



Product Solutions Announcement

Delta Industrial Automation Global Solution Center



Product	AMD	Type	VFD-C2000	Security Level	☒ General ☐ High ☐ Top
				No.	N/A
Issued by	Global SC	Author	John Zuo	Release Date	18 th July 2012

C2000 Modbus TCP Client in Speed Mode

Devices and tools:

Inverter: VFD007C23A, Firmware V9.020 (12274)

C2000 Optional Card: EMC-PG01U CMC-MOD01(V1.00)

PM motor: ECMA-C30602ES

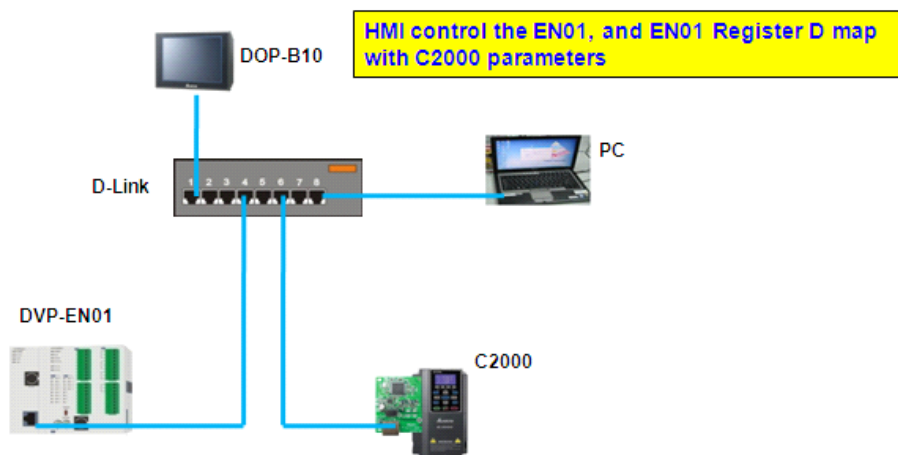
PLC: DVP28SV11T+DVPEN01(V2.06)

HMI:DOP-B10E615

HUB:D-Link

Operation Steps:

1. Setting necessary Parameters for C2000+PM motor with PG01U. (Please kindly refer to the announcements related to C2000+PM with PG01U).
2. Wiring C2000, 28SV, DOP-B10, PC into one Modbus TCP network.



3. Setting C2000 parameters for Modbus TCP.

Pr. no	Definition	Setting value
00-20	Source of Master Frequency Command	8(for communication card)
00-21	Source of the Operation Command	5(for communication card)
09-00	C2000 Communication Address	3 ^A
09-30	Communication Decoding Method	0(20XXH) 1(60XX) ^B
09-75	IP Configuration	0(Static) 1(DHCP) ^C
09-76	IP Address 1	192
09-77	IP Address 2	168
09-78	IP Address 3	1
09-79	IP Address 4	5
09-80	Net Mask 1	255
09-81	Net Mask 2	255
09-82	Net Mask 3	255
09-83	Net Mask 4	0
09-84	Gateway 1	192
09-85	Gateway 2	168
09-86	Gateway 3	1
09-87	Gateway 4	1
09-91	Ethernet Extra Setting	2 ^D

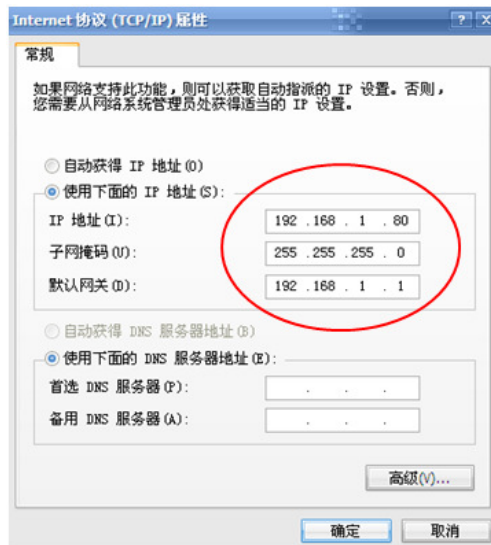
- A. Modbus TCP is based on Modbus, so the 09-00 Modbus Address of C2000 must be set correctly. And it should be different with PLC modbus address.
- B. Modbus TCP can support 20XX and 60XX based on 09-30 setting.
- C. IP Configuration should be Static if your HUB can't distribute the IP automatically. Of course, if you are

using Router, and it can distribute IP automatically, please set 09-75=1 namely DHCP.

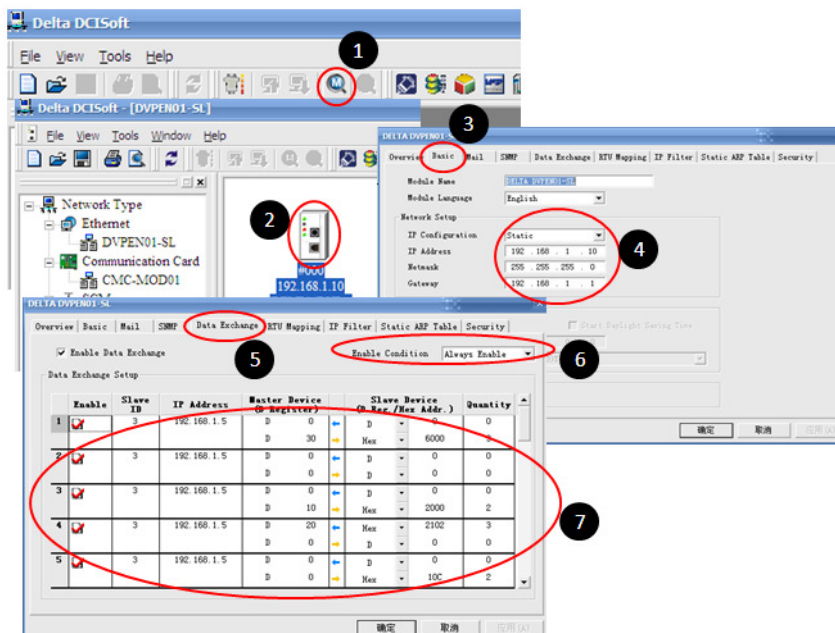
D. When we finish the IP address setting, please set 09-91 to 2 for enabling the setting.

- Setting PC IP address based on the C2000 IP setting 09-76~09-87. The Top three IP address should be the same as C2000 namely 192.168.1, but the final one should be different. In this case, PC IP address is 192. 168. 1. 80.

Net mask and Gateway are the same as C2000.



- Repower DVP-EN01 and C2000.
- Open the DCISoft for searching the modules in the network.



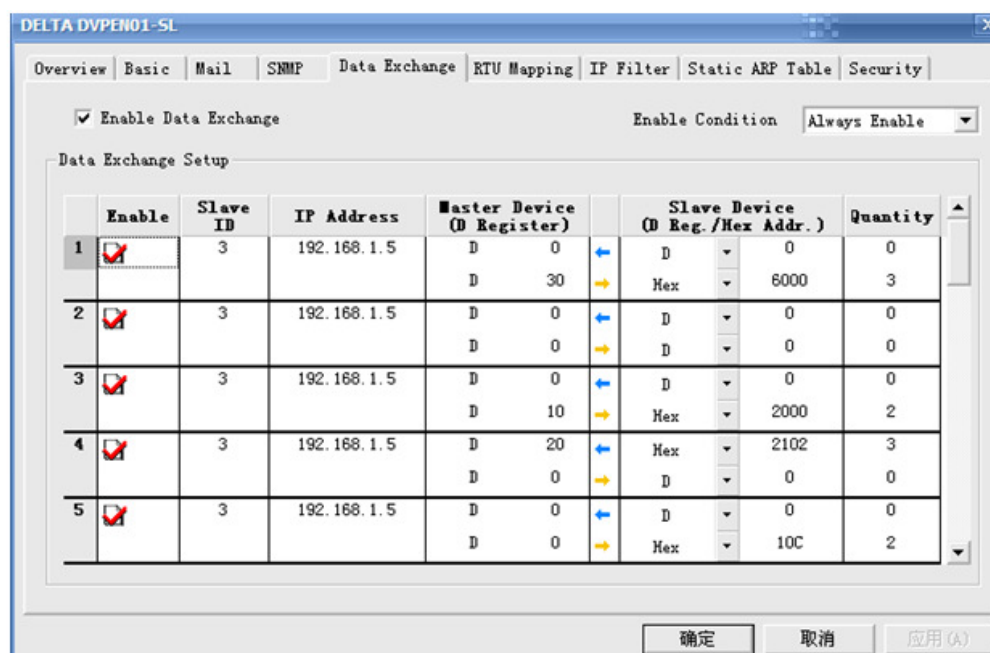
- Click Searching based on the modules.
- DN01 and C2000 will be searched there, and click the EN01.

- 3) Click the "Basic".
- 4) Set the IP address of EN01, and the IP address top three should be the same as C2000 and PC, but the final one should be different. Netmask and Gateway are the same as C2000 and PC. In this case, EN01 IP address is 192. 168. 1. 10.

Besides, IP configuration also is Static since we are using HUB not Router.

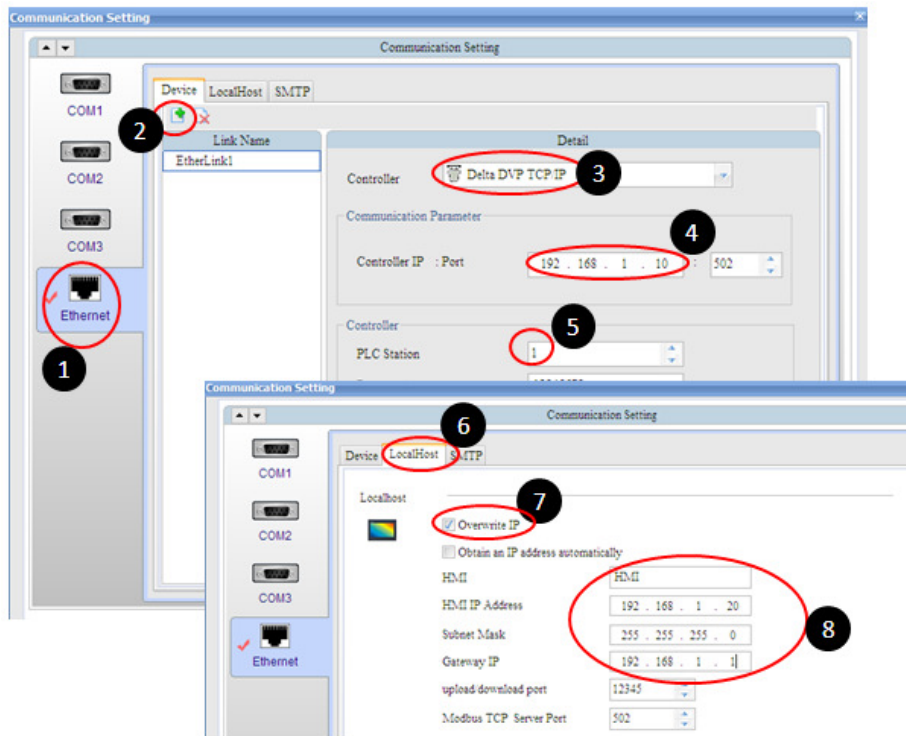
- 5) Click the "Data Exchange".
- 6) Set the "Enable Condition" to Always Enable.
- 7) Setting the mapping to C2000 in EN01. Slave IP should be the C2000 Pr09-00, IP address should be the C2000 IP, Master Device (D register) is the D in PLC, Slave Device is the parameter address of C2000 and you can choose HEX type or D type. In this case, HEX type is there since it is more convenient.

The Mapping information as follows:



Reading Data				Writing Data			
Parameter	HEX	Register D	Definition	Parameter	HEX	Register D	Definition
2102H	2102H	D20	Fre. Com.	2000H	2000H	D10	Ope. Com.
2103H	2103H	D21	Output Fre.	2001H	2001H	D11	Fre. Com.
2104H	2104H	D22	Output Cur.	01-12	01-0CH	D0	Acc. Time
				01-13	01-0DH	D1	Dec. Time
				6000H	6000H	D30	Ope. Com.
				6002H	6002H	D32	Fre. Com.

7. Open the DOPSOFT and setting the HMI MODBUS TCP setting.



- 1) Go to the “communication setting” of DOPSOFT, and click Ethernet.
- 2) Clicking “add new connection”.
- 3) Choose the “Delta DVP TCP/IP”.
- 4) Setting the IP address for the device you want to use HMI to control. In this case, HMI is to control EN01, so here is the EN01 IP address, 192.168.1.10.
- 5) Setting the modbus address for the device you want to use HMI to control. In this case, HMI is to control EN01, so here is the 28SV modbus address namely 1.
- 6) Clicking “LocalHost”
- 7) Clicking “Overwrite IP”
- 8) Setting the IP address for HMI, the top three IP address should be the same as C2000, PC and EN01, but the final one should be the different. In this case, the IP address of HMI is 192.168.1.20. Besides, Netmask and Gateway should be the same as C2000, PC and EN01.

8. Double check the IP address for C2000, EN01, DOP and PC for ensuring they are all different.

PLC	192.168.1.10
C2000	192.168.1.5
DOP-B10	192.168.1.20
PC	192.168.1.80

9. Making the PLC and DOP program based on 09-30.

- When 09-30=0 namely 20XX, please kindly refer to the “Modbus TCP 20XX Speed”.dps and “Modbus TCP 20XX Speed”.dvp.
- When 09-30=1 namely 60XX, please kindly refer to the “Modbus TCP 60XX Speed”.dps and “Modbus TCP 60XX Speed”.dvp.

10. Downloading programs and controlling the HMI.

Attentions:

1. Why can't scan the HMI in the DCISOFT ?

DCISOFT only can support PLC product or inverter option card but not HMI. So we can't scan HMI in the DCISOFT even if the HMI is in the Ethernet Network.

2. Why can't the IP address be saved after power off even if we set 09-91=2 ?

We can set 09-91=2 for saving IP address even after power off. But the CMC-MOD01 must be installed when we set IP address. Otherwise, if no CMC-MOD01 there, we set IP but it will be 0 again when we power off.

3. How many clients and servers for C2000 CMC-MOD01?

Ethernet doesn't have the master or slave conception again but the server and client.

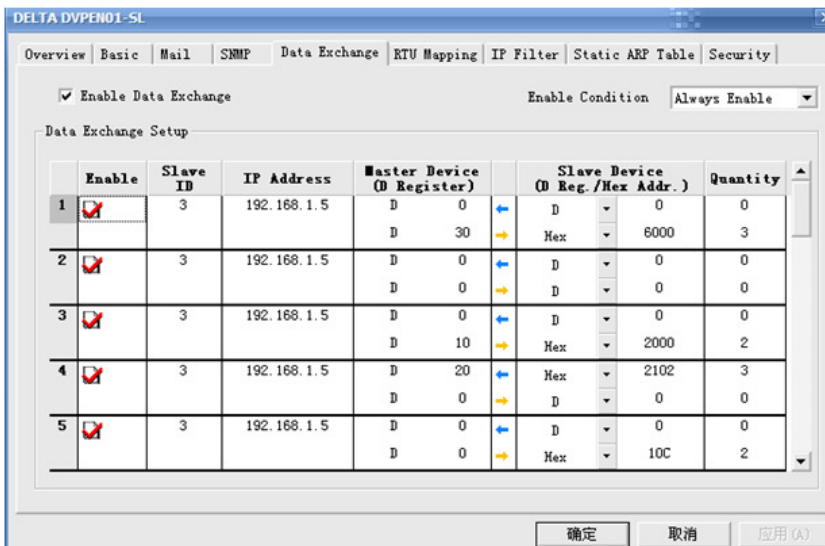
Server is to control and client is to follow.

	CMC-MOD01	CMC-EIP01	IFD9506	IFD9507
Modbus TCP Server	32	1	16	16
Modbus TCP Client	0	0	8	8
EtherNet/IP Server	0	32	0	16
EtherNet/IP Client	0	0	0	4

4. Can DCISOFT support the Data Read or Write in one channel?

Read and write in one channel is based on 0x17 function code, and only the devices support this function code can realize it (EN01, 12SE....). However, C2000 can't support the 0x17 function code, so it is impossible to realize it if we connect C2000 in Modbus TCP.

However, the firmware V2.08 for EN01 can provide one flexible software function, they can let we realize it by software only, so we can set read or write mapping in one channel from software but the practical operation still is separately by CR inside EN01. Only EN01 can have this now, if we use 12SE, we still can't use this in the software also.



5. Any EN01 with any firmware can connect inverter?

No, we suggest V2.06 or later EN01 to connect inverter in Modbus TCP. If your EN01 has older firmware than V2.06, please contact with Delta office and Delta office can guide you to update. But if your firmware is too old, it can't be updated to V2.06 and later, only V2.0 which is not OK to connect inverter. And you have to buy new EN01 in this case.

6. How can we check the Network working fine or not?

We can use the DOS command for "Ping" to check whether the network is fine or not. Click the "Run" in your Start Menu of Computer. And then:

```

C:\WINDOWS\system32\cmd.exe
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\admin>ping 192.168.1.161

Pinging 192.168.1.161 with 32 bytes of data:

Reply from 192.168.1.161: bytes=32 time<1ms TTL=128
Reply from 192.168.1.161: bytes=32 time<1ms TTL=128
Reply from 192.168.1.161: bytes=32 time<1ms TTL=128
Reply from 192.168.1.161: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.161:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms

C:\Documents and Settings\admin>ping 192.168.1.161

Pinging 192.168.1.161 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.161:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Documents and Settings\admin>
  
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Reply means connection OK

Request Time out