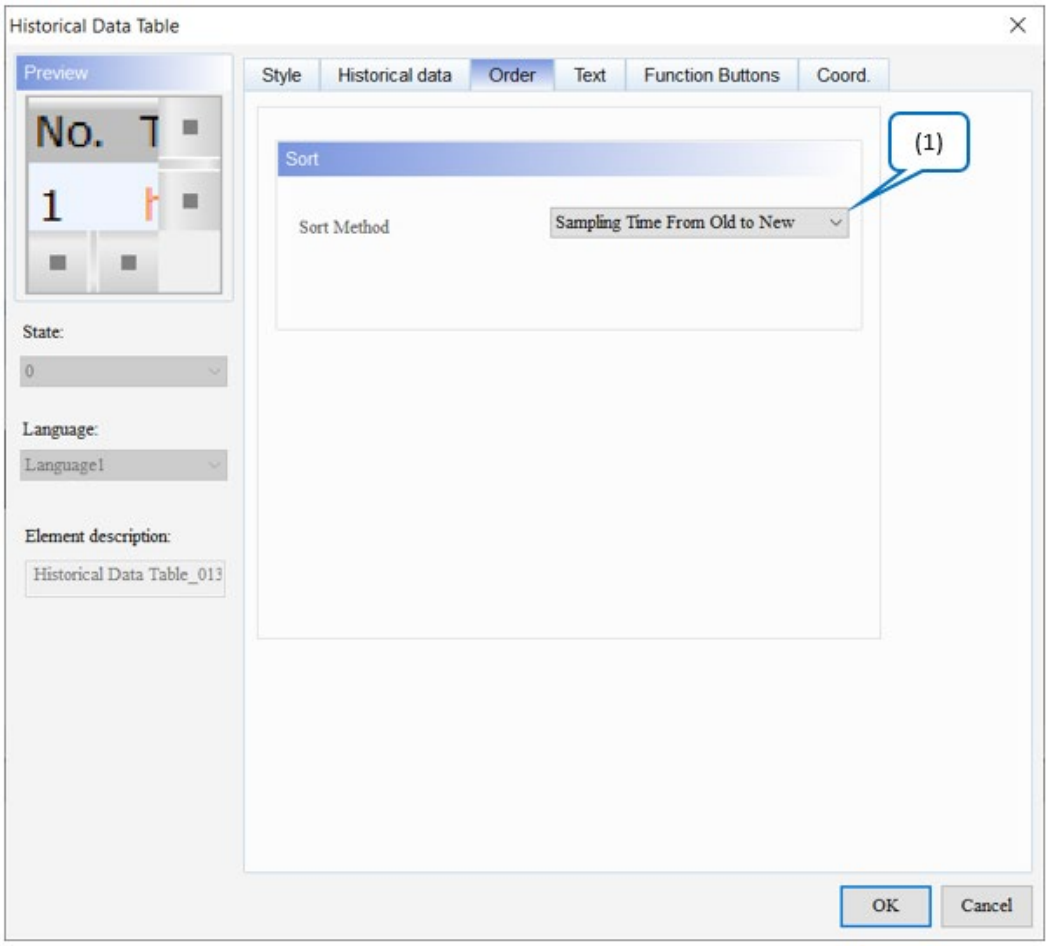
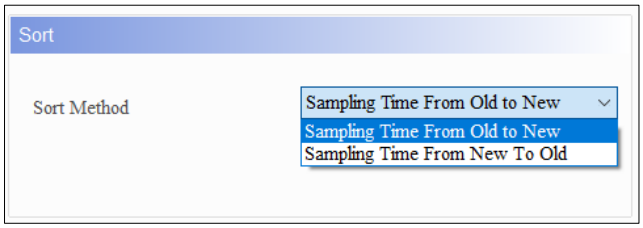


Figure 15 - 14: Historical Data Table element Order property page

No.	Function	Description
(1)	Sort Method	Select the data sorting method. The available options for **Sort Method** are: Sampling Time From Old to New and Sampling Time From New To Old. The default value is **Sampling Time From Old to New**. 

- Text

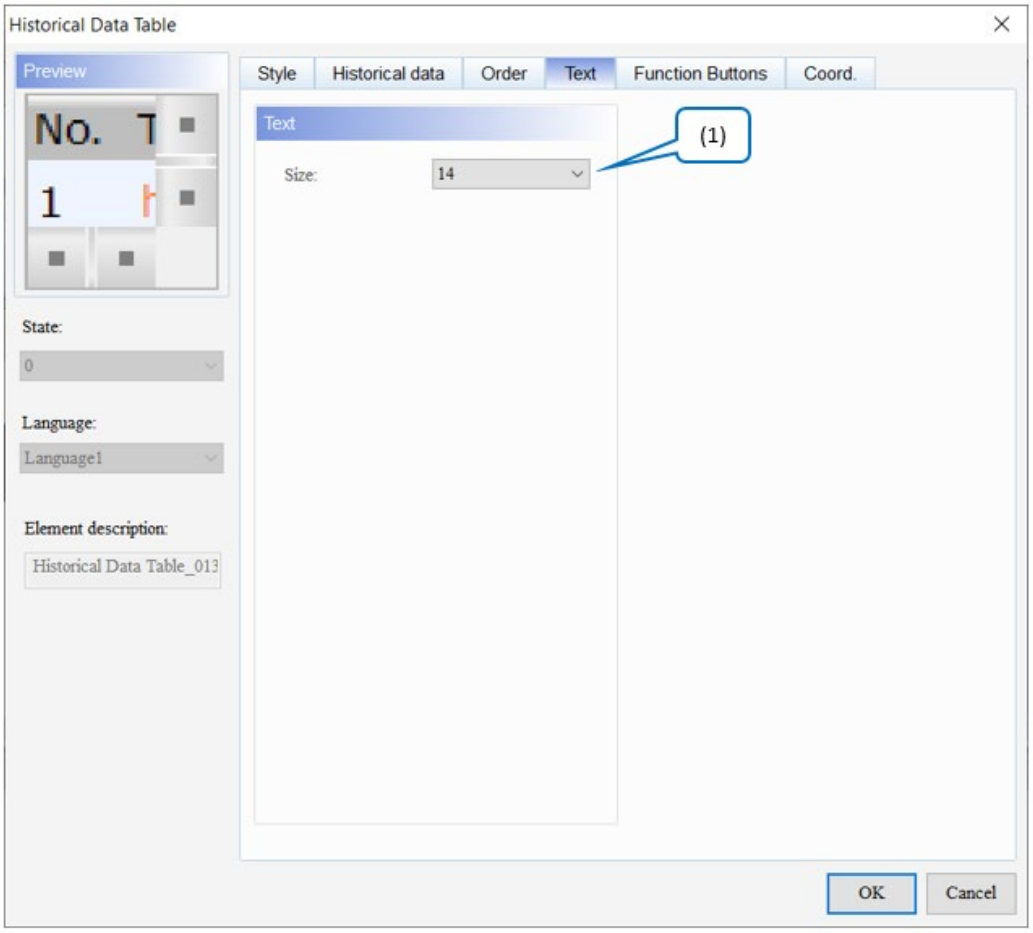
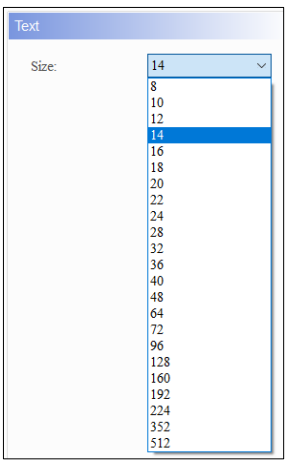


Figure 15 - 15: Historical Data Table element Text property page

No.	Function	Description
(1)	**Text**	Set the text size of the displayed numeric data. The default value is 14. 

- Function Buttons

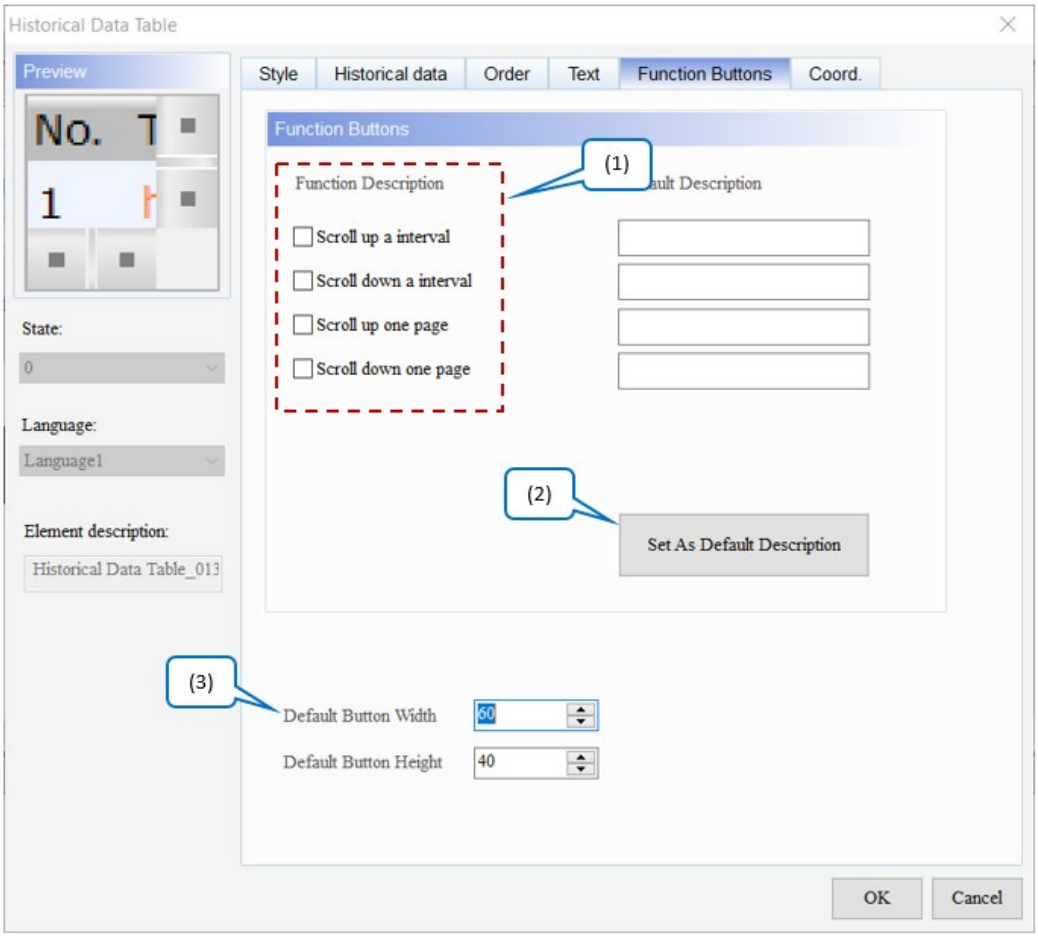
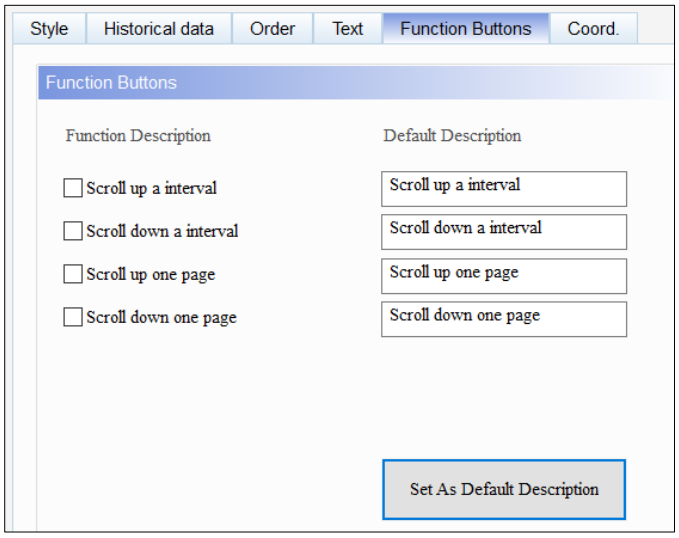


Figure 15 - 16: Historical Data Table element Function Buttons property page

No.	Function	Description
(1)	Function Description	Select the function buttons to display on the **Historical Data Table** element.
(2)	Set As Default Description	Select **Set As Default Description**. The default strings are automatically filled in the **Default Description** fields.

Scroll up an interval	Scroll up an interval.
Scroll down an interval	Scroll down an interval.
Scroll up one page	Scroll up one page.
Scroll down one page	Scroll down one page.

No.	Function	Description
		
(3)	Default Button Width / Height	Adjust the button width and height. The default values are **60** and **40**, respectively.

- Coord.

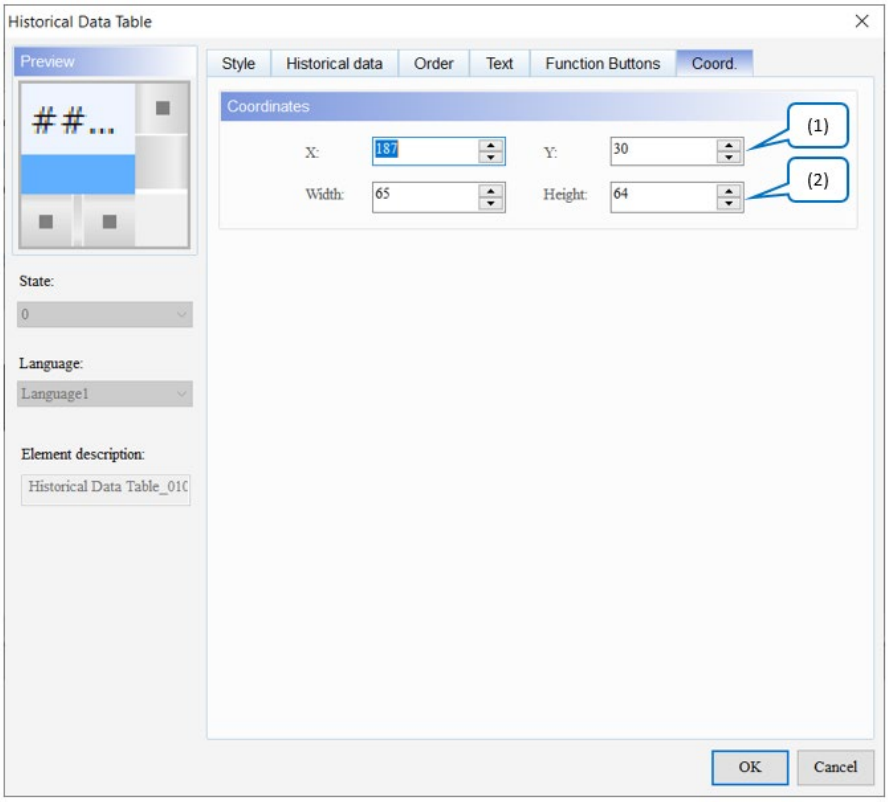


Figure 15 - 17: Historical Data Table element Coord. property page

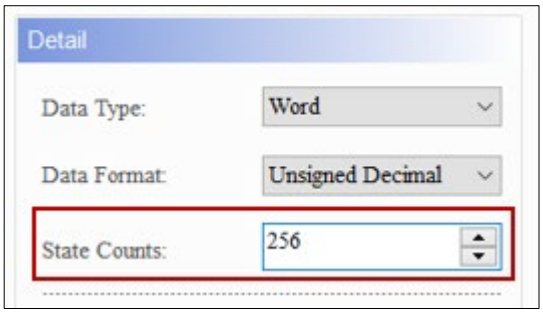
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

15.4 Historical Event Table

Historical Event Table supports **Data Type** as shown in following table. To add or reduce the total number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

<table>
<tr><th colspan="2">Historical Event Table</th></tr>
<tr><td>Data Type</td><td>State Counts</td></tr>
<tr><td>Word</td><td>

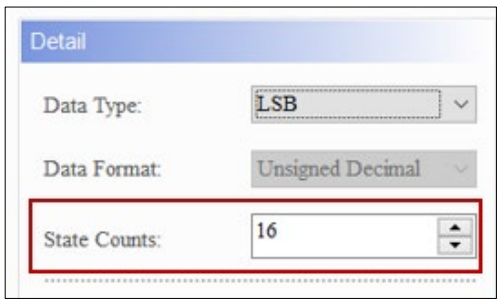
If the Data Type is Word, State Counts can be set from 1 ~ 256 states. The default value is 3.



If the Data Type is Word, the memory address is in units of Word.

</td></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>

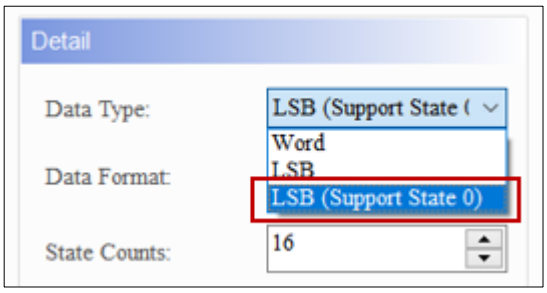
LSB is to first convert the data in the register to binary data, and then use the lowest non-zero bit to determine the current state of the object.
If the Data Type is LSB, State Counts can be set from 1 ~ 16 states except for State 0. The default value is 3.



</td></tr>
</table>

<table>
<tr><th colspan="2">Historical Event Table</th></tr>
<tr><th>Data Type</th><th>State Counts</th></tr>
<tr><td></td><td>

To display State 0, select LSB (Support State 0) for the Data Type.



If users select LSB, the element displays black when the state is 0.



When the Data Type is LSB or LSB (Support State 0), the memory address is also in units of Word.

</td></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>
The examples in the following table show how the state value is determined with the lowest non-zero bit of the binary value converted from a decimal value. There are also examples demonstrating how the software determines the displaying state value with the lowest bit when the decimal values are 3 and 7.
<table>
<tr><th>Decimal</th><th>Binary</th><th>State Value</th></tr>
<tr><td>0</td><td>0000000000000000</td><td>State = 0 when all bits are 0.

NOTE: LSB (Support State 0) must be selected.</td></tr>
<tr><td>1</td><td>0000000000000001</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>2</td><td>0000000000000010</td><td>The lowest non-zero bit is bit 1, State = 2.</td></tr>
<tr><td>3</td><td>0000000000000011</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>4</td><td>0000000000000100</td><td>The lowest non-zero bit is bit 2, State = 3.</td></tr>
<tr><td>7</td><td>0000000000000111</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The lowest non-zero bit is bit 3, State = 4.</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non-zero bit is bit 4, State = 5.</td></tr>
</table>
</td></tr>
</table>

Historical Event Table			
Data Type	State Counts		
	32	0000000000100000	The lowest non-zero bit is bit 5, State = 6.
	64	0000000001000000	The lowest non-zero bit is bit 6, State = 7.
	128	0000000010000000	The lowest non-zero bit is bit 7, State = 8.
	256	0000000100000000	The lowest non-zero bit is bit 8, State = 9.
	512	0000001000000000	The lowest non-zero bit is bit 9, State = 10.
	1024	0000010000000000	The lowest non-zero bit is bit 10, State = 11.
	2048	0000100000000000	The lowest non-zero bit is bit 11, State = 12.
	4096	0001000000000000	The lowest non-zero bit is bit 12, State = 13.
	8192	0010000000000000	The lowest non-zero bit is bit 13, State = 14.
	16384	0100000000000000	The lowest non-zero bit is bit 14, State = 15.
	32768	1000000000000000	The lowest non-zero bit is bit 15, State = 16.

On double-clicking the **Historical Event Table** element, the property page appears as follows.

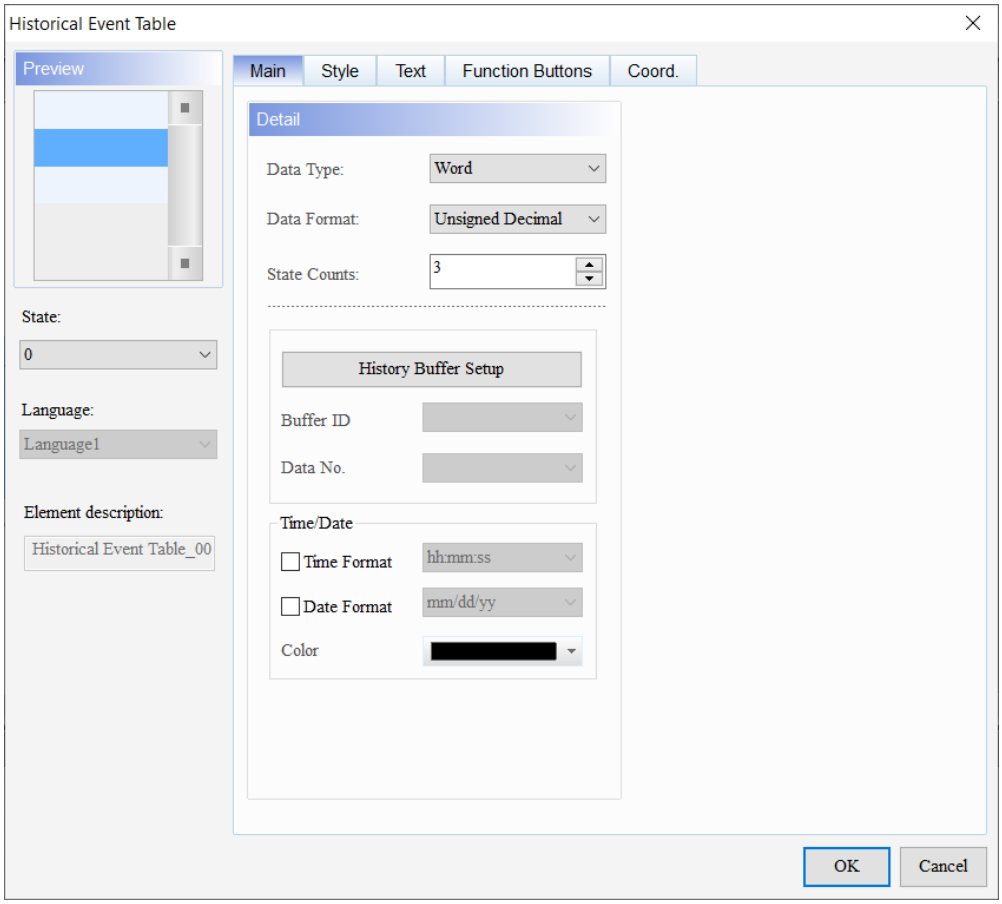


Figure 15 - 18: Historical Event Table element property page

Historical Event Table	
Function	**Description**
Preview	The **Historical Event Table** elements support multiple state values and multi-language data display.
Main	Set the Data Type, Data Format, State Counts, Buffer ID, and Data No. Set the Time/Date.
Style	Set the Border Color, Background Color, Row Color, Alternating Row, and Select Row Color. Set Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment type.
Function Buttons	Select the function buttons to enable and set the width and height of the buttons.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

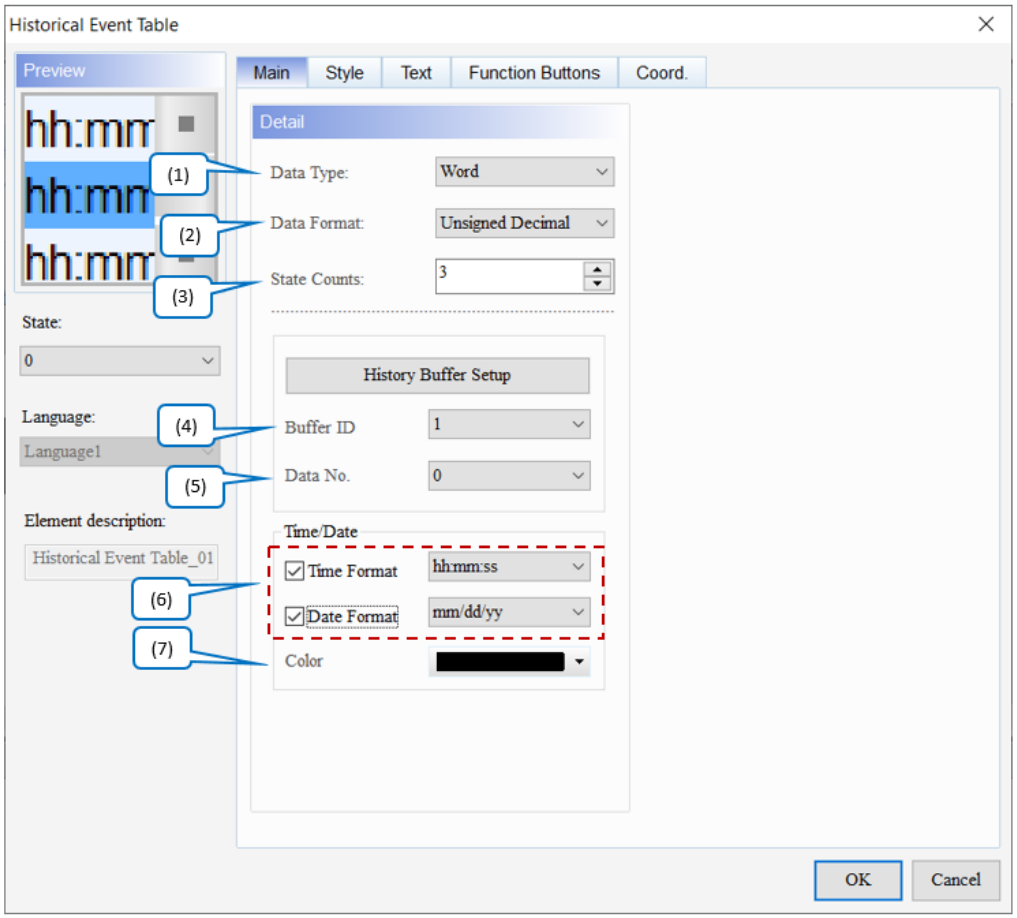
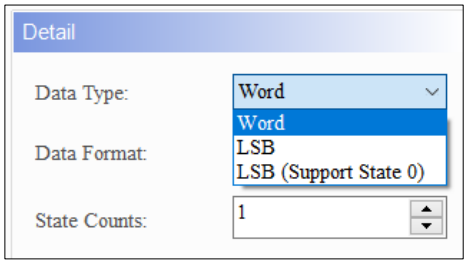
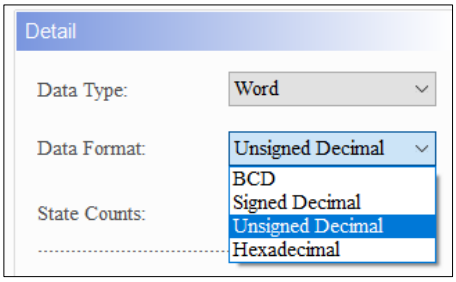
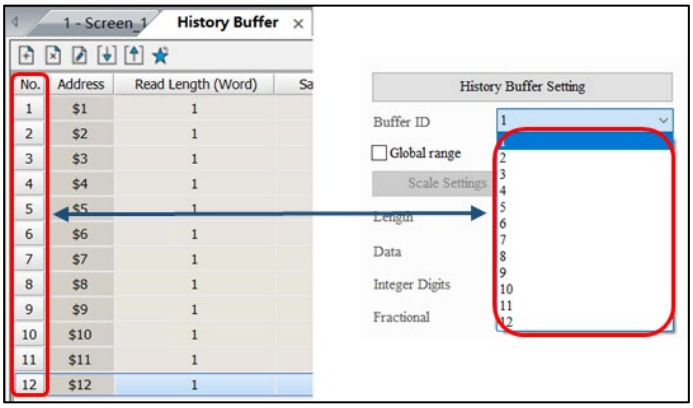
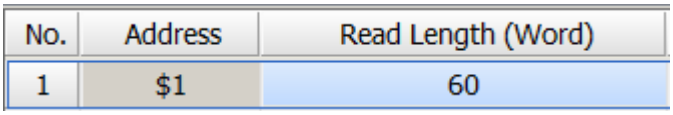
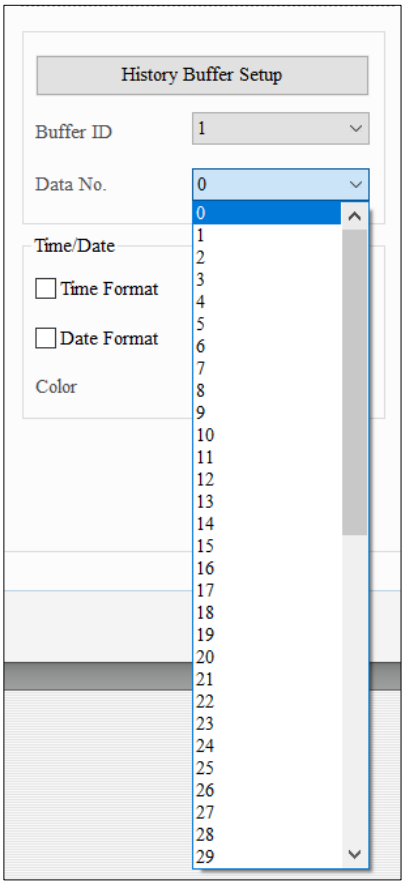
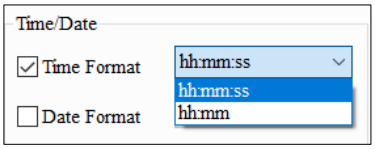
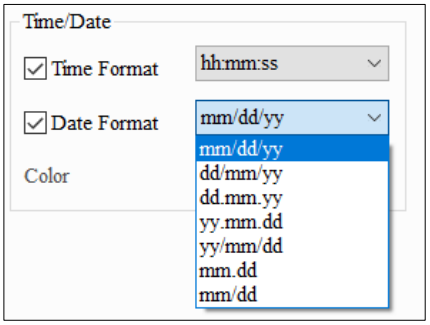
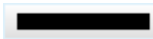
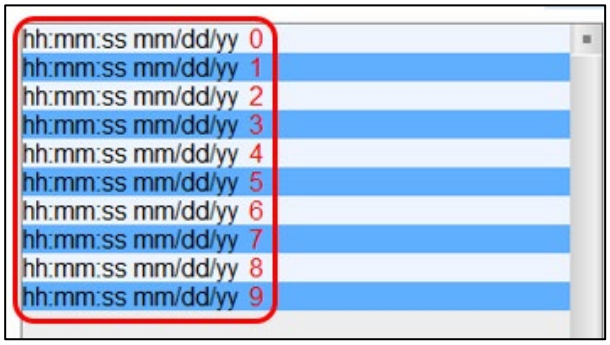


Figure 15 - 19: Historical Event Table element Main property page

No.	Function	Description
(1)	Data Type	The available options for **Data Type** are: Word, LSB, and LSB (Support State 0). The default value is **Word**. 
(2)	Data Format	Select the **Data Format** only when the **Data Type** is Word. The available options for **Data Format** are: BCD, Signed Decimal,

No.	Function	Description
		Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(3)	State Counts	• Set the **State Counts** for the **Historical Event Table** element. The default value is **3**. • If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.
(4)	Buffer ID	The **Buffer ID** corresponds to the set data number in the **History Buffer Setup**. The **History Buffer Setup** can set up to 12 sets of data, so the **Buffer ID** can be up to 12 sets. 
(5)	Data No.	**Data No.** corresponds to the **Read Length (Word)** set in the **History Buffer Setup**. When the **Read Length (Word)** is 1, the **Data No.** is 0; when the **Read Length (Word)** is 2, the **Data No.** can be 0 or 1. Thus, when the **Read Length (Word)** is 60 words, the **Data No.** is 0 ~ 59. 

No.	Function	Description
		
(6)	Time Format	● The available options for **Time Format** are: hh:mm:ss and hh:mm. The default value is **hh:mm:ss**. 
	Date Format	● The available options for **Date Format** are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is **mm/dd/yy**. 

No.	Function	Description
(7)	Color	Set the displaying color of date and time. The default is  . 

- Style

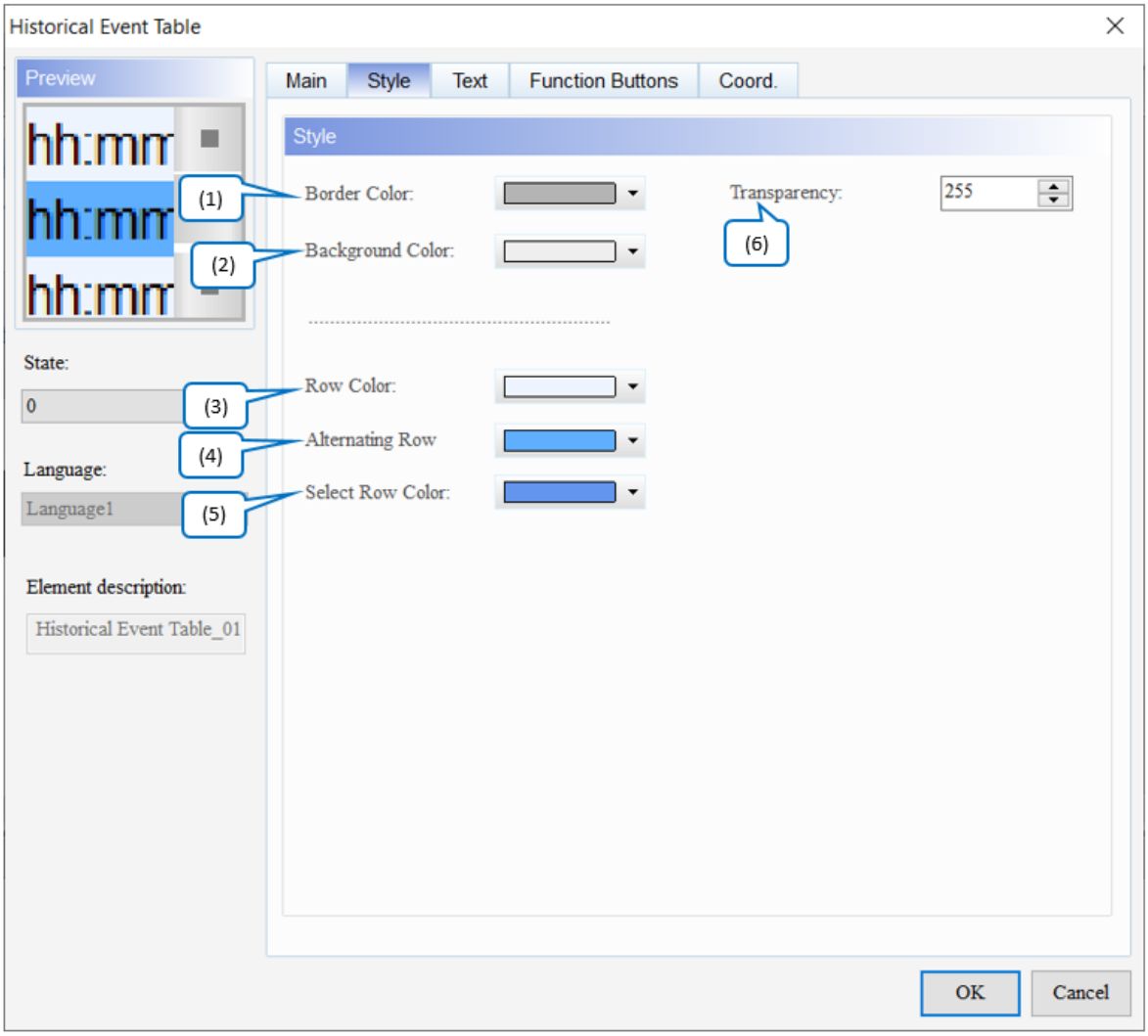
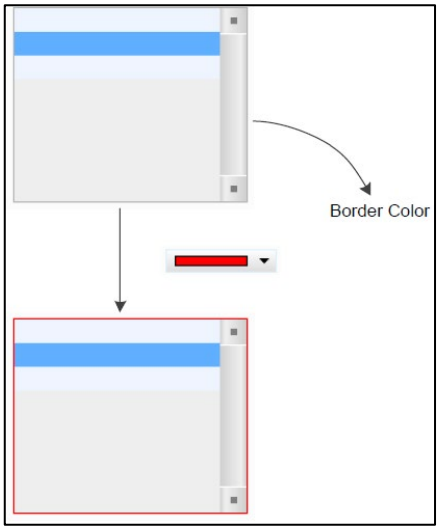
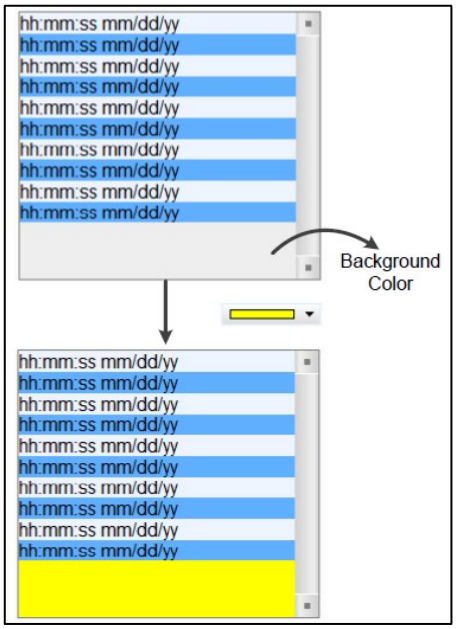
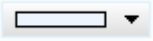
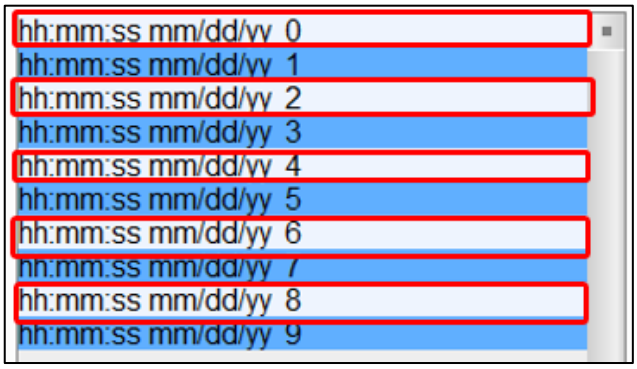
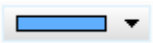
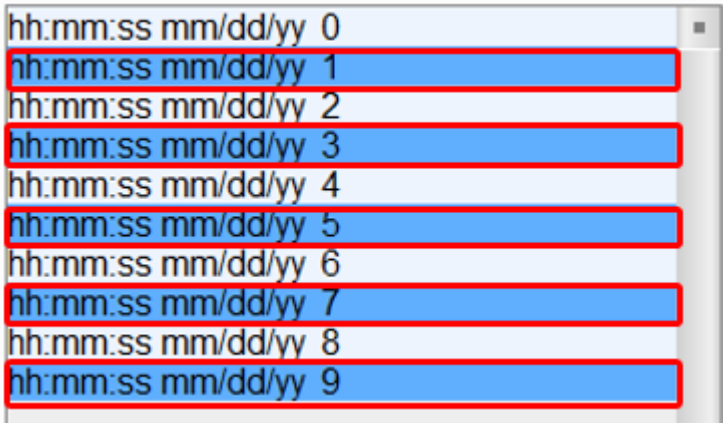
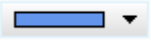
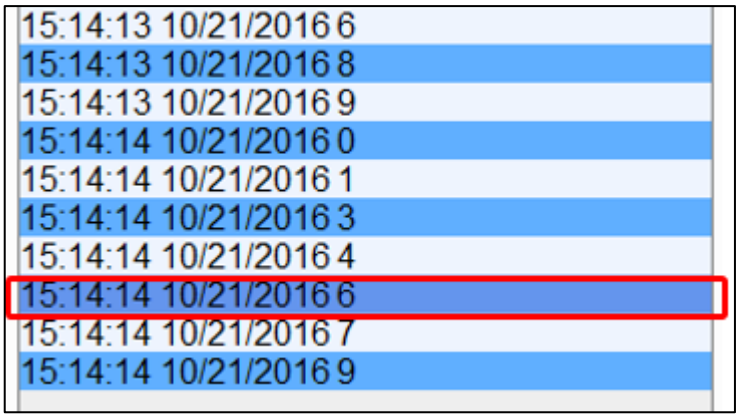


Figure 15 - 20: Historical Event Table element Style property page

No.	Function	Description
(1)	Border Color	Set the border color of the element. The default is  . 
(2)	Background Color	Set the background color of the element. The default is  . 
(3)	Row Color	Set the color of the odd rows. The default is  . 

No.	Function	Description
(4)	Alternating Row	Set the color of the even rows. The default is  . 
(5)	Select Row Color	Select the data rows to view the rows in the color specified in this setting. The default is  . 
(6)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Text

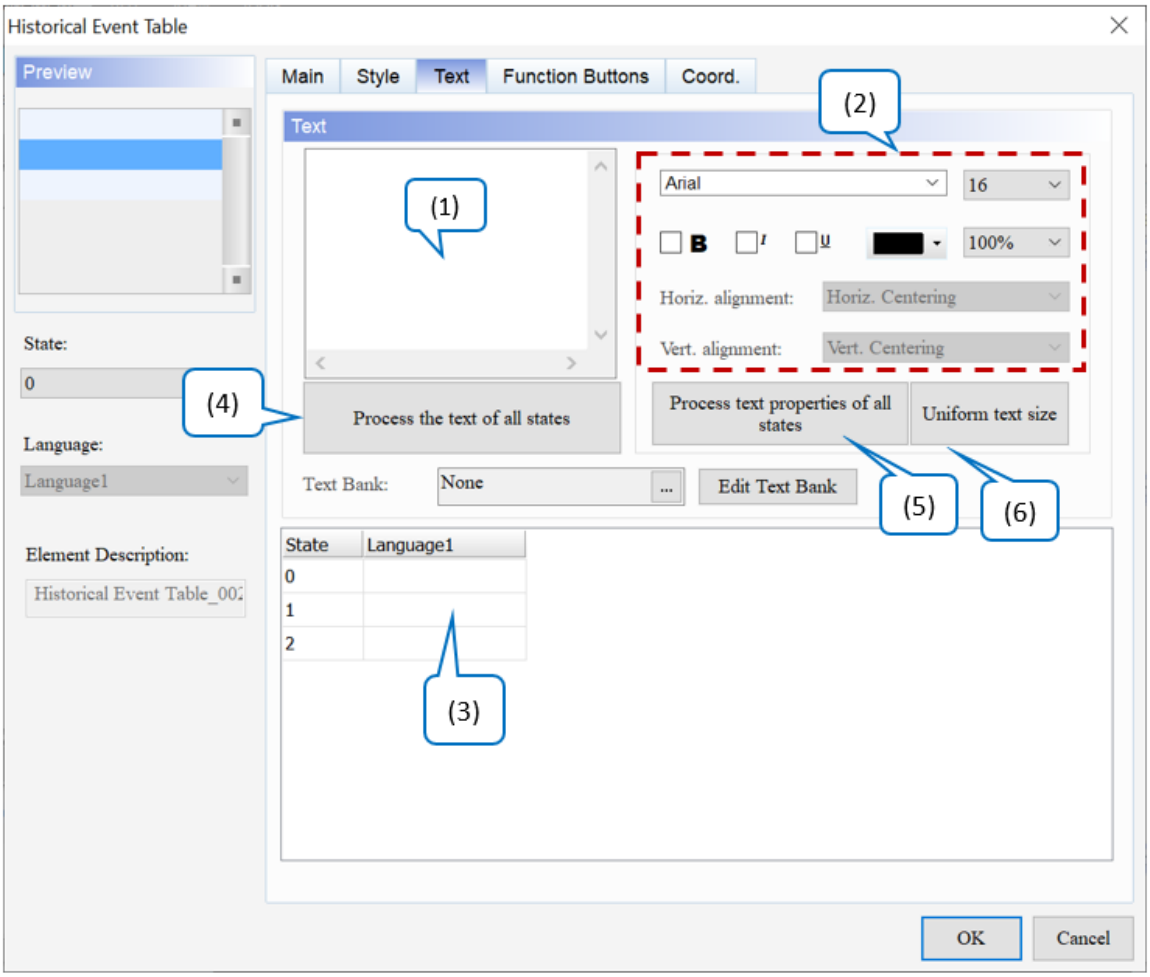
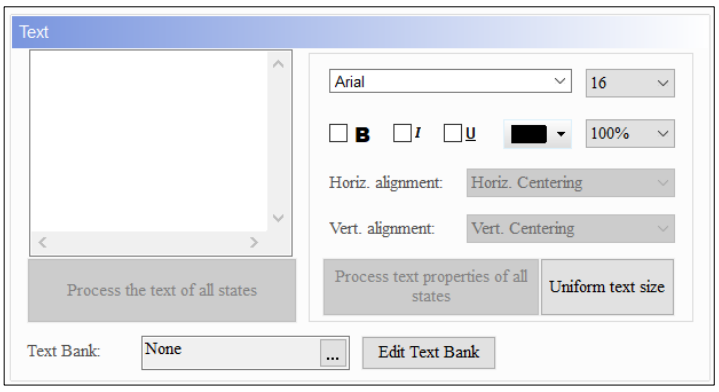
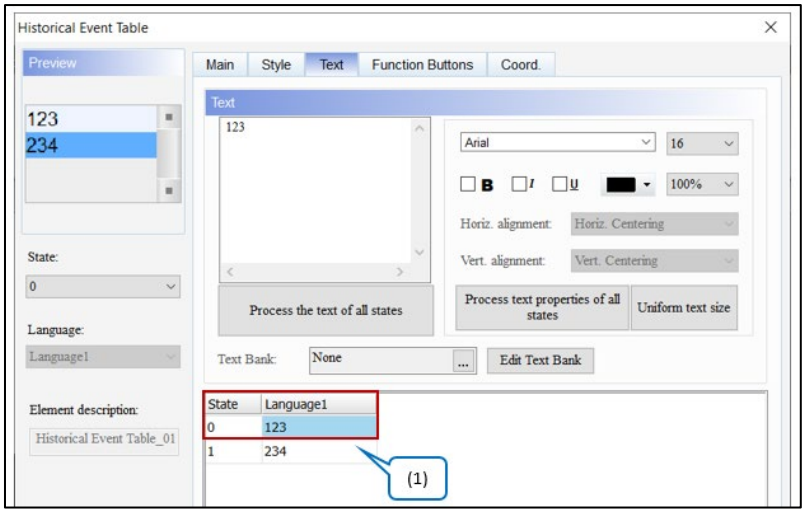
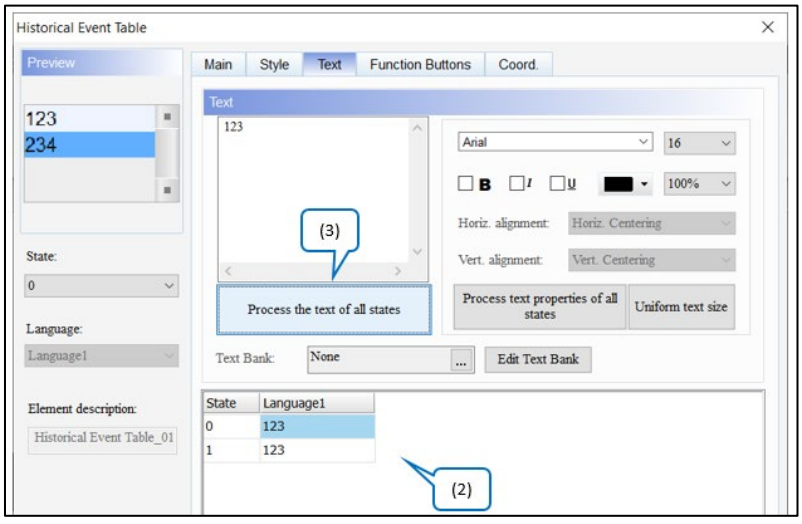


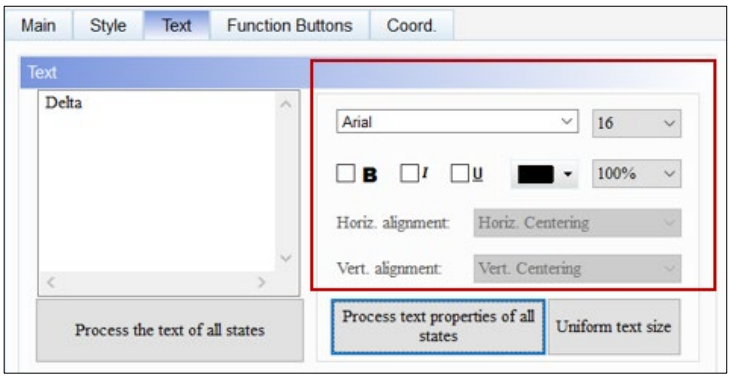
Figure 15 - 21: Historical Event Table element Text property page

No.	Function	Description
(1)	Text	Enter the text message to be displayed in the box. 

No.	Function	Description
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit Multi-language text	If users have added multi-language texts, the **Text** property page allows them to edit multi-language data.
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state users select. ● The following illustrates the steps: 1. Input *123* to State 0, and *234* to State 1. 2. Click State 0. 3. Click **Process the text of all states**, and State 1 text changes to *123*. Before  After 

(5) Process text properties of all states

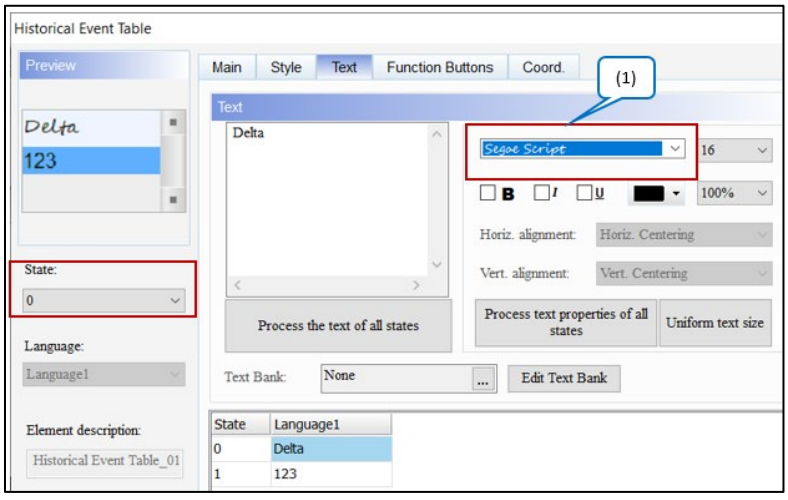
This function changes all the text properties based on the state selected. Items included in the text property are shown in the following figure.

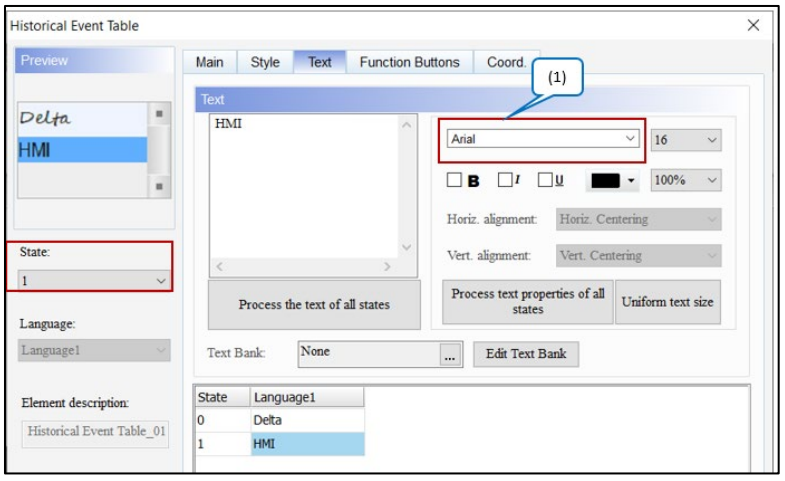


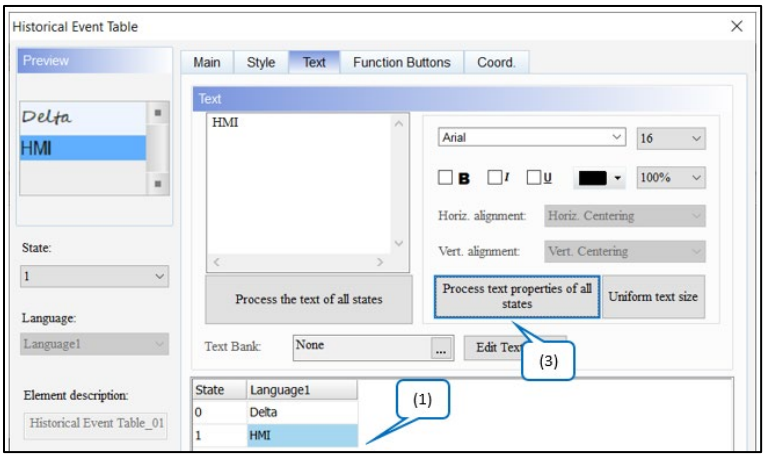
Refer to the following example:

- The following is an example description:
  1. Input *Delta* to State 0, and set the font to Segoe Script; input *HMI* to State 1, and set the font to Arial.
  2. Click State 0.
  3. Click **Process text properties of all states**, and State 1 font changes to Segoe Script.

Before Change





No.	Function	Description
		After Change 
(6)	Uniform text size	● This function is for all language texts, and will change the size of texts at one time according to the selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

- Function Buttons

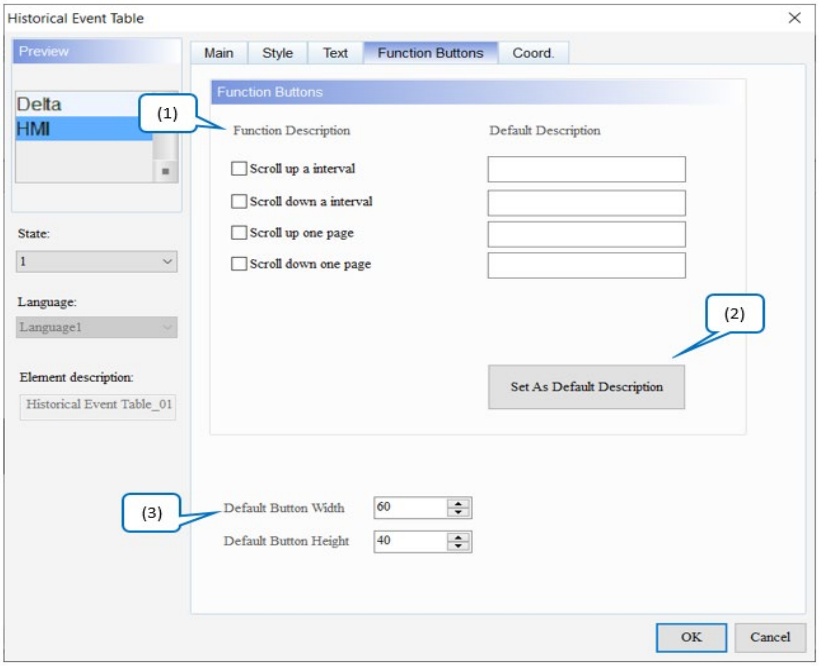
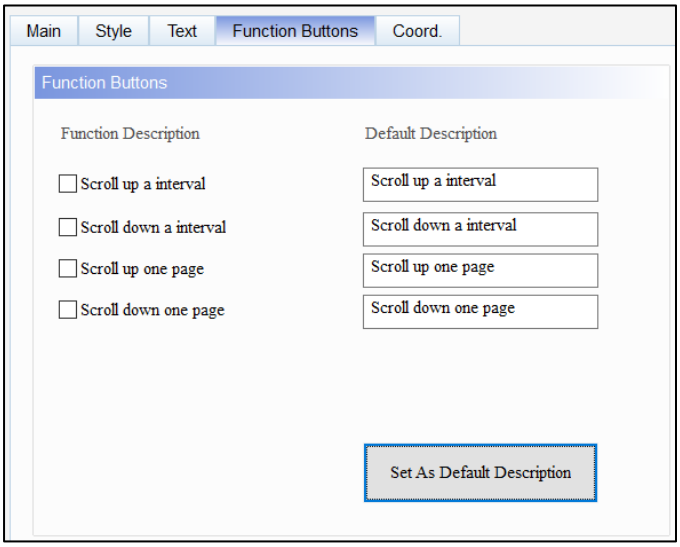


Figure 15 - 22: History Event Table element Function Buttons property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Function Description</td><td>Select the Function Buttons to display on the Historical Data Table element.
<table>
<tr><td>Scroll up an interval</td><td>Scroll up an interval.</td></tr>
<tr><td>Scroll down an interval</td><td>Scroll down an interval.</td></tr>
<tr><td>Scroll up one page</td><td>Scroll up one page.</td></tr>
<tr><td>Scroll down one page</td><td>Scroll down one page.</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Set As Default Description</td><td>Select Set As Default Description. The default strings are automatically filled in the Default Description fields.

</td></tr>
<tr><td>(3)</td><td>Default Button Width / Height</td><td>Adjust the button width and height. The default values are 60 and 40, respectively.</td></tr>
</table>

- Coord.

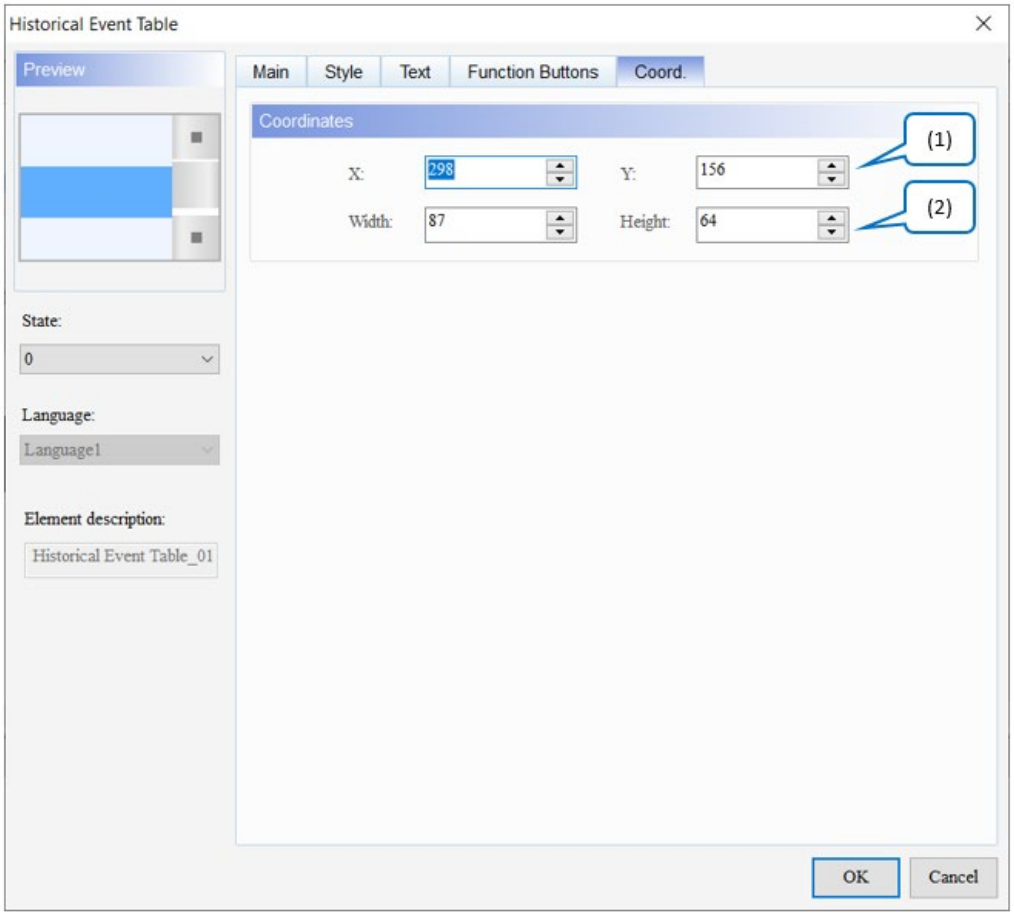


Figure 15 - 23: Historical Event Table element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

15.5 Historical Overview Table

The **Historical Overview Table** element is for viewing the stored **Historical Trend Graph** data. The left hand side of the element is the file browsing area and the right hand side is the trend graph. Select **Historical Trend Graph** data stored in the USB Disk or SD Card through the file browsing area on the left. Like the **Historical Trend Graph**, a **Historical Overview Table** can display up to 60 curves and read 60 words.

On double-clicking the right hand side of **Historical Overview Table** element, the property page appears as follows.

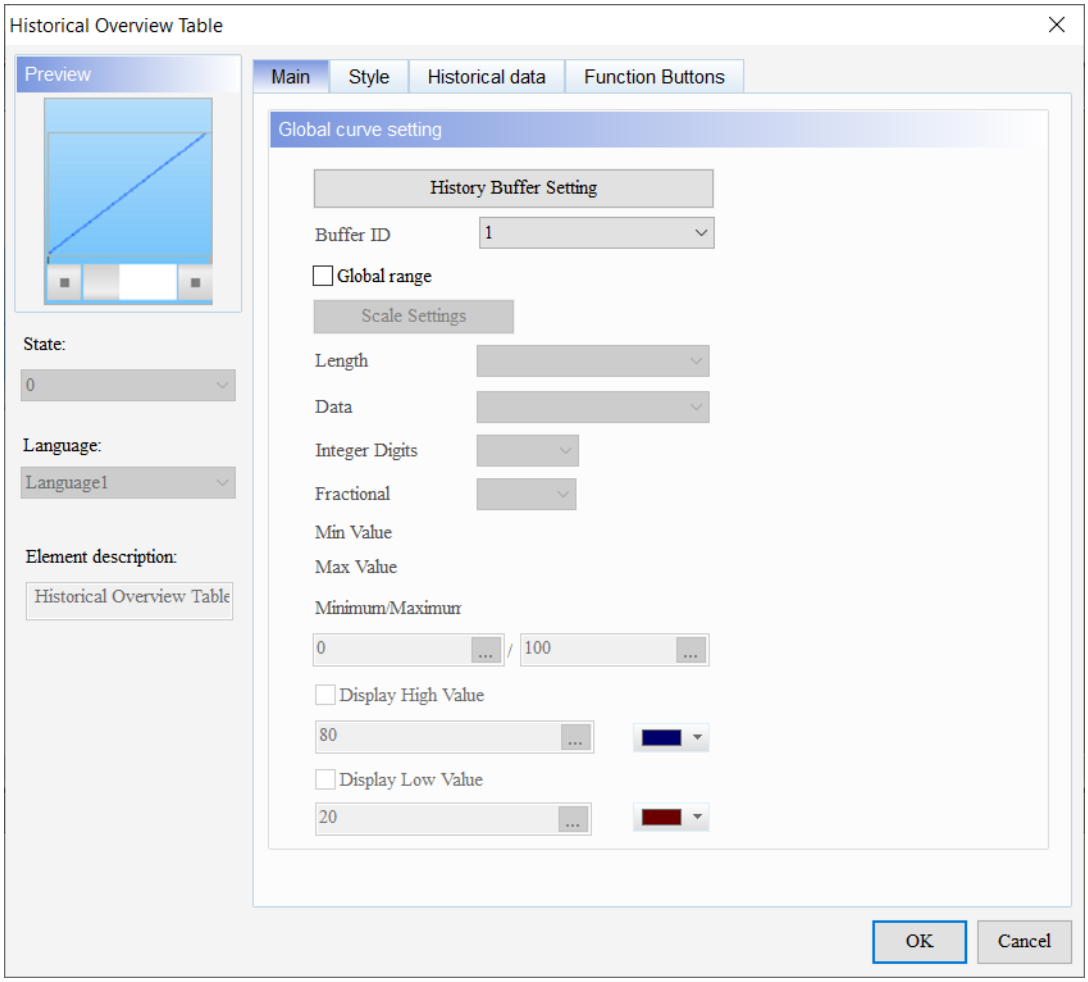


Figure 15 - 24: Historical Overview Table element property page

Historical Overview Table		
Function	**Description**	
Preview	The **Historical Overview Table** element displays data without multiple state values and multiple Chinese.	
Main	Data	Set the Buffer ID.
	Global range	Set the Scale Settings, Length, Data Format, Integer Digits, Fractional, Minimum/Maximum, Display High Value, Display Low Value, High Value color, and Low Value color.
	Scale Settings	Set the scale display, marker display, text size, text color, scale color, number of main scales, number of subscales, and scale width.
Style	Set the Number of Curves, Filling Curve, Horiz. Grid Number Gridline Color, Border Color, Background Color, Filled style, Transparency, Anti-aliasing, and Margin.	
Historical data	Individual curve setting	Set whether to enable curve, Length, Start Position, Data Format, Integer Digits, Fractional Digits, Line Weight, Line Color, Minimum, and Maximum.
	Time / Date	Set Time Format, Date Format, Display time/date, Time Interval, Color, and Font size.
Function Buttons	Select the Function Buttons to enable and set the Width and Height of the buttons.	

- Main

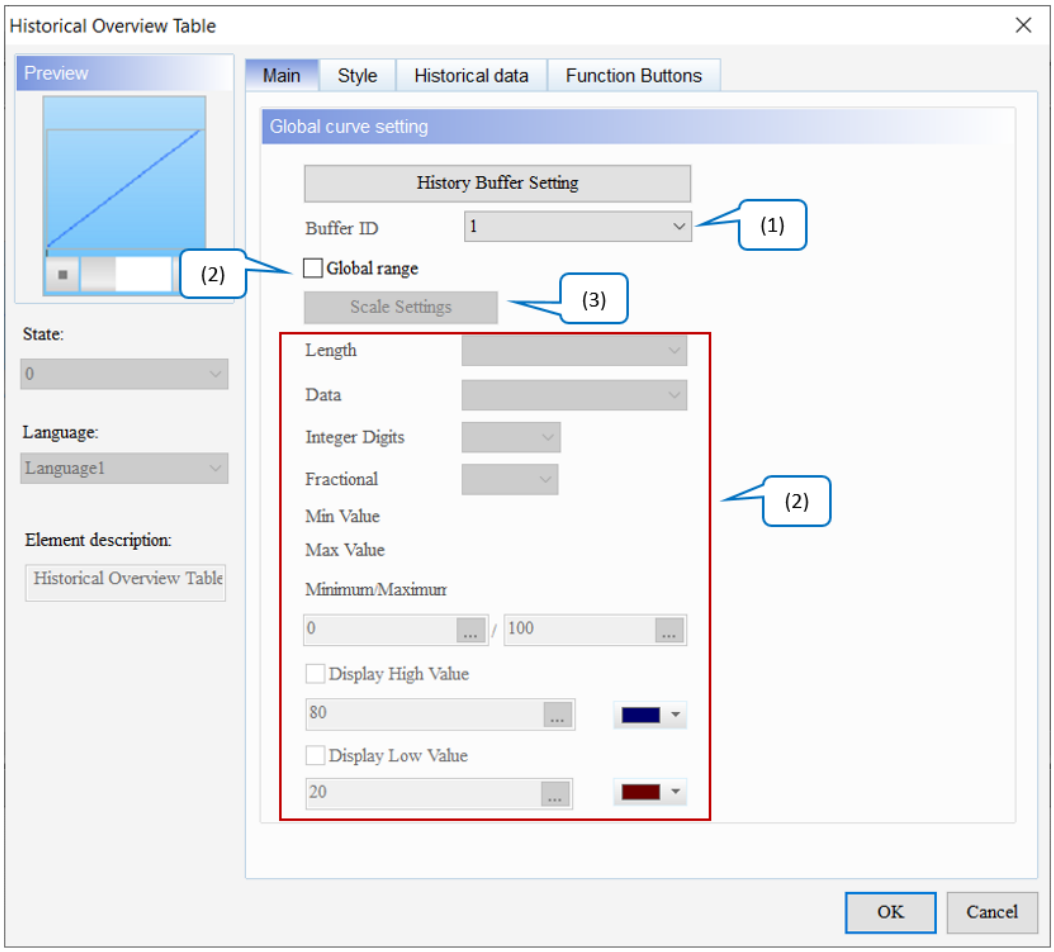
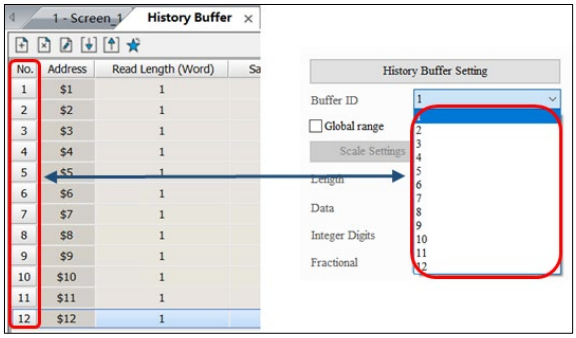
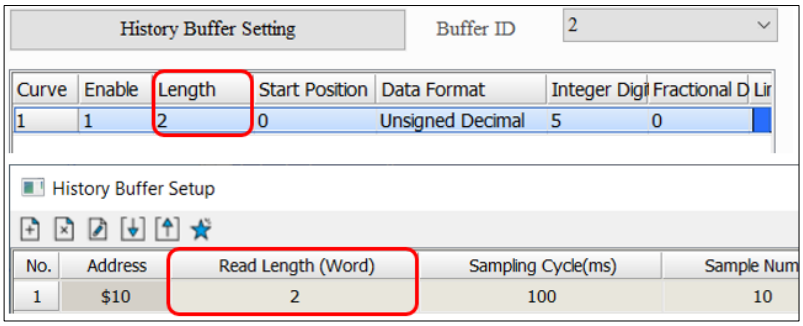
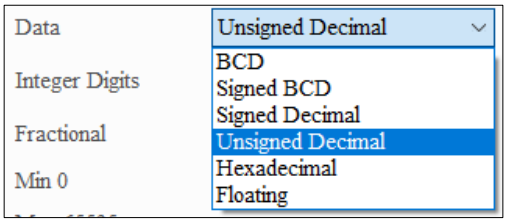


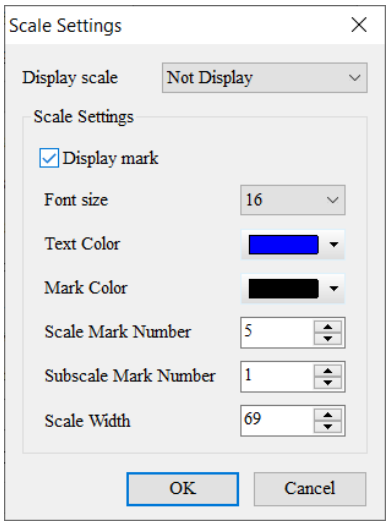
Figure 15 - 25: Historical Overview Table element Main property page

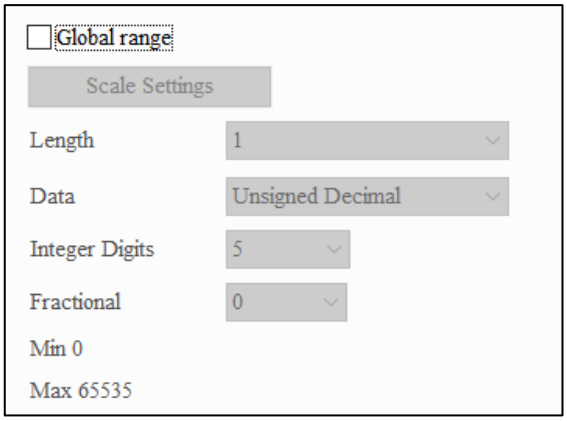
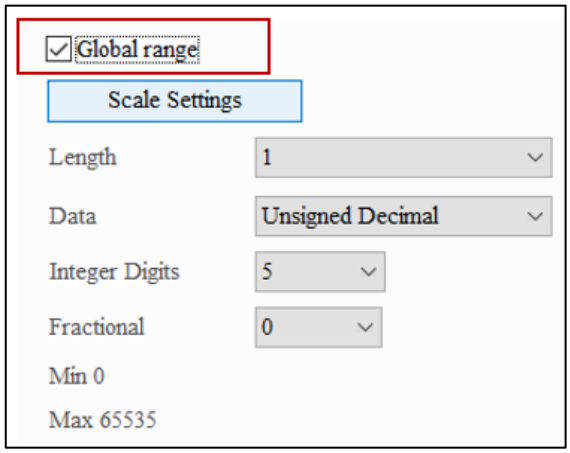
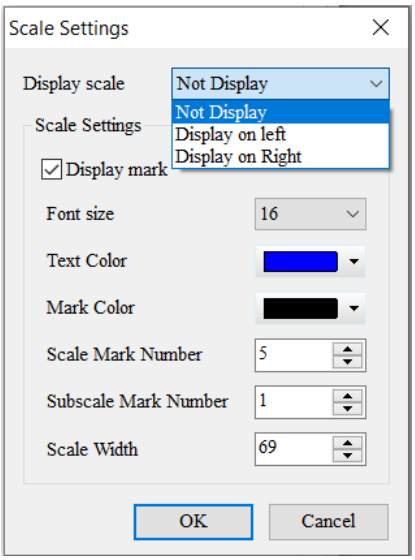
No.	Function	Description
(1)	Buffer ID	The **Buffer ID** is the data number that corresponds to the **History Buffer Setting**. The **History Buffer Setting** can increase the number of history data pens up to 12, so **Buffer ID** can be set up to 12 groups. 

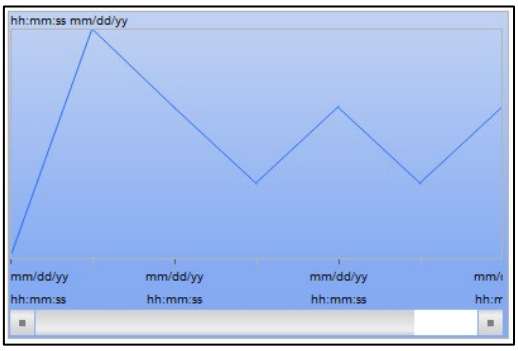
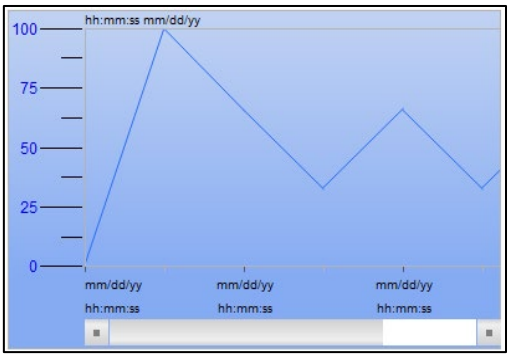
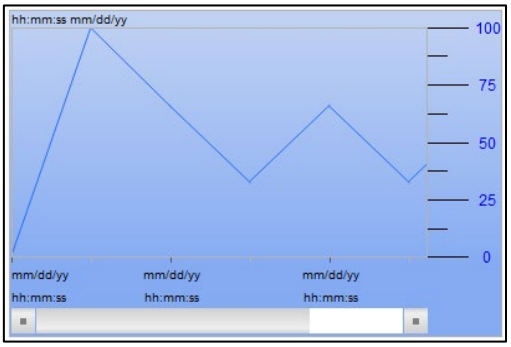
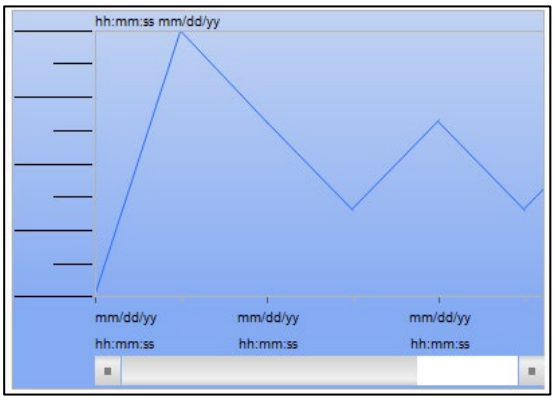
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4">(2)</td><td rowspan="4">Global range</td><td>Length</td><td>
The Length can be set to 1 or 2.
When the Length is 1, it means that the length of the data read is 1 Word; When the Length is 2, it means that the length of the data read is 2 Word.
NOTE: When Length is 2, the Read Length (Word) must be more than 2 values.


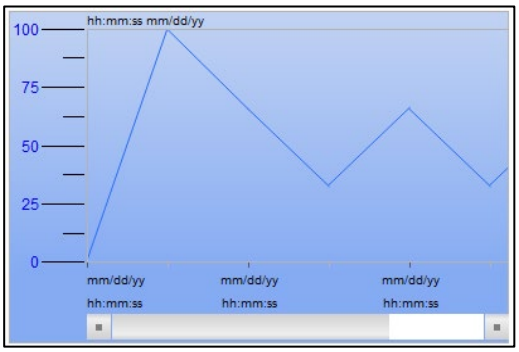
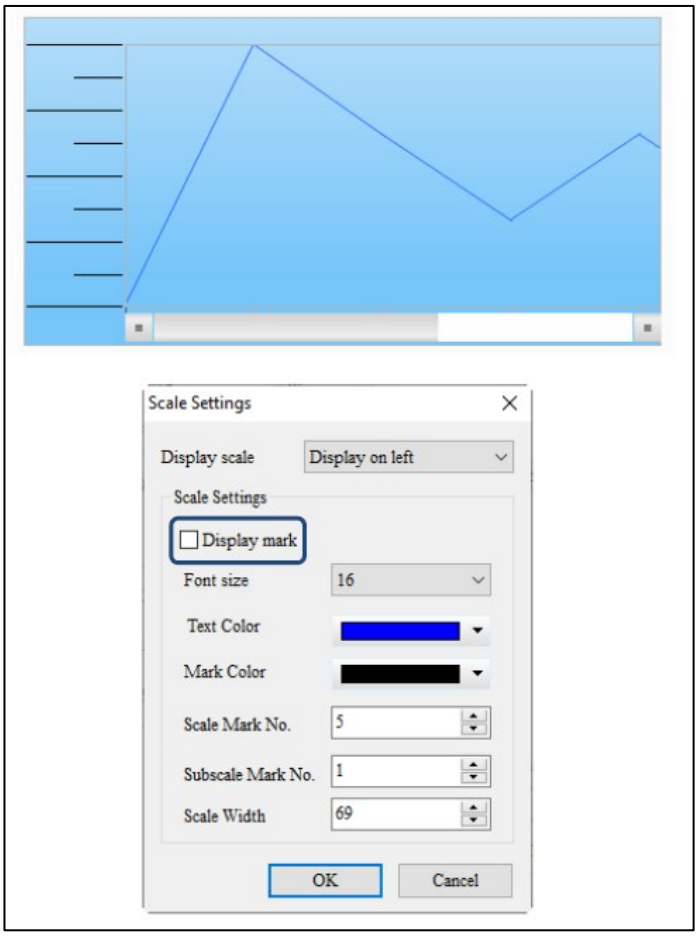
</td></tr>
<tr><td>Data Format</td><td>
The available options for Data Format of Historical Overview Table are: BCD, Signed BCD, Signed Decimal, Unsigned Decimal, Hexadecimal, and Floating. The default value is Unsigned Decimal.


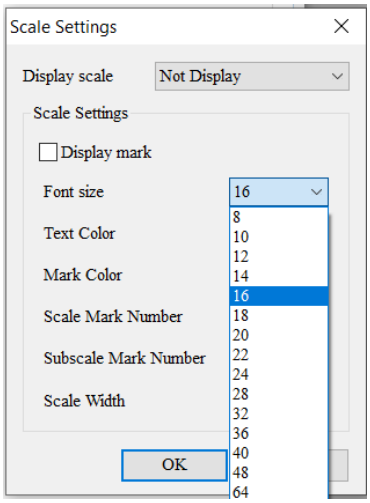
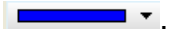
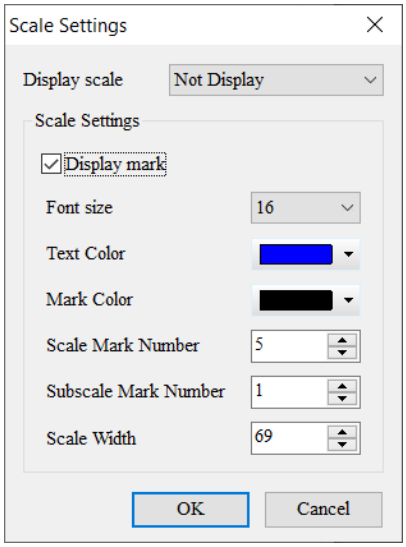
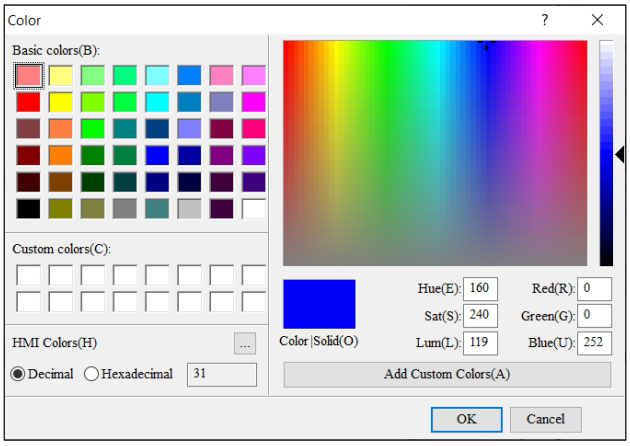
Floating can only be used if Length is 2.
</td></tr>
<tr><td>Integer / Fractional Digits</td><td>Set the displaying number of integer digits and the number of decimal places.</td></tr>
<tr><td>Minimum / Maximum</td><td>
If the Global range is checked, the Minimum and Maximum values of the curve in the advanced page cannot be set, and the minimum and maximum values of the global will be the main value; conversely, if the Global range is not checked, the Minimum and Maximum values of the curves in the advanced page can be set.
The Minimum and Maximum values can be set as constants or variables.
When the Minimum and Maximum values are variables, users can support picking the controller address (Word) and the internal register address.
When the Minimum and Maximum values are constant, the legal range of values varies depending
</td></tr>
</table>

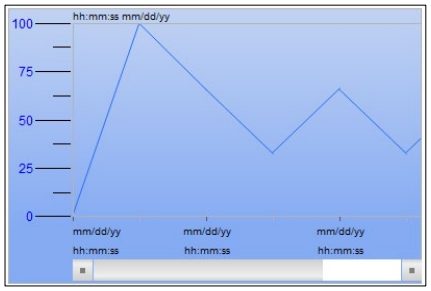
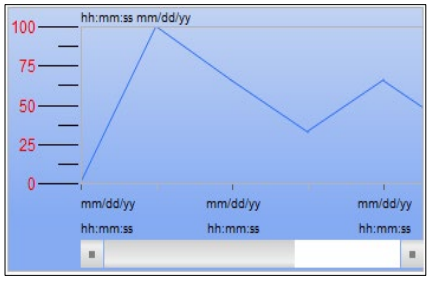
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td></td><td>on the selected Data Type and Data Format.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="6">DWord</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table></td></tr>
<tr><td>Display High Value / Display Low Value</td><td>Display High Value / Display Low Value are available on the Historical Overview Table. Users can set the Display High / Low Values with constants or using the Internal Memory or controller register address (Word). Also, users can set the displaying colors for Display High / Low Values.</td></tr>
<tr><td>(3)</td><td>Scale Settings</td><td colspan="2"> 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td colspan="2">Scale Settings is available only when the Global range checkbox is selected.
<table>
<tr><td>Uncheck</td><td> 
</td></tr>
<tr><td>Check</td><td> 
</td></tr>
</table>
<table>
<tr><td>Display scale</td><td>The available options for Display scale are: Not Display, Display on left, and Display on Right. The default value is Not Display.

</td></tr>
</table></td></tr>
</table>

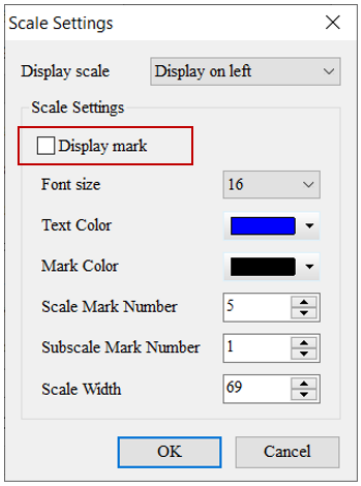
<table>
<tr><th>No.</th><th>Function</th><th colspan="3">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="3"></td><td>Not Display</td><td> 
</td></tr>
<tr><td>Display on Left</td><td> 
</td></tr>
<tr><td>Display on Right</td><td> 
</td></tr>
<tr><td></td><td></td><td>Display Mark</td><td colspan="2">Select to display the scale numbers or not.
Not selected 
</td></tr>
</table>

No.	Function	Description		
			Selected	
		Font size	The **Font size** setting is valid only when **Display mark** is selected.  The **Font size** is the size of the number displayed on the scale, and the font size of 8 ~ 512 is available for the users to choose. The default value is **16**.	

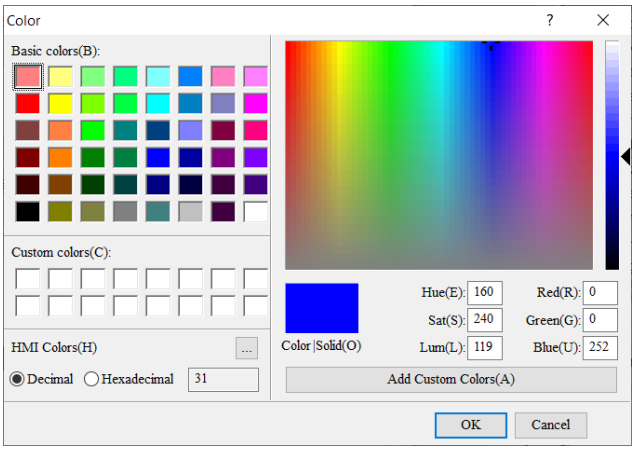
No.	Function	Description	
			
		Text Color	● The **Text Color** setting is valid only when **Display mark** is selected. The default is  .  ● Set the text color to display. 

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Before</td><td> 
</td></tr>
<tr><td>After</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td>Mark Color</td><td>

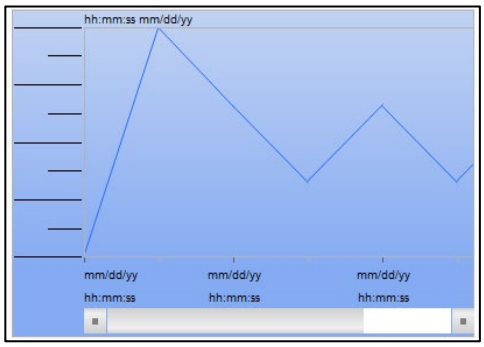
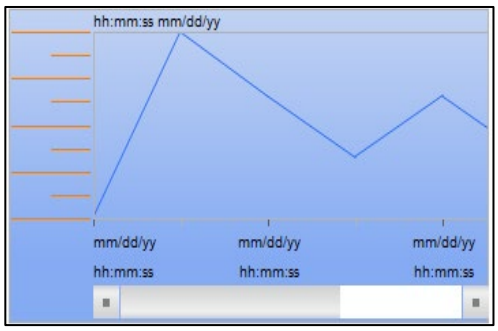
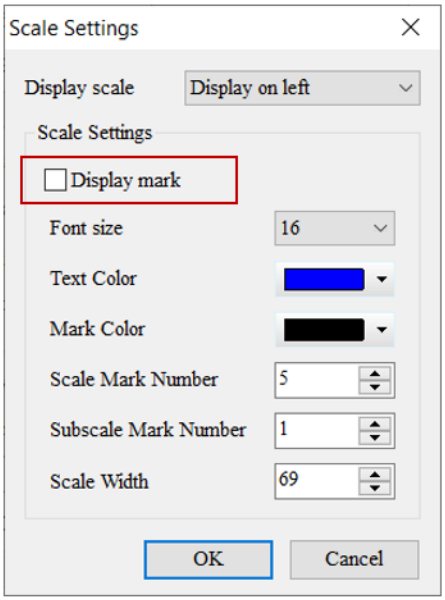
The Mark Color setting is valid even if Display mark is not selected. The default is .



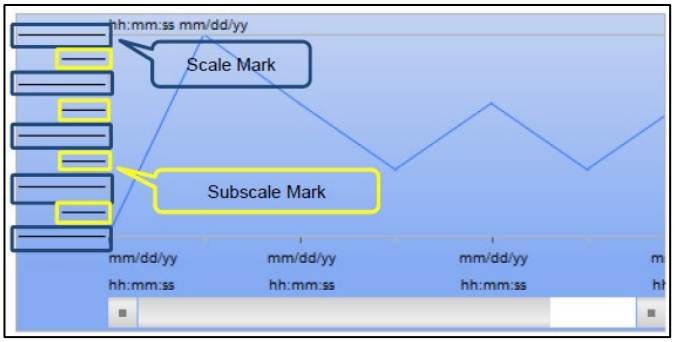
Set the color of the mark to display.

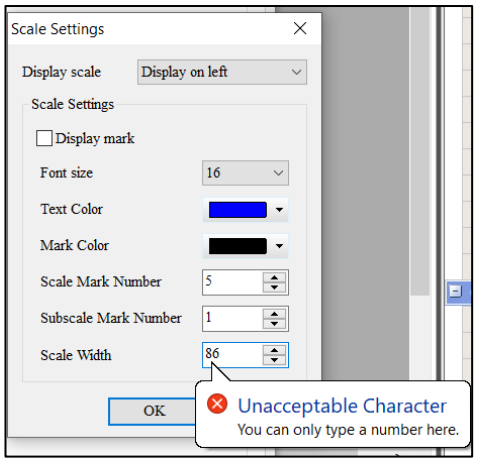


</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td rowspan="2"></td><td>Before
  </td><td> 
</td></tr>
<tr><td>After
  </td><td> 
</td></tr>
<tr><td>Scale Mark Number</td><td colspan="2" rowspan="2">● The Scale Mark Number and Subscale Mark Number settings are valid even if Display mark is not selected.
 

● The minimum number of primary and secondary scales is 1, and the maximum is 99.
● When the Scale Mark Number is 5 and the Subscale</td></tr>
<tr><td>Subscale Mark Number</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td></td><td>Mark Number is 1, the graph is as follows.
 
</td></tr>
<tr><td>Scale Width</td><td>When the font size is set too big, adjust the Scale Width to show the text.

NOTE:
1. The Scale Width should be less than the element width.
2. When users drag and drop the Scale Width to the symbol width, the scale is not displayed.
3. When users set the value to make the Scale Width greater than the element width, the Scale Width will immediately change back to the element width -1.
4. If users enter non-numeric characters, DIAScreen displays the following error message.
 
</td></tr>
</table>

- Style

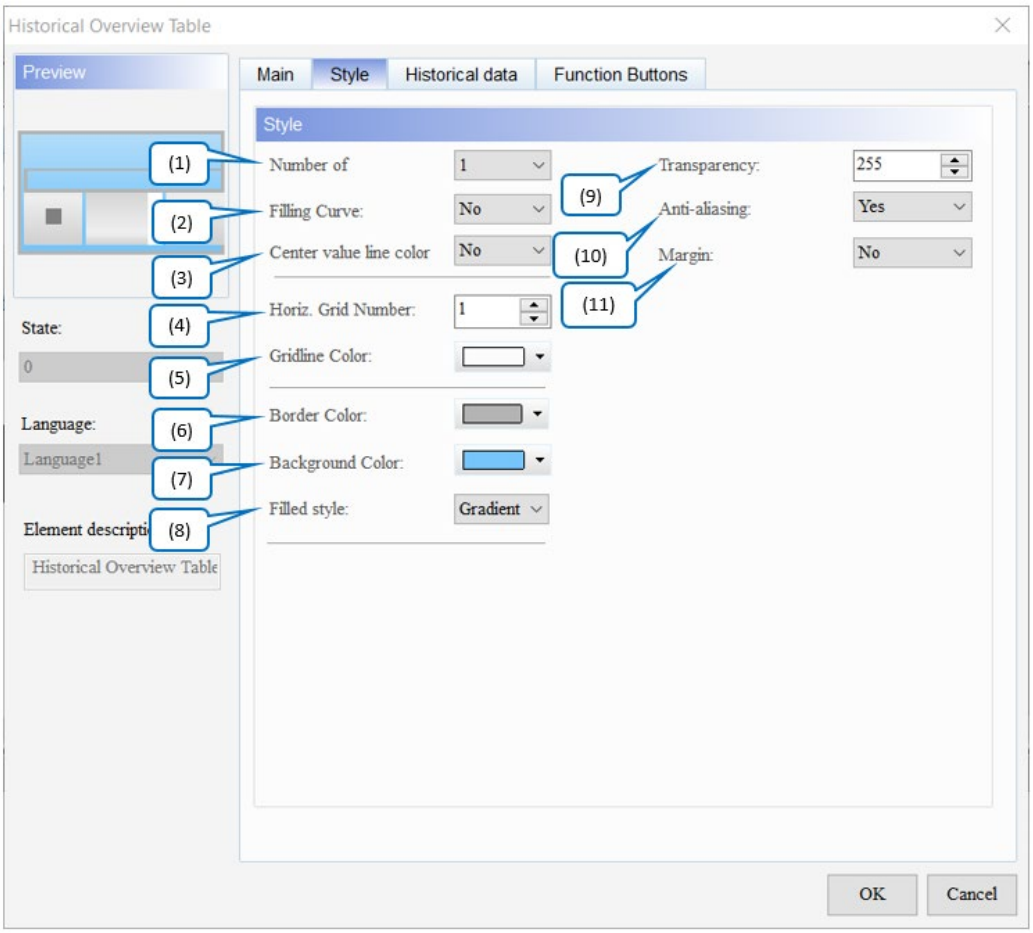
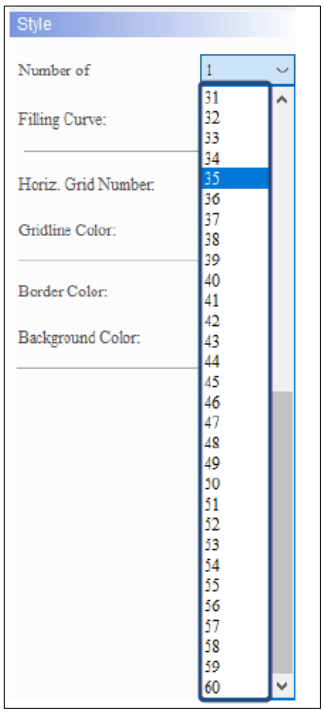
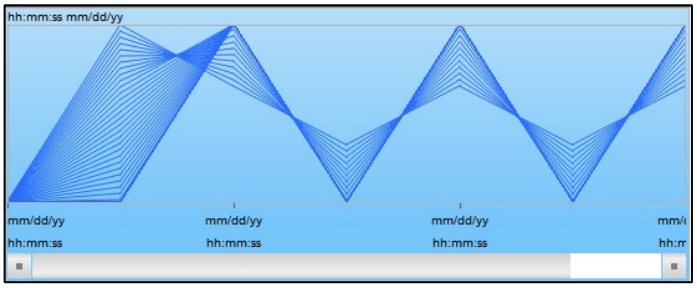
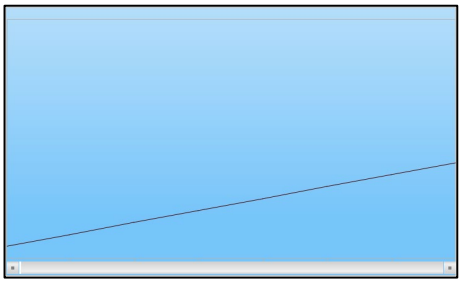
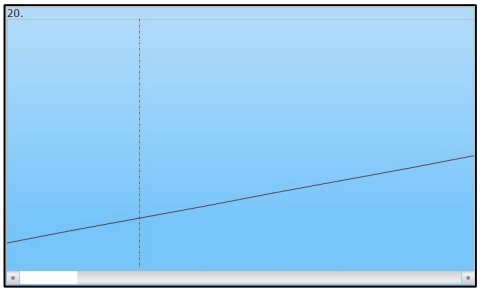
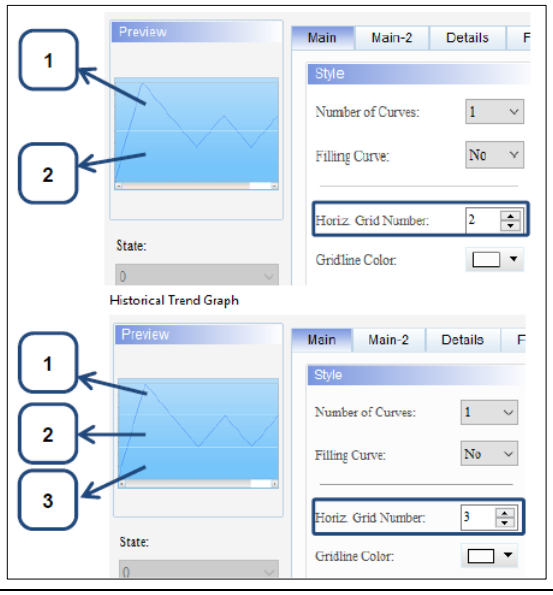


Figure 15 - 26: Historical Overview Table element Style property page

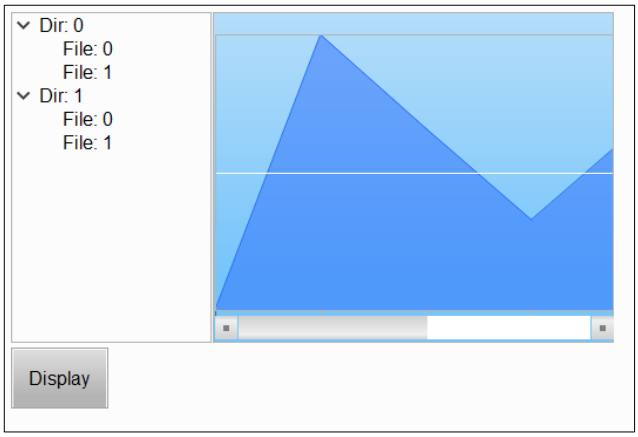
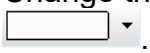
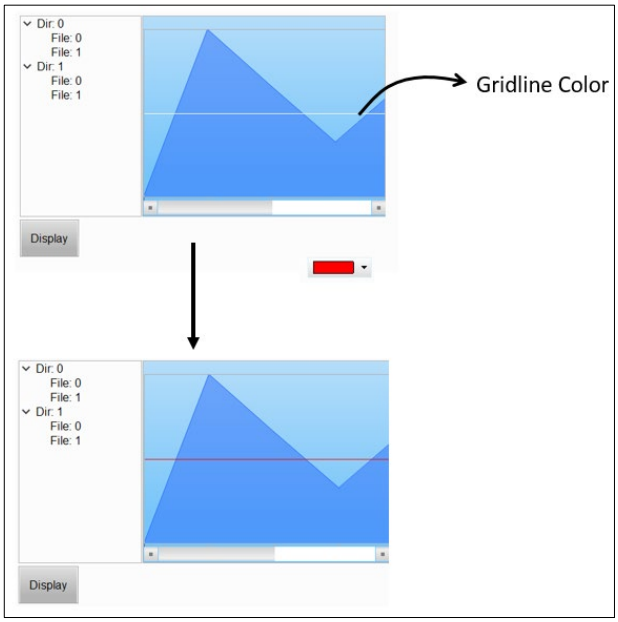
No.	Function	Description
(1)	Number of Curves	● A **Historical Overview Table** element supports up to 60 curves. The default value is **1**.  ● Select 60 curves, and users can also change the width and color of the lines. 
(2)	Filling Curve	● Set to fill the area under the curve. ● The default value is **No**. If set to Yes, the curve is as follows. 

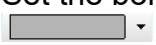
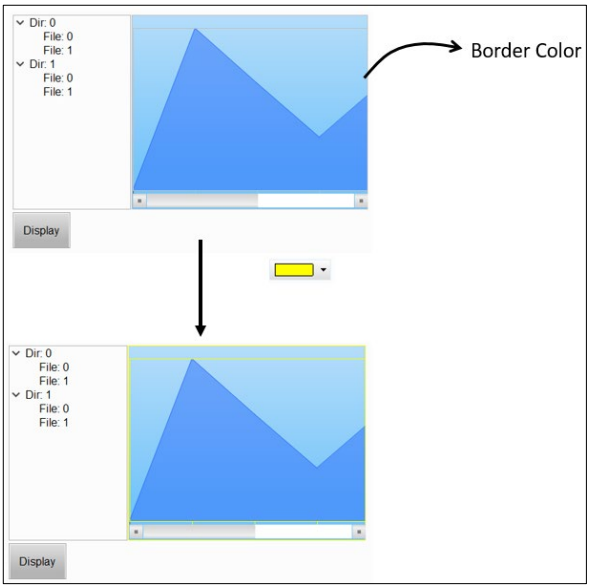
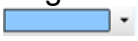
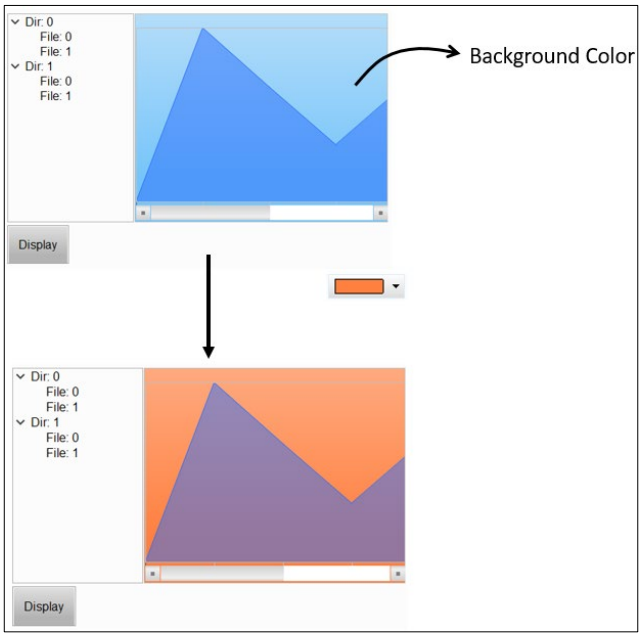
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Centre value line color</td><td>Set whether the Centre value line color on the HMI is maintained on the screen. The default value is No.
<table>
<tr><td>Centre value line color is set to No</td><td>  </td></tr>
<tr><td>Centre value line color is set to Yes</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Horiz. Grid Number</td><td>

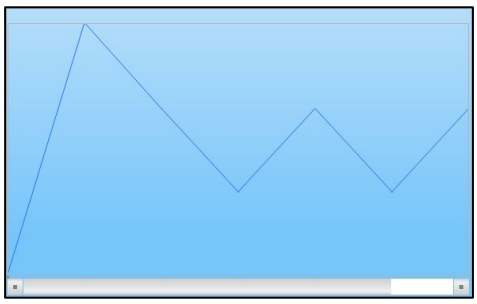
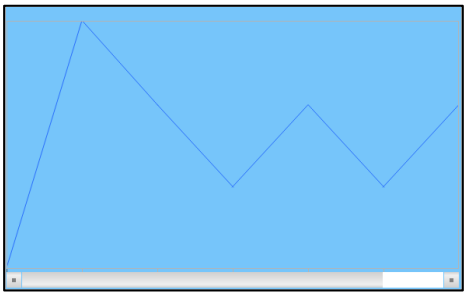
The number of horizontal grids can be supported up to 50.
The number of horizontal grids is the number of blocks used to separate the elements of the Historical Overview Table. The default value is 1.
Setting the value to 2 represents that the Historical Overview Table element has a grid line, so there are two blocks; Setting the value to 3 means that the Historical Overview Table element has two grids, and therefore three blocks, and so on.



</td></tr>
</table>

No.	Function	Description
(5)	Gridline Color	● The **Gridline Color** is the grid line within the **Historical Overview Table**.  ● Change the grid color. The default is  . 

No.	Function	Description
(6)	Border Color	Set the border color of the element. The default is  . 
(7)	Background Color	Set the background color of the element. The default is  . 
(8)	Filled style	● The available options for **Filled style** of the elements on the DOP-100 models are: Gradient and Fixed. The default value is **Gradient**. ● Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(9)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(10)</td><td>Anti-aliasing</td><td>● The Anti-aliasing function is available for this element. The default value is Yes.
● When this function is enabled, the element display becomes more delicate without jagged edges.</td></tr>
<tr><td>(11)</td><td>Margin</td><td>● The Margin function is available for this element. The default value is No.
● When users select Yes for Margin, the element indents are as shown in the following figure.
<table>
<tr><td>Margin is set to Yes</td><td>  </td></tr>
<tr><td>Margin is set to No</td><td>  </td></tr>
</table>
</td></tr>
</table>

- Historical data

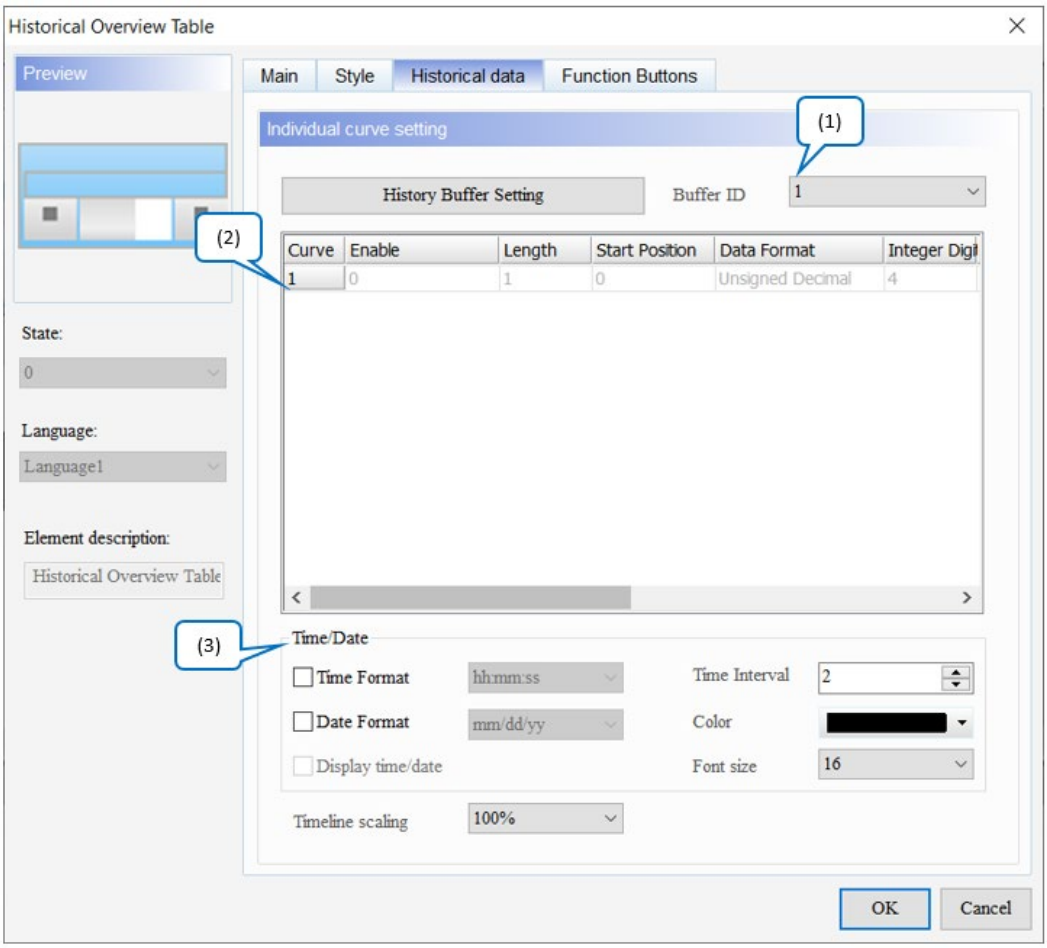
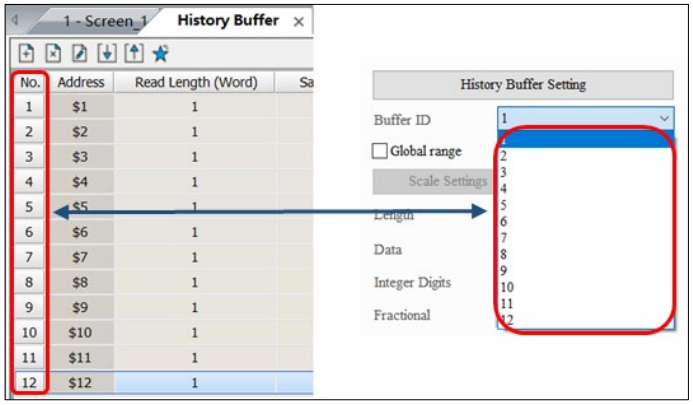
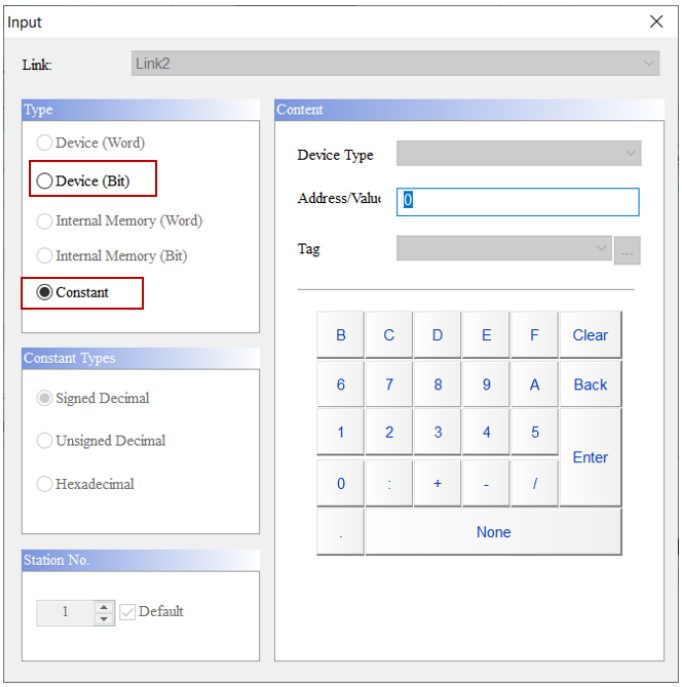
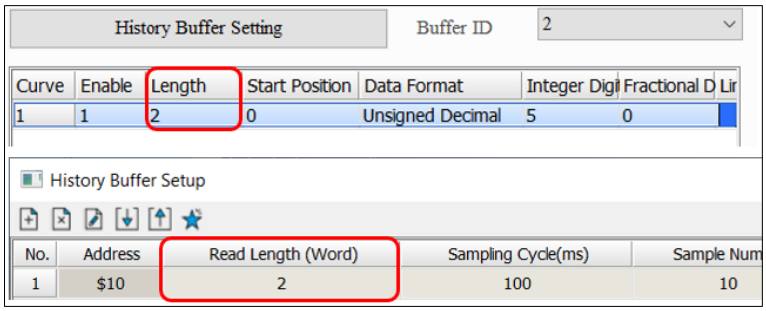
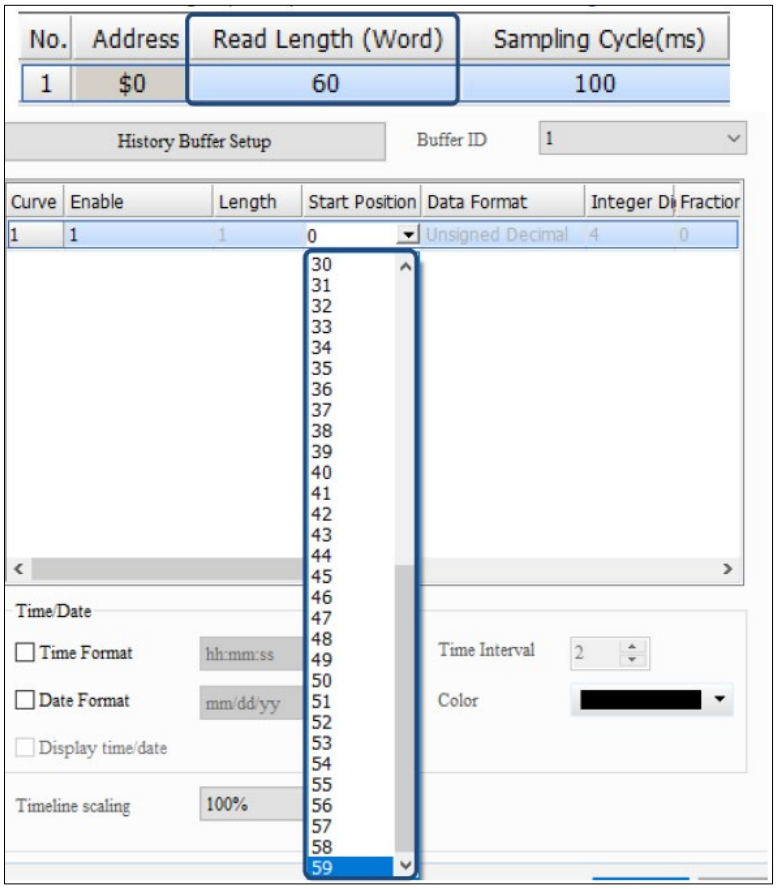
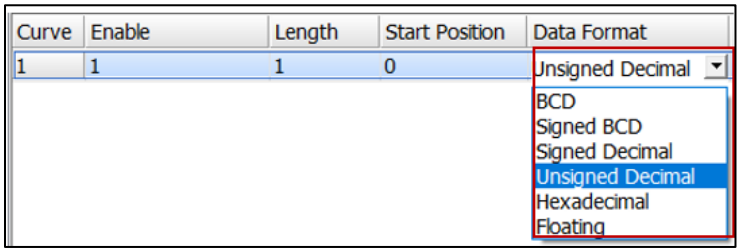
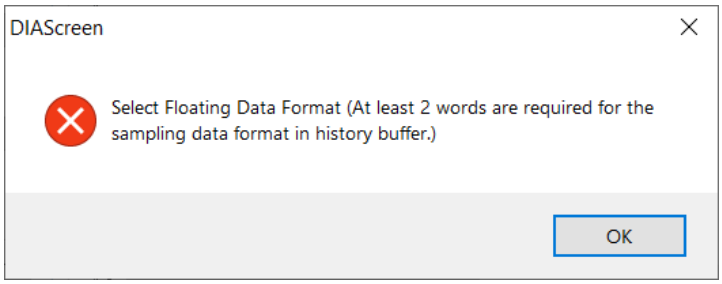
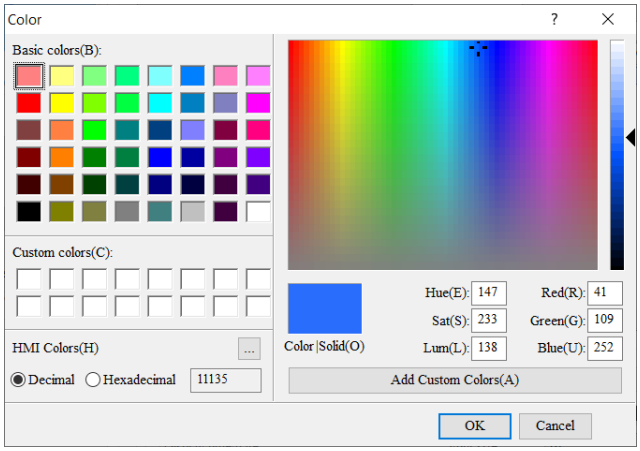
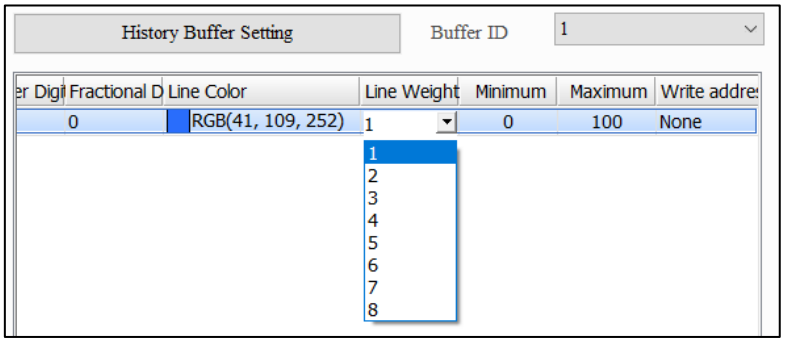


Figure 15 - 27: Historical Overview Table element Historical data property page

No.	Function	Description
(1)	Buffer ID	The **Buffer ID** corresponds to the set data number in the **History Buffer Setting**. The **History Buffer Setting** can set up to 12 sets of data, so the **Buffer ID** can be up to 12 sets. 

No.	Function	Description	
(2)	Curve Setting	Enable	● Set whether to enable the curve for data reading. ● If Constant is selected for **Type**, then setting the value to 1 indicates to enable and setting to 0 indicates to disable. If Bit is selected for Type, then Bit On indicates to enable and Bit Off indicates to disable. ● The **Type** supports the data types of Device (Bit), Internal Memory (Bit), and Constant. 
		Length	● Set **Length** to 1 or 2. Users can set the **Length** to 2 only when **Read Length (Word)** in the **History Buffer Setting** is set to 2 or above.  ● When **Global range** is checked, this function cannot be set.
(2)	Curve Setting	Start Position	● The **Start Position** is set depending on the **Length** of the read. ● If the **Read Length (Word)** is 60, the **Start Position** ranges from 0 ~ 59.

No.	Function	Description
		
	Data Format	● The supported **Data Format** is as follows. The default value is **Unsigned Decimal**.  ● When **Global range** is checked, this function cannot be set. ***NOTE**:* *1. If users select Floating as the **Data Format**, set the **Length** to 2.* *2. If users select Floating as the **Data Format**, but set the **Length** to 1 word, DIAScreen displays a message to remind users that they need to set the **Length** to 2 or above.*

No.	Function	Description	
			
`(2)	Curve Setting	Integer Digits/ Fractional Digits	● Set the number of integer digits and decimal places to be displayed as several digits. ● When **Global range** is checked, this function cannot be set.
		Line Color	Set the line color. 
		Line Weight	The line width can be set from 1 ~ 8. The default value is **1**. 
		Minimum / Maximum	● If the **Global range** is checked, the **Minimum** and **Maximum** values in the curve cannot be set, and the **Minimum** and **Maximum** values of the global will be the main value; conversely, if the **Global range** is not checked, the **Minimum** and **Maximum** values in the curve can be set. ● The permissible range of values for **Minimum** and **Maximum** values varies depending on the **Data Type** and **Data Format** chosen.

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="6">DWord</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294697295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
<tr><td>Floating</td><td>0 ~ 9999999</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">(3)</td><td rowspan="2">Time / Date</td><td>Display time / date</td><td>

Select the Display time/date checkbox to display the time scale at the bottom of the Historical Overview Table element; if it is not selected, the time scale does not display.

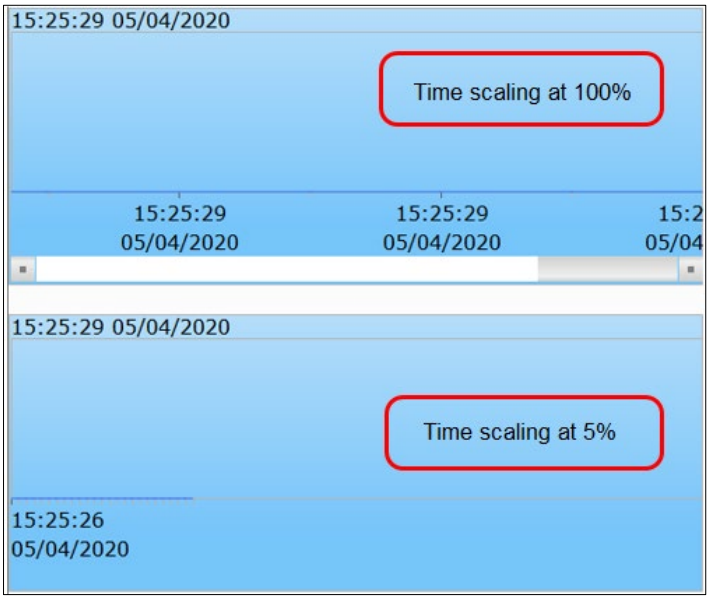
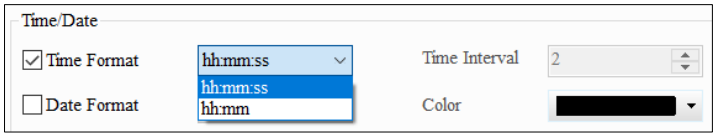
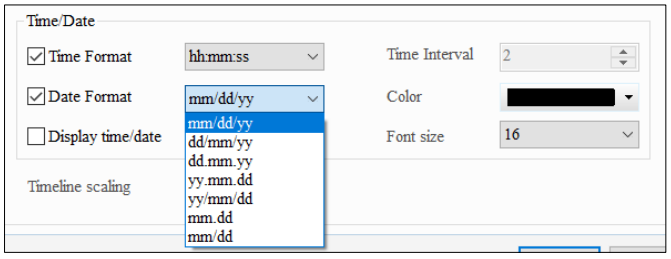


Check the timeline to set its time interval, up to 9999 time intervals can be displayed. The image above shows two time intervals.

</td></tr>
<tr><td>Timeline scaling</td><td>

The default is 100%.
The smaller the set range, the more sampling points can be seen.

</td></tr>
</table>

No.	Function	Description	
			
		Time Format / Date Format	● The available options for **Time Format** are: hh:mm:ss and hh:mm. The default value is **hh:mm:ss**.  ● The available options for **Date Format** are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is **mm/dd/yy**. 
		Color	Change the displaying color of the time and date, including the recorded time and date shown on top of the **Historical Overview Table** and the time scales. The default is  .

No.	Function	Description	
			

- Function Buttons

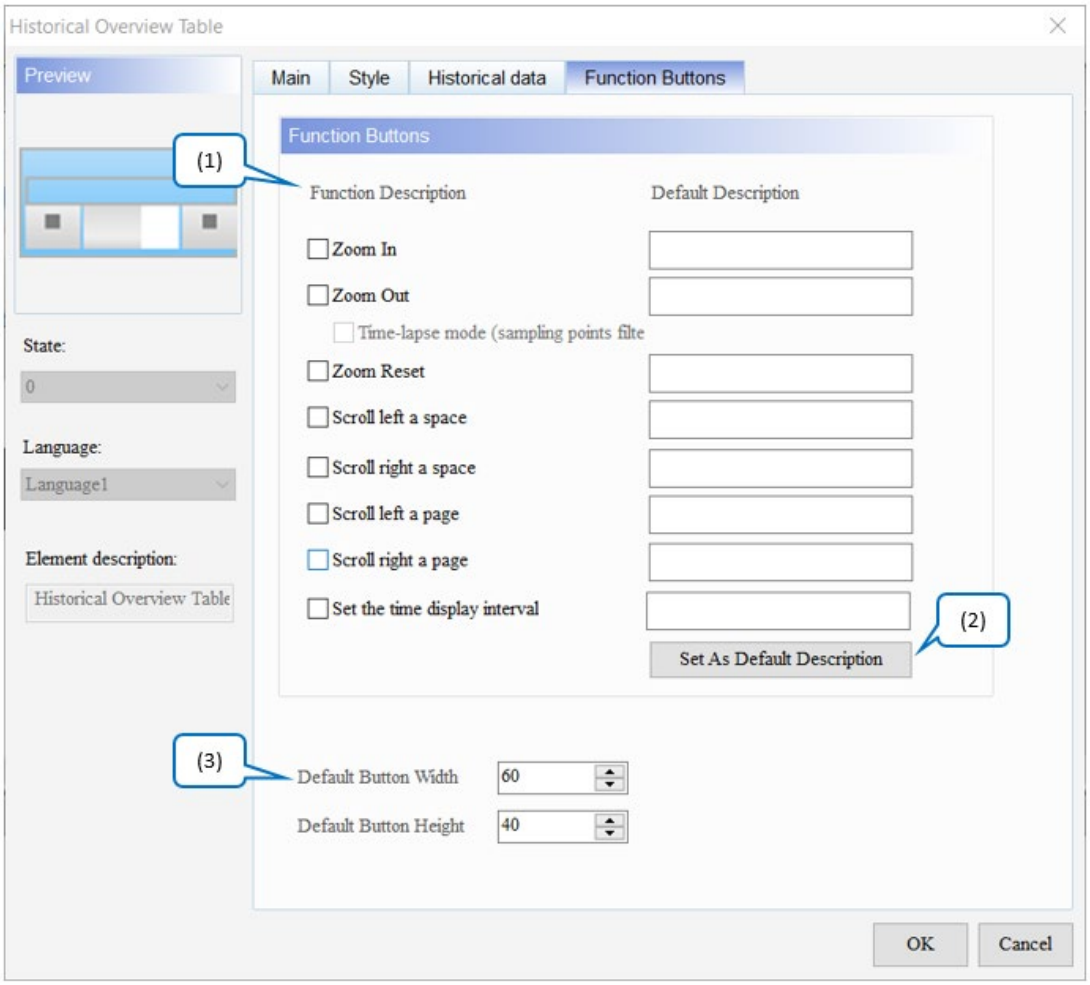
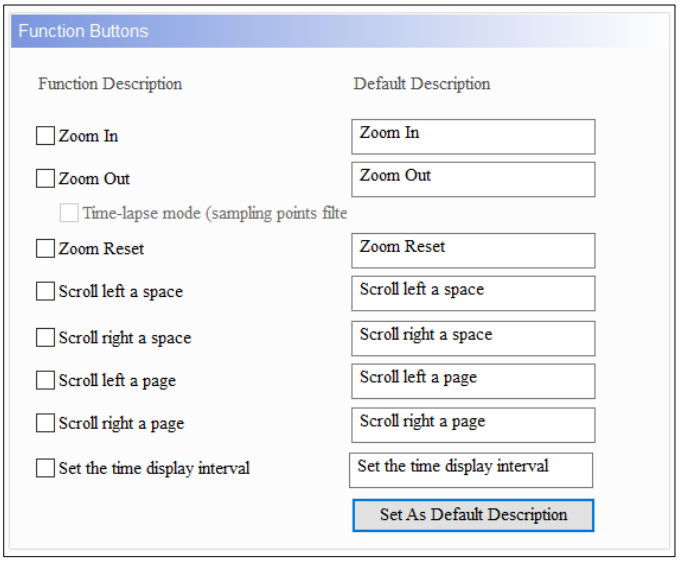
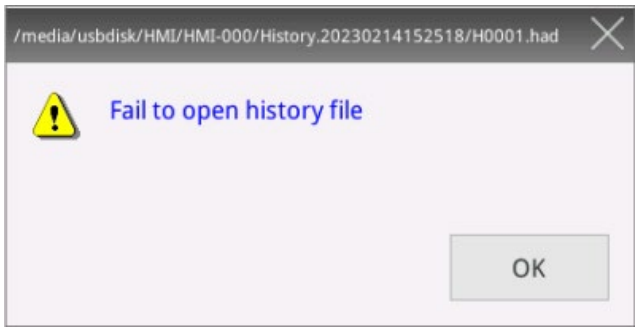


Figure 15 - 28: Historical Overview Table element Function Buttons property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Function Description</td><td>Select the Function Buttons to display on the Historical Overview Table element.
<table>
<tr><td>Zoom In</td><td>Zoom in on the history data of X-axis.</td></tr>
<tr><td>Zoom Out</td><td>Zoom out on the history data of X-axis.</td></tr>
<tr><td>Zoom Reset</td><td>Reset the history data of X-axis to the default size.</td></tr>
<tr><td>Scroll left a space</td><td>Scroll to the left a bit.</td></tr>
<tr><td>Scroll right a space</td><td>Scroll to the right a bit.</td></tr>
<tr><td>Scroll left a page</td><td>Scroll to the left for a page.</td></tr>
<tr><td>Scroll right a page</td><td>Scroll to the right for a page.</td></tr>
<tr><td>Set the time display interval</td><td>Display the corresponding data according to the set time interval.</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Set As Default Description</td><td>Select Set As Default Description. The default strings are automatically filled in the Default Description fields.
 

NOTE:
1. The display area for the overview table on the right can only display .dat files.
2. If the file in the file browsing area has the same name as the file name set by the buffer, and does not contain any time and date, it means that the file is the historical buffer data being sampled, and the historical overview table cannot be displayed. If users execute the Display button of the file list on the left, a warning window will pop up Failed to open historical file.</td></tr>
</table>

No.	Function	Description
		
(3)	Default Button Width / Height	Adjust the button width and height. The default values are **60** and **40**, respectively.

15.6 Operation Log Setup

The **Operation Log Setup** is for recording the operation and date/time of the operation of each element when users enter the HMI screen. The operations include changing the element data, security level, and switching elements. Users may refer to the **Operation Log Setup** when the machine malfunctions or there are defects in the products. In addition, Users can save the records as CSV files and view them with PCs.

***NOTE**:*

1. *The default operation record table is a CSV file to record 10,000 pieces of data.*
2. *When users save data in the HMI, the maximum number of data records is 10,000. When users save data in the USB disk or SD card, if the default 10,000 records have been exceeded, the HMI then operates with the setting of **Overwrite Files** or **Stop Log** in the **Save Settings**.*
3. *The **Operation Log Setup** can be saved in the HMI, USB Disks, or SD Cards. When users save data in the HMI, the read / write speed is faster. When users save data in the external device, the read speed is determined by the read / write speed of the external device. If the read / write speed of*

*the external storage device is slow, the display speed of the **Operation Log Setup** and the update speed of the screen operation are affected.*

On double-clicking the **Operation Log Setup** element, the property page appears as follows.

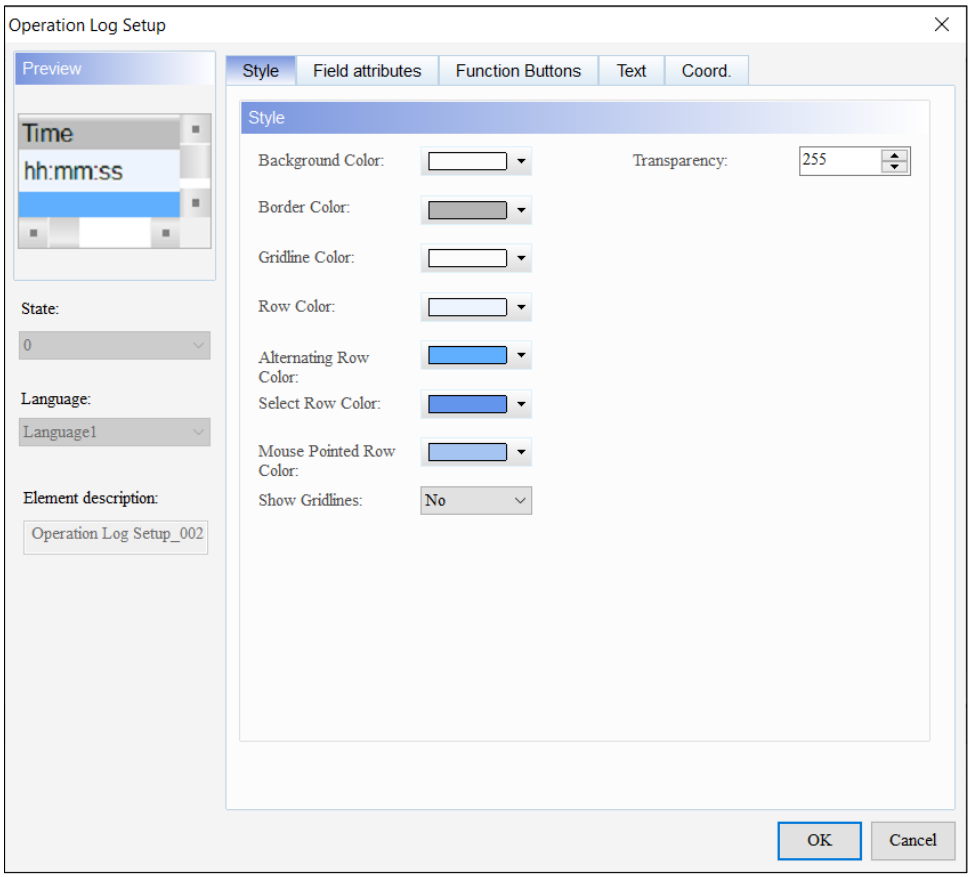


Figure 15 - 29: Operation Log Setup property page

Operation Log Setup	
Function	**Description**
Preview	The **Operation Log Setup** elements do not support multiple state values and multi-language data display.
Style	Set the Background Color, Border Color, Gridline Color, Row Color, Alternating Row Color, Select Row Color, Mouse Pointed Row Color, Show Gridlines, and Transparency.

Operation Log Setup		
Function	**Description**	
Field attributes	Operation Log settings…	Column order, Trigger Address, Save Settings, CSV output settings (setting Time Format, Date Format, and checking whether to record in the CSV header of the external storage device).
	Display Settings	Set whether to record the Time, Date, User Account, Level, Screen, Description, Action, Address, Previous value, New value, and adjust the Column order.
	Title setting	Set the text alignment, background color, and text color.
	Time / Date	Set the Time Format, Date Format, and Color.
Function Buttons	Select the function buttons to enable, and set the width and height of the buttons.	
Text	Set the text font, size, and color.	
Coord.	Set the X and Y coordinates, Width, and Height of the elements.	

- Style

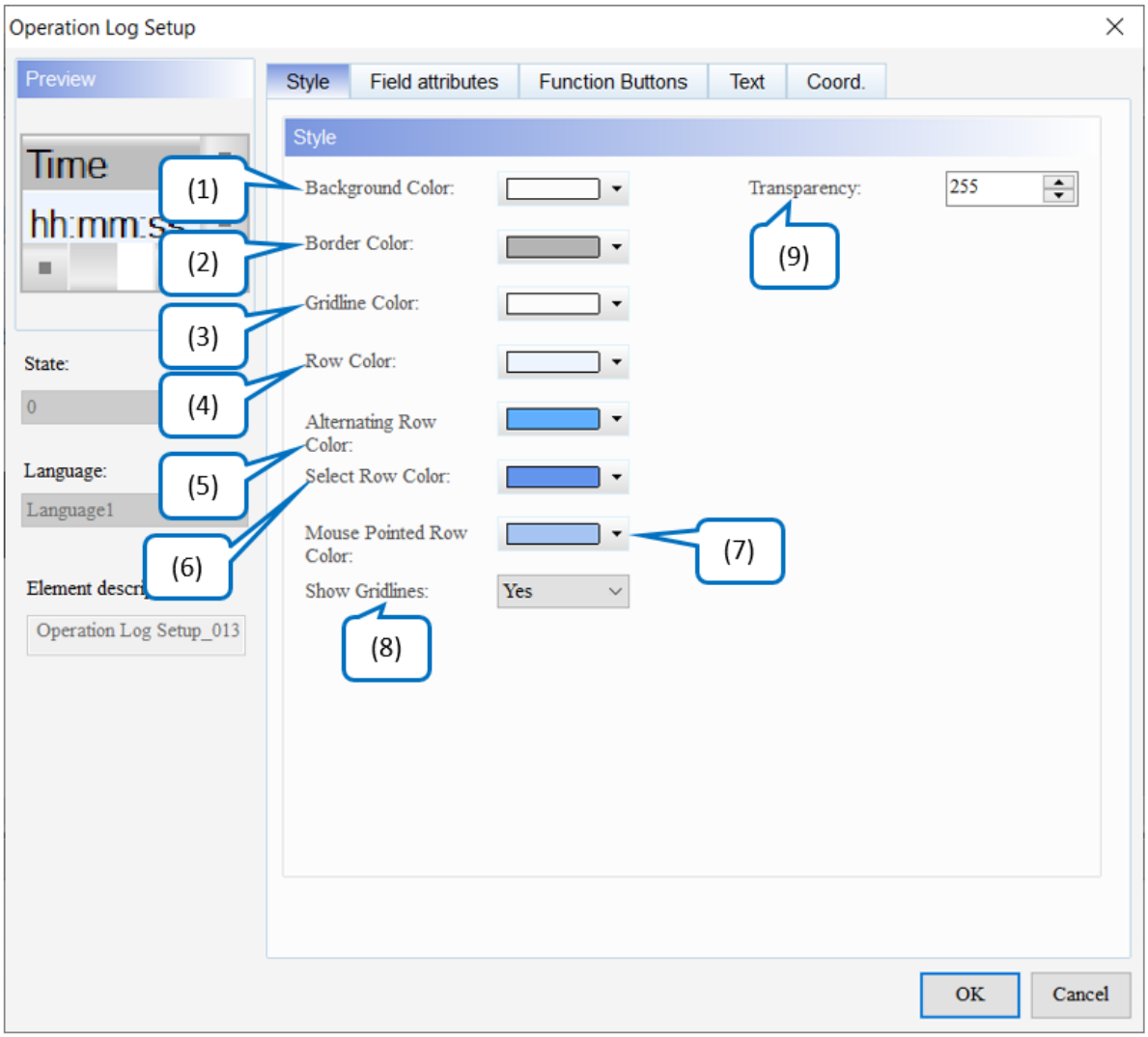
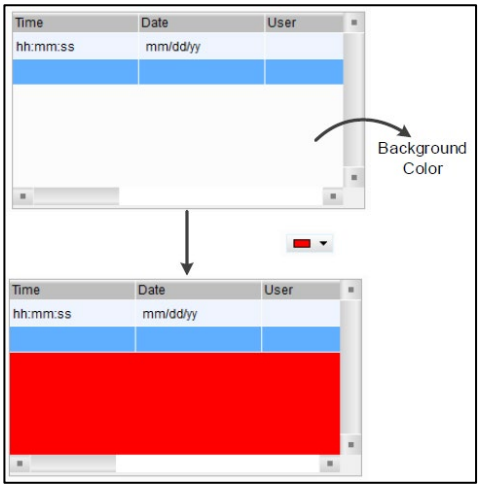
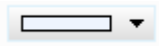
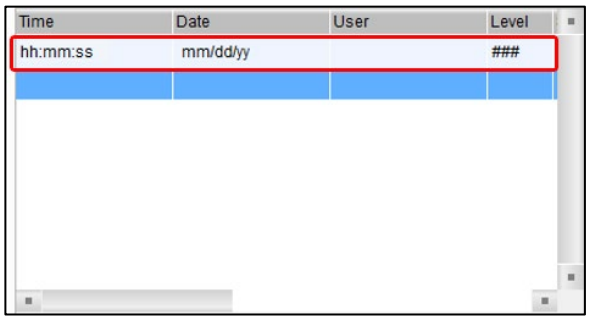
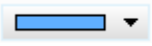
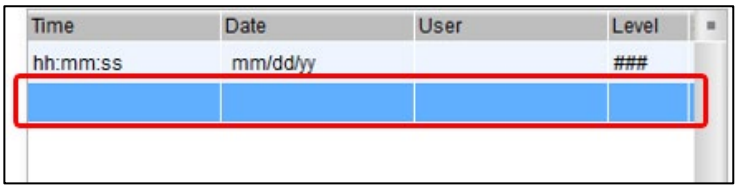
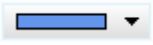
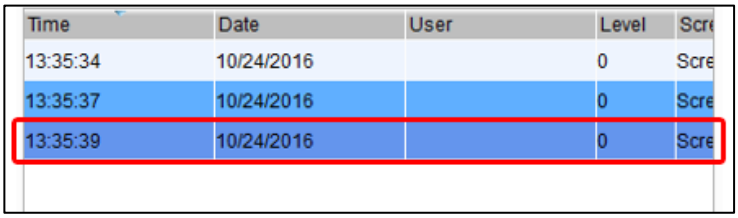
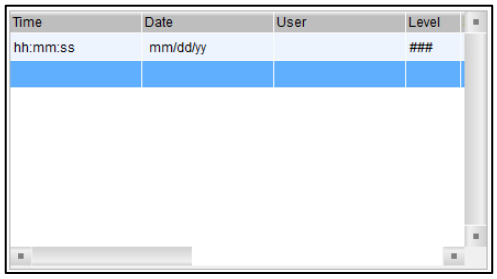
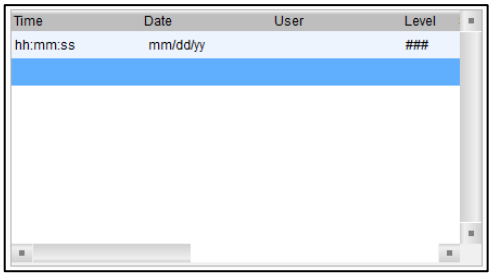


Figure 15 - 30: Operation Log Setup Style property page

No.	Function	Description
(1)	Background Color	Set the background color of the element. The default is  . 
(2)	Border Color	Set the border color of the element. The default is  . 
(3)	Gridline Color	Set the **Gridline Color** of the element. The default is  . 

No.	Function	Description
(4)	Row Color	Set the color of odd rows. The default is  . 
(5)	Alternative Row Color	Set the color of even rows. The default is .  . 
(6)	Select Row Color	Select the data rows to view the rows in the color specified in this setting. The default is  . 
(7)	Mouse Pointed Row Color	When the cursor is enabled, the row changes to the specified color where the cursor is placed at. The default is  .
(8)	Show Gridlines	The default value is **Yes**, so that there is a grid rendering between each piece of data in the **Operation Log Table**. Select Yes for Show Gridlines:  Select No for Show Gridlines: 

No.	Function	Description
(9)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Field attributes

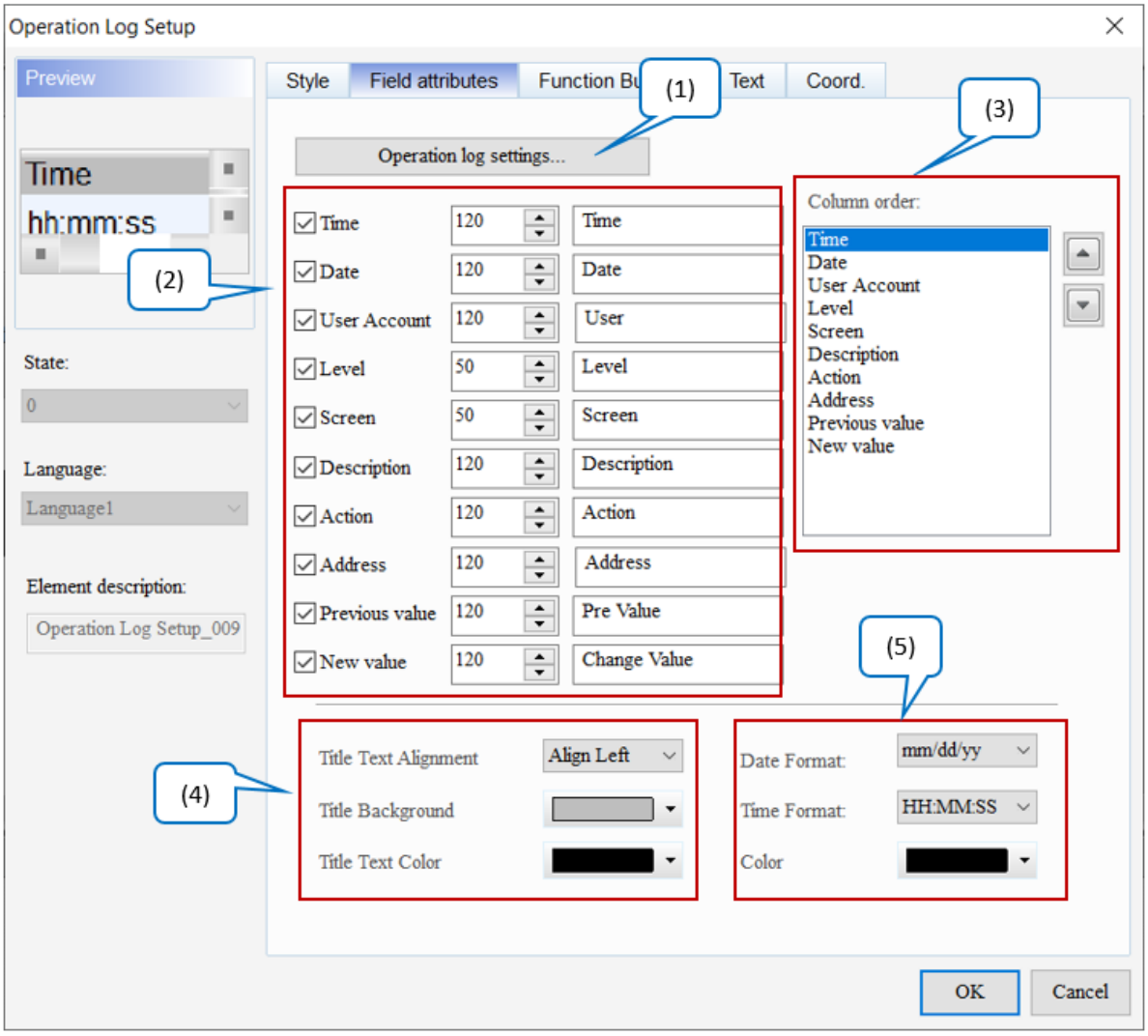
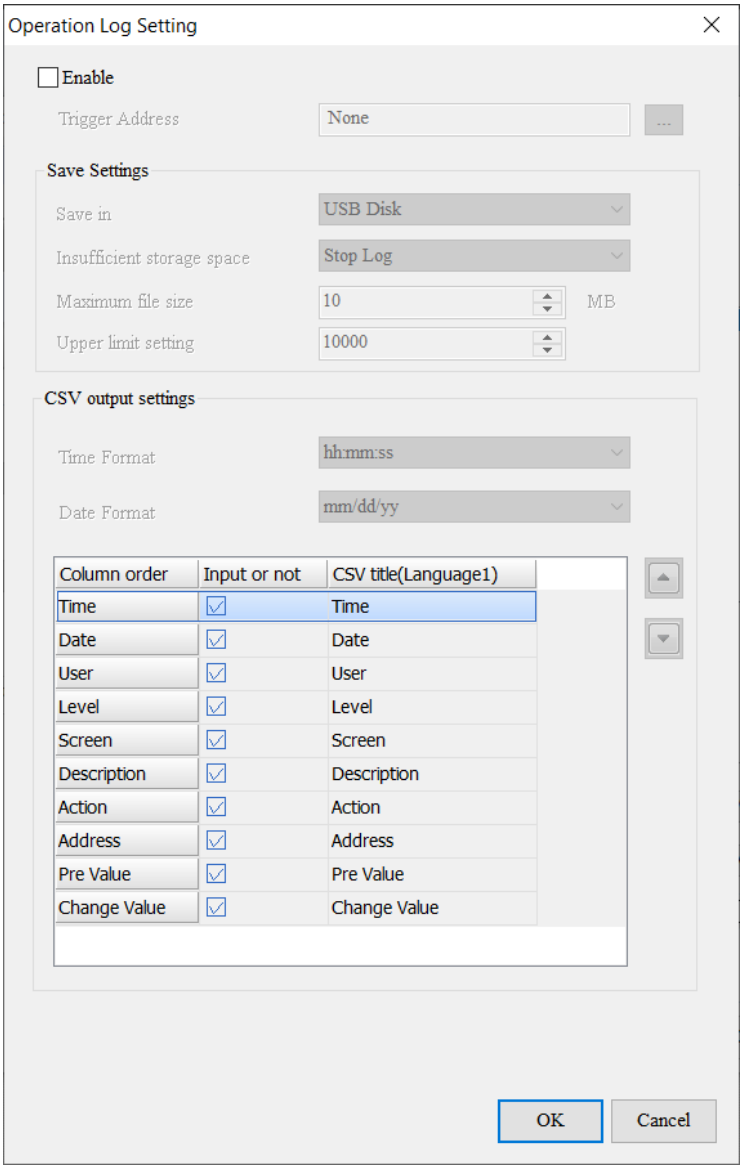
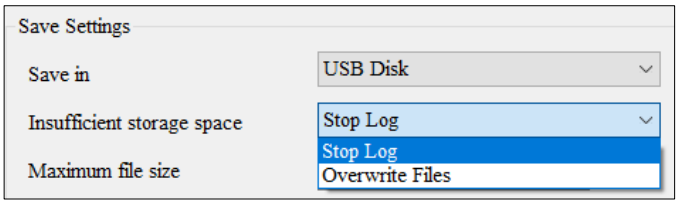
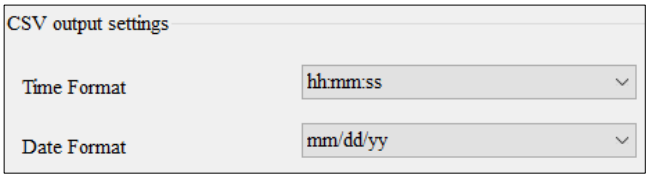
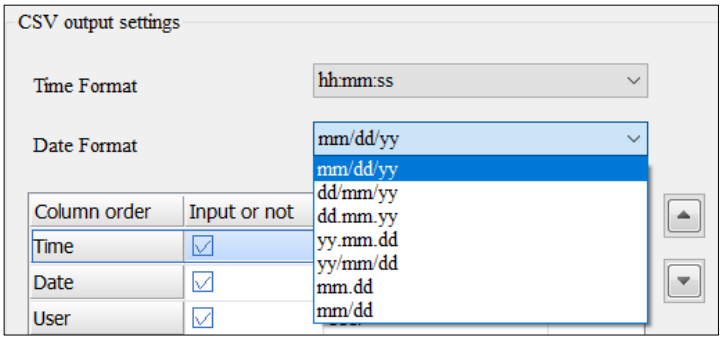


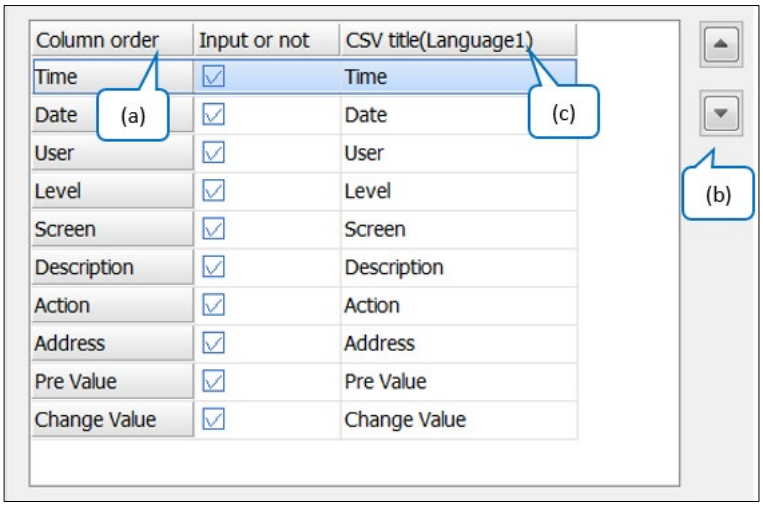
Figure 15 - 31: Operation Log Setup Field attributes property page

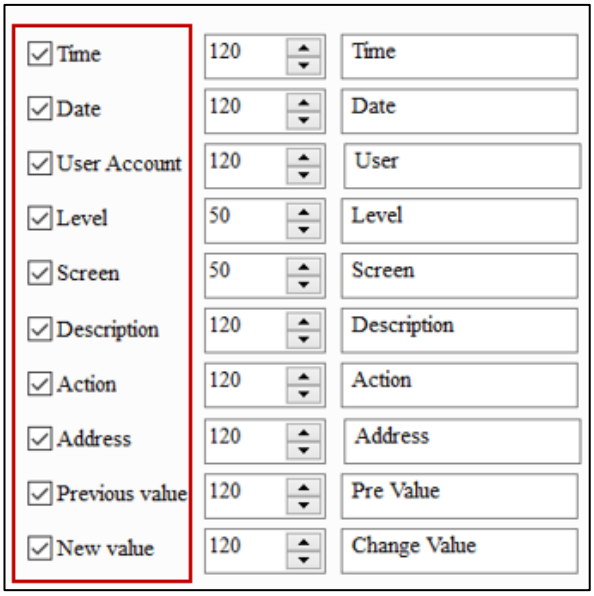
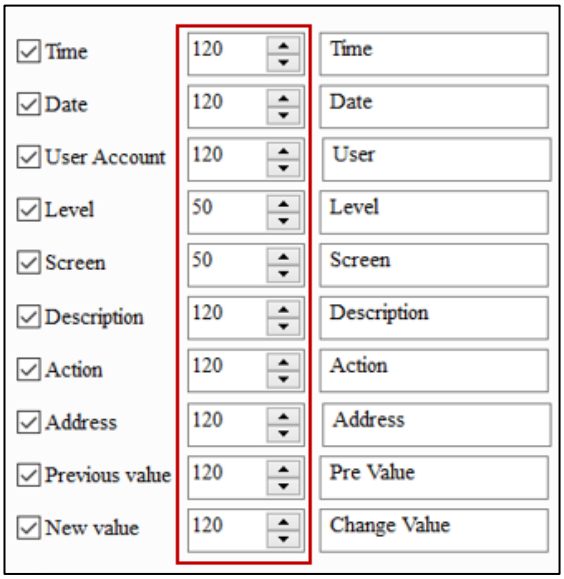
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Operation Log Settings</td><td>
Go to Data Management > Operation Log Setup to open Operation Log Setting window.


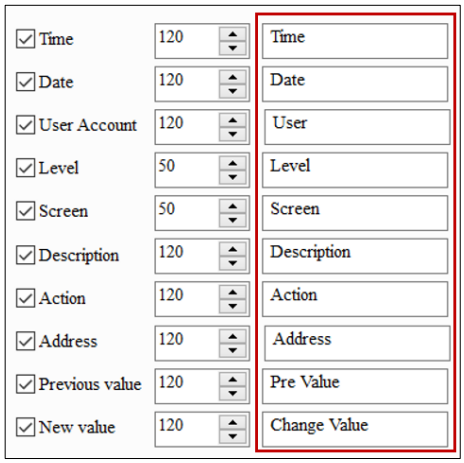
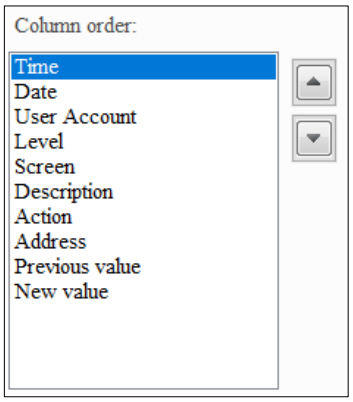
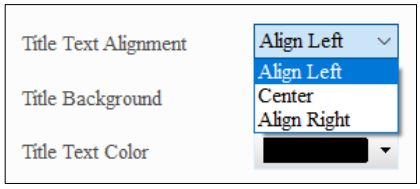
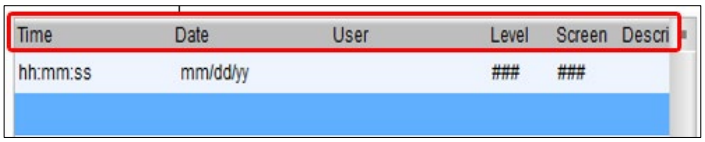
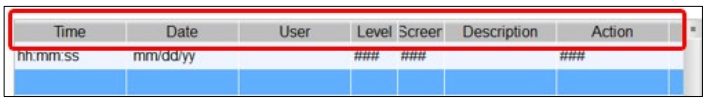
<table>
<tr><td>Enable</td><td>Not enabled by default. Select the Enable checkbox to edit settings.</td></tr>
<tr><td>Trigger Address</td><td>Set Trigger Address, which supports addresses of the Internal Memory and the external PLC. This function only supports bit trigger. As soon as this address is triggered, the Operation Log Setup starts recording all operations of the HMI.</td></tr>
<tr><td>Save Settings</td><td>● Set to save the Operation Log Setup in the HMI, USB Disk, or SD Card in CSV format.
● When the external storage space is insufficient, two options are available: Stop Log and Overwrite Files. Stop Log is to stop recording the HMI operations. Overwrite Files is to delete the</td></tr>
</table>
</td></tr>
</table>

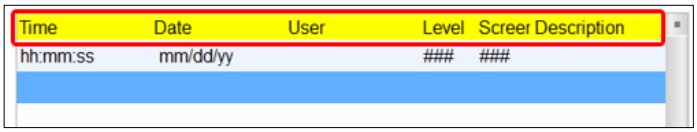
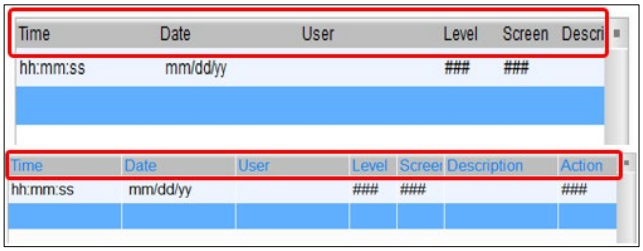
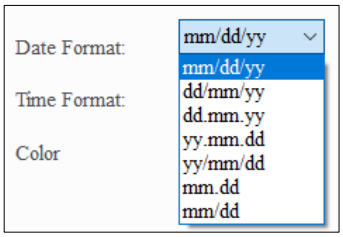
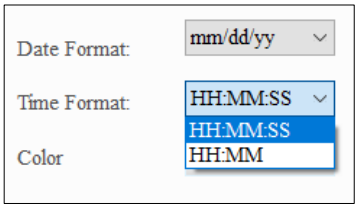
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td>recorded operation data and start recording the operations all over again. The default value is Stop Log.
 
</td></tr>
<tr><td></td><td></td><td>CSV output settings</td><td>● Set the recording time and date formats for the CSV file to output.
 



● Select the display columns to output to the CSV file (a), adjust the column displaying order (b), and define the display titles of the selected columns (c).
 
</td></tr>
</table>

No.	Function	Description	
(2)	Column Settings	Select the columns to display	By default setting, all columns are selected and shown in the **Operation Log Setup**. Users can select or clear the checkboxes of the display columns as required. 
		Adjust column width	Adjust the column width in the **Operation Log Setup**. 
		Edit display title	Edit the column titles in the **Operation Log Setup**. The default is English string, but Chinese characters are also supported.

No.	Function	Description	
			
(3)	Column order	Set the column display order in the **Operation Log Setup**. 	
(4)	Title Settings	Title Text Alignment	● Adjust the alignment of the titles.   ● The following figure is an example of setting the **Title Text Alignment** to Center. 
		Title Background	● Set the title background color. 

No.	Function	Description	
			
		Title Text Color	● Set the display title text color. 
(5)	Date and Time settings	Date Format	Set the date display format. 
		Time Format	Set the time display format. 
		Color	Set the display color for the date and time. 

- Function Buttons

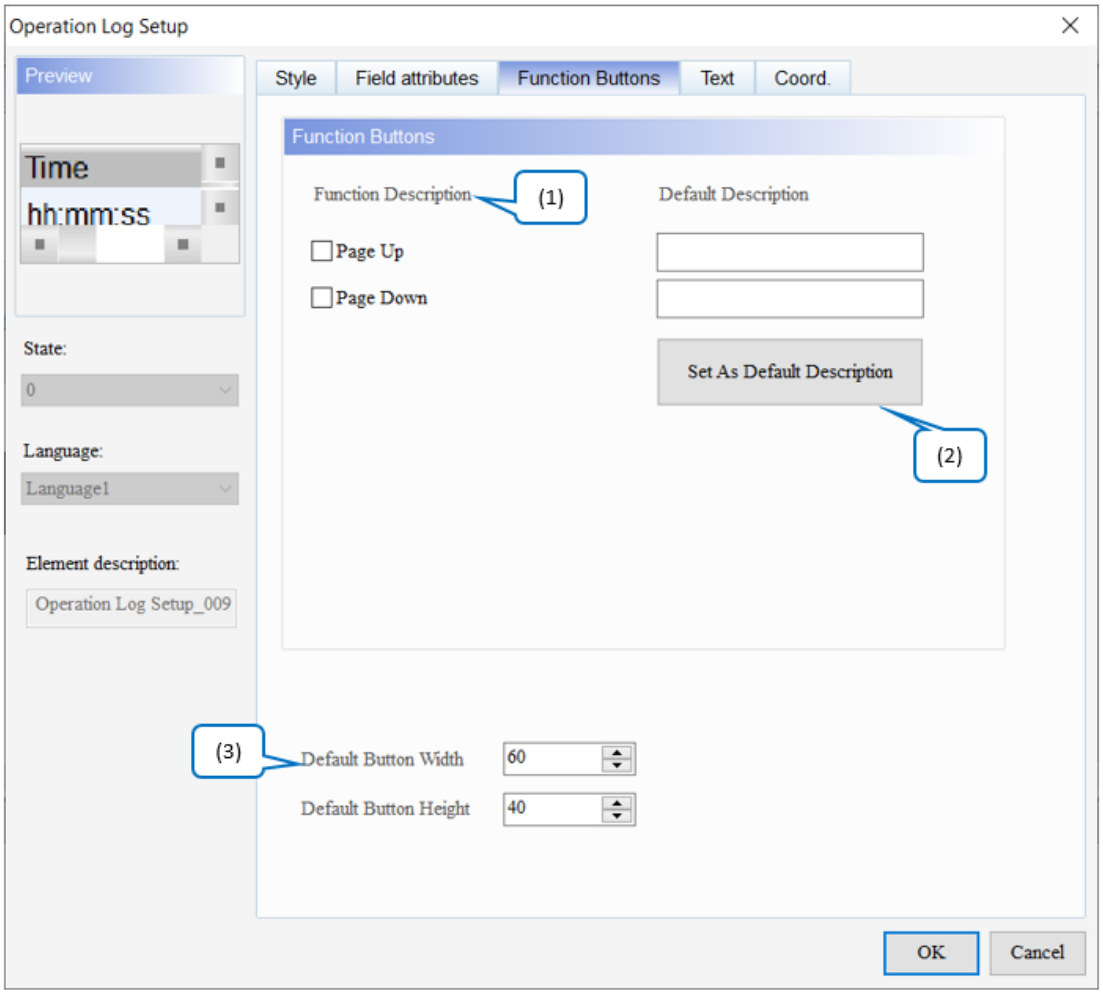
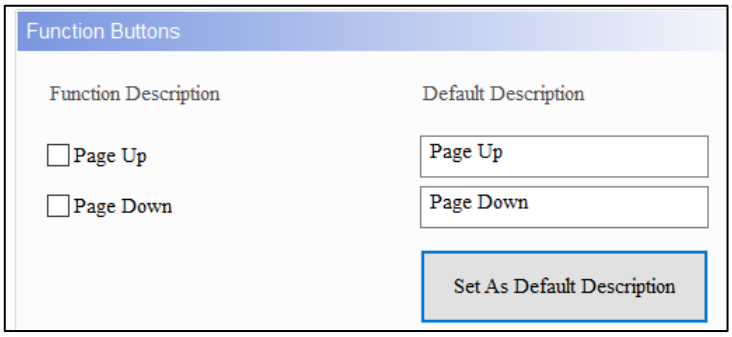


Figure 15 - 32: Operation Log Setup Function Buttons property page

No.	Function	Description
(1)	Function Description	● Select the function buttons to display on the **Operation Log Setup** element. Page Up: Go to the previous page of the Operation Log Setup. Page Down: Go to the next page of the Operation Log Setup. ● Use **Page Up** and **Page Down** to change the page only when there are more than 10,000 sets of data in the **Operation Log Setup**. That is, one CSV file contains 10,000 operation log data, and Page Up and Page Down are for switching between files of

No.	Function	Description
		Operation Log Setup.
(2)	Set As Default Description	Click Set As Default Description. The default strings are automatically filled in the Default Description fields. 
(3)	Default Button Width / Height	Adjust the button width and height. The default values are 60 and 40, respectively.

- Text

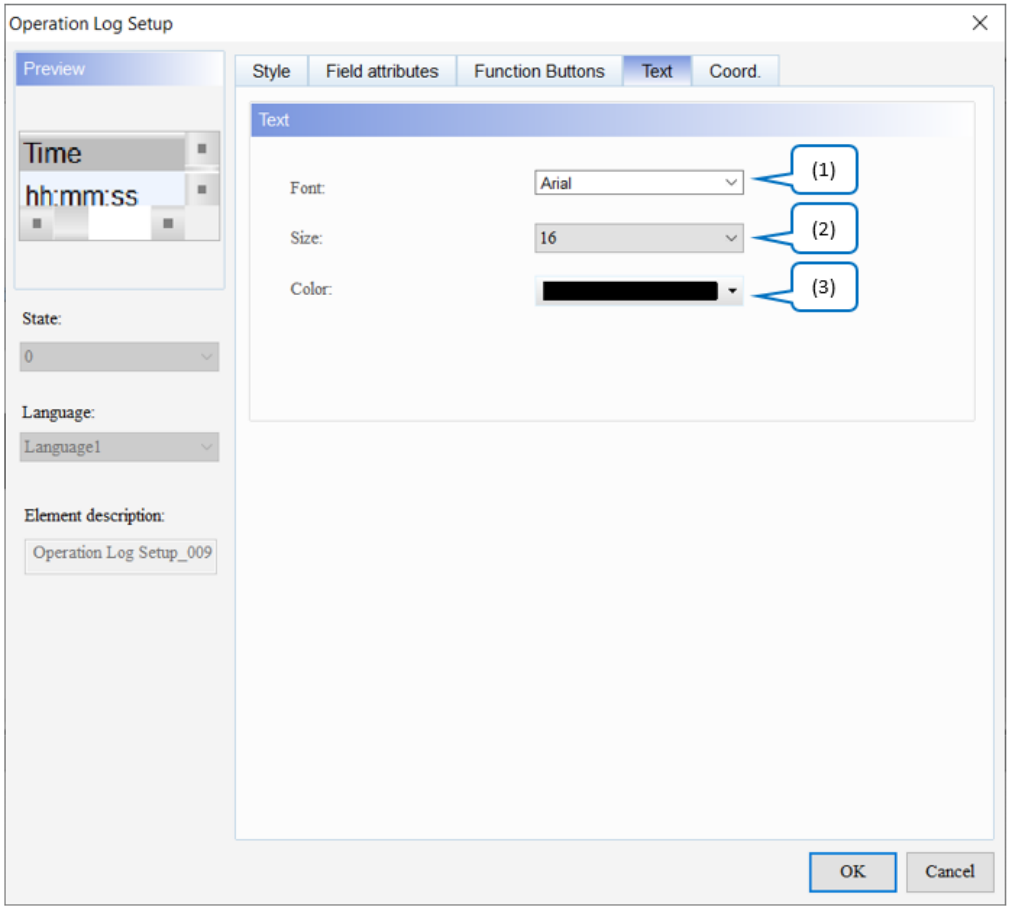


Figure 15 - 33: Operation Log Setup Text property page

No.	Function	Description
(1)	Font	Set the display text font. The default value is **Arial**.
(2)	Size	Set the display text size. The default value is **16**.
(3)	Color	Set the display text color. The default is [redacted].

- Coord.

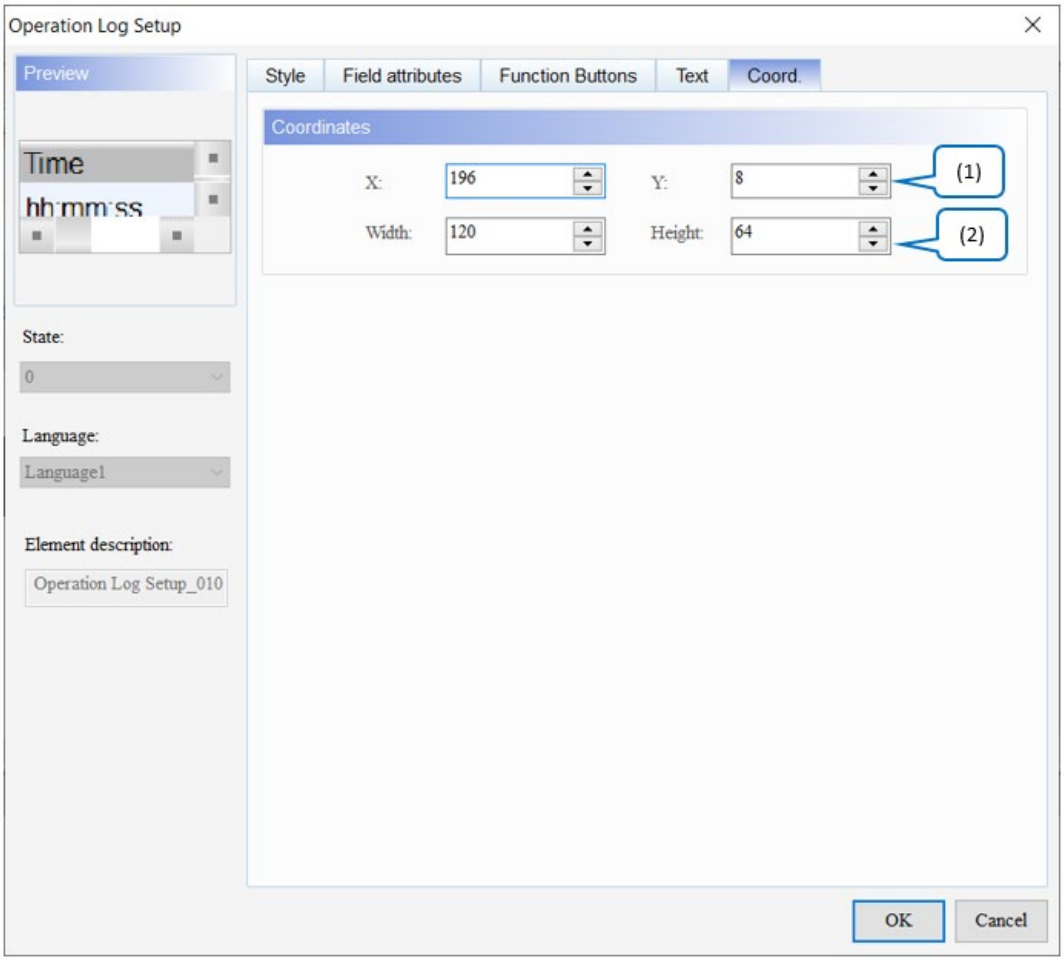


Figure 15 - 34: Operation Log Setup Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 16: Alarm

16.1 Alarm Setting

Go to **Data Management** > **Alarm Setting** for Alarm Setting. The **Alarm Setting** page is mainly to set the read address, sampling cycle, maximum savable data, non-volatile memory, alarm moving sign, exporting the data to a CSV file, and editing the alarm message to be displayed for displaying the alarm.

The DOP-B and DOP-H series HMIs use continuous Word addresses for the alarms, while the DOP-W and DOP-100 series HMIs use non-continuous addresses. Through non-continuous addresses, alarms can be triggered with either Bit or Word addresses, which is more flexible and user-friendly. In addition, alarm messages now support dynamic modification. In the previous version, the temperatures displayed on the alarm messages were fixed, e.g. 100 degrees; now add %d1 and %f1 to the alarm message and use the monitoring address in **Alarm Setting** to input the value, so the HMI displays the modified value when the alarm is triggered next time.

Alarm message supports up to 4,096 data entries. DIAScreen also provides a batch tasks tool which allows to quickly complete the group settings when users input the alarm group numbers. Sort and filter the display of the alarms on the **Alarm History Table** element, so the alarm messages are displayed in a way that is easier to view.

The formula provided by DIAScreen computes all the alarm relevant data edited by the users. Then, the set non-volatile memory saves these computation results. If the data is saved in the HMI, the alarm data size is subject to change based on the HMI model. Refer to the specifications for non-volatile memory in the HMI installation manual. For data saved in the USB Disk or SD Card, the alarm data size is determined by the external storage devices.

The alarm formulas are applicable to the **Alarm History Table** and **Alarm Frequency Table**, but since the CSV file size is determined by the message (length) entered by users, there is no formula for the CSV file.

The following are the formulas for the **Alarm History Table** and **Alarm Frequency Table**:

1. **Alarm History Table**

$$\{[6\ Bytes(a) + 2\ Bytes(b)] \times \mathrm{N}(c)\} + 6\ Bytes(d) = \text{Actual file size } Bytes$$

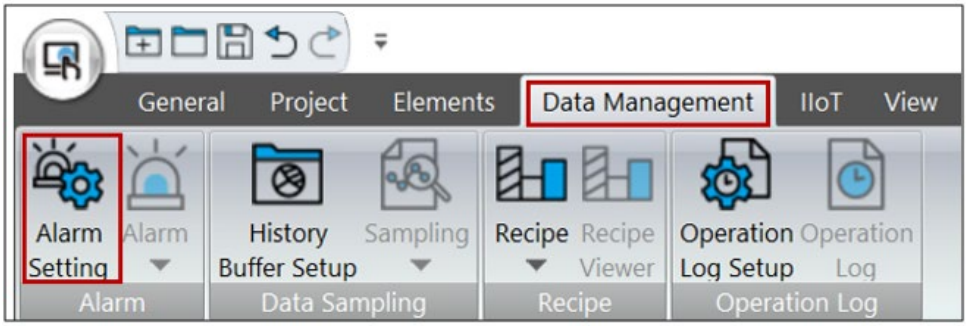
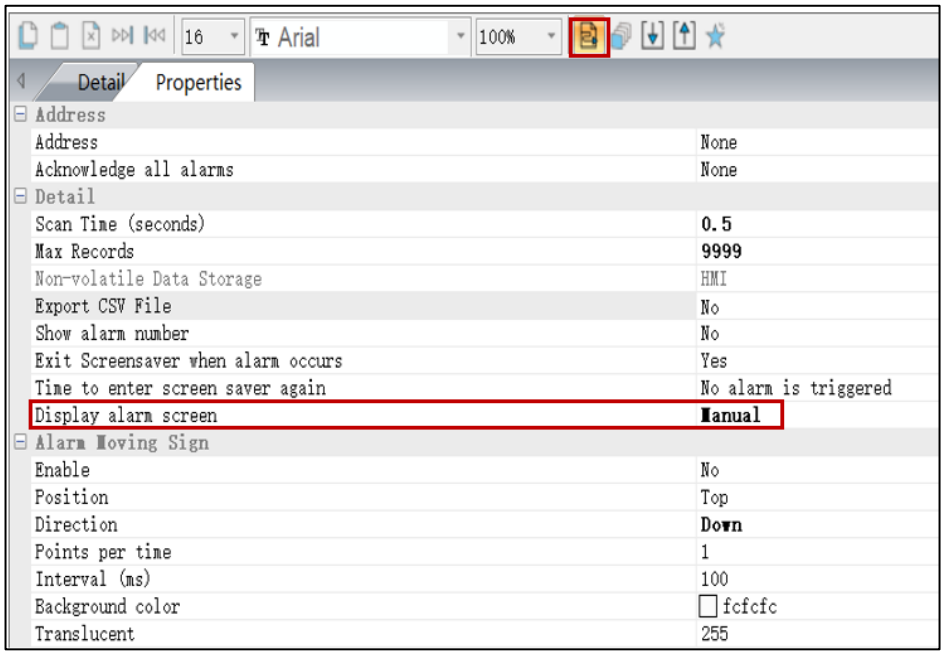
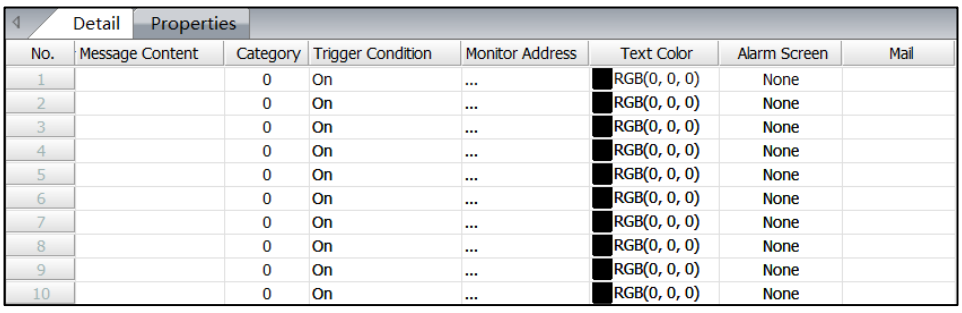
a	Time / date data
b	Alarm data
c	Sampling number
d	Data file header

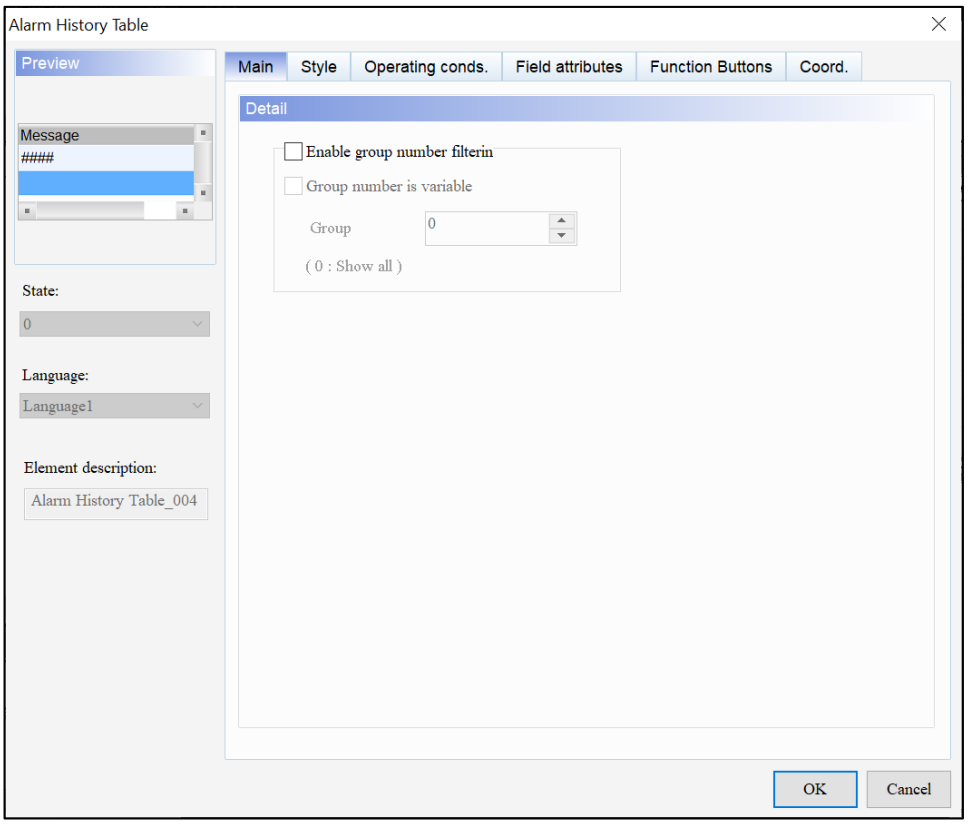
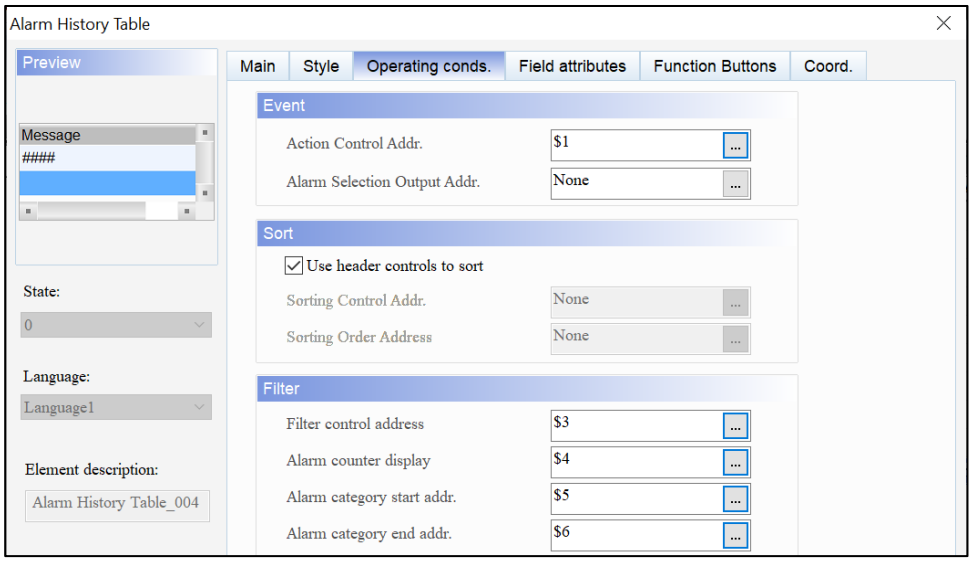
2. **Alarm Frequency Table**

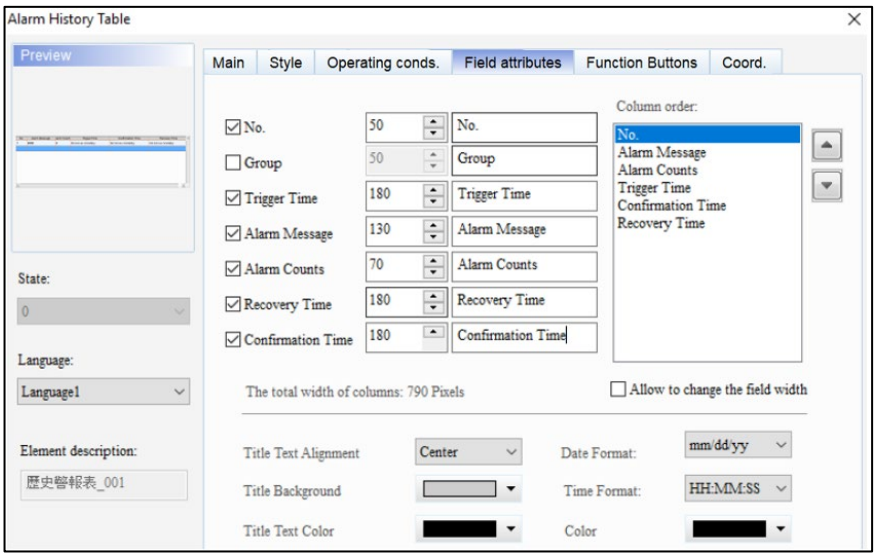
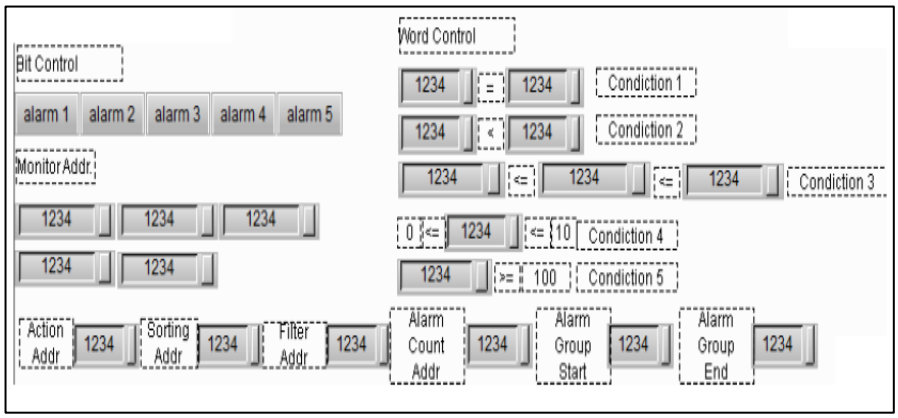
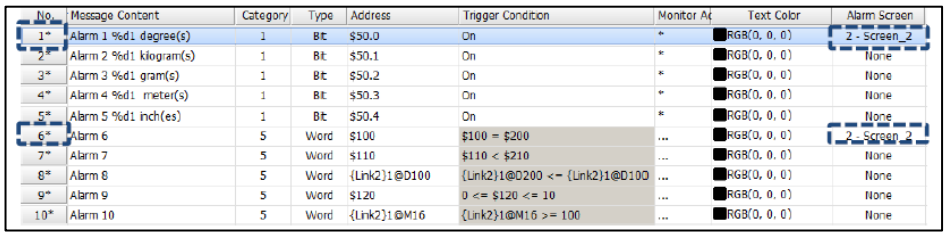
$$2\ Bytes(a) \times N(b) = \text{Actual file size } Bytes$$

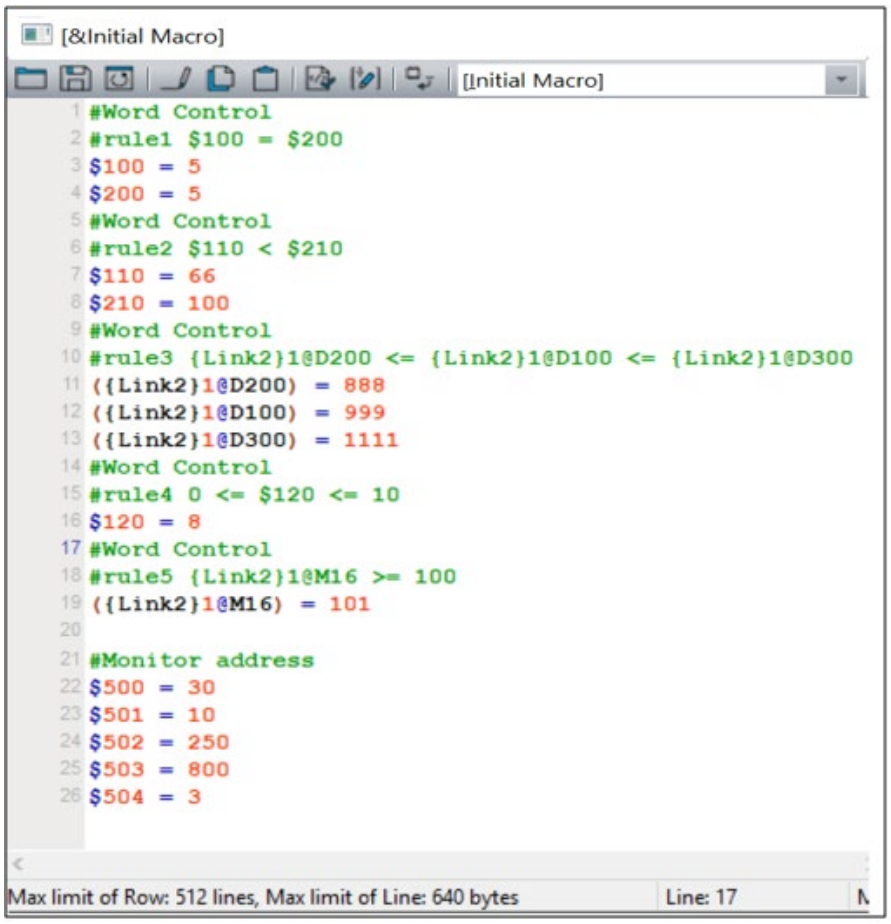
a	Alarm frequency data
b	Alarm records

The following table provides an example for non-continuous addresses settings.

Alarm Settings	
Alarm setting steps	**Step 1**: Go to **Data Management** > **Alarm Setting** to set up the alarm message display properties.  **Step 2**: Switch to non-continuous address, and in the **Alarm** window, click **Properties** tab and then set **Display alarm screen** to Manual. 
Alarm setting steps	Set ten alarms as follows. 

Alarm Settings	
Create Alarm History Table element	● Set the **Main** property page as follows.  ● Set the **Operating conds.** property page as follows. 

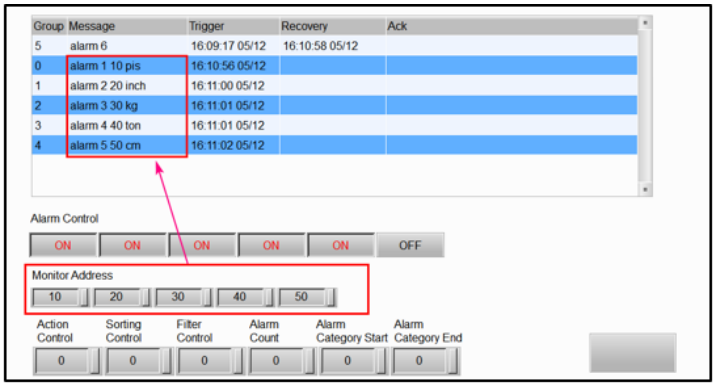
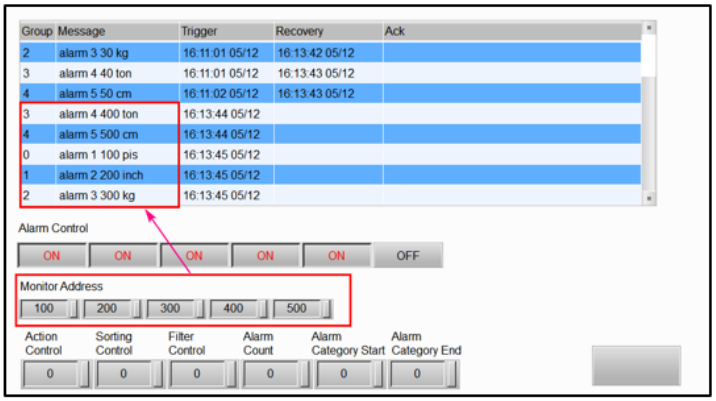
Alarm Settings	
Create Alarm History Table element	● Set **Field attributes** property page as follows. 
Create Numeric Entry elements and Maintained buttons for Alarm Settings and Alarm History Table addresses	Create **Maintained Button** and **Numeric Entry** elements. 
Create Alarm Screens	After creating an alarm screen as a Sub Screen, go to **General** > **Alarm Settings** to specify Alarm 1 and Alarm 6 as Screen_2.  

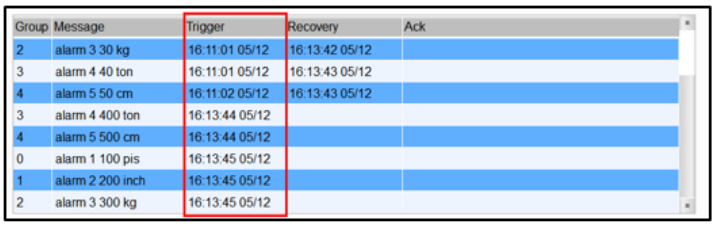
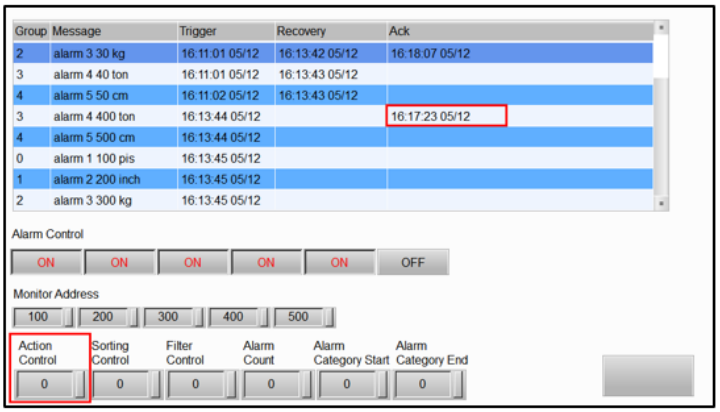
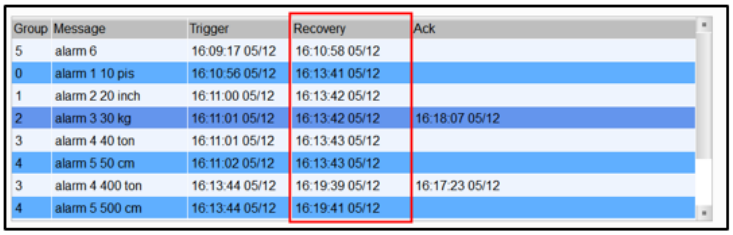
<table>
<tr><th colspan="2">Alarm Settings</th></tr>
<tr><td>Write Macro Command</td><td>
Go to Initial Macro to edit commands as follows. The action is set to “when the HMI screen is turned on”, Alarms 6 ~ 10 are on because the trigger conditions are met.
<table>
<tr><td>6*</td><td>alarm 6</td><td>5</td><td>Word</td><td>$100</td><td>$100 = $200</td></tr>
<tr><td>7*</td><td>alarm 7</td><td>5</td><td>Word</td><td>$110</td><td>$110 < $210</td></tr>
<tr><td>8*</td><td>alarm 8</td><td>5</td><td>Word</td><td>{Link2}1@D100</td><td>{Link2}1@D200 <= {Link2}1@D100 <= {Link2}1@D300</td></tr>
<tr><td>9*</td><td>alarm 9</td><td>5</td><td>Word</td><td>$120</td><td>0 <= $120 <= 10</td></tr>
<tr><td>10*</td><td>alarm 10</td><td>5</td><td>Word</td><td>{Link2}1@M16</td><td>{Link2}1@M16 >= 100</td></tr>
</table>


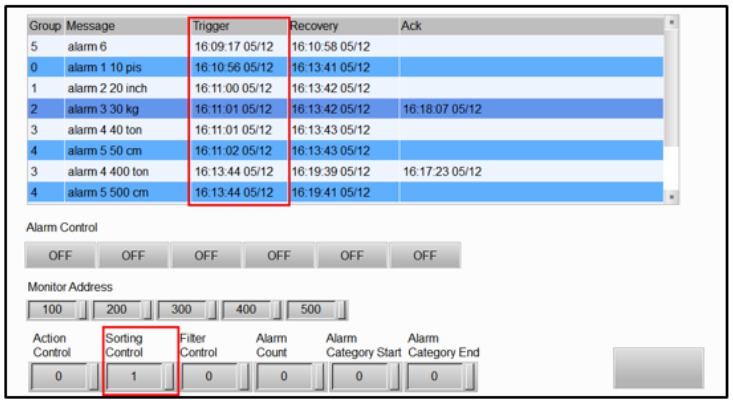
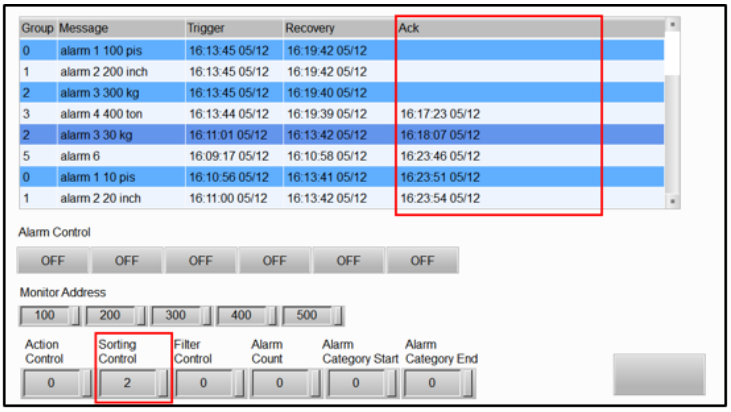
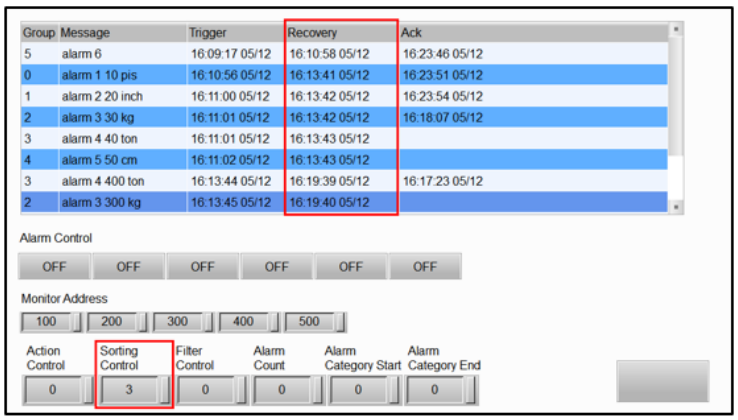
</td></tr>
<tr><td>Execution result</td><td>
Compile and download all screen data to the HMI. The actions are described as follows.
<table>
<tr><td>Display alarm screen</td><td>

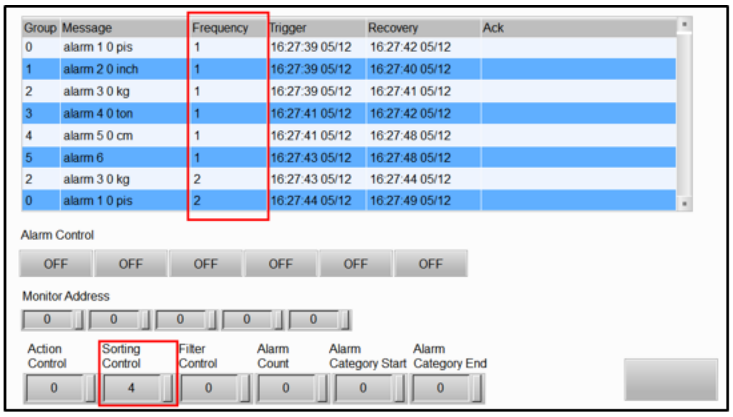
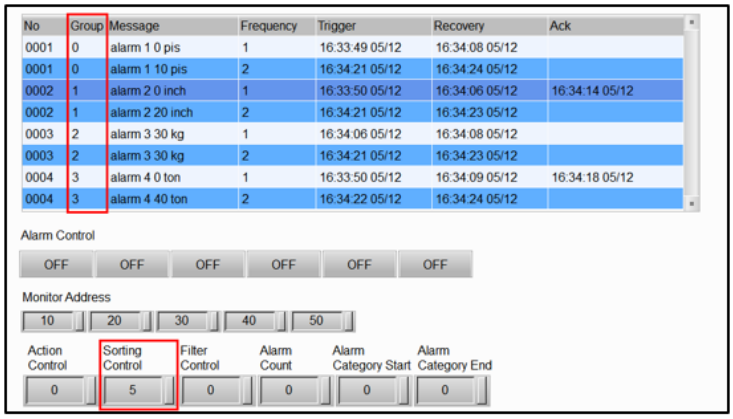
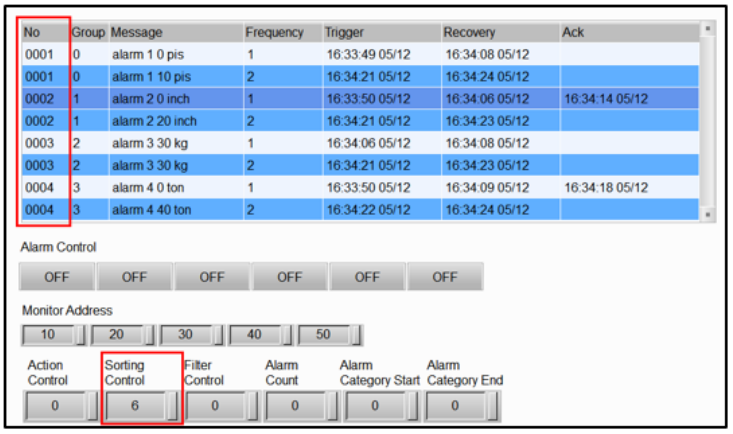
Set Display alarm screen to Manual and set Action Control Addr. to 2, and then the HMI displays the alarm screen.
If users set Display alarm screen to Auto and the Trigger Condition for Alarm 6 is met and thus the alarm switches to on, then the HMI automatically displays the set alarm screen.

</td></tr>
</table>
</td></tr>
</table>

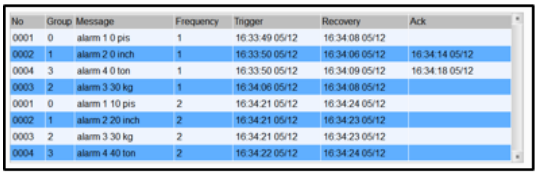
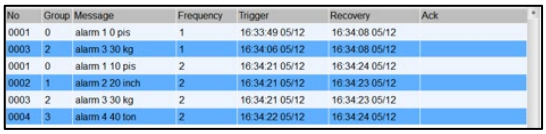
Alarm Settings		
		 ● Close the **Display alarm screen**.
	Trigger Condition 1 ~ 5 with Bit Control	Use Bit addresses to **Trigger Condition** 1 ~ 5, and the **Alarm History Table** element displays the user-defined alarm messages. 
	Trigger Alarms 1 ~ 5 with Bit Control	If the values of **Monitor Address** and Trigger Alarms 1 ~ 5 are changed again, the alarm messages change according to the modified values. 
	Trigger Time	When users use Bit or Word addresses to trigger the alarm and the trigger conditions are met, the **Alarm History Table** element shows the Trigger date and time.

<table>
<tr><th colspan="3">Alarm Settings</th></tr>
<tr><td rowspan="2"></td><td></td><td> 
</td></tr>
<tr><td>Acknowledge Time</td><td>Specify an alarm with the setting of Action Control Addr. as 1, and then the alarm Acknowledge Time is displayed.
 
</td></tr>
<tr><td rowspan="2">Execution result</td><td>Recovery Time</td><td>When users use Bit addresses to cancel the alarm-triggering action or when the Word trigger conditions are not met (such as Condition 1 and Condition 2), the Alarm History Table element shows the Recovery Time.
 
</td></tr>
<tr><td>Action Control Addr.</td><td>● If Action Control Addr. is 0, the Alarm History Table element has no action.
● If Action Control Addr. is 1, the Alarm History Table element shows the Acknowledge Time.
● If Action Control Addr. is 2 and Display alarm screen is set to Manual, the HMI displays the alarm screen.</td></tr>
</table>

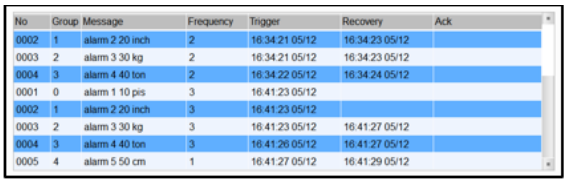
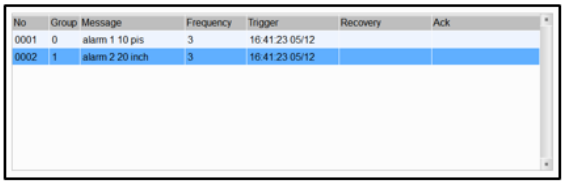
Alarm Settings		
	Sorting Control Addr.	● If **Sorting Control Addr.** is 0, the **Alarm History Table** has no action. ● If **Sorting Control Addr.** is 1, the alarms are sorted based on the **Trigger Time**.  ● If **Sorting Control Addr.** is 2, the alarms are sorted based on the **Acknowledge Time**.  ● If **Sorting Control Addr.** is 3, the alarms are sorted based on the **Recovery Time**.  ● If **Sorting Control Addr.** is 4, the alarms are sorted based on the alarm **Frequency** from low to high.

Alarm Settings		
		 ● If **Sorting Control Addr.** is 5, the alarms are sorted based on the alarm **Category** in ascending order.  ● If the **Sorting Control Addr.** is 6, the alarms are sorted based on the alarm numbers in ascending order. 
	Filter control address	● If **Filter control address** is 0, the **Alarm History Table** element displays all the triggered alarms. ● If **Filter control address** is 1, the **Alarm History Table** element hides alarms with both the **Recovery Time** and **Acknowledge Time**.

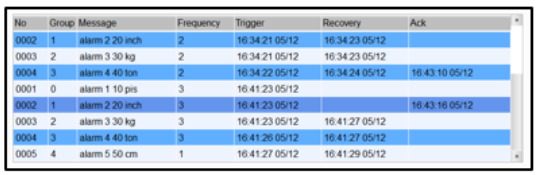
Alarm Settings

Not Hidden	
Hidden	

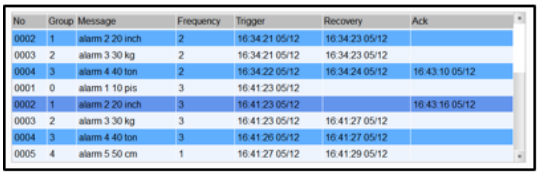
- If **Filter control address** is 2, the **Alarm History Table** element hides the alarms with **Recovery Time**.

Not Hidden	
Hidden	

- If **Filter control address** is 3, the **Alarm History Table** element hides the alarms with **Recovery Time** or **Acknowledge Time**.

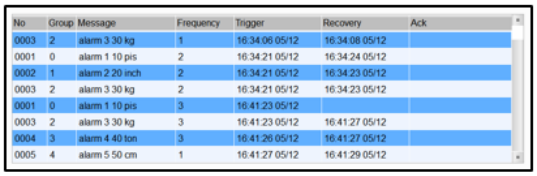
Not Hidden	
Hidden	

- If **Filter control address** is 4, the **Alarm History Table** element hides the alarms with **Acknowledge Time**.

Not Hidden	

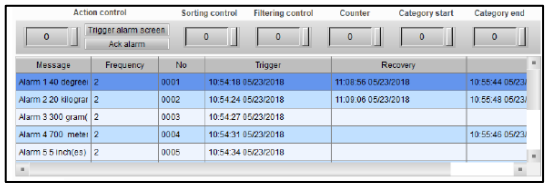
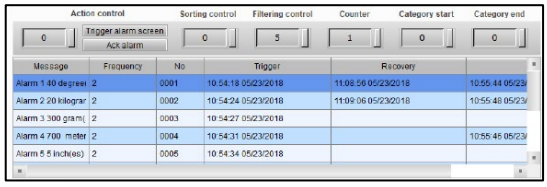
Alarm Settings

		Hidden



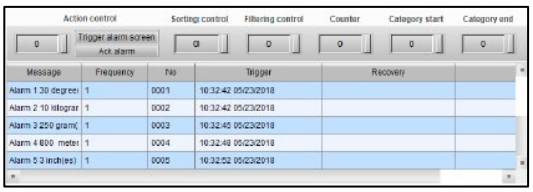
- When **Filter control address** is 5 and **Counter** (Alarm counter display) is set to 1, the **Alarm History Table** element hides the data with the alarm frequency less than 1. In this example, since there is no alarm frequency less than 1, all alarms are displayed.



Not Hidden	
Hidden	

- When **Filter control address** is 5 and **Counter** (Alarm counter display) is set to 2, the **Alarm History Table** element hides the data with the alarm frequency less than 2. In this example, all the alarms occurred only once, so all alarms are hidden.



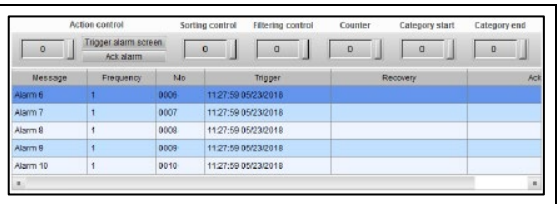
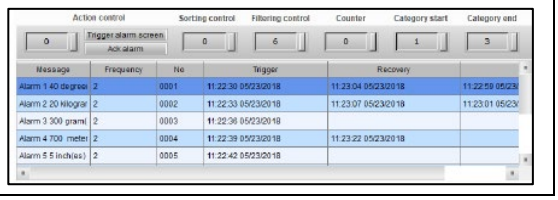
Not Hidden	
Hidden	

Alarm Settings

- When **Filter control address** is 6 with **Alarm Category Start Address** as 1 and **Alarm Category End Address** as 3, the alarm category numbers that are out of the range specified by **Category start** and **Category end** will be hidden.



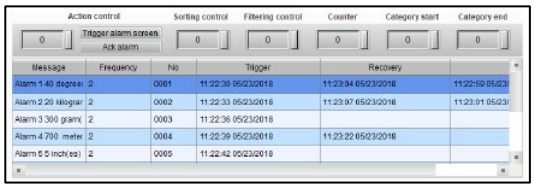
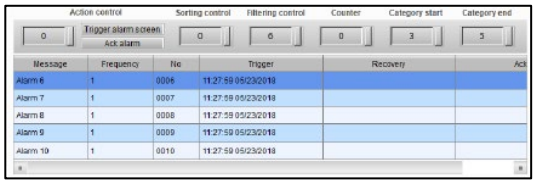
No.	Message Content	Category
1*	alarm 1 %d1 degree	1
2*	alarm 2 %d1 catty	1
3*	alarm 3 %d1 gram	1
4*	alarm 4 %d1 foot	1
5*	alarm 5 %d1 inch	1
6*	alarm 6	5
7*	alarm 7	5
8*	alarm 8	5
9*	alarm 9	5
10*	alarm 10	5

Not Hidden	
Hidden	

- When **Filter control address** is 6 with the **Alarm Category Start Address** as 3 and **Alarm Category End Address** 5, the alarm category numbers that are out of the range specified by **Category start** and **Category end** will be hidden.

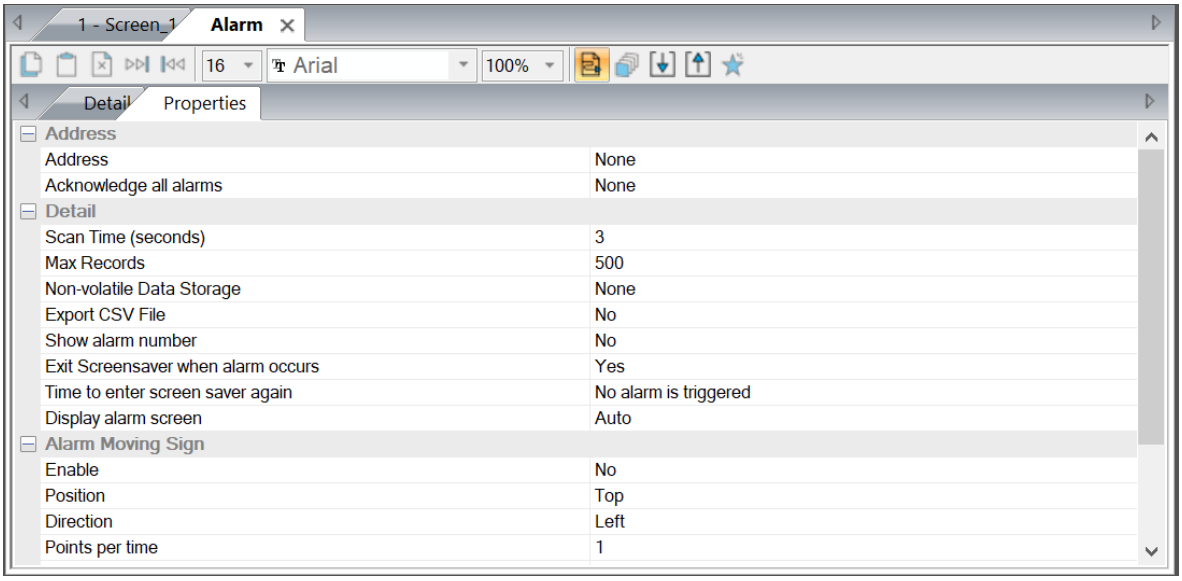


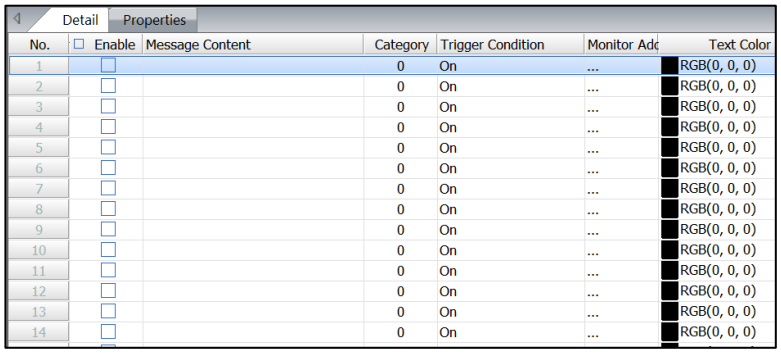
No.	Message Content	Category
1*	alarm 1 %d1 degree	1
2*	alarm 2 %d1 catty	1
3*	alarm 3 %d1 gram	1
4*	alarm 4 %d1 foot	1
5*	alarm 5 %d1 inch	1
6*	alarm 6	5
7*	alarm 7	5
8*	alarm 8	5
9*	alarm 9	5
10*	alarm 10	5

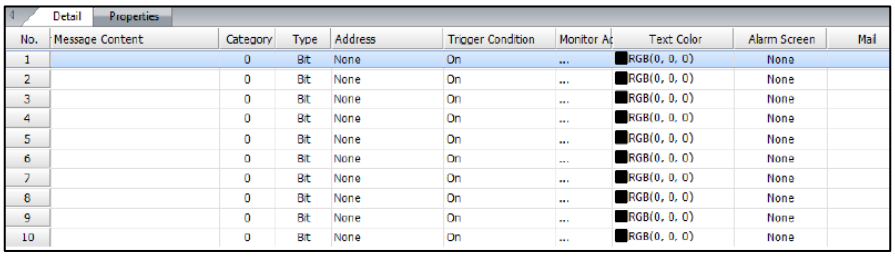
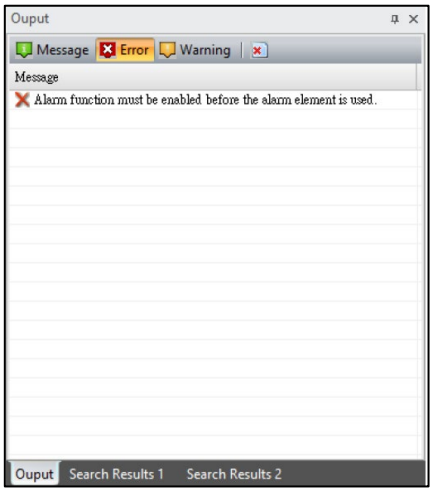
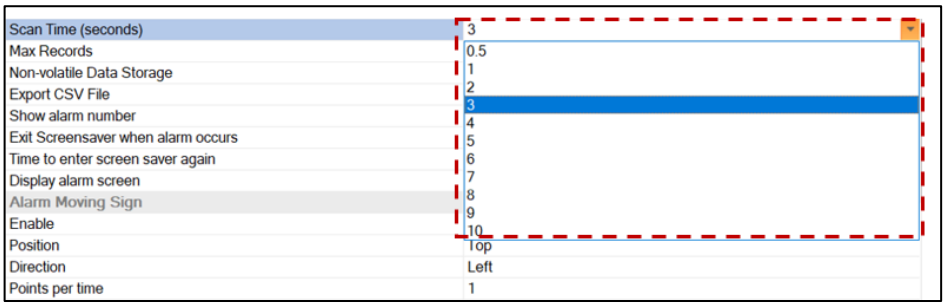
Alarm Settings			
		Not Hidden	
		Hidden	

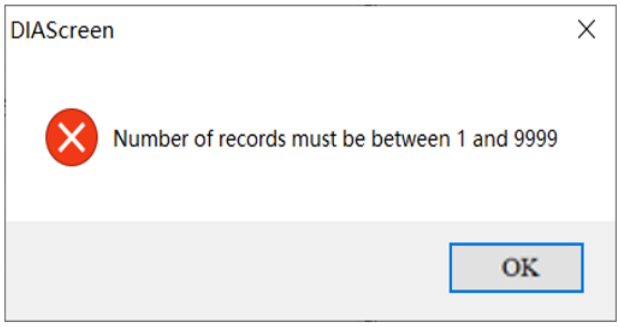
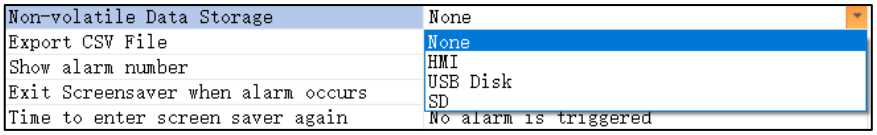
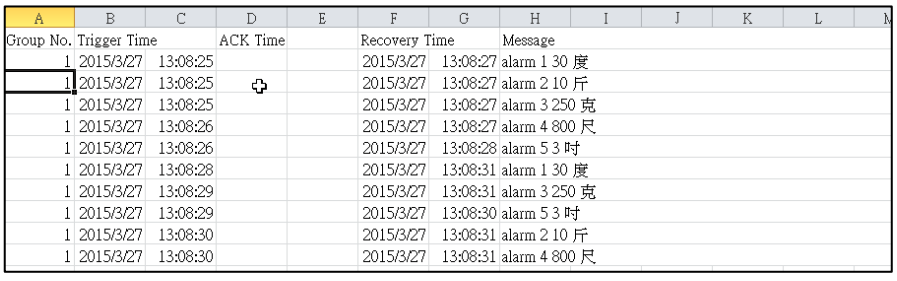
The following describes the detailed property functions for **Alarm Settings**.

Properties of Alarm Settings



Alarm Settings	
Switch between continuous and non-continuous alarm addresses 	● Its usage is the same as that of the DOP-B models. The default value is **Continuous Alarm Address**. 

Properties of Alarm Settings	
	● Click  icon, and the setting changes to non-continuous address. When the setting is non-continuous address, use Bit or Word addresses for alarm triggering. 
Read Address	● **Read Address** is only applicable to continuous addresses. ● Select the Internal Memory or the controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings* for details. ***NOTE**: If the alarm-related elements are created, but the alarm read address is not set, DIAScreen displays the following message when compiling data.* 
Scan Time (seconds)	**Scan Time** range is 0.5 ~ 10 seconds. The default value is **3** seconds. 
Max Records	● **Max Records** refers to the recorded data. When the recorded sampling number reaches the maximum, the record starts from 1 and overwrites the previous data. The default value is

Properties of Alarm Settings	
	500. ● The maximum record is 9,999. ***NOTE***: 1. *The maximum record must not be 0.* 2. *If users enter 0, DIAScreen displays the following message.* 
Non-volatile Data Storage	● The available options for the storage location are: None, HMI, USB Disk, and SD Card. The default value is **None**. ● If the model does not support using an SD Card, it only shows HMI and USB Disk; on the other hand, if the model does not support using a USB Disk, it only shows HMI and SD Card.  ● When users set to store the data in the HMI, it means when the power is cut off, the data is saved in the HMI SRAM. ● If **Export CSV File** is set to Yes, set **Non-volatile Data Storage** to USB Disk or SD Card.
Export CSV File	Setting **Export CSV File** to Yes means users can save the alarm data as CSV files in the external storage devices such as USB Disks or SD Cards. The default value is **No**. 

Group No.	Trigger Time		ACK Time		Recovery Time		Message
1	2015/3/27	13:08:25			2015/3/27	13:08:27	alarm 1 30 度
1	2015/3/27	13:08:25			2015/3/27	13:08:27	alarm 2 10 斤
1	2015/3/27	13:08:25			2015/3/27	13:08:27	alarm 3 250 克
1	2015/3/27	13:08:26			2015/3/27	13:08:27	alarm 4 800 尺
1	2015/3/27	13:08:26			2015/3/27	13:08:28	alarm 5 3 吋
1	2015/3/27	13:08:28			2015/3/27	13:08:31	alarm 1 30 度
1	2015/3/27	13:08:29			2015/3/27	13:08:31	alarm 3 250 克
1	2015/3/27	13:08:29			2015/3/27	13:08:30	alarm 5 3 吋
1	2015/3/27	13:08:30			2015/3/27	13:08:31	alarm 2 10 斤
1	2015/3/27	13:08:30			2015/3/27	13:08:31	alarm 4 800 尺

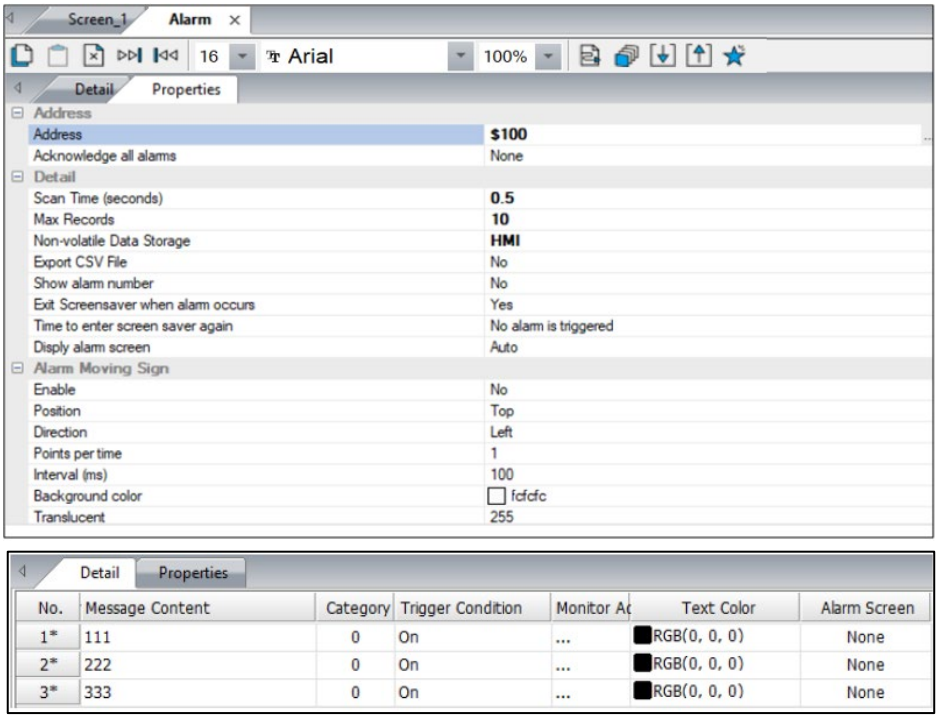
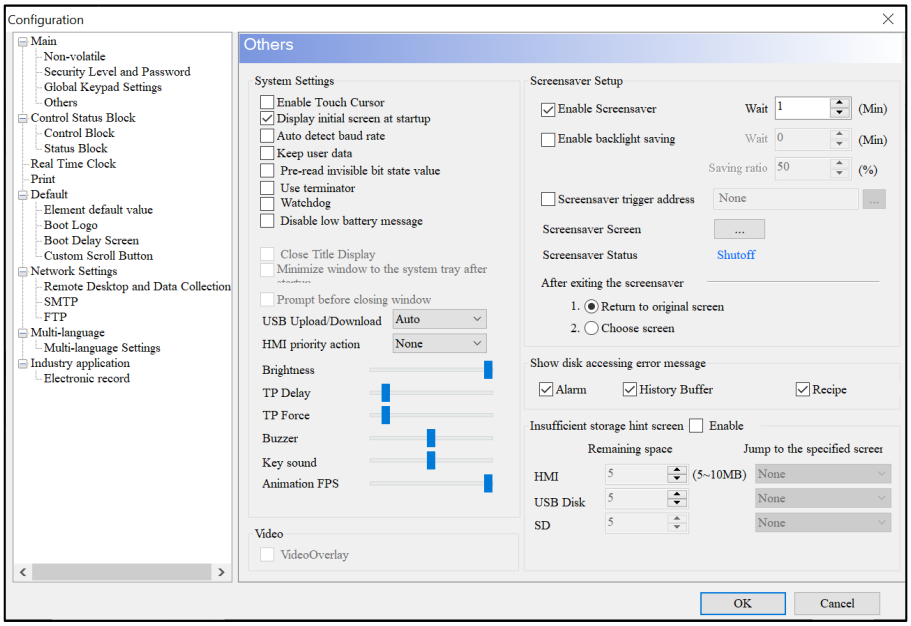
<table>
<tr><th colspan="2">Properties of Alarm Settings</th></tr>
<tr><td>Show alarm number</td><td>

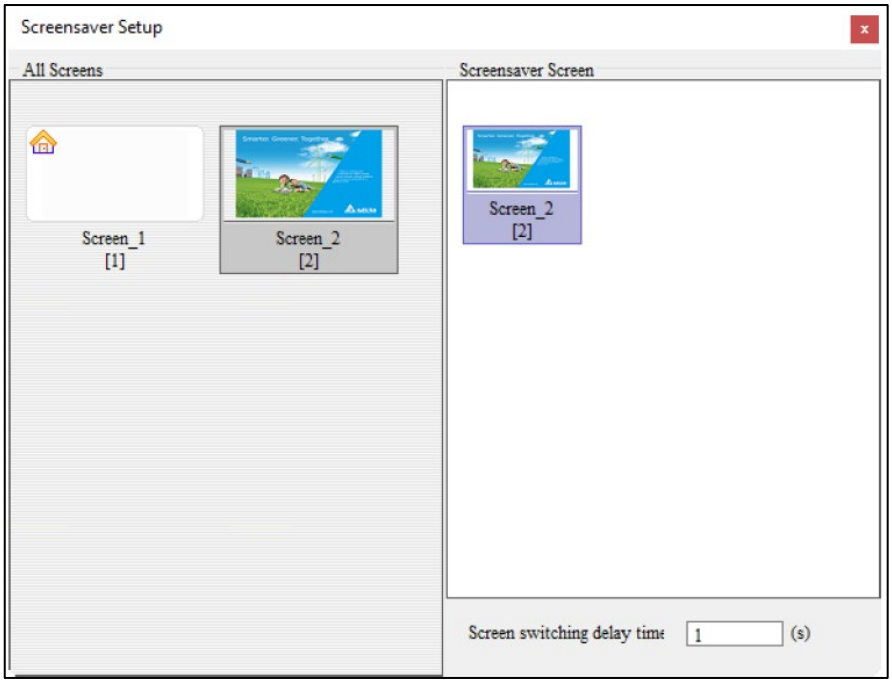
When users set Show alarm number to Yes, the exported CSV files include the alarm numbers.
When users set Show alarm number to No, the alarm numbers are not displayed. The default value is No.

<table>
<tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th><th>I</th></tr>
<tr><td>1</td><td>Group No</td><td>Trigger Time</td><td></td><td>ACK Time</td><td></td><td>Recovery Time</td><td></td><td>Alarm No</td><td>Message</td></tr>
<tr><td>2</td><td>0</td><td>2020/4/17</td><td>10:55:23</td><td></td><td></td><td></td><td></td><td>3</td><td>alarm3</td></tr>
<tr><td>3</td><td>0</td><td>2020/4/17</td><td>10:55:25</td><td></td><td></td><td></td><td></td><td>2</td><td>alarm2</td></tr>
<tr><td>4</td><td>0</td><td>2020/4/17</td><td>10:55:25</td><td></td><td></td><td></td><td></td><td>1</td><td>alarm1</td></tr>
</table>
</td></tr>
<tr><td>Exit Screensaver when alarm occurs / Time to enter screen saver again</td><td>

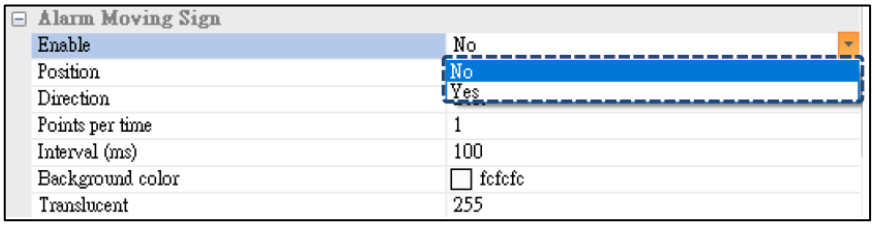
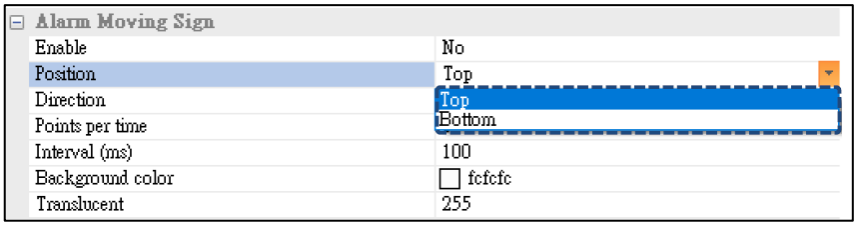
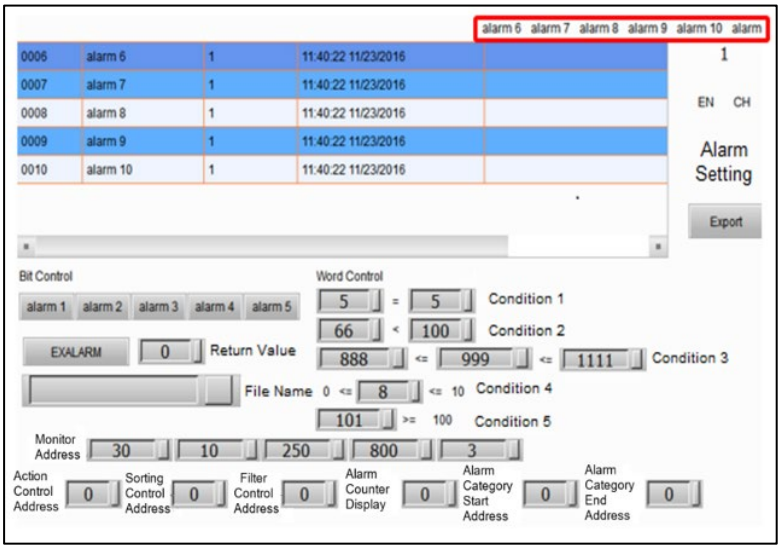
These functions are used with the screensaver. The default value for Exit Screensaver when alarm occurs is Yes.
Assume that the screensaver is enabled and the screensaver image is set, the HMI does not show the screensaver image if alarm occurs; if the screensaver image is not set, the HMI does not enter the backlight mode.
If users disable the Exit Screensaver when alarm occurs function, then the HMI exits the screensaver when the alarm is triggered for the first time. After that, whether the alarm is cleared or not, the HMI enters the screensaver mode according to the set time.
Time to enter screen saver again is enabled only when Exit Screensaver when alarm occurs is set to Yes. It is enabled under either of the two conditions: No alarm is triggered or No alarm is triggered during the screen saver waiting time. The default value is No alarm is triggered.

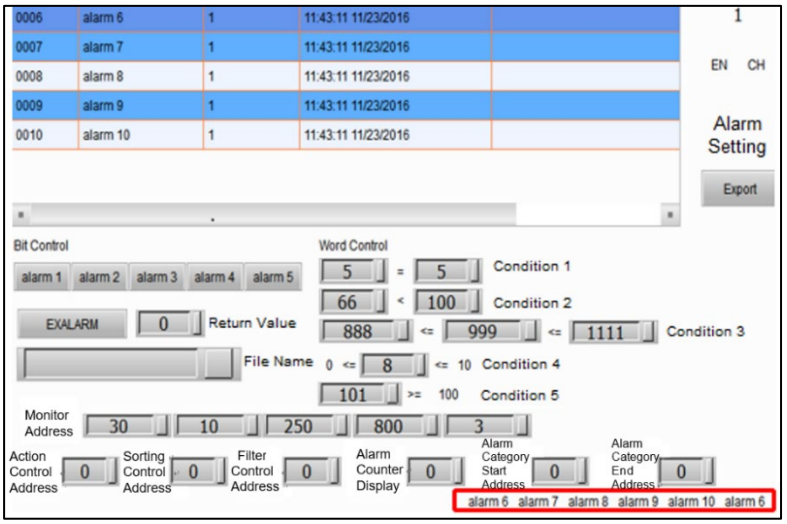
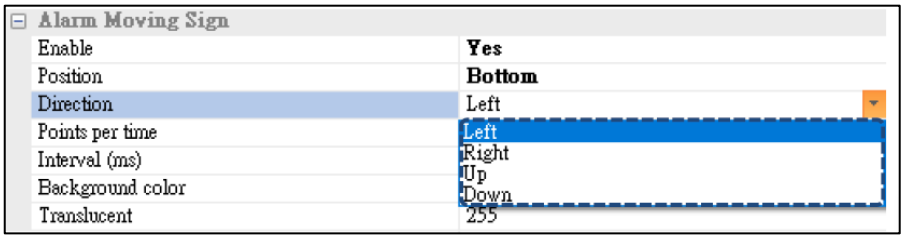
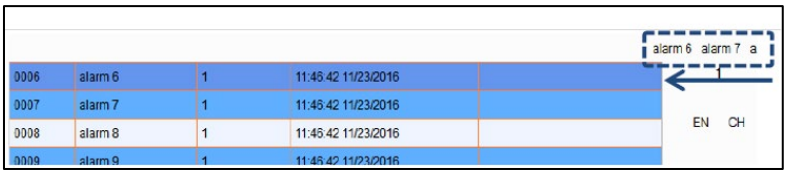
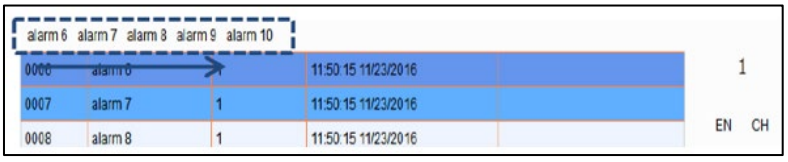
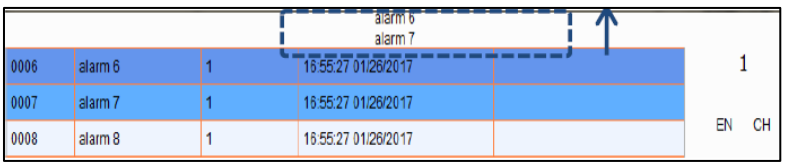
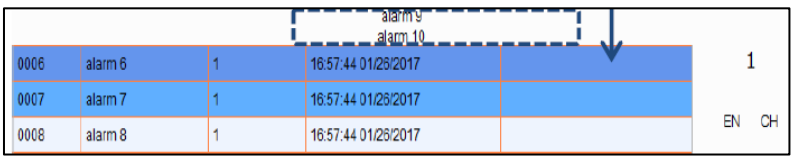
<table>
<tr><td>Exit Screensaver when alarm occurs</td><td>Yes</td></tr>
<tr><td>Time to enter screen saver again</td><td>No alarm is triggered</td></tr>
<tr><td>Display alarm screen</td><td>No alarm is triggered</td></tr>
<tr><td>Alarm Moving Sign</td><td>No alarm is triggered during the screen saver waiting time</td></tr>
</table>
<table>
<tr><td>No alarm is triggered</td><td>When Exit Screensaver when alarm occurs is set to Yes for the HMI, once the alarm occurs, the screensaver is exited immediately. If Time to enter screen saver again is set to No alarm is triggered, as long as no alarm is triggered, the HMI can enter the screensaver mode.</td></tr>
<tr><td>No alarm is triggered during the screen saver waiting time</td><td>When Exit Screensaver when alarm occurs is set to Yes for the HMI, once the alarm occurs, the screensaver is exited immediately. If Time to enter screen saver again is set to No alarm is triggered during the screen saver waiting time, as long as no alarm is triggered during the waiting time, the HMI can enter the screensaver mode.
Screensaver Setup
☑ Enable Screensaver Wait: 1 (Min)</td></tr>
</table>
</td></tr>
</table>

Properties of Alarm Settings	
	Example ● Create the alarm data as follows. 
Exit Screensaver when alarm occurs	● Create a **Numeric Entry** element and set **Write Address** to $100. ● Go to **General** > **Configuration** > **Main** > **Others**, and select the **Enable Screensaver** checkbox and set the waiting time as 1 minute.  ● Go to **Screen** > **Screensaver Setup** to create a screensaver screen.

Properties of Alarm Settings	
	 ● Compile the project and download the screen to the HMI. Enter 1 to the **Numeric Entry** element $100 to trigger the alarm. Wait 1 minute for the screensaver to enable. When the HMI detects an alarm, it automatically exits the screensaver mode.
Display alarm screen	● The available options for **Display alarm screen** are: Auto or Manual mode. The default value is **Auto**. ● **Auto**: The HMI displays the alarm screen as soon as the alarm with a set alarm screen is triggered. ● **Manual**: To have the HMI display the alarm screen, go to **Operating conds.** property page of the **Alarm History Table** element and enter 2 to **Action Control Addr.**, or select the **Trigger alarm screen** checkbox in the **Function Buttons** property page of the **Alarm History Table** element to display the alarm screen.

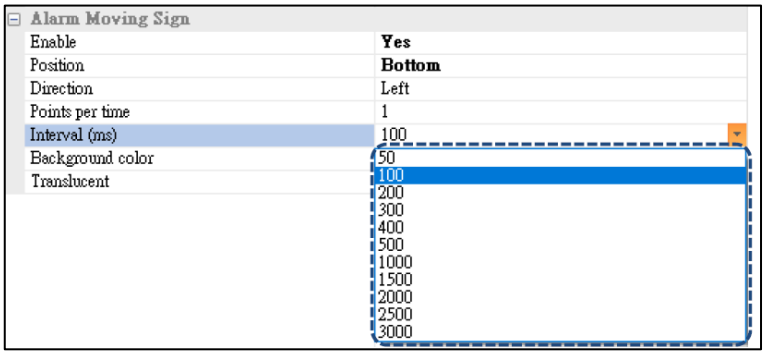
Properties of Alarm Settings	
Alarm Moving Sign	
Enable	● The available options for **Enable** are: Yes or No. The default value is **No**. ● When the alarm is triggered, selecting Yes means the alarm message shows at the specified position on the screen, whereas No means not to show the alarm message.

Properties of Alarm Settings	
Alarm Moving Sign	
	
Position	● The available options for **Position** are: Top and Bottom. The default value is **Top**. ● If users select Top, once the alarm is triggered, the alarm message shows at the top of the HMI screen; if users select Bottom, the alarm message shows at the bottom of the HMI screen. 
Top	

Properties of Alarm Settings	
Alarm Moving Sign	
	Bottom 
Direction	The available options for **Direction** are: Left, Right, Up, and Down. The default value is **Left**.  Left  Right  Up  Down 
Points per time	The greater the number, the greater the distance each time the text moves. The setting range is 1 ~ 50 pixels. The default value is **1**.

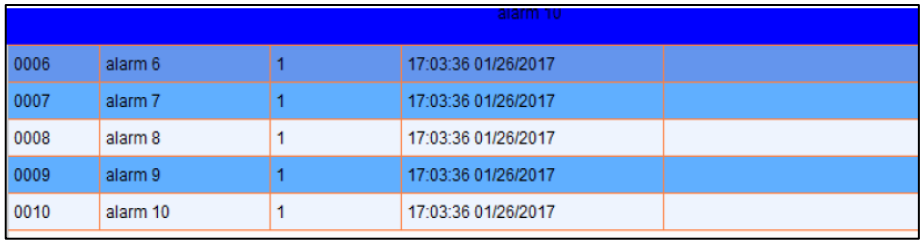
<table>
<tr><th colspan="2">Properties of Alarm Settings</th></tr>
<tr><td colspan="2">Alarm Moving Sign</td></tr>
<tr><td>Interval (ms)</td><td>

The Interval (ms) defines the time interval (unit: ms) between two message movements of the Moving Sign. The default value is 100.
The moving distance is determined by the setting of Points per time.

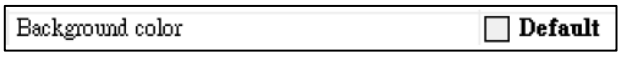


</td></tr>
<tr><td>Background color</td><td>

This is the background color of the Alarm Moving Sign element as shown in the following figure.

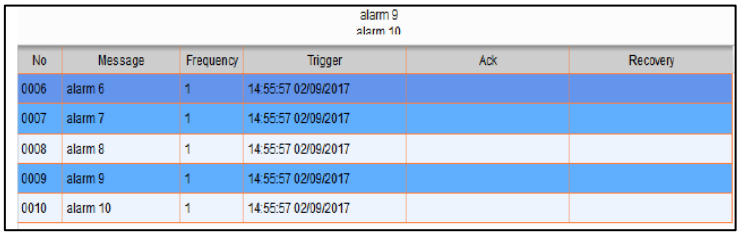
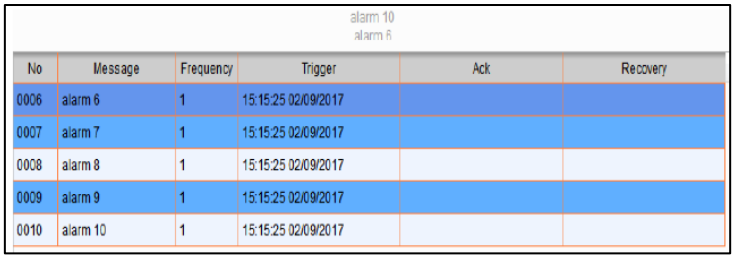


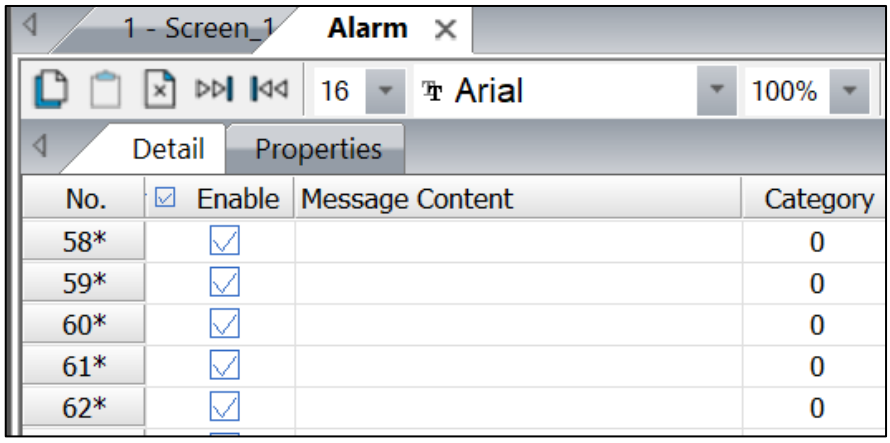
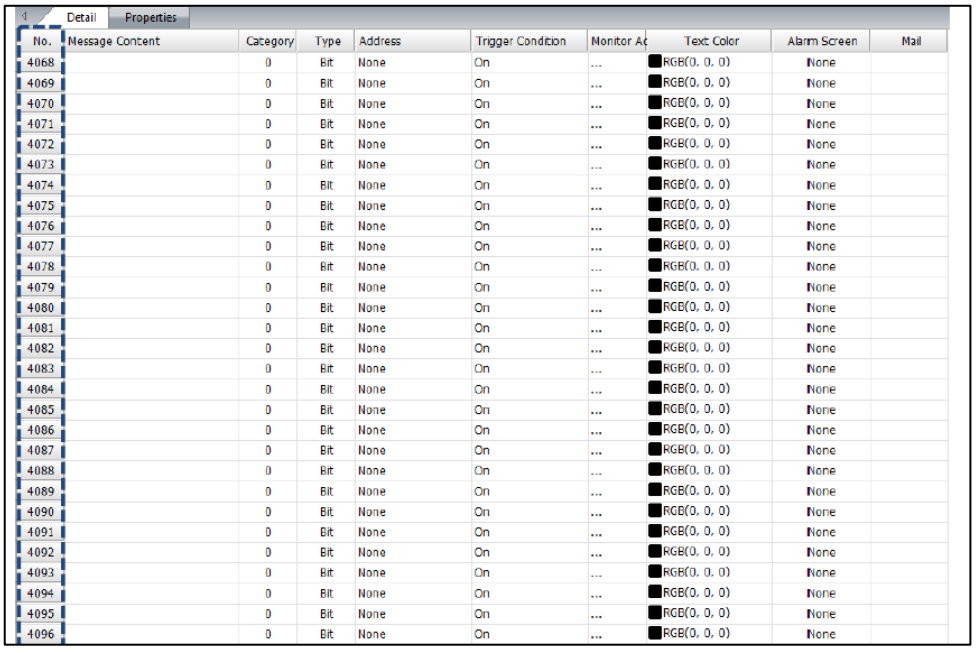
The default is  .

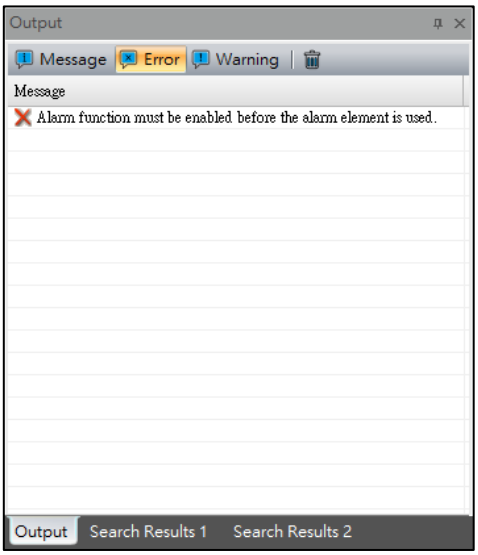
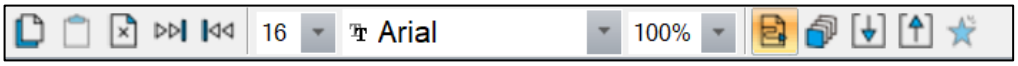


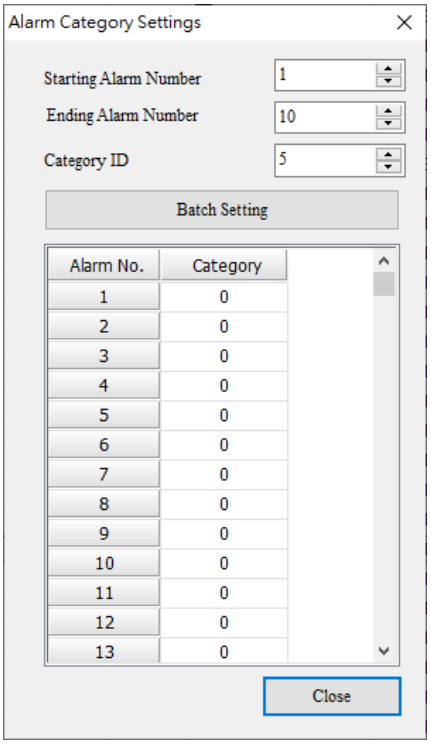
</td></tr>
<tr><td>Translucent</td><td>

Set the transparency level for the message of the Alarm Moving Sign element. The default value is 255. The minimum is 0.

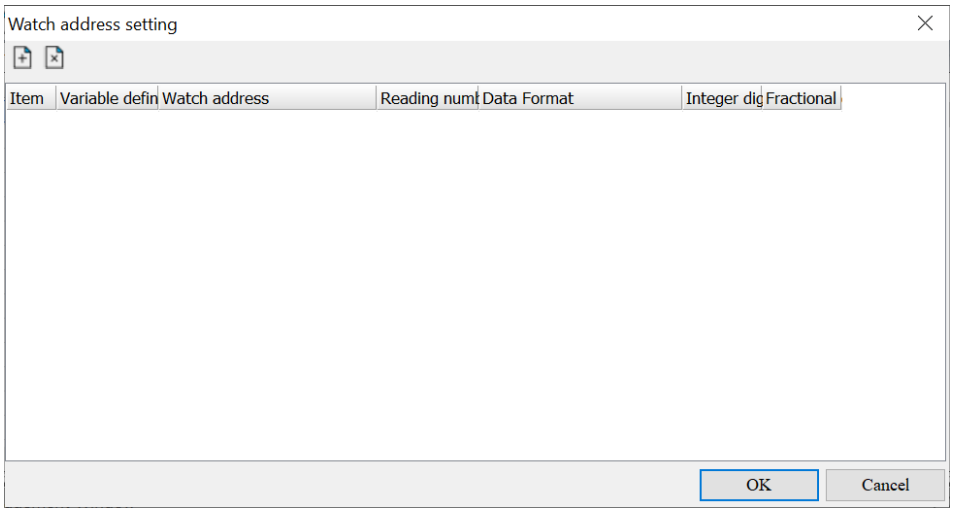
<table>
<tr><td>Translucent is set to 255</td><td> 
</td></tr>
<tr><td>Translucent is set to 100</td><td> 
</td></tr>
</table>
</td></tr>
</table>

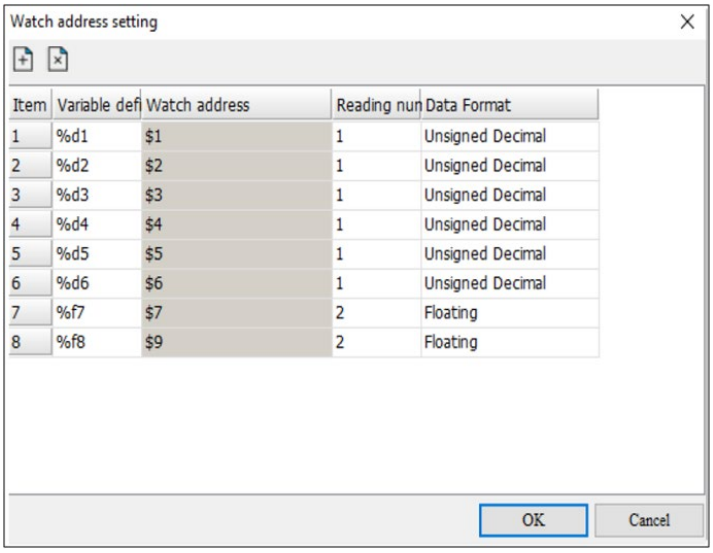
Properties of Alarm Settings	
Alarm Message Display Content	
No.	● When users use the **Backspace** or **Delete** key to delete the message content or leave the content blank, the number is marked with an asterisk (*), reminding that this alarm message still exists unless  icon is used to delete the alarm message.  ● **No.** represents the number of alarm messages, and supports up to 4096 alarms. 

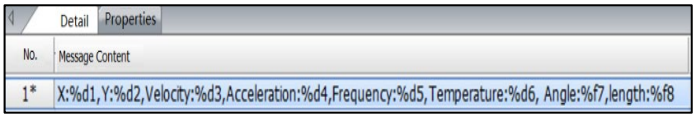
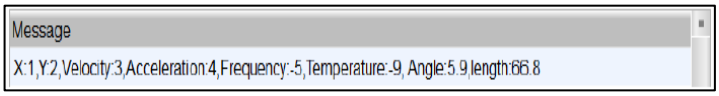
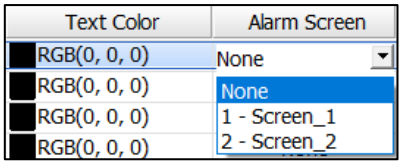
Properties of Alarm Settings	
Alarm Message Display Content	
Message Content	● In the **Message Content** field, edit the alarm messages to display. ● To modify the message, modify it directly in the field. ● Add "%d1" formatted string after the message content, e.g. Alarm%d1. This string must be used with monitoring addresses. ***NOTE***: *If users have created an alarm related element with alarm* ***Read Address*** *but leave the* ***Message Content*** field blank, *DIAScreen displays the following message when compiling data.* 
Category	● Refers to the category of the alarm number, which is similar to groups. ● The supported range is 0 ~ 4095. ● Use the **Batch Processing Category Settings**  icon to quickly set the category numbers.  ● Set 1 as the **Starting Alarm Number**, 10 as the **Ending Alarm Number**, 5 as the **Category ID**, click **Batch Setting**, and then Alarm No. 1 - 10 are defined as Category 5.

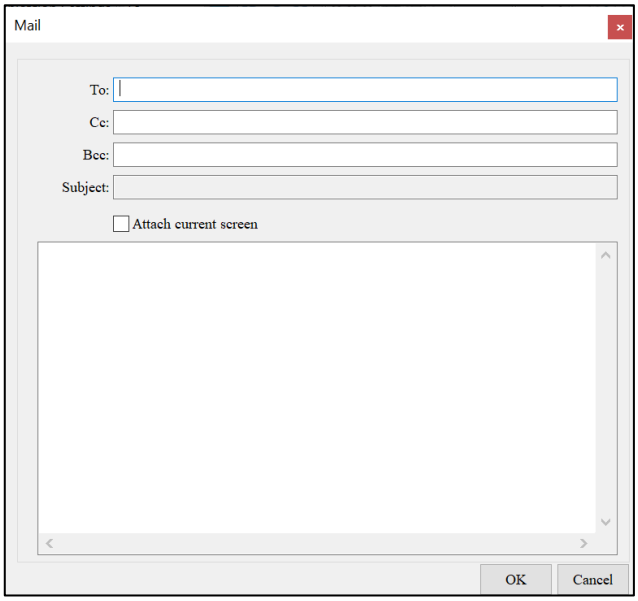
Properties of Alarm Settings	
Alarm Message Display Content	
	
Type	● This field appears when the **Continuous Alarm Address** icon is canceled. Cancel the selection of this field and then the alarm read address is disabled. Trigger the alarms individually depending on the alarm address **Type** setting which is Bit or Word. ● The available options for **Type** are: Bit and Word. The default value is **Bit**. ● Bit address: User-defined Bit address for alarm triggering. ● Word address: User-defined Word address for alarm triggering.
Address	● This field appears when the **Continuous Alarm Address** icon is canceled. Cancel the selection of this field and then the alarm read address is disabled. Trigger the alarms individually depending on the alarm address **Type** setting which is Bit or Word. ● Set the corresponding addresses to trigger the alarms according to the **Type** settings (Bit or Word). ● If users select Bit, enter the Bit address for alarm triggering. ● If users select Word, statements for determining when to trigger the alarm are provided.

Statement	Description
=	Equal to
>	Greater than
<	Less than

<table>
<tr><th colspan="3">Properties of Alarm Settings</th></tr>
<tr><td colspan="3">Alarm Message Display Content</td></tr>
<tr><td></td><td colspan="2"><table>
<tr><td>>=</td><td>Greater than or equal to</td></tr>
<tr><td><=</td><td>Less than or equal to</td></tr>
<tr><td>>,<</td><td>Out of range</td></tr>
<tr><td><=,<=</td><td>Within range</td></tr>
</table></td></tr>
<tr><td>Trigger Condition</td><td colspan="2">● The available options for Trigger Condition are: On and Off. The default value is On.
● If users select On, it means the alarm is triggered when the bit is on; if users select Off, it means the alarm is triggered when the bit is off.</td></tr>
<tr><td>Monitor Address</td><td colspan="2">Monitor Address is for displaying the user-defined alarm messages.
 

● Two types of formats are supported: %d (positive integer) and %f (floating-point number). Besides, one alarm can set up to 8 monitoring addresses.
 
</td></tr>
</table>

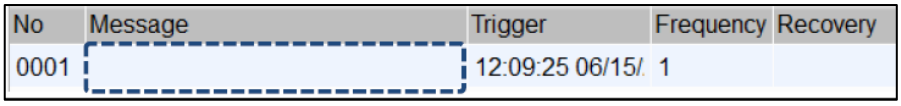
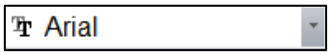
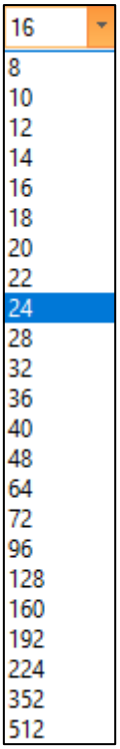
<table>
<tr><th colspan="2">Properties of Alarm Settings</th></tr>
<tr><td colspan="2">Alarm Message Display Content</td></tr>
<tr><td></td><td>
Enter the alarm message to be displayed in the Message Content field, and add the set Monitor Address such as %dx or %fx where x indicates 1 ~ 8.
<table>
<tr><td>Alarm message setting</td><td> 
</td></tr>
<tr><td>Execution result</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>Text Color</td><td>Set the text color of the displaying alarm message. The default is  .</td></tr>
<tr><td>Alarm Screen</td><td>
Set whether to show the specified Alarm Screen when the alarm is triggered. The default value is None.
If users have created other screens, use the drop-down list box to select the screen number to display.


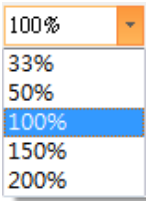
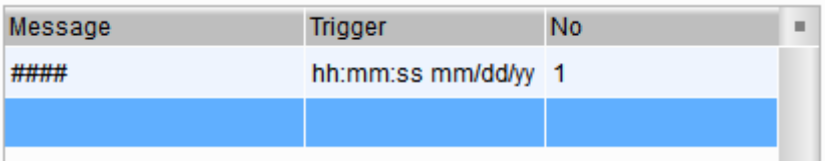
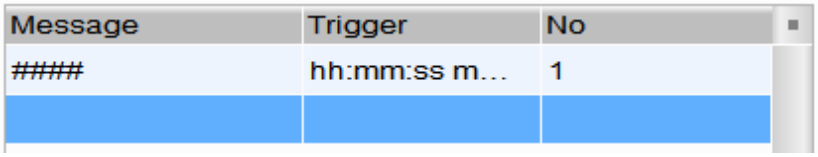
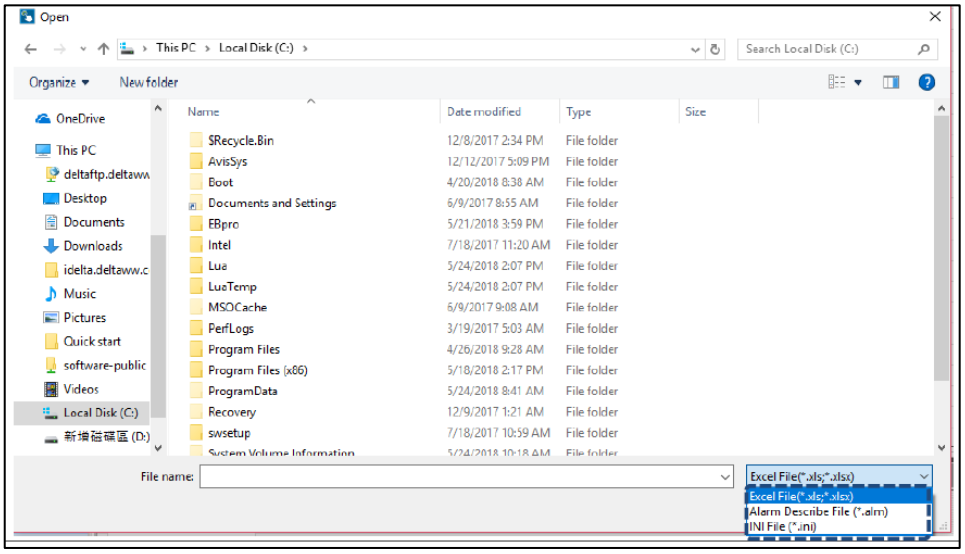
</td></tr>
<tr><td>Mail</td><td>
When an alarm occurs, the Mail function sends an e-mail to relevant recipients. Go to General > Configuration > Network Settings to enable SMTP function to have the Mail function work.
After the SMTP function is enabled, enter the email content in the Mail data fields.


<table>
<tr><td>To</td><td>Fill in the recipient’s email address for receiving the notification when an alarm occurs. Same as regular</td></tr>
</table>
</td></tr>
</table>

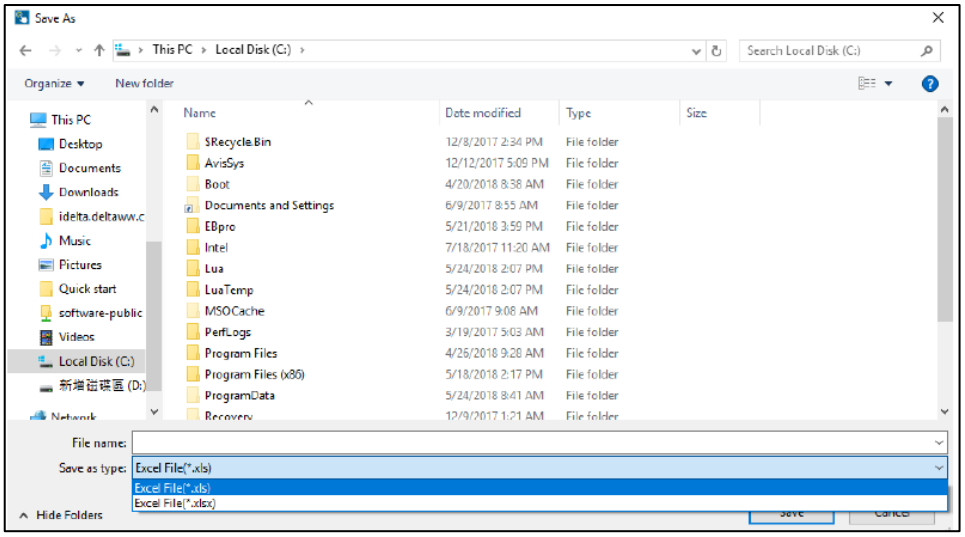
Properties of Alarm Settings		
Alarm Message Display Content		
		email systems, fill in multiple recipients by using semi-columns (;) to separate the recipients' email addresses.
	Cc	Apart from the main recipients, users can also send alarm notifications to other recipients by entering their email addresses in this field. Note that main recipients can see those who are in the **Cc** field.
	Bcc	Send blind copies to the recipients in this field. The main and carbon copy recipients cannot see those who are in the **Bcc** field in the alarm notification.
	Subject	The content in the **Subject** field is not editable in the **Mail** screen. The subject is generated based on the alarm message content. To modify the subject, go to the **Message Content** field to change the display message.
	Attach current screen	If users select this option, the current alarm screen is attached in this email and sent to the recipients. The attachment is in .bmp format.
	Content	● Enter the email content as needed. ● This content supports the formatted strings "%d" and "%f", which must be used with monitoring addresses.

Properties of Alarm Setting	
Alarm Message Text Properties	
Copy	● Support single and multiple copy functions. ● Use the **Ctrl** key to select the alarm number to copy, and use the **Shift** key to select a range of alarm numbers to copy.
Paste	The **Paste** function becomes available after executing the **Copy** function. It supports single and multiple paste functions.
Delete	After creating the alarm message, select the message to be deleted, and then click **Delete** button to complete the deletion. ***NOTE**: If users enter the message in the **Message Content** field and then move on to the next row, it means they have created a new alarm message. Next, if users delete this alarm message with the **Delete** or **Backspace** key on the keyboard instead of the **Delete** button, the HMI shows a blank alarm at the specified position after users exit **Alarm Settings** and download the screens to the HMI.*

Properties of Alarm Setting	
	
Next 2048 entries 	Click  icon. It shows Alarm No. 2049 ~ 4096.
Previous 2048 entries 	Click  icon. It shows Alarm No. 1 ~ 2048.
Font	Set the font for the displaying alarm message. The default font is **Arial**. 
Size	Size is the text size for displaying alarm message. The default size is **16**. 
Zoom	If users have set the zoom function, the zooming effect can be seen on the title and text. The default value is **100%**.

Properties of Alarm Setting	
	 100%:  150%: 
Import 	Click  icon to import the alarm data. Supported file formats are .xls or .xlsx, .alm, and .ini. 
Export 	● Click  icon to export the edited alarm messages. Supported file formats are .xls and .xlsx.

Properties of Alarm Setting



- Apart from the alarm messages, the editable alarm parameters include the alarm mail and alarm properties, as shown in the following figure.

O	P	Q	R	S	T
[Mail To]	[CC]	[BCC]	[AttachScreen]	[Language1 Mail Conter	[Language2 Mail Content]
Recipient	Cc.	Bcc.	Attach current screen	[Language1 Content]	[Language2 Content]
			0		
			0		
			0		
			0		
			0		
			0		
			0		
			0		
			0		
			0		

	A	B	C	D
1	[Language]	[Font]	[Size]	[Ratio]
2		Font	Size	Ratio
3	Language1	Arial	12	100
4	Language2	Arial	12	100
5				
6	Alarm Setting	Address		
7	Address	Address	None	
8	Scan Time	Scan Time (seconds)	0.50000	
9	Max Records	Max Records	9999	
10	Hold	Enable non-volatile me	1	
11	Hold Place	Non-volatile Data Stora	0	
12	CSV	Export CSV File	0	
13	Exit Screen Saver	Exit Screensaver when a	1	
14	Screen Display Mode	Display alarm screen	1	
15	Continue Address	Continuous alarm addr	0	
16				
17	Alarm Moving Sign	Alarm Moving Sign		
18	Enable	Enable	1	
19	Position	Position	0	
20	Direction	Direction	3	
21	Moving Points	Points per time	1	
22	Interval	Interval (ms)	100	
23	BackgroundColor	Background color	RGB(252,252,252)	
24	Opacity	Translucent	255	

Properties of Alarm Setting	
Enable alert read optimization 	Switch the addresses from continuous to non-continuous to enable this function. This function optimizes the speed of alarm reading for non-continuous addresses.

16.2 Alarm Function

A new **Enable** function has been added to the **Alarm** function. Click the **Enable** function for individual alarms. If an alarm without the **Enable** function is selected, the alarm will not be executed when it is downloaded to HMI.

To use **Alarm** function, go to **Data Management** > **Alarm Setting**.

Or

Project tree > Double-click **Alarm**.

The **Alarm Setting** page is mainly to set the **Address**, **Scan Time (seconds)**, **Max Records**, **Non-volatile Data Storage**, **Export CSV File**, and **Show alarm number**.

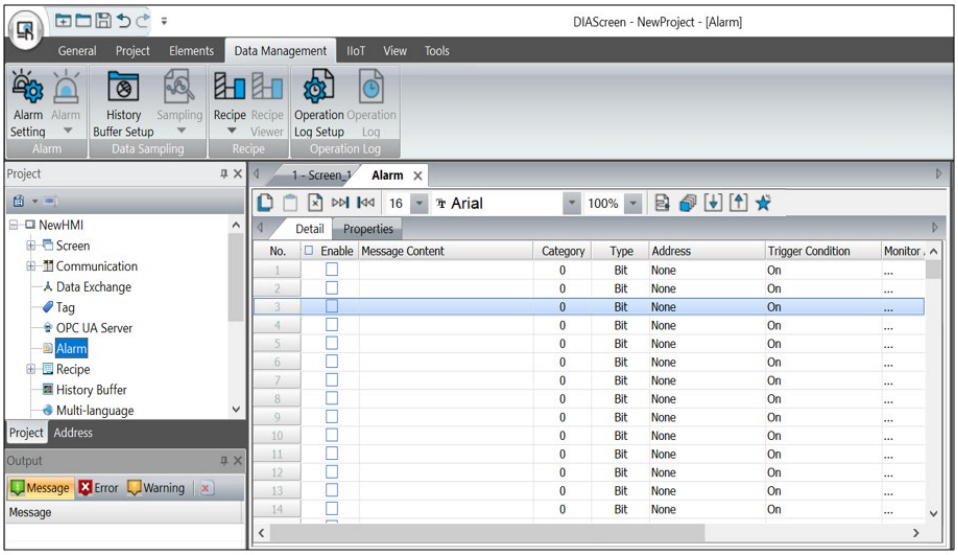
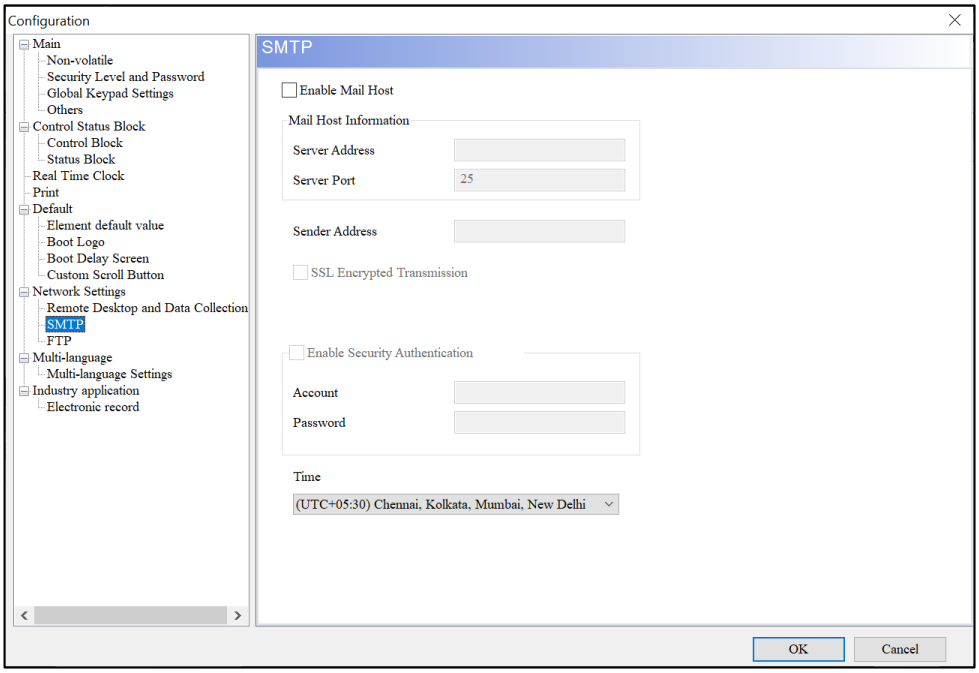


Figure 16 - 1: Alarm window

Function	Description
No.	**No.** represents the number of alarm messages, and supports up to 4096 alarms.
Enable	Alarms are Active only when they are ticked in respective alarms under **Enable** column (by default, it is disabled - if users want alarm to be active, tick the checkbox in **Enable** column)
Message Content	● In the **Message Content** field, edit the alarm messages to display. ● To modify the message, modify it directly in the field. ● Add "%d1" formatted string after the message content, e.g. Alarm%d1. This string must be used with **Monitoring Address**.
Category	● It refers to the category of the alarm number, which is similar to groups. ● The supported range is 0 ~ 4095. The default value is **0**. ● Use the **Batch Processing Category Settings** icon to quickly set the category numbers.  ● When setting the **Sorting Control Addr.**, it will be displayed in ascending order according to the alarm number.
Trigger Condition	● The available options for **Trigger Condition** are: On and Off. The default value is **On**. ● If users select On, it means the alarm is triggered when the bit is on; if users select Off, it means the alarm is triggered when the bit is off.
Monitor Address	● **Monitor Address** is for displaying the user-defined alarm messages. ● On clicking , **Watch address setting** window appears. In the **Message Content** field, add "%d1" after the filled message such as Alarm. When the **Monitor Address** value is 10, the alarm message displayed in the **Alarm History Table** element is Alarm10.
Text Color	**Text Color** setting is for selecting the color in which alarm texts are displayed. The default value is **RGB(0, 0, 0)**.
Alarm Screen	Set whether to show the specified **Alarm Screen** when the alarm is triggered. If users have created other screens, use the drop-down list box to select the screen number to display. The default is **None**.
Mail	● When an alarm occurs, the **Mail** function sends an e-mail to relevant recipients. Go to **General** > **Configuration** > **Network Settings** to enable **SMTP** function to have the **Mail** function work.

Function	Description
	

After setting the alarm-related configuration, select the alarm-related element on the screen, set **Address** and uncheck the alarm **Enable** function. When compiling, DIAScreen skips this item and no error message will be generated. Alarms that are enabled do not appear on the display of the alarm element, as shown in the following figure.

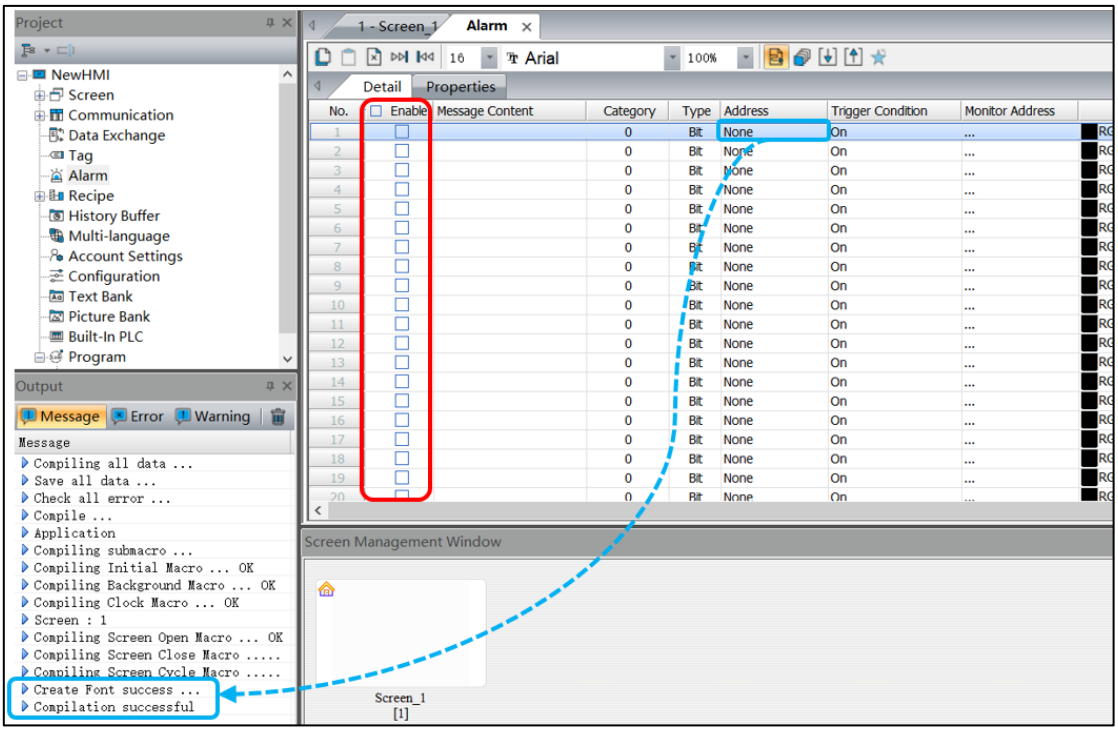


Figure 16 - 2: Alarm Enable / Disable function

16.3 Alarm History Table

The **Alarm History Table** element is different from the **Active Alarm List** element. Now, the **Alarm History Table** element includes alarm trigger time, alarm acknowledge time, and alarm recovery time so the alarm triggered and time of recovery are displayed in the same row, making it easier for viewing.

No	Message	Frequency	Trigger	Ack	Recovery
0006	alarm 6	1	18:00:57 02/09/2017		18:01:02 02/09/2017
0007	alarm 7	1	18:00:57 02/09/2017		
0008	alarm 8	1	18:00:57 02/09/2017	18:01:16 02/09/2017	
0009	alarm 9	1	18:00:57 02/09/2017	18:01:18 02/09/2017	18:01:24 02/09/2017
0010	alarm 10	1	18:00:57 02/09/2017		

This element provides sorting and filtering functions to filter the information and sort them in ascending or descending order, enhancing the readability of data.

On double-clicking the **Alarm History Table** element, the property page appears as follows.

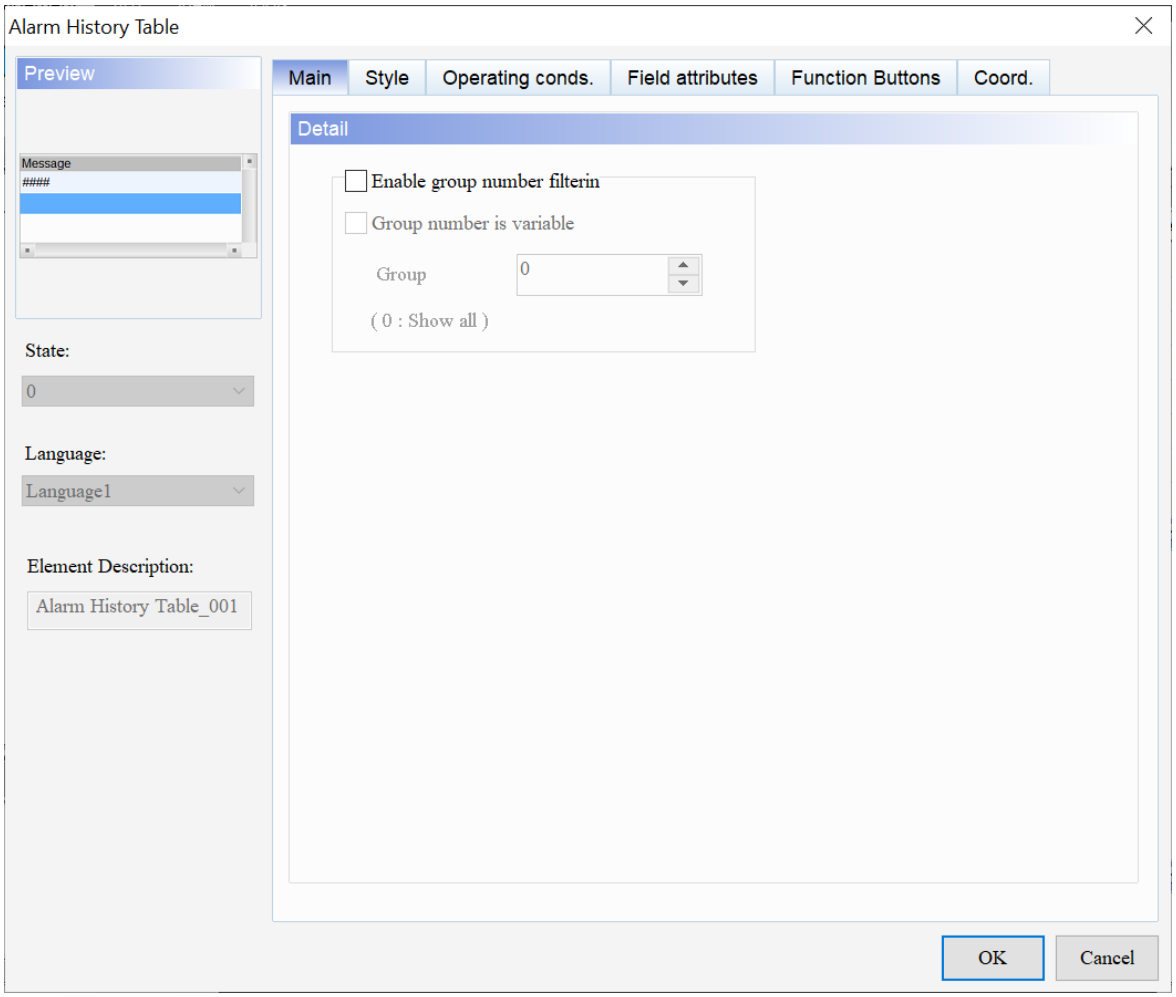


Figure 16 - 3: Alarm History Table element property page

Alarm History Table	
Function	**Description**
Preview	The **Alarm History Table** elements do not support multiple state values and multi-language data display.
Main	Select the Enable group number filtering checkbox.
Style	Set Background Color, Border Color, Gridline Color, Row Color, Alternating Row Color, Select Row Color, Show Gridlines, and Transparency.

Operating conds.	Set the Action Control Addr.; select the Use header controls to sort checkbox; set Sorting Control Addr. and Sorting Order Address; set Filter control address, Alarm counter display (addr.), Alarm category start addr., and Alarm category end addr.
Field attributes	Set the displaying alarm columns, width, description, the order of the columns, and select the Allow to change the field width checkbox. Set the Title Text Alignment, Title Background, Title Text Color, and format / color of the date / time.
Function Buttons	Select the Trigger alarm screen and Ack alarm checkboxes. Select the Scroll up an interval, Scroll down an interval, Scroll up one page, and Scroll down one page checkboxes. Set the displaying texts and default width / height of the buttons.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

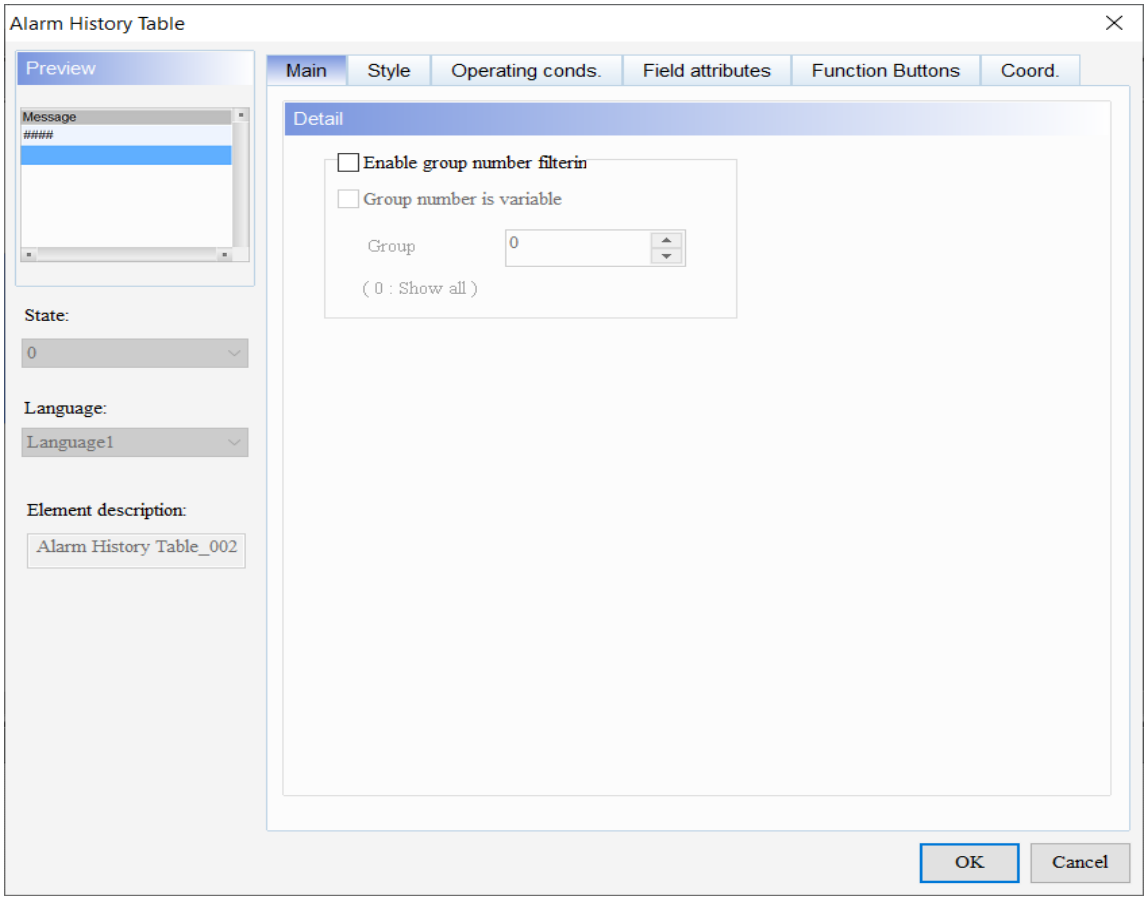
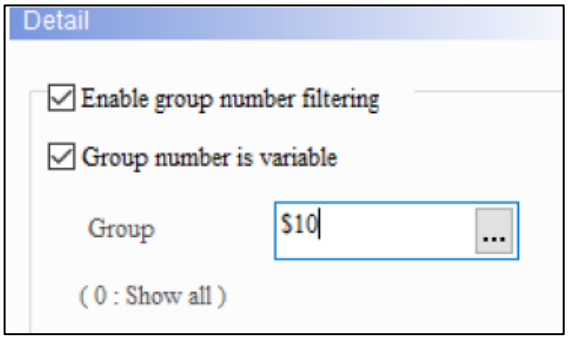
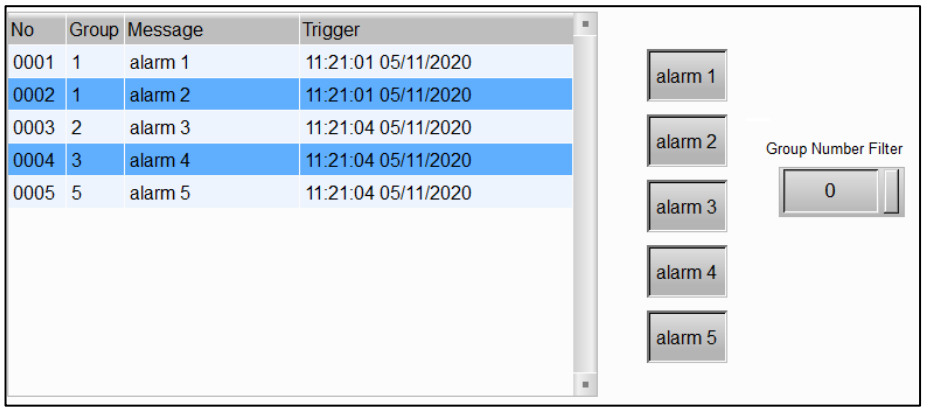
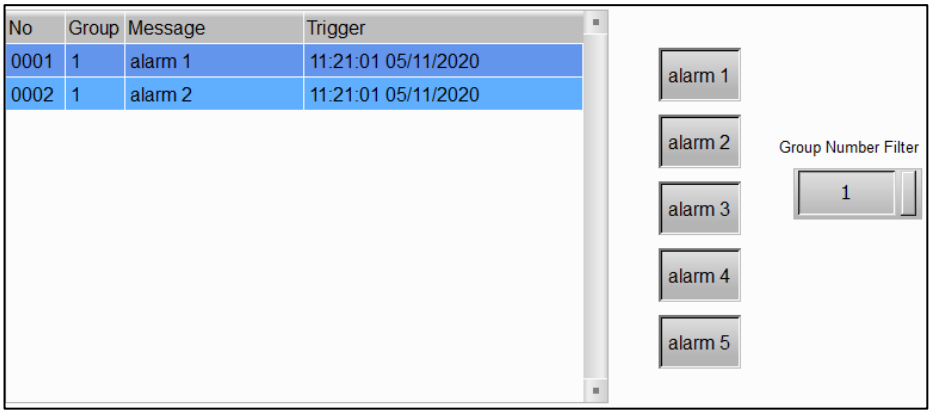


Figure 16 - 4: Alarm History Table element Main property page

Function	Description
Enable group number filtering	● Select the **Enable group number filtering** checkbox to filter the alarms to be displayed. Specify the group number to display the alarms in groups. ● The value of the group number can be a variable or constant. ● When **Group** is 0, all alarms are displayed.  **Example:** When **Group** is 0.  When **Group** is 1. 

- Style

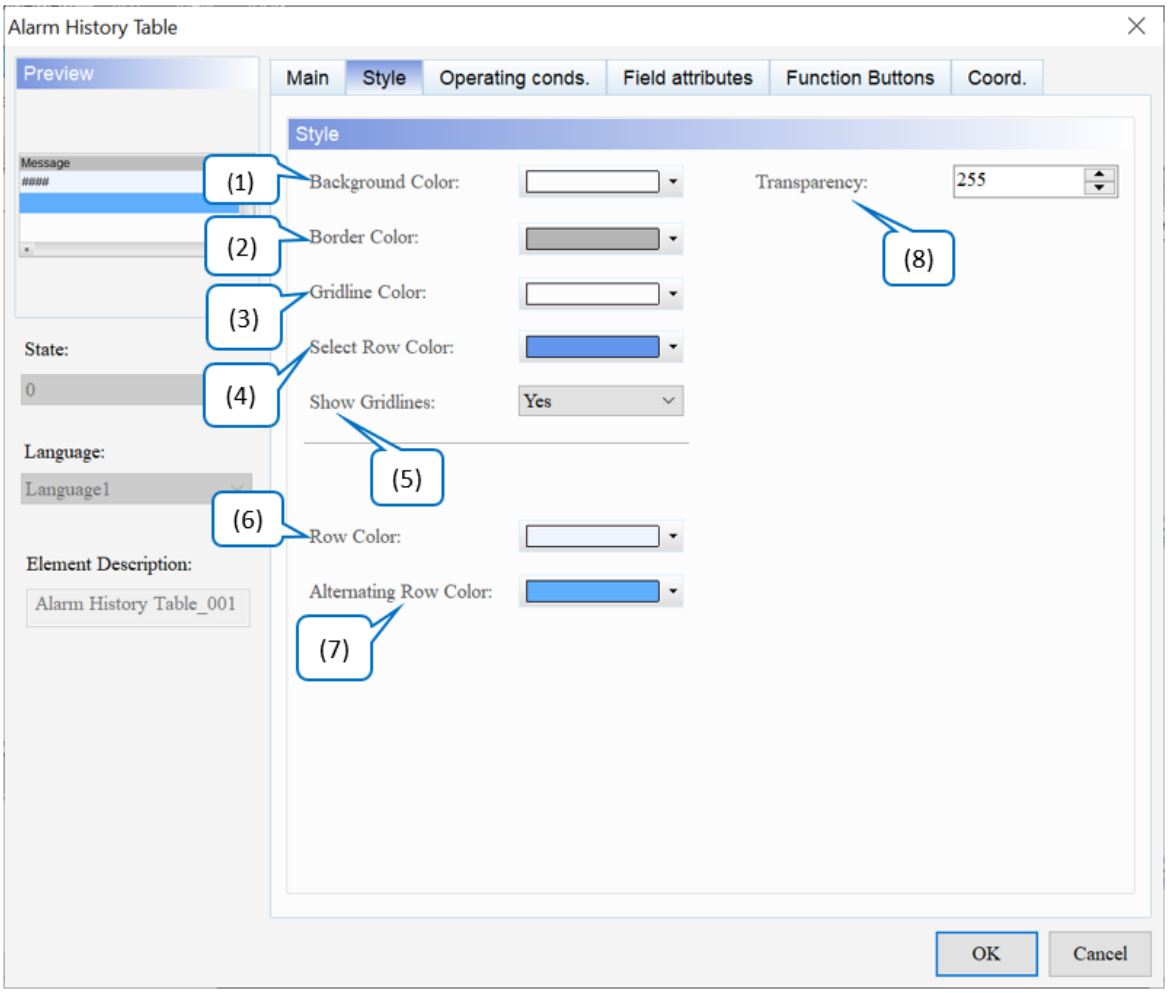
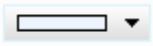
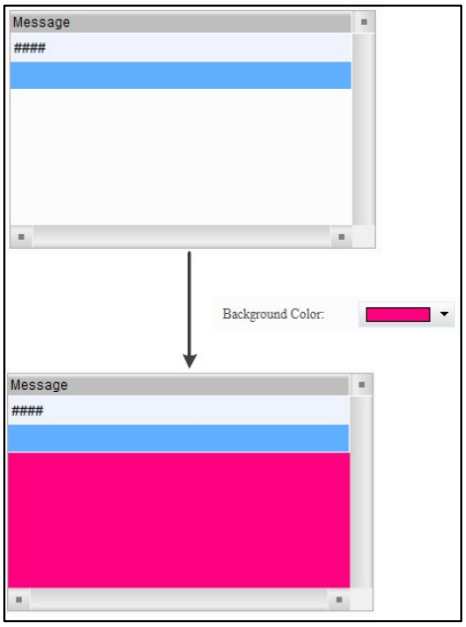
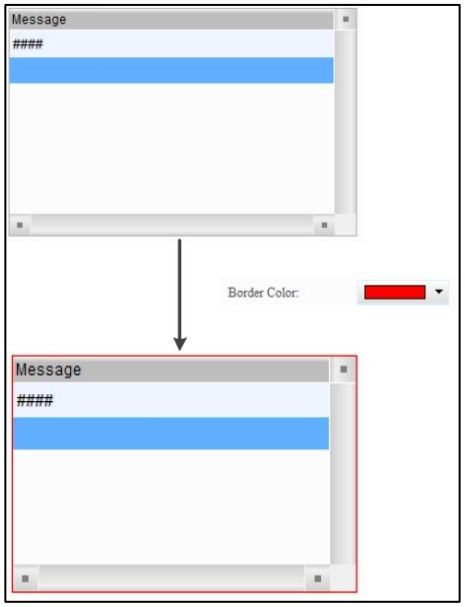
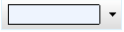
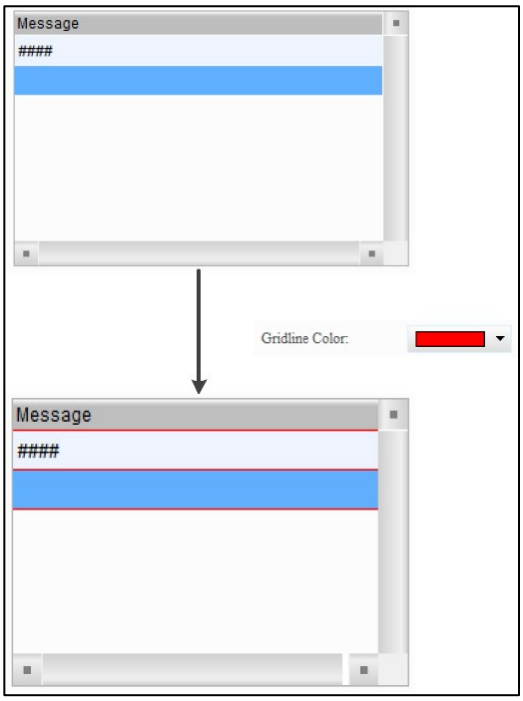
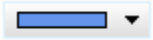
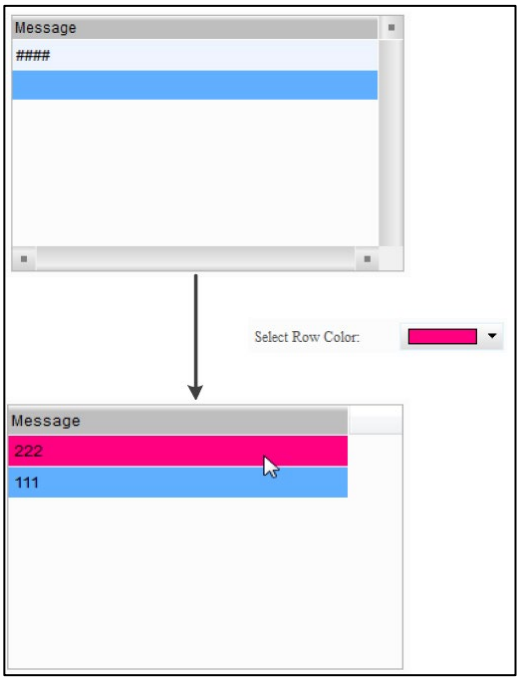
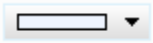
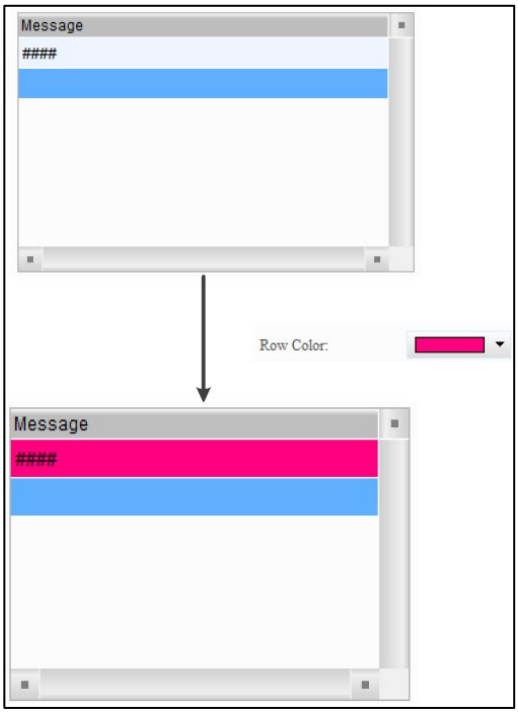
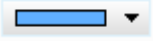
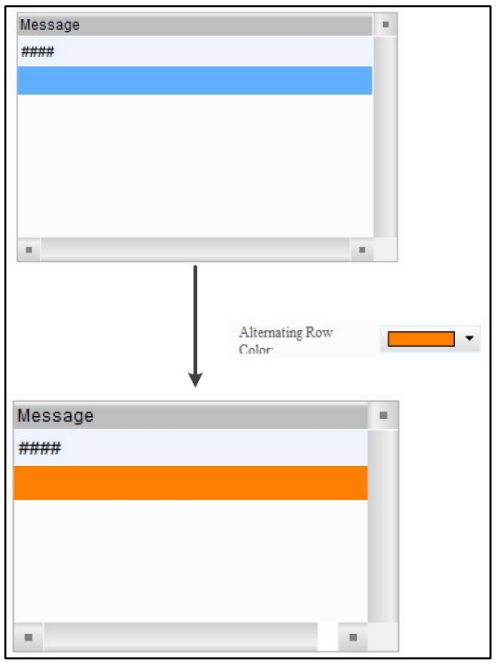


Figure 16 - 5: Alarm History Table element Style property page

No.	Function	Description
(1)	Background Color	Set the background color of the element. The default is  . 
(2)	Border Color	Set the border color of the element. The default is  . 

No.	Function	Description
(3)	Gridline Color	● Set the gridline color of the element. The default is  . ● The **Gridline Color** setting is valid only when users select Yes for **Show Gridlines**. 
(4)	Select Row Color	● The column color of the selected alarm data. ● Set the color of the selection column, the default is  . 

No.	Function	Description
(5)	Show Gridlines	● The default value is **Yes**. ● When set to No, the **Gridline Color** setting is invalid.
(6)	Row Color	Set the color to display for each row of the alarm. The default is  . 
(7)	Alternating Row Color	Set the color for the alternating row of the alarm. The default is  . 

No.	Function	Description
(8)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Operating conds.

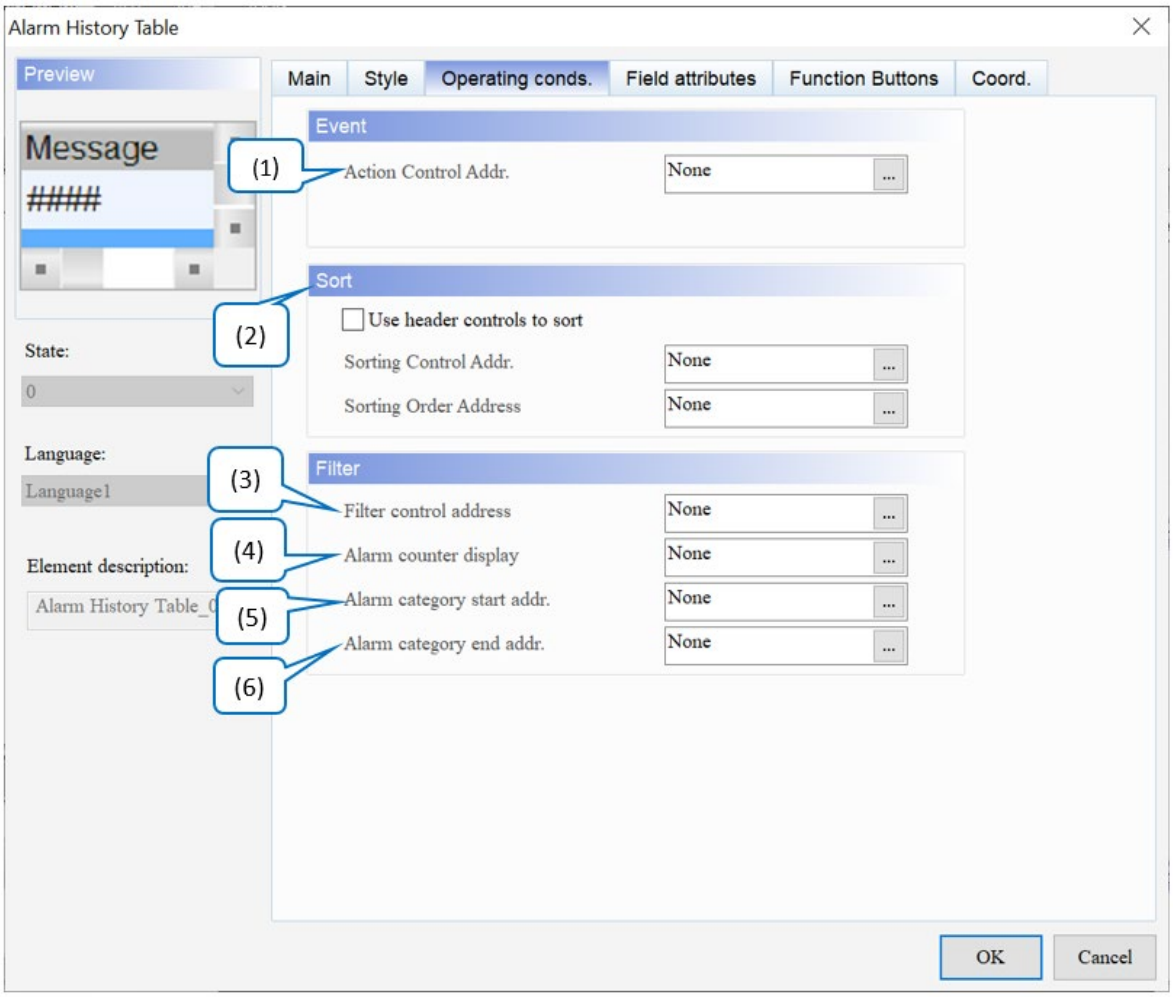
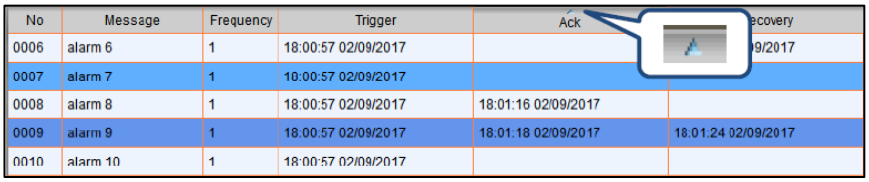


Figure 16 - 4: Alarm History Table element Operating conds. property page

No.	Function	Description
(1)	Action Control Addr.	Specify the alarms to change screens or acknowledge the alarms with **Action Control Addr.** Value: 0 — Description: Default state, no action

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>1</td><td>Acknowledge for selected alarms in the Alarm History Table element.</td></tr>
<tr><td>2</td><td>If the selected alarm in the Alarm History Table element has a set alarm screen which is set to display manually, the alarm screen is displayed when the value is 2.</td></tr>
</table>
</td></tr>
<tr><td>(2)</td><td>Sort</td><td>

Select the Use header controls to sort checkbox, and then press the Alarm History Table element header to sort the alarms in ascending or descending order. Once this function is selected, users cannot set Sorting Control Addr. and Sorting Order Address.


<table>
<tr><th>No</th><th>Message</th><th>Frequency</th><th>Trigger</th><th>Ack</th><th>ecovery</th></tr>
<tr><td>0006</td><td>alarm 6</td><td>1</td><td>18:00:57 02/09/2017</td><td></td><td>9/2017</td></tr>
<tr><td>0007</td><td>alarm 7</td><td>1</td><td>18:00:57 02/09/2017</td><td></td><td></td></tr>
<tr><td>0008</td><td>alarm 8</td><td>1</td><td>18:00:57 02/09/2017</td><td>18:01:16 02/09/2017</td><td></td></tr>
<tr><td>0009</td><td>alarm 9</td><td>1</td><td>18:00:57 02/09/2017</td><td>18:01:18 02/09/2017</td><td>18:01:24 02/09/2017</td></tr>
<tr><td>0010</td><td>alarm 10</td><td>1</td><td>18:00:57 02/09/2017</td><td></td><td></td></tr>
</table>

The Use header controls to sort function does not support the sorting of the Message column.
Specify the item for sorting with Sort Control Addr.

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Default; no sorting</td></tr>
<tr><td>1</td><td>Sort by Trigger Time</td></tr>
<tr><td>2</td><td>Sort by Acknowledge Time</td></tr>
<tr><td>3</td><td>Sort by Recovery Time</td></tr>
<tr><td>4</td><td>Sort by alarm count</td></tr>
<tr><td>5</td><td>Sort by alarm category</td></tr>
<tr><td>6</td><td>Sort by alarm No.</td></tr>
</table>

The values of Sorting Order Address and Sorting Control Addr. determine the ascending or descending order of the items. For example, if users set Sorting Control Addr. to 1 and Sorting Order Address to 0, the Trigger Time is sorted in ascending order.

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Sort in ascending order.</td></tr>
<tr><td>1</td><td>Sort in descending order.</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Filter control address</td><td>Filter the specified items with Filter control address.
<table>
<tr><th>Value</th><th>Action description</th></tr>
<tr><td>0</td><td>Default; display all triggered alarms.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>1</td><td>Hide the alarms with both Recovery Time and Acknowledge Time.</td></tr>
<tr><td>2</td><td>Hide alarms with Recovery Time.</td></tr>
<tr><td>3</td><td>Hide alarms with Recovery Time or Acknowledgement Time.</td></tr>
<tr><td>4</td><td>Hide alarms with Acknowledgement Time.</td></tr>
<tr><td>5</td><td>● This setting must be used with Alarm counter display.
● The alarm display count refers to the value of Alarm counter display. When the alarm display count is smaller than this value, the alarm is hidden.</td></tr>
<tr><td>6</td><td>● This setting must be used with Alarm category start addr. and Alarm category end addr.
● When the alarm category number is not within the range set by these two addresses, the alarm is hidden.</td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>Alarm counter display</td><td>
● This setting must be used with Filter control address.
● When Filter control address is set to 5, input the value of the alarm count.
<table>
<tr><th>Example</th><th>Description</th></tr>
<tr><td>Triggered alarms with alarm counts of 1, 2, and 3 times</td><td>Input 1, the Alarm History Table element displays the triggered alarms with 1 or more alarm counts; input 2, it displays the triggered alarms with 2 or more alarm counts; input 3, it displays the triggered alarms with 3 or more alarm counts.</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Alarm category start addr.</td><td rowspan="2">
● This setting must be used with Filter control address.
● When Filter control address is set to 6, input the alarm category number.
<table>
<tr><th>Example</th><th>Description</th></tr>
<tr><td>Alarms with alarm category numbers 1 and 5</td><td>● Input 1 to Alarm category start addr. and 3 to Alarm category end addr., the Alarm History Table element displays category 1 triggered alarms.
● Input 1 to Alarm category start addr. and 5 to Alarm category end addr., the Alarm History Table element displays category 1 and 5 triggered alarms.</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Alarm category end addr.</td></tr>
</table>

- Field attributes

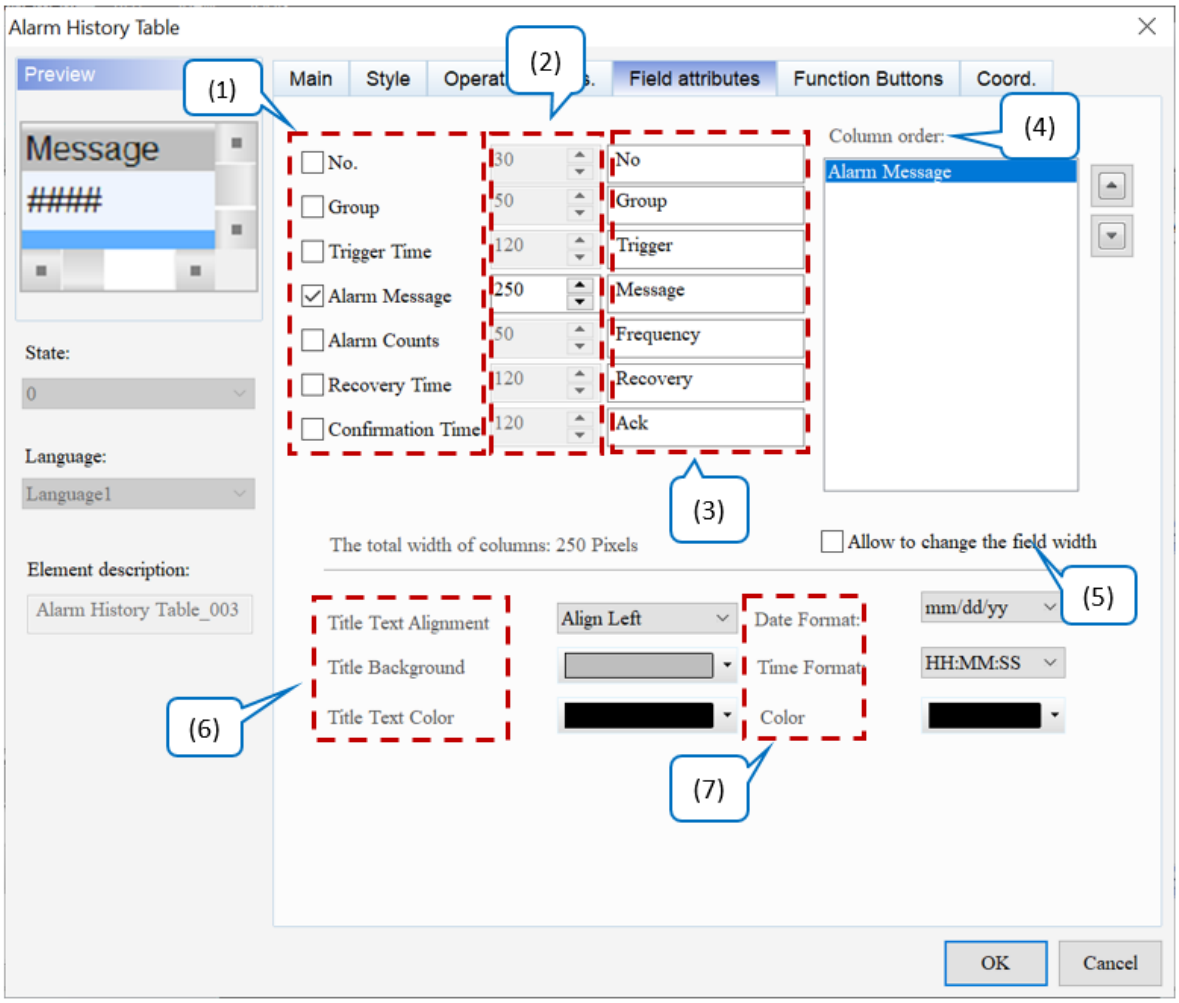
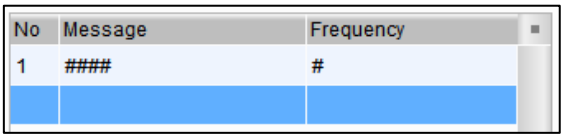
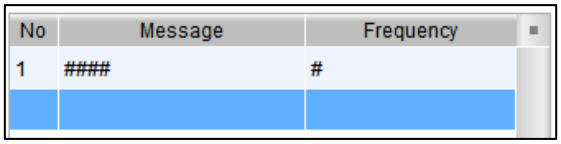
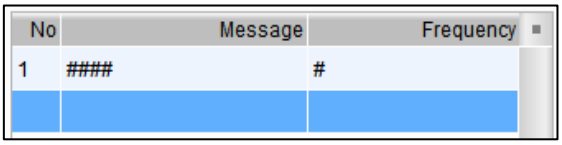
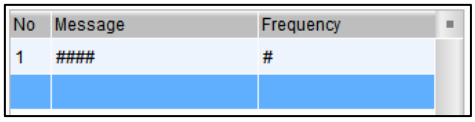


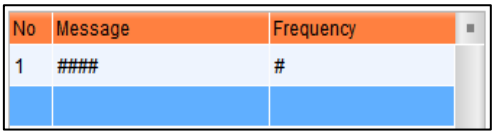
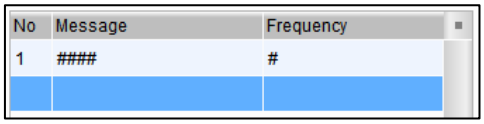
Figure 16 - 5: Alarm History Table element Field attributes property page

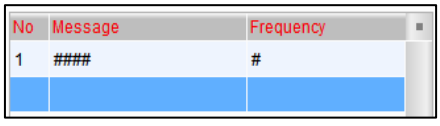
No.	Function	Description
(1)	Column display	Select the columns to display in the element.
(2)	Column width	Adjust the width for each column.
(3)	Column title	Define the titles for each column.
(4)	Column order	After selecting the columns to display, use and buttons to adjust the column displaying order.

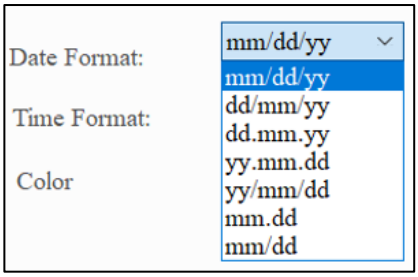
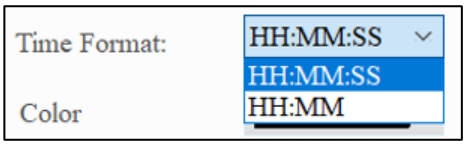
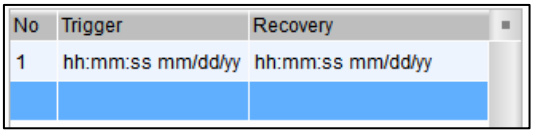
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>(5)</td><td>Allow to change the field width</td><td colspan="2">After selecting this checkbox, drag to adjust the displaying field width on the HMI.</td></tr>
<tr><td rowspan="6">(6)</td><td rowspan="6">Title</td><td rowspan="3">Title Text Alignment</td><td>The available options for Title Text Alignment are: Align Left, Center, and Align Right. The default value is Align Left.
Align Left
 

Center
 

Align Right
 
</td></tr>
<tr><td>Set the background color of the column title. The default is .
Default
 

After Change
 
</td></tr>
<tr><td>Title Text Color</td><td>Set the text color of the column title. The default is .
Default
 

After Change
 
</td></tr>
<tr><td>(7)</td><td>Date and time</td><td>Date Format</td><td>The available options for Date Format are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is mm/dd/yy.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td></td><td> 
</td></tr>
<tr><td>Time Format</td><td>The available options for Time Format are: HH:MM:SS and HH:MM. The default value is HH:MM:SS.
 
</td></tr>
<tr><td>Color</td><td>Set the display color for the date and time. The default is .
<table>
<tr><td>Default</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table></td></tr>
</table>

- Function Buttons

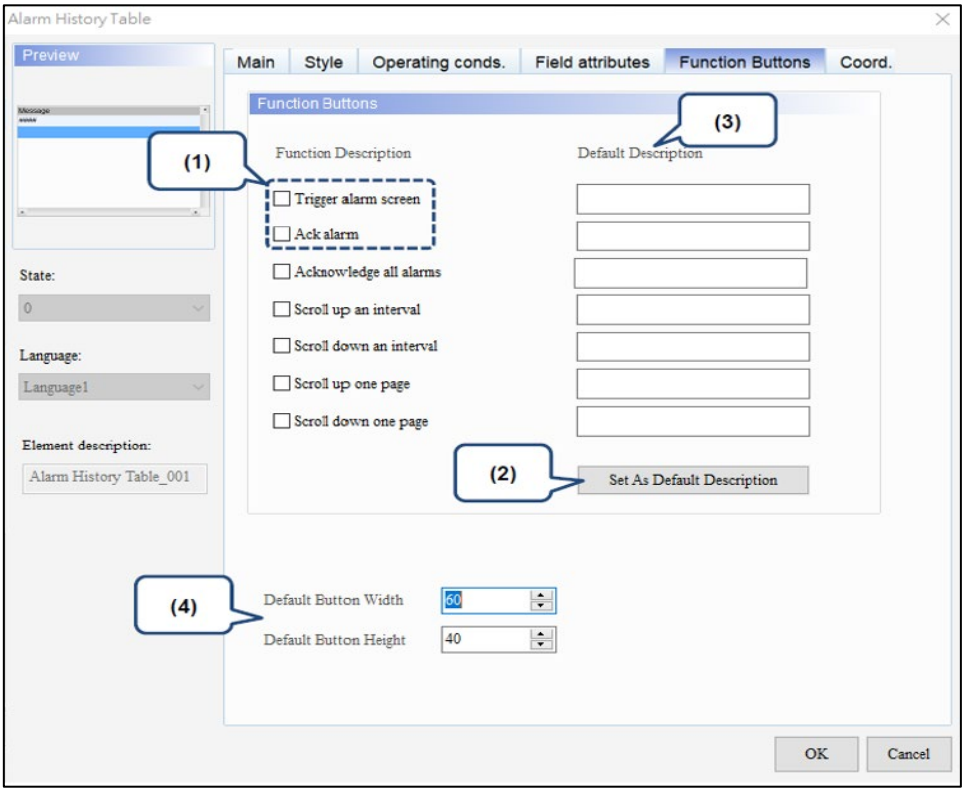


Figure 16 - 6: Alarm History Table element Function Buttons property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Function Buttons</td><td>
Two button options are provided for the action control function: Trigger alarm screen and Ack alarm.
<table>
<tr><th>Value</th><th>Function Buttons</th><th>Description</th></tr>
<tr><td>0</td><td colspan="2">Default; no actions.</td></tr>
<tr><td>1</td><td>Ack alarm</td><td>Acknowledge the selected alarms in the Alarm History Table element.</td></tr>
<tr><td>2</td><td>Trigger alarm screen</td><td>If the selected alarm in the Alarm History Table element has a set alarm screen which is set to display manually, the alarm screen is displayed when the value is 2.</td></tr>
</table>
By triggering the Function Buttons, it is easier to edit the screen. Use the functions provided by Action
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>Control Addr. without setting the address and value.
● Other function buttons are described as follows.<table><tr><td>Scroll up an interval</td><td>Scroll up a small interval.</td></tr><tr><td>Scroll down an interval</td><td>Scroll down a small interval.</td></tr><tr><td>Scroll up one page</td><td>Scroll up one page.</td></tr><tr><td>Scroll down one page</td><td>Scroll down one page.</td></tr></table></td></tr>
<tr><td>(2)</td><td>Set As Default Description</td><td>Click Set As Default Description to insert the default strings to the fields. Users can also enter user-defined strings.</td></tr>
<tr><td>(3)</td><td>Default Description</td><td>Click Set As Default Description button to insert the default strings to the Default Description fields.</td></tr>
<tr><td>(4)</td><td>Default Button Width and Default Button Height</td><td>Adjust the width and height of the function buttons. The default values for Default Button Width and Default Button Height are 60 and 40, respectively.</td></tr>
</table>

- Coord.

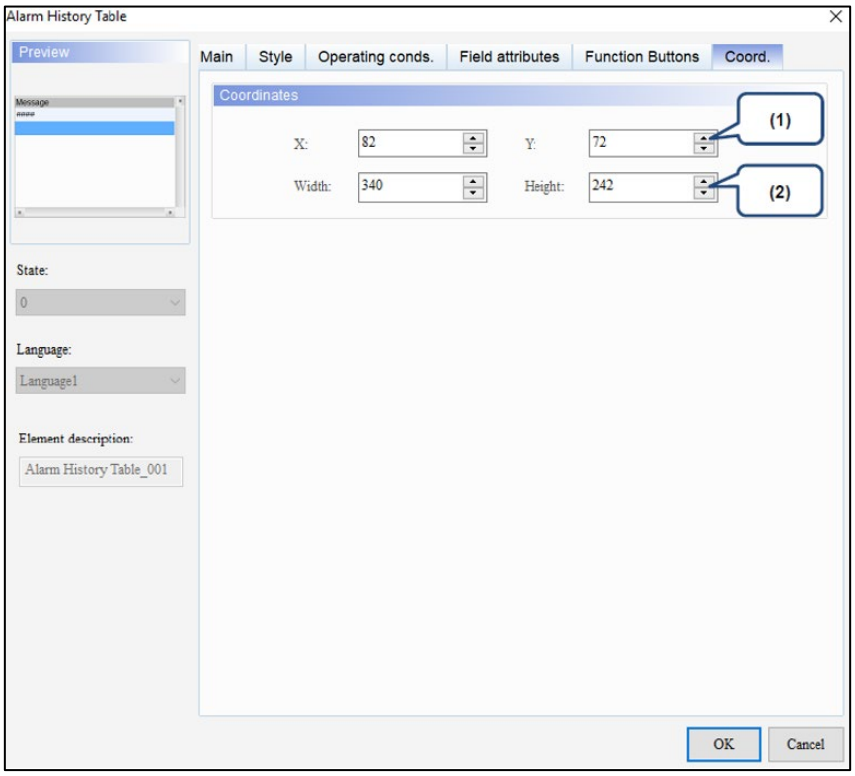


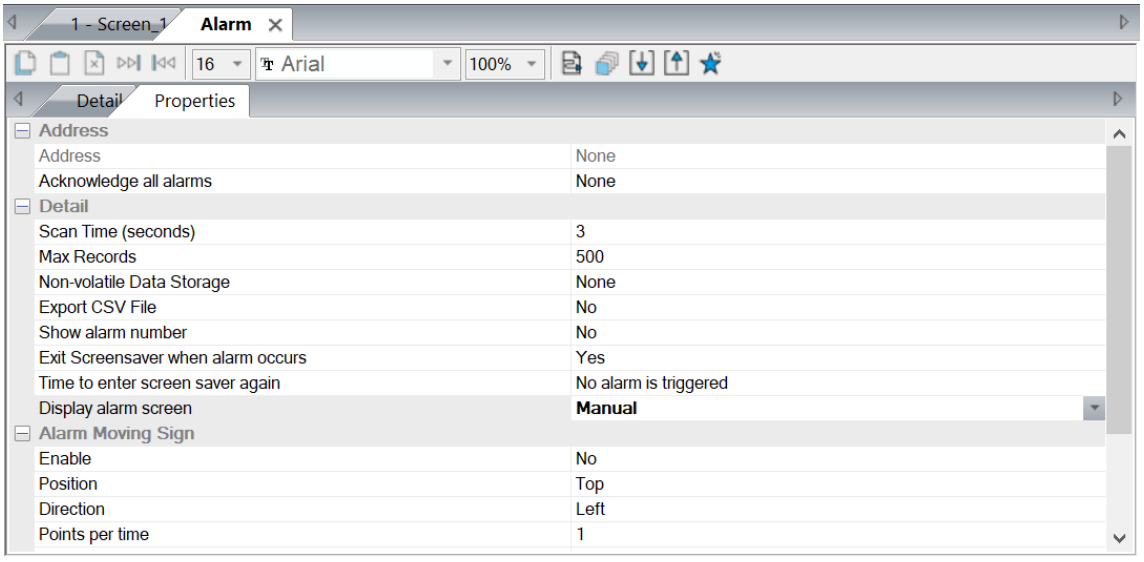
Figure 16 - 7: Alarm History Table element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

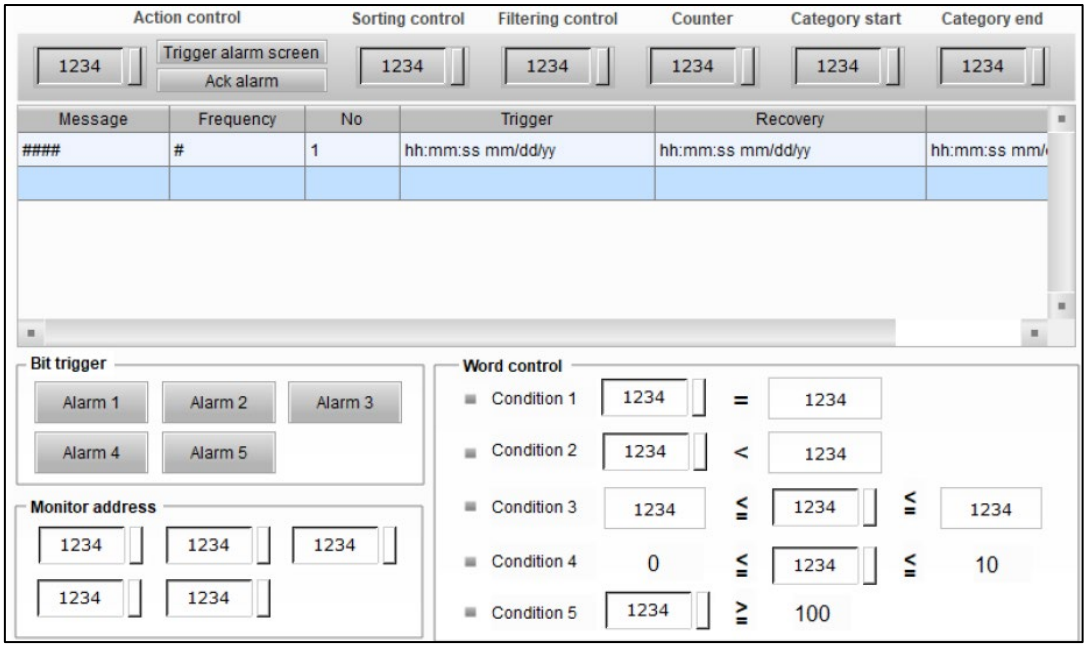
16.4 Active Alarm List

The **Active Alarm List** element displays the information of the current alarms. Refer to the following table for the **Active Alarm List** element example.

Active Alarm List

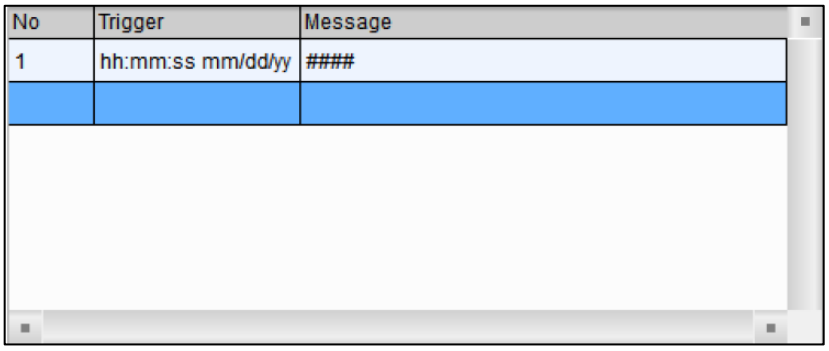


Active Alarm List



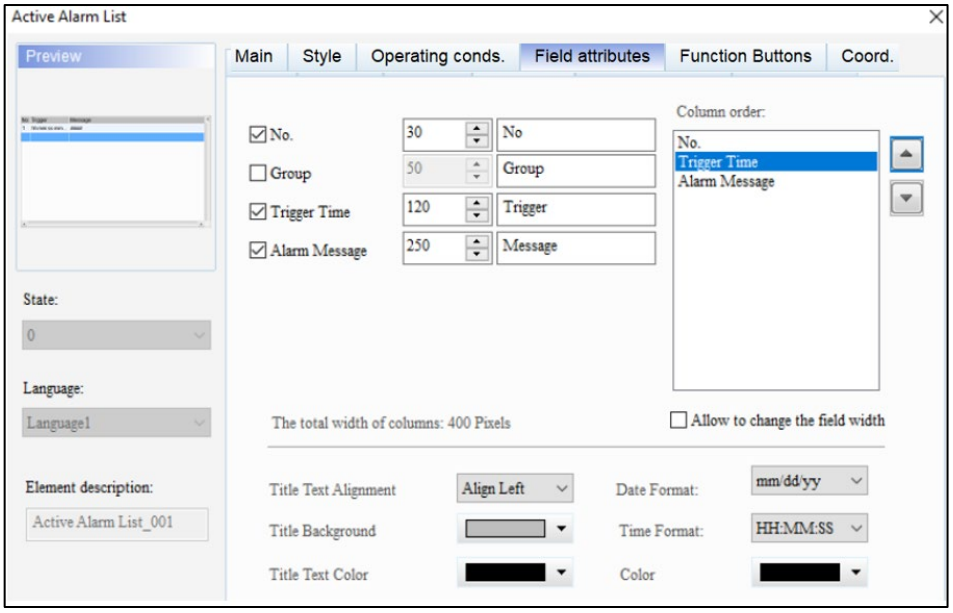
Create Active Alarm List element

Step 1: Create an **Active Alarm List** element.



Step 2: Select **No** and **Trigger Time** checkboxes. **Alarm Message** is selected by default. Then, the **Active Alarm List** element displays the alarm number, alarm trigger time, and alarm message.

Active Alarm List



Execution result

After creating the **Active Alarm List** element, compile and download the data to the HMI. When the trigger conditions are met for Alarms 6 ~ 10, the **Active Alarm List** element displays the current alarm time and date, alarm No., and alarm message. When the alarms are cleared, no items are displayed on the **Active Alarm List** element.

Alarm ON

No	Trigger	Message
0006	17:36:08 03/06/2017	alarm 6
0007	17:36:08 03/06/2017	alarm 7
0008	17:36:08 03/06/2017	alarm 8
0009	17:36:08 03/06/2017	alarm 9
0010	17:36:08 03/06/2017	alarm 10

Alarm OFF

No	Trigger	Message

On double-clicking the **Active Alarm List** element, the property page appears as follows.

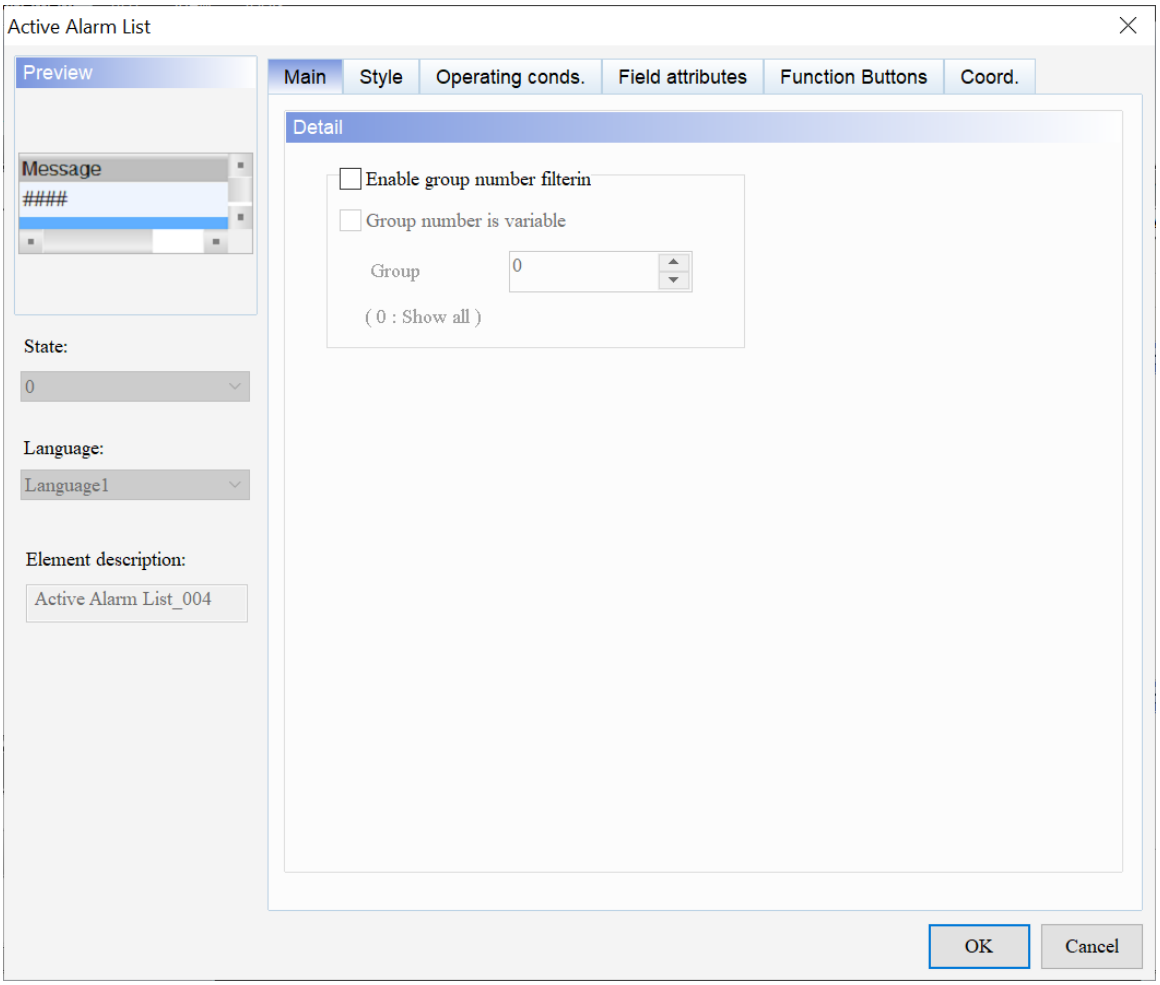


Figure 16 - 8: Active Alarm List property page

Active Alarm List	
Function	**Description**
Preview	The **Active Alarm List** elements do not support multiple state values and multi-language data display.
Main	Select the Enable group number filtering checkbox.
Style	Set Background Color, Border Color, Gridline Color, Row Color, Alternating Row Color, Select Row Color, Show Gridlines, and Transparency.

Active Alarm List	
Function	**Description**
Operating conds.	Set Filter control address, Alarm category start addr., and Alarm category end addr. Select the Use header controls to sort checkbox and set the Default sort field.
Field attributes	Set the displaying alarm columns, width, description, the order of the columns, and select the Allow to change the field width checkbox. Set the Title Text Alignment, Title Background, Title Text Color, and format / color of the date / time.
Function Buttons	Select the Scroll up an interval, Scroll down an interval, Scroll up one page, and Scroll down one page checkboxes. Set the displaying texts and default width / height of the buttons.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

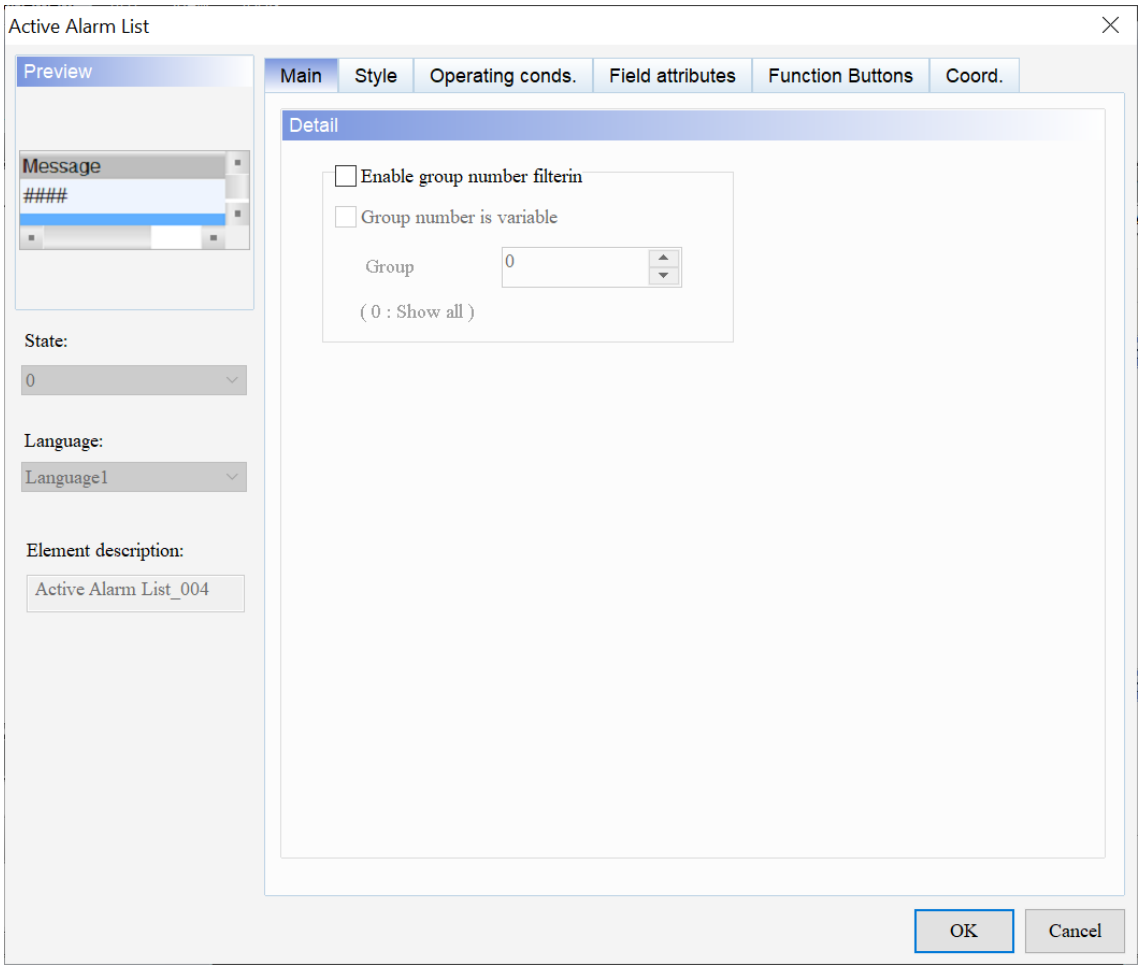
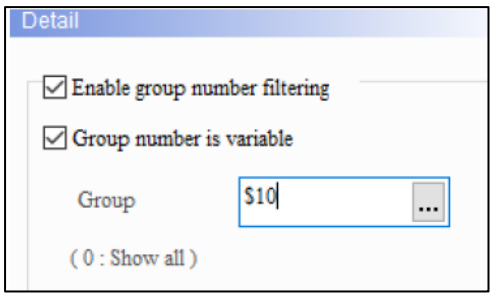
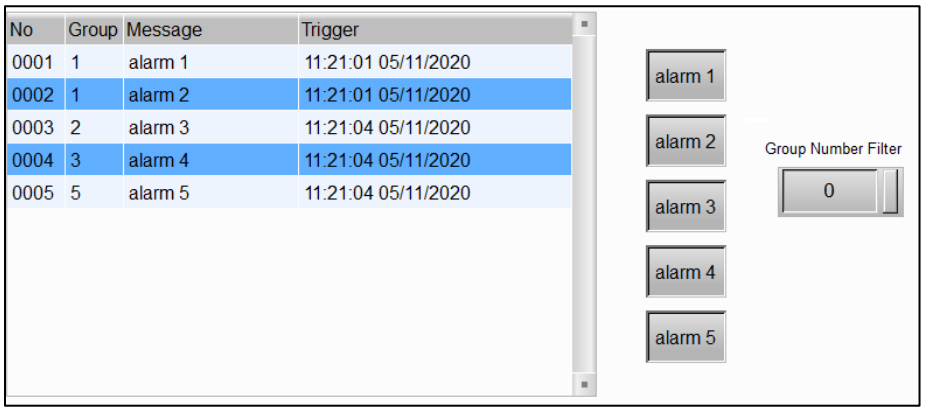
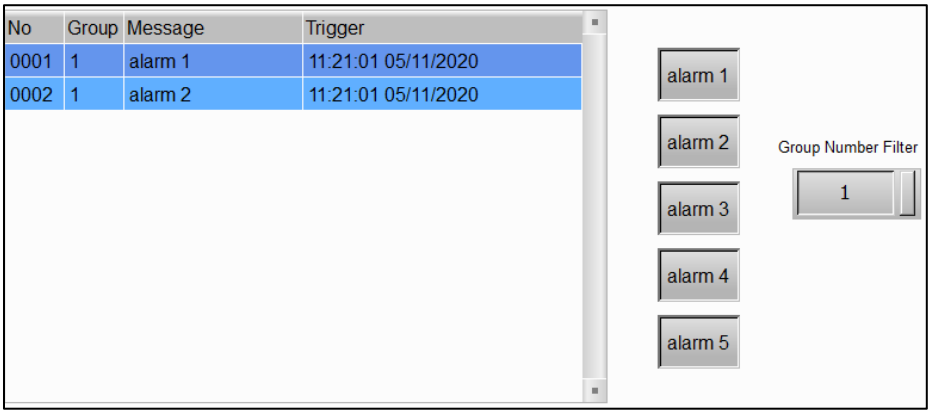


Figure 16 - 9: Active Alarm List element Main property page

Function	Description
Enable group number filtering	● Select the **Enable group number filtering** checkbox to filter the alarms to be displayed. Specify the group number to display the alarms in groups. ● The value of the group number can be a variable or constant. ● When **Group** is 0, all alarms are displayed.  **Example:** When **Group** is 0.  When **Group** is 1. 

- Style

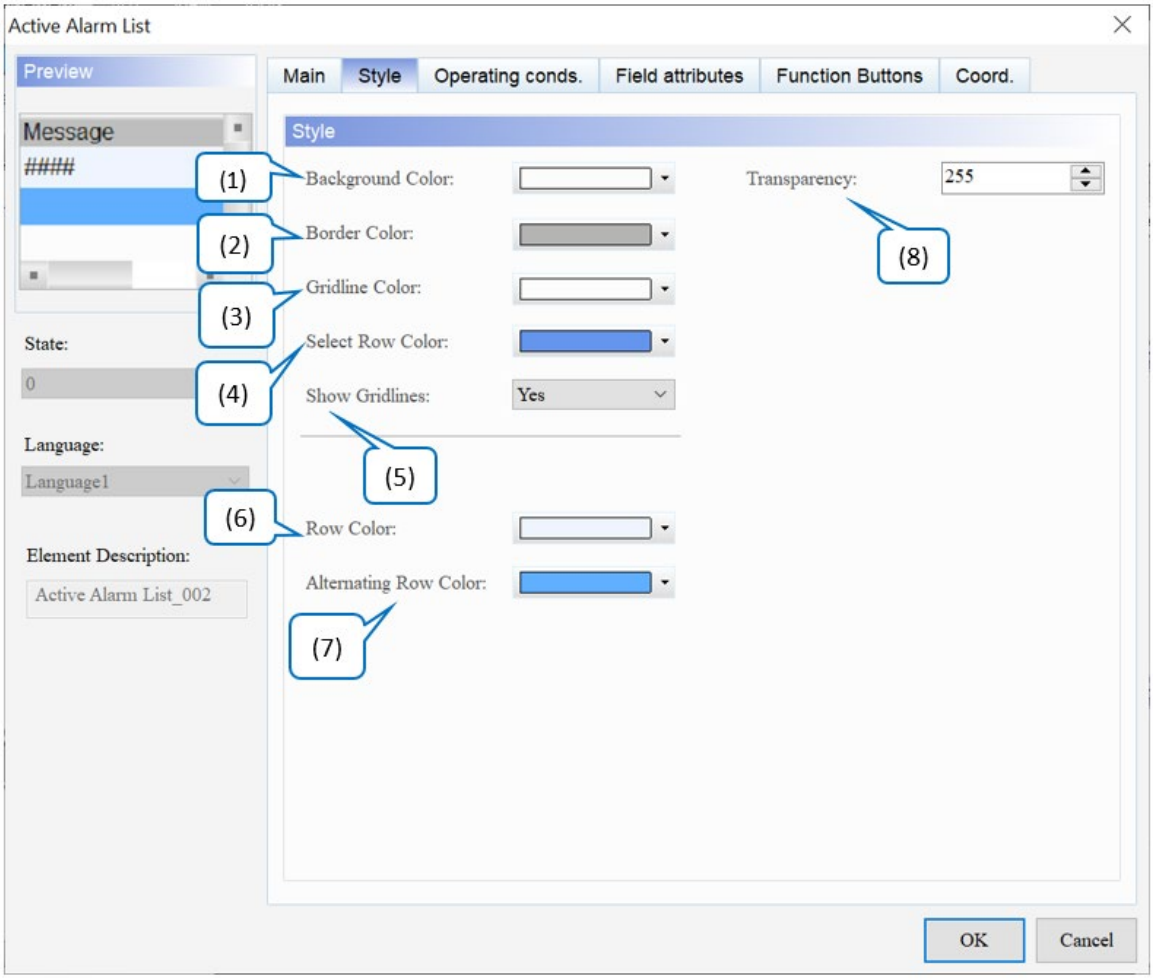
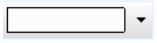
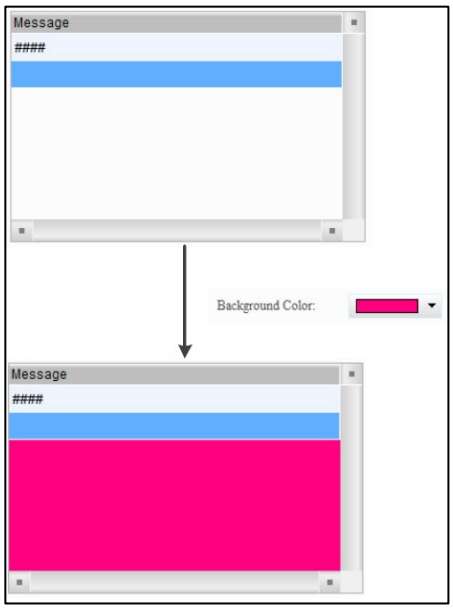
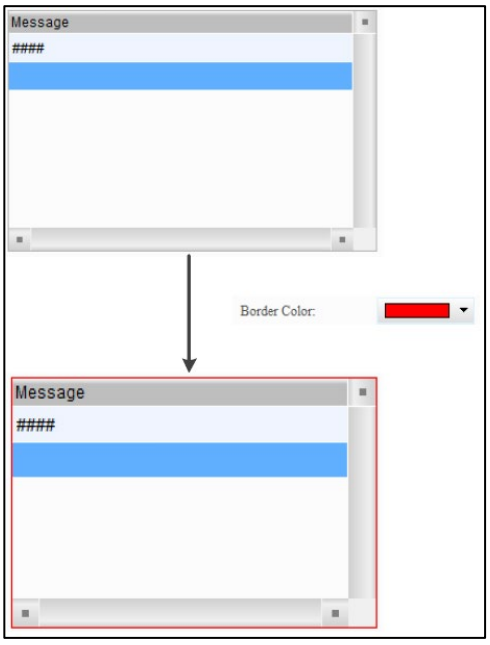
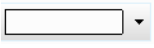
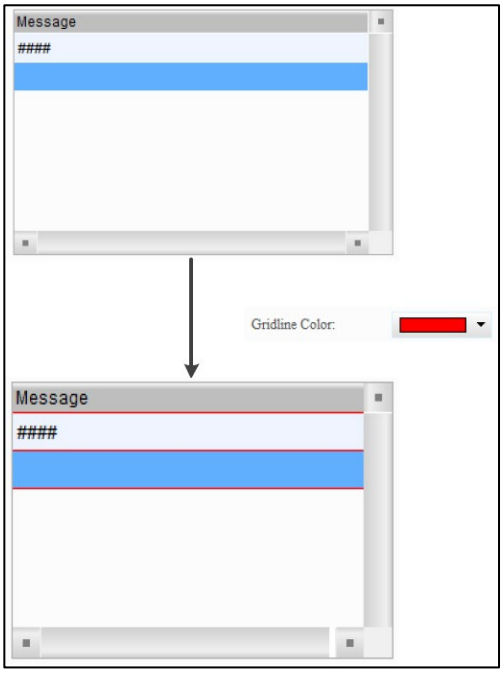
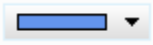
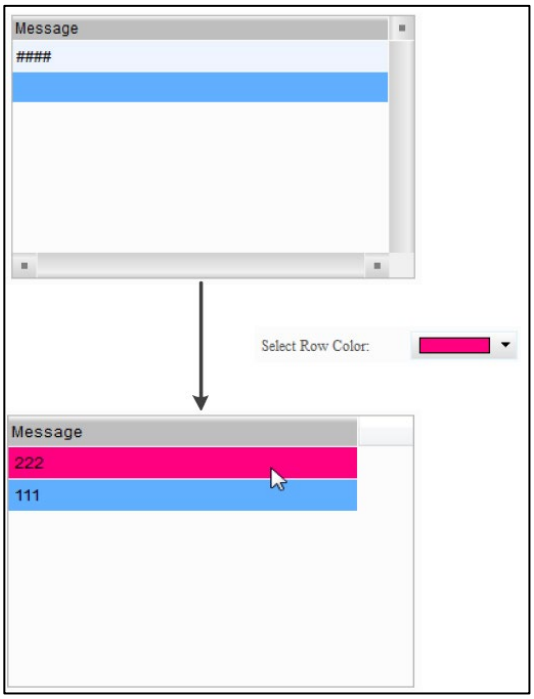
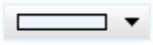
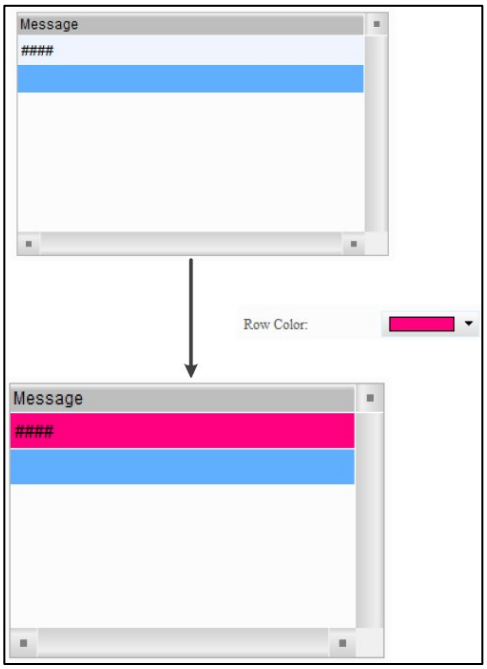
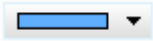
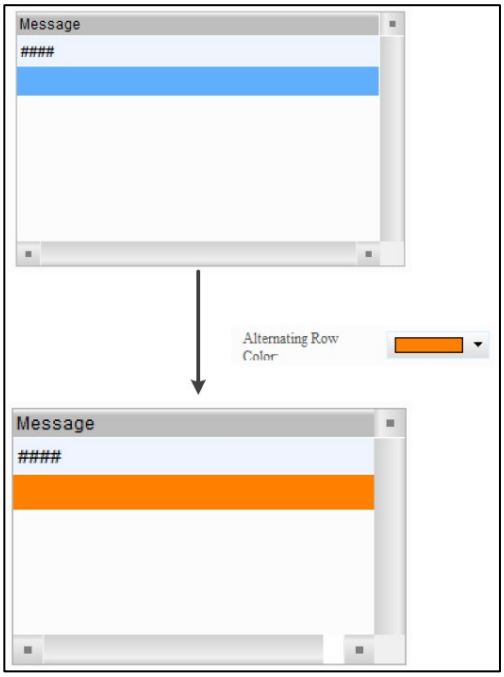


Figure 16 - 10: Active Alarm List element Style property page

No.	Function	Description
(1)	Background Color	Set the background color of the element. The default is  . 
(2)	Border Color	Set the border color of the element. The default is  . 

No.	Function	Description
(3)	Gridline Color	● Set the gridline color of the element. The default is  . ● The **Gridline Color** setting is valid only when users select Yes for **Show Gridlines**. 
(4)	Select Row Color	● The column color of the selected alarm data. ● Set the color of the selection column, the default is  . 

No.	Function	Description
(5)	Show Gridlines	● The default value is **Yes**. ● When set to No, the **Gridline Color** setting is invalid.
(6)	Row Color	Set the color to be displayed for each row of the alarm. The default is  . 
(7)	Alternating Row Color	Set the color for the alternating row of the alarm. The default is  . 
(8)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Operating conds.

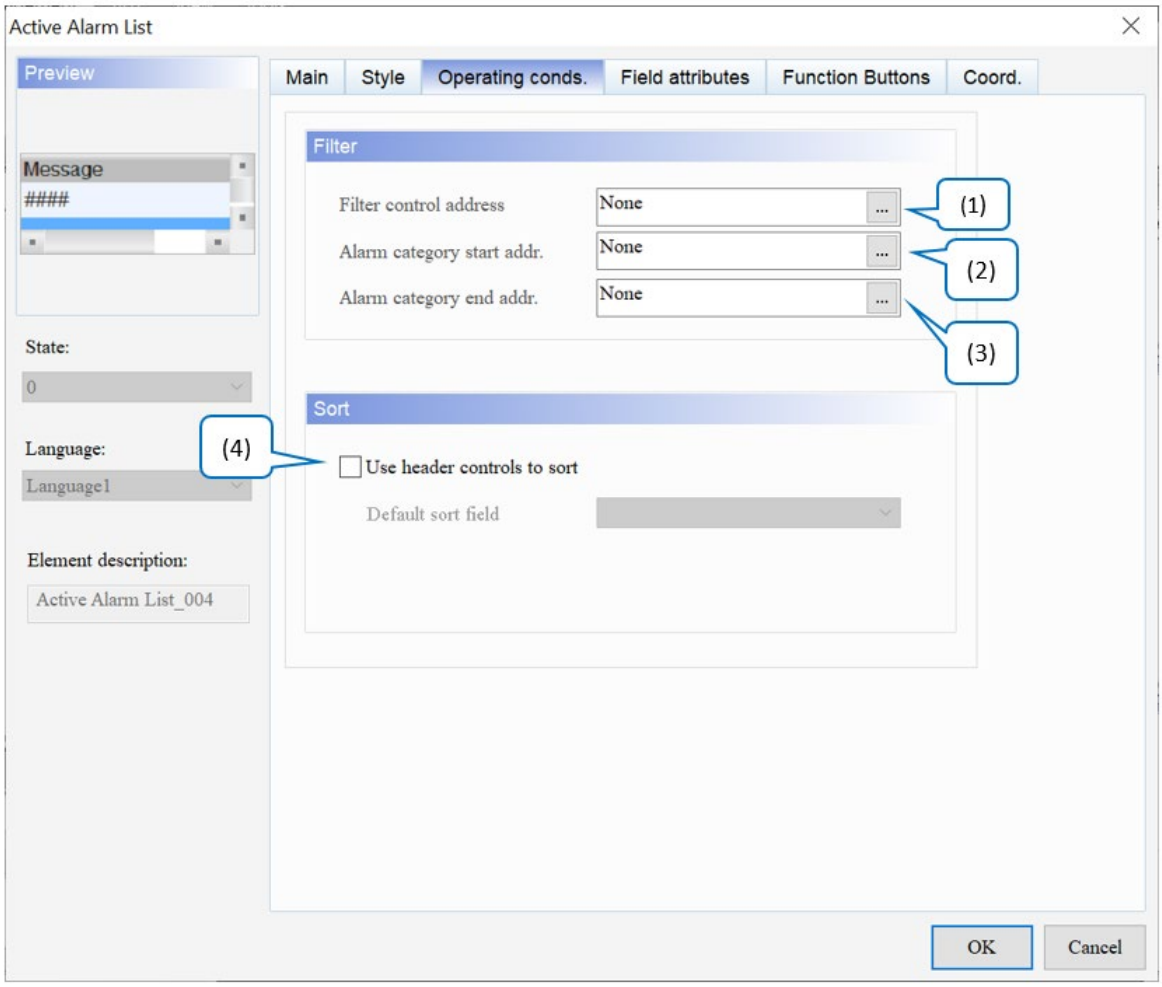
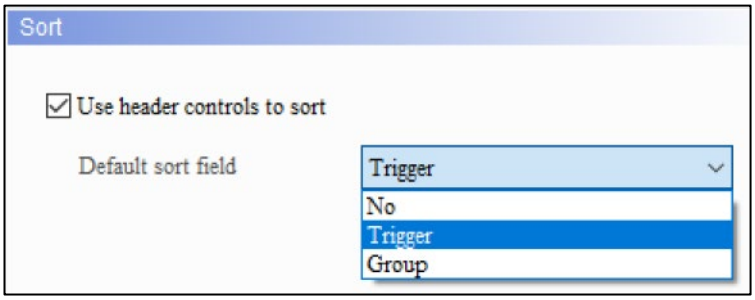
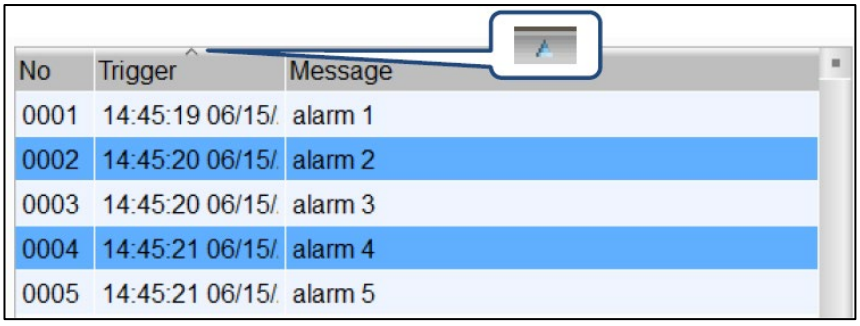


Figure 16 - 11: Active Alarm List element Operating conds. property page

No.	Function	Description
(1)	Filter control address	The **Filter control address** is used to filter the items specified by users.

Value	Description
0	Default; display all triggered alarms.
1	Hide the alarms with both **Recovery Time** and **Acknowledge Time**.
2	Hide alarms with **Recovery Time**.
3	Hide alarms with **Recovery Time** or **Acknowledgement Time**.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>4</td><td>Hide alarms with Acknowledgement Time.</td></tr>
<tr><td>5</td><td>● This setting must be used with Alarm counter display.
● The alarm display count refers to the value of Alarm counter display. When the alarm display count is smaller than this value, the alarm is hidden.</td></tr>
<tr><td>6</td><td>● This setting must be used with Alarm category start addr. and Alarm category end addr.
● When the alarm category number is not within the range set by these two addresses, the alarm is hidden.</td></tr>
</table>
</td></tr>
<tr><td>(2)</td><td>Alarm category start addr.</td><td rowspan="2">● This setting must be used with Filter control address.
● When Filter control address is set to 6, input the alarm category number.
<table>
<tr><th>Example</th><th>Description</th></tr>
<tr><td>Alarms with alarm category numbers 1 and 5</td><td>● Input 1 to Alarm category start addr. and 3 to Alarm category end addr., the Active Alarm List element displays category 1 triggered alarms.
● Input 1 to Alarm category start addr. and 5 to Alarm category end addr., the Active Alarm List element displays category 1 and 5 triggered alarms.</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Alarm category end addr.</td></tr>
<tr><td>(4)</td><td>Sort</td><td>Select the Use header controls to sort checkbox and set the Default sort field to the alarm number (No), alarm trigger time (Trigger), or alarm group (Group).

</td></tr>
</table>

No.	Function	Description
		

- Field attributes

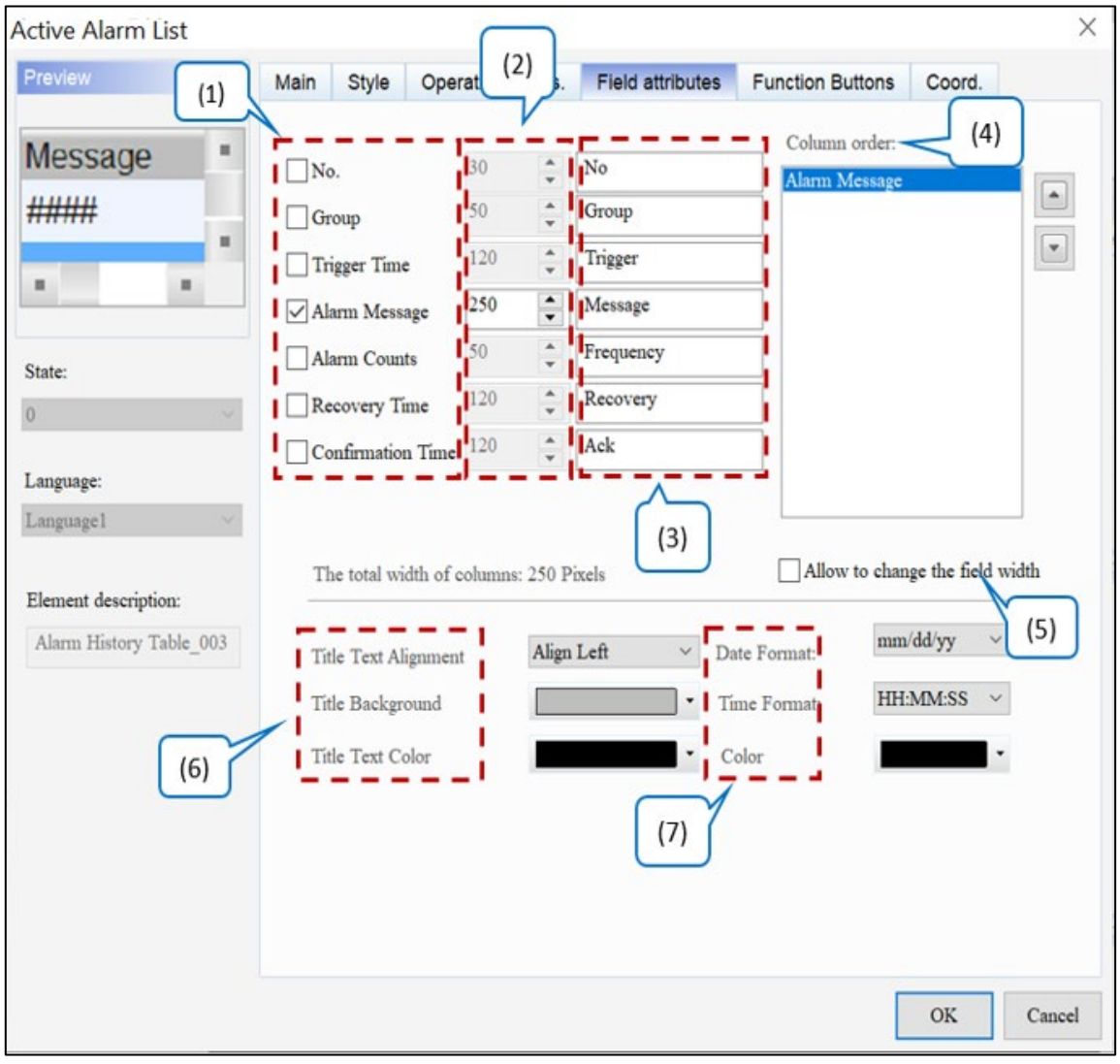
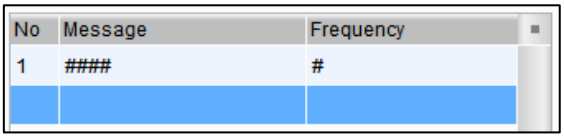
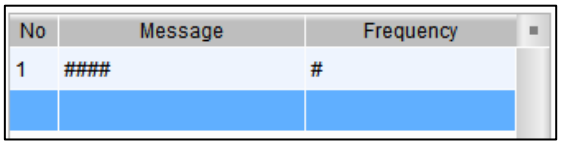
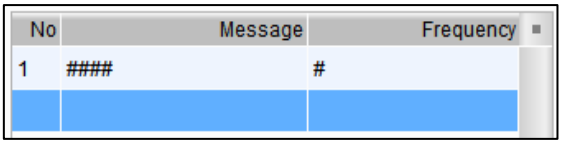
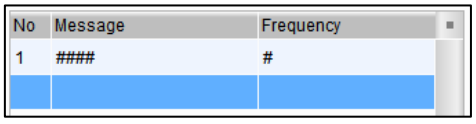
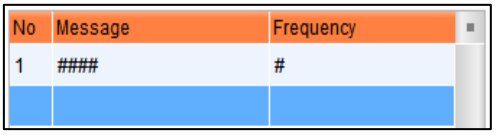
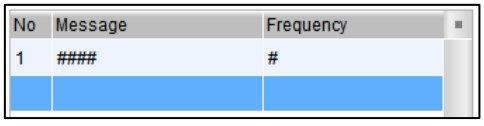
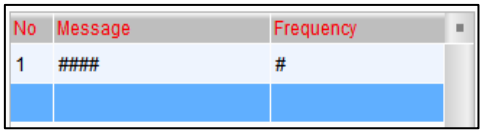
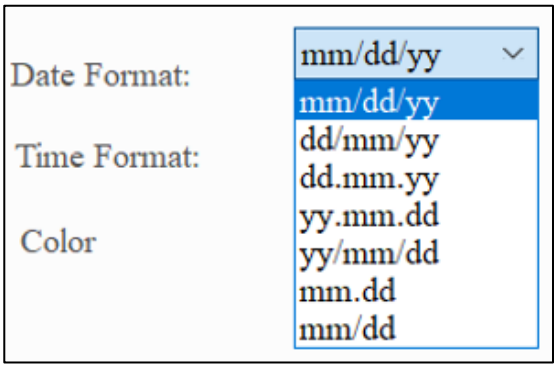
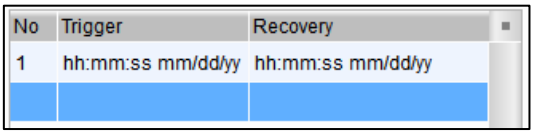
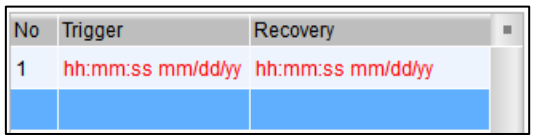


Figure 16 - 12: Active Alarm List element Field attributes property page

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>(1)</td><td>Column display</td><td colspan="2">Select the columns to display in the element.</td></tr>
<tr><td>(2)</td><td>Column width</td><td colspan="2">Adjust the width for each column.</td></tr>
<tr><td>(3)</td><td>Column title</td><td colspan="2">Define the titles for each column.</td></tr>
<tr><td>(4)</td><td>Column order</td><td colspan="2">After selecting the columns to display, use  and  buttons to adjust the column displaying order.</td></tr>
<tr><td>(5)</td><td>Allow to change the field width</td><td colspan="2">After selecting this checkbox, drag to adjust the displaying field width on the HMI.</td></tr>
<tr><td rowspan="5">(6)</td><td rowspan="5">Title</td><td rowspan="2">Title Text Alignment</td><td>The available options for Title Text Alignment are: Align Left, Center, and Align Right. The default value is Align Left.</td></tr>
<tr><td>
<table>
<tr><td>Align Left</td><td>  </td></tr>
<tr><td>Center</td><td>  </td></tr>
<tr><td>Align Right</td><td>  </td></tr>
</table>
</td></tr>
<tr><td rowspan="2">Title Background</td><td>Set the background color of the column title. The default is  .
<table>
<tr><td>Default</td><td>  </td></tr>
<tr><td>After Change</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>Title Text Color</td><td>Set the text color of the column title. The default is  .
<table>
<tr><td>Default</td><td>  </td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td></td><td></td><td>After Change
 
</td></tr>
<tr><td rowspan="3">(7)</td><td rowspan="3">Date and time</td><td>Date Format</td><td>The available options for Date Format are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is mm/dd/yy.
 
</td></tr>
<tr><td>Time Format</td><td>The available options for Time Format are: HH:MM:SS and HH:MM. The default value is HH:MM:SS.
 
</td></tr>
<tr><td>Color</td><td>Set the display color for the date and time. The default is .
Default
 

After Change
 
</td></tr>
</table>

- Function Buttons

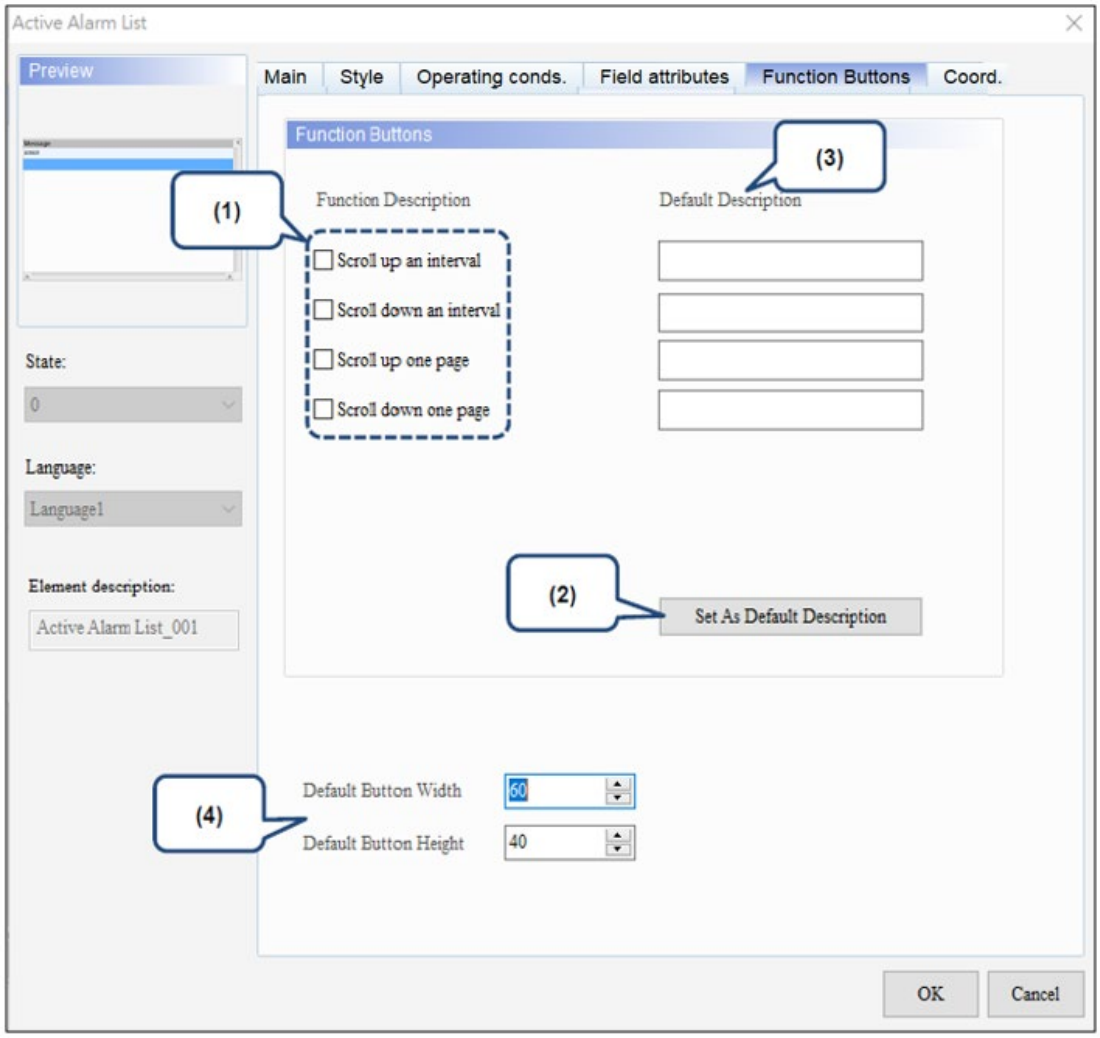


Figure 16 - 13: Active Alarm List element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	● **Function Buttons** are described as follows. Scroll up an interval: Scroll up a small interval. Scroll down an interval: Scroll down a small interval. Scroll up one page: Scroll up one page. Scroll down one page: Scroll down one page.
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.

No.	Function	Description
(3)	Default Description	Click **Set As Default Description** button to insert the default strings to the **Default Description** fields.
(4)	Default Button Width and Default Button Height	Adjust the width and height of the function buttons. The default values for **Default Button Width** and **Default Button Height** are **60** and **40**, respectively.

- Coord.

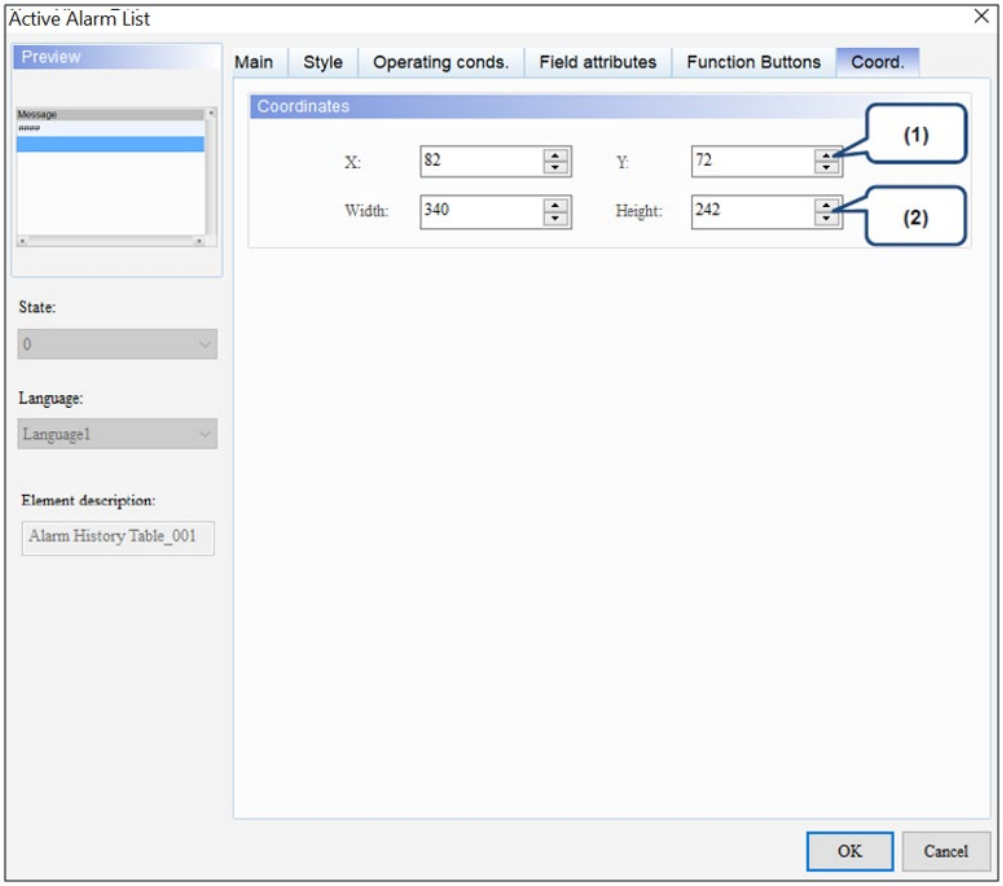


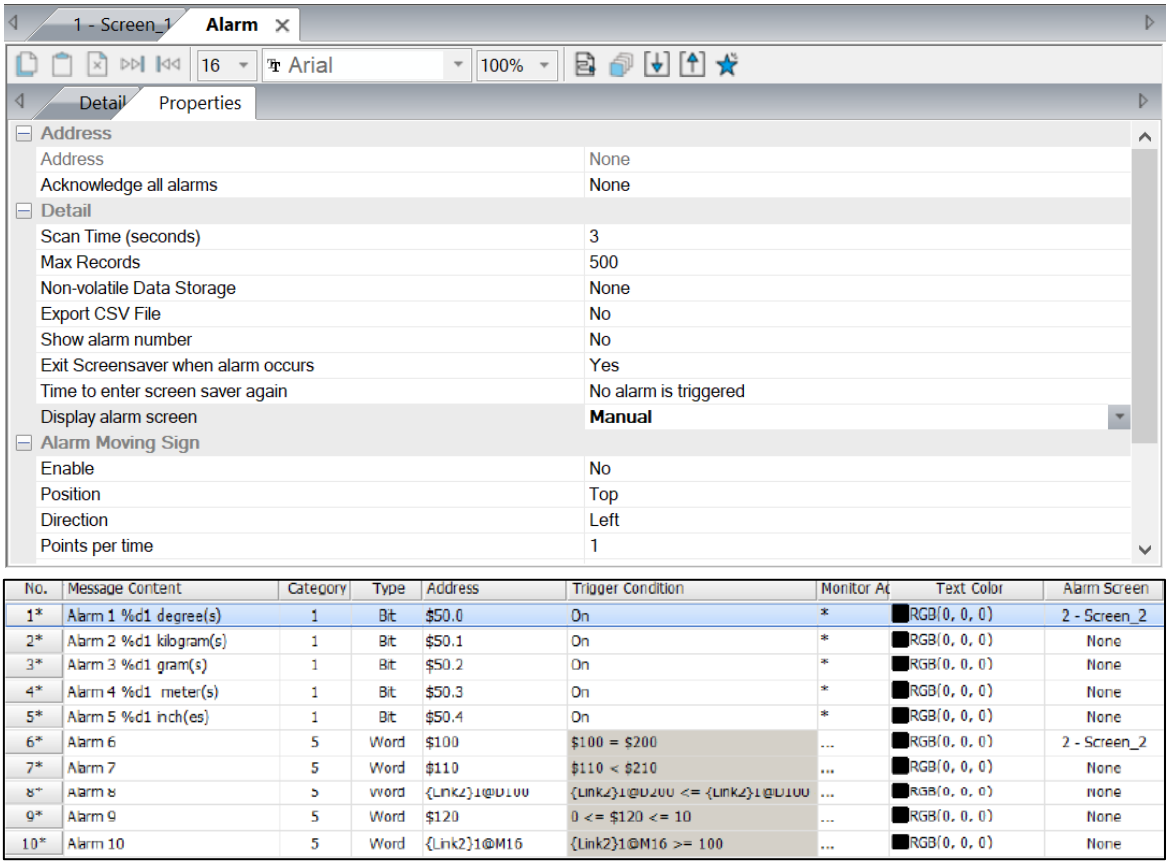
Figure 16 - 14: Active Alarm List element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

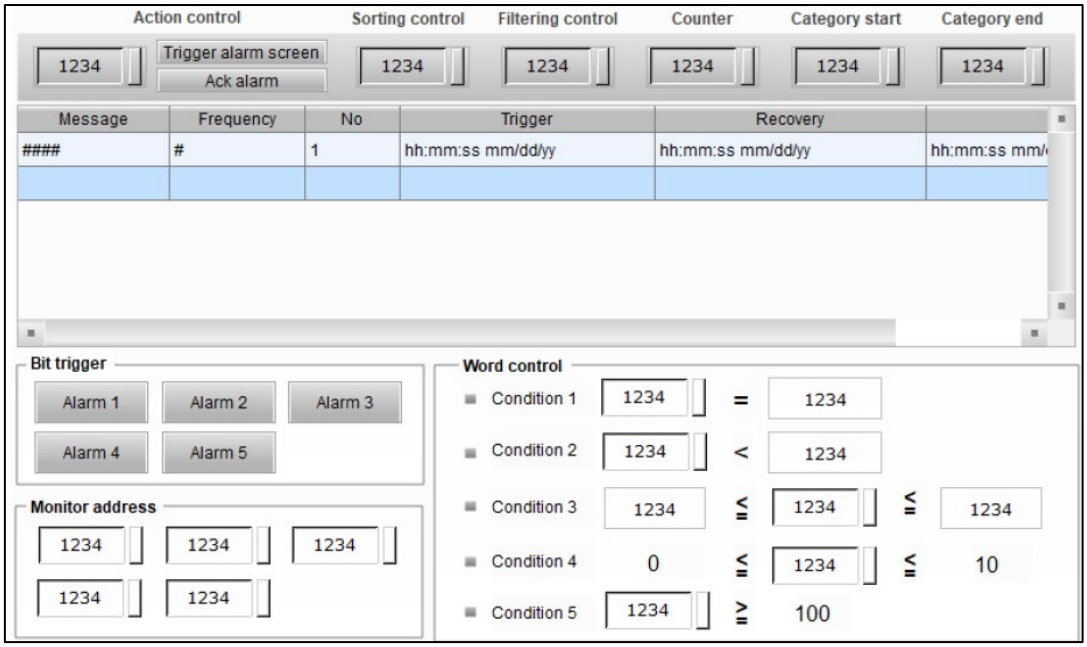
16.5 Alarm Frequency Table

The **Alarm Frequency Table** element records and displays the occurrence times of each alarm. Refer to the following table for the **Alarm Frequency Table** element example.

Alarm Frequency Table

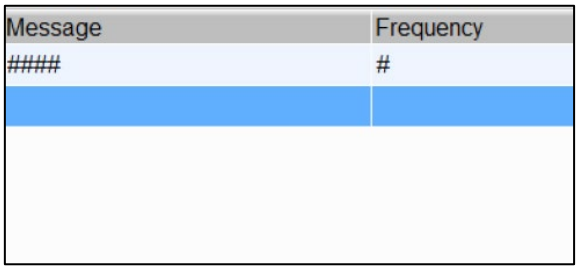


Alarm Frequency Table

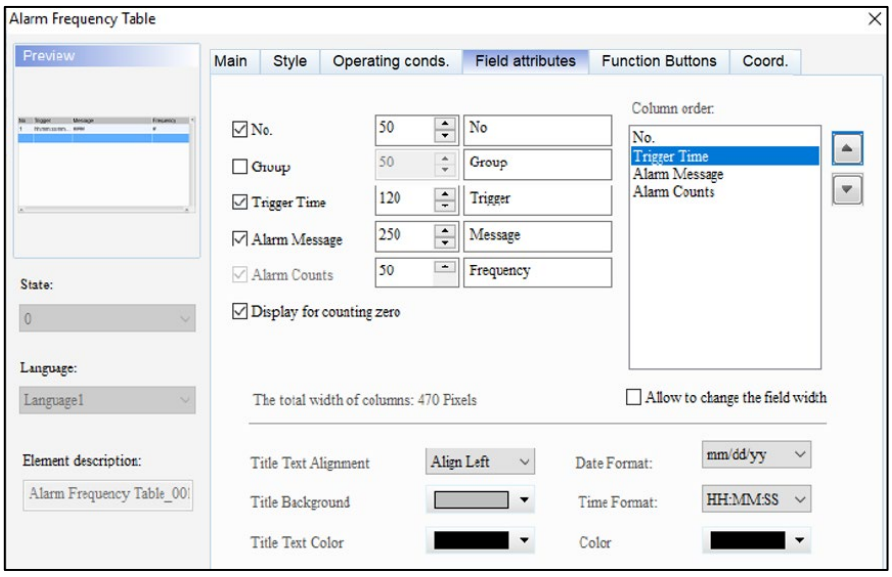


Create Alarm Frequency Table element

Step 1: Create an **Alarm Frequency Table** element.



Step 2: Select the **No.** and **Trigger Time** checkboxes. **Alarm Message**, **Alarm Counts**, and **Display for counting zero** are selected by default. Then, the **Alarm Frequency Table** element displays the alarm number, alarm trigger time, alarm message, and also records the occurrence times of each alarm.



<table>
<tr><th colspan="3">Alarm Frequency Table</th></tr>
<tr><td>Execution result</td><td colspan="2">

After creating the Alarm Frequency Table element, compile and download the data to the HMI. When the trigger conditions are met for Alarms 6 ~ 10, the Alarm Frequency Table element shows the current alarm time and date, alarm No., alarm Message, and alarm counts. When the Display for counting zero checkbox is selected, the Alarm Frequency Table element displays Alarms 1 ~ 5 with the Frequency as 0 even though they are not triggered.
After the alarm is cleared, the recorded alarm counts in the Alarm Frequency Table element will not be cleared.

<table>
<tr><td>Alarm ON</td><td>
<table>
<tr><th>No</th><th>Trigger</th><th>Message</th><th>Frequency</th></tr>
<tr><td>0001</td><td>00:00:00 00/00/0000</td><td>Alarm 1 %d1 degree(s)</td><td>0</td></tr>
<tr><td>0002</td><td>00:00:00 00/00/0000</td><td>Alarm 2 %d1 kilogram(s)</td><td>0</td></tr>
<tr><td>0003</td><td>00:00:00 00/00/0000</td><td>Alarm 3 %d1 gram(s)</td><td>0</td></tr>
<tr><td>0004</td><td>00:00:00 00/00/0000</td><td>Alarm 4 %d1 meter(s)</td><td>0</td></tr>
<tr><td>0005</td><td>00:00:00 00/00/0000</td><td>Alarm 5 %d1 inch(es)</td><td>0</td></tr>
<tr><td>0006</td><td>14:52:07 05/25/2018</td><td>Alarm 6</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>Alarm OFF</td><td>
<table>
<tr><th>No</th><th>Trigger</th><th>Message</th><th>Frequency</th></tr>
<tr><td>0001</td><td>00:00:00 00/00/0000</td><td>Alarm 1 %d1 degree(s)</td><td>0</td></tr>
<tr><td>0002</td><td>00:00:00 00/00/0000</td><td>Alarm 2 %d1 kilogram(s)</td><td>0</td></tr>
<tr><td>0003</td><td>00:00:00 00/00/0000</td><td>Alarm 3 %d1 gram(s)</td><td>0</td></tr>
<tr><td>0004</td><td>00:00:00 00/00/0000</td><td>Alarm 4 %d1 meter(s)</td><td>0</td></tr>
<tr><td>0005</td><td>00:00:00 00/00/0000</td><td>Alarm 5 %d1 inch(es)</td><td>0</td></tr>
<tr><td>0006</td><td>14:52:07 05/25/2018</td><td>Alarm 6</td><td>1</td></tr>
</table>
</td></tr>
</table>
</td></tr>
</table>

On double-clicking the **Alarm Frequency Table** element, the property page appears as follows.

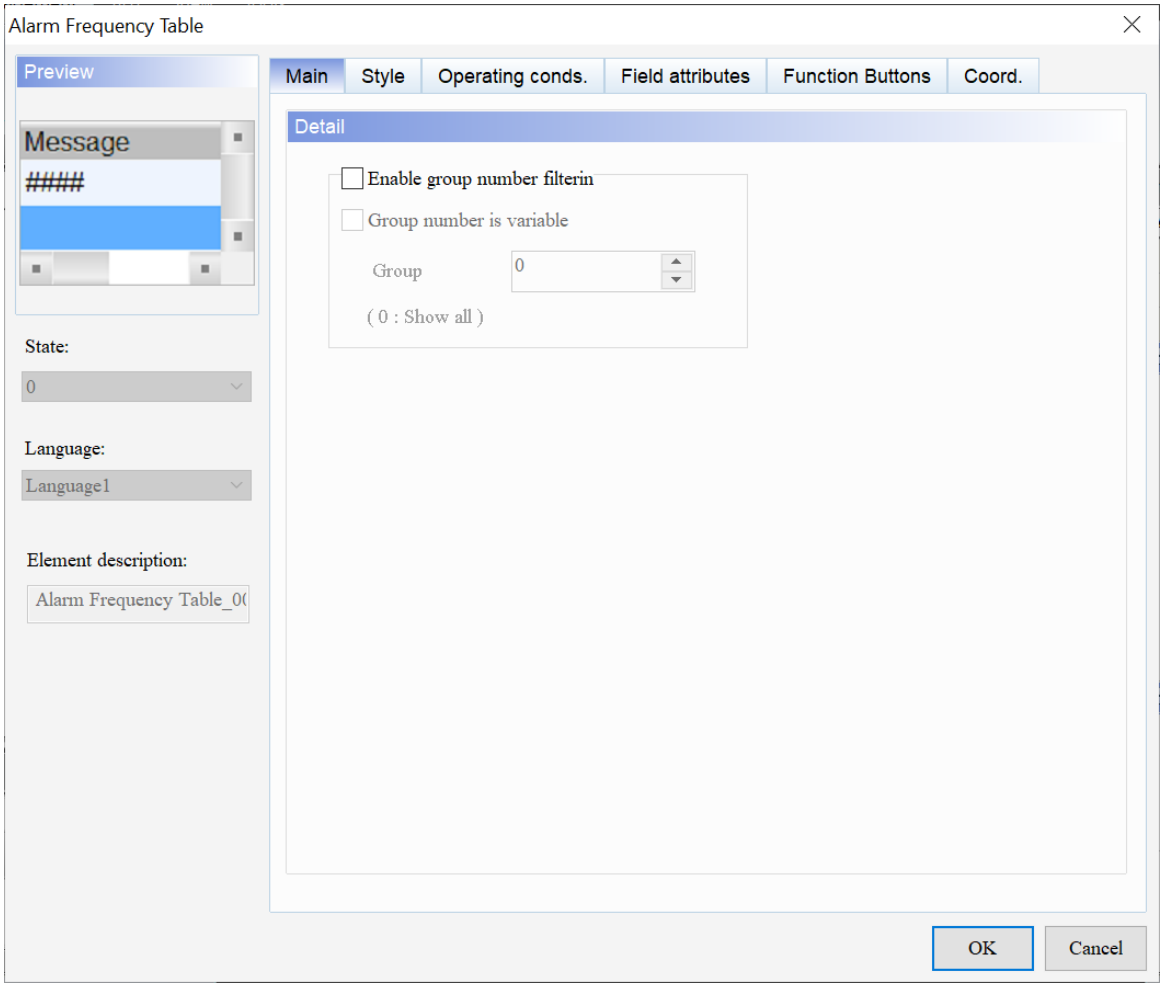


Figure 16 - 15: Alarm Frequency Table element property page

Alarm Frequency Table	
Function	**Description**
Preview	The **Alarm Frequency Table** elements do not support multiple state values and multi-language data display.
Main	Select the Enable group number filtering checkbox.
Style	Set Background Color, Border Color, Gridline Color, Row Color, Alternating Row Color, Select Row Color, Show Gridlines, and Transparency.
Operating conds.	Set Filter control address, Alarm category start addr., and Alarm category end addr. Select the Use header controls to sort checkbox and set the Default sort field.
Field attributes	Set the displaying alarm columns, width, description, the order of the columns, and select the Allow to change the field width checkbox. Set the Title Text Alignment, Title Background, Title Text Color, and format / color of the date / time.

Alarm Frequency Table	
Function	**Description**
Function Buttons	Select the Scroll up an interval, Scroll down an interval, Scroll up one page, and Scroll down one page checkboxes. Set the displaying texts and default width / height of the buttons.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

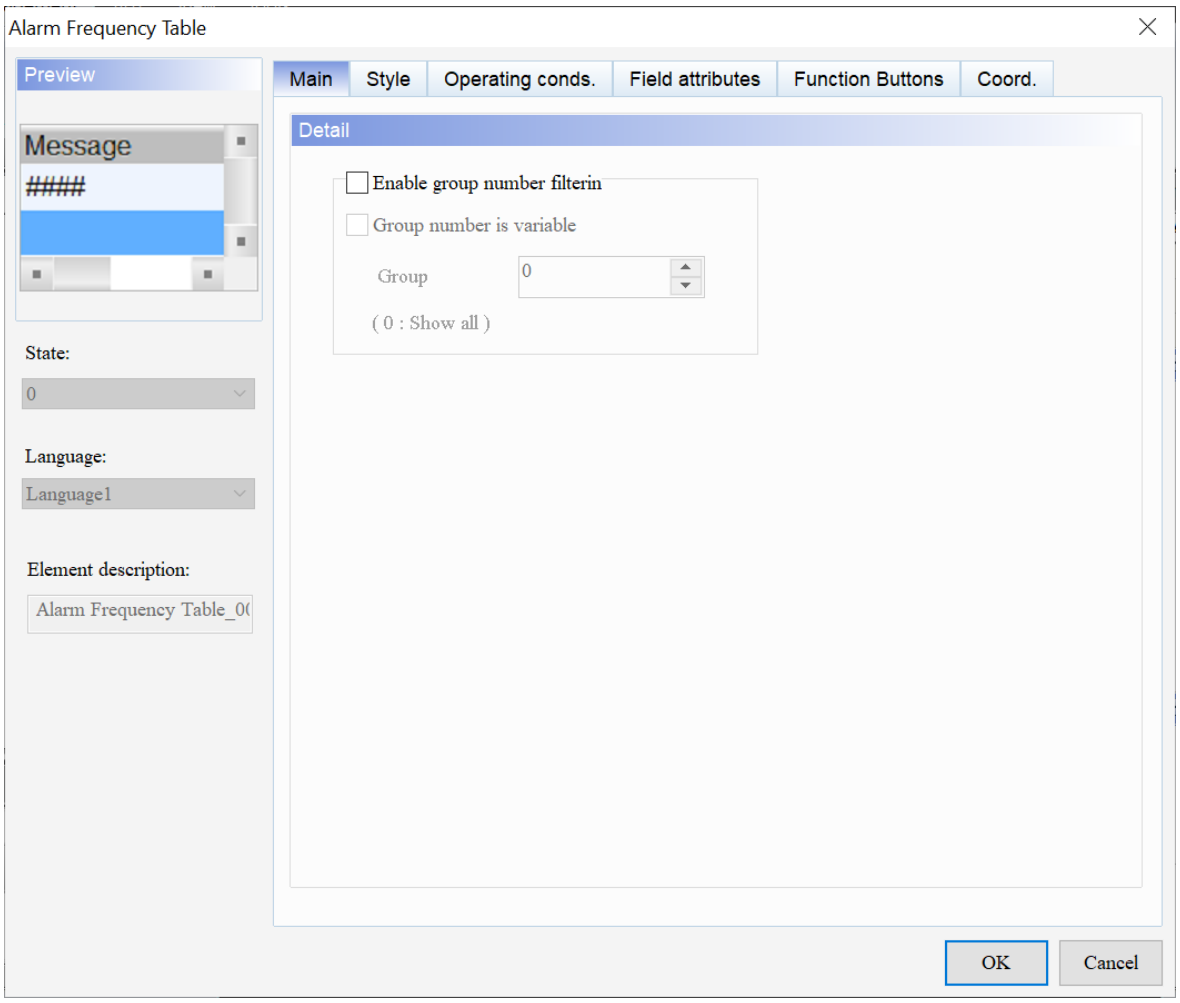
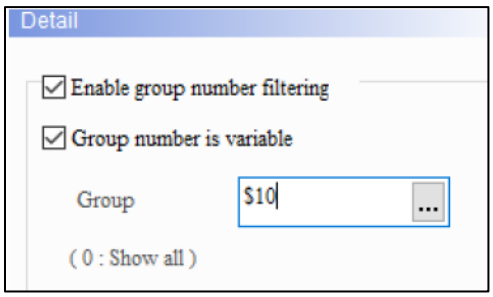
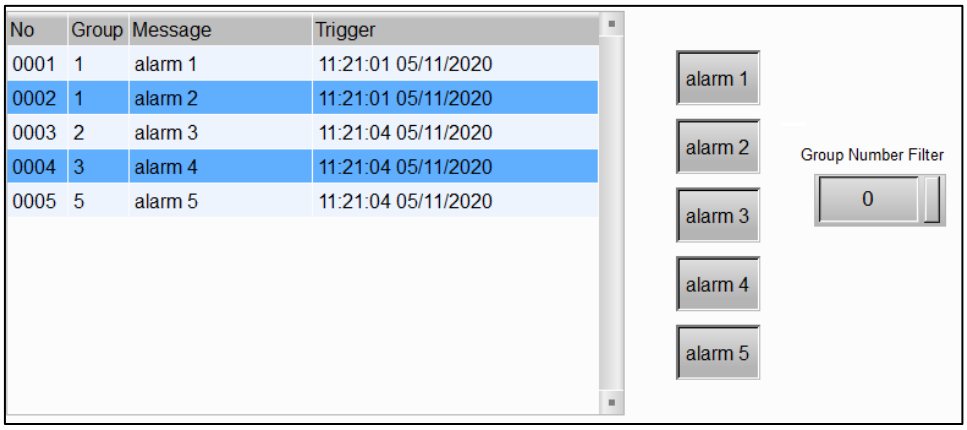
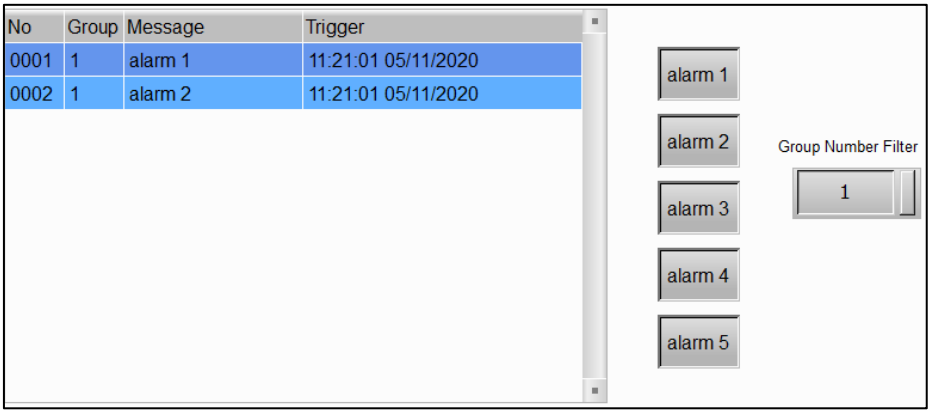


Figure 16 - 16: Alarm Frequency Table element Main property page

Function	Description
Enable group number filtering	● Select the **Enable group number filtering** checkbox to filter the alarms to be displayed. Specify the group number to display the alarms in groups. ● The value of the group number can be a variable or constant. ● When **Group** is 0, all alarms are displayed.  **Example:** When **Group** is 0.  When **Group** is 1. 

- Style

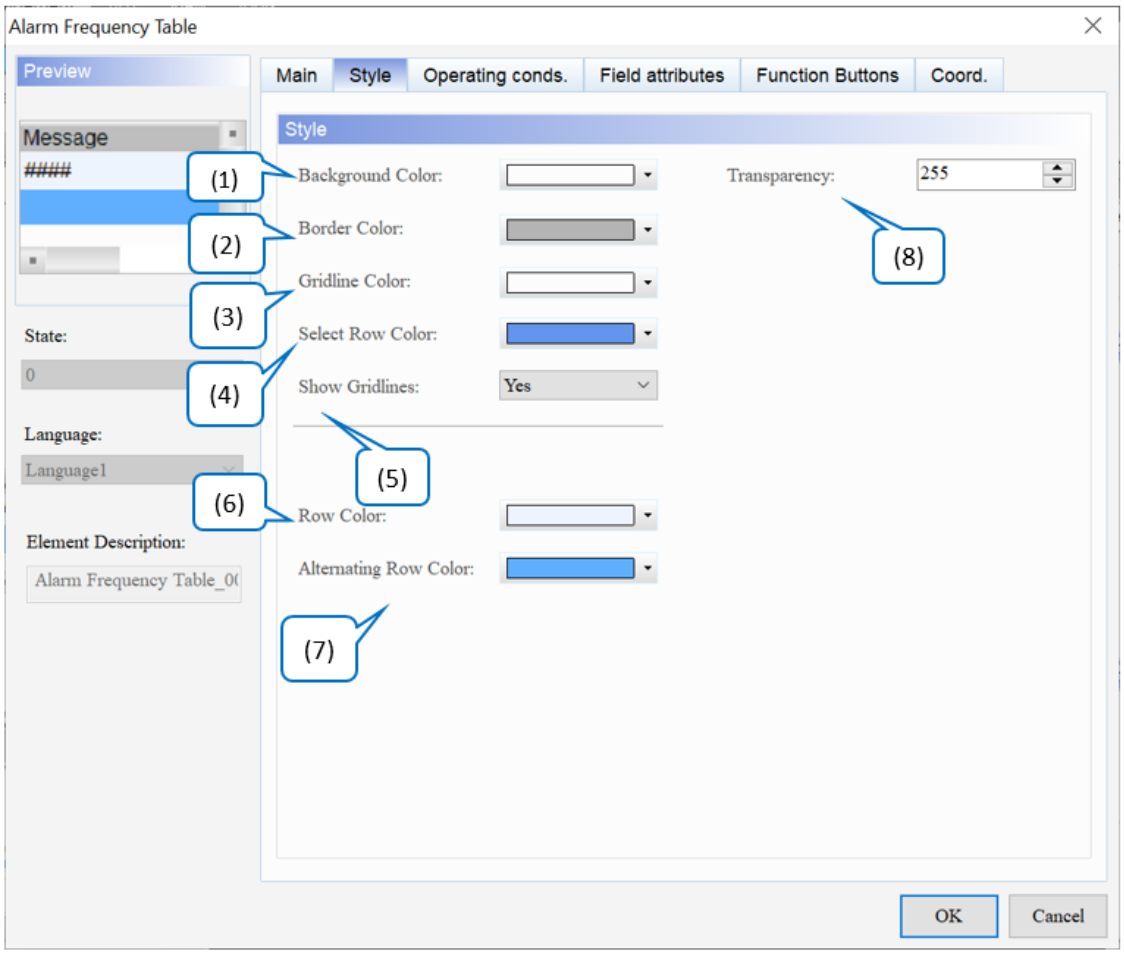
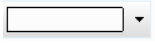
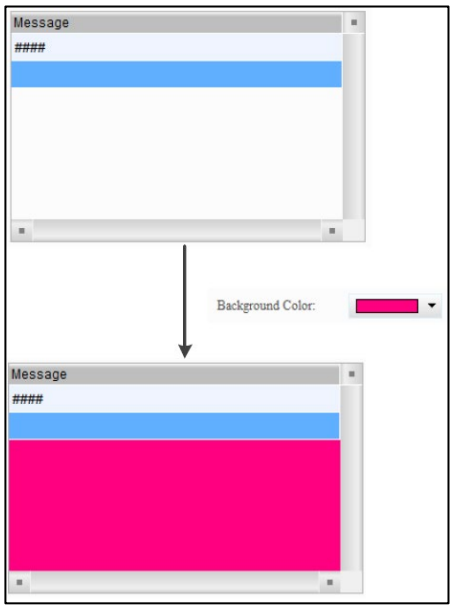
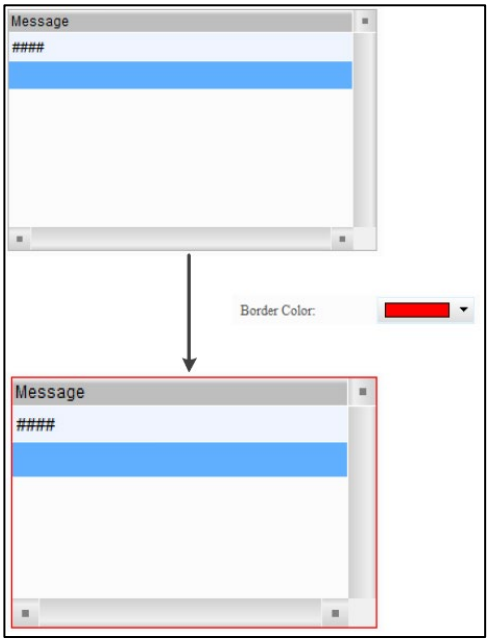
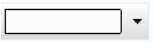
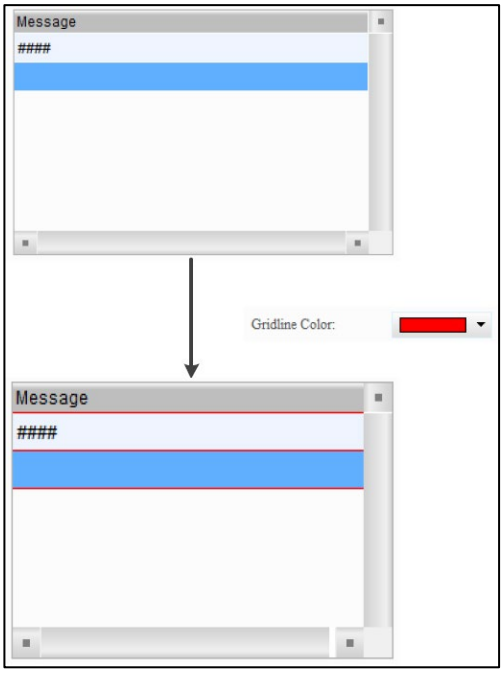
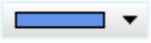
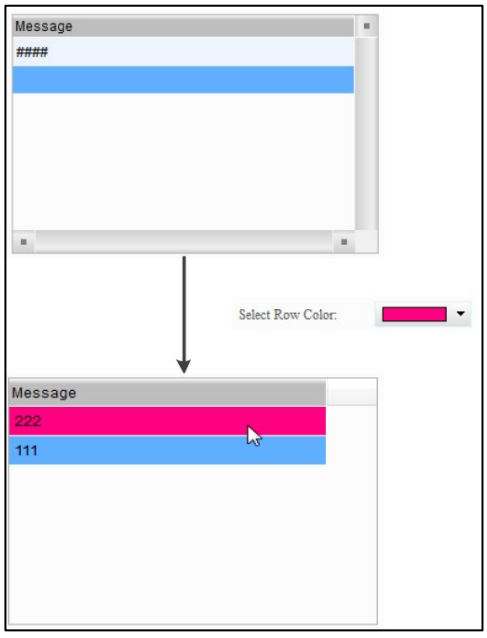
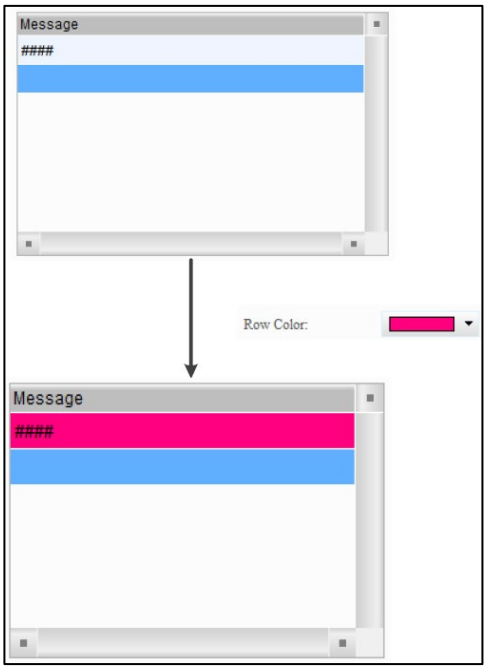
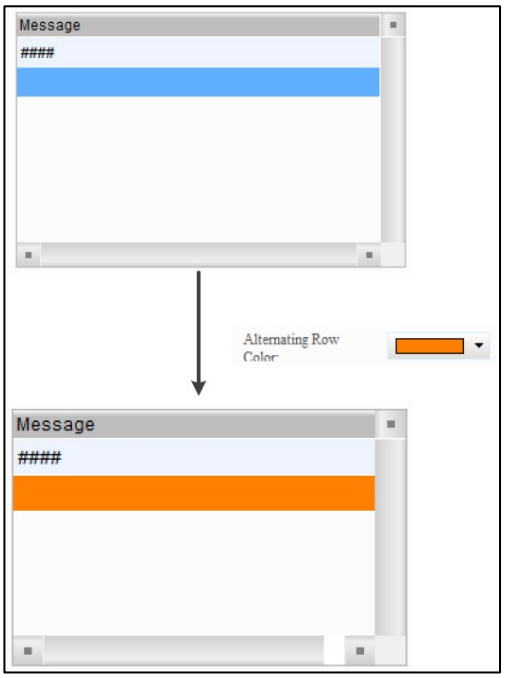


Figure 16 - 17: Alarm Frequency Table element Style property page

No.	Function	Description
(1)	Background Color	Set the background color of the element. The default is  . 
(2)	Border Color	Set the border color of the element. The default is  . 

No.	Function	Description
(3)	Gridline Color	● Set the gridline color of the element. The default is  . ● The **Gridline Color** setting is valid only when users select Yes for **Show Gridlines**. 
(4)	Select Row Color	● The column color of the selected alarm data. ● Set the color of the selection column. The default is  . 
(5)	Show Gridlines	● The default value is **Yes**. ● When set to No, the **Gridline Color** setting is invalid.

No.	Function	Description
(6)	Row Color	Set the color to be displayed for each row of the alarm. The default is . 
(7)	Alternating Row Color	Set the color for the alternating row of the alarm. The default is . 
(8)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Operating conds.

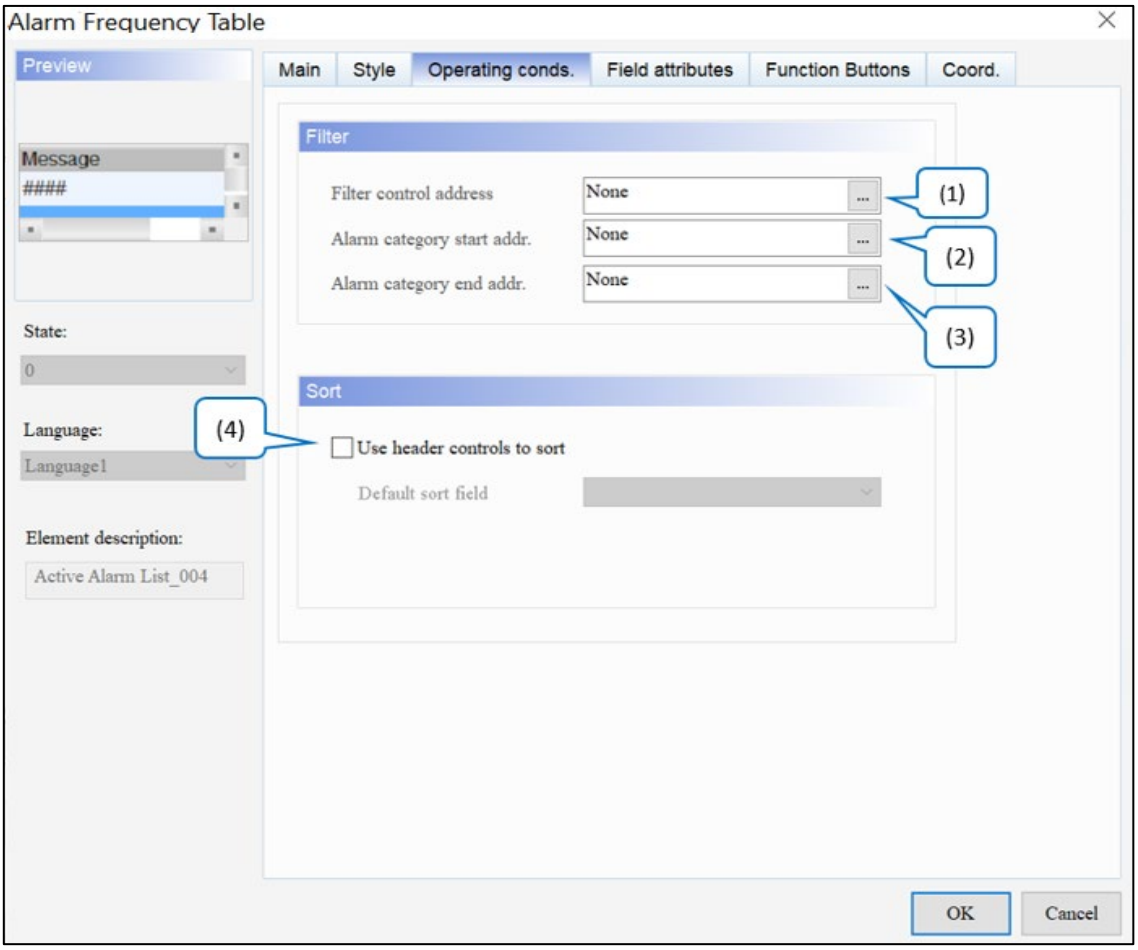
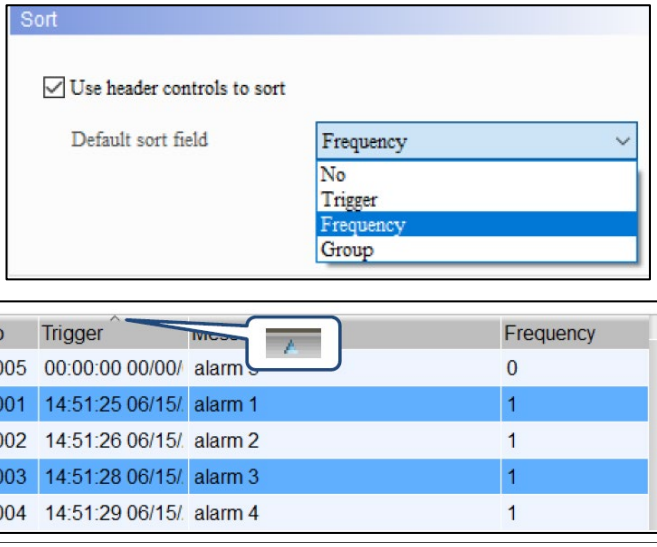


Figure 16 - 18: Alarm Frequency Table element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Filter control address</td><td>The Filter control address is used to filter the items specified by users.
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Default; display all triggered alarms.</td></tr>
<tr><td>1</td><td>Hide the alarms with both Recovery Time and Acknowledge Time.</td></tr>
<tr><td>2</td><td>Hide alarms with Recovery Time.</td></tr>
<tr><td>3</td><td>Hide alarms with Recovery Time or Acknowledgement Time.</td></tr>
<tr><td>4</td><td>Hide alarms with Acknowledgement Time.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>5</td><td>● This setting must be used with Alarm counter display.
● The alarm display count refers to the value of Alarm counter display. When the alarm display count is smaller than this value, the alarm is hidden.</td></tr>
<tr><td>6</td><td>● This setting must be used with Alarm category start addr. and Alarm category end addr.
● When the alarm category number is not within the range set by these two addresses, the alarm is hidden.</td></tr>
</table>
</td></tr>
<tr><td>(2)</td><td>Alarm category start addr.</td><td rowspan="2">● This setting must be used with Filter control address.
● When Filter control address is set to 6, input the alarm category number.
<table>
<tr><th>Example</th><th>Description</th></tr>
<tr><td>Alarms with alarm category numbers 1 and 5</td><td>● Input 1 to Alarm category start addr. and 3 to Alarm category end addr., the Alarm Frequency Table element displays category 1 triggered alarms.
● Input 1 to Alarm category start addr. and 5 to Alarm category end addr., the Alarm Frequency Table element displays category 1 and 5 triggered alarms.</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Alarm category end addr.</td></tr>
<tr><td>(4)</td><td>Sort</td><td>Select the Use header controls to sort checkbox and set the Default sort field to the alarm number (No), alarm trigger time (Trigger), alarm count (Frequency), or alarm group (Group). The default value is Frequency.


</td></tr>
</table>

- Field attributes

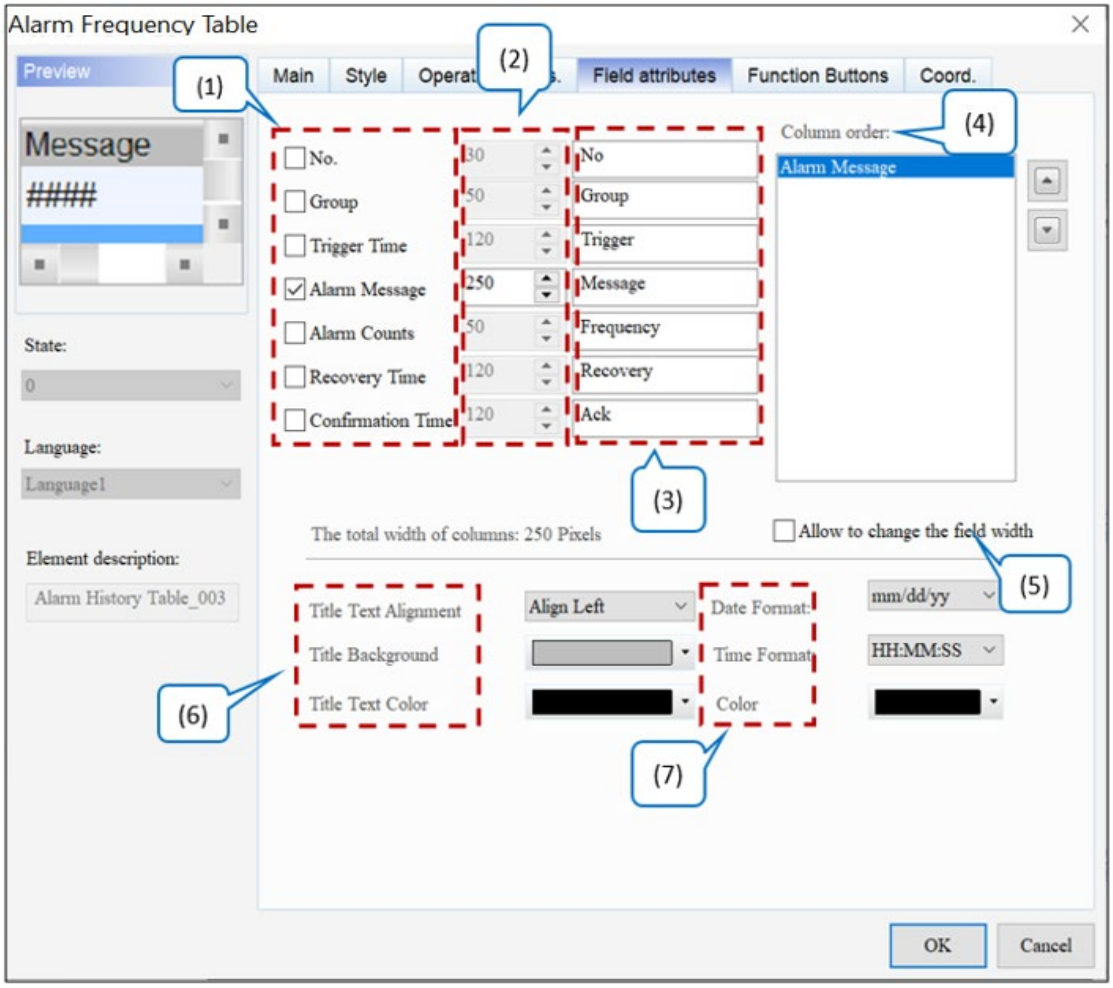
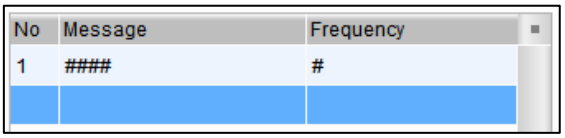
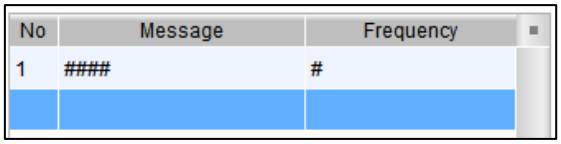
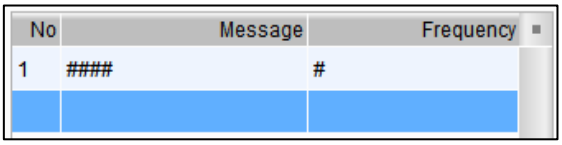
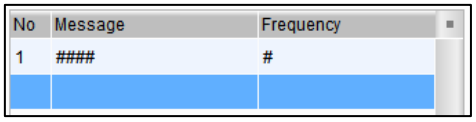


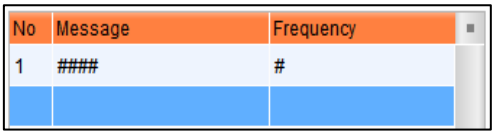
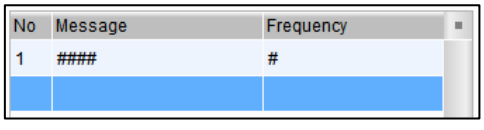
Figure 16 - 19: Alarm Frequency Table element Field attributes property page

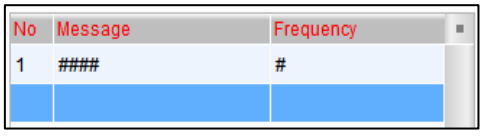
No.	Function	Description
(1)	Column display	Select the columns to display in the element.
(2)	Column width	Adjust the width for each column.
(3)	Column title	Define the titles for each column.
(4)	Column order	After selecting the columns to be displayed, use and buttons to adjust the column displaying order.

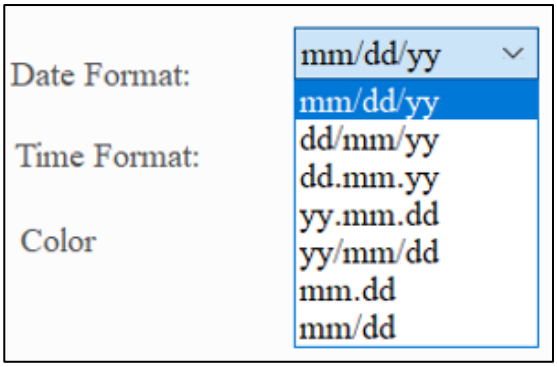
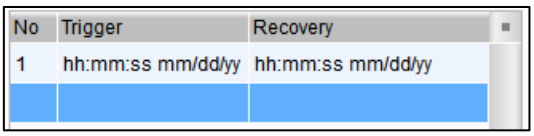
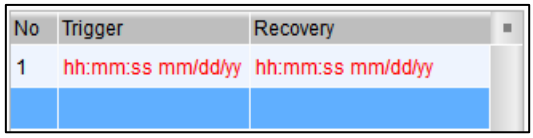
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>(5)</td><td>Allow to change the field width</td><td colspan="2">After selecting this checkbox, drag to adjust the displaying field width on the HMI.</td></tr>
<tr><td rowspan="5">(6)</td><td rowspan="5">Title</td><td>Title Text Alignment</td><td>The available options for Title Text Alignment are: Align Left, Center, and Align Right. The default value is Align Left.
Align Left
 

Center
 

Align Right
 
</td></tr>
<tr><td>Title Background</td><td>Set the background color of the column title. The default is .
Default
 

After Change
 
</td></tr>
<tr><td>Title Text Color</td><td>Set the text color of the column title. The default is .
Default
 

After Change
 
</td></tr>
<tr><td>(7)</td><td>Date and time</td><td>Date Format</td><td>The available options for Date Format are: mm/dd/yy, dd/mm/yy, dd.mm.yy, yy.mm.dd, yy/mm/dd, mm.dd, and mm/dd. The default value is mm/dd/yy.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td></td><td> 
</td></tr>
<tr><td>Time Format</td><td>The available options for Time Format are: HH:MM:SS and HH:MM. The default value is HH:MM:SS.
 
</td></tr>
<tr><td>Color</td><td>Set the display color for the date and time. The default is .
<table>
<tr><td>Default</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table></td></tr>
</table>

- Function Buttons

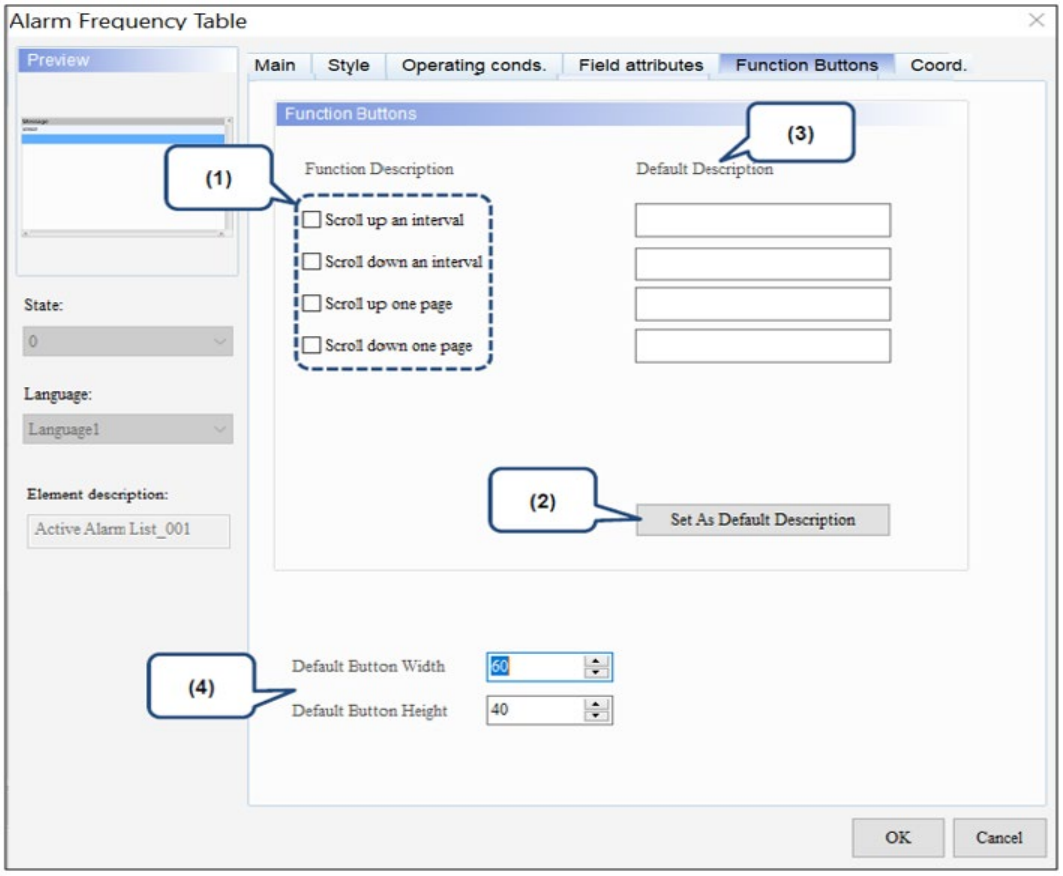


Figure 16 - 20: Alarm Frequency Table element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	● **Function Buttons** are described as follows. Scroll up an interval: Scroll up a small interval. Scroll down an interval: Scroll down a small interval. Scroll up one page: Scroll up one page. Scroll down one page: Scroll down one page.
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.
(3)	Default Description	Click **Set As Default Description** button to insert the default strings to the **Default Description** fields.

No.	Function	Description
(4)	Default Button Width and Default Button Height	Adjust the width and height of the function buttons. The default values for **Default Button Width** and **Default Button Height** are **60** and **40**, respectively.

- Coord.

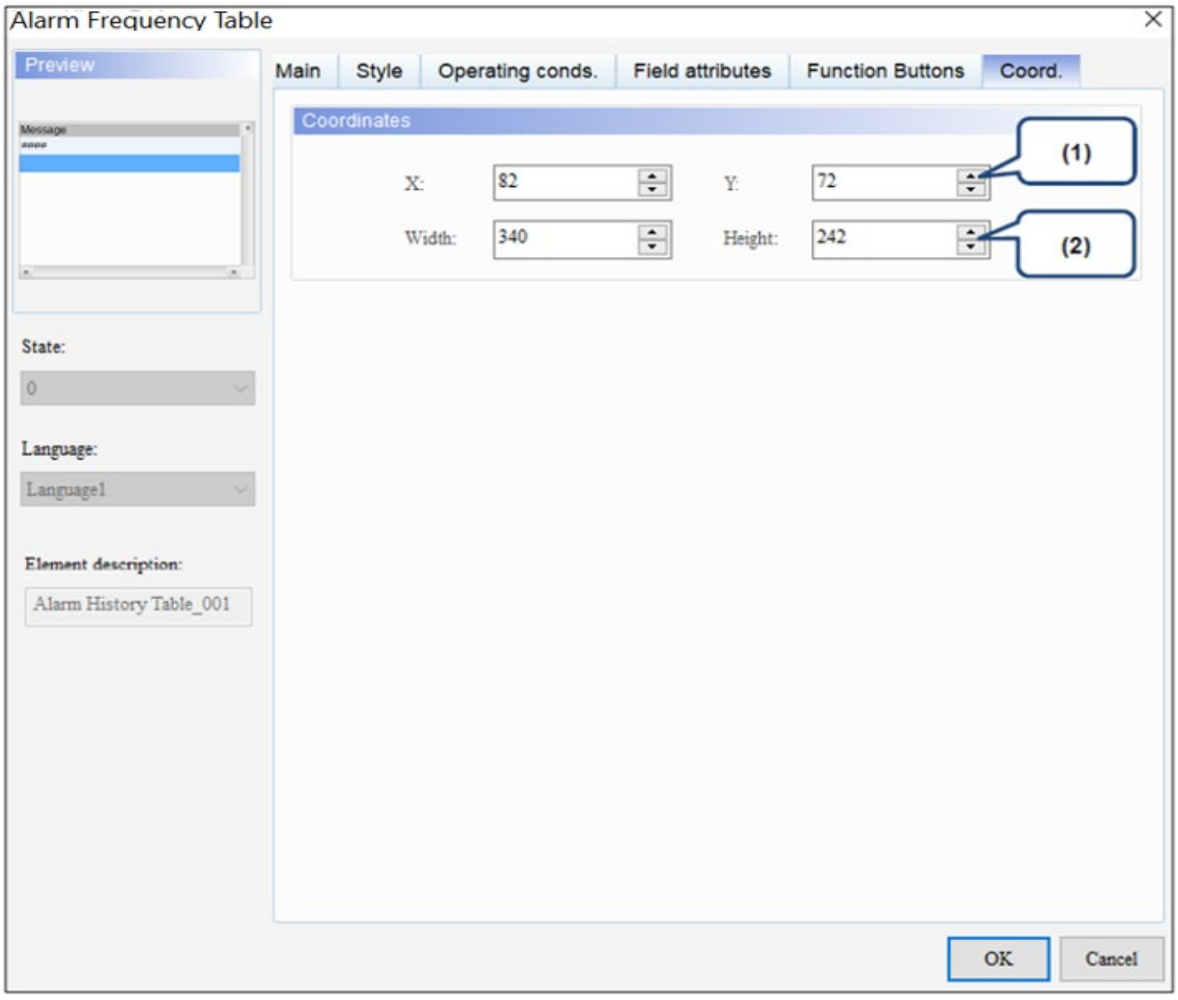


Figure 16 - 21: Alarm Frequency Table element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

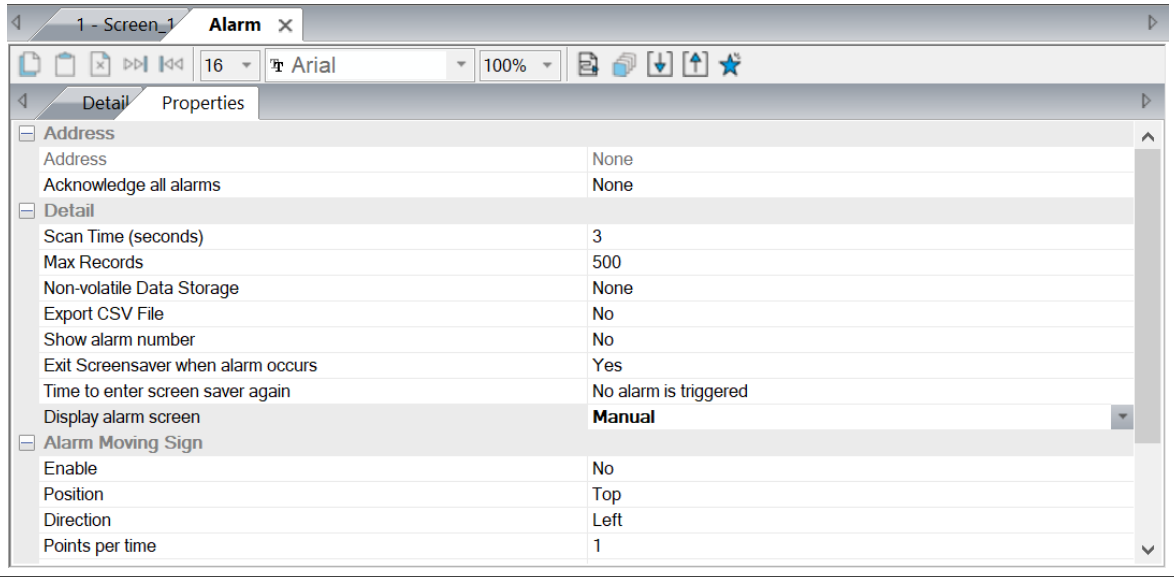
No.	Function	Description
(2)	Width and Height	Set the width and height of the elements.

16.6 Alarm Moving Sign

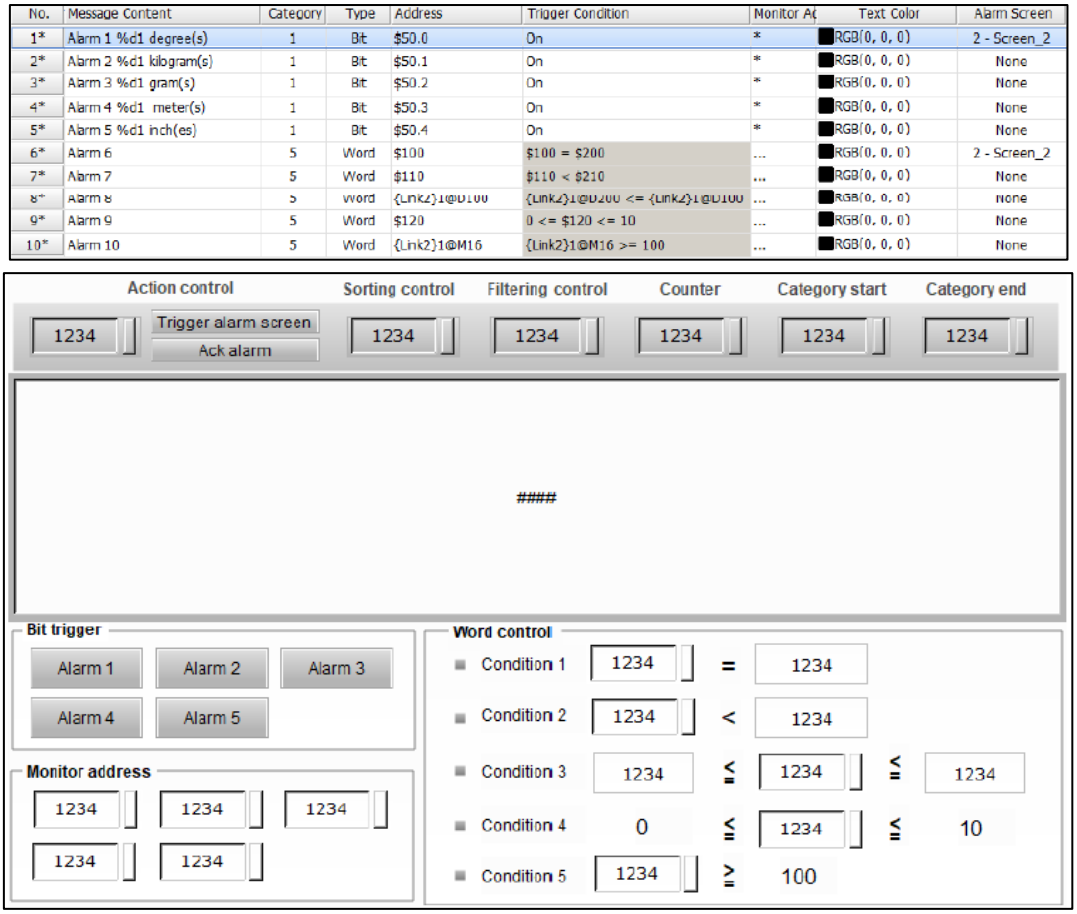
The **Alarm Moving Sign** element records the alarm number and the alarm trigger time and date. Users can also define the time interval and moving distance of the Alarm Moving Sign.

The effects of the **Alarm Moving Sign** element and the Alarm Moving Sign in **General** > **Alarm Settings** are the same, such as the moving distance and the time interval. The main difference is the Alarm Moving Sign in the **Alarm Settings** generates a moving sign message as soon as an alarm is triggered regardless of the operating page users are on. Users can use both functions at the same time, but the two settings are independent and not cross-referenced.

Refer to the following table for the **Alarm Moving Sign** element example.

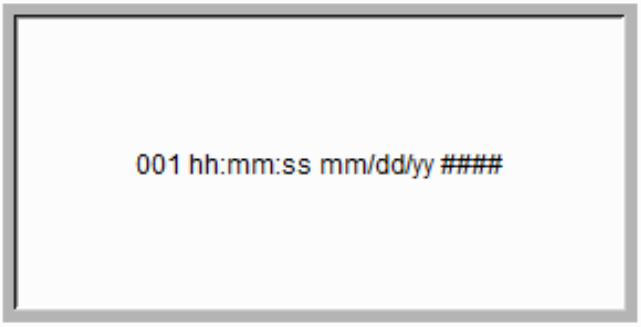
Alarm Moving Sign


Alarm Moving Sign

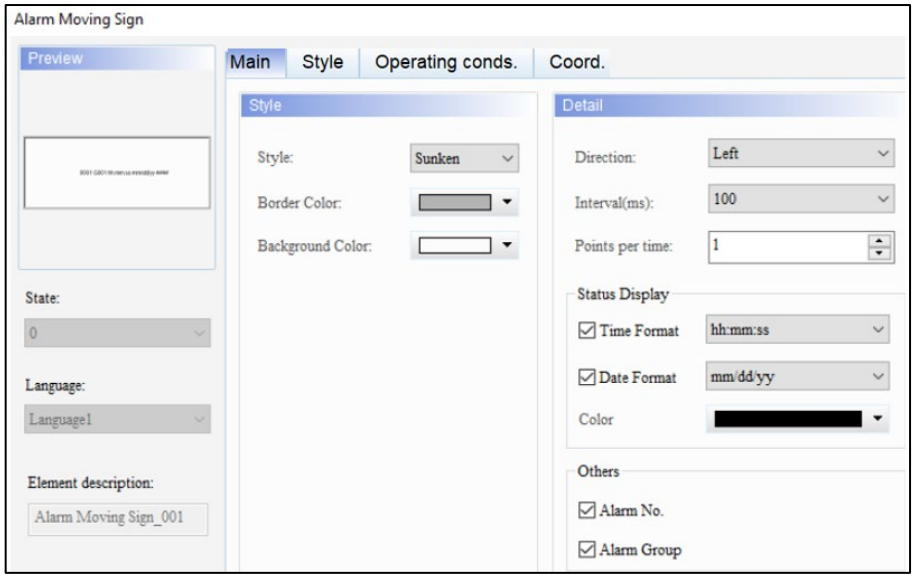


Create Alarm Moving Sign element

Step 1: Create an **Alarm Moving Sign** element.



Step 2: Select the **Time Format**, **Date Format**, and **Alarm No.** checkboxes. Then, the **Alarm Moving Sign** element displays the alarm number, alarm trigger time and date, and alarm message.

<table>
<tr><th colspan="2">Alarm Moving Sign</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Execution result</td><td>

After creating the Alarm Moving Sign element, compile and download the data to the HMI. When the trigger conditions are met for Alarms 6 ~ 10, the Alarm Moving Sign element displays the current alarm time and date, alarm No., and alarm message.
When the alarms are cleared, no items are displayed on the Alarm Moving Sign element.

<table>
<tr><td>Alarm ON</td><td> 
</td></tr>
<tr><td>Alarm OFF</td><td>  </td></tr>
</table>
</td></tr>
</table>

On double-clicking the **Alarm Moving Sign** element, the property page appears as follows.

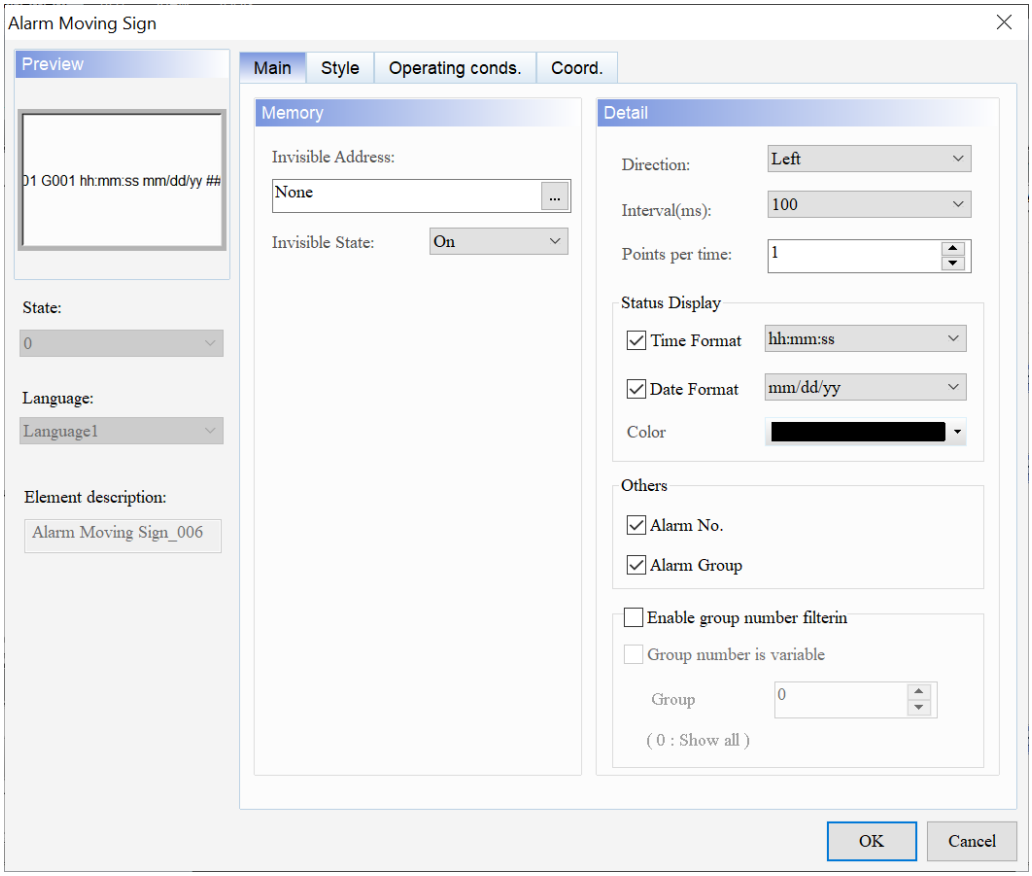


Figure 16 - 22: Alarm Moving Sign element property page

Alarm Moving Sign	
Function	**Description**
Preview	The **Alarm Moving Sign** elements do not support multiple state values and multi-language data display.
Main	Set the Invisible Address, Invisible State, Direction, Interval (ms), Points per time, Time Format, Date Format, Color, Alarm No., and Alarm Group. Select the Enable group number filtering checkbox.
Style	Set the Style, Border Color, Background Color, Size, Font, Ration, and Transparency.
Operating conds.	Set Filter control address, Alarm category start addr., and Alarm category end addr.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

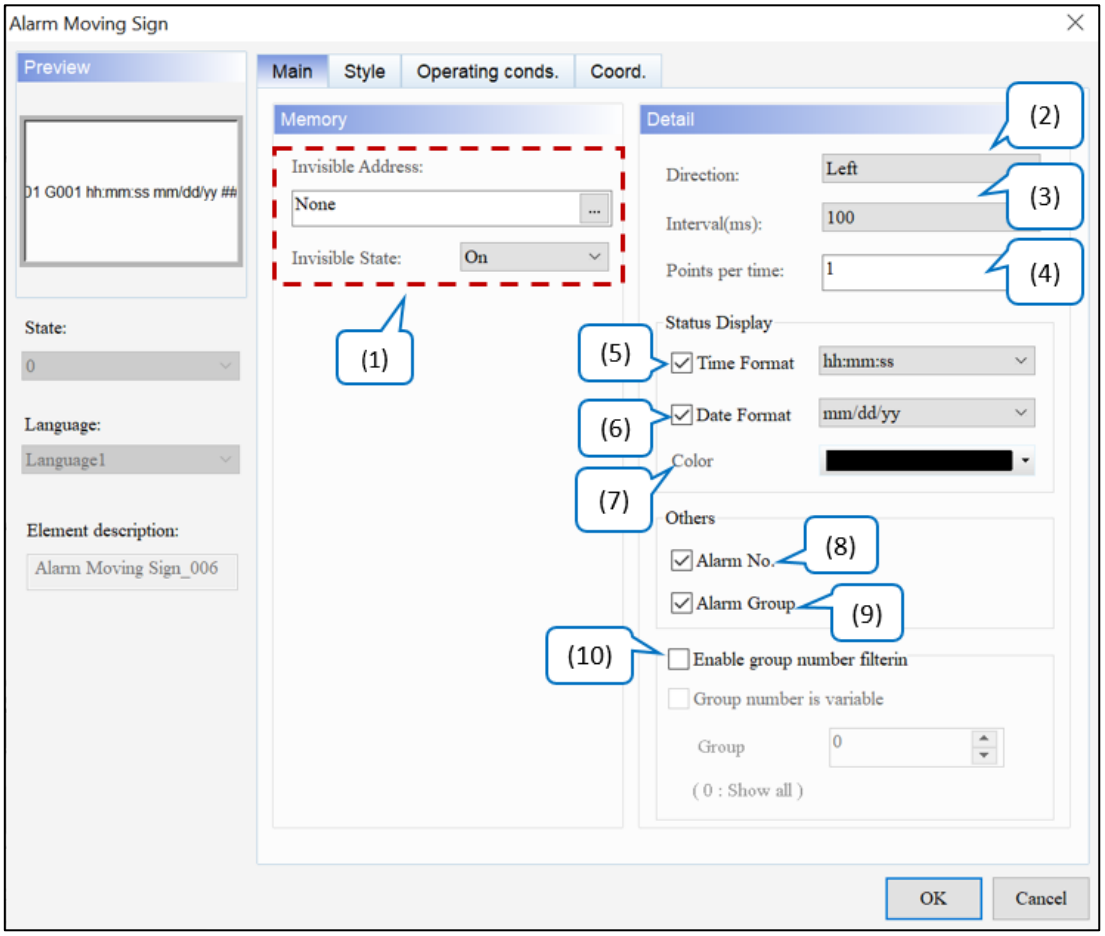
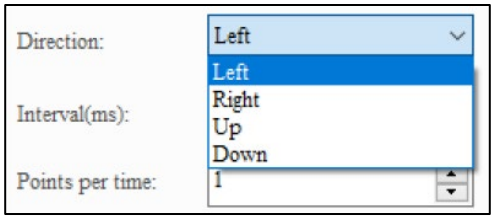
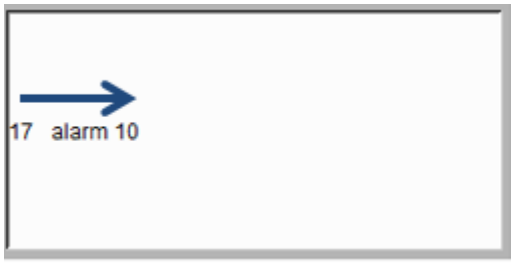
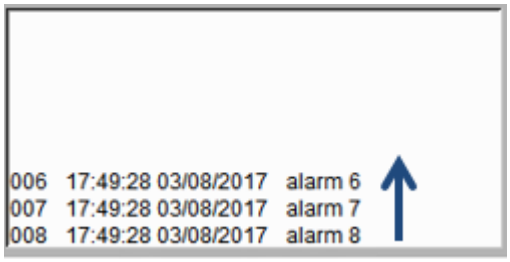
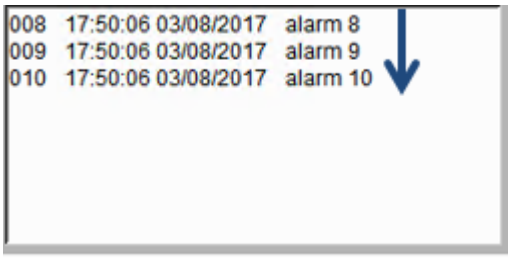


Figure 16 - 23: Alarm Moving Sign element Main property page

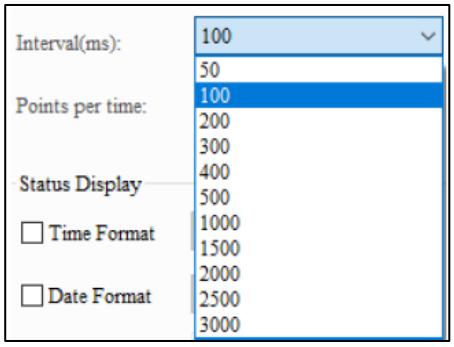
No.	Function	Description
(1)	Invisible Address	● The **Invisible Address** mainly allows users to hide an element through this address. ● If the **Invisible State** is set to On/Off, the button element is hidden through the address defined in the **Invisible Address** field. The default value is **On**. ● The following example explains **Invisible Address** usage: 1. Create an element and set its address to $9.0, then set the **Invisible Address** of the element to be hidden to $9.0. 2. To hide the element, first press the $9.0 button.

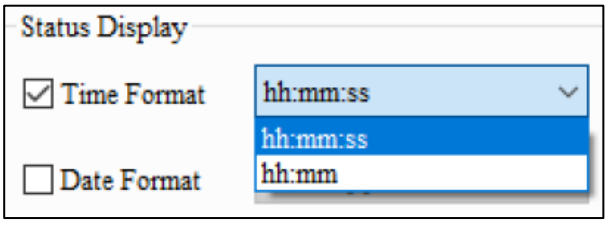
<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4"></td><td rowspan="4">Invisible State</td><td rowspan="2">Invisible State is On</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td>(2)</td><td>Direction</td><td colspan="2">The available options for Direction are: Left, Right, Up, and Down. The default value is Left.
 

<table>
<tr><td>Left</td><td> 
</td></tr>
<tr><td>Right</td><td> 
</td></tr>
</table></td></tr>
</table>

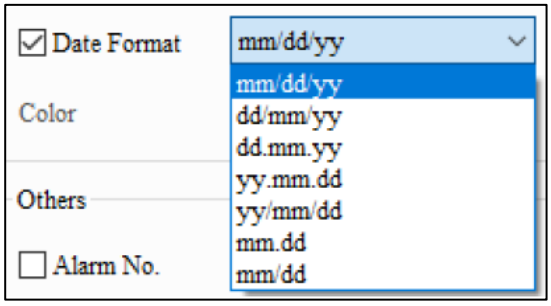
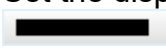
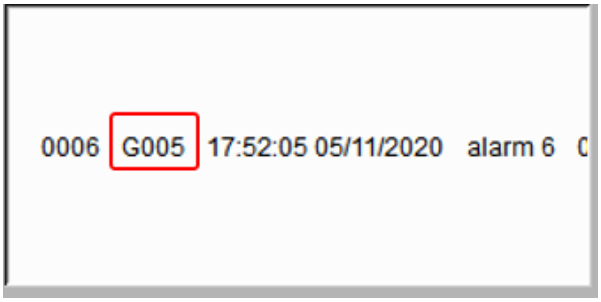
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Up</td><td> 
</td></tr>
<tr><td>Down</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Interval (ms)</td><td>

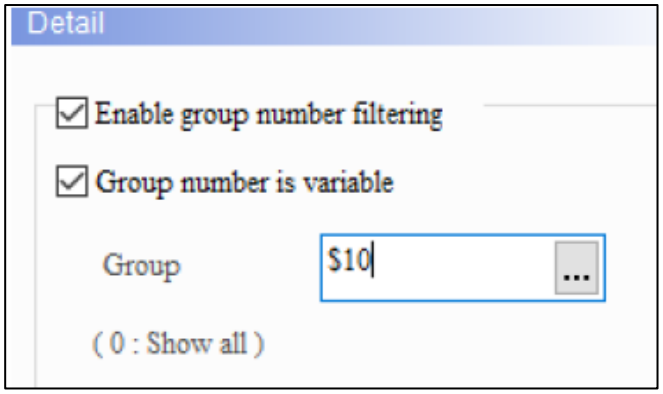
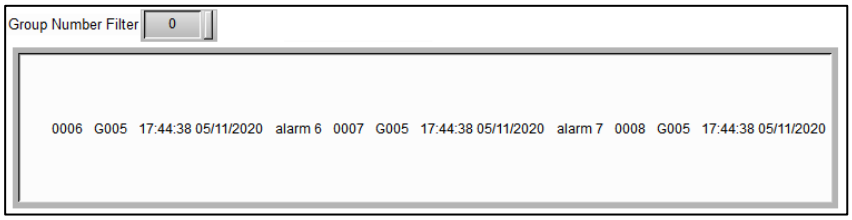
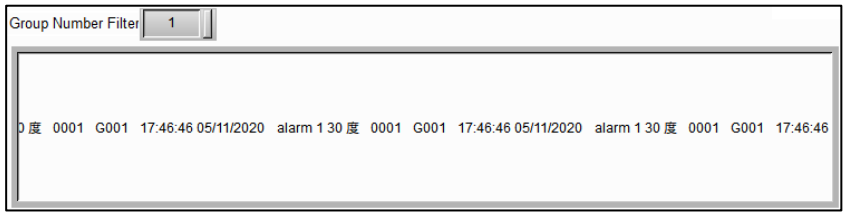
The Interval (ms) defines the time interval (unit: ms) between two message movements of the Alarm Moving Sign element. The default value is 100.
The moving distance is determined by the setting of Points per time.



</td></tr>
<tr><td>(4)</td><td>Points per time</td><td>The greater the number, the greater the distance each time the text moves. The setting range is 1 ~ 50 pixels. The default value is 1.</td></tr>
<tr><td>(5)</td><td>Time Format</td><td>The following Time Format is supported.


</td></tr>
</table>

No.	Function	Description
(6)	Date Format	The following **Date Format** is supported. 
(7)	Color	Set the display color for the date and time. The default is  . 
(8)	Alarm No.	If the **Alarm No.** checkbox is selected, the element shows the alarm number when an alarm is triggered. 
(9)	Alarm Group	If an **Alarm Group** is checked, its group will be displayed when an alarm occurs. 
(10)	Enable group number filtering	● Select the **Enable group number filtering** checkbox to filter the alarms to be displayed. Specify the group number to display the alarms in groups. ● The value of the group number can be a variable or constant. ● When **Group** is 0, all alarms are displayed.

No.	Function	Description
		 **Example:** When **Group** is 0.  When **Group** is 1. 

- Style

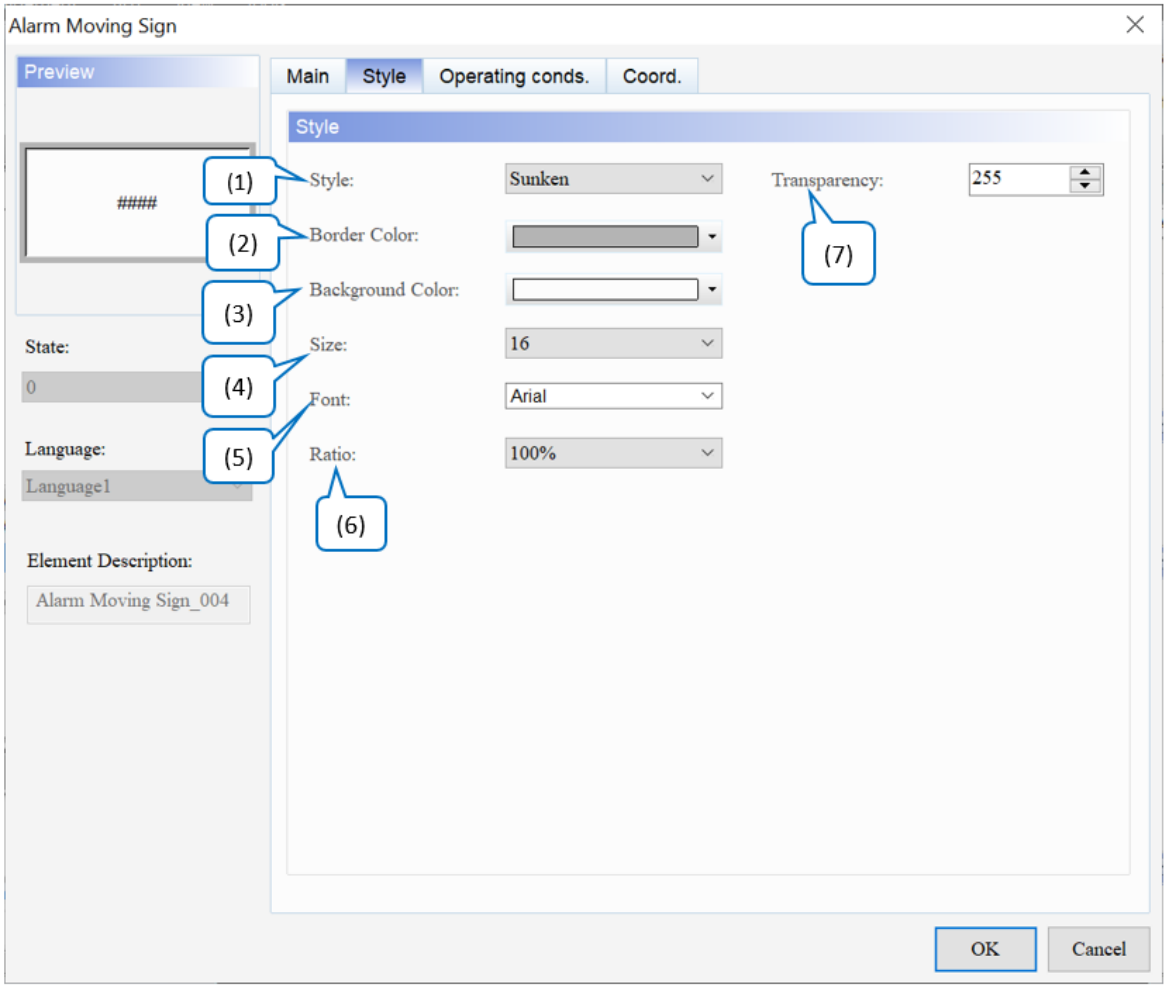
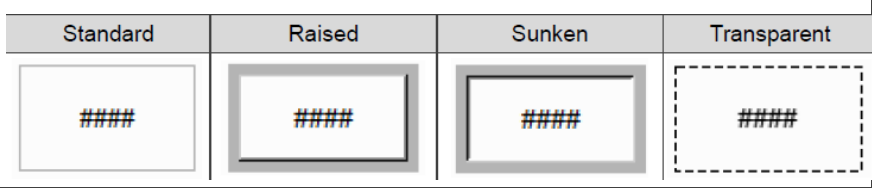
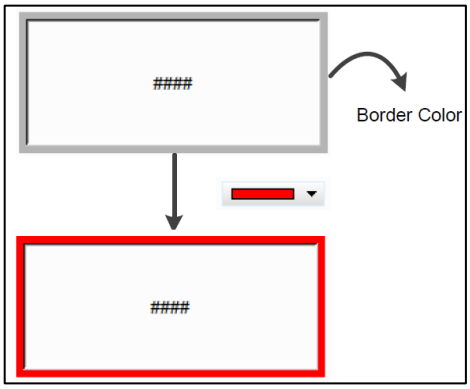
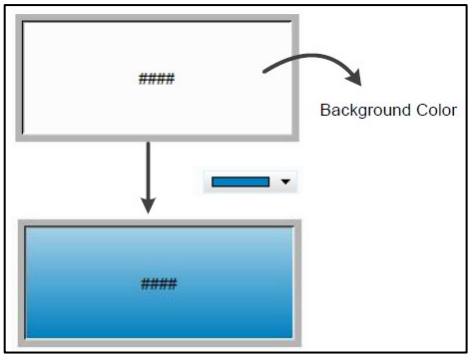
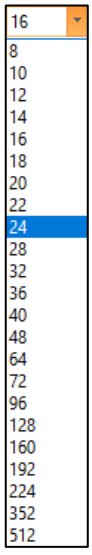


Figure 16 - 24: Alarm Moving Sign element Style property page

No.	Function	Description
(1)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard, Raised, Sunken, and Transparent. The default value is **Sunken**.



No.	Function	Description
(2)	Border Color	Set the border color of the element. The default is  . 
(3)	Background Color	Set the background color of the element. The default is  . 
(4)	Size	Size is the text size of the alarm message to be displayed. The default value is **16**. 
(5)	Font	Font is the font of the alarm message to be displayed. The default value is **Arial**.
(6)	Ratio	If users have set the **Ratio** function, the zooming effect can be seen on the text. The default value is **100%**.

No.	Function	Description
(7)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.

- Operating conds.

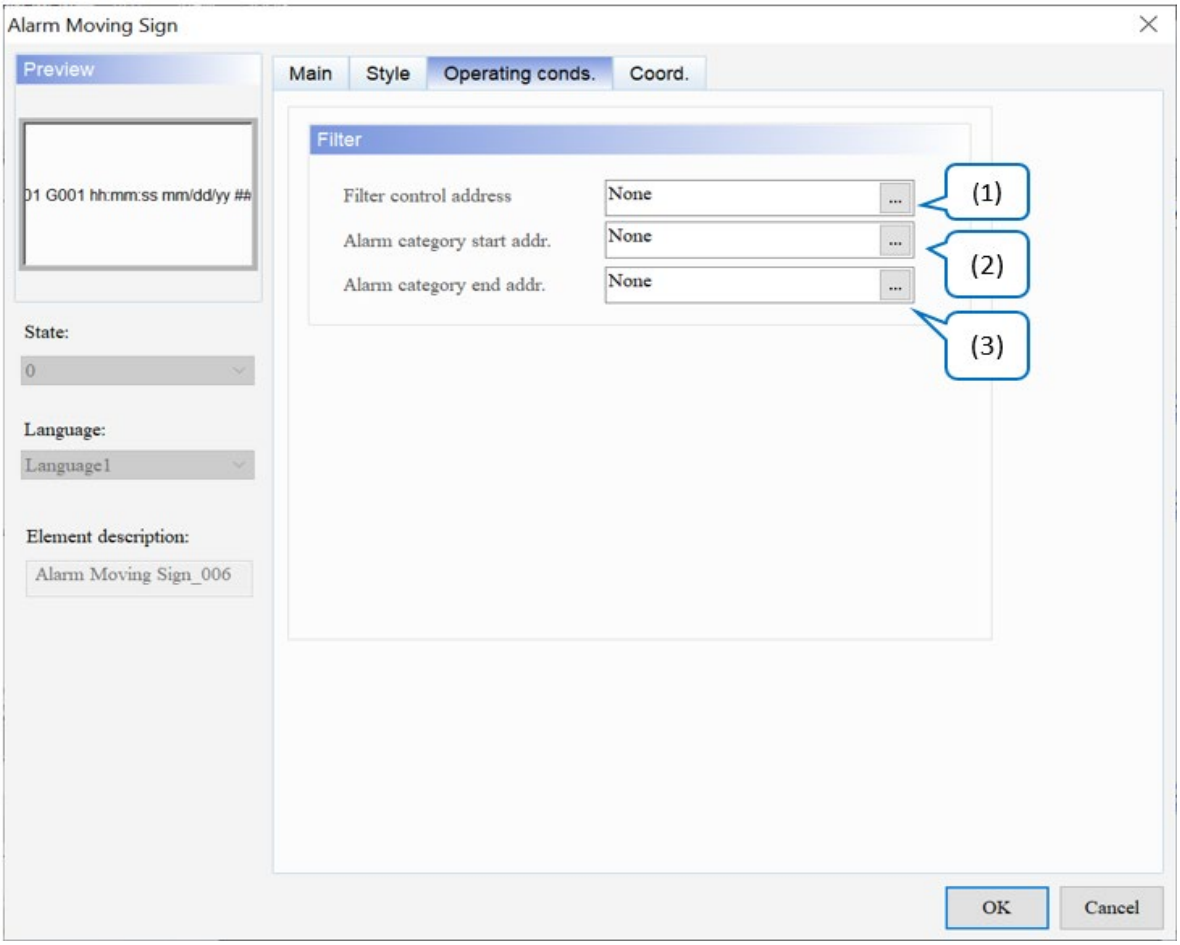


Figure 16 - 25: Alarm Moving Sign element Operating conds. property page

No.	Function	Description
(1)	Filter control address	The **Filter control address** is used to filter the items specified by users.

Value	Description
0	Default; display all triggered alarms.
1	Hide the alarms with both **Recovery Time** and **Acknowledge Time**.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>2</td><td>Hide alarms with Recovery Time.</td></tr>
<tr><td>3</td><td>Hide alarms with Recovery Time or Acknowledgement Time.</td></tr>
<tr><td>4</td><td>Hide alarms with Acknowledgement Time.</td></tr>
<tr><td>5</td><td>● This setting must be used with Alarm counter display.
● The alarm display count refers to the value of Alarm counter display. When the alarm display count is smaller than this value, the alarm is hidden.</td></tr>
<tr><td>6</td><td>● This setting must be used with Alarm category start addr. and Alarm category end addr.
● When the alarm category number is not within the range set by these two addresses, the alarm is hidden.</td></tr>
</table>
</td></tr>
<tr><td>(2)</td><td>Alarm category start addr.</td><td rowspan="2">● This setting must be used with Filter control address.
● When Filter control address is set to 6, input the alarm category number.
<table>
<tr><th>Example</th><th>Description</th></tr>
<tr><td>Alarms with alarm category numbers 1 and 5</td><td>● Input 1 to Alarm category start addr. and 3 to Alarm category end addr., the Alarm Moving Sign element displays category 1 triggered alarms.
● Input 1 to Alarm category start addr. and 5 to Alarm category end addr., the Alarm Moving Sign element displays category 1 and 5 triggered alarms.</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Alarm category end addr.</td></tr>
</table>

- Coord.

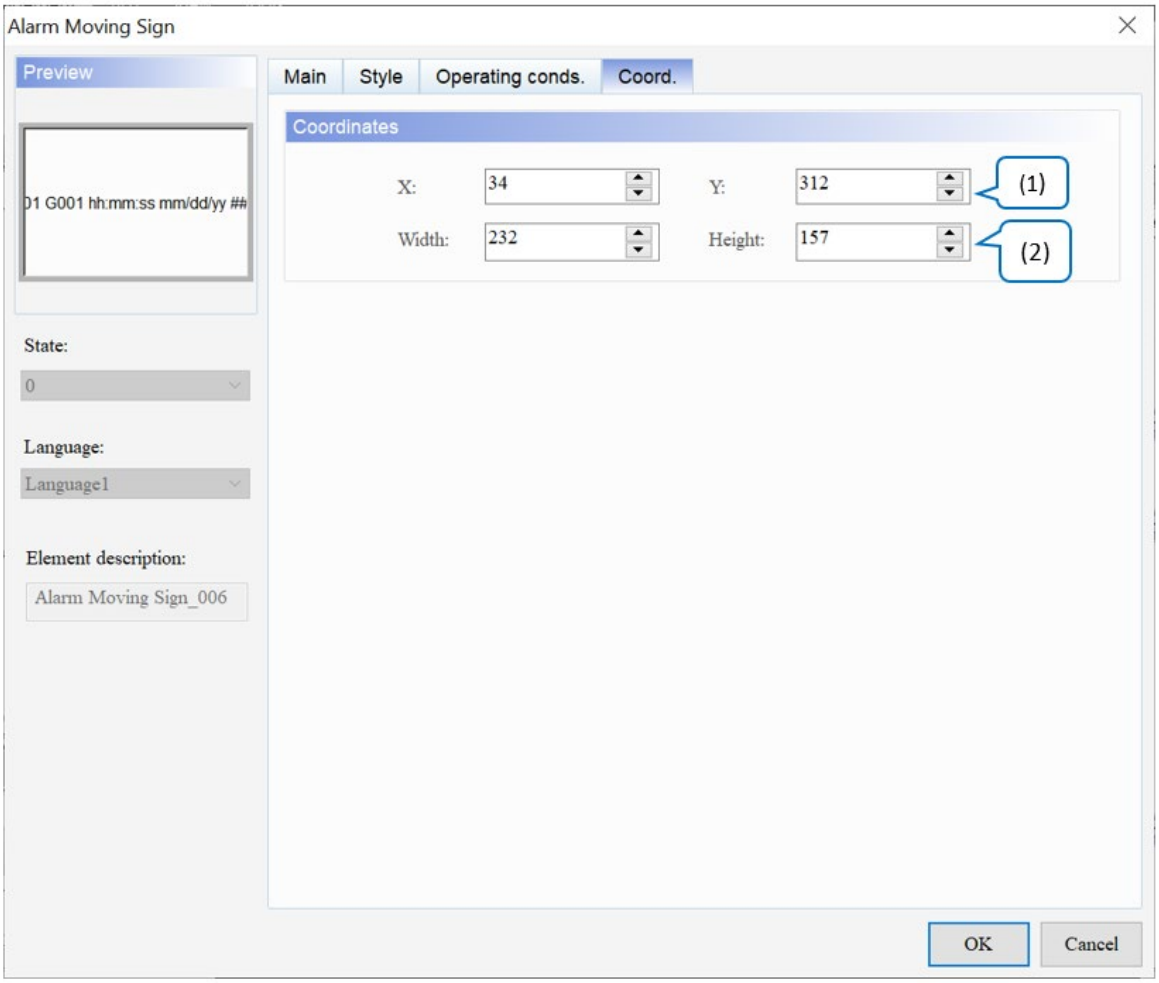


Figure 16 - 26: Alarm Moving Sign element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

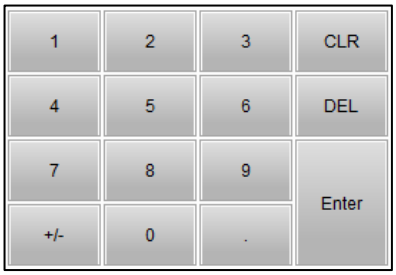
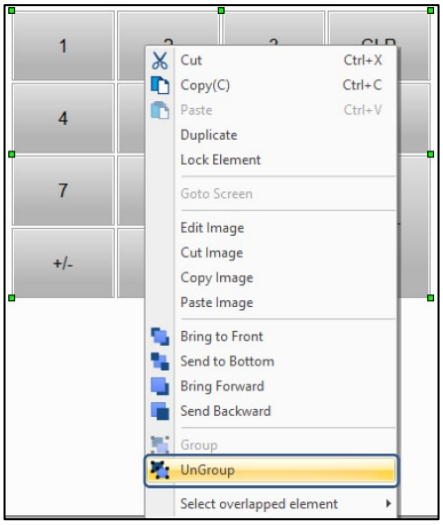
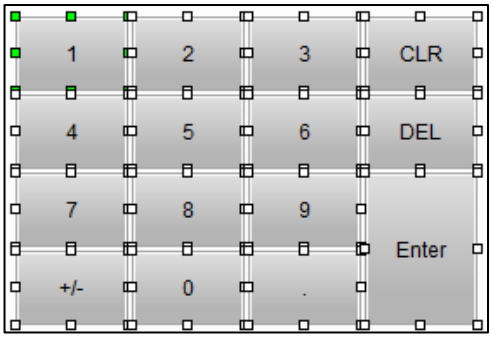
Chapter 17: Keypad

To create a Keypad element, go to **Elements** > **Keypad** and click the desired Keypad element.

17.1 Keypad(1)

Three types of Keypad elements are provided to use with the **Numeric Entry** element, **Character Entry** element, and **Barcode Input** element. For **Numeric Entry** and **Character Entry** elements, the **Input Mode** must be set as Active Non-Popup or Touch Non-Popup; while the **Input Mode** for the **Barcode Input** element must be set as Active. The **Interlock Address** for these three elements must be set up at the same time, but if the **Input Mode** is set as Touch Non-Popup, the **Interlock Address** setting is not required. Refer to *Chapter 13 Input* for more details.

Keypad(1) element is a decimal keypad, for which users can customize the font, size, color, and alignment. It also provides a variety of modes for selection, including ESC, ENT, CLR, DEL, and ASCII. **Keypad(1)** is a grouped element, but users can right-click on the element and select **UnGroup** to separate the buttons on the keypad. Users can also double-click the buttons for editing and making changes.

Grouped	 Right-click grouped element and select **UnGroup**. 
Ungroup	

On double-clicking **Keypad(1)** element, the property page appears as follows.

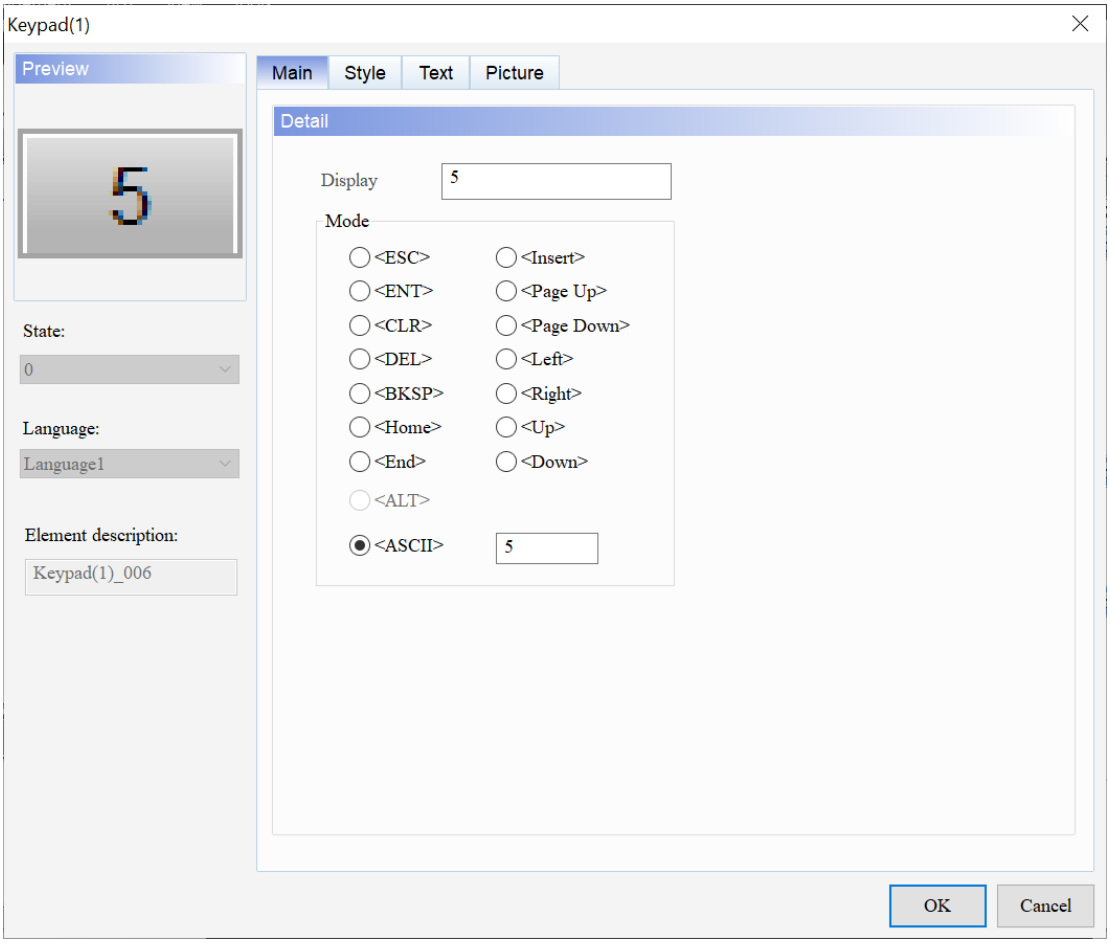


Figure 17 - 1: Keypad(1) element property page

Keypad(1)	
Function	**Description**
Preview	**Keypad(1)** elements do not support multiple state values, but can edit multi-language data display.
Main	Set Display and Mode.
Style	Set the Style, Foreground Color, Transparency, and enable Smooth animation.
Text	Set the text content / font / size / color / format / scale / alignment to be displayed.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.

- Main

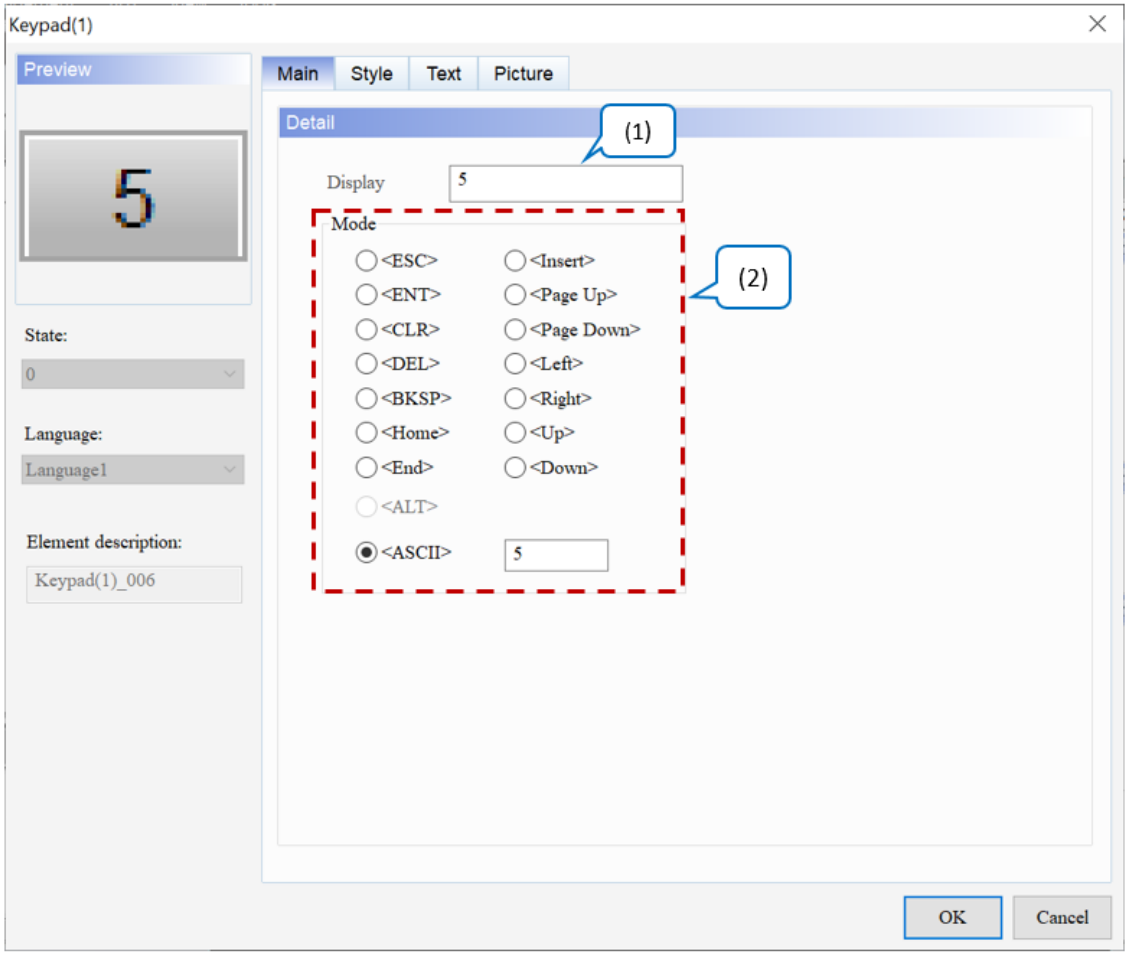
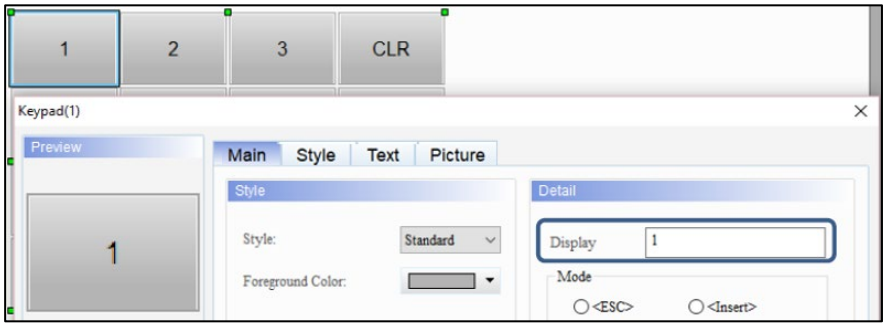


Figure 17 - 2: Keypad(1) element Main property page

No.	Function	Description
(1)	Display	When users press a button on **Keypad(1)** element, this will be the displaying value of that button. 

No.	Function	Description
(2)	Mode	Select a mode to define the action of a button. The available options for **Mode** are: **ESC**, **ENT**, **CLR**, **DEL**, **BKSP**, **Home**, **End**, **Insert**, **Page Up**, **Page Down**, **Left**, **Right**, **Up**, **Down**, **ASCII**. ● <ESC>: Cancel the entry. If the **Keypad(1)** element is on a sub-screen, executing ESC will also close the sub-screen. ● <ENT>: Input the entry. ● <CLR>: Clear a string of characters. ● <DEL>: Delete a single character. ● <BKSP>: Delete a single character. ● <Home>: Move the input cursor to the beginning of that line. ● <End>: Move the input cursor to the end of that line. ● <Insert>: Switch between insert and replace. ● <Page Up>: Switch the current page to the previous page. ● <Page Down>: Switch the current page to the next page. ● <Left>: Move the input cursor to the left by one character. ● <Right>: Move the input cursor to the right by one character. ● <Up>: Move the input cursor up a line. ● <Down>: Move the input cursor down a line. ● <ASCII>: Specify the input code.

- Style

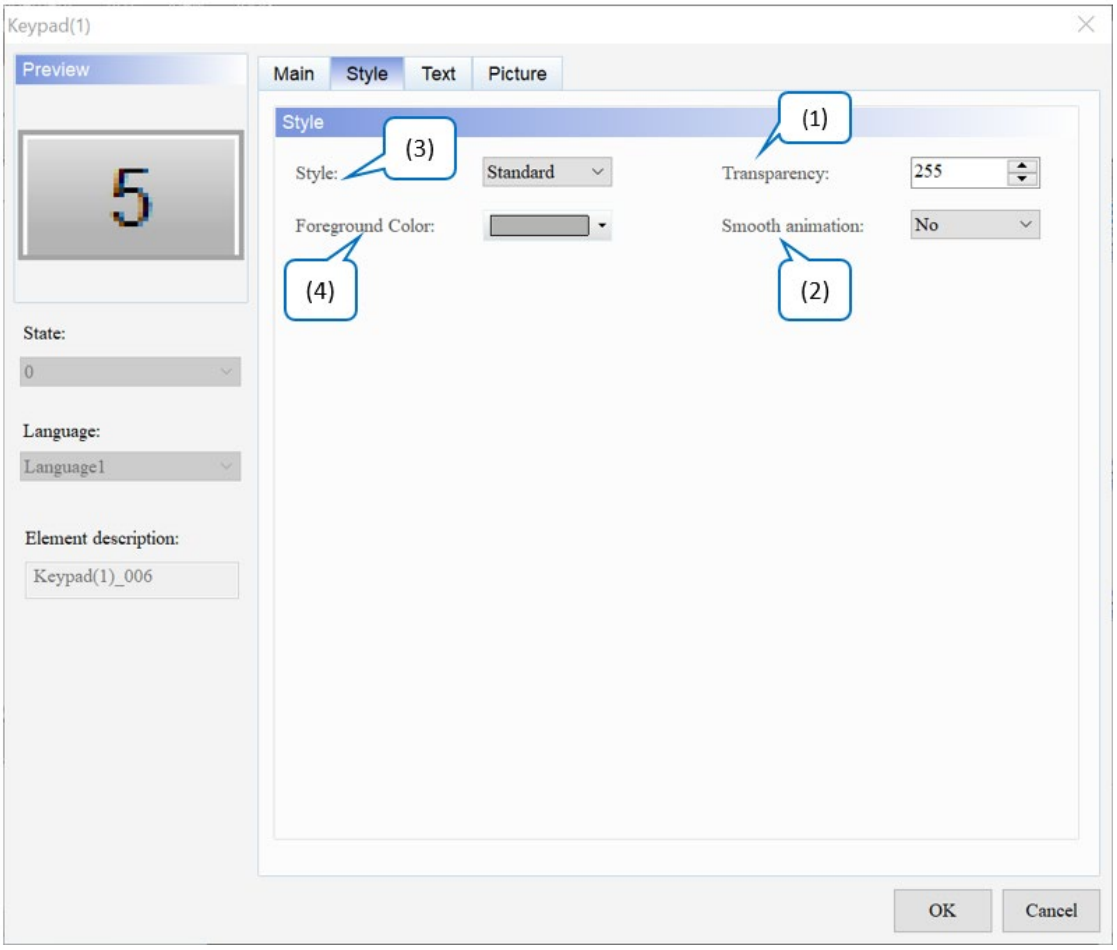
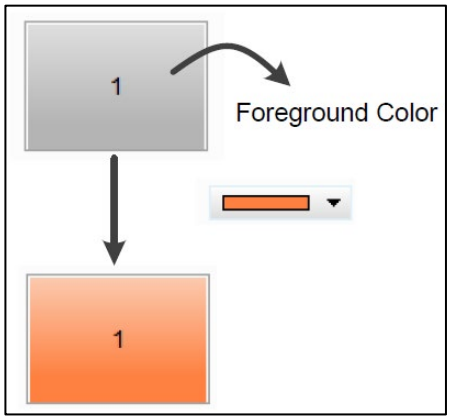


Figure 17 - 3: Keypad(1) element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Smooth animation	The **Smooth animation** function is available for this element. The default value is **No**.
(3)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard and Raised. The default value is **Standard**.

Standard	Raised
	

No.	Function	Description
(4)	Foreground Color	Set the foreground color of the element. The default is  . 

- Text

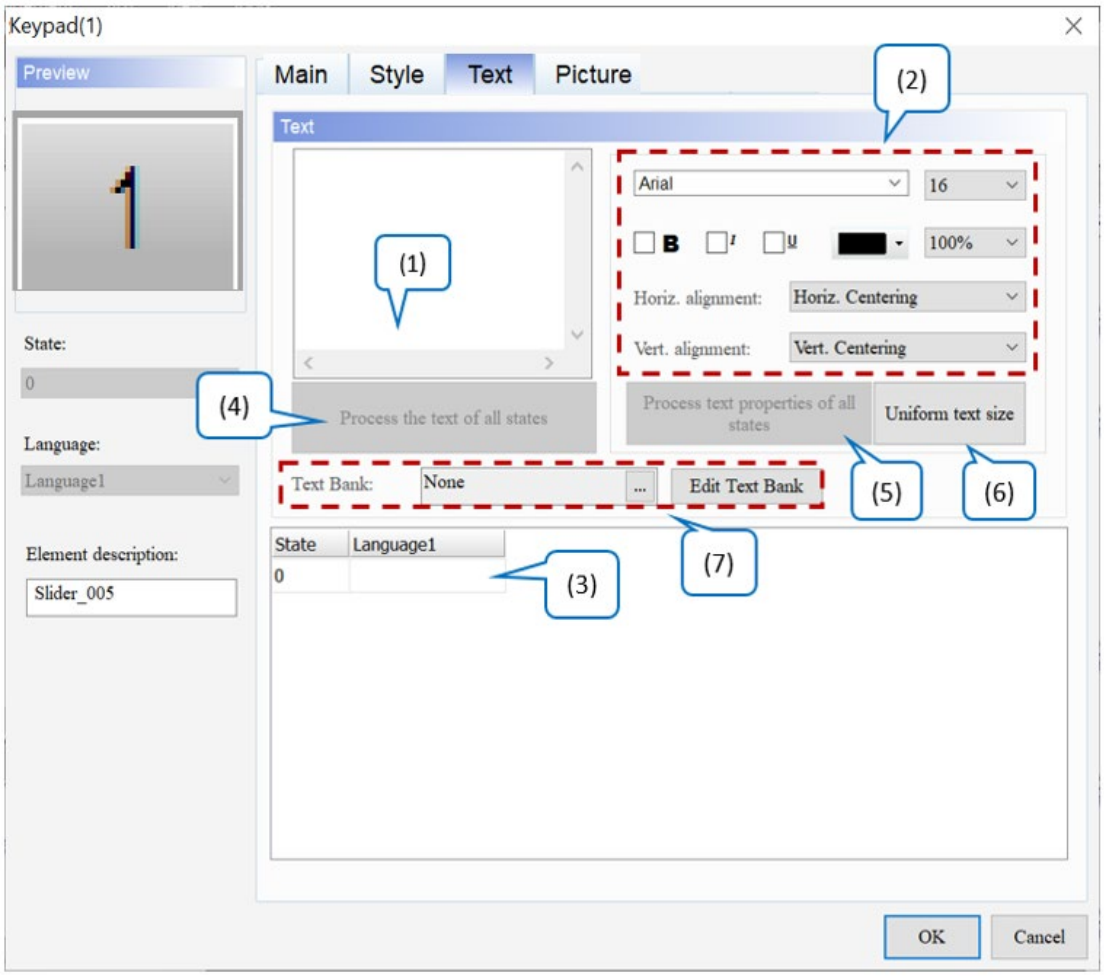
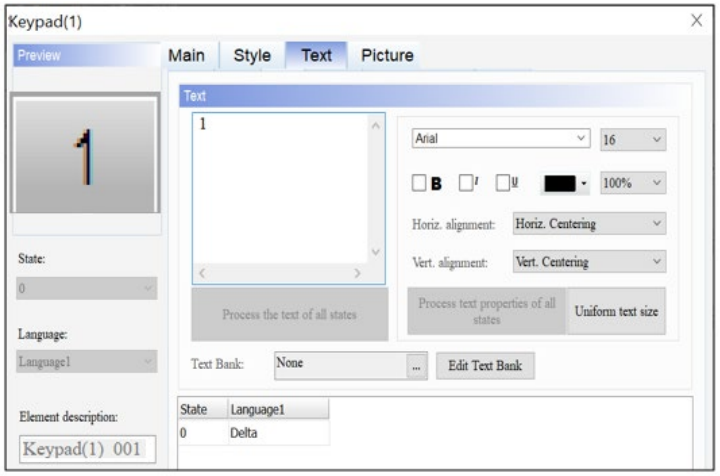
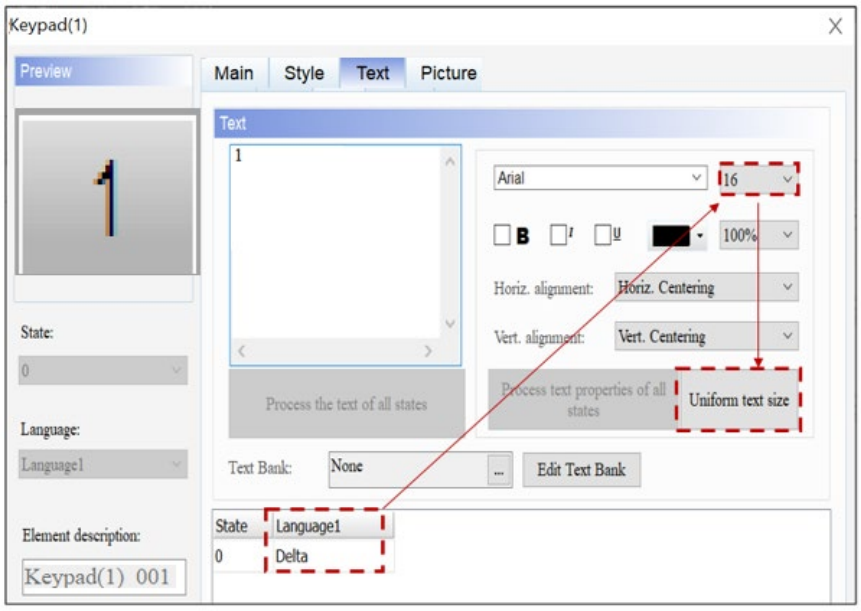


Figure 17 - 4: Keypad(1) element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. 
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text property** page allows to edit multi-language data.
(4)	Process the text of all states	This function is not supported as the **Keypad(1)** element does not have multiple states.
(5)	Process text properties of all states	This function is not supported as the **Keypad(1)** element does not have multiple states.
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

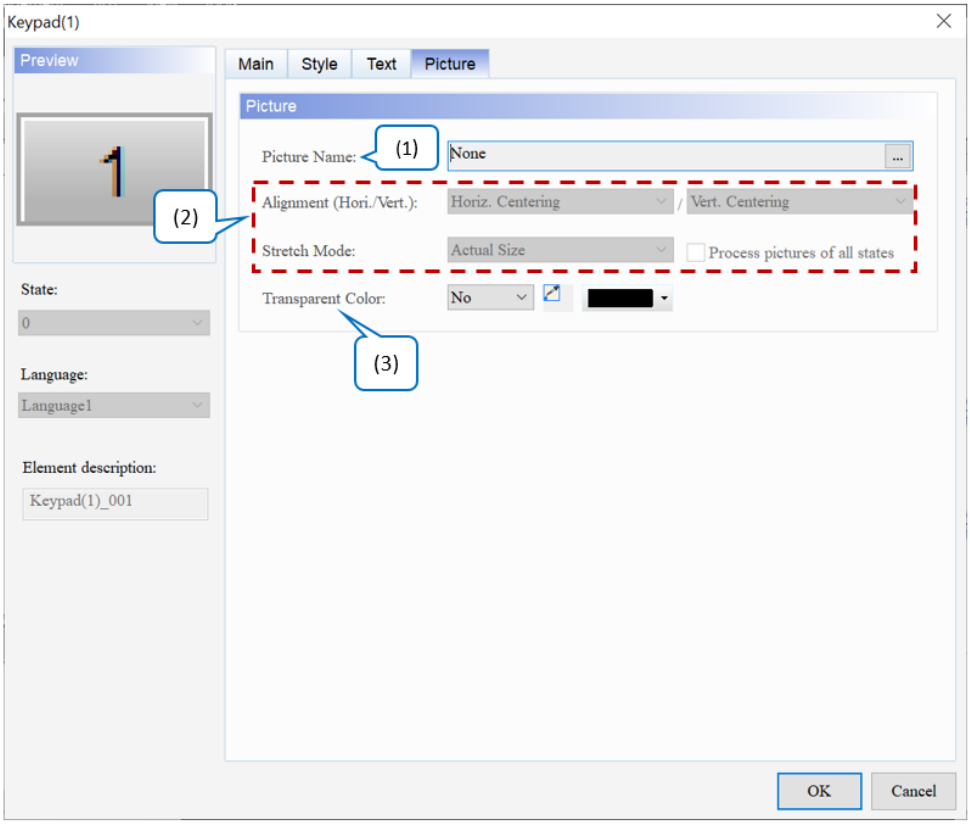
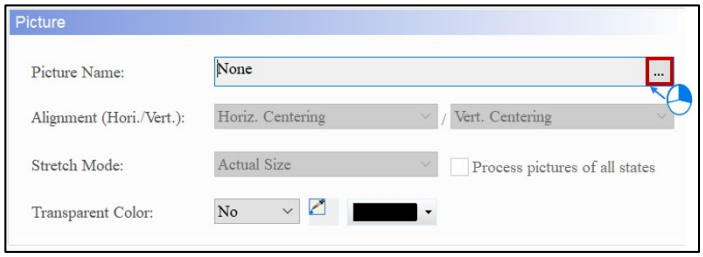


Figure 17 - 5: Keypad(1) element Picture property page

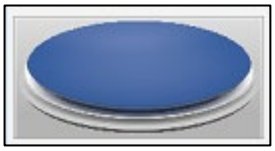
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Picture Name</td><td>

To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.





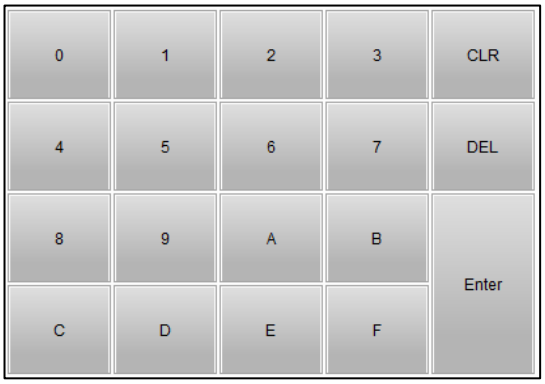
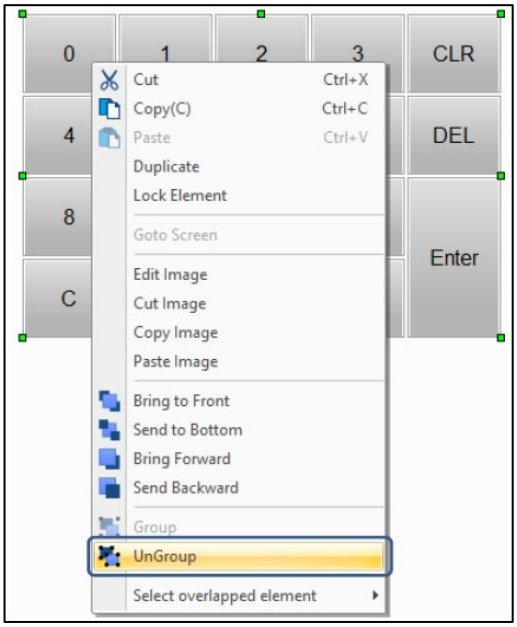
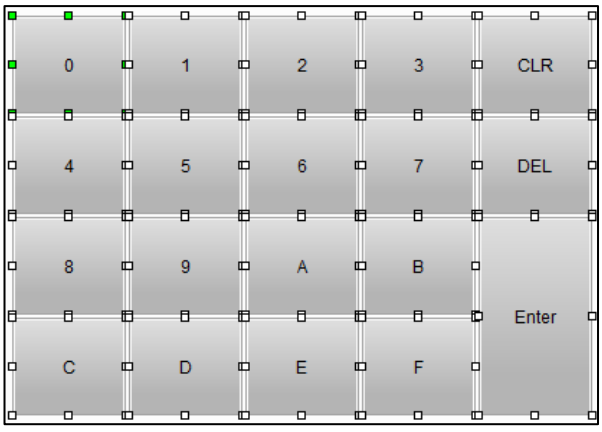
To configure other pictures, refer to Section 28.5 Picture Bank.

</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
	Process pictures of all states	If users select the checkbox for **Process pictures of all states**, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time. 
(3)	Transparent Color	● This function specifies a color in the picture and make it transparent. The default value is **No**. ● Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the **Foreground Color** of the element. 

17.2 Keypad(2)

Keypad(2) element is a hexadecimal keypad that allows users to customize styles such as font, text size, color, alignment. In addition, a variety of modes are available for users to select from, such as ESC, ENT, CLR, DEL, and ASCII. **Keypad(2)** is a grouped element, but users can right-click on the element and select **UnGroup** to separate the buttons on the keypad. Users can also double-click the buttons for editing and making changes.

Grouped	 Right-click grouped element and select **UnGroup**. 
Ungroup	

On double-clicking **Keypad(2)** element, the property page appears as follows.

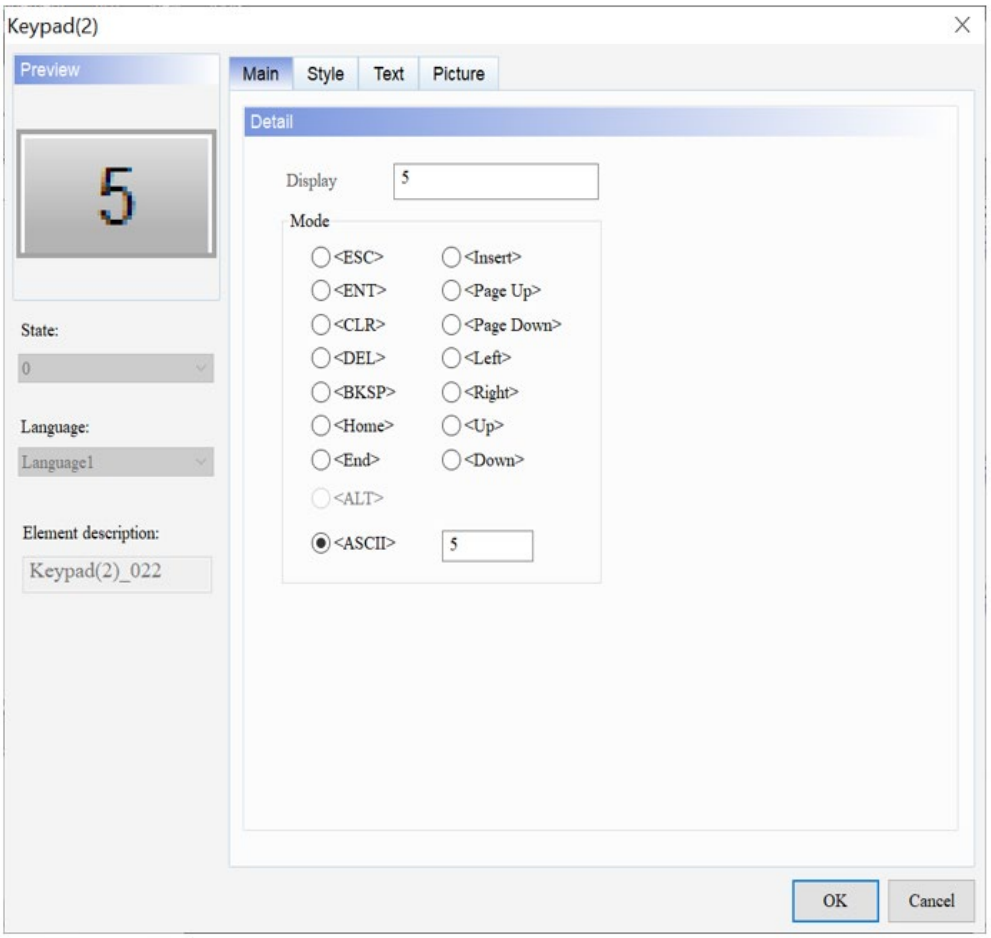


Figure 17 - 6: Keypad(2) element property page

Keypad(2)	
Function	**Description**
Preview	**Keypad(2)** elements do not support multiple state values, but can edit multi-language data display.
Main	Set Display and Mode.
Style	Set the Style, Foreground Color, Transparency, and enable Smooth animation.
Text	Set the text content / font / size / color / format / scale / alignment to be displayed.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.

- Main

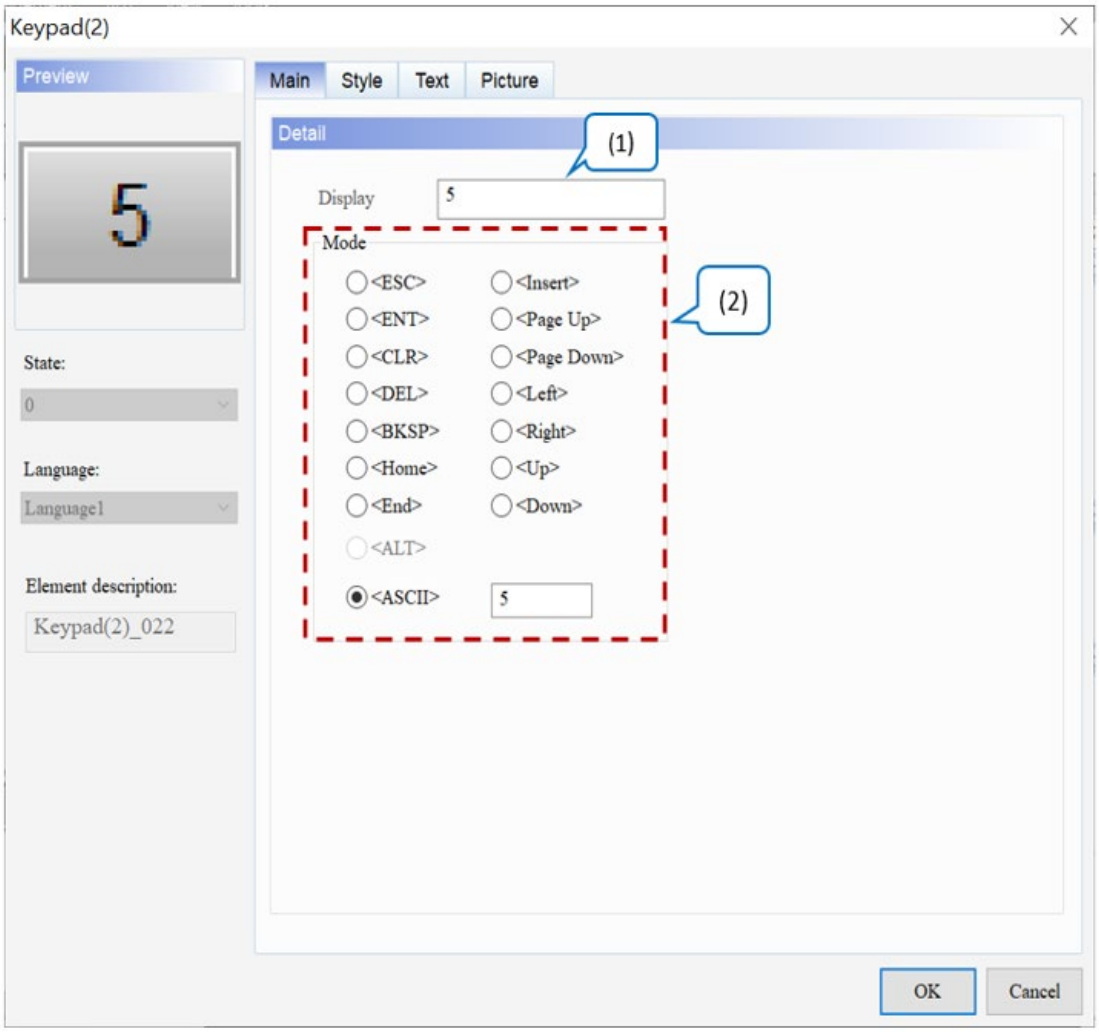
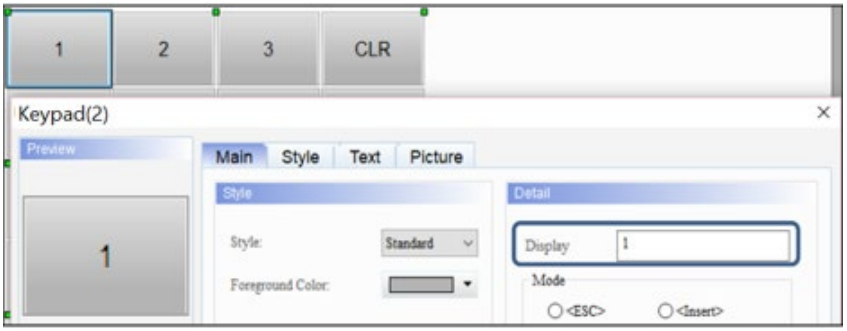


Figure 17 - 7: Keypad(2) element Main property page

No.	Function	Description
(1)	Display	Press a button on **Keypad(2)** element to display the value of that button. 
(2)	Mode	Select a mode to define the action of a button. The available options for **Mode** are: **ESC**, **ENT**, **CLR**, **DEL**, **BKSP**, **Home**, **End**, **Insert**, **Page Up**, **Page Down**, **Left**, **Right**, **Up**, **Down**, **ASCII**. ● <ESC>: Cancel the entry. If the **Keypad** element is on a sub-screen, executing ESC will also close the sub-screen. ● <ENT>: Input the entry. ● <CLR>: Clear a string of characters. ● <DEL>: Delete a single character. ● <BKSP>: Delete a single character. ● <Home>: Move the input cursor to the beginning of that line. ● <End>: Move the input cursor to the end of that line. ● <Insert>: Switch between insert and replace. ● <Page Up>: Switch the current page to the previous page. ● <Page Down>: Switch the current page to the next page. ● <Left>: Move the input cursor to the left by one character. ● <Right>: Move the input cursor to the right by one character. ● <Up>: Move the input cursor up a line. ● <Down>: Move the input cursor down a line. ● <ASCII>: Specify the input code.

- Style

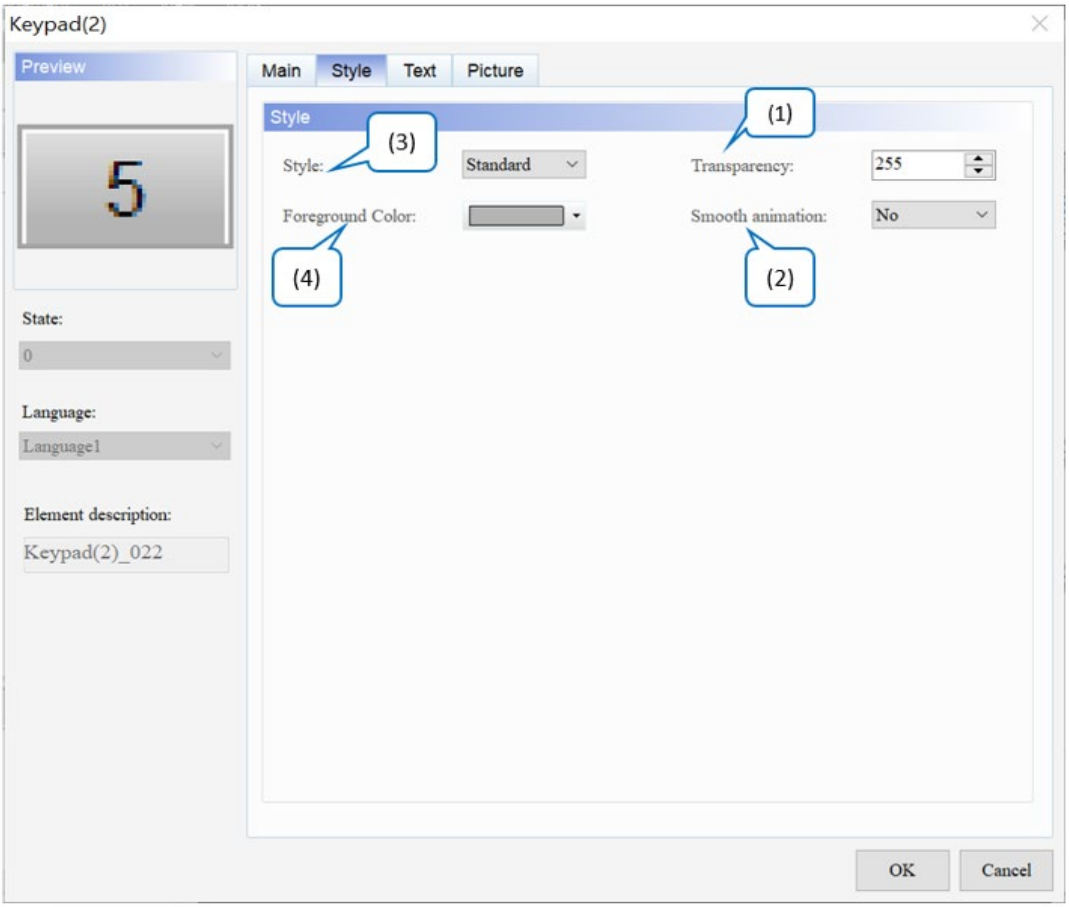
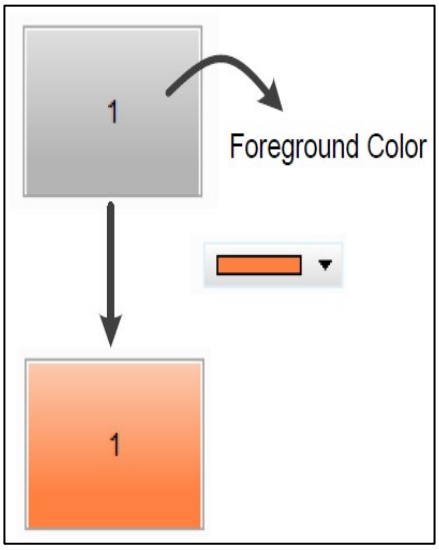


Figure 17 - 8: Keypad(2) element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Smooth animation	The **Smooth animation** function is available for this element. The default value is **No**.
(3)	Style	This setting allows users to change the appearance of the elements. The available options for **Style** are: Standard and Raised. The default value is **Standard**.

Standard	Raised
	

No.	Function	Description
(4)	Foreground Color	Set the foreground color of the element. The default is  . 

- Text

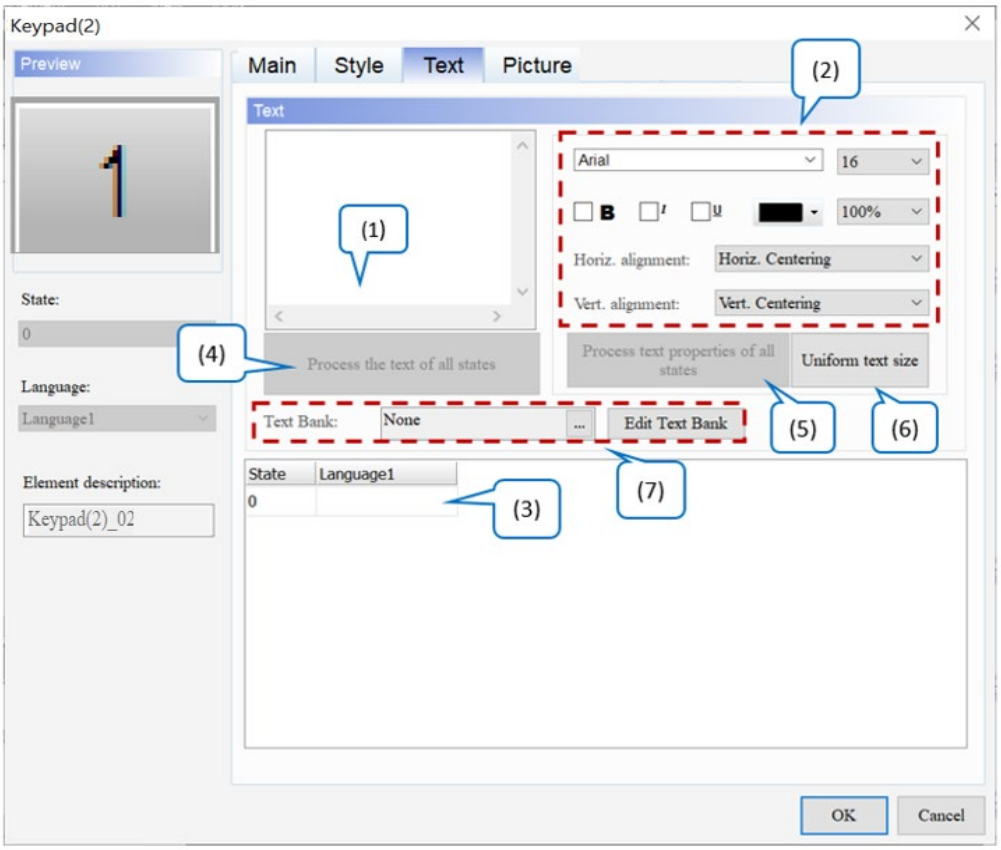
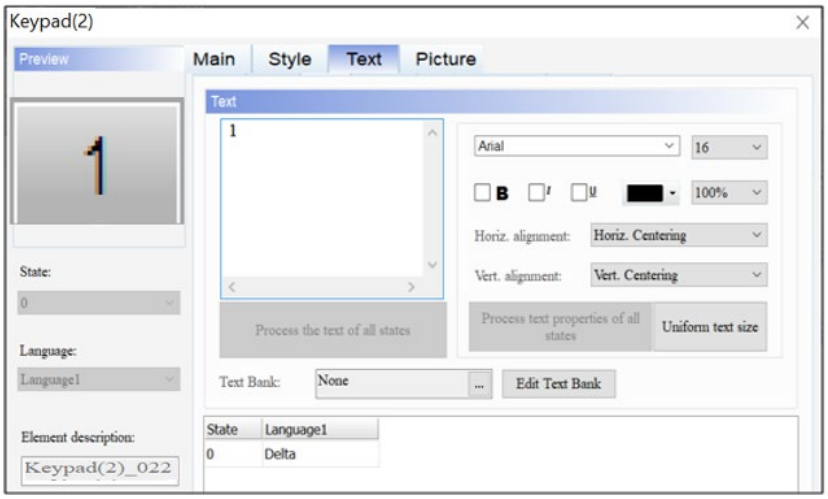
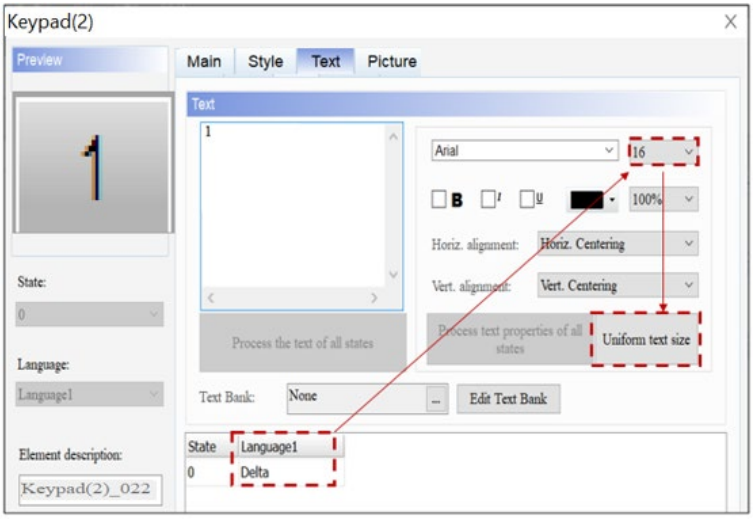


Figure 17 - 9: Keypad(2) element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. 
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** property page allows to edit multi-language data.
(4)	Process the text of all states	This function is not supported as the **Keypad(2)** element does not have multiple states.
(5)	Process text properties of all states	This function is not supported as the **Keypad(2)** element does not have multiple states.
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

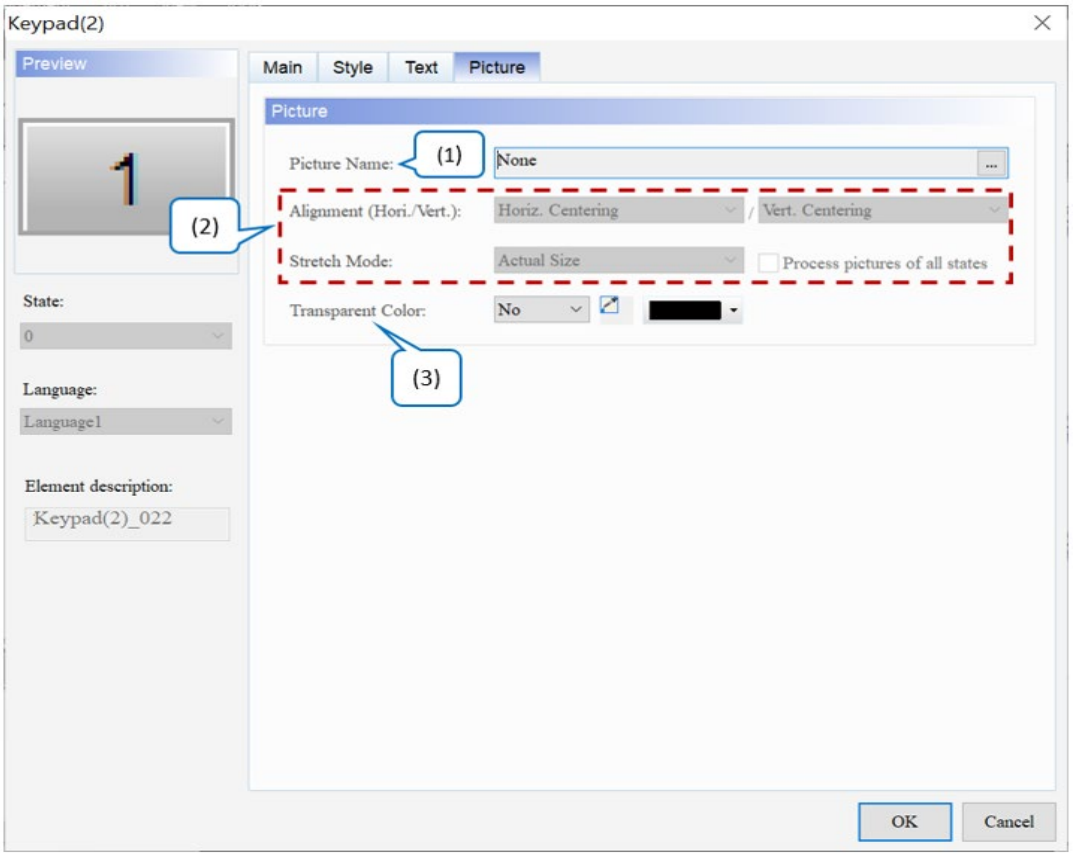
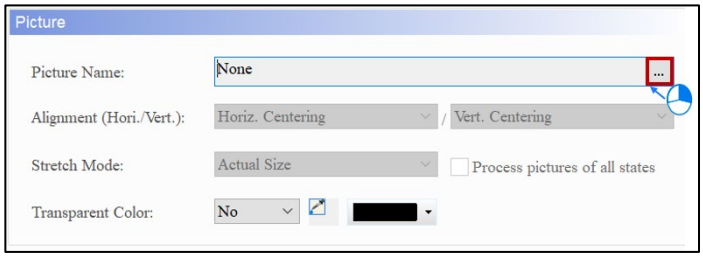


Figure 17 - 10: Keypad(2) element Picture property page

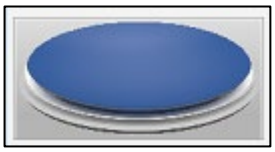
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Picture Name</td><td>

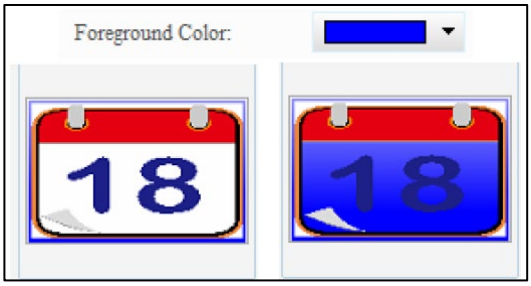
To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.





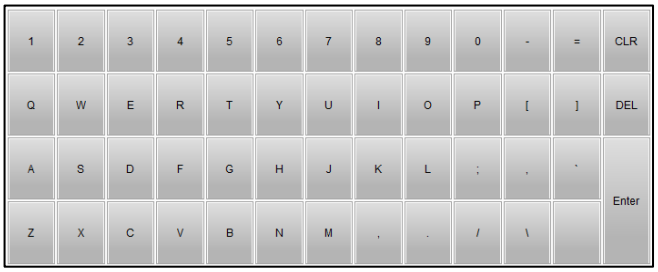
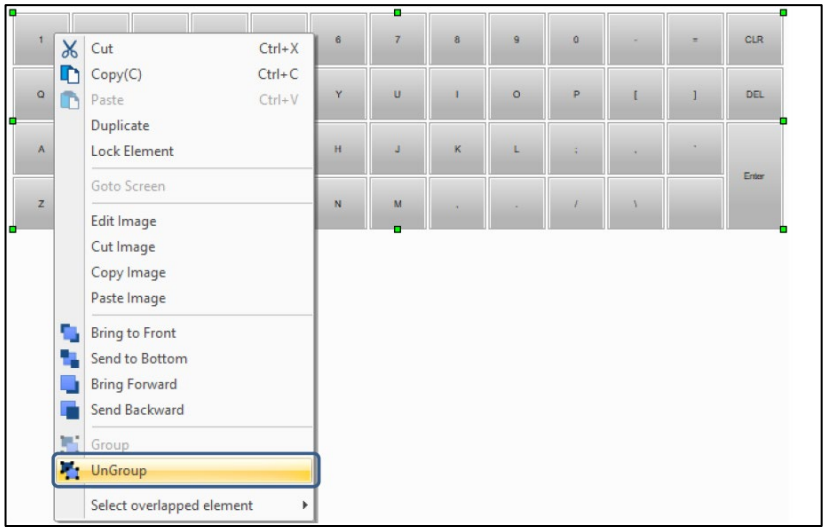
To configure other pictures, refer to Section 28.5 Picture Bank.

</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
	Process pictures of all states	If users select the checkbox for **Process pictures of all states**, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time. 
(3)	Transparent Color	● This function specifies a color in the picture and make it transparent. The default value is **No**. ● Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the **Foreground Color** of the element. 

17.3 Keypad(3)

Keypad(3) element is an alphanumeric input keypad, for which users can customize the font, size, color, and alignment. It also provides a variety of modes for selection, including ESC, ENT, CLR, DEL, and ASCII. Keypad(3) is a grouped element, but users can right-click on the element and select **UnGroup** to separate the buttons on the keypad. Users can also double-click the buttons for editing and making changes.

Grouped	 Right-click on the grouped components and select **UnGroup**. 
Ungroup	

On double-clicking the **Keypad(3)** element, the property page appears as follows.

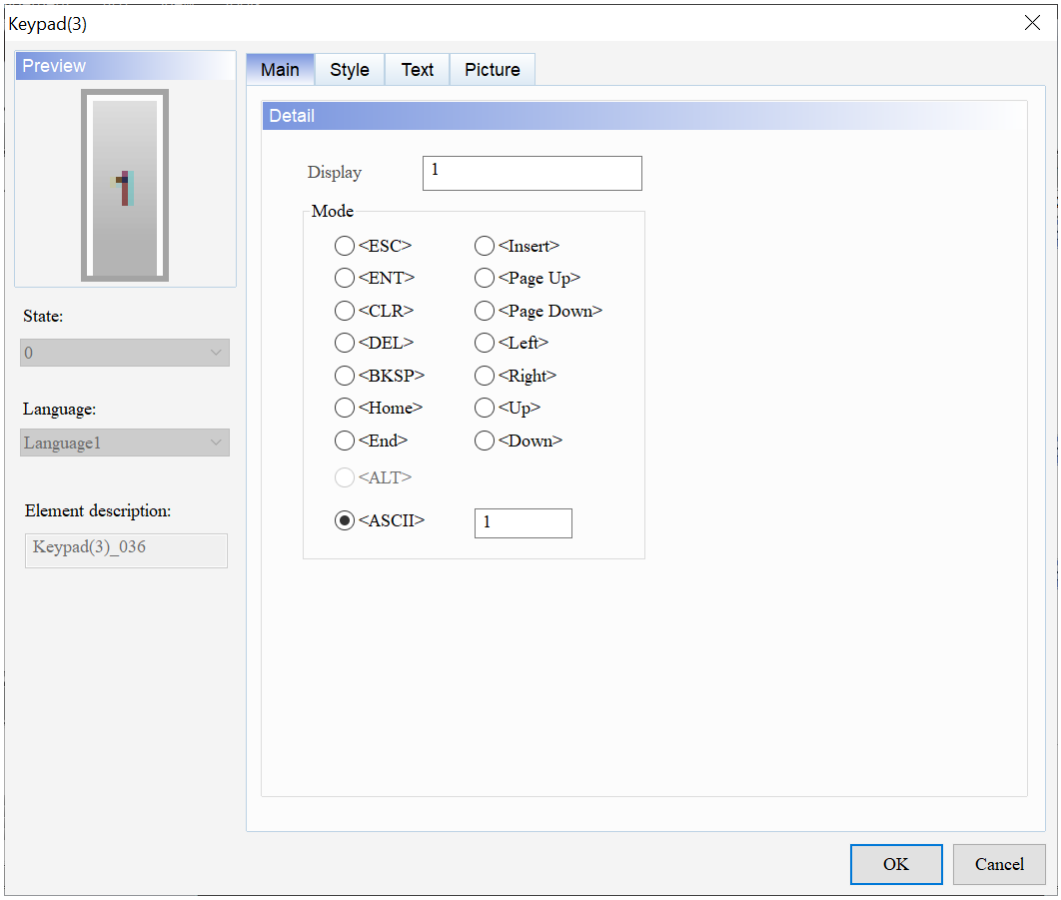


Figure 17 - 11: Keypad(3) element property page

Keypad(3)	
Function	**Description**
Preview	**Keypad(3)** elements do not support multiple state values, but can edit multi-language data display.
Main	Set Display and Mode.
Style	Set the Style, Foreground Color, Transparency, and enable Smooth animation.
Text	Set the text content / font / size / color / format / scale / alignment to be displayed.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.

- Main

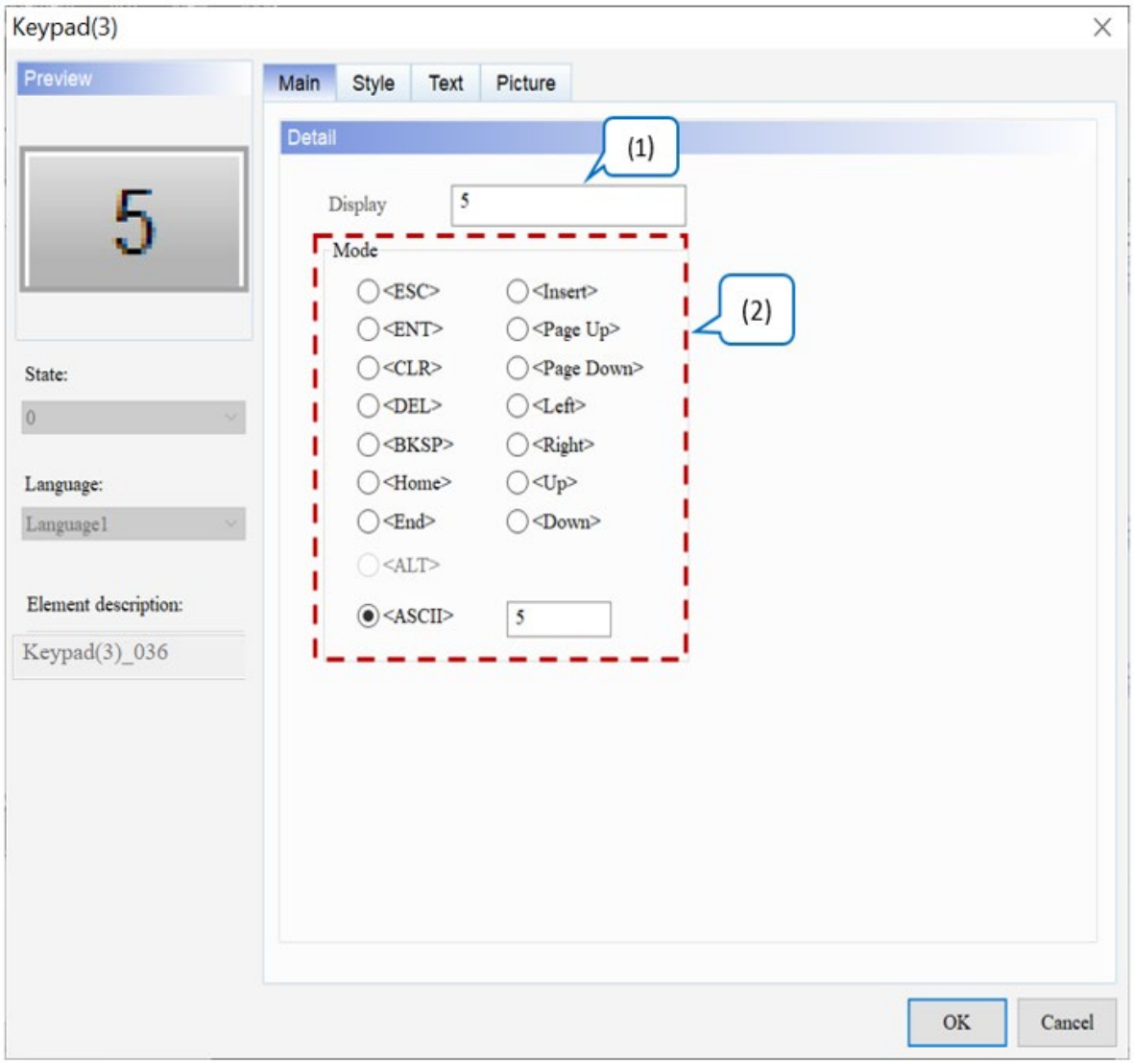
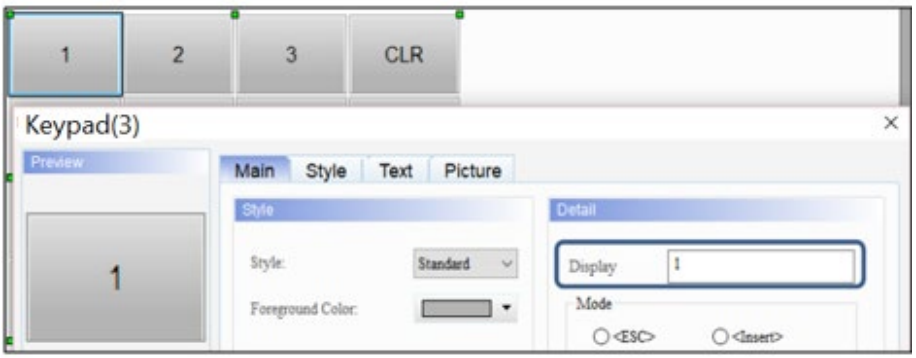


Figure 17 - 12: Keypad(3) element Main property page

No.	Function	Description
(1)	Display	When users press a button on **Keypad(3)** element, this will be the displaying value of that button. 
(2)	Mode	Select a mode to define the action of a button. The available options for **Mode** are: **ESC**, **ENT**, **CLR**, **DEL**, **BKSP**, **Home**, **End**, **Insert**, **Page Up**, **Page Down**, **Left**, **Right**, **Up**, **Down**, **ASCII**. ● <ESC>: Cancel the entry. If the **Keypad** element is on a sub-screen, executing ESC will also close the sub-screen. ● <ENT>: Input the entry. ● <CLR>: Clear a string of characters. ● <DEL>: Delete a single character. ● <BKSP>: Delete a single character. ● <Home>: Move the input cursor to the beginning of that line. ● <End>: Move the input cursor to the end of that line. ● <Insert>: Switch between insert and replace. ● <Page Up>: Switch the current page to the previous page. ● <Page Down>: Switch the current page to the next page. ● <Left>: Move the input cursor to the left by one character. ● <Right>: Move the input cursor to the right by one character. ● <Up>: Move the input cursor up a line. ● <Down>: Move the input cursor down a line. ● <ASCII>: Specify the input code.

- Style

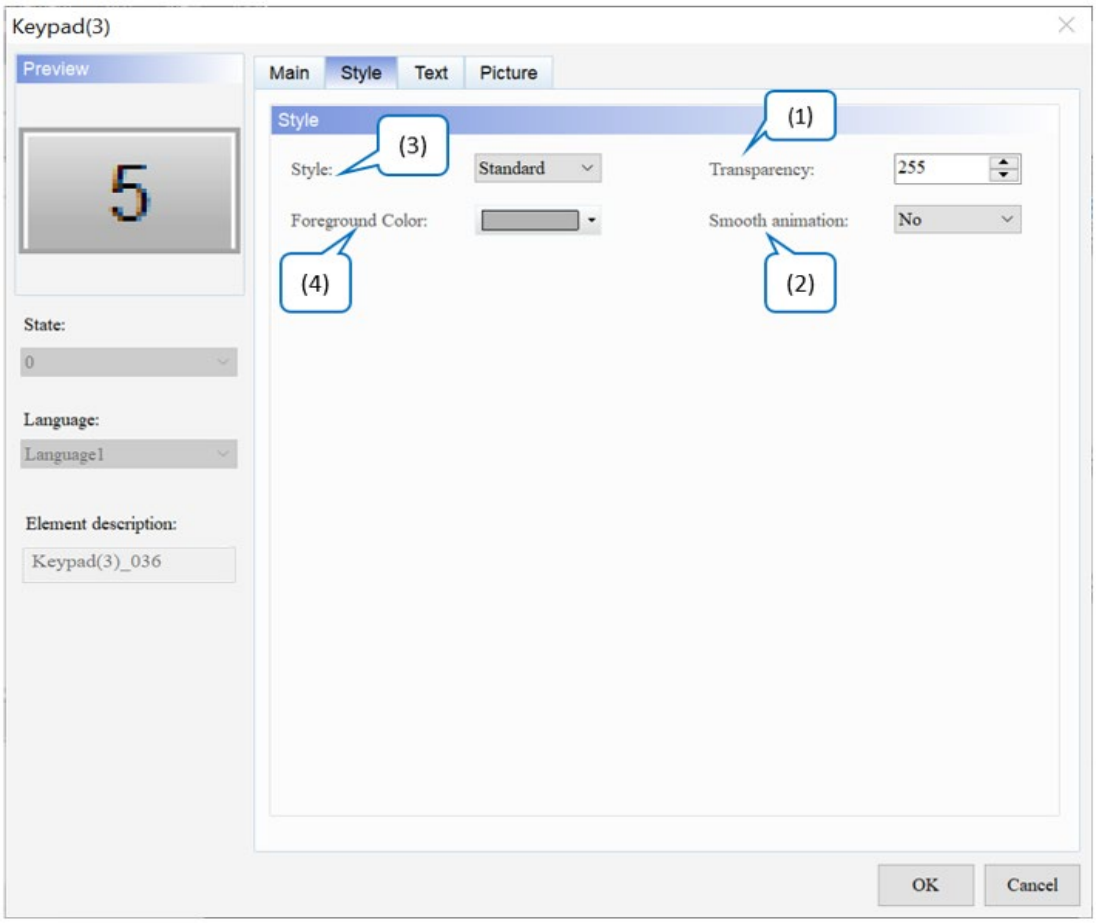
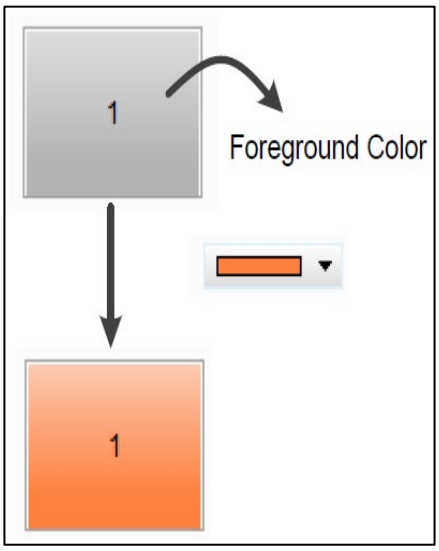


Figure 17 - 13: Keypad(3) element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Smooth animation	The **Smooth animation** function is available for this element. The default value is **No**.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for Style are: Standard and Raised. The default value is Standard.
<table>
<tr><th>Standard</th><th>Raised</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Foreground Color</td><td>Set the foreground color of the element. The default is  .

</td></tr>
</table>

- Text

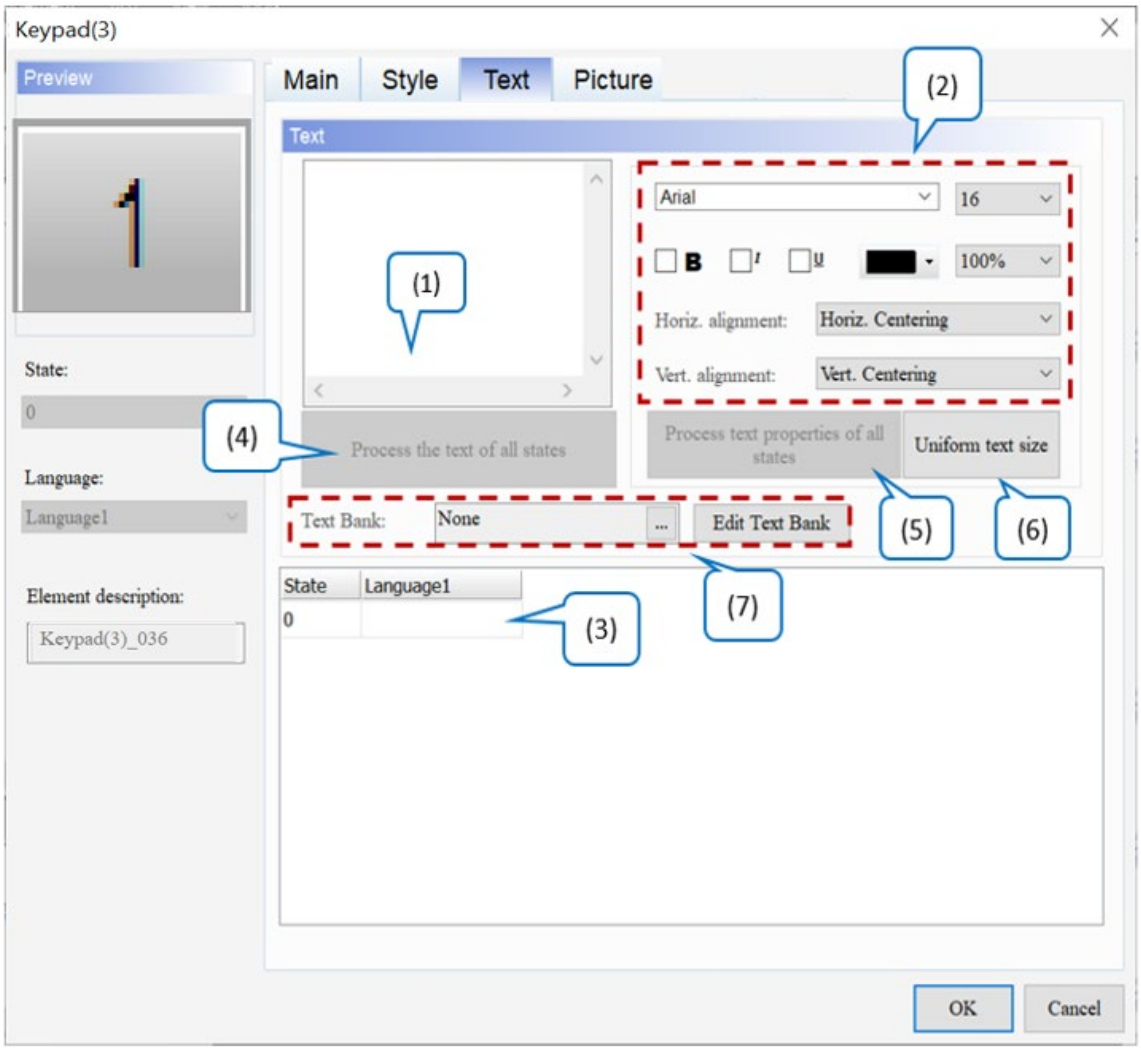
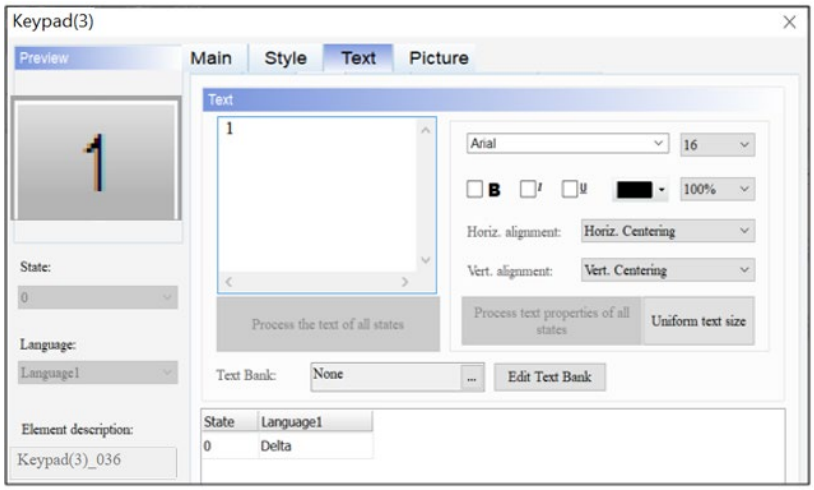
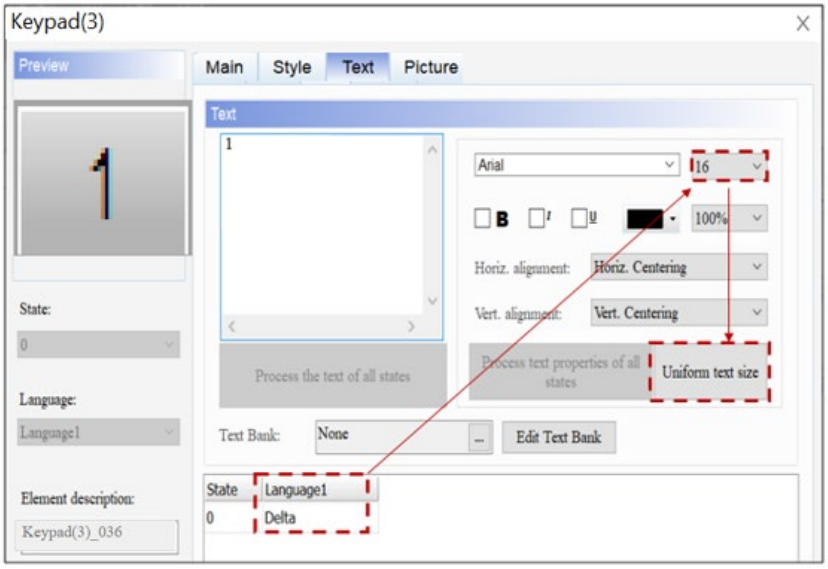


Figure 17 - 64: Keypad(3) element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box. 
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** property page allows to edit multi-language data.
(4)	Process the text of all states	This function is not supported as the **Keypad(3)** element does not have multiple states.
(5)	Process text properties of all states	This function is not supported as the **Keypad(3)** element does not have multiple states.
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size.

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

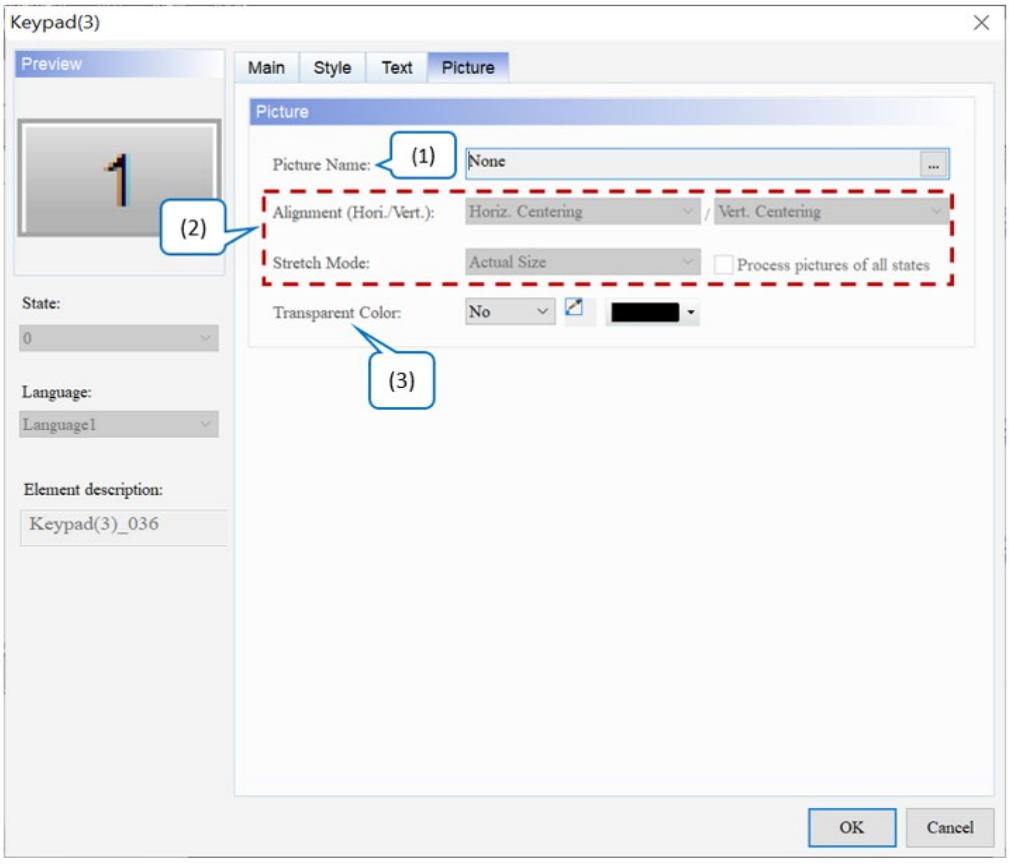
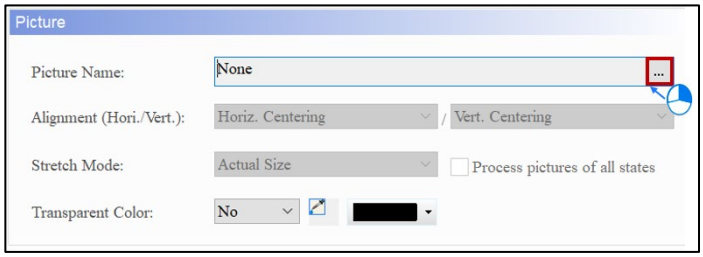


Figure 17 - 75: Keypad(3) element Picture property page

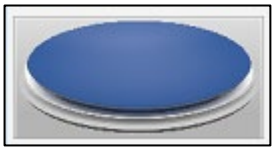
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Picture Name</td><td>

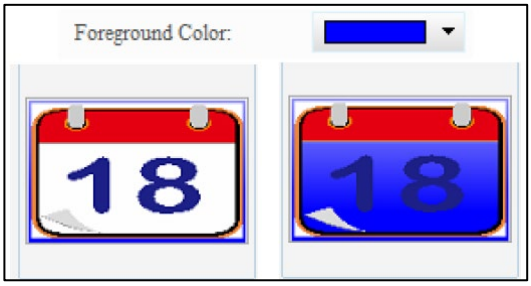
To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is None.





To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.

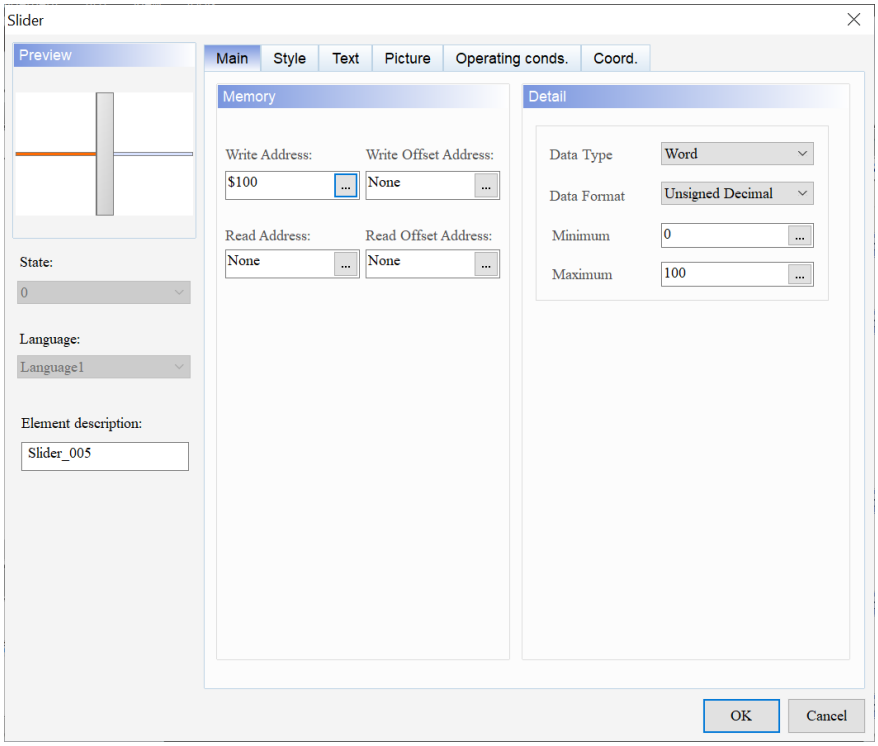
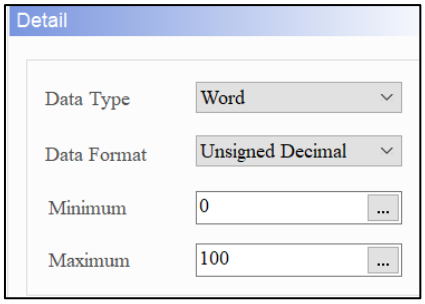
</td></tr>
<tr><td rowspan="2">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table>
</td></tr>
</table>

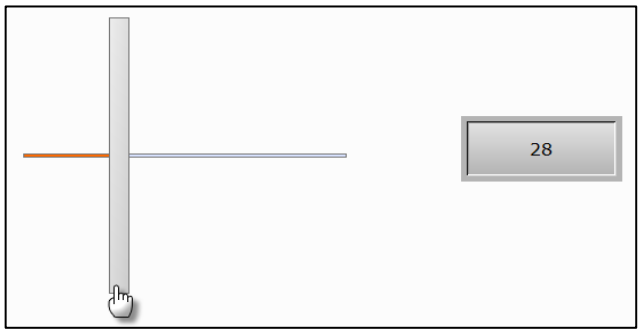
	Process pictures of all states	If users select the checkbox for **Process pictures of all states**, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time. 
(3)	Transparent Color	● This function specifies a color in the picture and make it transparent. The default value is **No**. ● Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the **Foreground Color** of the element. 

Chapter 18: Analog

18.1 Slider

To create a **Slider** element, go to **Elements** > **Analog** > **Slider**. Use the **Slider** element to drag and adjust the value easily. Refer to the following table for the **Slider** element example.

<table>
<tr><th colspan="4">Slider</th></tr>
<tr><td>Create Slider element</td><td colspan="3">Step 1: Create a Slider element with its Write Address as $100, and then set the Minimum and Maximum as 0 and 100, respectively.
 
</td></tr>
<tr><td>Create Numeric Display element</td><td colspan="3">Step 2: Create a Numeric Display element with its Read Address as $100 and complete Detail settings.
<table>
<tr><td rowspan="2">Numeric Display element</td><td>Read Address</td><td> 
</td></tr>
<tr><td>Detail settings</td><td> 
</td></tr>
</table></td></tr>
</table>

Slider	
Execution result	After creating the elements, compile and download the data to the HMI. On moving the **Slider** element, the **Numeric Display** element shows the value corresponding to the movement of the **Slider** element. 

On double-clicking the **Slider** element, the property page appears as follows.

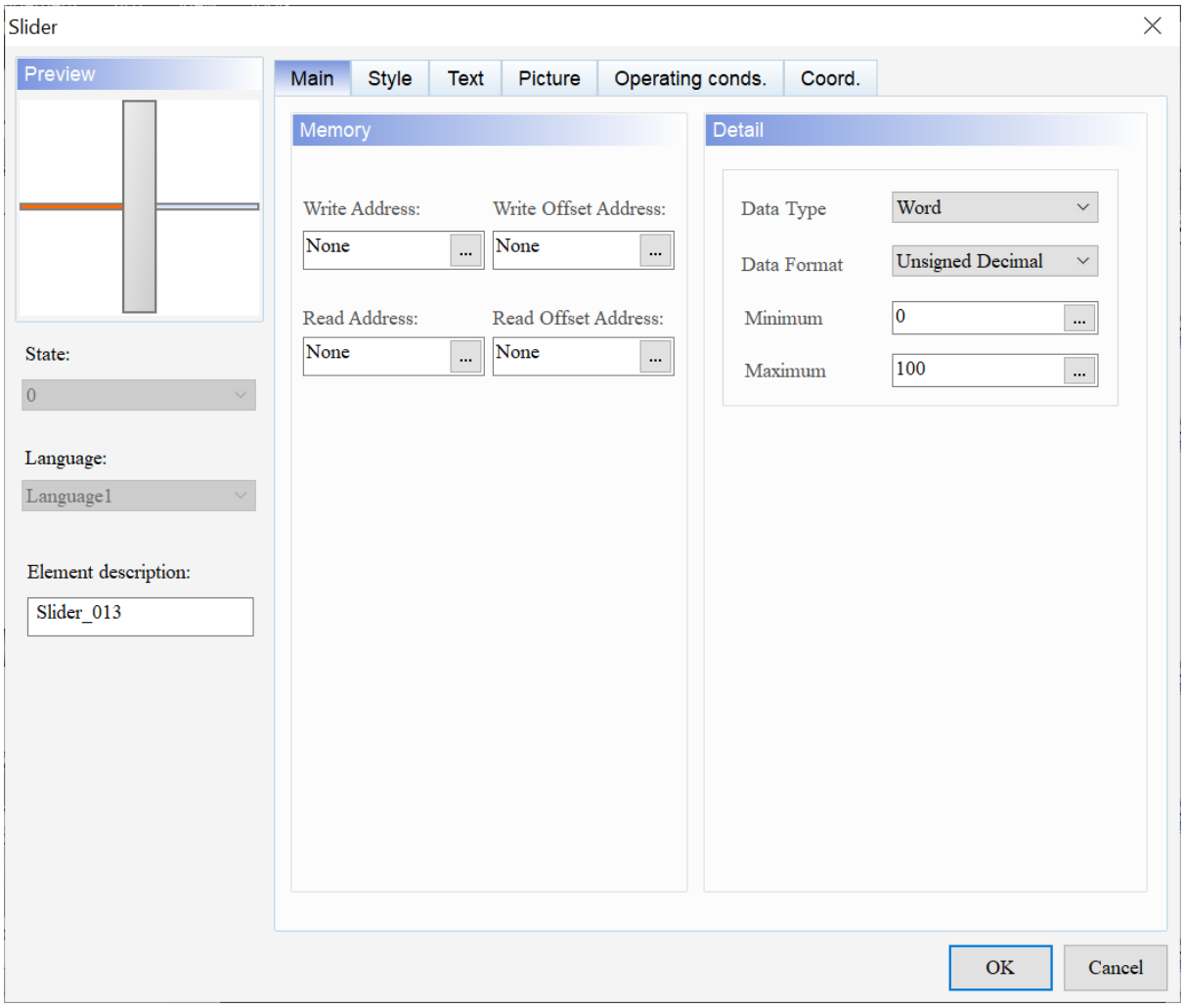


Figure 18 - 1: Slider element property page

Slider	
Function	**Description**
Preview	**Slider** elements do not support multiple state values, but can edit multi-language data display.
Main	Set Write Address, Read Address, Write Offset Address, Read Offset Address, Data Type, Data Format, Minimum, and Maximum.
Style	Set the Direction, Starting Point, Slider Width, Slider Button Length, Border Color, Foreground Color, Background Color, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment type.
Picture	Set the Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set the Interlock State, Interlock Display Mode, Interlock Address, Invisible Address, and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

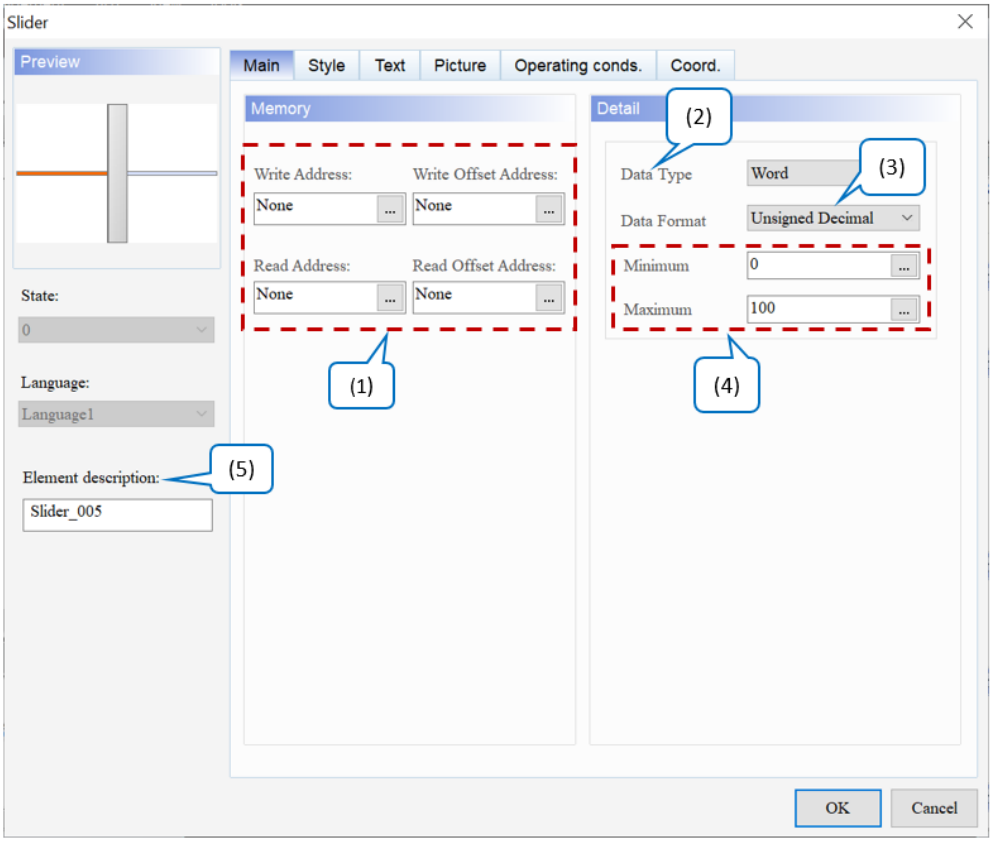
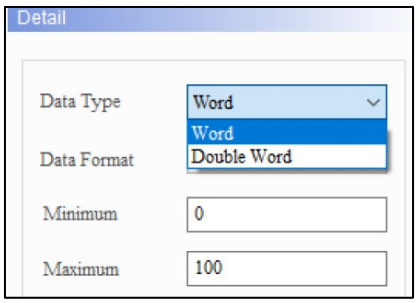
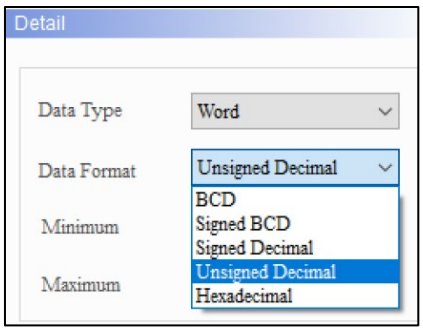
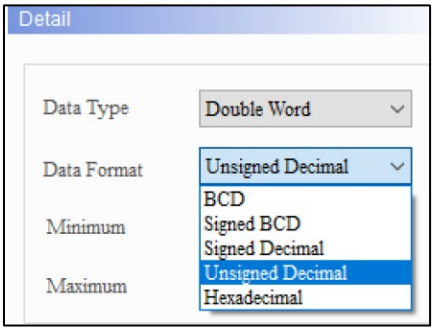
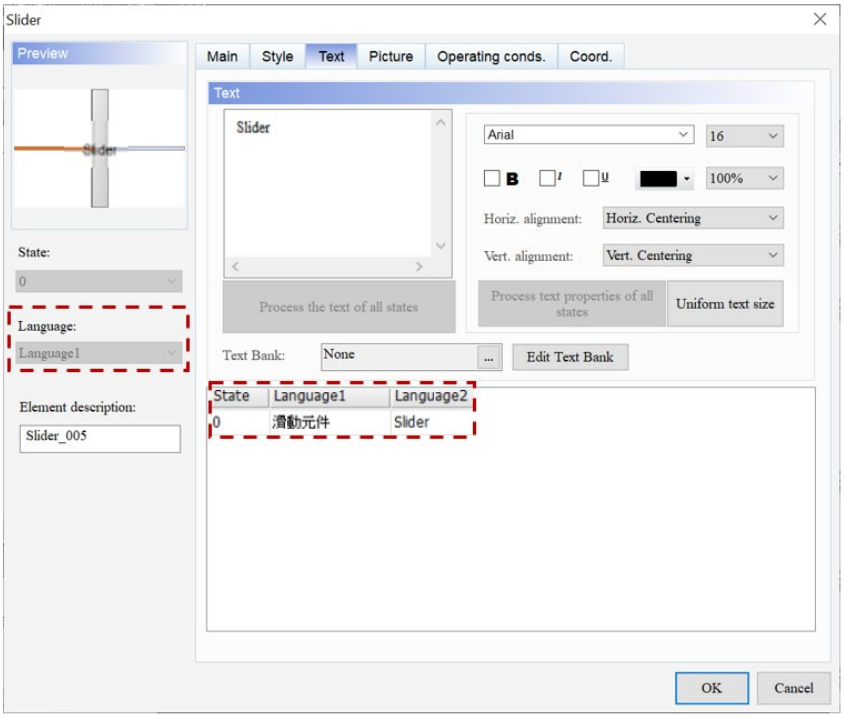


Figure 18 - 2: Slider element Main property page

No.	Function	Description
(1)	Write Address Read Address	● Select the Internal Memory or controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
	Write Offset Address Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Type	The available options for **Data Type** are: Word and Double Word. The default value is **Word**. 
(3)	Data Format	When the **Data Type** is Word, the available options for **Data Format** are: Unsigned Decimal, BCD, Signed BCD, Signed Decimal, and Hexadecimal. The default value is **Unsigned Decimal**.  When the **Data Type** is Double Word, the available options for **Data Format** are: Unsigned Decimal, BCD, Signed BCD, Signed Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(4)</td><td>Minimum / Maximum</td><td>The permissible range for the Minimum and Maximum values vary based on the selected Data Type.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th></tr>
<tr><td rowspan="5">Word</td><td>BCD</td><td>0 ~ 9999</td></tr>
<tr><td>Signed BCD</td><td>-999 ~ 9999</td></tr>
<tr><td>Signed Decimal</td><td>-32768 ~ 32767</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFF</td></tr>
<tr><td rowspan="5">Double Word</td><td>BCD</td><td>0 ~ 99999999</td></tr>
<tr><td>Signed BCD</td><td>-9999999 ~ 99999999</td></tr>
<tr><td>Signed Decimal</td><td>-2147483648 ~ 2147483647</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 4294967295</td></tr>
<tr><td>Hex</td><td>0 ~ 0xFFFFFFFF</td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Language</td><td>If users have set the language data, they can edit the properties of the text to be displayed with the Language setting of the element.
 
</td></tr>
</table>

- Style

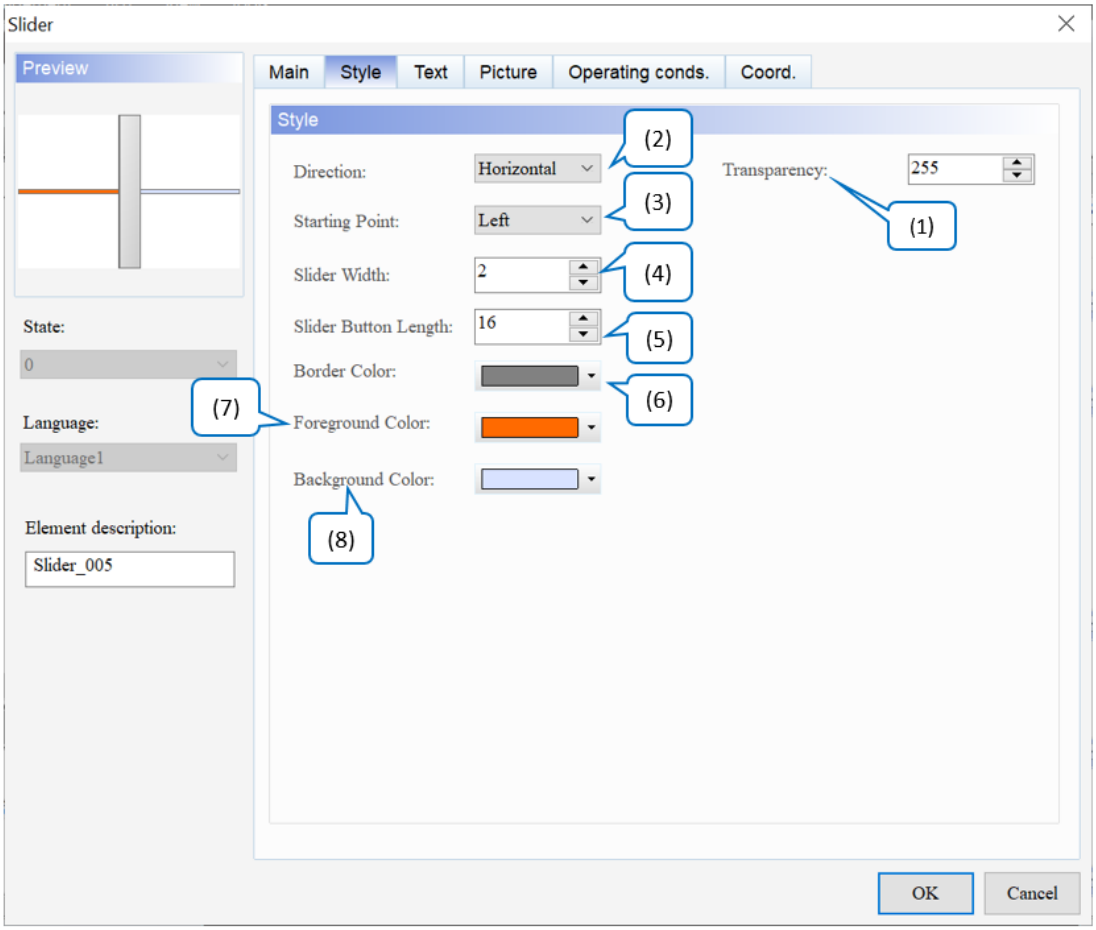
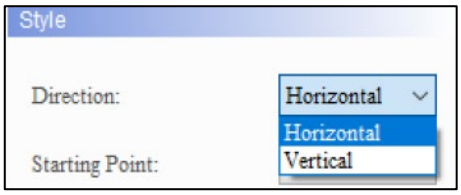
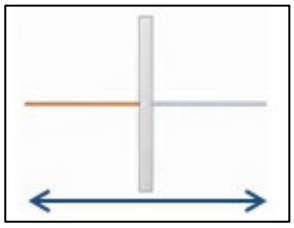
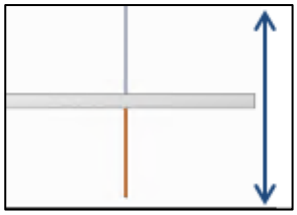


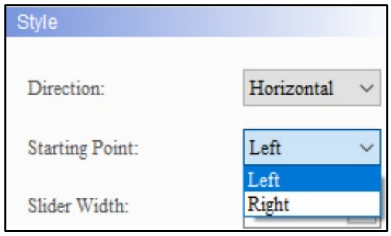
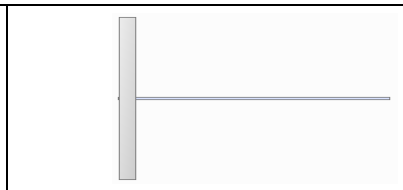
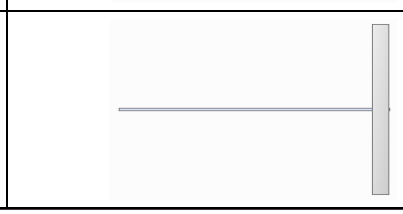
Figure 18 - 3: Slider element Style property page

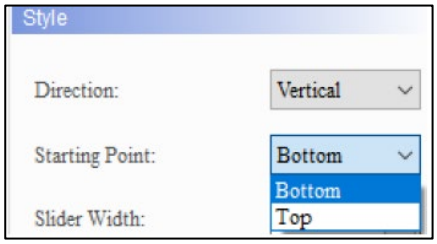
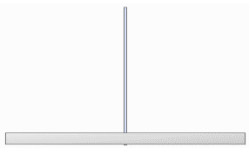
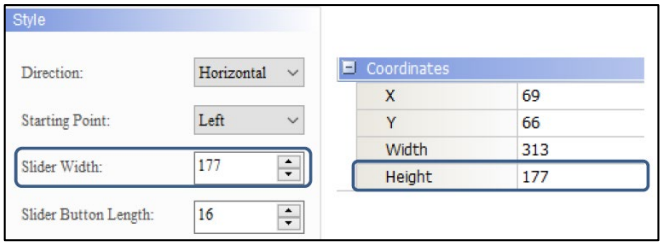
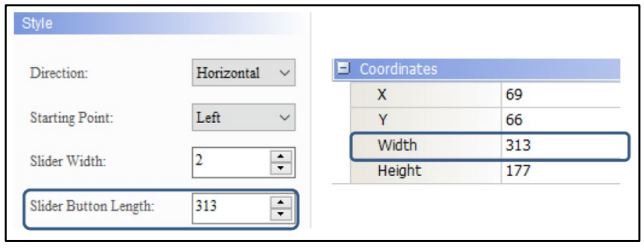
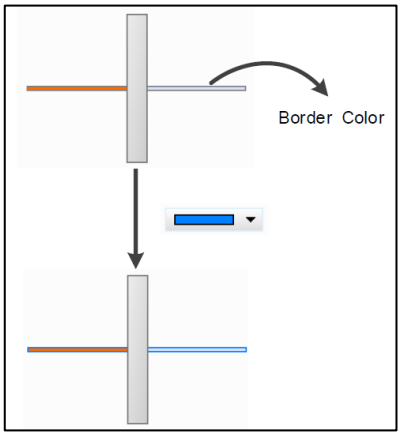
No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Direction	● The available options for **Direction** are: Horizontal and Vertical. The default value is **Horizontal**. ● Horizontal means the Slider button moves horizontally (left and right); Vertical means the Slider button moves vertically (up and down).

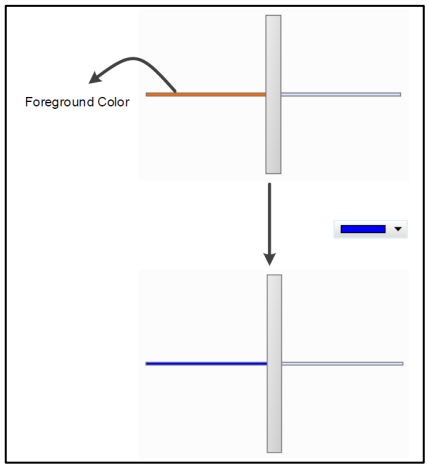
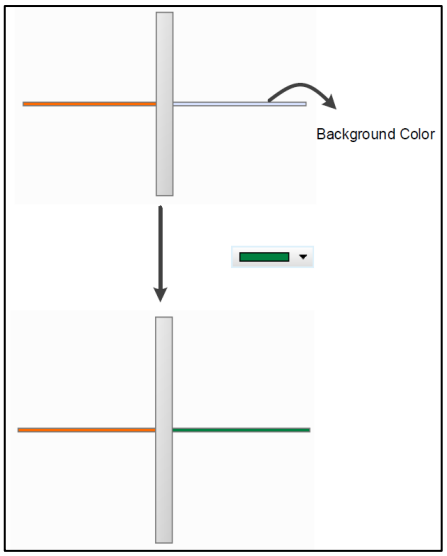
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>


<table>
<tr><td>Horizontal</td><td>  </td></tr>
<tr><td>Vertical</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Starting Point</td><td>

Starting Point varies depending on the selected Direction. This is the starting point position of the Slider button after the Slider element is loaded.
The Starting Point is Left or Right when the Direction is Horizontal. The default value is Left.
The Starting Point is Bottom or Top when the Direction is Vertical. The default value is Bottom.

<table>
<tr><td rowspan="3">Horizontal</td><td colspan="2"> 
</td></tr>
<tr><td>Left</td><td>  </td></tr>
<tr><td>Right</td><td>  </td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td rowspan="3">Vertical</td><td colspan="2"> 
</td></tr>
<tr><td>Bottom</td><td>  </td></tr>
<tr><td>Top</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>Slider Width</td><td>The height of the Slider element determines the maximum value of the Slider Width. The default value is 2.
 
</td></tr>
<tr><td>(5)</td><td>Slider Button Length</td><td>The width of the Slider element determines the maximum value of the Slider Button Length. The default value is 16.
 
</td></tr>
<tr><td>(6)</td><td>Border Color</td><td>Set the border color of the element. The default is  .
 
</td></tr>
</table>

No.	Function	Description
(7)	Foreground Color	Set the foreground color of the element. The default is  . 
(8)	Background Color	Set the background color of the element. The default is  . 

- Text

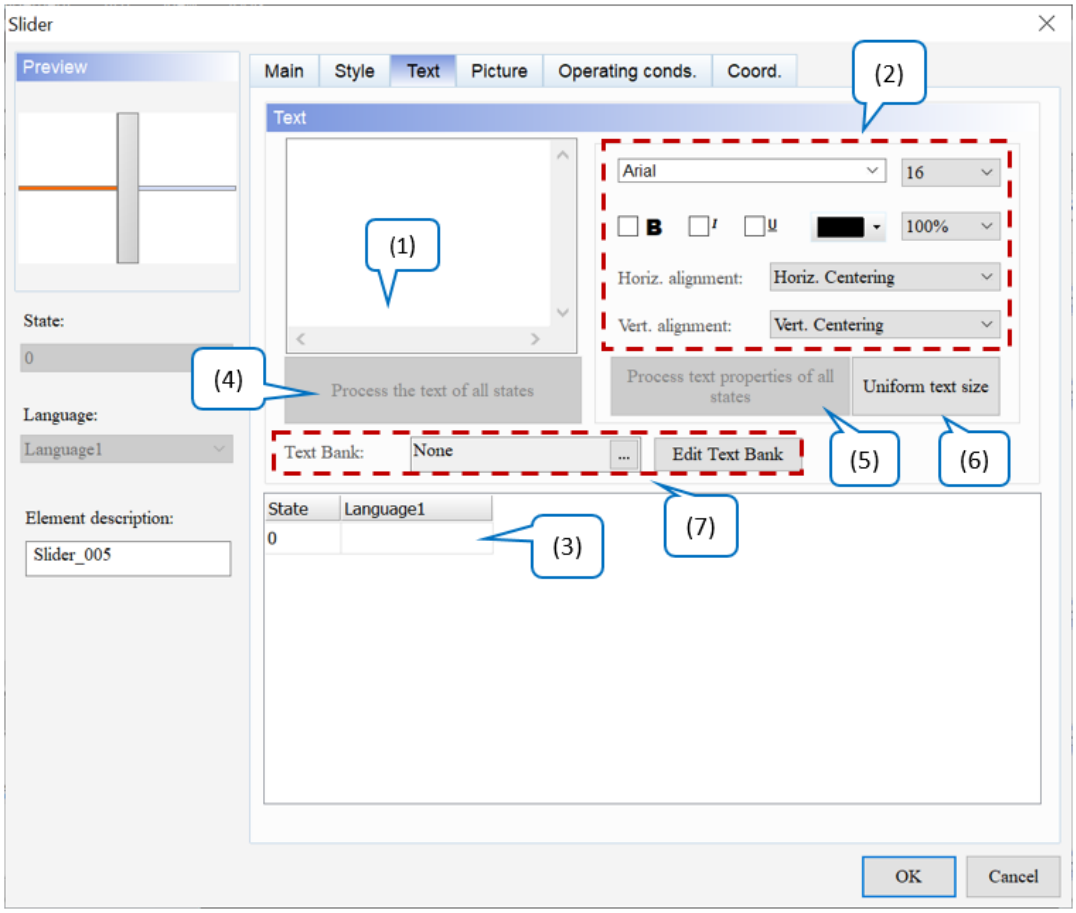
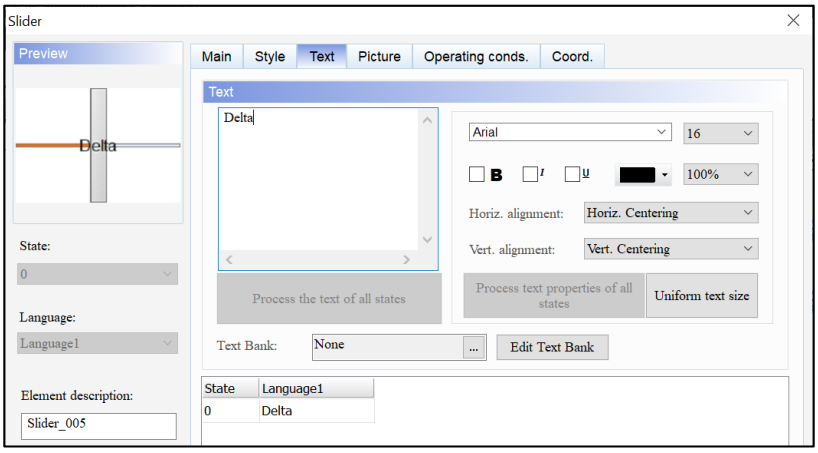
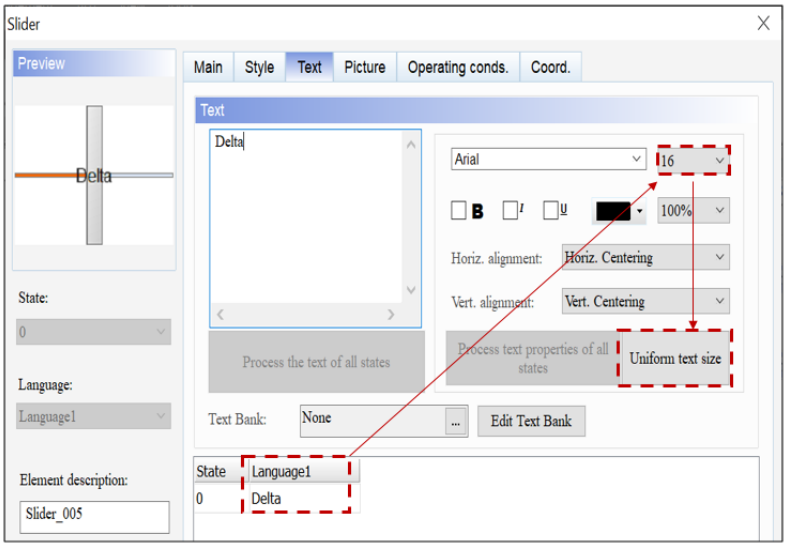


Figure 18 - 4: Slider element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to be displayed in the text box.  ● As long as the element allows text input, click the element on the screen and press the space key to start editing and

No.	Function	Description
		entering the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** property page allows to edit multi-language data.
(4)	Process the text of all states	This function is not supported as the **Slider** element does not have multiple states.
(5)	Process text properties of all states	This function is not supported as the **Slider** element does not have multiple states.
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Picture

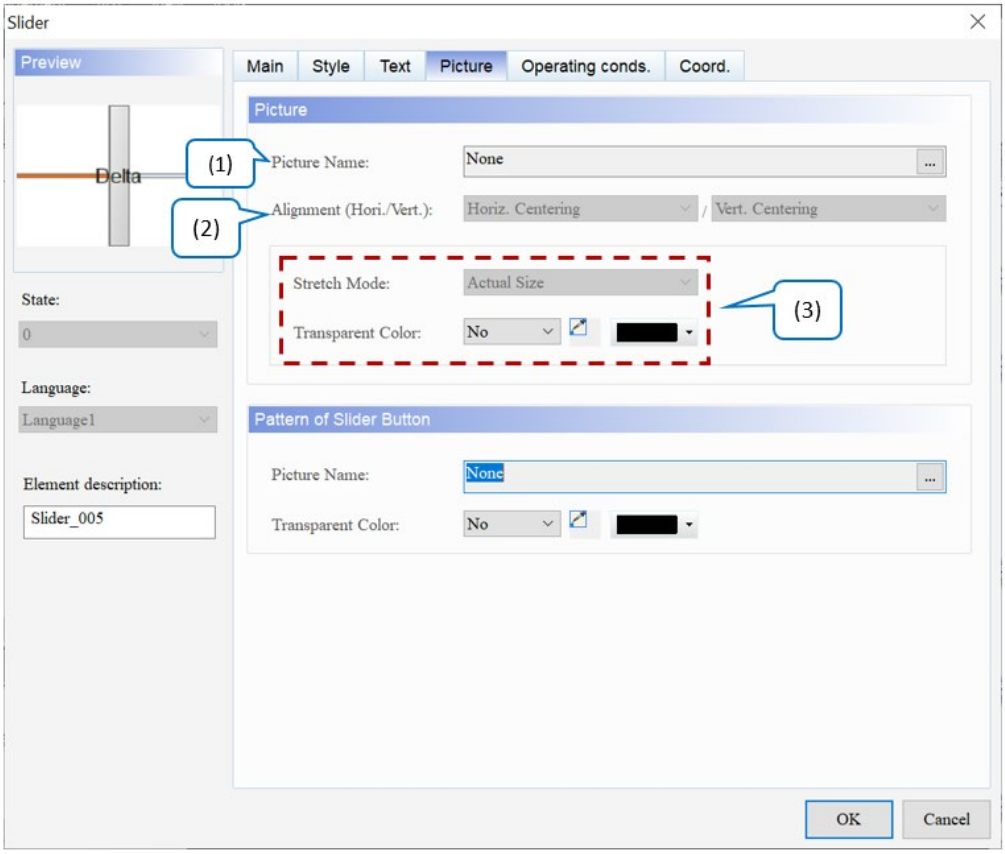
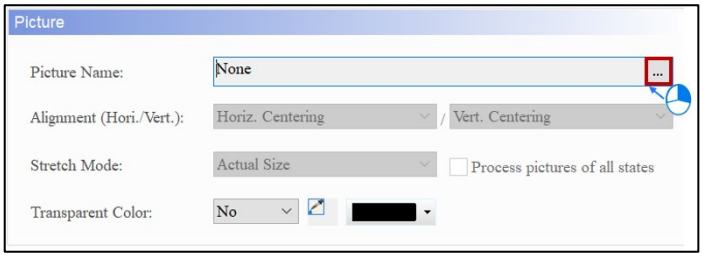
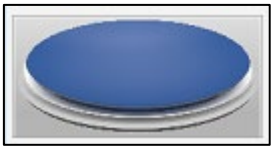
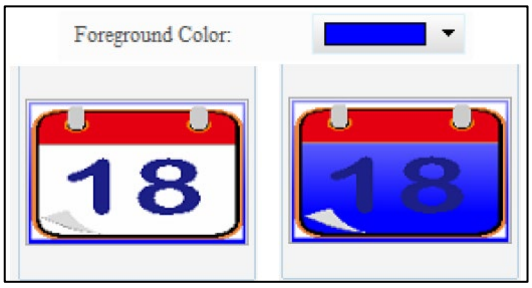


Figure 18 - 5: Slider element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.
 
</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the Foreground</td></tr>
</table>

No.	Function	Description
		Color of the element. 

- Coord.

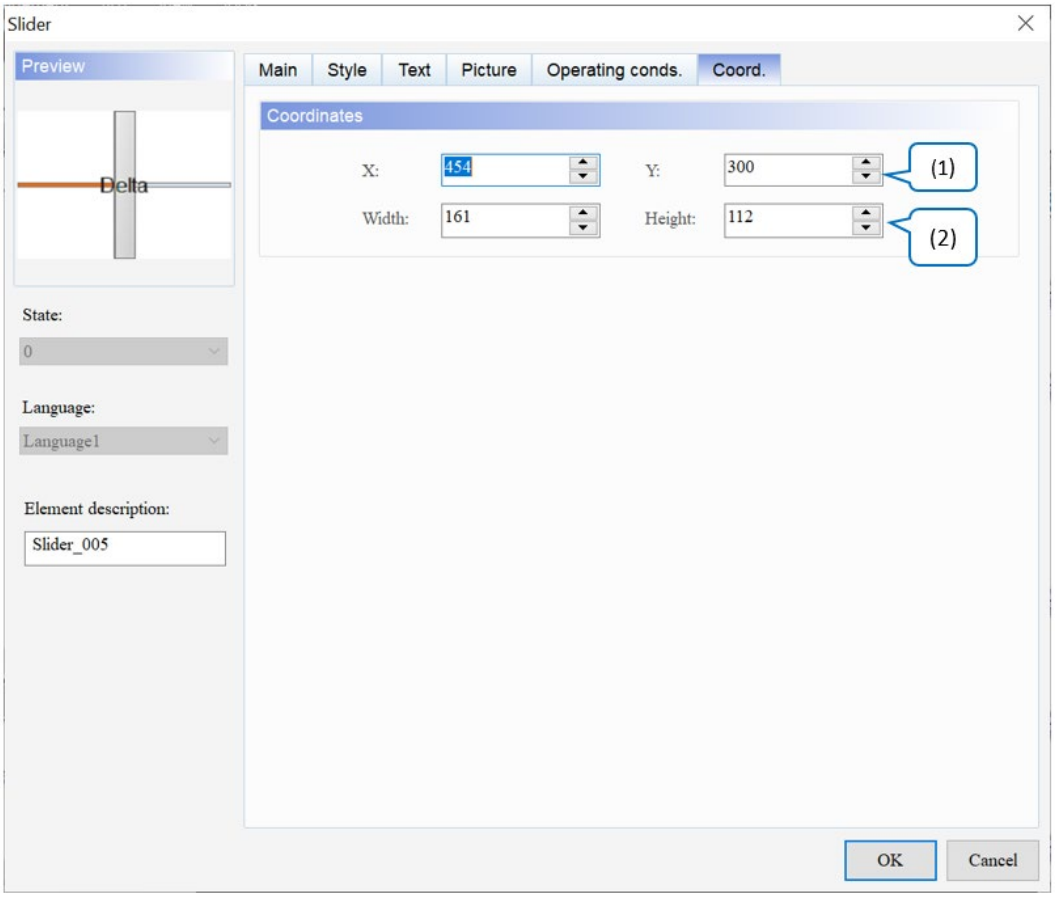


Figure 18 - 6: Slider element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

No.	Function	Description
(2)	Width and Height	Set the width and height of the elements.

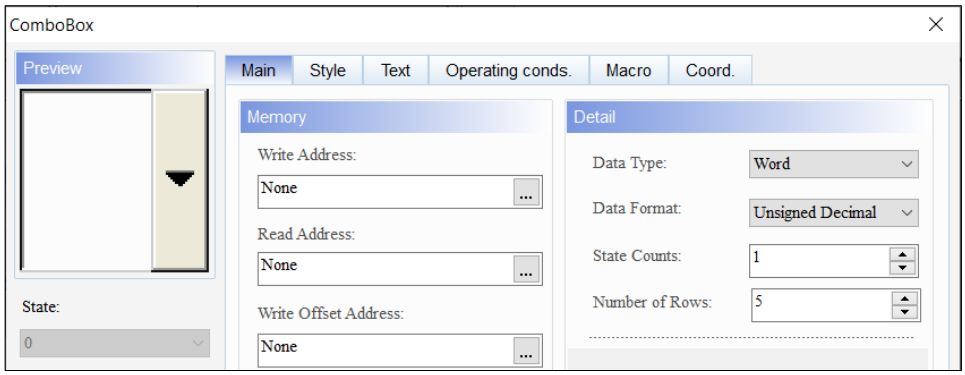
Chapter 19: List

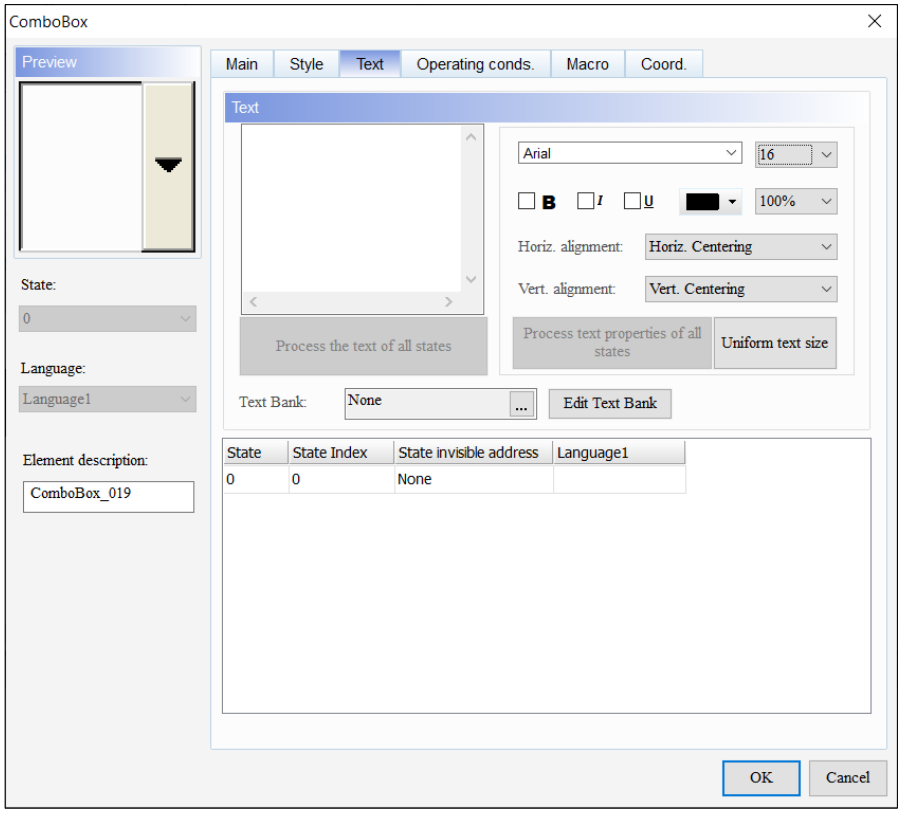
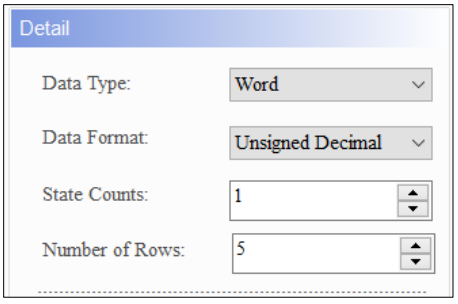
To create a List element, go to **Elements** > **List** and click the desired List element.

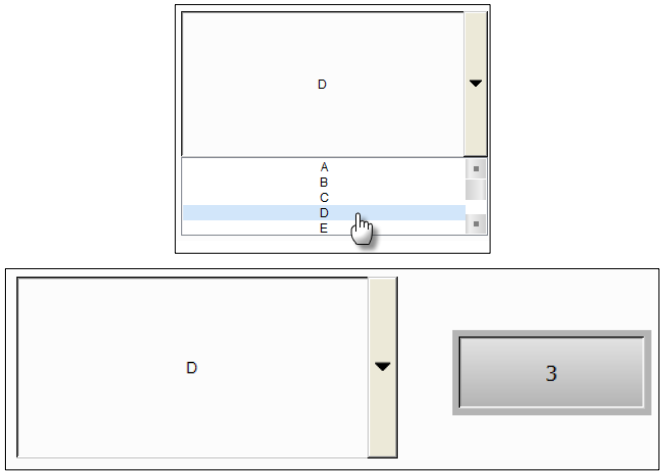
19.1 ComboBox

ComboBox List element provides display messages of multiple states allowing users to select the options for execution with the drop-down function. The functions of the same type are grouped in the same drop-down list, and only the currently selected item is displayed in the **ComboBox List** element.

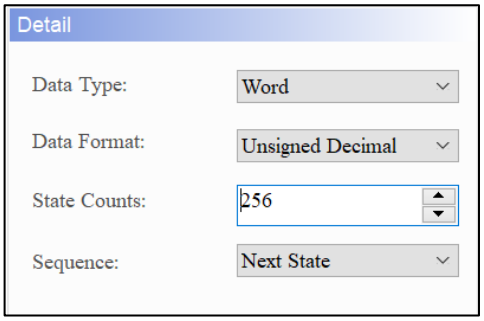
Refer to the following table for the **ComboBox List** element example.

ComboBox List	
Create ComboBox element	● Create a **ComboBox List** element with its **Write Address** as $10. Select Word for the **Data Type**, and then set the **State Counts** to 16 and **Number of Rows** to 5.  ● On the **Text** property page, edit the text messages to be displayed for the 16 states which are the characters from A ~ P respectively.

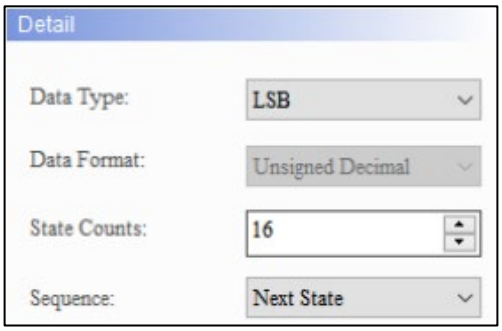
<table>
<tr><th colspan="4">ComboBox List</th></tr>
<tr><td></td><td colspan="3"> 
</td></tr>
<tr><td>Create Numeric Display element</td><td colspan="3">Create a Numeric Display element and set its Read Address as $10 and complete the Detail settings.
<table>
<tr><td rowspan="2">Numeric Display</td><td>Read Address</td><td> 
</td></tr>
<tr><td>Detail</td><td> 
</td></tr>
</table></td></tr>
<tr><td>Execution result</td><td colspan="3">After creating the elements, compile and download the data to the HMI. When users press the ComboBox List element, as the displaying number of rows is set to 5 in this example, five rows, A, B, C, D, and E are displayed accordingly, and the Numeric Display element shows the state value corresponding to the item users selected in the ComboBox List element.</td></tr>
</table>

ComboBox List	
	

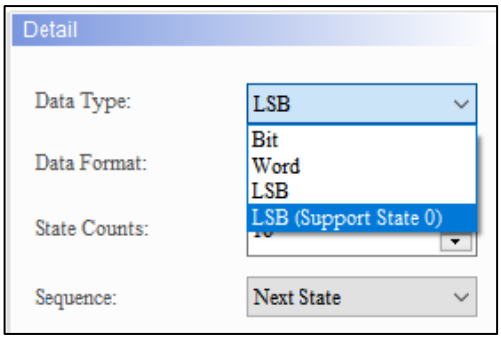
ComboBox List element supports four types of **Data Type**. To add or reduce the **State Counts**, simply increase or decrease the number of **State Counts** in the **Main** property page.

ComboBox List	
Data Type	State Counts
Word	If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states. 
LSB / LSB (Support 0 State)	● When the **Data Type** is set to LSB, the register data is first converted to binary data. And then, the current object state is defined by using the lowest non-zero bit. ● If the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states except for State 0.

ComboBox List	
Data Type	State Counts



- To display State 0, select LSB (Support State function) for **Data Type**.

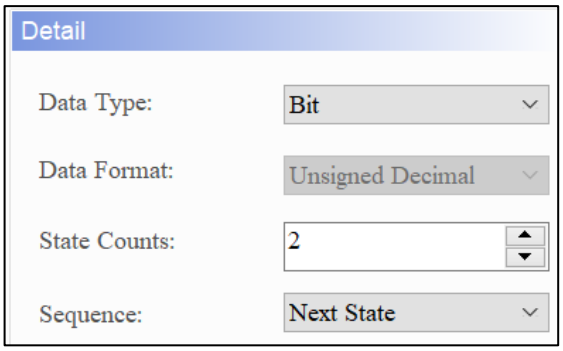


- If users select LSB, when the State is 0, the element displays black.



- When the **Data Type** is LSB or LSB (Support State 0), the memory address is also in Word as the unit.
- The following table illustrates the use of the least significant non-zero bit to determine its state value after converting from decimal to binary. For example, when the decimal values are 3 and 7, how will the DIAScreen determine the lowest bit to determine the displayed status value?

Decimal	Binary	State Value
0	0000000000000000	State = 0 when all bits are 0. Select LSB (Support State 0).
1	0000000000000001	The lowest non-zero bit is bit 0, State = 1.
2	0000000000000010	The lowest non-zero bit is bit 1, State = 2.
3	0000000000000011	The lowest non-zero bit is bit 0, State = 1.
4	0000000000000100	The lowest non-zero bit is bit 2, State = 3.
7	0000000000000111	The lowest non-zero bit is bit 0, State

<table>
<tr><th colspan="2">ComboBox List</th></tr>
<tr><td>Data Type</td><td>State Counts</td></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td>= 1.</td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The lowest non-zero bit is bit 3, State = 4.</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non-zero bit is bit 4, State = 5.</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The lowest non-zero bit is bit 5, State = 6.</td></tr>
<tr><td>64</td><td>0000000001000000</td><td>The lowest non-zero bit is bit 6, State = 7.</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The lowest non-zero bit is bit 7, State = 8.</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The lowest non-zero bit is bit 8, State = 9.</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The lowest non-zero bit is bit 9, State = 10.</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The lowest non-zero bit is bit 10, State = 11</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The lowest non-zero bit is bit 11, State = 12.</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The lowest non-zero bit is bit 12, State = 13.</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non-zero bit is bit 13, State = 14.</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non-zero bit is bit 14, State = 15.</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non-zero bit is bit 15, State = 16.</td></tr>
</table>
</td></tr>
<tr><td>Bit</td><td>If the Data Type is set to Bit, State Counts can be set to only 2 states.
 
</td></tr>
</table>

On double-clicking the **ComboBox List** element, the property page appears as follows.

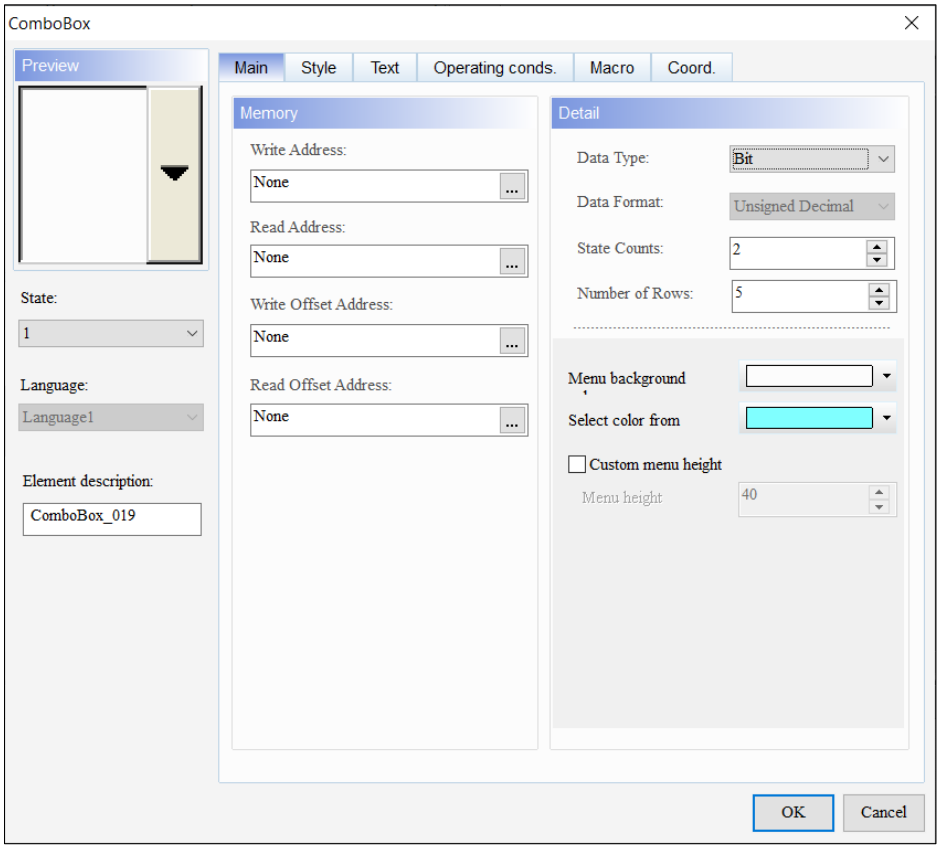


Figure 19 - 1: ComboBox List element property page

ComboBox List	
Function	**Description**
Preview	**ComboBox List** element supports multiple state values and multi-language data display.
Main	Set the Write Address, Read Address, Write Offset Address, Read Offset Address, Data Type, Data Format, State Counts, Number of Rows. Set the Menu background, Select color from, and Custom menu height.
Style	Set the Border Color, Background Color, and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Operating Conds.	Set the Interlock State, Interlock Display Mode, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, User Security Level, Set Low Security, and Confirm Window.

ComboBox List	
Function	**Description**
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

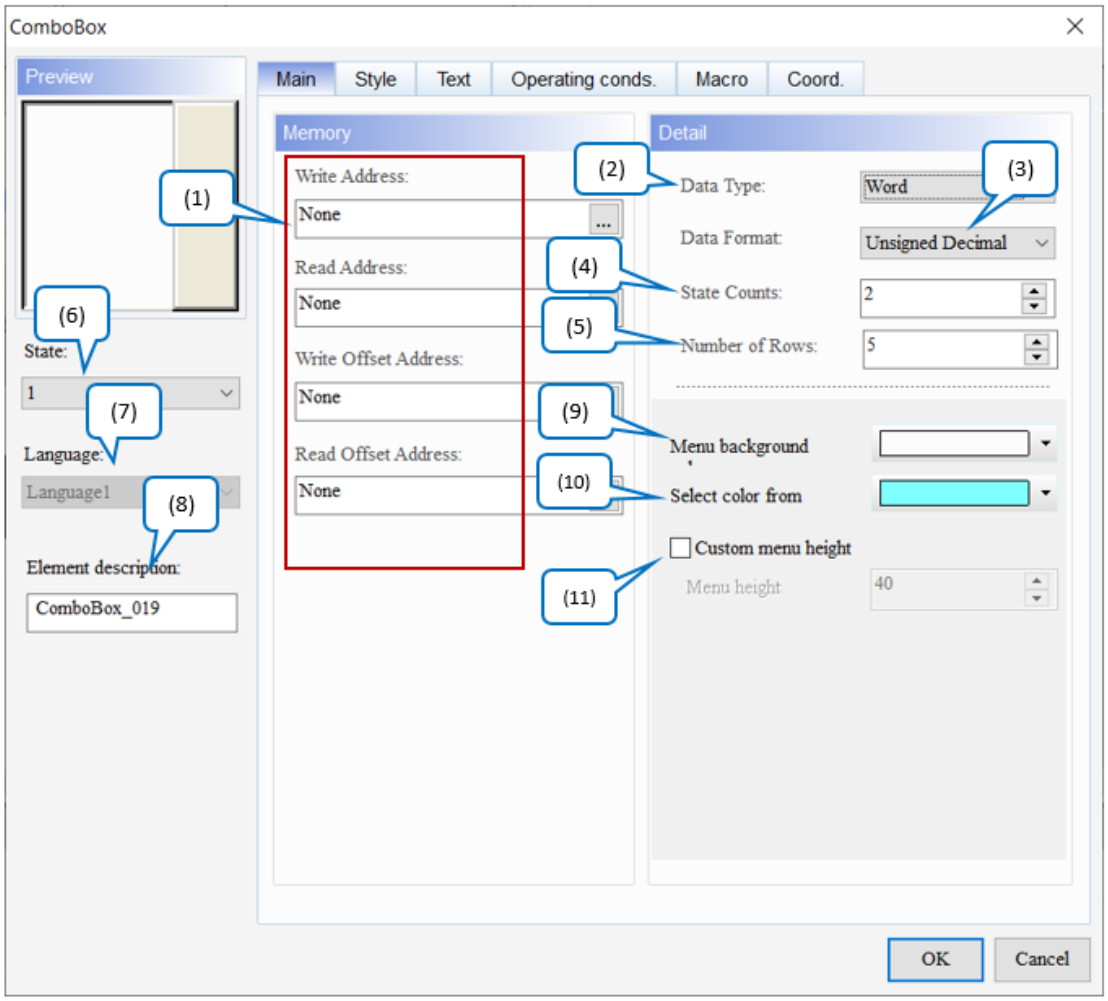
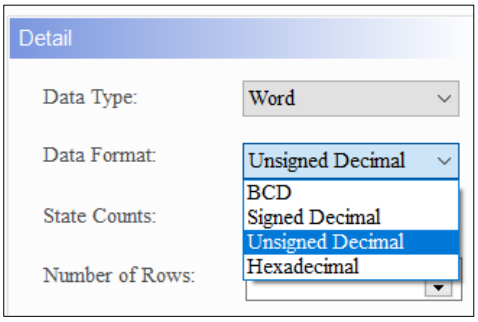
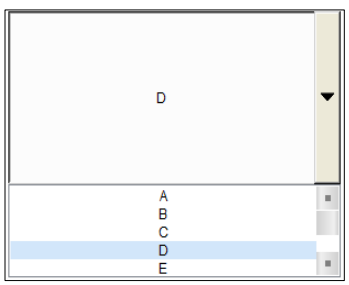
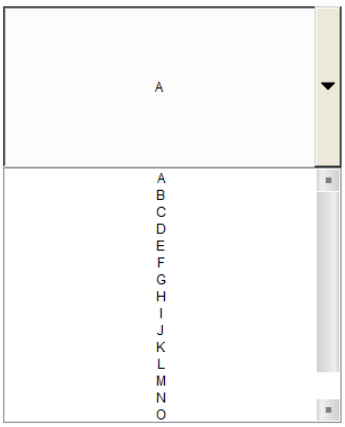
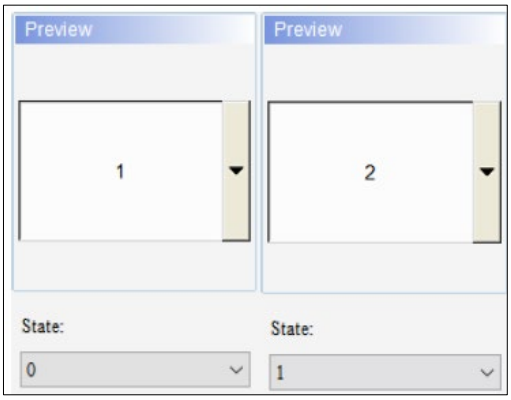
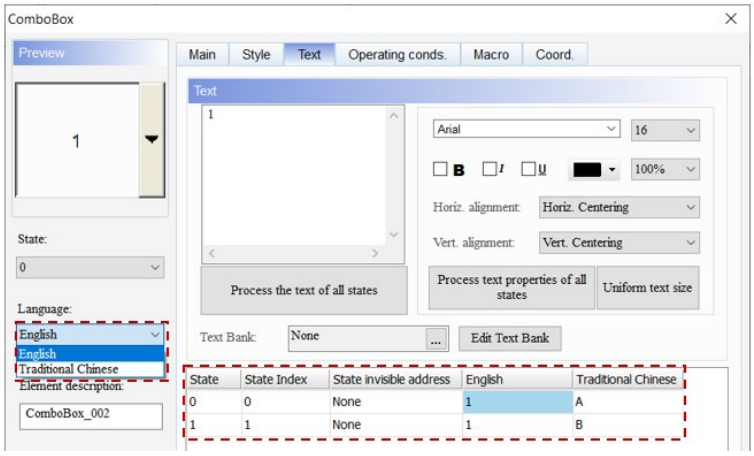
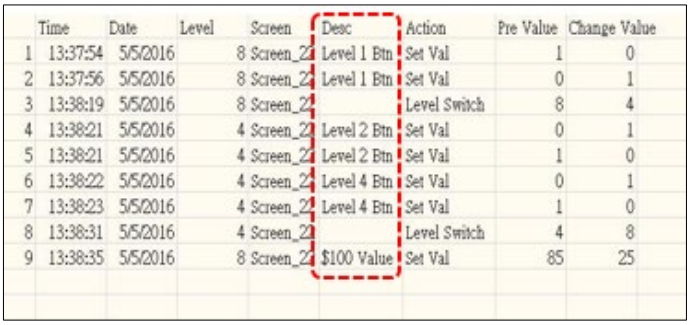
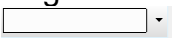
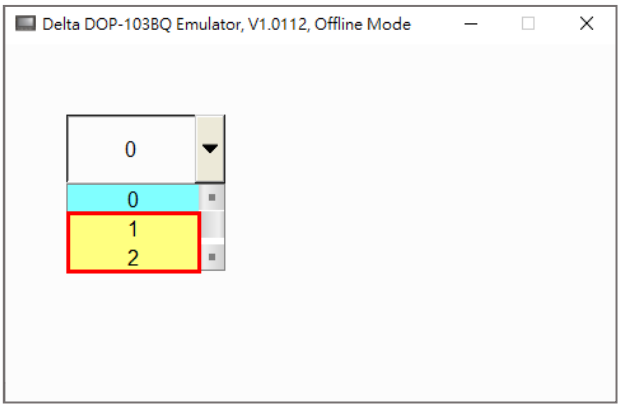
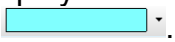
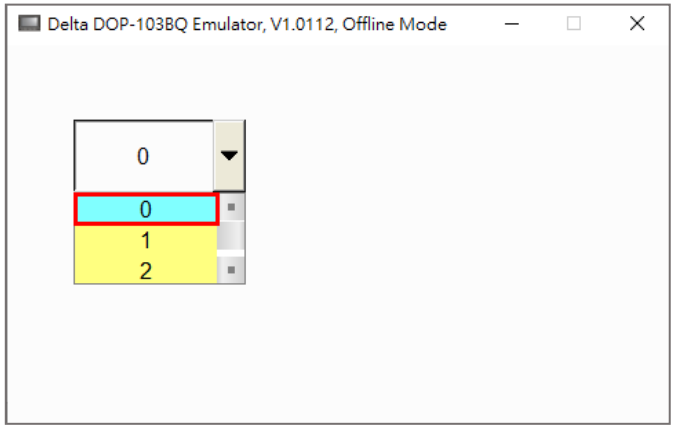


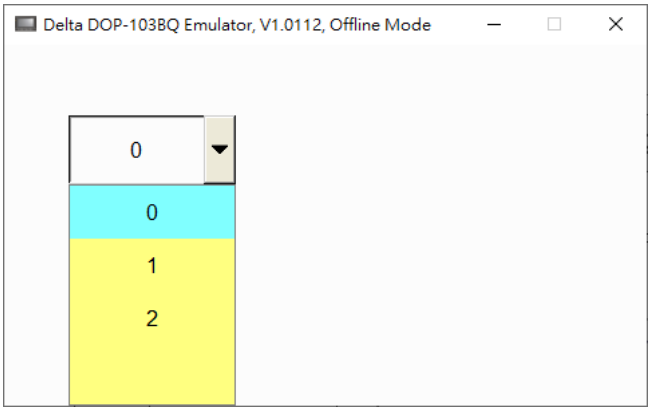
Figure 19 - 2: ComboBox List element Main property page

No.	Function	Description
(1)	Write Address	● Select Internal Memory or controller register address. The Input memory Type varies depending on the Data

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3"></td><td>Read Address</td><td>Type such as Word, LSB or Bit. If users set Write Address without setting Read Address, the HMI automatically reads Write Address value.
● Select Link name or Device Type. Refer to Memory Settings.</td></tr>
<tr><td>Write Offset Address</td><td rowspan="2">Refer to Appendix D Write and Read Offset Address.</td></tr>
<tr><td>Read Offset Address</td></tr>
<tr><td>(2)</td><td>Data Type</td><td>The available options for Data Type are: Bit, Word, LSB, and LSB (Support State 0).</td></tr>
<tr><td>(3)</td><td>Data Format</td><td>● Users can only select the Data Format when the Data Type is Word. The default value is Word.
● The available options for Data Format are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is Unsigned Decimal.
 
</td></tr>
<tr><td>(4)</td><td>State Counts</td><td>● Set the State Counts of the ComboBox List element. The default value is 1.
● If the Data Type is Word, State Counts can be set from 1 ~ 256 states; if the Data Type is LSB, State Counts can be set from 1 ~ 16 states; if the Data Type is LSB (Support State 0), State Counts can be set from 1 ~ 17 states; and if the Data Type is Bit, State Counts can be set to only 2 states.</td></tr>
<tr><td>(5)</td><td>Number of Rows</td><td>● Set the displaying Number of Rows when users press the ComboBox List element.
● The default value is 5 and the maximum is 15.
<table><tr><td>Number of Rows is set to 5</td><td> 
</td></tr></table></td></tr>
</table>

No.	Function	Description
		Number of Rows is set to 15 
(6)	State	Preview or change the settings of each state of the element by switching **State**. 
(7)	Language	When users set language data, they can edit the text attributes to display through the **Language** setting of the element. 

No.	Function	Description
(8)	Element description	Record the button actions to be executed. The record is written into the CSV file of the Operation Log Table so that users know what actions have been done. 
(9)	Menu background	● Set the background color of the drop-down menu. The default is  . ● For example, if users set the **Menu background** color to yellow, click the drop-down list element in the offline simulation or HMI, and the background color of the menu displays yellow, as shown in the following figure. 
(10)	Select color from	● Set the display color of the drop-down menu. The default is  . ● For example, if users set the **Menu background** color to blue, click the drop-down list of element in the offline simulation or HMI, and **Menu background** color displays blue, as shown in the following figure. 

No.	Function	Description
(11)	Custom menu height	Select **Custom menu height**, in the offline simulation or HMI. Click the **ComboBox List** element, and the **Menu height** displays according to the setting, as shown in the following figure. The default value is **40**. 

- Style

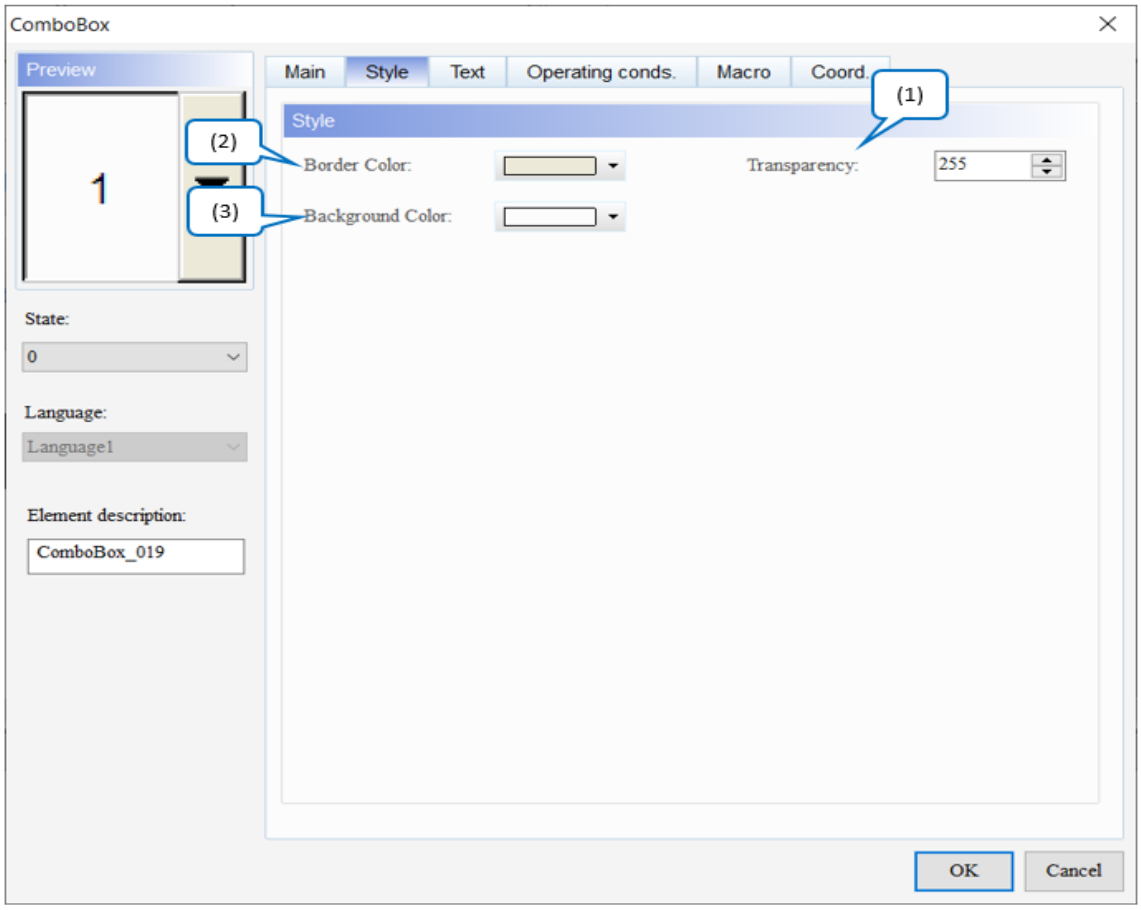
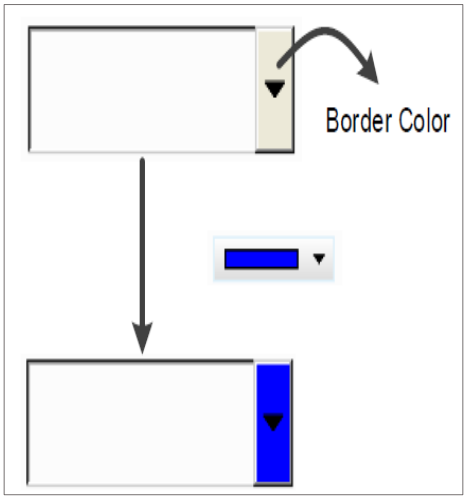
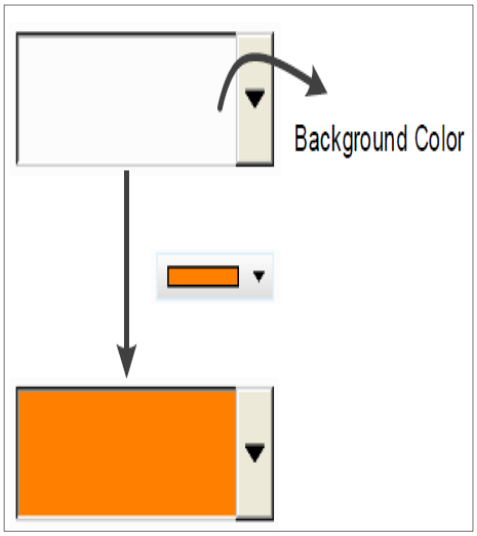


Figure 19 - 3: ComboBox List element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.
(2)	Border Color	Set the border color of the element. The default is  . 
(3)	Background Color	Set the background color of the element. The default is  . 

- Text

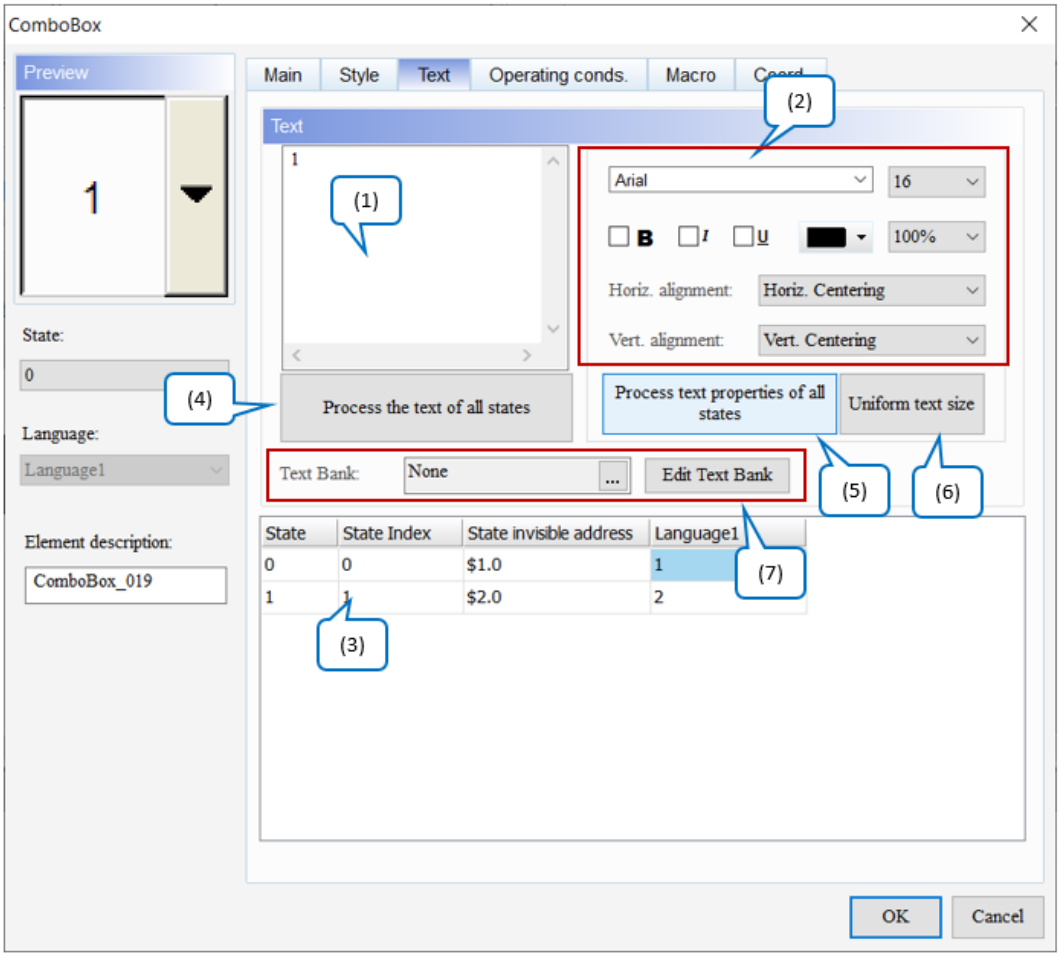
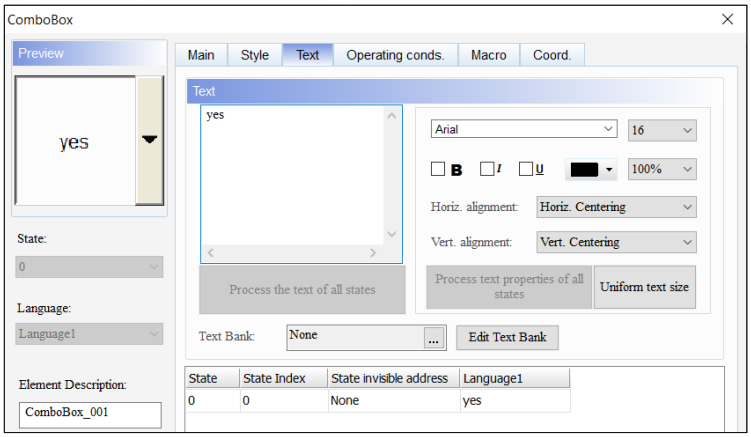
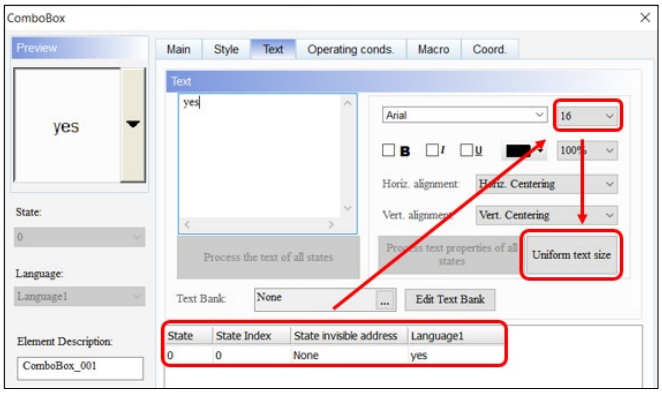


Figure 19 - 4: ComboBox List element Text property page

No.	Function	Description
(1)	Text	● Enter the text to display in this box. 

No.	Function	Description
		● As long as the element allows text input, click the element and press the space key to start editing the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the texts.
(3)	Edit Multi-language text	If users have added multi-language texts, the **Text** property page allows to edit multi-language data.
(4)	Process the text of all states	**ComboBox List** elements do not have a multi-state function and are not supported.
(5)	Process text properties of all states	**ComboBox List** elements do not have a multi-state function and are not supported.
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi- Language Settings*. 2. Select the state to change the text size. 3. Click the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Operating conds.

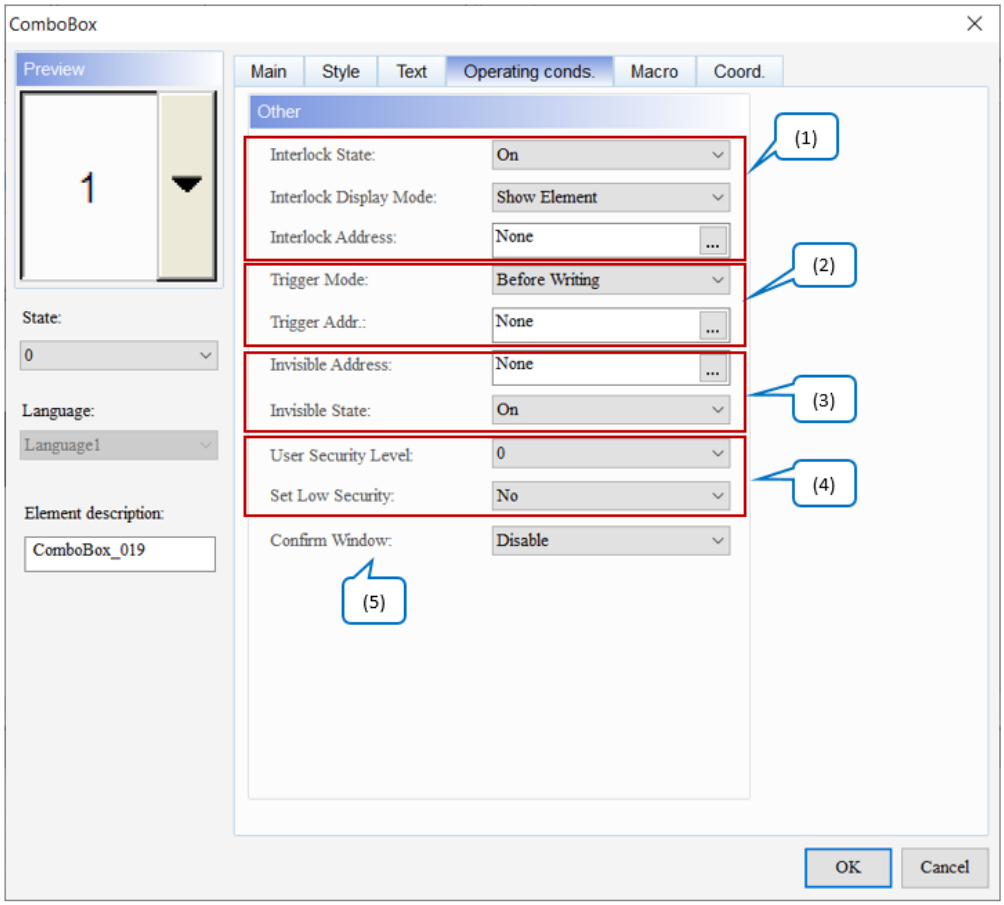
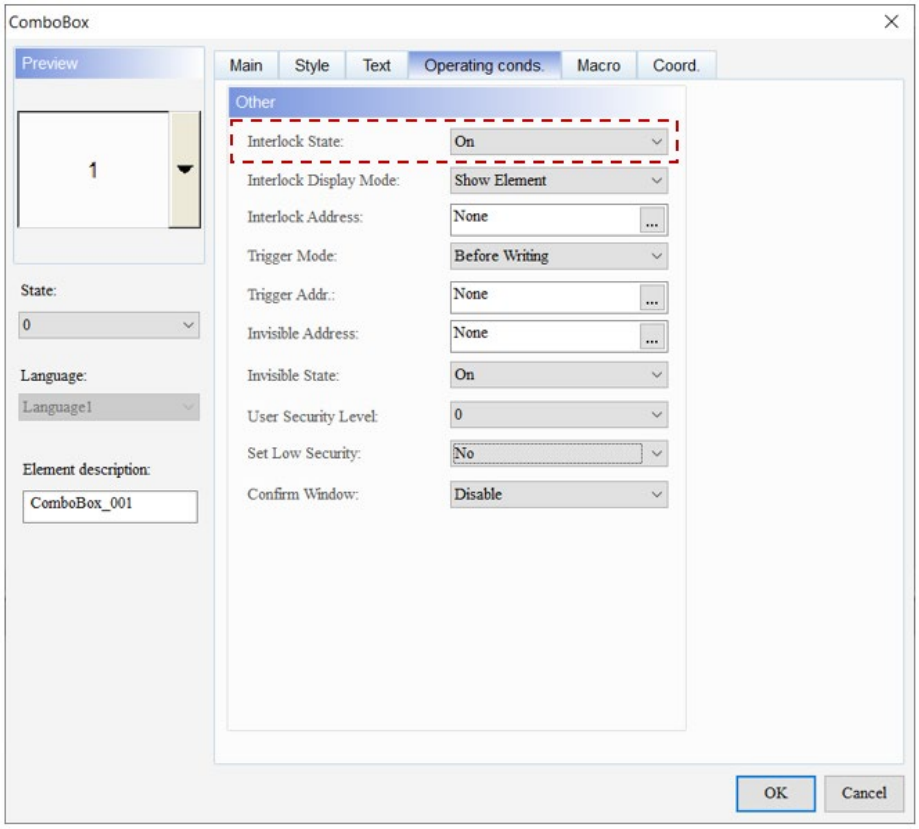
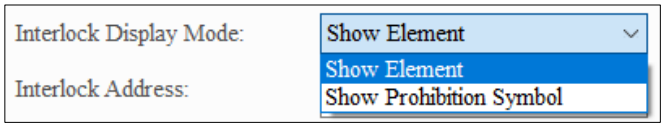


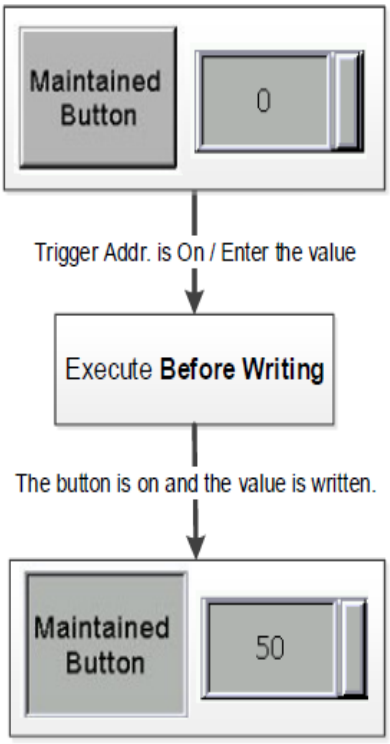
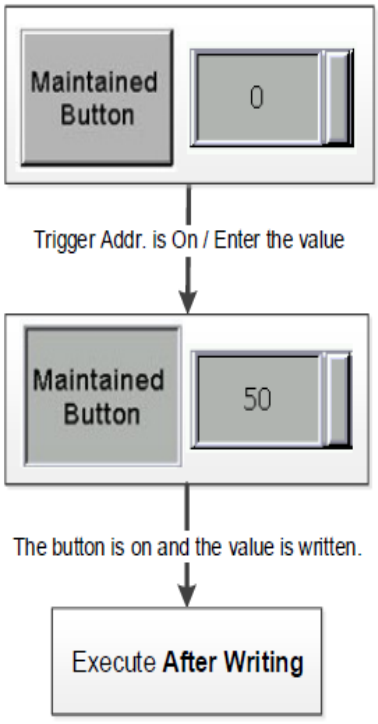
Figure 19 - 5: ComboBox List element Operating conds. property page

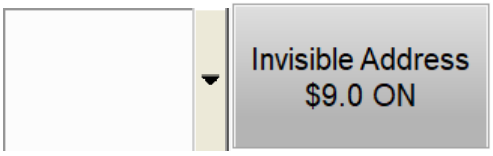
No.	Function	Description
(1)	Interlock State	● The **Interlock Address** enables to operate a certain element from this particular address, which must be operated along with the **Interlock State**. ● If the **Interlock State** is set to Off/On, the **Interlock Address** enables to operate a certain element from this particular address. The default value is **On**. ● The behavior is as follows: 1. Create an element and set its address to $8.0. Then, set the **Interlock Address** to $8.0 for the **ComboBox List** element with address $100. 2. To obtain the correct state value after users press **ComboBox List** element, they must first press the $8.0

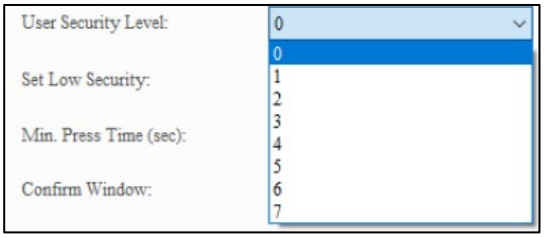
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Interlock Address</td><td>button to validate the action of the element.
 

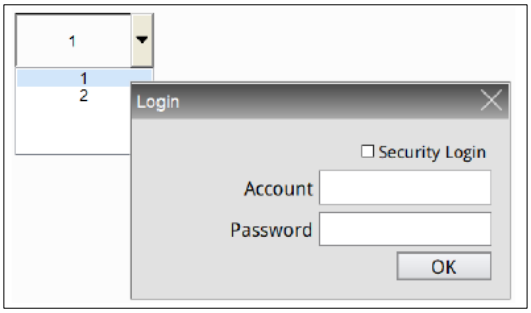

</td></tr>
<tr><td></td><td>Interlock Display Mode</td><td>The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 

<table>
<tr><td>Show Element</td><td>  </td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table>
</td></tr>
<tr><td rowspan="2">(2)</td><td>Trigger Mode</td><td>
The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><td rowspan="2">Triggering action</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td>Trigger Addr. must be set to On before the value changes.</td><td>Value is changed before the Trigger Addr. is set to On.</td></tr>
</table>
The triggering function only switches the set Trigger Addr. to On, so if triggering again is required, users need to set the Trigger Addr. to Off.
</td></tr>
<tr><td>Trigger Addr.</td><td>
<table>
<tr><th>Flowchart of Before Writing</th><th>Flowchart of After Writing</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Invisible Address</td><td>
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:
1. Create an element and set its address to $9.0, then set the
</td></tr>
</table>

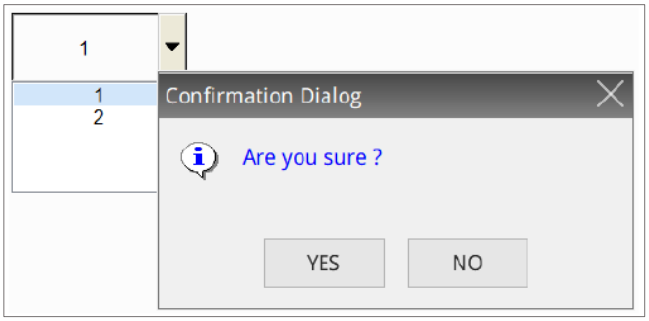
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Invisible State</td><td>
Invisible Address of the element to be hidden to $9.0.
2. To hide the element, first press the $9.0 button.
<table>
<tr><td>Invisible State is On</td><td> 
</td></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Invisible State is Off</td><td> 
</td></tr>
<tr><td></td><td> 
</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">(4)</td><td>User Security Level</td><td rowspan="2">

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
 

If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).
 

If users set the Set Low Security to Yes, the HMI automatically sets the security level to the lowest each time users enter the password. Next time users press the element,

</td></tr>
<tr><td>Set Low Security</td></tr>
</table>

No.	Function	Description
		users will be asked again to enter the password for the corresponding security level. The default value is **No**.
(5)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 

- Macro

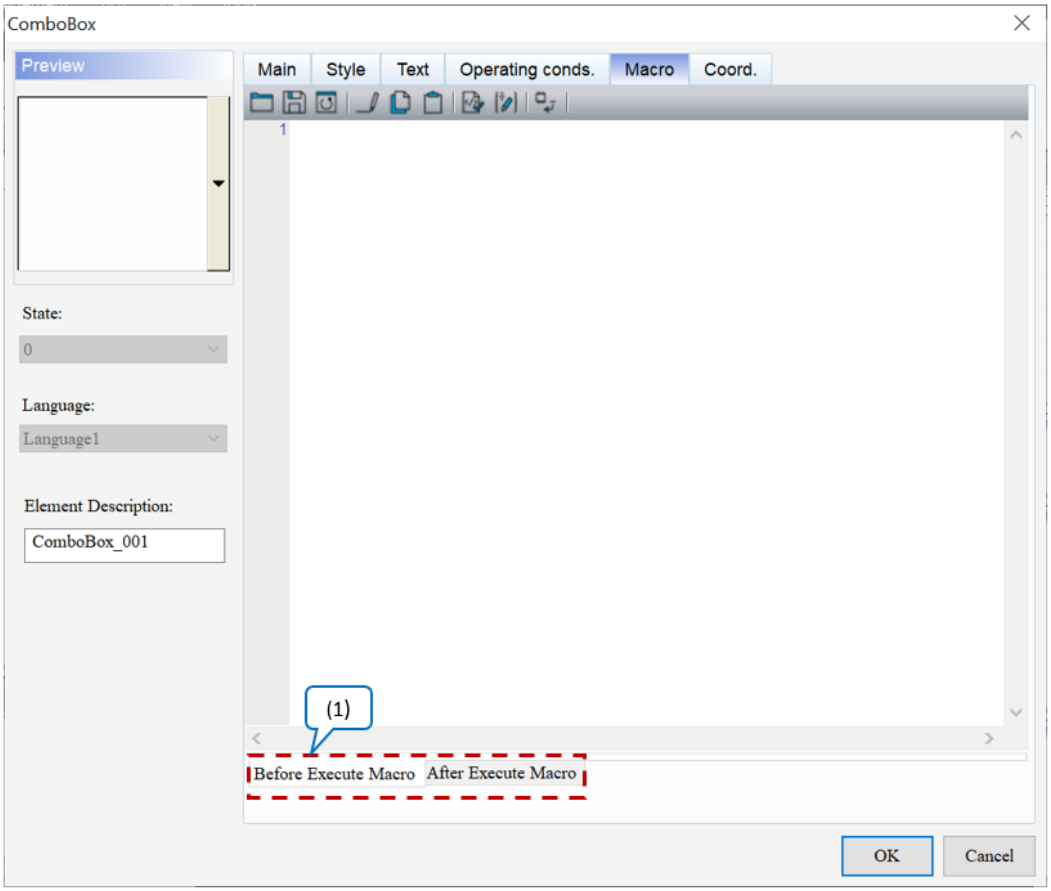
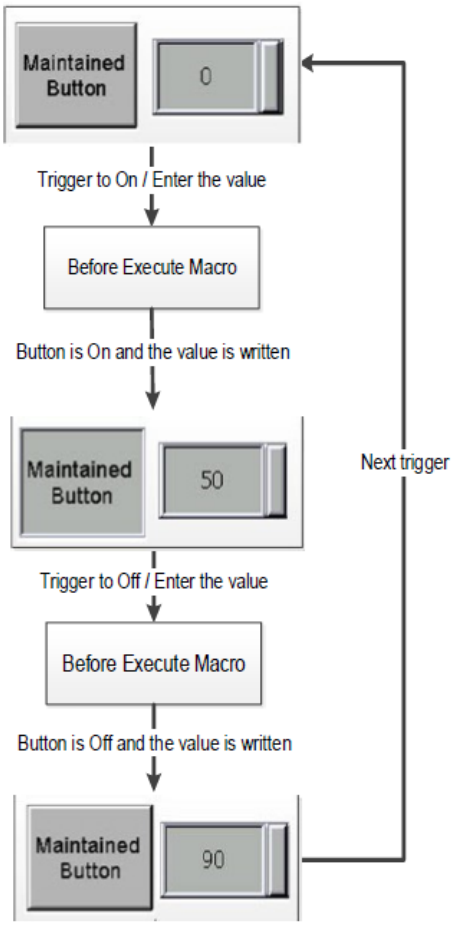
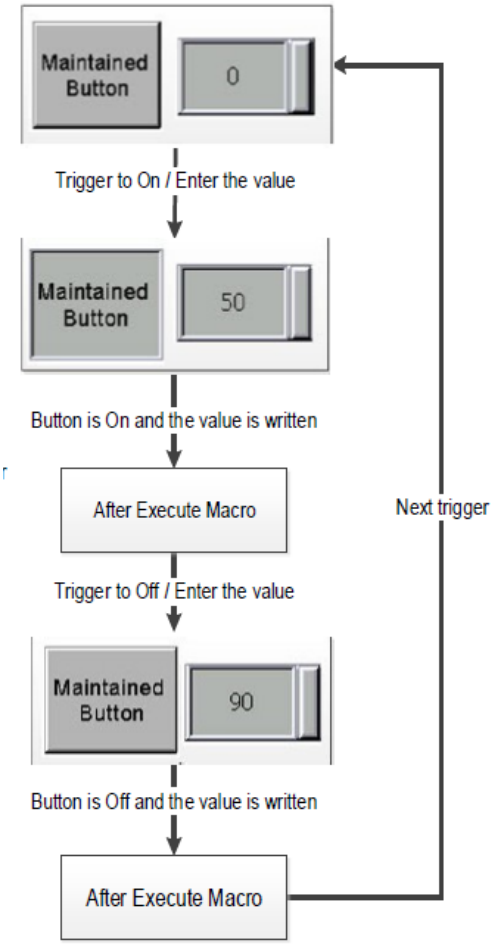


Figure 19 - 6: ComboBox List element Macro property page

No.	Description	
	Before Execute Macro	After Execute Macro
	Flowchart of **Before Execute Macro**:  When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.	Flowchart of **After Execute Macro**:  When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

- Coord.

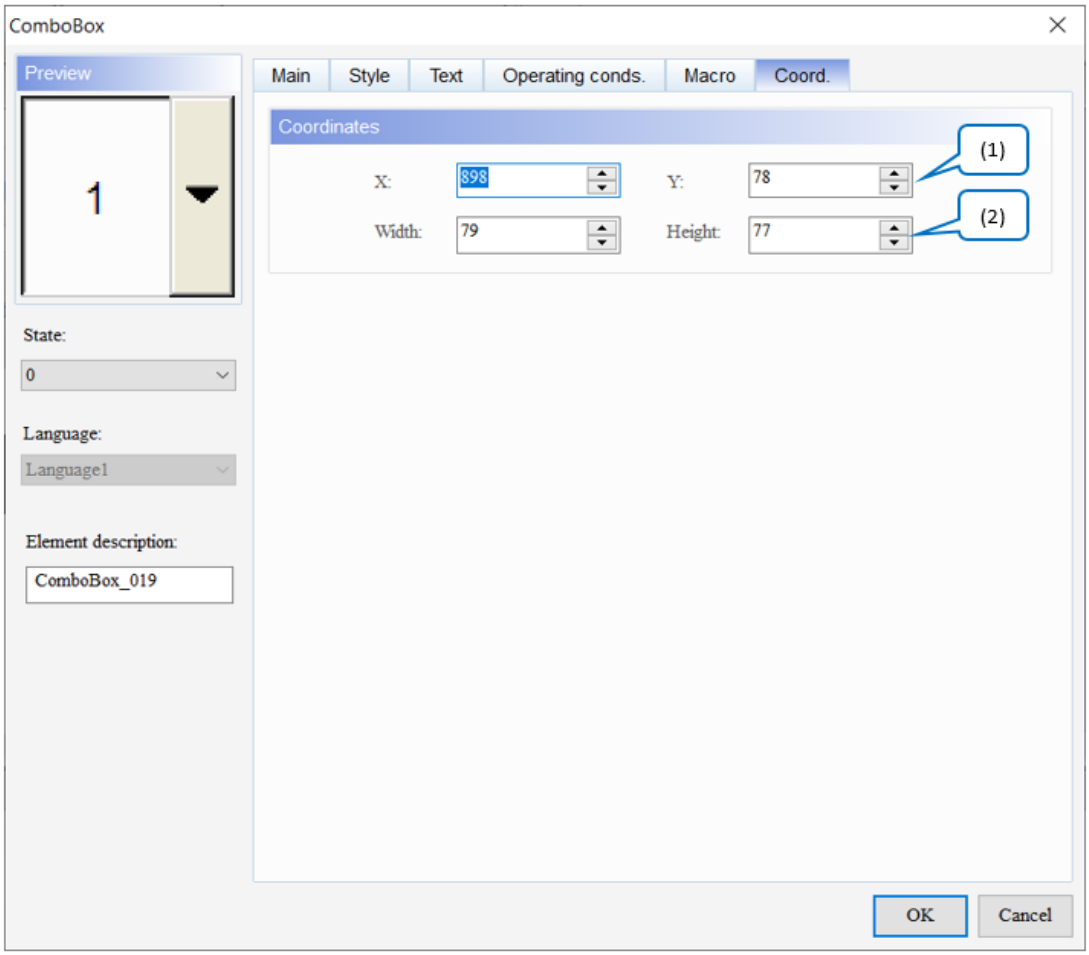


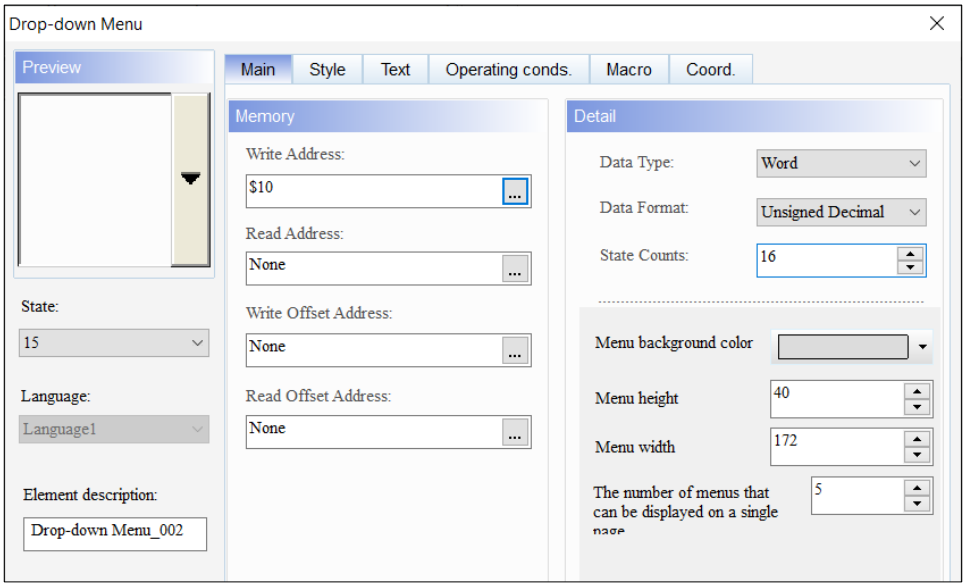
Figure 19 - 7: ComboBox List element Coord. property page

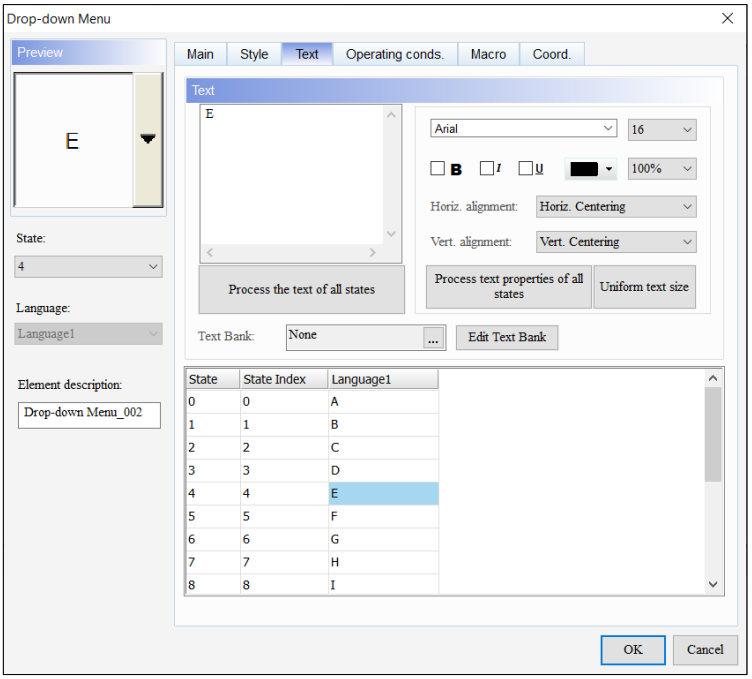
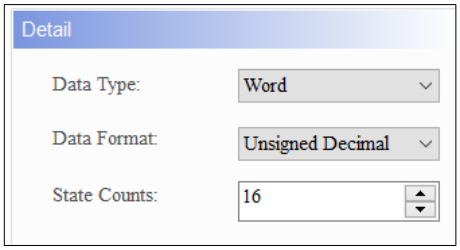
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

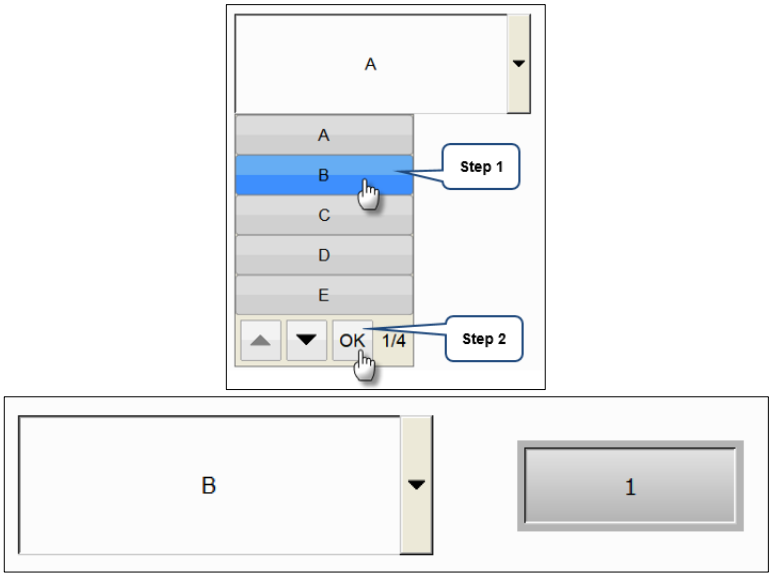
19.2 Drop-down Menu

Drop-down Menu List element provides display messages of multiple states allowing users to select the options for execution. Unlike **ComboBox List** element, after selecting the item to execute in the **Drop-down Menu List** element, click **OK** to complete the selection.

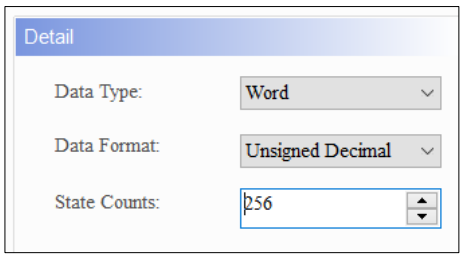
Refer to the following table for example of **Drop-down Menu List** element.

Drop-down Menu List	
Create Drop-down Menu element	● Create a **Drop-down Menu List** element with its **Write Address** as $10. Select Word for the **Data Type**, and then set 16 for the **State Counts** and 5 for **The number of menus that can be displayed on a single page**.  ● On the **Text** property page, edit the text messages to be displayed for the 16 states which are the characters from A ~ P respectively.

<table>
<tr><th colspan="4">Drop-down Menu List</th></tr>
<tr><td></td><td colspan="3"> 
</td></tr>
<tr><td>Create Numeric Display element</td><td colspan="3">Create a Numeric Display element and set its Read Address as $10 and complete the Detail settings.
<table>
<tr><td rowspan="2">Numeric Display</td><td>Read Address</td><td> 
</td></tr>
<tr><td>Detail</td><td> 
</td></tr>
</table></td></tr>
<tr><td>Execution result</td><td colspan="3">After creating the elements, compile and download the data to the HMI. Select the content in the Drop-down Menu List element, then click OK to complete the selection. As the number of menus that can be displayed on a single page is set to 5 in this example, five rows, A, B, C, D, and E are displayed accordingly, and the Numeric Display element shows the state value corresponding to the item users selected in the Drop-down Menu List element.</td></tr>
</table>

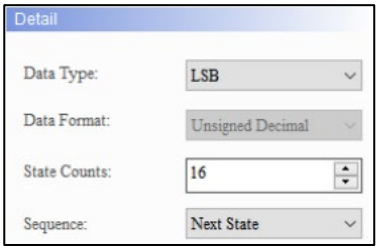
Drop-down Menu List	
	

The **Drop-down Menu List** element supports four types of **Data Type** as shown in the following table. To add or reduce the total number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

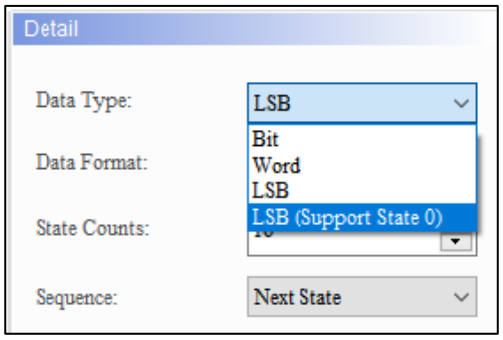
Drop-down Menu List	
Data Type	State Counts
Word	If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states. 

<table>
<tr><th colspan="2">Drop-down Menu List</th></tr>
<tr><th>Data Type</th><th>State Counts</th></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>

When the Data Type is set to LSB, the register data is first converted to binary data. And then, the current object state is defined by using the lowest non-zero bit.
When the Data Type is LSB, users can set 1 ~ 16 states except for State 0.



To display State 0, select LSB (Support State function) for Data Type.

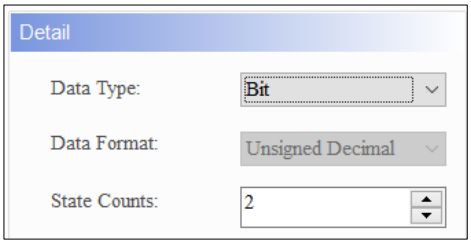


If users select LSB, when State is 0, the element displays black.



If the Data Type is LSB or LSB (Support State 0), the memory address is also in Word as the unit.
The following table illustrates the use of the least significant non-zero bit to determine its state value after converting from decimal to binary. For example, when the decimal values are 3 and 7, how will the DIAScreen determine the lowest bit to determine the displayed status value?

<table>
<tr><th>Decimal</th><th>Binary</th><th>State Value</th></tr>
<tr><td>0</td><td>0000000000000000</td><td>State = 0 when all bits are 0.
Select LSB (Support State 0).</td></tr>
<tr><td>1</td><td>0000000000000001</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>2</td><td>0000000000000010</td><td>The lowest non-zero bit is bit 1, State = 2.</td></tr>
<tr><td>3</td><td>0000000000000011</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="2">Drop-down Menu List</th></tr>
<tr><td>Data Type</td><td>State Counts</td></tr>
<tr><td></td><td>
<table>
<tr><td>4</td><td>0000000000000100</td><td>The lowest non-zero bit is bit 2, State = 3.</td></tr>
<tr><td>7</td><td>0000000000000111</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The lowest non-zero bit is bit 3, State = 4.</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non-zero bit is bit 4, State = 5.</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The lowest non-zero bit is bit 5, State = 6.</td></tr>
<tr><td>64</td><td>0000000001000000</td><td>The lowest non-zero bit is bit 6, State = 7.</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The lowest non-zero bit is bit 7, State = 8.</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The lowest non-zero bit is bit 8, State = 9.</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The lowest non-zero bit is bit 9, State = 10.</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The lowest non-zero bit is bit 10, State = 11</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The lowest non-zero bit is bit 11, State = 12.</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The lowest non-zero bit is bit 12, State = 13.</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non-zero bit is bit 13, State = 14.</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non-zero bit is bit 14, State = 15.</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non-zero bit is bit 15, State = 16.</td></tr>
</table>
</td></tr>
<tr><td>Bit</td><td>If the Data Type is Bit, users can set only 2 states.
 
</td></tr>
</table>

On double-clicking the **Drop-down Menu List** element, the property page appears as follows.

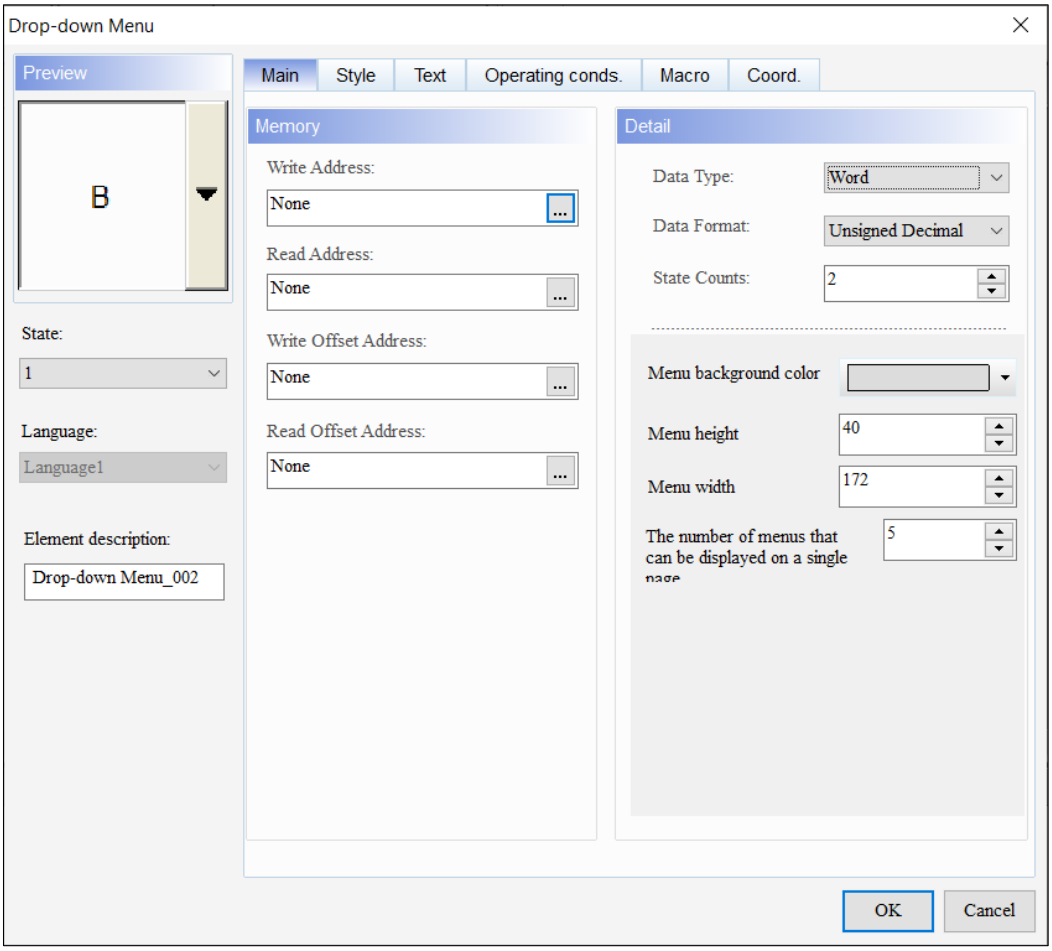


Figure 19 - 8: Drop-down Menu List element property page

Drop-down Menu List	
Function	**Description**
Preview	**Drop-down Menu List** element supports multiple state values and multi-language data display.
Main	Set the Write Address, Read Address, Write Offset Address, Read Offset Address, Data Type, Data Format, and State Counts. Set the Menu background color, Menu height, Menu width, and The number of menus that can be displayed on a single page.
Style	Set the Border Color and Background Color.
Text	Set the text content to display / font / size / color / format / scale / alignment type.

Drop-down Menu List	
Function	**Description**
Operating conds.	Set the options of Interlock State, Interlock Display Mode, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, User Security Level, Set Low Security, and Confirm Window.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord,	Set the X and Y coordinates, Width, and Height of the elements.

- Main

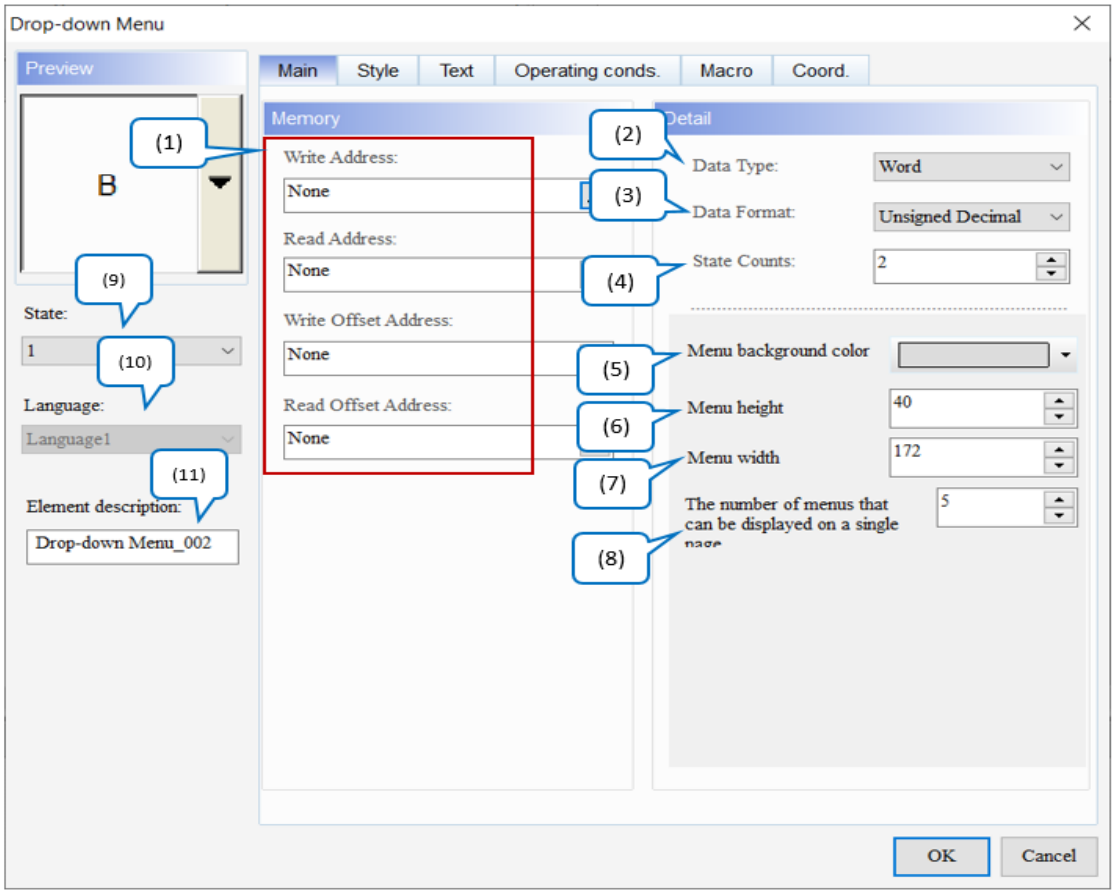
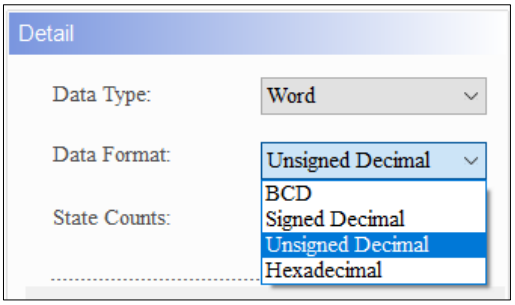
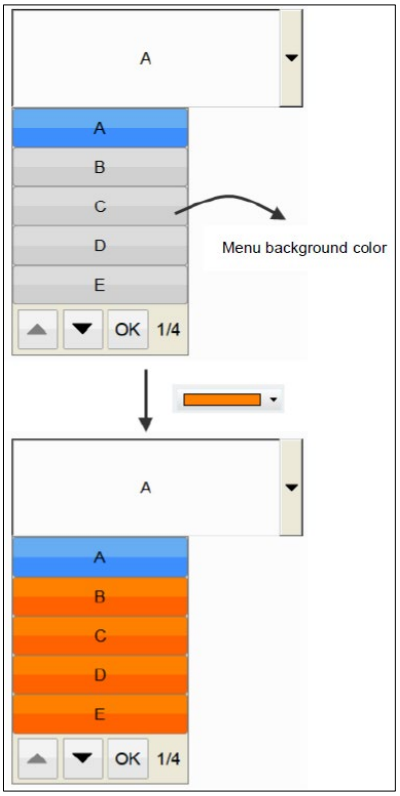
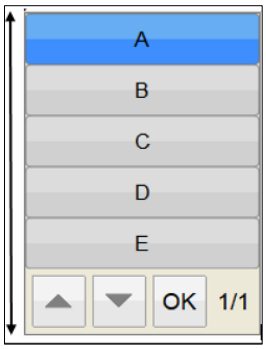
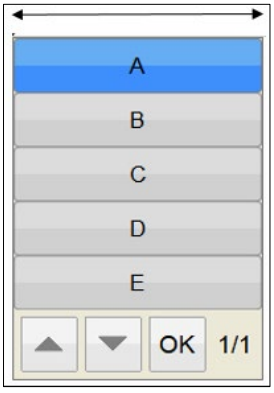
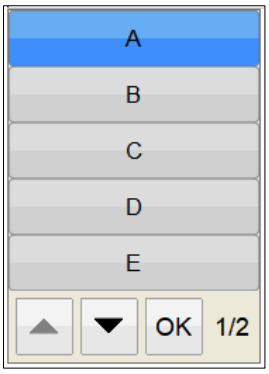
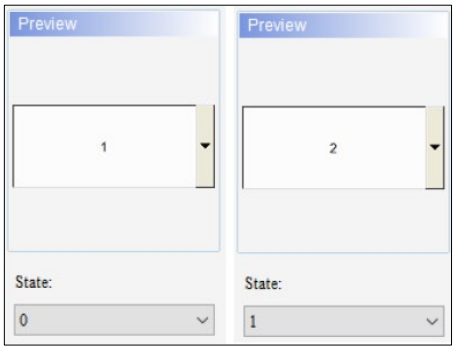
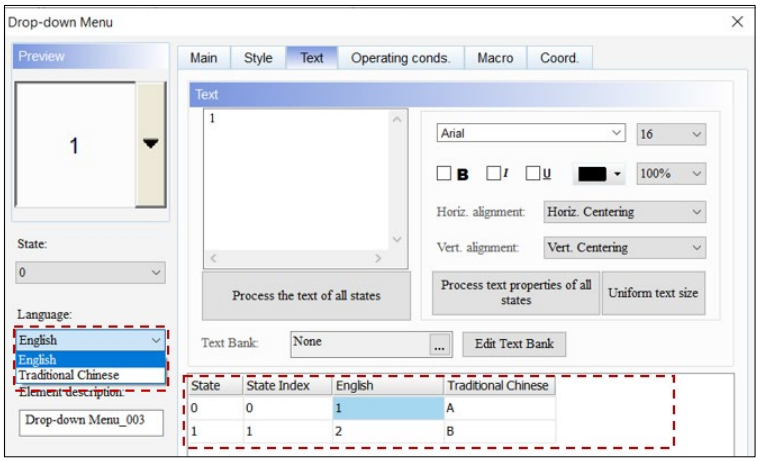


Figure 19 - 9: Drop-down Menu List element Main property page

No.	Function	Description
(1)	Write Address	● Select Internal Memory or controller register address.

No.	Function	Description
	Read Address	● The **Input** memory **Type** varies depending on the **Data Type** such as Word, LSB or Bit. If users set **Write Address** without setting **Read Address**, the HMI automatically reads **Write Address** value. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
	Write Offset Address	Refer to *Appendix D Write and Read Offset Address*.
	Read Offset Address	
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0).
(3)	Data Format	● Users can only select the **Data Format** when the **Data Type** is Word. The default value is **Word**. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(4)	State Counts	● Set the **State Counts** of the **Drop-down Menu List** element. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.

No.	Function	Description
(5)	Menu background color	Set the background color of the menu. The default is  . 
(6)	Menu height	Set the height of the menu. The default value is **40**. 
(7)	Menu width	Set the width of the menu. The default value is **172**. 

No.	Function	Description
(8)	The number of menus that can be displayed on a single page	● Set the number of items that can be displayed on a single page of the menu. The default value is **5**. ● If there are more than 5 items, click ▼ or ▲ to turn pages. 
(9)	State	Preview or change the settings of each state of the element by switching **State**. 
(10)	Language	When users set language data, they can edit the text attributes to display through the **Language** setting of the element. 

No.	Function	Description
(11)	Element description	Record the button actions to be executed. The record is also written in the CSV file of the Operation Log Table so users can know what actions have been done.

	Time	Date	Level	Screen	Desc	Action	Pre Value	Change Value
1	13:37:54	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	1	0
2	13:37:56	5/5/2016	8	Screen_22	Level 1 Btn	Set Val	0	1
3	13:38:19	5/5/2016	8	Screen_22		Level Switch	8	4
4	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	0	1
5	13:38:21	5/5/2016	4	Screen_22	Level 2 Btn	Set Val	1	0
6	13:38:22	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	0	1
7	13:38:23	5/5/2016	4	Screen_22	Level 4 Btn	Set Val	1	0
8	13:38:31	5/5/2016	4	Screen_22		Level Switch	4	8
9	13:38:35	5/5/2016	8	Screen_22	$100 Value	Set Val	85	25

- Style

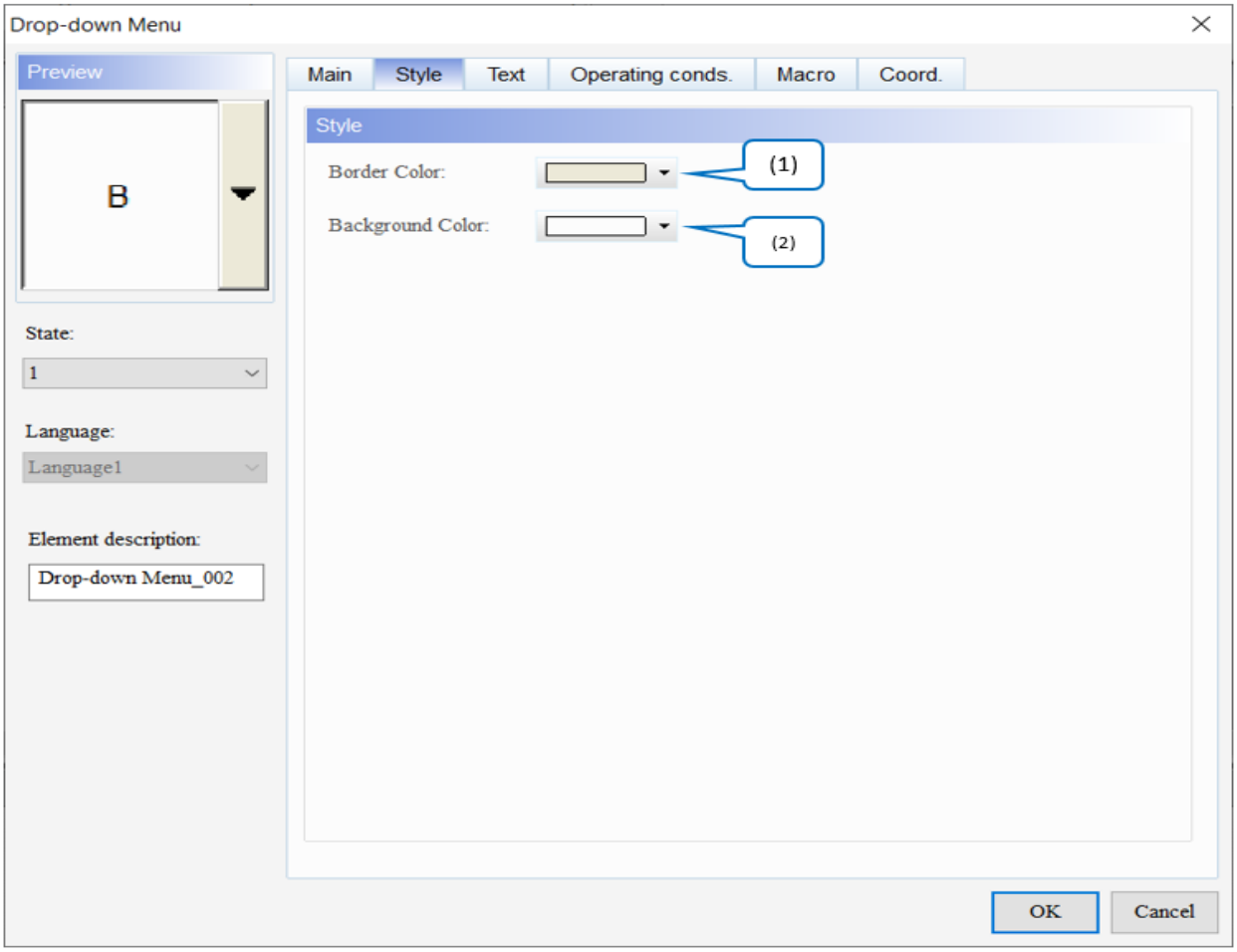
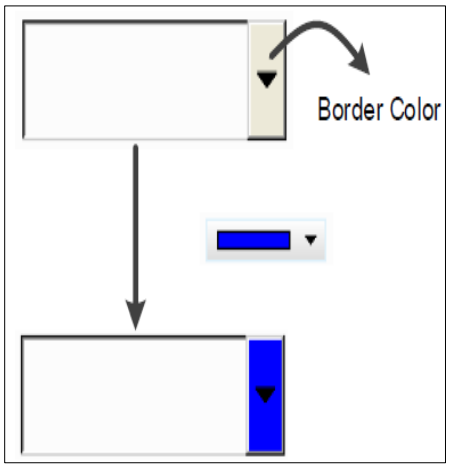
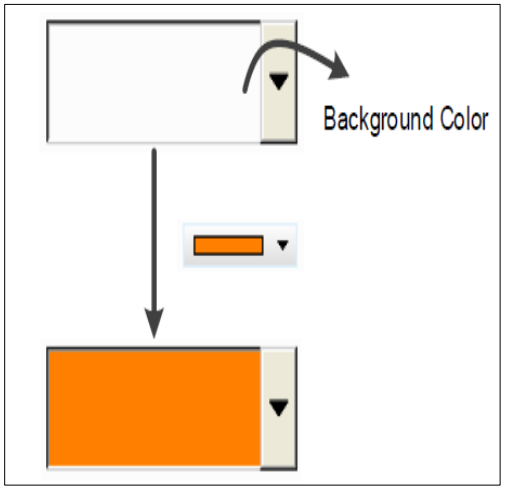


Figure 19 - 10: Drop-down Menu List element Style property page

No.	Function	Description
(1)	Border Color	Set the border color of the element. The default is  . 
(2)	Background Color	Set the background color of the element. The default is  . 

- Text

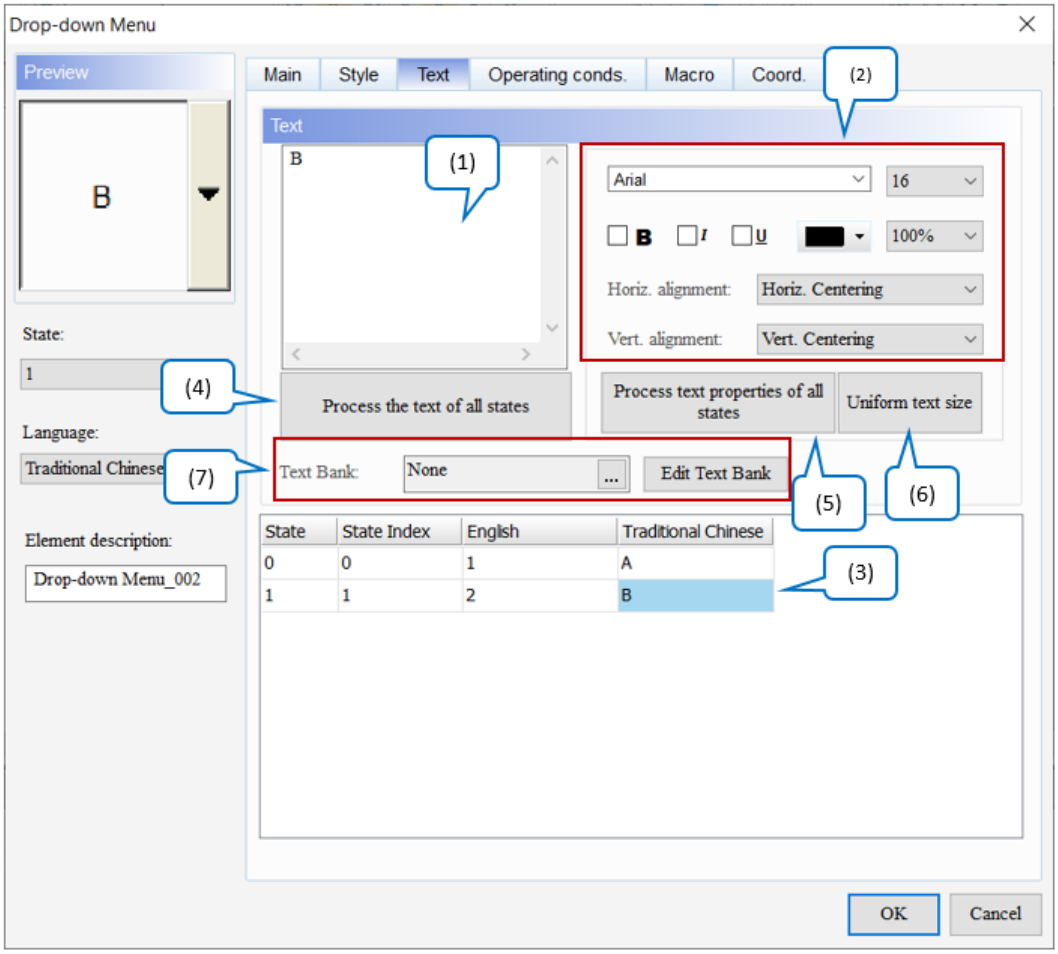
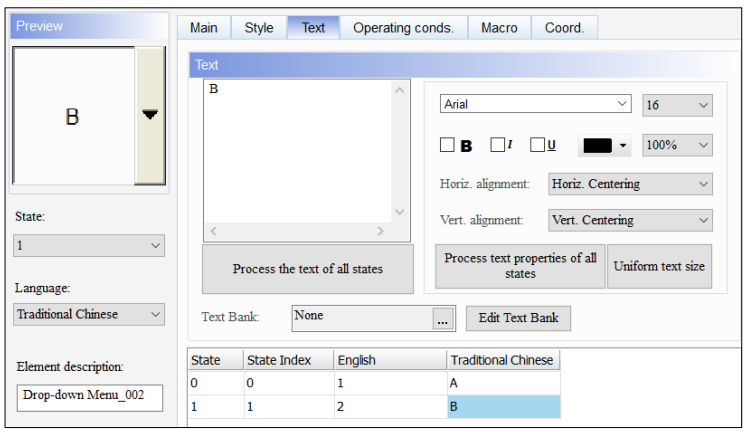
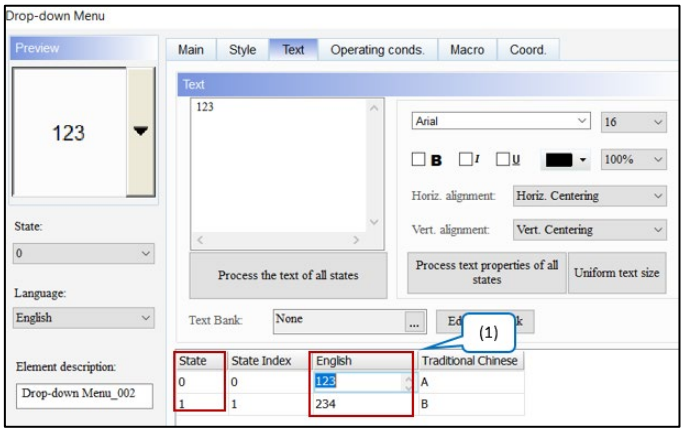
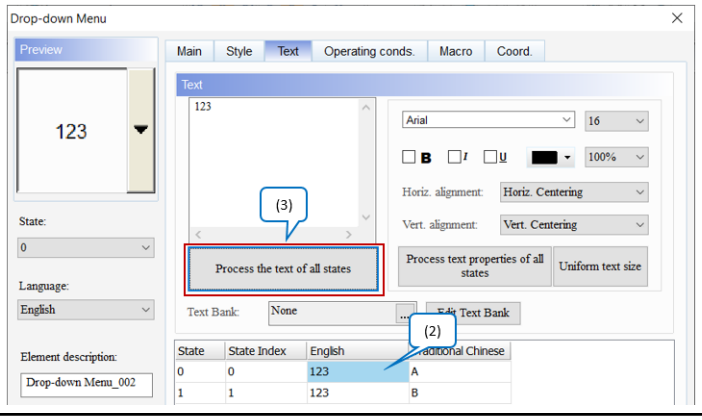
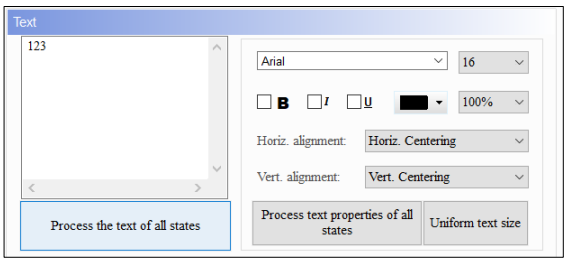


Figure 19 - 11: Drop-down Menu List element Text property page

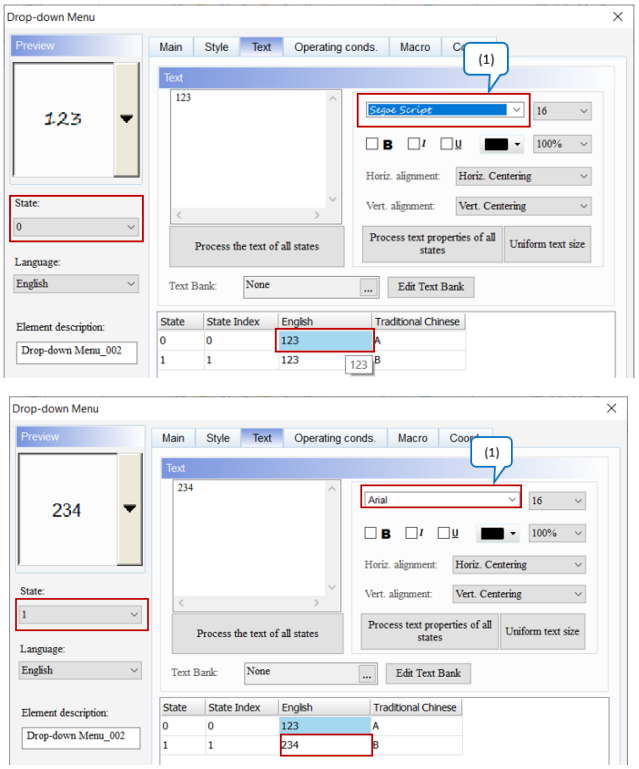
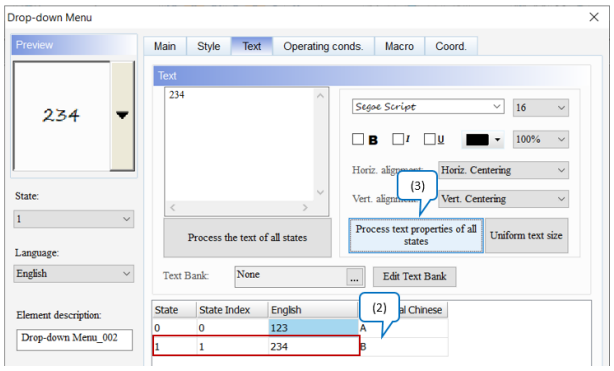
No.	Function	Description
(1)	Text	● Enter the text to display in this box.  ● As long as the element allows text input, click the element

No.	Function	Description
		and press the space key to start editing the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the texts.
(3)	Edit Multi-language text	If users have added multi-language texts, the **Text** property page allows to edit multi-language data.
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state users select. ● The following illustrates the steps: 1. Enter *123* to State 0, and *234* to State 1. 2. Click State 0. 3. Click **Process the text of all states**, and State 1 text changes to *123*. Before Change  After Change 
(5)	Process text properties of all states	● This function changes all the text properties based on the state users select. Items included in the **Text** property page are shown in the following figure. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>

The following is an example description with the steps to follow:
The following is an example description:

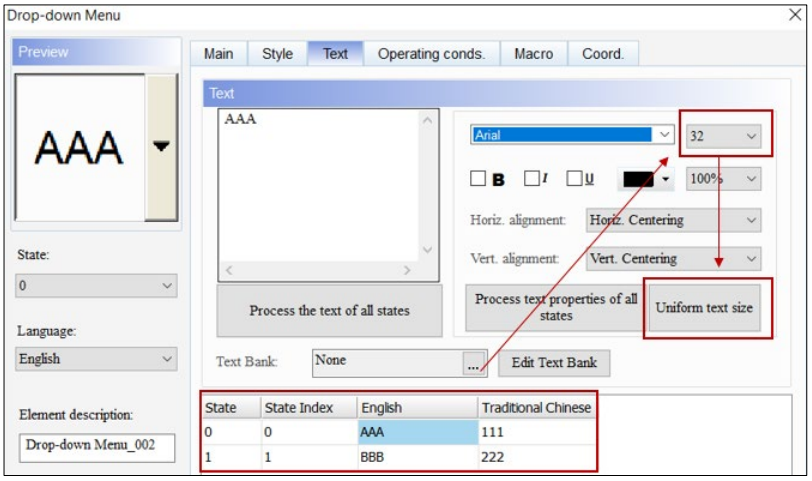
Enter 123 to State 0, and set the font to Segoe Script; enter 234 to State 1, and set the font to Arial.
Click State 0.
Click Process text properties of all states, and State 1 font changes to Segoe Script.

<table>
<tr><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Uniform text size</td><td>

This function is for all language texts, and changes the size of all texts at one time according to the currently selected state.
The following is an example description and steps:

To configure multiple languages, refer to Section 25.1 Multi-language Settings.
Select the state to change the text size.

</td></tr>
</table>

No.	Function	Description
		3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Operating conds.

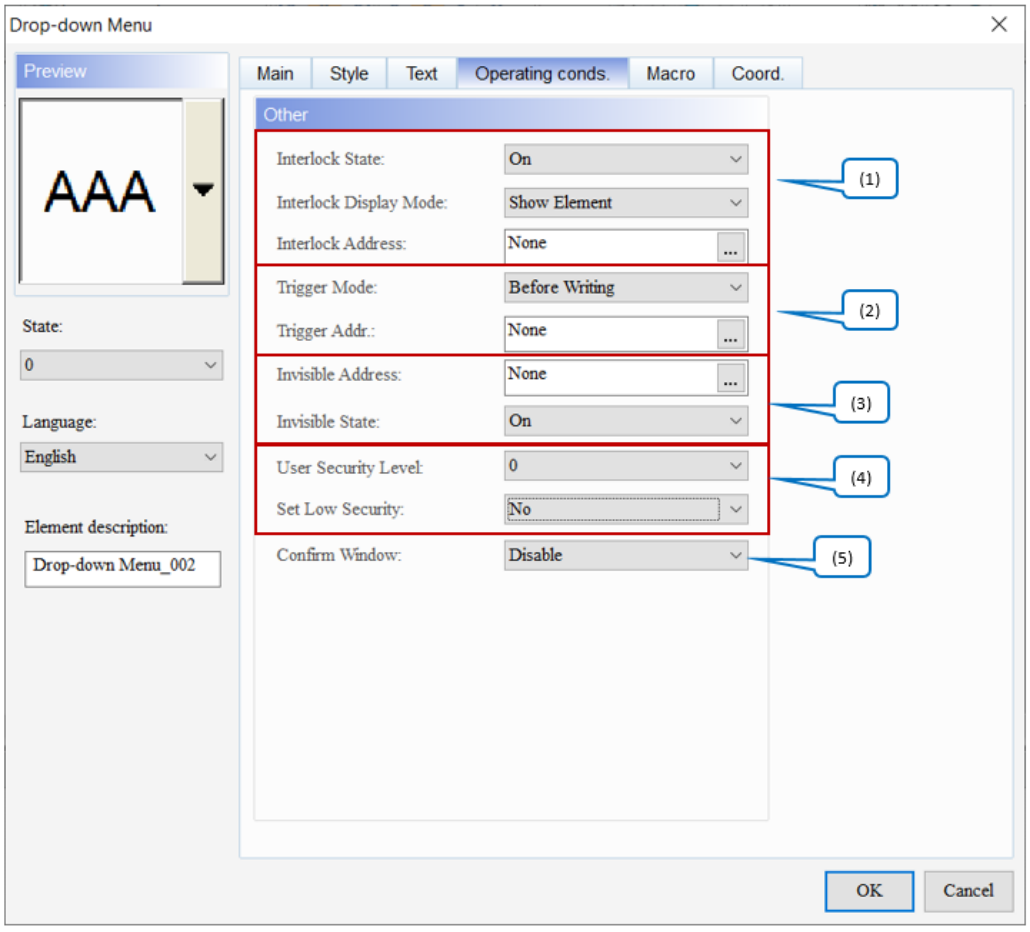
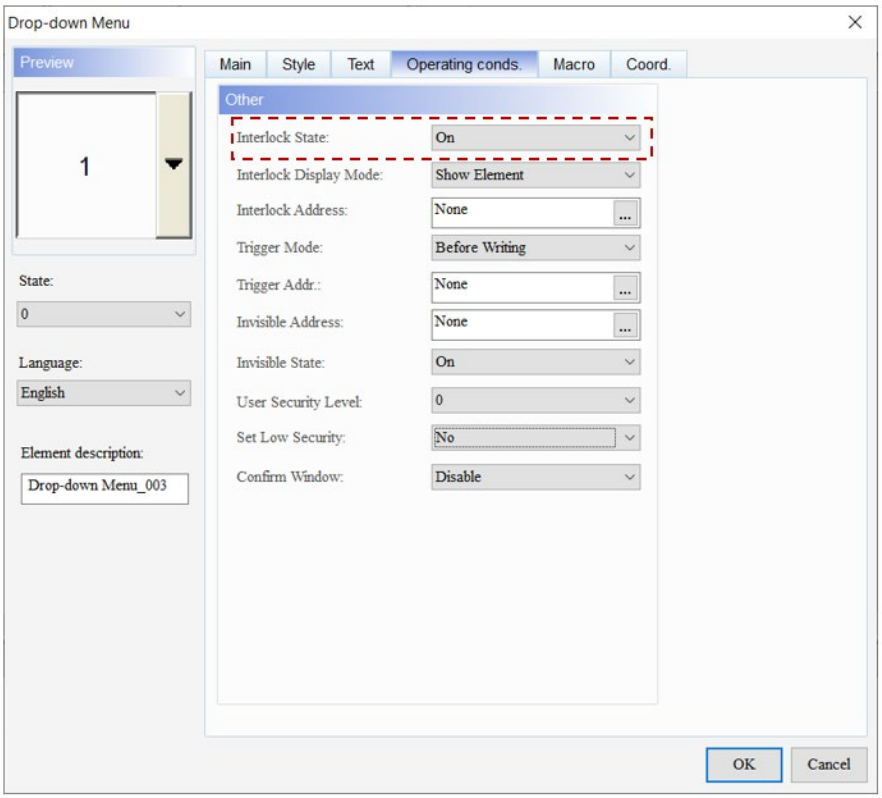
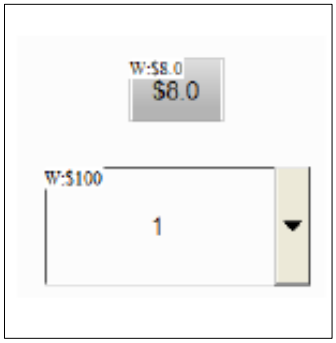
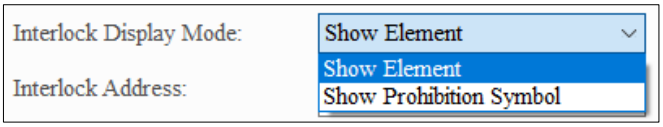
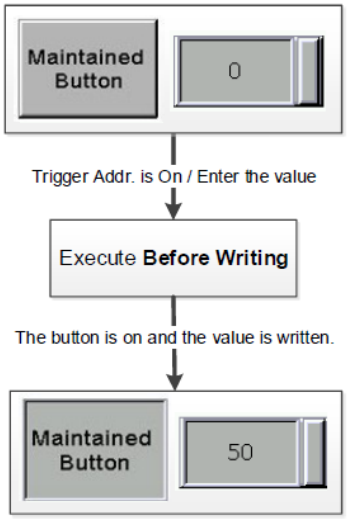
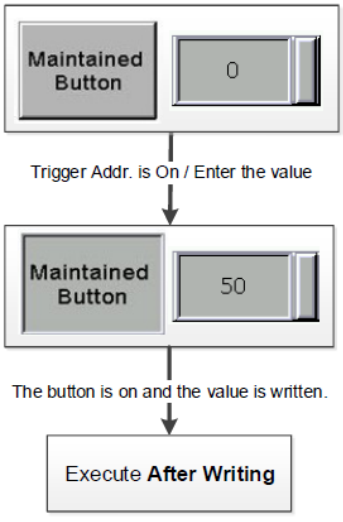


Figure 19 - 12: Drop-down Menu List element operating conds. property page

No.	Function	Description
(1)	Interlock State	● The **Interlock Address** enables to operate a certain element from this particular address, which must be operated along with the **Interlock State**. ● If the **Interlock State** is set to Off/On, the **Interlock Address** enables to operate a certain element from this particular address. The default value is **On**. ● The behavior is as follows: 1. Create an element, and set its address to $8.0. Then, set the **Interlock Address** to $8.0 for the **Drop-down Menu List** element with address $100. 2. To obtain the correct state value after users press **Drop-down Menu List** element, they must first press the $8.0 button to validate the action of the **Drop-down Menu List** element.
	Interlock Address	 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Interlock Display Mode</td><td>The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.
 

<table>
<tr><td>Show Element</td><td>  </td></tr>
<tr><td>Show Prohibition Symbol</td><td>  </td></tr>
</table></td></tr>
<tr><td rowspan="2">(2)</td><td>Trigger Mode</td><td>● The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.
<table>
<tr><td>Triggering action</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td></td><td>Trigger Addr. must be set to On before the value changes.</td><td>Value is changed before the Trigger Addr. is set to On.</td></tr>
</table></td></tr>
<tr><td>Trigger Addr.</td><td>● The triggering function only switches the set Trigger Addr. to On, so if triggering again is required, users need to set the Trigger Addr. to Off.
<table>
<tr><th>Flowchart of Before Writing</th><th>Flowchart of After Writing</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(3)</td><td>Invisible Address</td><td>

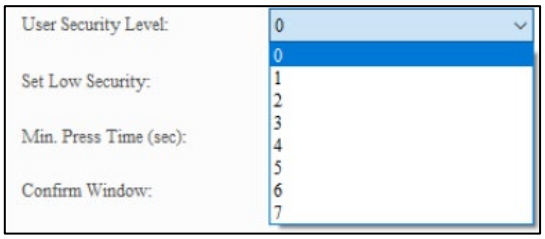
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

1. Create an element, and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
2. To hide the element, first press the $9.0 button.
</td></tr>
<tr><td>Invisible State</td><td>
<table>
<tr><td>Invisible State is On</td><td> 

 
</td></tr>
<tr><td>Invisible State is Off</td><td> 

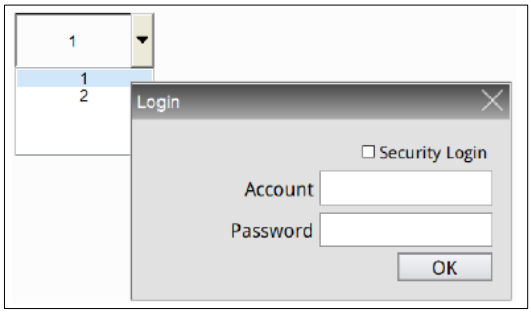
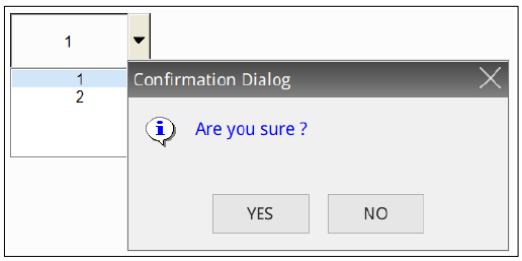
 
</td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>User Security Level</td><td>

This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.



If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting.

</td></tr>
</table>

No.	Function	Description
	Set Low Security	Refer to *Section 5.7.2 Password Table*).  ● If users set the **Set Low Security** to Yes, the HMI automatically sets the security level to the lowest each time users enter the password. Next time users press the element, they will be asked again to enter the password for the corresponding security level. The default value is **No**.
(5)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 

- Macro

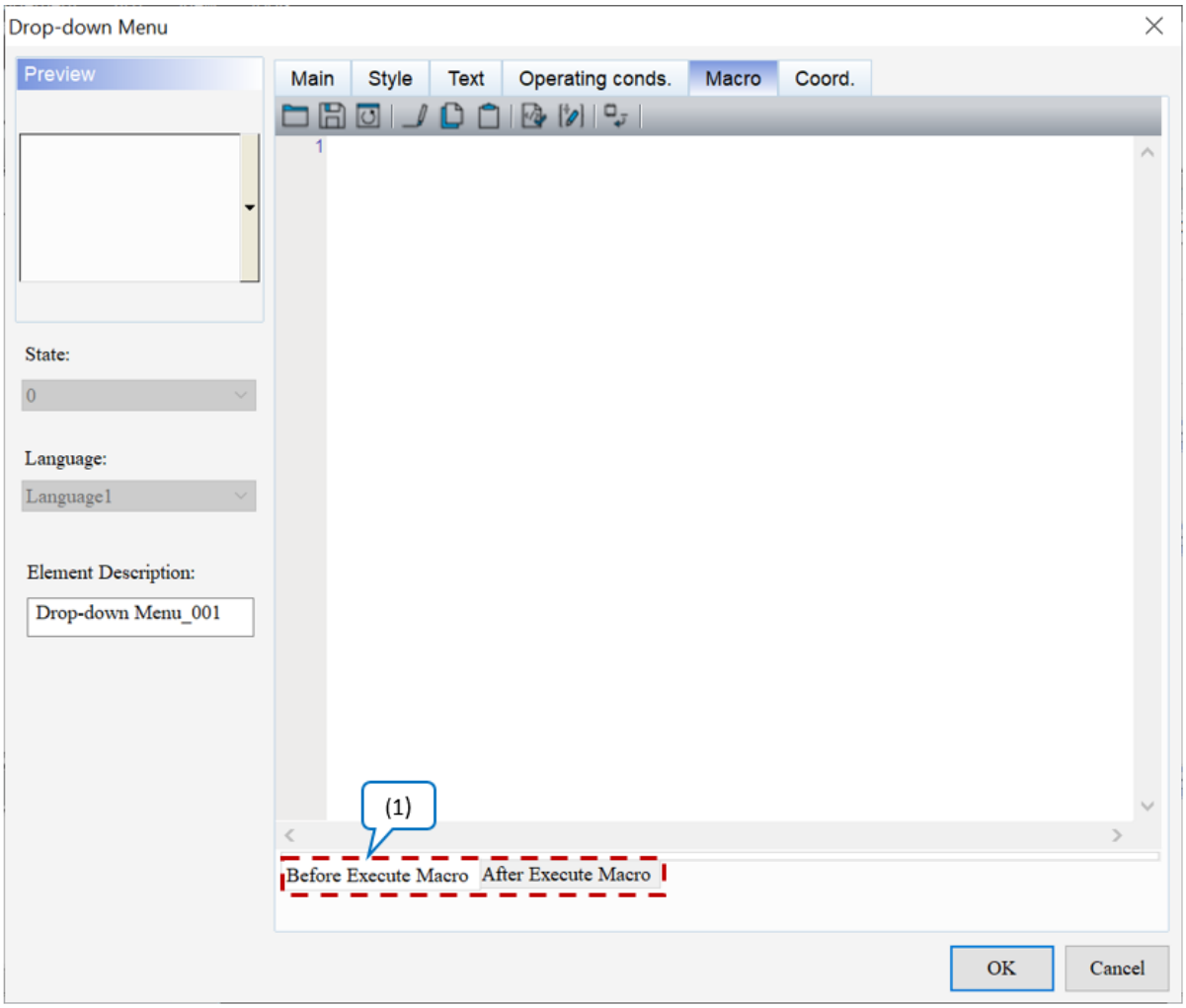
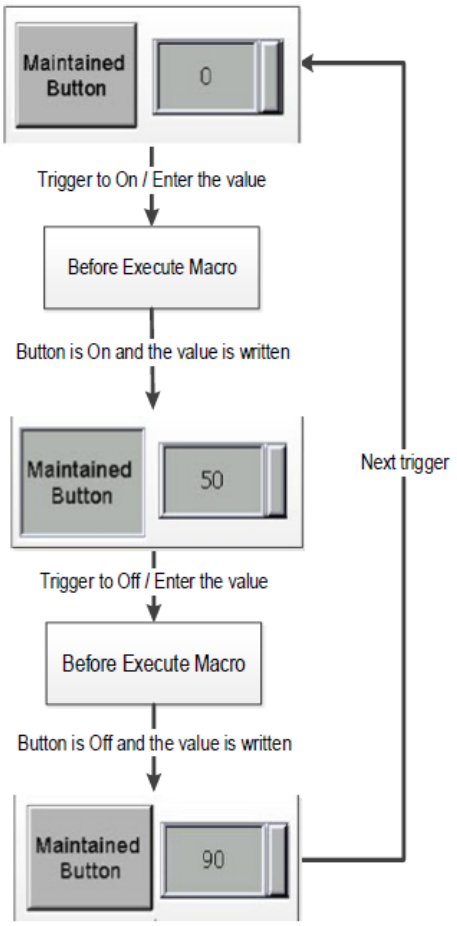
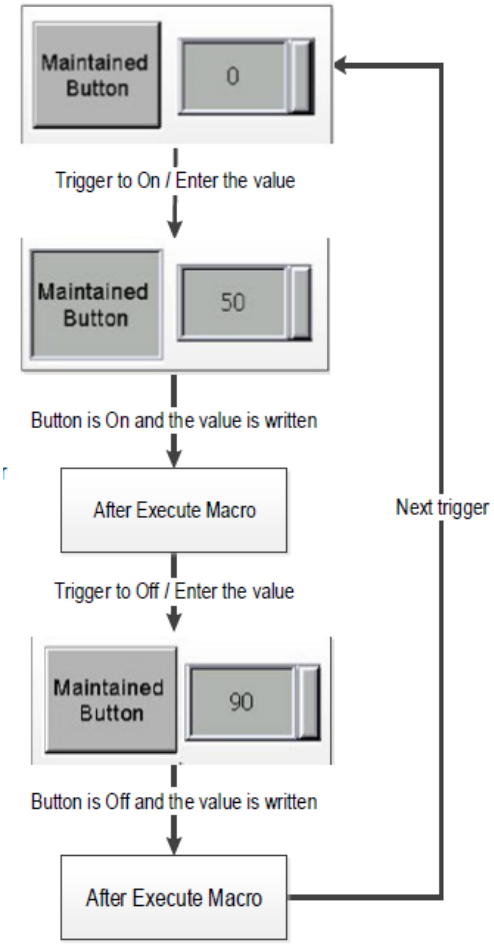


Figure 19 - 13: Drop-down Menu List element Macro property page

<table>
<tr><th rowspan="2">No.</th><th colspan="2">Description</th></tr>
<tr><th>Before Execute Macro</th><th>After Execute Macro</th></tr>
<tr>
<td></td>
<td>Flowchart of Before Execute Macro:
 

When users press the Button element, the HMI first executes the Macro commands and then executes the Button actions. If the Button states are not changed with the Button touch (using external controller commands or other macros instead), the HMI does not execute the Macro commands.</td>
<td>Flowchart of After Execute Macro:
 

When users press the Button element, the HMI first executes the Button actions and then executes the Macro commands. If the Button states are not changed with the Button touch (using external controller commands or other macros instead), the HMI does not execute the Macro commands.</td>
</tr>
</table>

- Coord.

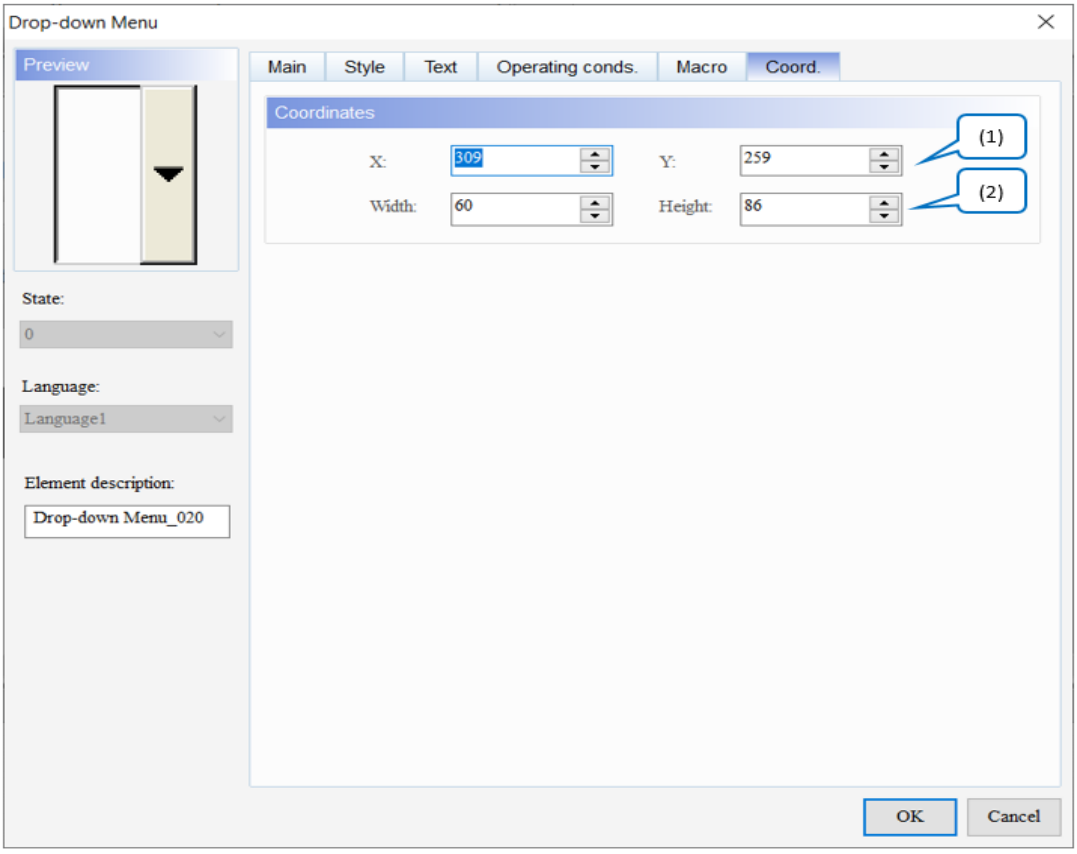


Figure 19 - 14: Drop-down Menu List element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

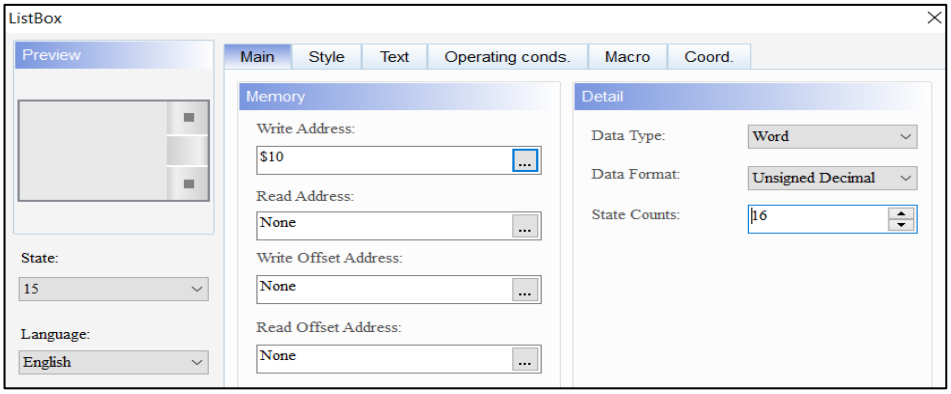
19.3 ListBox

Same as the **ComboBox List** element, the **ListBox List** element provides display messages of multiple states, but the **ListBox List** element allows users to view and select the options in a more intuitive way.

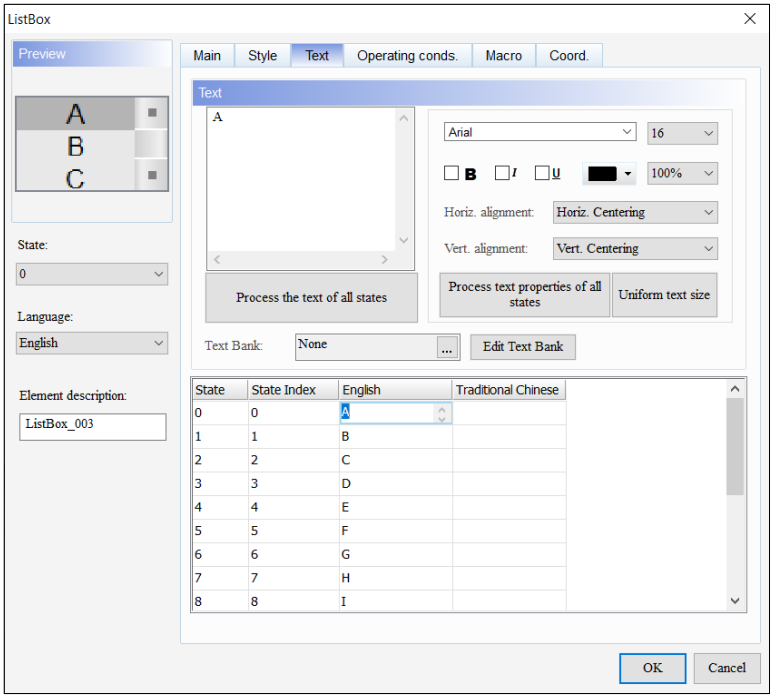
Refer to the following table for the **ListBox List** element example.

<table>
<tr><th colspan="3">ListBox List</th></tr>
<tr><td>Create ListBox element</td><td colspan="2">

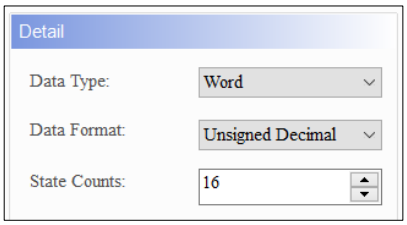
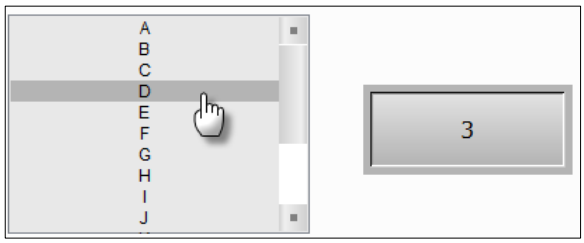
Create a ListBox List element with its Write Address as $10 select Word for the Data Type and then set the State Counts to 16.



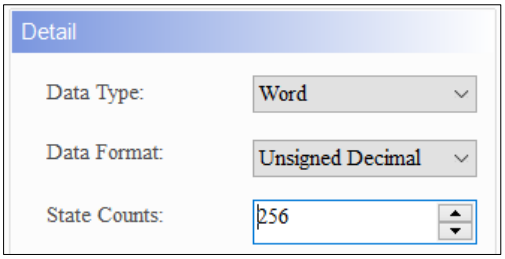
On the Text property page, edit the text messages to be displayed for the 16 states which are the characters from A ~ P respectively.

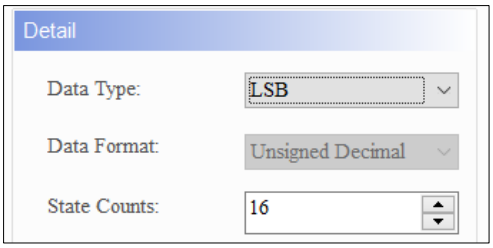


</td></tr>
<tr><td>Create Numeric Display element</td><td colspan="2">Create a Numeric Display element and set its Read Address as $10 and complete the Detail settings.
<table>
<tr><td>Numeric Display element</td><td>Read Address</td><td> 
</td></tr>
</table>
</td></tr>
</table>

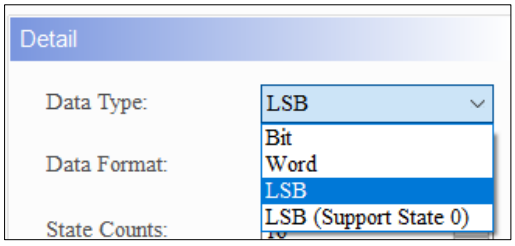
ListBox List			
		Detail	
Execution result	After creating the elements, compile and download the data to the HMI. The **Numeric Display** element shows the state value corresponding to the item users selected in the **ListBox List** element. 		

ListBox List element supports four types of **Data Type** as shown in table. If users need to add or reduce the total number of states, simply increase or decrease the number of **State Counts** in the **Main** property page.

ListBox List	
Data Type	State Counts
Word	If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states.  ● When the **Data Type** is set to LSB, the register data is first converted to binary data. And then, the current object state is defined by using the lowest non-zero bit. ● If the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states except for State 0.

<table>
<tr><th colspan="2">ListBox List</th></tr>
<tr><td>Data Type</td><td>State Counts</td></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>LSB / LSB (Support State 0)</td><td>

To display State 0, select LSB (Support State function) for Data Type.

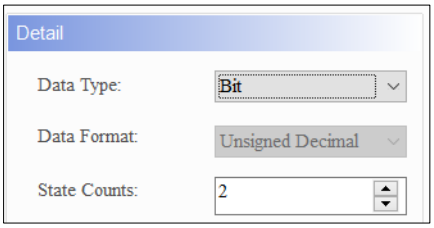


If the users select LSB, when the State is 0, the element displays black.



If the Data Type is LSB or LSB (Support State 0), the memory address is also in Word as the unit.
The following table illustrates the use of the least significant non-zero bit to determine its state value after converting from decimal to binary. For example, when the decimal values are 3 and 7, how will the DIAScreen determine the lowest bit to determine the displayed status value?

<table>
<tr><th>Decimal</th><th>Binary</th><th>State Value</th></tr>
<tr><td>0</td><td>0000000000000000</td><td>State = 0 when all bits are 0.
Select LSB (Support State 0).</td></tr>
<tr><td>1</td><td>0000000000000001</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>2</td><td>0000000000000010</td><td>The lowest non-zero bit is bit 1, State = 2.</td></tr>
<tr><td>3</td><td>0000000000000011</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>4</td><td>0000000000000100</td><td>The lowest non-zero bit is bit 2, State = 3.</td></tr>
<tr><td>7</td><td>0000000000000111</td><td>The lowest non-zero bit is bit 0, State = 1.</td></tr>
<tr><td>8</td><td>0000000000001000</td><td>The lowest non-zero bit is bit 3,</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="2">ListBox List</th></tr>
<tr><td>Data Type</td><td>State Counts</td></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td>State = 4.</td></tr>
<tr><td>16</td><td>0000000000010000</td><td>The lowest non-zero bit is bit 4, State = 5.</td></tr>
<tr><td>32</td><td>0000000000100000</td><td>The lowest non-zero bit is bit 5, State = 6.</td></tr>
<tr><td>64</td><td>0000000001000000</td><td>The lowest non-zero bit is bit 6, State = 7.</td></tr>
<tr><td>128</td><td>0000000010000000</td><td>The lowest non-zero bit is bit 7, State = 8.</td></tr>
<tr><td>256</td><td>0000000100000000</td><td>The lowest non-zero bit is bit 8, State = 9.</td></tr>
<tr><td>512</td><td>0000001000000000</td><td>The lowest non-zero bit is bit 9, State = 10.</td></tr>
<tr><td>1024</td><td>0000010000000000</td><td>The lowest non-zero bit is bit 10, State = 11</td></tr>
<tr><td>2048</td><td>0000100000000000</td><td>The lowest non-zero bit is bit 11, State = 12.</td></tr>
<tr><td>4096</td><td>0001000000000000</td><td>The lowest non-zero bit is bit 12, State = 13.</td></tr>
<tr><td>8192</td><td>0010000000000000</td><td>The lowest non-zero bit is bit 13, State = 14.</td></tr>
<tr><td>16384</td><td>0100000000000000</td><td>The lowest non-zero bit is bit 14, State = 15.</td></tr>
<tr><td>32768</td><td>1000000000000000</td><td>The lowest non-zero bit is bit 15, State = 16.</td></tr>
</table>
</td></tr>
<tr><td>Bit</td><td>If the Data Type is Bit, users can set only 2 states.
 
</td></tr>
</table>

On double-clicking the **ListBox List** element, the property page appears as follows.

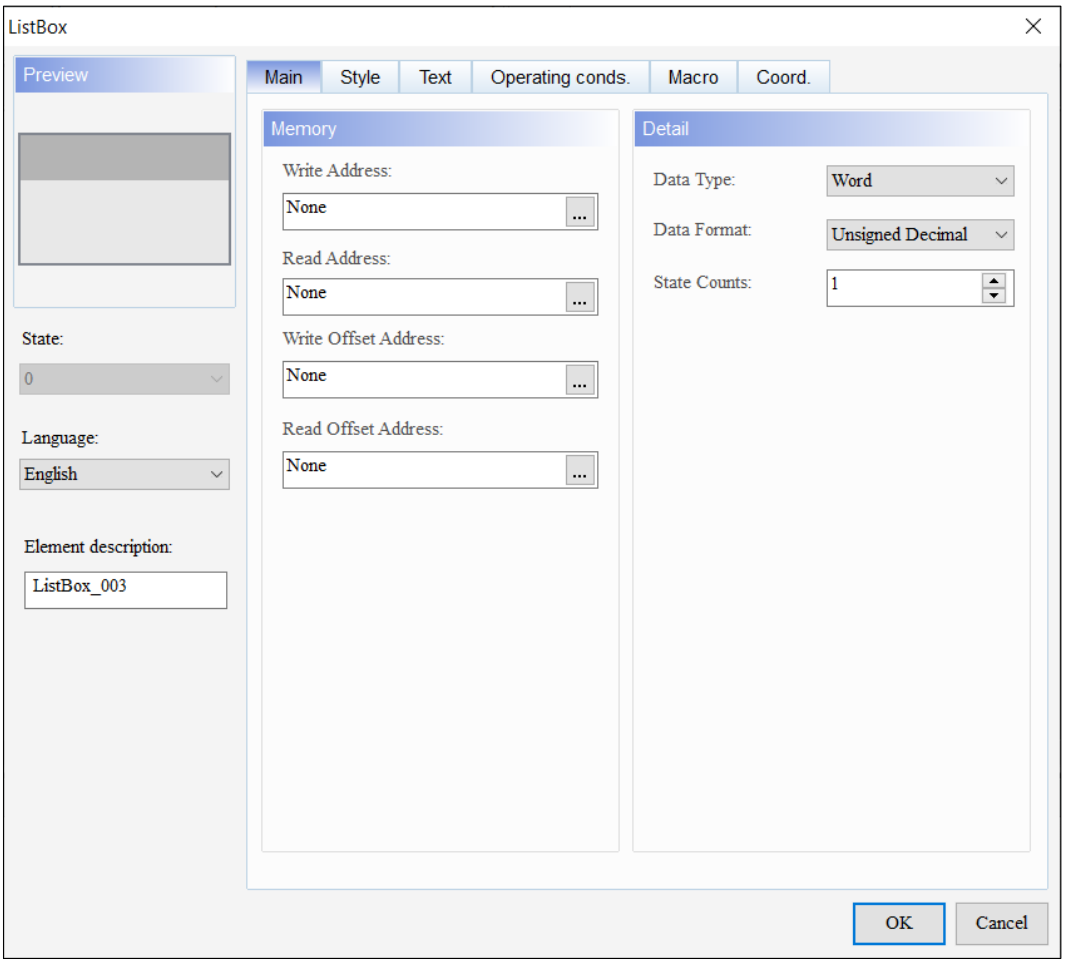


Figure 19 - 15: ListBox List element property page

ListBox List	
Function	**Description**
Preview	**ListBox List** element supports multiple state values and multi-language data display.
Main	Set the Write Address, Read Address, Write Offset Address, Read Offset Address, Data Type, Data Format, and State Counts.
Style	Set the Background Color, Foreground Color, Show Frame and Transparency.
Text	Set the text content, font, size, color, format, zoom, and alignment options.
Operating conds.	Set Interlock State, Interlock Display Mode, Interlock Address, Trigger Mode, Trigger Addr., Invisible Address, User Security Level, Set Low Security, and Confirm Window.
Macro	Set the Before Execute Macro and After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

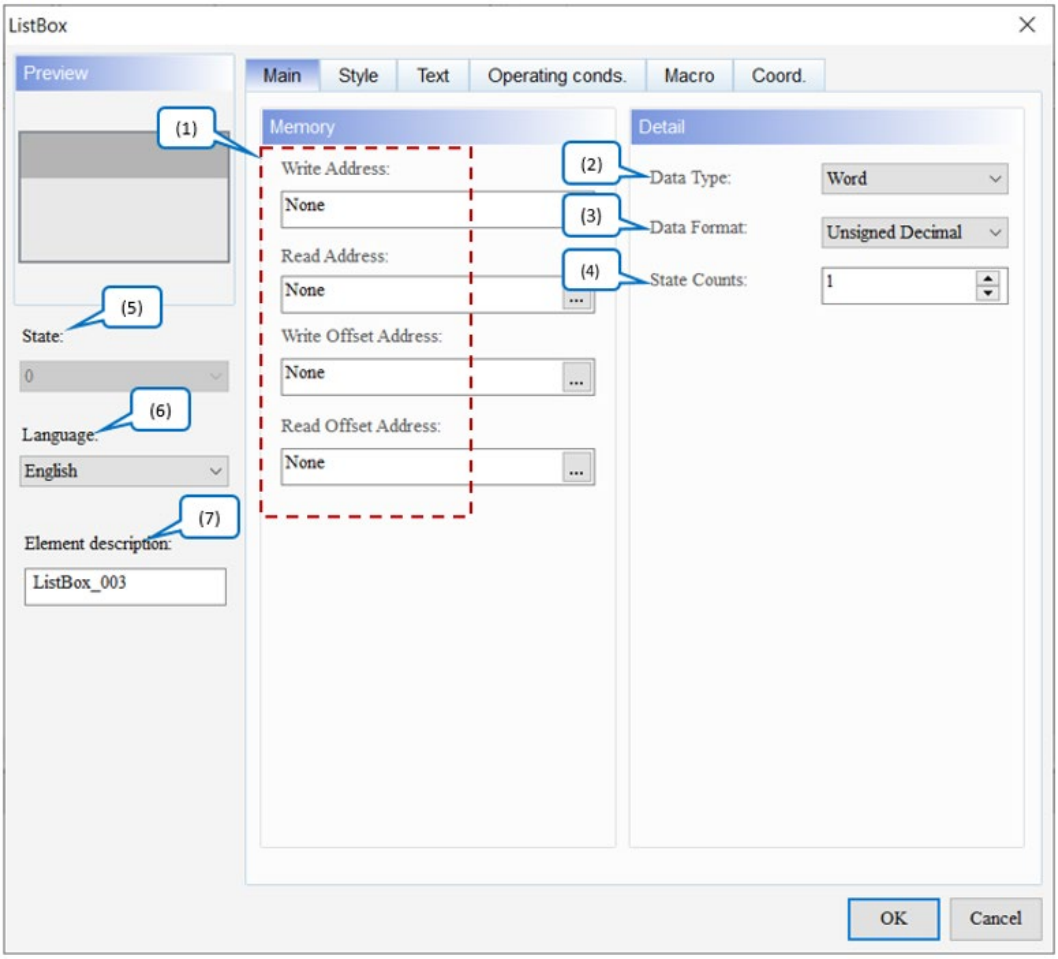
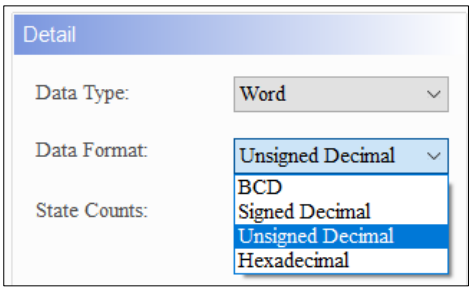
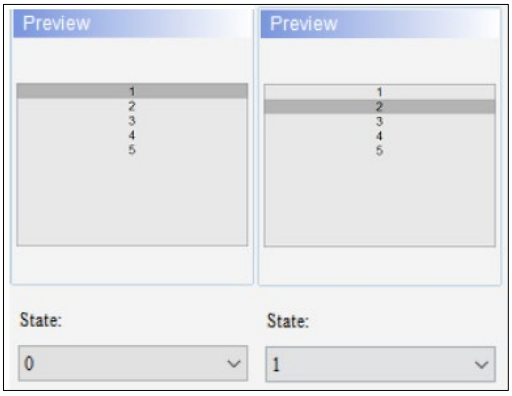
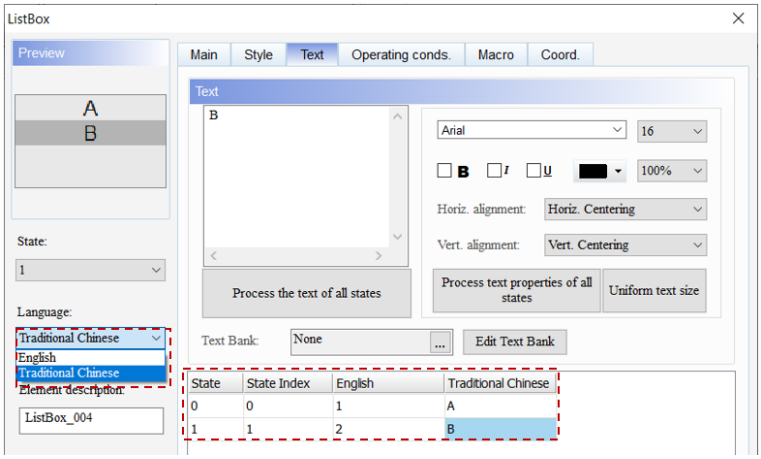
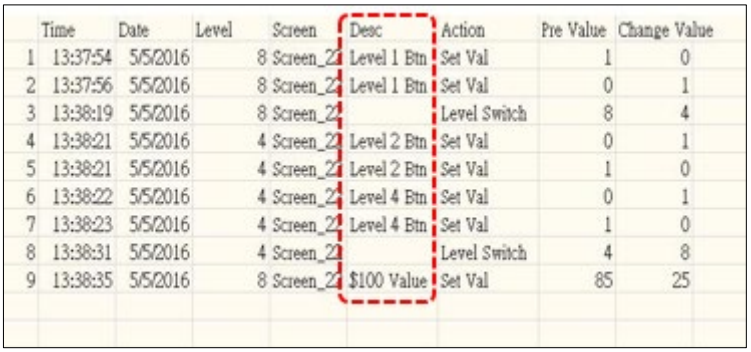


Figure 19 - 16: ListBox List element Main property page

No.	Function	Description
(1)	Write Address	● Select Internal Memory or controller register address. The **Input** memory **Type** varies depending on the **Data Type** such as Word, LSB or Bit. If users set **Write Address** without setting **Read Address**, the HMI automatically reads **Write Address** value. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.
	Read Address	
	Write Offset Address	Refer to *Appendix D Write and Read Offset Address*.
	Read Offset Address	

No.	Function	Description
(2)	Data Type	The available options for **Data Type** are: Bit, Word, LSB, and LSB (Support State 0). The default value is **Word**.
(3)	Data Format	● Users can only select the **Data Format** when the **Data Type** is Word. ● The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(4)	State Counts	● Set the **State Counts** of the **ListBox List** element. The default value is **1**. ● If the **Data Type** is Word, **State Counts** can be set from 1 ~ 256 states; if the **Data Type** is LSB, **State Counts** can be set from 1 ~ 16 states; if the **Data Type** is LSB (Support State 0), **State Counts** can be set from 1 ~ 17 states; and if the **Data Type** is Bit, **State Counts** can be set to only 2 states.
(5)	State	Preview or change the settings of each state of the element by switching **State**. 

No.	Function	Description
(6)	Language	When users set language data, they can edit the text attributes to be displayed through the **Language** setting of the element. 
(7)	Element description	Record the button actions to be executed. The record is also written in the CSV file of the Operation Log Table so users can know what actions have been done. 

- Style

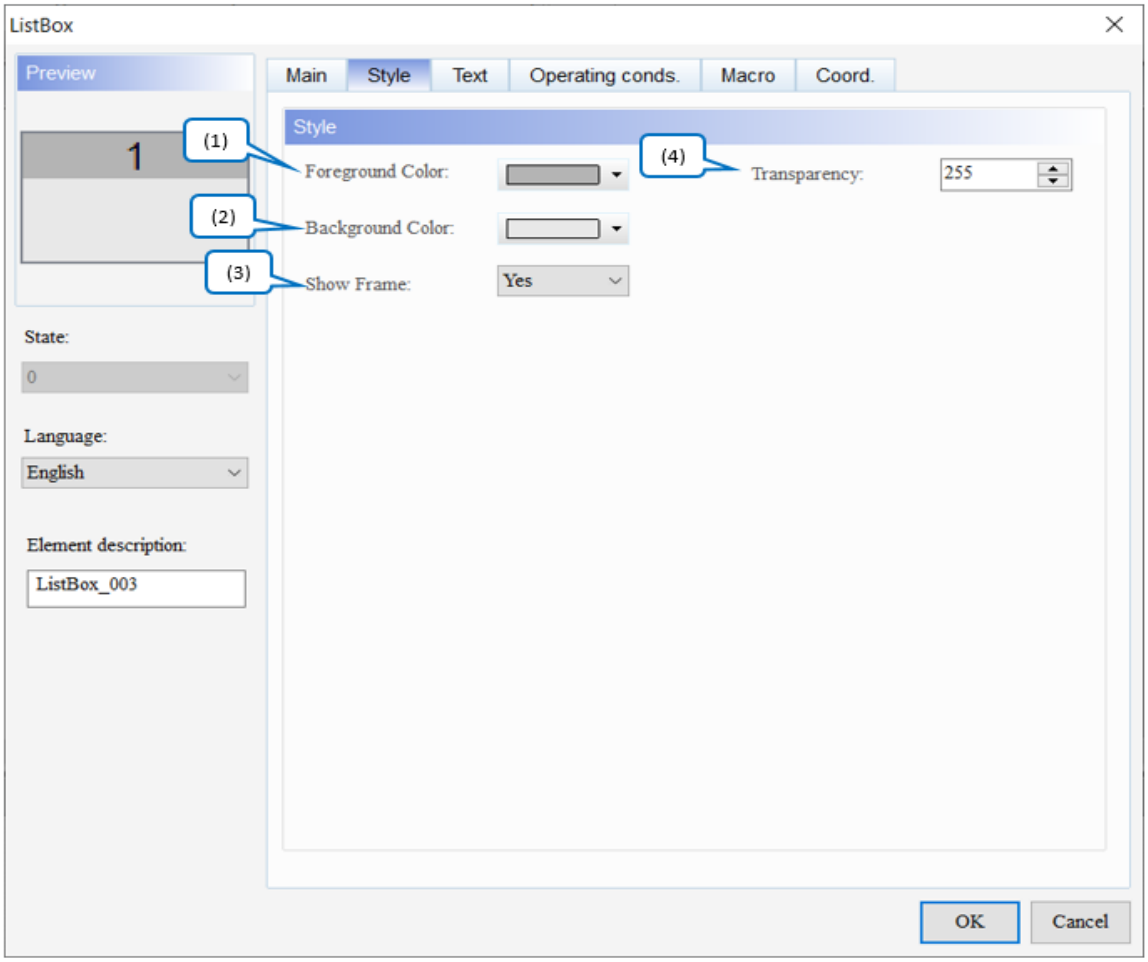
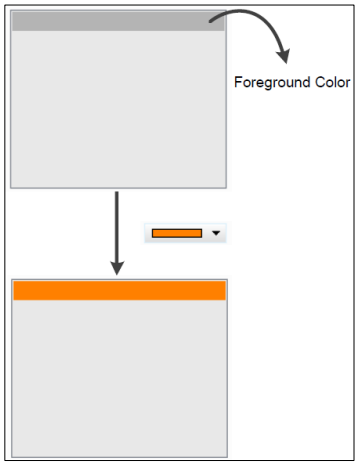
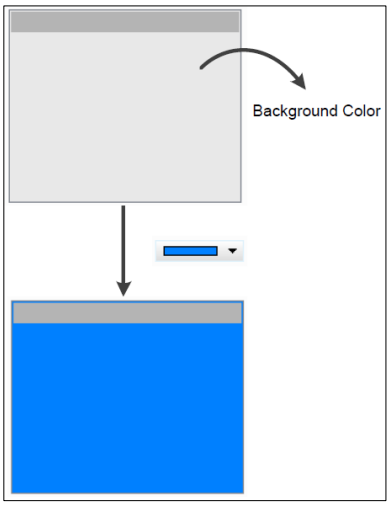
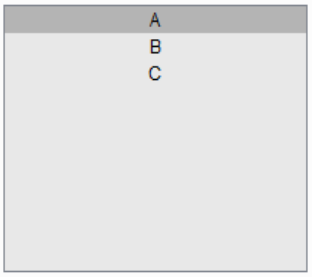
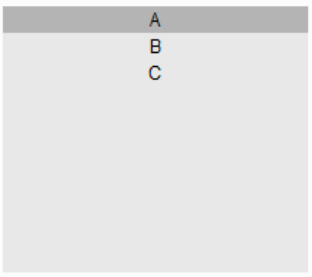


Figure 19 - 17: ListBox List element Style property page

No.	Function	Description
(1)	Foreground Color	Set the foreground color of the element. The default is  . 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Background Color</td><td>Set the background color of the element. The default is  .
 
</td></tr>
<tr><td>(3)</td><td>Show Frame</td><td>Set whether or not to display the border of the ListBox List element. The default value is Yes.
<table>
<tr><th>Show Frame is Yes</th><th>Show Frame is No</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default value is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

- Text

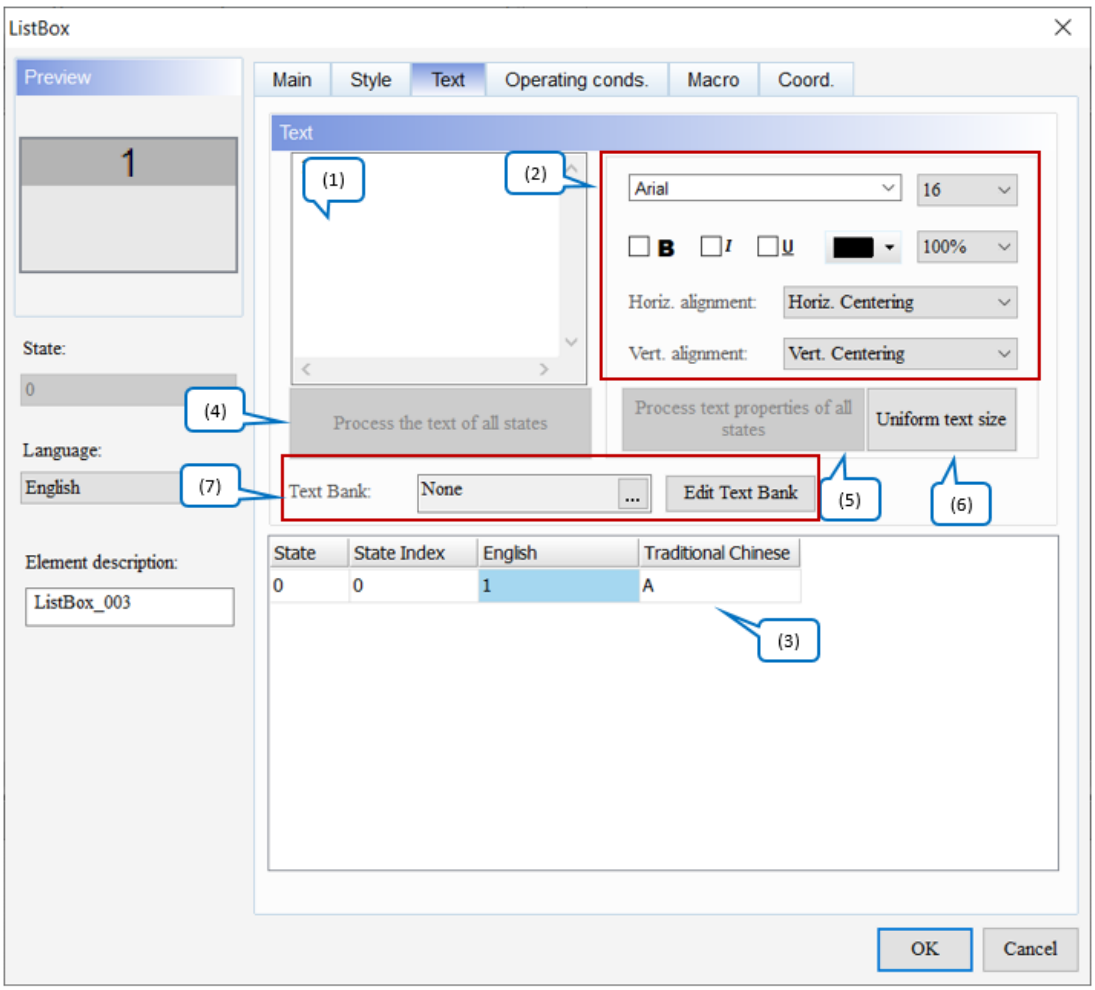
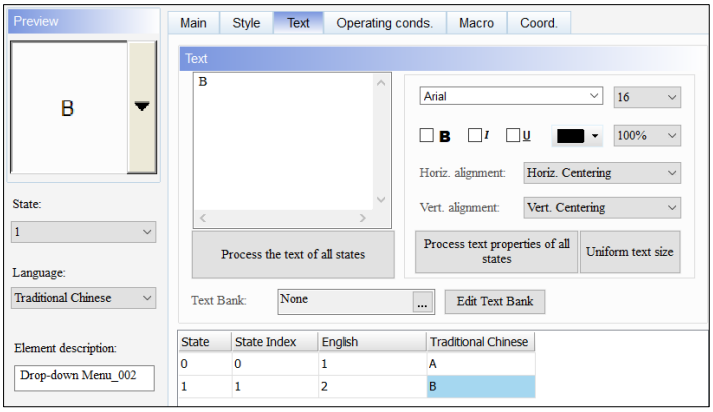
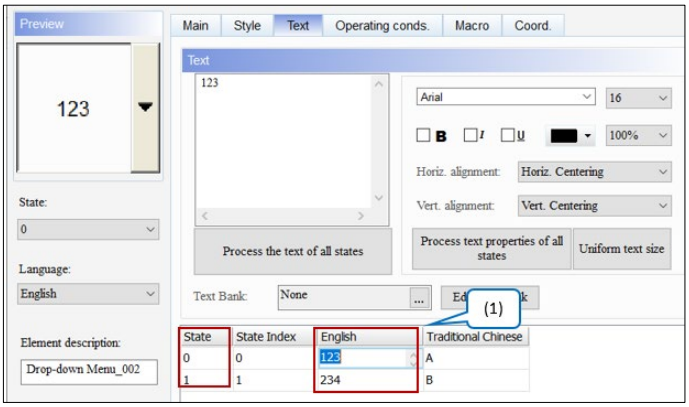
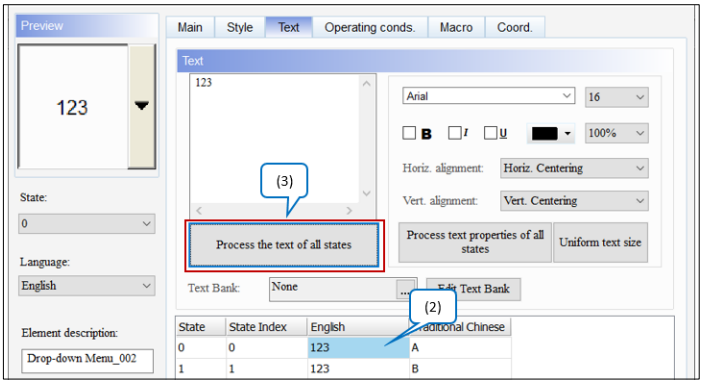
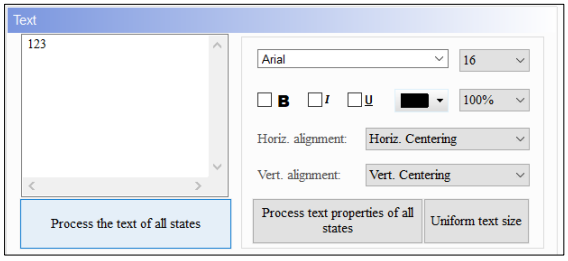


Figure 19 - 18: ListBox List element Text property page

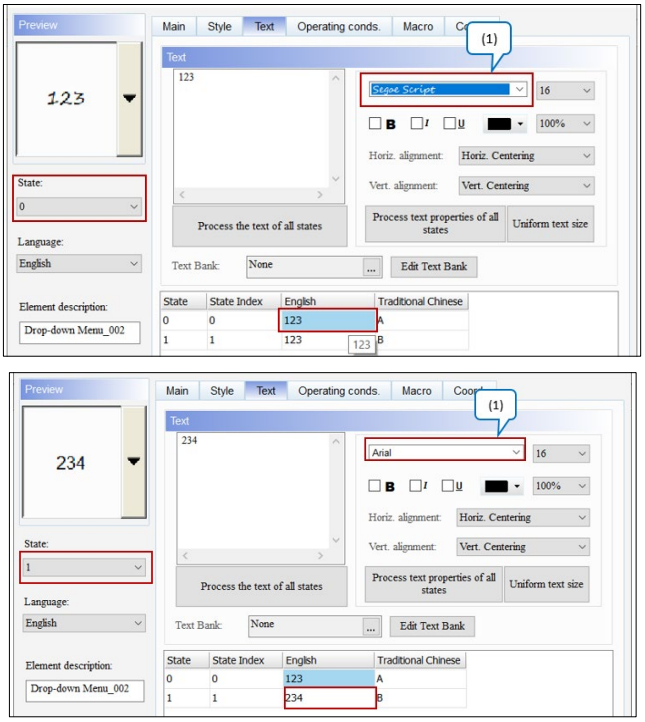
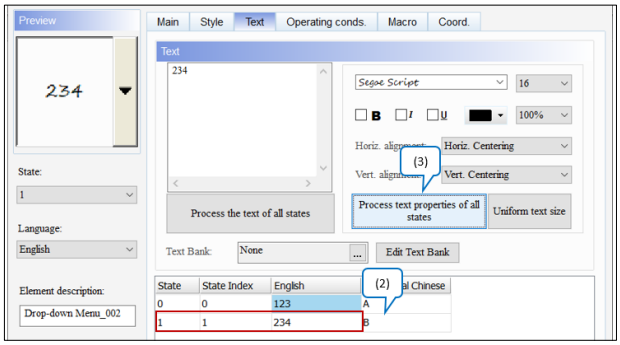
No.	Function	Description
(1)	Text	● Enter the text to display in this box.  ● As long as the element allows text input, click the element

No.	Function	Description
		and press the space key to start editing the text.
(2)	Text property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the texts.
(3)	Edit Multi-language text	If users have added multi-language texts, the **Text** property page allows to edit multi-language data.
(4)	Process the text of all states	● This function changes all the texts into the text contents of the state users select. ● The following illustrates the steps: 1. Enter *123* to State 0, and *234* to State 1. 2. Click State 0. 3. Click **Process the text of all states**, and State 1 text changes to *123*. Before Change  After Change 
(5)	Process text properties of all states	● This function changes all the text properties based on the state users select. Items included in the **Text** property page are shown in the following figure. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>

The following is an example description:

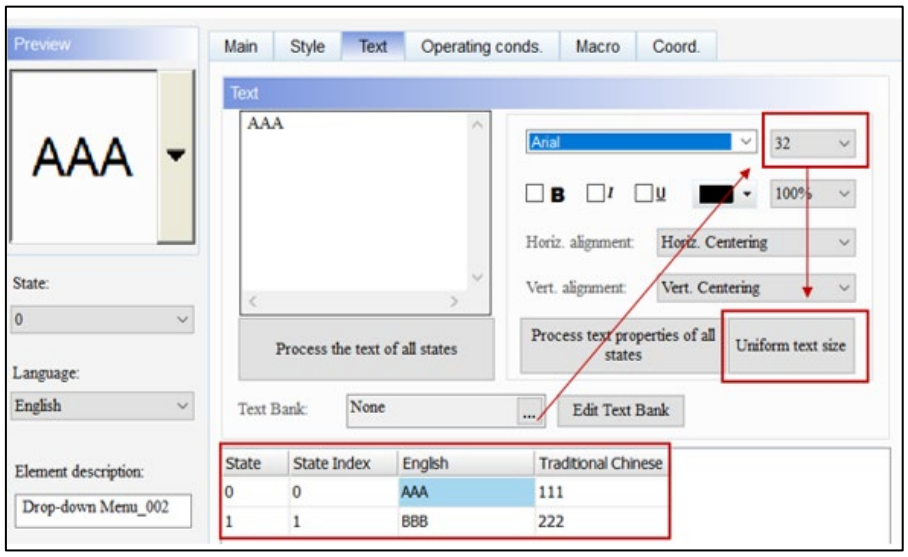
Enter 123 to State 0, and set the font to Segoe Script; enter 234 to State 1, and set the font to Arial.
Click State 0.
Click Process text properties of all states, and State 1 font changes to Segoe Script.

<table>
<tr><td>Before Change</td><td> 
</td></tr>
<tr><td>After Change</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Uniform text size</td><td>

This function is for all language texts, and will change the size of all texts at one time according to the currently selected state.
The following is an example description and steps:

To configure multiple languages, refer to Section 25.1 Multi-language Settings.
Select the state to change the text size.
Execute the Uniform text size, and the text size of all languages will be changed to the set size.

</td></tr>
</table>

No.	Function	Description
		
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Operating conds.

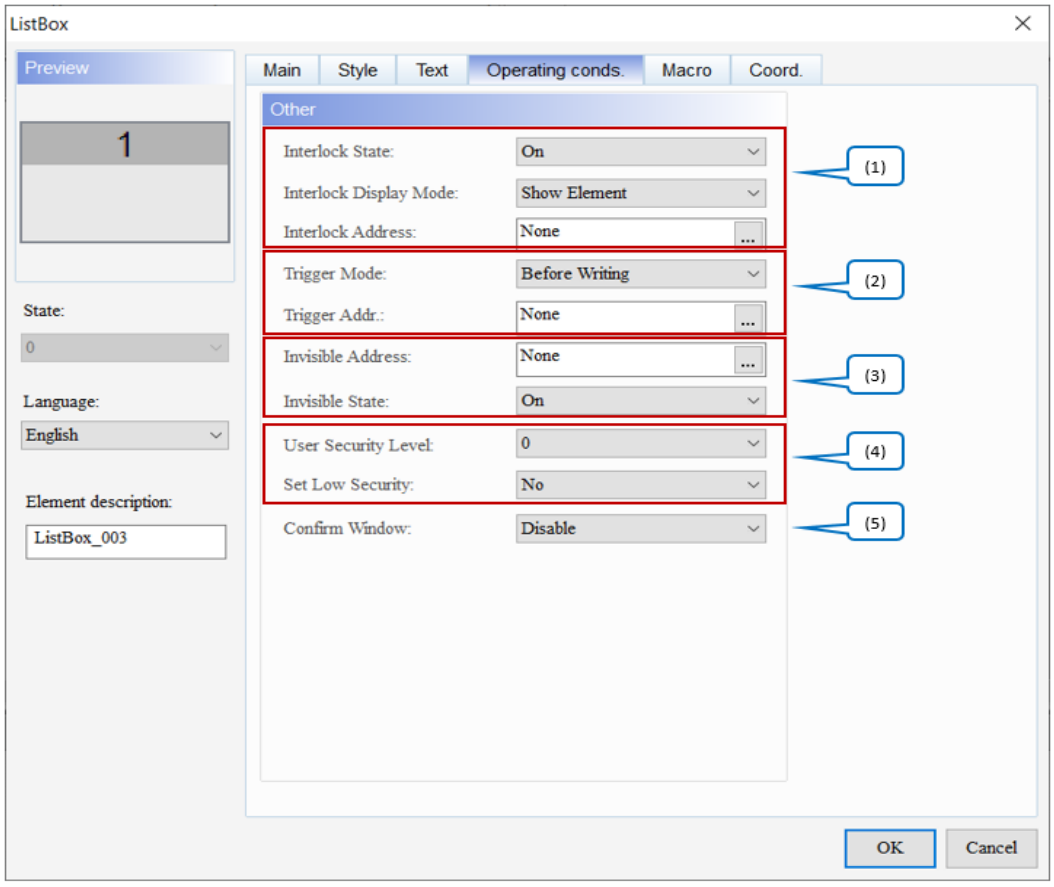
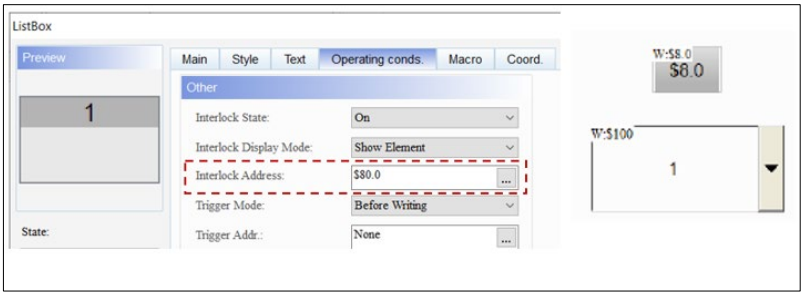


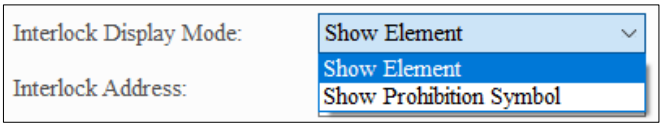
Figure 19 - 19: ListBox List element Operating conds. property page

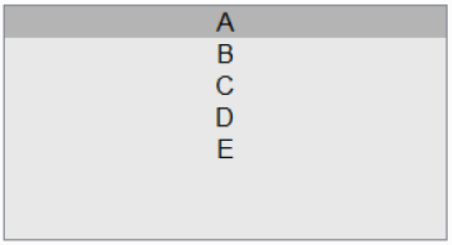
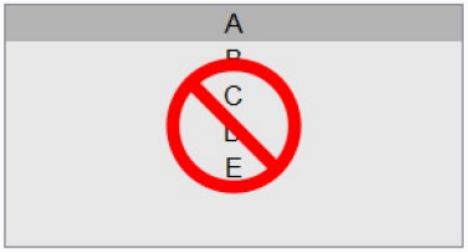
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">(1)</td><td>Interlock State</td><td rowspan="2">

The Interlock Address enables to operate a certain element from this particular address, which must be operated along with the Interlock State.
If the Interlock State is set to Off/On, the Interlock Address enables to operate a certain element from this particular address. The default value is On.
The behavior is as follows:

Create an element, and set its address to $8.0. Then, set the Interlock Address to $8.0 for the ListBox List element with address $100.
To obtain the correct state value after users press ListBox List element, they must first press the $8.0 element to validate the action of the ListBox List element.

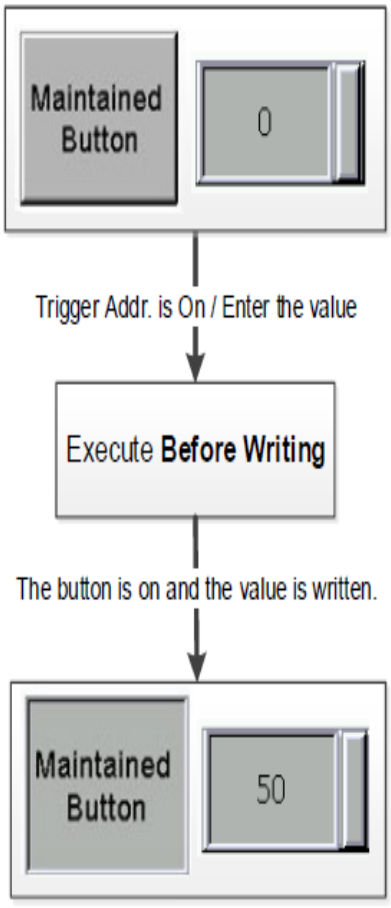
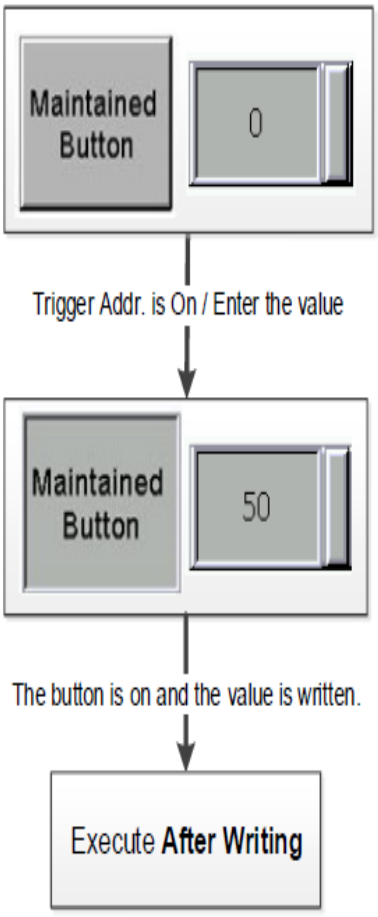


</td></tr>
<tr><td>Interlock Address</td></tr>
<tr><td>Interlock Display Mode</td><td>
The available options for Interlock Display Mode are: Show Element and Show Prohibition Symbol. The default value is Show Element.


<table>
<tr><td>Show Element</td><td> 
</td></tr>
<tr><td>Show Prohibition Symbol</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(2)</td><td>Trigger Mode</td><td>

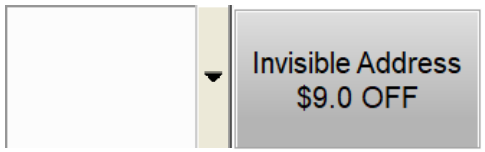
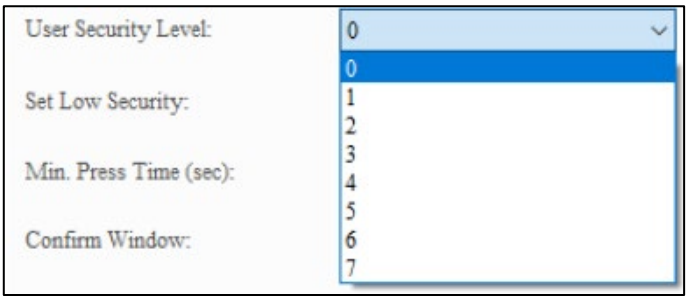
The available options for Trigger Mode are: Before Writing and After Writing. The default value is Before Writing.

</td></tr>
</table>

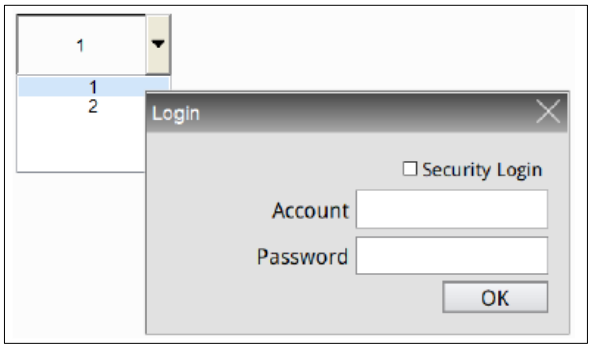
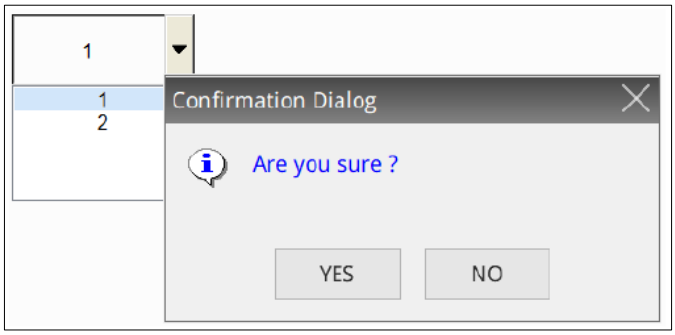
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td>Trigger Addr.</td><td>
<table>
<tr><td rowspan="2">Triggering action</td><td>Before Writing</td><td>After Writing</td></tr>
<tr><td>Trigger Addr. must be set to On before the value changes.</td><td>Value is changed before the Trigger Addr. is set to On.</td></tr>
</table>
The triggering function only switches the set Trigger Addr. to On, so if triggering again is required, users need to set the Trigger Addr. to Off.
<table>
<tr><th>Flowchart of Before Writing</th><th>Flowchart of After Writing</th></tr>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
</table>
</td></tr>
<tr><td rowspan="2">(3)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:
1. Create an element, and set its address to $9.0, then set the Invisible Address of the element to be hidden to

</td></tr>
<tr><td>Invisible State</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>$9.0.
2. To hide the element, first press the $9.0 button.
<table>
<tr><td rowspan="2">Invisible State is On</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 
</td></tr>
<tr><td> 
</td></tr>
</table></td></tr>
<tr><td rowspan="2">(4)</td><td>User Security Level</td><td rowspan="2">● This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set User Security Level. The default value is 0.
 

● If the User Security Level is set, the Login window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the Password Table Setting. Refer to Section 5.7.2 Password Table).</td></tr>
<tr><td>Set Low Security</td></tr>
</table>

No.	Function	Description
		 ● If users set the **Set Low Security** to Yes, the HMI automatically sets the security level to the lowest each time users enter the password. Next time users press the element, they will be asked again to enter the password for the corresponding security level. The default value is **No**.
(5)	Confirm Window	● The available options for **Confirm Window** are: Disable, Confirmation and Second confirmation of account. The default value is **Disable**. ● Except for Disable, selecting the rest two options opens the **Confirmation Dialog** window. 

- Macro

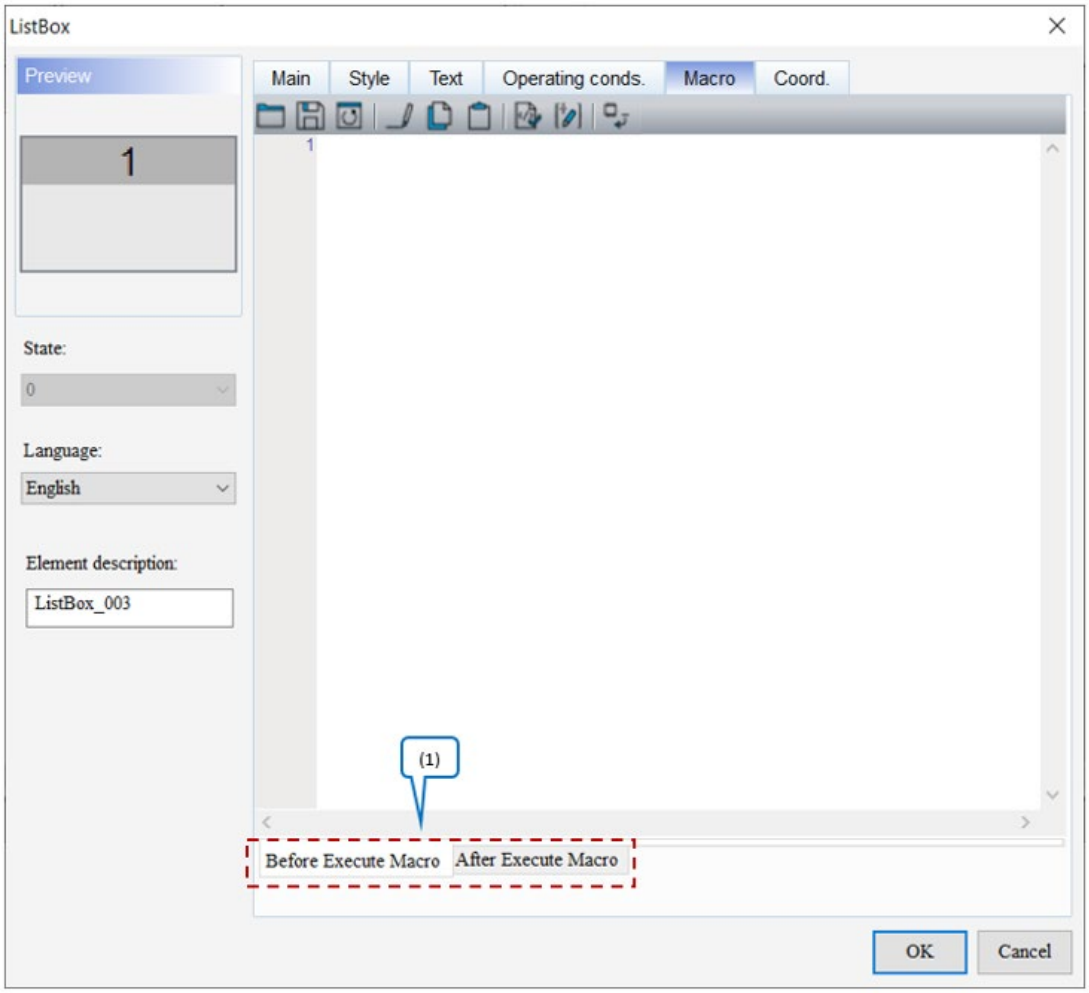
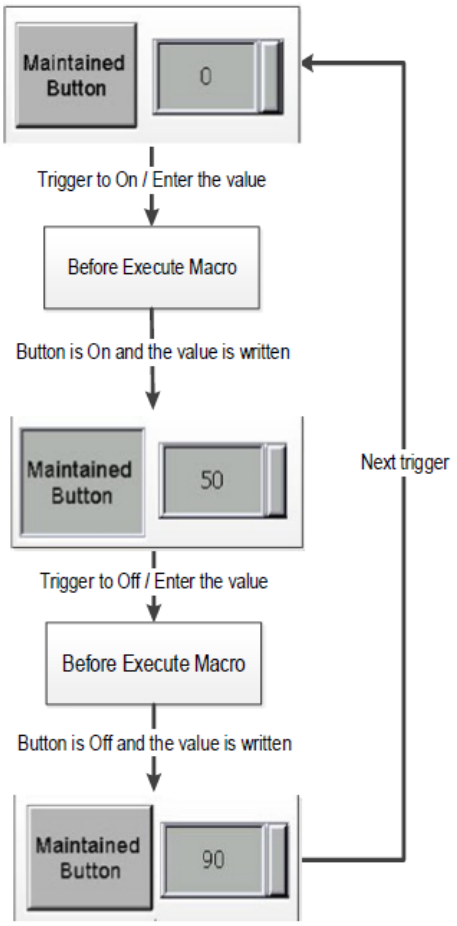
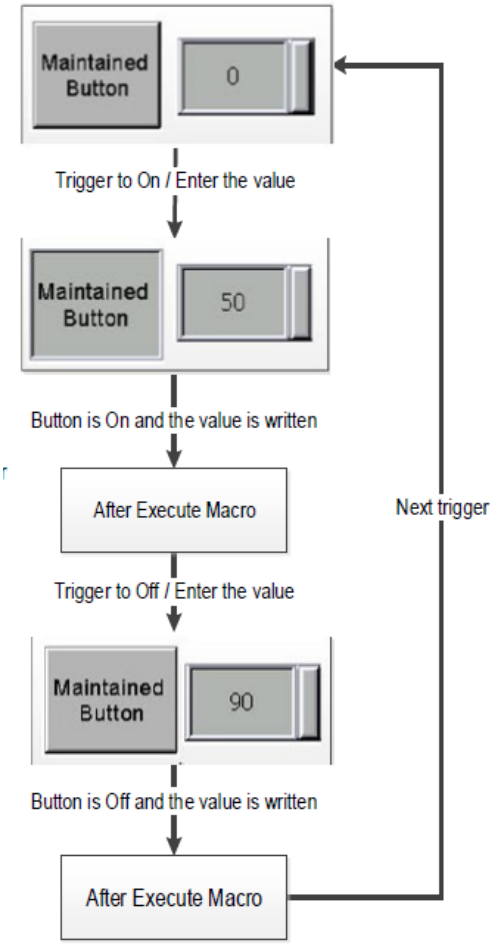


Figure 19 - 20: ListBox List element Macro property page

<table>
<tr><th rowspan="2">No.</th><th colspan="2">Description</th></tr>
<tr><th>Before Execute Macro</th><th>After Execute Macro</th></tr>
<tr>
<td></td>
<td>Flowchart of Before Execute Macro:
 

When users press the Button element, the HMI first executes the Macro commands and then executes the Button actions. If the Button states are not changed with the Button touch (using external controller commands or other macros instead), the HMI does not execute the Macro commands.</td>
<td>Flowchart of After Execute Macro:
 

When users press the Button element, the HMI first executes the Button actions and then executes the Macro commands. If the Button states are not changed with the Button touch (using external controller commands or other macros instead), the HMI does not execute the Macro commands.</td>
</tr>
</table>

- Coord.

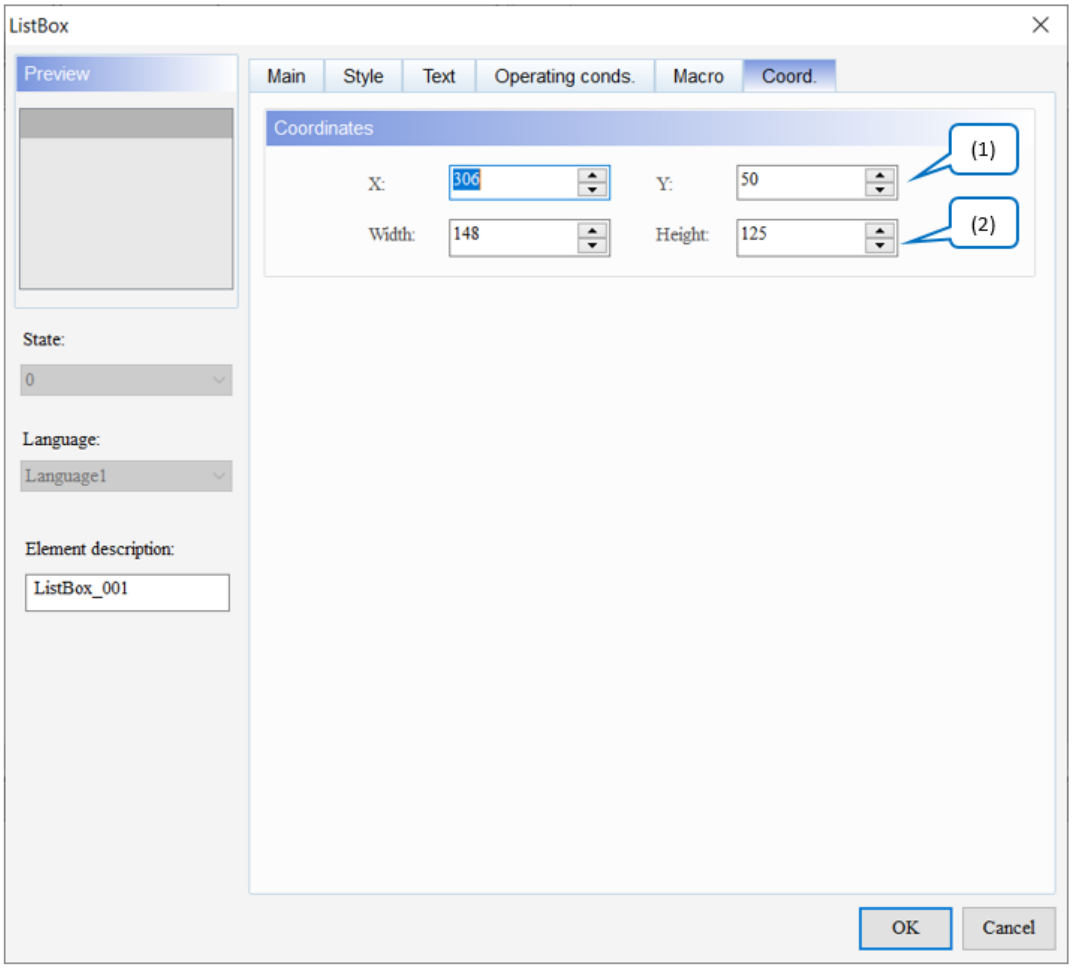


Figure 19 - 21: ListBox List element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

19.4 GridBox

The **GridBox List** element displays the data set by users in a gridbox format providing an interface for easier selection and operation. Its functions include automatic page change, insert, delete, copy, and paste.

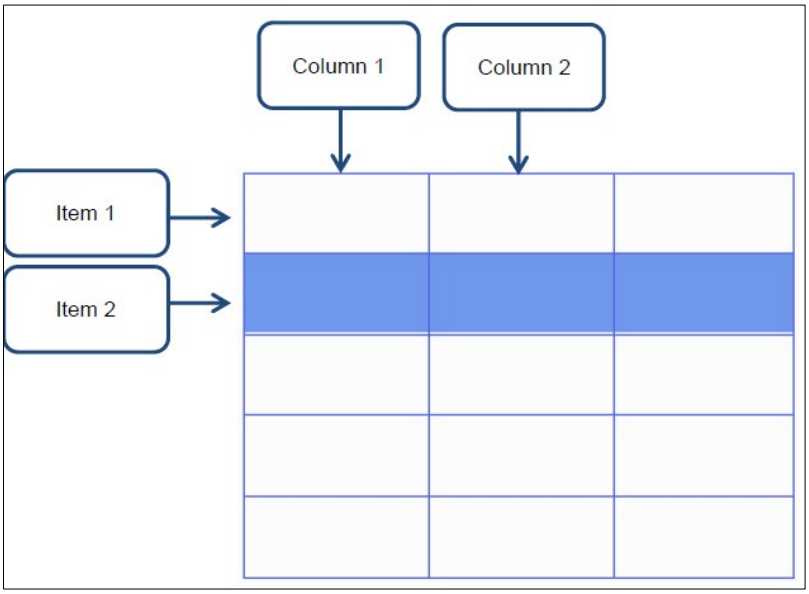
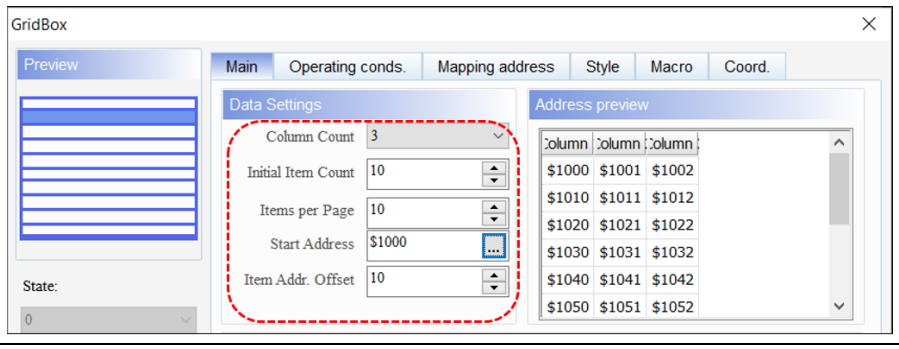


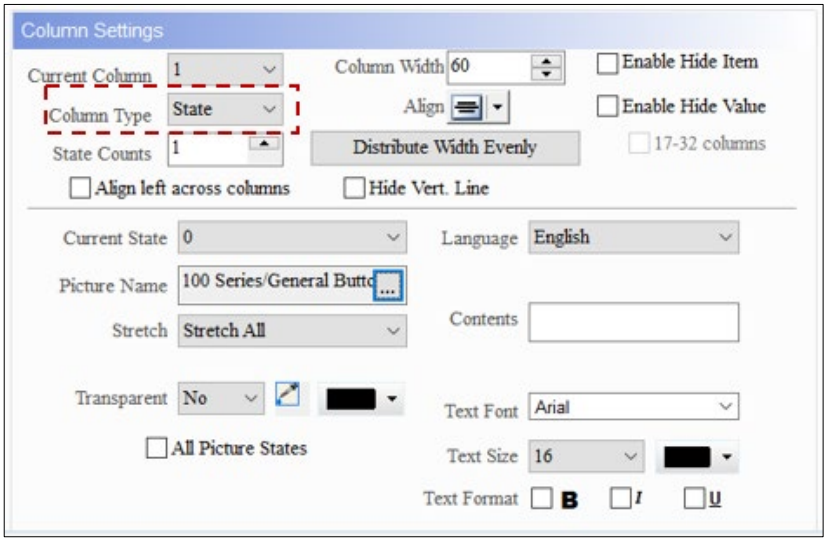
Figure 19 - 22: GridBox

Refer to the following table for the **GridBox List** element example.

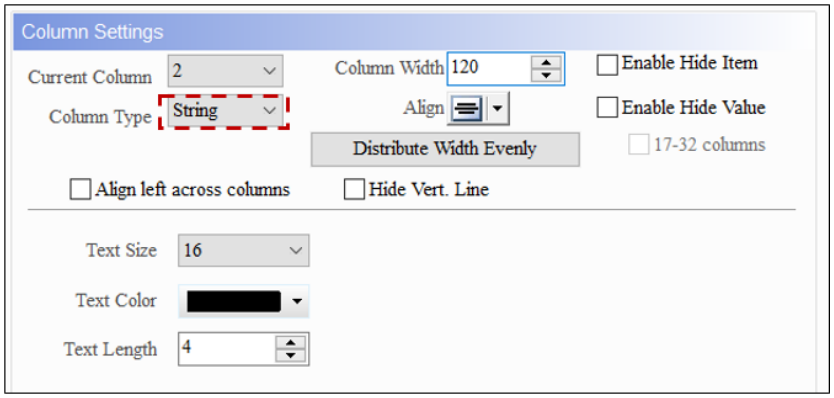
GridBox List	
Create GridBox List element	1. Select **Elements** > **List** > **GridBox** and create the **GridBox List** element on Screen 1. Set the **Column Count** as 3, **Start Address** as $1000, and **Item Addr. Offset** as 10. 

GridBox List

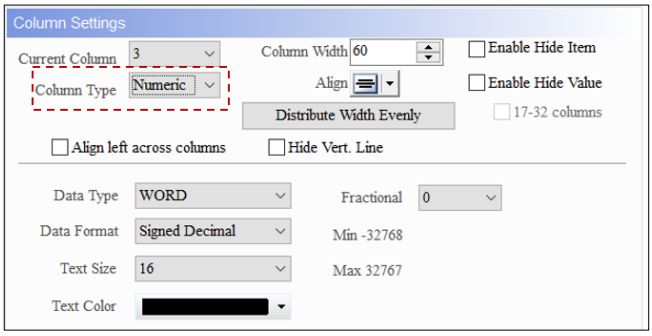
2. Set the **Column Type** of Column 1 to State as follows.



3. Set the **Column Type** of Column 2 to String, and also set the string length. The settings are as follows.

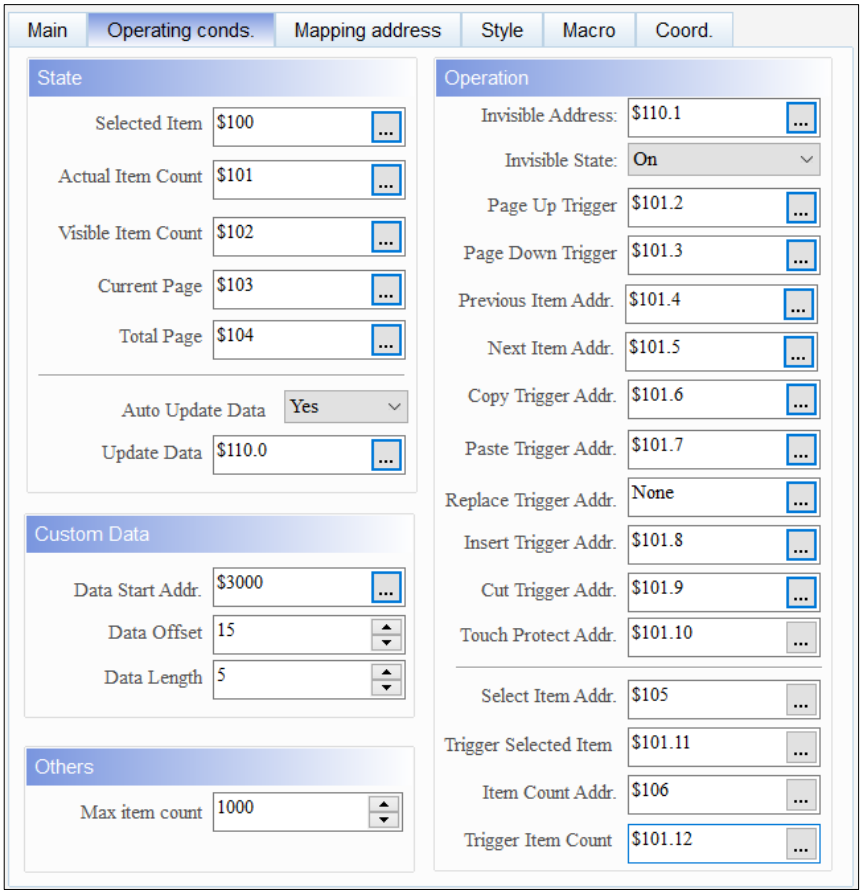


4. Set the **Column Type** of Column 3 to Numeric, and set **Data Type**. The settings are as follows.

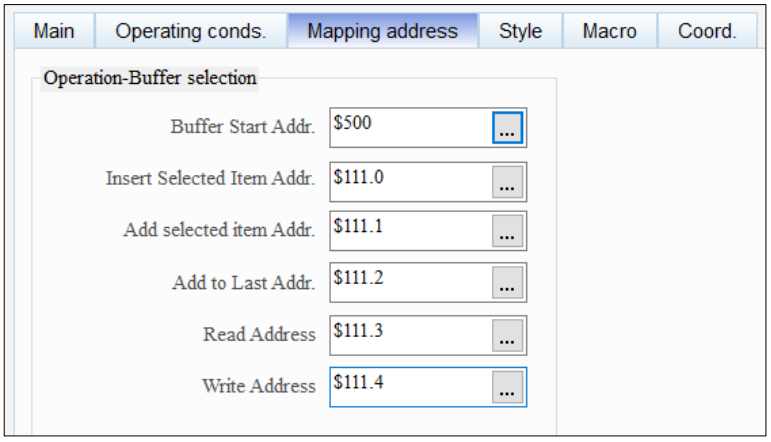


5. The settings for the control addresses on the **Operating conds.** property page are as follows.

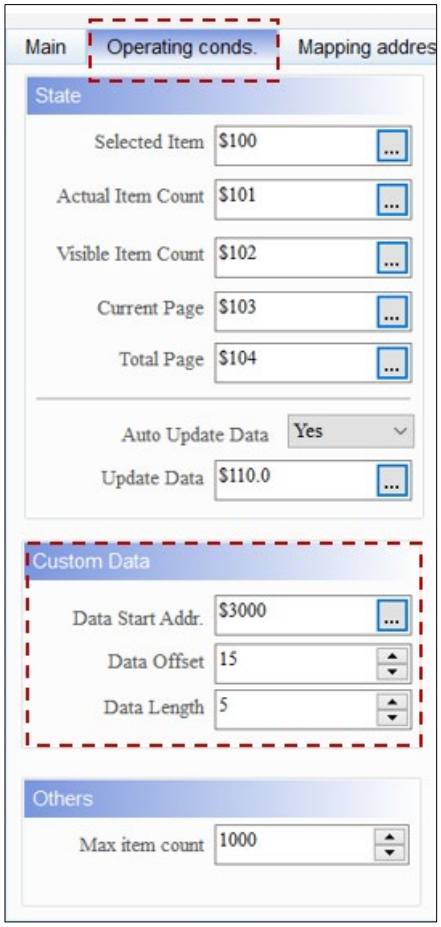
GridBox List



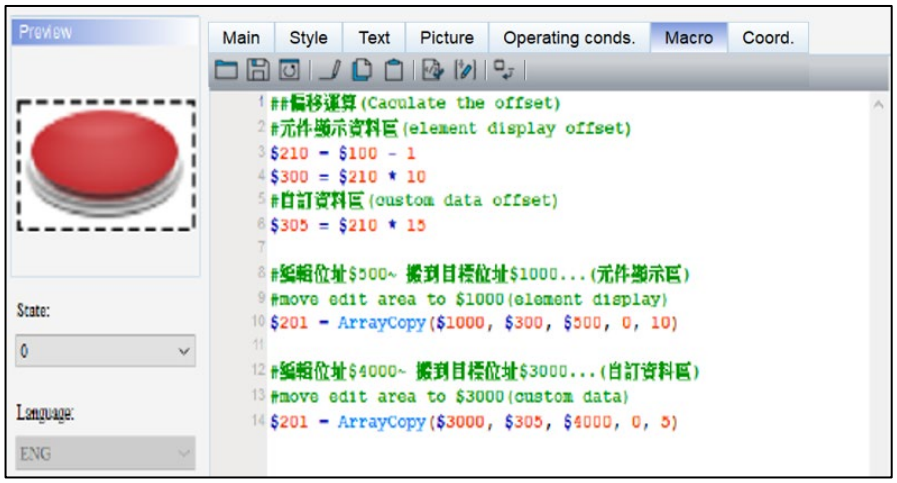
6. The settings for the control addresses on the **Mapping Address** property page are as follows.



7. Set the **Custom Data** to start from $3000 with the **Data Offset** as 15 Words and the **Data Length** for each data as 5 Words.

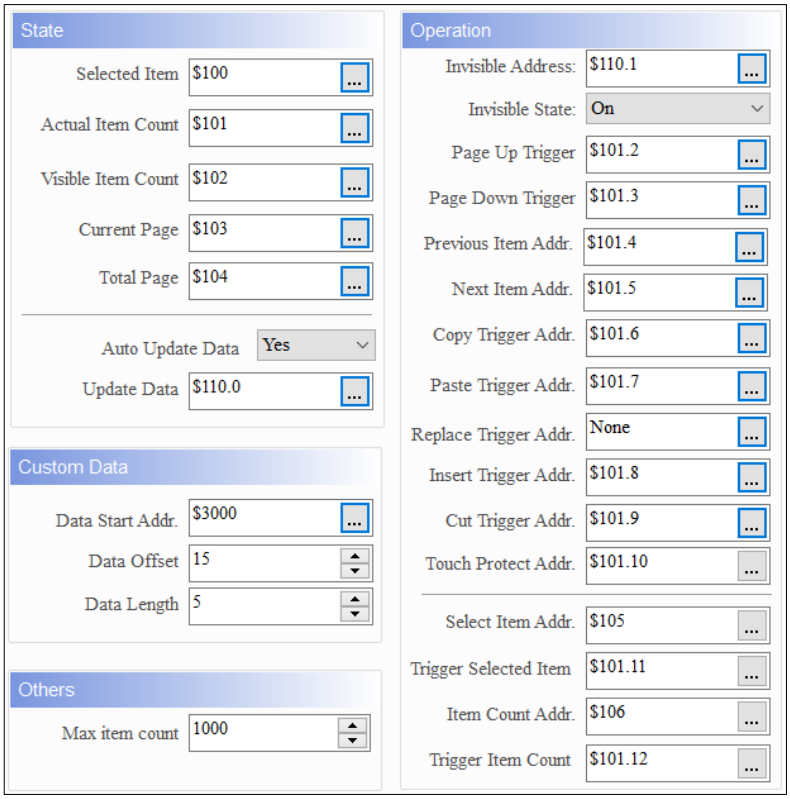
<table>
<tr><th colspan="2">GridBox List</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Create Numeric Entry and Character Entry elements</td><td>1. Create two Numeric Entry elements and set the addresses as $500 and $506.Create a Character Entry element and set its address as $501. These three elements are registers. With the set control bit of the GridBox List element, the data in these registers can be written into the GridBox List element.
2. Create a Character Entry element and set the address as $4000. This element is an editing area with a user-defined address. Use a macro to write the data of this editing area to the user-defined data of the GridBox List element.
 
</td></tr>
<tr><td>Create Momentary Button element</td><td>Create a Momentary Button element and set its address as $200.0. On Macro will copy the data from the editing area to the selected items in the GridBox List element.</td></tr>
</table>

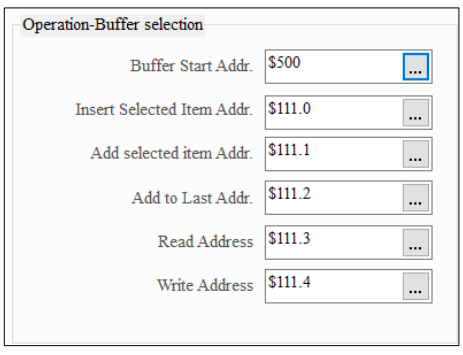
GridBox List

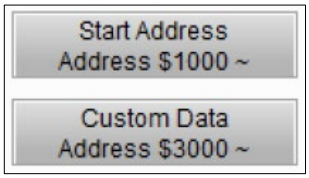
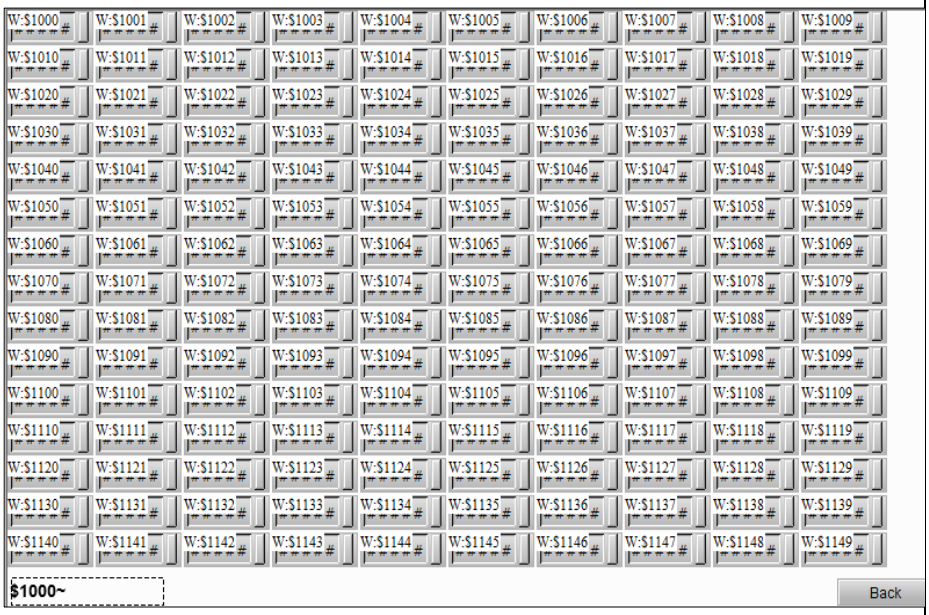


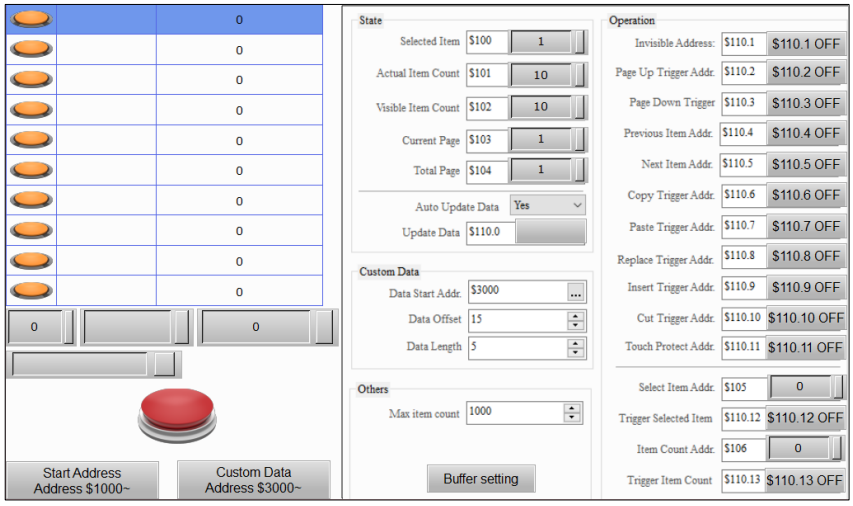
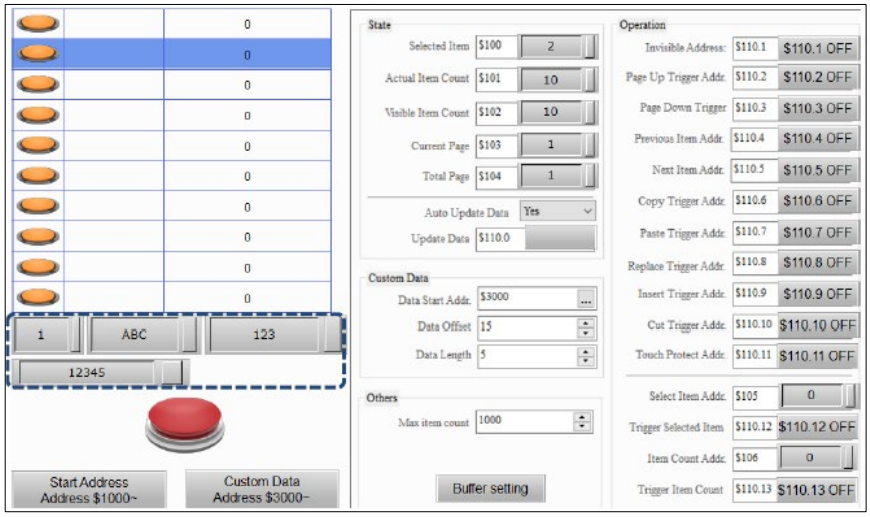
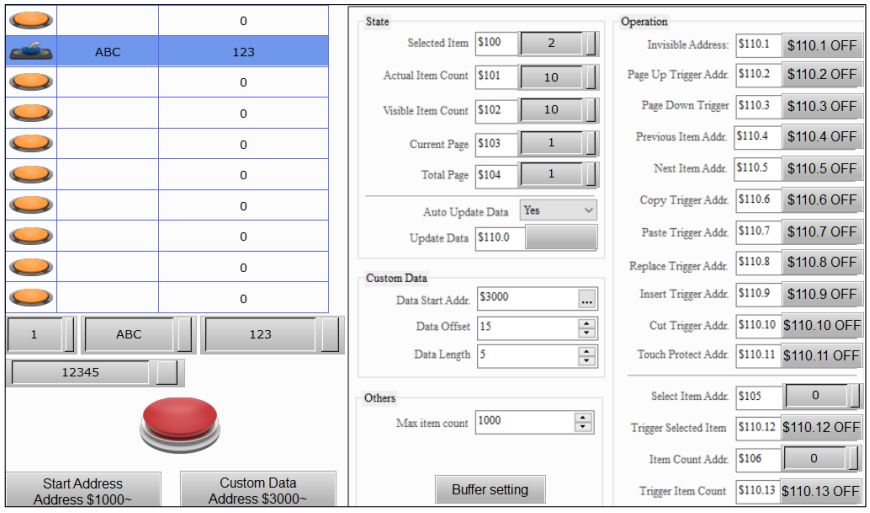
Create Numeric Entry elements ($100 ~ $106, $500) and Maintained Button elements ($110.0 ~ $110.13, $110.0 ~ $111.4)

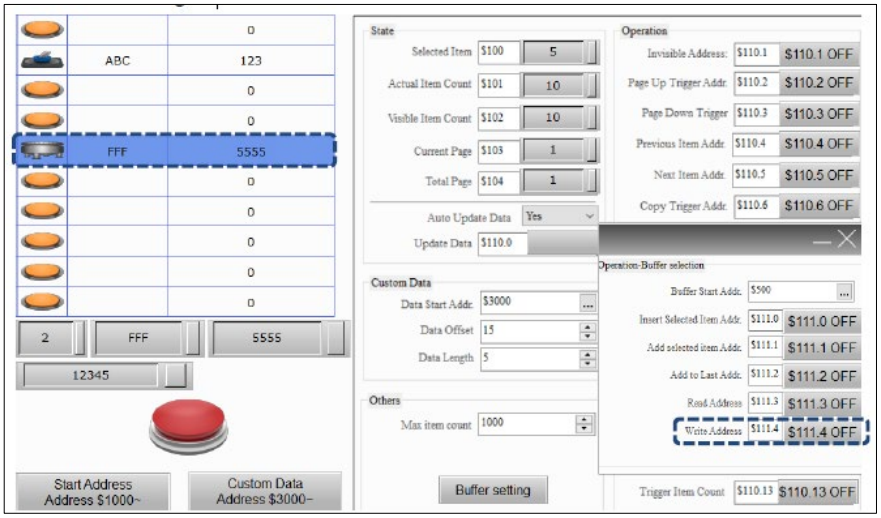
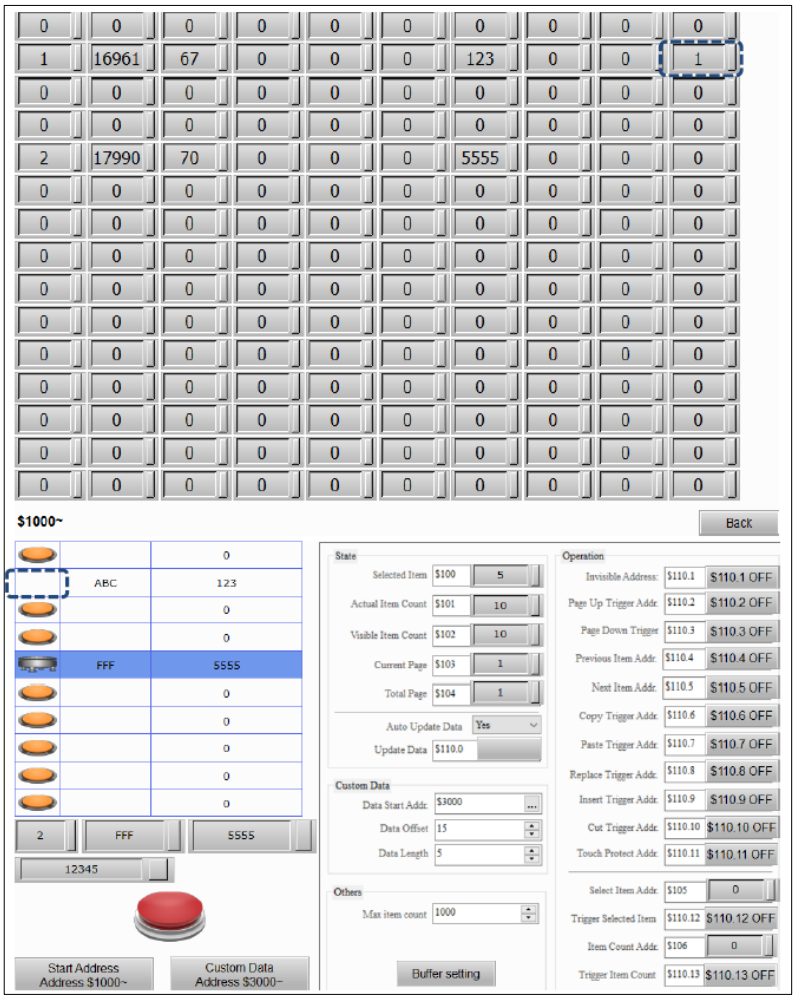
Create the figure of the detailed setting for the **GridBox List** element on the screen and place the corresponding elements and buttons on the figure for editing the element.

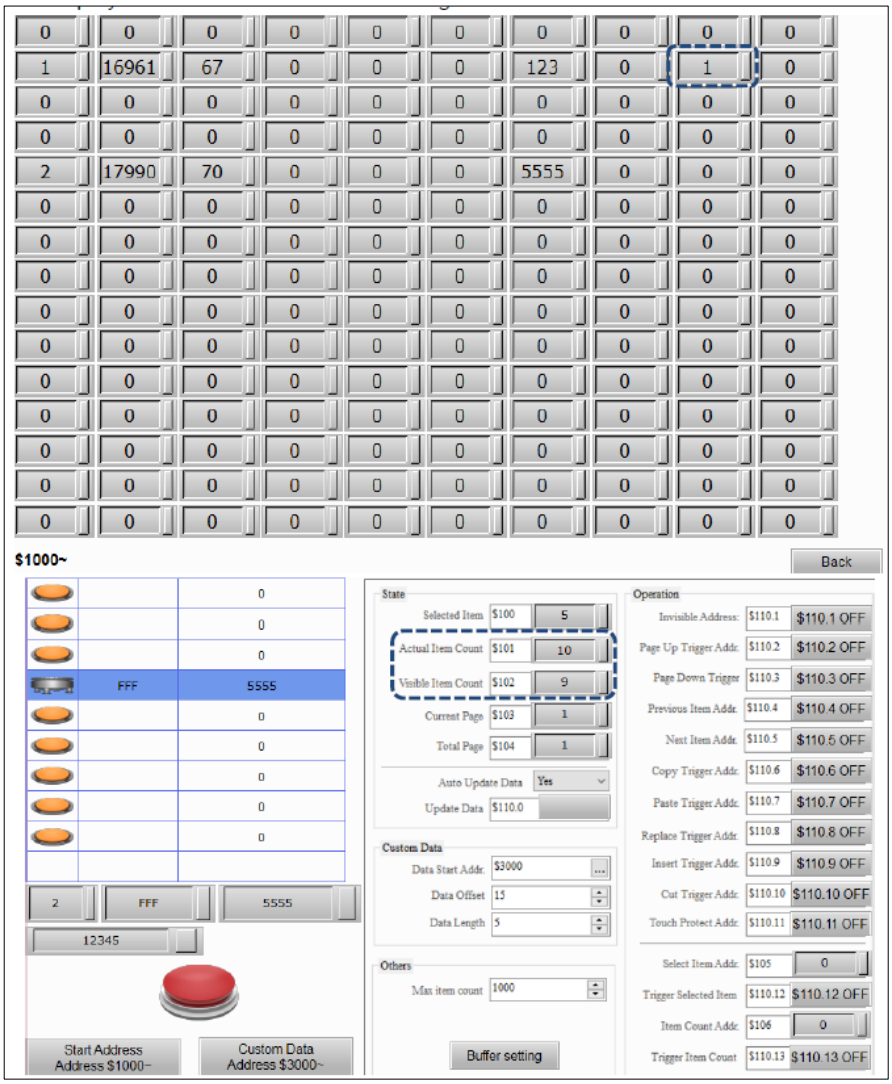


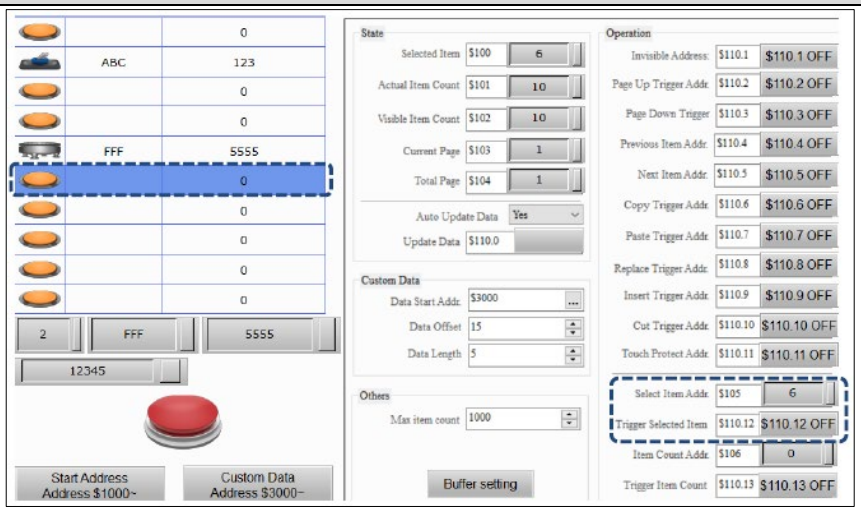
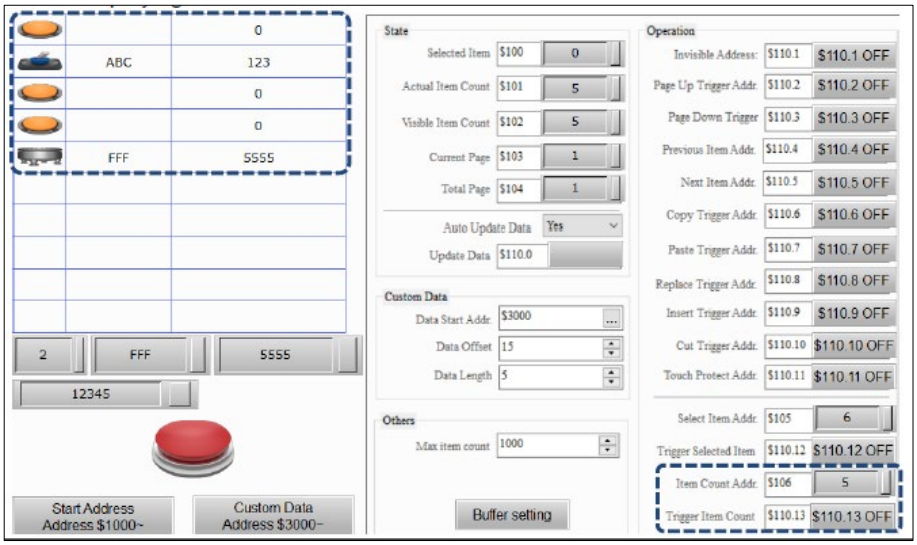


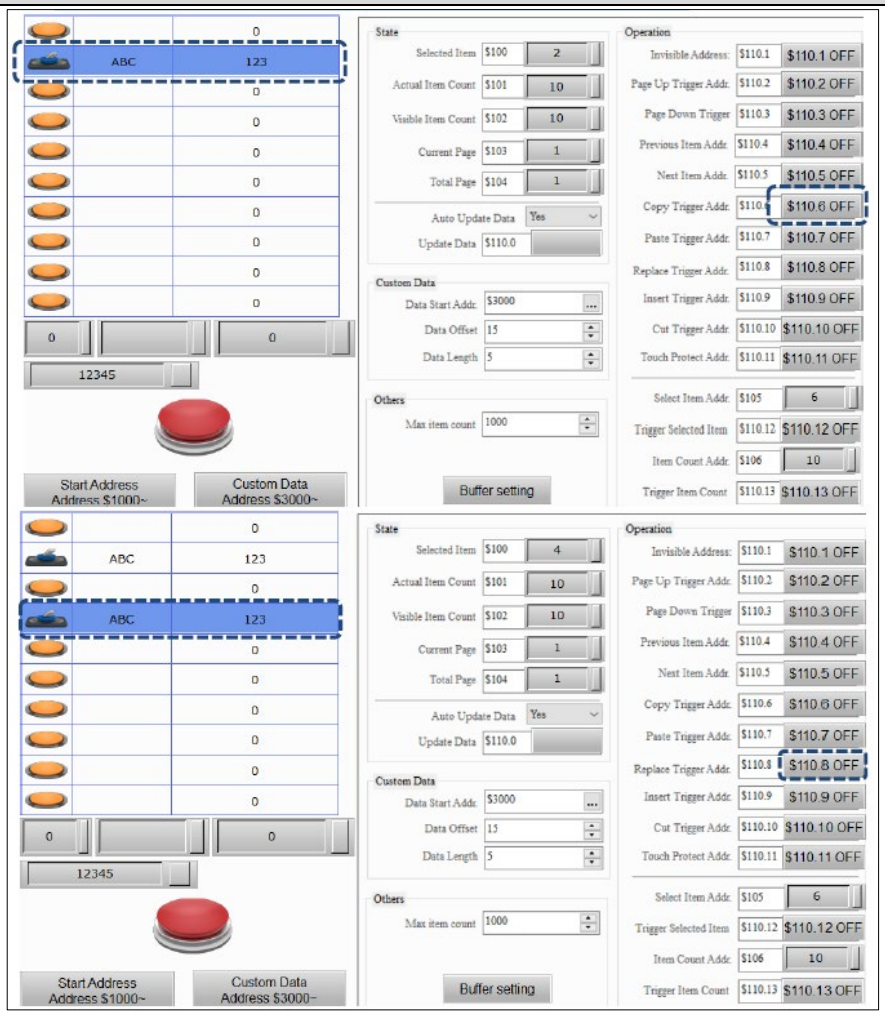
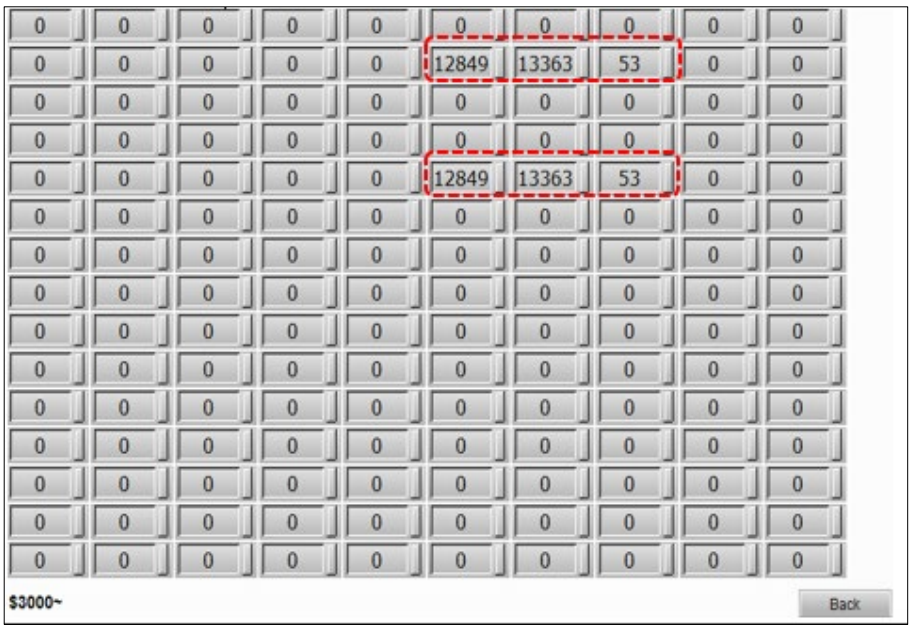
GridBox List	
Create Goto Screen Button element	Create two **Goto Screen Button** elements, and open Screen 2 and Screen 3 to view the actual data in the **GridBox List** element. 
Create Numeric Entry elements ($1000 ~ $1169)	Create Screen 2 to display the contents shown in the **GridBox List** element ($1000, $1001…). 
Create Numeric Entry elements ($3000 ~ $3254)	Create Screen 3 to display the user-defined data in the **GridBox List** element ($3000, $3001…). 
Execution result	● After creating the elements, compile the elements and

GridBox List	
	download the screen to the HMI.  ● Select the item and edit the data editing area. 
Execution results	● Press the red button, the data displayed on the element changes.  ● Trigger the **Write Address** in the **Operation - Buffer**

GridBox List	
	selection and the data displayed on the element changes. 
Execution result	Press **Start Address** $1000 ~ to switch the screen to Screen 2, set the value of $1019 (hidden value) to 1, and then the content in the first field in the second column will be hidden. 

GridBox List	
Execution result	Set the value of $1018 (hidden item) on Screen 2 to 1, and then this item will not be displayed and the **Actual Item Count** is greater than the **Visible Item Count**. 
Execution result	● Set **Select Item Addr.** to 6, and press **Trigger Selected Item**, then the 6th item is selected.

GridBox List	
	 ● Set **Item Count Addr.** to 5, and press **Trigger Item Count**, then the number of the displaying items becomes 5 and the other data will not be displayed. 
Execution result	Select Item 2 and press **Copy Trigger Addr**., then select Item 4 and press **Replace Trigger Addr**., and the content of Item 2 will be copied to Item 4.

GridBox List	
	
Execution result	Press **Custom Data Address $3000~** to switch the screen and users can see the user-defined data of Item 2 is also copied to Item 4. 

On double-clicking the **GridBox List** element, the property page appears as follows.

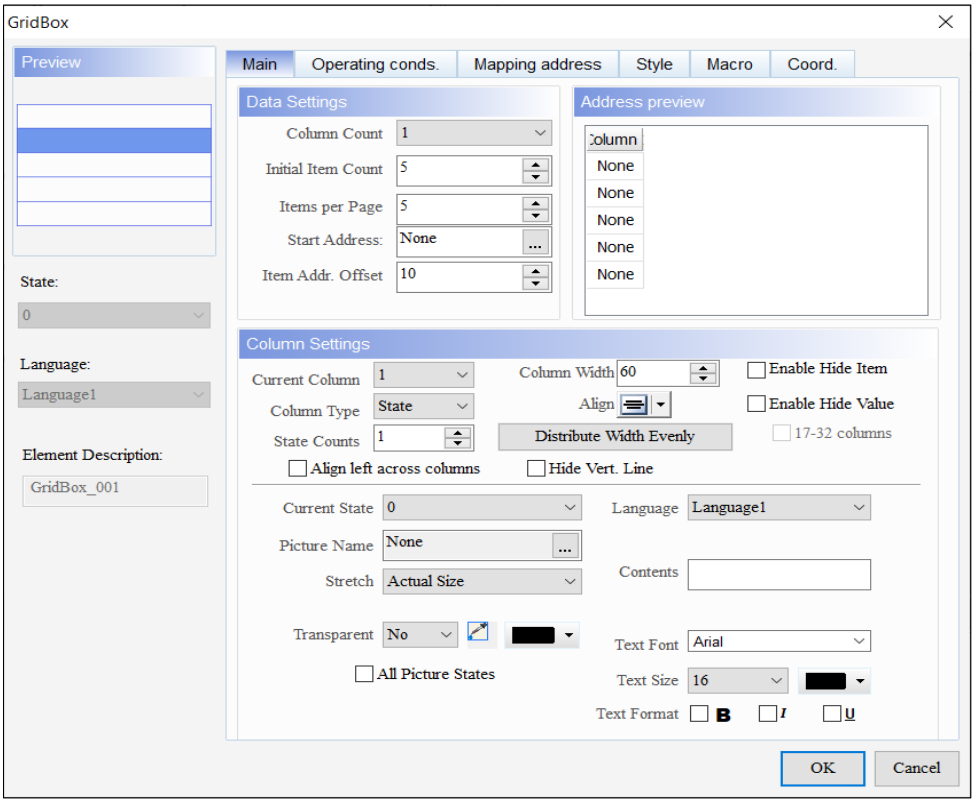


Figure 19 - 23: GridBox List element property page

GridBox List	
Function	**Description**
Preview	GridBox displays the data set in the Gridbox Format.
Main	It includes Data Settings and Column Settings: ● **Data Settings**: Set the Column Count, Initial Item Count, Items per Page, Start Address, and Item Addr. Offset. ● **Column Settings**: Set the Current Column, Column Width, Column Type, Align, State Counts, press Distribute Width Evenly, and select the checkboxes for Enable Hide Item, Enable Hide Value, Hide Vert. Line, Align left across columns, and 17-32 columns. ● The required settings vary according to the setting of Column Type. ● Address preview can be used to preview the assigned addresses according to the set data.
Operating conds.	It includes State, Custom Data, Others, and Operation: ● **State**: Set the Selected Item, Actual Item Count, Visible

GridBox List	
	Item Count, Current Page, Total Page, Auto Update Data, and Update Data. ● **Custom Data**: Set the Data Start Addr., Data Offset, and Data Length. ● **Others**: Set the Max item count. ● **Operation**: Set the Invisible Address, Page Up Trigger Addr., Page Down Trigger, Previous Item Addr., Next Item Addr., Copy Trigger Addr., Paste Trigger Addr., Replace Trigger Addr., Insert Trigger Addr., Cut Trigger Addr., Touch Protect Addr., Select Item Addr., Trigger Selected Item, Item Count Addr., and Trigger Item Count.
Mapping Address	Set the Operation-Buffer selection, including Buffer Start Addr., Insert Selected Item Addr., Add selected item Addr., Add to Last Addr., Read Address, and Write Address.
Style	It includes Column Settings and Style. ● **Column Settings**: Select the checkbox for Enable auto numbering and set the Column Width, Font size, and Text Color. ● **Style**: Set the Gridline Color, Background Color, Select Color, and Show Gridlines.
Macro	Set the After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

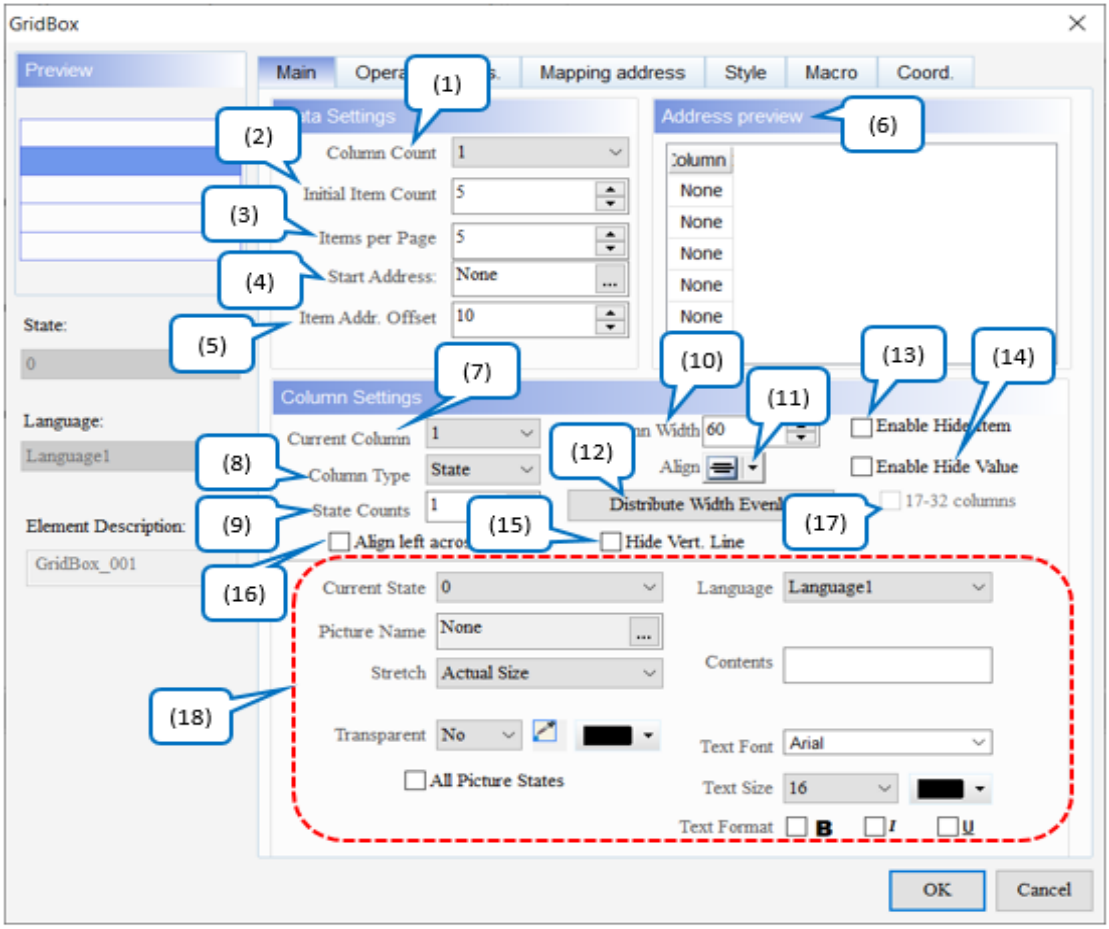
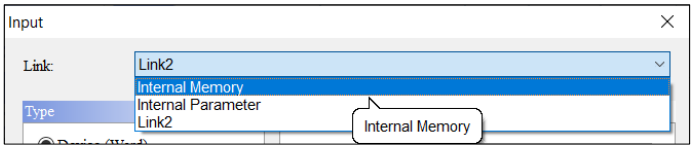
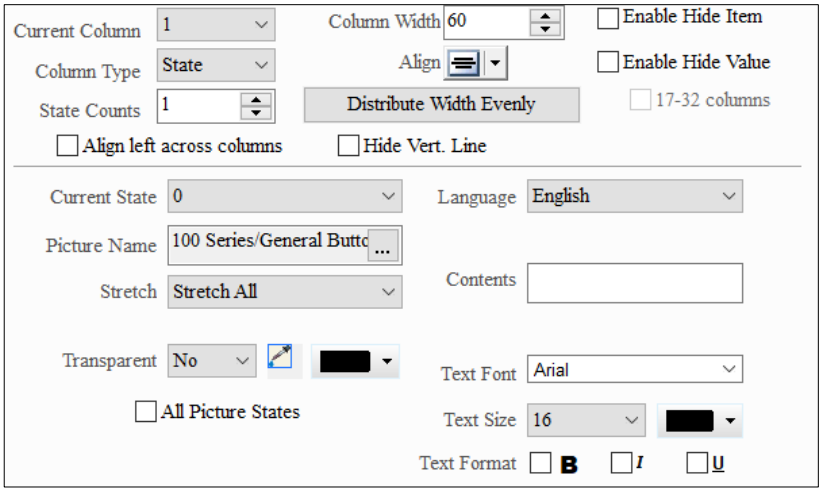
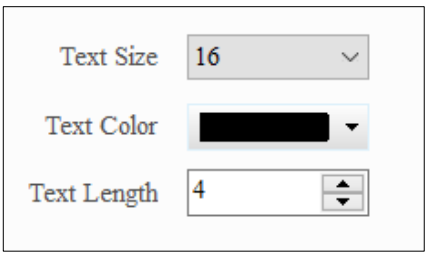
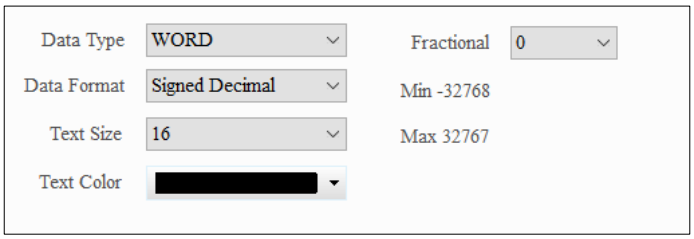
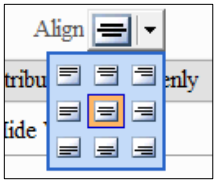
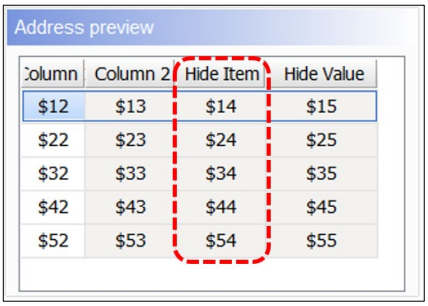
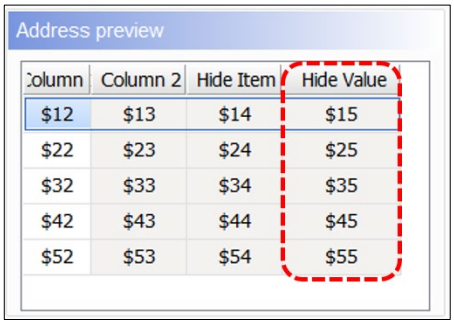


Figure 19 - 24: GridBox List element Main property page

No.	Function	Description
(1)	Column Count	● Set the number of columns used by the **GridBox List** element and the maximum setting is 32. ● If the **Column Count** is greater than the **Item Addr. Offset**, a warning message is displayed to remind users of the overlapping addresses. The default value is **1**.
(2)	Initial Item Count	Set the **Initial Item Count** of the element and the maximum setting is 1,000. The default value is **5**.
(3)	Items per Page	Set the number of items to display on a single page of the element, and the maximum setting is 100. The default value is **5**.

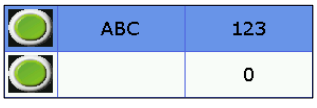
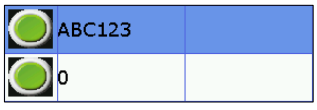
No.	Function	Description
(4)	Start Address	● Set the address that the element starts to read. ● The controller address (Word) and the internal register address (Word) are supported. 
(5)	Item Addr. Offset	● Set the address offset for the items and the maximum setting is 10,000. The default value is **10**. ● If the **Item Addr. Offset** is greater than the **Column Count**, a warning message appears to remind users of the overlapping addresses.
(6)	Address preview	According to the current property settings of the element, it displays the start address of each field.
(7)	Current Column	● Select the column for editing. The default value is **1**. ● The largest number does not exceed the setting of **Column Count**.
(8)	Column Type	● The available options for **Column Type** are: State, String, and Numeric. The default value is **State**. ● State: status display; String: string display; Numeric: numeric display. ● If users select State, the settings are shown as follows.  ● If users select String, the settings are shown as follows.  ● If users select Numeric, the settings are shown as

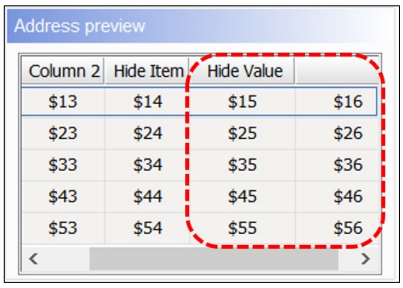
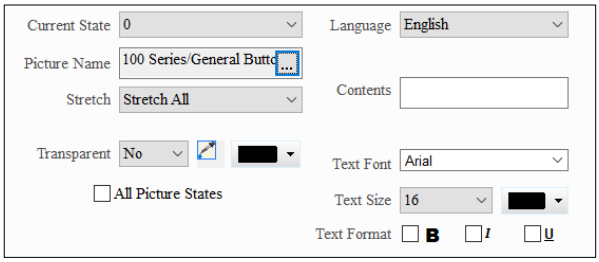
No.	Function	Description
		follows. 
(9)	State Counts	● The **State Counts** field is shown only when users select State for the **Column Type**. The default value is **1**. ● The maximum setting is 256 states mainly for indicating the number of state pictures. This setting affects the displayed number of **Current State**. If the **State Counts** is set to 3, then the **Current State** includes States 0, 1, and 2.
(10)	Column Width	Set the width of the column and the maximum setting is 65535. The default value is **60**.
(11)	Align	Set the alignment style in the cell. The default is  . 
(12)	Distribute Width Evenly	Click this button to distribute the width of the columns evenly.
(13)	Enable Hide Item	● When users select the checkbox for this function, the corresponding addresses of the **Hide Item** will be shown in the **Address preview**. ● When the **Hide Item** address value of an item is not 0, this item will not be displayed on the element. 
(14)	Enable Hide Value	● When users select the checkbox for **Enable Hide Value**, the corresponding addresses of the hidden values will be

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>shown in the Address preview.
 

If users select the checkbox for Enable Hide Value, only Columns 1 ~ 16 are hidden. To hide Columns 17 ~ 32, users need to select the checkbox for 17 ~ 32 columns.
Each bit of the address in the Hide Value column determines whether to display the corresponding column. For example, when Bit 0 is On, it means the data in the first column of this item will not be shown; when Bit 1 is On, it means the data in the second column of this item will not be shown. The same is true for other bits.
</td></tr>
<tr><td>(15)</td><td>Hide Vert. Line</td><td>If users enable this function, the right vertical line of the selected column in the table will be hidden.</td></tr>
<tr><td>(16)</td><td>Align left across columns</td><td>

This function allows the data to Merge Left with the data in the left field.
If this function is enabled, users can combine the data in two fields. To merge data, users need to enable this function for the fields to be merged. For example, if users want to merge the data of Field 2 and Field 3, select the checkbox for Align left across columns for both Field 2 and Field 3.

<table>
<tr><th>Align left across columns not enabled</th><th>Align left across columns enabled for Fields 2 and 3</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
</table>

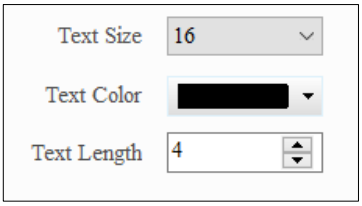
No.	Function	Description
(17)	17-32 columns	● Previously the **Enable Hide Value** function of the **GridBox List** element only supports hiding 1 ~ 16 fields, but now users can hide up to 32 fields. ● When users select the checkbox for **17 ~ 32 columns**, there will be two addresses for each hidden value. The bits of the first address correspond to Columns 1 ~ 16; the bits of the second address correspond to Columns 17 ~ 32. 
(18)	Column data settings (State)	Edit the detailed settings of the column selected in Current Column as follows. **Column Type** of **Current State**: State.  ● **Text properties**: Set the font, size, color, bold / italic / underline for the texts. ● **Language**: If users have added multiple languages, they can select the language data for display. ● **Picture Name**: To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>

The available options for Stretch are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.

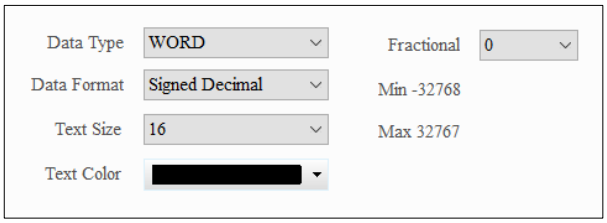
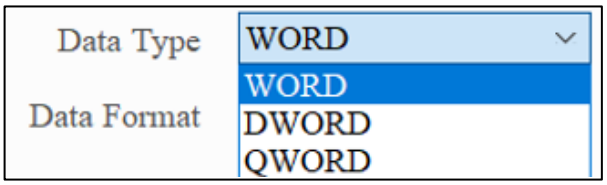
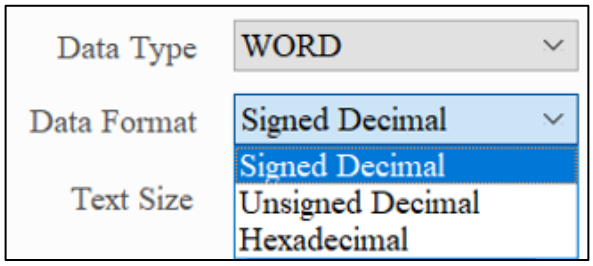
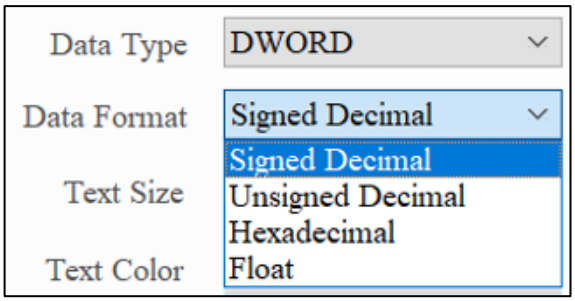
<table>
<tr><th>Stretch All</th><th>Stretch 1:1</th><th>Actual Size</th></tr>
<tr><td>If users select Stretch All, the picture fills the full element display area.
  </td><td>If users select Stretch 1:1, the picture displays in 1:1 size based on the element width and length.
  </td><td>If users select Actual Size, regardless of the element size, the picture displays in its actual size in the element display area.
  </td></tr>
</table>

If users select the checkbox for All Picture States, assuming that the elements have multiple states and some pictures do not fill the full element display area, use this function to process all pictures instead of setting them one by one, which saves the editing time.
 
This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon, and click the white part of the calendar. DIAScreen ignores the white part of the picture and make it transparent, which becomes identical to the Foreground Color of the element.
 

</td></tr>
<tr><td></td><td>Column data settings (String)</td><td>
Column Type of Current State: String
 

Set the Text Size, Text Color, and Text Length. The default value of Text Size is 16, and default Text Color is  .
The maximum setting for Text Length is 60. The default

</td></tr>
</table>

No.	Function	Description
		value is **4**.
	Column data settings (Numeric)	**Column Type** of **Current State**: Numeric  ● The available options for **Data Type** are: WORD, DWORD, and QWORD. The default value is **WORD**.  ● If users select WORD for **Data Type**, the available options for **Data Format** are: Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Signed Decimal**.  ● If users select DWORD or QWORD for **Data Type**, the available options for **Data Format** are: Signed Decimal, Unsigned Decimal, Hexadecimal, and Float. The default value is **Signed Decimal**.  ● If the **Data Type** is set to WORD, the setting range of the fractional digits is 0 ~ 5; if the **Data Type** is set to DWORD, the setting range of the fractional digits is 0 ~ 10; if the **Data Type** is set to QWORD, the setting range of the fractional digits is 0 ~ 19.

- Operating conds.

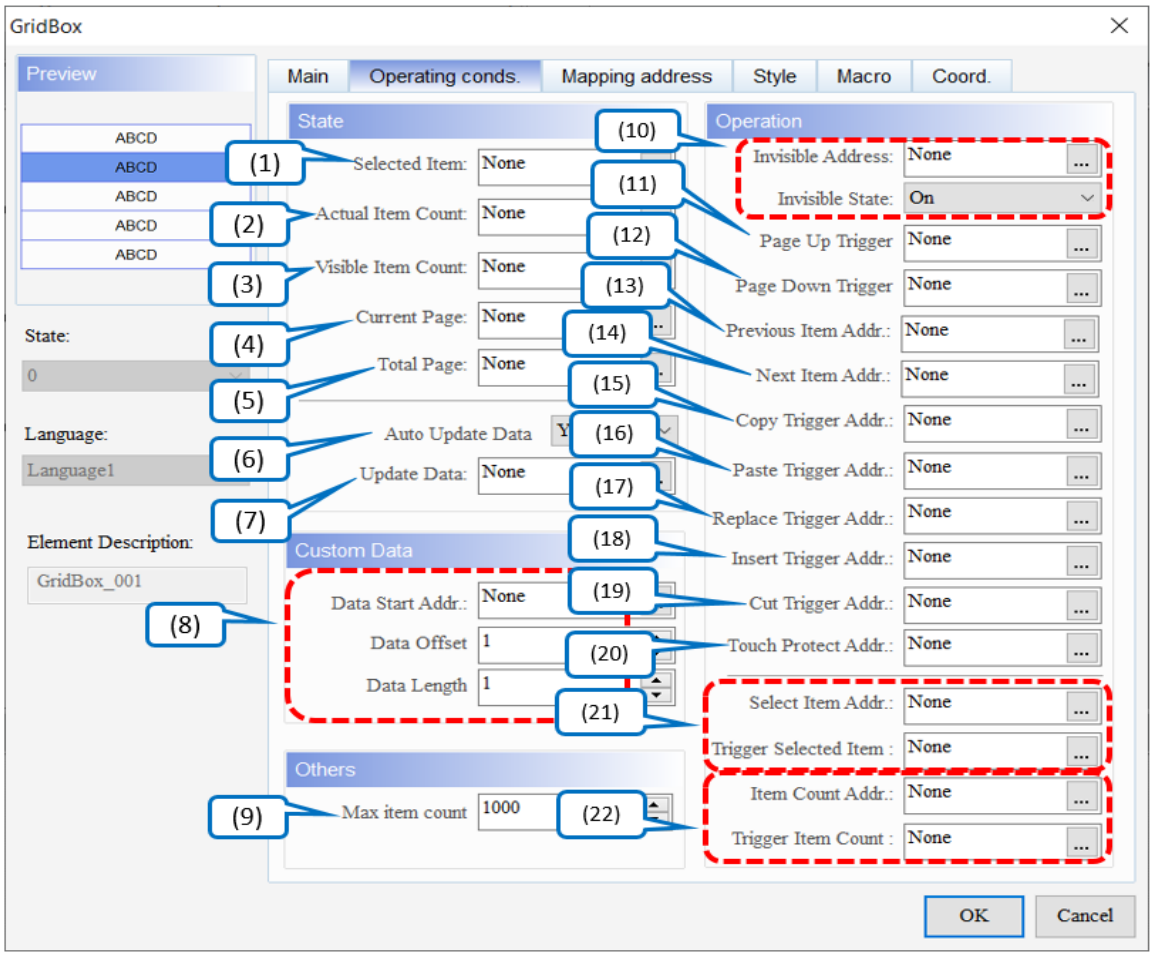
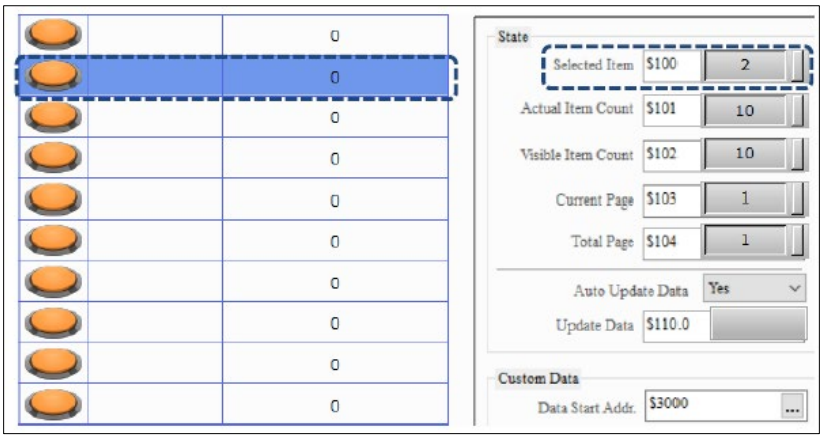
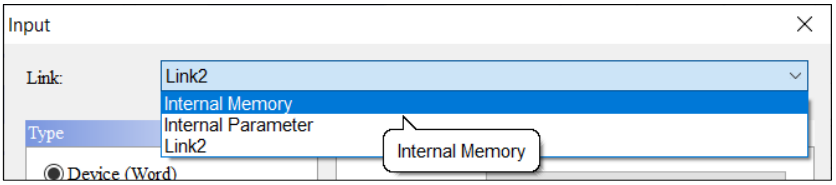
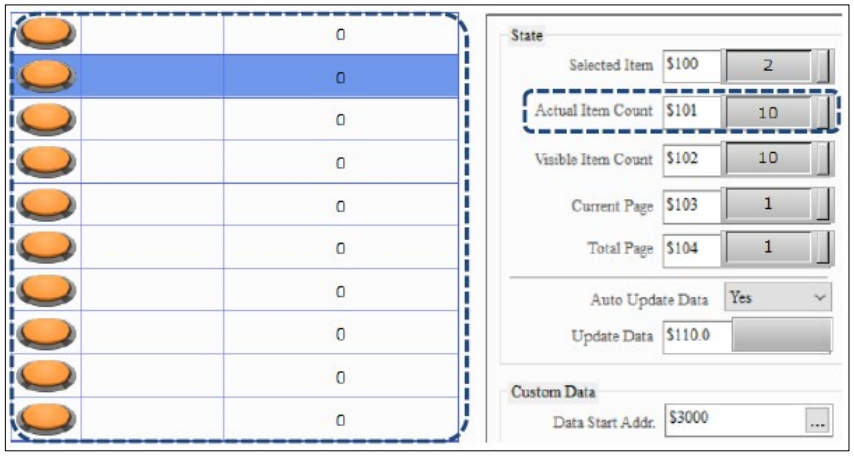
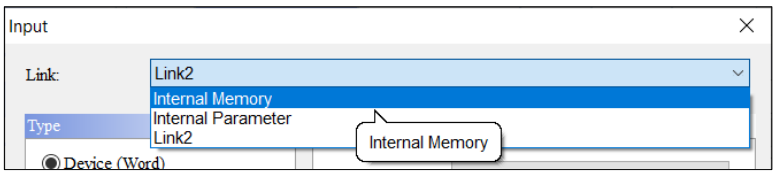
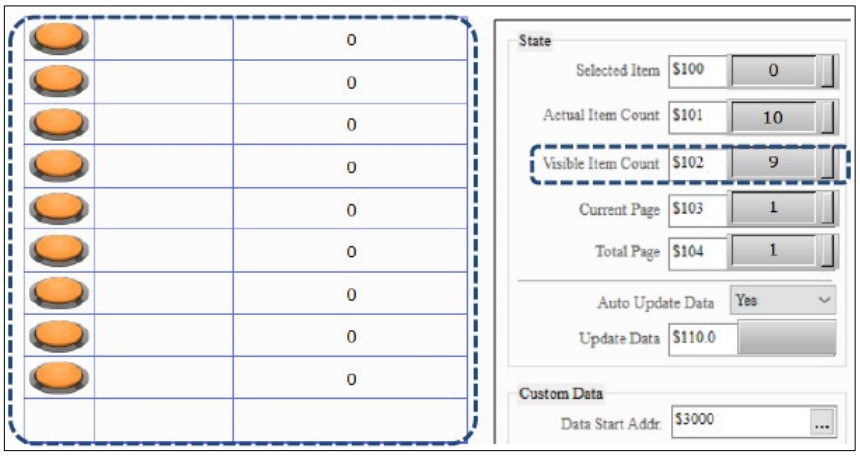
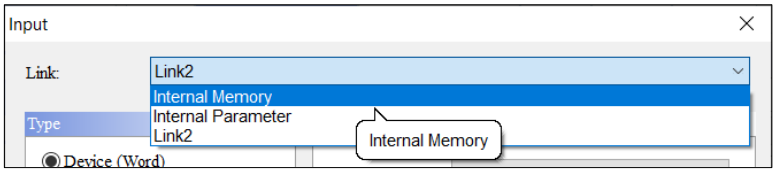
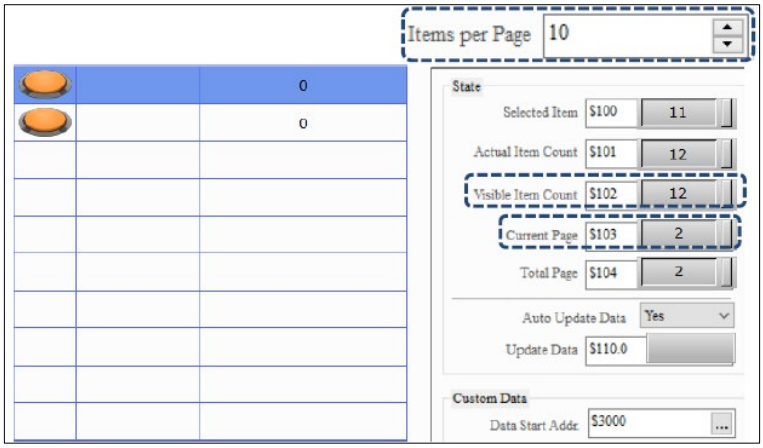
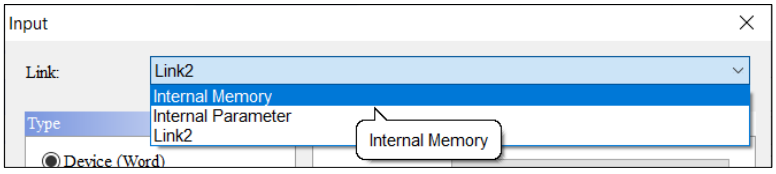
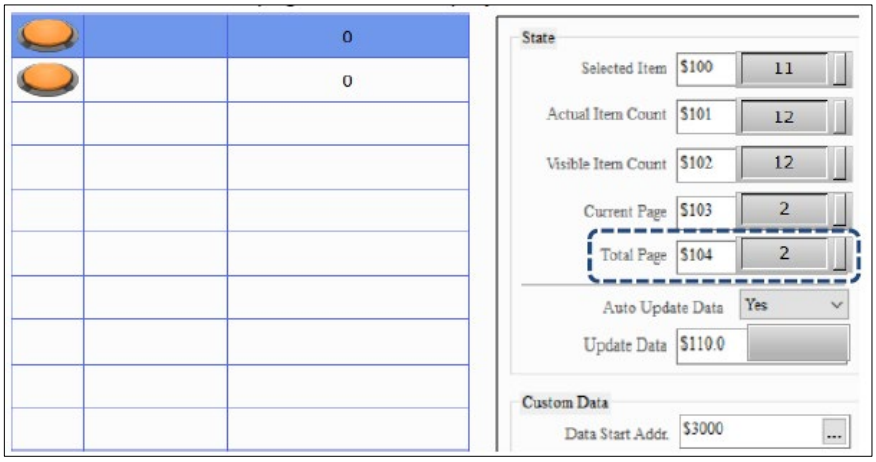
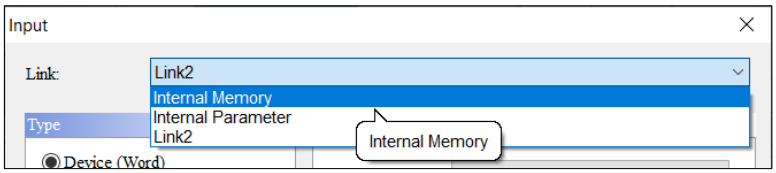
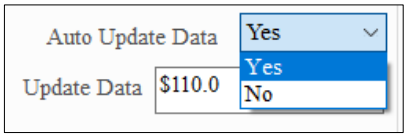
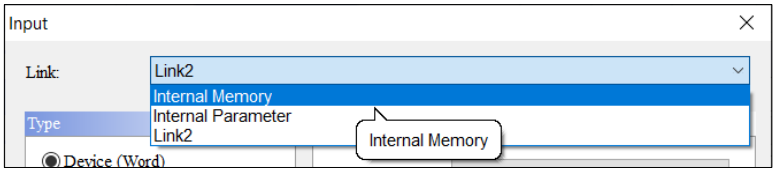


Figure 19 - 25: GridBox List element Operating conds. property page

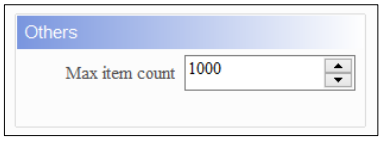
No.	Function	Description
(1)	Selected Item	● The number of the selected item of the element. ● When users select the second item of the **GridBox List** element, the value shown in **Selected Item** is 2.  ● The controller address (Word) and the internal register address (Word) are supported. 
(2)	Actual Item Count	● The total number of items actually displayed on the element.  ● The controller address (Word) and the internal register address (Word) are supported. 

No.	Function	Description
(3)	Visible Item Count	● **Visible Item Count** is the value of the Actual Item Count minus the hidden item count.  ● The controller address (Word) and the internal register address (Word) are supported. 
(4)	Current Page	● When the value of **Visible Item Count** is greater than **Items per Page**, the data will be shown on different pages and the value of **Current Page** is the currently displaying page of the element.  ● The controller address (Word) and the internal register address (Word) are supported. 

No.	Function	Description
(5)	Total Page	● The total number of pages used to display the visible items on the element.  ● The controller address (Word) and the internal register address (Word) are supported. 
(6)	Auto Update Data	If users select Yes, the element automatically updates the data; if users select No, users need to trigger the **Update Data** bit to update the element display. The default value is **Yes**. 
(7)	Update Data	When **Auto Update Data** is No, the currently displayed content of the element is updated only when users trigger the **Update Data** bit to On.
(8)	Custom Data	● Set the **Data Start Addr.**, **Data Offset**, and **Data Length**. The default value of **Data Offset** and **Data Length** is **1**. ● Customize another data block and the data change with editing action of the element. ● **Data Start Addr.**: The controller address (Word) and the internal register address (Word) are supported. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(9)</td><td>Max item count</td><td>

Max item count is for setting the maximum number of items that can be added to the GridBox List element.
The maximum setting for Max item count is 1000.



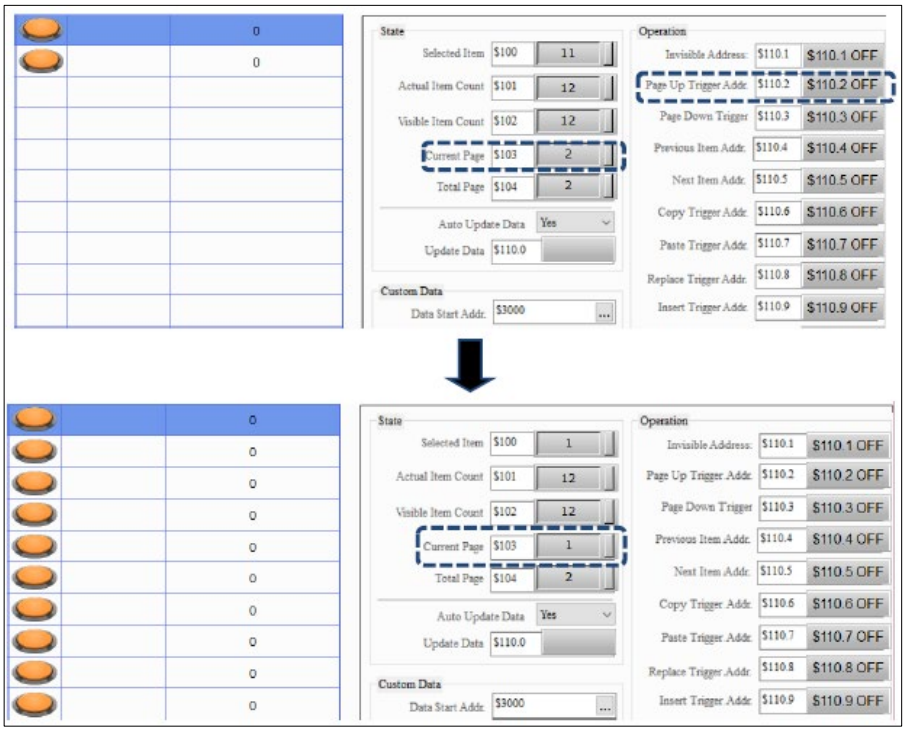
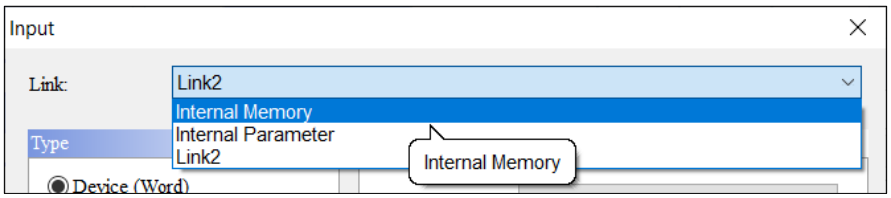
</td></tr>
<tr><td rowspan="2">(10)</td><td>Invisible Address</td><td rowspan="2">

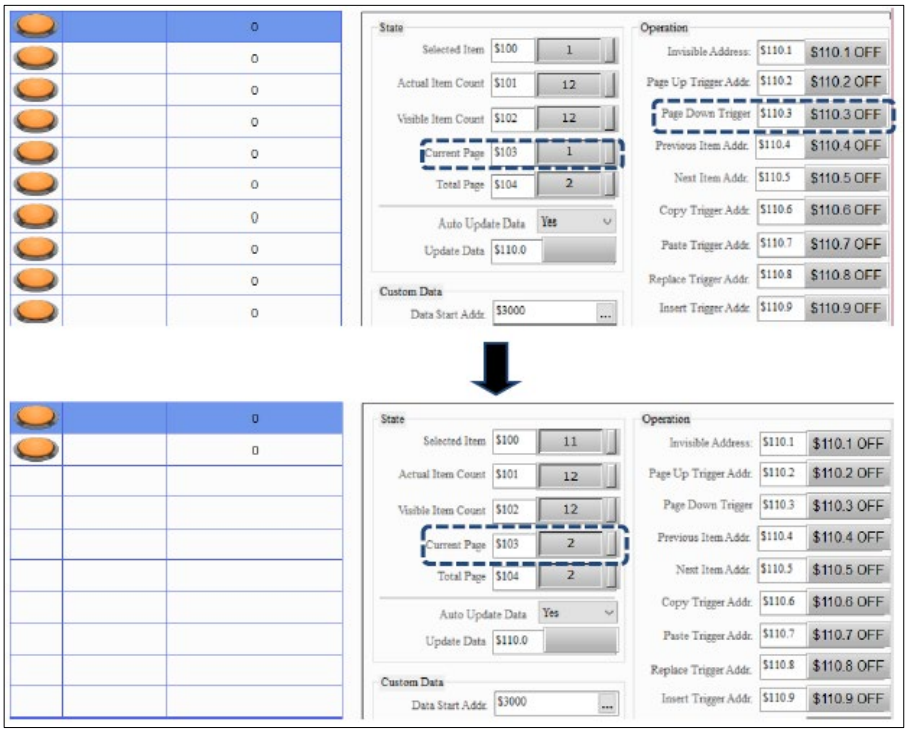
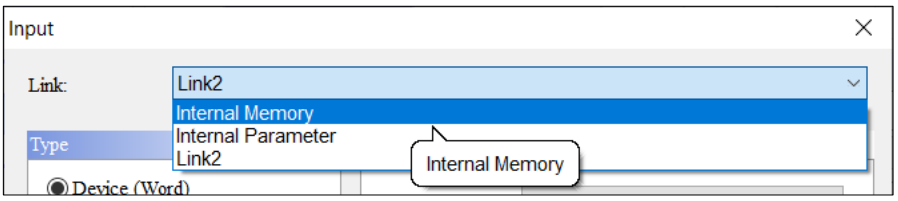
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

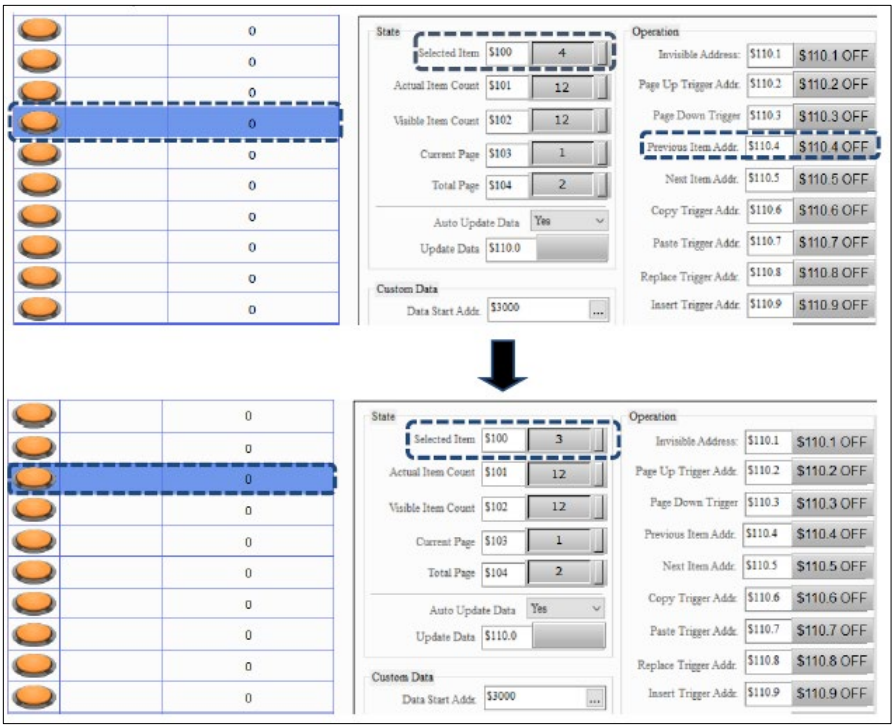
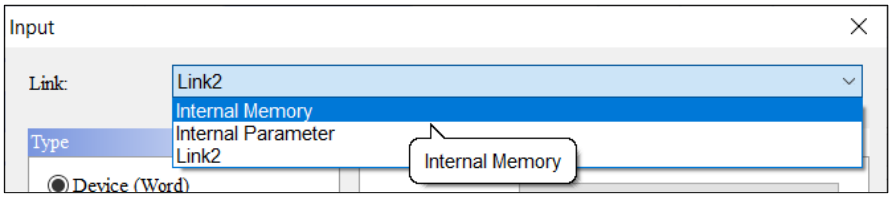
Create an element, and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

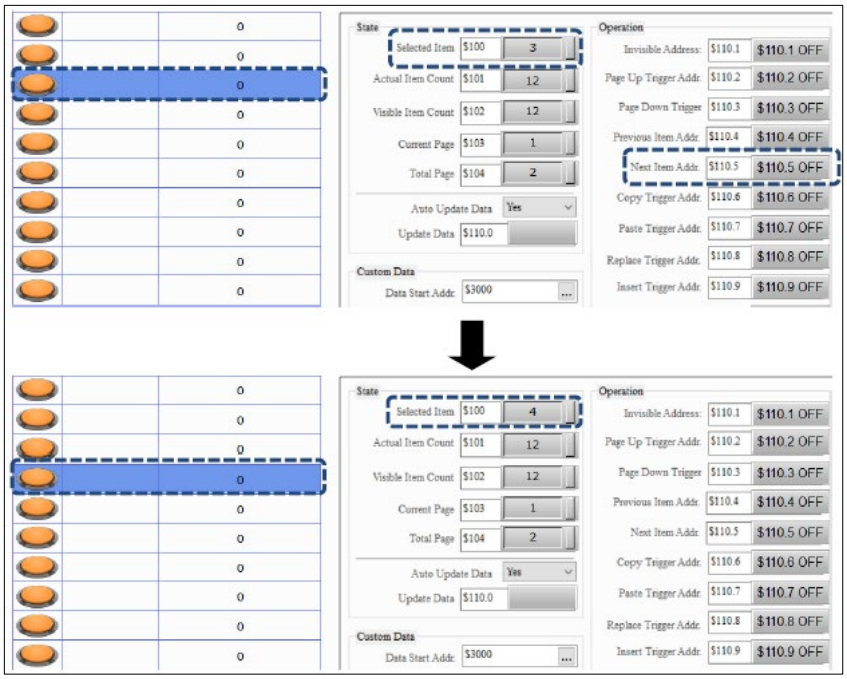
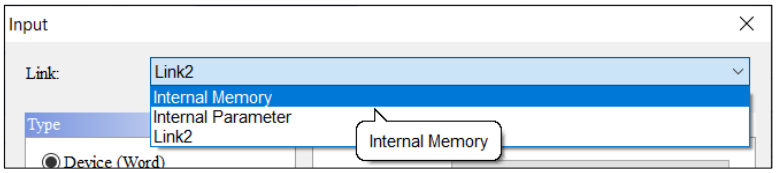
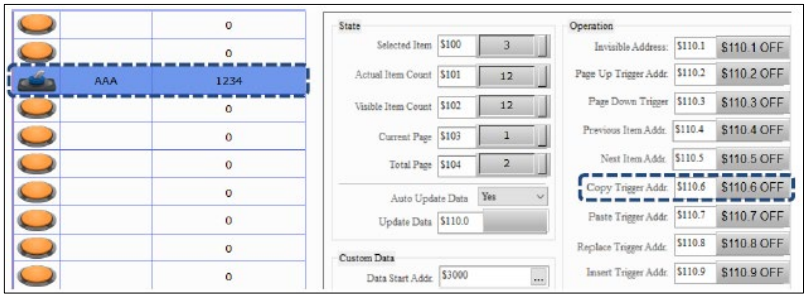


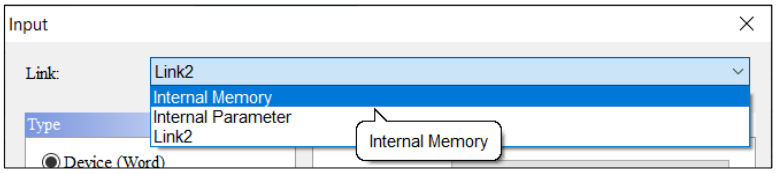
</td></tr>
<tr><td>Invisible State</td></tr>
</table>

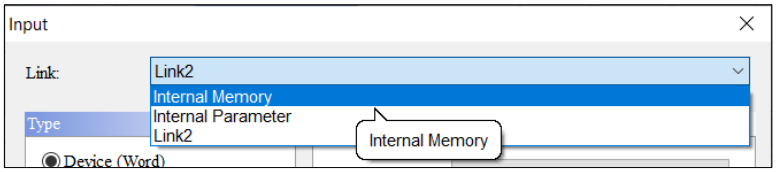
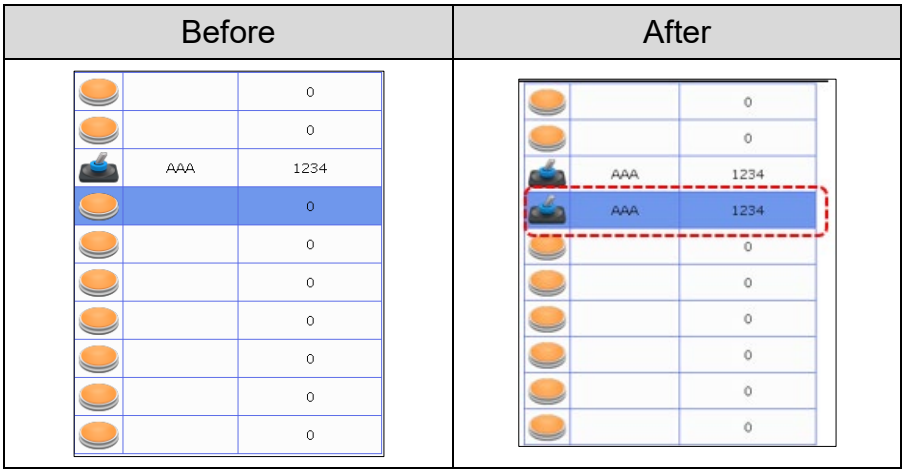
No.	Function	Description
(11)	Page Up Trigger	● When the **Page Up Trigger** bit is On, the element display switches to the previous page and this bit is automatically cleared once the action is complete. ● When the **Page Up Trigger** bit is not On, the **Current Page** shows 2; when it is On, the **Current Page** shows 1.  ● The controller address (Bit) and the internal register address (Bit) are supported. 

No.	Function	Description
(12)	Page Down Trigger	● When the **Page Down Trigger** bit is On, the element display switches to the next page and this bit is automatically cleared once the action is complete. ● When the **Page Down Trigger** bit is not On, the **Current Page** shows 1; when it is On, the **Current Page** shows 2.  ● The controller address (Bit) and the internal register address (Bit) are supported. 

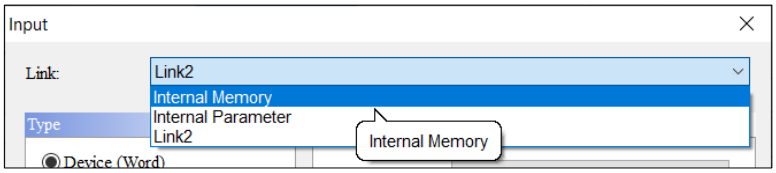
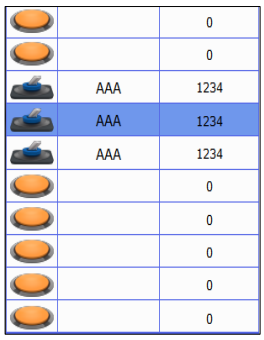
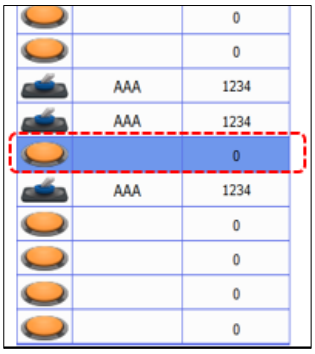
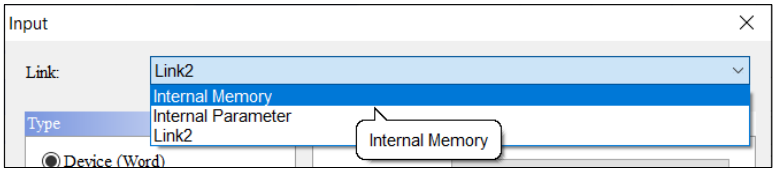
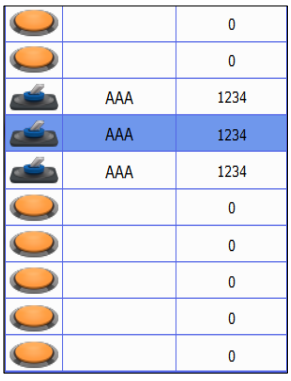
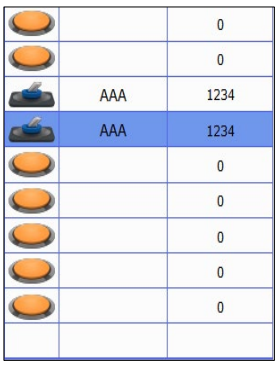
No.	Function	Description
(13)	Previous Item Addr.	● When the **Previous Item Addr.** bit is On, the previous item on the element is selected and this bit is automatically cleared once the action is complete. ● When the **Previous Item Addr.** bit is not On, the **Selected Item** shows 4; when it is On, the **Selected Item** shows 3.  ● The controller address (Bit) and the internal register address (Bit) are supported. 

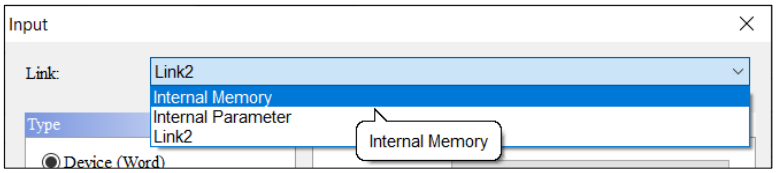
No.	Function	Description
(14)	Next Item Addr.	● When the **Next Item Addr.** bit is On, the next item on the element is selected and this bit is automatically cleared once the action is complete. ● When the **Next Item Addr.** bit is not On, the **Selected Item** shows 3; when it is On, the **Selected Item** shows 4.  ● The controller address (Bit) and the internal register address (Bit) are supported. 
(15)	Copy Trigger Addr.	● When the **Copy Trigger Addr.** bit is On, the current item is copied and this bit is automatically cleared once the action is complete.  ● The controller address (Bit) and the internal register

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>address (Bit) are supported.
 
</td></tr>
<tr><td>(16)</td><td>Paste Trigger Addr.</td><td>● When the Paste Trigger Addr. bit is On, the copied item is pasted and this bit is automatically cleared once the action is complete.
● The copied item is pasted after the selected row.
 

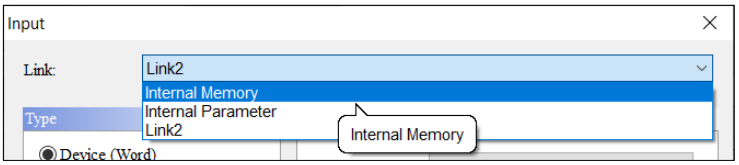
● The controller address (Bit) and the internal register address (Bit) are supported.
 
</td></tr>
<tr><td>(17)</td><td>Replace Trigger Addr.</td><td>● When the Replace Trigger Addr. bit is On, the copied item replaces the selected item and this bit is automatically cleared once the action is complete.
● The copied item appears on the selected row.
 

● The controller address (Bit) and the internal register</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>address (Bit) are supported.
 
</td></tr>
<tr><td>(18)</td><td>Insert Trigger Addr.</td><td>● When the Insert Trigger Addr. bit is On, a new blank item is inserted and this bit is automatically cleared once the action is complete.
● The blank item is inserted after the selected row.
<table>
<tr><th>Before</th><th>After</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
● The controller address (Bit) and the internal register address (Bit) are supported.
 
</td></tr>
<tr><td>(19)</td><td>Cut Trigger Addr.</td><td>● When the Cut Trigger Addr. bit is On, the current item is deleted and this bit is automatically cleared once the action is complete.
<table>
<tr><th>Before</th><th>After</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
● The controller address (Bit) and the internal register address (Bit) are supported.</td></tr>
</table>

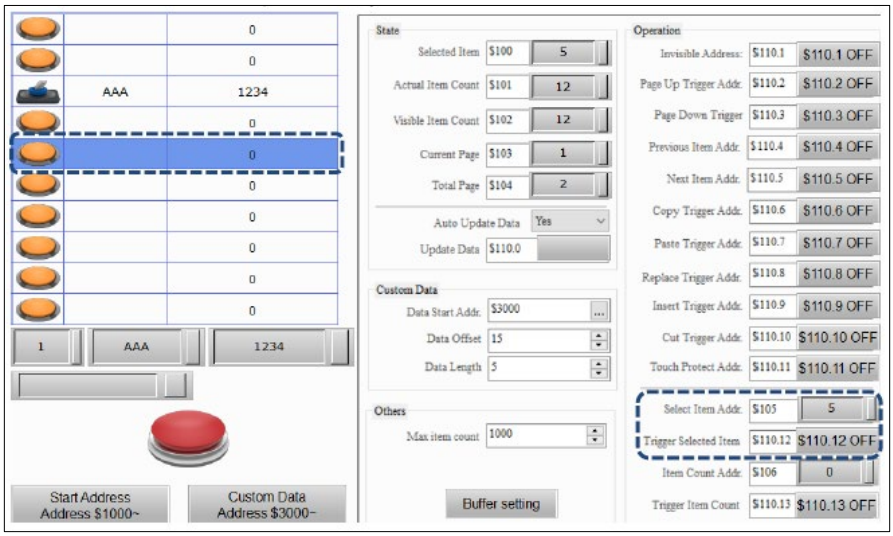
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(20)</td><td>Touch Protect Addr.</td><td>

When the Touch Protect Addr. bit is On, users cannot click the GridBox List element.
The controller address (Bit) and the internal register address (Bit) are supported.



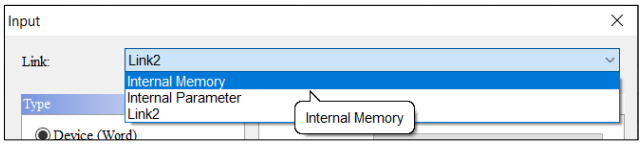
</td></tr>
<tr><td rowspan="2">(21)</td><td>Select Item Addr.</td><td>

Use Select Item Addr. to specify the item to select. Then, set the Trigger Selected Item to On, and the specified item is selected.

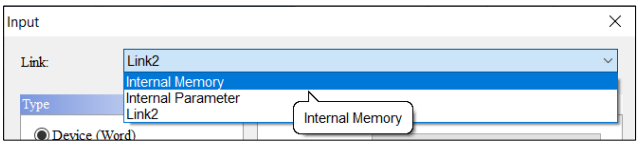


</td></tr>
<tr><td>Trigger Selected Item</td><td>

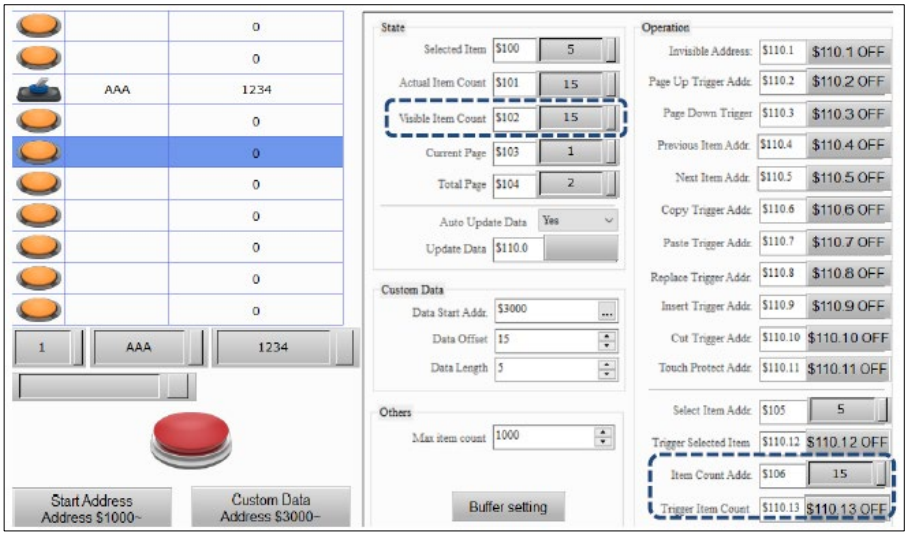
The controller address (Bit) and the internal register address (Bit) are supported.

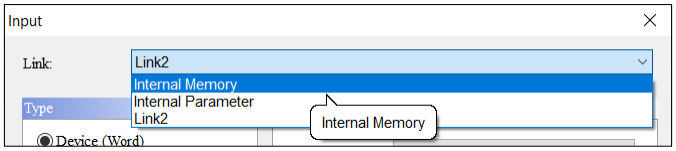


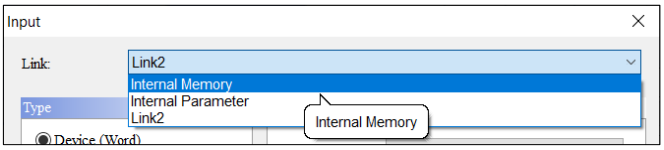
The controller address (Bit) and the internal register address (Bit) are supported.



</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(22)</td><td>Item Count Addr.</td><td>
Use the Item Count Addr. to specify the visible items. Then, set the Trigger Item Count to On, and the element changes the value of Visible Item Count.


</td></tr>
<tr><td>Trigger Item Count</td><td>
The controller address (Bit) and the internal register address (Bit) are supported.


The controller address (Bit) and the internal register address (Bit) are supported.


</td></tr>
</table>

- Mapping address

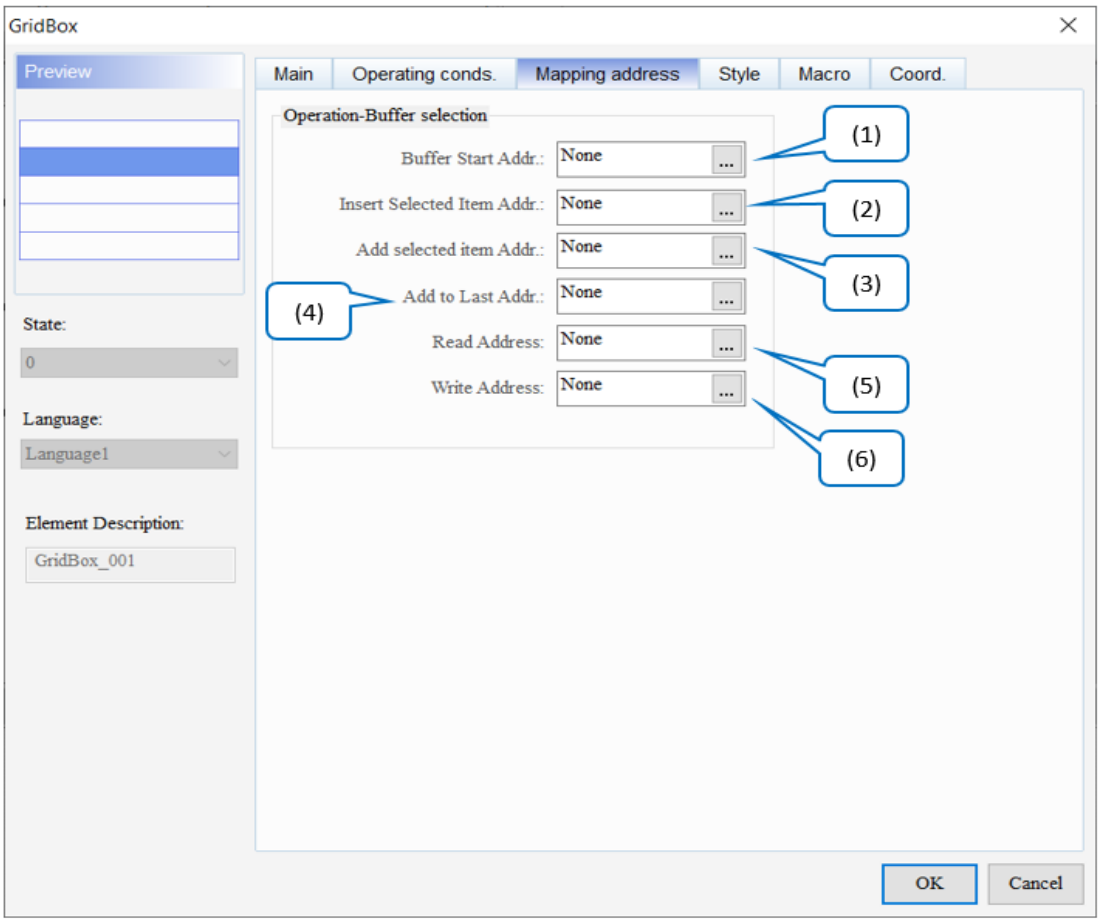
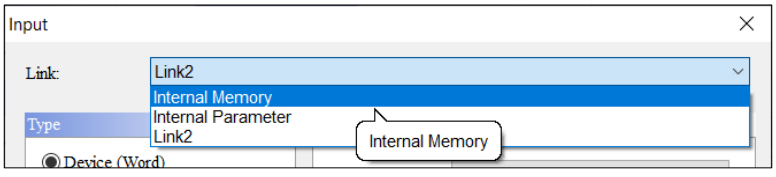
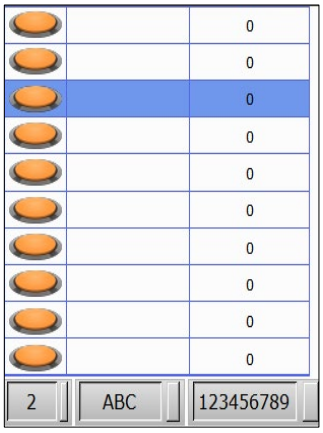
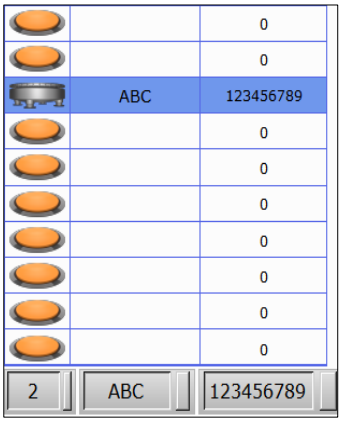


Figure 19 - 26: GridBox List element Mapping address property page

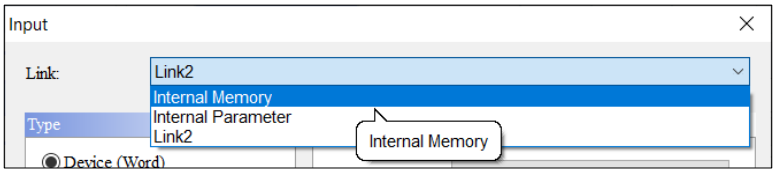
No.	Function	Description
(1)	Buffer Start Addr.	● This is the start address where the element temporarily stores data. The data in the buffer can be inserted, added, and written into the selected item, and the data in the selected item can also be read to the buffer. ● The controller address (Word) and the internal register address (Word) are supported. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Insert Selected Item Addr.</td><td>

When the Insert Selected Item Addr. bit is On, the Selected Item will be inserted from the Buffer Start Addr. plus the Item Addr. Offset. Then, the Actual Item Count increases by 1.
If the Actual Item Count has reached the Max item count, the Selected Item cannot be inserted.

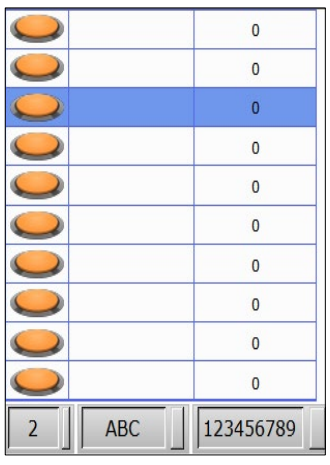
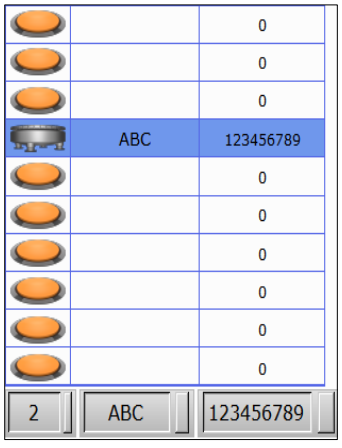
<table>
<tr><th>Before</th><th>After</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>

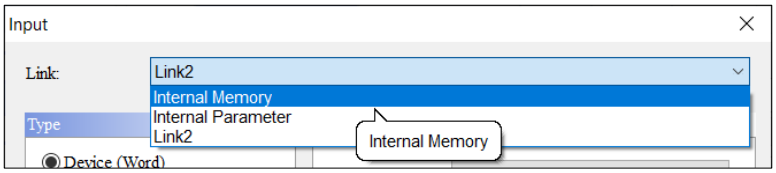
The controller address (Bit) and the internal register address (Bit) are supported.

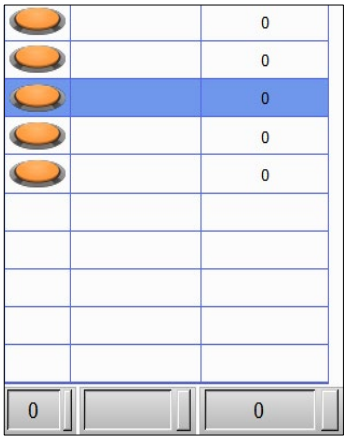
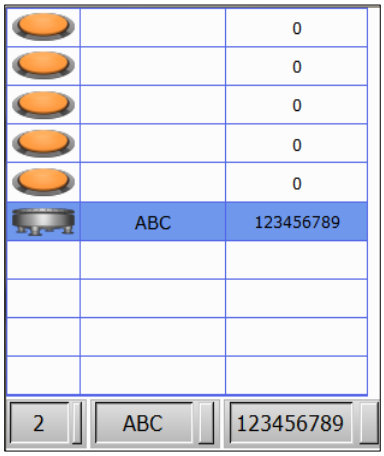
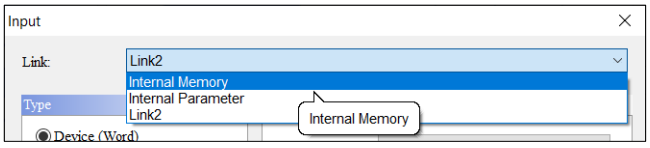


</td></tr>
<tr><td>(3)</td><td>Add selected item Addr.</td><td>

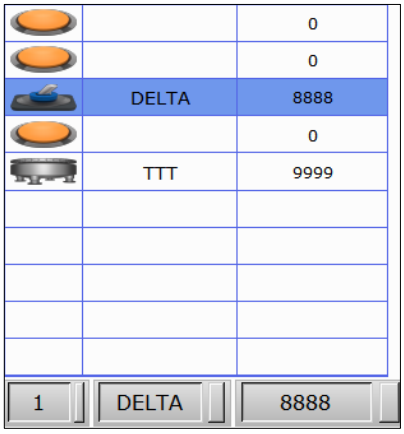
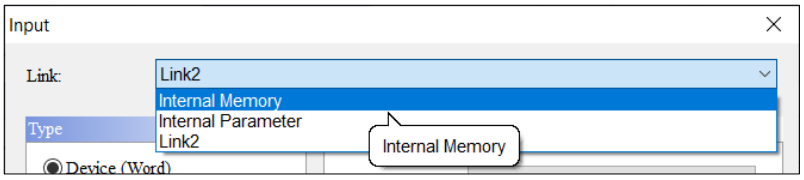
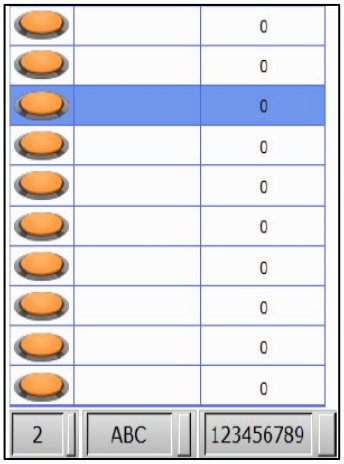
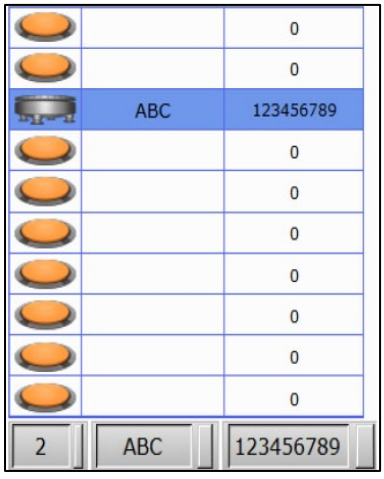
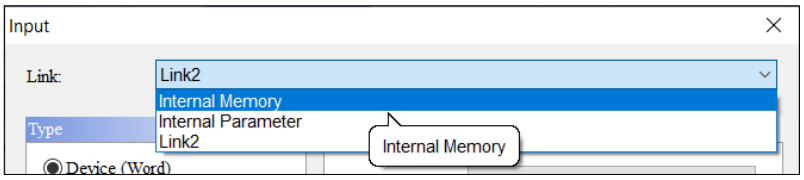
When the Add selected item Addr. bit is On, the item will be inserted after the Selected Item from the Buffer Start Addr. plus the Item Addr. Offset. Then, the Actual Item Count increases by 1.
If the Actual Item Count has reached the Max item count, the Selected Item cannot be inserted.

<table>
<tr><th>Before</th><th>After</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
The controller address (Bit) and the internal register address (Bit) are supported.


</td></tr>
<tr><td>(4)</td><td>Add to Last Addr.</td><td>
When the Add to Last Addr. bit is On, the Selected Item will be inserted to the last item from the Buffer Start Addr. plus the Item Addr. Offset. Then, the Actual Item Count increases by 1.
If the Actual Item Count has reached the Max item count, the Selected Item cannot be inserted.
<table>
<tr><th>Before</th><th>After</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
The controller address (Bit) and the internal register address (Bit) are supported.


</td></tr>
<tr><td>(5)</td><td>Read Address</td><td>
When the Read Address bit is On, the element saves the content of the Selected Item to the Buffer Start Addr. without changing the element
</td></tr>
</table>

No.	Function	Description
		content.  ● The controller address (Bit) and the internal register address (Bit) are supported. 
(6)	Write Address	● When the **Write Address** bit is On, the **Selected Item** will be written from the **Buffer Start Addr.** plus the **Item Addr. Offset**. Before  After  ● The controller address (Bit) and the internal register address (Bit) are supported. 

- Style

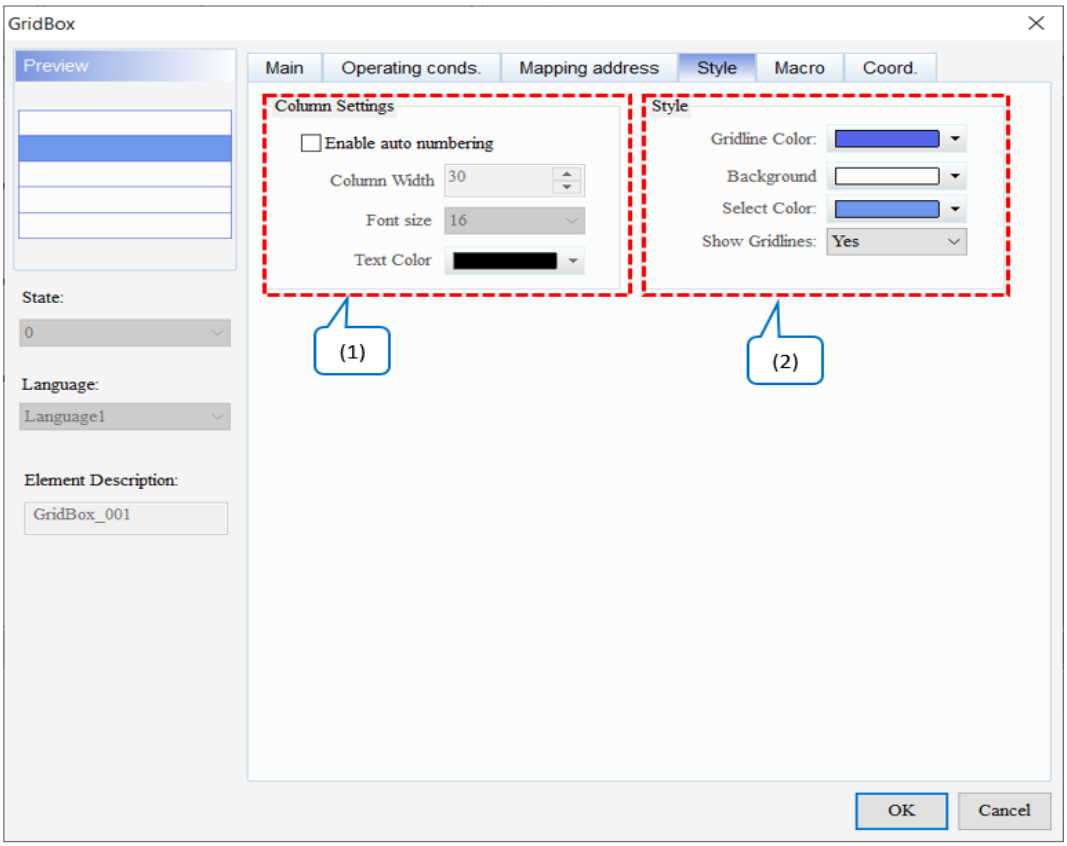
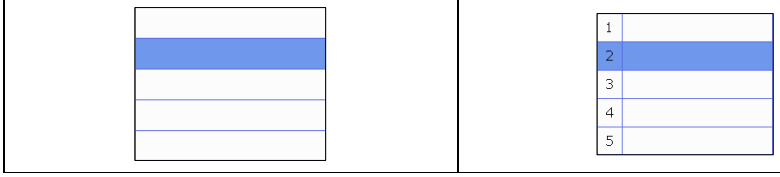
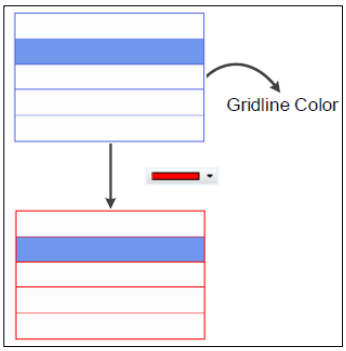
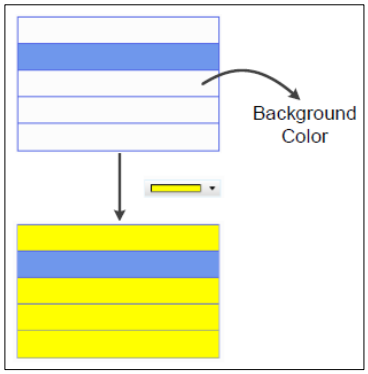
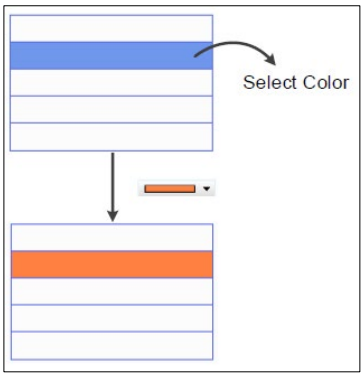


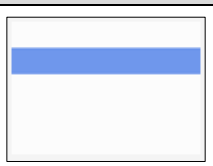
Figure 19 - 27: GridBox List element Style property page

No.	Function	Description
(1)	Column Settings	● Select the checkbox for **Enable auto numbering** to set **Column Width**, **Font size**, and **Text Color**. ● The **Enable auto numbering** function is for setting whether to display the auto numbering, the width of the auto numbering column, and the font color and size of the auto numbering. The default value of **Font Size** is **16**, and the default **Text Color** is [■]. ● Display auto numbering. Enable auto numbering not selected / Enable auto numbering selected  ● **Column Width**: Set the width of the auto numbering

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>column and the maximum setting is 65535. The default value is 30.</td></tr>
<tr><td>(2)</td><td>Style</td><td>The Style function is for setting the color and gridline of the element, which include the Gridline Color, Background Color, Select Color, and Show Gridlines.
● Gridline Color
 

● Background Color
 

● Select Color
 

● Show Gridlines
<table><tr><th>Show Gridlines is set to Yes</th><th>Show Gridlines is set to No</th></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
</table>

- Macro

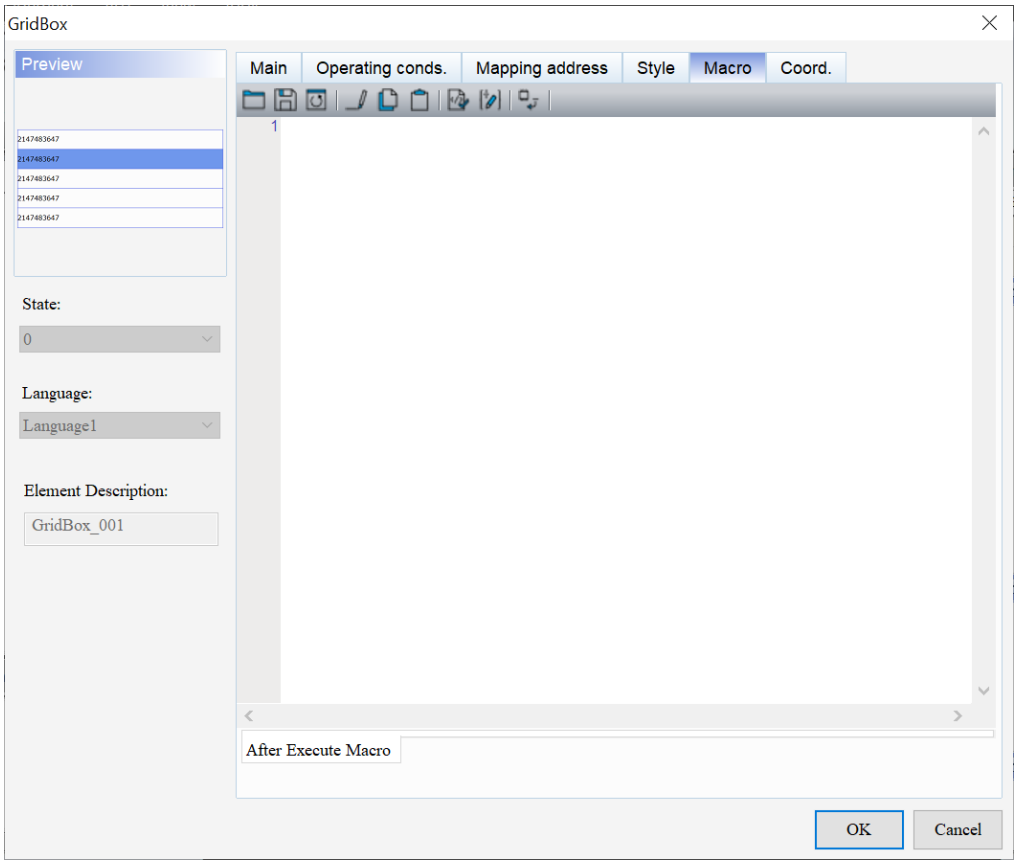
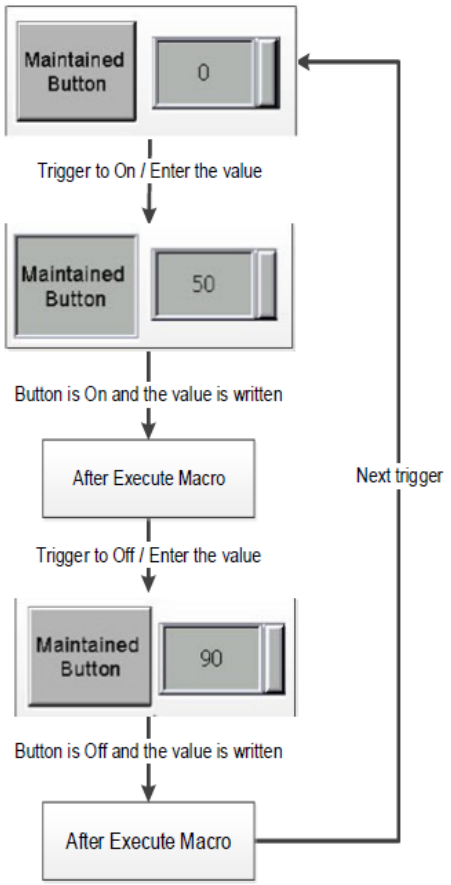


Figure 19 - 28: GridBox List element Macro property page

No.	Function	Description
(1)	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	The flowchart for **After Execute Macro** is as follows.	

No.	Function	Description
		

- Coord.

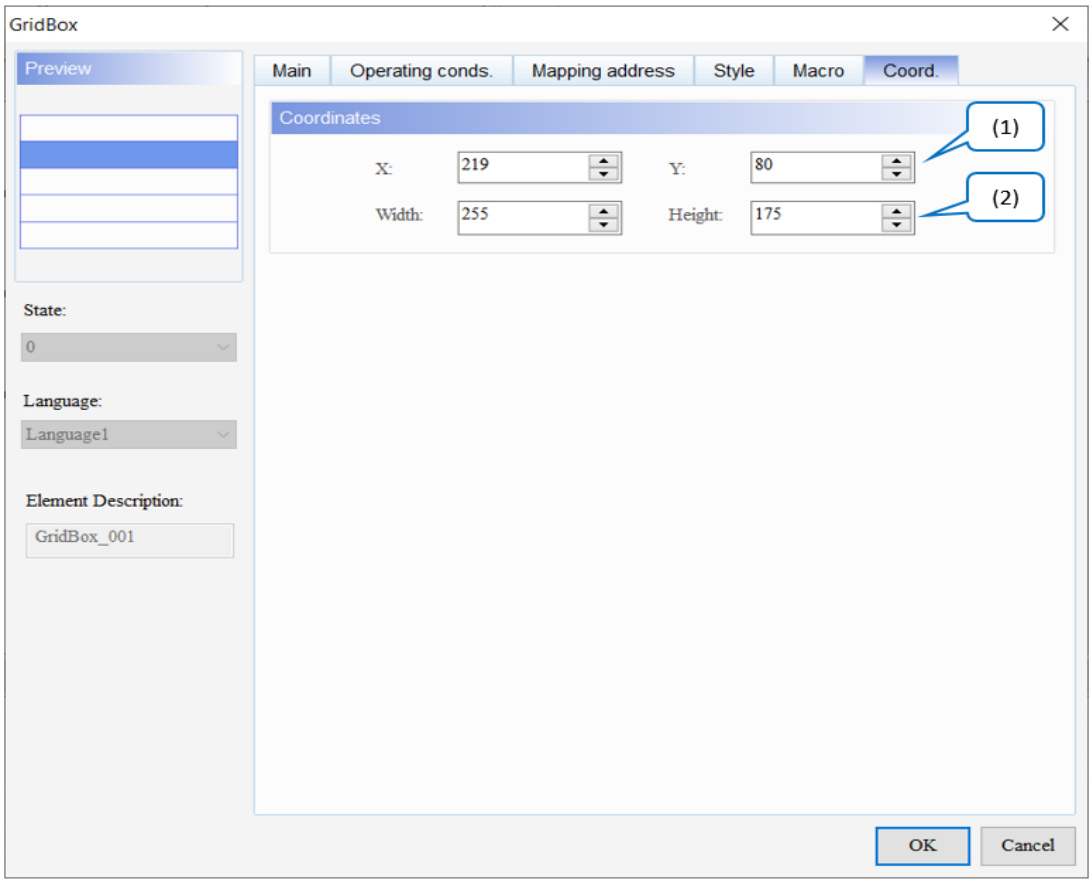


Figure 19 - 29: GridBox List element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

19.5 PDF Viewer

Use the **PDF Viewer** element to read PDF files on the HMI by saving the PDF files in an external storage device and inserting it to the HMI. With this feature, users can view the operation steps without a PC or printouts, which is more convenient and efficient.

The **PDF Viewer** element comprises two sections: File list is on the left and the Content of the PDF file on the right.

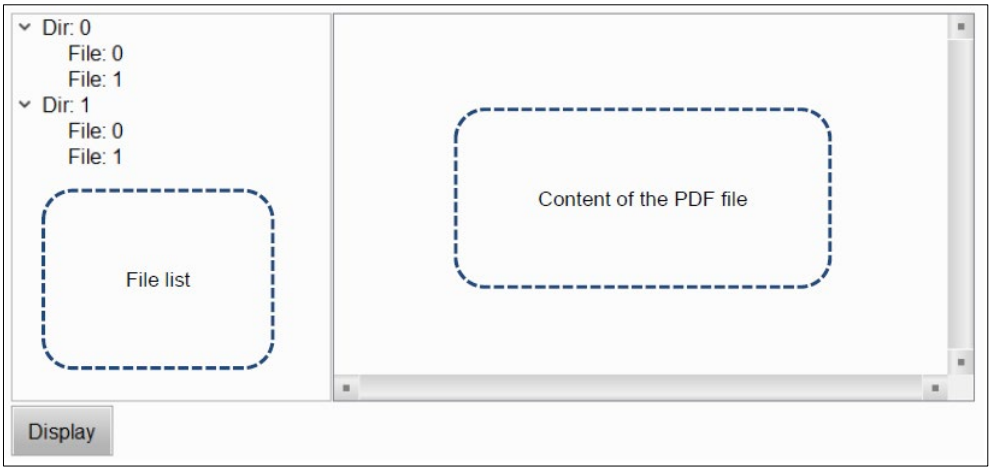
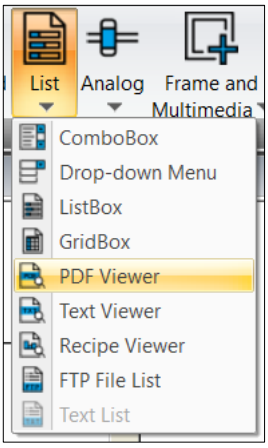
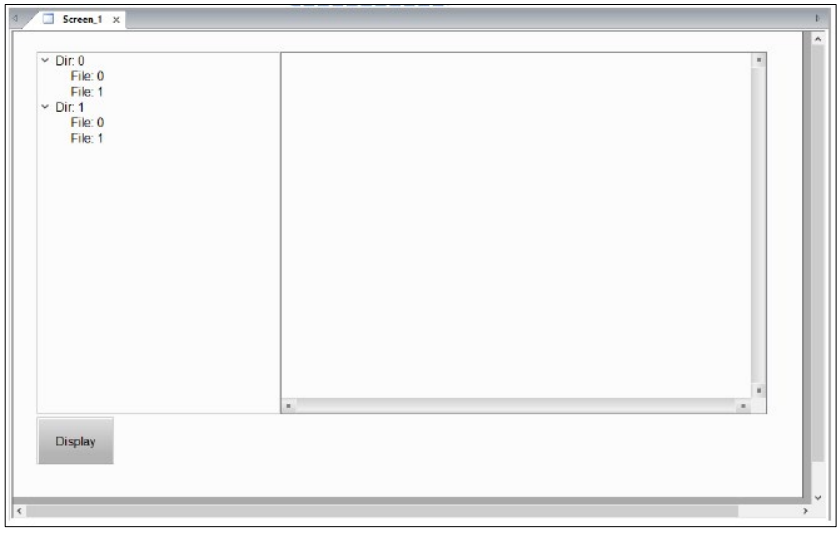
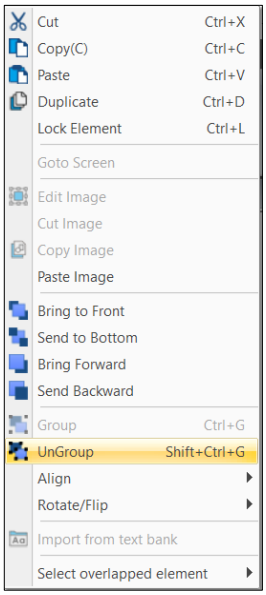
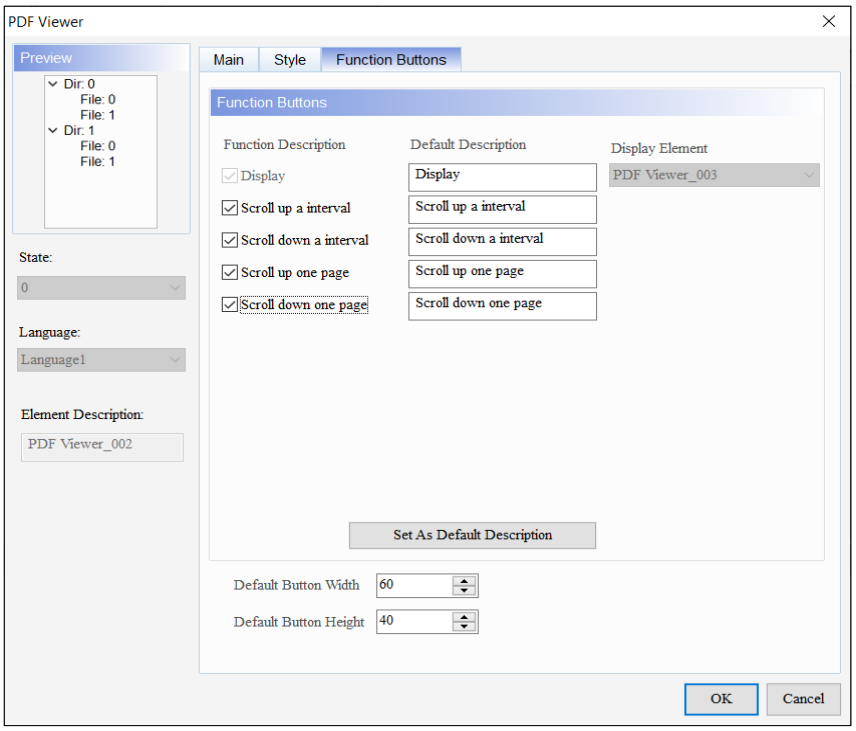
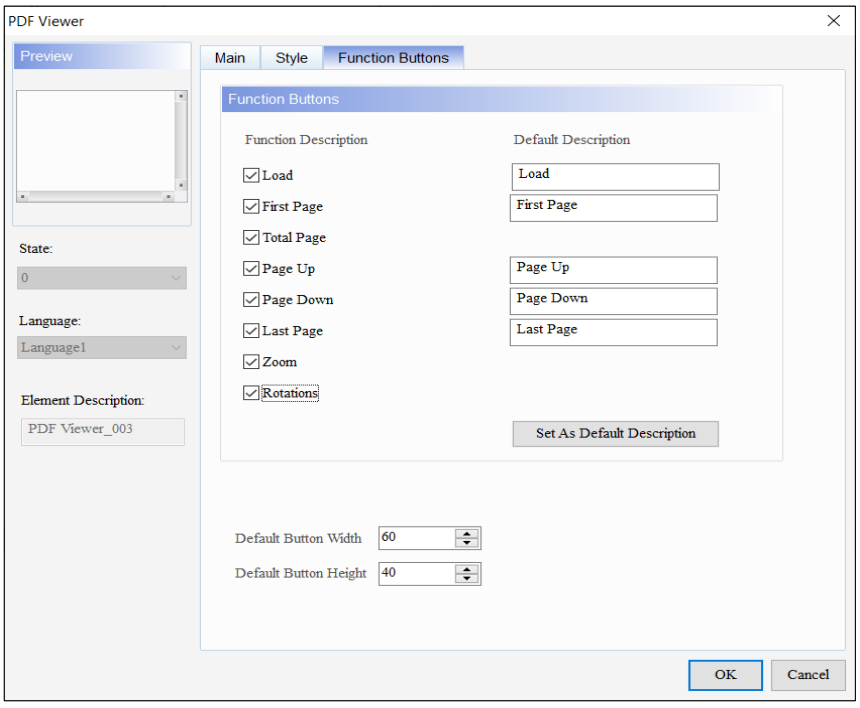


Figure 19 - 30: PDF Viewer

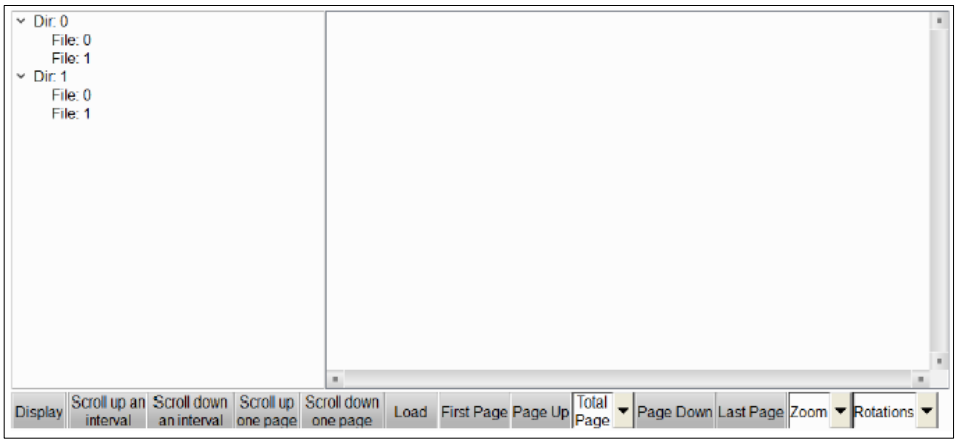
The PDF file is displayed on the HMI through an external storage medium, so if the reading and writing speed of the USB Disk or SD Card is slow or the PDF file is too large, the display speed of the PDF file will be affected by the HMI.

Refer to the following table for **PDF Viewer** element description.

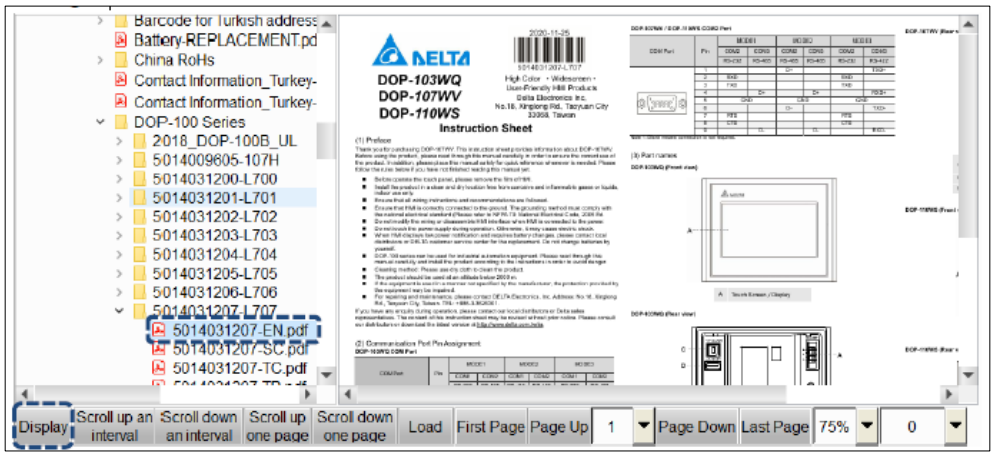
PDF Viewer	
Create PDF Viewer element	**Step 1**: Create a **PDF Viewer** element.   **Step 2**: Click the **PDF Viewer** element. Right-click and select **UnGroup**. 

PDF Viewer	
Create PDF Viewer element	**Step 3**: Click the File list on the left and go to the **Function Buttons** property page to set the functions as follows.  **Step 4**: Click the Content of the PDF file on the right and go to the **Function Buttons** property page to set the functions as follows. 
Create PDF Viewer element	**Step 5**: After the setting is completed, the editing screen is as follows.

PDF Viewer



Step 6: Compile the screen prior to performing off-line simulation. Select the PDF file to display, press **Display** to see the Content of the PDF file displayed on the right.



The following explains the properties of the File list on the left and the Content of the PDF file on the right.

On double-clicking the **PDF Viewer** (File list on the left) element, the property page appears as follows.

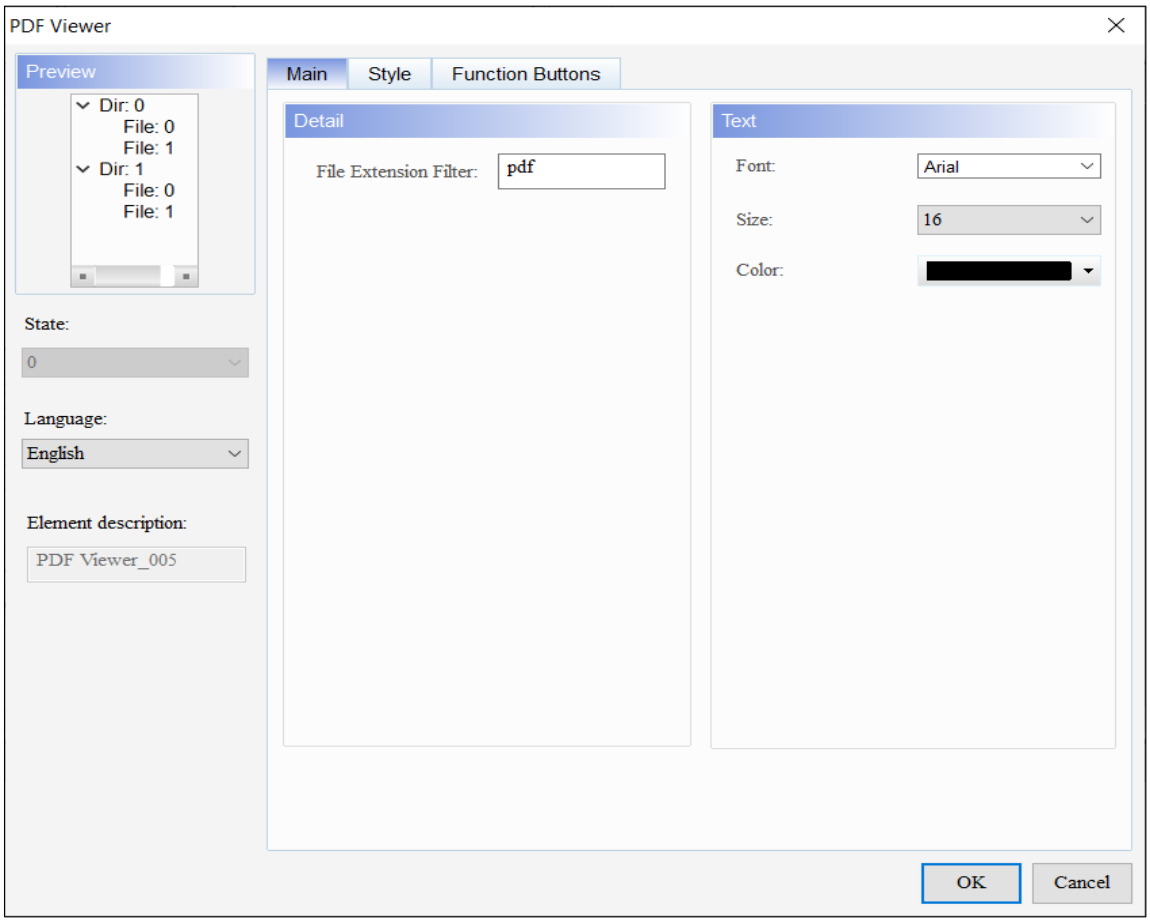


Figure 19 - 31: PDF Viewer (File list on the left) element property page

PDF Viewer (File list on the left)	
Function	**Description**
Main	Set the Text Font, Size, and Color. Set the File Extension Filter.
Style	Set the Border Color, Tree View Background, Transparency and smooth animation
Function Buttons	Select the checkboxes for Scroll up an interval, Scroll down an interval, Scroll up one page, and Scroll down one page. Click Set As Default Description. Set the width and height of the buttons.

- Main

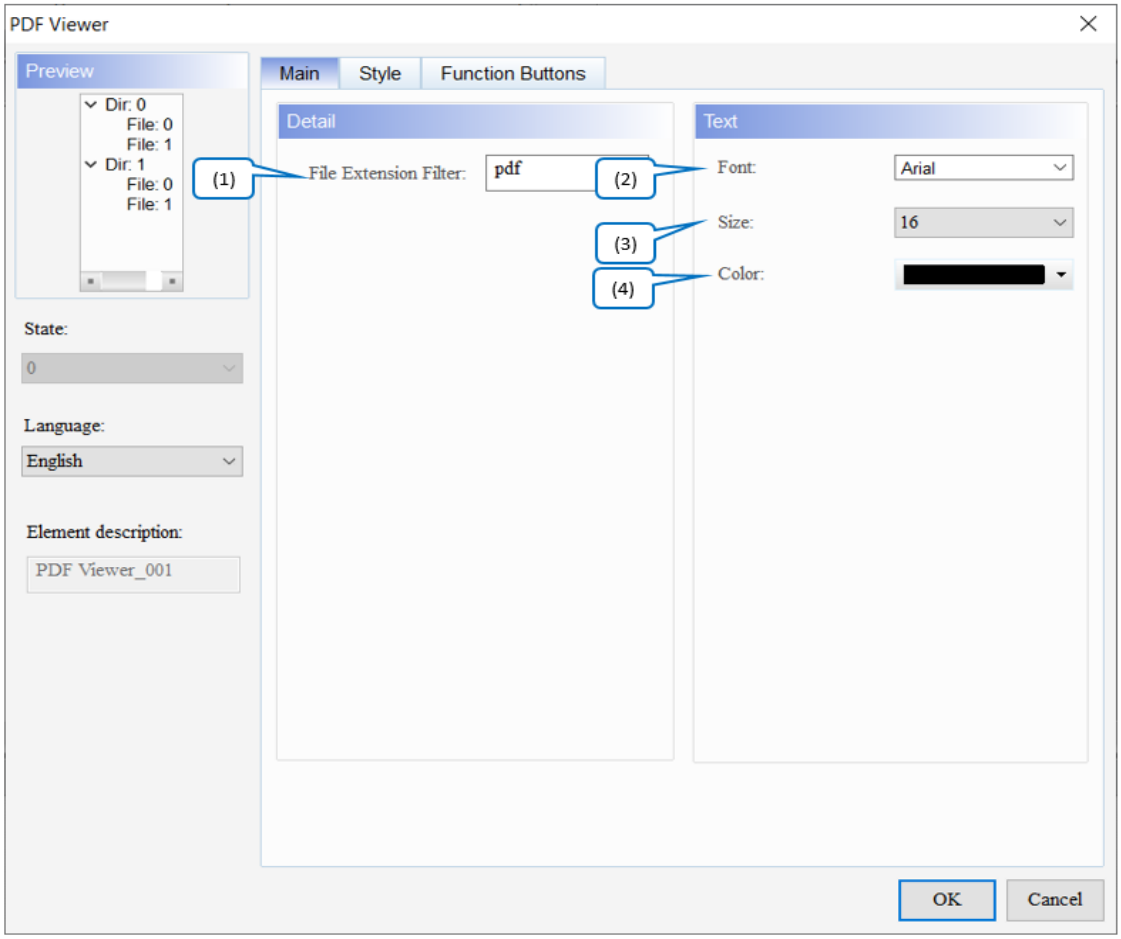


Figure 19 - 32: PDF Viewer (File list on the left) element Main property page

No.	Function	Description
(1)	File Extension Filter	● Set the file extension of the files to view. The default value is **pdf**. ● Setting the **File Extension Filter** to pdf means only files in pdf format are displayed.
(2)	Font	Set the text font for the File list on the left. The default value is **Arial**.
(3)	Size	Set the text size for the File list on the left. The default value is **16**.
(4)	Color	Set the text color for the File list on the left. The default is [■].

- Style

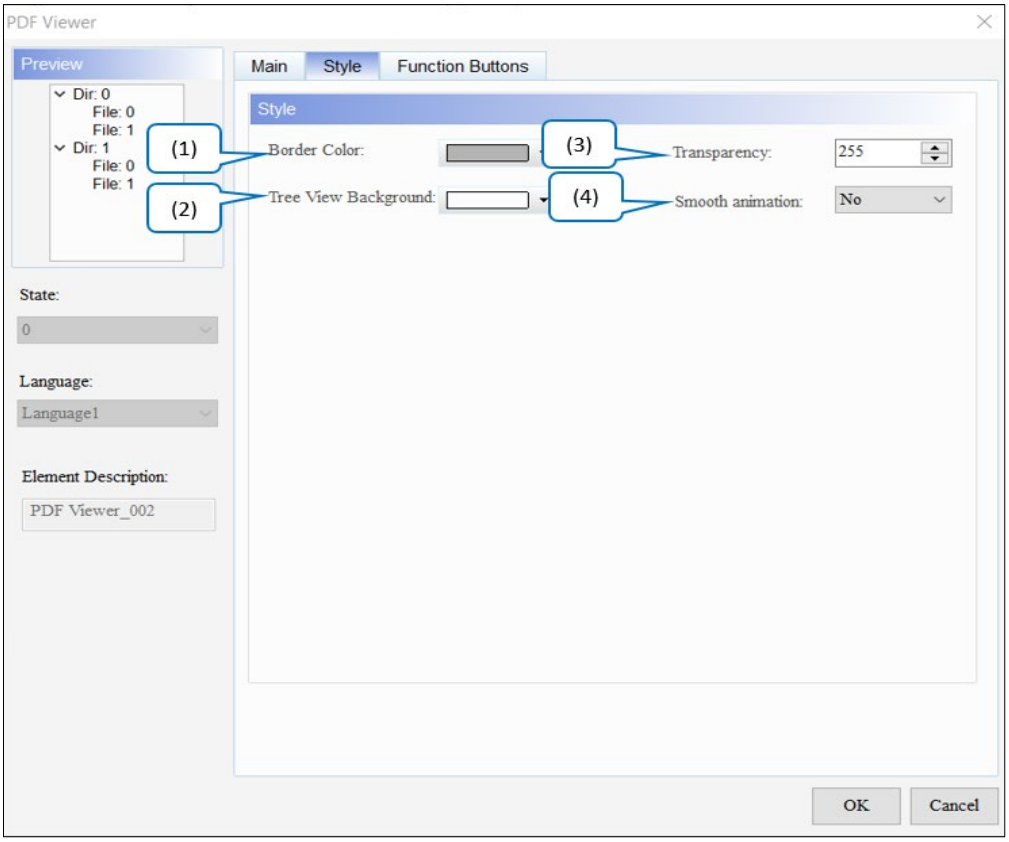
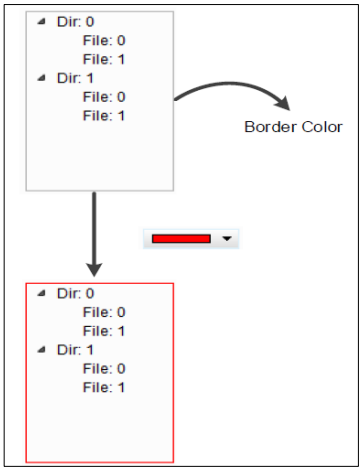
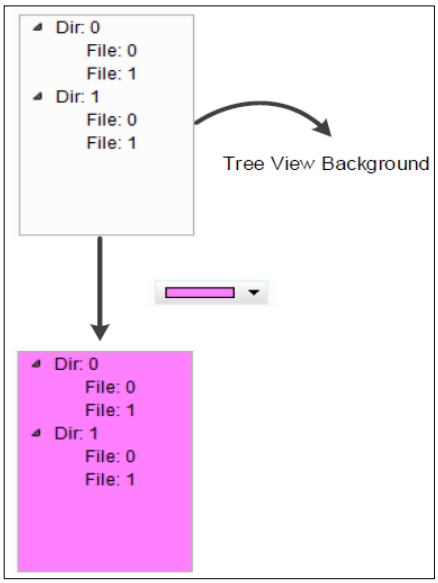


Figure 19 - 33: PDF Viewer (File list on the left) element Style property page

No.	Function	Description
(1)	Border Color	Set the border color of the File list on the left. The default is  . 

No.	Function	Description
(2)	Tree View Background	Set the tree view background color of the File List on the left. The default is  . 
(3)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.
(4)	Smooth animation	● The **Smooth animation** function is available for this element. The default value is **No**. ● When users activate the **Smooth animation** function, there is a sliding effect when the File list is expanded or collapsed.

- Function Buttons

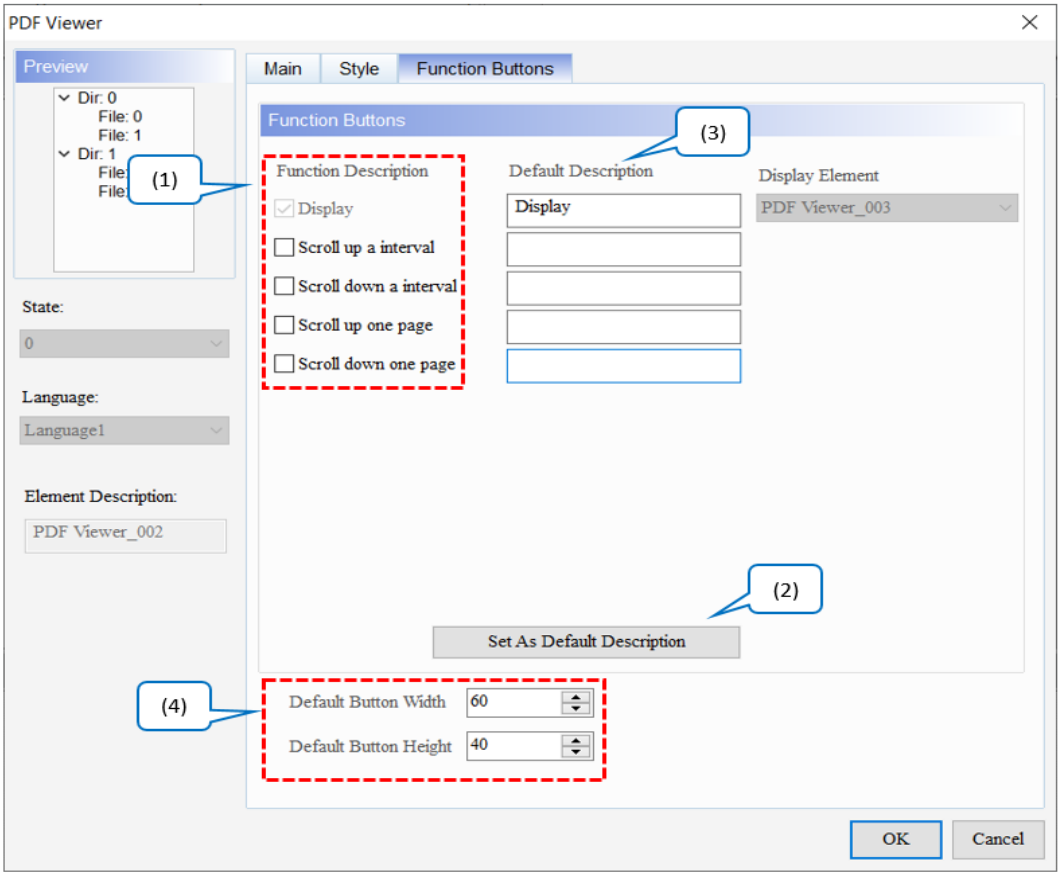


Figure 19 - 34: PDF Viewer (File list on the left) element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	● These are function buttons for the File list on the left. **Display** is selected by default and cannot be canceled. ● Other function buttons including **Scroll up an interval**, **Scroll down an interval**, **Scroll up one page**, and **Scroll down one page** are used to scroll the File list and determine how many lines to scroll each time.
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the **Default Description** fields.
(3)	Default Description	Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.
(4)	Default Button	Adjust the width and height of the function buttons. The default values are **60** and **40**, respectively.

No.	Function	Description
	Width and Height	

On double-clicking the **PDF Viewer** (Content of the PDF file on the right) element, the property page appears as follows.

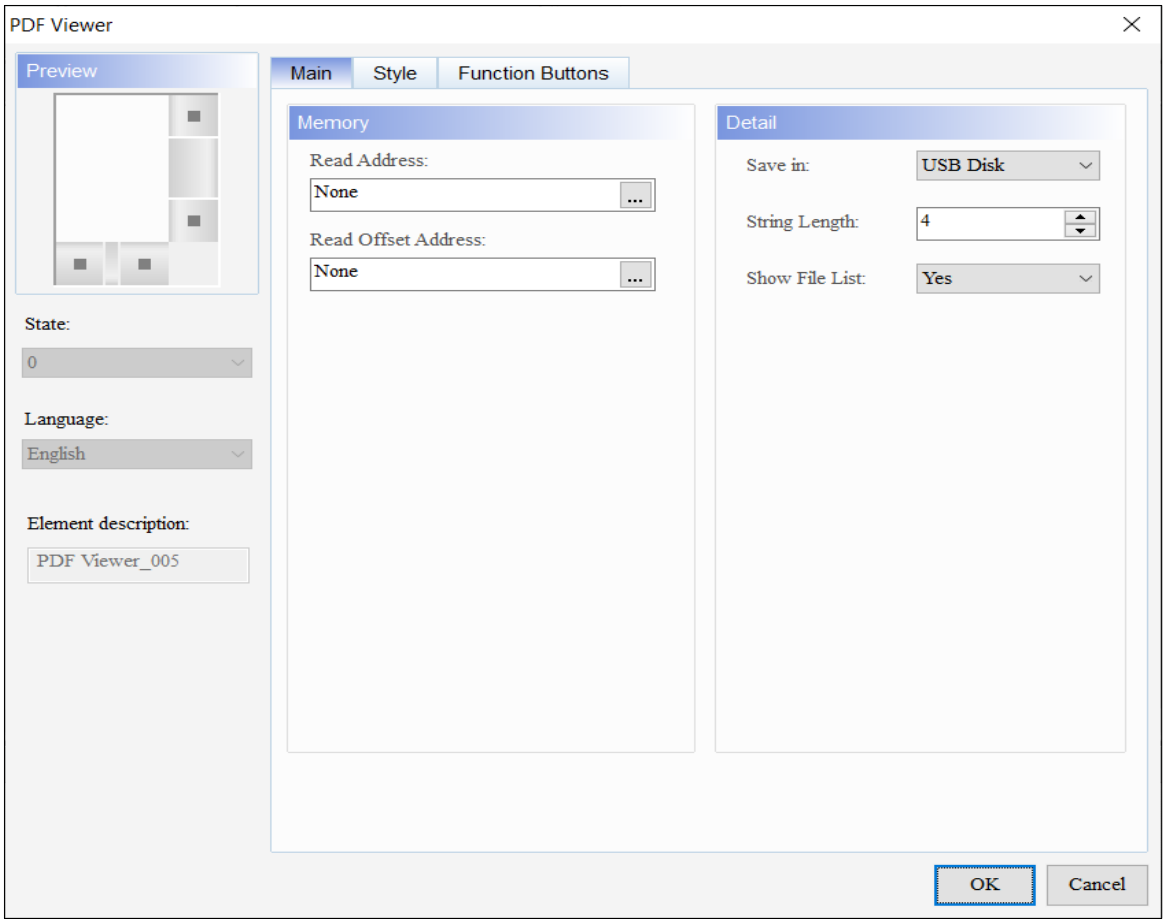


Figure 19 - 35: PDF Viewer (Content of the PDF file on the right) element property page

PDF Viewer (Content of the PDF file on the right)	
Function	**Description**
Main	Set the Read Address and Read Offset Address. Set the Save in, String Length, and Show File List.
Style	Set Transparency.

PDF Viewer (Content of the PDF file on the right)	
Function	**Description**
Function Buttons	● Select the checkboxes for Load, First Page, Total Page, Page Up, Page Down, Last Page, Zoom, and Rotations. Click Set As Default Description. Set the width and height of the buttons

● Main

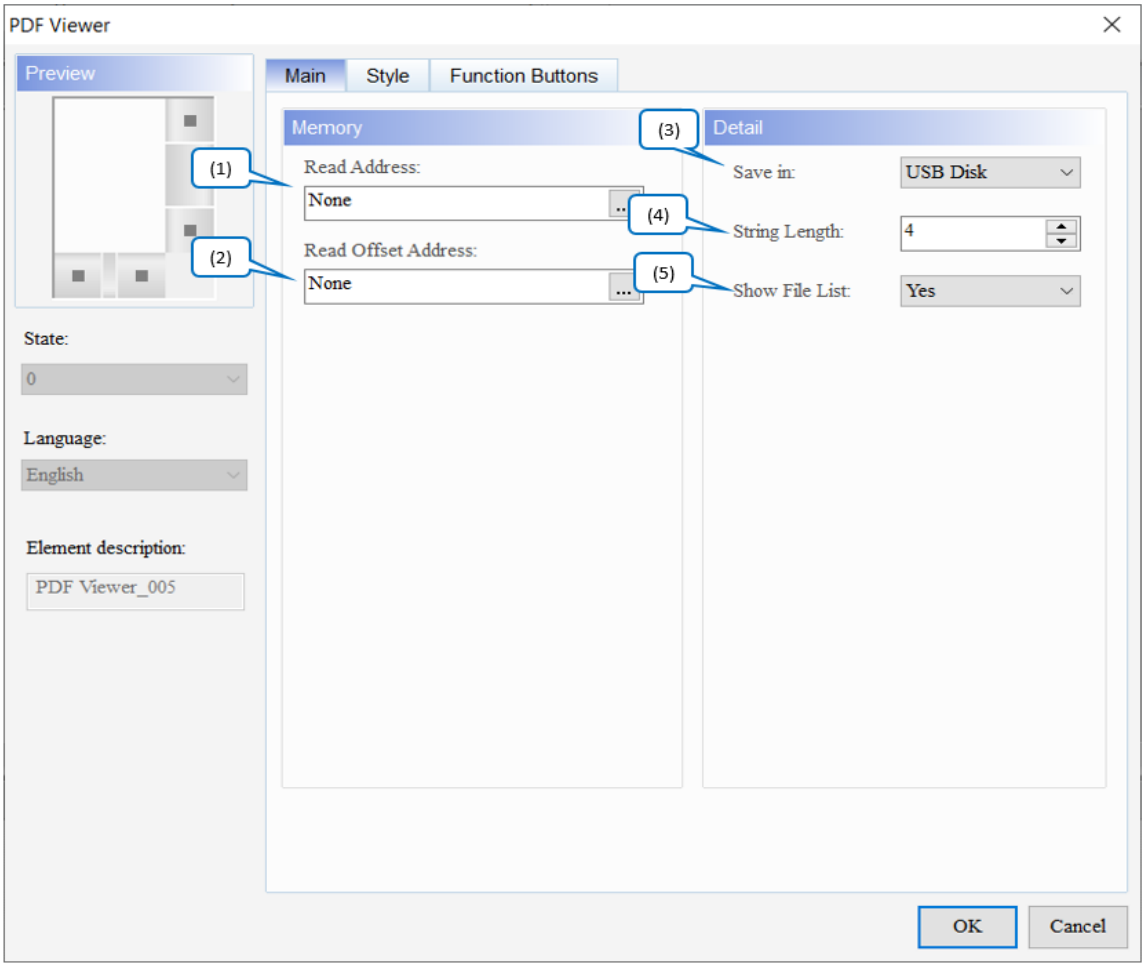


Figure 19 - 36: PDF Viewer (Content of the PDF file on the right) element Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*. ● If users choose the **Read Address** setting, users need to create a **Character Entry** element and set the **String Length** for the PDF file to display on the HMI.
(2)	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(3)	Save in	● Select USB Disk or SD Card as the storage device. The default value is **USB Disk**. ● When users save the PDF file in the USB Disk or SD Card, the HMI can read the PDF file from the storage device.
(4)	String Length	● The **String Length** setting is mainly used with the **Character Entry** element. The default value is **4**. ● The length of the string determines the input file name of the PDF.
(5)	Show File List	● Set whether to show the File list on the left. The default value is **Yes**. ● If users set the **Show File List** to No, the File list on the left is not shown.

- Style

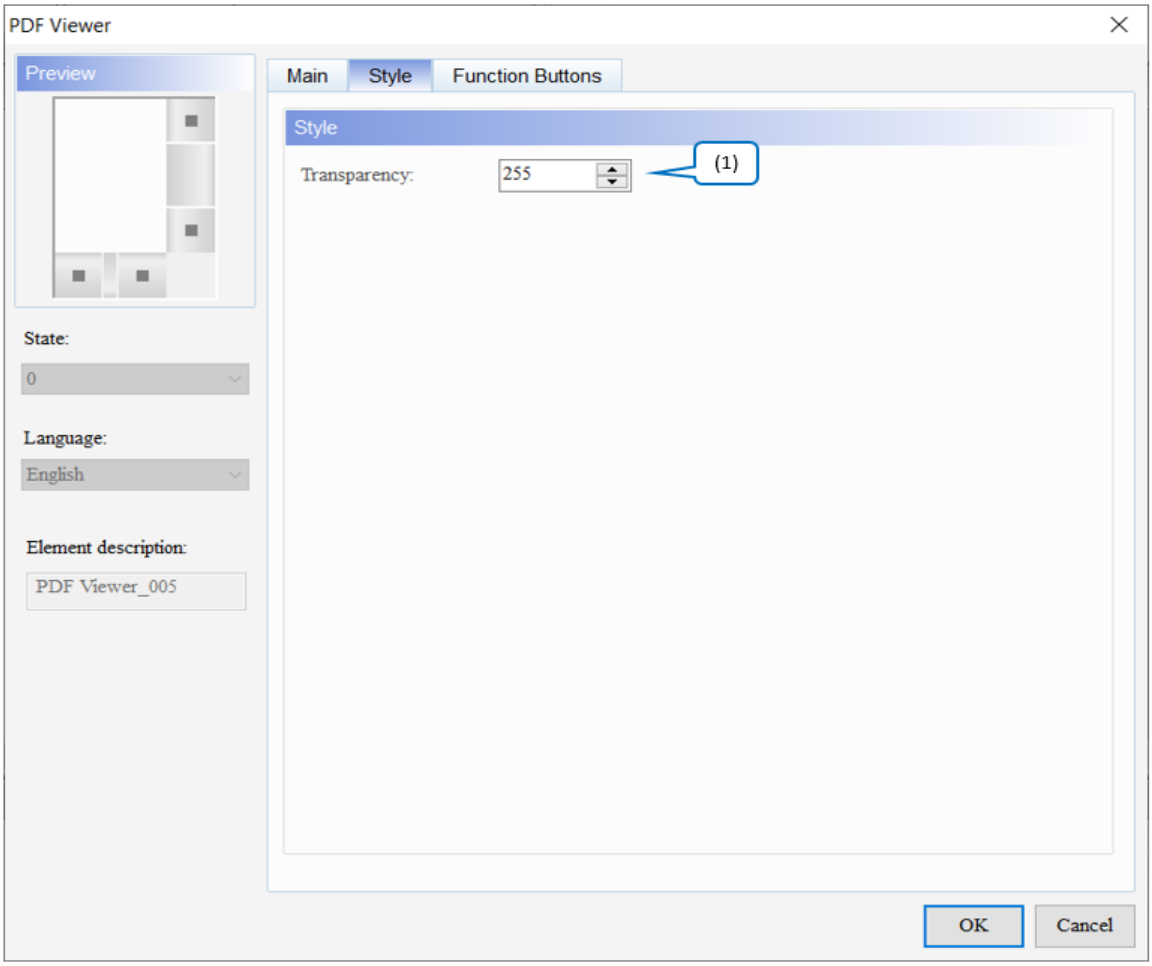


Figure 19 - 37: PDF Viewer (Content of the PDF file on the right) element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Function Buttons

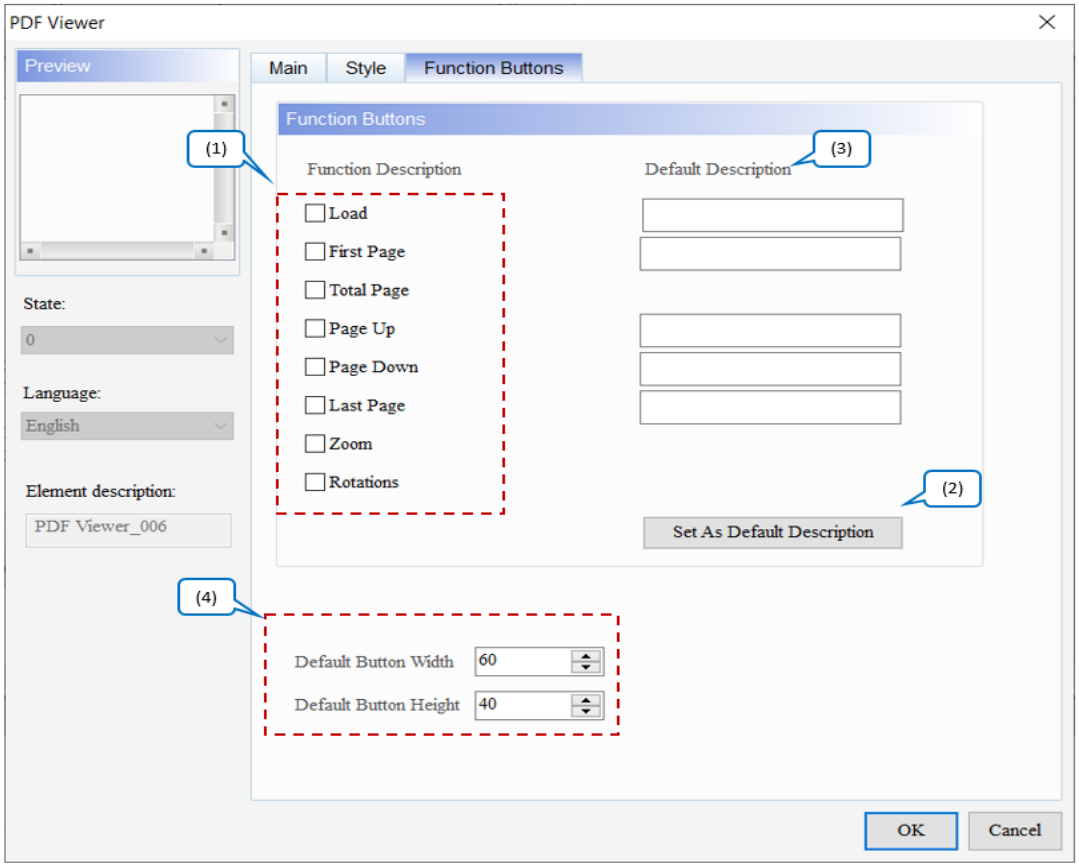


Figure 19 - 38: PDF Viewer (Content of the PDF file on the right) element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	● These are function buttons for the display content on the right, including Load, First Page, Total Page, Page Up, Page Down, Last Page, Zoom, and Rotations. ● The **Load** function for the display content and the Display function for the File list are used to read and display PDF files, but the way to use them are different. For **Load**, users need to manually enter the PDF file name and use the set **Read Address** to display the PDF file on the HMI. For **Display**, users only need to save the PDF file to a USB Disk or SD Card to display the PDF file on the HMI without manually entering the PDF file name.

No.	Function	Description
(2)	Set As Default Description	● Click **Set As Default Description** to insert the default strings to the **Default Description** fields. ● There are no default descriptions for **Total Page**, **Zoom**, and **Rotations**.
(3)	Default Description	● Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.
(4)	Default Button Width and Height	Adjust the width and height of the function buttons. The default values are **60** and **40**, respectively.

19.6 Text Viewer

Use the **Text Viewer** element to read .txt or .csv files on the HMI by saving the text files in an external storage device and inserting it to the HMI. With this feature, users can view the operation steps without a PC or printouts or record the data with the HMI, which is more convenient and efficient.

The **Text Viewer** element comprises two sections: File List on the left and Text file content to be displayed on the right.

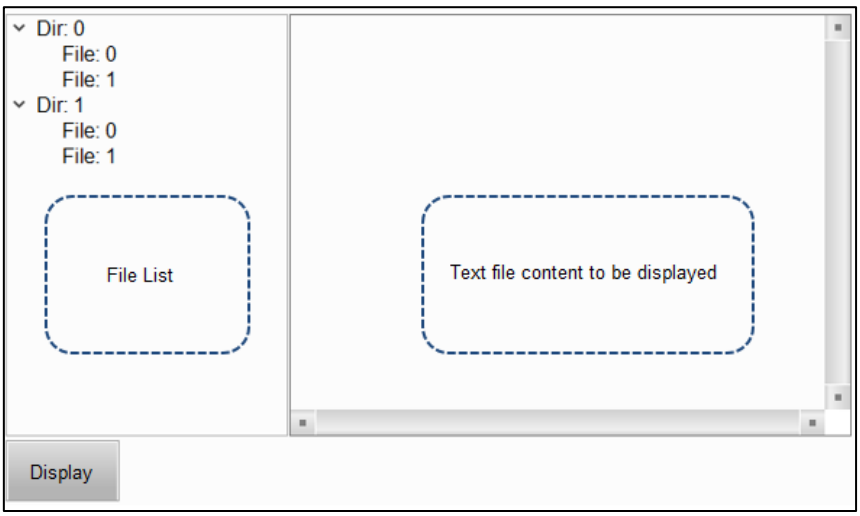


Figure 19 - 39: Text Viewer

Text files are displayed on the HMI from the external storage device, so if the USB Disk or SD Card read and write speed is too slow or the text file size is too big, the displaying speed of the text file will be affected.

NOTE:

1. *The maximum file size supported is 20M. A warning message is displayed when the file size exceeds the limit.*

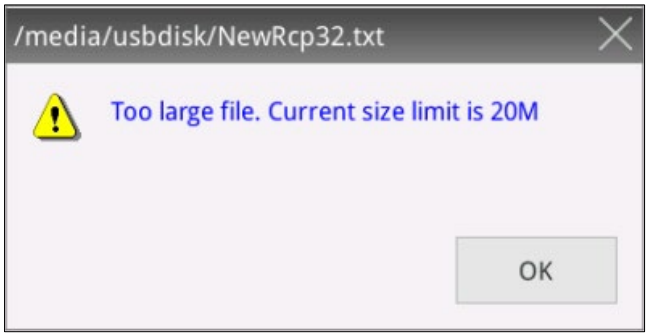


Figure 19 - 40: File size exceeds limit

2. *This function supports multi-language contents encoded in UTF-8. Multi-language contents not encoded in UTF-8 are displayed as garbled text.*
3. *Users can create only one **Text Viewer** element on a screen.*
4. *If the file type is CSV file, the table will be drawn with reference to the Recipe CSV Separator setting in **General** > **Environment**. The default value is ",".*

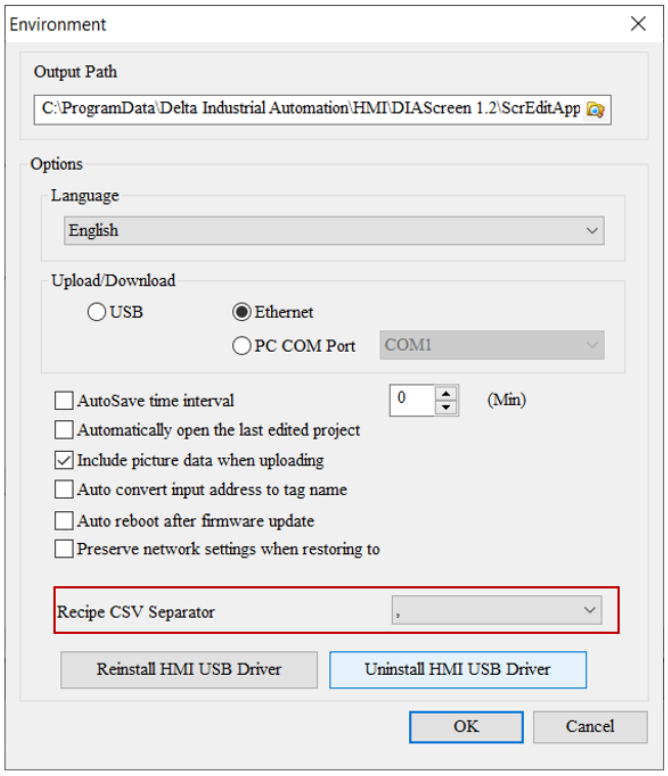


Figure 19 - 41: Recipe CSV Separator

5. *If the file type is CSV, the column width will be evenly allocated according to the column count and the width of the element.*

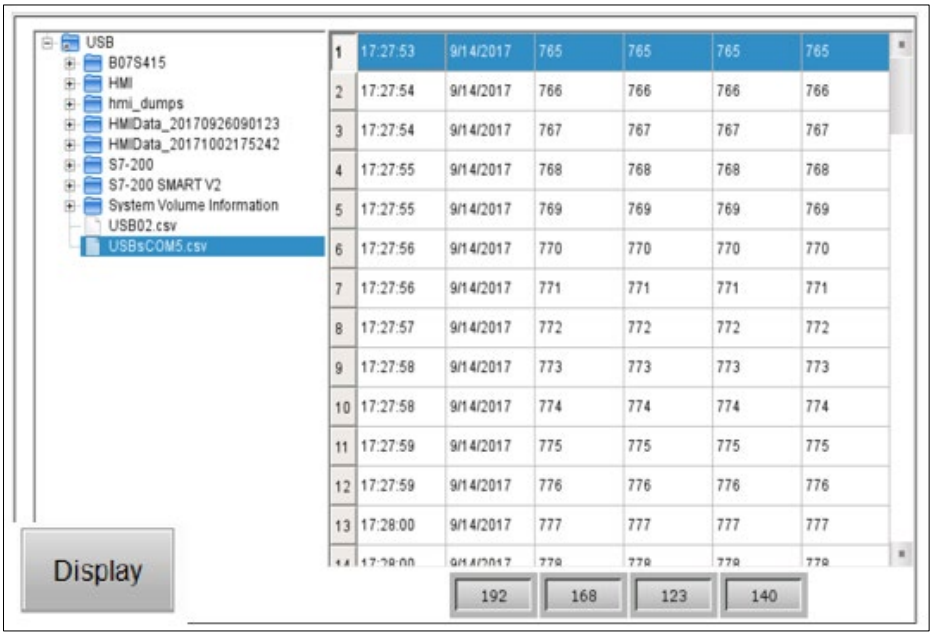
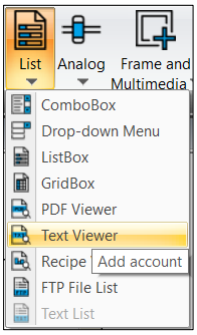
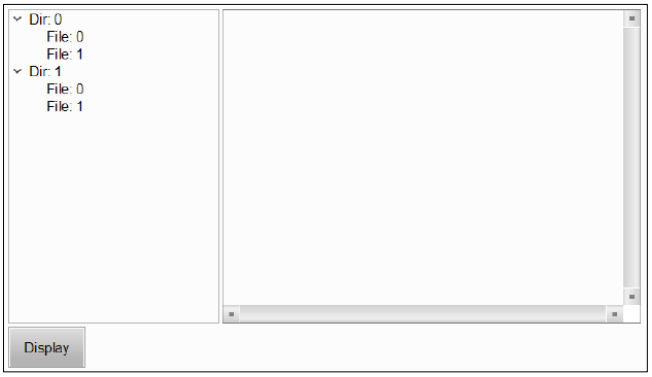
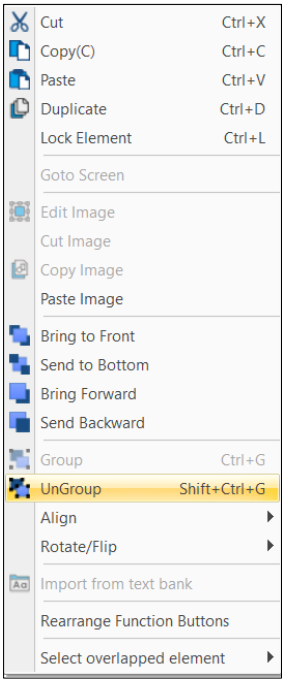
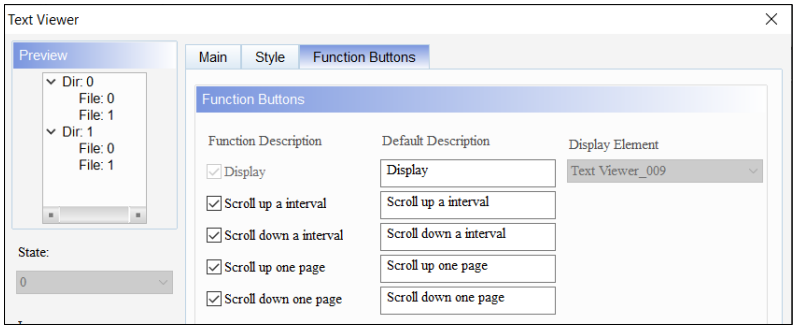


Figure 19 - 42: Evenly Distribute column and width of the element

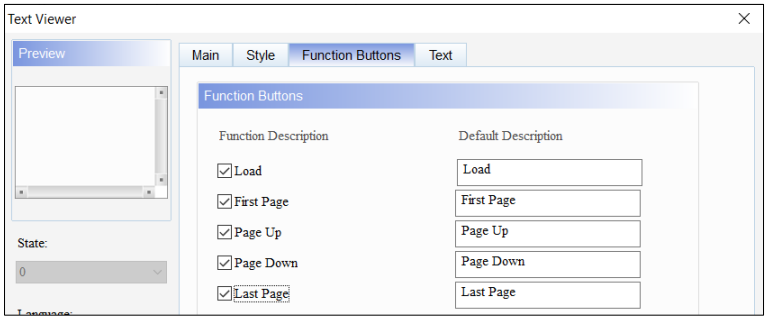
Refer to the following table for **Text Viewer** element description.

Text Viewer
Step 1: Create a **Text Viewer** element.       **Step 2**: After selecting the **Text Viewer** element, right-click and select **UnGroup**.    **Step 3**: Click the File List on the left to enter the **Function Buttons** page, and set it as follows.

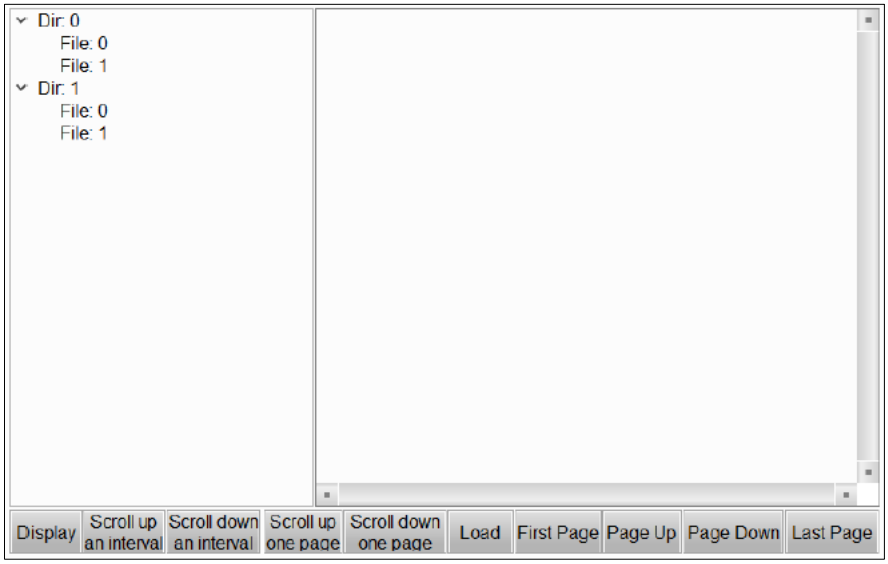
Text Viewer



Step 4: Click Text file content to be displayed on the right to enter the **Function Buttons** page, and set it as follows.



Step 5: After the setting is completed, the editing screen is as follows.



Step 6: After screen compilation, perform off-line simulation. Select the text file to be displayed, and then press the **Display** to display Text file content on the right.

Text Viewer



The properties of the File List on the left and the Text file content to be displayed on the right are described as follows.

On double-clicking the **Text Viewer** (File List on the left) element, the property page appears as follows.

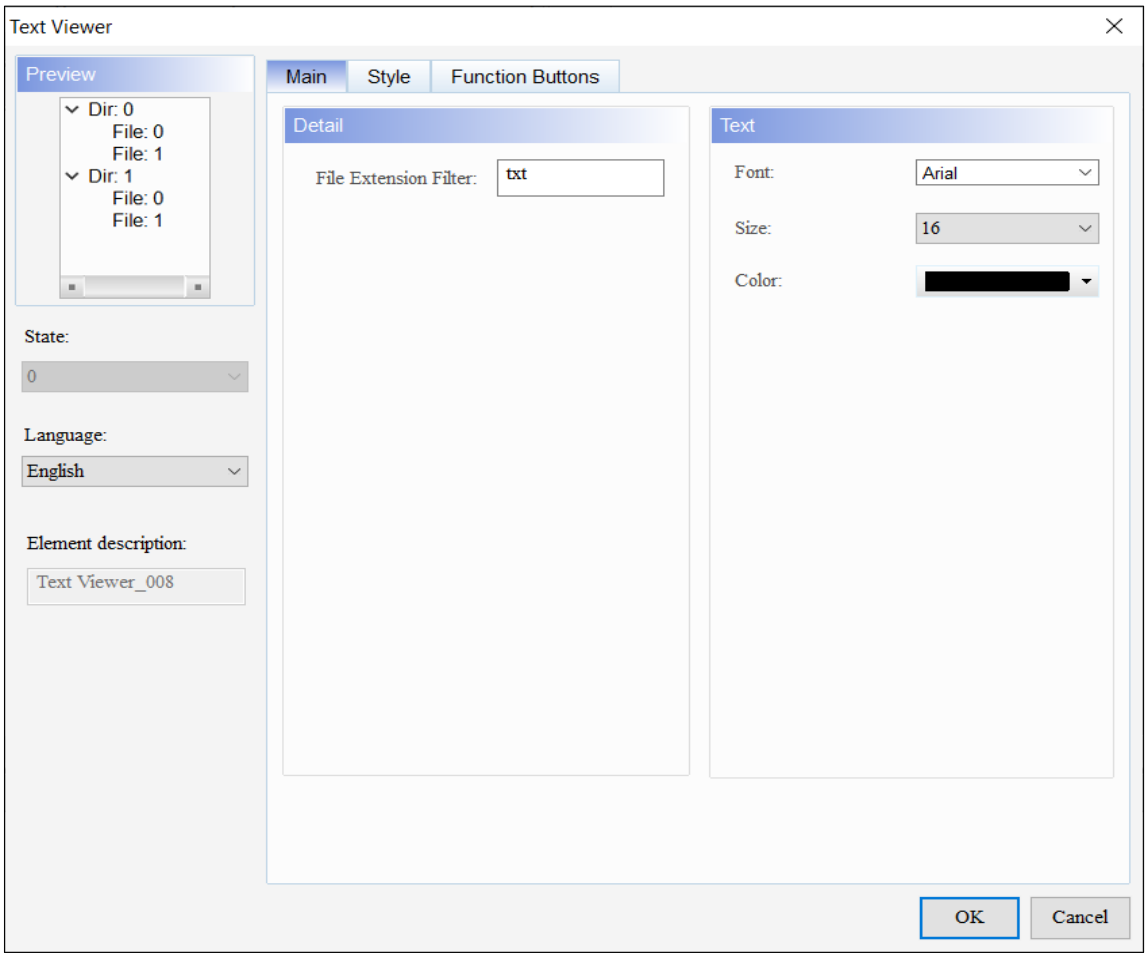


Figure 19 - 43：Text Viewer (File List on the left) element property page

Text Viewer (File List on the left)	
Function	**Description**
Preview	Read the files using the Text Viewer.
Main	Set the Text Font, Size, and Color. Set the File Extension Filter.
Style	Set the Border Color, Tree View Background, Transparency and smooth animation
Function Buttons	Select the checkboxes for Scroll up an interval, Scroll down an interval, Scroll up one page, and Scroll down one page. Click Set As Default Description. Set the width and height of the buttons.

- Main

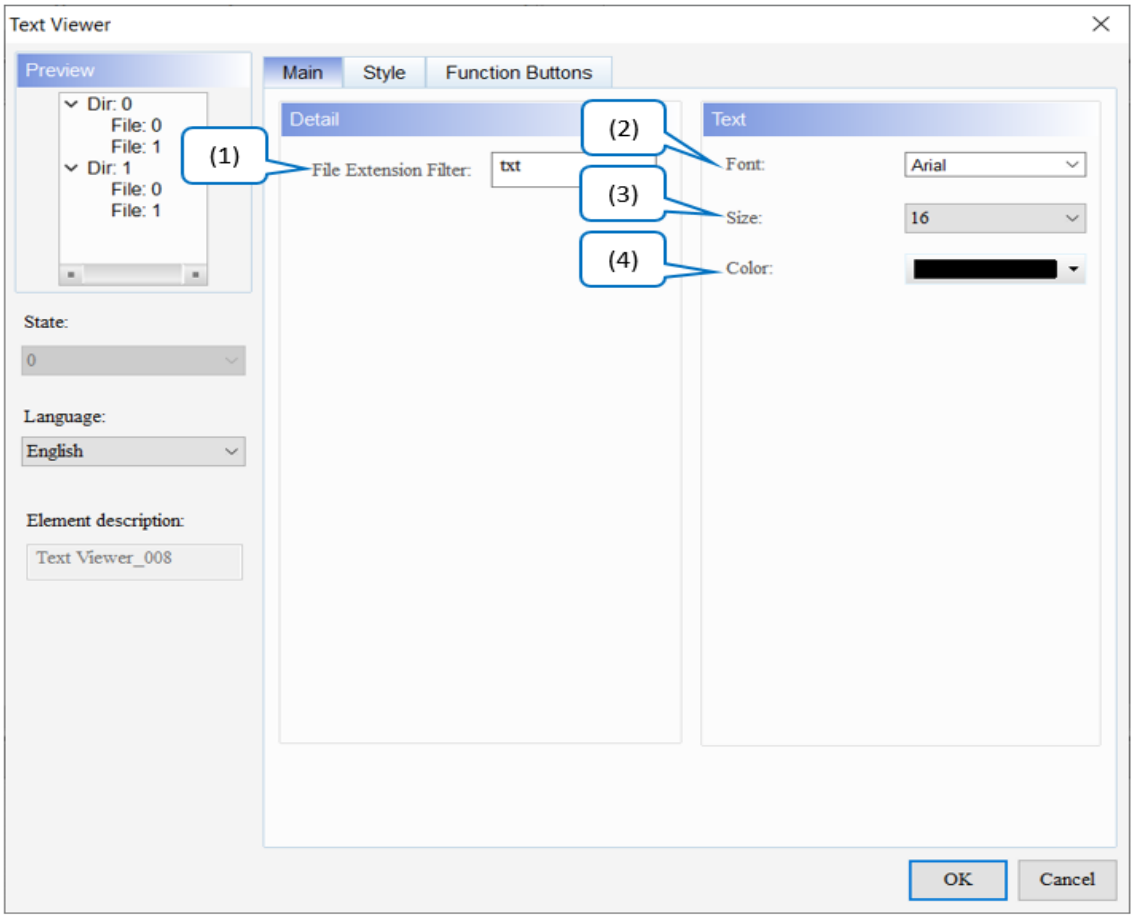
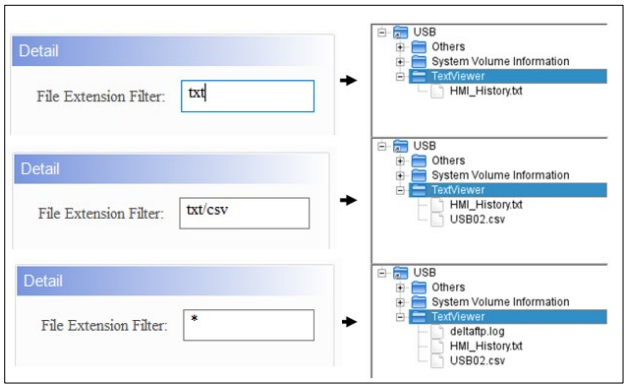


Figure 19 - 44: Text Viewer (File List on the left) element Main property page

No.	Function	Description
(1)	File Extension Filter	• Set the file format(s) to display in the File List on the left. This function supports displaying files of multiple formats. The default is txt. • To display files of multiple formats, insert a | symbol between file extensions. For example, if users enter **txt|csv** in the **File Extension Filter** field, both .txt and .csv files are displayed in the File List on the left. Users can also enter * in the **File Extension Filter** field to display all files.

No.	Function	Description
		
(2)	Font	Set the text font for the File List on the left. The default value is **Arial**.
(3)	Size	Set the text size for the File List on the left. The default value is **16**.
(4)	Color	Set the text color for the File List on the left. The default is [■].

- Style

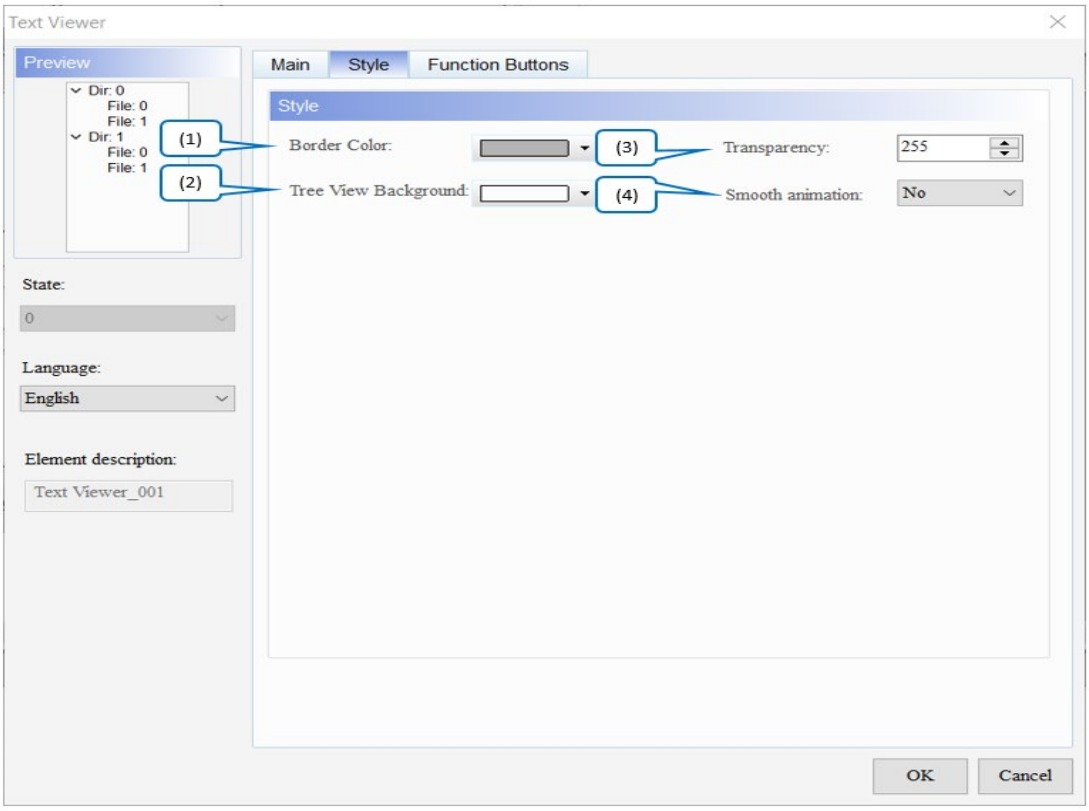
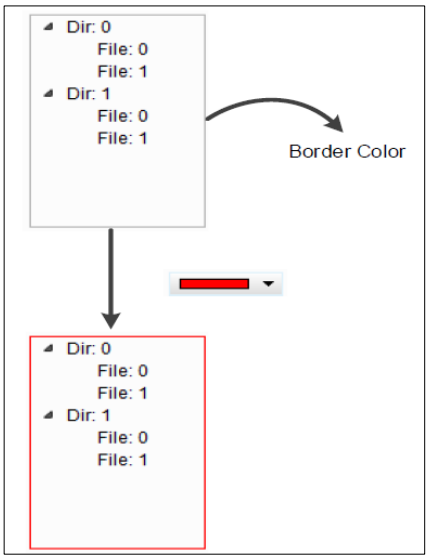
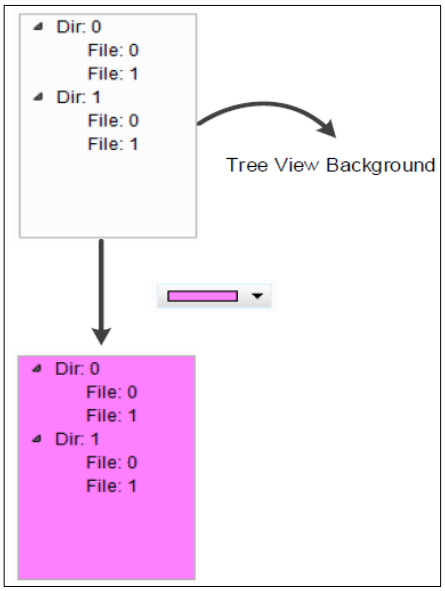


Figure 19 - 45: Text Viewer element (Left side) Style property page

No.	Function	Description
(1)	Border Color	Set the border color of the File List on the left. The default is  . 
(2)	Tree View Background	Set the tree view background color of the File List on the left. The default is  . 
(3)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.
(4)	Smooth animation	● The **Smooth animation** function is available for this element. The default value is **No**. ● When users activate the **Smooth animation** function, there is a sliding effect when the File List is expanded or collapsed.

- Function Buttons

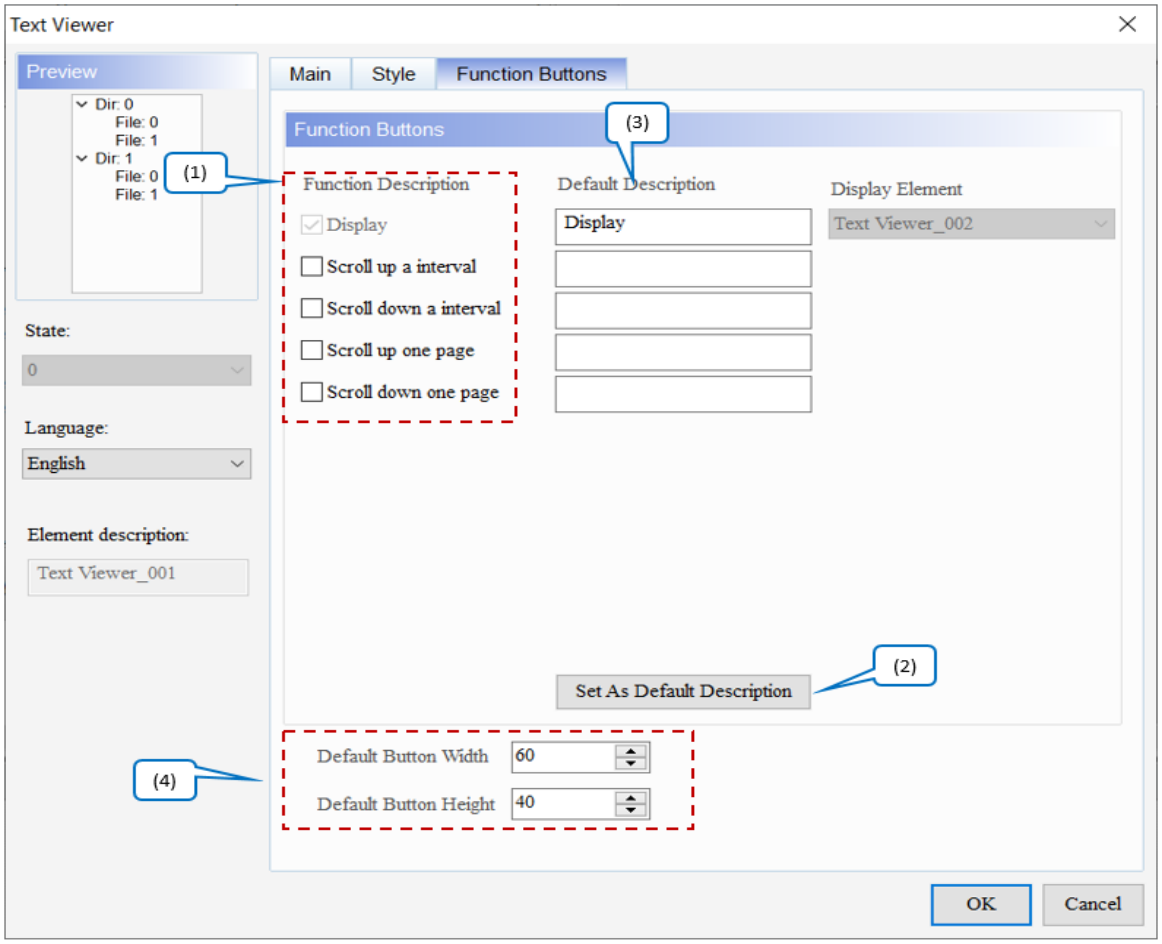


Figure 19 - 46: Text Viewer (File List on the left) element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	● These are function buttons for the File List on the left. **Display** is selected by default and cannot be canceled. ● Other function buttons including **Scroll up an interval**, **Scroll down an interval**, **Scroll up one page**, and **Scroll down one page** are used to scroll the File List and determine how many lines to scroll each time.
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the **Default Description** fields.
(3)	Default Description	Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.

No.	Function	Description
(4)	Default Button Width and Height	Adjust the width and height of the function buttons. The default values are 60 and 40, respectively.

On double-clicking the Text Viewer (Text file content to be displayed on the right) element, the property page appears as follows.

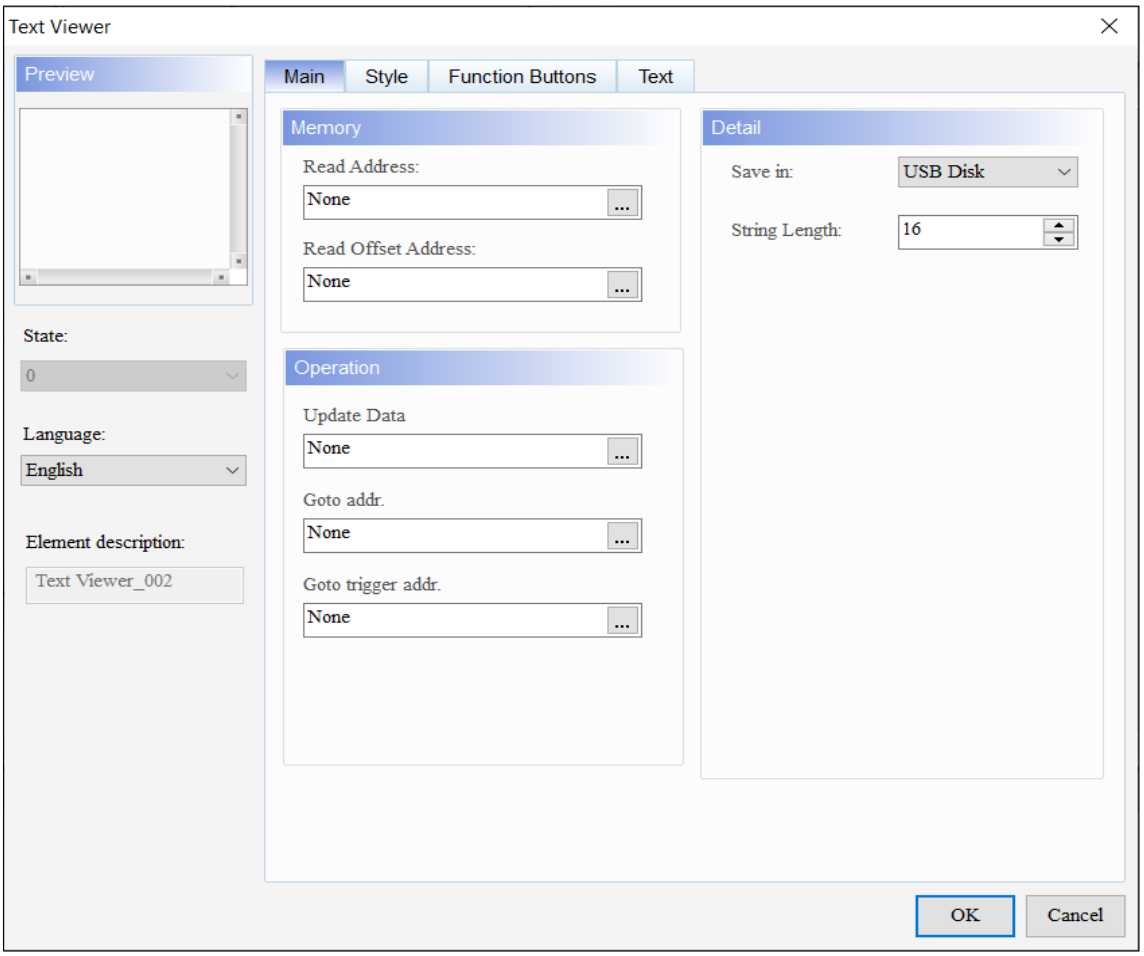


Figure 19 - 47: Text Viewer (Text file content to be displayed on the right) element property page

Text Viewer (Text file content to be displayed on the right)	
Function	**Description**
Main	Set the Read Address and Read Offset Address. Set the Save in, String Length, and Show File List. Set the Update Data, Goto addr., Goto trigger addr.
Style	Set the transparency.
Function Buttons	Select the checkboxes for Load, First Page, Total Page, Page Up, Page Down, Last Page, Zoom, and Rotations. Click Set As Default Description. Set the width and height of the buttons.
Text	Set the text font, size, and color.

- Main

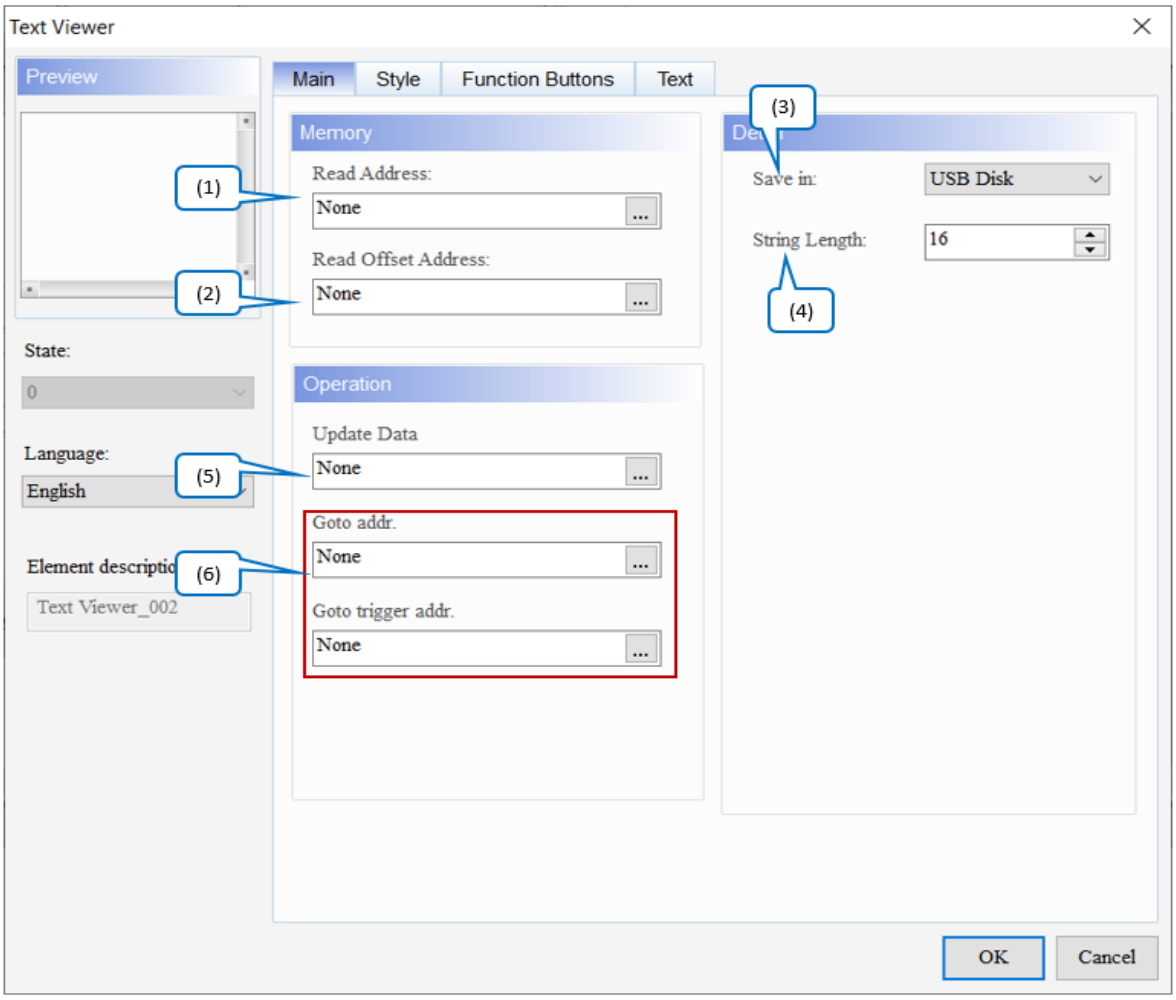


Figure 19 - 48: Text Viewer element (Text file content to be displayed on the right) Main property page

No.	Function	Description
(1)	Read Address	● Select the Internal Memory or the controller register address. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*. ● If users choose the **Read Address** setting, they need to create a **Character Entry** element and set the **String Length** for the text file to display on the HMI.
(2)	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(3)	Save in	● Select USB Disk or SD Card as the storage device. The default value is **USB Disk**. ● When users save the text file in the USB Disk or SD Card, the HMI can read the text file from the storage device.
(4)	String Length	● The **String Length** setting is mainly used with the **Character Entry** element. The default value is **16**. ● The length of the string determines the input file name of the text file.
(5)	Update Data	● When the **Update Data** bit is On, the HMI reads the text file set in the memory address. ● Note that the file displayed here is the file set in the **Read Address** rather than the file selected in the File List on the left.
(6)	Goto addr. Goto trigger addr.	● Use **Goto addr.** to specify the line to be selected. Then, set **Goto trigger addr.** to On, and the specified line is selected. ● The **Goto addr.** function supports the controller address (Word) and the internal register address (Word). ● The **Goto trigger addr.** supports the controller address (Bit) and the internal register address (Bit).

- Style

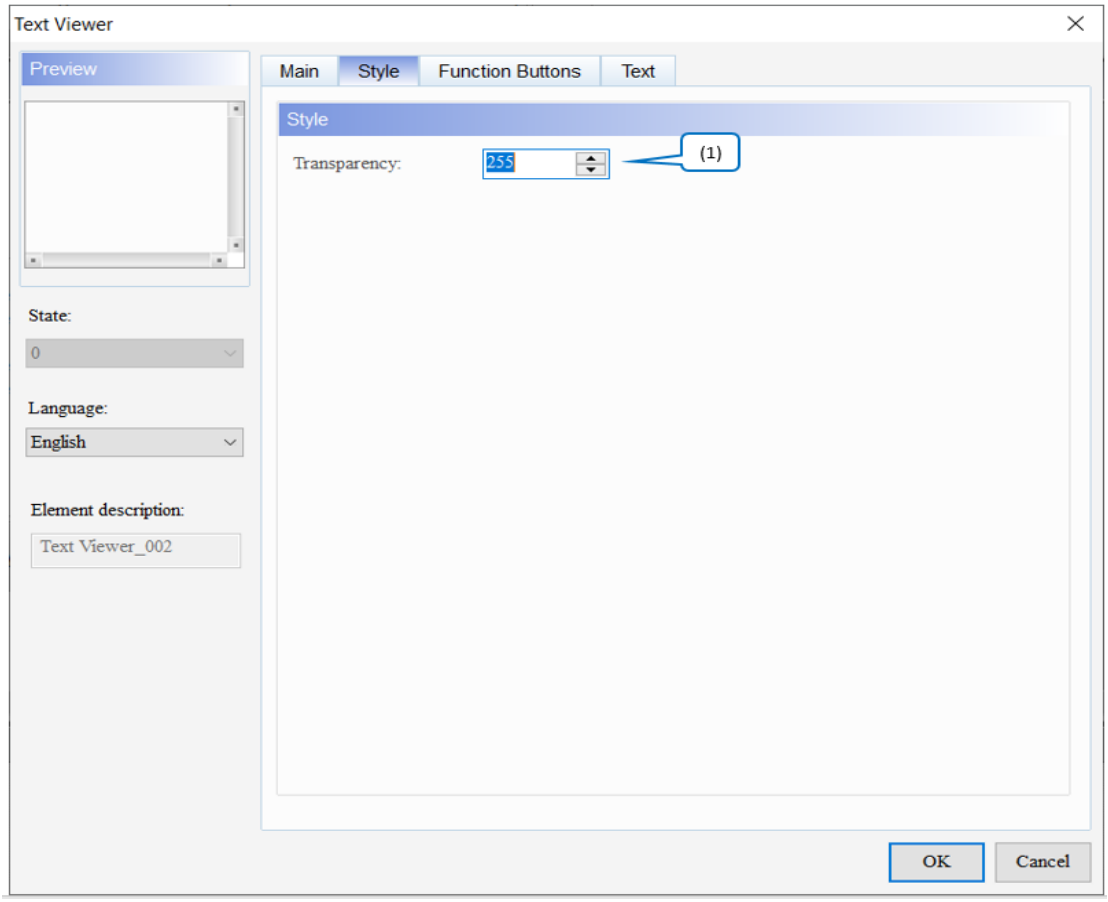


Figure 19 - 49: Text Viewer element (Right side) Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Function Buttons

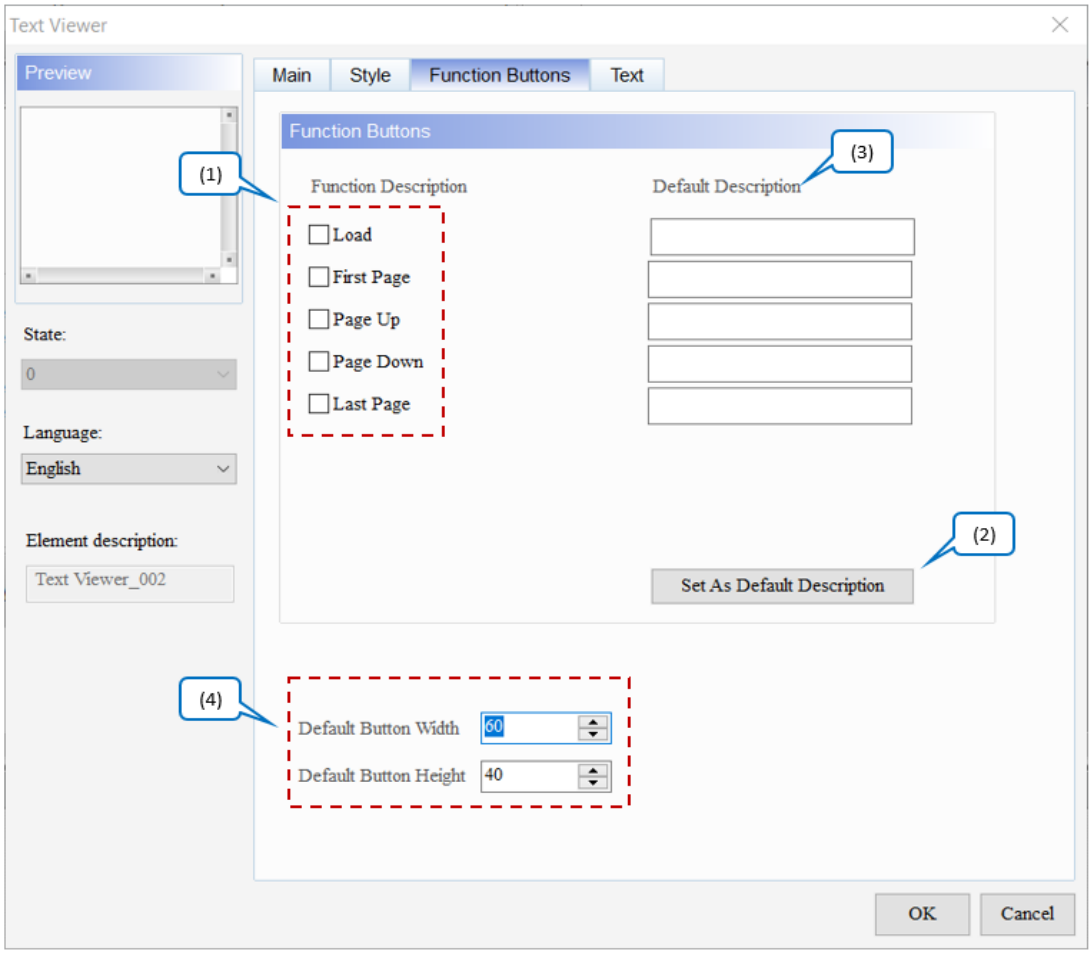


Figure 19 - 50: Text Viewer (Text file content to be displayed on the right) element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	● These are function buttons for the display content on the right, including **Load**, **First Page**, **Page Up**, **Page Down**, and **Last Page**. ● The **Load** function for Text file content to be displayed on the right and the **Display** function for the **File List** are used to read and display text files, but the way to use them are different. For **Load**, users need to manually enter the file name of the text file and use the set **Read Address** to display the text on the HMI. For **Display**, users only need to save the text file to a USB Disk or SD Card to display the text file on the HMI without manually entering the file name of the text file.

No.	Function	Description
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the **Default Description** fields.
(3)	Default Description	● Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.
(4)	Default Button Width and Height	Adjust the width and height of the function buttons. The default values are **60** and **40**, respectively.

- Text

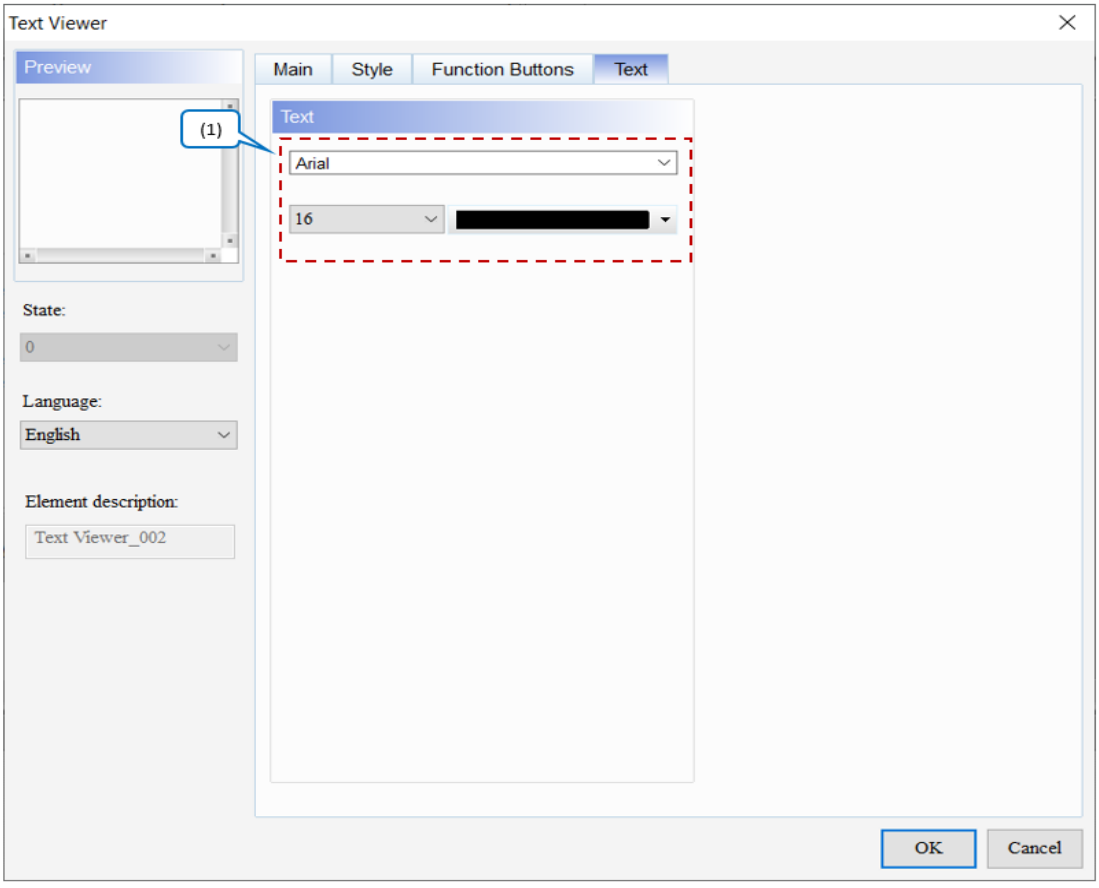


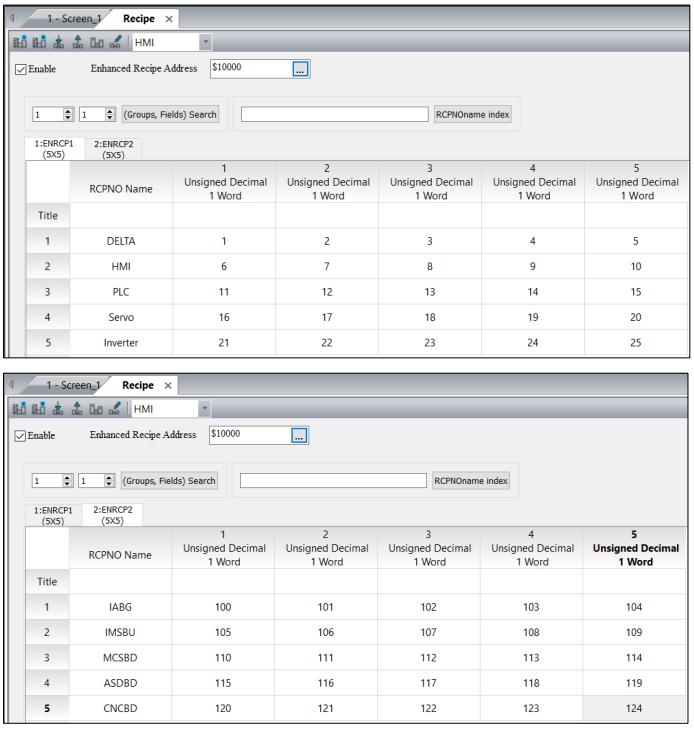
Figure 19 - 51: Text Viewer (Text file content to be displayed on the right) element Text property page

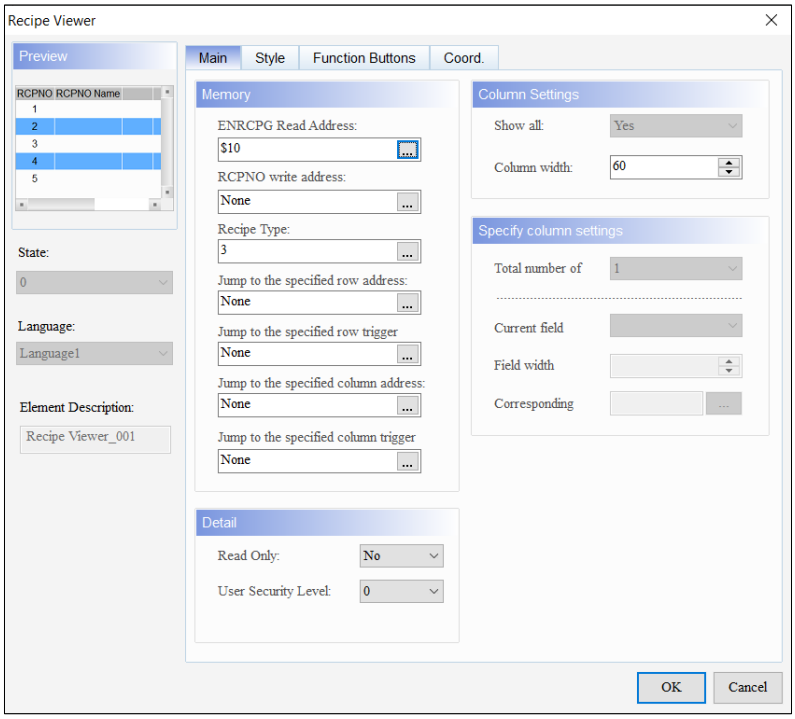
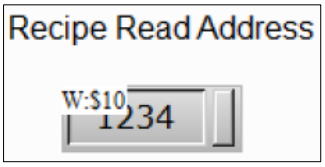
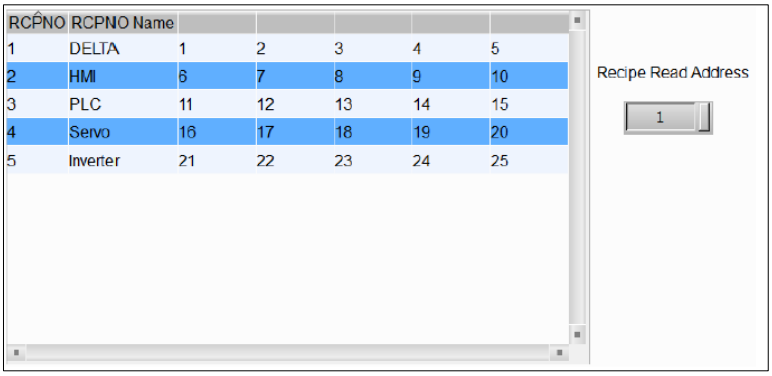
No.	Function	Description
(1)	Text property	Set the text properties, including the font, size, and color.

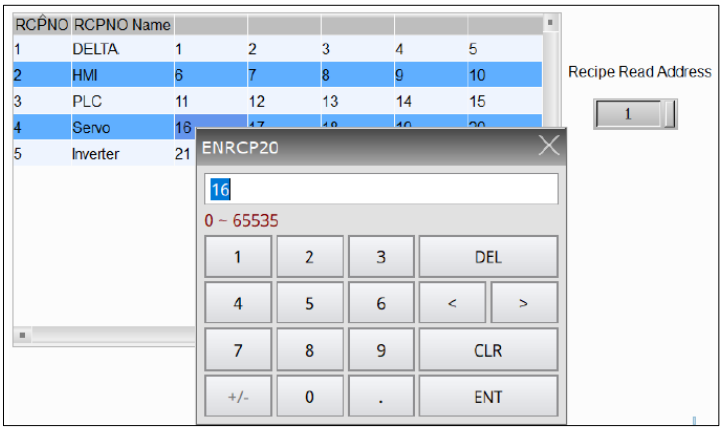
19.7 Recipe Viewer

Display all the recipe parameters on the HMI through the **GridBox List** element and the memory address of the recipe. However, the setting is too complicated and the recipe address does not match, resulting in insufficient flexibility and convenience in use. Therefore, a recipe view is provided. A device element, through which users can display each enhanced recipe parameter in a table and can change the recipe parameter.

Refer to the following table for **Recipe Viewer** element description.

Recipe Viewer	
Set Enhanced Recipe and create elements	**Step 1**: Go to **Data Management** > **Recipes** > **Enhanced Recipe** to create two sets of Enhanced Recipe. 

Recipe Viewer	
Set Enhanced Recipe and create elements	**Step 2-1**: Create a **Recipe Viewer** element. Set the **ENRCPG Read Address** to $10, and **Read Only** to No.  **Step 2-2**: Create a **Numeric Entry Button** element and set the **Write Address** to $10. 
Execution result	● After completing the creation and setting of elements, download the project to the HMI. ● Enter 1 in $10, then users can view the recipe parameters of Enhanced Recipe Group 1 through **Recipe Viewer** element.  ● Click the **Recipe Viewer** element to modify the recipe parameters. Note that if the **Read Only** function on the Main page is set to Yes, users cannot modify the parameters.

Recipe Viewer	
	

On double-clicking the **Recipe Viewer** element, the property page appears as follows.

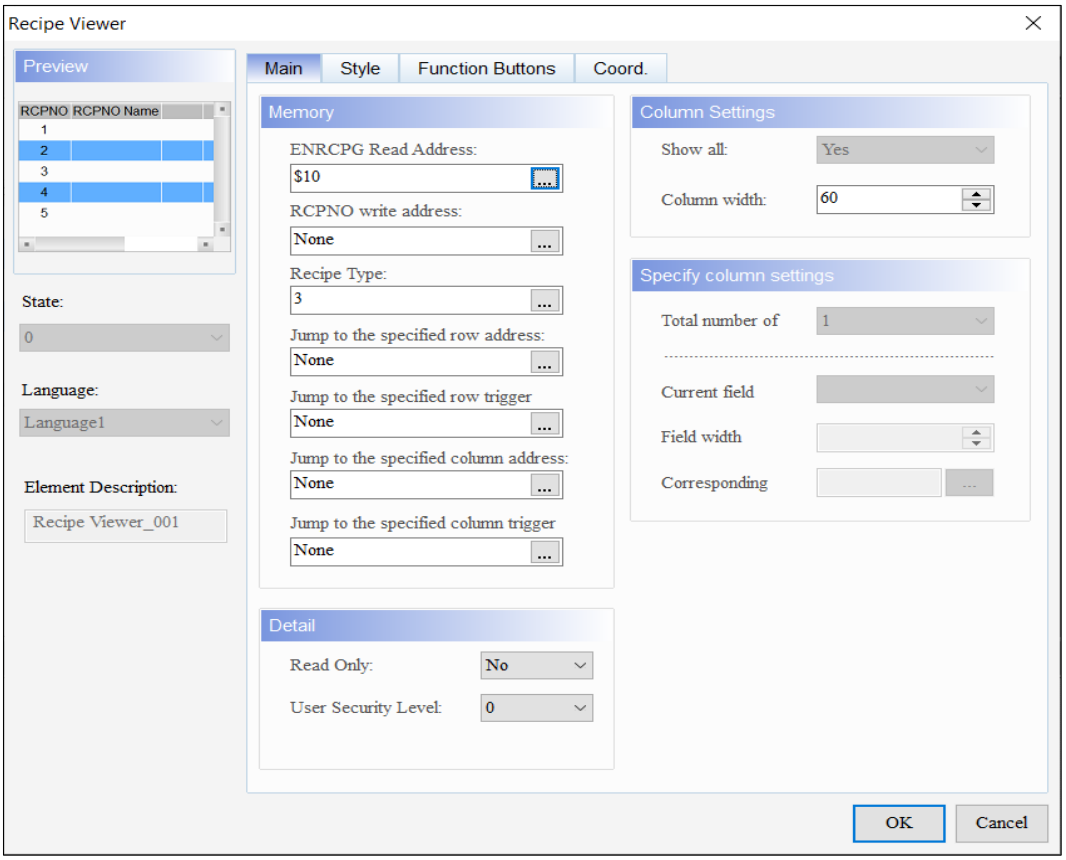


Figure 19 - 52: Recipe Viewer element property page

Function	Description
Main	Set the ENRCPG Read Address, RCPNO write address, Recipe Type, Jump to the specified row address, Jump to the specified row trigger, Jump to the specified column address, and Jump to the specified column trigger. Set whether to Read Only, User Security Level, Column Settings, Show all, and Column width. Set the Specify column settings, Total number of, Current field, Field width and Corresponding.
Style	Set the Transparency.
Function Buttons	Select the checkboxes for Scroll up one page and Scroll down one page. Click Set As Default Description. Set the width and height of the buttons.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

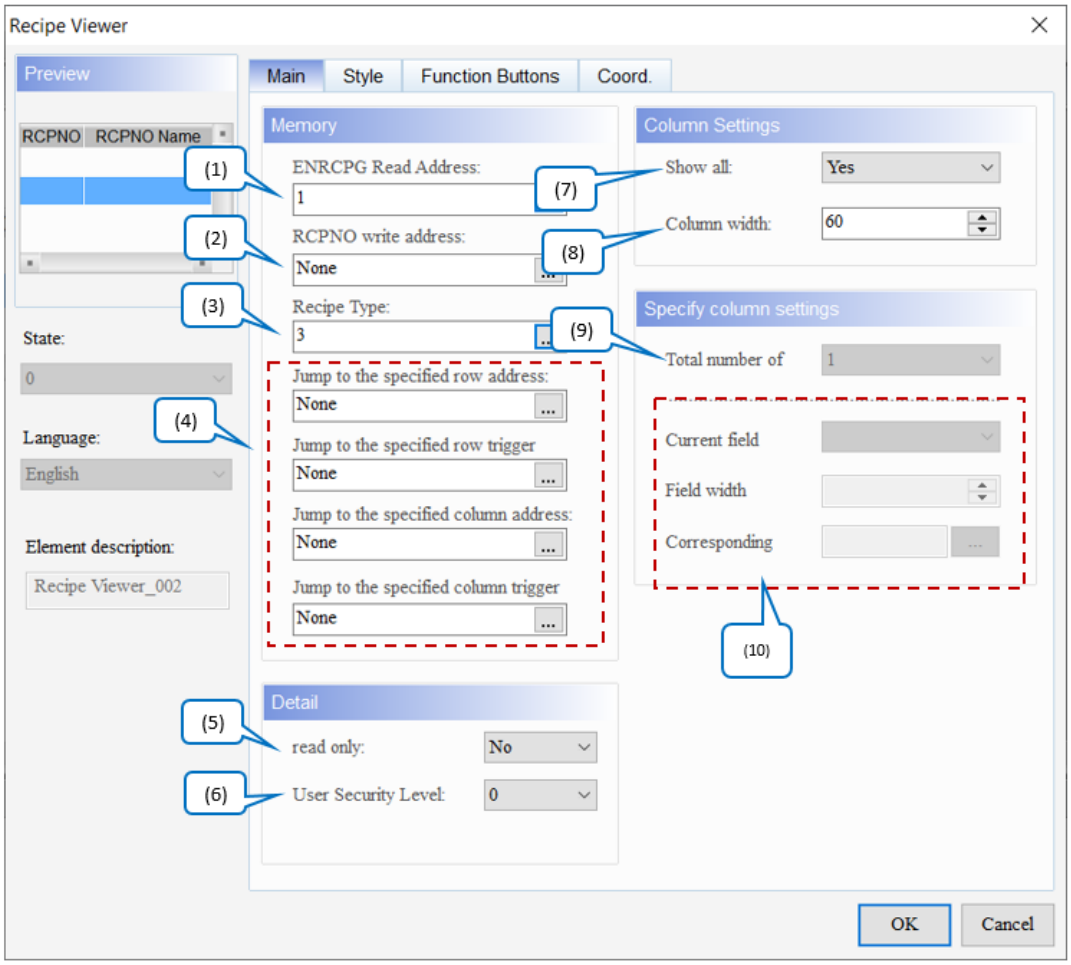
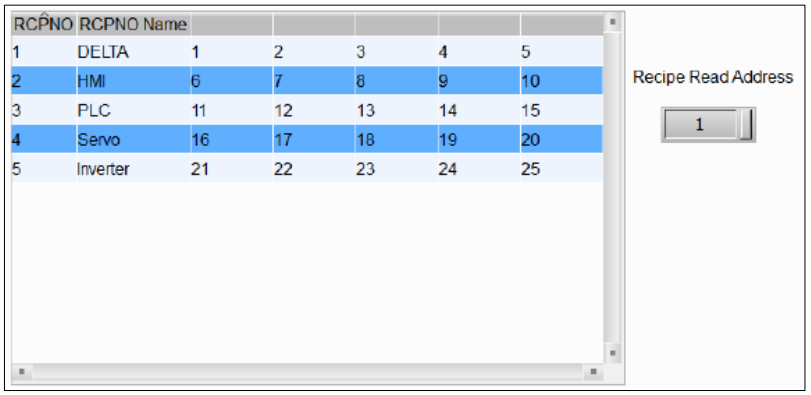
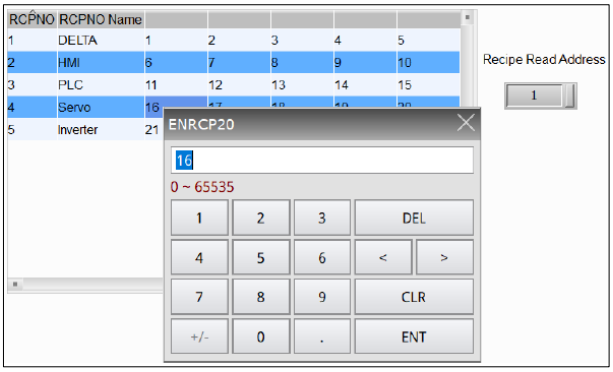
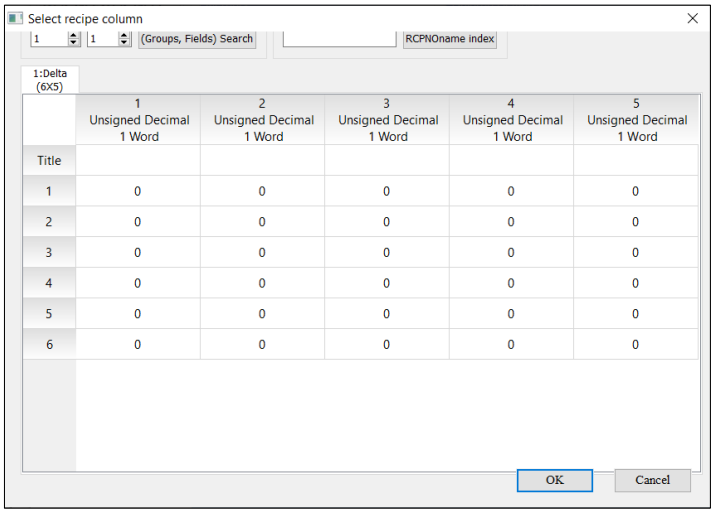


Figure 19 - 53: Recipe Viewer element Main property page

No.	Function	Description
(1)	ENRCPG Read Address	● Read the enhanced recipe group with this address. The default value is **1**. ● When the **ENRCPG Read Address** is 1, read the first group of the enhanced recipe. When the **ENRCPG Read Address** is 2, read the second group of the enhanced recipe. The same is true for other groups. 
(2)	RCPNO write address	Set the **Write Address** of the element.
(3)	Recipe Type	● Set the type of recipe to view. ● The numbers are defined as follows: 1: 16-Bit Recipe 2: 32-Bit Recipe 3: Enhanced Recipe
(4)	Jump to the specified row / column address Jump to specified row/column trigger address	● Specify the row number through the **row** / **column address**, and then trigger the **row** / **column trigger** address bit to On. The device displays the selected row number. ● The **row** / **column** address supports selection of controller address (Word) and internal register address (Word). ● The **row** / **column trigger** address supports selection of controller address (Bit) and internal register address (Bit).

No.	Function	Description
(5)	Read Only	● Set whether the content of the Enhanced Recipe can be edited. The default value is **No**, indicating the recipe parameters can be modified.  ● When the **Read Only** function is set to Yes, clicking the recipe parameters is invalid.
(6)	User Security Level	● This function can be used to set the permissions for the pressing action of the element which can only be used if it is equivalent to or higher than the set **User Security Level**. The default value is **0**. ● If the **User Security Level** is set, the **Login** window pops up when the element is pressed to confirm whether the security level password is correct (the security level password can be changed by the **Password Table Setting**. Refer to *Section 5.7.2 Password Table*).
(7)	Show all	● When the **Read Address** of the Recipe Group is set to constant, and the **Recipe Type** is set to 3, users can set whether to display all the fields. The default value is **Yes**. ● When set to No, users can set the specified field settings.
(8)	Column width	● The width of the edit field can be set up to 200. The default value is **60**.
(9)	Total number of columns	● When **Show all** is set to No, specify the total number of columns to display.
(10)	Current field	● The **Current field** should not exceed the setting of the total number of fields.
	Field width	● According to the **Current field**, the **Field width** can be set up to 300.
	Corresponding	● According to the **Current field**, click ... to open the enhanced row recipe form, and select the displayed

No.	Function	Description
		Recipe field. 

- Style

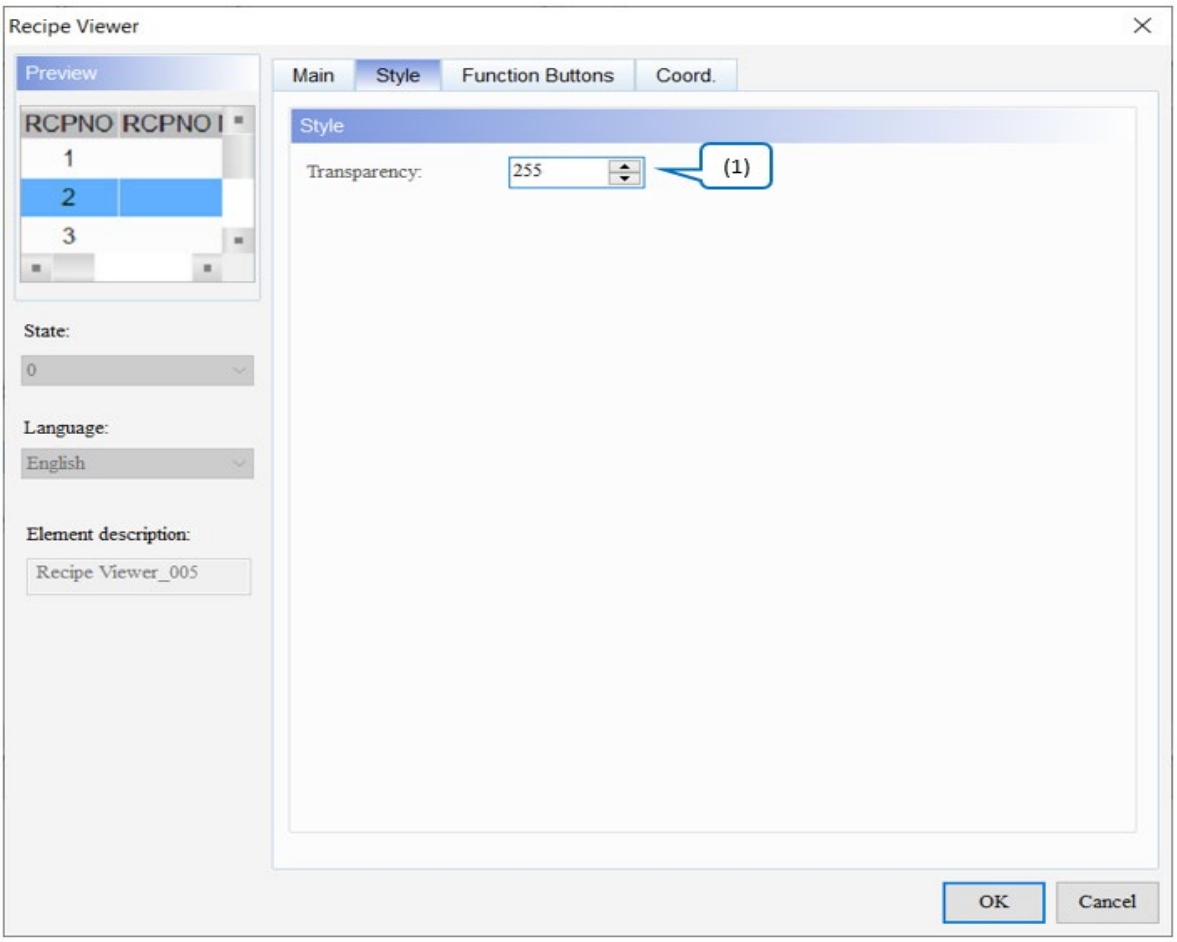


Figure 19 - 54: Recipe Viewer element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element.

- Function Buttons

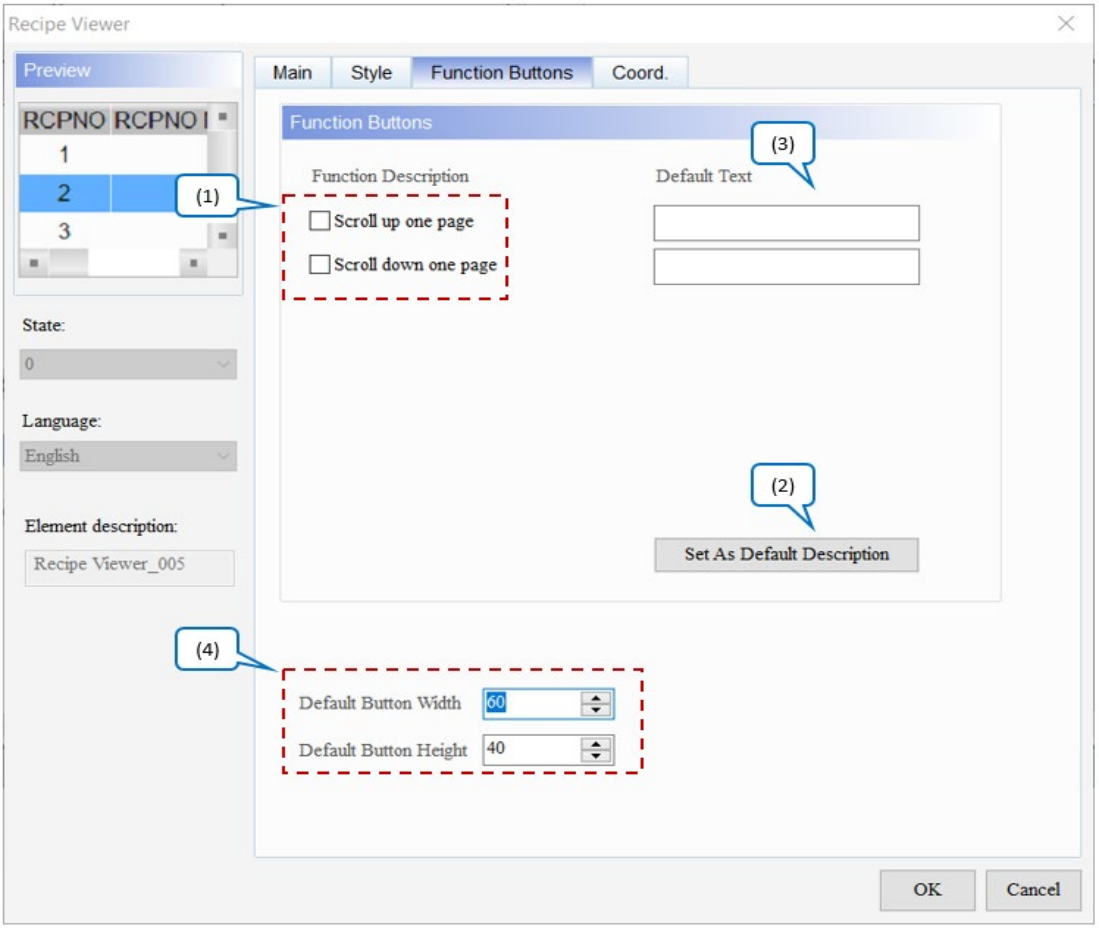


Figure 19 - 55: Recipe Viewer element Function Buttons property page

No.	Function	Description
(1)	Function Buttons	These are function buttons for the **Recipe Viewer** element, including **Scroll up one page** and **Scroll down one page**.
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the **Default Text** fields.

No.	Function	Description
(3)	Default text	By selecting **Set As Default Description** to insert the default strings to the fields, users can also enter user-defined strings.
(4)	Default Button Width and Height	Adjust the width and height of the function buttons. The default values are **60** and **40**, respectively.

- Coord.

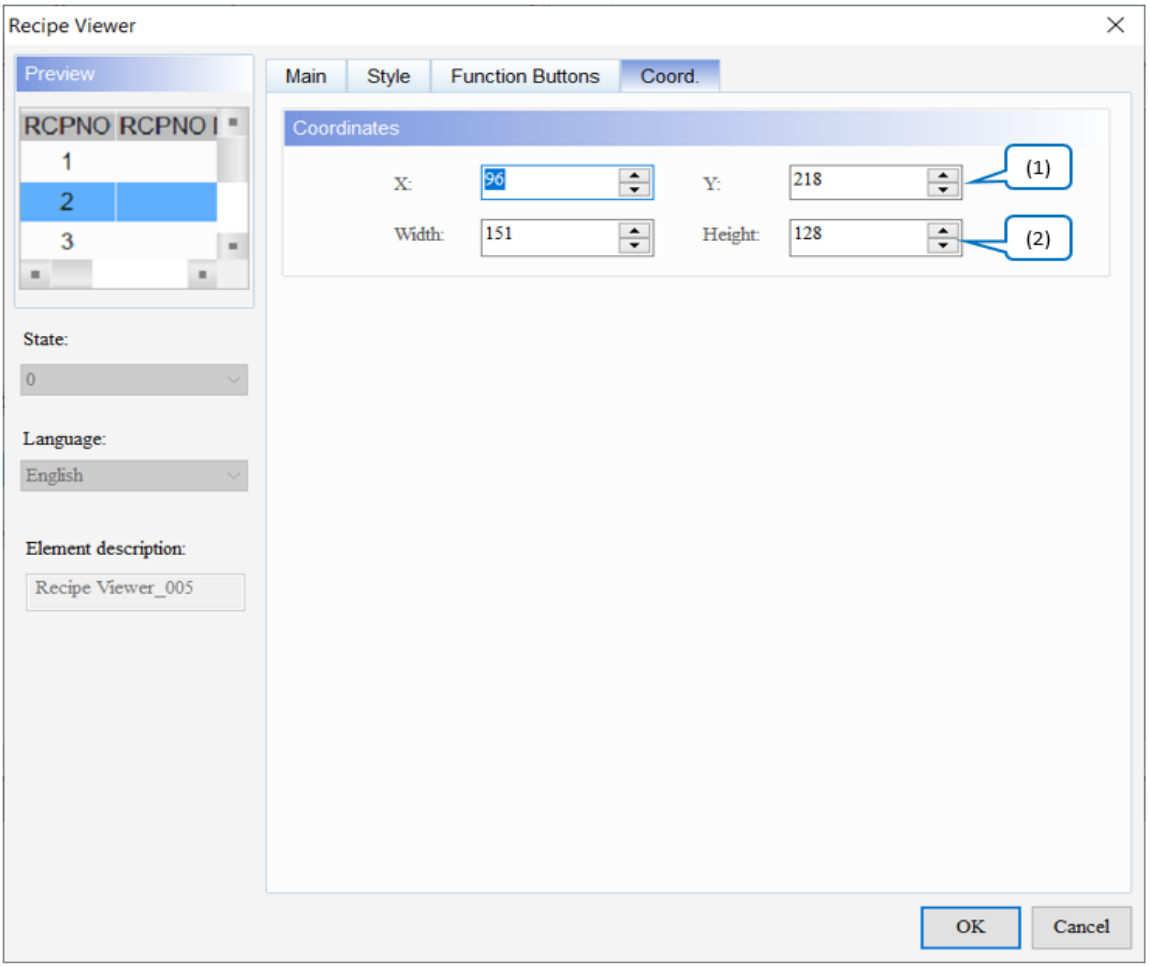


Figure 19 - 56: Recipe Viewer element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

No.	Function	Description
(2)	Width and Height	Set the width and height of the elements.

19.8 FTP File List

FTP File List element supports file transfer on the DOP-107H models only (FTP client). With this function, users can transfer files between the DOP-107H series HMI and the FTP server. Besides, functions of the login / logout mechanism, file upload, file deletion, file download, file management, file renaming, and directory (folder) management are provided. The **FTP File List** element must be used with the **FTP File Setting** function in **General** > **Configuration** > **Network Settings** > **FTP**.

On double-clicking the **FTP File List** element, the property page appears as follows.

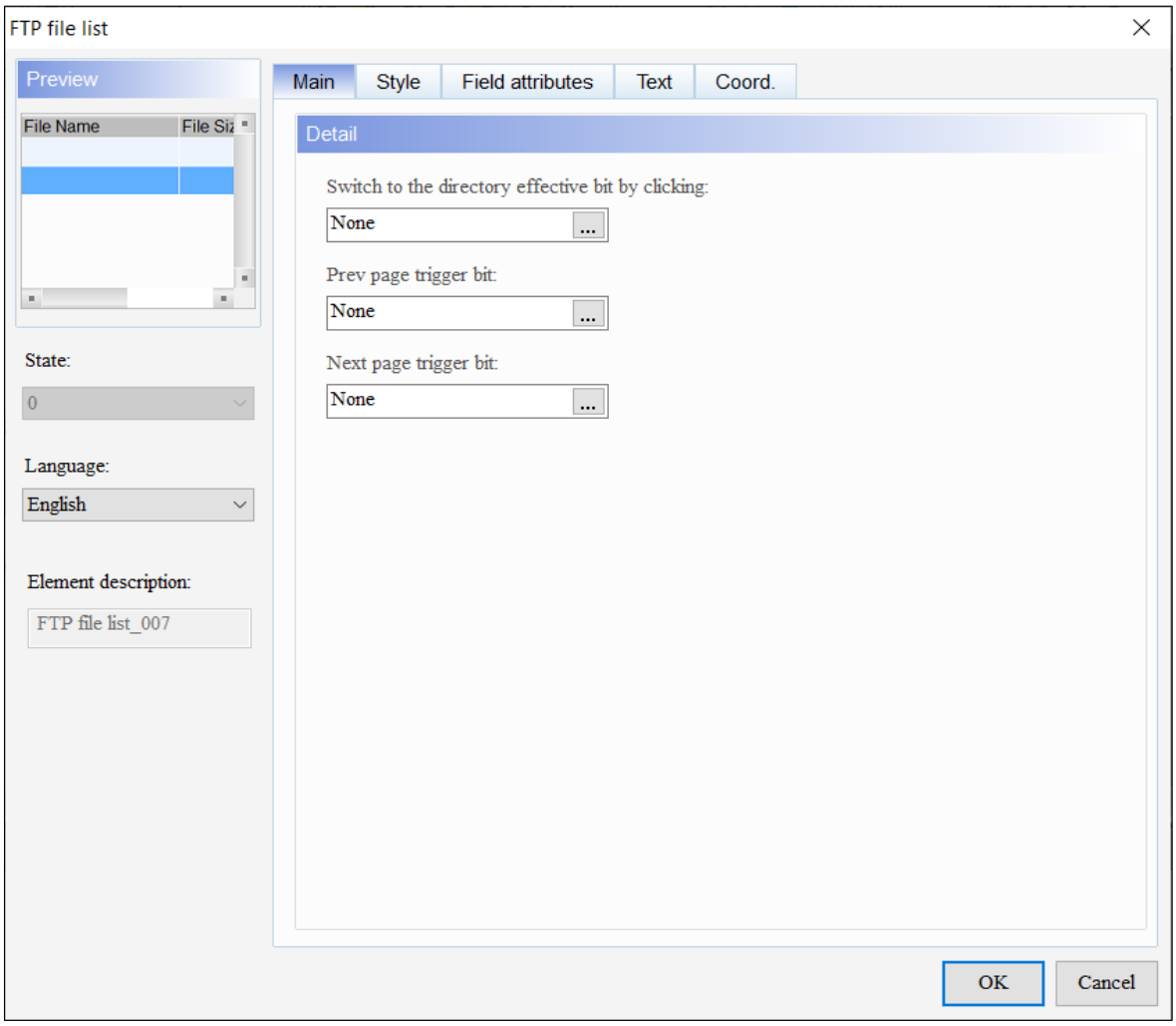


Figure 19 - 57: FTP File List element property page

FTP File List	
Function	**Description**
Main	Set the Switch to the directory effective bit by clicking, Prev page trigger bit, and Next page trigger bit.
Style	Set the Background Color, Border Color, Gridline Color, Row Color, Alternating Row Color, Select Row Color, and Show Gridlines, and Transparency.
Field Attributes	Select the checkboxes for File Size, File Timestamp, and File Name, and set the Column order. Set the Title Text Alignment, Title Background, and Title Text Color.
Text	Set the font, size, and color of the texts.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

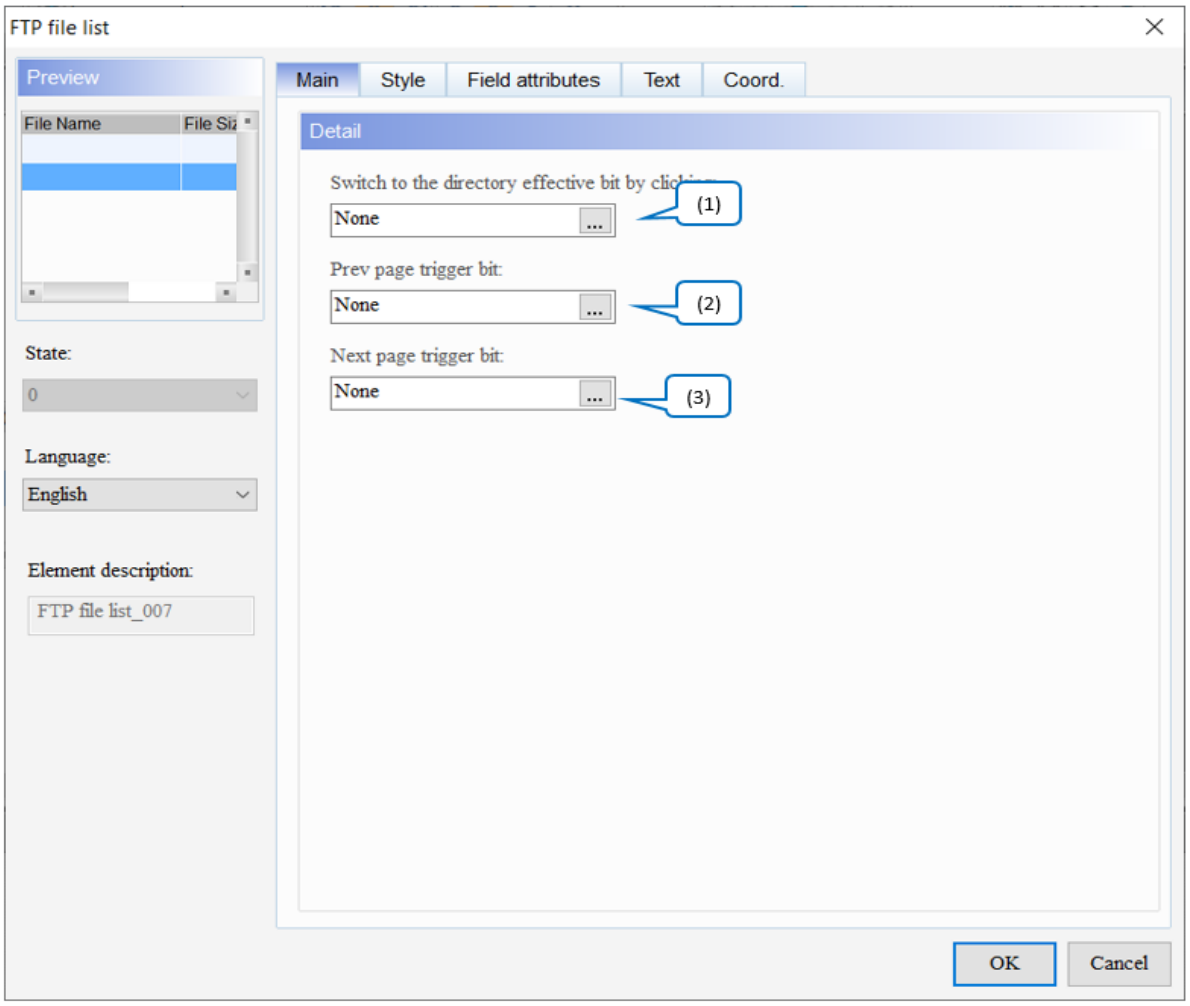


Figure 19 - 58: FTP File List element Main property page

No.	Function	Description
(1)	Switch to the directory effective bit by clicking	When this bit is On, double-click the directory to go inside the folder.
(2)	Prev page trigger bit	When this bit is On, the element display switches to the previous page, and this bit is automatically cleared once the action is complete.

No.	Function	Description
(3)	Next page trigger bit	When this bit is On, the element display switches to the next page, and this bit is automatically cleared once the action is complete.

- Style

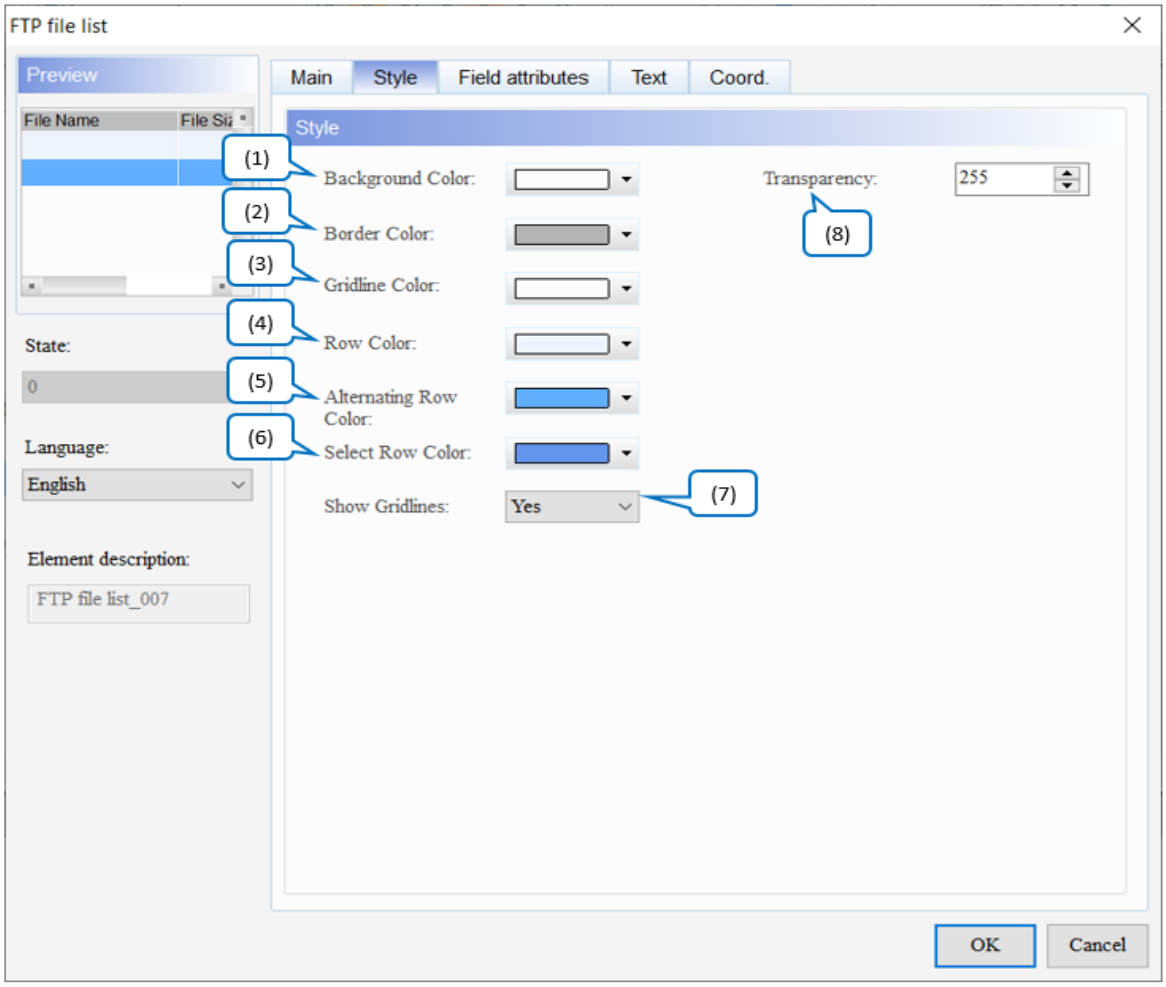
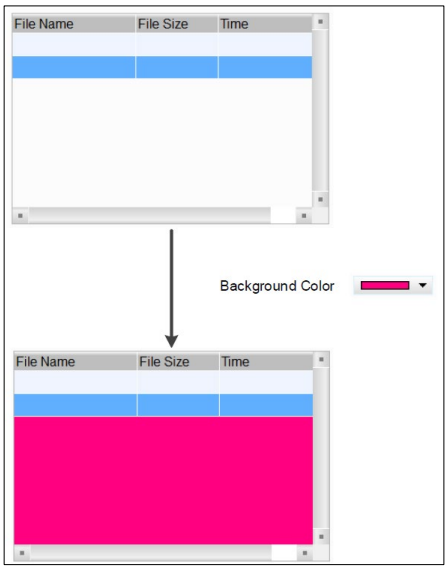
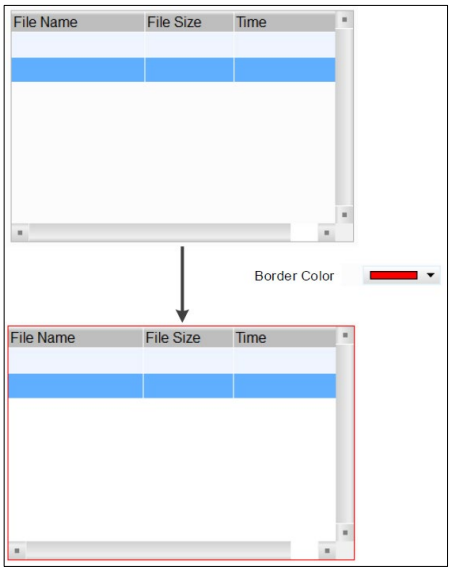
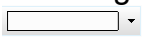
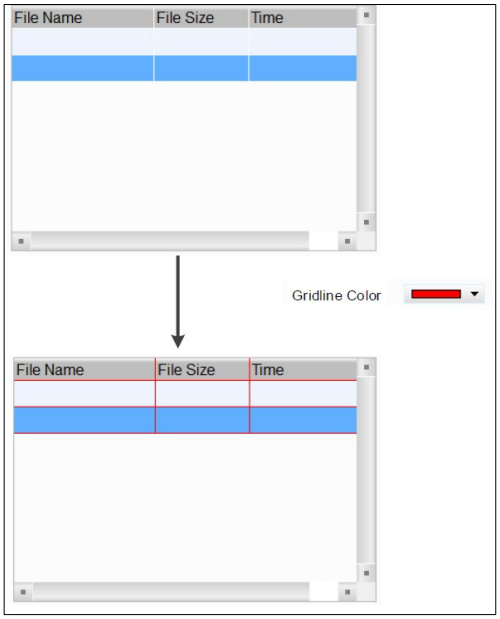
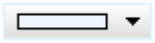
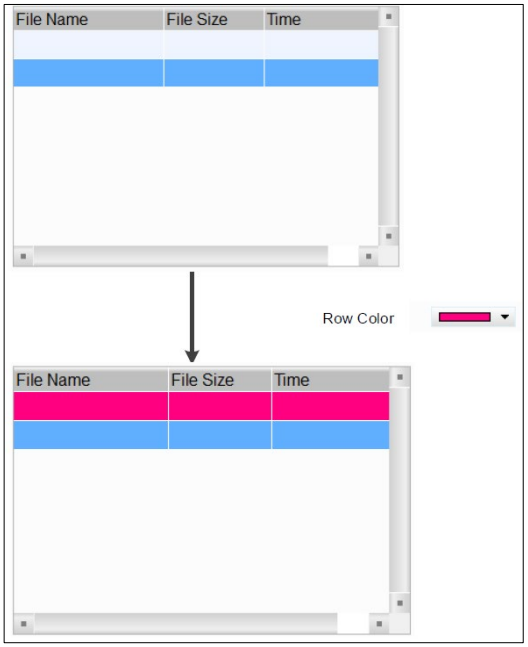
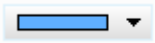
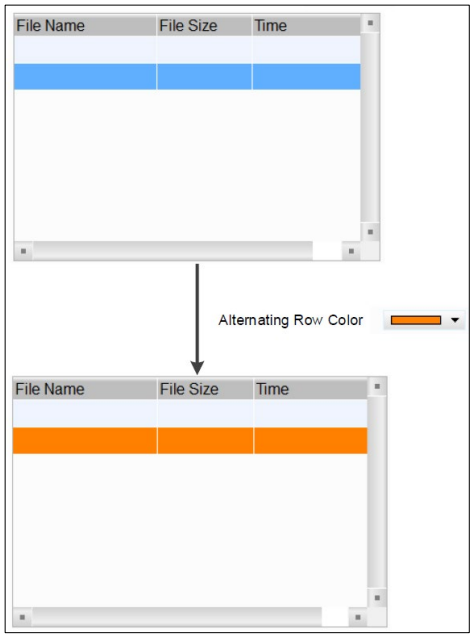
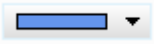


Figure 19 - 59: FTP File List element Style property page

No.	Function	Description
(1)	Background Color	Set the background color of the element. The default is  . 
(2)	Border Color	Set the border color of the element. The default is  . 

No.	Function	Description
(3)	Gridline Color	● The **Gridline Color** setting is available only when users select Yes for **Show Gridlines**. ● Set the gridline color of the element. The default is  . 
(4)	Row Color	Set the color for each row. The default is  . 

No.	Function	Description
(5)	Alternating Row Color	Set the color for the alternating row. The default is  . 
(6)	Select Row Color	● The color of the data row users select in the **FTP File List** element. ● Set the color of the selected row. The default is  .
(7)	Show Gridlines	● The default value is **Yes**. ● When set to No, the setting of **Gridline Color** is not available.
(8)	Transparency	Set the transparency value within the range of 50 ~ 255. The default value is **255**. The smaller the value, the higher the transparency of the element

- Field attributes

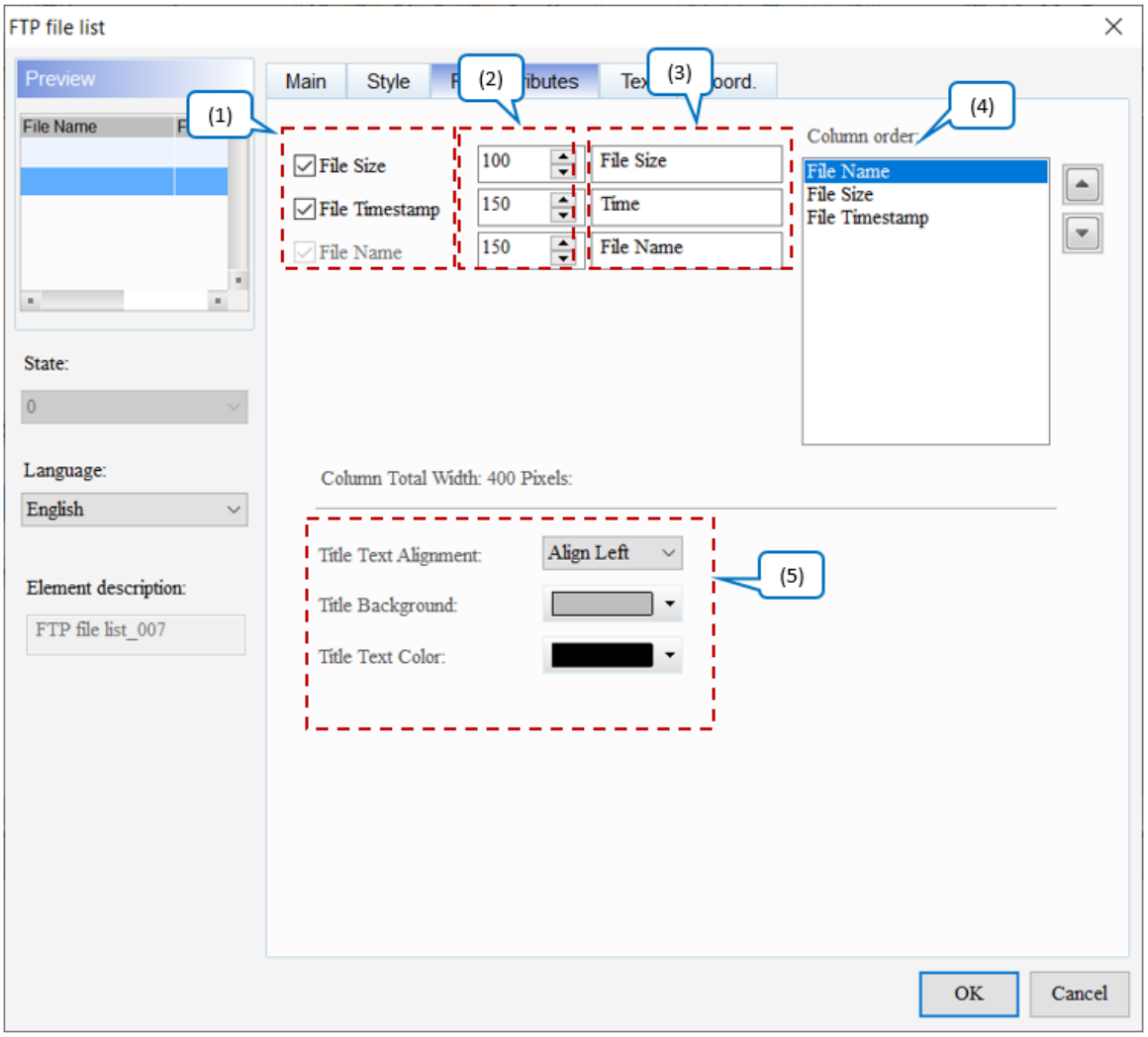
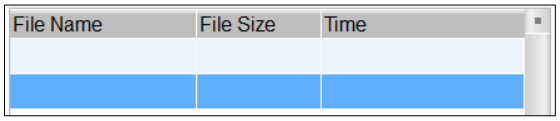
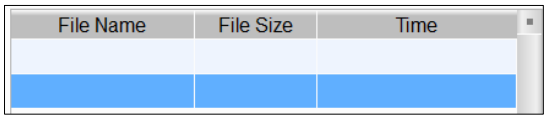
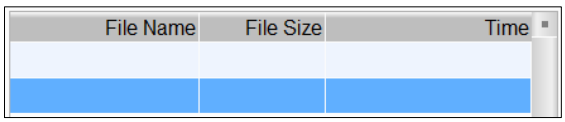
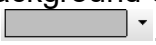
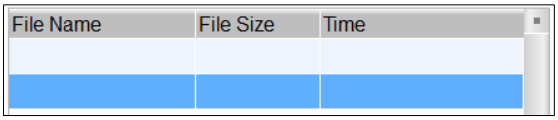
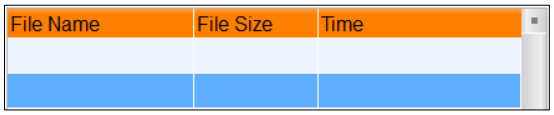
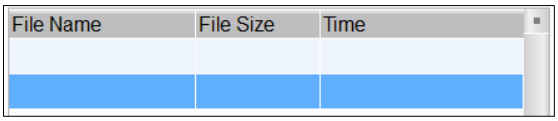
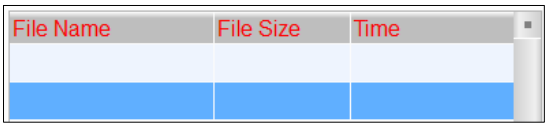


Figure 19 - 60: FTP File List element Field attributes property page

No.	Function	Description
(1)	Column display	Select the columns to display on the element.
(2)	Column width	Adjust the width for each column.
(3)	Column title	Define the titles for each column.
(4)	Column order	After selecting the columns, use  and  to adjust the column displaying order.

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3">(5)</td><td rowspan="3">Title</td><td>Title Text Alignment</td><td>The available options for Title Text Alignment are: Align Left, Center, and Align Right. The default value is Align Left.
<table>
<tr><td>Align Left</td><td> 
</td></tr>
<tr><td>Centre</td><td> 
</td></tr>
<tr><td>Align Right</td><td> 
</td></tr>
</table></td></tr>
<tr><td>Title Background</td><td>Set the background color of the column title. The default is  .
<table>
<tr><td>Default</td><td> 
</td></tr>
<tr><td>After</td><td> 
</td></tr>
</table></td></tr>
<tr><td>Title Text Color</td><td>Set the text color of the column title. The default is  .
<table>
<tr><td>Default</td><td> 
</td></tr>
<tr><td>After</td><td> 
</td></tr>
</table></td></tr>
</table>

- Text

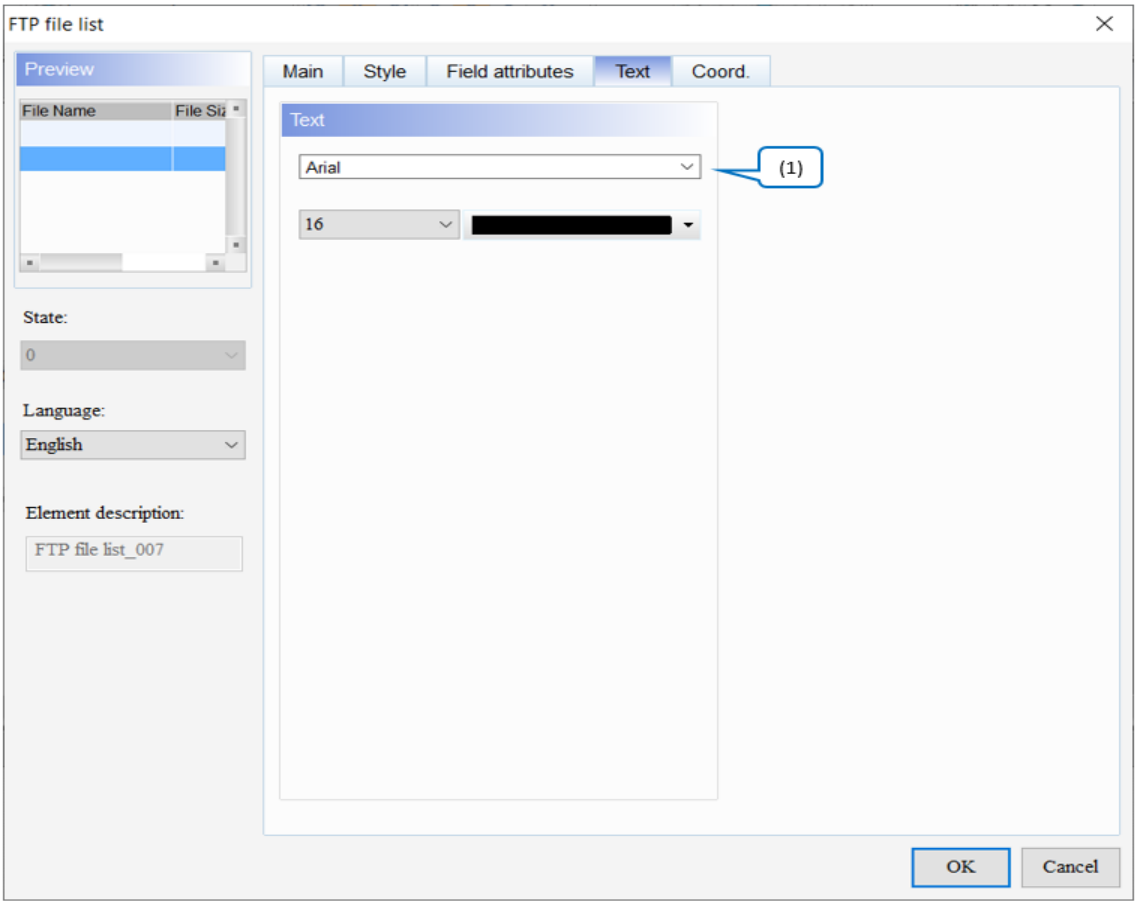


Figure 19 - 61: FTP File List element Text property page

No.	Function	Description
(1)	Text property	Set the text properties, including the font, size, and color.

- Coord.

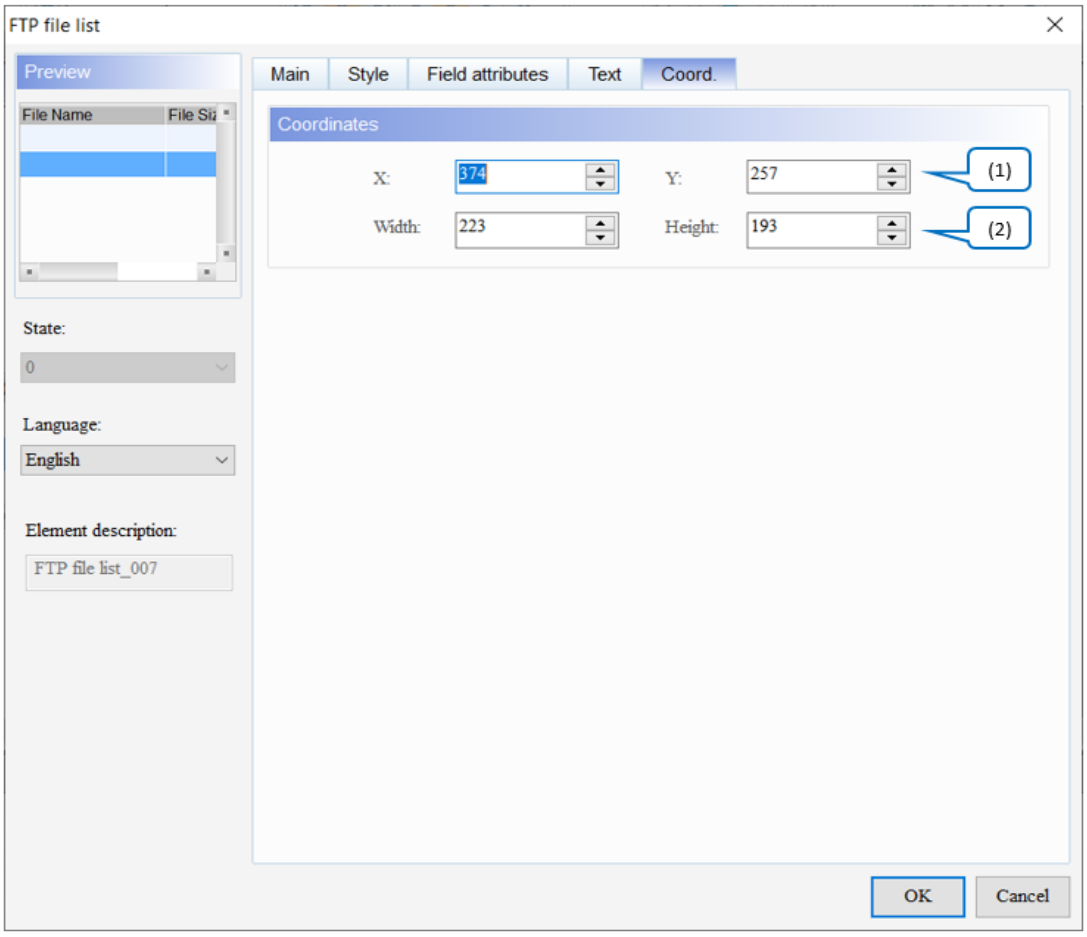


Figure 19 - 62: FTP File List element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

19.9 FTP File Setting

FTP File Setting supports file transfer on the DOP-107H models only (FTP client). With this function, users can transfer files between the DOP-107H series HMI and the FTP server. Besides, functions of the login / logout mechanism, file upload, file

deletion, file download, file management, file renaming, and directory (folder) management are provided.

The **FTP File Setting** functions must be used with the **FTP File List** element.

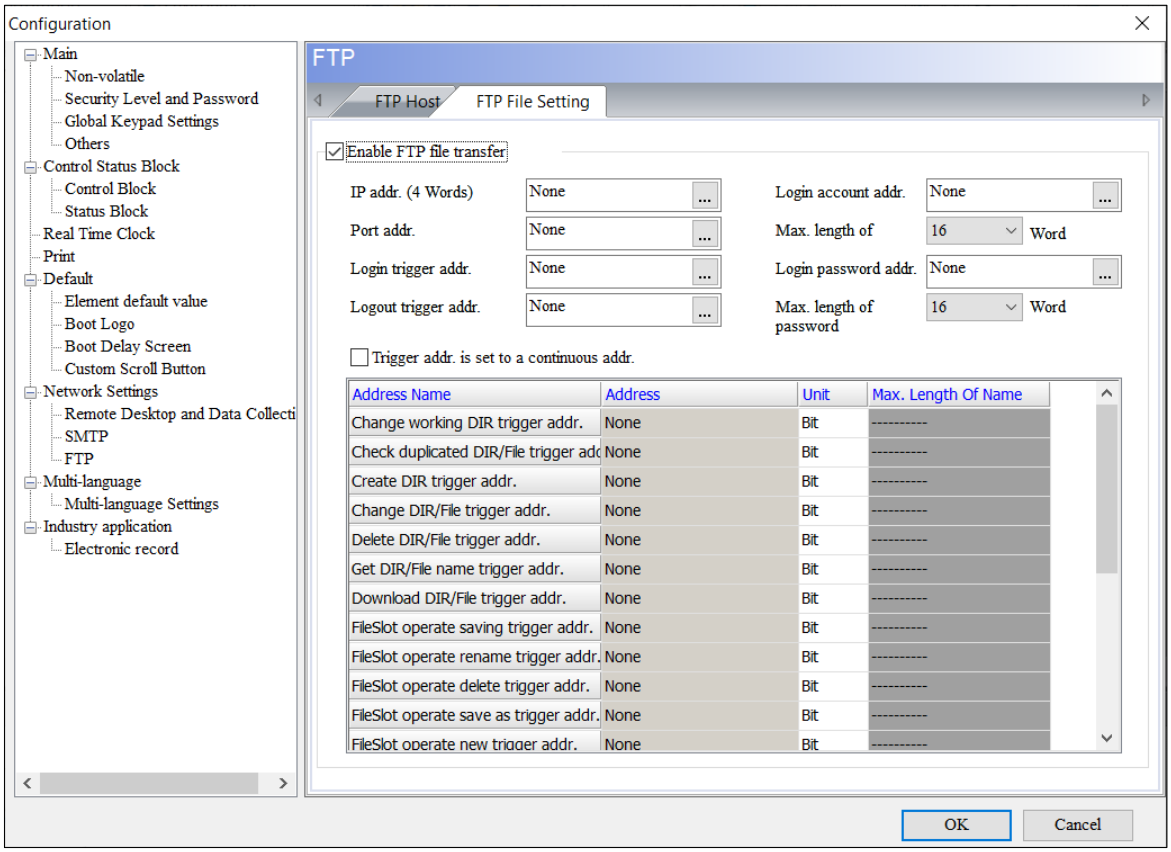


Figure 19 - 63: FTP File Setting (1)

The following describes each function based on this example.

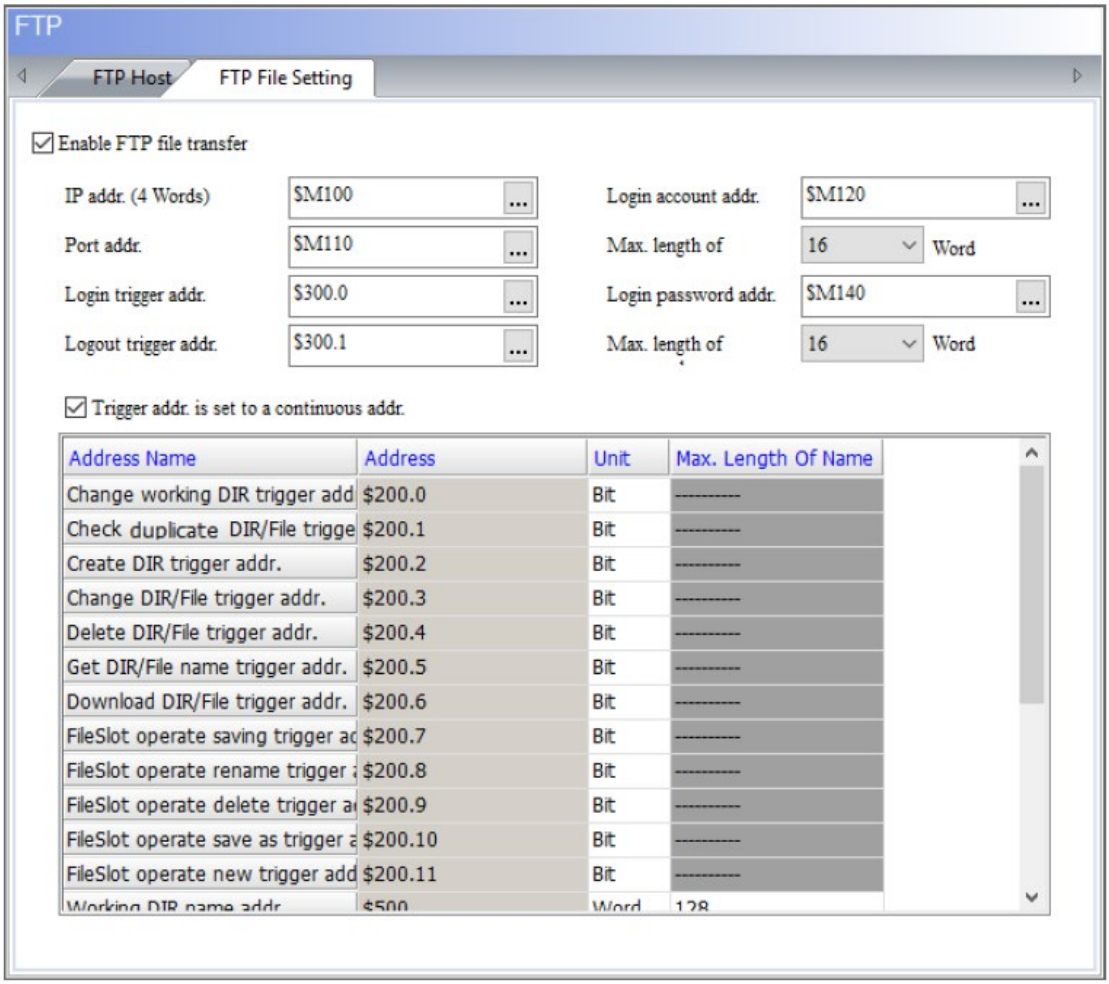
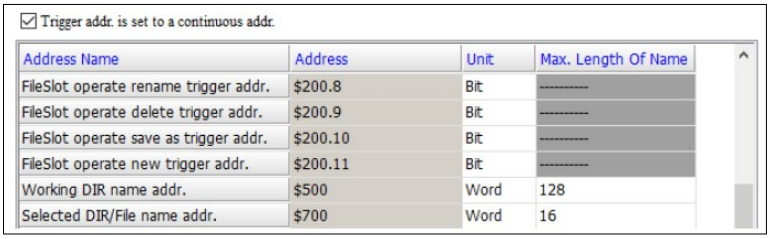
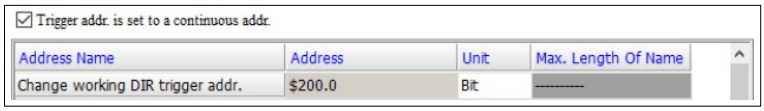


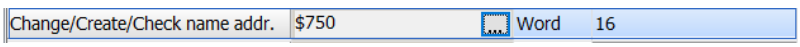
Figure 19 - 64: FTP file transfer (2)

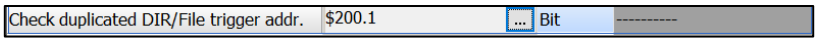
Function	Description	
Enable FTP file transfer	Select the checkbox for **Enable FTP file transfer** to enable the FTP client function.	
Host Login	IP addr.	Set the IP address of the FTP Server to connect.
	Port addr.	Set the FTP Server port to connect, the default value is 21.
	Login trigger addr.	The value is in bit. Triggering this bit to On to log in.
	Logout trigger addr.	The value is in bit. Triggering this bit to On to log out.
	Login account addr.	Set the start address of the account. The maximum length supports 16 Words.
	Max. length of	

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td>Login password addr.</td><td rowspan="2">Set the start address of the password, the maximum length supports 16 words.</td></tr>
<tr><td>Max. length of password</td></tr>
<tr><td rowspan="2">Switch working directory</td><td>Change working DIR trigger addr.</td><td>When this bit is On, the working directory is switched. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Example
Step 1: Set the string in Working DIR name addr. ($500) to “/lua”.
 

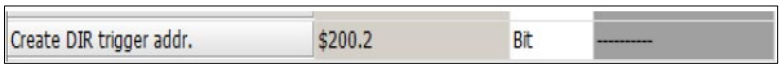
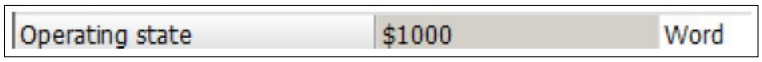
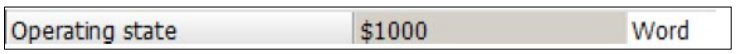
Step 2: Set Change working DIR trigger addr. ($200.0) to On.
 

Step 3: The FTP File List element switches to the lua directory.
If the directory does not exist, the content of Operating state becomes 0x0022.
 

Step 4: After the Change working DIR trigger addr. ($200.0) action is completed, it will be automatically set to Off.</td></tr>
<tr><td rowspan="2">Check duplicate directories / files</td><td>Check duplicate DIR/File trigger addr.</td><td>When this bit is On, the HMI checks for the duplicate directories or files. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Example
Step 1: Set the string in Change/Create/Check name addr. ($750) to lua.
 

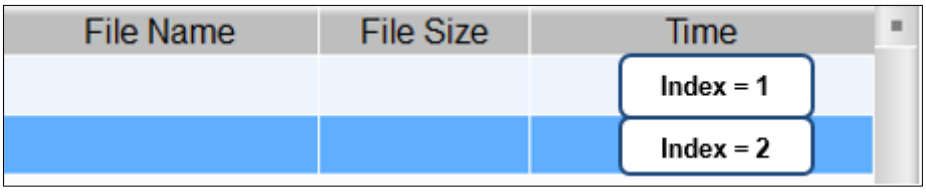
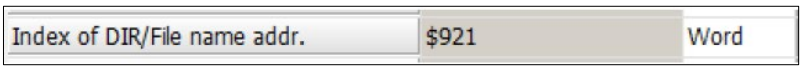
Step 2: Set Check duplicated DIR/File trigger addr. ($200.1) to On.
 

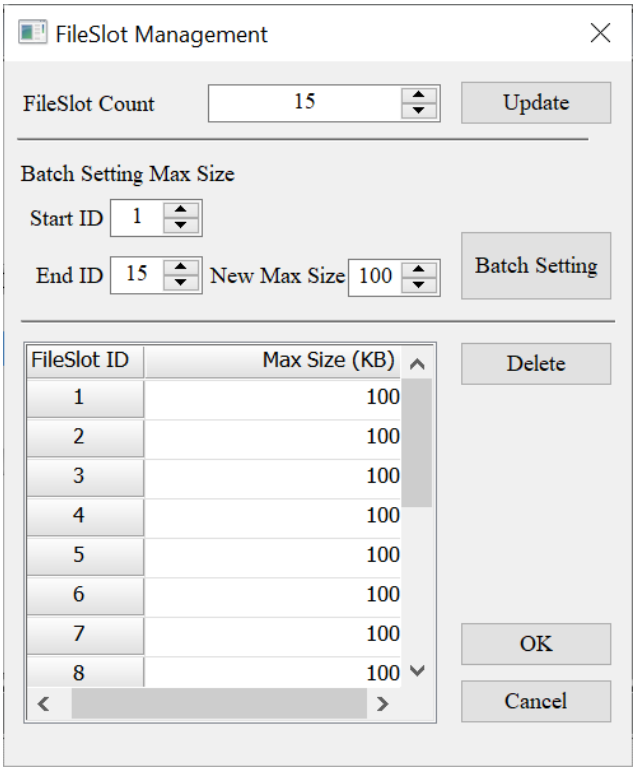
Step 3: If the lua directory already exists, the content of Check duplicated DIR/File result ($900) becomes 1; if the directory does not exist, the content of Check duplicated DIR/File result ($900) becomes 0.
 
</td></tr>
</table>

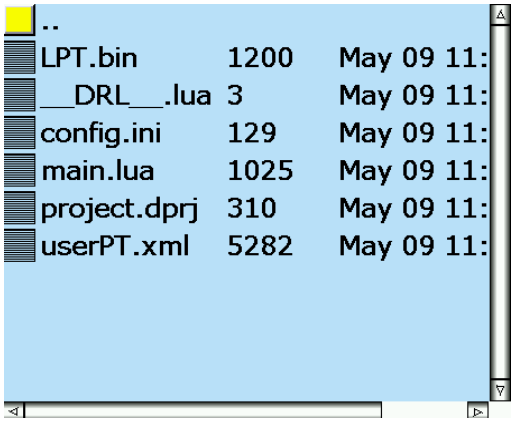
<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td colspan="2">Step 4: Check Check duplicated DIR/File trigger addr. ($200.1) will be automatically set to Off after the action is completed.</td></tr>
<tr><td rowspan="4">Create / delete / change directories or files</td><td>Create DIR trigger addr.</td><td>When this bit is On, the directory is created. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Example
Step 1: Set the string content of Change/Create/Check name addr. ($750) to TestHMI.
 
Step 2: Set Create DIR trigger addr. ($200.2) to On.
 
Step 3: Add the TestHMI folder to the FTP Server, and update the FTP File List element. If the TestHMI directory already exists, the Operating state ($1000) content becomes 0x0042.
 
Step 4: After the Create DIR trigger addr. ($200.2) action is completed, it will be automatically cleared to Off.</td></tr>
<tr><td>Change DIR/File trigger addr.</td><td>When this bit is On, the name of the directory or file is changed. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Example
Step 1: Use the FTP File List element and click the TestHMI directory which is to be changed.
Step 2: Set the string content of Change/Create/Check name addr. ($750) to ChangeHMI.
 
Step 3: Set Change DIR/File trigger addr. ($200.3) to On.
 
Step 4: The name of the TestHMI directory is changed to ChangeHMI, and the HMI updates the FTP File List element simultaneously. If the ChangeHMI directory already exists, the content of Operating state ($1000) becomes 0x0052.
 
Step 5: Change DIR/File trigger addr. ($200.3) will be automatically set to Off after the action is completed.

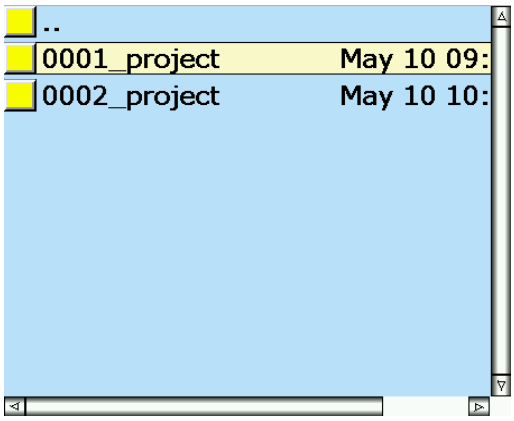
NOTE: The above example is to operate on the directory, the trigger address can also operate on the file.</td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="2"></td><td>Delete DIR/File trigger addr.</td><td>When this bit is On, the name of the directory or file is deleted. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Example
Step 1: Set the string content of Selected DIR/File name addr. ($700) to ChangeHMI.
 
Step 2: Set Delete DIR/File trigger addr. ($200.4) to On.
 
Step 3: Delete the ChangeHMI folder of the FTP Server, and the HMI updates the FTP File List element at the same time.
Step 4: Delete DIR/File trigger addr. ($200.4) will be automatically cleared to Off after the action is completed.

NOTE: The above example is to operate on the directory, the trigger address can also operate on the file.</td></tr>
<tr><td rowspan="2">Obtain the directory / file name</td><td>Get directory/file name trigger address</td><td>When this bit is On, the directory / file name is obtained, and it is automatically cleared after completion.</td></tr>
<tr><td colspan="2">Example
Step 1: The FTP File List element is shown in the following figure.
 
Step 2: Set Index of DIR/File name addr. ($921) to 2.
 
If the index value is set to 0, the content of Operating state ($1000) becomes 0x0027.
 
Step 3: Set Get DIR/File name trigger addr. ($200.5) to On.
 
Step 4: The directory name, when the index value of the FTP Server is 2, is obtained, and the content of Get DIR/File name result ($770) is lua.
  </td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td colspan="2">NOTE:
1. The above example is to operate on the directory line, the trigger address can also operate on the file.
2. The index value is mainly based on the FTP Server, and the display order of the HMI FTP File List element is not necessarily equal to the order of the FTP Server.</td></tr>
<tr><td rowspan="2">Download the directory / file</td><td>Download DIR/File trigger addr.</td><td>When this bit is On, the HMI starts to download the file from the FTP Server. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Before using this function, users need to go to Project > Other Setting > FileSlot Management to set the related settings.
 

Example
Step 1: When the FTP Server file is stored in the /lua/0001_project directory as shown in the following figure.
 
</td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td colspan="2">Switch to the /lua directory and select the 0001_project directory as shown in the following figure.
 

Step 2: Set Download DIR/File trigger addr. ($200.6) to On.
 

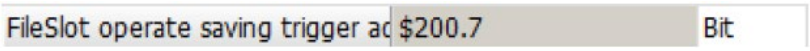
Step 3: The HMI downloads the file from the FTP Server to the FileSlot storage space set in Selected FileSlot addr. ($920). If there are multiple files in the directory, the Selected FileSlot addr. ($920) refers to the FileSlot start address.
 

After the download is complete, the value of Number of downloads ($910) becomes 6.
 

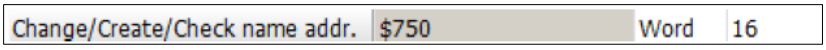
Step 4: After the download is complete, the file is stored in the FileSlot storage space. To edit the file, users need to use the Text List element. To read the name of the file, users need to use the FileSlotGetName macro command.

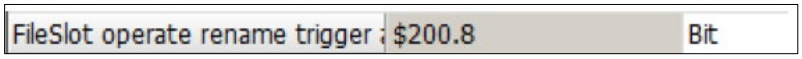
NOTE:
1. The above example is to operate on the directory, the trigger address can also operate on the file.
2. If the downloaded file name is known, the HMI can obtain the location information (ID) of the file stored in FileSlot through the FileSlotGetID macro command.</td></tr>
<tr><td rowspan="2">FileSlot operation</td><td>FileSlot operate saving trigger addr.</td><td>When this bit is On, the HMI uploads the selected FileSlot file to the FTP Server. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Before using this function, users need to set the FileSlot function and execute the Download DIR/File function.
Example:</td></tr>
</table>

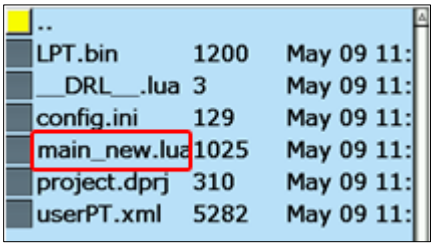
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td></td><td>
Step 1: Set Selected FileSlot addr. ($920) to 4.


Step 2: Set FileSlot operate saving trigger addr. ($200.7) to On.


Step 3: The HMI executes the upload action and uploads the file (main.lua) whose FileSlotID is 4 to the FTP Server.
<table>
<tr><td>FileSlot operate rename trigger addr.</td><td>When this bit is On, the HMI changes the name of the selected FileSlot file and uploads it to the FTP Server. This bit is automatically cleared once the action is complete.</td></tr>
</table>
Before using this function, users need to set the FileSlot file function and execute the download DIR/File function.
Example
Step 1: Set Selected FileSlot addr. ($920) to 4.

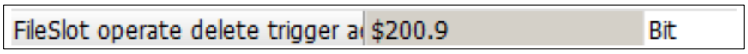

Step 2: Set the string in Change/Create/Check name addr. ($750) to main_new.lua.


Step 3: Set FileSlot operate rename trigger addr. ($200.8) to On.


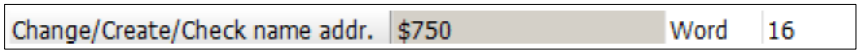
Step 4: The HMI changes the file name from main.lua to main_new.lua, and changes the name in the FileSlot and updates the FTP File List element simultaneously.


<table>
<tr><td>FileSlot operate delete trigger addr.</td><td>When this bit is On, the HMI deletes the selected FileSlot file from the FTP Server. This bit is automatically cleared once the action is complete.</td></tr>
</table>
Before using this function, users need to set the FileSlot function and execute the Download DIR/File function.
Example:
Step 1: Set Selected FileSlot addr. ($920) to 1.

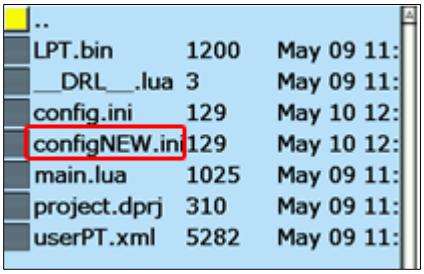
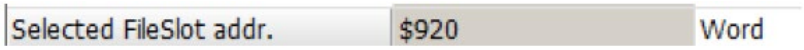

</td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="2">Description</th></tr>
<tr><td></td><td colspan="2">Step 2: Set FileSlot operate delete trigger addr. ($200.9) to On.
 

Step 3: The HMI deletes the file LPT.bin from the FTP Server and updates the FTP File List element simultaneously.</td></tr>
<tr><td rowspan="4">FileSlot operation</td><td>FileSlot operate save as trigger addr.</td><td>When this bit is On, the HMI saves the selected FileSlot file in the FTP Server. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Before using this function, users need to set the FileSlot function and execute the Download DIR/File function.
Example
Step 1: Set Selected FileSlot addr. ($920) to 3.
 

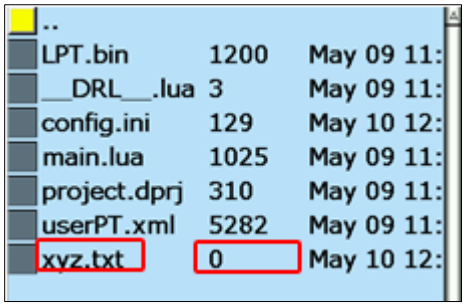
Step 2: Set the string in Change/Create/Check name addr. ($750) to configNEW.ini.
 

Step 3: Set FileSlot operate save as trigger addr. ($200.10) to On.
 

Step 4: The HMI saves the file to the FTP Server. The file named configNEW.ini is added to the FTP Server and the FTP File List element is updated simultaneously.
 
</td></tr>
<tr><td>FileSlot operate new trigger addr.</td><td>When this bit is On, the HMI adds the selected FileSlot file to the FTP Server. This bit is automatically cleared once the action is complete.</td></tr>
<tr><td colspan="2">Before using this function, users need to set the FileSlot file function.
Example
Step 1: Set Selected FileSlot addr. ($920) to 10.
 

Step 2: Set the string in Change/Create/Check name addr. ($750) to xyz.txt.
 

Step 3: Set FileSlot operate new trigger addr. ($200.11) to On.</td></tr>
</table>

Function	Description
	FileSlot operate new trigger add $200.11 Bit **Step 4**: The HMI adds the file to the FTP Server. The file named xyz.txt with the file size as 0 is added to the FTP Server and the **FTP File List** element is updated simultaneously. 

FTP File Setting		
Operations of setting the names and addresses for directories and files	**Set the name of the working directory to be switched**	● Set the name and maximum name length of the working directory to be switched. ● This function must be used with the **Change working DIR trigger addr.** Refer to its example Maximum name for descriptions.
	Maximum name length	
	Set the name of the selected directory / file	● Set the name and maximum name length of the directory or file to be deleted. ● This function must be used with the **Delete DIR/File trigger addr.** Refer to its example for descriptions.
	Maximum name length	
	Set the name of the directory / file to be changed / added / checked	● Set the name and maximum name length of the directory or file to be changed / added / checked. ● This function must be used with the **Check duplicate DIR/File trigger addr.** or **Create DIR trigger addr.** Refer to the corresponding example for descriptions.
	Maximum name length	
	Set the selected FileSlot	● The input **Data Type** is Word. Use this function to set the selected FileSlot. ● This function must be used with the **Download DIR/File trigger addr.** Refer to its example for descriptions.
	Set the index	● The input **Data Type** is Word. Set the index to

FTP File Setting		
	to obtain directory / file name	obtain the directory / file name. ● This function must be used with the **Get DIR/File name trigger addr.** Refer to its example for descriptions.
Execution result settings	Operating state	When the action set in the FTP transmission is complete, the **Operating state** changes as well. If the operation succeeded, 0 is displayed; if the operation failed, an error code is displayed.
	Result of checking for duplicate directories / files	Returns the result of **Check duplicated DIR/File trigger addr.**
	Number of files downloaded	● Returns the number of downloaded files. ● This function must be used with **Download DIR/File trigger addr.**
	Result of obtaining directory / file name	Returns the result of **Get DIR/File name trigger addr.**

19.10 Text List

***NOTE**: This function only supports DOP-107H HMI.*

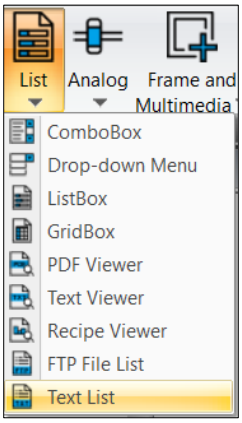
If there is a need for editing text files on the HMI, the **Text List** element supports reading and saving files, and file editing with the basic functions of Copy, Paste, Cut, and Insert. Edit any text with the **Text List** element along with the **Character Entry** element and the buffer configuration.

Refer to the following table for a **Text List** element description.

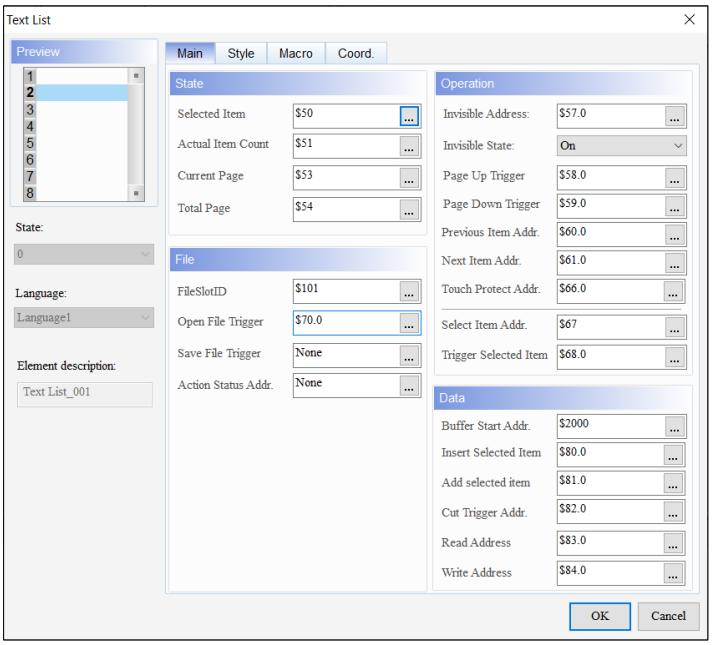
Text List

Create Text List element

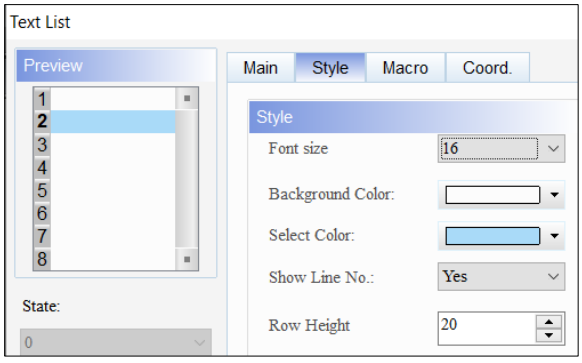
Step 1: On the edit screen, select **Elements** > **List** > **Text List** and create it on the screen.

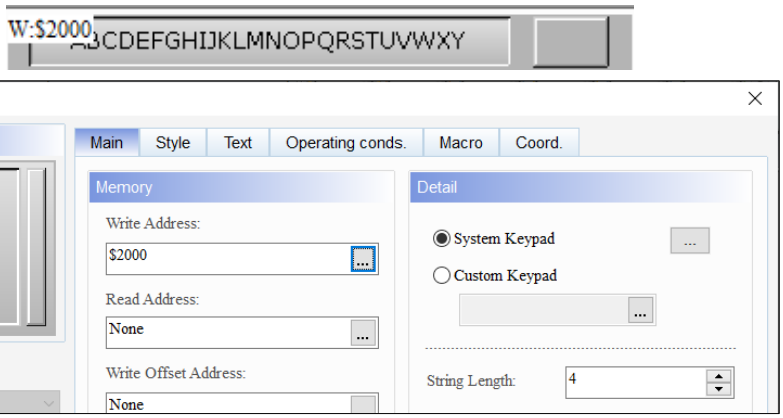
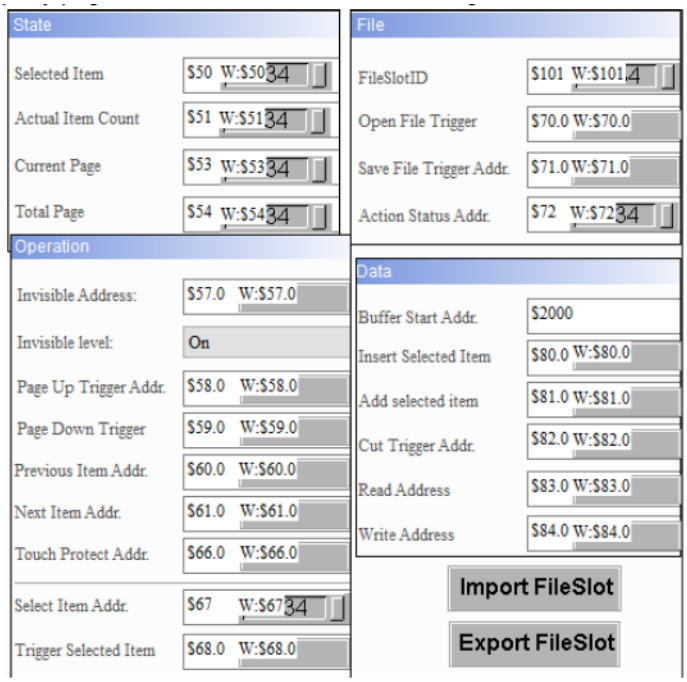


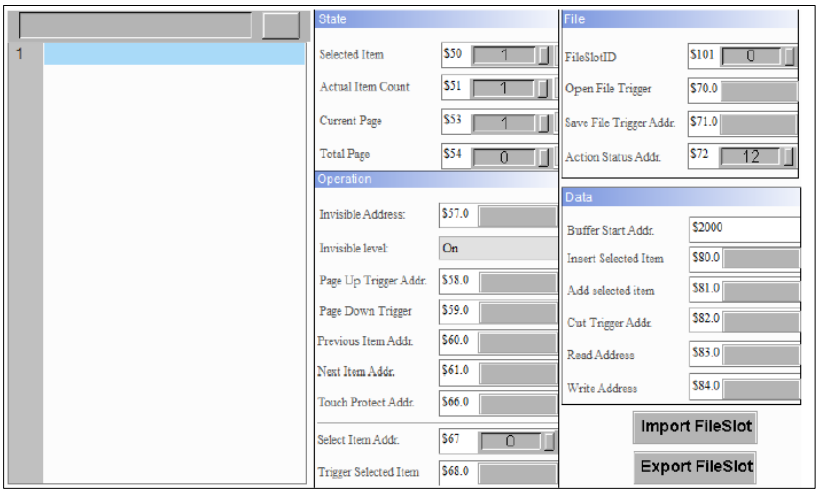
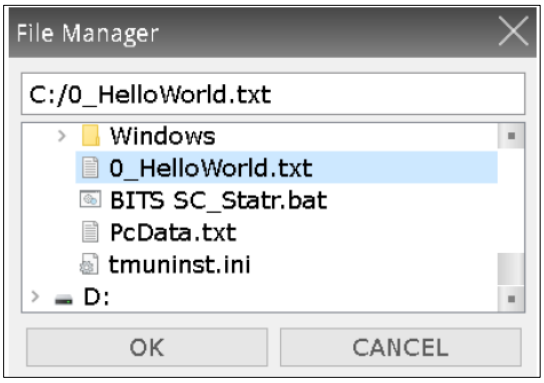
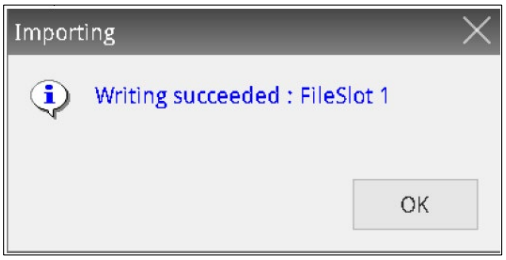
Step 2: On the **Main** property page, set the corresponding state addresses, including **FileSlotID** address, **Select Item Addr.**, and trigger addresses of other editing actions.

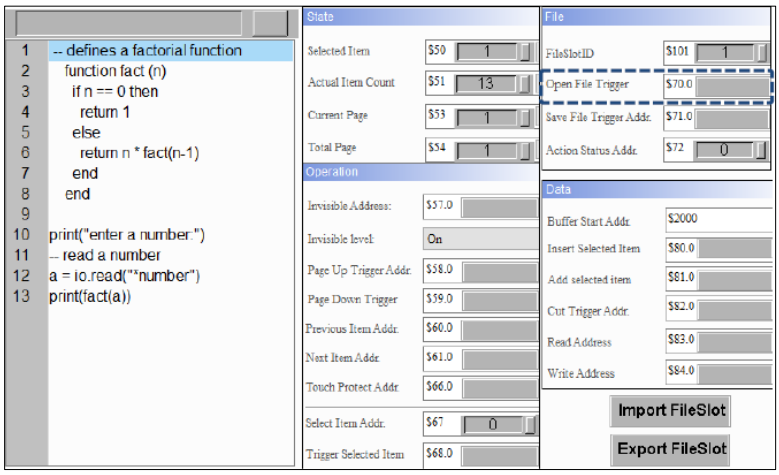
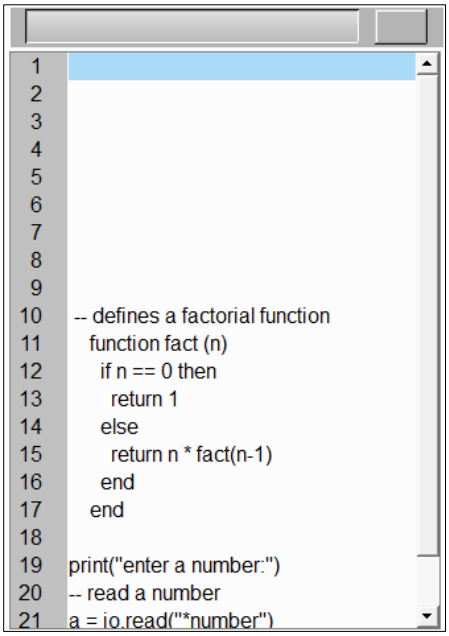


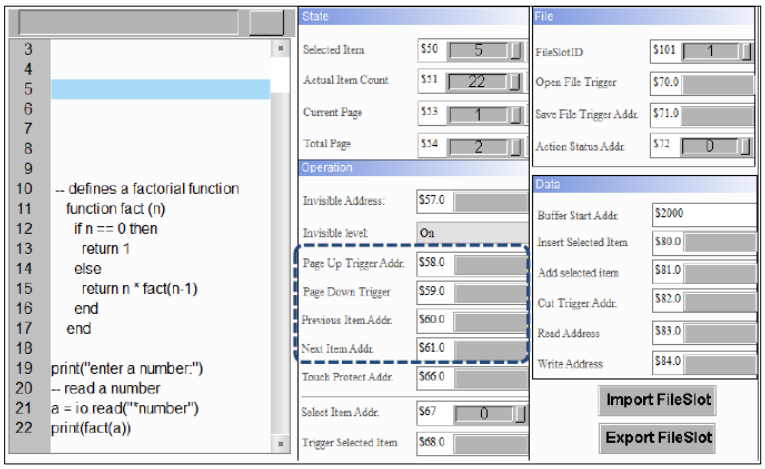
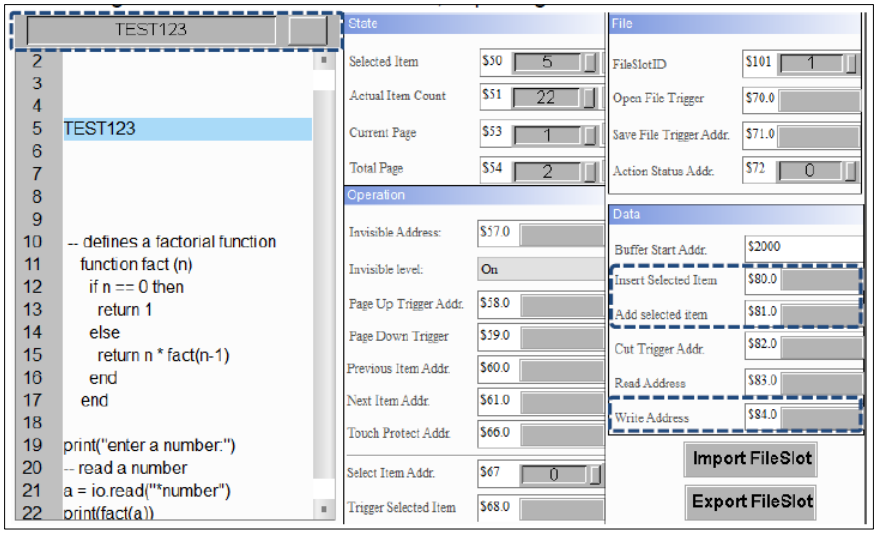
Step 3: Set the **Style** property to adjust the display appearance of the element.



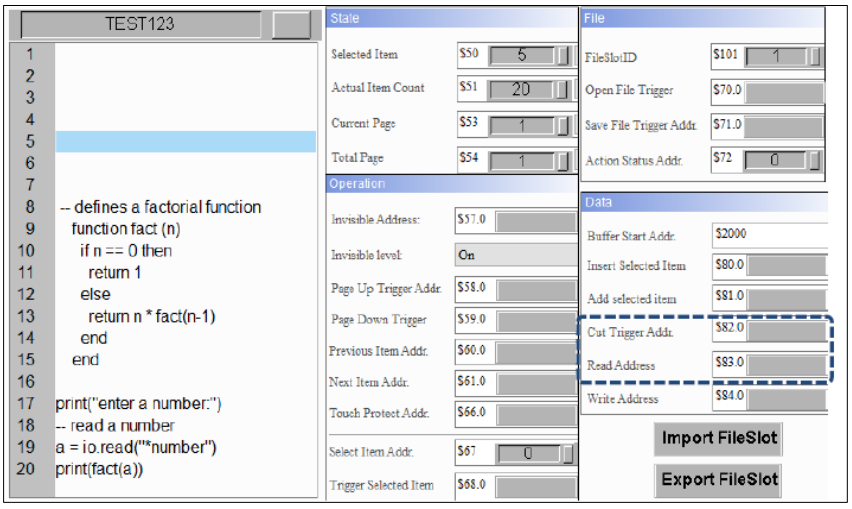
Text List	
Create Character Entry element	Create a **Character Entry** element on the screen and set its **Write Address** as the **Buffer Start Addr**. ($2000) of the **Text List** element. Then, enter user-defined data with the **Character Entry** element. 
Create Maintained Button and Numeric Entry elements	Create **Numeric Entry** and **Maintained Button** elements corresponding to the settings in the **Main** property page of the **Text List** element for editing the **Text List** element. 
Execution result	● After creating the elements, compile the elements and download the screen to the HMI. ● By default, a blank file is created.

Text List	
	 ● Set **FileSlotID** to 1, execute **Import FileSlot**, and select the file to be imported, as follows.  ● After the file is successfully imported, DIAScreen displays the following message to notify users. 
	● Then, trigger the **Open File Trigger address**, and the **Text List** element loads the imported file 0_HelloWord.txt.

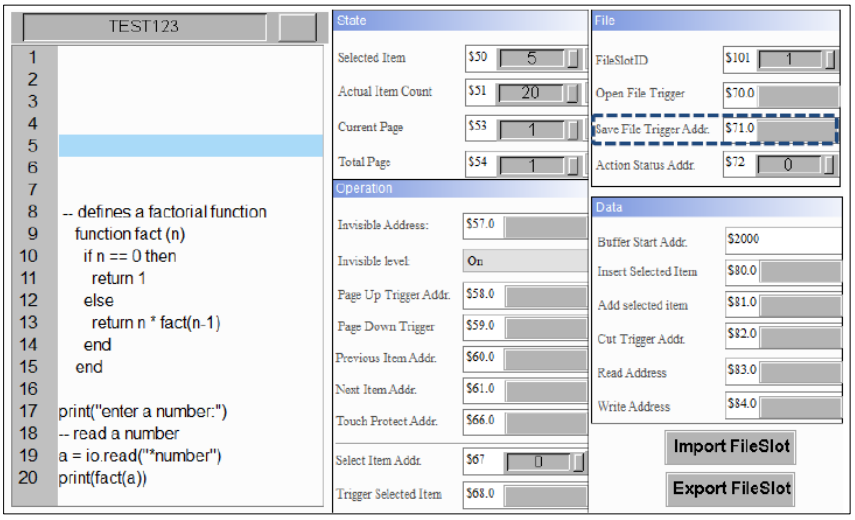
Text List	
	 ● When the number of data rows exceeds the display range, the **Text List** element displays the data on different pages and shows a vertical scroll bar on the right. 
Execution result	● Click **Page Up Trigger Addr.**, **Page Down Trigger**, **Previous Item Addr.**, or **Next Item Addr.** to trigger the action of selecting the previous item or the next item, or going to the previous page or the next page.

Text List	
	 ● Enter user-defined data in the **Character Entry** element and then press **Insert Selected Item**, **Add selected item**, or **Write Address** to trigger the action of inserting before or after the selected line, or pasting. 
Execution result	● Select the row to be deleted or copied and press **Cut Trigger Addr.** or **Read Address** to trigger the action of moving or copying the content to the buffer.

Text List



- Set **FileSlotID** as 1 and press **Save File Trigger Addr**., and then the element saves the current file content to the 0_HelloWord.txt file.



On double-clicking the **Text List** element, the property page appears as follows.

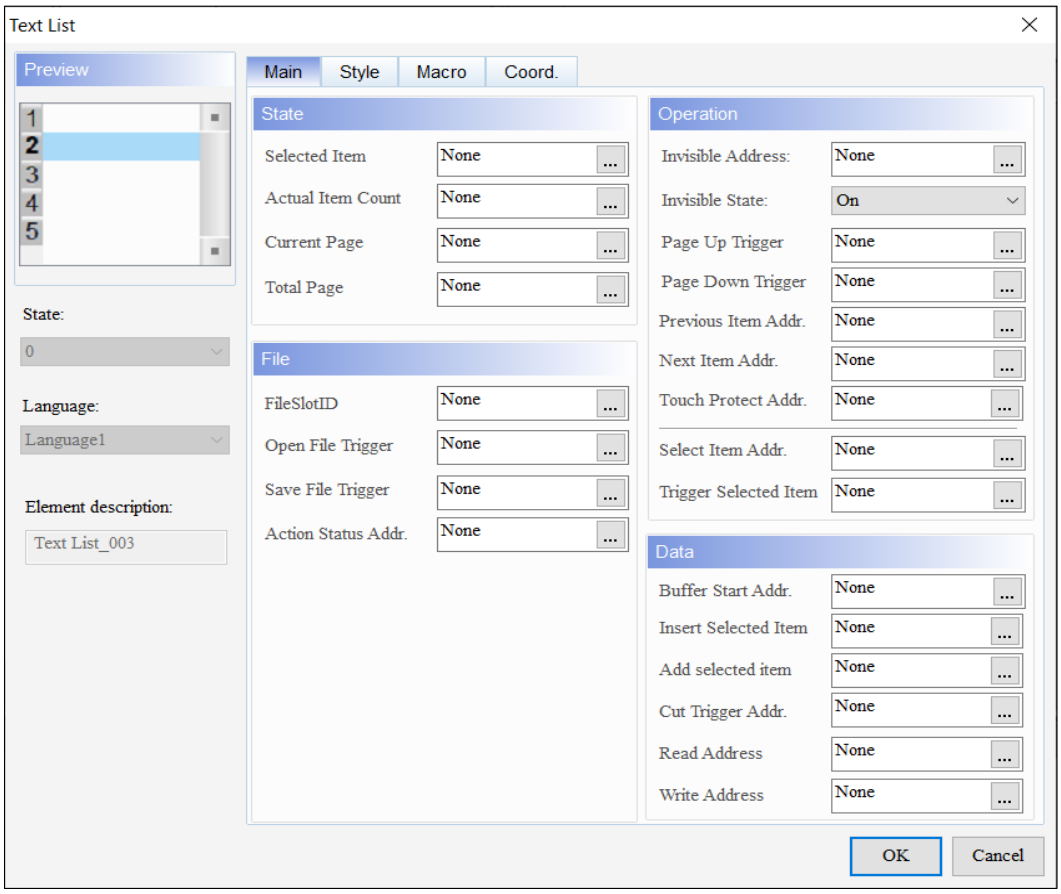


Figure 19 - 65: Text List element property page

Text List	
Function	**Description**
Main	Set the Selected Item, Actual Item Count, Current Page, and Total Page. Set the FileSlotID, Open File Trigger, Save File Trigger Addr., and Action Status Addr. Set the Invisible Address, Page Up Trigger Addr., Page Down Trigger, Previous Item Addr., Next Item Addr., Touch Protect Addr., Select Item Addr., and Trigger Selected Item. Set the Buffer Start Addr., Insert Selected Item, Add selected item, Cut Trigger Addr., Read Address, and Write Address.
Style	Set the Font size, Background Color, Select Color, Show Line No., and Row Height.
Macro	Set the After Execute Macro.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

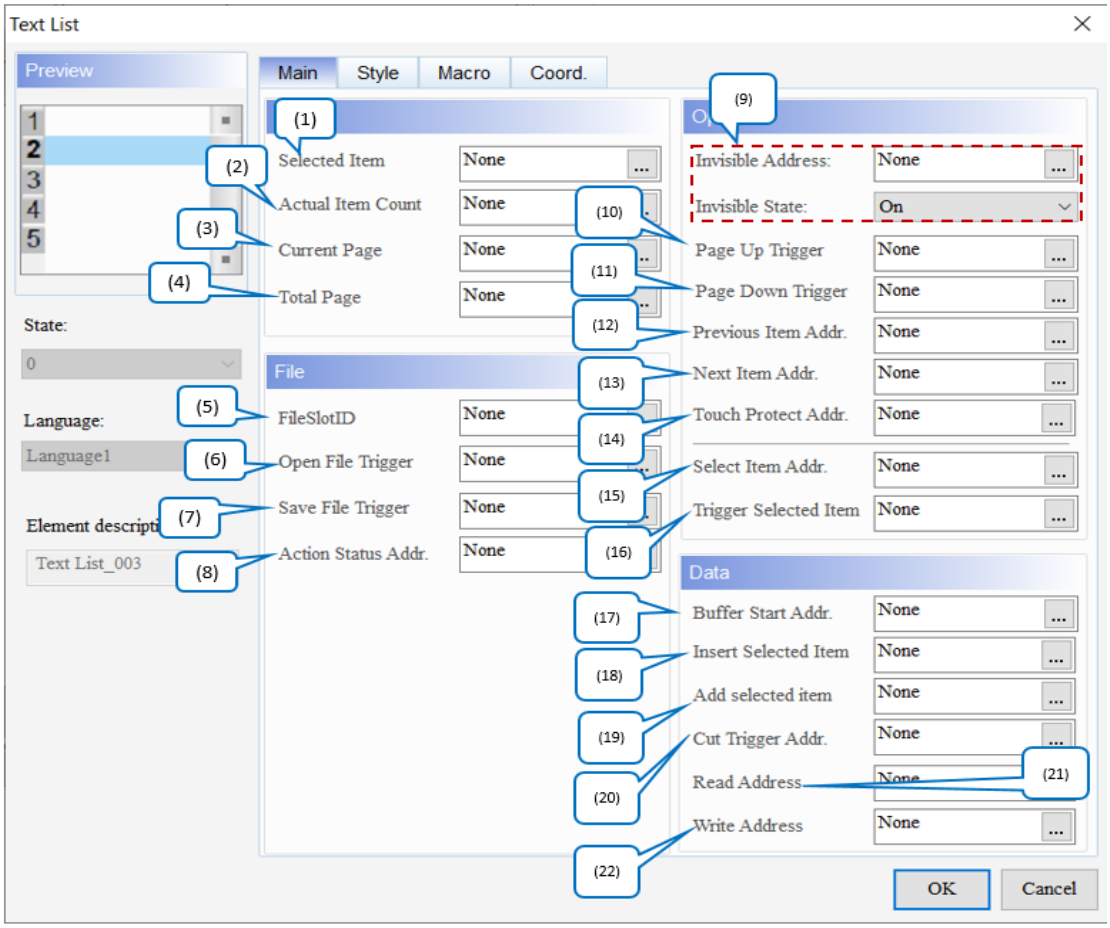
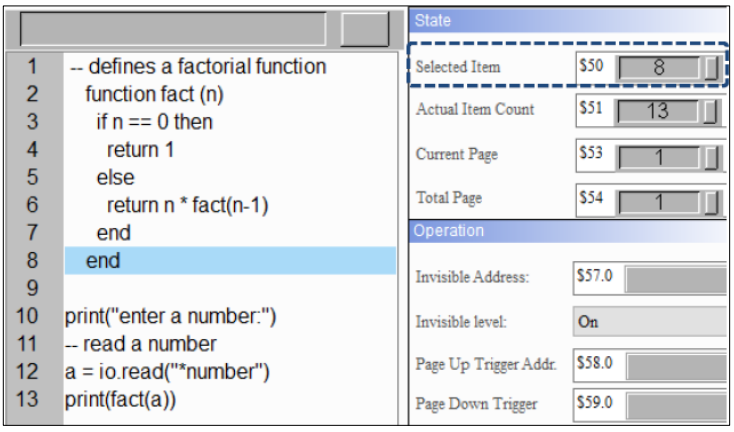
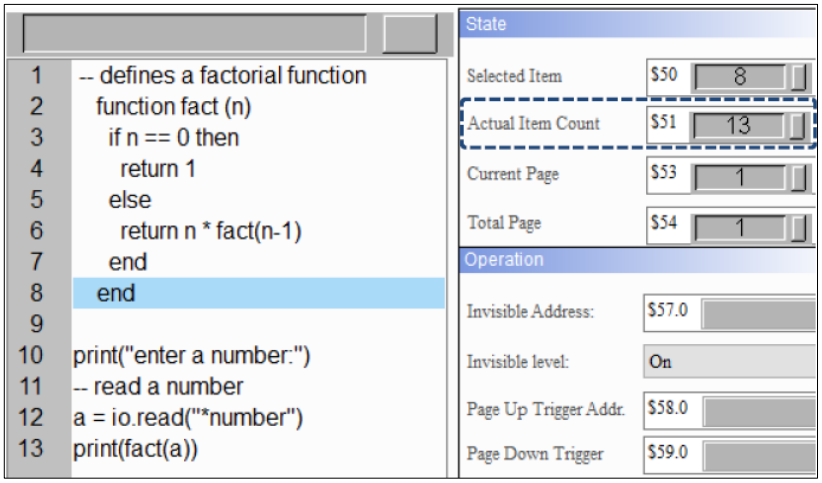
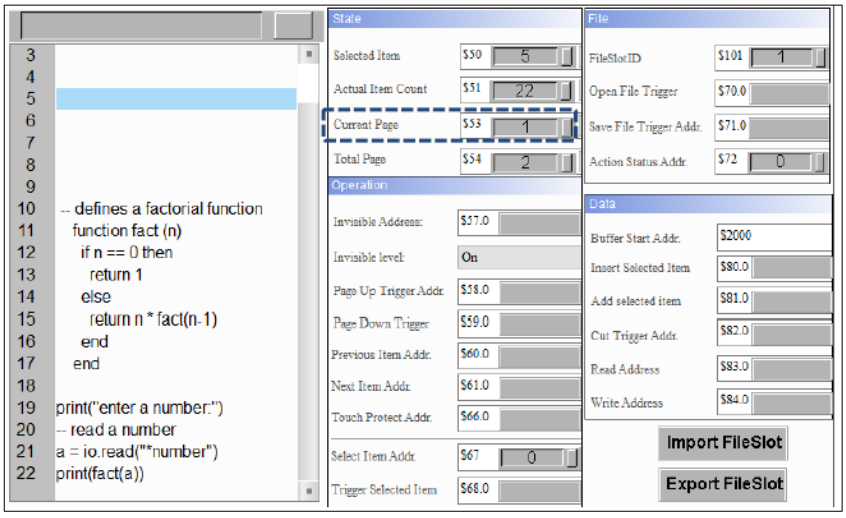
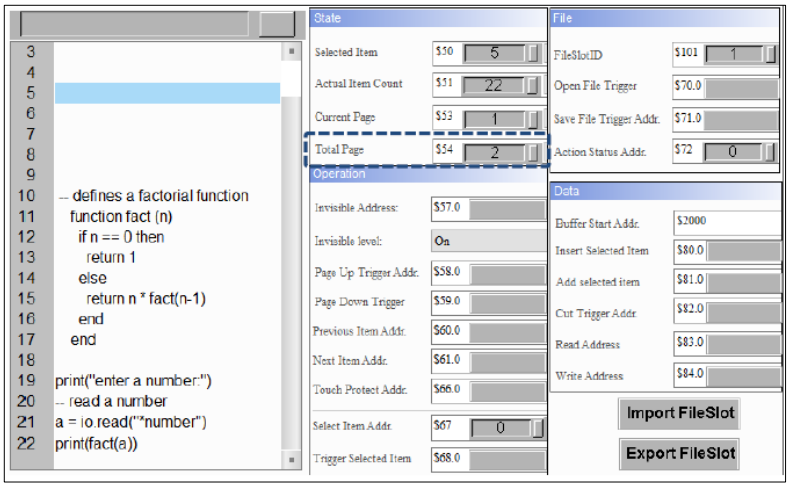
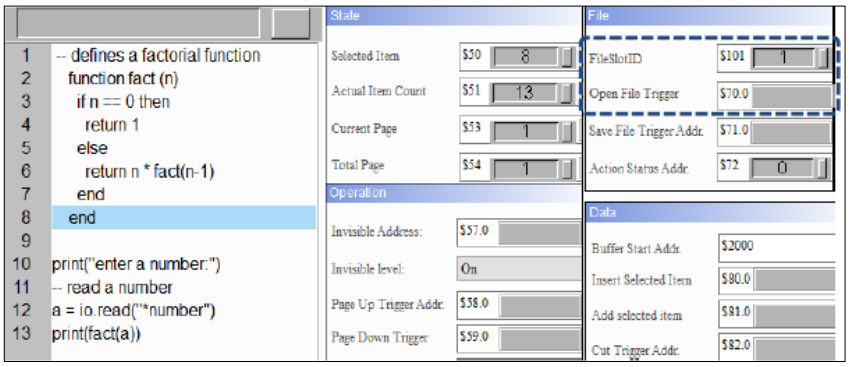


Figure 19 - 66: Text List element Main property page

No.	Function	Description
(1)	Selected Item	● When the selected row number is the 8th row, the value of the **Selected Item** is 8. 

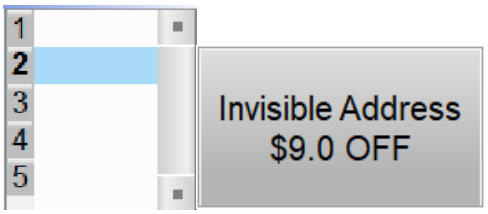
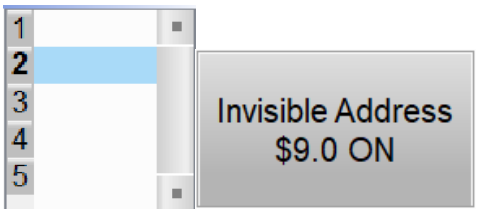
No.	Function	Description
		● Select the controller address (Word) or the internal register address (Word).
(2)	Actual Item Count	● This function displays the total number of data rows.  ● Select the controller address (Word) or the internal register address (Word).
(3)	Current Page	● This function shows the currently displayed page. ● When the total number of data rows exceeds the display range of the element, the data is displayed on different pages.  ● Select the controller address (Word) or the internal register address (Word).
(4)	Total Page	● This function shows the total number of pages.

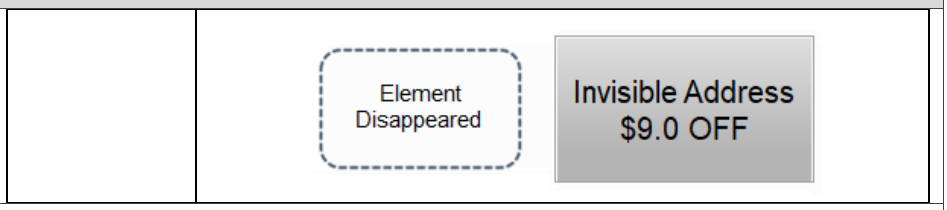
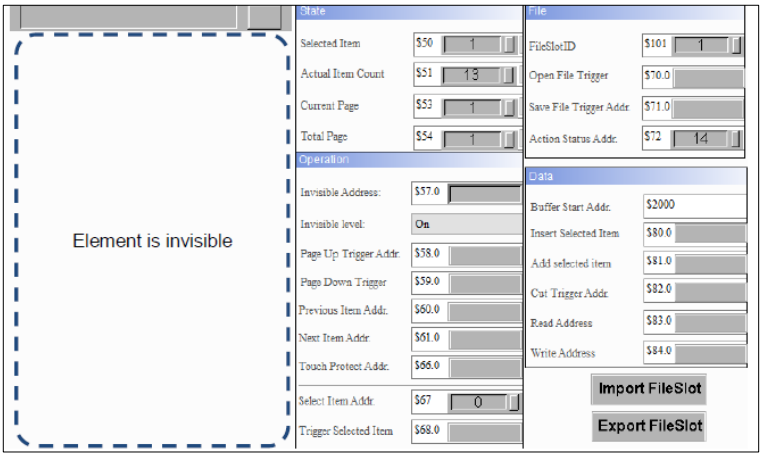
No.	Function	Description
		 ● Select the controller address (Word) or the internal register address (Word).
(5)	FileSlot ID	● Specify the ID of the file under **DIAScreen** > **FileSlot File Manager** with **FileSlotID**, then trigger **Open File Trigger** to On, and the element opens the file corresponding to the specified **FileSlotID**. ● When **Save File Trigger** is triggered to On, the element saves the current content to the file corresponding to the specified **FileSlotID**. ● **FileSlotID** can support selecting controller address (Word) and internal register address (Word).
(6)	Open File Trigger	 ● Select the controller address (Bit) or the internal register address (Bit) for **Open File Trigger**.
(7)	Save File Trigger	● When the **Save File Trigger** Bit is On, it will be saved to the file with the specified **FileSlotID**. If the file path does not exist, the file will be created and saved, and automatically cleared after completion. ● The **Save File Trigger** can support selecting the controller address (Bit) and the internal register address (Bit).
(8)	Action Status Addr.	● Select the controller address (Word) or the internal register address (Word). ● Access the current state of the **Text List** element with the

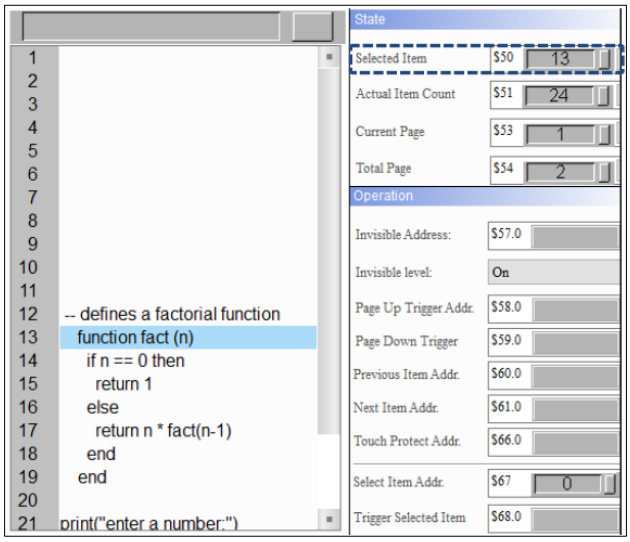
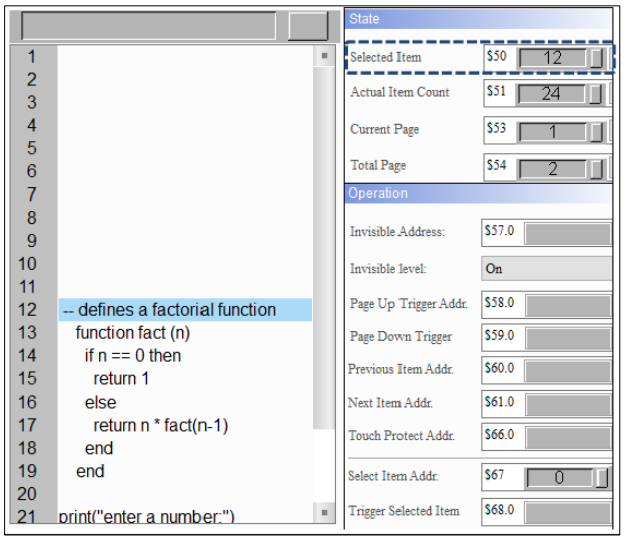
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>state values.
<table>
<tr><th>State Value</th><th>Description</th></tr>
<tr><td>0</td><td>Zero state</td></tr>
<tr><td>1</td><td>Row number does not exist</td></tr>
<tr><td>3</td><td>File does not exist</td></tr>
<tr><td>5</td><td>Failed to open file</td></tr>
<tr><td>6</td><td>Failed to write file</td></tr>
<tr><td>7</td><td>Triggered Open File Trigger or Save File Trigger without specifying FileSlotID</td></tr>
<tr><td>13</td><td>Element is touch-protected</td></tr>
<tr><td>14</td><td>Element is invisible</td></tr>
<tr><td>16</td><td>Exceeded the maximum file size (Maximum: 20 MB)</td></tr>
</table></td></tr>
<tr><td rowspan="2">(9)</td><td>Invisible Address</td><td rowspan="2">

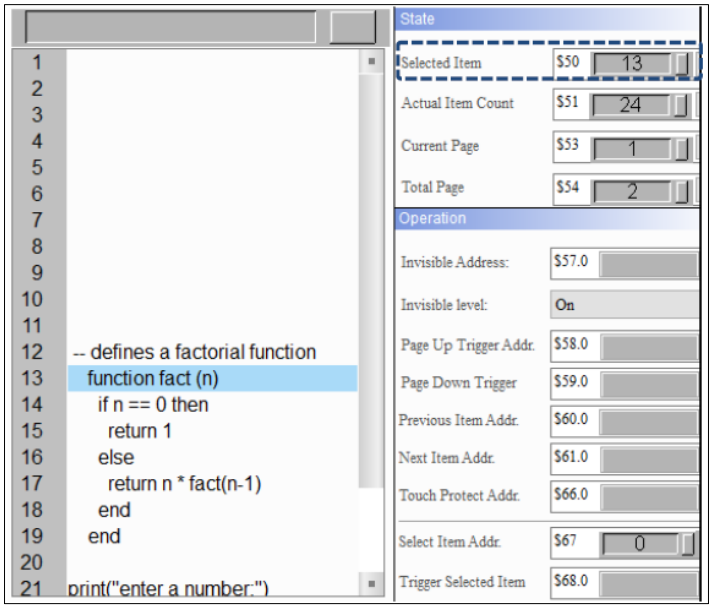
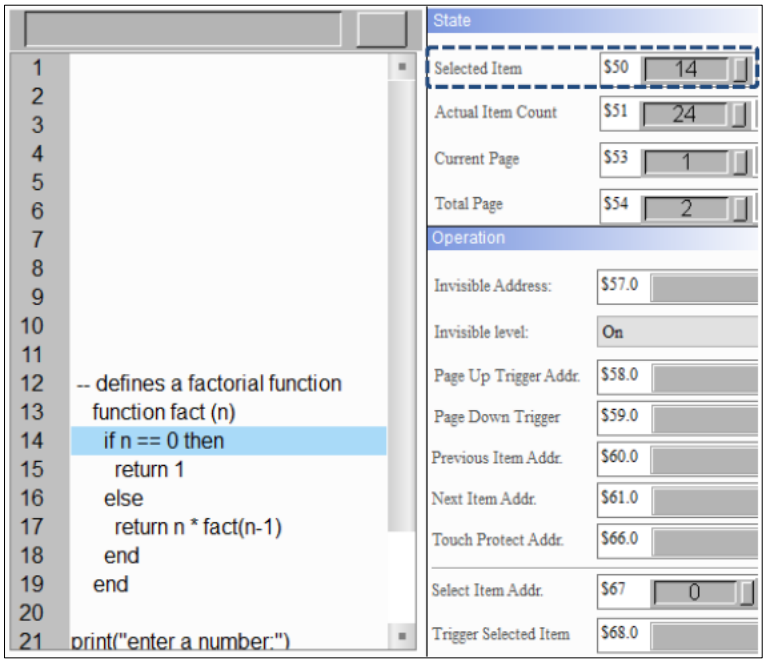
The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

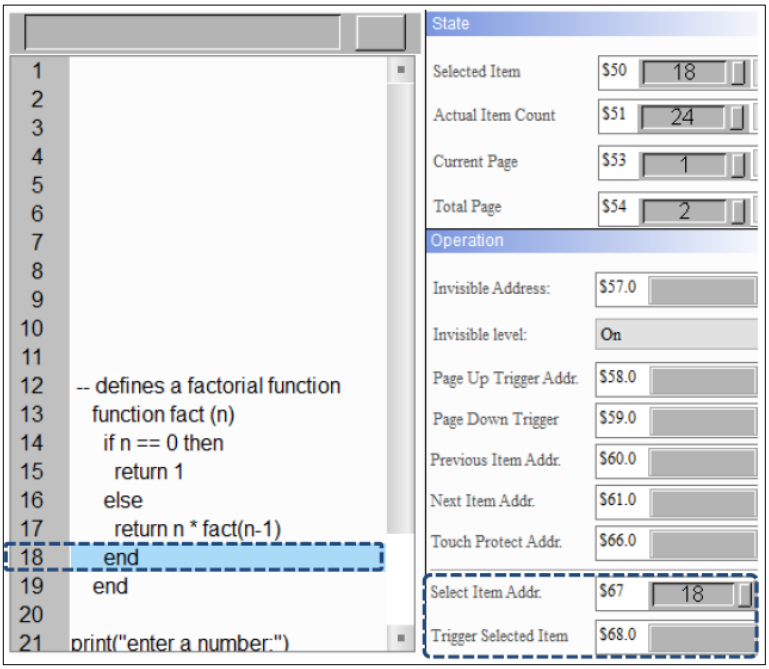
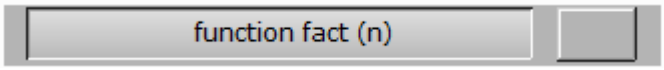
Create an element, and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

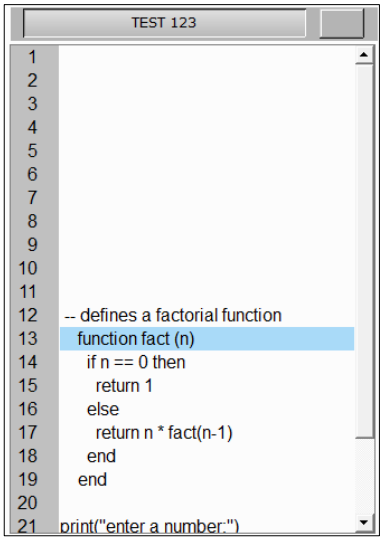
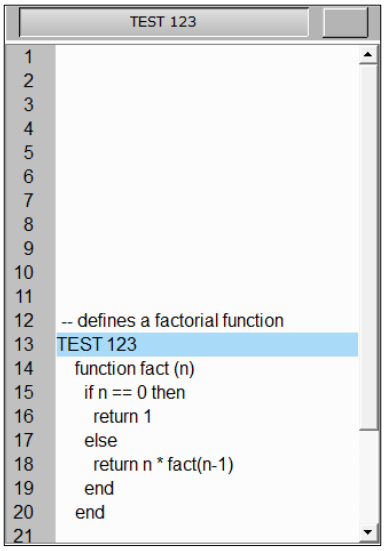
<table>
<tr><td>Invisible State is On</td><td> 
</td></tr>
<tr><td> 
</td></tr>
<tr><td>Invisible State is Off</td><td> 
</td></tr>
</table></td></tr>
<tr><td>Invisible State</td></tr>
</table>

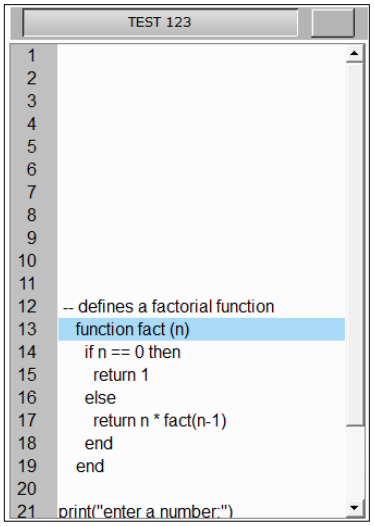
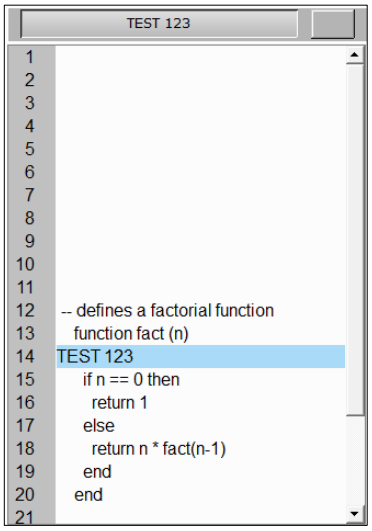
No.	Function	Description
		
(10)	Page Up Trigger	● When **Page Up Trigger** is On, the element display switches to the previous page. This bit is automatically cleared once the action is complete.  ● Select the controller address (Bit) or the internal register address (Bit).
(11)	Page Down Trigger	● When **Page Down Trigger** is On, the element switches to the next page. This bit is automatically cleared once the action is complete. ● Select the controller address (Bit) or the internal register address (Bit).
(12)	Previous Item Addr.	● When **Previous Item Addr.** is On, the **Selected Item** switches to the previous one. This bit is automatically cleared once the action is complete. **Example** When **Previous Item Addr.** is not triggered to On, the **Selected Item** shows 13. When **Previous Item Addr.** is triggered to On, the **Selected Item** shows 12.

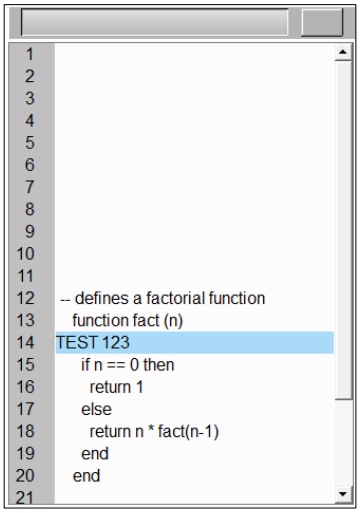
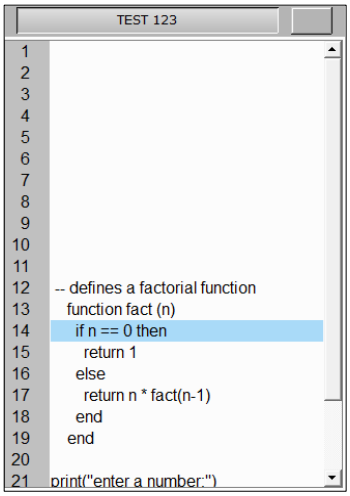
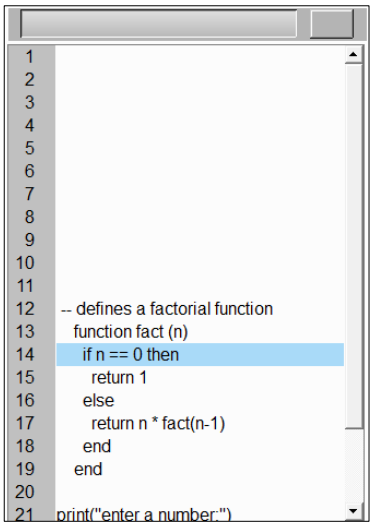
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before Previous Item Addr. is On</td><td> 
</td></tr>
<tr><td>After Previous Item Addr. is On</td><td> 
</td></tr>
</table>
Select the controller address (Bit) or the internal register address (Bit).
</td></tr>
<tr><td>(13)</td><td>Next Item Addr.</td><td>
When Next Item Addr. is On, the Selected Item switches to the next one. This bit is automatically cleared once the action is complete.
Example
When Next Item Addr. is not triggered to On, the Selected Item shows 13. When Next Item Addr. is triggered to On, the Selected Item shows 14.
</td></tr>
</table>

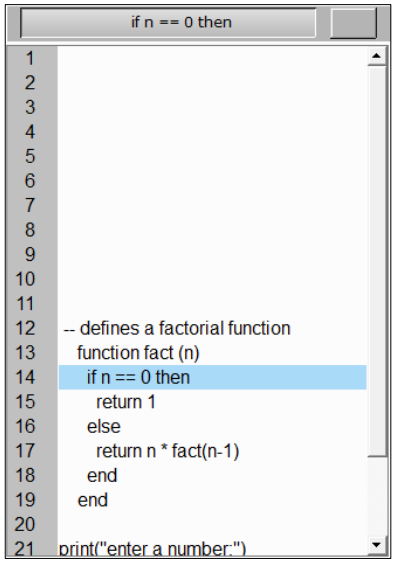
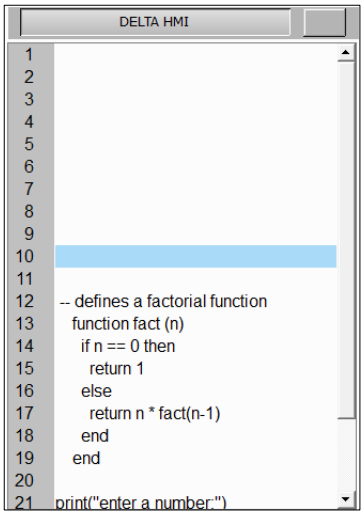
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before Next Item Addr. is On</td><td> 
</td></tr>
<tr><td>After Next Item Addr.is On</td><td> 
</td></tr>
</table>
Select the controller address (Bit) or the internal register address (Bit).
</td></tr>
<tr><td>(14)</td><td>Touch Protect Addr.</td><td>When Touch Protect Addr. is On, the Text List element is disabled and other operations are disabled. Action Status Addr. is set to 13.
Select the controller address (Bit) or the internal register address (Bit).</td></tr>
<tr><td>(15)</td><td>Select Item Addr.</td><td>Specify the item to select with Select Item Addr. When the Trigger Selected Item bit is On, the specified item is selected. This bit is automatically cleared once the action is</td></tr>
</table>

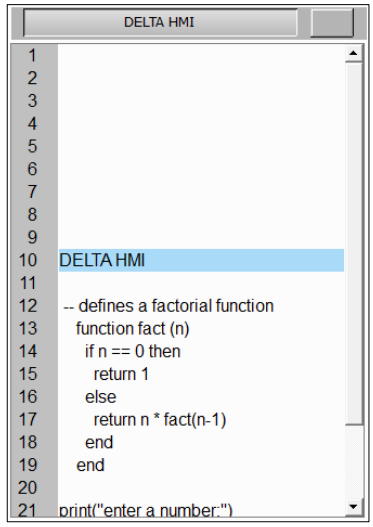
No.	Function	Description
(16)	Trigger Selected Item	complete.  ● Select the controller address (Word) or the internal register address (Word) for **Select Item Addr.** ● Select the controller address (Bit) or the internal register address (Bit) for **Trigger Selected Item**.
(17)	Buffer Start Addr.	● The address takes up 64 words (128 bytes) at most by default. If the address is set to None, the function of entering user-defined data with the **Character Entry** element is not supported.  ● Select the controller address (Word) or the internal register address (Word).
(18)	Insert Selected Item	● When the **Insert Selected Item** bit is On, the previously copied or cut item will be inserted to one line above the current selected line, and it will be automatically cleared once the action is complete.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before Insert Selected Item is On</td><td> 
</td></tr>
<tr><td>After Insert Selected Item is On</td><td> 
</td></tr>
</table>
● Select the controller address (Bit) or the internal register address (Bit).
</td></tr>
<tr><td>(19)</td><td>Add selected item</td><td>● When the Add selected item bit is On, insert the previously copied or cut item to the line below the current selected line. This bit is automatically cleared once the action is complete.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before Add selected item is On</td><td> 
</td></tr>
<tr><td>After Add selected item is On</td><td> 
</td></tr>
</table>
Select the controller address (Bit) or the internal register address (Bit).
</td></tr>
<tr><td>(20)</td><td>Cut Trigger Addr.</td><td>When Cut Trigger Addr. is On, the currently selected content is deleted and moved to the buffer. This bit is automatically cleared once the action is complete.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td>Before Cut Trigger Addr. is On</td><td> 
</td></tr>
<tr><td>After Cut Trigger Addr.is On</td><td> 
</td></tr>
<tr><td colspan="2">● Select the controller address (Bit) or the internal register address (Bit).</td></tr>
<tr><td>(21)</td><td>Read Address</td><td colspan="2">● When Read Address is set to On, the currently selected data is copied. This bit is automatically cleared once the action is complete.
 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>After Read Address is On</td><td> 
</td></tr>
</table>
Select the controller address (Bit) or the internal register address (Bit).
</td></tr>
<tr><td>(22)</td><td>Write Address</td><td>
When Write Address is set to On, the previously copied or deleted item is pasted to the currently selected row. This bit is automatically cleared once the action is complete.
<table>
<tr><td>Before Write Address is On</td><td> 
</td></tr>
</table>
</td></tr>
</table>

No.	Function	Description
		After Write Address is On  ● Select the controller address (Bit) or the internal register address (Bit).

- Style

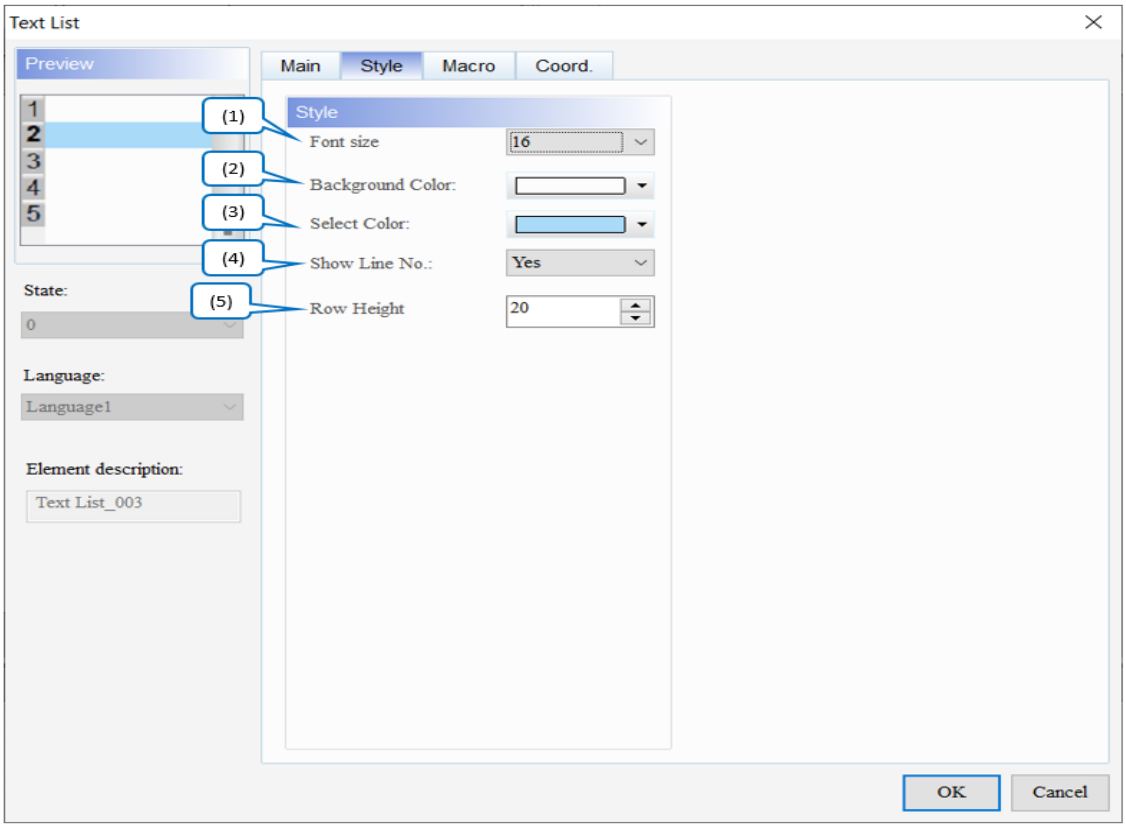
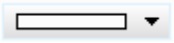
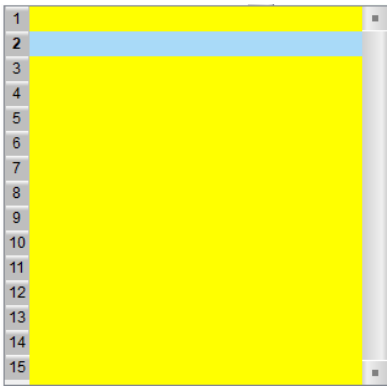
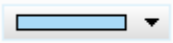
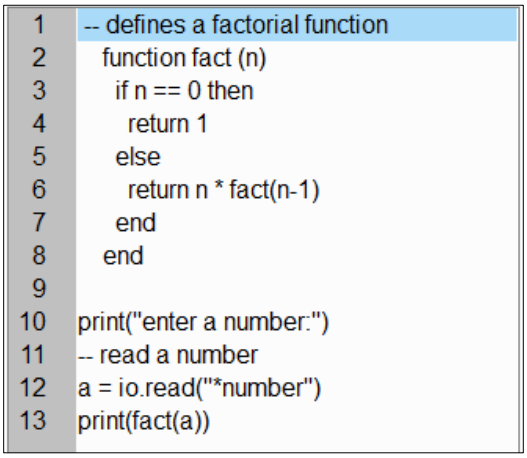
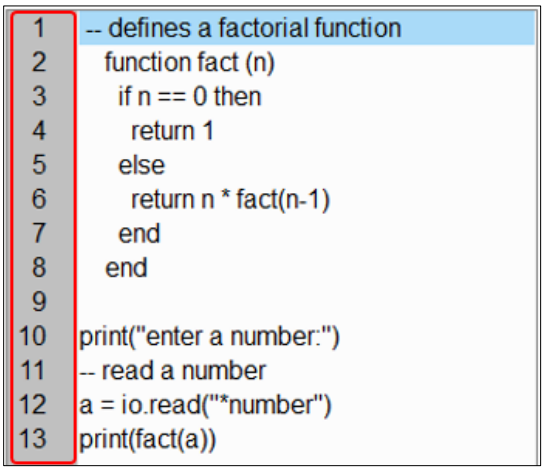


Figure 19 - 67: Text List element Style property page

No.	Function	Description
(1)	Font size	Set the font size of the element. The default value is **16**.
(2)	Background Color	Set the background color of the element. The default is  . 
(3)	Select Color	Set the color of the selected item in the **Text List** element. The default is  . 
(4)	Show Line No.	It displays the row numbers. The default value is **Yes**. 
(5)	Row Height	Set the height of each row. The default value is **20**. The maximum can be set to 256.

- Macro

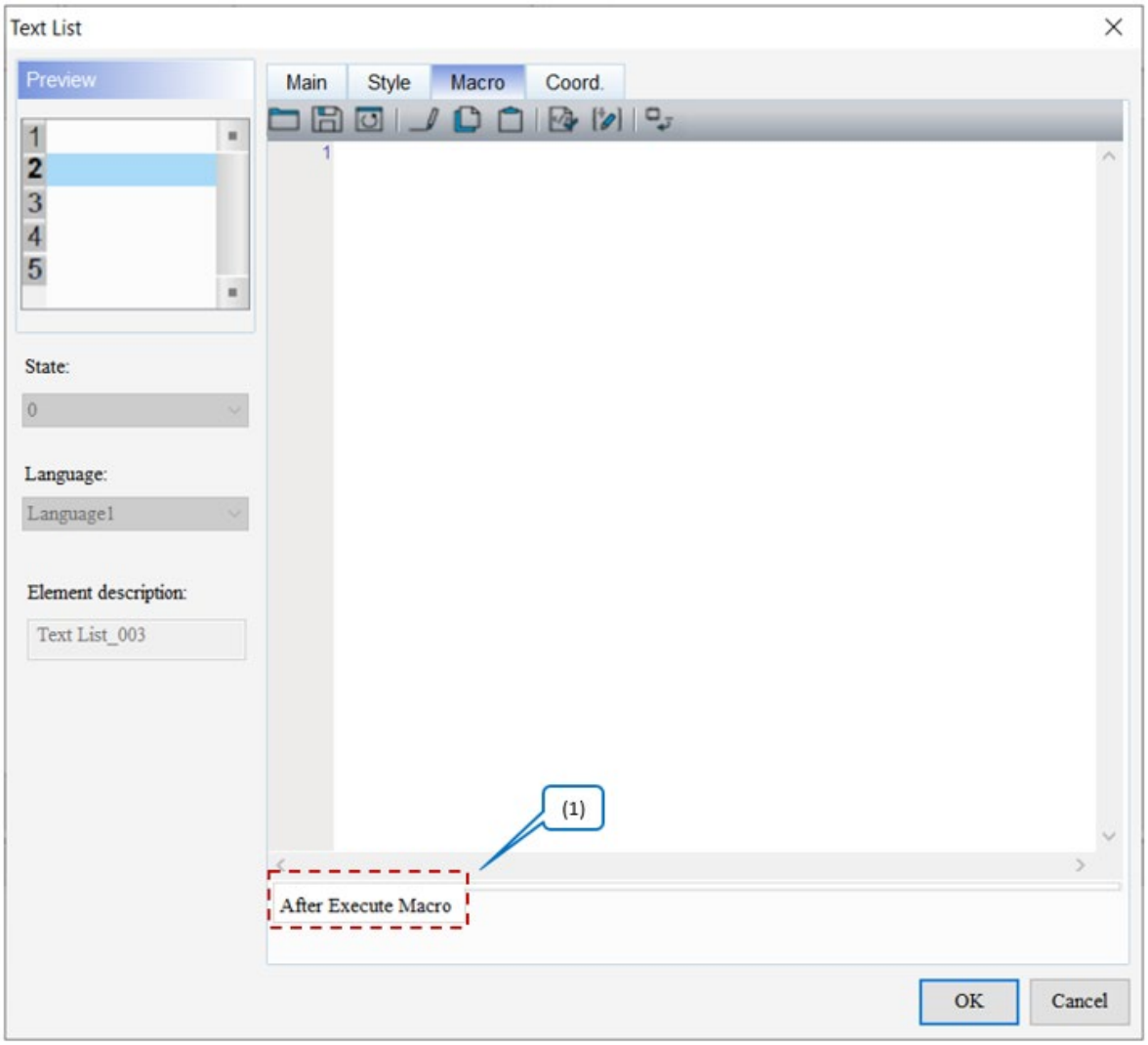
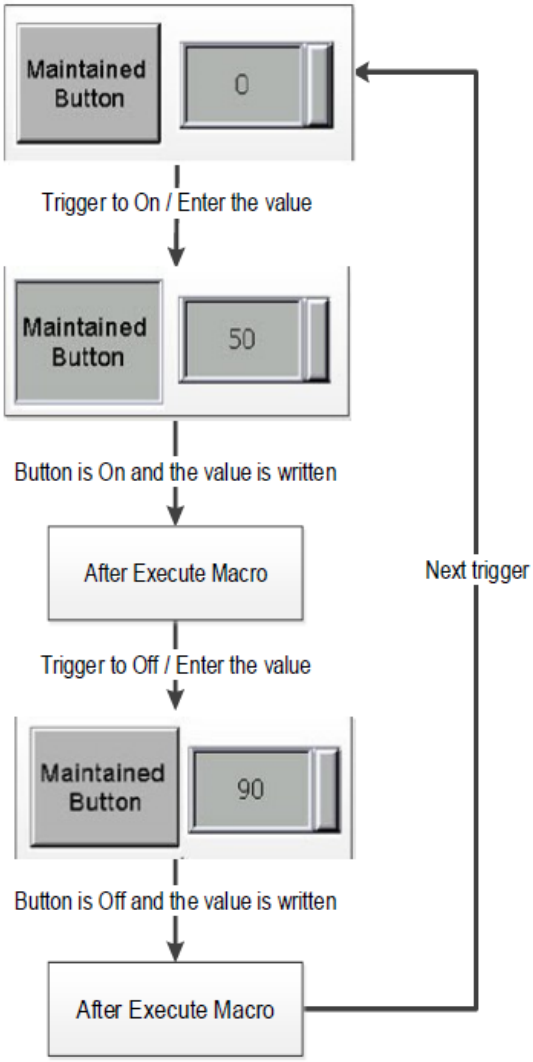


Figure 19 - 68: Text List element Macro property page

No.	Function	Description
(1)	After Execute Macro	When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.
	The flowchart of **After Execute Macro** is as follows.	

No.	Function	Description
		

- Coord.

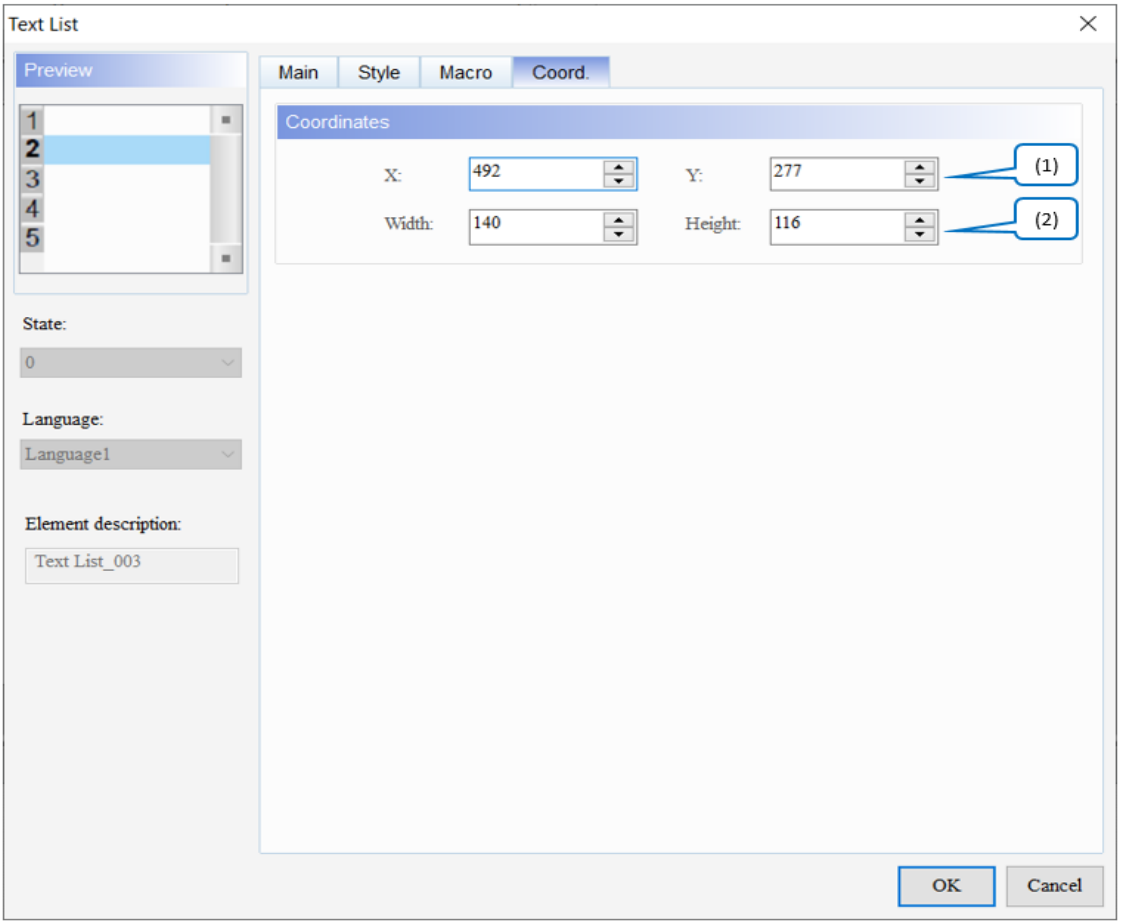


Figure 19 - 69: Text List element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 20: Frame and Multimedia

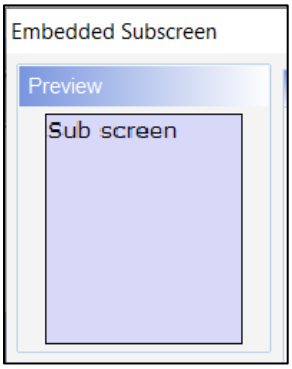
To create a Frame and Multimedia element, go to **Elements** > **Frame and Multimedia**, and click the desired Frame and Multimedia element.

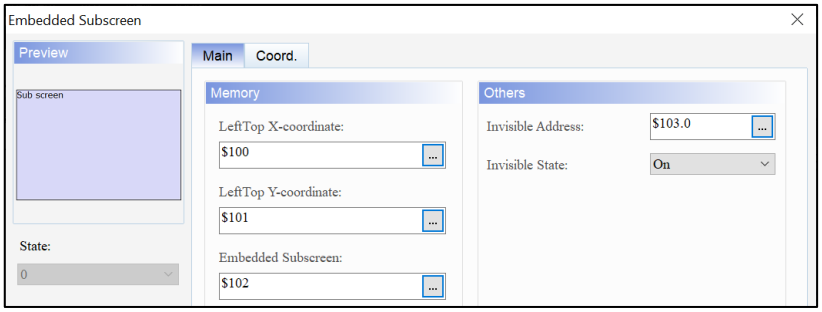
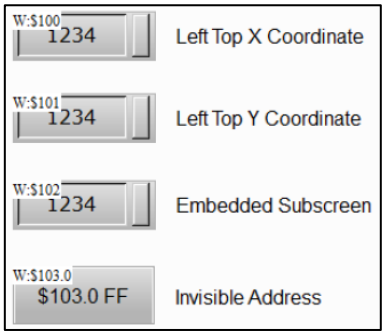
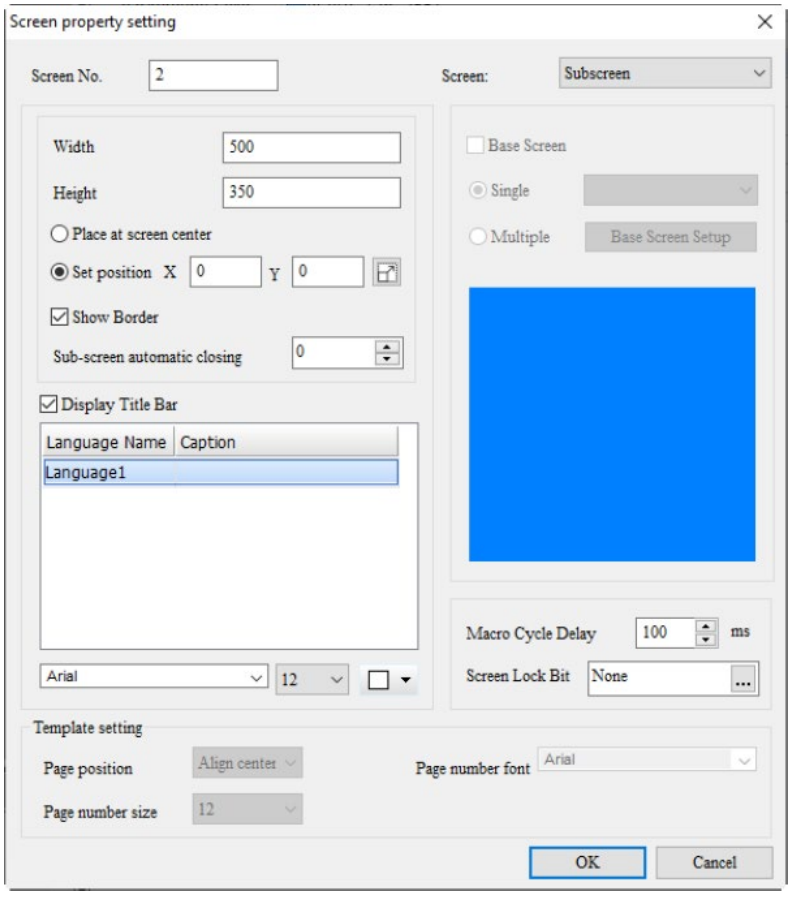
20.1 Embedded Subscreen

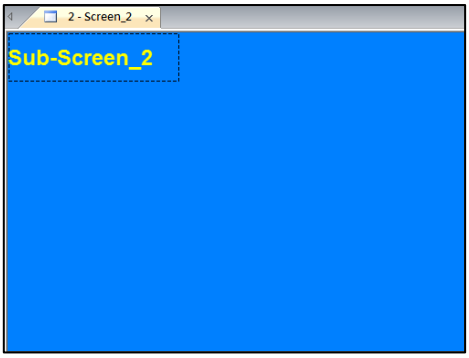
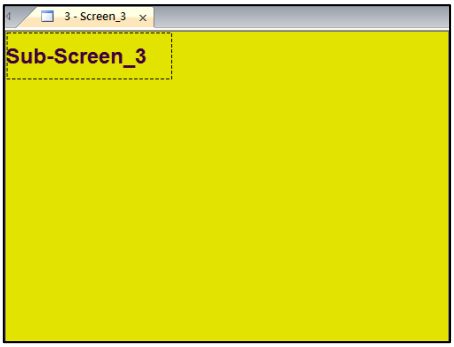
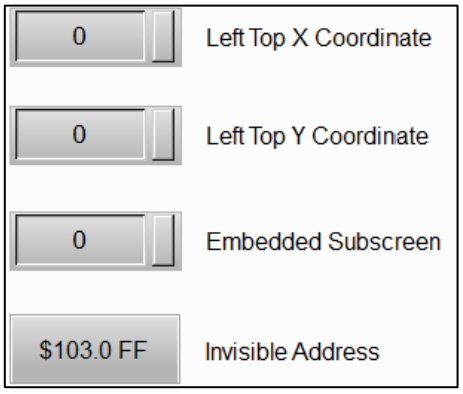
Use this function to embed the subscreen into the main screen and switch between different subscreens to display on the main screen.

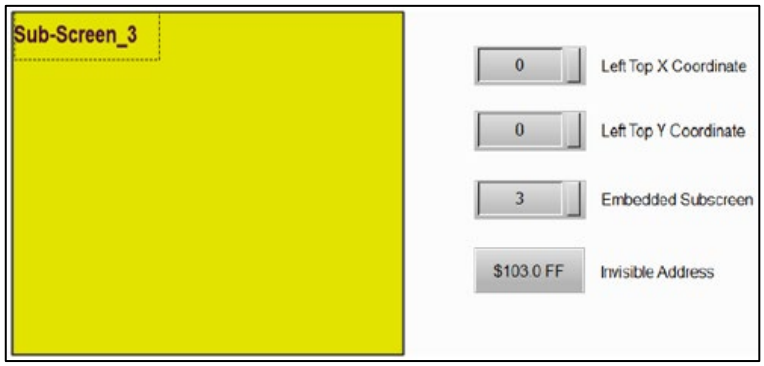
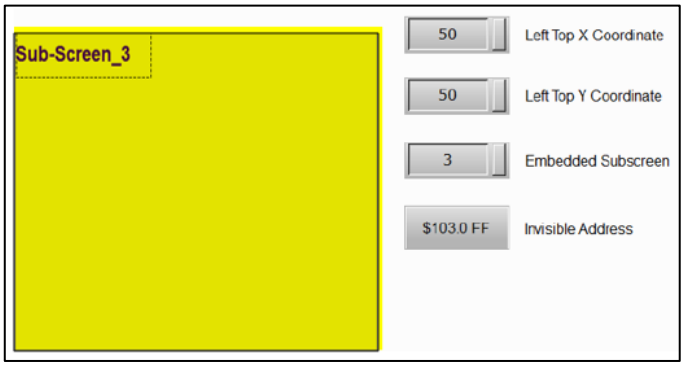
NOTE:

1. ***Embedded Subscreen*** *elements cannot be placed on subscreens.*
2. *The size of the subscreen can be different from the* ***Embedded Subscreen*** *element. It remains the same size before being embedded.*
3. *When the* ***Screen Lock*** *function is enabled for the* ***Embedded Subscreen*** *element, this function is automatically disabled after the subscreen is embedded.*

Embedded Subscreen	
Create Embedded Subscreen element	Go to **Elements** > **Frame and Multimedia** > **Embedded Subscreen** and create it on Screen 1. 

Embedded Subscreen	
Set Memory address	Set **Memory** addresses for the **Embedded Subscreen** element. 
Create Numeric Entry and Maintained button elements	Create three **Numeric Entry** elements ($100, $101, $102) and one **Maintained Button** element ($103.0). 
Create Sub-Screen	Create Sub-Screen 2 and Sub-Screen 3. 

Embedded Subscreen	
	 
Execution result	● After the screens are downloaded to the HMI, the subscreens are not loaded on the HMI screen.  ● Change the number of the subscreen $102 to 2 and Sub-Screen 2 is embedded to the screen.  ● Change the number of the subscreen $102 to 3 and Sub-

Embedded Subscreen	
	Screen 3 is embedded to the screen.  ● Change the element's position: Set $100 to 50 and $101 to 50, and then the subscreen moves to the set coordinate position. 

On double-clicking the **Embedded Subscreen** element, the property page appears as follows.

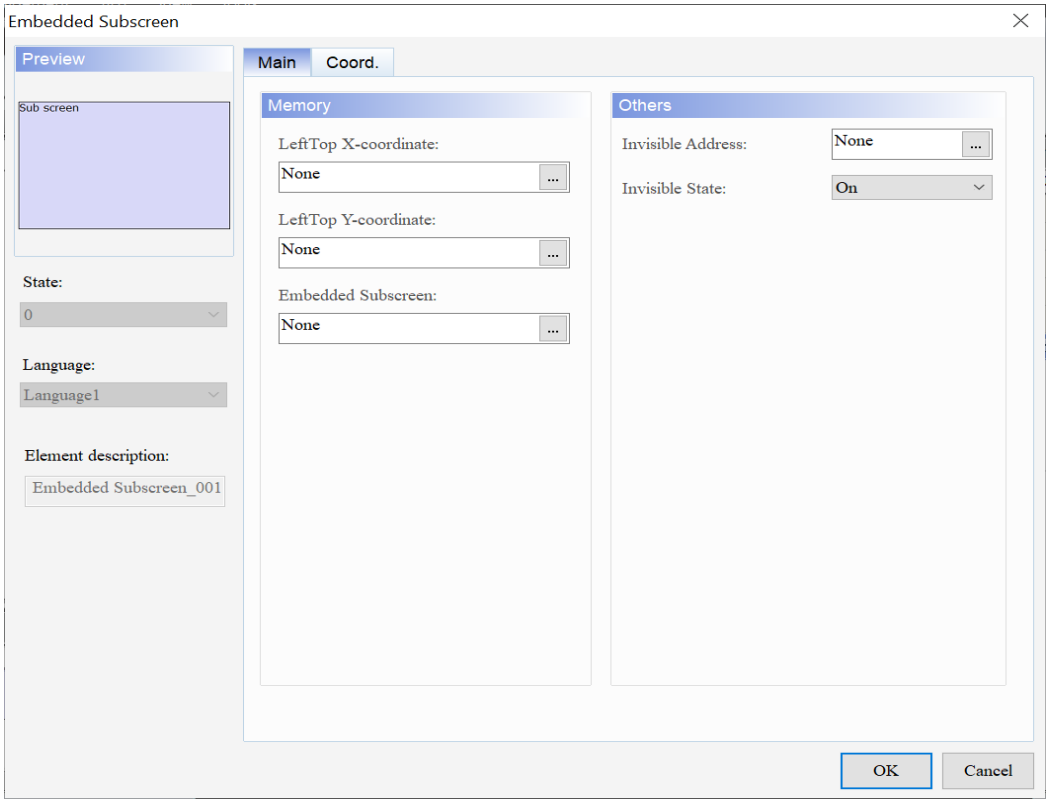


Figure 20 - 1: Embedded Subscreen element property page

Embedded Subscreen	
Function	**Description**
Preview	**Embedded Subscreen** elements do not support multiple state values and multi-language data display.
Main	Set the LeftTop X-coordinate, LeftTop Y-coordinate, Embedded Subscreen, Invisible Address, and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

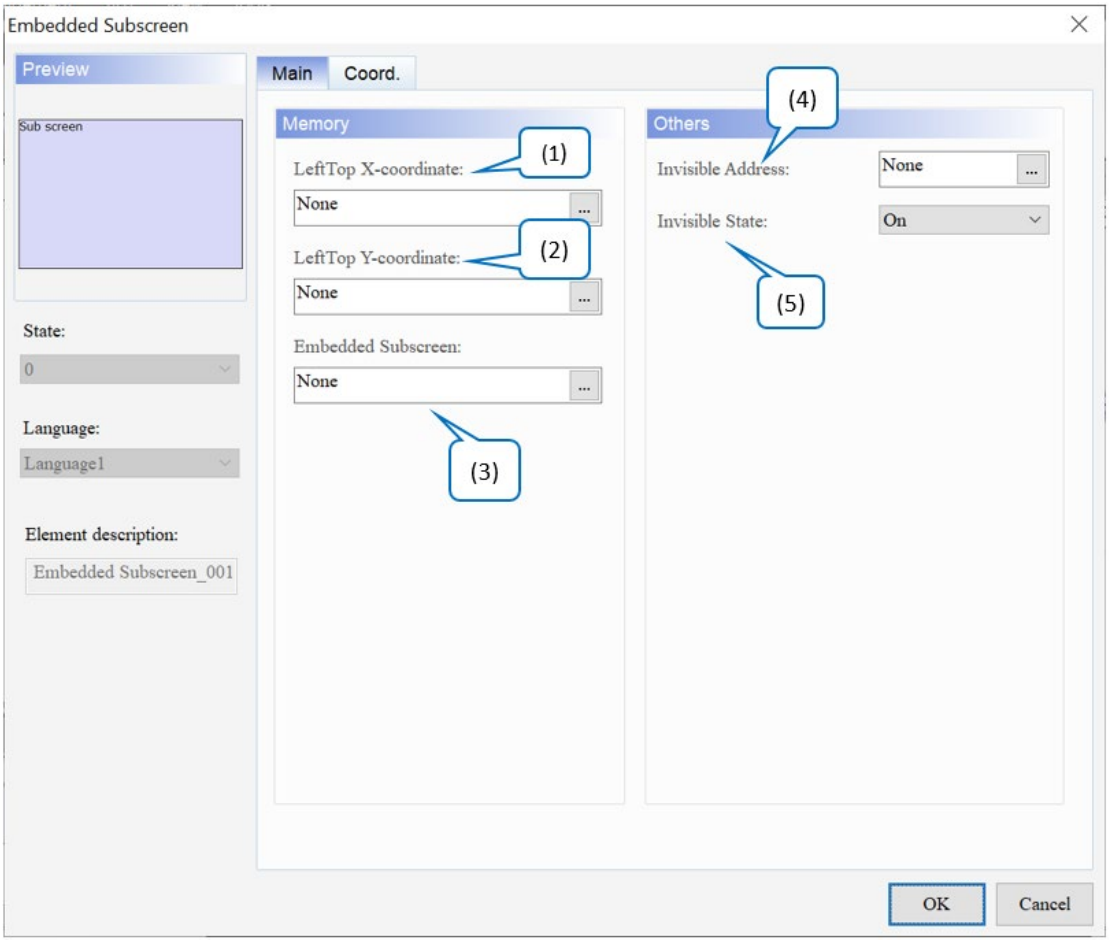
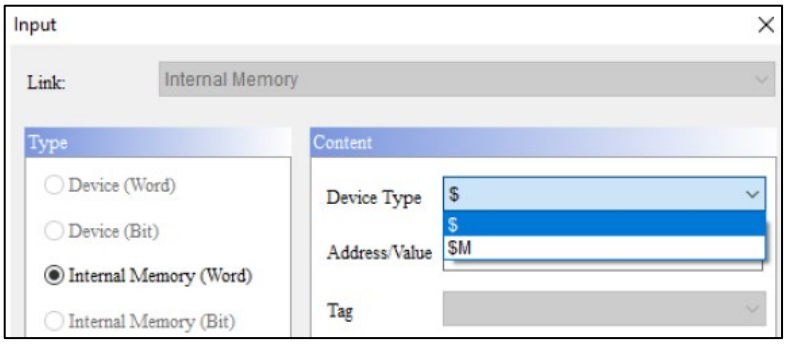
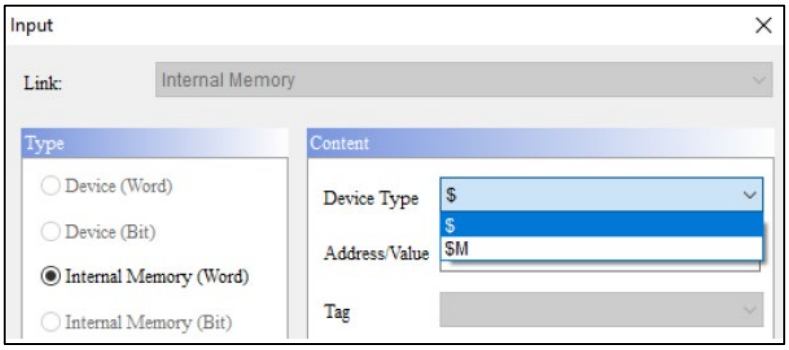
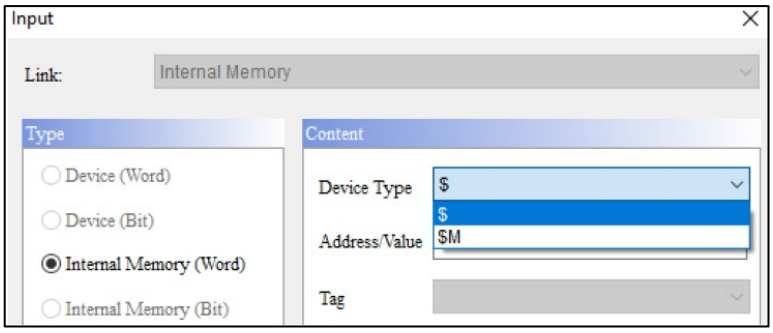
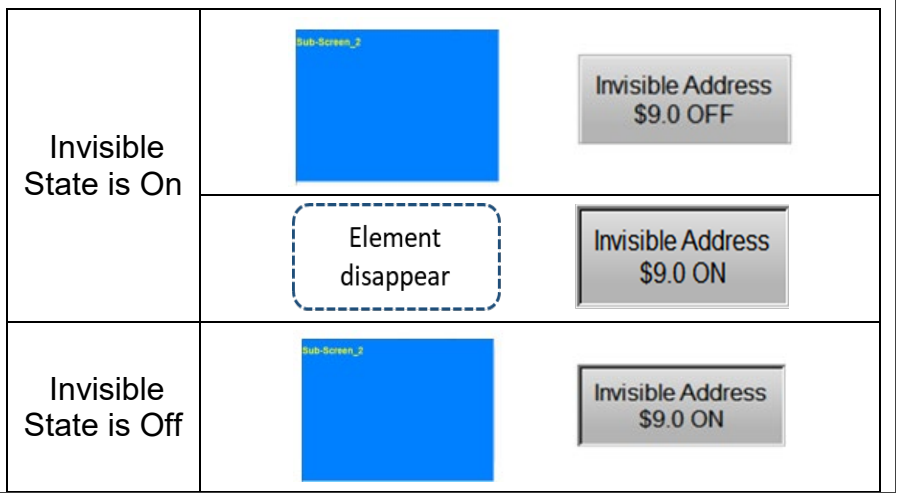


Figure 20 - 2: Embedded Subscreen element property page

No.	Function	Description
(1)	LeftTop X-coordinate	Set the element's X-axis position on the screen. Only **Internal Memory (Word)** is supported. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>LeftTop Y-coordinate</td><td>Set the element's Y-axis position on the screen. Only Internal Memory (Word) is supported.
 
</td></tr>
<tr><td>(3)</td><td>Embedded Subscreen</td><td>Set the displaying subscreen number of the element. Only Internal Memory (Word) is supported.
 
</td></tr>
<tr><td>(4)</td><td>Invisible Address</td><td rowspan="2">● The Invisible Address mainly allows users to hide an element through this address.
● If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
● The following example explains Invisible Address usage:
1. Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
2. To hide the element, first press the $9.0 button.
 
</td></tr>
<tr><td>(5)</td><td>Invisible State</td></tr>
</table>

No.	Function	Description
		Element disappear / Invisible Address $9.0 OFF

- Coord.

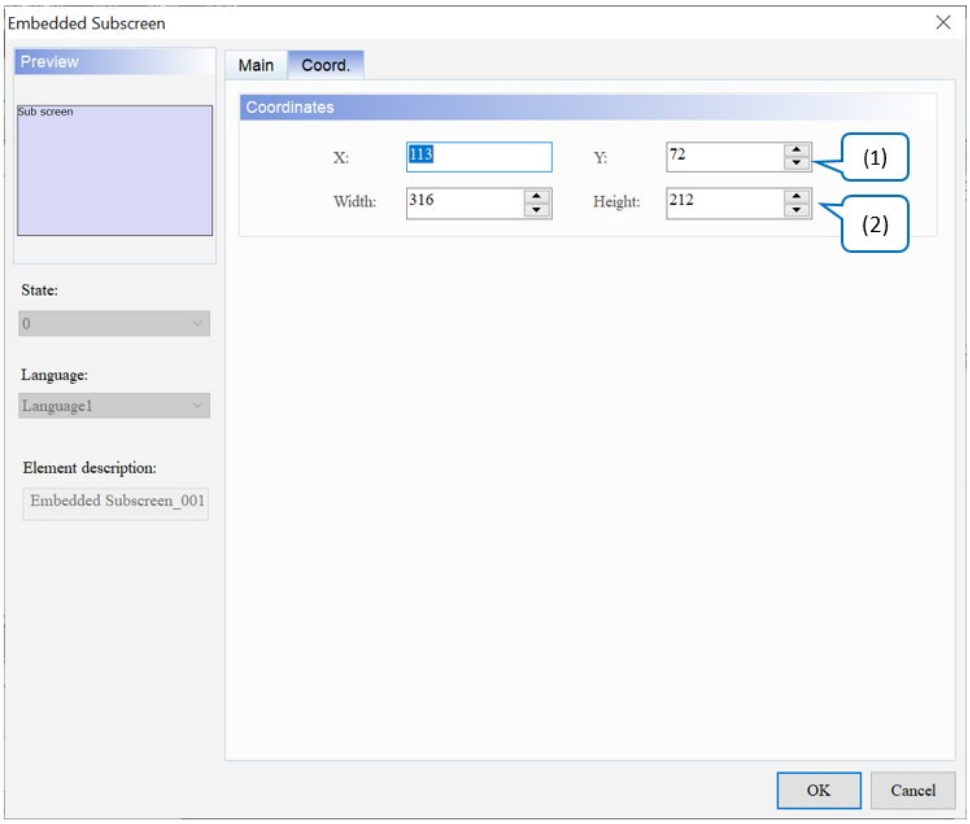


Figure 20 - 3: Embedded Subscreen element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

20.2 Camera Display

The DOP-100 series HMI models come in two screen sizes: 12-inch and 15-inch. There are four models available, including DOP-112MX, DOP-112WX, DOP-115MX, and DOP-115WX. M indicates a multimedia model, W indicates a narrow-framed model, and X indicates the model has an XGA TFT display.

The multimedia type models support functions such as Analog Camera, IP Camera, VGA display, Video Play, and Event trigger.

The following introduces the models with multimedia functions. For DOP-112MX and DOP-115MX models, refer to the following descriptions for setting and operating these functions. For DOP-112WX and DOP-115WX models, the functions supported by the multimedia type models are not available.

The **Camera Display** element supports two camera types: Analog Camera and IP Camera.

Analog Camera

An Analog Camera only supports CVBS signals in PAL or NTSC format. The input format of CVBS signal is different from that of AHD, TVI, and CVI signals. The analog camera connector is a BNC connector.

PAL (Phase Alternation Line) is a phase alternating scan. Generally, PAL uses a bandwidth of 8 MHz and the color signal transmission can tolerate a larger phase error.

NTSC (National Television System Committee) is the earliest developed television system. Generally, NTSC uses a bandwidth of 6 MHz and covers the widest range of colors.

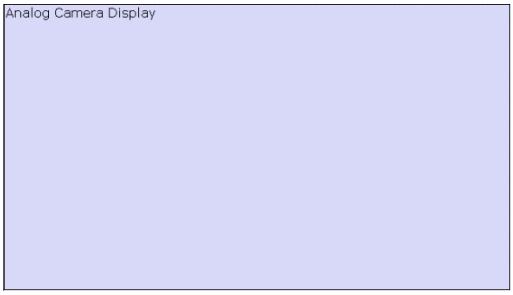
CVBS (Composite Video Baseband Signal) is commonly known as the visual signal of the AV connector. CVBS is the original video signal format that hasn't been processed. A CVBS signal cable includes luminance (Y), chrominance (C), horizontal synchronization (Hsync), and vertical synchronization (Vsync).

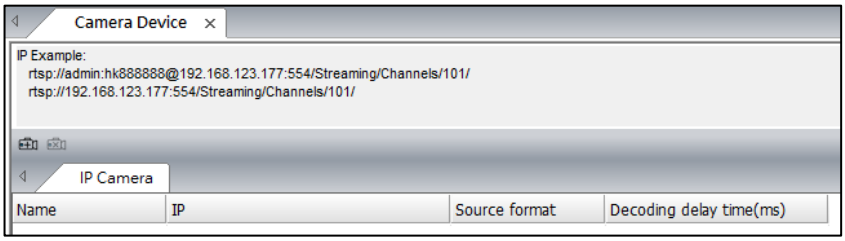
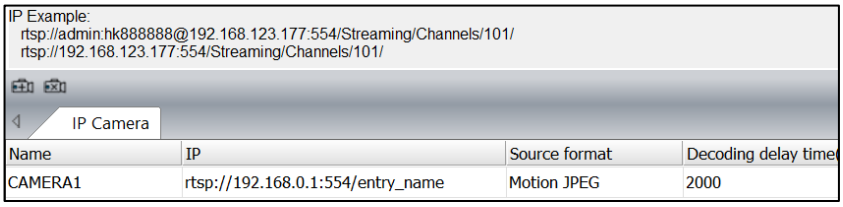
IP Camera

IP Camera combines traditional cameras and network technologies. It is a digital device based on network transmission and is equipped with a network output interface through which it can use the Ethernet for remote network connection. The IP Camera supported by the HMI only provides Real Time Streaming Protocol (RTSP). RTSP is an application layer protocol in the TCP/IP protocol system, which is designed for entertainment and communication systems to control streaming media servers.

Refer to the following tables for the Analog Camera and IP Camera examples.

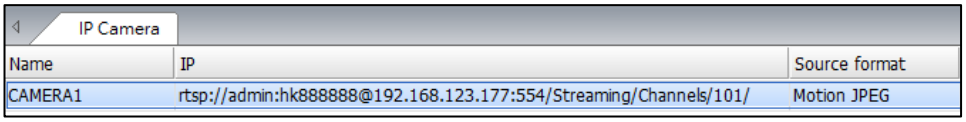
<table>
<tr><th colspan="3">Analog Camera</th></tr>
<tr><td>Camera Display element</td><td colspan="2">Create a Camera Display element and set its related parameters.
<table>
<tr><th colspan="2">Camera Display Element</th></tr>
<tr><td>Camera type</td><td>ANALOG CAMERA</td></tr>
<tr><td>Camera Name</td><td>CH1</td></tr>
<tr><td>Show size</td><td>640x360</td></tr>
</table></td></tr>
</table>

Analog Camera	
	
Execution result	● After creating the elements, compile and download the data to the HMI. ● When the download is complete, users can see the video recorded by the Analog Camera (CH1) displayed on the **Camera Display** element. 

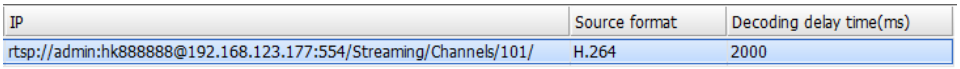
IP Camera	
Camera settings	● Before using IP Camera, first set the IP Camera device by going to **Project** > **Other Setting** > **Camera Device**. The setting screen of the **Camera Device** is as follows.  ● Click  icon to add a camera. The default IP is rtsp://192.168.0.1:554/entry_name.  ● At the top of the screen is an **IP Example**, which is the account

<table>
<tr><th colspan="2">IP Camera</th></tr>
<tr><td></td><td>
name, password, IP address, port, and entry name used by the HIKVISION camera.
rtsp://admin:hk888888@192.168.123.177:554/Streaming/Channels/101/
<table>
<tr><td>Account</td><td>admin</td></tr>
<tr><td>Password</td><td>hk888888</td></tr>
<tr><td>IP Address</td><td>192.168.123.177</td></tr>
<tr><td>Port</td><td>554</td></tr>
<tr><td>Entry name</td><td>Streaming/Channels/101/
Streaming/Channels/102/</td></tr>
</table>

Refer to the IP Example to modify the corresponding IP Address for the IP Camera.



After setting the IP Address, select the Source format. This example is set to H.264.

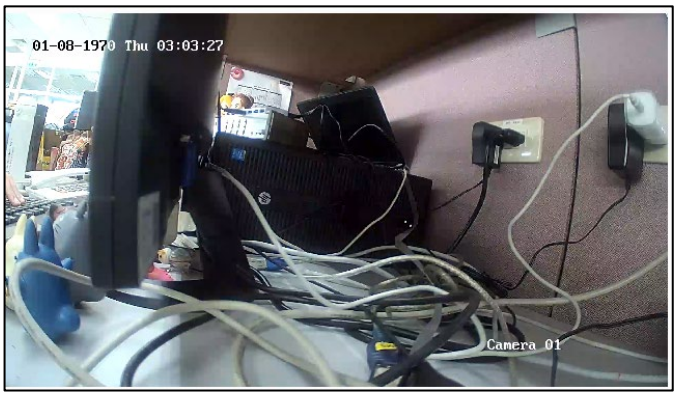


</td></tr>
<tr><td>Camera Display element</td><td>
Create a Camera Display element and set its related parameters.
<table>
<tr><th colspan="2">Camera Display Element</th></tr>
<tr><td>Camera Type</td><td>IP CAMERA</td></tr>
<tr><td>Camera Name</td><td>CAMERA1</td></tr>
<tr><td>Show Size</td><td>640x360</td></tr>
</table>


</td></tr>
<tr><td>Execution result</td><td>

After creating the elements, compile and download the data to the HMI.
When the download is complete, users can see the video recorded by the IP Camera displayed on the Camera Display element.

</td></tr>
</table>

IP Camera	
	

On double-clicking **Camera Display** element, the property page appears as follows.

***NOTE**: Since the **Camera Display** element is shared between Analog Camera and IP Camera, refer to the following settings for the Analog Camera when using the IP Camera.*

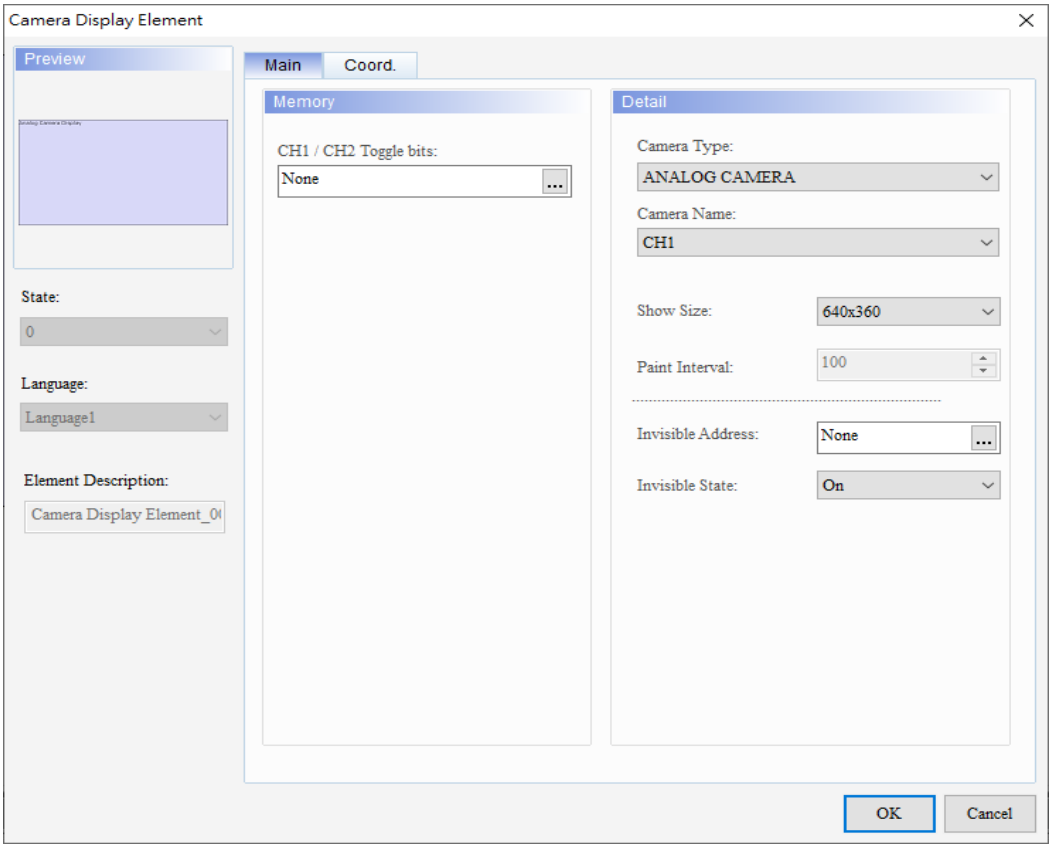


Figure 20 - 4: Camera Display element property page

Camera Display	
Function	**Description**
Preview	**Camera Display** elements do not support multiple state values and multi-language data display.
Main	Set CH1 / CH2 Toggle bits, Camera Type, Camera Name, Show Size, Paint Interval, Invisible Address, and Invisible State
Coord.	Set the X and Y coordinates.

- Main

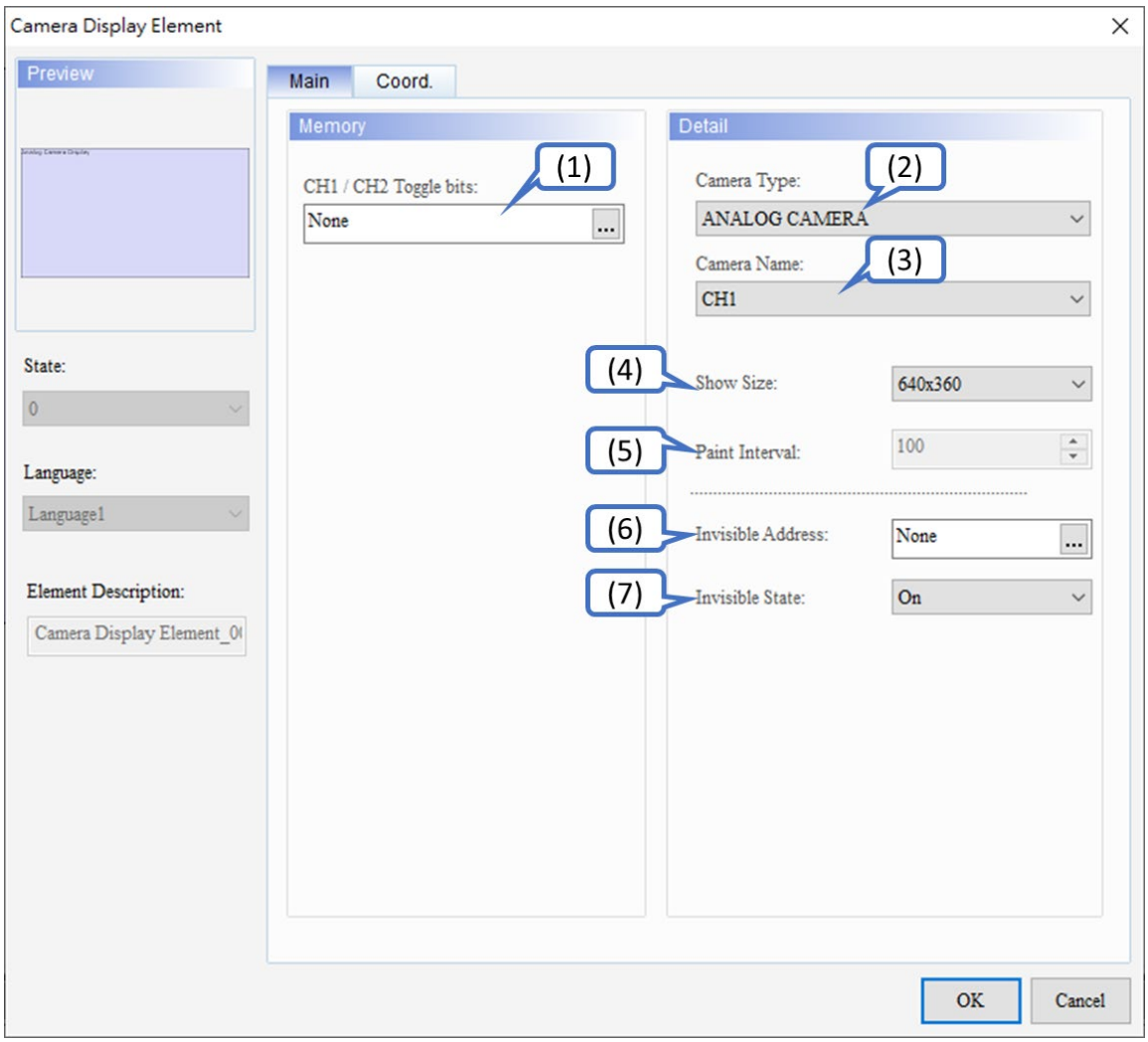
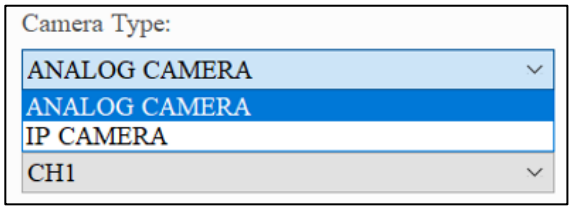
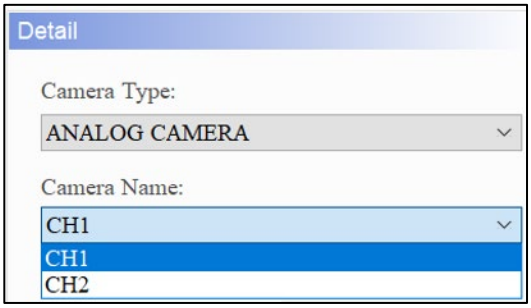
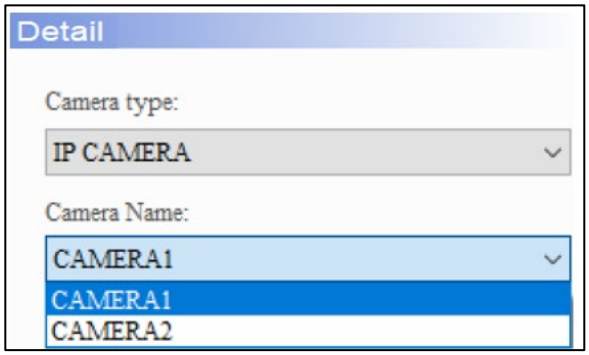
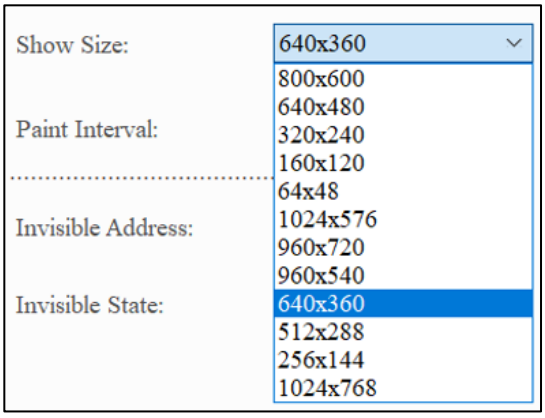
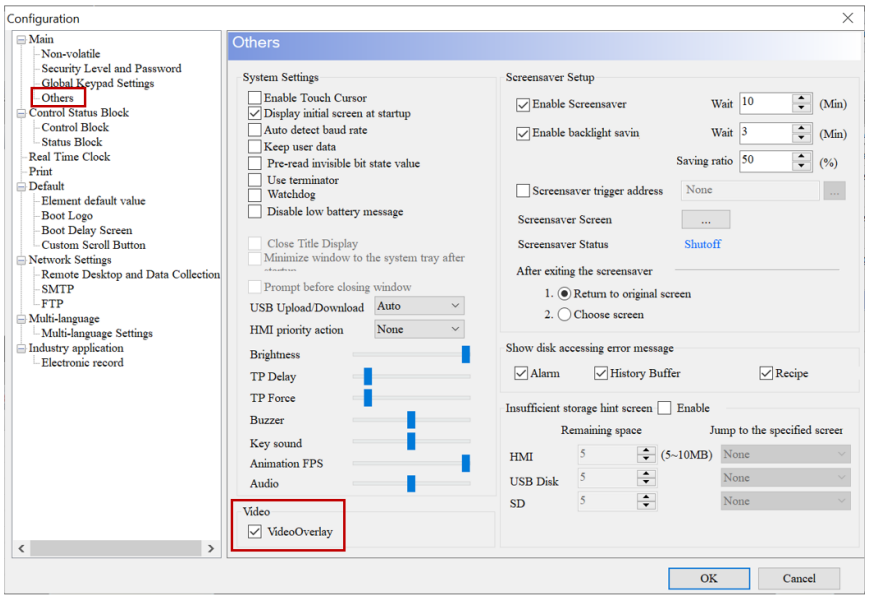


Figure 20 - 5: Camera Display element Main property page

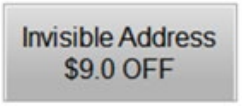
No.	Function	Description
(1)	CH1 / CH2 Toggle bits	● Use the toggle bit to switch between the CH1 and CH2 channels of the Analog Camera. ● As soon as the toggle bit is triggered to On, CH1 is switched to CH2 immediately, or vice versa.
(2)	Camera Type	The available options for **Camera Type** are: ANALOG CAMERA or IP CAMERA. The default value is **ANALOG CAMERA**. 
(3)	Camera Name	● The options vary depending on the selected **Camera Type**. ● If users select ANALOG CAMERA for the **Camera Type**, the available options for **Camera Name** are: CH1 and CH2. The default value is **CH1**. ● Connect a corresponding BNC connector to the CH1 or CH2 port on the back of the HMI. 
		● If users select IP CAMERA for the **Camera Type**, the available options for the **Camera Name** are: CAMERA1 and CAMERA2. The default value is **CAMERA1**. ● Use a webcam and set the network segment of its **IP Address** the same as that of the HMI. 

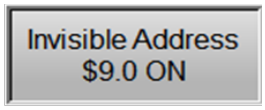
No.	Function	Description
(4)	Show Size	Set the display resolution of the element. The default value is **640x360**. 
(5)	Paint Interval	• Set the **Paint Interval** of the element in milliseconds (ms). The default value is **100**. • To enable this function, go to **General** > **Configuration** > **Others**, and select **VideoOverlay** checkbox, as shown in the following figure. 

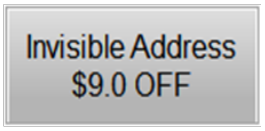
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(6)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
 

Element disappear
 
</td></tr>
<tr><td>Invisible State is Off</td><td> 
 

Element disappear
 
</td></tr>
</table>
</td></tr>
<tr><td>Invisible State</td></tr>
</table>

- Coord.

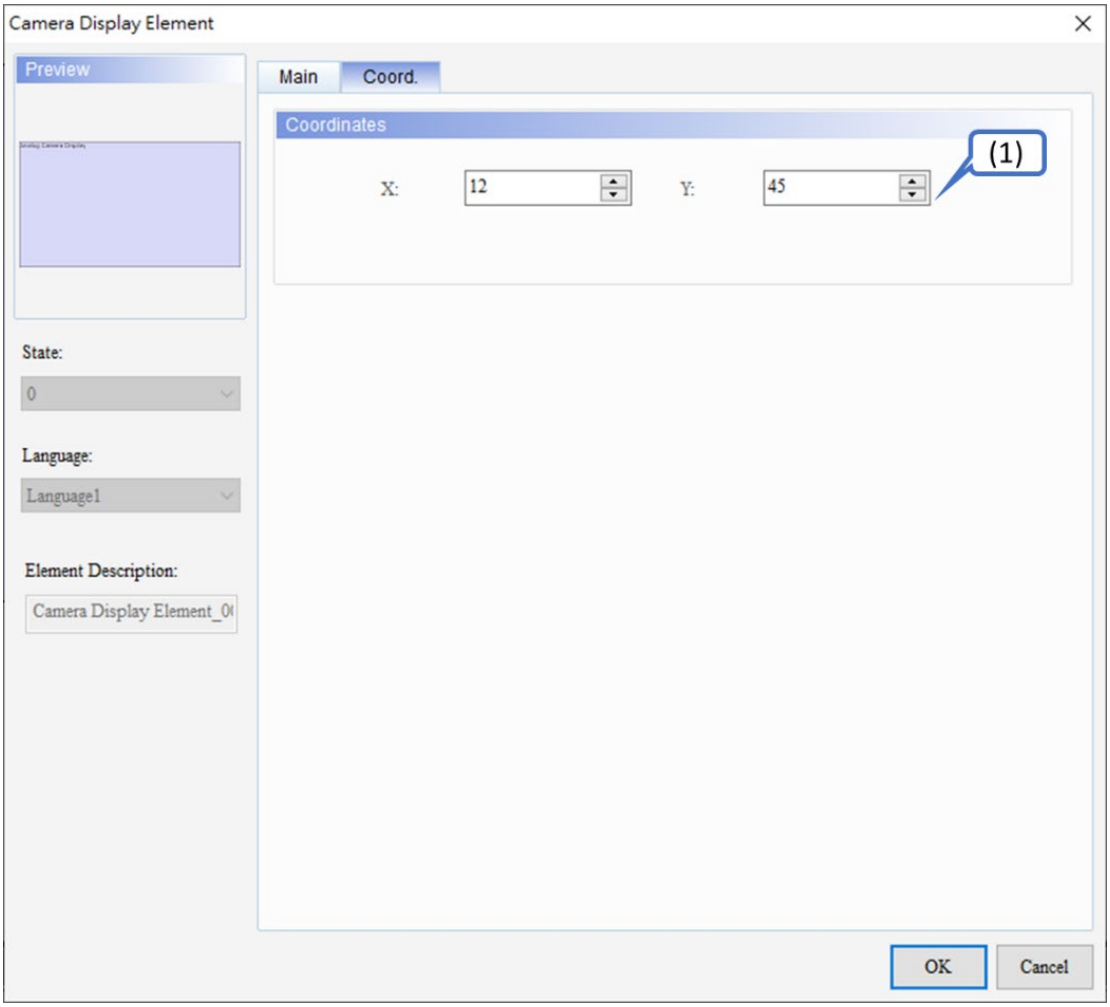


Figure 20 - 6: Camera Display element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

The following describes the properties of **Camera Device**. Go to **Project** > **Other Setting** > **Camera Device** to enter the setting screen.

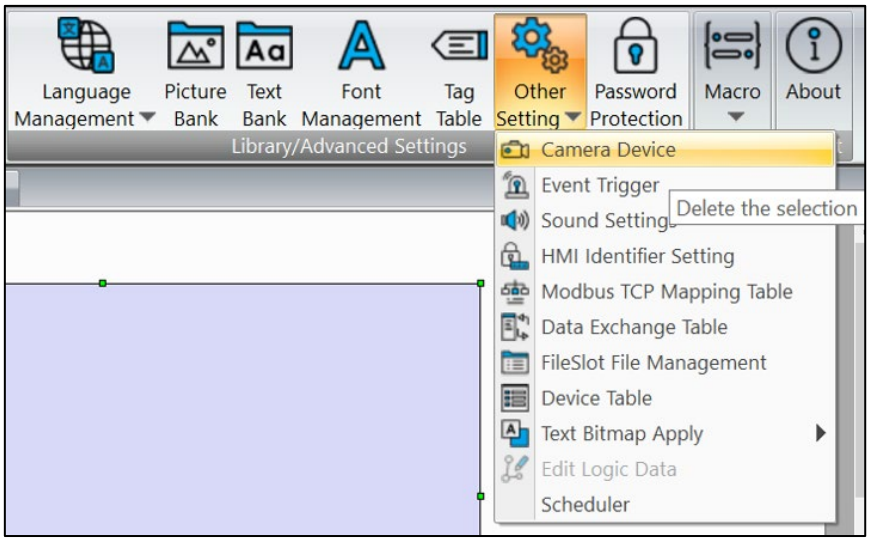


Figure 20 - 7: Setting screen

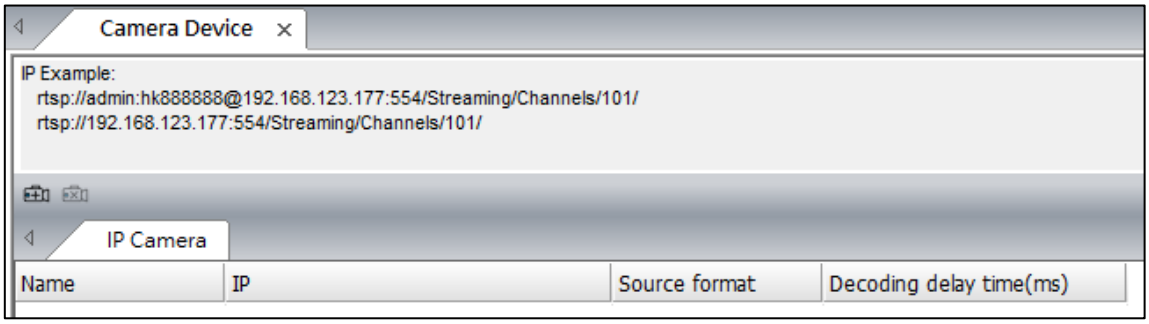
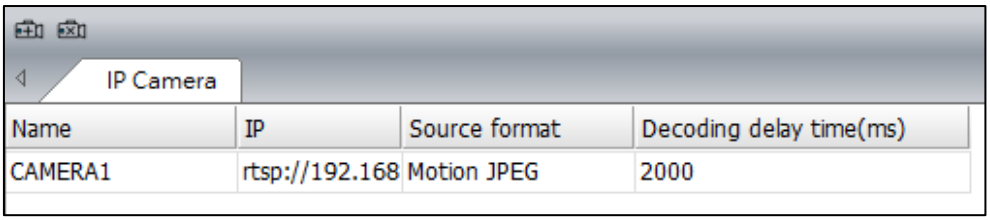
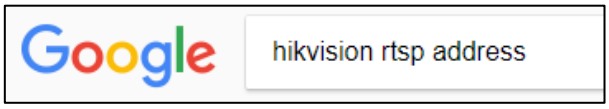
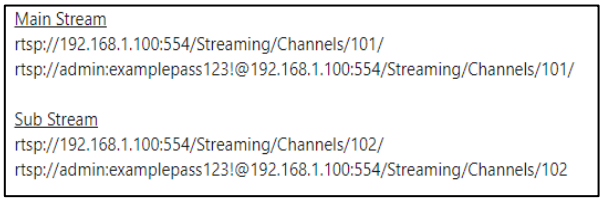
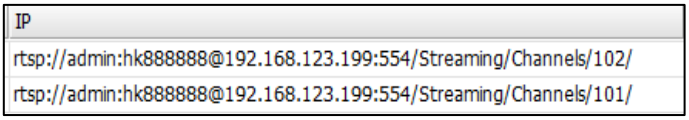


Figure 20 - 8: Camera Device setting

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td rowspan="3">Add camera  </td><td>Click  icon to add a new camera.

</td></tr>
<tr><td>Name</td><td>Name the camera.</td></tr>
<tr><td>IP</td><td>The format of the IP address is fixed. Modify the content according to the network camera settings. The IP address has following parts.
<table>
<tr><td>Account</td><td>Enter the account according to the settings of the network camera.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Function</th><th colspan="3">Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Password</td><td>Enter the password according to the settings of the network camera.</td></tr>
<tr><td>IP address</td><td>Enter the IP address according to the settings of the network camera.</td></tr>
<tr><td>Port</td><td>The default is 554.</td></tr>
<tr><td>Entry name</td><td>

The Entry name varies from different brands. Enter [Brand name rtsp address] in the input field of the search engine such as “HIKVISION rtsp address”.
 
The search results are as follows.
 
101 indicates the Main Stream and 102 indicates the Sub Stream of HIKVISION. Thus, the contents of the IP field are as follows.
 

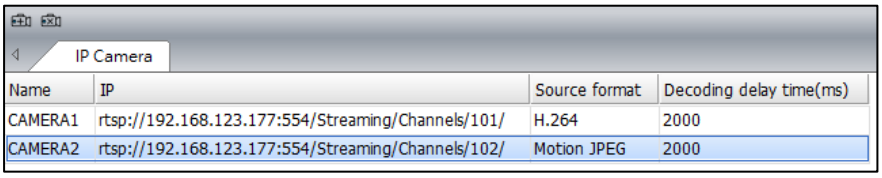
</td></tr>
</table>
</td></tr>
<tr><td></td><td>Source format</td><td>

Select the corresponding Source format according to the settings of the network camera.
Take the brand HIKVISON for example. Go to IP address http://192.168.123.199/doc/page/login.asp?_1534130000127 and enter the Account and Password to log in.

<table>
<tr><td>Account</td><td>admin</td></tr>
<tr><td>Password</td><td>hk888888</td></tr>
</table>


Go to Configuration > Video / Audio to check the Video Encoding. For HIKIVISION, the Main Stream supports the coding formats H.264 and H.265, and the Sub Stream

</td></tr>
</table>

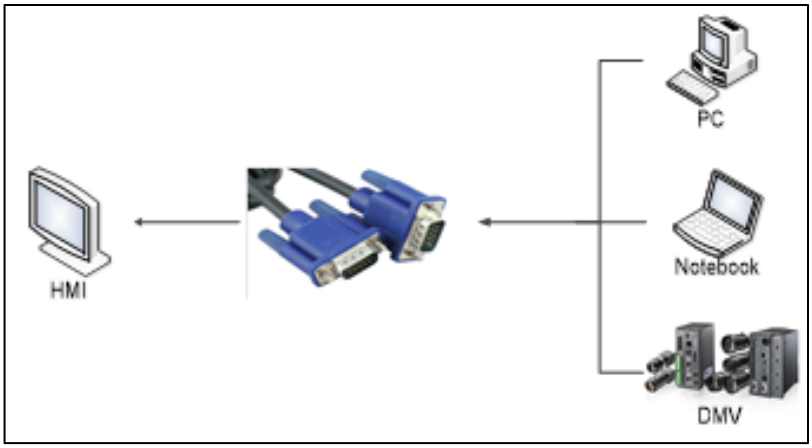
Function	Description
	supports the coding formats H.264, H.265, and Motion JPEG. Since the HMI supports only Motion JPEG and H.264, if users select the Main Stream (101), the **Source format** of the HMI should be set to H.264. If users select the Sub Stream (102), the **Source format** of the HMI should be set to Motion JPEG. ● The HMI settings are as follows. 
Remove camera 	Click a camera name and click  icon to delete the camera setting for the respective camera.

20.3 VGA Display

The HMI provides a VGA port to connect to an external device for displaying its screen images on the HMI. The external device can be a DMV (Delta Machine Vision) or the VGA output connector of a PC or notebook. The following provides an example of how to use the **VGA Display** element.

VGA Display Element	
VGA Display element	Create a **VGA Display** element and set its parameters.

VGA Display Element	
Source Resolution	1024x768 60 Hz
Show Size	640x360
	

VGA Display Element	
Wiring	Use a VGA cable to connect the HMI to the output device, such as a PC, notebook, or DMV. 
Execution result	● After creating the elements, compile and download the data to the HMI. ● When the download is complete, the **VGA Display** element displays the screen image of the output device. 

On double-clicking the **VGA Display** element, the property page appears as follows.

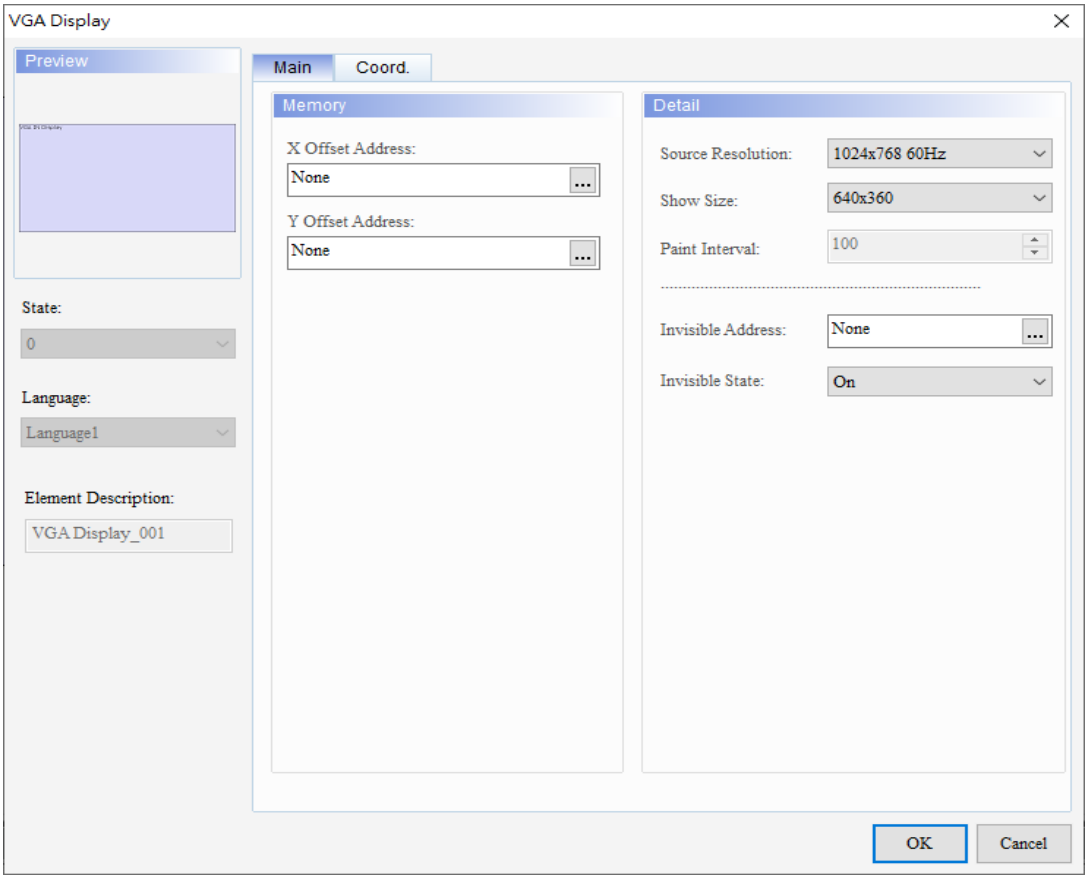


Figure 20 - 9: VGA Display element property page

VGA Display Element	
Function	**Description**
Preview	VGA Display elements do not support multiple state values and multi-language data display.
Main	Set the X Offset Address, Y Offset Address, Source Resolution, Show Size, Paint Interval, Invisible Address, and Invisible State
Coord.	Set the X and Y coordinates.

- Main

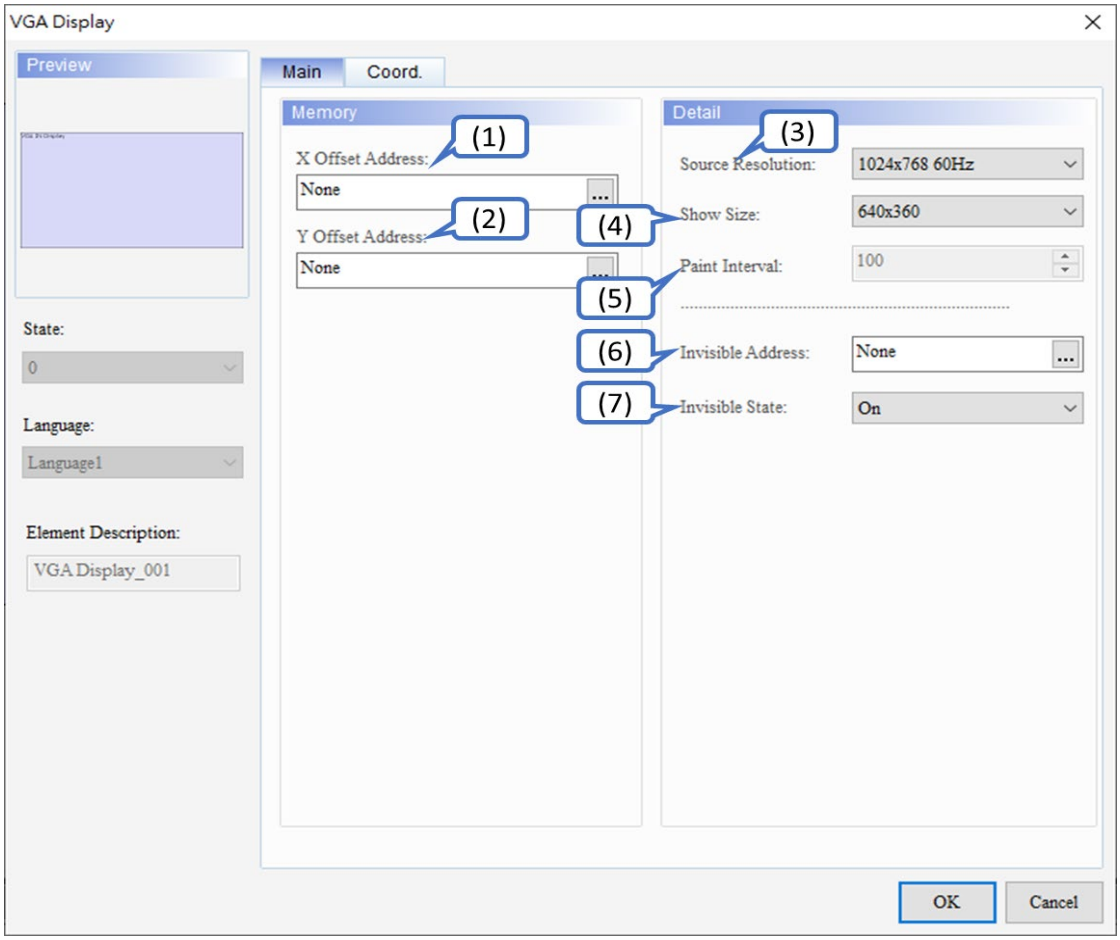
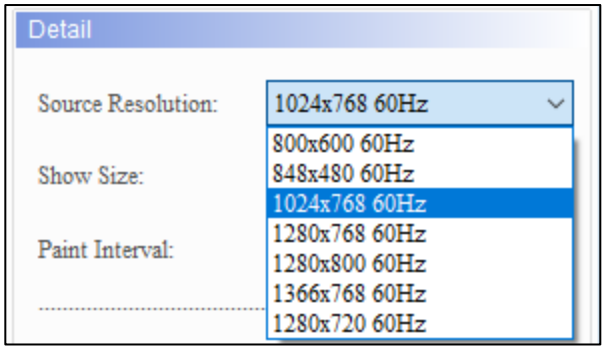
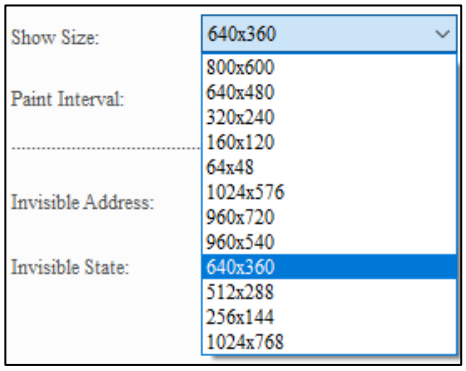
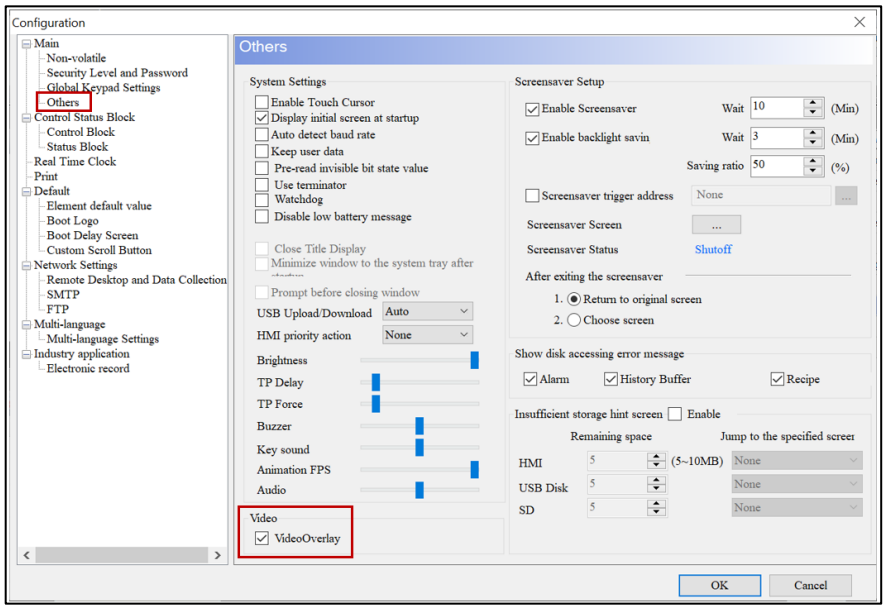


Figure 20 - 10: VGA Camera Display element Main property page

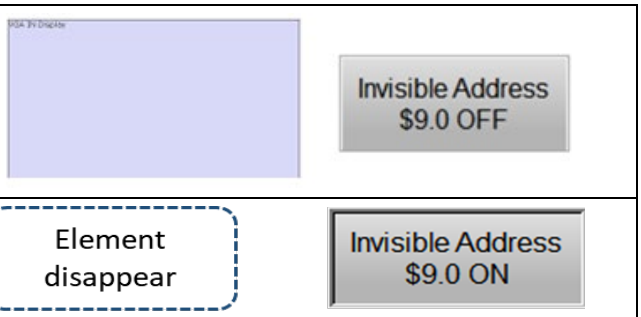
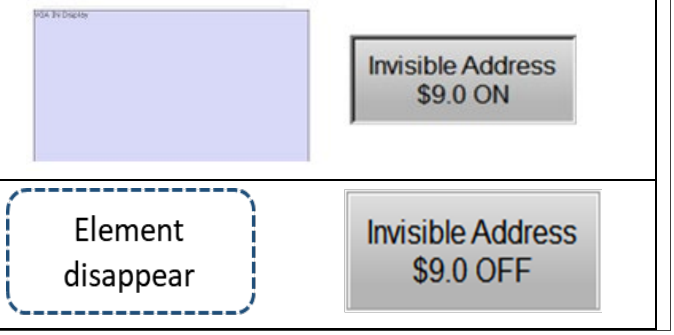
No.	Function	Description
(1)	X Offset Address	Fine adjust and display the whole image transmitted from the input source with these two addresses.
(2)	Y Offset Address	
(3)	Source Resolution	Set the resolution according to the resolution of the VGA output device. The default value is **1024x768 60 Hz**.

No.	Function	Description
		
(4)	Show Size	Set the display resolution of the element. The default value is **640x360**. 
(5)	Paint Interval	• Set the **Paint Interval** of the element in milliseconds (ms). The default value is **100**. • To enable this function, go to **General** > **Configuration** > **Others**, and select **VideoOverlay** checkbox, as shown in the following figure. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(6)</td><td>Invisible Address</td><td rowspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
</td></tr>
<tr><td>Invisible State is Off</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(7)</td><td>Invisible State</td></tr>
</table>

- Coord.

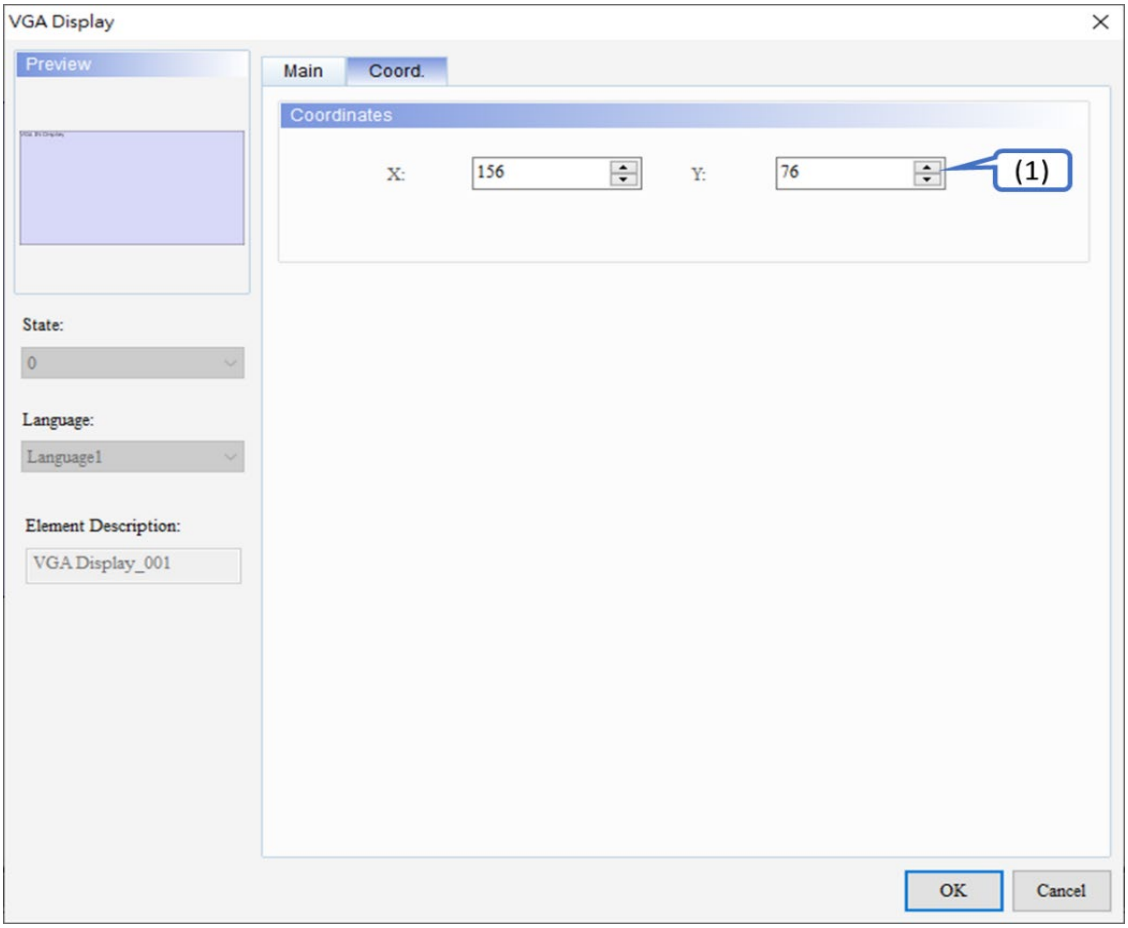


Figure 20 - 11: VGA Display element Coord. property page

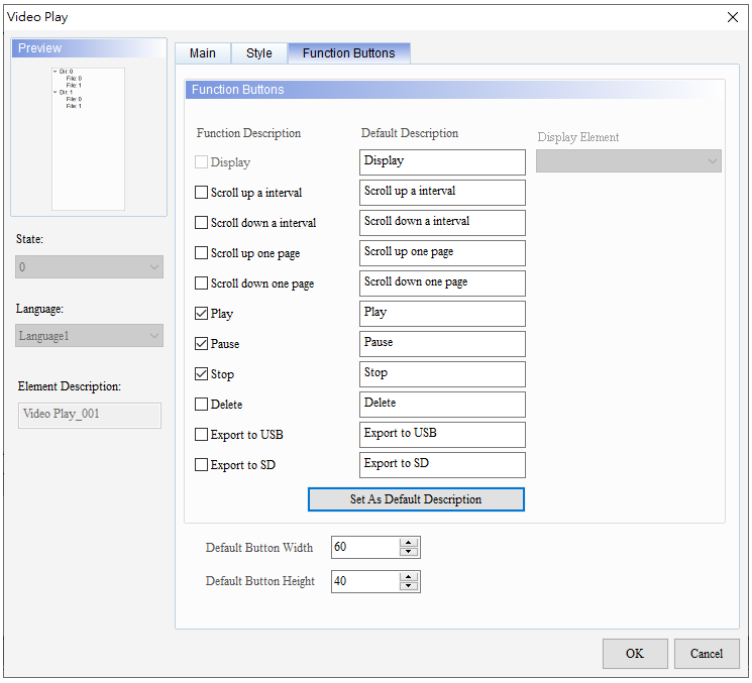
No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.

20.4 Video Play

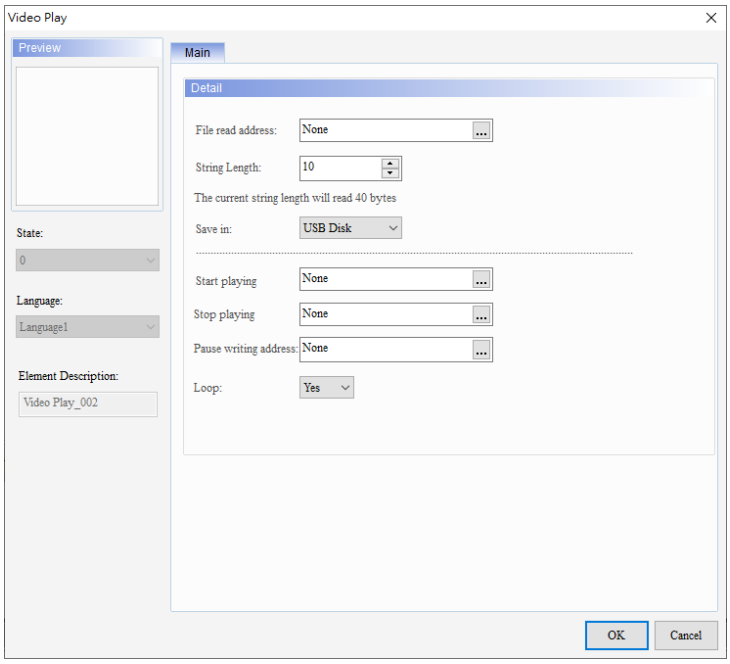
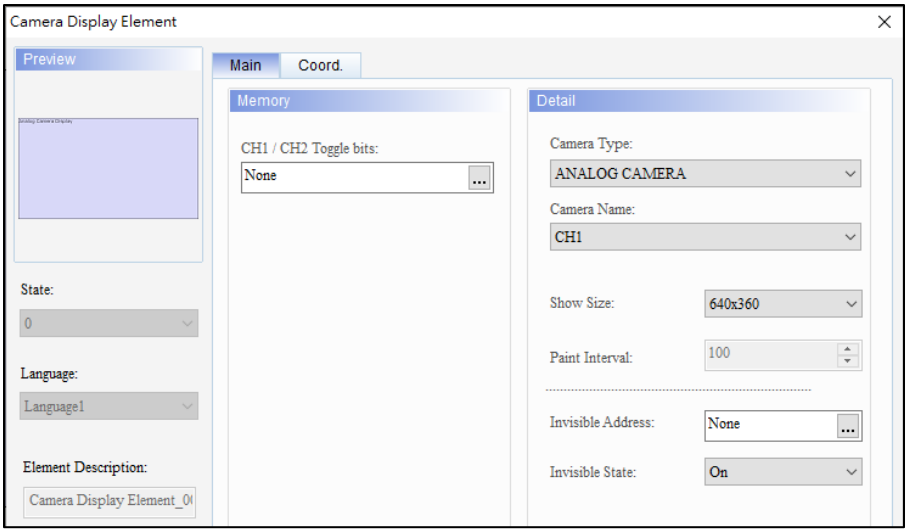
Use the **Video Play** element to view videos that are recorded with the Analog Camera or IP Camera and are stored in the HMI, or mpeg4 videos stored in the USB Disk or SD Card. If the videos stored in the USB Disk or SD Card are not recorded

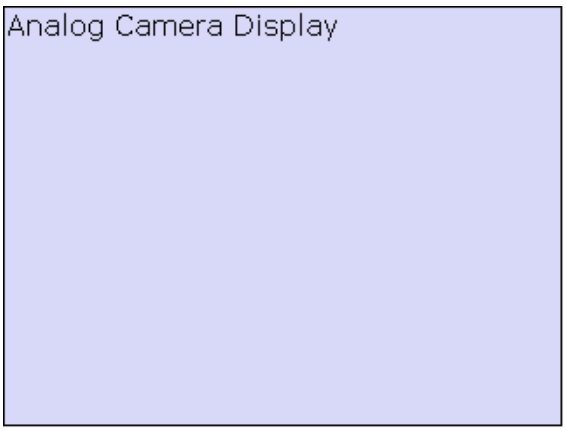
with the Analog Camera or IP Camera, the videos must be in the mpeg4 format which supports H.264 video coding for viewing on the HMI.

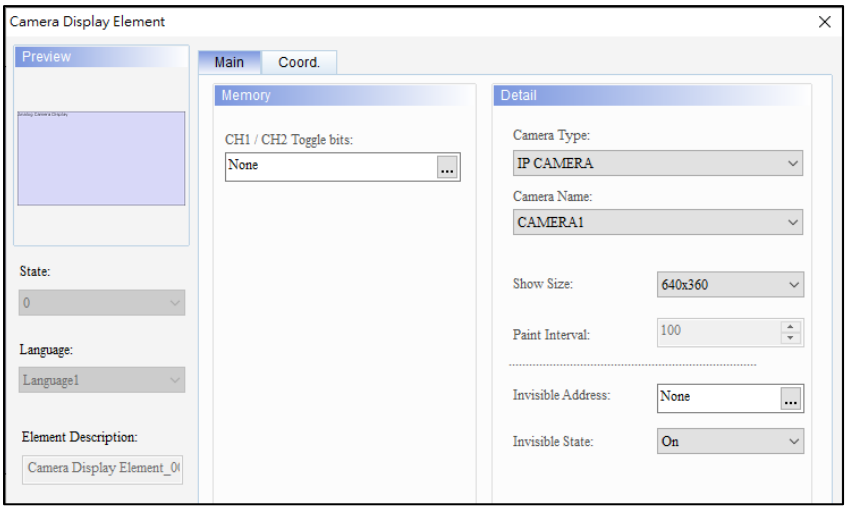
The following provides examples using the **Video Play** element to view videos recorded with the cameras and the mpeg4 videos stored in the USB Disk or SD Card.

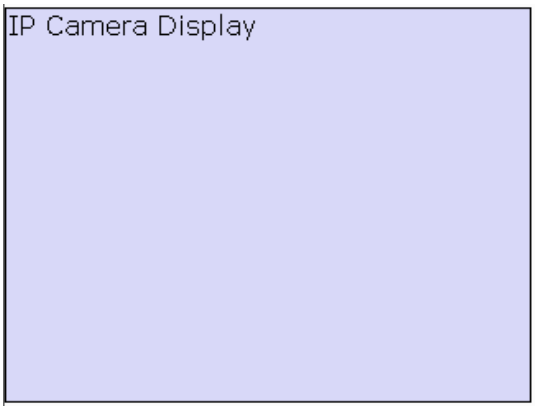
<table>
<tr><th colspan="2">Video Play</th></tr>
<tr><td>Video Play element</td><td>Create a Video Play element and set its related parameters.
● Select the checkboxes for Play, Pause, Stop, Delete, Export to USB, Export to SD and click the Set as Default Description button.
 

● Set Yes for Loop.</td></tr>
</table>

Video Play	
	 ● After the setting is complete, the element appears as follows. 
Camera Display element	Create a **Camera Display** element with the parameters set as follows. 

<table>
<tr><th colspan="2">Video Play</th></tr>
<tr><td></td><td>


Create a Camera Display element with the parameters set as follows.


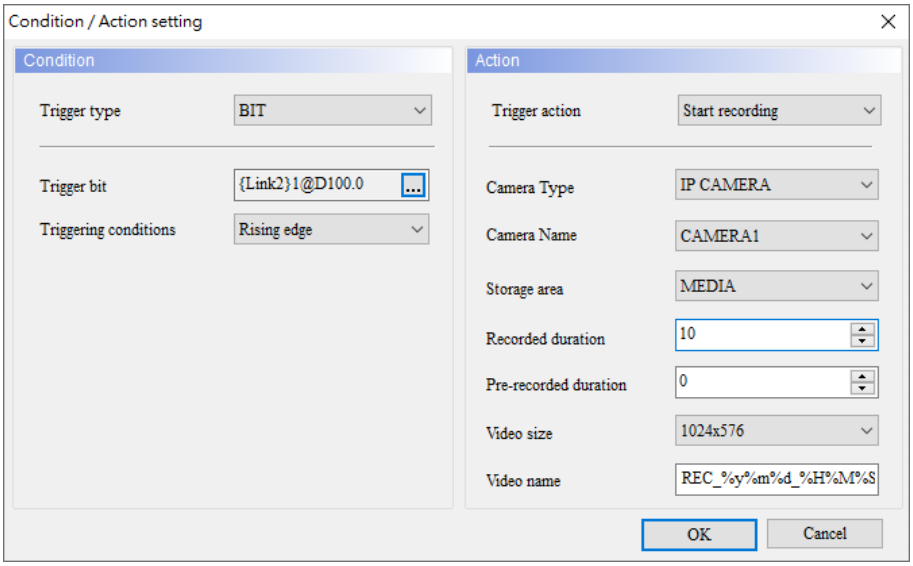


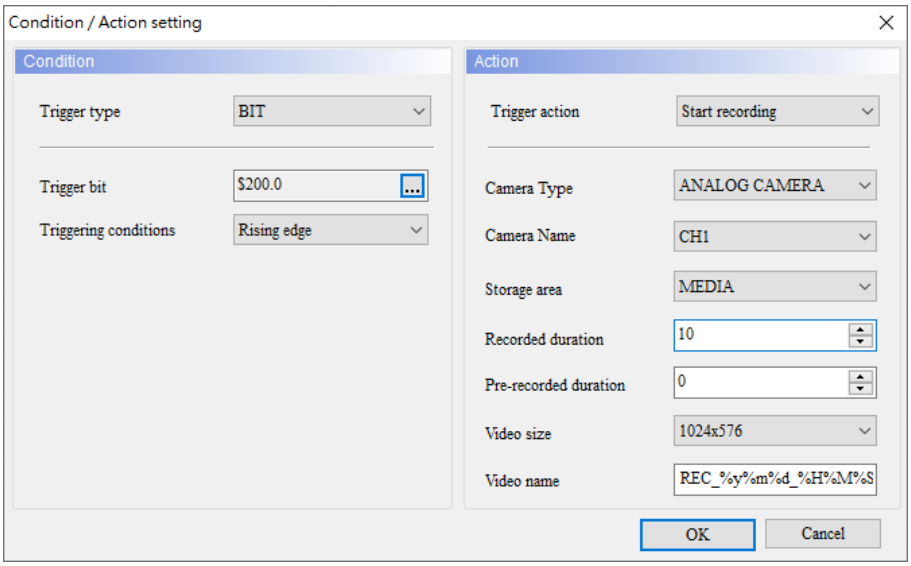
</td></tr>
<tr><td>Camera Device</td><td>
Go to General > Camera Device to set the IP for the IP Camera.


</td></tr>
<tr><td>Event Trigger</td><td>
Go to Project > Other Setting > Event Trigger. Set the trigger source to archive the recorded videos. Refer to Section 20.5 Event Trigger for more information.
</td></tr>
</table>

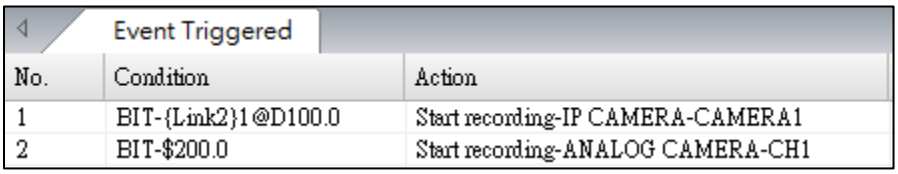
<table>
<tr><th colspan="2">Video Play</th></tr>
<tr><td></td><td>

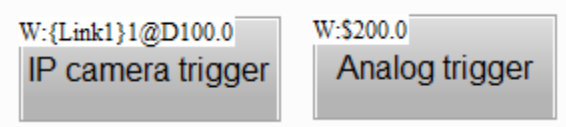
Add two trigger events with the parameters set as follows.





After the setting is complete, the table is as follows.



</td></tr>
<tr><td>Create Momentary Button</td><td>Create two Momentary Button elements with Write Address set as D100.0 and $200.0 respectively.


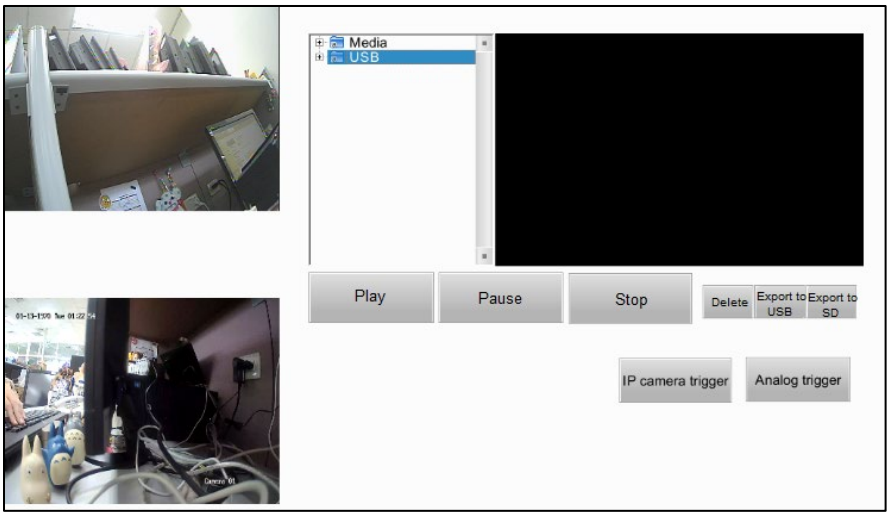
</td></tr>
<tr><td>Execution result</td><td>

After creating the elements, compile and download the data to the HMI.
When the download is complete, users can see the output

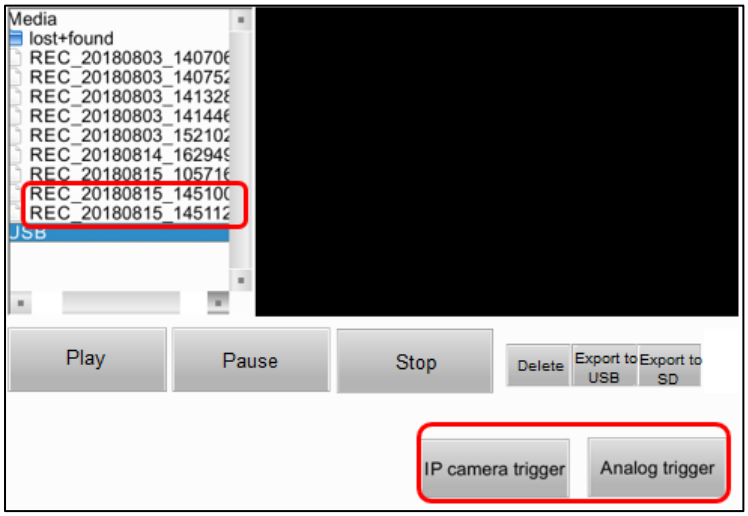
</td></tr>
</table>

Video Play	

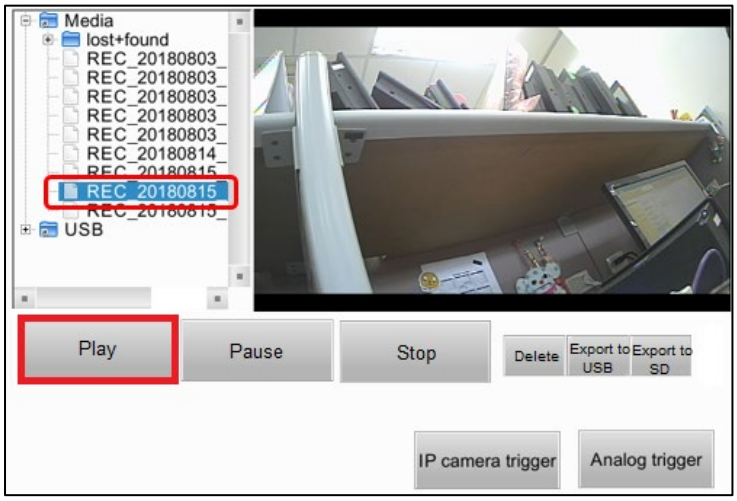
videos on the **Analog Camera Display** and **IP Camera Display** elements.



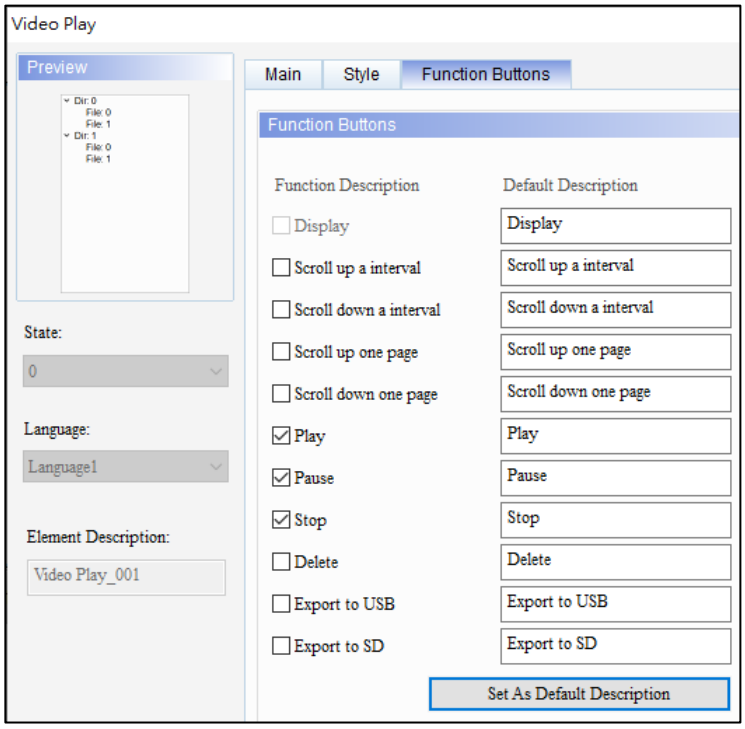
- After triggering the **IP camera trigger** (D100.0) and **Analog trigger** ($200.0) buttons, users can see two new video archives under **Media**.

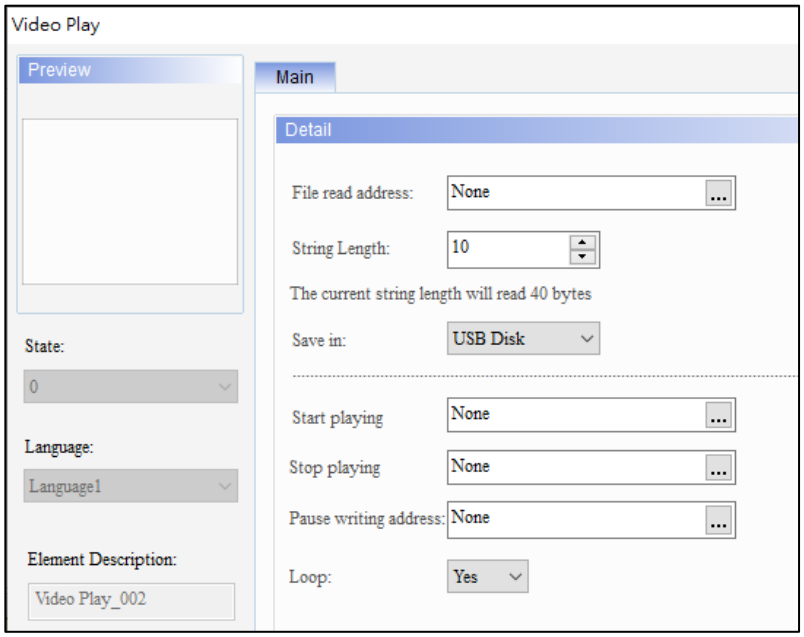


- Select a video file and click **Play** to play the recorded video.



The following example demonstrates how to play mpeg4 videos saved in the USB Disk or SD Card.

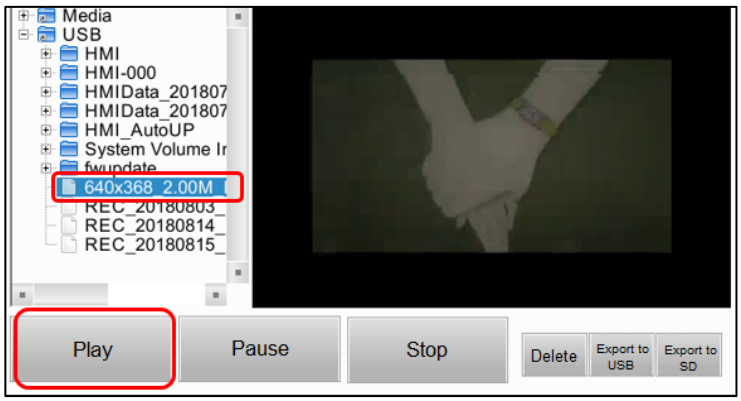
<table>
<tr><th colspan="2">Video Play</th></tr>
<tr><td>Video Play element</td><td>Create a Video Play element and set its related parameters.
Select the checkboxes for Play, Pause, Stop, Delete, Export to USB, and Export to SD, and click Set As Default Description.
 
Set Yes for Loop.</td></tr>
</table>

<table>
<tr><th colspan="2">Video Play</th></tr>
<tr><td></td><td>


After the setting is complete, the element is as follows.


</td></tr>
<tr><td>Execution result</td><td>

After creating the elements, compile and download the elements to the HMI.
First, load an H.264 coded mpeg4 video to the PC.
Then, select the video file and click Play to play the video.



</td></tr>
</table>

The **Video Play** element has File List on the left side and the display window on the right side.

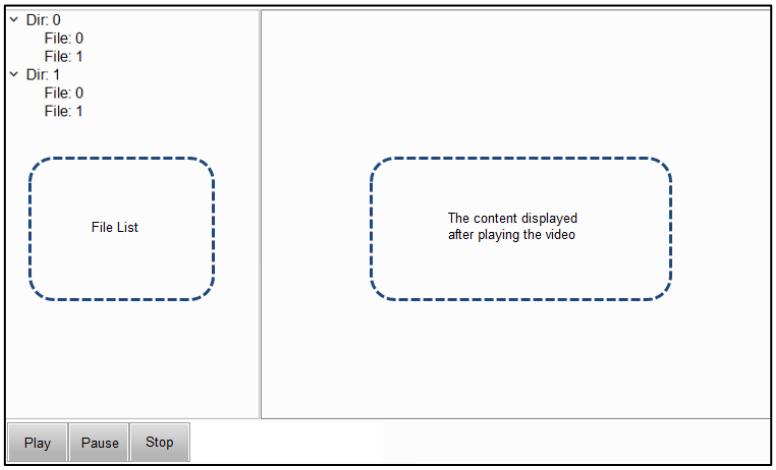


Figure 20 - 12: Video Play element

On double-clicking File List on the left side of the **Video Play** element, the property page appears as follows.

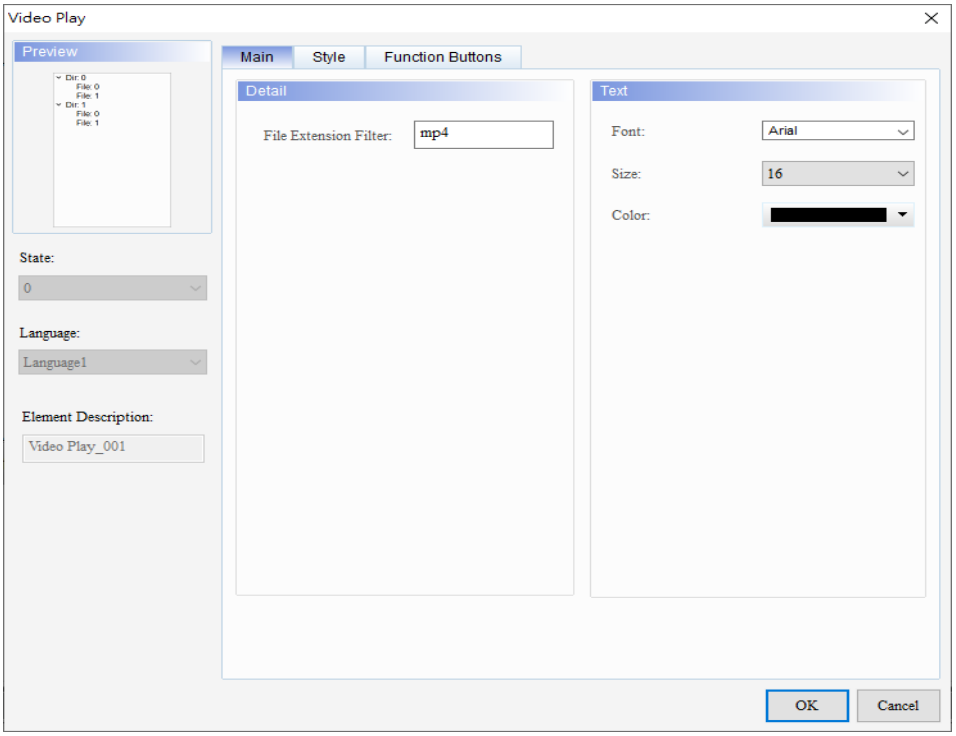


Figure 20 - 13: Video Play element property page (File List on the left side)

Video Play (File List on the left side)	
Function	**Description**
Preview	**Video Play** element does not support multiple state values and multi-language data display.
Main	Set File Extension Filter, Font, Size, and Color.
Style	Set Border Color, Tree View Background, Transparency, and Smooth animation.
Function Buttons	Select the checkboxes for Scroll up an interval, Scroll down an interval, Scroll up one page, Scroll down one page, Play, Pause, Stop, Delete, Export to USB, and Export to SD, and click Set As Default Description button. Set the width and height of the buttons.

- Main

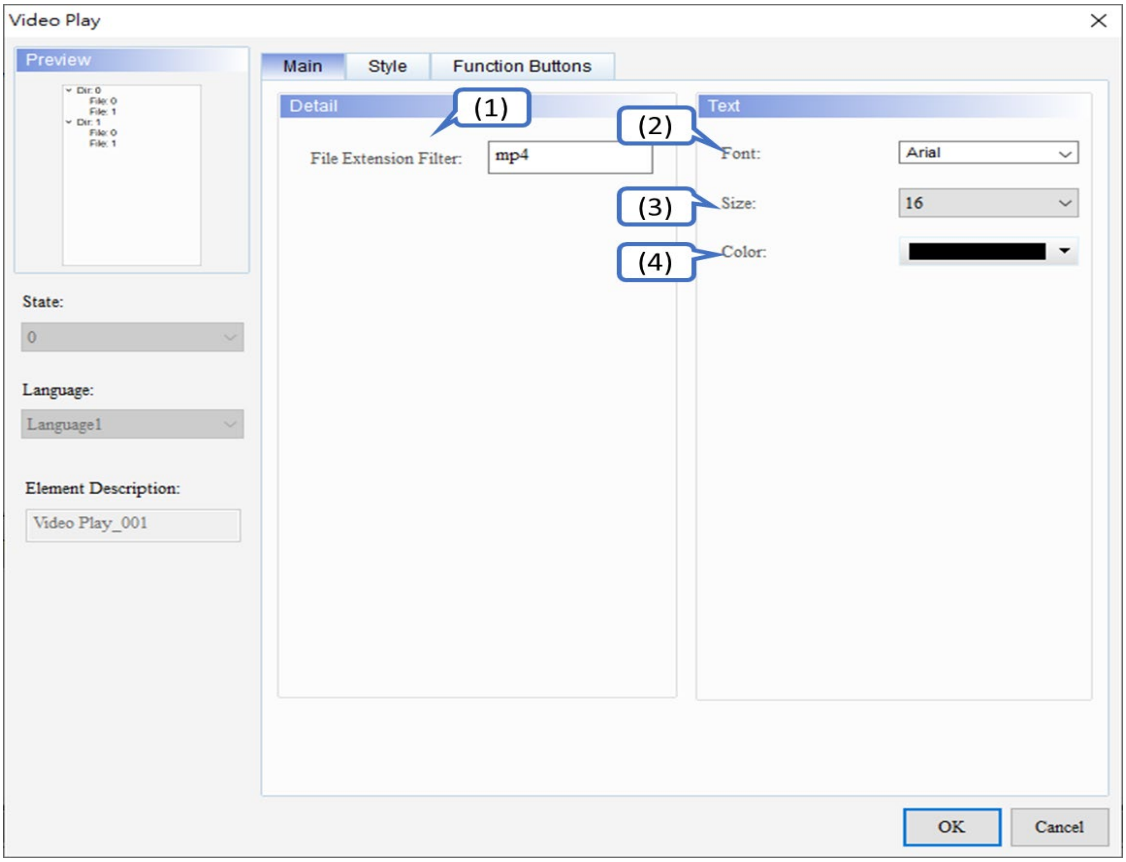


Figure 20 - 14: Video Play element Main property page (File List on the left side)

No.	Function	Description
(1)	File Extension Filter	● Set the file extension to be displayed in the File List on the left. The default value is **mp4**, meaning only the files with the mp4 file extension will be displayed in the root directory of the external drive. ● If users enter an asterisk symbol "*" to the **File Extension Filter** field, all files in the root directory will be displayed.
(2)	Font	Set the text font for the File List on the left. The default value is **Arial**.
(3)	Size	Set the text size for the File List on the left. The default value is **16**.
(4)	Color	Set the text color for the File List on the left. The default is [redacted].

- Style

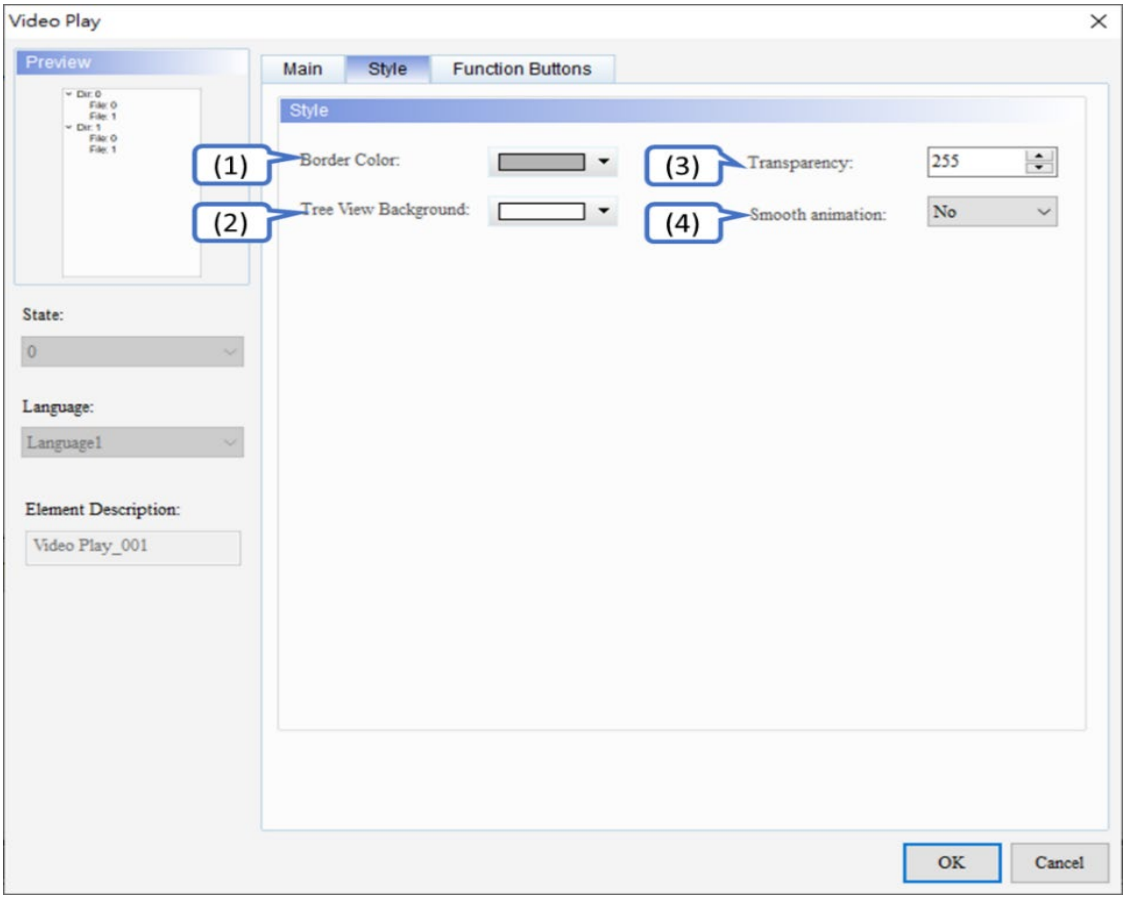
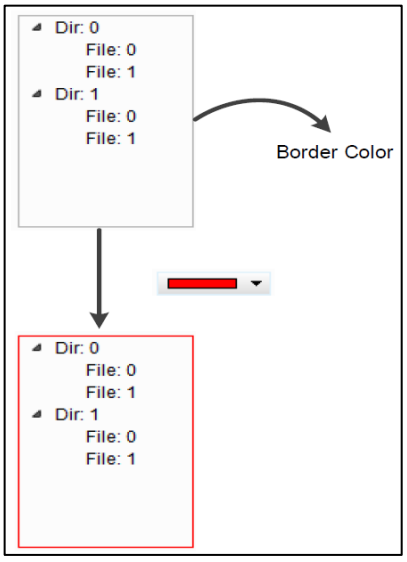
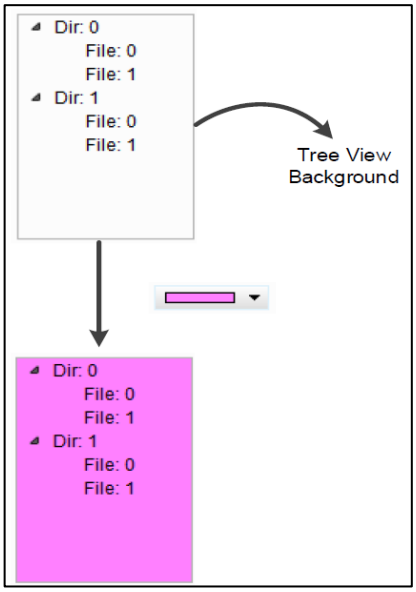


Figure 20 - 15: Video Play element Style property page (File List on the left side)

No.	Function	Description
(1)	Border Color	Set the border color of the File List on the left. The default is  . 
(2)	Tree View Background	Set the tree view background color of the File List on the left. The default is  . 
(3)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(4)	Smooth animation	● The **Smooth animation** function is available for this element. The default value is **No**. ● On activating **Smooth animation** function, there is a sliding effect when the File List expands or retracts.

- Function Buttons

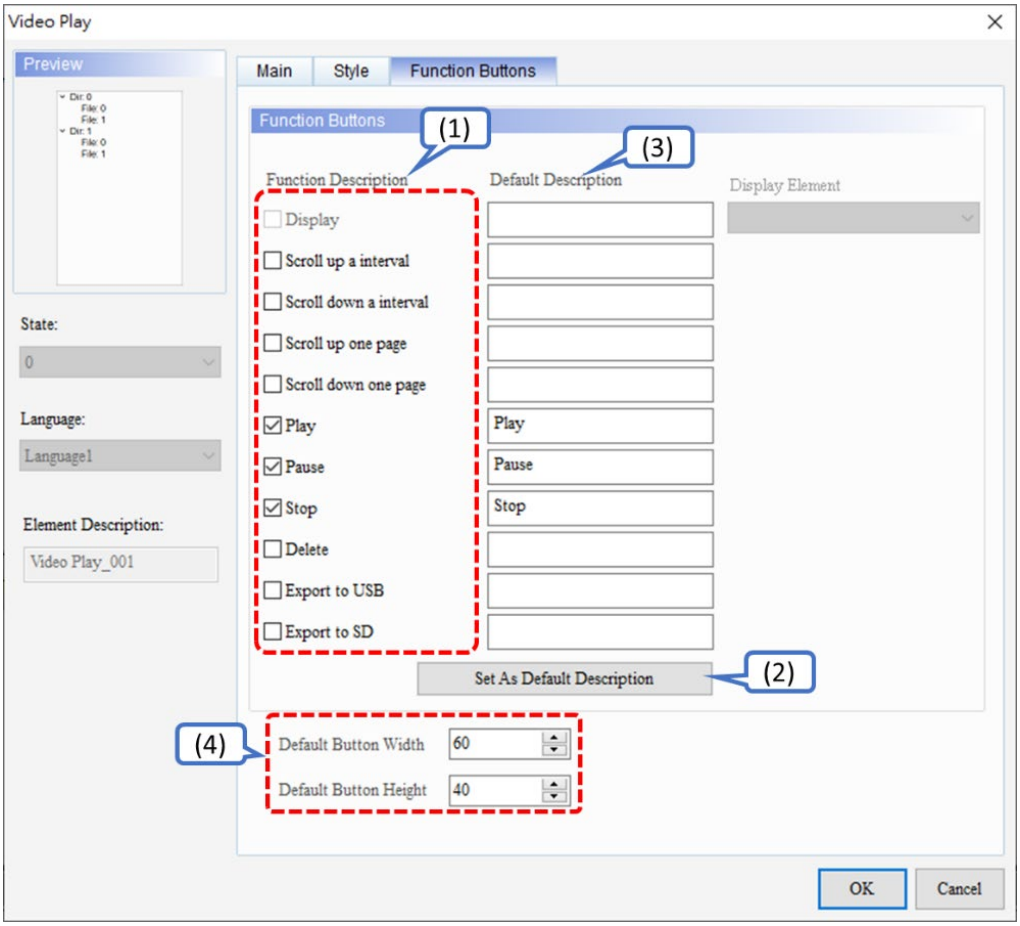


Figure 20 - 16: Video Play element Function Buttons property page (File List on the left side)

No.	Function	Description
(1)	Function Description	• Function buttons for the File List on the left are provided. • **Scroll up an interval**, **Scroll down an interval**, **Scroll up one page**, and **Scroll down one page** are used to scroll the File List and determine how many lines to scroll each time. • **Play**, **Pause**, **Stop**, and **Delete** are video control buttons. • When users select the checkbox for **Export to USB** or **Export to SD**, the buttons are used to export the video file stored in the HMI to the USB disk or SD card.

No.	Function	Description
(2)	Set As Default Description	Click **Set As Default Description** to insert the default strings to the fields. Users can also enter user-defined strings.
(3)	Default Description	Click **Set As Default Description** button to insert the default strings to the fields
(4)	Default Button Width and Height	Adjust the width and height of the function buttons. The default values are **60** and **40**, respectively.

On double-clicking the display content on the right of the **Video Play** element, the property page appears as follows.

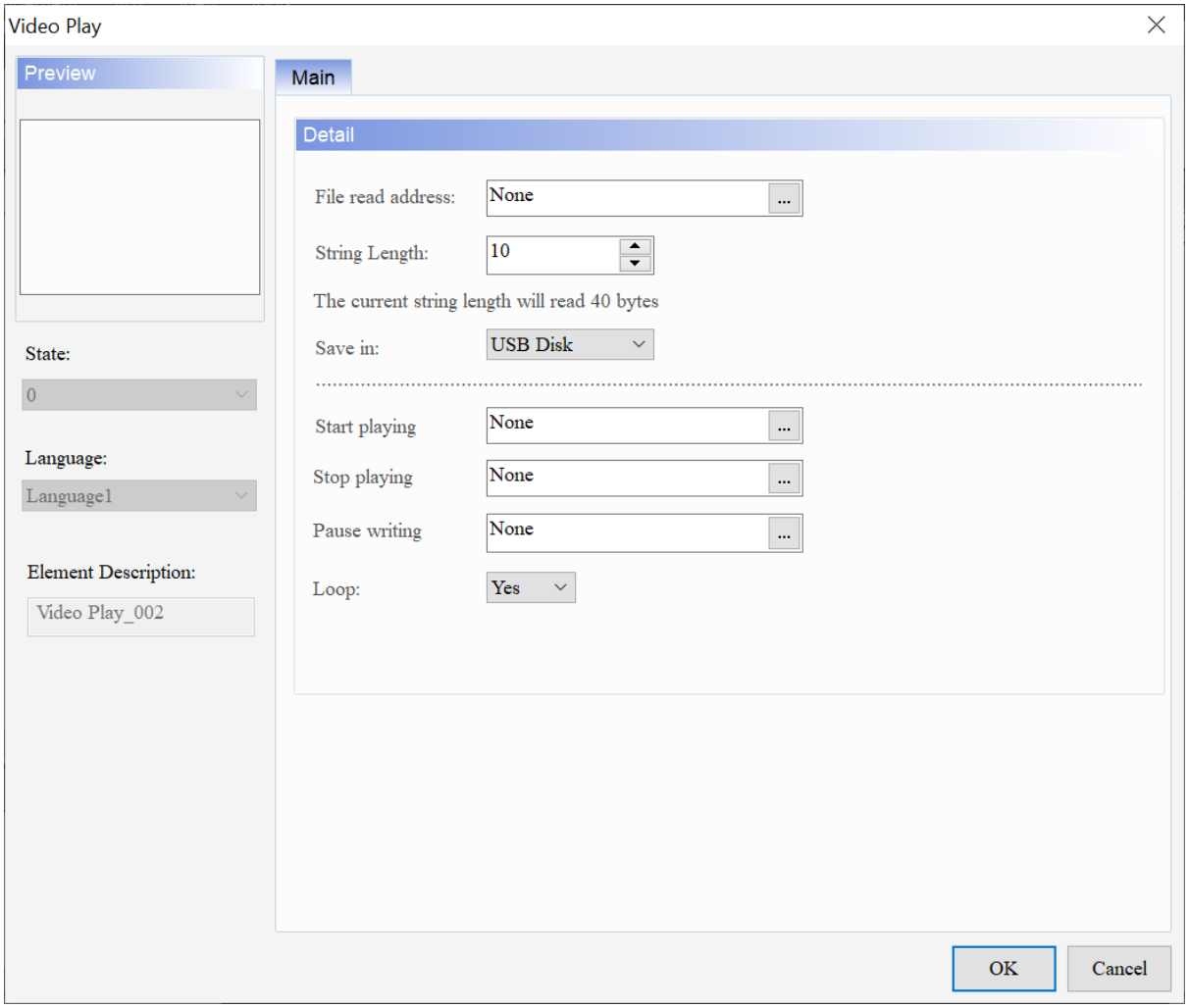


Figure 20 - 17: Video Play element property page (Display content on the right)

Video Play (Display content on the right)	
Function	**Description**
Main	Set the File read address, String Length, Save in, Start playing, Stop playing, Pause writing, and Loop.

- Main

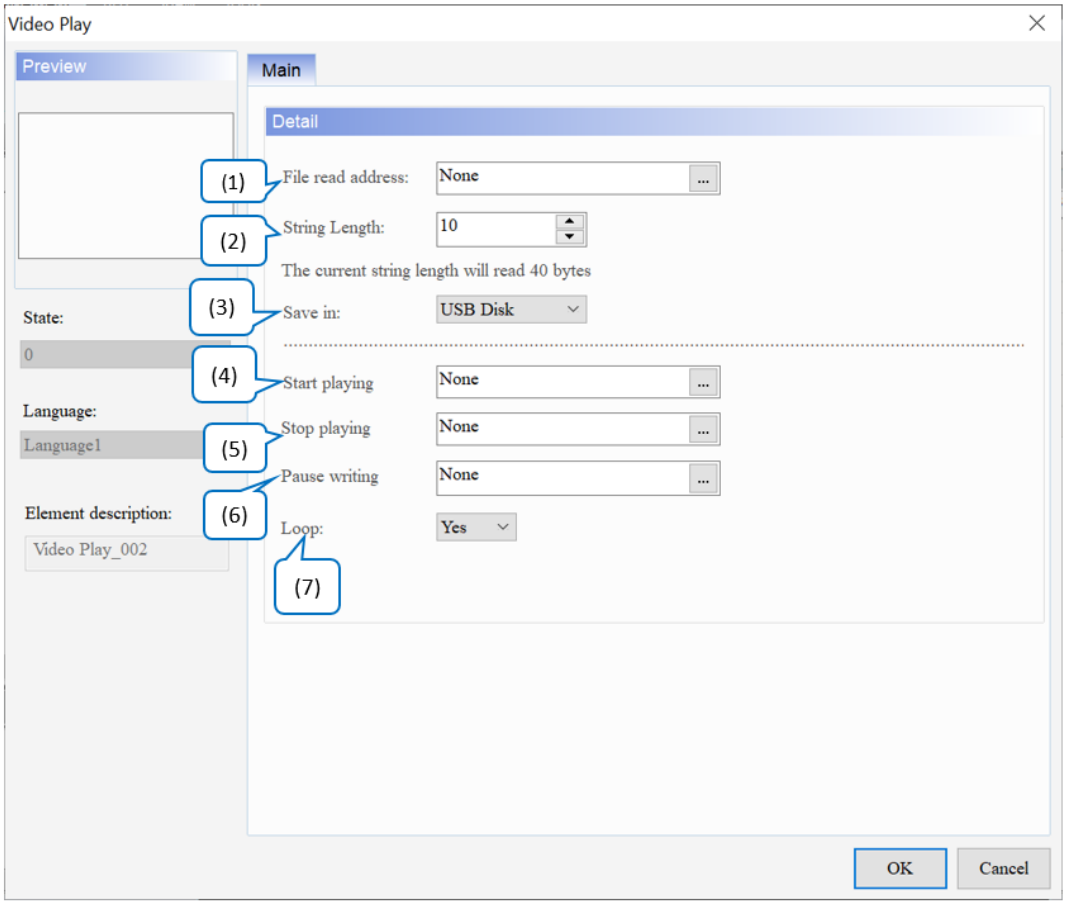


Figure 20 - 18: Video Play element Main property page (Display content on the right)

No.	Function	Description
(1)	File read address	Files can be read directly from USB Disk or SD card.
(2)	String Length	Set the length of the file name to be read. The default value is 10.

No.	Function	Description
(3)	Save in	The available options for **Save in** are: USB Disk, SD, and MEDIA. The default value is **USB Disk**.
(4)	Start playing	Set the bit for start playing the video.
(5)	Stop playing	Set the bit for stop playing the video.
(6)	Pause writing	Set the bit for pausing the video.
(7)	Loop	The default value is **Yes**, so the video plays back continuously.

20.5 Event Trigger

The **Event Trigger** function is mainly used with the **Camera Display** element. After the conditions set for the **Event Trigger** function are met, the content captured by the camera at that time can be archived into an mpeg4 file.

Go to **Project** > **Other Setting** > **Event Trigger** to set the triggering event.

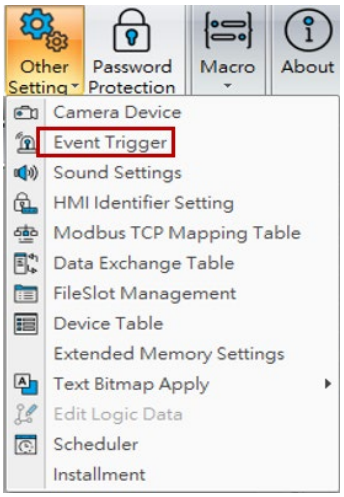


Figure 20 - 19: Project > Other Setting > Event Trigger

Click  icon to add a trigger event.

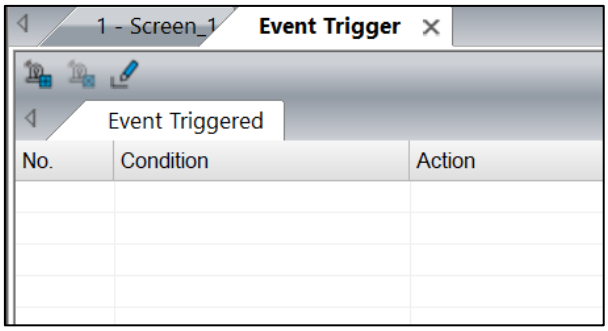


Figure 20 - 20: Add trigger event

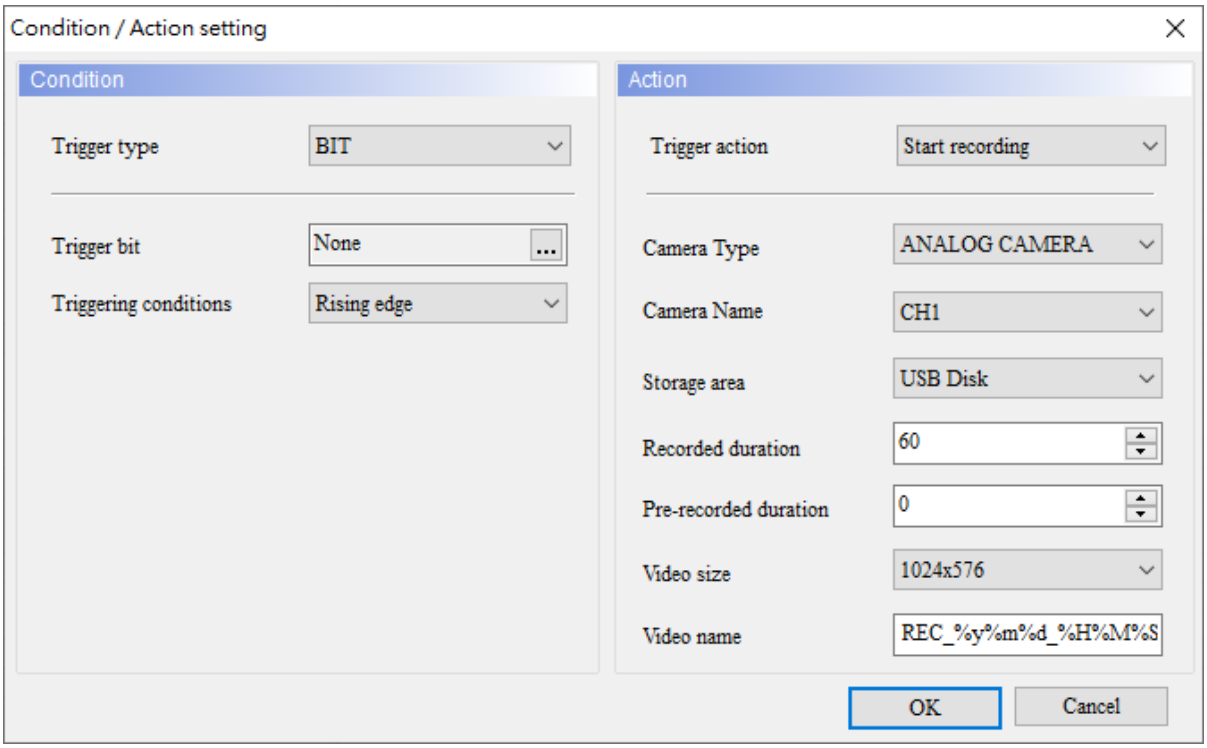
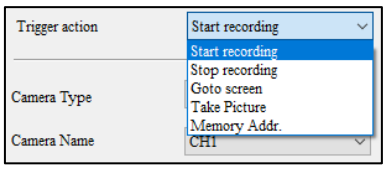
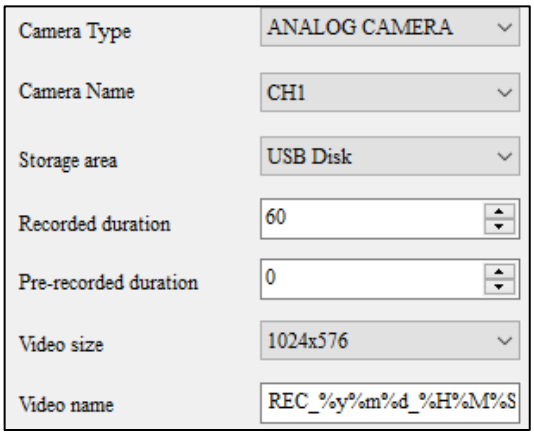
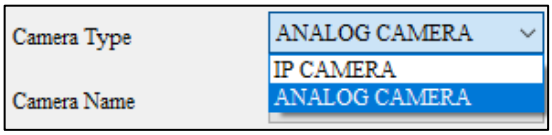
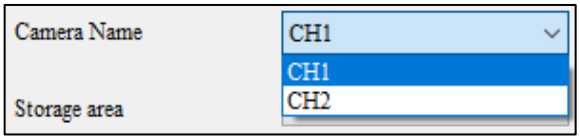
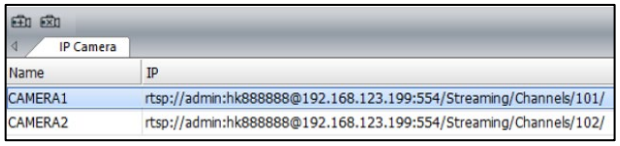
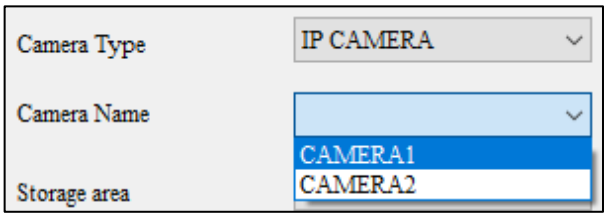
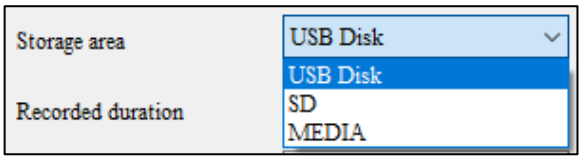


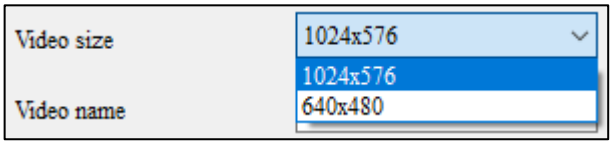
Figure 20 - 21: Condition / Action setting window

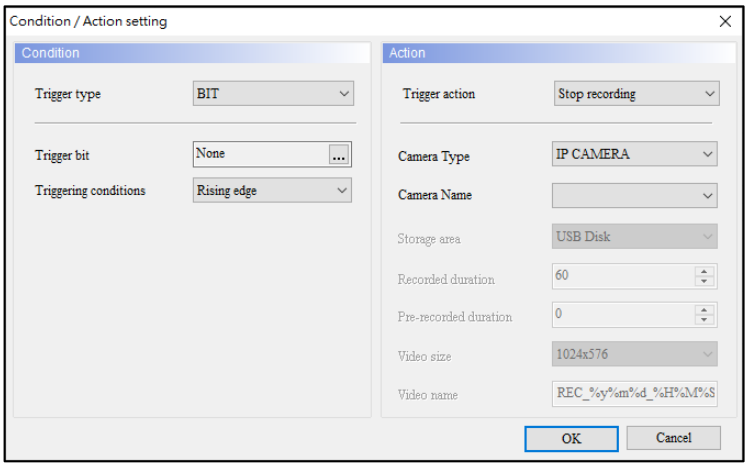
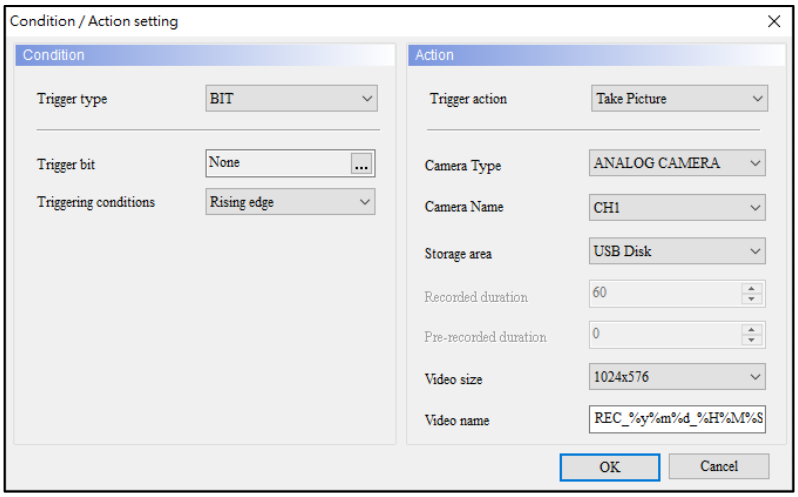
No.	Function	Description
Condition		
(1)	Trigger type	Currently only bit triggering is available.
(2)	Trigger bit	Set the address of the **Trigger bit**, which can be an external PLC memory address or an Internal Memory address.
(3)	Triggering conditions	The available options for **Triggering conditions** are: Rising edge, Falling edge, and Rising or Falling. The default value is **Rising edge**.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td colspan="3">Action</td></tr>
<tr><td colspan="3">The available options for Trigger action are: Start recording, Stop recording, Goto screen, Take Picture, and Memory Addr. The default value is Start recording.
 
</td></tr>
<tr><td></td><td rowspan="3">Start recording</td><td colspan="2">Select Start recording and the interface is as follows.
 
</td></tr>
<tr><td>Camera Type</td><td>Select ANALOG CAMERA or IP CAMERA.
 
</td></tr>
<tr><td>Camera Name</td><td>● The options for Camera Name vary depending on the selected Camera Type.
● If users select ANALOG CAMERA for the Camera Type, the available options for the Camera Name are: CH1 and CH2. The default value is CH1.
 

● If users select IP CAMERA for the Camera Type, the Camera Name is the name set for the IP Camera.
● Go to Project > Other Setting > Camera Device to set the names for the IP Camera as CAMERA1 and CAMERA2.
 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="5"></td><td rowspan="5"></td><td></td><td> 
</td></tr>
<tr><td>Storage area</td><td>● The available options for Storage area are: USB Disk, SD, and MEDIA. The default value is USB Disk.
 

● MEDIA is a Storage area in the HMI. If users select MEDIA to store the videos, only 2G of recorded videos can be stored in the HMI.
● If users select USB Disk or SD to store the videos, the storage capacity is determined by the selected USB Disk or SD Card. The supported format is FAT32.</td></tr>
<tr><td>Recorded duration</td><td>When the trigger bit condition is met, the camera records for the set duration (unit: seconds). The default value is 60 seconds.</td></tr>
<tr><td>Video size</td><td>● The available options for Video size are: 1024x576 and 640x480. The default value is 1024x576.
 
</td></tr>
<tr><td>Video name</td><td>● Name the file according to their requirements.
● The default value is REC_%y%m%d_%H%M%S. %Y: year; %m: month; %d: day; %H: hour; %M: minute; %S: second.</td></tr>
<tr><td colspan="2">Stop recording</td><td colspan="2">● Select Stop recording and the interface is as follows.</td></tr>
</table>

No.	Function	Description
		 ● Select **Camera Type** and **Camera Name** to stop recording.
Goto screen		● Select **Goto screen** and the interface is as follows,  ● If **Goto screen** is selected, the displaying screen switches to the screen of the specified screen number as soon as the **Trigger bit** condition is met.
Take Picture		● Select **Take Picture** and the interface is as follows.  ● The function of **Take Picture** is the same as those of **Start recording** except for the functions of **Recorded duration** and **Pre-recorded duration**.

Chapter 21: Basic Shape

DIAScreen provides with the function to draw basic shapes. Go to **Elements** > **Basic Shape** to draw required basic shapes. The available options for **Basic Shape** element are as follows:

- Rhombus
- Right Triangle
- Pentagon
- Pie Chart
- Arc
- Hexagon
- Star Shape
- Triangle
- Hollow Circle
- Stop Circle
- ¼ Arc

The following describes the properties of each **Basic Shape** element.

21.1 Rhombus

On double-clicking the **Rhombus** element, the property page appears as follows.

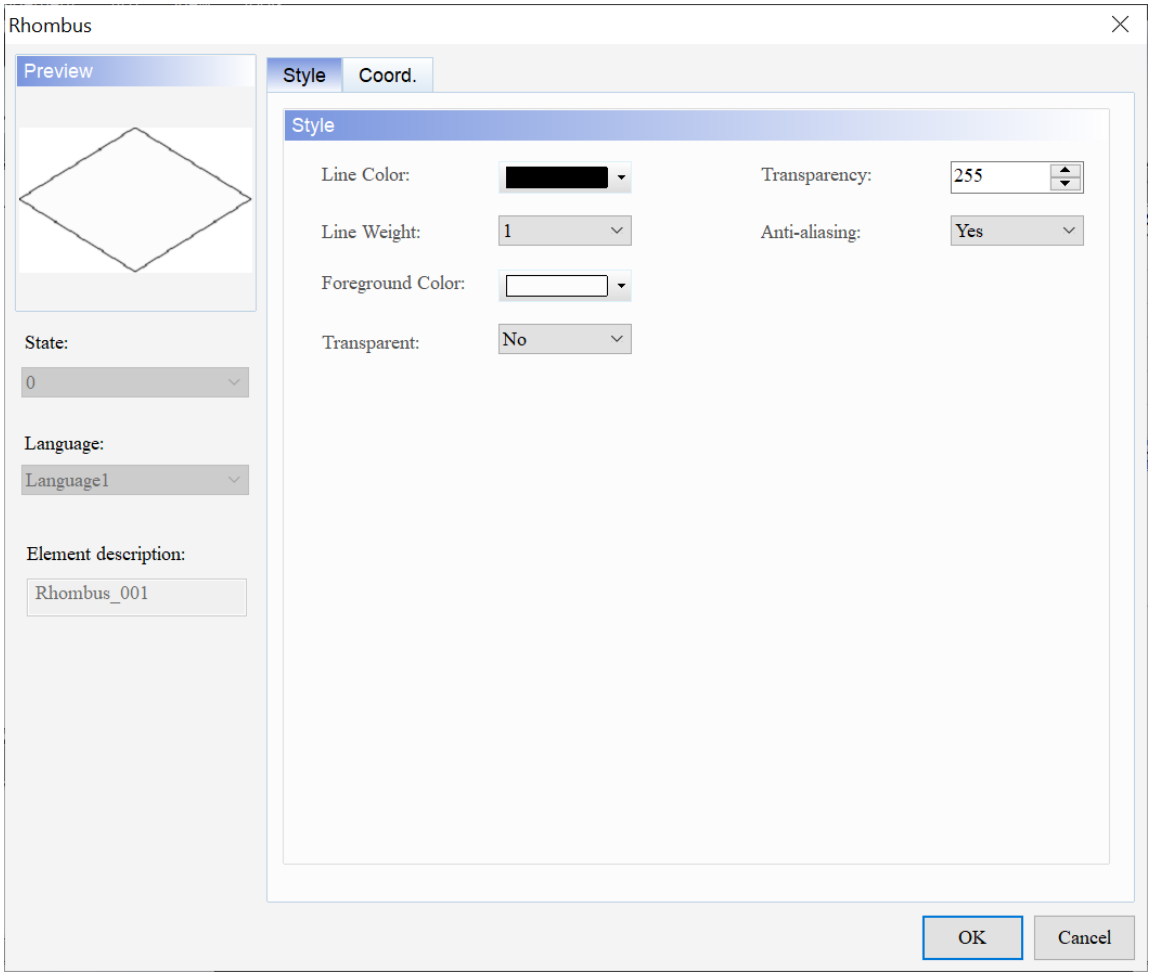


Figure 21 - 1: Rhombus element property page

Rhombus	
Function	**Description**
Preview	**Rhombus** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

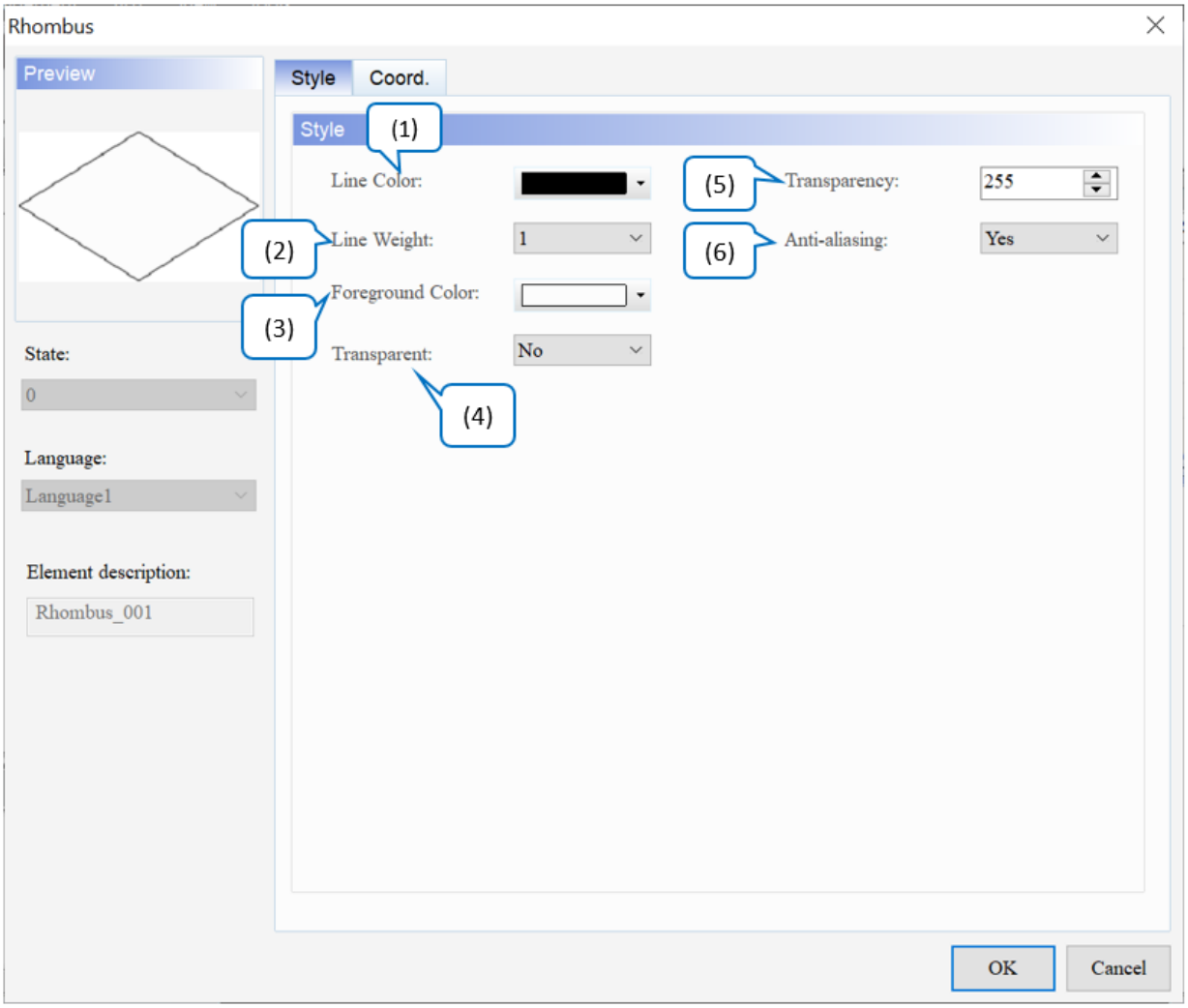
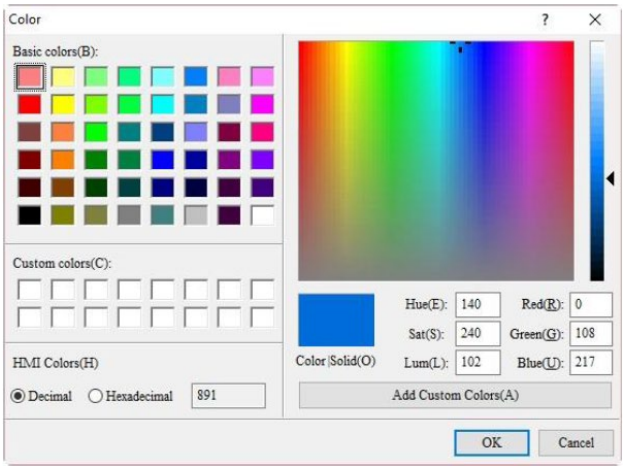
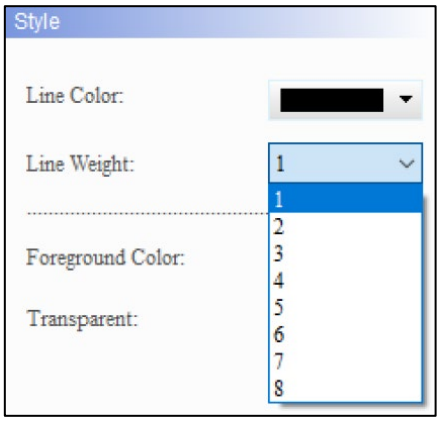
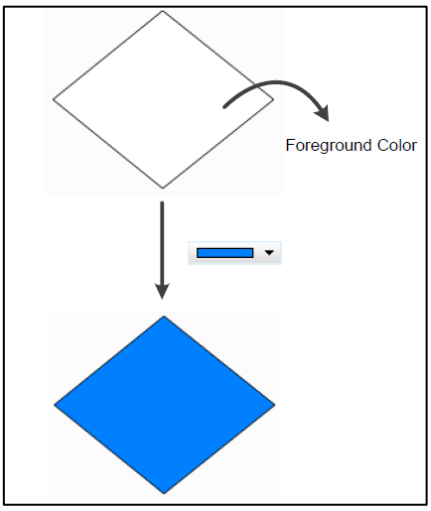
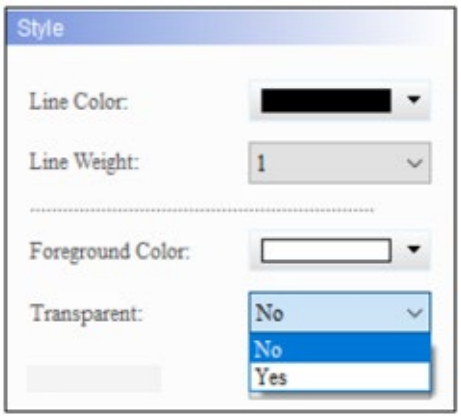
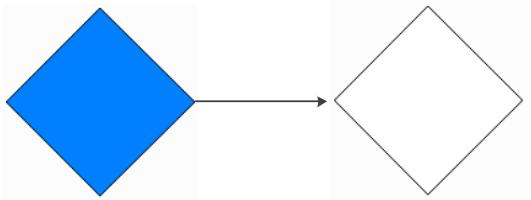
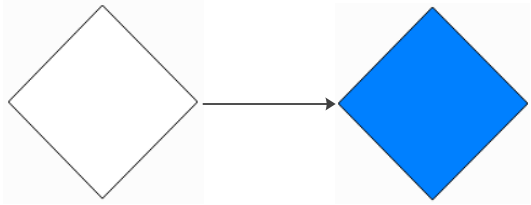
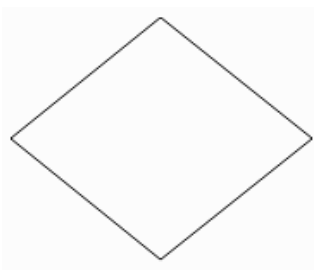
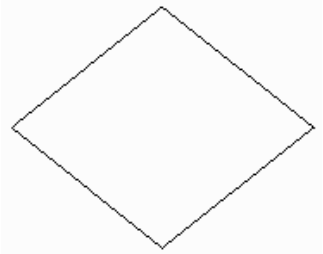


Figure 21 - 2: Rhombus element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is  . 
(4)	Transparent	● Select Yes or No for this function. The default value is

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>No.
 

If users select Yes, the foreground color of the Rhombus element is transparent and only the border color is displayed; if users select No, the foreground color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3">(6)</td><td rowspan="3">Anti-aliasing</td><td colspan="2">The Anti-aliasing function is available for this element. The default value is Yes.</td></tr>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table>

- Coord.

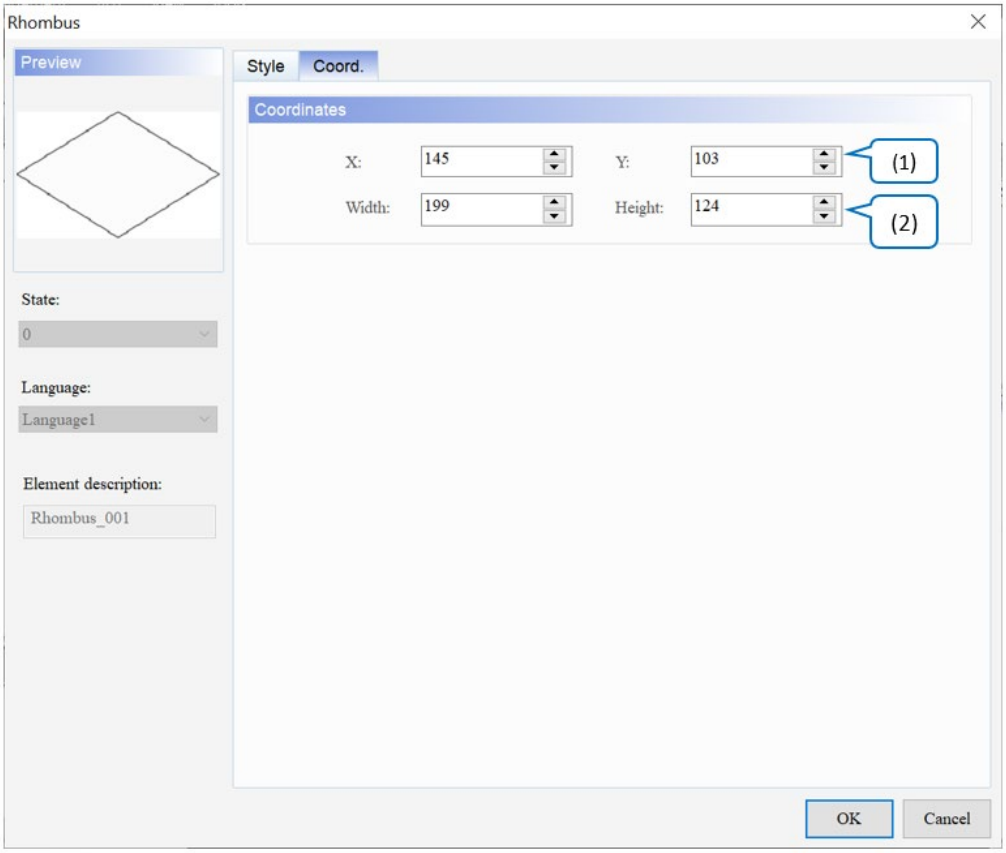


Figure 21 - 3: Rhombus element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.2 Right Triangle

On double-clicking the **Right Triangle** element, the property page appears as follows.

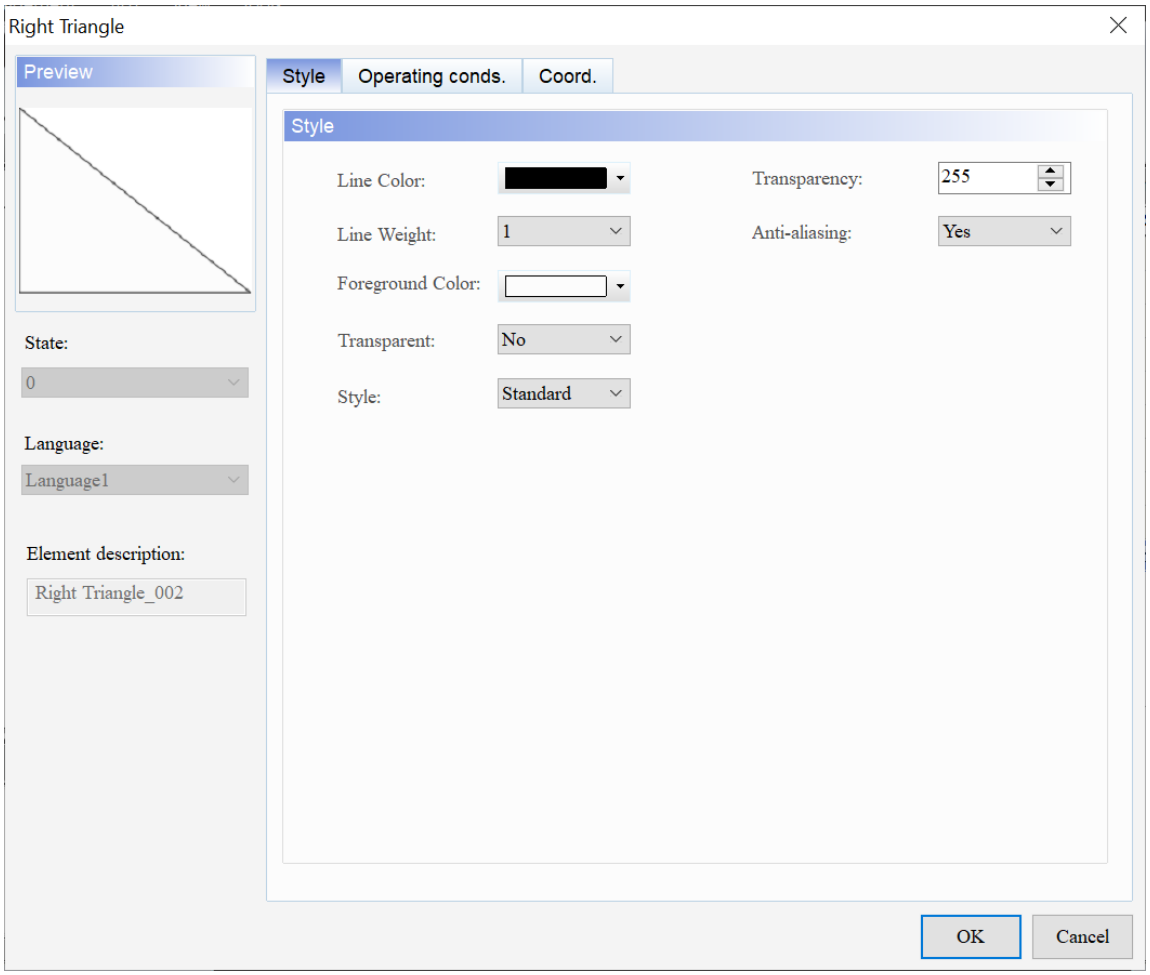


Figure 21 - 4: Right Triangle element property page

Right Triangle	
Function	**Description**
Preview	**Right Triangle** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Style, Transparency, and Anti-aliasing.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

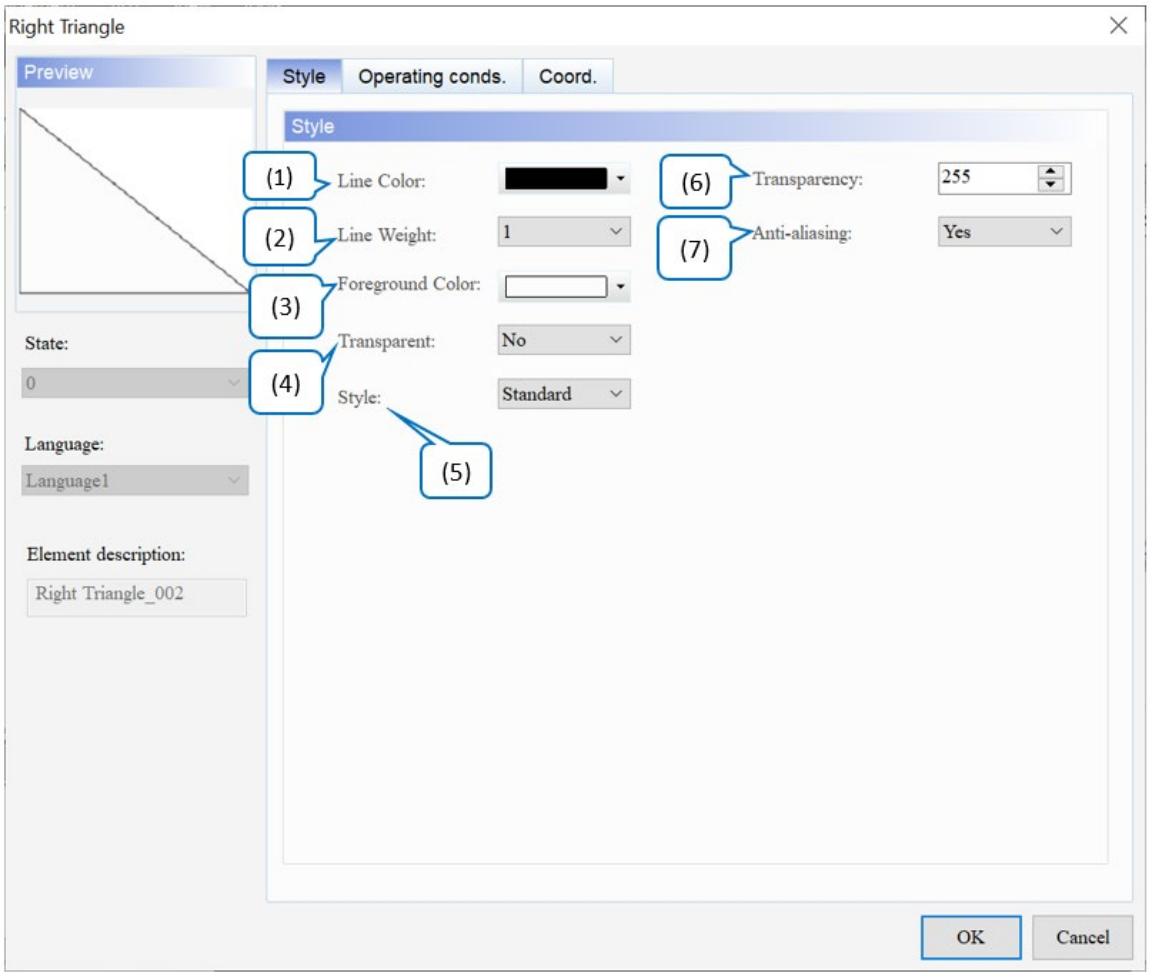
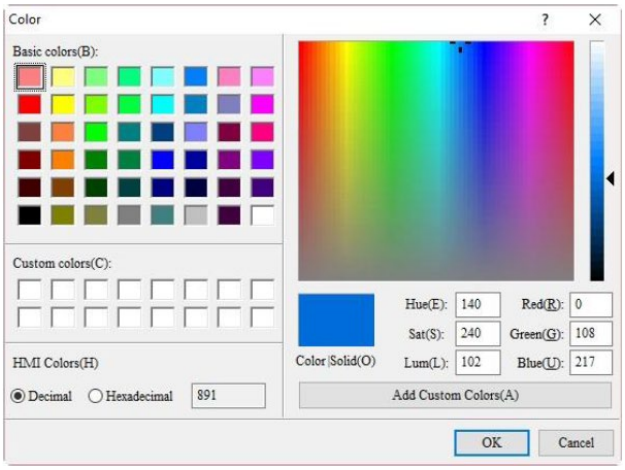
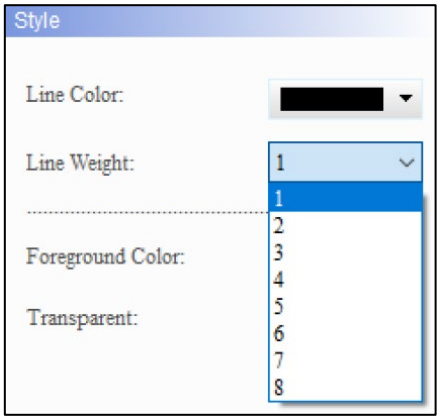
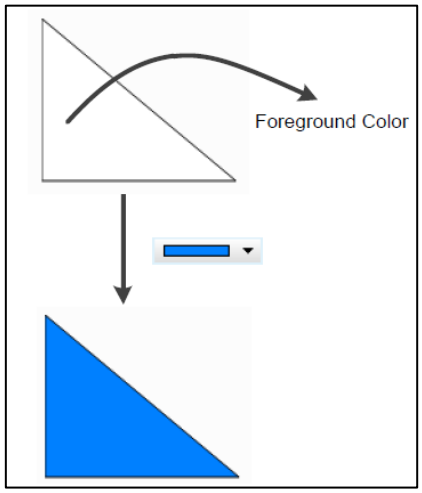
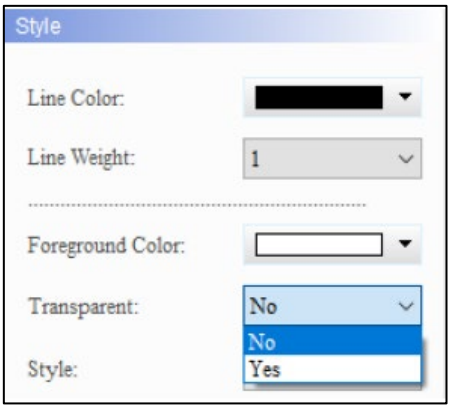
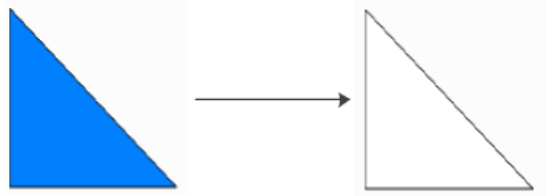
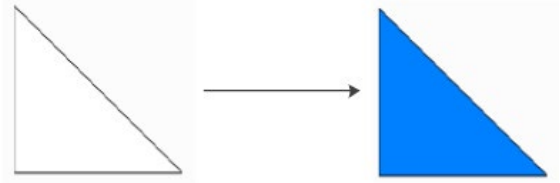
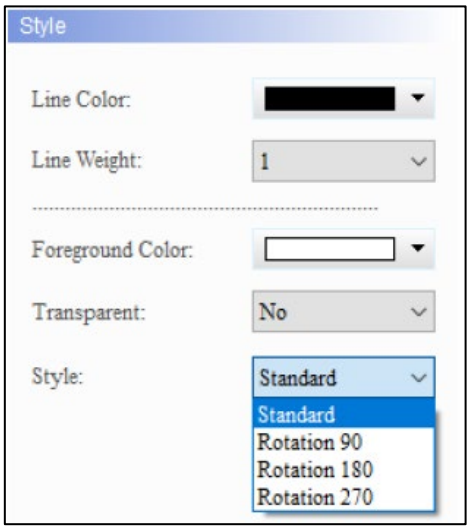
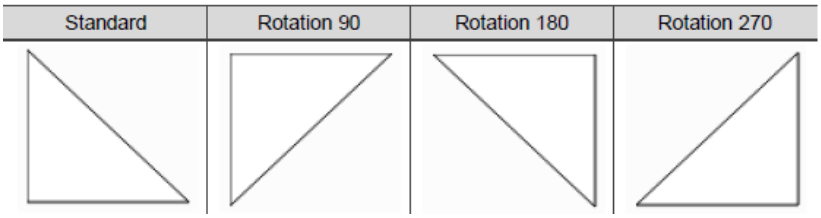
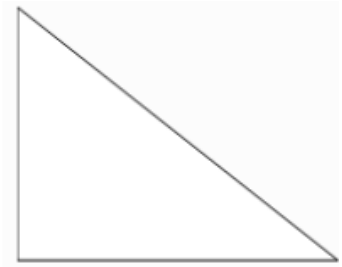
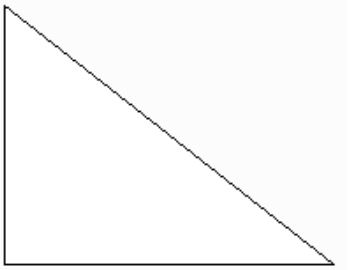


Figure 21 - 5: Right Triangle element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is  . 
(4)	Transparent	● Select Yes or No for this function. The default value is

No.	Function	Description
		No.  ● If users select Yes, the foreground color of the **Right Triangle** element is transparent and only the border color is displayed; if users select No, the foreground color of the element is displayed. Transparent is Yes  Transparent is No 
(5)	Style	The available options for **Style** are: Standard, Rotation 90, Rotation 180, and Rotation 270. The default value is **Standard**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(6)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(7)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Operating conds.

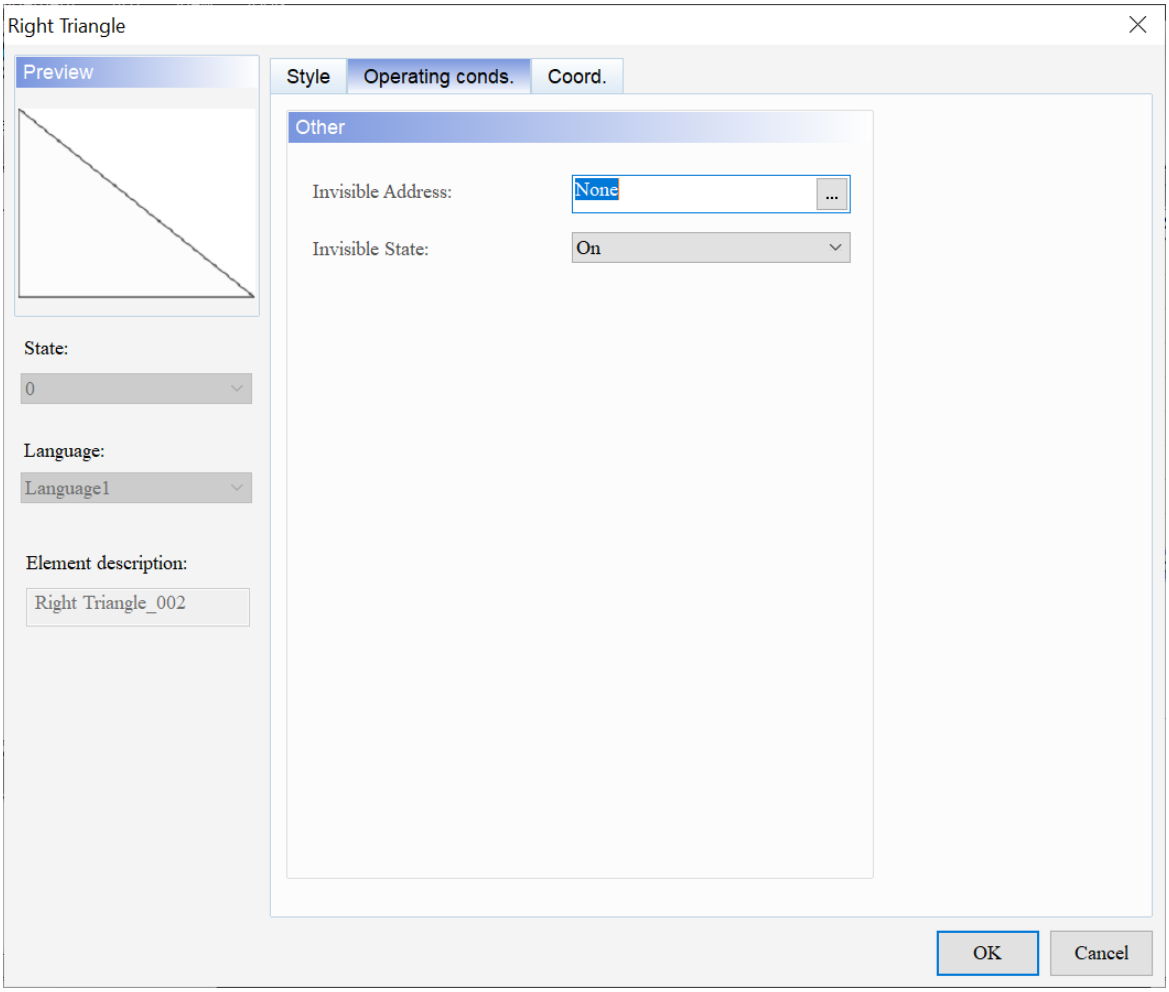
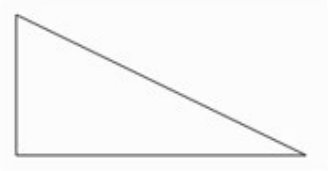
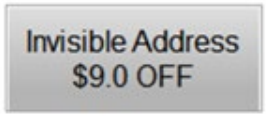
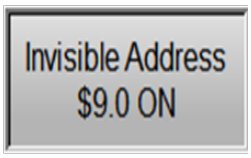
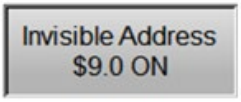


Figure 21 - 6: Right Triangle element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Invisible Address / Invisible State</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td rowspan="2">Invisible State is On</td><td>  </td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td>  </td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>
</td></tr>
</table>

- Coord.

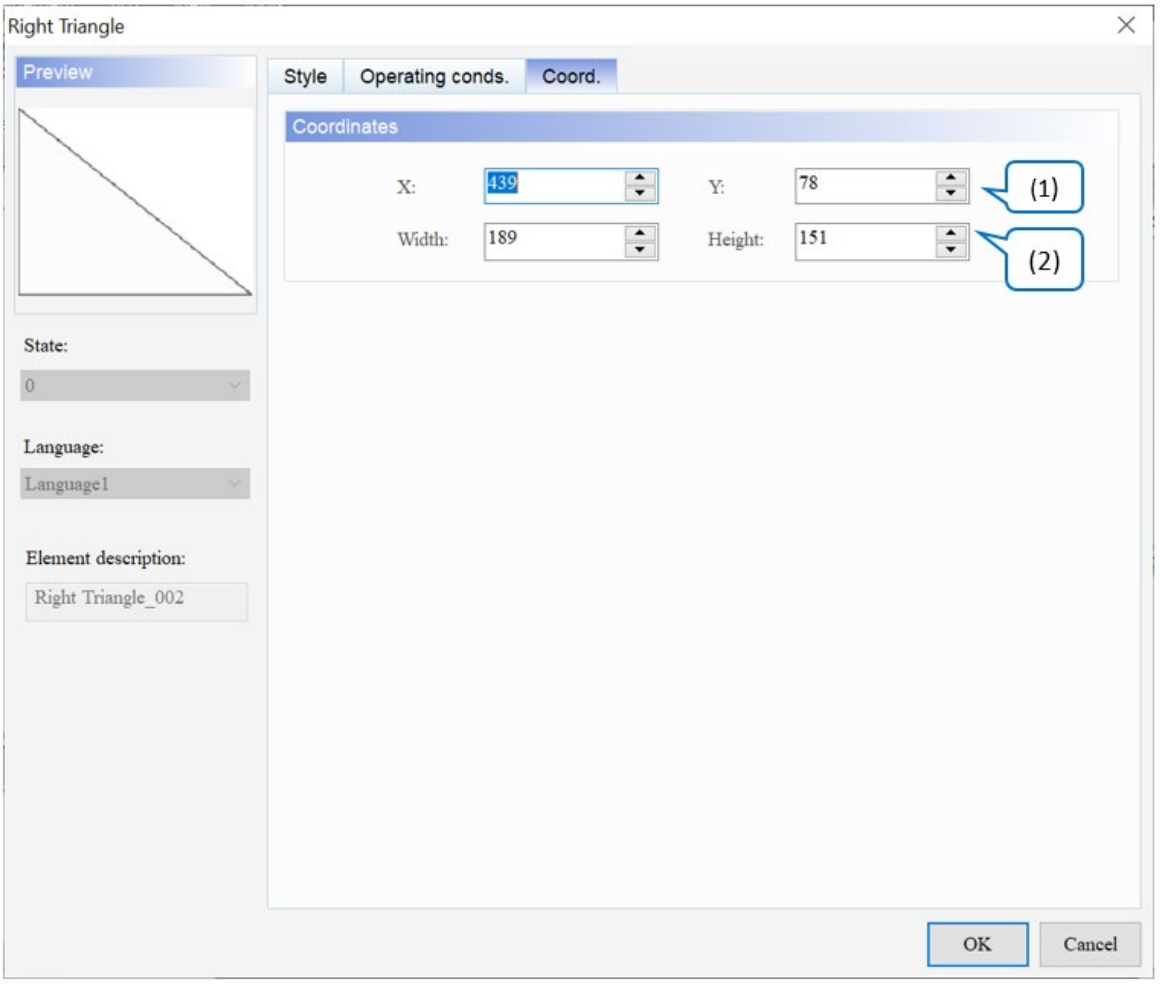


Figure 21 - 7: Right Triangle element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.3 Pentagon

On double-clicking the **Pentagon** element, the property page appears as follows.

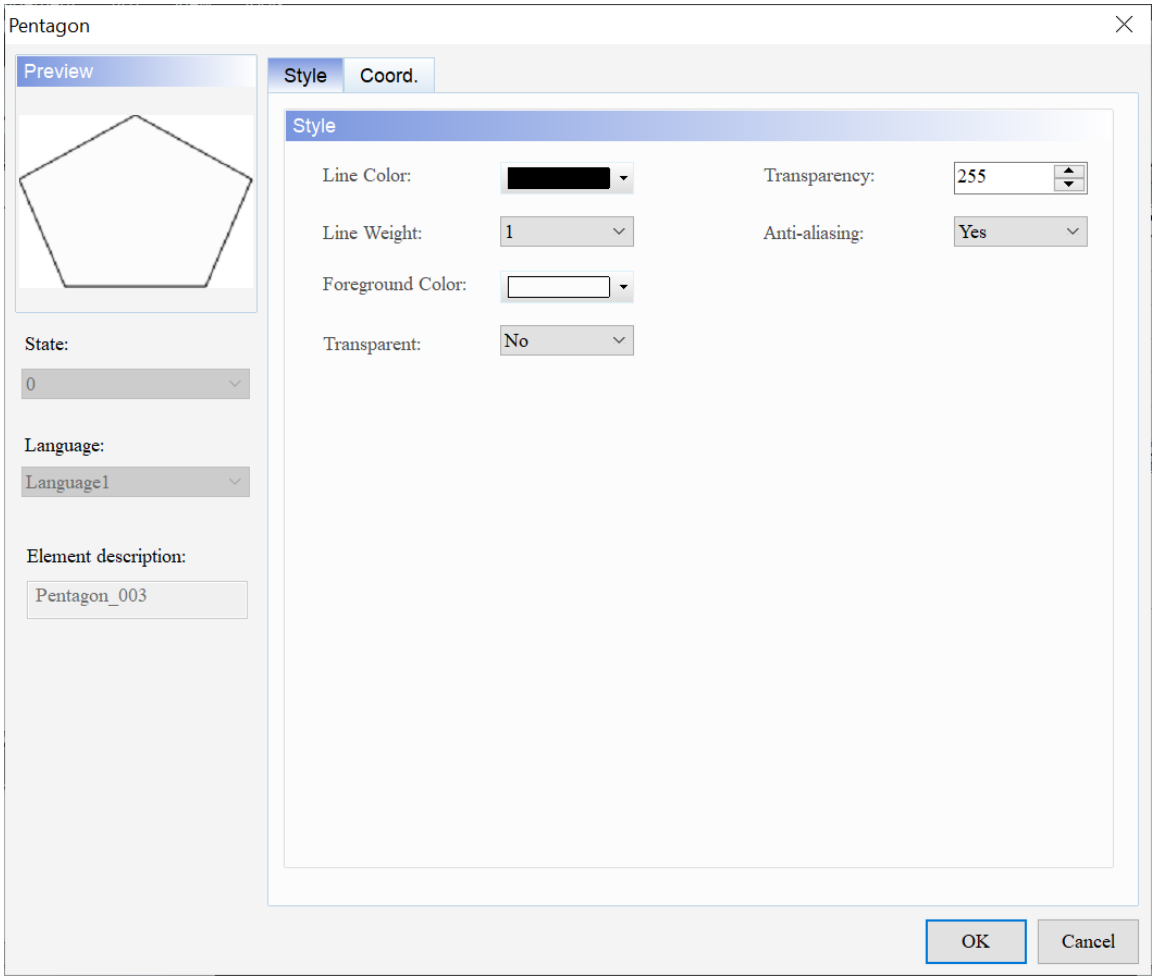


Figure 21 - 8: Pentagon element property page

Pentagon	
Function	**Description**
Preview	**Pentagon** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

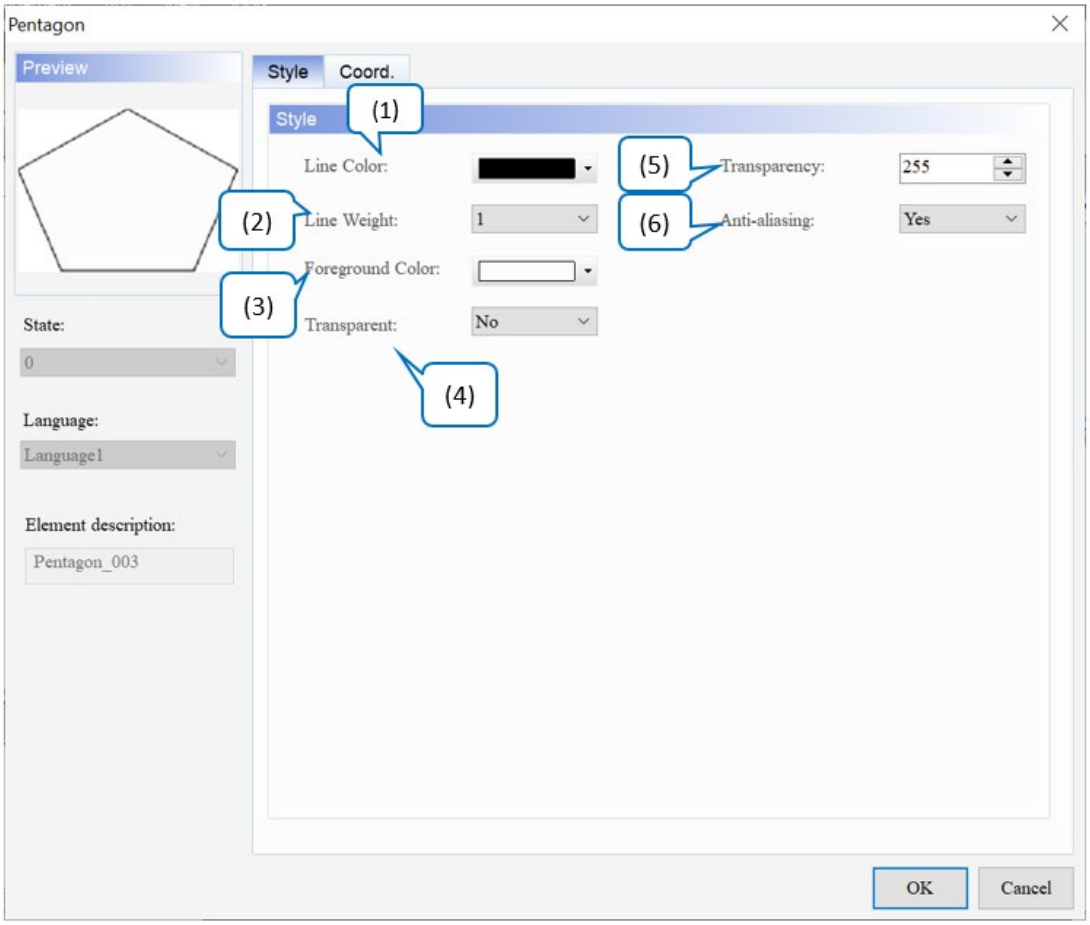
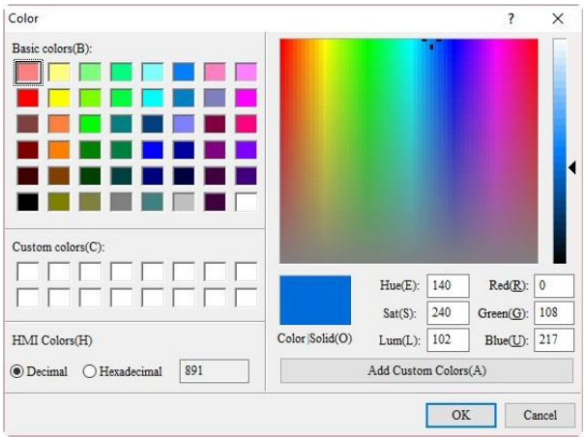
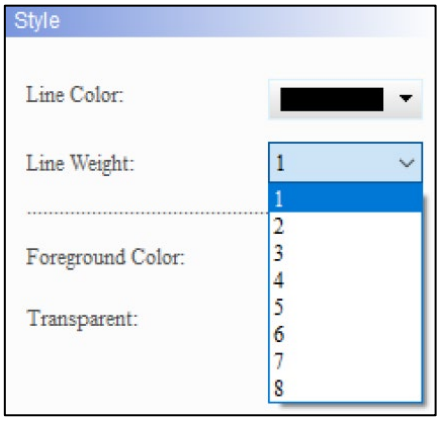
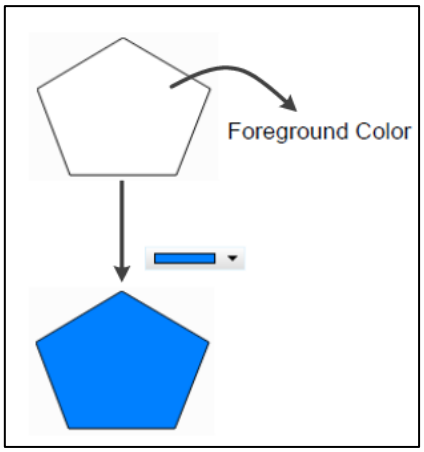
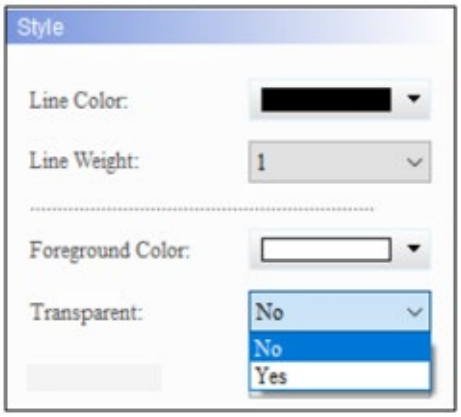
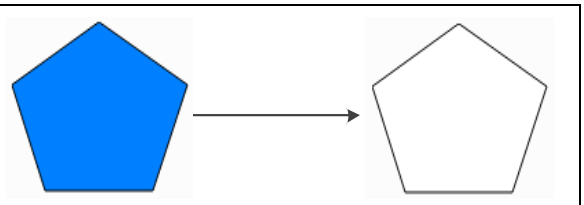
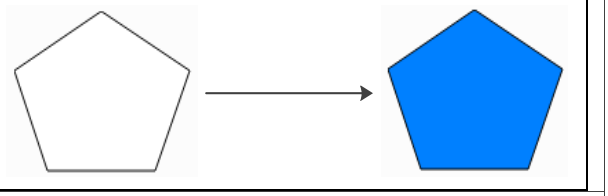
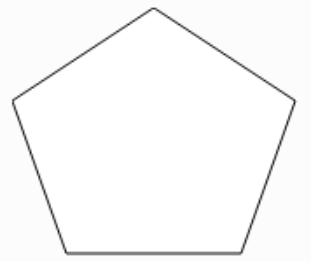
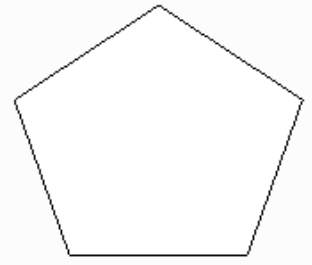


Figure 21 - 9: Pentagon element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is [color]. 

No.	Function	Description
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is . 
(4)	Transparent	● Select Yes or No for this function. The default value is No.  ● If users select Yes, the foreground color of the Pentagon element is transparent and only the border color is displayed; if users select No, the foreground

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(6)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Coord.

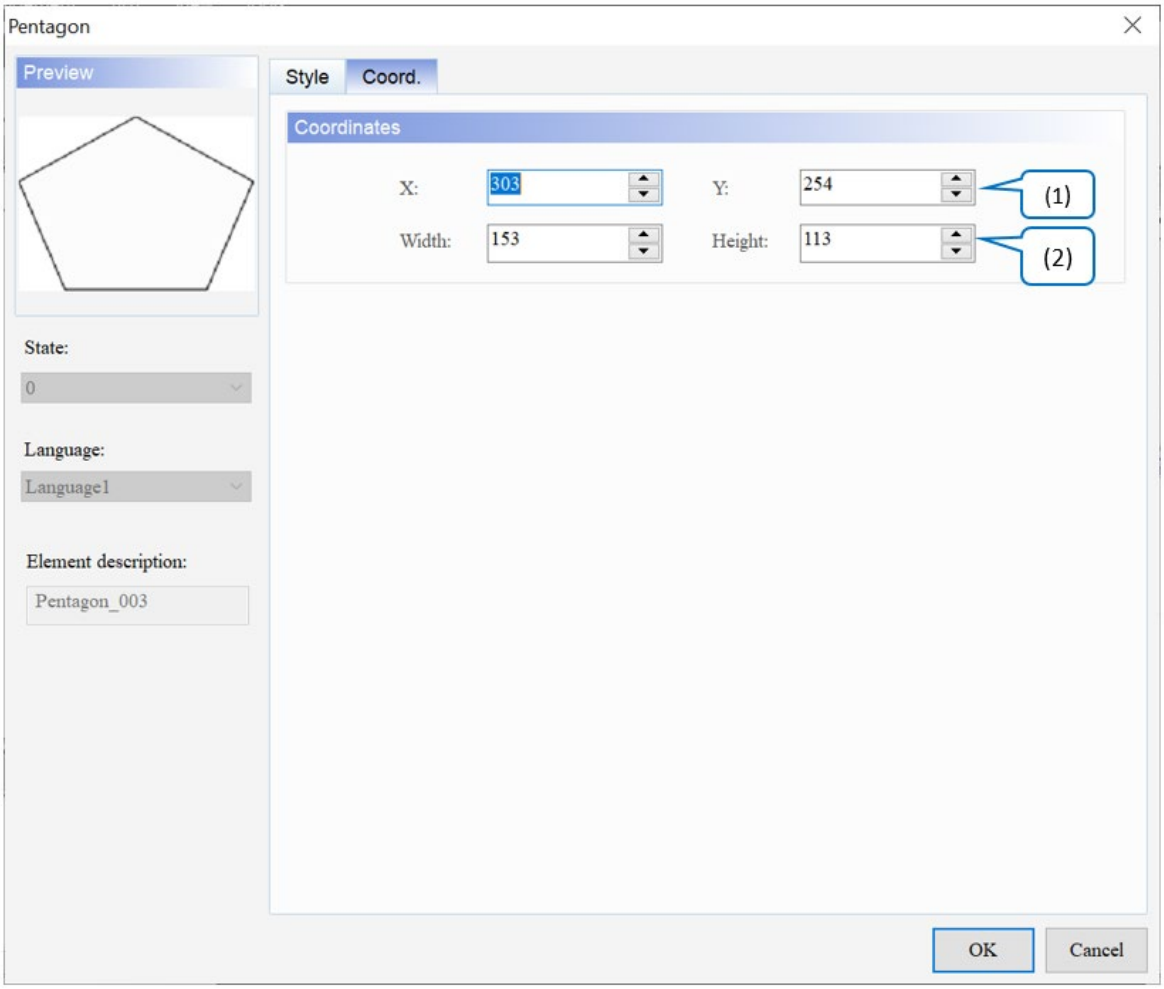


Figure 21 - 10: Pentagon element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.4 Pie Chart

On double-clicking the **Pie Chart** element, the property page appears as follows.

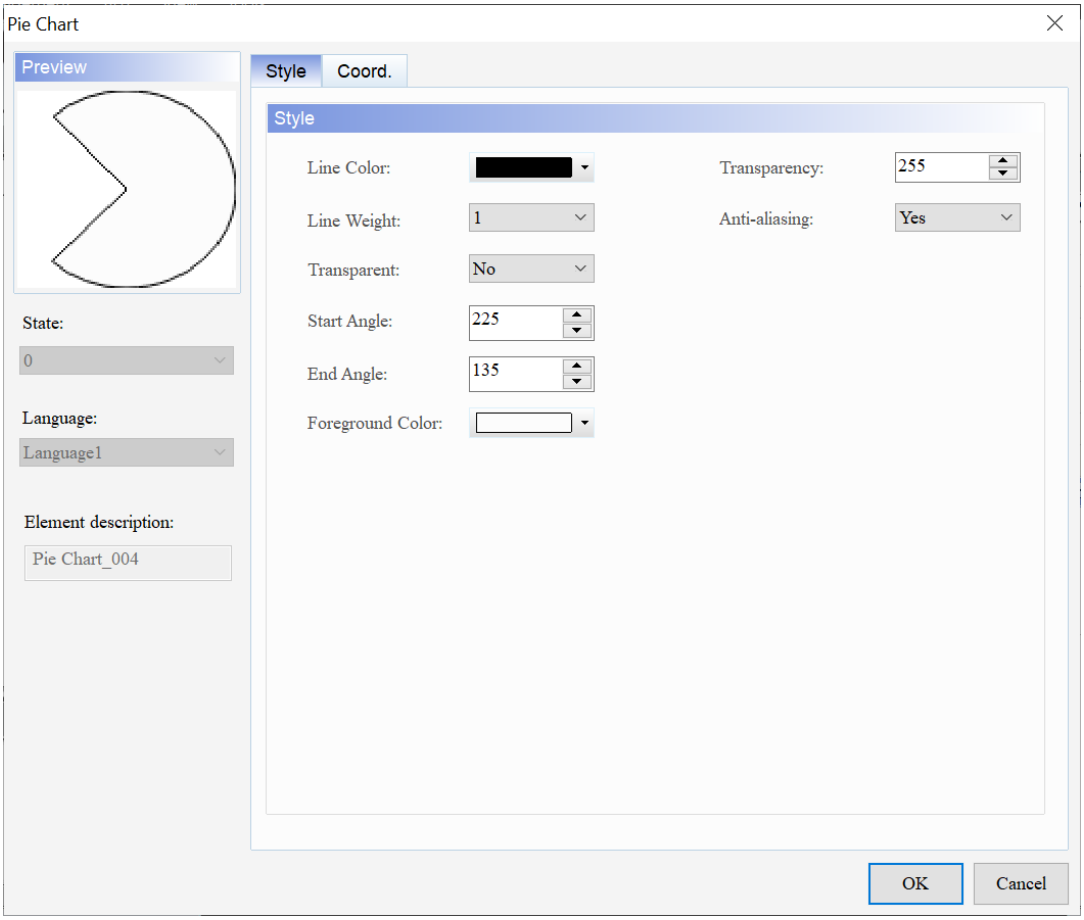


Figure 21 - 11: Pie Chart element property page

Pie Chart	
Function	**Description**
Preview	**Pie Chart** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Transparent, Start Angle, End Angle Foreground Color, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

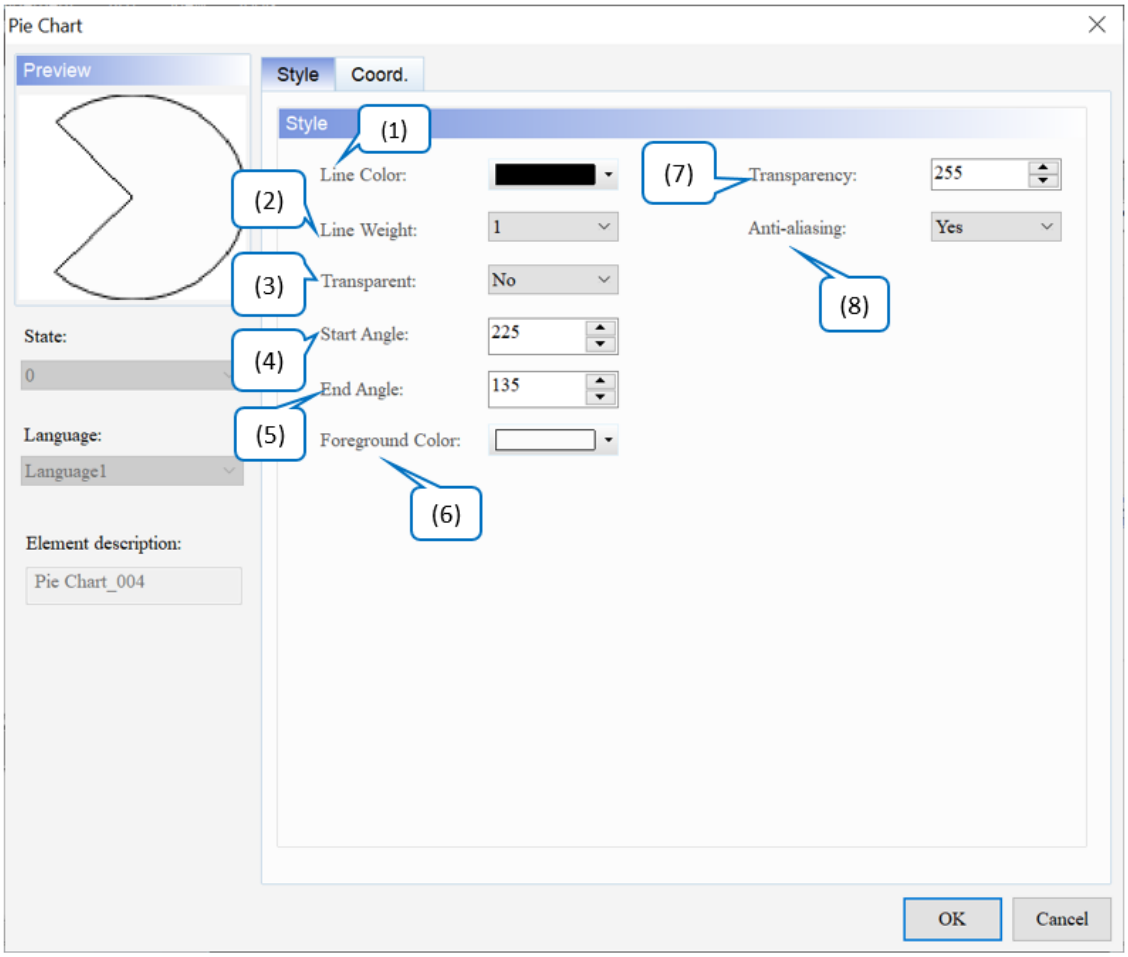
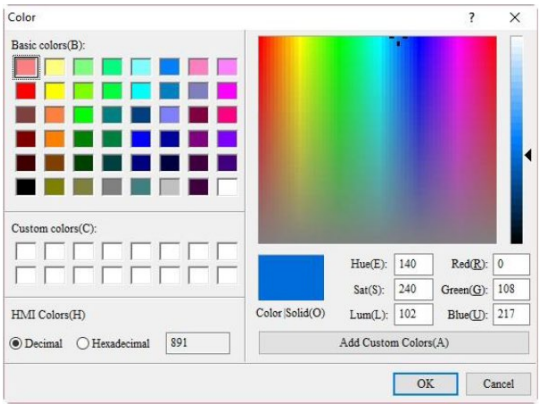
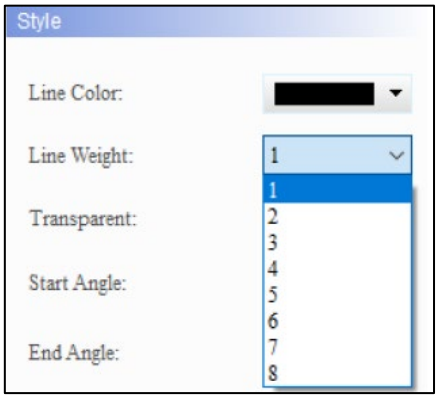
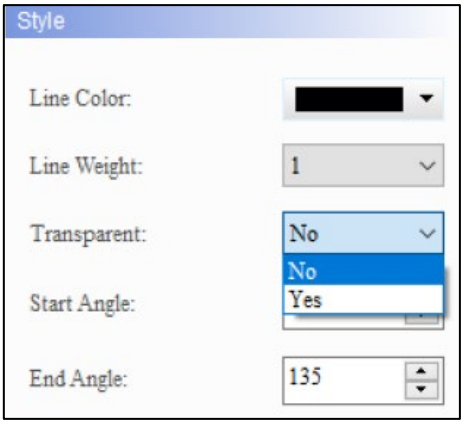
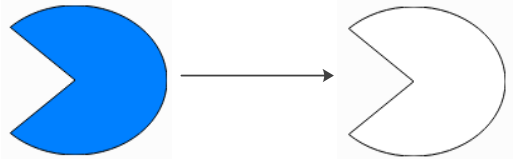
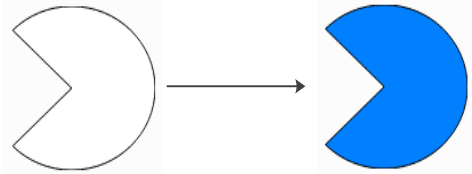
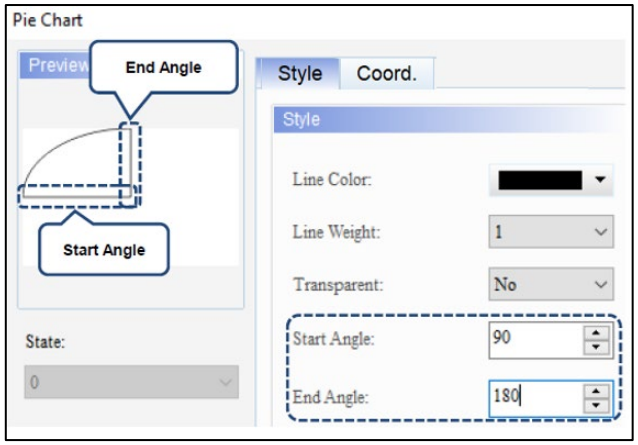
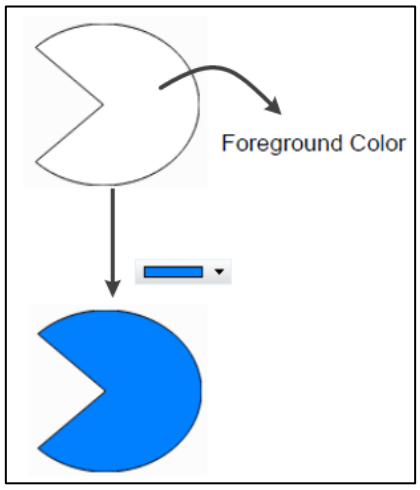
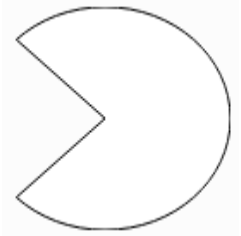
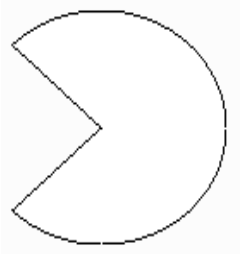


Figure 21 - 12: Pie Chart element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Line Weight</td><td>The line width setting ranges from 1 ~ 8. The default value is 1.
 
</td></tr>
<tr><td>(3)</td><td>Transparent</td><td>● Select Yes or No for this function. The default value is No.
 

● If users select Yes, the foreground color of the Pie Chart element is transparent and only the border color is displayed; if users select No, the foreground color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Start Angle</td><td>Set the opening angle for Pie Chart element with the Start Angle and End Angle settings. The default values are 225 and 135, respectively.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(5)</td><td>End Angle</td><td> 
</td></tr>
<tr><td>(6)</td><td>Foreground Color</td><td>Set the foreground color of the element. The default is .
 
</td></tr>
<tr><td>(7)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(8)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Coord.

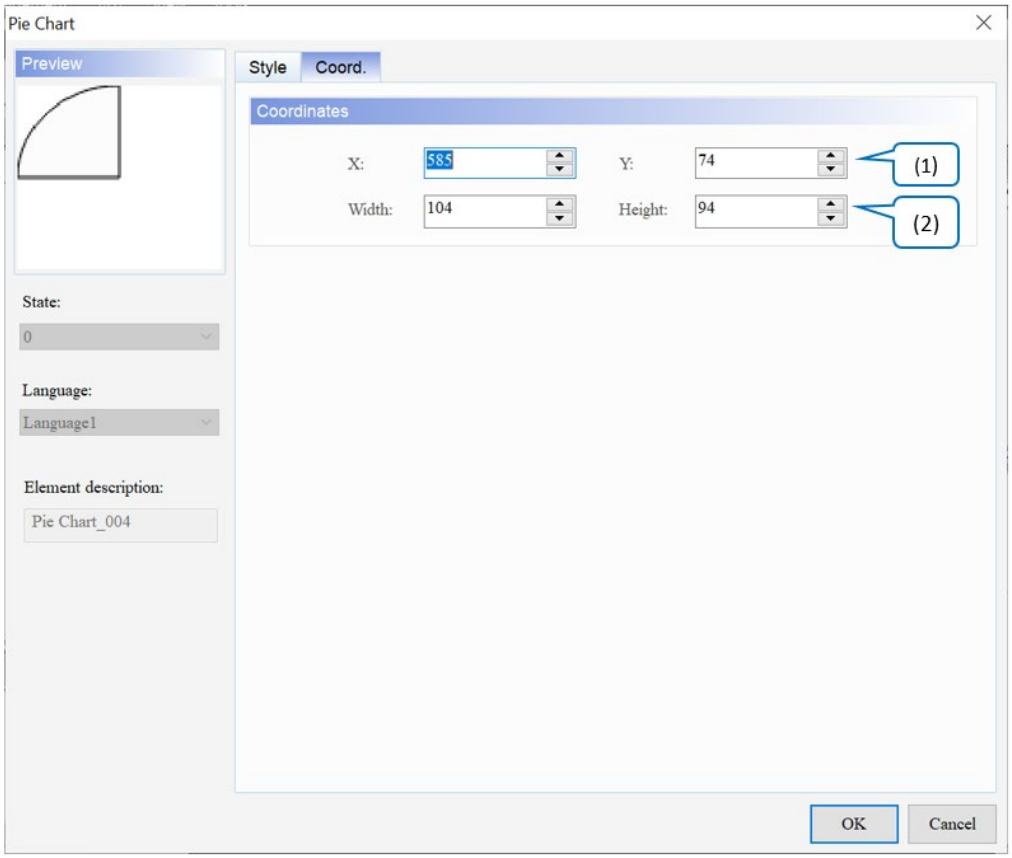


Figure 21 - 13: Pie Chart element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.5 Arc

On double-clicking the Arc element, the property page appears as follows.

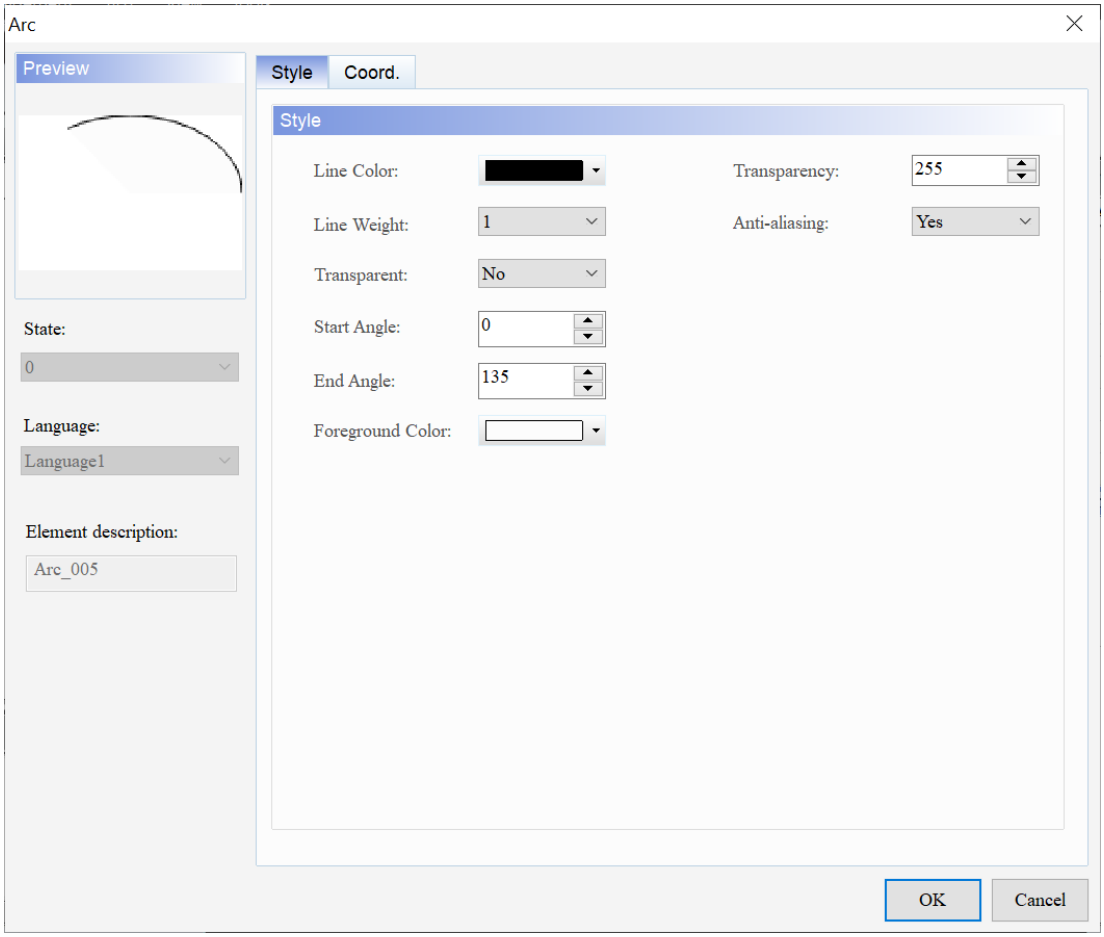


Figure 21 - 14: Arc element property page

Arc	
Function	**Description**
Preview	Arc element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Transparent, Start Angle, End Angle Foreground Color, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

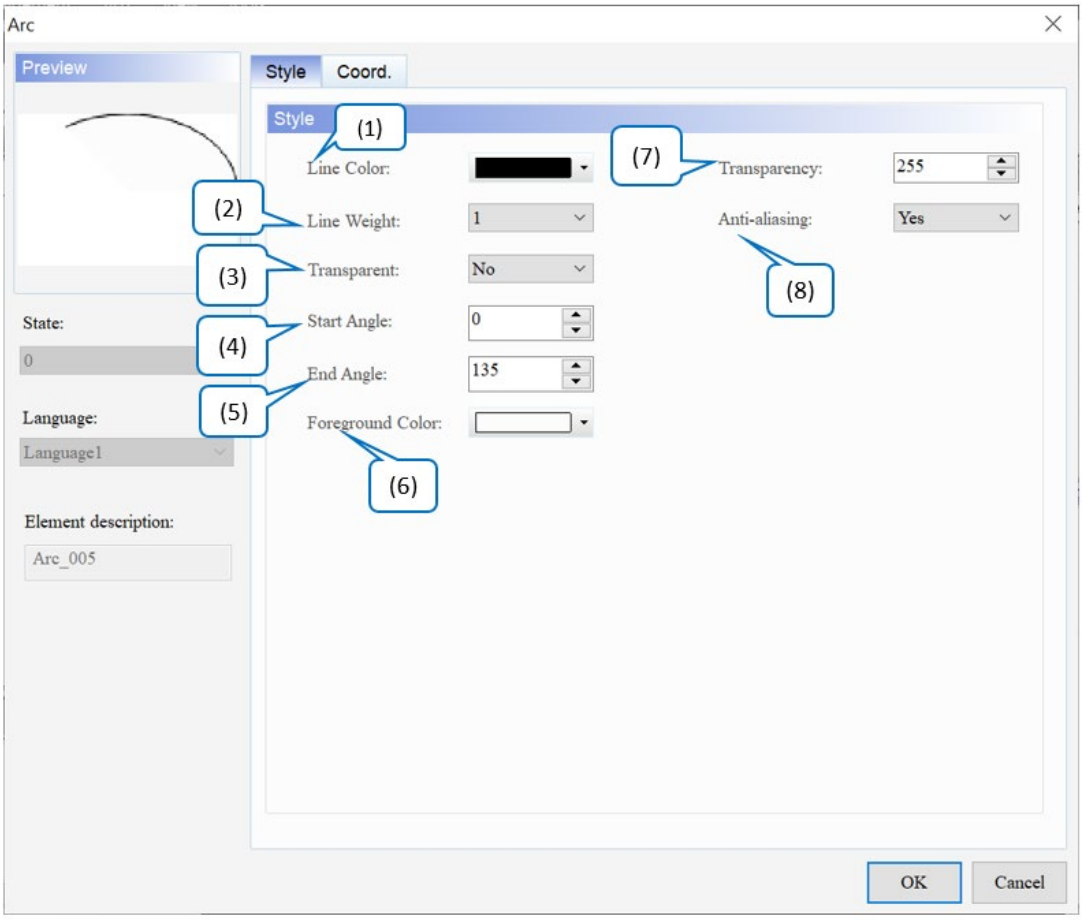
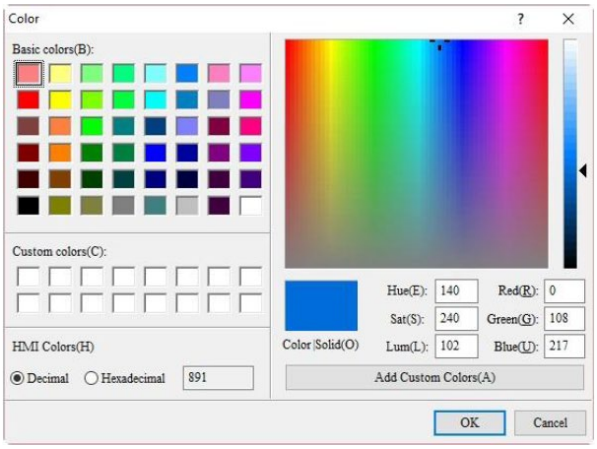
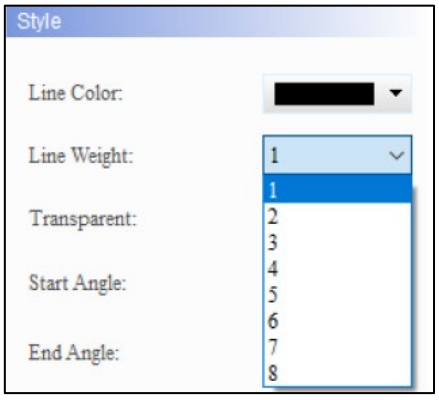
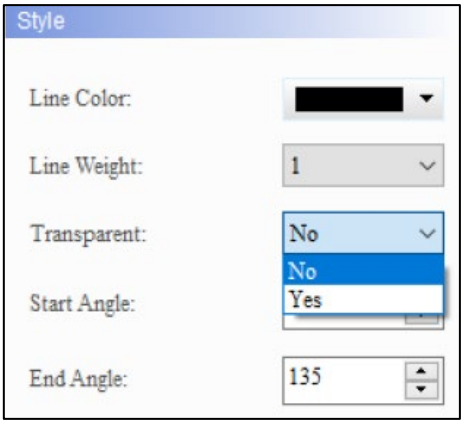
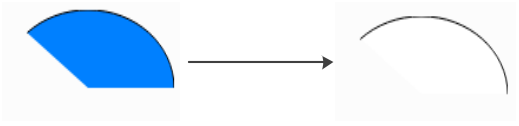
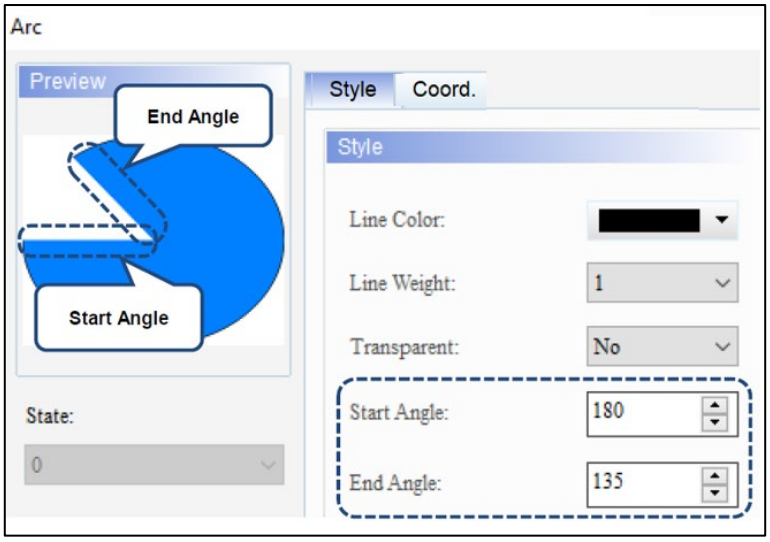
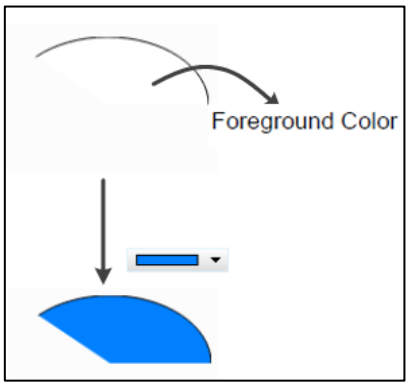


Figure 21 - 15: Arc element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(2)</td><td>Line Weight</td><td>The line width setting ranges from 1 ~ 8. The default value is 1.
 
</td></tr>
<tr><td>(3)</td><td>Transparent</td><td>● Select Yes or No for this function. The default value is No.
 

● If users select Yes, the foreground color of the Arc element is transparent and only the border color is displayed; if users select No, the foreground color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Start Angle</td><td>Set the opening angle for Arc element with the Start Angle and End Angle settings. The default values are 0 and 135, respectively.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(5)</td><td>End Angle</td><td> 
</td></tr>
<tr><td>(6)</td><td>Foreground Color</td><td>Set the foreground color of the element. The default is  .
 
</td></tr>
<tr><td>(7)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(8)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Coord.

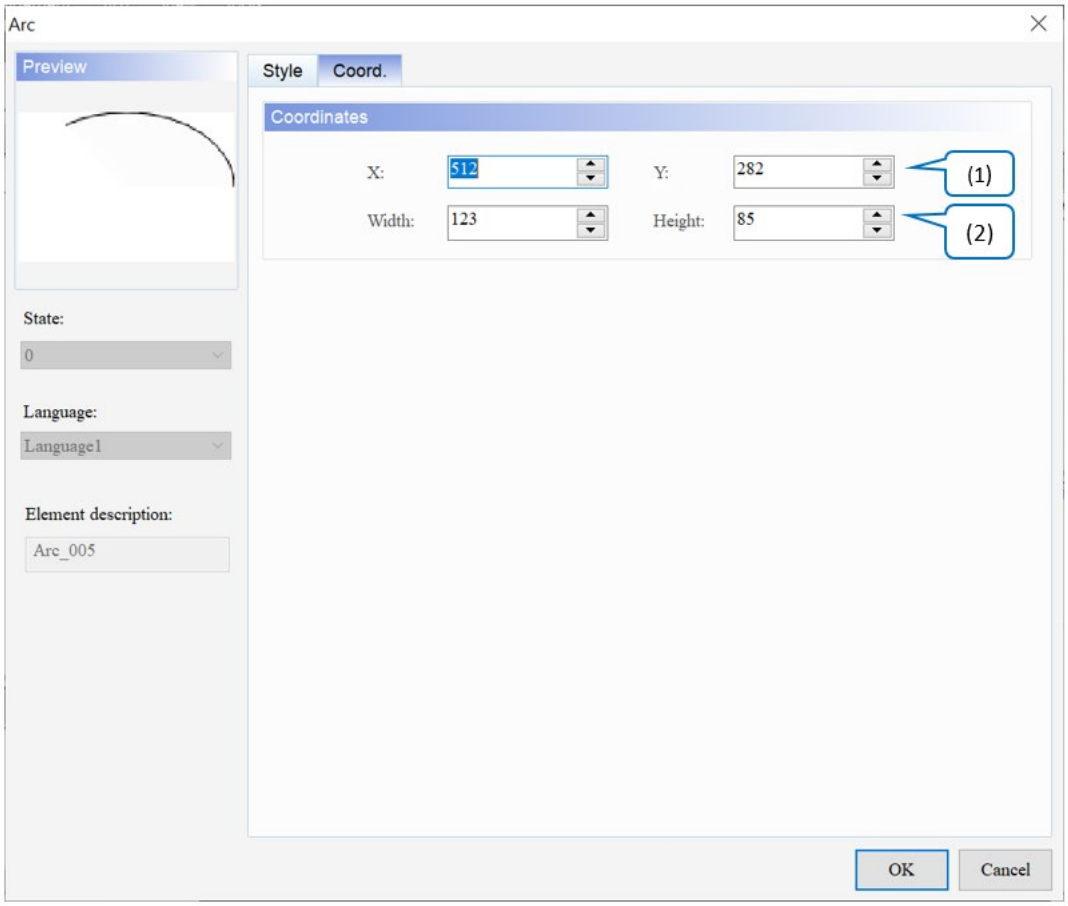


Figure 21 - 16: Arc element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.6 Hexagon

On double-clicking the **Hexagon** element, the property page appears as follows.

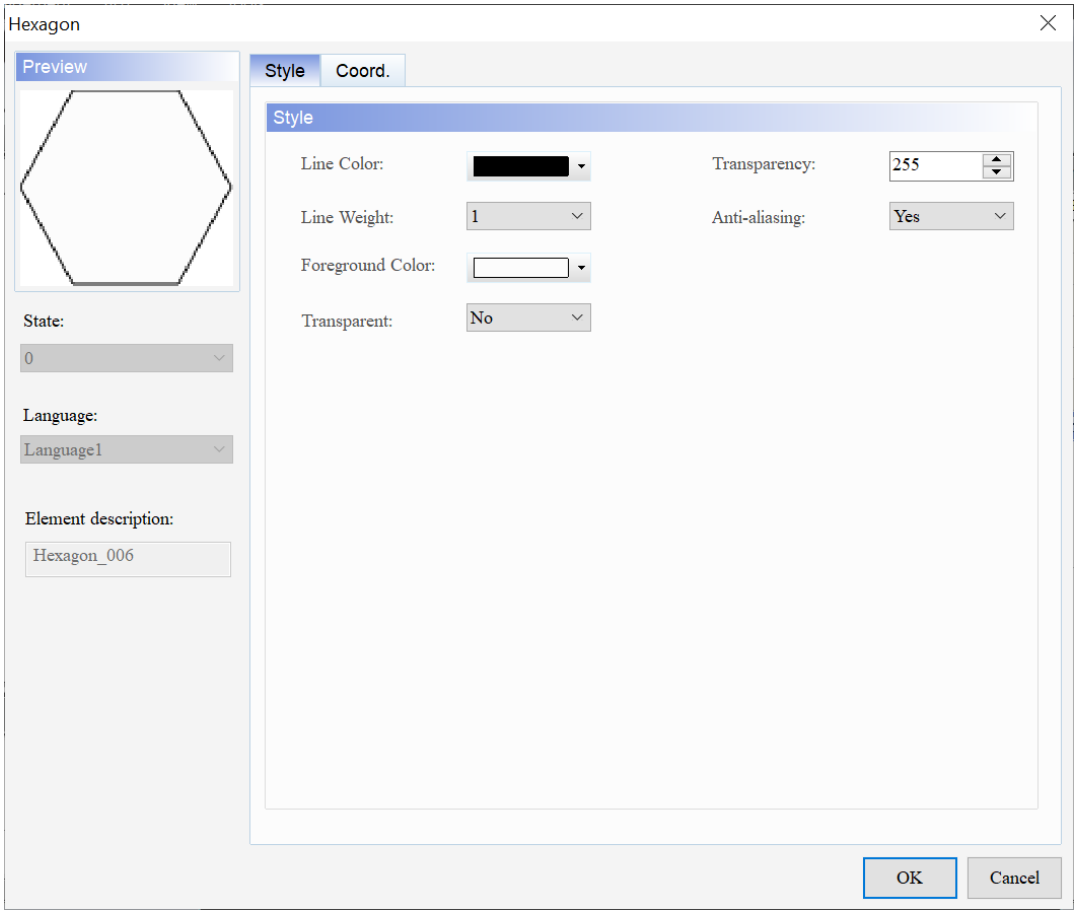


Figure 21 - 17: Hexagon element property page

Hexagon	
Function	**Description**
Preview	**Hexagon** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

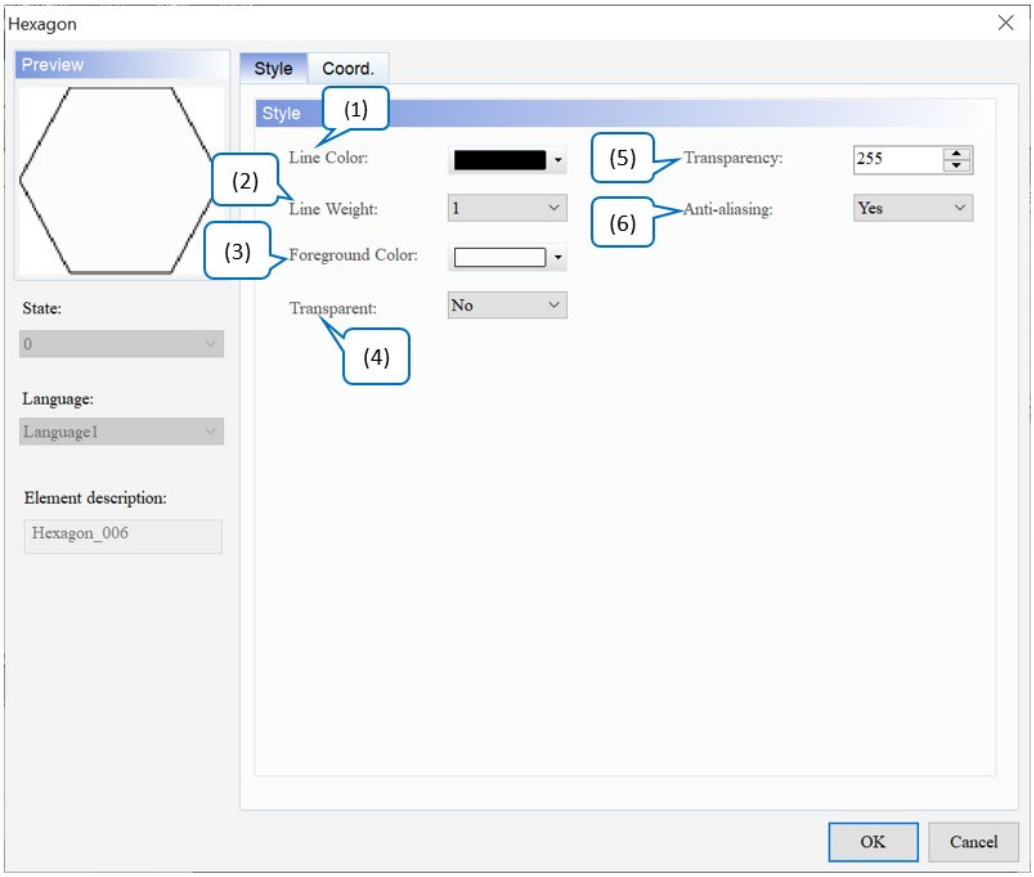
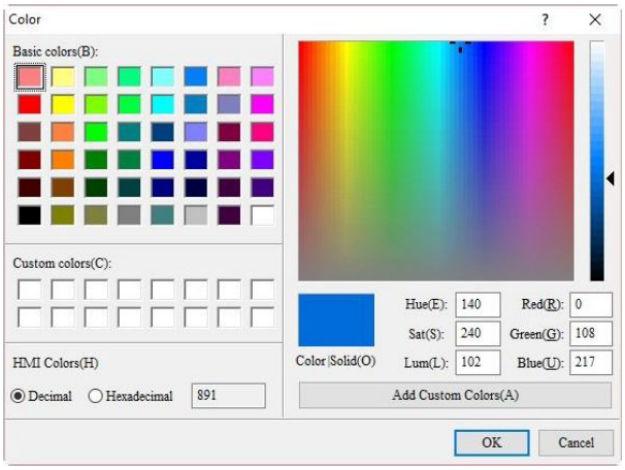
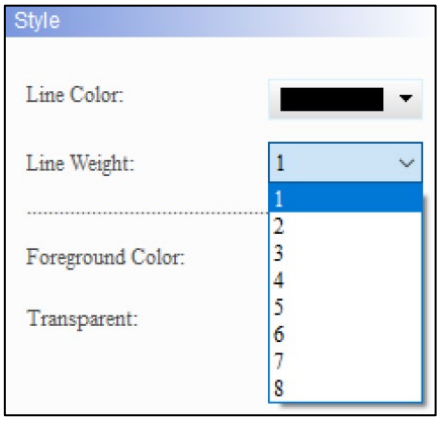
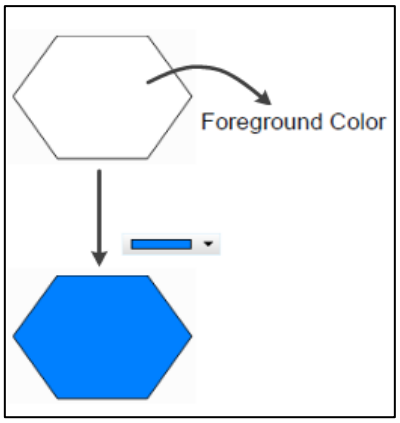
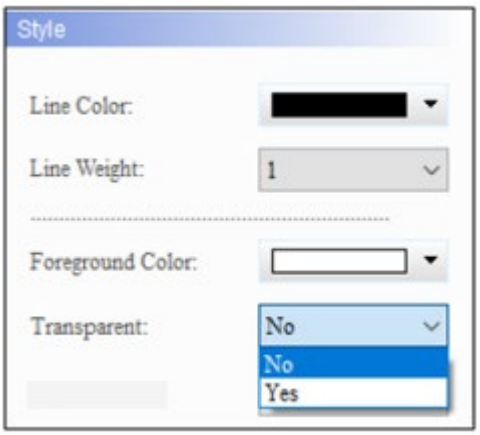
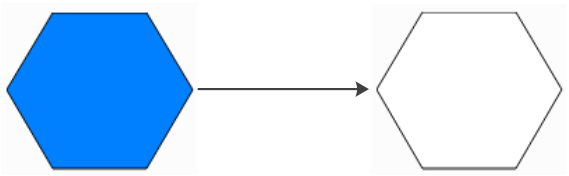
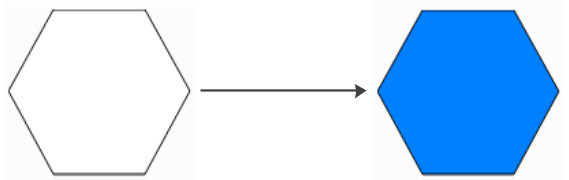
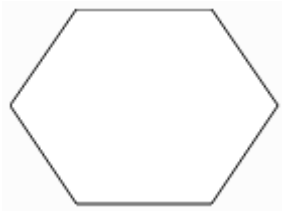
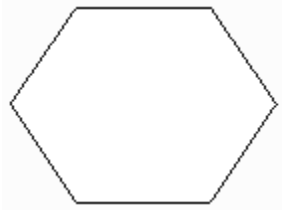


Figure 21 - 18: Hexagon element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 

No.	Function	Description
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is . 
(4)	Transparent	● Select Yes or No for this function. The default value is No.  ● If users select Yes, the foreground color of the Hexagon element is transparent and only the border color is displayed; if users select No, the foreground

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td rowspan="3">(6)</td><td rowspan="3">Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Coord.

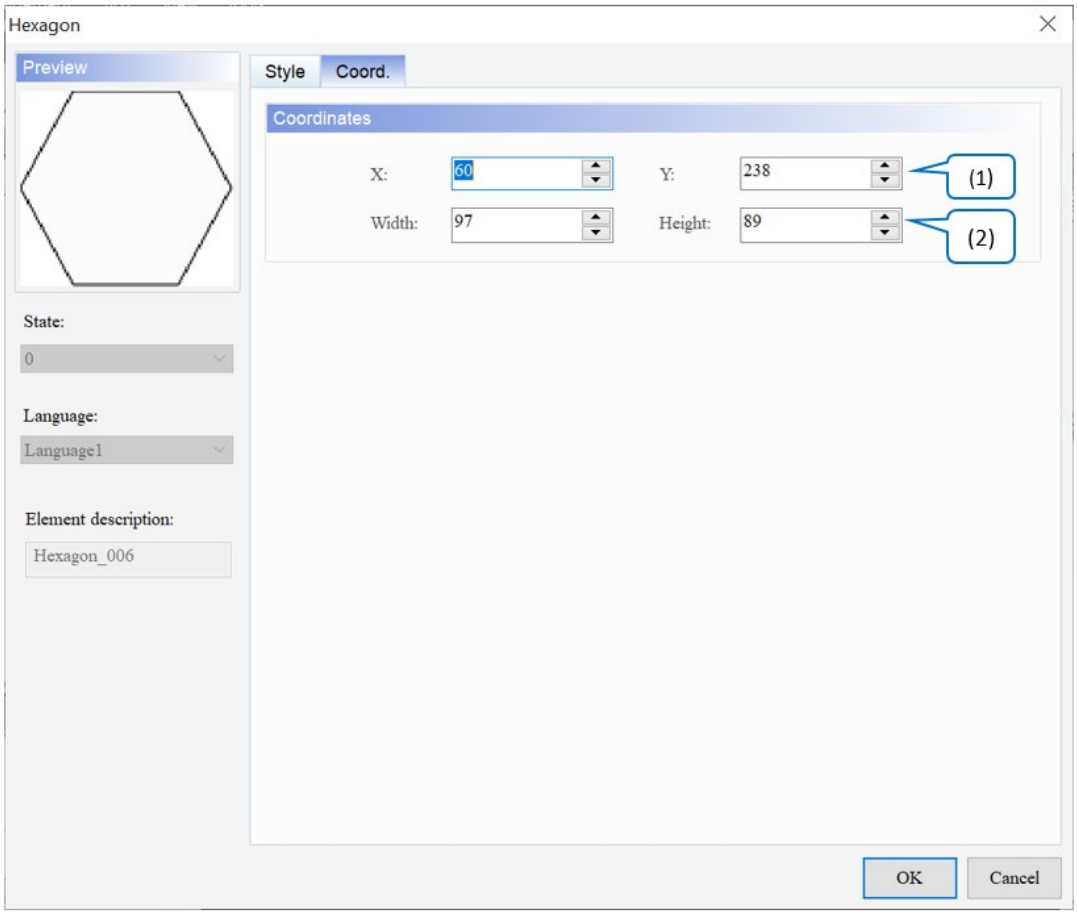


Figure 21 - 19: Hexagon element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.7 Star Shape

On double-clicking the **Star Shape** element, the property page appears as follows.

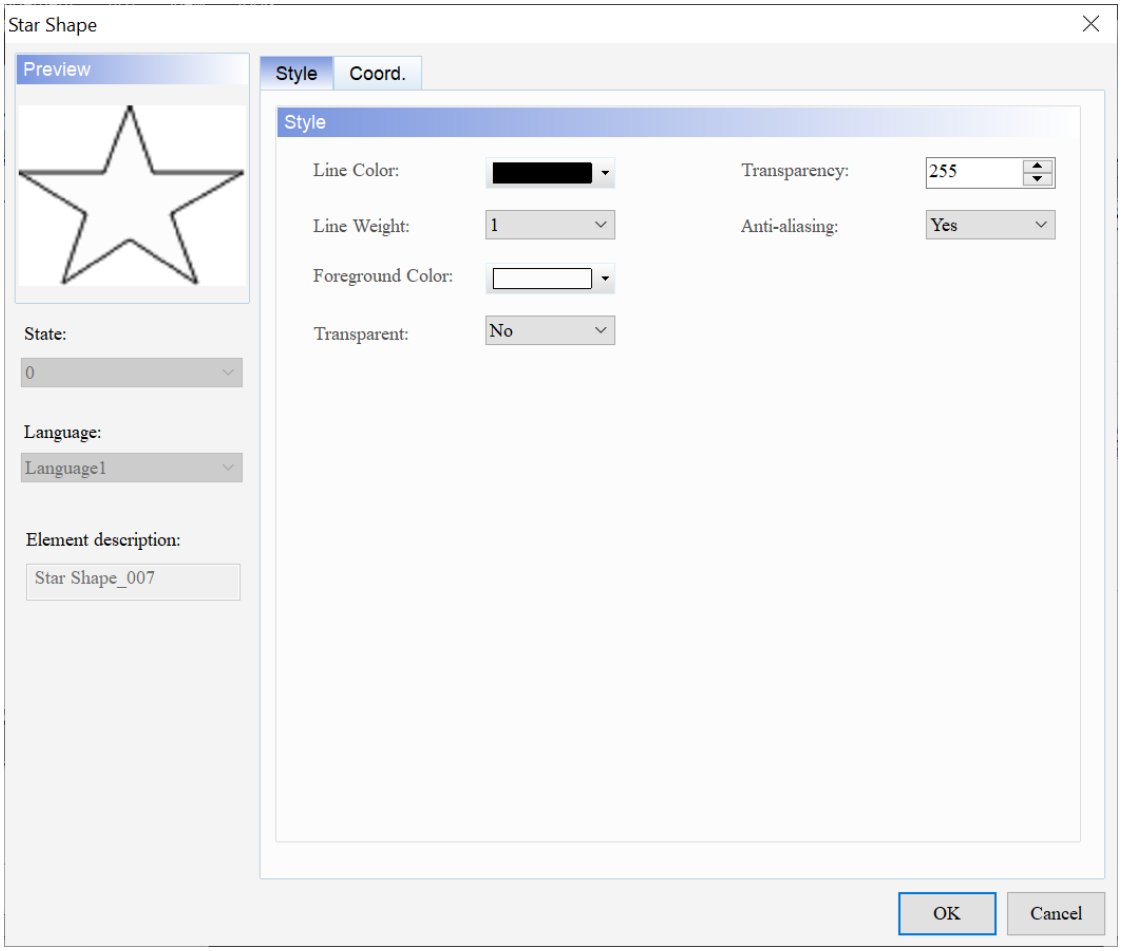


Figure 21 - 20: Star Shape element property page

Star Shape	
Function	**Description**
Preview	**Star Shape** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

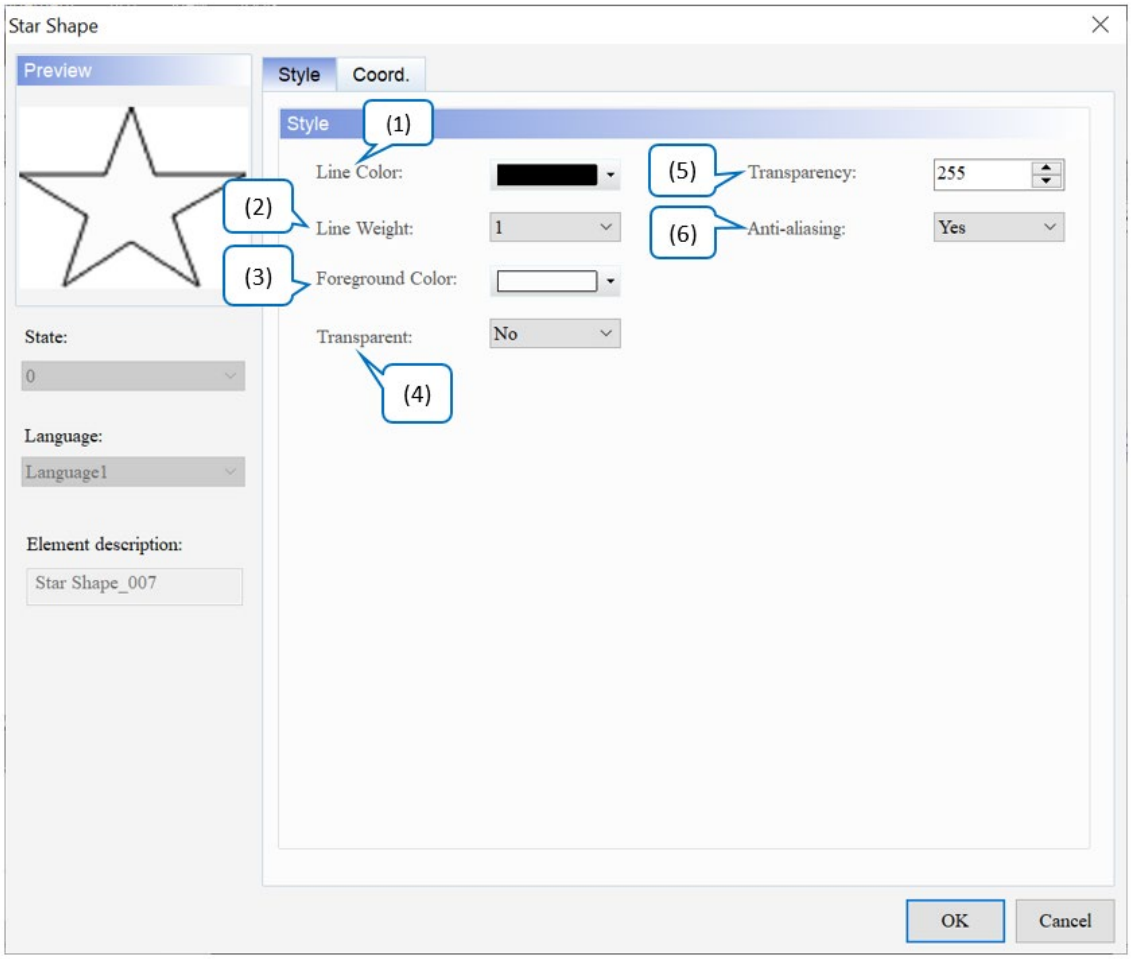
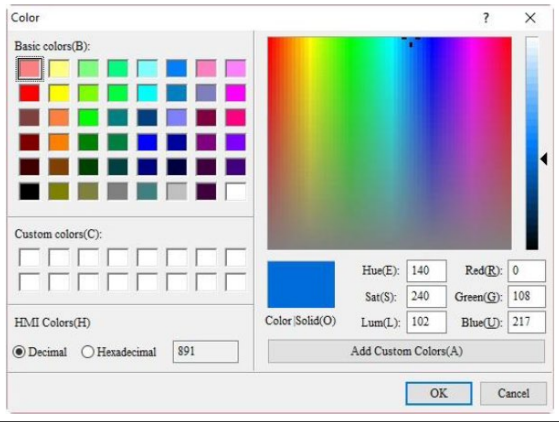
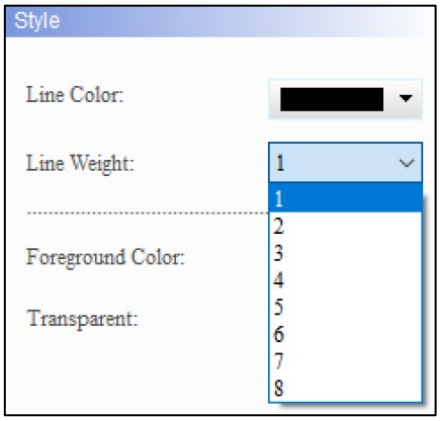
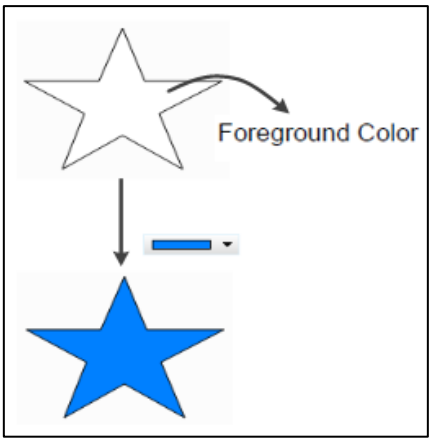
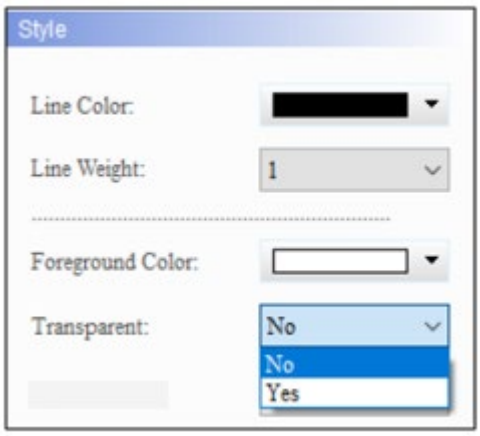
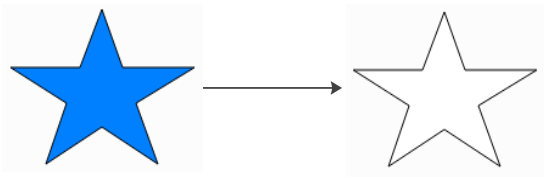
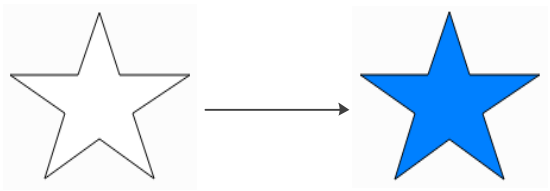


Figure 21 - 21: Star Shape element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 

No.	Function	Description
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is . 
(4)	Transparent	● Select Yes or No for this function. The default value is No.  ● If users select Yes, the foreground color of the Star Shape element is transparent and only the border color is displayed; if users select No, the foreground

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(6)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Coord.

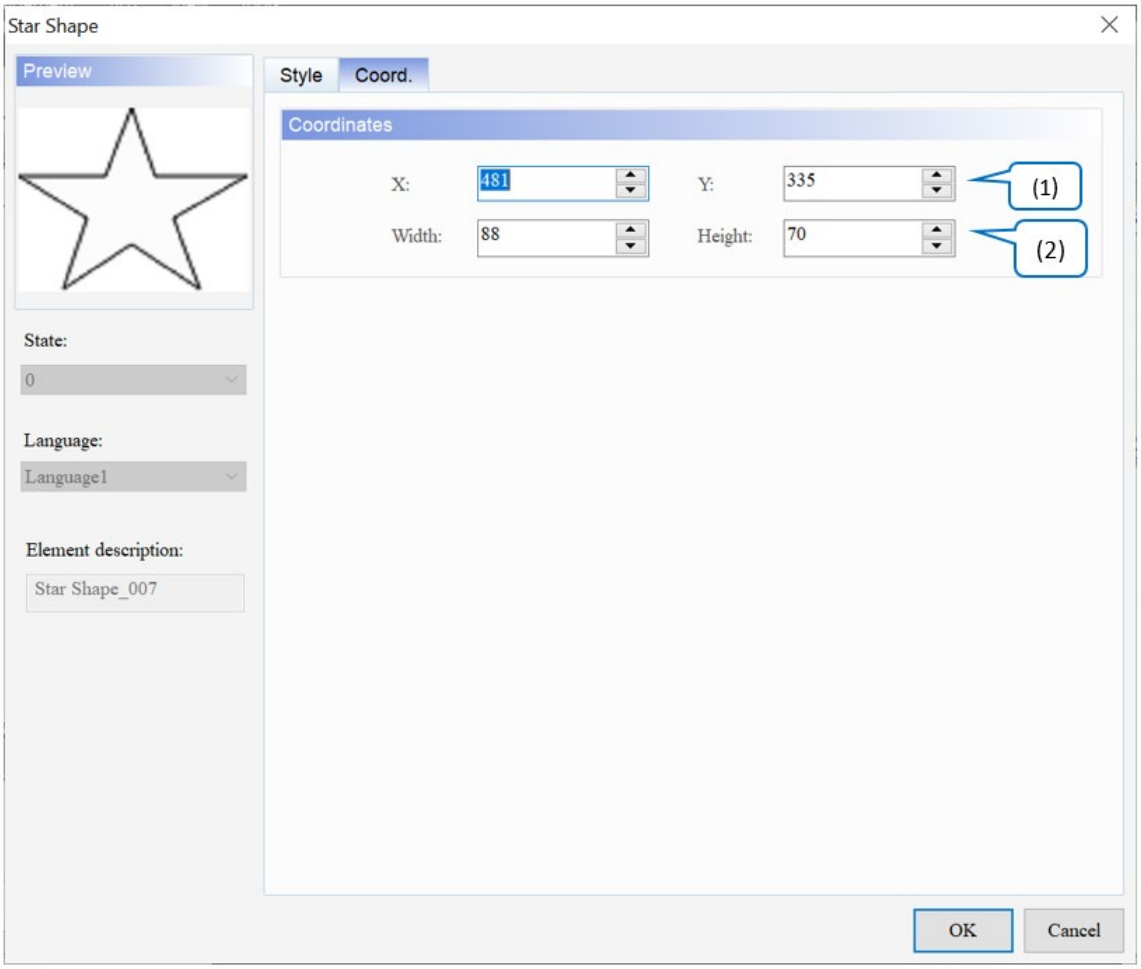


Figure 21 - 22: Star Shape element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.8 Triangle

On double-clicking the **Triangle** element, the property page appears as follows.

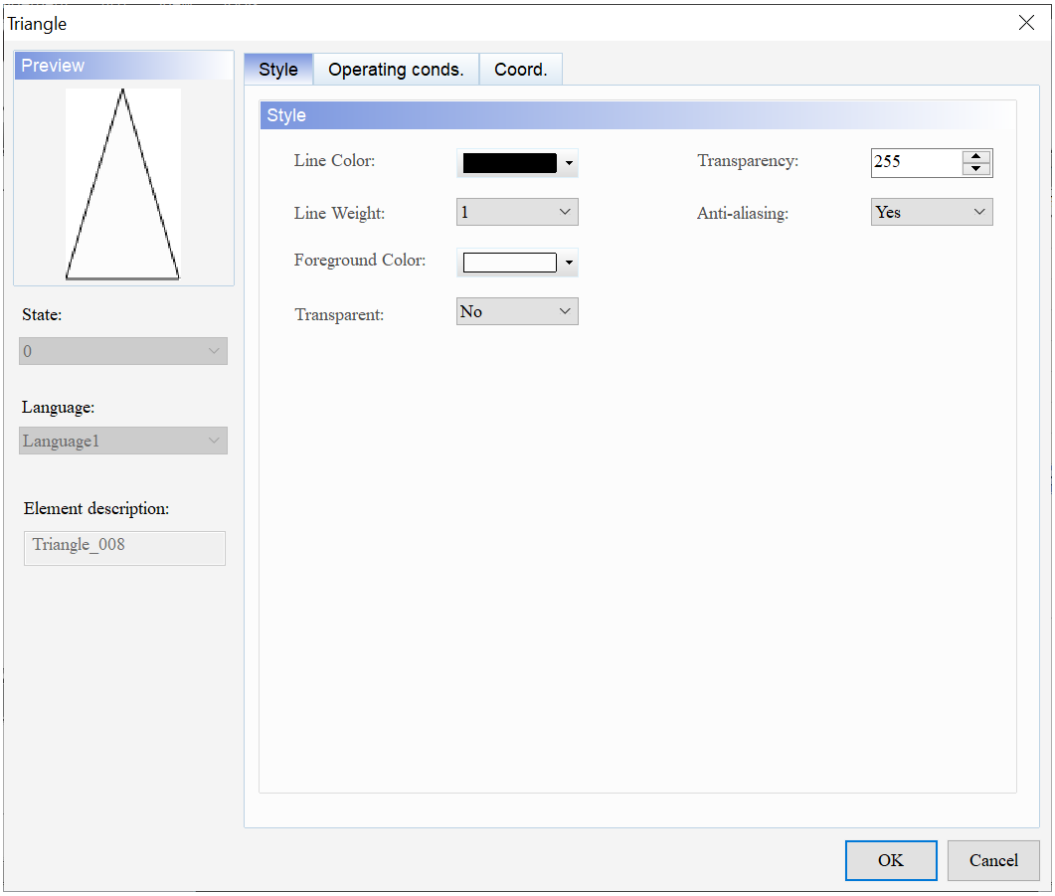


Figure 21 - 23: Triangle element property page

Triangle	
Function	**Description**
Preview	**Triangle** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Operating conds.	Set Invisible Address and Invisible State
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

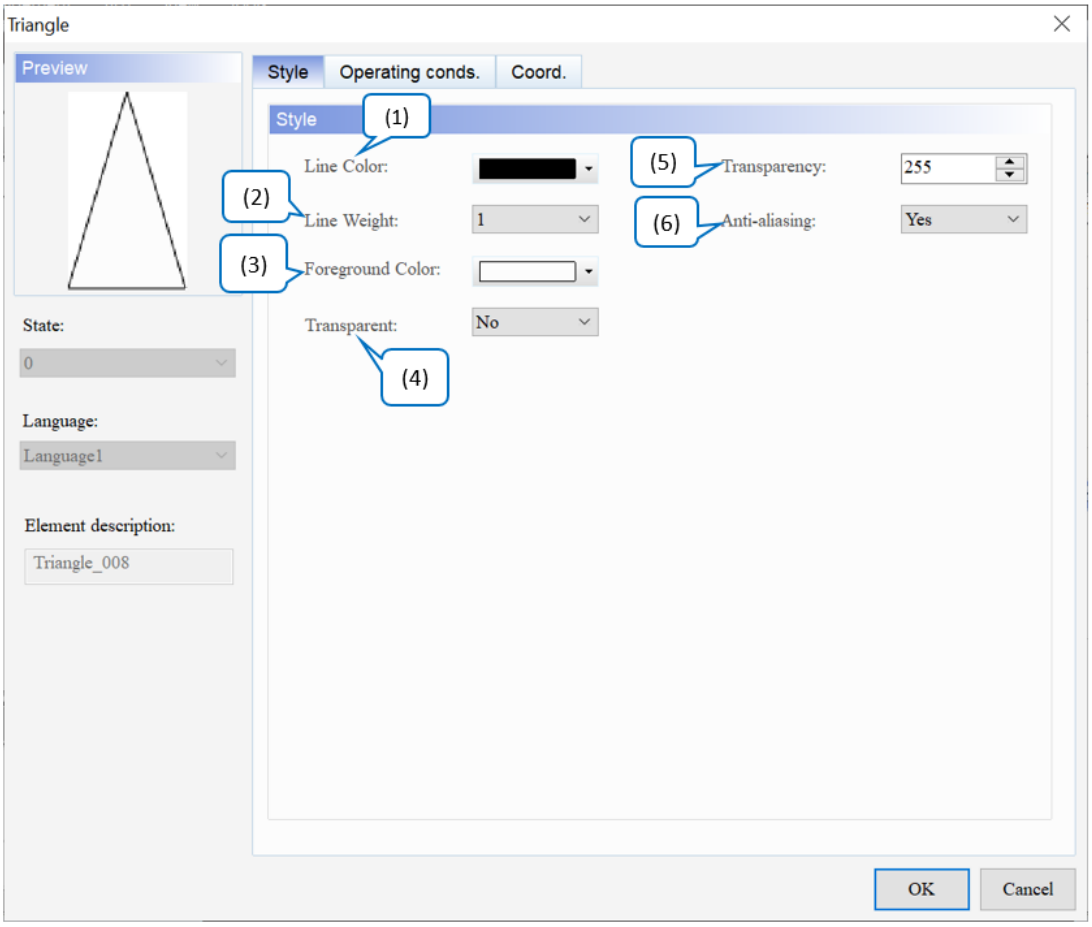
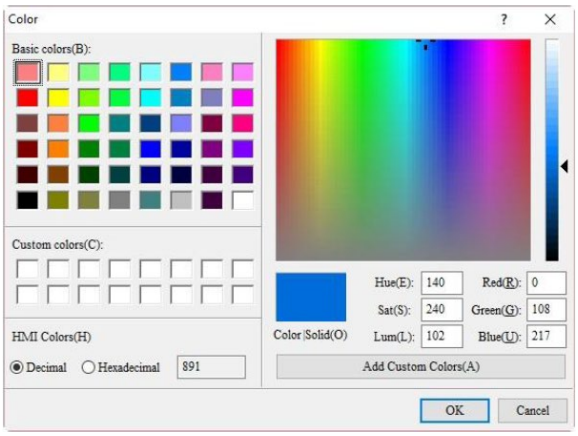
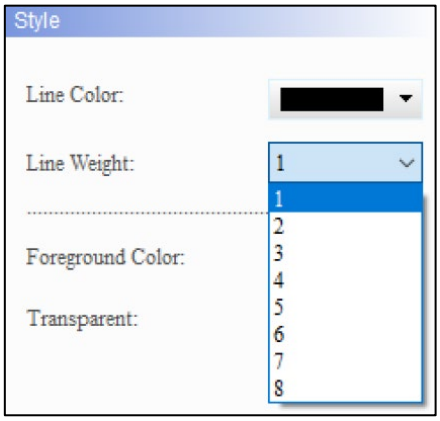
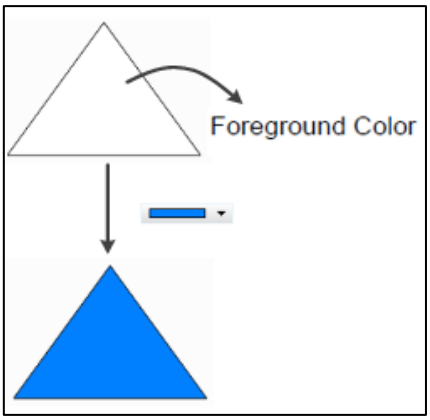
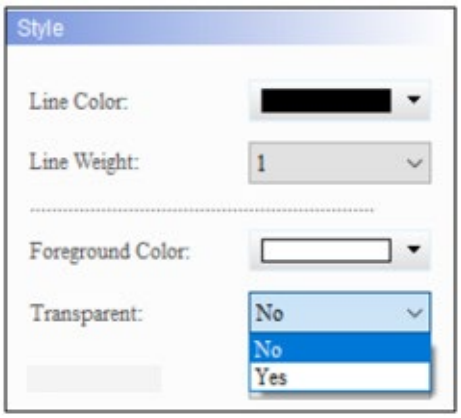
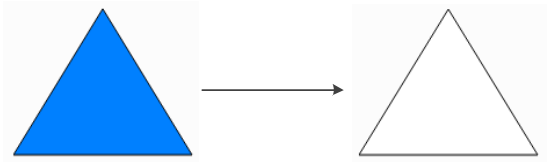
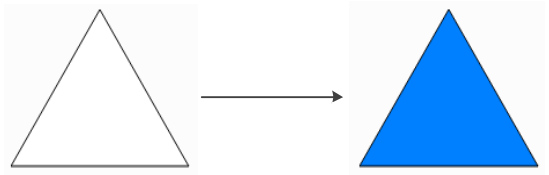
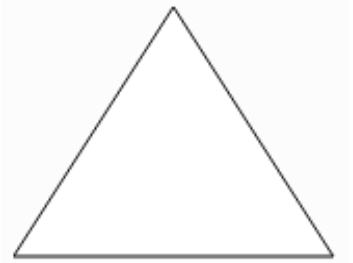
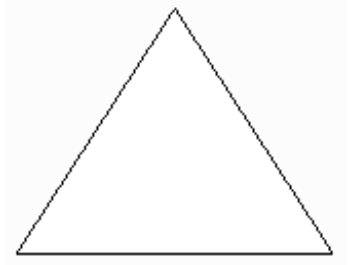


Figure 21 - 24: Triangle element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 

No.	Function	Description
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is . 
(4)	Transparent	● Select Yes or No for this function. The default value is No.  ● If users select Yes, the foreground color of the Triangle element is transparent and only the border color is displayed; if users select No, the foreground

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(6)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Operating conds.

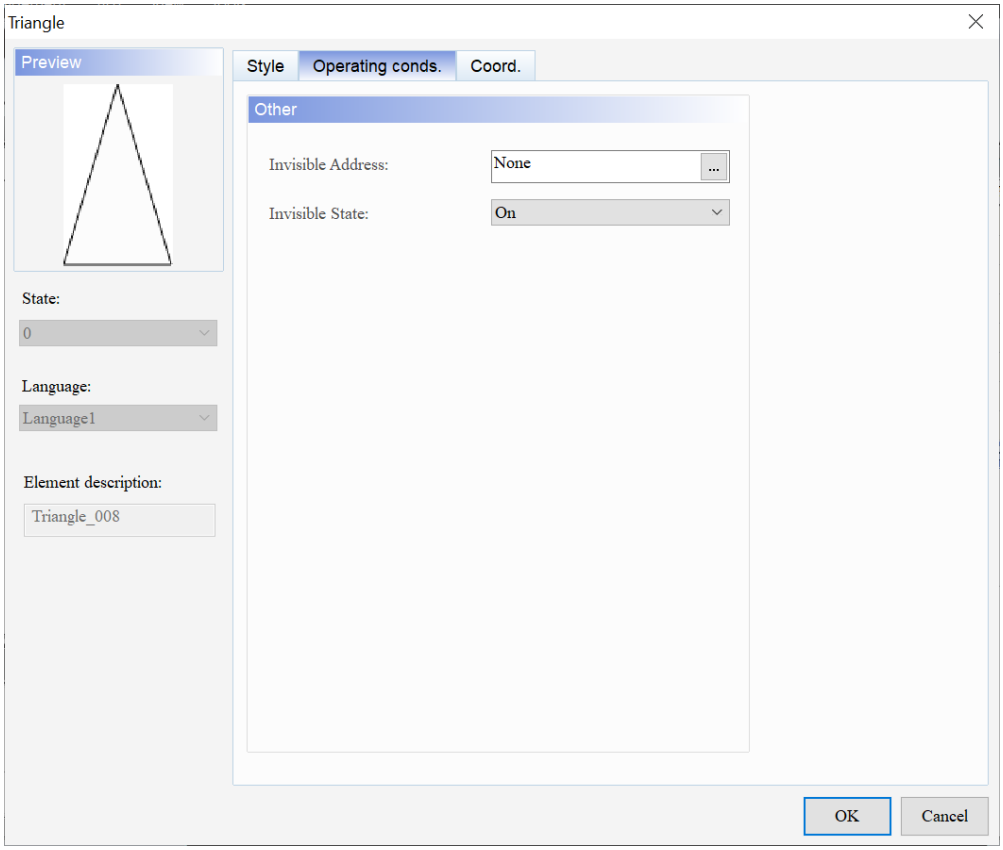
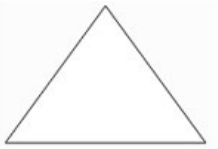


Figure 21 - 25: Triangle element Operating conds. property page

No.	Function	Description
(1)	Invisible Address	● The **Invisible Address** mainly allows users to hide an element through this address. ● If the **Invisible State** is set to On/Off, the button element is hidden through the address defined in the **Invisible Address** field. The default value is **On**. ● The following example explains **Invisible Address** usage: 1. Create a button and set its address to $9.0, then set the **Invisible Address** of the element to be hidden to $9.0. 2. To hide the element, first press the $9.0 button.
	Invisible State is On	

			Element disappear	Invisible Address $9.0 ON
		Invisible State is Off		Invisible Address $9.0 ON
			Element disappear	Invisible Address $9.0 OFF

- Coord.

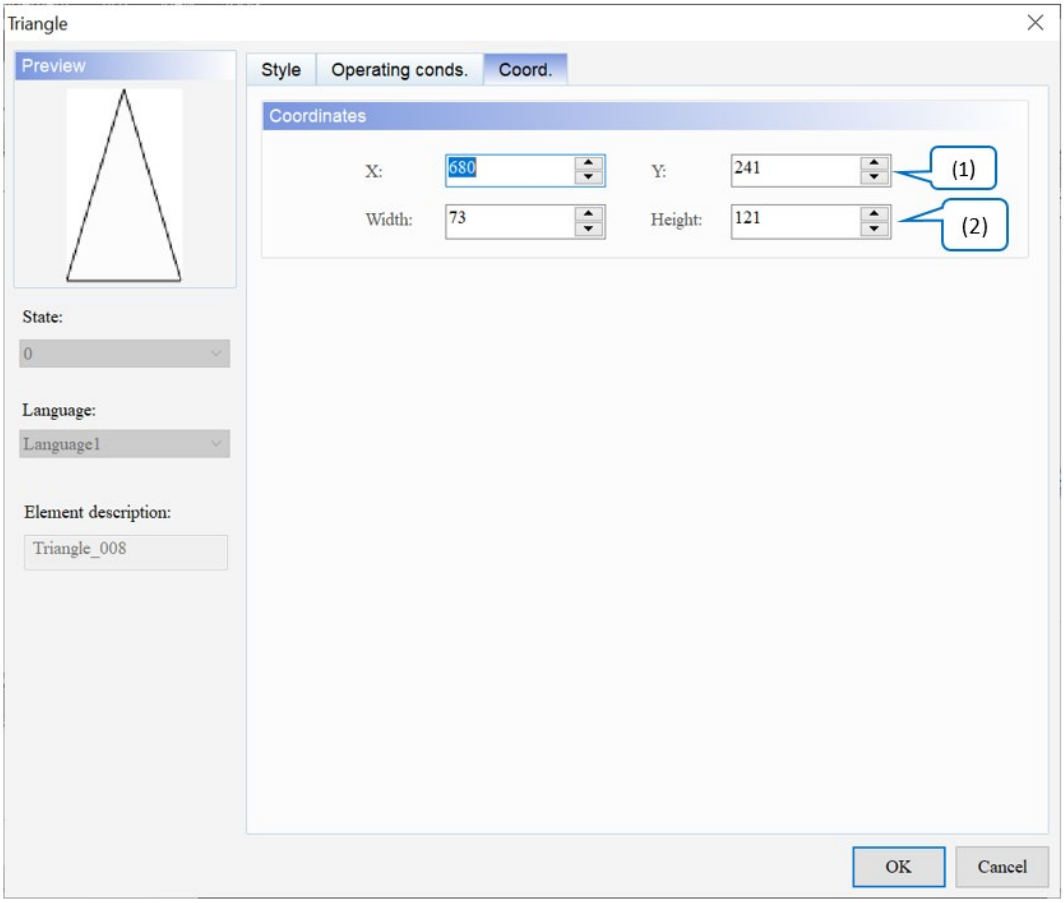


Figure 21 - 26: Triangle element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.9 Hollow Circle

On double-clicking the **Hollow Circle** element, the property page appears as follows.

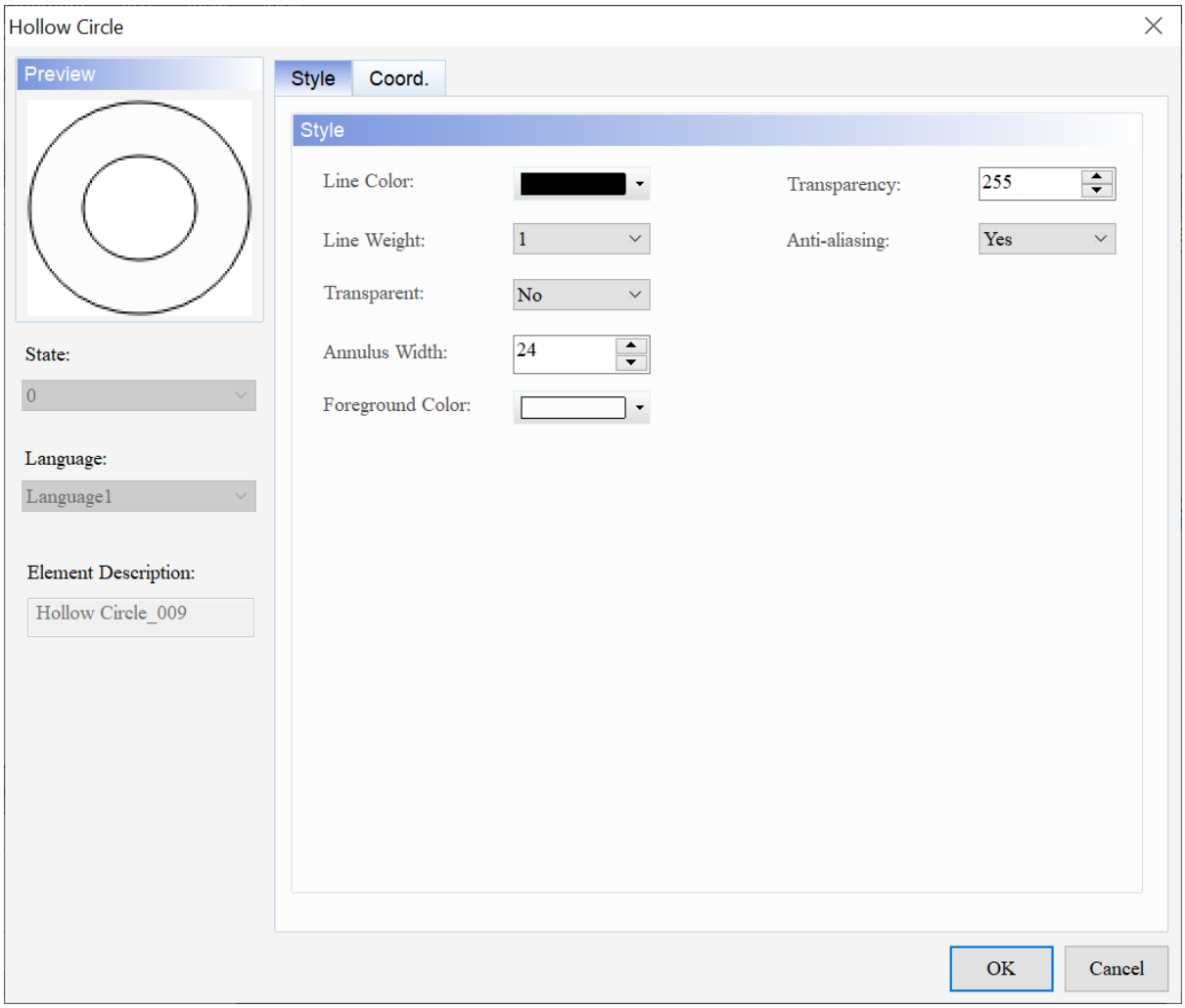


Figure 21 - 27: Hollow Circle element property page

Hollow Circle	
Function	**Description**
Preview	**Hollow Circle** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Transparent, Annulus Width, Foreground Color, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

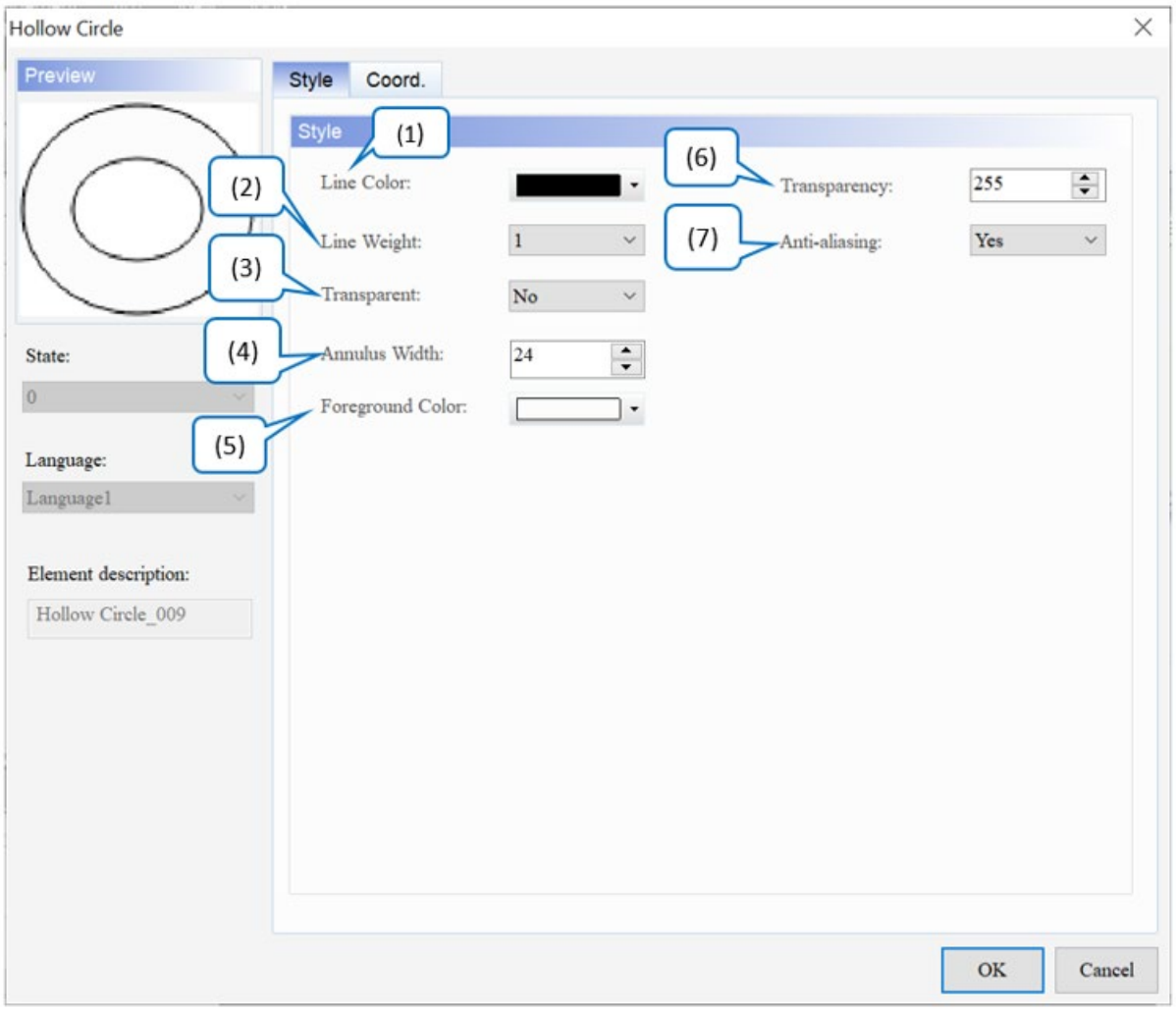
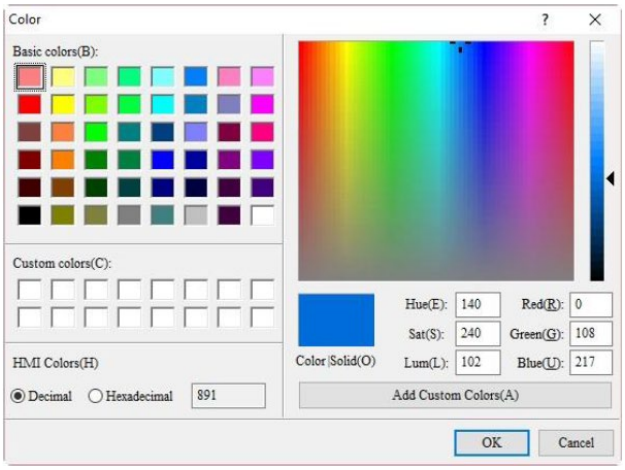
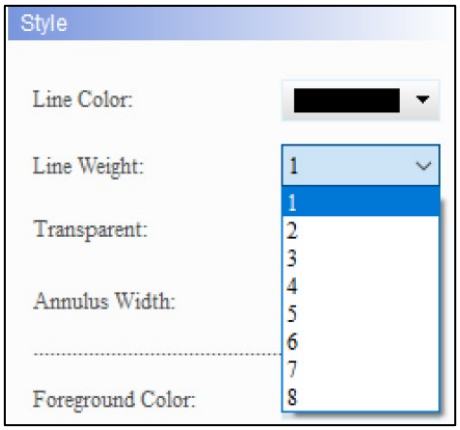
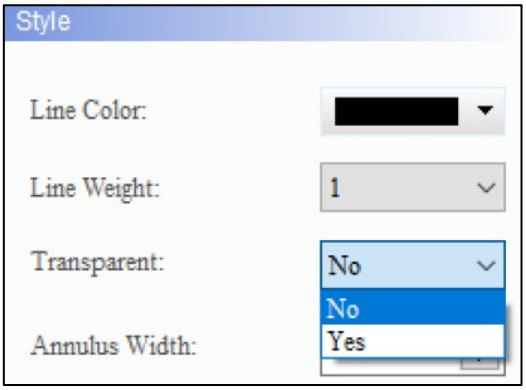
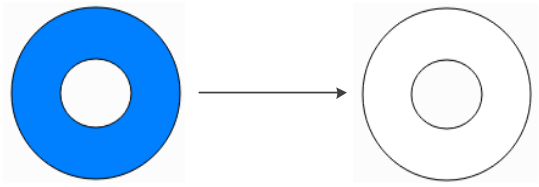
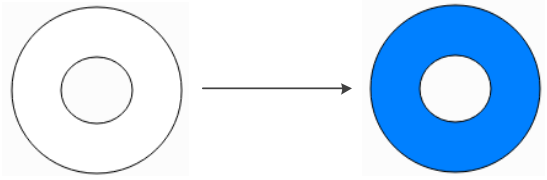
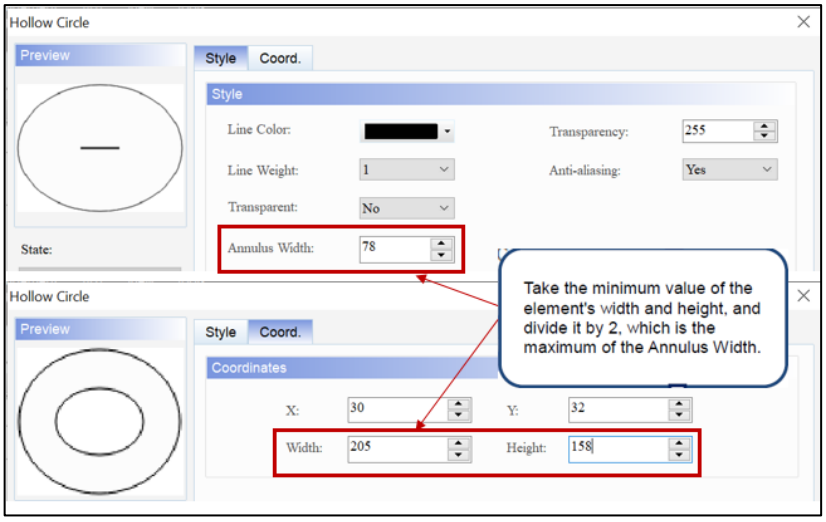
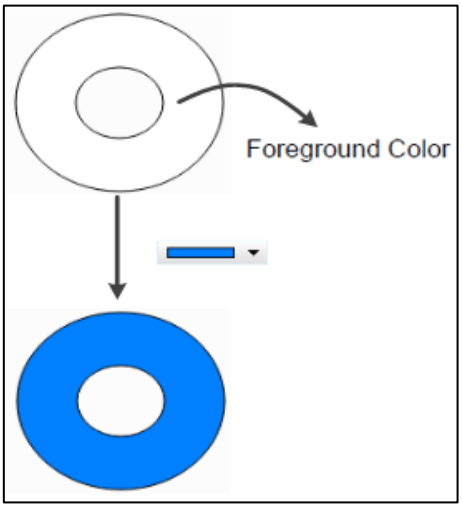
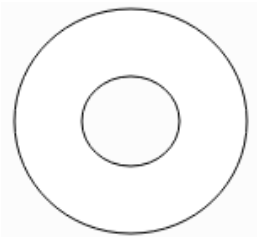
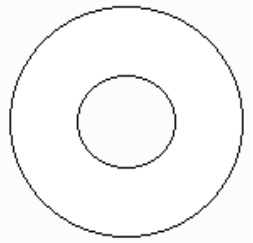


Figure 21 - 28: Hollow Circle element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is **1**. 
(3)	Transparent	● Select Yes or No for this function. The default value is **No**.  ● If users select Yes, the foreground color of the **Hollow Circle** element is transparent and only the border color is displayed; if users select No, the foreground

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Annulus Width</td><td>The maximum of the Annulus Width is determined by taking the minimum value of the element's width and height, and dividing it by 2. The default value is 24.
 
</td></tr>
<tr><td>(5)</td><td>Foreground Color</td><td>Set the foreground color of the element. The default is  .
 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>(5)</td><td>Transparency</td><td colspan="2">Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td rowspan="3">(7)</td><td rowspan="3">Anti-aliasing</td><td colspan="2">The Anti-aliasing function is available for this element. The default value is Yes.</td></tr>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table>

- Coord.

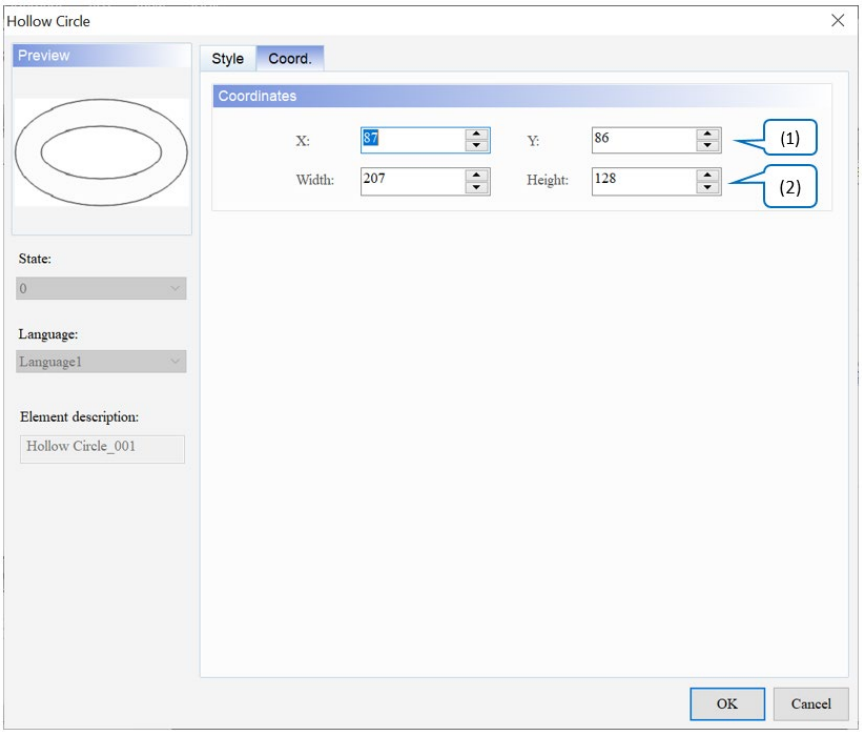


Figure 21 - 29: Hollow Circle element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.10 Stop Circle

On double-clicking the **Stop Circle** element, the property page appears as follows.

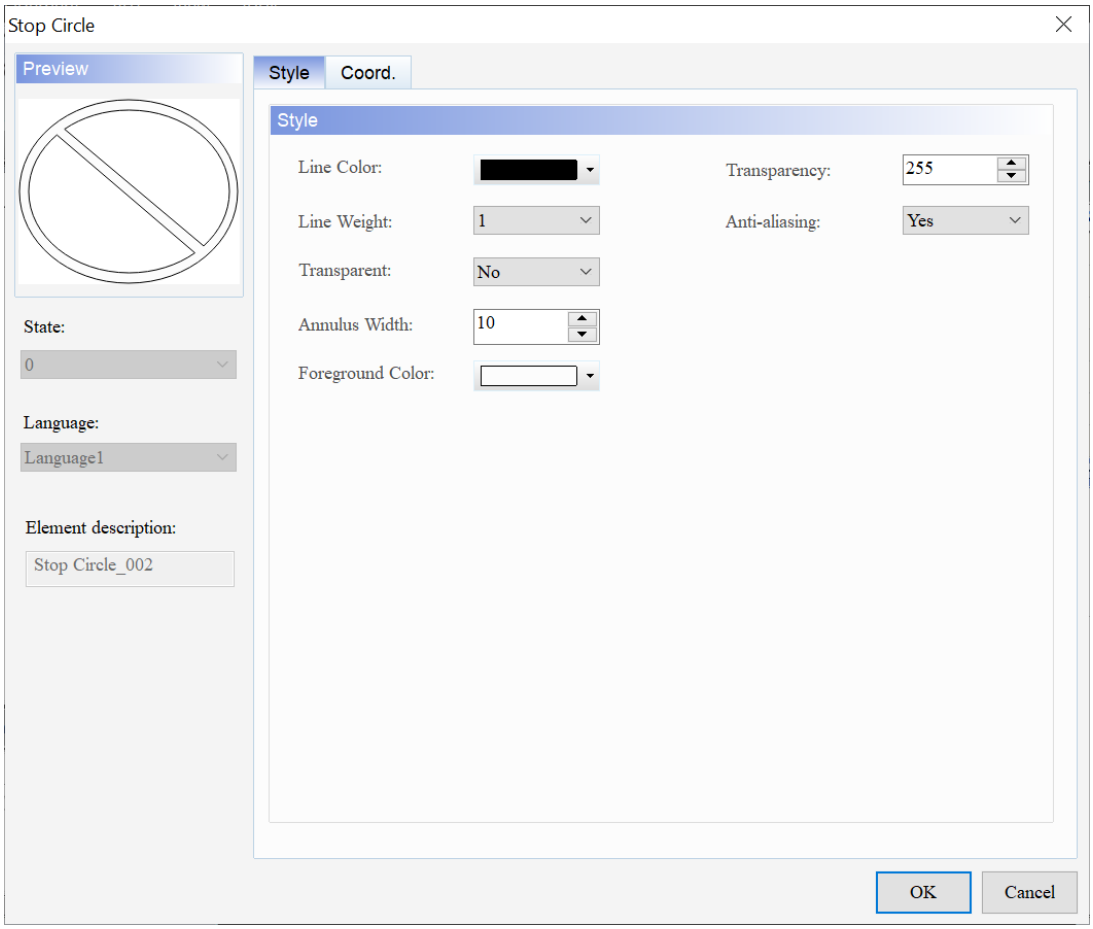


Figure 21 - 30: Stop Circle element property page

Stop Circle	
Function	**Description**
Preview	**Stop Circle** element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Transparent, Annulus Width, Foreground Color, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

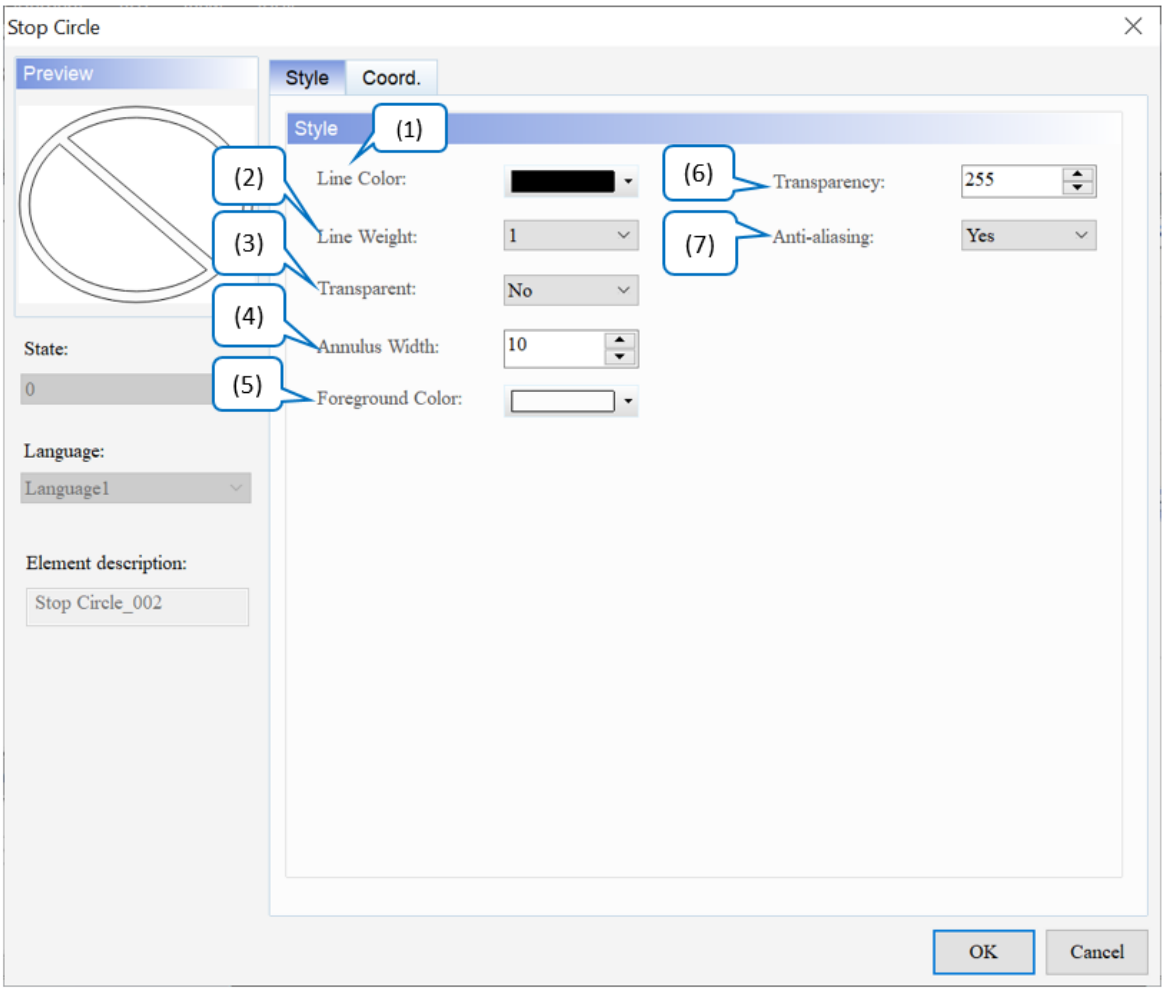
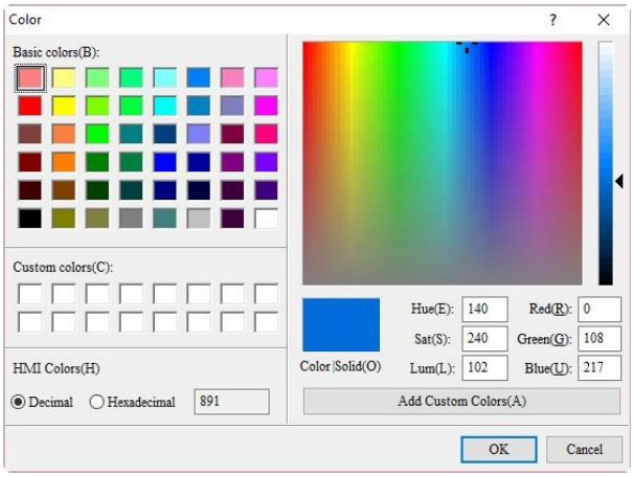
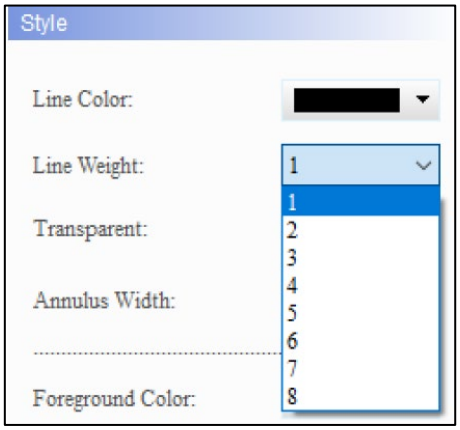
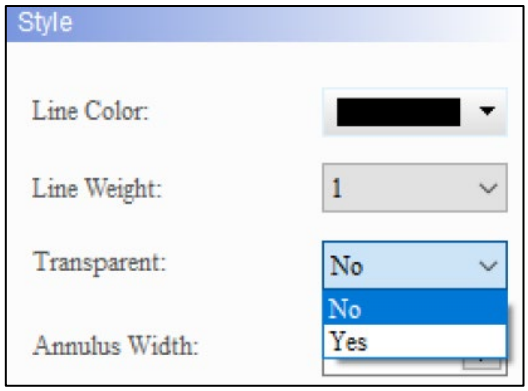
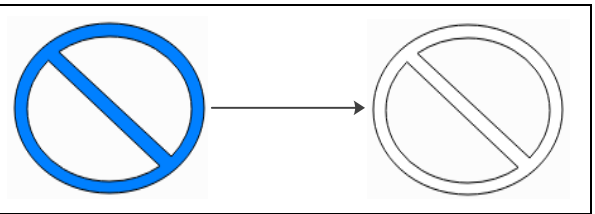
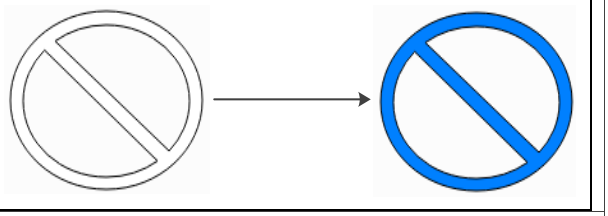
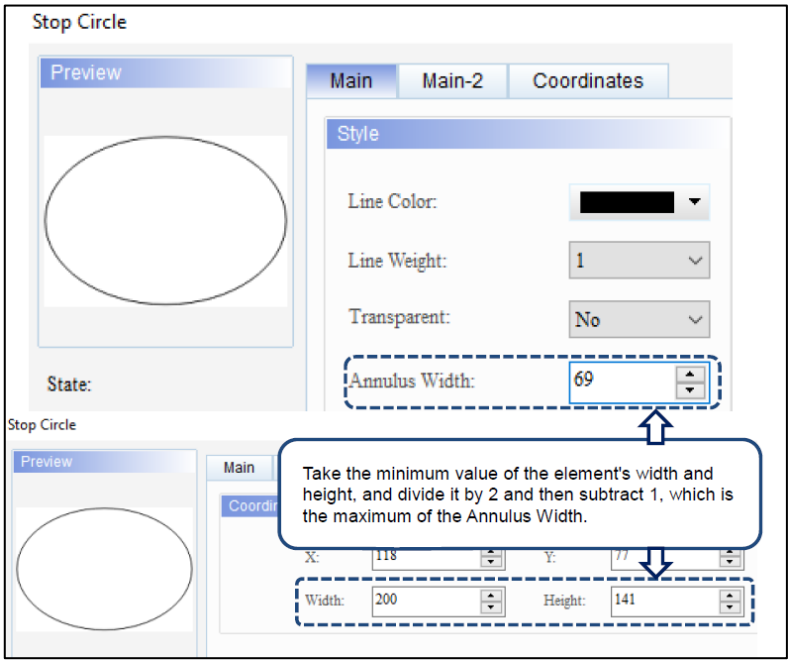
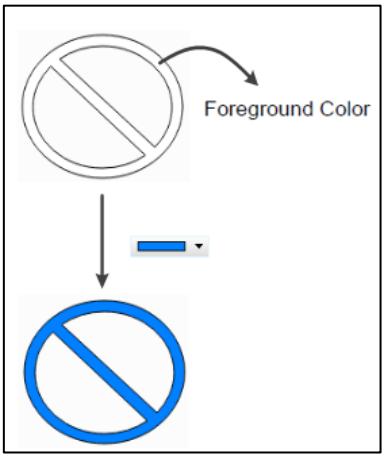
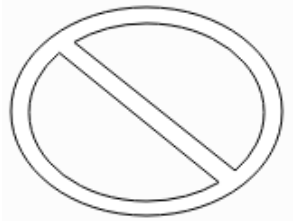
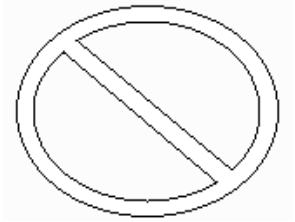


Figure 21 - 31: Stop Circle element Style property page

No.	Function	Description
(1)	Line Color	**Set the line color for the element. The default is**  **.** 
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is **1**. 
(3)	Transparent	● Select Yes or No for this function. The default value is **No**.  ● If users select Yes, the foreground color of the **Stop Circle** element is transparent and only the border color is displayed; if users select No, the foreground

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(4)</td><td>Annulus Width</td><td>The maximum of the Annulus Width is determined by taking the minimum value of the element's width and height, and dividing it by 2 and then subtracting 1. The reason for subtracting 1 is that the Annulus Width minimum value of the Stop Circle element is 1, not 0. The default value is 10.

</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(5)</td><td>Foreground Color</td><td>Set the foreground color of the element. The default is  .
 
</td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td rowspan="3">(7)</td><td rowspan="3">Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.</td></tr>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table>

- Coord.

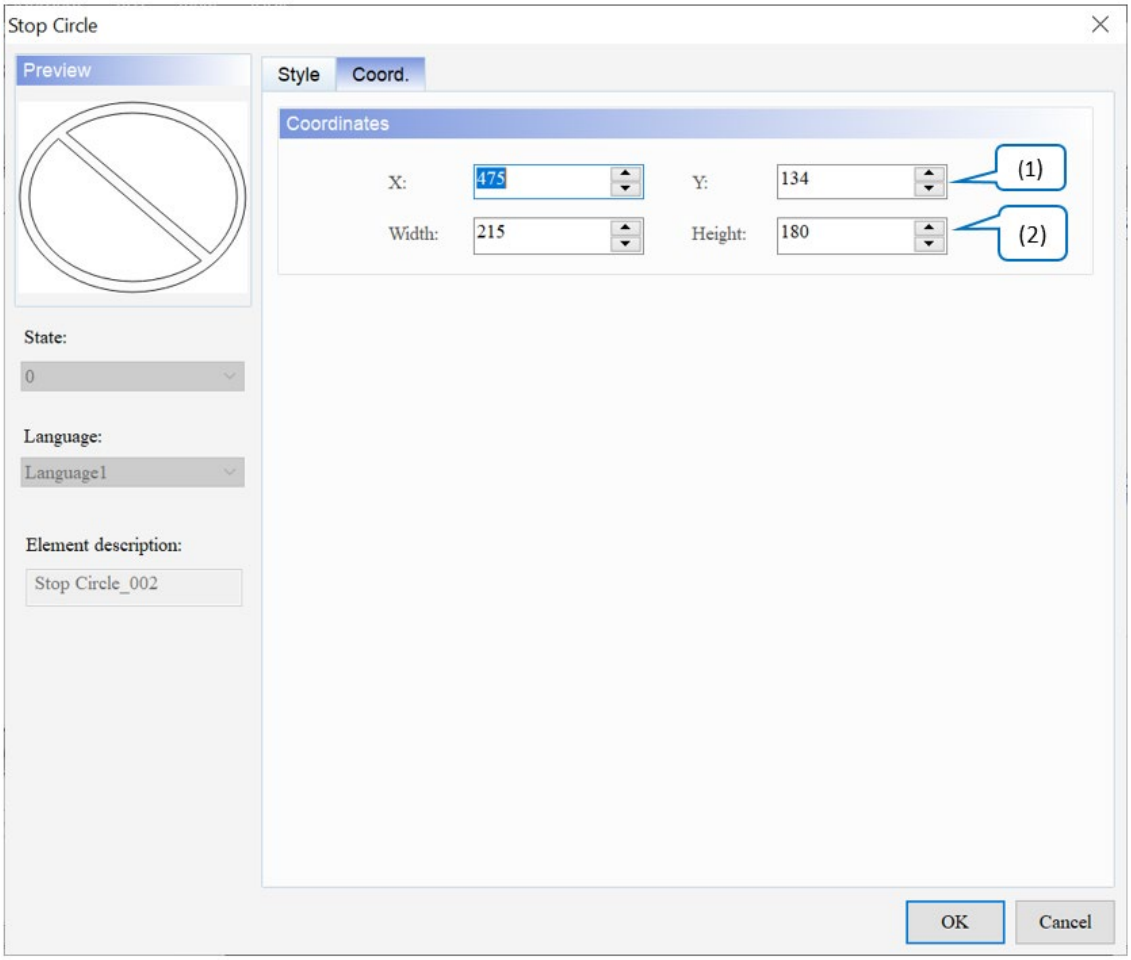


Figure 21 - 32: Stop Circle element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

21.11 1/4 Arc

On double-clicking the 1/4 Arc element, the property page appears as follows.

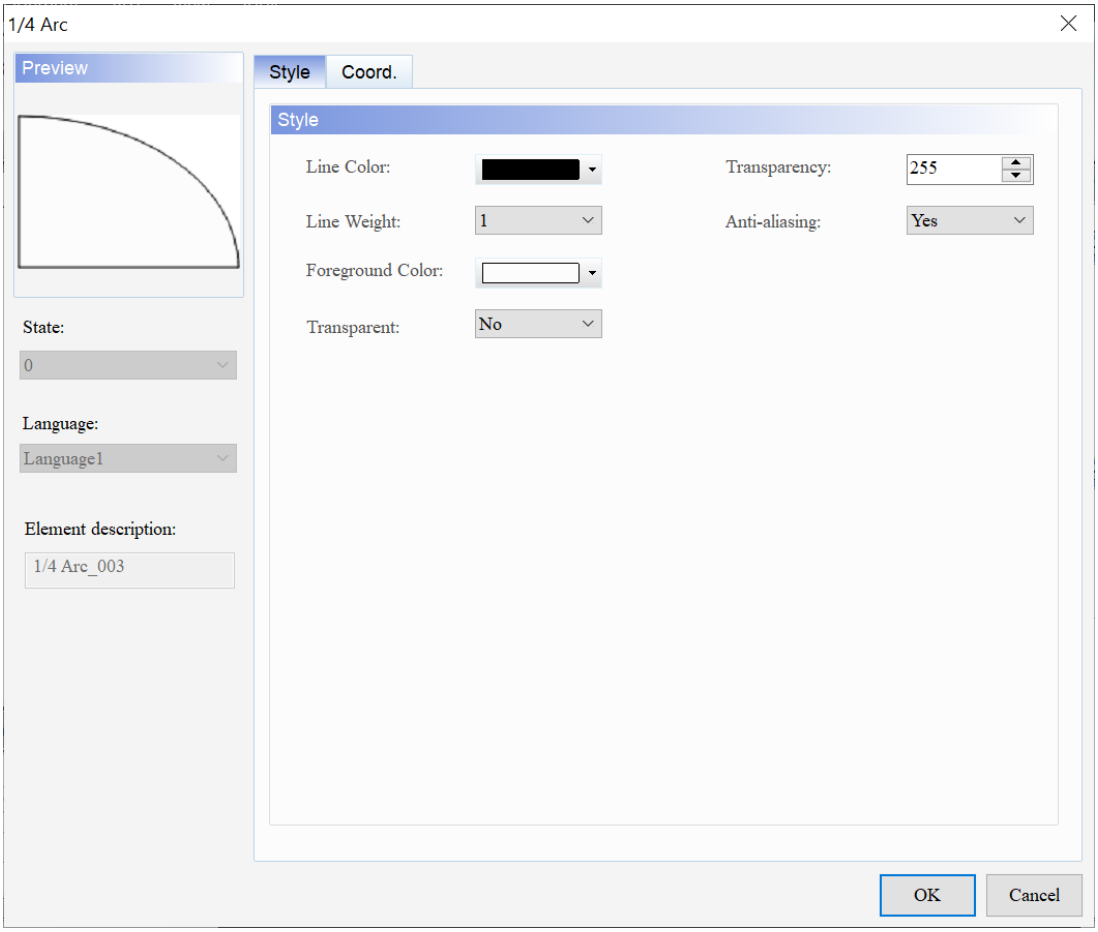


Figure 21 - 33: 1/4 Arc element property page

1/4 Arc	
Function	**Description**
Preview	1/4 Arc element supports multiple state values and multi-language data display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

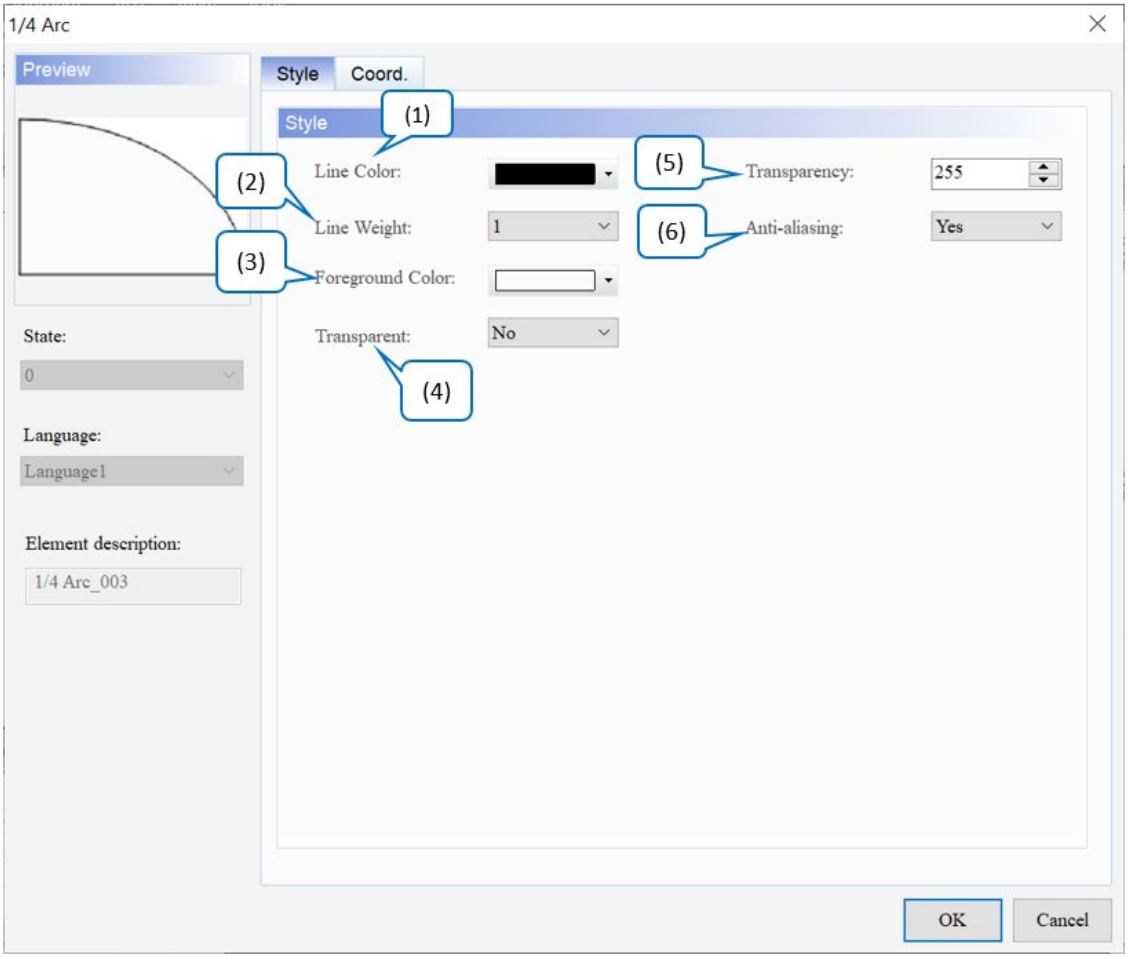
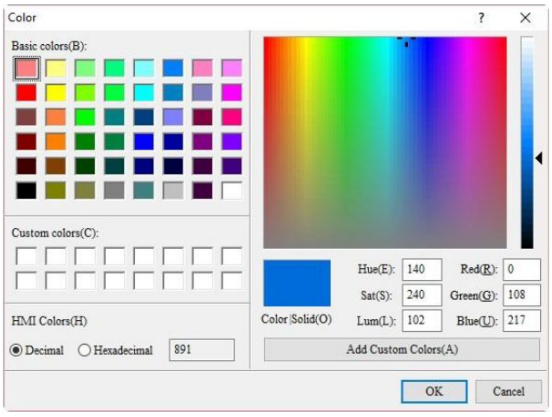
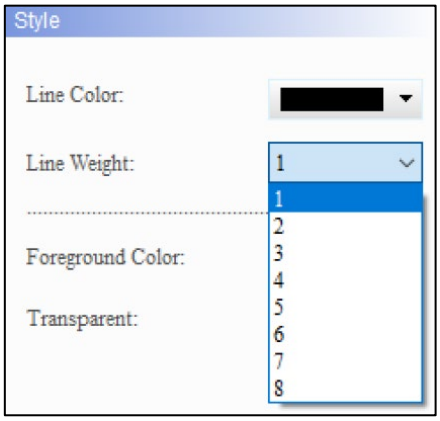
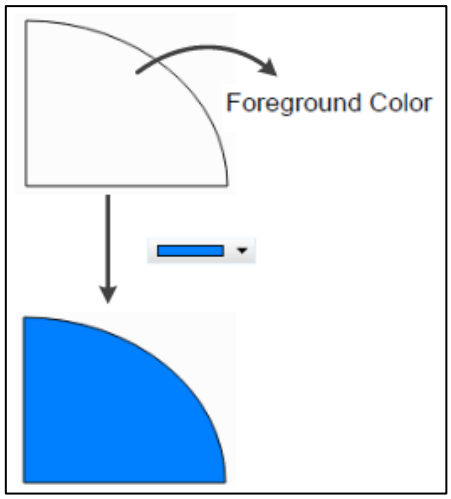
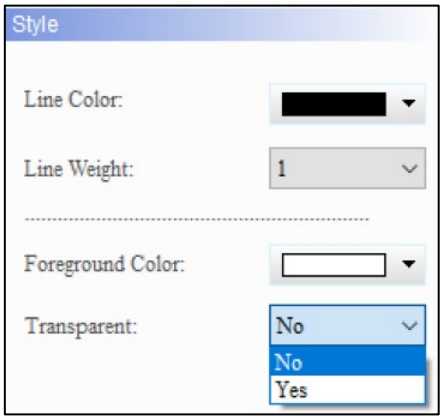
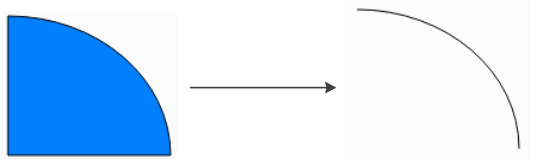
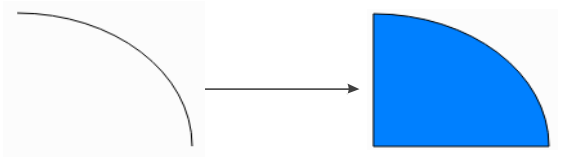
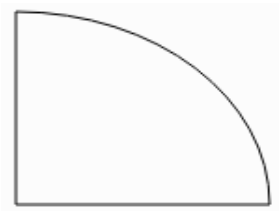
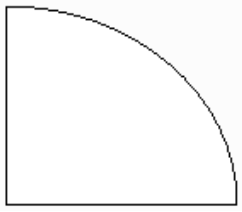


Figure 21 - 34: 1/4 Arc element Style property page

No.	Function	Description
(1)	Line Color	**Set the line color for the element. The default is**  **.** 

No.	Function	Description
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is . 
(4)	Transparent	● Select Yes or No for this function. The default value is No.  ● If users select Yes, the foreground color of the 1/4 Arc element is transparent and only the border color is displayed; if users select No, the foreground color of

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>the element is displayed.
<table><tr><td>Transparent is Yes</td><td>  </td></tr><tr><td>Transparent is No</td><td>  </td></tr></table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(6)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table><tr><td>Anti-aliasing is Yes</td><td>  </td></tr><tr><td>Anti-aliasing is No</td><td>  </td></tr></table></td></tr>
</table>

- Coord.

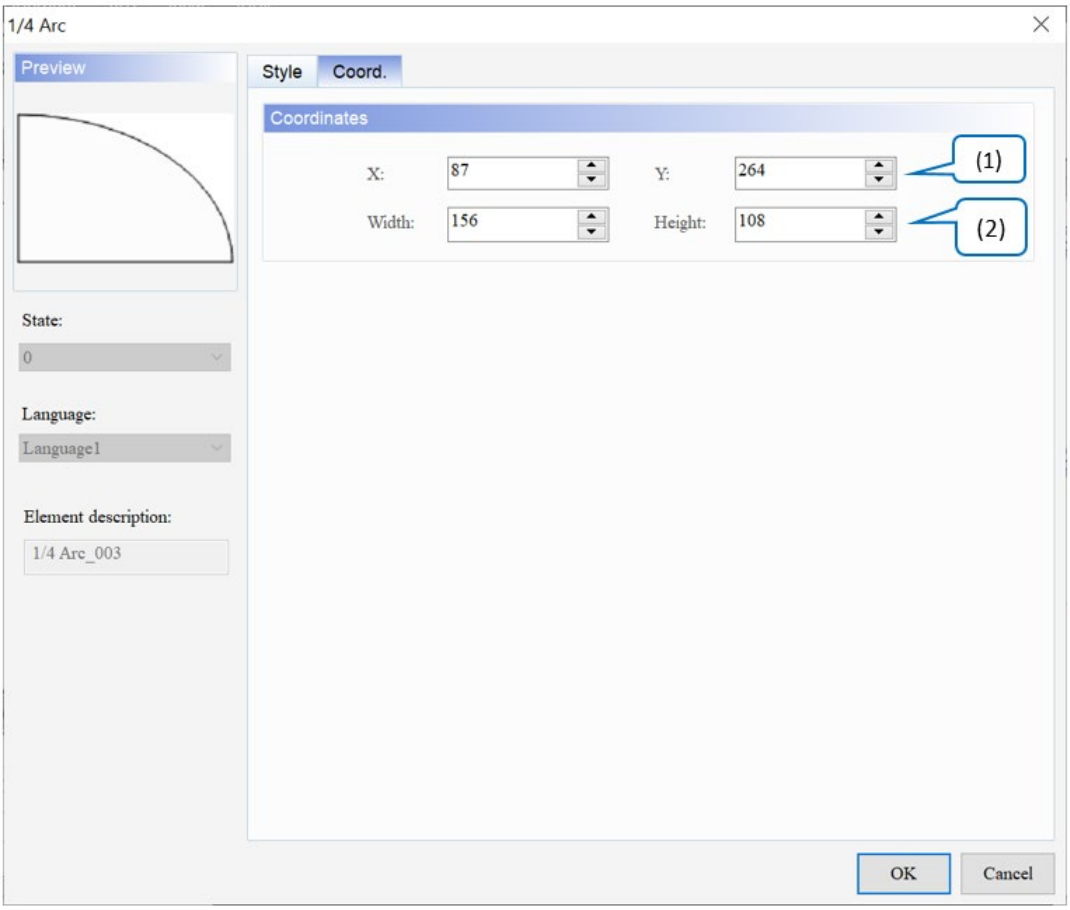


Figure 21 - 35: 1/4 Arc element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 22: Drawing

To create a **Drawing** element, go to **Elements** > **Drawing** and click the desired element as shown in the following figure.

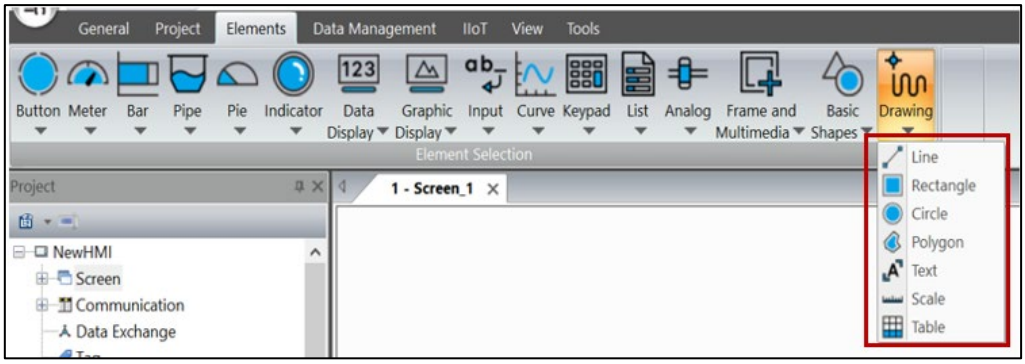


Figure 22 - 1: Create Drawing element

22.1 Line

When using the **Line** element, press and hold the mouse button to decide on the starting point of the line. Drag the mouse to the desired length and release the mouse button to create a straight line. On clicking this line, a rectangle shaped range appears to help adjust the size of this line. Users can also change the width and color of this line. In addition, use the set **Read Address** to control the moving position, color, blinking, and other functions of the **Line** element.

On double-clicking the **Line** element, the property page appears as follows.

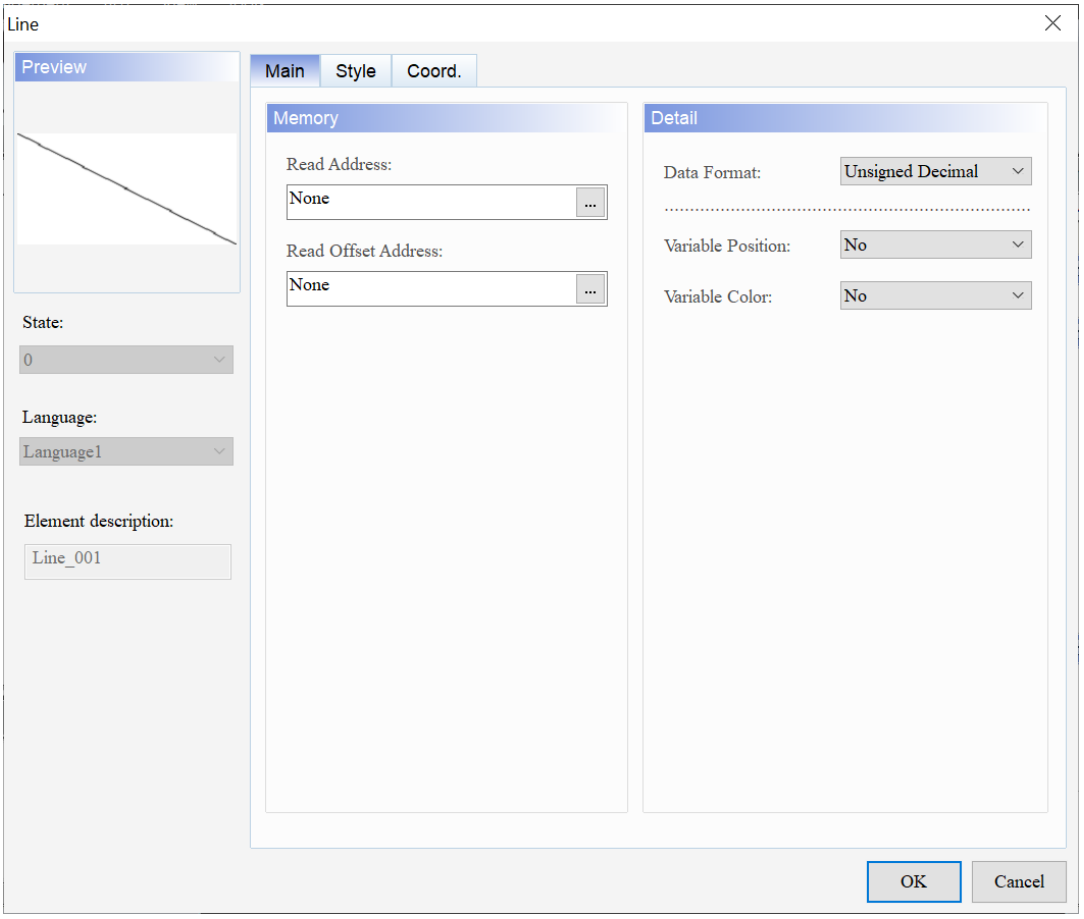


Figure 22 - 2: Line element property page

Line	
Function	**Description**
Preview	Line element does not support multiple state values and multi-language display.
Main	Set the Read Address, Read Offset Address, Data Format, Variable Position, and Variable Color.
Style	Set Line Style, Line Weight, Line Color, Blink, Transparency, and Anti-aliasing.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

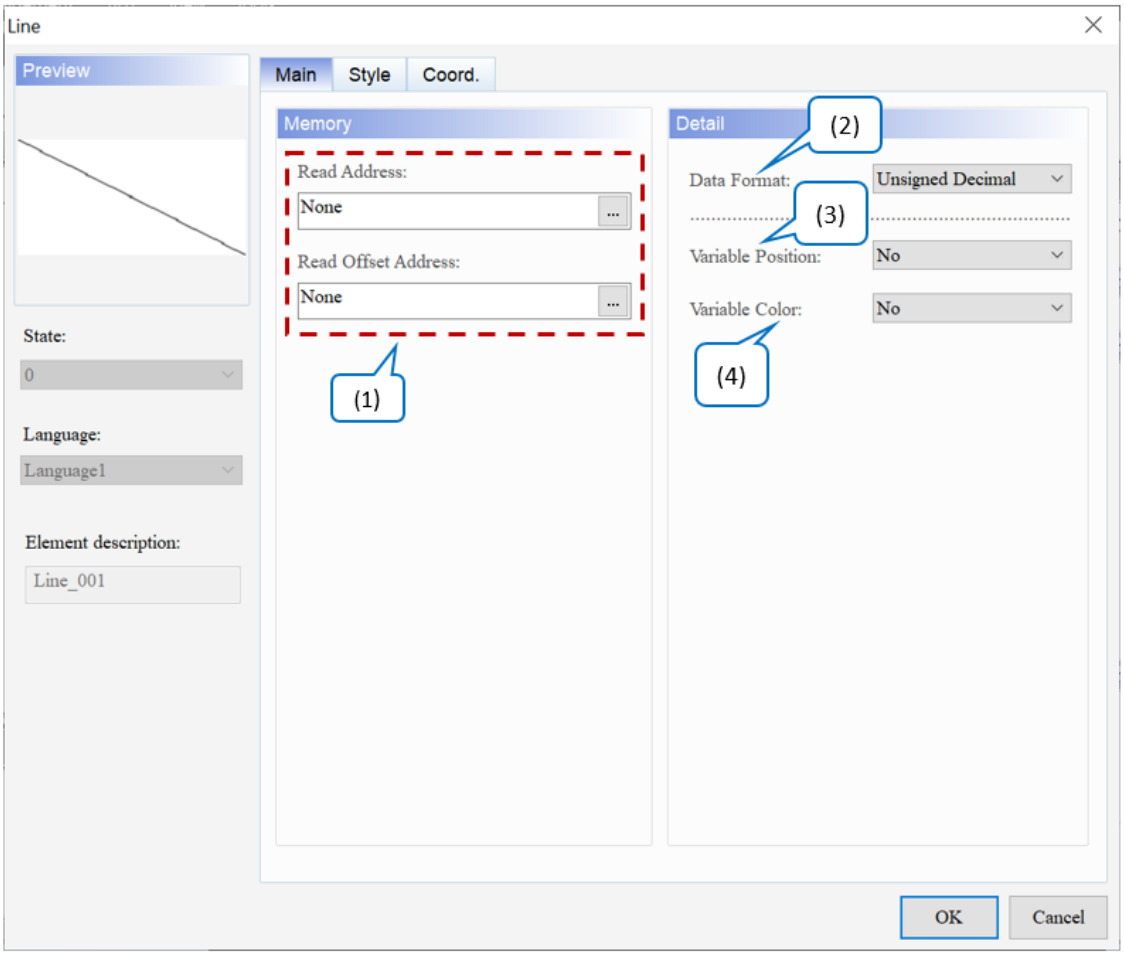
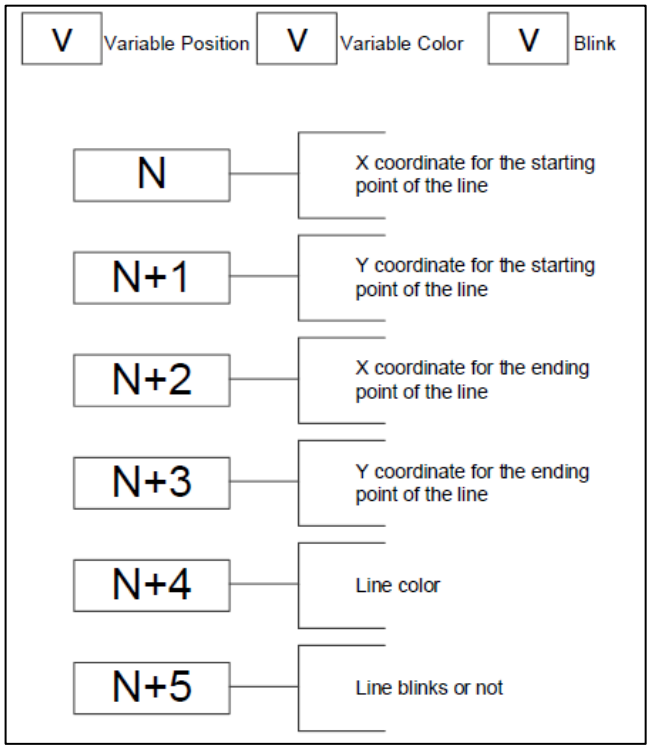
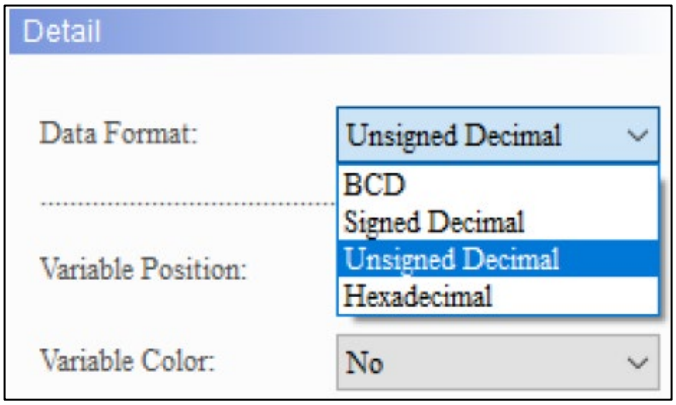
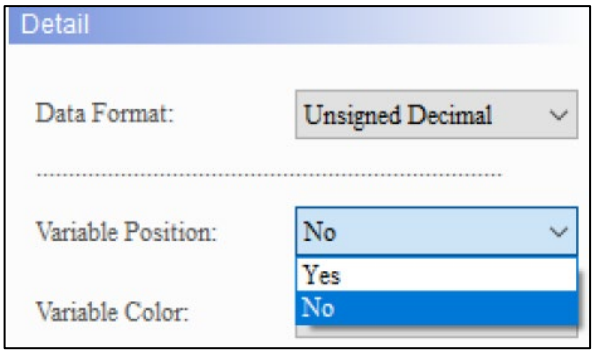
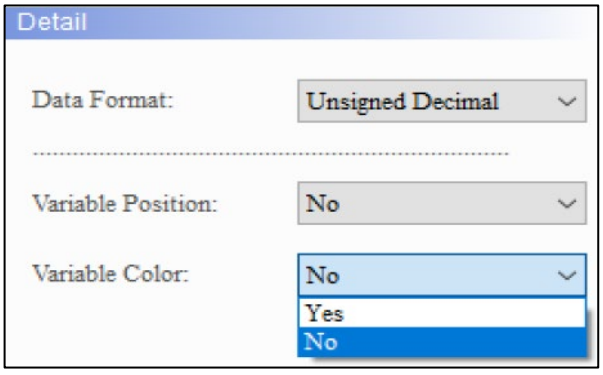


Figure 22 - 3: Line element Main property page

No.	Function	Description
(1)	Read Address	● Available options are Internal Memory and controller register address. ● When **Variable Position** is set to Yes, the value of the **Read Address** is regarded as the X coordinate for the starting point of the dynamic **Line** element. ● When **Variable Position** is set to Yes, the value of **Read Address+1** is regarded as the Y coordinate for the starting point of the dynamic **Line** element. ● When **Variable Position** is set to Yes, the value of **Read Address+2** is regarded as the X coordinate for the ending point of the dynamic **Line** element. ● When **Variable Position** is set to Yes, the value of **Read**

No.	Function	Description
		Address+3 is regarded as the Y coordinate for the ending point of the dynamic Line element. ● When Variable Color is set to Yes, the value of Read Address+4 is regarded as the color for the dynamic Line element. Its value ranges from 0 to 65535. ● When Blink is set to Yes, the value of Read Address+5 determines whether the dynamic Line element blinks or not. When its value is greater than 1, the dynamic Line element is displayed as blinking; when the value is 0, it does not blink.  ● Select Link name or Device Type. Refer to *Memory Settings*.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Format	The available options for Data Format are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is Unsigned Decimal.

No.	Function	Description
		
(3)	Variable Position	● Select Yes or No for **Variable Position**. The default value is **No**. ● When users select Yes, the position of the dynamic **Line** element can be changed; when users select No, the dynamic **Line** element cannot be moved. 
(4)	Variable Color	● Select Yes or No for **Variable Color**. The default value is **No**. ● When users select Yes, the color of the dynamic **Line** element can be changed; when users select No, the color of the dynamic **Line** element cannot be changed. Its value ranges from 0 ~ 65535. 

- Style

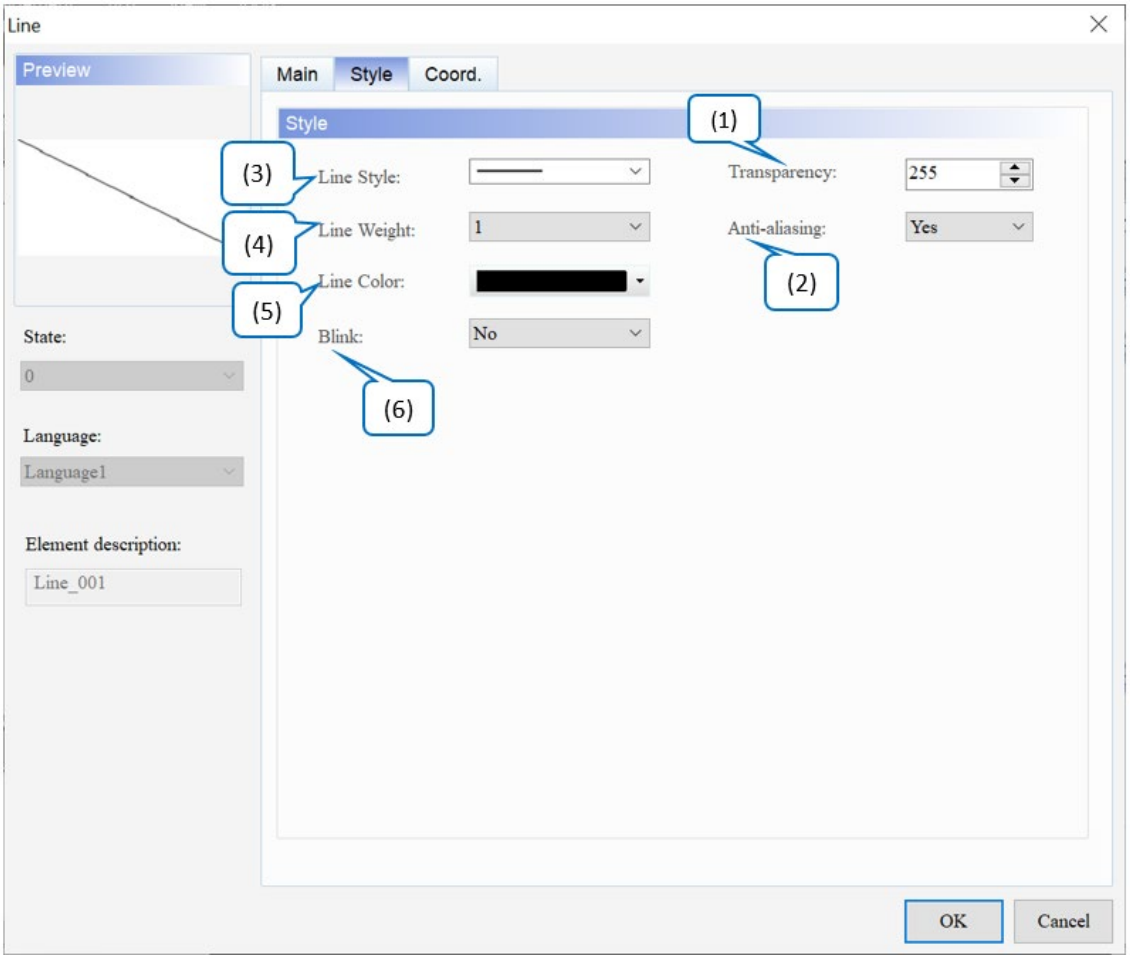
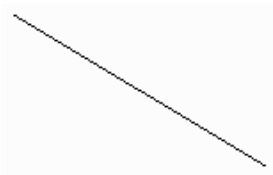
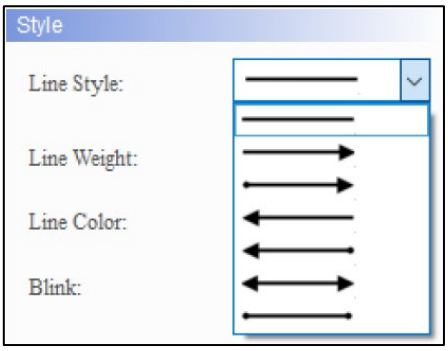
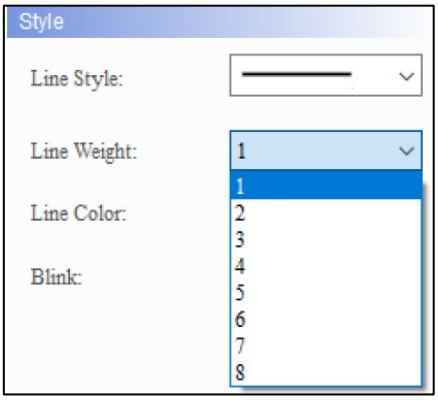
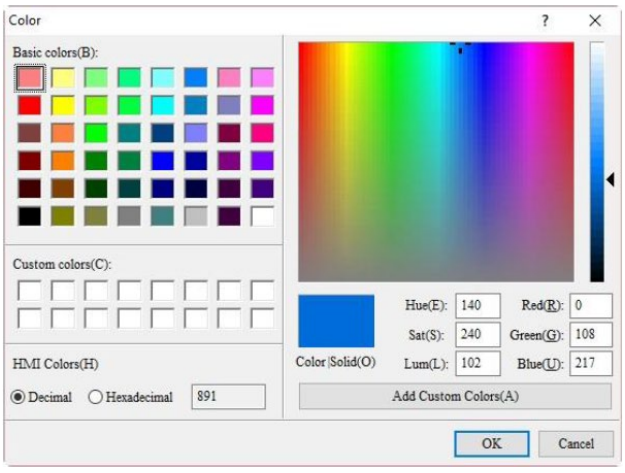
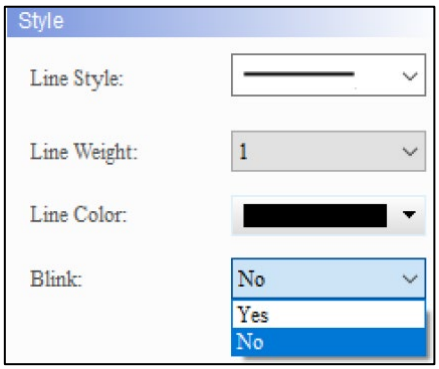


Figure 22 - 4: Line element Style property page

No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Anti-aliasing	The **Anti-aliasing** function is available for this element. The default value is **Yes**.
		Anti-aliasing is Yes 

No.	Function	Description
		Anti-aliasing is No 
(3)	Line Style	**The available options for Style are as follows. The default is**  **.** 
(4)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(5)	Line Color	**Set the line color for the element. The default is**  **.** 

No.	Function	Description
(6)	Blink	● Select Yes or No for **Blink**. The default value is **No**. ● When users select Yes, the dynamic **Line** element can be displayed as blinking. When the value of the corresponding **Read Address** is greater than 1, the dynamic **Line** element is displayed as blinking; when the value is 0, it does not blink. ● When users select No, the dynamic **Line** element does not blink. 

- Coord.

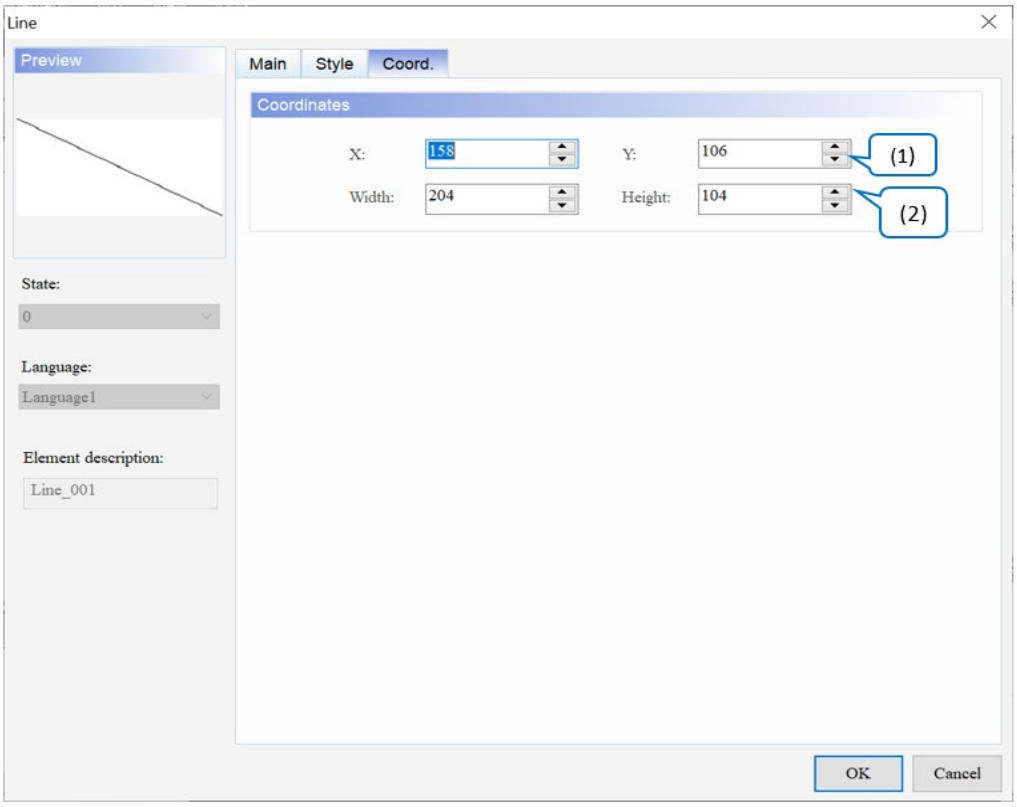


Figure 22 - 5: Line element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

22.2 Rectangle

Apart from drawing rectangular graphs, the **Rectangle** element allows to import graphs from the **Picture Name**. The **Invisible Address** function is also provided by this element for covering the entire editing screen with a **Rectangle** element, and after triggering **Invisible Address**, the editing screen under the **Rectangle** element is displayed. In addition, use the set **Read Address** to control the moving position, color, size, and blinking of the **Rectangle** element.

On double-clicking the **Rectangle** element, the property page appears as follows.

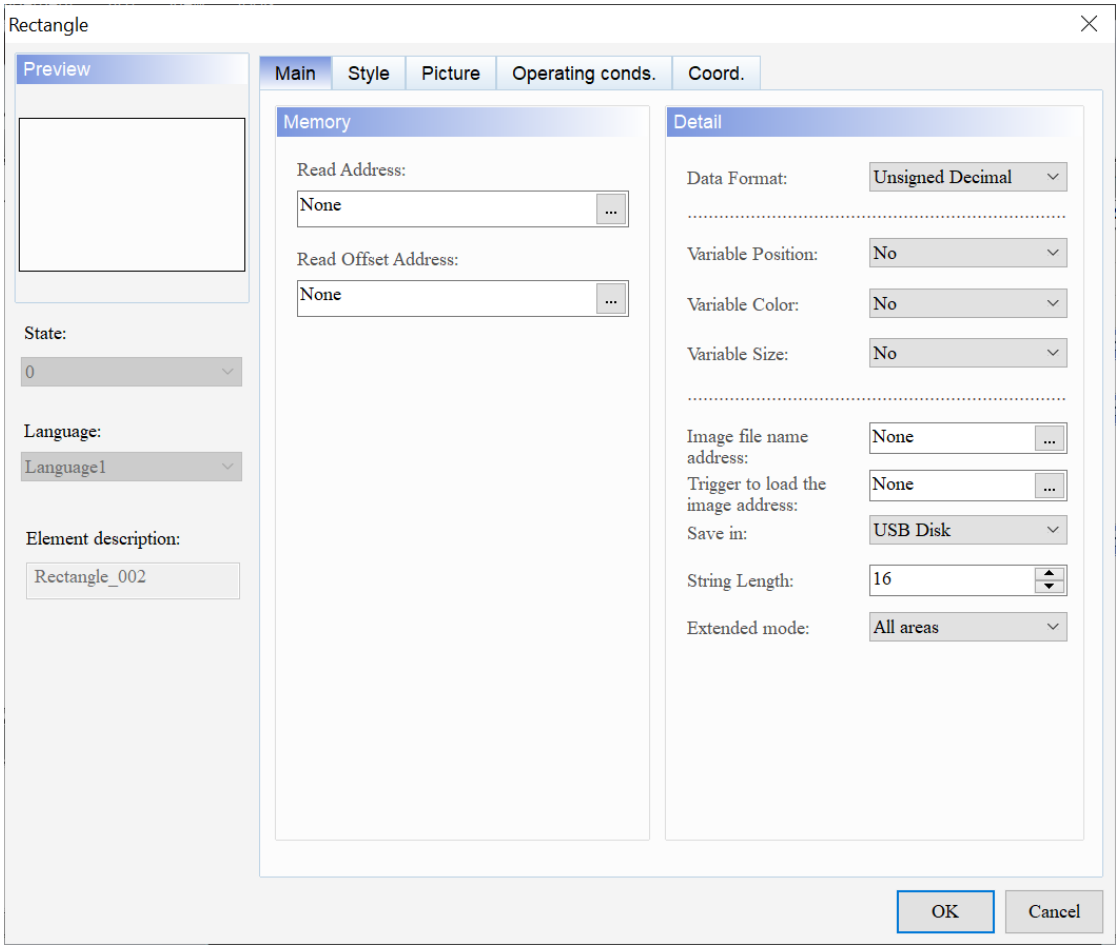


Figure 22 - 6: Rectangle element property page

Rectangle	
Function	**Description**
Preview	The **Rectangle** element does not support multiple state values and multi-language display.
Main	Set the Read Address, Read Offset Address, Data Format, Variable Position, Variable Color, Variable Size, Image file name address, Trigger to load the image address, Save in, String Length, and Extended mode.
Style	Set Line Color, Line Weight, Round Corner Radius, Foreground Color, Blink, Transparent, Penetrate, Filled style, Transparency, and Anti-aliasing. Select Customize each fillet radius.
Picture	Set Picture Name, Alignment, Stretch Mode, and Transparent Color
Operating conds.	Set Invisible Address and Invisible State
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

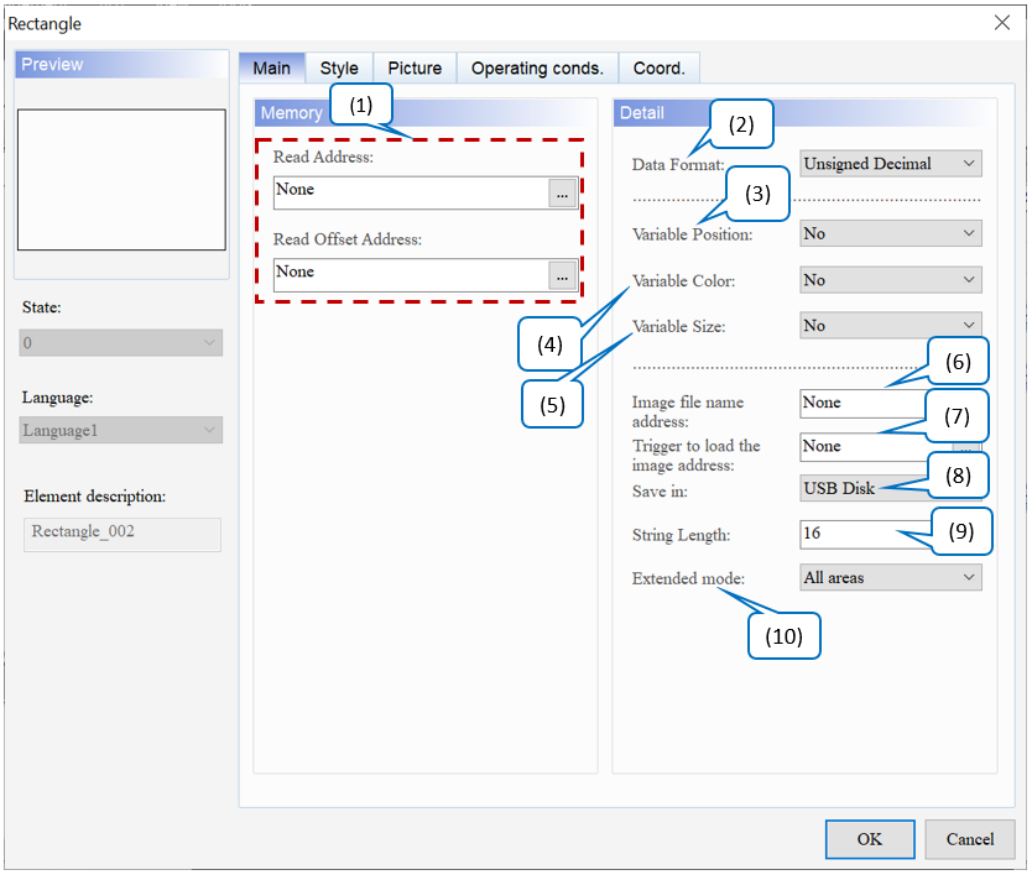
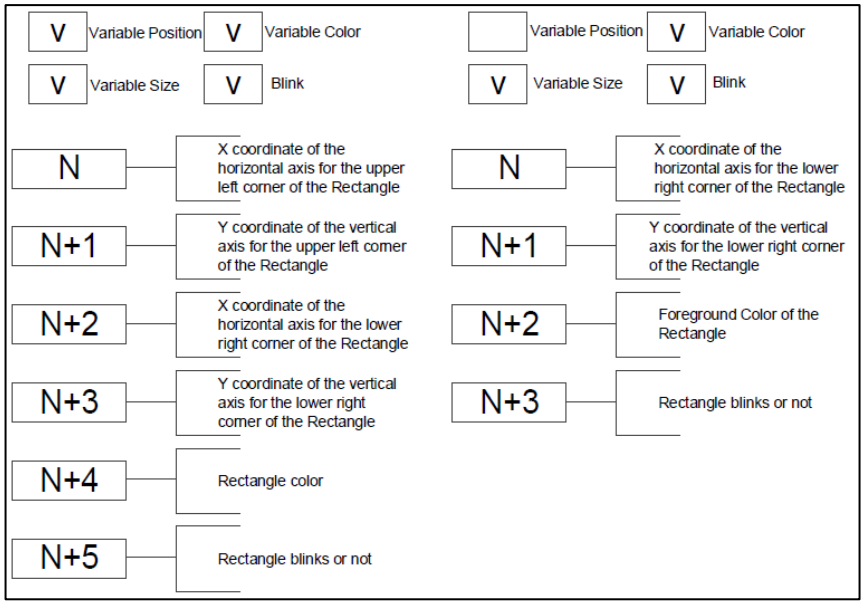
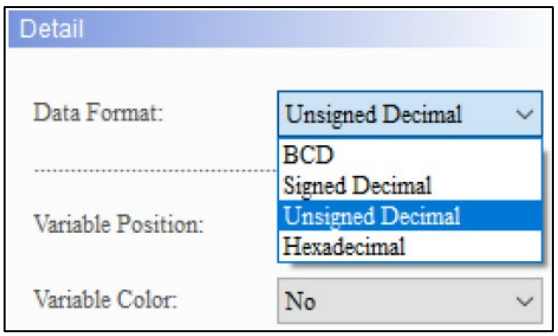
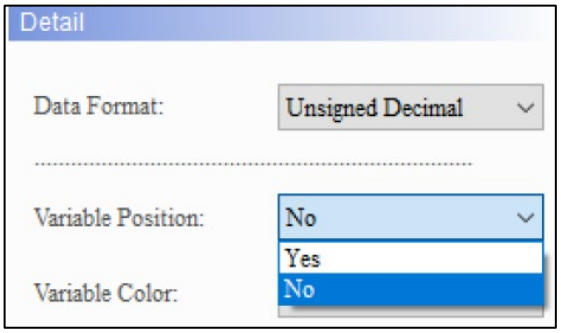
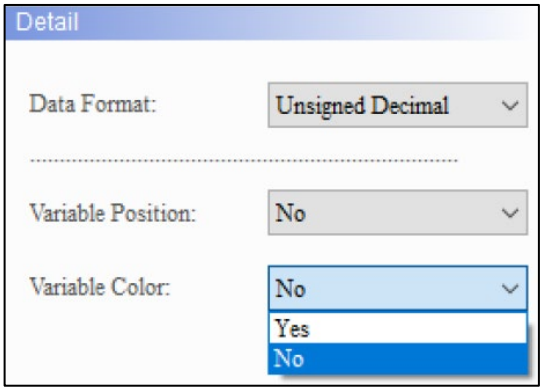
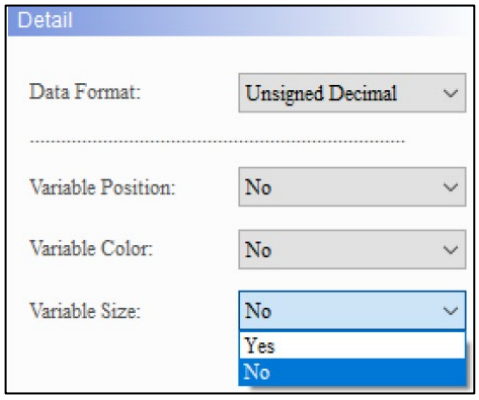


Figure 22 - 7: Rectangle element Main property page

No.	Function	Description
(1)	Read Address	● Available options are Internal Memory and controller register address. ● When **Variable Position** is set to Yes, the value of the **Read Address** is regarded as the X coordinate of the horizontal axis for the upper left corner of the dynamic **Rectangle element**. ● When **Variable Position** is set to Yes, the value of **Read Address+1** is regarded as the Y coordinate of the vertical axis for the upper left corner of the dynamic **Rectangle** element. ● When **Variable Size** is set to Yes, the value of **Read Address+2** is regarded as the width for the dynamic **Rectangle** element. ● When **Variable Size** is set to Yes, the value of **Read Address+3** is regarded as the height for the dynamic

No.	Function	Description
		Rectangle element. ● When **Variable Color** is set to Yes, the value of **Read Address+4** is regarded as the color for the dynamic **Rectangle** element. Its value ranges from 0 to 65535. ● When **Blink** is set to Yes, the value of **Read Address+5** determines whether the dynamic **Rectangle** element blinks or not. When its value is greater than 1, the dynamic **Rectangle** element is displayed as blinking; when the value is 0, it does not blink. ● When **Variable Position** is set to No, the corresponding memory addresses are automatically filled in. ● Select **Link** name or **Device Type**. Refer to *Memory Settings*. 
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Format	The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 

No.	Function	Description
(3)	Variable Position	● Select Yes or No for **Variable Position**. The default value is **No**. ● When users select Yes, the position of the dynamic **Rectangle** element can be changed; when users select No, the dynamic **Rectangle** element cannot be moved. 
(4)	Variable Color	● Select Yes or No for **Variable Color**. The default value is **No**. ● When users select Yes, the color of the dynamic **Rectangle** element can be changed; when users select No, the color of the dynamic **Rectangle** element cannot be changed. Its value ranges from 0 ~ 65535. 
(5)	Variable Size	● Select Yes or No for **Variable Size**. The default value is **No**. ● When users select Yes, the size of the dynamic **Rectangle** element can be changed by changing its coordinates at the lower right corner; when users select No, the size of the **Rectangle** element cannot be changed.

No.	Function	Description
		
(6)	Image file name address	● Specify the selected item through **Image file name address**, and then set **Trigger to load the image address** to On, the element displays the selected item. ● The **Image file name address** supports selecting the controller address (Word) and the internal register address (Word). ● **Trigger to load the image address** supports selection of controller address (Bit) and internal register address (Bit).
(7)	Trigger to load the image address	
(8)	Save in	● The available options for **Save in** are: USB Disk or SD Card. The default value is **USB Disk**. ● By storing the image file in a USB Disk or SD Card, the image file can be read on the HMI. Currently supported file formats are BMP, JPEG, PNG, and TIFF.
(9)	String Length	Set the length of the file name. The default value is **16**.
(10)	Extended mode	The available options for **Extended mode** are: All areas, Keep the ratio, and Actual size. The default value is **All areas**.

- Style

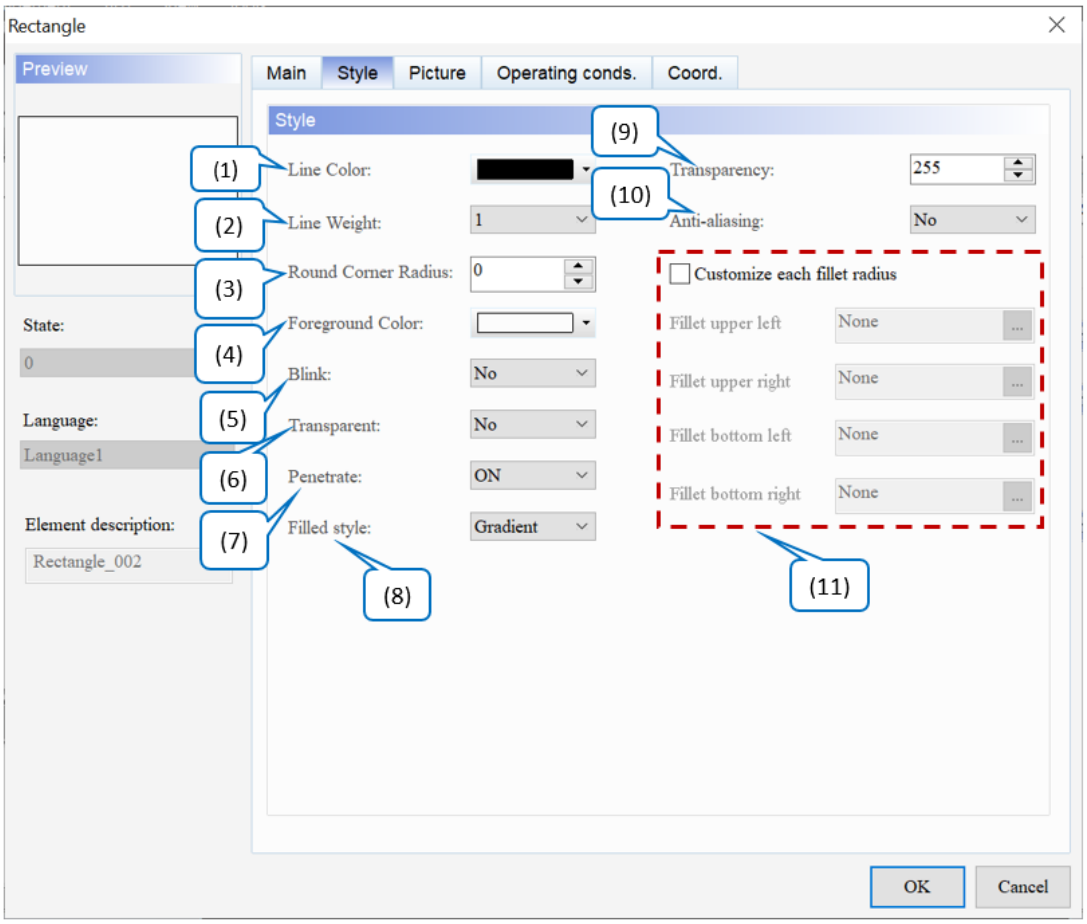
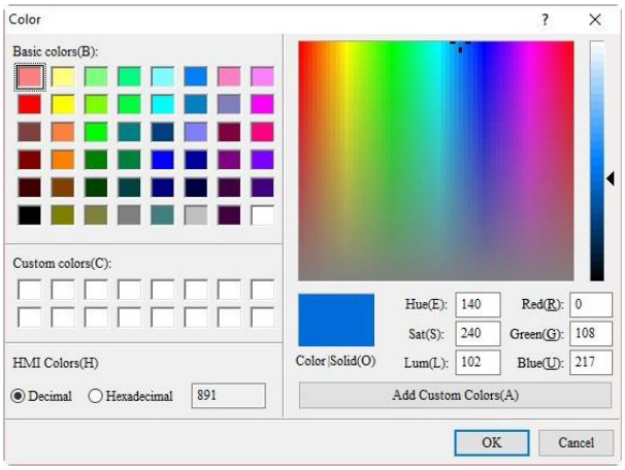
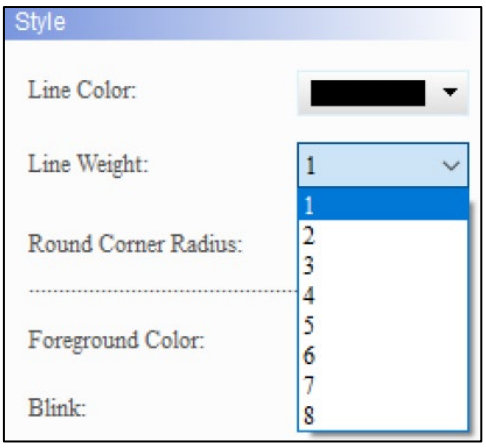
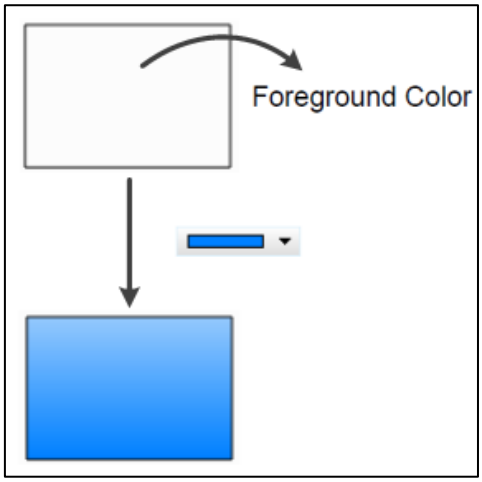
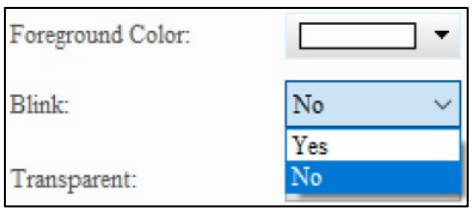


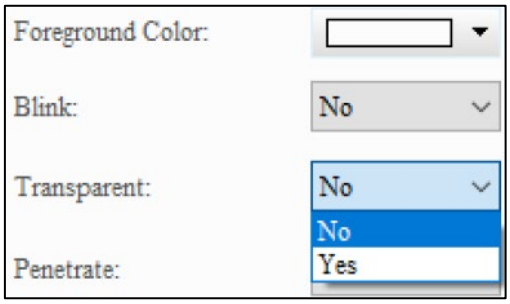
Figure 22 - 8: Rectangle element Style property page

No.	Function	Description
(1)	Line Color	**Set the line color for the element. The default is**  **.** 

No.	Function	Description
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is **1**. 
(3)	Round Corner Radius	The size of this **Round Corner Radius** is determined by the width and height of the **Rectangle** element. Take the smaller value among width/2 and height/2 of the **Rectangle** element. This is the maximum value that can be set for the radius. The default value is **0**.
(4)	Foreground Color	Set the foreground color of the element. The default is  . 
(5)	Blink	● Select Yes or No for **Blink**. The default value is **No**.  ● When users select Yes, the dynamic **Rectangle** element can be displayed as blinking. When the value of the corresponding **Read Address** is greater than 1, the dynamic **Rectangle** element is displayed as blinking; when the value is 0, it does not blink. ● When users select No, the dynamic **Rectangle** element

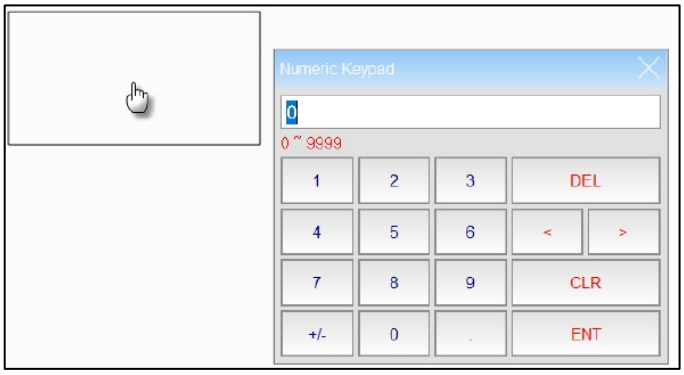
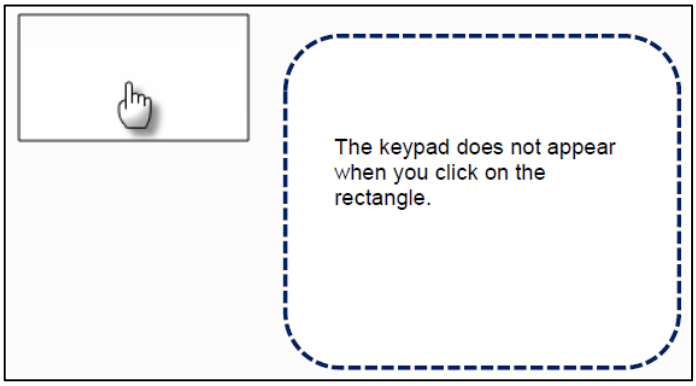
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>does not blink.</td></tr>
<tr><td>(6)</td><td>Transparent</td><td>

Select Yes or No for Transparent. The default value is No.
When users select Yes, the dynamic Rectangle element displays only the rectangle border line with the middle shown in transparent color; when users select No, the Foreground Color of the element is displayed.



</td></tr>
<tr><td>(7)</td><td>Penetrate</td><td>

This function allows users to click the elements that overlap with the Rectangle element. The default value is ON.
Refer to the following example.
Create a Numeric Entry element and then create a Rectangle element that overlaps on top of the Numeric Entry element.

<table>
<tr><td>Penetrate is ON</td><td>Click Numeric Entry element under Rectangle element.
 
</td></tr>
<tr><td>Penetrate is OFF</td><td>Users cannot click Numeric Entry element under Rectangle element.
 
</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(8)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(9)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(10)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(11)</td><td>Customize each fillet radius</td><td>The corner radius of the four corners can be defined.</td></tr>
</table>

- Picture

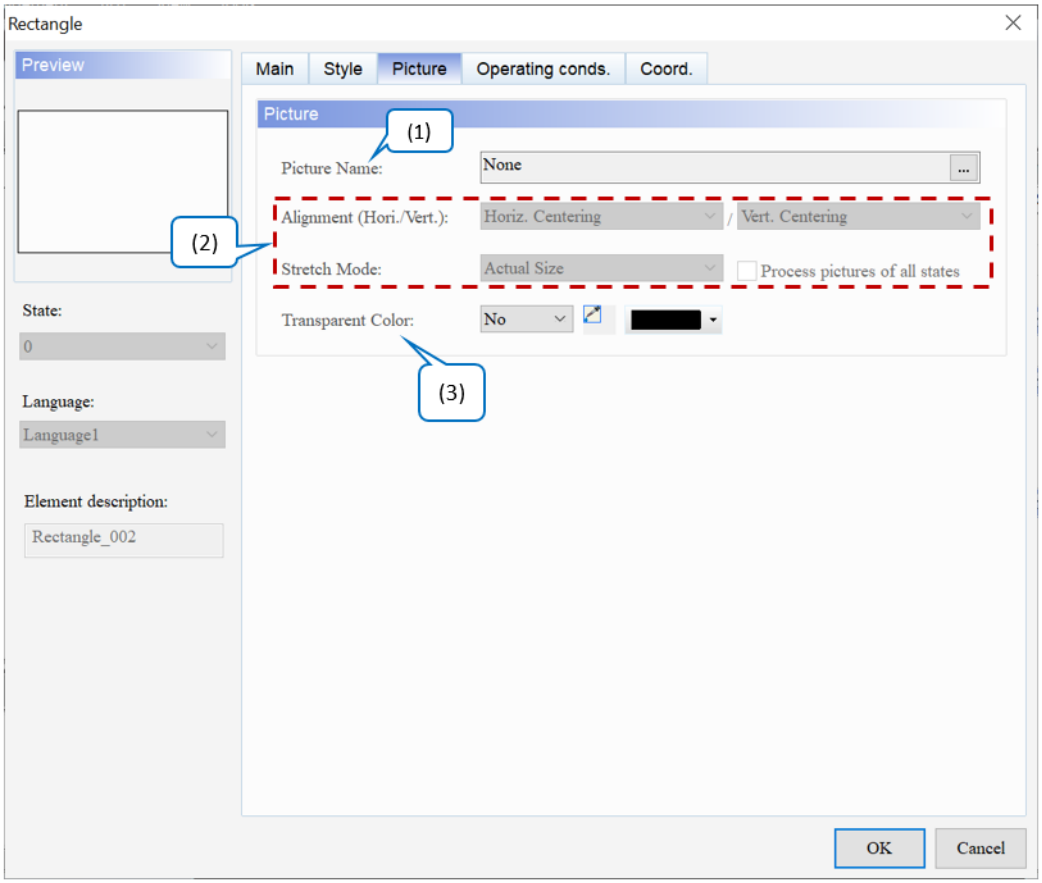
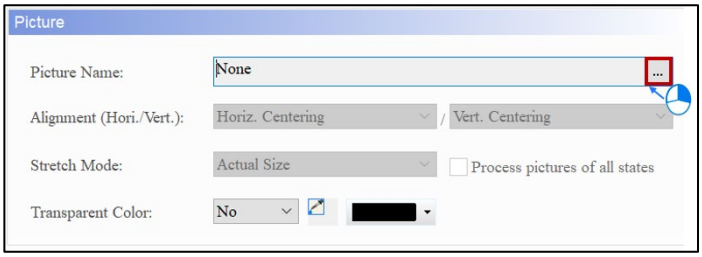
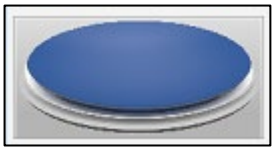
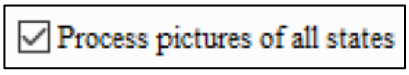


Figure 22 - 9: Rectangle element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.
 
</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make</td></tr>
</table>

No.	Function	Description
		it transparent, which becomes identical to the **Foreground Color** of the element. 

- Operating conds.

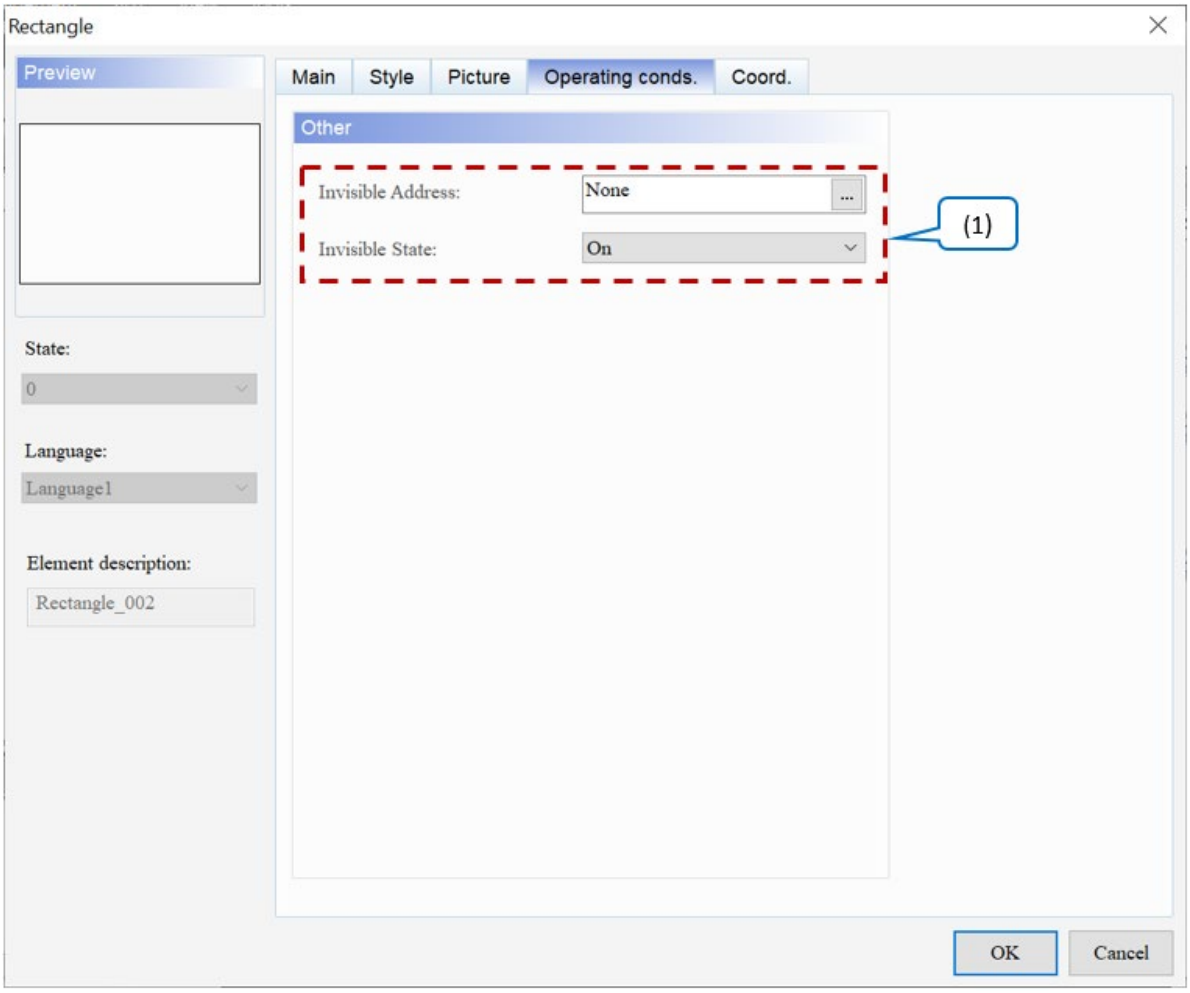
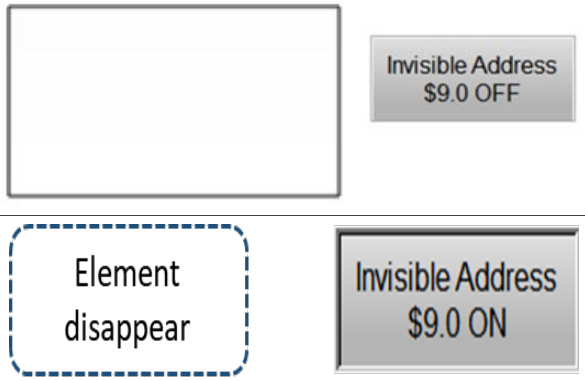
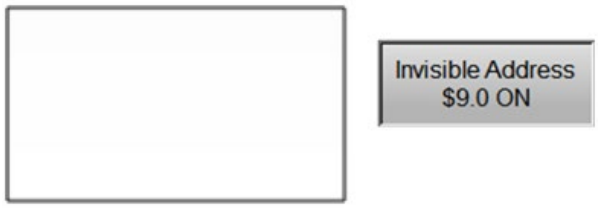


Figure 22 - 10: Rectangle element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Invisible Address / Invisible State</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
</td></tr>
<tr><td></td><td>
</td></tr>
<tr><td>Invisible State is Off</td><td> 
</td></tr>
<tr><td></td><td> 
</td></tr>
</table>
</td></tr>
</table>

- Coord.

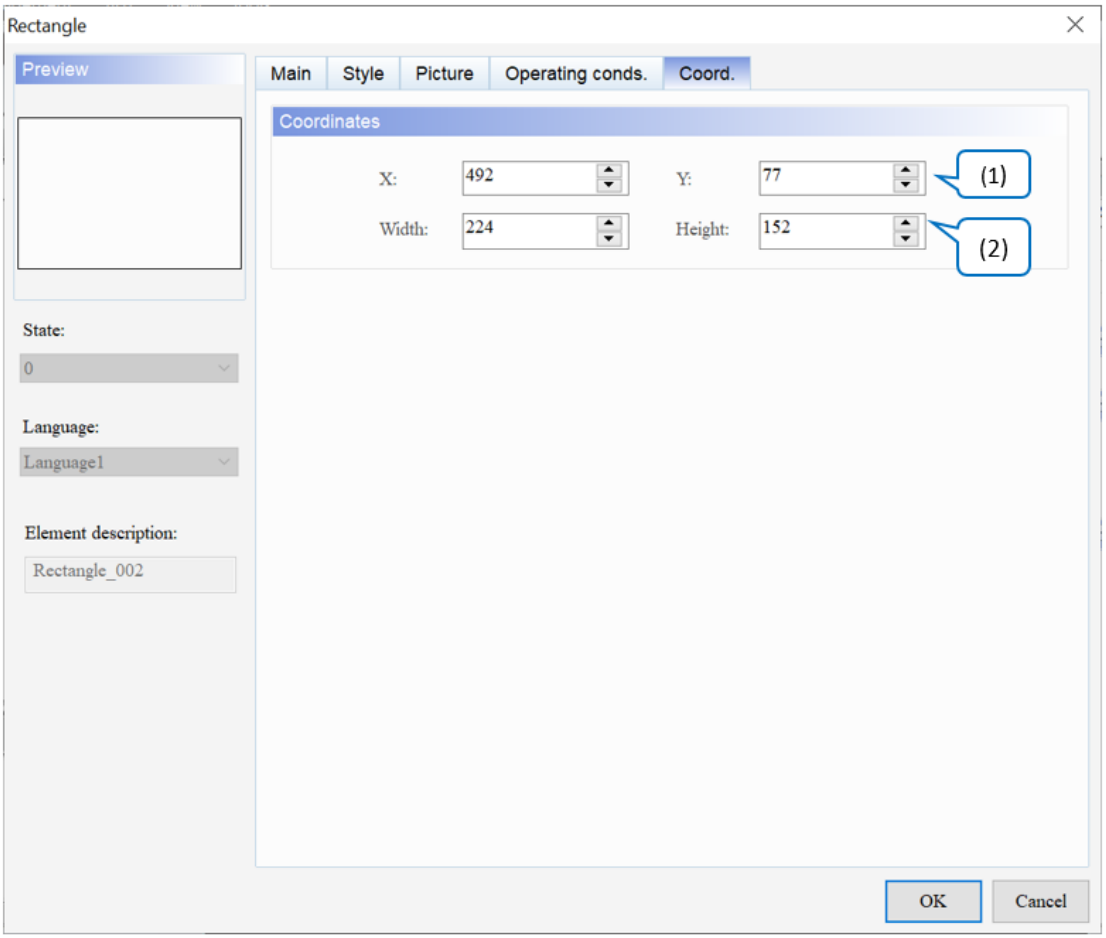


Figure 22 - 11: Rectangle element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

22.3 Circle

Press and drag the mouse to form a circle. If the length is equal to the width, the created graph becomes a circle; if not equal, it becomes an oval. Also use the set **Read Address** to control the moving position, color, size, and blinking of the circle.

On double-clicking the **Circle** element, the property page appears as follows.

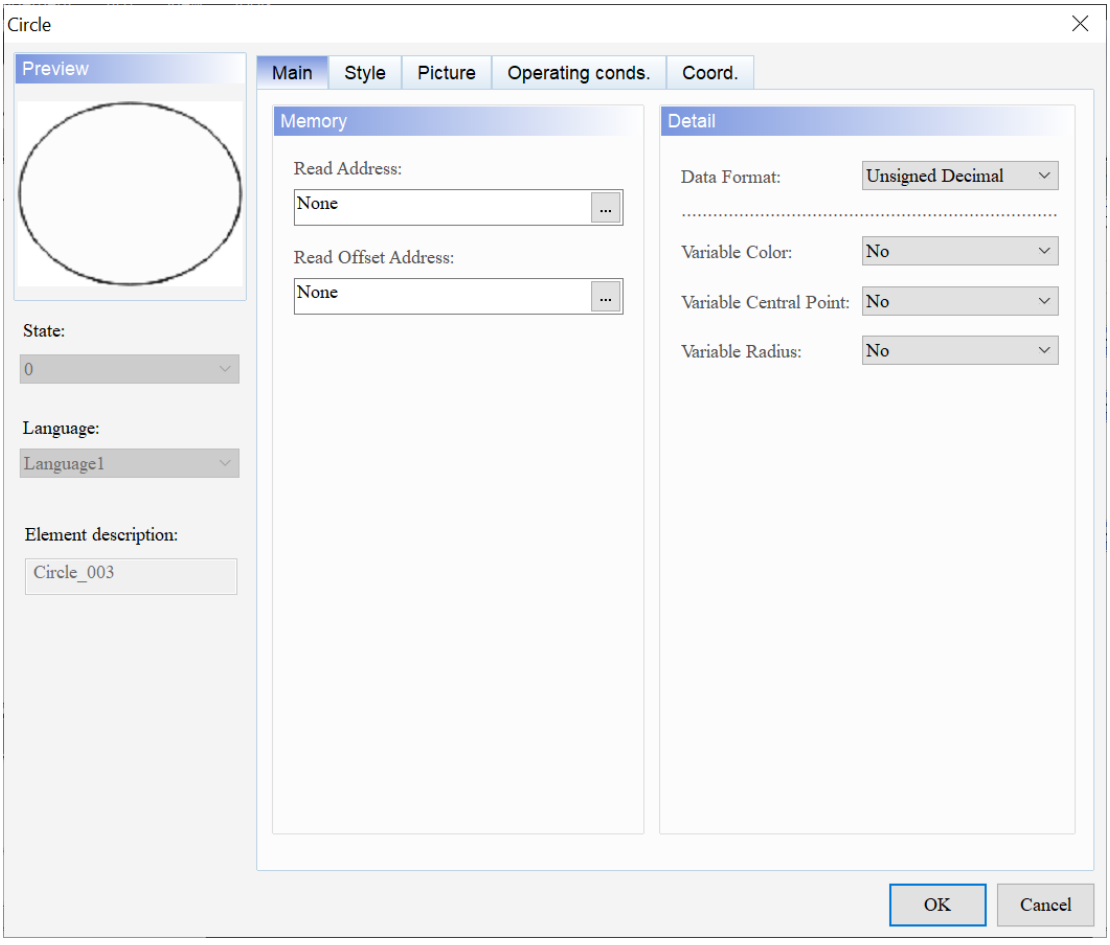


Figure 22 - 12: Circle element property page

Circle	
Function	**Description**
Preview	The Circle element does not support multiple state values and multi-language display.
Main	Set the Read Address, Read Offset Address, Data Format, Variable Color, Variable Central Point, and Variable Radius.
Style	Set Line Color, Line Weight, Foreground Color, Blink, Transparent, Filled style, Transparency, and Anti-aliasing.
Picture	Set Picture Name, Alignment, Stretch Mode, and Transparent Color
Operating conds.	Set Invisible Address and Invisible State
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

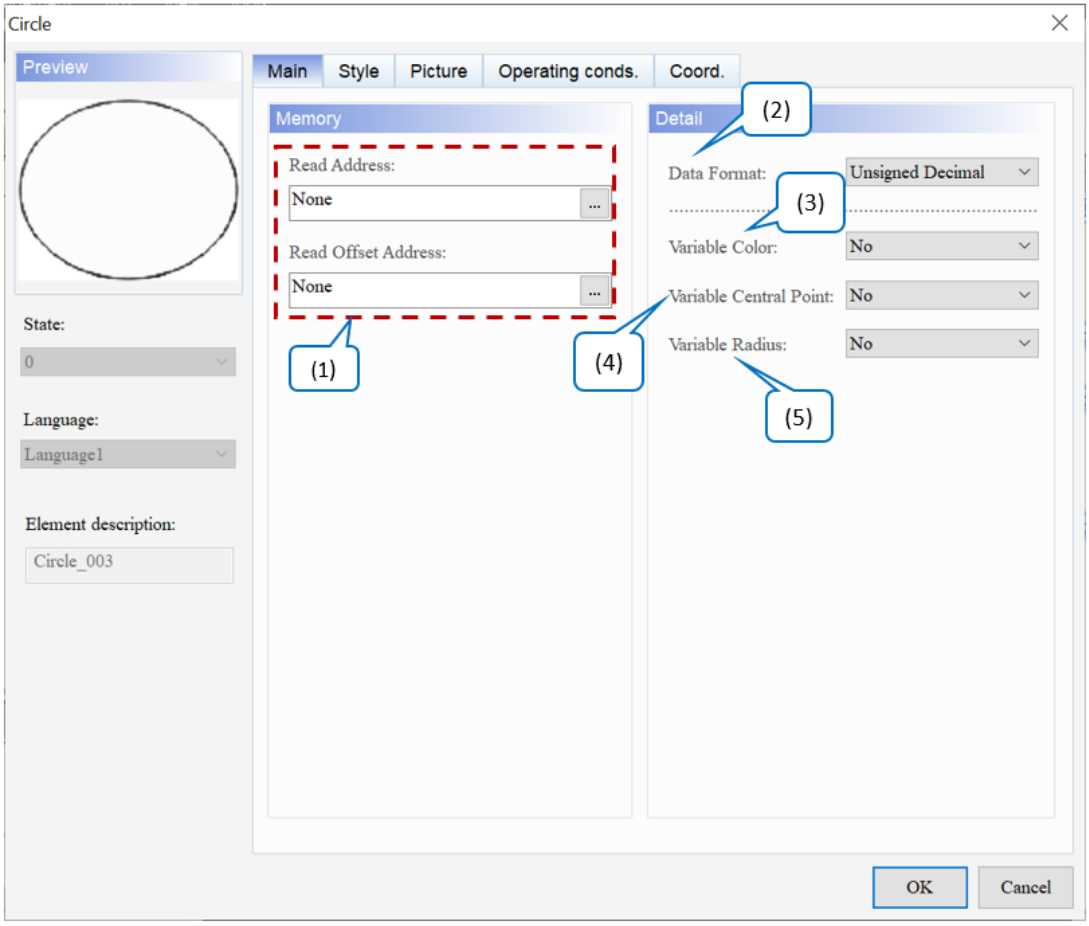
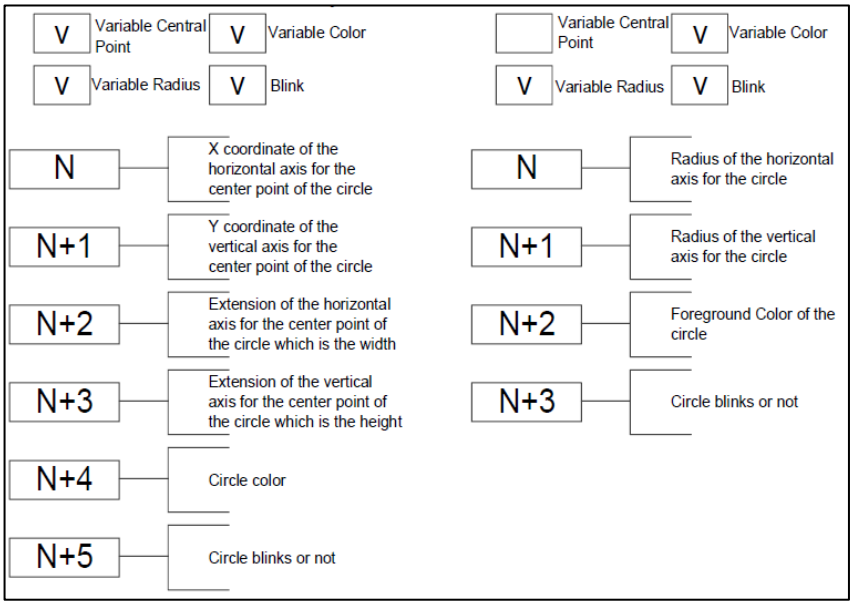
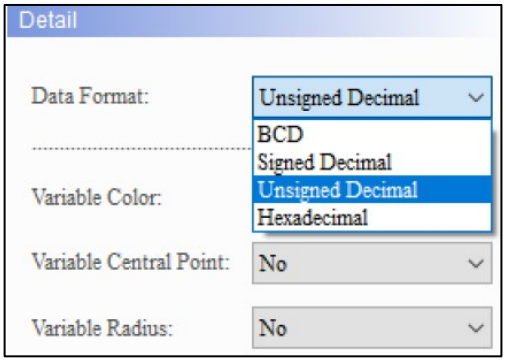
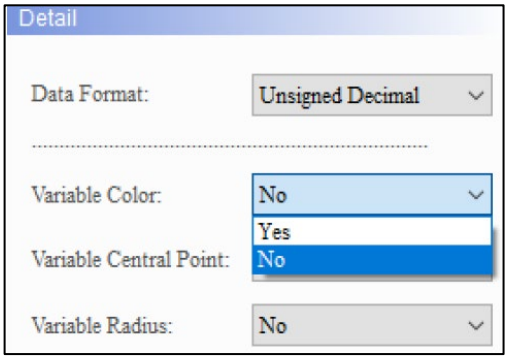
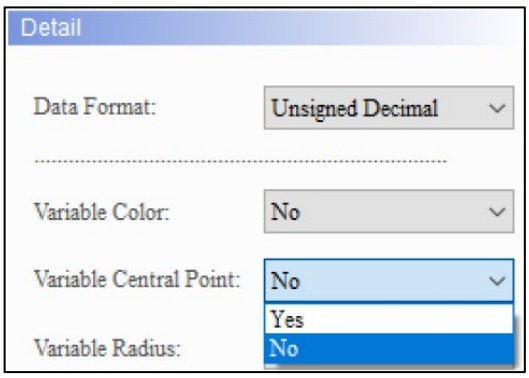
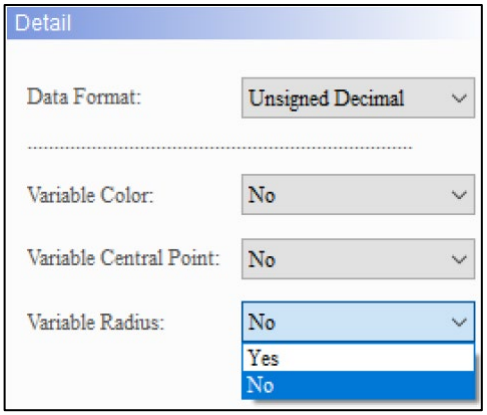


Figure 22 - 13: Circle element Main property page

No.	Function	Description
(1)	Read Address	● Available options are Internal Memory and controller register address. ● When **Variable Central Point** is set to Yes, the value of the **Read Address** is regarded as the X coordinate of the horizontal axis for the center point of the **Circle** element. ● When **Variable Central Point** is set to Yes, the value of **Read Address+1** is regarded as the Y coordinate of the vertical axis for the center point of the **Circle** element. ● When **Variable Radius** is set to Yes, the value of **Read Address+2** is regarded as the extension of the horizontal axis for the center point of the **Circle** element which is the width. ● When **Variable Radius** is set to Yes, the value of **Read Address+3** is regarded as the extension of the vertical axis for the center point of the **Circle** element which is the height. ● When **Variable Color** is set to Yes, the value of **Read Address+4** is regarded as the color for the **Circle** element. Its value ranges from 0 to 65535. ● When **Blink** is set to Yes, the value of **Read Address+5** determines whether the **Circle** element blinks or not. When its value is greater than 1, the **Circle** element is displayed as blinking; when the value is 0, it does not blink. ● When **Variable Central Point** is set to No, the corresponding memory addresses are automatically filled in.  ● Select **Link** name or **Device Type**. Refer to *Memory Settings*.

No.	Function	Description
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.
(2)	Data Format	The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(3)	Variable Color	● Select Yes or No for **Variable Color**. The default value is **No**. ● When users select Yes, the color of the **Circle** element can be changed; when users select No, the color of the **Circle** element cannot be changed. Its value ranges from 0 ~ 65535. 
(4)	Variable Central Point	● Select Yes or No for **Variable Central Point**. The default value is **No**.  ● When users select Yes, the position of the center point of the **Circle** element can be changed; when users select No, though the **Circle** element cannot be moved, users

No.	Function	Description
		can extend the size of the **Circle** element.
(5)	Variable Radius	• Select Yes or No for **Variable Radius**. The default value is **No**. • When users select Yes, the size of the **Circle** element can be extended; when users select No, the size of the **Circle** element cannot be extended. 

- Style

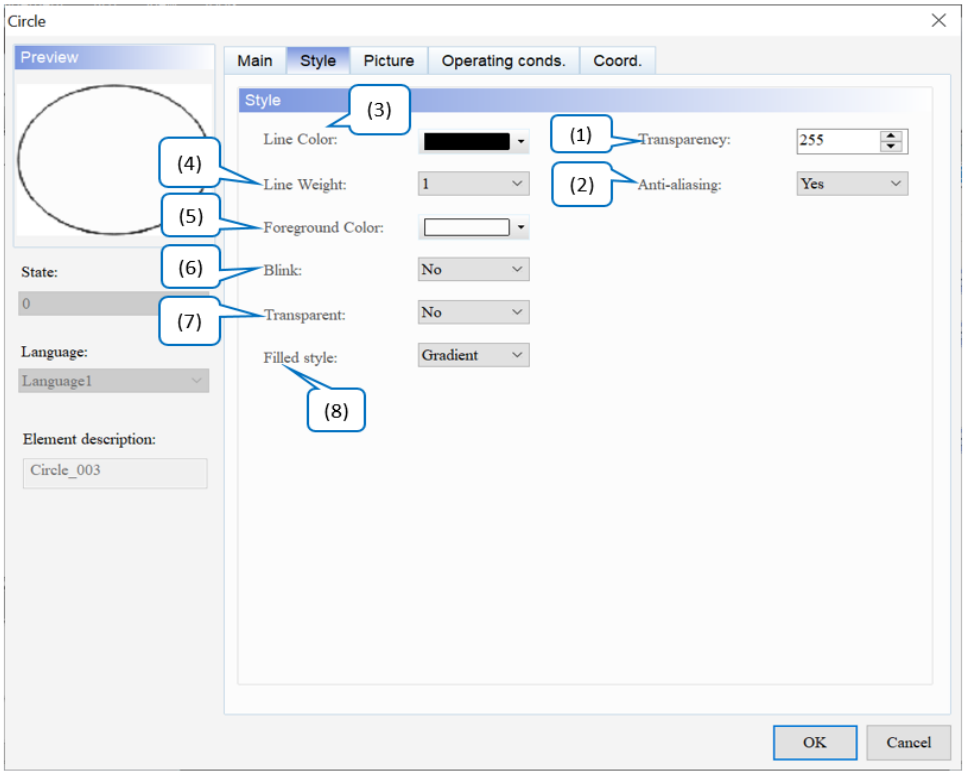
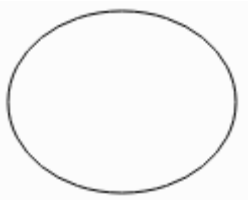
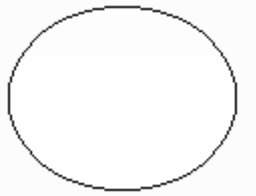
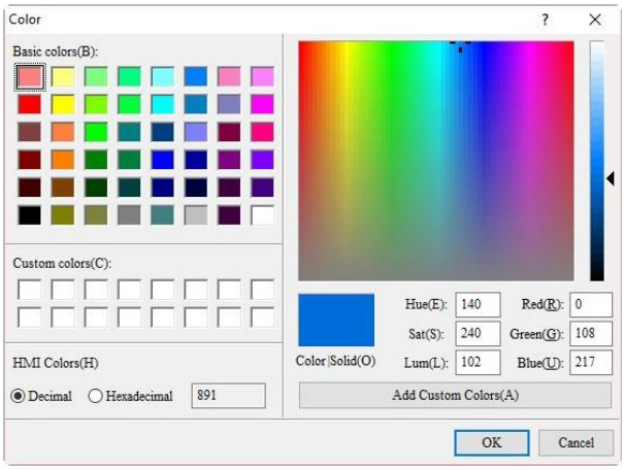
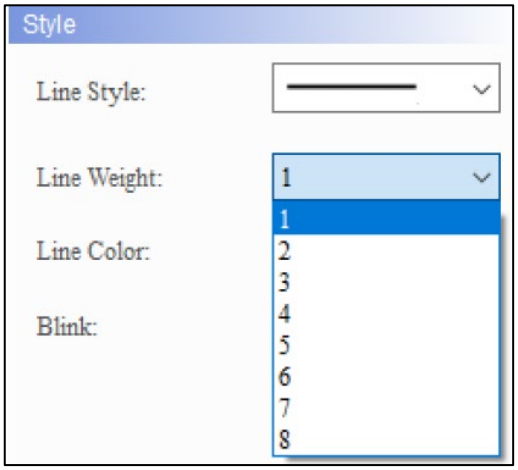
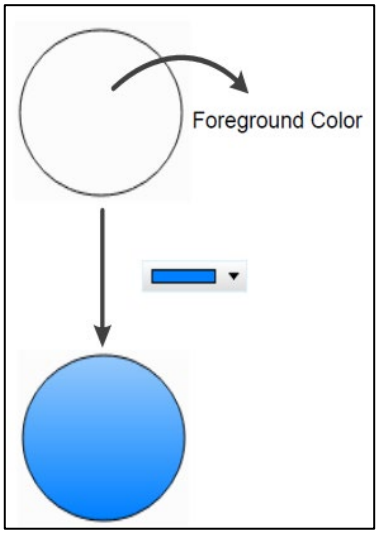
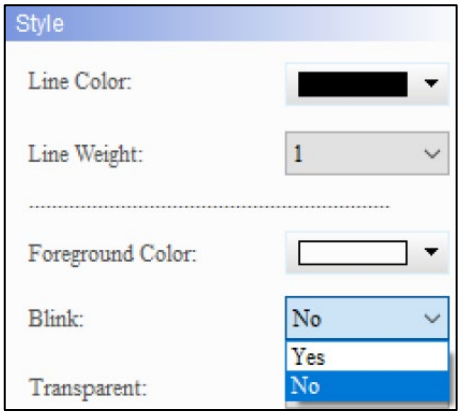
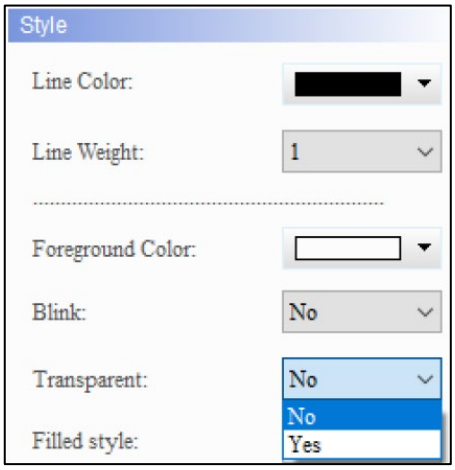


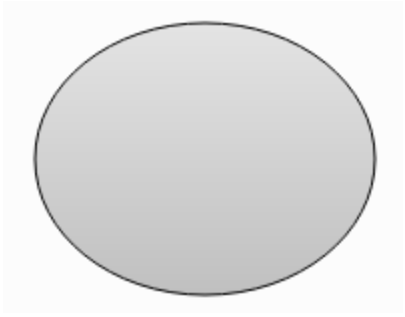
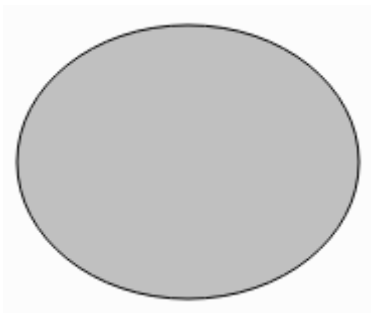
Figure 22 - 14: Circle element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(2)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(3)</td><td>Line Color</td><td>Set the line color for the element. The default is  .

</td></tr>
<tr><td>(4)</td><td>Line Weight</td><td>The line width setting ranges from 1 ~ 8. The default value is 1.

</td></tr>
</table>

No.	Function	Description
(5)	Foreground Color	Set the foreground color of the element. The default is  . 
(6)	Blink	● **Select Yes or No for Blink. The default value is No.** ● **When users select Yes, the Circle element can be displayed as blinking. When the value of the corresponding Read Address is greater than 1, the Circle element is displayed as blinking; when the value is 0, it does not blink.** ● **When users select No, the Circle element does not blink.** 
(7)	Transparent	● Select Yes or No for **Transparent**. The default value is **No**. ● When users select Yes, the **Circle** element displays only the circle border line with the middle shown in transparent color; when users select No, the **Foreground Color** of the element is displayed.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(8)</td><td>Filled style</td><td>

The available options for Filled style of the elements on the DOP-100 models are: Gradient and Fixed. The default value is Gradient.
Open the DOP-B project on a DOP-100 series model. The elements are displayed in Fixed, which is the same as opening the project on a DOP-B series model.

<table>
<tr><td>Gradient</td><td>  </td></tr>
<tr><td>Fixed</td><td>  </td></tr>
</table>
</td></tr>
</table>

- Picture

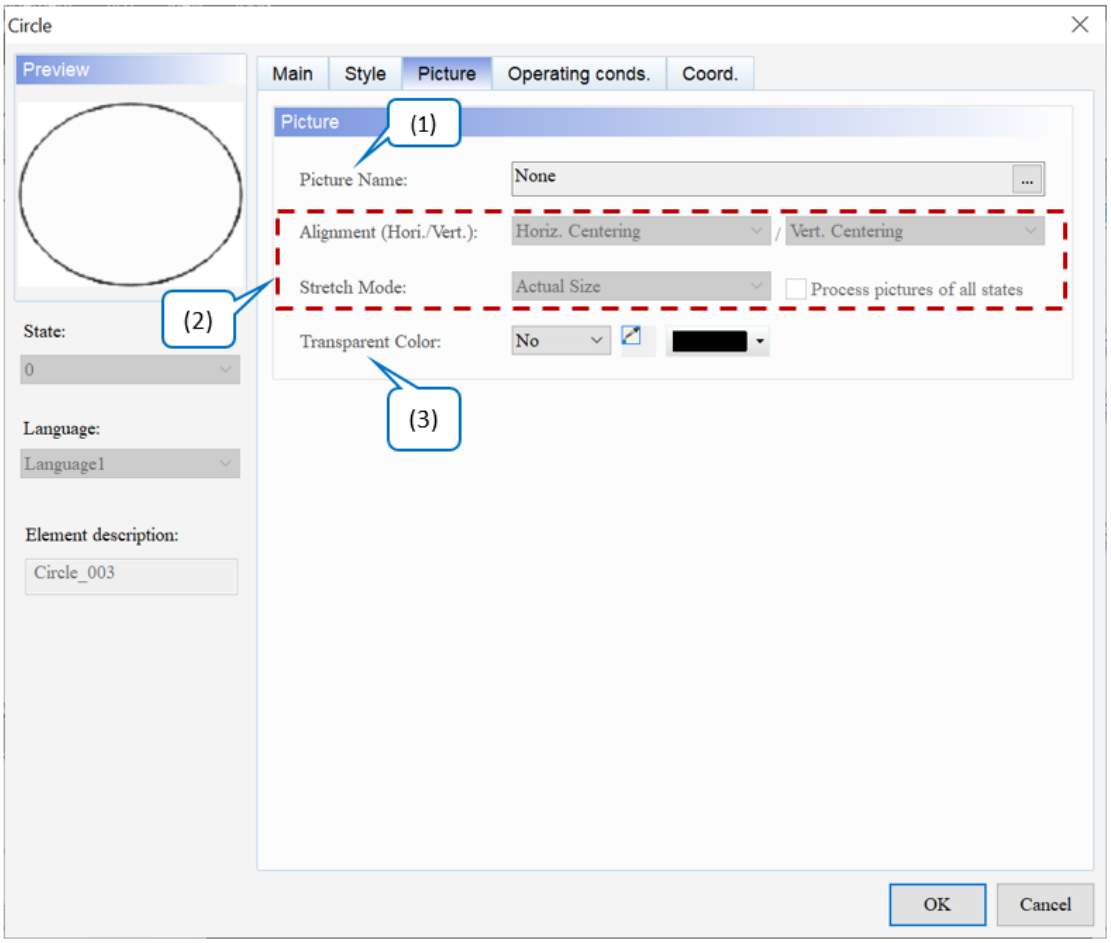
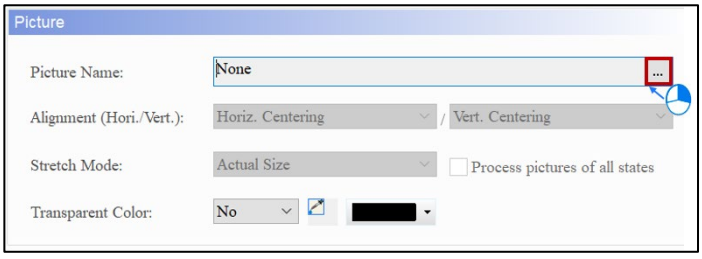
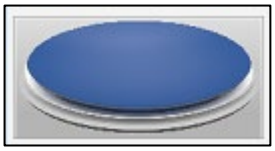
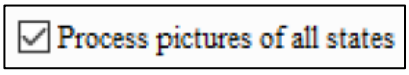


Figure 22 - 15: Circle element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.
 
</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make</td></tr>
</table>

No.	Function	Description
		it transparent, which becomes identical to the **Foreground Color** of the element. 

- Operating conds.

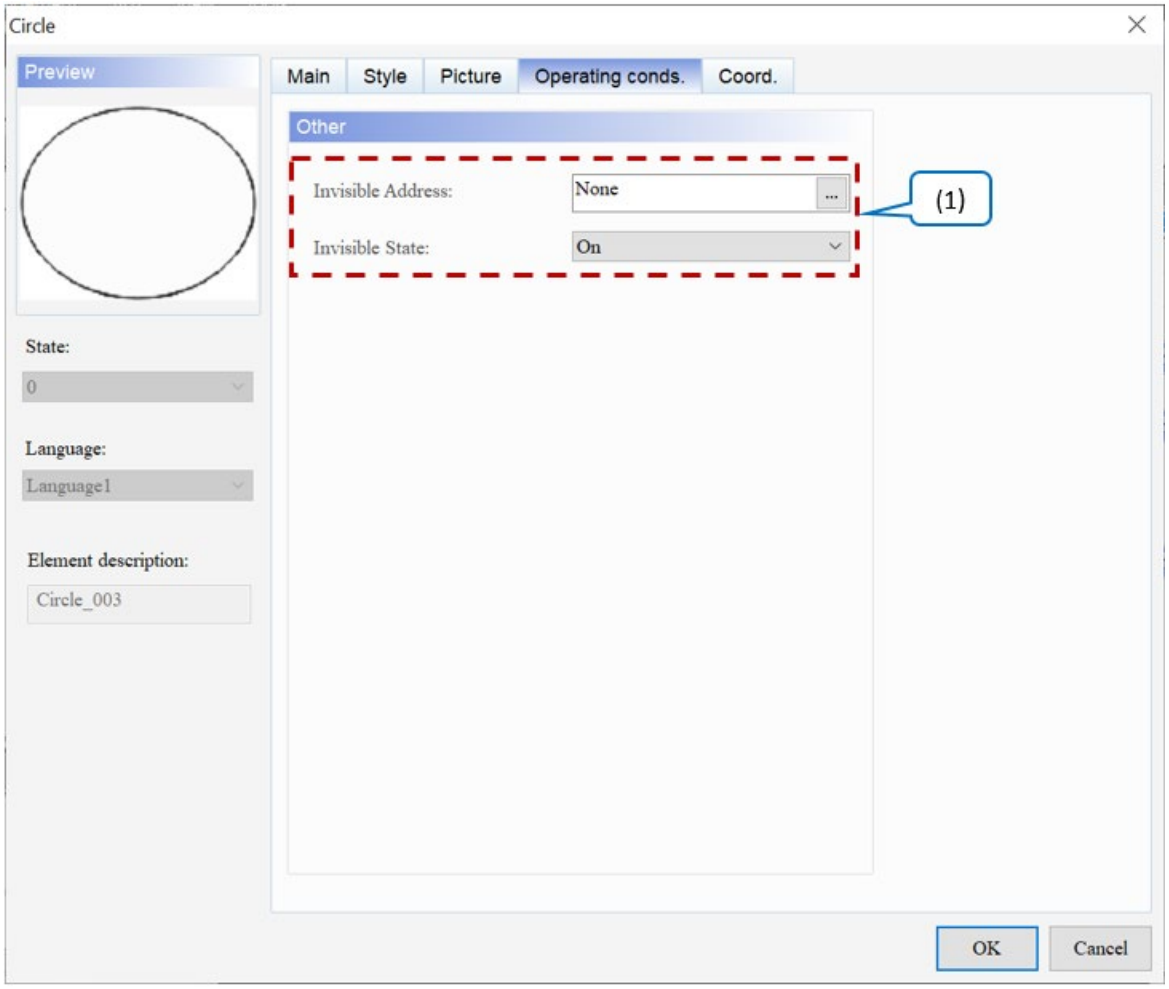
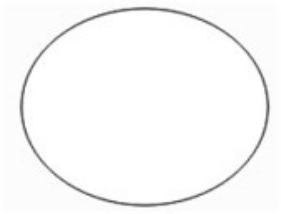
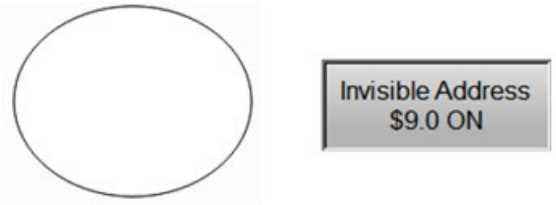


Figure 22 - 16: Circle element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Invisible Address / Invisible State</td><td>

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

<table>
<tr><td>Invisible State is On</td><td> 
</td></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Invisible State is Off</td><td> 
</td></tr>
<tr><td></td><td> 
</td></tr>
</table>
</td></tr>
</table>

- Coord.

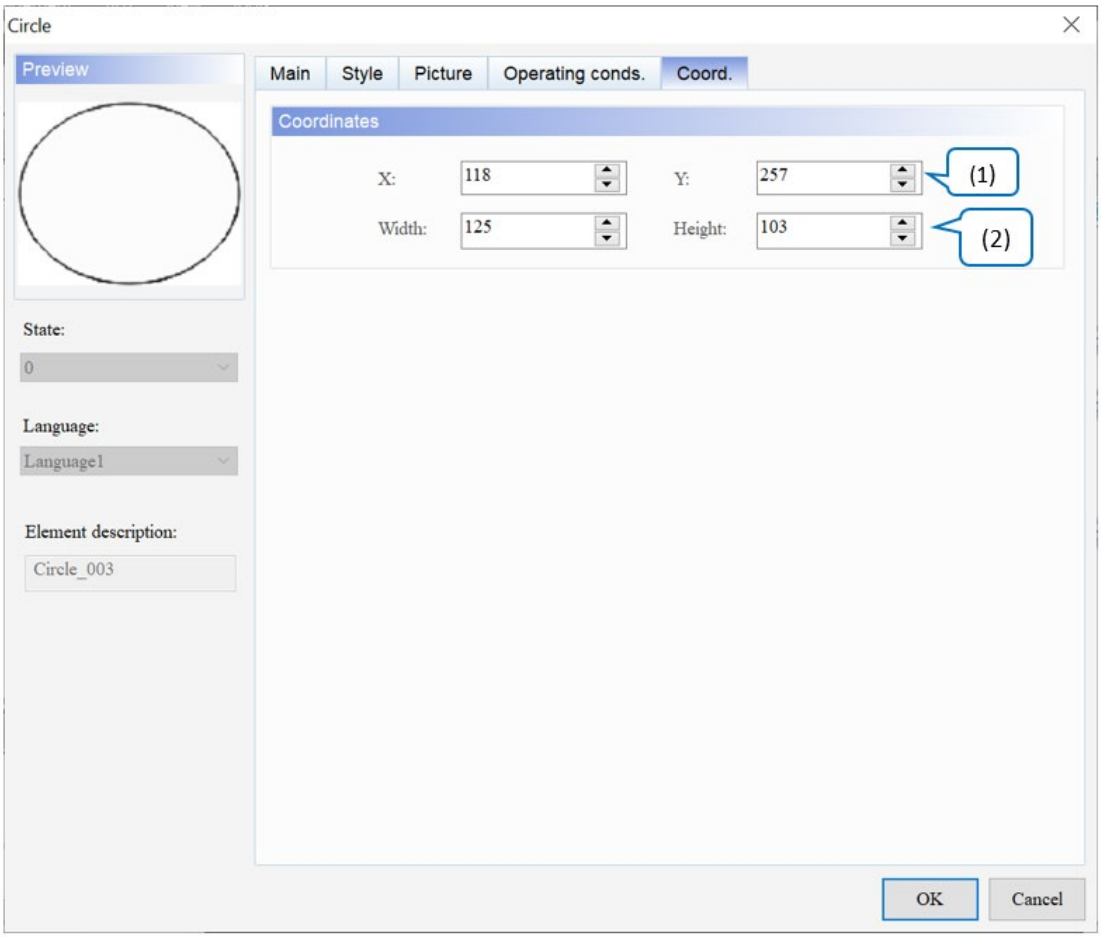


Figure 22 - 17: Circle element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

22.4 Polygon

Press the left mouse key to set each point for the polygon. When all the points are set, press the right mouse key to form a polygon.

On double-clicking the **Polygon** element, the property page appears as follows.

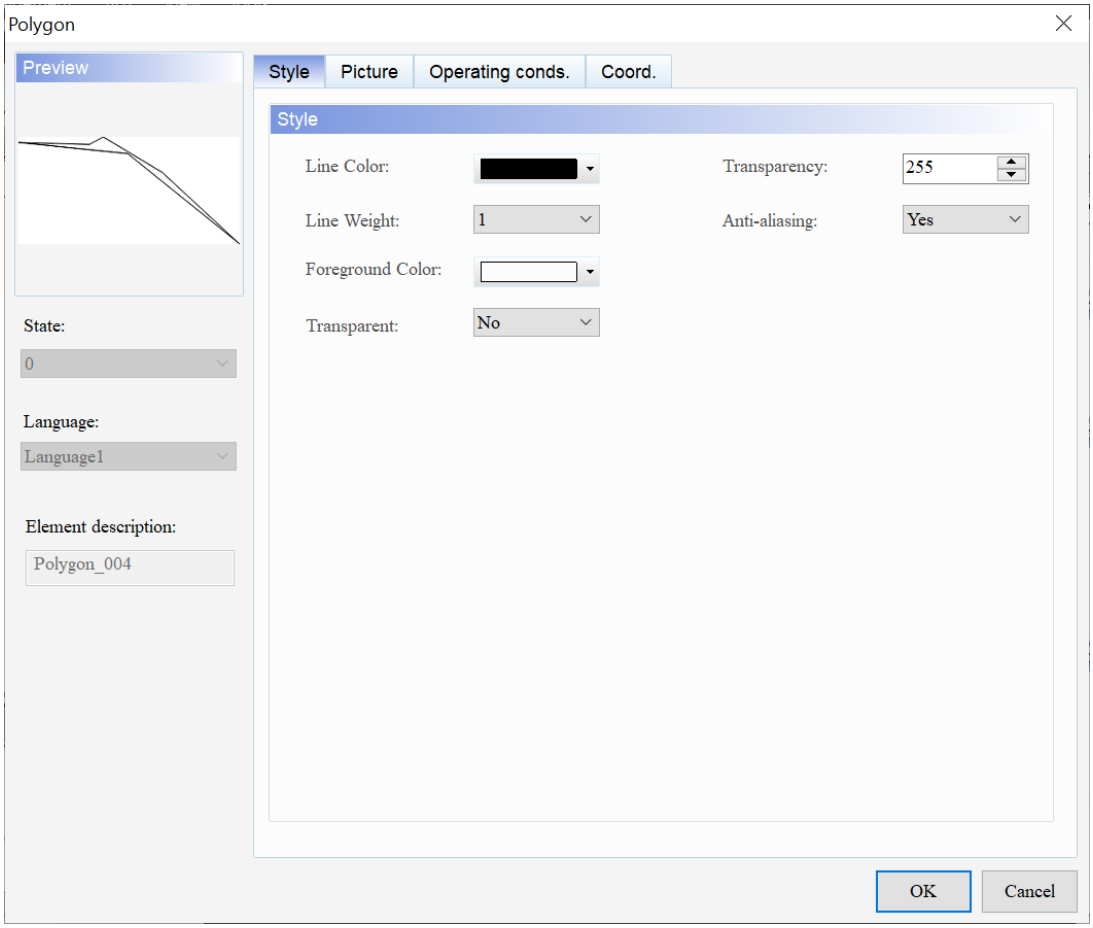


Figure 22 - 18: Polygon element property page

Polygon	
Function	**Description**
Preview	The **Polygon** element does not support multiple state values and multi-language display.
Style	Set Line Color, Line Weight, Foreground Color, Transparent, Transparency, and Anti-aliasing.
Picture	Set Picture Name, Alignment, Stretch Mode, and Transparent Color.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

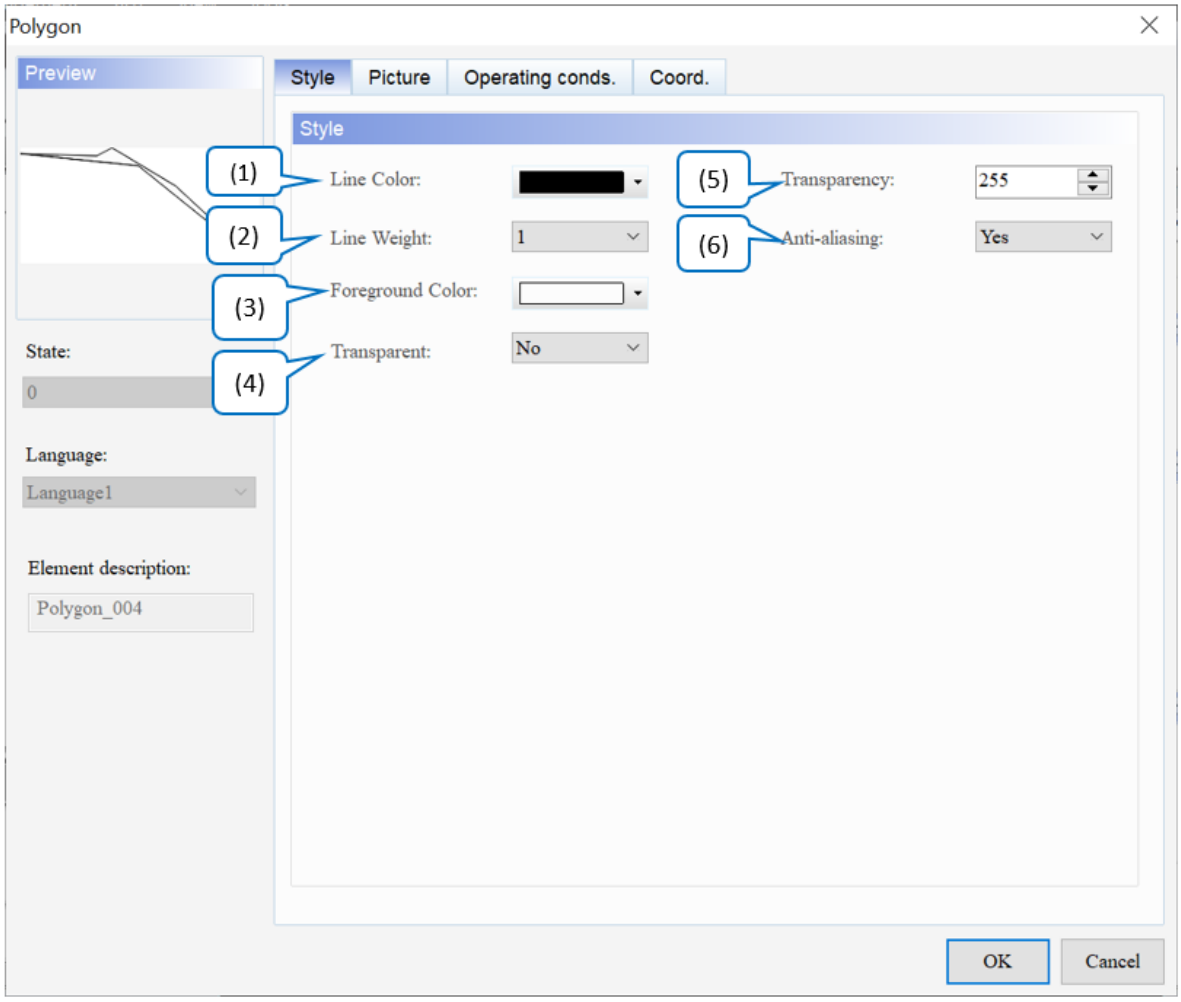
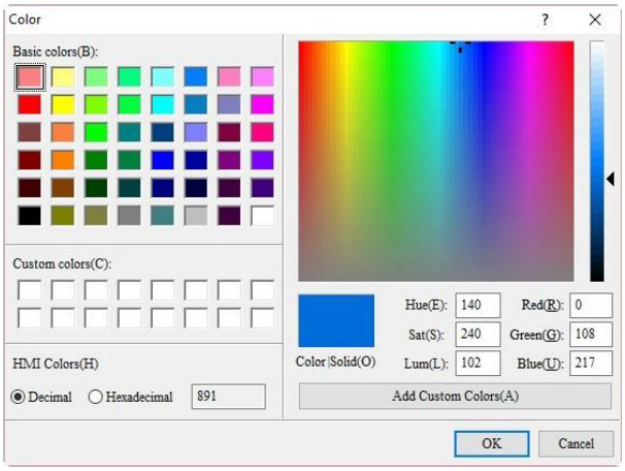
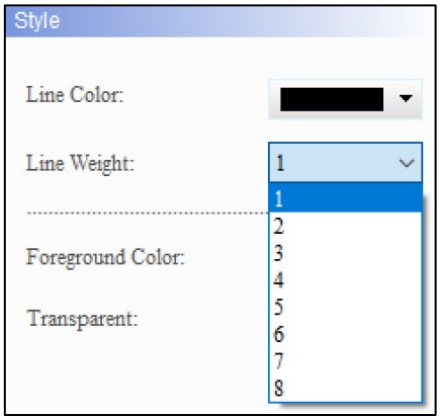
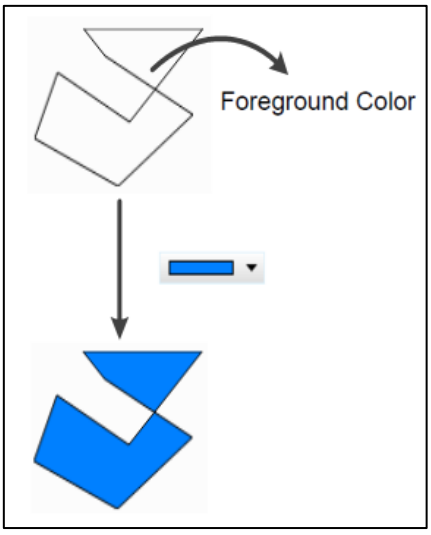
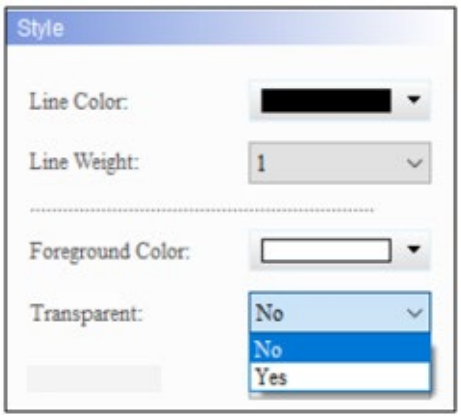
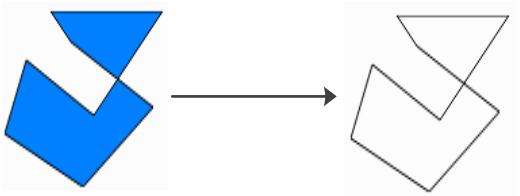
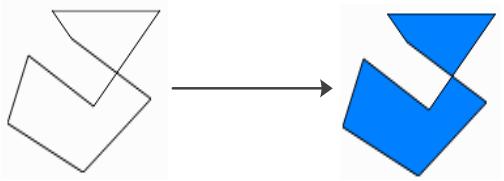
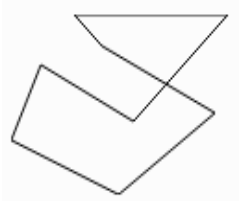
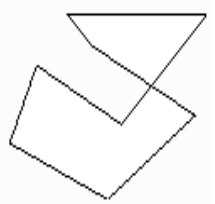


Figure 22 - 19: Polygon element Style property page

No.	Function	Description
(1)	Line Color	Set the line color for the element. The default is  . 
(2)	Line Weight	The line width setting ranges from 1 ~ 8. The default value is 1. 
(3)	Foreground Color	Set the foreground color of the element. The default is  . 
(4)	Transparent	● Select Yes or No for this function. The default value is

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>No.
 

If users select Yes, the foreground color of the Polygon element is transparent and only the border color is displayed; if users select No, the Foreground Color of the element is displayed.
<table>
<tr><td>Transparent is Yes</td><td>  </td></tr>
<tr><td>Transparent is No</td><td>  </td></tr>
</table></td></tr>
<tr><td>(5)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(6)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
<tr><td>Anti-aliasing is No</td><td>  </td></tr>
</table></td></tr>
</table>

- Picture

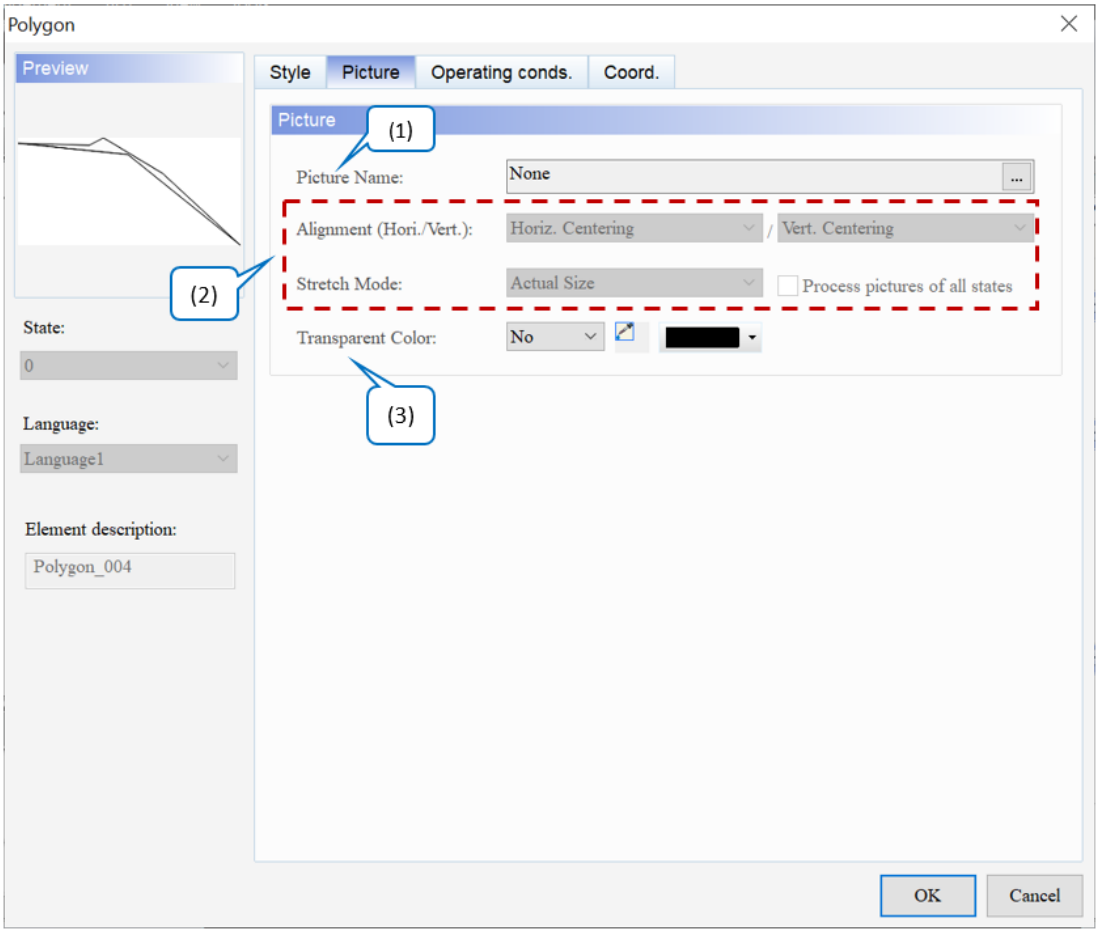
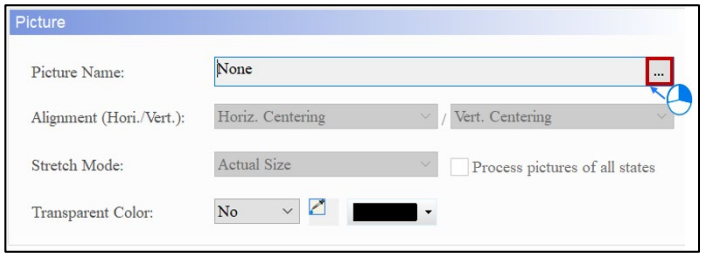
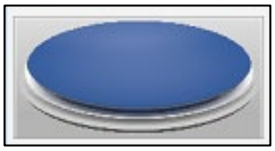
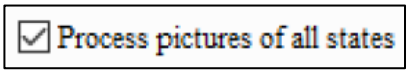


Figure 22 - 20: Polygon element Picture property page

No.	Function	Description
(1)	Picture Name	● To set the picture display, click ... to open the picture selection window. There are many built-in picture libraries. Select the picture provided by the software and then drag it to each state icon of the element to complete the picture configuration. The default value is **None**. 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 

To configure other pictures, refer to <u>Section 28.5 Picture Bank</u>.</td></tr>
<tr><td rowspan="3">(2)</td><td>Alignment</td><td>Set the alignment of the picture through the Alignment function.</td></tr>
<tr><td>Stretch Mode</td><td>The available options for Stretch Mode are: Stretch All, Stretch 1:1, and Actual Size. The default value is Actual Size.
<table>
<tr><th>Stretch All</th><th>Stretch 1.1</th><th>Actual Size</th></tr>
<tr><td>Stretch All means the picture fills the full element display area.
  </td><td>Stretch 1:1 means the picture displays in 1:1 size based on the element width and length.
  </td><td>Actual Size means that regardless of the size of the element, the actual size of the picture is displayed in the element display area.
  </td></tr>
</table></td></tr>
<tr><td>Process pictures of all states</td><td>If users select the checkbox for Process pictures of all states, it assumes that the elements have multiple states and some pictures do not fill the full element display area. Use this function to process all pictures instead of setting them one by one, which saves the editing time.
 
</td></tr>
<tr><td>(3)</td><td>Transparent Color</td><td>This function specifies a color in the picture and make it transparent. The default value is No.
Select  icon and click the white part of the calendar, DIAScreen ignores the white part of the picture and make</td></tr>
</table>

No.	Function	Description
		it transparent, which becomes identical to the **Foreground Color** of the element. 

- Operating conds.

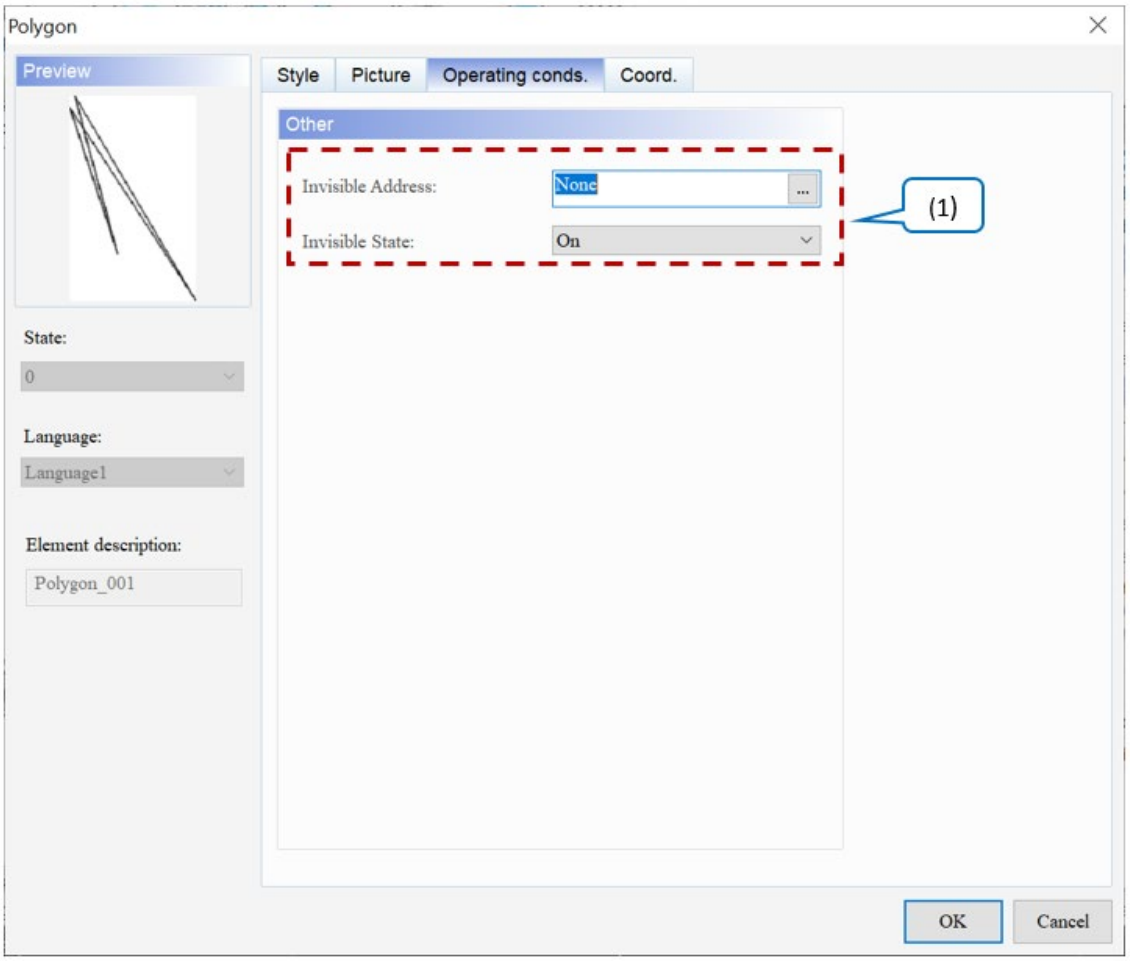
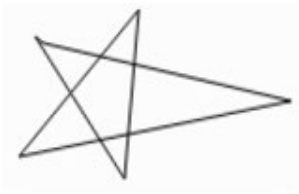
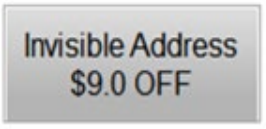
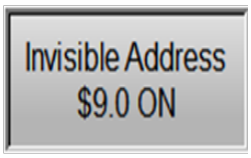
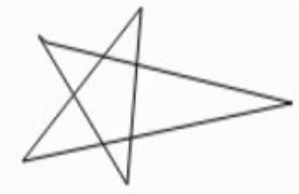
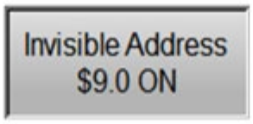
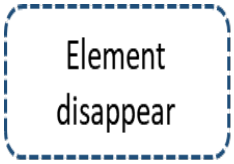


Figure 22 - 21: Polygon element Operating conds. property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="5">(1)</td><td rowspan="5">Invisible Address / Invisible State</td><td colspan="2">

The Invisible Address mainly allows users to hide an element through this address.
If the Invisible State is set to On/Off, the button element is hidden through the address defined in the Invisible Address field. The default value is On.
The following example explains Invisible Address usage:

Create a button and set its address to $9.0, then set the Invisible Address of the element to be hidden to $9.0.
To hide the element, first press the $9.0 button.

</td></tr>
<tr><td rowspan="2">Invisible State is ON</td><td> 
  </td></tr>
<tr><td> 
  </td></tr>
<tr><td rowspan="2">Invisible State is OFF</td><td> 
  </td></tr>
<tr><td> 
  </td></tr>
</table>

- Coord.

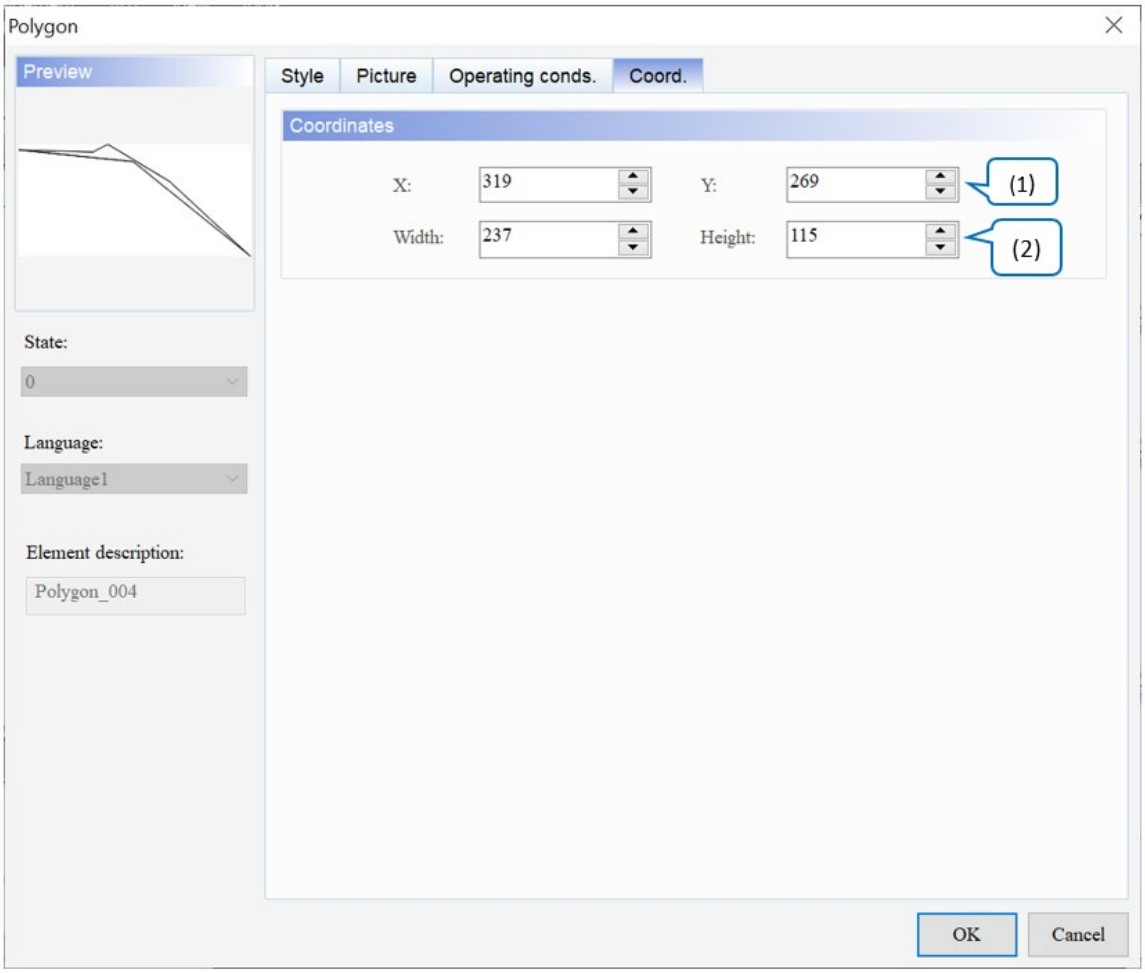


Figure 22 - 22: Polygon element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

22.5 Text

Use the **Text** element to enter the text for display. On double-clicking the **Text** element, the property page appears as follows.

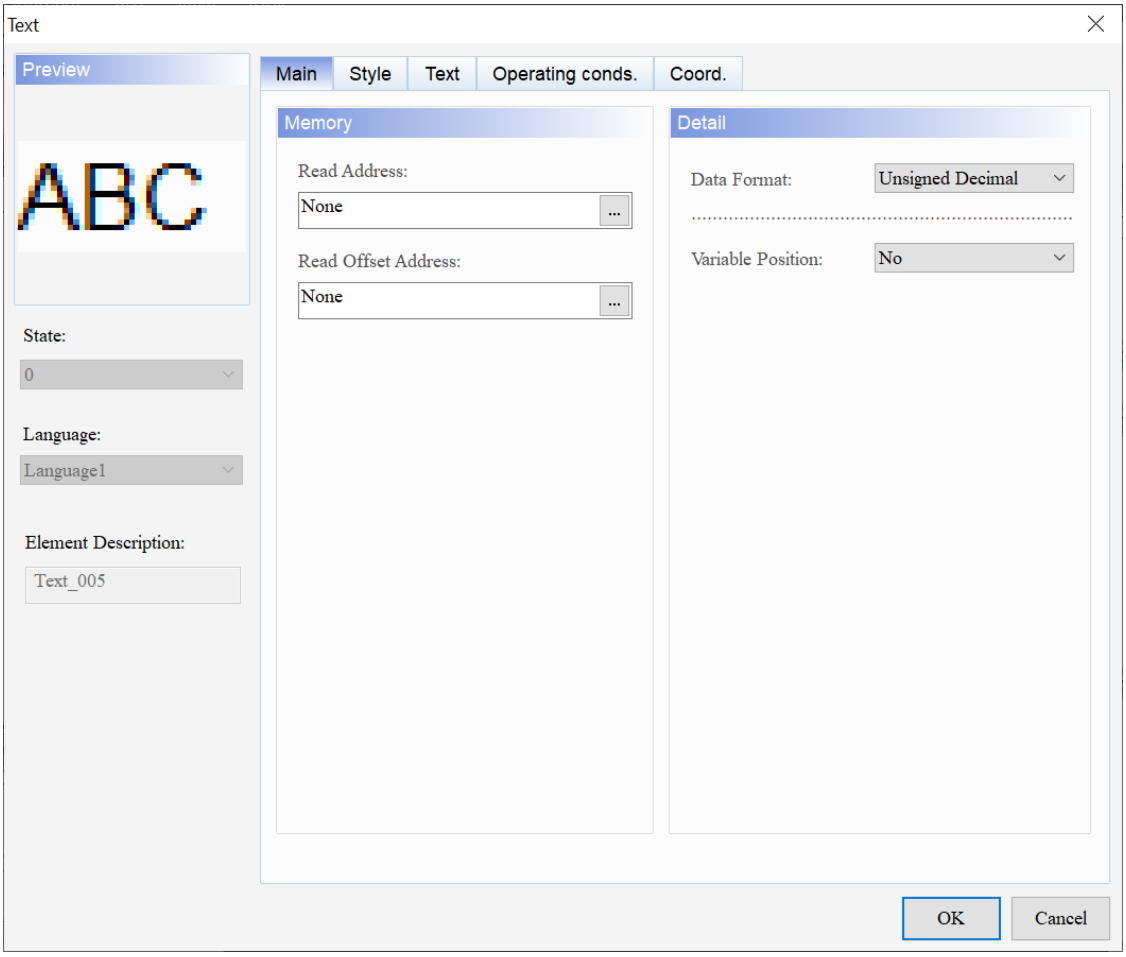


Figure 22 - 23: Text element property page

Text	
Function	**Description**
Preview	The Text element does not support multiple state values, but the multi-language display can be edited.
Main	Set Read Address, Read Offset Address, Data Format, and Variable Position.
Style	Set Foreground Color, Transparent, Smoothing, Use Text Pic, Show shadow, Offset X, Offset Y, Shadow color, Shadow blur radius, and Transparency.
Text	Set text content, font, size, color, format, zoom, and alignment options.
Operating conds.	Set Invisible Address and Invisible State.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

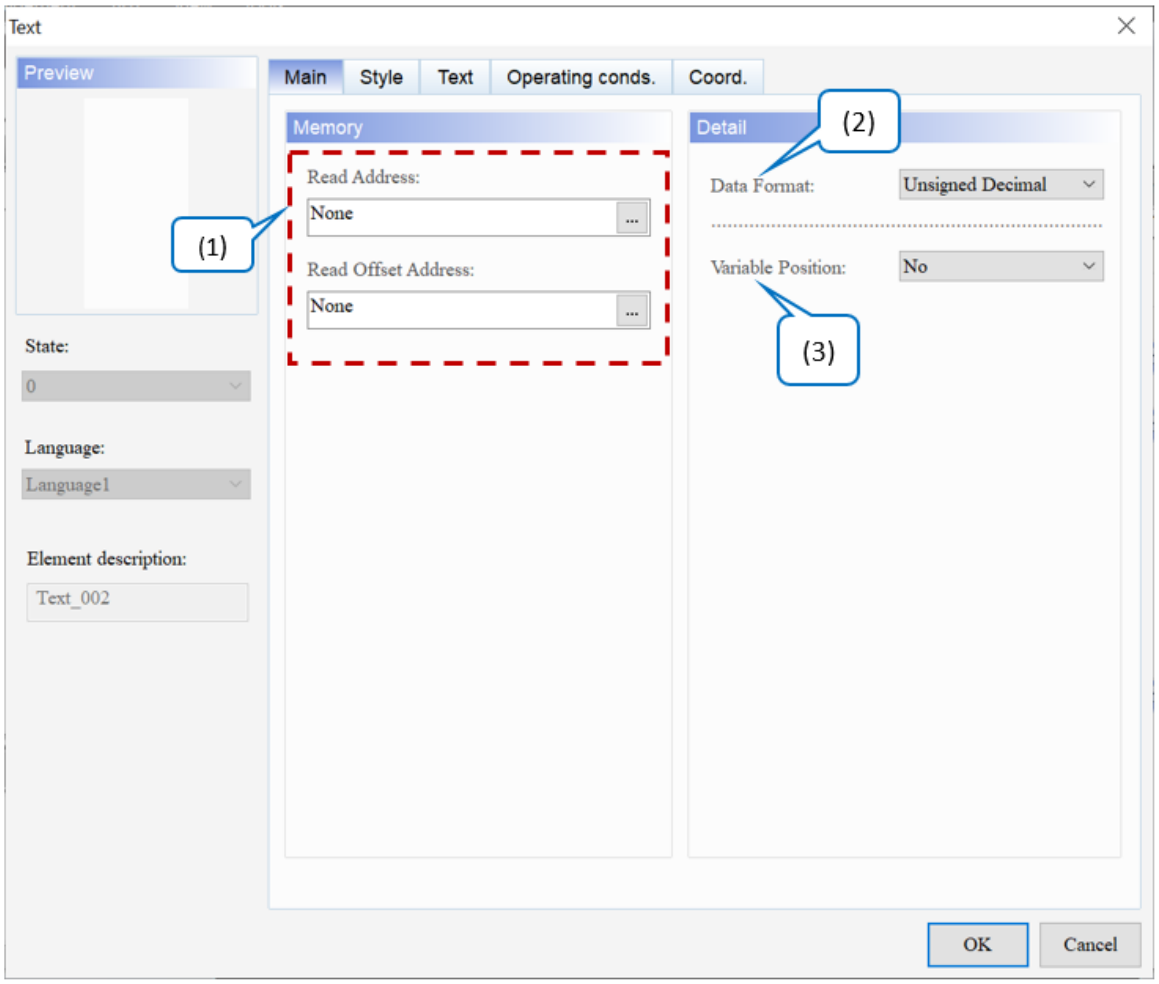
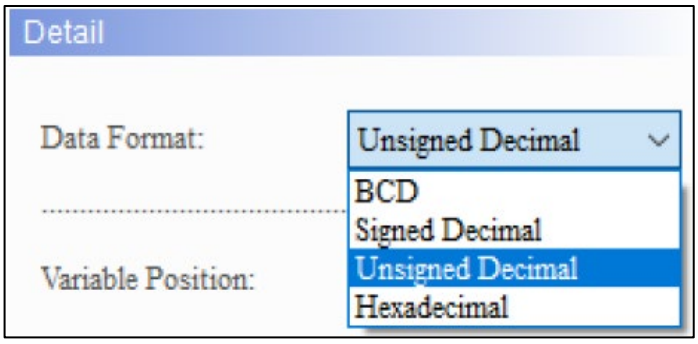
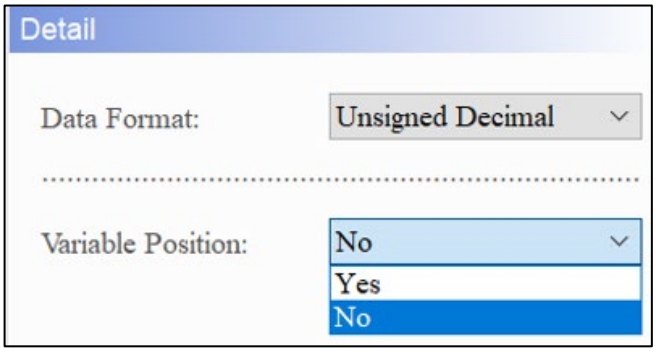


Figure 22 - 24: Text element Main property page

No.	Function	Description
(1)	Read Address	● Available options are Internal Memory and controller register address. ● When **Variable Position** is set to Yes, the value of the **Read Address** is regarded as the X coordinate for the horizontal axis of the **Text** element. ● When **Variable Position** is set to Yes, the value of **Read Address+1** is regarded as the Y coordinate for the vertical axis of the **Text** element.
	Read Offset Address	Refer to *Appendix D Write and Read Offset Address*.

No.	Function	Description
(2)	Data Format	The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, and Hexadecimal. The default value is **Unsigned Decimal**. 
(3)	Variable Position	● Select Yes or No for **Variable Position**. The default value is **No**. ● When users select Yes, the position of the **Text** element can be changed; when users select No, the position of the **Text** element cannot be changed. 

- Style

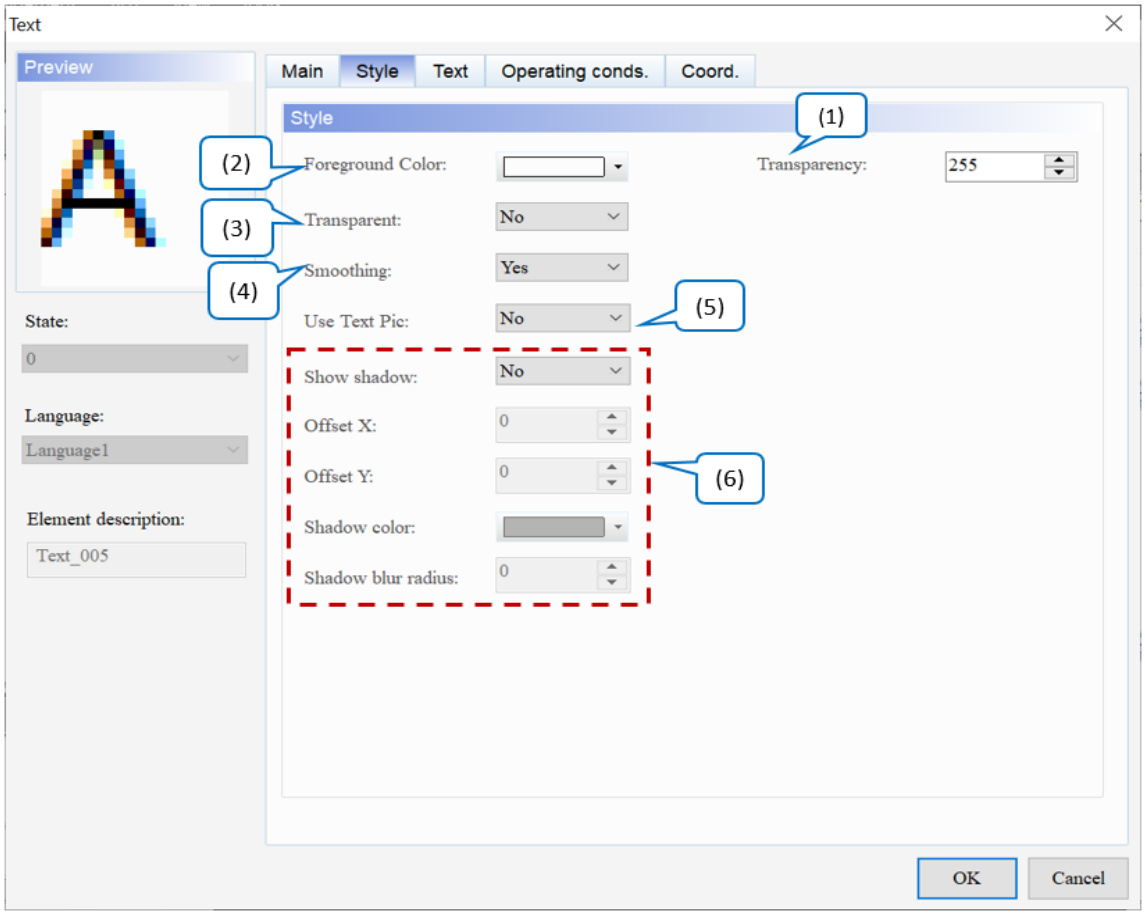
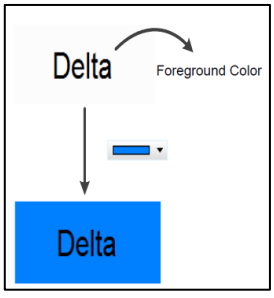
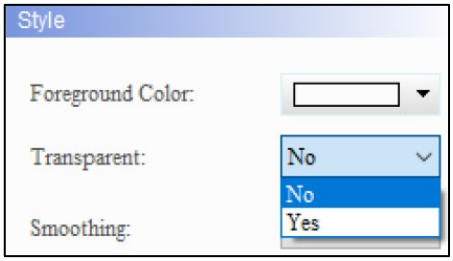


Figure 22 - 25: Text element Style property page

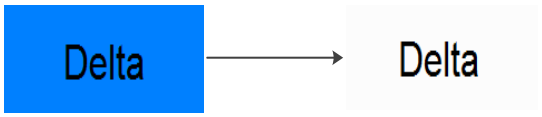
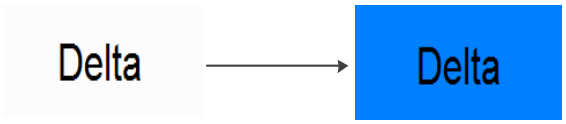
No.	Function	Description
(1)	Transparency	Set the transparency value within the range of 50 ~ 255. The default is **255**. The smaller the value, the higher the transparency of the element.
(2)	Foreground Color	Set the foreground color of the element. The default is  . 

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(3)</td><td>Transparent</td><td>

Select Yes or No for this function. The default value is No.



When users select Yes, the foreground color of the Text element is transparent with only the text color displayed; when users select No, the Foreground Color of the element is displayed.

<table>
<tr><td>Transparent is Yes</td><td> 
</td></tr>
<tr><td>Transparent is No</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(4)</td><td>Smoothing</td><td>

Select Yes or No for Smoothing. The default value is Yes.
When users select Yes, the font is displayed without jagged edges and is smoother; when users select No, the font is displayed with jagged edges and is not smooth.

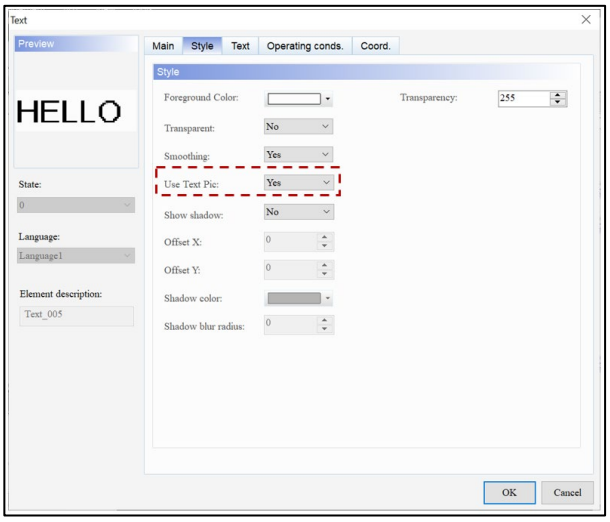
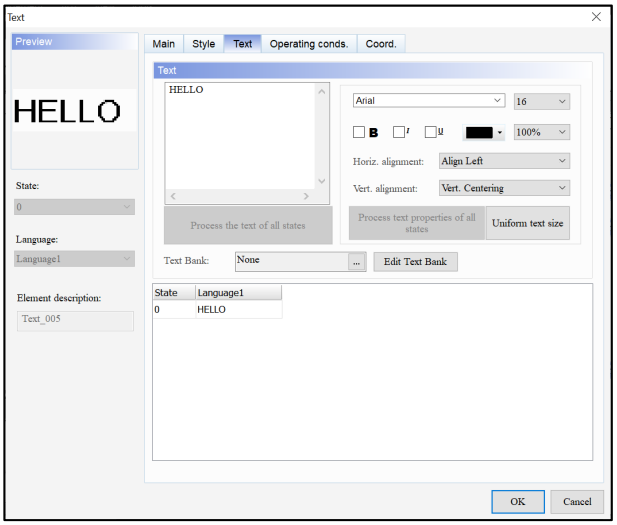
<table>
<tr><td>Smoothing is Yes</td><td> 
</td></tr>
<tr><td>Smoothing is No</td><td> 
</td></tr>
</table>
</td></tr>
<tr><td>(5)</td><td>Use Text Pic</td><td>

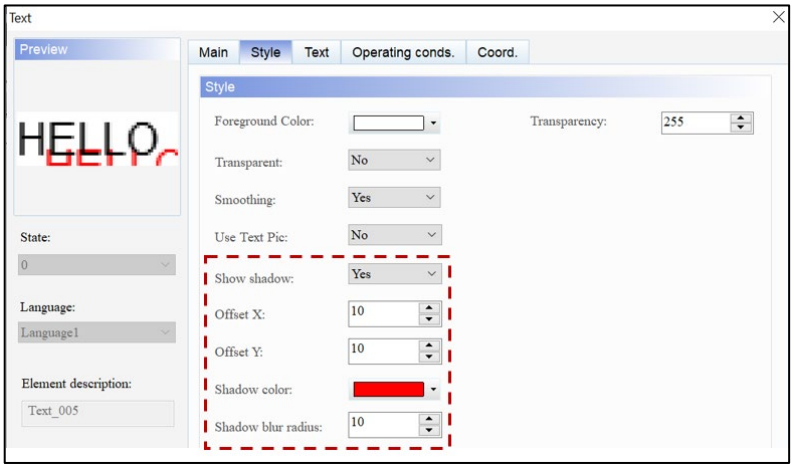
Since DOP-B series HMIs use pictures to present all text effects, while DOP-100 series HMIs use text to present them, so fonts that are not yet supported by the computer may appear missing characters on the HMI or garbled characters. Therefore, in order to be compatible with the effect of DOP-B text display, a new element is added to support the Use Text Pic function. The default value is No.
Refer to the following examples.

</td></tr>
</table>

No.	Function	Description

Use Text Pic

Create Text element	● Create a **Text** element, and go to **Style** page to set **Use Text Pic** function.  ***NOTE**: If users use DIAScreen to open a DOP-B project, the **Use Text Pic** function is enabled (Yes) by default. If users add a DOP-100 project, then the **Use Text Pic** function is disabled (No) by default.* ● Go to **Text** page, and type the text and set its font. 
Execution result	● After creating the element, download the data to the HMI.

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
The following table shows the results of using and not using the Use Text Pic function.
<table>
<tr><th>Use Text Pic is Yes</th><th>Use Text Pic is No</th></tr>
<tr><td>HELLO</td><td>HELLO</td></tr>
</table>
</td></tr>
<tr><td>(6)</td><td>Show shadow</td><td>
Set text on Text element to show shadow. The default value is No.
If Show shadow is Yes, the following setting can be done.
<table>
<tr><td>Offset X</td><td>Enter an integer from -100 ~ 100. If users enter a negative number, the shadow will be displayed on the left side of the text, and if users enter a positive number, the shadow will be displayed on the right side.</td></tr>
<tr><td>Offset Y</td><td>Enter an integer from -100 ~ 100. If users enter a negative number, the shadow will be displayed above the text, and if users enter a positive number, the shadow will be displayed below the text.</td></tr>
<tr><td>Shadow color</td><td>Set the color of the text shadow.</td></tr>
<tr><td>Shadow blur radius</td><td>Enter an integer from 0 ~ 100. The larger the value, the higher the degree of shadow blurring.</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td> 
</td></tr>
</table>

- Text

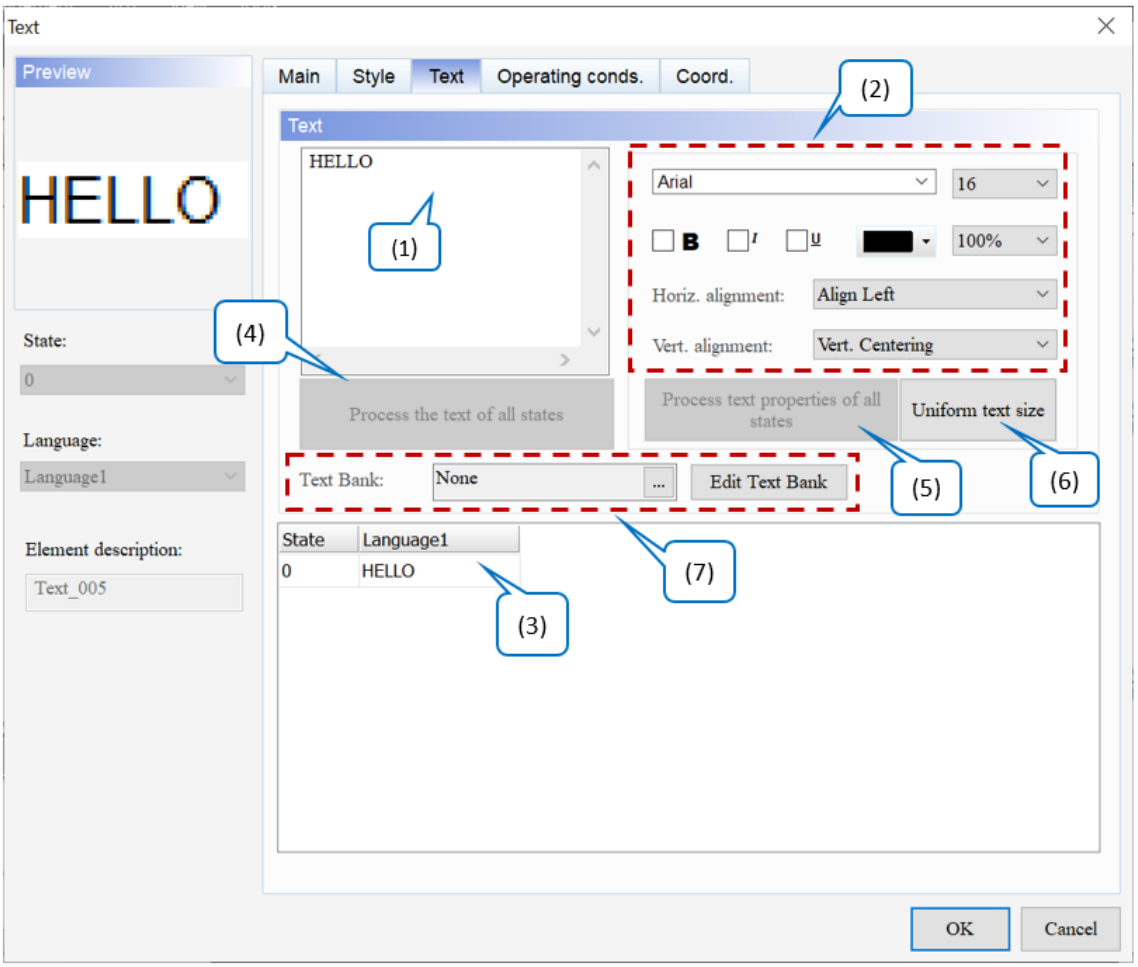
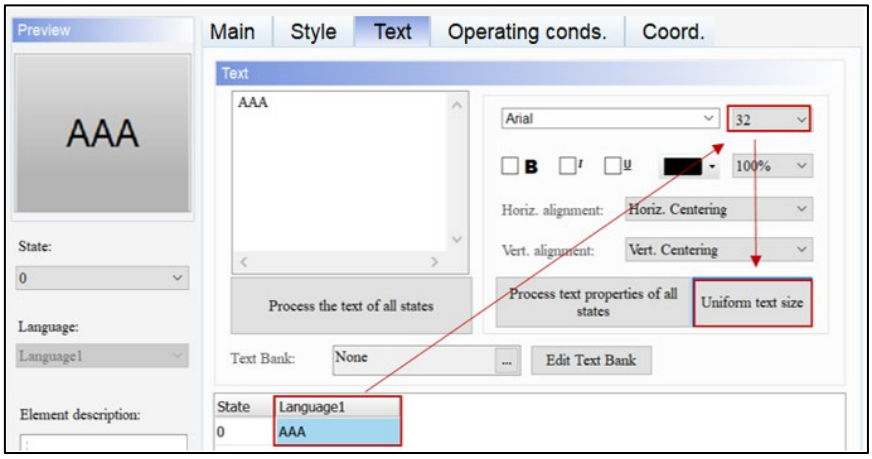


Figure 22 - 26: Text element Text property page

No.	Function	Description
(1)	Text	● Enter the text message to display in the text box. ● As long as the element allows text input, click the element on the screen and press the space key on the keyboard to edit and enter the text.
(2)	Text Property	Set the text properties, including the font, size, color, zoom, alignment, and bold / italic / underline for the text.
(3)	Edit multi-language text	If users have added multi-language text, the **Text** page allows to edit the multi-language data.

No.	Function	Description
(4)	Process the text of all states	This element does not support multi-state functions.
(5)	Process text properties of all states	This element does not support multi-state functions.
(6)	Uniform text size	● This function is for all language texts, and will change the size of all texts at one time according to the currently selected state. ● The following is an example description and steps: 1. To configure multiple languages, refer to *Section 25.1 Multi-language Settings*. 2. Select the state to change the text size. 3. Execute the **Uniform text size**, and the text size of all languages will be changed to the set size. 
(7)	Text Bank	Refer to *Section 28.6 Text Bank*.

- Operating conds.

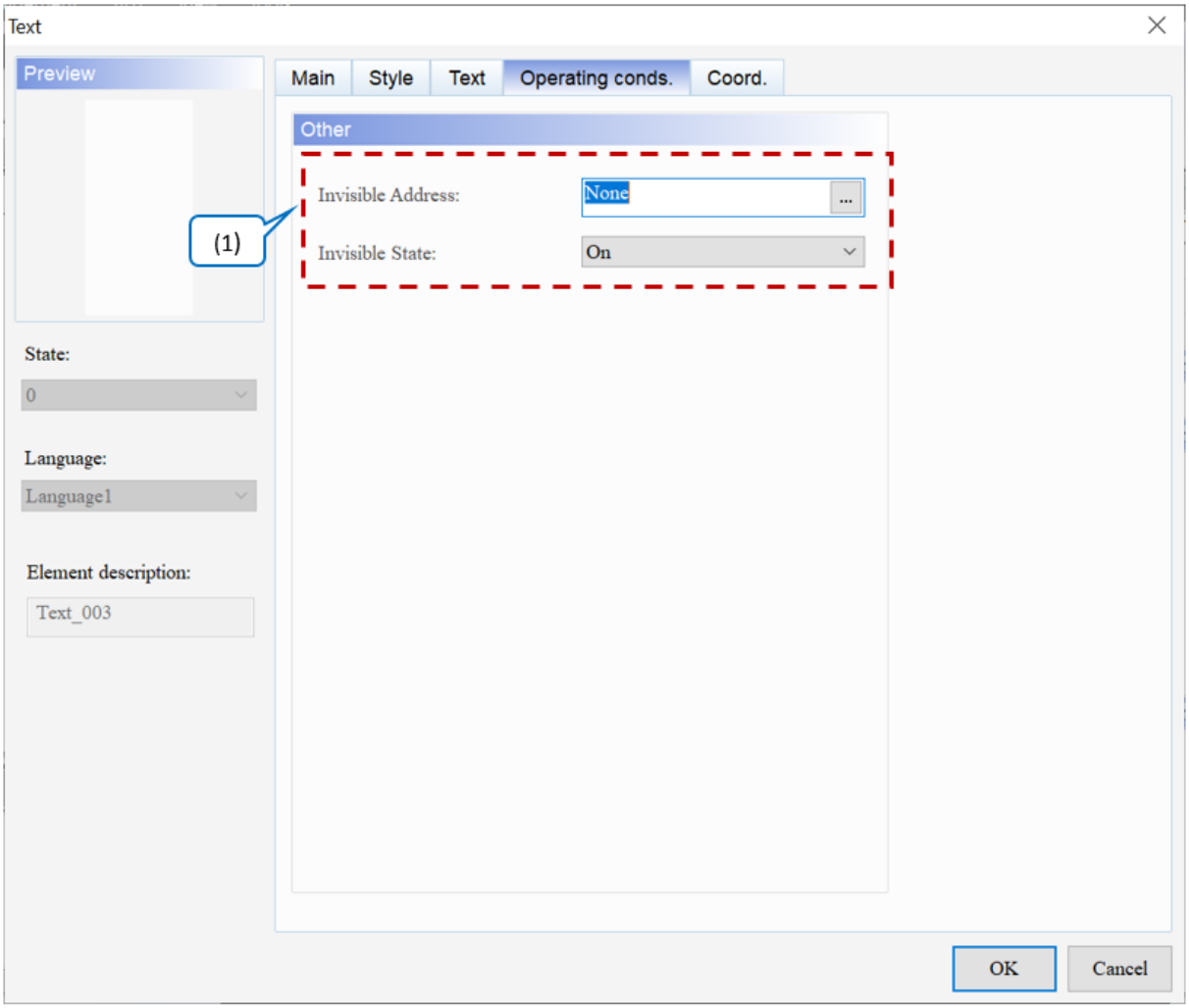
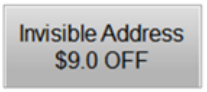
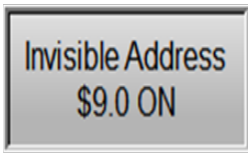


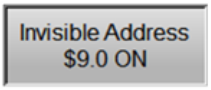
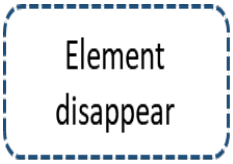
Figure 22 - 27: Text element Operating conds. property page

No.	Function	Description
(1)	Invisible Address / Invisible State	● The **Invisible Address** mainly allows users to hide an element through this address. ● If the **Invisible State** is set to On/Off, the button element is hidden through the address defined in the **Invisible Address** field. The default value is **On**. ● The following example explains **Invisible Address** usage: 1. Create a button and set its address to $9.0, then set the **Invisible Address** of the element to be

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
hidden to $9.0.
2. To hide the element, first press the $9.0 button.
<table>
<tr><td rowspan="2">Invisible State is On</td><td> 


</td></tr>
<tr><td> 


</td></tr>
<tr><td rowspan="2">Invisible State is Off</td><td> 


</td></tr>
<tr><td> 


</td></tr>
</table>
</td></tr>
</table>

- Coord.

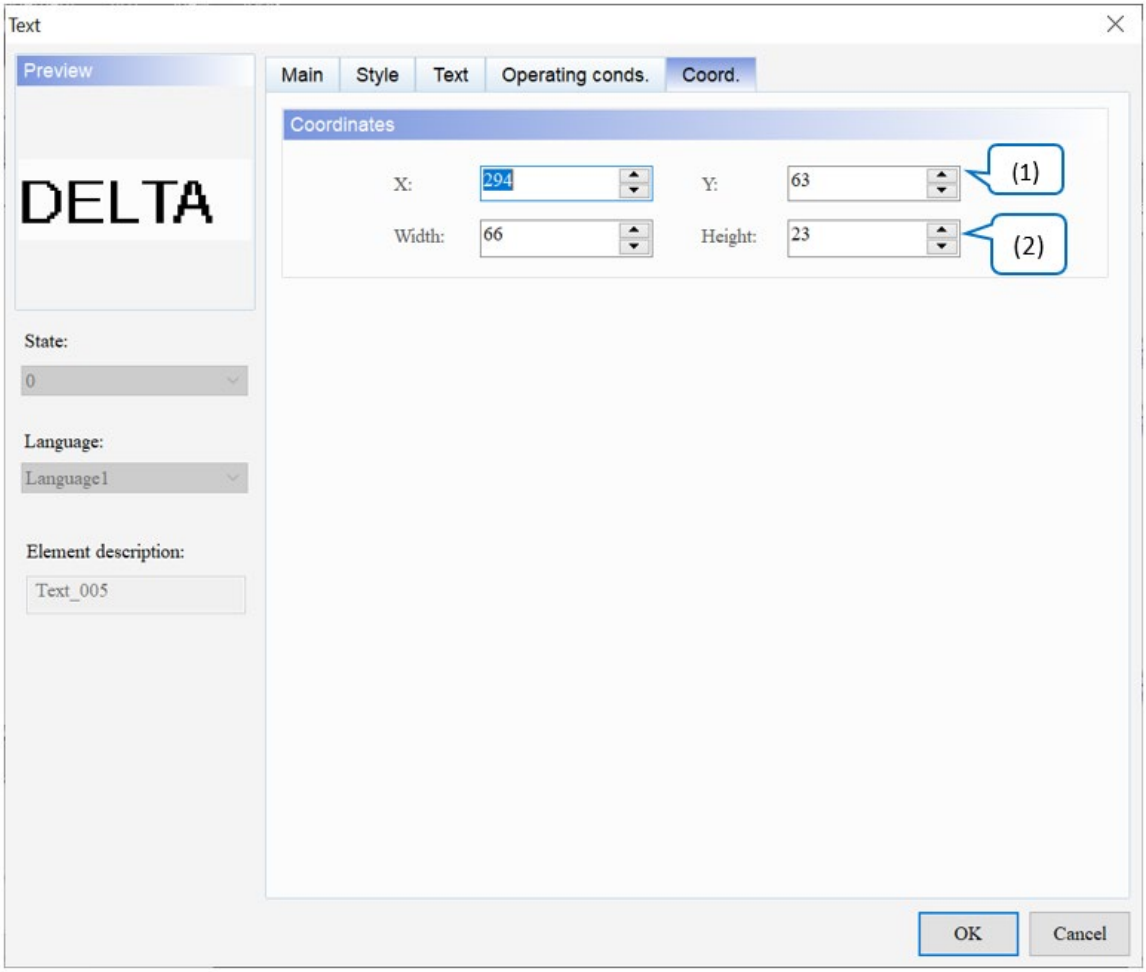


Figure 22 - 28: Text element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

22.6 Scale

Use **Scale** element to indicate the curve value for the **Historical Trend Graph**. In the **Scale** element property page, set the **Scale Mark Number** and **Subscale Mark Number**, as well as **Data Type**, **Data Format**, **Maximum**, and **Minimum** to display. Users can also decide whether to display the marked value or only to display the scale.

On double-clicking the **Scale** element, the property page appears as follows.

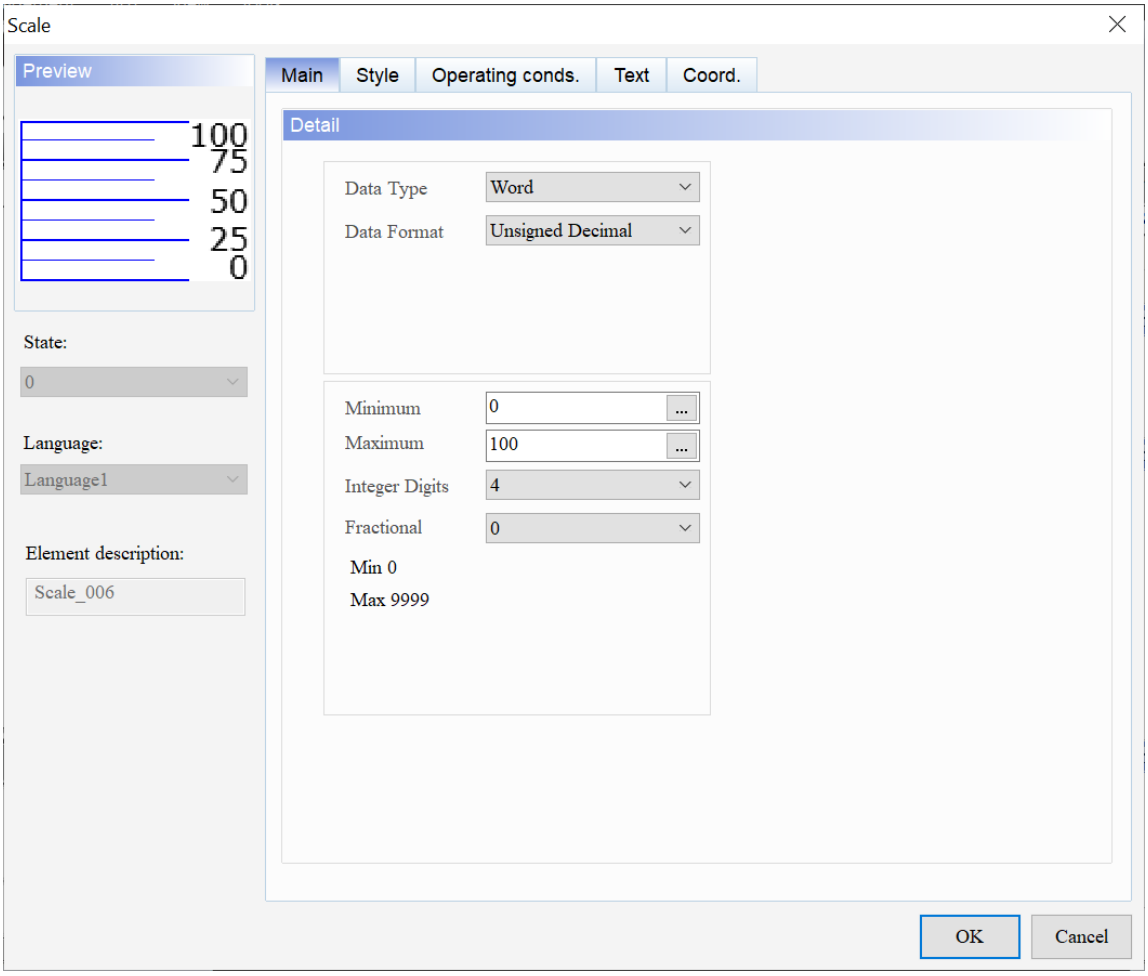


Figure 22 - 29: Scale element property page

Scale	
Function	**Description**
Preview	The **Scale element** does not support multiple state values and multi-language display.
Main	Set the Data Type, Data Format, Minimum, Maximum, Integer Digits, and Fractional (Digits).
Style	Set the Display Mark, Scale Mark Number, Subscale Mark Number, Mark Color, Swap the min/max mark, Style, and Transparency.
Operating conds.	Set the Invisible Address and Invisible State.
Text	Set the font, size, and color of the text to display.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Main

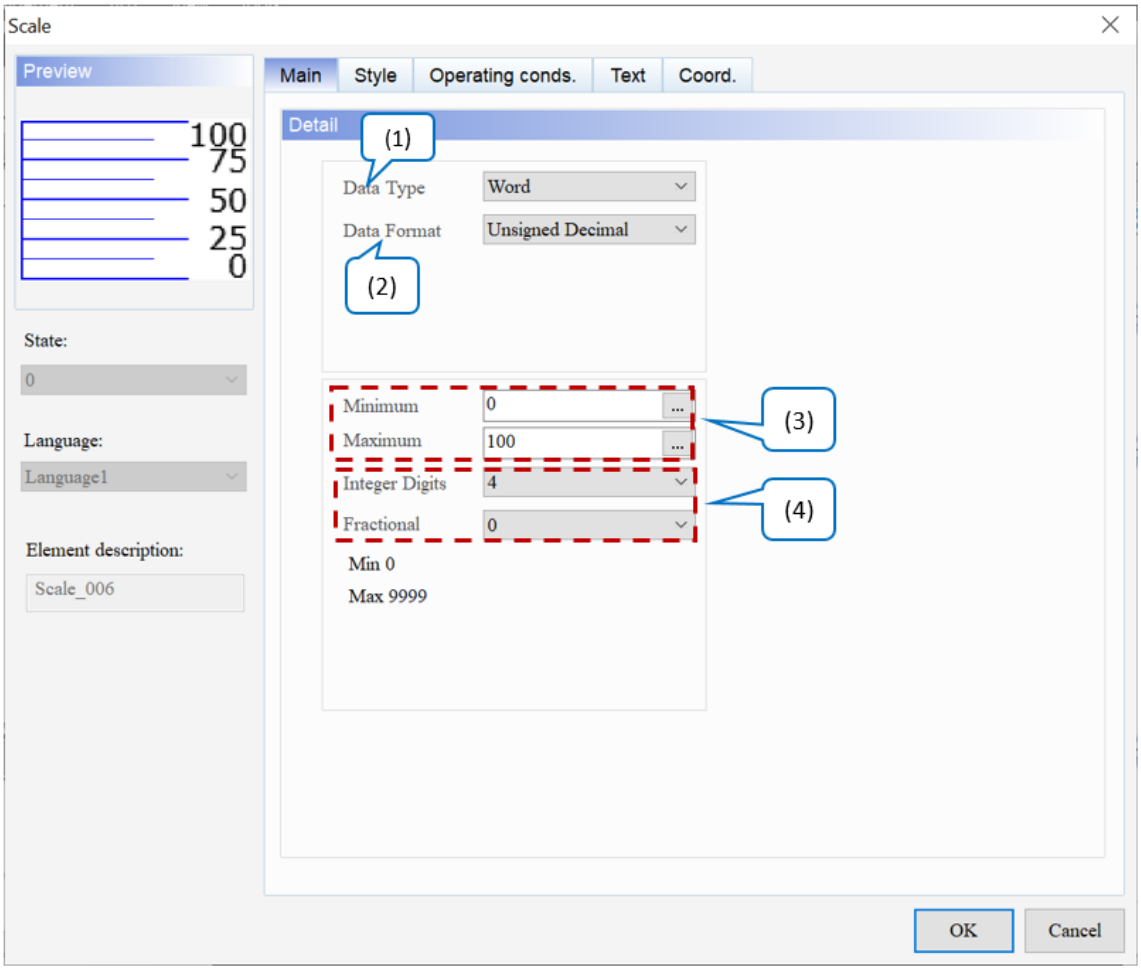
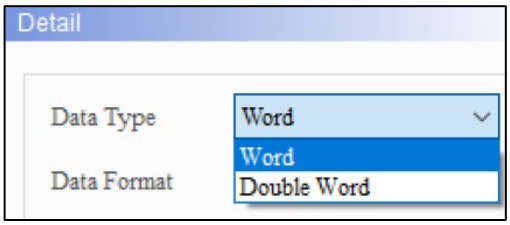
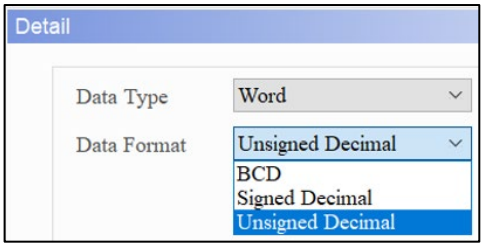
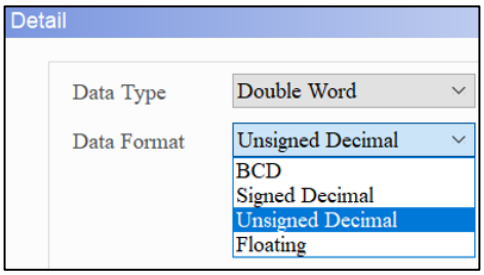


Figure 22 - 30: Scale element Main property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Data Type</td><td>The available options for Data Type are: Word and Double Word. The default value is Word.
 
</td></tr>
<tr><td>(2)</td><td>Data Format</td><td>● When the Data Type is Word, the available options for Data Format are: BCD, Signed Decimal, and Unsigned Decimal. The default value is Unsigned Decimal.
 

● When the Data Type is Double Word, the available options for Data Format are: BCD, Signed Decimal, Unsigned Decimal, and Floating. The default value is Unsigned Decimal.
 
</td></tr>
<tr><td>(3)</td><td>Minimum / Maximum value</td><td>The permissible ranges for Minimum and Maximum values vary based on the selected Data Type, Integer Digits, and Fractional (Digits). The following table is based on the example with no Fractional (Digits) set.
<table>
<tr><th>Data Type</th><th>Data Format</th><th>Permissible Range</th><th>Integer Digits</th><th>Fractional (Digits)</th></tr>
<tr><td rowspan="3">Word</td><td>BCD</td><td>0 ~ 9999</td><td>4</td><td>0</td></tr>
<tr><td>Signed Decimal</td><td>-3278 ~ 32767</td><td>5</td><td>0</td></tr>
<tr><td>Unsigned Decimal</td><td>0 ~ 65535</td><td>5</td><td>0</td></tr>
<tr><td></td><td>BCD</td><td>0 ~ 99999999</td><td>8</td><td>0</td></tr>
</table></td></tr>
</table>

No.	Function	Description				
		Double Word	Signed Decimal	-2147483648 ~ 2147483647	10	0
			Unsigned Decimal	0 ~ 4294697295	10	0
(4)	Integer Digits / Fractional (Digits)	Set the number of displayed integer and fractional digits. The default values are **10** and **0**, respectively.				

- Style

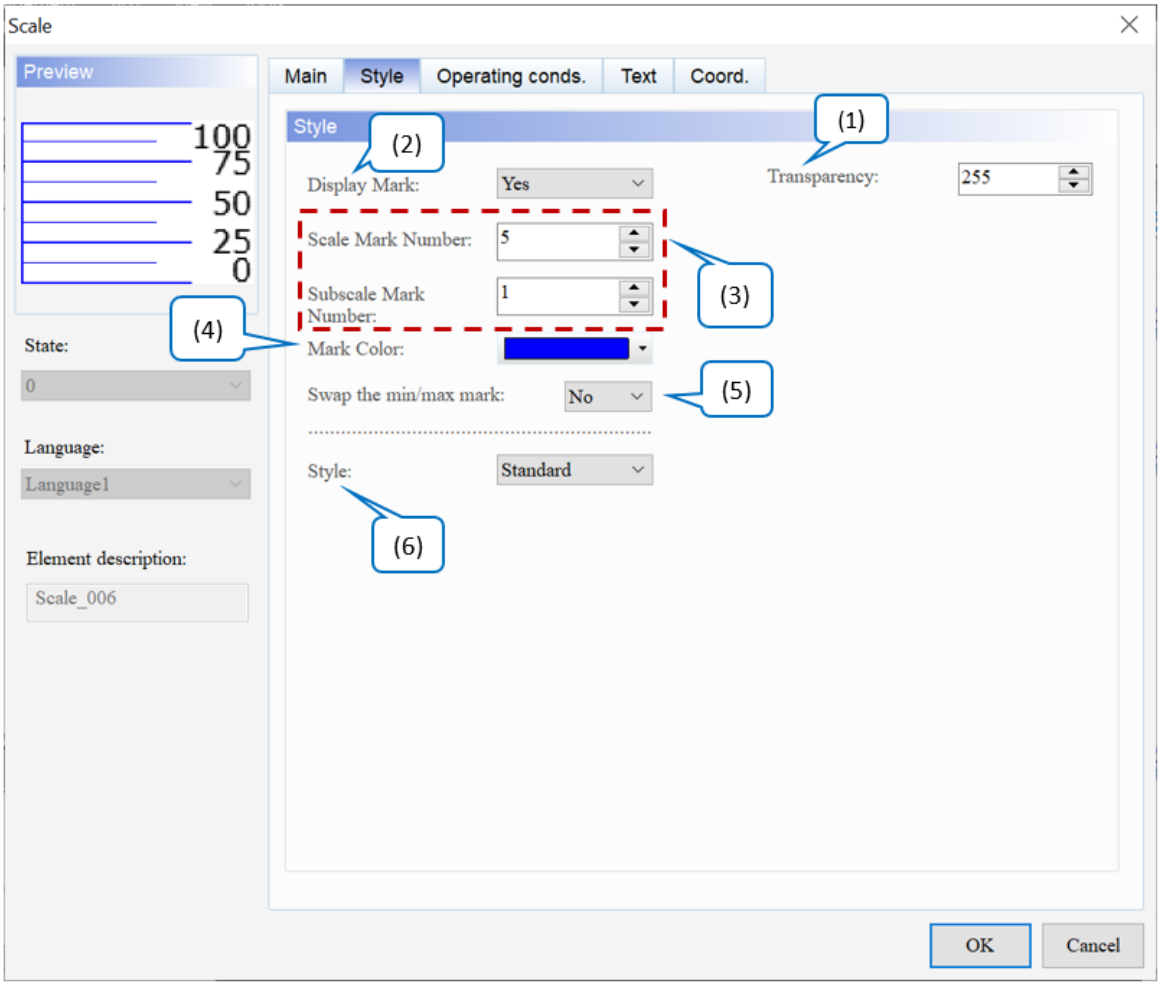
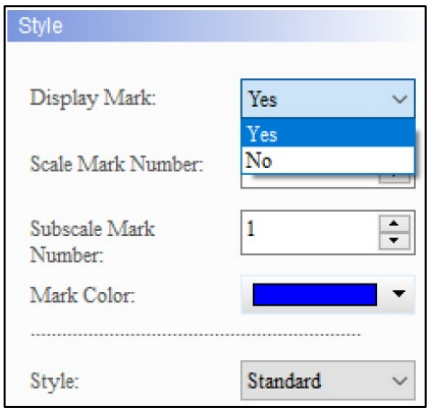
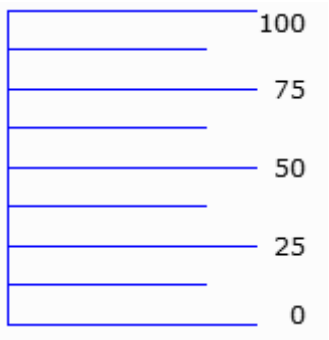
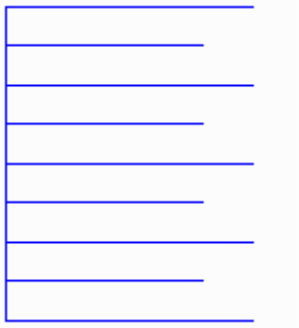


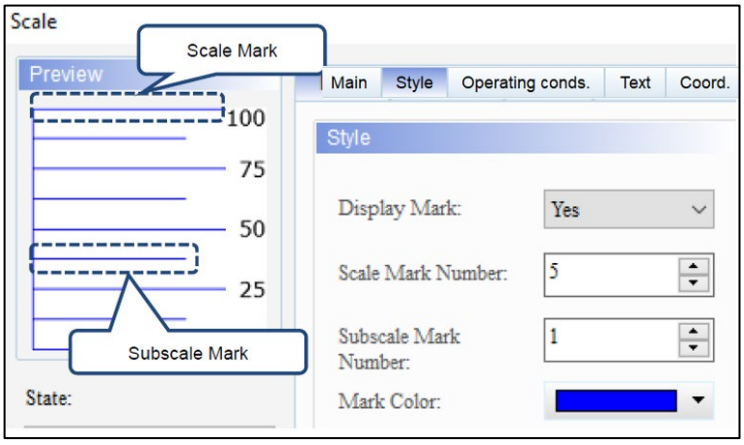
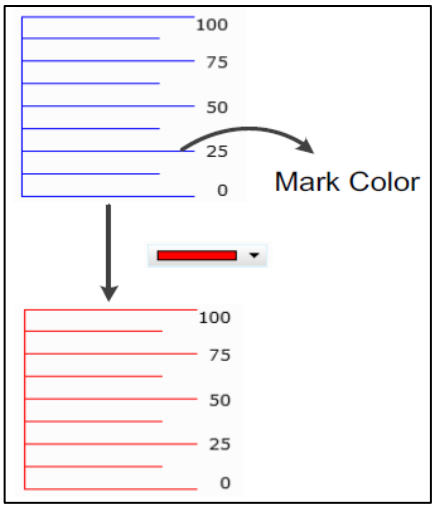
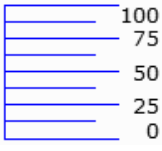
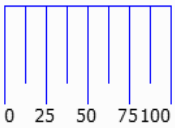
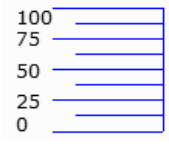
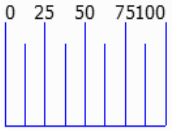
Figure 22 - 31: Scale element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>(1)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(2)</td><td>Display Mark</td><td>

Select Yes or No for Display Mark. The default value is Yes.
When users select Yes, the value on the Scale element is displayed; when users select No, the value on the Scale element is not displayed and only the scale is displayed.



<table>
<tr><td>Show Mark is set to Yes</td><td> 
</td></tr>
<tr><td>Show Mark is set to No</td><td>  </td></tr>
</table>
</td></tr>
<tr><td>(3)</td><td>Scale Mark Number
Subscale Mark Number</td><td>Set the number of marks to display for scale mark and subscale mark with the maximum of up to 99. The default values are 5 and 1, respectively.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td>(4)</td><td>Mark Color</td><td>Customize the color displayed for the scale. The default is  .
 
</td></tr>
<tr><td>(5)</td><td>Swap the min/max mark</td><td>Set the min/max order of mark. The default value is No.</td></tr>
<tr><td>(6)</td><td>Style</td><td>This setting allows users to change the appearance of the elements. The available options for Style are: Standard, Rotation 90, Rotation 180, and Rotation 270. The default value is Standard.
<table>
<tr><th>Standard</th><th>Rotation 90</th><th>Rotation 180</th><th>Rotation 270</th></tr>
<tr><td> 
</td><td> 
</td><td> 
</td><td> 
</td></tr>
</table></td></tr>
</table>

- Operating conds.

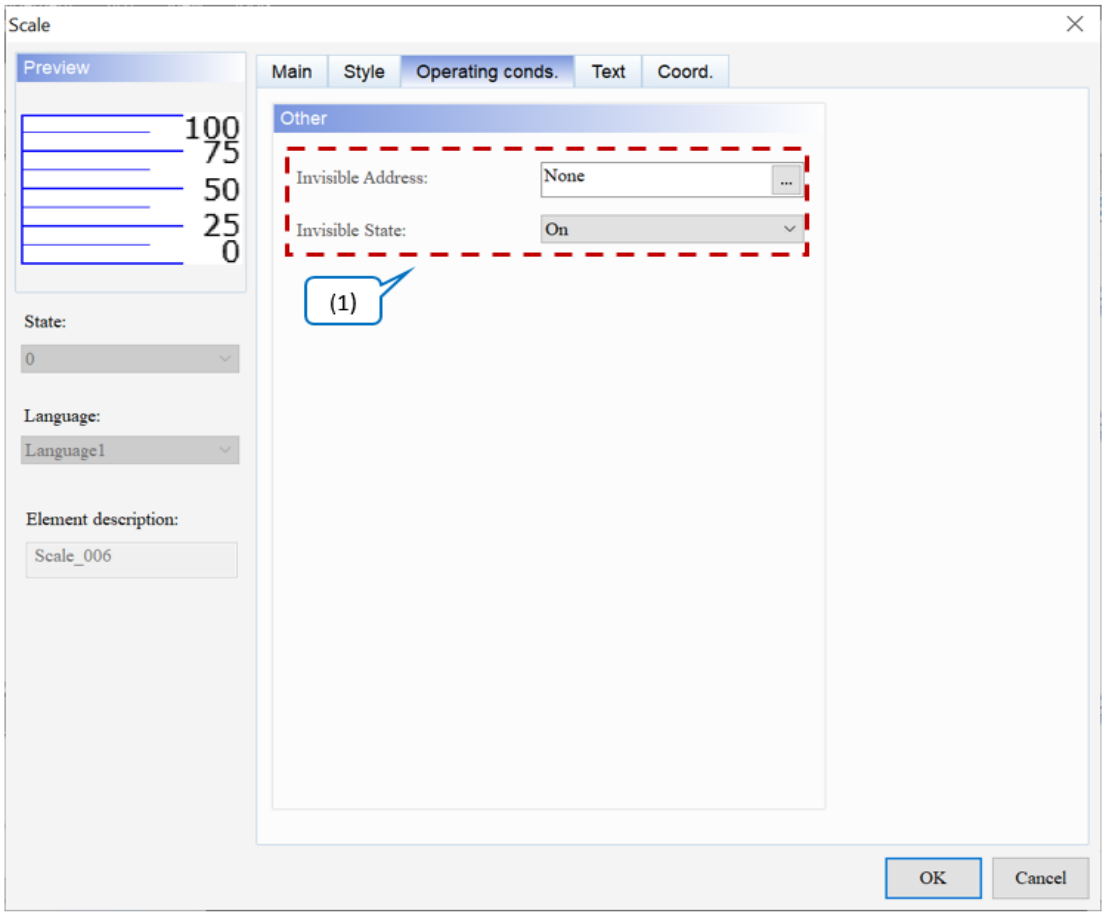
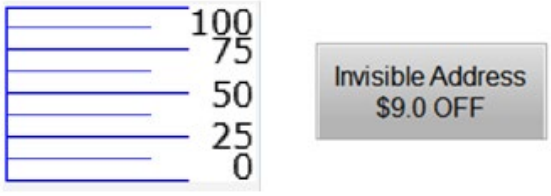
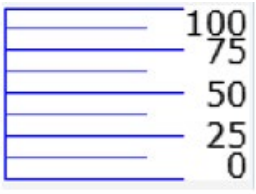


Figure 22 - 32: Scale element Operating conds. property page

No.	Function	Description
(1)	Invisible Address / Invisible State	● The **Invisible Address** mainly allows users to hide an element through this address. If the **Invisible State** is set to ON/OFF, the button element is hidden through the address defined in the **Invisible Address** field. ● The following example explains **Invisible Address** usage: 1. Create a button and set its address to $9.0, then set the **Invisible Address** of the element to be hidden to $9.0. 2. To hide the element, first press the $9.0 button. Invisible State is On 

			Element disappear	Invisible Address $9.0 ON
		Invisible State is Off		Invisible Address $9.0 ON
			Element disappear	Invisible Address $9.0 OFF

- Text

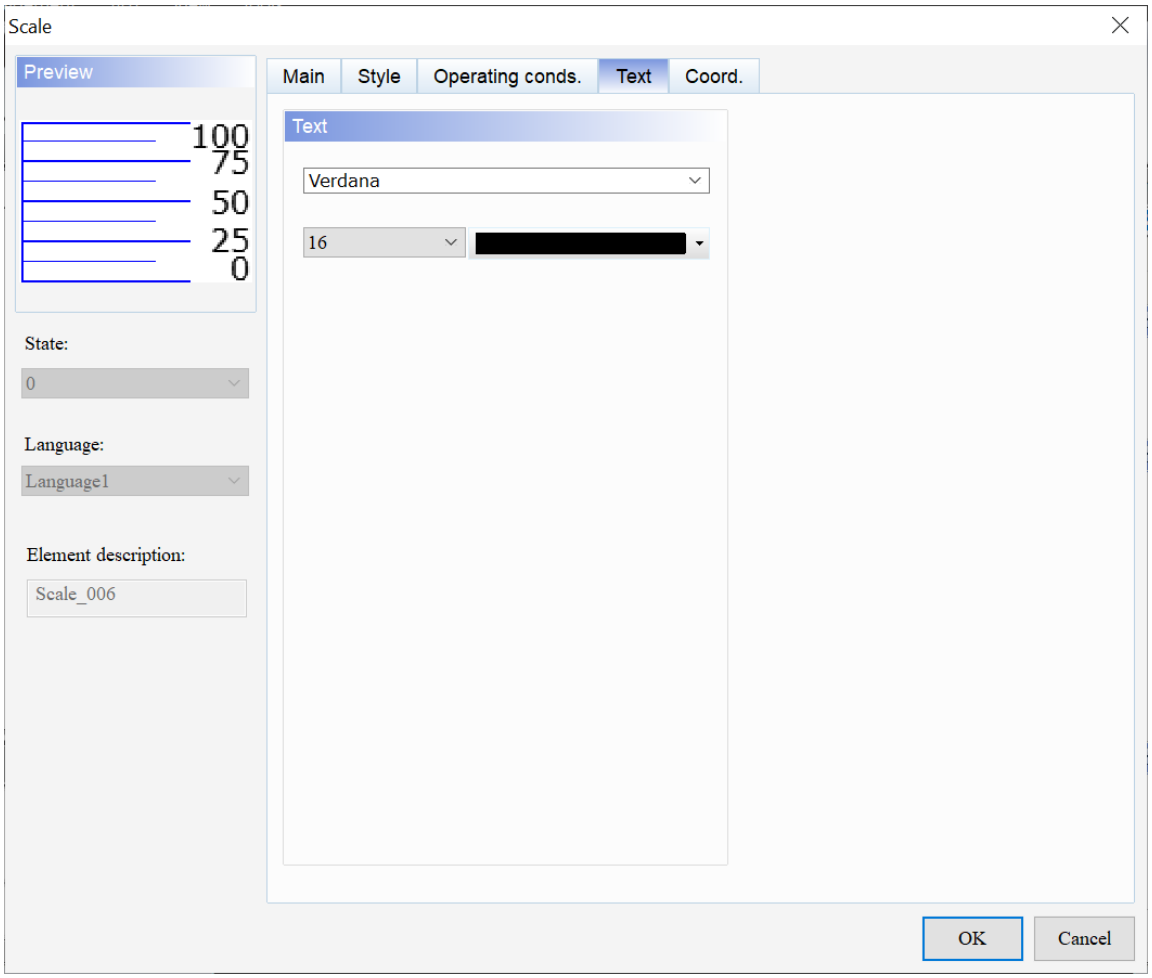


Figure 22 - 33: Scale element Text property page

No.	Function	Description
(1)	Text related properties	Set the text properties, including font, size, and color.

- Coord.

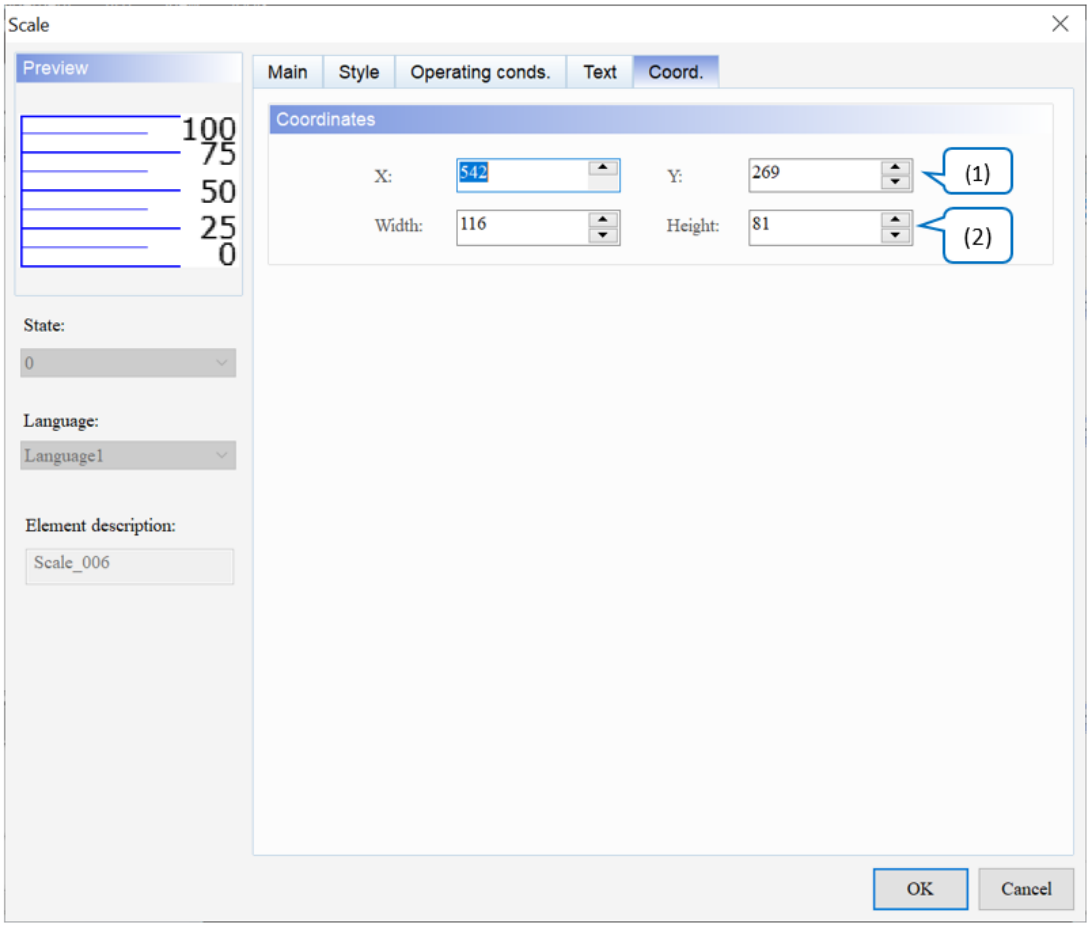


Figure 22 - 34: Scale element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

22.7 Table

The **Table** element offers the same functions as those in the Windows Office editing programs, enabling users to add rows and columns. Users can also set the colors for the rows and columns which adds more variety to the appearance of the tables.

On double-clicking the **Table** element, the property page appears as follows.

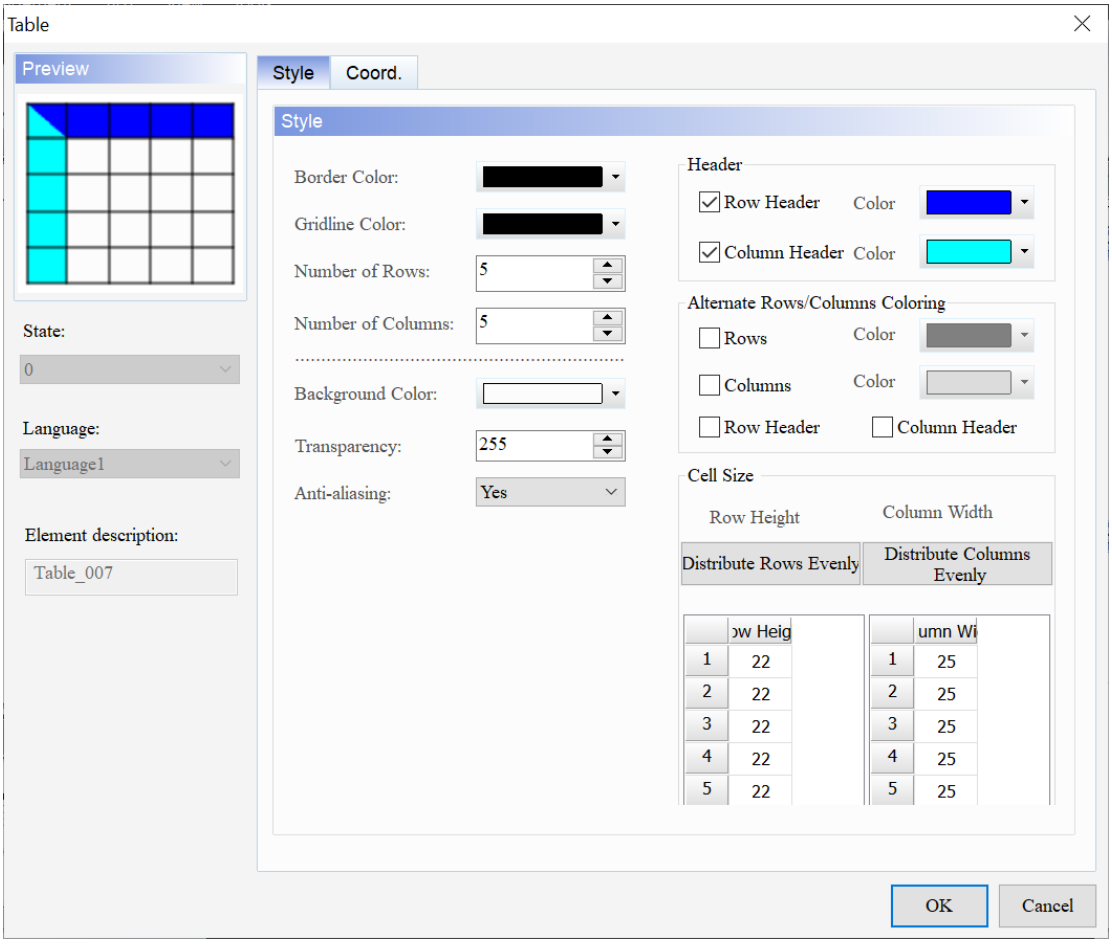


Figure 22 - 35: Table element property page

Table	
Function	**Description**
Preview	The Table element does not support multiple state values and multi-language display.
Style	Set the Border Color, Gridline Color, Number of Rows, Number of Columns, Background Color, Transparency, and Anti-aliasing. Set the Row Header, Column Header, (Alternate) Rows / Columns, and (Alternate) Row Header / Column Header. Set to Distribute Rows Evenly and Distribute Columns Evenly.
Coord.	Set the X and Y coordinates, Width, and Height of the elements.

- Style

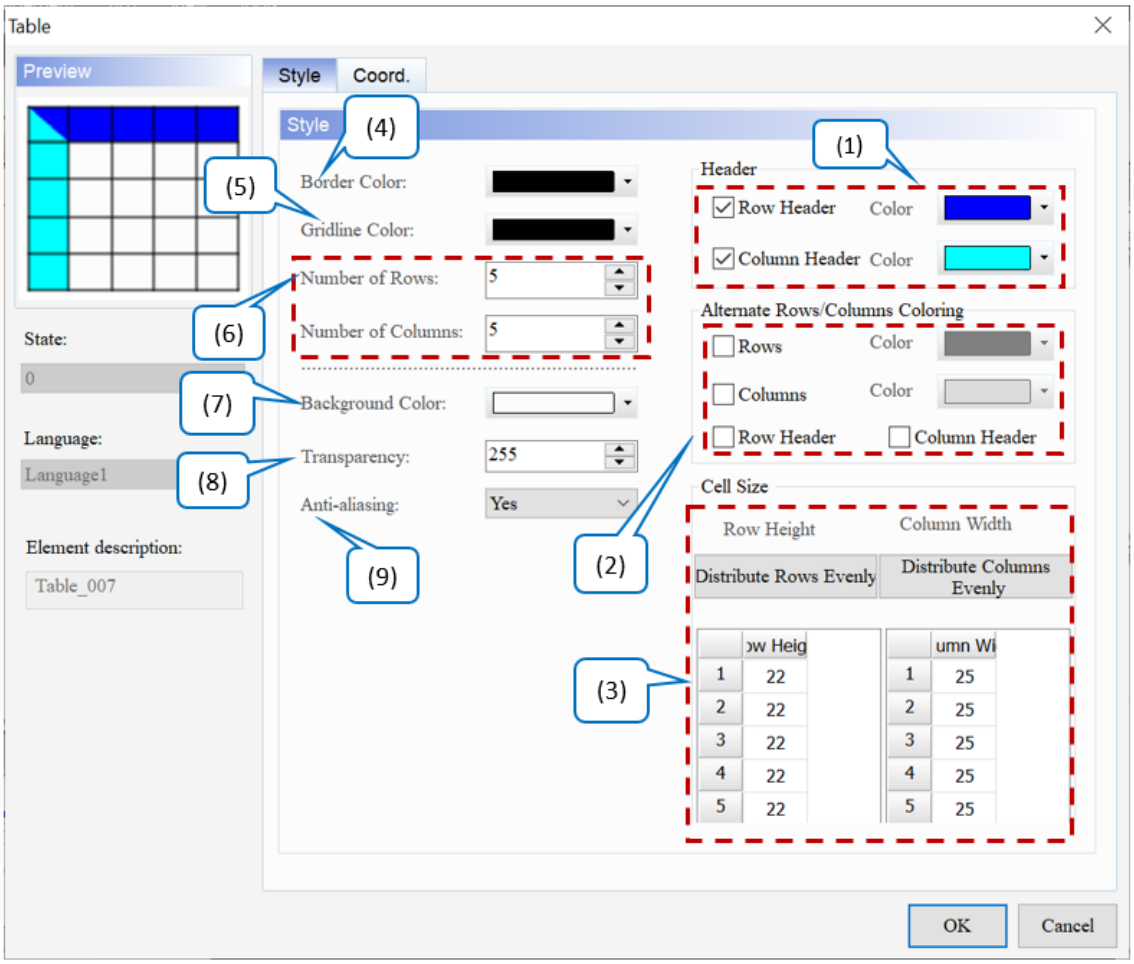
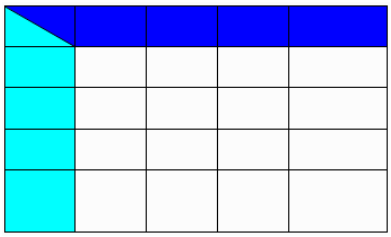
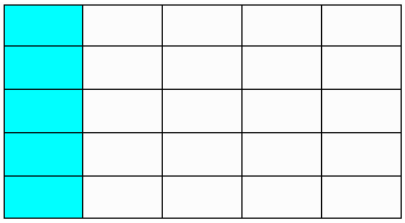
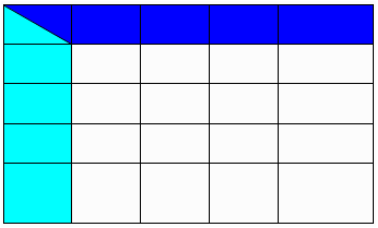
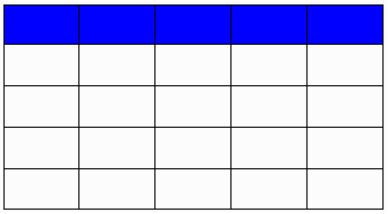
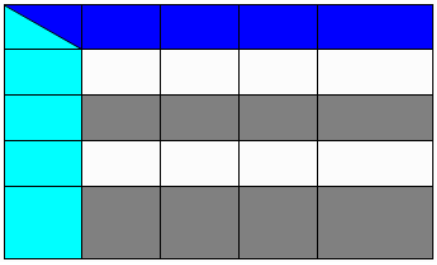
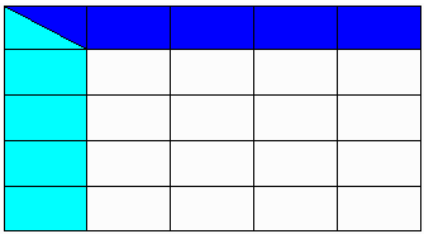
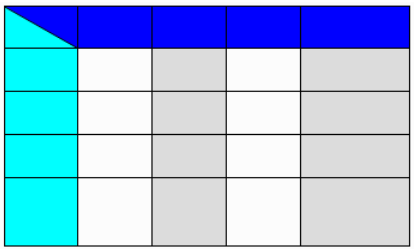
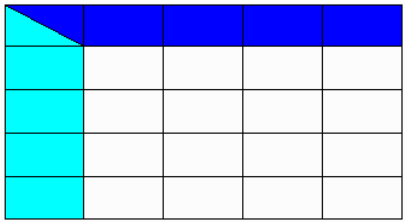
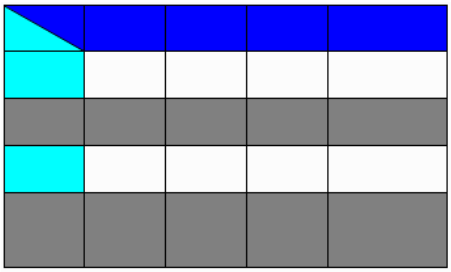
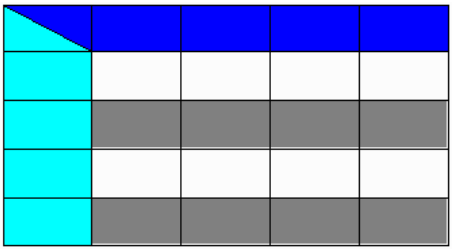
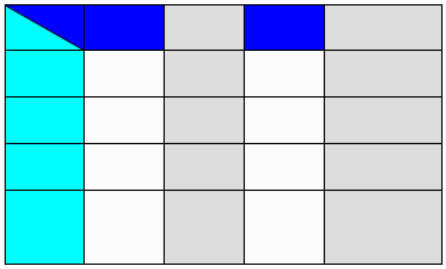
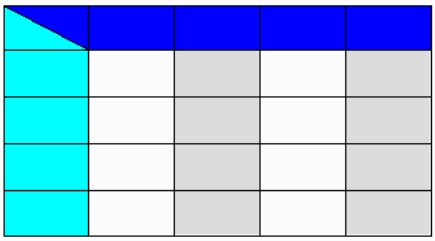
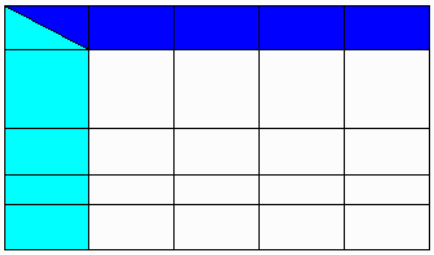
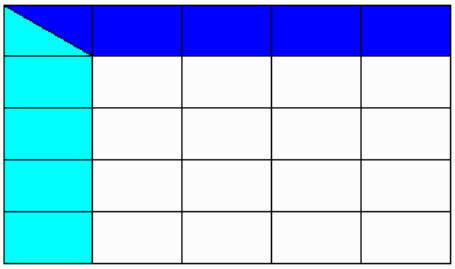
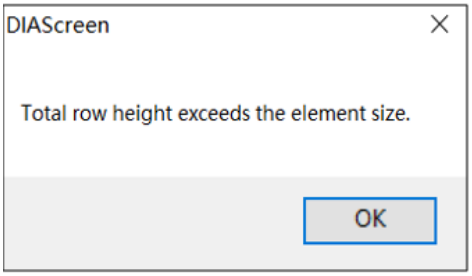


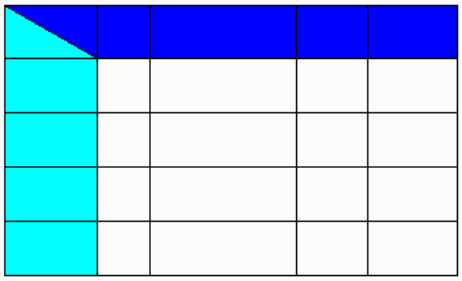
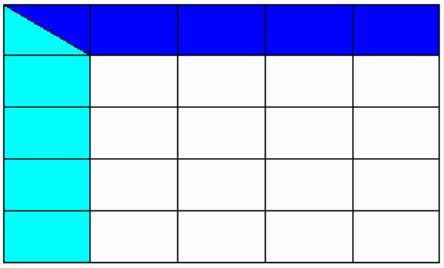
Figure 22 - 36: Table element Style property page

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td rowspan="2">(1)</td><td>Row Header</td><td>Set to display Row Header for the first row of the Table element and the displaying color for the Row Header. The default is .
<table>
<tr><td>Check</td><td>  </td></tr>
<tr><td>Uncheck</td><td>  </td></tr>
</table></td></tr>
<tr><td>Column Header</td><td>Set to display the Column Header for the first column of the Table element and the displaying color for the Column Header. The default is .
<table>
<tr><td>Check</td><td>  </td></tr>
<tr><td>Uncheck</td><td>  </td></tr>
</table></td></tr>
<tr><td>(2)</td><td>Rows (Alternate)</td><td>Set the displaying color for the (Alternate) Rows and to use the (Alternate) Rows format. The default is .
<table>
<tr><td>Check</td><td>  </td></tr>
</table></td></tr>
</table>

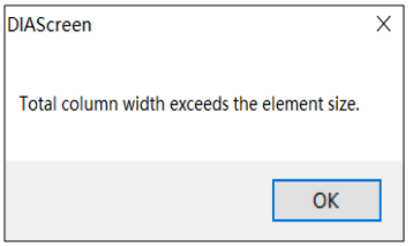
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Uncheck</td><td>  </td></tr>
</table>
</td></tr>
<tr><td></td><td>Columns (Alternate)</td><td>Set the displaying color for the (Alternate) Columns and to use the (Alternate) Columns format. The default is  .
<table>
<tr><td>Check</td><td>  </td></tr>
<tr><td>Uncheck</td><td>  </td></tr>
</table>
</td></tr>
<tr><td></td><td>Row Header (Alternate)</td><td>To use (Alternate) Row Header, users need to check (Alternate) Rows to enable the (Alternate) Row Header function.
<table>
<tr><td>Check</td><td>  </td></tr>
<tr><td>Uncheck</td><td>  </td></tr>
</table>
</td></tr>
<tr><td></td><td>Column Header (Alternate)</td><td>To use (Alternate) Column Header, users need to check (Alternate) Columns to enable the (Alternate) Column Header function.</td></tr>
</table>

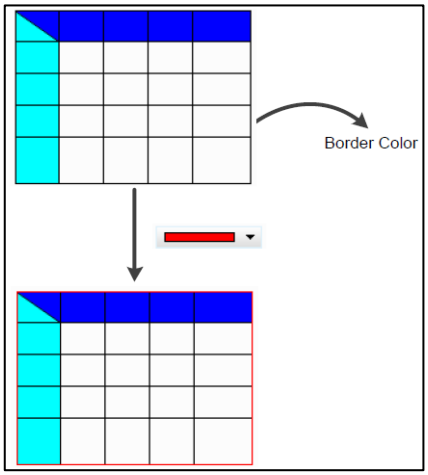
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Check</td><td>  </td></tr>
<tr><td>Uncheck</td><td>  </td></tr>
</table>
</td></tr>
<tr><td rowspan="2">(3)</td><td rowspan="2">Distribute Rows Evenly</td><td>
The Distribute Rows Evenly option adjusts uneven height between the rows in a table.
<table>
<tr><td>Before</td><td>  </td></tr>
<tr><td>After</td><td>  </td></tr>
</table>
Set the height for the row with the sum of the height not exceeding the element height.
If the set row height is greater than the element height, DIAScreen displays the following message.


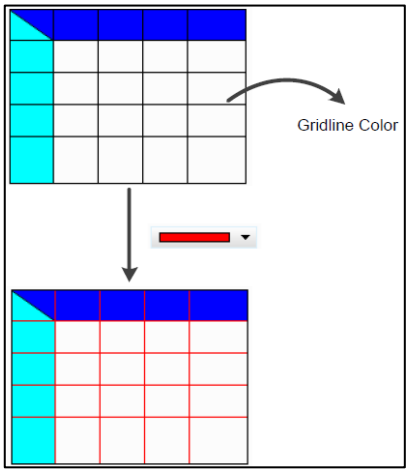
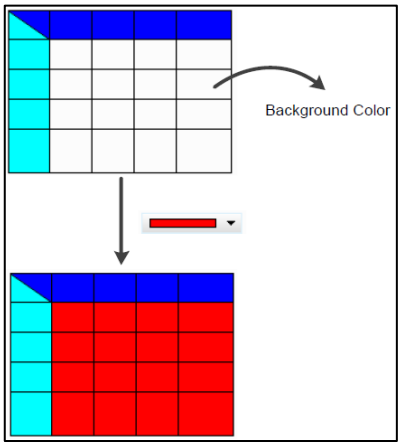
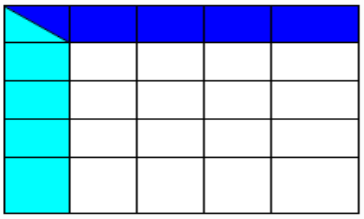
</td></tr>
<tr><td>
The Distribute Columns Evenly option adjusts uneven width between the columns in a table.
</td></tr>
</table>

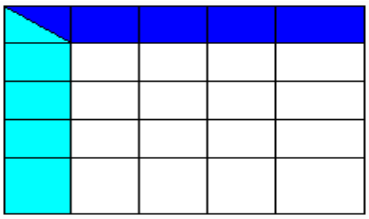
<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Before</td><td>  </td></tr>
<tr><td>After</td><td>  </td></tr>
</table>

Set the width for the column with the sum of the width not exceeding the element width.
If the set column width is greater than the element width, DIAScreen displays the following message.



</td></tr>
<tr><td>(4)</td><td>Border Color</td><td>Set the border color of the element. The default is  .
 
</td></tr>
<tr><td>(5)</td><td>Gridline Color</td><td>Set the Gridline Color of the element. The default is  .</td></tr>
</table>

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td> 
</td></tr>
<tr><td rowspan="2">(6)</td><td>Number of Rows</td><td rowspan="2">Up to 99 rows and columns can be added for the Number of Rows and Number of Columns. The default value is 5.</td></tr>
<tr><td>Number of Columns</td></tr>
<tr><td>(7)</td><td>Background Color</td><td>Customize the displaying color for the element background. The default is .
 
</td></tr>
<tr><td>(8)</td><td>Transparency</td><td>Set the transparency value within the range of 50 ~ 255. The default is 255. The smaller the value, the higher the transparency of the element.</td></tr>
<tr><td>(9)</td><td>Anti-aliasing</td><td>The Anti-aliasing function is available for this element. The default value is Yes.
<table>
<tr><td>Anti-aliasing is Yes</td><td>  </td></tr>
</table></td></tr>
</table>

No.	Function	Description	
		Anti-aliasing is No	

- Coord.

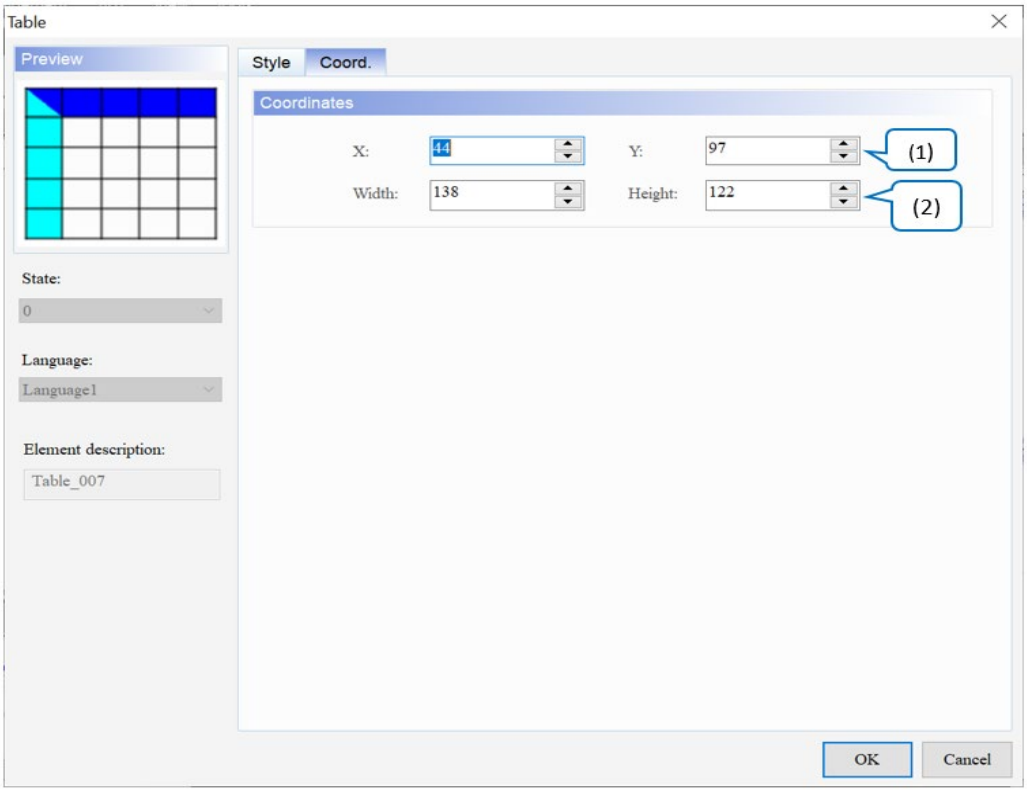


Figure 22 - 37: Table element Coord. property page

No.	Function	Description
(1)	X value and Y value	Set the upper left X coordinate and Y coordinate of the elements.
(2)	Width and Height	Set the width and height of the elements.

Chapter 23: Recipe

23.1 16-Bit Recipe

Check **Enable** and set the **16-bit Recipe Address**, and then the dedicated register appears to create the 16-Bit Recipe data.

The **16-bit Recipe** has its own registers - RCP and RCPNO.

RCP	**Recipe register**
RCPNO	Recipe number register

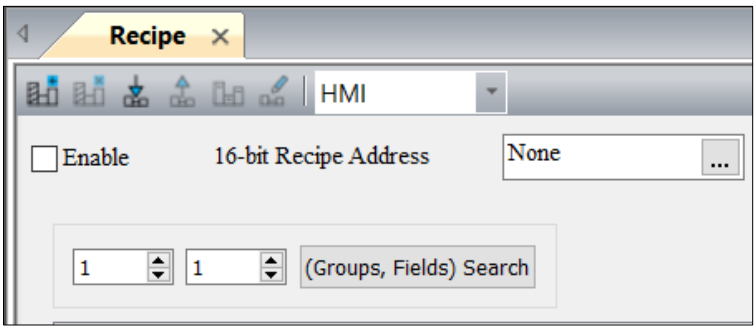


Figure 23 - 1: Select Enable and set 16-bit Recipe Read Address

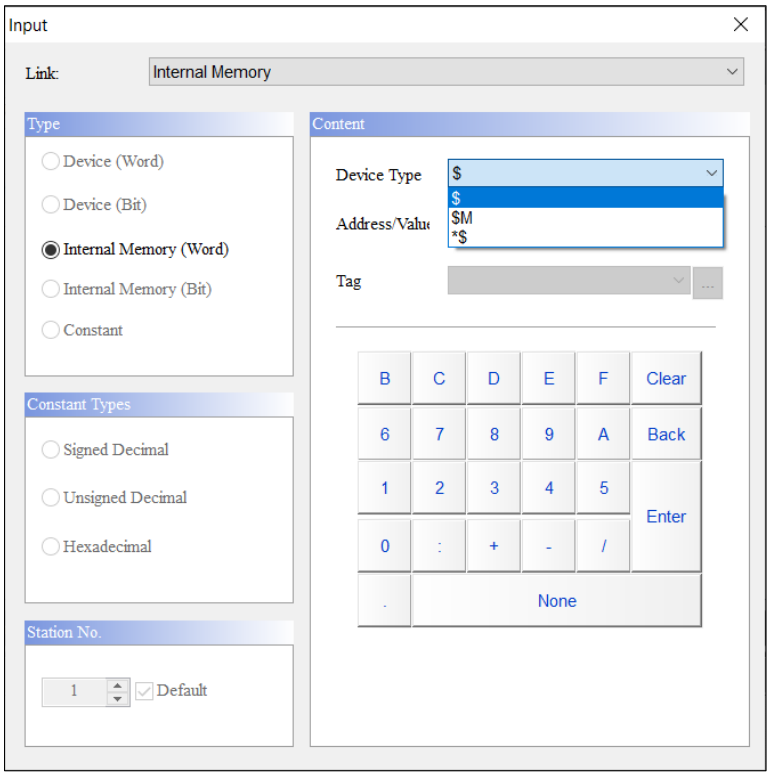


Figure 23 - 2: 16-Bit Recipe register

When the **16-Bit Recipe** is used, the size of each recipe register is 16 bits (16 bits = 1 word). Assuming the Length is L and the Group is G, the actual recipe count is L*G words.

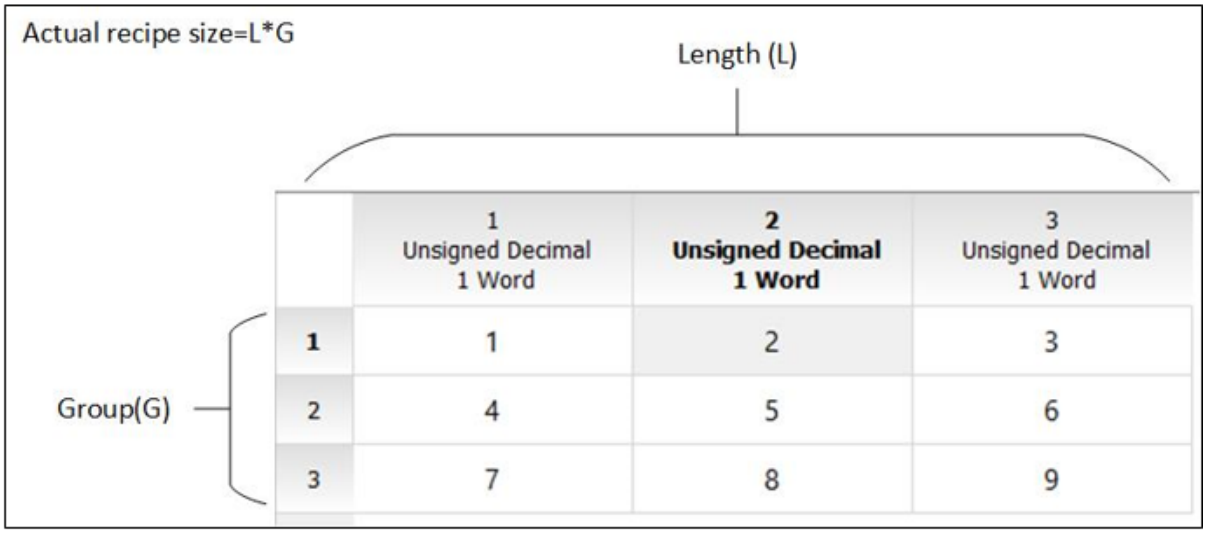
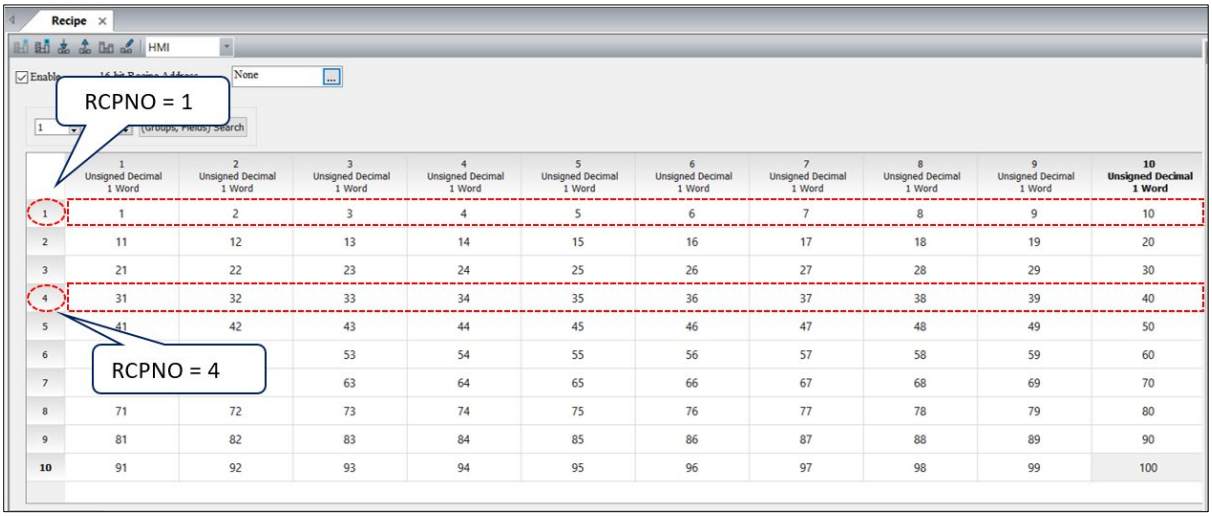


Figure 23 - 3: 16-Bit Recipe register size

Recipe Number Register (RCPNO)

The Recipe number register is used to specify the number for the 16-Bit Recipe. Reading / writing of the recipe means to read / write a set of recipes according to the recipe number recorded in the recipe number register. When users select the first set of recipes, RCPNO = 1; when users select the fourth set of recipes, RCPNO = 4.

***NOTE**: The **Recipe Number Register** does not feature the non-volatile function, so the data in the register cannot be maintained when the HMI is powered off.*



	1 Unsigned Decimal 1 Word	2 Unsigned Decimal 1 Word	3 Unsigned Decimal 1 Word	4 Unsigned Decimal 1 Word	5 Unsigned Decimal 1 Word	6 Unsigned Decimal 1 Word	7 Unsigned Decimal 1 Word	8 Unsigned Decimal 1 Word	9 Unsigned Decimal 1 Word	10 Unsigned Decimal 1 Word
1	1	2	3	4	5	6	7	8	9	10
2	11	12	13	14	15	16	17	18	19	20
3	21	22	23	24	25	26	27	28	29	30
4	31	32	33	34	35	36	37	38	39	40
5	41	42	43	44	45	46	47	48	49	50
6			53	54	55	56	57	58	59	60
7			63	64	65	66	67	68	69	70
8	71	72	73	74	75	76	77	78	79	80
9	81	82	83	84	85	86	87	88	89	90
10	91	92	93	94	95	96	97	98	99	100

Figure 23 - 4: Recipe number editing screen

Recipe Register (RCP)

A recipe buffer is featured in the HMI and is configured at the front of the **Recipe Register**. This buffer is used to store the selected set of recipes, and the length of the recipe buffer equals the length of the selected set of recipes, that is, the recipe buffer also occupies L recipe registers. Thus, the number of the recipe registers that a recipe table occupies is L * (G+1), where G+1 stands for the number of the registers with an additional buffer. With the recipe buffer, users only need to switch between the recipe numbers to check the currently specified recipe parameters.

When the selected recipe number (RCPNO) is 1, the first set of recipes is displayed in the recipe buffer, as shown in the following figure.

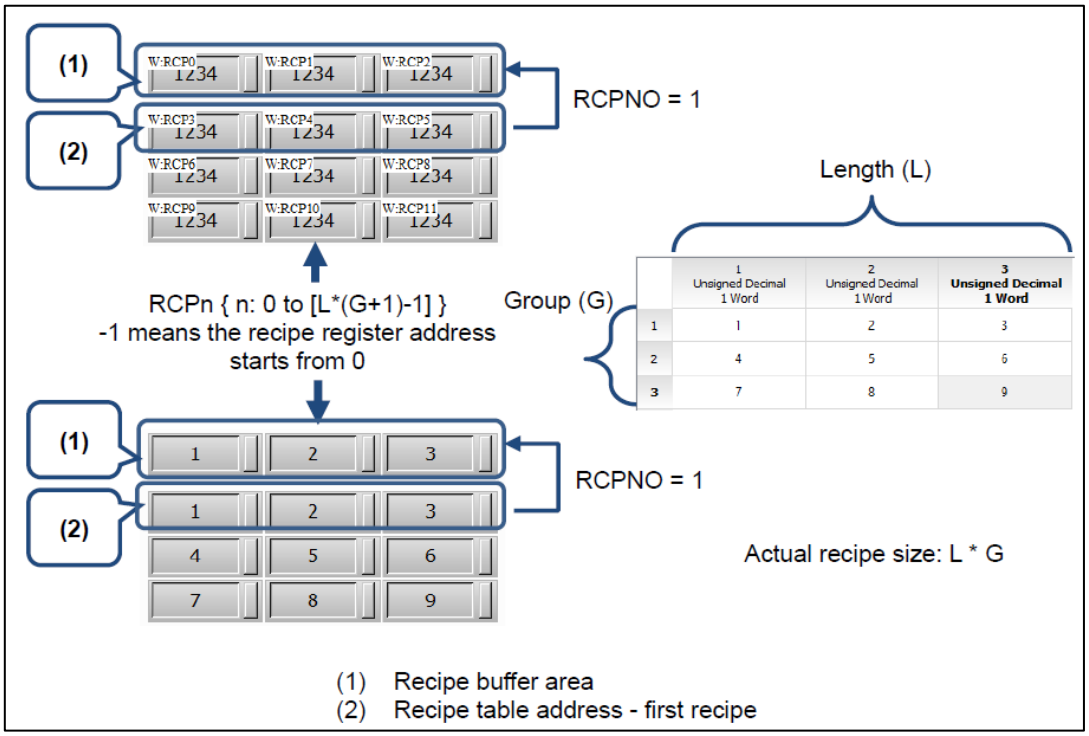


Figure 23 - 5: 16-Bit Recipe buffer configuration

Accessing range of the recipe register:

Accessing Type	Device Type	Accessing Range
Word	RCPn	RCP0 ~ RCP65535
Bit	RCPn	RCP0.0 ~ RCP65535.15

***NOTE**: n is Word (0 ~ 65535).*

The address accessing range provided by RCP is limited according to the recipe size that are created by the users. Assuming that the recipe size is Length 3*Group 3, then the RCP address ranges from RCP0 ~ RCP11. When the RCP12 address is created, DIAScreen displays the following warning message.

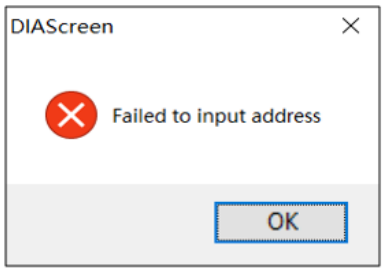


Figure 23 - 6: Recipe register configuration error

16-Bit Recipe size limit:

1. If the non-volatile memory area is set in the USB Disk or SD Card, the editable size of a **16-Bit Recipe** is (L*G) = 4194304. Go to **View** > **Memory List** to check the size and capacity for the **16-Bit Recipe**.

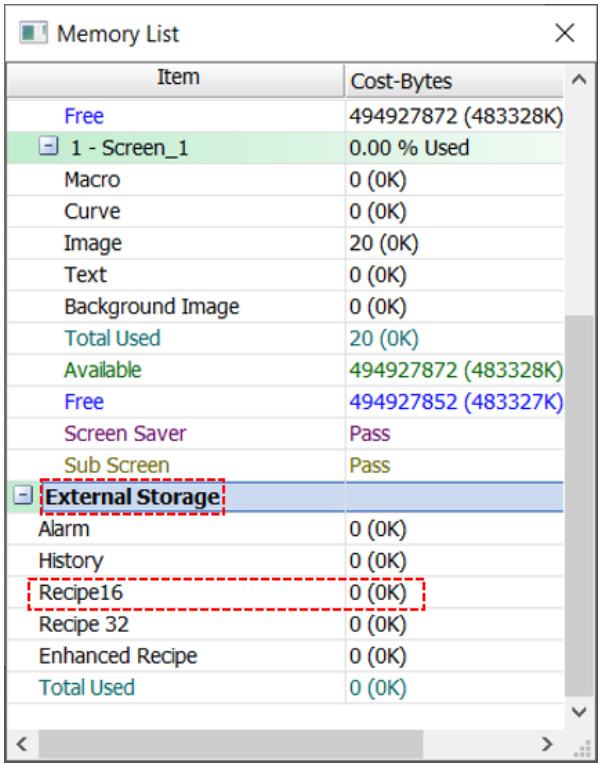


Figure 23 - 7: 16-Bit Recipe external storage

2. If the non-volatile memory area is set to the HMI, the editable size of a **16-Bit**

Recipe is (L*G) = 65536 words or 64K. Hence, when the edited **16-Bit Recipe** exceeds 64K, a warning message appears on the **16-bit Recipe Settings** window to remind that the current recipe size has exceeded the allowable limit.

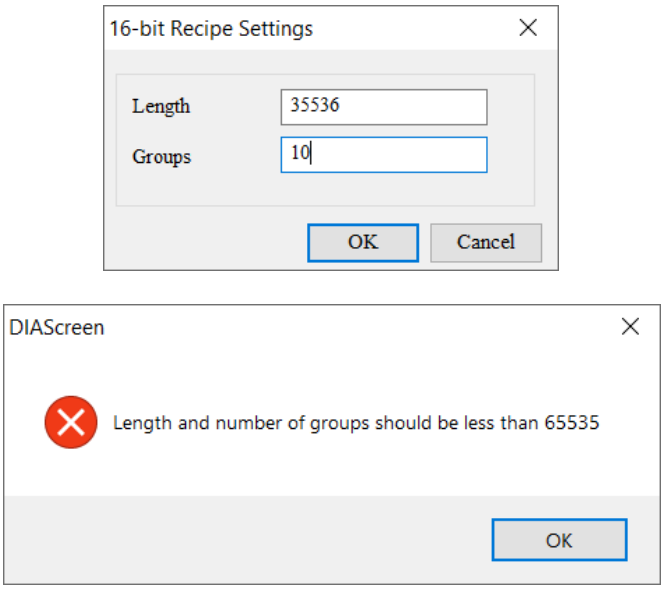


Figure 23 - 8: 16-bit Recipe internal storage

Go to **Data Management** > **Recipe** to create the **16-bit Recipe** data. By setting the recipe, users can batch write a large amount of data to the PLC or batch read the data from the PLC to the HMI with the **Recipe Control flag** of the **Control Block**. The recipe can be used for controlling the industrial production process, enhancing convenience in processing a large amount of data.

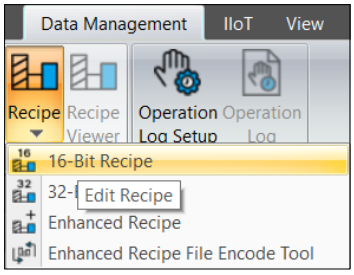
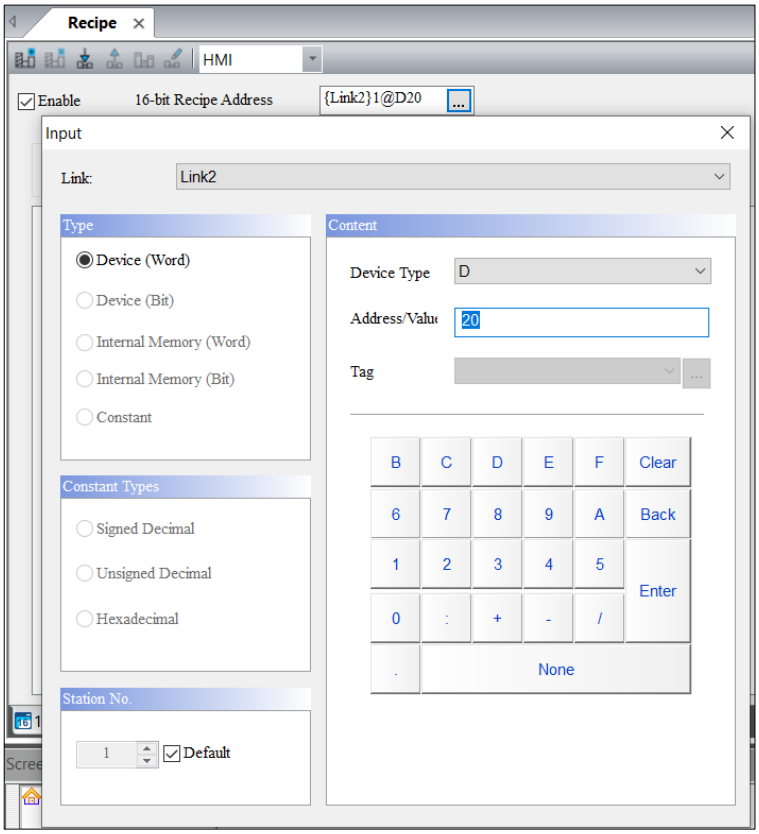
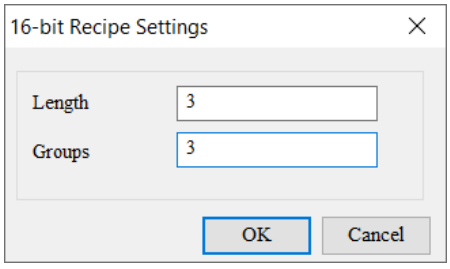
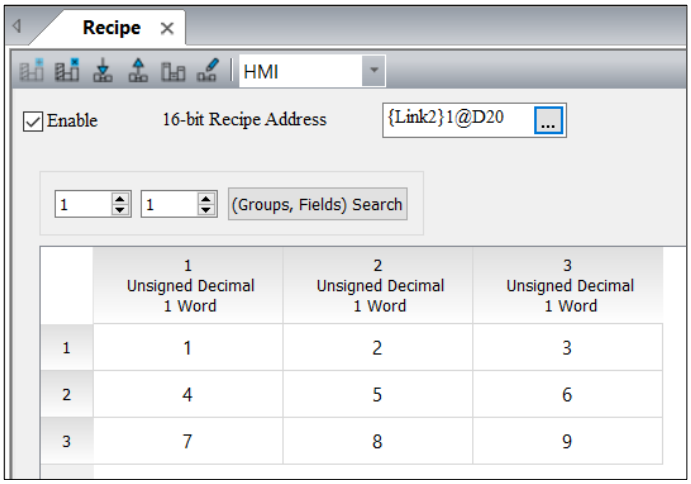
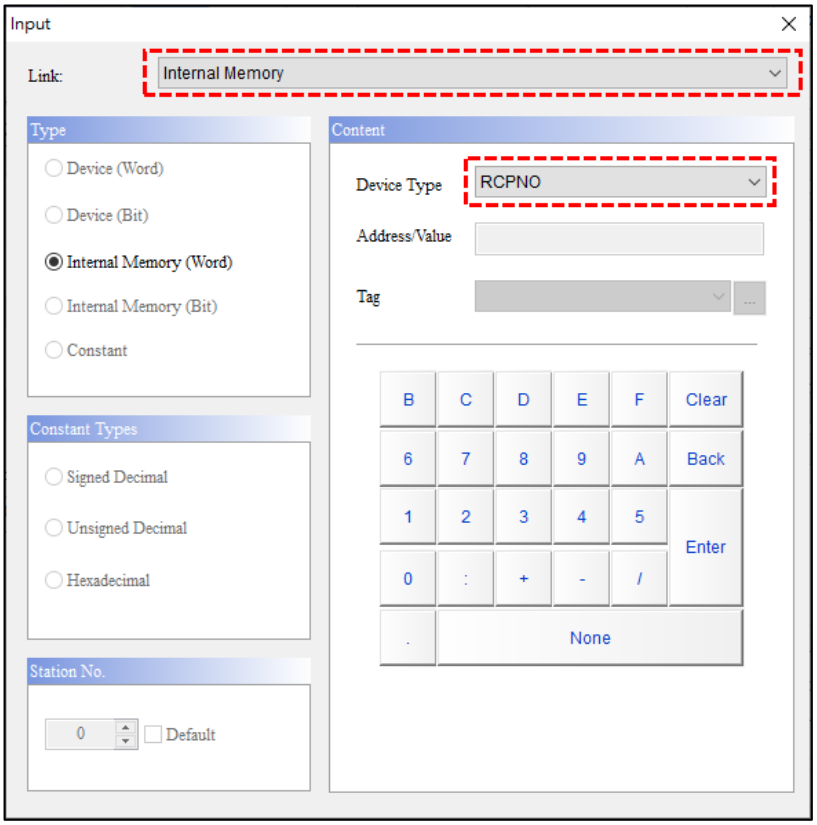
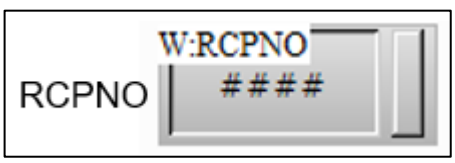


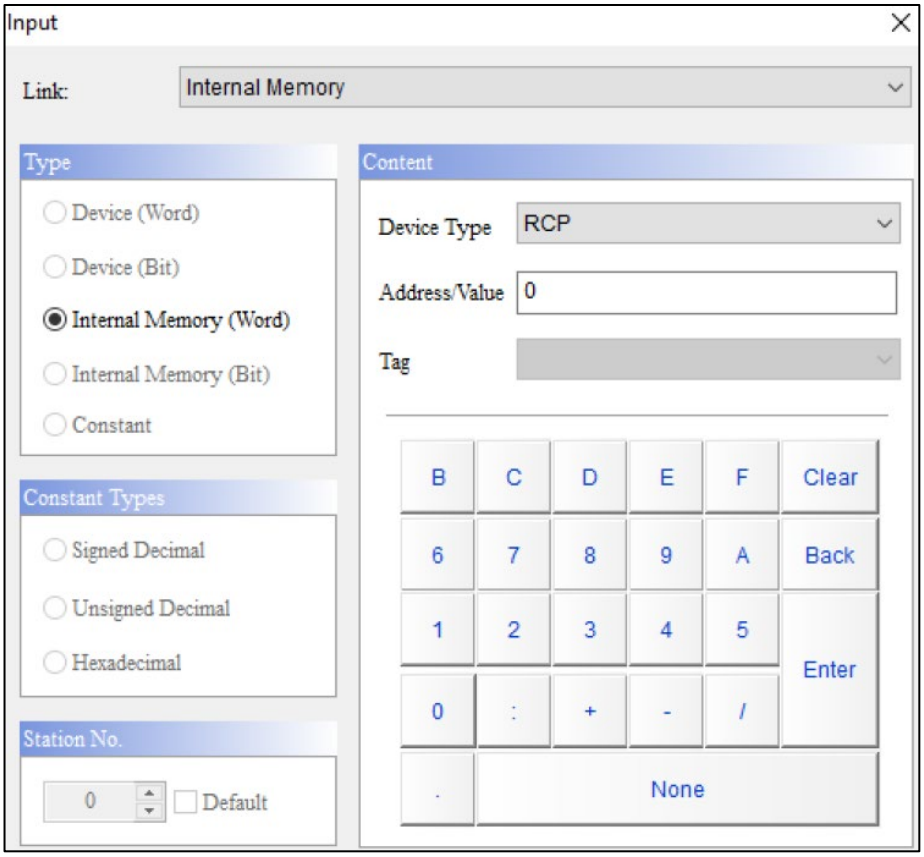
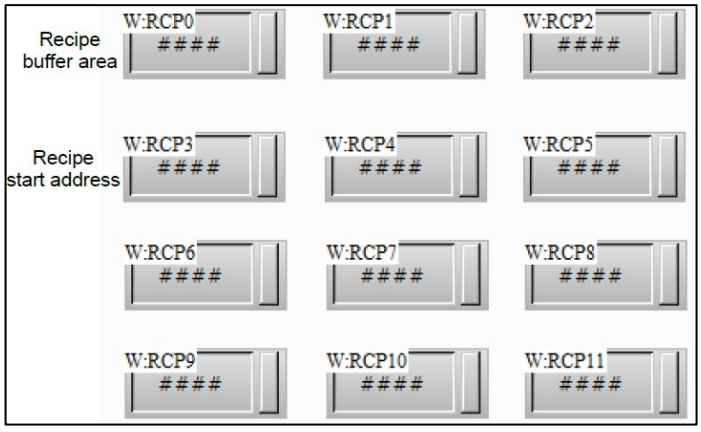
Figure 23 - 9: 16-Bit Recipe

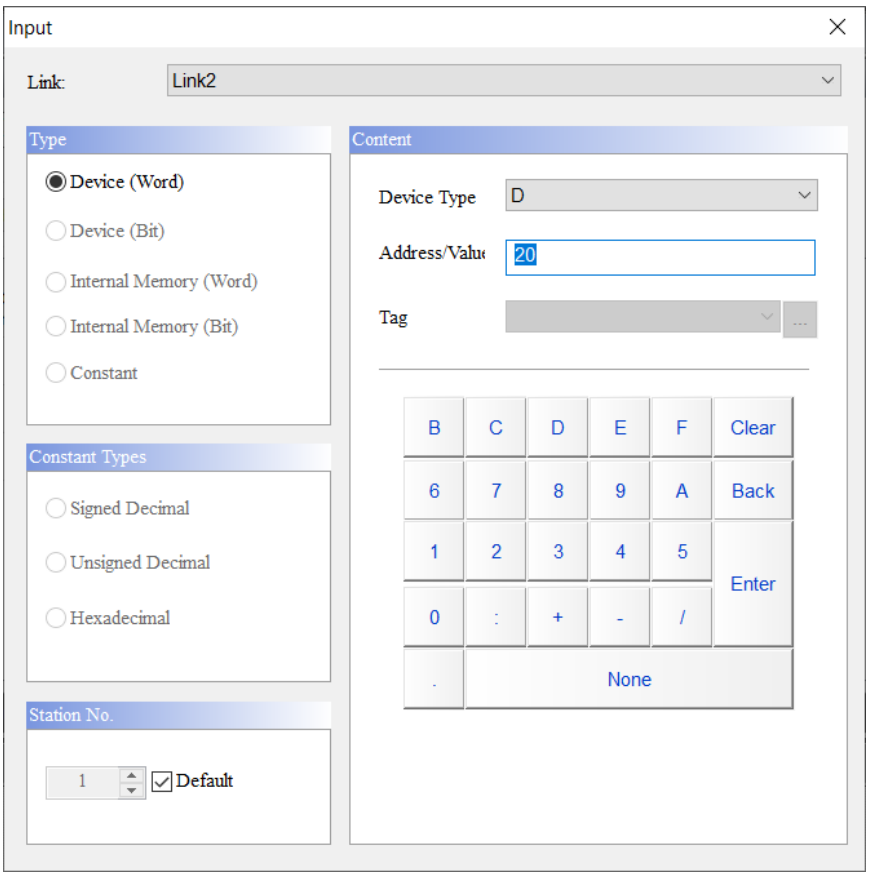
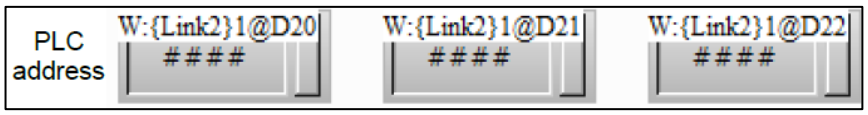
Refer to the following table for a **16-Bit Recipe** example.

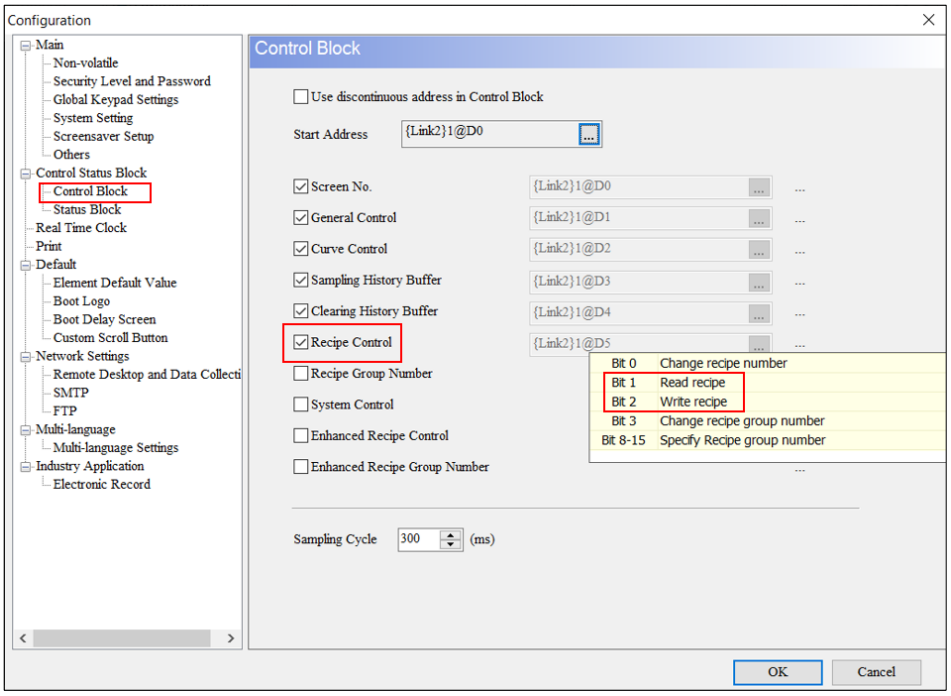
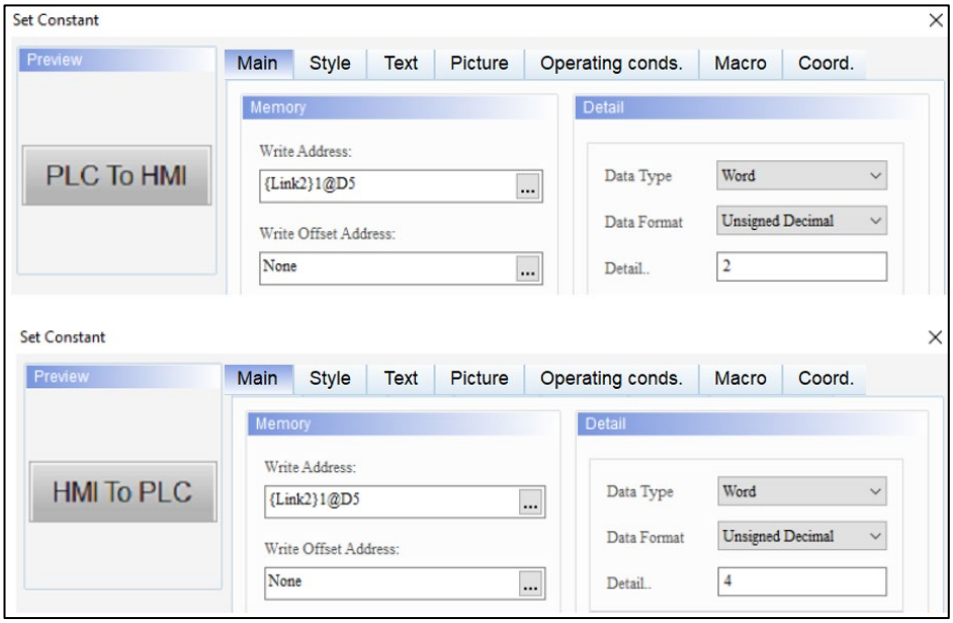
16-Bit Recipe	
Set 16-Bit Recipe	**Step 1**: Go to **Data Management** > **Recipe** > **16-Bit Recipe**. i. Select **Enable** checkbox. ii. Set the external address to D20.  **Step 2**: Click  to set the **Length** and **Groups** to 3.  **Step 3**: Click **OK** and a table with the set **Length** and **Groups** appears. Fill in the values to display.

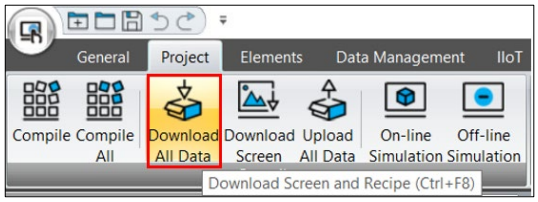
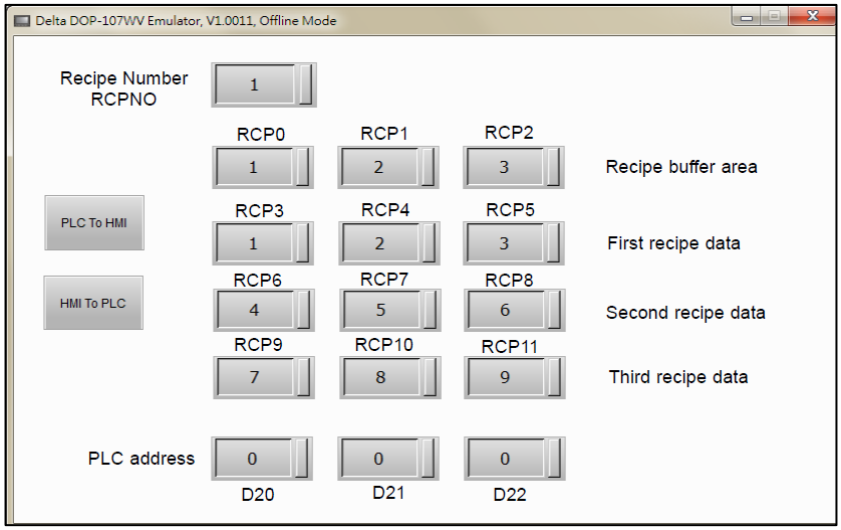
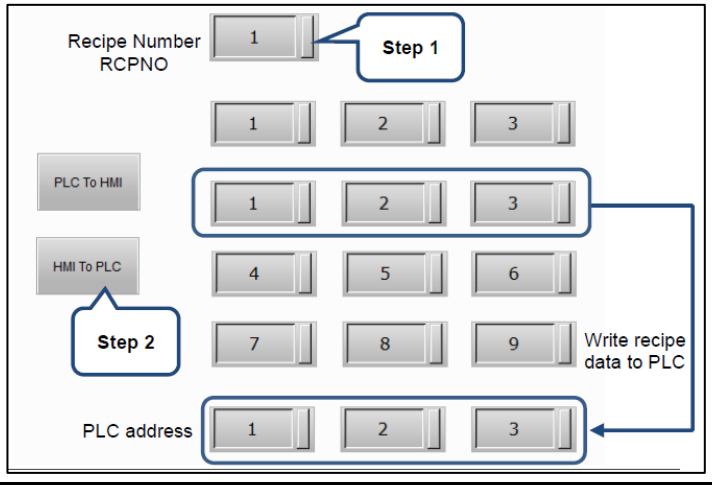
<table>
<tr><th colspan="2">16-Bit Recipe</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Create RCPNO Numeric Entry element</td><td>● Create a Numeric Entry element and set the Write Address to the Internal Memory. Select RCPNO for the Device Type. This element is used to select the recipe number.
 

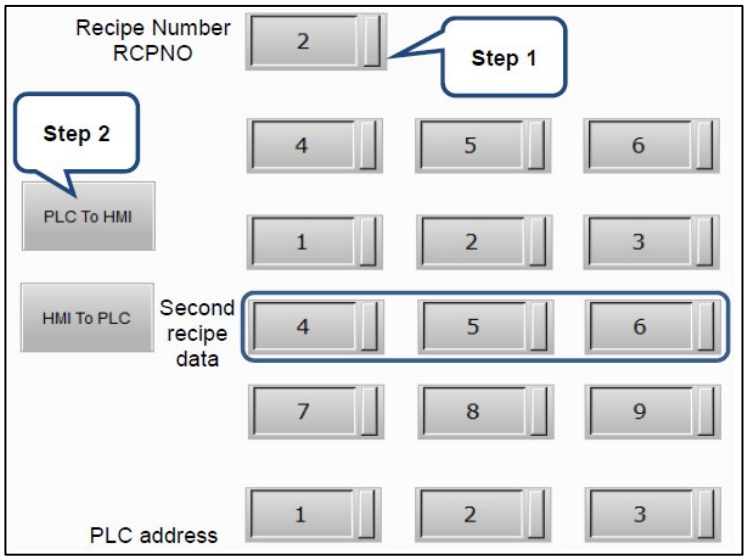
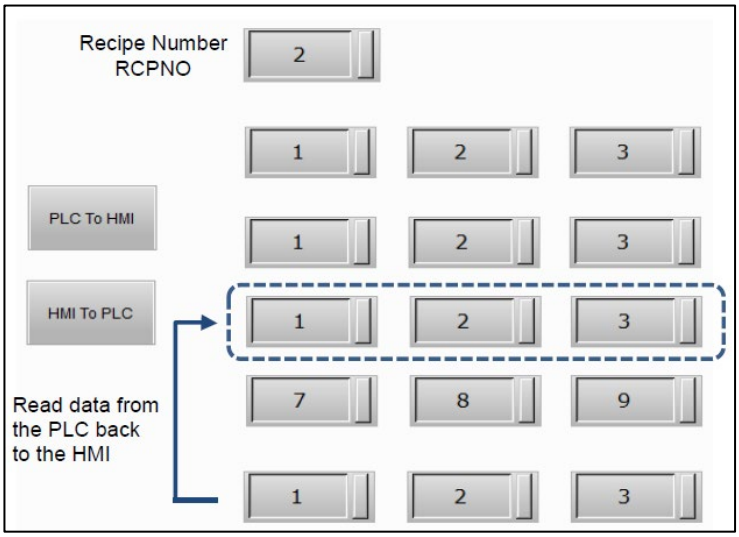
● The following is an example of the created element.
 
</td></tr>
<tr><td>Create RCP Numeric</td><td>The steps are as follows:
1. Input the size of the recipe (Length (L) x Group (G) = 3 x 3) into the formula L * (G+1) to get the actual configured RCP = RCP0 ~</td></tr>
</table>

16-Bit Recipe	
Entry elements	RCP11. 2. Create 12 **Numeric Entry** elements and set their **Read Address** as RCP0 ~ RCP11 of the **Internal Memory (Word)**.  3. The following is an example of the created elements.  ***NOTE**: The established RCP0 ~ RCP2 are recipe buffers, the actual recipe data are RCP3 ~ RCP11. Refer to Figure 23-5: 16-bit Recipe buffer configuration for more information.*
Create Numeric Entry elements	● Create three **Numeric Entry** elements, which are D20, D21, and D22, to display changes made to the data when the PLC recipes are read or written. ● Set the **Read Address** to D20 for the **Numeric Entry** element, as

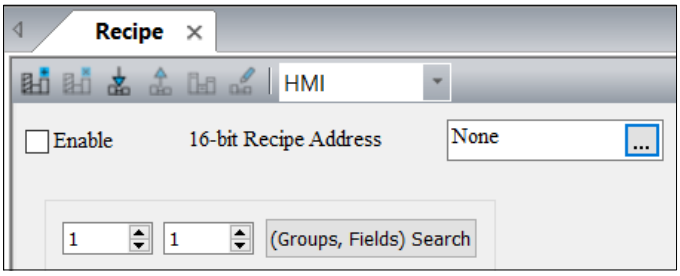
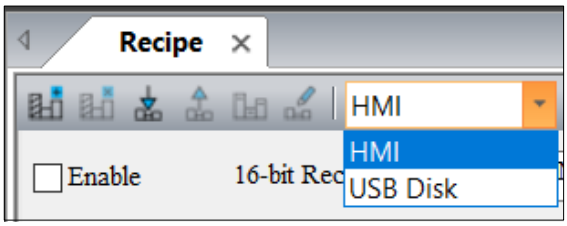
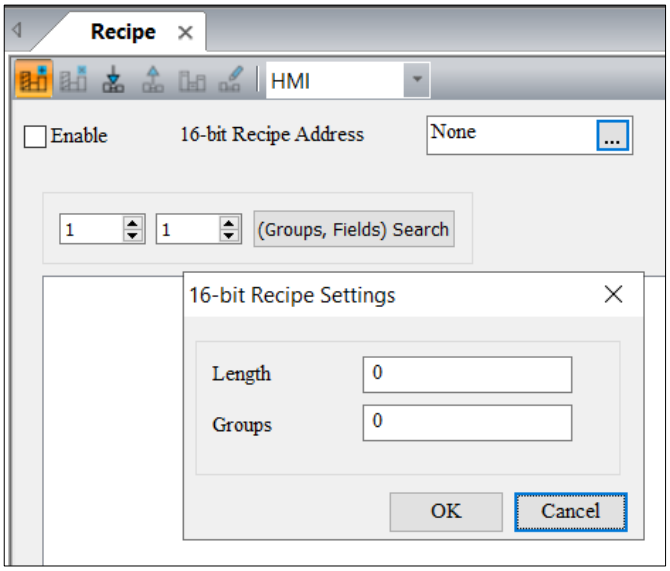
16-Bit Recipe	
for the Recipe Read Address	shown in the following figure.  ● The following is an example of the created elements. 
Set Recipe Control flag in Control Block	Go to **General** > **Configuration** > **Control Block**, and select the **Recipe Control flag** checkbox. Then, set the **Start Address** for the **Control Block** to define the **Recipe Control** address. Once the setting is complete, click **OK** to exit the **Configuration** window.

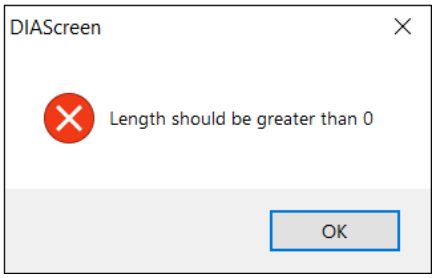
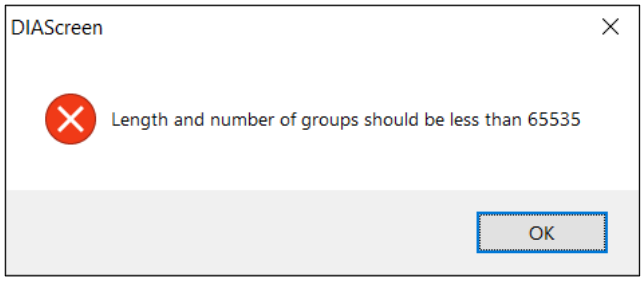
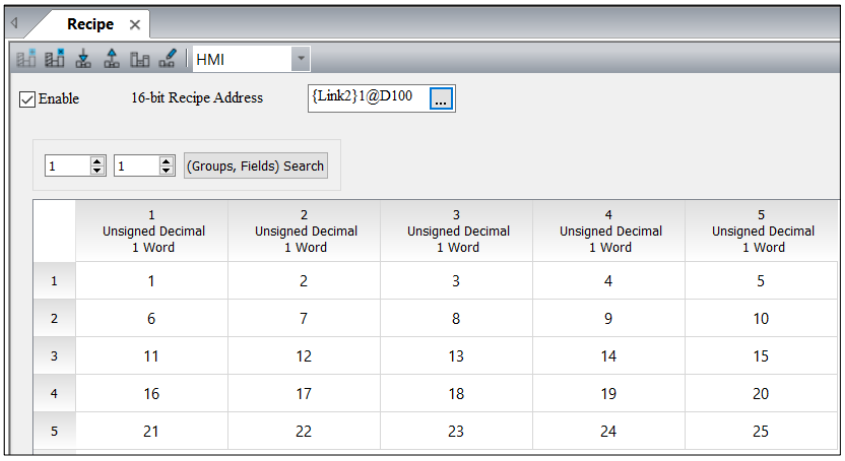
16-Bit Recipe	
	
Create Set Constant Button elements	Create two **Set Constant Button** elements. Set the **Write Address** to D5 and the setting values (**Detail**) to 2 and 4 corresponding to Bit 1 and Bit 2 of the **Recipe Control** flag D5 respectively for reading and writing the recipe. 
Execution result	● After creating all the elements, click **Compile** and **Download All Data** to download data to the HMI.

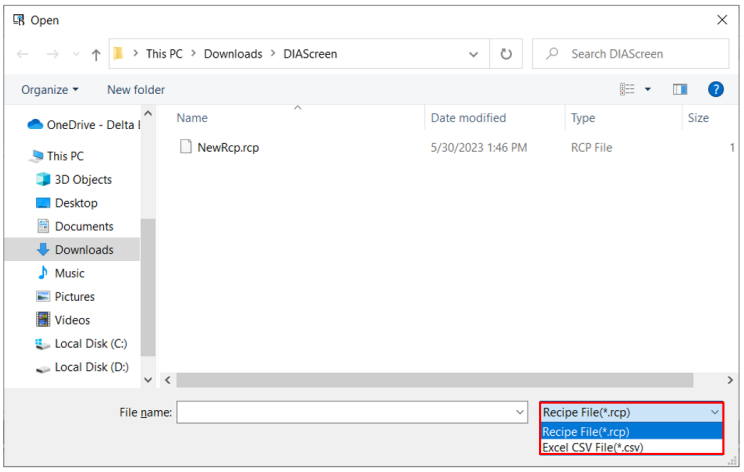
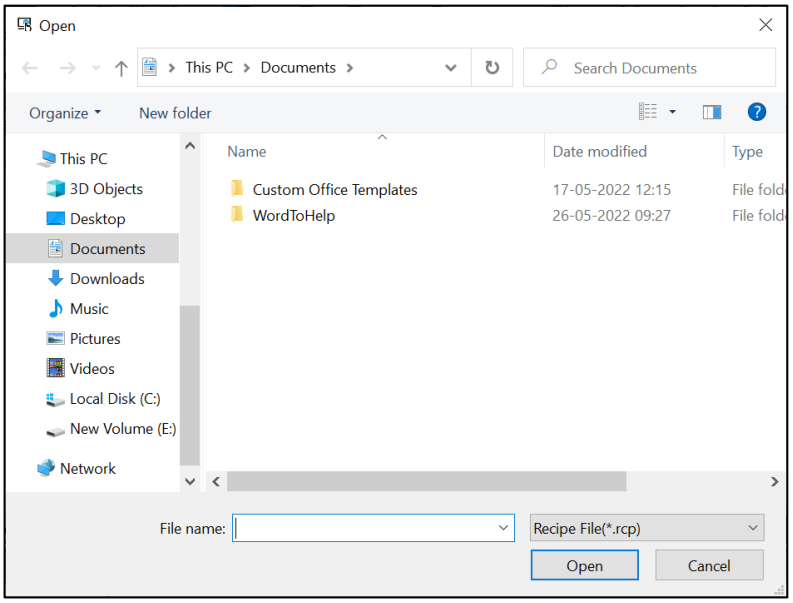
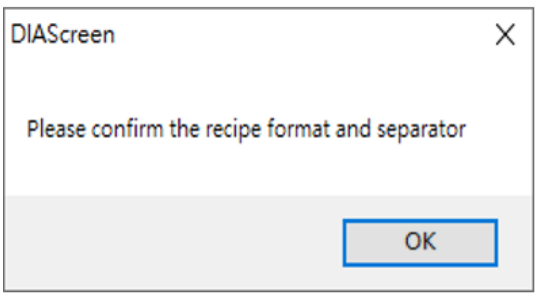
16-Bit Recipe	
	 ● Select the Recipe Number. The recipe data is displayed in RCP0 ~ RCP11 according to the set recipe, with RCP0 ~ RCP2 as the recipe buffers. The starting address for the first set of the actual recipe data is RCP3. 
Execution result	● Trigger the Write Recipe (HMI to PLC) button, and the recipe data of the selected set of recipe (RCPNO = 1) is written to the PLC. Trigger the Read Recipe (PLC to HMI) button, and the recipe data written to the PLC is read back to the HMI. And the recipe data read back is then written to the selected set of recipe (RCPNO = 2). Write Recipe (HMI to PLC) 

16-Bit Recipe			
		Read Recipe (PLC to HMI)	 After Step 2 is carried out, the data of the second set of recipe is changed to 1, 2, and 3 because the PLC data is read back to the HMI. 

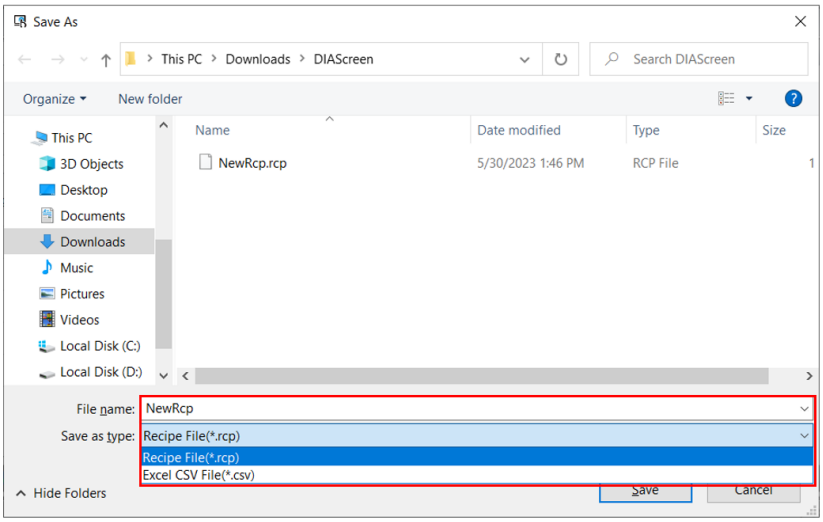
The following table describes the **16-Bit Recipe** property settings.

Property Settings for 16-Bit Recipe	
	
Enable	● Select the **Enable** checkbox to use the recipe register address. ● If **Enable** is not selected, setting the **16-Bit Recipe** remains disabled.
Non-volatile	● The available options for non-volatile memory are: HMI, USB Disk, and SD Card. The default value is **HMI**.  ● If users set to save in the HMI, the data is saved in the HMI ROM when the power is off.
Recipe Read Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type.** Refer to *Memory Settings*.
New Recipe 	Click  and set the **Length** and **Groups**. 
Length / Groups	● After entering the **Length** and **Groups** values for the recipe, click **OK** to create recipe. ● The **Length** and **Groups** cannot be 0. If users enter 0 in **Length** or **Groups**, DIAScreen displays an error message.

Property Settings for 16-Bit Recipe	
	
Recipe content	● Enter the **Length** and **Groups** to form a table of Length (L) x Groups (G) in the blank area. For example, with 4 for the Length and 3 for the Groups, the table is 4 x 3. ***NOTE***: *Limited by the Internal Memory size of the HMI, the recipe size cannot exceed 64K (Length x Groups cannot be greater than 65536). If the recipe size exceeds 64K, DIAScreen displays the following warning message*.  ● Fill in the recipe data in this table. 
Import Recipe 	● The **Import Recipe** function supports CSV and RCP file formats to select and import the recipe.

Property Settings for 16-Bit Recipe	
	 ● The opened and imported recipe file provides the current recipe data content only, and the recipe address does not support loading the originally set address. If users use the **16-Bit Recipe** to open a RCP or CSV file of the **32-Bit Recipe**, DIAScreen displays the following error message once the file is loaded.  
Export Recipe 	● The **Export Recipe** function saves the current **16-Bit Recipe**. The supported file formats are the same as those of the **Import Recipe** function, which are CSV and RCP files.

Property Settings for 16-Bit Recipe



- The saved recipe data does not support saving the set recipe address.

Clear Configuration



Clear the recipe content that has the value entered.

Before

	1 Unsigned Decimal 1 Word	2 Unsigned Decimal 1 Word	3 Unsigned Decimal 1 Word	4 Unsigned Decimal 1 Word	**5 Unsigned Decimal 1 Word**
1	1	2	3	4	5
2	6	7	8	9	10
3	11	12	13	14	15
4	16	17	18	19	20
5	21	22	23	24	25

After

	1 Unsigned Decimal 1 Word	2 Unsigned Decimal 1 Word	3 Unsigned Decimal 1 Word	4 Unsigned Decimal 1 Word	5 Unsigned Decimal 1 Word
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0

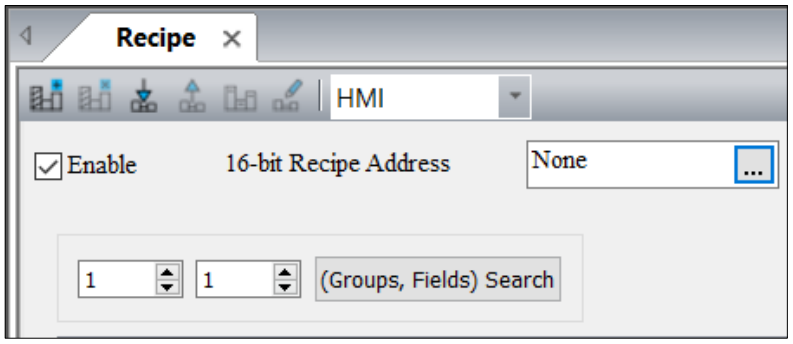
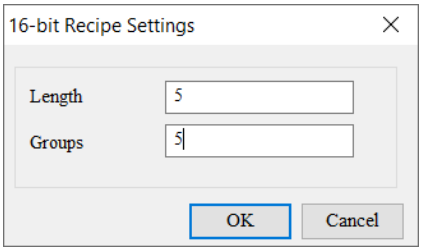
Delete Recipe



- Click  to delete the entire recipe. Users have to create a new recipe if necessary.
- The **Delete Recipe** function also sets the **16-bit Recipe Address** to None.

Before

	1 Unsigned Decimal 1 Word	2 Unsigned Decimal 1 Word	3 Unsigned Decimal 1 Word	4 Unsigned Decimal 1 Word	**5 Unsigned Decimal 1 Word**
1	1	2	3	4	5
2	6	7	8	9	10
3	11	12	13	14	15
4	16	17	18	19	20
5	21	22	23	24	25

<table>
<tr><th colspan="3">Property Settings for 16-Bit Recipe</th></tr>
<tr><td></td><td>After</td><td> 
</td></tr>
<tr><td>Recipe Settings  </td><td colspan="2">Change the settings of the Length and Groups for the recipe. 
</td></tr>
</table>

23.2 32-Bit Recipe

The Data Type that the **32-Bit Recipe** supports is Double Word. The supported Data Format includes Signed Decimal, Unsigned Decimal, and Floating. The size of each recipe register is 32 bits (2 Words or 1 Double Word, DW). Unlike **16-Bit Recipe**, the **32-Bit Recipe** features an additional recipe grouping option. When reading or writing the recipe, users have to specify both the recipe number and recipe group before reading / writing one of the recipe sets.

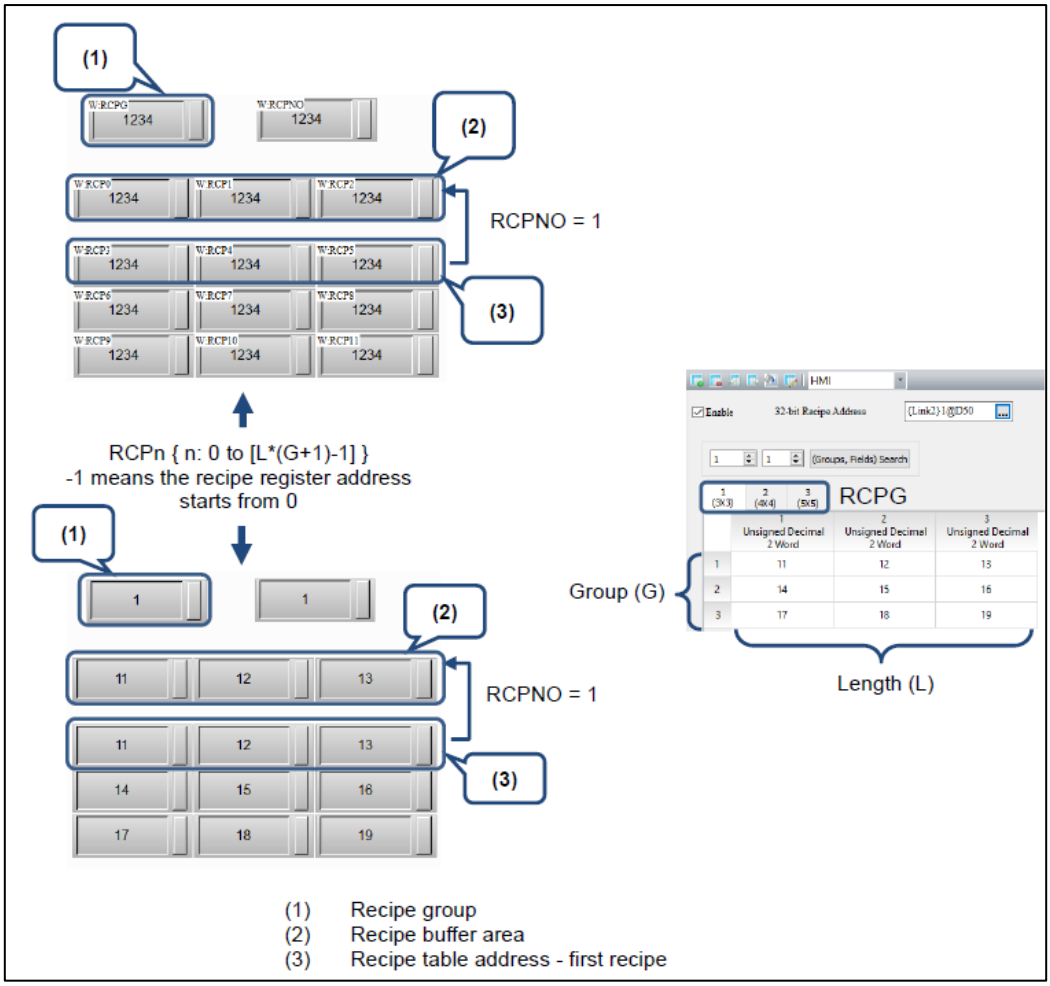


Figure 23 - 10: 32-Bit Recipe buffer configuration

The dedicated registers for **32-Bit Recipe** are RCP, RCPNO, and RCPG.

RCP	Recipe register
RCPNO	Recipe number register
RCPG	Recipe group register

RCP and RCPNO are registers that are jointly used with the **16-Bit Recipe**, as already introduced in the section on the 16-Bit Recipe. The following section introduces the features of the RCPG and RCPNO registers for the **32-Bit Recipe.**

Recipe Group Register (RCPG)

The **Recipe Group Register** is used to specify the group for the **32-Bit Recipe**. Users can create up to 255 groups of **32-Bit Recipe** data. The recipe group 0 (RCPG 0) is assigned for use by the **16-Bit Recipe**. Calling the **32-Bit Recipe** data requires use of the Recipe Groups 1 to 255 (RCPG 1 to 255). For a **32-Bit Recipe**, when users select the first set of recipe in the first recipe group, RCPG = 1 and RCPNO = 1; when users select the fourth set of recipe in the third recipe group, RCPG = 3 and RCPNO = 4.

NOTE: *The **Recipe Group Register** does not feature the non-volatile function, so the data in the register cannot be maintained when the HMI is powered off.*

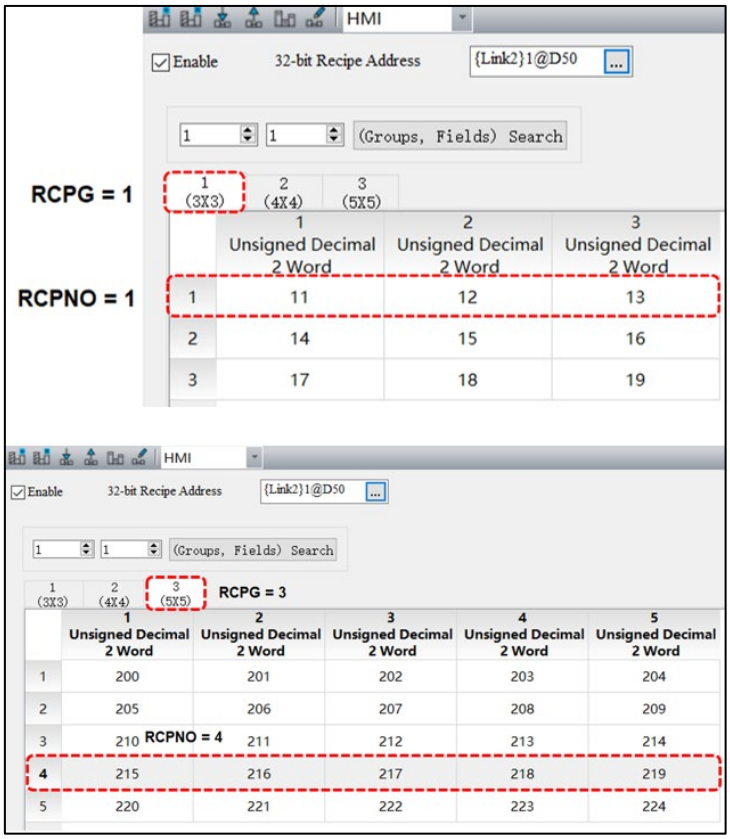
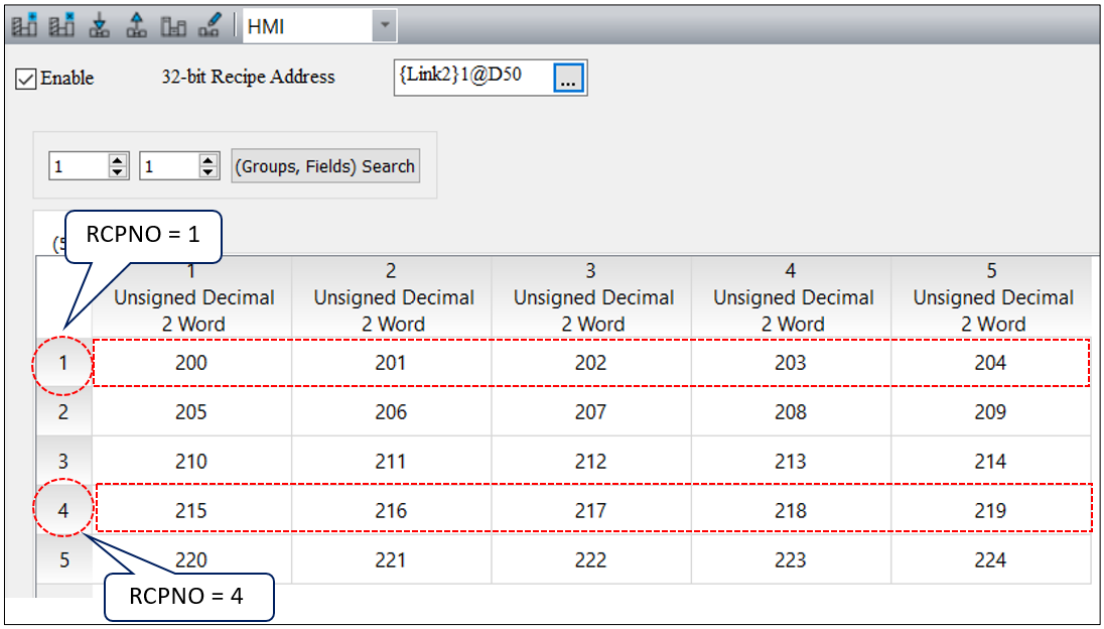


Figure 23 - 11: 32-Bit Recipe group editing screen

Recipe Number Register (RCPNO)

RCPNO is used to specify the number for the **32-Bit Recipe**. Reading / writing of the recipe means to read / write a set of recipes according to the recipe number recorded in the recipe number register. When users select the first set of recipes, RCPNO = 1; when users select the fourth set of recipes, RCPNO = 4.

NOTE: *The **Recipe Number Register** does not feature the non-volatile function, so the data in the register cannot be maintained when the HMI is powered off.*



	1 Unsigned Decimal 2 Word	2 Unsigned Decimal 2 Word	3 Unsigned Decimal 2 Word	4 Unsigned Decimal 2 Word	5 Unsigned Decimal 2 Word
1	200	201	202	203	204
2	205	206	207	208	209
3	210	211	212	213	214
4	215	216	217	218	219
5	220	221	222	223	224

Figure 23 - 12: Recipe number editing screen

32-Bit Recipe size limit:

If the non-volatile memory area is set in the USB Disk or SD Card, the size of the **32-Bit Recipe** file cannot exceed 50 MB. Unlike the **16-Bit Recipe**, the editable size of the **32-Bit Recipe** is dependent upon the specification of the flash memory of different HMI models when the non-volatile memory area is set in the HMI.

Go to **View** > **Memory List** to check the editable recipe size, as shown in the following figure.

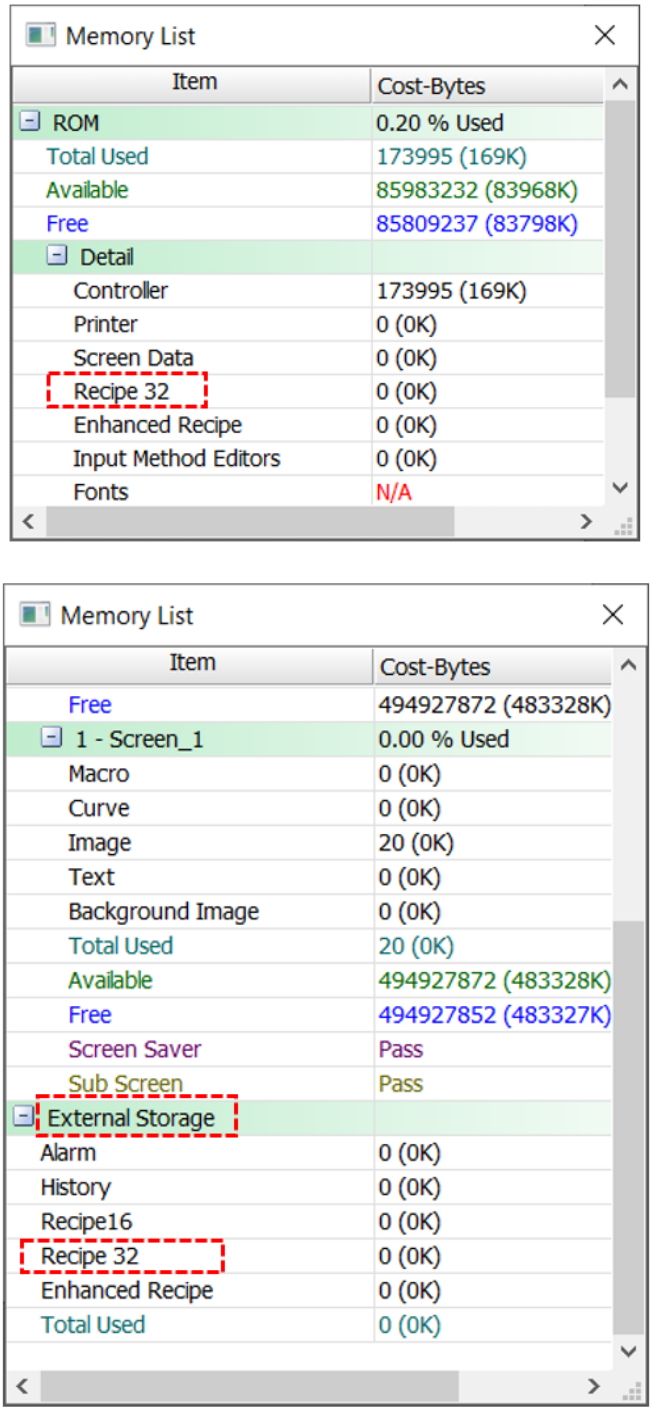
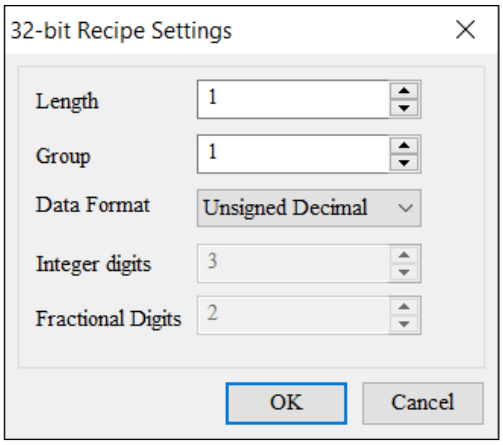
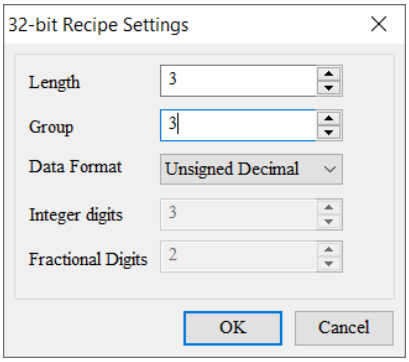
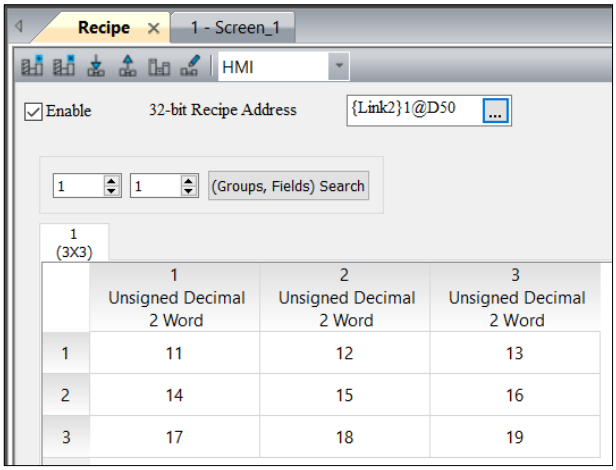
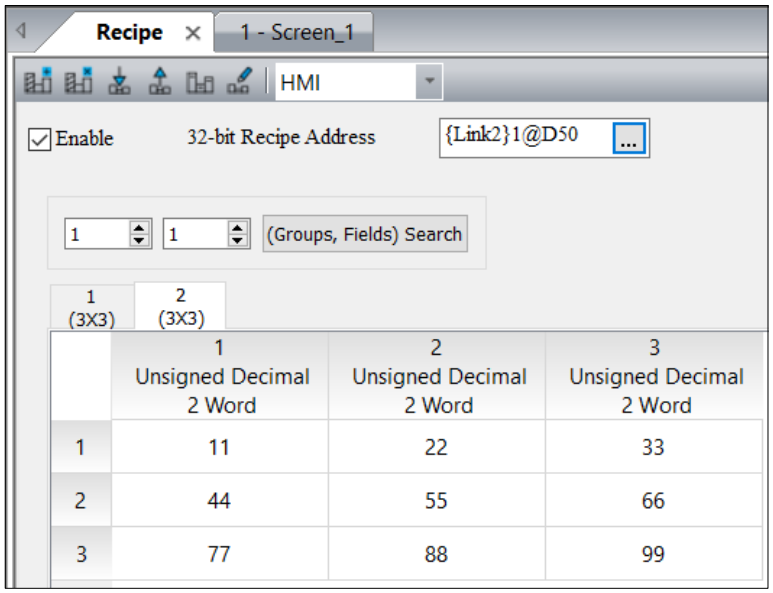
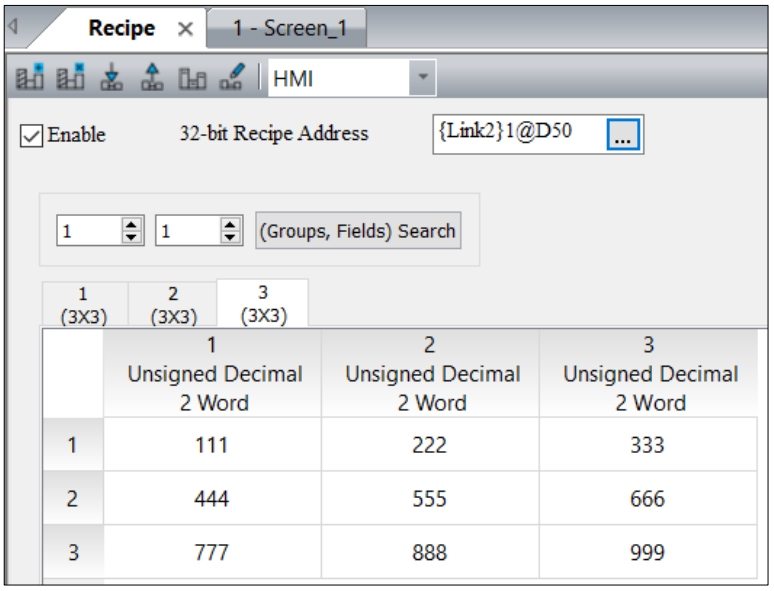
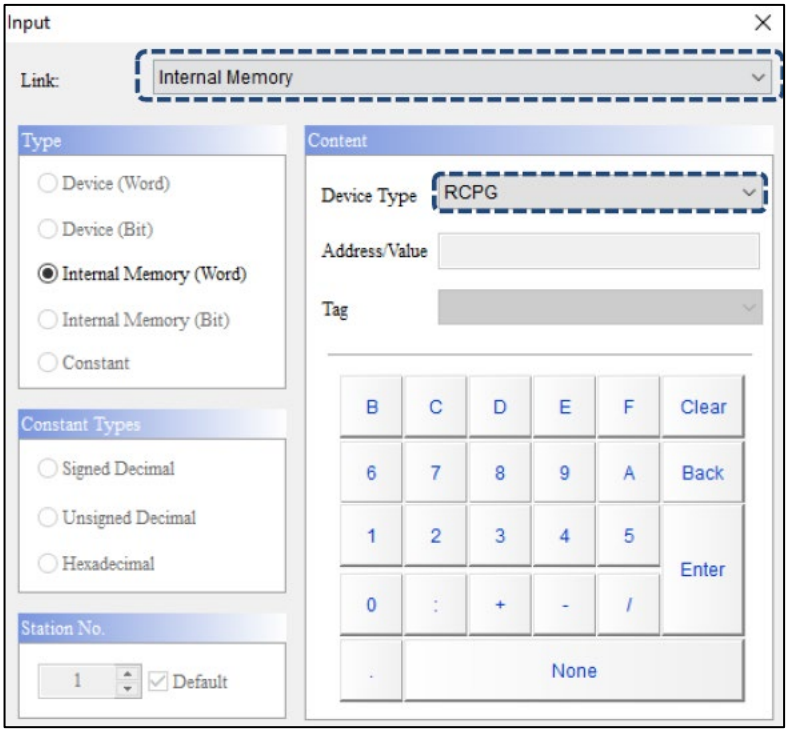
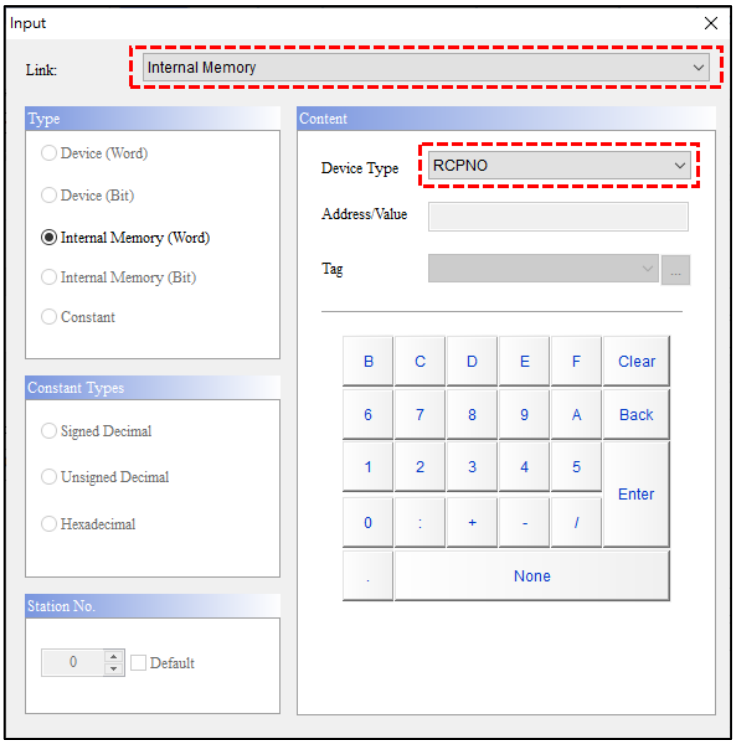


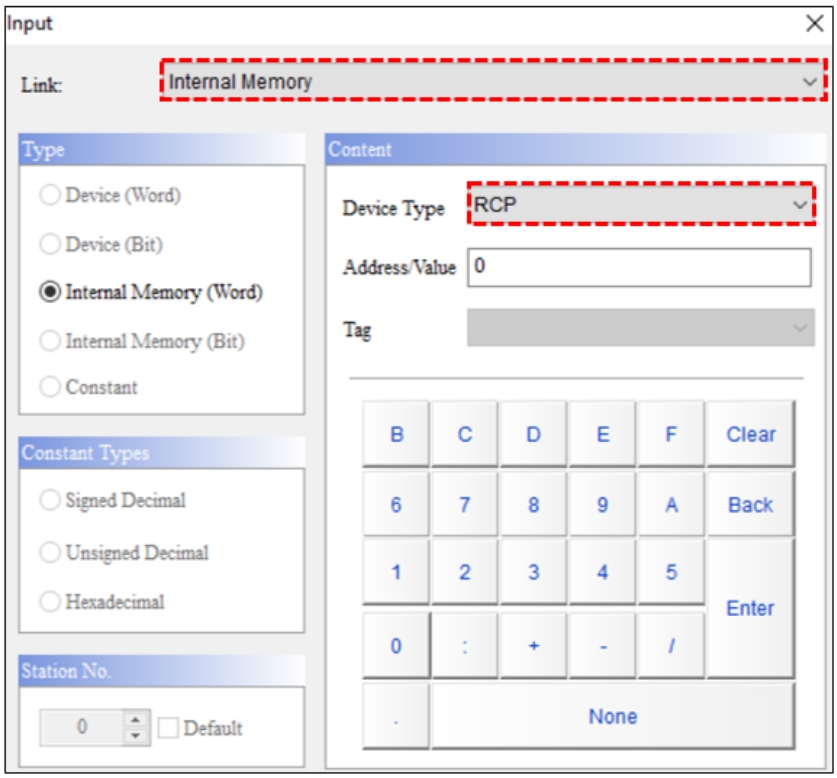
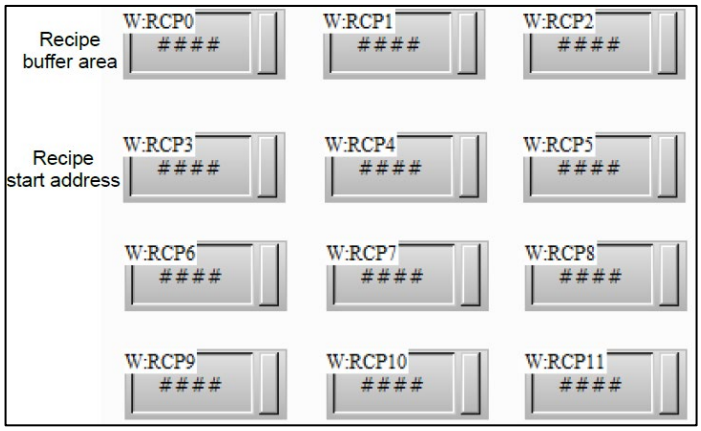
Figure 23 - 13: 32-Bit Recipe memory list

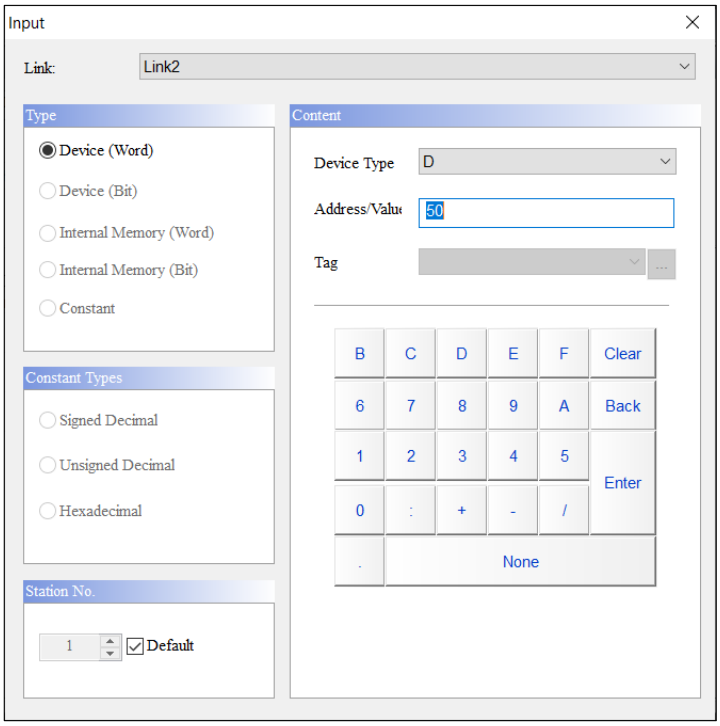
Refer to the following **32-Bit Recipe** example.

32-Bit Recipe	
Set 32-Bit Recipe	**Step 1**: Go to **Data Management** > **Recipe** > **32-Bit Recipe**. 1. Select **Enable** checkbox. 2. Set the **Recipe Address** to D20. **Step 2**: Click  to enter **32-bit Recipe Settings**.  Set both the **Length** and **Group** to 3 for the first set of recipe. Set the **Data Format** to Unsigned Decimal.  
Set 32-Bit Recipe	**Step 3**: Repeat Step 2. Set both the **Length** and **Group** to 3 to create the recipe data as shown in the following figure.

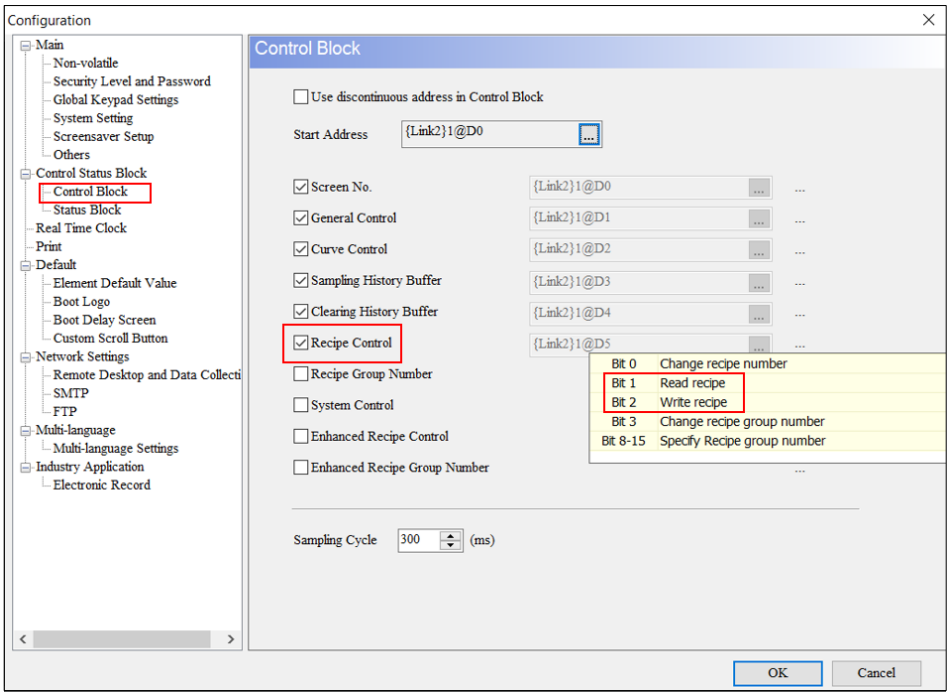
32-Bit Recipe	
	 **Step 4**: Repeat Step 2. Set both the **Length** and **Group** to 3 to create the recipe data as shown in the following figure. 
Create RCPG Numeric Entry element	• Create a **Numeric Entry** element and set the **Write Address** to the Internal Memory. Select RCPG for the **Device Type**. This element is used to select the Recipe Group.

32-Bit Recipe	
	 ● The following is an example of the created element. 
Create RCPNO Numeric Entry element	● Create a **Numeric Entry** element and set the **Write Address** to the Internal Memory. Select RCPNO for the **Device Type**. This element is used to select the Recipe Number. 

32-Bit Recipe	
	● The following is an example of the created element. 
Create RCP Numeric Entry elements	**Step 1**: Before creating the **Numeric Entry** elements to display the **32-Bit Recipe** register, use the recipe register formula [L*(G+1)-1] to calculate the number n in RCPn. Substitute the set size of the recipe (Length (L) x Group (G) = 3 x 3) into the formula to find the RCPn = RCP0 ~ RCP11. **Step 2**: Create 12 **Numeric Entry** elements and set their **Read Address** as RCP0 ~ RCP11 of the Internal Memory. 
Create RCP Numeric Entry elements	The following is an example of the created elements. 

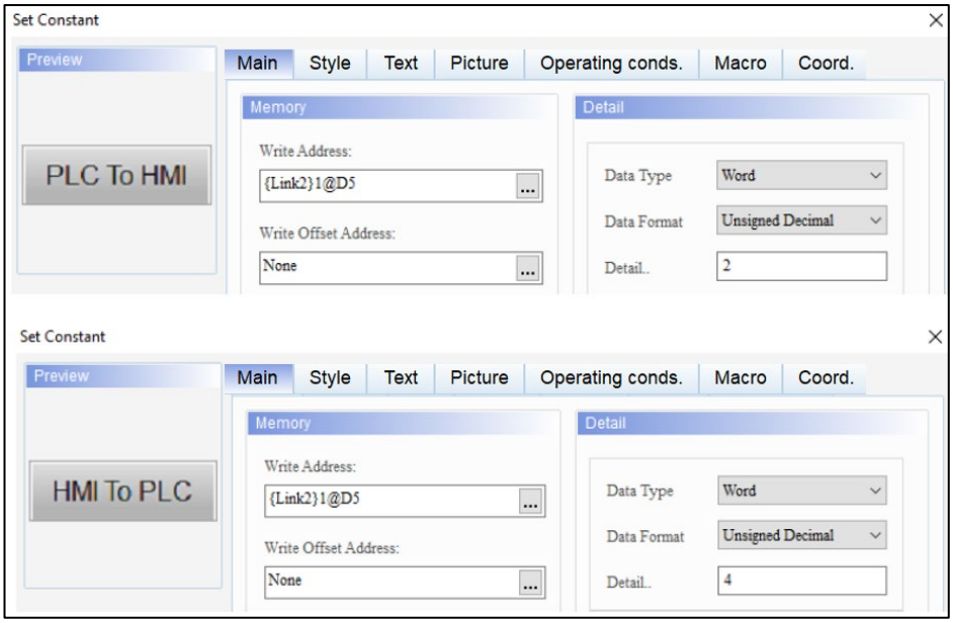
32-Bit Recipe	
	***NOTE**: The established RCP0 ~ RCP2 are recipe buffers, the actual recipe data are RCP3 ~ RCP11. Refer to Figure 23-10: 32-bit recipe buffer configuration for more information.*
Create Numeric Entry elements for the Recipe Read Address	● Create three **Numeric Entry** elements by referring to the address set for the **32-Bit Recipe** to display changes to the data when the PLC recipe is read or written. The **32-Bit Recipe** uses the Double Word format, so the **Recipe Address** entered needs to start from D50 and increment by 2 addresses to D52 and D54. ● Set the **Read Address** to D50 for the **Numeric Entry** element, which is shown as follows.  ● The following is an example of the created elements. 
Set Recipe Control flag in Control Block	Go to **General** > **Configuration** > **Control Block**, and select the **Recipe Control** flag checkbox. Then, set the **Start Address** for the **Control Block** to define the recipe control address. Once the setting is complete, click **OK** to exit the **Configuration** window.

32-Bit Recipe



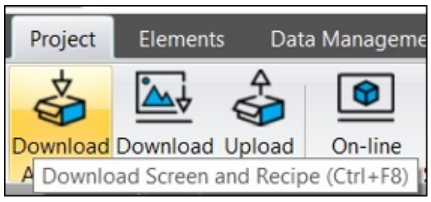
Create Set Constant Button elements

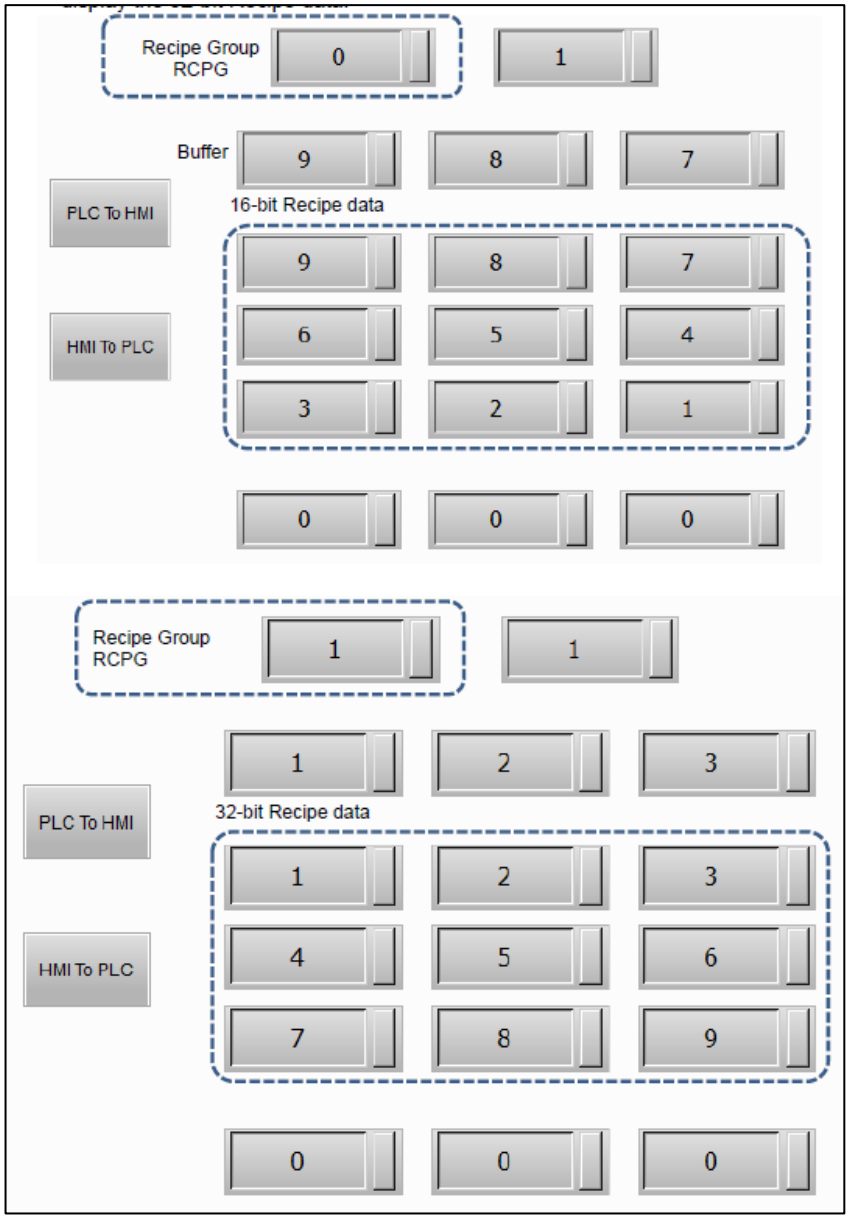
Create two **Set Constant Button** elements. Set the **Write Address** to D5 and the setting values (**Detail**) to 2 and 4 corresponding to Bit 1 and Bit 2 of the **Recipe Control** flag D5 respectively for reading and writing the recipe.



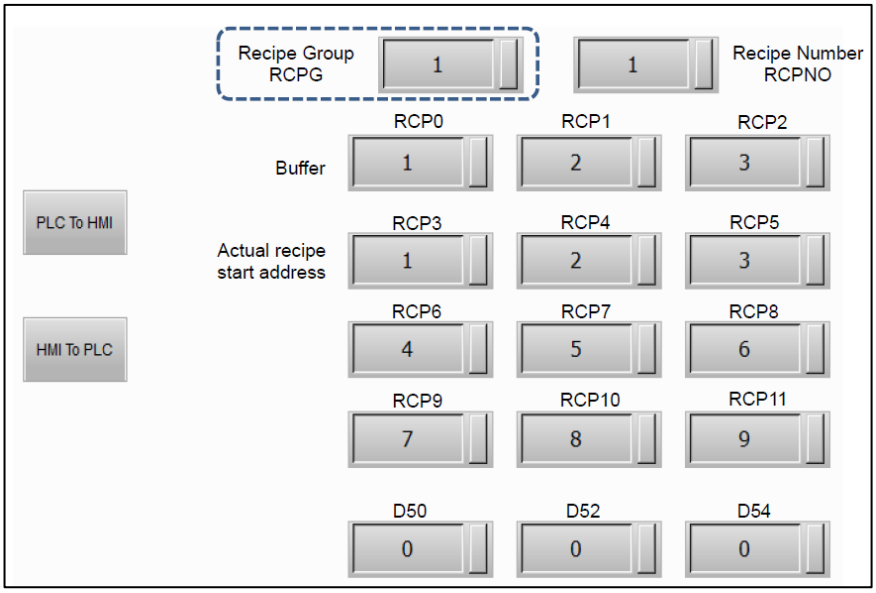
Execution result

- After creating all the elements, Click **Compile** and **Download Screen and Recipe** buttons to download data to the HMI.



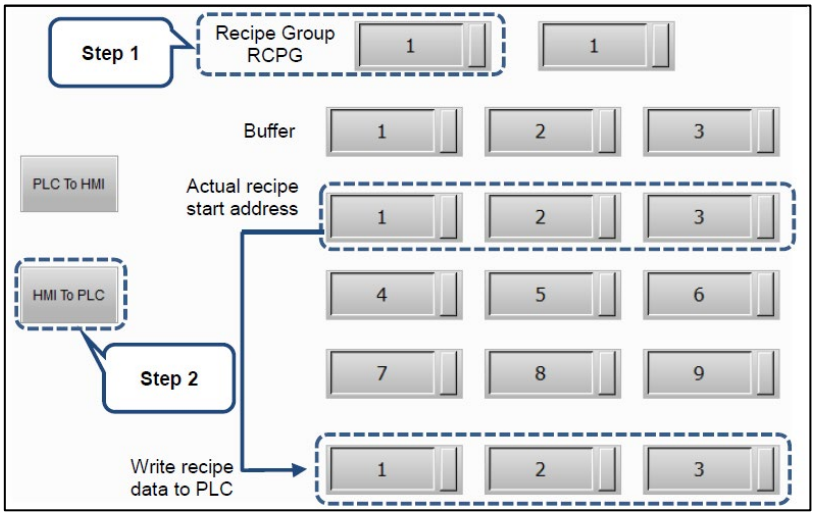
32-Bit Recipe	
	● The default for the **Recipe Group (RCPG)** is 0 after it is loaded to the HMI, meaning that the **16-Bit Recipe** data is displayed. Users need to set the Recipe Group to 1 to display the **32-Bit Recipe** data. 
Execution result	● The recipe data is displayed in RCP0 ~ RCP11 according to the selected recipe group. RCP0 ~ RCP2 are the recipe buffers and the starting address for the first set of the actual recipe data is RCP3.

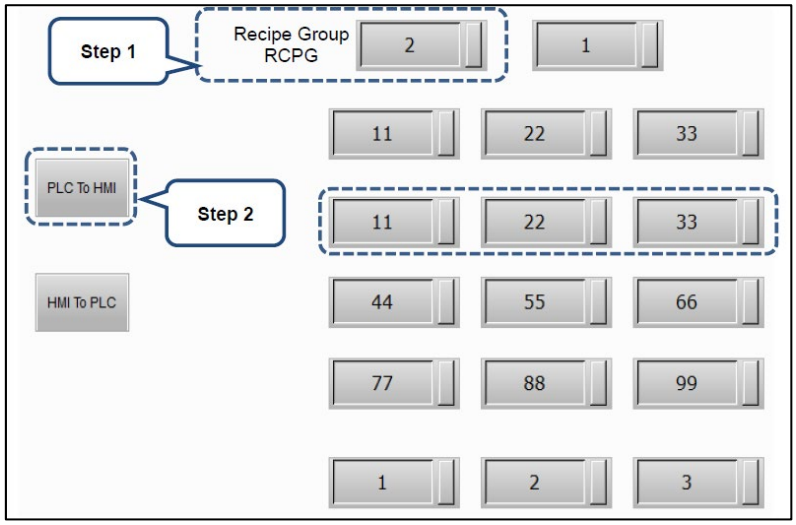
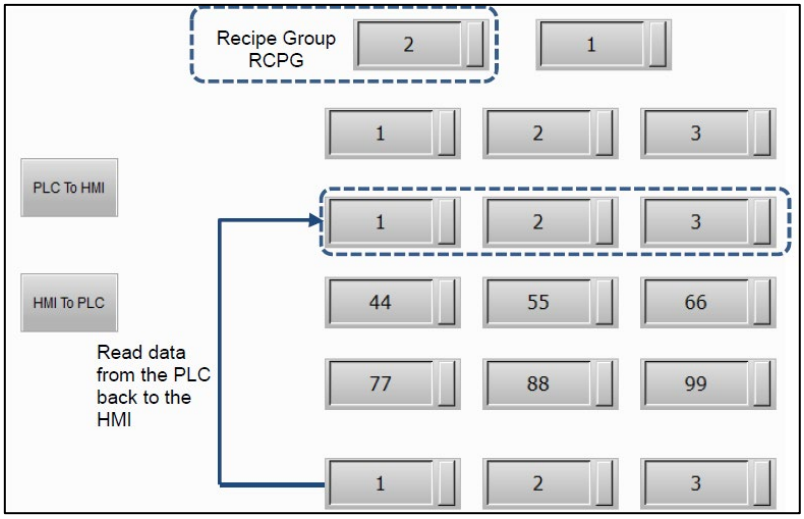
32-Bit Recipe



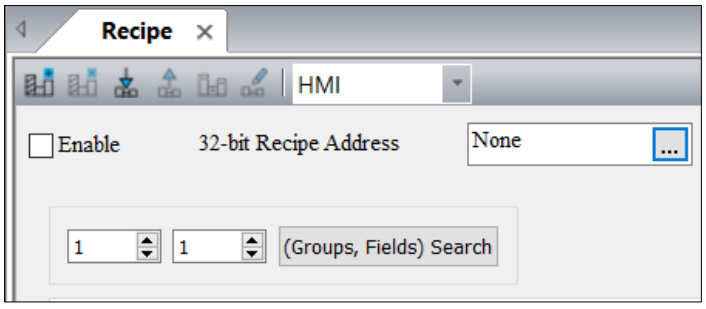
- Trigger the Write Recipe (HMI to PLC) button, and the recipe data of the selected set of recipe (RCPNO = 1) is written to the PLC. Trigger the Read Recipe (PLC to HMI) button, and the recipe data written to the PLC is read back to the HMI. And the recipe data read back is then written to the selected set of recipe (RCPNO = 2).

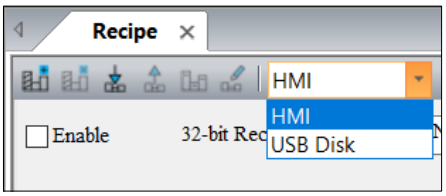
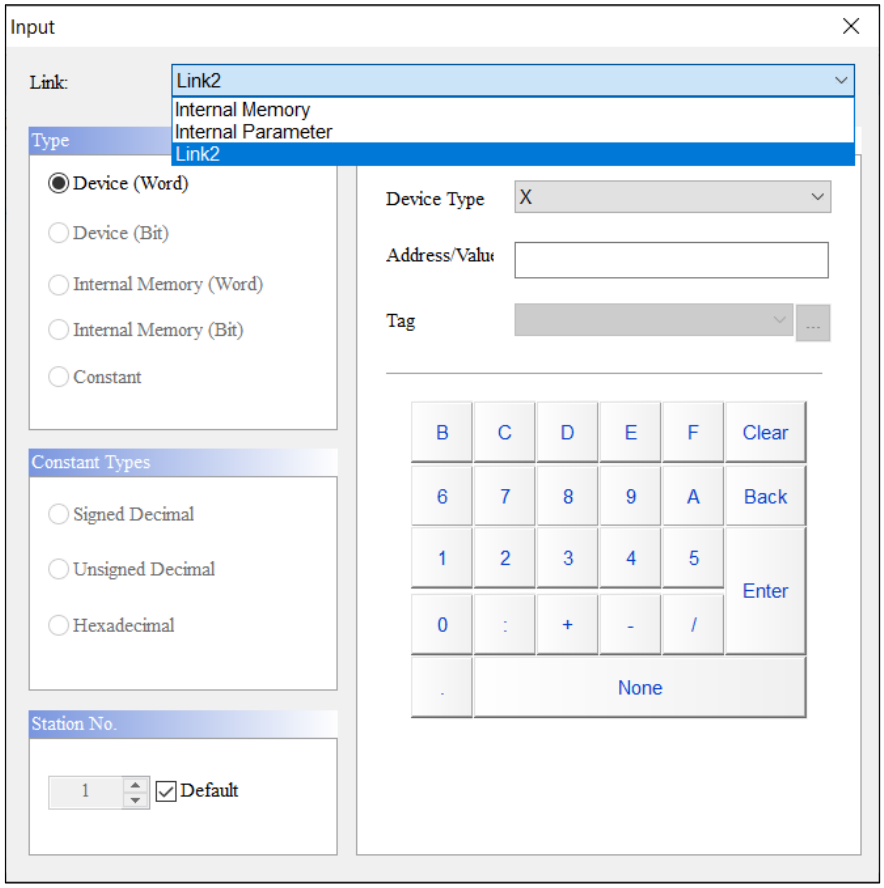
Write Recipe (HMI to PLC)



32-Bit Recipe		
	Read Recipe (PLC to HMI)	 ● After Step 2 is carried out, the first set of recipe data is changed to 1, 2, and 3 because the PLC data is read back to the HMI. 

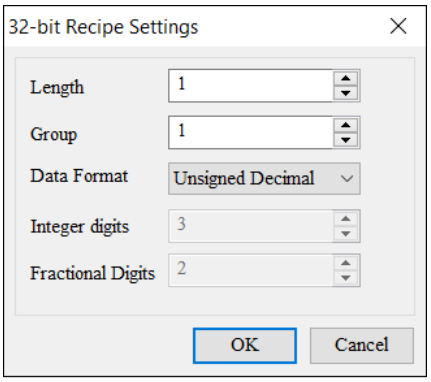
The following table describes the **32-Bit Recipe** property settings.

Property Settings for 32-Bit Recipe


Property Settings for 32-Bit Recipe	
Function	**Description**
Enable	● Select the **Enable** checkbox to use **32-Bit Recipe**. ● If **Enable** is not selected, setting the **32-Bit Recipe** does not take place.
Non-volatile	● The available options for non-volatile memory are: HMI, USB Disk, and SD Card. The default value is **HMI**.  ● If users set to save in the HMI, the data is saved in the HMI ROM when the power is off.
Recipe Read Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type.** Refer to *Memory Settings*. ● Regardless of the number of recipe sets, the **32-Bit Recipe** shares the same memory address. 

<table>
<tr><th colspan="3">Property Settings for 32-Bit Recipe</th></tr>
<tr><td rowspan="3">New Recipe  </td><td colspan="2">

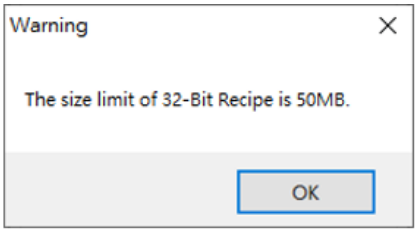
In the 32-bit Recipe Settings window, click  to add a 32-Bit Recipe data.



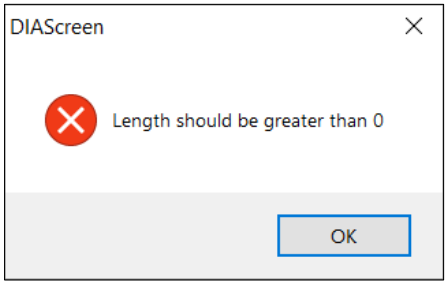
Add up to 255 groups of 32-Bit Recipe data with this  Button.

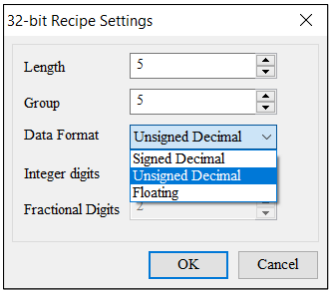
</td></tr>
<tr><td>Length / Group</td><td>

The Length and Group respectively represent the recipe length and group that is entered. The size of Length x Group cannot exceed 50 MB.

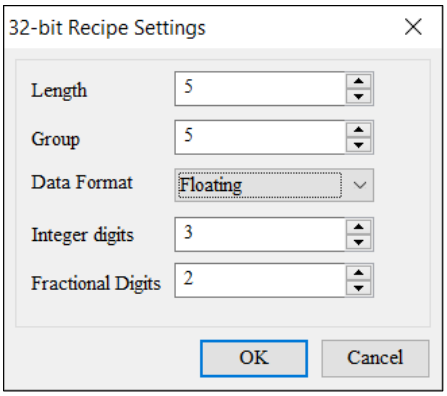
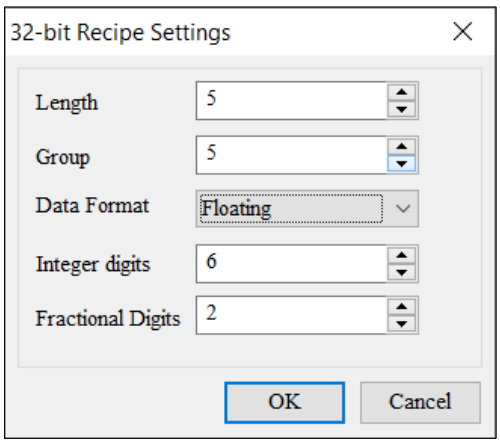
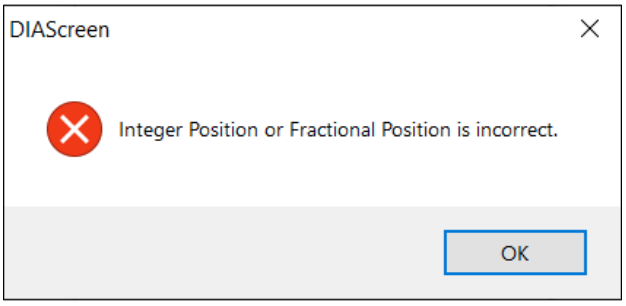


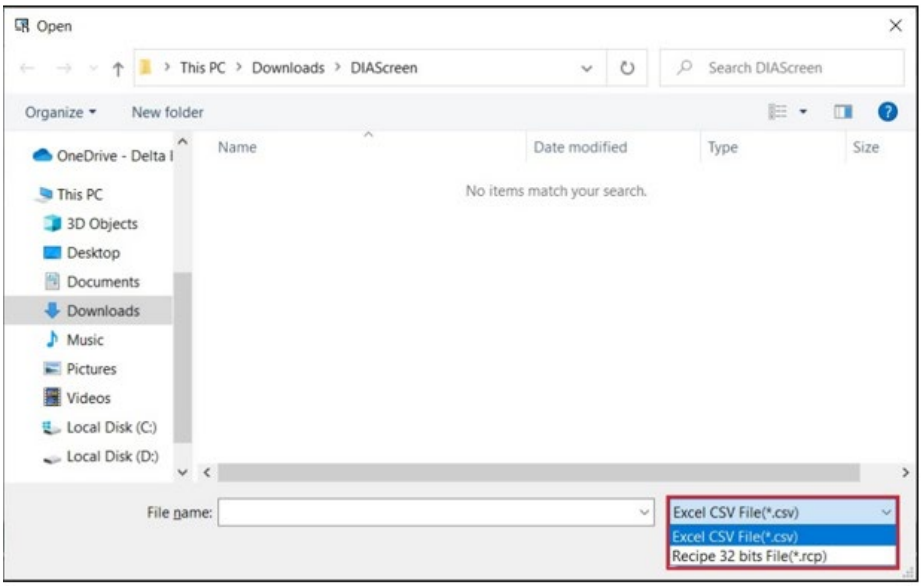
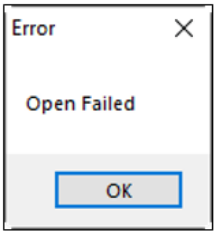
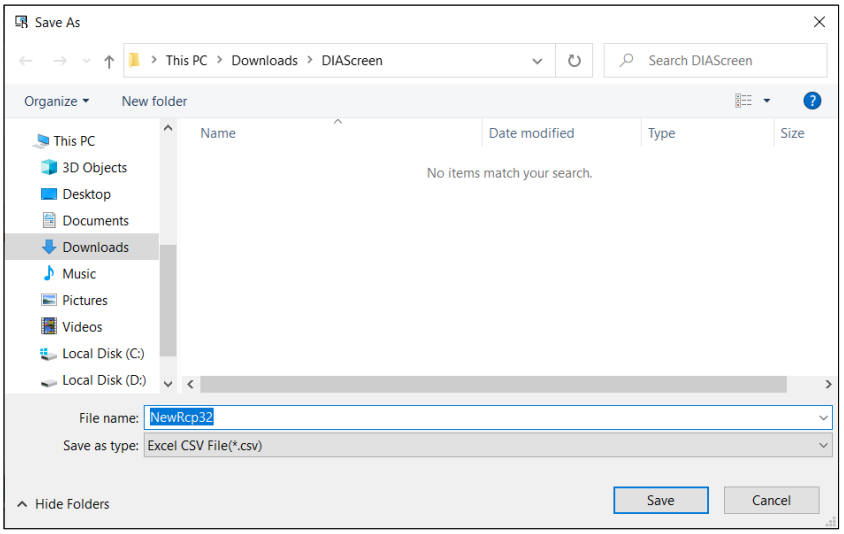
The Length and Group cannot be 0. If users enter 0 in Length or Group, DIAScreen displays an error message.

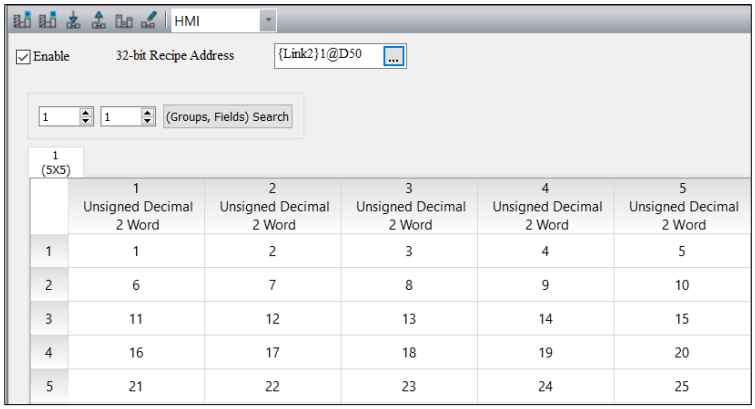
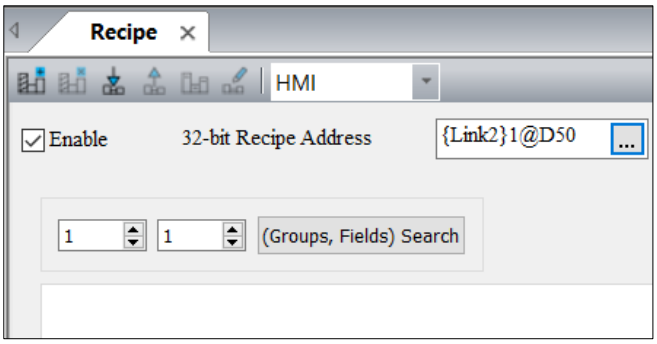
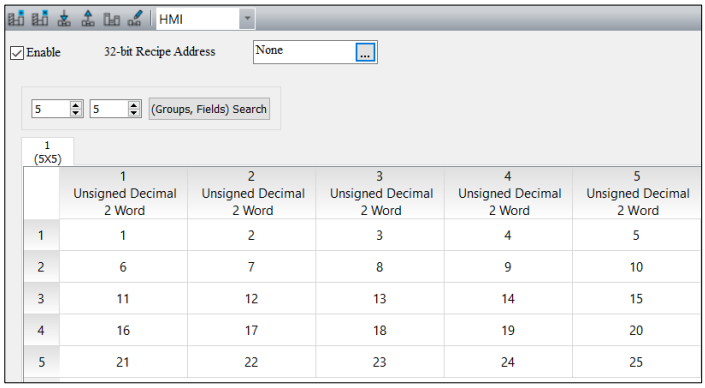


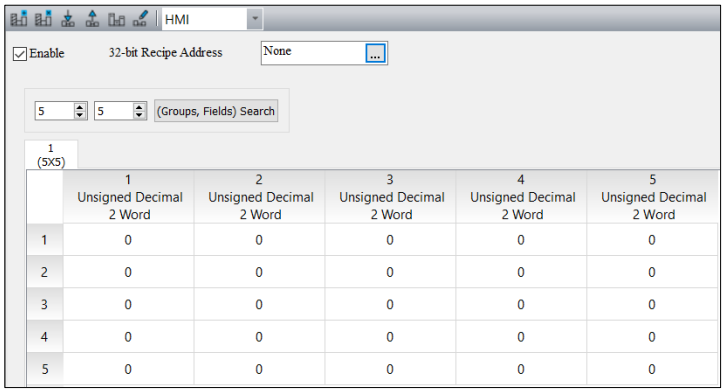
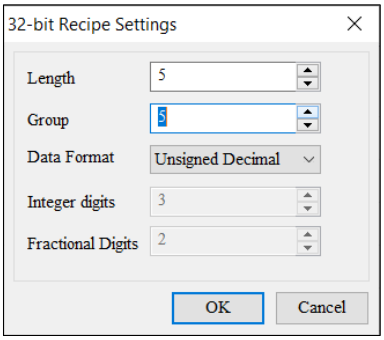
</td></tr>
<tr><td>Data Format</td><td>The available options for Data Format are: Signed Decimal, Unsigned Decimal, and Floating. The default value is Unsigned Decimal.


</td></tr>
</table>

Property Settings for 32-Bit Recipe		
	Integer digits / Fractional Digits	● Users can only set the **Integer digits** and **Fractional Digits** when **Data Format** is Floating.  ● When the **Data Format** is Floating, the **Integer digits** and **Fractional Digits** support only 7 digits in total. When this limit is exceeded, DIAScreen displays a warning message.  

Property Settings for 32-Bit Recipe	
Import Recipe 	● The **Import Recipe** function supports CSV and RCP file formats to select and import the recipe.  ● The opened and imported recipe file provides the current recipe data content only, and the recipe address does not support loading the originally set address. If users use the **32-Bit Recipe** to open a RCP or CSV file of the **16-Bit Recipe**, DIAScreen displays the following error message once the file is loaded. 
Export Recipe 	● The **Export Recipe** function saves the current **32-Bit Recipe**. The supported file format is CSV file. 

<table>
<tr><th colspan="3">Property Settings for 32-Bit Recipe</th></tr>
<tr><td></td><td colspan="2">● The saved recipe data does not support saving the set recipe address.</td></tr>
<tr><td>Delete Recipe</td><td colspan="2">The Delete Recipe function deletes the 32-Bit Recipe data. This function deletes the entire recipe, so users have to create a new recipe if necessary.</td></tr>
<tr><td></td><td>Before</td><td> 
</td></tr>
<tr><td></td><td>After</td><td> 
</td></tr>
<tr><td>Clear Configuration</td><td colspan="2">Clear the recipe content that has the value entered.</td></tr>
<tr><td></td><td>Before</td><td> 
</td></tr>
</table>

Property Settings for 32-Bit Recipe		
	After	
Recipe Settings 	Create the recipe data in **32-Bit Recipe**, to use **Recipe Settings** function. Use this function to change the **Length**, **Group**, and **Data Format** of the recipe. 	

23.3 Indirect Recipe Index Register (*RCP)

Indirect Recipe Index Register (*RCPn) can be used by both 16-Bit and 32-Bit Recipes. It acquires the value from RCPn first, and takes this value as the new address, and then accesses the value from this new address. For example, RCP1 = 3, RCP3 = 99, so *RCP1 = 99.

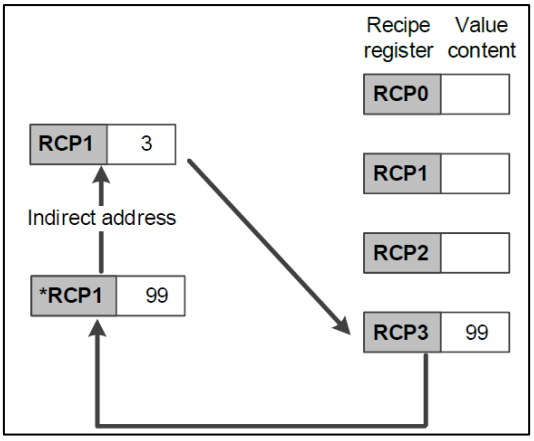


Figure 23 - 14: Indirect Recipe Index

The accessing range of the indirect recipe index register is as follows.

Accessing Type	Device Type	Accessing Range
Word	*RCPn	RCP0 ~ RCP65535

NOTE: *n = Word (0 ~ 65535)*

The address accessing range provided by *RCP is limited according to the recipe size created. Assuming that the recipe size is Length 3 * Group 3, then the RCP address ranges from *RCP0 ~ *RCP11. When *RCP12 is created, DIAScreen displays the following warning message.

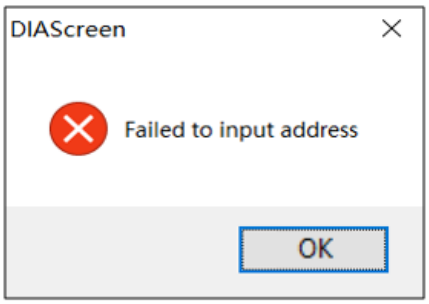
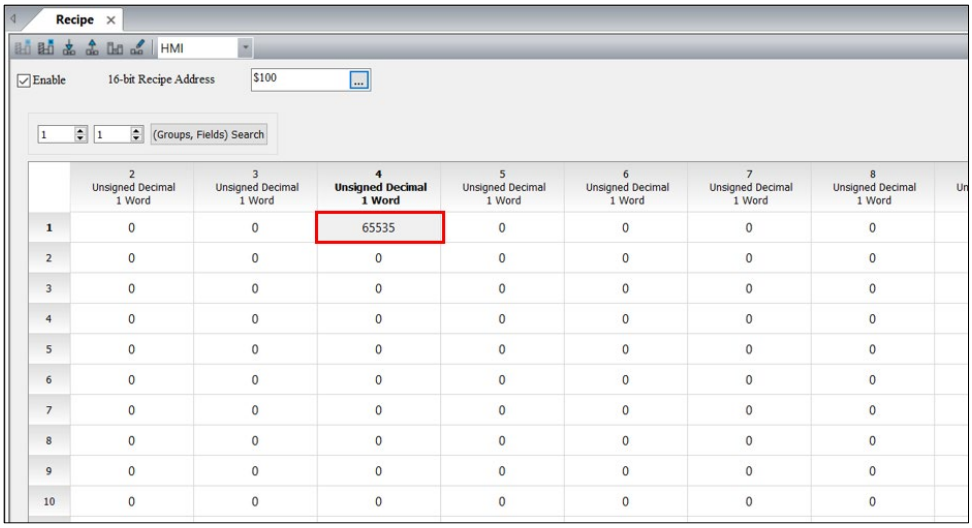
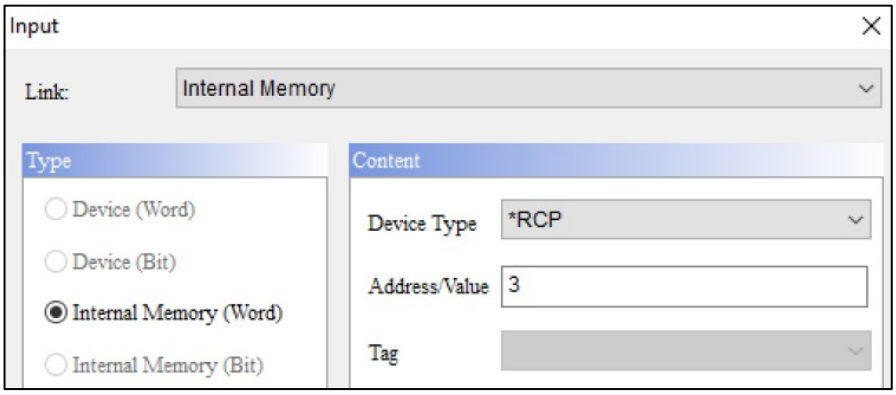
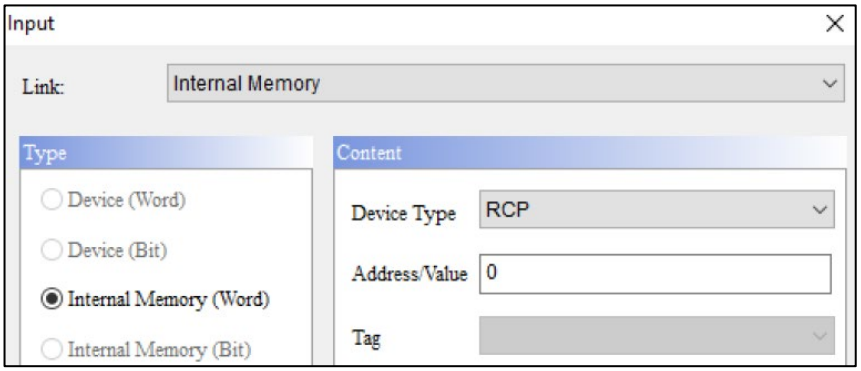


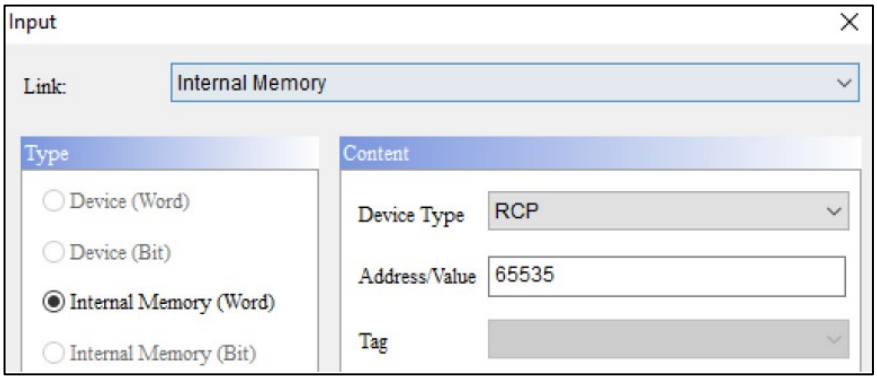
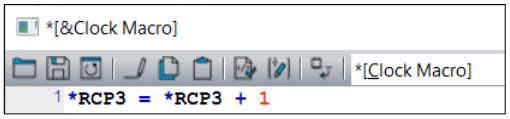
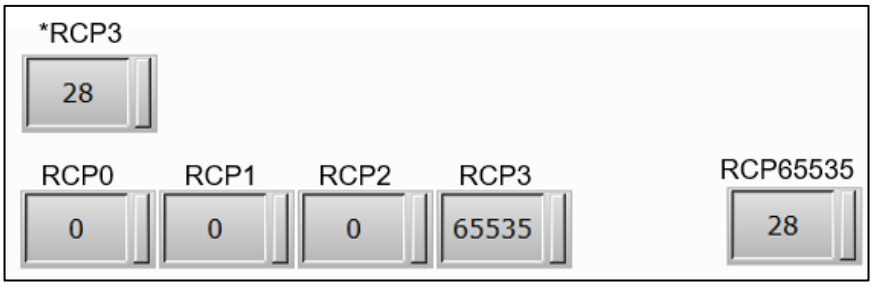
Figure 23 - 15: Indirect Recipe Index Register configuration error

The following table describes the **Indirect Recipe Index Register** example.

<table>
<tr><th colspan="2">Indirect Recipe Index Register</th></tr>
<tr><td>Set 16-Bit Recipe</td><td>Create a 16-Bit Recipe (1024 for Length, 64 for Group) and set RCP3 to 65535.
 
</td></tr>
<tr><td>Create Numeric Entry elements</td><td>● Create a Numeric Entry element and select *RCP for the Device Type. Then enter 3 for Address/Value.
 

● Create four Numeric Entry elements and select RCP for the Device Type. Then enter 0 to 3 for Address/Value respectively.
 

● Create a Numeric Entry element and select RCP for the Device Type. Then enter 65535 for Address/Value.</td></tr>
</table>

<table>
<tr><th colspan="2">Indirect Recipe Index Register</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Create Clock Macro command</td><td>Create the Clock Macro command *RCP3 = *RCP3 + 1.
 
</td></tr>
<tr><td>Execution result</td><td>After compiling the screen, download it to the HMI. Then users can see the values of *RCP3 and RCP65535 increase simultaneously.
 
</td></tr>
</table>

23.4 Enhanced Recipe

During the production process, recording information with character format is sometimes needed for ease of identification. Thus, DIAScreen provides the Enhanced Recipe which is able to record contents with combinations of characters (string) and numbers. Its supporting **Data Type** is Word or Double Word and its **Data Format** options include BCD, Signed Decimal, Unsigned Decimal, Hexadecimal, Floating, and Char. The Char format supports Unicode input and the read length of up to 32 Words (= 64 bits).

The use of its **Control Block** setting is the same as that of the **16-Bit** / **32-Bit Recipe** with the exception of using a different **Control Block** address. When reading

or writing the recipe, users have to specify both the recipe number and recipe group before reading / writing one of the recipe sets.

DIAScreen provides an Enhanced Recipe that incorporated the **Multi-language Input** element to name the recipe group, which does not require to memorize the content and other information for the first recipe group as the previous ENRCPG register address does. With the added ENRCPGNAME register address, enter the recipe name to call the recipe, which is more user-friendly. Also, ENRCPGNAME names the group in Unicode, so users can enter different languages. Therefore, users need to use the **Multi-language Input** element with the ENRCPGNAME register.

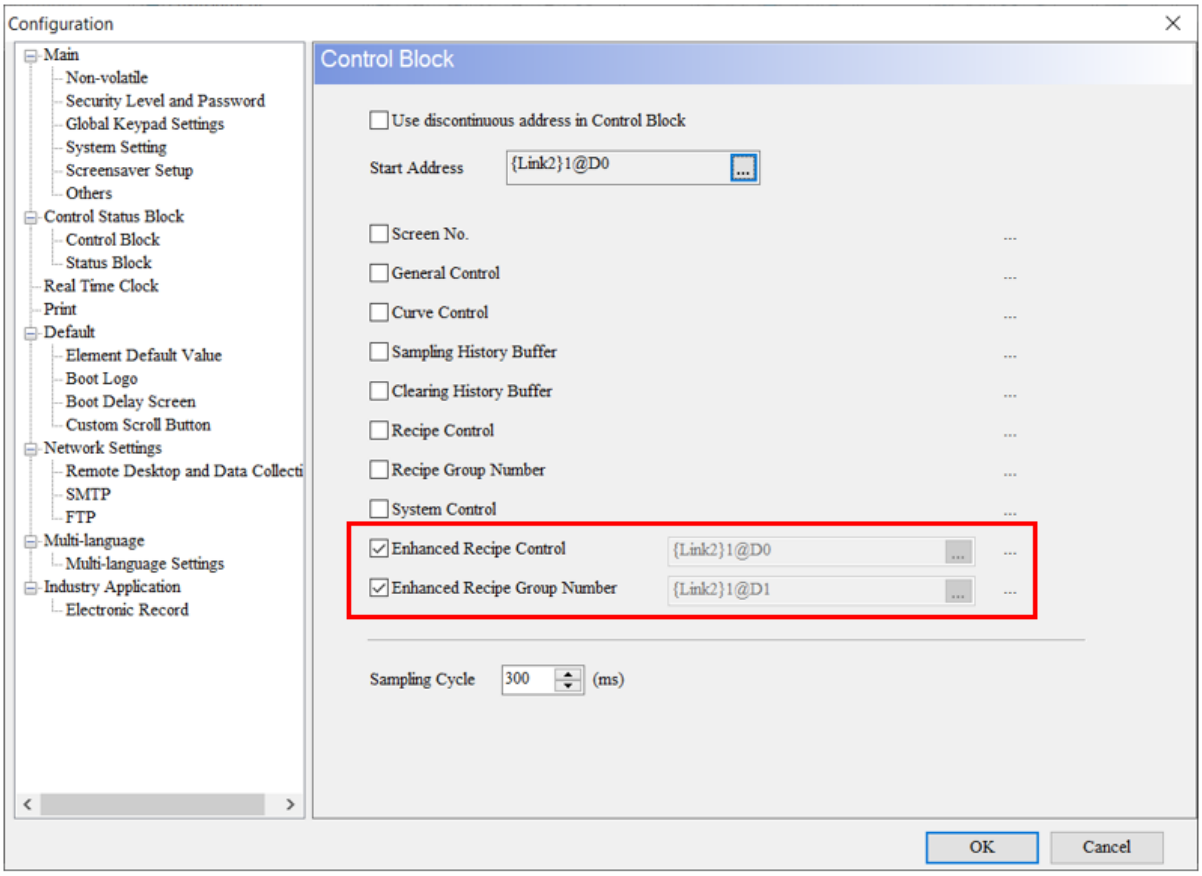


Figure 23 - 16: Using Enhanced Recipe address in the Control Block

The Enhanced Recipe has its own registers, which are ENRCP, ENRCPNO, ENRCPG, ENRCPGNAME, and *ENRCP.

ENRCP	Enhanced recipe register
ENRCPNO	Enhanced recipe number register
ENRCPG	Enhanced recipe group register
ENRCPGNAME	Enhanced recipe group register
*ENRCP	Enhanced indirect recipe index register

The following section introduces the features of each register.

Enhanced Recipe Number Register (ENRCPNO)

ENRCPNO is used to specify the number for the Enhanced Recipe. Reading / writing of the recipe means to read / write a set of recipes according to the recipe number recorded in the recipe number register. When users select the first set of recipes, ENRCPNO = 1; when users select the fourth set of recipes, ENRCPNO = 4.

***NOTE**: The **Recipe Number Register** does not feature the non-volatile function, so the data in the register cannot be maintained when the HMI is powered off.*

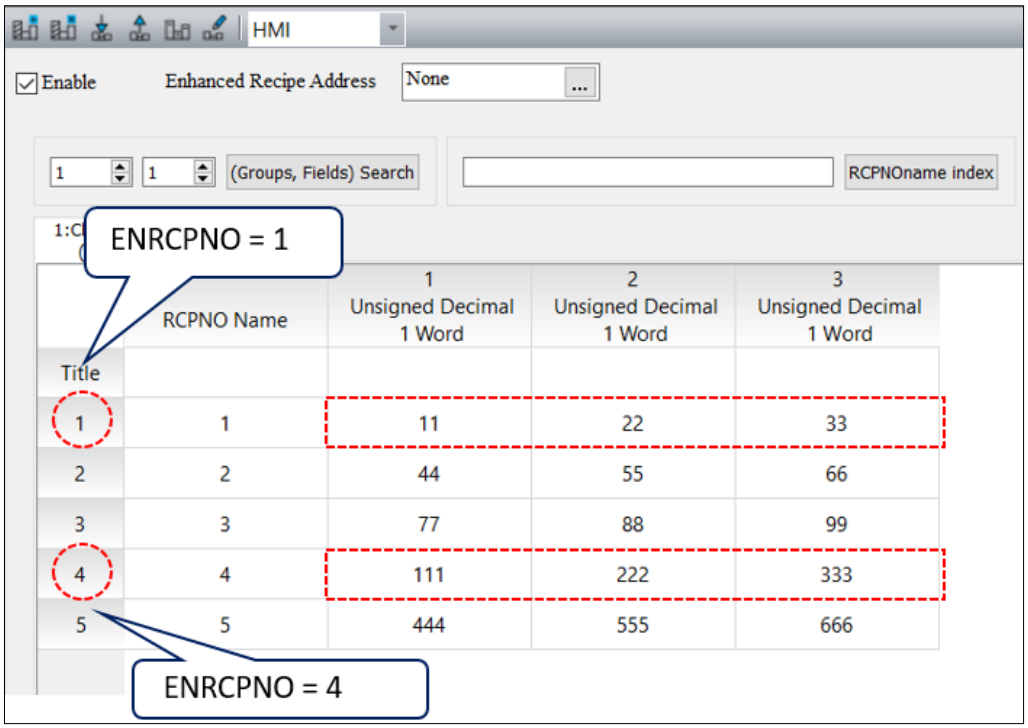


Figure 23 - 17: Enhanced recipe number editing screen

Enhanced Recipe Register (ENRCP)

A recipe buffer is featured in the HMI and is configured at the front of the recipe register. This buffer is used to store the selected set of recipes, and the number of fields for the recipe buffer equals the number of fields for the selected set of recipes, that is, the recipe buffer also occupies L recipe registers. Thus, the number of the recipe registers that a recipe table occupies is L * (G+1), where G+1 stands for the number of the registers with an additional buffer. With the recipe buffer, users only need to switch between the recipe numbers to check the currently specified recipe parameters. When the selected enhanced recipe number (ENRCPNO) is 1, the first set of enhanced recipe is displayed in the enhanced recipe buffer, as shown in the following figure.

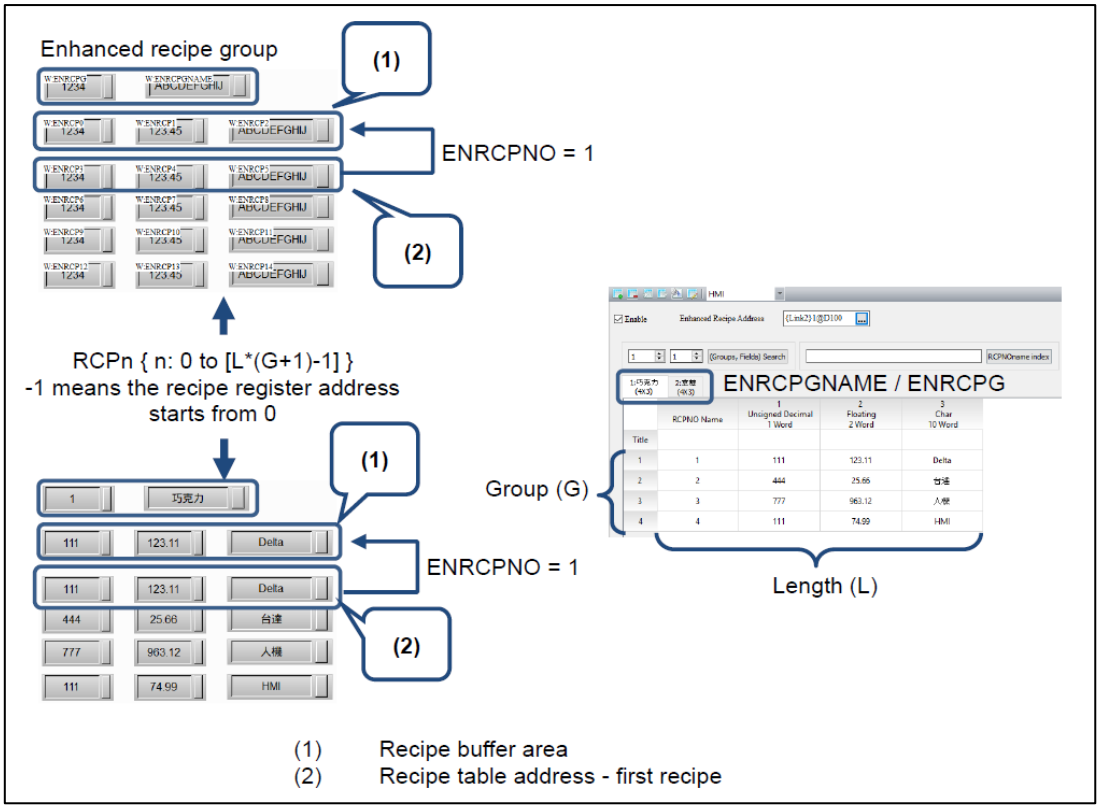


Figure 23 - 18: Enhanced Recipe buffer configuration

Enhanced Recipe Group Register (ENRCPG / ENRCPGNAME)

Enhanced recipe group register is used to specify the group for the Enhanced Recipe. Users can create up to 255 groups of Enhanced Recipe data. Calling the Enhanced Recipe data requires the use of the Recipe Groups 1 to 255 (RCPG 1 ~ 255). If the Enhanced Recipe is activated, the default value of the recipe group is 1.

For an Enhanced Recipe, if users select the first set of recipe in the first group, ENRCPG = 1 (ENRCPGNAME = Chocolate) and ENRCPNO = 1; if users select the third set of recipe in the second group, ENRCPG = 2 (ENRCPGNAME = Strawberry) and ENRCPNO = 3.

The function of the ENRCPGNAME register is identical to that of the ENRCPG register. The main difference is that with ENRCPGNAME, the recipe content is

acquired by entering the recipe name; with ENRCPG, the content is acquired by entering a value between 1 and 255.

***NOTE**: The **Recipe Group Register** does not feature the non-volatile function, so the data in the register cannot be maintained when the HMI is powered off.*

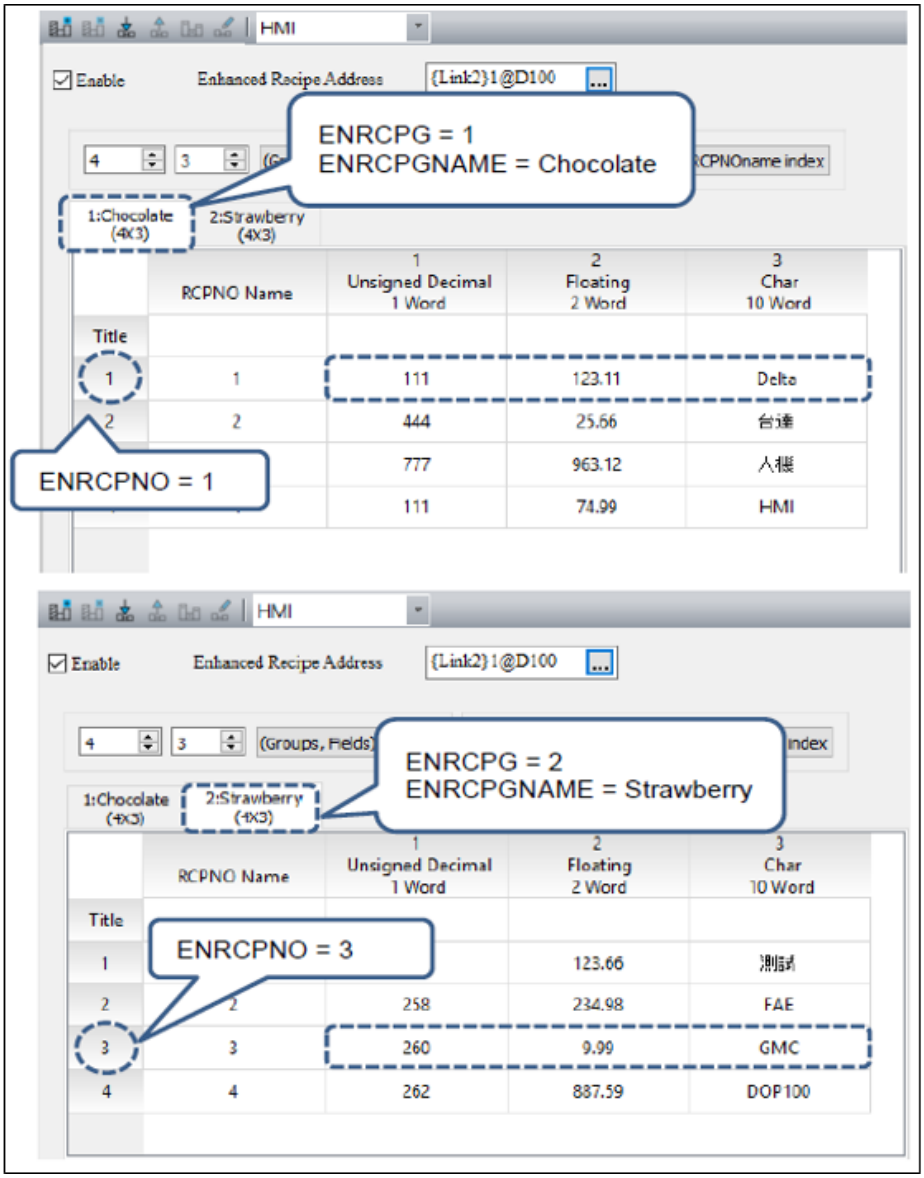


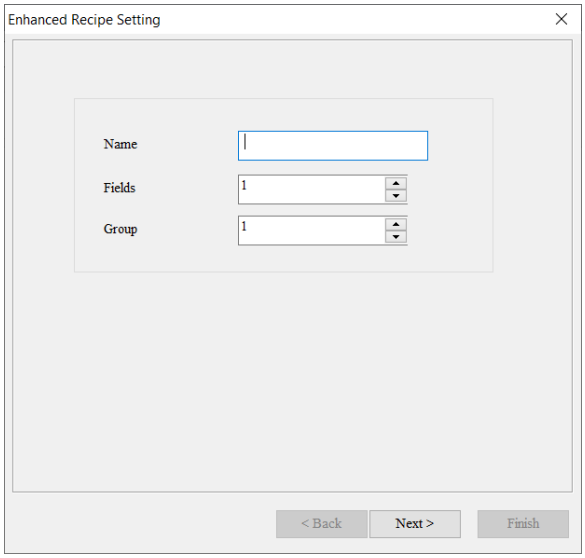
Figure 23 - 19: Recipe Group editing screen

Enhanced Recipe size limit:

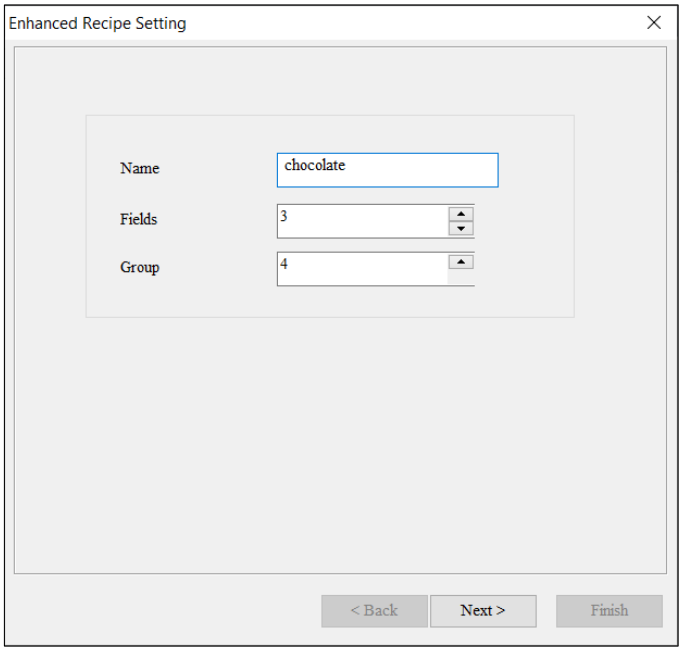
If the non-volatile memory area is set in the USB Disk or SD Card, the size of the enhanced recipe file cannot exceed Fields 256 x Groups 10000.

If the non-volatile area is set in the HMI, the editable size of the Enhanced Recipe is dependent upon the specification of the flash memory of different HMI models.

Refer to the following table for an example of **Enhanced Recipe**.

Enhanced Recipe	
Set Enhanced Recipe	**Step 1**: Go to **Data Management** > **Recipe** > **Enhanced Recipe**. 1. Select **Enable** checkbox. 2. Set Recipe Address to D100. **Step 2**: Click  to enter **Enhanced Recipe Setting**.  1. Set the **Name** as Chocolate, **Fields** as 3, and **Group** as 4 for the first recipe.

Enhanced Recipe

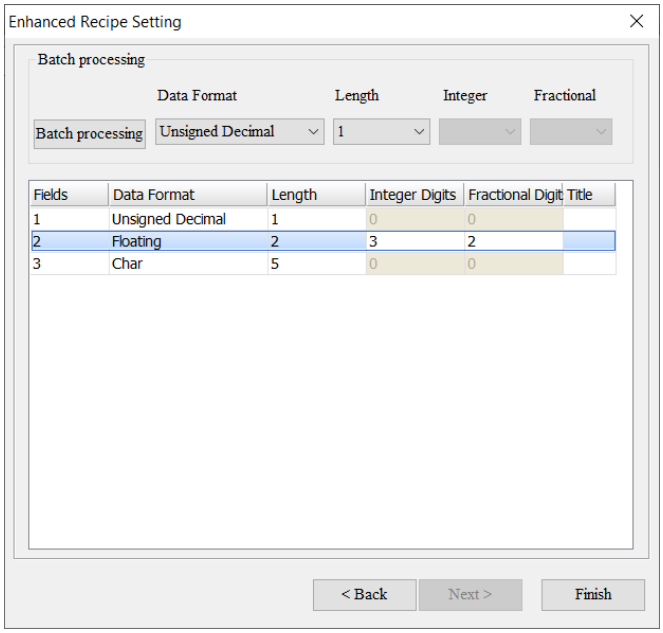


2. Set **Data Format** as follows.

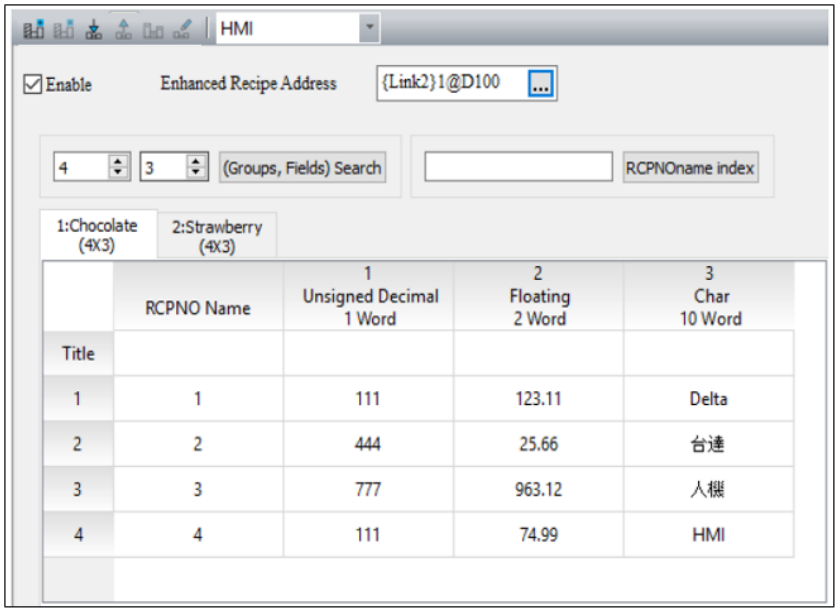
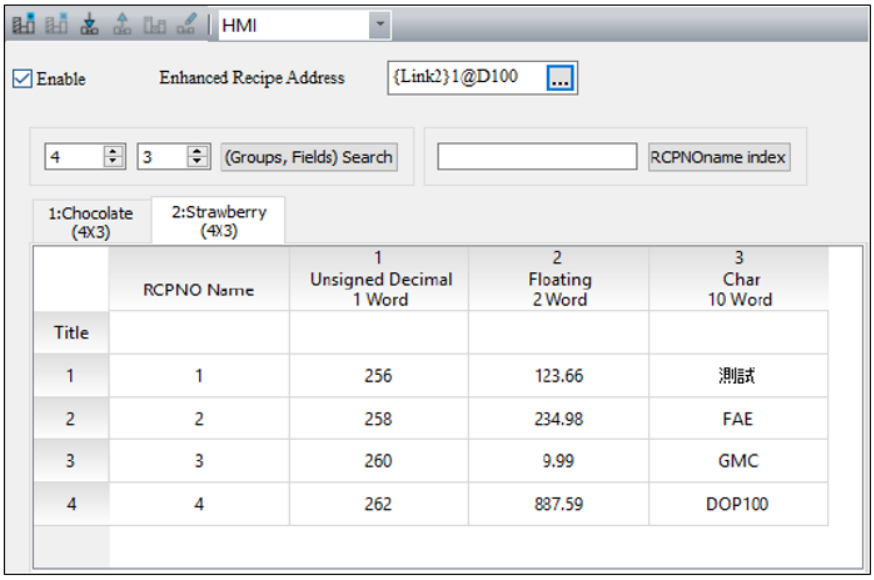
   Field 1: Unsigned Decimal. Set the **Length** as 1.

   Field 2: Floating. Set the **Length** as 2, **Integer Digits** as 3, and **Fractional Digits** as 2.

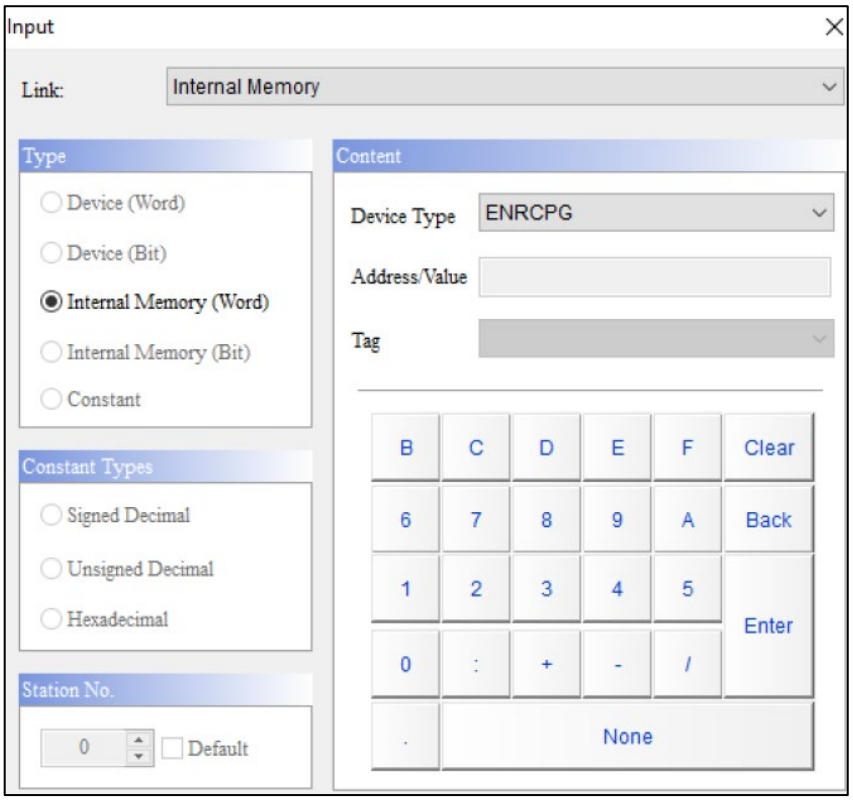
   Field 3: Char. Set the **Length** as 10.



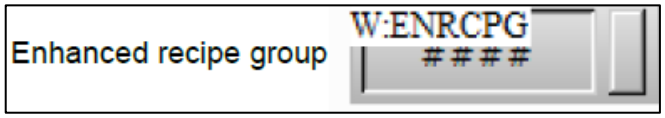
Step 3: Click **Finish** and enter the recipe data as follows.

Enhanced Recipe	
	 **Step 4**: Repeat Steps 1 and 2 with the **Fields** set to 3 and **Group** set to 4. The recipe data is shown as follows. 
Create Numeric Entry elements for ENRCPG and ENRCPNO and Multi-language Input element for ENRCPGNAME	**Step 1**: Create a **Numeric Entry** element and set the **Write Address** to Internal Memory. Select ENRCPG for the **Device Type**. This element is used to select the enhanced recipe group.

Enhanced Recipe	

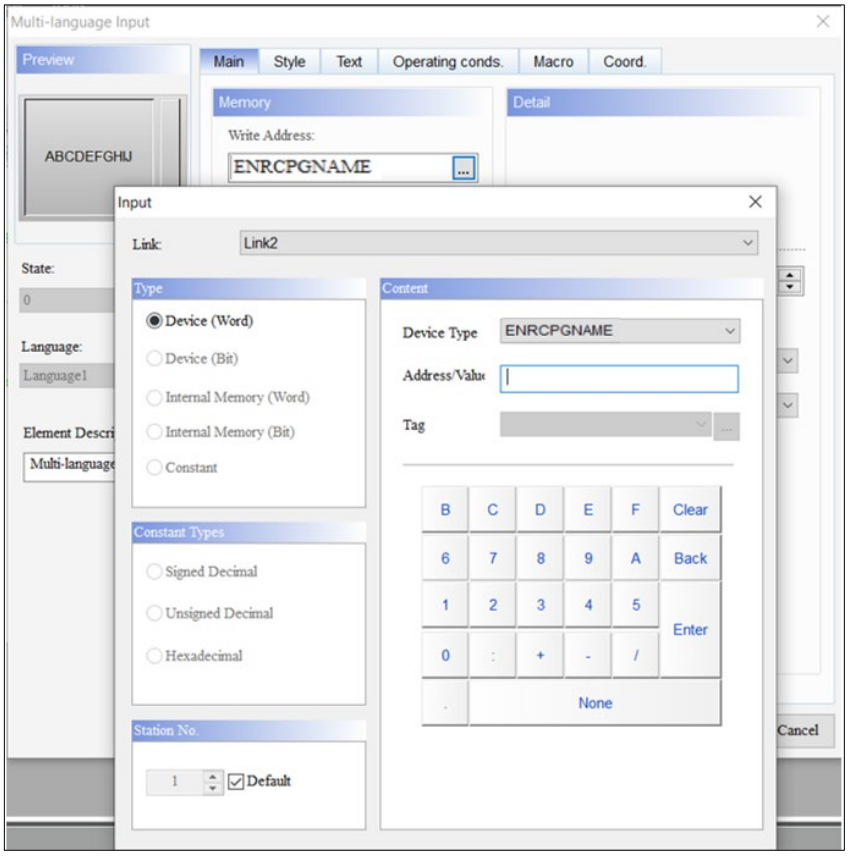


The following is an example of the created element.

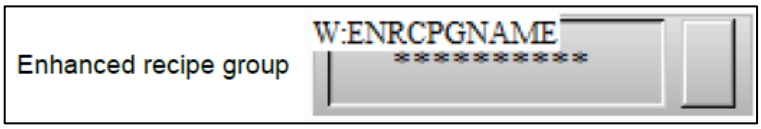


Step 2: Create a **Multi-language Input** element. Set the **String Length** to 10 and **Write Address** to Internal Memory, and select ENRCPGNAME for the **Device Type**. This element is used to select the enhanced recipe group by entering the recipe name.

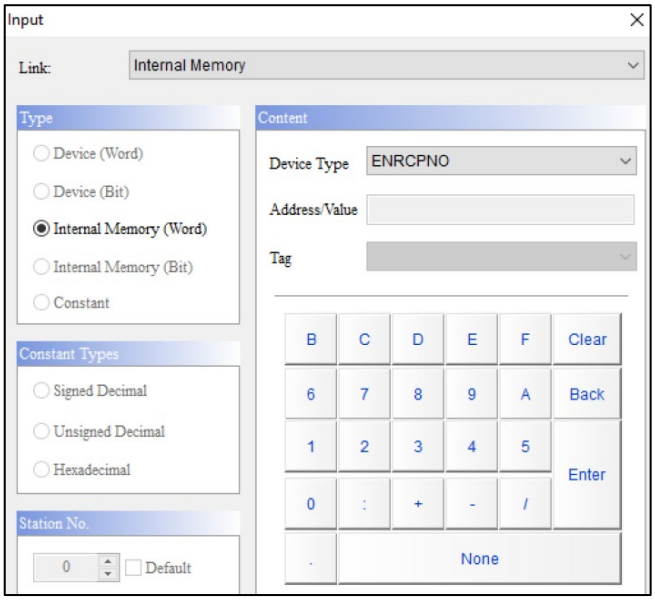
Enhanced Recipe	



The following is an example of the created element.



Step 3: Create a **Numeric Entry** element and set **Write Address** to Internal Memory. Select ENRCPNO for the **Device Type**. This element is used to select the enhanced recipe number.

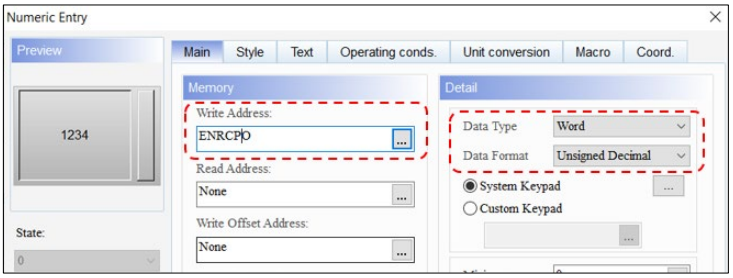
<table>
<tr><th colspan="2">Enhanced Recipe</th></tr>
<tr><td></td><td> 

The following is an example of the created element.

</td></tr>
<tr><td>Create Numeric Entry elements for ENRCP</td><td>

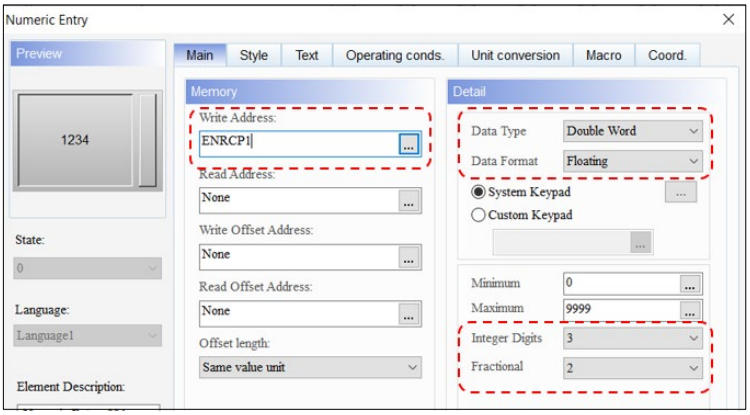
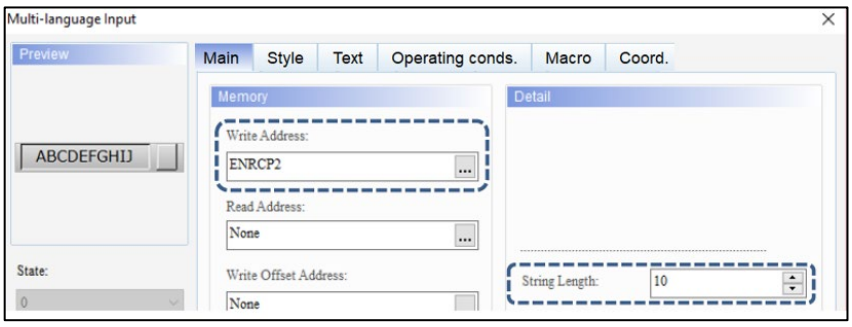
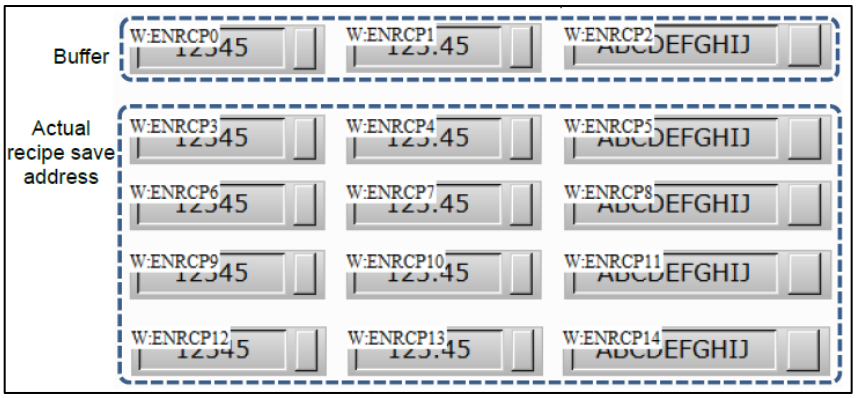
- Before the **Numeric Entry** element is created to display the Enhanced Recipe register, use the recipe register formula [L*(G+1)-1] to calculate the number n in ENRCPn. Substitute the size of the recipe (Length (L) x Group (G) = 3 x 3) into the formula to find the ENRCPn = ENRCP0 ~ ENRCP11.

  Step 1: Create a **Numeric Entry** element and set the **Write Address** to ENRCP0 of the Internal Memory. Set the way of expression according to **Field 1** of the recipe table with the **Data Type** as Word and **Data Format** as Unsigned Decimal.

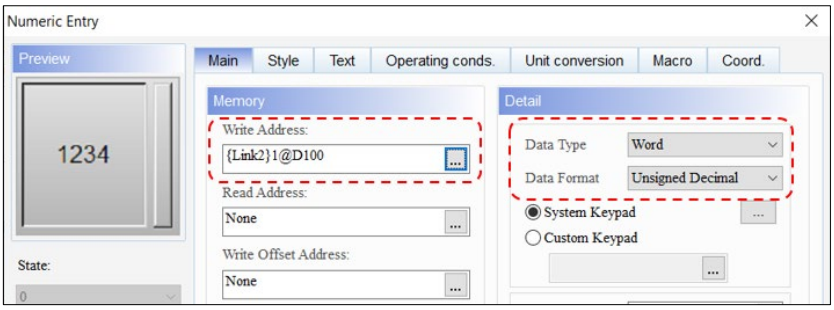


  Step 2: Create a **Numeric Entry** element and set the **Write Address** to ENRCP1 of the Internal Memory. Set the way of expression according to **Field 2** of the recipe table with the **Data Type** as Double Word and **Data Format** as Floating. Then, set the **Integer Digits** to 3 and **Fractional** (Digits) to 2.

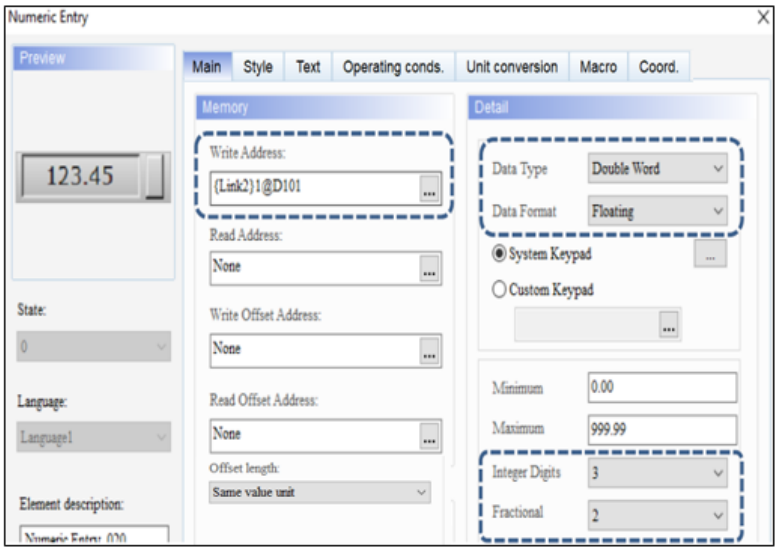
</td></tr>
</table>

Enhanced Recipe	
	 **Step 3**: Create a **Multi-language Input** element and set the **Write Address** to ENRCP2 of the Internal Memory. Set the way of expression according to **Field 3** of the recipe table and set the **String Length** to 10 (the length of 1 word can store 2 bits).  ● Repeat Steps 1 to 3 to create the display elements for ENRCP3 ~ ENRCP11 and set the **Data Format**. ● The following is an example of the created elements.  ***NOTE**: ENRCP0 ~ ENRCP2 are the recipe buffers and the actual recipe data ENRCPs are ENRCP3 ~ ENRCP11. For more information, refer to Figure 23 - 18 Enhanced Recipe buffer configuration.*
Create Numeric Entry elements	**Step 1**: Create a **Numeric Entry** element by referring to the address set for the **Enhanced Recipe** to display the data

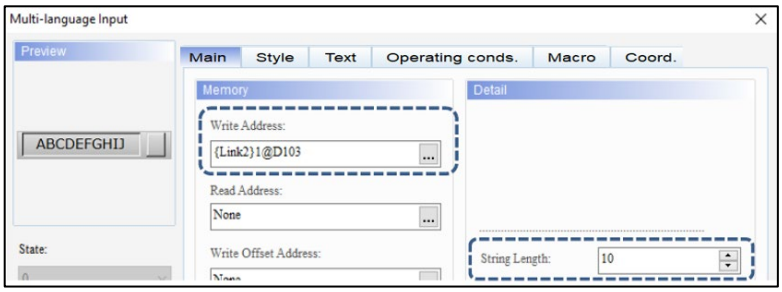
Enhanced Recipe	
for the Enhanced Recipe Address	change when the PLC recipe is read or written. Each field length of the **Enhanced Recipe** is not fixed, so set the PLC address to be entered based on the recipe table. For example, the first field of this recipe table is in Unsigned Decimal format and its read length is 1. Thus, the **Read Address** is set to D100, **Data Type** is Word, and **Data Format** is Unsigned Decimal.



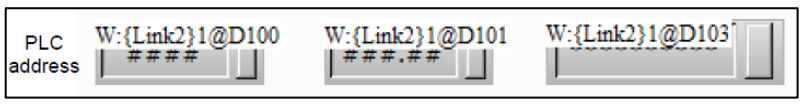
Step 2: Create a **Numeric Entry** element and set the **Write Address** to D101, **Data Type** as Double Word, and **Data Format** as Floating. Then, set the **Integer Digits** to 3 and **Fractional** (Digits) to 2.

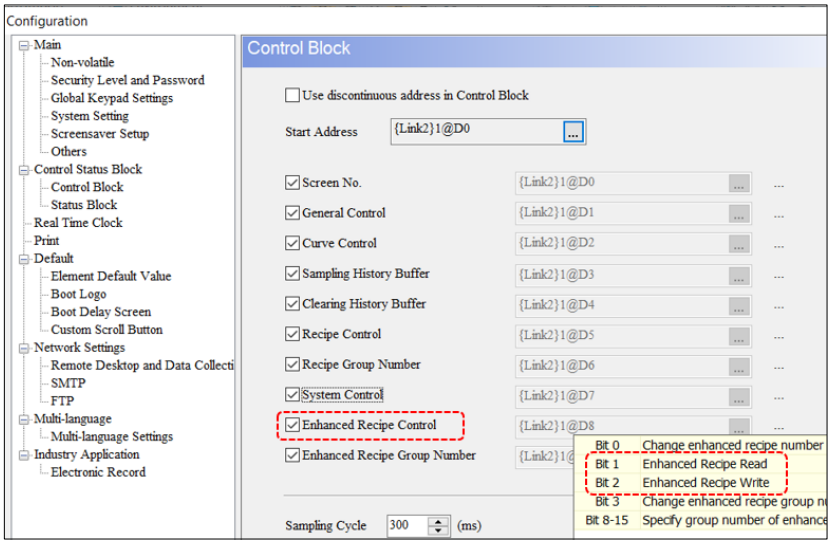
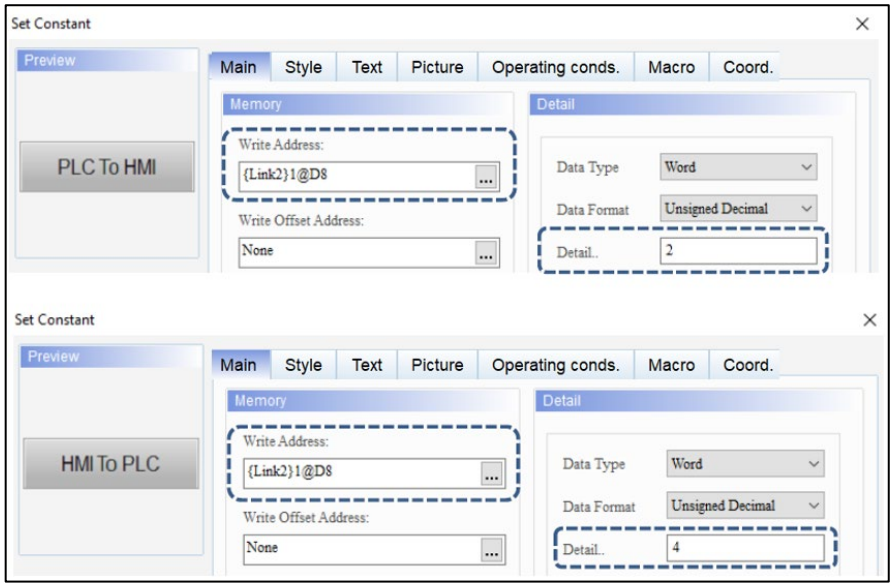


Step 3: Create a **Multi-language Input** element and set the **Write Address** to D103 and **String Length** to 10.

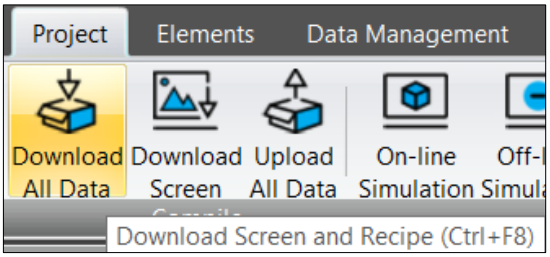


The following is an example of the created elements.

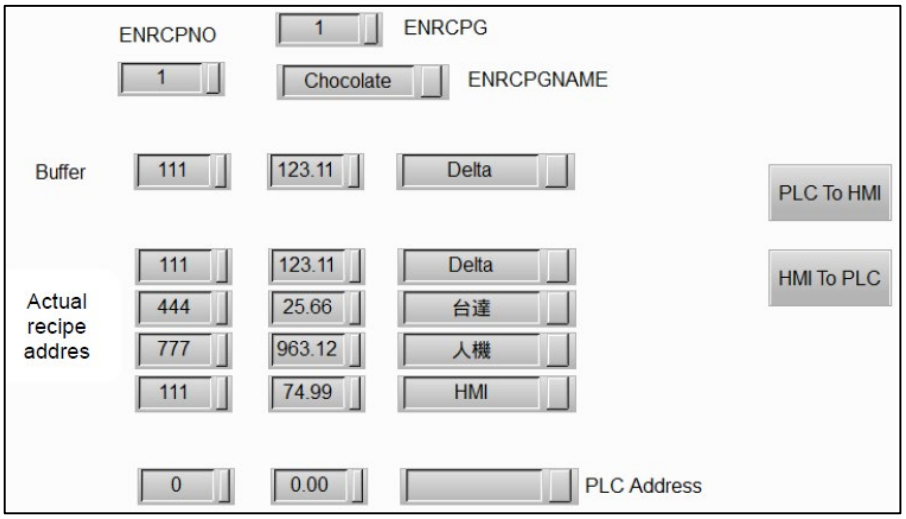


Enhanced Recipe	
Set Recipe Control flag in Control Block	Go to **General** > **Configuration** > **Control Block**, and select the **Enhanced Recipe Control flag** checkbox. Then, set the **Start Address** for the **Control Block** to define the recipe control address. Once the setting is complete, click **OK** to exit the **Configuration** window. 
Create Set Constant Button elements	Create two **Set Constant Button** elements with the **Write Address** as D8 and the setting values (**Detail..**) as 2 and 4 respectively, which correspond to Bit 1 and Bit 2 of the **Enhanced Recipe Control flag** D8 for reading and writing the recipe. 
Execution result	● After creating all the elements, click the **Compile** and **Download Screen and Recipe** buttons to download data to the HMI.

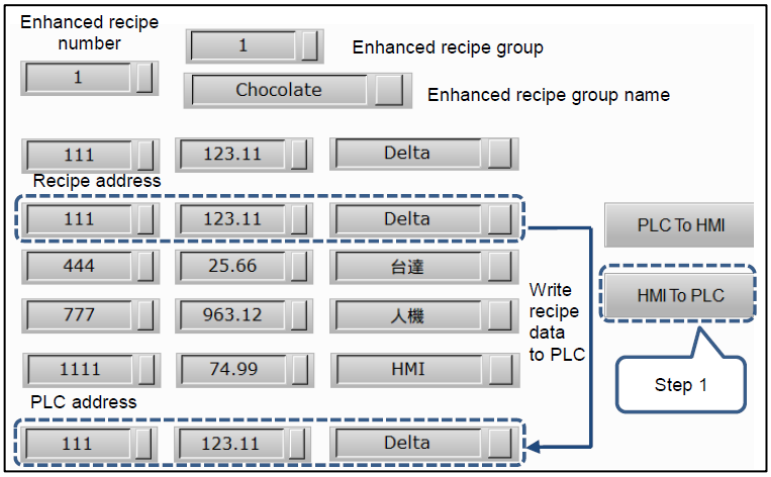
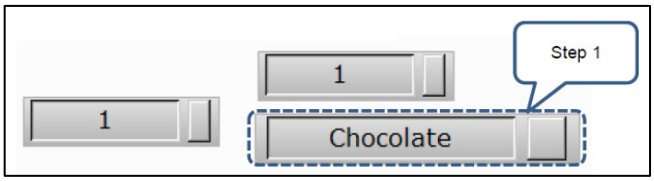
Enhanced Recipe	

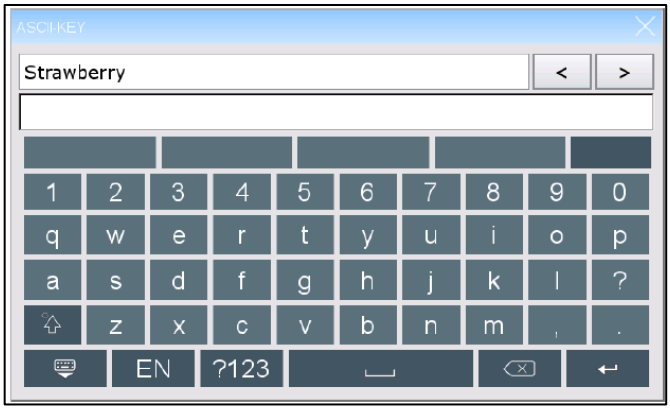


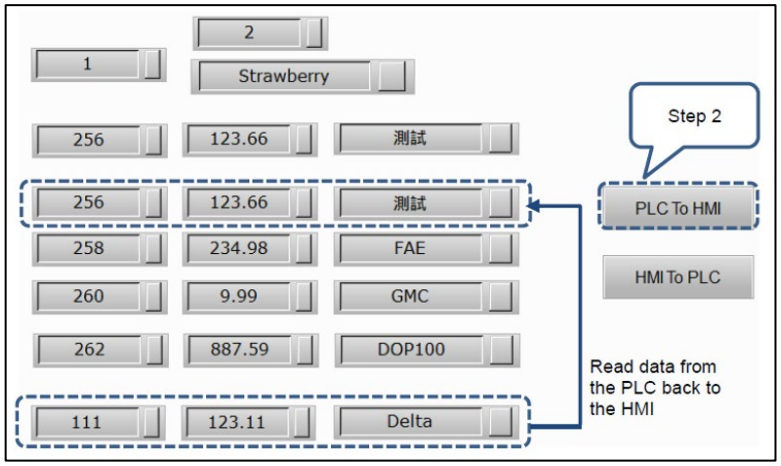
- When the enhanced recipe group is loaded into the HMI, the default value is 1. To display different groups, select a different enhanced recipe group according to the requirement.
- The recipe data is displayed in ENRCP0 ~ ENRCP11 according to the selected recipe group. ENRCP0 ~ ENRCP2 are the recipe buffer data and the starting address for the first set of recipe data is ENRCP3.



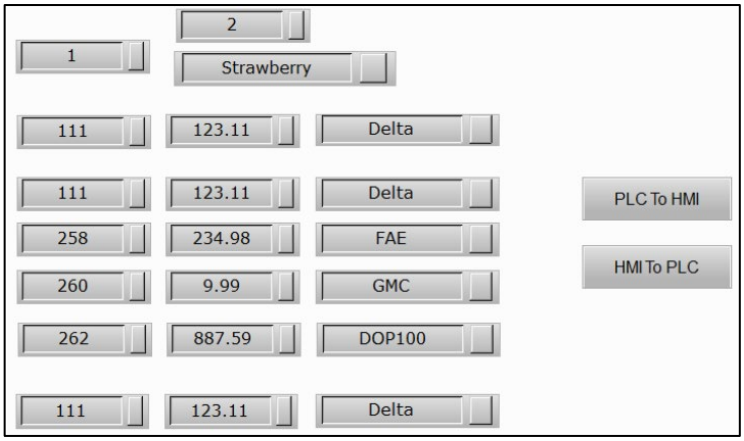
- Trigger the Write Recipe (HMI to PLC) Button, and the recipe data of the enhanced recipe group (ENRCPG =1 and ENRCPGNAME = Chocolate) is written to the PLC. Trigger the Read Recipe (PLC to HMI) Button, and the recipe data written to the PLC is read back to the HMI. And the recipe data read back is then written to the selected enhanced recipe group (ENRCPG = 2 and ENRCPGNAME = Strawberry).

<table>
<tr><th colspan="3">Enhanced Recipe</th></tr>
<tr><td></td><td>Write Recipe (HMI to PLC)</td><td> 
</td></tr>
<tr><td>Execution result</td><td>Read Recipe (PLC to HMI)</td><td>● Press the ENRCPGNAME element.
 

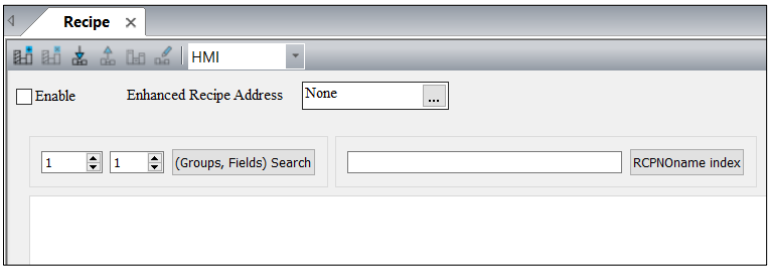
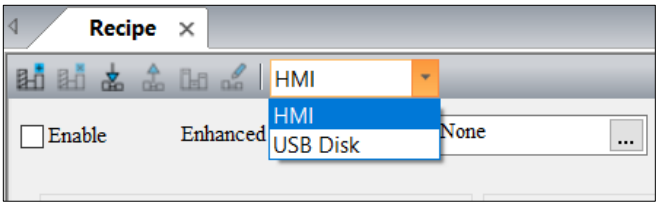
● Enter Strawberry, and press ↵.
 

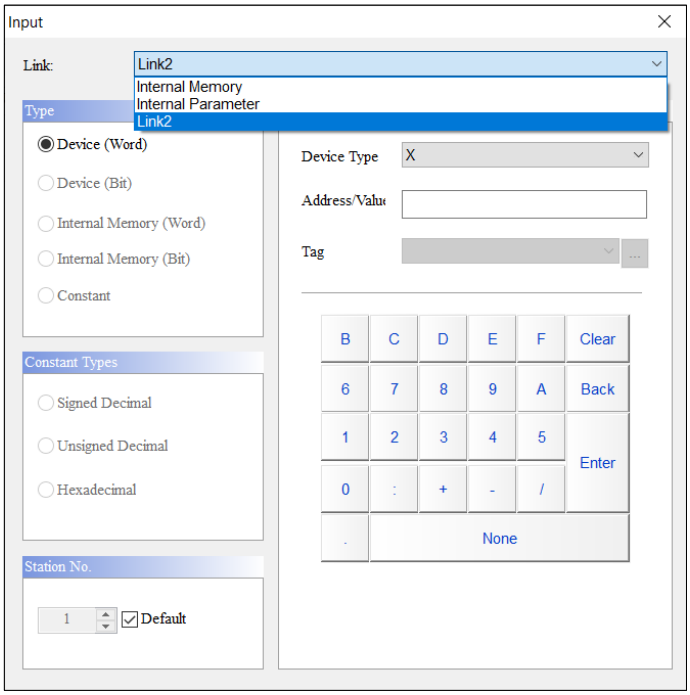
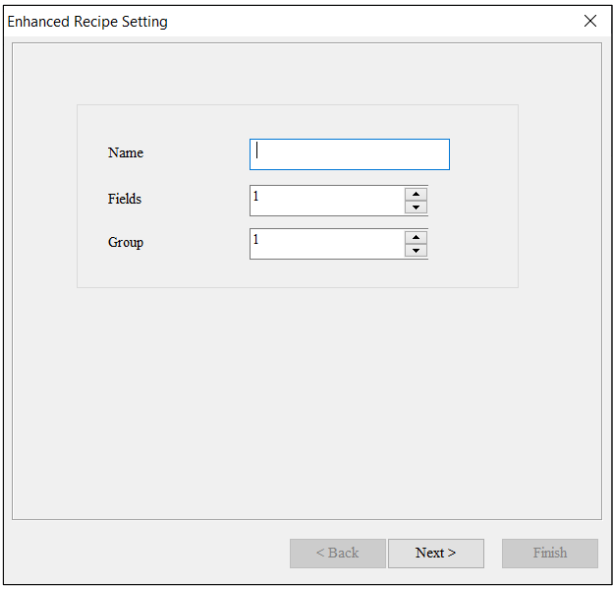
 

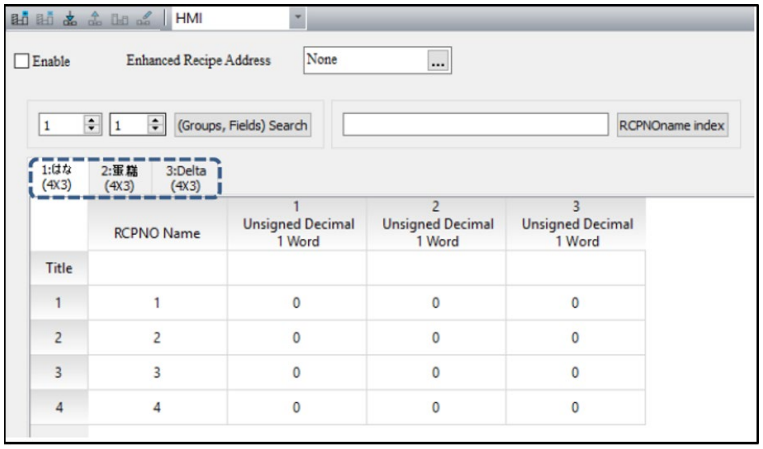
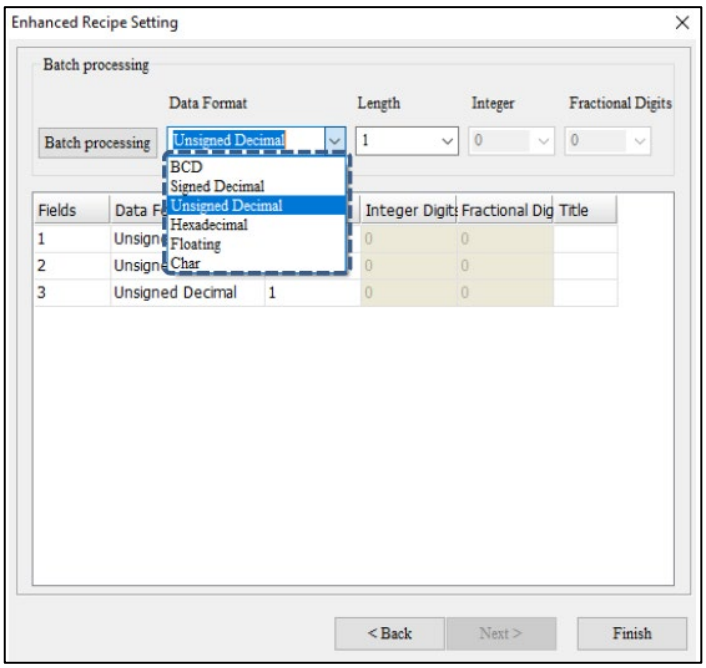
● After Step 2 is executed, the result is shown in the</td></tr>
</table>

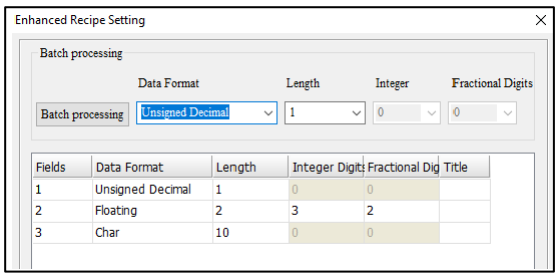
Enhanced Recipe		
		following figure. 

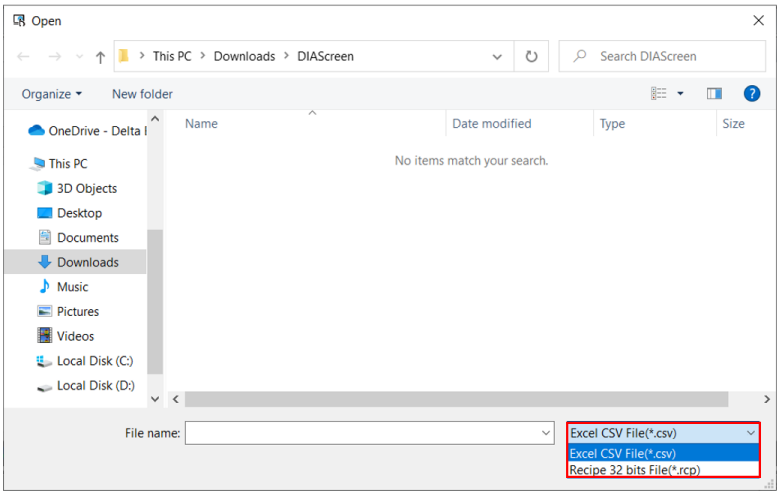
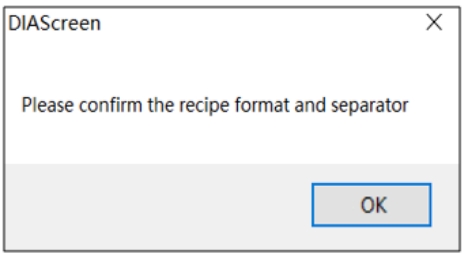
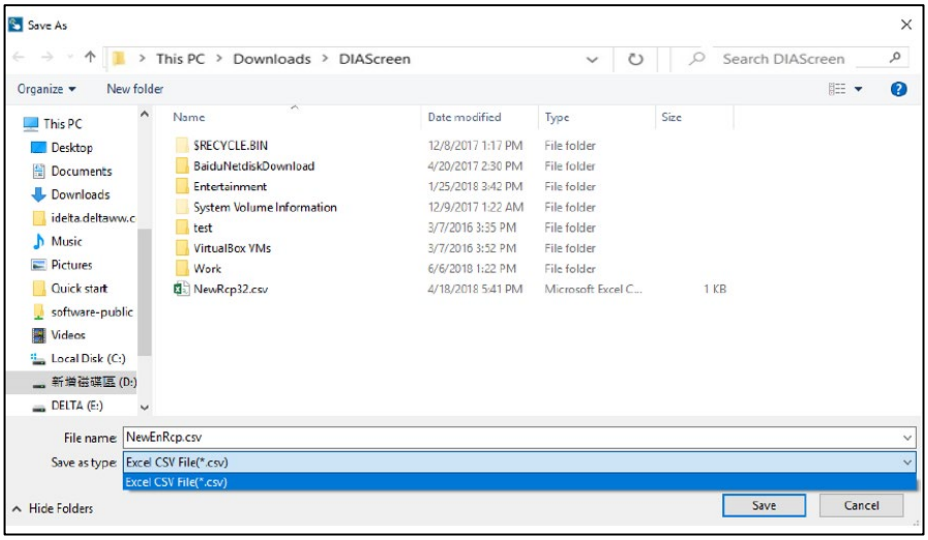
The following table describes the **Enhanced Recipe** property settings.

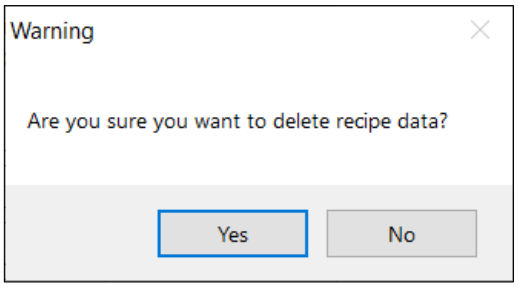
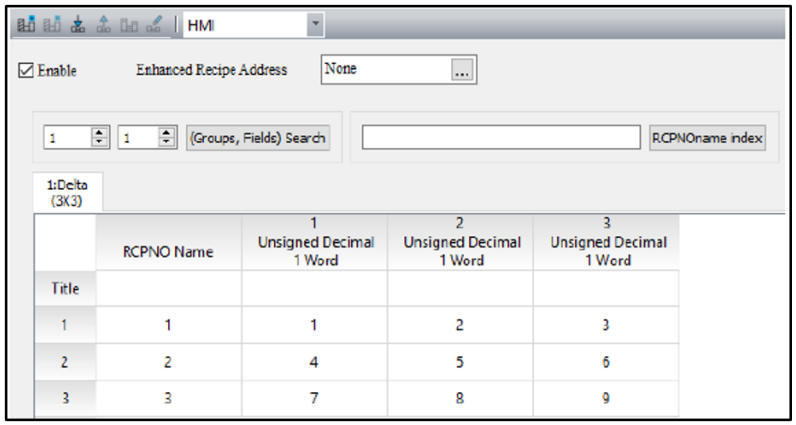
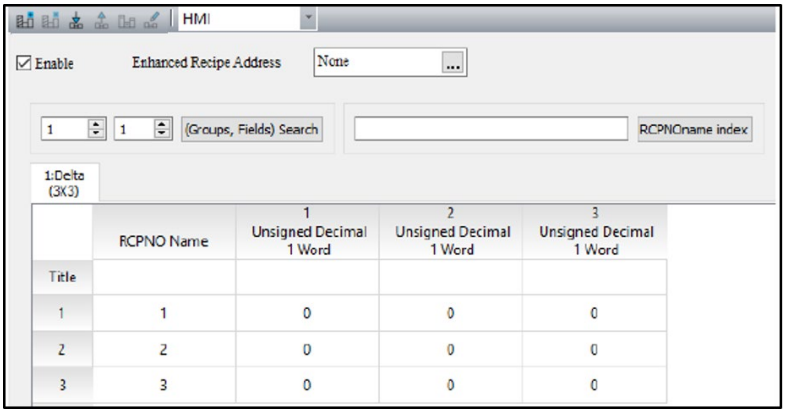
Property Settings for Enhanced Recipe	
	
Function	**Description**
Enable	● Select the **Enable** checkbox to use the recipe register address. ● If **Enable** is not selected, setting the **Enhanced Recipe** does not take place.
Non-volatile	● The available options for non-volatile memory are: HMI, USB Disk, and SD Card. The default value is **HMI**.  ● If users set to save in the HMI, the data is saved in the HMI ROM when the power is off.
Address	● Select Internal Memory or controller register address. ● Select **Link** name or **Device Type.** Refer to *Memory Settings* for more information. ● Regardless of the number of recipe sets, the enhanced recipes

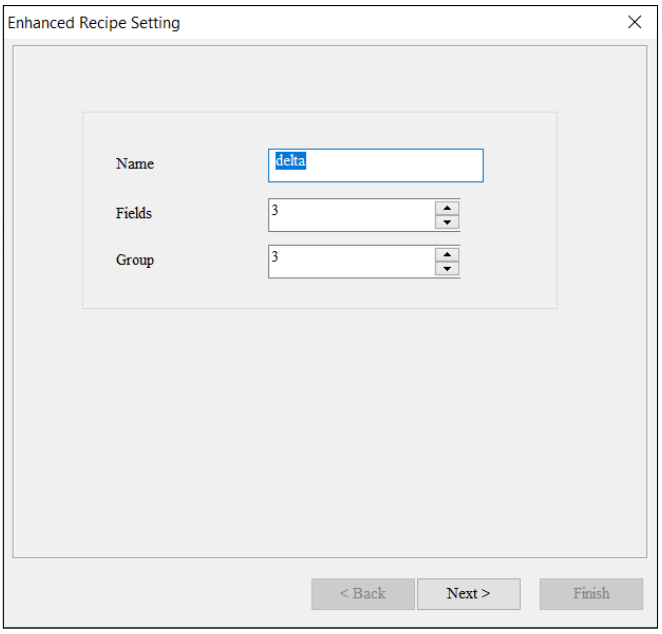
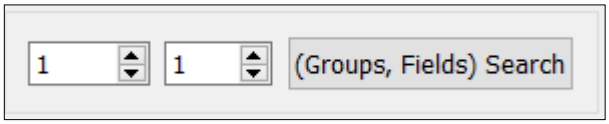
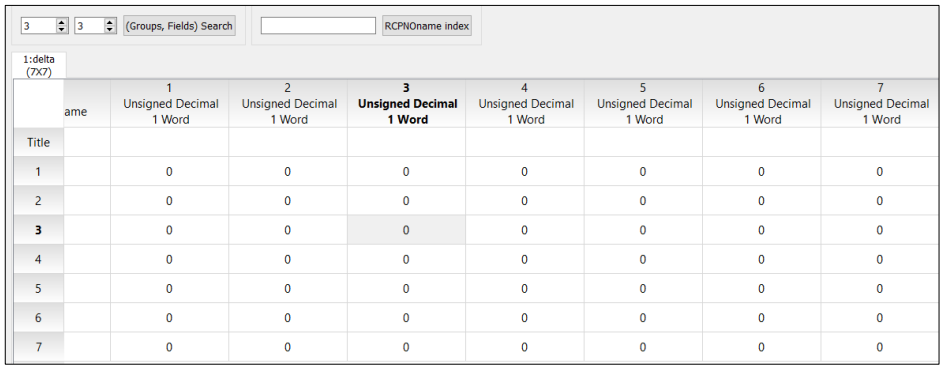
Property Settings for Enhanced Recipe	
	share the same memory address. 
New Recipe 	● Go to the **Enhanced Recipe Setting** window. Click  to add the enhanced recipe data.  ● Add up to 255 groups of **Enhanced Recipe** data with  Button.
	Name: ● Name the enhanced recipe group. The use of Unicode characters is supported. ● With the **Multi-language Input** element, enter the name of the enhanced recipe to call the recipe. ● The following example shows the first recipe

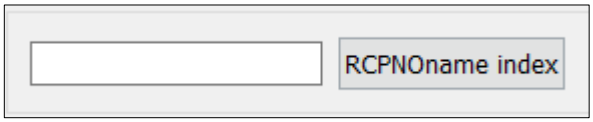
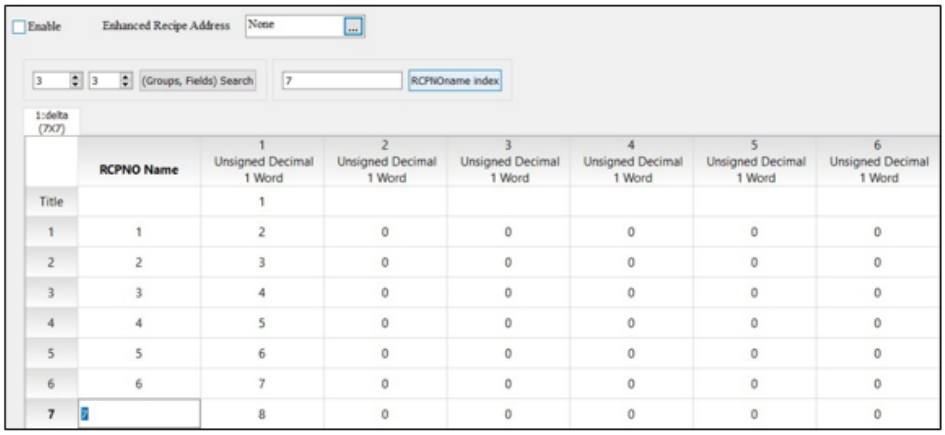
Property Settings for Enhanced Recipe		
		group name in Japanese, the second recipe group name in Chinese, and the third recipe group name in English. 
	Fields / Group	● The **Fields** and **Group** represent the recipe length and group that users enter respectively. It is suggested the numbers in Fields x Group should not exceed 350 x 65535. ● The numbers in **Fields** and **Group** cannot be 0. If any of the value is 0, the system automatically sets the value to the minimum which is 1.
	Data Format	The available options for **Data Format** are: BCD, Signed Decimal, Unsigned Decimal, Hexadecimal, Floating, and Char. The default value is **Unsigned Decimal**. 

<table>
<tr><th colspan="3">Property Settings for Enhanced Recipe</th></tr>
<tr><td></td><td></td><td>NOTE: If Char is selected as the Data Format, then do not use the same character for the input value and delimiter. Otherwise, it may cause data error and failure to import the data.</td></tr>
<tr><td></td><td>Length</td><td>
Limit of the read length varies according to different data formats.
<table>
<tr><th>Data Format</th><th>Length</th><th>Note</th></tr>
<tr><td>BCD</td><td>1 or 2</td><td rowspan="4">1: Word
2: Double Word</td></tr>
<tr><td>Signed Decimal</td><td>1 or 2</td></tr>
<tr><td>Unsigned Decimal</td><td>1 or 2</td></tr>
<tr><td>Hexadecimal</td><td>1 or 2</td></tr>
<tr><td>Floating</td><td>2</td><td>2: Double Word</td></tr>
<tr><td>Char</td><td>1 ~ 32</td><td>Supports up to 32 Words (64 bits)</td></tr>
</table>
If users select Char as the Data Format, the system automatically fills in the blank string if there is any remaining space after the characters are entered.
</td></tr>
<tr><td></td><td>Integer Digits / Fractional Digits</td><td>
Users can only set the Integer Digits and Fractional Digits when the Data Format is Floating.
<table>
<tr><td>Floating</td><td> 
</td></tr>
</table>
When the Data Format is Floating, the Integer Digits and Fractional Digits support only 7 digits in total. When this limit is exceeded, the number of decimal places will be automatically adjusted.
</td></tr>
<tr><td>Import Recipe  </td><td colspan="2">
The Import Recipe function supports CSV file format to select and import the recipe.
</td></tr>
</table>

Property Settings for Enhanced Recipe	
	 ● The opened and imported recipe file provides the current recipe data content only, and the recipe address does not support loading the originally set address. If the Enhanced Recipe is used to open a CSV file of the 16- or 32-Bit Recipe, the loaded recipe data cannot be displayed normally and DIAScreen displays the following error message. 
Export Recipe 	The **Export Recipe** function saves the current **Enhanced Recipe**. The supported file format is the same as that of the **Import Recipe** function, which is CSV file. 

Property Settings for Enhanced Recipe	
Delete Recipe 	The **Delete Recipe** function deletes the **Enhanced Recipe** data. When this function is executed, DIAScreen displays the following warning message for confirming if users want to delete the data. 
Clear Configuration 	Clear the recipe content that has the value entered. Before  After 
Enhanced Recipe Setting 	To use the **Enhanced Recipe Setting** function, there must be recipe data in the enhanced recipe. Use this function to change the **Name**, **Fields**, **Group**, and **Data Format** of the recipe.

Property Settings for Enhanced Recipe	
	
Groups / Fields Search	● Enter the group and field to be searched then click the **(Groups, Fields) Search** button, and the searching result is selected.  ● For example, enter 3 for the group and field respectively and click **(Groups, Fields) Search** button, the specified position is selected. 

Property Settings for Enhanced Recipe	
RCPNOname index	● Enter the RCPNO name to be searched then click the **RCPNOname index** button, and the searching result is selected.  ● For example, enter 10 and click **RCPNOname index** button, the specified position is selected. 

23.5 Enhanced Indirect Recipe Index Register (*ENRCP)

The Enhanced Indirect Recipe Index Register (*ENRCPn) is used specifically for the enhanced recipe. It acquires the value from ENRCPn first, and then it takes this value as the new address and accesses the value from this new address. For example, if ENRCP1 = 3 and ENRCP3 = 99, then *ENRCP1 = 99, as shown in the following figure.

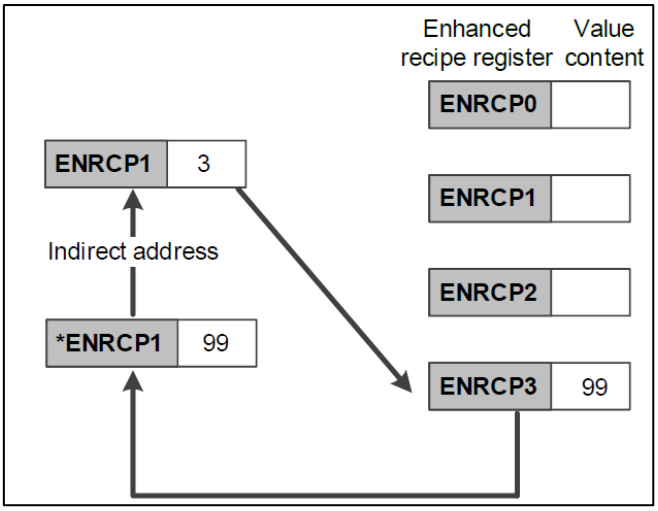


Figure 23 - 20: Enhanced Indirect Recipe Index

The accessing range of the Enhanced Indirect Recipe Index Register is as follows.

Accessing Type	Device Type	Accessing Range
Word	*ENRCPn	ENRCP0 ~ ENRCP65535

***NOTE**: n is Word (0 ~ 65535)*

The address accessing range provided by *ENRCP is limited according to the recipe size. Assuming that the recipe size is Length 3 * Group 3, then the ENRCP address ranges from *ENRCP0 ~ *ENRCP11. When *ENRCP12 is created, DIAScreen displays the following warning message.

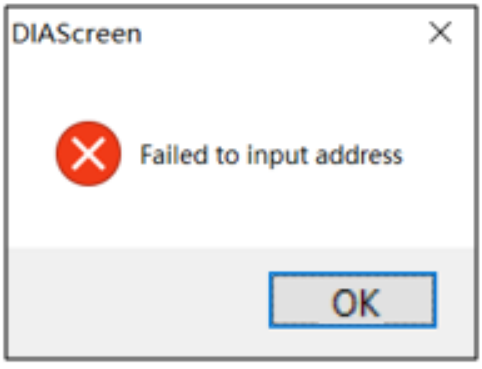
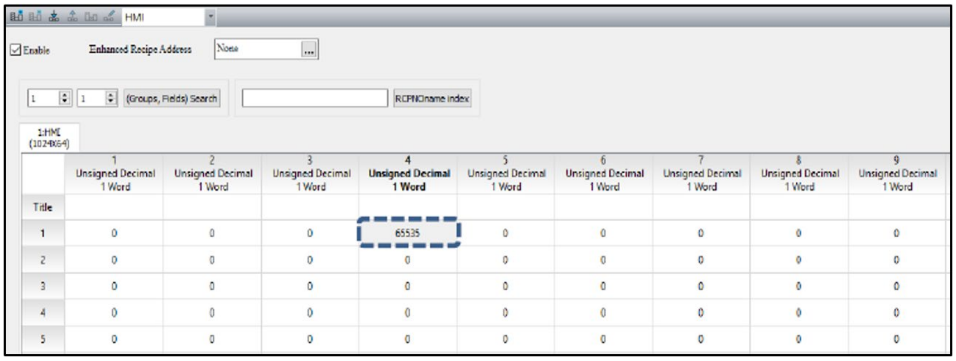
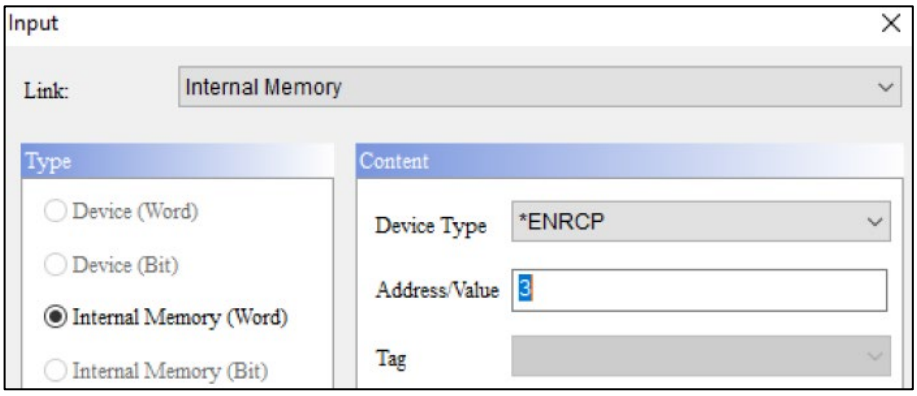
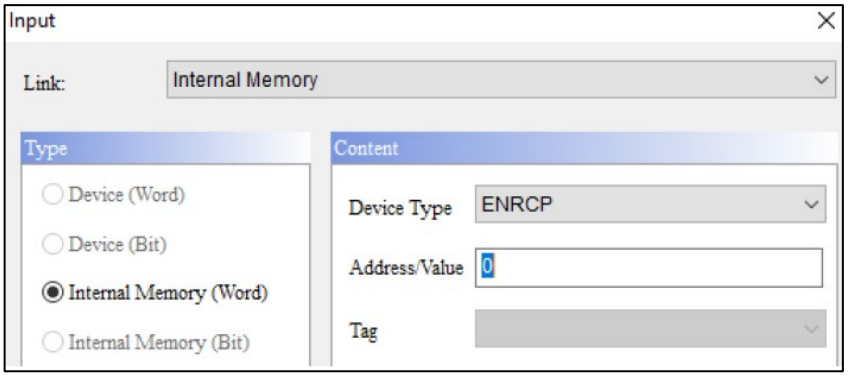
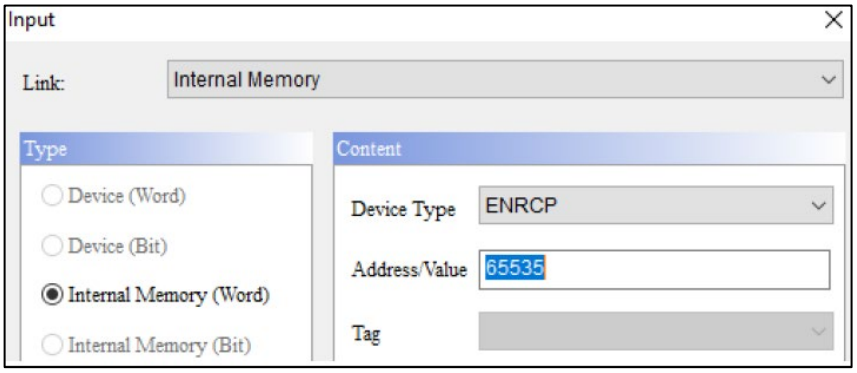
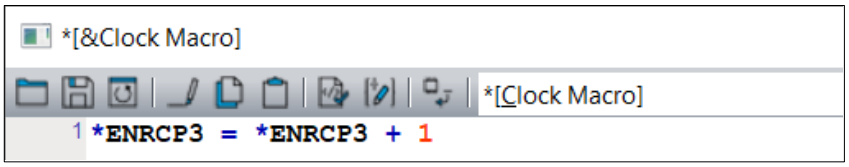
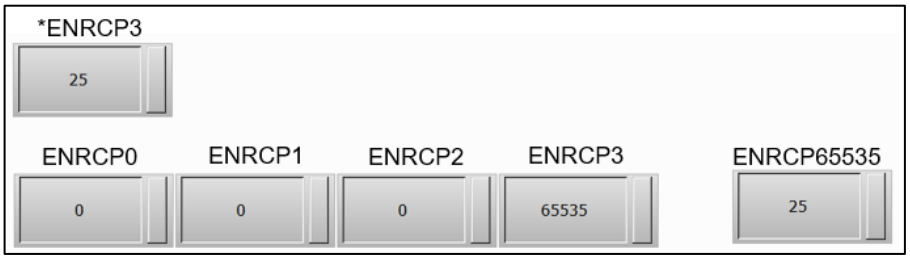


Figure 23 - 21: Enhanced Indirect Recipe Index Register configuration error

The following table describes the **Enhanced Indirect Recipe Index Register** functions.

Enhanced Indirect Recipe Index Register	
Set Enhanced Recipe	Create an **Enhanced Recipe** (64 for **Fields**, 1024 for **Group**) and set ENRCP3 to 65535. 
Create Numeric Entry elements	● Create a **Numeric Entry** element and select *ENRCP for the **Device Type**. Then enter 3 for **Address/Value**.  ● Create four **Numeric Entry** elements and select ENRCP for the **Device Type**. Then enter 0 ~ 3 for **Address/Value** respectively.  ● Create a **Numeric Entry** element and select ENRCP for the **Device Type**. Then enter 65535 for **Address/Value**.

Enhanced Indirect Recipe Index Register	
	
Create Clock Macro command	Create the **Clock Macro** command *ENRCP3 = *ENRCP3 + 1. 
Execution result	After compiling the screen, download it to the HMI. Then users can see the values of *ENRCP3 and ENRCP65535 increase simultaneously. 

Chapter 24: Macro

24.1 Types of Macro

Macro consists of independent commands processing programs written by users. 512 lines of commands can be edited in each type of Macro. The main features of each type of Macro are shown in the following table.

Types of Macro	Description
On Macro	● When the **On Macro** is triggered, it is executed only once. ● It is available only for **Set to On**, **Set to Off**, **Maintained** and **Momentary Button** elements.
Off Macro	● When the **Off Macro** is triggered, it is executed only once. ● It is available only for **Set to On**, **Set to Off**, **Maintained** and **Momentary Button** elements.
Before Execute Macro	● When users press the **Button** element, the HMI first executes the Macro commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands. ● It is available in all **Button** and **Input** elements.
After Execute Macro	● When users press the **Button** element, the HMI first executes the **Button** actions and then executes the Macro commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands. ● It is available in all **Button** and **Input** elements.
Screen Open Macro	Execute once when the screen is turned on.
Screen Close Macro	Execute once when the screen is closed.
Screen Cycle Macro	Execute the Macro continuously on the screen. If users have set the **Screen Open Macro**, the system first executes the **Screen Open Macro** and then executes **Screen Cycle Macro**.
Submacro	● **Submacro** provides 512 submacros, and 512 lines of commands can be programmed in each submacro. ● **Submacro** is similar to subroutines in programming

Types of Macro	Description
	languages. Write highly repetitive execution programs or functions into submacros, and then call the submacros when needed.
Initial Macro	The **Initial Macro** is the first macro to be executed after the HMI is started, and it is only executed once.
Background Macro	The **Background Macro** executes repeatedly during the operation of the man–machine. One or several lines of programs execute at a time (not completed at one time). After the last line of the program is executed, it executes again from the beginning.
Clock Macro	Execute the macro continuously on the screen. If users have set the **Screen Open Macro**, the system first executes the **Screen Open Macro** and then executes **Screen Cycle Macro**.

24.1.1 On Macro / Off Macro

On Macro / **Off Macro** are functions available only when **Set to On**, **Set to Off**, **Maintained**, and **Momentary Button** elements are created.

When users switch the state to On by pressing the **Button**, the HMI executes the **On Macro** commands. When users switch the state to Off by pressing the **Button**, the HMI executes the **Off Macro** commands. However, the **On Macro** / **Off Macro** commands will not be executed if the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead).

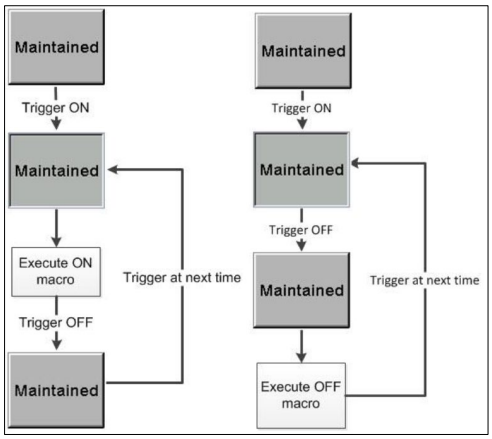


Figure 24 - 1: ON/OFF Macro flowchart

24.1.2 Before Execute Macro

The **Before Execute Macro** can only be used when the created elements are **Button** and **Input** elements.

When users press the **Button** element, the HMI first executes the **Macro** commands and then executes the **Button** actions. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

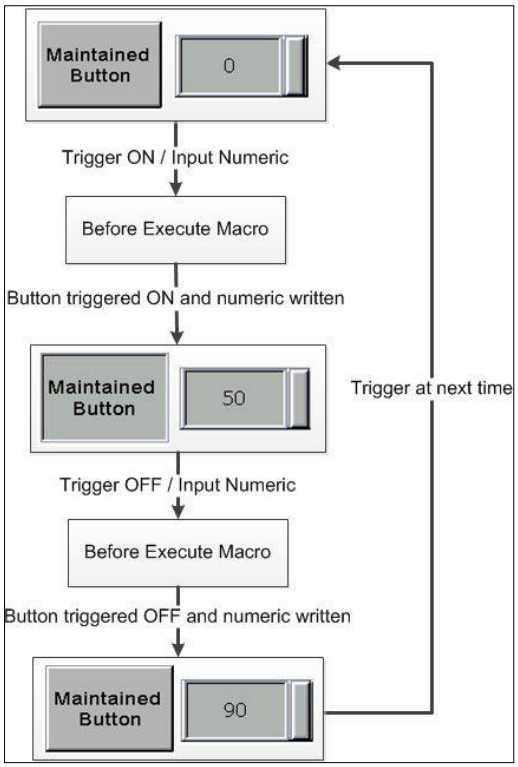


Figure 24 - 2: Before Execute Macro flowchart

24.1.3 After Execute Macro

The **After Execute Macro** can only be used when the created elements are **Button** and **Input** elements.

When users press the **Button** element, the HMI first executes the **Button** actions and then executes the **Macro** commands. If the **Button** states are not changed with the **Button** touch (using external controller commands or other macros instead), the HMI does not execute the **Macro** commands.

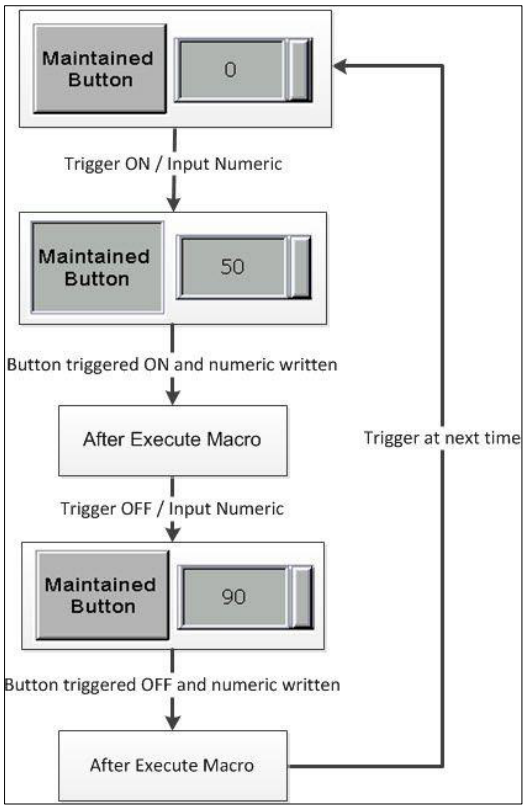


Figure 24 - 3: After Execute Macro flowchart

24.1.4 Screen Open Macro

Go to **General** > **Screen Macro** > **Screen Open Macro** to edit the Screen Open Macro.

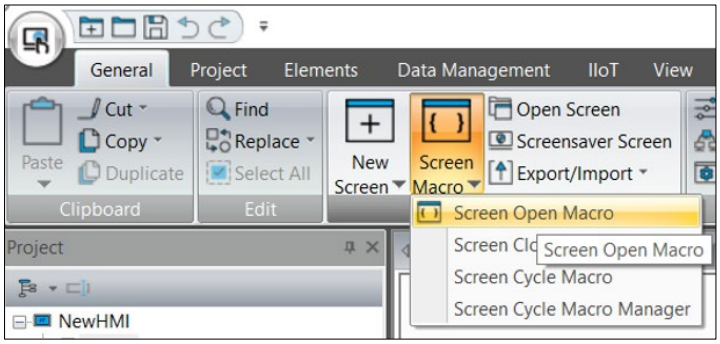


Figure 24 - 4: Screen Open Macro

Every screen created by DIAScreen contains a **Screen Open Macro**, which is executed when users open the current screen or switch to another screen. Other actions of the screen does not execute until the execution of the **Screen Open Macro** is finished.

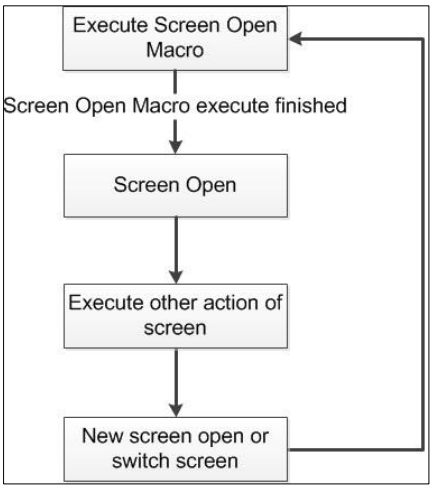


Figure 24 - 5: Screen Open Macro flowchart

24.1.5 Screen Close Macro

Go to **General** > **Screen Macro** > **Screen Close Macro** to edit the Screen Close Macro.

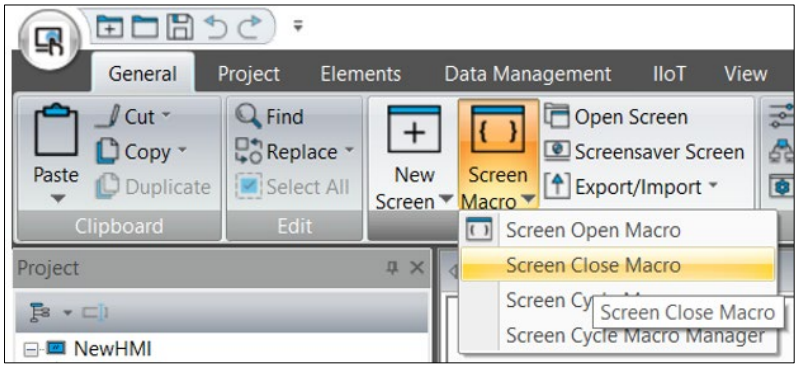


Figure 24 - 6: Screen Close Macro

Every screen created by DIAScreen contains a **Screen Close Macro**, which is executed when users close the current screen or switch to another screen. Other actions of the screen does not execute until the execution of the **Screen Close Macro** is finished.

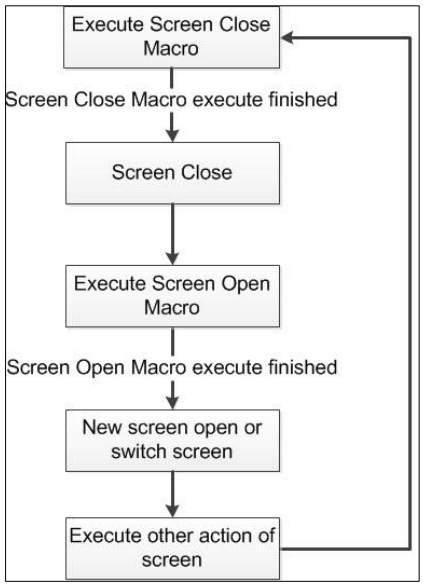


Figure 24 - 7: Screen Close Macro flowchart

24.1.6 Screen Cycle Macro

Go to **General** > **Screen Macro** > **Screen Cycle Macro** to edit the Screen Cycle Macro.

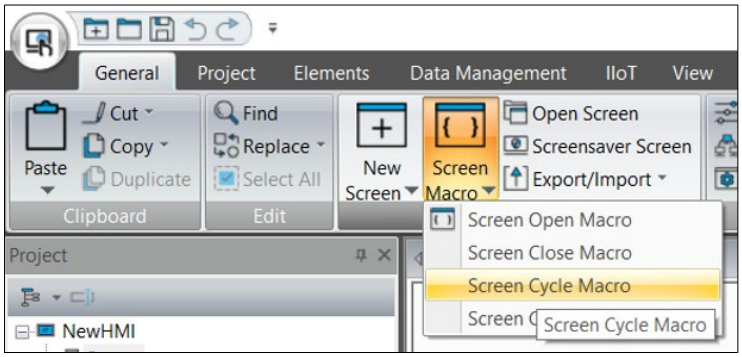


Figure 24 - 8: Screen Cycle Macro

Every screen created by DIAScreen contains a **Screen Cycle Macro**, which is executed according to the set Cycle Macro delay time after the execution of **Screen Open Macro** is finished. Double-click on the screen to go to the **Screen property setting** window for setting the **Macro Cycle Delay**. It represents the delay time before the re-execution of each **Screen Cycle Macro**. The default value is **100** ms.

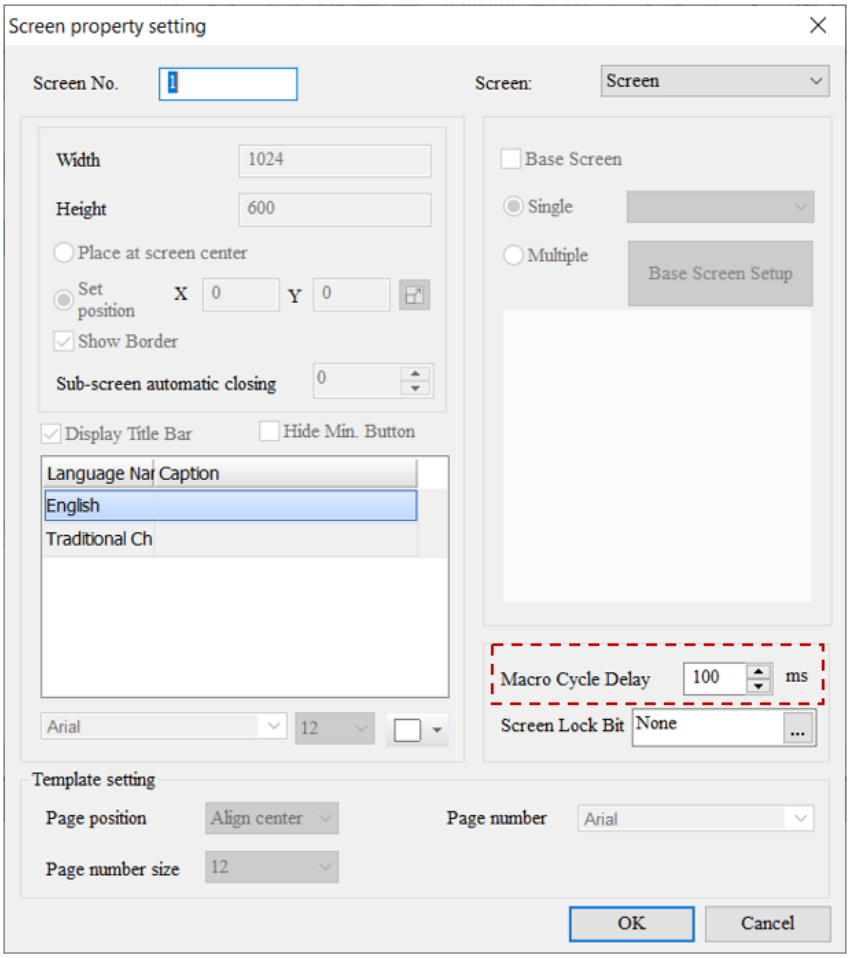


Figure 24 - 9: Macro Cycle Delay setting

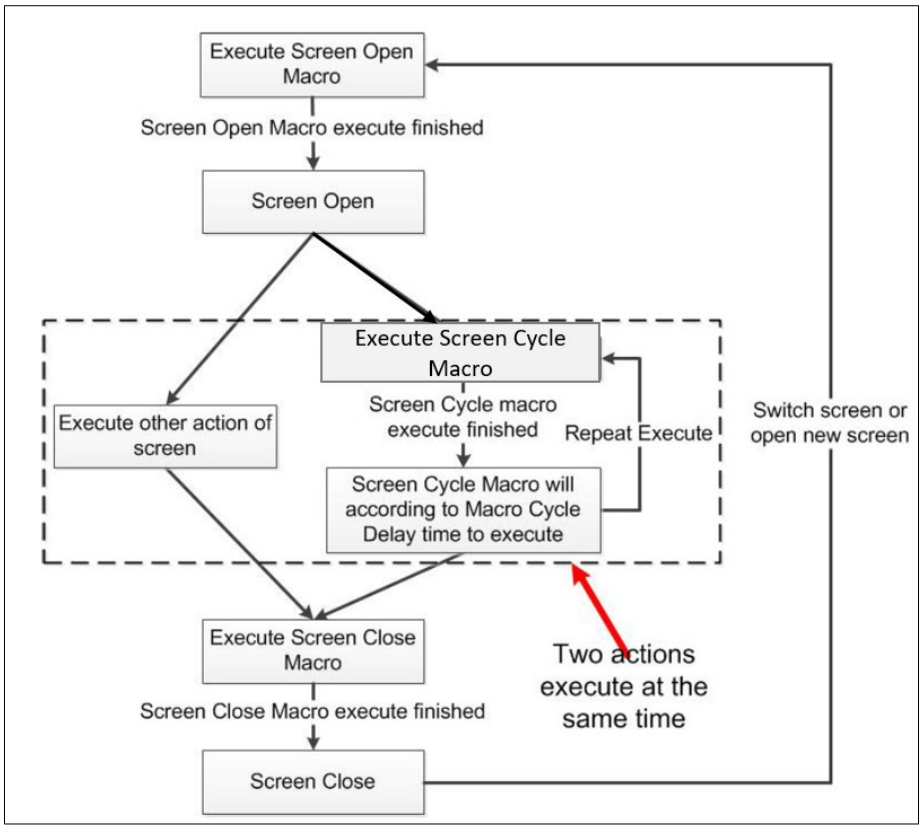


Figure 24 - 10: Screen Cycle Macro flowchart

24.1.7 Screen Cycle Macro Manager

Go to **General** > **Screen Macro** > **Screen Cycle Macro Manager** to open the cycle macro of each screen when they edit the **Screen Cycle Macro**. When users are programming for the HMI and it is not yet connected to the PLC, users can disable the execution of **Screen Cycle Macro**.

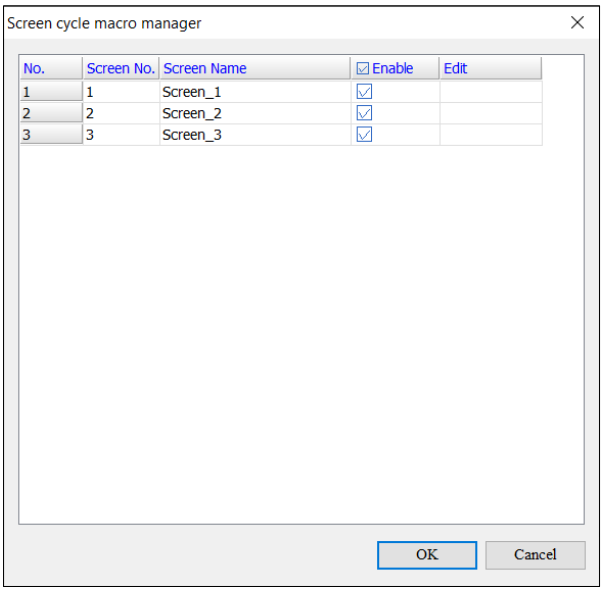


Figure 24 - 11: Screen cycle macro manager window

24.1.8 Submacro

Go to **Project** > **Macro** > **Submacro** to set Submacro.

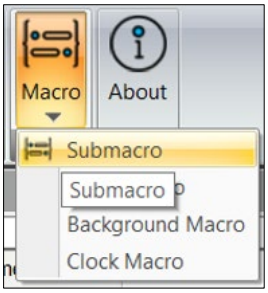


Figure 24 - 12: Submacro

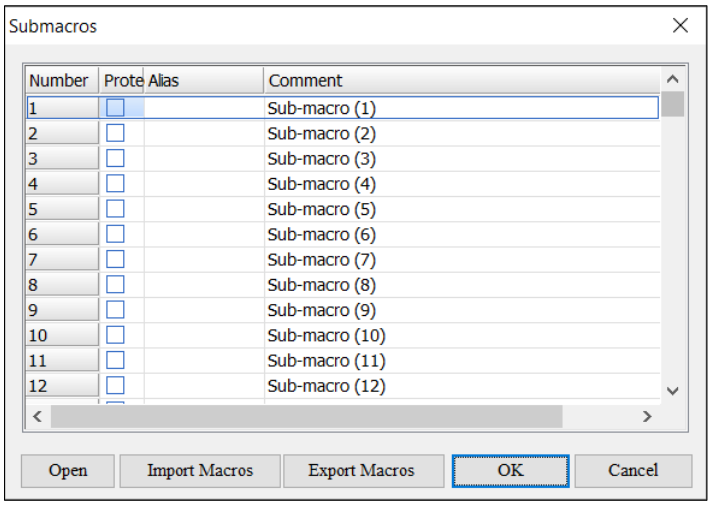


Figure 24 - 13: Submacros setting window

The **Submacro** provides 512 submacro programs with numbers 1 ~ 512 respectively. Submacros are similar to subroutines in programming languages where users can write highly repetitive actions or functions. In addition, users can call the submacros when needed, which saves the time for writing the macros and makes it easier for maintenance.

NOTE:

*The action of calling submacros in the **Submacro** should not exceed six levels.*

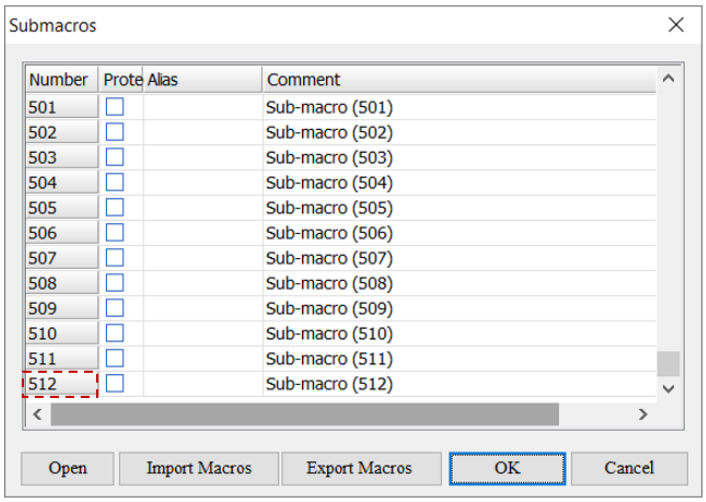


Figure 24 - 14: Submacros window

To call a **Submacro**, call its number directly or name it in the **Alias** column and call it alias. Submacro names support character and Chinese input for up to 64 characters.

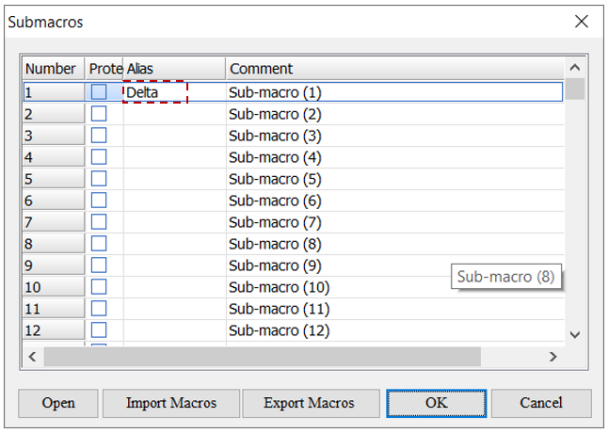


Figure 24 - 15: Submacro Alias

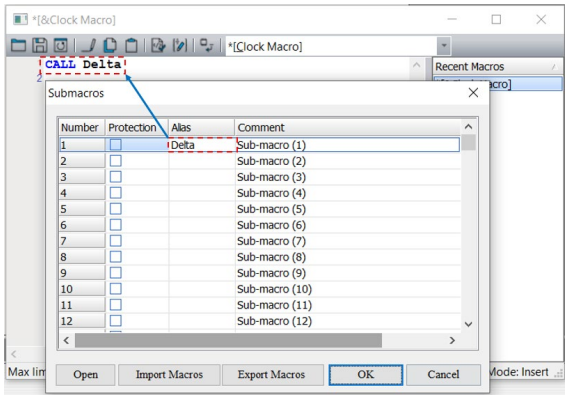


Figure 24 - 16: Submacro called in Clock Macro

The screen opens the macro content written in the macro.

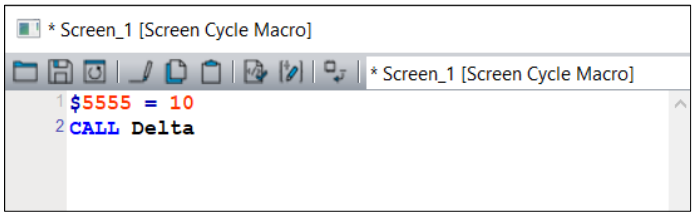


Figure 24 - 17: Screen Cycle Macro content writing

The macro content written in the **Submacros**.

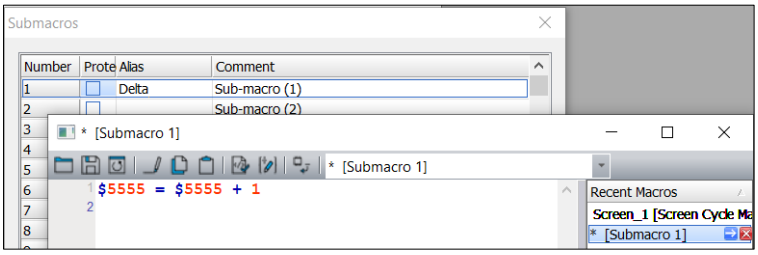


Figure 24 - 18: Macro content written in the Submacro

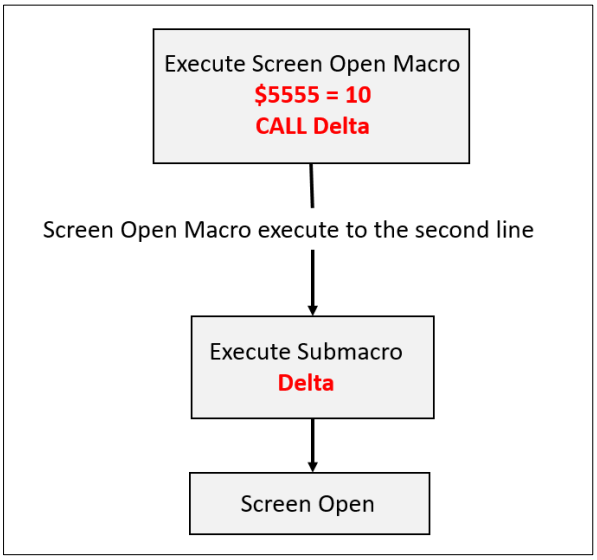


Figure 24 - 19: Submacro flowchart

Submacro also provides password protection, which can be encrypted for each sub-macro.

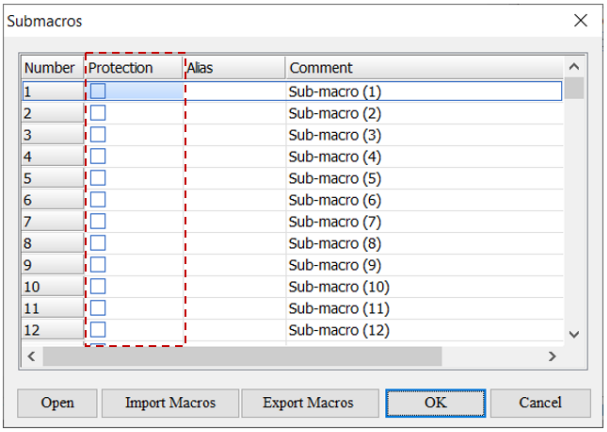


Figure 24 - 20: Submacros Protection function

When the checkbox of **Protection** is selected, users are immediately asked to enter a set of password.

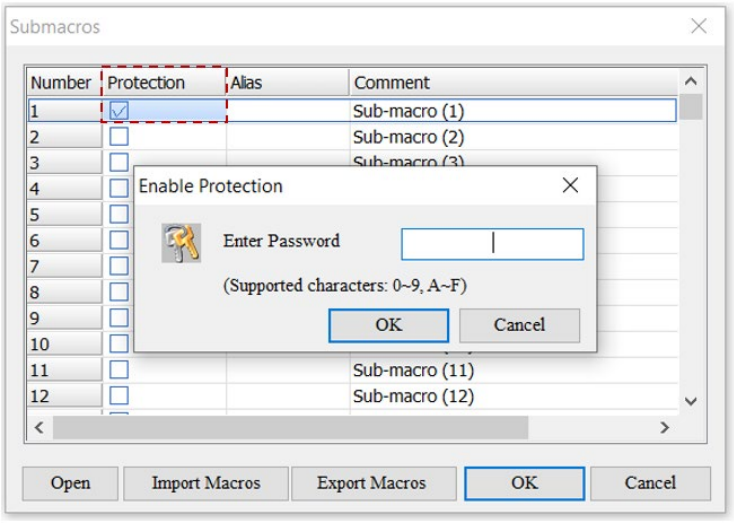


Figure 24 - 21: Submacro Enable Protection

After the sub-macro number 1 is encrypted, the next time users want to open it, they must enter the password to enter the sub-macro number 1 to edit the macro command.

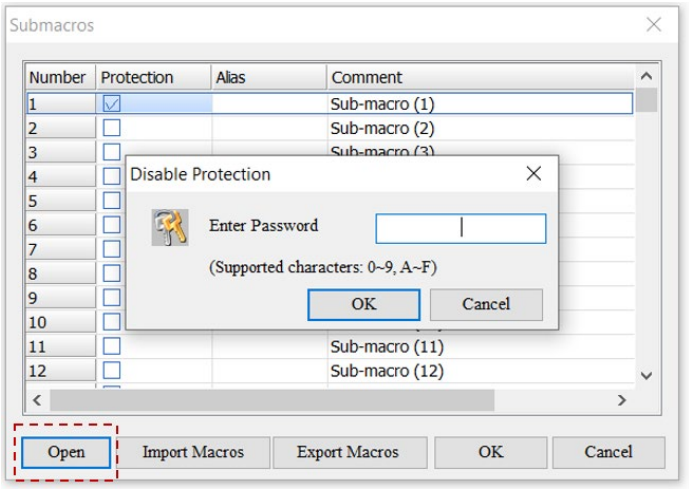


Figure 24 - 22: Submacro Disable Protection

When the protection is unchecked, users should enter the protection password of the sub-macro number 1 which is set newly.

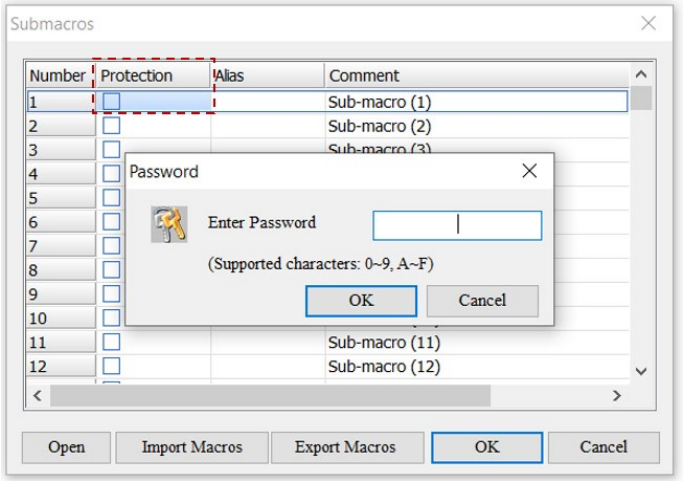
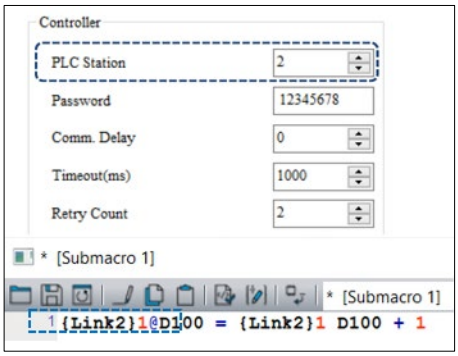


Figure 24 - 23: Disable Submacro Encryption

When the sub-macros are password protected, the affected functions are as follows.

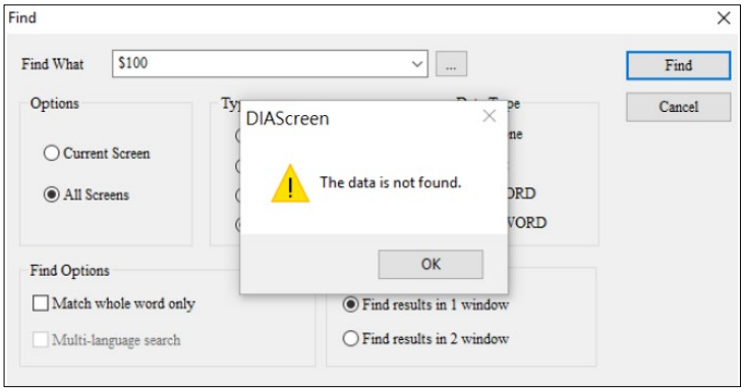
(1)

- If there is a communication station number in a protected submacro, the function of changing station number will be invalid.
- If the station number in the protected submacro is 1, change the **PLC Station** to 2 and then enter the protected submacro. Users will find that the station number must be 1 and will not be changed.



(2)

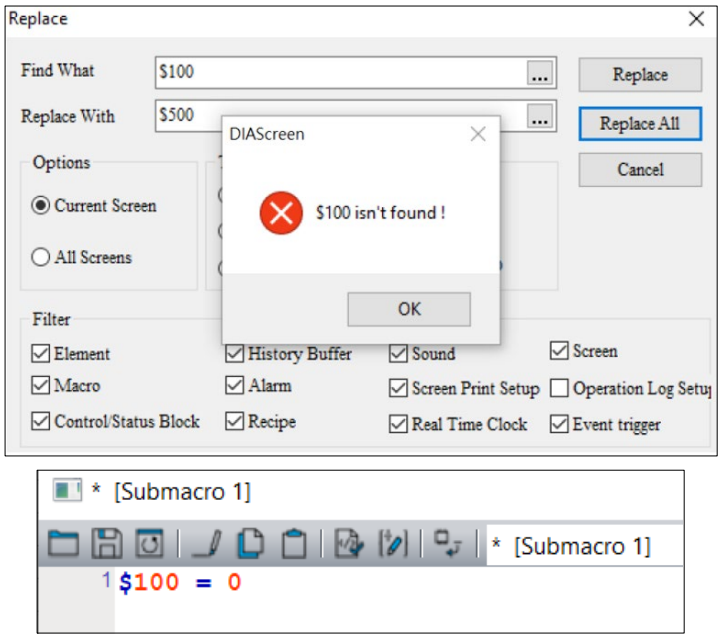
- If $100 is set in the protected sub-macro, $100 cannot be found when executing in the **Find** window.





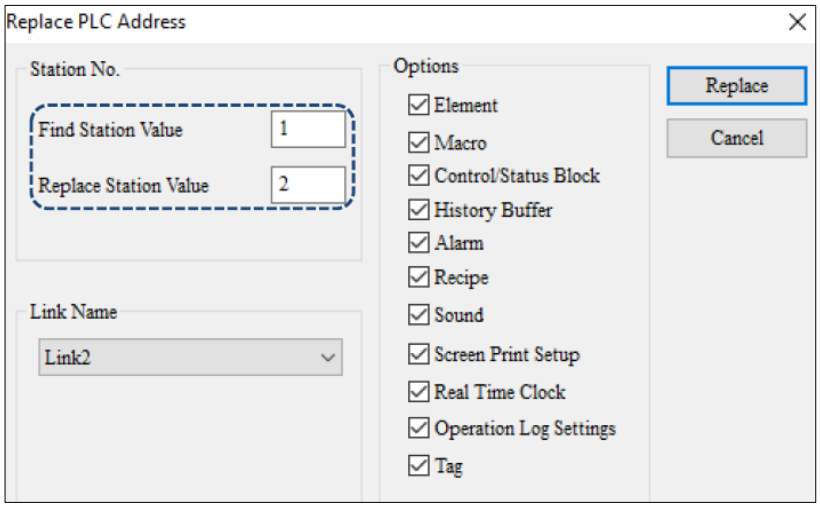
(3)

- If $100 is set in the protected sub-macro, when executing in the **Replace** window, $100 cannot be replaced with $500.



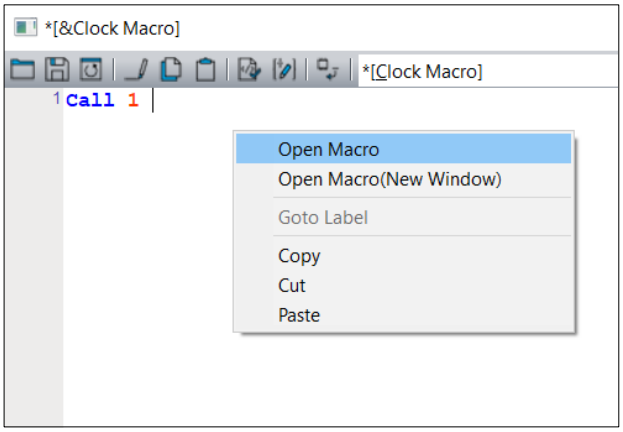
(4)

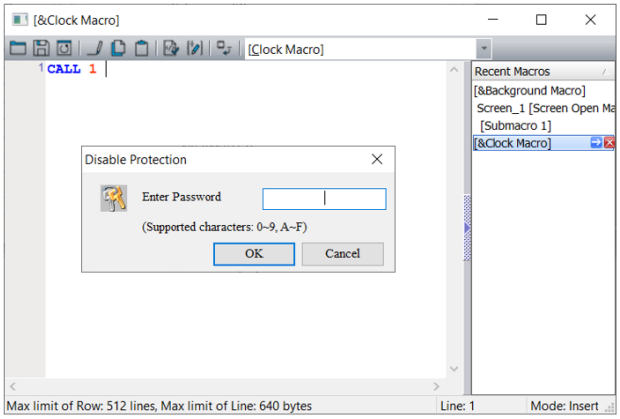
- If the Station Value in the protected submacro is 1, it cannot be replaced by 2 when the **Replace Station Value** number (Replace PLC Address) function is executed.



(5)

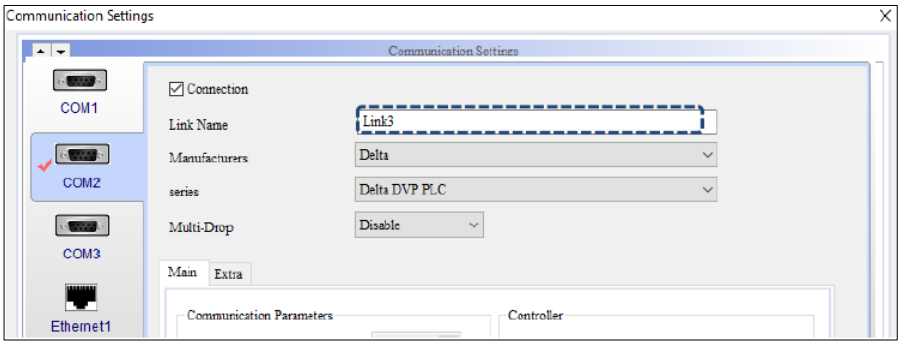
- When there is a **Call** command in the macro, right-click and select the **Open Macro** option. Users will be asked to enter the password if the submacro is password-protected.

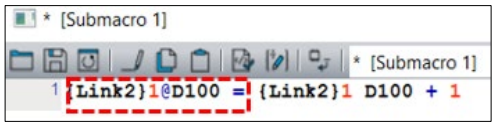




(6)

- Change the **Link Name** to Link3, and Link2 cannot be changed to Link3 in the protected submacro.





24.1.9 Initial Macro

Go to **Project** > **Macro** > **Initial Macro** to set the Initial Macro.

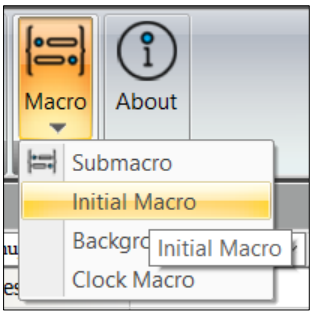


Figure 24 - 24: Initial Macro

Initial Macro is the first macro to be executed when the HMI starts up, so users can write the initial settings required for the whole HMI program in the Initial Macro.

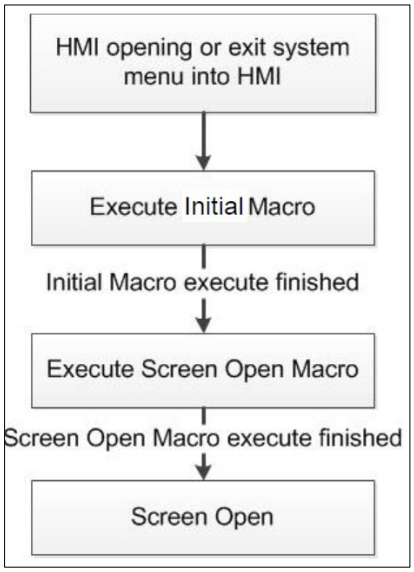


Figure 24 - 25: Initial Macro flowchart

24.1.10 Background Macro

Go to **Project** > **Macro** > **Background Macro** to set Background macro.

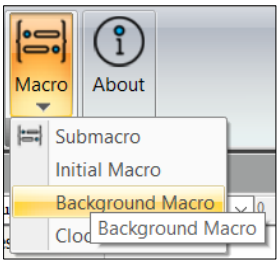


Figure 24 - 26: Background Macro

The **Background Macro** is a program that is executed repeatedly during the HMI operation. The **Background Macro** is executed in the manner of one line or several lines at a time (instead of finishing with one execution). When the last line is executed, this macro starts all over again. To define the number of lines for each Background Macro execution, go to **General** > **Configuration** to set the **Background macro update cycle** with a maximum of 512 lines.

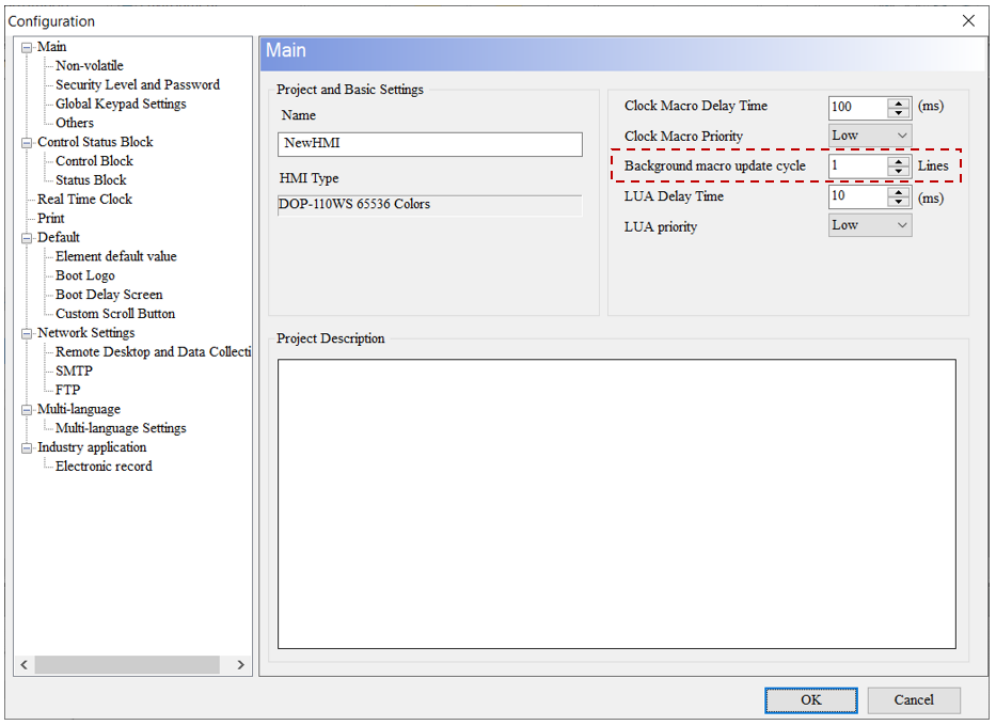


Figure 24 - 27: Background macro update cycle

Suppose that 10 elements are created on the HMI screen, enter 6 lines of macro commands into the **Background Macro** and set the **Background macro update**

cycle to 3 lines, then the execution process of Background Macro is shown as follows.

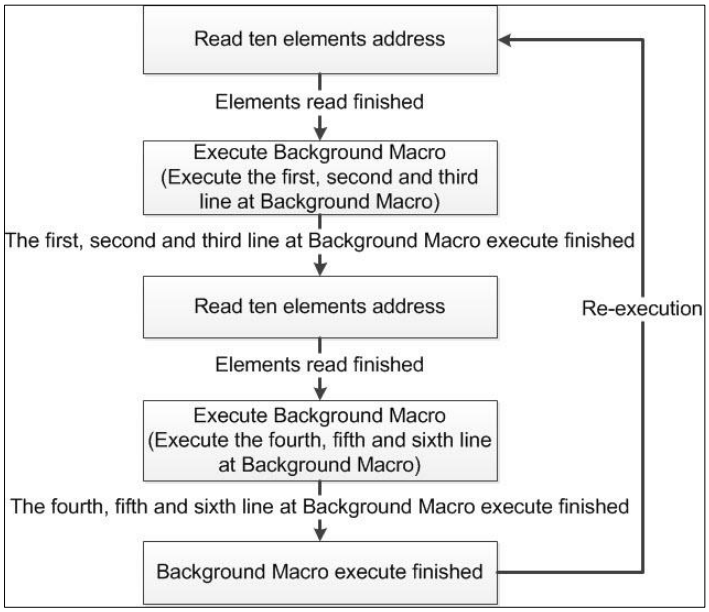


Figure 24 - 28: Background Macro flowchart

24.1.11 Clock Macro

Go to Project > Macro > Clock Macro to set Clock Macro.

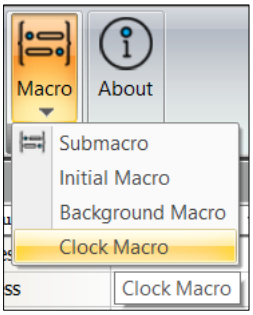


Figure 24 - 29: Clock Macro

Clock Macro executes repeatedly in the process of the HMI operation. Unlike Background Macro, Clock Macro executes its commands all at once rather than one line or several lines at a time. Similar to Screen Cycle Macro, the Clock Macro is executed repeatedly according to the set macro delay time. Go to General >

Configuration to set the **Clock Macro Delay Time**. At the end of each **Clock Macro** execution, it resumes its execution according to the set delay time. The default value is **100** ms and the maximum is **65535** ms.

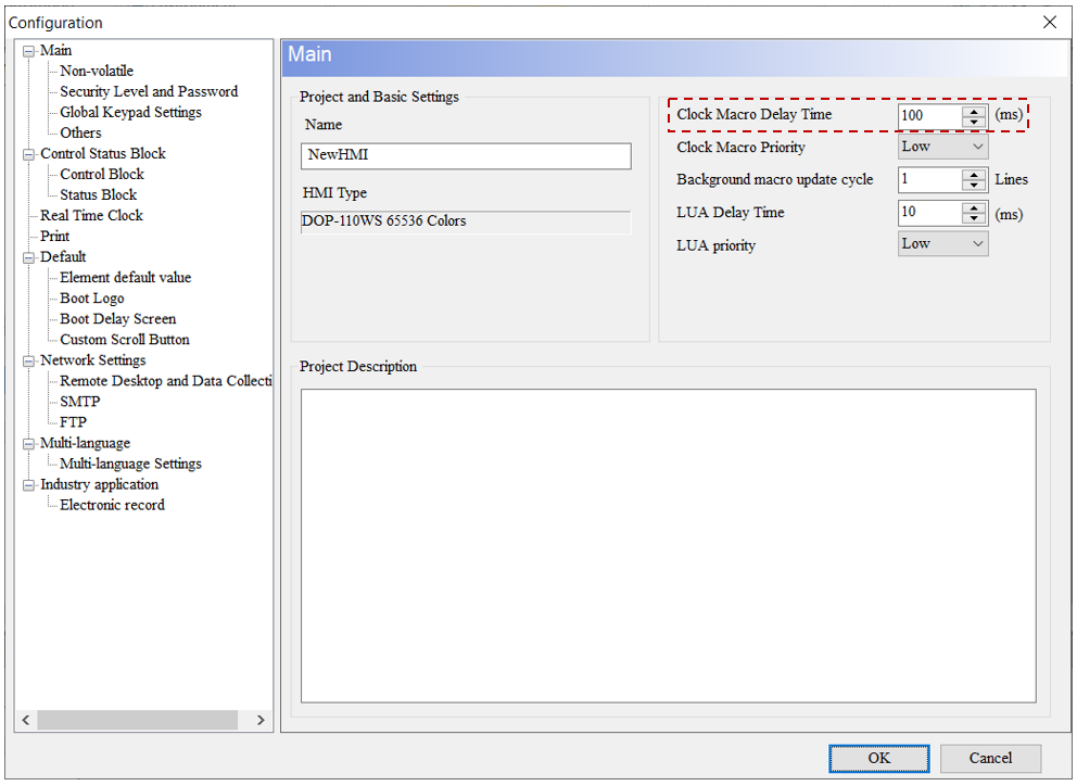


Figure 24 - 30: Clock Macro Delay Time

Clock Macro also provides users with the function to prioritize the execution of the Clock Macro, which provides the selections of **Low**, **Medium**, and **High**. Set the **Clock Macro Priority**, and when the priority is higher, it ensures the **Clock Macro Delay Time** is more accurate.

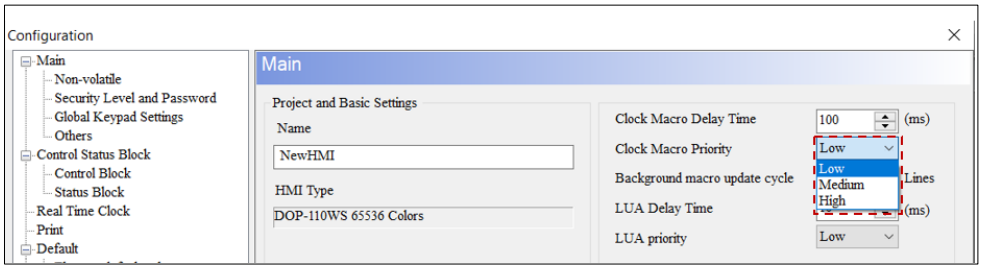


Figure 24 - 31: Clock Macro Priority

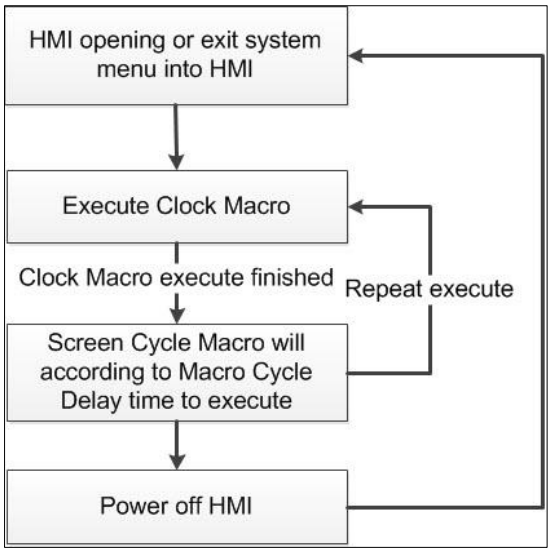


Figure 24 - 32: Clock Macro flowchart

24.2 Macro Edit Window

Open the macro screen window to start editing the macros. The maximum lines for each type of macros is **512** lines and the maximum words is **640** bytes or **640** words. The **Recent Macros** on the right side of the **Macro Edit Window** can only record a maximum of 10 recently-opened macros. In case of more than 10 records, the first macro will be closed and a new macro will be added. If the first macro record is updated before being closed, the system prompts users to save the first macro before adding the new macro.

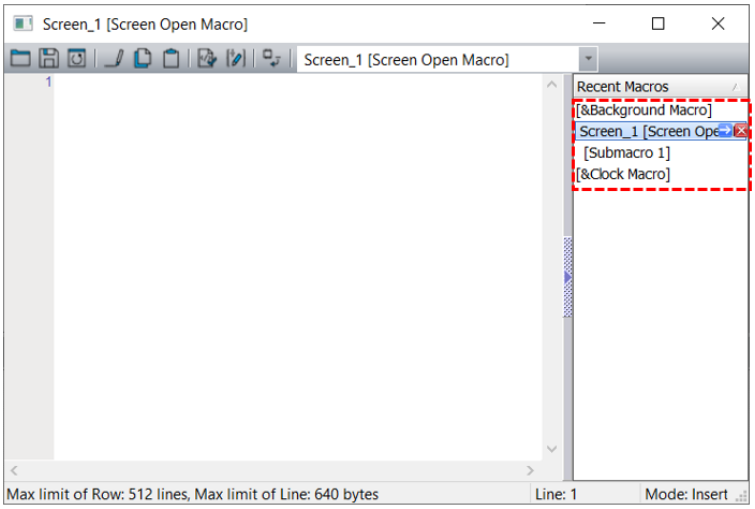


Figure 24 - 33: Macro editing window

Each macro provides a macro toolbar to assist users in planning and writing macro commands.

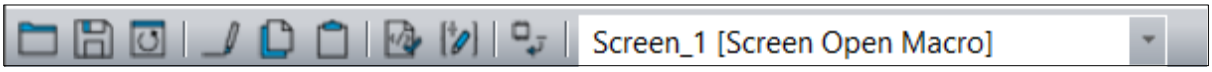
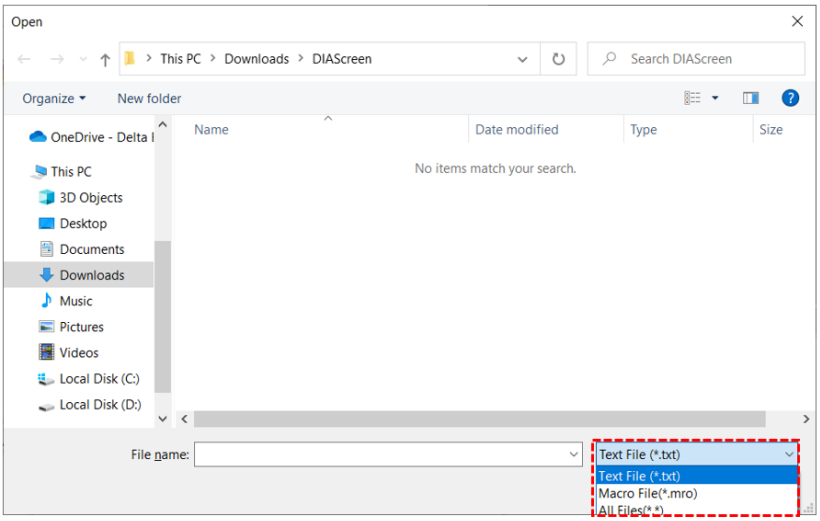
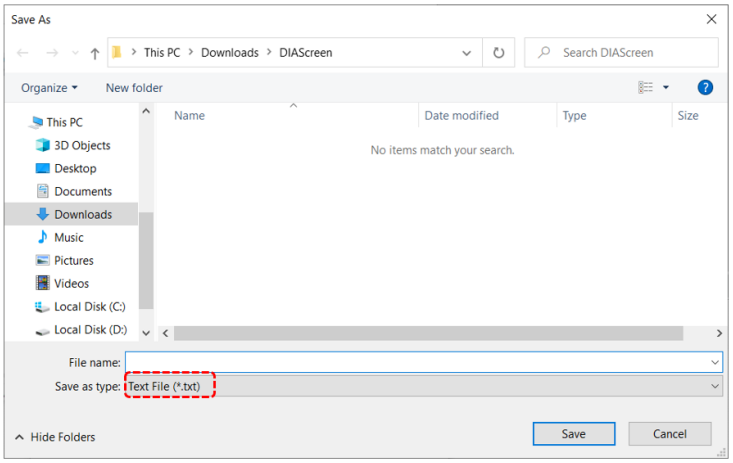
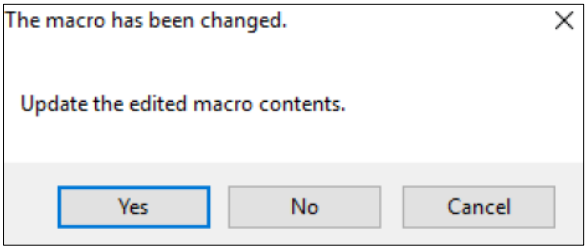
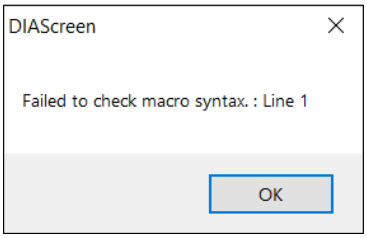


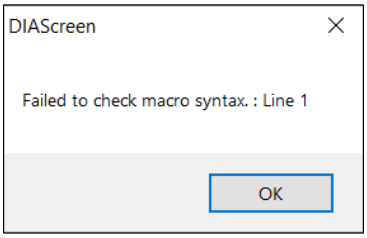
Figure 24 - 34: Macro toolbar

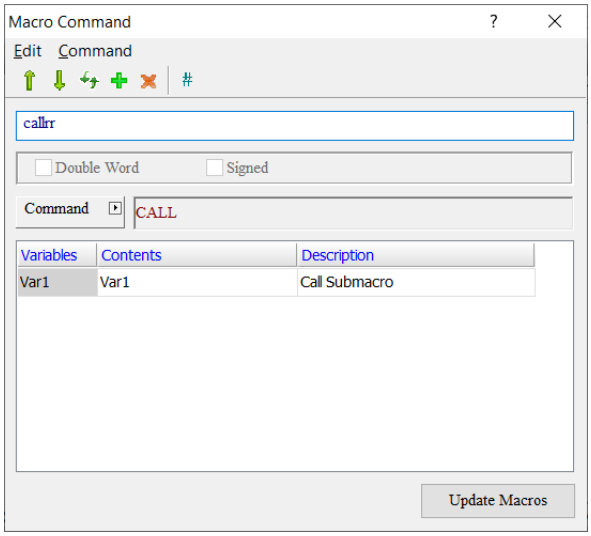
The following table describes the function options in the macro toolbar.

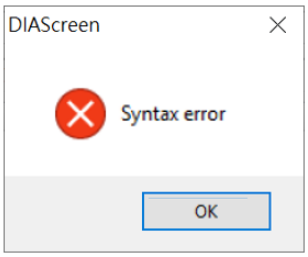
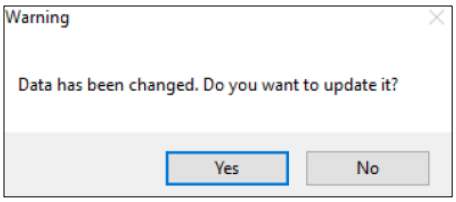
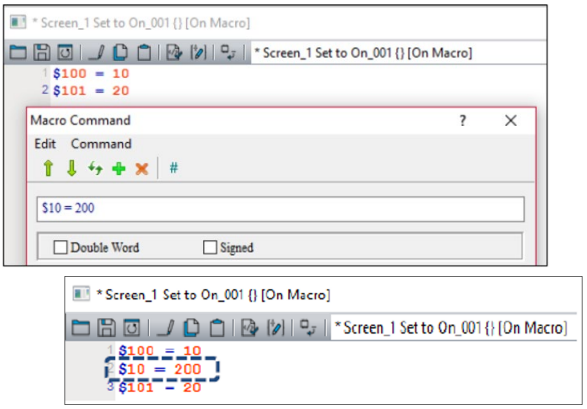
Macro Toolbar functions		
Icon	**Function**	**Description**
	Open	The Open function is equal to the action of Import. DIAScreen provides two formats: txt and mro. Import edited macros to reduce the time for repeated editing. 

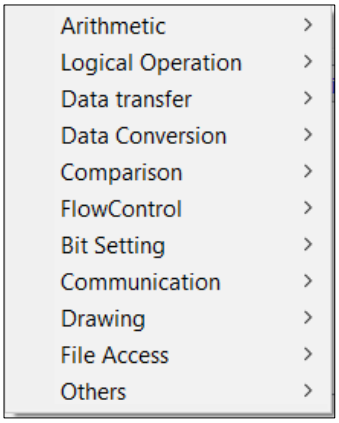
<table>
<tr><th colspan="3">Macro Toolbar functions</th></tr>
<tr><th>Icon</th><th>Function</th><th>Description</th></tr>
<tr><td>  </td><td>Save</td><td>The Save function is equal to the action of export. The software only provides the txt format for saving. Save the edited macros for backup or for use of other screens.
 
</td></tr>
<tr><td>  </td><td>Update</td><td>● The Update function is to update the modified macro contents and check the macro syntax as well. If users close the macro edit window without executing  , the software will inform users that the macro has been changed.
 

● If  is executed, the current syntax will be checked. If there are syntax errors, the software will show the following message.
 
</td></tr>
<tr><td>  </td><td>Cut</td><td rowspan="3">Operations of Cut, Copy, and Paste are the same as those of Office. Users can also execute Cut, Copy, and Paste with the keyboard shortcuts (Cut: Ctrl + X; Copy: Ctrl + C; Paste: Ctrl + V).</td></tr>
<tr><td>  </td><td>Copy</td></tr>
<tr><td>  </td><td>Paste</td></tr>
</table>

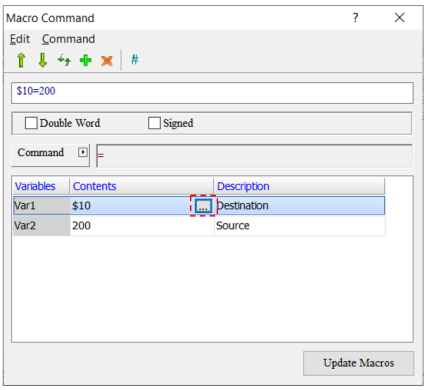
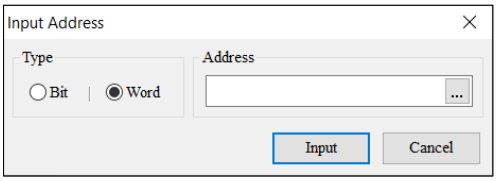
<table>
<tr><th colspan="3">Macro Toolbar functions</th></tr>
<tr><th>Icon</th><th>Function</th><th>Description</th></tr>
<tr><td>  </td><td>Syntax check</td><td>The Syntax check function is used to make sure that macro commands are correct. An error message will pop up if there is any syntax error.
 

NOTE: The Syntax check function is not equivalent to macro compilation. Users need to execute the compile function to compile macros.</td></tr>
<tr><td>  </td><td>Macro Wizard</td><td>The Macro Wizard function provides convenient and easy input of macro commands, which are less error than manually entering macro commands.
 
<table><tr><td rowspan="3">Edit</td><td>Up
  </td><td rowspan="2">● The cursor can be moved Up or Down.
● Use the Up and Down functions to select which line of macro to move to.</td></tr><tr><td>Down
  </td></tr><tr><td>Update
  </td><td>Execute the Update Button and check whether the syntax of macro command is correct. If there are Syntax error, an error message will pop up.</td></tr></table></td></tr>
</table>

Macro Toolbar functions			
Icon	**Function**	**Description**	
			 If users change data and close the **Macro Wizard** window without updating it, DIAScreen displays a message asking if users want to update the data as it has been changed. 
		Insert	**Insert** (add) a line of macro command. The new macro command will be inserted above the macro command of which the cursor has selected and the original one will be moved down. 
		Delete	Delete the macro command of which the cursor has selected. If there are other macro commands following the deleted one, they will be moved up automatically. If the cursor has selected a line without a macro command, the delete action is invalid.
		Comment	The function of **Comment** is to help users manage macros,

<table>
<tr><th colspan="3">Macro Toolbar functions</th></tr>
<tr><th>Icon</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td colspan="2"></td><td>improve readability, and easy maintenance. Type the symbol "#" in the macro edit screen, or use the Edit > Comment on the Macro Wizard or click #, and then write comments or macro programs. The comments written will not be executed in macros.</td></tr>
<tr><td colspan="2">Command</td><td>● Command includes all functions of macro commands which are shown as follows:
 

● For a detailed description of macro command functions, refer to Section 24.3 Macro Commands.</td></tr>
<tr><td colspan="2">Double Word</td><td rowspan="2">Macro commands provide 32 bits and signed number operations. If users select the checkbox of Signed, the command is operated with signed number; if users do not select this checkbox, the command is operated with unsigned number. If users select the Double Word, the command is operated with 32 bits; if users do not select this checkbox, the command is operated with 16 bits.
<table>
<tr><td>Unsigned</td><td>Unsigned number</td></tr>
<tr><td>Signed</td><td>Signed number</td></tr>
<tr><td>Word</td><td>16-bit data</td></tr>
<tr><td>DW (Double Word)</td><td>32-bit data</td></tr>
</table>
NOTE: If the Macro Command is set to Double Word, two registers</td></tr>
<tr><td colspan="2">Signed</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th colspan="3">Macro Toolbar functions</th></tr>
<tr><th>Icon</th><th>Function</th><th>Description</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>are occupied for each memory address in the command.</td></tr>
<tr><td>Command</td><td>Command has the same function as the Command of the Macro Wizard window, both are functions of selecting the macro command to be used. For details, refer to Section 24.3 Macro Commands.</td></tr>
<tr><td>Variable</td><td>Click  to set parameters if the variables are required in macro commands.
 
</td></tr>
</table>
</td></tr>
<tr><td>  </td><td>Input Address</td><td>Enter the PLC memory address to be used in the macro through the Input Address function to prevent entering the wrong address.
 
</td></tr>
</table>

24.3 Macro Commands

Macro commands include Arithmetic, Logical Operation, Data transfer, Data Conversion, Comparison, FlowControl, Bit Setting, Communication, Drawing, File Access, and Others.

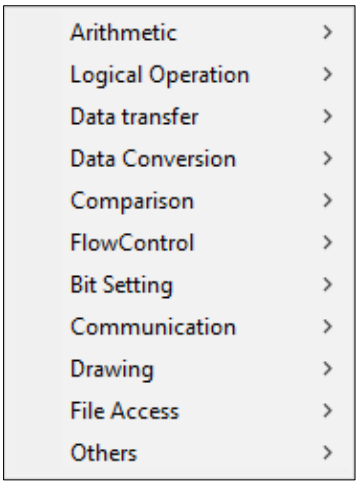


Figure 24 - 35: Types of Macro commands

The following table lists the Macro commands.

Macro Type	Command	Expression	Description
Arithmetic	+	Var1 = Var2 + Var3	Addition
	-	Var1 = Var2 - Var3	Subtraction
	*	Var1 = Var2 * Var3	Multiplication
	/	Var1 = Var2 / Var3	Division
	%	Var1 = Var2 % Var3	Remainder
	+-*/	Var1 = Var2	Arithmetic
	MUL64	Var1 = MUL64(Var2, Var3) (Signed DW)	64-Bit Multiplication
	ADDSUMW	Var1 = ADDSUMW(Var2, Var3)	Accumulative
	FADD	Var1 = FADD(Var2, Var3) (Signed DW)	Floating-point number addition
	FSUB	Var1 = FSUB(Var2, Var3) (Signed DW)	Floating-point number subtraction
	FMUL	Var1 = FMUL(Var2, Var3) (Signed DW)	Floating point number multiplication
	FDIV	Var1 = FDIV(Var2, Var3) (Signed DW)	Floating-point number division
	FMOD	Var1 = FMOD(Var2, Var3) (Signed DW)	Floating-point number remainder

Macro Type	Command	Expression	Description
	QADD	Var1 = QADD(Var2, Var3)	Quadruple word addition
	QSUB	Var1 = QSUB(Var2, Var3)	Quadruple Subtraction
	QMUL	Var1 = QMUL(Var2, Var3)	Quadruple multiplication
	QDIV	Var1 = QDIV(Var2, Var3)	Quadruple division operation
	QMOD	Var1 = QMOD(Var2, Var3)	Quadruple word remainder
	SIN	Var1 = SIN(Var2) (Signed DW)	Sine function
	COS	Var1 = COS(Var2) (Signed DW)	Cosine function
	TAN	Var1 = TAN(Var2) (Signed DW)	Tangent function
	COT	Var1 = COT(Var2) (Signed DW)	Cotangent function
	SEC	Var1 = SEC(Var2) (Signed DW)	secant function
	CSC	Var1 = CSC(Var2) (Signed DW)	Cosecant function
	FSQRT	Var1 = FSQRT(Var2) (Signed DW)	Floating-point number square root
	FCOS	Var1 = FCOS(Var2) (Signed DW)	Floating-point number cosine function
	FSIN	Var1 = FSIN(Var2) (Signed DW)	Floating-point number sine function
	FATAN2	Var1 = FATAN2(Var2,Var3) (Signed DW)	Floating-point inverse tangent function
Logical Operation	|	Var1 = Var2 | Var3	OR logical operation
	&&	Var1 = Var2 && Var3	AND logical operation
	^	Var1 = Var2 ^ Var3	XOR logical operation

Macro Type	Command	Expression	Description
	NOT	Var1 = NOT Var2	NOT logical operation
	<<	Var1 = Var2 << Var3	SHL (shift left) logical operation
	>>	Var1 = Var2 >> Var3	SHR (shift right) logical operation
Data Transfer	MOV	Var1 = Var2	Data Specified Operand
	BMOV	BMOV(Var1, Var2, Var3)	Copy Block
	ArrayCopy	Var1 = ArrayCopy(Var2, Var3, Var4, Var5, Var6)	Copy Array
	FILL	FILL(Var1, Var2, Var3)	Fill Block
	FILLASC	FILLASC(Var1, " ")	Convert text to ASCII value
	STRCAT	Var1 = STRCAT(Var2, Var3, Var4)	Connection string
	FMOV	Var1 = FMOV(Var2) (Signed DW)	Specify floating-point number data
	QMOV	Var1 = QMOV(Var2)	Quadruple word data designation
Data Conversion	BCD	Var1 = BCD(Var2)	Convert decimal values to BCD values
	BIN	Var1 = BIN(Var2)	Convert BCD values to decimal values
	TODWORD	Var1 = TODWORD(Var2)	Convert values from WORD to DOUBLE WORD
	TOWORD	Var1 = TOWORD(Var2, Var3)	Convert value from BYTE to WORD
	TOBYTE	Var1 = TOBYTE(Var2, Var3)	Convert values from Word to Byte
	SWAP	SWAP(Var1, Var2, Var3)	Swap high and low bytes of Word
	XCHG	XCHG(Var1, Var2, Var3)	Exchange value data
	MAX	Var1 = MAX(Var2, Var3)	Get maximum
	MIN	Var1 = MIN(Var2, Var3)	Get minimum

Macro Type	Command	Expression		Description
	TOHEX	Var1 = TOHEX(Var2)		Convert 4 ASCII characters to Word hexadecimal integers
	TOASC	Var1 = TOASC(Var2)		Convert a hexadecimal integer of Word to 4 Word ASCII characters
	FCNV	Var1 = FCNV(Var2) (Signed DW)		Convert an integer to a floating-point number
	ICNV	Var1 = ICNV(Var2) (Signed DW)		Convert float to integer
	SPRINTF	Var1 = SPRINTF(Var2, "%u", Var4)		Format String
Compare	IF…THEN GOTO	IF ==	IF Var1 == Var2 THEN GOTO LABEL Var3	If... ,then execute according to the specified label name
		IF !=	IF Var1 != Var2 THEN GOTO LABEL Var3	
		IF >	IF Var1 > Var2 THEN GOTO LABEL Var3	
		IF >=	IF Var1 >= Var2 THEN GOTO LABEL Var3	
		IF <	IF Var1 < Var2 THEN GOTO LABEL Var3	
		IF <=	IF Var1 <= Var2 THEN GOTO LABEL Var3	
		IF AND == 0	IF (Var1 && Var2) == 0 THEN GOTO LABEL Var3	
		IF AND != 0	IF (Var1 && Var2) != 0 THEN GOTO LABEL Var3	

Macro Type	Command	Expression		Description
		IF == ON	IF Var1 == ON THEN GOTO LABEL Var2	
		IF == OFF	IF Var1 == OFF THEN GOTO LABEL Var2	
		IFB == ON	IFB Var1 == ON THEN GOTO LABEL Var2	
		IFB == OFF	IFB Var1 == OFF THEN GOTO LABEL Var2	
	IF…THEN CALL	IF == CALL	IF Var1 == Var2 THEN CALL Var3	If... call submacro
		IF != CALL	IF Var1 != Var2 THEN CALL Var3	
		IF > CALL	IF Var1 > Var2 THEN CALL Var3	
		IF >= CALL	IF Var1 >= Var2 THEN CALL Var3	
		IF < CALL	IF Var1 < Var2 THEN CALL Var3	
		IF <= CALL	IF Var1 <= Var2 THEN CALL Var3	
		IF AND == 0 CALL	IF (Var1 && Var2) == 0 THEN CALL Var3	
		IF AND != 0 CALL	IF (Var1 && Var2) != 0 THEN CALL Var3	
		IF == ON CALL	IF Var1 == ON THEN CALL Var2	
		IF == OFF	IF Var1 == OFF	

Macro Type	Command	Expression		Description
		CALL	THEN CALL Var2	
	IF…	IF ==	IF Var1 == Var2	Logical comparison
		IF !=	IF Var1 != Var2	
		IF >	IF Var1 > Var2	
		IF >=	IF Var1 >= Var2	
		IF <	IF Var1 < Var2	
		IF <=	IF Var1 <= Var2	
		IF AND == 0	IF (Var1 && Var2) == 0	
		IF AND != 0	IF (Var1 && Var2) != 0	
		IF == ON	IF Var1 == ON	
		IF == OFF	IF Var1 == OFF	
	ELSEIF…	ELSEIF ==	ELSEIF Var1 == Var2	Logical comparison
		ELSEIF !=	ELSEIF Var1 != Var2	
		ELSEIF >	ELSEIF Var1 > Var2	
		ELSEIF >=	ELSEIF Var1 >= Var2	
		ELSEIF <	ELSEIF Var1 < Var2	
		ELSEIF <=	ELSEIF Var1 <= Var2	
		ELSEIF AND == 0	ELSEIF (Var1 && Var2) == 0	
		ELSEIF AND != 0	ELSEIF (Var1 && Var2) != 0	
		ELSEIF == ON	ELSEIF Var1 == ON	
		ELSEIF == OFF	ELSEIF Var1 == OFF	
	ELSE	ELSE		Logical comparison
	ENDIF	ENDIF		Logical comparison
	FCMP	Var1 = FCMP(Var2, Var3) (Signed DW)		Comparison of floating-point value

Macro Type	Command	Expression	Description
	QCMP	Var1 = QCMP(Var2, Var3) (Signed DW)	Quadruple Numerical Comparison
FlowControl	GOTO	GOTO LABEL Var1	Go to a label unconditionally (LABEL)
	LABEL	LABEL Var1	Label
	CALL	CALL Var1	Call Submacro
	RET	RET	Exit Submacro
	FOR	FOR Var1	Program Loop
	NEXT	NEXT	
	END	END	End Macro Program
Bit setting	BITON	BITON Var1	Set the bit to ON
	BITOFF	BITOFF Var1	Set the bit to OFF
	BITNOT	BITNOT Var1	Inverse bit (ON→OFF，OFF→ON)
	GETB	Var1 = GETB Var2	Get bit value
Communic-ation	INITCOM	Var1 = INITCOM(Var2, Var3, Var4, Var5, Var6, Var7, Var8)	COM PORT initialization
	ADDSUM	Var1 = ADDSUM(Var2, Var3)	Calculate CHECKSUM by addition
	XORSUM	Var1 = XORSUM(Var2, Var3)	Calculate CHECKSUM by XOR
	PUTCHARS	Var1 = PUTCHARS(Var2, Var3, Var4)	Export characters via the communication port
	GETCHARS	Var1 = GETCHARS(Var2, Var3, Var4)	Get characters via the communication port
	SELECTCOM	SELECTCOM(Var1)	Select COM Port
	CLEARCOMBUFFER	CLEARCOMBUFFER(Var1, Var2)	Clear buffer of Com Port
	CHRCHKSUM	Var1 =	Calculate the length

Macro Type	Command	Expression	Description
		CHRCHKSUM("Var2", Var3, Var4)	and checksum of string
	LOCKCOM	Var1 = LOCKCOM(Var2, Var3)	Lock COM Port
	UNLOCKCOM	UNLOCKCOM(Var1)	Unlock COM Port
	STATIONCHK	Var1 = STATIONCHK(Var2, Var3)	Check COM Port communication state
	STATIONON	STATIONON(Var1, Var2)	Station On
	STATIONOFF	STATIONOFF(Var1, Var2)	Station Off
	IPON	Var1 = IPON(Var2, Var3, Var4, Var5, Var6)	Enable IP address
	IPOFF	Var1 = IPOFF(Var2, Var3, Var4, Var5, Var6)	Disable IP address
	IPCHANGE	Var1 = IPCHANGE(Var2, Var3, Var4, Var5, Var6, Var7)	Change the IP address of the connecting controller and the communication port
	COMLINKSTATUS	Var1 = COMLINKSTATUS(Var2)	Communication port status
	NETLINKSTATUS	Var1 = NETLINKSTATUS(Var2)	Internet connection status
	CLOSECOM	Var1 = CLOSECOM(Var2)	Close port
Drawing	RECTANGLE	RECTANGLE(Var1)	Rectangle
	LINE	LINE(Var1)	Line
	POINT	POINT(Var1)	Point
	CIRCLE	CIRCLE(Var1)	Circle
File Access	FileSlotRead	Var1 = FileSlotRead(Var2, Var3, Var4, Var5)	Read file
	FileSlotWrite	Var1 = FileSlotWrite(Var2, Var3, Var4, Var5)	Write file
	FileSlotRemove	Var1 = FileSlotRemove(Var2)	Remove file
	FileSlotGetLength	Var1 = FileSlotGetLength(Var2, Var3)	Read length of file

Macro Type	Command	Expression	Description
	FileSlotExport	Var1 = FileSlotEXPORT(Var2, Var3, Var4, Var5)	Export file
	FileSlotImport	Var1 = FileSlotIMPORT(Var2, Var3, Var4, Var5)	Import file
	FileSlotGetName	Var1 = FileSlotGetName(Var2, Var3, Var4)	Get file name
	FileSlotSetName	Var1 = FileSlotSetName(Var2, Var3, Var4)	Set file name
	FileSlotGetID	Var1 = FileSlotGetID(Var2, Var3, Var4)	Get file id
Others	Time Tick	Var1 = TIMETICK	Get the time from the start of the system up to now
	GETLASTERROR	Var1 = GETLASTERROR	Get the error value of the previous command
	Comment	#	Comment
	Delay	Delay(Var1)	Delay
	GETSYSTEMTIME	Var1 = GETSYSTEMTIME	Get system time
	SETSYSTEMTIME	SETSYSTEMTIME(Var1)	Set system time
	GETHISTORY	Var1 = GETHISTORY(Var2, Var3, Var4, Var5, Var6)	Get history data
	EXPORT	EXPORT	EXPORT(Var1)
	EXRCP16	EXRCP16	Var1 = EXRCP16(Var2, Var3)
	IMRCP16	IMRCP16	Var1 = IMRCP16(Var2, Var3)
	EXRCP32	Var1 = EXRCP32(Var2, Var3)	Export 32-bit Recipe
	IMRCP32	Var1 = IMRCP32(Var2, Var3)	Import 32 bit Recipe

Macro Type	Command	Expression	Description
	EXENRCP	Var1 = EXENRCP(Var2, Var3)	Export Enhanced Recipe
	IMENRCP	Var1 = IMENRCP(Var2, Var3)	Import Enhanced Recipe
	EXHISTORY	Var1 = EXHISTORY(Var2, Var3, Var4)	Export history data
	EXALARM	Var1 = EXALARM(Var2, Var3)	Export alert data
	EXALARMGROUP	Var1 = EXALARMGROUP(Var2, Var3, Var4)	Export alert assignment group information
	DISKFORMAT	Var1 = DISKFORMAT(Var2)	Disk format
	BMPCAPTURE	Var1 = BMPCAPTURE(Var2)	Capture screen
	PLCDOWNLOAD	Var1 = PLCDOWNLOAD(Var2, Var3, Var4, Var5, Var6)	Download DVP or ISP file to PLC via the HMI
	OPENSCREEN	OPENSCREEN(Var1)	● Open the screen ● Cannot be used in Screen On Macro/Screen Off Macro/Screen Cycle Macro
	CLOSESUBSCREEN	CLOSESUBSCREEN(Var1)	● Close the sub-screen ● Cannot be used in Screen On Macro/Screen Off Macro/Screen Cycle Macro
	GetCircleCenter	Var1 = GetCircleCenter(Var2, Var3)	Calculate the coordinates of the center of the circle
	VAR	VAR Var1	Variable
Industrial	ECAM	Var1 = ECAM(Var2, Var3,	

Macro Type	Command	Expression	Description
application		Var4, Var5)	
	RSVP	Var1 = RSVP(Var2, Var3, Var4)	
	WSVP	Var1 = WSVP(Var2, Var3, Var4)	
	SAVEMOTIONINSLOG	Var1 = SAVEMOTIONINSLOG(Var2, Var3, Var4)	Record Motion command operation

24.3.1 Arithmetic

Arithmetic include integer and floating-point operations, and the macro commands are described as follows.

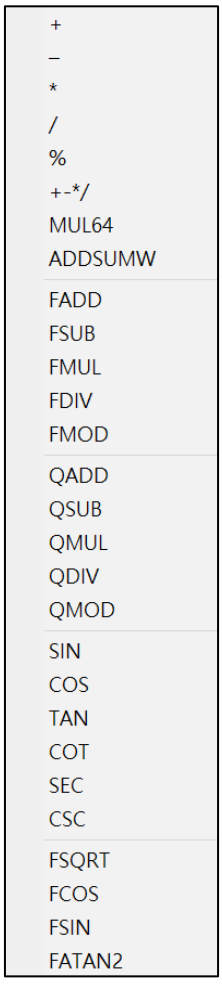


Figure 24 - 36: Arithmetic Operation

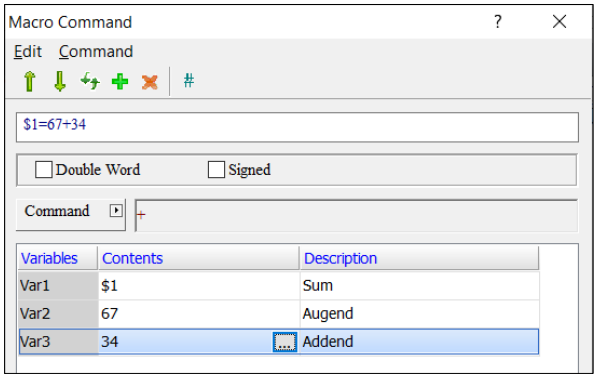
- + (Addition)

Expression	Meaning of Variable		Note
Var1 = Var2 + Var3 (W) Var1 = Var2 + Var3 (DW) Var1 = Var2 + Var3 (Signed W) Var1 = Var2 + Var3 (Signed DW)	Var1	Sum	W: Word DW: Double Word Signed: Number
	Var2	Augend	
	Var3	Addend	
	Description of Action		
	Add Var2 and Var3, and put the result in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- When the command is $1= 67 + 34, an addition operation will be executed to put the result obtained by adding 67 and 34 into $1, so $1 = 101.

- - (Subtraction Operation)

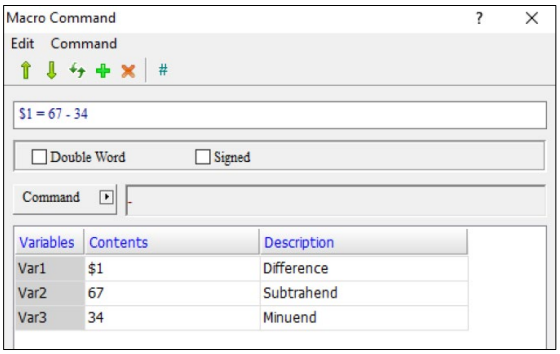
Expression	Meaning of Variable		Note
Var1 = Var2 - Var3 (W)	Var1	Difference	W: Word

Expression	Meaning of Variable		Note
Var1 = Var2 - Var3 (DW) Var1 = Var2 - Var3 (Signed W) Var1 = Var2 - Var3 (Signed DW)	Var2	Subtrahend	DW: Double Word Signed: Number
	Var3	Minuend	
	Description of Action		
	Subtract Var2 from Var3, and put the result in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- When the command is $1 = 67 - 34, the subtraction operation is executed and the result of 67 – 34 is put in $1, so $1 = 33.

- * (Multiplication)

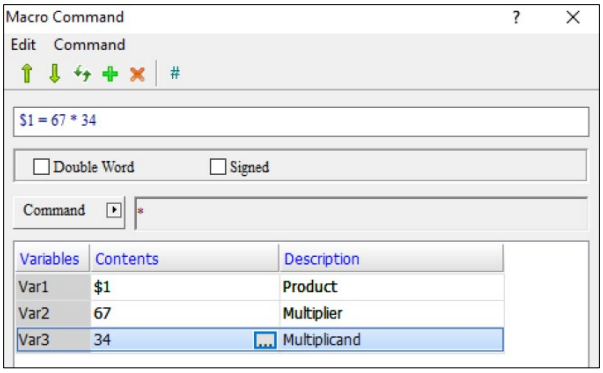
Expression	Meaning of Variable		Note
Var1 = Var2 * Var3 (W) Var1 = Var2 * Var3 (DW) Var1 = Var2 * Var3 (Signed W) Var1 = Var2 * Var3 (Signed DW)	Var1	Product	W: Word DW: Double Word Signed: Number
	Var2	Multiplier	
	Var3	Multiplicand	

Expression	Meaning of Variable	Note
	Description of Action	
	Multiply Var2 by Var3, and put the result in Var1.	

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- When the command is $1 = 67 * 34, the multiplication operation is executed and the result of 67 * 34 is put in $1, so $1 = 2278.

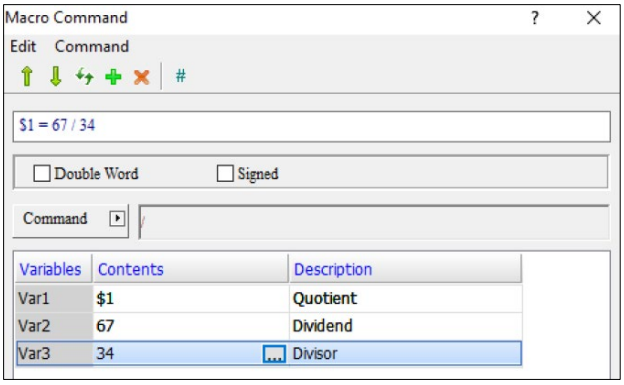
- / (Division)

Expression	Meaning of Variable		Note
Var1 = Var2 / Var3 (W) Var1 = Var2 / Var3 (DW) Var1 = Var2 / Var3 (Signed W) Var1 = Var2 / Var3 (Signed DW)	Var1	Quotient	W: Word DW: Double Word Signed: Number
	Var2	Dividend	
	Var3	Divisor	
	Description of Action		
	Divide Var2 by Var3 and put the result in Var1.		
NOTE: *Var3 cannot be 0.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



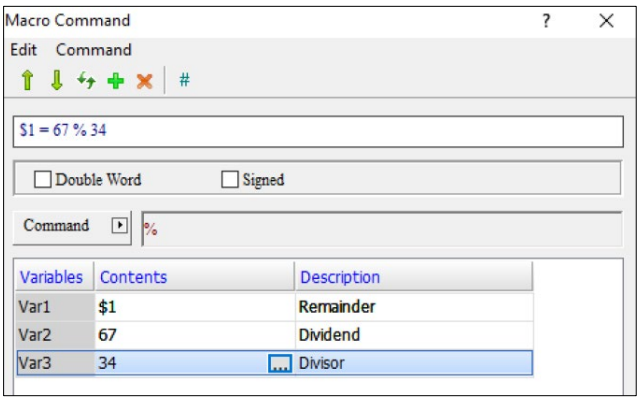
- When the command is $1 = 67 / 34, the division operation is executed and the result of 67 / 34 is put in $1, so $1 = 1.

- % (Remainder)

Expression	Meaning of Variable		Note
Var1 = Var2 % Var3 (W) Var1 = Var2 % Var3 (DW) Var1 = Var2 % Var3 (Signed W) Var1 = Var2 % Var3 (Signed DW)	Var1	Remainder	W: Word DW: Double Word Signed: Number
	Var2	Dividend	
	Var3	Divisor	
	Description of Action		
	Divide Var2 by Var3 and put the remainder in Var1.		
NOTE: *Var 3 cannot be 0.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	

Variable	Type		
	Internal Memory	PLC Register	Constant
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.    ● When the command is $1 = 67 % 34, the remainder operation is executed and the result of 67 % 34 is put in $1, so $1 = 33.

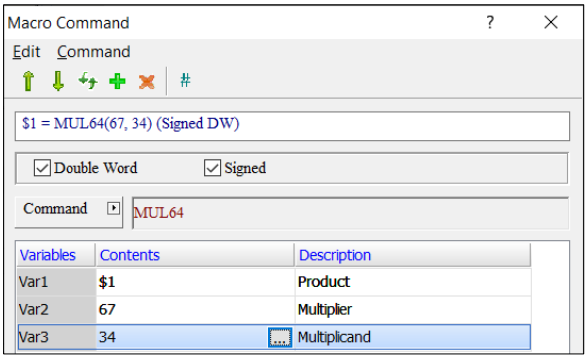
● MUL64 (64-bit Multiplication)

Expression	Meaning of Variable		Note
Var1 = MUL64(Var2, Var3) (W) Var1 = MUL64(Var2, Var3) (DW) Var1 = MUL64(Var2, Var3) (Signed W) Var1 = MUL64(Var2, Var3) (Signed DW)	Var1	Product	W: Word DW: Double Word Signed: Number
	Var2	Multiplier	
	Var3	Multiplicand	
	Description of Action		
	Multiple Var3 by Var2, and put the result in Var1.		

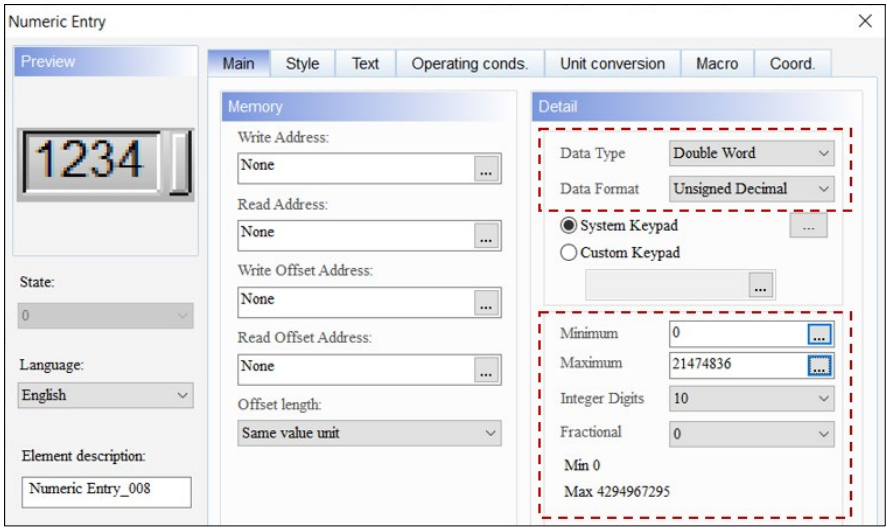
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- If the checkbox of **Double Word** is selected, set the **Data Type** of the elements to **Double Word** so as to save the correct value.



- When the command is $1 = MUL64 (67, 34), the MUL64 bit multiplication is executed and the result of 67 multiplied by 34 is put in $1, so $1 = 2278.

- ADDSUMW (Accumulation)

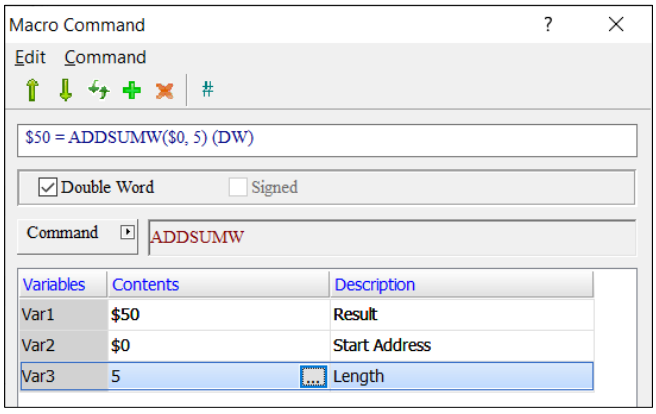
Expression	Meaning of Variable		Note
Var1 = ADDSUMW(Var2, Var3) (W) Var1 = ADDSUMW(Var2, Var3) (DW)	Var1	Result	W: Word DW: Double Word
	Var2	Start address	
	Var3	Length	
	Description of Action		
	Add up Var3 length		

Expression	Meaning of Variable	Note
	addresses continuously from Var2 start address, and put the result in Var1.	
***NOTE:** If Double Word is selected, the Start Address increments by 2 to Length; if Word is selected, it increments by 1.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 and Var2 are the Internal Memory addresses, Var3 is a constant, and the checkbox of Double Word is selected.
- Memory address increases by 2 addresses from $0 to 5 lengths: $0, $2, $4, $6, & $8.



- Enter $0 = 1, $2 = 2, $4 = 3, $6 = 4, and $8 = 5, and put the accumulated value in $50, so $50 = 15.

- FADD (Floating-Point Number Addition)

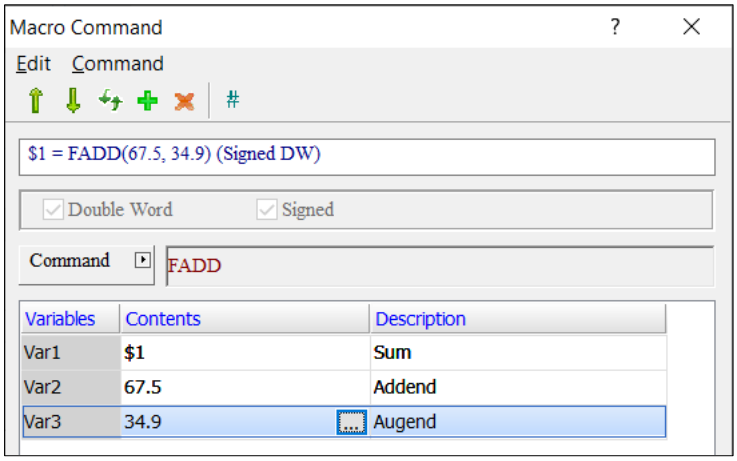
Expression	Meaning of Variable		Note
Var1 = FADD(Var2, Var3) (Signed DW)	Var1	Sum	DW: Double Word Signed: Number
	Var2	Addend	

Expression	Meaning of Variable		Note
	Var3	Augend	
	Description of Action		
	Add Var2 and Var3, and put the result in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- When the command is $1 = FADD (67.5, 34.9), the floating-point number addition operation is executed and the result of 67.5 plus 34.9 is put in $1, so $1 = 102.4.

- FSUB (Floating-Point Number Subtraction)

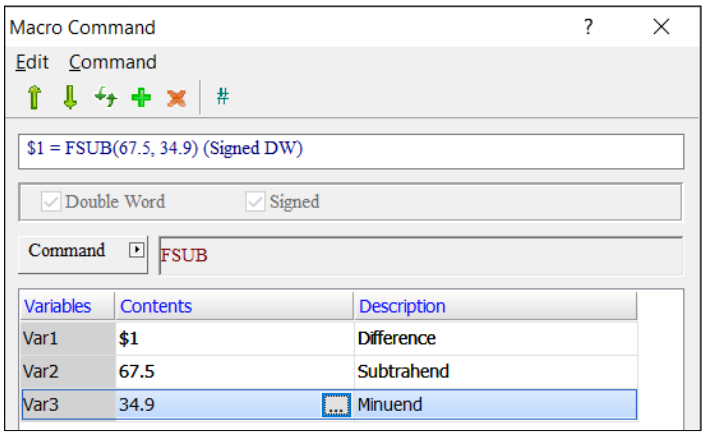
Expression	Meaning of Variable		Note
Var1 = FSUB(Var2, Var3) (Signed DW)	Var1	Difference	DW: Double Word Signed: Number
	Var2	Subtrahend	
	Var3	Minuend	
	Description of Action		

Expression	Meaning of Variable	Note
	Subtract Var2 from Var3, and put the result in Var1.	

Variable	Type		
	Internal Memory	PLC Register	constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- When the command is $1 = FSUB (67.5, 34.9), the floating-point number subtraction operation is executed and the result of 67.5 minus 34.9 is put in $1, so $1 = 32.6.

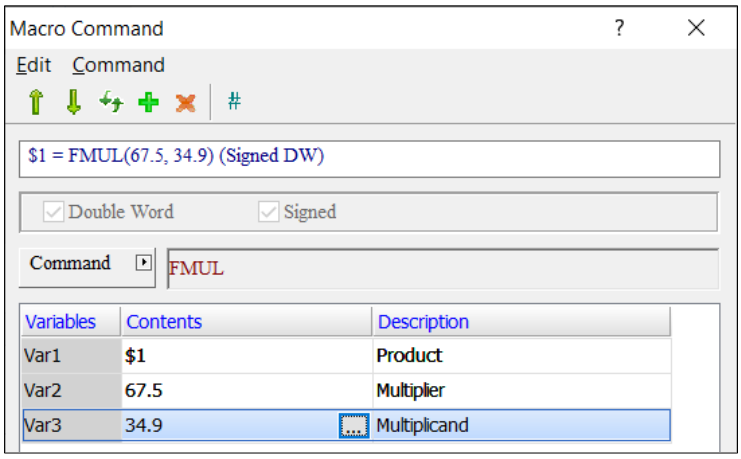
- FMUL (Floating Point Number Multiplication)

Expression	Meaning of Variable		Note
Var1 = FMUL(Var2, Var3) (Signed DW)	Var1	Product	DW: Double Word Signed: Number
	Var2	Multiplier	
	Var3	Multiplicand	
	Description of Action		
	Multiply Var3 by Var2, and put the result in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



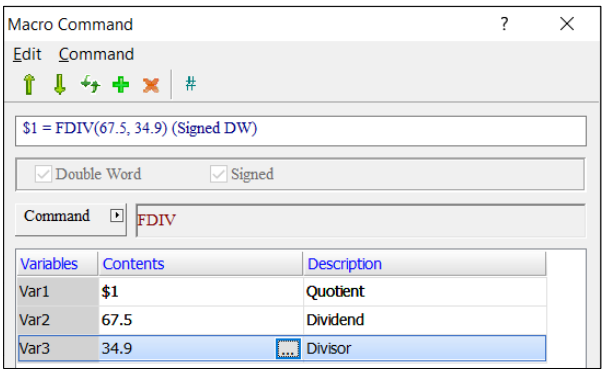
- When the command is $1 = FMUL (67.5, 34.9), the floating-point number multiplication is executed and the result of 67.5 multiplied by 34.9 is put in $1, so $1 = 2355.75.

- FDIV (Floating Point Number Division)

Expression	Meaning of Variable		Note
Var1 = FDIV(Var2, Var3) (Signed DW)	Var1	Quotient	DW: Double Word Signed: Signed number
	Var2	Dividend	
	Var3	Divisor	
	Description of Action		
	Divide Var2 by Var3, and put the result in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	

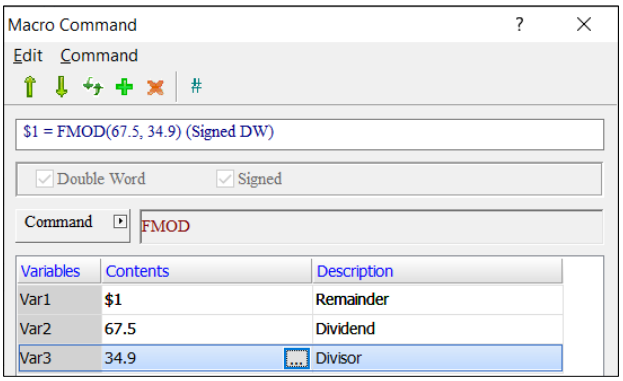
Variable	Type		
	Internal Memory	PLC Register	Constant
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $1 = FDIV (67.5, 34.9), the floating-point number division operation is executed and the result of 67.5 divided by 34.9 is put in $1, so $1 = 1.934.

● FMOD (Floating-Point Number Remainder)

Expression	Meaning of Variable		Note
Var1 = FMOD(Var2, Var3) (Signed DW)	Var1	Remainder	DW: Double Word Signed: Signed number
	Var2	Dividend	
	Var3	Divisor	
	Description of Action		
	Divide Var2 by Var3 and put the remainder in Var1.		

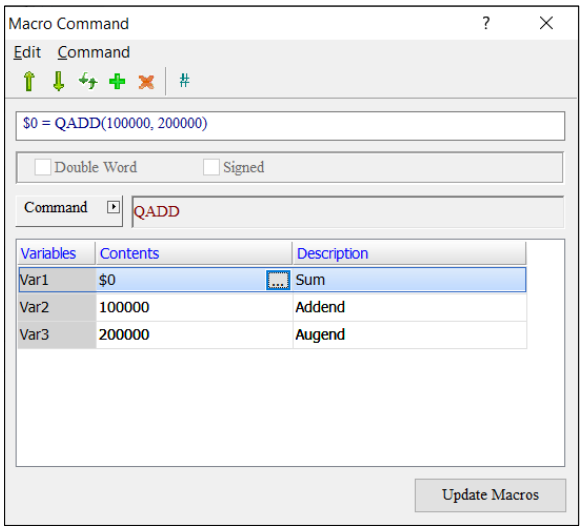
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $1 = FMOD (67.5, 34.9), the floating-point number remainder operation is executed and the remainder of 67.5 divided by 34.9 is put in $1, so $1 = 32.6.

● QADD (Quadruple Word Addition)

Expression	Meaning of Variables		Note
Var1 = QADD(Var2, Var3)	Var1	Sum	Q: Quad Word
	Var2	Addend	
	Var3	Augend	
	Description of Action		
	The sum obtained by dividing Var2 by Var3 is placed in Var1.		

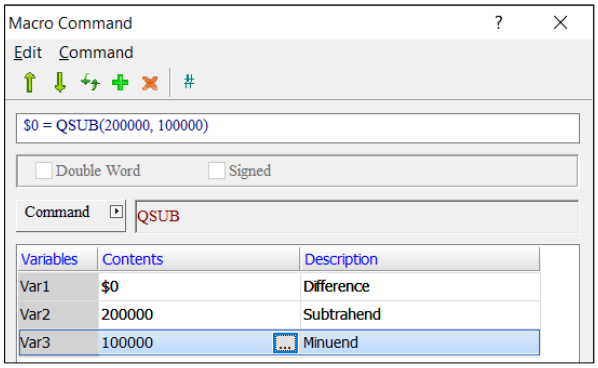
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $0 = QADD (100000, 200000), it will execute quadruple word addition operation and put the result obtained by adding 100000 and 200000 into $0, so $0 = 300000.

- QSUB (Quadruple Subtraction)

Expression	Meaning of Variables		Note
Var1 = QSUB(Var2, Var3)	Var1	Difference	Q: Quad Word
	Var2	Subtrahend	
	Var3	Minuend	
	Description of Action		
	Var2 is subtracted from Var3, and the result is placed in Var1.		

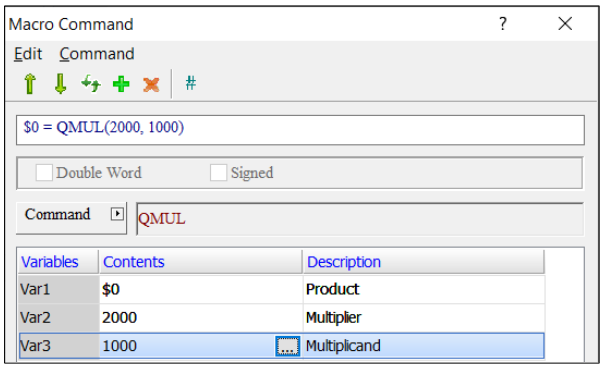
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $0 = QSUB (200000, 100000), the floating-point subtraction operation will be executed to put the result obtained by subtracting 100000 from 200000 into $0, so $0 = 100000.

● QMUL (Quad Word Multiplication)

Expression	Meaning of Variable		Note
Var1 = QMUL(Var2, Var3)	Var1	Product	Q: Quad Word
	Var2	Multiplier	
	Var3	Multiplicand	
	Description of Action		
	Var2 is multiplied by Var3 and the result is placed in Var1.		

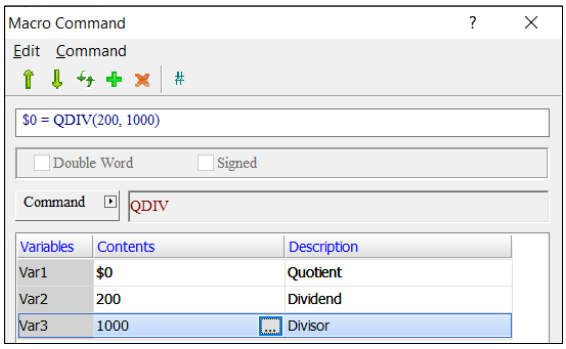
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $0 = QMUL (2000, 1000), it will perform floating-point multiplication and put the result obtained by multiplying 2000 by 1000 into $0, so $0 = 2000000.

● QDIV (Quad Word Division)

Expression	Meaning of Variable		Note
Var1 = QDIV(Var2, Var3)	Var1	Quotient	Q: Quad Word
	Var2	Dividend	
	Var3	Divisor	
	Description of Action		
	Var2 is divided by Var3 and the result is placed in Var1.		

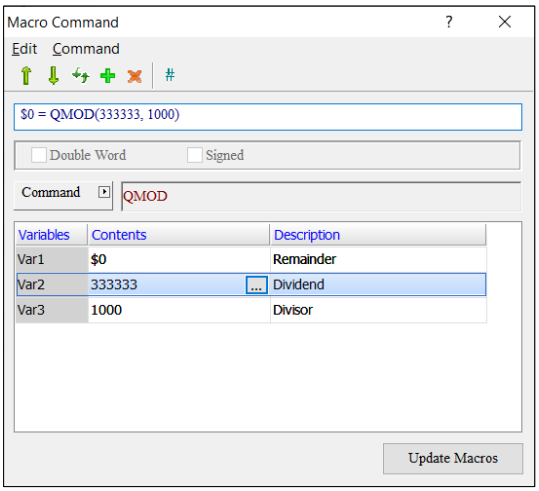
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $0 = QDIV (200, 1000), the floating-point number division operation will be executed and the result obtained by dividing 200 by 1000 will be put into $0, so $0 = 0.2.

● Q MOD (Quadruple Word Remainder Operation)

Expression	Meaning of Variable		Note
Var1 = QMOD(Var2, Var3)	Var1	Remainder	Q: Quad Word
	Var2	Dividend	
	Var3	Divisor	
	Description of Action		
	The remainder obtained by dividing Var2 and Var3 is put into Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● When the command is $0 = QMOD (333333, 1000), the floating-point remainder operation will be executed to put the remainder obtained by dividing 333333 by 1000 into $0, so $0 = 333.

● SIN (Sine function)

Expression	Meaning of Variable		Comment
Var1 = SIN(Var2) (Signed DW)	Var1	Sine	DW: Double Word Signed: Number
	Var2	Angle	
	Description of Action		
	Sine operation is executed for the value input in Var2, and the result is put in Var1.		

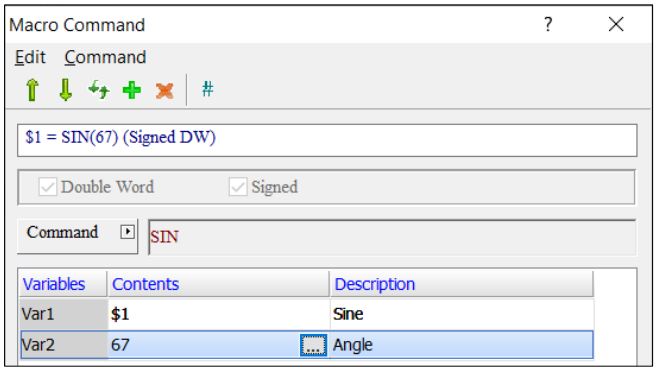
NOTE:

1. *The Data format of Var1 must be Floating.*
2. *The Data format of Var2 must be Signed Decimal, and the number of decimal places cannot be set.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example

- Var1 is the Internal Memory address and Var2 is a constant.



- When the command is $1 = SIN (67), the input angle of 67 is used for sine operation and the result is put in $1, so $1 = 0.921.

- COS (Cosine function)

Expression	Meaning of Variable		Comment
Var1 = COS(Var2) (Signed DW)	Var1	Cosine	DW: Double Word Signed: Signed number
	Var2	Angle	
	Description of Action		
	Cosine operation is executed for the value input in Var2, and the result is put in Var1.		

NOTE:

1. *The Data Format for Var1 must be Floating.*
2. *The Data Format for Var2 must be Signed Decimal, and no decimal digits can be set.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example
● Var1 is the Internal Memory address and Var2 is a constant.  ● When the command is $1 = COS (67), the input angle of 67 is used for cosine operation and the result is put in $1, so $1 = 0.391.

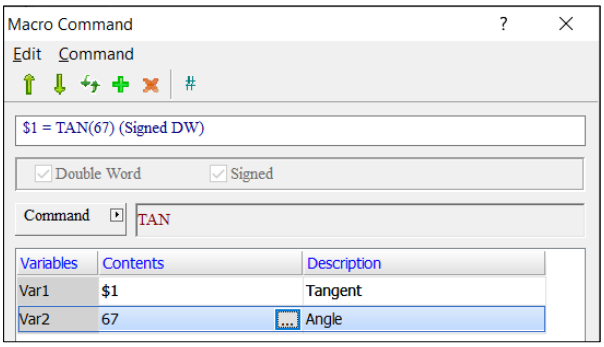
● TAN (Tangent function)

Expression	Meaning of Variable		Note
Var1 = TAN(Var2) (Signed DW)	Var1	Tangent	DW: Double Word Signed: Signed number
	Var2	Angle	
	Description of Action		
	Tangent operation is executed for the value input in Var2, and the result is put in Var1.		

NOTE:

1. *The Data Format for Var1 must be Floating.*
2. *The Data Format for Var2 must be Signed Decimal, and no decimal digits can be set.*

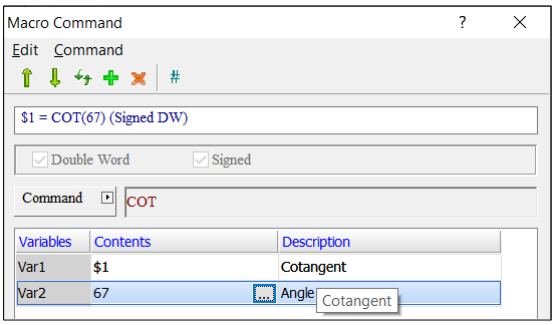
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example
● Var1 is the Internal Memory address and Var2 is a constant.  ● When the command is $1 = TAN (67), the input angle of 67 is used for tangent operation and the result is put in $1, so $1 = 2.356.

● COT (Cotangent function)

Expression	Meaning of Variable		Note
Var1 = COT(Var2) (Signed DW)	Var1	Cotangent	DW: Double Word Signed: Signed number
	Var2	Angle	
	Description of Action		
	Cotangent operation is executed for the value input in Var2. and the result is put in Var1.		
NOTE: *1. The Data Format for Var1 must be Floating.* *2. The Data Format for Var2 must be Signed Decimal, and no decimal digits can be set.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example
● Var1 is the Internal Memory address and Var2 is a constant.  ● When the command is $1 = COT (67), the input angle of 67 is used for cotangent operation and the result is put in $1, so $1 = 0.424.

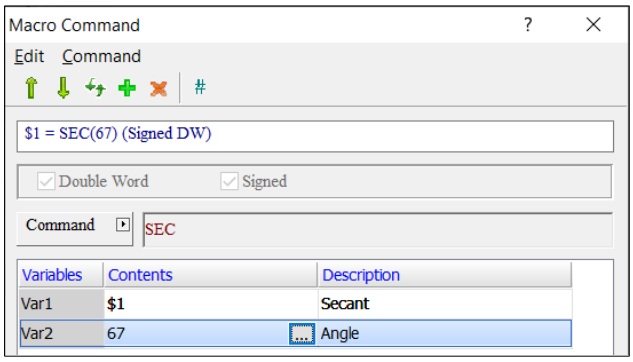
● SEC (Secant function)

Expression	Meaning of Variable		Note
Var1 = SEC(Var2) (Signed DW)	Var1	Secant	DW: Double Word Signed: Signed number
	Var2	Angle	
	Description of Action		
	Secant operation is executed for the value input in Var2, and the result is put in Var1.		

***NOTE**:*

1. *The Data Format for Var1 must be Floating.*
2. *The Data Format for Var2 must be Signed Decimal, and no decimal digits can be set.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example
● Var1 is the Internal Memory address and Var2 is a constant.  ● When the command is $1 = SEC (67), the input angle of 67 is used for secant operation and the result is put in $1, so $1 = 2.559.

● CSC (Cosecant function)

Expression	Meaning of Variable		Note
Var1 = CSC(Var2) (Signed DW)	Var1	Cosecant	DW: Double Word Signed: Signed number
	Var2	Angle	
	Description of Action		
	Cosecant operation is executed for the value input in Var2, and the result is put in Var1.		

NOTE:

1. *The Data Format for Var1 must be Floating*
2. *The Data Format for Var2 must be Signed Decimal, and no decimal digits can be set.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example
● Var1 is the Internal Memory address and Var2 is a constant.  ● When the command is $1 = CSC (67), the input angle of 67 is used for cosecant operation and the result is put in $1, so $1 = 1.086.

24.3.2 Logical Operation

Logic Operation contains six operators which convert numerical values to binary 0 and 1 representations, and then conduct |, &&, ^, NOT, < <, and > > operations. The macro commands are detailed as follows.

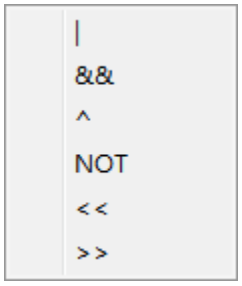


Figure 24 - 37: Logical Operation

- | (OR Logical Operation)

Or Logical Operation Feature	
Expression	Result
0 | 0	0
0 | 1	1
1 | 0	1

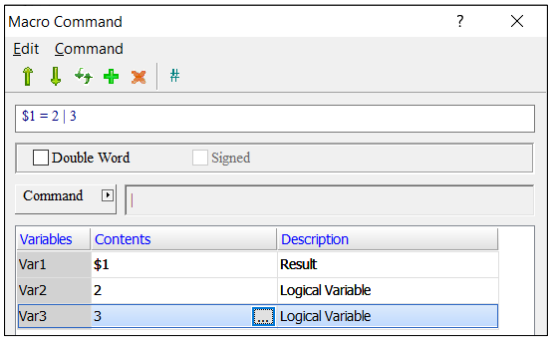
Or Logical Operation Feature	
Expression	Result
1 | 1	1

Expression	Meaning of Variable		Note
Var1 = Var2 | Var3 (W) Var1 = Var2 | Var3 (DW)	Var1	Result	W: Word DW: Double Word
	Var2	Logical Variable	
	Var3	Logical Variable	
	Description of Action		
	Execute OR operation on Var2 and Var3, and put the result in Var1.		

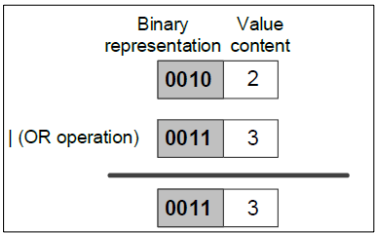
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are Constant.



- After converting the values of Var2 and Var3 into binary representations (2 = 0010 and 3 = 0011), execute OR logical operation on 0010 and 0011, and the result is 0011 which is also 3.



- && (AND Logical Operation)

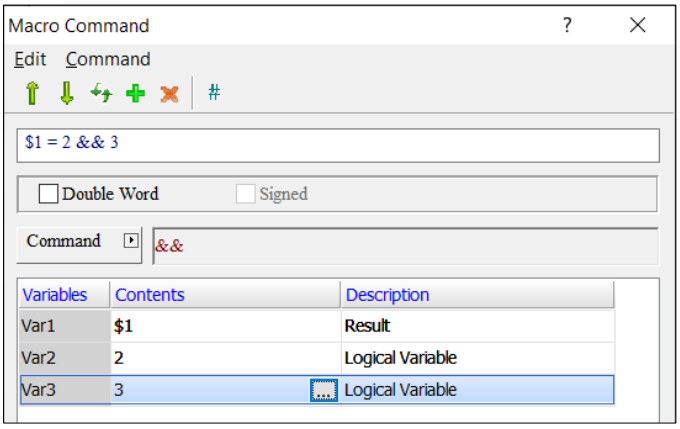
AND Logical Operation feature	
Expression	Result
0 && 0	0
0 && 1	0
1 && 0	0
1 && 1	1

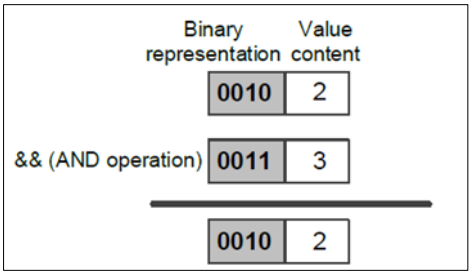
<table>
<tr><th>Expression</th><th colspan="2">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="5">Var1 = Var2 && Var3 (W)
Var1 = Var2 && Var3 (DW)</td><td>Var1</td><td>Result</td><td rowspan="5">W: Word
DW: Double Word</td></tr>
<tr><td>Var2</td><td>Logical Variable</td></tr>
<tr><td>Var3</td><td>Logical Variable</td></tr>
<tr><td colspan="2">Description of Action</td></tr>
<tr><td colspan="2">Execute AND operation on Var2 and Var3, and put the result in Var1.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



Example
● After converting the values of Var2 and Var3 into binary representations (2 = 0010 and 3 = 0011), execute AND logical operation on 0010 and 0010, and the result is 0010 which is also 2. 

● ^ (XOR Logical Operation)

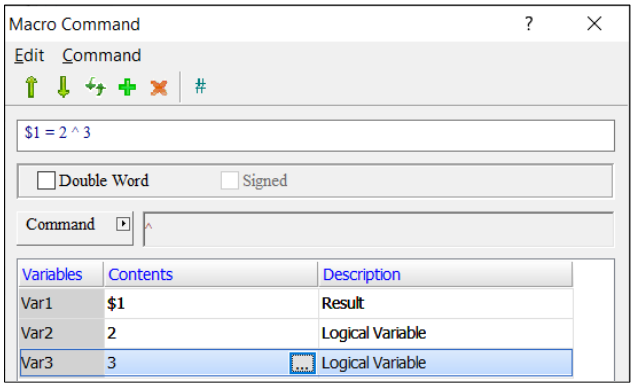
XOR Logical Operation feature	
Expression	Result
0 ^ 0	0
0 ^ 1	1
1 ^ 0	1
1 ^ 1	0

Expression	Meaning of Variable		Note
Var1 = Var2 ^ Var3 (W) Var1 = Var2 ^ Var3 (DW)	Var1	Result	W: Word DW: Double Word
	Var2	Logical Variable	
	Var3	Logical Variable	
	Description of Action		
	Execute XOR operation on Var2 and Var3, and put the result in Var1.		

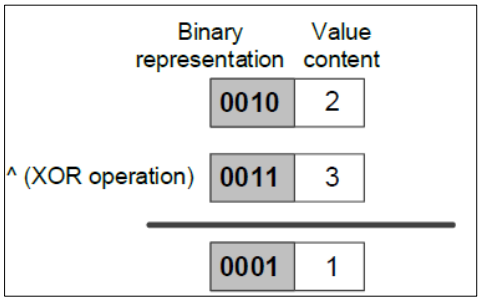
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- After converting the values of Var2 and Var3 into binary representations (2 = 0010 and 3 = 0011), execute XOR logical operation on 0010 and 0011, and the result is 0001 which is also 1.



- NOT (NOT Logical Operation)

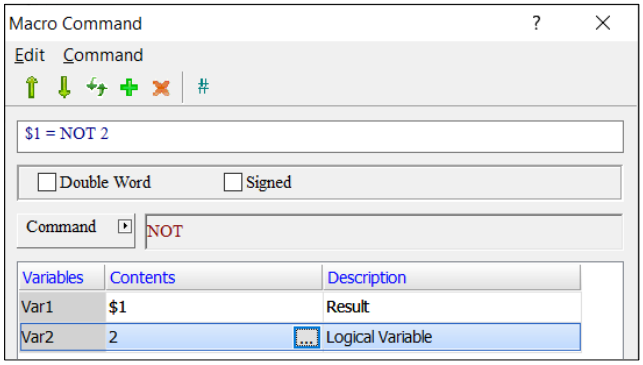
NOT Logical Operation feature	
Expression	Result
NOT 0	1
NOT 1	0

<table>
<tr><th>Expression</th><th colspan="2">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="4">Var1 = NOT Var2 (W)
Var1 = NOT Var2 (DW)
Var1 = NOT Var2 (Signed W)
Var1 = NOT Var2 (Signed DW)</td><td>Var1</td><td>Result</td><td rowspan="4">W: Word
DW: Double Word
Signed: Signed number</td></tr>
<tr><td>Var2</td><td>Logical Variable</td></tr>
<tr><td colspan="2">Description of Action</td></tr>
<tr><td colspan="2">Execute NOT operation on Var2, and put the result in Var1.</td></tr>
</table>

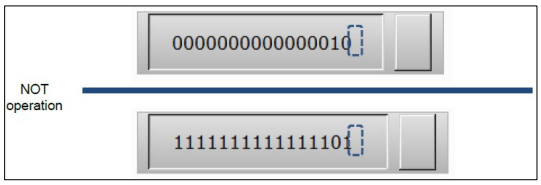
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example

- Var1 is the Internal Memory address and Var2 is a constant.



- After converting the value of Var2 into binary representation (2 = 0000000000000010), execute NOT 2 logical operation on 0000000000000010, and the result is 1111111111111101.



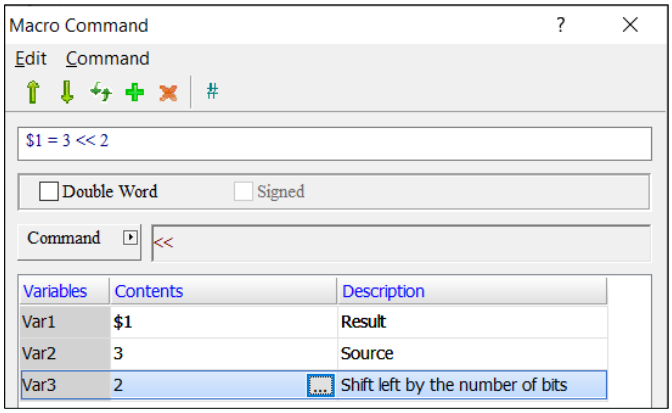
- << (SHL Left Shift Logical Operation)

Expression	Meaning of Variable		Note
Var1 = Var2 << Var3 (W) Var1 = Var2 << Var3 (DW)	Var1	Result	W: Word DW: Double Word
	Var2	Source	
	Var3	Shift left by the number of bits	
	Description of Action		
	Move the number of bits of Source Var2 to the left by Var3, and put the result in Var1.		

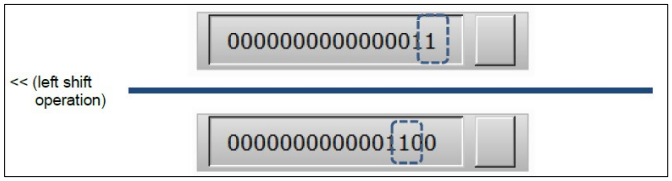
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- After converting the value of Var2 into binary representation (3 = 0000000000000011), execute the logical operation of << left shift by 2 bits on 0000000000000011, and the result is 0000000000001100.



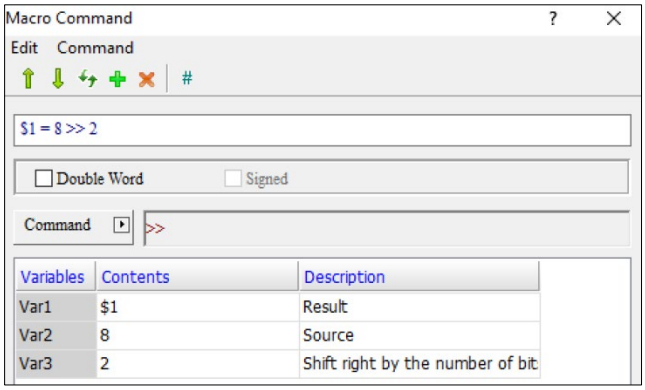
- >> (SHR Right Shift Logical Operation)

Expression	Meaning of Variable		Note
Var1 = Var2 >> Var3 (W) Var1 = Var2 >> Var3 (DW)	Var1	Result	W: Word DW: Double Word
	Var2	Source	
	Var3	Shift right by the number of bits	
	Description of Action		
	Move the number of bits of Source Var2 to the right by Var3, and put the result in Var1.		

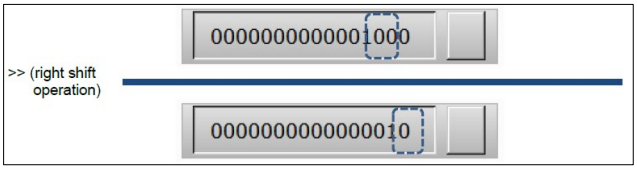
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- After converting the value of Var2 into binary representation (8 = 0000000000001000), execute the logical operation of >> right shift by 2 bits on 0000000000001000, and the result is 0000000000000010.



24.3.3 Data Transfer

Data transfer includes the following transfer commands, which are detailed as follows.

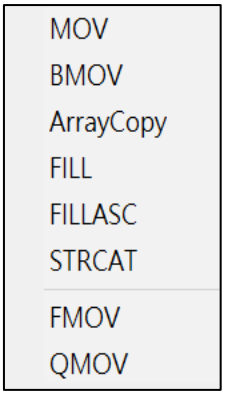
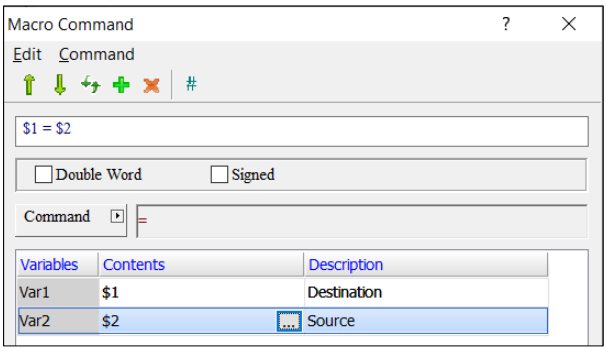
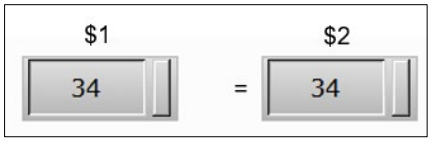


Figure 24 - 38: Data Transfer

- MOV (Data Specified Operand)

Expression	Content		Note
Var1 = Var2 (W) Var1 = Var2 (DW) Var1 = Var2 (Signed W) Var1 = Var2 (Signed DW)	Var1	Destination	W: Word DW: Double Word Signed: Signed number
	Var2	Source	
	Description of Action		
	Copy the source of Var2 to the Var1 destination, and Var2's source will not be changed due to the data specify command.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example
● Var1 and Var2 are Internal Memory addresses.    ● When the command $1 = $2 is executed, the Input value of $2 will be moved to $1. If the Input value of $2 is 34, $1 is 34. 

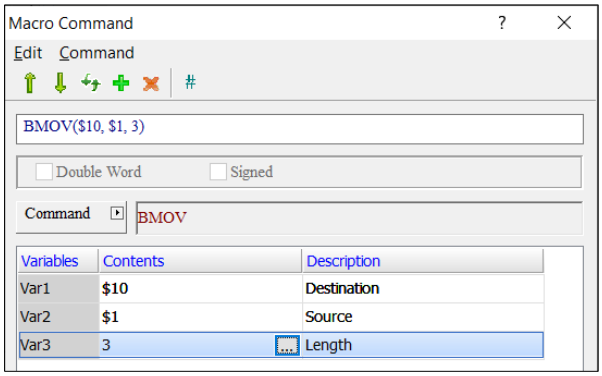
● BMOV (Copy Block)

Expression	Meaning of Variable		Note
BMOV(Var1, Var2, Var3)(W)	Var1	Destination	W: Word
	Var2	Source	
	Var3	Length (Word)	
	Description of Action		
	Copy Var3 data lengths from Var2 source to Var1 destination.		

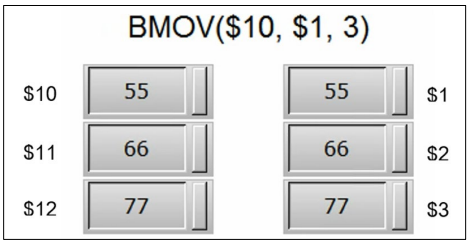
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Get the data of the three addresses starting from $1 and move the data to $10, so the Input value in $1, $2, and $3 are transferred to $10, $11, and $12 respectively.



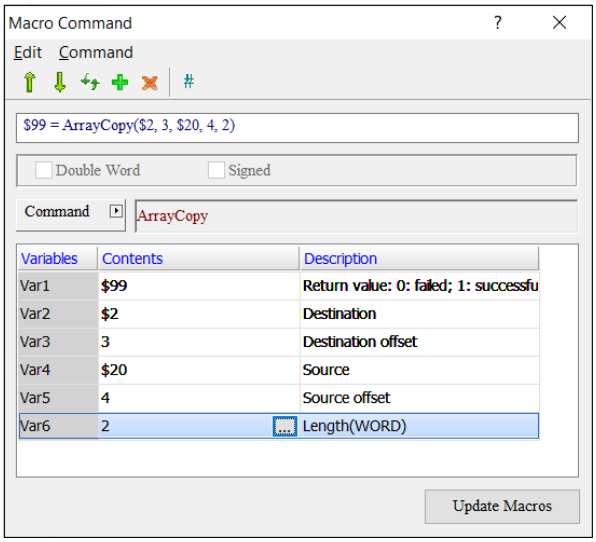
- ArrayCopy (Copy Array)

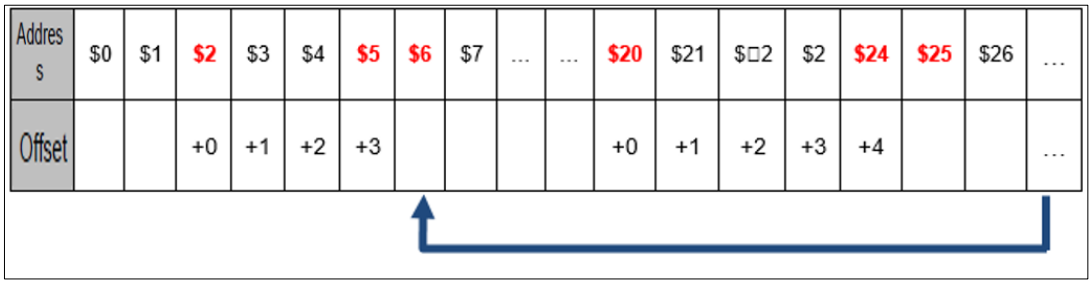
Expression	Meaning of Variable		
Var1 = ArrayCopy(Var2, Var3,Var4, Var5, Var6)	Var1	Return Value	
		Failed	0
		Succeeded	1
	Var2	Destination	
	Var3	Destination offset	
	Var4	Source	
	Var5	Source offset	
	Var6	Length (Word)	
	Description of Action		
	Copy a Continuous address data to another address.		

Variable	Type			
	Internal Memory	PLC Register	String	Constant
Var1	V			
Var2	V	V		
Var3	V	V		V
Var4	V	V		
Var5	V	V		V
Var6	V	V		V

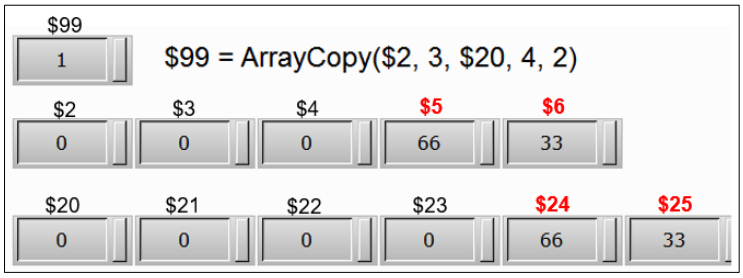
Example

- Var1, Var2, and Var4 are Internal Memory addresses, and Var3 and Var5 are constants.





- Copy the offset (4, address is $24) specified by the source address ($20) to the offset (3, address is $5) specified by the destination address ($2) and move 2 Words in length according to the start address determined by the offset, as shown in the following figure.

Example


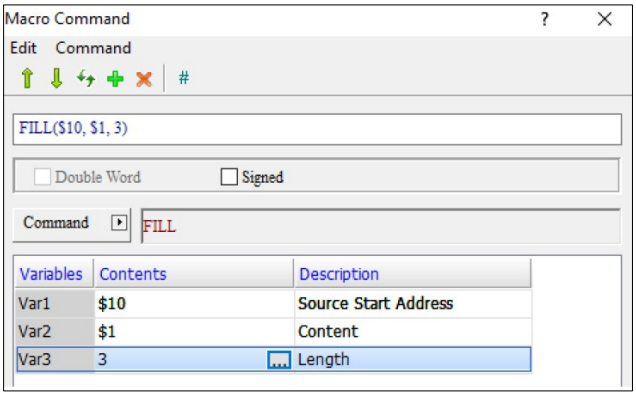
- FILL (Fill Block)

Expression	Meaning of Variable		Note
FILL(Var1, Var2, Var3) (W) FILL(Var1, Var2, Var3) (Signed W)	Var1	Destination Start Address	W: Word
	Var2	Source	
	Var3	Length	
	Description of Action		
	Store values of Var2 to the Var1 start address in sequence. The total length is Var3.		

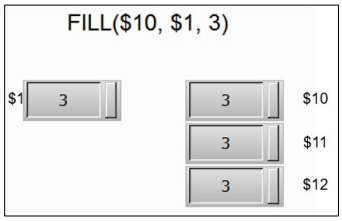
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- Save the input value of $1 for 3 data lengths in sequence to $10, $11, and $12.



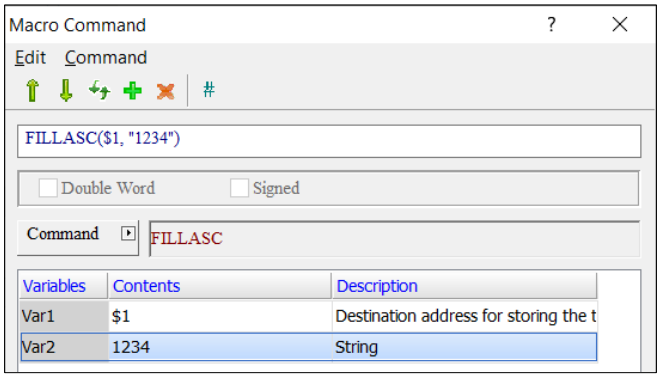
- FILLASC (Convert Text to ASCII Values)

Expression	Meaning of Variable		Note
FILLASC(Var1, "Var2") (W)	Var1	Destination address for storing string	W: Word
	Var2	String	
	Description of Action		
	Convert each character of Var2 string into an ASCII value, and put it in Var1 address.		

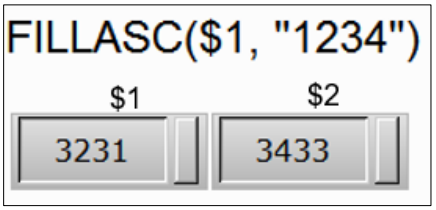
Variable	Type			
	Internal Memory	PLC Register	Constant	String
Var1	V	V		
Var2				V

Example

- Var1 is the Internal Memory address and Var2 is a string.



- The results after operation are $1 = 3231H and $2 = 3433H.



- STRCAT (Connection String)

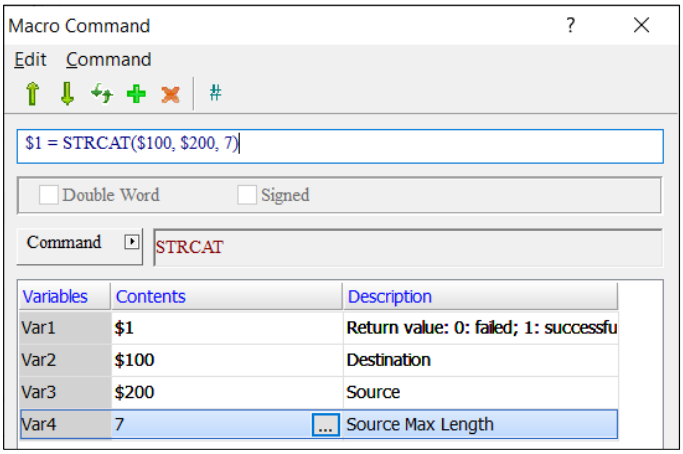
Expression	Meaning of Variable			Note
Var1 = STRCAT(Var2,Var3,Var4)	Var1	Return value		
		Failed	0	
		Succeeded	1	
	Var2	Destination		
	Var3	Source		
	Var4	Maximum length of the destination string (unit: Char)		
	Description of Action			
	Connect the source address string to the destination address string.			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		

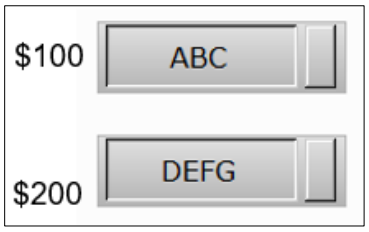
Variable	Type		
	Internal Memory	PLC Register	Constant
Var3	V		
Var4	V		V

Example

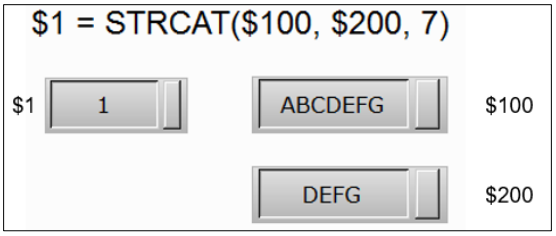
- Var1 is the Internal Memory address, Var2 and Var3 are strings, and Var4 is a constant.



- Create a **Numeric Entry** element with the address as $1 and create **Character Entry** elements of $100 and $200.
- After execution, enter the following values.

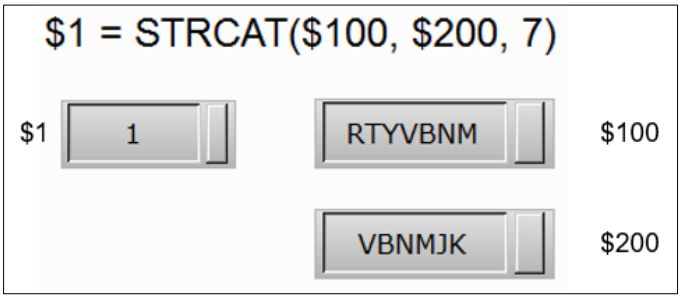


- After operation the results are $100 = ABCDEFG and $1 = 1.

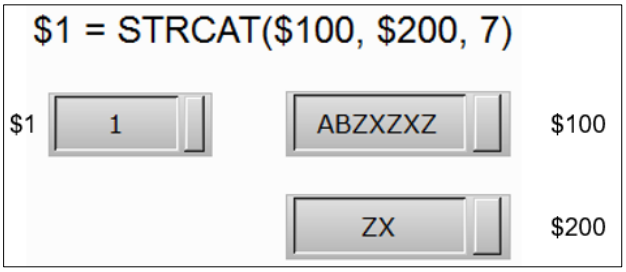


- A length of 7 indicates a maximum length of 7 characters in $100. If the connection string is more than 7 characters, only 7 characters will be displayed.

Example



- If the total length is less than 7 characters, it will be added to 7 characters for display.



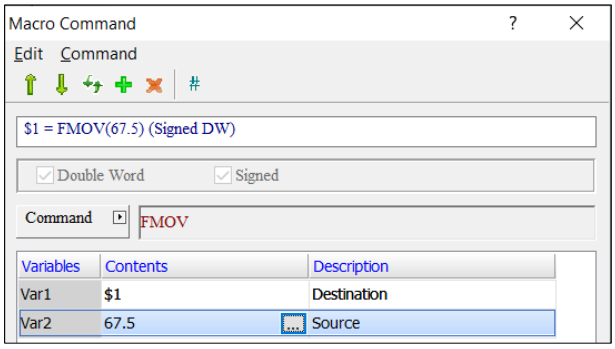
- FMOV (Specify Floating-Point Number Data)

Expression	Meaning of Variable		Note
Var1 = FMOV(Var2) (Signed DW)	Var1	Destination	DW: Double Word Signed: Signed number
	Var2	Source	
	Description of Action		
	Copy the floating-point number data of Var2 to Var1. The source data of Var2 will not be changed by the floating-point number data command.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example

- Var1 is the Internal Memory address and Var2 is a constant.



- Store the floating-point number data of 67.5 to $1, so $1 = 67.5.

24.3.4 Data Conversion

Data Conversion includes conversion of Data Format, Maximum and Minimum, and value data swap commands, which are explained in detail as follows.

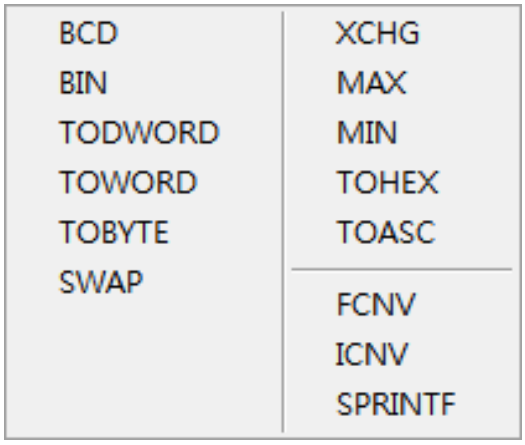


Figure 24 - 39: Data Conversion

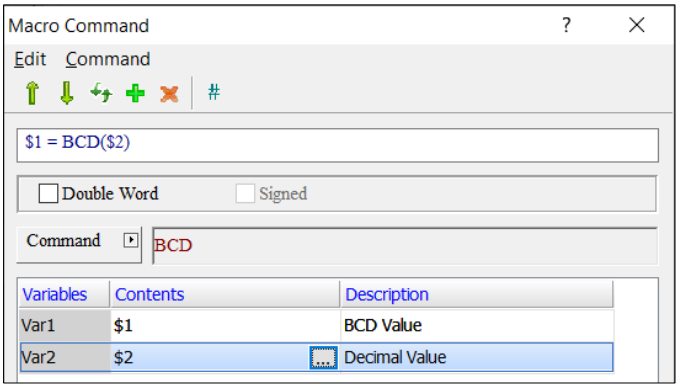
- BCD (Convert Decimal Values to BCD values)

Expression	Meaning of Variable		Note
Var1 = BCD(Var2) (W) Var1 = BCD(Var2) (DW)	Var1	BCD Value	W: Word DW: Double Word
	Var2	Decimal Value	
	Description of Action		
	Convert the decimal value in Var2 to the BCD format value, and put it in Var1.		

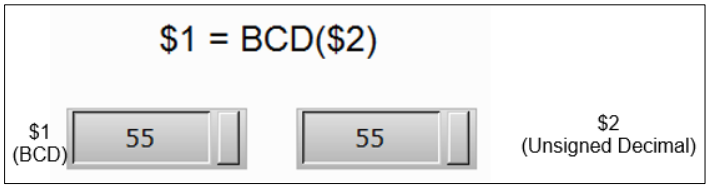
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert the decimal value of $2 to BCD and store it in $1.



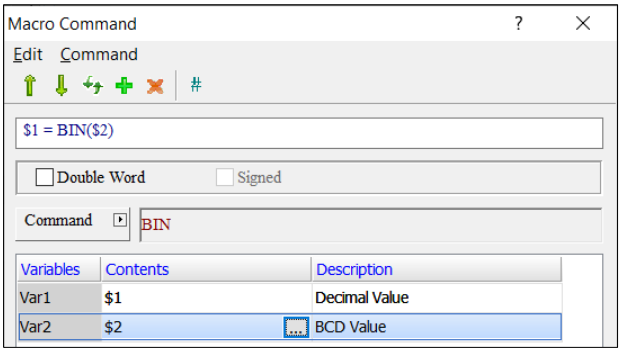
- BIN (Convert BCD Values to Decimal Values)

Expression	Meaning of Variable		Note
Var1 = BIN(Var2) (W) Var1 = BIN(Var2) (DW)	Var1	Decimal Value	W: Word DW: Double Word
	Var2	BCD Value	
	Description of Action		
	Convert the BCD format value in Var2 to a decimal value and put it in Var1.		

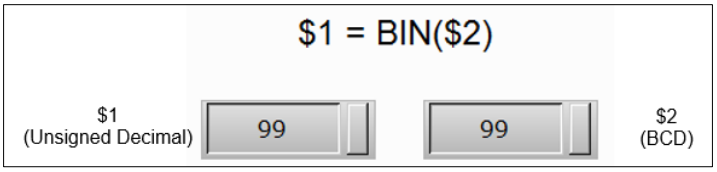
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert the BCD value format of $2 to decimal value format and save it in $1.



- TODWORD (Convert Values from Word to Double Word)

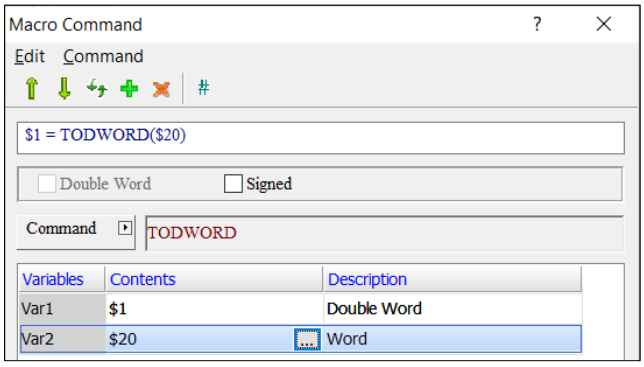
Expression	Meaning of Variable		Note
Var1 = TODWORD(Var2) (W)	Var1	Double Word	W: Word

Expression	Meaning of Variable		Note
Var1 = TODWORD(Var2) (Signed W)		value	Signed: Signed number
	Var2	Word value	
	Description of Action		
	Convert the Word format value in Var2 to the Double Word value and put it in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert the Word value of $20 to Double Word value and store it in $1. Because the value has been converted to Double Word format, it actually occupies two addresses, $1 and $2

- TOWORD (Convert Values from Byte to Word)

Expression	Meaning of Variable		Note
Var1 = TOWORD(Var2, Var3) (W)	Var1	Word value	W: Word
	Var2	Source Start Address	
	Var3	Length	
	Description of Action		

Expression	Meaning of Variable	Note
	Starting from Var2 start address, convert a continuous Var3 bytes to Word value and save the result in Var1. Add 0 for the high byte of each Var1.	

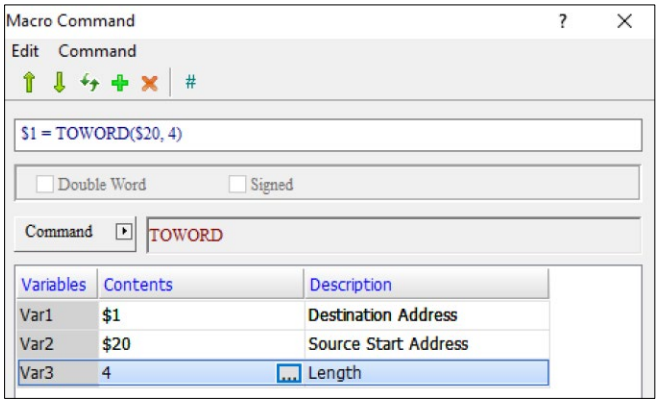
NOTE:

1. *Since the unit of Var2 is Word, each Word of Var2 can be converted into 2 Words.*
2. *After data conversion, the high and low bytes of Word will be swapped.*

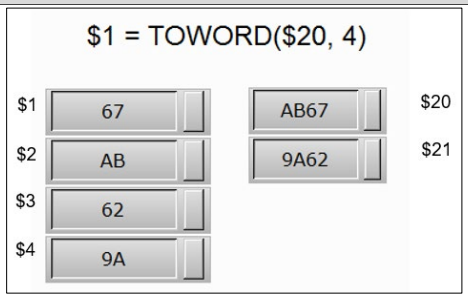
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Convert a continuous 4 bytes from $20 to Word value and put it in $1.
- The Data Format of $1 and $20 is set to Hex.
- Suppose $20 = AB67H and $21 = 9A62H, read 4 bytes of data in $20 with the TOWORD command and put them in $1, $2, $3, and $4. Accordingly, the data obtained are $1 = 67H, $2 = ABH, $3 = 62H, and $4 = 9AH.

Example


- TOBYTE (Convert Values from Word to Byte)

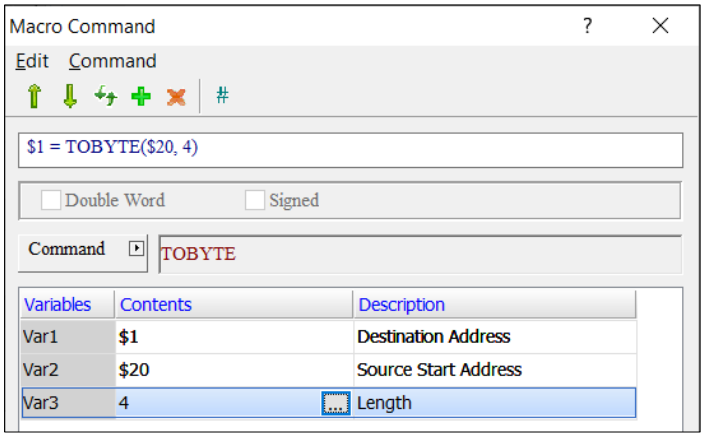
Expression	Meaning of Variable		Note
Var1 = TOBYTE(Var2, Var3) (W)	Var1	BYTE Value	W: Word
	Var2	Source Start Address	
	Var3	Length	
	Description of Action		
	Starting from the low byte of Var2, convert a continuous Var3 Words to byte values and ignore the high byte of Var2. The result is saved in Var1.		

NOTE: *After data conversion, the high and low bytes of Word will be swapped.*

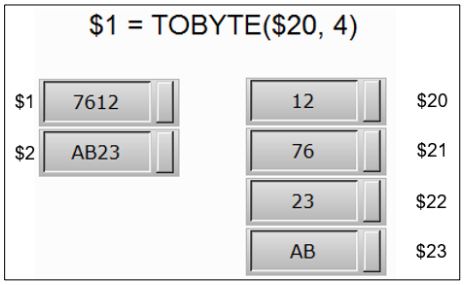
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Convert a continuous 4 Words from $20 to byte value and put it in $1.
- The Data format of $1 and $20 is set to Hex.
- Suppose $20 = 12H, $21 = 76H, $22 = 23H, and $23 = ABH, read 4 Words of data in $20 with the
- TOBYTE command and put them in $1 and $2. Accordingly, the data obtained are $1 = 7612H and $2 = AB23H.



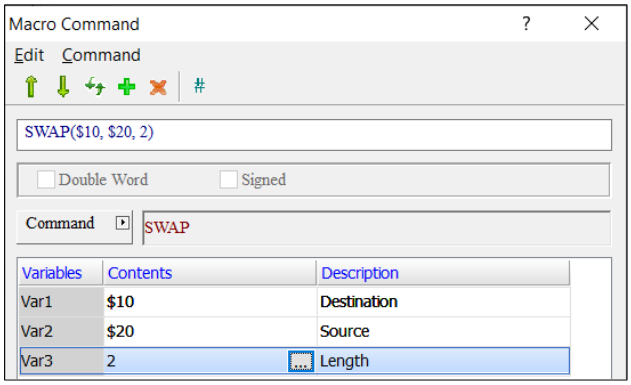
- SWAP (Swap High and Low Bytes of Word)

Expression	Meaning of Variable		Note
SWAP(Var1, Var2, Var3) (W)	Var1	Destination Start Address	W: Word
	Var2	Source Start Address	
	Var3	Length	
	Description of Action		
	Convert Var3 lengths from Var2 start address and swap high and low bytes of Var2 Word data to Var1.		

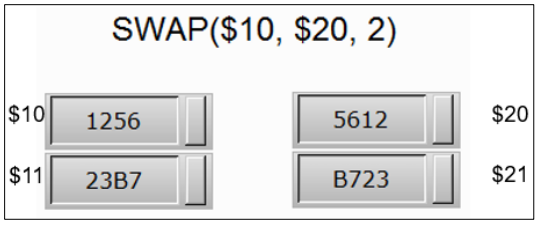
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Swap high and low bytes of the value in $20, and put them in $10. Exchange 2 data lengths of values.
- The Data format of $10 and $20 is set to Hex.
- Suppose $20 = 5612H and $21 = B723H, swap high and low bytes of the data in $20 with the
- SWAP command and put them in $10 and $11. Accordingly, the data obtained are $10 = 1256H and $11 = 23B7H.



- XCHG (Exchange Value Data)

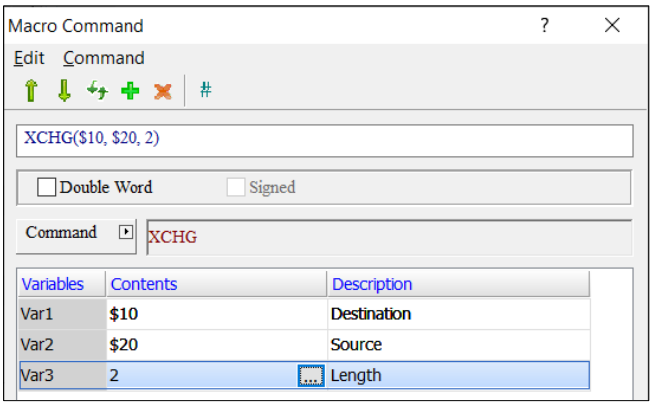
Expression	Meaning of Variable		Note
XCHG(Var1, Var2, Var3) (W) XCHG(Var1, Var2, Var3) (DW)	Var1	Destination Start Address	W: Word DW: Double Word
	Var2	Source Start Address	

Expression	Meaning of Variable		Note
	Var3	Length	
	Description of Action		
	Exchange Var2 start address data to Var1 destination start address according to Var3 lengths.		

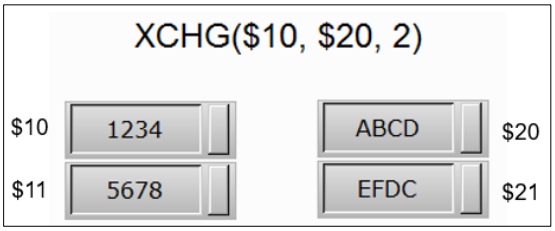
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Exchange 2 data lengths of values in $20 and $10.
- The Data Formats of $10 and $27 is set to Hex.
- Suppose $20 = 1234H, $21 = 5678H, $10 = ABCDH, and $11 = EFDCH, exchange the data in $20 and $21 with the data in $10 and $11 with the XCHG command. Accordingly, the data obtained are $20 = ABCDH, $21 = EFDCH, $10 = 1234H, and $11 = 5678H.



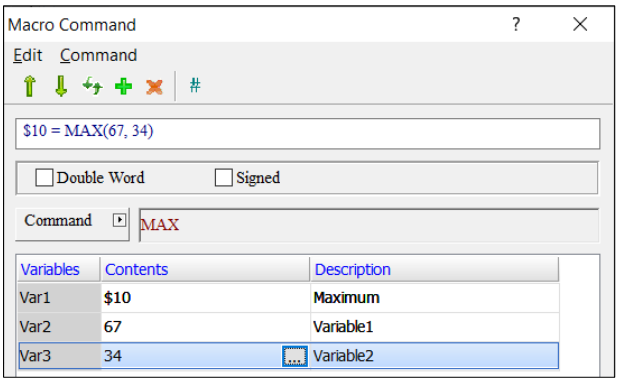
- MAX (Get Maximum)

Expression	Meaning of Variable		Note
Var1 = MAX(Var2, Var3) (W) Var1 = MAX(Var2, Var3) (DW) Var1 = MAX(Var2, Var3) (Signed W) Var1 = MAX(Var2, Var3) (Signed DW)	Var1	Maximum	W: Word DW: Double Word
	Var2	Variable1	
	Var3	Variable2	
	Description of Action		
	Take the maximum value of Var2 and Var3, and put it in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V
Var3	V		V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- Enter the Maximum value of 67 and 34 in $1, so $1 = 67.

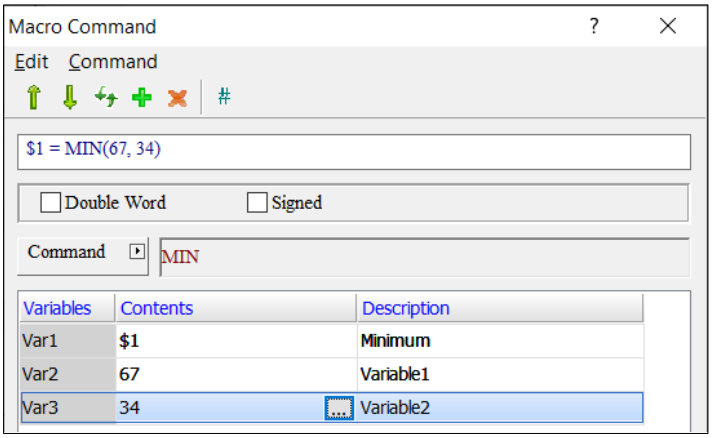
- MIN (Get Minimum)

Expression	Meaning of Variable		Note
Var1 = MIN(Var2, Var3) (W) Var1 = MIN(Var2, Var3) (DW) Var1 = MIN(Var2, Var3) (Signed W) Var1 = MIN(Var2, Var3) (Signed DW)	Var1	Minimum	W: Word DW: Double Word
	Var2	Variable1	
	Var3	Variable2	
	Description of Action		
	Take the minimum value of Var2 and Var3 and put it in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V
Var3	V		V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- Put the Minimum value of 67 and 34 in $1, so $1 = 34.

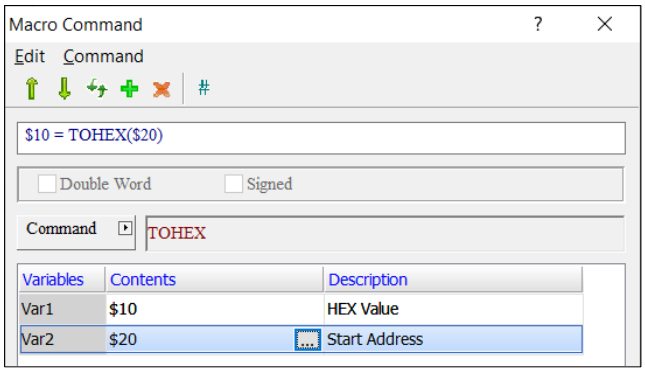
- TOHEX (Convert 4 ASCII Characters to HEX)

<table>
<tr><th>Expression</th><th colspan="2">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="4">Var1 = TOHEX(Var2) (W)</td><td>Var1</td><td>HEX Value</td><td rowspan="4">W: Word</td></tr>
<tr><td>Var2</td><td>ASCII Start Address</td></tr>
<tr><td colspan="2">Description of Action</td></tr>
<tr><td colspan="2">Convert 4 ASCII characters of WORD to HEX from Var2 and put it in Var1.</td></tr>
</table>

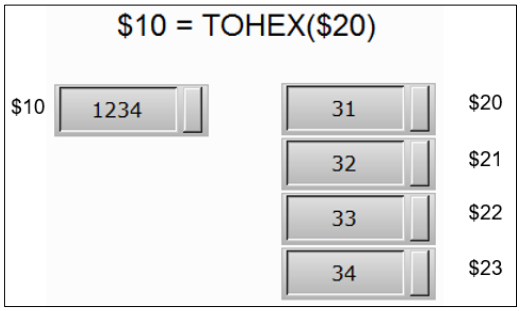
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert 4 consecutive ASCII characters of Word from the Start Address of $20 to HEX value and put it in $10.
- The Data Format of $10 and $20 is set to Hex.
- Suppose $20 = 31H, $21 = 32H, $22 = 33H, and $23 = 34H, convert ASCII characters in $20, $21, $22, and $23 to HEX with the TOHEX command and put it in $10. Accordingly, the data obtained is $10 = 1234H.

Example


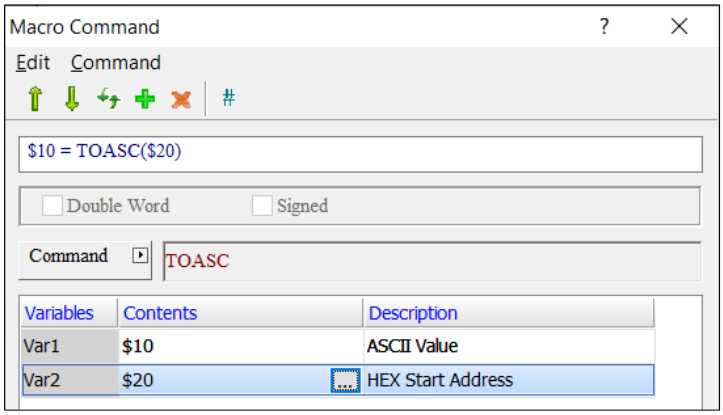
- TOASC (Convert HEX to 4 ASCII Characters of Word)

Expression	Meaning of Variable		Note
Var1 = TOASC(Var2) (W)	Var1	ASCII Value	W: Word
	Var2	HEX Start Address	
	Description of Action		
	Convert HEX from the address of Var2 to 4 ASCII characters of WORD and put them in Var1.		

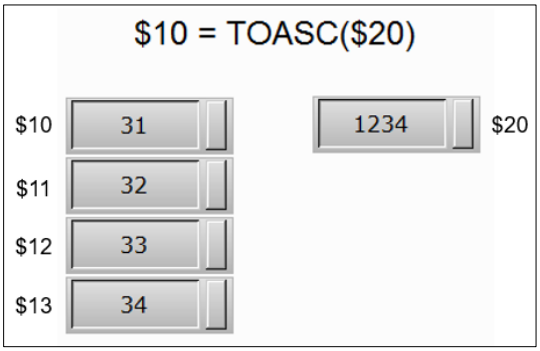
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert HEX value of $20 into 4 consecutive ASCII characters of Word and put them in $10.
- The Data format of $10 and $20 is set to Hex.
- Suppose $20 = 1234H, convert HEX in $20 into ASCII characters with the TOASC command and put them in $10, $11, $12, and $13. Accordingly, the data obtained are $10 = 31H, $11 = 32H, $12 = 33H, and $13 = 34H.



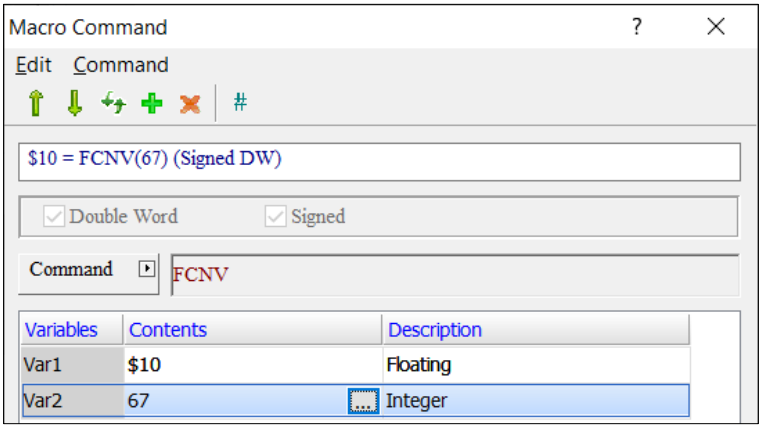
- FCNV (Convert Integer to Floating-Point Number)

Expression	Meaning of Variable		Note
Var1 = FCNV(Var2) (Signed DW)	Var1	Floating	DW: Double Word Signed: Signed number
	Var2	Integer	
	Description of Action		
	Convert the integer in Var2 to floating-point number and put it in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert the integer value of 67 to a floating-point value and put it in $10.
- The Data format set for $10 is Floating and the Data Type is Double Word.
- The result after the HMI operation is $10 = 67.0.

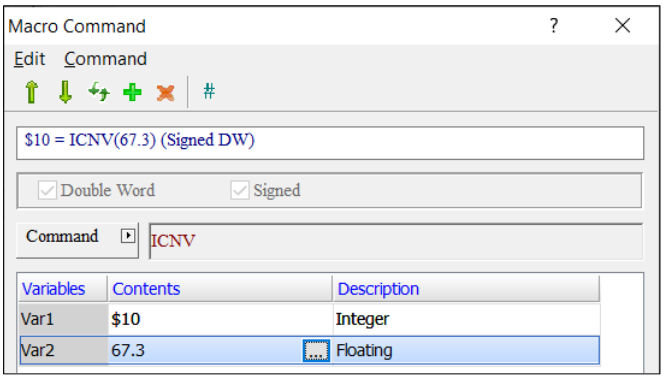
- ICNV (Convert Floating-Point Number to Integer)

Expression	Meaning of Variable		Note
Var1 = ICNV(Var2) (Signed DW)	Var1	Integer	DW: Double Word Signed: Signed number
	Var2	Floating	
	Description of Action		
	Convert the floating-point number in Var2 to integer and put it in Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.



- Convert the floating-point value of 67.3 into an integer value and put it in $10.
- The Data format set for $10 is Unsigned Decimal, and the Data Type is Word.
- After the HMI operation, the result is $10 = 67.

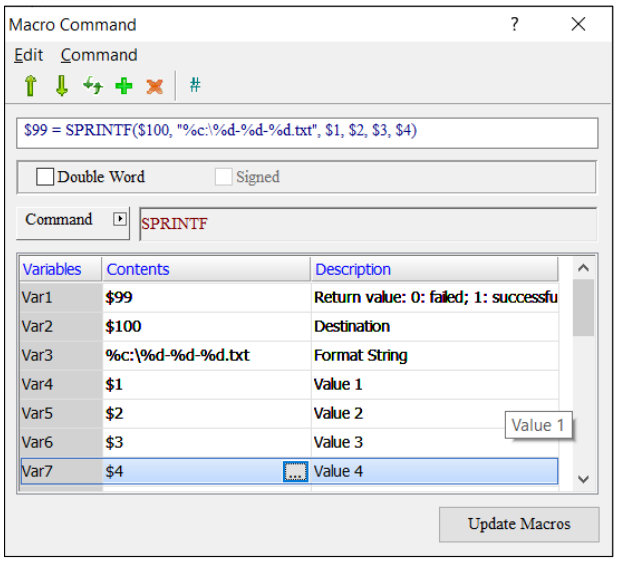
- SPRINTF (Format String)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="11">Var1 = SPRINTF (Var2, "%u", Var4) (DW)
Var1 = SPRINTF (Var2, "%u", Var4, …, Var23) (DW) (Note2)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="11">DW = Double Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">Enter destination address of string</td></tr>
<tr><td>Var3</td><td colspan="2">Format description string (Note 1)</td></tr>
<tr><td>Var4</td><td colspan="2">Value 1</td></tr>
<tr><td>…</td><td colspan="2">…</td></tr>
<tr><td>Var23</td><td colspan="2">Value 20</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Connect the values according to Var2 format description string and fill in the destination address.</td></tr>
<tr><td colspan="5">NOTE:
1. The supporting string formats are as follows:
%d: signed integer</td></tr>
</table>

Expression	Meaning of Variable	Note
%u: unsigned integer *%c: ASCII character* *%x: hexadecimal value* 2. *Support up to 20 numeric variables.* 3. *The number of the parameters of variable conversion in the string contents should be consistent with the number of values.*		

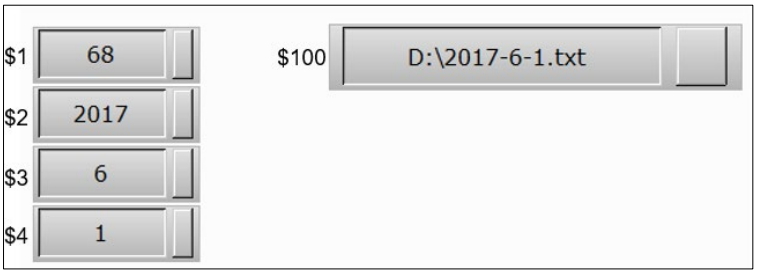
Variable	Type			
	Internal Memory	PLC Register	String	Constant
Var1	V			
Var2	V	V		
Var3			V	
Var4	V	V		V
…	…	…		…
Var23	V	V		V

Example



- Create a **Character Entry** element, set the address as $100, and set the length as 20.
- Create **Numeric Entry** elements of $1, $2, $3, and $4.
- After downloading the screen to the HMI, enter $1 = 68 (representing D in ASCII code), $2 = 2017, $3 = 6, and $4 = 1 on the HMI. The results are as follows.

Example



24.3.5 Comparison

Comparison contains IF... THEN GOTO, IF... THEN CALL, IF…, ELSEIF… and other comparison commands, as detailed as follows.

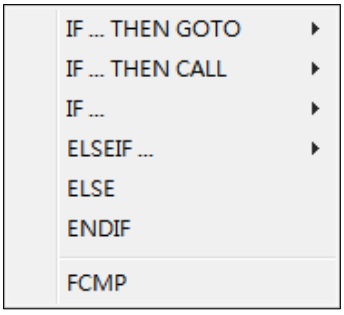


Figure 24 - 40: Comparison

- The nested structure of IF... supports up to 7 layers.

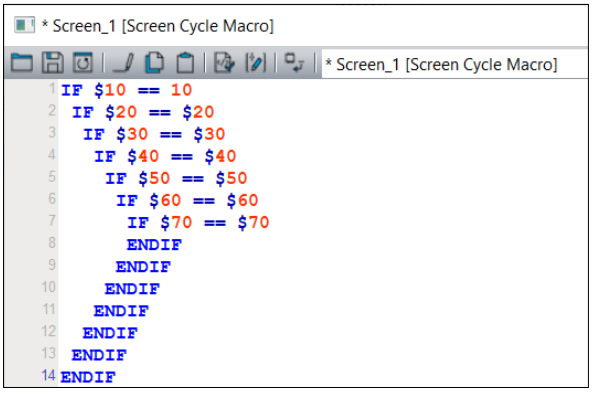


Figure 24 - 41: IF Support

- IF... THEN GOTO (if..., then execute according to the specified label name)

IF ==	IF AND == 0
IF !=	IF AND != 0
IF >	IF == ON
IF >=	IF == OFF
IF <	IFB == ON
IF <=	IFB == OFF

The following describes the 12 commands of the IF... THEN GOTO macro.

(1) IF ==			
Expression	Meaning of Variable		Note
IF Var1 == Var2 THEN GOTO LABEL Var3 (W) IF Var1 == Var2 THEN GOTO LABEL Var3 (DW) IF Var1 == Var2 THEN GOTO LABEL Var3 (Signed W) IF Var1 == Var2 THEN GOTO LABEL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label Name	
	Description of Action		
	If Condition1 equals Condition2, then GOTO executes LABEL Var3.		

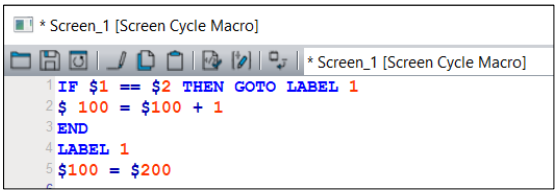
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



Example



- If the value of $1 equals $2, execute LABEL1 ($100 = $200); if $1 does not equal $2, then execute $100 = $100 + 1.

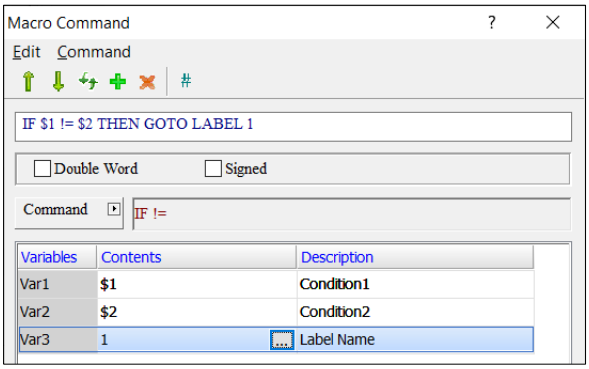
(2) IF !=

Expression	Meaning of Variable		Note
IF Var1 != Var2 THEN GOTO LABEL Var3 (W) IF Var1 != Var2 THEN GOTO LABEL Var3 (DW) IF Var1 != Var2 THEN GOTO LABEL Var3 (Signed W) IF Var1 != Var2 THEN GOTO LABEL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label Name	
	Description of Action		
	If Condition1 does not equal Condition2, then GOTO executes LABEL Var3.		

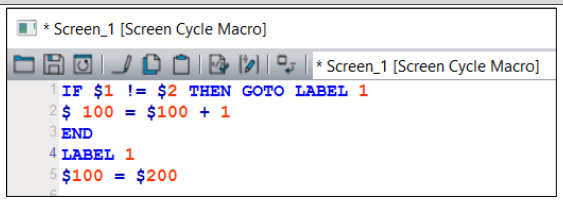
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



Example



- If the value of $1 does not equal $2, execute LABEL1 ($100 = $200); if $1 equals $2, then execute $100 = $100 + 1.

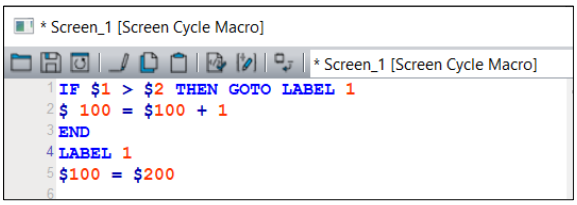
(3) IF >			
Expression	Meaning of Variable		Note
IF Var1 > Var2 THEN GOTO LABEL Var3 (W) IF Var1 > Var2 THEN GOTO LABEL Var3 (DW) IF Var1 > Var2 THEN GOTO LABEL Var3 (Signed W) IF Var1 > Var2 THEN GOTO LABEL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label index name	
	Description of Action		
	If Condition1 is greater than Condition2, then GOTO executes LABEL Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.





- If the value of $1 is greater than $2, execute LABEL1 ($100 = $200); if $1 is less than or equal to $2, then execute $100 = $100 + 1.

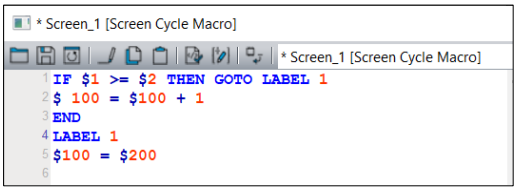
(4) IF >=			
Expression	Meaning of Variable		Note
IF Var1 >= Var2 THEN GOTO LABEL Var3 (W) IF Var1 >= Var2 THEN GOTO LABEL Var3 (DW) IF Var1 >= Var2 THEN GOTO LABEL Var3 (Signed W) IF Var1 >= Var2 THEN GOTO LABEL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 is greater than or equal to Condition 2, then GOTO executes LABEL Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.





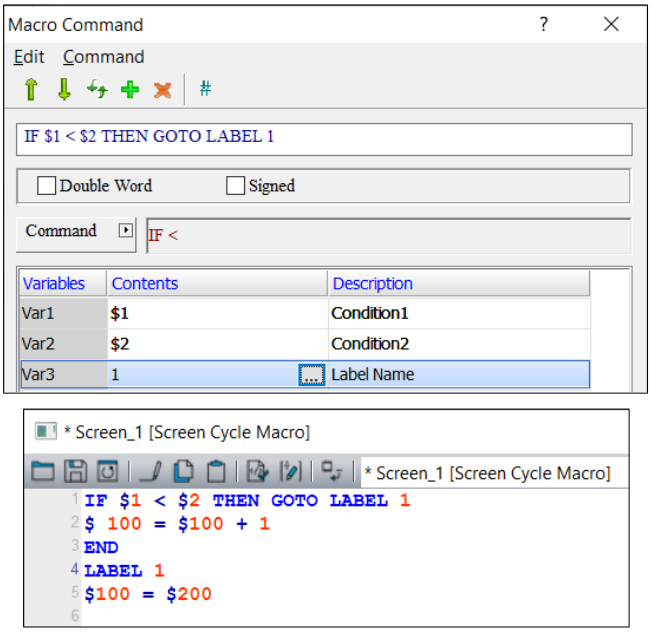
- If the value of $1 is greater than or equal to $2, execute LABEL1 ($100 = $200); if $1 is less than $2, then execute $100 = $100 + 1.

(5) IF <			
Expression	Meaning of Variable		Note
IF Var1 < Var2 THEN GOTO LABEL Var3 (W) IF Var1 < Var2 THEN GOTO LABEL Var3 (DW) IF Var1 < Var2 THEN GOTO LABEL Var3 (Signed W) IF Var1 < Var2 THEN GOTO LABEL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 is less than Condition2, then GOTO executes LABEL Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

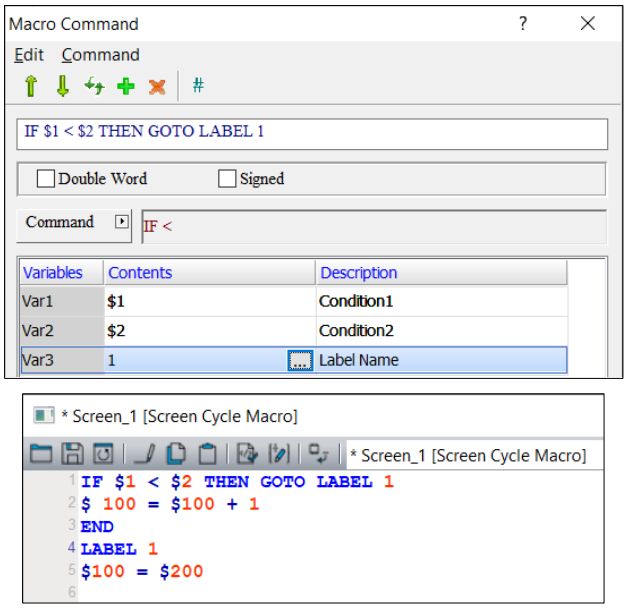
- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- If the value of $1 is less than $2, execute LABEL1 ($100 = $200); If $1 is greater than or equal to $2, execute $100 = $100 + 1.

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



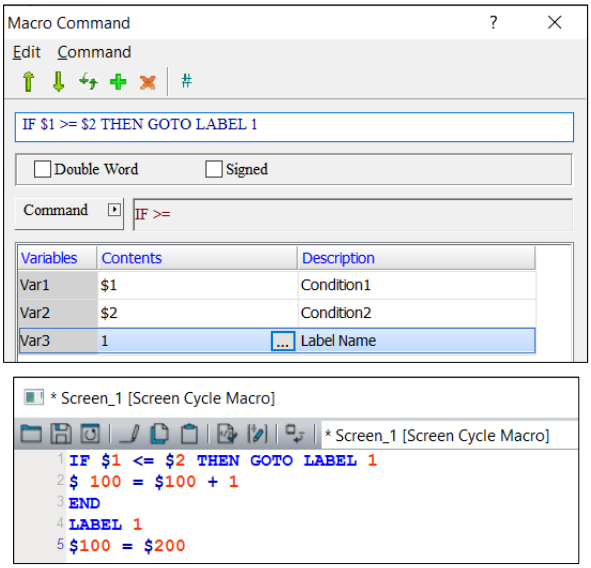
- If the value of $1 is less than $2, execute LABEL1 ($100 = $200); If $1 is greater than or equal to $2, execute $100 = $100 + 1.

(6) IF <=			
Expression	Meaning of Variable		Note
IF Var1 <= Var2 THEN GOTO LABEL Var3 (W) IF Var1 <= Var2 THEN GOTO LABEL Var3 (DW) IF Var1 <= Var2 THEN GOTO LABEL Var3 (Signed W) IF Var1 <= Var2 THEN GOTO LABEL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 is less than or equal to Condition2, then GOTO executes LABEL Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



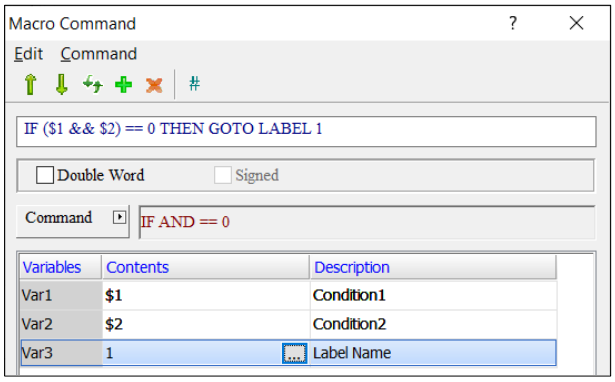
- If the value of $1 is less than or equal to $2, execute LABEL1 ($100 = $200); if $1 is greater than $2, then execute $100 = $100 + 1.

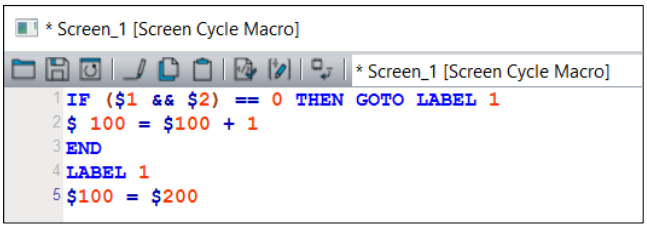
(7) IF AND == 0			
Expression	Meaning of Variable		Note
IF (Var1 && Var2) == 0 THEN GOTO LABEL Var3 (W) IF (Var1 && Var2) == 0 THEN GOTO LABEL Var3 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If the result of AND operation on Condition1 and Condition2 is 0, then GOTO executes LABEL Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.





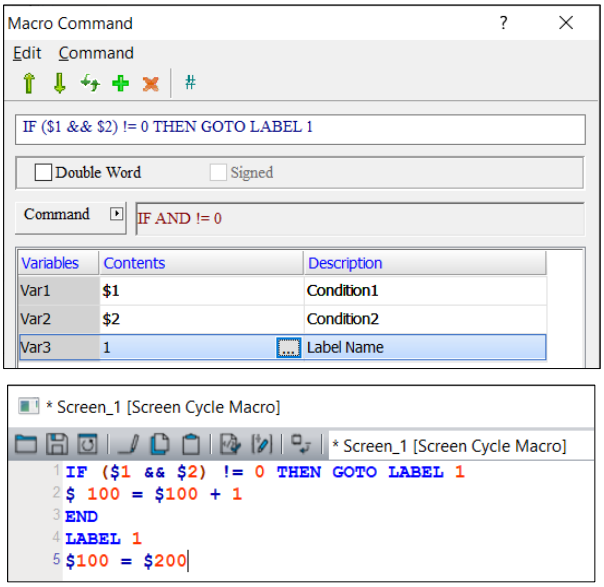
- If the result of AND operation on $1 and $2 is 0, execute LABEL1 ($100 = $200); if the result of AND operation on $1 and $2 is not 0, then execute $100 = $100 + 1.

(8) IF AND != 0			
Expression	Meaning of Variable		Note
IF (Var1 && Var2) != 0 THEN GOTO LABEL Var3 (W) IF (Var1 && Var2) != 0 THEN GOTO LABEL Var3 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If the result after AND operation on Condition1 and Condition2 is not 0, then GOTO executes LABEL Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



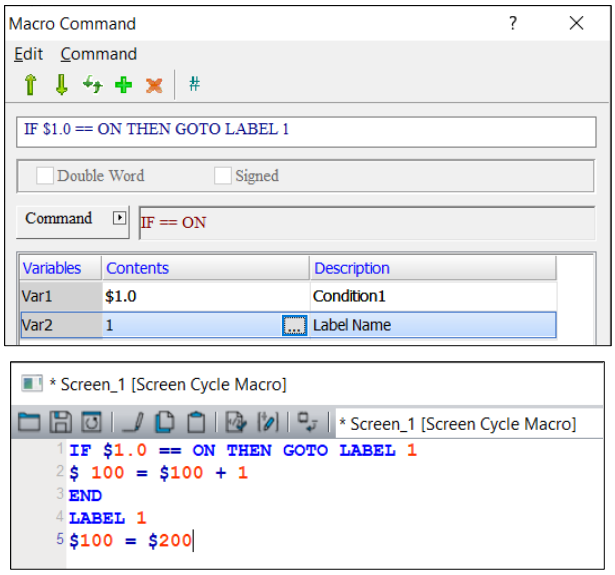
- If the result of AND operation on $1 and $2 is not 0, execute LABEL1 ($100 = $200); if the result of AND operation on $1 and $2 is 0, then execute $100 = $100 + 1.

(9) IF == ON			
Expression	Meaning of Variable		Note
IF Var1 == ON THEN GOTO LABEL Var2 (W)	Var1	Condition1	W: Word
	Var2	Label name	
	Description of Action		
	If Condition1 is ON, then GOTO executes LABEL Var2.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		
Var2			V

Example

- Var1 is the Internal Memory address and Var2 is a constant.



- If $1.0 is ON, execute LABEL1 ($100 = $200); if $1.0 is not ON, then execute $100 = $100 + 1.

(10) IF == OFF			
Expression	Meaning of Variable		Note
IF Var1 == OFF THEN GOTO LABEL Var2 (W)	Var1	Condition1	W: Word
	Var2	Label name	

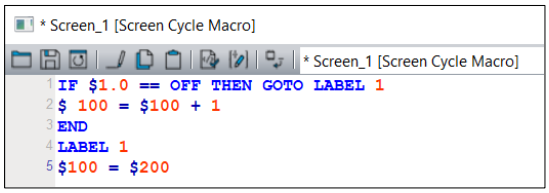
(10) IF == OFF		
Expression	Meaning of Variable	Note
	Description of Action	
	If Condition1 is OFF, then GOTO executes LABEL Var2.	

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		
Var2			V

Example

- Var1 is the Internal Memory address and Var2 is a constant.





- If $1.0 is OFF, execute LABEL1 ($100 = $200); if $1.0 is not OFF, then execute $100 = $100 + 1.

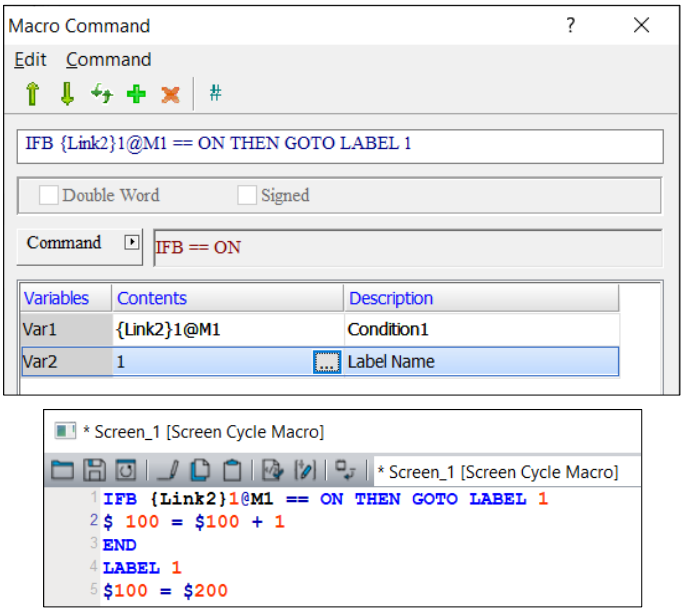
(11) IFB == ON			
Expression	Meaning of Variable		Note
IFB Var1 == ON THEN GOTO LABEL Var2 (W)	Var1	Condition1	W: Word
	Var2	Label name	
	Description of Action		
	If Condition1 is ON, then GOTO executes LABEL		

(11) IFB == ON		
Expression	Meaning of Variable	Note
	Var2.	
NOTE: *For the IFB == ON command, its Bit address of Var1 can support the setting of external PLC Register.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)	V (can only be Bit)	
Var2			V

Example

- Var1 is the address of PLC Register and Var2 is a constant.



- If M1 is ON, execute LABEL1 ($100 = $200); if M1 is not ON, then execute $100 = $100 + 1.

(12) IFB == OFF			
Expression	Meaning of Variable		Note
IFB Var1 == OFF THEN GOTO LABEL Var2 (W)	Var1	Condition1	W: Word
	Var2	Label name	
	Description of Action		
	If Condition 1 is OFF, then GOTO executes		

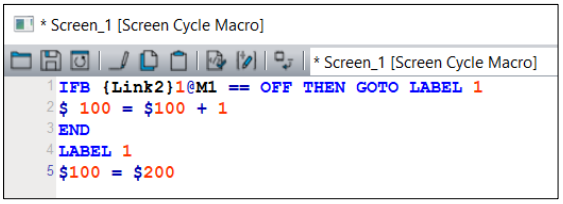
(12) IFB == OFF		
Expression	Meaning of Variable	Note
	LABEL Var2.	
***NOTE:** For the IFB == OFF command, its Bit address of Var1 can support the setting of external PLC Register.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)	V (can only be Bit)	
Var2			V

Example

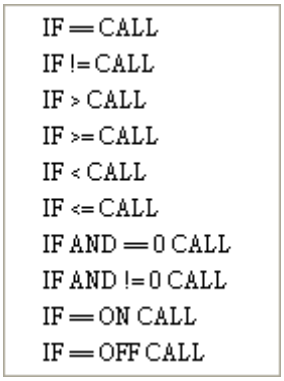
- Var1 is the address of PLC Register and Var2 is a constant.





- If M1 is OFF, execute LABEL1 ($100 = $200); if M1 is not OFF, then execute $100 = $100 + 1.

- IF… THEN CALL (If…call submacro)



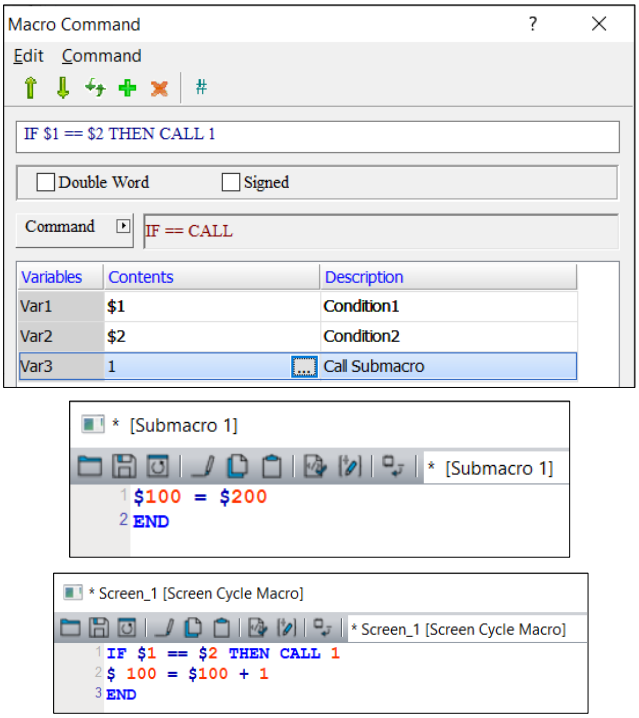
The following describes the 10 commands of the IF... THEN CALL macro.

<table>
<tr><th colspan="4">(1) IF ==</th></tr>
<tr><th>Expression</th><th colspan="2">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="6">IF Var1 == Var2 THEN CALL Var3 (W)
IF Var1 == Var2 THEN CALL Var3 (DW)
IF Var1 == Var2 THEN CALL Var3 (Signed W)
IF Var1 == Var2 THEN CALL Var3 (Signed DW)</td><td>Var1</td><td>Condition1</td><td rowspan="6">W: Word
DW: Double Word
Signed: Signed number</td></tr>
<tr><td>Var2</td><td>Condition2</td></tr>
<tr><td>Var3</td><td>Label name</td></tr>
<tr><td colspan="2">Description of Action</td></tr>
<tr><td colspan="2">If Condition1 equals Condition2, then call Submacro Var3.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



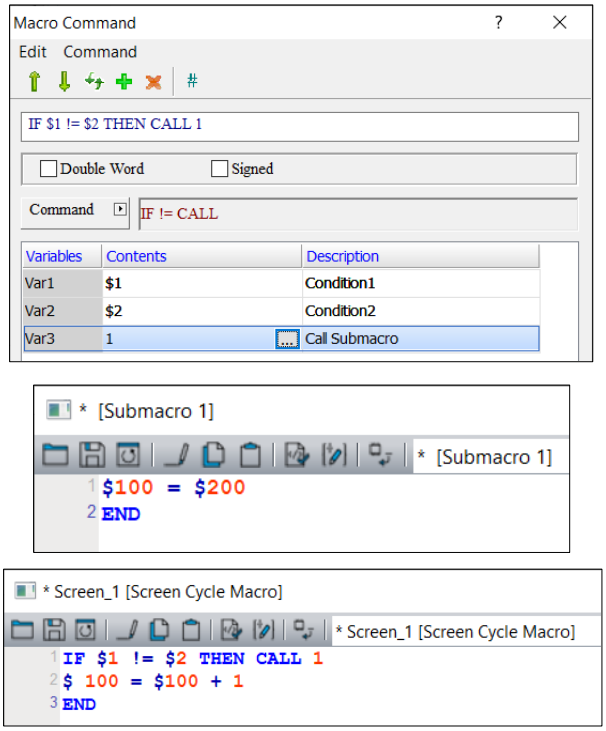
- If the value of $1 equals $2, call Submacro 1 ($100 = $200); if $1 does not equal $2, then execute $100 = $100 + 1.

(2) IF !=			
Expression	Meaning of Variable		Note
IF Var1 != Var2 THEN CALL Var3 (W) IF Var1 != Var2 THEN CALL Var3 (DW) IF Var1 != Var2 THEN CALL Var3 (Signed W) IF Var1 != Var2 THEN CALL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 does not equal Condition2, call Submacro Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



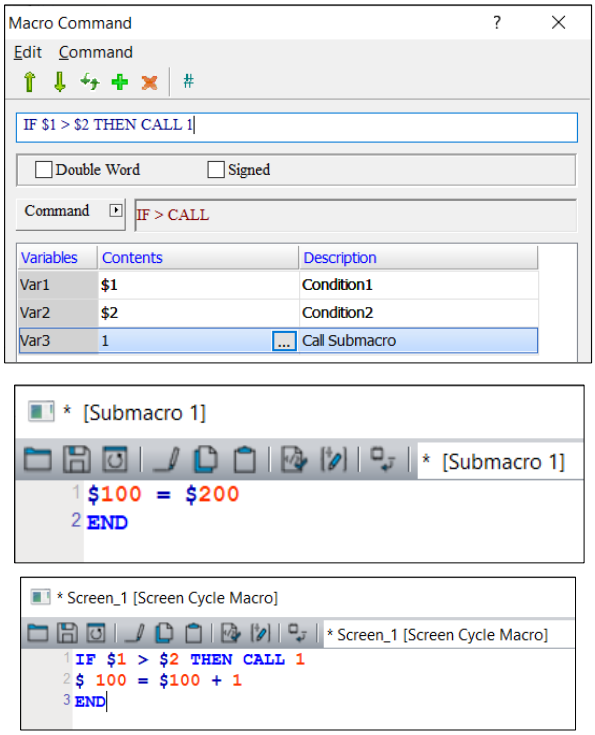
- If the value of $1 equals $2, call Submacro 1 ($100 = $200); if $1 does not equal $2, then execute $100 = $100 + 1.

(3) IF >			
Expression	Meaning of Variable		Note
IF Var1 > Var2 THEN CALL Var3 (W) IF Var1 > Var2 THEN CALL Var3 (DW) IF Var1 > Var2 THEN CALL Var3 (Signed W) IF Var1 > Var2 THEN CALL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 does not equal Condition2, call Submacro Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- If the value of $1 is greater than $2, call Submacro 1 ($100 = $200); if $1 is less than or equal to $2, then execute $100 = $100 + 1.

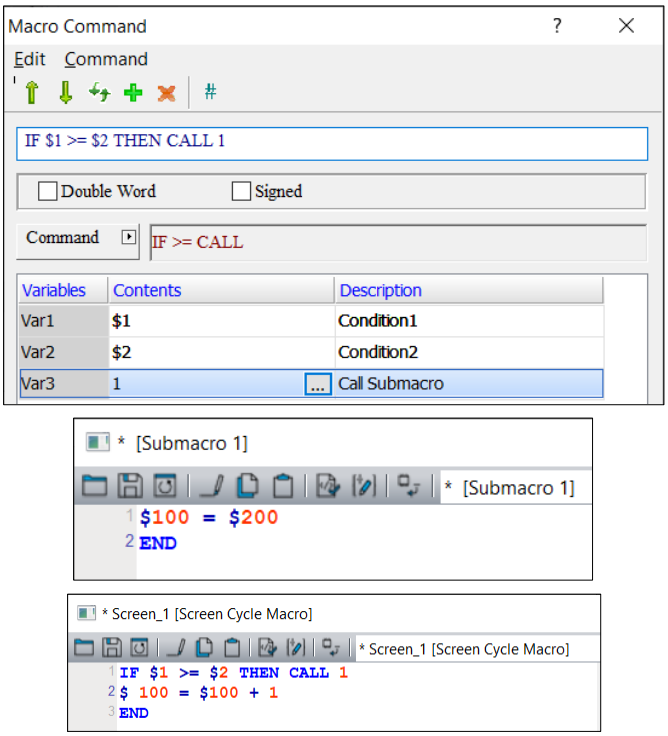
(4) IF >=

Expression	Meaning of Variable		Note
IF Var1 >= Var2 THEN CALL Var3 (W) IF Var1 >= Var2 THEN CALL Var3 (DW) IF Var1 >= Var2 THEN CALL Var3 (Signed W) IF Var1 >= Var2 THEN CALL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 is greater than or equal to Condition2, call Submacro Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



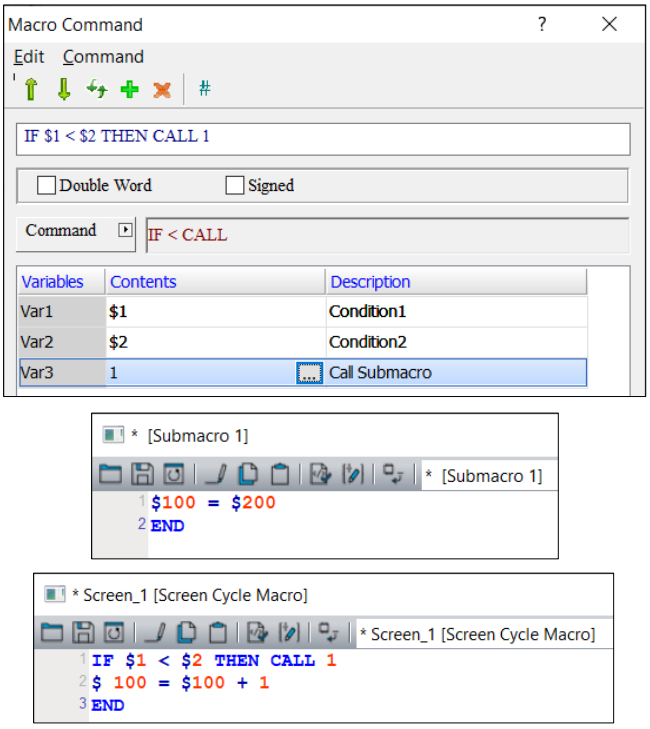
- If the value of $1 is greater than or equal to $2, call Submacro 1 ($100 = $200); if $1 is less than $2, then execute $100 = $100 + 1.

(5) IF <			
Expression	Meaning of Variable		Note
IF Var1 < Var2 THEN CALL Var3 (W) IF Var1 < Var2 THEN CALL Var3 (DW) IF Var1 < Var2 THEN CALL Var3 (Signed W) IF Var1 < Var2 THEN CALL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 is less than Condition2, call Submacro Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



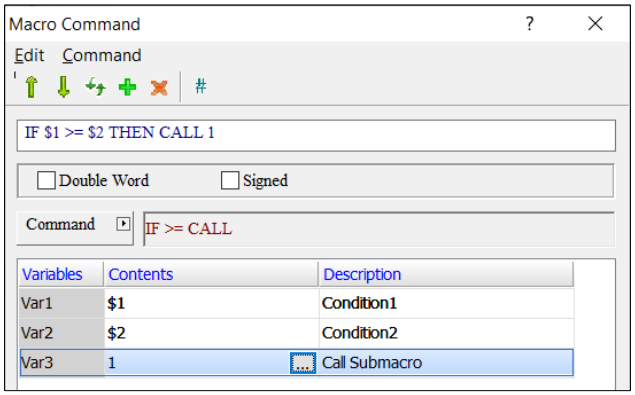
- If the value of $1 is less than $2, call Submacro 1 ($100 = $200); if $1 is greater than or equal to $2, then execute $100 = $100 + 1.

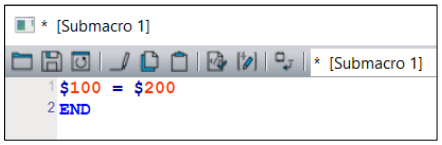
(6) IF <=			
Expression	Meaning of Variable		Note
IF Var1 <= Var2 THEN CALL Var3 (W) IF Var1 <= Var2 THEN CALL Var3 (DW) IF Var1 <= Var2 THEN CALL Var3 (Signed W) IF Var1 <= Var2 THEN CALL Var3 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If Condition1 is less than or equal to Condition2, call Submacro Var3.		

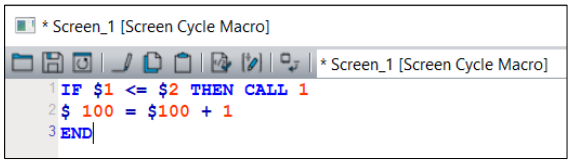
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.







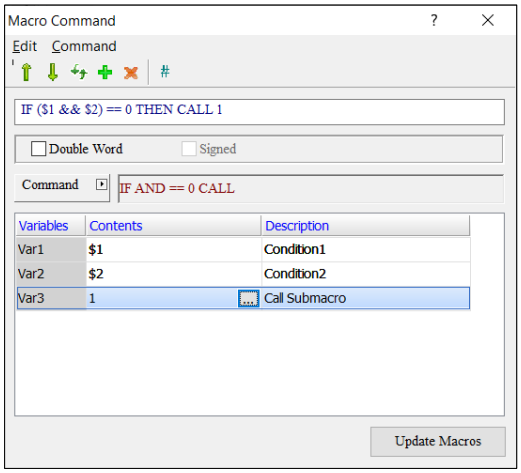
- If the value of $1 is less than or equal to $2, call Submacro 1 ($100 = $200); if $1 is greater than $2, then execute $100 = $100 + 1.

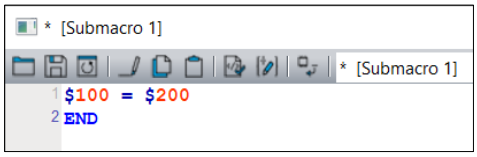
(7) IF AND == 0			
Expression	Meaning of Variable		Note
IF (Var1 && Var2) == 0 THEN CALL Var3 (W) IF (Var1 && Var2) == 0 THEN CALL Var3 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If the result of the AND operation on Condition1 and Condition2 is 0, call Submacro Var3.		

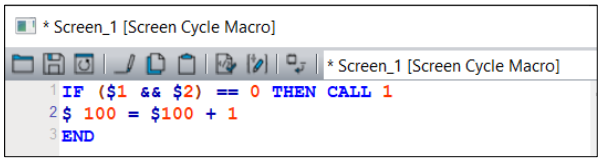
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.







- If the result of the AND operation on $1 and $2 is 0, call Submacro 1 ($100 = $200); if the result of the AND operation on $1 and $2 is not 0, then execute $100 = $100 + 1.

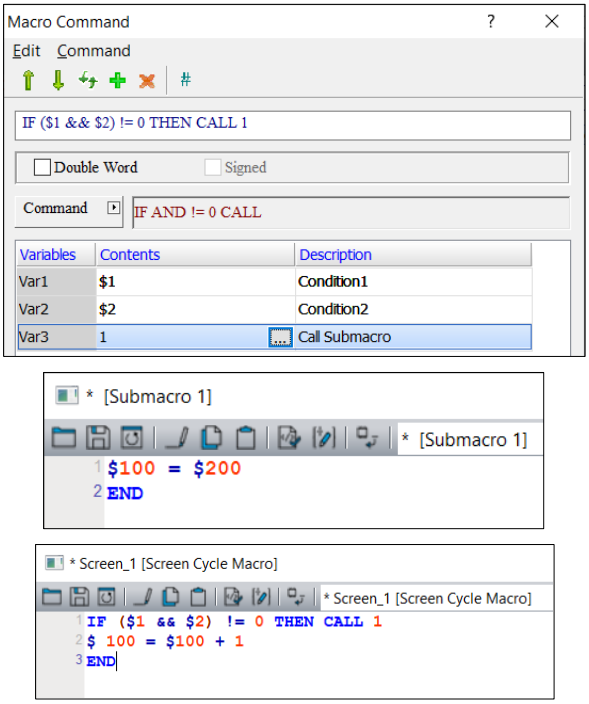
(8) IF AND != 0			
Expression	Meaning of Variable		Note
IF (Var1 && Var2) != 0 THEN CALL Var3 (W) IF (Var1 && Var2) != 0 THEN CALL Var3 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Var3	Label name	
	Description of Action		
	If the result of the AND operation on Condition1 and Condition2 is not 0, call Submacro Var3.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V

Variable	Type		
	Internal Memory	PLC Register	Constant
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- If the result of the AND operation on $1 and $2 is not 0, call Submacro 1 ($100 = $200); if the result of the AND operation on $1 and $2 is 0, then execute $100 = $100 + 1.

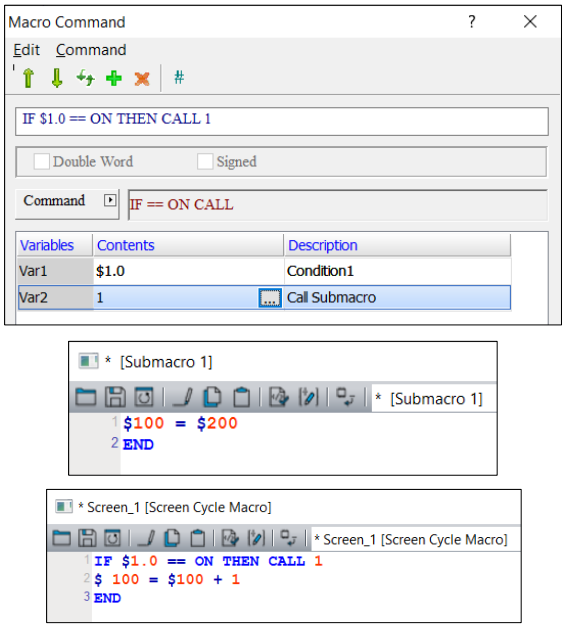
(9) IF == ON

Expression	Meaning of Variable		Note
IF Var1 == ON THEN CALL Var2 (W)	Var1	Condition1	W: Word
	Var2	Label name	
	Description of Action		
	If Condition1 is ON, call Submacro Var2.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Variable	Type		
	Internal Memory	PLC Register	Constant
	(can only be bit)		
Var2			V

Example
● Var1 is the Internal Memory address and Var2 is a constant.



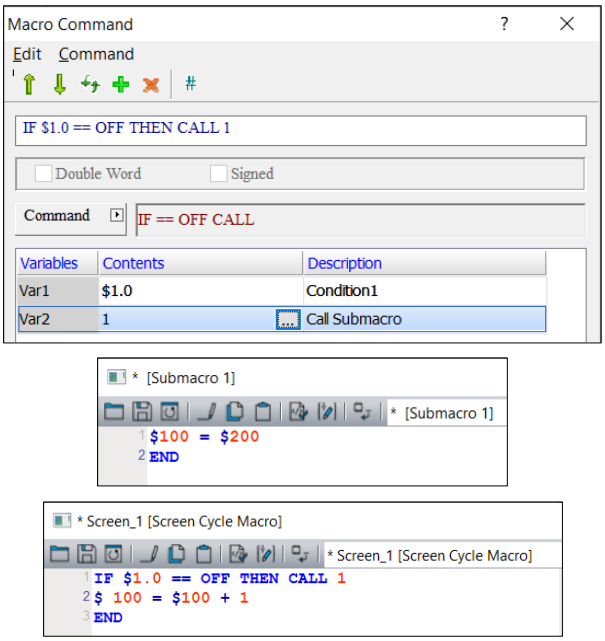
● If $1.0 is ON, call Submacro 1 ($100 = $200); if $1.0 is not ON, then execute $100 = $100 + 1.

(10) IF == OFF			
Expression	Meaning of Variable		Note
IF Var1 == OFF THEN CALL Var2 (W)	Var1	Condition1	W: Word
	Var2	Label name	
	Description of Action		
	If Condition1 is OFF, call Submacro Var2.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		
Var2			V

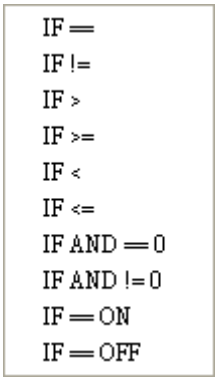
Example

- Var1 is the Internal Memory address and Var2 is a constant.



- If $1.0 is OFF, call Submacro 1 ($100 = $200); if $1.0 is not OFF, then execute $100 = $100 + 1.

- IF… (If…)



The following introduces 10 commands of the IF… macro.

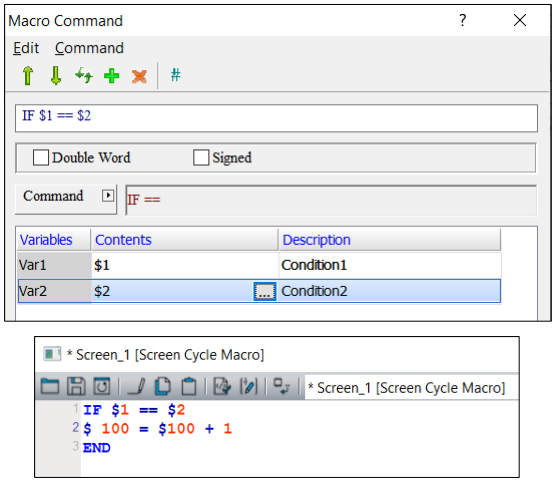
(1) IF ==			
Expression	Meaning of Variable		Note
IF Var1 == Var2 (W) IF Var1 == Var2 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	

(1) IF ==		
IF Var1 == Var2 (Signed W) IF Var1 == Var2 (Signed DW)	Description of Action If Condition1 equals Condition2, execute...	Signed: Signed number
NOTE: *The IF macro command must be used with ENDIF, otherwise an error message will pop up while compiling.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



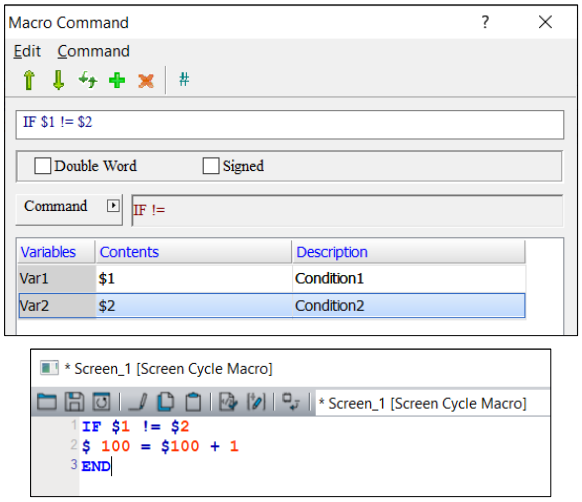
- If the value of $1 equals $2, execute $100 = $100 + 1; if $1 is greater than or less than $2, then $100 = $100 + 1 will not be executed.

(2) IF !=			
Expression	Meaning of Variable		Note
IF Var1 != Var2 (W) IF Var1 != Var2 (DW) IF Var1 != Var2 (Signed W) IF Var1 != Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	If Condition1 does not equal Condition2, execute…		
NOTE*: The IF macro command must be used with ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.

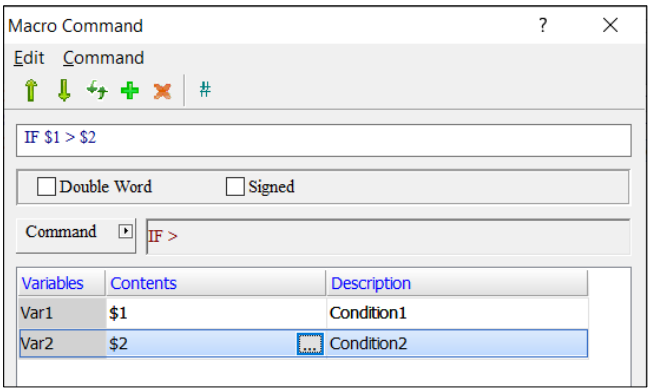
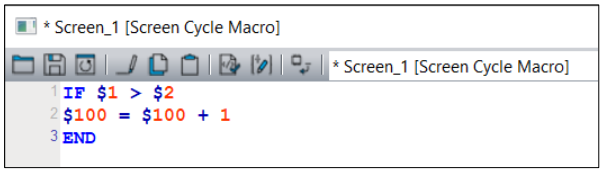


- If the value of $1 does not equal $2, execute $100 = $100 + 1; if $1 is greater than or less than $2, then $100 = $100 + 1 will not be executed.

(3) IF >

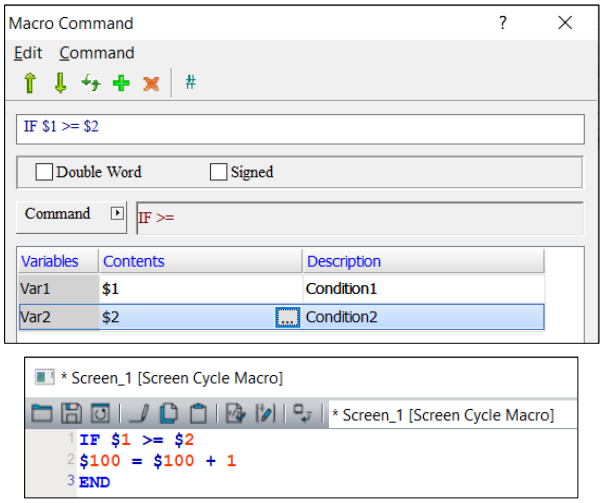
Expression	Meaning of Variable		Note
IF Var1 > Var2 (W) IF Var1 > Var2 (DW) IF Var1 > Var2 (Signed W) IF Var1 > Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	If Condition1 is greater than Condition2, execute…		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example
● Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.       ● If the value of $1 is greater than $2, execute $100 = $100 + 1; if $1 is less than or equal to $2, then $100 = $100 + 1 will not be executed.

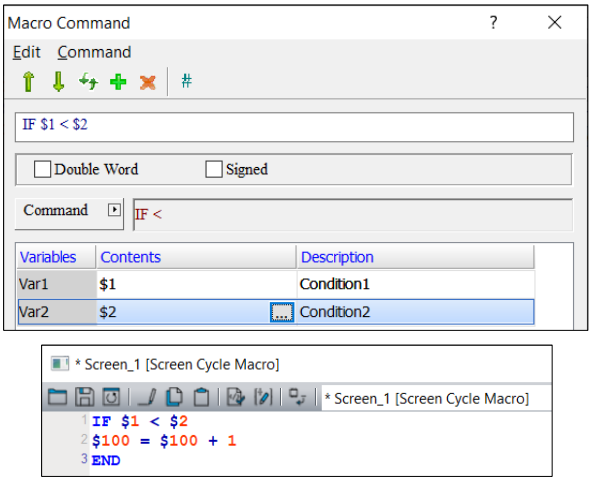
(4) IF >=			
Expression	Meaning of Variable		Note
IF Var1 >= Var2 (W) IF Var1 >= Var2 (DW) IF Var1 >= Var2 (Signed W) IF Var1 >= Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	If Condition1 is greater than or equal to Condition2, execute…		
NOTE: *The IF macro command must be used with ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example
● Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.  ● If the value of $1 is greater than or equal to $2, execute $100 = $100 + 1; if $1 is less than $2, then $100 = $100 + 1 will not be executed.

(5) IF <			
Expression	Meaning of Variable		Note
IF Var1 < Var2 (W) IF Var1 < Var2 (DW) IF Var1 < Var2 (Signed W) IF Var1 < Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	If Condition1 is less than Condition2, execute…		
***NOTE**: The IF macro command must be used with ENDIF, otherwise an error message will pop up while compiling.*			

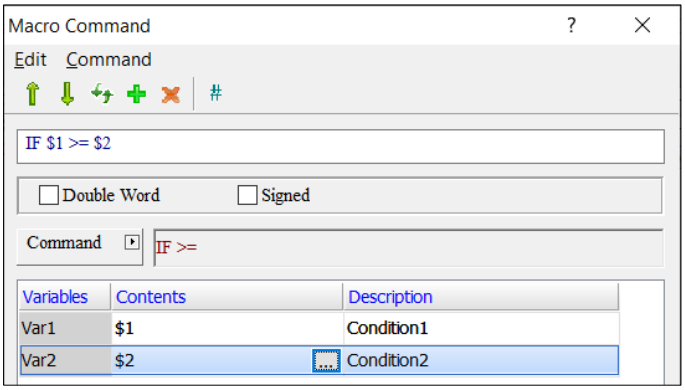
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

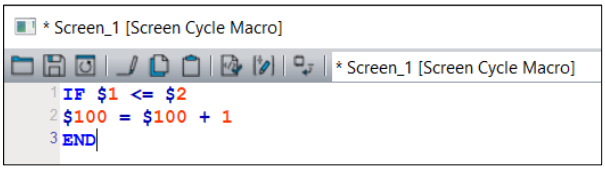
Example
● Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.  ● If the value of $1 is less than $2, execute $100 = $100 + 1; if $1 is greater than or equal to $2, then $100 = $100 + 1 will not be executed.

(6) IF <=			
Expression	Meaning of Variable		Note
IF Var1 <= Var2 (W) IF Var1 <= Var2 (DW) IF Var1 <= Var2 (Signed W) IF Var1 <= Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	If Condition1 is less than or equal to Condition2, execute…		
NOTE: *IF macro command must be used with ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V
Var3			V

Example
● Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.

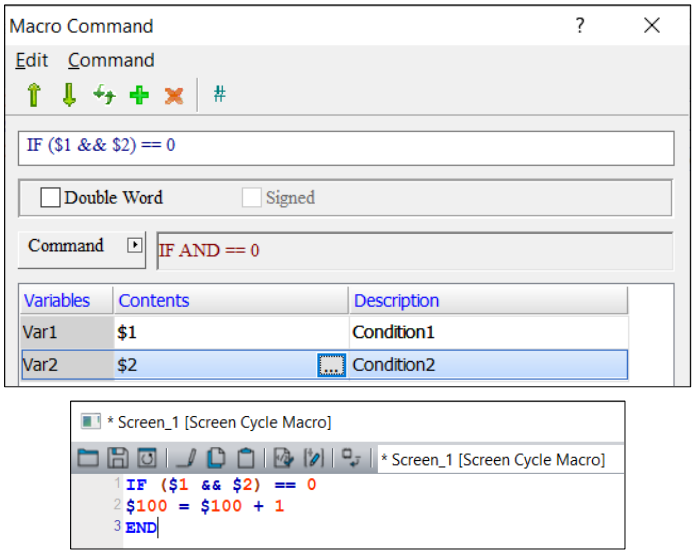




● If the value of $1 is less than or equal to $2, execute $100 = $100 + 1; if $1 is greater than $2, then $100 = $100 + 1 will not be executed.

(7) IF AND == 0			
Expression	Meaning of Variable		Note
IF (Var1 && Var2) == 0 (W) IF (Var1 && Var2) == 0 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Description of Action		
	If the result of the AND operation on Condition1 and Condition2 is 0, execute…		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

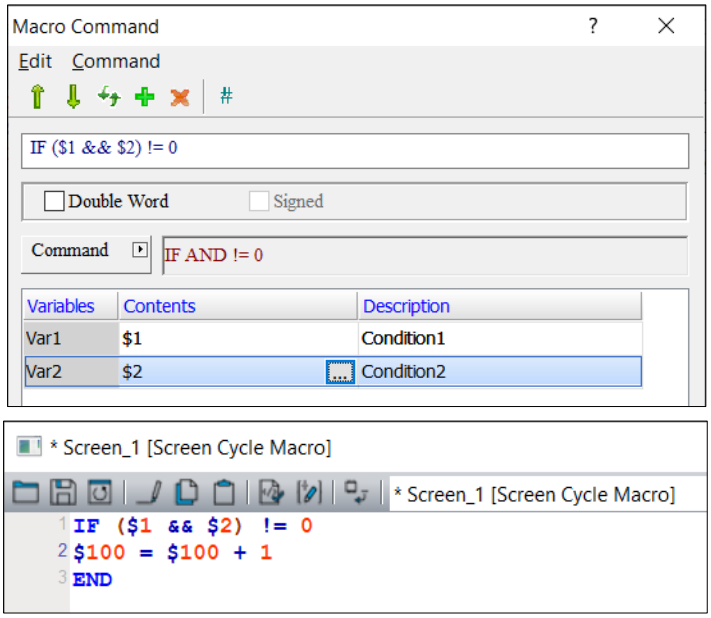
Example
● Var1 and Var2 are Internal Memory addresses.    ● If the result of the AND operation on $1 and $2 is 0, execute $100 = $100 + 1; if the result of the AND operation on $1 and $2 is not 0, then $100 = $100 + 1 will not be executed.

(8) IF AND != 0			
Expression	Meaning of Variable		Note
IF (Var1 && Var2) != 0 (W) IF (Var1 && Var2) != 0 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Description of Action		
	If the result of the AND operation on Condition1 and Condition2 is not 0, execute…		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

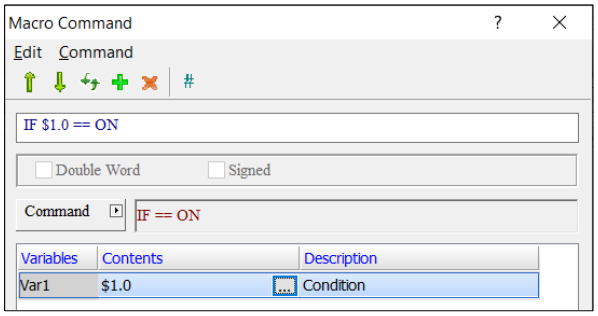
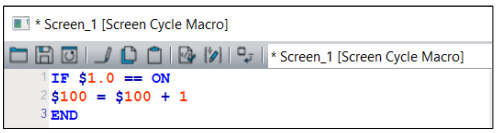
- Var1 and Var2 are Internal Memory addresses.



- If the result of the AND operation on $1 and $2 is not 0, execute $100 = $100 + 1; if the result of the AND operation on $1 and $2 is 0, then $100 = $100 + 1 will not be executed.

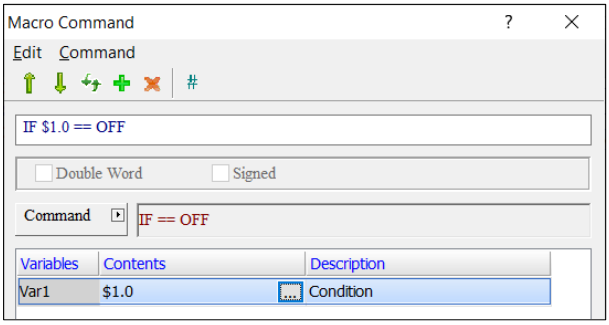
(9) IF == ON			
Expression	Meaning of Variable		Note
IF Var1 == ON (W)	Var1	Condition1	W: Word
	Description of Action		
	If Condition1 is ON, execute…		

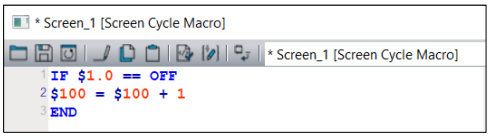
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		

Example
● Var1 is the Internal Memory address.     ● If $1.0 is ON, execute $100 = $100 + 1; if $1.0 is not ON, then $100 = $100 + 1 will not be executed.

(10) IF == OFF			
Expression	Meaning of Variable		Note
IF Var1 == OFF (W)	Var1	Condition1	W: Word
	Description of Action		
	If Condition1 is OFF, execute…		

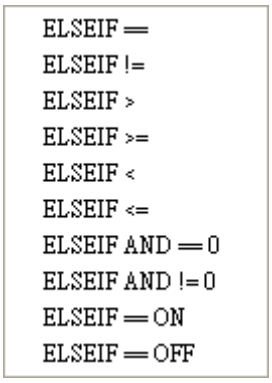
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		

Example
● Var1 is the Internal Memory address. 

Example


- If $1.0 is OFF, execute $100 = $100 + 1; if $1.0 is not OFF, then $100 = $100 + 1 will not be executed.

- ELSEIF… (else if…)



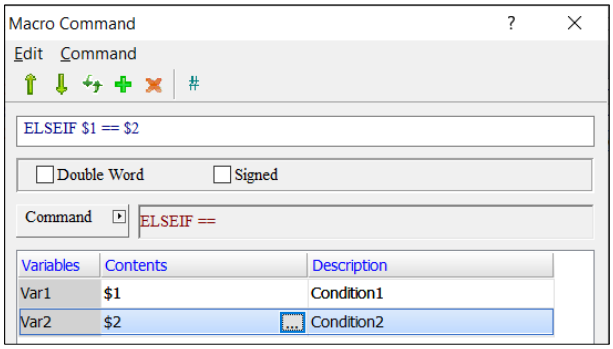
The following introduces 10 commands of ELSEIF… macro.

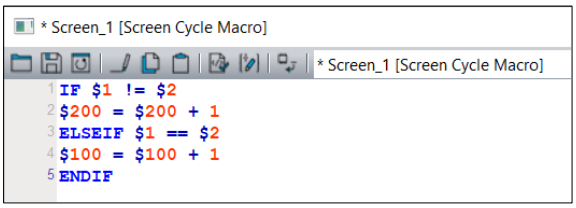
(1) ELSEIF ==			
Expression	Meaning of Variable		Note
ELSEIF Var1 == Var2 (W) ELSEIF Var1 == Var2 (DW) ELSEIF Var1 == Var2 (Signed W) ELSEIF Var1 == Var2 (Signed DW)	Var 1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var 2	Condition2	
	Description of Action		
	Else if Condition1 equals Condition2, execute...		
NOTE: *ELSEIF macro command must be used with IF...ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.





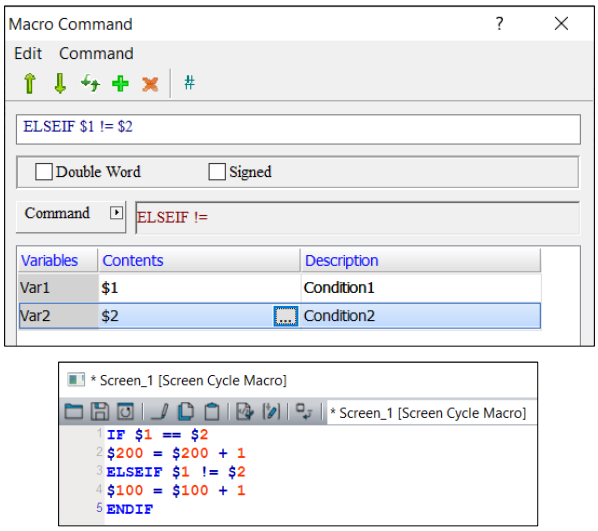
- If the value of $1 does not equal $2, execute $200 = $200 + 1; else if $1 equals $2, then execute $100 = $100 + 1.

(2) ELSEIF !=			
Expression	Meaning of Variable		Note
ELSEIF Var1 != Var2 (W) ELSEIF Var1 != Var2 (DW) ELSEIF Var1 != Var2 (Signed W) ELSEIF Var1 != Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	Else if Condition1 does not equal Condition2, execute…		
NOTE: *ELSEIF macro command must be used with IF...ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.



- If the value of $1 equals $2, execute $200 = $200 + 1; else if $1 does not equal $2, then execute $100 = $100 + 1.

(3) ELSEIF >

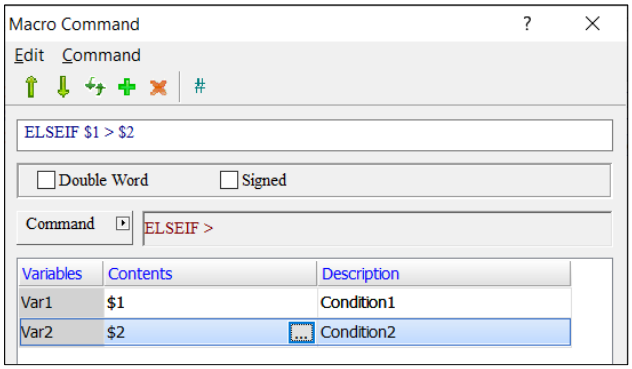
Expression	Meaning of Variable		Note
ELSEIF Var1 > Var2 (W) ELSEIF Var1 > Var2 (DW) ELSEIF Var1 > Var2 (Signed W) ELSEIF Var1 > Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	Else if Condition1 is greater than Condition2, execute...		

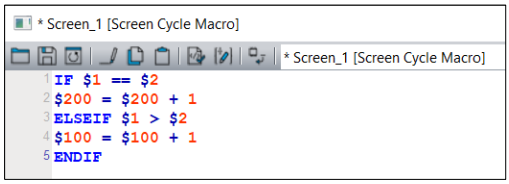
NOTE: *ELSEIF macro command must be used with IF...ENDIF, otherwise an error message will pop up while compiling.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.





- If the value of $1 equals $2, execute $200 = $200 + 1; else if $1 is greater than $2, then execute $100 = $100 + 1.

(4) ELSEIF >=

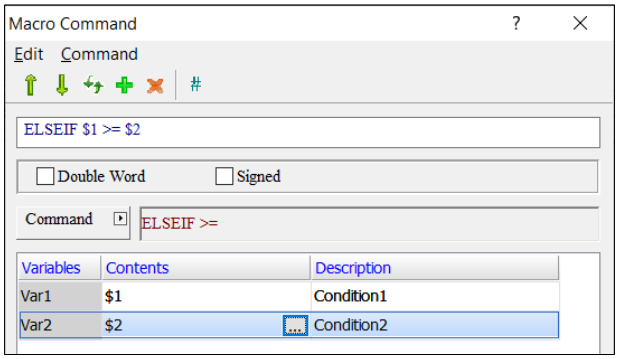
Expression	Meaning of Variable		Note
ELSEIF Var1 >= Var2 (W) ELSEIF Var1 >= Var2 (DW) ELSEIF Var1 >= Var2 (Signed W) ELSEIF Var1 >= Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	Else if Condition1 is greater than or equal to Condition2, execute…		

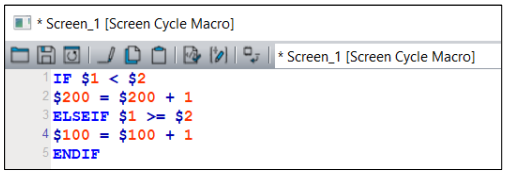
NOTE: *ELSEIF macro command must be used with IF...ENDIF, otherwise an error message will pop up while compiling.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.





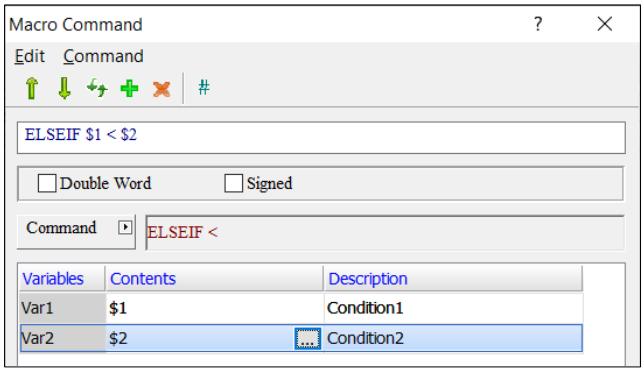
- If the value of $1 is less than $2, execute $200 = $200 + 1; else if $1 is greater than or equal to $2, then execute $100 = $100 + 1.

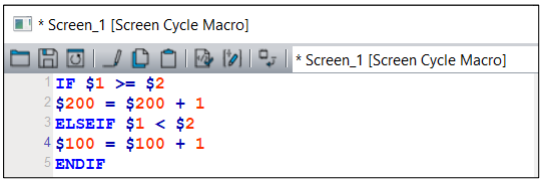
(5) ELSEIF <			
Expression	Meaning of Variable		Note
ELSEIF Var1 < Var2 (W) ELSEIF Var1 < Var2 (DW) ELSEIF Var1 < Var2 (Signed W) ELSEIF Var1 < Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	Else if Condition1 is less than Condition2, execute…		
NOTE: *ELSEIF macro command must be used with IF...ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.





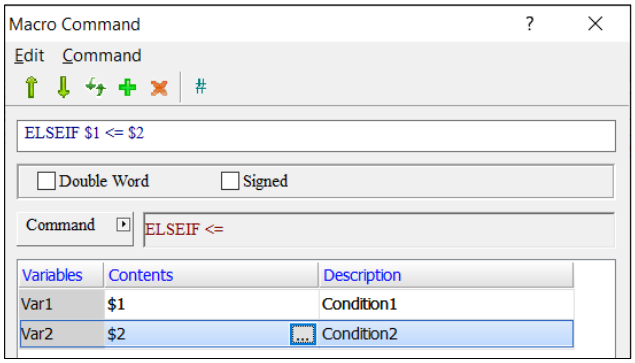
- If the value of $1 is greater than or equal to $2, execute $200 = $200 + 1; else if $1 is less than $2, then execute $100 = $100 + 1.

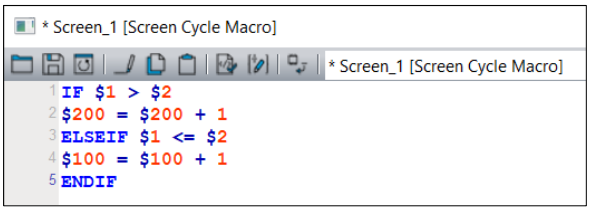
(6) ELSEIF <=			
Expression	Meaning of Variable		Note
ELSEIF Var1 <= Var2 (W) ELSEIF Var1 <= Var2 (DW) ELSEIF Var1 <= Var2 (Signed W) ELSEIF Var1 <= Var2 (Signed DW)	Var1	Condition1	W: Word DW: Double Word Signed: Signed number
	Var2	Condition2	
	Description of Action		
	Else if Condition1 is less than or equal to Condition2, execute…		
NOTE: *ELSEIF macro command must be used with IF...ENDIF, otherwise an error message will pop up while compiling.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	◎		◎
Var2	◎		◎

Example

- Var1 and Var2 are Internal Memory addresses.





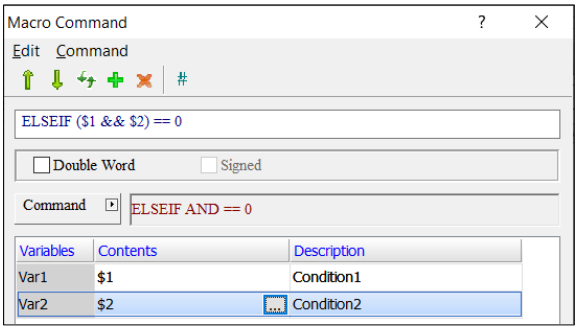
- If the value of $1 is greater than $2, execute $200 = $200 + 1; else if $1 is less than or equal to $2, then execute $100 = $100 + 1.

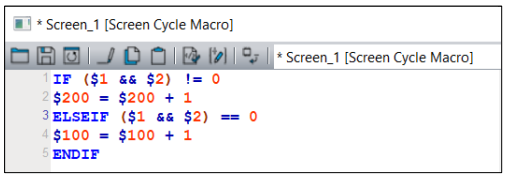
(7) ELSEIF AND == 0			
Expression	Meaning of Variable		Note
ELSEIF (Var1 && Var2) == 0 (W) ELSEIF (Var1 && Var2) == 0 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Description of Action		
	Else if the result of the AND operation on Condition1 and Condition2 is 0, execute…		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.





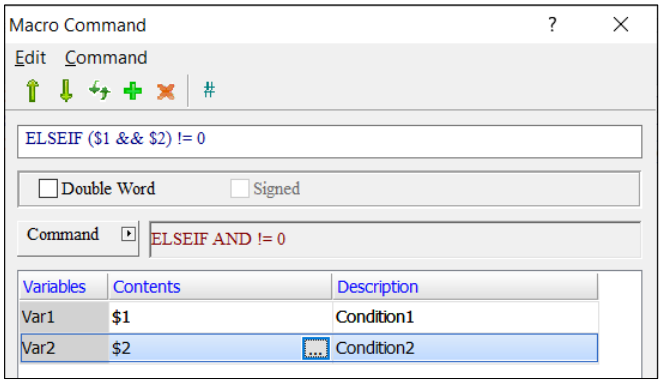
- If the result of the AND operation on $1 and $2 is not 0, execute $200 = $200 + 1; else if the result of the AND operation on $1 and $2 is 0, then execute $100 = $100 + 1.

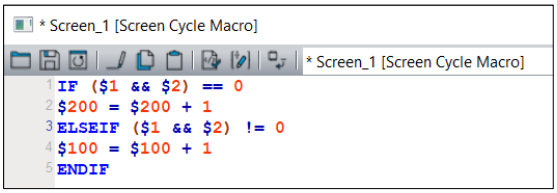
(8) ELSEIF AND != 0			
Expression	Meaning of Variable		Note
ELSEIF (Var1 && Var2) != 0 (W) ELSEIF (Var1 && Var2) != 0 (DW)	Var1	Condition1	W: Word DW: Double Word
	Var2	Condition2	
	Description of Action		
	Else if the result of the AND operation on Condition1 and Condition2 is not 0, execute…		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

- Var1 and Var2 are Internal Memory addresses.





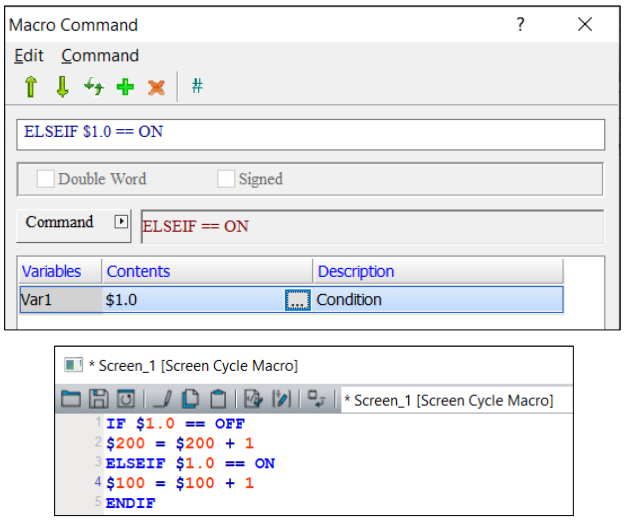
- If the result of the AND operation on $1 and $2 is 0, execute $200 = $200 + 1; else if the result of the AND operation on $1 and $2 is not 0, then execute $100 = $100 + 1.

(9) ELSEIF == ON			
Expression	Meaning of Variable		Note
ELSEIF Var1 == ON (W)	Var1	Condition1	W: Word
	Description of Action		
	Else if Condition1 is ON, execute…		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		

Example

- Var1 is the Internal Memory address.



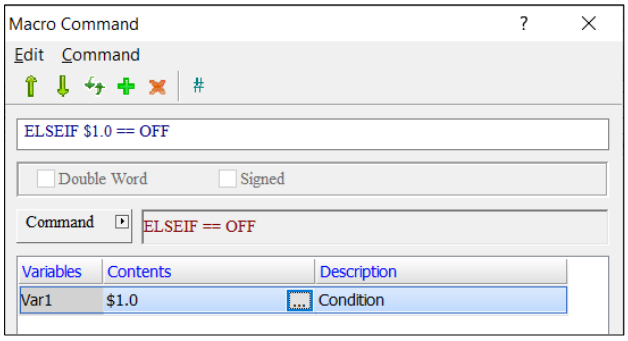
- If $1.0 is OFF, execute $200 = $200 + 1; else if $1.0 is ON, then execute $100 = $100 + 1.

(10) ELSEIF == OFF			
Expression	Meaning of Variable		Note
ELSEIF Var1 == OFF (W)	Var1	Condition1	W: Word
	Description of Action		
	Else if Condition1 is OFF, execute…		

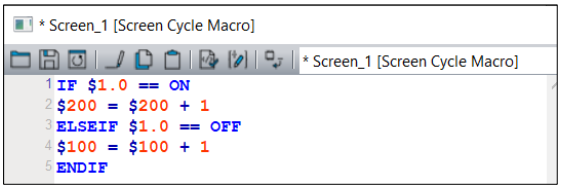
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)		

Example

- Var1 is the Internal Memory address.



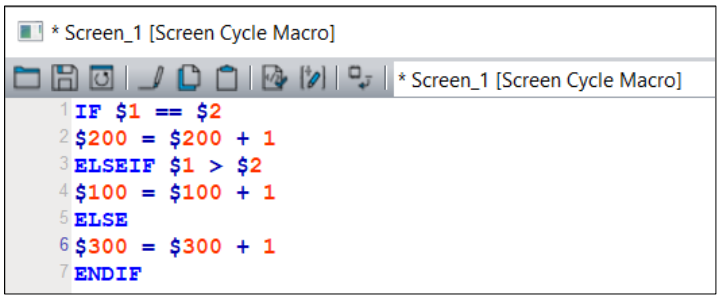
Example



- If $1.0 is ON, execute $200 = $200 + 1; else if $1.0 is OFF, then execute $100 = $100 + 1.

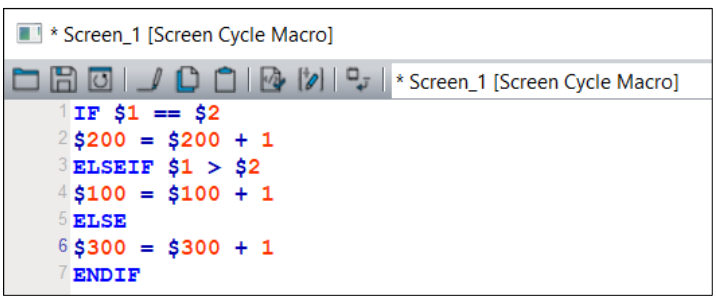
- ELSE

The ELSE command is mainly used to execute other programs when conditions of IF... or ELSEIF are not met. ELSE must be used together with IF… and ENDIF, otherwise the software will prompt a syntax error message while compiling.



- ENDIF

ENDIF is mainly used together with IF..., ELSE, and ELSEIF... commands.



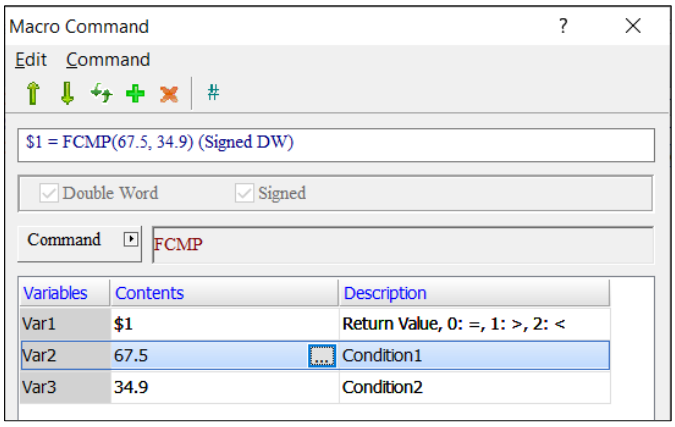
- FCMP (Comparison of Floating-point Value)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="8">Var1 = FCMP(Var2, Var3) (Signed DW)</td><td>Var1</td><td colspan="2">Return value of comparison result</td><td rowspan="8">DW: Double Word
Signed: Signed number</td></tr>
<tr><td></td><td>=</td><td>0</td></tr>
<tr><td></td><td>></td><td>1</td></tr>
<tr><td></td><td><</td><td>2</td></tr>
<tr><td>Var2</td><td colspan="2">Condition1</td></tr>
<tr><td>Var3</td><td colspan="2">Condition2</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Compare Var2 and Var3, and put the result in Var1.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V
Var3	V		V

Example

- Var1 is the Internal Memory address, and Var2 and Var3 are constants.



- Compare the floating-point values of 67.5 and 34.9. 67.5 > 34.9, and the return value is 1, so $1 = 1.

24.3.6 FlowControl

FlowControl includes commands such as GOTO, LABEL, CALL, RET, FOR, NEXT, END, etc., to control the execution process while writing macro programs. It is explained as follows.

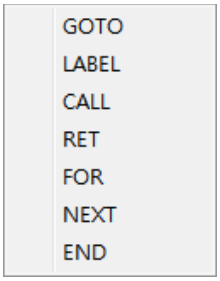
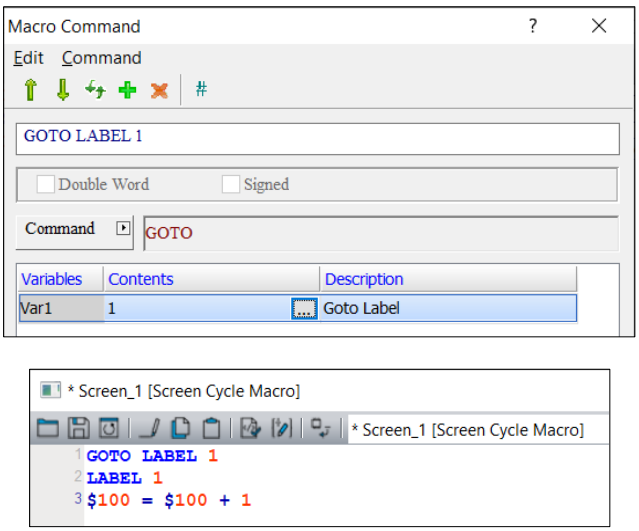


Figure 24 - 42: FlowControl

- GOTO LABEL (unconditionally execute a label name)

Expression	Meaning of Variable		Note
GOTO LABEL Var1 (W)	Var1	Goto Label	W: Word
	Description of Action		
	Directly execute the specified label name.		

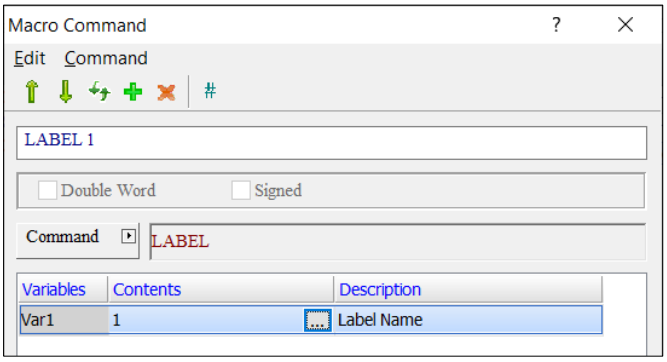
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1			V

Example
● Var1 can only be a constant.    ● Execute LABEL 1 directly. The command of LABEL 1 is $100 = $100 + 1.

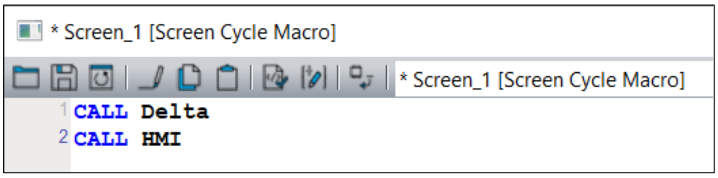
● LABEL (Label name)

Expression	Meaning of Variable		Note
LABEL Var1 (W)	Var1	Label name	W: Word
	Description of Action		
	Specify the label name.		
***NOTE**: The same label name shall not be used in the same macro.*			

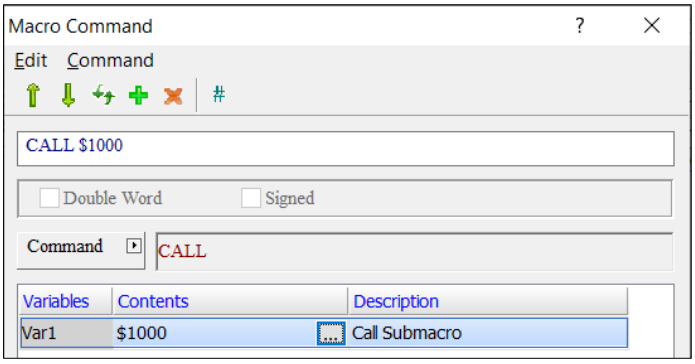
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1			V

Example
Var1 can only be a constant. 

- CALL (Call Submacro)

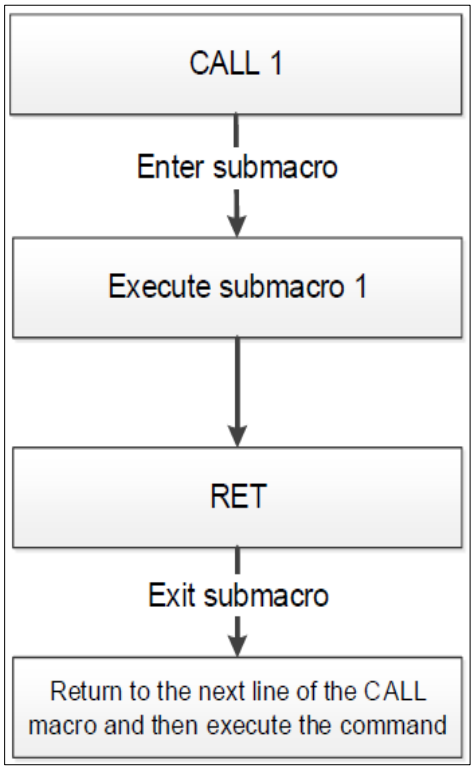
Expression	Meaning of Variable		Note
CALL Var1 (W)	Var1	Submacro number (1 - 512)	W: Word
	Description of Action		
	Specify the names of submacros.		
***NOTE**: Var1 can support the input of Chinese and English names. If users want to input Chinese and English names, enter its macro alias manually. The Macro Wizard only supports the input of submacro numbers.* 			

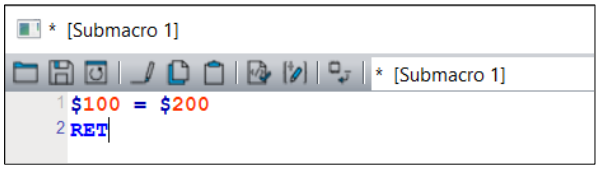
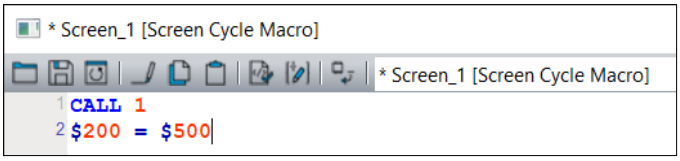
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V

Example
● Var1 is the Internal Memory address.  ● Execute the submacro commands by entering submacro numbers via the Internal Memory address $1000 (**Numeric Entry** element).

● RET (Exit submacro)

Expression	Description of Action	Note
RET	Exit submacro and return to the next line of the CALL submacro and then execute the command.	RET should be added at the end of the submacro, and must be used together with the CALL command.



Example
● The RET command must be written at the end of the submacro.    ● Return and execute the next line of the CALL macro command after exiting the submacro. 

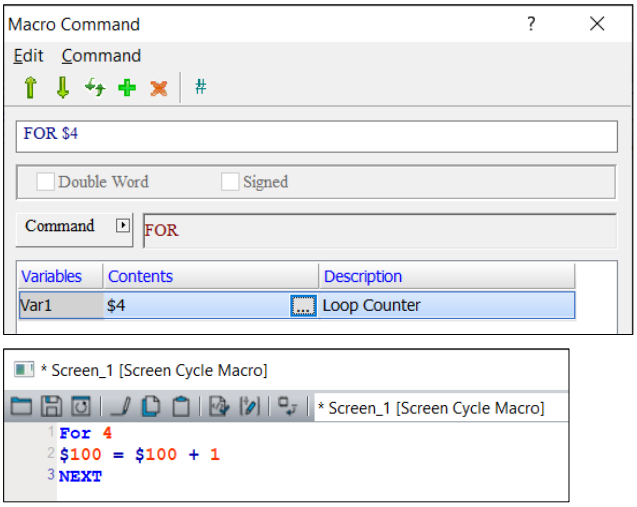
● FOR, NEXT (Program Loop)

Expression	Meaning of Variable		Note
FOR Var1 (W)	Var1	Loop Counter	W: Word
	Description of Action		
	Execute the statement for Var1 times continuously.		
Expression	Description of Action		**Note**
NEXT	It must be used together with the FOR command.		
NOTE: *The multilayer loops can be used to support up to 10 layers.*			

Memory Usage			
Variable	Internal Memory	PLC Register	Constant
Var1	V		V

Example

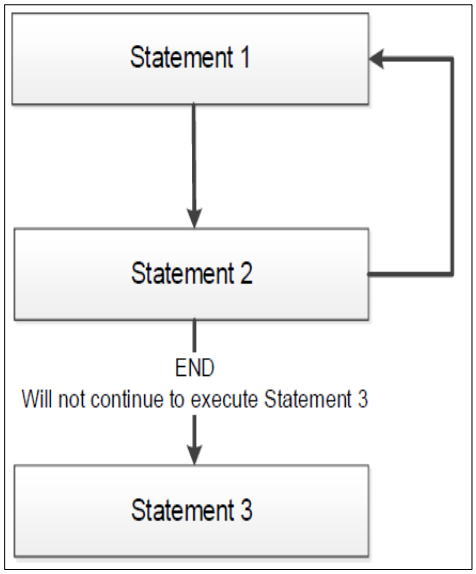
- Var1 is a constant.



- FOR 4 means that the $100 = $100 + 1 command is executed for four times, so the result obtained is 4.

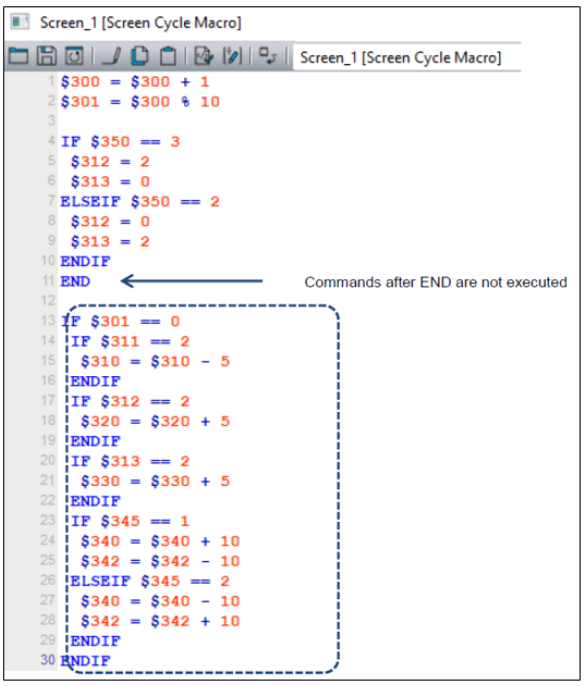
- END (End Macro Programs)

Expression	Description of Action	Note
END	End macro programs.	Adding END to the submacro means the program will not return to the original macro command to continue executing the next line.

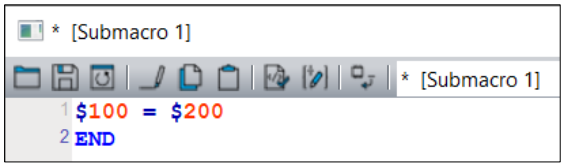


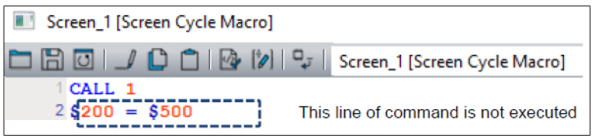
Example

- The commands after END are not executed.



- When the END command is written to the end of a submacro, it means the program will not return to execute the previous macro command.





24.3.7 Bit Setting

Bit Setting includes BITON, BITOFF, BITNOT, GETB and other commands, which allow users to set the On / Off state of bit, inverse bit, and get the value represented by the bit. The details are provided as follows.

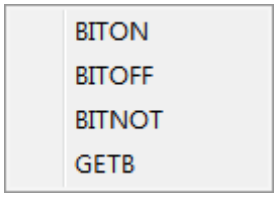


Figure 24 - 43: Bit Setting

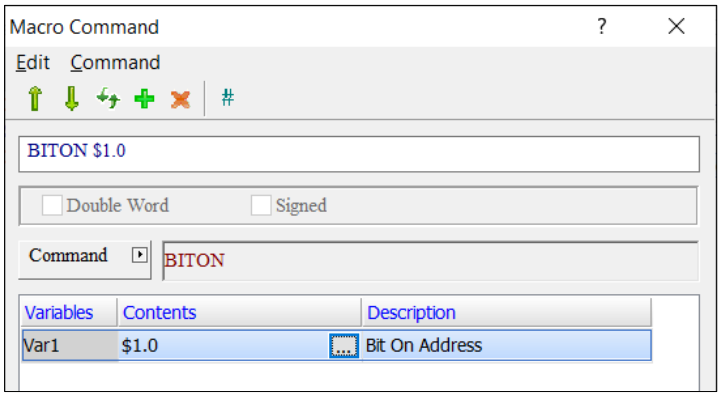
- BITON (Set Bit as On)

Expression	Meaning of Variable		Note
BITON Var1 (W)	Var1	Bit setting	W: Word
	Description of Action		
	Set Var1 to ON.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be bit)	V (can only be bit)	

Example

- Var1 is the Internal Memory address.



- Create a **Maintained Button** and set the Write Address to $1.0. When **BITON** $1.0 is executed, the result is as follows.



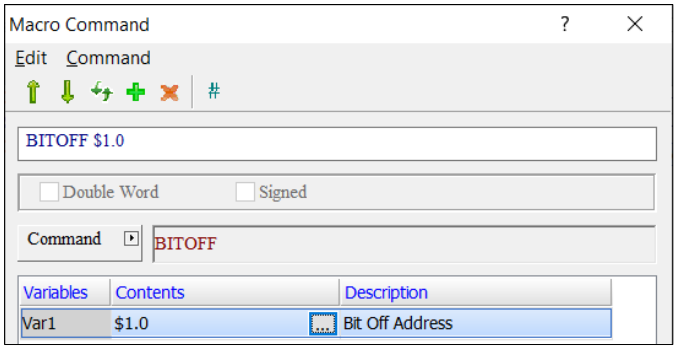
- BITOFF (Set bit as Off)

Expression	Meaning of Variable		Note
BITOFF Var1 (W)	Var1	Bit setting	W: Word
	Description of Action		
	Set Var1 to Off.		

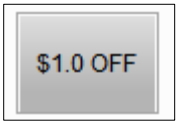
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be bit)	V (can only be bit)	

Example

- Var1 is the Internal Memory address.



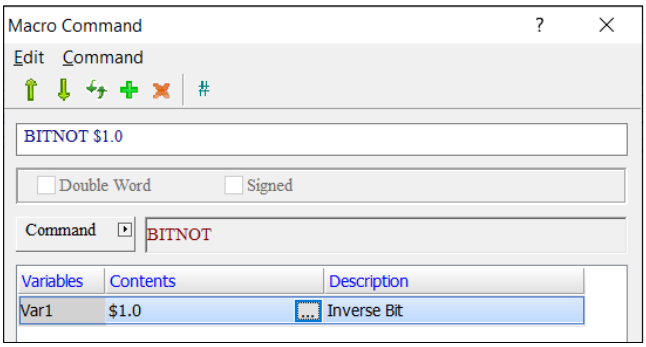
- Create a **Maintained Button** and set the Write Address to $1.0. When BITOFF $1.0 is executed, the result is as follows.



- BITNOT (Inverse Bit, ON→OFF, OFF→ON)

Expression	Meaning of Variable		Note
BITNOT Var1 (W)	Var1	Bit Setting	W: Word
	Description of Action		
	Set Var1 bit from On to Off and from Off to On.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be Bit)	V (can only be Bit)	

Example
● Var1 is the Internal Memory address.    ● Create a **Maintained Button** and set the **Write Address** to $1.0. When BITNOT $1.0 is executed, the actions of the **Maintained Button** will be continuously switched from On to Off and from Off to On.

● GETB (Get Bit Value)

Expression	Meaning of Variable		Note
(Var1) = GETB (Var2) (W)	Var1	Bit setting	W: Word
	Description of Action		
	Put the Var2 bit value in Var1.		

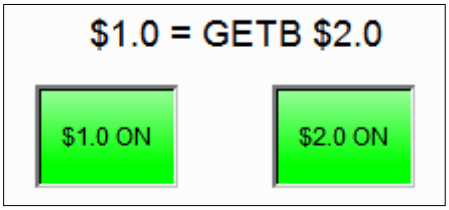
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V (can only be bit)	V (can only be bit)	
Var2	V (can only be bit)	V (can only be bit)	

Example

- Var1 and Var2 are Internal Memory.



- Set $1.0 and $2.0 as **Set to On Button** elements. When executing $1.0 = GETB $2.0, press the $2.0 **Button**, then $1.0 will be triggered to ON.



24.3.8 Communication

The Communication macro command provides several macros related to COM Port and network IP control, as detailed as follows.

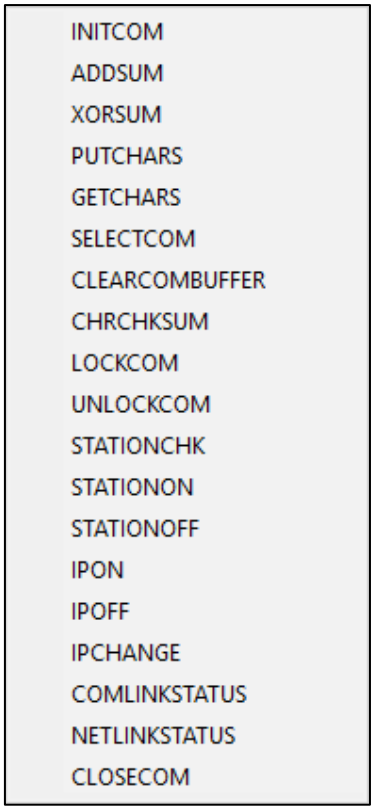


Figure 24 - 44: Communication

- INITCOM (COM Port Initialization)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="12">Var1 = INITCOM(Var2, Var3, Var4, Var5, Var6, Var7, Var8) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="12">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">COM Port</td></tr>
<tr><td>Var3</td><td colspan="2">Interface</td></tr>
<tr><td>Var4</td><td colspan="2">Data Bits</td></tr>
<tr><td>Var5</td><td colspan="2">Parity Bits</td></tr>
<tr><td>Var6</td><td colspan="2">Stop Bits</td></tr>
<tr><td>Var7</td><td colspan="2">Baud Rate</td></tr>
<tr><td>Var8</td><td colspan="2">Flow Control</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">The initialization of COM Port is used to open the communication</td></tr>
</table>

Expression	Meaning of Variable	Note
	port, set the communication protocol (Var2 - Var8), and put the return value of the initialization result in Var1.	
NOTE: *INITCOM command can only be issued once. If it is used again, the command is invalid.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Parameter Setting			
Variable	Option	Option Content	Corresponding Code
Var2	COM Port	COM1	0
		COM2	1
		COM3	2
Var3	Interface	RS232	0
		RS422	1
		RS485	2
Var4	Data Bits	7 Bits	0
		8 Bits	1
Var5	Parity Bits	None	0
		Old	1
		Even	2
Var6	Stop Bits	1 Bits	0
		2 Bits	1
Var7	Baud Rate	300	0
		600	1
		900	2
		1200	3

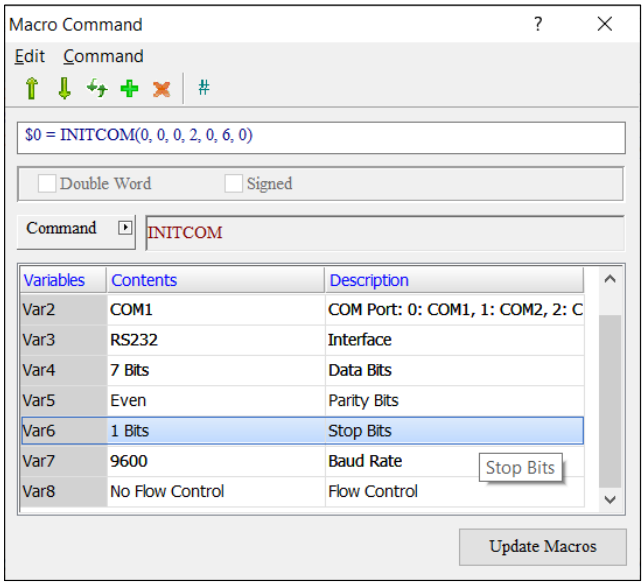
Parameter Setting			
Variable	Option	Option Content	Corresponding Code
		2400	4
		4800	5
		9600	6
		14400	7
		19200	8
		28800	9
		38400	10
		57600	11
		115200	12
Var8	Flow Control	No Flow Control	0
		CTS RTS Flow Control	1
		DTR DSR Flow Control	2
		Xon Xoff Flow Control	3

Notes for FlowControl		
No FlowControl		FlowControl is not set.
FlowControl		When using the serial port to transmit data, due to the new transmission processing technology such as real-time compression and debugging, the speed and accuracy of the communication are greatly improved, but the speed of data transmission between the computer and the HMI is greater than its real Data transmission speed. In order to ensure the security and integrity of data during transmission, it is necessary to have the control of transmission flow.
FlowControl	CTS / RTS FlowControl	FlowControl for the hardware, which is achieved by the electrical pulse wave generated by the hardware flowing to internal modem or to external modem through a connecting cable.
	DSR / DTR FlowControl	FlowControl for the hardware, which is achieved by a cable directly connecting the computer and the HMI.

Notes for FlowControl		
	X On / X Off FlowControl	FlowControl for the software, which is only used in 2400 bps modem. It is achieved by adding the control code generated by software to the data in transmission.

Example

- Var1 is the Internal Memory address.



- After executing the INITCOM command, 0 or 1 will be returned to $1 for failure or success, respectively.

- ADDSUM (Get CHECKSUM through Addition)

Expression	Meaning of Variable		Note
Var1 = ADDSUM(Var2, Var3) (W)	Var1	CHECKSUM Value	W: Word
	Var2	Source Start Address	
	Var3	Data Length	
	Description of Action		
	Get CHECKSUM through addition. Var1 is the CHECKSUM value after calculation, Var2 is the start address of the data to be calculated, and Var3 is the		

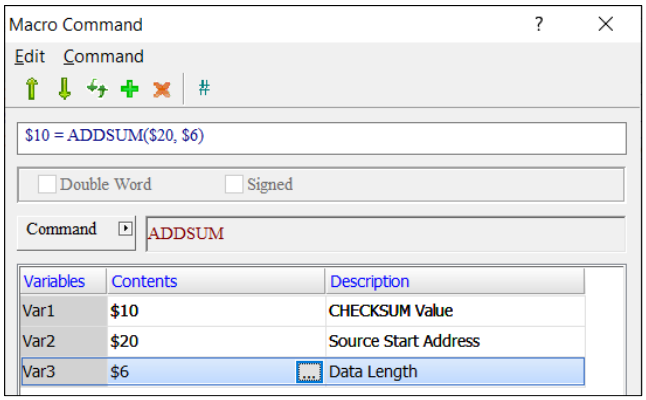
	length of the data.	

NOTE: *The value of CHECKSUM calculated by ADDSUM is based on Byte. If the length of data is 6, it has to be divided by 2, so the actual length is 3.*

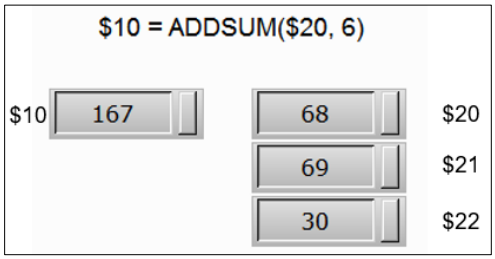
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Conduct addition operation for 3 (6 / 2 = 3) consecutive data length from the start address of $20 and put the value result in $10. The expression is $20 + $21 + $22 = $10.



- XORSUM (Get CHECKSUM through XOR)

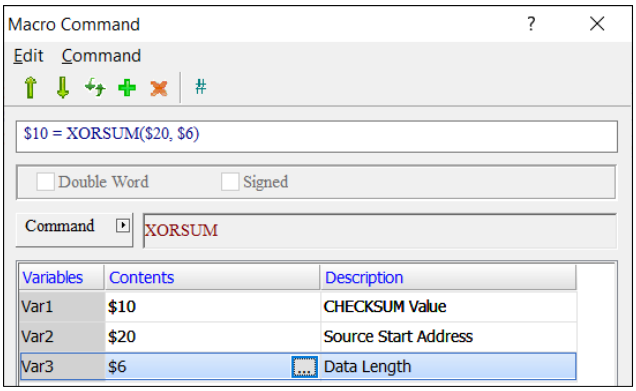
Expression	Meaning of Variable		Note
Var1 = XORSUM(Var2, Var3) (W)	Var1	CHECKSUM Value	W: Word
	Var2	Source Start Address	

Expression	Meaning of Variable		Note
	Var3	Data Length	
	Description of Action		
	Get CHECKSUM through addition. Var1 is the CHECKSUM value after calculation, Var2 is the start address of the data to be calculated, and Var3 is the length of the data.		
NOTE: *The value of CHECKSUM calculated by XORSUM is based on Byte. If the length of data is 6, it has to be divided by 2, so the actual length is 3.*			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 is a constant.



- Conduct XOR operation for 3 (6 / 2 = 3) consecutive data length from the start address of $20 and put the value result in $10.

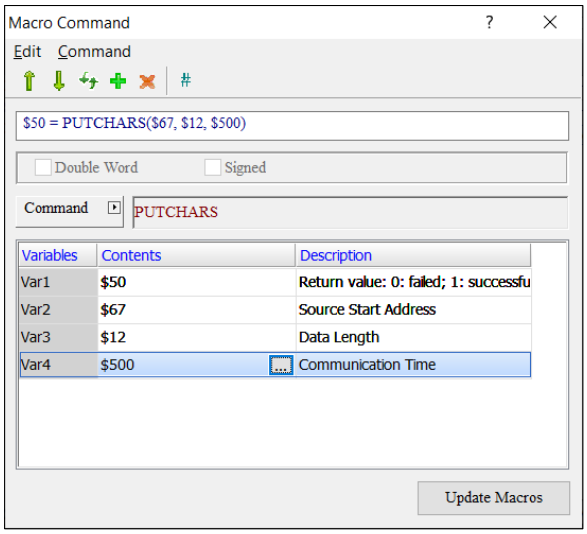
- PUTCHARS (Output Characters via the Communication Port)

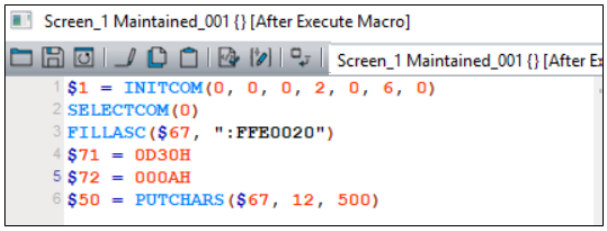
<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="8">Var1 = PUTCHARS(Var2, Var3, Var4) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="8">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">Source Start Address</td></tr>
<tr><td>Var3</td><td colspan="2">Data Length</td></tr>
<tr><td>Var4</td><td colspan="2">Communication Time</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">By the selected communication port, output characters of Var3 data length to Var2 start address within the required Var4 communication time, and put the return value in Var1.</td></tr>
<tr><td colspan="5">NOTE:
1. The PUTCHARS command must be used together with INITCOM and SELECTCOM.
2. The unit of Var3 is Byte.
3. The unit of Var4 is ms, which means to complete the macro execution within a specific time and end the execution when the time is up, so as to avoid delaying the execution of macros afterwards.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V
Var4	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 and Var4 are constants.





- In the case of $50 = PUTCHARS ($67, 12, 500), its action is to send 12 bytes (6 words) data and write them to $67. If 12 bytes cannot be sent within 500 ms, the program will exit the macro command when the time is up and write 0 to $50; if 12 bytes are sent successfully, it will exit this command immediately and write 1 to $50.

- GETCHARS (Get Characters via the COM Port)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="7">Var1 = GETCHARS(Var2, Var3, Var4) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="7">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">Source Start Address</td></tr>
<tr><td>Var3</td><td colspan="2">Data Length</td></tr>
<tr><td>Var4</td><td colspan="2">Communication Time</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="4">By the selected communication port, obtain characters of Var3 data length</td></tr>
</table>

Expression	Meaning of Variable	Note
	to Var2 start address within the required Var4 communication time, and put the return value in Var1.	

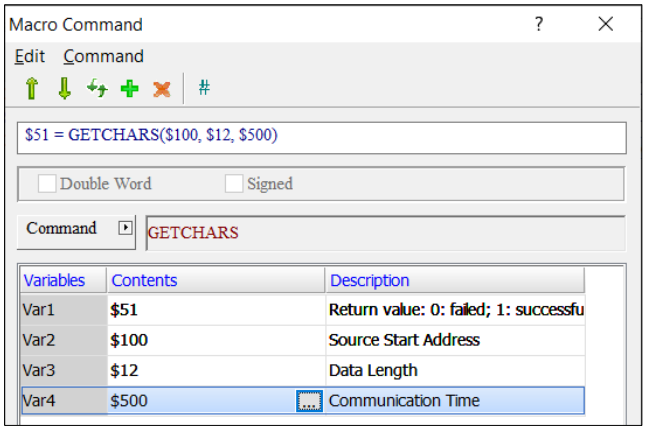
NOTE:

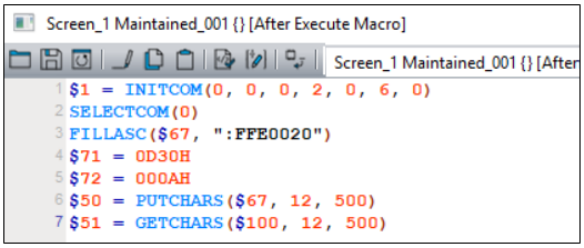
1. *The GETCHARS command must be used together with INITCOM and SELECTCOM.*
2. *The unit of Var3 is Byte.*
3. *The unit of Var4 is ms, which means to complete the macro execution within a specific time and end the execution when the time is up, so as to avoid delaying the execution of macros afterwards.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		V
Var4	V		V

Example

- Var1 and Var2 are Internal Memory addresses, and Var3 and Var4 are constants.





- In the case of $51 = GETCHARS ($100, 12, 500), its action is to collect 12 bytes (6 words) data and write them to $100. If 12 bytes cannot be collected within 500 ms, the program will exit the macro command when the time is up and write 0 to $51; if 12 bytes are collected successfully, it will exit this command immediately and write 1 to $51.

- SELECTCOM (Select COM Port)

Expression	Meaning of Variable			Note
SELECTCOM(Var1) (W)	Var1	COM1	0	W: Word
		COM2	1	
		COM3	2	
	Description of Action			
	Select the communication port.			

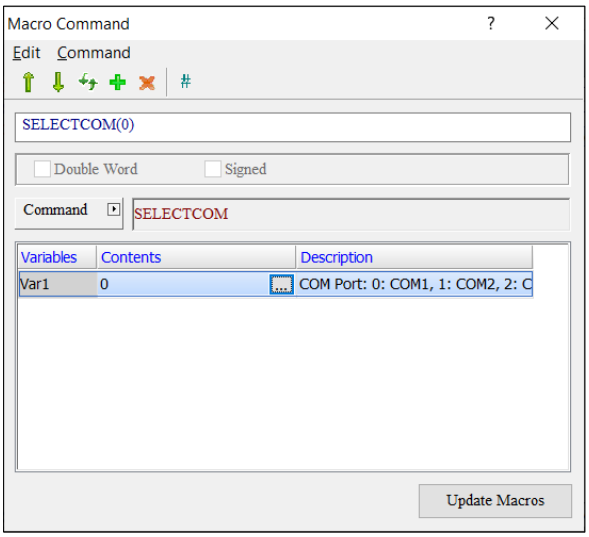
***NOTE**:*

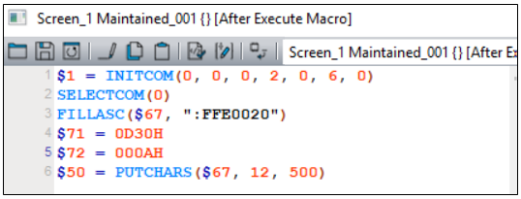
1. *The SELECTCOM command must be used together with INITCOM.*
2. *The specified COM Port cannot be the same as the one used by the system. The selected COM Port will process relevant communication commands, so the SELECTCOM command in different macros will not support or interfere with each other.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1			V

Example

Var1 can only be a constant.



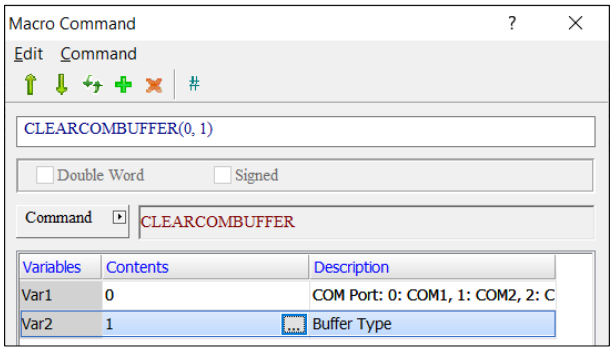


- CLEARCOMBUFFER (Clear Buffer of COM Port)

Expression	Meaning of Variable			Note
CLEARCOMBUFFER(Var1, Var2) (W)	Var1	COM1	0	W:Word
		COM2	1	
		COM3	2	
	Var2	Receive Buffer	0	
		Transmit Buffer	1	
	Description of Action			
	Clear buffer of Var1 COM Port.			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1			V
Var2			V

Example
Var1 and Var2 can only be constants.



- CHRCHKSUM (Calculate the Length and CHECKSUM Value of the String)

Expression	Meaning of Variable		Note
Var1 = CHRCHKSUM("Var2",	Var1	String Length	W: Word
	Var2	Input String	

<table>
<tr><td rowspan="4">Var3, Var4) (W)</td><td>Var3</td><td colspan="3">Memory address for storing strings</td></tr>
<tr><td rowspan="2">Var4</td><td rowspan="2">Select the display format for CHECKSUM result</td><td>1 BYTE</td><td>1</td></tr>
<tr><td>2 BYTES (WORD)</td><td>2</td></tr>
<tr><td colspan="4">Description of Action</td></tr>
<tr><td colspan="4">Calculate string length and CHECKSUM value, and put them in Var1.</td></tr>
</table>

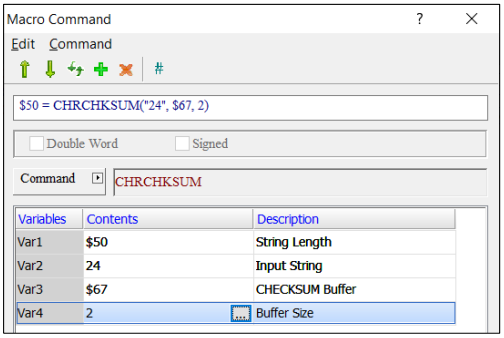
NOTE:

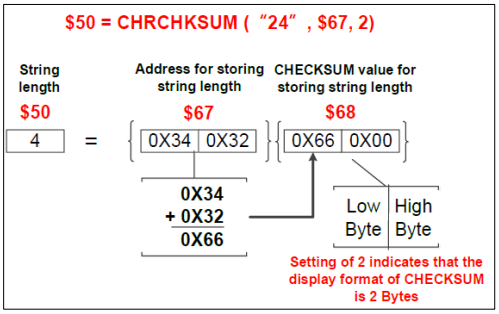
1. *The string length of Var1 varies according to the format set by Var4.*
2. *If the input string is "345", Var4 is set as 2, the result value of the string length of Var1 is 5. On the contrary, if Var4 is set as 1, the result value is 4. (Unit based on Byte.)*

Variable	**Type**			
	Internal Memory	PLC Register	String	Constant
Var1	V			
Var2			V	
Var3	V			
Var4				V (can only input 1 and 2)

Example

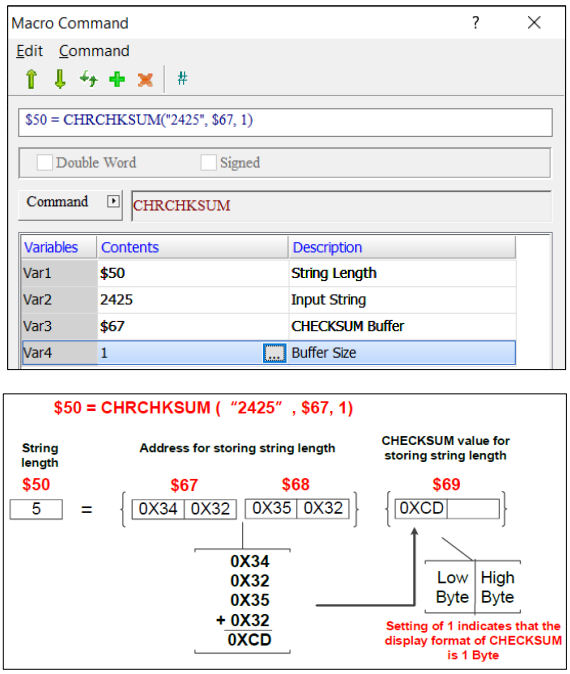
- Example 1





Example

- Example 2



- LOCKCOM / UNLOCKCOM (Lock COM Port / Unlock COM Port)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="9">Var1 = LOCKCOM(Var2, Var3) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="11">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td rowspan="3">Var2</td><td>COM1</td><td>0</td></tr>
<tr><td>COM2</td><td>1</td></tr>
<tr><td>COM3</td><td>2</td></tr>
<tr><td>Var3</td><td colspan="2">Time Out</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Lock COM port.</td></tr>
<tr><td rowspan="5">UNLOCKCOM(Var1) (W)</td><td rowspan="3">Var1</td><td>COM1</td><td>0</td></tr>
<tr><td>COM2</td><td>1</td></tr>
<tr><td>COM3</td><td>2</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Unlock COM port.</td></tr>
</table>

Expression	Meaning of Variable	Note

NOTE:

1. *If the LOCKCOM command is set to infinite waiting (i.e. Var3 = 0), it means LOCKCOM will be executed twice in the same macro which will cause the HMI unable to respond.*
2. *If there are communication commands in more than one macro at the same time, it may cause interference of the communication data. To prevent this problem, LOCKCOM and UNLOCKCOM can be added before and after the communication commands. This can avoid communication interruption and execution of other communication actions in the same period of time to ensure the integrity of communication contents.*
3. *Use LOCKCOM and UNLOCKCOM together, otherwise the HMI cannot execute the download action.*
4. *The unit of Var3 Time Out value is ms.*

Variable	LOCKCOM command type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2			V
Var3			V

Variable	UNLOCKCOM command type		
	Internal Memory	PLC Register	Constant
Var1			V

The following are examples of the proper, improper, and incorrect usages of the LOCKCOM / UNLOCKCOM macro commands.

LOCKCOM / UNLOCKCOM example (Proper use)

Background Macro

```
$50 = LOCKCOM(0,500)
$51 = PUTCHARS($67, 3,
300)
UNLOCKCOM(0)
```

Element On Macro

```
$50 = LOCKCOM(0,500)
$51 = GETCHARS($67, 3,
300)
UNLOCKCOM(0)
```

Screen Cycle Macro

```
$50 = LOCKCOM(0,500)
$51 = PUTCHARS($67, 3,
300)
UNLOCKCOM(0)
```

Suppose that communication commands are currently executed in three macros, when the **Background Macro** executes LOCKCOM (0, 500) first, then COM 1 is locked. As a result, LOCKCOM (0, 500) in **Element On Macro** and **Screen Cycle Macro** will stop, which will not be executed until Background macro executes UNLOCKCOM (0) to unlock COM 1. This action can avoid data interference or receiving error.

LOCKCOM / UNLOCKCOM example (Improper use)

Element On Macro

```
$51 = GETCHARS($67, 3, 300)
```

Screen Cycle Macro

```
$50 = LOCKCOM(0,500)
$51 = PUTCHARS($67, 3, 300)
UNLOCKCOM(0)
```

Suppose that communication commands are currently executed in two macros, when **Screen Cycle Macro** executes LOCKCOM (0, 500) first, COM 1 is locked. However, because **Element On Macro** is not locked by LOCKCOM, the GETCHARS command can still be executed, meaning it does not need to wait until the **Screen Cycle Macro** executes the UNLOCKCOM command. This will result in data interference and errors, so please avoid the above usage.

LOCKCOM / UNLOCKCOM example (Incorrect use)

Background Macro

```
$50 = LOCKCOM(0, 500)
$51 = PUTCHARS($67, 3, 300)
```

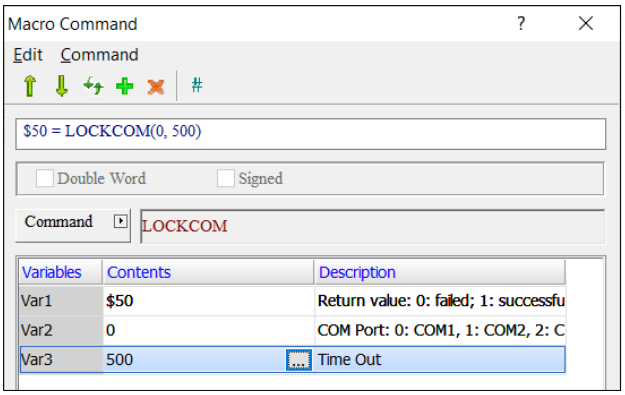
Element On Macro

```
UNLOCKCOM(0)
```

Suppose users lock COM Port in the **Background Macro** and transmits data through COM Port, but users cannot unlock COM Port in **Element On Macro**. This means that the two commands of locking COM Port and unlocking COM Port cannot be written separately.

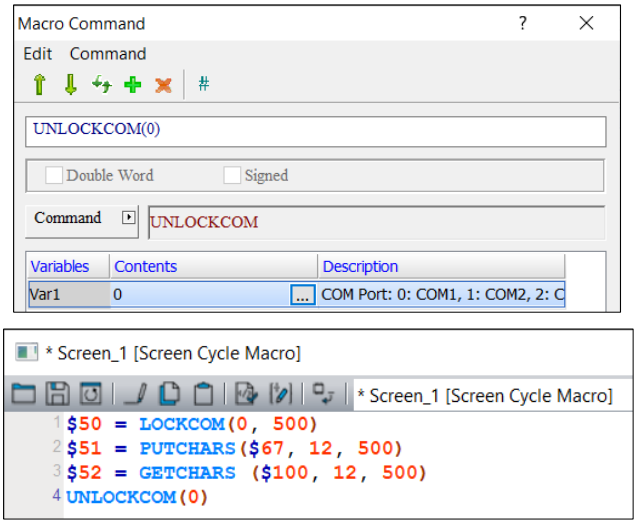
Example

- Var1 is the Internal Memory address, and Var2 and Var3 can only be constants.



- Var1 can only be a constant.

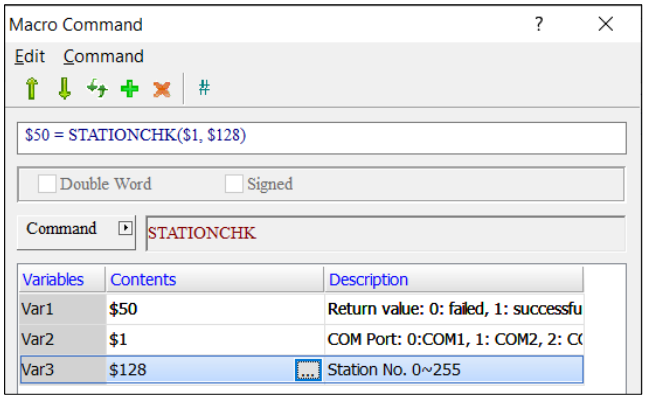
Example



- STATIONCHK (Check COM Connection Status)

Expression	Meaning of Variable			Note
Var1 = STATIONCHK(Var2, Var3) (W)	Var1	Return value		W: Word
		Failed	0	
		Succeeded	1	
	Var2	COM1	0	
		COM2	1	
		COM3	2	
	Var3	Station No.		
	Description of Action			
	Check COM connection status.			
NOTE: *This command reads Internal Memory parameters without increasing the HMI communication.*				

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V
Var3	V		V

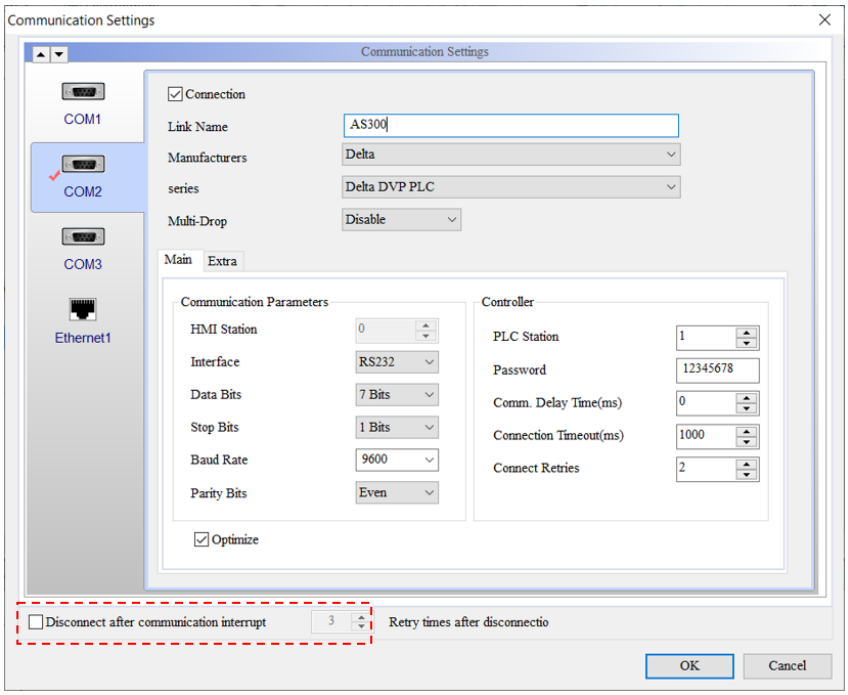
Example
● Var1 is the Internal Memory address, and Var2 and Var3 are constants.  ● After executing this **Macro**, if the communication between the HMI COM2 and the PLC of Station No. 128 is normal, the return value is $50 = 1; if the communication is abnormal, the return value is $50 = 0.

● STATIONON (Station ON)

Expression	Meaning of Variable			Note
STATIONON(Var1, Var2) (W)	Var1	COM1	0	W: Word
		COM2	1	
		COM3	2	
	Var2	Station No.		
	Description of Action			
	Enable Station No. Var2 of COM Var1 and the HMI can communicate with the station controller.			

NOTE: *The STATIONON macro and the Disconnect after communication interrupt of* ***General*** *>* ***Communication Settings*** *cannot be used at the same time.*

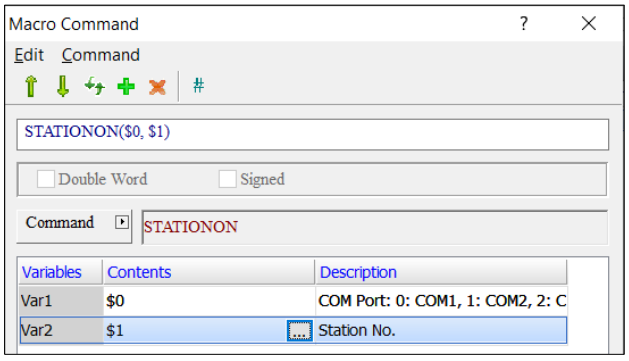
Expression	Meaning of Variable	Note



Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example

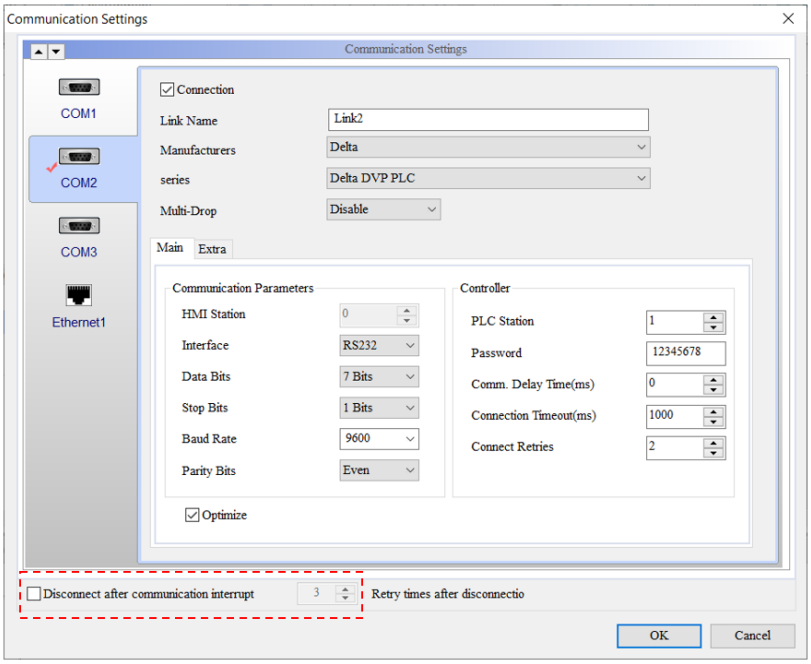
- Var1 and Var2 are constants.
- Enable Station No. 1 on COM 1.



- STATIONON (Station OFF)

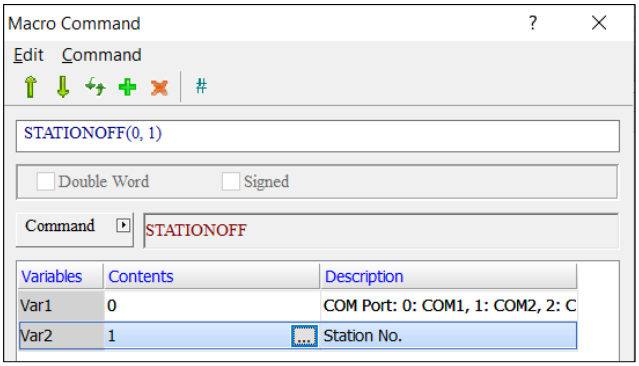
Expression	Meaning of Variable			Note
STATIONOFF(Var1, Var2) (W)	Var1	COM1	0	W: Word
		COM2	1	
		COM3	2	
	Var2	Station No.		
	Description of Action			
	Disable Station No. Var2 of COM Var1, and the HMI cannot communicate with the station controller.			

NOTE: *The STATIONOFF macro and the Disconnect after communication interrupt of* ***General*** *>* ***Communication Settings*** *cannot be used at the same time.*



Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V
Var2	V		V

Example
● Var1 and Var2 are constants. ● Disable Station No. 1 on COM 1.



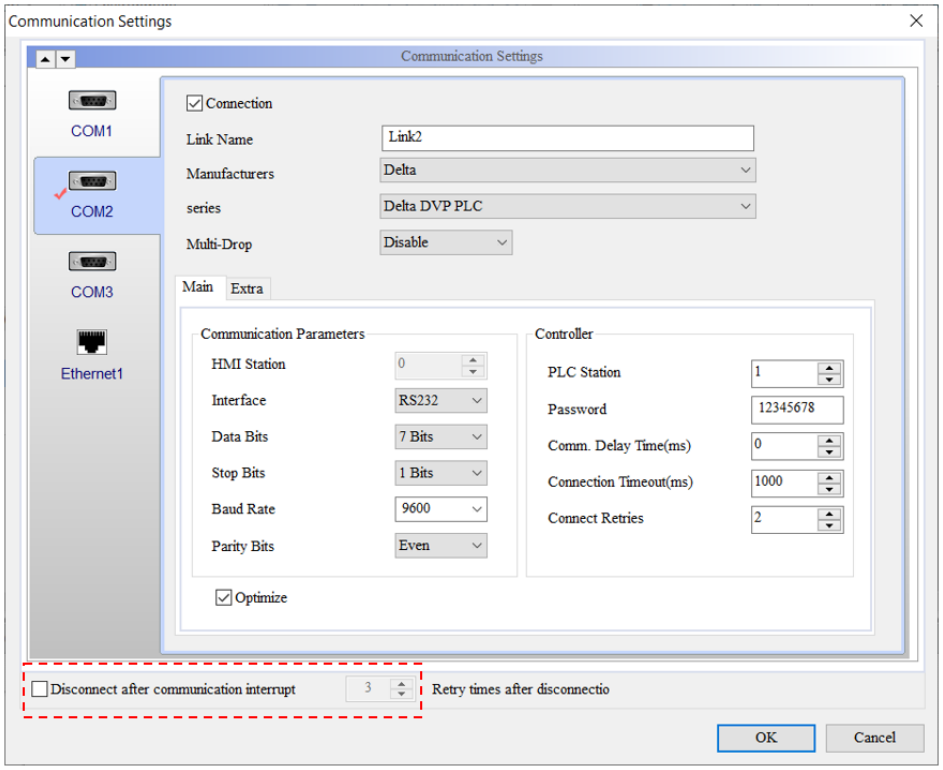
- IPON (Activate IP address)

Expression	Meaning of Variable			Note
Var1 = IPON(Var2,Var3,Var4, Var5,Var6) (W)	Var1	Return value		W: Word
		Failed	0	
		Succeeded	1	
	Var2	IP1		
	Var3	IP2		
	Var4	IP3		
	Var5	IP4		
	Var6	Port		
	Description of Action			
	Activate IP Var2, Var3, Var4, Var5, and Port Var6, and the HMI can communicate with the station controller.			

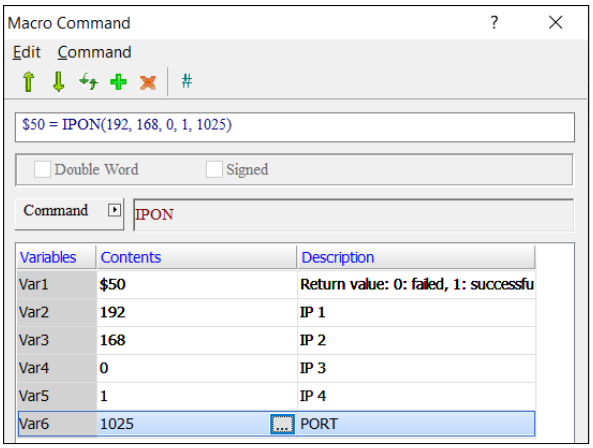
NOTE:

1. *Using Var6 is not necessary. All ports under this IP will be activated when it is not in use.*
2. *The IPON macro and the Disconnect after communication interrupt of* ***General*** *>* ***Communication Settings*** *cannot be used at the same time.*

Expression	Meaning of Variable	Note



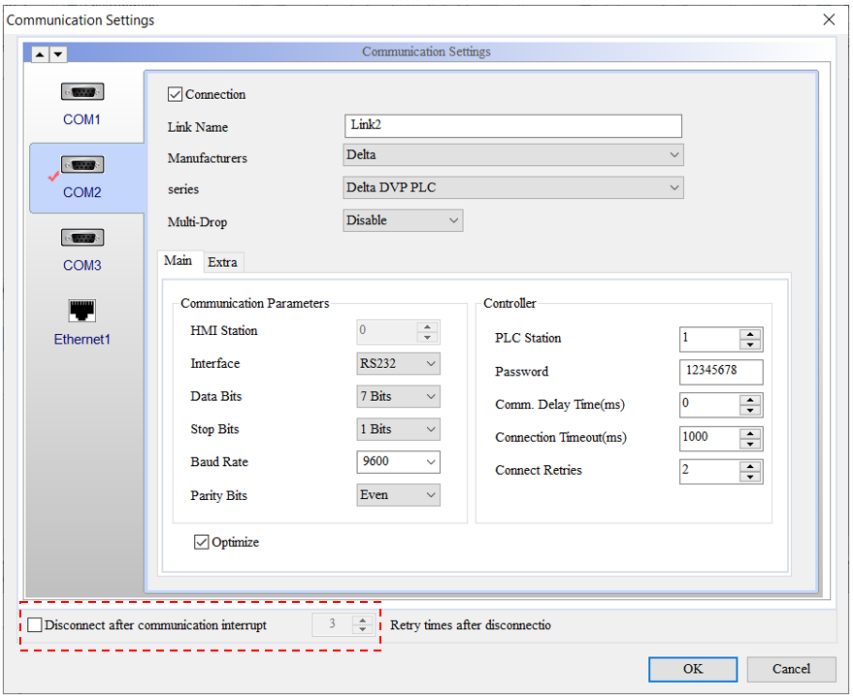
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	V
Var4	V	V	V
Var5	V	V	V
Var6	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 to Var6 are constants. Activate IP 192.168.0.1 Port: 1025.    ● If users are not using Var6, enter $50 = IPON (192, 168, 0, 1), and all ports of IP 192.168.0.1 will be activated after the macro operation.

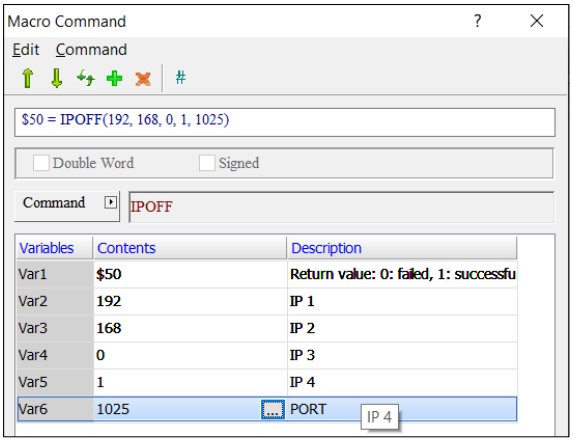
● IPOFF (Disable IP address)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="10">Var1 = IPOFF(Var2,Var3,Var4,Var5,Var6) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="10">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">IP1</td></tr>
<tr><td>Var3</td><td colspan="2">IP2</td></tr>
<tr><td>Var4</td><td colspan="2">IP3</td></tr>
<tr><td>Var5</td><td colspan="2">IP4</td></tr>
<tr><td>Var6</td><td colspan="2">Port</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Disable IP Var2, Var3, Var4, Var5, and Port Var6, and the HMI cannot communicate with the station controller.</td></tr>
<tr><td colspan="5">NOTE:
1. Using Var6 is not necessary. All ports under this IP will be disabled when it is not in use.
2. The IPOFF macro and the Disconnect after communication interrupt of General > Communication Settings cannot be used at the same time.</td></tr>
</table>

Expression	Meaning of Variable	Note



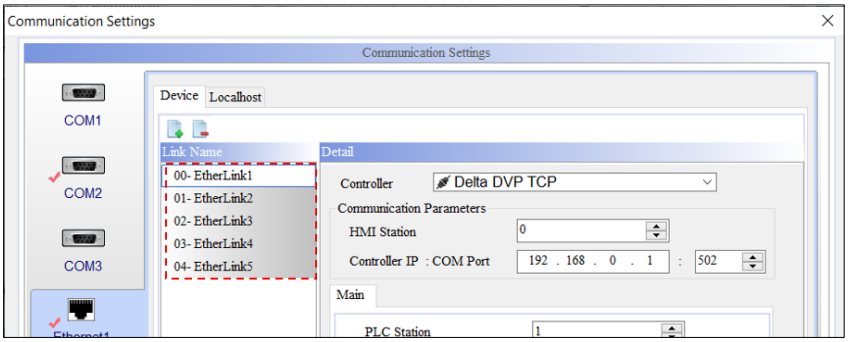
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	V
Var4	V	V	V
Var5	V	V	V
Var6	V	V	V

Example
● Var1 is the Internal Memory address, and Var2 to Var6 are constants. Disable IP 192.168.0.1 Port: 1025.    ● If users are not using Var6, enter $50 = IPON (192, 168, 0, 1), and all ports in IP 192.168.0.1 will be disabled after the macro operation.

● IPCHANGE (Change the Connection IP and Communication Port of the Connection Controller)

Expression	Meaning of Variable			Note
Var1 = IPCHANGE(Var2, Var3, Var4, Var5, Var6, Var7) (W)	Var1	Return value		W: Word
		Failed	0	
		Succeeded	1	
	Var2	Link No		
	Var3	IP1		
	Var4	IP2		
	Var5	IP3		
	Var6	IP4		
	Var7	Port		
	Description of Action			
	Change the IP setting of PLC connection, Var3, Var4, Var5, Var6, and Port Var7, and the HMI can dynamically change the information of Link for the HMI to reconnect with another PLC.			
NOTE: *Link No. starts from 0.*				

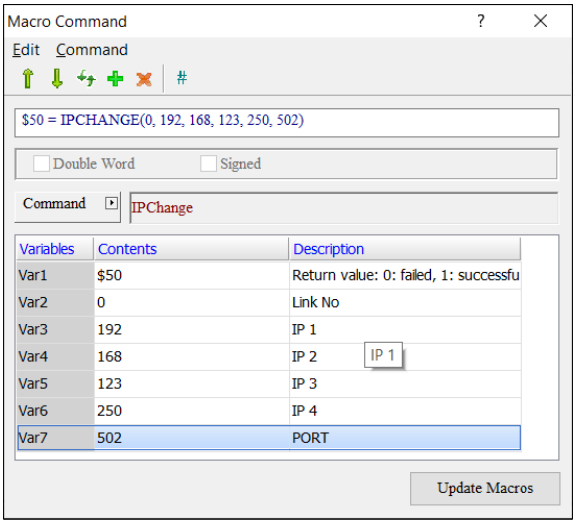
Expression	Meaning of Variable	Note



Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	V
Var4	V	V	V
Var5	V	V	V
Var6	V	V	V
Var7	V		

Example

- Var1 is the Internal Memory address, and Var2 to Var7 are constants.



- Change the IP of PLC connection to 192.168.123.250 Port: 502.

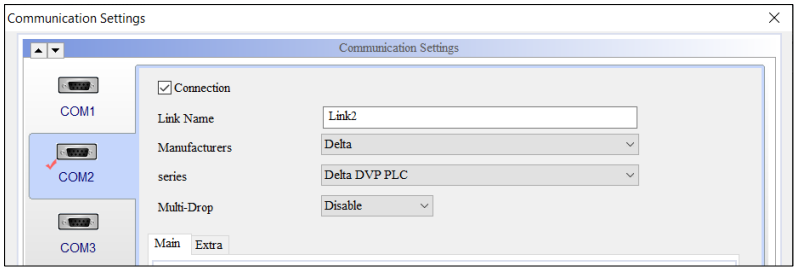
- COMLINKSTATUS (Communication Port Connection Status)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="6">Var1 = COMLINKSTATUS(Var2)</td><td>Var1</td><td colspan="2">Communication error code. Return 0 when the communication is normal.</td><td rowspan="6"></td></tr>
<tr><td rowspan="3">Var2</td><td>COM1</td><td>0</td></tr>
<tr><td>COM2</td><td>1</td></tr>
<tr><td>COM3</td><td>2</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Return the error code of COM Var2 to Var1</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example

Step 1: In the **Communication Settings**, set the controller **Series** to Delta DVP PLC.

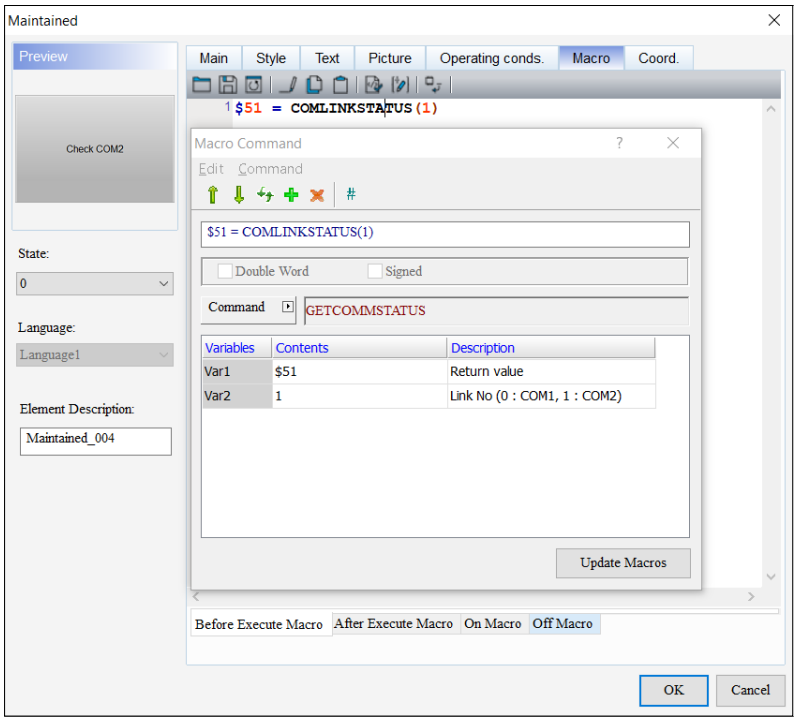


Step 2: Create two **Numeric Entry** elements on the HMI screen with the addresses as $51 and {Link2}1@D0 and the data formats as Hexadecimal.

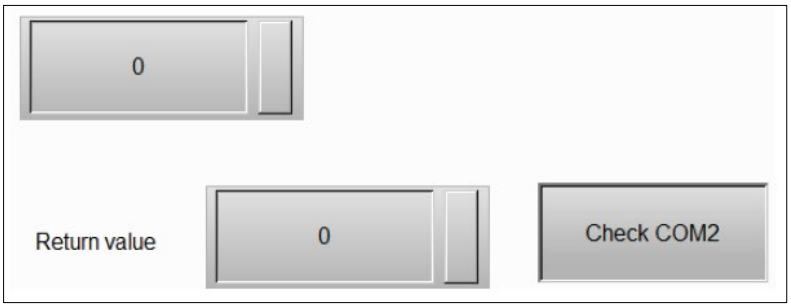


Example

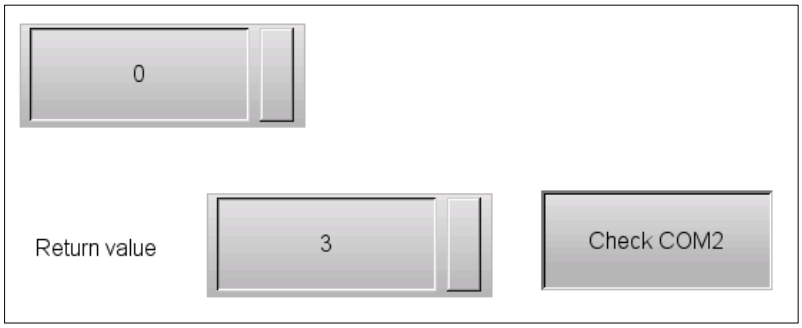
Step 3: Create a **Maintained Button**, set the address to $100.1, and add the **On Macro** to detect the communication status of COM2.



Step 4: Download the project to the HMI. Under normal communication, the return value is 0 when users execute the **Maintained Button**.



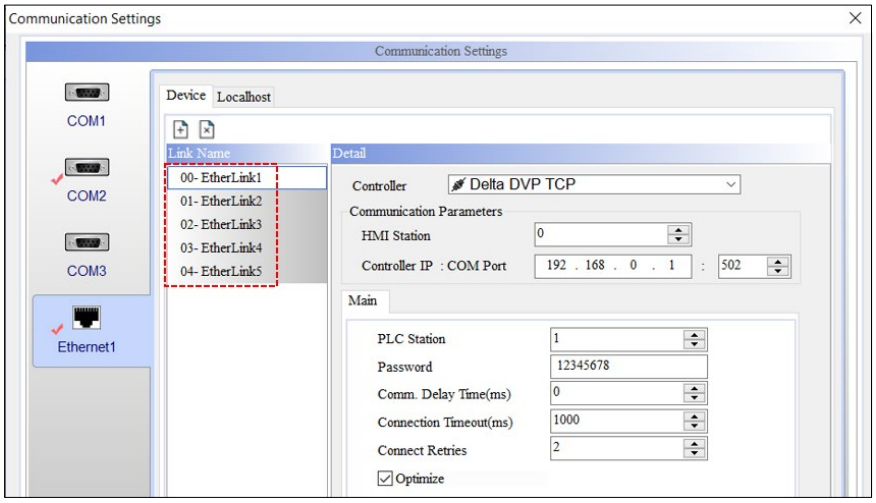
Step 5: Remove the communication cable. When the HMI displays Communication error 3 and users execute the **Maintained Button**, the return value is 3.



- NETLINKSTATUS (Network Connection Status)

Expression	Meaning of Variable		Note
Var1 = NETLINKSTATUS(Var2)	Var1	Return value	-
		Communication error code. When the return value is 0, it means the communication is normal.	
	Var2	Link No	
	Description of Action		
	Return the error code of Var2 of the current Link No. to Var 1.		

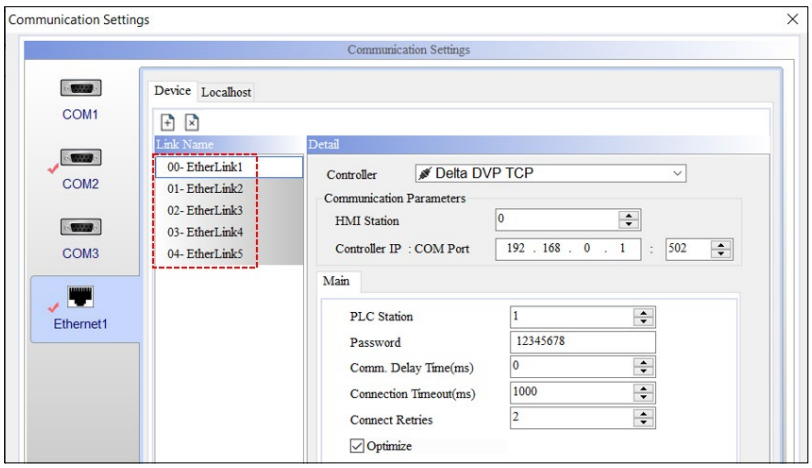
NOTE: *The Link No. starts from 0.*



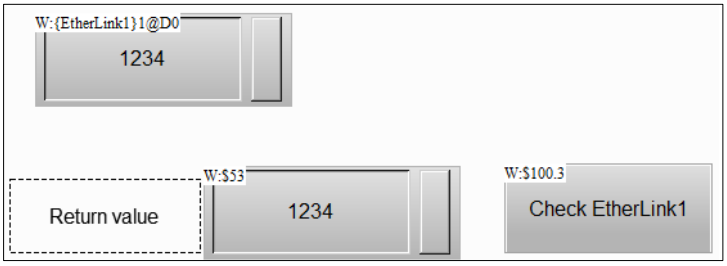
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example

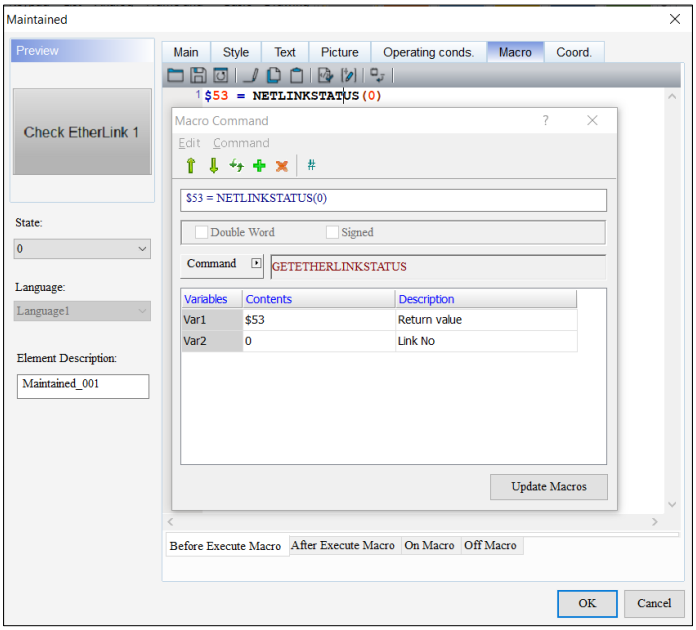
Step 1: In the **Communication Settings**, set the **Controller** to Delta DVP TCP/IP.



Step 2: Create two **Numeric Entry** elements on the HMI screen with the addresses as $53 and {EtherLink1}1@D0 and the data formats as Hexadecimal.

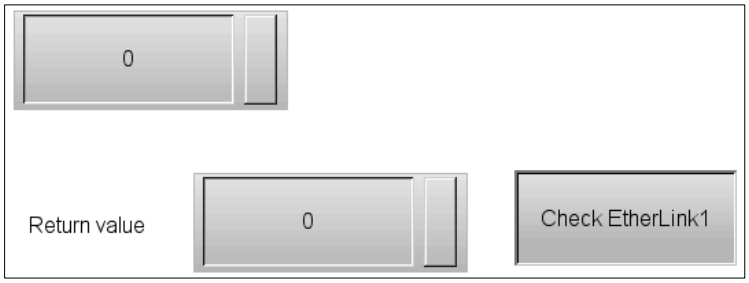


Step 3: Create a **Maintained Button**, set the address to $100.3, and add the **On Macro** to detect the communication status of Link No.0.

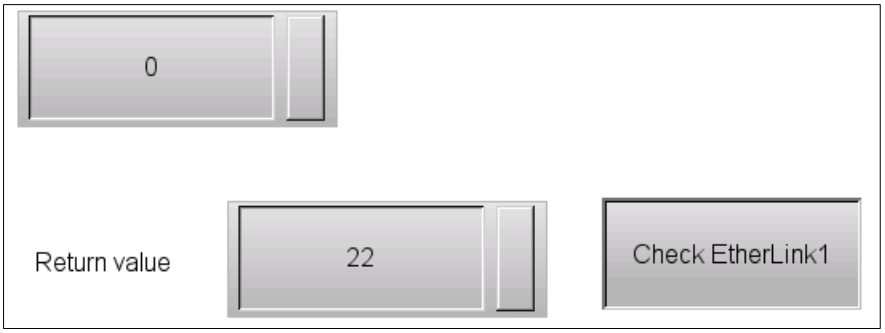


Step 4: Download the project to the HMI. Under normal communication, the return value is 0 when users execute the **Maintained Button**.

Example



Step 5: Remove the network cable. When the HMI displays TCP reading error 22 and users execute the **Maintained Button**, the return value is 22.



- CLOSECOM (Disable the Communication Port)

Expression	Meaning of Variable			Note
Var1 = CLOSECOM(Var2)	Var1	Return value		
		Failed	0	
		Succeeded	1	
	Var2	COM1	0	
		COM2	1	
		COM3	2	
	Description of Action			
	Disable the communication port and return the value indicating success or failure to Var1.			

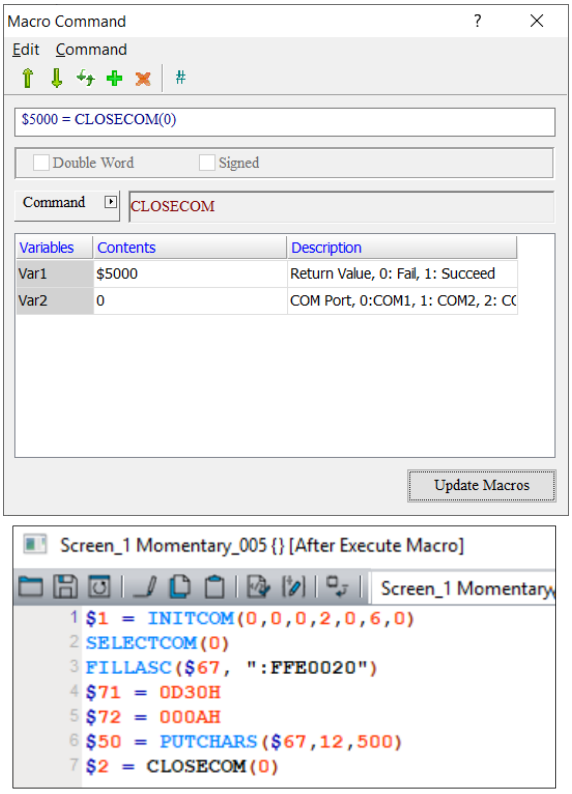
NOTE:

1. *The CLOSECOM command must be used with INITCOM.*
2. *The communication port that users specify must be different from the port used for the system. All communication commands are processed based on the selected communication ports, so there are no interference or reference between the specified communication port commands used in different macros.*
3. *If users need to change to another communication, each time they complete the INITCOM communication, execute the CLOSECOM macro to disable the current COM communication. Next, execute the INITCOM macro for the communication parameters to*

be used next time.			
Variable	**Type**		
	Internal Memory	PLC Register	Constant
Var1	V	V	V
Var2	V	V	V

Example

Var1 and Var2 can be external memory, Internal Memory, or constants.



24.3.9 Drawing

Drawing includes commands such as RECTANGLE, LINE, POINT, CIRCLE, etc., which allow users to draw figures. The commands are described in detail as follows.

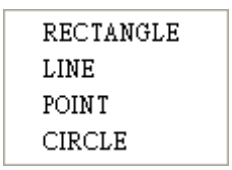


Figure 24 - 45: Drawing

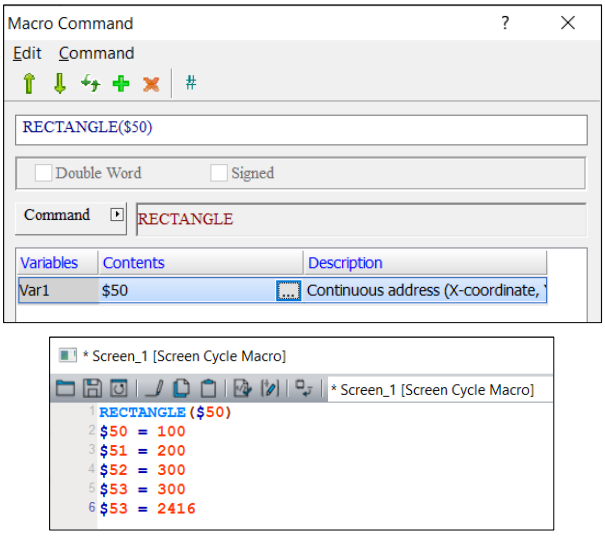
- RECTANGLE (Rectangle)

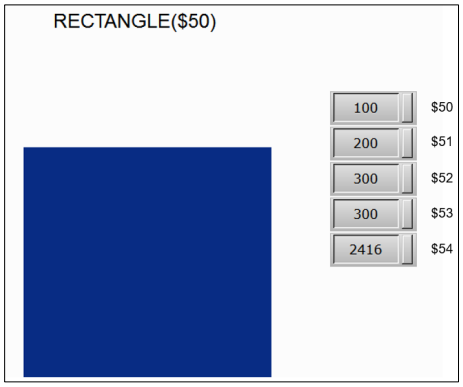
Expression	Meaning of Variable		Note
RECTANGLE(Var1) (W)	Var1	Upper-left X-coordinate	W: Word
	Var1 + 1	Upper-left Y-coordinate	
	Var1 + 2	Rectangle width	
	Var1 + 3	Rectangle height	
	Var1 + 4	Rectangle color	
	Description of Action		
	Draw a rectangle with continuous addresses.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

Var1 is the Internal Memory address.



Example


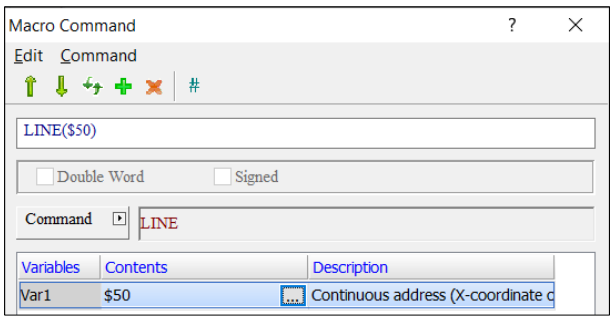
- LINE (Line)

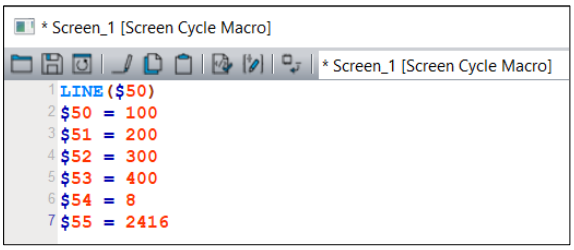
Expression	Meaning of Variable		Note
LINE(Var1) (W)	Var1	X-Coordinate of starting point	
	Var1 + 1	Y-Coordinate of starting point	W: Word
	Var1 + 2	X-Coordinate of end point	
	Var1 + 3	Y-Coordinate of end point	
	Var1 + 4	Line width	
	Var1 + 5	Line color	
	Description of Action		
	Draw a line with continuous addresses.		

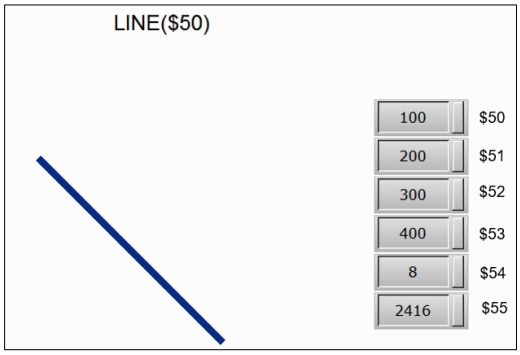
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

Var1 is the Internal Memory address.





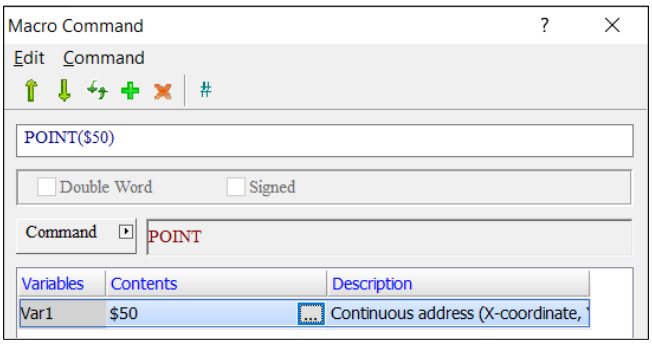


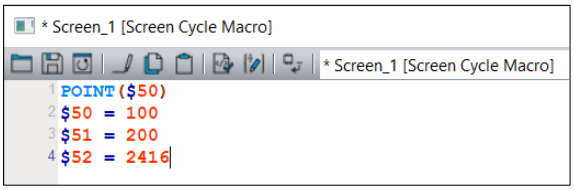
- POINT (Point)

Expression	Meaning of Variable		Note
POINT(Var1) (W)	Var1	X-Coordinate	W: Word
	Var1 + 1	Y-Coordinate	
	Var1 + 2	Point color	
	Description of Action		
	Draw a point with continuous addresses.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example
Var1 is the Internal Memory address.





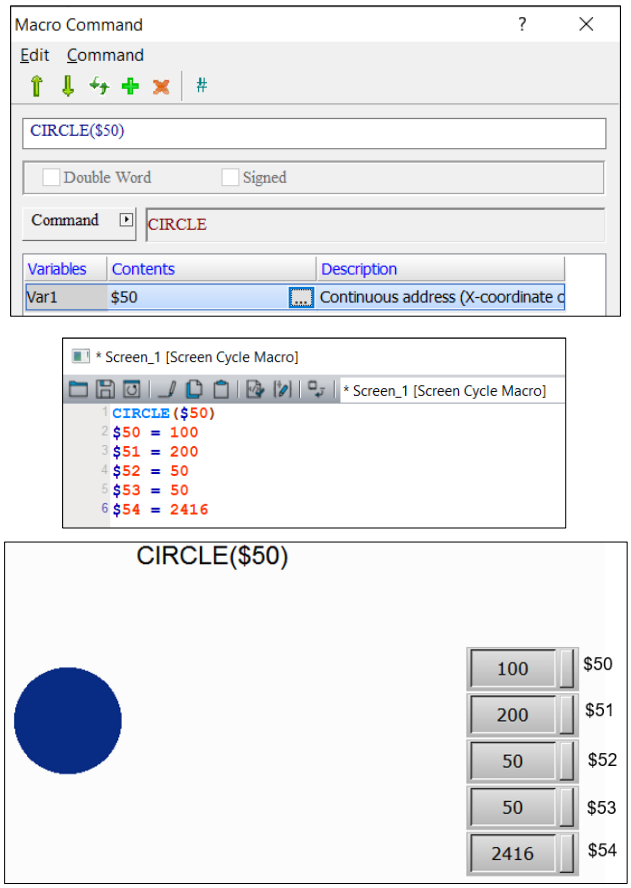
- CIRCLE (Circle)

Expression	Meaning of Variable		Note
CIRCLE(Var1) (W)	Var1	X-Coordinate at the center of a circle	W: Word
	Var1 + 1	Y-Coordinate at the center of a circle	
	Var1 + 2	Circle length	
	Var1 + 3	Circle width	
	Var1 + 4	Circle color	
	Description of Action		
	Draw a circle with continuous addresses.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

Var1 is the Internal Memory address.



24.3.10 File Access

File Access includes FileSlotRead, FileSlotWrite, FileSlotRemove, FileSlotGetLength, FileSlotExport, FileSlotImport and other FileSlot related commands. The commands are described in detail as follows.

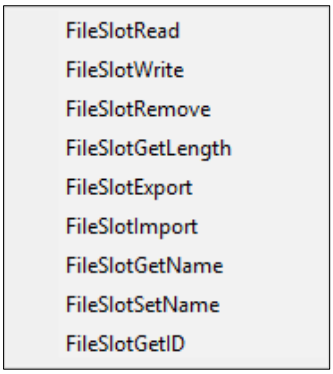


Figure 24 - 46: File Access

- FileSlotRead (Read the file)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="8">Var1 = FileSlotRead (Var2, Var3, Var4, Var5) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="8">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">FileSlot ID</td></tr>
<tr><td>Var3</td><td colspan="2">Destination</td></tr>
<tr><td>Var4</td><td colspan="2">FileSlot content start address (DW)</td></tr>
<tr><td>Var5</td><td colspan="2">Word data length</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="4">Read FileSlot contents of Var2 for Var5 Word data starting from Var4 to Var3 destination address and return the results to Var1.</td></tr>
<tr><td colspan="5">NOTE: If the specified FileSlot file does not exist yet, use the FileSlotWrite command to create the file.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	
Var4	V	V	V
Var5	V	V	V

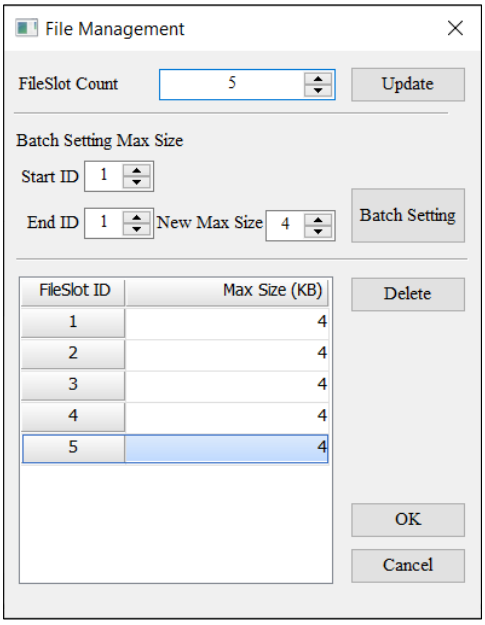
- FileSlotWrite (Write the file)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="8">Var1 = FileSlotWrite (Var2, Var3, Var4, Var5) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="8">W: Word</td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">FileSlot ID</td></tr>
<tr><td>Var3</td><td colspan="2">Source</td></tr>
<tr><td>Var4</td><td colspan="2">FileSlot content start address (DW)</td></tr>
<tr><td>Var5</td><td colspan="2">Word data length</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="4">Read Var5 Word data starting from Var3, write in Var2 FileSlot from Var4 start address, and return the results to Var1.</td></tr>
</table>

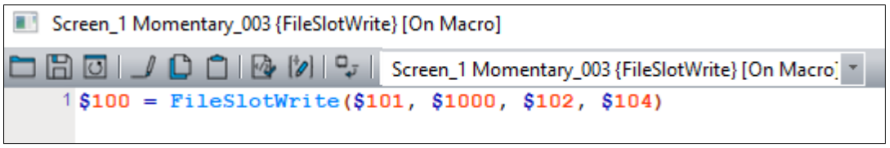
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	
Var4	V	V	V
Var5	V	V	V

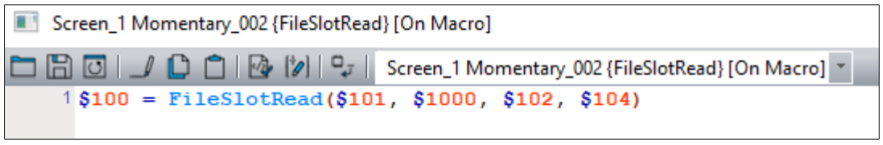
Example
● Users must use FileSlotWrite to create a file before using FileSlotRead to read the data. The procedures are as follows. 1. Go to **Project** > **Other Setting** > **Fileslot File Management** to set FileSlot.

Example



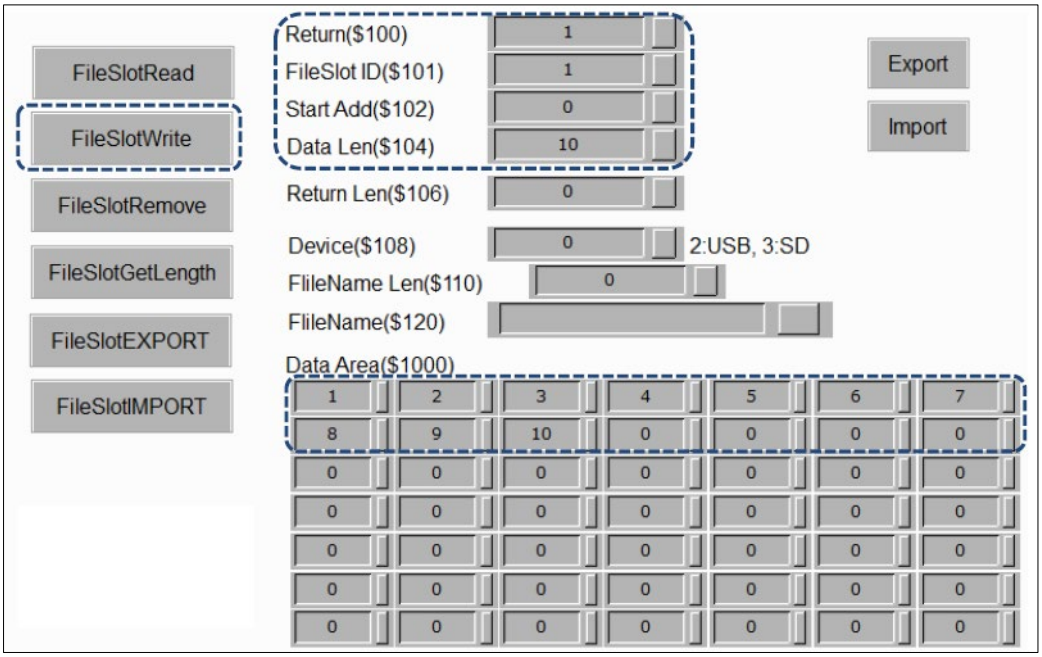
2. Create two **Momentary Button** elements and write the **On Macro**.



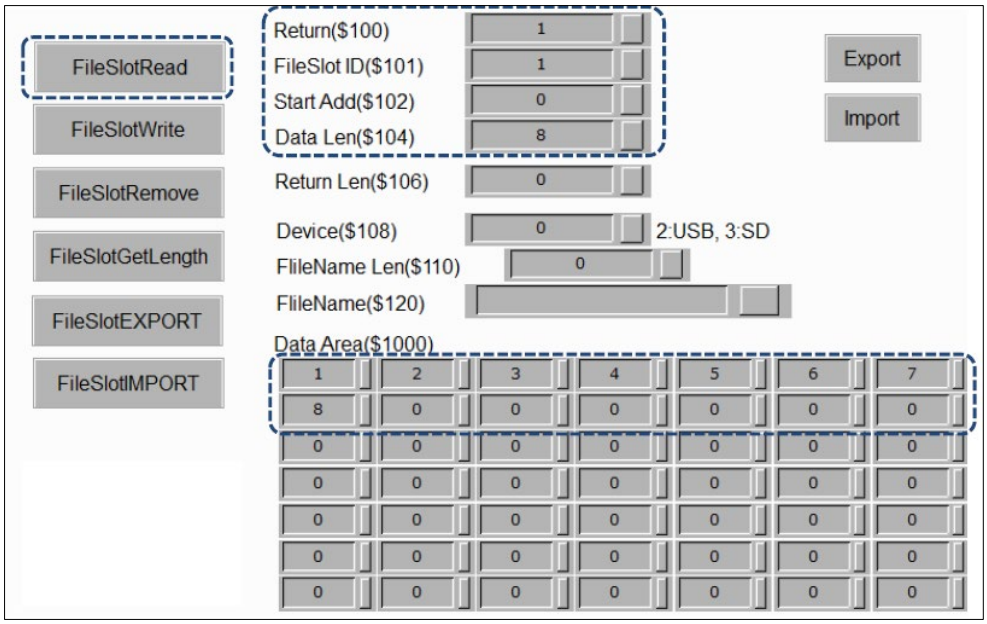


3. After compiling the screen and downloading it to the HMI, edit the data of 10 Words with $1000 as the start address. Set $101 as 1, $102 as 0, and $104 as 10. By triggering FileSlotWrite, the data of $1,000 - $1009 will be written to the FileSlot ID 1 starting from the 0th address.

Example



4. Reset the data of $1000 - $1009 to zero, and then set $104 as 8. By triggering **FileSlotRead**, the data of 8 Words starting from the 0th address of the FileSlot ID 1 will be written to $1000 to $1007.



- FileSlotRemove (Remove the file)

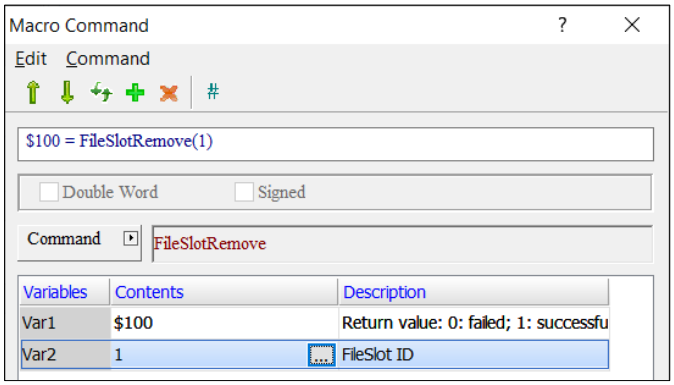
Expression	Meaning of Variable		Note
Var1 = FileSlotRemove (Var2)	Var1	Return value	W: Word

Expression	Meaning of Variable			Note
(W)		Failed	0	
		Succeeded	1	
	Var2	FileSlot ID		
	Description of Action			
	Remove the FileSlot of Var2 and return the result to Var1.			

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V

Example

- Var1 is the Internal Memory address and Var2 is a constant.
- Remove FileSlot ID 1 (Var2) and put the return value in $100 (Var1).



- FileSlotGetLength (Read the file length)

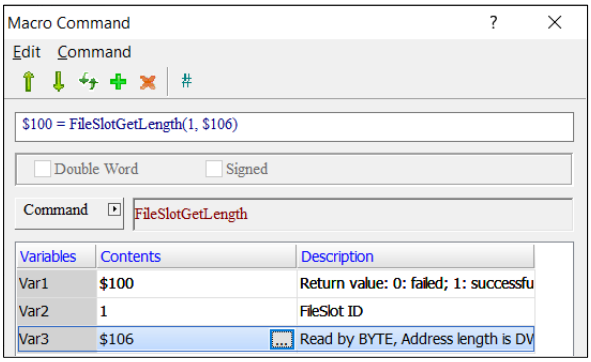
Expression	Meaning of Variable			Note
Var1 = FileSlotGetLength (Var2, Var3) (W)	Var1	Return value		W: Word
		Failed	0	
		Succeeded	1	
	Var2	FileSlot ID		
	Var3	FileSlot LengthReturn value(DW)		

Expression	Meaning of Variable	Note
	Description of Action	
	Store the length of the Var2 FileSlot to Var3 and return the result to Var1.	
***NOTE:** Unit of read length is Byte.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	

Example

- Var1 and Var3 are Internal Memory addresses, and Var2 is a constant.
- Get the length of FileSlot ID 1 (Var2) and save it to $106, and put the return value in $100 (Var1). If the FileSlot length is 10 words, the value returned to $106 is 20 (Byte).



- FileSlotExport (Export the file)

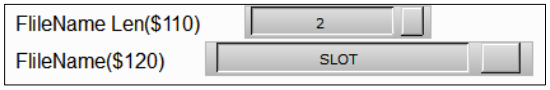
Expression	Meaning of Variable				Note
Var1 = FileSlotExport (Var2, Var3, Var4, Var5) (W)	Var1	Return value			W: Word
		Failed	0		
		Succeeded	1		
	Var2	FileSlot ID			
	Var3	File export device	USB Disk	2	
			SD Card	3	

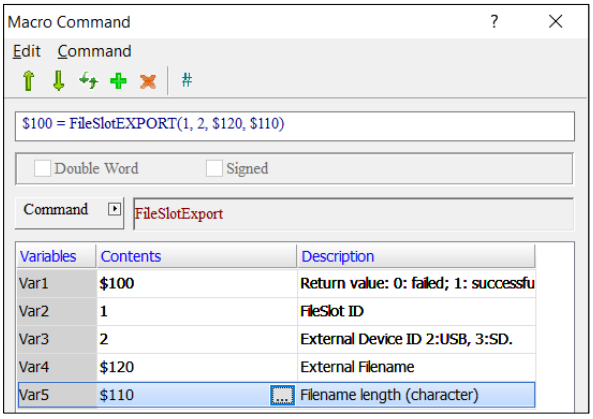
Expression	Meaning of Variable		Note
	Var4	Name of the file exported	
	Var5	Name length of the file exported	
	Description of Action		
	Export the Var2 FileSlot to the external storage device Var3, name the file as Var4, and return the result to Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	V
Var4	V	V	
Var5	V	V	V

Example

- Var1, Var4, and Var5 are Internal Memory addresses, and Var2 and Var3 are constants.
- Export FileSlot ID 1 (Var2) to USB Disk (Var3), which name length of the file is 2 (Var5) and file name is Slot (Var4), and put the return value in $100 (Var1).



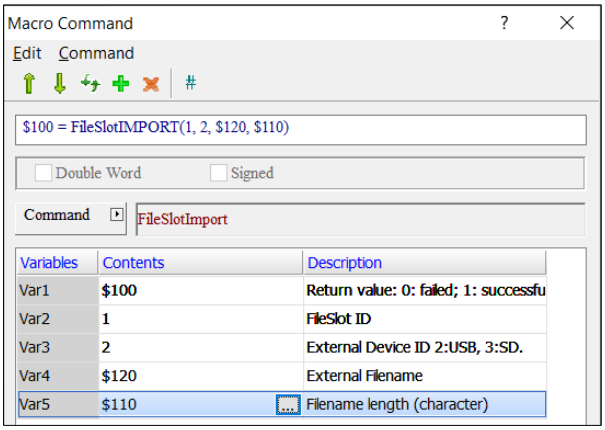


- FileSlotImport (Import the file)

<table>
<tr><th>Expression</th><th colspan="5">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="8">Var1 = FileSlotImport (Var2, Var3, Var4, Var5) (W)</td><td rowspan="3">Var1</td><td colspan="4">Return value</td><td rowspan="8">W: Word</td></tr>
<tr><td>Failed</td><td colspan="3">0</td></tr>
<tr><td>Succeeded</td><td colspan="3">1</td></tr>
<tr><td>Var2</td><td colspan="4">FileSlot ID</td></tr>
<tr><td rowspan="2">Var3</td><td rowspan="2">Device to export the file</td><td>USB Disk</td><td colspan="2">2</td></tr>
<tr><td>SD Card</td><td colspan="2">3</td></tr>
<tr><td>Var4</td><td colspan="4">Name of the file imported</td></tr>
<tr><td>Var5</td><td colspan="4">Length of the filename to be imported</td></tr>
<tr><td colspan="6">Description of Action</td></tr>
<tr><td colspan="6">Import the file named Var4 in the external storage device Var3 to the Var2 FileSlot and send the return value to Var1.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	V
Var4	V	V	
Var5	V	V	V

Example
● Var1, Var4, and Var5 are Internal Memory addresses, and Var2 and Var3 are constants. ● Import the file named Slot (Var4) with the length of 2 (Var5) in USB Disk (Var3) to the FileSlot ID 1 (Var2), and put the return value in $100 (Var1). 

Example


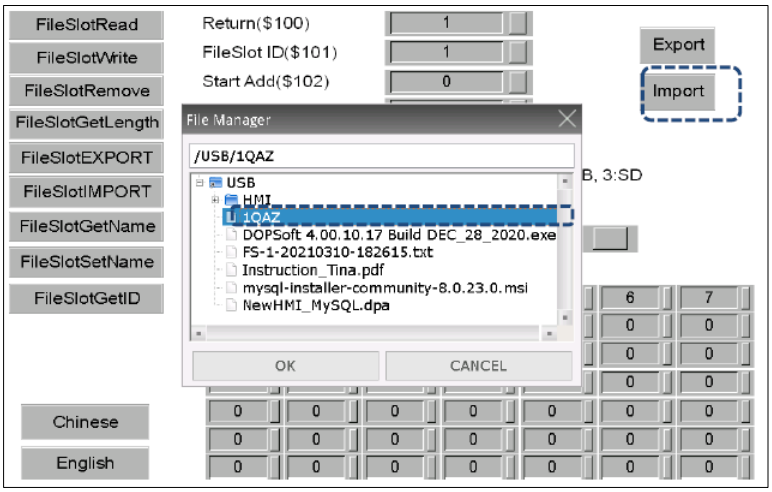
- FileSlotGetName (Get the filename)

Expression	Meaning of Variable			Note
Var1 = FileSlotGetName(Var2, Var3, Var4)	Var1	Return value		
		Failed	0	
		Succeeded	1	
	Var2	FileSlot ID		
	Var3	Filename		
	Var4	Length of the filename (read in units of Byte)		
	Description of Action			
	Store the filename of Var2 (FileSlot ID) referencing the length specified by Var4 and return the result to Var1.			

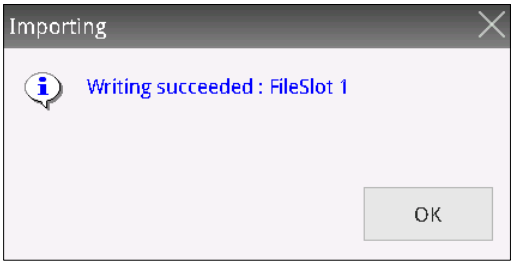
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	
Var4	V	V	V

Example

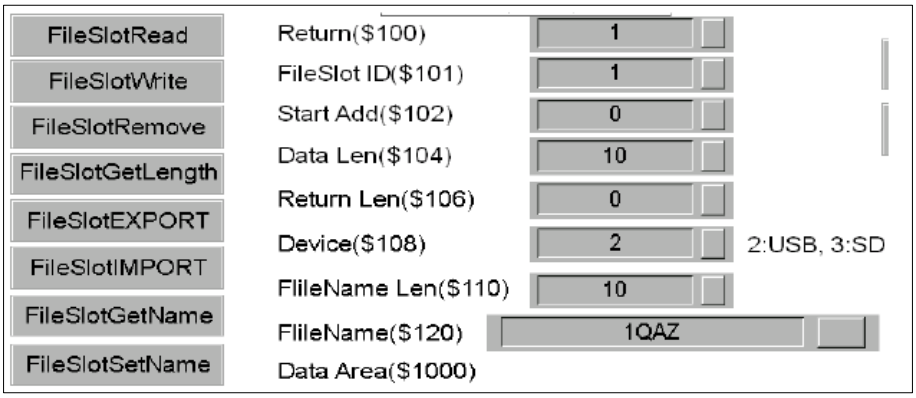
- Import the FileSlot file, and then get the filename through the imported FileSlot ID.



- When the **Import** is successful, the following message appears.



- Execute the **FileSlotGetName** command to get the filename of the file that is just imported.



- FileSlotSetName (Set the filename)

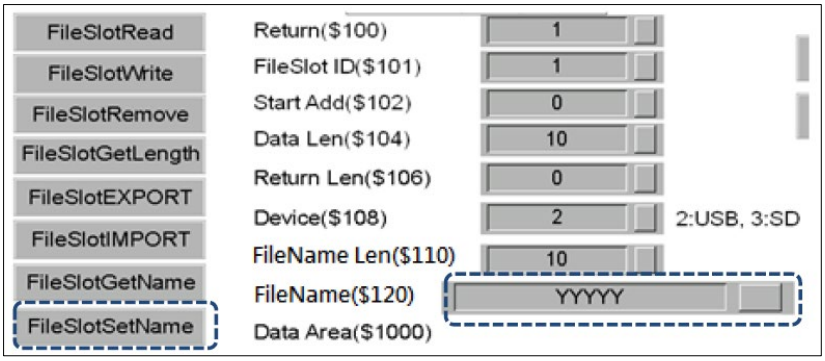
Expression	Meaning of Variable			Note
Var1 = FileSlotSetNaSme(Var2,	Var1	Return value		
		Failed	0	

Expression	Meaning of Variable			Note
Var3, Var4)		Succeeded	1	
	Var2	FileSlot ID		
	Var3	Filename		
	Var4	Length of the filename (read in units of Byte)		
	Description of Action			
	Set the filename of Var2 (FileSlot ID) to Var3 referencing the length specified by Var4, and then return the result to Var1.			

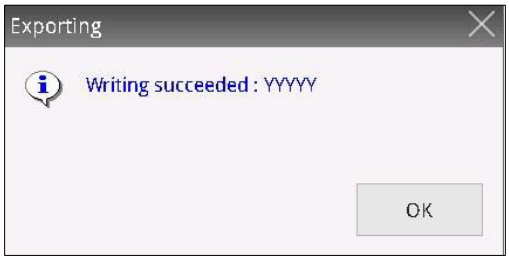
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	
Var4	V	V	V

Example

This command modifies the name of the imported FileSlot file.



After users modified the filename, **Export** the file to the USB Disk or SD Card.



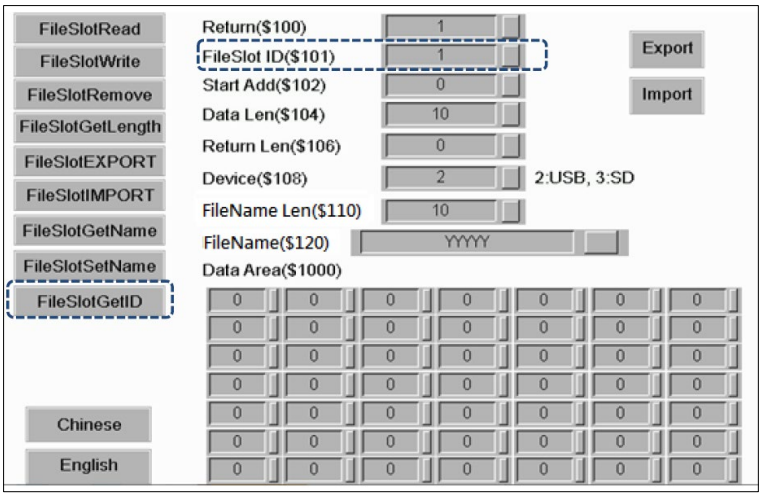
- FileSlotGetID (Get the file ID)

<table>
<tr><th>Expression</th><th colspan="3">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="7">Var1 = FileSlotGetID (Var2,
Var3, Var 4) (W)</td><td rowspan="3">Var1</td><td colspan="2">Return value</td><td rowspan="7"></td></tr>
<tr><td>Failed</td><td>0</td></tr>
<tr><td>Succeeded</td><td>1</td></tr>
<tr><td>Var2</td><td colspan="2">Filename</td></tr>
<tr><td>Var3</td><td colspan="2">Length of the filename (read in units of Byte)</td></tr>
<tr><td>Var4</td><td colspan="2">FileSlot ID</td></tr>
<tr><td colspan="3">Description of Action</td></tr>
<tr><td colspan="3">Refer to the length of the filename specified by Var3, store the FileSlot ID of the filename specified by Var2 to Var4, and return the result to Var1.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V	V	V
Var3	V	V	V
Var4	V	V	

Example

Use the filename of the FileSlot file to get the corresponding FileSlot ID.



24.3.11 Others

Others include Time Tick, GETLASTERROR, Comment, Delay, GETSYSTEMTIME, SETSYSTEMTIME, GETHISTORY, EXPORT, EXRCP, IMRCP, EXENRCP, IMENRCP, EXHISTORY, EXALARM, EXALARMGROUP, DISKFORMAT, BMPCAPTURE, PLCDOWNLOAD, OPENSCREEN, CLOSESUBSCREEN, GetCircleCenter, VAR, and other commands.

The commands are described in detail as follows.

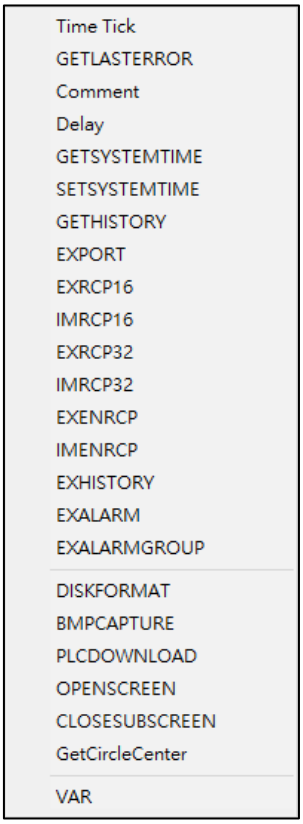


Figure 24 - 47: Others

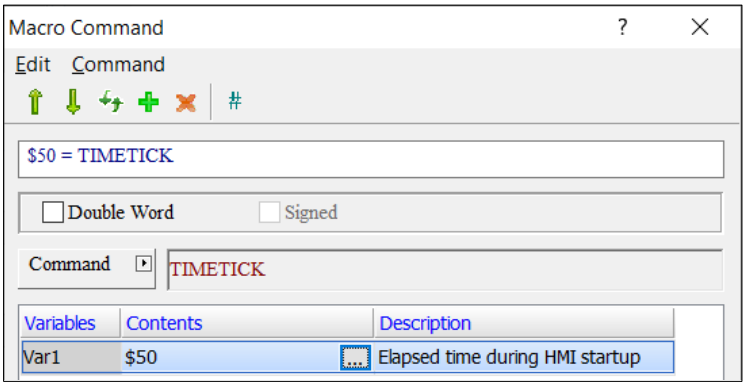
- Time Tick (get the time from the start of the system up to now)

Expression	Meaning of Variable		Note
Var1 = TIMETICK (W) Var1 = TIMETICK (DW)	Var1	Elapsed time during HMI startup	W: Word DW: Double Word
	Description of Action		
	Get the time from the start of the system up to now and put it in Var1 (unit: ms).		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

- Var1 is the Internal Memory address.
- Put elapsed time during the HMI startup in $50.



- GETLASTERROR (Get Error Value of Previous Command)

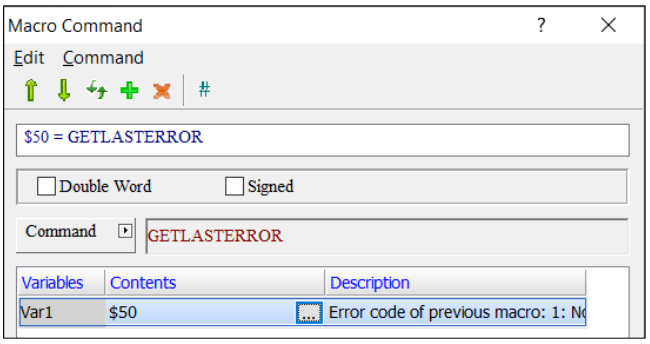
Expression	Meaning of Variable		Note
Var1 = GETLASTERROR (W) Var1 = GETLASTERROR (DW) Var1 = GETLASTERROR (Signed W) Var1 = GETLASTERROR	Var1	Error code of previous macro	W: Word DW: Double Word Signed: Signed number
		1: Succeeded	
		Negative value: error *(Section 24.4 Macro*	

Expression	Meaning of Variable	Note
(Signed DW)	*Error Code*)	
	Description of Action	
	Get the error value of the previous macro command and put the result in Var1.	
NOTE: *This command must follow a macro command with an error in order to obtain its error value.*		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

- Var1 is the Internal Memory address.
- Get the result of the error value of the previous macro command and put it in $50.

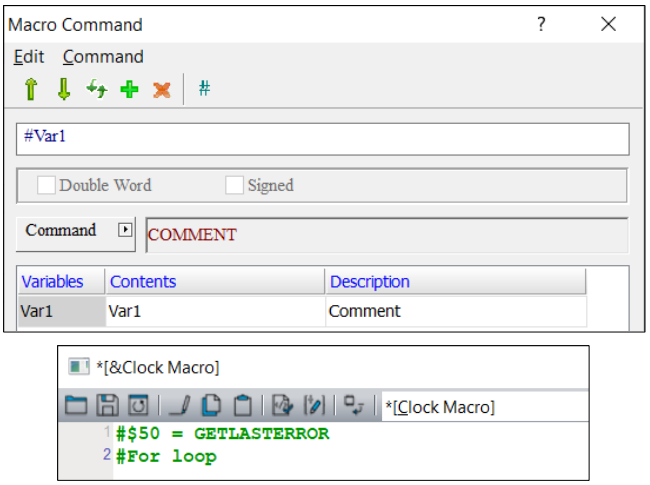


- COMMENT (Comments)

Expression	Meaning of Variable		Note
#Var1 (W)	Var1	Contents of command	W: Word
	Description of Action		
	Comment Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example
Add # before the command to make a comment on the command. # can also be used for describing the purpose of a macro.



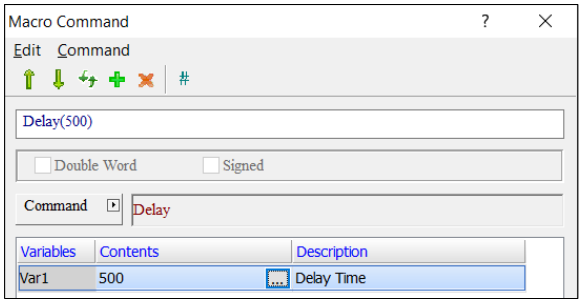
- Delay (Delay)

Expression	Meaning of Variable		Note
Delay(Var1) (W)	Var1	Delay time	W: Word
	Description of Action		
	Delay the time of Var1 before executing commands of the next line. The unit is ms.		

NOTE:

1. *Due to multitasking of the HMI, a system delay may occur by default. If users set this Delay command, the delay time may increase because of the busy operations of the system, and the command will not be executed in advance.*
2. *Excessive Delay setting will result in slow response of the HMI.*
3. *When the Delay command is executed, the HMI will suspend all actions until the Delay time is over.*

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V

Example
● Var1 is a constant. ● Set the Delay time to 500 ms. 

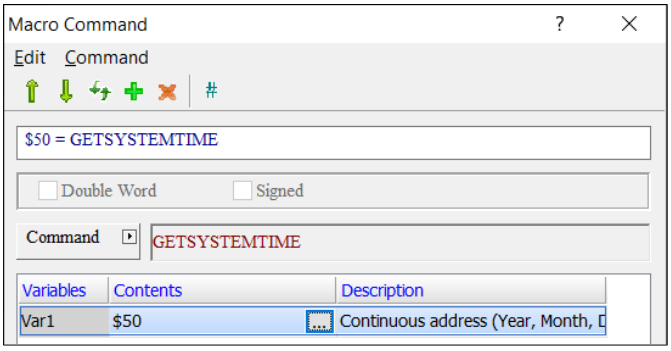
- GETSYSTEMTIME (Get System Time)

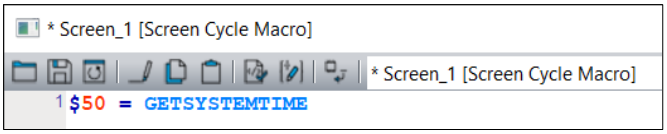
Expression	Meaning of Variable		Note
Var1 = GETSYSTEMTIME (W)	Var1	Year	W: Word
	Var1 + 1	Month	
	Var1 + 2	Day	
	Var1 + 3	Week	
	Var1 + 4	Hour	
	Var1 + 5	Minute	
	Var1 + 6	Second	
	Description of Action		
	Get the system time from Var1 to Var7 for 7 consecutive Words address.		

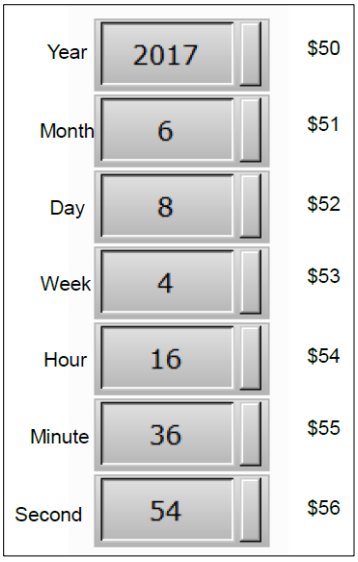
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

- Var1 is the Internal Memory address.
- Put the current system time in $50 to $56.







- SETSYSTEMTIME (Set System Time)

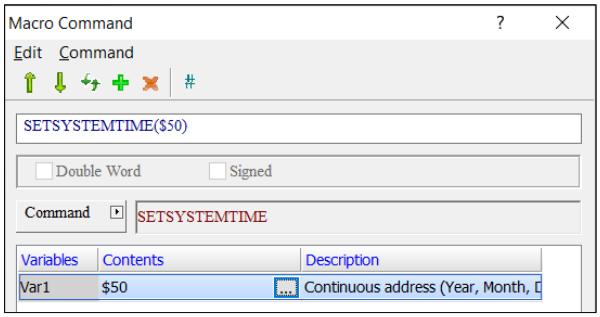
Expression	Meaning of Variable		Note
Var1 = SETSYSTEMTIME (W)	Var1	Year	W: Word
	Var1 + 1	Month	
	Var1 + 2	Day	
	Var1 + 3	Week	
	Var1 + 4	Hour	
	Var1 + 5	Minute	

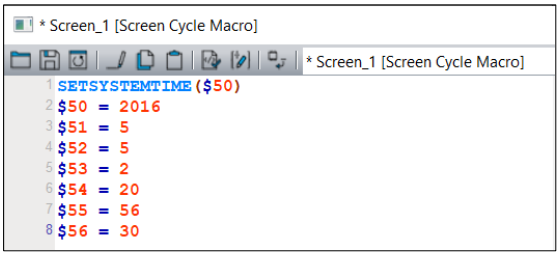
Expression	Meaning of Variable		Note
	Var1 + 6	Second	
	Description of Action		
	Set the system time from Var1 to Var7 for 7 consecutive Words address.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		

Example

- Var1 is the Internal Memory address.
- Set the current system time and put it in $50 to $56.







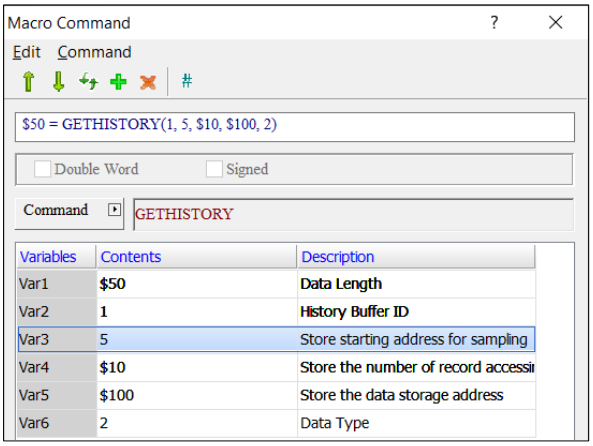
- GETHISTORY (Get History Data)

<table>
<tr><th>Expression</th><th colspan="4">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="10">Var1 = GETHISTORY(Var2, Var3, Var4, Var5, Var6) (W)</td><td>Var1</td><td colspan="3">Store Data Length</td><td rowspan="10">W: Word</td></tr>
<tr><td>Var2</td><td colspan="3">History Buffer ID</td></tr>
<tr><td>Var3</td><td colspan="3">Read starting address for sampling</td></tr>
<tr><td>Var4</td><td colspan="3">Read points</td></tr>
<tr><td>Var5</td><td colspan="3">Data storage address</td></tr>
<tr><td rowspan="3">Var6</td><td rowspan="3">Data Type</td><td>Data</td><td>0</td></tr>
<tr><td>Time</td><td>1</td></tr>
<tr><td>Date and Time</td><td>2</td></tr>
<tr><td colspan="4">Description of Action</td></tr>
<tr><td colspan="4">Get history data.</td></tr>
<tr><td colspan="6">NOTE: Double Word is recommended to be used for Var1, Var3, and Var4. If the continuous address of Word is used, data may be overwritten and the result may be affected.</td></tr>
</table>

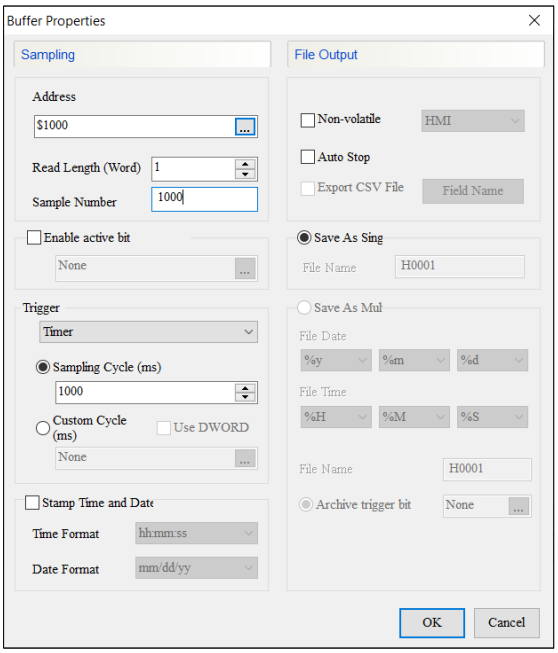
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		V
Var3	V		V
Var4	V		V
Var5	V	V	
Var6	V		V

Example
● Var1 and Var5 are Internal Memory addresses, and Var2, Var3, Var4, and Var6 are constants. ● Set the History Buffer ID as 1 (Var2), sample from the fifth data (Var2) to the tenth data (Var3), put the data type (including time and data) set as 2 (Var6) in the continuous address (Var5) of $100, and finally put the obtained Data Length in $50 (Var1).

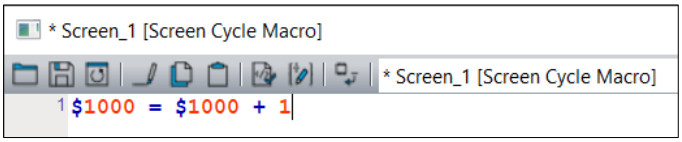
Example



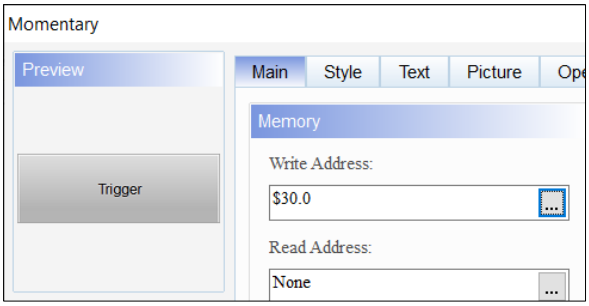
- Set the **Read Address** $1000 as the history buffer **Sampling** data **Address**.



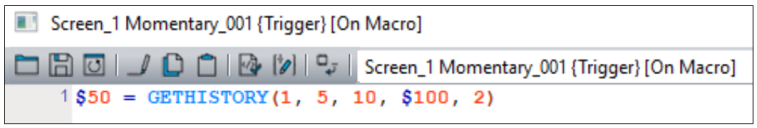
- Edit the **Screen Cycle Macro** to add up the history data of $1000.



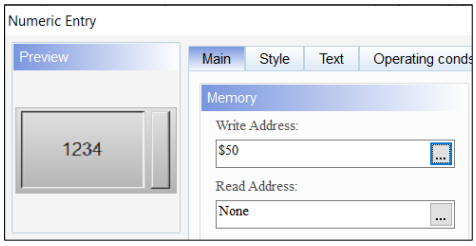
- Create a **Momentary Button**, edit the **On Macro**, and set the GETHISTORY command as follows.



Example



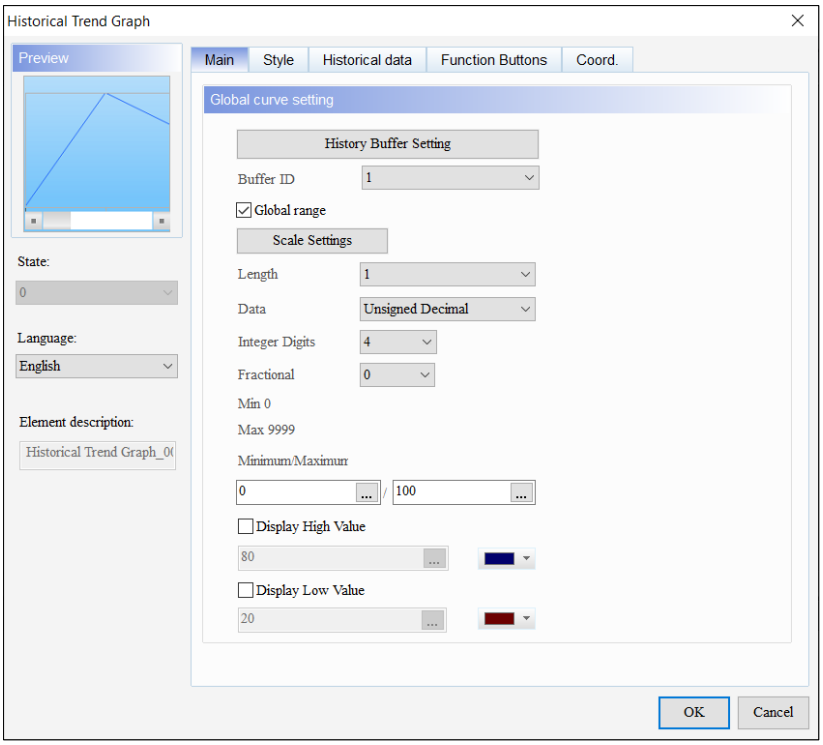
- Create a **Numeric Entry** element and set the **Write Address** as $50.



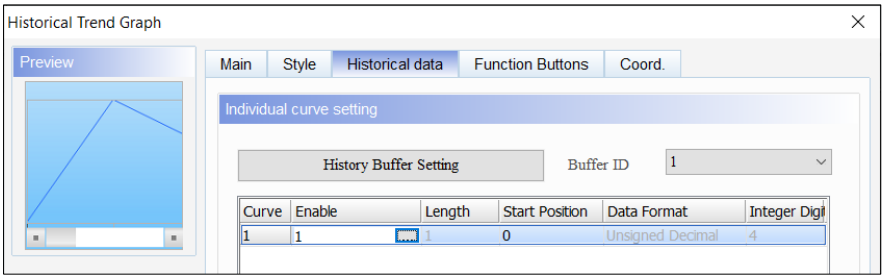
- Create **Numeric Entry** elements of $100 to $134, as shown as follows.



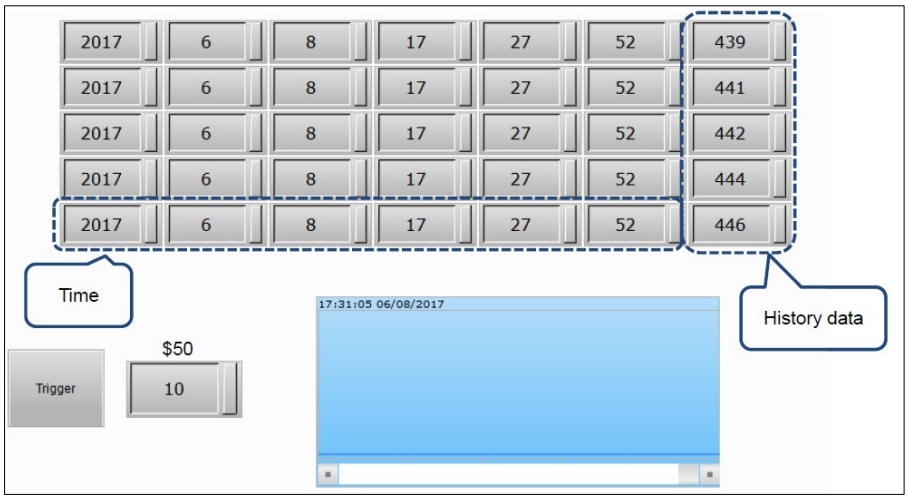
- Create a **Historical Trend Graph** and enable it.



Example



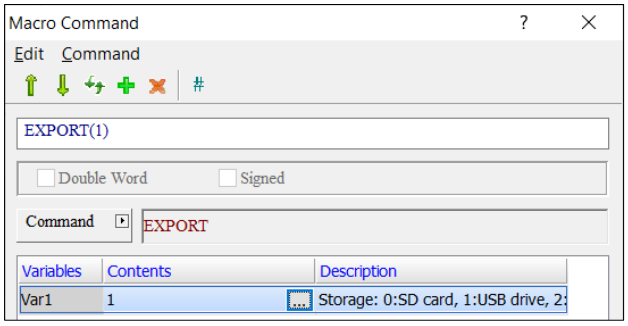
- After compiling the screen, the execution result is as follows:



- EXPORT (Export Data)

Expression	Meaning of Variable				Note
EXPORT(Var1) (W)	Var1	Data export device	SD Card	0	W: Word
			USB Disk	1	
			Printer	2	
	Description of Action				
	Export and print historical and alarm data to external storage device Var1.				

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		V

Example
● Var1 is a constant. ● Export data to the USB Disk. 

● EXRCP16 / EXRCP32 (Export 16-bit Recipe / Export 32-bit Recipe)

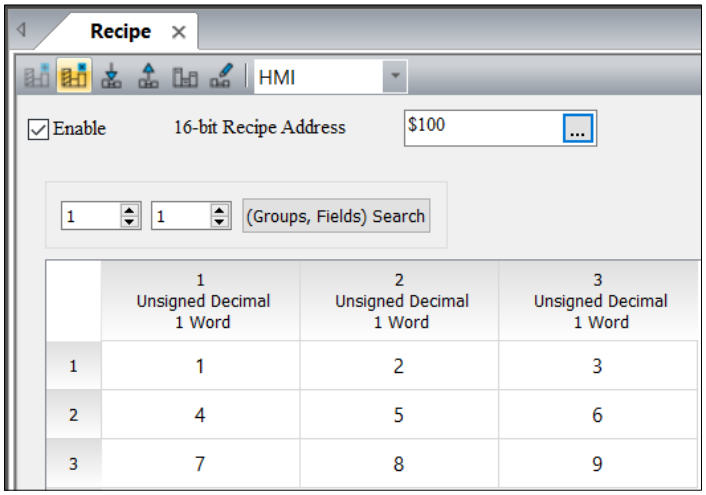
Expression	Meaning of Variable				Note
Var1 = EXRCP16(Var2, Var3) (W) Var1 = EXRCP32(Var2, Var3) (W)	Var1	Return value			W: Word
		Failed	0		
		Succeeded	1		
	Var2	File name of the exported 16-bit Recipe / 32-bit Recipe			
	Var3	Recipe export storage device	USB Disk	2	
			SD Card	3	
	Description of Action				
	Export the 16-bit Recipe / 32-bit Recipe and store in Var3, and return the result to Var1.				
NOTE: *The exported 16-bit and 32-bit Recipe files will be stored in the root directory of the external storage device.*					

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	
Var3	V	V	V

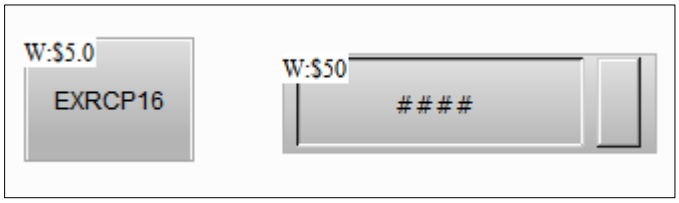
Example

- The following example shows the export command of 16-bit Recipe, which is the same as that of 32-bit Recipe.
- Export the16-bit Recipe data to the USB Disk, and the file name is Delta. The steps are as follows:

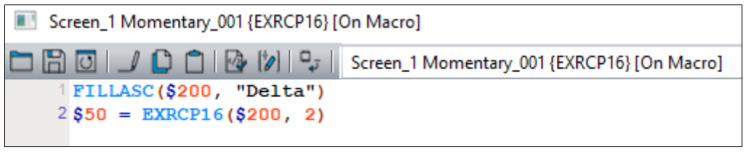
1. Go to **Data Management** > **Recipe** and set the recipe data.



2. Create a **Momentary Button** ($5.0) and a **Numeric Entry** element ($50).

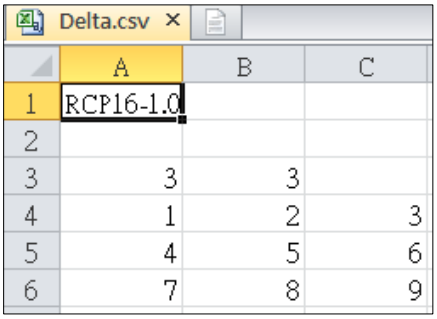


3. Go to the **Momentary Button** and write the **On Macro** as follows. Put the Delta string in $200 and store the data in the USB Disk by exporting 16-bit Recipe, and the file name is Delta.



4. After compiling the screen and downloading the recipe data to the HMI, trigger the $5.0 **Button** and $50 shows 1, representing successful action, and then the HMI exports the 16-Bit Recipe data to the USB Disk.



Example


- IMRCP16 / IMRCP32 (Import 16-bit Recipe / Import 32-bit Recipe)

Expression	Meaning of Variable				Note
Var1 = IMRCP16(Var2, Var3) (W) Var1 = IMRCP32(Var2, Var3) (W)	Var1	Return value			W: Word
		Failed	0		
		Succeeded	1		
	Var2	File name of the imported 16-bit Recipe / 32-bit Recipe			
	Var3	Recipe import storage device	USB Disk	2	
			SD Card	3	
	Description of Action				
	Import the 16-bit Recipe / 32-bit Recipe from Var3 to the HMI, and return the result to Var1.				

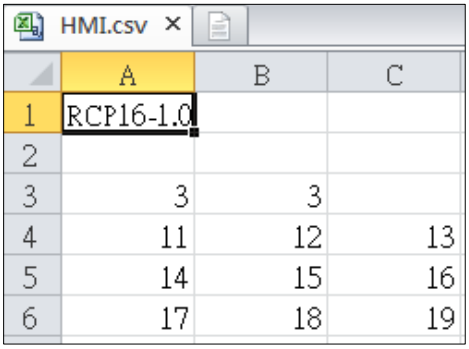
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	
Var3	V	V	V

Example
● The following example shows the import command of 16-bit Recipe, which is the same as that of 32-bit Recipe. ● Import 16-Bit Recipe data from the USB Disk to the HMI, and the file name is

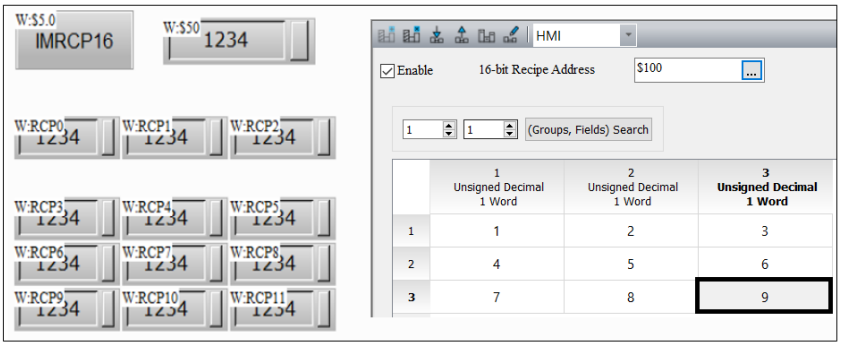
Example

HMI. The steps are as follows:

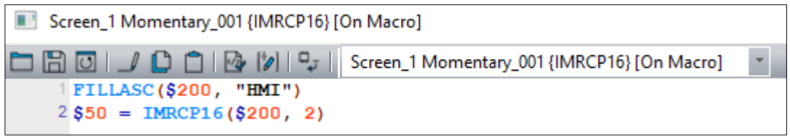
1. Refer to the following figure, use Excel to make a recipe file called HMI.csv and store it to the USB Disk.



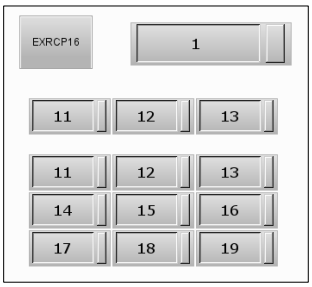
2. Create a **Momentary Button** ($5.0), a **Numeric Entry** element ($50), and recipe addresses RCP0 to RCP11. This is the default recipe content of the software.



3. Go to the **Momentary Button** and write the **On Macro** as follows. Put the HMI string in $200 and **Import** 16-Bit Recipe data from the USB Disk.



4. After compiling the screen and downloading the recipe data to the HMI, trigger the $5.0 **Button** and $50 shows 1, representing successful action, and then the 16-bit Recipe data is imported to the HMI. The recipe data of the HMI is then changed to the HMI recipe file.



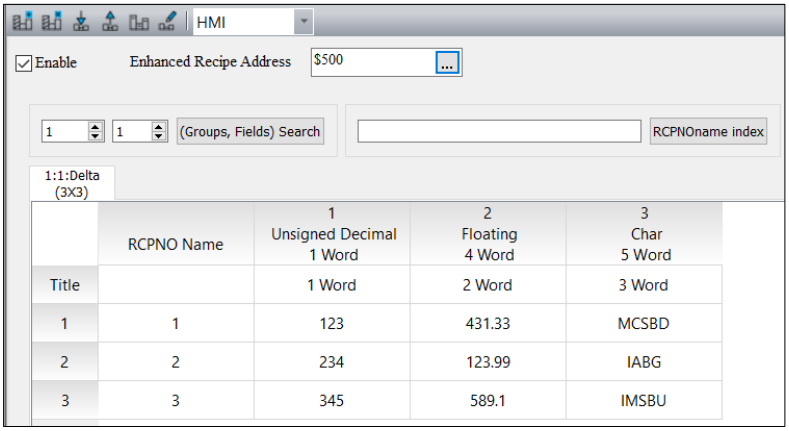
- EXENRCP (Export Enhanced Recipe)

<table>
<tr><th>Expression</th><th colspan="5">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="8">Var1 = EXENRCP(Var2, Var3)
(W)</td><td rowspan="3">Var1</td><td colspan="4">Return value</td><td rowspan="8">W: Word</td></tr>
<tr><td>Failed</td><td colspan="3">0</td></tr>
<tr><td>Succeeded</td><td colspan="3">1</td></tr>
<tr><td>Var2</td><td colspan="4">File name of the exported enhanced recipe</td></tr>
<tr><td rowspan="2">Var3</td><td rowspan="2">Recipe export storage device</td><td>USB Disk</td><td>2</td></tr>
<tr><td>SD Card</td><td>3</td></tr>
<tr><td colspan="5">Description of Action</td></tr>
<tr><td colspan="5">Export the enhanced recipe and store it in Var3, and return the result to Var1.</td></tr>
<tr><td colspan="7">NOTE: The exported enhanced recipe file will be stored in the root directory of the external storage device.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	
Var3	V	V	V

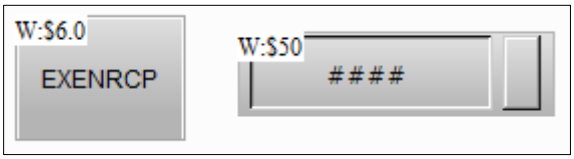
Example

- Export the enhanced recipe data to the USB Disk, and the file name is ABC. The steps are as follows:
  1. Go to **Data Management** > **Enhanced Recipe** and set the recipe data.

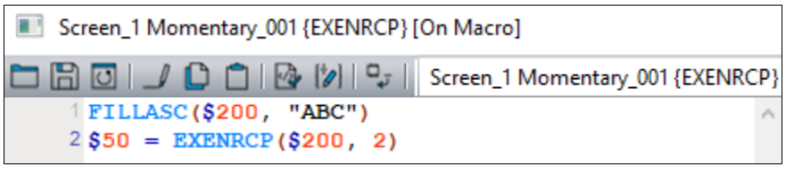


	RCPNO Name	1 Unsigned Decimal 1 Word	2 Floating 4 Word	3 Char 5 Word
Title		1 Word	2 Word	3 Word
1	1	123	431.33	MCSBD
2	2	234	123.99	IABG
3	3	345	589.1	IMSBU

  2. Create a **Momentary Button** ($6.0) and a **Numeric Entry** element ($50).



  3. Go to the **Momentary Button** to write the **On Macro** as follows. Put the ABC string in $200 and store the data in the USB Disk by exporting the enhanced recipe, and the file name is ABC.



  4. After compiling the screen and downloading the recipe data to the HMI, trigger the $5.0 **Button** and $50 shows 1, representing successful action, and then the HMI exports the enhanced recipe data to the USB Disk.



ABC.csv

	A	B	C	D
1	ENRCP-2.0			
2	Delta	3	3	
3	2	1	0	0
4	5	2	3	2
5	8	5	0	0
6	123	431.33	MCSBD	
7	234	123.99	IABG	
8	345	589.1	IMSBU	

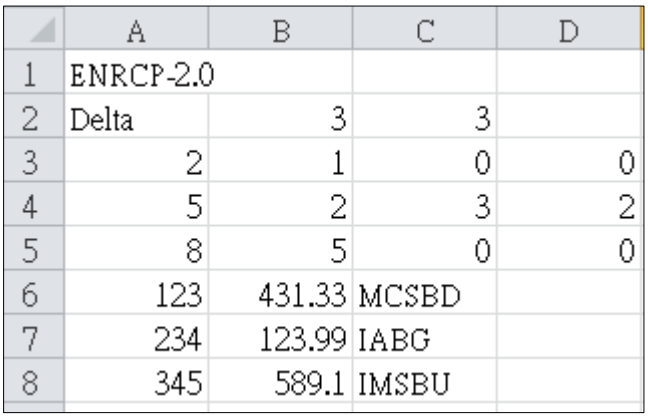
- For each **Data Format** and the corresponding defined value, refer to the

Example

following table.

Data Format	DIAScreen
BCD	0
Signed Decimal	1
Unsigned Decimal	2
Hexadecimal	3
Binary	4
Floating	5
Char	8

- Each cell of the exported CSV file is explained as follows:



	A	B	C	D
1	ENRCP-2.0			
2	Delta	3	3	
3	2	1	0	0
4	5	2	3	2
5	8	5	0	0
6	123	431.33	MCSBD	
7	234	123.99	IABG	
8	345	589.1	IMSBU	

Excel cell	Definition	Content
A-1	Version	ENRCP-2.0
A-2	Enhanced recipe group name	Delta
B-2	Column number	3
C-2	Group number	3
A-3	Data Format of Column 1	2 (Unsigned Decimal)
B-3	Data Length of Column 1	1 (Word)
C-3	Integer Digits of Column 1	0
D-3	Fractional (Digits) of Column 1	0
A-4	Data Format of Column 2	5 (Floating)
B-4	Data Length of Column 2	2 (Word)
C-4	Data Length of Column 2	3

Example		
D-4	Fractional (Digits) of Column 2	2
A-5	Data Format of Column 3	8 (Char)
B-5	Data Length of Column 3	5 (Word)
C-5	Integer Digits of Column 3	0
D-5	Fractional (Digits) of Column 3	0

- IMENRCP (Import Enhanced Recipe)

<table>
<tr><th>Expression</th><th colspan="5">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="6">Var1 = IMENRCP(Var2, Var3)
(W)</td><td rowspan="3">Var1</td><td colspan="4">Return value</td><td rowspan="6">W: Word</td></tr>
<tr><td>Failed</td><td colspan="3">0</td></tr>
<tr><td>Succeeded</td><td colspan="3">1</td></tr>
<tr><td>Var2</td><td colspan="4">File name of the imported enhanced recipe</td></tr>
<tr><td rowspan="2">Var3</td><td rowspan="2">Recipe import storage device</td><td>USB Disk</td><td>2</td></tr>
<tr><td>SD Card</td><td>3</td></tr>
<tr><td colspan="5">Description of Action</td></tr>
<tr><td colspan="5">Import the enhanced recipe from Var3 to the HMI and return the result to Var1</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	
Var3	V	V	V

Example

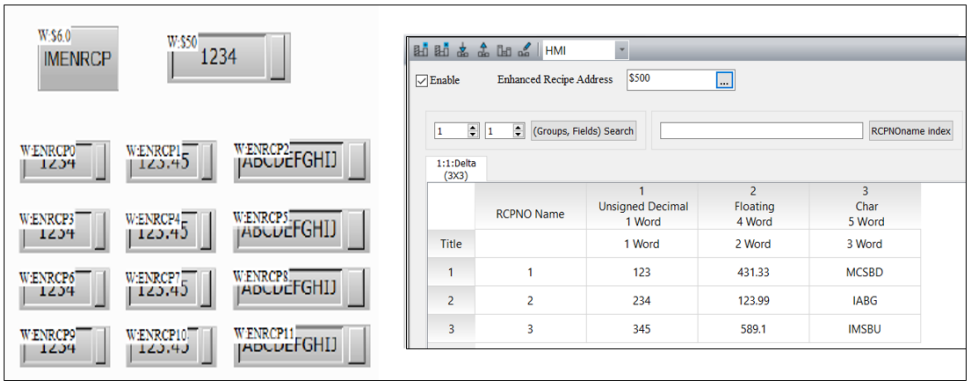
- **Import** the enhanced recipe from the USB Disk to the HMI, and the file name is DEF. The steps are as follows:

1. Refer to the following figure, use Excel to make a recipe file called DEF.csv and store it to the USB Disk.

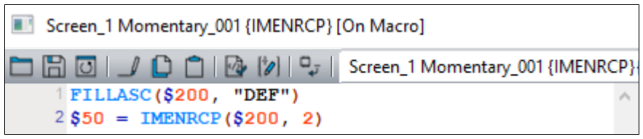
DEF.csv

	A	B	C	D
1	ENRCP-2.0			
2	Delta	3	3	
3	2	1	0	0
4	5	2	3	2
5	8	5	0	0
6	1123	31.33	HMI	
7	1234	23.99	DOP-B	
8	1345	89.1	DOP-W	

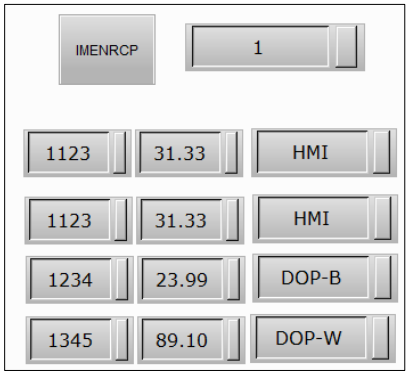
2. Create a **Momentary Button** ($6.0), a **Numeric Entry** element ($50), and recipe addresses RCP0 to RCP11.



3. Go to the **Momentary Button** to write the **On Macro** as follows. Put the DEF string in $100 and import the enhanced recipe from the USB Disk.



4. After compiling the screen and downloading the recipe data to the HMI, trigger the $5.0 **Button** and $50 shows 1, representing the successful action, and then the enhanced recipe data is imported to the HMI. The recipe data of the HMI is then changed to the DEF recipe file.



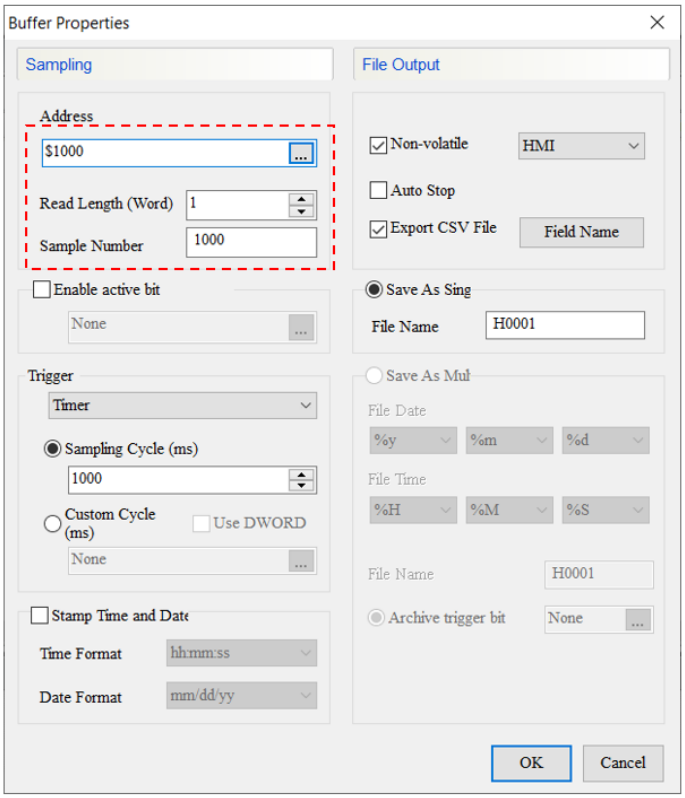
- EXHISTORY (Export History Data)

<table>
<tr><th>Expression</th><th colspan="5">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="7">Var1 = EXHISTORY(Var2, Var3, Var4)</td><td rowspan="3">Var1</td><td colspan="4">Return value</td><td rowspan="7">-</td></tr>
<tr><td colspan="2">Failed</td><td colspan="2">0</td></tr>
<tr><td colspan="2">Succeeded</td><td colspan="2">1</td></tr>
<tr><td>Var2</td><td colspan="4">History Buffer ID</td></tr>
<tr><td>Var3</td><td colspan="4">Exported file name</td></tr>
<tr><td rowspan="2">Var4</td><td rowspan="2">External storage device</td><td>USB Disk</td><td>2</td></tr>
<tr><td>SD Card</td><td>3</td></tr>
<tr><td colspan="6">Description of Action</td></tr>
<tr><td colspan="6">Export history data to an external storage device.</td></tr>
<tr><td colspan="7">NOTE:
1. Users must select the checkbox for Export CSV File in the Buffer Properties setting. If not, execution of this macro will only export the .dat file.
2. When users input 0 to the History Buffer ID, it means to export all history buffers. If 3 history buffers are opened, 3 files will be exported after execution. The file names are Export file name 1.csv, Export file name 2.csv, and Export file name 3.csv respectively. When users input a non-0 number, it represents that the specified ID of history buffer will be exported. After execution, one file will be exported with the name of Export file name.csv
3. File extension .csv will be added automatically after exporting. The file name cannot contain characters such as \, /,:, *, ?, ”, <, >, and | x00 indicates the end of the file name string.</td></tr>
</table>

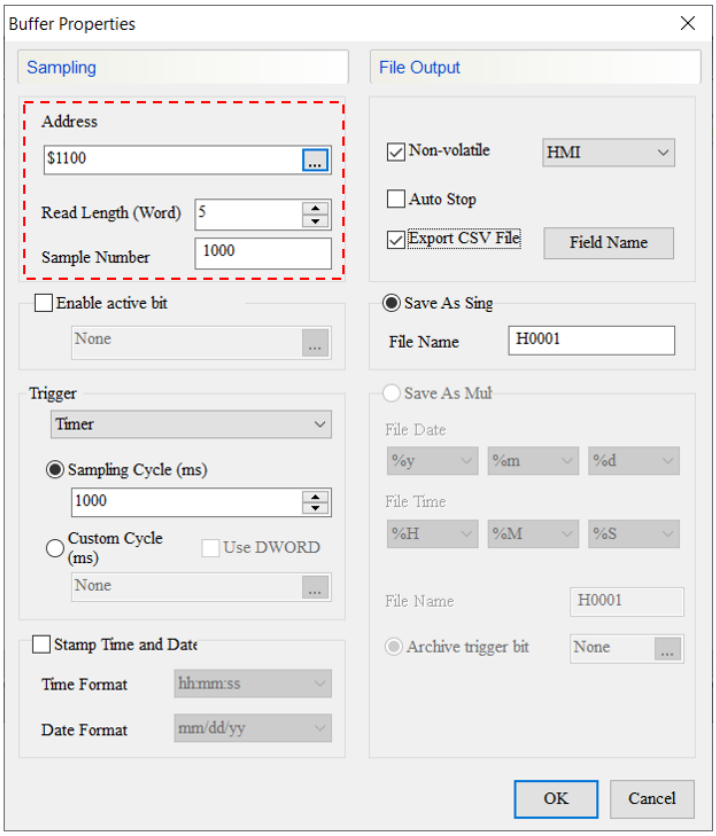
Variable	Type			
	Internal Memory	PLC Register	String	Constant
Var1	V	V		
Var2	V	V		V
Var3	V	V		
Var4	V	V		V

Example
Step 1: Set three history buffers as follows: 1. For History data buffer 1, set the **Address** to $1000, **Read Length (Word)** to 10, and select the checkbox of **Export CSV File**.

Example



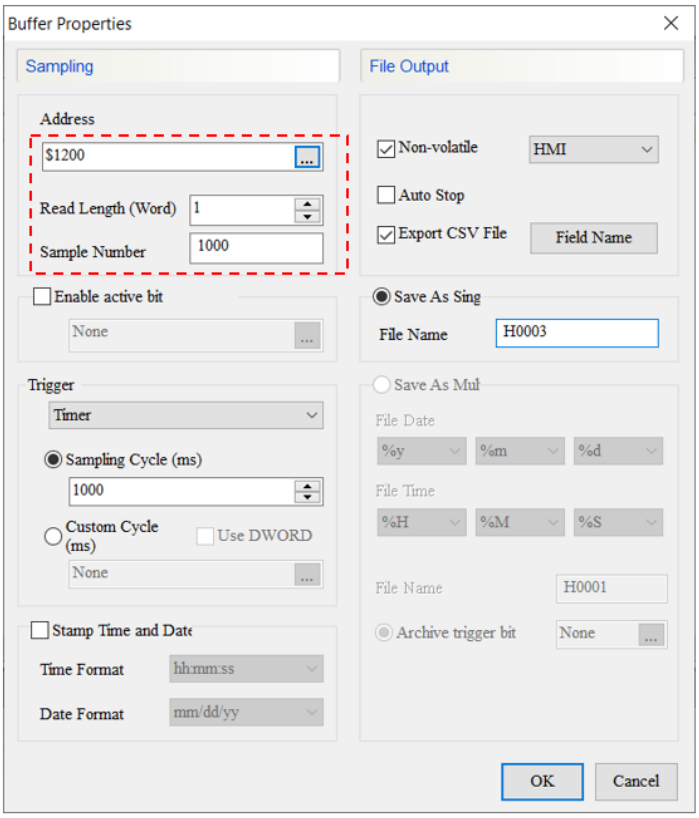
2. For History data buffer 2, set the **Address** to $1100, **Read Length (Word)** to 5, and select the checkbox of **Export CSV File**.



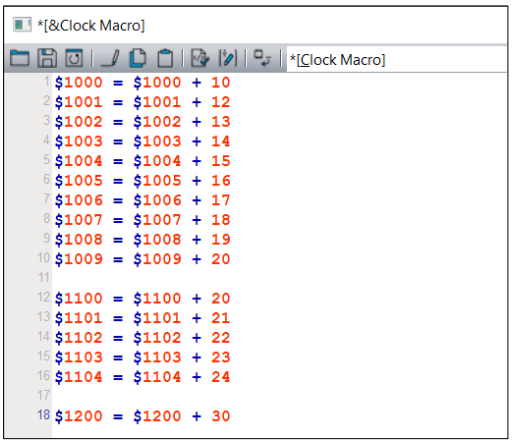
3. For History data buffer 3, set the **Address** to $1200, **Read Length (Word)**

Example

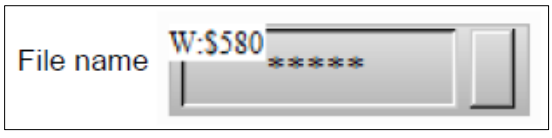
to 1, and select the checkbox of **Export CSV File**.



Step 2: Add up history data in the **Clock Macro**.

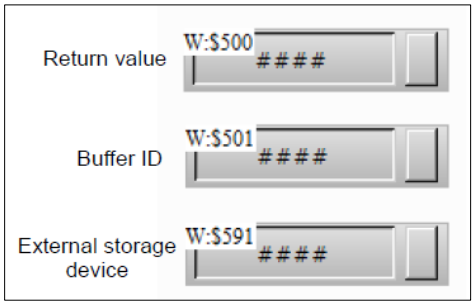


Step 3: Create a **Character Entry** element on the screen with the address as $580 and string length as 5.

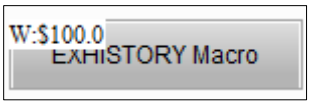


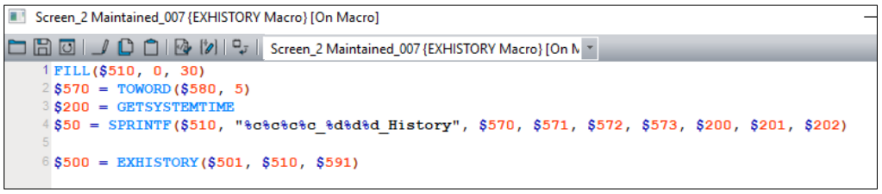
Step 4: Create 3 **Numeric Entry** elements on the screen with the addresses of $500, $591, and $501.

Example



Step 5: Create a **Maintained Button** element on the screen with the address of $100.0, and add the On Macro.





Macro commands description:

Line 1: Clear $510 - $539.

Line 2: Convert the unit of $580 (file name string) from byte to word.

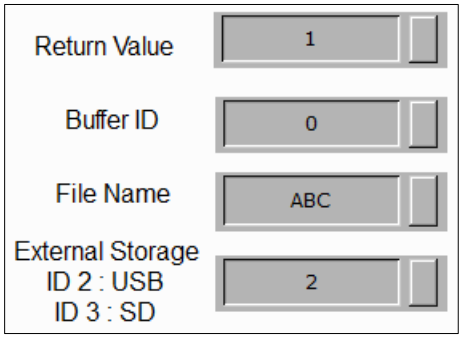
Line 3: Move the system time to $200 - $206 (year, month, day, week, hour, minute, second).

Line 4: Add _year, month, day and _History to three characters of device name to form a continuous string and assign it to the $510 start address.

Line 6: Export the history data to the specified external device and file name.

Step 6: Download the editing screen to the HMI and insert the USB Disk into the HMI.

Step 7: Enter the device name as ABC on the screen, and select 2 to use the USB Disk for the external storage device. Set the **Buffer ID** as 0 (export all) and press the EXHISTORY Button. The **Return Value** becomes 1 after the action.



Step 8: After the USB Disk is removed, the files exported to the USB Disk are as follows:

Example


- EXALARM (Export Alarm Data)

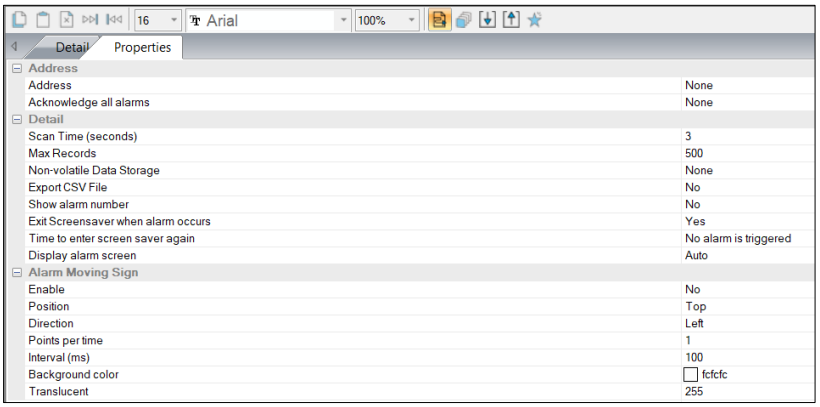
<table>
<tr><th>Expression</th><th colspan="4">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="6">Var1 = EXALARM(Var2, Var3)</td><td rowspan="3">Var1</td><td colspan="3">Return value</td><td rowspan="6"></td></tr>
<tr><td>Failed</td><td colspan="2">0</td></tr>
<tr><td>Succeeded</td><td colspan="2">1</td></tr>
<tr><td>Var2</td><td colspan="3">Exported file name</td></tr>
<tr><td rowspan="2">Var3</td><td rowspan="2">External storage device</td><td>USB Disk</td><td>2</td></tr>
<tr><td>SD Card</td><td>3</td></tr>
<tr><td colspan="5">Description of Action</td></tr>
<tr><td colspan="5">Export alarm data to external storage devices.</td></tr>
<tr><td colspan="6">NOTE:
1. Users must select the checkbox of Export CSV File in the alarm settings.
2. File extension ".csv" will be added automatically after exporting. The file name cannot contain characters such as \, /, :, *, ?, ”, <, >, and |.x00 indicates the end of the file name string.</td></tr>
</table>

Variable	Type			
	Internal Memory	PLC Register	String	Constant
Var1	V	V		
Var2	V	V		
Var3	V	V		V

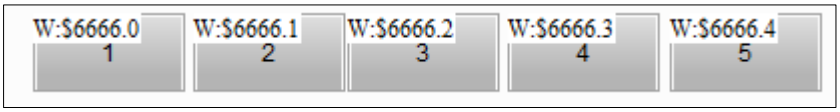
Example

- The steps are as follows:

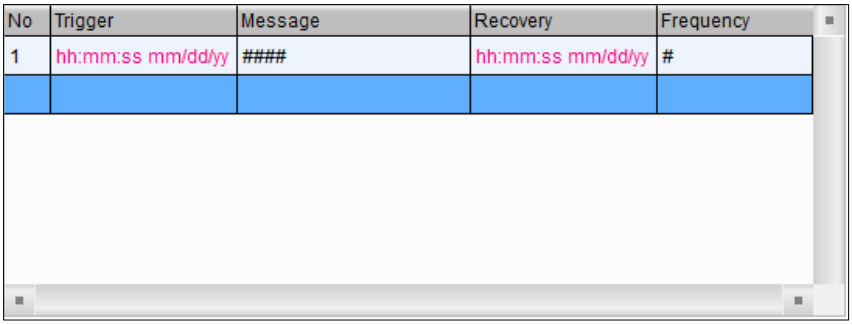
1. The alarm settings are as follows. Set the **Address** as $6666 and set the **Export CSV File** to **Yes**.



2. Create **Maintained Button** elements that trigger alarm bits on the screen to trigger alarms. Set the addresses as $6666.0, $6666.1, $6666.2, $6666.3, and $6666.4 in sequence.



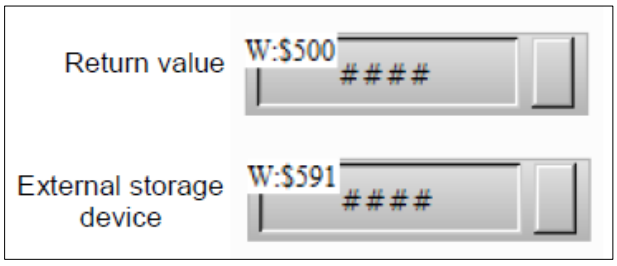
3. Create an **Alarm History Table** element on the screen to display the current history alarm.



4. Create a **Character Entry** element on the screen with the address as $580 and string length of 5.



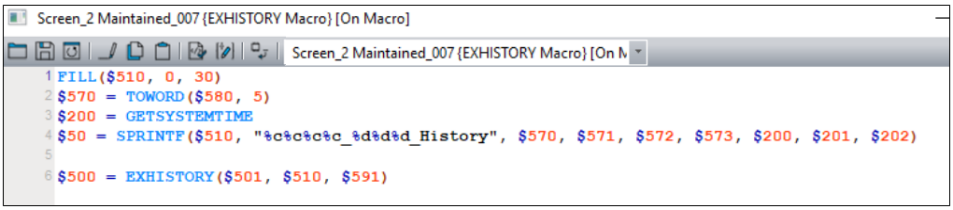
5. Create two **Numeric Entry** elements on the screen with the addresses as $500 and $591.



Example

6. Create a **Maintained Button** element on the screen with the address as $100.1, and add **On Macro**.





The macro commands are described as follows:

Line 1: Clear $510 - $539.

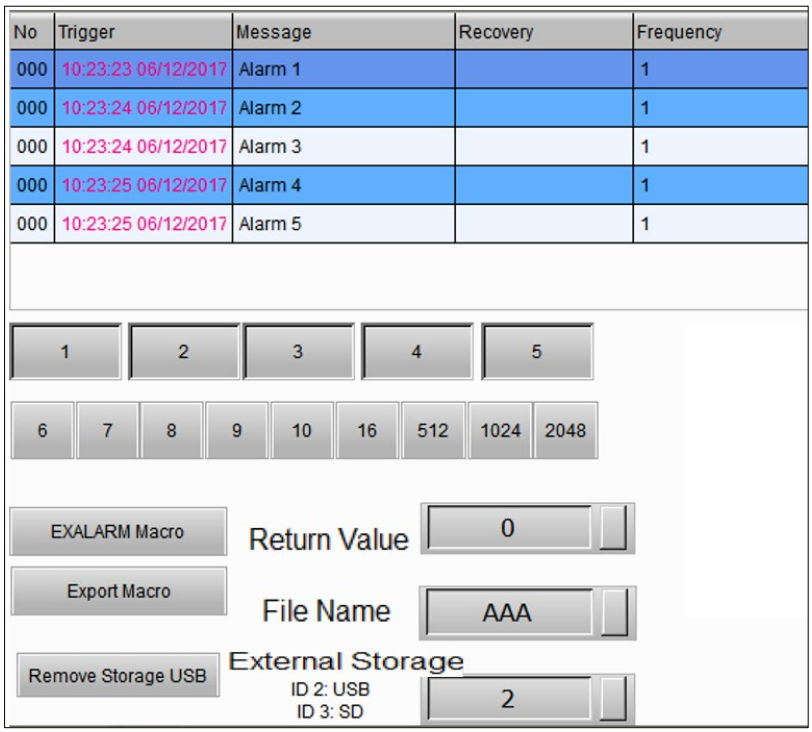
Line 2: Convert the unit of $580 (device name string) from byte to word.

Line 3: Move the system time to $200 - $206 (year, month, day, week, hour, minute, second).

Line 4: Add "_year, month, day" and "_Alarm" to "three characters of device name" to form a continuous string and assign to the $510 start address.

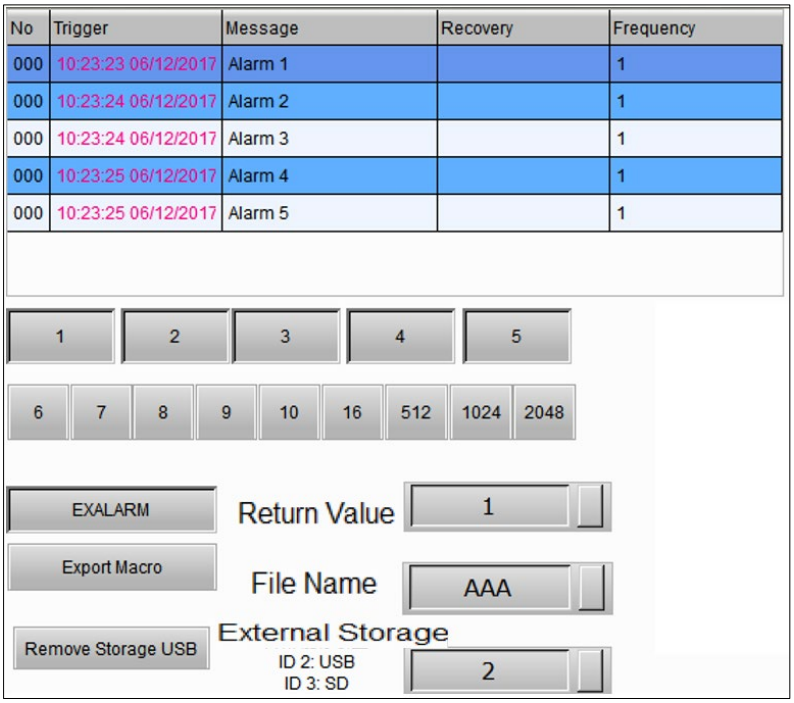
Line 6: Export the history alarm to the specified external device and file name.

7. Download the editing screen to the HMI and insert the USB Disk into the HMI.
8. Trigger the alarm and enter the device name as AAA on the screen, and select 2 to use the USB Disk for the external storage device.

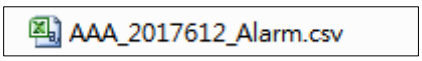


9. Press the **EXALARM Macro Button** and the **Return Value** becomes 1 after the action.

Example



10. After the USB Disk is removed, the file exported to the USB Disk is as follows:



- EXALARMGROUP (Export Group Data Specified by Alarm)

Expression	Meaning of Variable			Note
Var1 = EXALARMGROUP(Var2, Var3, Var4)	Var1	Return value		
		Failed	0	
		Succeeded	1	
	Var2	Alarm group number		
	Var3	Exported file name		
	Var4	External storage device	USB Disk	2
			SD Card	3
	Description of Action			
	Export the alarm data to the external storage device in accordance with the specified group.			

NOTE:

1. Users must select checkbox of Export CSV File in the alarm settings.

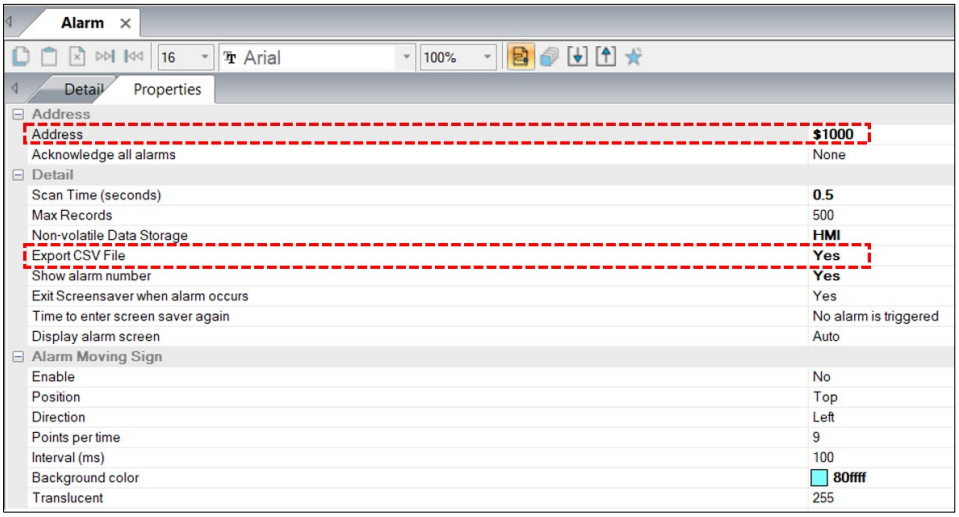
Expression	Meaning of Variable	Note
2. *File extension of "- group number" and ".csv " will be added automatically after exporting. The file name cannot contain characters such as \, /, :, *, ?, ", <, >, and |.x00 indicates the end of the file name string.*		

Variable	Type			
	Internal Memory	PLC Register	String	Constant
Var1	V	V		
Var2	V	V		V
Var3	V	V		
Var4	V	V		V

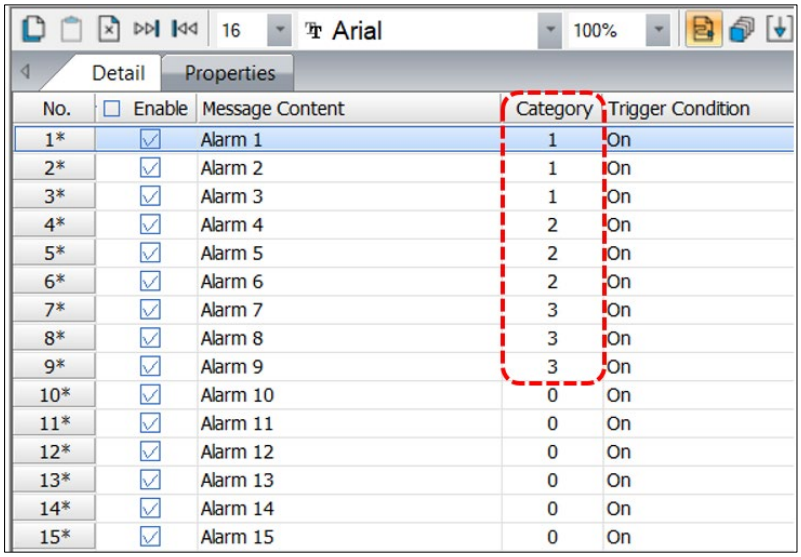
Example

The steps are as follows:

1. The alarm settings are as follows. Set the **Address** to $1000 and set the **Export CSV File** to Yes. Set Alarms 1 ~ 3 as Group 1, Alarms 4 ~ 6 as Group 2, and Alarms 7 ~ 9 as Group 3.

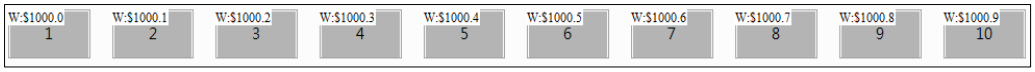


Example

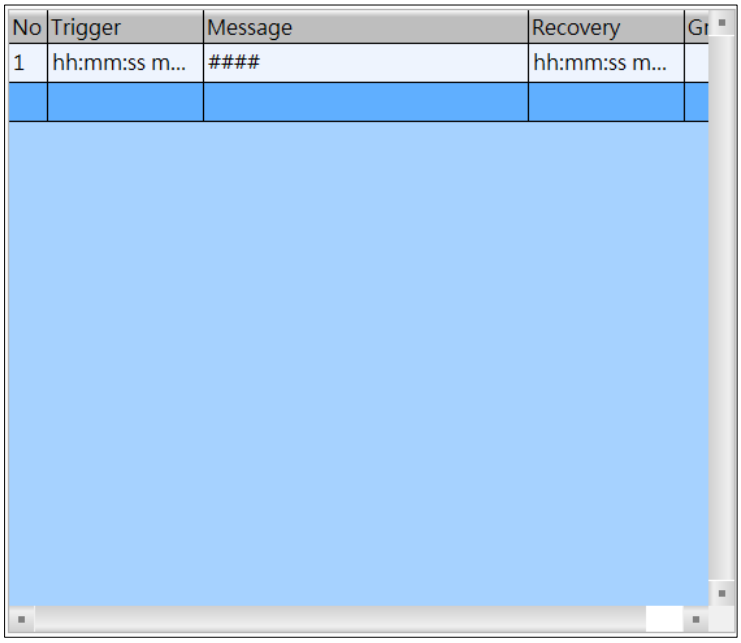


No.	Enable	Message Content	Category	Trigger Condition
1*	☑	Alarm 1	1	On
2*	☑	Alarm 2	1	On
3*	☑	Alarm 3	1	On
4*	☑	Alarm 4	2	On
5*	☑	Alarm 5	2	On
6*	☑	Alarm 6	2	On
7*	☑	Alarm 7	3	On
8*	☑	Alarm 8	3	On
9*	☑	Alarm 9	3	On
10*	☑	Alarm 10	0	On
11*	☑	Alarm 11	0	On
12*	☑	Alarm 12	0	On
13*	☑	Alarm 13	0	On
14*	☑	Alarm 14	0	On
15*	☑	Alarm 15	0	On

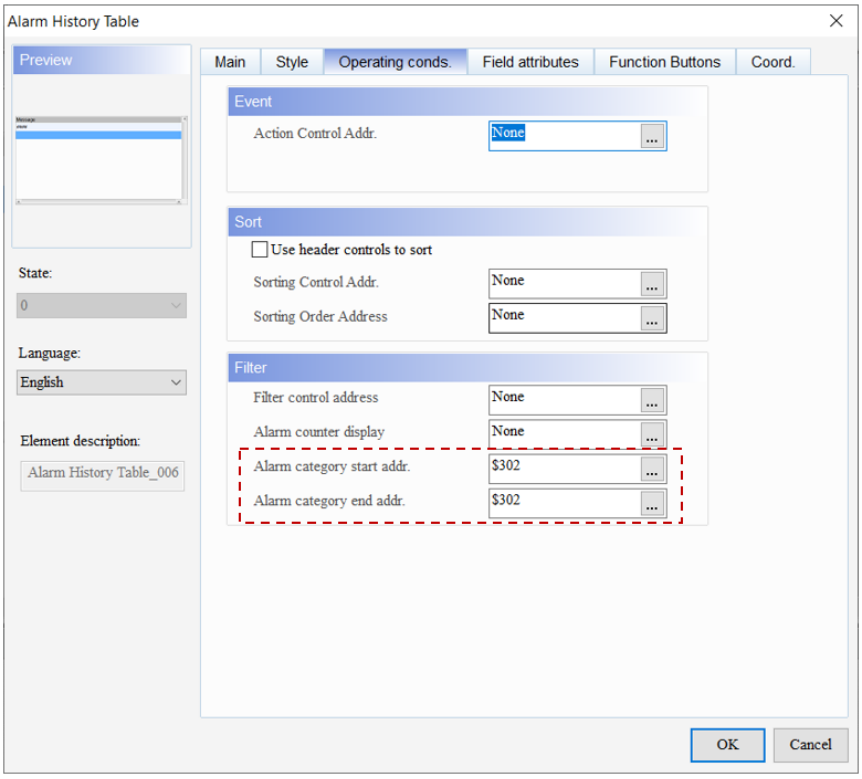
2. Create **Maintained Button** elements that trigger alarm bits on the screen to trigger alarms. Set the Write addresses as $1000.0, $1000.1, $1000.2 to $1000.9 in sequence.



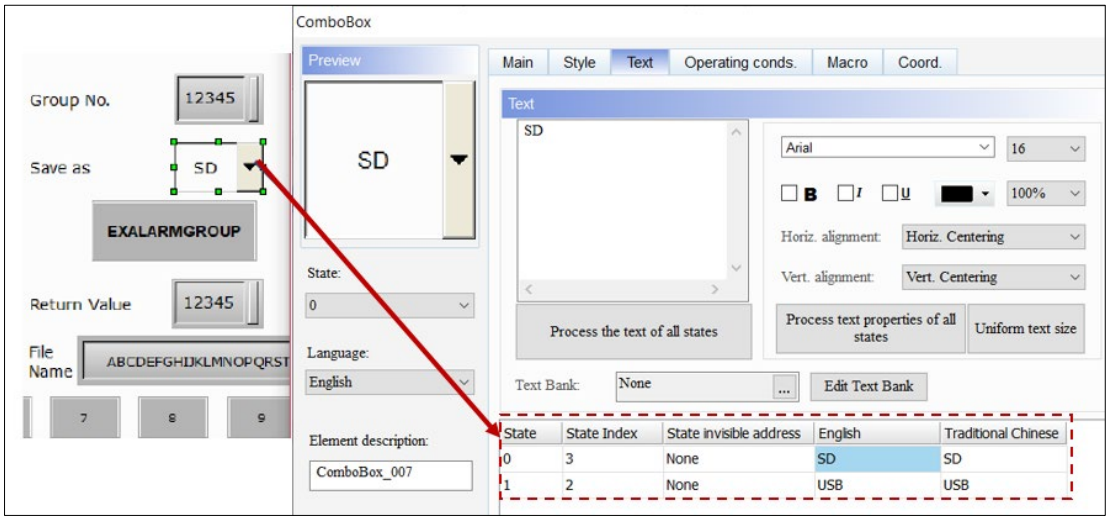
3. Create an **Alarm History Table** element on the screen to display the current history alarm and set the group number as variable and the read address as $302.



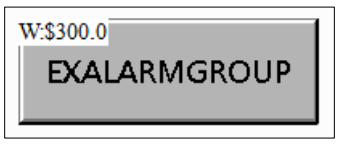
Example



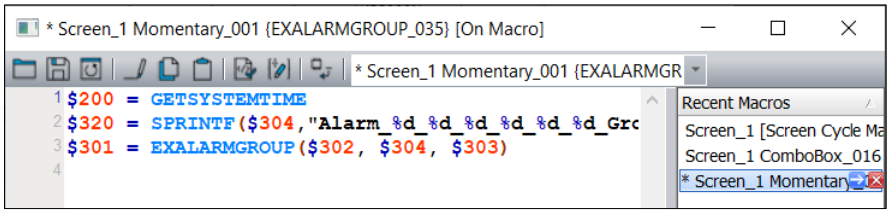
4. Create a **Character Display** element on the screen with the address as $304 and the string length as 20; Create 2 **Numeric Entry** elements with the addresses as $302 and $301. Create a **ComboBox** with the address as $303. The total number of **State** is 2, the **State Index** of State 1 is 3, the text is SD, the **State Index** of State 2 is 2, and the **Text** is USB.



5. Create a **Maintained Button** element on the screen with the address as $300.0, and add the **On Macro**.



Example



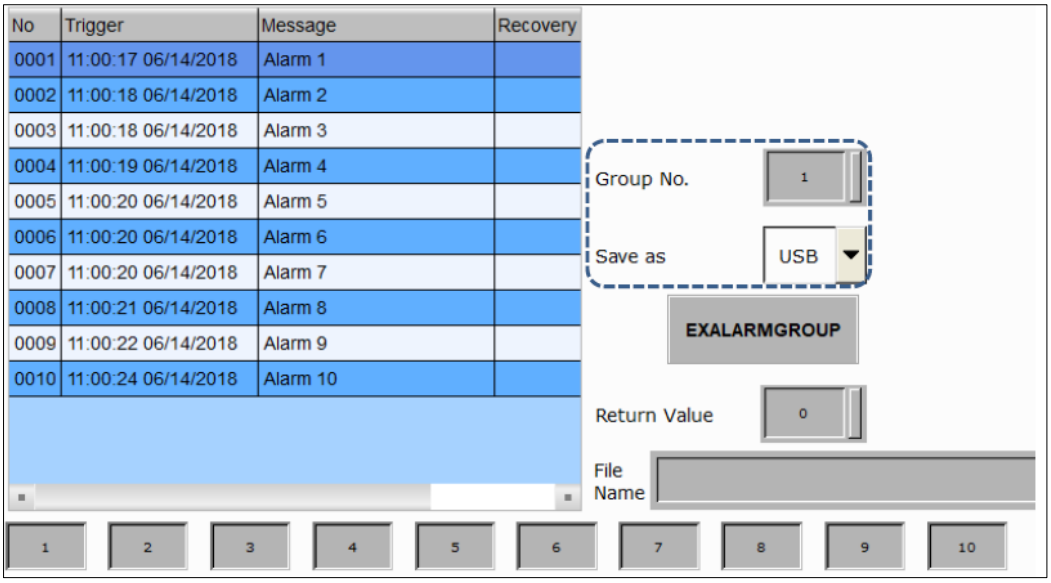
The macro commands are described as follows:

Line 1: Record the system time to $200 - $206 (year, month, day, week, hour, minute, second).

Line 2: Add _year, month, day, hour, minute, second and _Group to Alarm to form a continuous string and assign to the $304 start address as file name.

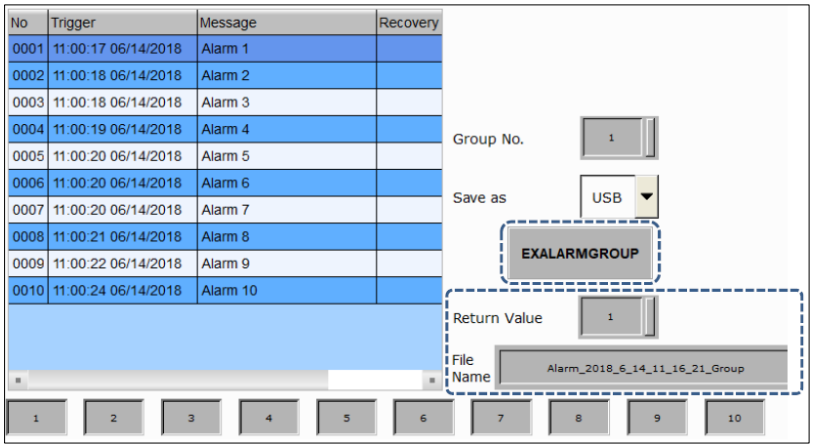
Line 3: Export history alarm to the specified external device according to the specified group number and file name.

6. Download the editing screen to the HMI and insert the USB Disk into the HMI.
7. Trigger Alarm 1 to Alarm 10, enter group number 1 on the screen, and select USB for the external storage device.

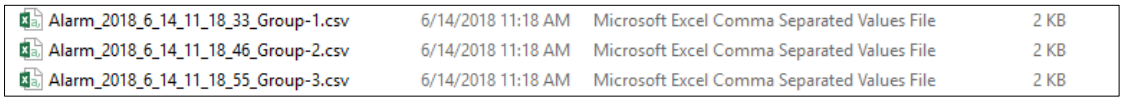


8. Press the **EXALARMGROUP Button** and the file name will be displayed, and the return value will become 1 after the action.

Example



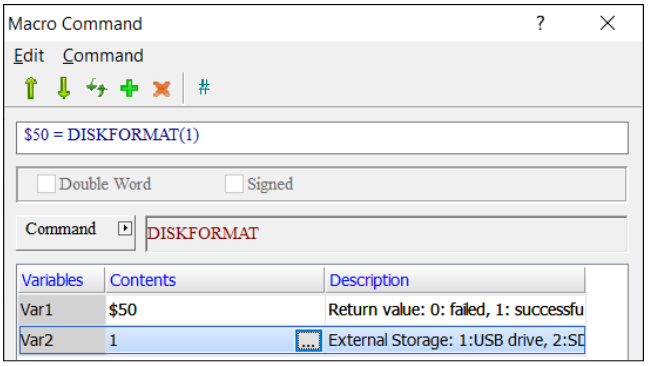
9. Then, set group numbers as 2 and 3 as in Step 8, and press the **EXALARMGROUP Button** respectively.
10. After the USB Disk is removed, the files exported to the USB Disk are as follows.



- DISKFORMAT (Disk Format)

<table>
<tr><th>Expression</th><th colspan="5">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="5">Var1 = DISKFORMAT(Var2) (W)</td><td rowspan="3">Var1</td><td colspan="4">Return value</td><td rowspan="5">W: Word</td></tr>
<tr><td colspan="2">Failed</td><td colspan="2">0</td></tr>
<tr><td colspan="2">Succeeded</td><td colspan="2">1</td></tr>
<tr><td rowspan="2">Var2</td><td rowspan="2">External storage device</td><td>USB Disk</td><td>1</td></tr>
<tr><td>SD Card</td><td>2</td></tr>
<tr><td colspan="5">Description of Action</td></tr>
<tr><td colspan="6">Select Var2 device to be formatted and return the result value to Var1.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example
● Var1 is the Internal Memory address and Var2 is a constant. ● Format the USB Disk and put the Return value in $50. 

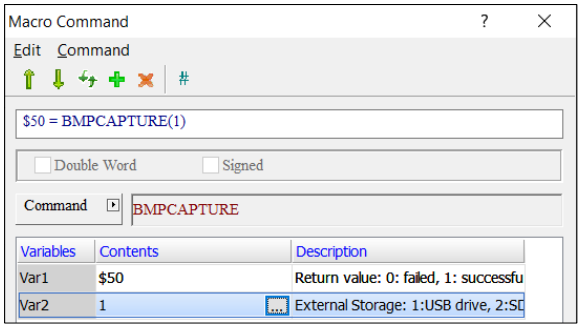
- BMPCAPTURE (Screen Capture)

<table>
<tr><th>Expression</th><th colspan="4">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="6">Var1 = BMPCAPTURE(Var2)
(W)</td><td rowspan="3">Var1</td><td colspan="3">Return value</td><td rowspan="6">W: Word</td></tr>
<tr><td>Failed</td><td colspan="2">0</td></tr>
<tr><td>Succeeded</td><td colspan="2">1</td></tr>
<tr><td rowspan="2">Var2</td><td rowspan="2">External storage device</td><td>USB Disk</td><td>1</td></tr>
<tr><td>SD Card</td><td>2</td></tr>
<tr><td colspan="4">Description of Action</td></tr>
<tr><td colspan="4">Store the captured screen file in the Var2 device and return the result value to Var1.</td></tr>
<tr><td colspan="6">NOTE:
1. All formats of the exported files are .BMP.
2. The exported path is the folder with the current date in the root directory of the external storage device, and the current screen file is saved in hour, minute and second.</td></tr>
</table>

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V

Example

- Var1 is the Internal Memory address and Var2 is a constant.
- Save the captured screen to the USB Disk and put the Return value in $50.



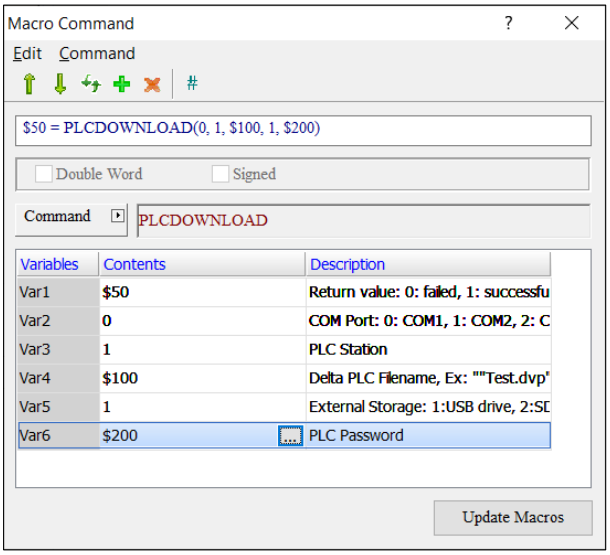
- PLCDOWNLOAD (PLC File Download)

<table>
<tr><th>Expression</th><th colspan="4">Meaning of Variable</th><th>Note</th></tr>
<tr><td rowspan="11">Var1 = PLCDOWNLOAD(Var2, Var3, Var4, Var5, Var6) (W)</td><td rowspan="3">Var1</td><td colspan="3">Return value</td><td rowspan="11">W: Word</td></tr>
<tr><td>Failed</td><td colspan="2">0</td></tr>
<tr><td>Succeeded</td><td colspan="2">1</td></tr>
<tr><td rowspan="3">Var2</td><td rowspan="3">COM Port</td><td>COM1</td><td>0</td></tr>
<tr><td>COM2</td><td>1</td></tr>
<tr><td>COM3</td><td>2</td></tr>
<tr><td>Var3</td><td colspan="3">PLCStation No.</td></tr>
<tr><td>Var4</td><td colspan="3">DELTA PLC file name (i.e. delta.dvp, delta.isp)</td></tr>
<tr><td rowspan="2">Var5</td><td rowspan="2">External storage device</td><td>USB Disk</td><td>1</td></tr>
<tr><td>SD Card</td><td>2</td></tr>
<tr><td>Var6</td><td colspan="3">PLC Password</td></tr>
<tr><td colspan="4">Description of Action</td></tr>
<tr><td colspan="4">Download PLC file to PLC.</td></tr>
<tr><td colspan="6">NOTE:
1. Only support Delta PLC.
2. Support .dvp and .isp file formats.
3. Use Character Entry elements for Var6 password.</td></tr>
</table>

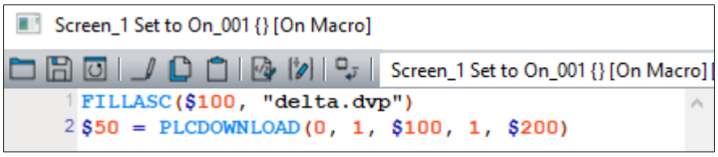
Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	
Var2	V	V	V
Var3	V	V	V
Var4	V	V	
Var5	V	V	V
Var6	V	V	

Example

- Store the DVP or ISP file to be downloaded to the USB Disk or SD Card and put the Return value in $50.

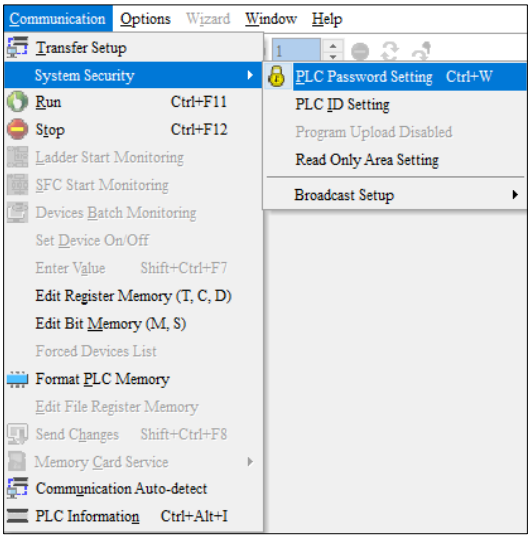


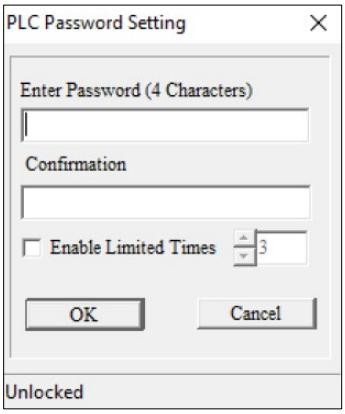
- Var4 is the PLC file name. First, the name string of the file to be downloaded must be put in a register address with the **FILLASC** command provided by the software. Then fill in the register address $100 with Var4 of **PLCDOWNLOAD**.



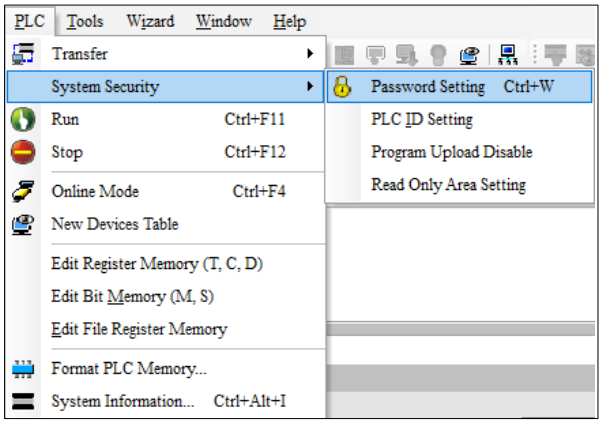
- The PLC password of Var6 must be set by going to **System Security** > **Password Setting** of the WPLSoft and ISPSoft. After the setting is finished, enter the password with the **Character Entry** element of the HMI, then the PLC files can be downloaded to the PLC.
- WPLSoft password setting.

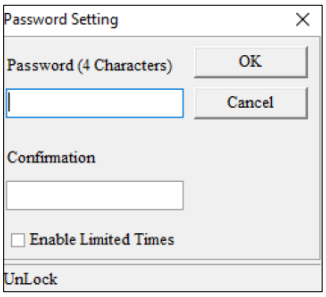
Example





- ISPSoft password setting.





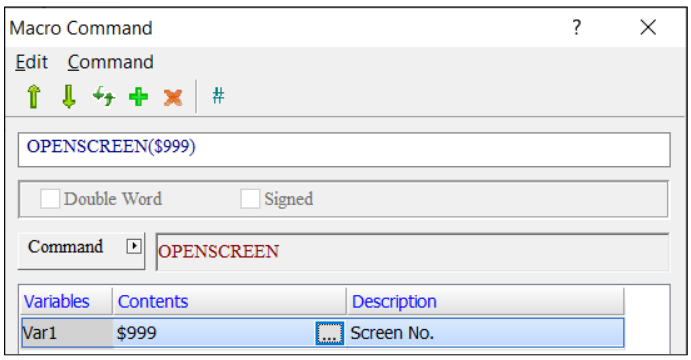
- OPENSCREEN

Expression	Meaning of Variable		Note
OPENSCREEN(Var1) (W)	Var1	Screen number	W: Word
	Description of Action		
	Open the screen number specified by Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	V

Example

- Var1 is the Internal Memory address. When $999 = 2, the macro switches the screen to Screen 2.



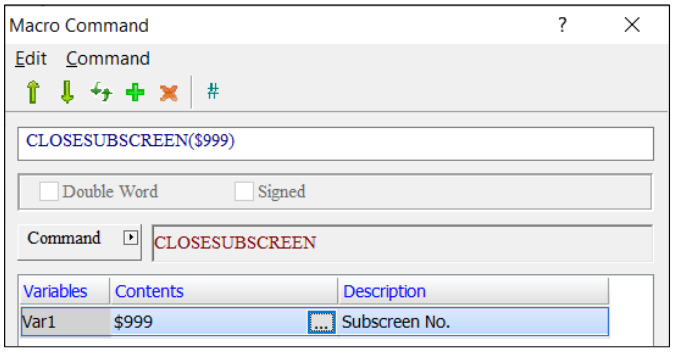
- This **Macro** does not support Screen Cycle Macro, Screen Open Macro, and Screen Close Macro.

- CLOSESUBSCREEN

Expression	Meaning of Variable		Note
CLOSESUBSCREEN(Var1) (W)	Var1	Subscreen number	W: Word
	Description of Action		
	Close the subscreen number specified by Var1.		

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V	V	V

Example
● Var1 is the Internal Memory address. When $999 = 2, the macro closes Subscreen No. 2.



● This macro does not support Screen Cycle Macro, Screen Open Macro, and Screen Close Macro.

● GetCircleCenter (Calculate Coordinates of the center of a circle)

Expression	Meaning of Variable		Note
Var1 = GetCircleCenter (Var2, Var3)	Var1	Return value	DW: Double Word
		Failed 0	
		Succeeded 1	
	Var2	Input coordinates of the 3 points (Note 1)	
	Var3	Center coordinates after calculation (Note 2)	
	Description of Action		
	Enter the calculated coordinates of 3 points to calculate the center coordinates. (Note 3)		

NOTE:

1. *Input coordinates of the 3 points:*
   Set the 3 points as P1(x1, y1), P2(x2, y2), and P3(x3, y3), and the length of each point is

Expression	Meaning of Variable	Note

Signed DW.

If Var2 is $100:

Save LOW WORD of x1 in $100, HIGH WORD in $101

Save LOW WORD of y1 in $102, HIGH WORD in $103

Save LOW WORD of x2 in $104, HIGH WORD in $105

Save LOW WORD of y2 in $106, HIGH WORD in $107

Save LOW WORD of x3 in $108, HIGH WORD in $109

Save LOW WORD of y3 in $110, HIGH WORD in $111

2. *Center coordinates after calculation:*

Set the center coordinates as P4(x4, y4), and the length of each point is Signed DW.

If Var 3 is $200:

Save LOW WORD of x4 in $200, HIGH WORD in $201

Save LOW WORD of y4 in $202, HIGH WORD in $203

3. *Formulas:*

$x = \triangle x/\triangle$

$y = \triangle y/\triangle$

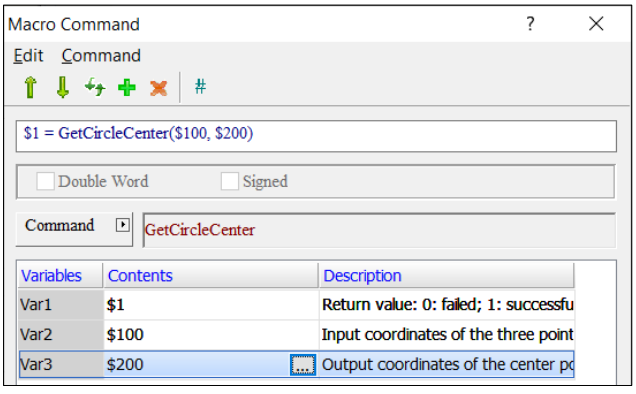
$where\ \triangle = 2(xa - xb) * (yc - yb) - 2(ya - yb) * (xc - xb)$

$\triangle x = (yc - yb) * (xa^2 + ya^2 - xb^2 - yb^2) - (ya - yb) * (xc^2 + yc^2 - xb^2 - yb^2)$

$\triangle y = (xa - xb) * (xc^2 + yc^2 - xb^2 - yb^2) - (xc - xb) * (xa^2 + ya^2 - xb^2 - yb^2)$

Variable	Type		
	Internal Memory	PLC Register	Constant
Var1	V		
Var2	V		
Var3	V		

Example



The steps are as follows:

1. Create a **Numeric Display** element as $1 and the Data Type is Word.
2. Create **Numeric Entry** elements of $100, $102, $104, $106, $108, and $110, and the Data Type is Double Word.

Example

Enter the following values:

$100 = 0

$102 = 0

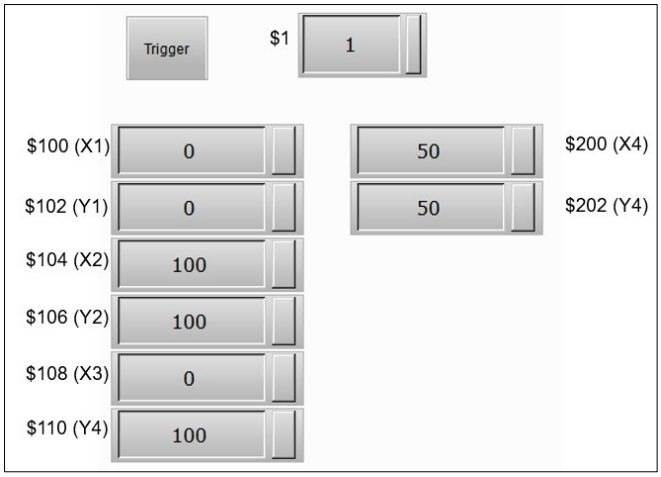
$104 = 100

$106 = 100

$108 = 0

$110 = 100

3. Create **Numeric Display** elements of $200 and $202, and the **Data Type** is Double Word. After executing the macro, the screen is as follows.



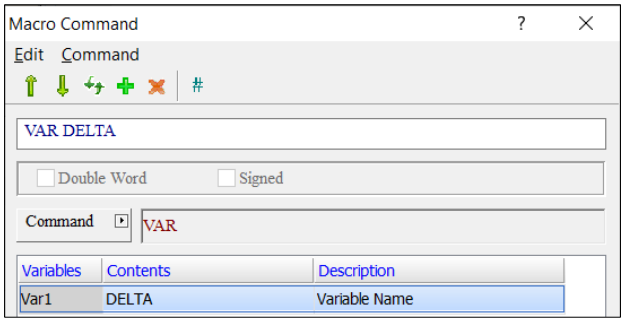
- VAR

Expression	Meaning of Variable		Note
VAR Var1 (W)	Var1	Variable Name	W: Word
	Description of Action		
	Specify a name as a global variable.		

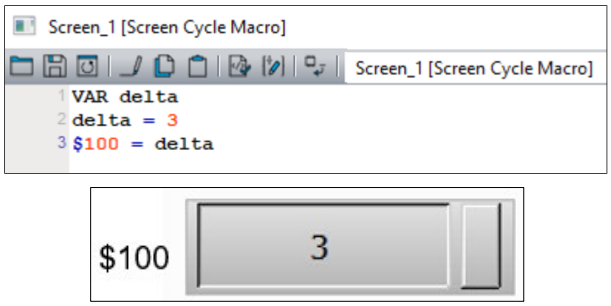
Variable	Type			
	Internal Memory	PLC Register	String	Constant
Var1			V	

Example

- Var1 is a word string. Declare DELTA as a variable.



- Set the value of the variable “delta” as 3, then move the value to $100, and execute $100 = 3.



24.4 Macro Error Codes

Error codes will be listed in the output field for easier troubleshooting while compiling the macros. If users miss out a command, the software will also prompt error messages to notify syntax errors.

- Error message during editing

Code	Code Name	Cause of Error
-91	Local variable is not allowed	Using local variables is not allowed when parameters of continuous addresses are used in the macro. Example: Parameter 1 of FILL.
-92	Elementary arithmetic error	The variable format is incorrect when the codes of elementary arithmetic are edited.

Code	Code Name	Cause of Error
-93	Submacro does not exist	This Error message indicates that the submacro users are calling does not exist. For example, when users write a line of CALL 5, which means the submacro 5 is to be called, but users did not edit the submacro 5 (could be an input error or users forgot to edit the corresponding submacro), this message serves as a reminder to prevent unpredictable errors.
-94	Number of labels exceeds the maximum	The number of labels exceeds the maximum of 65536.
-95	Flow control setting error	A non-existing flow control setting is used.
-96	Calling a null address	Memory configuration failure causes the macro to use memory address 0 to process the data.
-97	IF exceeds the maximum	The maximum layer of the nested IF statement is 6.
-98	Lack of ENDIF	When the IF statement is used, users must put the ENDIF at the end, so the macro nested within and outside the IF statement can be identified.
-99	IF ELSE execution error	This warning is sent when the IF ELSE statement is edited with its code not matching the IF ELSE logic.
-100	LABEL cannot be found	This error message indicates that the LABEL requested by GOTO cannot be found.
-101	Recursion occurred	This error message indicates the occurrence of recursion which mostly occurs in submacros. The reason is that if a submacro calls itself, whether directly or indirectly, it is the occurrence of recursion. Technically, submacros cannot be recursively edited, but if this is unavoidable, use GOTO or For (infinite loop) instead.
-102	More than 10 nested FOR are used	This error message indicates that more than 10 nested FOR commands have been used. The purpose is to prevent excessive use of nested FOR and insufficient memories. Use GOTO or IF when necessary.

Code	Code Name	Cause of Error
-103	Non-existing submacro is called	The submacro called is not within the range of 1 – 512 (i.e. CALL 0 or CALL 513).
-104	The number of NEXT is less than the number of FOR	This error message indicates that the number of NEXT operand does not match the number of FOR operand. Because FOR and NEXT need to be used in pairs, if a NEXT is missing, an error will occur while the program is running.
-105	The number of FOR is less than NEXT	This error message indicates that the number of NEXT operand does not match the number of FOR operand. Because FOR and NEXT need to be used in pairs, if there is one extra NEXT, an error will occur while the program is running.
-106	Repeated LABEL	This error message indicates that a LABEL is set repeatedly in the same macro. This means GOTO will generate two different results. In order to avoid unpredictable mistakes, this editing error message appears to remind users.
-107	There is RET in macro	This error message indicates that the use of RET in a macro. Since RET is designed for the submacro to return to the next command called, which means the program is not finished. END should be used to end a program if it is necessary to mark the end of a macro.
-109	Incorrect address format in macro	This error message indicates that the input address format in the macro is incorrect.
-110	Recipe address input error	This error message indicates that the input recipe address in the macro is incorrect. The recipe address does not exist.
-111	Recipe address input error	This error message indicates that the input recipe address in the macro is incorrect. The recipe address exceeds the range.
-112	Incorrect COM setting in macro	This error message indicates that the COM setting in the macro is incorrect; the COM port does not allow flow control.
-113	Incorrect COM setting in macro	This error message indicates that the COM setting in the macro is incorrect; the COM port is occupied.
-114	Incorrect COM setting in macro	This error message indicates that the COM setting in the macro is incorrect. Users must set both COM2 and COM3 to RS485. Otherwise, set COM2 to RS232 and COM3 to RS422.
-115	Macro command error	This error message indicates that the command in the macro is incorrect or the called submacro is incorrect.

Code	Code Name	Cause of Error
-117	Disk formatting error	This error message indicates that the device code in the macro is incorrect. It is possible that the parameter is set to an unsupported device (such as an SD card).
-118	Unsupported device is used in macro	This error message indicates that the macro has used the command not supported by the device.
-119	Repeat variable statement	This error message indicates that the macro includes repeat variable statements.

- Macro Error Messages in the HMI

The GETLASTERROR macro command can be used to read an error message on the HMI, but if a new correct command is executed before the error message is read, the error message will be changed. The execution of a macro will not change the error messages of other macros.

Code	Code Name	Cause of error
-1	Program End	The program has ended.
-2	Encoding error	This macro command does not exist.
-3	Lock error	Unable to lock the specified COM Port.
-10	GOTO error	There is a GOTO error in the macro.
-11	Stack overflow	This error message indicates that users have called too many submacros, so the stacks are not enough for use since many different macros are executing at the same time. This is a protection to avoid memory insufficiency.
-12	Empty submacro	This is a call submacro error. Since the command of CALL can call the submacro ID represented by the value in the Internal Memory of CALL, if users enter the value of this memory address while there is no corresponding submacro to call, this error message occurs.
-13	Data Read Error	Data read error may be an error of the Internal Memory data, but it mostly represents data read error of the controller.
-14	Data Write Error	Data write error may be an error of the Internal

Code	Code Name	Cause of error
		Memory data, but it mostly represents data write error of the controller.
-15	Divisor is 0	The divisor is 0 during the division or remainder operation.
-16	Data Process Error with BCD format	An error occurred while executing the BCD macro command.
-17	Data Process Error while converting ASCII to HEX	An error occurred while executing the TOHEX macro.
-18	NEXT OFFSET Processing Error	The macro data error results in errors while executing the NEXT macro command.
-19	Character Command Error	An error occurred while executing FILLASC.
-20	Data process error with BIN format	An error occurred while executing the BIN command.
-21	Submacro Data Error	The macro data error results in errors while calling submacros.
-22	FOR loop has OFFSET error	The macro data error results in errors while executing the FOR macro command.
-23	INITIAL Error	An error occurred while executing the INICOM macro command.
-24	Memory allocation error	The HMI memory is insufficient to execute macros.
-25	COM Port error	An error occurred in COM Port resulting in execution failure of the COM Port related communication macros.
-26	Print Port error	Print Port selection error when printing.
-27	Read value error	An error occurred when macros read parameter data that are out of range.
-28	IF ELSE ENDIF Error	An error occurred while executing the IF ELSE ENDIF macro command.

Code	Code Name	Cause of error
-29	Pen Width Setting Error	An error occurred while setting the pen width for the drawing macro.
-30	History Data Error	An error occurred while executing the GETHISTORY macro.
-31	Export Option Error	An error occurred while executing the EXPORT macro.
-32	Disk Reading Error	An error occurred in the external or internal disk resulting in execution error in the associated macros (EXPORT, DISKFORMAT...).
-33	Print Error	An error occurred while the macro is executing printing.
-34	Stack Overflow in IF ELSE ENDIF.	An error occurred due to stack overflow when the IF ELSE ENDIF macro command is executing.
-35	Password Error	Password confirmation is required when executing the macro, and the password entered is incorrect.
-36	Password Lock Error	Password confirmation is required when executing the macro, and users have reached the password attempt limit.
-37	ID Code Identification Error	ID password confirmation is required when executing the macro, and the ID password entered is incorrect.
-38	Syntax Error	Syntax error occurred after downloading the PLC program.
-39	Connection Failure/No Response	The connection fails or does not respond when the PLC program is downloaded.
-66	History ID Error	History buffer ID error.

Code	Code Name	Cause of error
-67	Identified String Error	Unrecognizable RL program string.
-69	Identified Encoding Error	An error occurs when analyzing the RL program.
-70	Variable 1 Error	The first variable in the macro command is incorrect.
-71	Variable 2 Error	The second variable in the macro command is incorrect.
-72	Variable 3 Error	The third variable in the macro command is incorrect.
-73	Field Language Reading Error	Unable to read the RL program or G-code.
-74	Field Language Writing Error	Unable to write the RL program or G-code.
-75	Field Language Execution Error	Unable to execute the RL program or G-code.
-76	Subprogram ID Error	Incorrect Subprogram ID of the RL program.
-77	Subprogram Size Error	Incorrect subprogram size of the RL program.
-78	Exceed the Maximum Number of Program Lines	Number of lines of the RL program exceeds the maximum allowable number.
-79	G Code Compilation Error	G code compilation error.
-80	Exceeding the Range when Converting Double to INT	The value in the data type of Double exceeds the range for the value in int type.
-82	Local Variable Configuration Error	For example, Var1 and Var2 of the BMOV command cannot use the local variables.
-83	Restricted Macro Command	The current execution is not allowed because there is a restricted macro command. For example, executing the OpenScreen macro in the Screen Cycle macro.
-85	Temporary Memory Space Error	The specified file space is too small.

- PLC related file error description, including file formats of DVP and ISP

Code	Code Name	Cause of error
-40	This file name is not supported	The file name to be opened by the macro execution is not supported.
-41	This version is not supported	The file version to be opened by the macro execution is not supported.
-42	File Open Error	There is an action to open file when the macro is executed, and the action failed.
-43	File Handle Error	Handle error in the file opened by the macro execution.
-44	File Read Error	The file opened by the macro execution cannot be read properly.
-45	File Seek Error	The content of the file opened by the macro execution cannot be moved properly.
-46	File Write Error	The file opened by the macro execution cannot be written properly.
-47	File Removal Error	There is an action to remove file when the macro is executed, and the action failed.
-48	File Rename Error	There is an action to rename the file when the macro is executed, and the action failed.
-49	File Length Error	A file length error is found when the macro is executed.
-50	File Data Error	A file data error is found when the macro is executed.

- File Slot file Error Description

Code	Code Name	Cause of Error
-51	File Slot Macro ID Error	The ID for the macro execution to open does not exist.
-52	File Slot Macro Handle Error	Handle error in the file opened by the macro execution.
-53	File Slot Macro Read Error	The file opened by the macro execution cannot be read properly.
-54	File Slot Macro Seek Error	The file opened by the macro execution cannot be moved properly.
-55	File Slot Macro Write Error	The file opened by the macro execution cannot be written properly.
-56	File Slot Macro Removal Error	There is an action to remove file when the macro is executed, and the action failed.
-57	File Slot Macro Length Error	A file length error is found when the macro is executed.
-58	File Slot Macro Export Error	The destination device assigned for the file export is incorrect when the macro is executed.
-59	File Slot Export Error	The macro execution fails to export the file.
-61	File Slot Import Error	The macro execution fails to import the file.
-62	The file corresponding to the File Slot does not exist	The FileSlot file read or exported by the macro execution does not exist.
-63	Failed to Read the file from External Disk	The external file to be imported by the macro execution does not exist.
-64	Failed to Copy the file	The macro execution fails to copy the file when performing file import or export.
-84	Failed to Read the File Slot filename	The macro execution fails to read the FileSlot filename.

Code	Code Name	Cause of Error
-86	Failed to set the File Slot filename	The macro execution fails to set the FileSlot filename.
-87	Failed to search for the File Slot ID	The macro execution fails to search for the selected FileSlot ID.

Chapter 25: Multi-language

25.1 Multi-language Settings

The **Multi-language** function supports all languages and users can select up to 32 languages at the same time. The **Multi-language** setup example is described as follows.

Click **General** > **Configuration** > **Multi-language** to set multi-language parameters.

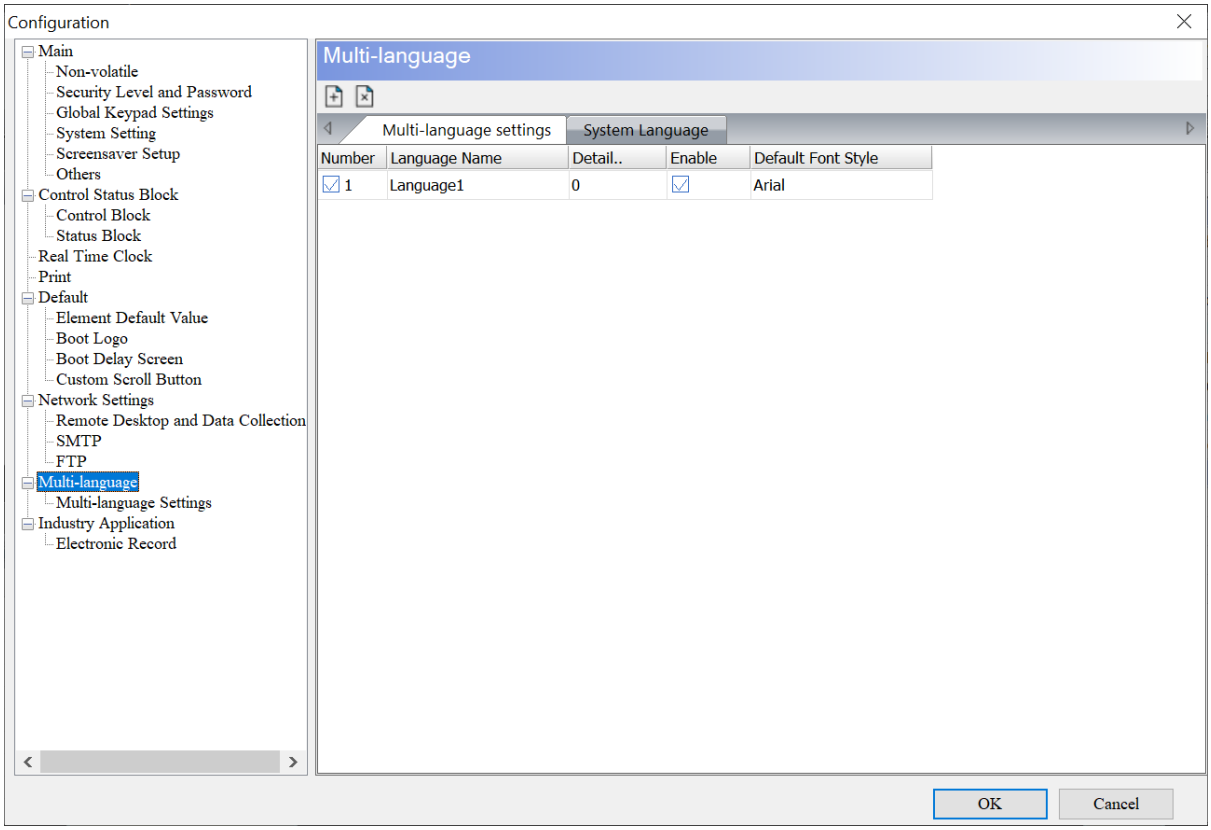
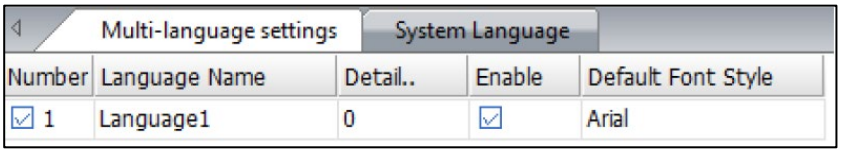


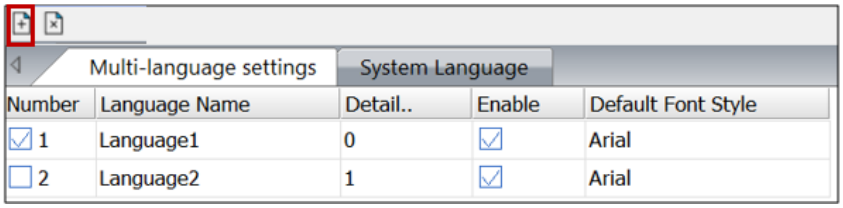
Figure 25 - 1: Multi-language settings interface

<table>
<tr><th colspan="3">Multi-language Settings</th></tr>
<tr><td>Add</td><td colspan="2">

Multi-language settings allows to add, modify, and delete the language settings. Language 1 is set in DIAScreen by default, and users may change Language Name and Detail...

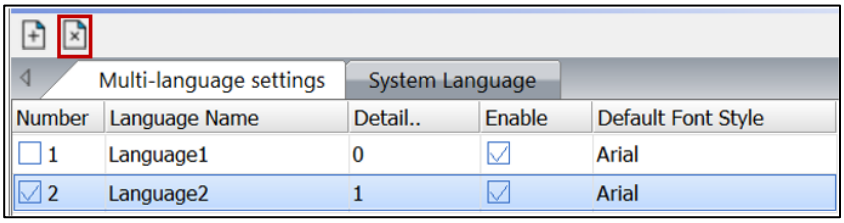


Click  icon to add a language, as shown in the following figure.

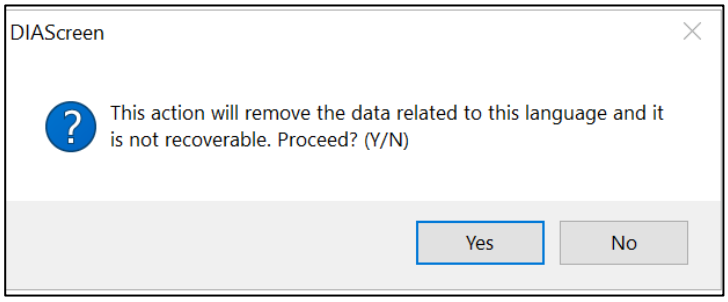


</td></tr>
<tr><td>Delete</td><td colspan="2">

To delete a language, select the language to be deleted, and then click  icon to delete the selected language entry.

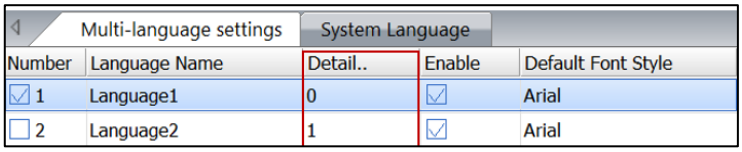


A warning message appears to confirm the deletion.



</td></tr>
<tr><td rowspan="2">Modify</td><td>Language Name</td><td>Set the Language Name based on the name of the language or their preference.</td></tr>
<tr><td>Detail..</td><td>

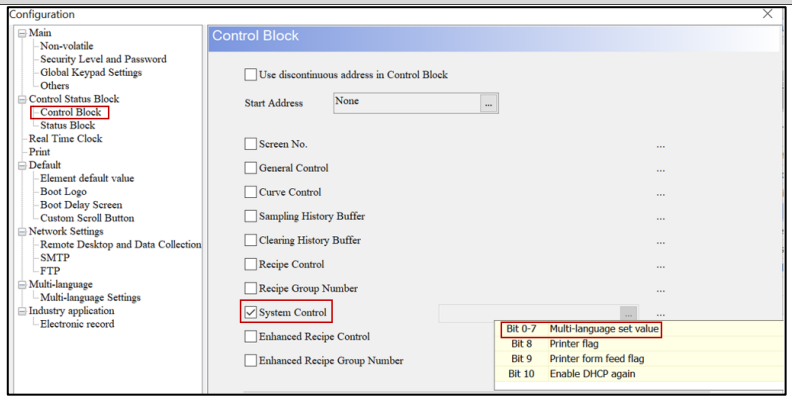
The Detail.. column is used to switch between languages.



DIAScreen switches the language to the corresponding setting via the System Control in the Control Block. The elements also achieve the Language Change function based on the Detail.. settings.

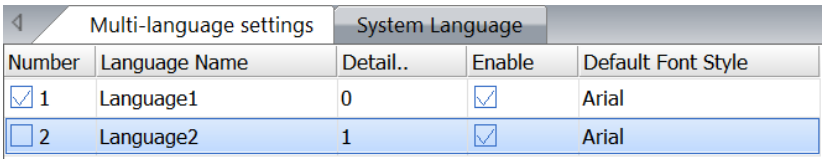
</td></tr>
</table>

Multi-language Settings

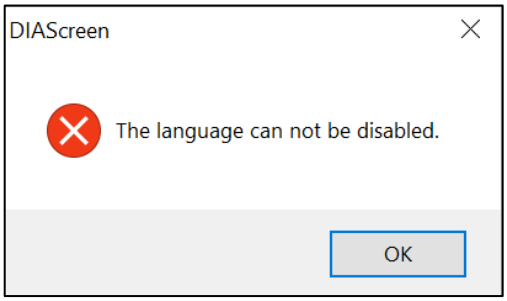


Enable

- Users may enable other languages that have been added. The added Language 2 can be enabled, as shown in the following figure.

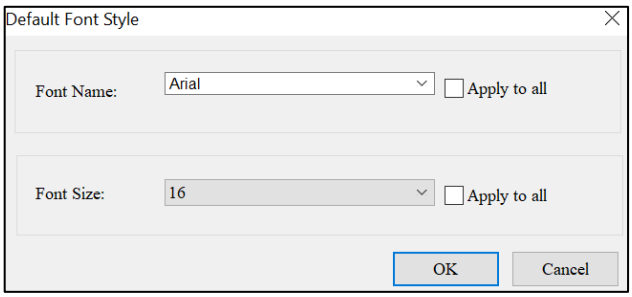


- If users uncheck the **Enable** checkbox of Language 1, a warning message appears, showing that the language cannot be disabled.



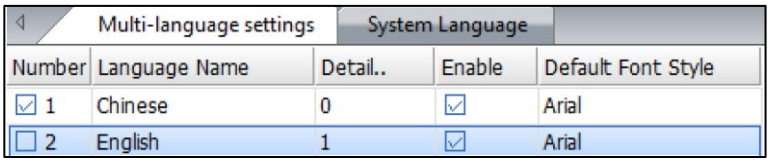
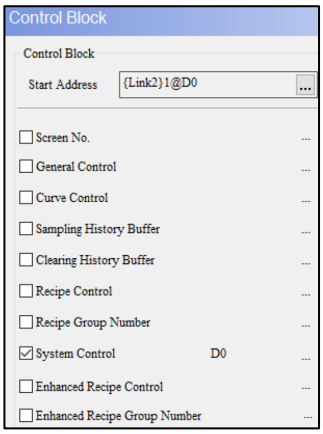
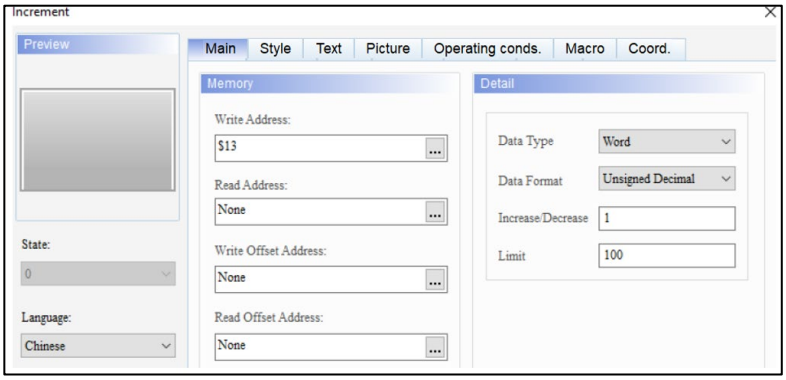
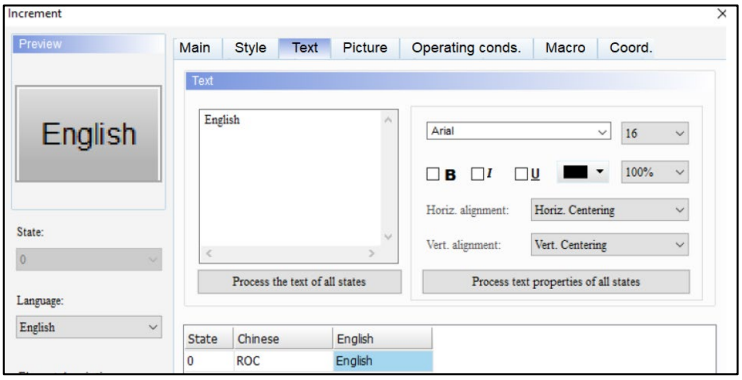
Default Font Style

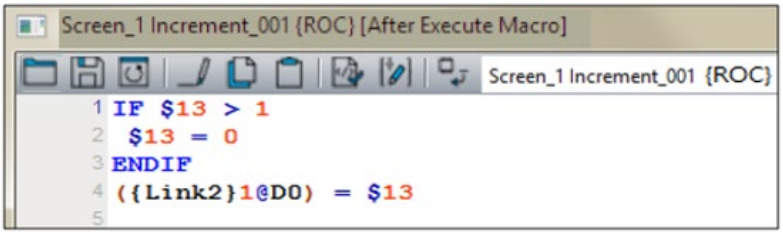
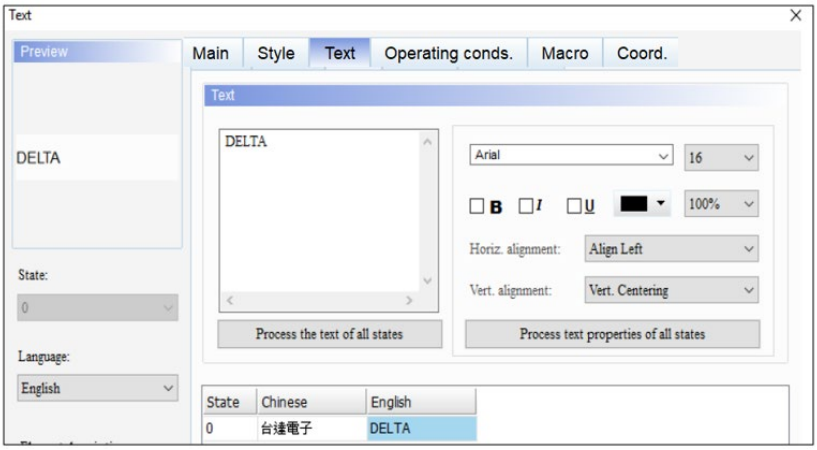
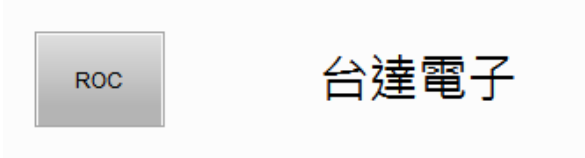
- **Default Font Style** allows to apply the **Font Name** and **Font Size** according to the language selected. The default values are **Arial** and **16**, respectively.



- If users choose to apply either the **Font Name** or the **Font Size**, the font setting applies to the newly created elements after making a change to the font setting.
- If users choose to apply both **Font Name** and **Font Size**, the font setting applies to both existing and newly created elements.

***NOTE**: The **Font Name** and **Font Size** settings are applied to the elements that users can enter.*

Multi-language	
Step 1	Click **General** > **Configuration** > **Multi-language**. If users want to rename Language 1, Language 2, then rename 'Language 1' to 'Chinese' and 'Language 2' to 'English'. 
Step 2	Click **General** > **Configuration** > **Control Status Block** to select the checkbox of **System Control**. 
Step 3	● Create an **Increment Button** element. Set **Write Address** to $13, and set relevant parameters.  ● On the **Text** property page, enter the text to display in Chinese and English as shown in the following figure. 

<table>
<tr><th colspan="3">Multi-language</th></tr>
<tr><td></td><td colspan="2">● Write the following commands in the After Execute Macro of the Increment Button element.
 
</td></tr>
<tr><td>Step 4</td><td colspan="2">Create a static text, and enter the text to be displayed in Chinese and English on the Text property page as follows:
 
</td></tr>
<tr><td>Step 5</td><td colspan="2">Compile the elements, and then download the screen to HMI.
 
</td></tr>
<tr><td>Step 6</td><td colspan="2">After downloading to HMI, click the ROC button to change the language to English, and then the text DELTA displays.</td></tr>
<tr><td></td><td>Before Language Change</td><td> 
</td></tr>
<tr><td></td><td>After Language Change</td><td> 
</td></tr>
</table>

25.1.1 System Language Settings

The HMI **System Language** settings provide six language options, and users can set the language in three different ways, described as follows.

Click **General** > **Configuration** > **Multi-language** > **System Language** to set the system language. Download the project to HMI, and then the system displays in the language set.

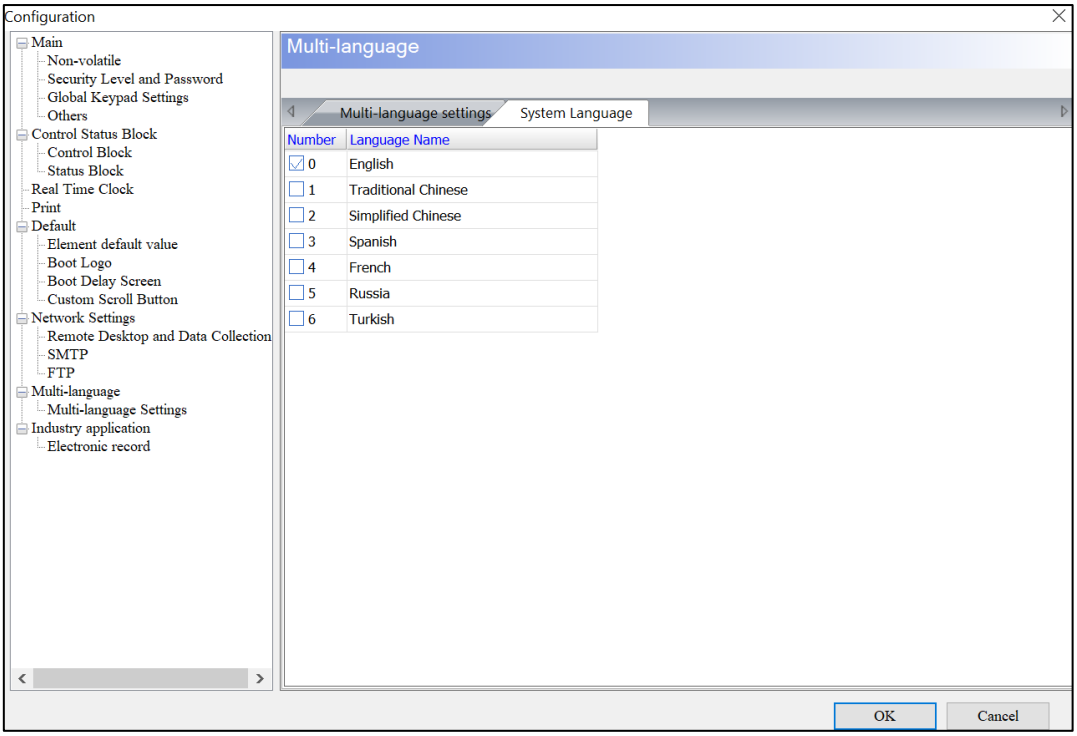


Figure 25 - 2: System Language settings

1. To set the language via internal parameters, refer to *Section 3.4 Internal Parameter*.
2. To set the language via the HMI System Setting, refer to the following figure.

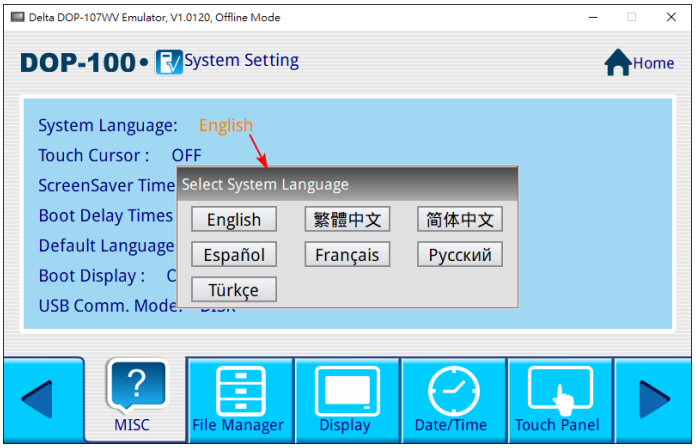


Figure 25 - 3: HMI System Setting

25.2 Multi-language Input Method Settings

The system provides 16 input methods to edit the displayed text. To use multi-language input, check the input methods and use the **Multi-language Input** element within the input element.

***NOTE**:*

1. ***Multi-language Input** function does not support **On-line Simulation** and **Off-line Simulation**.*
2. *For related elements, refer to Section 13.4 Multi-language Input.*

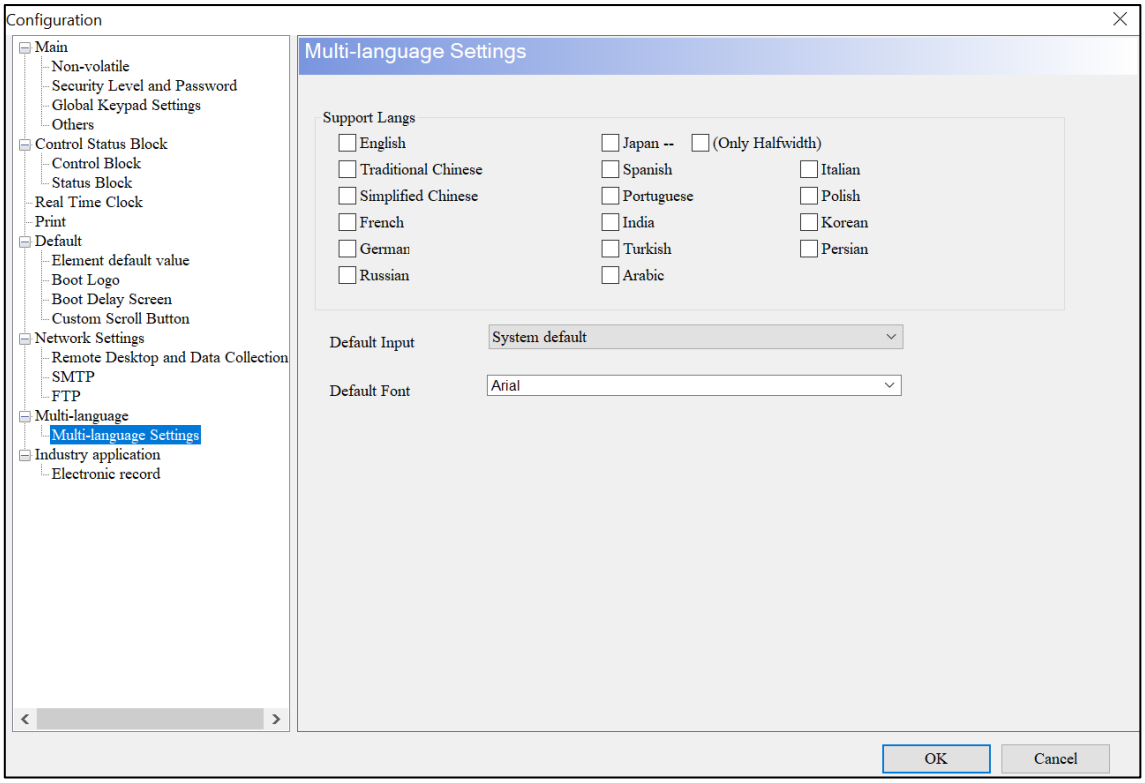


Figure 25 - 4: Multi-language Settings

Chapter 26: Print Settings

26.1 Print Settings

Print Settings allows to print multiple pages, plan the print layout and print history data.

Pay attention to the following before executing **Print Settings**:

- Print Screen cannot be set as Goto Screen.
- Goto Screen cannot be changed to Print Screen.
- Default Screen cannot be set as Print Screen.
- Base Screen cannot be set as Print Screen.
- Subscreen cannot be set as Print Screen.
- Screensaver Screen cannot be set as Print Screen.

In the **Print Settings** window, two options are available, **Print All** and **Custom Print**. **Print All** means that all the screens that are dragged to the **Print Output Screen** on the right side for printing will be printed. History data can also be printed using the **Print Output Screen**. Select the screen to be printed, set the printing sequence, or delete the screen that does not need to be printed.

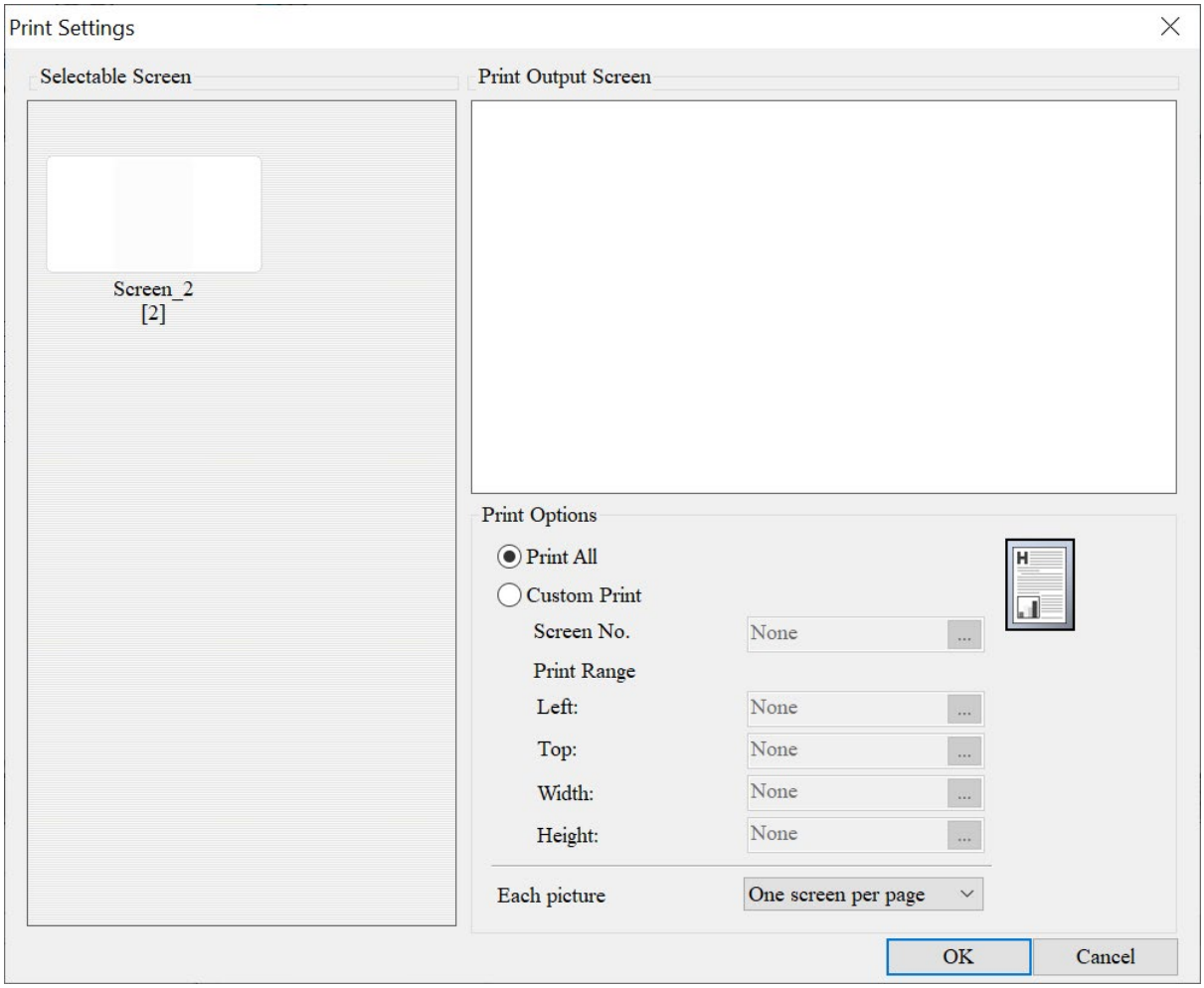


Figure 26 - 1: Print Settings window

Custom Print allows to print customized screens. Set the **Screen No.**, **Height**, **Width**, X coordinate (**Left**), and Y coordinate (**Top**) of the starting points of the **Print Range**. This function can be used with the Printer flag in the **Control Block** and the **Print Output Button** element.

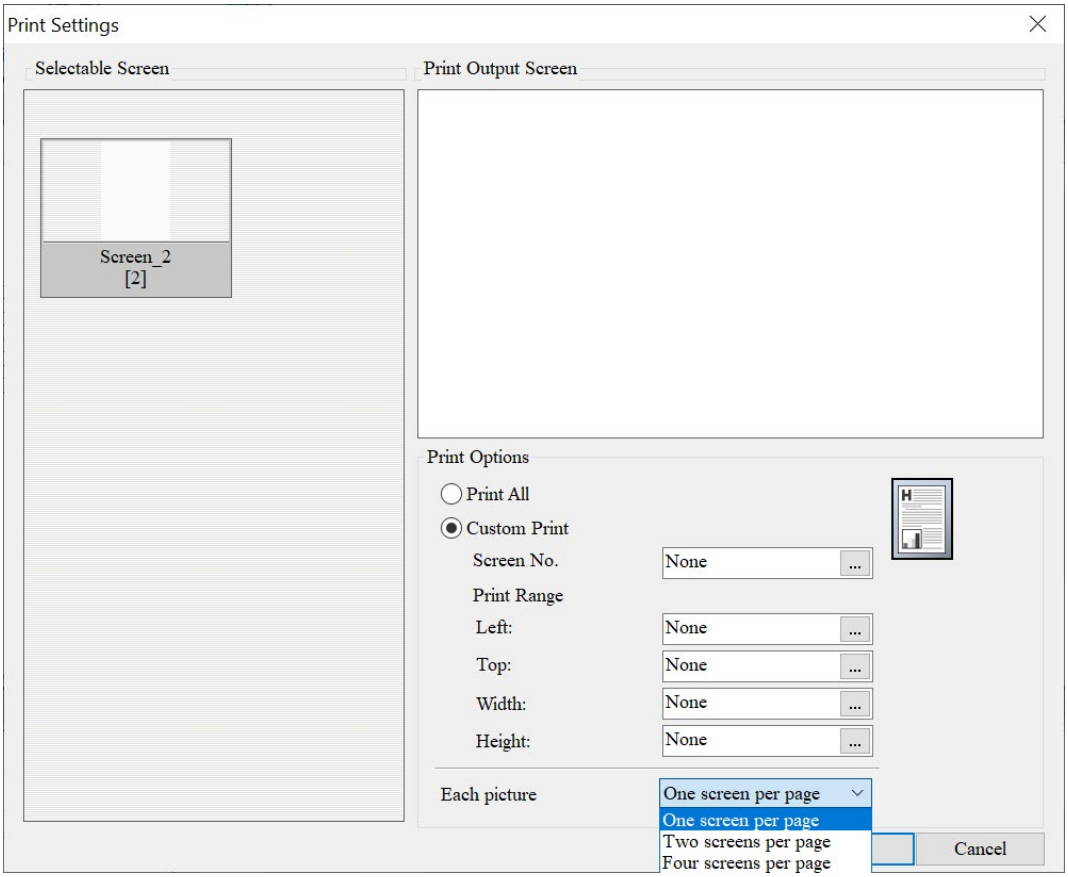
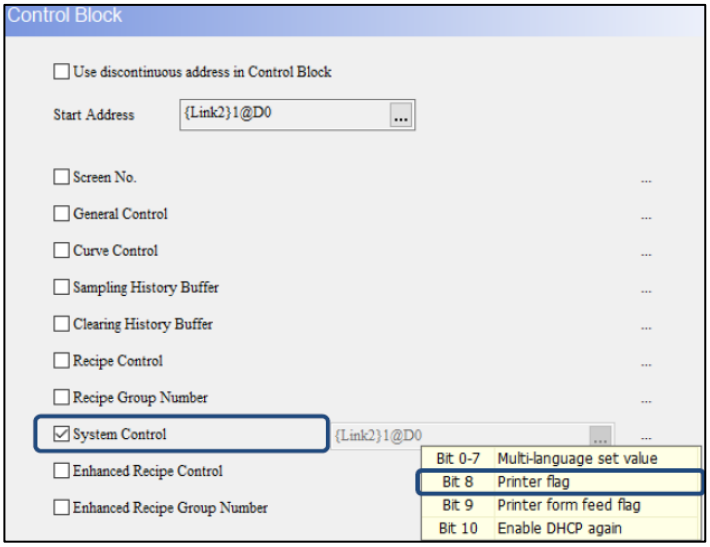
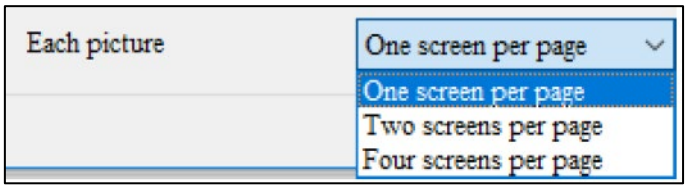


Figure 26 - 2: Custom Print

Function	Description
Screen No.	**Screen No.** refers to the number of the screen to be printed. Set the **Read Address** of the Screen to print; when the entered value is 0, all screens in **Print Settings** get printed. The **Screen No.** can also be used with the Printer flag in the **Control Block**. 

Left	Set the X coordinate of the starting point of the **Print Range**.
Top	Set the Y coordinate of the starting point of the **Print Range**.
Width	Set the width of the **Print Range**.
Height	Set the height of the **Print Range**.

Each picture allows to set the number of screens to be printed per page.

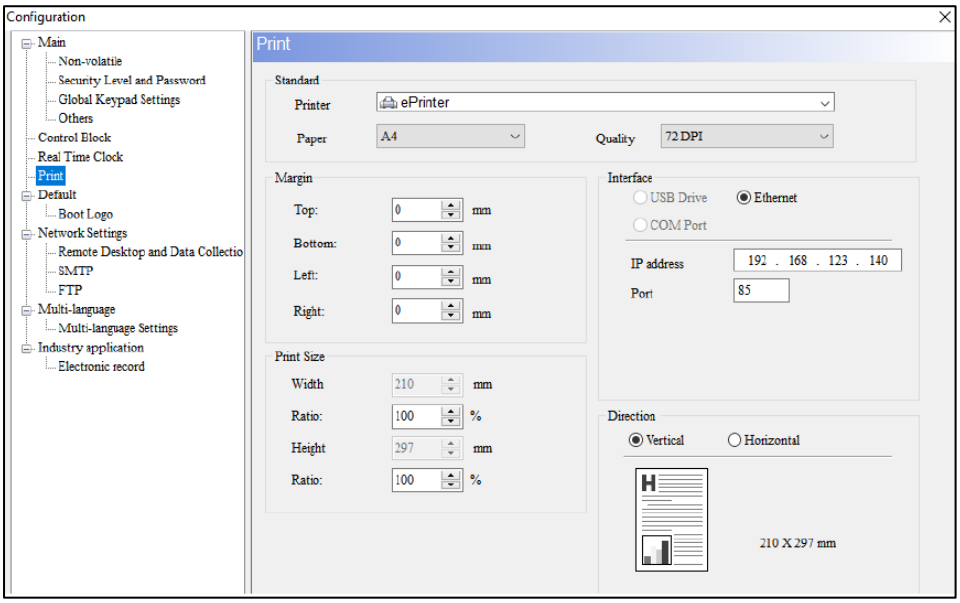


One screen per page	
Two screens per page	
Four screens per page	

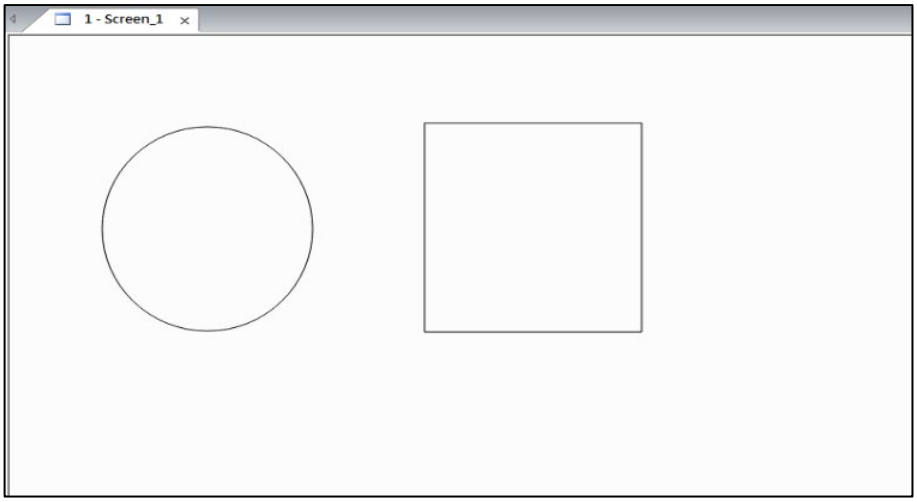
With all functions and properties for **Print Settings** introduced, the following section provides an example for **Print Settings**.

Print Settings	
Step 1	● Create a new project. Select **ePrinter** as the printer, and set the IP address to the IP address of PC and the port to 85. Then add 3 screens.

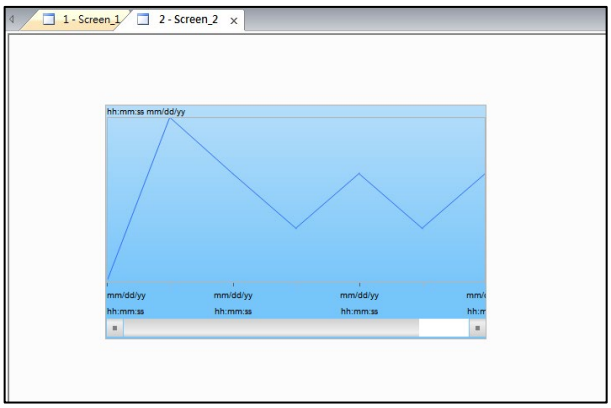
Print Settings



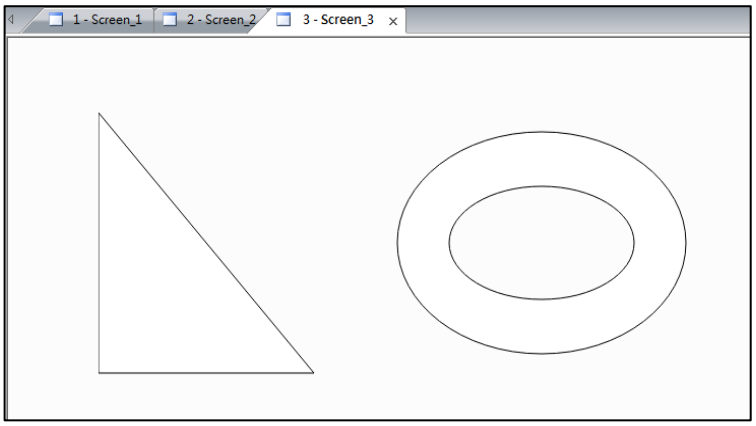
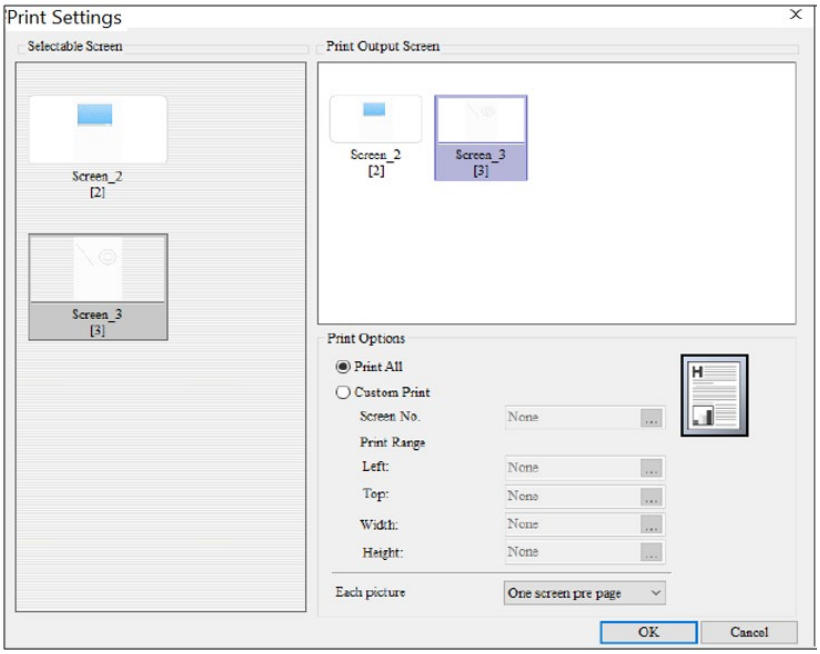
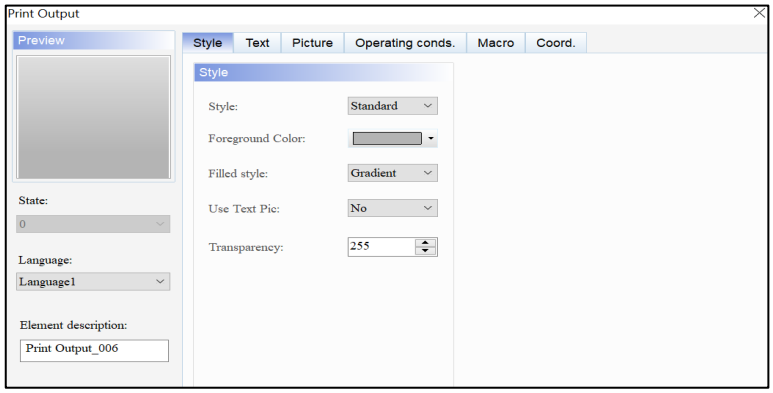
- On the first **Screen**, create a **Circle** element and a **Rectangle** element as shown in the following figure.

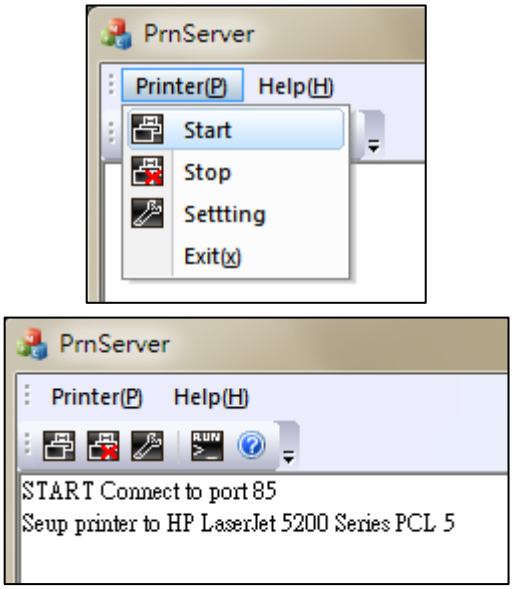


- On the second **Screen**, create a **Historical Trend Graph** element as shown in the following figure.



- On the third **Screen**, create a **Right Triangle** element and a **Hollow Circle** element as shown in the following figure.

Print Settings	
	
Step 2	● Click **Tools** > **Print Settings**. Drag Screen_2 and Screen_3 to the **Print Output Screen** on the right side. Click **OK** to exit the **Print Settings** window. 
Step 3	● Create a **Print Output Button** element. 

Print Settings	
Step 4	● Configure IP address of the HMI and the ePrinter to be under the same network segment. Then compile and download the screen to the HMI. ● Open PrnServer and select **Start**. 
Step 5	After PrnServer is connected to port 85, click **Print Output Button** element to print the set screens. It takes more time for the HMI to process the print data if there are multiple screens or the history data element to be printed contains a large amount of sampling data.

26.2 ePrinter

ePrinter allows users to online print screens on the HMI without a physical printer, which not only saves hardware space but also facilitates printing. For the ePrinter architecture, refer to the following figure.

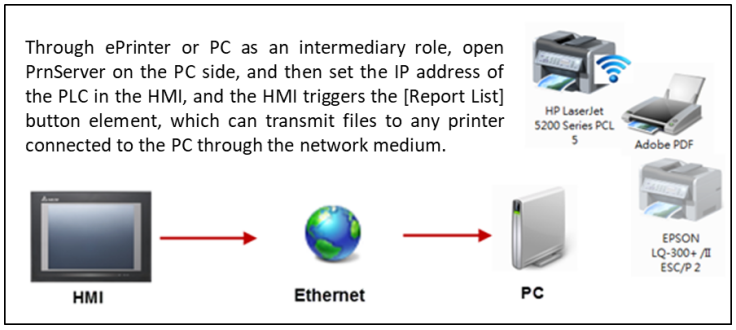


Figure 26 - 3: ePrinter Architecture

The ePrinter functions will be introduced in two parts: One is about the introduction of PrnServer, and the other is about how to connect HMI to ePrinter for e-printing.

26.2.1 PrnServer

The PrnServer executable file allows to install PrnServer and print files online. The PrnServer executable file is located on the PC: C:\Program Files (x86)\Delta Industrial Automation\DIAStudio\DIAScreen 1.3\PrnServer.exe.

Upon opening, the following screen appears.

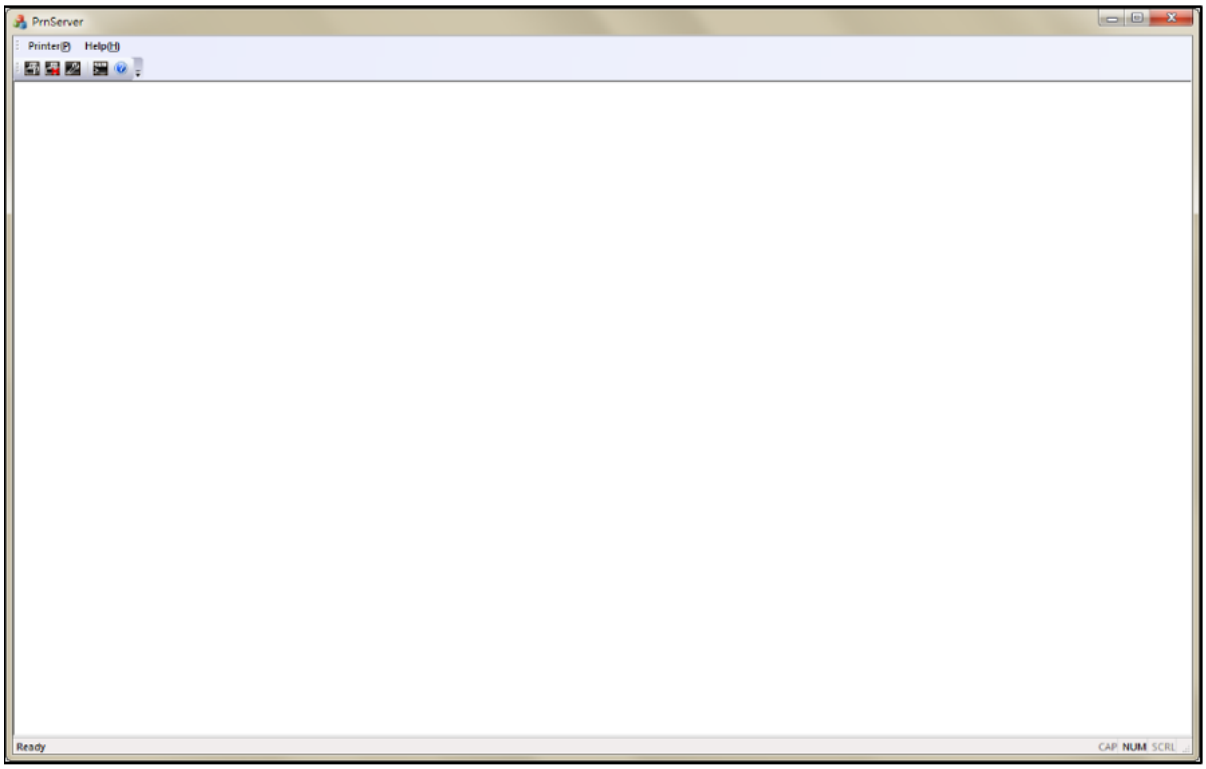
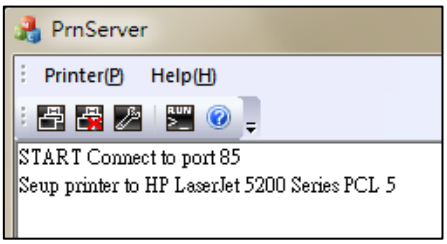


Figure 26 - 4: ePrinter screen

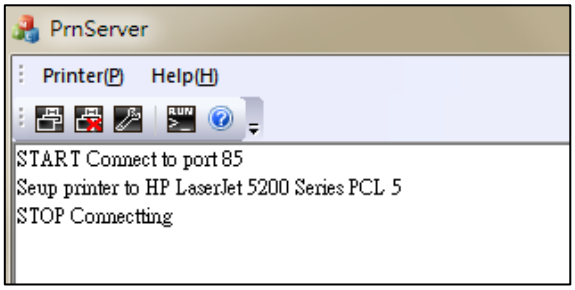
<table>
<tr><td rowspan="3">Printer</td><td>Connect</td><td>

Before printing, click icon to connect HMI to the printer.
The default connection port is 85, and HMI auto-connects to the PCs current default printer.



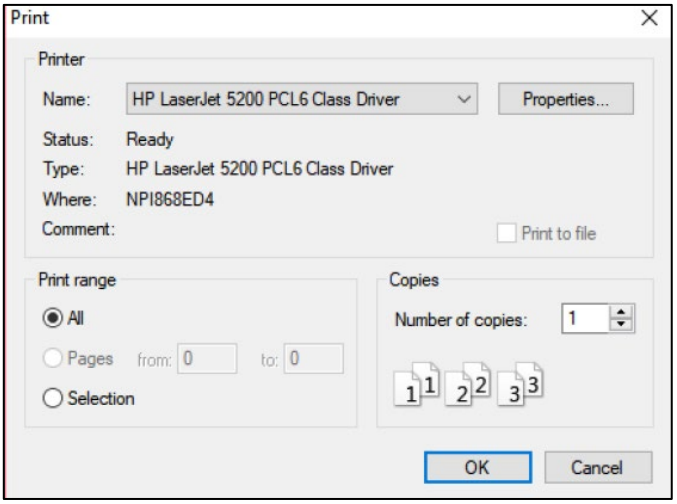
</td></tr>
<tr><td>Disconnect</td><td>

Click icon and PrnServer displays the following message.

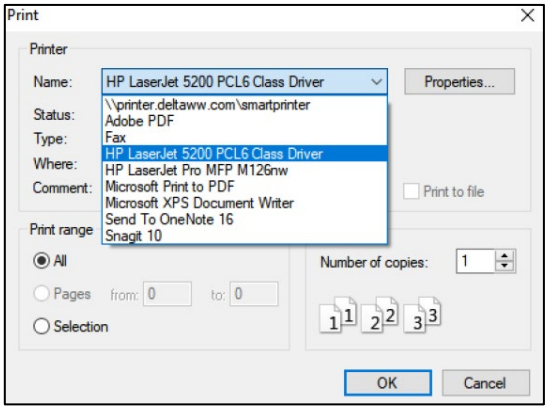


</td></tr>
<tr><td>Settings</td><td>

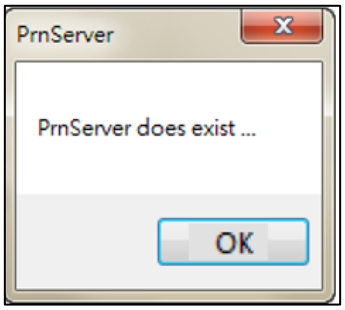
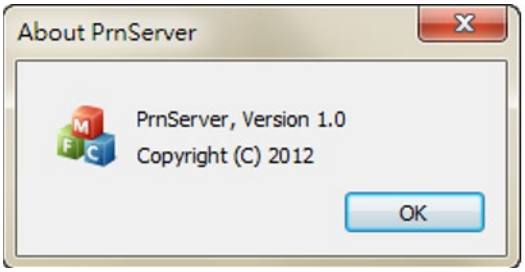
Display the settings related to the printer.



Change the printer to connect.



</td></tr>
</table>

Printer	Exit 	● Click **Exit** to exit PrnServer. ● When users do not use ePrinter, be sure to exit. Clicking  icon to close the PrnServer window does not stop the connection. If users click  to close PrnServer and open it again, the following message appears. 
Description	About 	● Displays the current version of PrnServer. 

26.2.2 HMI Connection Settings

HMI settings help understand how to set the ePrinter functions in the HMI screen and how to trigger and finish printing via HMI. Refer to the following steps:

1. Create a project. Select 107WV and set **Printer** to ePrinter (as shown in the following figure). Then click **Next**.

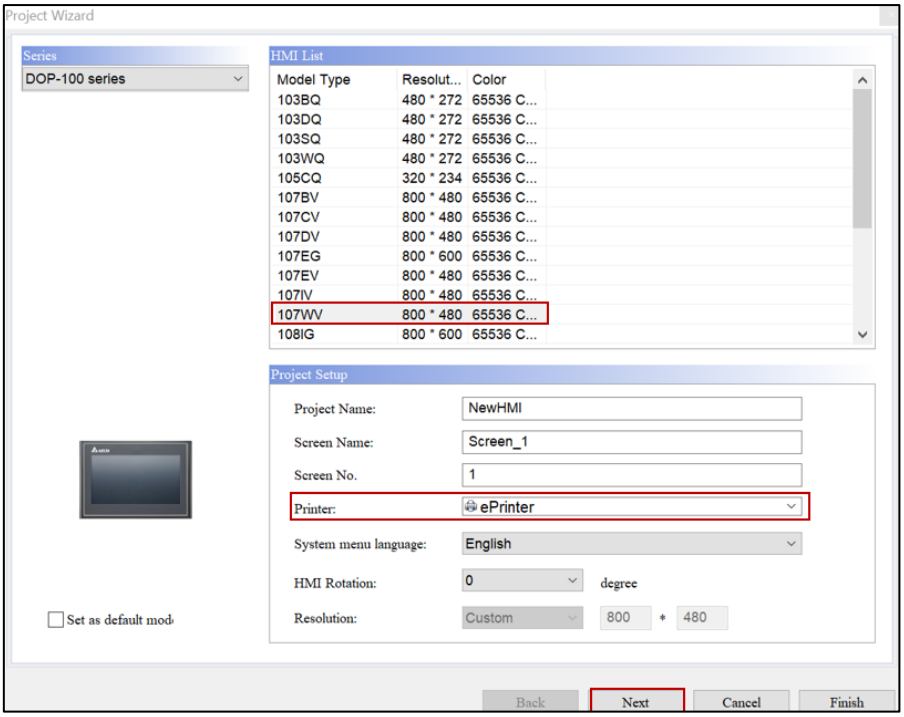
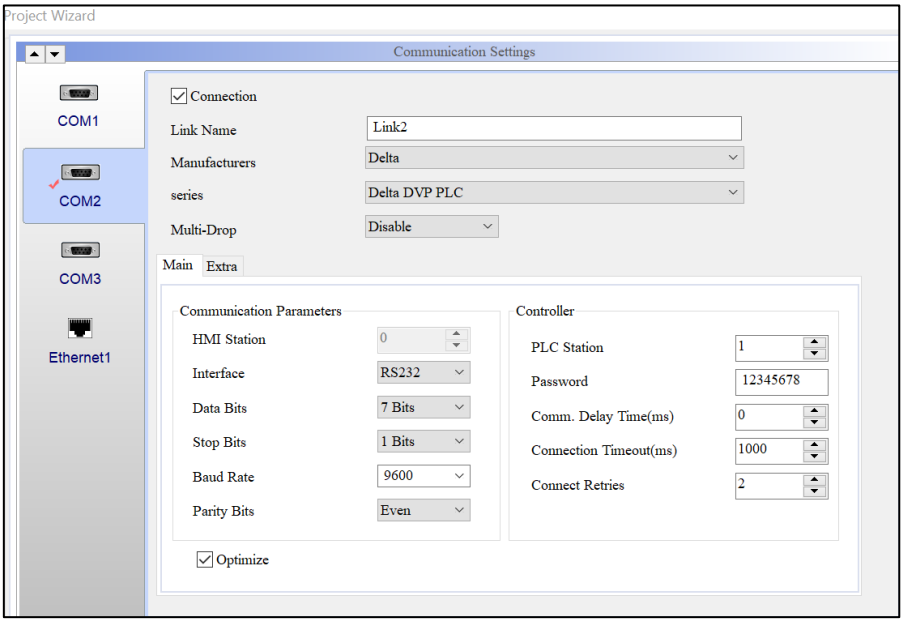


Figure 26 - 5: HMI screen setting (I)

2. Complete the communication and network settings.



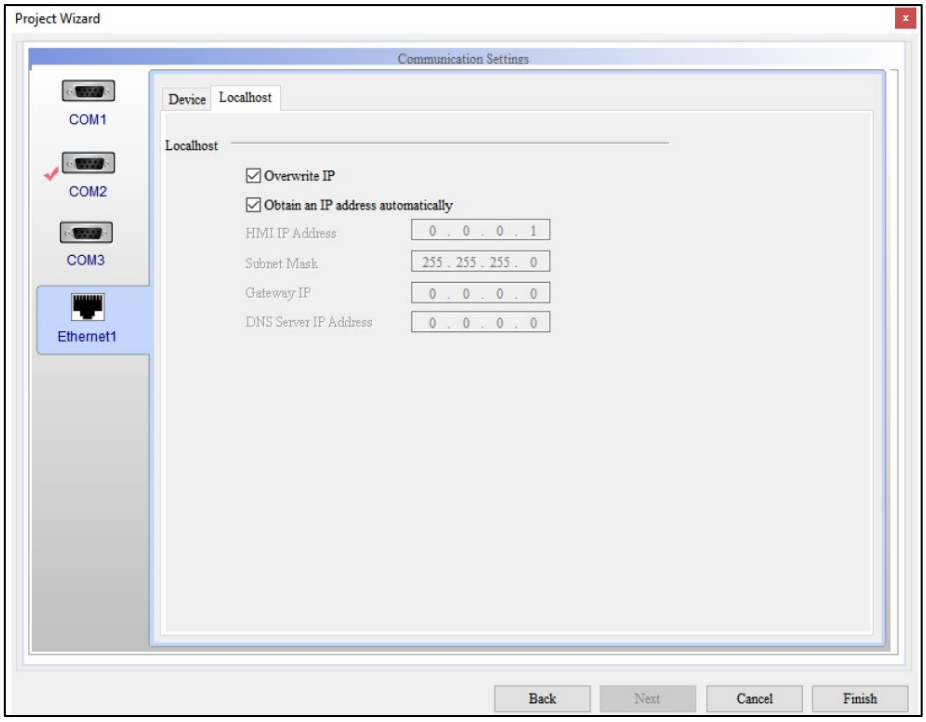


Figure 26 - 6: HMI screen setting (II)

3. Set up **Print** settings. Click **General** > **Configuration** > **Print**. Select the **Ethernet** in **Interface**, and fill in the **IP Address** and **Port** number.

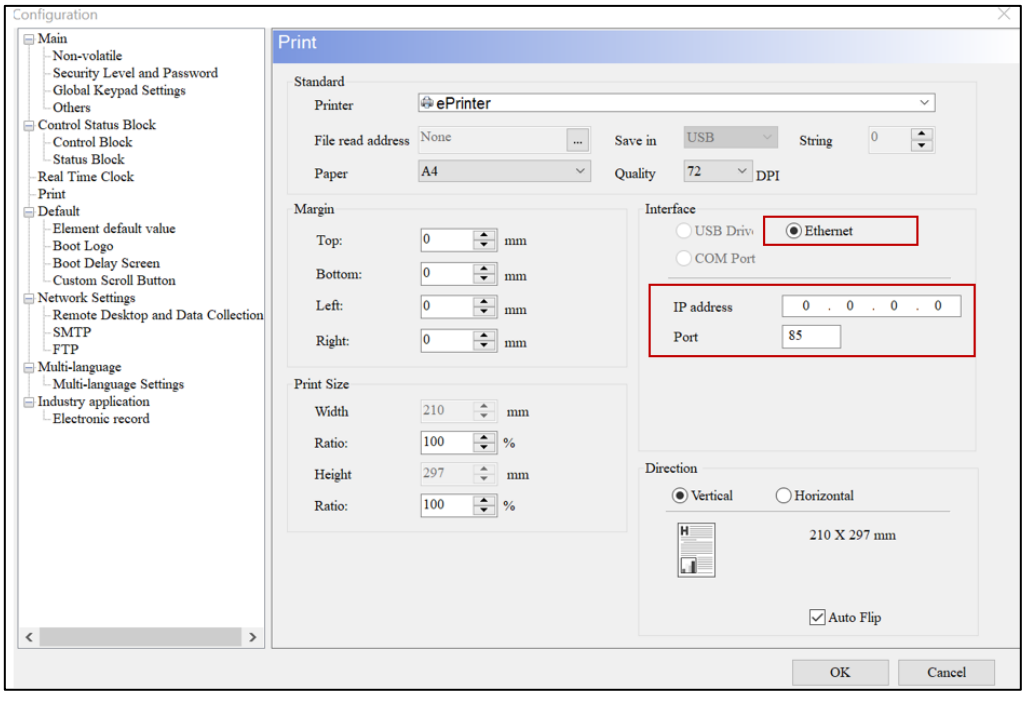


Figure 26 - 7: HMI screen setting (III)

4. IP address: This address is the IP address of the PC where PrnServer is enabled. Issue ipconfig through Command Mode to query the IP address of the PC. The IP address is 192.168.123.140 in this example.

   ***NOTE**: This IP address and the IP address of HMI screen should be in the same network segment.*

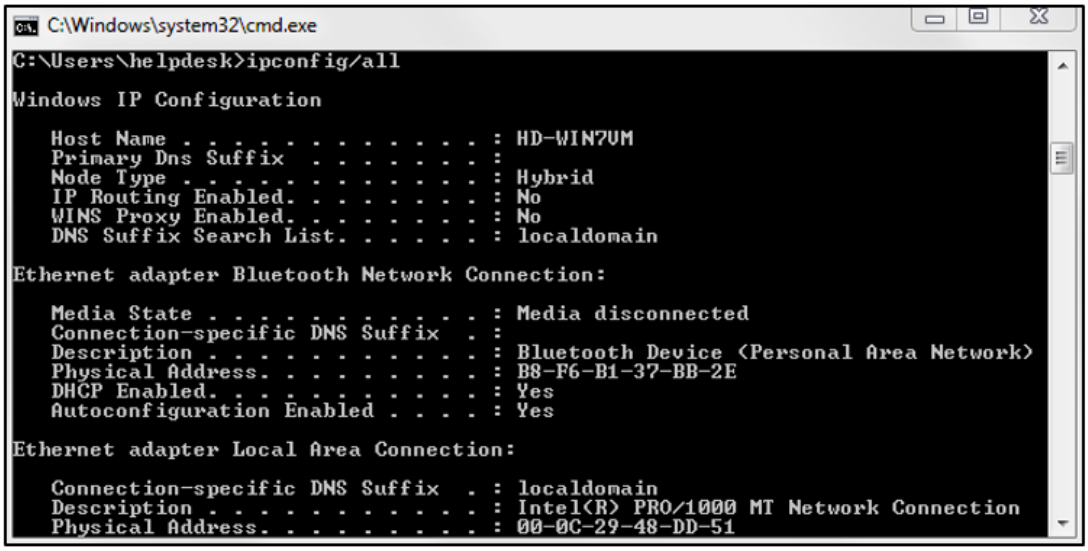


Figure 26 - 8: Querying the IP address

5. Port 85 is both the default connection port and the connected printer port during the PrnServer connection.

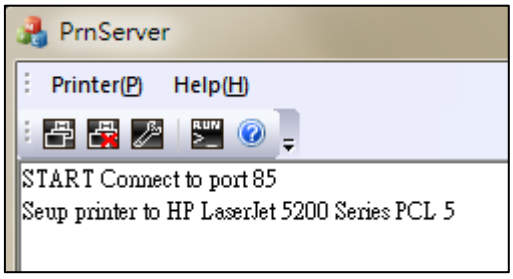


Figure 26 - 9: ePrinter connection port

6. Create a **Rectangle** element, a **Circle** element and a **Print Output Button** element on the DIAScreen editing screen.

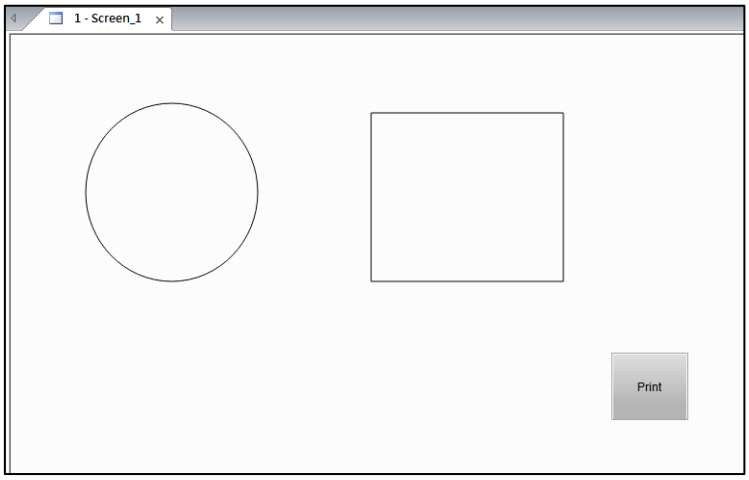


Figure 26 - 10: Creating Rectangle, Circle and Print Output Button elements

7. Compile and download the screen data to the HMI.
8. Before executing the **Print Output** (Print) element, start and run the PrnServer.

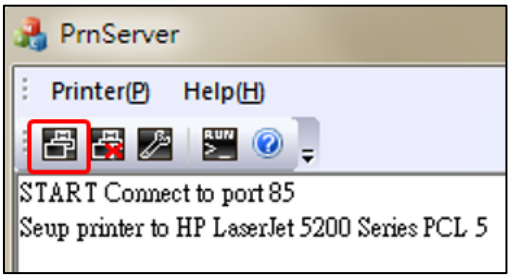


Figure 26 - 11: Running PrnServer

9. Then press **Print** button on the HMI to complete printing.

26.3 Printer Error Codes

If an error occurs when the printing function is executed, refer to the error code displayed by the printer to figure out and troubleshoot the error.

Code	Definition	Cause	Troubleshooting
-2	ERROR_PRINT_PORT Printer port error	USB, parallel port or COM selection error.	Check if the set transmission port is correct.
-3	ERROR_MEMORY_NULL Memory configuration error	HMI memory is insufficient to process print data.	Delete partial screen data to be printed, or select another printer with a larger memory capacity.
-4	ERROR_USB Failed to print due to printer error	This error message will pop up when the printer fails to print due to a fault.	The fault may be caused by ink run-out, paper jam, etc. Print again after troubleshooting.
-5	ERROR_USB_NOT_SELECT Failed to start the printer and unable to connect	The printer has been connected, but HMI failed to recognize it.	The printer driver cannot be connected to the HMI. Contact our Global Customer Service Department.
-6	ERROR_USB_PAPER Failed to print due to paper run-out	The printer displays "out of paper".	Load paper to solve the problem.
-7	ERROR_USB_NOT_CONNECT Failed to connect to the printer	The USB cable is not connected to the printer.	Check if the USB cable is connected to the printer correctly.
-8	ERROR_USB_OPEN Failed to enable USB	Failed to enable USB when starting to print.	Restart the HMI. If printing still fails, contact our Global Customer Service Department.

Code	Definition	Cause	Troubleshooting
-9	ERROR_USB_CLOSE Failed to disable USB	Failed to disable USB when printing is finished.	Restart the HMI. If printing still fails, contact our Global Customer Service Department.
-11	ERROR_NOT_OK The printer has not been initialized	The printer will be initialized when powered on. If users print at this time, the printer will display this error message.	It may take a long time to initialize some printers, so do not print until the initialization is finished.
-14	PRINTER ERROR The printer fails to print	CTS pin status error	Check if the CTS communication pin is connected. If printing still fails, contact our Global Customer Service Department.

26.4 Template Print

The HMI's Print Template function allows to customize the header and footer of the output PDF file, which contains history data, recipes, alarms, and operation logs. In addition to editable names, PDF files printed from the template screens not only prevent data tampering, but also facilitate data saving.

To customize the header and footer of the output PDF file, a **Template screen** must be added first.

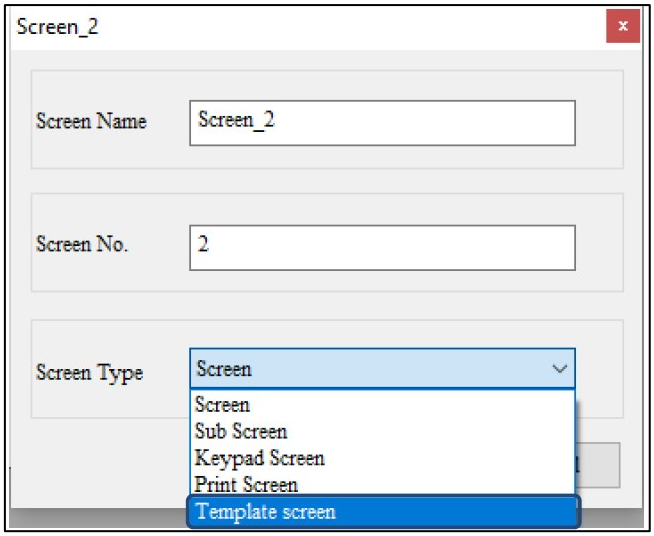


Figure 26 - 12: Template screen

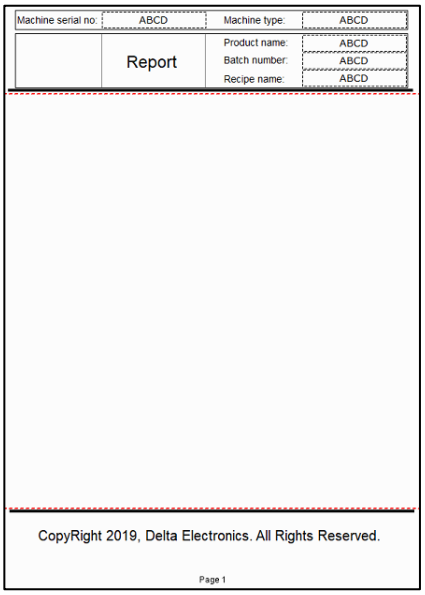


Figure 26 - 13: Editing the header and footer styles

Double-click the Template screen to set the **Page position**, **Page number size**, and **Page number**.

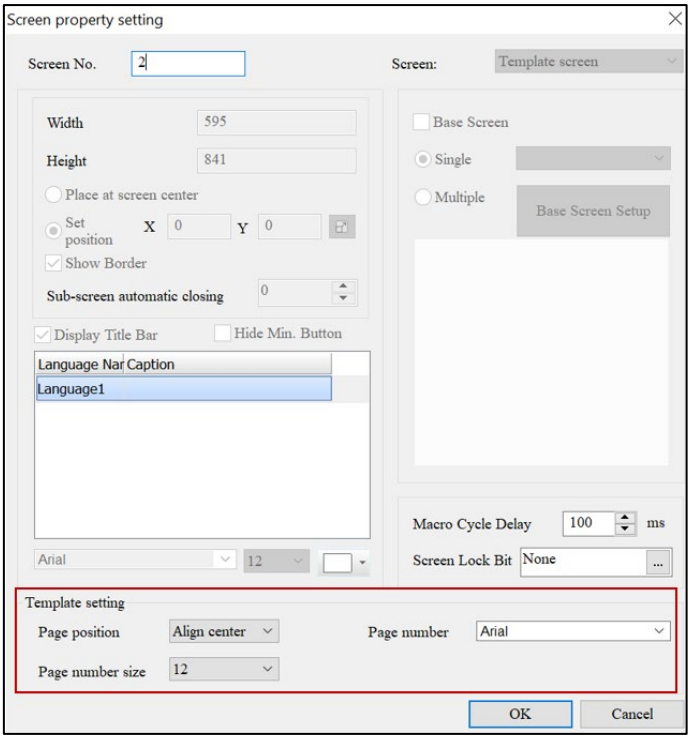


Figure 26 - 14: Screen property setting – Template setting

Create the **Report List Button** element and click **Template setting** to edit the template.

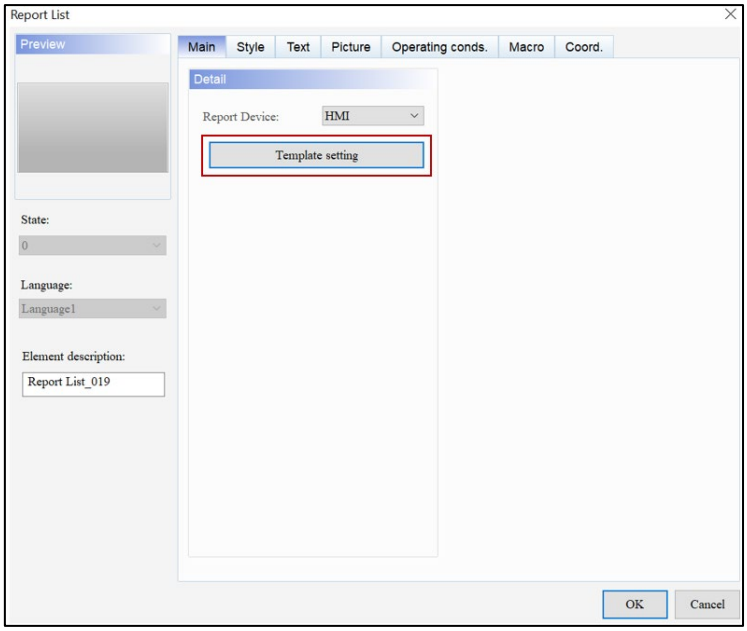


Figure 26 - 15: Report List Template setting

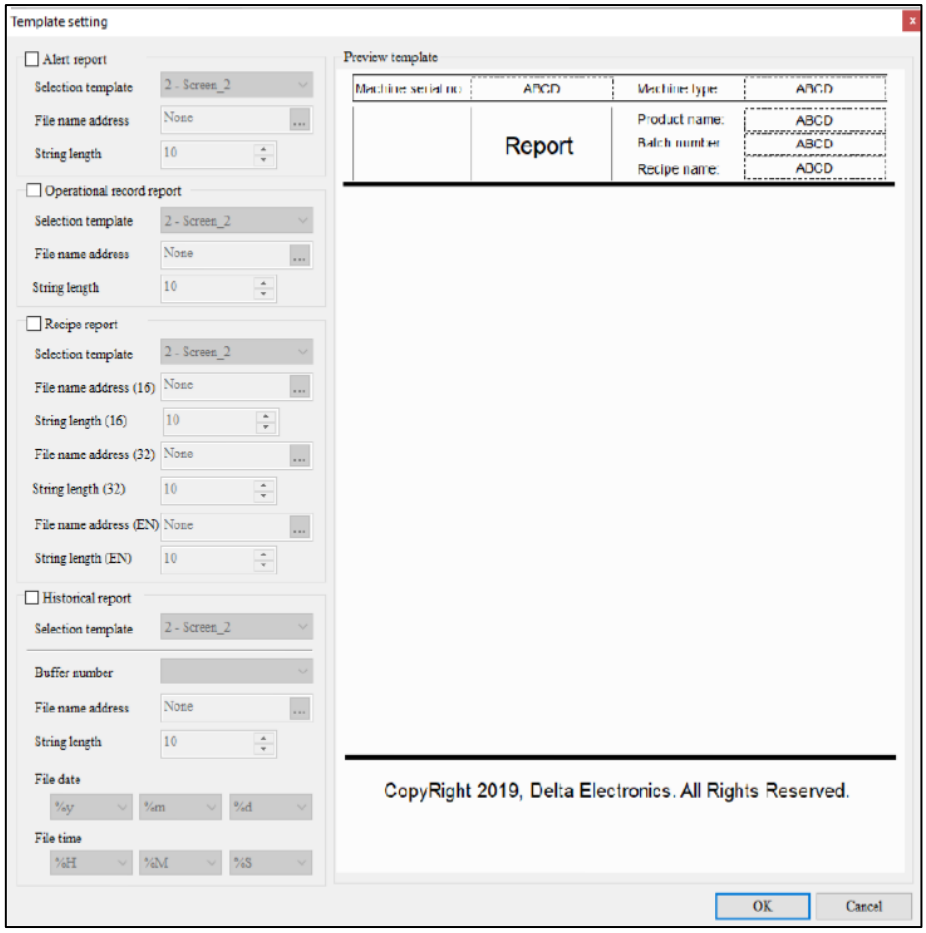
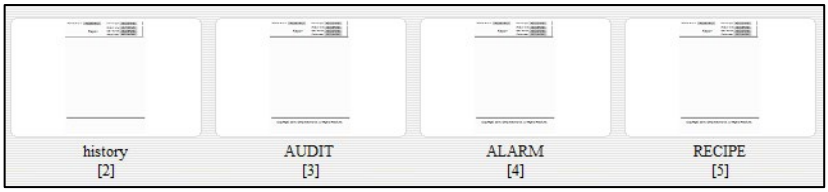
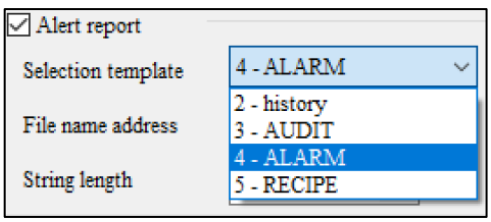
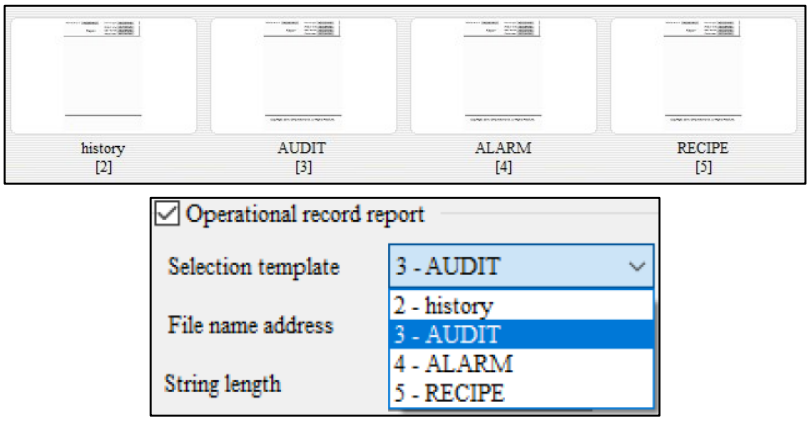
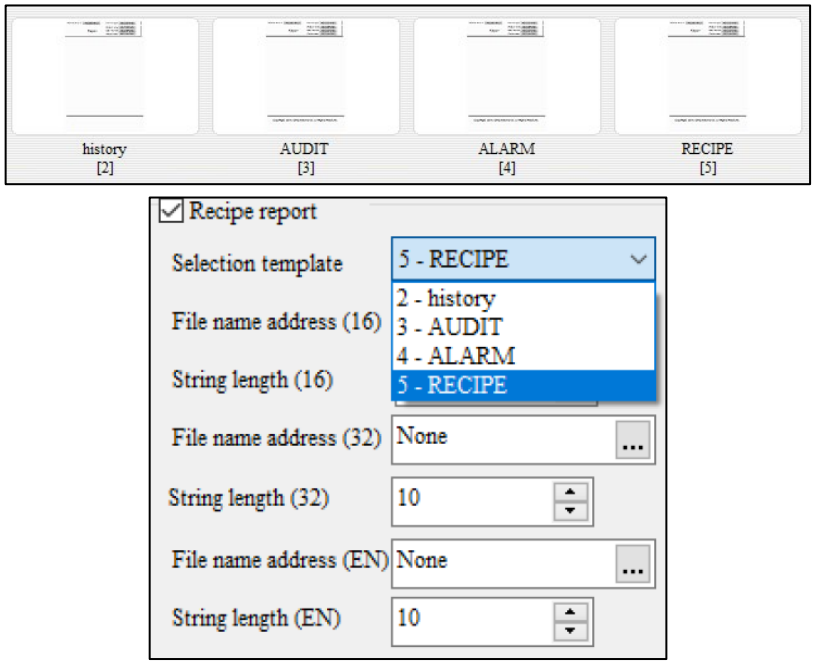
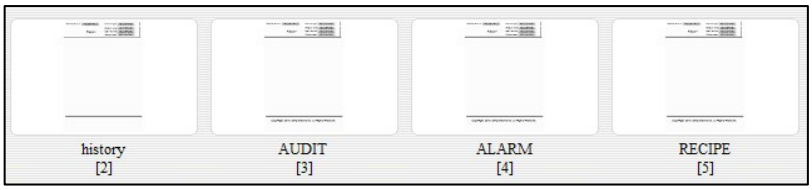
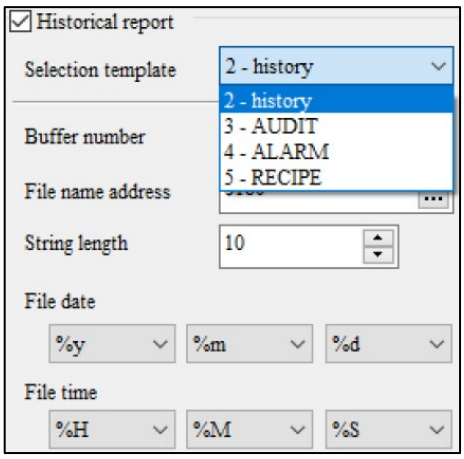


Figure 26 - 16: Template setting

Function		Description
Alert report	Selection template	Create a **Template Screen** in advance. Then, create a **Report List Button** element and click **Template setting** to select **Alert report**. After creating the template, select the corresponding template.  
	File name address	Allow to define the name of the alarm file to be generated.

Function		Description
	String length	Set the string length of its file name.
Operation record report	Selection template	Create a **Template Screen** in advance. Then, create a **Report List Button** element and click **Template setting** to select Operational record report. After creating the template, select the corresponding template. 
	File name address	Allow to customize the name of the Operation Log Table file to be generated.
	String length	Set the string length of its file name.
Recipe report	Selection template	Create a **Template Screen** in advance. Then, create a **Report List Button** element and click **Template setting** to select Recipe report. After creating the template, select the corresponding template. 
	File name address	Allow to customize the name of the 16-Bit recipe file to be generated.

Function		Description
	String length (16)	Set the string length of its file name.
	File name address	Allow to customize the name of the 32-Bit recipe file to be generated.
	String length (32)	Set the string length of its file name.
	File name address	Allow to customize the name of the enhanced recipe file to be generated.
	String length (EN)	Set the string length of its file name.
Historical report	Selection template	Create a **Template Screen** in advance. Then, create a **Report List Button** element and click **Template setting** to select Historical report. After creating the template, select the corresponding template.  
	Buffer number	Allow to select the buffer data to be output. Select 0 to output all buffer data. Select 1 to output the data corresponding to buffer ID 1, and so on.
	File name address	Allow to customize the name of the history data file to be generated.
	String length	Set the string length of its file name.
	File date	Set the year, month, and date of the file. It can also be set to None, which means that the file date is not output.

Function		Description
	File time	Set the hour, minute, and second of the file. It can also be set to None, which means that the file time is not output.

The PDF file printed with the template printing function is stored in the folder \HMI\HMI-000\@HMI0000.

The following are the output PDF files with user-defined file names.

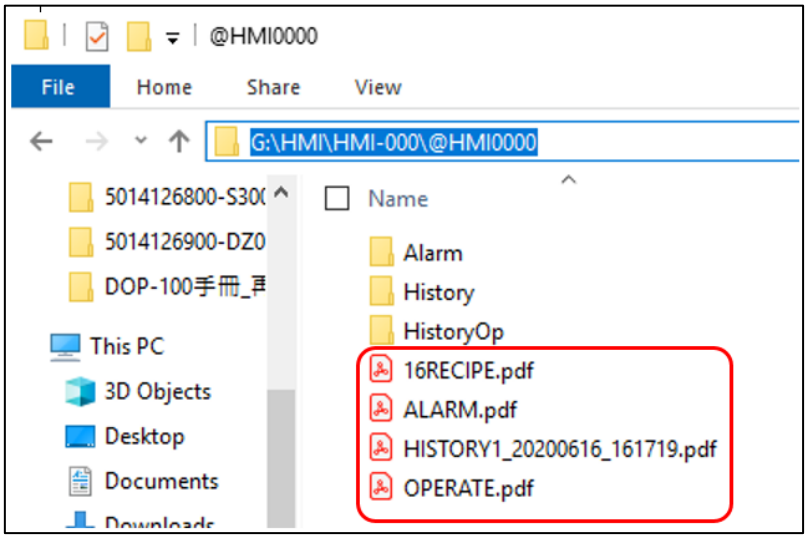


Figure 26 - 17: Output PDF files

Chapter 27: Parameter Settings

27.1 Communication Settings

Click **General** > **Communication Settings** to set COM1, COM2, COM3 and Ethernet related parameters.

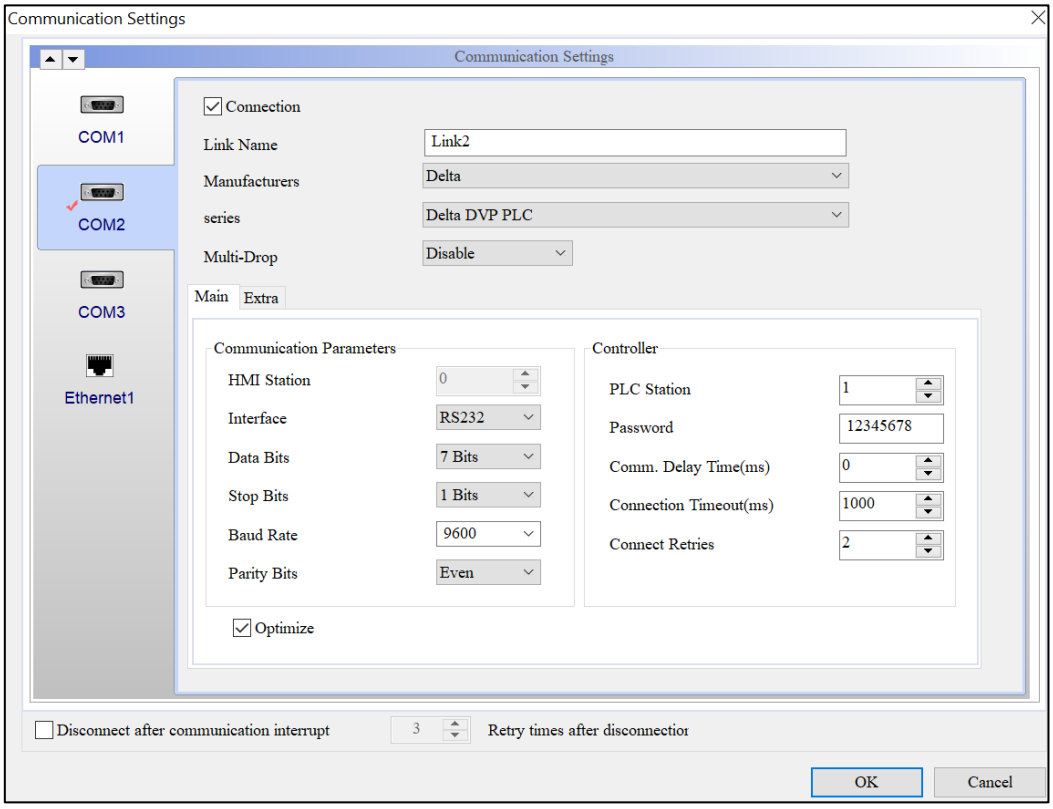
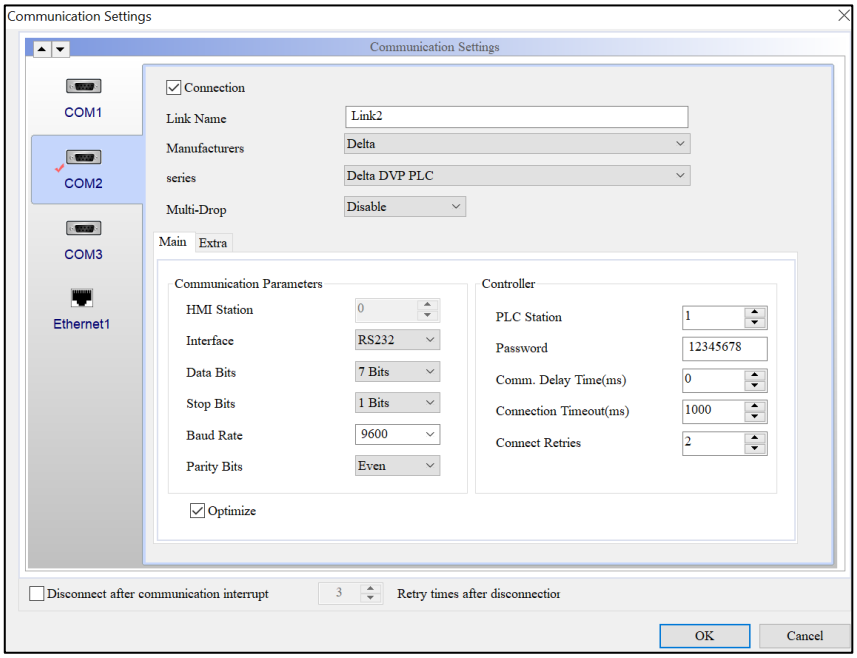


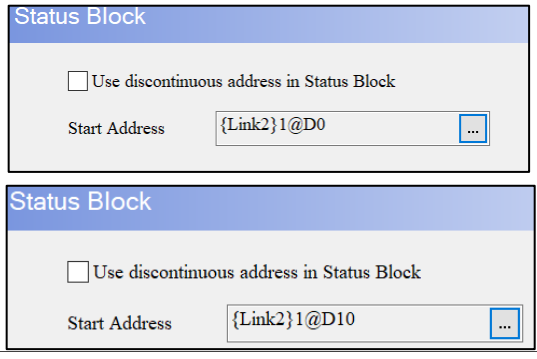
Figure 27 - 1: Communication Settings

The next part introduces how to set the **Communication Parameters** and **Controller** for each COM port as well as the Ethernet parameters.

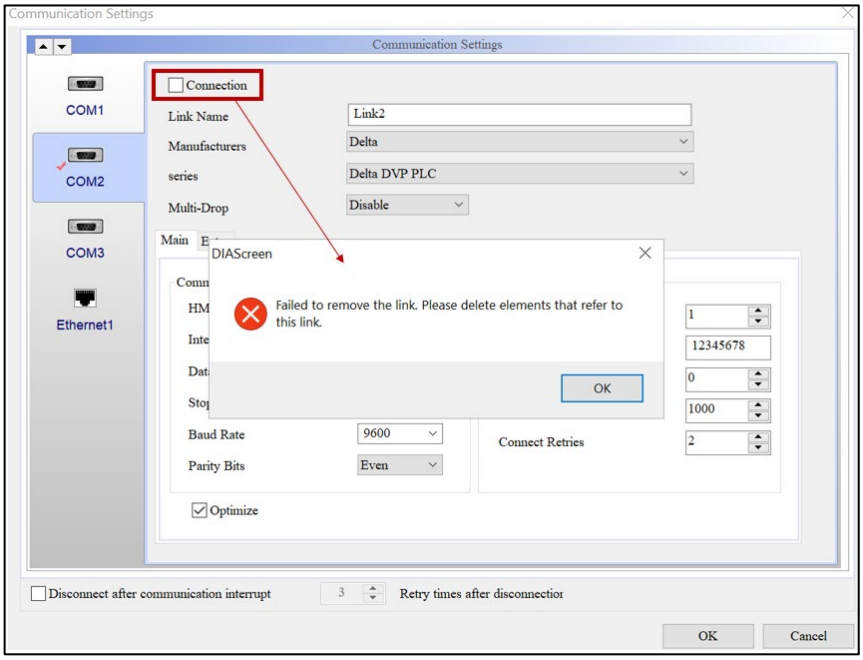
Communication Settings



The **Communication Parameters** and **Controller** settings for COM1, COM2 and COM3 are detailed as follows:

Connection	● **Connection** means to enable the communication of a COM port. Select **Connection** checkbox to select the COM port(s) as required, such as COM1, COM2, and COM3. ● After selecting the **Connection** checkbox, set the **Link Name** and select the **Controller** (i.e. PLC) to be used. Refer to the connection manual for the selection and use of the controller. ● If users uncheck **Connection**, DIAScreen detects that Link2 is currently being used by the **Control Block** and **Status Block**. Thereby a warning message appears to remind users that Link2 cannot be deleted because there are elements referring to Link2.
Status Block	**General** > **Configuration** > **Control Status Block** > **Control Block** / **Status Block** 

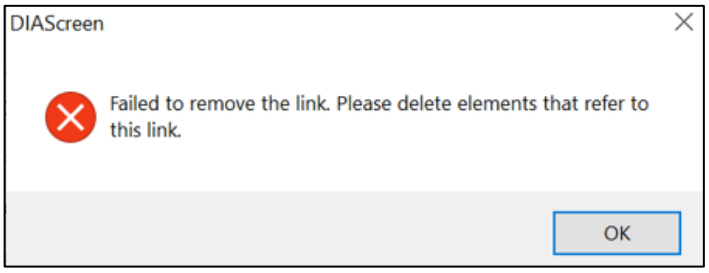
Communication Settings

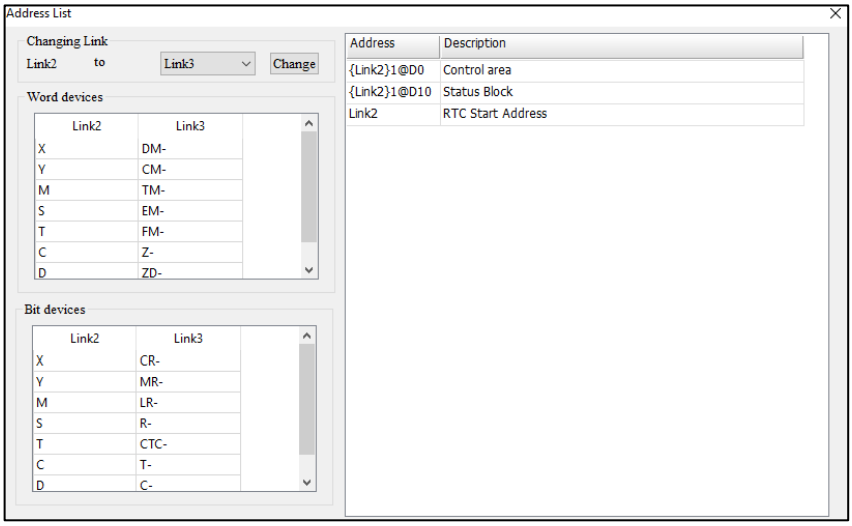
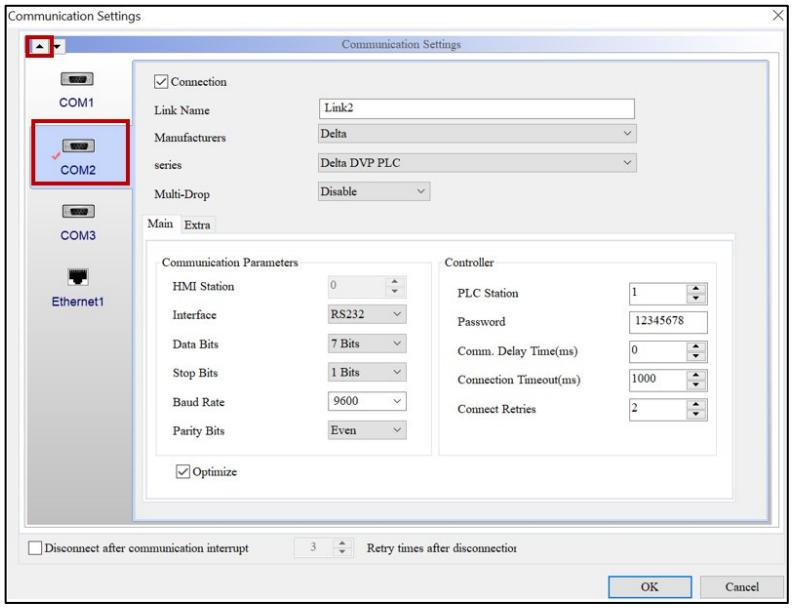


- If users want to cancel Link2 from COM2, the following methods can be used to cancel it:

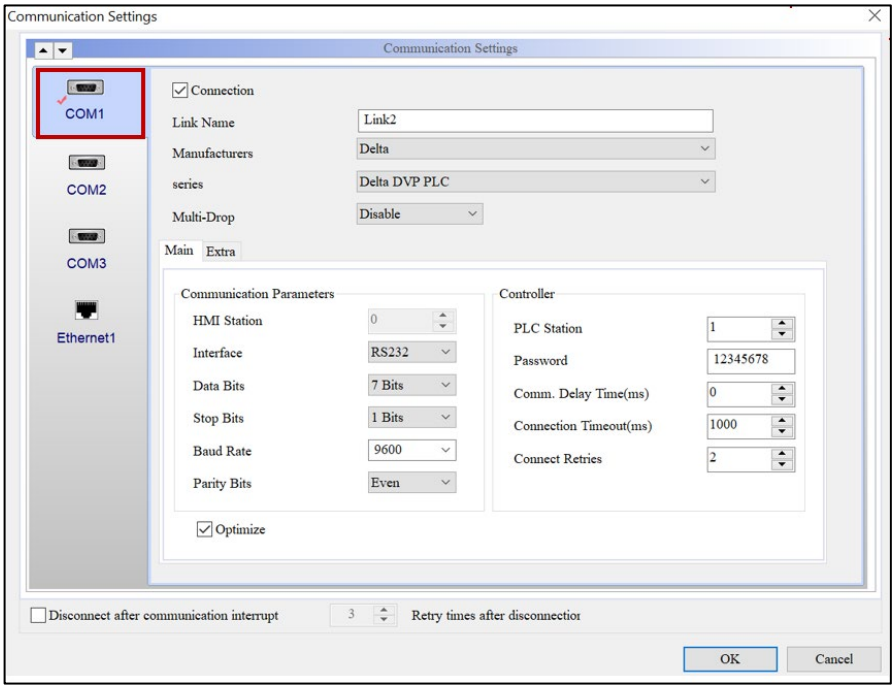
A. Add a new controller to COM3

1. Add a new link for COM3 and click **OK** to complete the setting.
2. Next, clear the **Connection** checkbox for COM2 and a message of deletion failure appears. Click **OK** to enter the **Address List** to change the address of the Link. Select the **Link Name** (Link3) to be converted to, and then click **Change**.

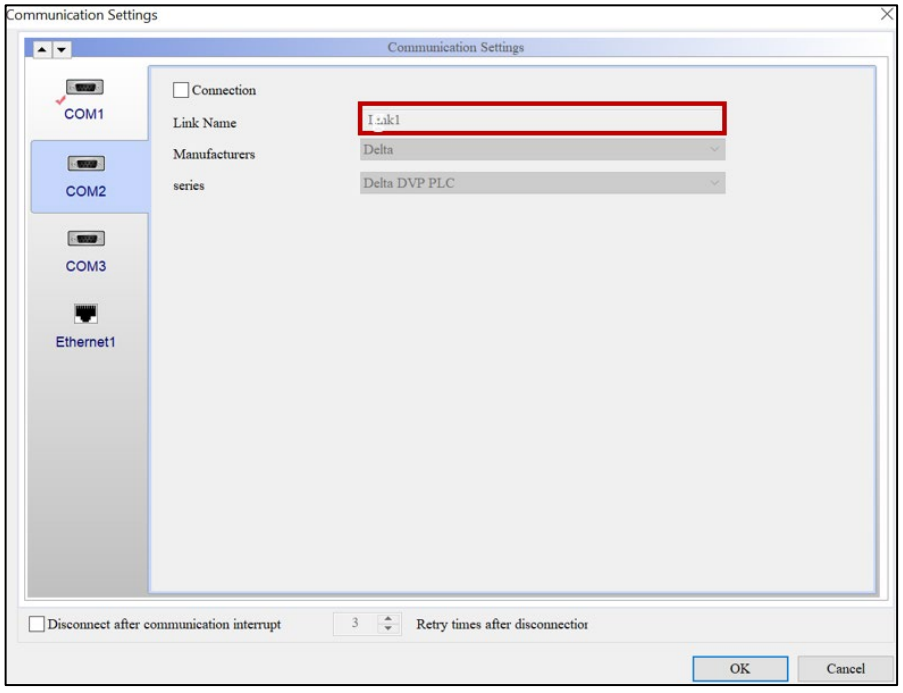


Communication Settings	
Connection	 In the **Word devices** table, Link2 on the left is the controller register address to cancel, and Link3 on the right is the controller register address to chang. Users can change the controller register address in the default order or specify the address to change. B. Move Link2 to COM1 by using the Up and Down arrows at the upper left corner. Next, go to COM2 to check if the **Link Name** is changed to Link1. The arrows allow to move the link to other communication ports. Follow these steps. **Step 1**: Go to COM2 and click the Up arrow.  **Step 2**: Users can find that Link2 is moved to COM1.

Communication Settings

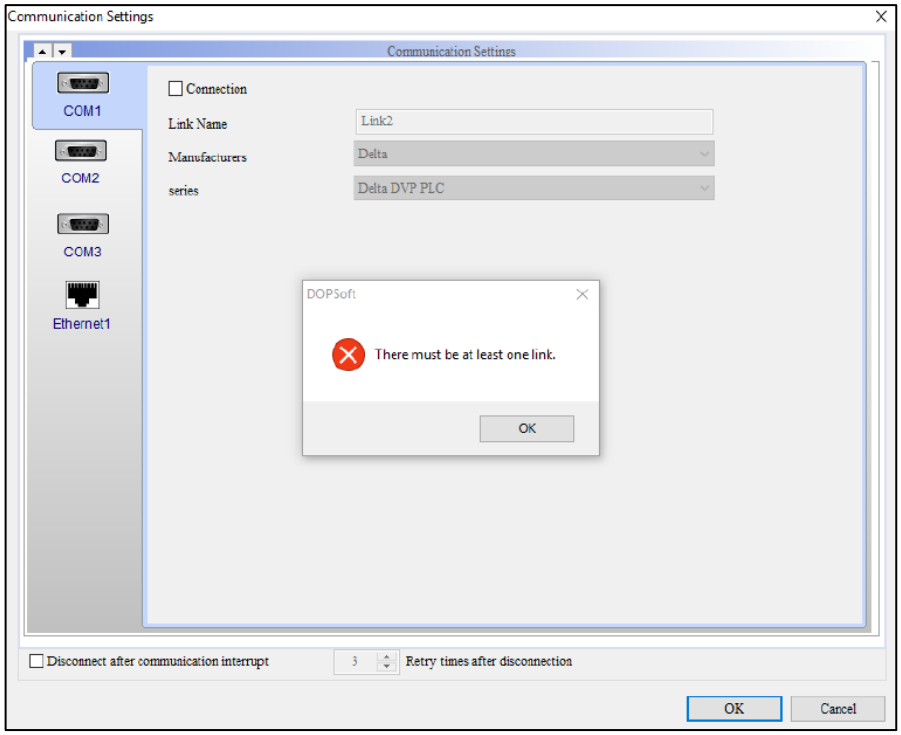


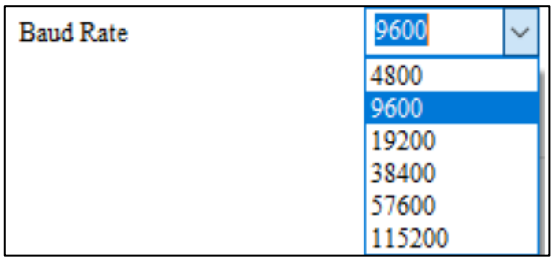
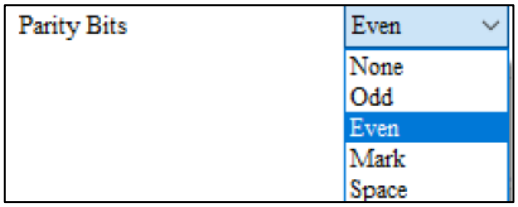
Step 3: Go to COM2 to check the setting. The **Link Name** of COM2 is changed to Link1.

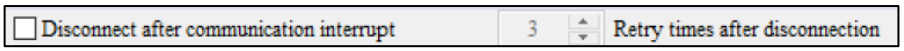


***NOTE**:*

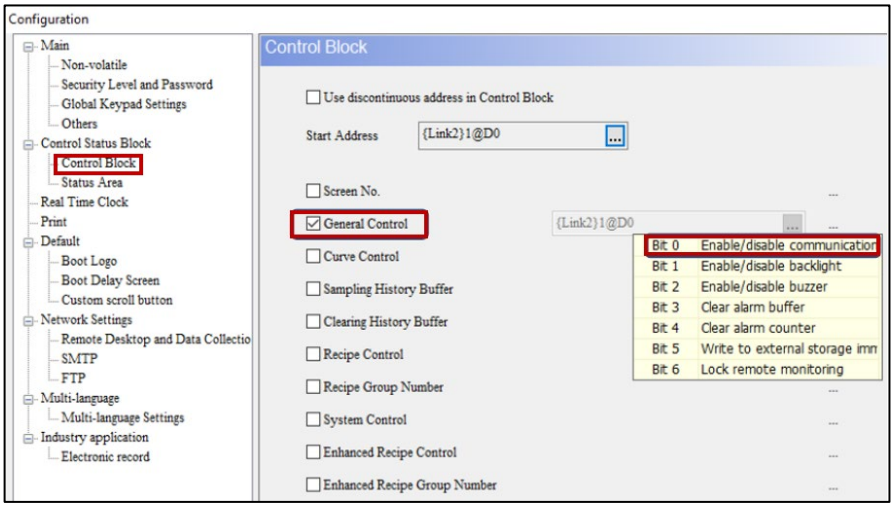
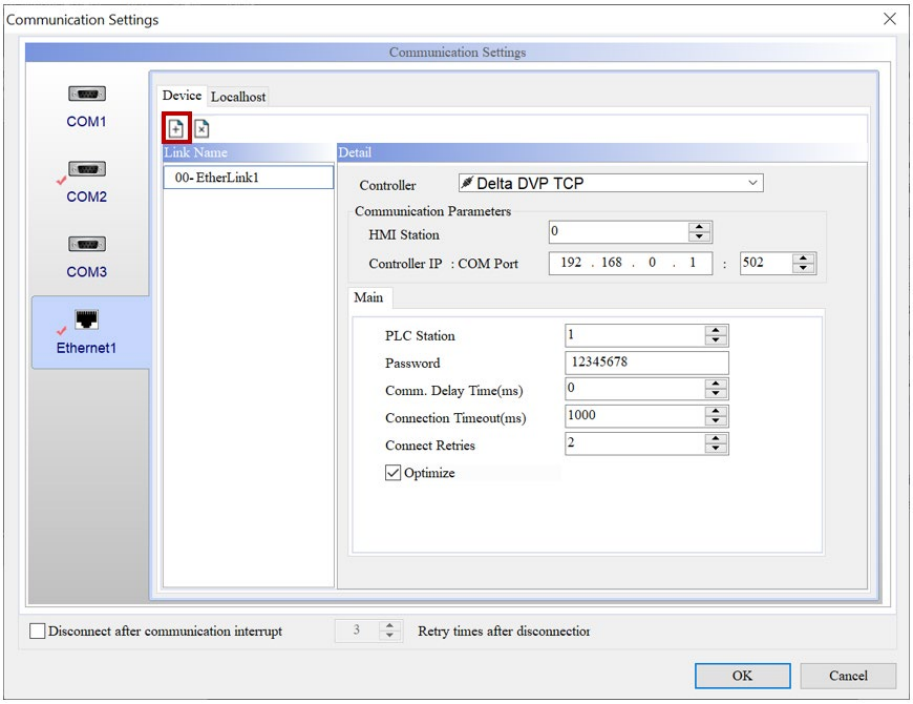
1. *The default setting of COM1 is Link1, COM2 is Link2, and COM3 is Link3.*
2. *When Link2 is moved up to COM1 with the arrow, the **Link Name** for COM2 becomes Link1; similarly, when Link2 is moved down to COM3, the **Link Name** for*

<table>
<tr><th colspan="3">Communication Settings</th></tr>
<tr><td></td><td colspan="2">COM2 becomes Link3.
3. This movement does not change the Link Name, and there will be no warning message. The Up and Down arrows work in the same way as the Up and Down functions in the previous Screen Editor.
4. When users cancel all the links, DIAScreen prompts to set at least one link.
 
</td></tr>
<tr><td rowspan="3">Communication Parameters</td><td>HMI Station</td><td>Set the HMI station number. It ranges from 1 ~ 255. The default value is 0.</td></tr>
<tr><td>Interface</td><td>● It refers to the transmission mode. The available options for Interface are: RS232, RS422, and RS485. The default value is RS232.
● For COM1, only RS232 can be selected as the interface; for COM2 and COM3, RS232, RS422, and RS485 can be selected.
<table>
<tr><th></th><th>COM1</th><th>COM2</th><th>COM3</th></tr>
<tr><td>RS232</td><td>V</td><td>V</td><td>V</td></tr>
<tr><td>RS422</td><td></td><td>V</td><td>V</td></tr>
<tr><td>RS485</td><td></td><td>V</td><td>V</td></tr>
</table></td></tr>
<tr><td>Data Bits</td><td>Data Bits represents the length of the received data packet. The available options for Data Bits are: 7 Bits and 8 Bits which means that the format of the data is 7 Bits or 8 Bits. The default</td></tr>
</table>

<table>
<tr><th colspan="3">Communication Settings</th></tr>
<tr><td rowspan="4"></td><td></td><td>value is 7 Bits.
 
</td></tr>
<tr><td>Stop Bits</td><td>It is used to inform the receiver of the end of the data signal. The available options for Stop Bits are: 1 Bits and 2 Bits. The default value is 1 Bits.
 
</td></tr>
<tr><td>Baud Rate</td><td>It indicates data transmission speed in bps. The available options for Baud Rate are: 4800, 9600, 19200, 38400, 57600 and 115200. The default value is 9600.
 
</td></tr>
<tr><td>Parity Bits</td><td>It is used to check for errors in the data transmitted. The available options for Parity Bits are: None, Odd, Even, Mark and Space. The default value is Even.
 
</td></tr>
<tr><td rowspan="2">Controller</td><td>PLC Station</td><td>● PLC Station is the default station number generated automatically after selecting the controller to be used.
● Adjust station number in the range of 0 ~ 255. The default value is 1.</td></tr>
<tr><td>Password</td><td>If the PLC set requires a password check, users must set the corresponding password for communication in the software. The default value is 12345678.</td></tr>
</table>

<table>
<tr><th colspan="3">Communication Settings</th></tr>
<tr><td rowspan="3"></td><td>Comm. Delay Time (ms)</td><td>● It refers to the time interval between each communication. It ranges from 0 ~ 255 ms. The default value is 0 ms.
● If Delta Controller ASCII or Delta Controller RTU is selected, the default Comm. Delay Time changes to 5 ms. This is because the DOP-100 series transmits packets faster than the DOP-B series. If some controllers are slower, the update frequency of the HMI screen lags more</td></tr>
<tr><td>Connection Timeout (ms)</td><td>The amount of time passed without the PLC's response after the communication starts. It ranges from 10 ~ 2000 ms. The default value is 1000 ms.</td></tr>
<tr><td>Connect Retries</td><td>If the PLC fails to respond to the communication, the HMI sends the communication command again. If the number of attempts reaches the set Connect Retries, the HMI displays a warning message of abnormal communication. It ranges from 0 ~ 15. The default value is 2.</td></tr>
<tr><td>Optimize</td><td colspan="2">● Select Optimize checkbox to optimize the process of reading the elements and make the communication faster. If Optimize is unchecked, the Optimize function is disabled and the speed for reading the elements becomes slow.
● This option is checked by default, and Read Address of the elements referring to this link gets optimized.</td></tr>
<tr><td>Disconnect after communication interrupt</td><td colspan="2"> 

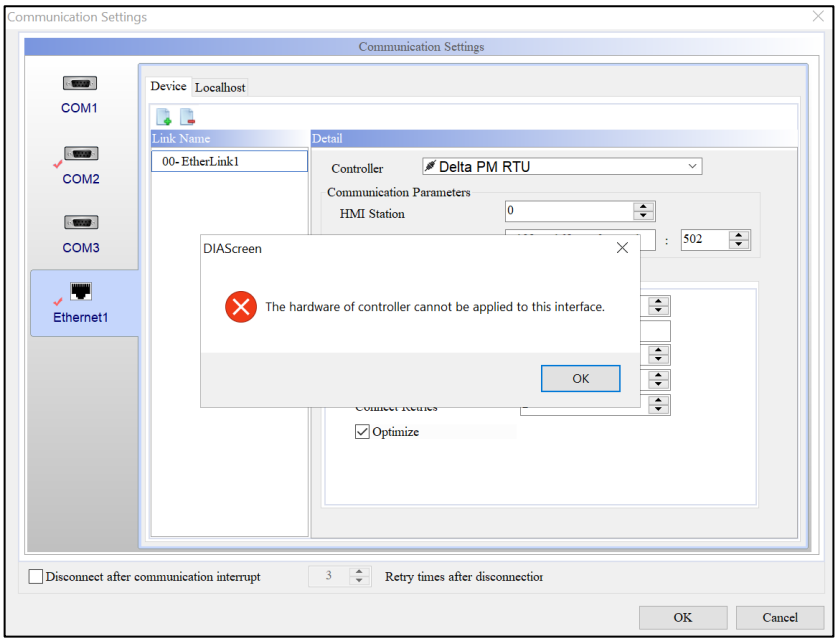
● The retry times can only be set when Disconnect after communication interrupt is checked. If this checkbox is selected, when the communication is interrupted and the set retry attempts are reached, the HMI stops trying to connect to the controller. It ranges from 0 ~ 255. The default value is 3.
● When the communication between the HMI and the controller stops because the maximum number of retries is reached, use Bit 0 in the Control Block to enable/disable communication.</td></tr>
</table>

Communication Settings	
	
The detailed operation settings for Ethernet are described as follows.	
Device	

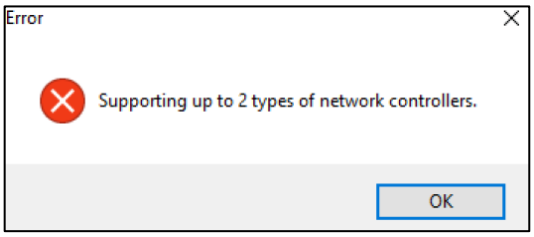
- Click  icon on the **Device** page to add a link device named EtherLink1. The **Link Name** EtherLink1 can be changed as desired.
- Select the **Controller** to be used after adding the link device. If users select a PLC that is not a network device, a warning message appears to inform that the hardware of the

Communication Settings

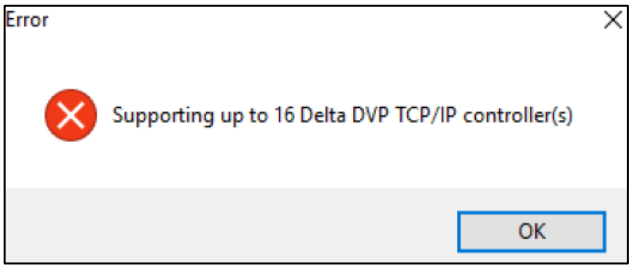
controller cannot be applied to this interface.



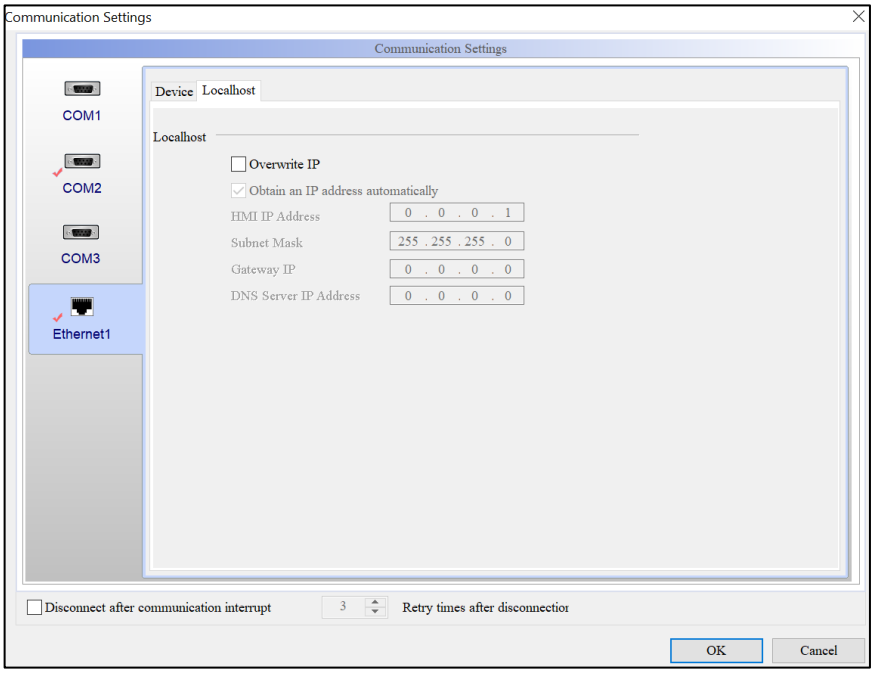
- After the network link device is added, only two protocols can be set, which are Delta DVP TCP/IP and S7300 (ISO TCP). If users try to add a third protocol, the following message appears.



- Up to 16 links are supported for each protocol. If more than 16 links are added to a protocol, a warning message appears, stating that the number of controllers added exceeds the allowable set value.



Communication Settings			
	Communi-cation Parameters	HMI Station	Set the station number of HMI. It ranges from 1 ~ 255. The default value is **0**.
		Controller IP	Set the IP address of the PLC. It must have the same network segment as the HMI IP for the PLC to communicate with the HMI.
		COM Port	The **COM port** varies depending on the **Controller** selected. Set the **COM Port** corresponding to the PLC's port.
	Controller	PLC Station	● The **PLC Station** is the default station number automatically generated by DIAScreen after selecting the **Controller** to be used. ● Set station number within the range of 0 ~ 255. The default value is **1**.
		Password	If the PLC set requires a password check, set the corresponding password for communication in DIAScreen. The default value is **12345678**.
		Comm. Delay Time (ms)	It refers to the time interval between each communication. It ranges from 0 ~ 255 ms. The default value is **0** ms.
		Connection Timeout (ms)	The amount of time passed without the PLC's response after the communication starts. It ranges from 10 ~ 2000 ms. The default value is **1000** ms.
		Connect Retries	If the PLC fails to respond to the communication, the HMI sends the communication command again until the maximum number of retries is reached. Then a warning message of abnormal communication appears. It ranges from 0 ~ 15. The default value is **2**.

Communication Settings			
	Optimize		● Select **Optimize** checkbox to optimize the process of reading the elements and make the communication faster. If **Optimize** is unchecked, the **Optimize** function is disabled and the speed for reading the elements becomes slow. ● This option is checked by default, and **Read Address** of elements referring to this link gets optimized.
Localhost			
	Localhost	Overwrite IP	● **Localhost** is the local IP address of the HMI. Customize the IP address or obtain an IP address automatically. ● If **Overwrite IP** is not checked, the default IP address **0.0.0.0**, will be used. If users choose not to use the **Overwrite IP** option in DIAScreen, they can go to **System Settings** > **Network** to change its IP address. ● If users check **Overwrite IP**, they can choose IP address from DIAScreen. Set the IP address to be written, the HMI name, and other parameters.
		Obtain an IP address	● The **Obtain an IP address automatically** option is only available when **Overwrite IP** is

<table>
<tr><th colspan="4">Communication Settings</th></tr>
<tr><td></td><td></td><td>automati-cally</td><td>checked.
● When both options are checked, the HMI uses the DHCP mode to get the IP address. To check the current IP address, enter the system screen and go to System Settings > Network.</td></tr>
<tr><td></td><td></td><td>HMI IP Address</td><td>● The HMI IP Address must be set in the same network segment as the controller IP address.</td></tr>
<tr><td></td><td></td><td>Subnet Mask</td><td>● The Subnet Mask is used to "segment the network" and "identify the destination address". It has the same format as the IP address, which is represented by four bytes separated by decimal points.
<table>
<tr><th>IP Class</th><th>Network Address</th><th>Subnet Mask</th></tr>
<tr><td>Class A</td><td>1.x.x.x to 126.x.x.x</td><td>255.0.0.0</td></tr>
<tr><td>Class B</td><td>128.0.x.x to 191.255.x.x</td><td>255.255.0.0</td></tr>
<tr><td>Class C</td><td>192.0.0.x to 223.255.255.x</td><td>255.255.255.0</td></tr>
</table>
● Subnet Mask must be set when the IP address is set on each computer. For Class C in the figure above, the first 3 bytes of the IP address are Network ID. Therefore, the first 3 bytes of the Subnet Mask are all 255. The last byte is the Host ID, which is 0.</td></tr>
<tr><td></td><td></td><td>Gateway IP</td><td>● The Gateway IP is mostly used to connect local area networks and large computer host systems. Generally, a gateway is required as long as there are two systems with different levels to be connected.
● The gateway is the exit of the local area network. All packets to be sent to the Internet are first</td></tr>
</table>

Communication Settings			
			sent to the gateway and are then transmitted to other hosts on the Internet and finally to the host at the destination. ● To connect to the external network, set the gateway address according to the network rules. The default address is **0.0.0.0**.

27.2 Change Model

Go to **Tools** > **Change Model** to use the **Change Model** function to switch to the screen of the selected model.

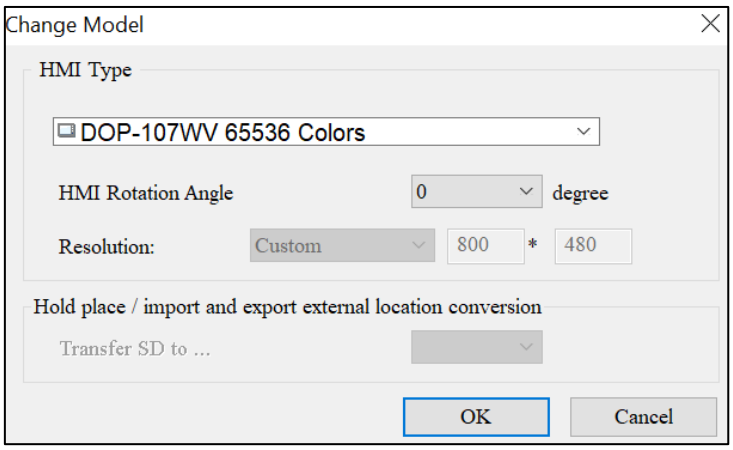


Figure 27 - 2: Change Model

If the model being used (e.g. DOP-110WS) supports SD card devices and the element data is stored in the SD cards, when users choose to switch to another model, the option **Hold place / import and export external location conversion** displays as USB Disk.

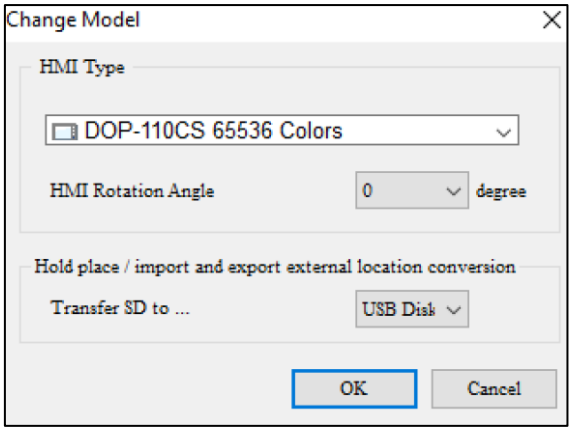
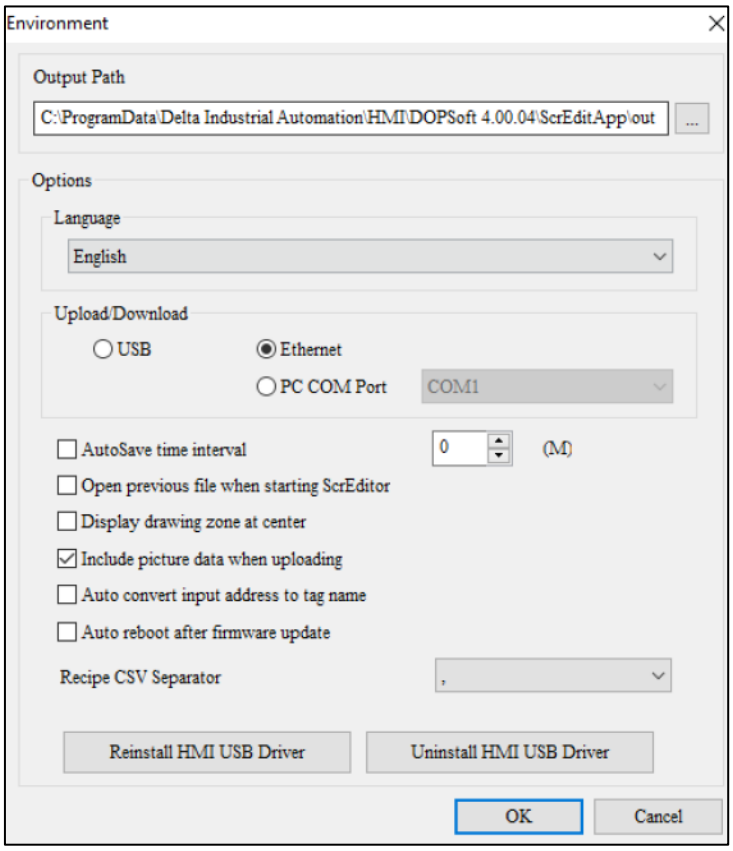
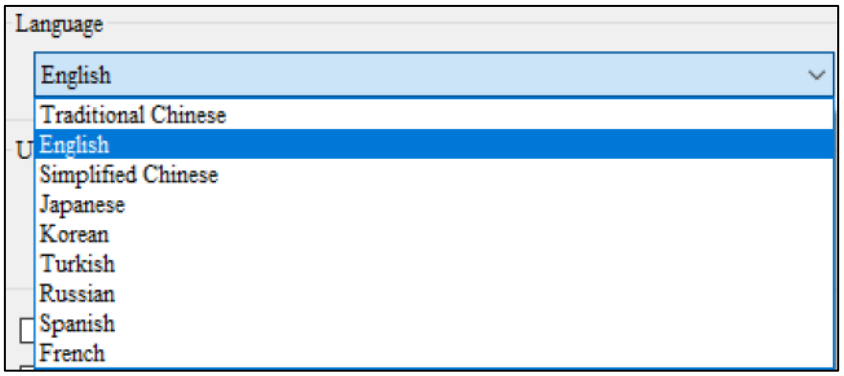


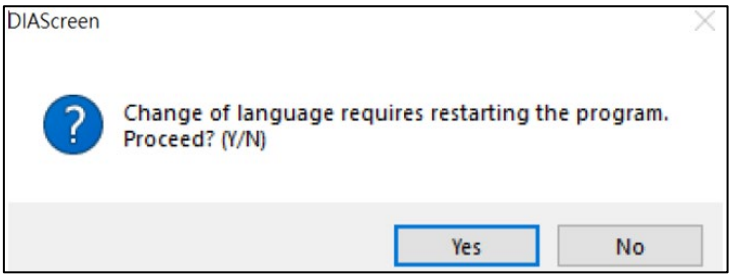
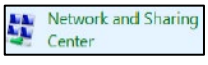
Figure 27 - 3: Non-volatile external device settings

DIAScreen enables to open the screens of the DOP-B, DOP-W, and DOP-H models and convert the screens into the compatible format for the DOP-100 models to edit.

27.3 Environment

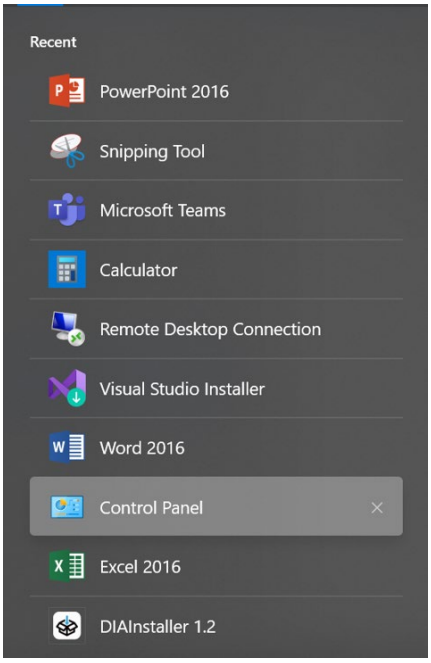
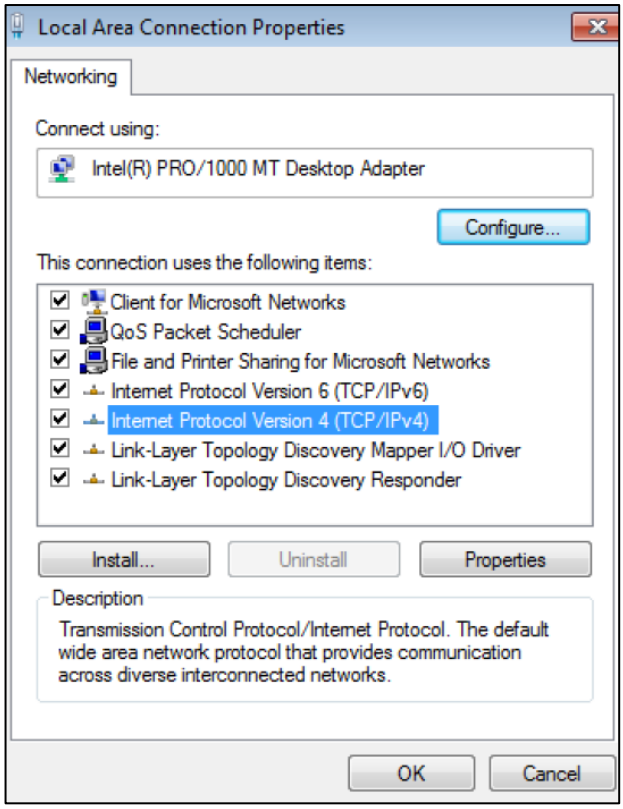
Go to **General** > **Environment** for **Environment** setting to set the environment parameters related to the HMI system, including the language of user interface and data transmission methods. The following introduces the parameter settings in the **Environment** setting.

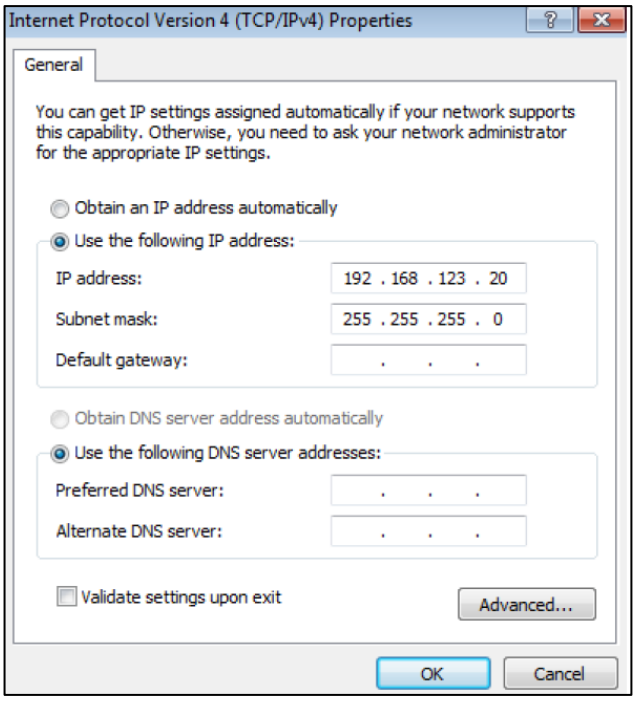
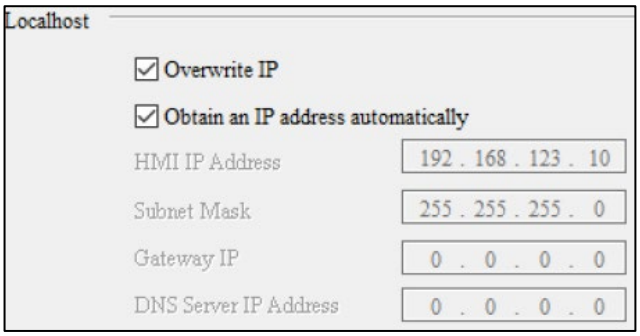
Environment	
	
In the **Environment** setting, view the **Output Path** and set the system environment parameters for the **Upload/Download** settings and USB driver installation.	
Output Path	It refers to the output path of a CIN file generated after screen compilation. DIAScreen functions such as the online / offline simulation and file upload / download refers to the data in this path. So, do not change this path unless necessary, otherwise the program execution may fail or DIAScreen may not be able to find a file.
Language	● DIAScreen interface is available in nine languages: Traditional Chinese, English, Simplified Chinese, Japanese, Korean, Turkish, Russian, Spanish, and French.  ● Select one of the languages, click **OK** and a message appears, which displays "Change of language requires restarting the program. Proceed? (Y/N)". Click **Yes** and DIAScreen restarts automatically.

<table>
<tr><th colspan="4">Environment</th></tr>
<tr><td></td><td colspan="3">Then, users can find the language is changed.
 
</td></tr>
<tr><td>Upload / Download</td><td>USB</td><td colspan="2">● The default transmission mode for data Upload/Download between DIAScreen and HMI is USB.
● There are four types of USB transmission modes. The first one is the general upload / download type (Normal = USBCommMode 0) and users must manually install the driver. The second one is the USB Disk type (Disk = USBCommMode 1), which allows to upload / download HMI programs without installing the driver. The third one is the USB CDC type (CDC = USBCommMode 2) and users need to install an additional driver for transmission. The fourth one is the AUTO type, which means DIAScreen uses the USB upload / download mode currently set in the HMI System Menu.
● USBCommMode 0 is only compatible with Windows XP operating system.
● USBCommMode 1 and USBCommMode 2 are compatible with Windows 7 / Windows 10 operating systems.
● The Ethernet option is used for HMI data upload / download over the network.
● If users use Ethernet to upload / download the data, they must set the IP address of both the HMI and the computer on the same network segment. Users can set the HMI IP by selecting Overwrite IP or Obtain an IP address automatically.</td></tr>
<tr><td></td><td></td><td>Overwrite IP</td><td>● Computer
In the Windows Start menu, go to > Control Panel > Network and Sharing Center
 

> Local Area Connection
 

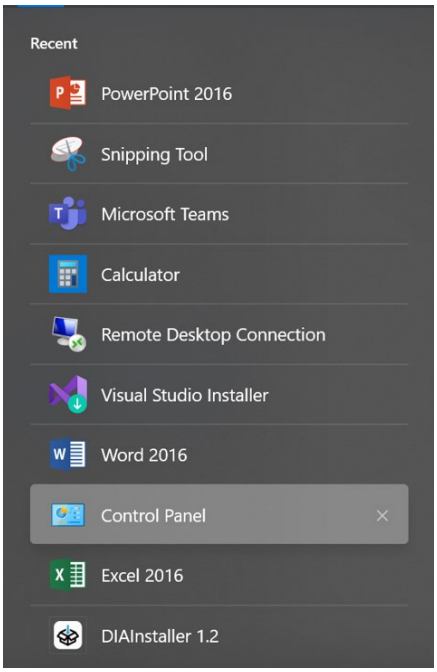
> Internet Protocol (TCP/IP) in the LAN Settings.</td></tr>
</table>

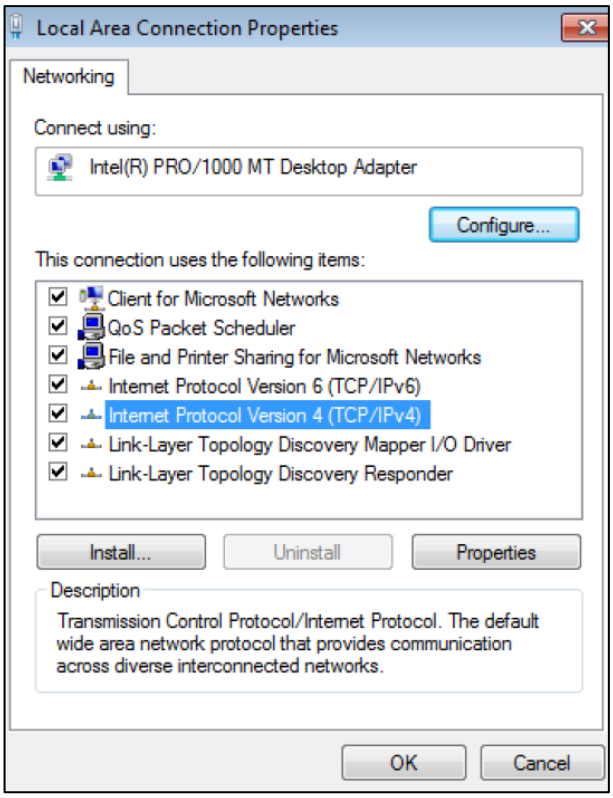
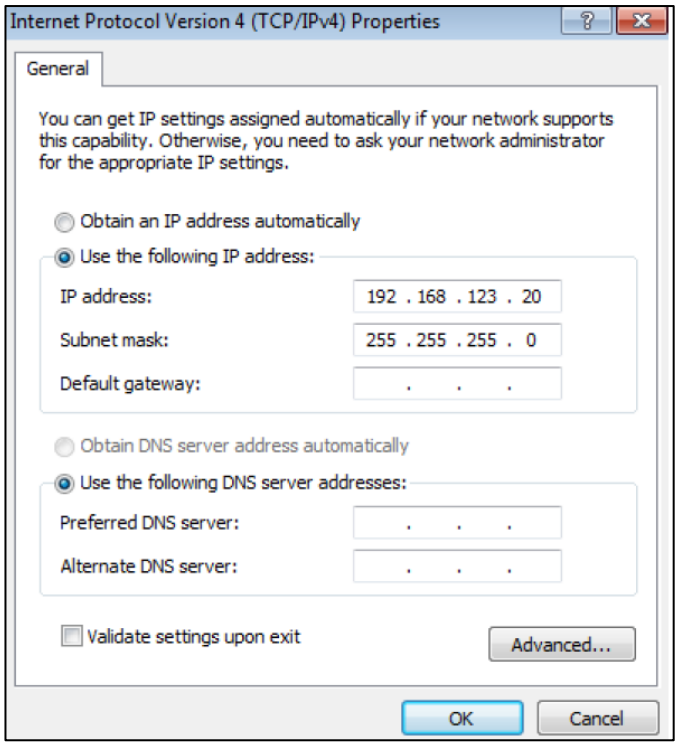
Environment			
			 
		Overwrite IP	Click **Properties** to enter the TCP / IP settings page, as shown in the following figure.

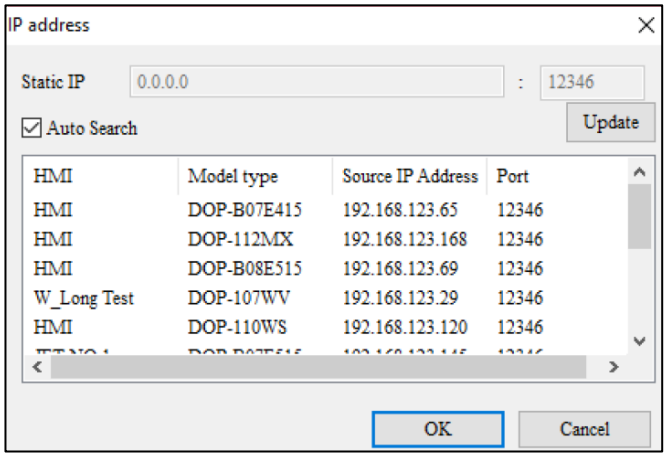
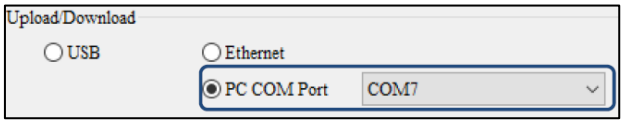
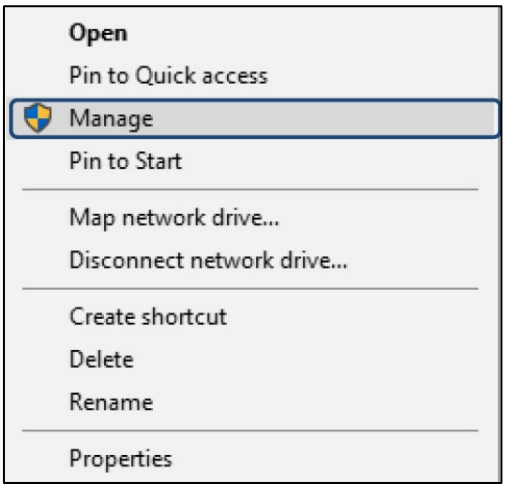
Environment			
			
		Obtain an IP address automatically	● HMI When users check **Obtain an IP address automatically**, they do not need to set the IP address; DHCP dynamically assigns the IP address to the HMI instead. Go to the **System screen** > **System Settings > Network** to set DHCP to ON. The setting interface of DIAScreen is shown in the following figure.  The setting interface of the system screen is shown in the following figure.

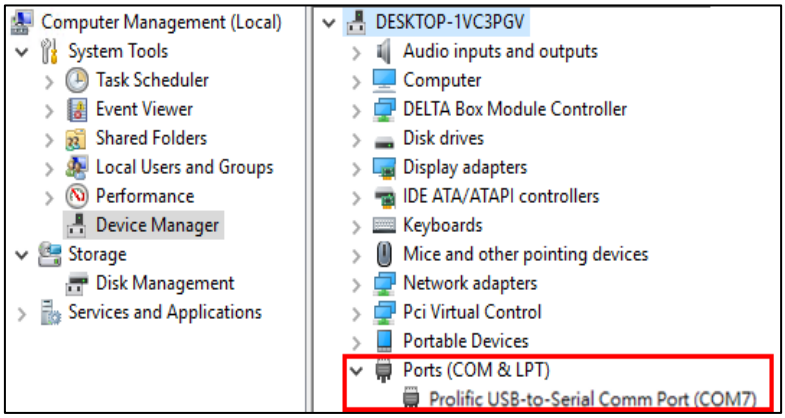
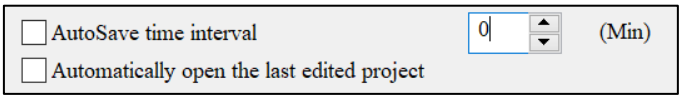
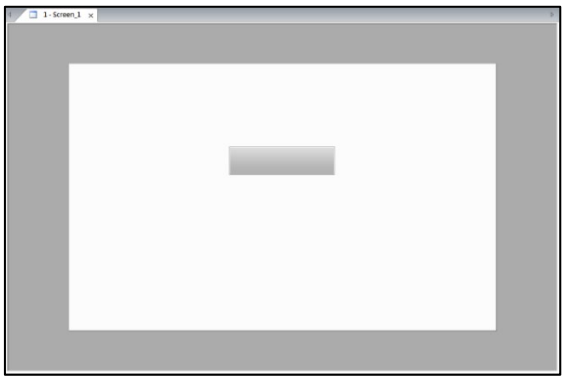
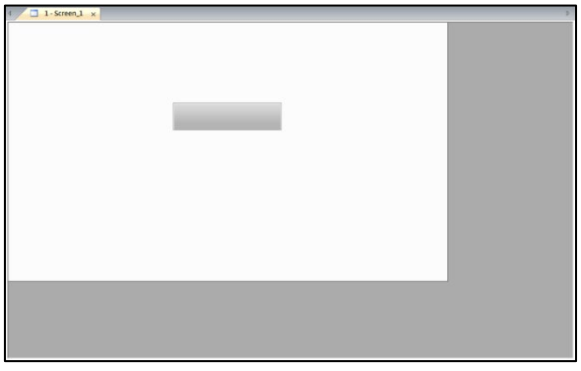
<table>
<tr><th colspan="4">Environment</th></tr>
<tr><td></td><td></td><td></td><td> 
</td></tr>
<tr><td>Upload / Download</td><td>Ethernet</td><td>Obtain an IP address automati-cally</td><td>● Computer
In the Windows Start menu, go to > Control Panel > Network and Sharing Center
 

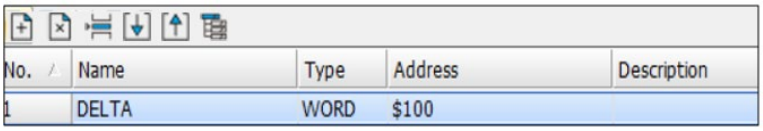
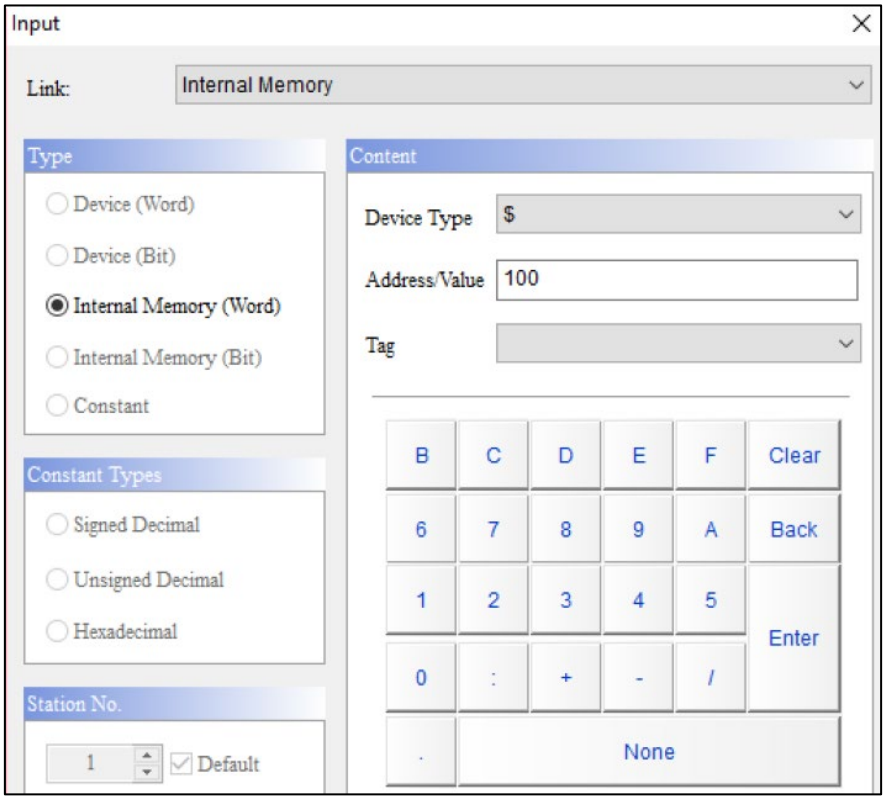
> Local Area Connection
 

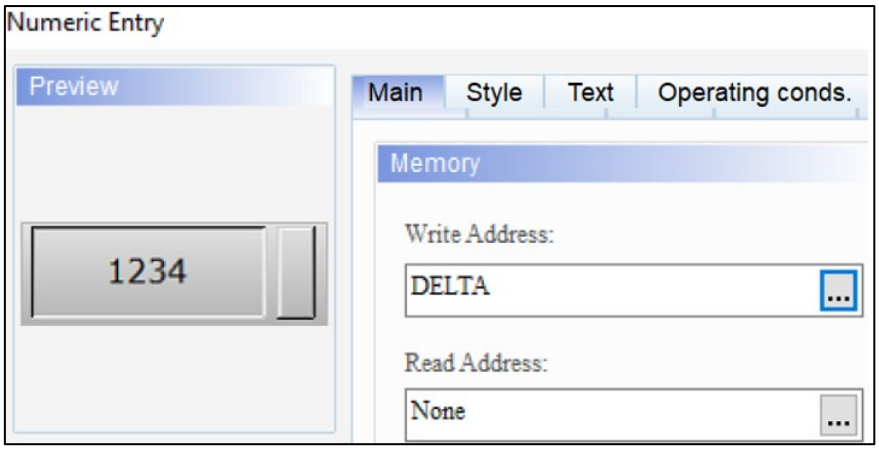
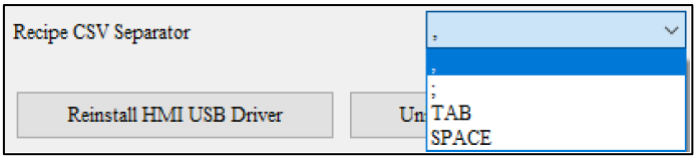
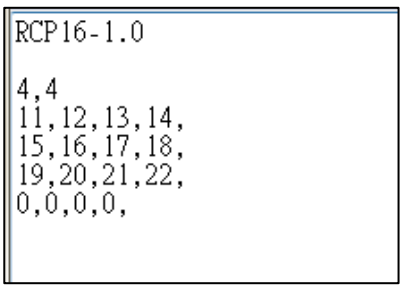
> Internet Protocol (TCP/IP) in the LAN Settings.
 
</td></tr>
</table>

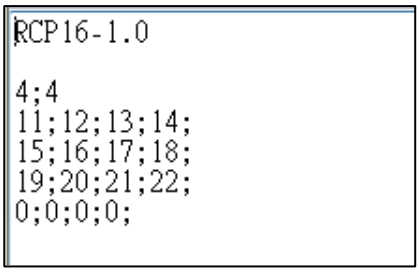
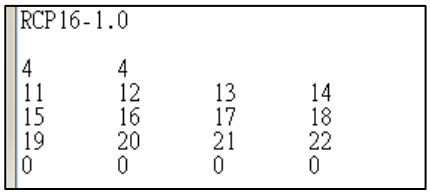
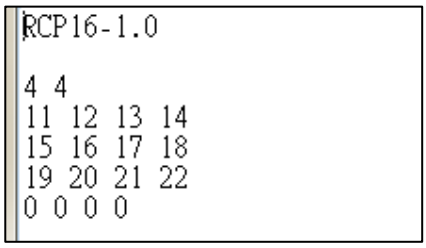
Environment			
			 Click **Properties** to enter the TCP / IP settings page, as shown in the following figure.  After the IP addresses of the HMI and computer are set in the same network segment, the HMI upload / download can be done via Ethernet. When users click **Download Screen Data** or

Environment			
			Upload Screen Data, DIAScreen automatically searches for the HMI with the same network segment. Click **OK** to download or upload data to HMI. 
Upload / Download	PC COM Port		● **PC COM Port** is for data upload / download between the PC COM port and HMI. If users select **PC COM Port** to upload / download data, they must first enter the HMI system screen. Go to **Up / Download Standard Mode** and then choose COM1 or COM2. ● Next, set the port number for the **PC COM Port** in DIAScreen.  ● Right-click **My Computer > Manage > Ports** to see the COM Port number of the computer. 

Environment		
		
AutoSave time interval	Set the time interval for DIAScreen to save the project automatically. If users set it to 0 min, it means this option is unchecked. The default minimum is 0 min. and the maximum is 120 min. 	
Automatically open the last edited project	If users check this option, the HMI automatically displays the last edited project the next time they start DIAScreen.	
Display drawing zone at center	● If Display drawing zone at center is checked, the edit screen of DIAScreen displays in the center.  ● Otherwise, the edit screen displays in the upper left corner by default. 	

Environment	
Include picture data when uploading	If the project includes graphic data, but this option is not checked, the picture data content will be empty after the screen data is uploaded to the HMI.
Auto convert input address to tag name	● The **Auto convert input address to tag name** is a function that automatically converts the memory address of the elements into tag names according to the Tag Table. ● Perform the following steps to check **Auto convert input address to tag name**: **Step 1**: Go to **Project** > **Tag Table** and edit the data information.  **Step 2**: Go to **General** > **Environment** and check **Auto convert input address to tag name**. Create a **Numeric Entry** element and set the **Write Address** to $100. 

Environment	
	Step 3: After setting the address, the memory address is automatically converted to the tag “DELTA.” 
Auto reboot after firmware update	With this option checked, after the firmware is updated, the HMI automatically reboots without displaying the "Update Firmware Succeed!!!" window to notify users.
Reinstall HMI USB Driver Uninstall HMI USB Driver	● After performing **Reinstall HMI USB Driver**, the system reinstalls HMI USB driver. ● After performing **Uninstall HMI USB Driver**, the system uninstalls HMI USB driver. ● These two options are mainly used when users are unable to upload / download via USB transfer. Users may uninstall and reinstall the HMI USB driver so that the upload / download can be performed properly via USB between the HMI and DIAScreen. ● This only applies when the USB upload / download is in Normal and CDC USB transmission mode.
Recipe CSV Separator	● The following four types of separators are provided for users to customize the separator to display in the output CSV file. 
,	

Environment		
	;	
	TAB	
	SPACE	
	● Open output CSV files with Notepad to check if the separators displayed are correct.	

Chapter 28: Advanced Settings

28.1 Tag Table

The **Tag Table** is mainly used to help users set the tag for the memory address. For example, if a certain address is set to $100 = DELTA, when users want to enter $100 in the future, DELTA can be used to replace $100. Refer to the following figure.

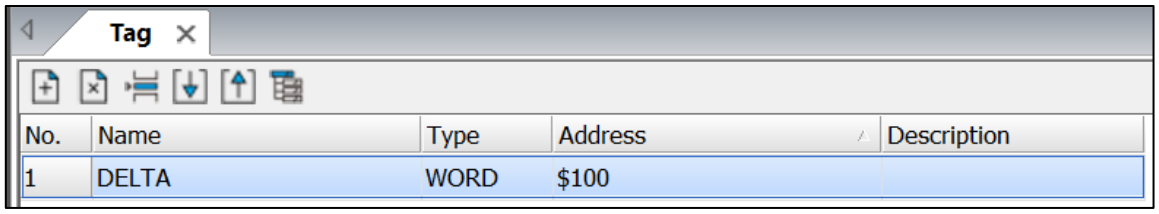


Figure 28 - 1: Tag Table

There are two methods for setting element tags. The first one is to select the corresponding tag from the **Tag** drop-down list.

1. After double-clicking the **Numeric Display** element, click "**...**" to the right of **Read Address**.
2. Link Name: **Internal Memory**.
3. Device Type: **$**
4. Address / Value: **100**
5. Tag: **DELTA** set in the tag table

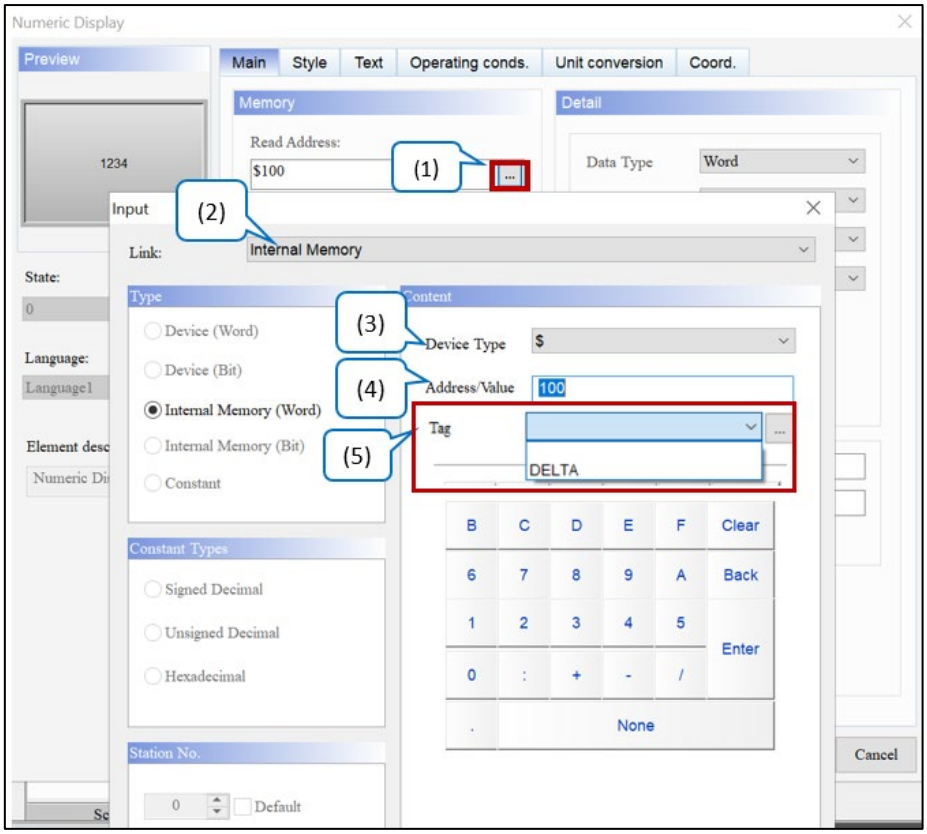


Figure 28 - 2: Tag setting

The second method is to click ... next to the Tag drop-down list and click the corresponding tag.

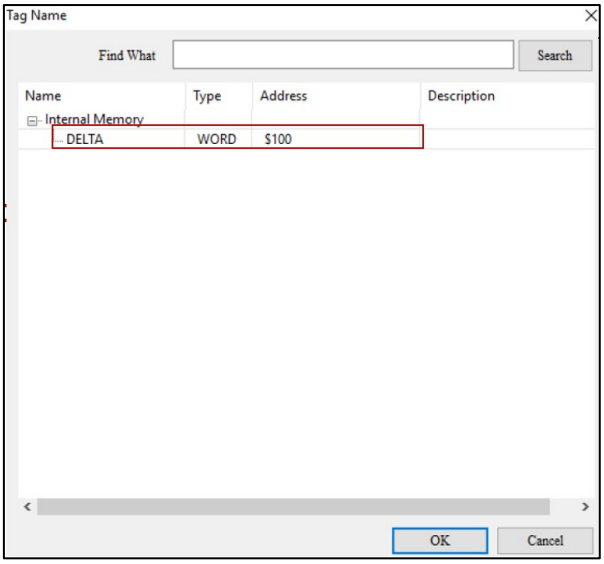
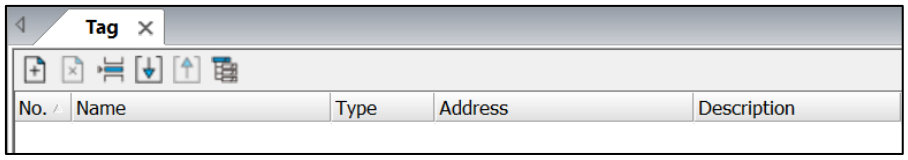
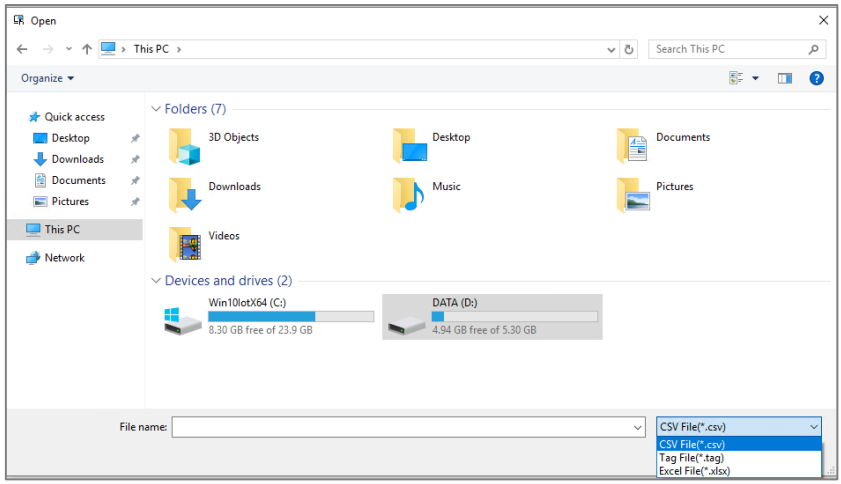
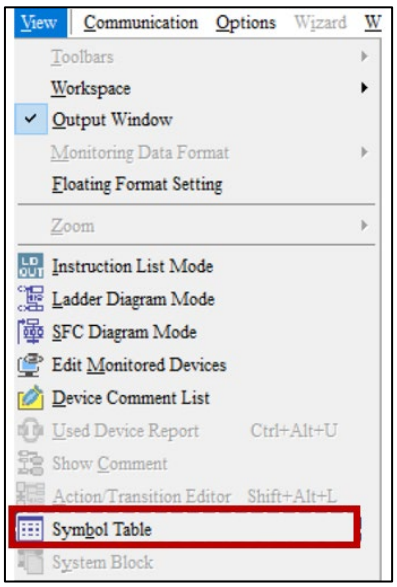


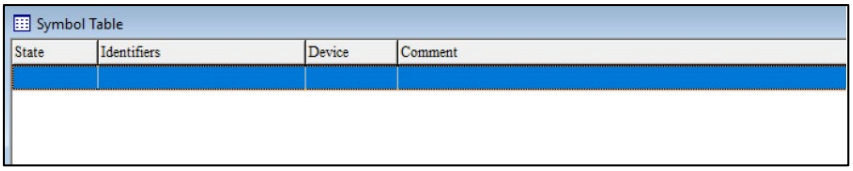
Figure 28 - 3: Tag Name

The **Tag Table** allows users to import and use the tag table edited by WPLSoft and ISPSoft to facilitate programming. The following describes each item of the tag table.

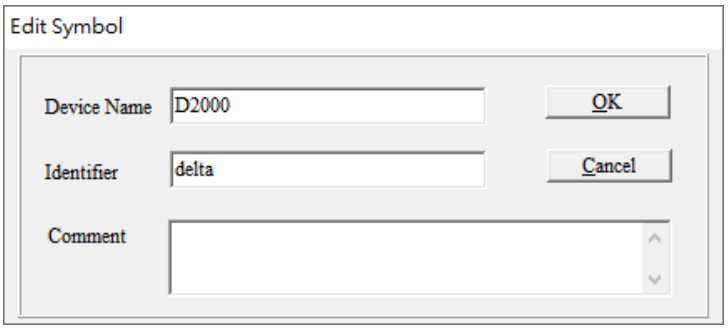
Tag Table	
	
Import Tag File	● Open created tag files or CSV files in the tag table. CSV files include tag table files exported by WPLSoft and ISPSoft or tag tables exported by DIAScreen.  ● Export a **Symbol Table** from the WPLSoft software. Perform the following steps: 1. Launch the WPLSoft software. Create a new project and click **View** > **Symbol Table** menu to open the **Symbol Table** window. 

Tag Table

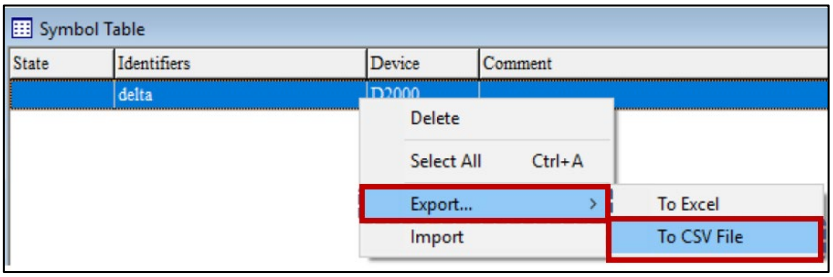
2. In the **Symbol Table**, double-click the left mouse button in the blank area to open **Edit Symbol** pop-up.



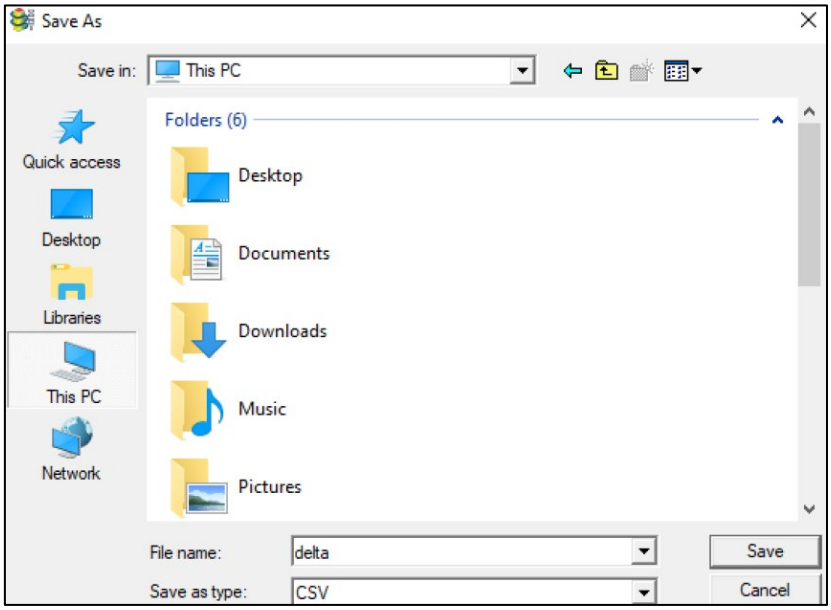
3. Enter "D2000" for the Device Name and "delta" for the Identifier. Click **OK** to exit the **Edit Symbol** window.



4. Right-click on the delta symbol added in the previous step to open its context menu and select **Export...** > **To CSV File**.



5. Name the exported CSV file as delta.csv.

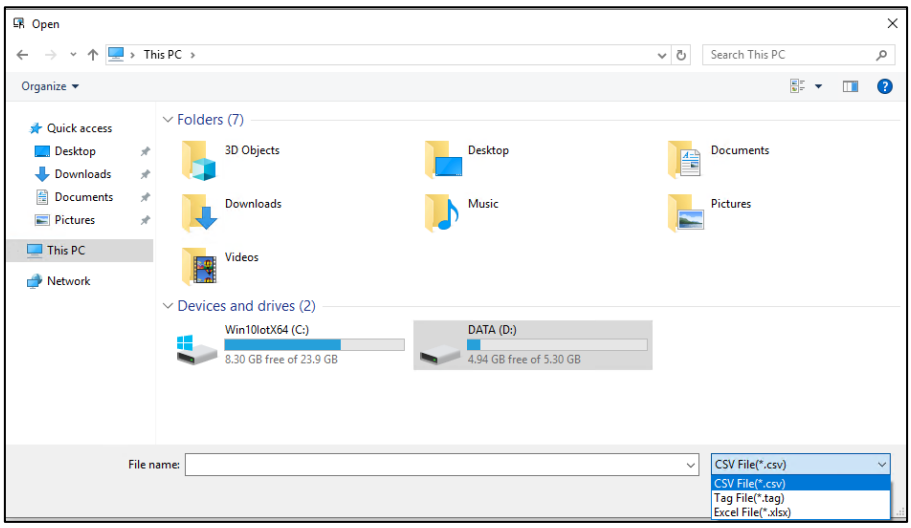


6. Run DIAScreen. Select **Project** > **Tag Table** to open the **Tag Import Setup** window. Click  and select the delta.csv file

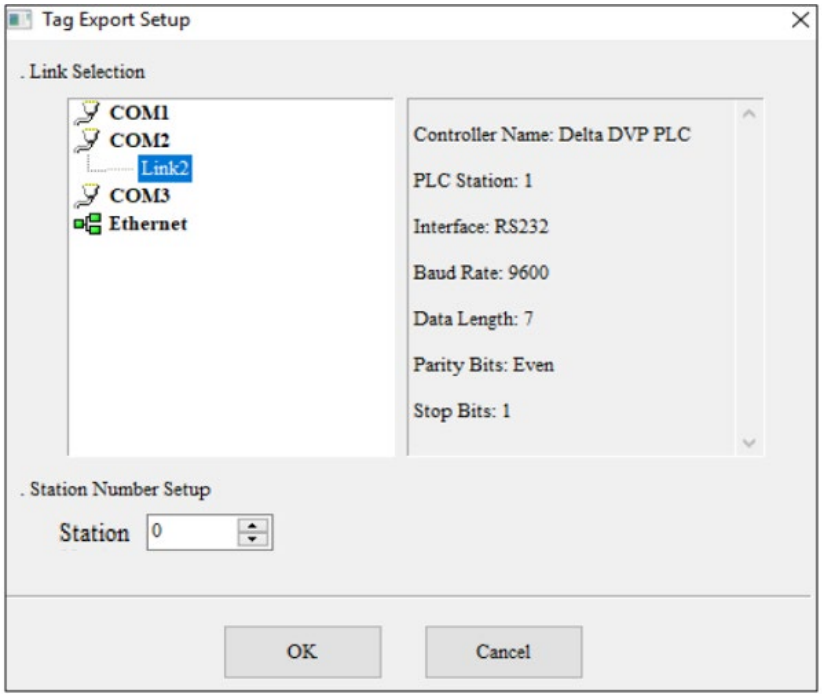
Tag Table

to import.

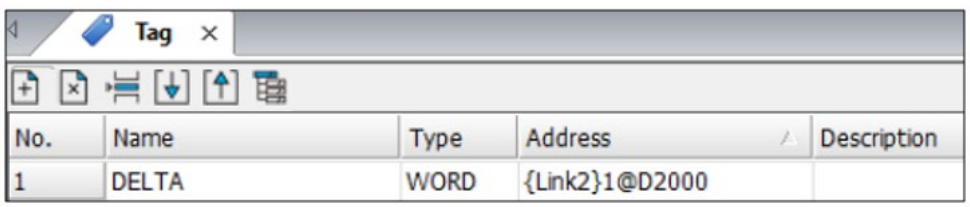




7. Select the COM Port to import and set the **Station Number**. Click **OK** once the setup is complete. The **Station Number** is 0 by default and can be customized by users as desired.



8. After clicking **OK,** the **Symbol Table** from WPLSoft is imported to DIAScreen.



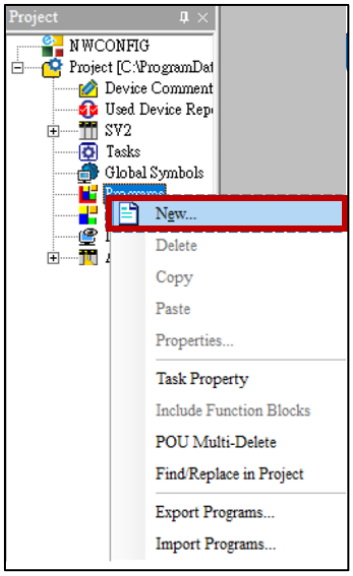
Tag Table

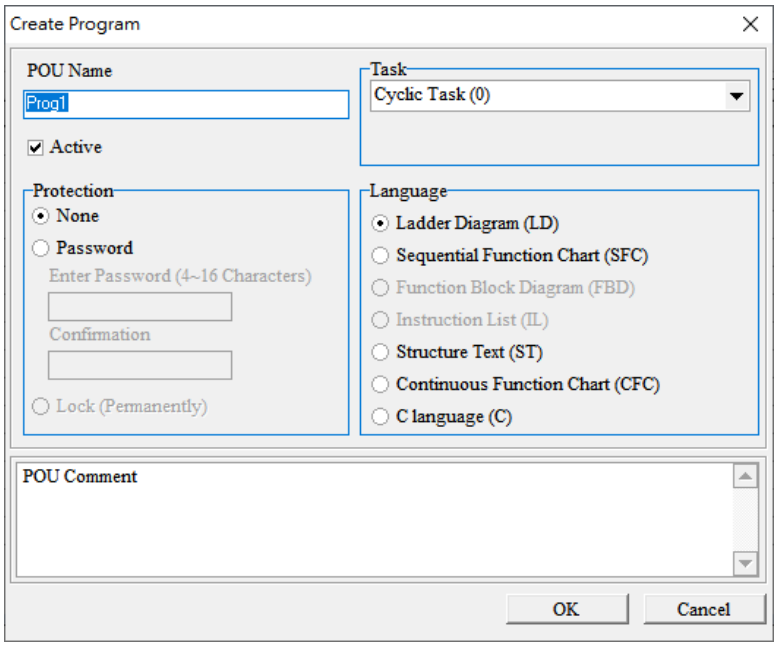
***NOTE**: The tags will be recognized by DIAScreen as uppercase letters. Therefore, for the above example, the tag delta in lowercase edited by WPLSoft will be recognized as DELTA in uppercase.*

- Export a **Symbol Table** from ISPSoft.

  Perform the following steps:

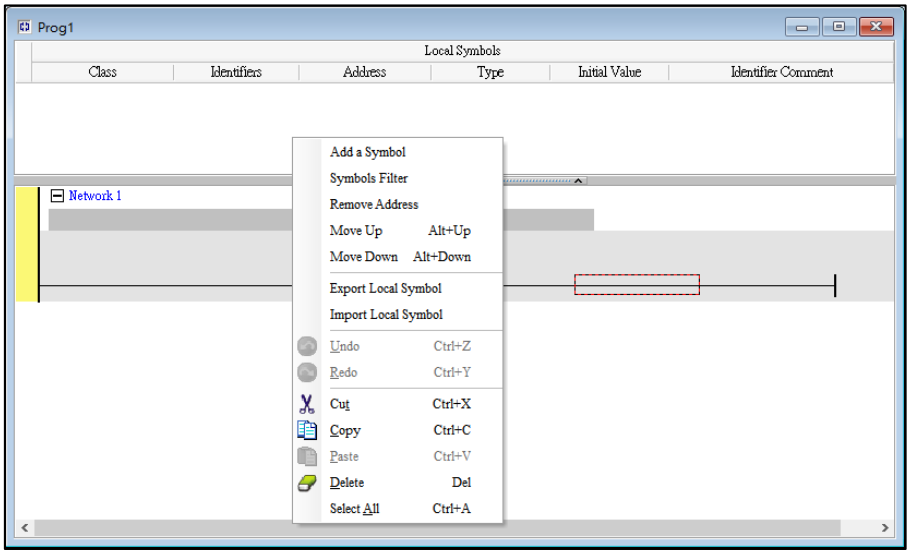
  1. Launch **ISPSoft**. Right-click on the **Programs** in the **Project** tree to open its context menu and click **New...** to open **Create Program** window. Click **OK** to finish.



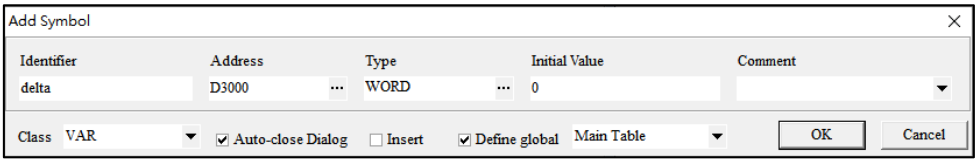


  2. After adding the POU, right-click in the blank area in the **Local Symbols** space and click **Add a Symbol** to open Add Symbol pop up.

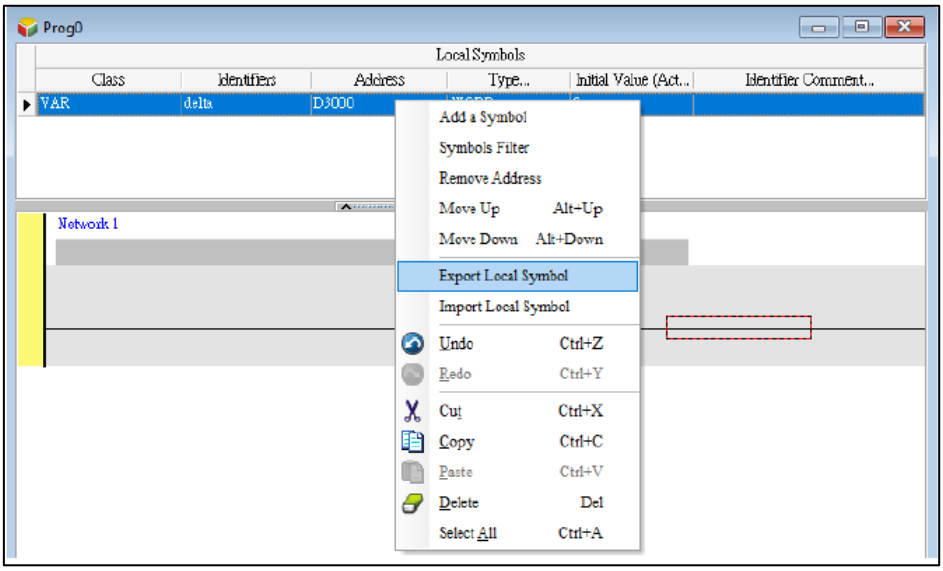
Tag Table



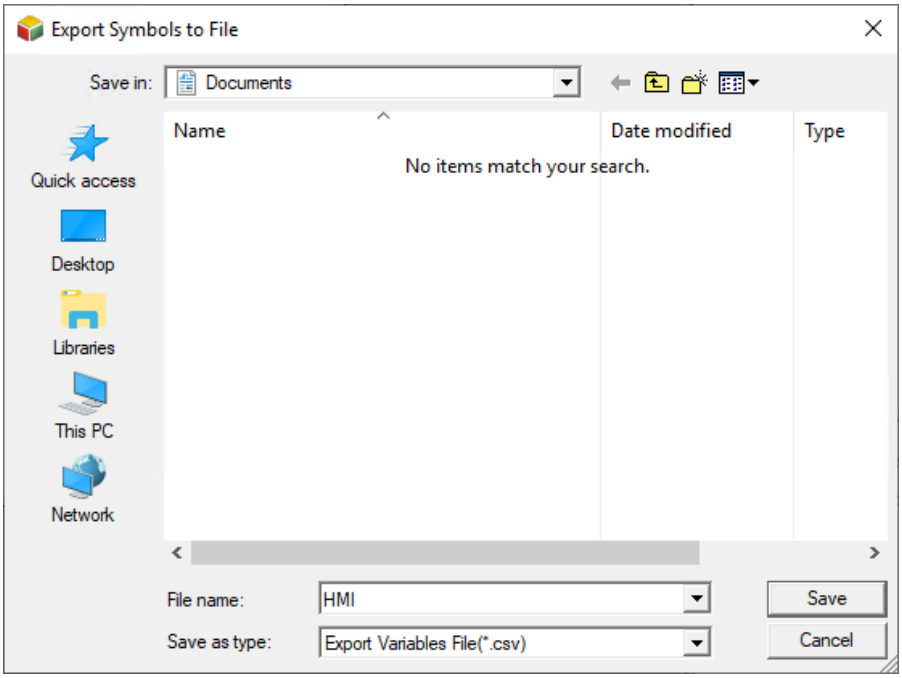
3. Input Symbol name as “delta” and the address as “D3000”. Click **OK** after completion to exit the window.



4. After adding the symbol, go to the **Local Symbols** window. Right-click the delta tag, and select **Export Local Symbol** to save it as HMI. csv file.

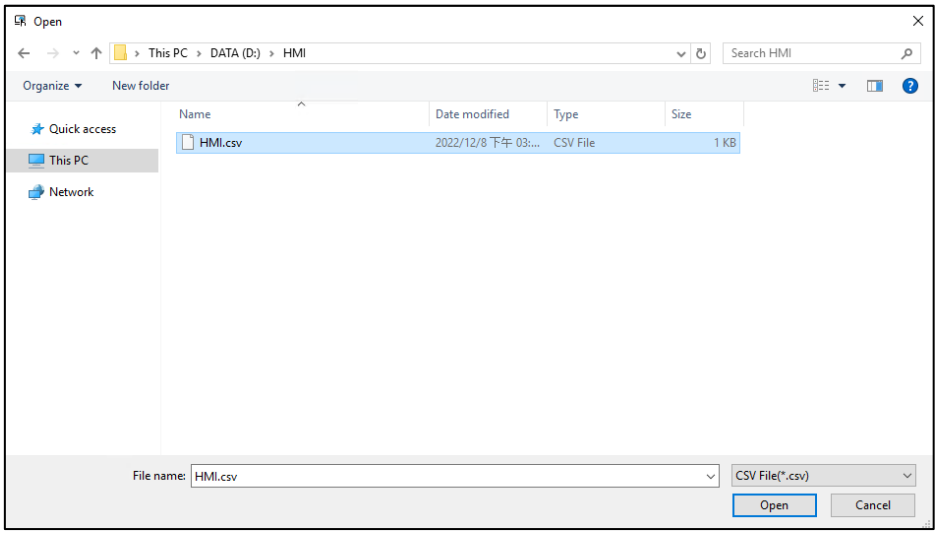


Tag Table

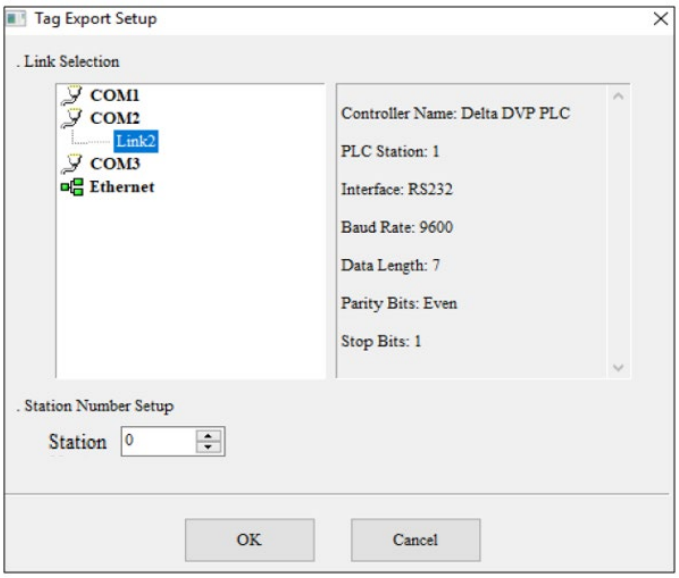
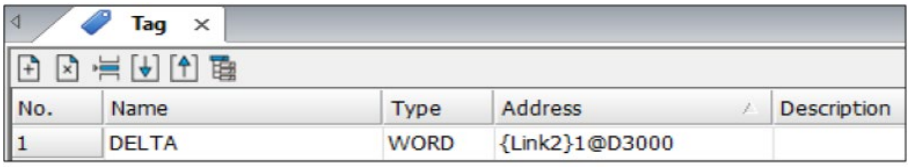
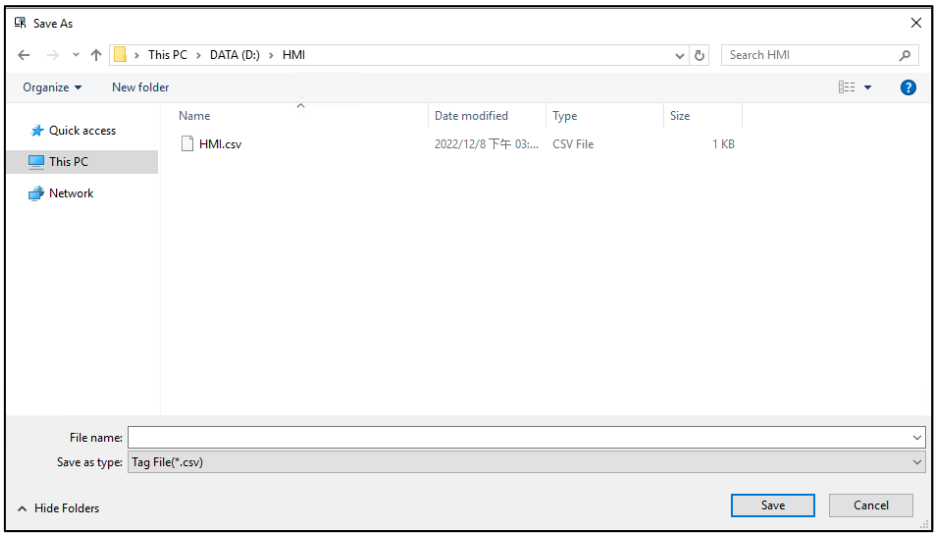


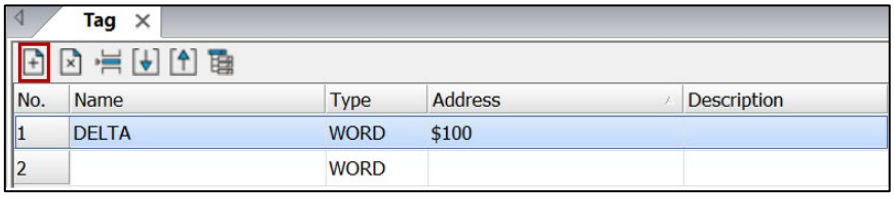
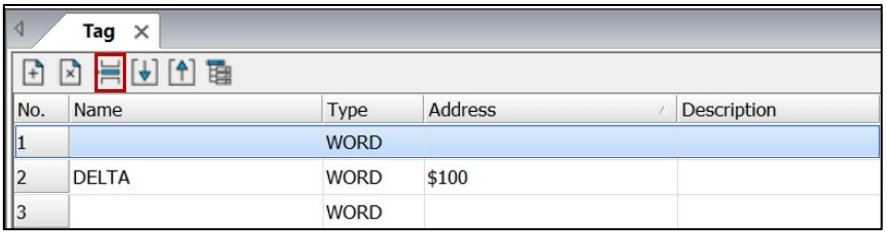
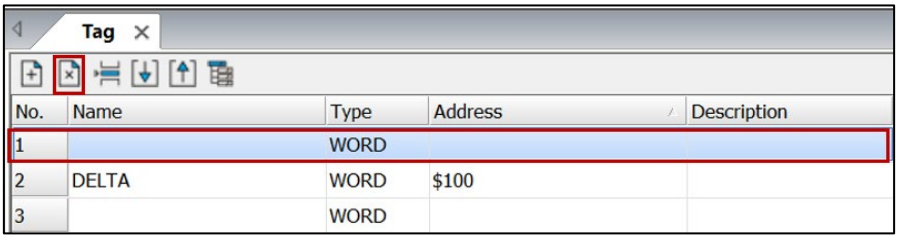
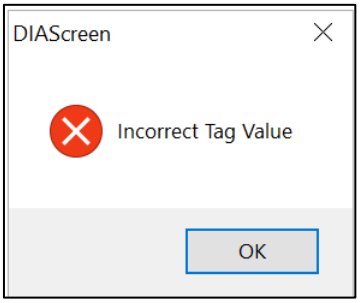
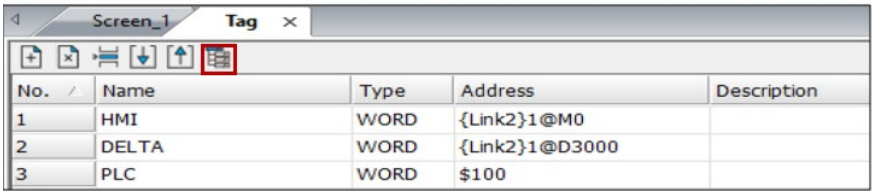
5. Launch DIAScreen. Go to **Project** > **Tag Table**. Click  to open the **Open** window, and select the HMI.csv file to import.

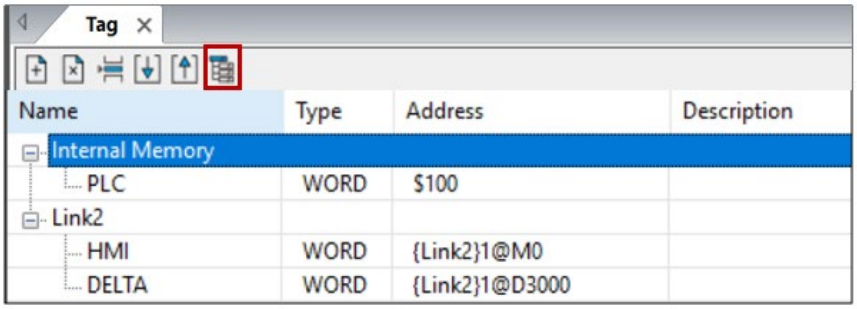




6. Select the COM Port to import and set the **Station Number**. Click **OK** once the setup is complete. The **Station Number** is 0 by default and can be customized by users as desired.

Tag Table	
	 7. After clicking **OK**, the Symbol Table of ISPSoft is imported to DIAScreen.  ***NOTE**: The imported symbols are recognized by DIAScreen as uppercase letters. Therefore, for the above example, the lower case symbols of "delta" edited in ISPSoft are recognized as upper case symbols of "DELTA".*
Export Tag File 	Save edited tags to a new file in CSV format. 
Add tag 	To add tag data, click  icon.

Tag Table	
	
Insert tag file 	Inserting a tag file inserts new data above the selected data row. 
Delete tag 	Select a data row and then click  icon to delete the selected data row. 
Exit	If users add or insert a data row but exits this edit page without entering any data, the following warning message appears. 
Sorted by connection name 	● Sort and display the created links by connection name. ● If there are three sets of tags created, the display without sorting is as follows.  ● If users sort the tags by the connection name, they are displayed with a tree view.

Tag Table	
	

28.2 HMI Identifier

This section describes the **HMI Identifier Setting** function provided by DIAScreen software. If an HMI Identifier is set on the HMI, and users open a screen not set with an identical HMI Identifier, an error message appears. This function restricts the download destination of customer-specific screen projects so that the destination can only be the customer-specific HMI. When the HMI Identifier function is enabled, the HMI will verify the correct HMI Identifier on startup before operating properly. Therefore, the HMI identifier can be set separately for the HMI and the screen. Locate the HMI Identifier Setting function in **Project** > **Other Setting** > **HMI Identifier Setting.**

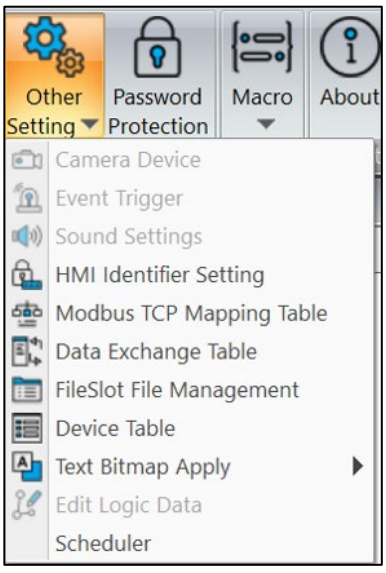
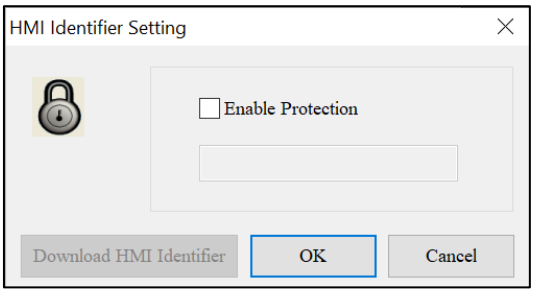
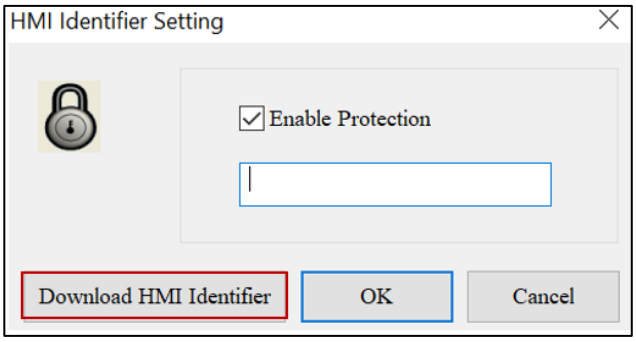


Figure 28 - 4: HMI Identifier Setting

Property Description for HMI Identifier Setting	
	
Enable Protection	Check to enable the HMI Identifier for protection. 
Password	Only HEX characters are accepted in Password, supports numbers 0~9 and letters A~F. Other characters are forbidden or not supported.
Download HMI Identifier	● This button only writes the identifier to the HMI. ● After the identifier is downloaded, every time the HMI is turned on, it compares the screen file with the identifier of the HMI.

***NOTE**:*

1. *After checking **Enable Protection** and setting its password, if users execute **Download All Data** without performing **Download HMI identifier**, only the screen identifier will be downloaded.*



2. *If the HMI has an identifier but the screen does not have, **Check HMI Machine ID Fail 1** appears.*
3. *If the screen has an identifier but the HMI does not have, **Check HMI Machine ID Fail 2** appears.*

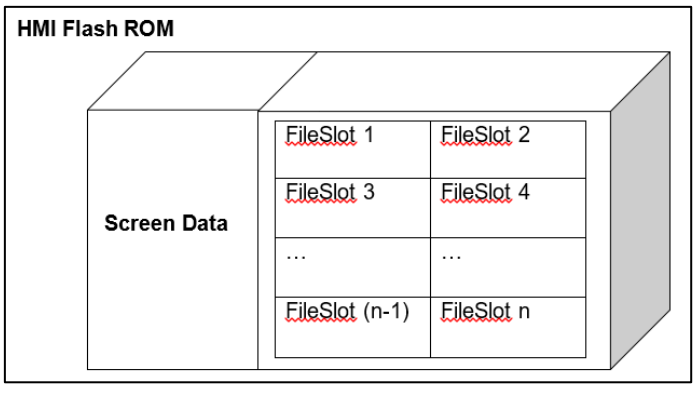
4. *If both the HMI and the screen have identifiers but these identifiers do not match, **Check HMI Machine ID Fail 3** appears.*
5. *If users forget to set the identifier, go to **Project** > **Reset HMI** to clear the HMI identifier. Doing so also deletes the screen files in the HMI.*

28.3 FileSlot Management

In the **FileSlot Management** setting window, customize the size and content of each FileSlot. FileSlot files provide users with more flexibility and convenience in planning the storage and use of large amount of data. After creating a FileSlot, read the contents of the file into the register through a macro instruction (FileSlotRead) and can save register data in these files. For example, the extraction arm program is different for each product. Save the program for each product in a different FileSlot and switch the product processes quickly by reading different FileSlots.

***NOTE**:*

1. *After downloading a FileSlot to the HMI, the memory space required for the FileSlot will be reserved in the HMI ROM.*

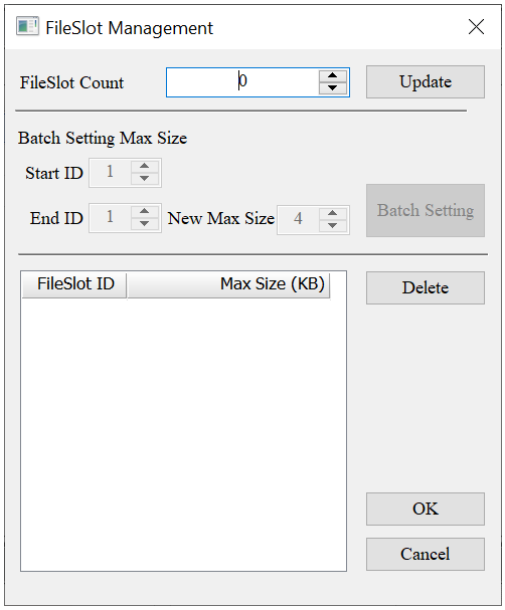
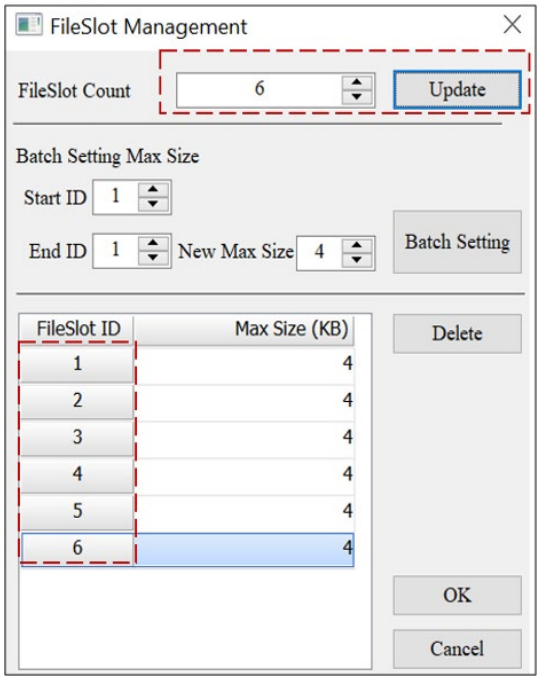


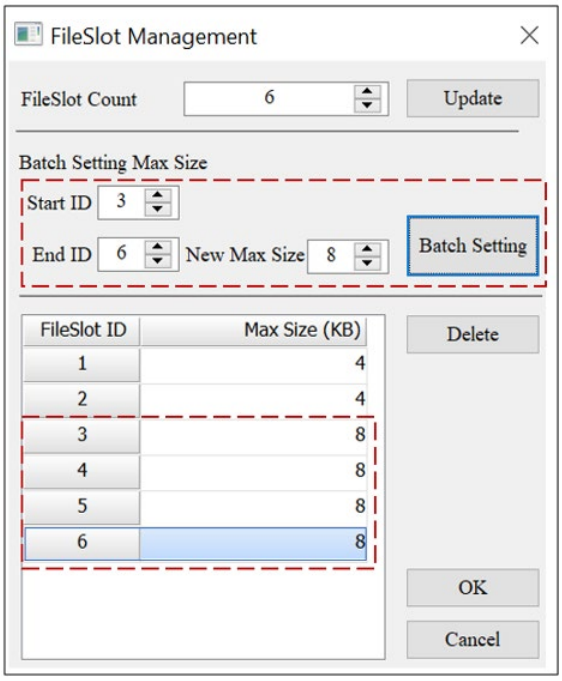
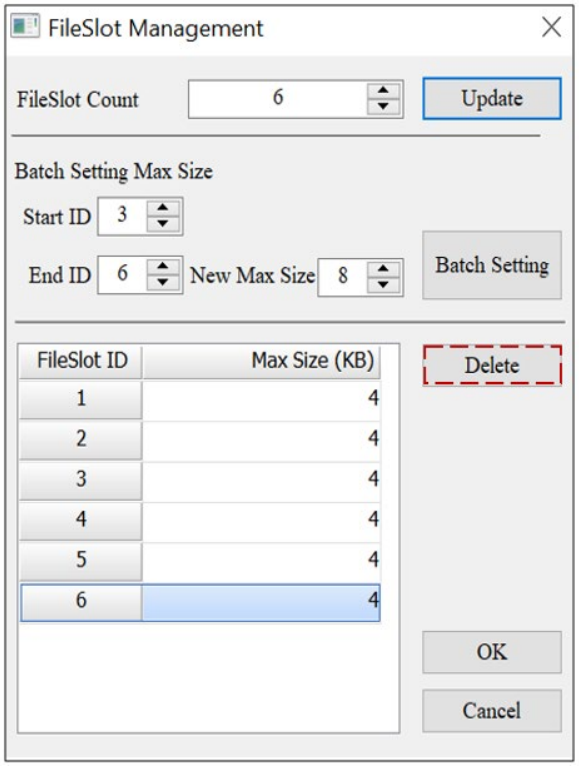
2. *Taking into consideration the efficiency and data saving characteristics of the HMI, when downloading a screen with a planned FileSlot to the HMI, instead of generating files directly, only memory space will be reserved. File data can only*

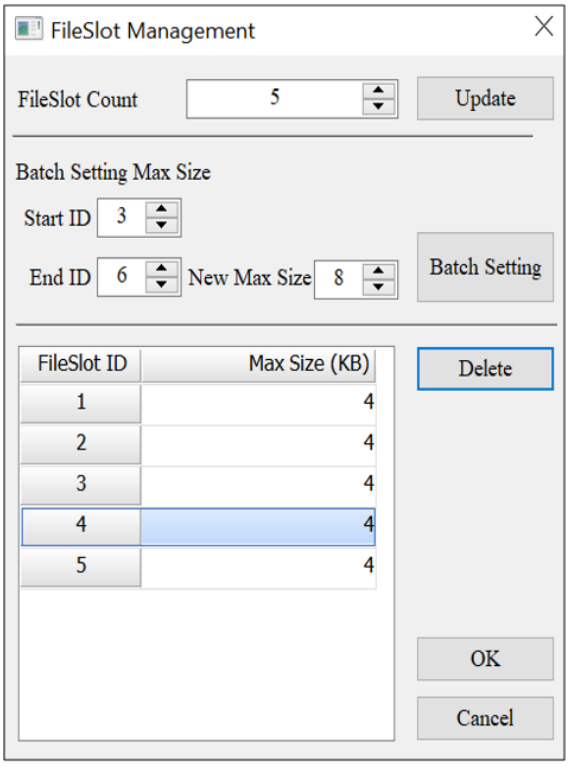
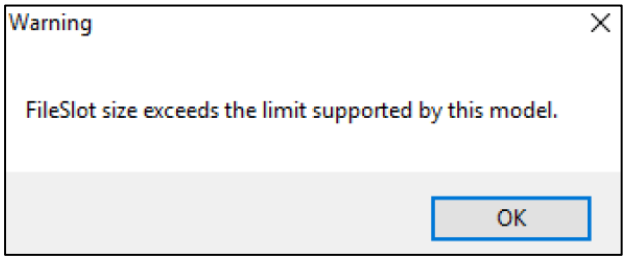
be generated through file macros (FileSlotWrite and ImportFileSlot).

3. *FileSlot file data that exists in the HMI can only be deleted by **Format HMI**, **Reset HMI**, or the FileSlotRemove macro command.*
4. *If there is FileSlot file data in the HMI and the downloaded FileSlot file data is smaller than the original FileSlot file data existing in the HMI screen, downloading screens will delete the excess FileSlot file data. For example, if five FileSlots are downloaded, but there are originally 10 FileSlots, then the 6th-10th FileSlots will be deleted.*
5. *The rule described in Item 4 also applies when copying screen data files and screen auto-update files created by DIAScreen to the HMI with FileSlot file data by the **Copy File** function of the HMI system. Only under this condition, the data will be deleted. Otherwise, the number of pieces of FileSlot file data in the HMI will not change.*
6. *Since updating the screen will not change the FileSlot files, users are advised to **Format HMI** or **Reset HMI** before reprogramming the screen and FileSlot size.*
7. *The **Copy File** function of the HMI system can export the FileSlot file, and the exported file will be stored in HMI-000\FILESLOT; in this way, the FileSlot file can be imported to other HMIs, and the FileSlot file data stored in the other HMI will be overwritten.*

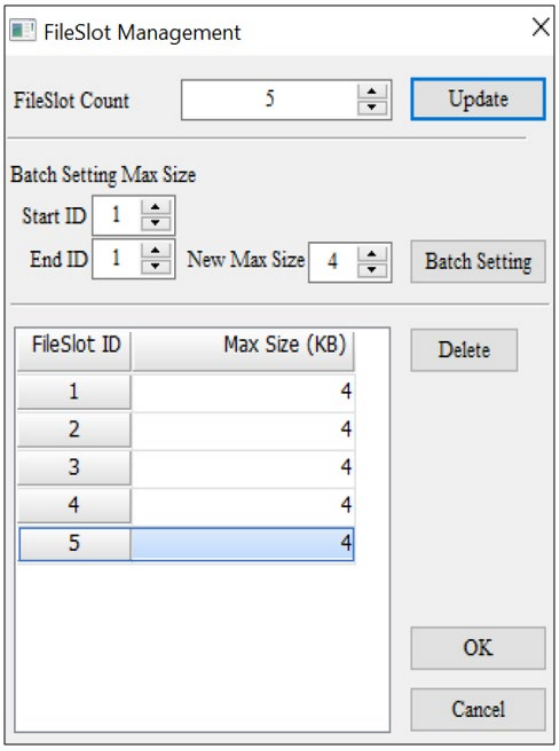
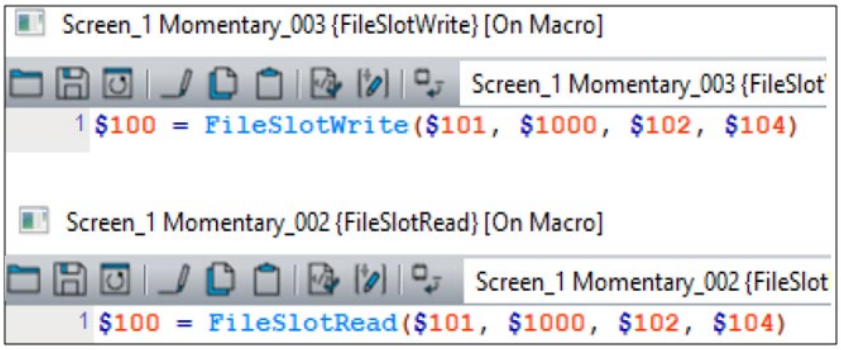
Go to **Project** > **Other Setting** > **FileSlot Management.** The property page of **FileSlot Management** appears. The following explains the properties of **FileSlot Management**.

FileSlot Management Setting	
	
FileSlot Count	Enter the desired number of FileSlots. Up to 1024 FileSlots can be used. The default value is **0**.
Update	Enter the total **FileSlot Count**, and then click **Update** to plan for the set number of FileSlot. As shown in the following figure, setting the **FileSlot Count** to 6 will plan 6 FileSlots. 
Batch Setting Max Size	● Set the Max Size of FileSlot in batch. ● Enter the **Start ID**, **End ID**, and **New Max Size** and click **Batch Setting** to set the **New Max Size** to the FileSlot with the specified ID. The default values of **Start ID**, **End ID**, and **New Max Size** are **1**, **1**, and **4**, respectively. ● As shown in the following figure, set the **Start ID** to 3, **End ID** to

<table>
<tr><th colspan="3">FileSlot Management Setting</th></tr>
<tr><td></td><td colspan="2">6, and New Max Size to 8, the Max Size of FileSlot ID3 ~ ID6 will be changed to 8, and the Max Size of the rest of FileSlots will be kept at the default value of 4.
 
</td></tr>
<tr><td>Delete</td><td colspan="2">The Delete button deletes the FileSlots in the File Management window.</td></tr>
<tr><td></td><td>Before Deletion</td><td>Select one FileSlot and click Delete.
 
</td></tr>
</table>

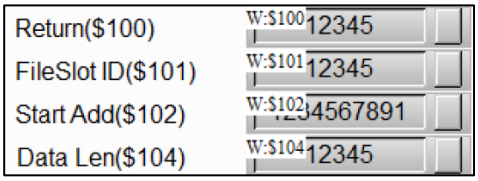
<table>
<tr><th colspan="3">FileSlot Management Setting</th></tr>
<tr><td></td><td>After Deletion</td><td>Originally, there were 6 FileSlots, but after deletion, 5 are left.
 
</td></tr>
<tr><td>Max Size</td><td colspan="2">Max Size of each FileSlot can be set individually. The maximum value of Max Size is 102400 KB, and the minimum value is 4 KB.</td></tr>
<tr><td>OK</td><td colspan="2">After the FileSlot Management is completed, click OK to save the changes and then exit the FileSlot Management window. If the total file size of the planned FileSlot is larger than the User Application space in the Flash ROM provided by the model, a warning message appears as shown in the following figure. Refer to the manual of each model for the size of the User Application space in Flash ROM.
 
</td></tr>
<tr><td>Cancel</td><td colspan="2">When users click Cancel, no matter they have made any changes or not, the saving action is not executed, which works the same way as clicking  on the top right corner of the window.</td></tr>
</table>

The following is the example of **FileSlot Management**.

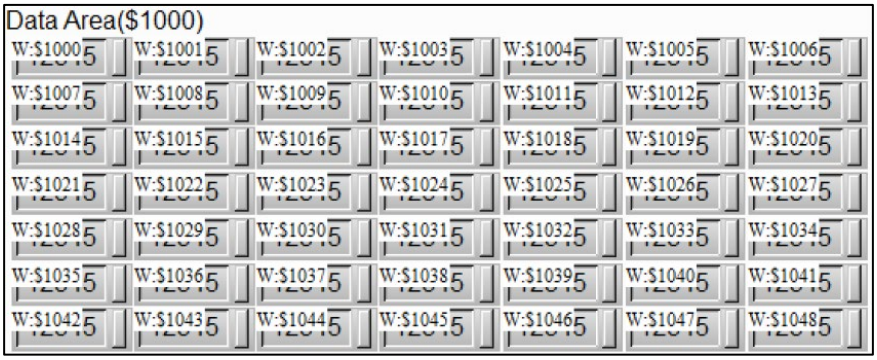
FileSlot Management	
Add FileSlot	● Go to **Project** > **Other Setting** > **FileSlot Management**. ● Set the **FileSlot Count** to 5 and click **Update**. The set number of FileSlot appears, and the maximum file size of each FileSlot can be set. Click **OK** to leave the **FileSlot Management** window after the setting is complete. 
Create button for executing Macro command	In the Edit screen of DIAScreen, create two **Momentary Button** elements. Set their **Write Address** to \$50.0 and \$50.1, respectively. For **On Macro**, enter the FileSlotRead command, \$100 = FileSlotRead (\$101, \$1000, \$102, \$104) and the FileSlotWrite command, \$100 = FileSlotWrite (\$101, \$1000, \$102, \$104) 

<table>
<tr><th colspan="2">FileSlot Management</th></tr>
<tr><td>Create Numeric Entry element</td><td>

On the screen, create Numeric Entry elements corresponding to the macro command parameters, as shown in the following figure.

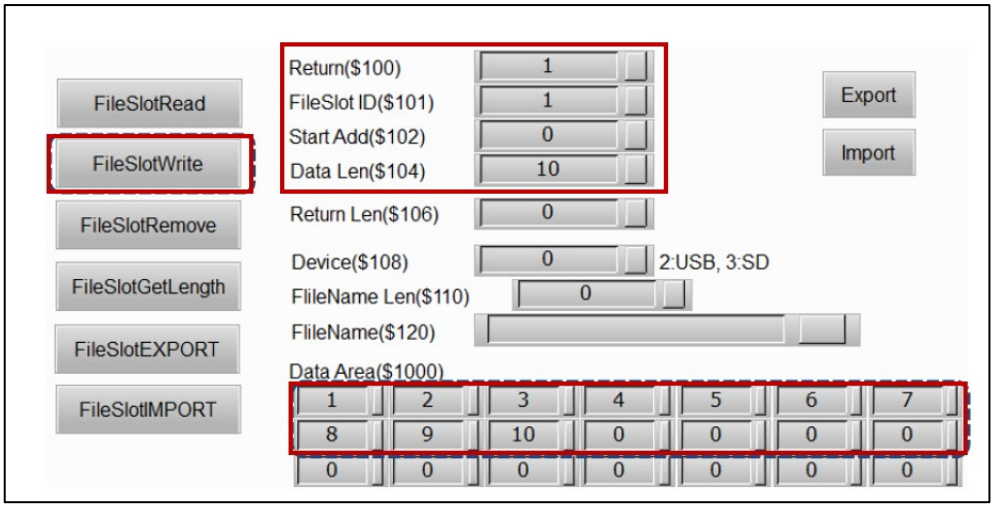


Create Numeric Entry elements (addresses of $1000 - $1048) on the screen to read the content of the FileSlot file, as shown in the following figure.



</td></tr>
<tr><td>Execution result</td><td>

When all the elements are created, compile the elements and download the screen to the HMI.
Use the FileSlotWrite macro to write the data in the data area to the specified FileSlot file. The example in the following figure shows how to write 10 Words from the data area into the FileSlot file with ID 1. The data written into FileSlot can be read with FileSlotRead.



Use FileSlotWrite or FileSlotIMPORT to create actual files before using FileSlotRead.

</td></tr>
</table>

28.4 Device Table

The device table provides $M non-volatile data that can be imported or exported by the HMI but does not support data editing and download from the DIAScreen. It can be used to read $M data from an HMI A, upload the data through the upload function provided by DIAScreen, export the data, and then import it to an HMI B. In this way, the two HMIs can share the same $M data content.

Locate Device Table in the **Project** > **Other Setting** > **Device Table**. By checking the **Include device table**, users can also update $M data to the HMI when downloading all screen data or creating screen data files or copying files, etc. This provides convenience when multiple HMIs need to share the same $M data.

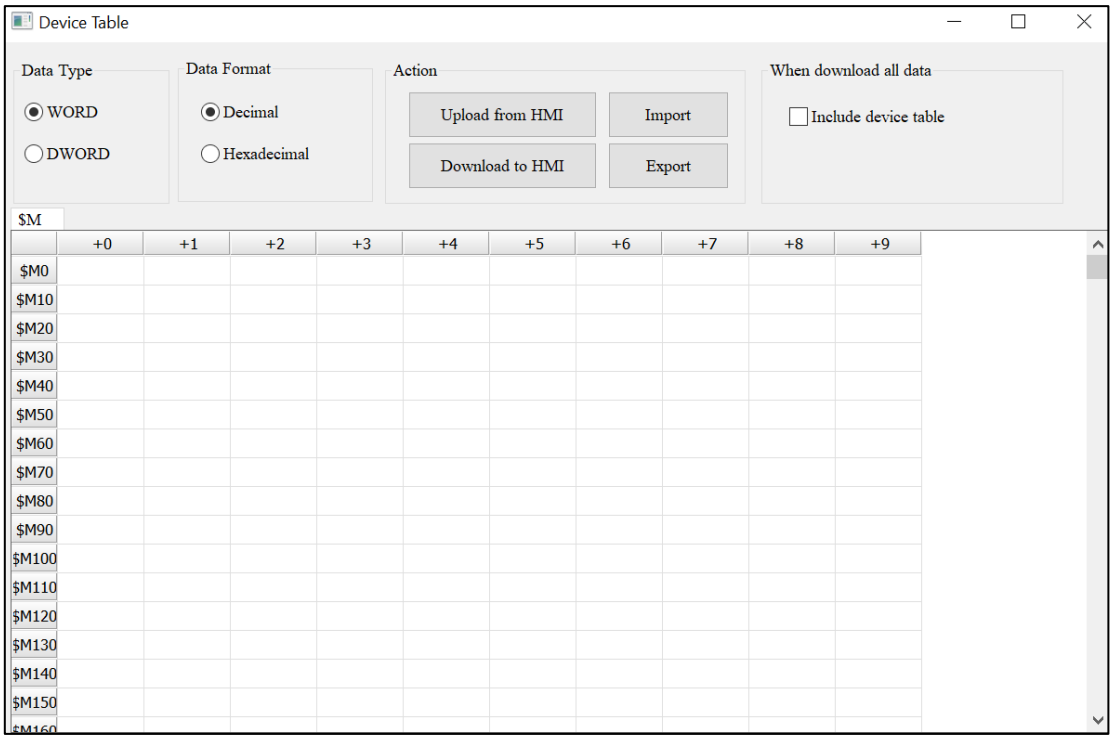
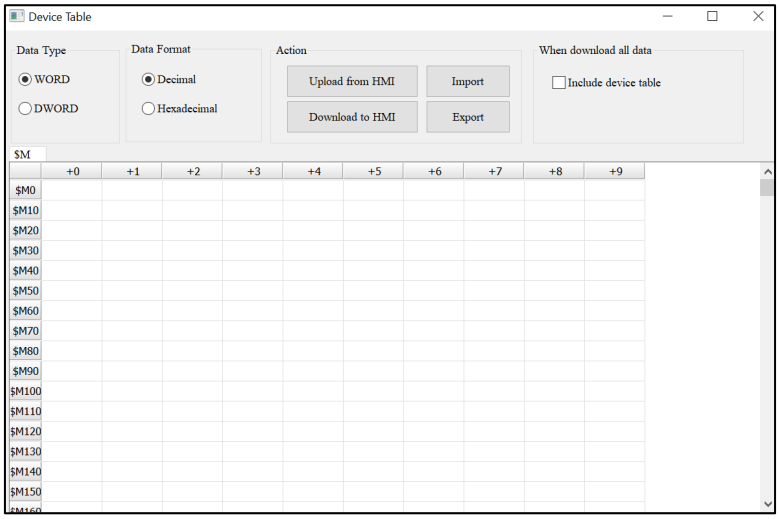
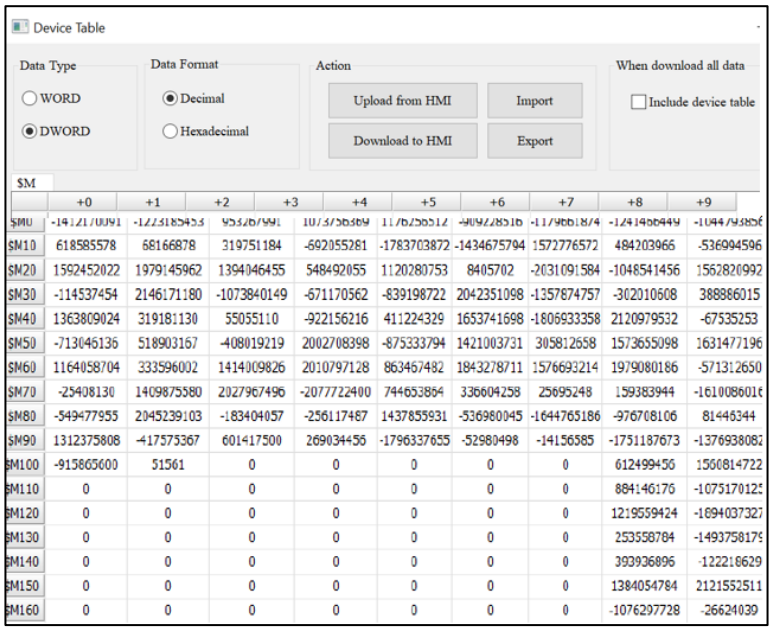
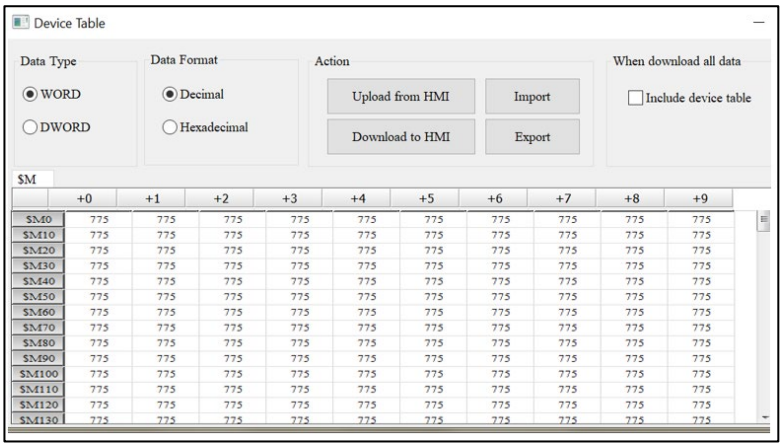
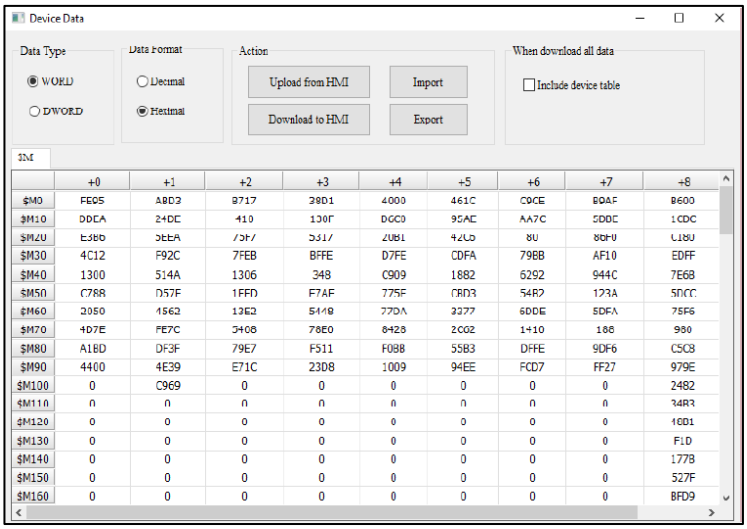
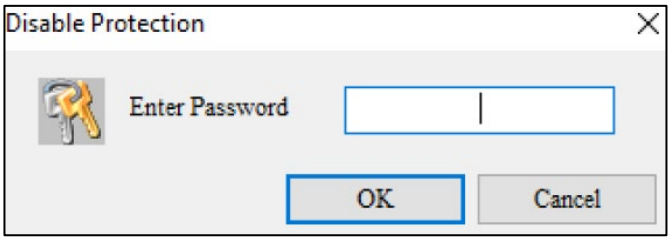
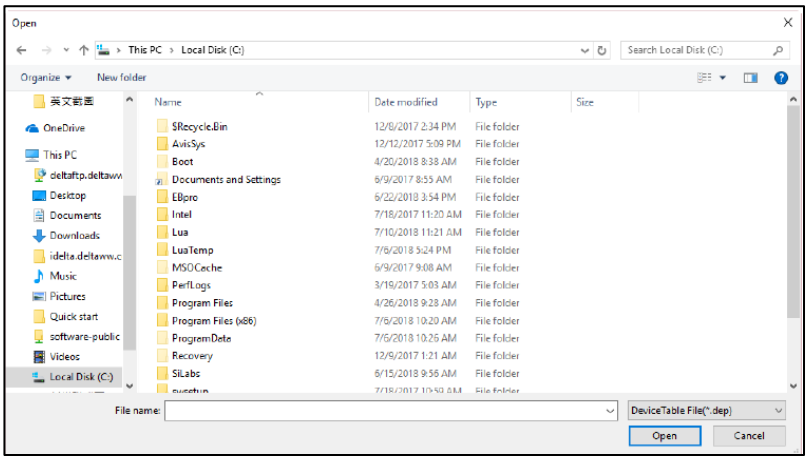


Figure 28 - 5: Device Table

<table>
<tr><th colspan="3">Device Table</th></tr>
<tr><td colspan="3"> 
</td></tr>
<tr><td colspan="3">The device table displays $M non-volatile data in the range of $M0-$M1023. Set the data type or data format.</td></tr>
<tr><td rowspan="2">Data Type</td><td>WORD</td><td>The values are displayed in WORD by default.</td></tr>
<tr><td>DWORD</td><td>Change Data Type of $M data to DWORD.
 
</td></tr>
<tr><td>Data Format</td><td>Decimal</td><td>The Data Format is in Decimal by default.</td></tr>
</table>

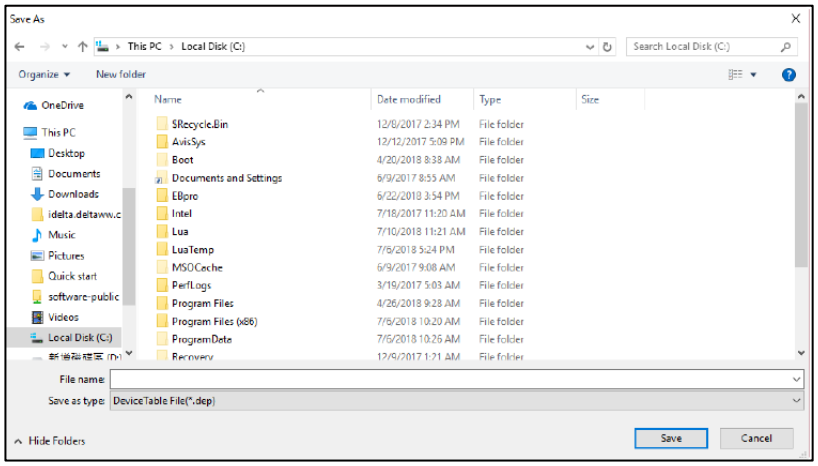
<table>
<tr><th colspan="3">Device Table</th></tr>
<tr><td rowspan="3"></td><td></td><td> 
</td></tr>
<tr><td>Hexadecimal</td><td>Change the Data Format of $M data to Hexadecimal.
 
</td></tr>
<tr><td>Action</td><td>Upload from HMI</td><td>● This action reads $M data on the HMI and uploads it to this Device Table for display.
● Before performing the action, users will be asked to enter the highest security password, which is 12345678 by default.
 
</td></tr>
<tr><td>Download to HMI</td><td>● This action downloads the $M data displayed on the Device Table to the HMI.
● The HMI can check the correctness of the data by creating $M0 ~ $M1023 registers.</td></tr>
<tr><td>Import</td><td>Import the Device Tables stored in other HMIs. The supported file format is .dep.</td></tr>
</table>

Device Table



Export

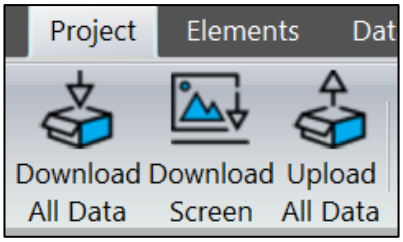
Export $M data displayed on the current **Device Table**. The saved file format is .dep.



When download all data

- If the **Include device table** option is checked, $M non-volatile data can be downloaded to the HMI by executing **Download All Data** action.



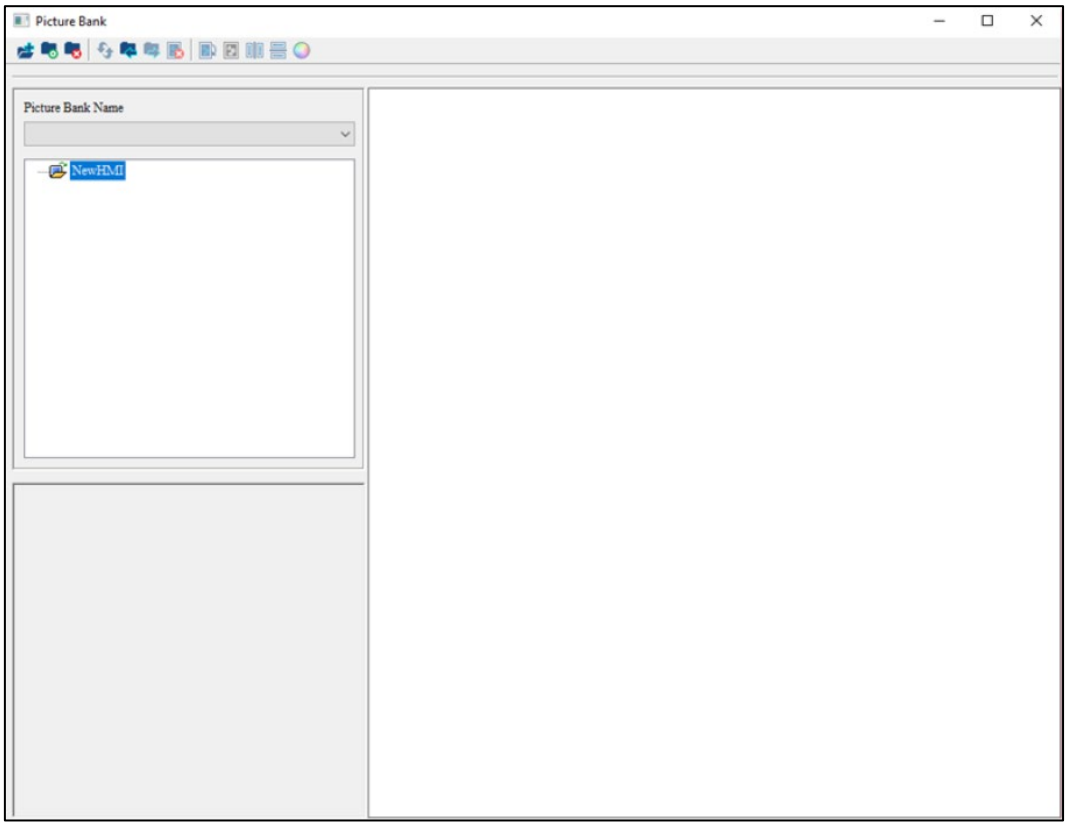


- When users select the checkbox for **Include device table**, it means they can sync the Device Data table to another HMI by using the **Create Screen Data File** function to copy the screen data file.

28.5 Picture Bank

The **Picture Bank** is designed to allow users to apply pictures to the elements quickly. Users can also import non-built-in pictures and perform simple editing on the pictures, such as color inversion, converting to 256 colors grayscale, horizontal mirroring, and vertical mirroring.

Picture Bank



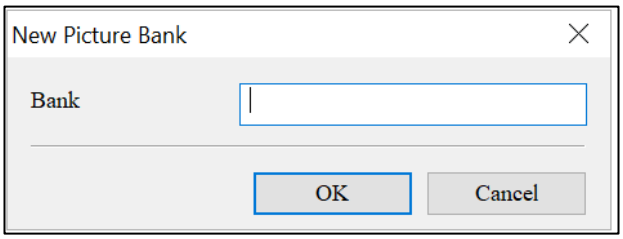
Picture Bank

The Picture Bank provides following functions:

- **New Picture Bank**
- **Install Picture Bank**
- **Remove Picture Bank**
- **Update Picture Bank**
- **Import Picture Data**
- **Export Picture Bank**
- **Delete**
- **Color Inverse**
- **Convert to 256 colors grayscale**
- **Horizontal Mirror**
- **Vertical Mirror**
- **Adjust saturation**

New Picture Bank

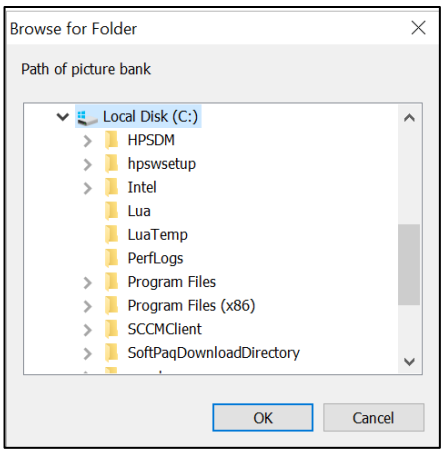
- After clicking icon, DIAScreen asks users to enter the name of the picture bank.

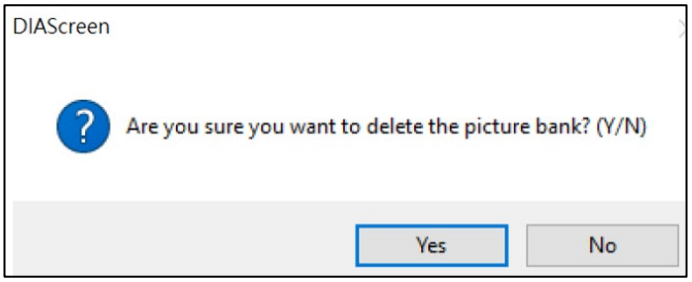
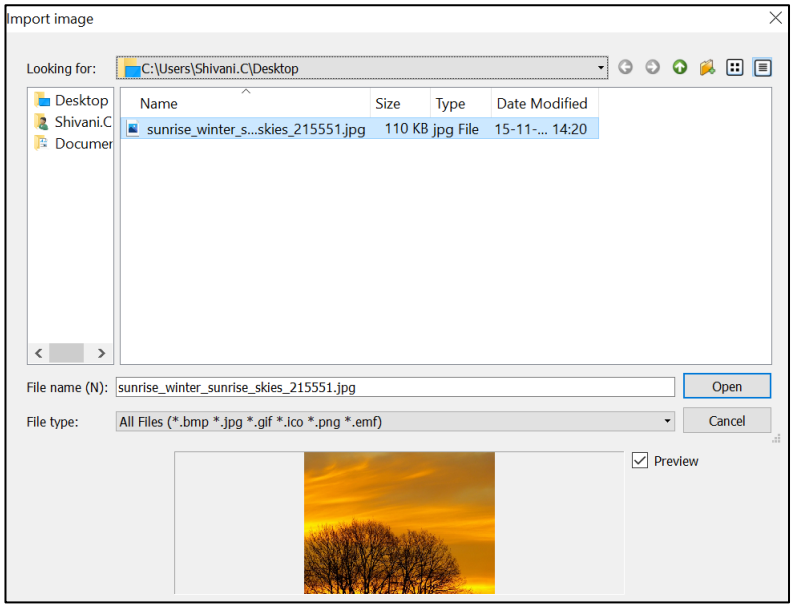
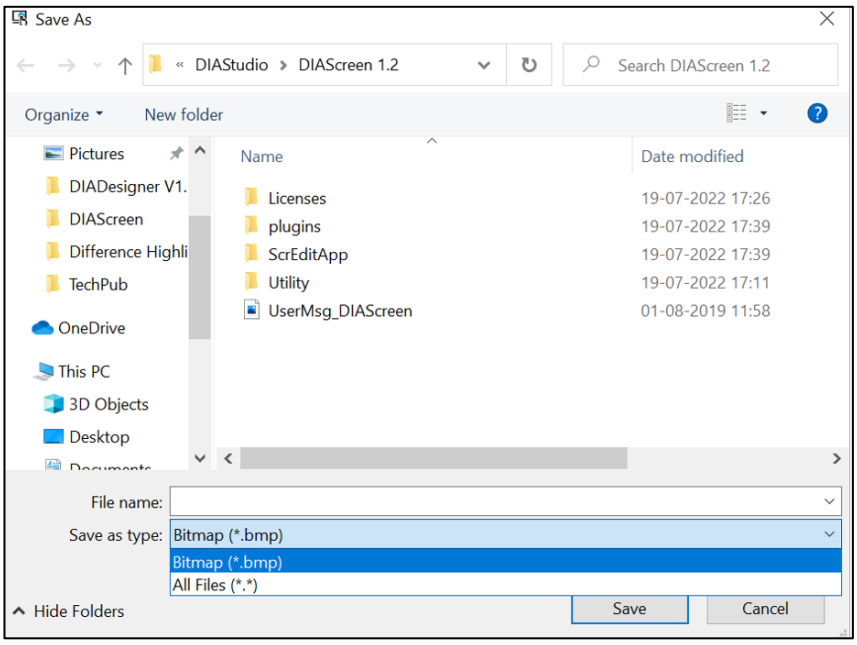


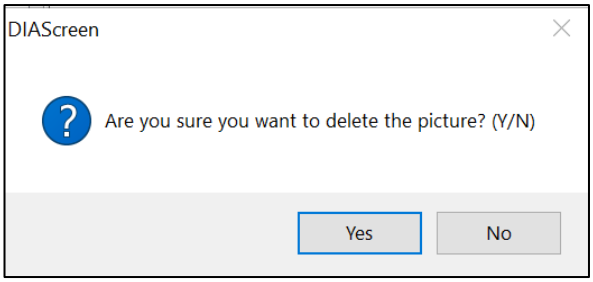
- After adding the picture bank, click **Import Picture Data** to import pictures to the picture bank.

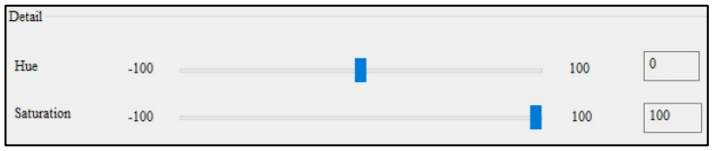
Install Picture Bank

Install Picture Bank allows users to use the picture bank created by other projects. Users must select the path to the location where the existing picture bank is stored.



Picture Bank	
Remove Picture Bank 	**Remove Picture Bank** asks users whether to remove the picture bank. 
Import Picture Data 	After adding a picture bank, click  icon to import pictures data into the picture bank. 
Export Picture Bank 	After importing the picture data, users can also export the content of the picture bank. The exported file is saved in .bmp format. 

<table>
<tr><th colspan="3">Picture Bank</th></tr>
<tr><td>Delete</td><td colspan="2">The Delete function deletes the imported picture data and pictures. Before deleting, DIAScreen prompts for confirmation.
 
</td></tr>
<tr><td>Color Inverse</td><td colspan="2">The Color Inverse function switches the colors of the original pictures to have it displayed in Negative film.</td></tr>
<tr><td></td><td>Before Color Inverse</td><td>After Color Inverse</td></tr>
<tr><td></td><td>  </td><td>  </td></tr>
<tr><td>Convert to 256 colors grayscale</td><td colspan="2">The Convert to 256 colors grayscale function converts the original colors of the picture to have it displayed in grayscale (256 levels).</td></tr>
<tr><td></td><td>Before Converting to 256 Colors Grayscale</td><td>After Converting to 256 Colors Grayscale</td></tr>
<tr><td></td><td>  </td><td>  </td></tr>
<tr><td>Horizontal Mirror</td><td colspan="2">The Horizontal Mirror function generates a left-to-right mirror image of the original picture.</td></tr>
<tr><td></td><td>Before Horizontal Mirroring</td><td>After Horizontal Mirroring</td></tr>
<tr><td></td><td>  </td><td>  </td></tr>
</table>

<table>
<tr><th colspan="3">Picture Bank</th></tr>
<tr><td>Vertical Mirror</td><td colspan="2">The Vertical Mirror function generates an upside-down mirror effect of the original picture.<table><tr><th>Before Vertical Mirroring</th><th>After Vertical Mirroring</th></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
<tr><td>Adjust saturation</td><td colspan="2">Saturation is also known as chroma of the colors. It refers to the colorfulness of the colors or the amount of a single color within a specific color. The higher the amount, the higher the color saturation is for this color; whereas, the lower the amount, the lower the color saturation is for this color.
Adjust saturation makes the original picture more vivid in color.
The following settings will adjust the saturation to 100. 

<table><tr><th>Before Adjusting Saturation</th><th>After Adjusting Saturation</th></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
</table>

28.6 Text Bank

Edit certain frequently used texts and store them in the Text Bank (**Project** > **Text Bank**). In this way, when it is necessary to enter texts on the element, import prior-edited strings directly from the text bank instead of retyping them. Once text strings have been created in the Text Bank, **Select the element** and right-click > **Import from text bank** function. It allows users to connect to the text bank and import the created text directly into the selected element, as shown in the following figure.

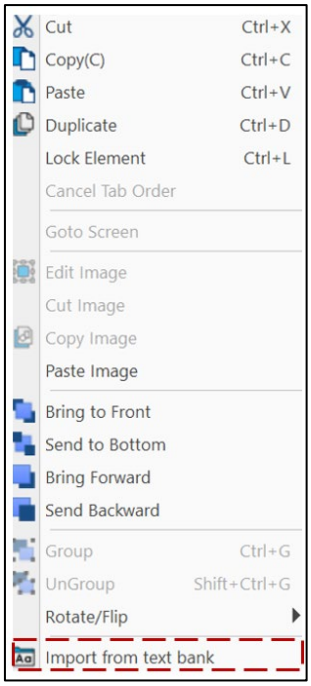
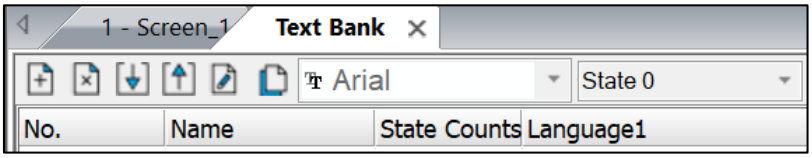


Figure 28 - 6: Import text from text bank

NOTE:

1. *If multiple languages have been set, users can also edit the text data of the languages in the Text Bank beforehand.*
2. *When executing* ***Import from text bank*** *function, if the element has used the created text of the Text Bank, it will not be replaced.*

The description of the function setting of Text Bank is as follows.

Text Bank Property Description

● The Text Bank provides the following functions: • **New Text Bank**  • **Delete Selected Text Bank** 

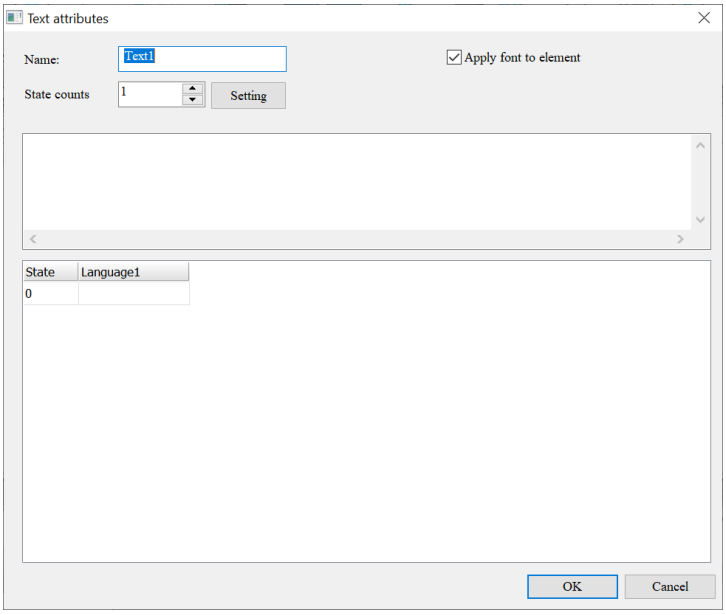
<table>
<tr><th colspan="2">Text Bank Property Description</th></tr>
<tr><td colspan="2">

Import Text Bank
Export Text Bank
Edit the selected Text Bank
Copy Text Bank library

Click the language column to set the font of each language.
Select State to switch and display the text content of each state.

</td></tr>
<tr><td>New Text Bank</td><td>

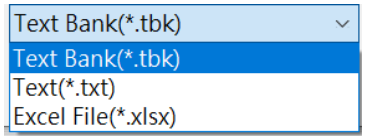
Click icon. Text attributes window appears, as shown in the following figure.



Enter Name and State counts in the Text attributes window, and select the checkbox Apply font to element. Enter the text, and click OK.

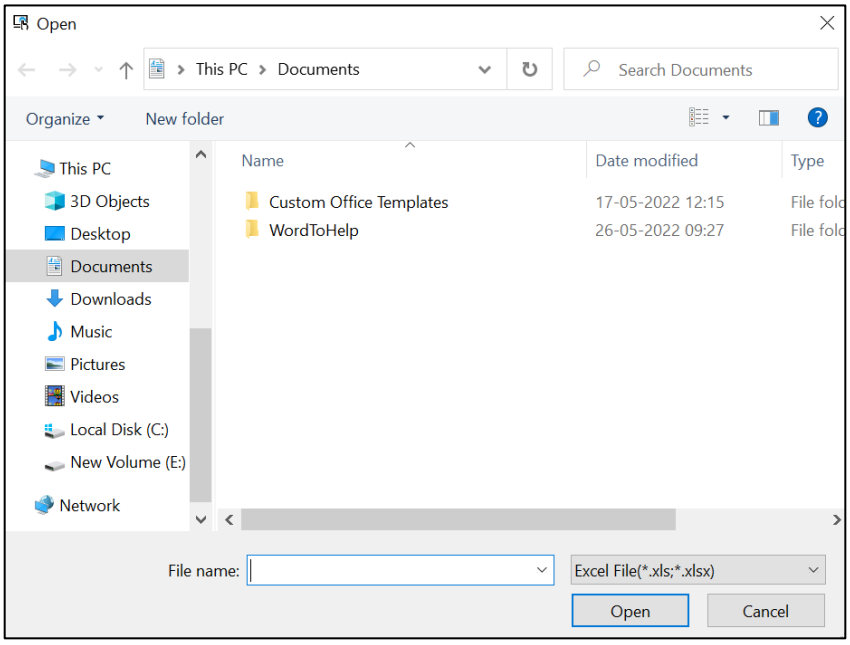
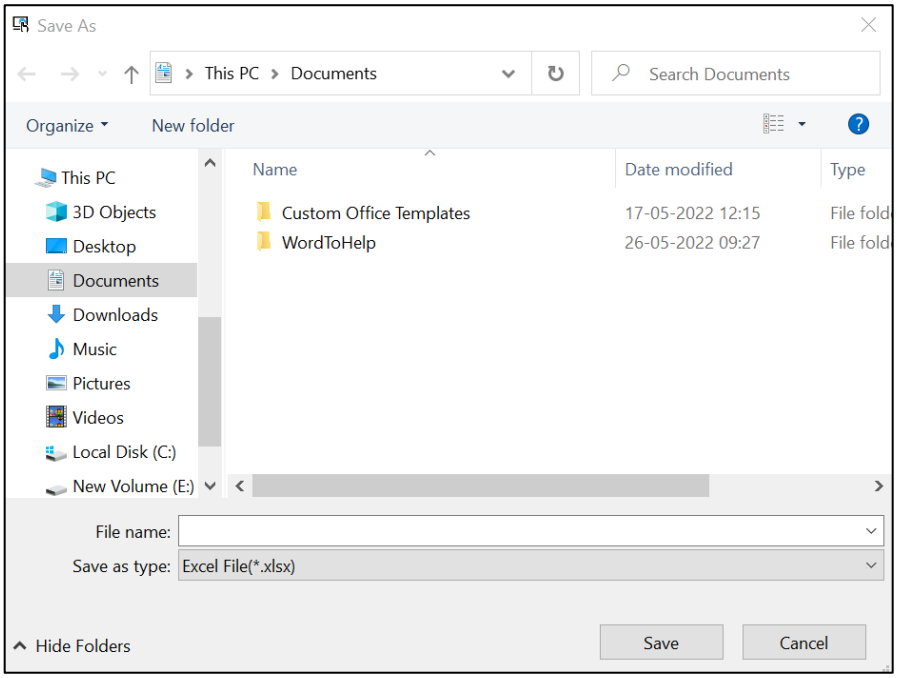
NOTE: The Text Bank content supports multi-line text.
</td></tr>
<tr><td>Delete Selected Text Bank</td><td>Select a data row to delete. Then click icon.</td></tr>
<tr><td>Import Text Bank</td><td>

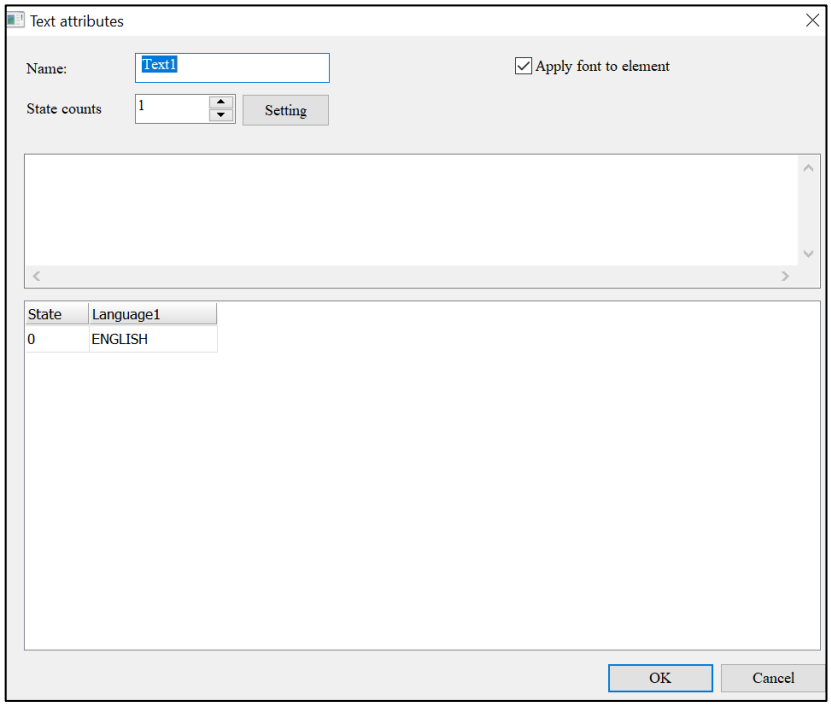
Supported file formats are .tbk, .txt and .xlsx.



Import texts from an already created text file (.txt) or Excel file (.xls).
Click icon to select the text file to be imported.

</td></tr>
</table>

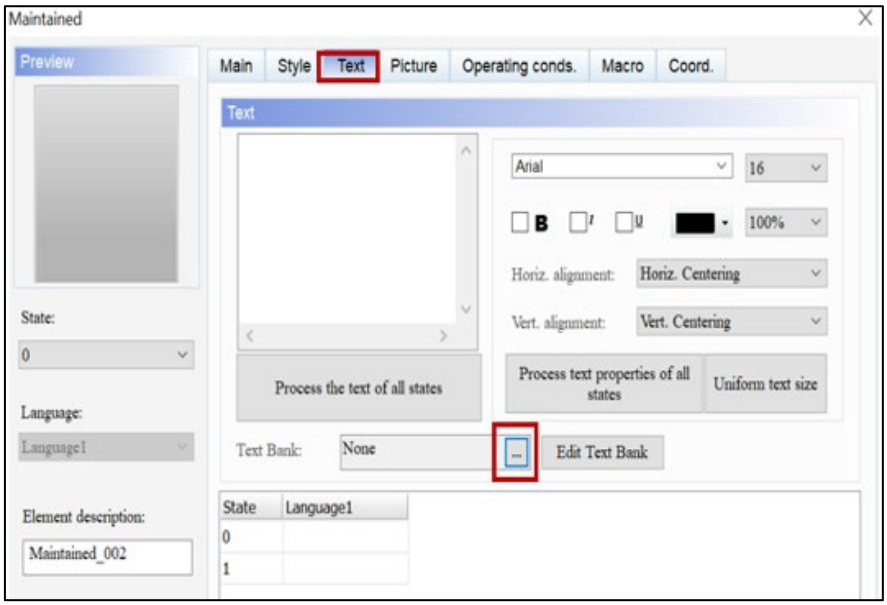
Text Bank Property Description	
	 ● After opening the text file, the text bank imports the content of text bank in the text file.
Export Text Bank 	● This function allows users to export the content of a text bank and save it as a file. ● Supported storage formats are .tbk and .xls. ● Click  icon to export the text bank. 
Edit the selected Text Bank 	● Click  icon to open the **Text attributes** window.

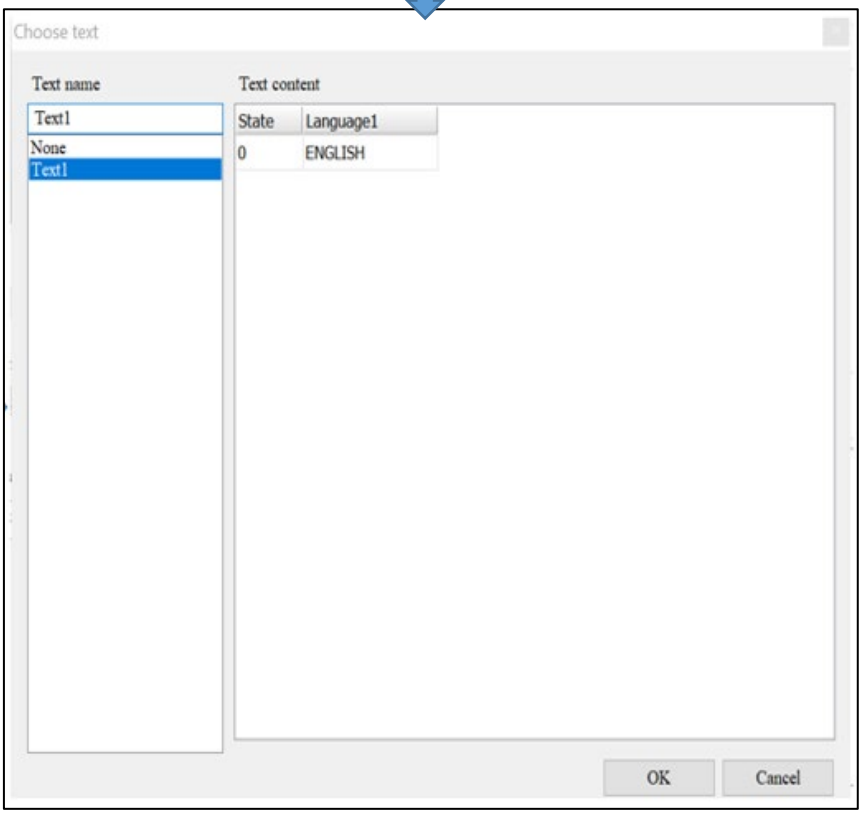
Text Bank Property Description	
	 ● It allows to edit **Name**, **State counts**, and **Apply font to element**. ● **State counts** support to set different values; up to 255 values can be set. The default value is **1**.

Following is the example of the Text Bank and elements.

Using Text Bank Function in Elements
● Add an element to the screen. Double-click the element to open the element property page. ● Open the **Text** property page. Click **Text Bank** to open the **Choose text** window.

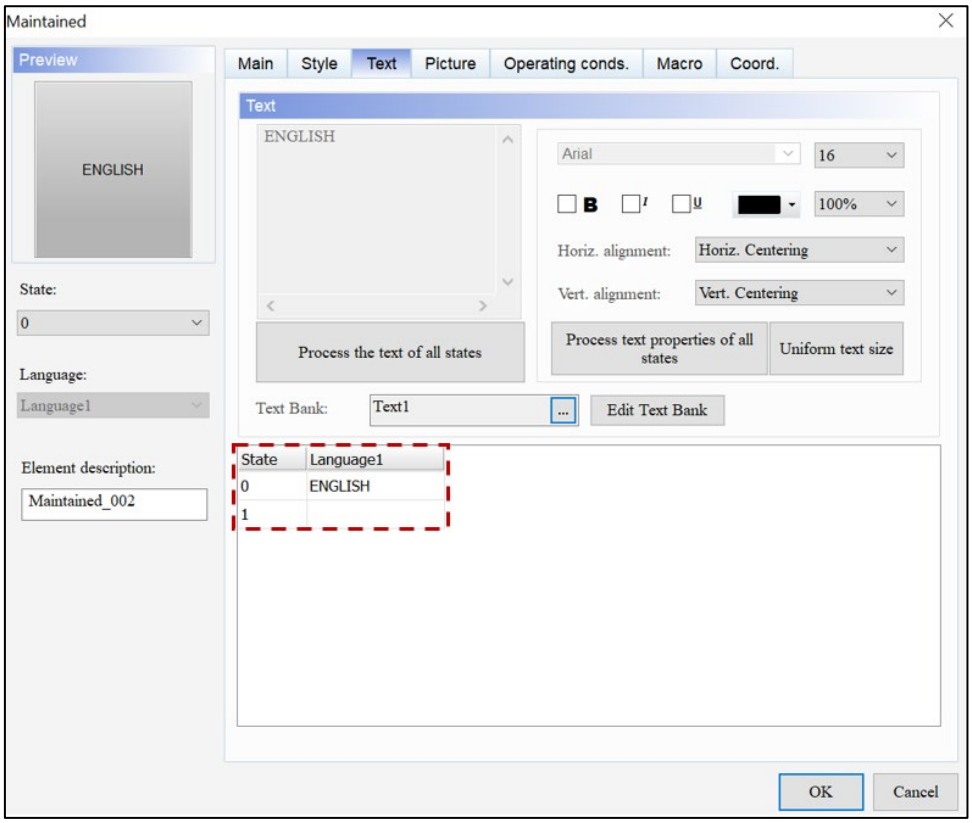
Using Text Bank Function in Elements



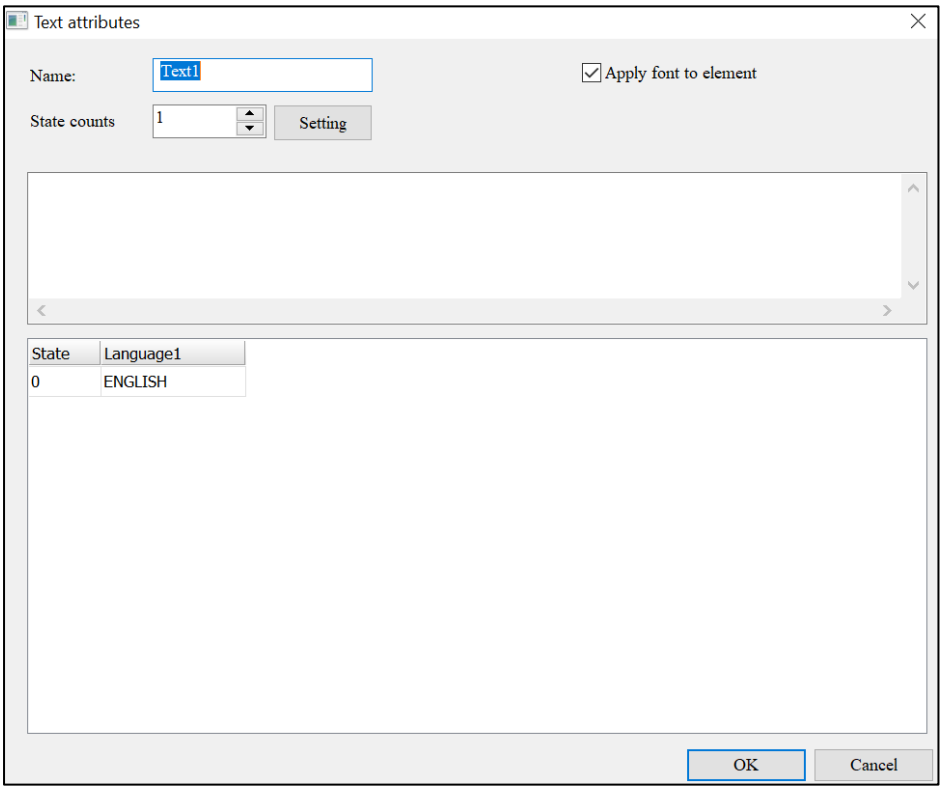


- Select **Text name** to be used, and then click **OK.** The text content applies to the element text.

Using Text Bank Function in Elements



- Click **Edit Text Bank** to edit the content of the selected Text Bank.



28.7 Multi-Lang Input Character Count Calculation

This function allows users to know precisely total bytes of the input characters. The number of bytes for different languages varies, possibly resulting in errors when calculating the length. Therefore, this widget is provided to help users calculate the correct number of bytes for Unicode.

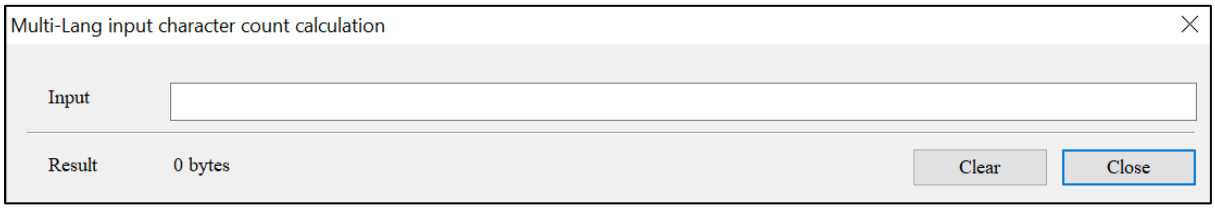
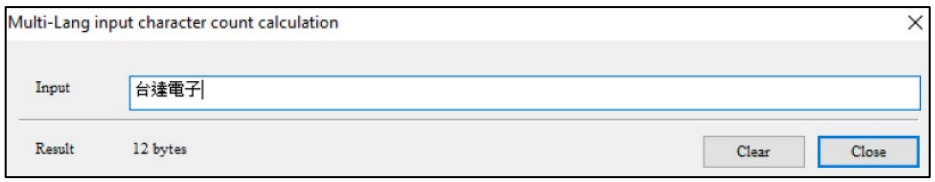
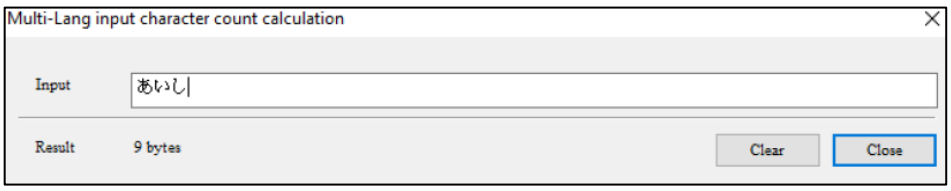


Figure 28 - 7: Multi-Lang input character count calculation

The numbers of bytes calculated after entering characters in three different languages are as follows.

Traditional Chinese	
English	
Japanese	

28.8 Custom Keypad

To create a **Custom Keypad**, go to the **Element Bank**, and drag and drop the element to the Home screen (the **Element Bank** is located on the right side DIAScreen window - next to **Properties** window).

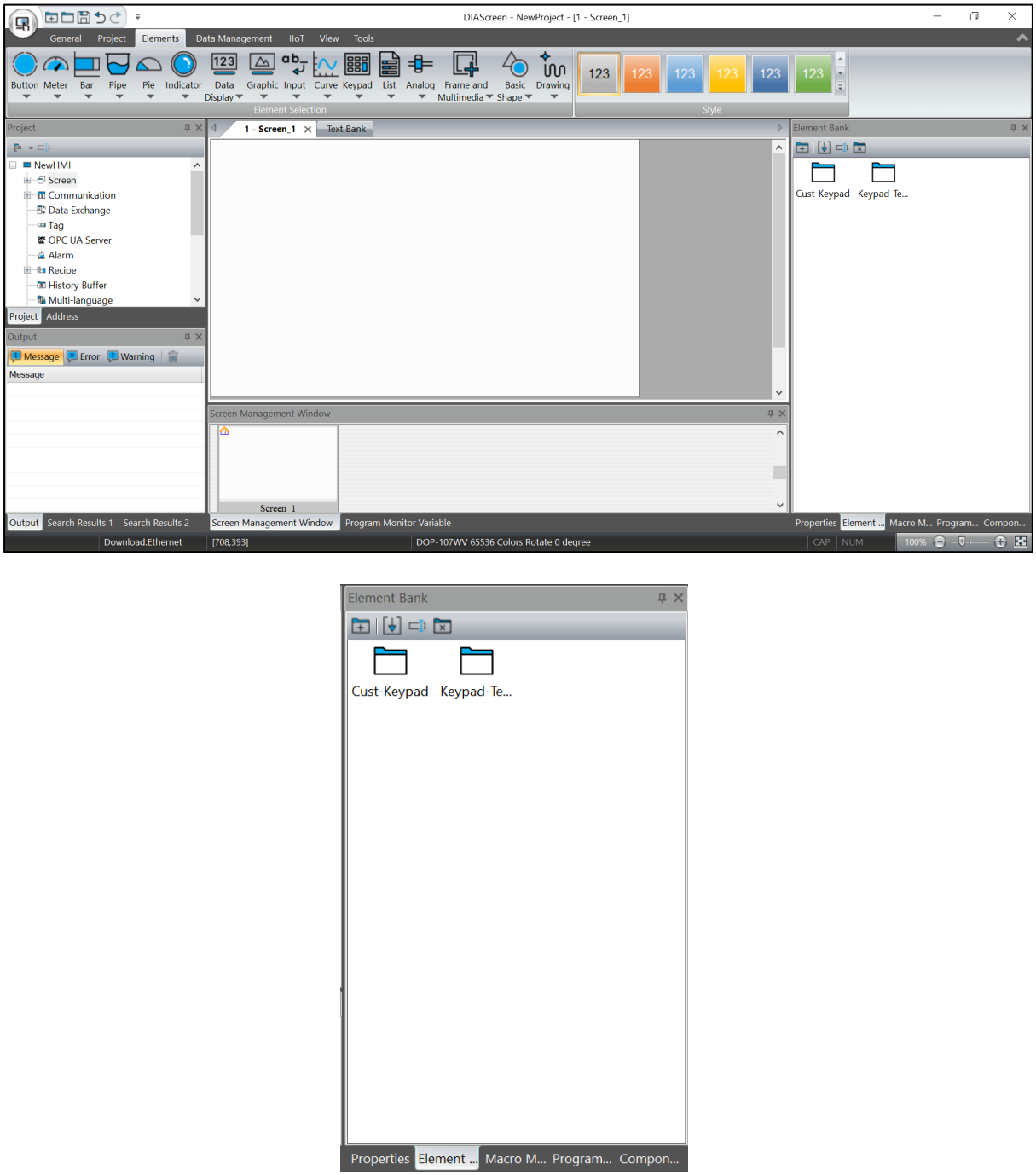


Figure 28 - 8: How to access Element Bank

Click **Element Bank** > **Keypad-Template** to see 16 keypad template styles provided by the software.

- KP(1): Decimal keypad (two styles, each with two sizes available <Big/Small>)
- KP(2): Hexadecimal keypad (two styles, each with two sizes available <Big/Small>)
- KP(3): ASCII keypad (two styles, each with two sizes available <Big/Small>)
- EASCII: Extended ASCII (one style, with two sizes available <Big/Small>)
- KP_Swedish: Swedish keypad (one style, with two sizes available <Big/Small>)

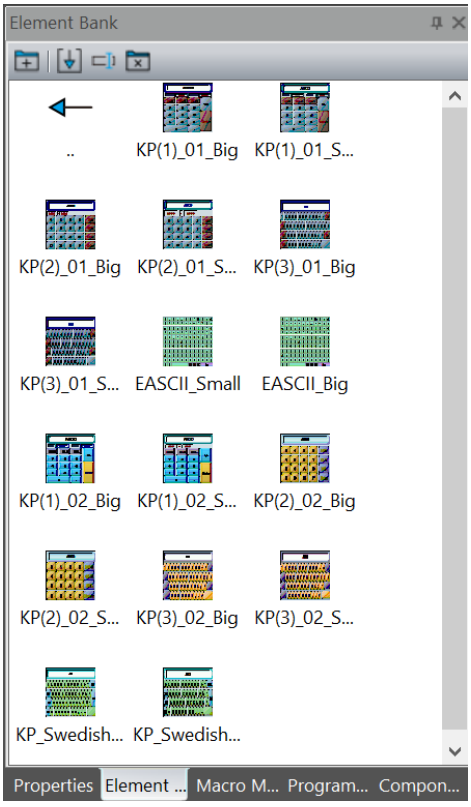


Figure 28 - 9: Element Bank - Keypad styles

DIAScreen not only provides built-in keypad styles but also allows users to customize keypad styles with the custom elements in **Cust-Keypad**.

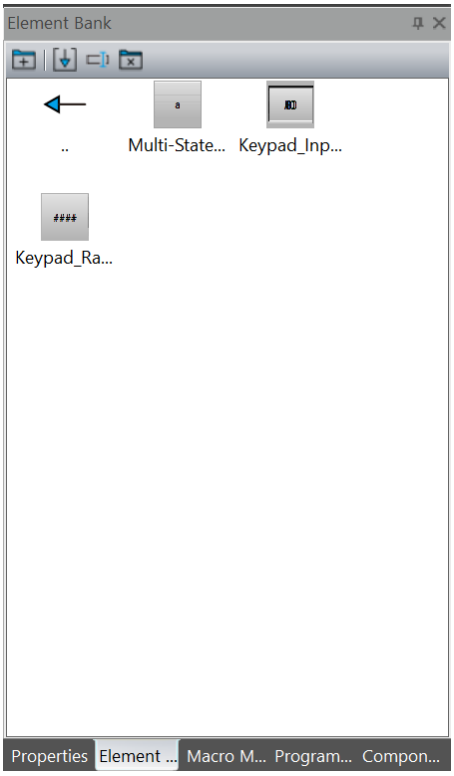
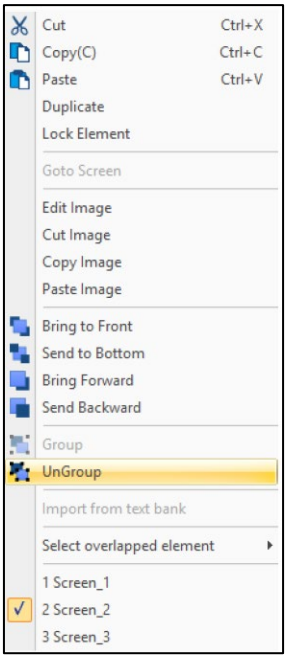


Figure 28 - 10: Cust-Keypad elements

With the custom element, replace the original keypad style provided by DIAScreen. Ungroup the keypad elements first to add the element from **Cust-Keypad** to the keypad, as shown in the following figure.



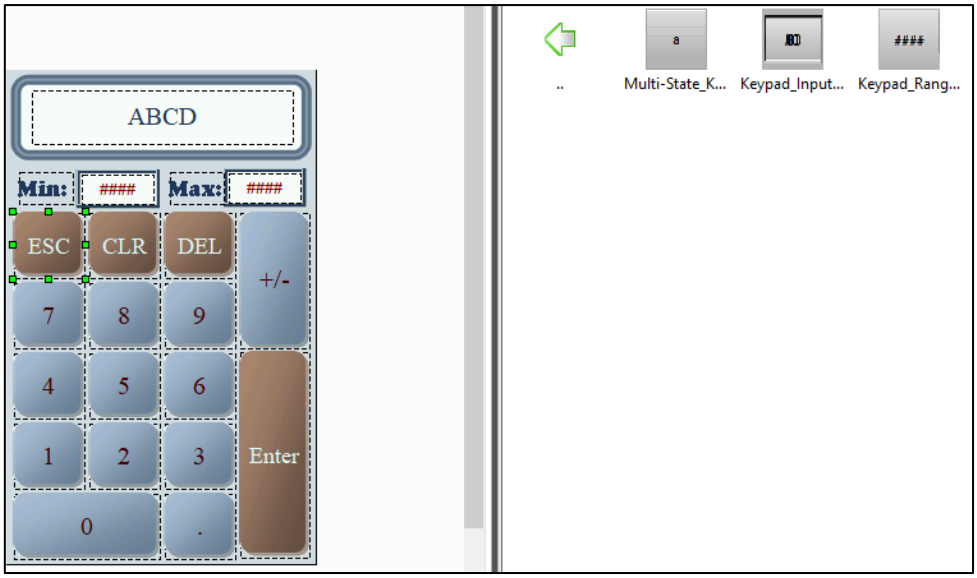


Figure 28 - 11: Replace with customized elements

28.8.1 Create Keypad Screen

Before creating the **Cust-Keypad** element of the **Element Bank**, set the screen to **Keypad Screen** to make the options of the Custom Keypad selectable. If the Custom Keypad element is created in a screen or subscreen, DIAScreen compiles the data normally, but users will not be able to select the Screen and Subscreen when using the Global Keypad Setting, a **Numeric Entry** element, a **Character Entry** element, a **Barcode Input** element, or **Set Value Button** element. In other words, only **Keypad Screen** can be selected by the custom keypad function.

Keypad screens can be created by the following methods:

- Select the screen type as **Keypad Screen** when adding a new screen.

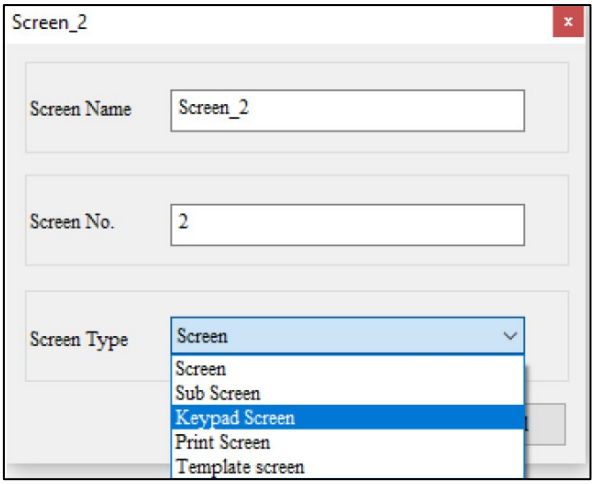


Figure 28 - 12: Create a screen

- Double-click the screen to enter the **Screen property setting** window and set the **Screen** to Keypad Screen.

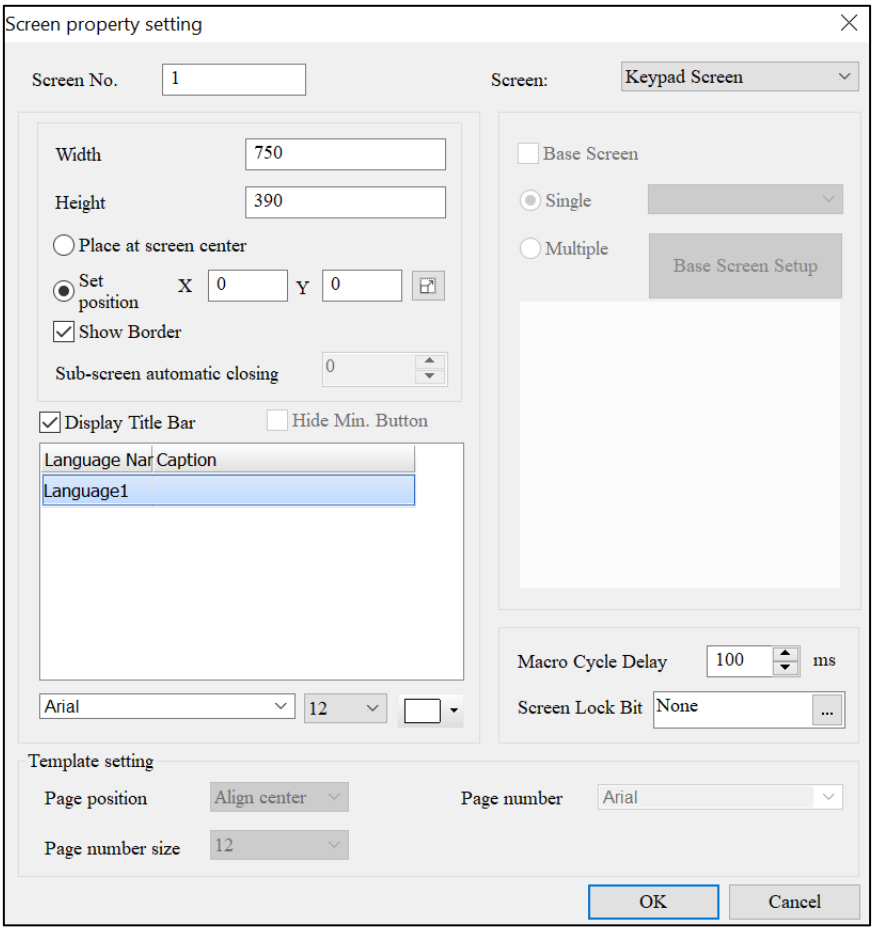


Figure 28 - 13: Screen property setting window

The Custom Keypad can also be used with Global Keypad Setting. Simply set the **Screen** as Keypad Screen and then create a keypad style to apply the keypad style to all keypad elements.

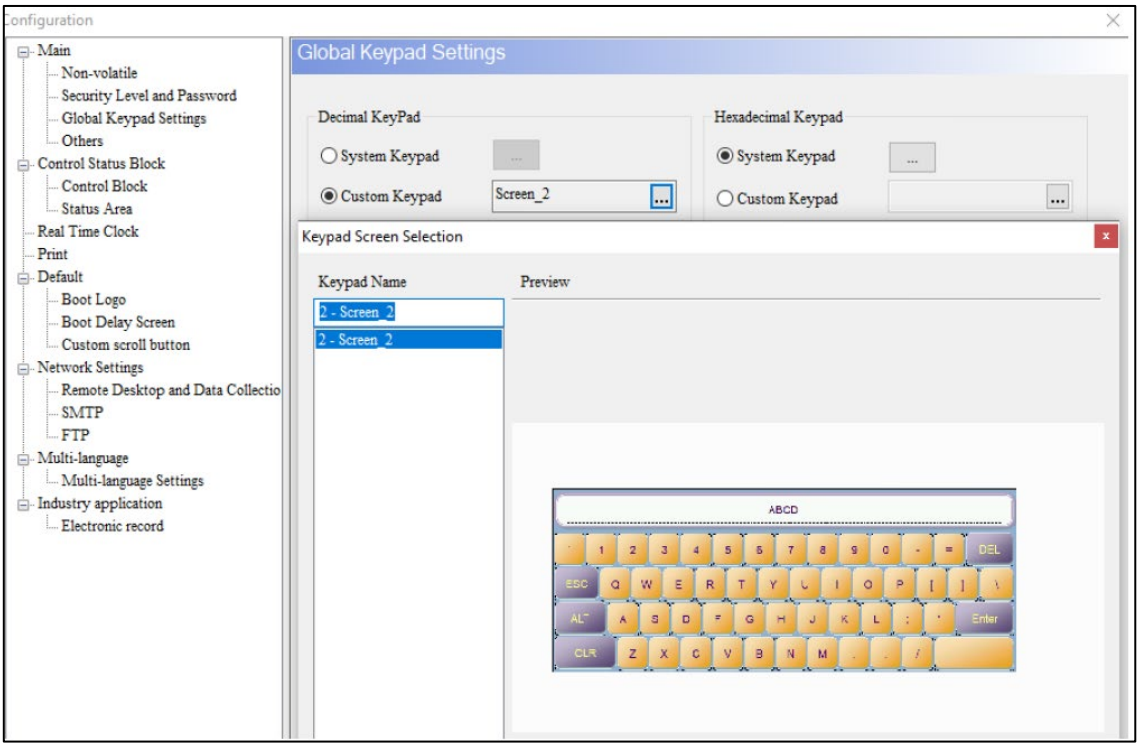
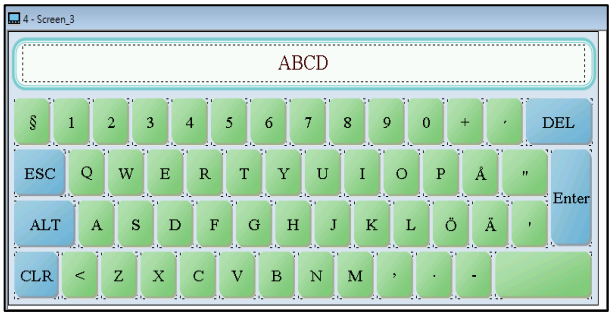
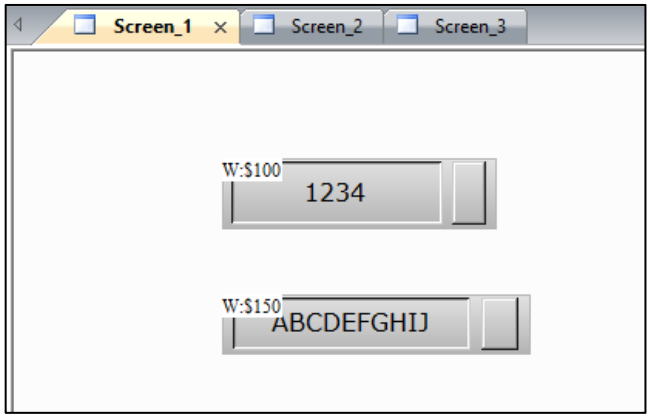


Figure 28 - 14: Custom Keypad

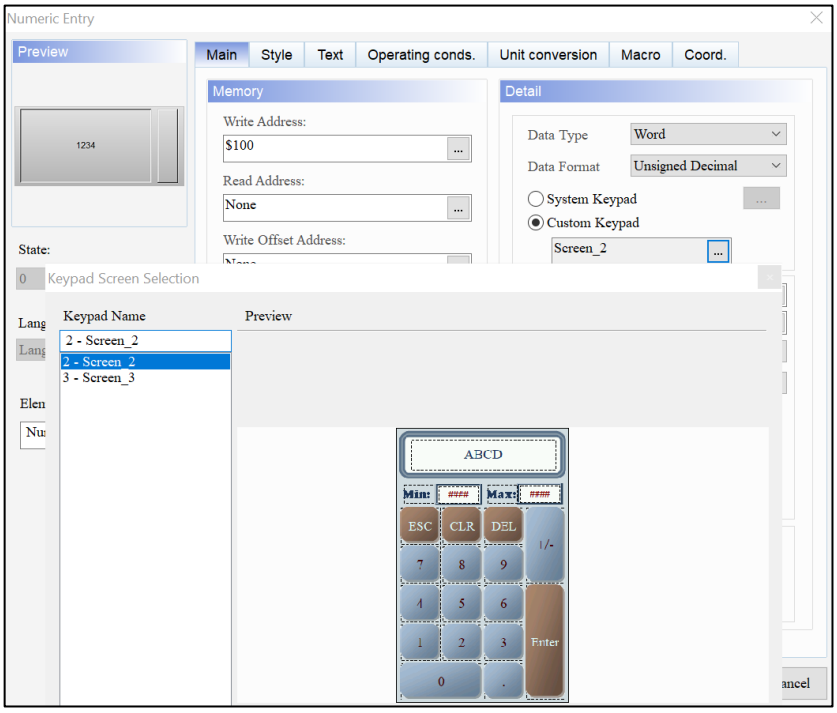
NOTE:

1. *The Keypad Screen cannot be the default boot screen.*
2. *Users can create multiple Keypad elements in the Keypad Screen.*
3. *Once deleted, Keypad Screen cannot be recovered.*
4. *Both Off-line Simulation and On-line Simulation are supported.*

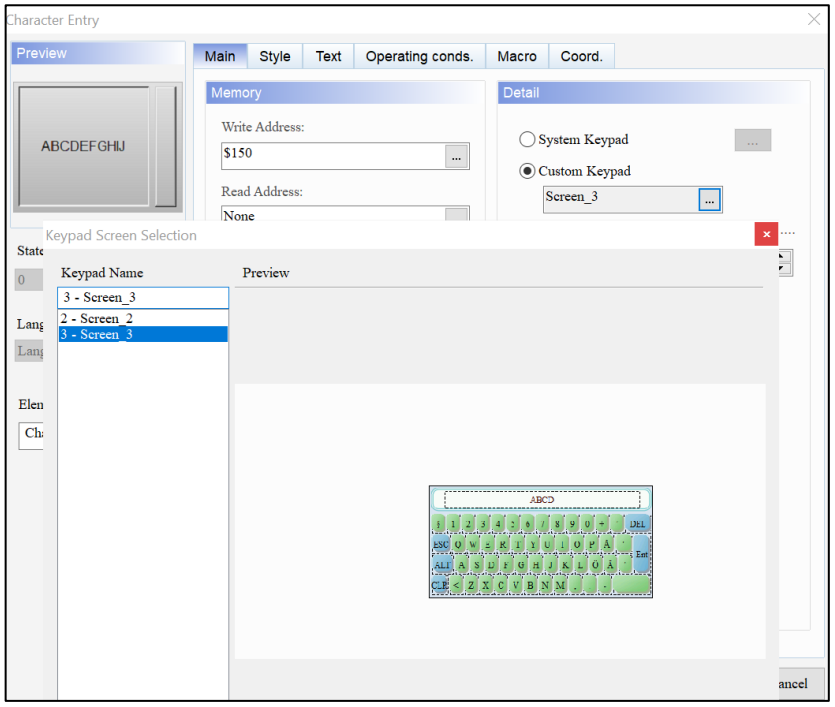
Refer to the following table for an example of a Cust-Keypad.

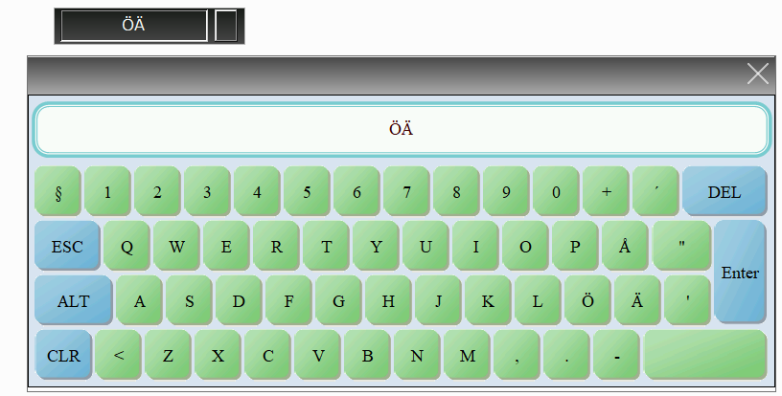
Cust-Keypad		
Step 1	Set Keypad Screen and create Keypad element	● Create three screens, one as Screen and the other two as Keypad Screen. ● Go to the **Keypad-Template** in the **Element Bank** and select KP (1)_01.Big keypad style for the first Keypad Screen.  ● Go to the **Keypad-Template** in the **Element Bank** and select KP_Swedish.Big keypad style for the second Keypad Screen. 
Step 2	Set Screen and create Numeric Entry and Character Entry elements	● Create a **Numeric Entry** element and a **Character Entry** element on the screen. Set **Write Address** of the **Numeric Entry** element to $100 and **Character Entry** element to $150 with **String Length** as 10. 
Step 3	Custom Keypad	● Select Custom Keypad for the **Numeric Entry** element of $100 and set Screen_2 as the Keypad Screen.

Cust-Keypad



- Select Custom Keypad for the **Character Entry** element of $150 and set Screen_3 as the Keypad Screen.



Cust-Keypad		
Step 4	Execution result	● After completing all settings, compile and download all the data to the HMI. ● When the **Numeric Entry** element of $100 is executed, the style of the pop-up keypad is Custom Keypad.  ● When the **Character Entry** element of $150 is executed, the input and display for EASCII characters / symbols are also supported. 

28.8.2 Delete Keypad Screen

If users want to delete the Keypad Screen, it can be explained whether the screen is referred.

DIAScreen can delete the Keypad Screen in two ways:

- Go to the **Screen Management** window, right-click the mouse on the screen to be deleted, and click **Delete**.

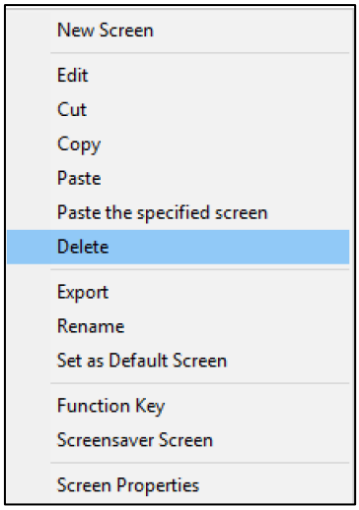


Figure 28 - 15: Delete screen

- Change the **Screen** to Screen or Subscreen and remove Keypad Screen.

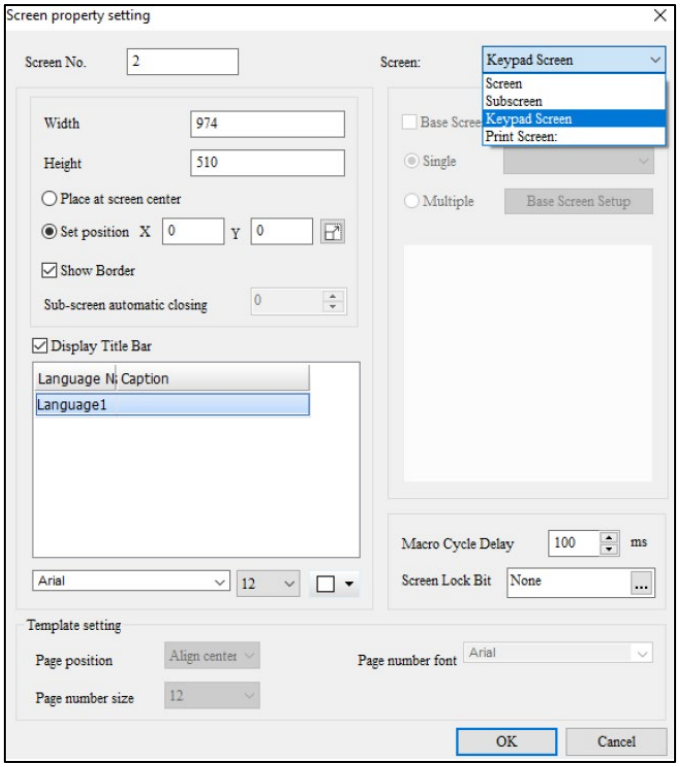


Figure 28 - 16: Delete screen

28.8.2.1 Keypad Screen Referred by Elements

If the keypad screen created is referred by the Global Keypad Settings, a **Numeric Entry** element, a **Character Entry** element, a **Barcode Input** element or the **Set Value Button** element, the following window appears when the keypad screen is deleted.

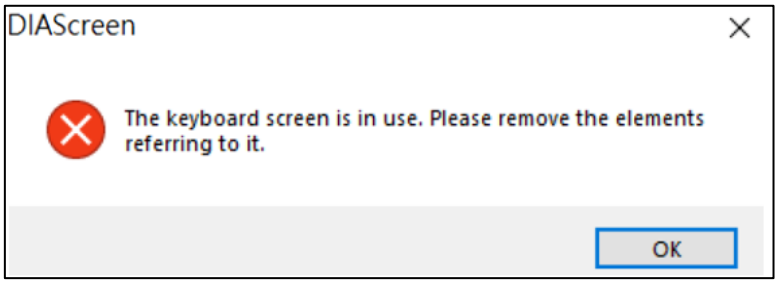


Figure 28 - 17: Keypad Screen is referred

Click **OK** and **Keypad Lists** window appears, allowing users to change the selection.

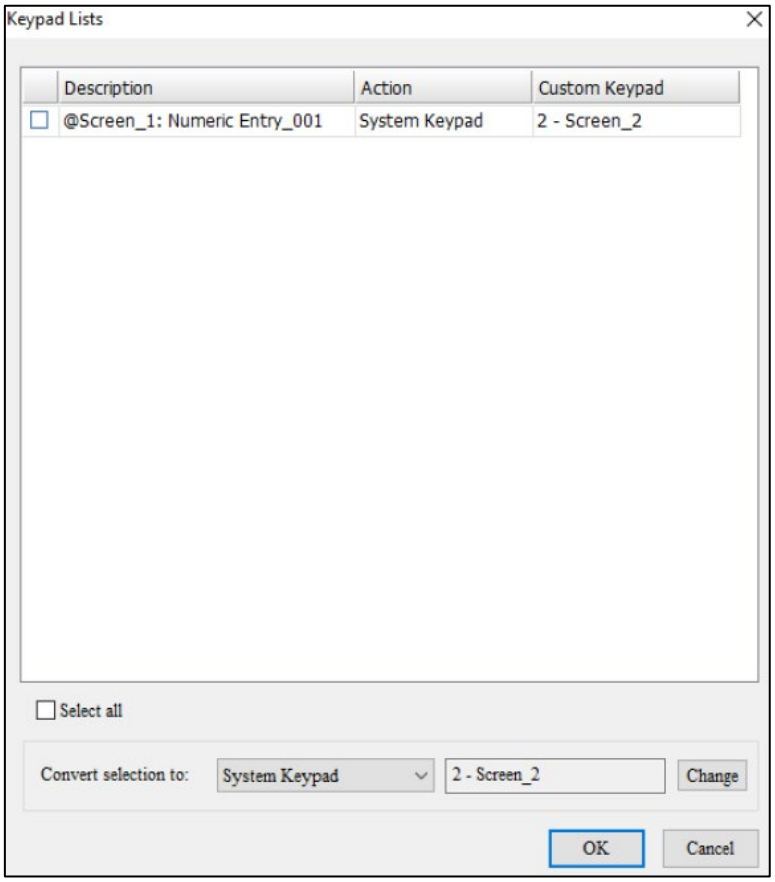
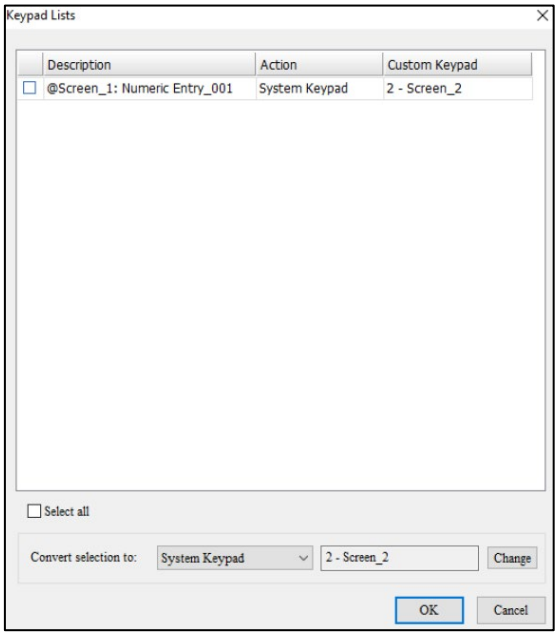
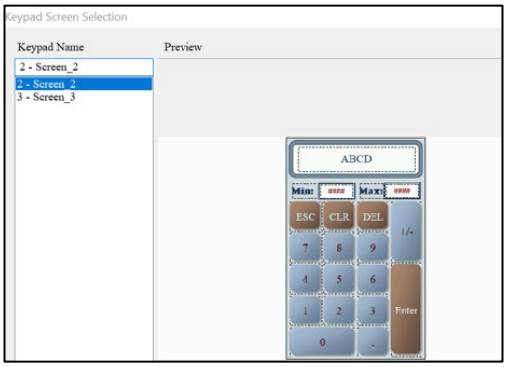
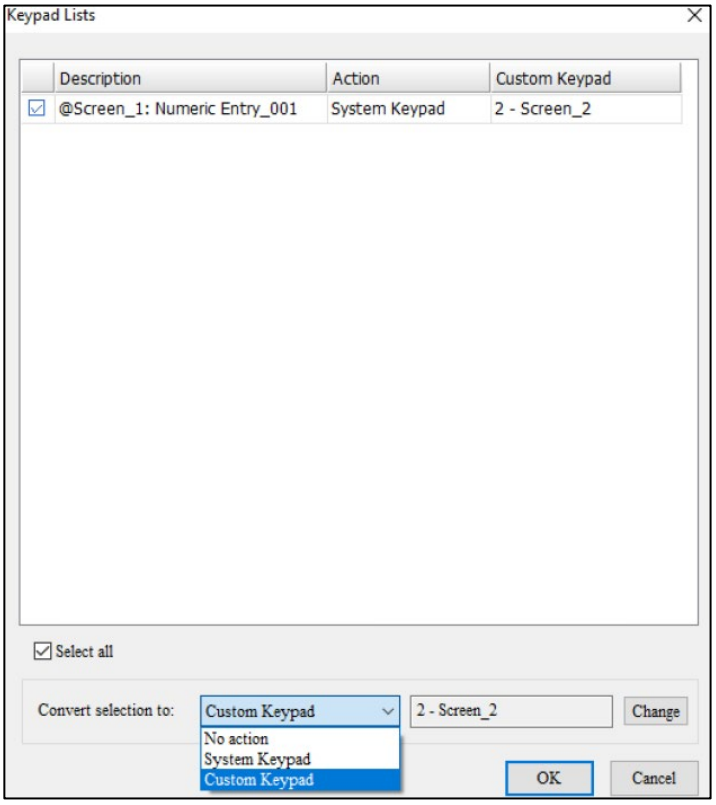
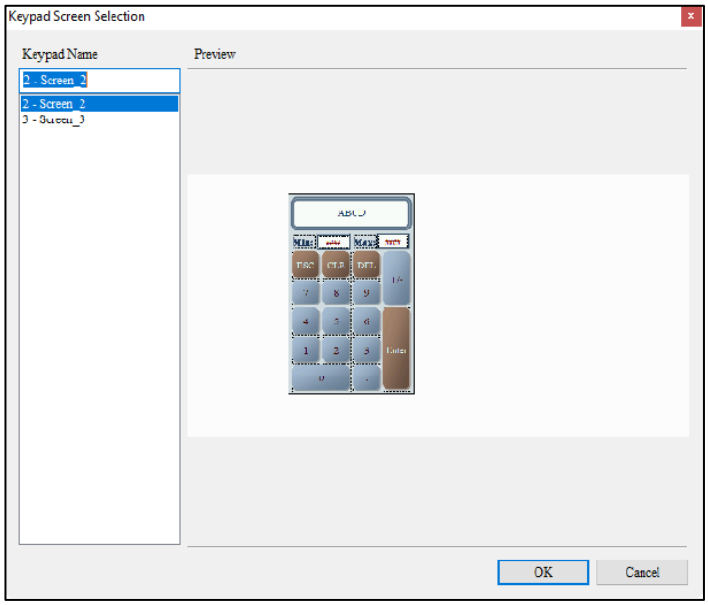


Figure 28 - 18: Keypad Lists

Refer to the following table for the Keypad Lists.

<table>
<tr><th colspan="3">Keypad Lists</th></tr>
<tr><td colspan="3"> 
</td></tr>
<tr><td>☐</td><td colspan="2">Allow to select an element and set its action to System Keypad, Custom Keypad, or No action.</td></tr>
<tr><td>Description</td><td colspan="2">It is the description of the element or the Global Keypad. Click description of an element, and corresponding screen appears to select the paired element.</td></tr>
<tr><td rowspan="3">Action</td><td>No action</td><td>Indicate that current setting will not be changed.</td></tr>
<tr><td>System Keypad</td><td>Indicate to use the system keypad instead.</td></tr>
<tr><td>Custom Keypad</td><td>Indicate to switch to another custom keypad, and a window for selecting a keypad appears. 
</td></tr>
<tr><td>Custom Keypad</td><td colspan="2">Display the currently set Custom Keypad and the ID. This field setting is only applicable when users set Custom Keypad for the Action field.</td></tr>
<tr><td>Select All</td><td colspan="2">Select the System Keypad, Custom Keypad, and No action in the Action field of all elements at once.</td></tr>
</table>

<table>
<tr><th colspan="3">Keypad Lists</th></tr>
<tr><td></td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Convert selection to</td><td>No action</td><td>The current settings will not be changed.</td></tr>
<tr><td>System Keypad</td><td>The System Keypad will be used.</td></tr>
<tr><td>Custom Keypad</td><td>A Custom Keypad will be used. At this time, a window appears to select the keypad screen users want to use.
 
</td></tr>
<tr><td>Change</td><td colspan="2">● The change will be made based on the selected element and action or the option selected in the Convert selection to.</td></tr>
</table>

Keypad Lists	
	● If users do not click **OK** after the conversion, this conversion is not applied.
OK	● After clicking **OK**, the system applies the setting to the corresponding elements and global keypad. ● Closing the window by clicking **X** or **Cancel** will not change any settings.

After the conversion, the HMI asks whether users want to delete the screen. Select **Yes** to delete the keypad screen. Select **No** to keep the keypad screen and simply cancel or transfer the link referred by the element.

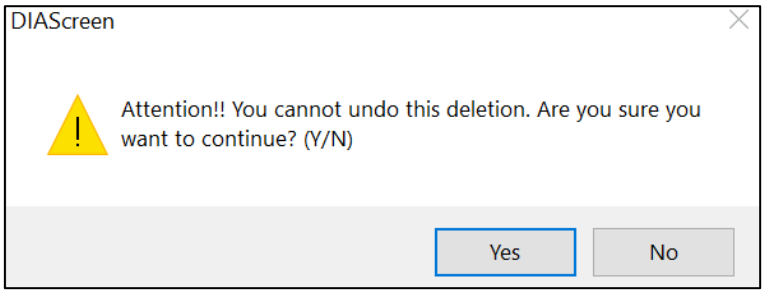


Figure 28 - 19: Confirmation for Delete Screen

28.8.2.2 Keypad Screen Not Referred by Elements

If the keypad screen created is not referred by the Custom Keypad of the Global Keypad Settings, a **Numeric Entry** element, a **Character Entry** element, a **Barcode Input** element or the **Set Value Button** element, the following window appears when users delete the keypad screen by right-clicking the screen in **Screen Management** window and click **Delete**.

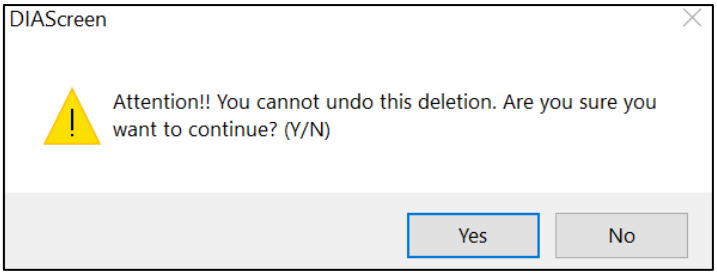


Figure 28 - 20: Confirmation for Delete Screen

Select Yes to delete the keypad screen or select No to keep the screen.

If users change the **Screen** to Screen or Subscreen in the **Screen property setting** window, the change will be applied directly without showing any warning message.

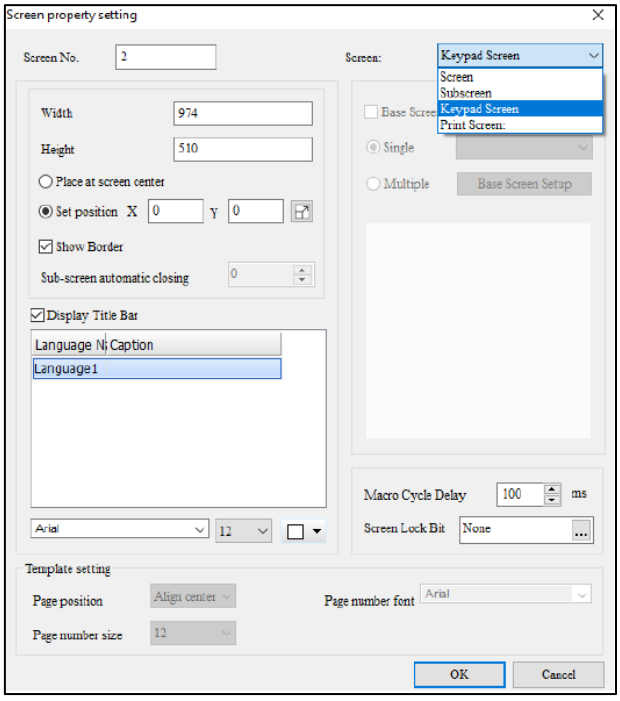


Figure 28 - 21: Change Screen type

28.9 Sound Settings

***NOTE**: Currently, the models supported by **Sound Settings** are DOP-107IV, DOP-107EG, DOP-108IG, DOP-110IG, DOP-110IS, DOP-112MX, DOP-112WX, DOP-115MX, and DOP-115WX.*

From the toolbar **Project** > **Other Setting** > **Sound Settings**, use sound output to inform the on-site operators if there is any error. This function can be triggered by the bit address of the sound file and can be used with the values in the word register to specify different sound files. The supported sound file formats are mp3 and wav. If users are editing the project for the model which does not support the Sound Settings, then this option is not available.

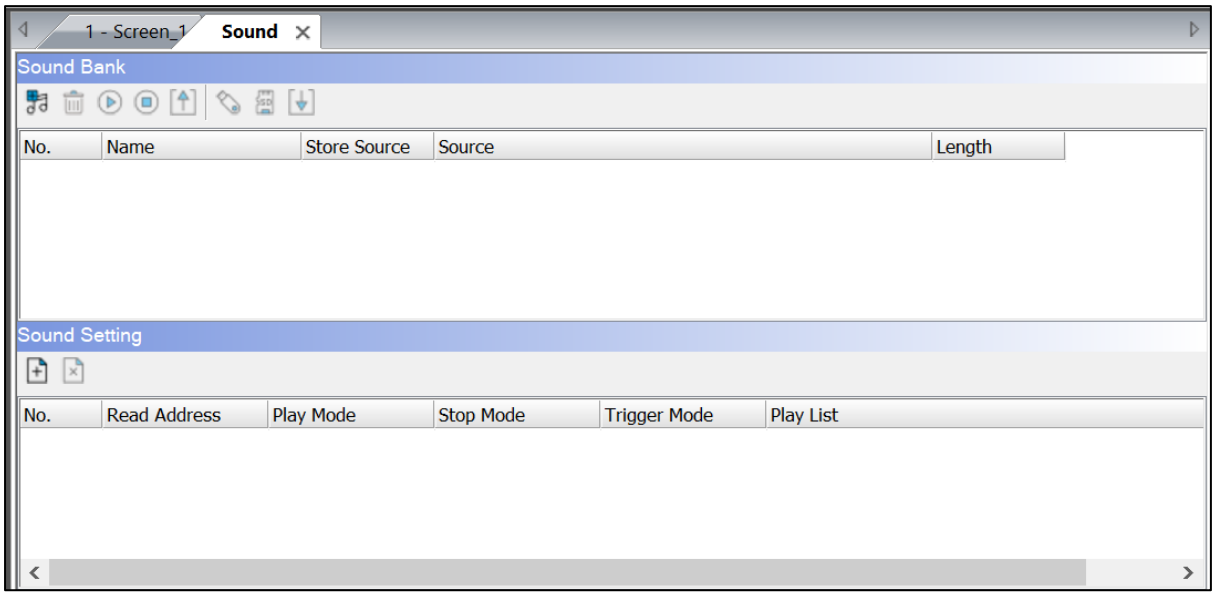


Figure 28 - 22: Sound Settings

Sound Settings can be described from two aspects: **Sound Bank** and **Sound Setting**.

Sound Bank allows to add, delete or export sound files, or specify the storage location of the sound files.

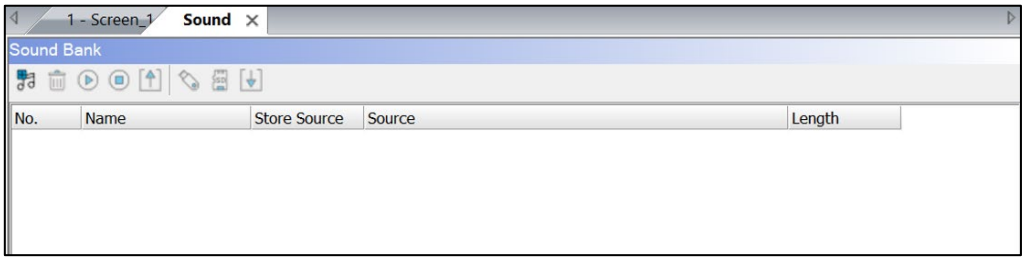


Figure 28 - 23: Sound Bank

Sound Setting sets how the sound files are played, stopped and triggered.

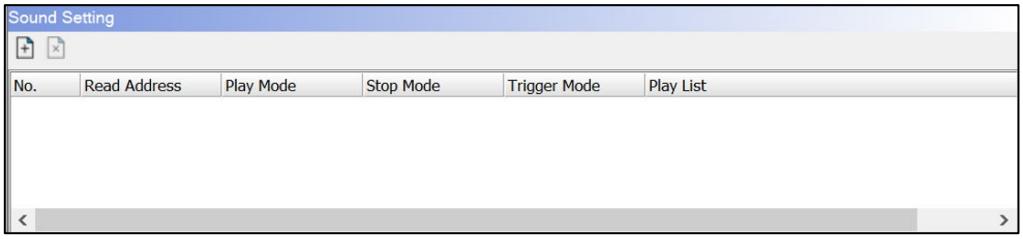
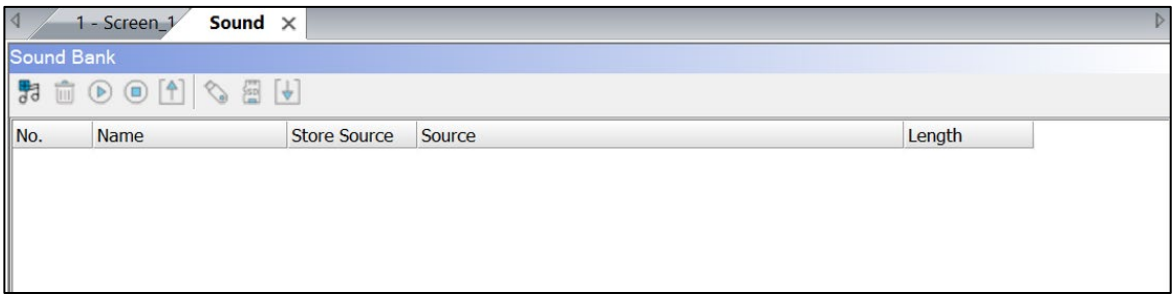
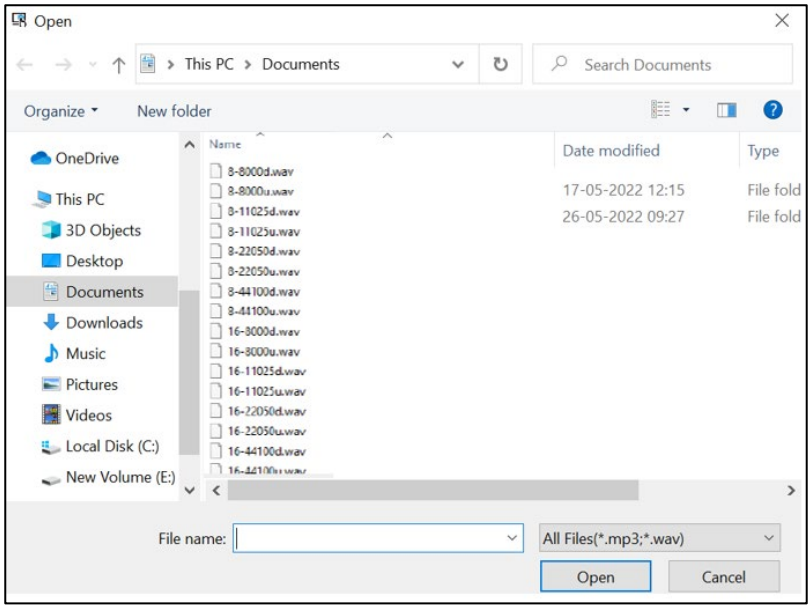
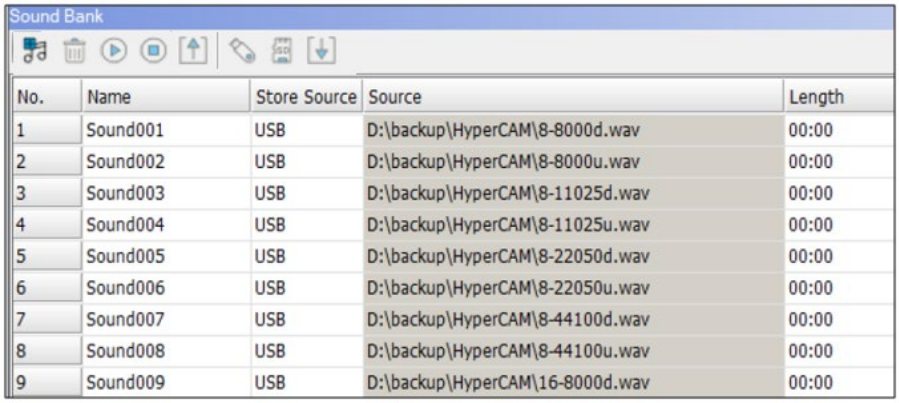


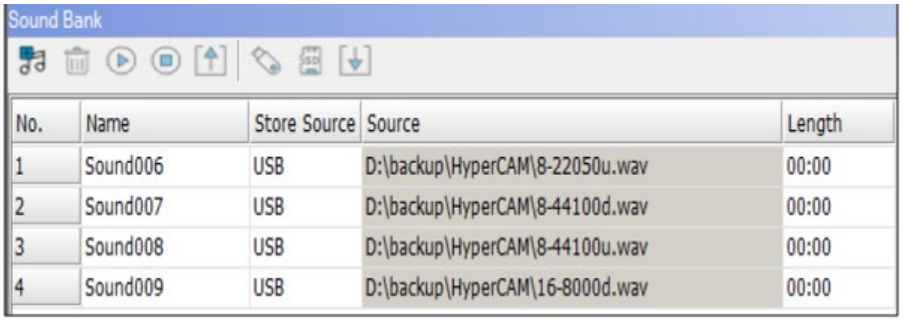
Figure 28 - 24: Sound Setting

Sound Bank and **Sound Setting** are described in detail as follows.

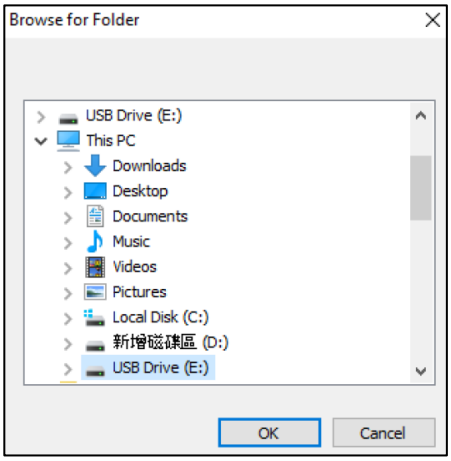
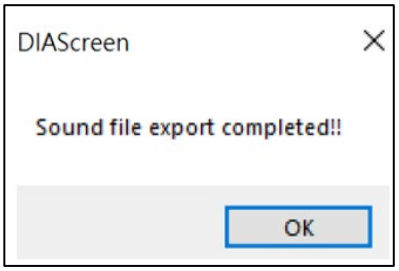
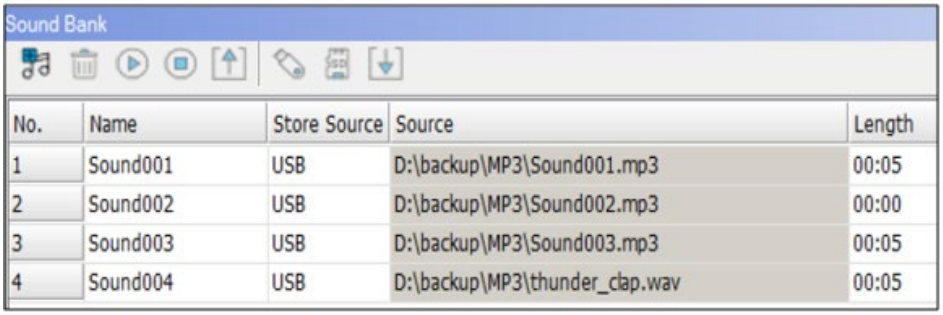
Sound Bank	
	
Toolbar Icon Description	
Add new	● Click  icon to select the sound file to play.

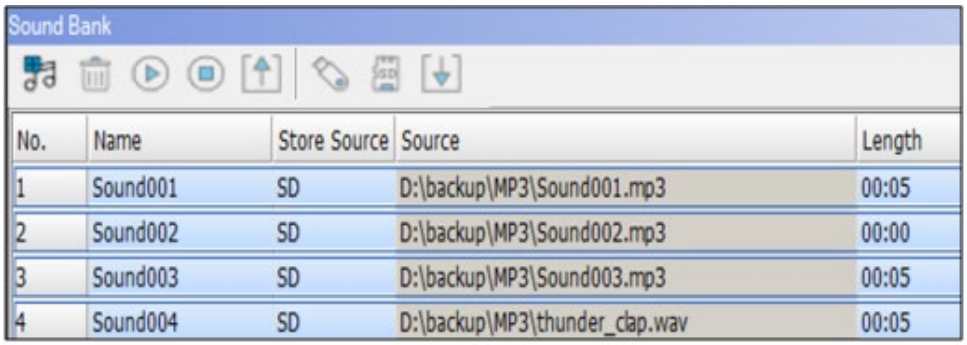
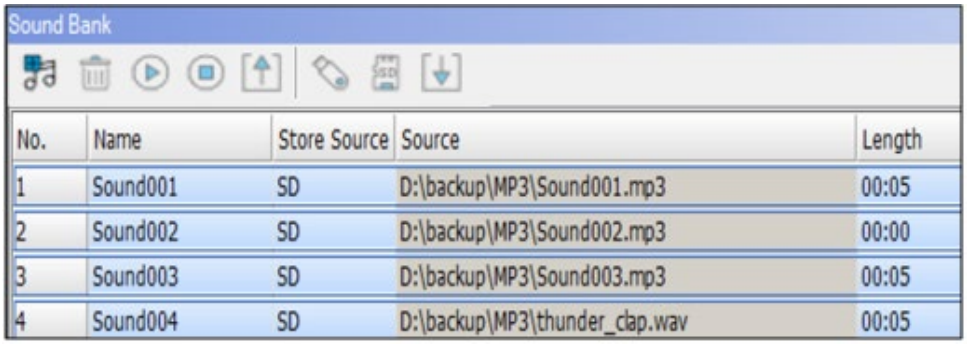
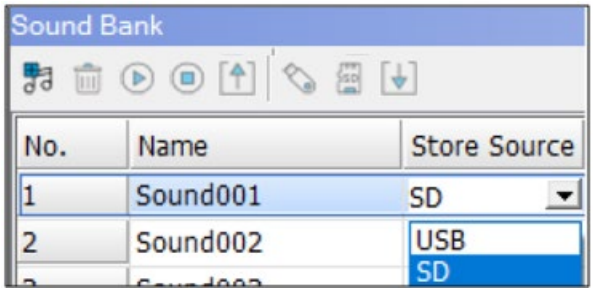
<table>
<tr><th colspan="2">Sound Bank</th></tr>
<tr><td>audio file  </td><td>
Add up to 1000 (0 ~ 999) audio files.


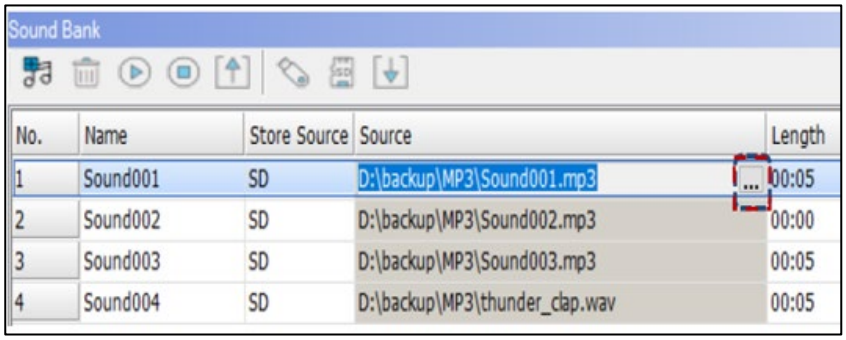
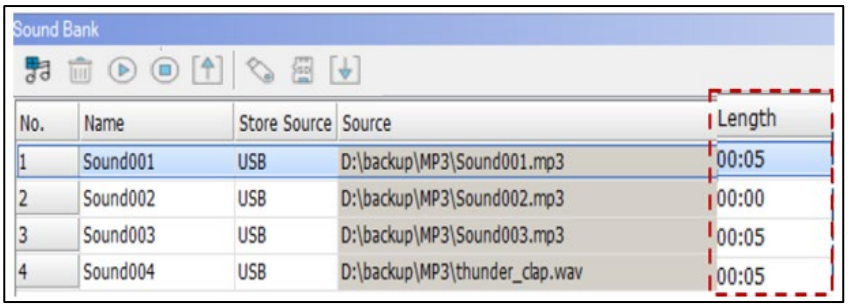
</td></tr>
<tr><td>Remove audio files  </td><td>
To delete one or multiple audio files after the files are added, click one file or hold the Shift or Ctrl key and left-click multiple files to be deleted, and then click  icon.


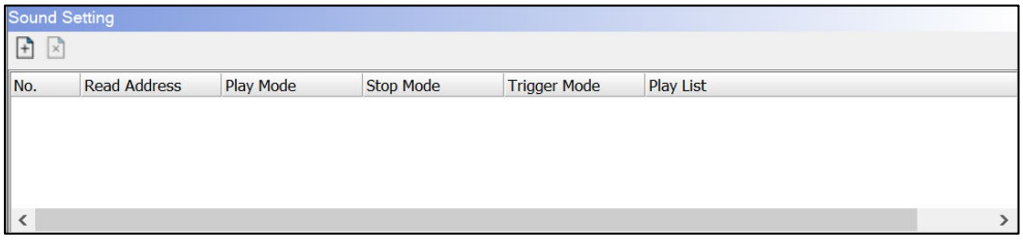
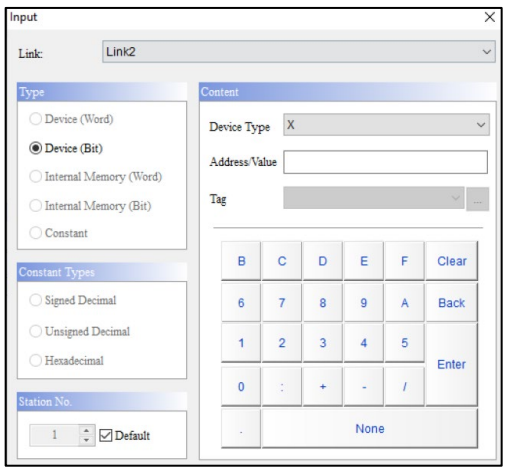
<table>
<tr><th>No.</th><th>Name</th><th>Store Source</th><th>Source</th><th>Length</th></tr>
<tr><td>1</td><td>Sound001</td><td>USB</td><td>D:\backup\HyperCAM\8-8000d.wav</td><td>00:00</td></tr>
<tr><td>2</td><td>Sound002</td><td>USB</td><td>D:\backup\HyperCAM\8-8000u.wav</td><td>00:00</td></tr>
<tr><td>3</td><td>Sound003</td><td>USB</td><td>D:\backup\HyperCAM\8-11025d.wav</td><td>00:00</td></tr>
<tr><td>4</td><td>Sound004</td><td>USB</td><td>D:\backup\HyperCAM\8-11025u.wav</td><td>00:00</td></tr>
<tr><td>5</td><td>Sound005</td><td>USB</td><td>D:\backup\HyperCAM\8-22050d.wav</td><td>00:00</td></tr>
<tr><td>6</td><td>Sound006</td><td>USB</td><td>D:\backup\HyperCAM\8-22050u.wav</td><td>00:00</td></tr>
<tr><td>7</td><td>Sound007</td><td>USB</td><td>D:\backup\HyperCAM\8-44100d.wav</td><td>00:00</td></tr>
<tr><td>8</td><td>Sound008</td><td>USB</td><td>D:\backup\HyperCAM\8-44100u.wav</td><td>00:00</td></tr>
<tr><td>9</td><td>Sound009</td><td>USB</td><td>D:\backup\HyperCAM\16-8000d.wav</td><td>00:00</td></tr>
</table>
The list after the deletion of sound files:


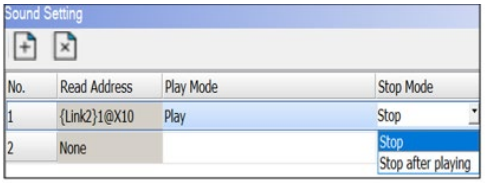
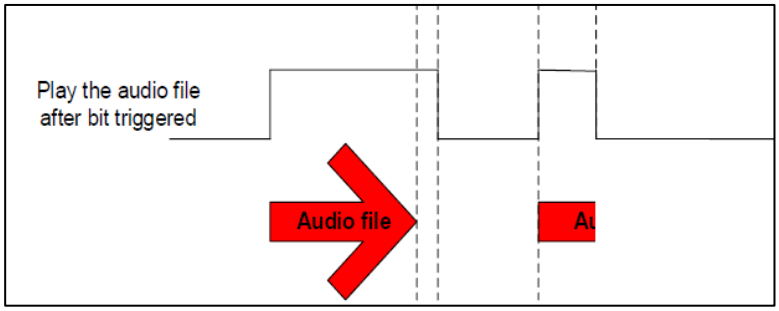
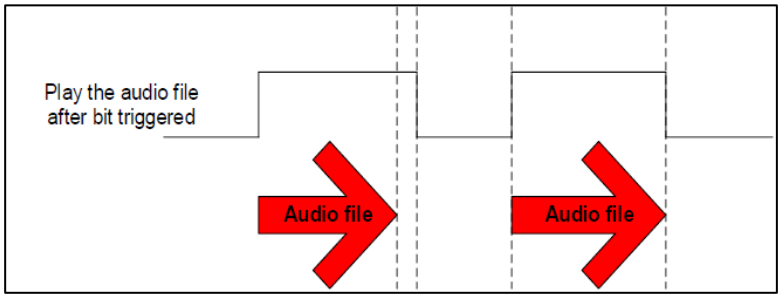
<table>
<tr><th>No.</th><th>Name</th><th>Store Source</th><th>Source</th><th>Length</th></tr>
<tr><td>1</td><td>Sound006</td><td>USB</td><td>D:\backup\HyperCAM\8-22050u.wav</td><td>00:00</td></tr>
<tr><td>2</td><td>Sound007</td><td>USB</td><td>D:\backup\HyperCAM\8-44100d.wav</td><td>00:00</td></tr>
<tr><td>3</td><td>Sound008</td><td>USB</td><td>D:\backup\HyperCAM\8-44100u.wav</td><td>00:00</td></tr>
<tr><td>4</td><td>Sound009</td><td>USB</td><td>D:\backup\HyperCAM\16-8000d.wav</td><td>00:00</td></tr>
</table>
</td></tr>
<tr><td>Play  </td><td>  icon allows to play the selected sound file and check if it can be played properly.</td></tr>
</table>

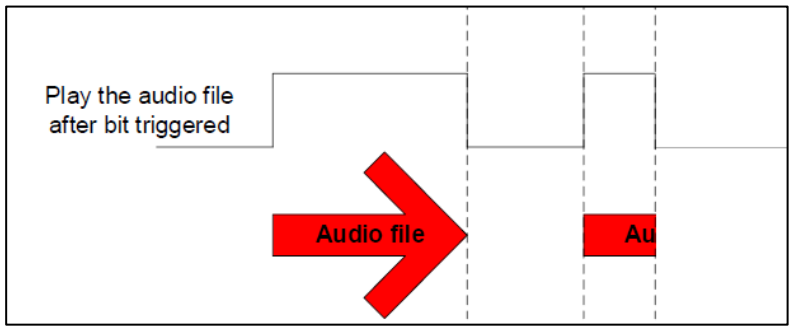
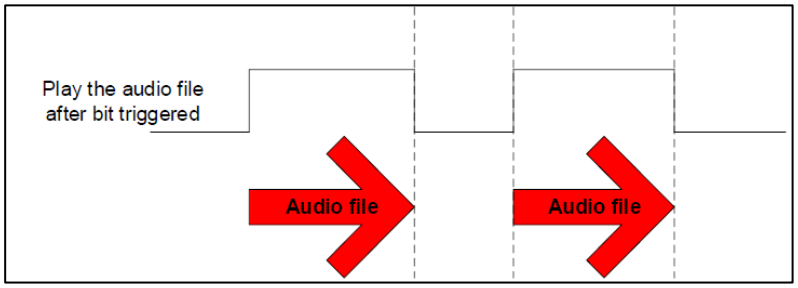
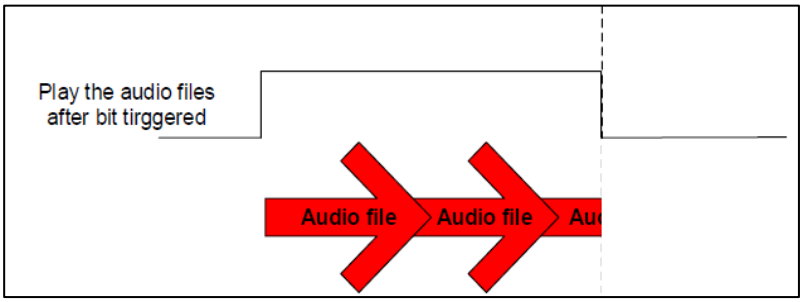
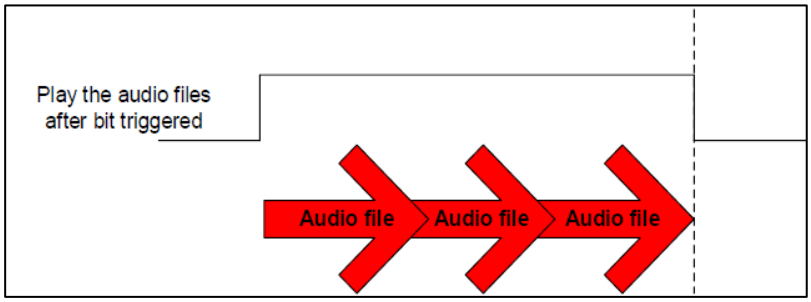
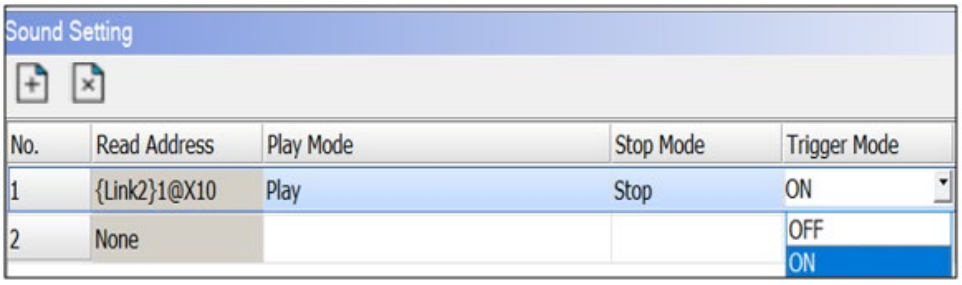
Sound Bank	
Stop 	 icon allows to stop the sound file currently being played.
Export audio files 	● While exporting a sound file, users will be asked to select a device to save the file. Note that the file must be saved to the root directory. In other words, do not save the sound files in any folder.  ● After the export is complete, a message of successful export appears as shown in the following figure. 
Audio files stored on USB 	**Audio files stored in USB or SD** allows to change the storage device of multiple sound files quickly. These two buttons can also be used on a single sound file. Select multiple sound files in the same way as that for deleting files. Refer to the latter for details. ● Before changing the storage device to SD:
Audio files stored in SD 	

Sound Bank	
	● After changing the storage device to SD: 
Field Description	
No.	The **No.** field is a major reference value when playing audio files. When users use address as the reading method in the playlist, DIAScreen determines which audio file to play based on the set memory address. 
Name	Filenames of the audio files added to the list are displayed as Sound. The filename of the first audio file starts with 001, which is Sound001, and followed by Sound002, Sound003, and so on.
Store Source	The available options for Storage location are: USB and SD. Change the storage device as required. The default value is **USB**. 
Source	**Source** is the path of the added audio file. After the audio file is added, users can change the source audio file, which means replacing the sound track.

Sound Bank	
	
Length	**Length** displays the length of the audio file. 

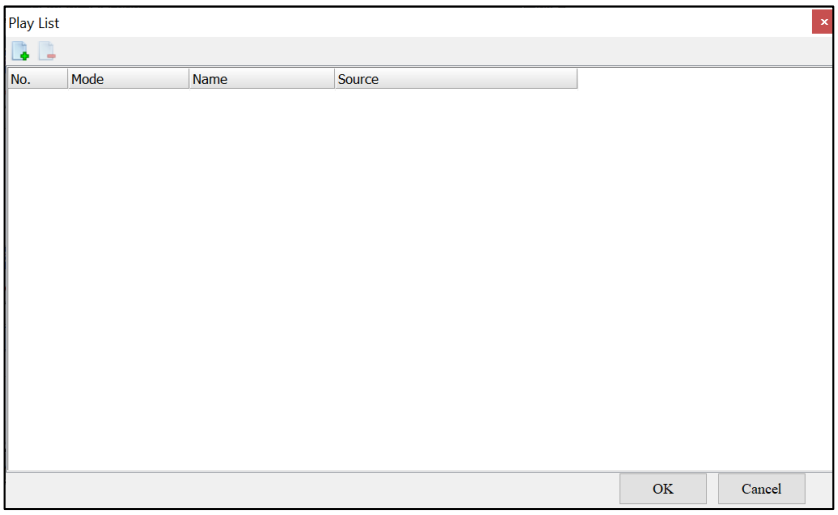
Sound Setting	
	
The Sound Setting includes **No.**, **Read Address**, **Play Mode**, **Stop Mode**, **Trigger Mode**, and **Play List**.	
No.	It allows maximum 512 data entries.
Read Address	**Read Address** can only be set as Bit to trigger and play audio files. 

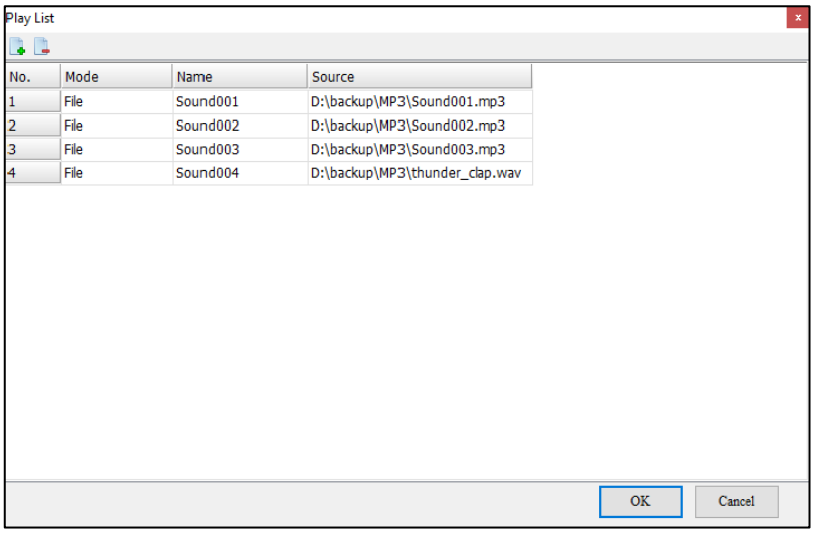
<table>
<tr><th colspan="4">Sound Setting</th></tr>
<tr><td rowspan="5">Mode</td><td colspan="2">Play Mode</td><td>Stop Mode</td></tr>
<tr><td colspan="2">The available options for Play Mode in the control list are: Play, Cleared automatically after playing, and Repeat play. The default value is Play.
 
</td><td>The available options for Stop Mode in the control list are: Stop and Stop after playing. The default value is Stop.
 
</td></tr>
<tr><td colspan="3">● Play Mode: Play.
● Play means that the sound plays immediately after the Bit is triggered.</td></tr>
<tr><td>Stop Mode: Stop</td><td colspan="2">● If Stop is selected as the Stop Mode, no matter the sound track is playing or not, it stops immediately.
 
</td></tr>
<tr><td>Stop Mode: Stop after playing</td><td colspan="2">● If Stop after playing is selected as the Stop Mode, the sound track is played to the end and stopped.
 
</td></tr>
<tr><td colspan="3">● Play Mode: Cleared automatically after playing
● The Cleared automatically after playing option means that the audio file clears the bit after playing the sound track.
● If users select the same address for triggering and playing two sound tracks, this bit is cleared after these two sound tracks finish playing.</td></tr>
</table>

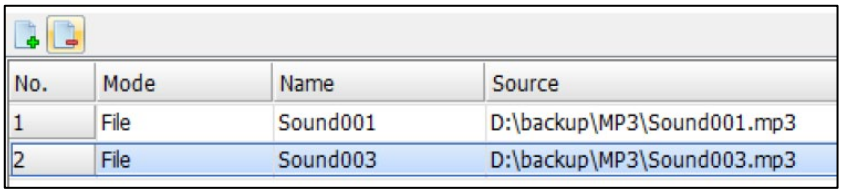
<table>
<tr><th colspan="3">Sound Setting</th></tr>
<tr><td rowspan="5"></td><td>Stop Mode: Stop</td><td> 
</td></tr>
<tr><td>Stop Mode: Stop after playing</td><td> 
</td></tr>
<tr><td colspan="2">● Play Mode: Repeat play</td></tr>
<tr><td>Stop Mode: Stop</td><td> 
</td></tr>
<tr><td>Stop Mode: Stop after playing</td><td> 
</td></tr>
<tr><td>Trigger Mode</td><td colspan="2">The available options for Trigger Mode are: ON and OFF states. It indicates whether users want to trigger the sound track when the button is ON or OFF.

</td></tr>
</table>

<table>
<tr><th colspan="3">Sound Setting</th></tr>
<tr><td>Play List</td><td colspan="2">

Play List provides the functions of adding and removing playing items.
Each trigger address set in the Play List supports up to 100 sound files.
Mode is determined by the added sound files. It includes File and Address.



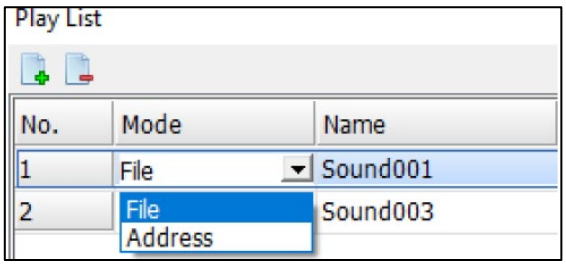
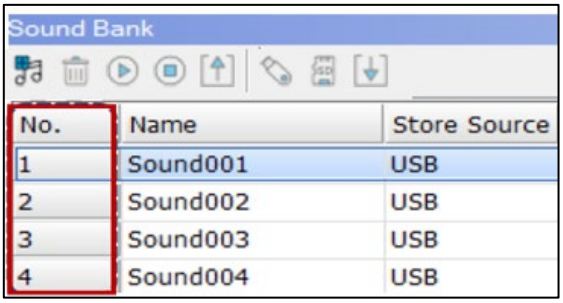
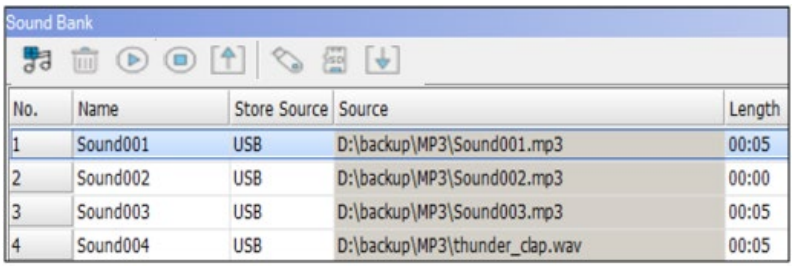
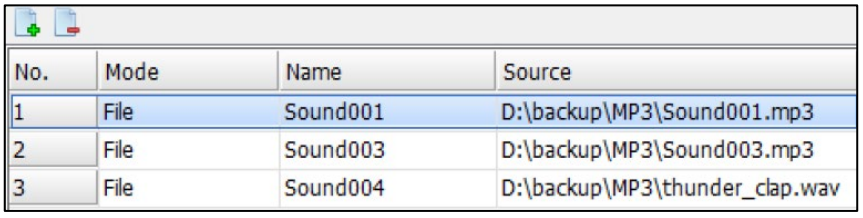
</td></tr>
<tr><td>Add audio setting item  </td><td>Click  icon. DIAScreen asks users to select the audio files to be added to the Play List.


</td></tr>
<tr><td>Delete audio setting item</td><td>After the audio files are added to the Play List, delete unnecessary audio files as required.


</td></tr>
<tr><td>Mode</td><td>

The available options for Mode are: File and Address. The default value is File.

</td></tr>
</table>

Sound Setting		
		 ● File: Select the audio file from the **Sound Bank** and add it to the **Play List**. When the read bit address of the Sound Setting is triggered, the selected audio file is played. ● Address: Specify a register address. When the trigger condition is met, the HMI reads the input values of the register and plays the sound file according to **No.** in the **Sound Bank** > **Sound Selection List**. 
Name	The filename is written as Sound plus 001, so the name is Sound001 and followed by Sound002, Sound003, and so on. 	
Source	**Source** in the **Play List** shows the source paths of the sound files and it cannot be changed. It is only displayed for users to view the paths of sound files. If the source must be changed, go to the **Source** in the **Sound Bank** to make the change. 	

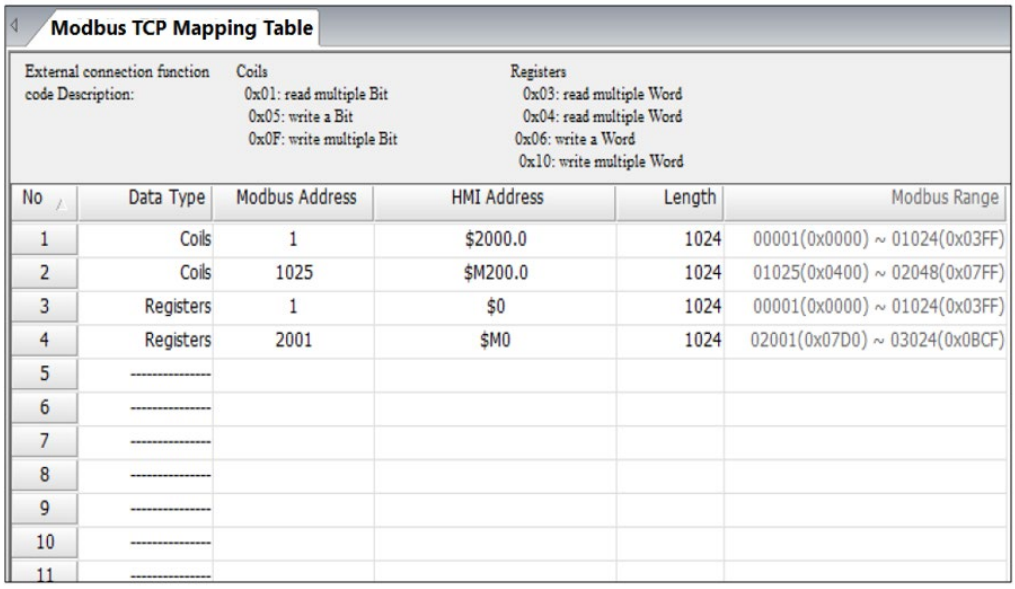
28.10 Modbus TCP Mapping Table

In the past, screen editing and address planning can be inflexible because ranges and addresses of the Modbus address table are very limited, as shown in the following table.

Modbus Address	Modbus 6-digit Address		HMI Internal Register Definition	
W40001 - W41024	W4-00001 - W4-01024	→	$0 - $1023	Internal register
W42001 - W43024	W4-02001 - W4-03024	→	$M0 - $M1023	Non-volatile internal register
W44001	W4-04001	→	RCPNO	Recipe number register
W45001 ...	W4-05001 ...	→	RCP0 - RCPn	Recipe register
B00001 - B01024	B0-00001 - B0-01024	→	$2000.0 - $2063.15	Internal register (bit)
B01025 - B02048	B0-01025 - B0-02048	→	$M200.0 - $M263.15	Non-volatile internal register (bit)

The DOP-100 provides this function to allow users to program Modbus addresses more flexibly. In addition to the expanded length of the Modbus and HMI memory addresses, users can define the initial address and the range of the read length.

Locate Modbus TCP Mapping Table in **Project** > **Other Setting** > **Modbus TCP Mapping Table.**



Modbus TCP Mapping Table

External connection function code Description:

Coils
0x01: read multiple Bit
0x05: write a Bit
0x0F: write multiple Bit

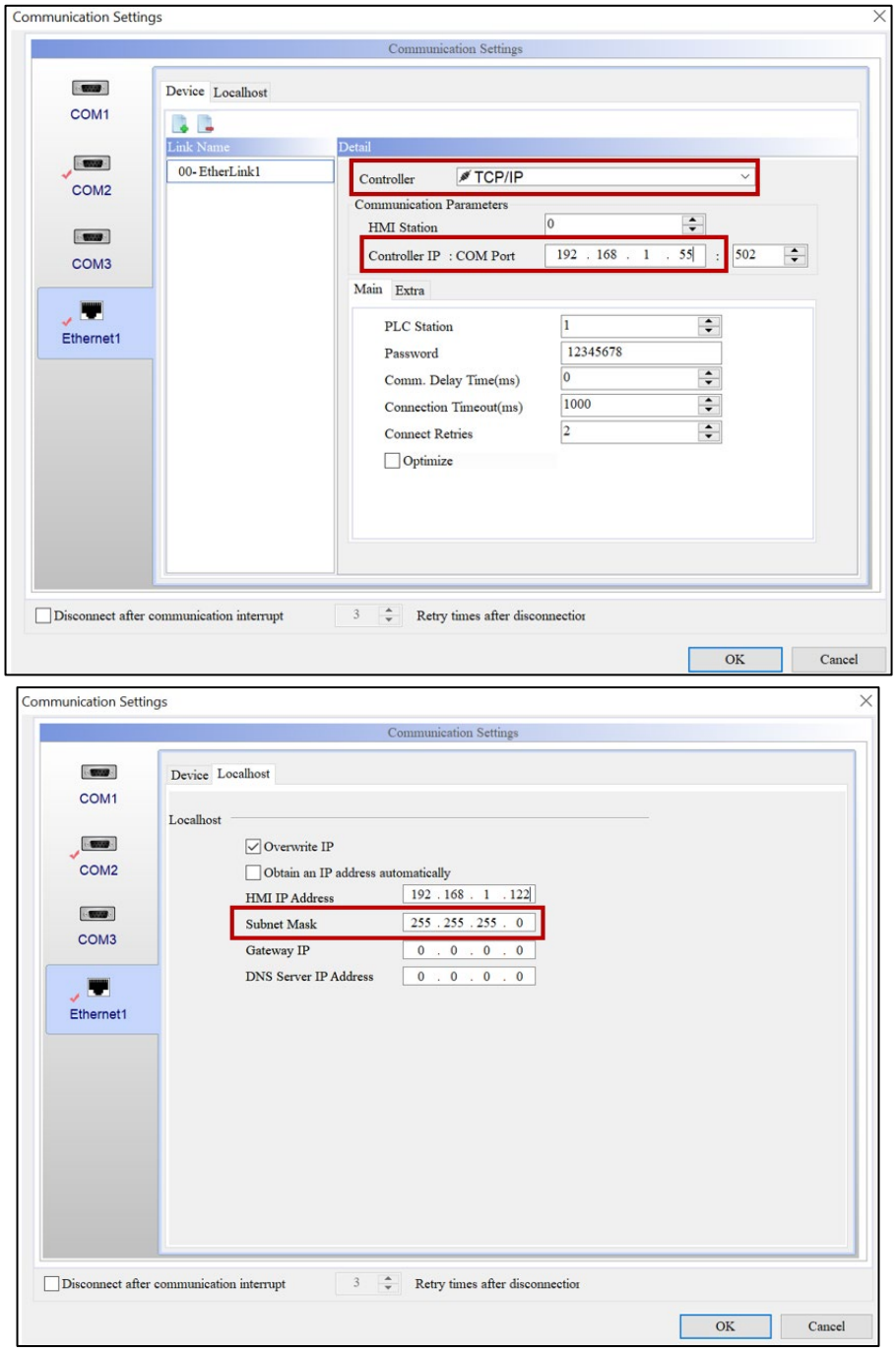
Registers
0x03: read multiple Word
0x04: read multiple Word
0x06: write a Word
0x10: write multiple Word

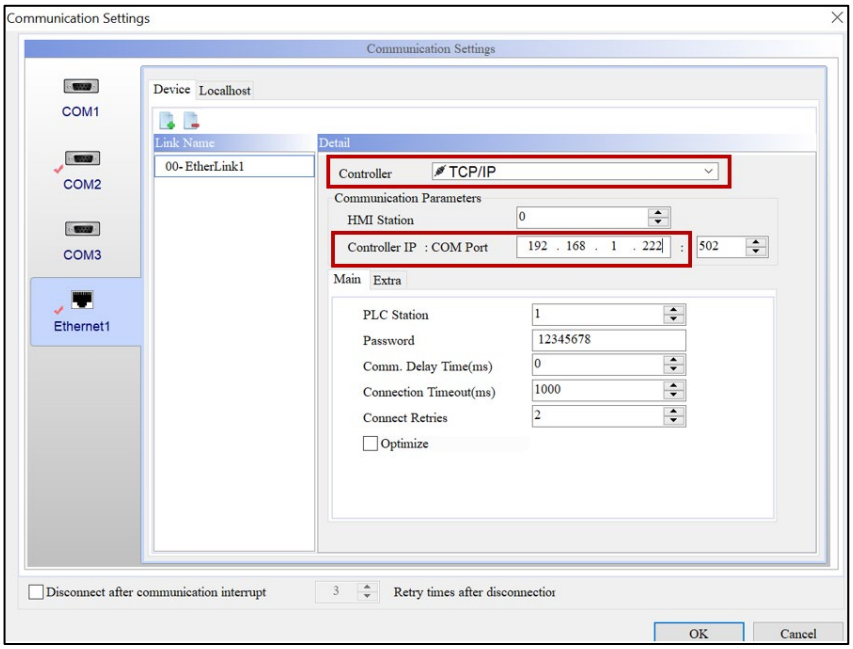
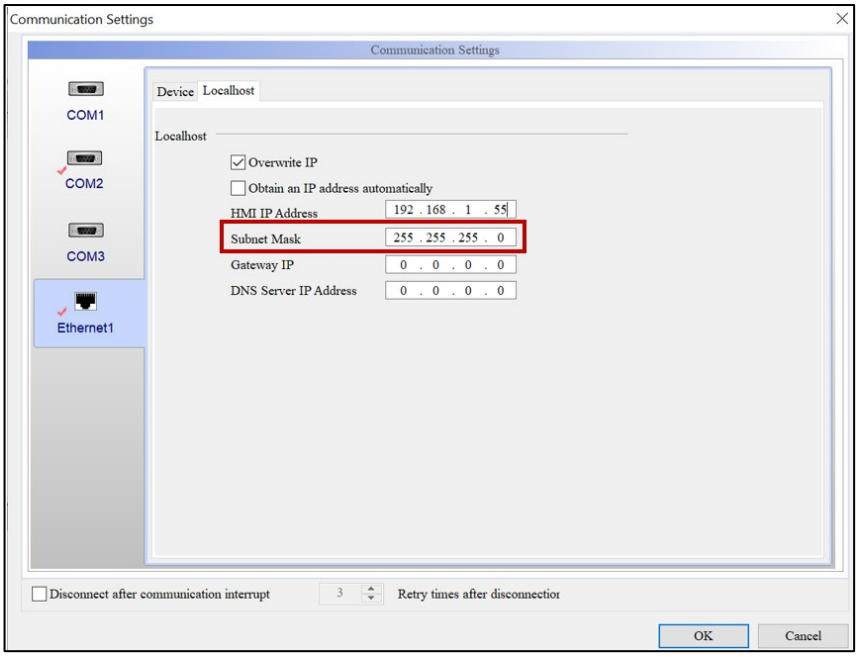
No	Data Type	Modbus Address	HMI Address	Length	Modbus Range
1	Coils	1	$2000.0	1024	00001(0x0000) ~ 01024(0x03FF)
2	Coils	1025	$M200.0	1024	01025(0x0400) ~ 02048(0x07FF)
3	Registers	1	$0	1024	00001(0x0000) ~ 01024(0x03FF)
4	Registers	2001	$M0	1024	02001(0x07D0) ~ 03024(0x0BCF)
5	----------				
6	----------				
7	----------				
8	----------				
9	----------				
10	----------				
11	----------				

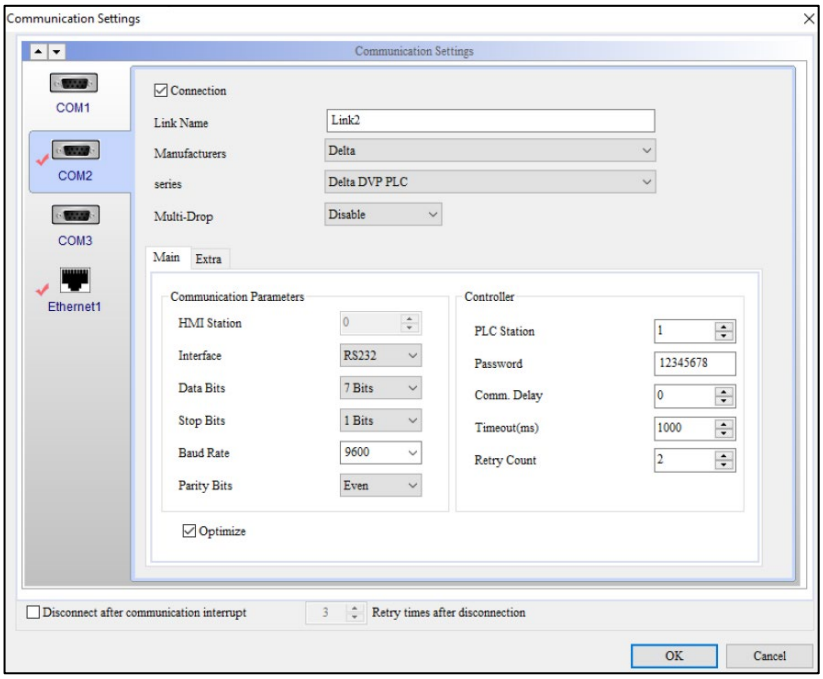
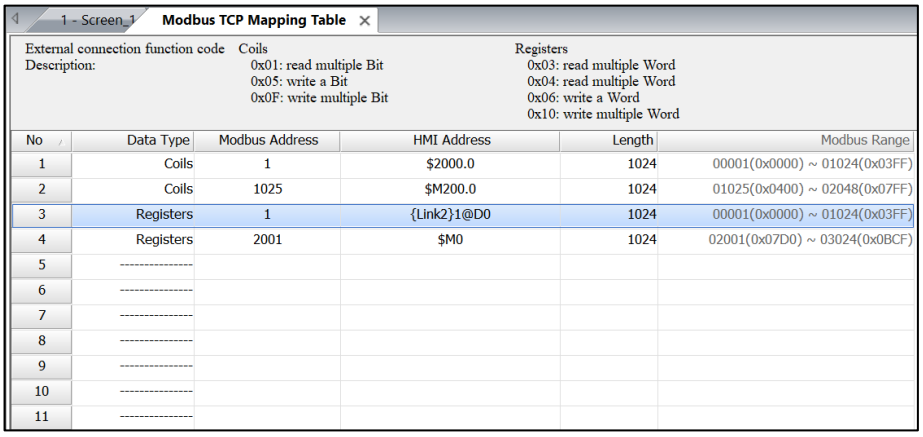
Figure 28 - 25: Modbus TCP Mapping Table

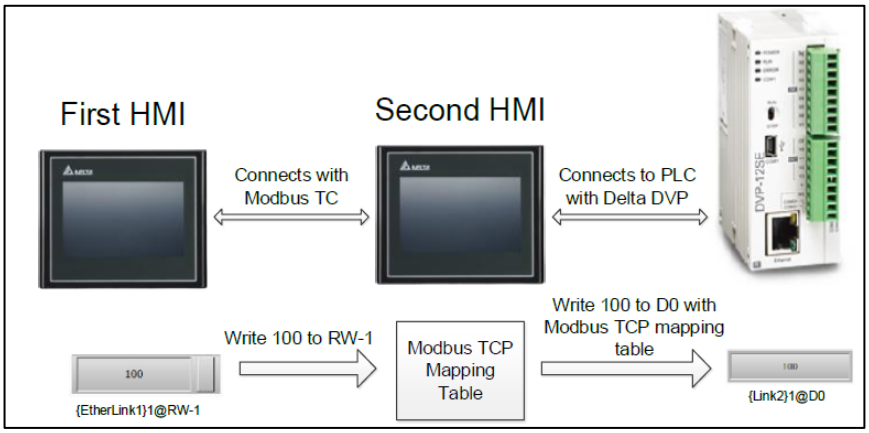
Modbus TCP Mapping Table supports both internal and external memory addresses and allows users to set the Internal Memory address and the external memory address of the HMI to which the Modbus address is mapped. Refer to the following example.

Modbus TCP Mapping Table	
Communication Settings	This example uses Modbus TCP to establish communication between two HMIs. **Step 1**: Communication parameters of the first HMI: **General** > **Communication Settings** > **Ethernet1** > Add **Modbus** Network Connection > **TCP/IP** in the **Controller** field in the **Device** tab. The communication parameters are set as follows.

Modbus TCP Mapping Table	
	
Communication Settings	**Step 2**: Communication parameters of the second HMI: **General** > **Communication Settings** > **Ethernet1** > Add **Modbus** Network Connection > **TCP/IP** in the **Controller** field in the **Device** tab. The communication parameters are set as follows.

Modbus TCP Mapping Table	
	 
Communication Settings	**Step 3**: Set the Delta DVP PLC communication parameters in **General** > **Communication Settings** > **COM2** for the communication parameters of the second HMI.

<table>
<tr><th colspan="2">Modbus TCP Mapping Table</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Set Modbus TCP Mapping Table parameters</td><td>Set Modbus address 2 (address {EtherLink1}1@RW-1) to map to the external memory address {Link2}1@D0 with a mapping length of 1024 words at Project > Other Setting > Modbus TCP Mapping Table.
 
</td></tr>
<tr><td>Create Numeric Entry and Numeric Display elements</td><td>● On the first HMI, create a Numeric Entry element and set the Write Address to {EtherLink1}1@RW-1.
● On the second HMI, create a Numeric Display element and set the external memory address to {Link2}1@D0.</td></tr>
<tr><td>Execution result</td><td>● After creating and setting the elements, compile and download the project to the HMI.
● On the first HMI, write 100 to the Numeric Entry element of the Write Address {EtherLink1}1@RW-1. Meanwhile, the second HMI uses the Modbus TCP Mapping Table to map the value 100 to the external memory address {Link2}1@D0.</td></tr>
</table>

Modbus TCP Mapping Table	
	

28.11 Font Management

Font Management allows to replace fonts globally at one time. Users can change the fonts quickly, thus improving programming efficiency.

To replace fonts, go to **Project** > **Font Management**.

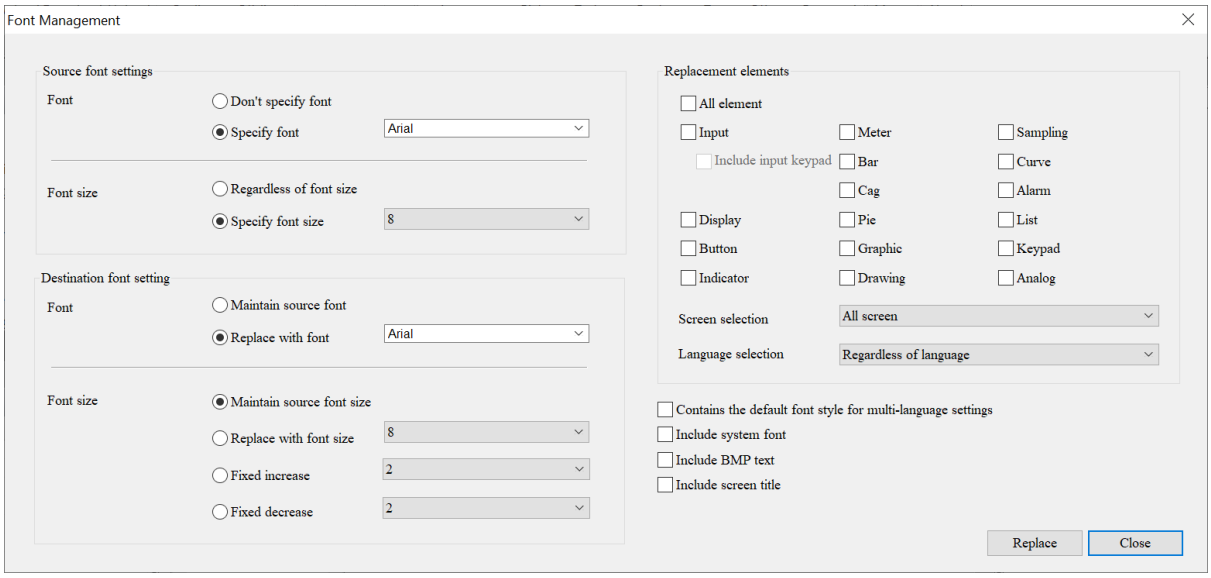


Figure 28 - 26: Font Management

Chapter 29: Variable Sharing

29.1 Tag Sharing with DIAStudio Programs

DIAScreen can inherit the variables or tags declared by DIADesigner / DIADesigner-AX in the DIAStudio software suite. These variables can be directly extracted and assigned to the HMI elements via the DIA Tag function in DIAScreen without declaring repeatedly.

For operation, refer to AX series / IMP series Package Installation Manual and the following sections.

29.1.1 DIA Tag File Import Function (with ISPSoft)

The **DIA Tag** in DIAScreen provides an **Import** function that allows users to export ISPSoft's tag table to a file and then import and extract the variables via the DIA Tag function in DIAScreen and assign them to the HMI elements.

***NOTE**: This function requires ISPSoft version 3.13 or above, and only the **Main Table** can be exported as .diatag.*

Follow these steps to import a .diatag file to DIAScreen:

1. Create variables in ISPSoft with **Global Symbols** > **Main Table** and specify variable addresses.

   ***NOTE**: If no address is specified, DIAScreen will not be able to use the tag.*

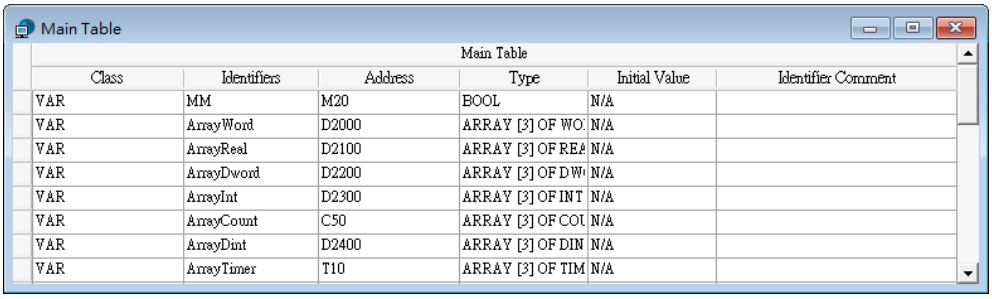


Figure 29 - 1: ISPSoft Main Table

2. Right-click **Main Table** > **Export Global Symbol** to open the **Export Symbols to File** window and select the file type *.diatag.

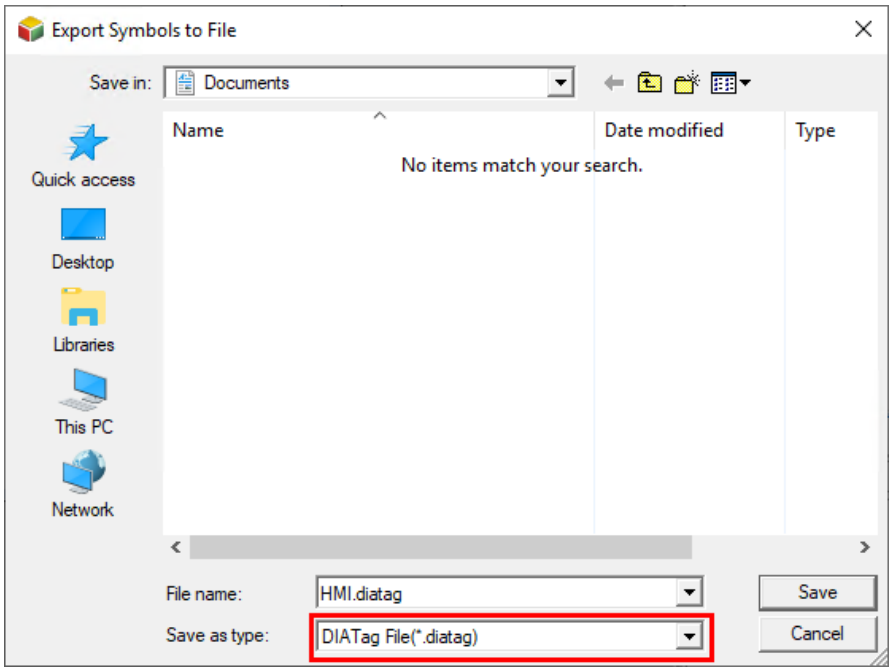


Figure 29 - 2: DIATag File export

3. Add a DOP-100 project in DIAScreen and select Delta in the **Manufacturers** field of **Communication Settings**. Select the controller type created in ISPSoft in the **series** menu, as shown in the following figure, and then click **Finish**.

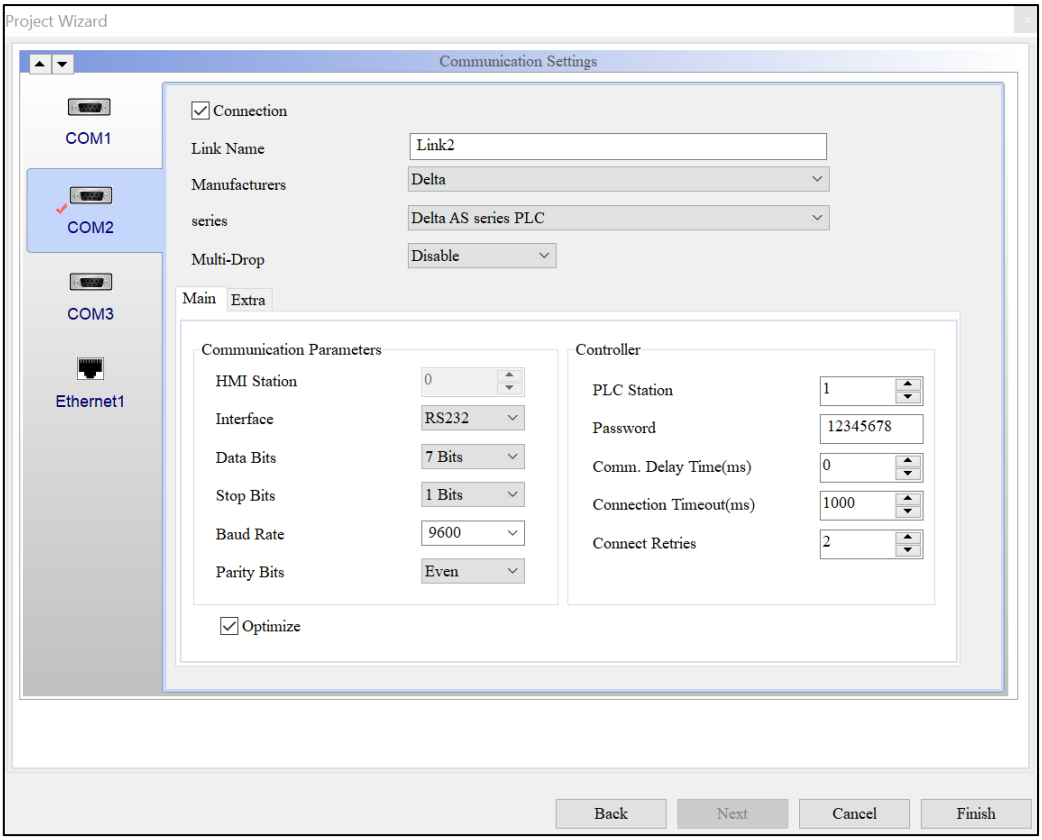


Figure 29 - 3: Project Wizard window

4. Double-click **DIA Tag** in the DIAScreen **Project** tree.

   Result: The **DIA Tag** window appears, as shown in the following figure.

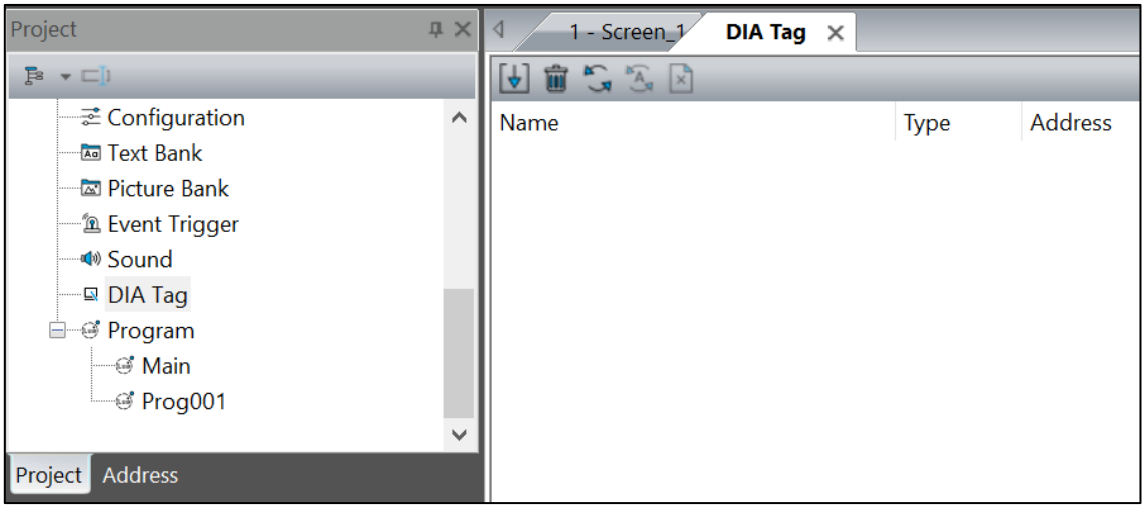


Figure 29 - 4: DIA Tag window

5. Click  icon under the **DIA Tag** window, and select the *.diatag file to be imported. The **Tag Import Setup** window appears as shown in the following figure. Select the connection link in the **Link Selection** and set the **Station Number**.

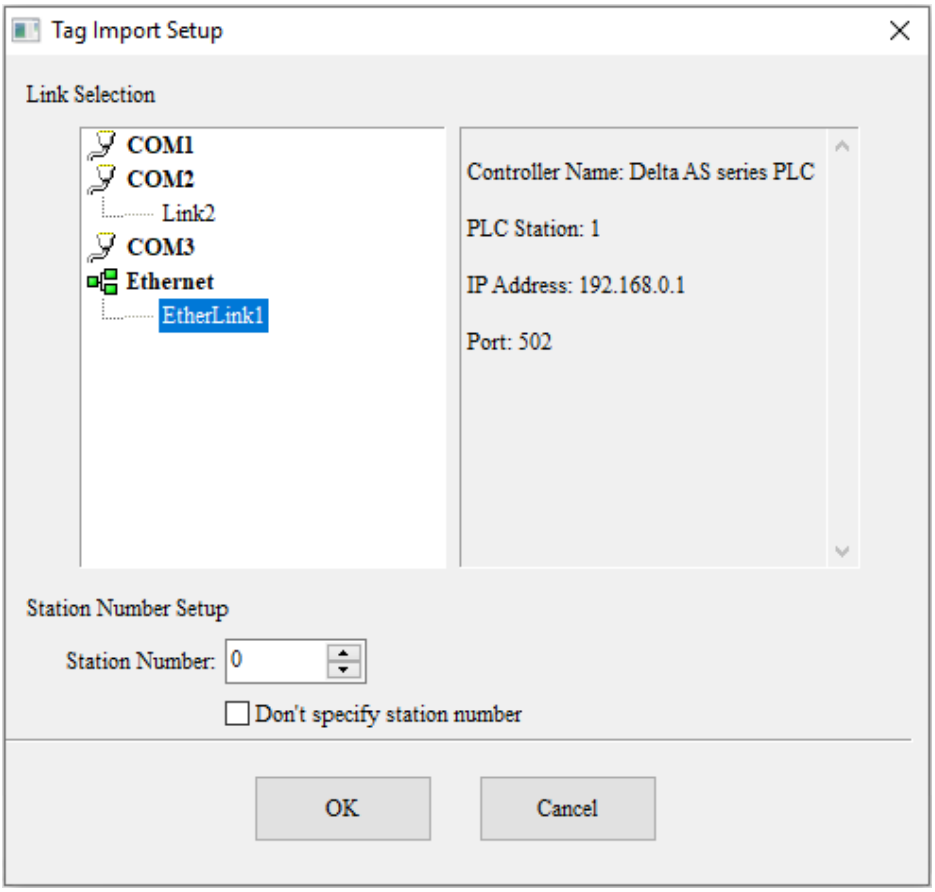


Figure 29 - 5: Select HMI connection and Station Number

6. After a successful import, the list of variables in the ISPSoft **Main Table** will be displayed on the **DIA Tag** window.

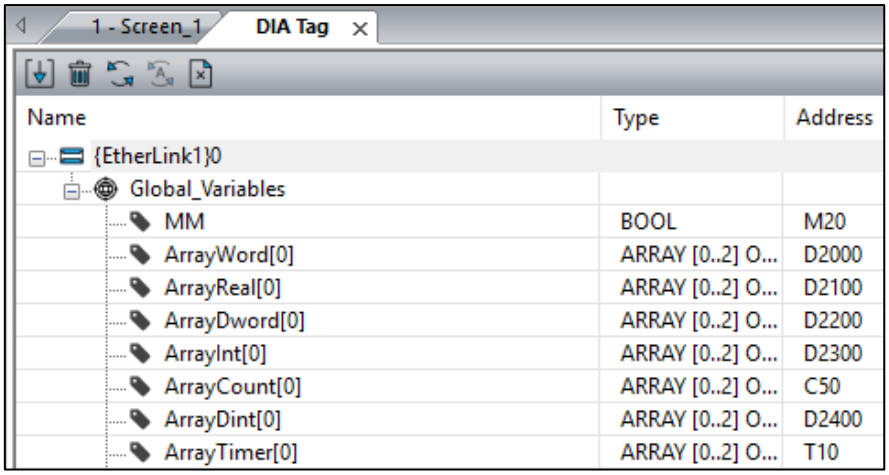


Figure 29 - 6: DIA Tag file import

7. Create an element and set **Read** / **Write Address** to DIA Tag. For example, for a **Numeric Entry** element, select the variables created by ISPSoft and assign them to the address of this element via DIA Tag, as shown in the following figure.

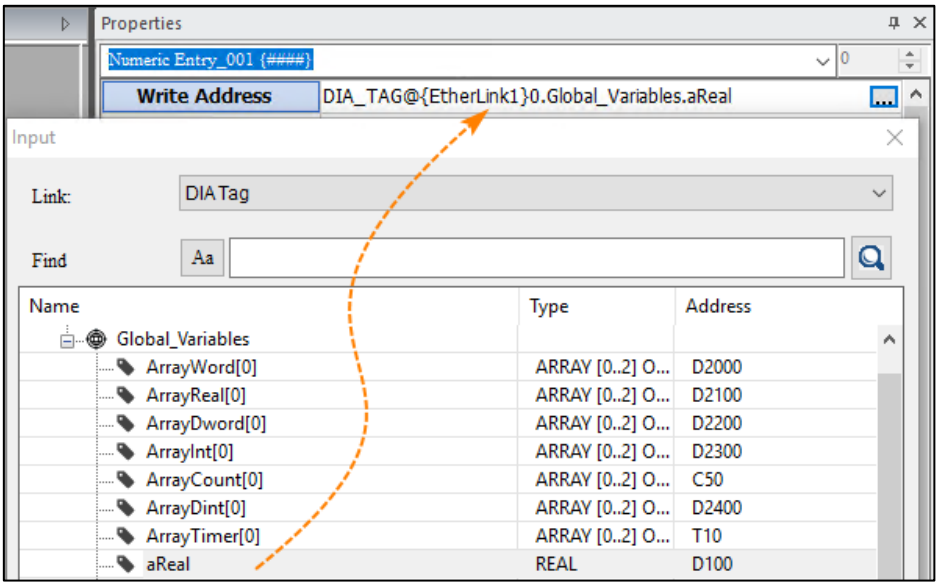


Figure 29 - 7: Use DIA Tag for the element

29.1.2 DIA Tag Synchronization (with DIADesigner)

The DIA Tag in DIAScreen provides a **Sync** function that allows users to synchronize the variables of DIADesigner to the DIA Tag variable table in DIAScreen and assign them to HMI elements.

***NOTE**: Currently, DIADesigner only supports the synchronization of **Global Variables** to DIAScreen.*

Follow these steps to share Tag to DIAScreen:

1. In DIADesigner, create variables in any global variable table by addresses at **Controller** > **Programming** > **Global Variable**.

***NOTE**: If no address is specified, DIAScreen will not be able to use the tag.*

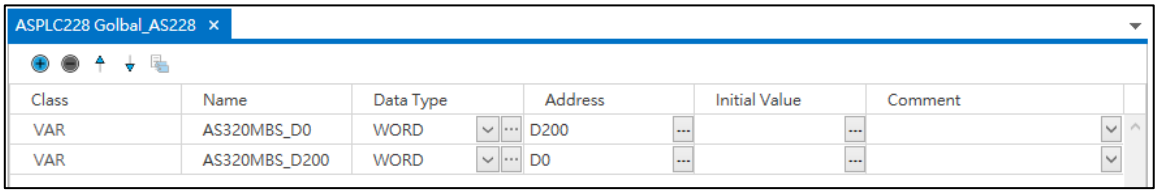


Figure 29 - 8: DIADesigner Global Variable

2. Compile the DIADesigner project.
3. Add a DOP-100 project in DIAScreen. Select Delta in the **Manufacturers** field of **Communication Settings**, and then select the controller type created in DIADesigner in the **series** menu, and click **Finish**, as shown in the following figure.

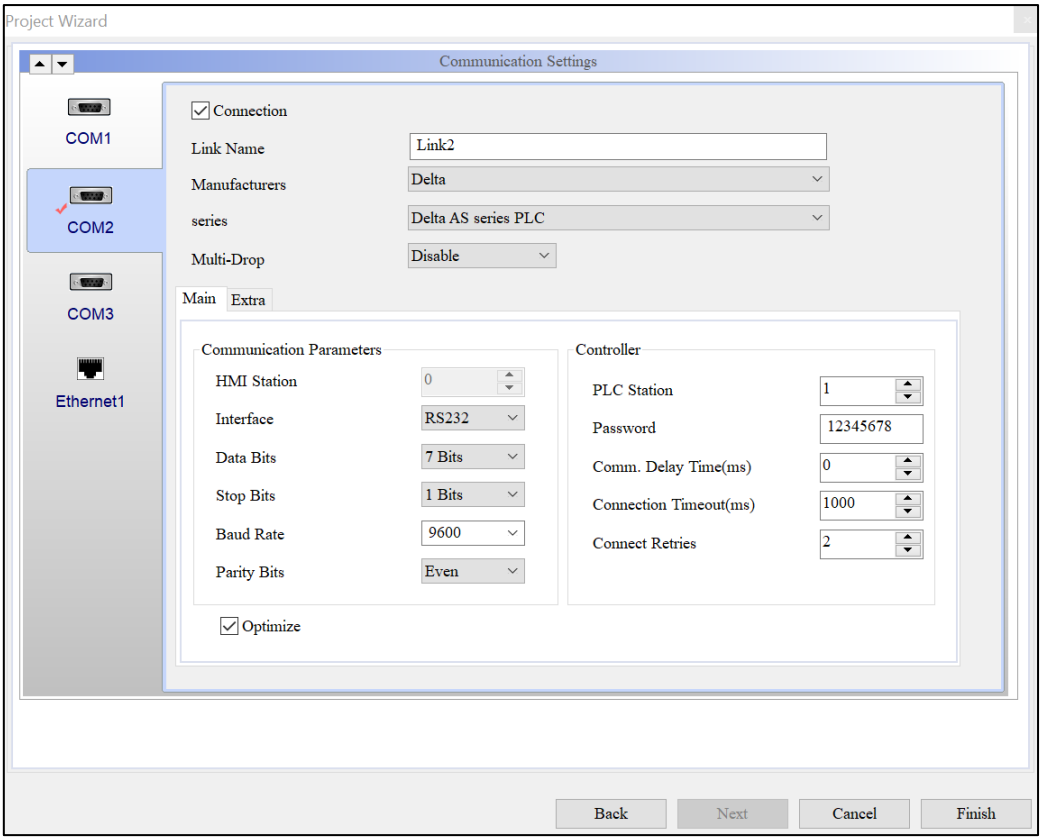


Figure 29 - 9: Project Wizard window

4. Double-click **DIA Tag** in the DIAScreen **Project** tree.

   Result: The **DIA Tag** window appears, as shown in the following figure.

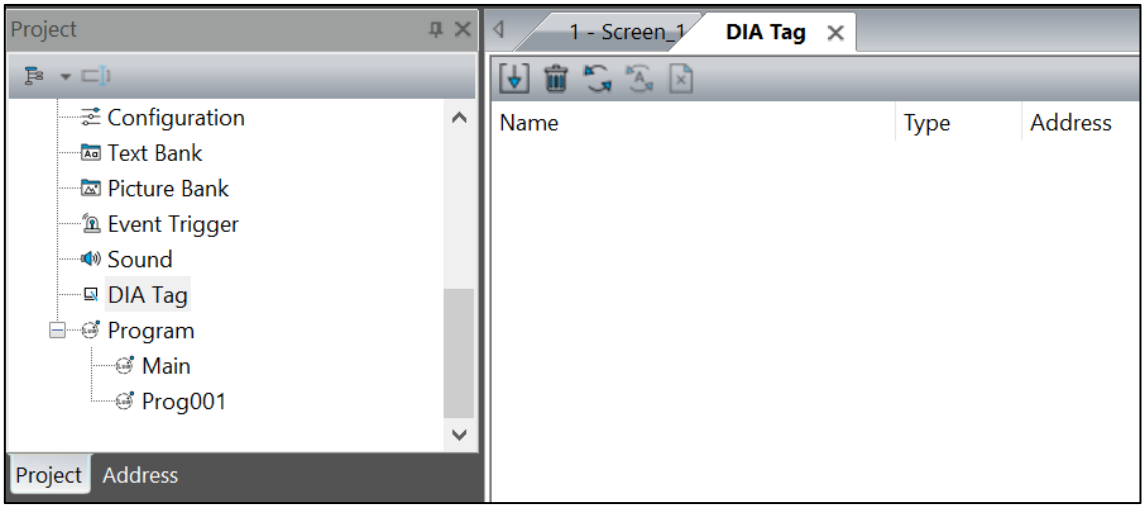


Figure 29 - 10: DIA Tag window

5. Click  icon in the **DIA Tag** window.

   Result: The **Select the device to import** window appears, as shown in the following figure.

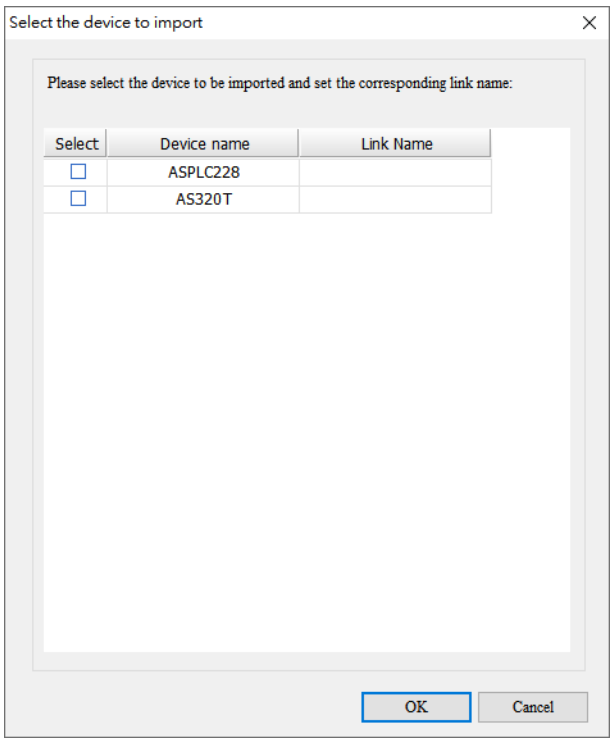


Figure 29 - 11: Select the device to import window

6. Check the **Device name** of the controller, select the **Link Name**, and click **OK**.

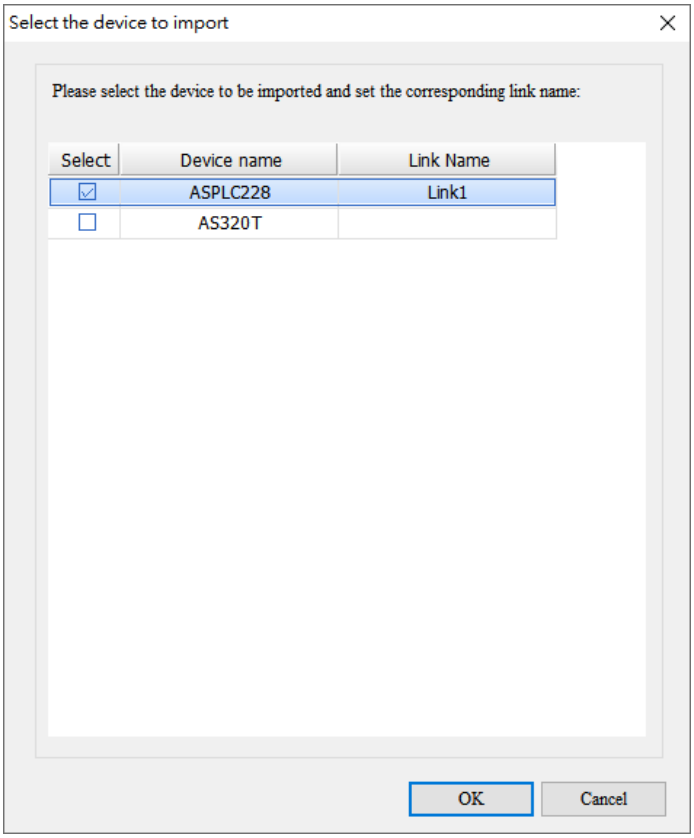


Figure 29 - 12: Select the device to import window

7. After a successful import, the variables of DIADesigner will be shared with DIAScreen, and the **DIA Tag Automatic Synchronization** function activates, as shown in the following figure.

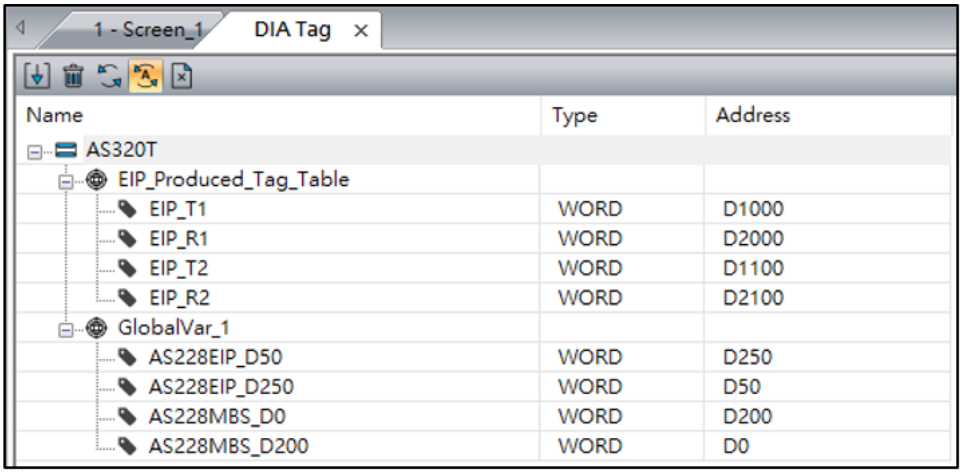


Figure 29 - 13: DIA Tag Automatic Synchronization

The following describes the automatic synchronization function:

- Automatic Synchronization ON 

  After a variable is added / deleted / modified in DIADesigner, click **Compile** and DIAScreen automatically imports the added / deleted / modified DIA Tag. The **Automatic Synchronization** button is turned ON.

- Automatic Synchronization OFF 

  The Automatic Synchronization function can be disabled by clicking **DIA Tag Automatic Synchronization**. If DIADesigner changes any variables, click **Sync** manually in DIAScreen to synchronize DIA Tag.

8. Create an element and set **Read** / **Write Address** to **DIA Tag**. Take the **Set to On Button** element as an example. Select the variables from DIADesigner and assign them to the address of this element via **DIA Tag**, as shown in the following figure.

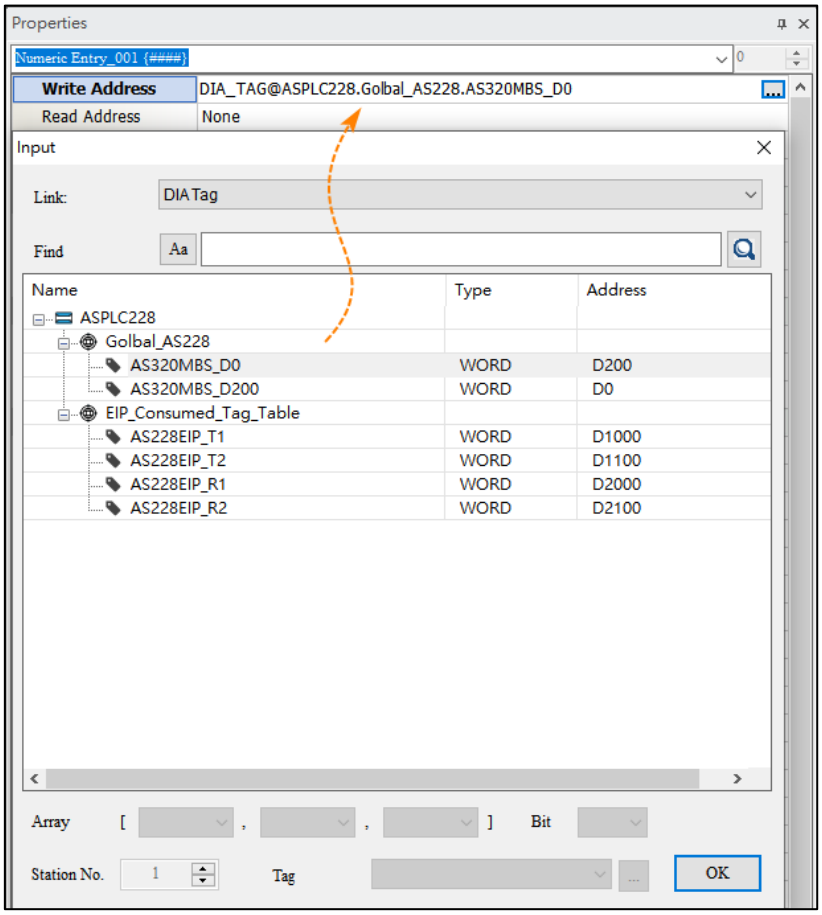


Figure 29 - 14: Use DIA Tag for the element

29.1.3 DIA Tag One-to-Many Synchronization

According to *Section 29.1.2 DIA Tag Synchronization*, DIAScreen can inherit tags declared by DIADesigner. Click **DIA Tag** and the window for selecting the controller appears, as shown in the following figure.

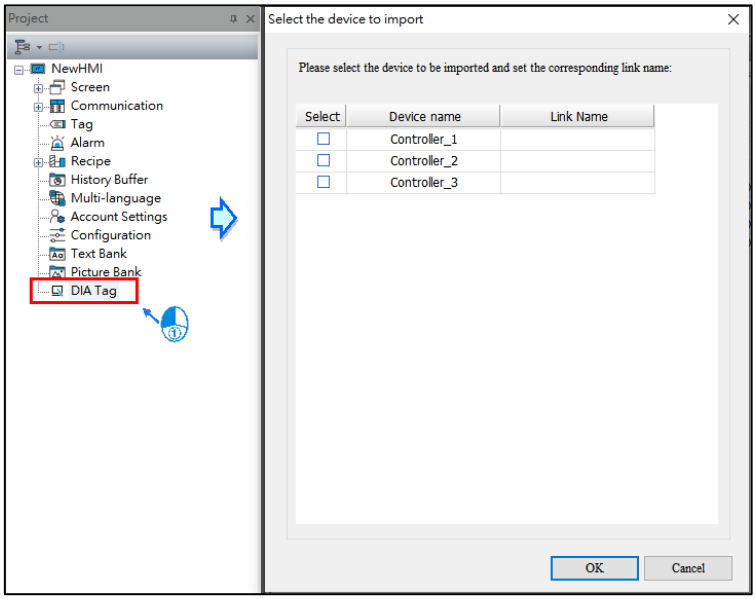


Figure 29 - 15: DIA Tag

Check **Select** and select **Link Name** to import DIA Tag.

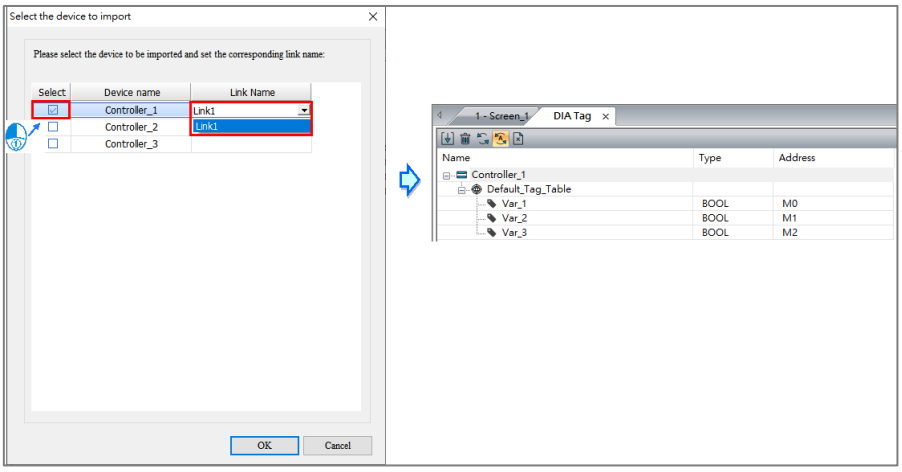


Figure 29 - 16: Import DIA Tag

The DIAScreen controller for **Communication Settings** needs to be consistent with DIADesigner, as shown in the following figure.

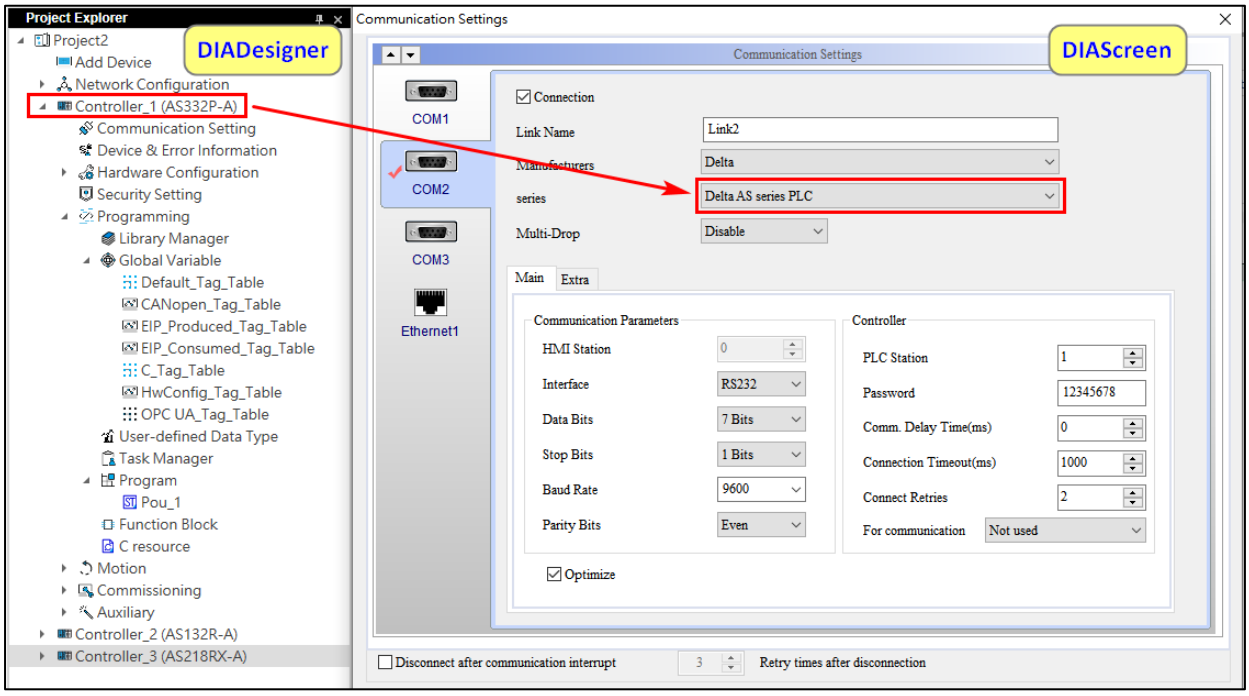


Figure 29 - 17: DIADesigner and DIAScreen controller options

If the DIAScreen controller for **Communication Settings** is inconsistent with DIADesigner, an error message appears when users click **OK** to confirm the imported **DIA Tag**, as shown in the following figure.

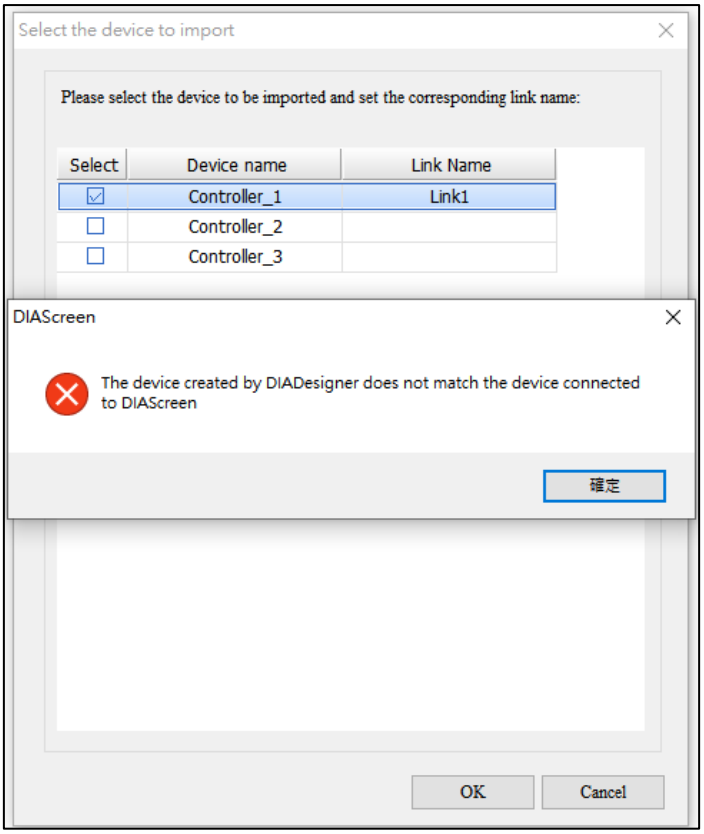


Figure 29 - 18: Error message when DIADesigner is inconsistent with DIAScreen controller

DIA Tag supports opening multiple DIAScreen programs at once and can import tags generated by DIADesigner into multiple DIAScreen programs, as shown in the following figure.

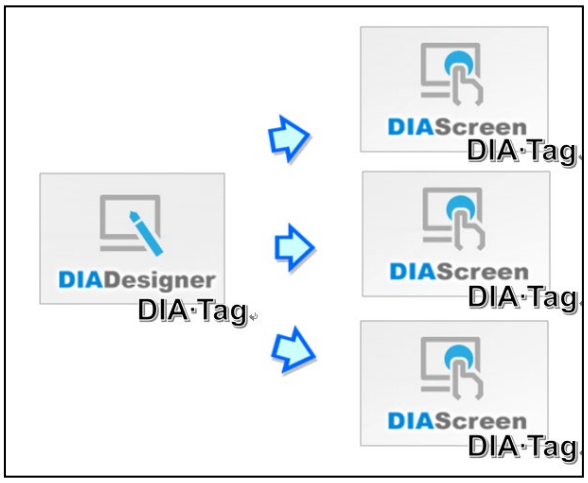


Figure 29 - 19: Import DIA Tag into multiple DIAScreen programs

29.2 OPC UA Client Communication

DIAScreen supports the communication between the HMI and OPC UA Client, and provides importing tags from file or via Ethernet and OPC UA Server connection.

29.2.1 Import OPC UA Tag from File

Follow these steps to create an OPC UA Client project by importing tags from files:

1. Create a project. Select a model with Ethernet connection. Also, select **OPC UA Client** in Ethernet connection, as shown in the following figure.

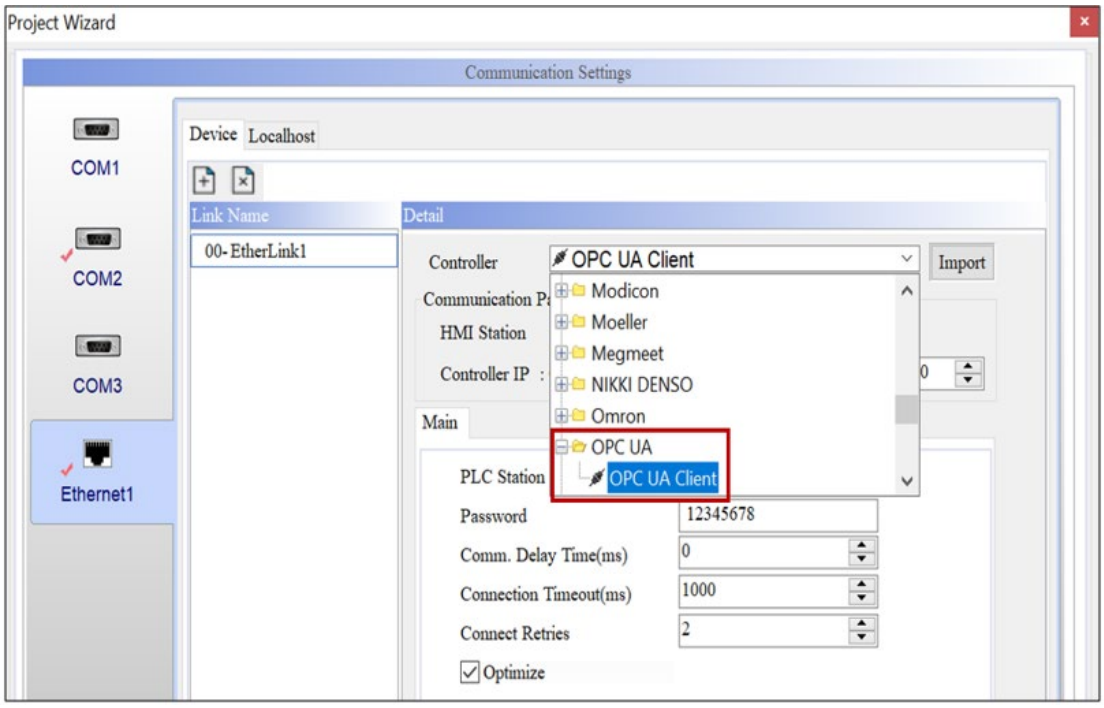


Figure 29 - 20: Create an OPC UA Client connection

2. Import OPC UA Tag from file by clicking  icon as shown in the following figure.

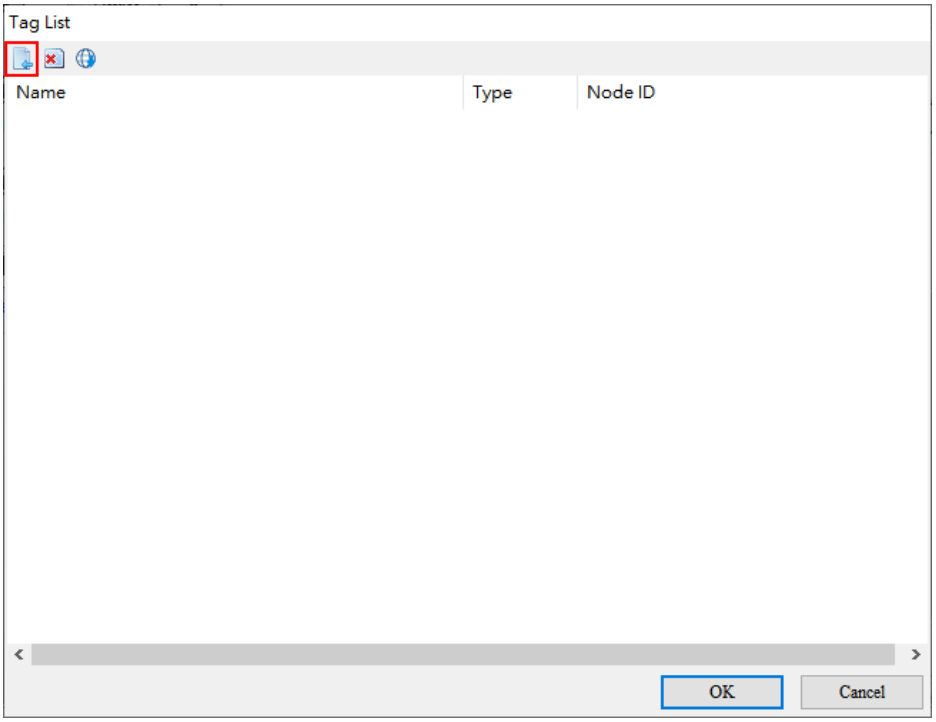


Figure 29 - 21: Import OPC UA Tag from file

The following describes various sources of OPC UA Tag files.

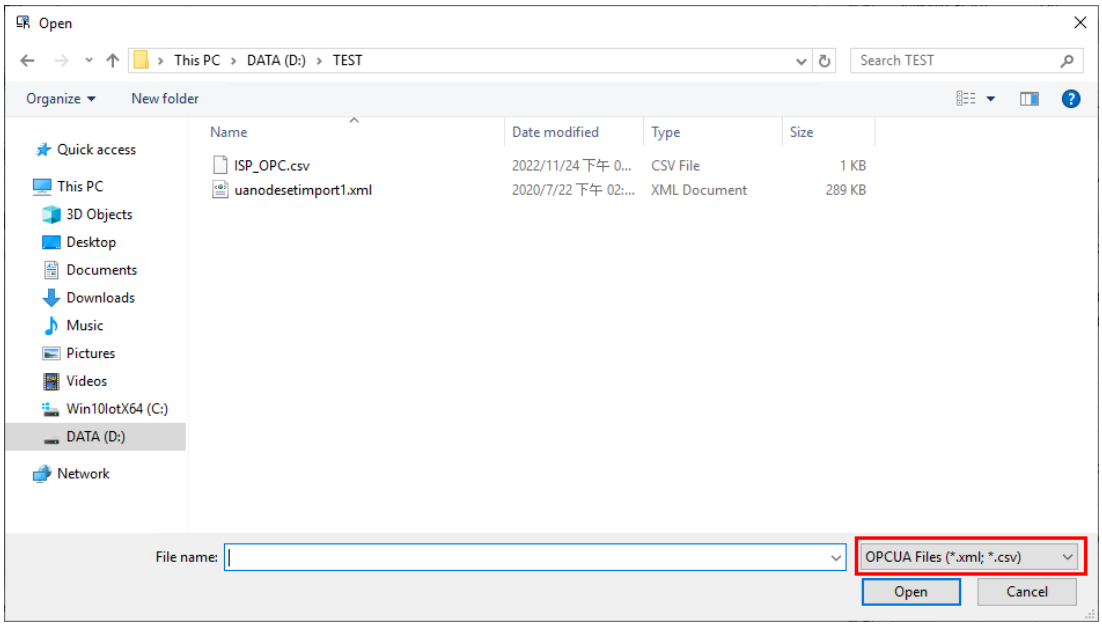


Figure 29 - 22: Import OPC UA Tag File

- XML file: Export file from OPC UA Server.
- CSV file: Open **OPC UA Tag Table** in Global Tags in ISPSoft, create the tags and then export them as a CSV file.

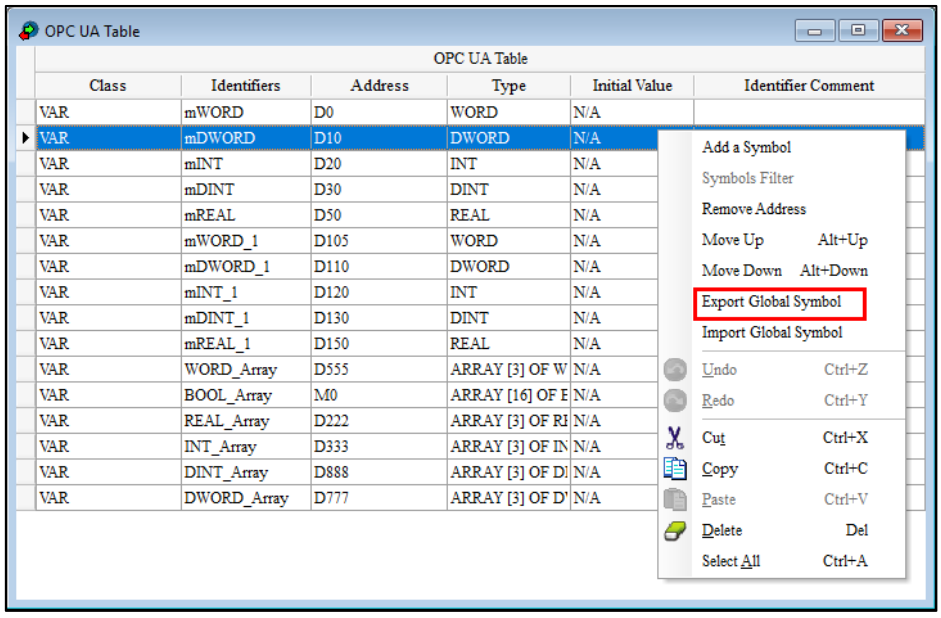


Figure 29 - 23: Export ISPSoft OPC UA Tag Table

***NOTE**: Delta PLC AS300 model currently supports OPC UA Server, but requires an additional communication card. AS-FOP02 can be used with ISPSoft version 3.13 or above.*

- CSV file: Open a DIAScreen DOP-100 MX or WX model, and enable OPC UA function on the **Network Settings** page of **Configuration**. Create tags and then export the tag file.

***NOTE**: Only Bit and Word types are supported for tags. If the address value is neither of these two types, the HMI will not display the correct value.*

3. After the file is imported, view the **Tag List**.

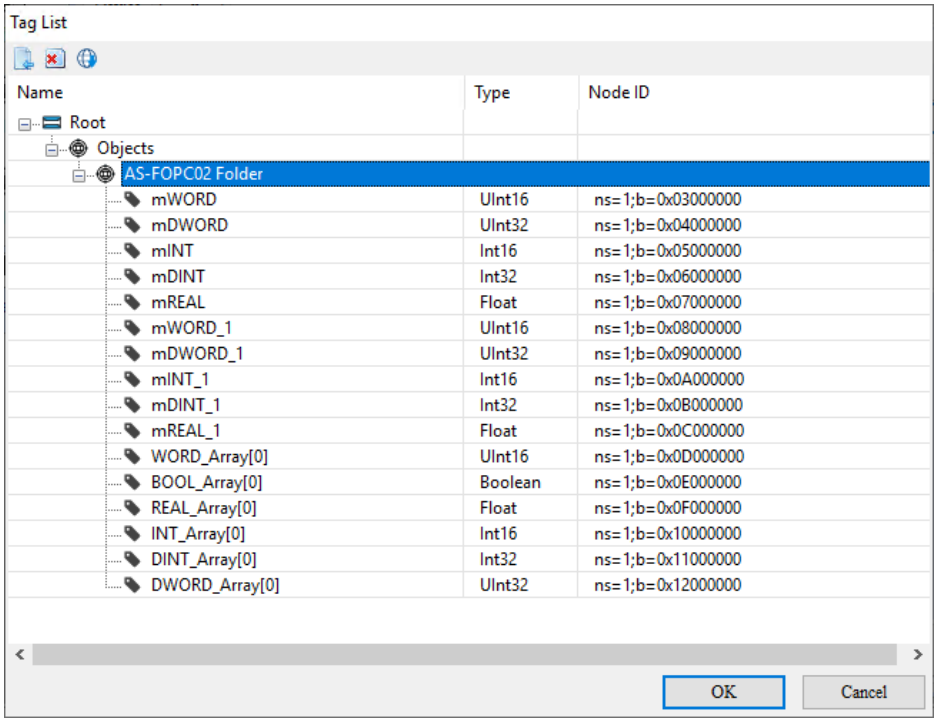


Figure 29 - 24: OPC UA Tag List

4. Set the IP of OPC UA Client and click **Finish** to create an OPC UA Link project.
5. Create an element and set **Read** / **Write Address** to OPC UA Tag.

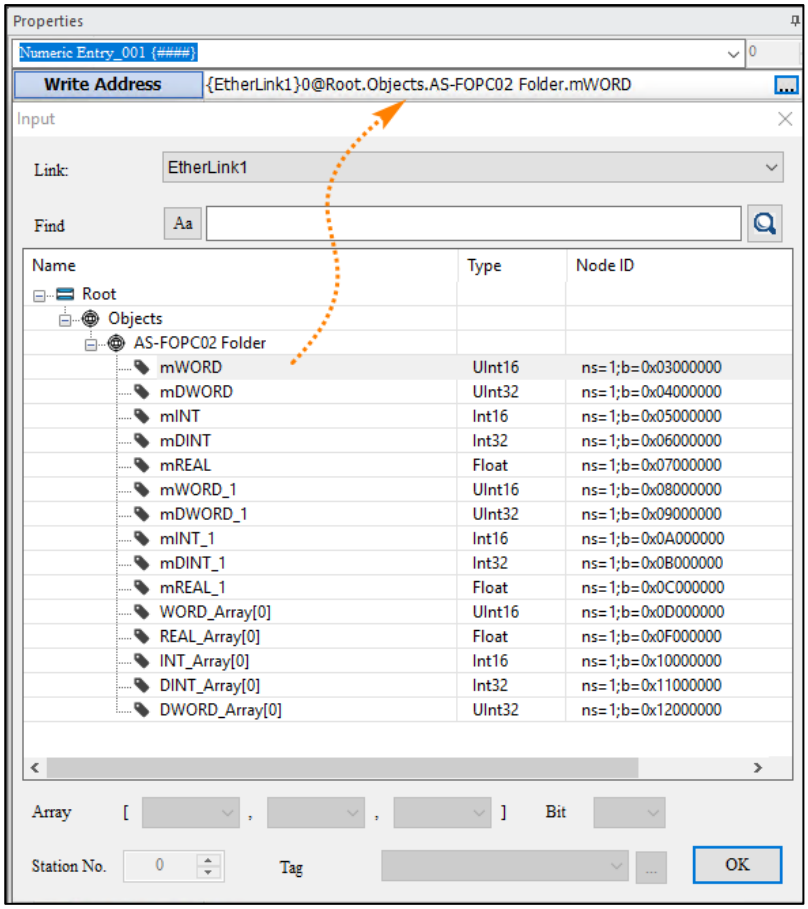


Figure 29 - 25: Use OPC DIA Tag for the element

6. Use OPC UA Tag in macro: Open the macro edit window. Click **Macro Wizard** , and input the Macro Command. If the variable content is selected as OPC UA Tag, the OPC UA Tag will be automatically enclosed in single quotation marks after the macro is updated. If the OPC UA Tag is filled in with the **Input Address** tool, users need to add single quotation marks manually before and after the OPC UA Tag, as shown in the following figure.

```
'{OPC_UA}0@Root.Objects.DemoUANodeSetXML.010_ComplianceTest.Static.All Profiles.Scalar.Double'
```

29.2.2 Import OPC UA Tag via Network Connection

Follow these steps to create an OPC UA Client project by importing a Tag via a network connection:

1. Create a project, select a model with Ethernet connection, and select **OPC UA Client** in Ethernet connection, as shown in the following figure.

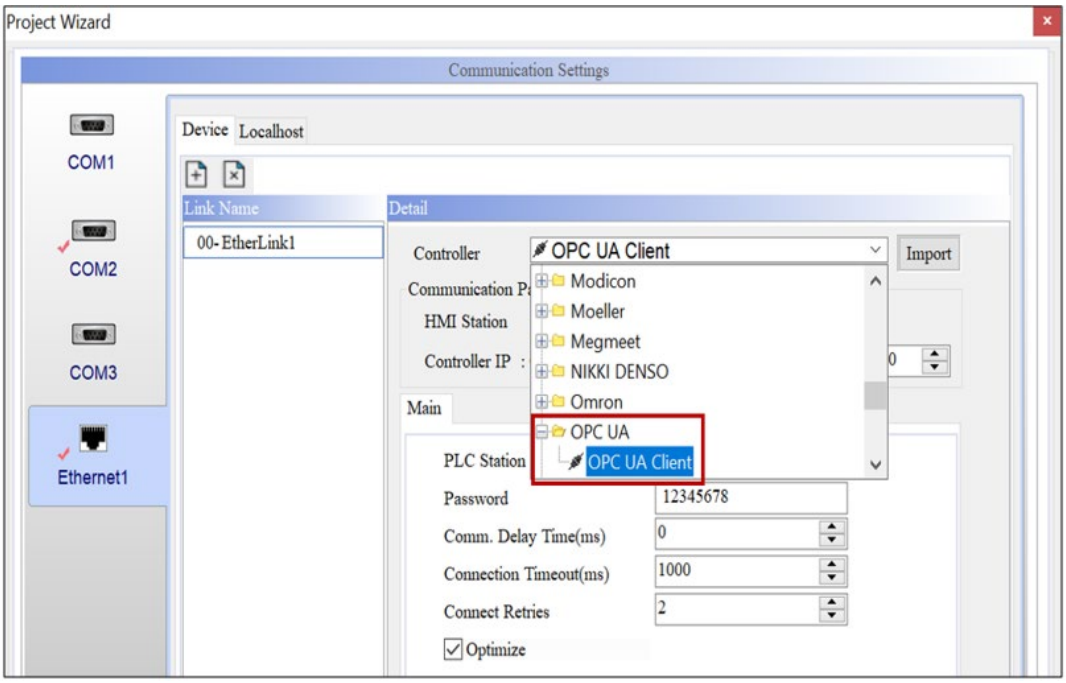


Figure 29 - 26: Create an OPC UA Client connection

2. Set the IP address for OPC UA Server.

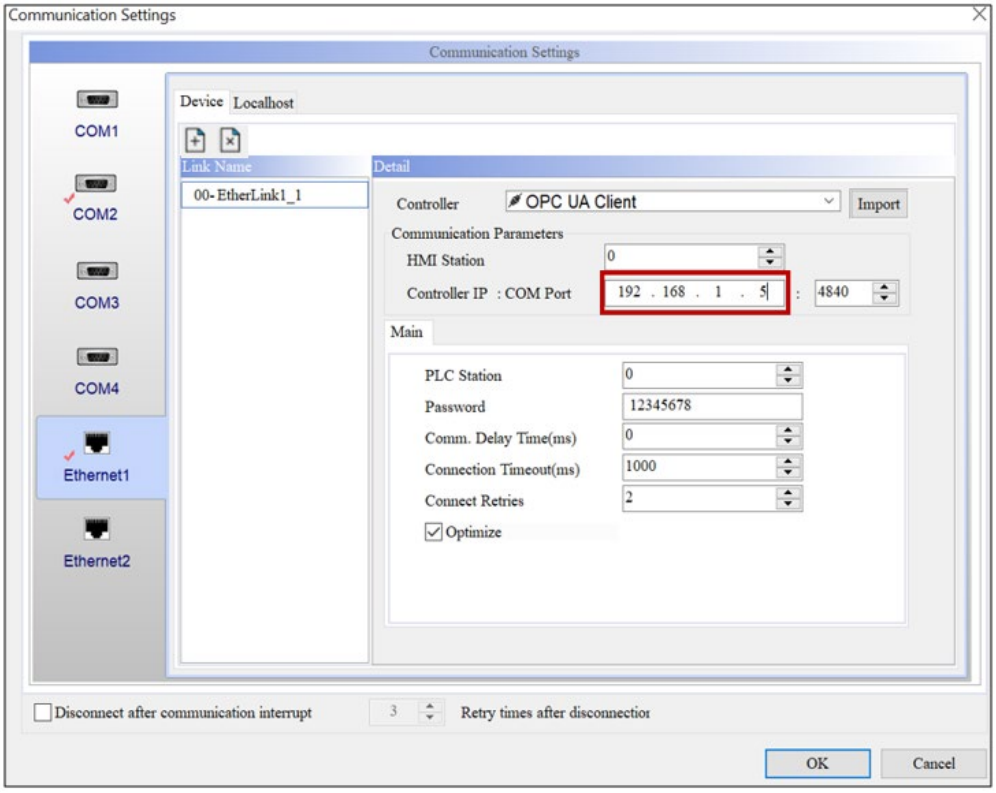


Figure 29 - 27: Set the IP address for OPC UA Server

3. Click **Import** to open the **Tag List** window, and then click icon, which will import tags from OPC US Server via the set IP address.

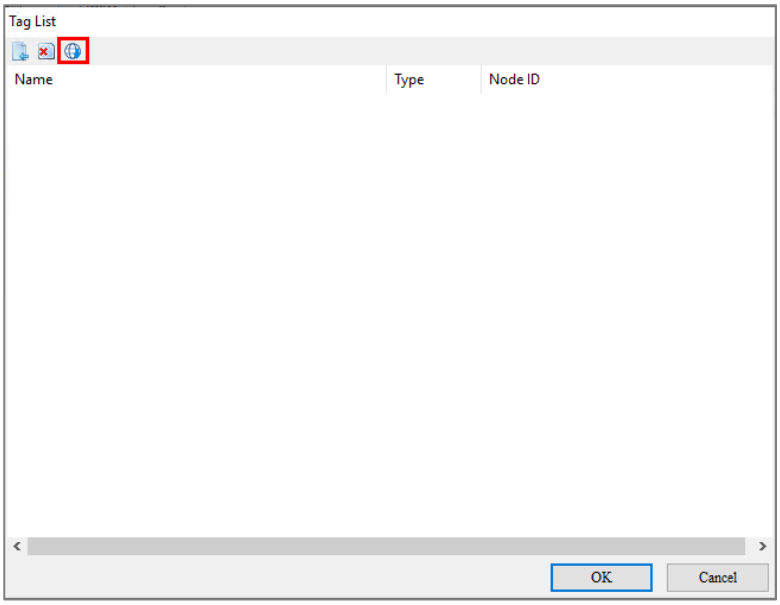


Figure 29 - 28: Import Tag from OPC UA Server

4. The **Tag List** can be viewed after being imported from OPC UA Server.

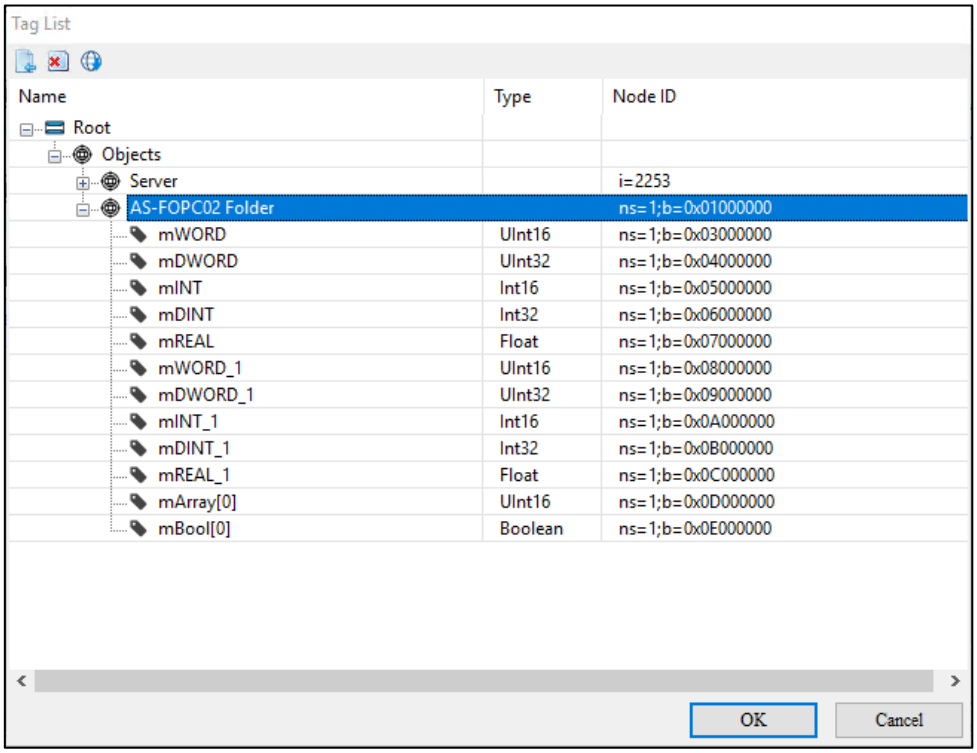


Figure 29 - 29: OPC UA Tag List

5. Set the IP of OPC UA Client and click **Finish** to create an OPC UA Link project.
6. Create an element and set **Read** / **Write Address** to OPC UA Tag.

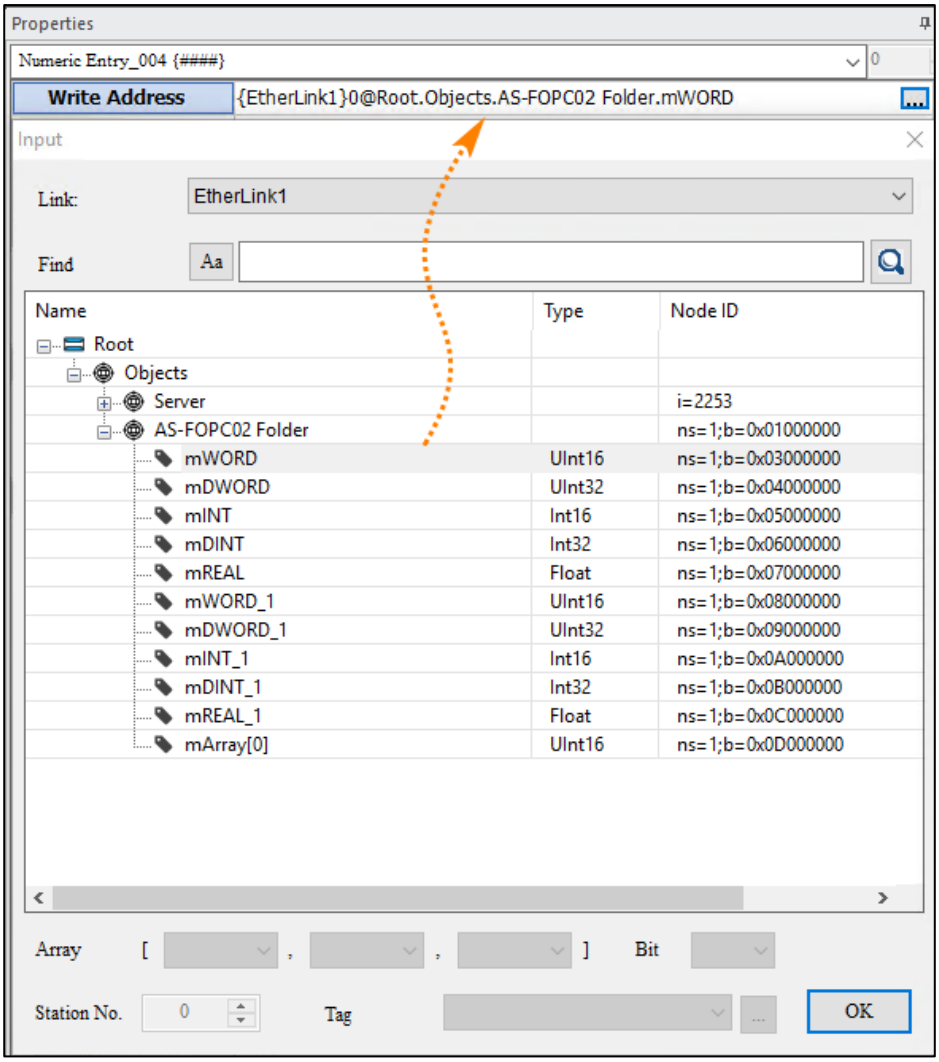


Figure 29 - 30: Use OPC DIA Tag for the element

7. Use OPC UA Tag in macro: Open the **Macro Edit** window, click **Macro Wizard** and input the Macro Command. If the variable content is selected as OPC UA Tag, the OPC UA Tag will be automatically enclosed in single quotation marks after the macro is updated; if the OPC UA Tag is filled in with the **Input Address** tool, users need to manually add single quotation marks before and after the OPC UA Tag, as shown in the following figure.

```
'{OPC_UA}0@Root.Objects.DemoUANodeSetXML.010_ComplianceTest.Static.All Profiles.Scalar.Double'
```

29.2.3 OPC UA Server Configuration

HMI provides OPC UA server function. Set the communication address as OPC UA Tag through the **Communication Settings**.

***NOTE**: Supported models are DOP-107WV, DOP-103WQ, DOP-110WS, DOP-112MX, DOP-115MX, DOP-112WX, DOP-115WX.*

Double-click the OPC UA Server option in the **Project** to enter the setting window.

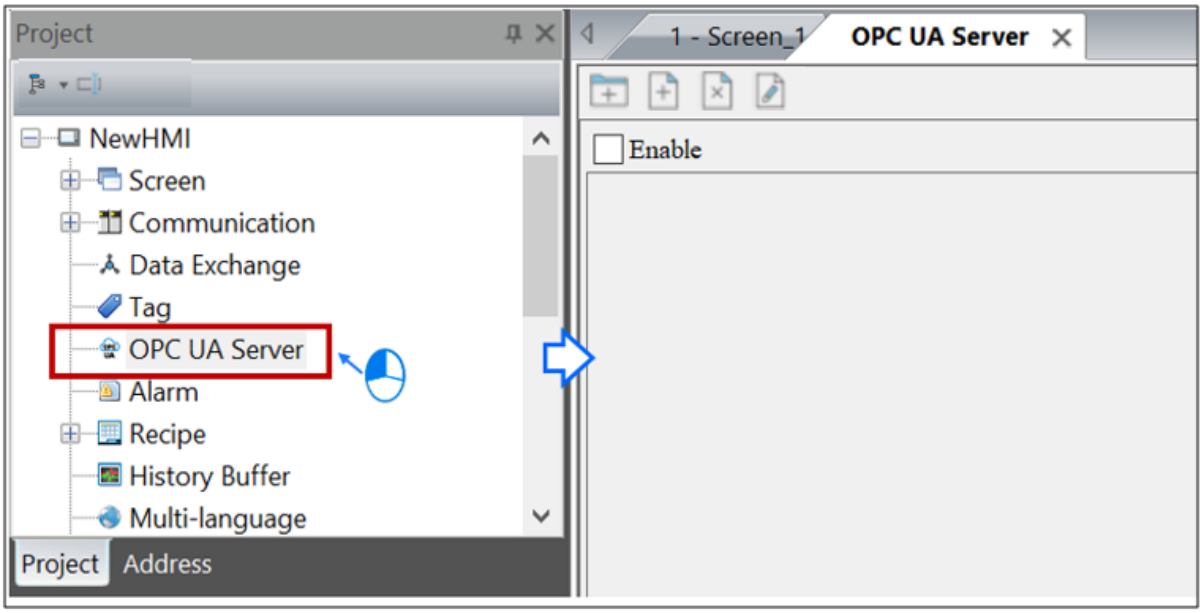


Figure 29 - 31: Open the OPC UA Server window

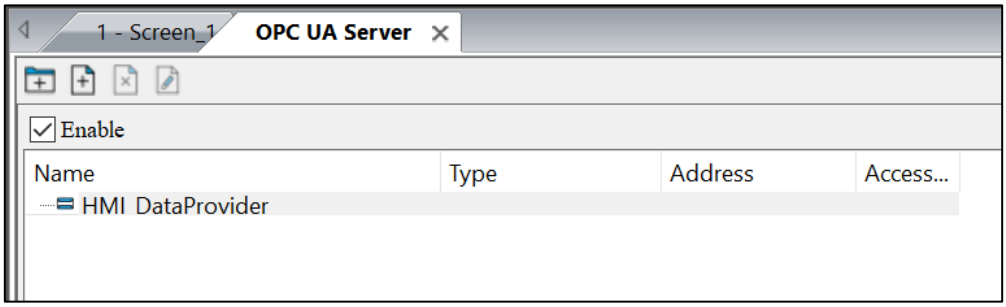
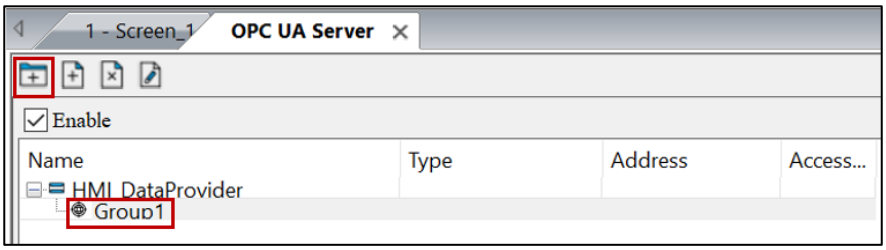


Figure 29 - 32: OPC UA Server setting window

<table>
<tr><th colspan="2">OPC UA Server Configuration</th></tr>
<tr><td>Add group</td><td>

Add groups in the label list.
Click icon, enter the group name, and complete adding the group after confirming, as shown in the following figure.

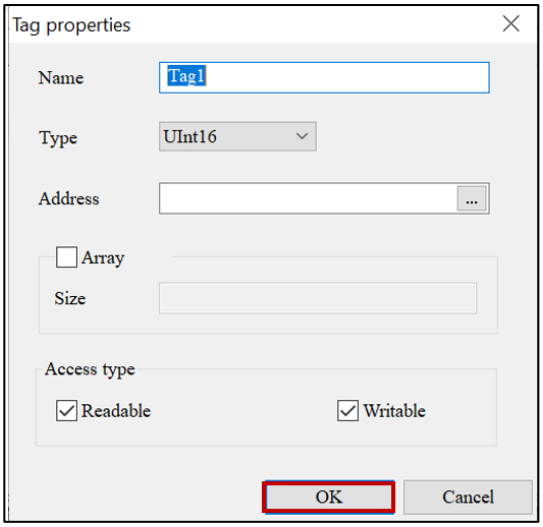


</td></tr>
<tr><td>Add Tag</td><td>

Add tags in the Tag List.
Click icon to open the Tag properties window.

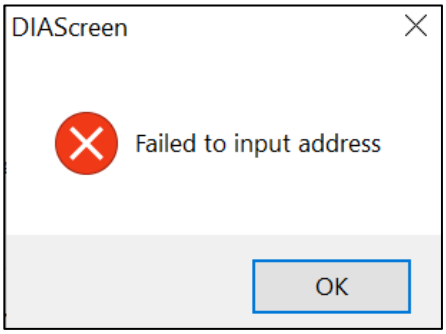


Enter the Name, Type, and Address in the Tag properties window. Select the Access type, and click OK.



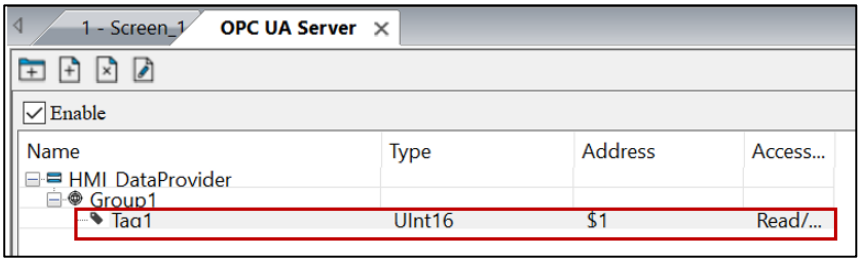
NOTE:

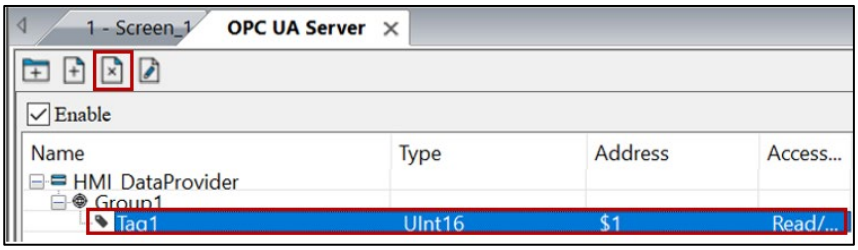
The Address property is mandatory. If it is not filled, the following error message appears.

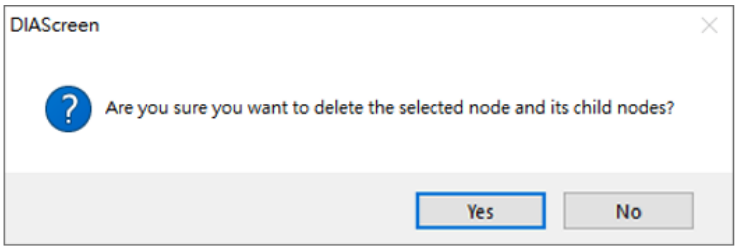


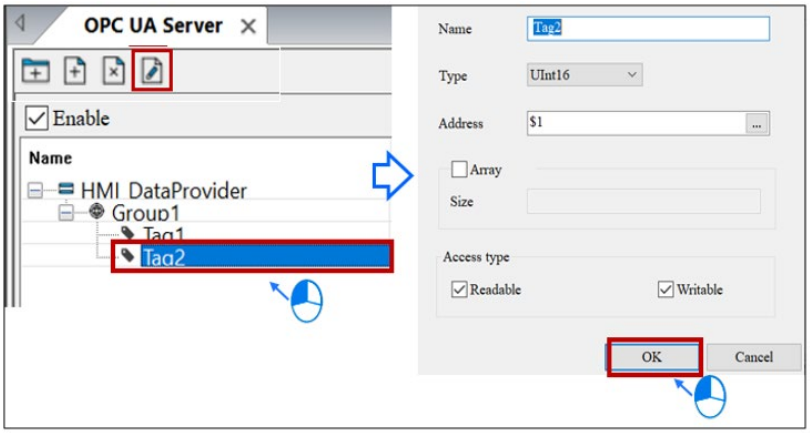
<ol start="2">
Boolean type does not support array format.

</td></tr>
</table>

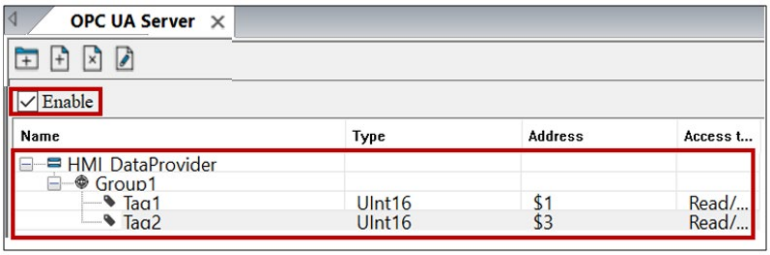
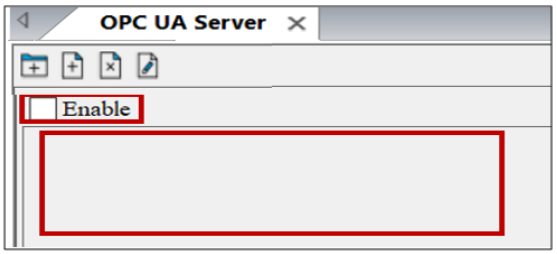
<table>
<tr><th colspan="2">OPC UA Server Configuration</th></tr>
<tr><td></td><td>
The label is added.


</td></tr>
<tr><td>Delete
  </td><td>
Delete the selected tags and groups.
Select the item to be deleted, and click  icon.


Click Yes in the confirmation window.


The item is deleted.
</td></tr>
<tr><td>Edit
  </td><td>
Edit the attributes of the selected tags and groups.
Select the item to be edited. Click  icon to enter the Tag / Group properties window, and then click OK to complete the edit.


NOTE: Double-click a tag or group to enter the Tag / Group properties window for editing.
</td></tr>
</table>

OPC UA Server Configuration	
Enable / disable ☑ Enable	● Decide whether to enable / disable the OPC UA Server function. ● Check **Enable** to enable the OPC UA Server function and display the tag list.  ● Uncheck **Enable** to disable the OPC UA Server function, and the tag list will be hidden.  ***NOTE***: *Unchecking **Enable** and disable the OPC UA Server function and hide the tag list will not delete the created OPC UA tags / groups. Re-checking **Enable** displays the original content.*

29.3 Import CODESYS Tag

NOTE: *Currently, only tag tables generated by DIADesigner-AX and CODESYS Development System are supported.*

To allow users to input a tag prefix to filter tags generated by DIADesigner-AX with such prefix, perform the following steps:

Example based on **AX8_Linux_Series**

1. Create a **New project** > Select **AX series** > **AX8_Linux_Series** from the HMI series drop-down menu > **Finish**.

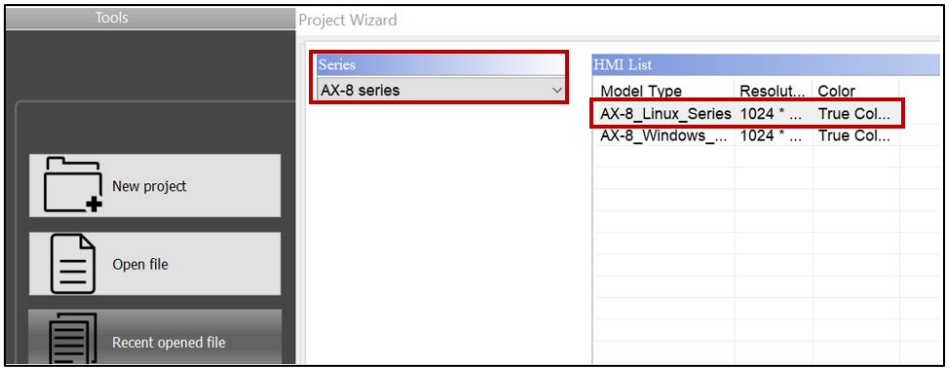


Figure 29 - 33: Project Wizard window

2. Double-click **Built-In PLC** in the **Project** tree on the left side of the screen.

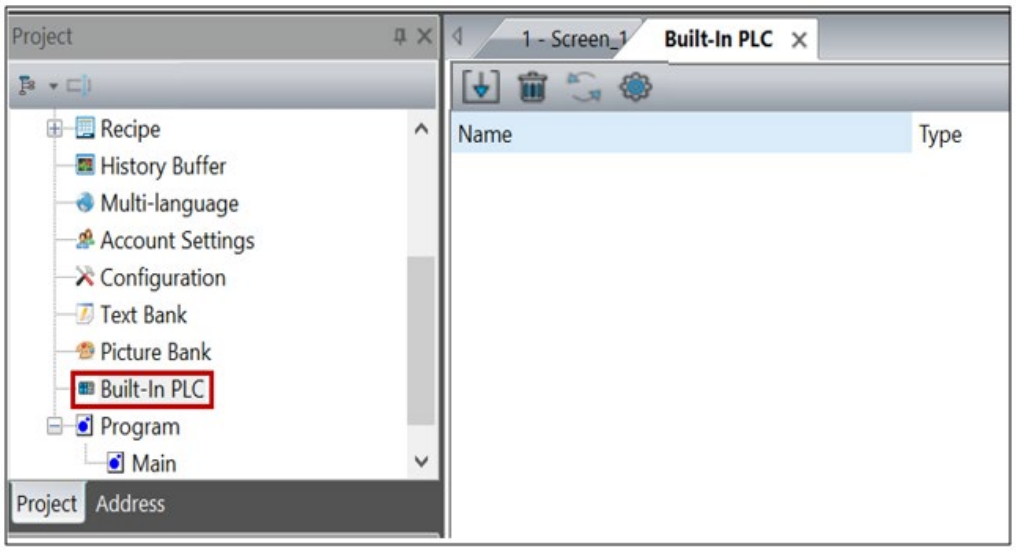


Figure 29 - 34: Click Built-In PLC in Project tree

Result: The Built-In PLC tab opens.

3. Click  icon in the Built-In PLC tab.

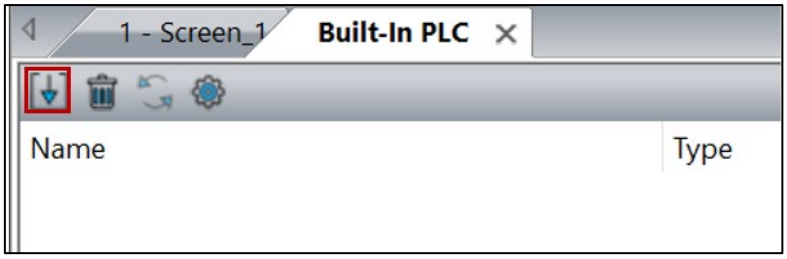


Figure 29 - 35: Import

Result: The **Open** window appears.

4. Select the XML file and click **Open**.

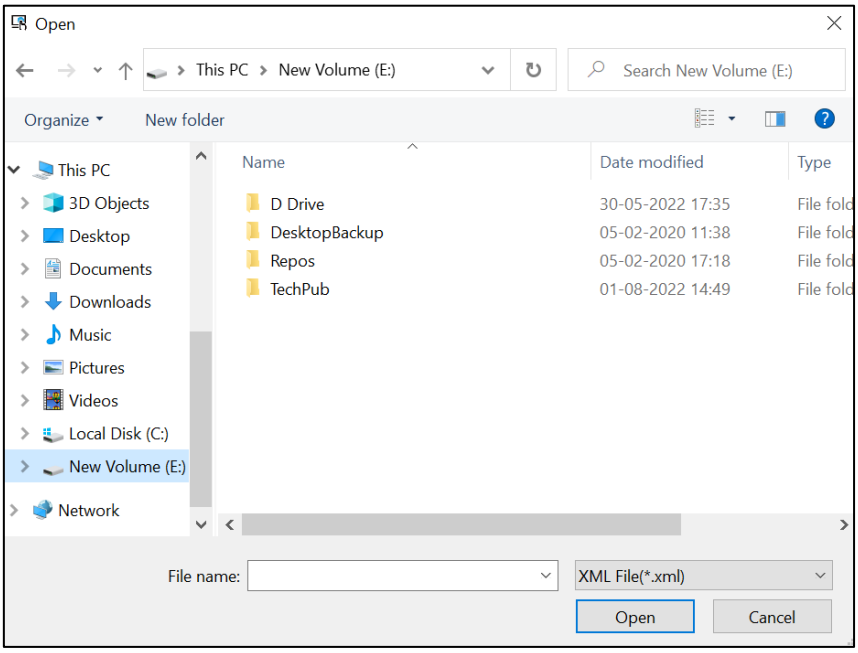


Figure 29 - 36: Open XML File

5. Go back to the Screen tab created at the beginning, and add an element.
6. Double-click the element to open it and click **Write Address**.

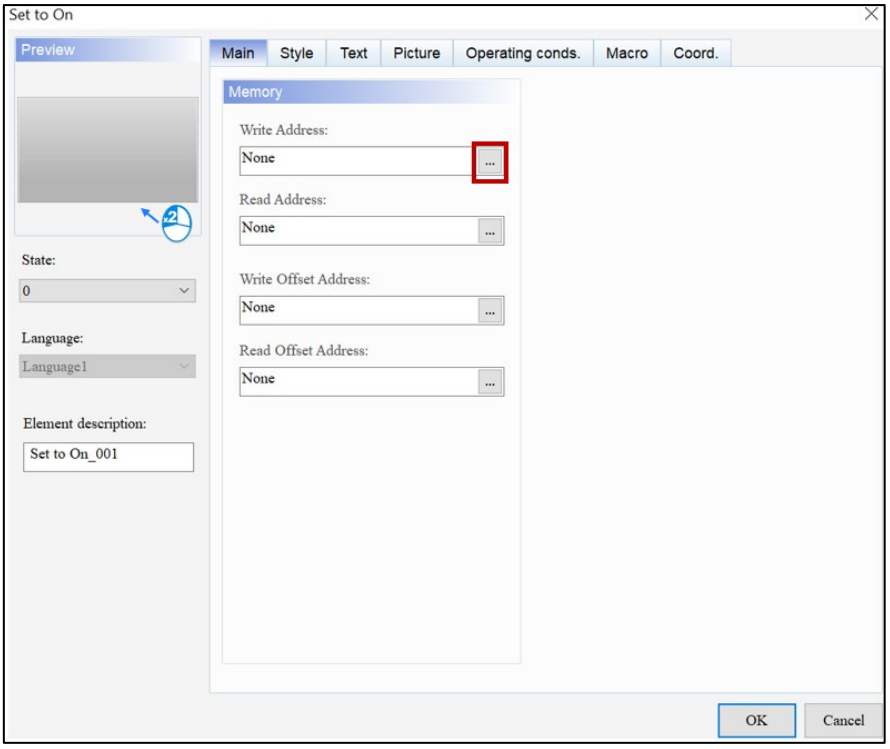


Figure 29 - 37: Write Address

Result: The **Input** window appears.

7. Select **Built-In PLC** from the **Link** drop-down menu in the **Input** window.

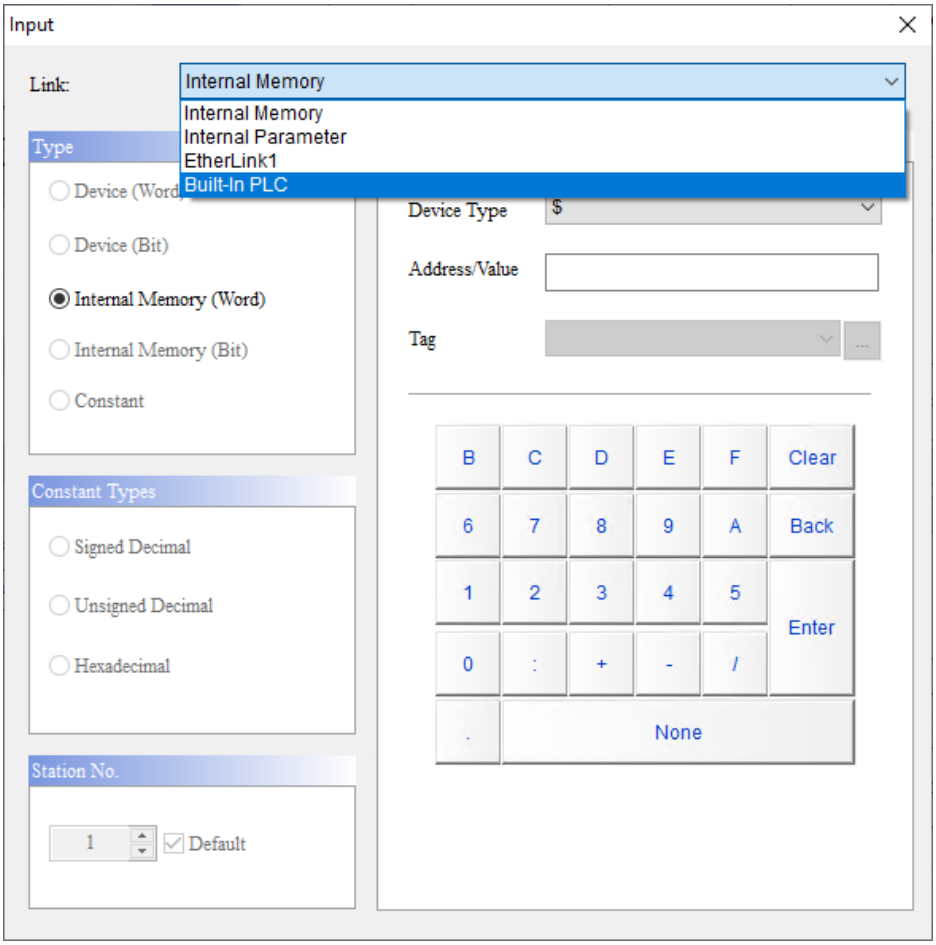


Figure 29 - 38: Link Name > Built-In PLC

Result: The **Input** window appears and the imported XML file is linked to this screen.

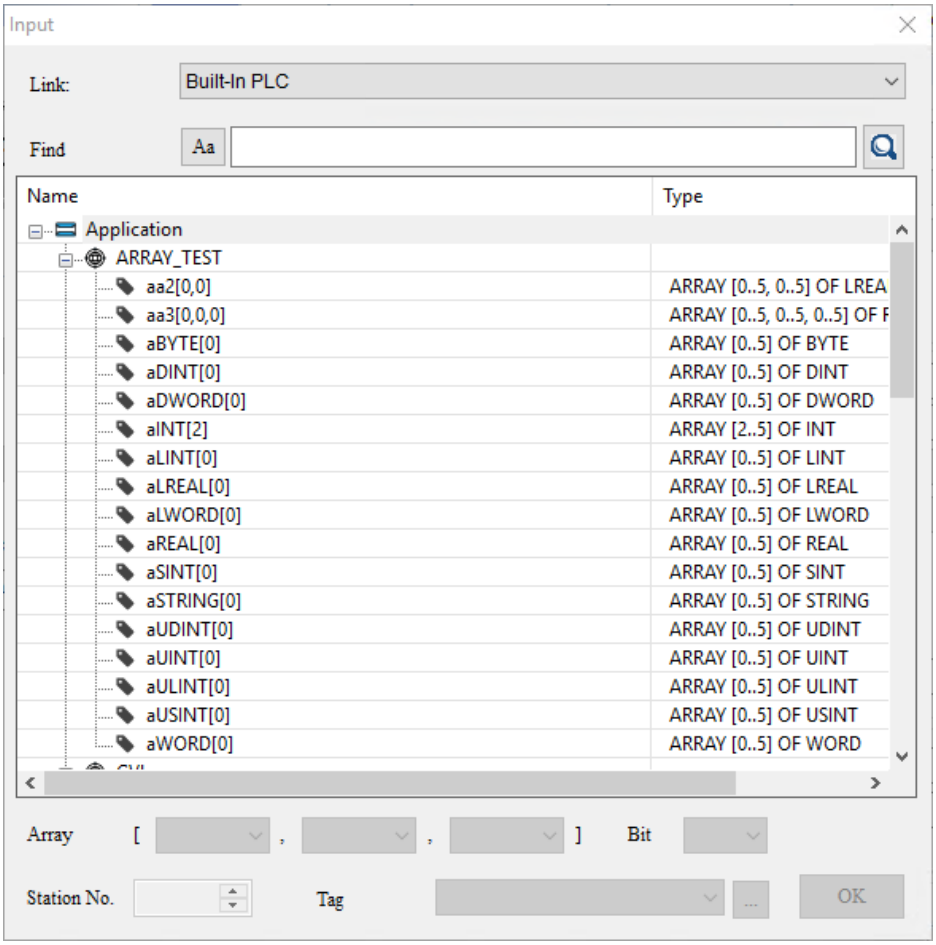


Figure 29 - 39: Input window

Example of selecting **DOP-100 series**

1. Create a **New project** > **DOP-100 series** > Select the desired model > **Next**.

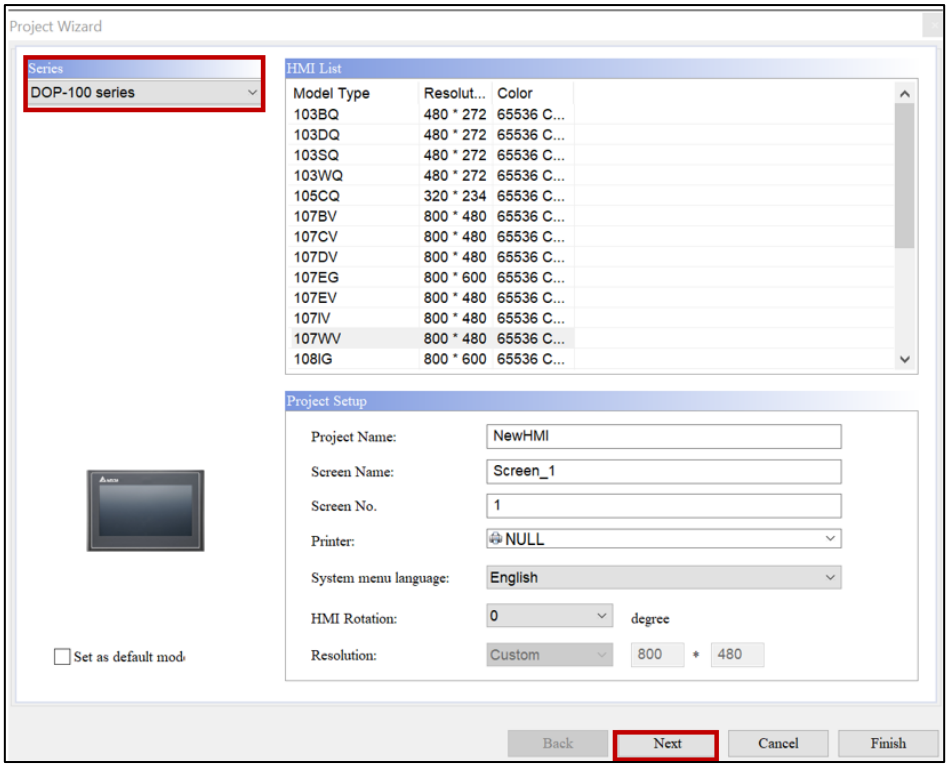


Figure 29 - 40: Project Wizard window

2. ①Choose **Ethernet** connection > ② Add network connection > ③Choose **CODESYS** in the controller drop-down menu > ④**Import**.

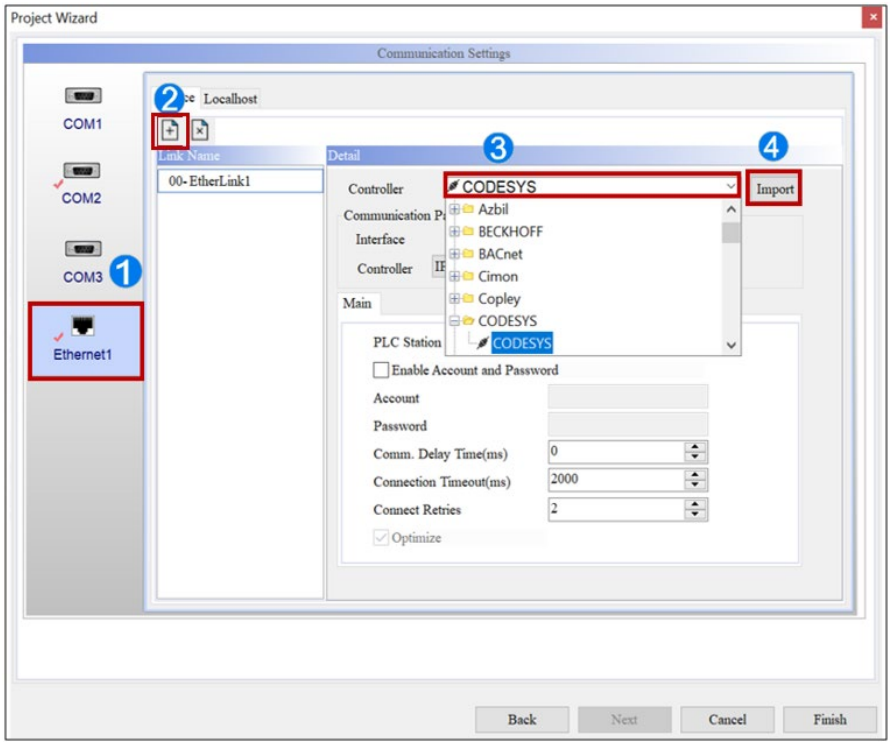


Figure 29 - 41: Import xml file

Result: The Tag List window appears.

3. In the Tag List window, click  icon.

   Result: Open window appears.

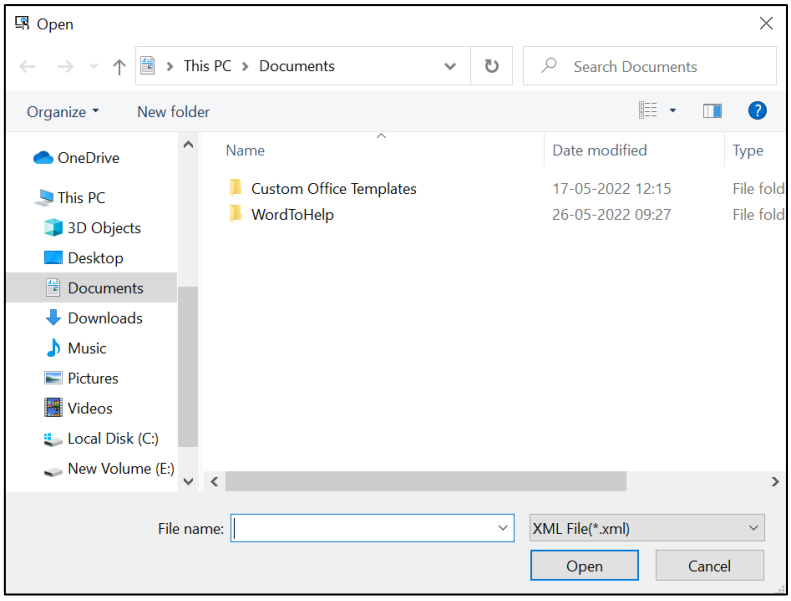


Figure 29 - 42: Select the xml file to import

4. Select the xml file to import and click **Open**.

   Result: The xml file is linked to the **Tag List** window.

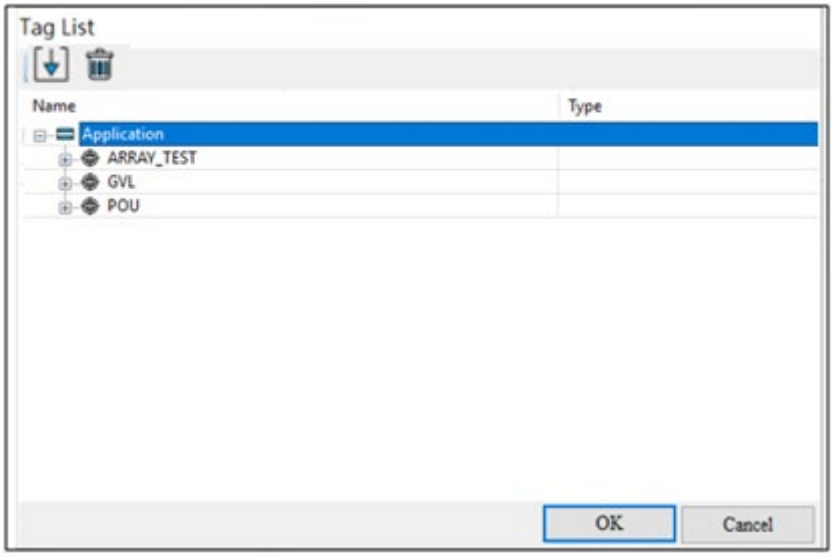


Figure 29 - 43: Link xml file

5. Go to the Screen tab and add an element.
6. Double-click to open the element, and click **Write Address**.

7. In the **Input** window, select **EtherLink1** from the **Link** drop-down menu. CODESYS Tag table appears.

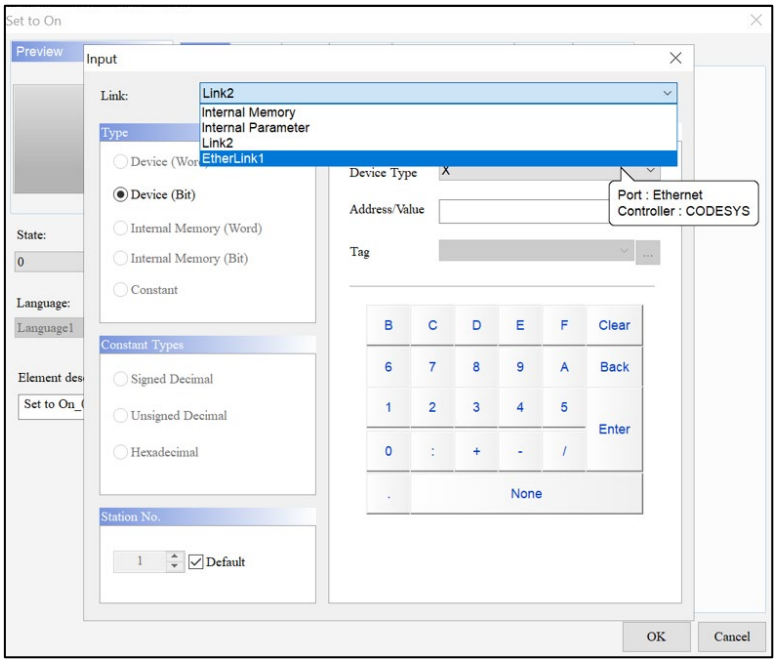


Figure 29 - 44: Select EtherLink

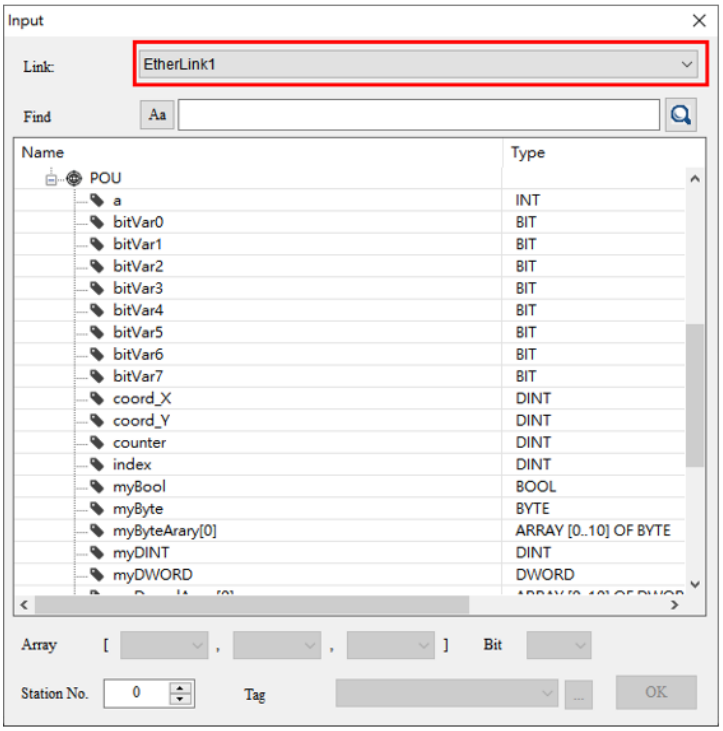


Figure 29 - 45: CODESYS Tag table

29.3.1 CODESYS Settings

Model AX-8 series

To build an AX-8 series model, open the **Built-In PLC** page from the **Project** tree.

Click  icon to open **Built-In PLC Settings** window, as shown in the following figure.

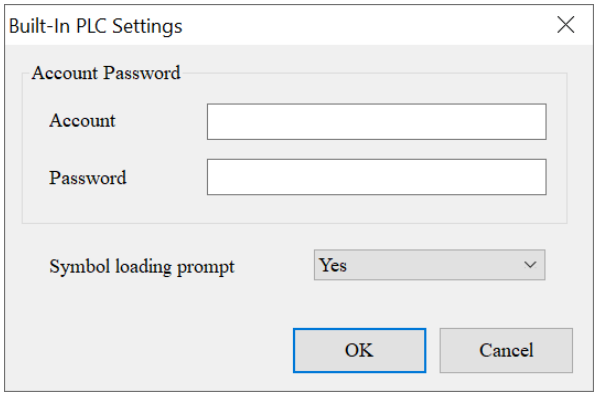
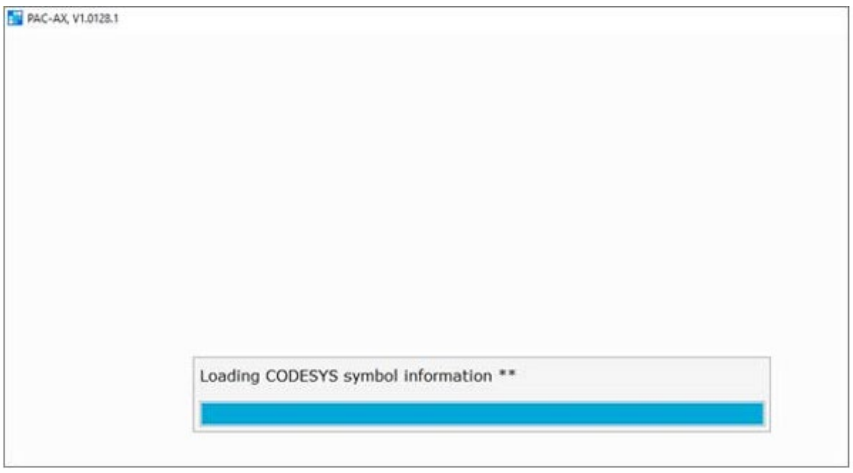


Figure 29 - 46: Built-In PLC Settings window

Built-In PLC Setting	
Account Password	Set the **Account** / **Password** for CODESYS PLC login. If the PLC bit sets the login **Account** / **Password**, these fields can be left blank.
Symbol loading prompt	● Set whether to display the CODESYS **Symbol loading prompt**. ● Select Yes, after the HMI screen is loaded, a CODESYS **Symbol loading prompt** appears, as shown in the following figure. 

Model DOP-100 series

To create a DOP-100 series model, set CODESYS properties through **General** > **Communication Settings**, as shown in the following figure.

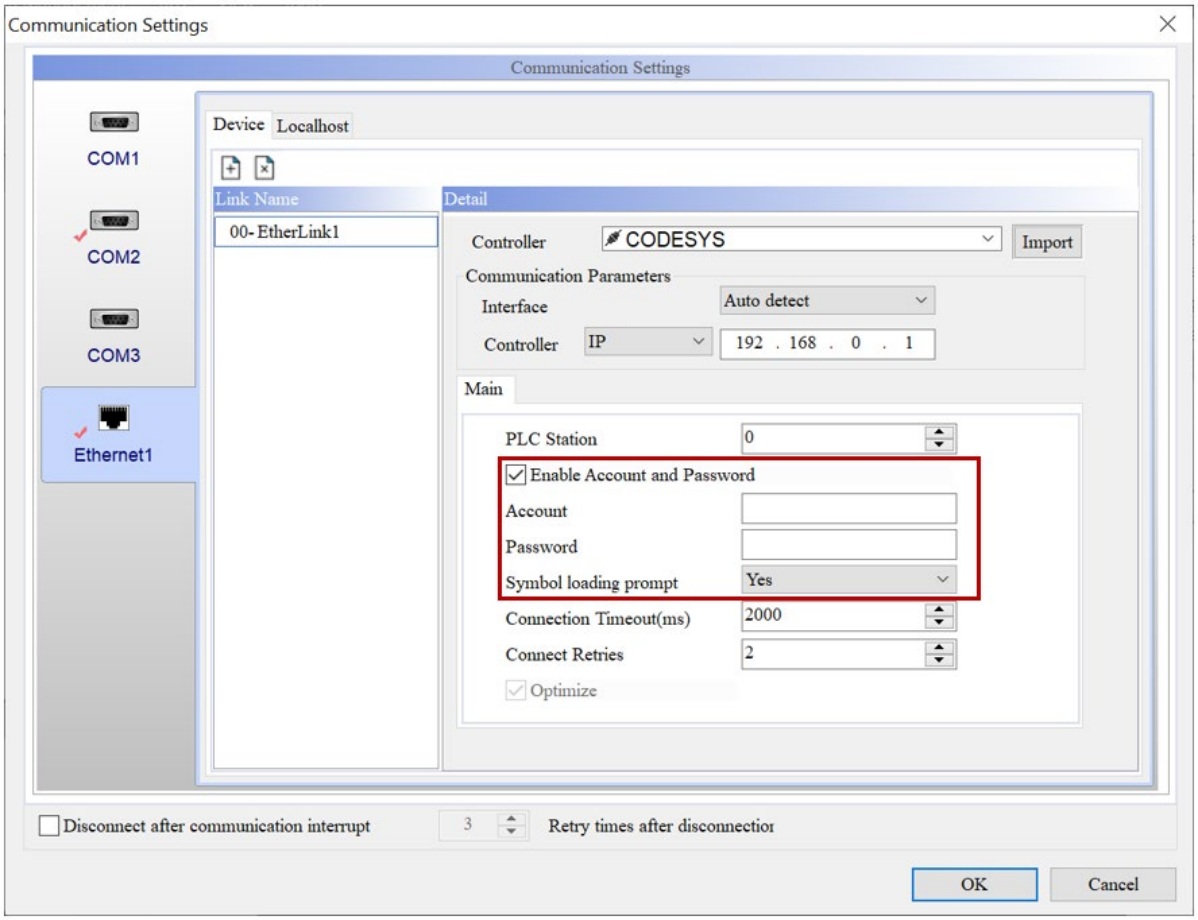
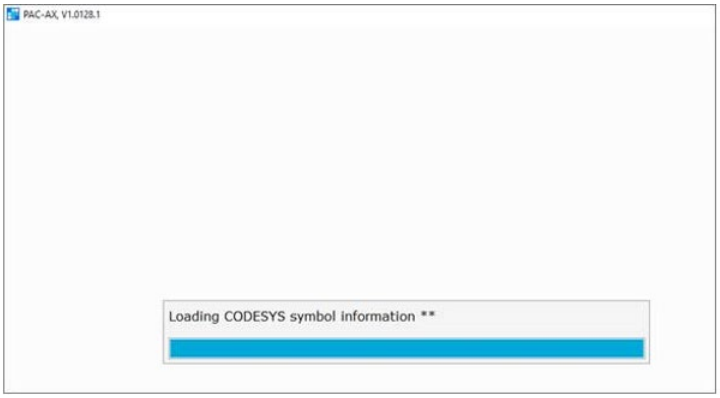


Figure 29 - 47: CODESYS Communication Settings window

CODESYS Communication Settings	
Account Password	Select **Enable Account and Password** checkbox to set the **Account** / **Password** for CODESYS PLC login. If the PLC bit sets the login **Account** / **Password**, these fields can be left blank.
Symbol loading prompt	● Set whether to display the CODESYS **Symbol loading prompt**. ● Select Yes, after the HMI screen is loaded, a CODESYS **Symbol loading prompt** appears, as shown in the following figure. 

29.4 Tag Keyword Filtering Function

DIAScreen supports entering keywords to filter tags with related names, making it easier for users to find the desired Tag. Open **Input** window; select the **Link** name with the imported Tag, and the Tag List appears, as shown in the following figure. After users enter a keyword in the red box, the system displays the corresponding Tag.

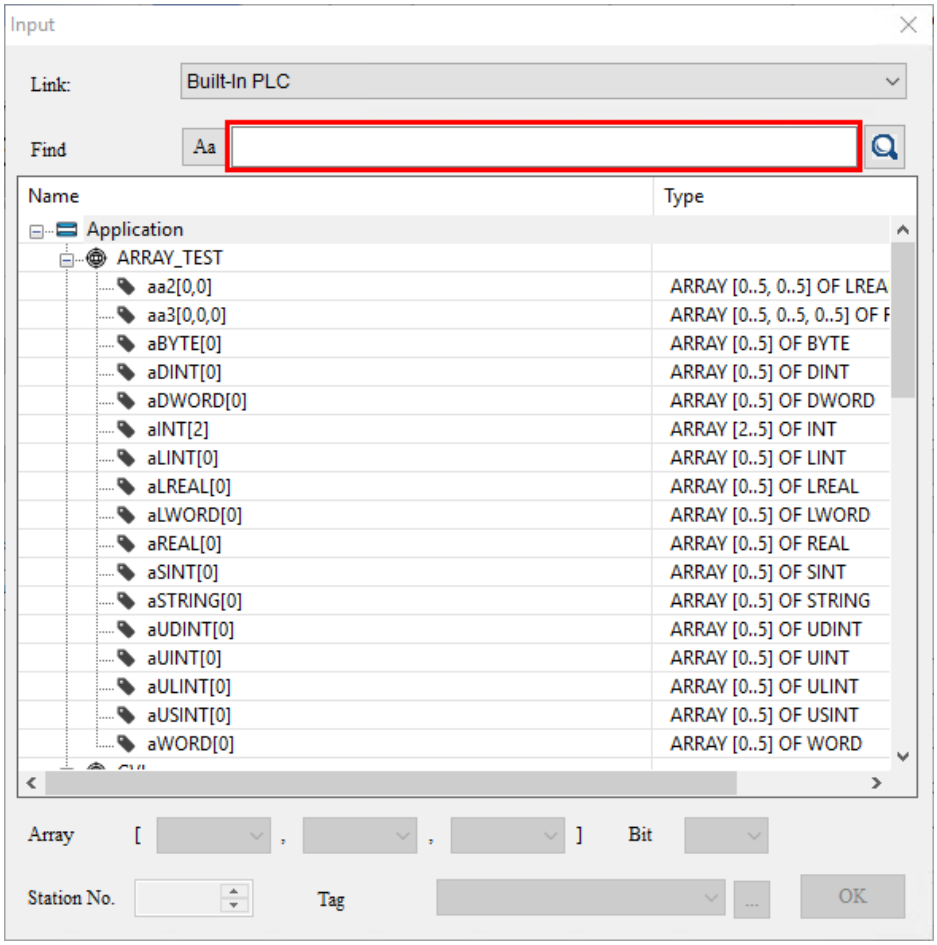


Figure 29 - 48: Keyword filter Tag function

NOTE: *English filter is not case-sensitive by default; click*  *icon to distinguish the filter case.*

There are three ways to filter keywords. Examples are as follows:

1. Enter the Tag keyword directly. For example, Input bool > click  icon > Tag tree to filter all BOOL-named Tags.

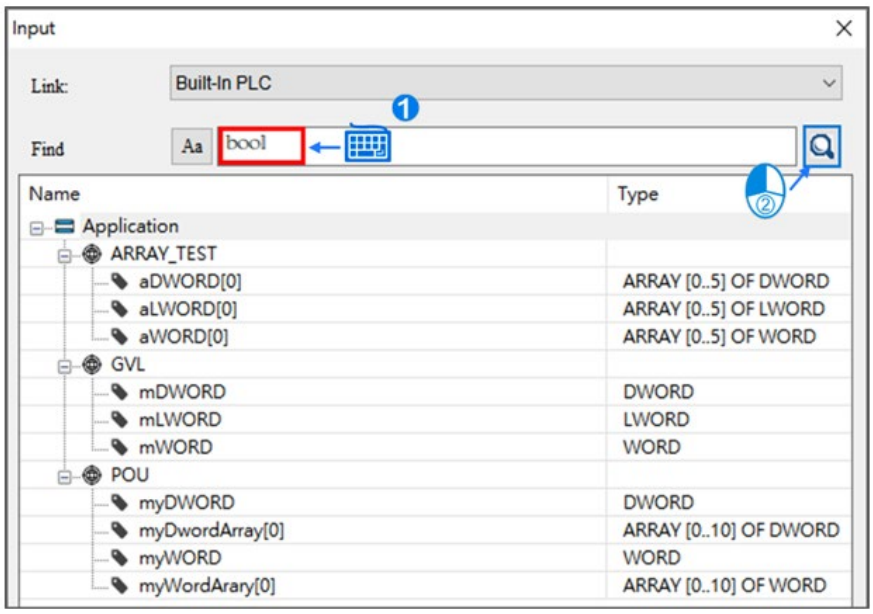


Figure 29 - 49: Enter keywords directly

2. Enter two keywords separated by a space (filter some matching keywords according to the Tag tree hierarchy). For example, input gvl bool (represents the Tag with the BOOL keyword under the GVL hierarchy) > click icon > Tag tree to filter out the Tags whose names match.

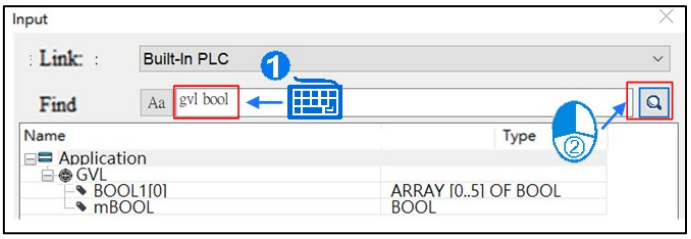


Figure 29 - 50: Filtering some matching keywords according to the Tag tree hierarchy

3. Enter two keywords and separate them with a dot "." (that is the two levels connected by the Tag tree completely match the keywords). For example, input ou.bi (represents tags beginning with the bi keyword connected under the POU level) > click icon > Tag tree to filter out the Tags whose names match.

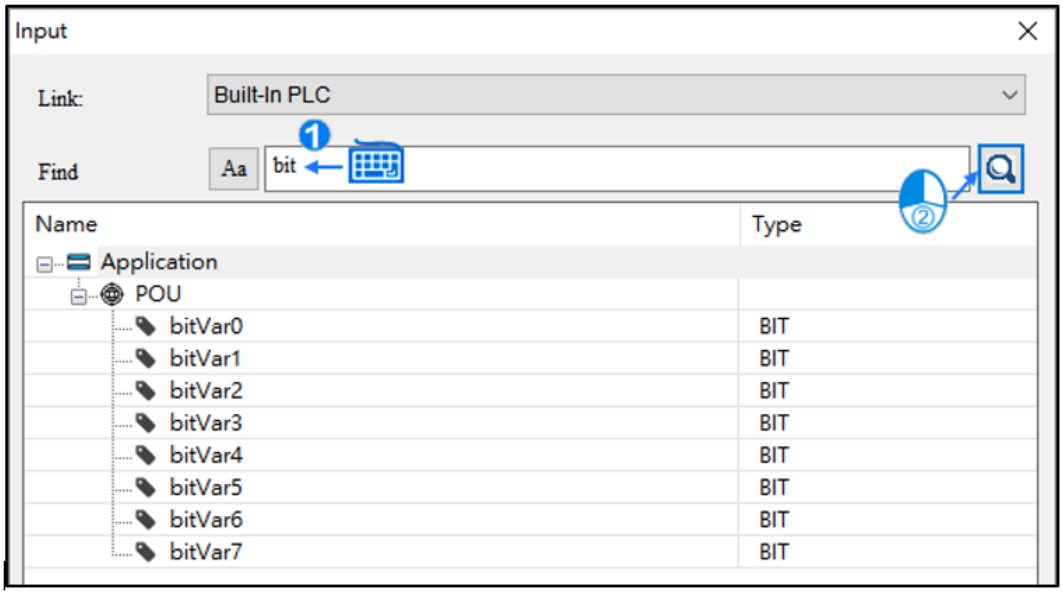


Figure 29 - 51: Two hierarchies connected by Tag tree fully matched keyword

29.5 Beckhoff Tag Import Function

DIAScreen supports communication between HMI and Beckhoff TwinCAT PLC, and imports tags from files. Refer to the following steps to create a Beckhoff TwinCAT project from the file import Tag:

1. Create a **New project** > select the model with **Ethernet** connection > click **Next.**
2. ①Select **Ethernet** connection > ② add network connection.
3. ③ In the **Controller** drop-down menu, select **BECKHOFF** > ④ **Beckhoff TwinCAT Ethernet (Use Tags)** > ⑤ click **Import**.

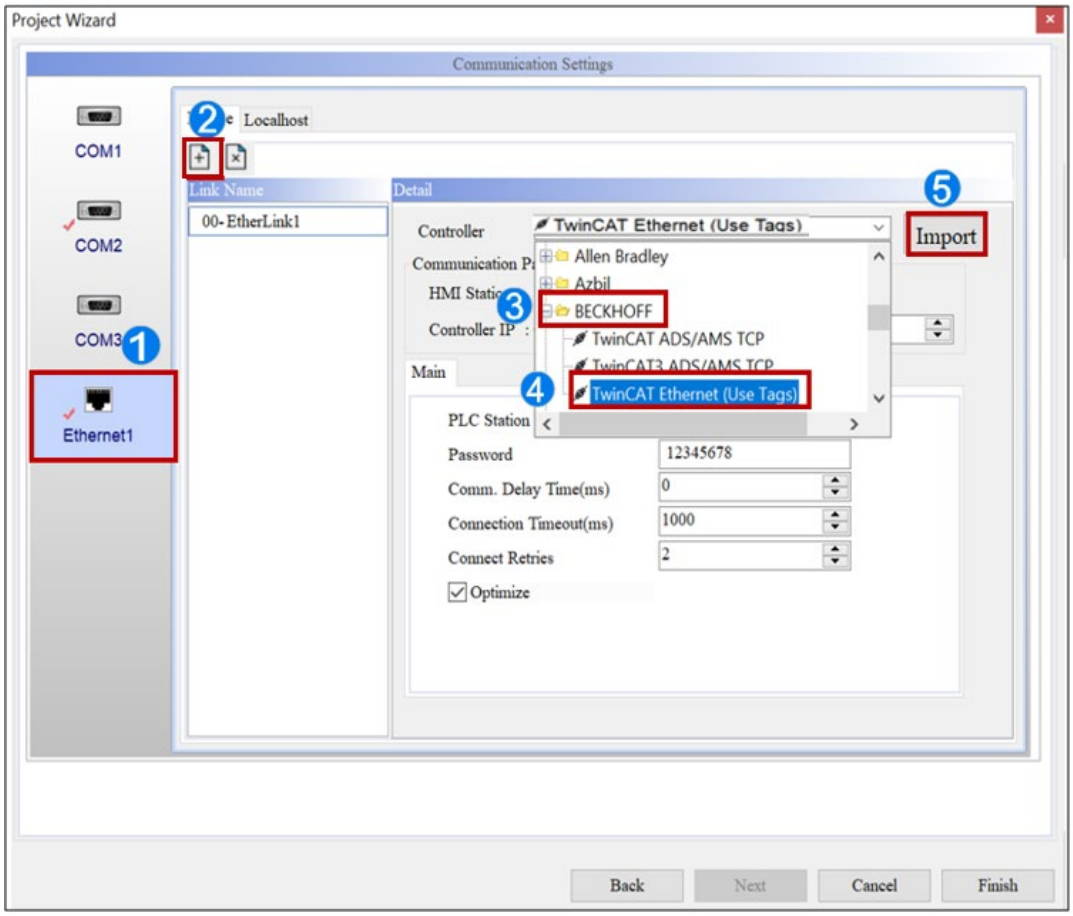


Figure 29 - 52: Establish TwinCAT Ethernet (Use Tags) connection

Result: The **Tag Summary** window appears.

4. Click  icon in the **Tag Summary** window to **import** the **Beckhoff Tag** file. The file types include TcPOU and TcGVL. Select file and click **Open**.

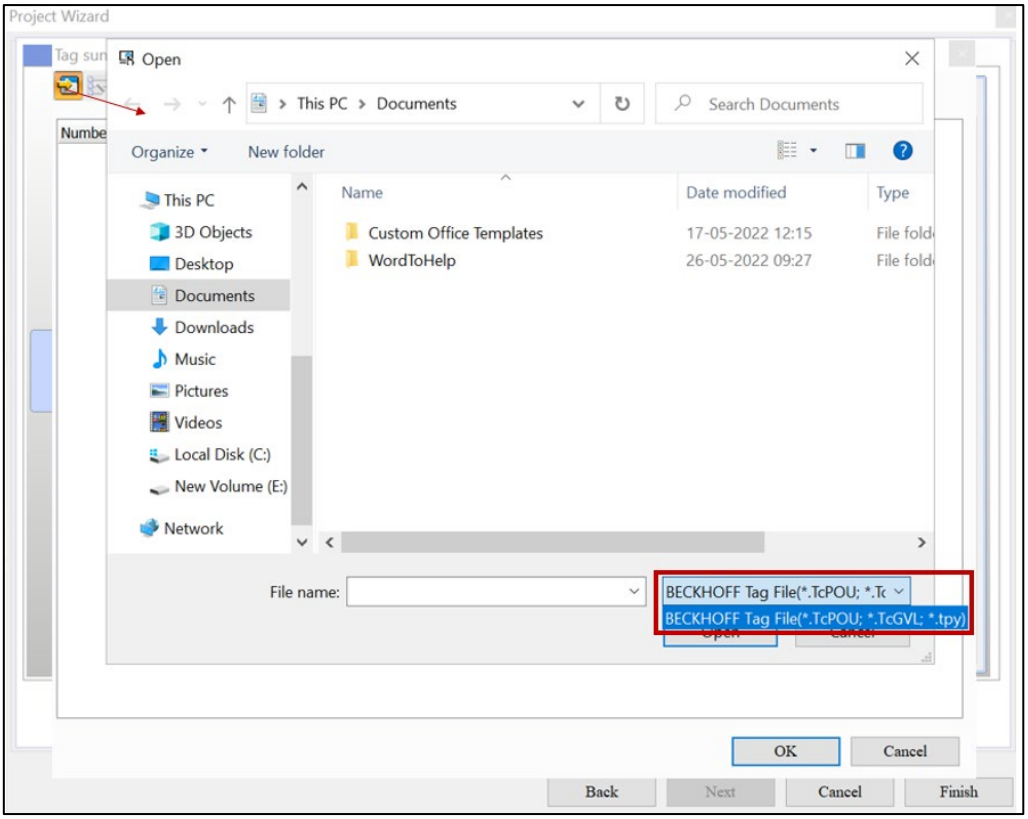


Figure 29 - 53: Import Beckhoff Tag File

Result: The Beckhoff Tag File has been imported into the Tag master list.

5. If users have created a custom variable, they need to import the custom variable DUT file, as shown in the following figure.

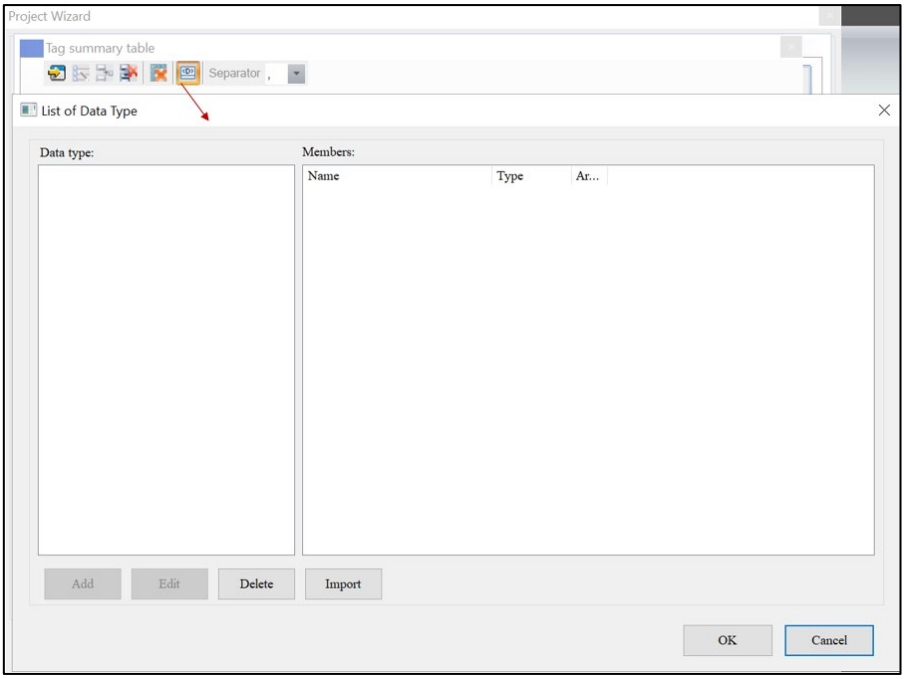


Figure 29 - 54: Import custom variable file

6. Click **OK** on the Tag summary table to set the IP.

   Controller IP: Beckhoff PLC host IP

   Sender AMS NetId: HMI man-machine IP

   Target AMS NetId: Obtained by the TwinCAT software Target System, as shown in the following figure.

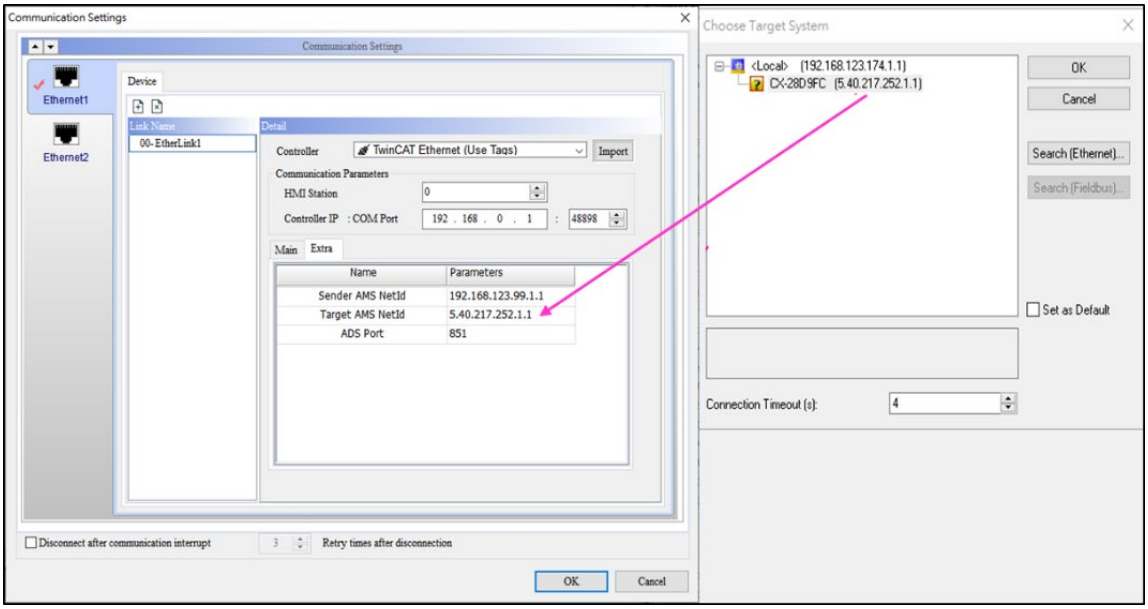


Figure 29 - 55: Beckhoff TwinCAT IP settings

7. Click **OK** to complete the creation of the Beckhoff controller, and the Tag can be used on various functions and elements.

Chapter 30: LUA

30.1 Password Protection for LUA Programs

Set password protection for LUA programs. A unique password can be set for each program (Prog). Protected programs can only be opened properly after the correct password is entered. This password will not be cleared or changed after performing Export / Import or Save / Open File.

When the programming is finished, follow these steps to set the password:

1. Right-click the program to be used (**Project** > **Program**).
2. Click the **Protection** item in the menu.
3. Enter the desired password (up to 8 digits, consisting of numbers 0-9 and letters A-F).
4. After setting the password, the color of the Prog icon changes from blue to red. Right-click the icon and the Protect item will be highlighted in a selected orange box.

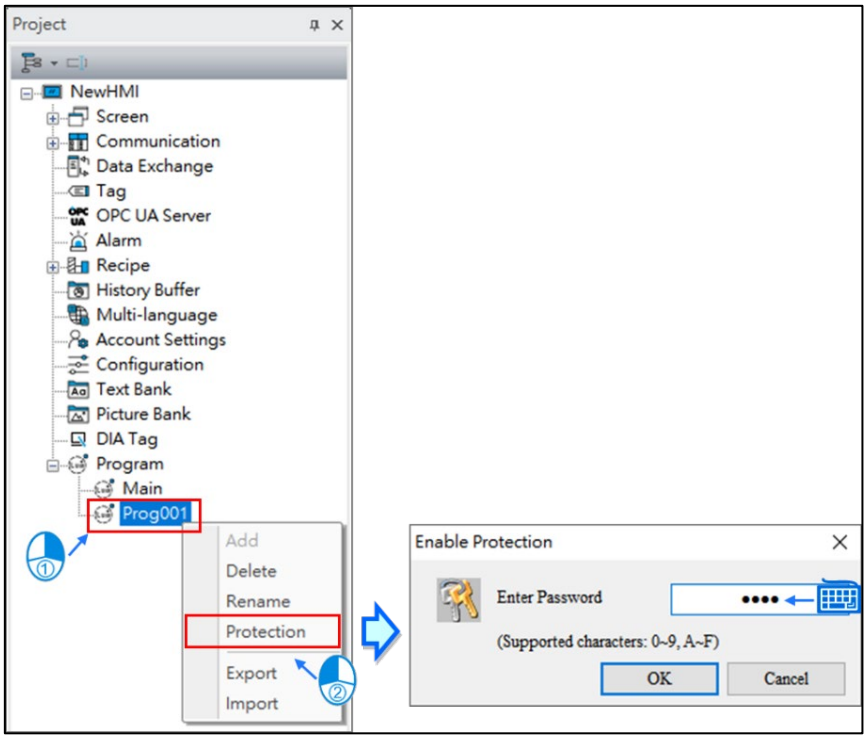


Figure 30 - 1: Enable Password Protection for program

To open a protected program (Prog) file, follow the steps:

1. Double-click the protected program (Prog).
2. Enter the correct password.
3. Open the file.

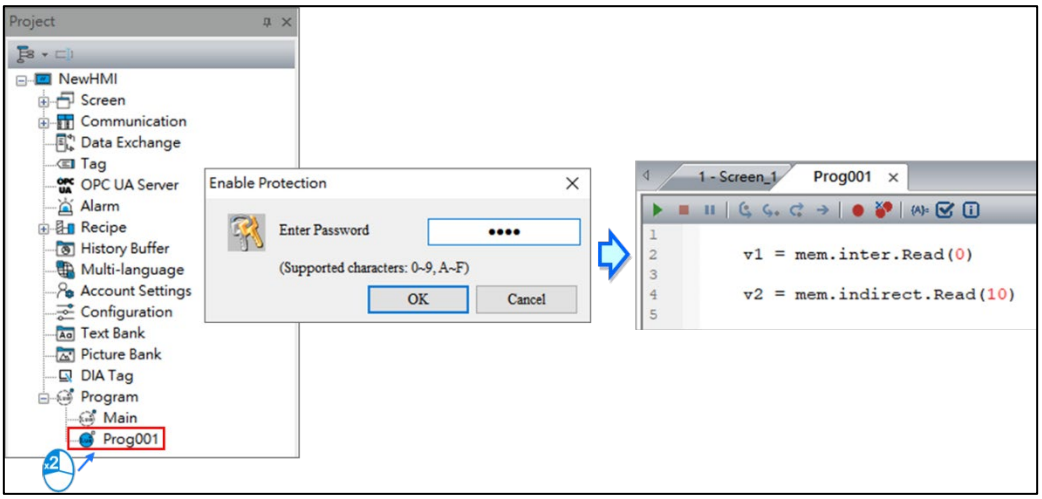


Figure 30 - 2: Open protected program

To remove password protection, follow the steps:

1. Right-click the protected program.
2. Left-click the **Protection** item.
3. Enter the correct password.
4. After finishing the setting of the password, the color of the Prog icon changes from red to blue and the Protect item is not highlighted in the selected orange box.

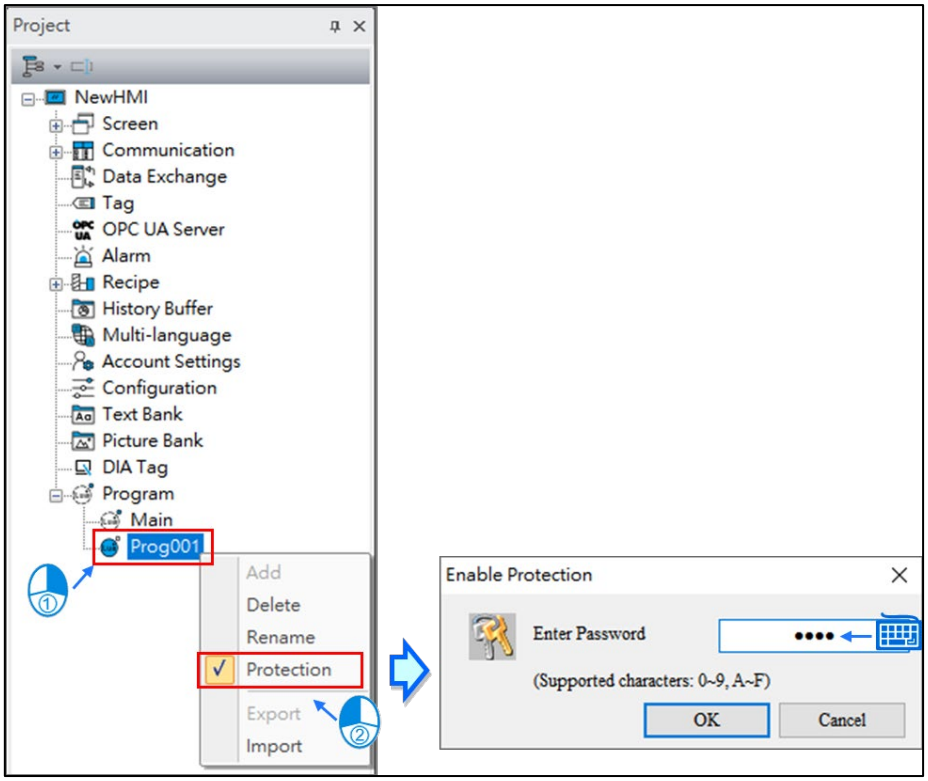


Figure 30 - 3: Removing Password Protection for program

Chapter 31: MQTT Configuration

31.1 MQTT Settings

This chapter on HMI MQTT function introduces Broker, Publisher, Subscriber software function settings.

For the installation and introduction of Mosquitto Server, refer to the website https://swf.com.tw/?p=1005

31.1.1 Broker information

Enter **Broker** settings from **IIoT** > **MQTT**, and set the content of the Broker server.

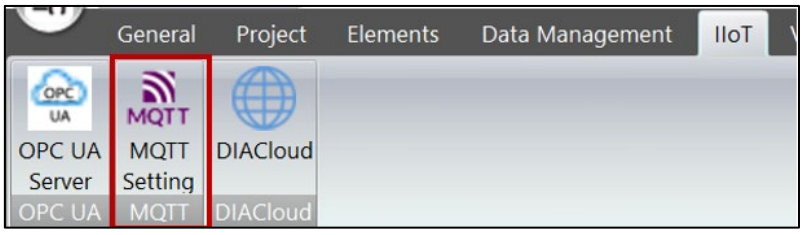


Figure 31 - 1: MQTT Settings

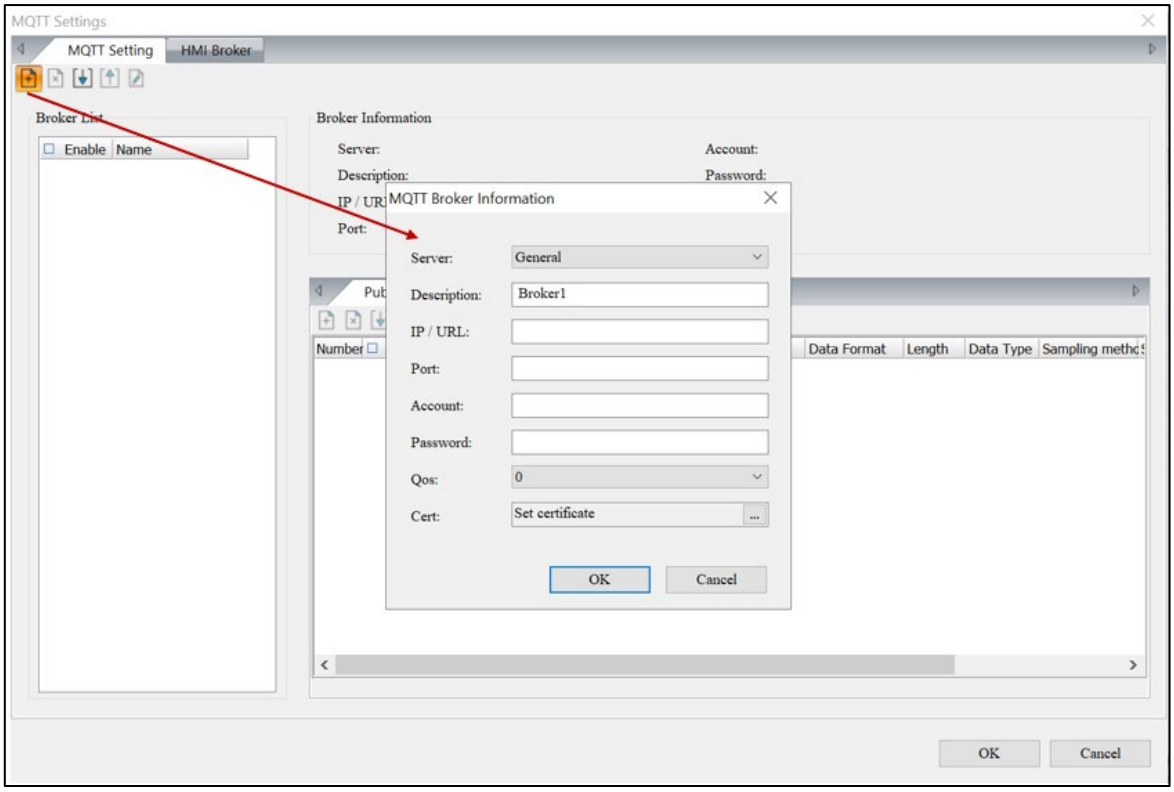
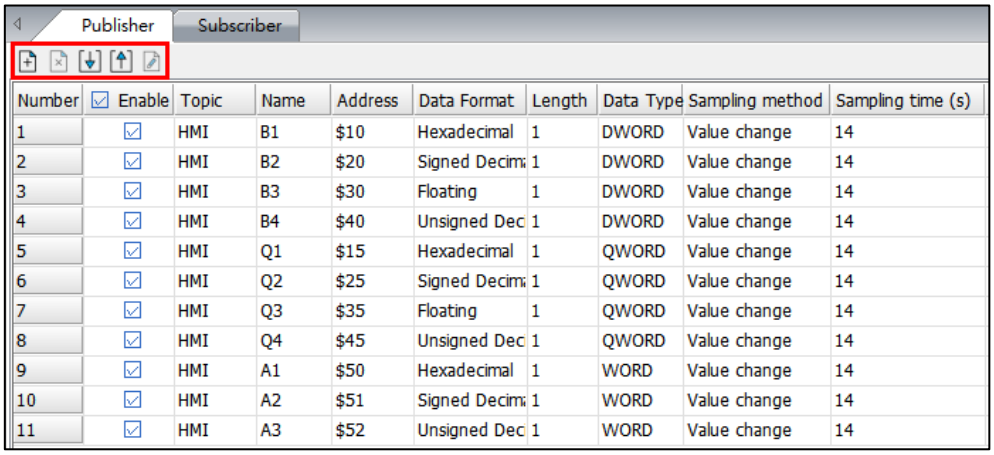


Figure 31 - 2: MQTT Broker Setting

Function	Description
Server	Choose General or Amazon IoT.
IP/URL	Enter the server host IP.
Port	Set server port.
Account / Password	Enter the server configuration account password.
Qos	See URL settings https://swf.com.tw/?p=1015
Cert	Set certificate

31.1.2 Publisher / Subscriber Information



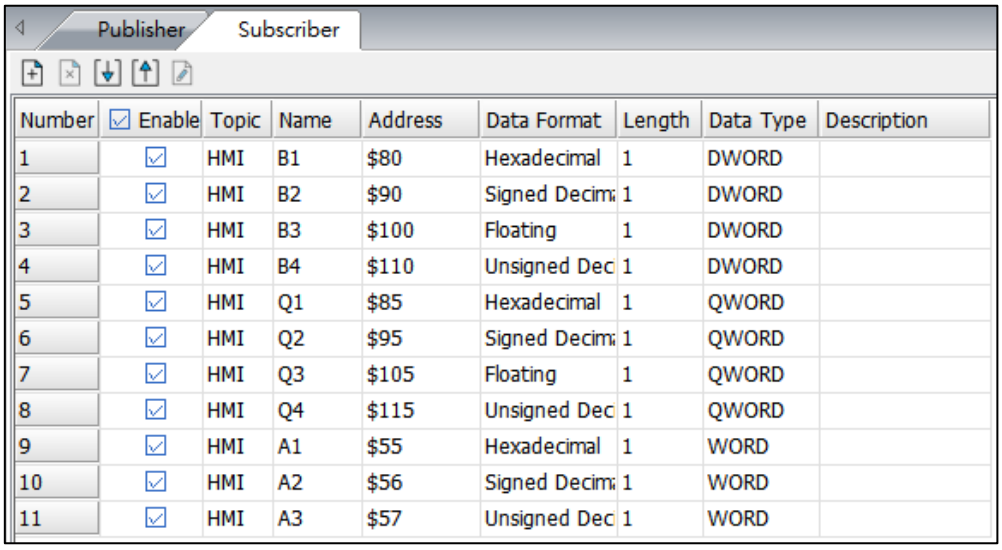
Number	Enable	Topic	Name	Address	Data Format	Length	Data Type	Sampling method	Sampling time (s)
1	☑	HMI	B1	$10	Hexadecimal	1	DWORD	Value change	14
2	☑	HMI	B2	$20	Signed Decim	1	DWORD	Value change	14
3	☑	HMI	B3	$30	Floating	1	DWORD	Value change	14
4	☑	HMI	B4	$40	Unsigned Dec	1	DWORD	Value change	14
5	☑	HMI	Q1	$15	Hexadecimal	1	QWORD	Value change	14
6	☑	HMI	Q2	$25	Signed Decim	1	QWORD	Value change	14
7	☑	HMI	Q3	$35	Floating	1	QWORD	Value change	14
8	☑	HMI	Q4	$45	Unsigned Dec	1	QWORD	Value change	14
9	☑	HMI	A1	$50	Hexadecimal	1	WORD	Value change	14
10	☑	HMI	A2	$51	Signed Decim	1	WORD	Value change	14
11	☑	HMI	A3	$52	Unsigned Dec	1	WORD	Value change	14

Figure 31 - 3: MQTT Publisher settings

Publisher uses the toolbar icons (**Add** , **Delete** , **Import** , **Export** , and **Edit**) to set up the page. The following table introduces each title.

Item	Description
Enable	Enable or disable Publisher item.
Topic / Name	Set subject / name.
Address	Set the memory address of the value pushed by Publisher.
Data Format	Select the **Data Format** of the corresponding address.
Length	The length of the data selected according to the value unit.
Data Type	Select WORD, DWORD, QWORD.
Sampling method	**Timed Execution**: Push once according to the set time period, ranging from 1 ~ 7200 seconds. **Value change**: If the value changes, it will be pushed once.
Sampling time	The sampling method can only be enabled when **Timed Execution** is selected, and the range is 1 ~ 7200 seconds.
Description	Write a description and mark the purpose.

Subscribers receive value feeds according to the same **Topic** / **Name** set by Publisher.



Number	Enable	Topic	Name	Address	Data Format	Length	Data Type	Description
1	☑	HMI	B1	$80	Hexadecimal	1	DWORD	
2	☑	HMI	B2	$90	Signed Decim	1	DWORD	
3	☑	HMI	B3	$100	Floating	1	DWORD	
4	☑	HMI	B4	$110	Unsigned Dec	1	DWORD	
5	☑	HMI	Q1	$85	Hexadecimal	1	QWORD	
6	☑	HMI	Q2	$95	Signed Decim	1	QWORD	
7	☑	HMI	Q3	$105	Floating	1	QWORD	
8	☑	HMI	Q4	$115	Unsigned Dec	1	QWORD	
9	☑	HMI	A1	$55	Hexadecimal	1	WORD	
10	☑	HMI	A2	$56	Signed Decim	1	WORD	
11	☑	HMI	A3	$57	Unsigned Dec	1	WORD	

Figure 31 - 4: MQTT Subscriber settings

31.1.3 HMI Broker Settings

HMI also supports Broker server, and the description is as follows:

Function	Description
Enable Broker server	Enable HMI as MQTT Broker server
Account and Password	1. If no account and password is set, the Publisher / Subscriber host can send and receive push broadcasts without filling in the account and password. 2. After setting the account and password, Publisher / Subscriber needs to set the corresponding account and password to receive the push broadcast.

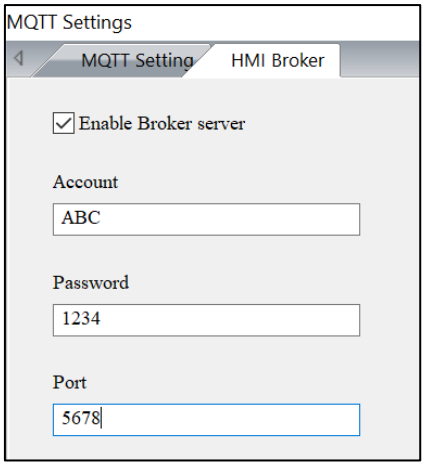


Figure 31 - 5: MQTT HMI Broker Setting

31.1.4 MQTT HMI Screen Display

Publisher and Subscriber set the **Topic**, **Name**, **Address**, **Data Format**, and **Length**.

The element screen appears as follows.

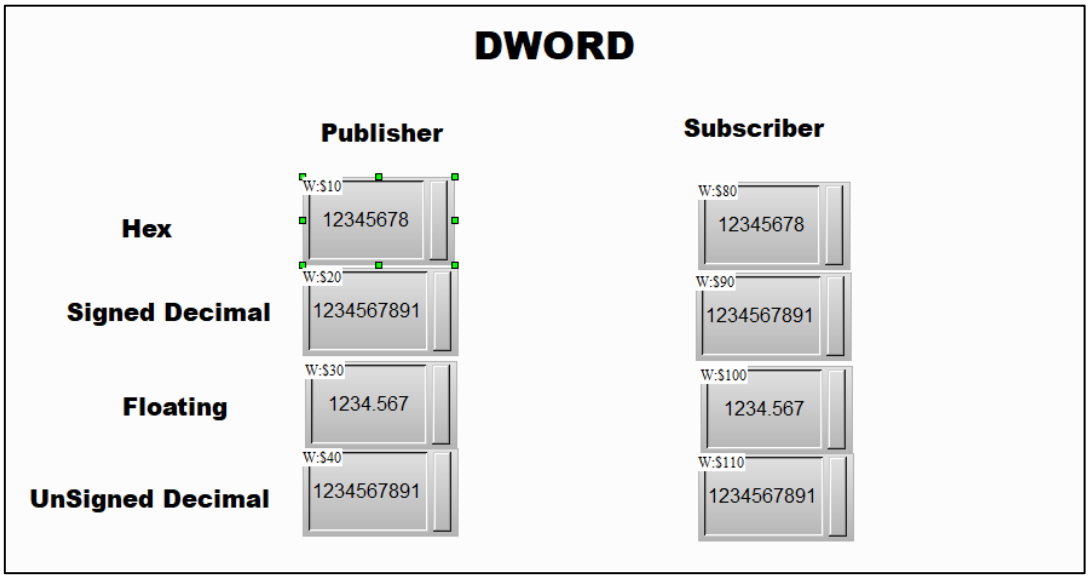


Figure 31 - 6: MQTT screen settings

After downloading to the HMI, enter a value in the Publisher value component, that is, the Subscriber value component corresponding to the Topic theme. It displays the same value. The HMI screen is shown in the following figure.

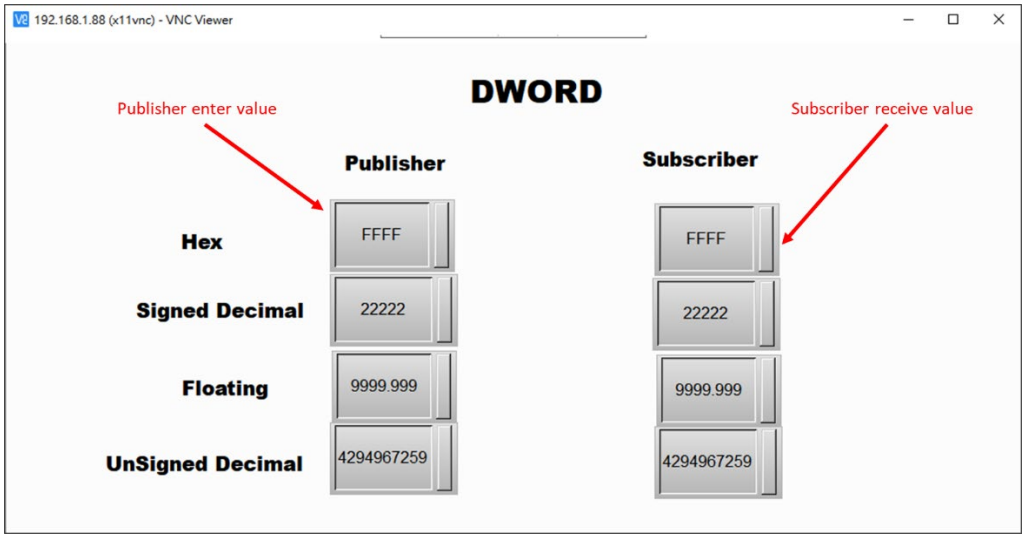


Figure 31 - 7: MQTT HMI screen

Appendix A: System Screen

A.1 System Screen Overview

How to enter the system screen

Press on a blank space for more than 3 seconds, and system directory appears on the left.

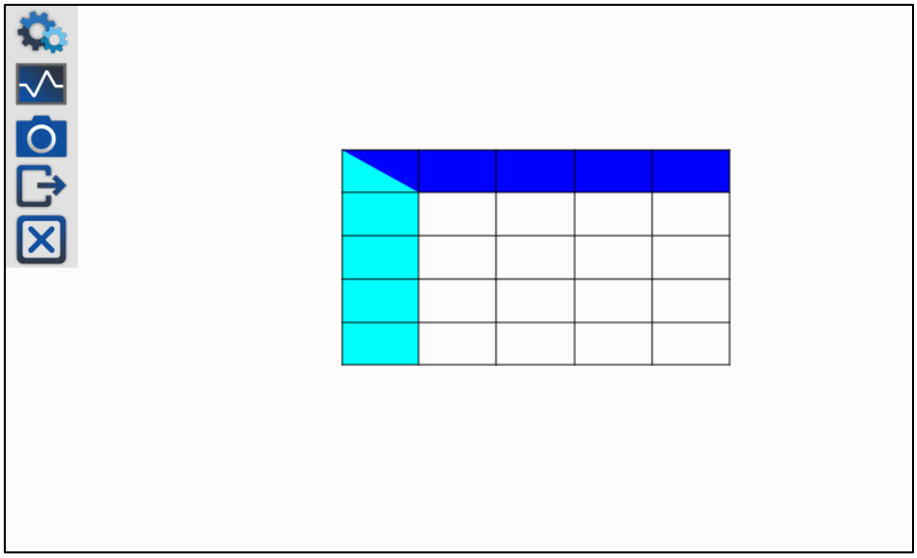
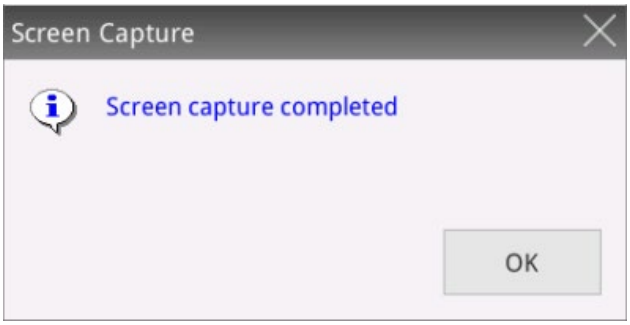
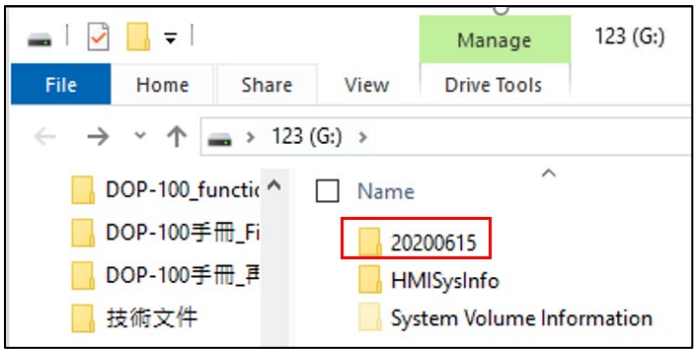
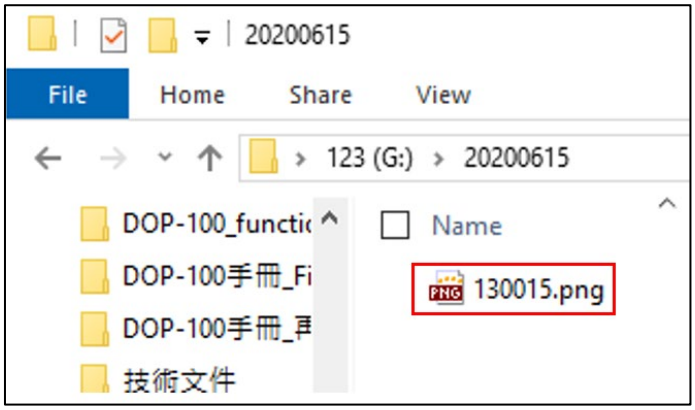
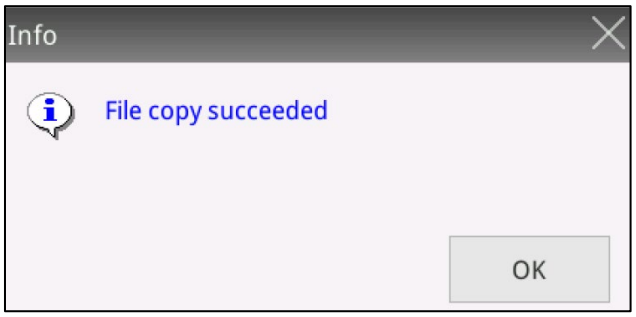
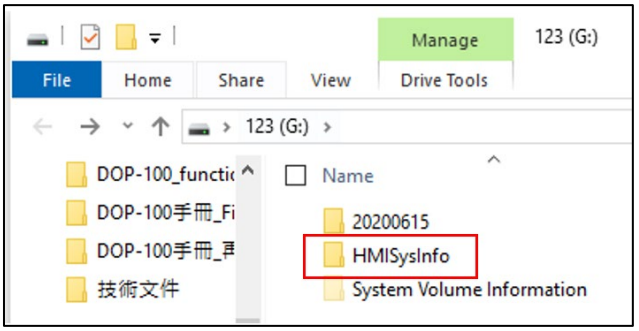


Figure A - 1: System screen directory

Function	Description
System menu 	Click to enter the system screen.
System monitor 	Display the system usage status.

Function	Description
Screen capture	Capture the screen and saves the screenshots in PNG format to the USB disk. The following message appears when the process is complete.  The exported file will be archived in the archive folder and named by date (yyyymmdd), and the file is named by time (hhmmss).  

Function	Description
Export system data 	System related data can be exported. After the export is complete, the following message appears.  The exported files will be archived in the **HMISysInfo** folder. 
Exit system directory 	Click to cancel the display of the system directory on the left and return to the HMI operation screen.

How to exit the system screen

Once in the system screen, click the button on the top right corner to exit the HMI system screen.

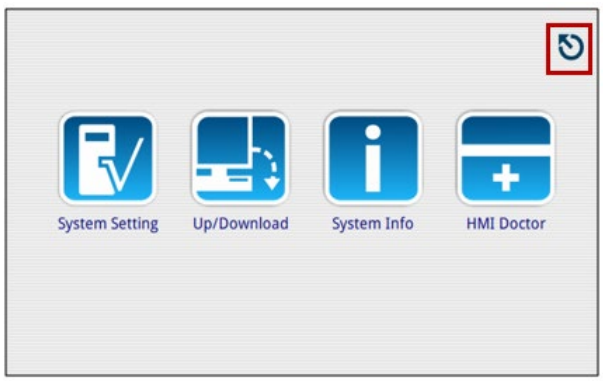


Figure A - 2: Click the top right corner to exit the system screen

How to operate the system screen

Click the icon on the screen to access the corresponding function options. The following section introduces each of the functions on the system screen.

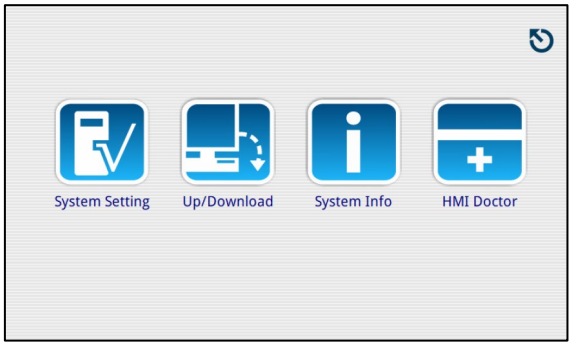


Figure A - 3: System screen

System Screen Functions			
System Setting	Display	Brightness	Adjust the brightness.
	Date/Time	Date	Set the system date.
		Time	Set the system time.
	Touch Panel	Delay	Set the delay time for the touch panel.
		Force	Set the pressing force on the touch panel.

System Screen Functions				
				
		Calibration 	Calibrate the touch panel.	
	Network 	HMI Name	Display the name set for the HMI.	
		Mode	DHCP	Obtain an IP address automatically.
			Static	Customize the IP address.
			BOOTP	Obtain an IP address automatically.
		IP	Set the IP address.	
		Mask	Set the network mask.	
		Gateway	Set the gateway.	
		DNS	Set the domain name.	
		MAC	Display the MAC address of the HMI.	
System Setting 	Network App 	VNC	Enable	Enable or disable VNC.
			Password	Set the connection password.
			Port	Set the VNC connection port.
		eServer	Enable	Enable or disable eServer.
			Password	Set the connection password.
	COM Port	COM1	Set the COM Mode, Baud Rate, Stop Bits, Data Bits, Parity Bits, Comm. Delay,	

System Screen Functions			
		COM2	Comm. Timeout, Comm. Retry Times, HMI Station, PLC Station, Multi-Link Mode, and Baud Rate Tuning for COM1 ~ COM3.
		COM3	
	Audio 	Buzzer 	Adjust HMI key tone and buzzer volume.
	Password 	Set the Password Table for Levels 0 ~ 7. The highest security password is required for setting up the Password Table.	
	MISC 	System Language	Set the display language of the System Menu.
		Touch Cursor	Set whether to display the touch cursor.
		ScreenSaver Time	Set up the time after which the screensaver is enabled.
		Boot Delay Time	Set up the delay time for starting the device.
		Default Language	Select the ID number of the language to use.
		Boot Display	Set whether to display the boot screen at startup.
		USB Comm. Mode	Set the USB upload / download mode.
System Setting 	File Manager 	Format 	Formatting is available for HMI, USB Disk, and SD Card. The HMI project file is cleared after formatting.
		File Copy 	Copy the screen to external storage devices (USB Disk or SD Card).
		Firmware Update 	Update HMI firmware from USB Disk or SD Card.

<table>
<tr><th colspan="4">System Screen Functions</th></tr>
<tr><td rowspan="5">Upload / Download  </td><td rowspan="2">Standard Mode  </td><td>COM1</td><td rowspan="2">To upload / download through the COM Port, select COM1 or COM2 in the Standard Mode for up- and downloading the screen data.</td></tr>
<tr><td>COM2</td></tr>
<tr><td rowspan="2">Bypass Mode  </td><td>Mode 1
COM1 > COM2</td><td rowspan="2">The HMI is used as a bridge in the Bypass Mode to transmit data between PC and PLC.</td></tr>
<tr><td>Mode 2
COM2 > COM1</td></tr>
<tr><td rowspan="2">Transfer Mode  </td><td>Upload</td><td rowspan="2">Upload and download DVP files used in the PLC.</td></tr>
<tr><td>Download</td></tr>
<tr><td>System Info  </td><td colspan="3">Display HMI-related data, including firmware version, model, battery capacity, memory space, CPU rate, test data, current time, PLC driver in use, and connection to external storage.</td></tr>
<tr><td rowspan="8">HMI Doctor  </td><td>Network  </td><td colspan="2">Network test</td></tr>
<tr><td rowspan="5">Color  </td><td>Red</td><td>Red screen test</td></tr>
<tr><td>Green</td><td>Green screen test</td></tr>
<tr><td>Blue</td><td>Blue screen test</td></tr>
<tr><td>Black</td><td>Black screen test</td></tr>
<tr><td>White</td><td>White screen test</td></tr>
<tr><td>ADC  </td><td colspan="2">ADC test</td></tr>
<tr><td>Buzzer / LED  </td><td colspan="2">Buzzer / LED test</td></tr>
<tr><td>Draw Line  </td><td colspan="2">Line drawing test for the touch panel</td></tr>
</table>

A.2 System Setting

The System Setting operation is described as follows.

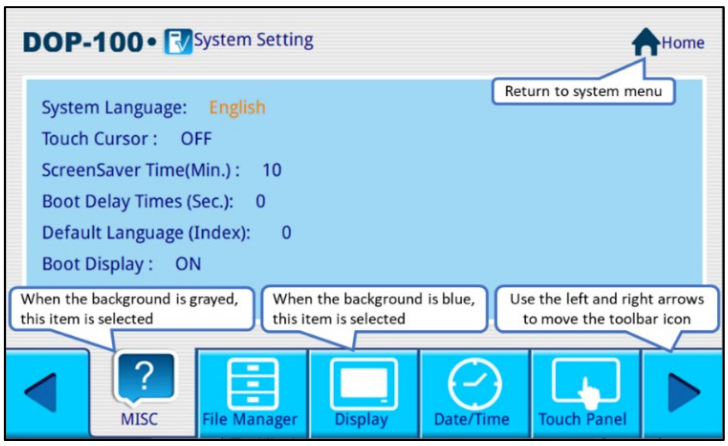


Figure A - 4: System Setting operation

- Display

  Set the LCD Display.

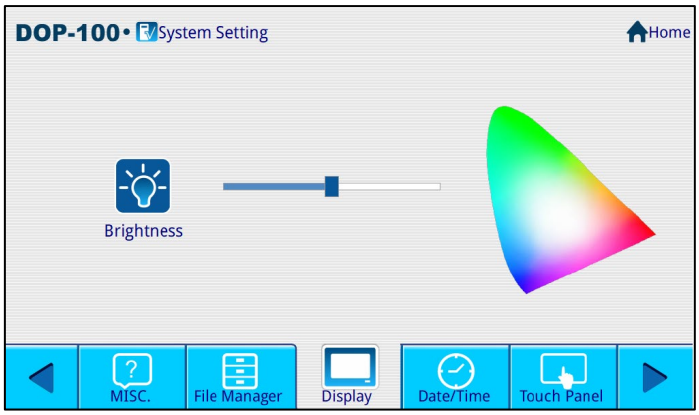


Figure A - 5: Display

Display 	Brightness 	Adjust the brightness of the HMI.

- Date / Time

Set the date and time (year, month, day, hour, minute, and second) for the HMI system.

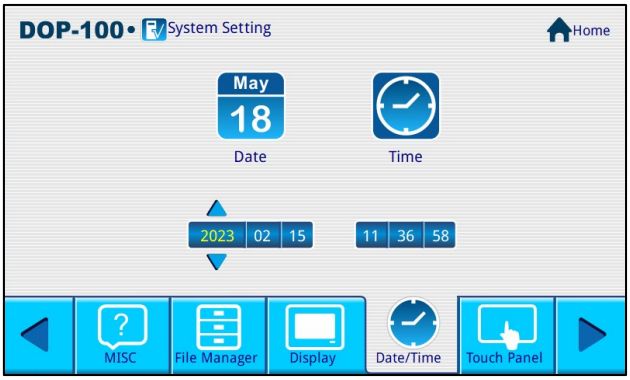


Figure A - 6: Date/Time

Date/Time 	Date 	Set the HMI system date with the year, month, and day.
	Time 	Set the HMI system time with the hour, minute, and second.

- Touch Panel

Set the delay time, pressing force, and calibration for the touch panel.

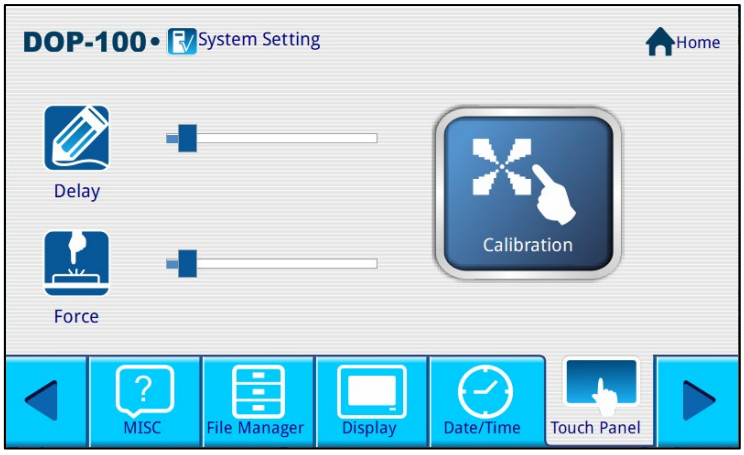
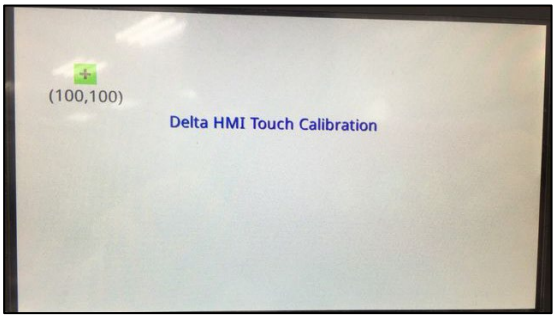


Figure A - 7: Touch Panel

Touch Panel 	Delay 	Set the delay time of HMI processing the touch and movement data. The farther to the right, the shorter the delay time, which means the speed is faster; the farther to the left, the longer the delay time, which means the speed is slower.
	Force 	Set the pressing force for the HMI touch panel. Move the slider left to reduce the force, meaning the HMI is more sensitive to forces, thereby requiring less force for the touch operation; move the slider right to increase the force, meaning the HMI is less sensitive to forces, thereby requiring more force for the touch operation.
	Calibration 	Follow the instructions and touch the center of the calibration icon to conduct five-point calibration for the HMI touch panel. A significant deviation may occur to the touch panel if users touch a point far away from the center point in the calibration area. It is suggested to use a dedicated stylus for the calibration. 

- Network

Set the network IP access mode, IP, Mask, Gateway, and DNS.

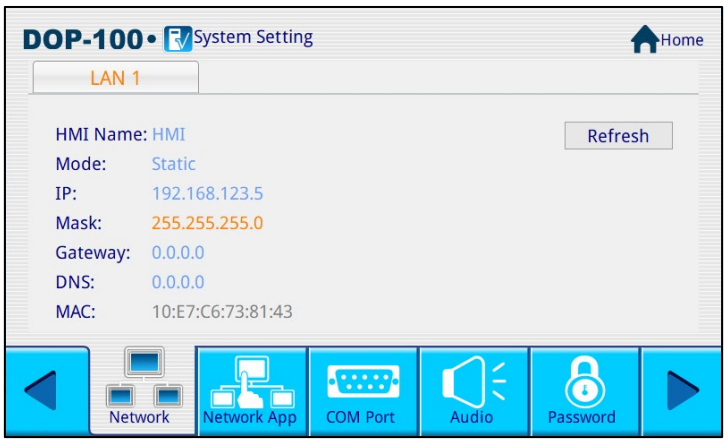
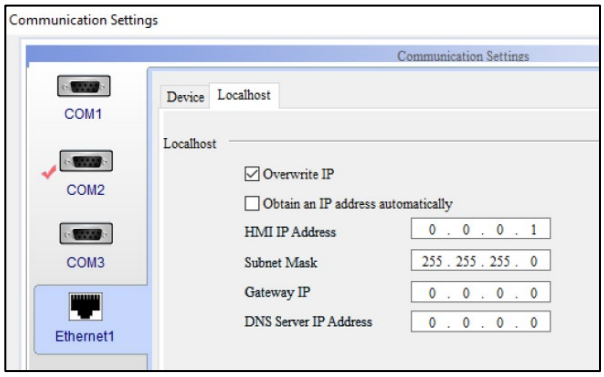


Figure A - 8: Network

Function	Description		
Network 	Go to **General** > **Communication Settings** > **Ethernet1** > **Localhost** in the DIAScreen to change the following settings for the **Network** in the **System Setting**. 		
	HMI	Display the name set for the HMI. This is the default name set up by the HMI. To change it, go to **General** > **Configuration** > **Main**.	
	Mode	DHCP	Obtain the IP address of the HMI automatically.
		Static	Set the IP address of the HMI manually.

		BOOTP	Obtains the IP address of the HMI automatically, but there is no lease period for this IP address.
	Mask	Set the network mask. Mask can be set manually when DHCP is OFF.	
	Gateway	Set the gateway. Gateway can be set manually when DHCP is OFF.	
	DNS	Set the domain name server. DNS can be set manually when DHCP is OFF.	
	MAC	Display the MAC address of the HMI. This setting cannot be changed.	

- Network App

Set whether to enable VNC and eRemote/eServer.

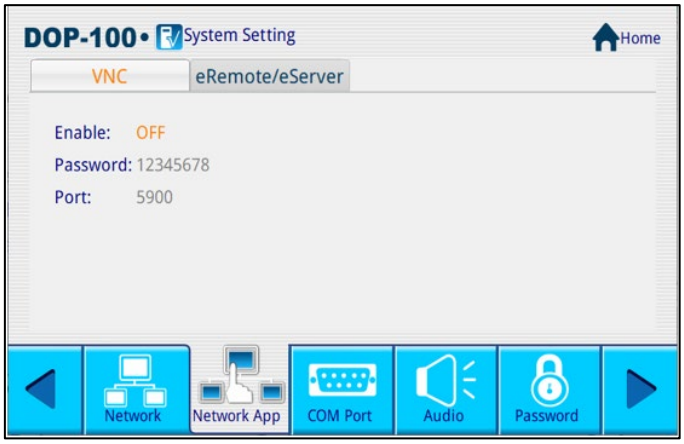


Figure A - 9: Network App

Network Application 	VNC	Enable	● The default value is **OFF**. ● When it is set to ON, use VNC Viewer to remotely control the HMI.
		Password	● The default password is **12345678**. ● Users can change the password.
		Port	● Set the connection port password. The default value is **5900**.

	eRemote/eServer	Enable	● The default value is **OFF**. ● When it is set to ON, use it to collect the HMI data.
		Password	● The default password is **12345678**. ● Users can change the password.

- COM Port

Set the parameters of COM1, COM2, and COM3.

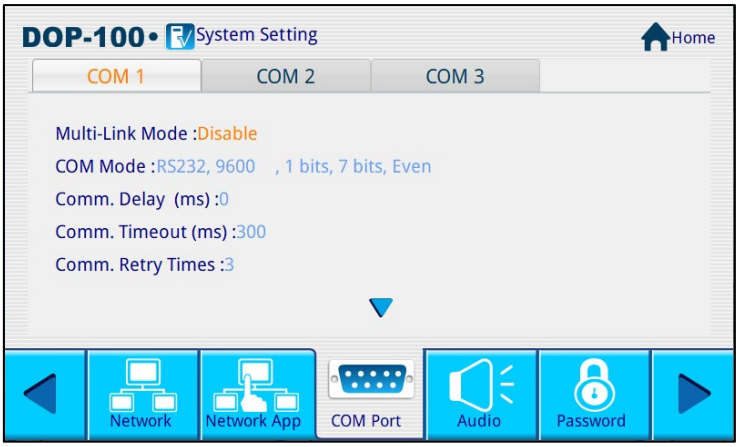


Figure A - 10: COM Port

COM Port 	COM1	Set the COM Mode, Baud Rate, Stop Bits, Data Bits, Parity Bits, Comm. Delay, Comm. Timeout, Comm. Retry Times, HMI Station, PLC Station, Multi-Link Mode, and Baud Rate Tuning for COM1 ~ COM3.
	COM2	
	COM3	

- Audio

Set the volume for the buzzer.

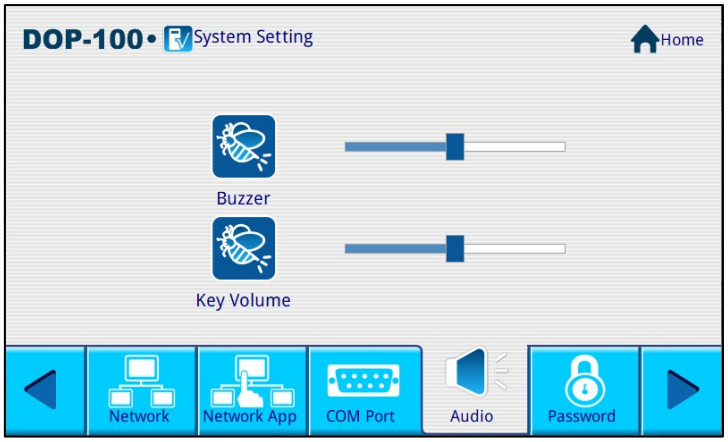


Figure A - 11: Audio

Sound 	Buzzer 	Adjust the volume for the HMI buzzer. Move the slider left to decrease the volume; move the slider right to increase the volume.

- Password

Set up the HMI Password Table for passwords of Levels 0 ~ 7.

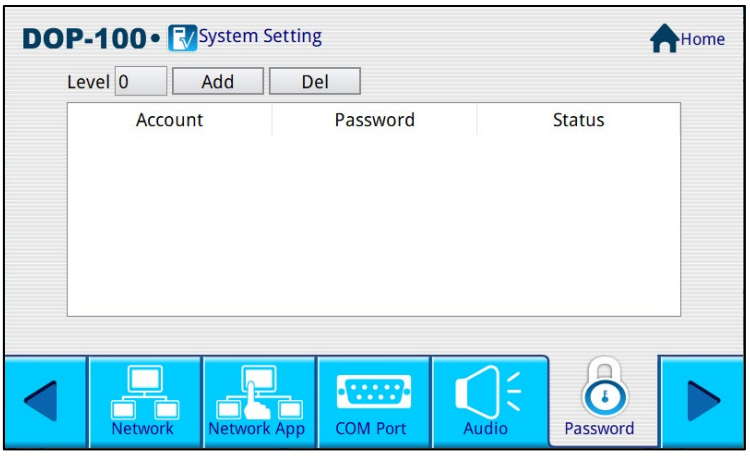
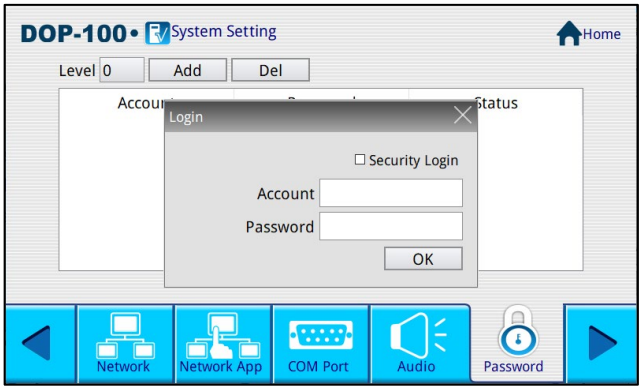
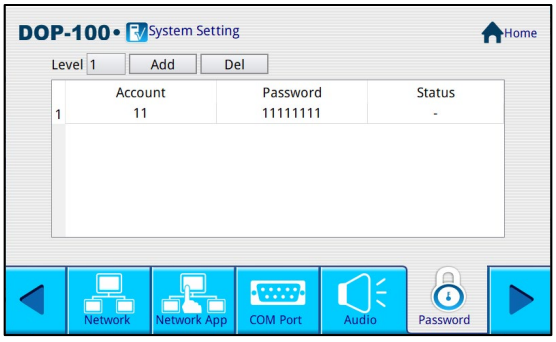


Figure A - 12: Password

Function	Description
Password 	Set the Password Table for Levels 0 ~ 7. Select the level to log in with, and then enter **Account** and **Password** to set the password.  

- MISC

Set MISC settings for the HMI

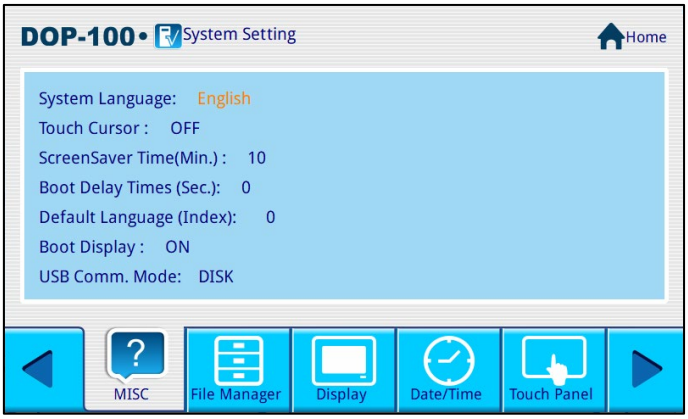
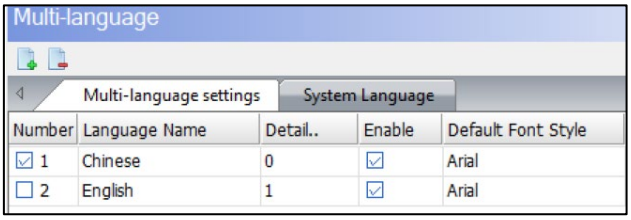
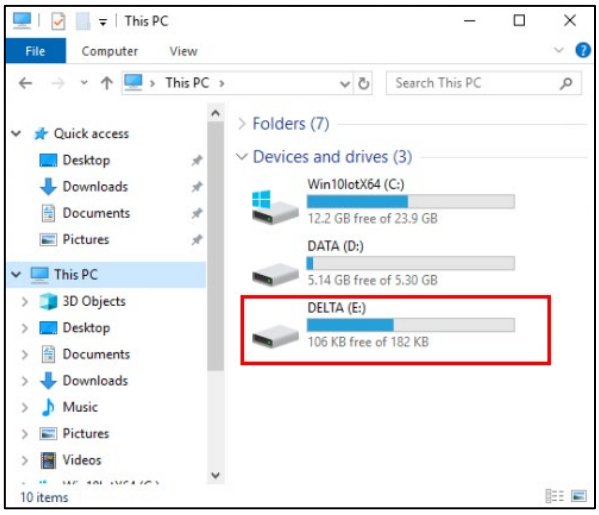
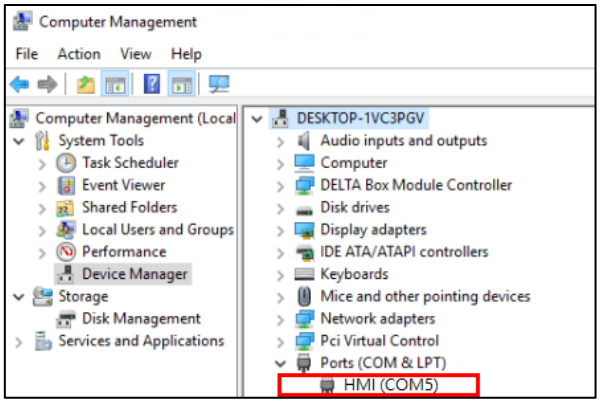


Figure A - 13: MISC

<table>
<tr><td rowspan="8">MISC</td><td>System Language</td><td colspan="2">Set the language of the interface for the System Menu. It supports English, French, Russian, Simplified Chinese, Spanish, Traditional Chinese and Turkish.</td></tr>
<tr><td>Touch Cursor</td><td colspan="2">Set whether to display the touch cursor. The default value is OFF.</td></tr>
<tr><td>ScreenSaver Time (Min.)</td><td colspan="2">Set the time after which the screensaver is enabled. The default value is 10 Min.</td></tr>
<tr><td>Boot Delay Times (Sec.)</td><td colspan="2">Set the delay time for starting the device. The default value is 0.</td></tr>
<tr><td>Default Language (Index)</td><td colspan="2">Select the ID number of the language to use.
 
</td></tr>
<tr><td>Boot Display</td><td colspan="2">Set whether to display the boot screen at startup. The default value is ON.</td></tr>
<tr><td rowspan="2">USB Comm. Mode</td><td>DISK</td><td>Under this mode, users can find a removable storage device named "DELTA" in This PC.
 
</td></tr>
</table>

		CDC	Under this mode, go to **This PC** > right-click and select **Content** > **Device Manager** and see if the device named "HMI" is displayed under **Ports**. 

- File Manager

This setting is used for formatting and copying files, selecting multiple boot screens, and updating firmware.

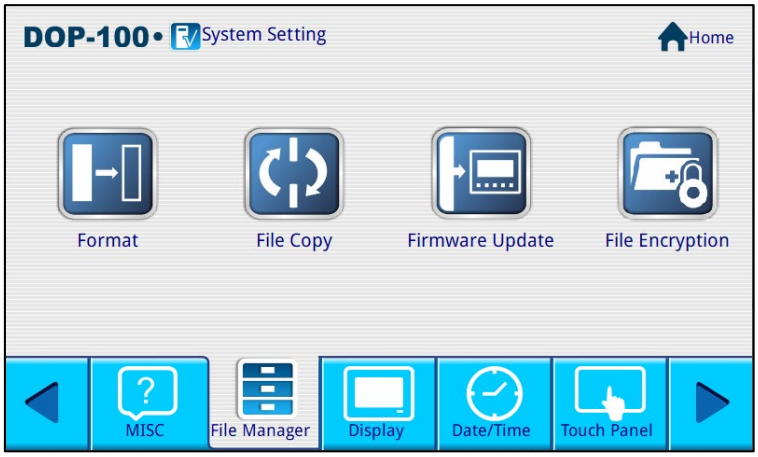
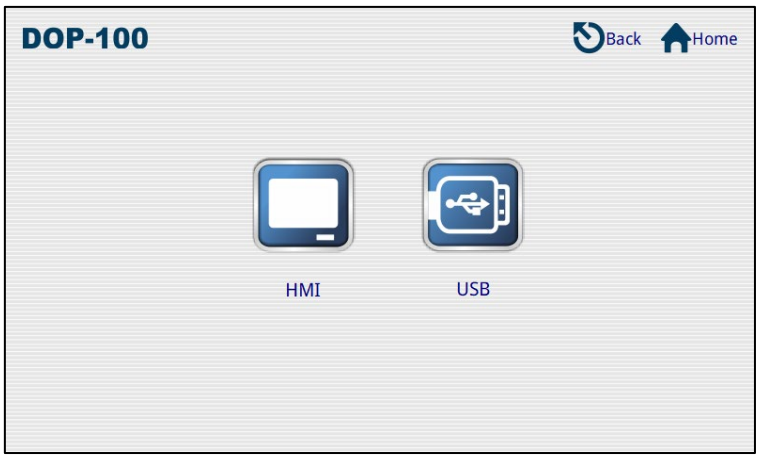


Figure A - 14: File Manager

File Manager 	Format 	Formatting is available for HMI, USB Disk, and SD Card. The HMI project file is cleared after formatting.
	File Copy 	Copy the screen to external storage device (USB Disk or SD Card).
	Firmware Update 	Update the HMI firmware from USB Disk or SD Card.

- Format

Format the HMI internal and external devices with this Format function, and the devices include HMI, USB Disk, and SD Card. Users cannot select the USB and SD options if the USB Disk and SD Card are not inserted into the HMI. After selecting the device to be formatted, enter the highest security password (default is **12345678**), and the selected device will be formatted once the password is verified. When the formatting is complete, the system displays a message to remind that the HMI is restarting.



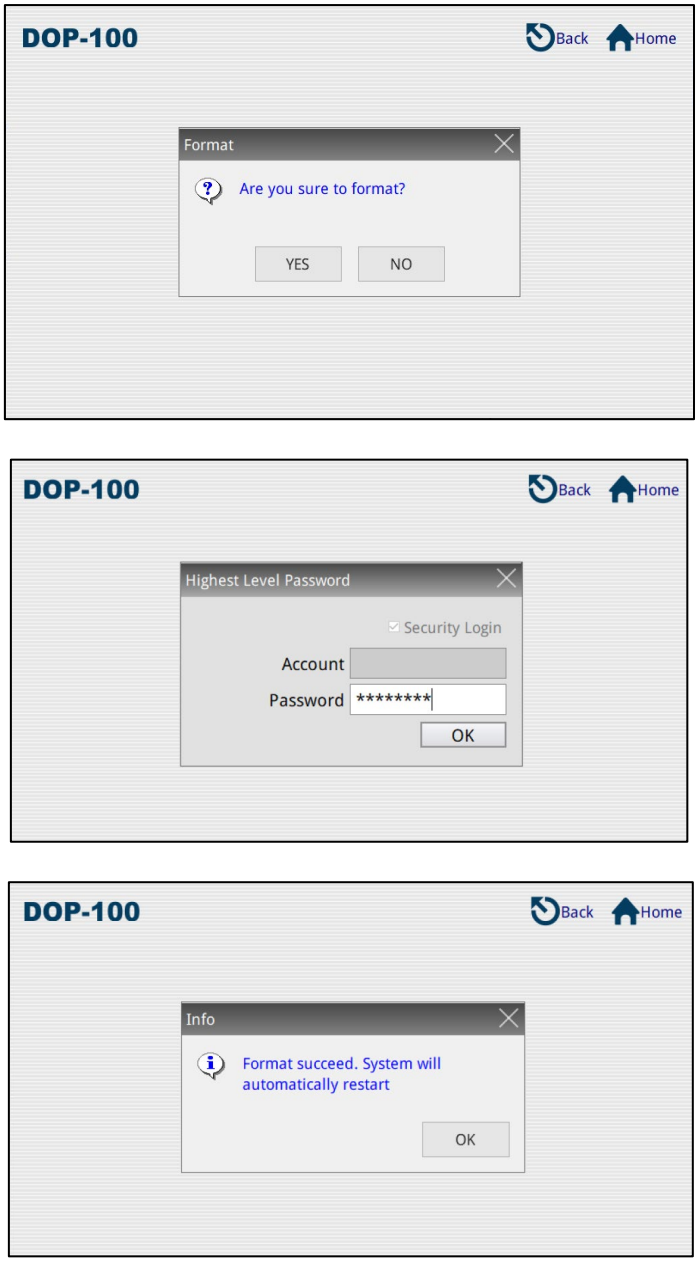


Figure A - 15: Format

Select files in the source directory to copy to the destination directory.

- File Copy

Select files in the source directory to copy them to the destination directory.

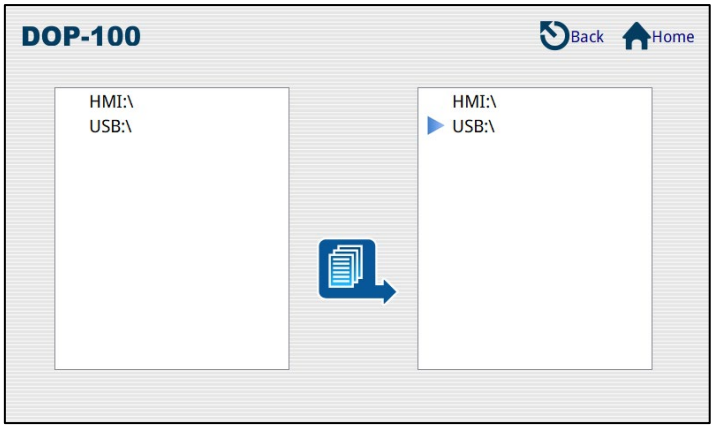


Figure A - 16: File Copy

NOTE:

1. *The HMI does not support direct copying between disks.*
2. *The HMI only supports the fixed directories HMI-000 to HMI-255.*
3. *If users select **HMI** as the destination directory, the original files will be removed before the files from the source directory are copied to the destination directory.*
4. *If users select **New..** as the destination directory, the HMI looks for a directory not used in HMI-000 to HMI-255 and creates it as the destination directory.*
5. *If the screen file in the source directory is password-protected, the HMI prompts for the password. Enter the highest security password for the screen file of the source directory to perform the copy function.*

- Firmware Update

This function enables to perform the firmware update using an external storage device (USB Disk or SD Card).

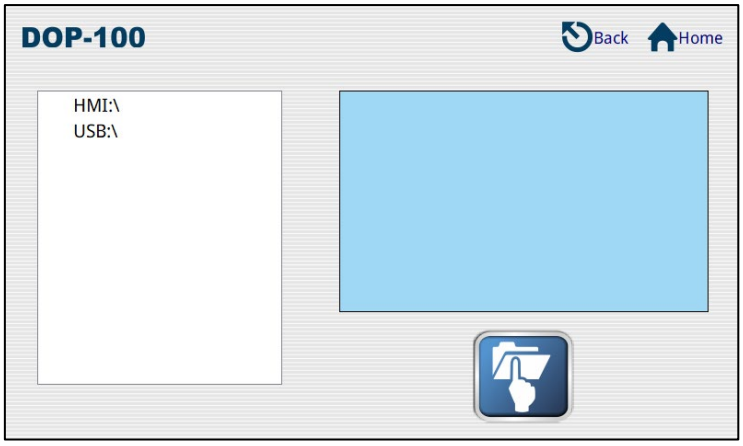
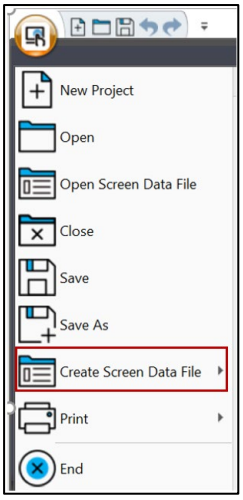
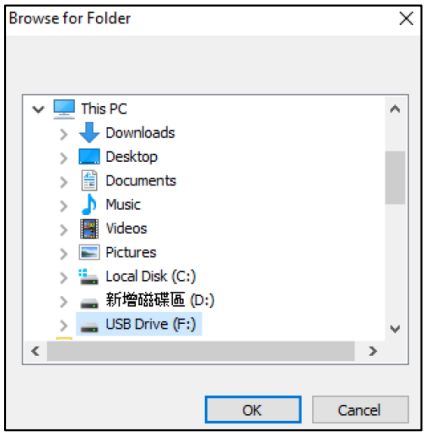
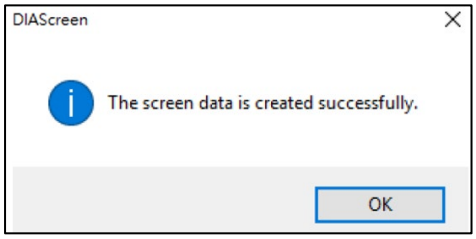
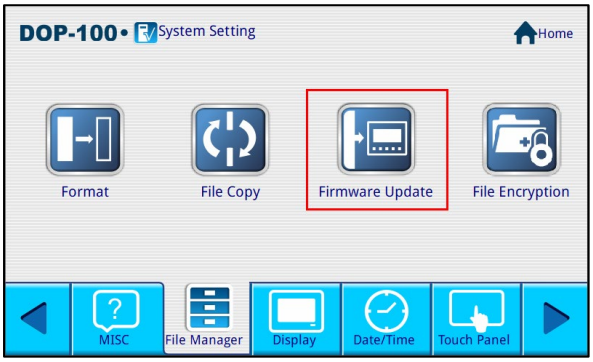
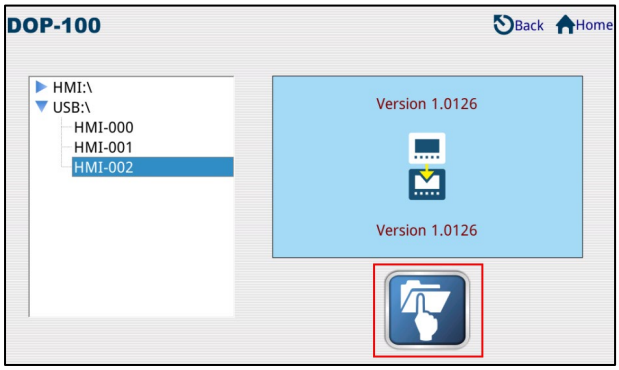
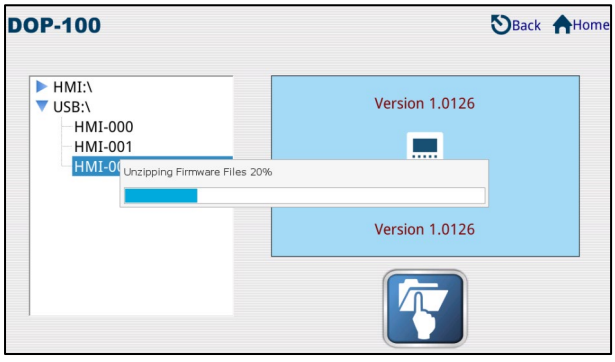


Figure A - 17: Firmware Update

The following section presents an example for the Firmware Update.

Step 1	**Create screen data file** as shown in the following figure. 
Step 2	Select an external disk (USB Disk or SD Card) for creating the screen data and click **OK**. 

Step 3	When the screen data is created successfully, the following message appears. 
Step 4	Insert the external disk into the HMI.
Step 5	Enter the HMI system screen and select **System Setting** > **File Manager** > **Firmware Update**. 
Step 6	Select the source location of the firmware to be updated. The firmware version after the update will be displayed on the screen. Confirm the version and click  icon at the bottom to update the firmware. 
Step 7	After clicking  icon, the HMI processes and unzips the firmware file in the USB Disk or SD Card. 

Step 8	When the firmware file is unzipped, the HMI automatically restarts and proceeds with the firmware updating. 

A.3 Up/Download

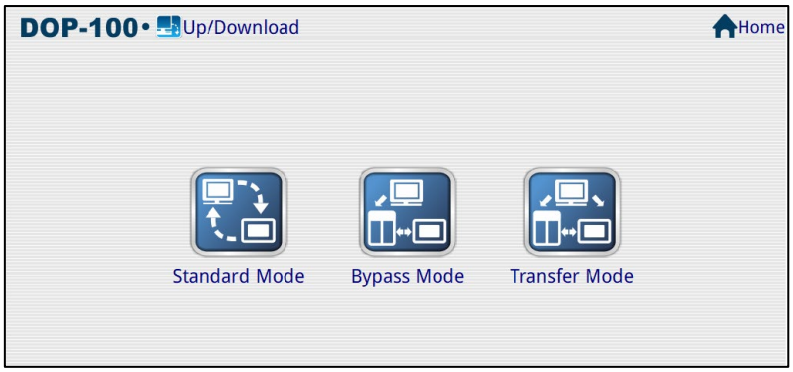


Figure A - 18: Up/Download

- Standard Mode

Set the COM Port to communicate with DIAScreen and wait for DIAScreen to send the motion command and data packets for Up/Download. To use the PC COM Port provided by the software to download data, go to **General** > **Environment**, then go to the system screen to select **Up/Download** > **Standard Mode**. Select the COM1 or COM2 port and wait for the Up/Download of the screen data and recipe data.

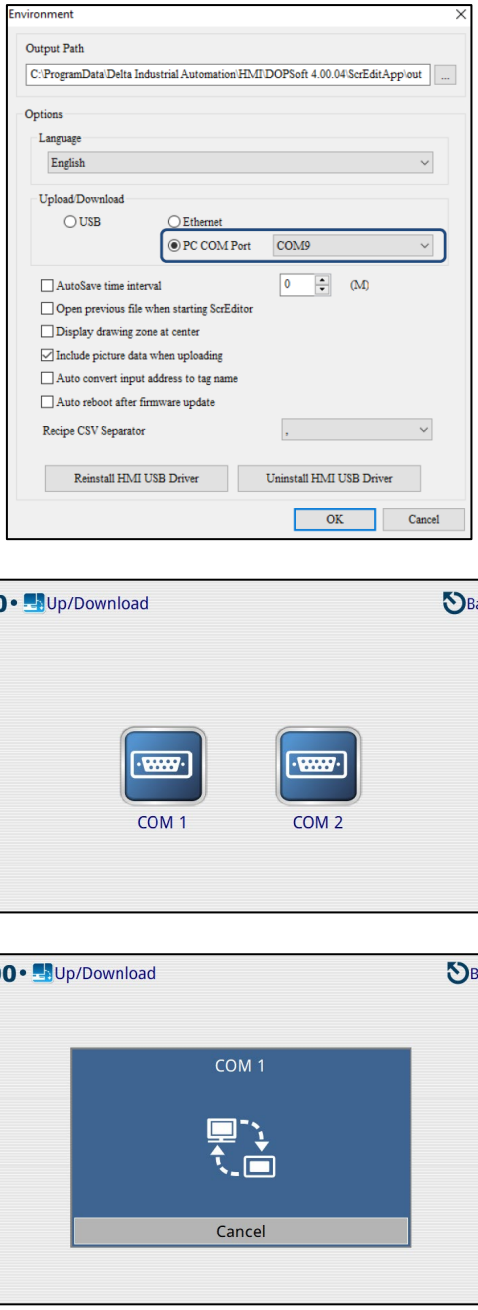


Figure A - 19: Standard Mode

Standard Mode 	COM1	Upload/Download through COM1. Set COM1 to transmit and receive the command data and data packets for the up/downloading of DIAScreen.
	COM2	Upload/Download through COM2. Set COM2 to transmit and receive the command data and data packets for the up/downloading of DIAScreen.

- Bypass Mode

With the HMI as an intermediary, it transmits the data received from the source port to the destination port.

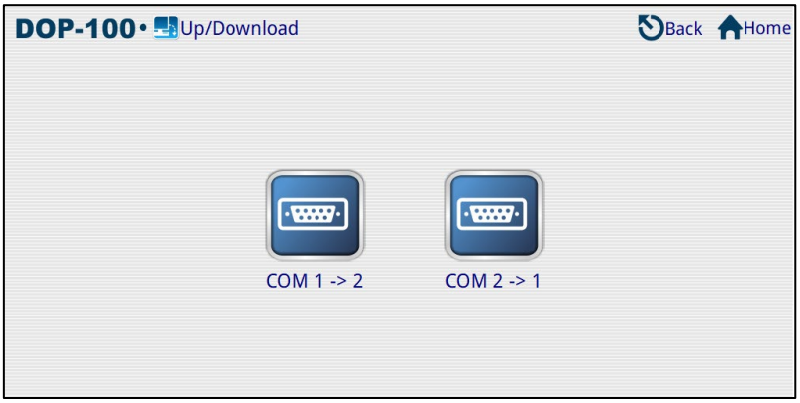


Figure A - 20: Bypass Mode

Bypass Mode 	Mode 1 COM1 → COM2	With COM1 as the source port and COM2 as the destination port, the data that COM1 received is transmitted using the COM2 protocol.
	Mode 2 COM2 → COM1	With COM2 as the source port and COM1 as the destination port, the data that COM2 received is transmitted using the COM1 protocol.

- Transfer Mode

Transfer Mode is used for uploading / downloading the DVP and ISP files in the PLC used by the HMI.

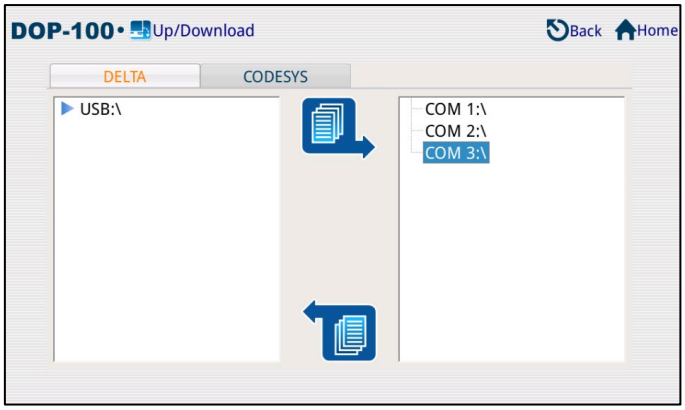


Figure A - 21: Transfer Mode 1

Select COM2, and the HMI automatically searches for the PLC.

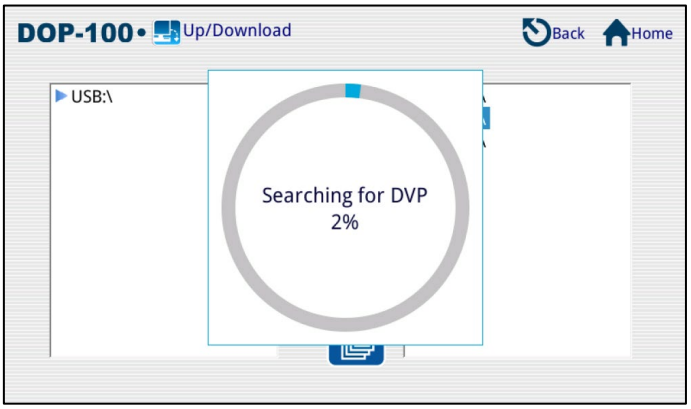


Figure A - 22: Transfer Mode 2

Once the search is complete, the DVP file found can be uploaded or downloaded from the external storage device to the PLC.

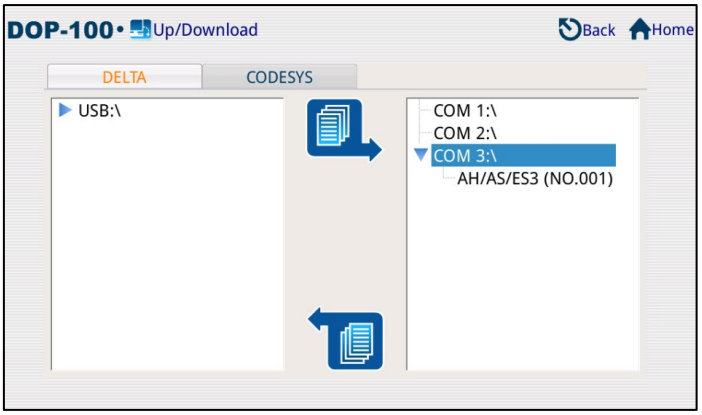


Figure A - 23: Transfer Mode 3

Transfer Mode 	Upload	Upload and download the DVP and ISP files used in the PLC. When users press COM1 ~ COM3, DIAScreen automatically searches for the currently connected PLC devices. Once the searching is done, the files found during the search can be uploaded to the storage device. To copy the DVP and ISP files from the storage device to the PLC, click **Download**.
	Download	

Download DVP file to PLC

Select the communication port that connects to the PLC. Then the HMI searches for the files in the PLC.

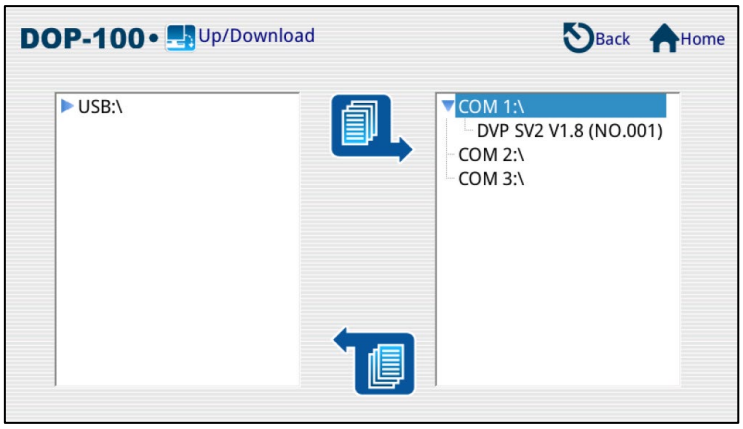


Figure A - 24: HMI searches for file

Select the Dvp0.dvp file in the external storage device, and click the **Download** to download the file to the PLC.

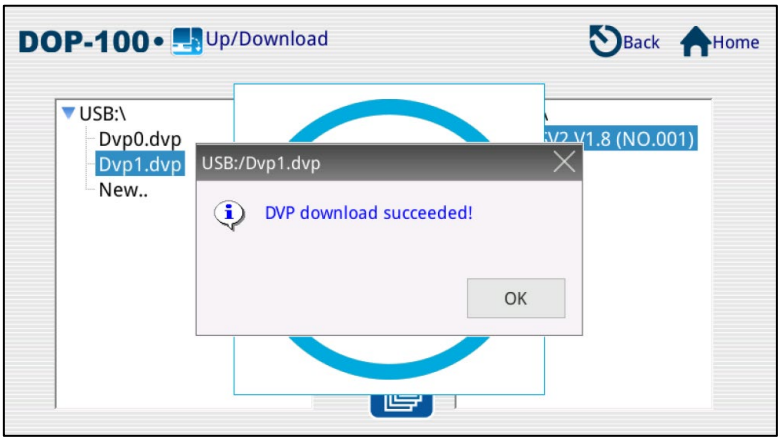


Figure A - 25: DVP download

Upload DVP file in the PLC to the external storage device (USB Disk)

Select the DVP file in the PLC and click **Upload** to upload the file to the USB Disk.

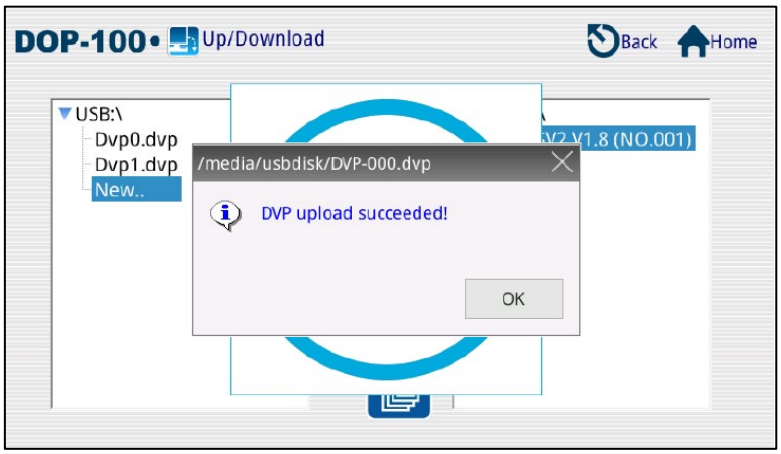


Figure A - 26: DVP upload

NOTE:

1. *If a PLC file is to be uploaded as a new file, select* ***New..*** *from the window on the left and click* ***Upload****.*
2. *The program uploaded by the HMI will be saved in *.DVP format.*
3. *When downloading a PLC file, the HMI will ask for the project password and PLC password*.*
4. *When downloading a PLC file, both the program and PLC need IDs, and their IDs need to be identical to be allowed for downloading. Or, when both of them have no IDs, downloading is also allowed.*
5. *When downloading a PLC file, the HMI prompts the pop-up window for the project password first and then the PLC password.*
6. *When uploading a PLC file, the HMI prompts the pop-up window for the PLC ID first and then the PLC password.*
7. *When uploading a file, the HMI will ask for the PLC ID and PLC password. If the PLC has a set PLC password, this PLC password will be placed in the program as the project password when uploading. For example, assume that the PLC password is set to 1234 and the project password is set to 5678, the password inquired by the HMI is the PLC password when uploading the file. The PLC password will be regarded as the project password for the program when opening the file after uploading. At this time, both the PLC password and the project password will be 1234.*
8. *When using a project edited by ISPSoft, execute compiling before downloading it to the PLC. Otherwise, the error message "IL code size is mismatch" will appear.*
9. *The Transfer Mode only supports *.dvp and *.isp Up/Download. It does not support the upload or download of Subroutine / Ladder Graphic Code / SFC Graph / Device Name Comment / Row Comment / Non-volatile Data / Label Structure / Symbol Structure, etc.*

Remark: The *PLC password is the password set in the WPL and ISP software by selecting **System Security Setting** > **Password Function**.

Refer to the following tables for the functions supported in each version.

PLC Series	PLC Password	Limit on Login Attempts	Password for Subroutines	PLC ID and Program ID	Project Password (Set in the editing software)
ES/EC/EC3	V	V8.20 or above	V8.20 or above	V8.20 or above	WPLSoft V2.20 and ISPSoft V1.60 or above versions support the project password function.
SS	V	X	X	X	
EX	V	V8.20 or above	V8.20 or above	V8.20 or above	
SA	V	X	X	X	
SX	V	V3.00 or above	V3.00 or above	V3.00 or above	
SC	V	X	X	X	
EH	V	X	X	X	
EH2	V	V1.40 or above	V1.40 or above	V1.40 or above	
SV	V	V1.40 or above	V1.40 or above	V1.40 or above	
ES2/EX2	V	V	V	V	
SS2	V	V	V	V	
SA2	V	V	V	V	
SX2	V	V	V	V	
SE	V	V	V	V	
MC	V	V	V	V	
EH3	V	V	V	V	
SV2	V	V	V	V	

AH Series	PLC Password	Limit on Login Attempts	Password for Subroutines	PLC ID and Program ID	Project Password (Set in the editing software)
AHCPU510-EN	V	V	V	V	ISPSoft supports the project password function.
AHCPU510-RS2	V	V	V	V	
AHCPU520-EN	V	V	V	V	
AHCPU520-RS2	V	V	V	V	
AHCPU530-EN	V	V	V	V	
AHCPU530-RS2	V	V	V	V	

AS Series	PLC Password	Limit on Login Attempts	Password for Subroutines	PLC ID and Program ID	Project Password (Set in the editing software)
AS218PX-A	V	V	X	V	ISPSoft supports the project password function.
AS218RX-A	V	V	X	V	
AS218TX-A	V	V	X	V	
AS228P-A	V	V	X	V	
AS228R-A	V	V	X	V	
AS228T-A	V	V	X	V	
AS300N-A	V	V	X	V	
AS320P-B	V	V	X	V	
AS320T-B	V	V	X	V	
AS324MT-A	V	V	X	V	
AS332P-A	V	V	X	V	
AS332T-A	V	V	X	V	

A.4 System Info

This function enables to view the HMI-related info, including the firmware version, model, current battery capacity, size of internal Flash ROM, CPU clock, current system date and time, PLC device, and external storage device.

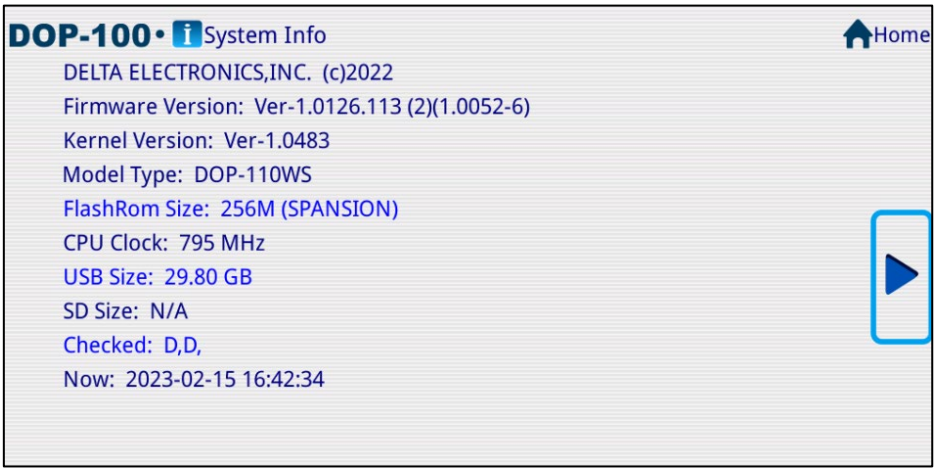


Figure A - 27: HMI-related Info

After switching the screen, users can see the PLC Driver information of the HMI.

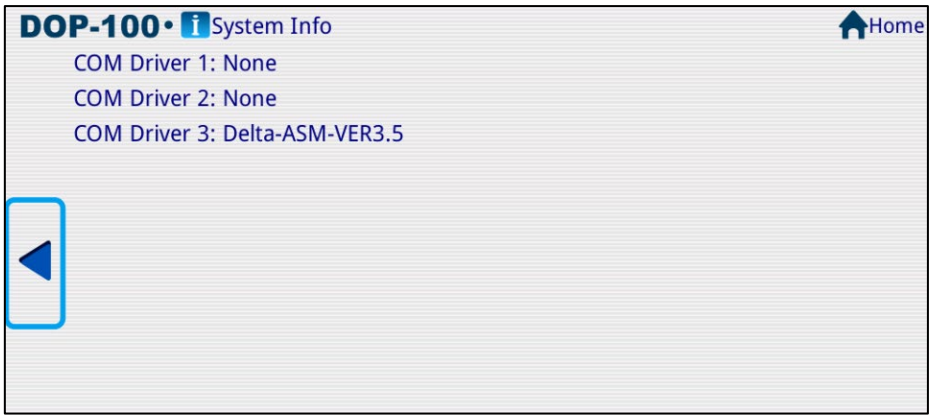


Figure A - 28: PLC Driver information of the HMI

A.5 HMI Doctor

HMI Doctor is a simple application that enables to test the hardware interface. Functions currently available include Color (Red, Green, Blue, Black, and White), Draw Line, Buzz/LED, ADC, and Network.

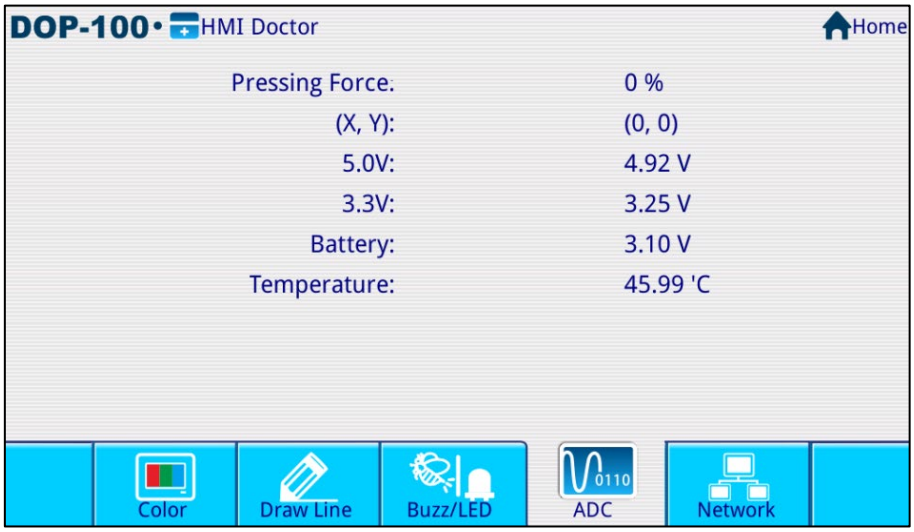


Figure A - 29: HMI Doctor

- Red Screen Test

  Check if there is any dark point or similar stain on the red screen of the LCD surface.

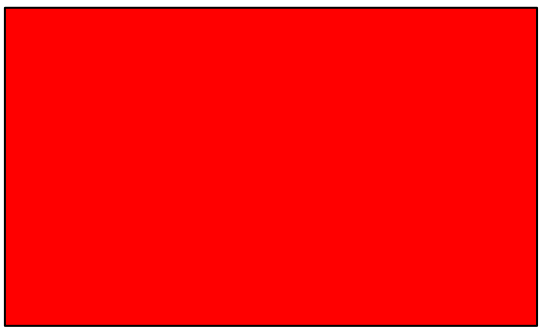


Figure A - 30: Red screen test

- Green Screen Test

  Check if there is any dark point or similar stain on the green screen of the LCD surface.

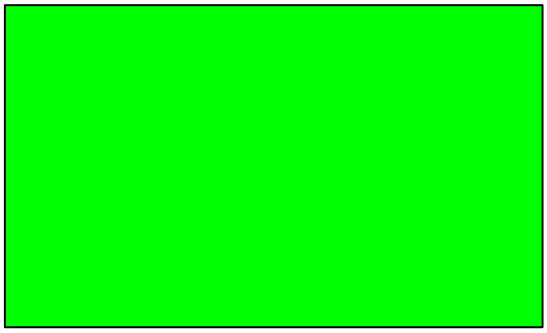


Figure A - 31: Green screen test

- Blue Screen Test

  Check if there is any dark point or similar stain on the blue screen of the LCD surface.

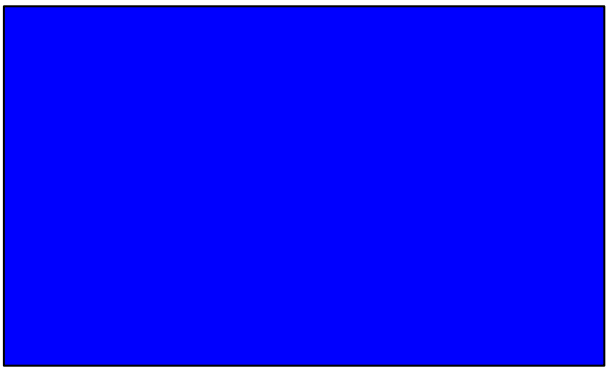


Figure A - 32: Blue screen test

- Black Screen Test

  Check if there is any dark point or similar stain on the black screen of the LCD surface.



Figure A - 33: Black screen test

- White Screen Test

  Check if there is any dark point or similar stain on the white screen of the LCD surface.



Figure A - 34: White screen test

- Color Test

Check if the LCD color scale is displayed normally.

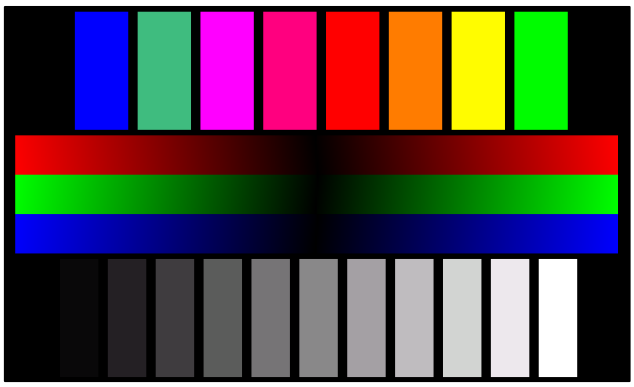


Figure A - 35: Color test

- Draw Line

The **Draw Line** function tests if there is deviation between the position where users draw the line and the actual position of the line displayed on the screen. If the deviation is significant, re-calibrate the touch panel.



Figure A - 36: Draw Line

- Buzz/LED

The **Buzz/LED** function tests if the buzzer would ring.

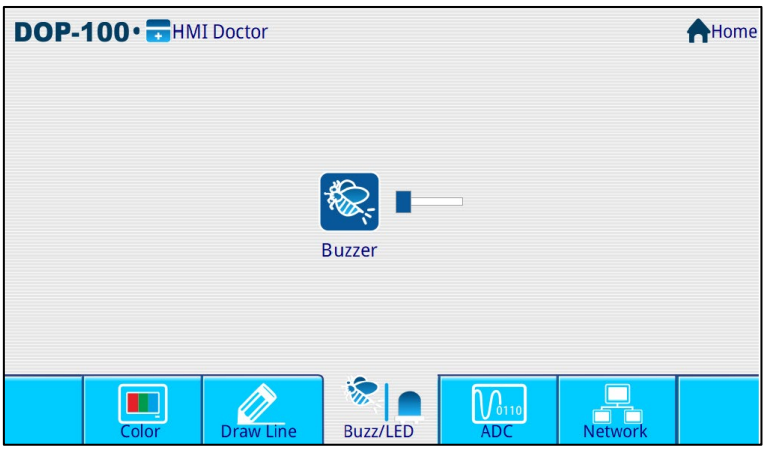


Figure A - 37: Buzz/LED

- ADC

The **ADC** function tests the Pressing Force, touch position (X and Y coordinates), system voltage, Battery, and Temperature.

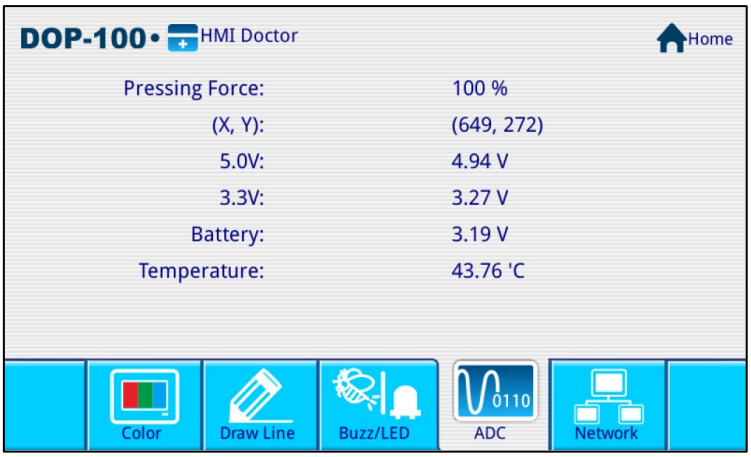


Figure A - 38: ADC

- Network

  The **Network** function tests to see if the network is successfully connected. At first, Lan 1 icon displays in gray, and if the connection is successful, the icon displays in color.



Figure A - 39: Network

Appendix B: Multi-Drop

B.1 Multi-Drop Example

The following example is taken in an environment using 3 HMIs to test the multi-drop mode. HMI-HOST is the host, while HMI-Client 1 and HMI-Client 2 are the client end. The HMI-HOST is physically connected to a Delta DVP PLC. Refer to the following figure.

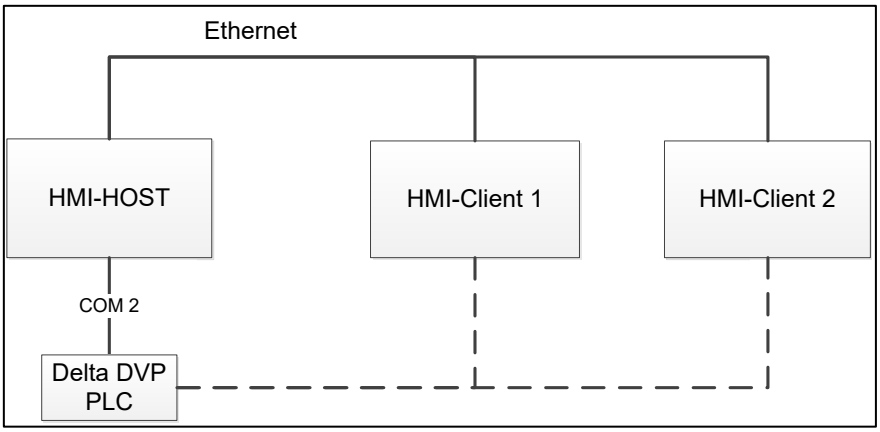


Figure B - 1: Multi-drop environment

HMI-HOST setup

Create a project. Select the **Delta DVP PLC** as the controller and select **Host** for the **Multi-Drop** mode.

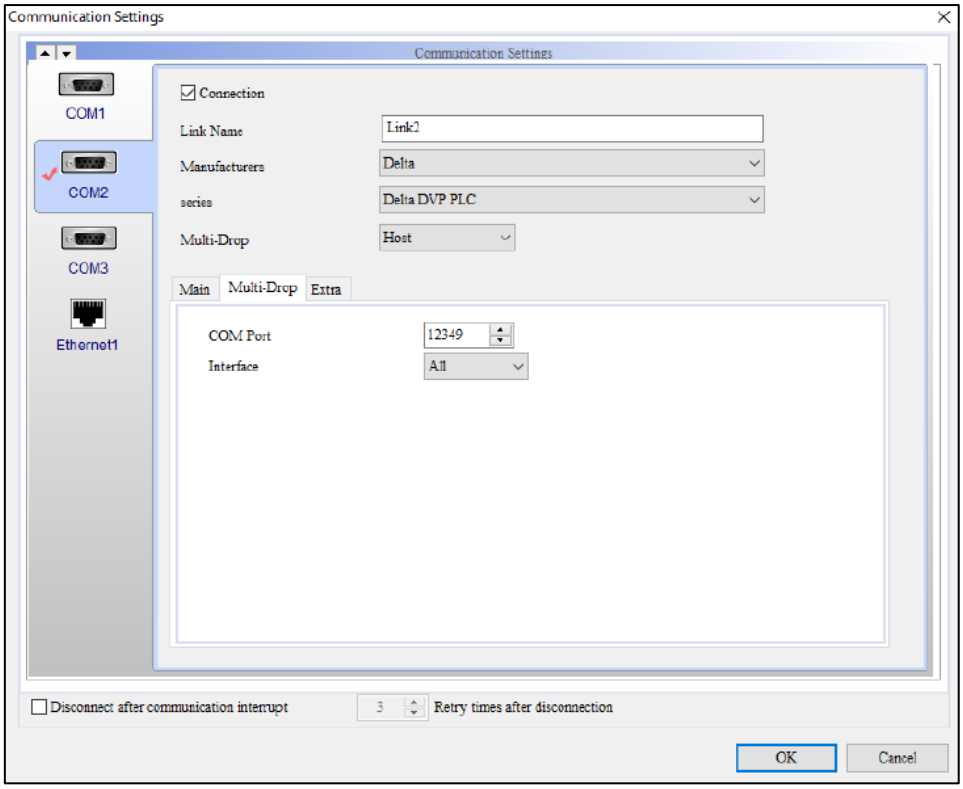


Figure B - 2: Select Host for the Multi-Drop mode

Go to **Ethernet1** > **Localhost**. Check **Overwrite IP** and set **HMI IP Address** as 172.16.190.100.

Go to **General** > **Configuration** > **Network Settings** to set the **HMI** name as HMI-HOST.

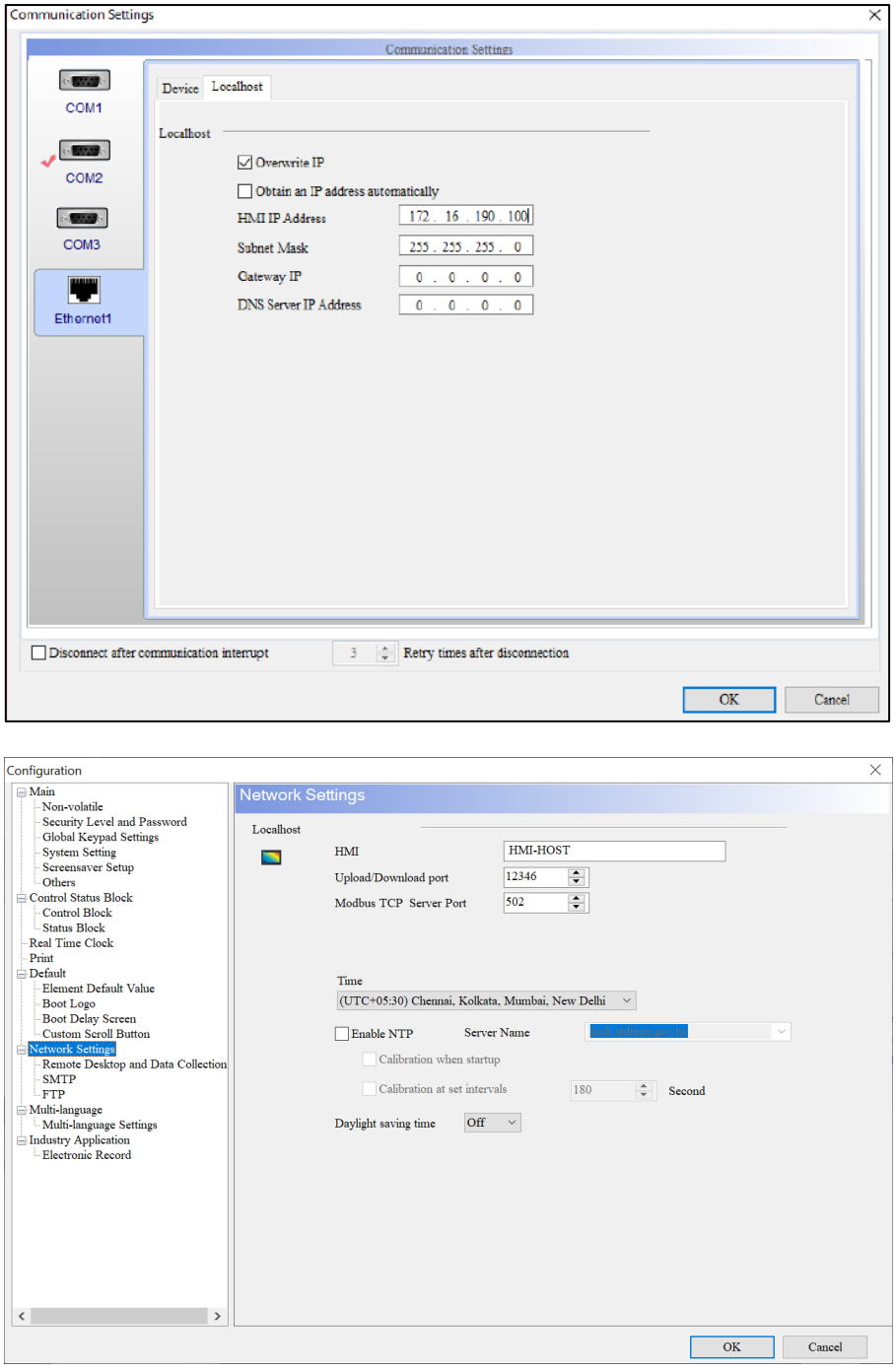


Figure B - 3: HMI-HOST IP Address Setup

Create a **Numeric Entry** element on the editing screen and set its **Write Address** to D100. Create a **Numeric Display** element and set its **Read Address** to D200.

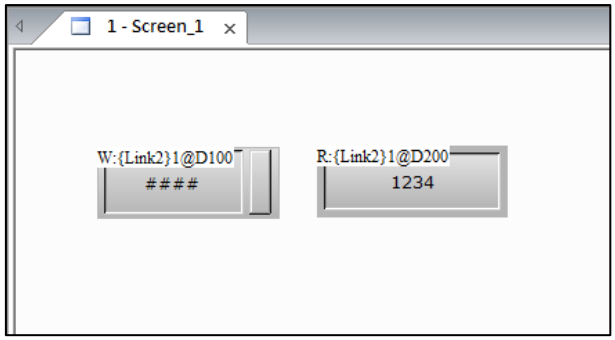


Figure B - 4: Create elements

After the editing is completed, compile the elements and download the screen to the HMI.

HMI-Client 1 Setup

Create a project. Set the **Delta DVP PLC** as the controller and select **Client** for the **Multi-Drop** mode. Enter 172.16.190.100 in the **IP Address** field, which is the HMI-HOST IP address.

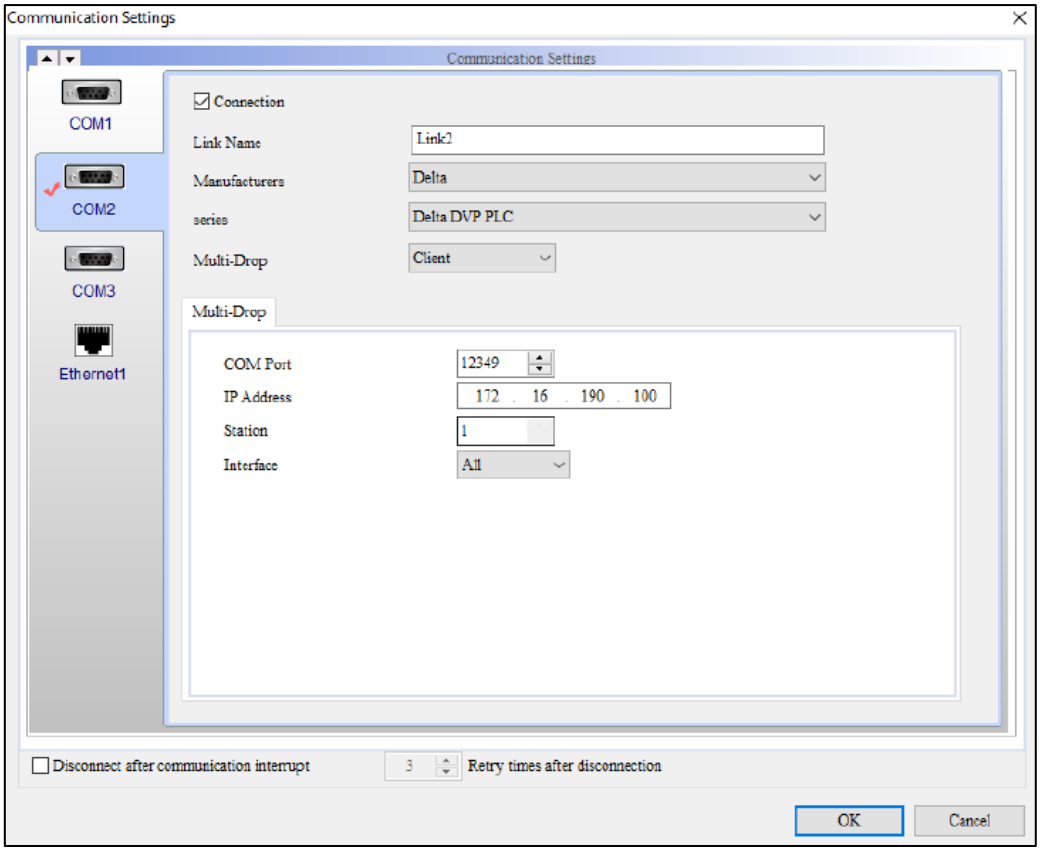
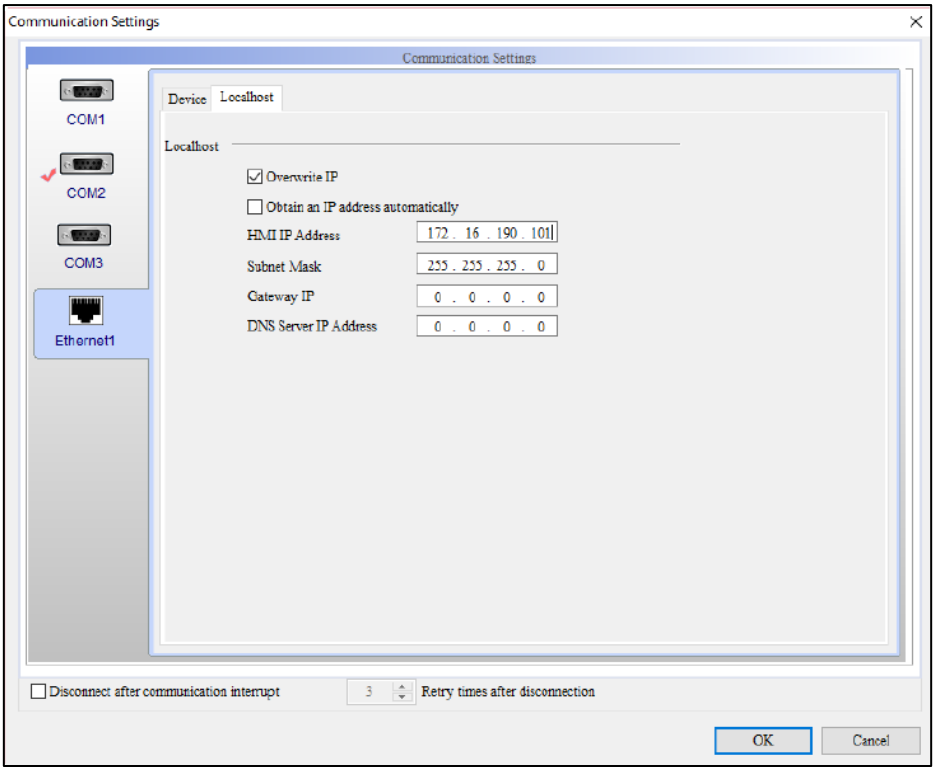


Figure B - 5: Select Client for the Multi-Drop mode

Go to **Ethernet1** > **Localhost**. Check **Overwrite IP** and set **HMI IP Address** as 172.16.190.101.

Go to **General** > **Configuration** > **Network Settings** to set the HMI name as HMI-Client1.



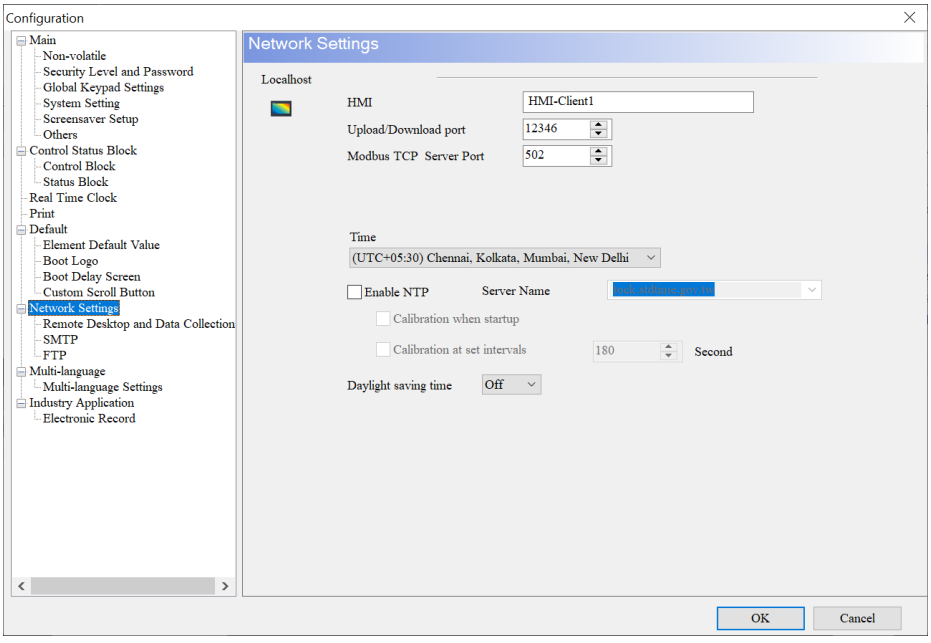


Figure B - 6: HMI-Client1 IP Address setup

Create a **Numeric Entry** element on the editing screen and set its **Write Address** to D200. Create a **Numeric Display** element and set its **Read Address** to D100.

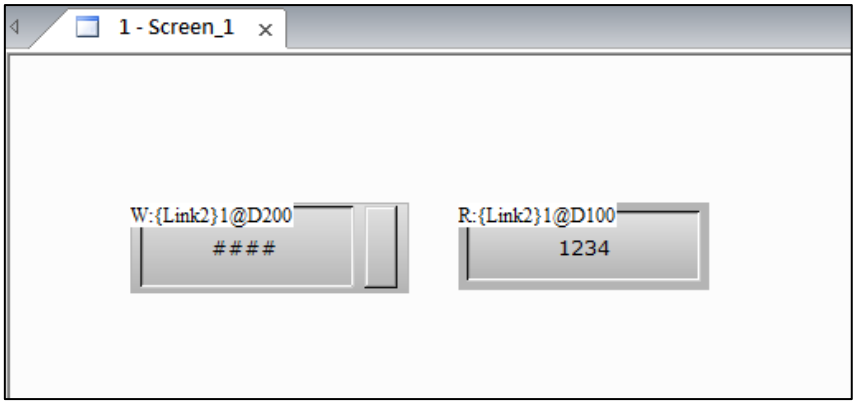


Figure B - 7: Create elements

After the editing is completed, compile the elements and download the screen to the HMI.

HMI-Client 2 setup

Create a project. Set the **Delta DVP PLC** as the controller and select **Client** for the **Multi-Drop** mode. Enter 172.16.190.100 in the **IP Address** field, which is the HMI-HOST IP address.

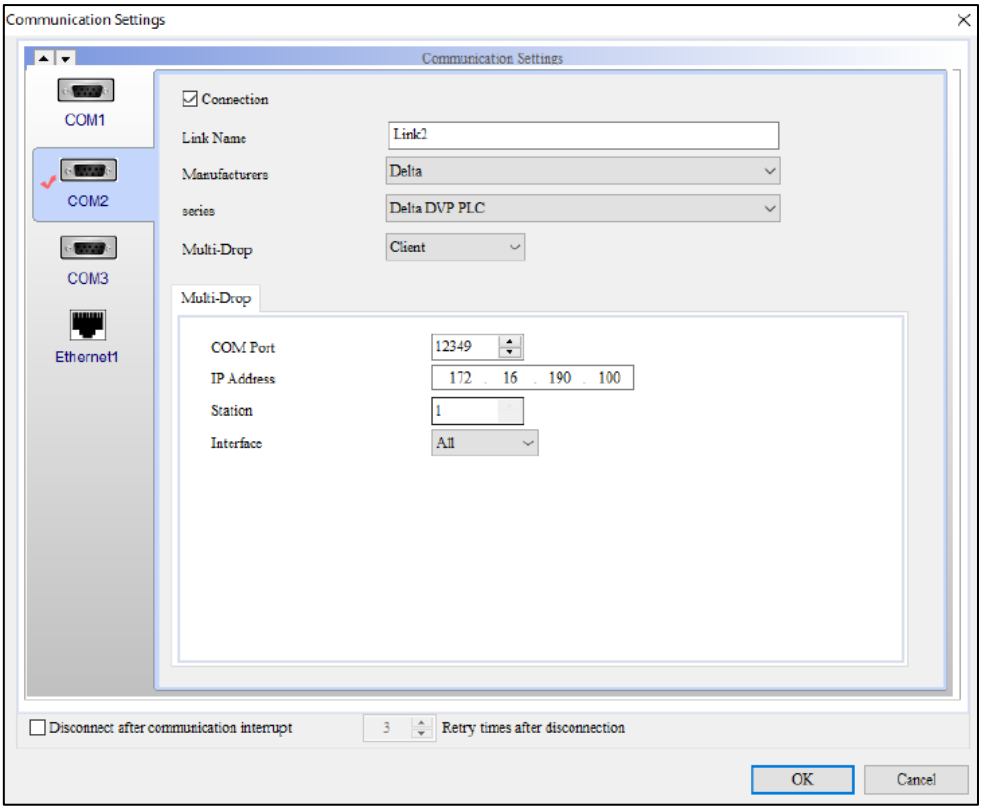


Figure B - 8: Select Client for the Multi-Drop mode

Go to **Ethernet1** > **Localhost**. Check **Overwrite IP** and set **HMI IP Address** as 172.16.190.102.

Go to **General** > **Configuration** > **Network Settings** to set the **HMI** name as HMI-Client 2.

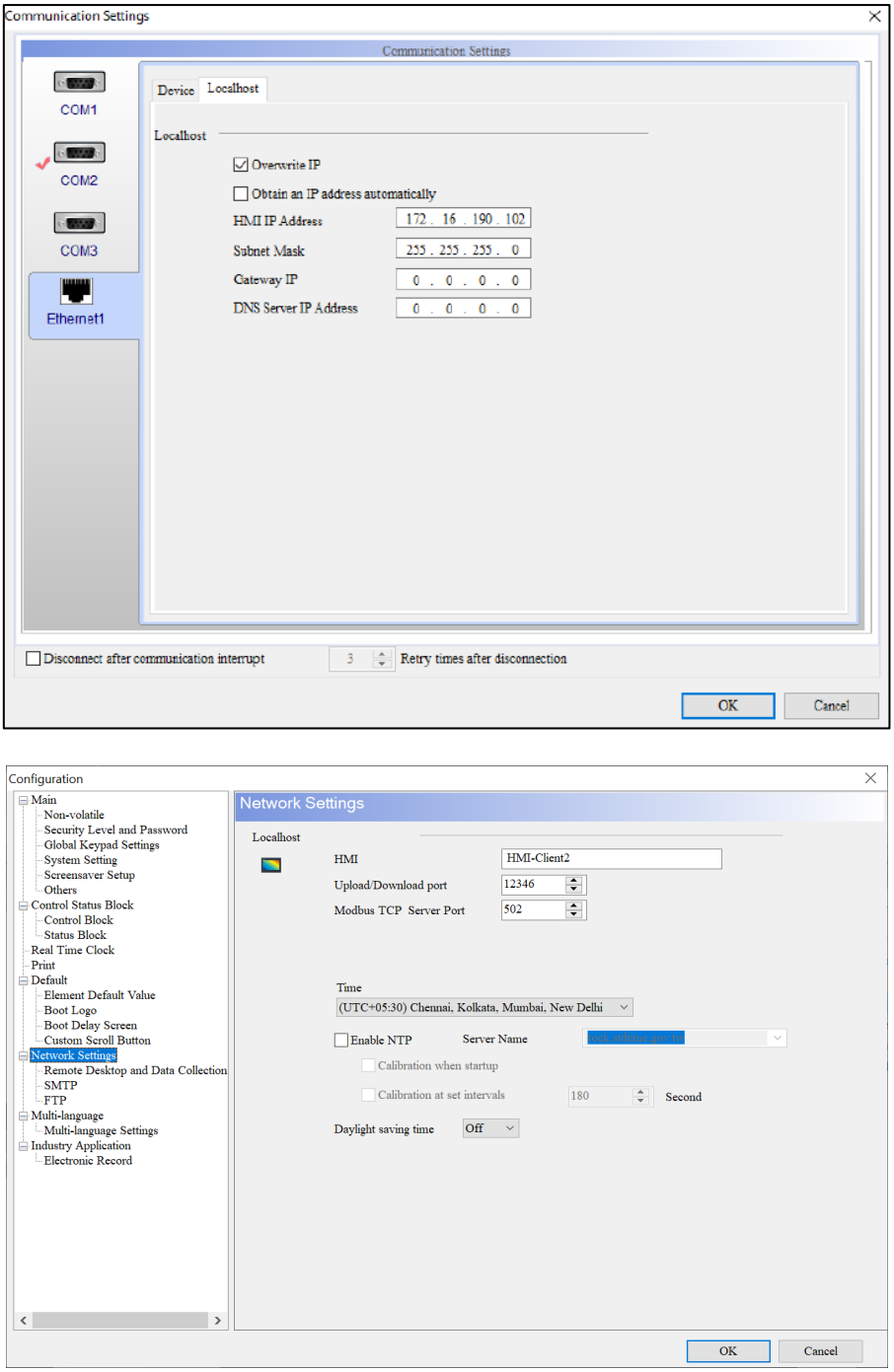


Figure B - 9: HMI-Client2 IP Address setup

Create a **Numeric Entry** element on the editing screen and set its **Write Address** to D200. Create a **Numeric Display** element and set its **Read Address** to D100.

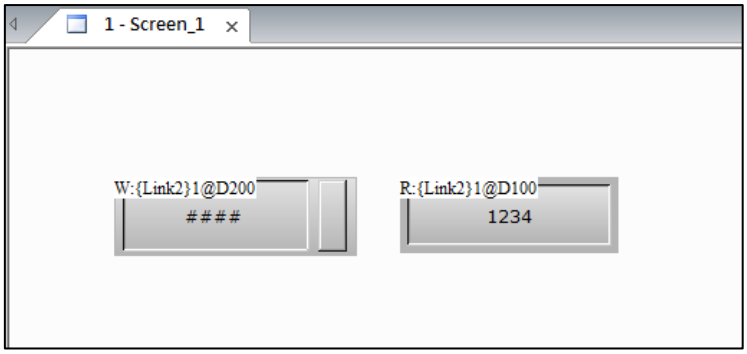


Figure B - 10: Create elements

After the editing is completed, compile the elements and download the screen to the HMI.

After HMI-HOST, HMI-Client 1 and HMI-Client 2 are set up and downloaded to the HMI, use any HMI to operate the PLC. If users enter 36 for D200 on the HMI-Client 1, then both the D200 addresses of the HMI-HOST and HMI-Client 2 show 36. If users enter 99 for D100 on the HMI-HOST, then both the D100 addresses of the HMI-Client 1 and HMI-Client 2 show 99.

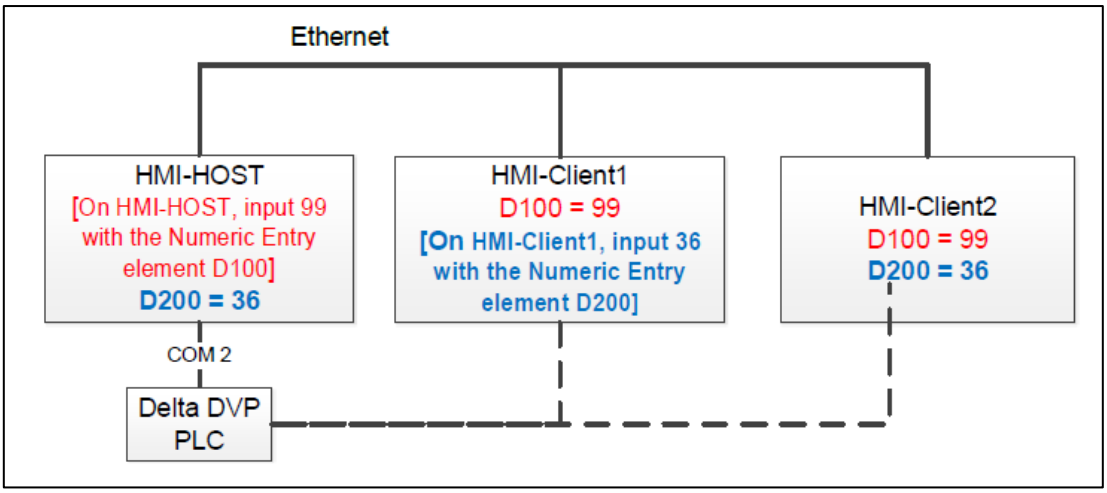


Figure B - 11: Execution result

Appendix C: Communication Error Code List

C.1 Communication Error Code List

This appendix describes the meanings of the communication error messages and the ways to troubleshoot these errors when a communication error occurs for the HMI. COMMUNICATION ERROR 3 displayed in the following figure is the code for the error.

For communication error messages for DOP-100, a message has been added to display which register cannot access data normally. As can be seen in the following figure, the D100 address cannot be accessed normally.



Figure C - 1: HMI communication error message

Through these codes, users can view the messages displayed and determine the reason why the HMI cannot be connected. The following table lists the communication error codes and messages, as well as the corresponding meanings of these error codes.

Code	Communication Error Message	Cause	Troubleshooting
0x02	Unknown	Noise interference.	Improve the anti-noise interference equipment and shielding for the transmission cable.
0x03	NoResponse	Incorrect communication cable wiring, PLC station number, and communication parameters including the baud rate, parity, data bits, stop bit, etc.	Check if the setting on the left is incorrect.
0x05	ControllerCheckSumError	Error identified by HMI from checking the PLC CheckSum.	Check if PLC CheckSum has been enabled (PLC software is usually required for the checking).
0x06	CommandError	Read and write PLC command error.	Check if the read and write address for the HMI exceeded the address available for use by the PLC, or if this address cannot be written.
0x07	AddressError	Read and write PLC address error.	Check if the read and write address for the HMI exceeded the address available for use by the PLC, or if this address cannot be written.
0x08	ValueError	Error in data written to the PLC.	Check the range of values accepted by the PLC.
0x09	Controller busy	PLC busy and unable to process the given command.	PLC is busy, please try again later.
0x0A	NoCTS	HMI CTS pin did not receive PLC RTS signal.	Check if CTS pin on the HMI end and RTS pin on the PLC end are connected, or if the PLC has sent out an RTS signal.

Code	Communication Error Message	Cause	Troubleshooting
0x0E	HMIStationNumberError	HMI station number error.	Check if the HMI station number exceeded the range of valid station numbers, or if it is duplicated with other station numbers.
0x0F	PLCStationNumberError	PLC station number error.	Check if the PLC station number exceeded the range of valid station numbers, or if it is duplicated with other station numbers.
0x10	UARTCommunicateFail	Communication error occurred at the bottom layer of the HMI. COM port was not opened correctly, or task overload on HMI caused abnormal COM port operation.	Make sure if the COM port could be used normally, or simplify HMI task load, for example, delete ALARM or MACRO command.
0x1A	RTCSYNCError	PLC does not support this command.	Use the PLC that supports this command.
0x1B	Receive Error	Invalid data format sent by PLC.	Make sure the data format is correct.

MPI communication error codes are created for Siemens' controllers, such as S7-300 series (Direct MPI), S7-300 series (Without PC Adaptor), and S7-200 series, when communication with the HMI fails.

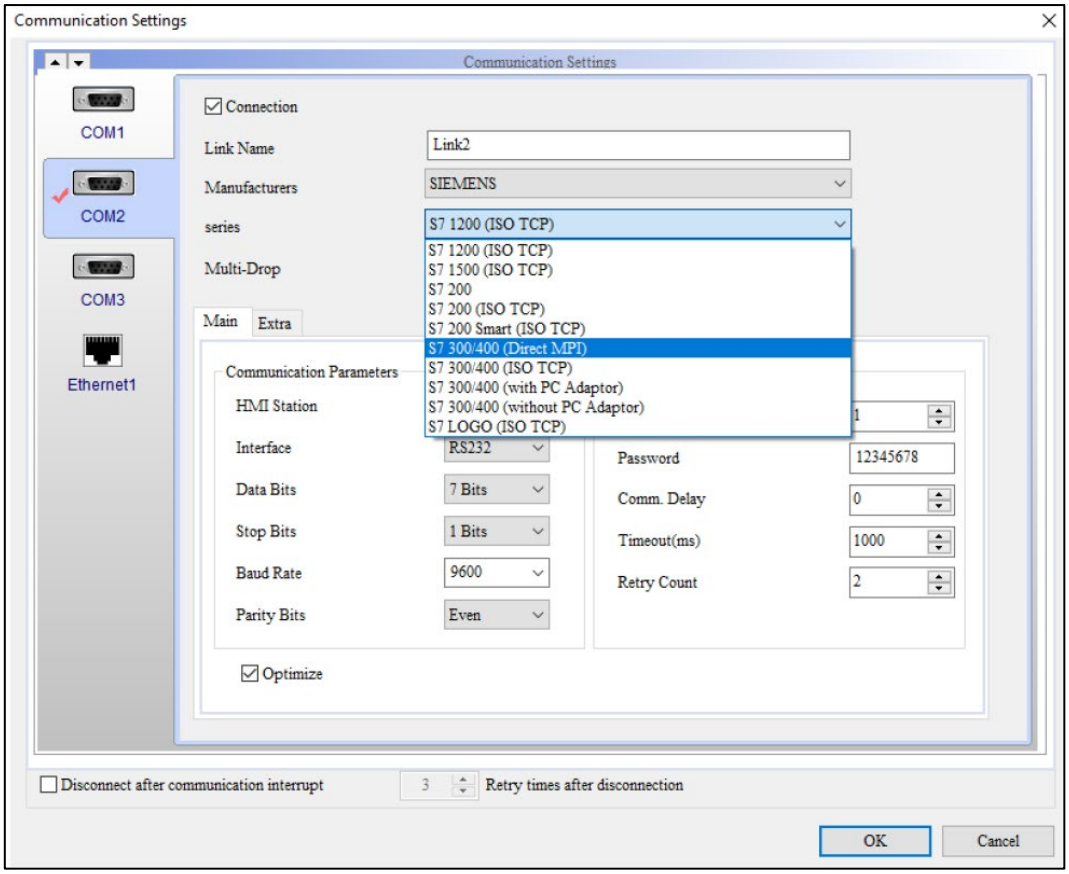


Figure C - 2: Siemens' Controller

Code	Communication Error Message	Cause	Troubleshooting
0x11	MPI_IDLE (For S7 300 - without PC adaptor, S7 300 - Direct MPI, or S7-200)	This is a special error message for Siemens PLC. HMI cannot acquire packets under idle Internet connection.	Check if there are too many connected modules causing insufficient bandwidth.
0x12	MPI_SN_COLLID (For S7 300 - without PC adaptor, S7 300 - Direct MPI, or S7-200)	This is a special error message for Siemens PLC. Station numbers are duplicated.	Check if there are modules with duplicated stations.
0x14	MPI_NO_SC (For S7 300 - without PC adaptor, S7 300 - Direct MPI, or S7-200)	This is a special error message for Siemens PLC. A maximum number of stations connected, with no more connections available.	Check if the number of the connected modules exceeds the limit.

Code	Communication Error Message	Cause	Troubleshooting
0x18	MPINoResponse (For S7 300 - without PC adaptor or S7 300 - Direct MPI)	This is a special error message for Siemens PLC. There is no response for the connection requested, as there is no resource allocated.	Check if the network cable is disconnected or if it has a poor connection.
0x0B	NoResource (For S7 300 - without PC adaptor, S7 300 - Direct MPI, or S7-200)	This is a special error message for Siemens PLC. It is caused by task overload on the PLC.	Simplify the programs on the PLC to reduce task load.
0x0C	NoService (For S7 300 - without PC adaptor, S7 300 - Direct MPI, or S7-200)	This is a special error message for Siemens PLC. It is caused by task overload on the PLC.	Simplify the programs on the PLC to reduce task load.
0x3F	Read Error (For S7 300 - without PC adaptor, S7 300 - Direct MPI, or S7-200)	This is a special error message for Siemens PLC. The set PLC address exceeded the accessible range.	Set the PLC address within the accessible range.

If OMRON C / CPM / CQM series controller is used for communication, refer to the following table for the applicable error code when an error occurred.

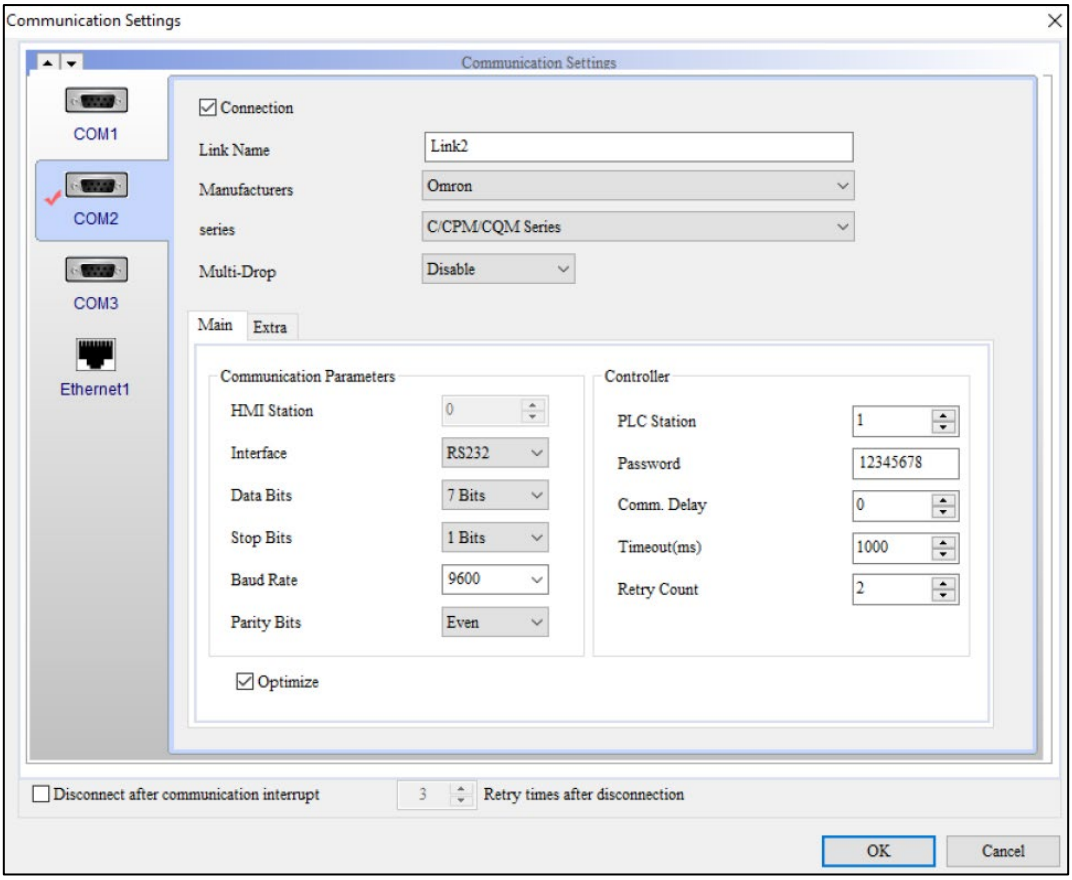


Figure C - 3: OMRON Controller

Code	Communication Error Message	Cause	Troubleshooting
0x1F	NOTExecutableInRunMode	The HMI is already connected with the PLC, but the PLC is in Run mode and cannot accept the "write data" command.	The PLC must be in Monitor mode to accept "write data" command. This error message will only appear once because when the HMI notices an error with the mode, it will automatically change the PLC mode to Monitor mode.

Appendix D: Write and Read Offset Address

D.1 Write and Read Offset Address

The offset address enables to flexibly read and write the memory address without downloading the screen again when changing the address.

After setting the offset address,

- Actual write address of the element: Write Address + Value in Write Offset Address × Element [Data Type].
- Actual read address of the element: Read Address + Value in Read Offset Address × Element [Data Type].

If users have set the **Write Offset Address** but not the **Read Offset Address**, the **Read Offset Address** will be regarded the same as the **Write Offset Address**.

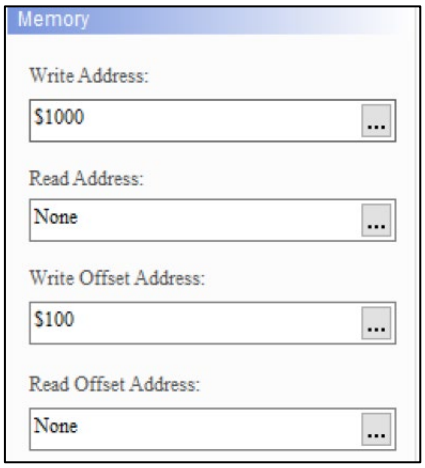


Figure D - 1: Offset address setup

NOTE:

1. *The values in offset addresses must be unsigned with ranges from 0 ~ 65535.*
2. *If the button element does not have the **Data Type** selection, its **Data Type** will be Bit. **Data Type** for the **Character Display** and **Character Entry** elements is*

*Word, not **String Length**.*

3. *All elements that can be set with a **Write Address** can also be set with a **Write Offset Address**, and all elements that can be set with a **Read Address** can also be set with a **Read Offset Address**. Refer to the following table for all the elements that can be set with write or read offset addresses.*

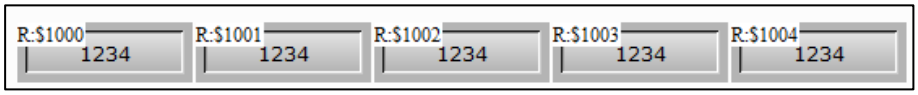
Element		Offset Address	
		Write	Read
Button	Set to On	v	v
	Set to Off	v	v
	Momentary	v	v
	Maintained	v	v
	Multistate	v	v
	Set Value	v	
	Set Constant	v	
	Increment	v	v
	Decrement	v	v
Meter (1)(2)(3)			v
Bar	Normal		v
	Differential		v
Pipe (1)(2)(6)(7)			v
Pie (1)(2)(3)(4)			v
Indicator	Multistate Indicator		v
	Range Indicator		v
	Simple Indicator		v
Data Display	Numeric Display		v
	Character Display		v
	General Message Display		v
	Moving Sign		v
Graphic Display	State Graphic		v
	Animated Graphic		v
Input	Numeric Entry	v	v
	Character Entry	v	v

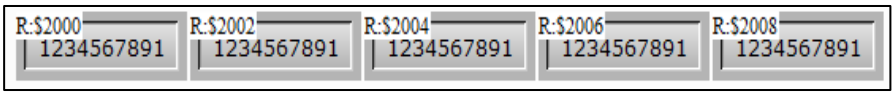
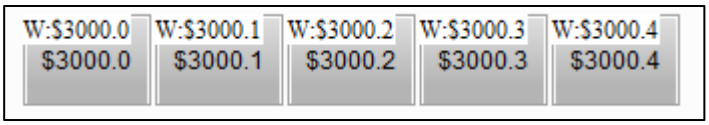
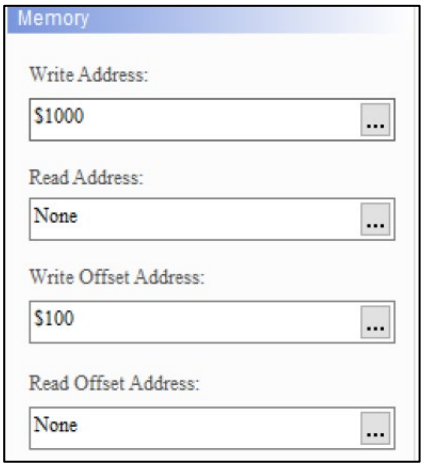
Element		Offset Address	
		Write	Read
	Barcode Input	v	v
	Multi-language Input	v	v
Analog	Slider	v	v
List	ComboBox	v	v
	ListBox	v	v
Drawing	Line		v
	Rectangle		v
	Circle		v
	Text		v

4. *Select the Internal Memory or controller register address as the **Write** / **Read Address** for the elements, but only the controller register address for which the Data Length is not Word is currently not supported. For example, C200-C255 in Deltas DVP PLC is not supported because the Data Length is Double Word.*

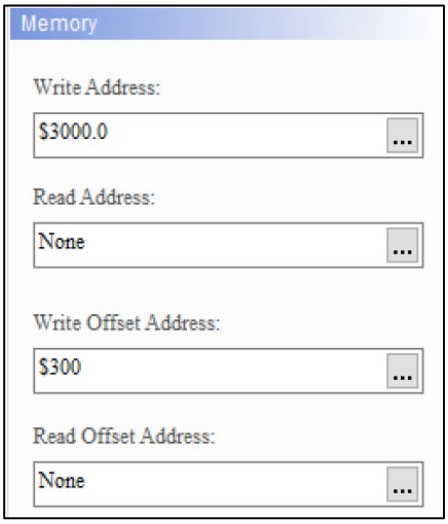
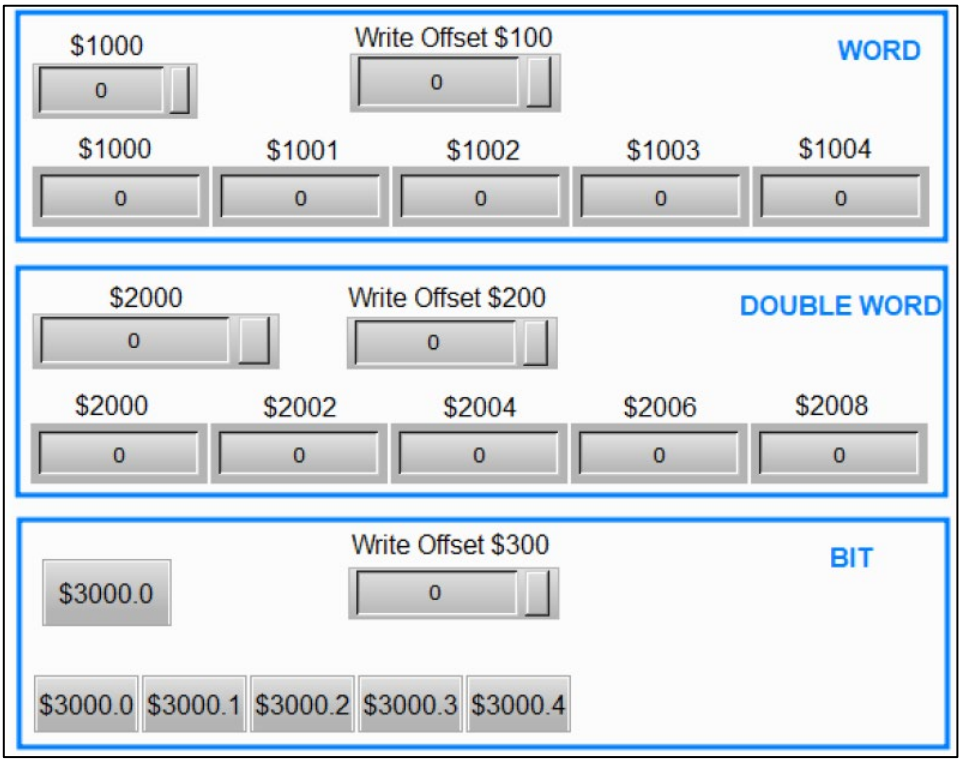
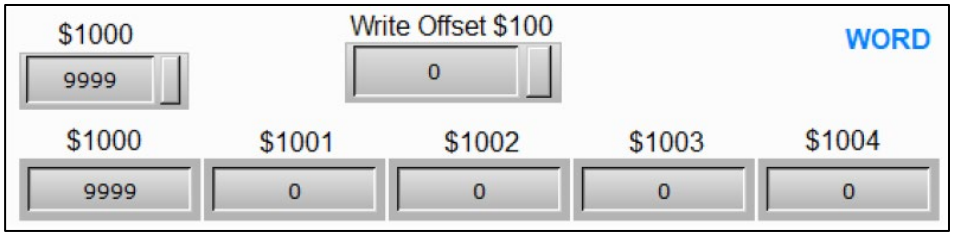
Variable	Type		
	Internal Memory	PLC Register	Constant
Write Offset Address	v	v	
Read Offset Address	v	v	

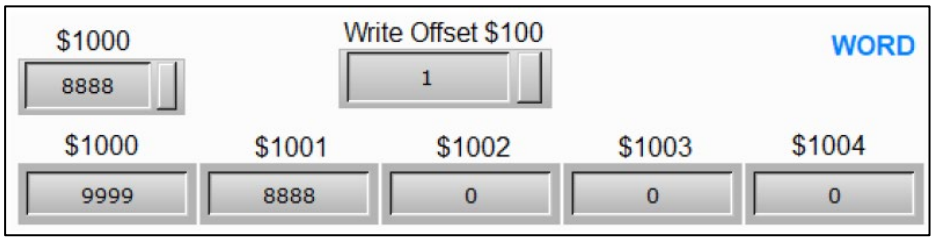
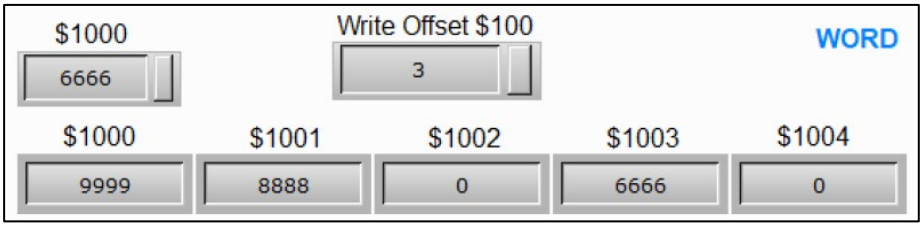
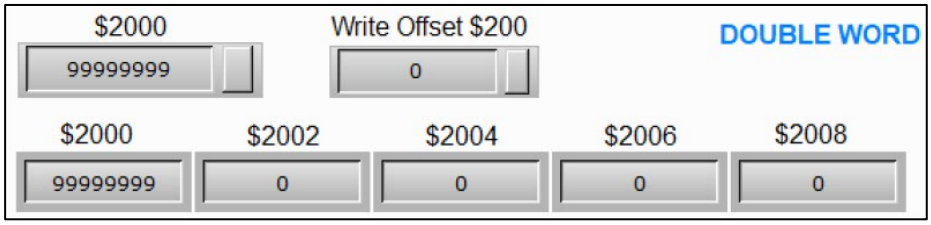
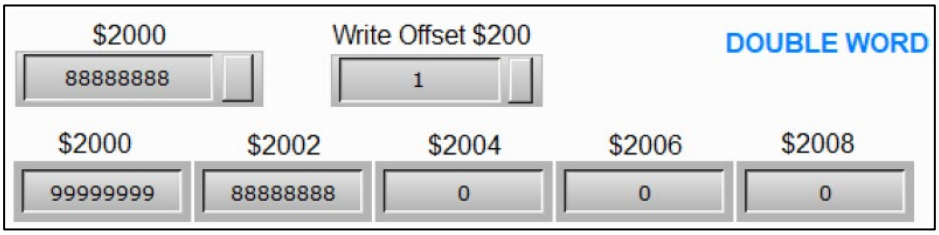
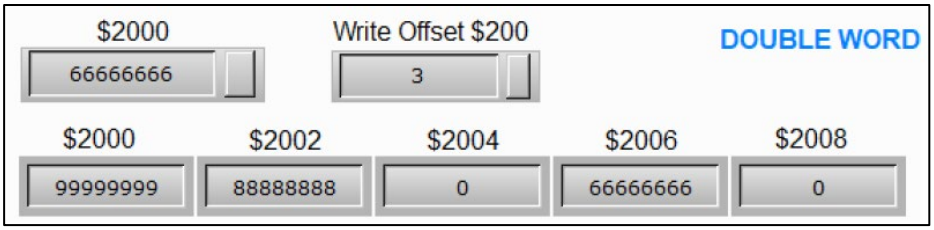
Refer to the following examples of **Offset Address**.

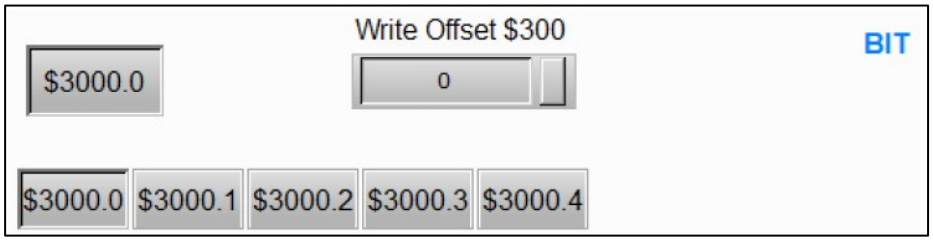
Examples for Applying Offset Address	
Create Numeric Entry elements	Create three **Numeric Entry** elements and set **Write Address** to $100, $200, and $300, respectively.
Create Numeric Display elements	**Step 1**: Create five **Numeric Display** elements with the **Data Type** as Word and set the addresses from $1000 ~ $1004 in sequence. 

<table>
<tr><th colspan="2">Examples for Applying Offset Address</th></tr>
<tr><td></td><td>Step 2: Create five Numeric Display elements with the Data Type as Double Word and set the addresses from $2000 ~ $2004 in sequence.
 
</td></tr>
<tr><td>Create Maintained Button elements</td><td>Create five Maintained Button elements and set the addresses from $3000.0 ~ $3000.4 in sequence.
 
</td></tr>
<tr><td rowspan="2">Set offset addresses</td><td>Step 1: Create one Numeric Entry element with the Data Type as Word and set the Write Address to $1000 and Write Offset Address to $100.
 

Step 2: Create one Numeric Entry element with the Data Type as Double Word and set the Write Address to $2000 and Write Offset Address to $200.
 
</td></tr>
<tr><td>Step 3: Create one Maintained Button element and set the Write Address to $3000.0 and Write Offset Address to $300.</td></tr>
</table>

Examples for Applying Offset Address	
	
Download the screen to HMI	After creating all the elements, compile and download the data to the HMI. 
Execution result when the Data Type is Word	● When the **Write Offset Address** $100 is 0, the actual **Write Address** of the **Numeric Entry** element Word is $1000.  ● When the **Write Offset Address** $100 is 1, the actual **Write Address** of the **Numeric Entry** element is 1 Word address after

Examples for Applying Offset Address	
	$1000, which is $1001.  ● When the **Write Offset Address** $100 is 3, the actual **Write Address** of the **Numeric Entry** element is 3 Word addresses after $1000, which is $1003. 
Execution result when the Data Type is Double Word	● When the **Write Offset Address** $200 is 0, the actual **Write Address** of the **Numeric Entry** element Double Word is $2000.  ● When the **Write Offset Address** $200 is 1, the actual **Write Address** of the **Numeric Entry** element is 1 Double Word address after $2000, which is $2002.  ● When the **Write Offset Address** $200 is 3, the actual **Write Address** of the **Numeric Entry** element is 3 Double Word addresses after $2000, which is $2006. 
Execution result when the	● When the **Write Offset Address** $300 is 0, the actual **Write Address** of the **Maintained Button** element is $3000.0.

Examples for Applying Offset Address	
Data Type is Bit	 ● When the **Write Offset Address** $300 is 1, the actual **Write Address** of the **Maintained Button** element is 1 Bit address after $3000.0, which is $3000.1.  ● When the **Write Offset Address** $300 is 3, the actual **Write Address** of the **Maintained Button** element is 3 Bit addresses after $3000.0, which is $3000.3. 