



PRODUCT

USE INSTRUCTIONS

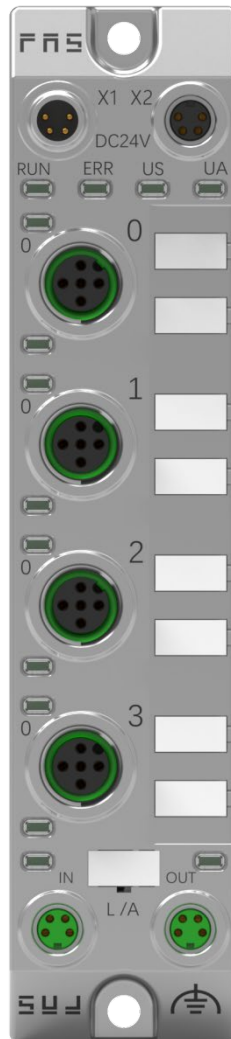


Ordering code: 006EA1

Part number: FNI ECT-302-000-S

IP 67 module user manual

8xDI/DO PNP adaptive



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■ Expected use

This manual describes as decentralized input and output modules for connecting to an industrial network.

■ Installation and start-up

Precautions!

Installation and start-up may only be performed by trained personnel. A qualified individual is one who is familiar with the installation and operation of the product and has the necessary qualifications to perform such operations. Any damage caused by unauthorized operation or illegal and improper use is not covered by the manufacturer's warranty. The equipment operator is responsible for ensuring that appropriate safety and accident prevention regulations are observed.

■ Corrosion resistance

Precautions!

FNI modules generally have good chemical and oil resistance. When used in corrosive media (e.g. high concentrations of chemicals, oils, lubricants, coolants and other material media (i.e. very low water content), these media must be checked before the corresponding application material compatibility. If a module fails or is damaged due to this corrosive medium, a defect claim cannot be made.

■ Dangerous voltage

Precautions!

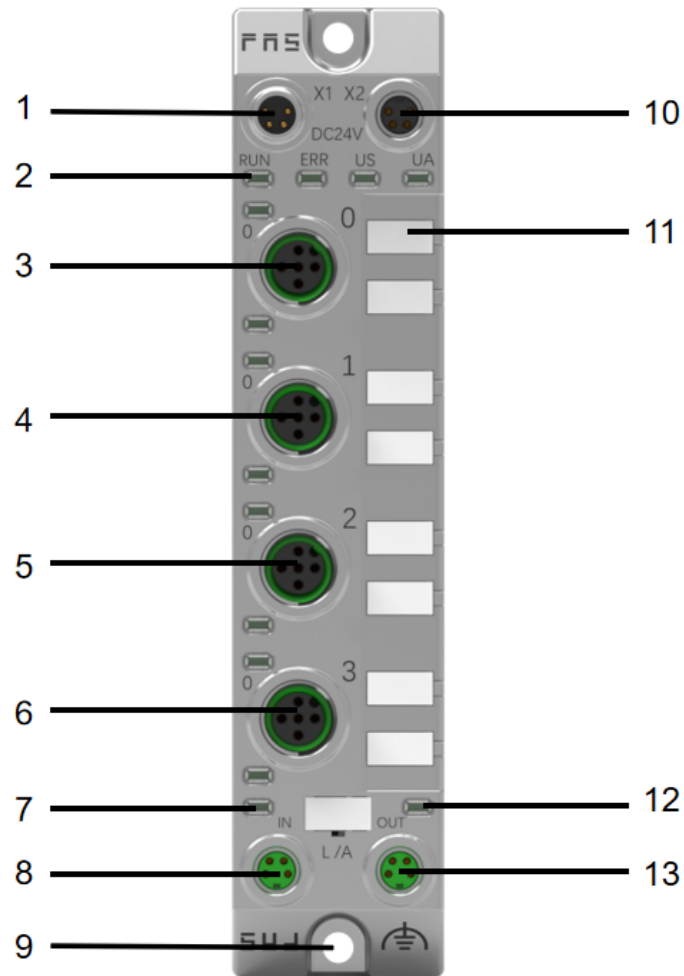
Disconnect all power before using the device!

■ General security

Debugging and inspection	Fault	Owner/operator obligations	Expected use
Before debugging, read the user manual carefully.	If the defect or equipment failure cannot be corrected, the operation of the equipment must be stopped to avoid damage that may be caused by unauthorized use.	This equipment is an EMC Class A compliant product. This device produces RF noise.	The warranty and limited liability statement provided by the manufacturer does not cover damage caused by: ·Unauthorized tampering ·Improper use operation ·The instructions provided in the user manual explain the use, installation and handling of discrepancies
This system cannot be used in an environment where the safety of personnel depends on the functionality of the equipment.	Only after the housing is fully installed can the intended use be assured.	The owner/operator must take appropriate precautions to use this equipment. This device can only use the power supply that matches this device, and can only connect cables approved for application.	

1. Getting Started Guide

1.1 Module overview



1 Power input port

2 Module indicator

3 Port 0

4 Port 1

5 Port 2

6 Port 3

7 Network input status indicator light

8 Network input port

9 Ground connection

10 Power output port

11 Port identification board

12 Network output status indicator light

13 Network output port

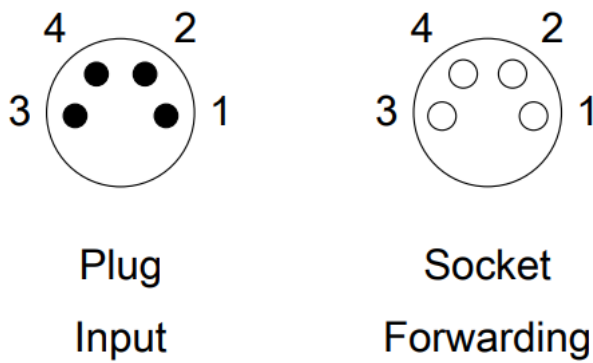
1.2 Mechanical connection

The modules are connected using 2 M4 bolts and 2 washers.

Isolation pads are available as accessories.

1.3 Electrical connection

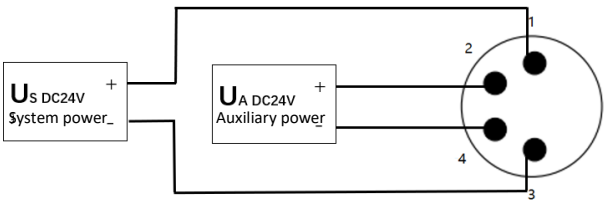
1.3.1 Power interface (M8)



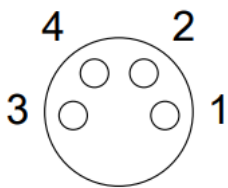
Pin	Function	Description
1	Us+	+24V (Brown)
2	Ua+*	+24V (White)
3	Us-	0V (Blue)
4	Ua-*	0V (Black)

- Note:
- 1. If possible, provide sensor/module power supply and actuator power supply separately.
Total current <4A. Total current of all modules <4A, even when actuator power supplies are daisy chained.
 - 2.The FE connection from the housing to the machine must be low impedance and kept as short as possible.

Power port



1.3.2 Network interface (M8)

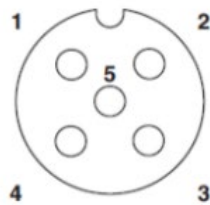


Pin	Function	
1	Tx+	Send data+
2	Rx+	Receive data+
3	Rx-	Receive data-
4	Tx-	Send data-

Note:

Unused I/O port sockets must be covered with end caps to meet IP67 protection rating.

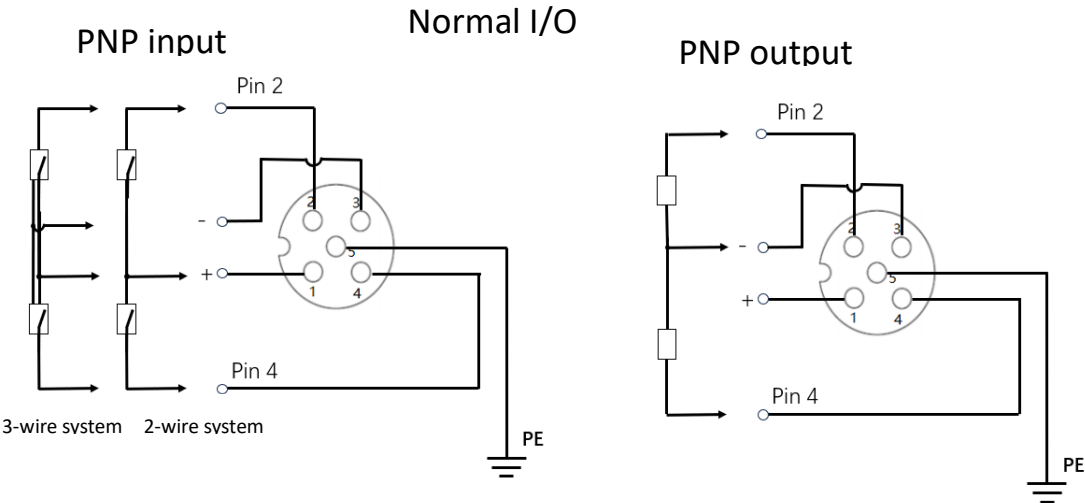
1.3.3 I/O-port (M12 A-coded)



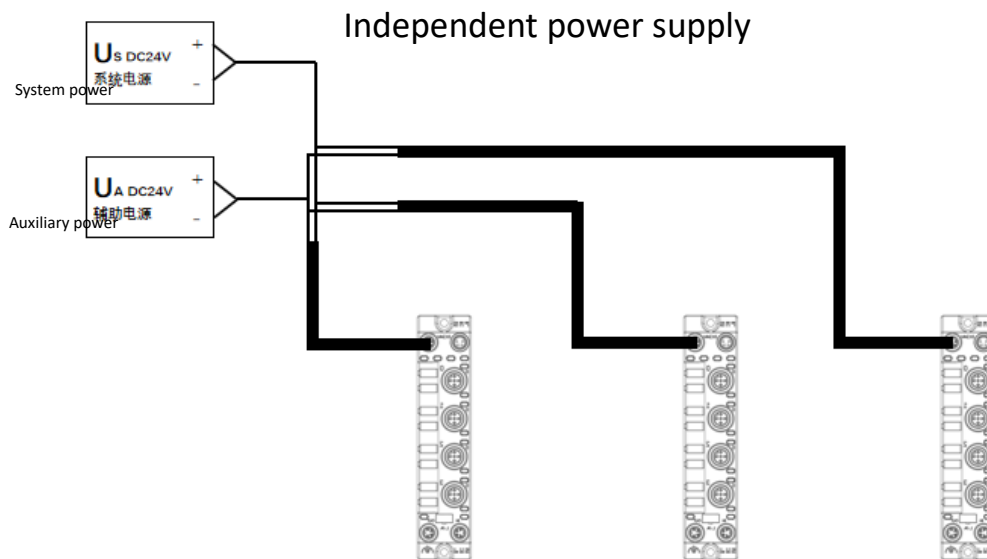
Pin	Function
1 (Brown)	24V
2 (White)	Input /Output
3 (Blue)	0V
4 (Black)	Input /Output
5 (Gray)	PE

Note:

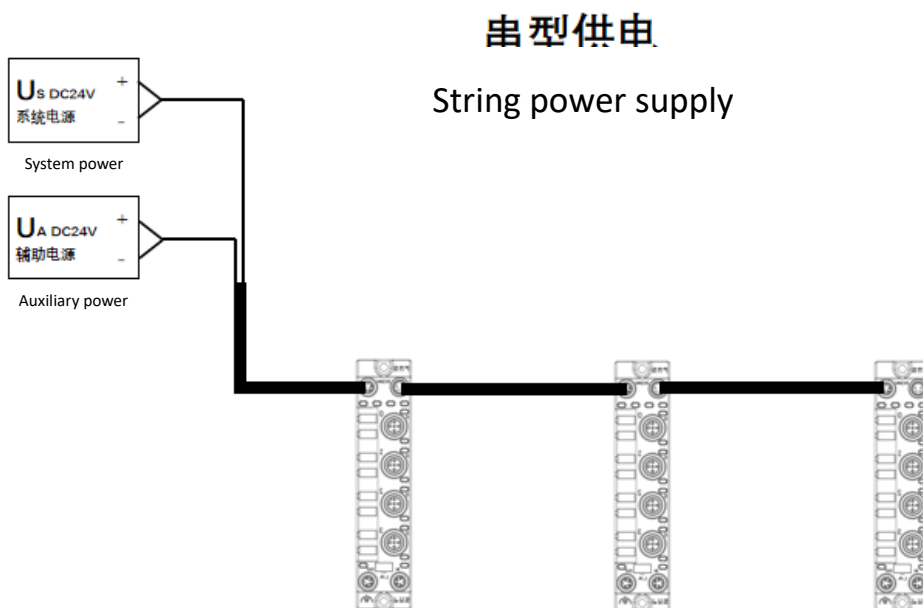
- 1. Regarding digital sensor input, please follow the input guidance of EN61131-2, Type 2.
- 2. The maximum single output current of pins 2 and 4 is 0.5A. The total module current is <4A.
- 3. Unused I/O port sockets must be covered with end caps to meet IP67 protection level.



1.3.4 Remote module wiring method



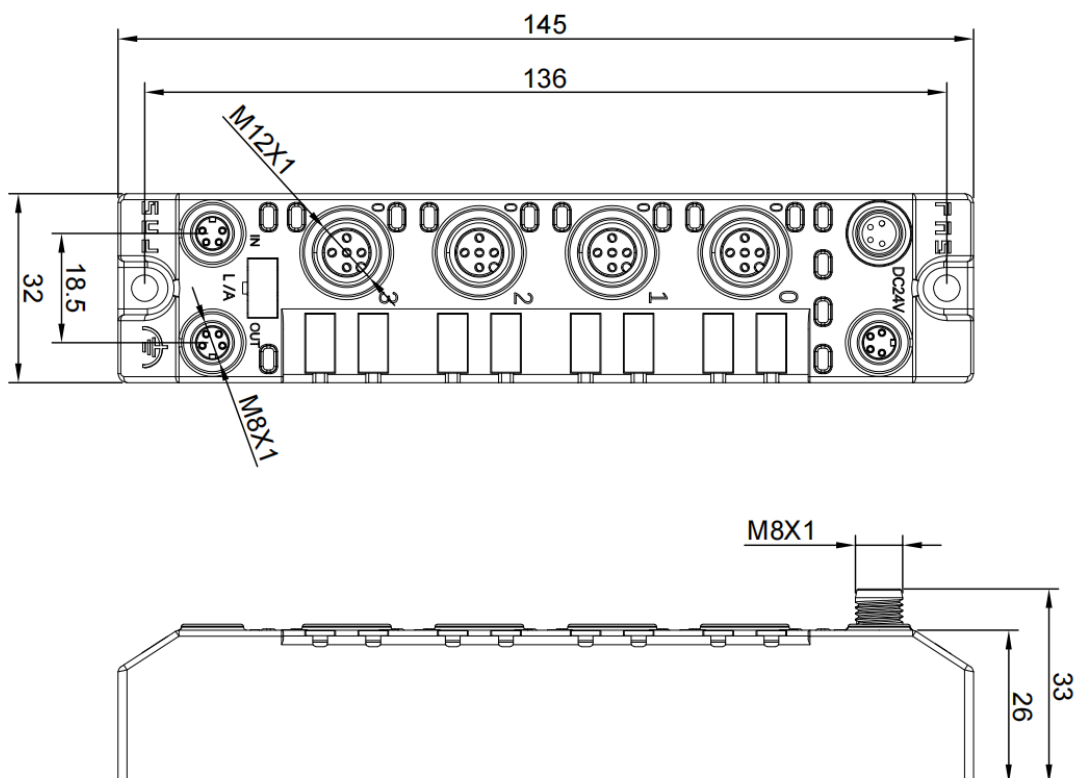
In independent power supply mode, the maximum current of each master can reach 4A.



In the serial power supply wiring mode, if the rear module needs to be connected to the front module, the cumulative current must not exceed 4A.

2. Technical data

2.1 Size



2.2 Mechanical data

Shell material	Zinc alloy die casting
Housing rating according to IEC 60529	IP67 (Only in plug-in or plug type)
Power interface	M8 (male and female)
Input port/output port	M8 (8*Female)
Size(W*H*D)	32mm*145mm*33mm
Installation type	2-Through hole mounting
Ground bus accessories	M4
Weight	About 670g

2.3 Operating conditions

Operating temperature	-25°C ~ 70°C
Storage temperature	-25°C ~ 85°C

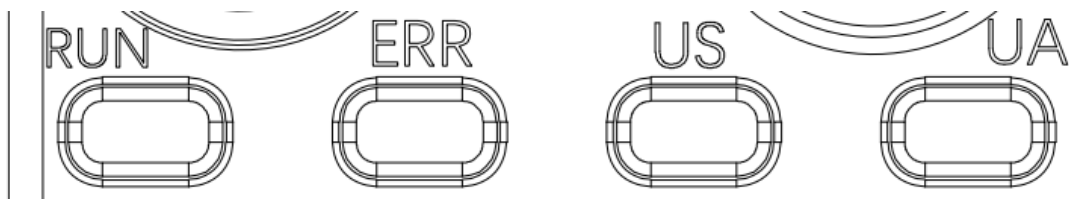
2.4. Electrical data

Voltage	18~30V DC, conform to EN61131-2
Voltage fluctuation	<1%
Module operating current when power supply voltage is 24V	<130mA

2.5 Network port

Port	2 x 10Base-/100Base-Tx
Port connection	M8
IEEE 802.3 compliant cable types	Shielded twisted pair, minimum STP CAT 5/STP CAT 5e
Data transfer rate	10/100Mbit/s
Maximum cable length	100m
Flow control	Half working condition/full working condition (IEEE 802.3-PAUSE)

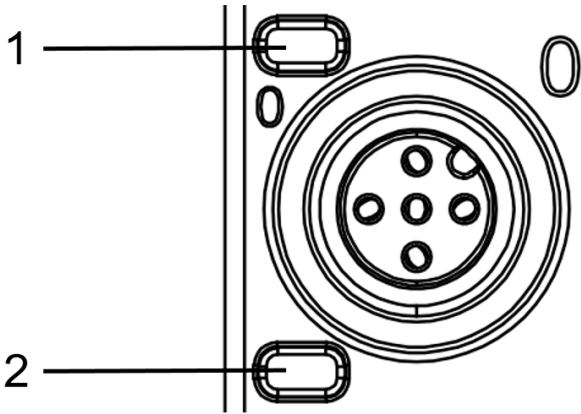
2.6 Function indicator



ECT communication protocol module status

LED	State	Function
US	Green	Power supply is normal
	Red	Greater than 30V or less than 11V
	Flashing red	Less than 18V
UA	Green	Power supply is normal
	Red	Greater than 30V or less than 11V
	Flashing red	Less than 18V
RUN	Closure	No error, device initializing
	Green light flashes 2.5HZ	Pre-operation: The device is in pre-operation state
	Green light flashes 1HZ	Safe operation: The equipment is in safe operation.
	Steady green	Running: The device is running
ERR	Cloture	No errors, device EtherCAT communication is working
	Red light flashes 2.5HZ	Invalid configuration
	Red light flashes 1HZ	local error

I/O port status



LED	State	Function
1	Closure	The status of Pin4 input or output is 0
1	Yellow	The status of Pin4 input or output is 1
1	Yellow flashing	The port is output: output overcurrent
2	Closure	or port is out and UA is down
2	Yellow	The status of Pin2 input or output is 0
2	Yellow flashing	The status of Pin2 input or output is 1

Network port status



LED	State	Function
IN	Flashing green	Data transfer in progress
OUT	Flashing green	Data transfer in progress

3.Integrated

3.1 Data mapping

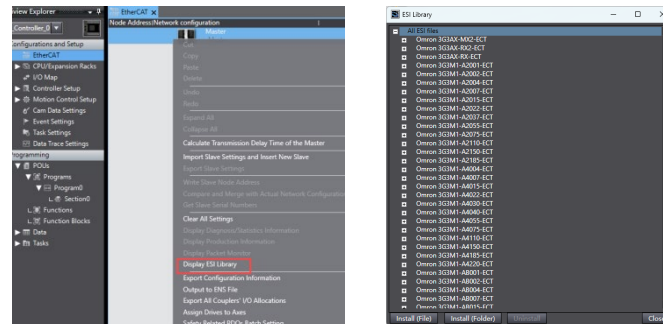
ECT process input data									
Byte	Function description								
	Status description	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Standard IO input	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
1	Module status				US Over voltage	UA Over voltage	Over heat	US Under voltage	UA Under voltage
Data description (binary): 0=no signal 1=signal									

ECT process output data									
Byte	Function description								
	Status description	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Standard IO output	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
Data description (binary): 0=off 1=on									

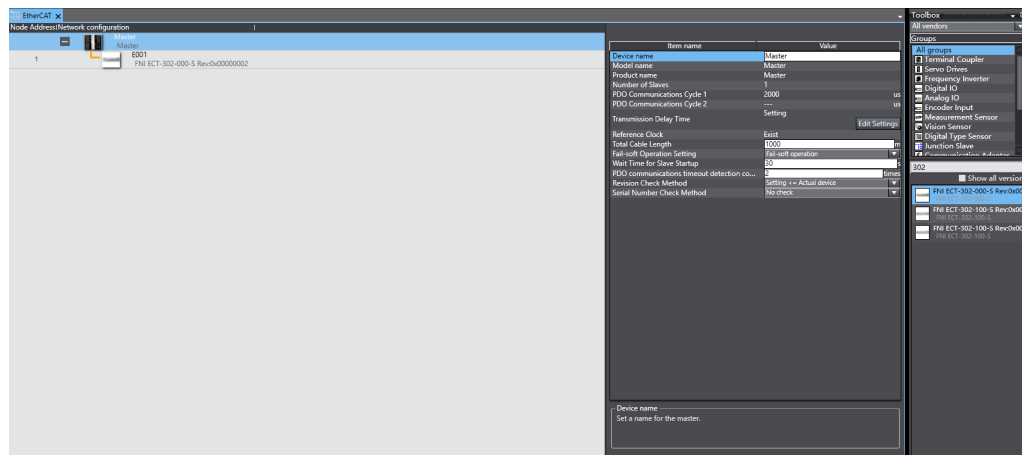
3.2 PLC integration tutorial

3.2.1 Omron NX1P2 Sysmac Studio Integrated (ECT)

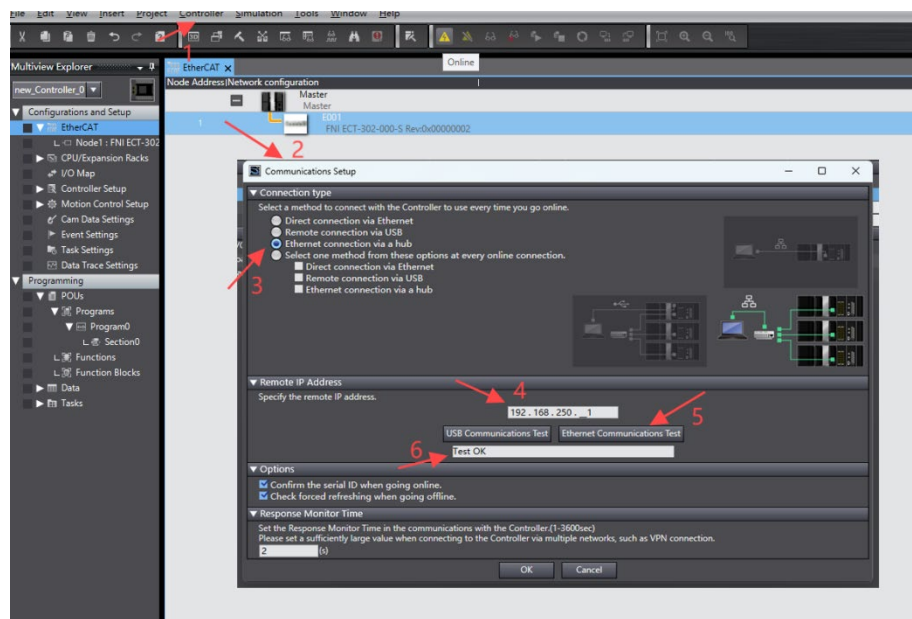
1. Install the ESI file: Double-click EtherCAT in Configuration and Settings--right-click the main device--select "Display ESI Library", and select the ESI file in the pop-up window for installation.



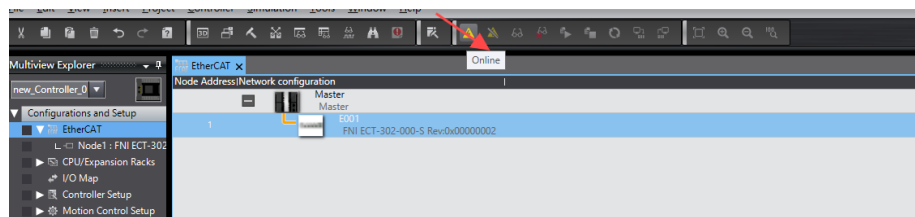
2. Configure the module into the EtherCAT network: Find the module model icon in the FieldBus Modules toolbox on the right and double-click to join the network.



3. Click on the controller---Communication settings---Select Ethernet-Hub connection---Enter the PLC address---Click on Ethernet communication test---Test successful



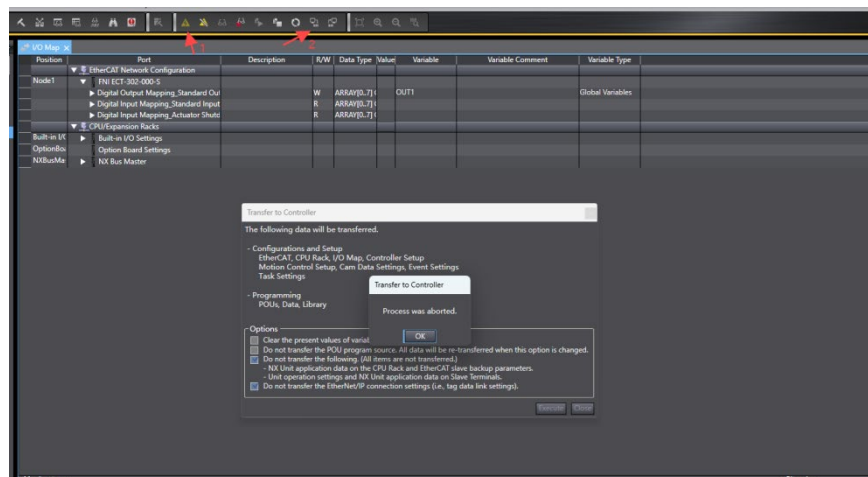
4. Switch the PLC to online mode, right-click the master device and click "Write hub device node address".



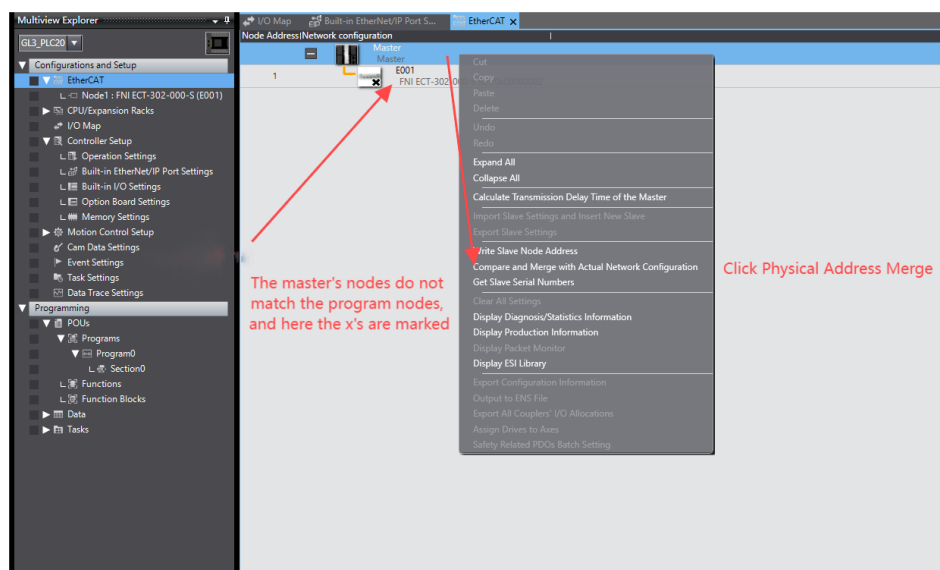
5. Variable mapping: PLC goes to offline mode, select the configured node in the I/O mapping, and fill in the name of the variable.

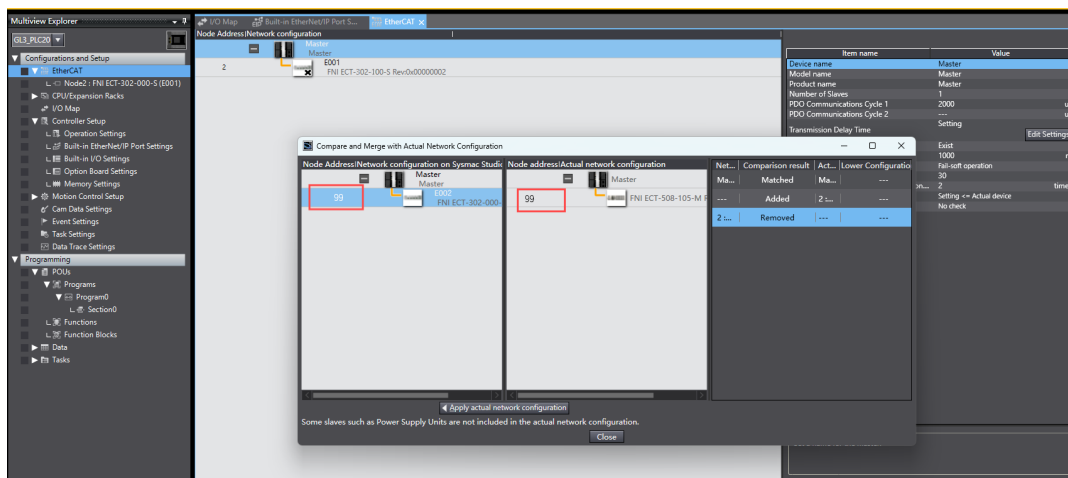
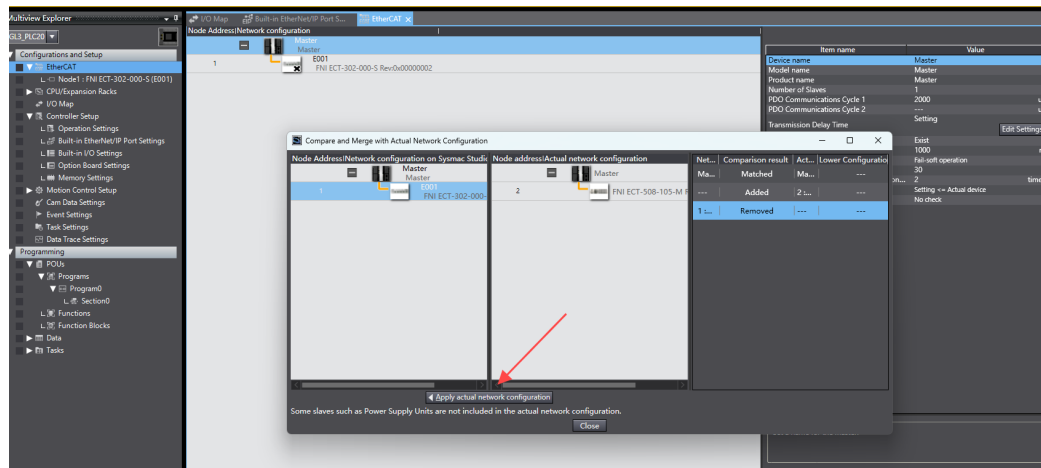
Position	Port	Description	R/W	Data Type	Variable	Variable Comment	Variable Type
Node1	FNI ECT-302-000-S	Digital Output Mapping_Standard Out	W	ARRAY[0..7] OF BOOL	OUT1		Global Variables
		Digital Input Mapping_Standard Input	R	ARRAY[0..7] OF BOOL			
		Digital Input Mapping_Actuator Shut	R	ARRAY[0..7] OF BOOL			
Built-in I/O	OptionBox	Built-in I/O Settings					
		Option Board Settings					
		NX Bus Master					

6. Switch the PLC to online mode and click "To Controller"

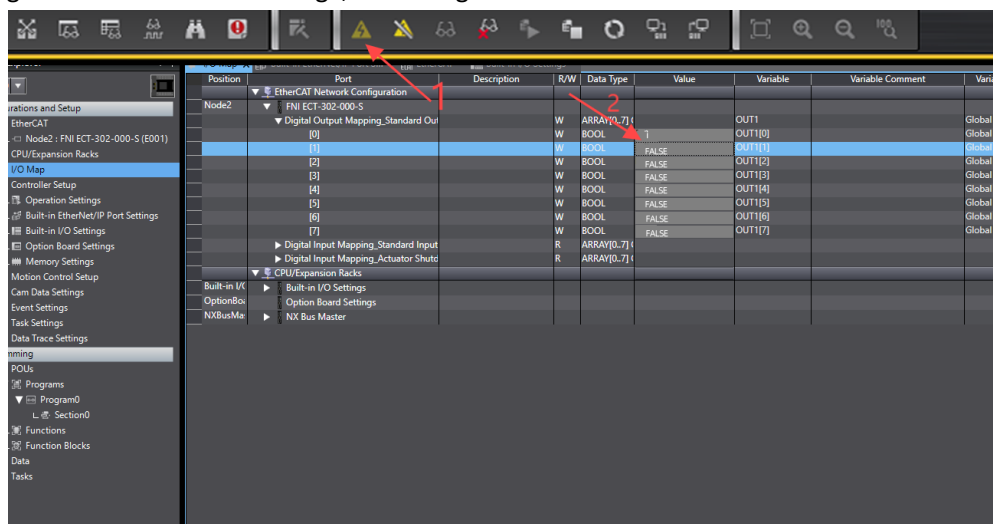


7. If the software setting node does not match the hardware node (if they are consistent, you can skip this step)





8. In the I/O mapping, set the output value of any port to 1 and press Enter. If the output value changes to TRUE and turns orange, the configuration is successful.



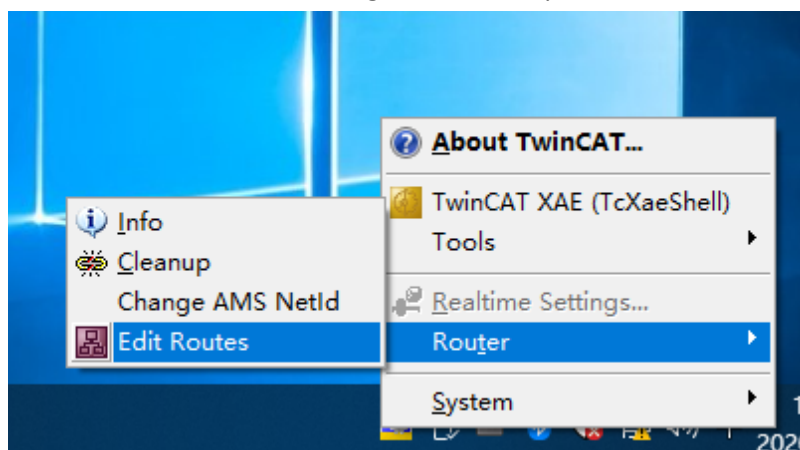
Position	Port	Description	R/W	Data Type	Value	Variable	Variable Comment	Variable Type
EtherCAT Network Configuration								
Node2: FNI ECT-302-000-5								
Digital Output Mapping_Standard Out								
[0]			W	BOOL	1	OUT1[0]		Global Variables
[1]			W	BOOL	TRUE	OUT1[1]		Global Variables
[2]			W	BOOL	FALSE	OUT1[2]		Global Variables
[3]			W	BOOL	FALSE	OUT1[3]		Global Variables
[4]			W	BOOL	FALSE	OUT1[4]		Global Variables
[5]			W	BOOL	FALSE	OUT1[5]		Global Variables
[6]			W	BOOL	FALSE	OUT1[6]		Global Variables
[7]			W	BOOL	FALSE	OUT1[7]		Global Variables
Digital Input Mapping_Standard Input								
Digital Input Mapping_Actuator Shuts								
CPU/Expansion Racks								
Built-in I/O								
Option Board								
NXBusMaster								

3.2.2 Integrated in BECKHOFF winCATXAE

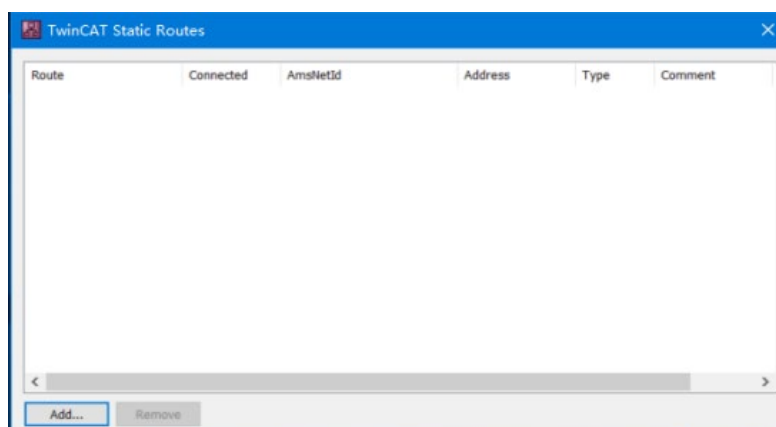
Here you will see an example of how to integrate this module into TwinCAT XAE, using a CX5050 PLC as an example:

Add PLC path:

Right-click the TwinCAT icon in the lower right corner to open Edit Routes



Click Add...;Add route (Add Route Dialog)



Broadcast Search-Select PLC(CX-3D0A4)-Add Route

Add Route Dialog

Enter Host Name / IP: Refresh Status Broadcast Search

Host Name	Connected	Address	AMS NetId	TwinCAT	OS Version	Fingerprint
CX-3D0A4		169.254.196.80	5.61.176.164.1.1	3.1.4024	Win CE (6.0)	EE34BAF81AC3E868A0B891DBA...

Route Name (Target): Route Name (Remote):

AmstNetId:

Transport Type:

Address Info:

☐ Host Name ☒ IP Address

Connection Timeout (s):

Max Fragment Size (kByte):

Target Route: ☐ Project ☒ Static ☐ Temporary

Remote Route: ☐ None / Server ☒ Static ☐ Temporary

☒ Advanced Settings ☐ Unidirectional

Add Route Close

Enter the default password "1" - click OK to complete adding the PLC path

Add Remote Route

☒ Secure ADS (TwinCAT 3.1 >= 4024)

☒ Self Signed Certificate

Check Fingerprint:

Compare with:

☐ Shared Certificate Authority (CA) ☐ Ignore Common Name

☐ Preshared Key (PSK)

Remote User Credentials

User: Password:

Okay Cancel

Add device profile: FAS FNI-ECT-302-000-S (provided by FAS)

Copy the file to the following path to complete adding the configuration file:

C:\TwinCAT\3.1\Config\IO\EtherCAT

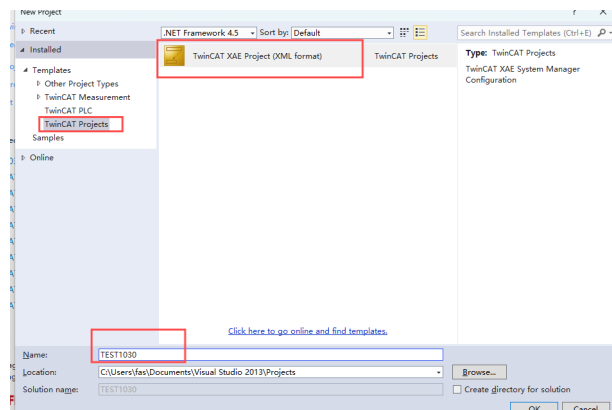
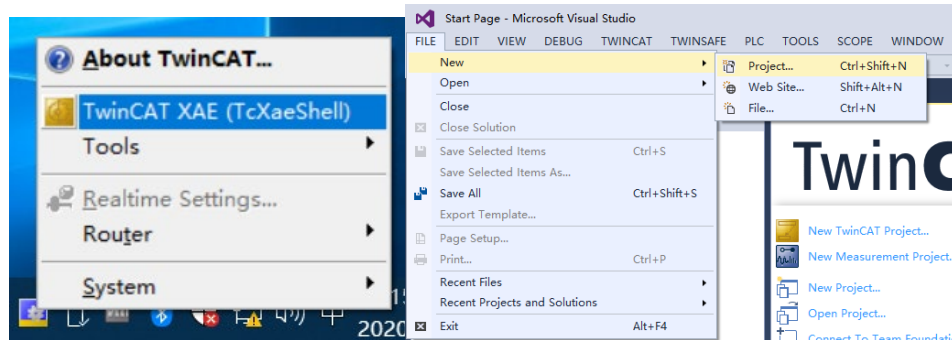
TwinCAT Explorer

IO -> EtherCAT

Host Name	Connected	Address	AMS NetId	TwinCAT	OS Version	Fingerprint
CX-3D0A4		169.254.196.80	5.61.176.164.1.1	3.1.4024	Win CE (6.0)	EE34BAF81AC3E868A0B891DBA...

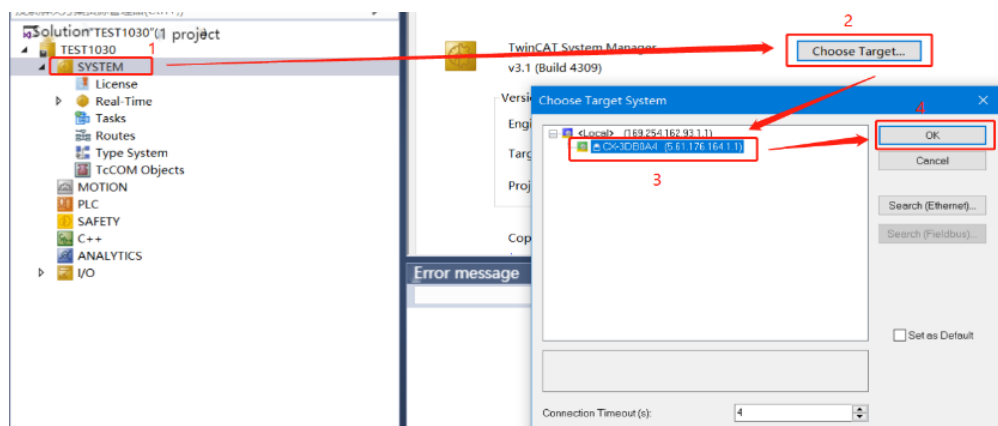
New Construction:

Open the TwinCAT XAE software---File-New-Project---Select TwinCAT XAE Project-Enter the name-OK



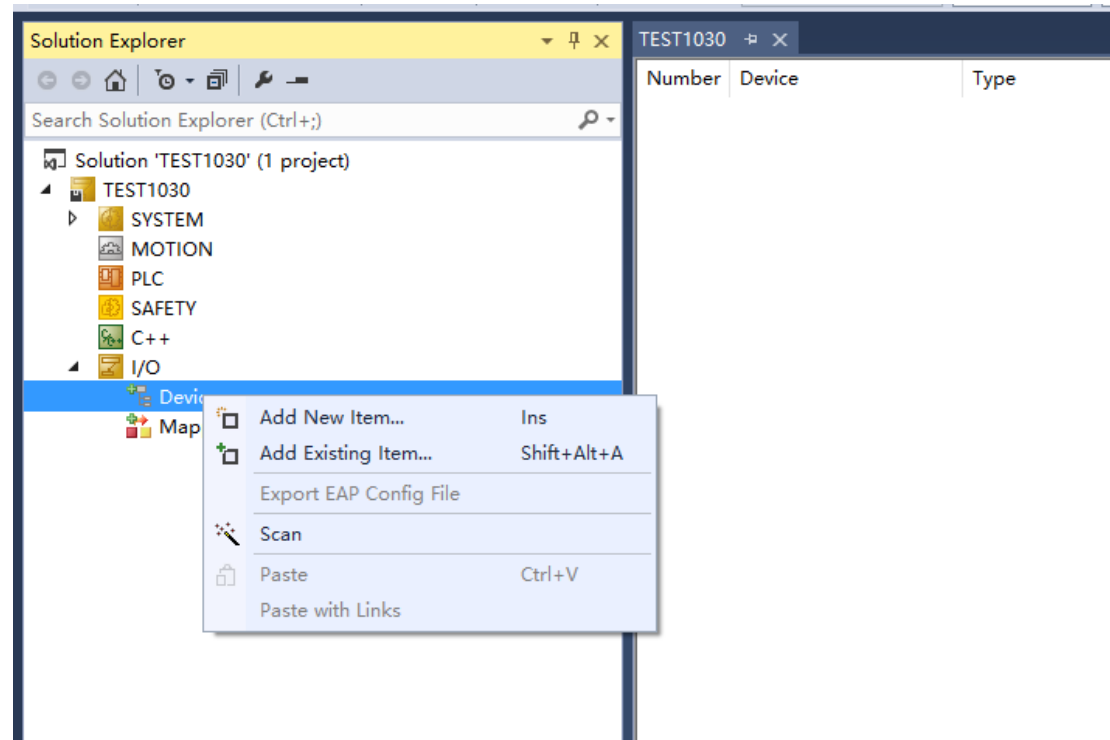
Select target system:

SYSTEM-Choose Target System-Select PLC(CX-3DB0A4)-OK



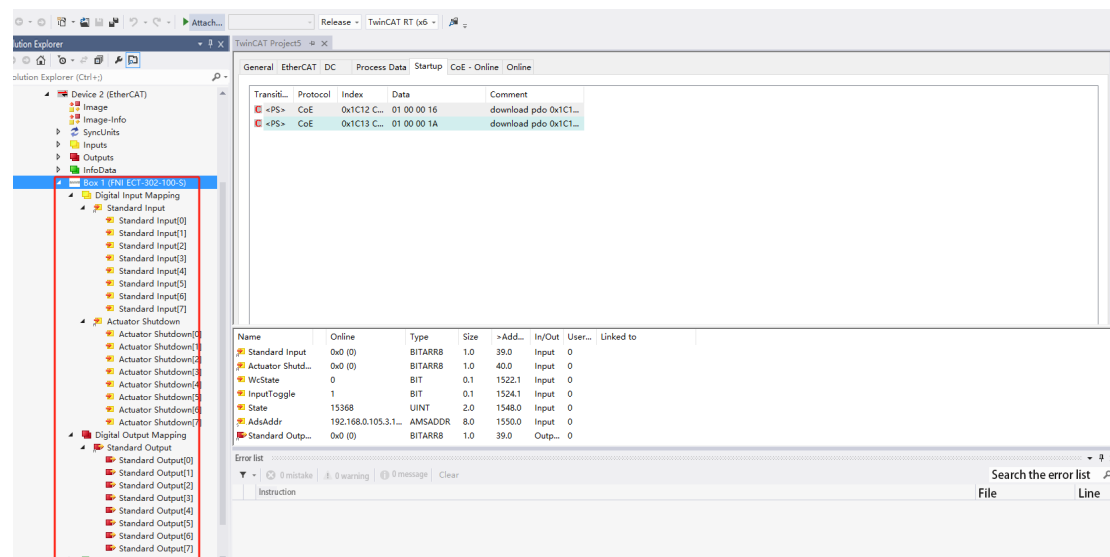
Add module:

Pull down the IO option-DEVICES-SCAN; search for the master , select Device 2 (EtherCAT)-OK



Module mapping data:

When the module requires input/output, the mapping below needs to be operated. When the variable is set to 1, it is output, and when it is set to 0, it is turned off.

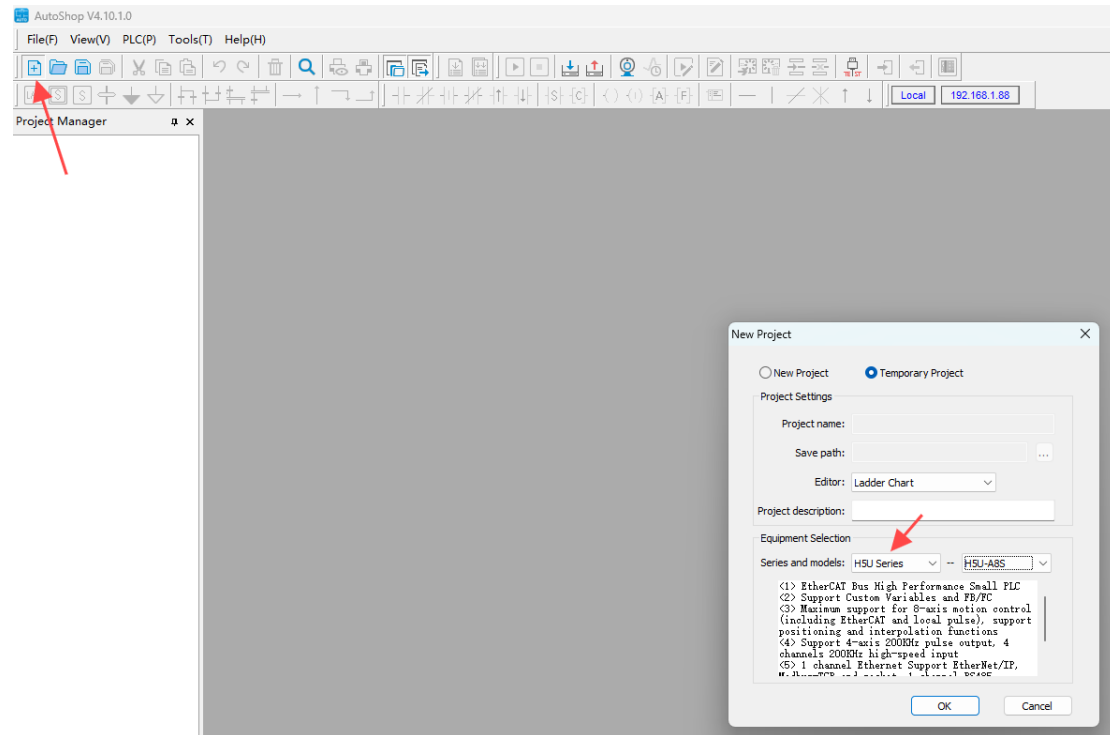


3.2.3 Integrated in Inovance H5U-1614MTD-A8S

Here you will see an example of how to integrate this module into AutoShop, taking the H5U-1614MTD-A8S as an example:

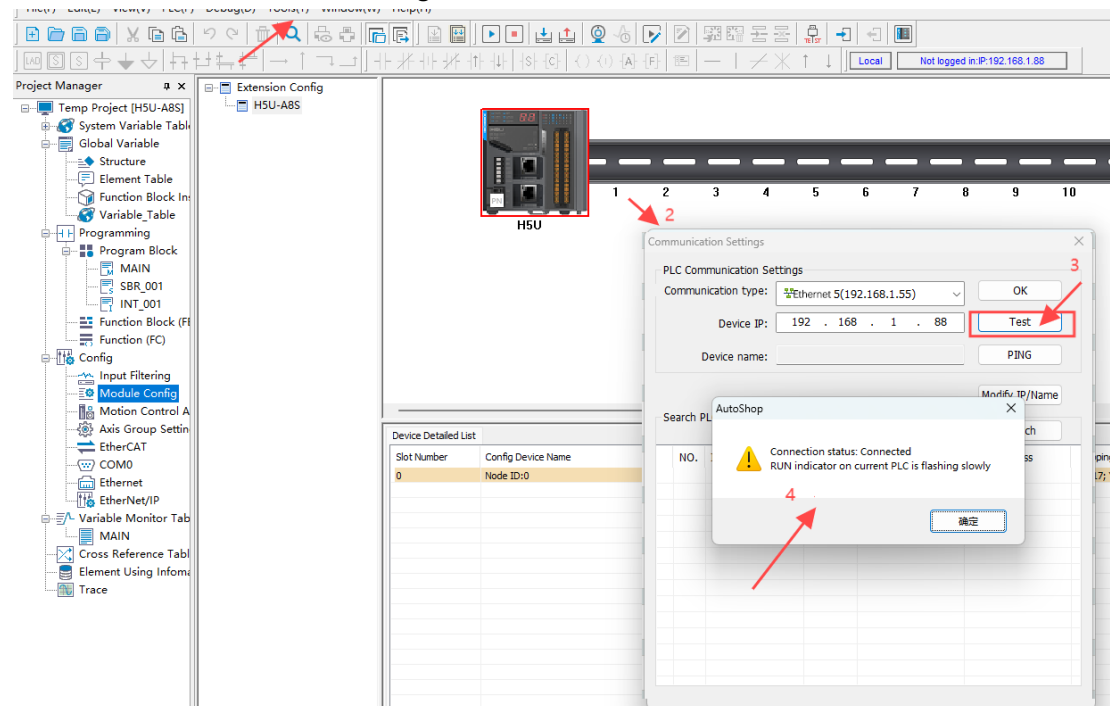
Add new project:

Select the corresponding PLC model for a new project



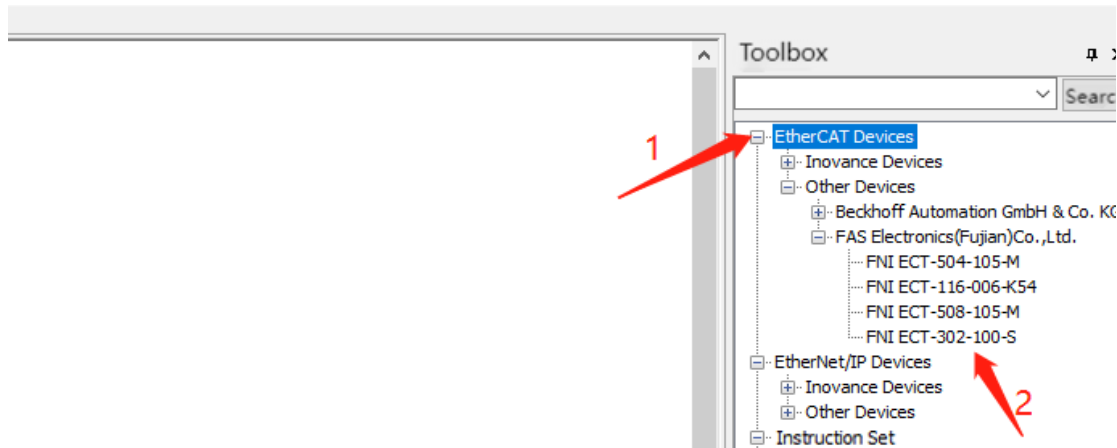
Communication settings:

Click Tools---Communication Settings---Test, the connection status shows Connected---OK



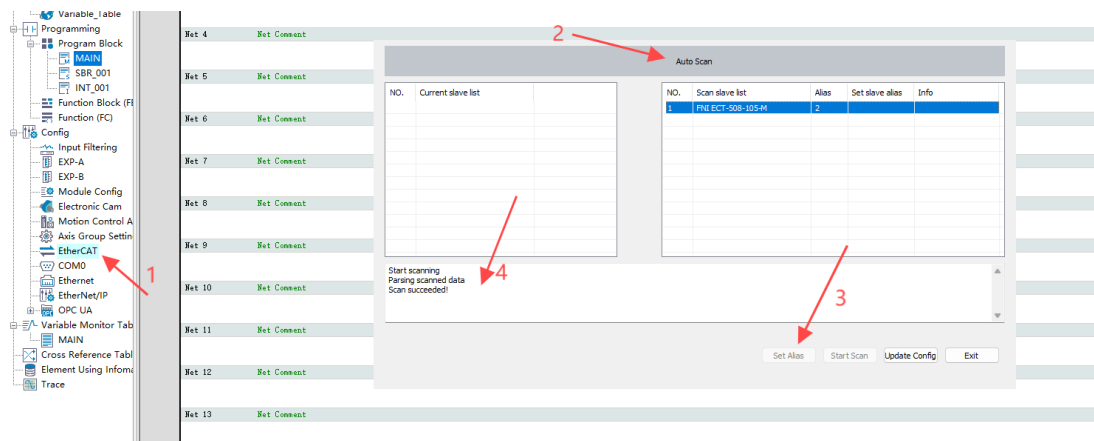
Add description file:

Right-click EtherCAT Devices in the right toolbox---Import device XML----select the description file of FNI ECT-302-000-S. (Pictured models are examples only)



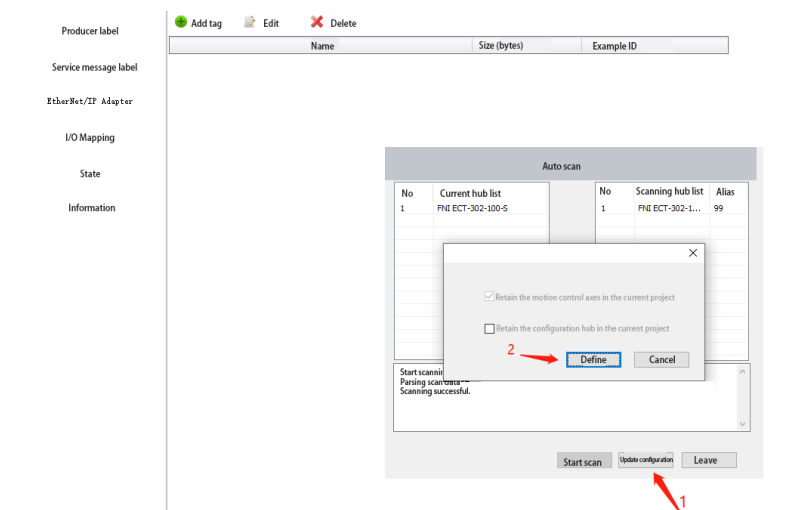
Automatic scan:

Right-click EtherCAT in the project management on the left--automatic scan--start scanning, and the scan is displayed successfully.



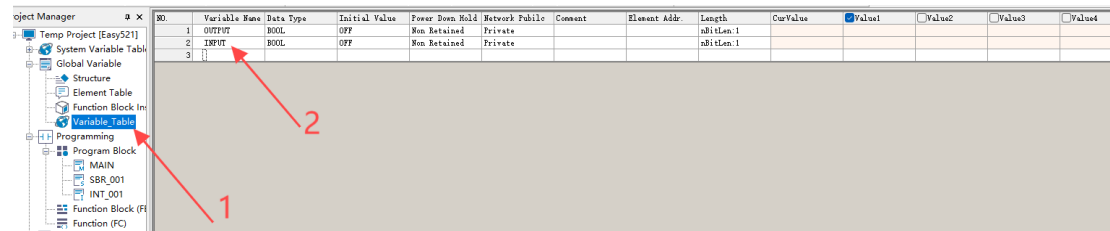
Update configuration:

After the scan is completed, click Update Configuration----OK



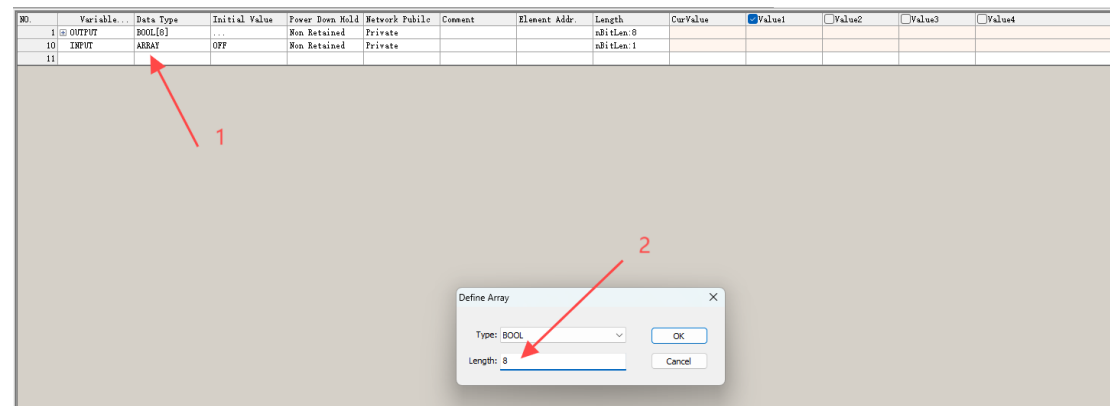
Create new variable:

Create two new input and output variables in the variable table of the project management on the left



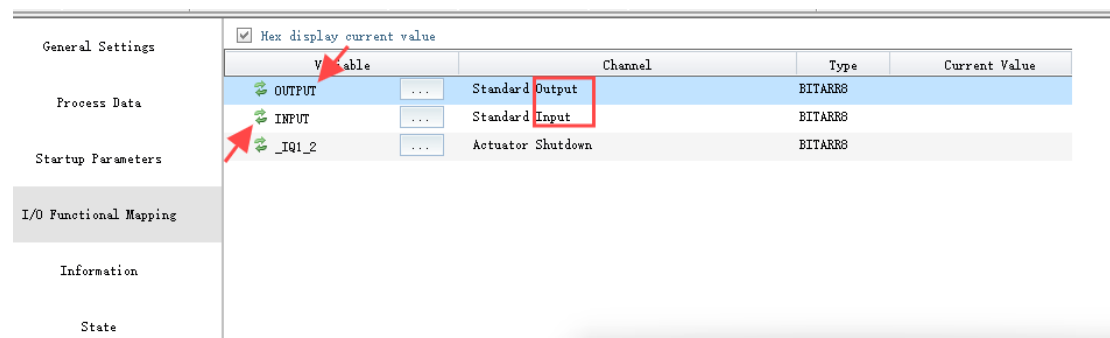
Modify variable type:

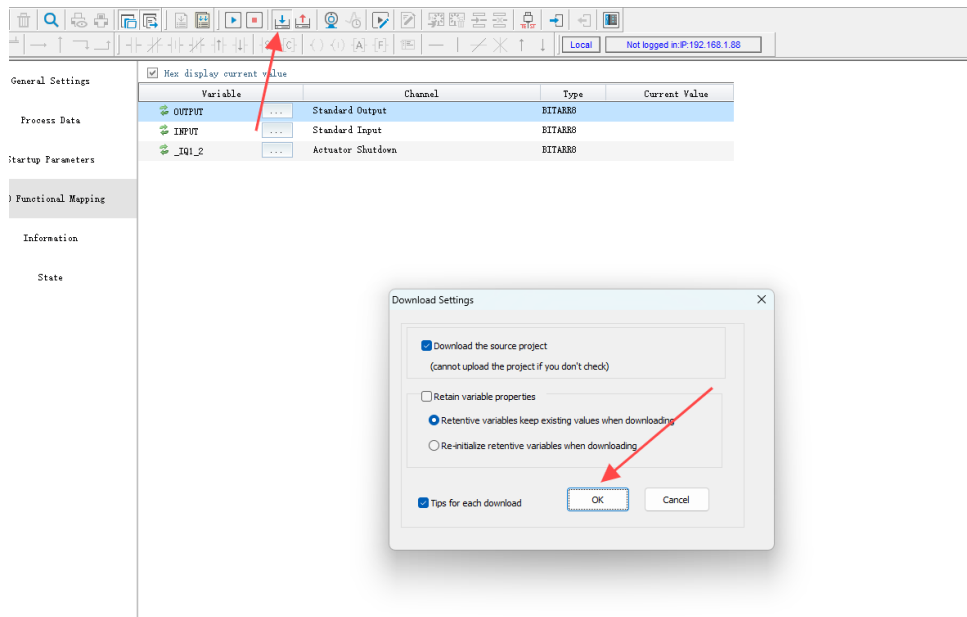
Change the data type of the variable to ARRAY, and change the length of the defined array in the pop-up window to 8



Function mapping:

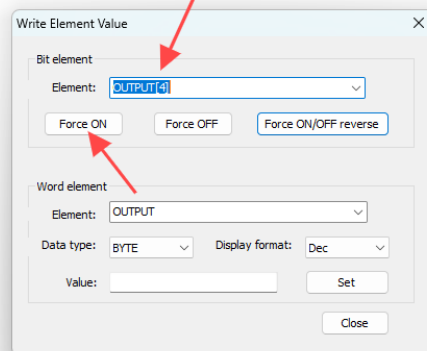
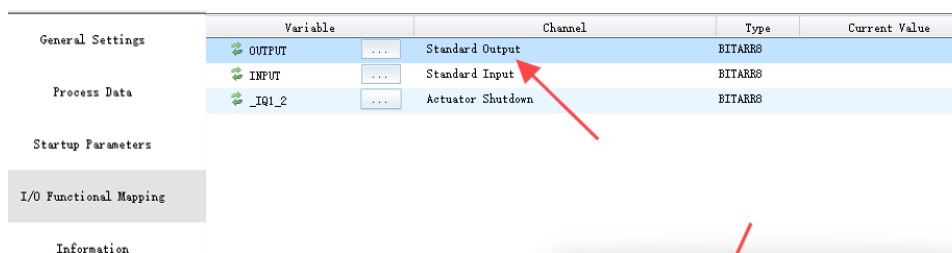
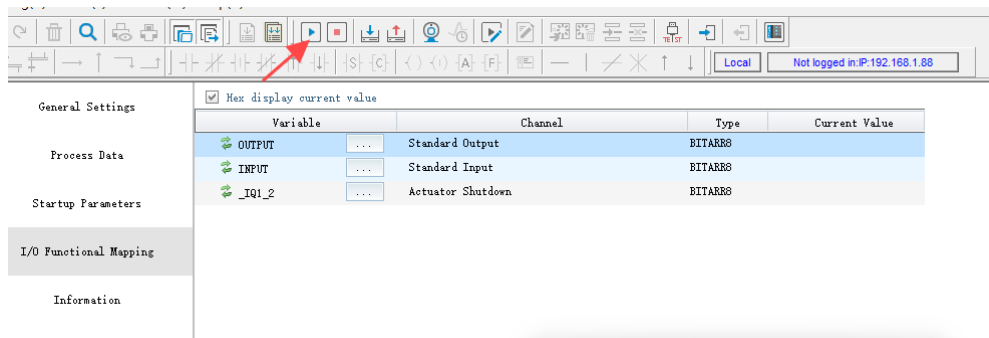
Double-click the corresponding hub in EtherCAT in the project management - I/O function mapping, modify the input and output variables to the newly created variable names in the variable table, and download them to the device.





Run the test:

After clicking Run, the variable row is output on the left. Enter the variable name in the device, such as OUTPUT[4], and click Force ON. If the corresponding 4-port port lights up, it means the configuration is successful.



4. Appendix

4.1 Ordering information

Product ordering code	Ordering code
FNI ECT-302-000-S	006EA1

■ High Quality Product / Sincere Service



경기도 성남시 중원구 사기막골로 124

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