Integrated EtherCAT bus remote IO module

MODEL：CK-EC3XXX

Formulated by: Jiang Beiqiao Reviewer: Fan Xin Version number: Vr1.1

Temperature 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-EC3XXX temperature signal data collector can collect up to 16 thermocouple signals or 8 thermal resistor signals. It is suitable for collecting and controlling various IO signals in industrial sites.

Technical Parameters

◆Embedded real-time operating system
◆Input: thermocouple, thermal resistor input
◆Thermocouple type: K, T, J
◆Thermal resistor type: PT100, PT1000
◆Wide power supply range: DC 10-30V
◆Nominal power supply voltage: DC 12/24V
◆Module power consumption: 2W
◆Support EtherCAT protocol
◆±15KV ESD protection
◆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	Thermocouple	Thermal resistor PT100	Thermal resistor PT1000
CK-EC3043		4	
CK-EC3045			4
CK-EC3049	4		
CK-EC3083		8	
CK-EC3085			8
CK-EC3089	8		
CK-EC3169	16		

catalog

1 CK-EC3XXX Module Introduction 4
1.1 Temperature data collection 4
1.2 Input and output isolation 4
1.4 Surge protection 4
2 Technical indicators 4
2.1 Thermocouple input 4
2.2 Thermal resistor input 4
3 Port Information 5
3.1 Power supply and communication terminal 5
3.2 IO Terminals 5
3.2.1 CK-EC3043/EC3045 Port Arrangement 5
3.2.2 CK-EC3083/EC3085 Port Arrangement 5
3.2.3 CK-EC3049/EC3089 Port Arrangement 5
3.2.4 CK-EC3169 Port Arrangement 5
3.2.5 CK-EC3043/EC3045 Port Description 5
3.2.6 CK-EC3083/EC3085 Port Description 6
3.2.7 CK-EC3049/EC3089 Port Description 6
3.2.8 CK-EC3169 Port Description 6
4 Wiring Diagram 7
4.1 CK-EC3043/EC3045 wiring diagram 7
4.2 CK-EC3083/EC3085 wiring diagram 7
4.3 CK-EC3049/EC3089 wiring diagram 7
4.4 CK-EC3169 wiring diagram 7
5 Indicator Lights 8
5.1 Module status indicator 8
5.2 EtherCAT network port indicator 8
6 Electrical parameters 8
6.1 Module parameters 8
7 Communication Example 9
8 Mechanical specifications 12
8.1 Mechanical Dimensions 12
9 Installation Method 12
10 Three guarantees and maintenance instructions 12
11 Disclaimer 12
11.1 copyright 12
12 Product display picture 13

CK-EC3049/EC3089/EC3169 4/8/16-way thermocouple
CK-EC3043/ 3045/ 3083/ 3085 4/8-way thermal resistor

Input Type: K/T/J ;PT100/PT1000

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.

Temperature data collection

CK-EC3XXX adopts advanced data processing technology. Different models of modules can collect up to 16 thermocouple signals or 8 thermal resistor signals, which 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

Theproductisdesignedforindustrialapplications: throughphotoelectricisolationtechnology,the measurementcircuitandthemaincontrolcircuitpower supplyareisolated;atthesametime,thecontrolunitand thesignalacquisitionunitareelectricallyisolatedbyusing photoelectricisolationtechnology,whicheffectively ensuresthereliabilityandsafetyofdataacquisition.

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

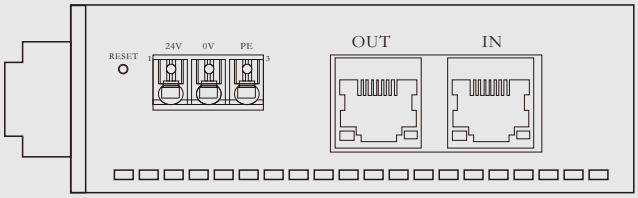
Thermocouple input

◆Number of input channels: up to 16 channels
◆Input type: K, T, J type switchable

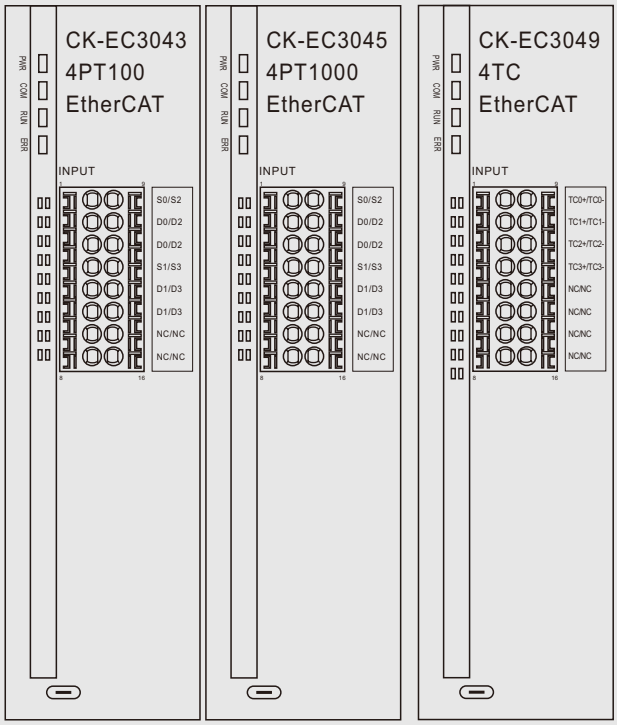
Thermal resistor input

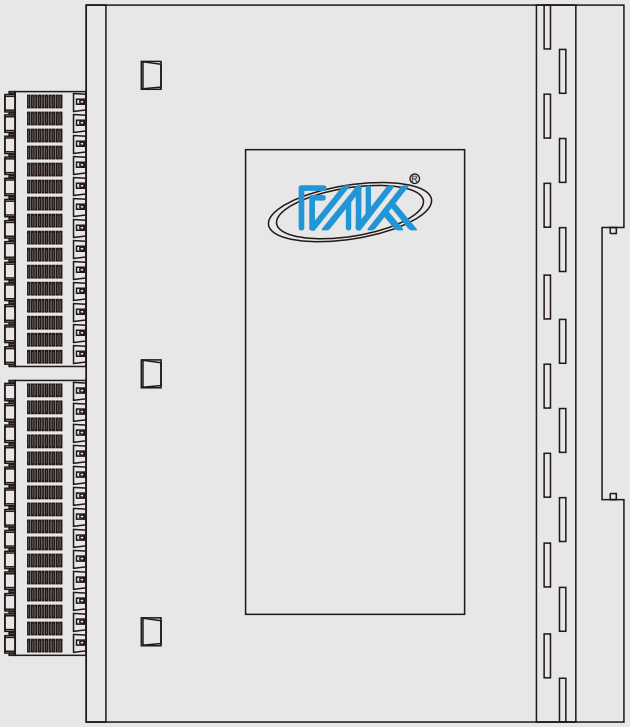
◆Numberofinputchannels:upto8
◆Inputtype:CK-EC30X3;supportsPT100input
CK-EC30X5;supportsPT1000input

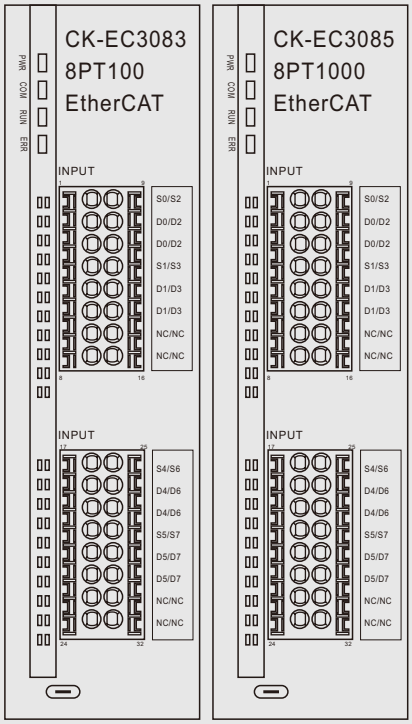
端口信息

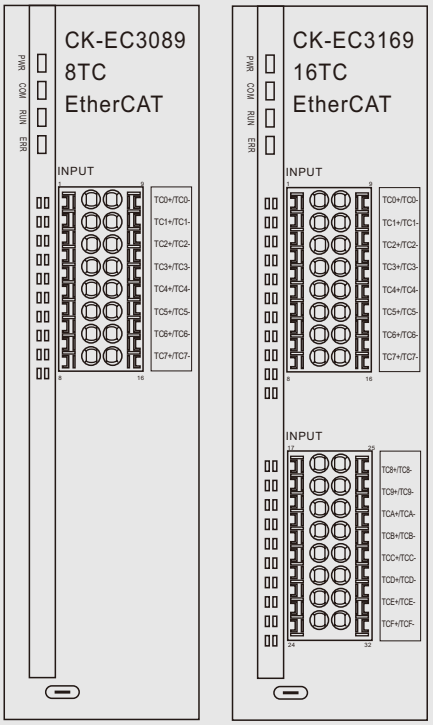


Serial Number	Mark	Definition
1	24V	Power input positive
2	0V	Power input negative
3	PE	Ground terminal









Port Information

CK-EC3043 Port Description

Description	Serial number	Mark	Mark	Serial number	Description
Thermal resistor PT100 input	1	S0	S2	9	Thermal resistor PT100 input
	2	D0	D2	10	
	3	D0	D2	11	
	4	S1	S3	12	
	5	D1	D3	13	
	6	D1	D3	14	
	7	NC	NC	15	
	8	NC	NC	16	

CK-EC3045 Port Description

Description	Serial number	Mark	Mark	Serial number	Description
Thermal resistor PT1000 input	1	S0	S2	9	Thermal resistor PT1000 input
	2	D0	D2	10	
	3	D0	D2	11	
	4	S1	S3	12	
	5	D1	D3	13	
	6	D1	D3	14	
	7	NC	NC	15	
	8	NC	NC	16	

CK-EC3083 Port Description

Description	Serial number	Mark	Mark	Serial number	Description
Thermal resistor PT100 input	1	S0	S2	9	Thermal resistor PT100 input
	2	D0	D2	10	
	3	D0	D2	11	
	4	S1	S3	12	
	5	D1	D3	13	
	6	D1	D3	14	
	7	NC	NC	15	
	8	NC	NC	16	
Thermal resistor PT100 input	17	S4	S6	25	Thermal resistor PT100 input
	18	D4	D6	26	
	19	D4	D6	27	
	20	S5	S7	28	
	21	D5	D7	29	
	22	D5	D7	30	
	23	NC	NC	31	
	24	NC	NC	32	

CK-EC3085 Port Description

Description	Serial number	Mark	Mark	Serial number	Description
Thermal resistor PT1000 input	1	S0	S2	9	Thermal resistor PT1000 input
	2	D0	D2	10	
	3	D0	D2	11	
	4	S1	S3	12	
	5	D1	D3	13	
	6	D1	D3	14	
	7	NC	NC	15	
	8	NC	NC	16	
Thermal resistor PT1000 input	17	S4	S6	25	Thermal resistor PT1000 input
	18	D4	D6	26	
	19	D4	D6	27	
	20	S5	S7	28	
	21	D5	D7	29	
	22	D5	D7	30	
	23	NC	NC	31	
	24	NC	NC	32	

CK-EC3049 Port Description

描述	序号	符号	符号	序号	描述
热电偶输入	1	TC0+	TC0-	9	热电偶输入
	2	TC1+	TC1-	10	
	3	TC2+	TC2-	11	
	4	TC3+	TC3-	12	
	5	NC	NC	13	
	6	NC	NC	14	
	7	NC	NC	15	
	8	NC	NC	16	

CK-EC3089 Port Description

描述	序号	符号	符号	序号	描述
热电偶输入	1	TC0+	TC0-	9	热电偶输入
	2	TC1+	TC1-	10	
	3	TC2+	TC2-	11	
	4	TC3+	TC3-	12	
	5	TC4+	TC4-	13	
	6	TC5+	TC5-	14	
	7	TC6+	TC6-	15	
	8	TC7+	TC7-	16	

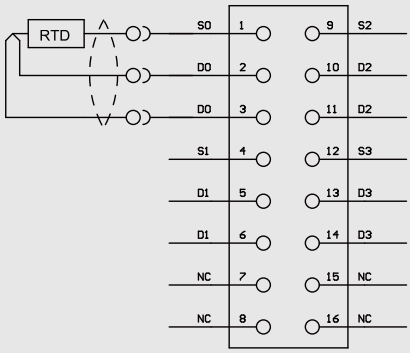
CK-EC3169 Port Description

描述	序号	符号	符号	序号	描述
热电偶输入	1	TC0+	TC0-	9	热电偶输入
	2	TC1+	TC1-	10	
	3	TC2+	TC2-	11	
	4	TC3+	TC3-	12	
	5	TC4+	TC4-	13	
	6	TC5+	TC5-	14	
	7	TC6+	TC6-	15	
	8	TC7+	TC7-	16	
热电偶输入	17	TC8+	TC8-	25	热电偶输入
	18	TC9+	TC9-	26	
	19	TCA+	TCA-	27	
	20	TCB+	TCB-	28	
	21	TCC+	TCC-	29	
	22	TCD+	TCD-	30	
	23	TCE+	TCE-	31	
	24	TCF+	TCF-	32	

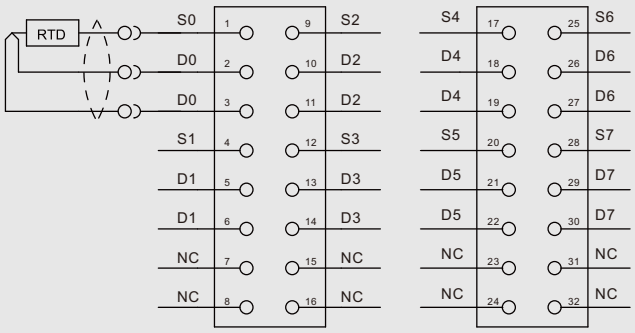
Wiring Diagram

Thermal resistor wiring diagram

CK-EC3043/EC3045 Wiring diagram



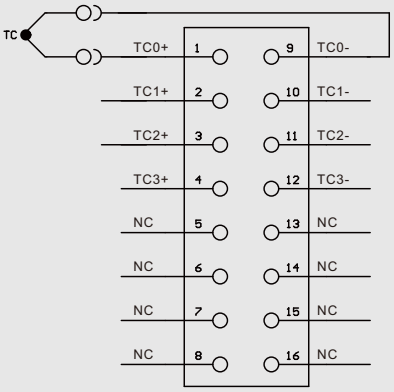
CK-EC3083/EC3085 Wiring diagram



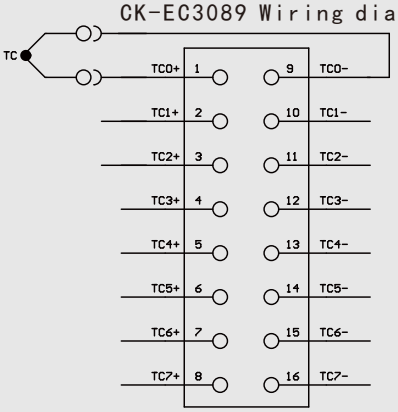
It is recommended to use cables with a core diameter less than 1mm². The cold terminal

Thermocouple Wiring Diagram

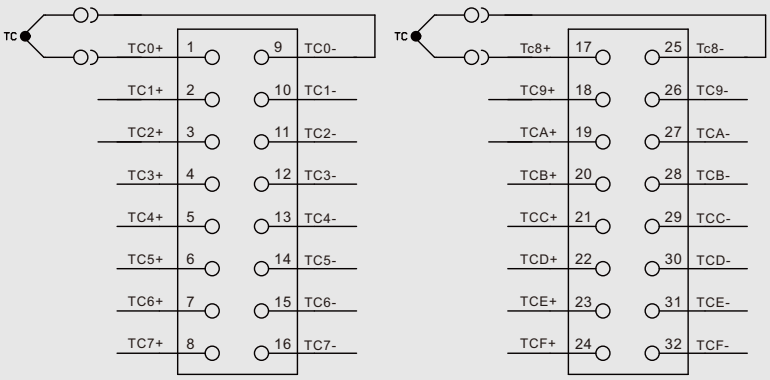
CK-EC3049 Wiring diagram



CK-EC3089 Wiring diagram



CK-EC3169 Wiring diagram



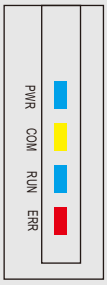
Indicator Lights

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

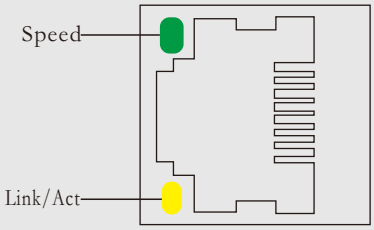
Light logo	Color	Explanation
PWR	Blue	On: The module is powered on.
COM	Yellow	On:The module EtherCAT has entered the OP state Off:The module EtherCAT is not connected to the upper-level device Flashing:The module is hand shaking with theupper-level device
RUN	Blue	Flashing:Thedeviceprogramisrunning
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-EC3XXX data acquisition module are the values when Tamb=25℃.

Module parameters

Entry	Parameter	Entry	Parameter
Power supply	10-30VDC (nominal 24VDC)	Thermocouple Support Types	PT100、PT1000
Power consumption	2W	wiring	I/Owiring:Maximum 1mm^2
Communication Protocol	EtherCAT	Operating temperature	-35℃~75℃
Network Interface	2个RJ45	Ambient humidity	5%-95% (no condensation)
Connection rate	10/100Mbps	Protection level	IP20
Thermocouple Support Types	K、T、J		

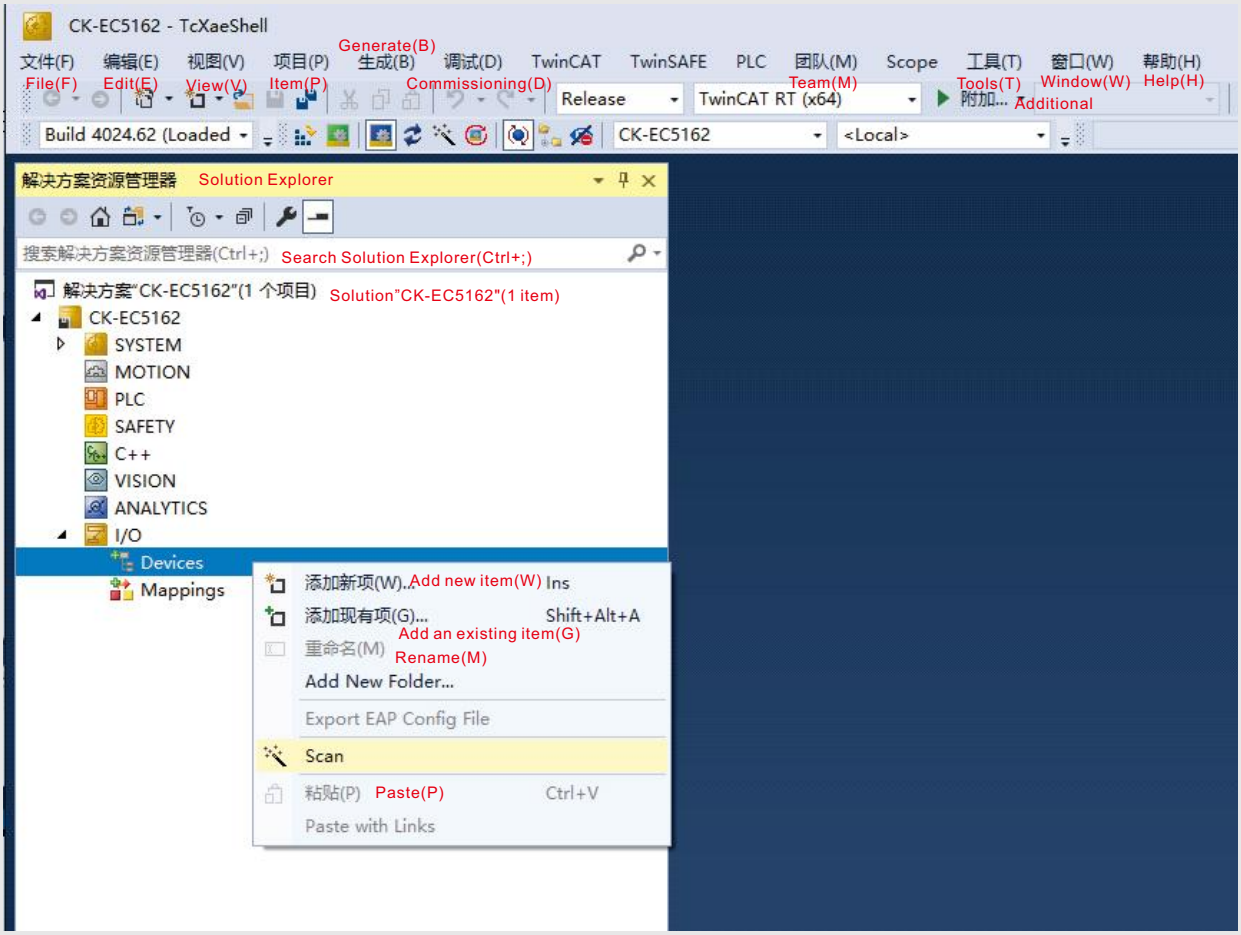
Communication Example

CK-EC3XXX 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-EC3XXX module IN port, and connect the module to a 24V power supply.

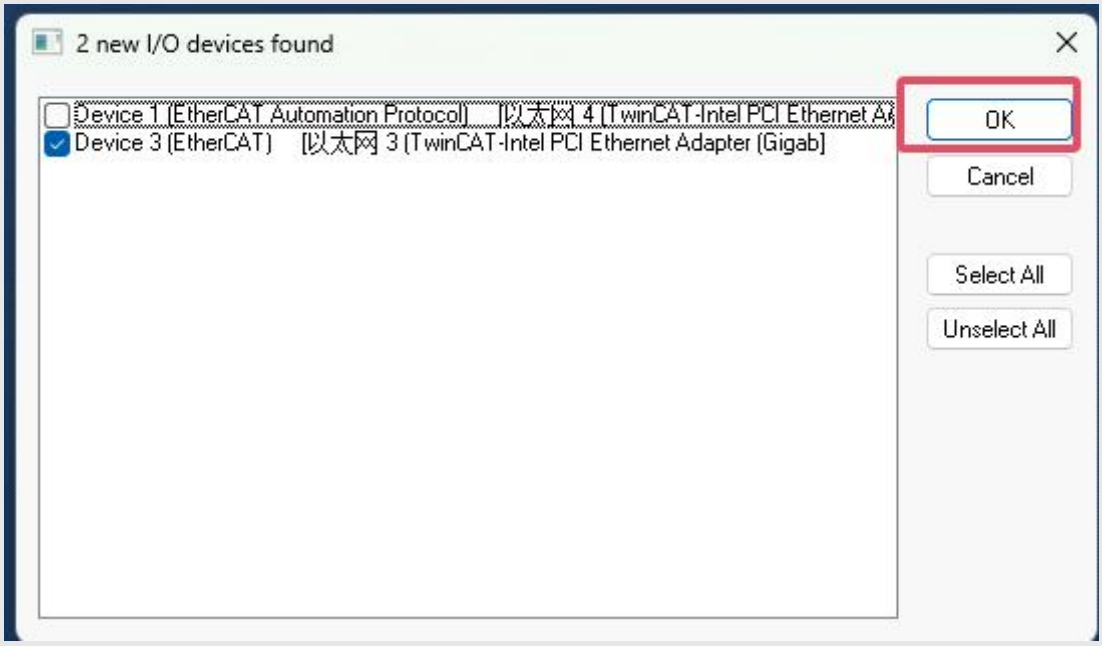
1. Open the TwinCAT XAE Shell software, click "File" - "New" - "Project" in the upper left corner, and create a new TwinCATx project. The project name and save location can be customized.

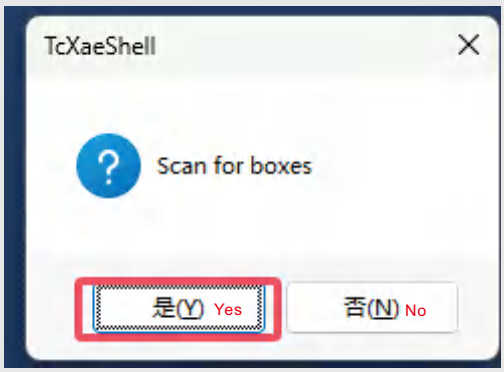
2. In the project solution explorer, expand "I/O", right-click "Devices", and click "Scan" to start scanning the device.

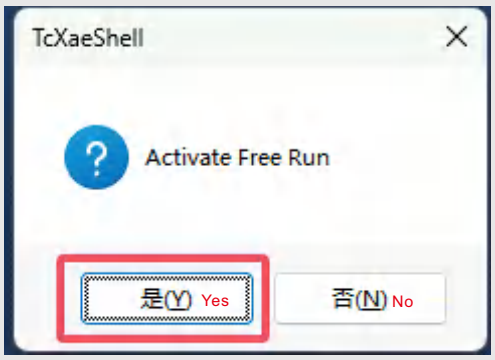


Communication Example

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

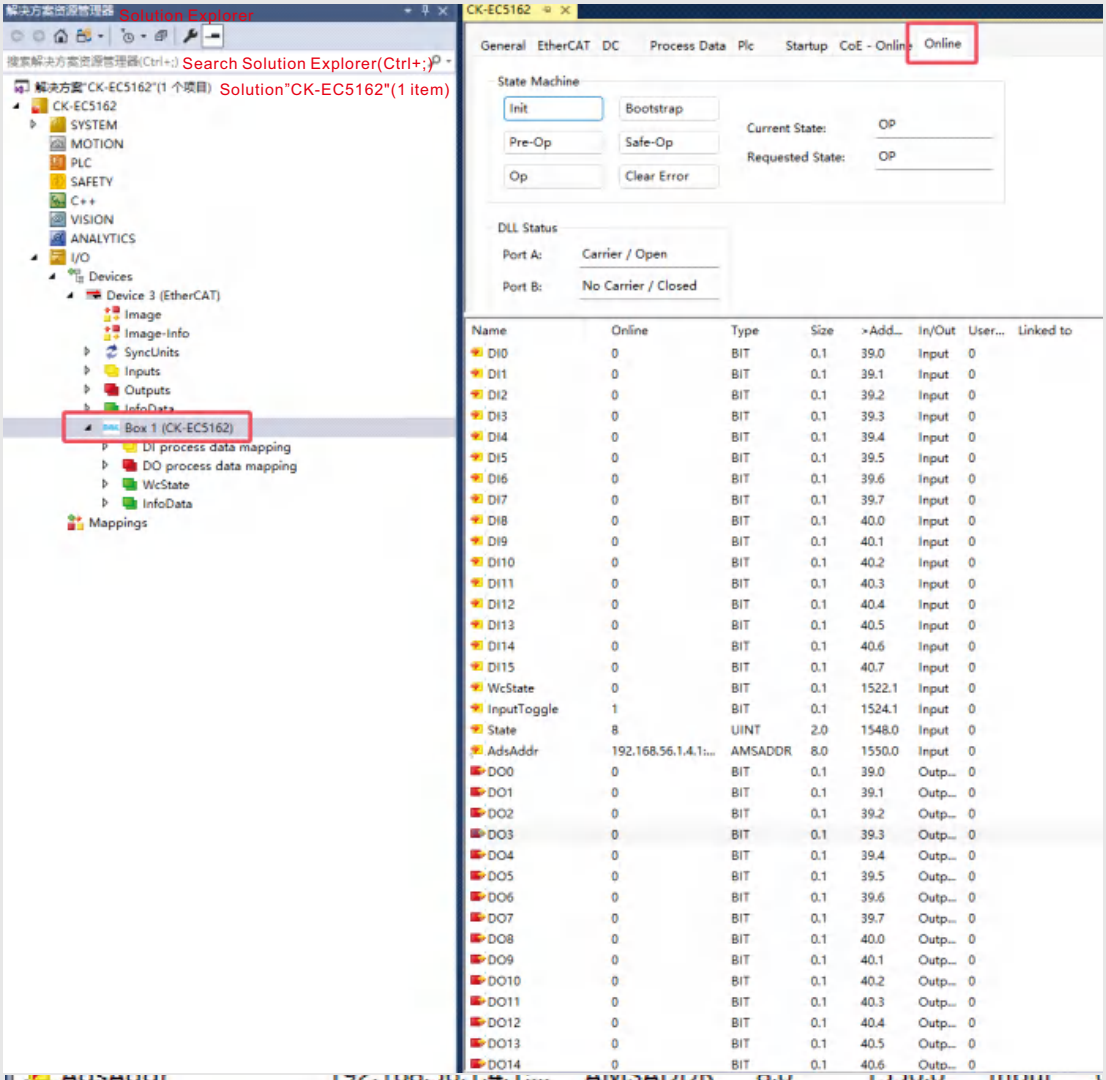




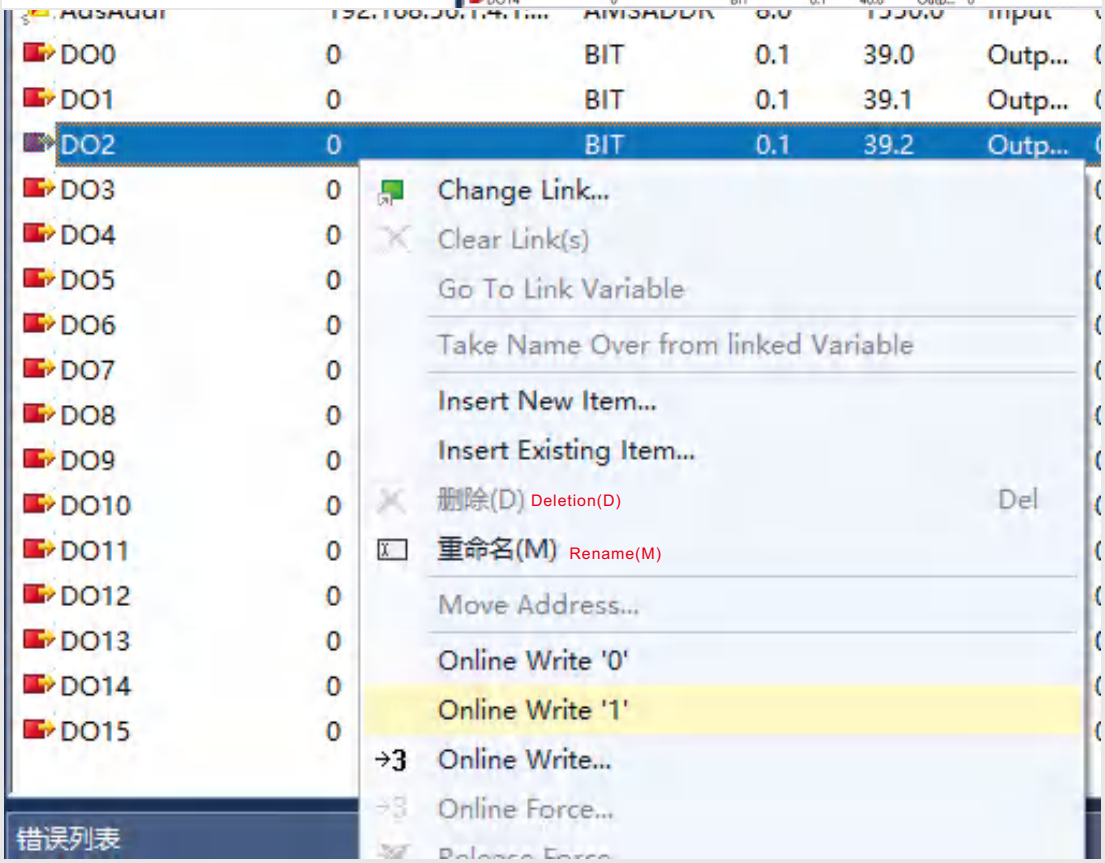


4. Double-click the searched device "Box 1 (CK-EC3XXX)" to expand the relevant information of this module. Click "Online" to check that "Current State" is OP, which means the device is operating normally. The DI state in the window displays the current input state of the DI port in real time; to operate 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.

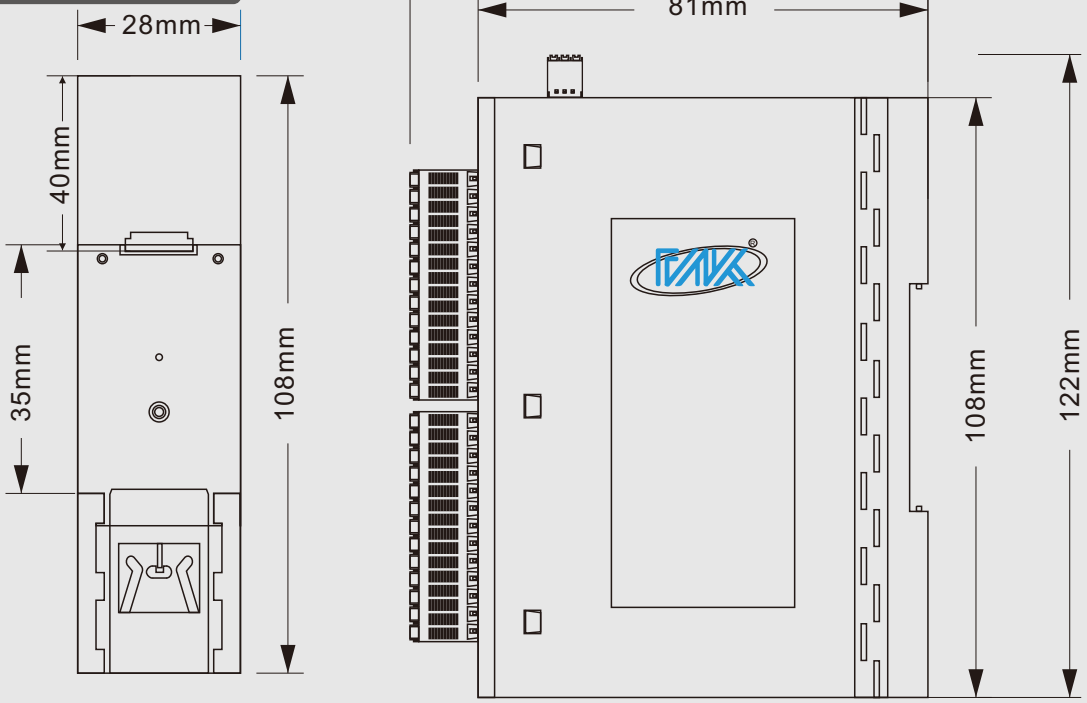
Communication Example



Name	Online	Type	Size	>Add...	In/Out	User...	Linked to
DI0	0	BIT	0.1	39.0	Input	0	
DI1	0	BIT	0.1	39.1	Input	0	
DI2	0	BIT	0.1	39.2	Input	0	
DI3	0	BIT	0.1	39.3	Input	0	
DI4	0	BIT	0.1	39.4	Input	0	
DI5	0	BIT	0.1	39.5	Input	0	
DI6	0	BIT	0.1	39.6	Input	0	
DI7	0	BIT	0.1	39.7	Input	0	
DI8	0	BIT	0.1	40.0	Input	0	
DI9	0	BIT	0.1	40.1	Input	0	
DI10	0	BIT	0.1	40.2	Input	0	
DI11	0	BIT	0.1	40.3	Input	0	
DI12	0	BIT	0.1	40.4	Input	0	
DI13	0	BIT	0.1	40.5	Input	0	
DI14	0	BIT	0.1	40.6	Input	0	
DI15	0	BIT	0.1	40.7	Input	0	
WcState	0	BIT	0.1	1522.1	Input	0	
InputToggle	1	BIT	0.1	1524.1	Input	0	
State	8	UINT	2.0	1548.0	Input	0	
AdsAddr	192.168.56.1.4.1:...	AMSADDR	8.0	1550.0	Input	0	
DO0	0	BIT	0.1	39.0	Outp...	0	
DO1	0	BIT	0.1	39.1	Outp...	0	
DO2	0	BIT	0.1	39.2	Outp...	0	
DO3	0	BIT	0.1	39.3	Outp...	0	
DO4	0	BIT	0.1	39.4	Outp...	0	
DO5	0	BIT	0.1	39.5	Outp...	0	
DO6	0	BIT	0.1	39.6	Outp...	0	
DO7	0	BIT	0.1	39.7	Outp...	0	
DO8	0	BIT	0.1	40.0	Outp...	0	
DO9	0	BIT	0.1	40.1	Outp...	0	
DO10	0	BIT	0.1	40.2	Outp...	0	
DO11	0	BIT	0.1	40.3	Outp...	0	
DO12	0	BIT	0.1	40.4	Outp...	0	
DO13	0	BIT	0.1	40.5	Outp...	0	
DO14	0	BIT	0.1	40.6	Outp...	0	



Mechanical specifications

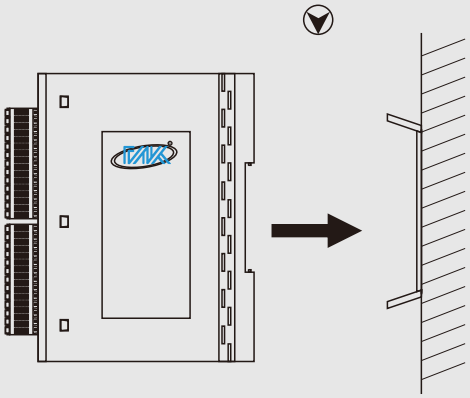


Installation Method

CK-EC3XXX 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.

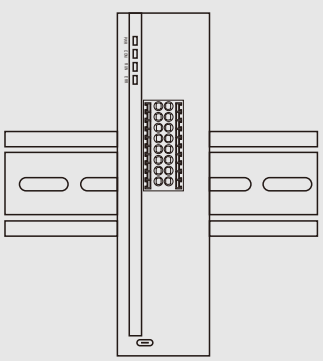


Disclaimer

copyright

The copyright of the product text and related software described in this manual belongs to Shenzhen Chengkong Electronics Co., Ltd., and its property rights are absolutely protected by national laws. Without the authorization of our company, other companies, units, agents and individuals shall not illegally use and copy them, otherwise the company has the right to impose severe sanctions on national laws.

Shenzhen Chengkong Electronics Co., Ltd. reserves the right to modify this data sheet at any time without prior notice.



Product display picture

精工品质 独具匠心