

Wecon LX6V-4TC Module User Manual

V1.0



How to get the manual

This manual is not shipped with the product. If you need to obtain the PDF file, you can use the following methods:

- Log in the Wecon support center (<https://docs.we-con.com.cn/bin/view/Expansions/>) to obtain product manual.
- Scan the QR code on the machine to obtain the manual.

Website: <https://docs.we-con.com.cn/bin/view/Home/>

Email: support@we-con.com.cn



1 Introduction



LX6V to 4TC (4-channel analog inputs), used for the acquisition of thermocouple input analog signals. Suitable for Wecon LX6 series PLC and LX6V to EM to ECAT module equipment

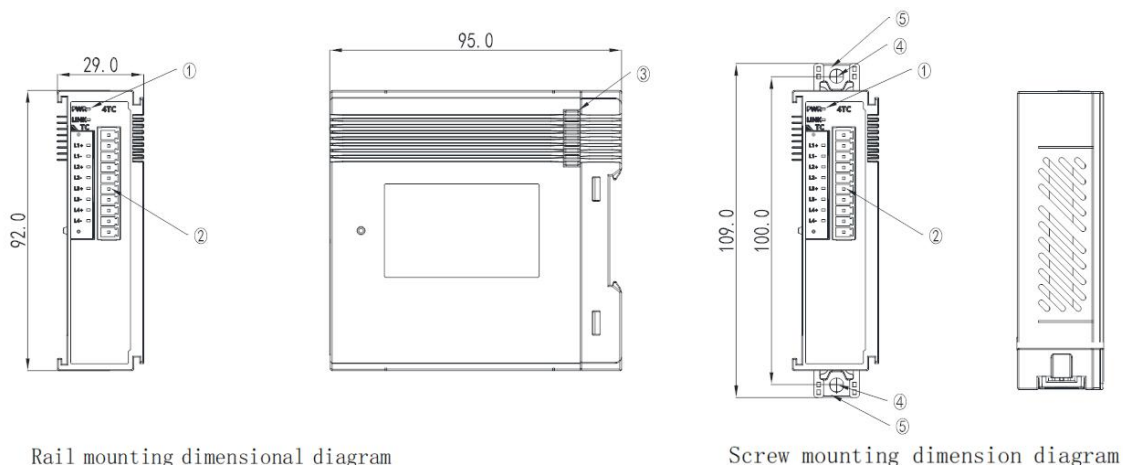
Upper computer software version that supports this module: 2.6. 236 and above, PLC firmware version: 2.321. 1032 and above.

LX6V to EM to ECAT firmware version that supports this module: V2.022 and above, and the corresponding XML version is 1.3 and above.

Note: The total power of expansion modules connected to LX6 series PLC and LX6V to EM to ECAT cannot be greater than 48W.

2 Appearance and terminal description

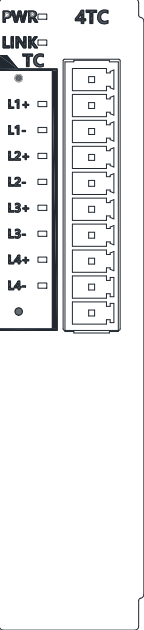
2.1 Appearance and size



- ① LED; ② Terminal; ③ Expansion module interface; ④ Mounting hole: 2 (Φ4.5);
⑤ DIN rail clip.

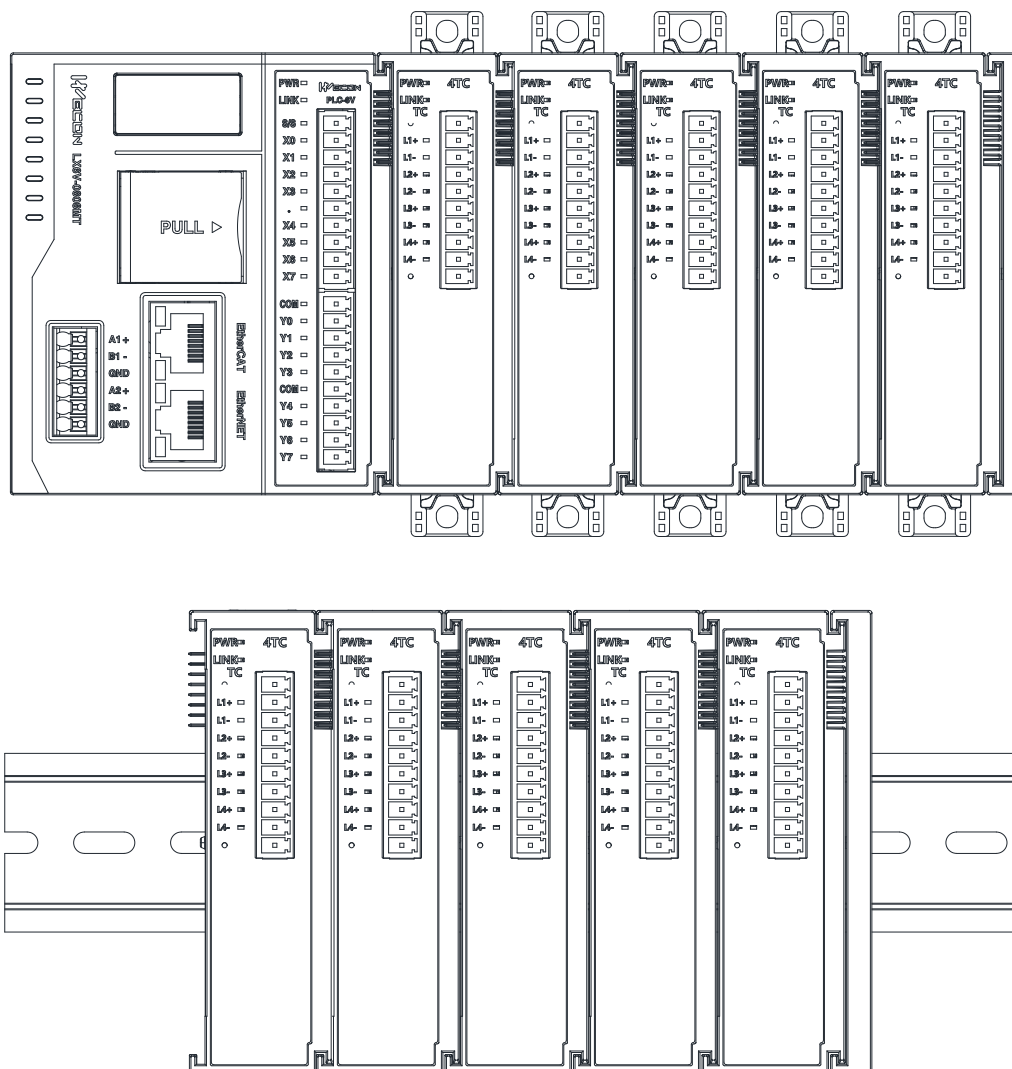
2.2 Terminal description

The 4TC expansion module terminal are arranged as follows:

Module model	Terminal arrangement	
LX6V to 4TC		

2.3 Installation

Please install the end cover on the right side of the last expansion module, align it with the module interface slot and connect it, as shown in the figure below:



2.4 Indicator

The 4TC expansion module LED is shown below:

Indicator lamp	Description
PWR	Always lights up when the module is powered on normally.
LINK light	Communication indicator light between the expansion module and PLC. Lights out: Data interaction is abnormal, stopped, or failed Lights on: Data interaction is normal.
Ln +	Defined as: Status light. Light up to indicate channel enabled; Flashing is used to indicate that the channel is overlimit and disconnection.
Ln -	N/A

3 Parameter specifications

3.1 Input specifications

Item	Specification
Input channel	4
Digital resolution	16 bit
Sensitivity	0.1 °C, 0.1 °F
Input terminal	Thermocouple input, thermocouple type: K, J, E, B, N, R, S, T
Compensation method	Internal cold junction compensation
Accuracy (normal temperature 25 °C)	Full range $\pm 0.1\%$ + cold junction compensation error
Accuracy (working temperature to 20 °C to 55 °C)	Full range $\pm 0.3\%$ + cold junction compensation error
Isolation or not	Isolation between I/O terminals and power supply, isolation between channels
Overlimit disconnection detection	Support
Power consumption	< 0.8 W
Power supply	Power supply via interface, DC24V $\pm 10\%$, 32mA

3.2 Environmental specification

Item	Specification				
Usage environment	No corrosive, combustible gas, no large amount of conductive dust				
Environment temperature	Working temperature: 0°C to 55°C Storage temperature: - 20°C to 70°C				
Environment humidity	Working humidity: 10% to 90%RH (no condensation) Storage humidity: ≤ 90% RH (no condensation)				
Installation	Snap mount on DIN46277 (width 35mm) rail or direct positioning hole mount				
Vibration resistance	According to JISC0040 standard				
		Frequency	Acceleration	Amplitude	X, Y, Z 10 times in each of three directions (80 minutes in each direction)
	DIN rail installation	10 to 57Hz	-	0.035 mm	
		57 to 150Hz	4.9 m/S ²	-	
	Direct installation	10 to 57Hz	-	0.075 mm	
		57 to 150Hz	9.8 m/S ²	-	
Shock resistance	Compliant with JISC0041 standard (147 m/S ² , action time 11 ms, three sinusoidal half to wave pulses in each of X, Y, and Z directions)				
EMC immunity level	Zone B IEC 61131 to 2				
Altitude requirements	≤ 2000 m (80 kPa)				
Protection level	IP20				
Grounding	Not co - located with the strong current system				

3.3 Software specification

Item	Specification
Input PDO data volume	Maximum 24 byte
Diagnostic reporting function configuration	Support
Diagnostic detection enable configuration	Support overlimit and disconnection detection
Sensor type configuration	Support thermocouple module type: K, J, E, B, N, R, S, T, default to K to type thermocouple
Filter time	0s to 100s (can be configured by software, default 5s)
Overflow detection	Supports reporting overflow status only when overflow is enabled
Overlimit detection enable configuration	Support
Independent channel configuration	Support
Temperature offset enable configuration	Support
Temperature offset configuration range	-300 to +300, temperature unit
Display mode	Celsius (°C), Fahrenheit (°F)
Display sensitivity	0.01°C, 0.01°F
Sample refresh	Refresh asynchronously according to the sampling time, do not require synchronization refresh according to the bus cycle
Stop mode	Output according to the maximum value, no more refresh
Disconnected or overlimit	Output according to the maximum value, no more refresh
System diagnostics	System power abnormality
Channel diagnosis	Over upper limit alarm, over lower limit alarm, disconnection alarm, overflow alarm
Configuration diagnostics	Configuration error identification, channel parameter configuration error

3.4 Accuracy calculation

Within the working temperature range, when the temperature change rate is less than 0.3 °C/min, the accuracy of this product = ADC sampling accuracy + cold junction compensation error. According to the test principle, it is need to wait for the module to be powered on for 45 minutes before measuring.

Recommended: Within the working temperature range and under the condition of horizontal and vertical installation direction, when the adjacent module is a temperature module, the cold end compensation error is within $\pm 3^{\circ}\text{C}$.

Not recommended: Adjacent modules consume more than 3.5 W of power, for example host PLC, LX6V - 32EXYT.

Installation direction	Adjacent module type	Cold junction compensation error (- 20 °C to 0 °C)	Cold junction compensation error (0 °C to 55 °C)
Horizontal installation	Temperature module	$\pm 0.8^{\circ}\text{C}$	$\pm 1.1^{\circ}\text{C}$
	Non - temperature module	$\pm 0.6^{\circ}\text{C}$	$\pm 2.8^{\circ}\text{C}$
Non - horizontal installation	Temperature module	$\pm 1.1^{\circ}\text{C}$	$\pm 2.8^{\circ}\text{C}$
	Non - temperature module	$\pm 1.37^{\circ}\text{C}$	$\pm 4.9^{\circ}\text{C}$

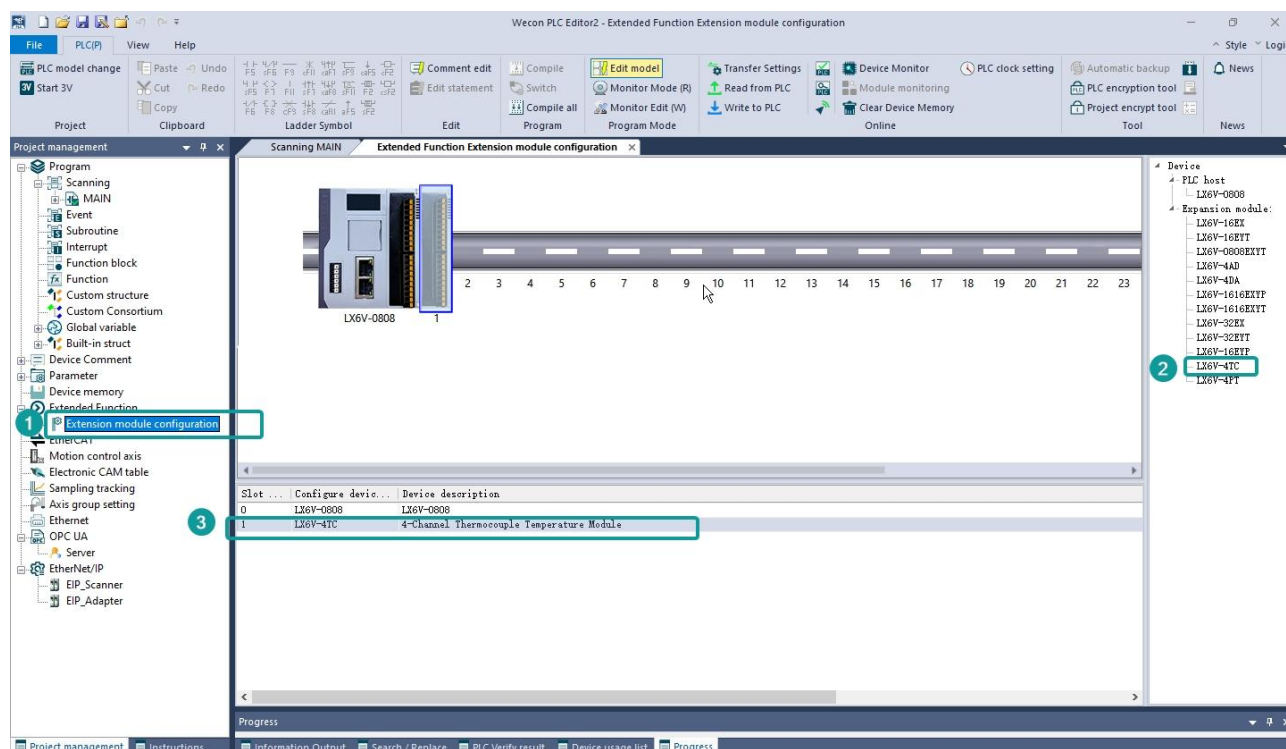
4 Usage

This module is suitable for Wecon LX6 series PLC and LX6V - EM□ - ECAT module equipment. The two usage methods are as follow.

4.1 Use on LX6V/LX6S



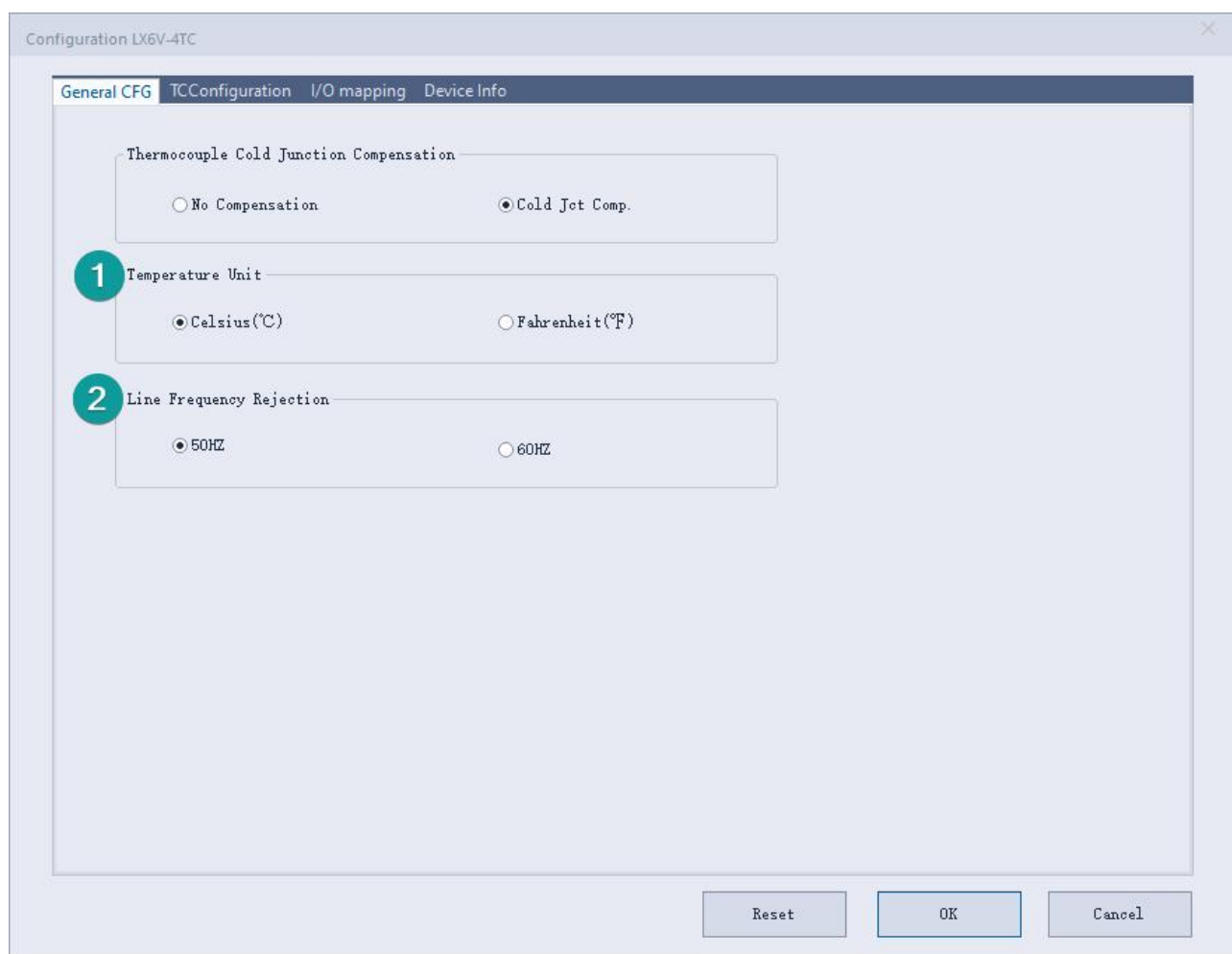
The parameter configuration interface is as below:



Upper computer expansion module configuration process description:

- ① Double - click the expansion module configuration to open the configuration interface;
- ② Adding new modules according to the model and position of the current module connected;
- ③ Double - click the module in the current machine slot to open the parameter configuration interface;

(1) TC general configuration



Configuration LX6V-4TC

General CFG | TCConfiguration | I/O mapping | Device Info

Thermocouple Cold Junction Compensation

☐ No Compensation ☒ Cold Jet Comp.

1 Temperature Unit

☒ Celsius(°C) ☐ Fahrenheit(°F)

2 Line Frequency Rejection

☒ 50HZ ☐ 60HZ

Reset OK Cancel

- ① Thermocouple cold junction compensation: Set whether the module enables cold junction compensation, and the cold junction compensation is enabled by default;
- ② Temperature unit: Set the temperature unit output by the module, and the supported temperature unit types are Celsius (°C) or Fahrenheit (°F), the default unit is: Celsius;
- ③ Power frequency suppression: Set the power frequency suppression of the module to suppress 50Hz or suppress 60Hz. The default suppression is 50Hz. Please set the appropriate power frequency suppression option for the module according to the actual application scenario;

(2) TC channel configuration

- ① Enable channels: It can be set whether to enable the current expansion module channel;
- ② Sensor type: Set the sensor type connected to the module channel, the default sensor type is K to type, there are 8 types of sensors supported by TC module, which are: K, J, E, B, N, R, S, T; The temperature range that can be measured by each sensor is as follows:

Sensor type	Temperature range	
	Degree Celsius	Degree Fahrenheit
K	- 200℃ to 1372℃	- 328.0°F to 2501.6°F
J	- 200℃ to 1000℃	- 328.0°F to 1832.0°F
E	- 200℃ to 1000℃	- 328.0°F to 1832.0°F
B	400℃ to 1820℃	752.0°F to 3308.0°F
N	- 200℃ to 1300℃	- 328.0°F to 2372.0°F
R	- 50℃ to 1768℃	- 58.0°F to 3214.4°F
S	- 50℃ to 1768℃	- 58.0°F to 3214.4°F
T	- 200℃ to 400℃	- 328.0°F to 752.0°F

- ③ Filtering time: The supported filtering time is 0 to 100s, it is used to reduce fluctuations in

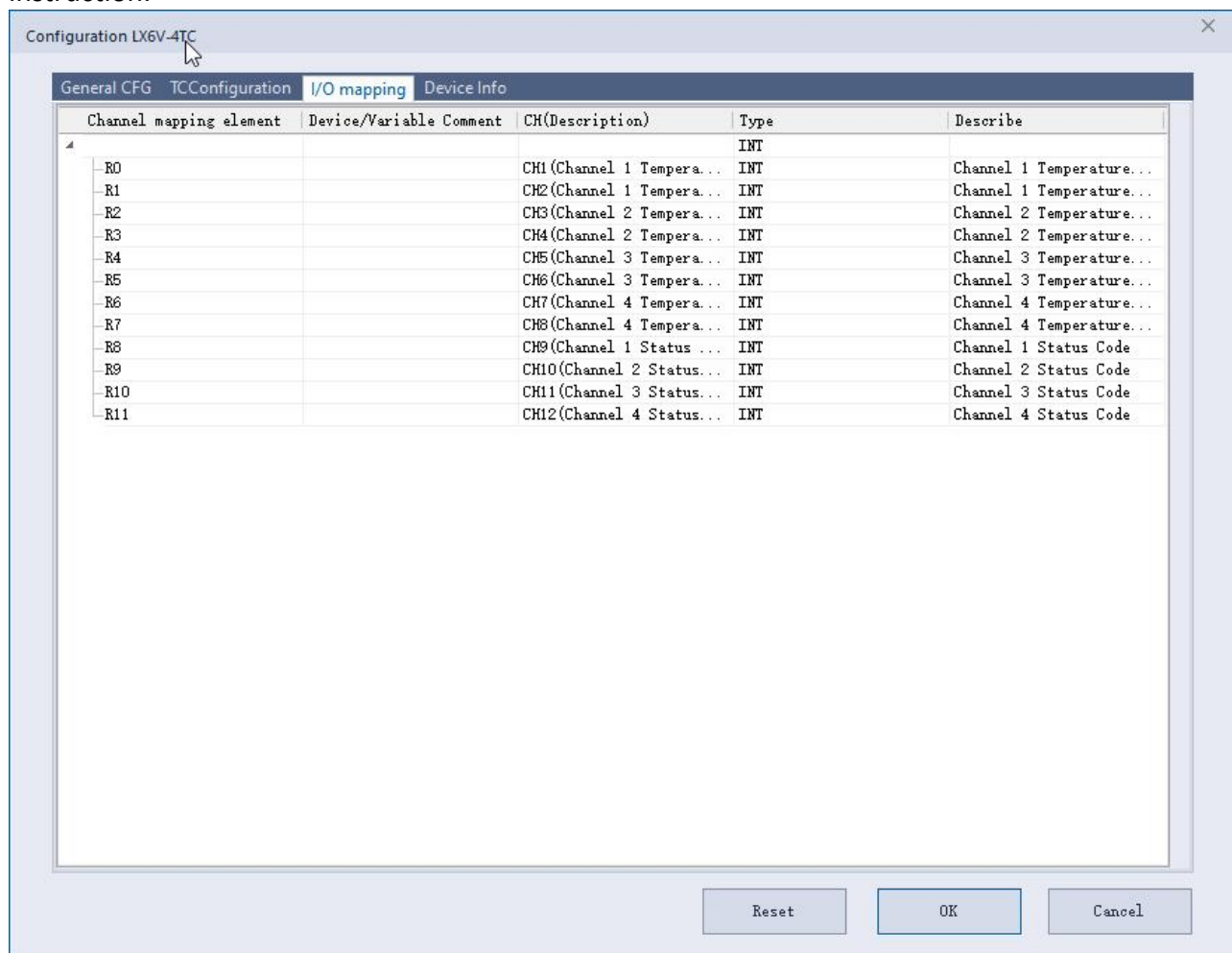
channel temperature data. The default filtering time is 5s. Please choose the appropriate filtering time according to the requirements of actual application scenarios for channel output data;

④ Enable overlimit detection: Channel temperature data overlimit judgment switch, when overlimit detection is enabled, the upper and lower limits of temperature can be set. When the temperature output by the channel is greater than the upper limit of temperature or less than the lower limit of temperature, the state of this channel will output a channel over to limit warning;

⑤ Enable temperature offset: Channel temperature data offset enable switch. When temperature offset is enabled, the output temperature data of the channel will be offset;

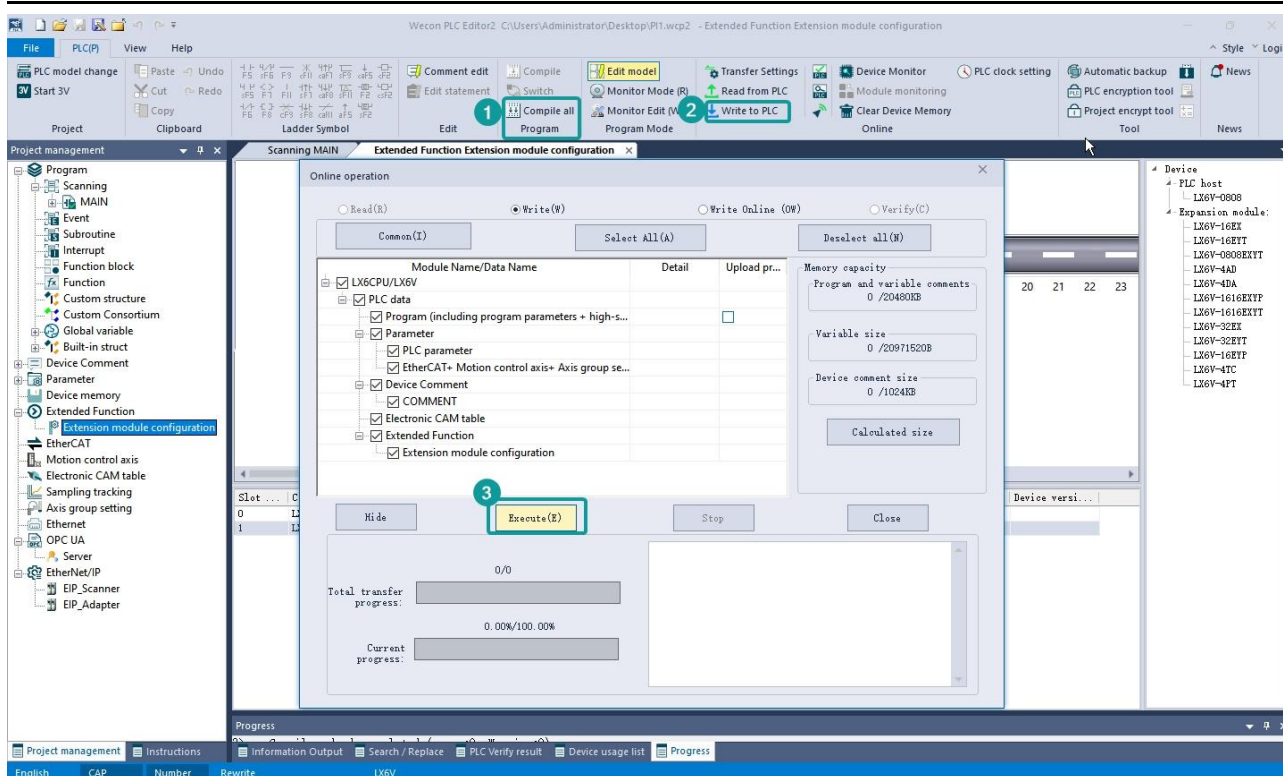
(3) I/O mapping

By default, channel are mapped into the R device according to the current number of module channels. The following figure shows the mapping of the modules CH1 to CH12 to the R0 to R11 device. The temperature value data type of the channel is REAL. If it is necessary to display the channel 1 The temperature value can be viewed after assigning a variable using the DEMOV instruction.



(4) Download configuration

Click OK to save the configuration, according to the interface shown in the figure to download the module configuration to the PLC.

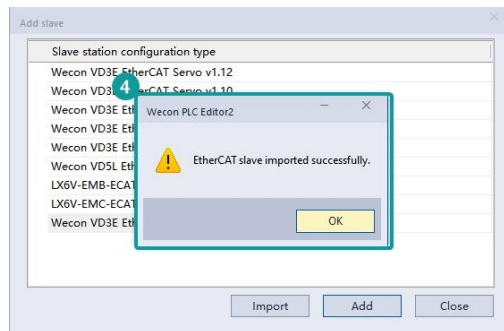
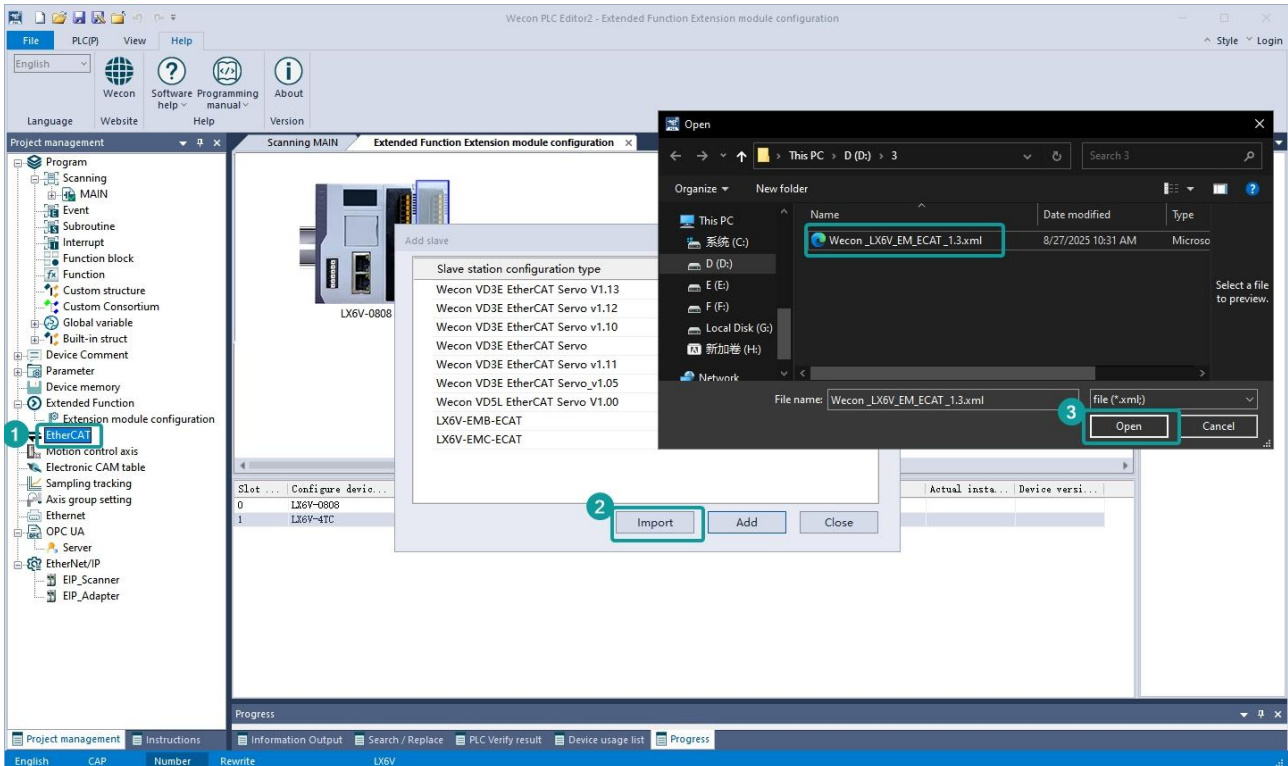


4.2 Used on LX6V to EM□ to ECAT module

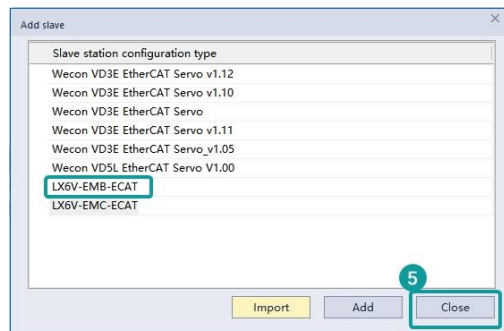


(1) First add EtherCAT device

According to steps ① to ④ in the figure below, right to click EtherCAT, and click [New] to >[Import] to import the ESI device description file of the device;

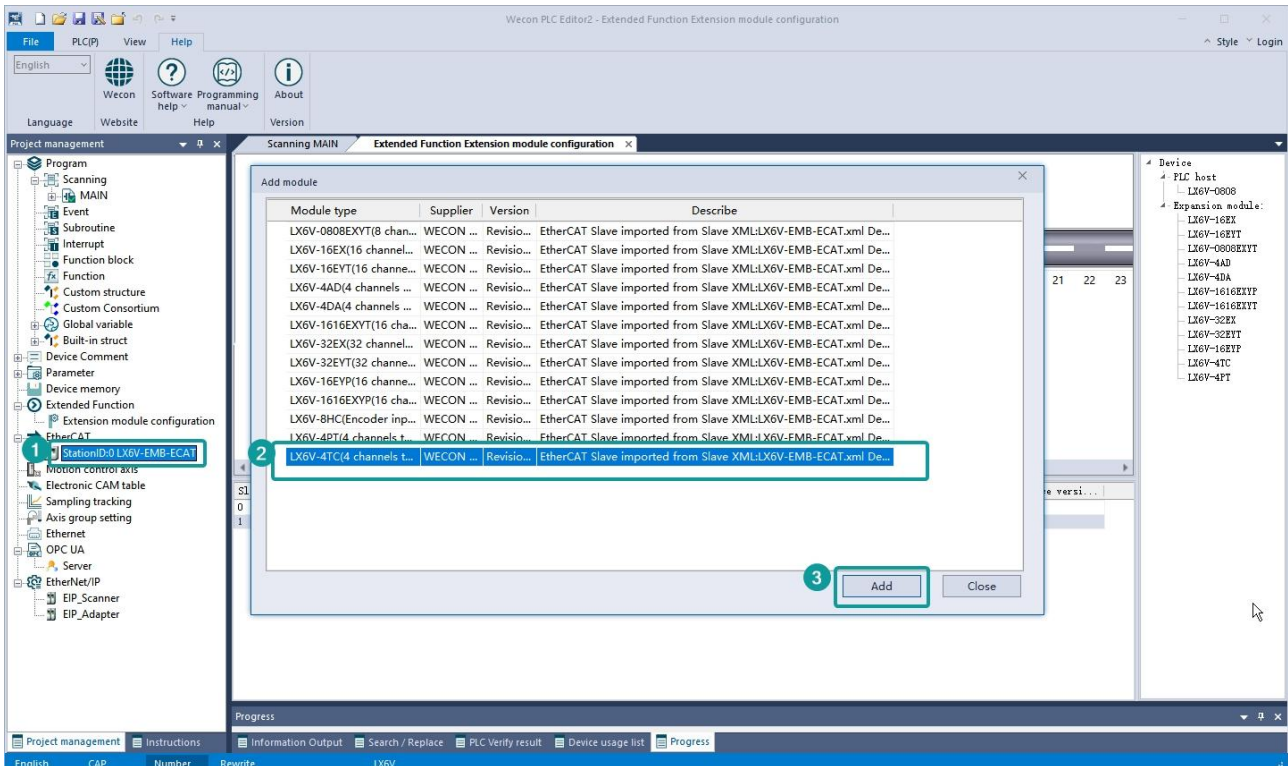


After the import is completed, select the coupler according to the module model and location connected to PLC (the figure below takes LX6V to EMB to ECAT as an example);



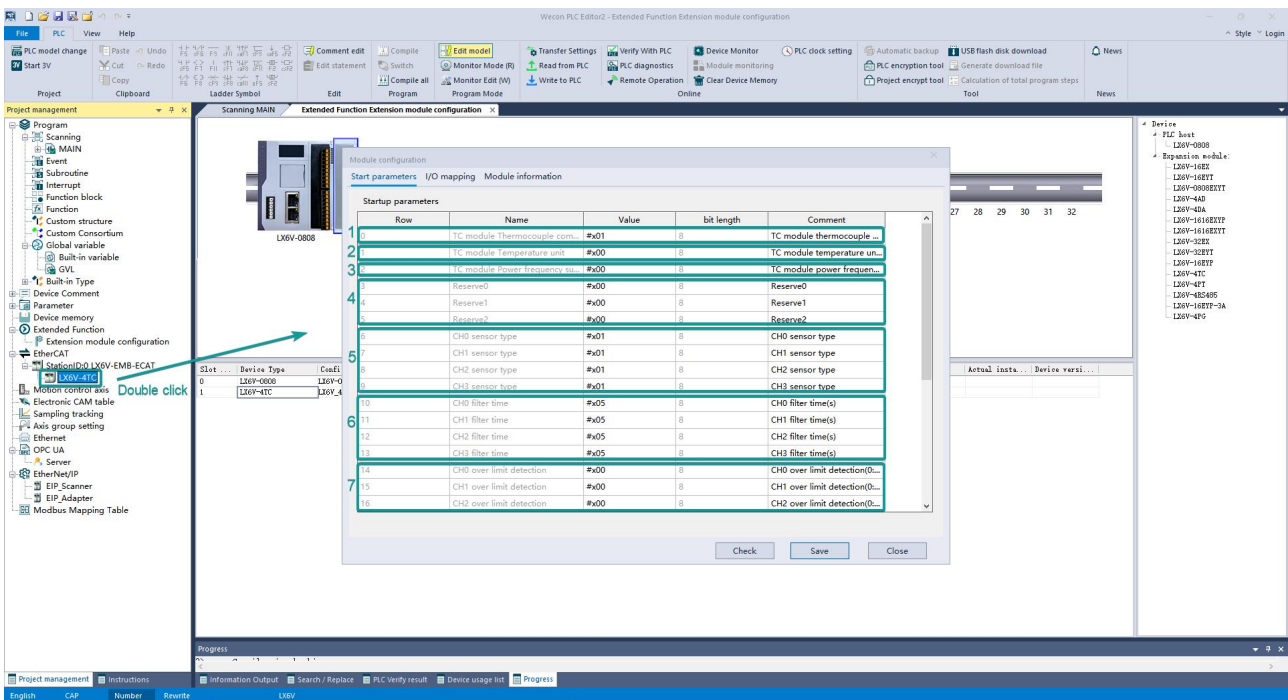
(2) Configuration module

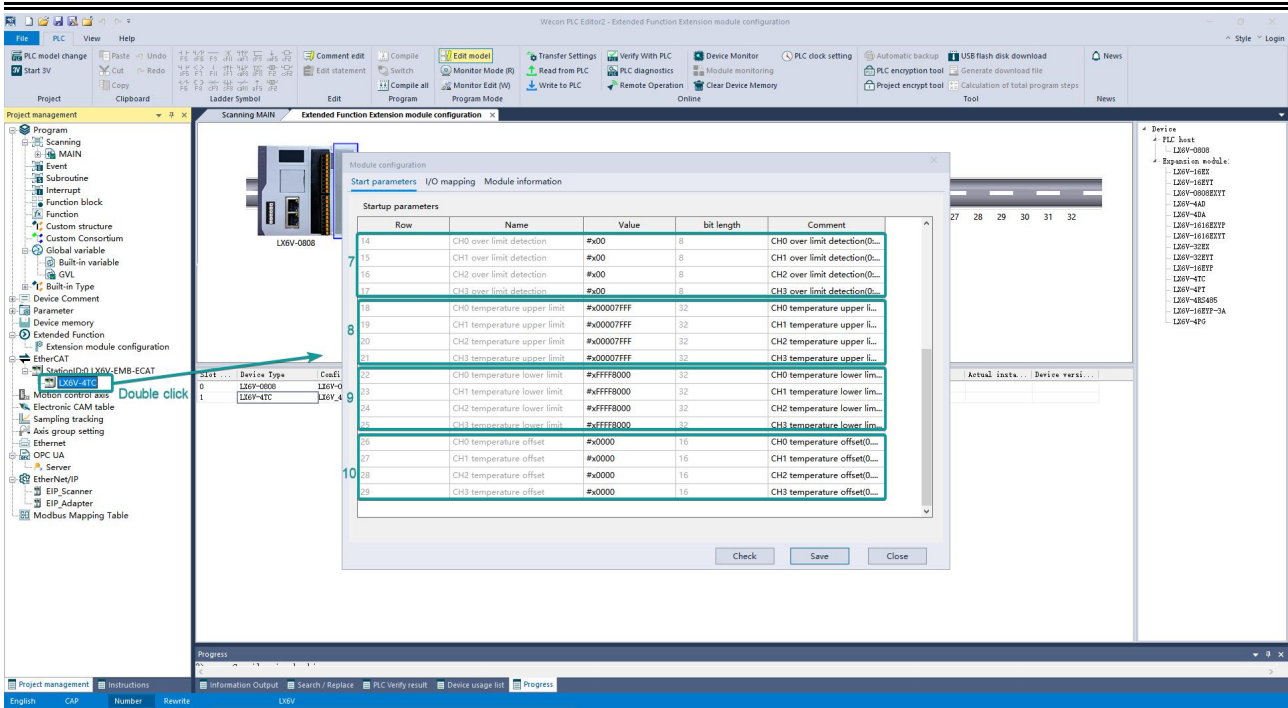
Right to click the currently added coupler to add the expansion module mounted to the current coupler.



Note: When the configuration module is inconsistent with the actual mounted module, an error will be reported that the OP cannot be successful.

(3) Configure module parameters





General configuration

① TC module thermocouple compensation: Set whether the module enables cold junction compensation, and the cold junction compensation is enabled by default;

0: No cold junction compensation;

Others: Enable cold junction compensation;

② TC module temperature unit: Set the temperature unit output by the module. The supported temperature unit types are Celsius (°C) or Fahrenheit (°F). The default unit is: Celsius;

0: Degrees Celsius (°C);

Others: Degrees Fahrenheit (°F);

③ TC module power frequency support: Set the power frequency suppression of the module to suppress 50Hz or suppress 60Hz, and the default suppression is 50Hz;

0: Suppress 50 Hz;

Others: Suppress 60 Hz;

④ Reserve: Reserve;

⑤ CHx sensor type: Set the type of sensor connected to the channel;

Supported sensor types:

0: Not enabled

1: K;

2: J;

3: E;

4: B;

5: N

6: R

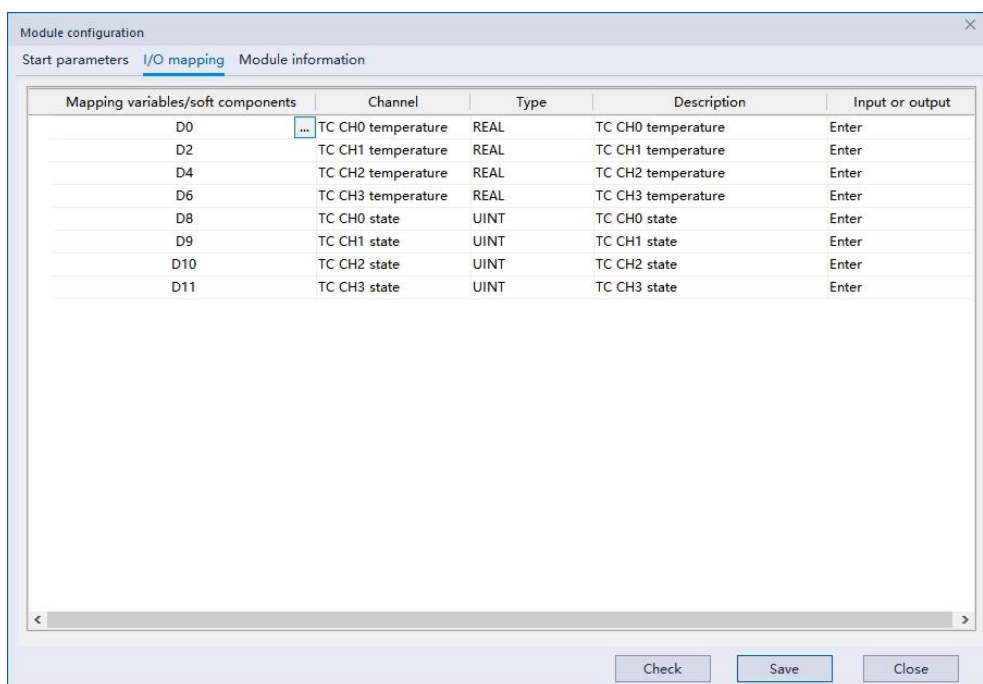
7: S

8: T

- ⑥ CHx filtering time: Used to specify the filtering time of the current channel. The supported filtering time is 0 to 100s, it is used to reduce the fluctuation of channel temperature data. The default filtering time is 5s;
- ⑦ CHx overlimit detection: Overlimit detection enables configuration, 0: Overlimit detection detection is not enabled, others: Enable over limit detection
- ⑧ CHx temperature upper limit: The upper limit value of the channel over limit detection temperature;
- ⑨ CHx temperature lower limit: The lower limit value of the channel overlimit detection temperature;
- ⑩ CHx temperature offset: The offset of channel data, supported offset range: - 300 to + 300;

I/O mapping

The temperature and state of the module can be mapped to variables/device. For example, the following figure maps the temperature values of the CH0 to CH3 channels to the D0 to D7 device, and the status codes of the CH0 to CH3 channels to the D8 to D11 device.



Click save configuration and download the configuration to PLC.

5 Object dictionary

Model	Index	Sub - index	Description	Data Type	Range	Read - write	Unit	Default	Name
LX6V - 4TC	16#8000	16#01	TC module thermocouple cold junction compensation 0: No compensation Others: Cold junction compensation	UINT8	0 to 255	W	-	1	TC module thermocouple compensation
		16#02	TC module temperature unit 0: Degrees Celsius (°C) Others: Degrees Fahrenheit (°F)	UINT8	0 to 255	W	-	0	TC module temperature unit
		16#03	TC module power frequency suppression 0: Suppress 50 Hz Others: Suppress 60Hz	UINT8	0 to 255	W	-	0	TC module power frequency suppression
		16#04	Reserve parameter 0	UINT8	0 to 255	W	-	0	Reserve 0
		16#05	Reserve parameter 1	UINT8	0 to 255	W	-	0	Reserve 1
		16#06	Reserve parameter 2	UINT8	0 to 255	W	-	0	Reserve 2
	16#8001	16#01	Sensor type 0: Disable 1: K 2: J 3: E 4: B 5: N 6: R 7: S	UINT8	0 to 8	W	-	1	CH0 sensor type
		16#02							CH1 sensor type
		16#03							CH2 sensor type

Model	Index	Sub - index	Description	Data Type	Range	Read - write	Unit	Default	Name
	16#800 2	16#04	8: T Others: Not supported						CH3 sensor type
		16#01	TC module channel filtering time: 0 to 100s Others: 100s	UINT8	0 to 255	W	s	5	CH0 filter time
		16#02							CH1 filter time
		16#03							CH2 filter time
		16#04							CH3 filter time
	16#800 3	16#01	Overlimit detection enable 0: Disable Others: Enable	UINT8	0 to 255	W	-	0	CH0 overlimit detection
		16#02							CH1 overlimit detection
		16#03							CH2 overlimit detection
		16#04							CH3 overlimit detection
	16#800 4	16#01	Temperature unit: 0.1℃/0.1℉ The upper and lower limits of sensors are	INT32	-2147483648 to 2147483647	W	-	32767	CH0 temperature upper limit

Model	Index	Sub - index	Description	Data Type	Range	Read - write	Unit	Default	Name
		16#02	different for each model						CH1 temperature upper limit
		16#03							CH2 temperature upper limit
		16#04							CH3 temperature upper limit
	16#8005	16#01		INT32	-2147483648 to 2147483647	W	-	-32768	CH0 temperature lower limit
		16#02							CH1 temperature upper limit
		16#03							CH2 temperature upper limit
		16#04							CH3 temperature lower limit
	16#8006	16#01	Offset temperature value (0.1 °C/0.1 °F) 0: No offset	INT16	3000 to 3000	W	-	0	CH0 temperature offset

Model	Index	Sub - index	Description	Data Type	Range	Read - write	Unit	Default	Name
		16#02							CH1 temperature offset
		16#03							CH2 temperature offset
		16#04							CH3 temperature offset
	16#A000	16#00	Module status information	UINT16	-	R	-	-	Module status
		16#01	Version code	UINT16	-	R	-	-	Version
		16#02	Error status	UINT16	-	R	-	-	Run status
		16#03	Channel status	UINT16	-	R	-	-	Channel status
	16#6000	16#01	Current temperature value of TC CH0 to CH3 channel (°C/°F)	Float	-400 to 32767	R	-	-	TC CH0 temperature
		16#02		Float	-400 to 32767	R	-	-	TC CH1 temperature
		16#03		Float	-400 to 32767	R	-	-	TC CH2 temperature
		16#04		Float	to 400 to 32767	R	-	-	TC CH3 temperature
	16 # 6001	16#01	AD CH0 to CH3 channel value. Status code 0, no error 0xFF, sensor not supported 0x10, configuration	UINT16	0 to 65535	R	-	-	TC CH0 status
		16#02		UINT16	0 to 65535	R	-	-	TC CH1 status

Model	Index	Sub - index	Description	Data Type	Range	Read - write	Unit	Default	Name
		16#03	abnormal: Temperature overlimit configuration	UINT16	0 to 65535	R	-	-	TC CH2 status
		16#04	overlimit 0x11, configuration error: The upper limit of the over limit configuration is less than the lower limit 0x12, configuration error: Temperature offset configuration overlimit 0x13, configuration error: NTC B Value over limit 0x40, channel disconnection error 0x41, channel temperature overflow 0x42, channel temperature overlimit	UINT16	0 to 65535	R	-	-	TC CH3 status

6 Error code

Error code	Description	Action	Solution	Detection time
7080	Expansion module and checksum error	Continue to run	Detect whether there is external interference between the expansion module and the PLC.	Instruction running
7081	Expansion module communication message error	Continue to run	Detect whether there is external interference between the expansion module and the PLC	Instruction running
7083	Expansion module access error	Continue to run	Detect the link between the expansion module and the host	Instruction running
7084	The number of expansion modules configured does not match the actual number	Continue to run	Check whether the configuration is correct.	Instruction running
7110	Extension module configuration error	Stop running	Check whether the extension module is configured correctly	Instruction running

7 Version record

Revision date	Release version	Revisions
2025 to 07	V1.0	First edition