



# PRODUCT

USE INSTRUCTIONS

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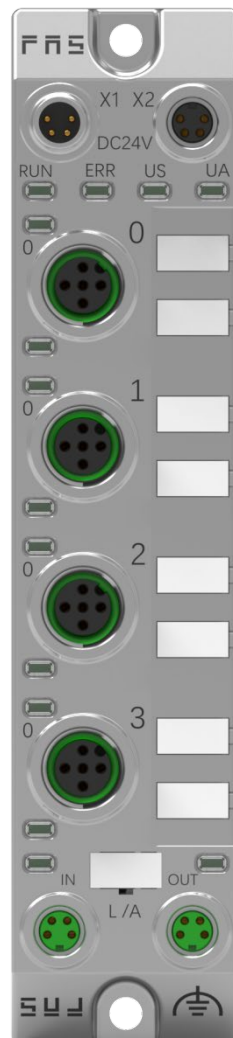


**Ordering code: 006CA1**

**Part number: FNI ECT-104-000-S**

# IP 67 module user manual

## 8xDI PNP



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## ■ Expected use

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

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## ■ 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.

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## ■ 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.

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## ■ Dangerous voltage

Precautions!

Disconnect all power before using the device!

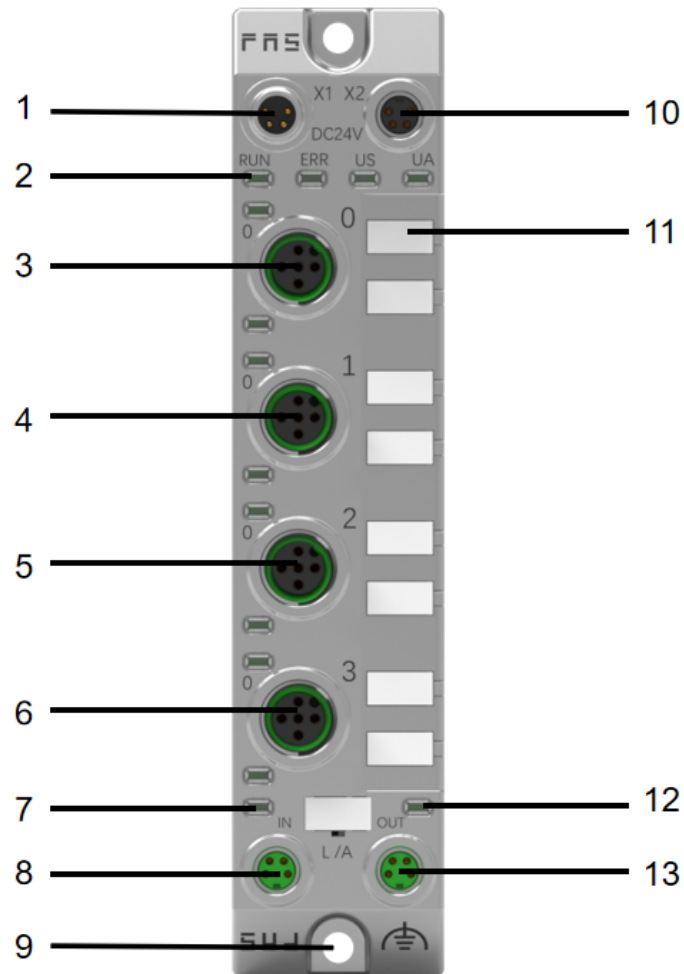
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## ■General security

| 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.<br>This device produces RF noise.                                                                                                                               | <p>The warranty and limited liability statement provided by the manufacturer does not cover damage caused by:</p> <ul style="list-style-type: none"> <li>·Unauthorized tampering</li> <li>·Improper use operation</li> </ul> <p>·The instructions provided in the user manual explain the use, installation and handling of discrepancies</p> |
| 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.                                                                                     | <p>The owner/operator must take appropriate precautions to use this equipment.</p> <p>This device can only use the power supply that matches this device, and can only connect cables approved for application.</p> |                                                                                                                                                                                                                                                                                                                                               |

# 1. Getting Started Guide

## 1.1 Module overview



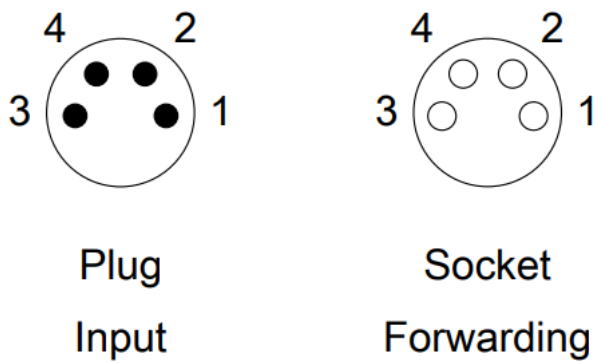
- |                                        |                                          |
|----------------------------------------|------------------------------------------|
| 1 Power input port                     | 8 Network input port                     |
| 2 Module indicator                     | 9 Ground connection                      |
| 3 Port 0                               | 10 Power output port                     |
| 4 port 1                               | 11 port identification board             |
| 5 Port 2                               | 12 Network output status indicator light |
| 6 Port 3                               | 13 Network output port                   |
| 7 Network input status indicator light |                                          |

## 1.2 Mechanical connection

The modules are connected using 2 M4 bolts and 2 washers.  
Isolation pads are available as accessories.

## 1.3 Electrical connections

1.3.1 Power interface (M8)

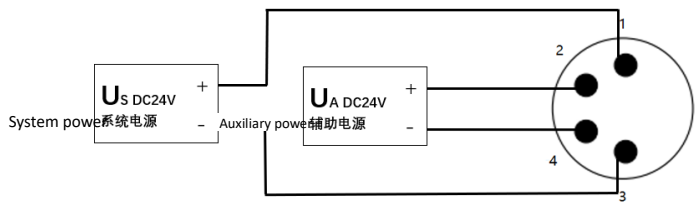


| Pin | Function | Description  |
|-----|----------|--------------|
| 1   | Us+      | +24V (Brown) |
| 2   | Ua+*     | +24V (White) |
| 3   | Us-      | 0V (Blue)    |
| 4   | Ua-*     | 0V (Black)   |

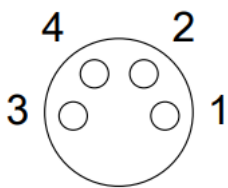
Note:

- 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



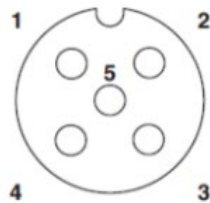
1.3.2 Network Interface (M8)



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

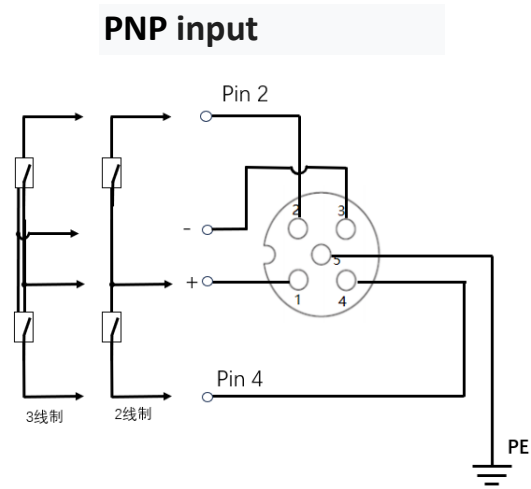
Note:  
Unused I/O port sockets must be covered with end caps to meet IP67 protection, etc.

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

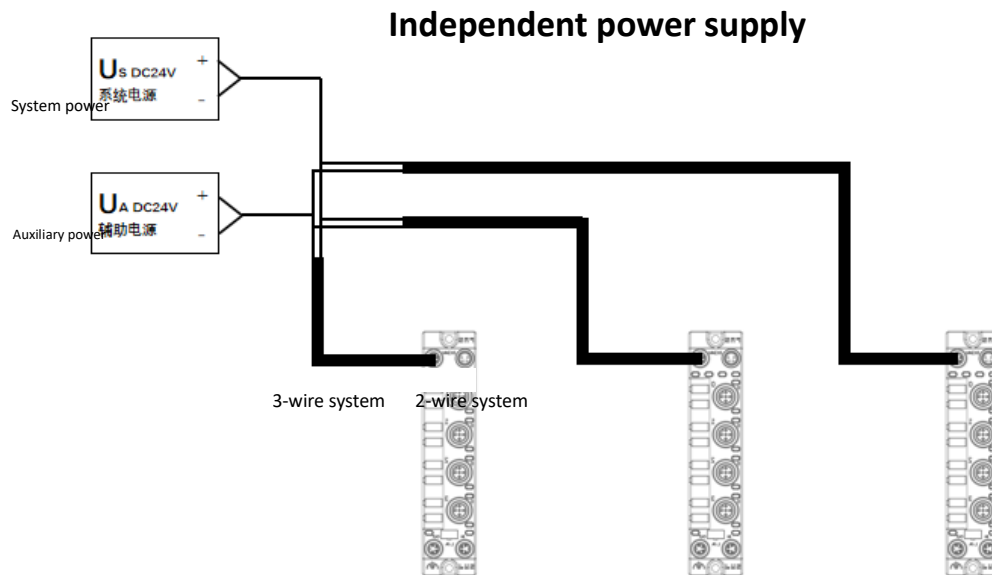


| Pin       | Function |
|-----------|----------|
| 1 (Brown) | 24V      |
| 2 (White) | Input    |
| 3 (Blue)  | 0V       |
| 4 (Black) | Input    |
| 5 (Gray)  | PE       |

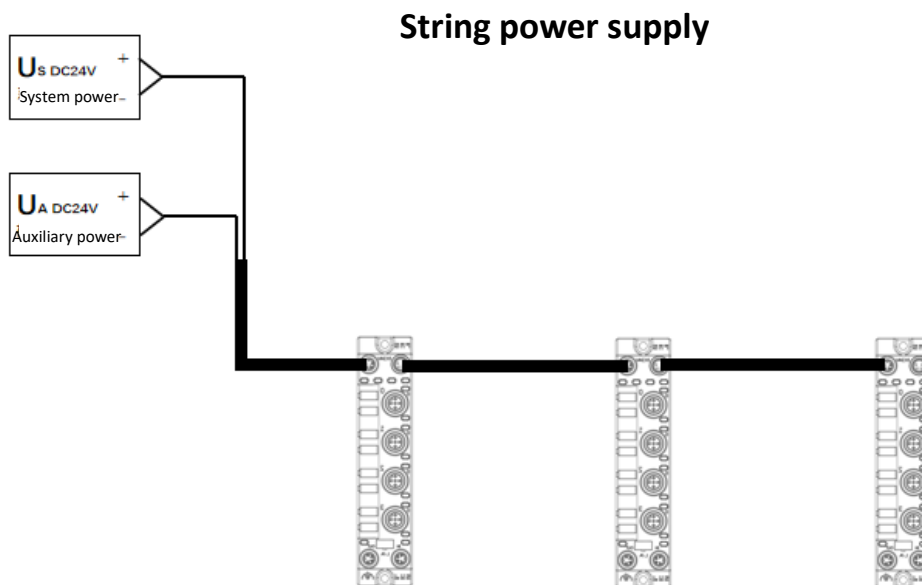
- Note:
- 1. Regarding digital sensor input, please follow the input guidance of EN61131-2, Type 2.
  - 2. Unused I/O port sockets must be covered with end caps to meet IP67 protection level.



### 1.3.4 Remote module wiring method



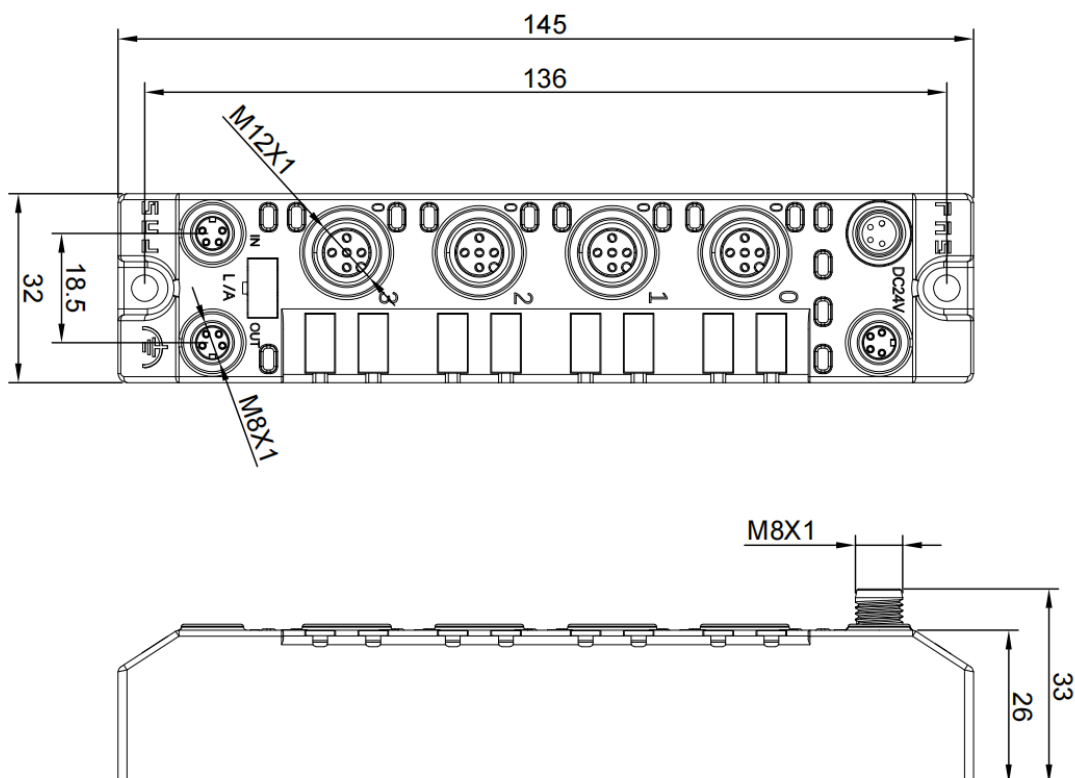
In independent power supply mode, the maximum current of each master station can reach 4A.



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 |

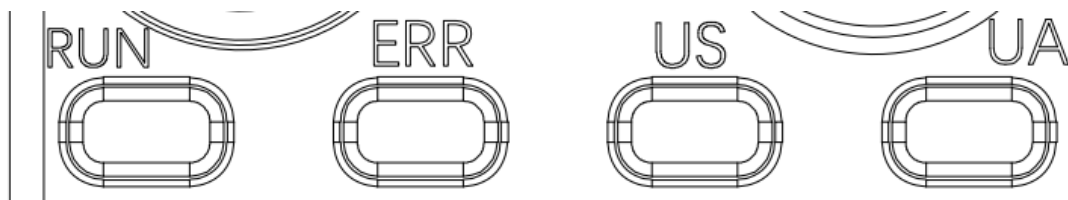
## 2.4 Electrical data

|                                                           |                                 |
|-----------------------------------------------------------|---------------------------------|
| 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               | 10/100 M bit/s                                                   |
| Maximum cable length             | 100m                                                             |
| Flow control                     | Half working condition/full working condition (IEEE 802.3-PAUSE) |

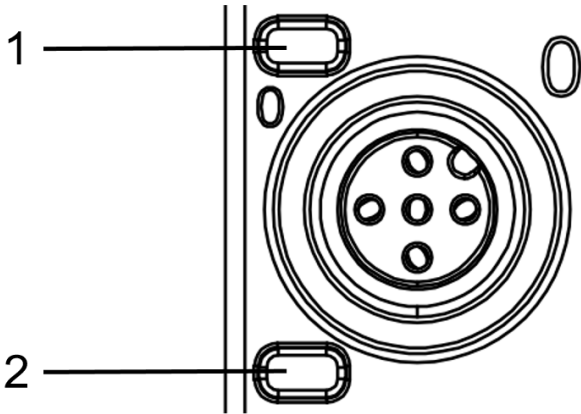
## 2.6 Function indicator



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 | Closure                   | 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 is 0 |
| 1   | Yellow  | The status of Pin4 input is 1 |
| 2   | Closure | The status of Pin2 input is 0 |
| 2   | Yellow  | The status of Pin2 input is 1 |

Network port status



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

## 3 Integrated

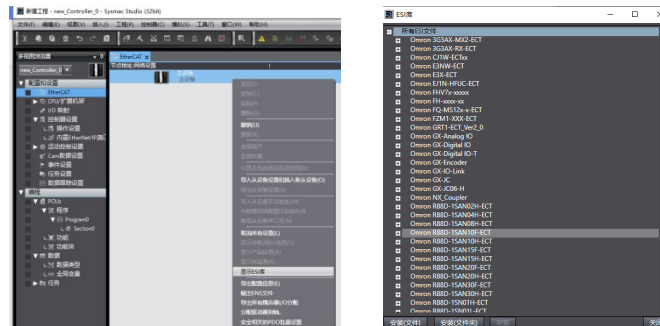
### 3.1 Data mapping

| 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 Overvoltage | UA Overvoltage | overheat | US Under voltage | UA Under voltage |
| Data description (binary): 0=no signal 1=signal |                      |       |       |       |                |                |          |                  |                  |

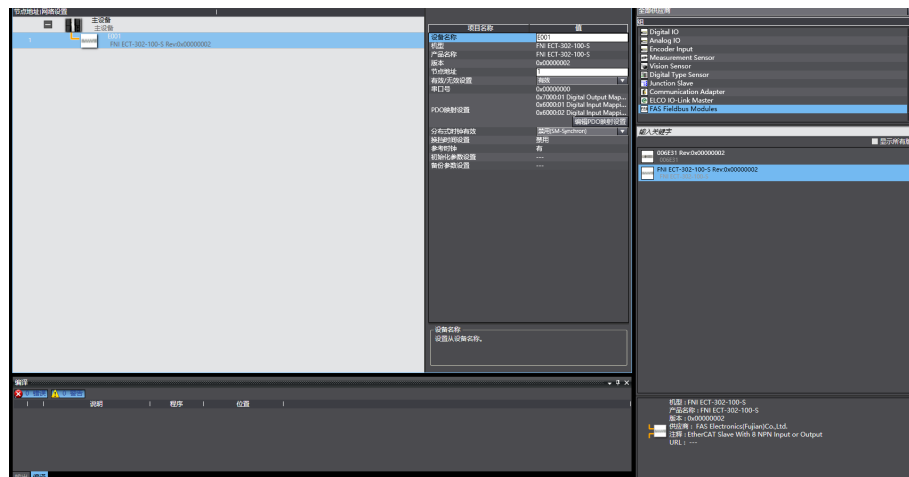
## 3.2 PLC integration tutorial

### 3.2.1 Omron NX1P2 sysmac studio Integrated (ECT)

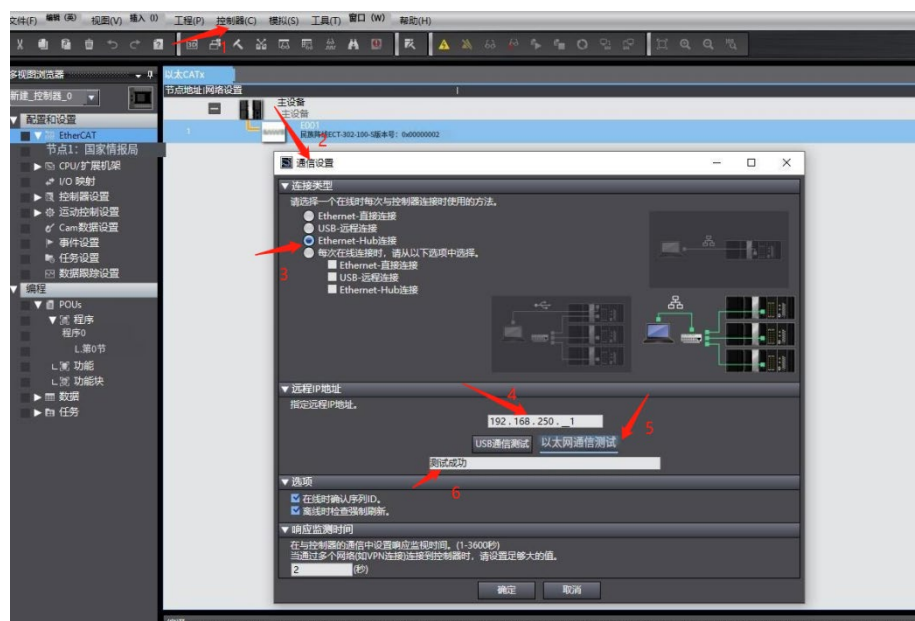
1. Install the ESI file: Double-click EtherCAT in Configuration and Settings--right-click the main device--select "Show ESI Library", and select the ESI file in the pop-up window for installation.



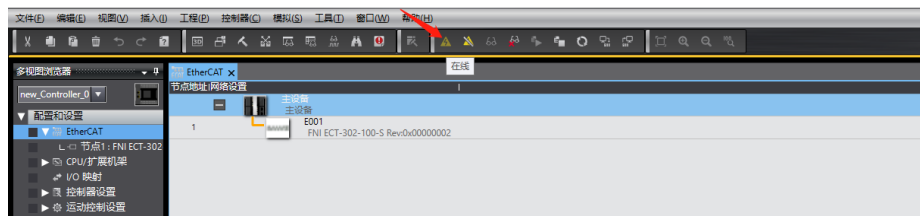
2. Configure the module into the EtherCAT network: Find the module model icon in the FieldBus Modules toolbox on the right and double-click to join the network.



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



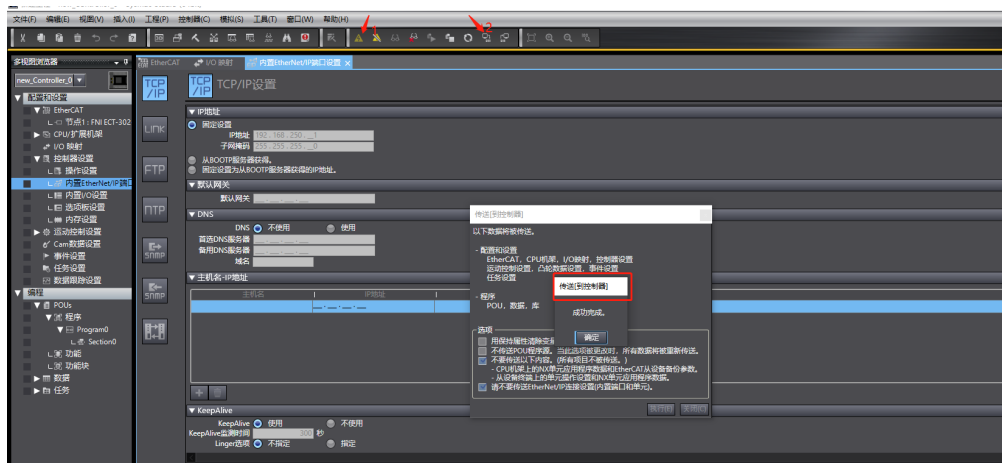
4. Switch the PLC to online mode, right-click the master device and click "Write slave device node address".



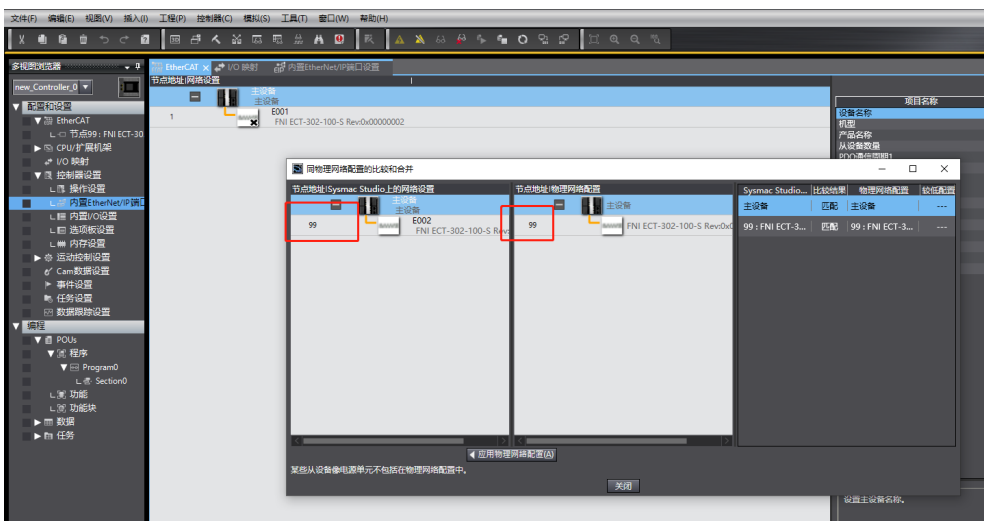
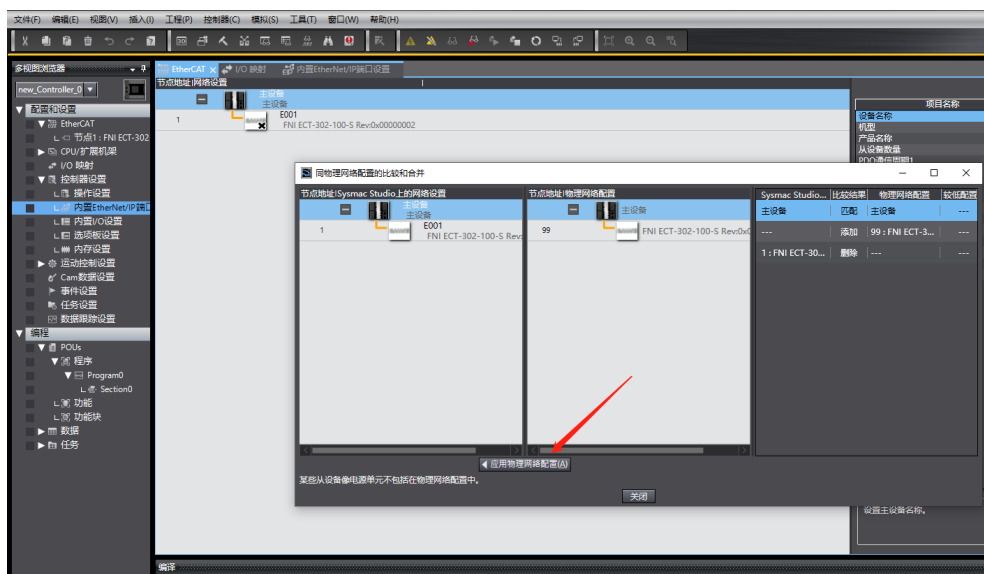
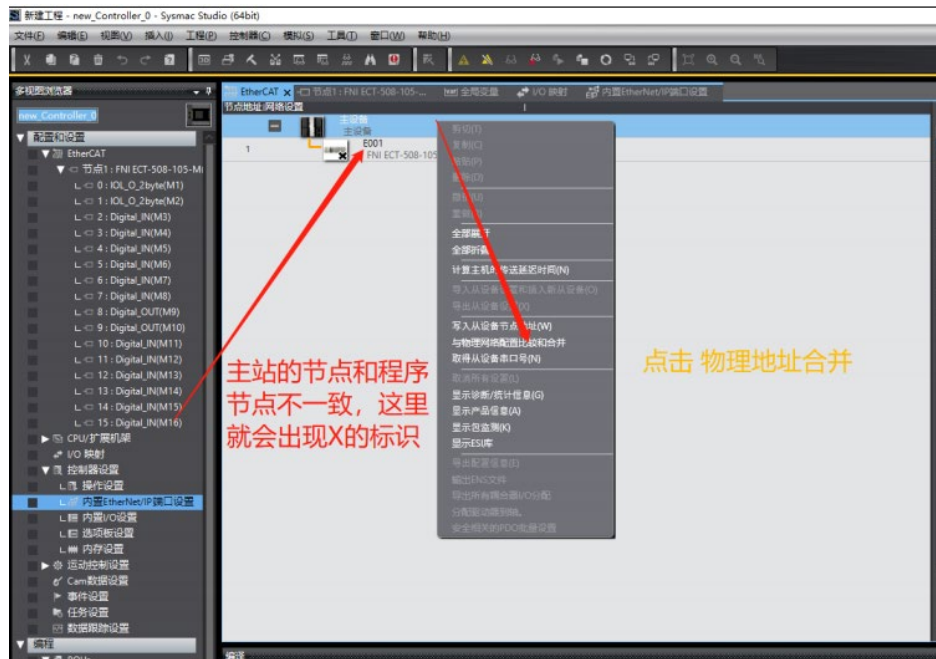
5. Variable mapping: PLC goes to offline mode, select the configured node in the I/O mapping, and fill in the name of the variable.

| 位置     | 端口                                              | 说明 | R/W | 数据类型                | 变量   | 变量注释 | 变 |
|--------|-------------------------------------------------|----|-----|---------------------|------|------|---|
| 节点1    | FNI ECT-302-100-S                               |    |     |                     |      |      |   |
|        | Digital Output Mapping_Standard Output_7000_01  |    | W   | ARRAY[0..7] OF BOOL | OUT1 |      |   |
|        | Digital Input Mapping_Standard Input_6000_01    |    | R   | ARRAY[0..7] OF BOOL |      |      |   |
|        | Digital Input Mapping_Actuator Shutdown_6000_02 |    | R   | ARRAY[0..7] OF BOOL |      |      |   |
| CPU机架0 | CPU机架0                                          |    |     |                     |      |      |   |

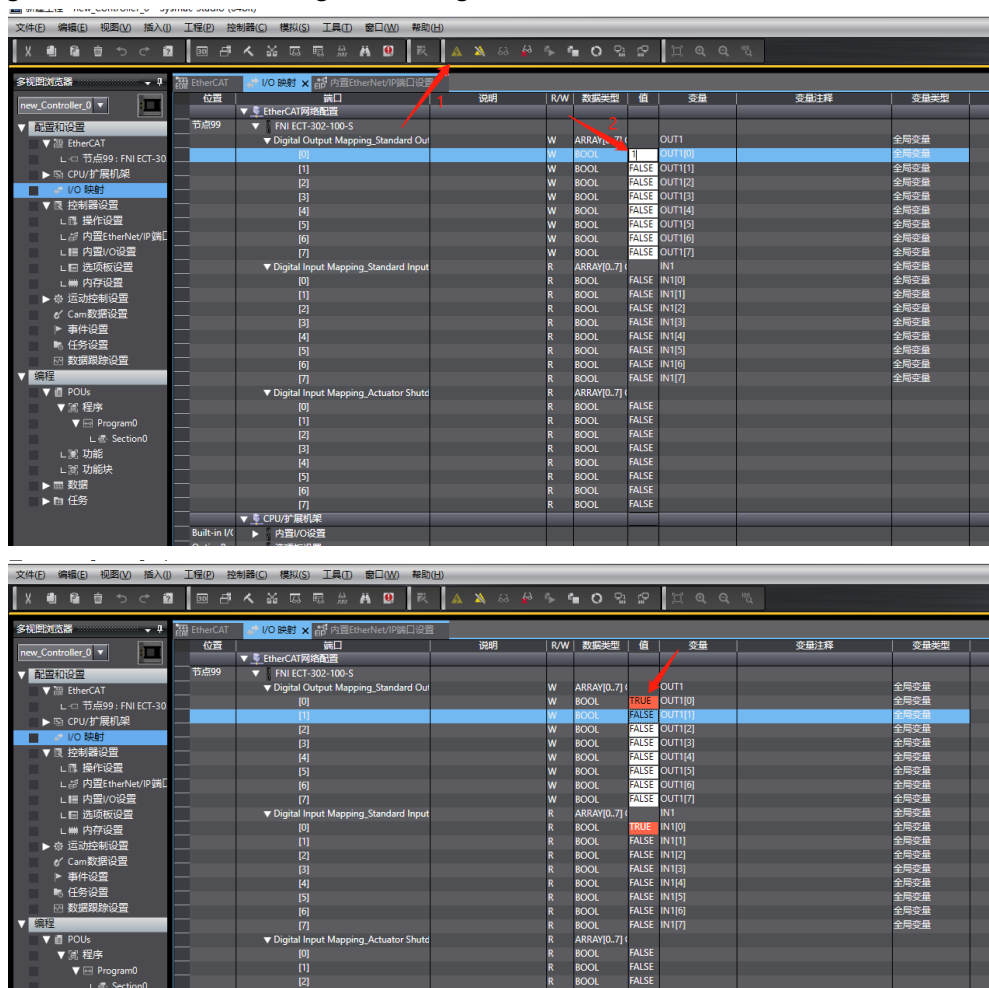
6. Switch the PLC to online mode and click "To Controller"



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



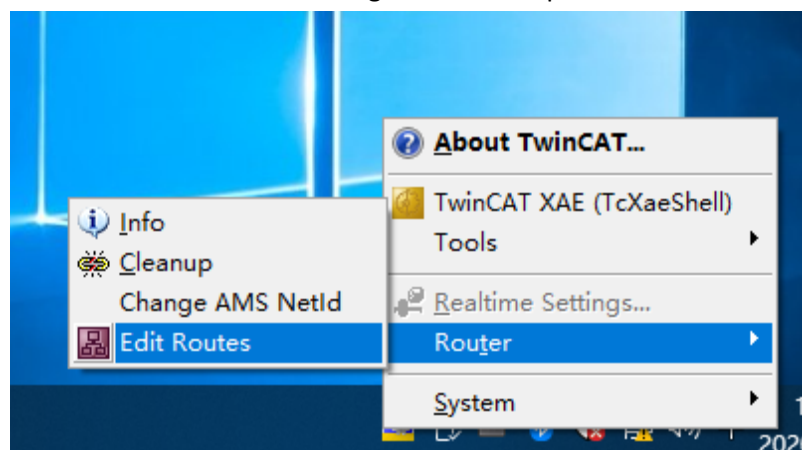
8. In the I/O mapping, set the output value of any port to 1 and press Enter. If the output value changes to TRUE and turns orange, the configuration is successful.



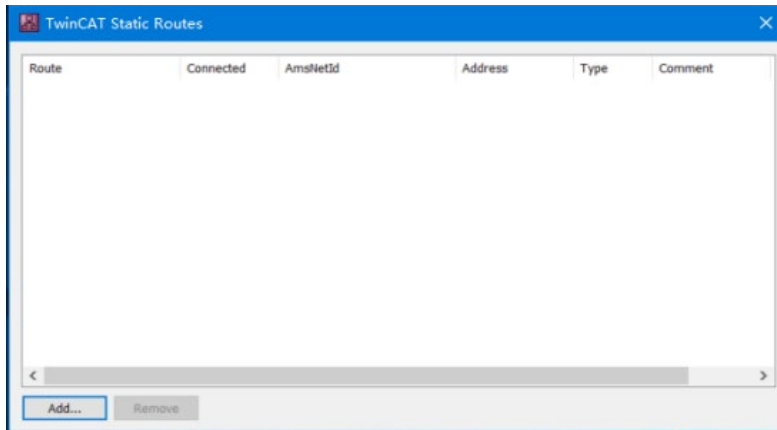
### 3.2.2 Integrated in BECKHOFF winCATXAE

Integrated in BECKHOFF winCATXAE

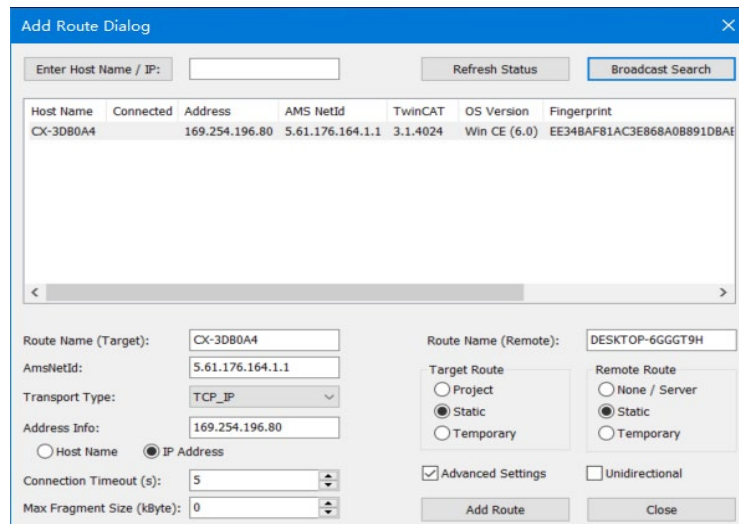
Right-click the TwinCAT icon in the lower right corner to open Edit Routes



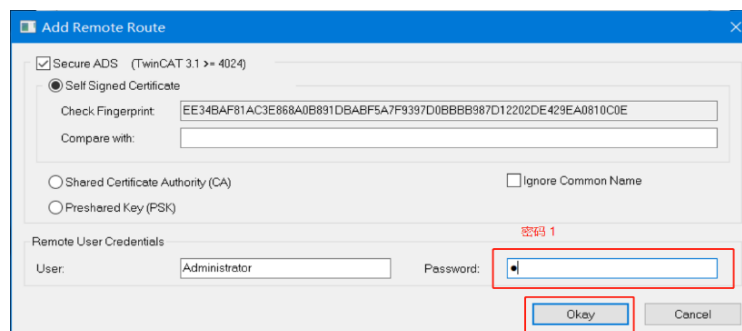
Click Add...;Add route (Add Route Dialog)



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



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

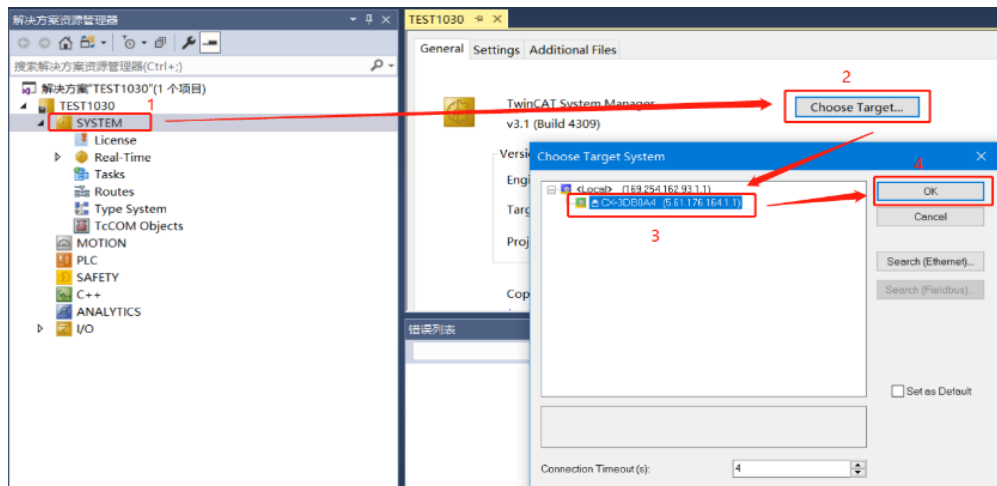


**Add device profile:** FAS FNI-ECT-104-000-S (provided by FAS)

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

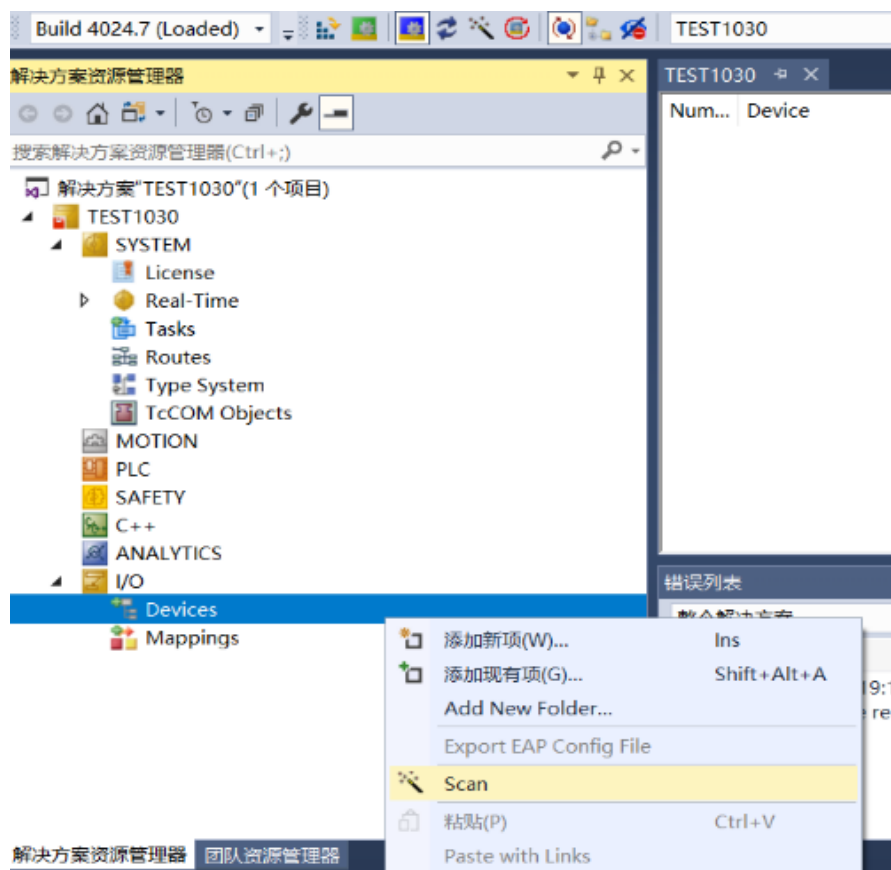
C:\TwinCAT\3.1\Config\IO\EtherCAT





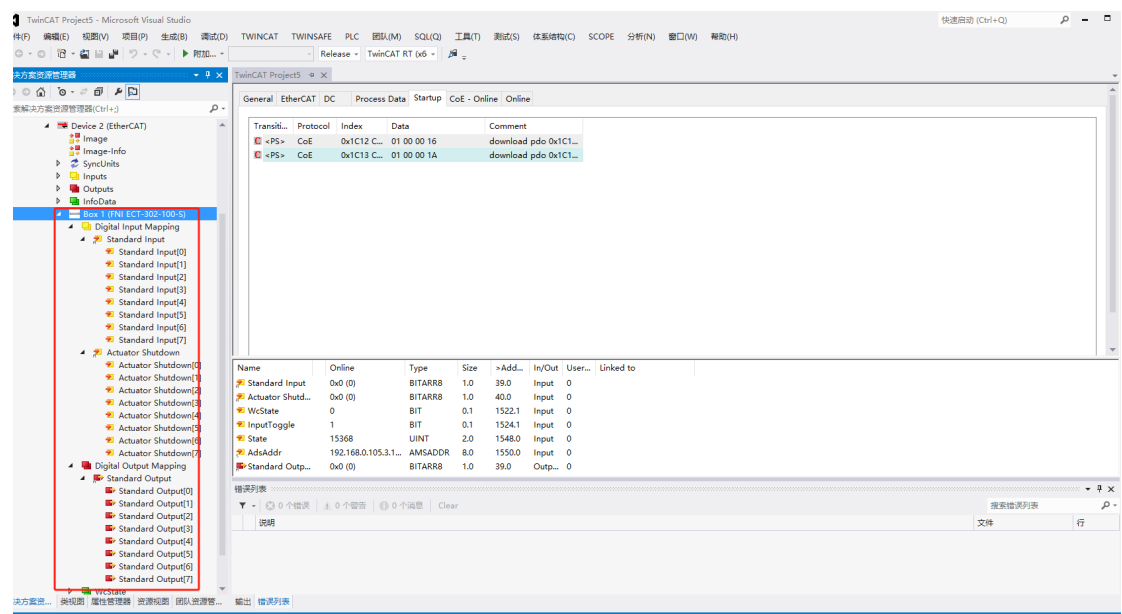
### Add module:

Pull down the IO option-DEVICES-SCAN; search for the master station, 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.

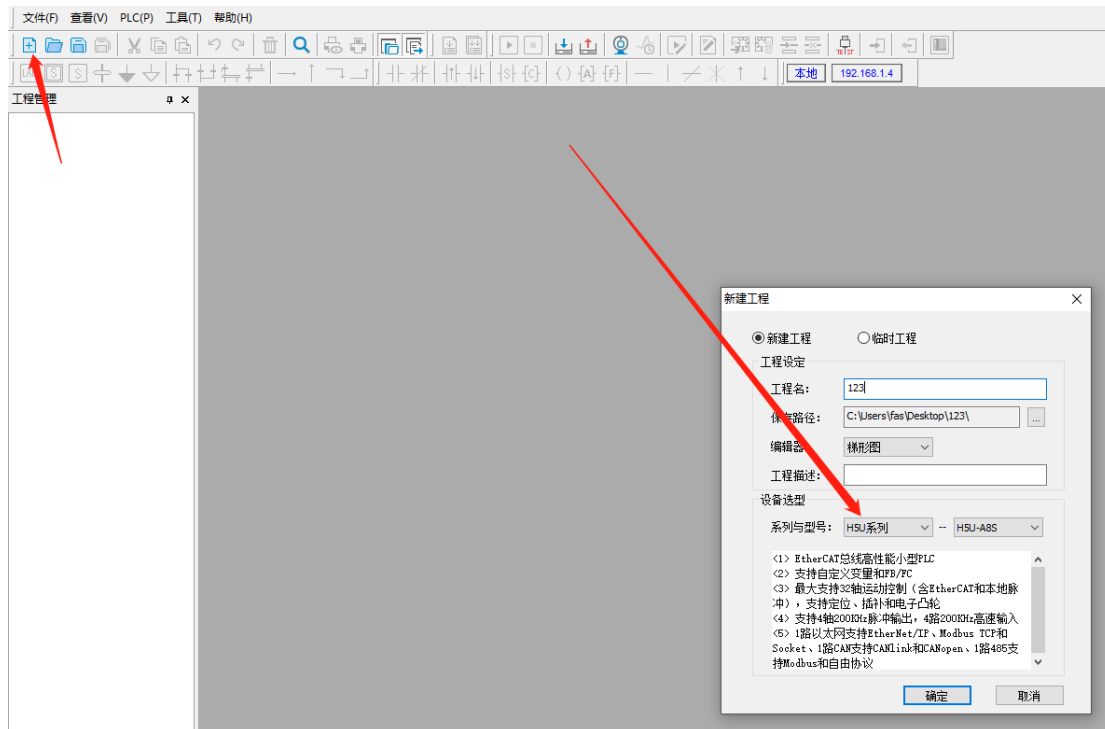


### 3.2.3 Integrated in Inovance H5U-1614MTD-A8S

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

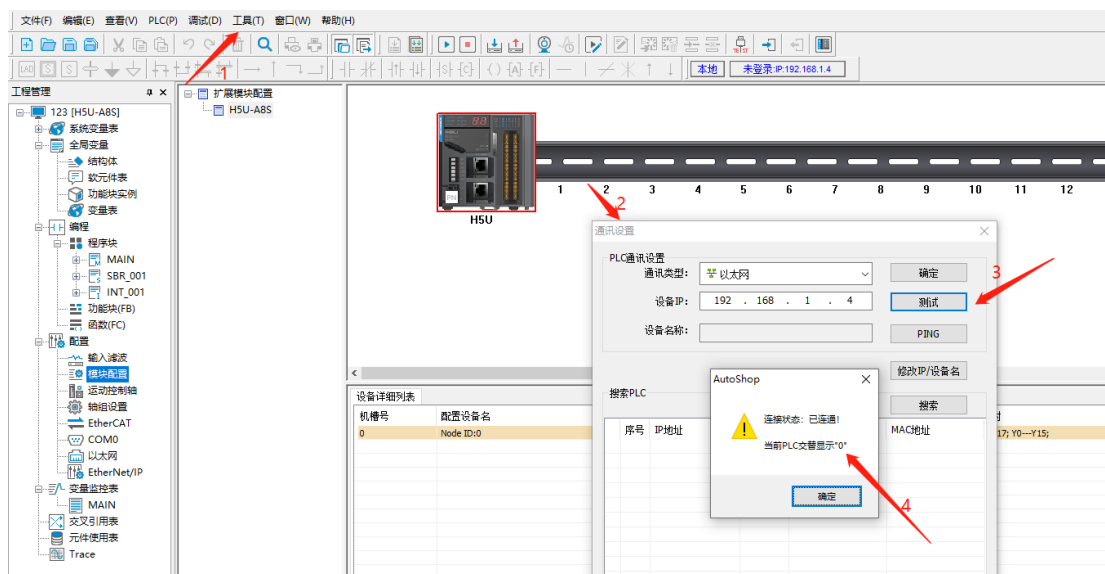
**Add new project:**

**Select the corresponding PLC model for a new project**



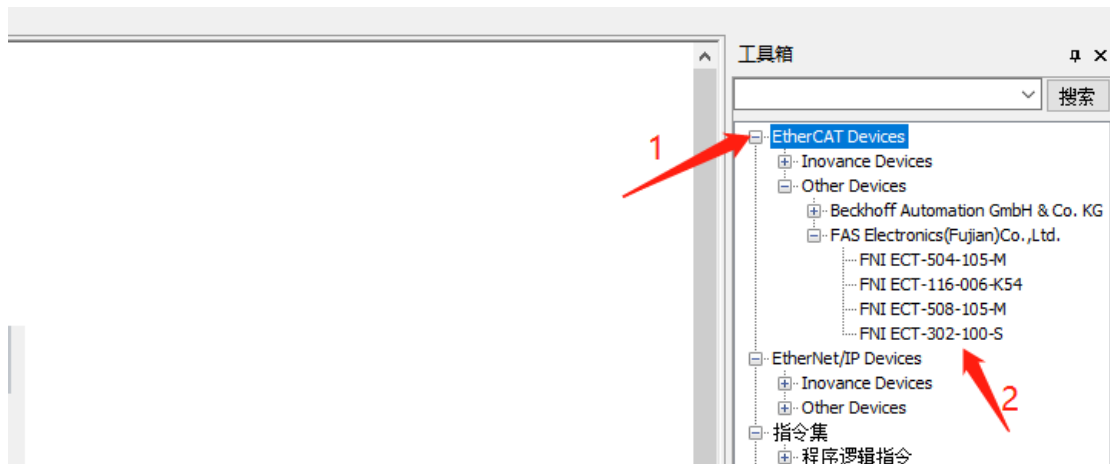
**Communication settings:**

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



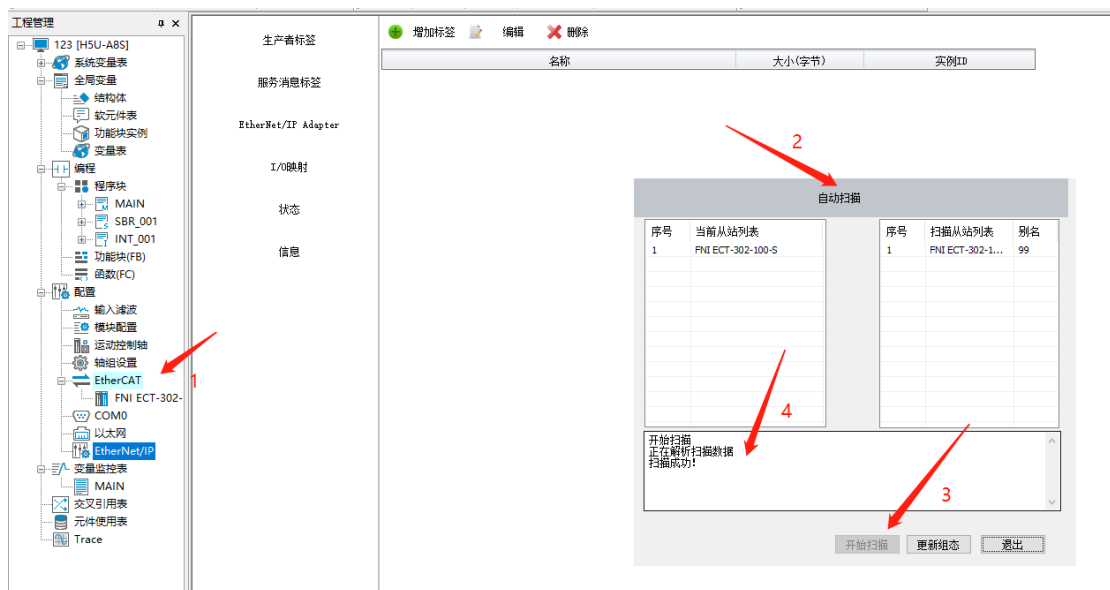
### Add description file:

Right-click EtherCAT Devices in the right toolbox---Import device XML----select the description file of FNI ECT-104-000-S. (Pictured models are examples only)



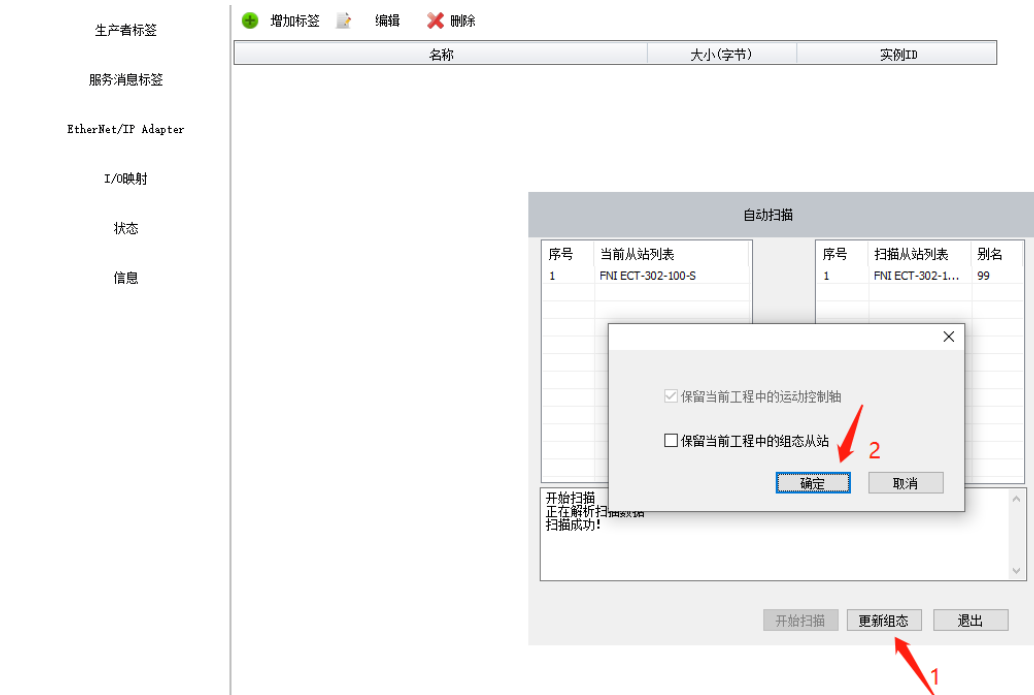
### Automatic scan:

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



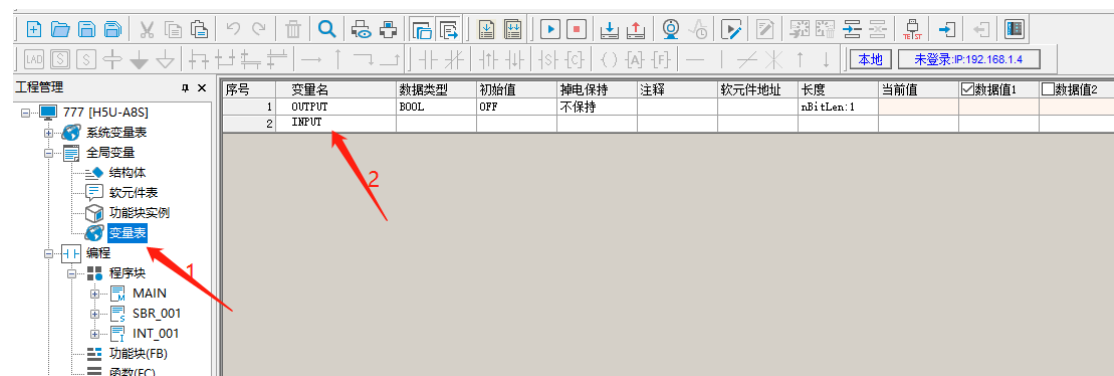
## Update configuration:

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



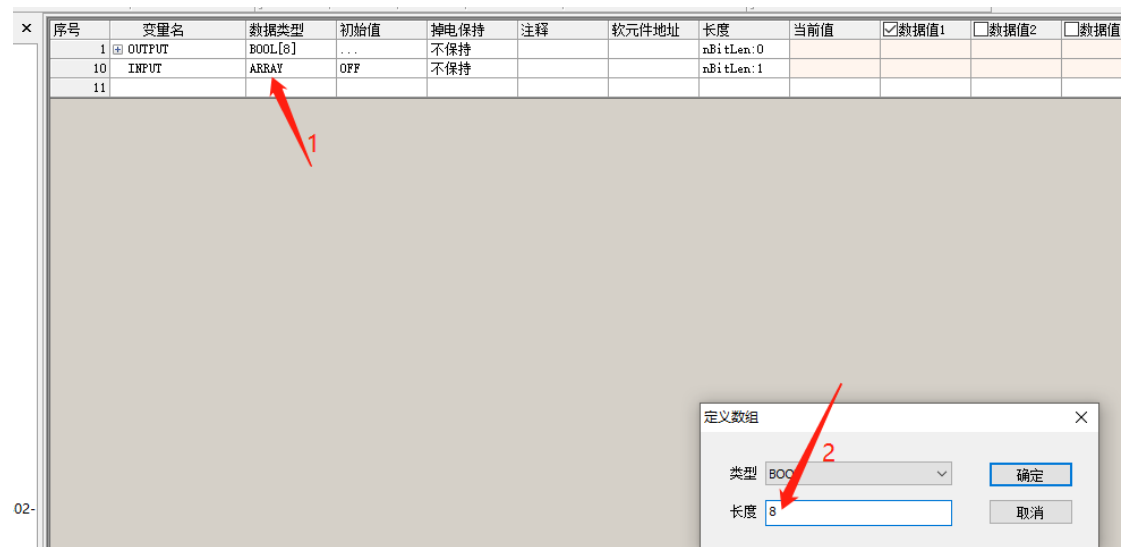
## Create new variable:

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



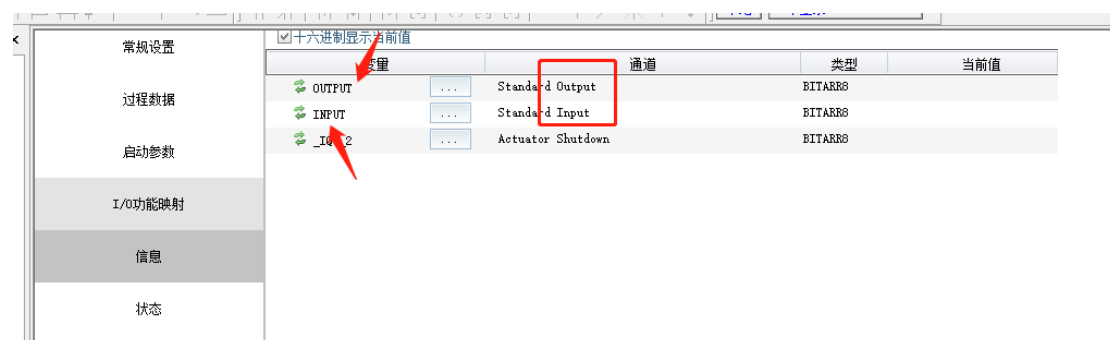
## Modify variable type:

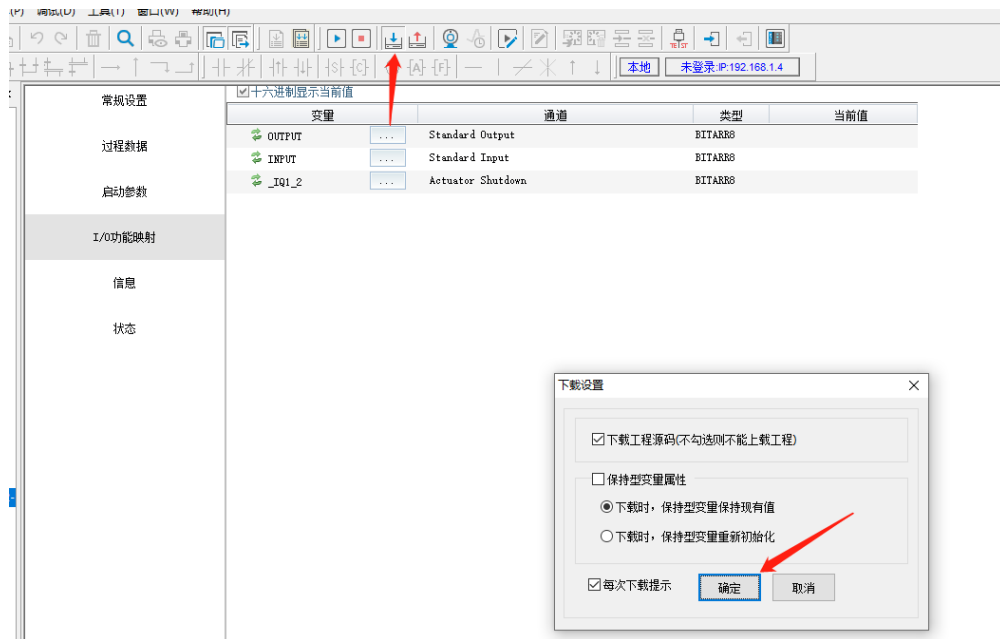
Change the data type of the variable to ARRAY, and change the length of the defined array in the pop-up window to 8



### Function mapping:

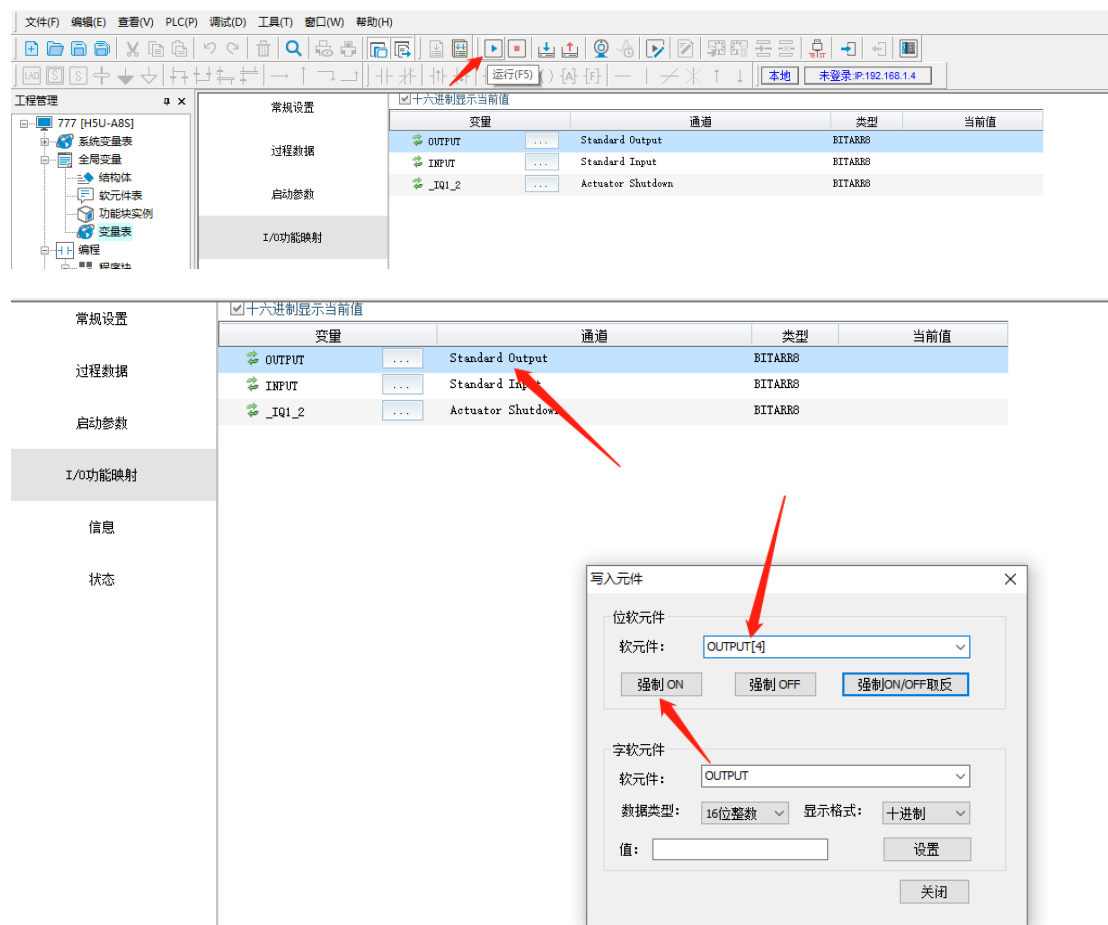
Double-click the corresponding slave station in EtherCAT in the project management - I/O function mapping, modify the input and output variables to the newly created variable names in the variable table, and download them to the device.





### Run the test:

After clicking Run, double-click the output variable row, type the variable name in the device, such as OUTPUT[4], and click Force ON. If the corresponding port 4 indicator lights up, the configuration is successful.



## **4.Appendix**

### **4.1 Ordering information**

|                       |            |
|-----------------------|------------|
| Product ordering code | Order code |
| FNI ECT-104-000-S     | 006CA1     |

■ High Quality Product / Sincere Service



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