

# DVP04DA-S DVP04DA-S2



## Installation Sheet 安裝說明 安 裝 說 明

Analog Output Module  
類比輸出模組  
模拟输出模块



### Warning

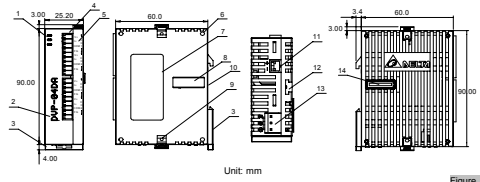
**EN** # DVP04DA-S/DVP04DA-S2 is an OPEN-TYPE device. It should be installed in a control cabinet free of airborne dust, humidity, electric shock and vibration. To prevent non-maintenance staff from opening DVP04DA-S/DVP04DA-S2, or to prevent an accident from damaging DVP04DA-S/DVP04DA-S2, the control cabinet in which DVP04DA-S/DVP04DA-S2 is installed should be equipped with a safeguard. For example, the control cabinet in which DVP04DA-S/DVP04DA-S2 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 DVP04DA-S/DVP04DA-S2 is powered up. After DVP04DA-S/DVP04DA-S2 is disconnected, DO NOT touch any terminals in a minute. Make sure that the ground terminal Ⓢ on DVP04DA-S/DVP04DA-S2 is correctly grounded in order to prevent electromagnetic interference.  
**FR** # DVP04DA-S/DVP04DA-S2 est un module OUVERT. Il doit être installé que dans une enceinte protectrice (boîtier, armoire, etc.) sans, 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 DVP04DA-S/DVP04DA-S2 pourra être endommagé. Merci de vérifier encore une fois le câblage avant la mise sous tension du DVP04DA-S/DVP04DA-S2. 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.

### Introduction

#### Model Explanation & Peripherals

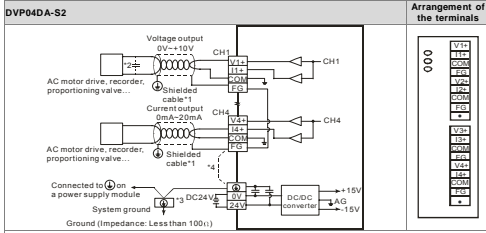
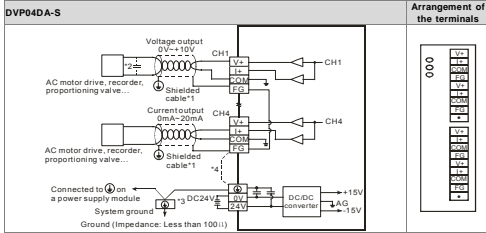
- Thank you for choosing the Delta DVP series PLC. A DVP-SS/AS/SC/SV series PLC can read data from DVP04DA-S/DVP04DA-S2 or write data to DVP04DA-S/DVP04DA-S2 by means of the instruction FROM/TO. The analog output module receives four pieces of 12-bit digital data from a PLC, and converts the digital data into 4-point analog signal output (voltage or current). There are 49 CRs (control registers) in the module, and each register has 16 bits.
- Users can select output from 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



- POWER, RUN and ERROR indicators
- Extension port
- Model name
- Extension unit clip
- DIN rail clip
- DIN rail groove (35mm)
- I/O terminals
- RS-485 communication port
- I/O point indicators
- Mounting groove of the extension unit
- Mounting hole of the extension unit
- DC power input
- Extension port

### External Wiring



**Note 1:** Please isolate the analog output cable from other power cables.  
**Note 2:** If noise interferes with the wiring, and makes the ripple voltage of the input terminal of the load connected high, please connect a 0.1-0.47µF and 25 V capacitor.  
**Note 3:** Please connect Ⓢ on a power supply module and Ⓢ on the analog output module to the system ground, and then ground the system ground or connect the system ground to a distribution box.  
**Note 4:** If there is much noise, please connect the terminal FG to the ground terminal.  
**Warning:** DO NOT wire to the terminal Ⓢ.

### Specifications

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 (1LSB=2.5mV)	12 bits (1LSB=5µA)
Output impedance	0.5Ω or lower	≥0.5% of full scale at 25°C (77°F)
Overall accuracy	±1% of full scale during 0 ~ 55°C (32 ~ 131°F)	

Digital/Analog (2D/A) module	Voltage output	Current output
Response time	3ms × Number of channels	
Max. output current	10mA (1KΩ ~ 2MΩ)	-
Tolerance carried impedance	-	0 ~ 500Ω
Digital data format	16-bit 2's complement	
Isolation method	The analog circuit is isolated from the digital circuit by an optocoupler, but the analog channels are not isolated from one another.	
Protection	Voltage output has short circuit protection but a long period short circuit may cause internal wire damage and current output break. Yes, communication formats are (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). Communication format of RTU mode is 8 bits, even bit, 1 stop bit (8, E, 1). RS-485 is disabled when DVP04DA-S/DVP04DA-S2 is connected in series to a PLC.	
Communication mode (RS-485)	If DVP04DA-S/DVP04DA-S2 modules are connected to a PLC, the modules are numbered from 0 ~ 7. 0 is the closest and 7 is the furthest to the PLC. 8 modules is the max and they DO NOT occupy any digital I/O points of the PLC.	

### Others

Max. rated power consumption	Power supply
24VDC (20.4VDC ~ 28.8VDC) (-15% ~ +20%), 4W, supply from external power.	Environment
Operation/storage	Operation: 0°C ~ 55°C (temperature); 5 ~ 95% (humidity); pollution degree 2. Storage: -25°C ~ 70°C (temperature); 5 ~ 95% (humidity).
Vibration/shock immunity	International standards: IEC 61131-2, IEC 68-2-6 (TEST Fc)/IEC 61131-2 & IEC 68-2-27 (TEST Ea)

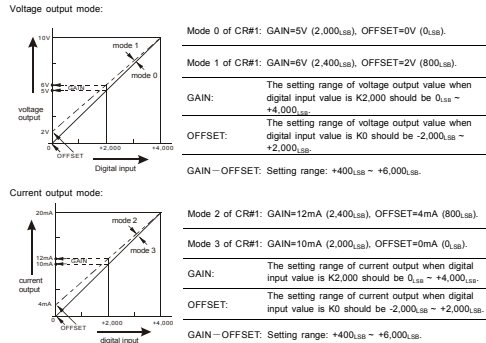
### CR (Control Register)

CR# (parameters address)	Latched	Register name	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0
#0	H 4032	Model type	For system use. Data length: 8 bits (b7 ~ b0) Model code of DVP04DA-S: H89 Model code of DVP04DA-S2: H91 Users can read the model type by means of a program to check if the extension module exists. Reserved CH4   CH3   CH2   CH1 Output mode setting. The factory setting is H0000. Mode 0: Voltage output mode (0V ~ 10V) Mode 1: Voltage output mode (2V ~ 10V) Mode 2: Current output mode (0mA ~ 20mA) Mode 3: Current output mode (0mA ~ 20mA)
#1	H 4033	Output mode setting	CR#1 is used to set two internal channels working mode of analog output module. Every channel has four modes that can be set individually. For example: if setting CH1 to mode 2 (b2 = b0 = 010), CH2 to mode 1 (b5 = b3 = 001). It needs to set CR#1 to H000A.
#7	H 4038	CH1 output value	The output setting range of channel CH1 ~ CH4 is K0 ~ K4,000. Default setting is K0 and unit is LSB.
#8	H 4039	CH2 output value	
#9	H 403B	CH3 output value	
#10	H 403B	CH4 output value	
#18	H 4044	To adjust OFFSET value of CH1	It is used to set the OFFSET value of CH1 ~ CH4. The setting range is K-2,000 ~ K2,000.
#19	H 4045	To adjust OFFSET value of CH2	
#20	H 4046	To adjust OFFSET value of CH3	
#21	H 4047	To adjust OFFSET value of CH4	
#24	H 404A	To adjust GAIN value of CH1	It is used to set the GAIN value of CH ~ CH4. The setting range is K0 ~ K4,000.
#25	H 404B	To adjust GAIN value of CH2	
#26	H 404C	To adjust GAIN value of CH3	
#27	H 404D	To adjust GAIN value of CH4	

RS-485 parameters address	Latched	Register name	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0							
CR#18 ~ CR#27		Please be noticed that GAIN VALUE - OFFSET VALUE + 400 <sub>LSB</sub> ~ +6,000 <sub>LSB</sub> (voltage or current) if the value difference comes up small (within range), the output signal resolution is then aim and the resolution is definitely larger. On the contrast, if the value difference exceeds the range, the output signal resolution becomes larger and the variation is definitely smaller.								
#30	H 4050	Error status	Data register to save all error status. Please refer to error code chart for detail.							
CR#30		Please refer to the following chart.								
Error description	Content	b15 ~ b8	b7	b6	b5	b4	b3	b2	b1	b0
Power source abnormal	K1 (H1)		0	0	0	0	0	0	0	1
Analog input value error	K2 (H2)		0	0	0	0	0	0	0	1
Setting mode error	K4 (H4)		0	0	0	0	0	0	1	0
Offset/gain error	K8 (H8)		0	0	0	0	0	1	0	0
Hardware malfunction	K16 (H10)	Reserved	0	0	0	1	0	0	0	0
Digital range error	K32 (H20)		0	0	1	0	0	0	0	0
Average times setting error	K64 (H40)		0	1	0	0	0	0	0	0
Instruction error	K128 (H80)		1	0	0	0	0	0	0	0
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 having error.										
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	Output latched setting	Used to set RS-485 communication address. The setting range is from 011 to 254 and the default setting is K1. 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). Communication format of 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 (RTU mode only). b15: ASCII/RTU mode selection.							
#32	H 4052	Communication baud rate setting	Reserved CH4   CH3   CH2   CH1 Output latched setting, default setting H0000. Give CH1 setting for example: When b0=b1 user can set OFFSET and GAIN value of CH1 (CR#18, CR#24). When b0=1, inhibit user to adjust OFFSET and GAIN value of CH1 (CR#18, CR#24). b2: b1 is used to check if characteristic register is latched. b1=0 latched (default setting), b1=1 not latched. 3. When b2 is set to 1, all settings are reset to default setting.							
#33	H 4053	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	Software version	Show software version in hexadecimal. For example: H010A means 1.0A.							
#35 ~ #48		System used								
Symbol:		means latched.								
		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 <sub>LSB</sub> =10V/6,000=2.5mV								
		2. Current output: 1 <sub>LSB</sub> =20mA/4,000=5µA								

- The corresponding parameters address H4032 ~ H4054 of CR#0 ~ CR#34 are provided for user to read/write data via RS-485.
- 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). Communication format of RTU mode is 8 bits, even bit, 1 stop bit (8, E, 1).
- Function code: 03H - read data from register. 06H - write one word to register. 10H - write multiple words to register.

### Adjusting D/A Conversion Characteristic Curves



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#18 ~ CR#21) and GAIN values (CR#24 ~ CR#27) dependent on application.

### 注意事項

- 請在使用之前，仔細閱讀本使用說明書。
- 請勿在上電前觸摸任何端子，實際配線，務必斷電操作。
- 本機為開放型 (OPEN TYPE) 機殼，因此使用其使用本機時，必須須之安裝於防塵、防濕及免於電擊/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者觸摸本機，造成危險及損壞。
- 交流輸入電源不可連接於輸入信號端，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。
- 本機上之接地端子 Ⓢ 務必正確的连接，可提高產品抗雜訊能力。

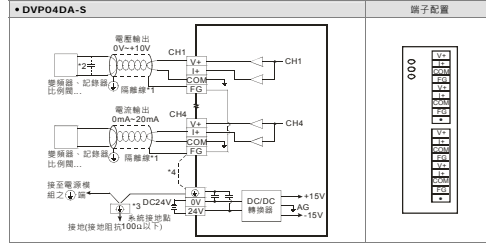
### 產品簡介

- 說明及週邊裝置
- 謝亞忠採用台達 DVP 系列產品，DVP04DA-S/DVP04DA-S2 類比信號輸出模組可透過 DVP-PLC SS/AS/XC/SC/SV 主機程式以指令 FROM/TO 來讀寫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 4 組 12 位元數位資料，再將數位資料轉換為 4 點類比信號輸出 (電壓或電流皆可)，模組內共有 49 個 CR (Control Register) 寄存器，每個寄存器有 16 位元。
- 使用者可經由軟體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)。

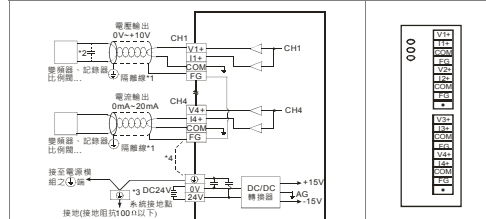
### 產品外觀及各部介紹

- 請參閱英文版之 Figure 1 (尺寸單位: mm)。
- 電源、錯誤及運行指示燈
  - 擴充槽擴充模組組定座
  - DIN 軌固定架
  - 端子
  - 端子配置
  - 擴充槽擴充模組定座孔
  - 插頭
  - 擴充槽擴充模組組定座
  - 擴充槽擴充模組組定座
  - DIN 軌槽 (35mm)
  - RS-485 通訊口
  - 擴充槽擴充模組組定座槽
  - 電源輸入口
  - 擴充槽擴充模組組定座

### 外部配線



### DVP04DA-S2



- 類比輸出請與其他電源線隔離。
- 如果配線受雜訊干擾，造成負載之輸入誤差变大，請接裝 0.1 ~ 0.47µF 25V 之電容。
- 請將電源端組之 Ⓢ 端及類比信號輸出端組之 Ⓢ 端接接到系統接地點，再將系統接地點作接接到配電槽之機殼上。
- 如接線誤大，請務必 Ⓢ 及接地端子連接。
- 空端子 Ⓢ 請勿配線。

### 規格

數位類比 (4D/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%)	
類比信號輸入通道	4 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 <sub>LSB</sub> =2.5mV)	12 bits (1 <sub>LSB</sub> =5µA)
輸出阻抗	0.5Ω 或更低	
線性和精密度	±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。	
回應時間	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 位二進數	
隔離方式	類比與數位信號使用光電耦合隔離，類比信號間未隔離。	
保護	電壓輸出有短路保護但須注意長時間短路仍可造成內部線路損壞，電流輸出可開路。	
通訊模式 (RS-485)	有，包含 ASCII/RTU 模式，通訊速率可選 (4,800/9,600/19,200/38,400/57,600/115,200)。ASCII 模式資料格式設定為 8 位元，偶位，1 stop bit (7, E, 1)。	
RTU 模式資料格式設定為 8 位元，偶位，1 stop bit (8, E, 1)。當與 PLC 主機串接時，RS-485 通訊無法使用。		
模組編碼以靠近主機之順序自動編碼由 0 到 7。最大可連接 8 台且不用數字 I/O 點		

與 DVP-PLC 主機串接說明

