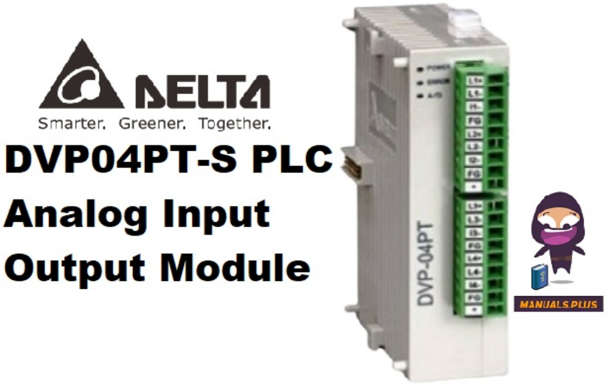


DELTA DVP04PT-S PLC Analog Input Output Module Instructions

Contents

DELTA DVP04PT-S PLC Analog Input Output Module

Specifications

- Model: DVP04/06PT-S
- Input: 4/6 points of RTDs
- Output: 16-bit digital signals
- Installation: Control cabinet free of dust, humidity, electric shock, and vibration
- Dimensions: 90.00mm x 60.00mm x 25.20mm
- Open-type device
- Separate power unit

Product Usage Instructions

Installation Guidelines

- Ensure the control cabinet is free of airborne dust, humidity, electric shock, and vibration.
- Use a safeguard to prevent unauthorized access or accidents.
- Avoid connecting AC power to any I/O terminals.

Powering Up

- Double-check all wiring before powering up the device.
- Avoid touching any terminals for a minute after disconnecting the device.
- Correctly ground the terminal to prevent electromagnetic interference.

External Wiring

- Follow the wiring diagram provided in the manual for proper connection.
- Use shielded cables for better signal integrity.
- Keep wires as short as possible to reduce noise interference.

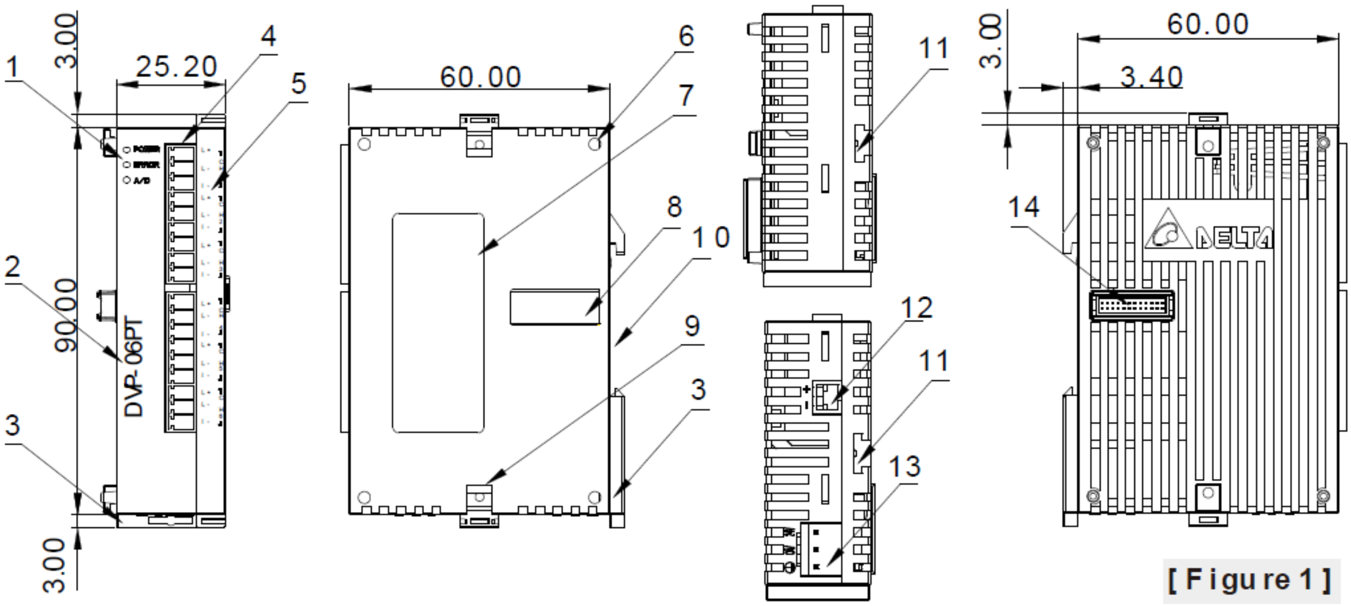
Introduction

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.

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.

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.

Product Profile & Dimension



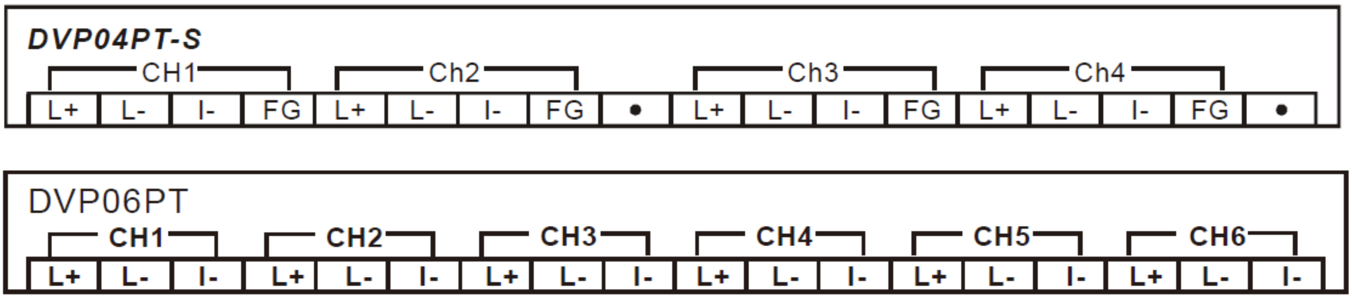
[Figure 1]

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	

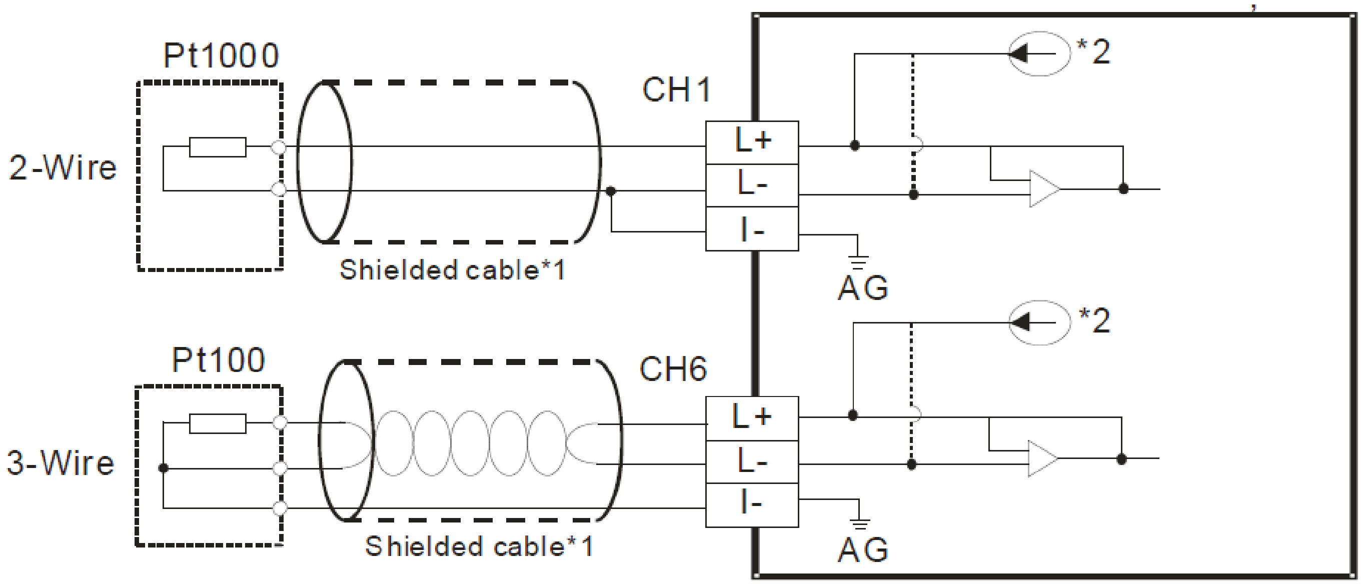
Wiring

I/O Terminal Layout


DVP04PT-S
CH1
Ch2
Ch3
Ch4
L+ L- I- FG L+ L- I- FG ● L+ L- I- FG L+ L- I- FG ●
DVP06PT
CH1
CH2
CH3
CH4
CH5
CH6
L+ L- I- L+ L- I- L+ L- I- L+ L- I- L+ L- I- L+ L- I-

[Figure 2]

External Wiring



Notes

- 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.

- 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.
- 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.
- 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.
- 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.

Specifications

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: 160/ms/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

<table>
<tr><td rowspan="3">#1</td><td rowspan="3">H’4065</td><td rowspan="3">X</td><td rowspan="3">R/W</td><td rowspan="3">CH1~CH4 Mode setting</td><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>
<tr><td colspan="4">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.</td></tr>
<tr><td rowspan="2">#2</td><td>H’4066</td><td rowspan="2">O</td><td rowspan="2">R/W</td><td>DVP04PT-S:
CH1 average number</td><td colspan="4">Number piece of readings used for the calculation of “average” temperature on CH1.
Setting range: K1~K20. Default setting is K10.</td></tr>
<tr><td>—</td><td>DVP06PT-S:
CH1~CH6 average number</td><td colspan="4">Number piece of readings used for the calculation of “average” temperature on CH1 ~ 6.
Setting range: K1~K20. Default setting is K10.</td></tr>
<tr><td>#3</td><td>H’4067</td><td>O</td><td>H’4067</td><td>DVP04PT-S:
CH2 average number</td><td colspan="4">Number piece of readings used for the calculation of “average” temperature on CH2.
Setting range: K1~K20. Default setting is K10.</td></tr>
</table>

#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. 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	
#12	H’4070	X	R	CH1 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)
#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	

#17	—	X	R	CH6 average degrees	
#18	H’4076	X	R	Present temp. of CH1	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)
#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	
#22	—	X	R	Present temp. of CH5	
#23	—	X	R	Present temp. of CH6	
#24	H’407C	X	R	Present temp. of CH1	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)
#25	H’407D	X	R	Present temp. of CH2	
#26	H’407E	X	R	Present temp. of CH3	
#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	Set H’5678 as PID mode and other values as normal mode Default value is H’0000.

<table>
<tr><td>#30</td><td>H’4082</td><td>X</td><td>R</td><td>Error status</td><td>Data register stores the error status. Refer to the error code chart for details.</td></tr>
<tr><td rowspan="2">#31</td><td>H’4083</td><td>O</td><td>R/W</td><td>DVP04PT-S:
Communication address setup</td><td>Set up the RS-485 communication address; setting range: 01~254.
Default: K1</td></tr>
<tr><td>—</td><td>X</td><td>R/W</td><td>DVP06PT-S:
CH5~CH6 Mode setting</td><td>CH5 mode: b0 ~ b3 CH6 mode: b4 ~ b7
See CR#1 for reference</td></tr>
<tr><td rowspan="2">32</td><td>H’4084</td><td>O</td><td>R/W</td><td>DVP04PT-S:
Communication format setting</td><td>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.</td></tr>
<tr><td>—</td><td>X</td><td>R/W</td><td>DVP06PT-S:
CH5~CH6
Error LED indicator setting</td><td><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 colspan="2">reserved</td><td>CH6</td><td>CH5</td></tr>
<tr><td colspan="5">b12~13 correspond to CH5~6, when bit is ON, the scale exceeds the range, and the Error LED indicator flashes.</td></tr>
</table></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

<table>
<tr><td>#33</td><td>H’4085</td><td>O</td><td>R/W</td><td>DVP04PT-S:
CH1~CH4
Reset to default setting And Error LED indicator setting</td><td><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><tr><td colspan="5">If b2~b0 are set to 100, all the setting values of CH1 will be reset</td></tr></table></td></tr>
<tr><td></td><td>—</td><td>X</td><td>R/W</td><td>DVP06PT-S:
CH1~CH4 Reset to default setting And CH1~CH4 Error LED indicator setting</td><td>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.</td></tr>
<tr><td>#34</td><td>H’4086</td><td>O</td><td>R</td><td>Firmware version</td><td>Display version in hexadecimal. ex:
H’010A = version 1.0A</td></tr>
<tr><td colspan="6">#35 ~ #48 For system use</td></tr>
<tr><td colspan="6"><b>Symbols:</b> 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.</td></tr>
</table>

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	RTU, 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

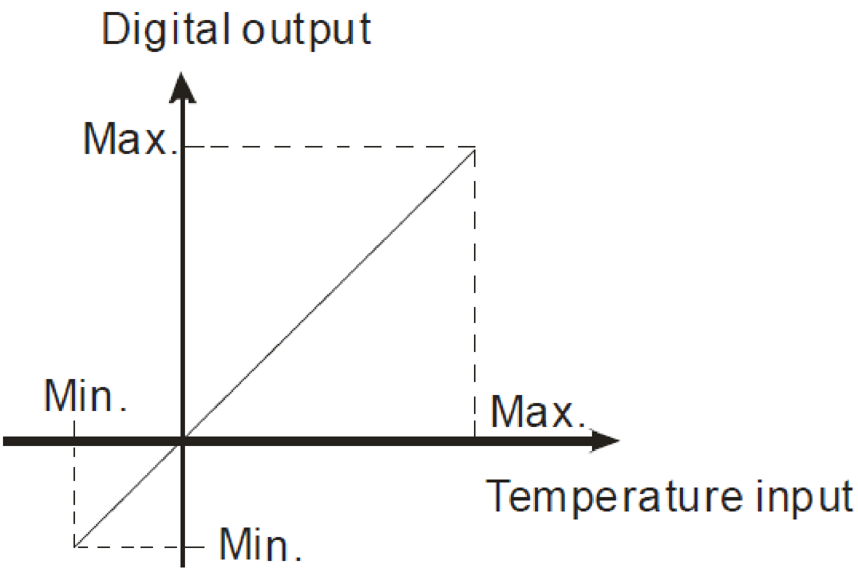
Note *1: This is only available for ASCII format.
Ex: Write H’C310 into CR#32 for a result of RTU, exchange low and high byte of CRC check code, 8,N,1 and baud rate at 57600 bps.

1. 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.
2. 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

1. 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**	
0~300Ω	0Ω ~ 320Ω	K0 ~ 32000	0~300Ω	0Ω ~ 320Ω
0~3000Ω	0Ω ~ 3200Ω	K0 ~ 32000	0~3000Ω	0Ω ~ 3200Ω

1. 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.

FAQ

- **Q:** Can I connect AC power to any of the I/O terminals?
  - **A:** No, connecting AC power to any I/O terminals can cause serious damage. Always double-check the wiring before powering up.
- **Q:** How should I handle the device after disconnection?
  - **A:** After disconnecting the device, avoid touching any terminals for at least a minute to ensure safety.
- **Q:** What should I do to prevent electromagnetic interference?
  - **A:** Ensure that the ground terminal on the device is correctly grounded to prevent electromagnetic interference.

Documents / Resources

DVP04PT-S
DVP06PT-S
Instruction Sheet
安 裝 說 明
安 装 说 明
Temperature Measurement Module

DELTA DVP04PT-S PLC Analog Input Output Module [pdf] Instructions
DVP04PT-S, DVP06PT, DVP04PT-S PLC Analog Input Output Module, DVP04PT-S, PLC Analog Input Output Module, Analog Input Output Module, Input Output Module, Output Module, Module

References

- **User Manual**