



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	SC	Author	John Zuo	Release Date	20 th Jan. 2014

CanOpen Master Position Function for C2000

Devices and tools:

Inverter: VFD007C23A, 2PCS (Firmware V1.04 D13305)

C2000 Optional Card: EMC-PG01U (2PCS) EMC-COP01(2PCS)

PM motor: ECMA-C30602ES 2PCS

HMI: DOP-B10E615

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. Set 00-02=6 to reset the program of PLC inside C2000 (Both C2000).
3. Set 00-02=7 to reset the CanOpen Slave Setting for C2000 CanOpen Slave Only.
4. Set the necessary Parameters for C2000 CanOpen Master:

Parameters	Descriptions	Value
09-37	CanOpen Speed	0 (1M)
09-45	CanOpen Master Function	1 (enabled)
09-46	CanOpen Master Address	100 (Default)

Besides:

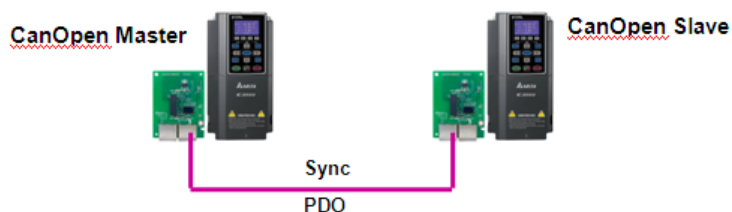
- please go to PLC mode for master.
- After the procedures above, please repower the master C2000.

5. Set the necessary Parameters for C2000 CanOpen slave:

Parameters	Descriptions	Value
00-40	Homing Mode Choice	3(for ORG and Z pulse)

00-41	Homing First Speed	8.00HZ
00-42	Homing Second Speed	2.00HZ
02-01	MI1 Definition	46(ORG)
00-20	Source of the Master Frequency Command	6 (for Canopen)
00-21	Source of the Operation Command	3 (for Canopen)
09-36	CanOpen Slave Address	1
09-37	CanOpen Speed	0 (1M)
09-40	CanOpen Decoding Method	1 (for DS402)
11-40	Source of Position Command	3
11-43	P2P Maximum Frequency	15.00HZ
11-44	P2P Acce. Time	1.00s
11-45	P2P Dec. Time	3.00s

6. Wiring C2000 Master and Slave together based on EMC-COP01.



7. Understanding the CanOpen Master Slave Special Auxiliary Relays M.

Relays	Descriptions
M1034	Enable CanOpen Real Time Control
M1059	CanOpen Master Setting Complete
M1060	Initializing CanOpen Slave
M1061	Initializing CanOpen Slave Failed

Besides, there are many Special Registers for CanOpen Master. There is a very clear

explanation in our C2000 manual. The ones from D1070~D1099 and D2000~D2799 must be set correctly, otherwise, the CanOpen Master can't be fulfilled.

Some key Registers can be introduced here:

Registers	Descriptions	Remarks
D1090	Synchronous cycle setting	$D1090 \geq (1M/Rate) * (N/4)$ ^A
D1091	The station for initialization during Initializing process	Bit0~7 is the mapping for 1~8Channel ^B
D2034	Transmission setting of slave No. n=0	For TXPDO Transmission Setting ^C
D2067	Transmission setting of slave No. n=0	For RXPDO Transmission Setting ^C

A. Rate is the value you set in 09-37, and N is the PDO number in your loop.

B. Channel one is D2000~D2099, Channel two is D2100~D2199..... Channel eight is D2700~D2799.

C. D2034+n*100 is for eight channels TXPDO Transmission Setting.
D2067+n*100 is for eight channels RXPDO Transmission Setting.

They all abide by the structure as below, and the En is for enable the mode you choosing, the number is the PDO Index number (e.g. 6040H 607AH....). The difference is D2034+n*100 is to regard the TXPDO as targets, but D2067+n*100 is to regard the RXPDO as targets.

	PDO4		PDO3		PDO2		PDO1	
	Torque		Position		Remote I/O		Speed	
Bit	15	14 ~ 12	11	10 ~ 8	7	6 ~ 4	3	2 ~ 0
Definition	En	Number	En	Number	En	Number	En	Number

And the detailed indexes information for PDO1 ~ PDO4 as follows:

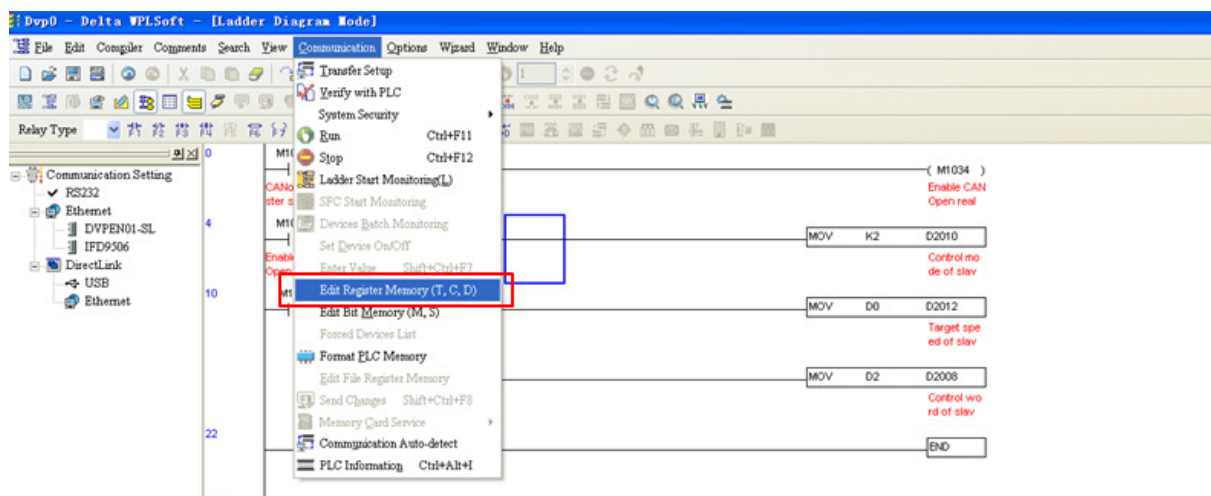
TXPDO							
PDO4 (Torque Mode)		PDO3 (Position Mode)		PDO2 (Remote I/O)		PDO1 (Speed Mode)	
Description	Special D	Description	Special D	Description	Special D	Description	Special D
Control Word	D2008+n100	Control Word	D2008+n100	Slave MO	D2027+n100	Control Word	D2008+n100
Tor. Target	D2017+n100	Pos. Target ^A	D2020+n100 D2021+n100	Slave AO1	D2031+n100	Freq. Com.	D2012+n100
Control Mode	D2010+n100	Control Mode	D2010+n100	Slave AO2	D2032+n100		

RXPDO							
PDO4 (Torque Mode)		PDO3 (Position Mode)		PDO2 (Remote I/O)		PDO1 (Speed Mode)	
Description	Special D	Description	Special D	Description	Special D	Description	Special D
Status Word	D2009+n100	Status Word	D2009+n100	Slave MI	D2026+n100	Status Word	D2009+n100
Rel. Torque	D2018+n100	Rel. Position ^A	D2022+n100 D2023+n100	Slave AI1	D2028+n100	Freq. Com.	D2013+n100
Rel. Mode	D2011+n100	Rel. Mode	D2011+n100	Slave AI2	D2029+n100		
				Slave AI3	D2030+n100		

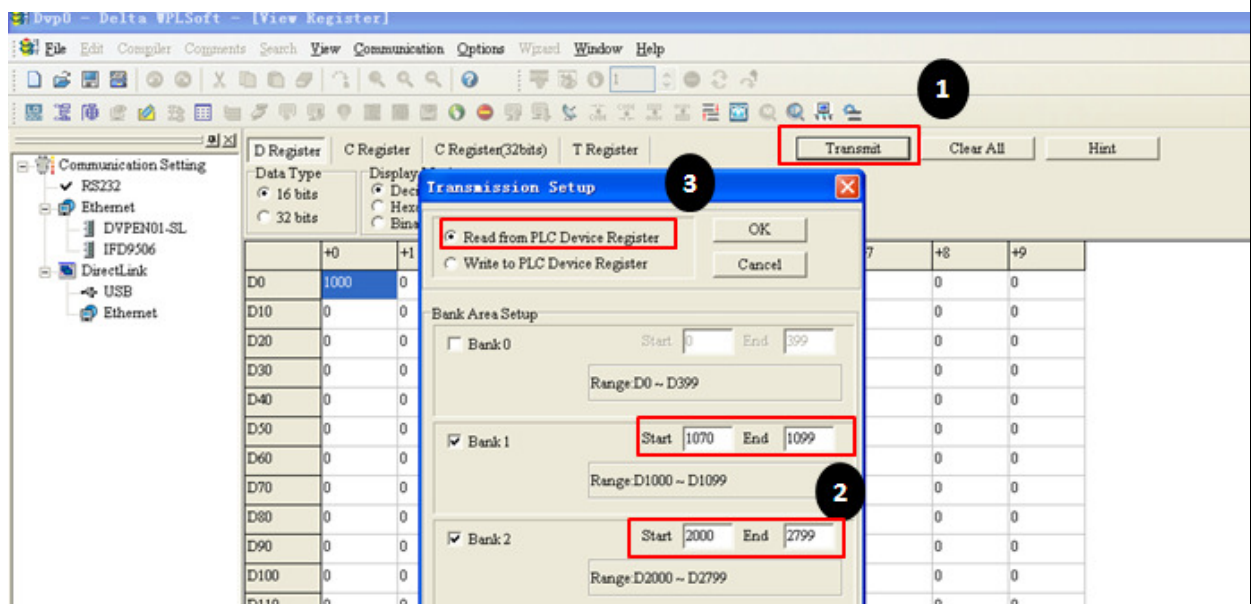
A. There are two PDOs for Position Command or Position display, but the length number is one since they are 32-bit PDO for one definition.

8. Programming C2000 CanOpen Master PLC.

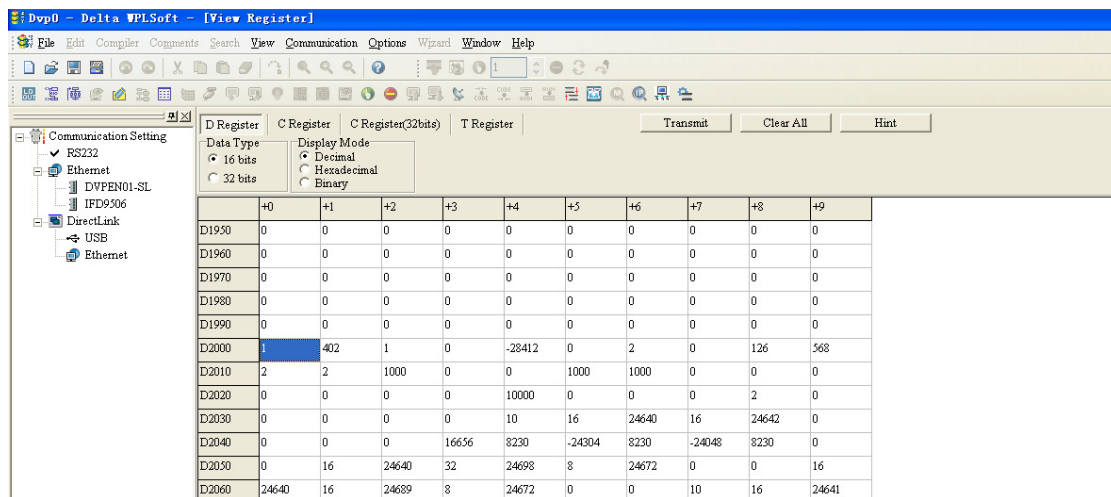
- Choose Communication—Edit Register Memory(T,C,D) in WPLSoft.



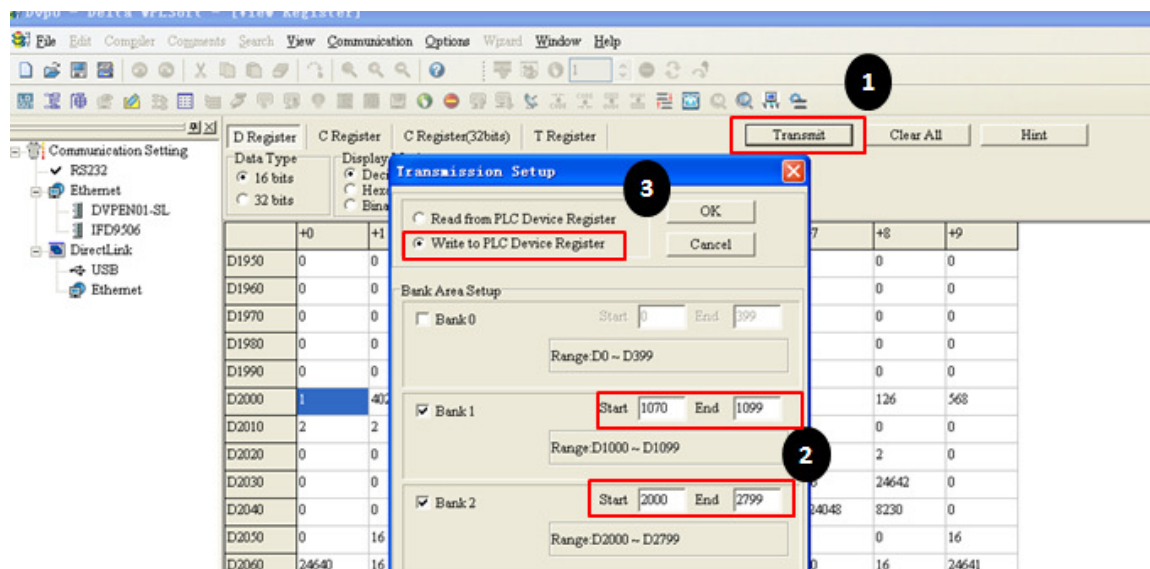
- Click Transmit, and choose D1070~D1099 D2000~D2799, and click the “Read from PLC Device Register” for reading the D1070~D1099 D2000~D2799 from Current PLC.



- When Reading complete, don't change the value of D1070~D1099 which are very less something to do with application setting. But D2000~D2799 should be set carefully based on your CanOpen Configuration. In this case, CanOpen Slave address is 1 and I choose D2000~D2099 as the operation registers. So I set D1090=8, D1091=1(Bit 0=1 for D2000~D2099), D2034=0B0AH (Position mode 3-Length TXPDO), D2067=0B0AH(Position mode and 3-Length RXPDO). Please use "Edit Register Memory" to set these D since they are configurations, and other D can be set in your program.



- Click Transmit, and choose D1070~D1099 D2000~D2799, and click the "Write to PLC Device Register" for writing the D1070~D1099 D2000~D2799 to Current PLC.



- Making the ladder steps for C2000 CanOpen Master. In this case, I realize the CanOpen Master-Slave Position control, and I used D2010 for control mode, D2008 for Control word, D2020 D2021 for Position Command.
For any CanOpen Master application in C2000, [M1059 M1060 M1061 M1034](#) must be used correctly, and otherwise the application can't be fulfilled.

Please refer to the CanOpen Master sample program in Position Mode.

FAQ:

A. What is the difference between CANFLS with CANTX CANRX?

CANFLS is for DS402 SDO, CANTX CANRX is for all CanOpen Protocols SDO even it is 60XX, 20XX or normal parameters based on DS301. So if we want to read 60XX, 20XX or DS301 parameter indexes in CanOpen Master, we can use CANRX. Of course, if we want to read or write DS402 in CanOpen Master, we can use CANFLS or CANTX CANRX.

B. Are M1066 M1067 available for PDO mapping?

M1066 is the flag for Can Master read/write finished, M1067 is the flag for Can Master read/write finished and corrected. M1066 M1067 only are available for SDO not PDO. Because SDO can support information reply after information sending, but PDO can't. So M1066 M1067 only are available for SDO, namely CANFLS CANTX CANRX.

