



Product Solutions Announcement

Delta Industrial Automation Global Solution Center



Product	AMD	Type	VFD-C2000	Security Level	<input checked="" type="checkbox"/> General <input type="checkbox"/> High <input type="checkbox"/> Top
				No.	N/A
Issued by	Global SC	Author	John Zuo	Release Date	7 th June 2012

Modbus Master for PLC inside C2000

Devices and tools:

Inverter: VFD007C23A, Firmware V9.019 (12221), PG:EMC-PG01U

PM motor: ECMA-C30602ES

PLC: DVP28SV11T

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. Understanding the function code from C2000 PLC built-in for modbus master.

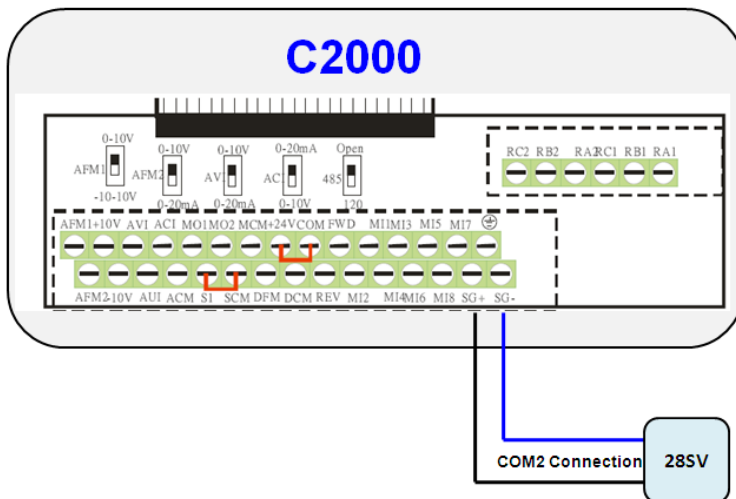
MODRW					Slave is PLC	Slave is Inverter
Slave Address	Function code	Slave Data address	C2000 Register D	Length		
KXX	H01 ^A	HXX	DXX	KXX	Read slave Y, M, T, C bits in length to C2000 registers D.	No function.
KXX	H02	HXX	DXX	KXX	Read slave X, Y, M, T, C bits in length to C2000 registers D.	No function.
KXX	H03	HXX	DXX	KXX	Read slave words in length to C2000 registers D.	Read slave parameters values in length to C2000 registers D.
KXX	H06	HXX	DXX	XX ^B	Write slave word by C2000 register D. Only one word.	Write slave parameter value by C2000 register D. Only one word.
KXX	H0F	HXX	DXX	KXX	Write slave Y, M, T, C bits in length by C2000 registers D.	No function
KXX	H10	HXX	DXX	KXX	Write slave words in length by C2000 registers D.	Write slave parameters values in length by C2000 registers D.

A. Slave X can't be read by H01 function code, if we do this, the error will be there.

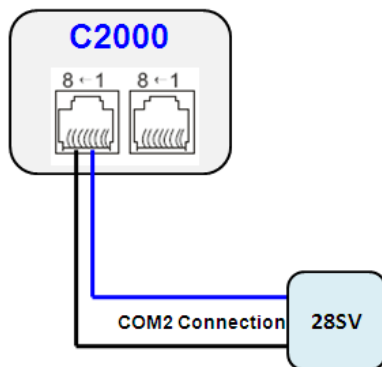
B. Please don't care the length here, but you have to input one value.

3. Wiring 28SV and C2000 for one Modbus network.

A. Using SG+ SG- on the terminal board of C2000 to connect 28SV.

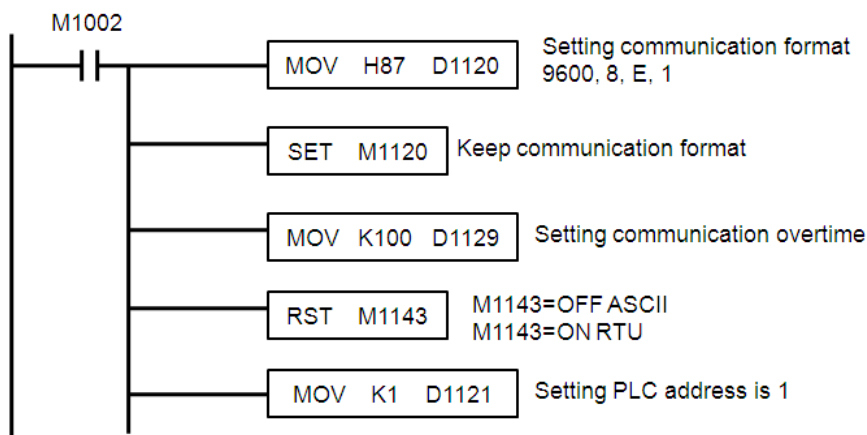


B. Using RJ45 port on the control board of C2000 to connect 28SV. There are two RJ45 ports in C2000, any one is available for connecting 28SV.



4. The Modbus slave can be all Modbus devices including inverter, PLC. In this case, we take Delta DVP28SV11T as the slave.

So, we set 28SV modbus communication format and address by PLC program first.



And then, we download this program to 28SV and execute it for enabling the Modbus format and address setting.

5. Setting C2000 communication Parameters based on the same Modbus format inside one network.

Pr. no	Definition	Setting value
09-01	COM1 Transmission Speed	9.6 (namely 9600)
09-02	COM1 Transmission Fault Treatment	3
09-03	COM1 Time-out Detection	0
09-04	COM1 Communication Protocol	8 (namely 8 E 1 ASCII)
09-31	Internal communication method	0 (namely MODBUS 485)
09-35	The address of PLC built-in	2

6. Making the program of PLC inside C2000 for making the best use of MODRW instruction.
Please kindly refer to the sample program named [C2000 Program](#).
7. Download the program to PLC inside C2000 and execute it.
8. Making the PLC program of 28SV for collaborating the program of PLC inside C2000.
Please kindly refer to the sample program named [28SV Program](#).
9. Setting C2000 Pr09-31 to -12 for enabling the PLC Modbus Master of C2000.
10. Connecting keypad modbus port to computer for monitoring WPL program of PLC inside C2000.
When we set Pr09-31=-12, the common RJ45 or SG+ SG- can't monitor WPL again. Only the keypad port of C2000 can support monitoring WPL at this time, and the Modbus format for this port is stable namely RTU, 8, N, 2, 19200.

Attentions:

1. Why don't we set Pr09-31=-12 at the first time?
- When we use the SG+ SG- or RJ45 on control board of C2000 to connect 28SV:
If we set Pr09-31=-12, the PLC Modbus Master function inside C2000 will be enabled. However, WPL software can't support Pr09-31=-12 and the program can't be made and downloaded in WPL if we set Pr09-31=-12. Hence, we should set Pr09-31=0 first and when we finish the WPL program mission, we set Pr09-31=-12 for enabling the PLC Modbus Master function.
 - When we use the Keypad Modbus Port of C2000 to connect 28SV:
This port is special one for C2000 and it can support WPL software all the time even you set

Pr09-31=-12. So if you use this port to connect 28SV, we can set Pr09-31=-12 at the first time. However, this port is for Keypad, if we occupy it for connecting 28SV, Keypad can't be used again. Besides, this port has one stable Modbus Format namely RTU, 8, N, 2, 19200.

2. What is the difference between MODRW function in C2000 PLC with normal PLC of Delta?

For normal PLC in Delta, MODRW can support COM1 COM2 COM3. So for distinguishing the data from different COM, when we use H02 or H03 function code in normal PLC MODRW, the master registers can't receive the direct data but the ASCII or RTU series codes.

For C2000 PLC built-in, MODRW always receive the direct data in the register since there is one real Modbus Port, so it is easier. Besides, the MODRW enabling is easier compared with normal PLC since there is no sending request auxiliary relay for C2000 PLC.

In a word, MODRW function in C2000 PLC built-in is more direct and simple.

3. Why is there no H05 function code for C2000 PLC built-in?

C2000 PLC built-in will add this function in the new firmware. The firmware is after V9.019 D12221, but the exact firmware is not sure.

4. What is the meaning for special auxiliary relays M1177 M1178 M1179?

When the MODRW execution is finished, M1177 will be ON. Besides, when M1178 or M1179 is ON, M1177 also is ON.

When the MODRW execution error happen (Reading or Writing), M1178 will be ON.

When the MODRW execution overtime, M1179 will be ON.

M1177 M1178 M1179 will be OFF automatically when we execute MODRW next time.

Besides, R&D will add one special auxiliary relay for expressing MODRW is executed successfully or not. When MODRW execution is finished and no error happen, this M will be ON. And this M will be OFF automatically when we execute MODRW next time. This firmware is after V9.019 D12221, but the exact firmware is not sure.

