

# DVP04PT-S INSTRUCTION SHEET

## 安裝說明 安装说明

- ▲ Temperature Measurement Module
- ▲ 溫度量測模組
- ▲ 溫度量測模塊



## Warning

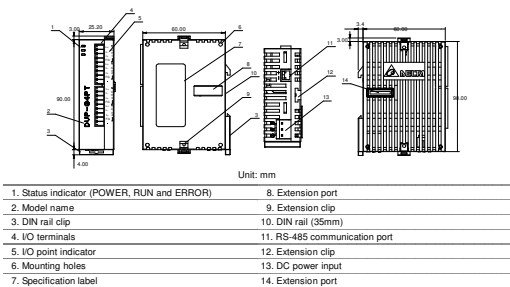
- Please read this instruction sheet carefully before use.
- In order to prevent electric shock, DO NOT touch the terminals or conduct any maintenance while the power is on. DO NOT open the PLC. Only qualified personnel or Delta staff is allowed to conduct any internal electrical work on the PLC.
- DVP04PT-S is an OPEN-TYPE device and certified to meet IEC 61131-2 (UL 508) safety requirements when installed in an enclosure.
- DVP04PT-S must be kept under the environment away from high temperatures, high humidity, excessive vibration, corrosive gases, liquids, airborne dust, and metallic particles.
- DO NOT apply AC power to any of the input/output terminals, or it may damage DVP04PT-S.
- Make sure that the DVP04PT-S is properly grounded, to prevent any electromagnetic noise.
- Please keep the wires as short as possible when connecting RTD to PLC and keep power lead as far away as possible from I/O wires to prevent noise interference.

## Introduction

### Model Explanation & Peripherals

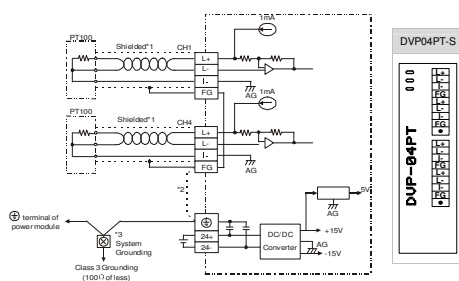
- Thank you for choosing Delta DVP series PLC. DVP04PT-S is able to receive 4 points of platinum temperature sensors (PT 100 3-WIRE 100Q 3850 PPM°C (DIN 43760 JIS C1604-1989)) and convert them into 14-bit digital signals. Besides, through FROM/TO instructions in DVP Slim series MPU program, the data in DVP04PT-S can be read and written. There are 49 16-bit control registers (CR) in DVP04PT-S.
- The system version of DVP04PT-S can be updated via RS-485 communication. The power unit is separate from it and is small in size and easy to install.
- DVP04PT-S displays temperatures in both Celsius (resolution: 0.1°C) and Fahrenheit (resolution: 0.18°F).

### Product Profile & Outline



- Status indicator (POWER, RUN and ERROR)
- Model name
- DIN rail clip
- I/O terminals
- I/O point indicator
- Mounting holes
- Specification label
- Extension port
- Extension clip
- DIN rail (35mm)
- RS-485 communication port
- Extension clip
- DC power input
- Extension port

## External Wiring



- Note 1: Use only the wires that are packed with the temperature sensor (PT100) for analog input and separate from other power line or any wire that may cause noise. Please use 3-wire for PT100.
- Note 2: Terminal FG is grounded for noise suppression.
- Note 3: Please connect power supply module terminal and DVP-04PT-S temperature measurement module terminal to system earth ground.
- Warning: DO NOT connect wires to the No Connection terminals.

## Specifications

Temperature measurement module	Celsius (°C)	Fahrenheit (°F)
Power supply voltage	24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%)	
Analog input channel	4 channels per module	
Sensors type	3-WIRE PT 100Q 3850 PPM°C (DIN 43760 JIS C1604-1989)	
Current excitation	1mA	
Temperature input range	-200°C ~ 600°C	-328°F ~ 1112°F
Digital conversion range	K-2,000 ~ K-6,000	K-3,280 ~ K-11,120
Resolution	14 bits (0.1°C)	14 bits (0.18°F)
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	200ms × channels	
Isolation method	Isolation between digital and analog circuitry. There is no isolation between channels.	
Digital data format	2's complement of 16-bit, (13 significant bits).	
Average function	Yes (CR#2 ~ CR#5 may be set and the range is K1 ~ K4,095)	

Self diagnostic function		Yes
Communication mode (RS-485)	Modbus ASCII or RTU Mode. Communication baud rate 4,800/9,600/19,200/38,400/57,600/115,200. For ASCII mode, data format is 7 bits, even, 1 stop bit (7, E, 1), while RTU mode, data format is 8 bits, even, 1 stop bit (8, E, 1). RS-485 is disabled when the DVP04PT-S is connected in series with an MPU.	
Connection to a DVP-PLC MPU in series	If DVP04PT-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.	
Power supply		
Maximum power consumption	2W at 24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%), supplied by external power.	
Environment		
Operation/storage	1. Operation: 0°C ~ 55°C (temperature), 50 ~ 95% (humidity), pollution degree 2 2. Storage: -25°C ~ 70°C (temperature), 5 ~ 95% (humidity)	
Vibration/shock immunity	Standard: IEC61131-2, IEC 68-2-6 (TEST F)/IEC61131-2 & IEC 68-2-27 (TEST Ea)	

## CR (Control Register)

DVP04PT-S temperature measurement module			Explanation		
CR #	RS-485 parameter address	Latched	Register name		
#0	H4064	○	R	Model type	System used, data length is 8 bits (b7 ~ b0). DVP-04PT model code = H#8A.
#2	H4066	○	R/W	CH1 average number	
#3	H4067	○	R/W	CH2 average number	Number piece of readings used for the calculation of "average" temperature on channels CH1 ~ CH4. Setting range is K1 ~ K4,095 and default setting is K10.
#4	H4068	○	R/W	CH3 average number	
#5	H4069	○	R/W	CH4 average number	
#6	H406A	×	R	CH1 average degrees (°C)	Average degrees for channels CH1 ~ CH4.
#7	H406B	×	R	CH2 average degrees (°C)	(Unit: 0.1 degrees C). Temperature is calculated by averaging multiple pieces temperature readings. Example: If CR#2 is 10, the temperature in CR#6 will be the average of the last 10 readings on CH1.
#8	H406C	×	R	CH3 average degrees (°C)	
#9	H406D	×	R	CH4 average degrees (°C)	
#12	H4070	×	R	CH1 average degrees (°F)	Average degrees for channels CH1 ~ CH4.
#13	H4071	×	R	CH2 average degrees (°F)	(Unit: 0.1 degrees F). Temperature is calculated by averaging multiple pieces temperature readings. Example: If CR#2 is 10, the temperature in CR#12 will be the average of the last 10 readings on CH1.
#14	H4072	×	R	CH3 average degrees (°F)	
#15	H4073	×	R	CH4 average degrees (°F)	
#18	H4076	×	R	Present temperature of CH1 (°C)	
#19	H4077	×	R	Present temperature of CH2 (°C)	Present temperature of channels CH1 ~ CH4.
#20	H4078	×	R	Present temperature of CH3 (°C)	(Unit: 0.1 degrees C).
#21	H4079	×	R	Present temperature of CH4 (°C)	

DVP04PT-S temperature measurement module			Explanation		
CR #	RS-485 parameter address	Latched	Register name		
#24	H407C	×	R	Present temperature of CH1 (°F)	
#25	H407D	×	R	Present temperature of CH2 (°F)	Present temperature of channels CH1 ~ CH4.
#26	H407E	×	R	Present temperature of CH3 (°F)	(Unit: 0.1 degrees F).
#27	H407F	×	R	Present temperature of CH4 (°F)	
#30	H4082	×	R	Error status	Data register stores the error status. Refer to the error code chart for details.

CR#30 is the error code register. Refer to the chart below.

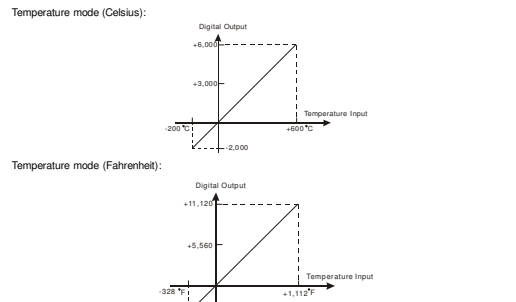
Error description	Content	b15 ~ b8	b7	b6	b5	b4	b3	b2	b1	b0
Power source abnormal	K1 (H1)		0	0	0	0	0	0	0	1
Wiring to empty external contact	K2 (H2)		0	0	0	0	0	0	1	0
Setting mode error	K4 (H4)		0	0	0	0	0	1	0	0
Offset/Gain error	K8 (H8)	Reserved	0	0	0	0	1	0	0	0
Hardware malfunction	K16 (H10)		0	0	0	1	0	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

#31	H4083	○	R/W	Communication address setting	RS-485 communication address. Setting range is 01 ~ 254 and default setting is K1.
#32 <td>H4084 <th>○</th> <th>R/W</th> <th>Communication baud rate</th> <td>Communication baud rate (4,800, 9,600, 19,200, 38,400, 57,600 and 115,200 bps). 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: switch between low bit and high bit of CRC code (RTU mode only). b15: RTU mode.</td> </td>	H4084 <th>○</th> <th>R/W</th> <th>Communication baud rate</th> <td>Communication baud rate (4,800, 9,600, 19,200, 38,400, 57,600 and 115,200 bps). 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: switch between low bit and high bit of CRC code (RTU mode only). b15: RTU mode.</td>	○	R/W	Communication baud rate	Communication baud rate (4,800, 9,600, 19,200, 38,400, 57,600 and 115,200 bps). 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: switch between low bit and high bit of CRC code (RTU mode only). b15: RTU mode.
#33 <td>H4085 <th>○</th> <th>R/W</th> <th>Reset to default setting</th> <td>Definition of ERR LED: CH4 CH3 CH2 CH1 Example: Setting of CH1 1. b0: Reserved. 2. b1: Reserved. 3. b2: Set to 1 and PLC will be reset to default settings. Definition of ERR LED: b12-b15=1111 (default settings) 1. b12 corresponds to CH1; when b12=1, scale exceeds the range, ERR LED flashes.</td> </td>	H4085 <th>○</th> <th>R/W</th> <th>Reset to default setting</th> <td>Definition of ERR LED: CH4 CH3 CH2 CH1 Example: Setting of CH1 1. b0: Reserved. 2. b1: Reserved. 3. b2: Set to 1 and PLC will be reset to default settings. Definition of ERR LED: b12-b15=1111 (default settings) 1. b12 corresponds to CH1; when b12=1, scale exceeds the range, ERR LED flashes.</td>	○	R/W	Reset to default setting	Definition of ERR LED: CH4 CH3 CH2 CH1 Example: Setting of CH1 1. b0: Reserved. 2. b1: Reserved. 3. b2: Set to 1 and PLC will be reset to default settings. Definition of ERR LED: b12-b15=1111 (default settings) 1. b12 corresponds to CH1; when b12=1, scale exceeds the range, ERR LED flashes.

DVP04PT-S temperature measurement module			Explanation		
CR #	RS-485 parameter address	Latched	Register name		
#34	H4086 <td>○</td> <td>R</td> <td>Software version</td> <td>Display the software version in hexadecimal. Example: H'010A = version 1.0A.</td>	○	R	Software version	Display the software version in hexadecimal. Example: H'010A = version 1.0A.
#35 ~ #48				System used	

- Symbols:  
○ means latched.  
× means not latched. (Support when using RS-485 communication, not support when connecting with MPU)  
R means read data by using FROM instruction or RS-485.  
W means write data by using TO instruction or RS-485.
- †: The corresponding parameters address H4064 ~ H4086 of CR#0 ~ CR#34 are provided for users to read/write data via RS-485 communication.
- 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: 03'H - read data from register. 06'H - write one word to register. 10'H - write multiple words to registers.

## Temperature/Digital Curve



## 注意事項

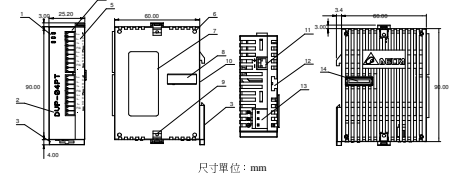
- 請在使用之前，詳細閱讀本使用說明書。
- 實施配線，務必關閉電源。
- 上電時請勿接觸機體端子或進行維修。
- 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將其安裝於具防塵、防潮及免於電擊傷害意外之致險此種機殼內，另務必將其保險措施 (如：箱內之工具或鑰匙可打開) 防止非專業人員操作或意外拆裝本機，造成危險及損壞。
- 交流輸入電源不可連接於輸入/輸出端端，否則可能造成嚴重之損壞，因此請在上電之前再次確認電源配線。
- 輸入電路斷後，一分鐘之內，請勿觸摸內部電路。
- 本體上之接地端子 務必正確的接地，可提高產品抗雜訊能力。
- 由測溫器到本體的配線路請用最短距離配線，為了避免訊號及傳導的影響儘可能將電源線和負載配線分開。

## 產品簡介

### 說明及週邊裝置

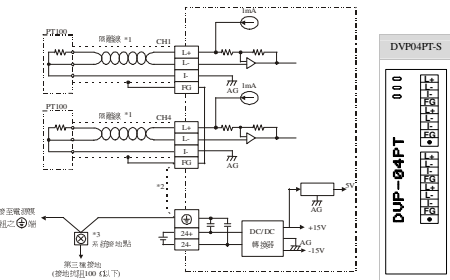
- 測溫器採用台灣 DVP 系列產品，DVP04PT-S 溫度量測模組可接受外部 4 點白金溫度感測器 (PT 100 3 線 100Q 3850 PPM°C (DIN 43760 JIS C1604-1989))，將之轉換成 14 位元之數位信號，透過 DVP-PLC S/S/SAX/S/CS/CSV 主機程式以指令 FROM/TO 來讀/寫模組內之資料。模組內具有 49 個 CR (Control Register) 暫存器，每個暫存器有 16 位元。
- DVP04PT-S 溫度量測模組可由 RS-485 通訊來更新系統版本，電阻單元與模組分離，體積小，安裝容易。
- 使用者可選擇攝氏溫度或華氏溫度，攝氏溫度輸入解析度為 0.1°C，華氏溫度輸入解析度為 0.18°F。

### 產品外觀及各部介紹



- 電源、跳線及運行指示燈
- 機種型號
- DIN 軌面定距
- 端子
- 端子配置
- 擴充模塊充模塊定位孔
- 銘牌
- 擴充模塊充模塊組連接口
- 擴充模塊充模塊組固定扣
- DIN 軌槽 (35mm)
- RS-485 通訊口
- 擴充模塊充模塊組固定槽
- 電源輸入口
- 擴充模塊充模塊組連接口

### 外部配線



- 使用於 銅比輸入的配線應採用 PT 100 溫度感測器之連接線或雙絞線隔離並與其它電源線或可能引起雜訊之線路分離，PT 100 使用 3 線式溫度感測器。
- 如果雜訊過大請將 FG 及接地端子連接。
- 請將電源模塊之 端及 DVP04PT-S 溫度量測模塊之 端連接於系統接地點，再將系統接地點第三種接地點接到配電箱之機殼上。  
注意：空端子 請勿配線。

## 規格

溫度量測 (04PT) 模組	攝氏 (°C)	華氏 (°F)
電源電壓	24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%)	
類比訊號輸入通道	4 通道/片	
適合感測器形式	3-WIRE PT100Q 3850 PPM°C (DIN 43760 JIS C1604-1989)	
驅動電流	1mA	
輸入溫度範圍	-200°C ~ 600°C	-328°F ~ 1112°F
數位轉換範圍	K-2,000 ~ K-6,000	K-3,280 ~ K-11,120
解析度	14 bits (0.1°C)	14 bits (0.18°F)
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	200ms × 通道數	
隔離方式	數位區與類比區有隔離，通道間未隔離。	
數位資料格式	16 位元二補數，有效位 13 位。	
平均功能	有 (CR#2 ~ CR#5 可設定；範圍 K1 ~ K4,095)	

