COMPANY PROFILE

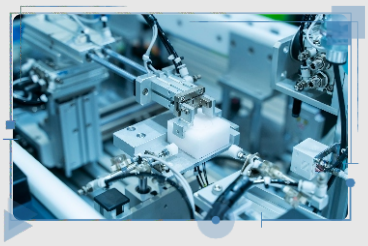
Chengkong Electronics,
Professional data collection product supplier。

More than ten years of ingenious quality assurance
and first-class data collection services

Product Categories

Ⅰ	Analog input module	Ⅱ	Analog output module
Ⅲ	AC input module	Ⅳ	Weighing module
Ⅴ	TC/RTD temperature acquisition module	Ⅵ	Analog input and output module
Ⅶ	Switching/digital module	Ⅷ	Develop custom modules
Ⅸ	signal isolator	Ⅹ	Interface conversion module

Application areas

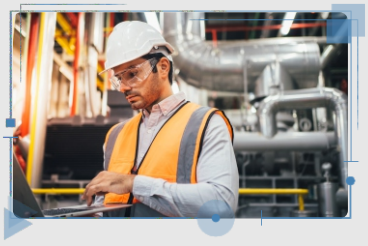


Automation equipment

Medical electronics

Smart manufacturing

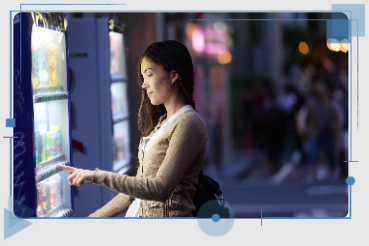
Remote monitoring



industrial control

Smart warehousing

Instruments anemometer



new retail

Thermal resistance acquisition module

Overview

The CK module is a new generation of modular data collector based on embedded system. It adopts standard DIN35 rail installation method, which is simple to install on site and flexible to use; it can cope with various field applications. The module is equipped with isolated RS485 interface and Ethernet dual-port cascade interface. It can communicate with PC or PLC alone, or it can be used in networking with multiple 485 modules.

CK-3043ES/3083ES thermal resistor data collector can collect up to 8 thermal resistor signals. The module uses a high-performance 16-bit AD chip with a measurement accuracy of ±0.5℃. It is suitable for collecting various temperature signals in industrial sites.

CK-3043ES/3083ES adopts photoelectric technology to effectively ensure reliable and safe data collection.

Technical Parameters

◆Embedded real-time operating system
◆Input channel: 4/8-channel thermal resistor (channel fully isolated)
◆Input type: PT100/PT1000
◆Communication mode: dual network port cascade + RS485 interface
◆AD conversion resolution: 16 bits
◆Measurement accuracy: ±0.5℃ (typical value)
◆Conversion rate: 3043ES --25 times/second (full channel)3083ES--50 times/second (full channel)
◆Circuit break detection
◆Wide power supply range: DC +10～+30V
◆Address/baud rate can be configured by the user
◆Support MODBUS-RTU, MODBUS-TCP
◆ ±15KV ESD protection
◆Isolation withstand voltage: DC 2000V
◆Operating temperature range: -40℃ ～80℃
◆Industrial grade plastic housing, standard DIN35 rail installation

Application

Automation equipment
Remote monitoring and data collection
Intelligent manufacturing/smart factory
Industrial site control
Smart warehousing and monitoring
Medical and industrial control product development
Packaging and material transfer
Electronic product manufacturing

Function Configuration

Module Model	CK-3043ES	CK-3083ES
RTD	4-CH	8-CH
RS485	supported	supported
ETH	supported	supported

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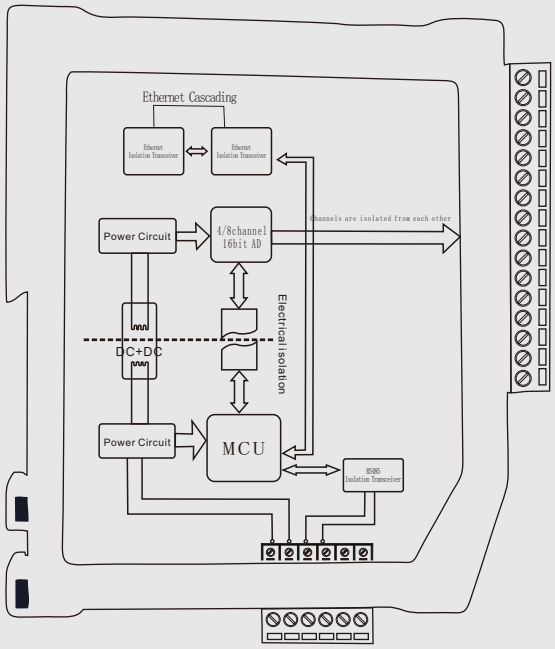
CK-3043ES **4-channel RTD**
CK-3083ES **8-channel RTD**

Input: PT100/PT1000
Output: RS485/ETH
modbus-RTU/modbus-TCP protocol

CK-3043ES/3083ES is a thermal resistor input data logger with up to 8 thermal resistor input channels. It is suitable for collecting various temperature signals at industrial sites.

Module working principle diagram



High-precision data collection

CK-3043ES/3083ES uses an advanced △-∑ high-precision integrated digital mode converter with a resolution of up to 16 bits and the measurement accuracy is better than 0.5 ° C (typical value). It can meet the occasion of industrial scenes and security, smart buildings, smart home, power monitoring, process control, etc. with high measurement requirements.

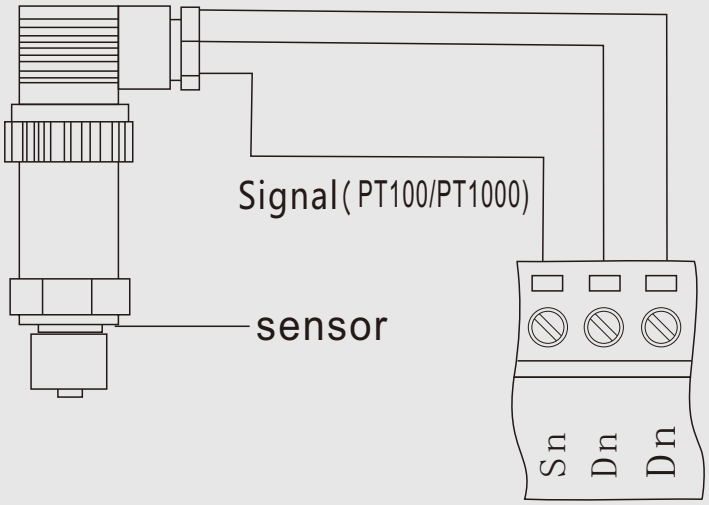
Input and output isolation

Products for industrial application design: DC-DC transformation can beoed to beolate the power supply and main control circuit power supply. At the same time, the control unit and signal acquisition unit adopt photoelectric isolation technology to achieve electrical isolation to effectively guarantee reliable and safe data collection.

Surge protection

The module is equipped with a transient suppression circuit that can effectively suppress various surge pulses and protect the module to work reliably in harsh environments.

Thermal resistor input



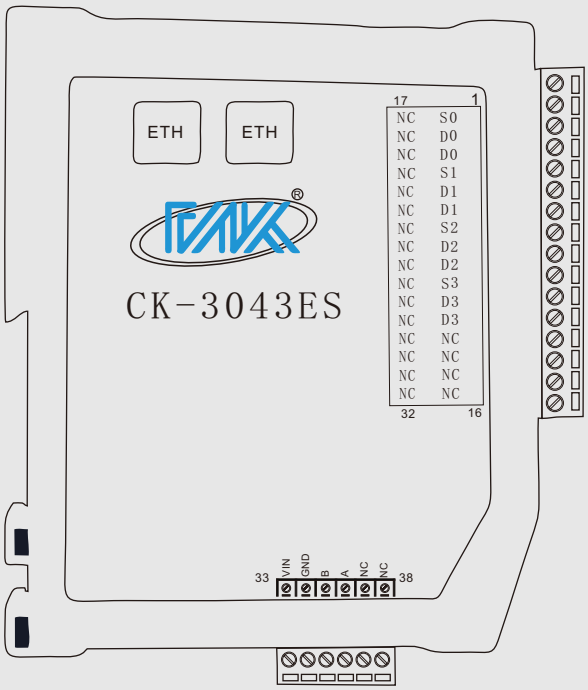
explanation:

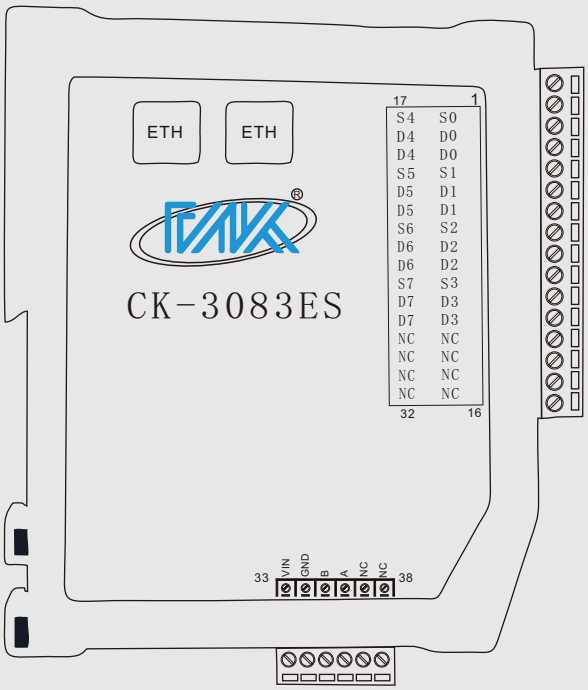
Same color wire connection Dn

Color single line connection Sn

Wiring diagram of three-wire thermal resistor input

Port Information





CK-3043ES/3083ESPort Description

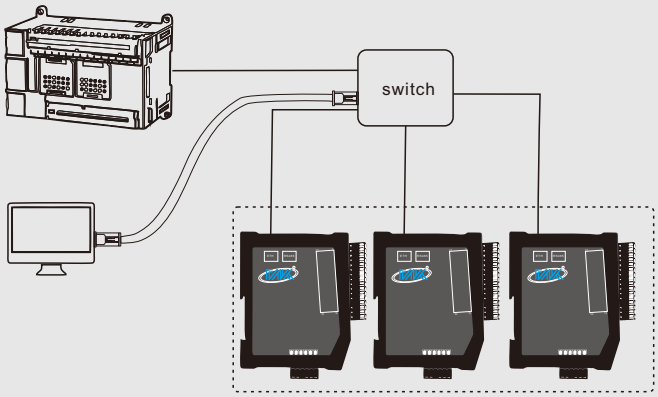
Port	Port ID	Port Function
1	S0	Connect thermal resistor 0 color single wire
2	D0	Connect two wires of the same color to thermal resistor 0
3	D0	Connect two wires of the same color to thermal resistor 0
4	S1	Connect thermal resistor 1 color single wire
5	D1	Connect two wires of the same color to thermal resistor 1
6	D1	Connect two wires of the same color to thermal resistor 1
7	S2	Connect thermal resistor 2 color single wire
8	D2	Connect two wires of the same color to thermal resistor 2
9	D2	Connect two wires of the same color to thermal resistor 2
10	S3	Connect thermal resistor 3 color single wire
11	D3	Connect two wires of the same color to thermal resistor 3
12	D3	Connect two wires of the same color to thermal resistor 3
13	NC	Null Port
14	NC	Null Port
15	NC	Null Port
16	NC	Null Port
17	S4	Connect thermal resistor 4 color single wire
18	D4	Connect two wires of the same color to thermal resistor 4
19	D4	Connect two wires of the same color to thermal resistor 4

Port	Port ID	Port Function
20	S5	Connect thermal resistor 5 color single wire
21	D5	Connect two wires of the same color to thermal resistor 5
22	D5	Connect two wires of the same color to thermal resistor 5
23	S6	Connect thermal resistor 6 color single wire
24	D6	Connect two wires of the same color to thermal resistor 6
25	D6	Connect two wires of the same color to thermal resistor 6
26	S7	Connect thermal resistor 7 color single wire
27	D7	Connect two wires of the same color to thermal resistor 7
28	D7	Connect two wires of the same color to thermal resistor 7
29	NC	Null Port
30	NC	Null Port
31	NC	Null Port
32	NC	Null Port
33	VIN	Power input positive terminal
34	GND	Power Ground
35	B	RS485 signal negative input terminal
36	A	RS485 signal positive input terminal
37	NC	Null Port
38	NC	Null Port

通信接口

Ethernet connection

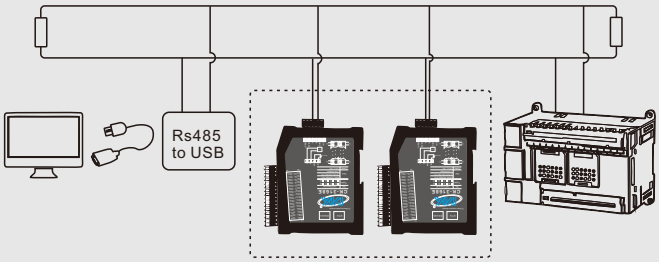
Some modules of the CK series support 100M/10M standard Ethernet interface. Support Modbus TCP protocol and support automatic polarity identification (AUTO MDIX) of the network port.



CK module network connection diagram through Ethernet interface device

RS485 Connection

The RS485 interface of the CK series module is a standard RS485 interface, which adopts differential signal logic. The logic "1" is represented by a voltage difference of +(2~6)V between the two lines; the logic "0" is represented by a voltage difference of -(2~6)V between the two lines. The network connection of RS485 devices is very simple. You only need to connect the positive and negative ends of the device to the bus. When the communication distance is long, you should pay special attention to the network topology. The RS485 network topology generally adopts a terminal matching bus structure, and does not support ring or star networks. The lead-out length from the bus to each node should be as short as possible to minimize the impact of the reflected signal in the lead-out line on the bus signal. For more detailed information, please refer to the relevant information

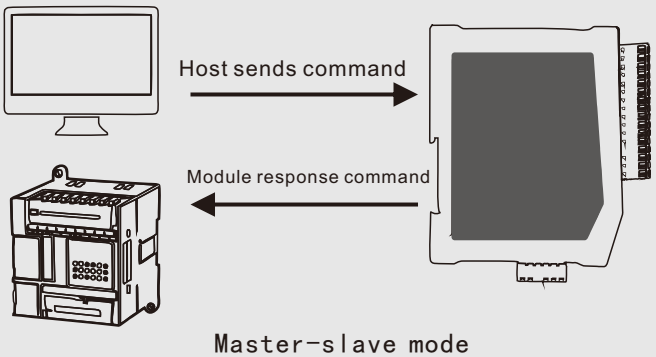


Schematic diagram of the module connecting to other devices via RS485 interface

Module communication mode

Master-slave mode

The communication mode of CK-3043E/3083E module is usually master-slave mode (one question and one answer mode); the host sends commands to the module through the communication interface, and the module responds accordingly after receiving the correct command.



Master-slave mode

Serial communication parameters (default 9600 8,N,1 address 01)

Mailing address

The communication address range of the CK-3043E/3083E module is 01~F7(1~247), and the module address is factory set to 01; the module communication address can be modified by the user through commands according to site needs. For specific methods, please refer to the corresponding commands.

Communication Protocol

MODBUS-RTU/ MODBUS-TCP Protocol

Modbus protocol is a universal communication protocol that has been widely used in today's industrial control field. Through this protocol, controllers can communicate with each other or with other devices via a network (such as Ethernet).

The module MODBUS address allocation is as follows:

Order (HEX)	Register address (HEX)	Data Description
03	2	Sensor channel 1 temperature value [Note 0]
03	3	Sensor channel 2 temperature value
03	4	Sensor channel 3 temperature value
03	5	Sensor channel 4 temperature value
03	6	Sensor channel 5 temperature value
03	7	Sensor channel 6 temperature value
03	8	Sensor channel 7 temperature value
03	9	Sensor channel 8 temperature value
01/05/0F	0	Read and write digital quantity 0 output status (write 1 and the load is powered)
01/05/0F	1	Read and write digital quantity 1 output status (write 1 and the load is powered)
01/05/0F	2	Read and write digital quantity 2 output status (write 1 and the load is powered)
01/05/0F	3	Read and write digital quantity 3 output status (write 1 and the load is powered)
01/05/0F	4	Read and write digital quantity 4 output status (write 1 and the load is powered)
01/05/0F	5	Read and write digital quantity 5 output status (write 1 and the load is powered)
01/05/0F	6	Read and write digital quantity 6 output status (write 1 and the load is powered)
01/05/0F	7	Read and write digital quantity 7 output status (write 1 and the load is powered)
01/05/0F	20	Read and write switch output status 0~7 channels (bit 0 represents channel 0)

Note 0: The temperature value is a 2-byte signed integer, which is 10 times the actual temperature value, in °C.

Example: The return value is 013AH=314D. The actual temperature value is: 31.4°C

Communication rate

CK-3043ES/3083ES module RS485 supports baud rates:1200bps, 2400bps, 4800bps, 9600bps, 14400bps, 19200bps, 115200bps; the module communication rate can be modified by the user through commands according to site needs. For specific methods, please refer to the corresponding commands.

The CK-3043ES/3083ES module supports the industrial standard MODBUS-RTU (RS485)/MODBUS-TCP (Ethernet) protocol. The module works in the MODBUS slave (server) state. It can communicate with PLCs, RTUs or computers of various brands. The module supports the following MODBUS commands:

Serial number	Order (HEX)	Function	Remark
1	03	Read module temperature data	

Temperature acquisition module Modbus output data calculation:

The read data result is a 16-bit signed number, and the result value is 10 times the Celsius value.

$$\text{Measurement result} = \frac{\text{Data Results}}{10}$$

For example:

Measurement of PT100 thermal resistor, the read data is 1678, the measurement result is 1678÷10=167.8℃;
Measurement of K-type thermocouple, the read data is 5089, the measurement result is 5089÷10=508.9℃
Measurement of PT100 thermal resistor, the read data is -389, the measurement result is -389÷10=-38.9℃

Temperature acquisition module Modbus RTU communication example:

In actual use, due to different module configuration addresses and different input signal amplitudes, the data is not completely consistent with the example.When using PLC and other communication, you may not need to understand the underlying communication protocol, so you do not need to understand the following table.Please refer to the communication examples of related products.

Example	Read PT100 thermal resistance acquisition results
Module Description	Number of channels: 4, address: 1
Master sends	01 03 00 02 00 04 E5 C9
Module Reply	01 03 08 06 18 03 D9 01 5A 03 15 70 CC
The main station sends analysis	01:Module slave address 03: Modbus RTU Read holding register function code 00 02:0x0002 Register start address 00 04:Number of registers E5 C9:CRC Check digit
Module reply analysis	01:Module slave address 03: Modbus RTU Read holding register function code 08:Number of data bytes

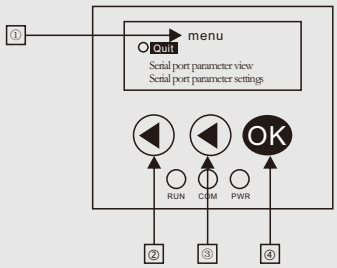
Channel	Receiving Data	Hexadecimal	Decimal	Parsing results
0	06 18	0x0618	1560	156.0℃
1	03 D9	0x03D9	985	98. 5℃
2	01 5A	0x015A	346	34.6℃
3	03 15	0x0315	789	78.9℃

70 CC:CRC Check digit

Menu Operation

CK series modules, some models are equipped with OLED menu (see function configuration table for details). Through the OLED menu, you can query and configure serial communication parameters, Ethernet communication parameters, sensor calibration, etc.

Menu Appearance Description



①Menu display area;
②Left button: select the position to move left, move up, or adjust parameters;
③Down key: select position down, parameter adjustment button;
④OK button: enter the menu and confirm the adjustment parameter button;

Menu Operation

Enter and exit menu

In standby mode, press the OK button to enter the menu settings.

Move the selection items up and down in the menu, select the exit item, and press the OK button to exit the menu settings.

Serial port parameter settings

①In standby mode, press the OK button to enter the menu settings,move down to the serial port parameter settings, and press the OK button to enter;
②Move up or down to select the parameter you want to set, and press OK to enter. For example: To set the device station number, move the cursor to the device station number and press OK.
③When setting IP, move the cursor to the left to select the parameter to be adjusted, and press the up key to adjust the parameter. After adjustment, press the OK key to confirm the setting parameter;
④Move the cursor to the Exit option and press OK to exit the settings;

After the network parameters are set, they will not take effect immediately. Exit the network parameter settings, restart the device or power on again to make the settings effective.
If DHCP is turned on in the network parameter settings and the series is set to dynamic IP, the IP set in the menu will be invalid, waiting for the router to assign an IP, and the menu related items will be hidden. DHCP is turned off, the system is set to static IP, and the IP set in the menu will take effect.
The factory default settings are DHCP: Off, IP: 192.168.1.30, Subnet Mask: 255.255.255.0, Gateway: 192.168.1.1.

Electrical parameters

Unless otherwise specified, the electrical parameters of the CK-3043ES/3083ES data acquisition module are the values when Tamb=25℃.

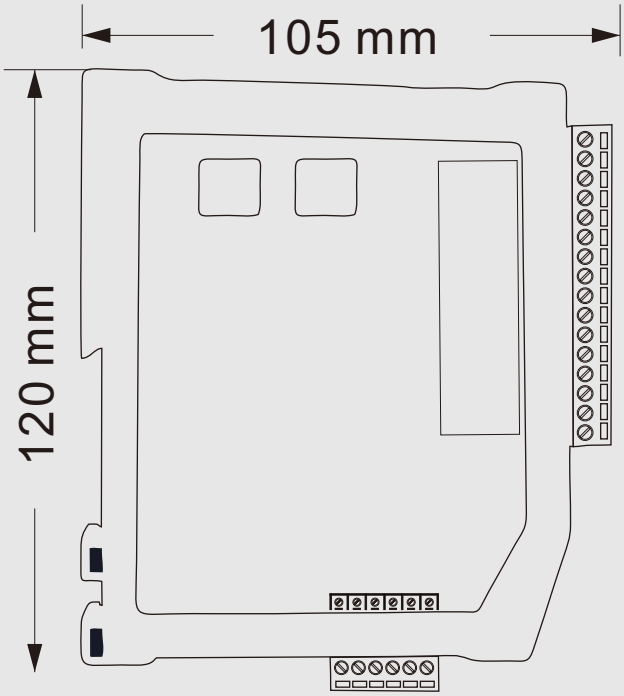
Module parameters

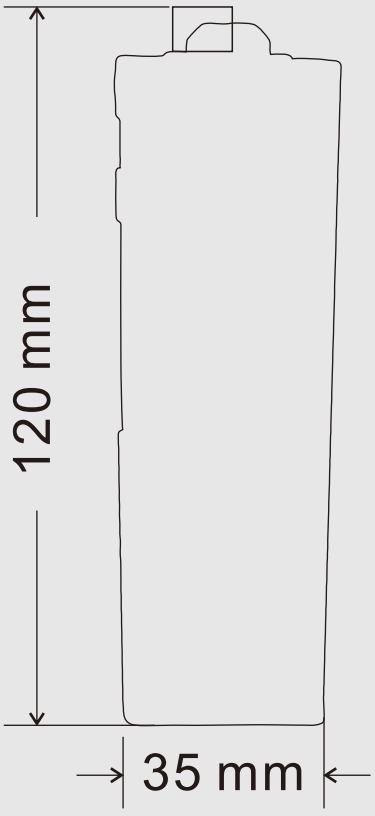
参数	Parameter	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
供电电压	Power Supply	+10	---	+30	V
看门狗复位周期	Watchdog Period		1		S
输入保护	Input Protect		100/60		mA/V

Analog input parameters

参数	Parameter	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
分辨率	Resolution		16		bit
精度	Accuracy		±0.5℃		%ofFS
零点飘移	Zero Drift	-50		+50	uV/℃
温度系数	Temperature Coefficient			±50	ppm/℃
非线性	Differential Nonlinearity			±2	LSB
隔离电压	Isolation Voltage			2000	Vdc

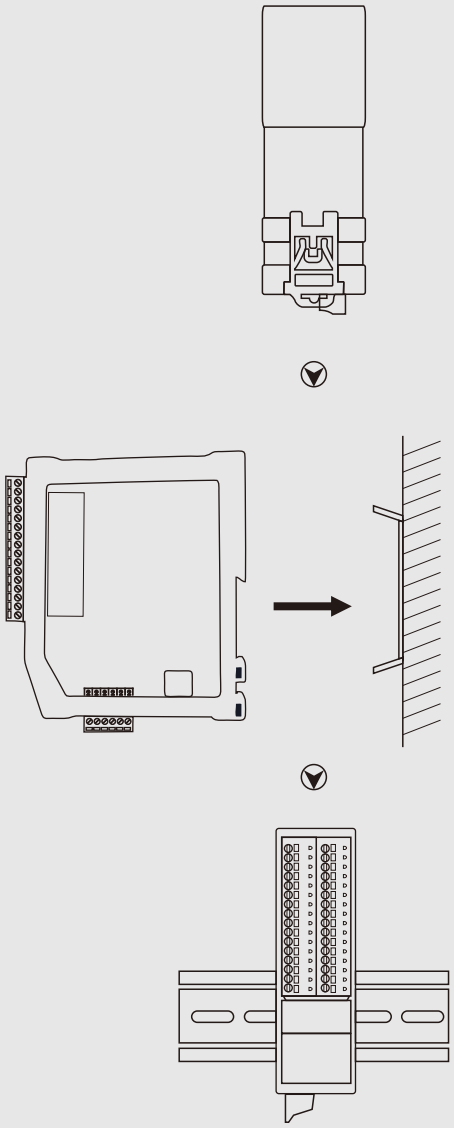
Mechanical Dimensions





Installation method

CK-3043E/3083E supports DIN35 rail installation. Users can easily install or remove the module on the rail, providing assistance for industrial site application and installation.



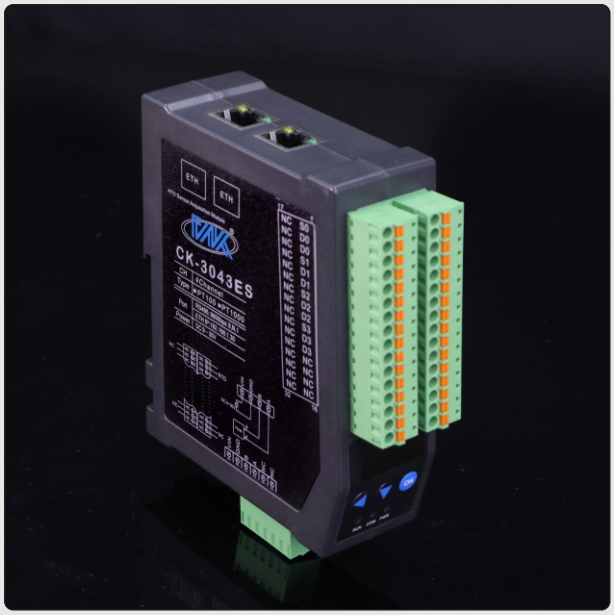
Three guarantees and maintenance instructions

Within five years from the date of sale, if the product is damaged or the product quality is lower than the technical indicators under the conditions of storage, transportation and use, the user can return it to the factory for free repair. If the damage is caused by violation of operating regulations and requirements , the device fee and repair fee shall be paid.

Disclaimer

Copyright

Product display picture



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Wiring Diagram