

# DVP06XA-H2 INSTRUCTION SHEET

## 安裝說明 安装说明

### ▲ Mixed Analog I/O Module

### ▲ 類比/I/O混合模組

### ▲ 模擬/I/O混合模块



## Warning

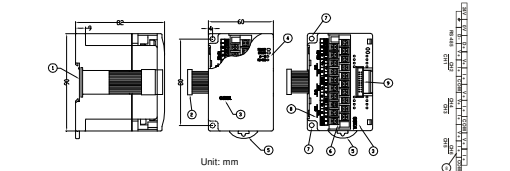
- Please read this instruction sheet carefully before use.
- DO NOT touch any terminal when the power is switched on. Switch off the power before wiring.
- DVP06XA-H2 is an OPEN-TYPE device and therefore should be installed in an enclosure free of airborne dust, humidity, electric shock and vibration. The enclosure should prevent non-maintenance staff from operating the device (e.g. key or specific tools are required to open the enclosure) in case danger and damage on the device may occur.
- DO NOT connect input AC power supply to any of the I/O terminals; otherwise serious damage may occur. Check all the wiring again before switching on the power.
- DO NOT touch the internal circuit for 1 minute after the power is switched off.
- Make sure the ground terminal is correctly grounded in order to prevent electromagnetic interference.

## Introduction

### Model Explanation & Peripherals

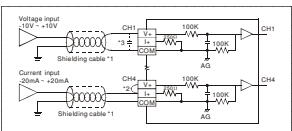
- Thank you for choosing Delta DVP series PLC. DVP06XA-H2 is able to receive 4 points of analog input signals (voltage or current) and convert them into 12-bit digital signals. DVP06XA-H2 receives 2 groups of 12-bit digital data from PLC MPU and converts them into 2 points of analog signal for output (in voltage/current).
- You can select voltage or current input by wiring. Range of voltage input:  $\pm 10V$  DC (resolution: 5mV). Range of current input:  $\pm 20mA$  (resolution: 20 $\mu A$ ).
- You can also select voltage or current output by wiring. Range of voltage output:  $0V \sim +10V$  DC (resolution: 2.5mV). Range of current output:  $0mA \sim 20mA$  (resolution: 5 $\mu A$ ).

### Product Profile (Indicators, Terminal Block, I/O Terminals)

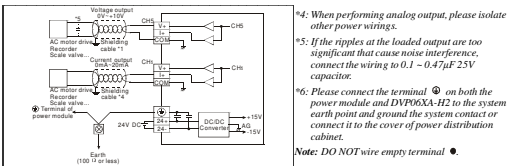


- ① DIN rail (35mm)
- ② Connection port for extension unit/module
- ③ Model name
- ④ POWER\_ERROR\_AWD indicator
- ⑤ DIN rail clip
- ⑥ Terminals
- ⑦ Mounting hole
- ⑧ I/O terminals
- ⑨ Connection port for extension unit/module

### External Wiring



- When performing analog input, please isolate other power wirings.
- Short-circuit V+ and I+ terminal when connecting current signals.
- If the ripples at the loaded output are too significant that cause noise interference, connect the wiring to 0.1 ~ 0.47 $\mu F$  25V capacitor.



- When performing analog output, please isolate other power wirings.
  - If the ripples at the loaded output are too significant that cause noise interference, connect the wiring to 0.1 ~ 0.47 $\mu F$  25V capacitor.
  - Please connect the terminal on both the power module and DVP06XA-H2 to the system earth point and ground the system connect or connect it to the cover of power distribution cabinet.
- Note: DO NOT wire empty terminal.

## Specifications

Analog/Digital (AD)	Voltage input	Current input
Power supply voltage	24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%)	
Analog input channel	4 channels/module	
Range of analog input	$\pm 10V$	$\pm 20mA$
Range of digital conversion	$\pm 2000$	$\pm 1000$
Resolution	12 bits ( $1_{LSB} = 5mV$ )	11 bits ( $1_{LSB} = 20\mu A$ )
Input impedance	200K $\Omega$ or higher	250 $\Omega$
Overall accuracy	$\pm 1\%$ when in full scale within the range of $0 \sim 55^\circ C$ , $32 \sim 131^\circ F$	
Response time	3ms $\times$ the number of channels	
Isolation	Between analog and digital channels	
Range of absolute input	$\pm 15V$	$\pm 32mA$
Digital data format	11 significant bits out of 16 bits are available; in 2's complement	
Average function	Yes; available for setting up in CR#2 ~ CR#5; Range: K1 ~ K20	
Self-diagnosis	Upper and lower bound detection/channel	
Digital/Analog (DA)	Voltage output	Current output
Analog output channel	2 channels/module	
Range of analog output	$0 \sim 10V$	$0 \sim 20mA$
Range of digital data	$0 \sim 4,000$	$0 \sim 4,000$
Resolution	12 bits ( $1_{LSB} = 2.5mV$ )	12 bits ( $1_{LSB} = 5\mu A$ )
Overall accuracy	$\pm 0.5\%$ when in full scale within the range of $0 \sim 55^\circ C$ , $32 \sim 131^\circ F$	
Output impedance	0.5 $\Omega$ or lower	
Response time	3ms $\times$ the number of channels	
Max. output current	20mA (1K $\Omega$ ~ 2M $\Omega$ )	-
Tolerable load impedance	-	$0 \sim 500\Omega$
Digital data format	11 significant bits out of 16 bits are available; in 2's complement	
Isolation	Internal circuit and analog output terminals are isolated by optical coupler. No isolation among analog channels.	
Protection	No isolation among analog channels. No isolation among analog channels. No isolation among analog channels. No isolation among analog channels.	
Communication mode (RS-485)	ASCII/RTU mode. Communication speed: 4,800 ~ 115,200 bps. ASCII data format: 7-bit, even bit, 1 stop bit (7. E, 1). RTU data format: 8-bit, even bit, 1 stop bit (8. E, 1).	
When connected to DVP-PLC MPU in series	The modules are numbered from 0 to 7 automatically by their distance from MPU. No. 0 is the closest to MPU and No. 7 is the furthest. Maximum 8 modules are allowed to connect to MPU and will not occupy any digital I/O points.	

## Other Specifications

Power supply	
Max. rated power consumption	24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%), 3.5W supplied by external power
Environment	
Operation/storage	Operation: $0^\circ C \sim 55^\circ C$ (temperature); 50 ~ 95% (humidity); pollution degree 2 Storage: $-25^\circ C \sim 70^\circ C$ (temperature); 5 ~ 95% (humidity)
Vibration/shock immunity	International standards: IEC 61131-2, IEC 68-2-6 (TEST Fc) IEC 61131-2 & IEC 68-2-7 (TEST Ea)

## Control Register

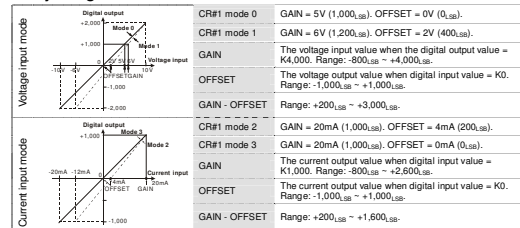
CR #	RS-485 parameter address	Latched	Register content	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0
#0	H40C8	R	Model name	Set up by the system. DVP06XA-H2 model code = H604. You can read the model name from the program and see if the extension module exists.
#1	H40C9	R/W	I/O mode setting	CH5 CH4 CH3 CH2 CH1 Input mode (CH1 ~ CH4): Mode 0: Voltage input (-10V ~ +10V); Default = H0000. Mode 1: Voltage input (-6V ~ +10V); Mode 2: Current input (-12mA ~ +20mA); Mode 3: Current input (-20mA ~ +20mA) Output mode (CH5 ~ CH4): Mode 0: Voltage output (0V ~ 10V); Mode 1: Voltage output (2V ~ 10V); Mode 2: Current output (4mA ~ 20mA); Mode 3: Current output (0mA ~ 20mA).
#2	H40CA	R/W	CH1 average time	Range of settings in CH1 ~ CH4; K1 ~ K20.
#3	H40CB	R/W	CH2 average time	Default = K10.
#4	H40CC	R/W	CH3 average time	Please note that the average time settings at CR#2 ~ CR#5 only need to be written in once.
#5	H40CD	R/W	CH4 average time	Average of input signals at CH1 ~ CH4.
#6	H40CE	R	CH1 input average	For example, if the settings of CR#2 ~ CR#5 are 10, the content in CR#6 ~ CR#9 will be the average of the most recent 10 signals at CH1 ~ CH4.
#7	H40CF	R	CH2 input average	Output value at CH5 ~ CH6. Range: K0 ~ K4,000.
#8	H40D0	R	CH3 input average	Default = K0; Unit: LSB.
#9	H40D1	R	CH4 input average	Present value of input signals at CH1 ~ CH4.
#10	H40D2	R/W	CH5 output value	OFFSET settings at CH5 ~ CH6. Range: K-2,000 ~ K2,000.
#11	H40D3	R/W	CH6 output value	Default = K0; Unit: LSB.
#12	H40D4	R	CH1 input present value	GAIN settings at CH1 ~ CH4. Default = K1,000; Unit: LSB.
#13	H40D5	R	CH2 input present value	When voltage input, range: K-800 ~ K1,000.
#14	H40D6	R	CH3 input present value	When current input, range: K-800 ~ K2,600.
#15	H40D7	R	CH4 input present value	
#16	H40DA	R/W	Adjusted OFFSET value of CH1	OFFSET settings at CH1 ~ CH4. Default = K0; Unit: LSB.
#17	H40DB	R/W	Adjusted OFFSET value of CH2	When voltage input, range: K-1,000 ~ K1,000.
#18	H40DC	R/W	Adjusted OFFSET value of CH3	When current input, range: K-1,000 ~ K1,000.
#19	H40DD	R/W	Adjusted OFFSET value of CH4	
#20	H40DE	R/W	Adjusted OFFSET value of CH5	OFFSET settings at CH5 ~ CH6. Range: K-2,000 ~ K2,000.
#21	H40DF	R/W	Adjusted OFFSET value of CH6	Default = K0; Unit: LSB.
#22	H40E0	R/W	Adjusted GAIN value of CH1	GAIN settings at CH1 ~ CH4. Default = K1,000; Unit: LSB.
#23	H40E1	R/W	Adjusted GAIN value of CH2	When voltage input, range: K-800 ~ K1,000.
#24	H40E2	R/W	Adjusted GAIN value of CH3	When current input, range: K-800 ~ K2,600.
#25	H40E3	R/W	Adjusted GAIN value of CH4	

CR #	RS-485 parameter address	Latched	Register content	b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0
#26	H40E4	R/W	Adjusted GAIN value of CH5	GAIN settings at CH5 ~ CH6. Range: K0 ~ K4,000.
#27	H40E5	R/W	Adjusted GAIN value of CH6	Default = K2,000; Unit: LSB.
#28	H40E6	R/W	Adjusted GAIN value of CH5	Default = K2,000; Unit: LSB.
#29	H40E7	R/W	Adjusted GAIN value of CH6	Default = K2,000; Unit: LSB.
#30	H40E8	R	Error status	See the table of error status for more information.
#31	H40E9	R/W	Communication address setting	For setting RS-485 communication address. Range: 01 ~ 254. Default = K1.
#32	H40EA	R/W	Communication speed (baud rate) setting	For setting up communication speed: 4,800 ~ 115,200 bps; b0: 4,800 bps; b1: 9,600 bps; b2: 11,520 bps; b3: 38,400 bps; b4: 57,600 bps; b5: 115,200 bps; b6 ~ b13: Reserved; b14: high/low bit exchange of CRC checksum (only valid in RTU mode); b15 = 0: ASCII mode; b15 = 1: RTU mode. ASCII data format: 7-bit, even bit, 1 stop bit (7. E, 1). RTU data format: 8-bit, even bit, 1 stop bit (8. E, 1). Default = H0002.
#33	H40EA	R/W	OFFSET/GAIN tuning authorization	2. b1 represents whether the OFFSET/GAIN tuning registers are latched; b1 = 0 (default, latched); b1 = 1 (non-latched). 3. When b2 = 1, all settings will return to default values. Take the setting of CH5 for the settings of CH5 ~ CH6: When b3 and b2 = 0: adjustable, latched; 01: adjustable, non-latched; 10: not adjustable; 11: returning to default setting and reset b3 and b2 as 0.
#34	H40EA	R	Firmware version	Displaying the current firmware version in hex; e.g. version 1.0A is indicated as H101A.
#35	#48		For system use	

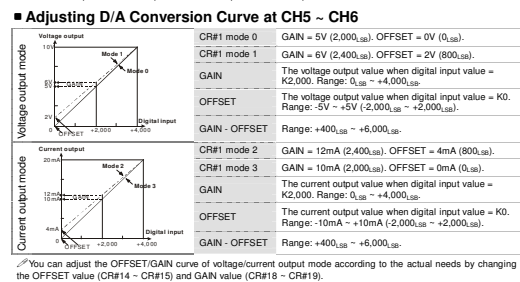
- CR#30: Error status value (see the table below)
- CR#31: Error status value (see the table below)
- CR#32: Error status value (see the table below)
- CR#33: For authorizations on some internal functions, e.g. OFFSET/GAIN tuning. The latched function will store the output setting in the internal memory before the power is cut off.
- CR#34: H40EA
- CR#35: #48

## Temperature/Digital Characteristic Curve

### Adjusting A/D Conversion Curve at CH1 ~ CH4



### Adjusting D/A Conversion Curve at CH5 ~ CH6



## 注意事項

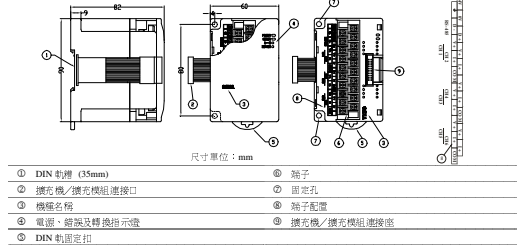
- 請在使用之前，詳細閱讀本使用說明書。
- 請勿在電路開關任何端子，實施配線，務必關閉電源。
- 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將之安裝於具防塵、防濕及避免於電擊/衝擊之外殼保護箱內。另必須具備保險措施 (如：將操作工具或鑰匙才可打開) 防止非專業人員操作或意外傷害身體。造成危險及損壞。
- 輸入電源不可直接接於輸入，其輸出端，否則可能造成嚴重之損壞。因此請在上機之前先確認電源配線。
- 輸入電源切斷後，一分鐘之內，請勿觸摸內部電路。
- 本機上之接地端子，務必正確的接地，可提高產品抗雜訊能力。

## 產品簡介

### 說明及週邊裝置

- 選選您採用台達 DVP 系列產品，DVP06XA-H2 類比輸入/輸出混合模組包含可接受外部 4 點類比信號輸入 (電壓或電流信號)，將之轉換成 12 位元之數位信號，類比信號輸出則接受來自 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 (電壓或電流信號)。
- 類比信號輸入部份使用者可藉由軟體選擇電壓輸入或電流輸入，電壓輸入範圍  $\pm 10V$  DC (解析度為 5mV)，電流輸入範圍  $\pm 20mA$  (解析度為 20 $\mu A$ )。
- 類比信號輸出部份使用者可藉由軟體選擇電壓輸出或電流輸出，電壓輸出範圍  $0V \sim +10V$  DC (解析度為 2.5mV)，電流輸出範圍  $0mA \sim 20mA$  (解析度為 5 $\mu A$ )。

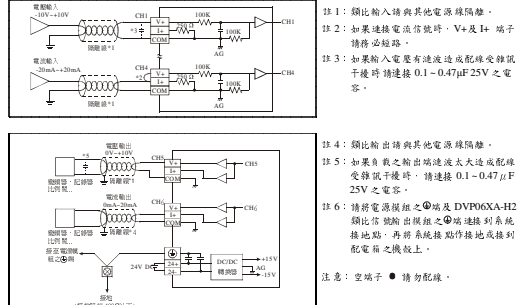
### 產品外觀及各部介紹



尺寸單位: mm

- ① DIN 軌槽 (35mm)
- ② 擴充槽/擴充模組連接口
- ③ 電壓/電流輸入端子
- ④ 電壓/電流輸出端子
- ⑤ 電壓/電流輸出端子
- ⑥ 電壓/電流輸出端子
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- ㊿ 電壓/電流輸出端子

### 外部配線



## 規格

類比/數位 (AD) 部份	電壓輸入	電流輸入
電壓電壓	24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%)	
類比信號輸入選擇	4 種選擇	
類比輸入範圍	$\pm 10V$	$\pm 20mA$
數位轉換範圍	$\pm 2000$	$\pm 1000$
解析度	12 bits ( $1_{LSB} = 5mV$ )	11 bits ( $1_{LSB} = 20\mu A$ )
輸入阻抗	200K $\Omega$ 以上	250 $\Omega$
總和精密度	$\pm 0.5\%$ 在 ( $25^\circ C$ , 77 $^\circ F$ ) 範圍內滿刻度時; $\pm 1\%$ 在 ( $0 \sim 55^\circ C$ , $32 \sim 131^\circ F$ ) 範圍內滿刻度時。	
響應時間	3ms $\times$ 通道數	
隔離方式	類比信號數位隔離	
絕對輸入範圍	$\pm 15V$	$\pm 32mA$
數位資料格式	16 位元二進數，有效位 11 位	
平均功能	有 (CR#2 ~ CR#5 可設定，範圍 K1 ~ K20)	
自動診斷功能	上下極限偵測/選擇	
數位/類比 (DA) 部份	電壓輸出	電流輸出
類比信號輸出選擇	2 種/台	
類比輸出範圍	$0 \sim 10V$	$0 \sim 20mA$
數位資料範圍	$0 \sim 4,000$	$0 \sim 4,000$
解析度	12 bits ( $1_{LSB} = 2.5mV$ )	12 bits ( $1_{LSB} = 5\mu A$ )
總和精密度	$\pm 0.5\%$ 在 ( $25^\circ C$ , 77 $^\circ F$ ) 範圍內滿刻度時; $\pm 1\%$ 在 ( $0 \sim 55^\circ C$ , $32 \sim 131^\circ F$ ) 範圍內滿刻度時。	
輸出阻抗	0.5 $\Omega$ 或更低	
響應時間	3ms $\times$ 通道數	
最大輸出電流	20mA (1K $\Omega$ ~ 2M $\Omega$ )	-
容許負載阻抗	-	$0 \sim 500\Omega$
隔離方式	16 位元二進數，有效位 11 位	
隔離方法	內部電路與類比輸出端光耦合隔離，類比信號數位隔離。	
保護	電壓輸出具有短路保護區且長時間過載時仍有可能造成內部線路損壞，電壓輸出可開路，包含 ASCII/RTU 模式，過載速率可達 (4,800 ~ 115,200 bps)，ASCII 模式資料格式字元定為 7-bit，偶數位，1 stop bit (7. E, 1)；RTU 模式資料格式字元定為 8-bit，偶數位，1 stop bit (8. E, 1)；電壓/電流輸入選擇，RS-485 通訊協議選擇。	
選擇模式 (RS-485)	模組編號以靠近主機之模組開始編號由 0 到 7，最大可接 8 台且不同數位 I/O 和數。	

■ 其他規格

Table with 2 columns: 電源規格 (Power Specifications) and 環境規格 (Environmental Specifications). Includes max power consumption, operating temperature, and storage temperature.

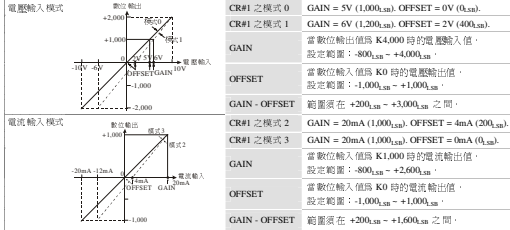
● 控制暫存器 CR

Table of Control Registers (CR) with columns for CR number, bit range, and description. Includes CR0 (mode), CR1-4 (input/output settings), CR5-8 (gain/offset), and CR9-12 (communication).

- 1. 支援傳輸速率 4,800/9,600/19,200/38,400/57,600/115,200 bps。
2. 可使用 Modbus ASCII 模式/RTU 模式通訊協定。
3. 功能碼 (Function): 'H'03 讀出暫存器資料...

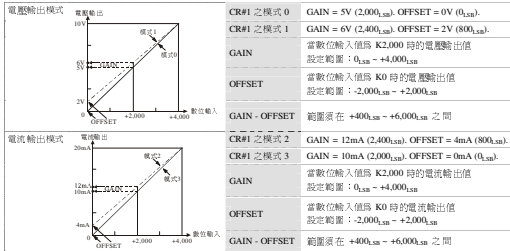
● 溫度 / 數位特性曲線

■ CH1 - CH4 調整 A/D 轉換特性曲線說明



↑ 上列表示電壓輸入模式與電流輸入模式的 A/D 轉換特性曲線。使用者可依實際應用需要調整轉換特性曲線。調整時可改變 OFFSET 值 (CR18 - CR21) 及 GAIN 值 (CR24 - CR27) 來進行。

■ CH5 - CH6 調整 D/A 轉換特性曲線說明



↑ 上列表示電壓輸出模式與電流輸出模式的 D/A 轉換特性曲線。使用者可依實際應用需要調整轉換特性曲線。調整時可改變 OFFSET 值 (CR14 - CR15) 及 GAIN 值 (CR18 - CR19) 來進行。

⚠ 注意事項

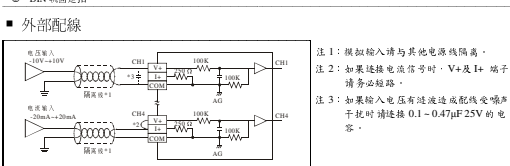
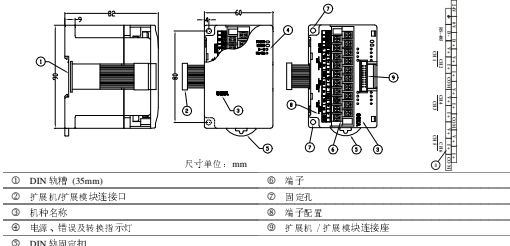
- ✓ 請在接線前，詳細閱讀使用說明書。
✓ 請在上電時解除任何封鎖，實施絕緣。
✓ 輸入電源不可連接於輸入 / 輸出端...

● 產品簡介

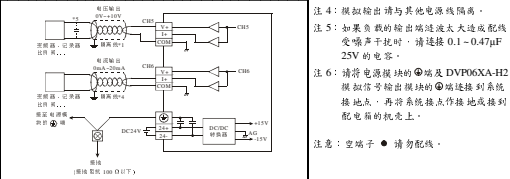
■ 說明及周邊裝置

- 謝您也採用上述 DVP 系列產品。
■ 模塊信號輸出部份接受來自 PLC 主機的 2 組 12 位數字數據。
■ 模塊信號輸出部份使用者可經由配線選擇電壓輸入或電流輸出。

■ 產品外觀及各部介紹



注 1: 模擬輸入請與其他電源隔離。
注 2: 如果連接電流信號時，V+ 及 I+ 端請務必短路。
注 3: 如果輸入電壓有快速過渡或配線電壓的電氣干擾時請連接 0.1~0.47μF 25V 的電容。



● 規格

Table of Specifications (規格) with columns for Input/Output, Voltage, and Current. Includes details for address, power, communication, and environmental conditions.

■ 其他規格

Table of Additional Specifications (其他規格) with columns for Power, Environment, and Operation. Includes max power, temperature, and vibration specs.

● 控制寄存器 CR

Table of Control Registers (CR) with columns for CR number, bit range, and description. Includes CR0 (mode), CR1-4 (input/output settings), CR5-8 (gain/offset), and CR9-12 (communication).

Table of Control Registers (CR) with columns for CR number, bit range, and description. Includes CR0 (mode), CR1-4 (input/output settings), CR5-8 (gain/offset), and CR9-12 (communication).

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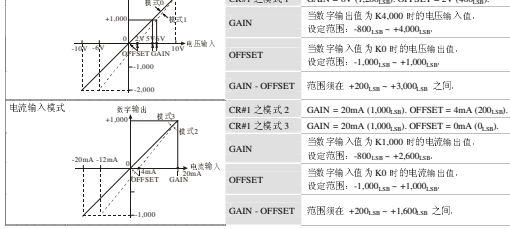
Table of Control Registers (CR) with columns for CR number, bit range, and description. Includes CR0 (mode), CR1-4 (input/output settings), CR5-8 (gain/offset), and CR9-12 (communication).

Table of Control Registers (CR) with columns for CR number, bit range, and description. Includes CR0 (mode), CR1-4 (input/output settings), CR5-8 (gain/offset), and CR9-12 (communication).

Table of Control Registers (CR) with columns for CR number, bit range, and description. Includes CR0 (mode), CR1-4 (input/output settings), CR5-8 (gain/offset), and CR9-12 (communication).

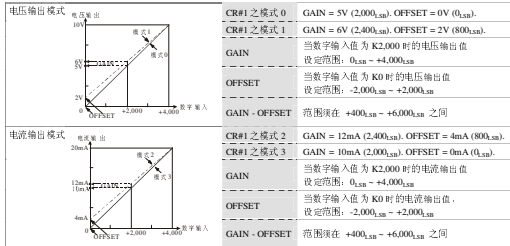
● 溫度 / 數位特性曲線

■ CH1 - CH4 調整 A/D 轉換特性曲線說明



↑ 上列表示電壓輸入模式與電流輸入模式的 A/D 轉換特性曲線。使用者可依實際應用需要調整轉換特性曲線。調整時可改變 OFFSET 值 (CR18 - CR21) 及 GAIN 值 (CR24 - CR27) 來進行。

■ CH5 - CH6 調整 D/A 轉換特性曲線說明



↑ 上列表示電壓輸出模式與電流輸出模式的 D/A 轉換特性曲線。使用者可依實際應用需要調整轉換特性曲線。調整時可改變 OFFSET 值 (CR14 - CR15) 及 GAIN 值 (CR18 - CR19) 來進行。

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