2013-12-15

5011692502-CDN2

CMC-*DN01*

Instruction Sheet

安 裝 說 明

安 装 说 明

DeviceNet Communication Card

DeviceNet 通訊卡

DeviceNet 通讯卡

DELTA

Smarter. Greener. Together.

⚠ Warning ..... ENGLISH

EN ↗ CMC-DN01 is an OPEN-TYPE device. It should be installed in a control cabinet free of airborne dust, humidity, electric shock and vibration. To prevent non-maintenance staff from operating CMC-DN01, or to prevent an accident from damaging CMC-DN01, the control cabinet in which CMC-DN01 is installed should be equipped with a safeguard. For example, the control cabinet in which CMC-DN01 is installed can be unlocked with a special tool or key.

EN ↗ DO NOT connect AC power to any of I/O terminals, otherwise serious damage may occur. Please check all wiring again before CMC-DN01 is powered up. After CMC-DN01 is disconnected, Do NOT touch any terminals in a minute. Make sure that the ground terminal ⏚ on CMC-DN01 is correctly grounded in order to prevent electromagnetic interference.

FR ↗ CMC-DN01 est un module OUVERT. Il doit être installé que dans une enceinte protectrice (boitier, armoire, etc.) saine, dépourvue de poussière, d'humidité, de vibrations et hors d'ateinte des chocs électriques. La protection doit éviter que les personnes non habilitées à la maintenance puissent accéder à l'appareil (par exemple, une clé ou un outil doivent être nécessaire pour ouvrir a protection).

FR ↗ Ne pas appliquer la tension secteur sur les bornes d'entrées/Sorties, ou l'appareil CMC-DN01 pourra être endommagé. Merci de vérifier encore une fois le câblage avant la mise sous tension du CMC-DN01. Lors de la déconnection de l'appareil, ne pas toucher les connecteurs dans la minute suivante. Vérifier que la terre est bien reliée au connecteur de terre ⏚ afin d'éviter toute interférence électromagnétique.

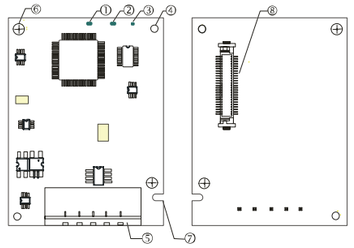
❶ Introduction

Thank you for choosing Delta CMC-DN01 network communication card. CMC-DN01 is a DeviceNet network communication card for connecting Delta C2000 series, CH2000 series, CP2000 series, CT2000 series, and AFE2000 series AC motor drives to DeviceNet network.

■ Functions

1. Based on the high-speed communication interface of Delta HSSP protocol, able to conduct immediate control to AC motor drive.
2. Supports Group 2 only connection and polling I/O data exchange.
3. For I/O mapping, supports Max. 32 words of input and 32 words of output.
4. Supports EDS file configuration in DeviceNet configuration software.
5. Supports all baud rates on DeviceNet bus: 125kbps, 250kbps, 500kbps and extendable serial transmission speed mode.
6. Node address and serial transmission speed can be set up on AC motor drive.
7. Power supplied from AC motor drive.

■ Product Profile



[Figure 1]

1. NS indicator	2. MS indicator	3. POWER indicator
4. Positioning hole	5. DeviceNet connection port	6. Screw fixing hole
7. Fool-proof groove	8. AC motor drive connection port	

❷ Specifications

■ DeviceNet Connector

Interface	5-PIN open removable connector. Of 5.08mm PIN interval
Transmission method	CAN
Transmission cable	Shielded twisted pair cable (with 2 power cables)
Transmission speed	125kbps, 250kbps, 500kbps and extendable serial transmission speed mode
Network protocol	DeviceNet protocol

■ AC Motor Drive Connection Port

Interface	50 PIN communication terminal
Transmission method	SPI communication
Terminal function	1. Communicating with AC motor drive 2. Transmitting power supply from AC motor drive
Communication protocol	Delta HSSP protocol

■ Electrical Specification

Power supply voltage	5VDC (supplied by AC motor drive)
Insulation voltage	500VDC
Communication wire power consumption	0.85W
Power consumption	1W
Weight	23g

■ Environment

Noise immunity	ESD (IEC 61800-5-1,IEC 6100-4-2) EFT (IEC 61800-5-1,IEC 6100-4-4) Surge Test (IEC 61800-5-1,IEC 6100-4-5) Conducted Susceptibility Test (IEC 61800-5-1,IEC 6100-4-6)
Operation /storage	Operation: -10ºC ~ 50ºC (temperature), 90% (humidity), pollution degree 2 Storage: -25ºC ~ 70ºC (temperature), 95% (humidity, non-condensing)
Shock / vibration resistance	International standards: IEC61131-2, IEC68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea)

❸ Installation

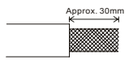
Note: The contents below are about installing CMC-DN01 on C2000.

■ DeviceNet Connector

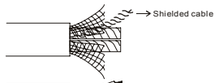
PIN	Signal	Color	Definition
1	V+	Red	DC24V
2	CAN_H	White	Signal+
3	S	-	Earth
4	CAN_L	Blue	Signal-
5	V-	Black	0V

■ How to Install

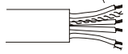
① Use efficient tool to peel the communication cable for approx. 30mm. DO NOT damage the shielded cable while peeling.



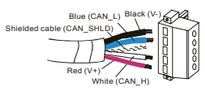
② Peel off the metallic shielded net and foil and you will see 2 power cables (in red and black), 2 signal cables (in blue and white) and 1 shielded cable.



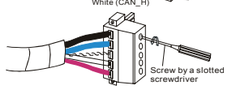
③ Peel off the exterior metallic shielded net, foil and the plastic cover of the power cable and signal cable in proper length.



④ Insert the peeled communication cables into the holes in the connector in correct order.

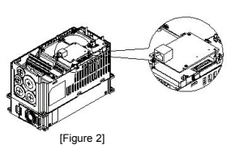


⑤ Tighten the screws on the connector by a slotted screwdriver, and fix the communication cables in the holes in the connector.

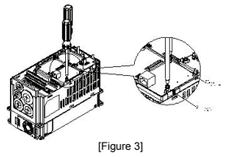


⑥ Install CMC-DN01 on C2000:

1. Switch off the power supply of C2000.
2. Open the cover on top of C2000.
3. Place the insulation spacer into the positioning pin, and aim the two holes on the PCB at the positioning pin. Press the pin to clip the holes with the PCB (see Figure 2).
4. Screw up at torque 6~8 kg-cm (5.21~6.94 in-lbs) after the PCB is clipped with the holes (see Figure 3).

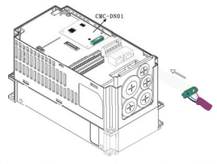


[Figure 2]



[Figure 3]

⑦ Connect to DeviceNet connector: Insert the connector to the connection port on CMC-DN01 (see Figure4)



[Figure 4]

■ Communication Parameters for C2000 Connected to DeviceNet

When C2000 is connected to DeviceNet, please set up the communication parameters for it according to the table below. The DeviceNet master is only able to read/write the frequency word and control word of C2000 after the communication parameters are set.

Parameter	Function	Set value	Explanation
P00-20	Setting up source of frequency command	8	The frequency command is controlled by the communication card.
P00-21	Setting up source of operation command	5	The operation command is controlled by the communication card.
P09-30	Decoding method for communication	0	The old decoding method for the Delta AC motor drive
P09-70	Node address of communication card	User defined	Node address of C2000 in DeviceNet.
P09-71	Serial transmission speed of communication card	User defined	Serial transmission speed of C2000 in DeviceNet.
P09-72	Setting up mode for P09-71	User defined	When P09-72 = 0, P09-71 will enter standard mode. When P09-72 = 1, P09-71 will enter extension mode.

Note: The value of P09-70 is the address of C2000 in DeviceNet. The address has to be consistent with the address of C2000 during configuration. Changing the value in P09-70 when C2000 is working will be invalid. After the value in P09-70 is changed, please shut down C2000 and re-power it to make the parameter valid.

■ Constructing DeviceNet Network

DVPDNET-SL is the DeviceNet master, and CMC-DN01 and C2000 construct DeviceNet slave. Use DeviceNet Builder software to configure the DeviceNet network.

■ Controlling and Using the I/O on an AC Motor Drive by a Communication Card

1. Controlling the setting by a control card

Multi-function output terminal	Parameter	Setting value
Relay1~Relay3*	02-13~02-15	52
MO1~MO2	02-16~02-17	52
MO10~MO15(RY10~RY15)	02-36~02-41	52
AFM1	03-20	22
AFM2	03-23	22

*Relay3 is for CP2000. MO1~MO2 are for C2000/CH2000.

2. Control addresses

Terminal	Address	R/W	Address length	Description
DI	2600h	R	b15~b0	Digital inputs b15~b0
DO	2640h	RW	b15~b0	Digital outputs b15~b0
AI	2660h	R	b15~b0	Percentage of AVI analog input signals
	2661h	R	b15~b0	Percentage of ACI analog input signals
	2662h	R	b15~b0	Percentage of AUI analog input signals
AO	26A0h	RW	b15~b0	Percentage of AFM1 analog output signals
	26A1h	RW	b15~b0	Percentage of AFM2 analog output signals

Correspondence for the address 2600:

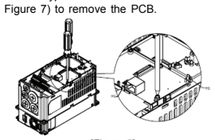
Number	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8	Bit 9	Bit 10	Bit 11	Bit 12	Bit 13	Bit 14	Bit15
I/O on the control panel	FWD	REV	MI1	MI2	MI3	MI4	MI5	MI6	MI7	MI8	-	-	-	-	-	-
EMC-D611A	-	-	-	-	-	-	-	-	-	-	MI10	MI11	MI12	MI13	MI14	MI15
EMC-D42A	-	-	-	-	-	-	-	-	-	-	MI10	MI11	MI12	MI13	-	-

Correspondence for the address 2640:

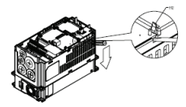
Number	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8	Bit 9	Bit 10	Bit 11	Bit 12	Bit 13	Bit 14	Bit15
I/O on the control panel	RY1	RY2	-	MO1	MO2	-	-	-	-	-	-	-	-	-	-	-
EMC-D42A	-	-	-	-	-	MO10	MO11	-	-	-	-	-	-	-	-	-
EMC-R6AA	-	-	-	-	-	RY10	RY11	RY12	RY13	RY14	RY15	-	-	-	-	-

■ Disconnecting CMC-DN01 from C2000

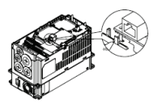
After C2000 is shut down, remove the two screws (as Figure 5) to twist open the card clip (as Figure 6). Insert the slot type screwdriver to the hollow and prize the PCB off the card clip. Twist open the other card clip (as Figure 7) to remove the PCB.



[Figure 5]



[Figure 6]



[Figure 7]

❹ LED Indicator & Troubleshooting

There are 3 LED indicators on CMC-DN01. POWER LED displays the status of power supply. MS LED and NS LED are dual-color LED, displaying the connection status of the communication and error messages.

■ POWER LED

LED status	Indication	How to correct
On	Power supply in abnormal status.	Check the power supply of CMC-DN01.
Off	Power supply in normal status	--

■ NS LED

LED status	Indication	How to correct
Off	No power supply or CMC-DN01 has not completed MAC ID test yet.	1. Check the power of CMC-DN01 and see if the connection is normal. 2. Make sure at least one or more nodes are on the bus. 3. Check if the serial transmission speed of CMC-DN01 is the same as that of other nodes.
Green light flashes	CMC-DN01 is on-line but has not established connection to the master.	1. Configure CMC-DN01 to the scan list of the master. 2. Re-download the configured data to the master.
Green light on	CMC-DN01 is on-line and is normally connected to the master	--
Red light flashes	CMC-DN01 is on-line, but I/O connection is timed-out.	1. Check if the network connection is normal. 2. Check if the master operates normally.
Red light on	1. The communication is down. 2. MAC ID test failure. 3. No network power supply. 4. CMC-DN01 is off-line.	1. Make sure all the MAC IDs on the network are not repeated. 2. Check if the network installation is normal. 3. Check if the baud rate of CMC-DN01 is consistent with that of other nodes. 4. Check if the node address of CMC-DN01 is illegal. 5. Check if the network power supply is normal.

■ MS LED

LED status	Indication	How to correct
Off	No power supply or being off-line	Check the power supply of CMC-DN01 and see of the connection is normal.
Green light flashes	Waiting for I/O data	Switch the master PLC to RUN status
Green light on	I/O data are normal	--
Red light flashes	Mapping error	1. Reconfigure CMC-DN01 2. Re-power AC motor drive
Red light on	Hardware error	1. See the error code displayed on AC motor drive. 2. Send back to the factory for repair if necessary.
Orange light flashes	CMC-DN01 is establishing connection with AC motor drive.	If the flashing lasts for a long time, check if CMC-DN01 and AC motor drive are correctly installed and normally connected to each other.

⚠ 注意事項 ..... 繁体中文

- ✓ 此安裝手冊只提供電氣規格、一般規格、安裝及配線等。
- ✓ 配線時請務必關閉電源，請勿在上電時觸摸任何端子。
- ✓ 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將之安裝於具防塵、防潮及免於電擊／衝擊意外之外殼配線箱內。另必須具備保護措施（如：特殊之工具或鑰匙才可打開），防止非維護人員操作或意外衝擊本體，造成危險及損壞。
- ✓ 輸入電源切斷後，一分鐘之內，請勿觸摸內部電路。
- ✓ 交流輸入電源不可連接於輸入／輸出信號端，否則可能造成嚴重損壞。請在上電前再次確認電源配線，且請勿在上電時觸摸任何端子。本體上的接地端子 ⏚ 務必正確的接地，以提高產品抗干擾能力。

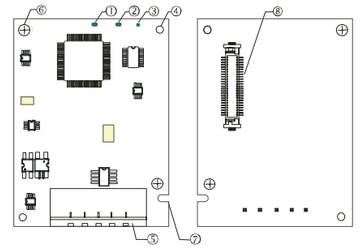
❶ 產品簡介

感謝您使用台達 CMC-DN01 網路通訊卡。CMC-DN01 定義爲 DeviceNet 網路通訊卡，用於將台達 C2000、CH2000、CP2000、CT2000 及 AFE2000 系列交流馬達驅動器接入 DeviceNet 網路。

■ 功能特色

1. 基於台達 HSSP 協定的高速通訊介面，可對交流馬達驅動器進行即時控制。
2. 支援 Group 2 only 連接方式，支援輪詢 I/O 資料交換。
3. I/O 映射最大支持 32 字輸入，32 字輸出。
4. 支援在 DeviceNet 配置工具軟體裡使用 EDS 檔進行配置
5. 支援 DeviceNet 匯流排的所有通訊速率：125kbps、250kbps、500kbps 及擴充串列傳輸速率模式。
6. 通訊站號和串列傳輸速率可直接在交流馬達驅動器上設定
7. 通訊卡可自動從交流馬達驅動器獲得工作電源

■ 產品外觀



[圖 1]

1. NS 指示燈	2. MS 指示燈	3. POWER 指示燈
4. 通訊卡定位孔	5. DeviceNet 連接埠	6. 螺絲固定孔
7. 通訊卡防呆溝槽	8. 交流馬達驅動器連接埠	

❷ 功能規格

■ DeviceNet 連接埠

接頭	5 針開放式可插拔連接頭，腳位間隔 5.08mm
傳輸方式	CAN
傳輸電纜	遮罩式雙絞線（帶兩條電源線）
傳輸速率	125kbps、250kbps、500kbps 及擴展串列傳輸速率模式
網路協議	DeviceNet 協議

■ 交流馬達驅動器連接埠

接頭	50 PIN 通訊端子
傳輸方式	SPI 通訊
端子功能	1. 通訊卡通過該介面與交流馬達驅動器通訊 2. 交流馬達驅動器通過該介面給通訊卡提供電源
通訊協議	台達 HSSP 協議

■ 電氣規格

電源電壓	5VDC（由交流馬達驅動器提供）
絕緣電壓	500VDC
通訊線電力消耗	0.85W
電力消耗	1W
重量	23g

■ 環境規格

雜訊免疫力	ESD (IEC 61800-5-1,IEC 6100-4-2) EFT (IEC 61800-5-1,IEC 6100-4-4) Surge Teat(IEC 61800-5-1,IEC 6100-4-5) Conducted Susceptibility Test(IEC 61800-5-1,IEC 6100-4-6)
操作／儲存環境	操作：-10°C ~ 50°C（溫度），90%（濕度） 儲存：-25°C ~ 70°C（溫度），95%（濕度）
耐震動／衝擊	國際標準規範 IEC61131-2, IEC68-2-6 (TEST Fc) / IEC61131-2 & IEC 68-2-27(TEST Ea)

❸ 安裝

註：以下內容僅以 C2000 示意。

■ DeviceNet 連接埠腳位定義

腳 位	訊 號	顏 色	敘 述
1	V+	紅色	DC24V
2	CAN_H	白色	正信號線
3	S	-	接地線
4	CAN_L	藍色	負信號線
5	V-	黑色	0V