



PRODUCT

USE INSTRUCTIONS



Ordering code: 007EA3

Part number: FNI MPL-302-100-S

FNI MPL-302-100-S

8 DI/DO NPN

IP 67 module user manual



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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!

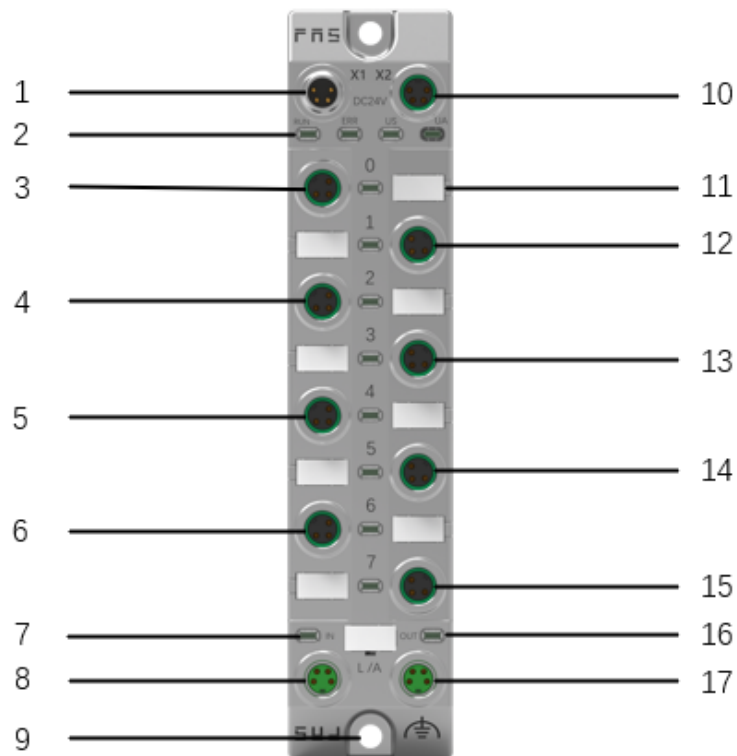
Disconnect all power before using the device!

■ 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 2

5 Port 4

6 Port 6

7 Network input status indicator

8 Network input port

9 Ground connection

10 Power output port

11 Port identification board

12 Port 1

13 Port 3

14 Port 5

15 Port 7

16 Network output status indicator

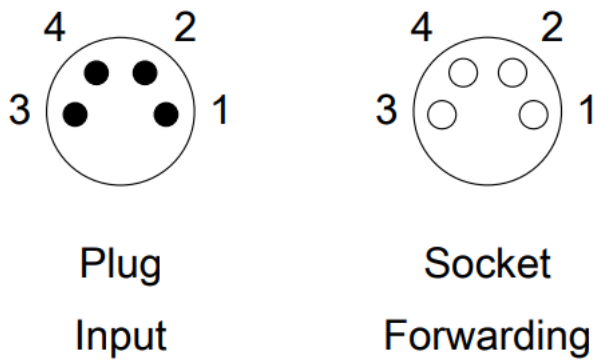
17 Network output port

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)

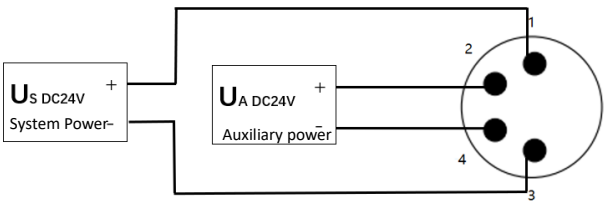


Pin	Function		Description
1	Us+		+24V(Brown)
2	Ua+*		+24V(White)
3	Us-		0V(Blue)
4	Ua-*		0V(Black)

Note:

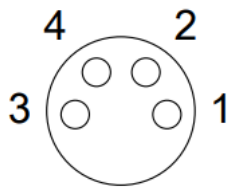
- 1. If possible, provide US power supply and UA power supply separately.
Total current <4A. Total current of all modules <4A, even when actuator power supplies are daisy chained.
- 2. The FE connection from the housing to the machine must be low impedance and kept as short as possible.

Power port



1.3.2 Network Interface(M8)

Pin	Function
-----	----------

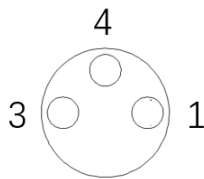


1	Tx+	Send data+
2	Rx+	Receive data+
3	Tx-	send data-
4	Rx-	Receive data-

Note:

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

1.3.3 I/O-port (M8)

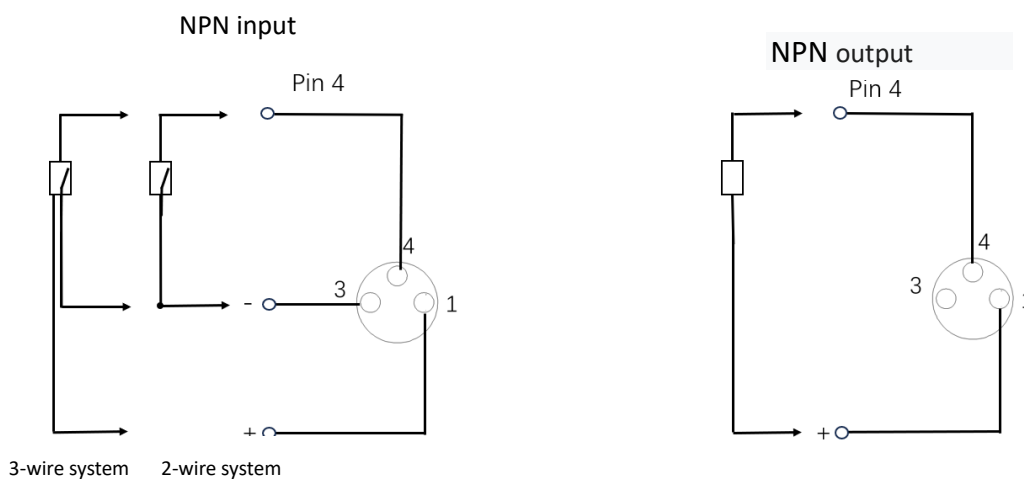


Pin	Function
1 (Brown)	24V
3 (White)	0V
4 (Black)	input /Output

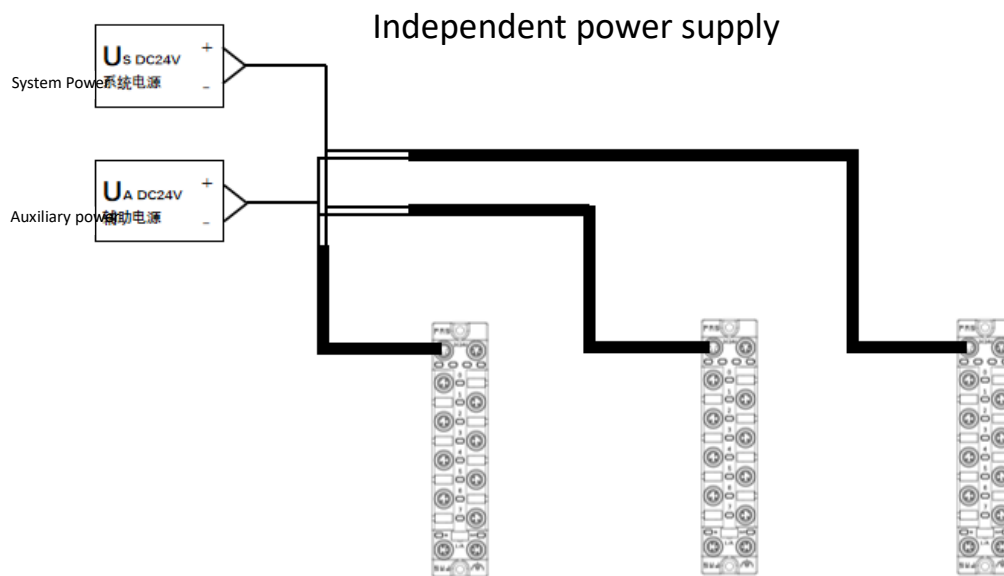
Note:

1. Regarding digital sensor input, please follow the input guidance of EN61131-2, Type 2.
2. The maximum single output current of pin 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.

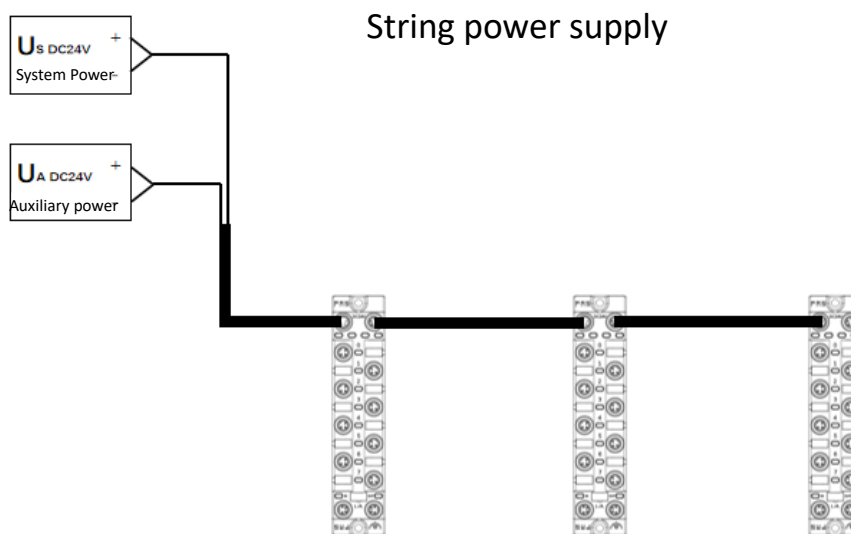
Normal I/O



1.3.4 Remote module wiring method



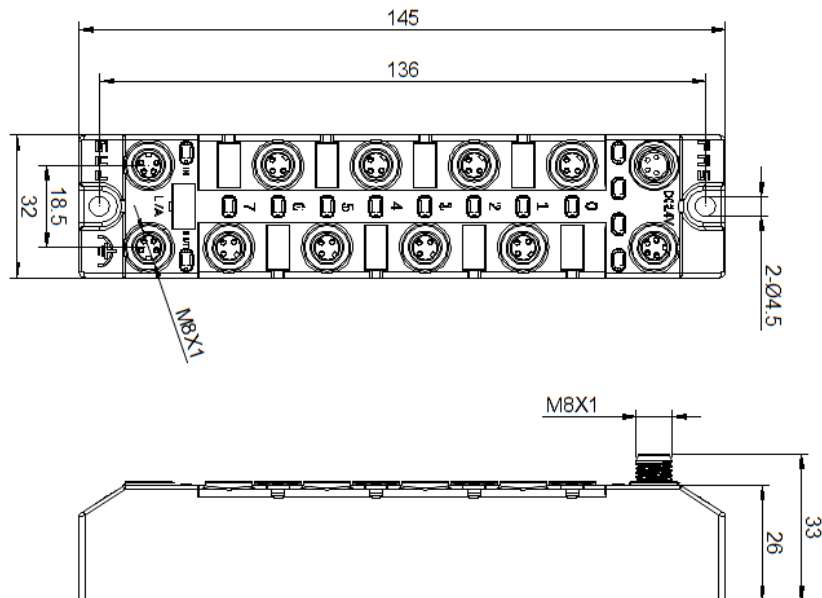
In independent power supply mode, the maximum current of each master station can reach 4A.



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	Die-cast aluminum housing, pearl nickel plated
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	-5°C ~ 85°C
Storage temperature	-25°C ~ 85°C

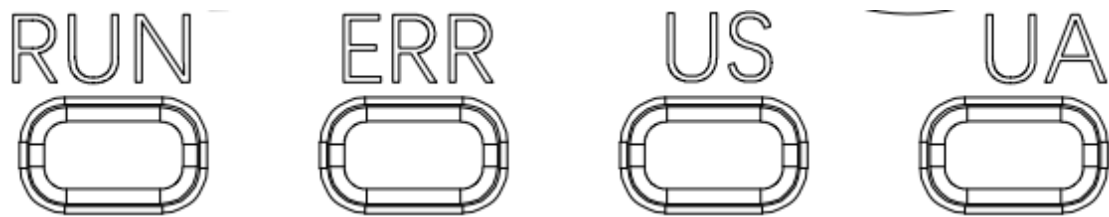
2.4. Electrical data

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



PN communication protocol module status

LED	Show	Function
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	
ERR	Closure	Running: The device is running
	Red light flashes 2.5HZ	No errors, device EtherCAT communication is working
	Red light flashes 1HZ	Invalid configuration
US	Green	local error
	Flashing red	Input voltage is normal
UA	Green	Input voltage low (< 18 V)
	Flashing red	Output voltage is normal
	Red always on	Output voltage low (< 18 V)

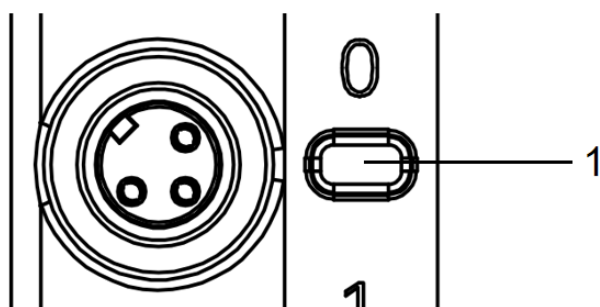
EIP communication protocol module status

LED	Show	Function
RUN	Green light is always on	Working status: The equipment is running normally
	Green light flashes 1HZ	Standby: The device is not configured
	Flashing green, red and green alternately	Self-test: The device is undergoing a power-on test.
	Flashing red 1HZ	Recoverable faults:
	Red light always on	Unrecoverable failure
	Closure	US no input voltage
ERR	Green light is always on	Connected
	Green light flashes 1HZ	Not connected:
	Flashing green and red alternately	Self-test: The device is undergoing a power-on test.
	Red light flashes 1HZ	Connection timed out
	Red light always on	Duplicate IP:
	Closure	USNo input voltage or no IP address
US	Green	Input voltage is normal
	Flashing red	Input voltage low (< 18 V)
UA	Green	Output voltage is normal
	Flashing red	Output voltage low (< 18 V)
	Red always on	No output voltage present (< 11 V)

CIE communication protocol module status

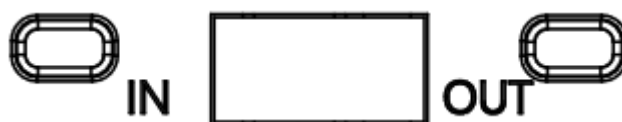
LED	Show	Function
RUN	Green light off	Module not connected
	Green light flashes 2.5HZ	Module has no communication
	Green light flashes 1HZ	Module not configured
	Steady green	Running: The device is running
ERR	Closure	Module works fine
	Red light always on	Communication error
US	Green	Input voltage is normal
	Flashing red	Input voltage low (< 18 V)
UA	Green	Output voltage is normal
	Flashing red	Output voltage low (< 18 V)
	Red always on	No output voltage present (< 11 V)

I/O port status



LED	Status	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	Port configured as input: short circuit between Pin1 and 3 The port is configured as output: Pin4 overcurrent Port configured as output: short circuit between Pin1 and 3

Network port status



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

3 Integrated

3.2 Data mapping

PROFINET communication protocol module data									
Module	Function description								
	Status description	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Device Status	Module status				US Overvoltage	UA Overvoltage	Overheated	US Voltage	UA Voltage
Standard input	Digital input	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
Standard output	Digital output	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
Data description (binary): 0=no signal 1=signal									

EIP communication protocol process input data									
Byte	Function description								
	Status description	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Digital input	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
1	Module status				US Overvoltage	UA Overvoltage	Overheated	US Voltage	UA Voltage
Data description (binary): 0=no signal 1=signal									

EIP communication protocol process output data									
Byte	Function description								
	Status description	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Digital output	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
Data description (binary): 0=no signal 1=signal									

CIEBS communication protocol process data								
Function description								
Regional function description	Y107	Y106	Y105	Y104	Y103	Y102	Y101	Y100
RY area standard IO output 0=off, 1=on	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
	The remaining points are reserved							
Regional function description	X107	X106	X105	X104	X103	X102	X101	X100
RX area standard IO input 0=off, 1=on	PORT7	PORT6	PORT5	PORT4	PORT3	PORT2	PORT1	PORT0
	The remaining points are reserved							

3.2 PLC integration tutorial

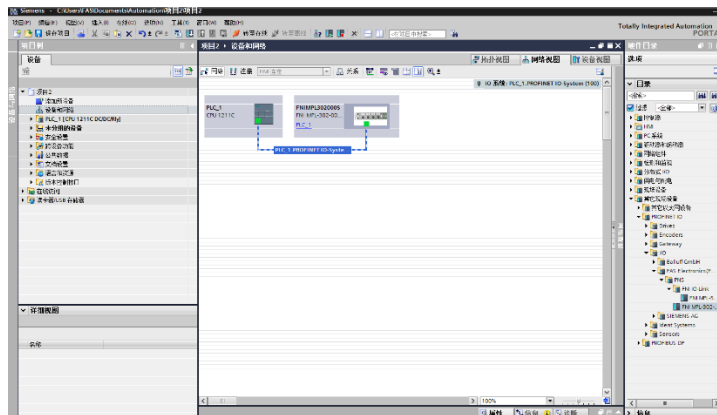
3.2.1 Siemens S7-1200 Botu Integration (PN)

1. Install the GSD file



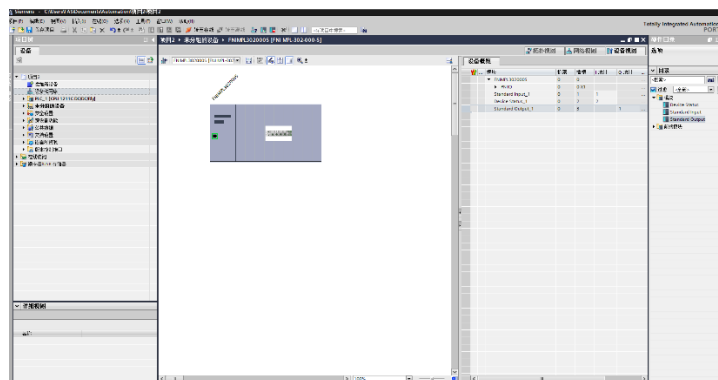
In PLC---Device

Configuration---Network View---Hardware Catalog, select the module and drag it in, click "Unassigned", and select the PLC to be connected;



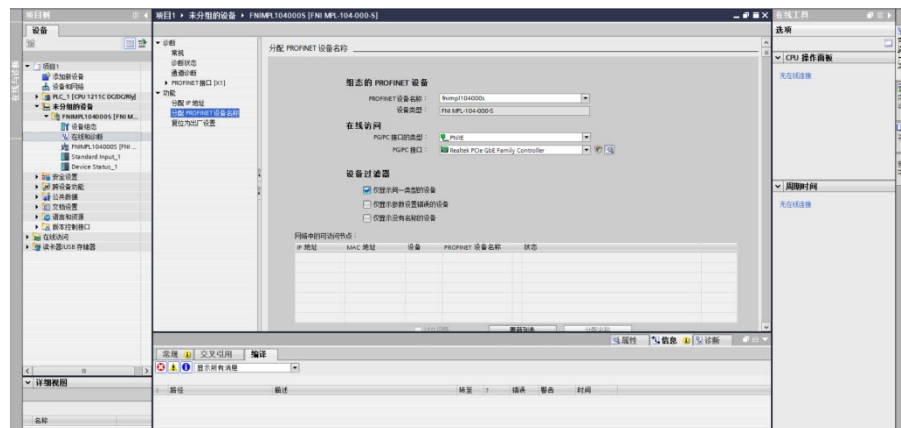
2. Double-click the module to enter the configuration.

(1) Slot function configuration: Select the required data in the hardware catalog--Module and drag it into the slot in the device overview window;



(2) After the configuration is completed, click Download in the configuration view.

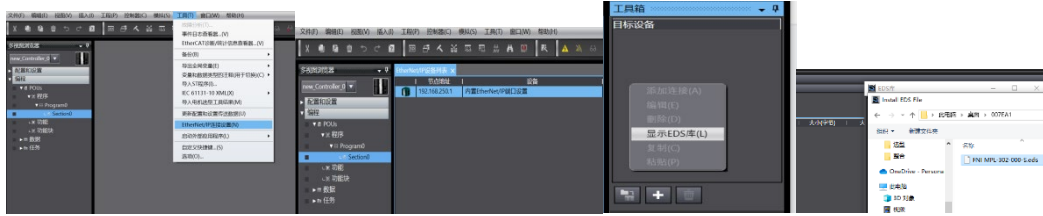
- Assign module PN name: PLC switches to online state, select "Ungrouped Device"---Click on the module name---Select Online and Diagnosis---Function-----Assign PROFINET device name-- --Select the module to be assigned in the list (should be selected based on the physical MAC) ---Click "Assign Name" to complete the configuration!



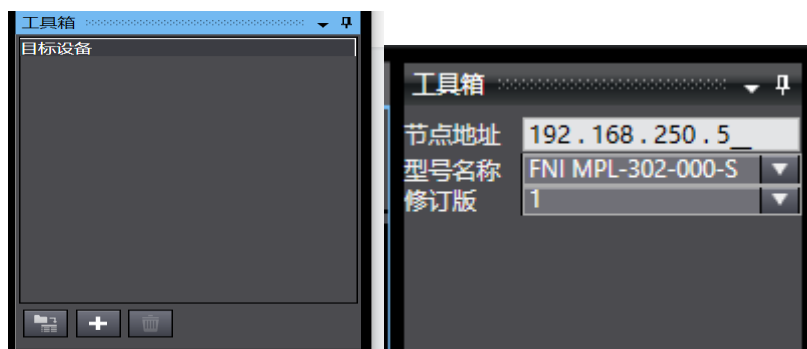
5.3.2 Omron NX1P2 Sysmac Studio Integration (EIP)

1. Install the EDS file: Tools---ETHERNET/IP Connection Settings---Double-click PLC in the window---the toolbox on the right is blank

Right-click and select "Show EDS Library", click "Install" in the pop-up window, and select EDS file installation

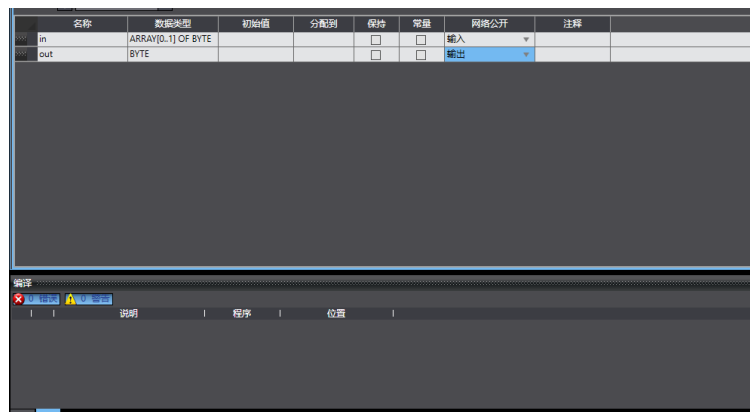


2. Create a module: Click "+" in the toolbox window, fill in the module IP address, model name, version, and click "Add". Click "Add" below to complete the module creation;

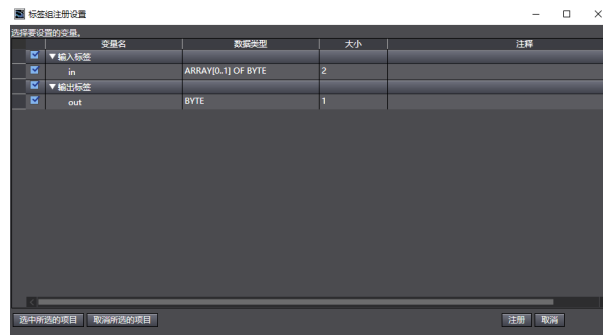


3. Create variable association:

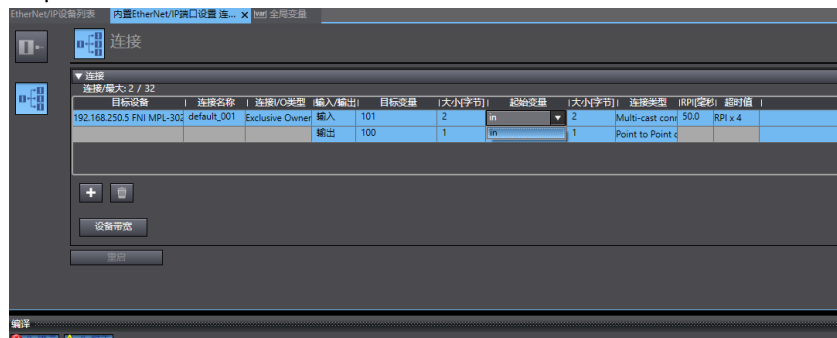
- (1) Programming--Data--Global variables create two arrays, output 1 byte and input 2 bytes, Corresponding input and output should be configured in network disclosure;



(2) In the built-in ETHERNET/IP port setting window--select the first icon (label) on the left---click "Register All"

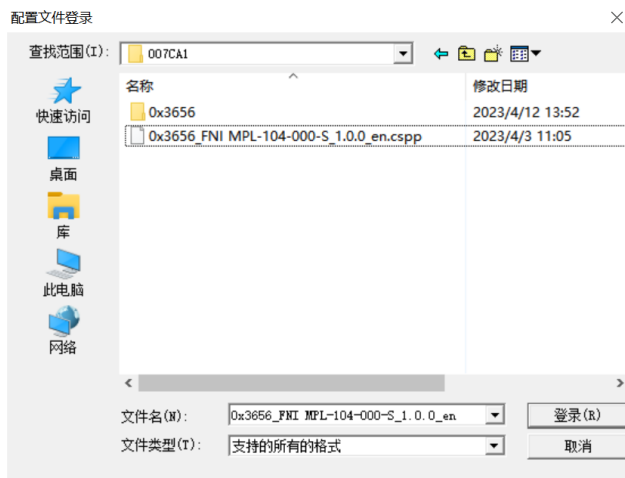


(3) In the built-in ETHERNET/IP port setting window--select the second icon on the left (connection)---click "+", select the previously configured module for the target device, select EXCLUSIVE Owner for the IO type, and select the corresponding input For output, the target variable must be filled in 101,100; then select the corresponding starting variable and go online after completion. Select "Transfer to controller" and the configuration is complete!

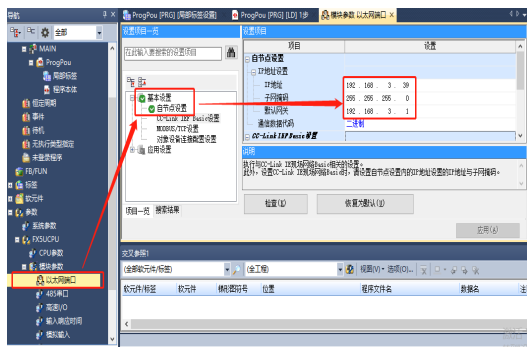


3.3.4 Mitsubishi FX5U Work2 Integration (CIE)

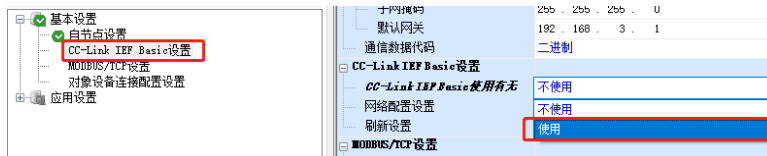
1. Install the CCSP file: First open GX WORKS 3-Tools-Configuration File Management-Login-CSPP file (required The project must be closed before the file can be imported)



2. Click Project on the left - Parameters - FX5UCPU - Module parameters - Ethernet port, Basic settings - Self-node settings. Set own node IP



3. Click CC-Link IEF Basic settings - select whether to use CC-Link IEF Basic - click Use



4. Click CC-Link IEF Basic settings-select network configuration settings-detailed settings;



5. Automatic detection of connected devices - occupies 1 station, IP address is set using DIP switch - reflects the setting and closes

连接设备的自动检测				链接扫描设置									
总连接台数				1									
台数	型号	站号	站类型	RX/RX+设置			RW/RW+设置			组No.	保留站	IP地址	子网掩码
				点数	起始	结束	点数	起始	结束				
0	本站	0	主站									192.168.3.250	
1	FNI MPL-104-000-S	1	从站	64 (占用1站)	0000	003F	32	0000	001F	1	无设置	192.168.3.1	

6. To refresh the target, select the specified device-software name M-assign the device address-application, and the configuration is completed!

链接侧					CPU侧					
软元件名	点数	起始	结束		刷新目标	软元件名	点数	起始	结束	
RX	64	00000	0003F	↔	指定软元	X	64	100	177	
RY	64	00000	0003F	↔	指定软元	Y	64	100	177	
RWr	32	00000	0001F	↔	指定软元	D	32	100	131	
RWw	32	00000	0001F	↔	指定软元	D	32	200	231	

4.Appendix

4.1 Ordering information

Product ordering code	Ordering code
FNI_MPL-302-100-S	007EA3

■ High Quality Product / Sincere Service



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