

# HC10 Series Temperature Module

User Manual



V1.1 2022.01

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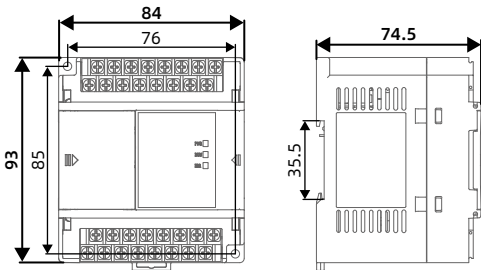
**Warning**

- **Be sure to check the terminal label carefully when wiring.**
- **Avoid installation in places exposed to direct sunlight, moisture, or water.**
- **Avoid installation in locations with flammable and explosive gases and liquids.**
- **Avoid installation in areas with oily dust, fibers and metal particles.**
- **Use rails or M3 screws for installation.**

## Size and Gross Weight

**1**

GW: 0.3kg



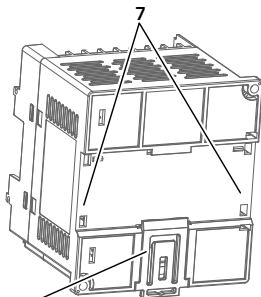
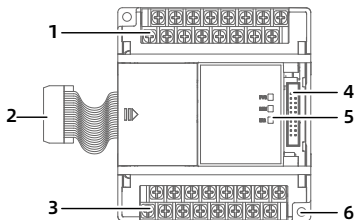
Unit: mm

## Structure Description

1	Output terminal( Reserved )
2	Extension cable
3	Input terminal
4	Expansion port

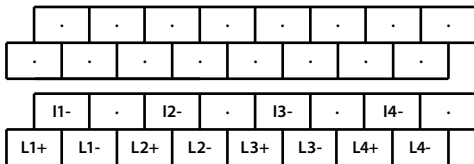
5	Power/run/fault indicator LED
6	Mounting fixing hole (M3)
7	DIN guideway groove (35mm)
8	DIN rail fixing buckle

1



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## L0400PT1 Terminal Description



### Model

HC10-L0400PT1 (PT100 thermistor)

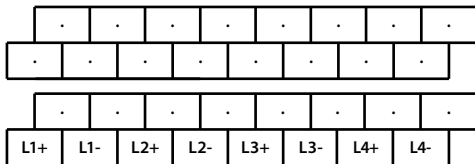
### Terminal

L1+ ~ L4+	PTA terminal
L1- ~ L4-	PTB terminal
I1- ~ I4-	PTC terminal

### Size and Structure

Size and structure	Figure 1
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## L0400TC Terminal Description



### Model

HC10-L0400TC (thermocouple)

### Terminal

L1+ ~ L4+	Positive terminal
L1- ~ L4-	Negative terminal

### Size and Structure

Size and structure	Figure 1
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# Product Specifications

## General Specifications

<b>Environmental Temperature</b>	Run: -10 ~ +55°C Storage: -40 ~ +70°C
<b>Relative Humidity</b>	<95%, no condensation
<b>Altitude</b>	Run: <2000m Storage: 0 ~ 3000m (not less than 70kPa)
<b>Pollution Level</b>	Pollution level 2

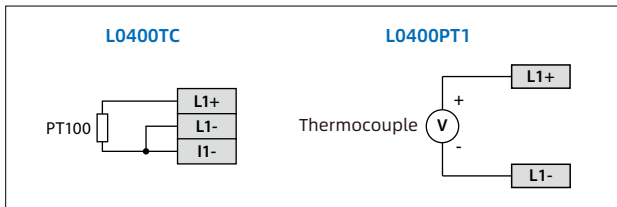


## Temperature Expansion Module Specifications

<b>Connection</b>	Barrier terminal block (end point distance: 7.62mm)	
<b>Input Number</b>	L1+ ~ L4+	
<b>Input Function</b>	PT100 thermistor	Thermocouple
<b>Temperature Sampling Range</b>	-100.0 ~ +600.0°C	It depends on the type of thermocouple <ul style="list-style-type: none"><li>• K-type: -100.0 ~ +1200.0°C</li><li>• J-type: -100.0 ~ +800.0°C</li><li>• T-type: -200.0 ~ +400.0°C</li><li>• E-type: -100.0 ~ +600.0°C</li><li>• N-type: -100.0 ~ +1200.0°C</li><li>• R-type: 0.0 ~ +1700.0°C</li><li>• S-type: 0.0 ~ +1700.0°C</li><li>• B-type: 100.0 ~ 1700.0°C</li></ul>
<b>Comprehensive Accuracy</b>	±0.5% full range	±0.3% full range
<b>Resolution</b>	0.1°C	

## Instructions

1. Wiring the temperature module and confirm that it is correct.



2. After connecting all expansion modules with expansion module cables, the main module is powered up.
  - Connect up to 8.
  - According to the distance from the main module from near to far, the expansion modules are numbered 0, 1, 2, 3, 4, 5, 6, 7.
3. Write user instructions to achieve read and write functions.
  - See page 8 for instruction description.
  - See page 9 for the description of the module data address.

## Instruction Description (FROM, TO)

### Read Input Data

#### FROM S1 S2 S3 S4

S1: Module number.

S2: Module data read starting address.

S3: Read the data storage register.

- When reading multiple data, the read data is stored sequentially from this address.

S4: Read data length.

### Write Thermocouple Type

#### TO S1 S2 S3 S4

S1: Module number.

S2: Module data write start address.

S3: Write the data register.

- When writing multiple data, write data sequentially from this address.

S4: Write data length.

## Module Data Address Description (L0400PT1)

HC10-L0400PT1		
Module Data Address	Data Content	Read/Write
0	Module type (0x40)	Read only
1	Software version	Read only
2 ~ 4	Reserved	/
5 <sup>1)</sup>	Channel 1 temperature results	Read only
6 <sup>1)</sup>	Channel 2 temperature results	Read only
7 <sup>1)</sup>	Channel 3 temperature results	Read only
8 <sup>1)</sup>	Channel 4 temperature results	Read only
9 ~ 11	Reserved	/

1): -100.0 ~ +600.0°C corresponding range -1000 ~ +6000.

## Module Data Address Description (L0400TC)

<b>HC10-L0400TC</b>		
<b>Module Data Address</b>	<b>Data Content</b>	<b>Read/Write</b>
0	Module type (0x41)	Read only
1	Software version	Read only
2 ~ 4	Reserved	/
5	Channel 1 temperature results	Read only
6	Channel 2 temperature results	Read only
7	Channel 3 temperature results	Read only
8	Channel 4 temperature results	Read only
9 ~ 11	Reserved	/
12	Thermocouple type selection	Read and write

## Module Data Address Description (L0400TC) (Continued)

### 5 ~ 8: Channel 1 ~ 4 Temperature Results

#### 12: Thermocouple Type Selection

Module Data Address	Bit15 ~ Bit12	Bit11 ~ Bit8	Bit7 ~ Bit4	Bit3 ~ Bit0
12	Channel 4	Channel 3	Channel 2	Channel 1

The values of each channel setting (thermocouple type) are shown in the table below.

Value	Thermocouple Type	Range	Range (Digital)
0000	K	-100.0 ~ +1200.0°C	-1000 ~ +12000
0001	J	-100.0 ~ +800.0°C	-1000 ~ +8000
0010	T	-200.0 ~ +400.0°C	-2000 ~ +4000
0011	E	-100.0 ~ +600.0°C	-1000 ~ +6000
0100	N	-100.0 ~ +1200.0°C	-1000 ~ +12000
0101	R	0.0 ~ +1700.0°C	0 ~ +17000
0110	S	0.0 ~ +1700.0°C	0 ~ +17000
0111	B	100.0 ~ 1700.0°C	1000 ~ 17000

Example: The thermocouple types of module channels 1 ~ 4 need to be set to K-type, J-type, N-type, and T-type in sequence, and the module data address 12 should be written as 0x2410.

## Expansion Module Type

According to the distance from the main module from near to far, the expansion modules are numbered 0, 1, 2, 3, 4, 5, 6, 7.

<b>Number</b>	1st	2nd	3rd	4th
<b>Module Number</b>	0	1	2	3
<b>Mapped Address</b>	D8265	D8267	D8269	D8271
<b>Data</b>	0x40: L0400PT1, 0x41: L0400TC			

<b>Number</b>	5th	6th	7th	8th
<b>Module Number</b>	4	5	6	7
<b>Mapped Address</b>	D8273	D8275	D8277	D8279
<b>Data</b>	0x40: L0400PT1, 0x41: L0400TC			

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