

DVP04PT-S DVP06PT-S

Instruction Sheet

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Temperature Measurement Module

溫度量測模組

温度测量模块

DVP-0010530-04
20240110



Send Quote Requests to info@automatedpt.com

Thank you for choosing Delta DVP series PLC. DVP04/06PT-S is able to receive 4/6 points of RTDs and convert them into 16-bit digital signals. Through FROM/TO instructions in DVP Slim series MPU program, the data can be read and written. There are many 16-bit control registers (CR) in modules. The power unit is separate from it and is small in size and easy to install.

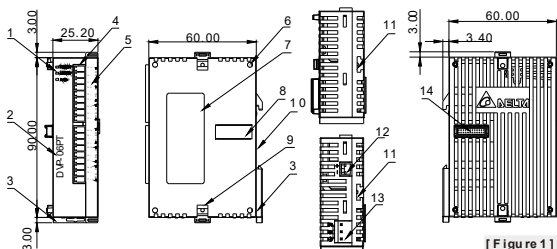
EN ✗ DVP04/06PT-S is an OPEN-TYPE device. It should be installed in a control cabinet free of airborne dust, humidity, electric shock and vibration. To prevent non-maintenance staff from operating DVP04/06PT-S, or to prevent an accident from damaging DVP04/06PT-S, the control cabinet in which DVP04/06PT-S is installed should be equipped with a safeguard. For example, the control cabinet in which DVP04/06PT-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 DVP04/06PT-S is powered up. After DVP04/06PT-S is disconnected, Do NOT touch any terminals in a minute. Make sure that the ground terminal (⏏) on DVP04/06PT-S is correctly grounded in order to prevent electromagnetic interference.

FR ✗ DVP04/06PT-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 nécessaire pour ouvrir a protection).

FR ✗ Ne pas appliquer la tension secteur sur les bornes d'entrées/Sorties, ou l'appareil DVP04/06PT-S pourra être endommagé. Merci de vérifier encore une fois le câblage avant la mise sous tension du DVP04/06PT-S. 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.

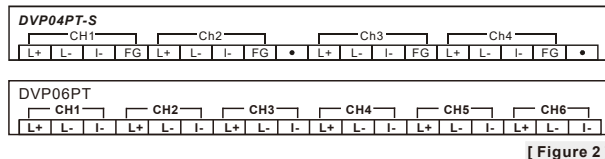
■ Product Profile & Dimension



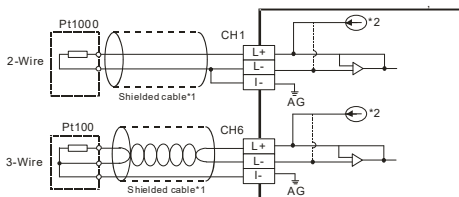
Unit: mm

1. Status indicator (POWER, RUN and ERROR)	2. Model name	3. DIN rail clip
4. I/O terminals	5. I/O point indicator	6. Mounting holes
7. Specification label	8. I/O module connection port	9. I/O module clip
10. DIN rail (35mm)	11. I/O module clip	12. RS-485 communication port (DVP04PT-S)
13. Power connection port (DVP04PT-S)	14. I/O connection port	

■ I/O Terminal Layout



■ External Wiring



Note1: Use only the wires that are packed with the temperature sensor for analog input and separate from other power line or any wire that may cause noise.

Note2: 3-wire RTD sensor provides a compensation loop that can be used to subtract the wire resistance while 2-wire RTD sensor has no mechanism to compensate. Use cables (3-wired) with the same length (less than 200 m) and wire resistance of less than 20 ohm.

Note3: If there is noise, please connect the shielded cables to the system earth point, and then ground the system earth point or connect it to the distribution box.

Note4: Please keep wires as short as possible when connecting the module to a device whose temperature is going to be measured, and keep the power cable used as far away from the cable connected to a load as possible to prevent noise interference.

Note5: Please connect ⚡ on a power supply module and ⚡ on the temperature module to a system ground, and then ground the system ground or connect the system ground to a distribution box.

■ Electrical Specifications

Max. rated power consumption	2W
Operation/storage	Operation: 0°C~55°C (temp.), 5~95% (humidity), pollution degree 2 Storage: -25°C~70°C (temp.), 5~95% (humidity)
Vibration/shock resistance	International standards: IEC61131-2, IEC 68-2-6 (TEST Fc) IEC61131-2 & IEC 68-2-27 (TEST Ea)
Series connection to DVP-PLC MPU	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.

■ Functional Specifications

DVP04/06PT-S	Celsius (°C)	Fahrenheit (°F)
Analog input channel	4/6 channels per module	
Sensors type	2-wire/3-wire Pt100 / Pt1000 3850 PPM/°C (DIN 43760 JIS C1604-1989) / Ni100 / Ni1000 / LG-Ni1000 / Cu100 / Cu50/ 0~300Ω/ 0~3000Ω	
Current excitation	1.53mA / 204.8uA	
Temperature input range	Please refer to the temperature/digital value characteristic curve.	
Digital conversion range	Please refer to the temperature/digital value characteristic curve.	
Resolution	0.1°C	0.18°F
Overall accuracy	±0.6% of full scale during 0 ~ 55°C (32 ~ 131°F)	
Response time	DVP04PT-S: 200ms/channel; DVP06PT-S: 160ms/channel	
Isolation method (between digital and analog circuitry)	There is no isolation between channels. 500VDC between digital/analog circuits and Ground 500VDC between analog circuits and digital circuits 500VDC between 24VDC and Ground	
Digital data format	2's complement of 16-bit	
Average function	Yes (DVP04PT-S: CR#2 ~ CR#5 / DVP06PT-S: CR#2)	
Self diagnostic function	Every channel has the upper/lower limit detection function.	
RS-485 Communication Mode	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: Refer to Slim Type Special Module Communications in the appendix E of the DVP programming manual for more details on RS-485 communication setups.	

*1: The unit of temperature would be displayed as 0.1°C/0.1°F. If the temperature unit is set to be Fahrenheit, the second decimal place would not be shown.

■ Control Register

CR#	Address	Latched	Attribute	Register content	Description								
#0	H'4064	O	R	Model name (Set up by the system)	DVP04PT-S model code= H'8A DVP06PT-S model code = H'CA								
#1	H'4065	X	R/W	CH1~CH4 Mode setting	<table><tr><td>b15~12</td><td>b11~8</td><td>b7~4</td><td>b3~0</td></tr><tr><td>CH4</td><td>CH3</td><td>CH2</td><td>CH1</td></tr></table> Take CH1 mode (b3,b2,b1,b0) for example. 1. (0,0,0,0): Pt100 (default) 2. (0,0,0,1): Ni100 3. (0,0,1,0): Pt1000 4. (0,0,1,1): Ni1000 5. (0,1,0,0): LG-Ni1000 6. (0,1,0,1): Cu100 7. (0,1,1,0): Cu50 8. (0,1,1,1): 0~300 Ω 9. (1,0,0,0): 0~3000 Ω 10. (1,1,1,1)The channel is disabled. Mode 8 and 9 are only available for DVP04PT-S V4.16 or later and DVP06PT-S V4.12 or later.	b15~12	b11~8	b7~4	b3~0	CH4	CH3	CH2	CH1
					b15~12	b11~8	b7~4	b3~0					
CH4	CH3	CH2	CH1										
#2	H'4066	O	R/W	DVP04PT-S: CH1 average number	Number piece of readings used for the calculation of "average" temperature on CH1. Setting range: K1~K20. Default setting is K10.								
--	DVP06PT-S: CH1~CH6 average number			Number piece of readings used for the calculation of "average" temperature on CH1 ~ 6. Setting range: K1~K20. Default setting is K10.									
#3	H'4067	O	H'4067	DVP04PT-S: CH2 average number	Number piece of readings used for the calculation of "average" temperature on CH2. Setting range: K1~K20. Default setting is K10.								
#4	H'4068	O	H'4068	DVP04PT-S: CH3 average number	Number piece of readings used for the calculation of "average" temperature on CH3. Setting range: K1~K20. Default setting is K10.								
#5	H'4069	O	H'4069	DVP04PT-S: CH4 average number	Number piece of readings used for the calculation of "average" temperature on CH4. Setting range: K1~K20.								

CR#	Address	Latched	Attribute	Register content	Description										
					Default setting is K10.										
#6	H'406A	X	R	CH1 average degrees	DVP04PT-S: Average degrees for CH1 ~ 4 DVP06PT-S: Average degrees for CH1 ~ 6 Unit: 0.1°C, 0.01 Ω (0~300 Ω), 0.1 Ω (0~3000 Ω)										
#7	H'406B	X	R	CH2 average degrees											
#8	H'406C	X	R	CH3 average degrees											
#9	H'406D	X	R	CH4 average degrees											
#10	--	X	R	CH5 average degrees											
#11	--	X	R	CH6 average degrees	DVP04PT-S: Average degrees for CH1 ~ 4 DVP06PT-S: Average degrees for CH1 ~ 6 Unit: 0.1°F, 0.01 Ω (0~300 Ω), 0.1 Ω (0~3000 Ω)										
#12	H'4070	X	R	CH1 average degrees											
#13	H'4071	X	R	CH2 average degrees											
#14	H'4072	X	R	CH3 average degrees											
#15	H'4073	X	R	CH4 average degrees											
#16	--	X	R	CH5 average degrees	DVP04PT-S: Present temperature of CH 1~4 DVP06PT-S: Present temperature of CH1~6 Unit: 0.1°C, 0.01 Ω (0~300 Ω), 0.1 Ω (0~3000 Ω)										
#17	--	X	R	CH6 average degrees											
#18	H'4076	X	R	Present temp. of CH1											
#19	H'4077	X	R	Present temp. of CH2											
#20	H'4078	X	R	Present temp. of CH3											
#21	H'4079	X	R	Present temp. of CH4	DVP04PT-S: Present temperature of CH 1~4 DVP06PT-S: Present temperature of CH 1~6 Unit: 0.1°F, 0.01 Ω (0~300 Ω), 0.1 Ω (0~3000 Ω)										
#22	--	X	R	Present temp. of CH5											
#23	--	X	R	Present temp. of CH6											
#24	H'407C	X	R	Present temp. of CH1											
#25	H'407D	X	R	Present temp. of CH2											
#26	H'407E	X	R	Present temp. of CH3	Set H'5678 as PID mode and other values as normal mode Default value is H'0000.										
#27	H'407F	X	R	Present temp. of CH4											
#28	--	X	R	Present temp. of CH5											
#29	--	X	R	Present temp. of CH6											
#29	H'4081	X	R/W	DVP04PT-S: PID mode setup											
#30	H'4082	X	R	Error status	Data register stores the error status. Refer to the error code chart for details.										
#31	H'4083	O	R/W	DVP04PT-S: Communication address setup	Set up the RS-485 communication address; setting range: 01~254. Default: K1										
	--	X	R/W	DVP06PT-S: CH5~CH6 Mode setting	CH5 mode: b0 ~ b3 CH6 mode: b4 ~ b7 See CR#1 for reference										
32	H'4084	O	R/W	DVP04PT-S: Communication format setting	For baud rate, the settings are 4,800/9,600/19,200/38,400/57,600/115,200 bps. Communication format: ASCII: 7,E,1 / 7,O,1 / 8,E,1 / 8,O,1 / 8,N,1 RTU: 8,E,1 / 8,O,1 / 8,N,1 Factory default : ASCII,9600,7,E,1 (CR#32=H'0002) Refer to ※CR#32 communication format settings at the end of this table for more information.										
	--	X	R/W	DVP06PT-S: CH5~CH6 Error LED indicator setting	<table><tr><td>b15~12</td><td>b11~9</td><td>b8~6</td><td>b5~3</td><td>b2~0</td></tr><tr><td>ERR LED</td><td>reserved</td><td>CH6</td><td>CH5</td><td></td></tr></table> b12~13 correspond to CH5~6, when bit is ON, the scale exceeds the range, and the Error LED indicator flashes.	b15~12	b11~9	b8~6	b5~3	b2~0	ERR LED	reserved	CH6	CH5	
b15~12	b11~9	b8~6	b5~3	b2~0											
ERR LED	reserved	CH6	CH5												
#33	H'4085	O	R/W	DVP04PT-S: CH1~CH4 Reset to default setting And Error LED indicator setting	<table><tr><td>b15~12</td><td>b11~9</td><td>b8~6</td><td>b5~3</td><td>b2~0</td></tr><tr><td>ERR LED</td><td>CH4</td><td>CH3</td><td>CH2</td><td>CH1</td></tr></table> If b2~b0 are set to 100, all the setting values of CH1 will be reset	b15~12	b11~9	b8~6	b5~3	b2~0	ERR LED	CH4	CH3	CH2	CH1
b15~12	b11~9	b8~6	b5~3	b2~0											
ERR LED	CH4	CH3	CH2	CH1											

CR#	Address	Latched	Attribute	Register content	Description
	--	X	R/W	DVP06PT-S: CH1~CH4 Reset to default setting And CH1~CH4 Error LED indicator setting	to the defaults. To reset all channels to defaults, set b11~0 to H'924 (DVP04PT-S supports single and all channels reset; DVP06PT-S supports all channels reset only). b12~15 correspond to CH1~4, when bit is ON, the scale exceeds the range, and the Error LED indicator flashes.
#34	H'4086	O	R	Firmware version	Display version in hexadecimal. ex: H'010A = version 1.0A

#35 ~ #48 For system use

Symbols: O means latched. (Supported with RS485, but does not support when connecting to MPUs.)

X means not latched. R means can read data by using FROM instruction or RS-485.

W means can write data by using TO instruction or RS-485.

1. Added the RESET function is only for 04PT-S modules with firmware V4.16 or later and not available for 06PT-S. Connect the module power input to 24 VDC and write H'4352 into CR#0 and then turn the power off and on again; all parameters in modules, including communication parameters are restored to factory defaults.
2. If you want to use Modbus address in decimal format, you can transfer a hexadecimal register to decimal format and then add one to have it become a decimal Modbus register address. For example transferring the address "H'4064" of CR#0 in hexadecimal format to decimal format, to have the result 16484 and then adding one to it, you have 16485, the Modbus address in decimal format.
3. CR#32 communication format settings: for DVP04PT-S modules with firmware V4.14 or previous versions, b11~b8 data format selection is not available. For ASCII mode, the format is fixed to 7, E, 1 (H'00XX) and for RTU mode, the format is fixed to 8, E, 1 (H'C0xx/H'80xx). For modules with firmware V4.15 or later, refer to the following table for setups. Note that the original code H'C0XX/H'80XX will be seen as RTU, 8, E, 1 for modules with firmware V4.15 or later.

b15 ~ b12		b11 ~ b8		b7 ~ b0	
ASCII/RTU, exchange low and high byte of CRC check code		Data format		Baud rate	
Description					
H'0	ASCII	H'0	7,E,1*1	H'01	4800 bps
H'8	do not exchange low and high byte of CRC check code	H'1	8,E,1	H'02	9600 bps
		H'2	reserved	H'04	19200 bps
H'C	RTU, exchange low and high byte of CRC check code	H'3	8,N,1	H'08	38400 bps
		H'4	7,O,1*1	H'10	57600 bps
		H'5	8,O,1	H'20	115200 bps

Note *: This is only available for ASCII format.

Ex: Write H'C310 into CR#32 for a result of RTU, exchange low and high byte of CRC check code, 8,N,1 and baud rate at 57600 bps.

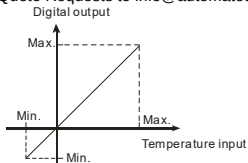
4. RS-485 function codes: 03'H is for reading data from registers. 06'H is for writing a data word to registers. 10'H is for writing multiple data words to registers.
5. CR#30 is the error code register.

Note: Each error code will have a corresponding bit and should be converted to 16-bit binary numbers (Bit0~15). Two or more errors may happen at the same time. Refer to the chart below:

Bit number	0	1	2	3
Description	Power source abnormal	The contact is not connected to anything.	Reserved	Reserved
Bit number	4	5	6	7
Description	Reserved	Reserved	average number error	Instruction error
Bit number	8	9	10	11
Description	CH1 Abnormal conversion	CH2 Abnormal conversion	CH3 Abnormal conversion	CH4 Abnormal conversion
Bit number	12	13	14	15
Description	CH5 Abnormal conversion	CH6 Abnormal conversion	Reserved	Reserved

6. Temperature/Digital Value Characteristic Curve

The mode of measuring Celsius (Fahrenheit) temperature:



Sensor	Temperature range		Digital value conversion range	
	°C (Min./Max.)	°F (Min./Max.)	°C (Min./Max.)	°F (Min./Max.)
Pt100	-180 ~ 800°C	-292 ~ 1,472°F	K-1,800 ~ K8,000	K-2,920 ~ K14,720
Ni100	-80 ~ 170°C	-112 ~ 338°F	K-800 ~ K1,700	K-1,120 ~ K3,380
Pt1000	-180 ~ 800°C	-292 ~ 1,472°F	K-1,800 ~ K8,000	K-2,920 ~ K14,720
Ni1000	-80 ~ 170°C	-112 ~ 338°F	K-800 ~ K1,700	K-1,120 ~ K3,380
LG-Ni1000	-60 ~ 200°C	-76 ~ 392°F	K-600 ~ K2,000	K-760 ~ K3,920
Cu100	-50 ~ 150°C	-58 ~ 302°F	K-500 ~ K1,500	K-580 ~ K3,020
Cu50	-50 ~ 150°C	-58 ~ 302°F	K-500 ~ K1,500	K-580 ~ K3,020
Sensor	Input resistor range		Digital value conversion range	
	0Ω ~ 300Ω	0Ω ~ 320Ω	0 ~ 3000Ω	0Ω ~ 3200Ω
0~3000Ω	0Ω ~ 3200Ω	K0 ~ 32000	0~3000Ω	0Ω ~ 3200Ω

7. When CR#29 is set to H'5678, CR#0 ~ CR#34 can be used for PID settings with DVP04PT-S version V3.08 and above.

PID Mode description						
CR#	Keep	R/W		CR#	Keep	R/W
#0	O	R	Model name	#24	O	R/W
#1	X	R/W	CH1~CH4 Mode setting	#25	O	R/W
#2	X	R	PID Output % at CH1	#26	O	R/W
#3	X	R	PID Output % at CH2	#27	O	R/W
#4	X	R	PID Output % at CH3	#28	X	R/W
#5	X	R	PID Output % at CH4			
CR#2~CR#5: 0~1000; Unit: 0.1%						
#6	X	R	Average temperature (°C) at CH1			
#7	X	R	Average temperature (°C) at CH2			
#8	X	R	Average temperature (°C) at CH3			
#9	X	R	Average temperature (°C) at CH4			
CR#6~CR#9 : Unit: 0.1%						
#10	O	R/W	Set temperature at CH1			
#11	O	R/W	Set temperature at CH2			
#12	O	R/W	Set temperature at CH3			
#13	O	R/W	Set temperature at CH4			
CR#10~CR#13: Set the PID target value (SV)						
#14	O	R/W	CH1 K _P	#29	X	R/W
#15	O	R/W	CH2 K _P	#30	X	R
#16	O	R/W	CH3 K _P			
#17	O	R/W	CH4 K _P			
#19	O	R/W	CH1 K _I			
#20	O	R/W	CH2 K _I			
#21	O	R/W	CH3 K _I			
#22	O	R/W	CH4 K _I			
CR#31~CR#34: 1~30; Unit: 1s						
Note: CR#29 must be set to H'5678 so as to enter the PID mode before configuring settings on other control registers.						