Integrated EtherCAT bus remote IO module

MODEL：CK-EC7XXX

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Analog acquisition module

Overview

The CK-EC series 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 EtherCAT communication, which can communicate with PC, PLC, touch screen and other devices that support EtherCAT protocol.

CK-EC7XXX analog input data collector can collect up to 8 differential or 16 single-ended analog signals; the module adopts high-performance 24-bit AD chip, and the collection and measurement accuracy is ±0.1%. It is suitable for collecting various voltage and current signals in industrial sites.

CK-EC7XXX adopts photoelectric isolation technology to effectively ensure reliable and safe data collection.

Technical Parameters

◆Embedded real-time operating system
◆Analog input signal range: 4-20mA, ±20mA, 0-5V, ±5V, 0-10V, ±10V (factory preset)
◆Wide power supply range: DC 10-30V
◆Support EtherCAT slave protocol
◆±15KV ESD protection
◆Power consumption: 2W
◆Isolation withstand voltage: DC 2500V
◆Operating temperature range: -35℃ ~75℃
◆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

Model	Channel	EtherCAT	Input form	Range	Accuracy	Sampling rate
CK-EC7082I1	8	support	Differential/ Single-ended	4-20mA/ ±20mA	0.1%	100SPS (Omnichanneland)
CK-EC7082I6				0-10V/±10V		
CK-EC7082I5				0-5V/±5V		
CK-EC7160I1	16		Single-ended	4-20mA/ ±20mA		150SPS (Omnichanneland)
CK-EC7160I6				0-10V/±10V		
CK-EC7160I5				0-5V/±5V		

catalog

CK-EC7082	8 single-ended inputs
CK-EC7160	16 single-ended inputs

Input Current: 4-20mA/±20mA
Input voltage: 0-5V/±5V/0-10V/±10V

CK-EC series modules are a new generation of modular data loggers based on embedded systems. They are installed using standard DIN35 rails, are easy to install on site, and are flexible to use. They can handle a variety of on-site applications. The modules are equipped with EtherCAT communication and can communicate with devices that support the EtherCAT protocol, such as PCs, PLCs, and touch screens.

High-precision data acquisition

CK-EC7XXX adopts advanced △-∑ high-precision integrated digital-to-analog converter, and the module adopts high-speed, high-resolution ADC, with a measurement accuracy better than 0.1% (typical value). It can meet the industrial sites with high measurement requirements, security, smart buildings, smart homes, power monitoring, process control and other occasions.

Input and output isolation

The product is designed for industrial applications: through DC-DC conversion, the measurement circuit and the main control circuit power supply are isolated; at the same time, the control unit and the signal acquisition unit are electrically isolated using photoelectric isolation technology, effectively ensuring reliable and safe data acquisition.

Surge protection

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

Technical indicators

Analog input

◆Number of input channels:
CK-EC7082X Up to 8 differential
CK-EC7160X Up to 16 differential

◆Input range: 4-20mA, ±20mA,
0-10V, ±10V, 0-5V, ±5V

◆Conversion rate:
CK-EC708X: 100SPS (full channel)
CK-EC716X: 150SPS (full channel)

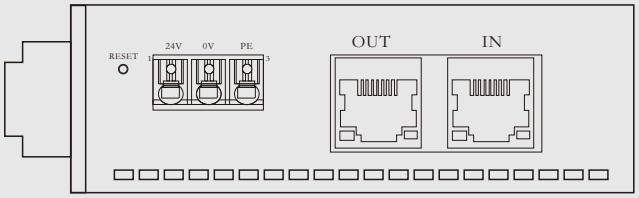
◆Measurement accuracy: ±0.1%

◆Input overvoltage protection,
overcurrent protection, and low-pass filtering

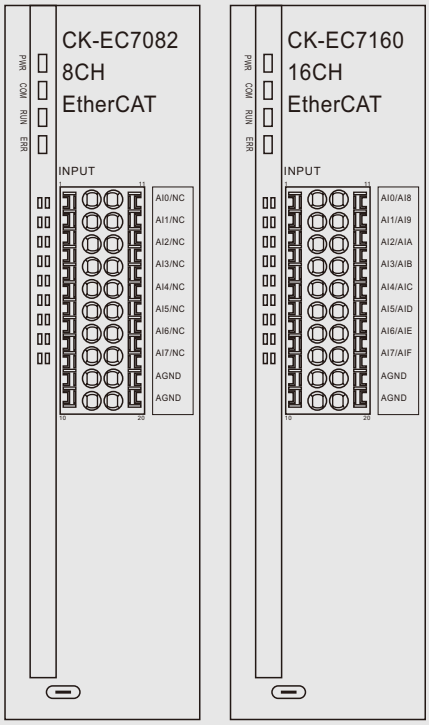
◆Normal Mode Rejection(NMR):
60 dB(1kΩ Source Imbalance @ 50/60 Hz)

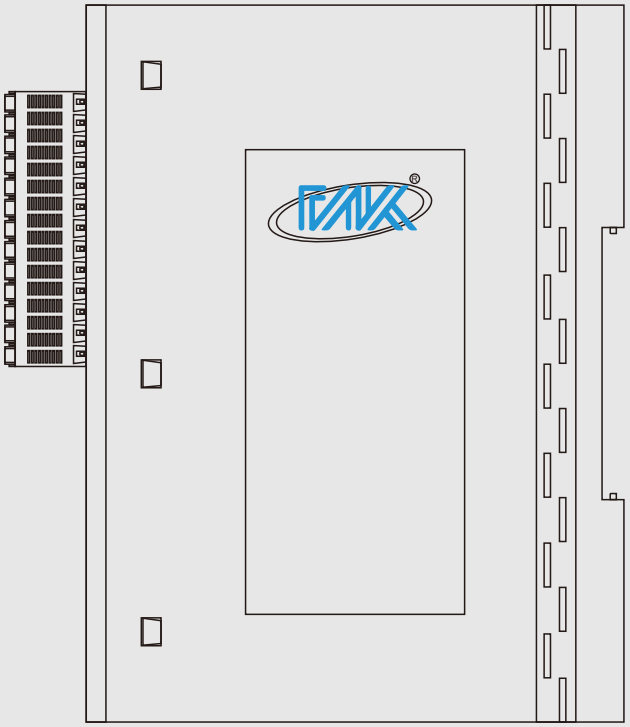
◆Common Mode Rejection(CMR):
120 dB(1kΩ Source Imbalance @ 50/60 Hz)

Port Information



Serial Number	Mark	Definition
1	24V	Power input positive
2	0V	Power input negative
3	PE	Ground terminal





Port Information

CK-EC7082 Port Description

Description	Serial number	Mark	Mark	Serial number	Description
Single-ended AI Input	1	AI0+	AI0-	11	Single-ended AI Input
	2	AI1+	AI1-	12	
	3	AI2+	AI2-	13	
	4	AI3+	AI3-	14	
	5	AI4+	AI4-	15	
	6	AI5+	AI5-	16	
	7	AI6+	AI6-	17	
	8	AI7+	AI7-	18	
Analog input ground	9	AGND	AGND	19	Analog input ground
	10	AGND	AGND	20	

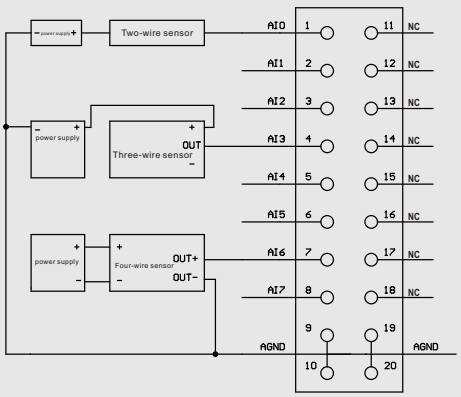
CK-EC7160 Port Description

Description	Serial number	Mark	Mark	Serial number	Description
Single-ended AI Input	1	AI0	AI8	11	Single-ended AI Input
	2	AI1	AI9	12	
	3	AI2	AIA	13	
	4	AI3	AIB	14	
	5	AI4	AIC	15	
	6	AI5	AID	16	
	7	AI6	AIE	17	
	8	AI7	AIF	18	
Analog input ground	9	AGND	AGND	19	Analog input ground
	10	AGND	AGND	20	

Wiring Diagram

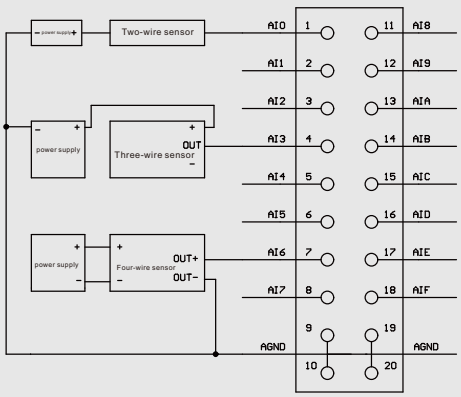
CK-EC7082 Wiring Diagram

8-channel AI input



CK-EC7160 Wiring Diagram

16-channel AI input



It is recommended to use cables with a core diameter less than 1mm². The cold terminal

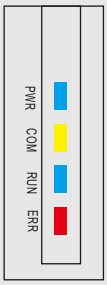
Indicator Lights

Users can use the LED status indicator to determine the module's operating and communication status, as well as the status of the DIO channel.

The module can communicate normally only after entering the OP state.

Module status indicator

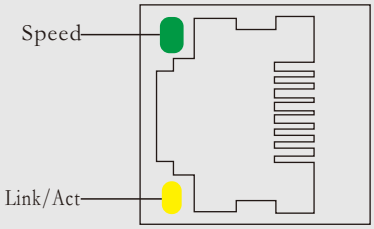
Light logo	Color	Explanation
PWR	Blue	On: The module is powered on.
COM	Yellow	On:The module EtherCAT has entered the OP state Off:The module EtherCAT is not connected to the upper-level device Flashing:The module is hand shaking with theupper-level device
RUN	Blue	Flashing:Thedeviceprogramisrunning
ERR	Red	On:Themoduledetectsanerror



EtherCAT network port indicator

The module contains 2 network ports, IN is the EtherCAT input port, which is used to connect to a computer, PLC or the upper level module. OUT is the EtherCAT output port, which is used to connect to the lower level module.

Light logo	color	Explanation
Speed	Green	Link speed indicator light: On: 100M Off: 10M
Link/Act	Yellow	Link status indicator Steady on:Physical link connected,no communication Blinking:Communicating Off:Link not connected



Electrical parameters

Unless otherwise specified, the electrical parameters of the CK-EC5162/5163 data acquisition module are the values when Tamb=25℃.

Module parameters

Entry	Parameter
Power supply	10-30VDC (nominal 24VDC)
Power consumption	2W
Communication Protocol	EtherCAT
Network Interface	2*RJ45
Connection rate	10/100Mbps
Range	4-20mA,±20mA, 0-10V,±10V,0-5V,±5V
wiring	I/Owiring:Maximum 1mm²
Operating temperature	-35-75℃
Ambient humidity	5%-95% (no condensation)
Protection level	IP20

Communication Example

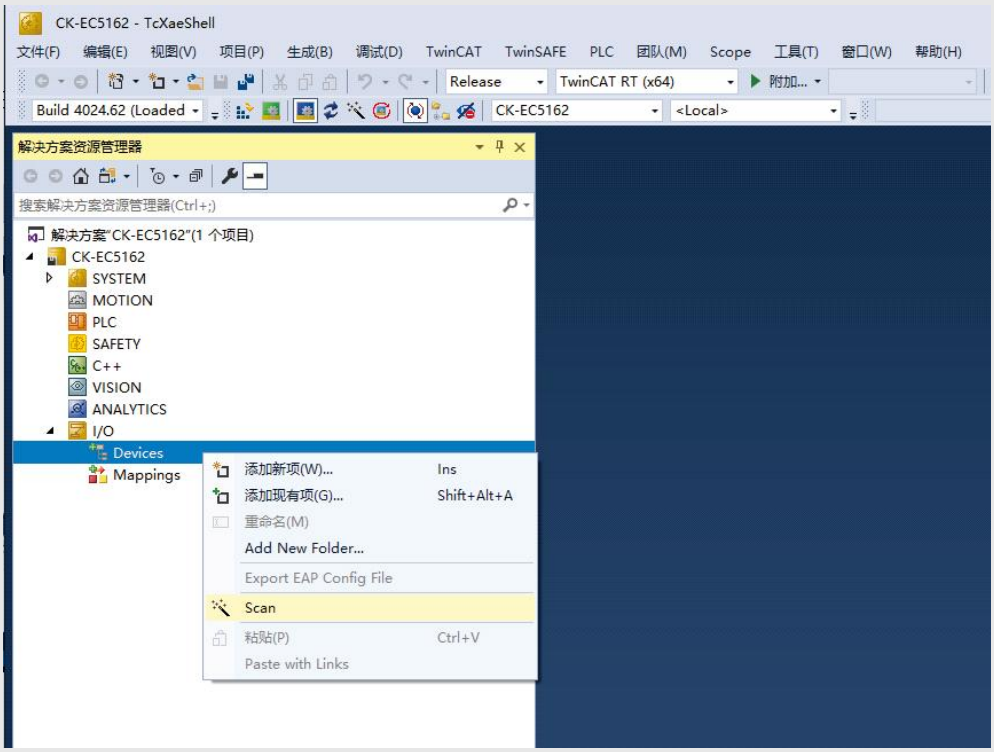
CK-EC7XXX Tested with TwinCAT

0. Before testing, install the TwinCAT XAE Shell software and the network port driver.
Use a network cable to connect the computer's network port to the CK-EC7XXX module IN port, and connect the module to a 24V power supply.

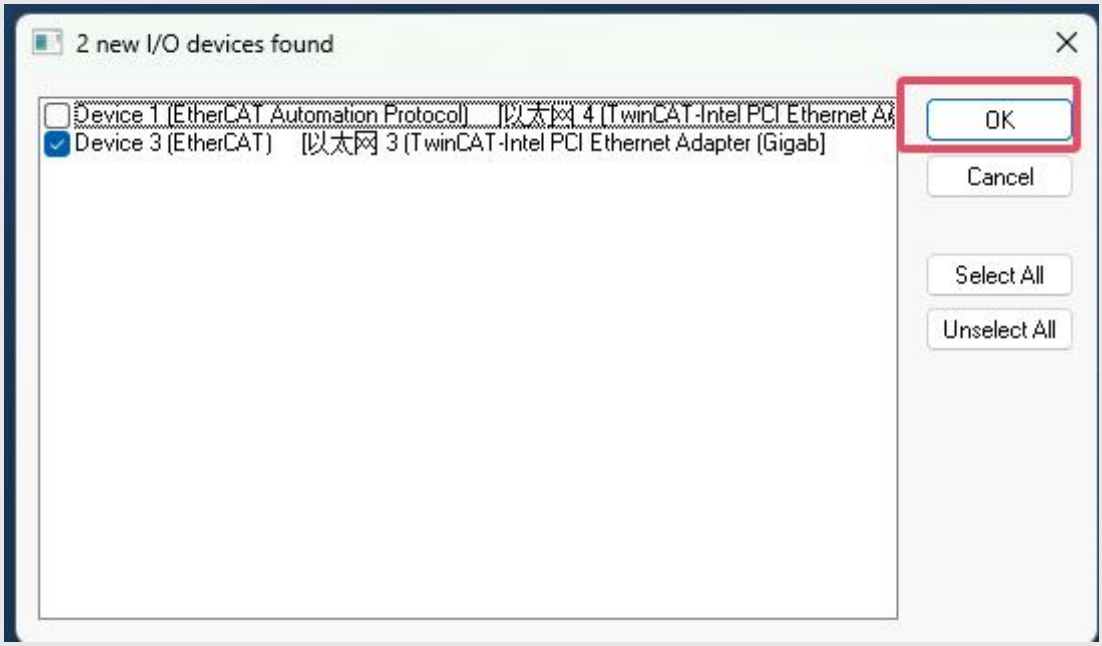
1. Open the TwinCAT XAE Shell software, click "File" - "New" - "Project" in the upper left corner, and create a new TwinCATx project. The project name and save location can be customized.

Communication Example

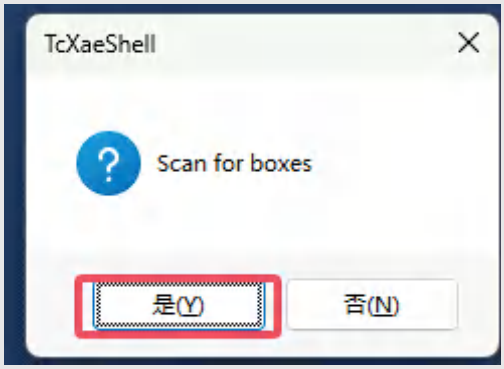
2. In the project solution explorer, expand "I/O", right-click "Devices", and click "Scan" to start scanning the device.

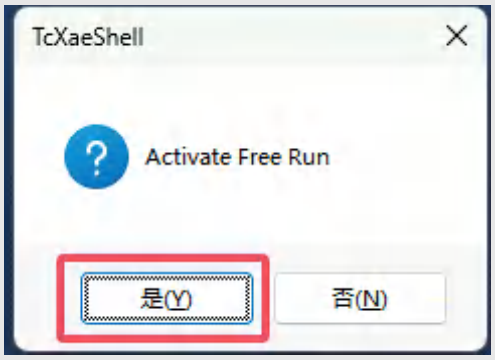


3. Click on the icons one by one to discover the device.

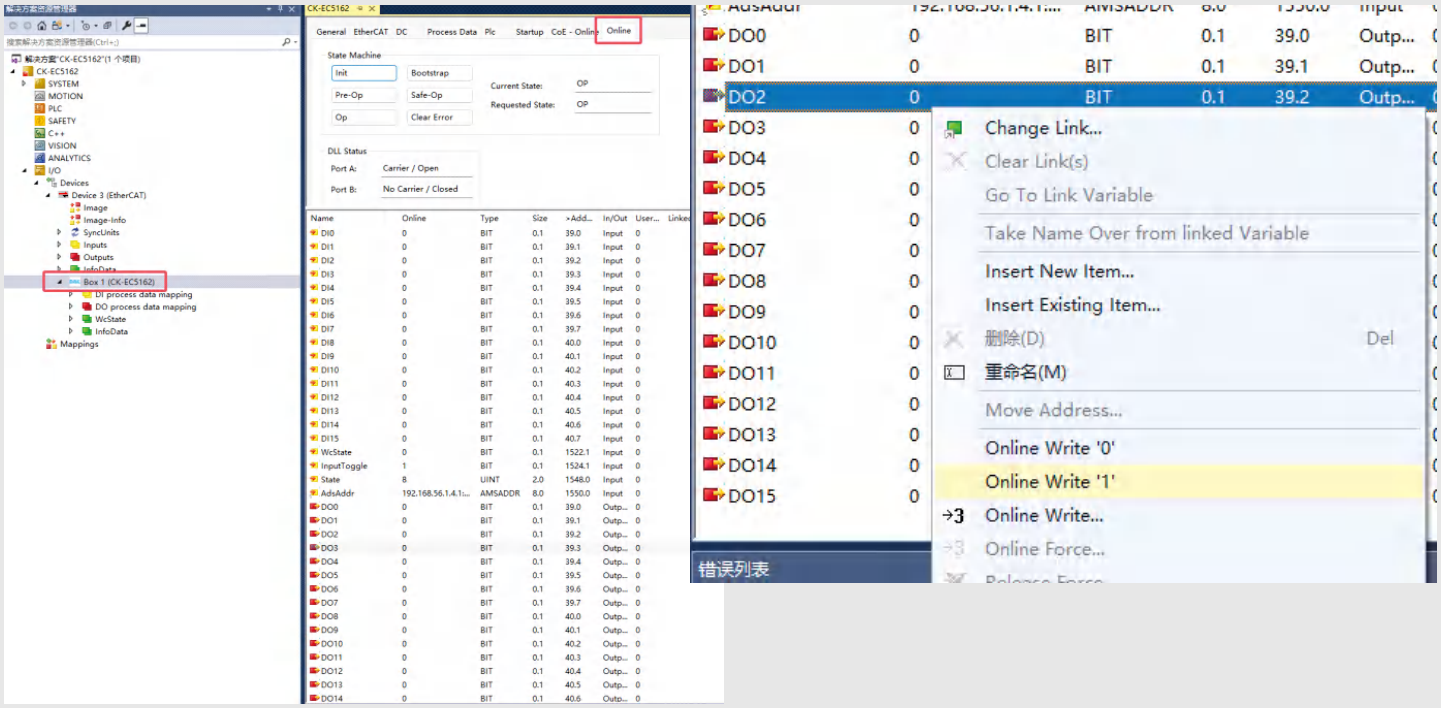


Communication Example

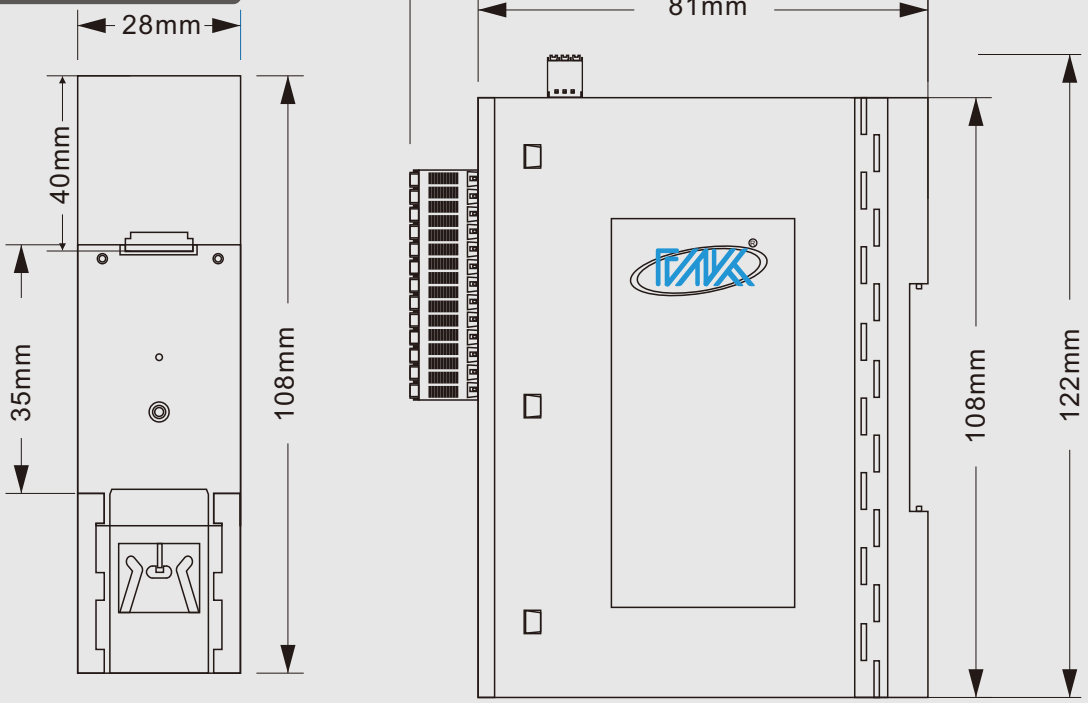




4. Double-click the searched device "Box 1 (CK-EC7XXX)" to expand the relevant information of this module. Click "Online" to check that "Current State" is OP, which means the device is operating normally. The DI state in the window displays the current input state of the DI port in real time; to operate the DO port, you can select the DO channel and right-click to call out the menu, select Online Write to write a new DO state. After writing 1, the DO indicator on the corresponding module is on, and writing 0, the DO indicator on the corresponding module is off.



Mechanical specifications

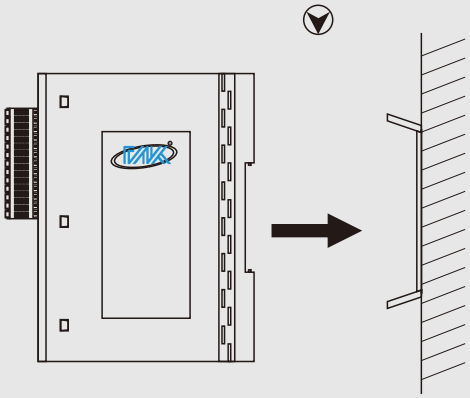


Installation Method

CK-EC7XXX 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 two 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.



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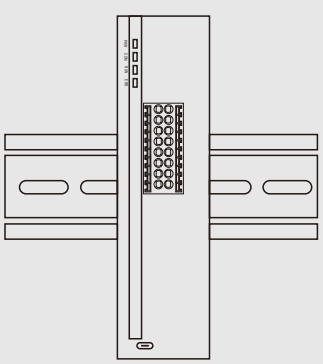

Product display picture

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