XF-E4RTD & XF-E2COM24

1. Ordinary thermistor temperature acquisition unit XF-E4RTD

1.1 Product Overview

XF-E4RTD series ordinary thermistor temperature acquisition expansion module, 4-channel thermistor temperature acquisition, power supply DC24V, compatible with XF, XSF series CPU unit products and XF series communication coupler units.

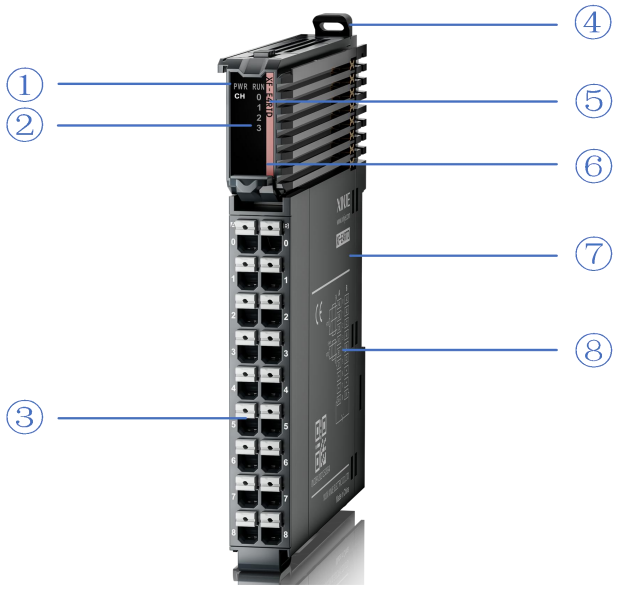
- 4-channel thermal resistance temperature acquisition;
- Compatible with three wire and two-wire thermal resistance sensors;
- Supports PT100, PT1000, CU50, CU100, NTC-5K, NTC-10K sensor types;
- 0.1 ℃, 1 ℃ resolution (optional);
- Conversion speed of 250ms/4CH, 500ms/4CH, 1000ms/4CH (optional);
- 12mm width design.

■ Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

1.2 Module view

1）Description of each section



No.	Name	No.	Name
①	System LED indicator light	②	Channel LED indicator light
③	Detachable terminal block	④	Buckle

⑤	Model indication	⑥	Color identification indicating module type
⑦	Module hardware and firmware versions	⑧	Wiring diagram

1.3General specifications

General specifications	
Item	Specification
Protection level	IP20
Anti vibration	Compliant with IEC61131-2 Under intermittent vibration (frequency 5-9Hz, constant amplitude 3.5mm peak displacement) and (frequency 9-150Hz, constant acceleration 1.0g peak acceleration) Under continuous intermittent vibration (frequency 5-9Hz half amplitude 1.75mm displacement) and (frequency 9-150Hz constant acceleration 0.5g constant frame amplitude) Scan 10 times in each direction of X, Y, and Z
Impact resistance	Compliant with IEC61131-2 standard Impact strength of 15G (peak) with a duration of 11ms is applied to three mutually perpendicular axes, with 3 impacts per axis (a total of 18 impacts)
Use altitude	0-2000m
Overvoltage level	II：Compliant with IEC61131-2
Pollution level	2, Compliant with IEC61131-2
Anti interference EMC	Compliant with IEC 61131-2 IEC61000-6-4 Type B
Related certifications	CE

1.4 Technical specification

Item		Specification
Number of input channels		4CH
Sensor type		PT100、PT1000、CU50、CU100、NTC-5K、NTC-10K
Temperature input range		Pls refer to the sensor accuracy table for details
Conversion speed		250ms, 500ms,1000msoptional (Default 500ms)
Resolution		1℃、0.1℃ optional (Default0.1℃)
Module power supply	Rated input	DC24V±10%，6mA
	Protection	Reverse polarity protection
Accuracy	Normal temperature 25℃±5℃	Pls refer to the sensor accuracy table for details

	Full temperature range -20~55℃	Pls refer to the sensor accuracy table for details
Isolation		Channel not isolated, Power isolated
Module power consumption		0.53W (Backplane bus)+0.14W(External input)
Weight		82g
Maximum cable length		200m(Only three wire PT100 PT1000、CU50、CU100；Two line sensors cannot measure line resistance, while NTC sensors have low sensor accuracy and cannot guarantee sampling accuracy over long distances

Example of channel conversion speed calculation:

If the sampling time is set to 250ms, then each channel=250ms/4 channels=62.5ms.
When channels are not disabled, sampling time=number of channels 4*62.5ms=250ms for each 4 channels;
When disabling a channel and enabling three channels, the sampling time is 3*62.5ms=187.5ms;
When disabling two channels and enabling two channels, the sampling time is 2*62.5ms=125ms.

1.5 Sensor Accuracy Table

Type		Temperature lower limit	temperature upper limit	Normal temperature accuracy（25℃±5℃）	Full temperature range accuracy（-20~55℃）
PT100		-200.0	850.0	±1℃	±2℃
PT1000		-200.0	850.0	±1℃	±2℃
CU50		-50.0	150.0	±1℃	±2℃
CU100		-50.0	150.0	±1℃	±2℃
NTC-5K	B value:2000~6000	Resistance value: 40000Ω Calculate the temperature	Resistance value: 400Ω Calculate the temperature	±1.5℃	±3℃
NTC-10K	B value: 2000~6000	Resistance value: 40000Ω Calculate	Resistance value: 400Ω Calculate the	±1.5℃	±3℃

		the temperature	temperature		

The above accuracy indicators are all technical indicators in ℃ units.

The resistance measurement range of NTC sensor is 400 Ω~40000 Ω, the setting range of B value is 2000~6000, and the sensor label supports 5K and 10K. The temperature measurement range of NTC sensor is calculated based on the B value and sensor label setting. The temperature calculation formula is as follows:

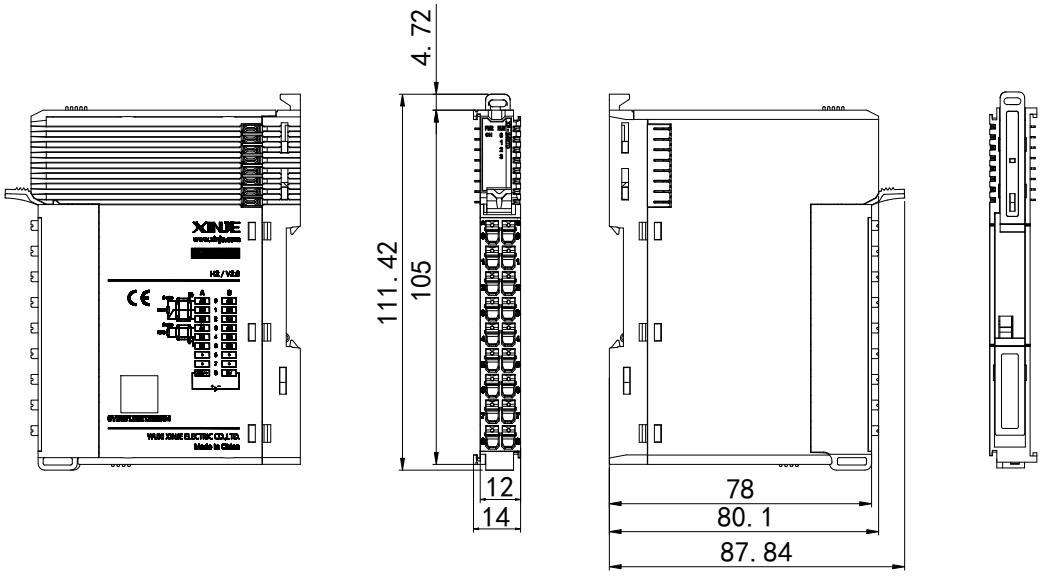
$T=\frac{298.15*B}{298.15*\ln(\frac{R_L}{R_{25}})+B}-273.15$ (Refer to the method specified in 4.9 of the Chinese national standard GB/T6663.1-2007)

The resistance value measured by R_L has a maximum value of 40000Ω and a minimum value of 400Ω.
B is the B value, with a mini value of 2000 and a max value of 6000.
R_{25} is the sensor label, currently supporting 5K and 10K.

For example:
The NTC sensor is NTC-5K, with a B value set to 3000, a maximum R_L value of 40000 Ω, and a minimum R_L value of 400Ω. The lower temperature limit is calculated to be -26 ℃ (rounded to the nearest integer), and the upper temperature limit is calculated to be 125 ℃ (rounded to the nearest integer).

1.6 Installation&Wiring

Dimension



（Unit：mm）

2. Serial Communication Unit XF-E2COM24

2.1 Product overview

XF-E2CO4 serial communication expansion module has 2 serial channels and supports 232 and 485 communication (each channel can only select one of 232 and 485 for communication). It is compatible with XF, XSF series CPU unit products and XF series communication coupler units.

- Two independent 232/485 serial communication channels;
- Supports Modbus master, slave, and free format communication;
- Channel and internal isolation to enhance anti-interference capability;
- 12mm width design.

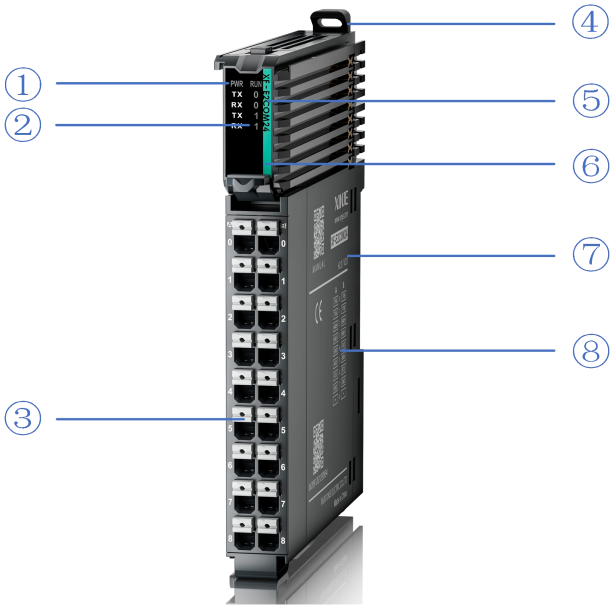
■ Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

A single coupler can support up to 8 serial communication modules for expansion.

2.2 Module view

1）Description of each section



No.	Name	No.	Name
①	System LED indicator light	②	Channel LED indicator light

No.	Name	No.	Name
③	Detachable terminal block	④	Buckle
⑤	Model indication	⑥	Color identification indicating module type
⑦	Module hardware and firmware versions	⑧	Wiring diagram

2.3 General specifications

General specifications		
Item		Specification
Operating temperature	Max temperature	55℃
	Min temperature	-20℃
Storage temperature	Max temperature	70℃
	Min temperature	-40℃
Environmental humidity (including operation/storage)	Upper limit	95%
	Lower limit	10%
Protection level		IP20
Anti vibration		Compliant with IEC61131-2 Under intermittent vibration (frequency 5-9Hz, constant amplitude 3.5mm peak displacement) and (frequency 9-150Hz, constant acceleration 1.0g peak acceleration) Under continuous intermittent vibration (frequency 5-9Hz half amplitude 1.75mm displacement) and (frequency 9-150Hz constant acceleration 0.5g constant frame amplitude) Scan 10 times in each direction of X, Y, and Z
Impact resistance		Compliant with IEC61131-2 standard Impact strength of 15G (peak) with a duration of 11ms is applied to three mutually perpendicular axes, with 3 impacts per axis (a total of 18 impacts)
Use environment		Non corrosive gas
Use altitude		0-2000 m
Overvoltage level		II: Compliant with IEC61131-2
Pollution level		2; Compliant with IEC61131-2
Anti interference EMC		Compliant with IEC 61131-2 IEC61000-6-4 Type B

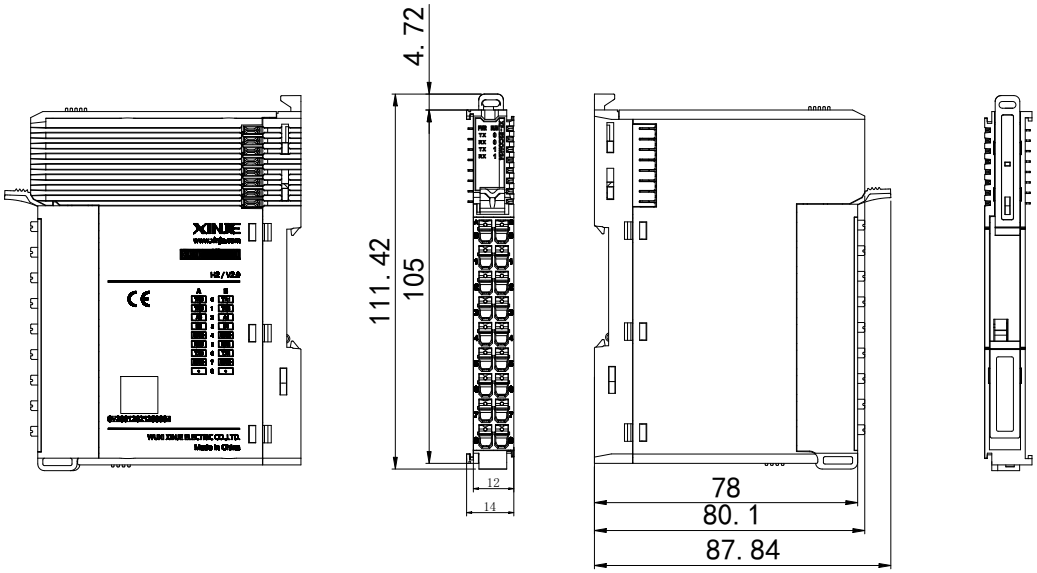
General specifications	
Item	Specification
Related certifications	CE

2.4 Technical specification

Item		Specification
Number of ports		2
Communication port		RS-232 and RS-485 (choose one of 232 and 485 for single COM)
Communication protocol		Modbus-RTU/ASCII Master/Slave/Free Format
Communication specifications	communication mode	Half-duplex
	Channel isolation	Yes
	Baud rate	2400bps、4800bps、9600bps、19200bps (Default)、38400bps、57600bps、115200bps
	Data bits	7 or 8 (Default)
	Stop bit	1(Default) or 2
	Check bit	Odd, even (Default), none
Communication distance		RS-232 15m (19200bps) RS-485 1200m (9600bps)
Max number of modules		8 pcs (The right extension of the main body and the remote IO adapter each support max 8 modules)
Max number of bytes		256 bytes(Modbus)　1024 bytes(Free Format)

2.5 Installation&Wiring

Dimension



（Unit：mm）