

DVP02DA-S

Instruction Sheet 安裝說明 安裝说明

Analog Output Module
類比輸出模組
模拟输出模块



Warning

EN DVP02DA-S 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 DVP02DA-S, or to prevent an accident from damaging DVP02DA-S, the control cabinet in which DVP02DA-S is installed should be equipped with a safeguard. For example, the control cabinet in which DVP02DA-S 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 DVP02DA-S is powered up. After DVP02DA-S is disconnected, DO NOT touch any terminals in a minute. Make sure that the ground terminal is correctly grounded in order to prevent electromagnetic interference.

FR DVP02DA-S est un module OUVERT. Il doit être installé que dans une enceinte protectrice (boîtier, armoire, etc.) saine, dépourvue de poussière, d'humidité, de vibrations et hors d'atteinte 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 nécessaires pour ouvrir la protection).

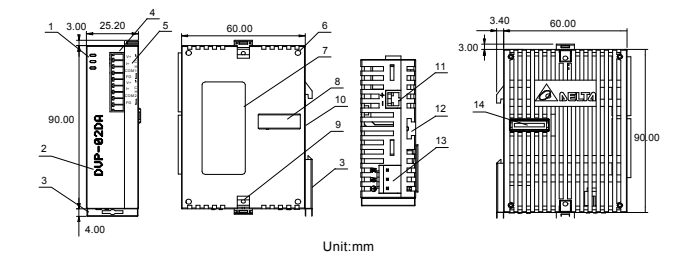
FR Ne pas appliquer la tension secteur sur les bornes d'entrées/Sorties, ou l'appareil DVP02DA-S pourra être endommagé. Avant de vérifier encore une fois le câblage avant la mise sous tension du DVP02DA-S. Lors de la déconnexion de l'appareil, ne pas toucher les connecteurs dans la minute suivante. Vérifier que la terre est bien reliée au connecteur de terre afin d'éviter toute interférence électromagnétique.

Introduction

Model Explanation & Peripherals

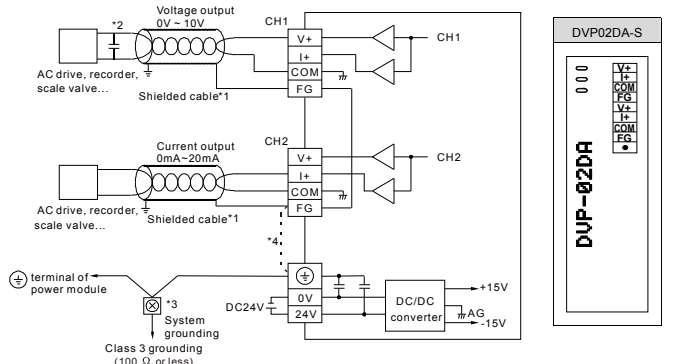
- Thank you for choosing Delta DVP PLC Series. The analog output module of DVP02DA-S series can read/write the data of analog output module by using instructions FROM/TO via DVP-PLC SS/SA/SX/SC/SV Series MPU program. The analog output module receives 2 group 12-bit digital data from PLC MPU and converts it into 2 points analog output signal (voltage or current). There are 49 CR (Control Register) in each module and there are 16 bits in each register.
- Users can select output either voltage or current via wiring. Voltage output range is 0V ~ +10VDC (resolution is 2.5mV). Current output range is 0mA ~ 20mA (resolution is 5µA).

Product Profile & Outline



1. Status indicator (POWER, RUN and ERROR)	8. Extension port
2. Model name	9. Extension unit clip
3. DIN rail clip	10. DIN rail (35mm)
4. I/O terminals	11. RS-485 communication port
5. I/O point indicator	12. Mounting rail for extension unit
6. Mounting hole of the extension unit	13. DC power input
7. Nameplate	14. Extension port

External Wiring



Note 1: Please isolate analog output and other power wiring.
 Note 2: If noise interferes from loaded input wiring terminal is significant, please connect a capacitor with 0.1 ~ 0.47µF 25V for noise filtering.
 Note 3: Please connect power module terminal and analog output module terminal to system earth point and make system earth point be grounded or connects to machine cover.
 Note 4: If there is much noise, please connect the terminal FG to the ground terminal.
 Warning: DO NOT wire to the No function terminal

Specifications

Functions

Digital/Analog (2D/A) module	Voltage output	Current output
Power supply voltage	24VDC (20.4VDC ~ 28.8VDC) (-15% ~ +20%)	
Analog input channel	2 channels/each module	
Analog output range	0 ~ 10V	0 ~ 20mA
Digital data range	0 ~ 4,000	0 ~ 4,000
Resolution	12 bits (1 _{LSB} =2.5mV)	12 bits (1 _{LSB} =5µA)
Output impedance	0.5Ω or lower	
Overall accuracy	±0.5% of full scale of 25°C (77°F). ±1% of full scale during 0 ~ 55°C (32 ~ 131°F).	
Response time	3ms × channels	
Max. output current	10mA (1KΩ ~ 2MΩ)	—
Tolerance carried impedance	—	0 ~ 500Ω
Digital data format	2's complementary of 16-bit, 13 significant bits.	
Isolation method	An analog circuit is isolated from a digital circuit by an optocoupler, but the analog channels are not isolated from each other.	
Protection	Voltage output has short circuit protection but a long period of short circuit may cause internal wire damage and current output break.	
Communication mode (RS-485)	Supported, including ASCII/RTU mode. Default communication format: 9600, 7, E, 1, ASCII; refer to CR#32 for details on the communication format. Note1: RS-485 cannot be used when connected to CPU series PLCs. Note2: The communication format can only be changed via RS-485 and cannot be changed via the instruction TO while connected to CPU series PLCs. Refer to Communication Format Setup in the appendix of the DVP programming manual for more details.	

Digital/Analog (2D/A) module	Voltage output	Current output
Connect to DVP-PLC MPU in series	If DVP02DA-S modules are connected to MPU, the modules are numbered from 0 ~ 7. 0 is the closest and 7 is the furthest to the MPU. 8 modules is the max and they DO NOT occupy any digital I/O points of the MPU.	

Other Specifications

Power supply	
Max. rated power consumption	24VDC (20.4VDC ~ 28.8VDC) (-15% ~ +20%), 3W, supply from external power.
Environment	
Operation/storage	1. Operation: 0°C~ 55°C (temperature), 5 ~ 95% (humidity), pollution degree 2 2. Storage: -25°C~ 70°C (temperature), 5 ~ 95% (humidity) Standard: IEC 61131-2, IEC 68-2-6 (TEST Fc)/IEC 61131-2 & IEC 68-2-27 (TEST Ea)
Vibration/shock immunity	

CR (Control Register)

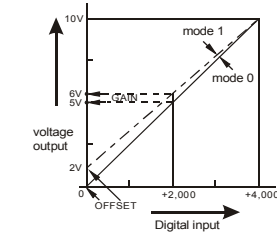
CR #	RS-485 parameters address	Latched	Register name	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0	
#0	H'4032	<input type="radio"/>	R	Model type	System used, data length is 8 bits (b7 ~ b0). DVP-04AD model code=H'49. User can read the data from program to check if there is extension module.
#1	H'4033	<input type="radio"/>	R/W	Output mode setting	Reserved CH2 CH1 Output mode setting: default setting is H'0000. Mode 0: output voltage mode (0V ~ 10V). Mode 1: output voltage mode (2V ~ 10V). Mode 2: output current mode (4mA ~ 20mA). Mode 3: output current mode (0mA ~ 20mA). Mode 4: none use.
#10	H'403C	<input checked="" type="radio"/>	R/W	CH1 output value	The output setting range of channel CH1 ~ CH2 is K0 ~ K4,000. Default setting is K0 and unit is LSB.
#11	H'403D	<input checked="" type="radio"/>	R/W	CH2 output value	
#22	H'4048	<input type="radio"/>	R/W	To adjust OFFSET value of CH1	It is used to set the OFFSET value of CH1 ~ CH2. The setting range is K-2,000 ~ K2,000. The default setting is K0 and unit is LSB.
#23	H'4049	<input type="radio"/>	R/W	To adjust OFFSET value of CH2	
#28	H'404E	<input type="radio"/>	R/W	To adjust GAIN value of CH1	It is used to set the GAIN value of CH ~ CH2. The setting range is K0 ~ K4,000. The default setting is K2,000 and unit is LSB.
#29	H'404F	<input type="radio"/>	R/W	To adjust GAIN value of CH2	
#30	H'4050	<input checked="" type="radio"/>	R	Error status	It is the data register to save all error status. Please refer to error code chart for detail.

CR #	RS-485 parameters address	Latched	Register name	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0																																																																																																			
CR#30 is the error code. Please refer to the following chart.																																																																																																							
<table border="1"> <thead> <tr> <th>Error description</th> <th>Content</th> <th>b15 ~ b8</th> <th>b7</th> <th>b6</th> <th>b5</th> <th>b4</th> <th>b3</th> <th>b2</th> <th>b1</th> <th>b0</th> </tr> </thead> <tbody> <tr> <td>Power source abnormal</td> <td>K1 (H'1)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Analog input value error</td> <td>K2 (H'2)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Setting mode error</td> <td>K4 (H'4)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>Offset/gain error</td> <td>K8 (H'8)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Hardware malfunction</td> <td>K16 (H'10)</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Digital range error</td> <td>K32 (H'20)</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Average times setting error</td> <td>K64 (H'40)</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Instruction error</td> <td>K128 (H'80)</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>					Error description	Content	b15 ~ b8	b7	b6	b5	b4	b3	b2	b1	b0	Power source abnormal	K1 (H'1)	0	0	0	0	0	0	0	0	1	Analog input value error	K2 (H'2)	0	0	0	0	0	0	0	1	0	Setting mode error	K4 (H'4)	0	0	0	0	0	0	1	0	0	Offset/gain error	K8 (H'8)	0	0	0	0	0	1	0	0	0	Hardware malfunction	K16 (H'10)	0	0	0	1	0	0	0	0	0	Digital range error	K32 (H'20)	0	0	1	0	0	0	0	0	0	Average times setting error	K64 (H'40)	0	1	0	0	0	0	0	0	0	Instruction error	K128 (H'80)	1	0	0	0	0	0	0	0	0
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Power source abnormal	K1 (H'1)	0	0	0	0	0	0	0	0	1																																																																																													
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Note: Each error code will have corresponding bit (b0 ~ b7). Two or more errors may happen at the same time. 0 means normal and 1 means error happened. EX: If the digital input exceeds 4,000, error (K2) will occur. If the analog output exceeds 10V, both analog input value error K2 and K32 will occur.																																																																																																							
#31	H'4051	<input type="radio"/>	R/W	Communication address setting	It is used to set RS-485 communication address. The setting range is from 1 to 254 and the default setting is K1. It is used to set communication baud rate (4,800/9,600/19,200/38,400/57,600/115,200 bps). Communication format: ASCII mode is 7 bits, even bit, 1 stop bit (7, E, 1), while RTU mode is 8 bits, even bit, 1 stop bit (8, E, 1). b0: 4,800 bps (bit/sec). b1: 9,600 bps (bit/sec) (default setting). b2: 19,200 bps (bit/sec). b3: 38,400 bps (bit/sec). b4: 57,600 bps (bit/sec). b5: 115,200 bps (bit/sec). b6-b13: reserved. b14: exchange low and high byte of CRC check code (only for RTU mode). b15: ASCII/RTU mode selection.																																																																																																		
#32	H'4052	<input type="radio"/>	R/W	Communication baud rate setting	Reserved CH2 CH1 Output latched setting, default setting H'0000. Give CH1 setting for example: 1. When b0=0, user can set OFFSET and GAIN value of CH1 (CR#22, CR#28). When b1=1, inhibit user to adjust OFFSET and GAIN value of CH1 (CR#22, CR#28). 2. b1 means if characteristic register is latched. b1=0 (default setting, latched), b1=1 (not latched). 3. When b2 is set to 1, all settings will be reset to default setting.																																																																																																		
#33	H'4053	<input type="radio"/>	R/W	Reset to default setting and set characteristics adjustable priority	CR#33 is used to set the internal function priority. For example: characteristic register. Output latched function will save output setting to the internal memory before power loss.																																																																																																		
#34	H'4054	<input type="radio"/>	R	Software version.	In hexadecimal to display software version. For example: H'010A means 1.0A.																																																																																																		
#35 ~ #48	System used																																																																																																						
Symbols: <input type="radio"/> means latched. <input checked="" type="radio"/> means not latched. R means can read data by using FROM instruction via RS-485. W means can write data by using TO instruction via RS-485. LSB (Least Significant Bit): 1. Voltage output: 1 _{LSB} =10V/8,000=2.5mV. 2. Current output: 1 _{LSB} =20mA/4,000=5µA.																																																																																																							

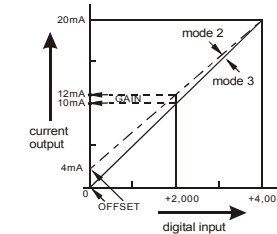
※ The corresponding parameters address H'4032 ~ H'4054 of CR#0 ~ CR#34 are provided for user to read/write data via RS-485.
 A. Communication baud rate: 4,800/9,600/19,200/38,400/57,600/115,200 bps.
 B. Communication format: ASCII mode is 7 bits, even bit, 1 stop bit (7, E, 1). Communication format of RTU mode is 8 bits, even bit, 1 stop bit (8, E, 1).
 C. Function code: 03'H - read data from register. 06'H - write one word into register. 10'H - write multiple words into register.

Adjust D/A Conversion Curve

Voltage output mode:



Current output mode:



The charts above are D/A conversion characteristic curve of voltage input mode and current input mode. Users can adjust conversion characteristic curve by changing OFFSET values (CR#22 ~ CR#23) and GAIN values (CR#28 ~ CR#29) depend on application.

注意事項

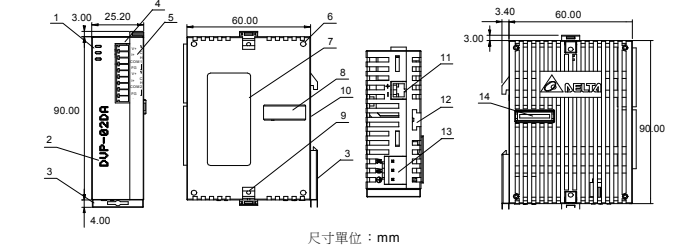
- 請在使用之前，詳細閱讀本使用說明書。
- 請勿在上電時觸摸任何端子。實施配線，務必關閉電源。
- 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將之安裝於具防塵、防潮及免於電擊/衝擊意外之外殼配線箱內，另必須具備保護措施 (如：特殊之工具或鑰匙才可打開) 防止非維護人員操作或意外衝擊本體，造成危險及損壞。
- 交流輸入電源不可連接於輸入/輸出端，否則可能造成嚴重的損壞，因此請在上電之前再次確認電源配線。
- 輸入電源切斷後，一分鐘之內，請勿觸摸內部電路。
- 本體上之接地端子 務必正確的接地，可提高產品抗雜訊能力。

產品簡介

說明及週邊裝置

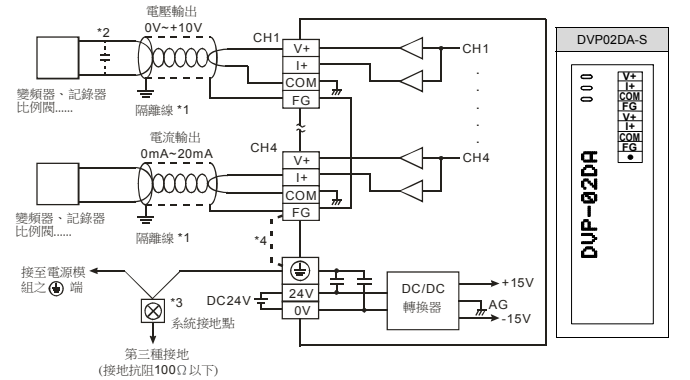
- 謝謝您採用台達 DVP 系列產品。DVP02DA-S 類比信號輸出模組可透過 DVP-PLC SS/SA/SX/SC/SV 主機程式以指令 FROM/TO 來讀寫 DVP02DA-S 類比信號輸出模組之資料。而類比信號輸出模組接受來自 PLC 主機的 2 組 12 位元數位資料，再將數位資料轉換為 2 點類比信號輸出 (電壓或電流皆可)。模組內具有 49 個 CR (Control Register) 暫存器，每個暫存器有 16 bits。
- 使用者可經由配線選擇電壓輸出或電流輸出，電壓輸出範圍 0V ~ +10VDC (解析度為 2.5mV)，電流輸出範圍 0mA ~ 20mA (解析度為 5µA)。

產品外觀及各部介紹



1. 電源、錯誤及運行指示燈
2. 機種型號
3. DIN 軌固定扣
4. 端子
5. 端子配置
6. 擴充機/擴充模組定位孔
7. 鉗牌
8. 擴充機/擴充模組連接口
9. 擴充機/擴充模組固定扣
10. DIN 軌槽 (35mm)
11. RS-485 通訊口
12. 擴充機/擴充模組固定槽
13. 電源輸入口
14. 擴充機/擴充模組連接口

外部配線



- 註 1: 類比輸出請與其他電源線隔離。
 註 2: 如果負載之輸入端濾波太大造成配線受雜訊干擾時，請連接 0.1 ~ 0.47µF 25V 之電容。
 註 3: 請將電源模組之 端及 DVP02DA-S 類比信號輸出模組之 端連接至系統接地點，再將系統接地點第三種接地或接到配電箱之機殼上。
 註 4: 如果雜訊過大，請將 FG 及接地端子連接。
 注意: 空端子 請勿配線。

規格

功能規格

數位/類比 (2D/A) 模組	電壓輸出 (Voltage output)	電流輸出 (Current output)
電源電壓	24VDC (20.4VDC ~ 28.8VDC) (-15% ~ +20%)	
類比訊號輸出通道	2 通道/台	
類比輸出範圍	0 ~ 10V	0 ~ 20mA
數位資料範圍	0 ~ 4,000	0 ~ 4,000
解析度	12 bits (1 _{LSB} =2.5mV)	12 bits (1 _{LSB} =5µA)
輸出阻抗	0.5Ω 或更低	
總和精密度	±0.5% 在 (25°C, 77°F) 範圍內滿刻度時。 ±1% 在 (0 ~ 55°C, 32 ~ 131°F) 範圍內滿刻度時。	
響應時間	3ms × 通道數	
最大輸出電流	10mA (1KΩ ~ 2MΩ)	—
容許負載阻抗	—	0 ~ 500Ω
數位資料格式	16 位元二補數，有效位 11 bits	
隔離方式	類比與數位端使用光耦合器隔離，類比通道間未隔離。	

