FuYanShengElectronic(FuJian)Co.,Ltd.

FNI MPL-106-009-K54
(009B53)

IP20 Module User Manual
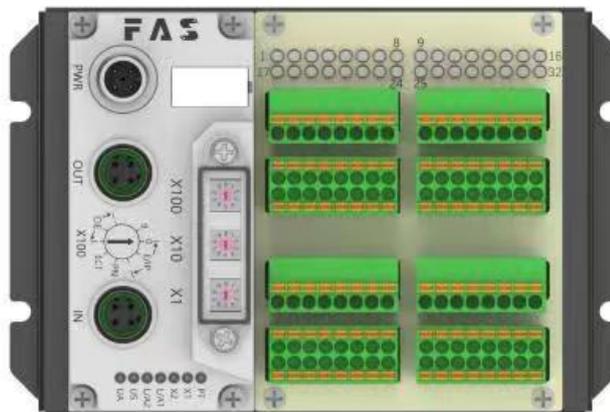
Content

1 Notes

1.1. Manual structure   1.1This manual is organized by organization, so the chapters are interconnected.

Section 2: Basic Security Information.

Chapter 3: Getting Started Guide

Chapter 4: Technical Data

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1.2. Typography   The following typographic conventions are used in this manual.

Enumerate   The enumeration is displayed as a list with bullets.

• Headword 1

• Headword 2

Action   Action descriptions are represented by a front triangle.

he res lt of the action is represented by an arrow.

Action description 1

Action result

Action description 2

Step programs can also be displayed numerically in parenteses.

(1) Step1

(2) Step2

Grammar number：

Decimal numbers are displayed without additional indicators (eg 123)

Hexadecimal numbers are displayed with an additional indiator hex (eg: 00hex) or with the prefix "OX" (eg: 0x00)

Cross reference

Cross-references indicate where to find additional informtion on this topic.

1.3. Symbol   _____

Notes

This symbol indicates a general comment.

Notice!!

This symbol indicates the most important safety notice.

1.3. Acronym
           FNI   FAS network interface
            I   Standard input port
           PN   Profinet
     ECT   EtherCAT
     CCIEBS   CC-Link IE Field Basic Slave
     EIP   Ethernet/IP
     EMC   Electromagnetic Compatibility
     FE   Functional ground
     O   Standard output port

1.5. Viewing angle deviation   Product views and explanations in this manual m
                                ay deviate from the actual product. They are on
                                ly used left and right to explain the material.

2 Safety

2.1. Expected usage   This manual describes as a decentralized input and output module
                       for connection to an industrial network.

2.2. Install and start   Precautions!
                          Installation and start-up should only be carried out by trained an
                          d specialized personnel. A qualified individual is one who is famili
                          ar with the installation and operation of the product and has the
                           necessary qualifications to do so. Any damage caused by unautho
                          rized operation or illegal and improper use is not covered by the
                          manufacturer's warranty. Equipment operators are responsible for e
                          nsuring compliance with appropriate safety and accident preventio
                          n regulations.

2.3. General security   Debug and check
     Notes   Before debugging, you should read the contents of the user manu
                          al carefully.
                          The system cannot be used in applications where the safety of pe
                           sonnel depends on the functionality of the equipment.
                          intended use
                          The manufacturer's warranty coverage and limited liability statement
                          do not cover damage caused by:
                          · Unauthorized tampering
                          · Improper use
                          · Handling, installation and operation that do not conform to the
                          instructions provided in the user manual
                          Owner/Operator Obligations
                          This device is an EMC Class A compliant product. This device gen

erates RF noise.

The owner/operator must take proper precautions when using thi equipment. This device can only use

Use a power supply compatible with this equipment, and connect only approved cables.

Fault

If the defect or equipment failure cannot be corrected, the operat ion of the equipment must be stopped in order to

protected from possible damage caused by unauthorized use.

Intended use can only be ensured when the enclosure is fully inst alled.

_____

2.4. Corrosion resistance Precautions!

FNI modules generally have good chemical and oil resi stance characteristics. When used in aggressive media (e.g. high concentrations of chemicals, oils, lubric ants and coolants (i.e. very low water content)), the se media must be checked before the corresponding app lication material compatibility confirm. If the modul e fails or is damaged due to this corrosive medium, n o claim for defects can be claimed.

_____

Dangerous voltage   Precautions!

Disconnect all power sources before using the equipment!

_____

3   Getting Started Guide

3.1. Module overview

3.1. 模块综述
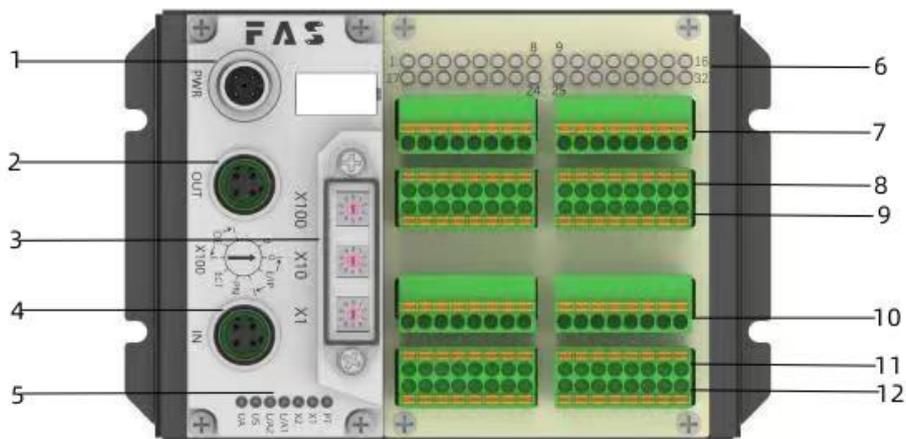
1	Power port	7	Sensor Actuator Power Supply+24V
2	Network output port	8	1-16 signal interface
3	DIP switch	9	Sensor Actuator Power Supply 0V
4	Network input port	10	Sensor Actuator Power Supply+24V
5	module status LED	11	17-32 signal interface
6	signal status LED	12	Sensor Actuator Power Supply 0V

Module Status Indicator

LED	display	Function
PT	always on	White:CIEBS protocol Orange：PN protocol Green：EIP protocol
L/A1	green always on	Device (IN) connected to Ethernet
	flashing yellow light	Device (IN) sends/receives Ethernet frames
	OFF	Device (IN) is not connected to ethernet
L/A2	green always on	Device (OUT) connected to Ethernet
	flashing yellow light	Device (OUT) sends/receives Ethernet frames
	OFF	Device (OUT) is not connected to ethernet
US	green	Input voltage is normal
	flashing red light	Low input voltage (< 18 V)
UA	green	The output voltage is normal
	flashing red light	Low output voltage (< 18 V)
	red always on	No output voltage present (< 11 V)

CIEBS protocol	Display	Function
X1	green light off	module not connected
	green light flashing 2.5HZ	Module isn't communicating
	green light flashing 1HZ	module is not configured
	green always on	Running: The device is running
X2	Off	module works fine
	red light always on	communication error

PN protocol	Display	Function
X1	OFF	work normally
	Flashing red light 1HZ	bus start
	red light always on	system error
X2	OFF	work normally
	Flashing red light 1HZ 2HZ	no data exchange
	red light always on	No configuration; or slow physical link; or no physical link

EIP protocol	Display	Function
X1	green light always on	Working status: the equipment is running normally
	green light flashing 1HZ	Standby: the device is not configured
	Flashing alternately between green and red	Self-test: The device is running a power-on test.
	flashing red 1HZ	Recoverable faults:
	red light always on	unrecoverable failure
	OFF	US No input voltage
X2	green light always on	connected
	green light flashing 1HZ	disconnected
	Alternate flashing between green and red	Self-test: The device is running a power-on test.
	flashing red light 1HZ	Connection timed out
	red light always on	IP repeat::
	OFF	US No input voltage or no IP address

3.1 guide

3.2. mechanical connection3.　The module is installed with 4 M4 bolts or DIN35 rail clips.

3. Electrical connections

3.3.1

Network Interface (D-code)
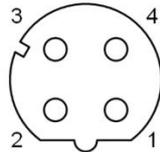
Pin	Pin	
1	Tx+	send data+
2	Rx+	receive data-
3	Tx-	send data+
4	Rx-	receive data-

illustrate:

Unused I/O port sockets must be covered with end caps to meet the

3.3.2　IP67 degree of protection. Power port (A-code)
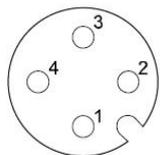
Pin	Pin	
1	UA	Actuator Power(BR)
2	GND	Actuator Gnd(WH)
3	US	Bus Power(BU)
4	GND	Bus Gnd(BK)

illustrate:
1、It is recommended to provide Bus power and Actuator power separately.
2、The total current of the Actuator power supply is <4A, and the total current of the Bus power supply is <1A;
3、The FE connection from the case to the machine must be low impedance and kept as short as possible.

3.3.3　Signal port (screw free spring type terminal block)
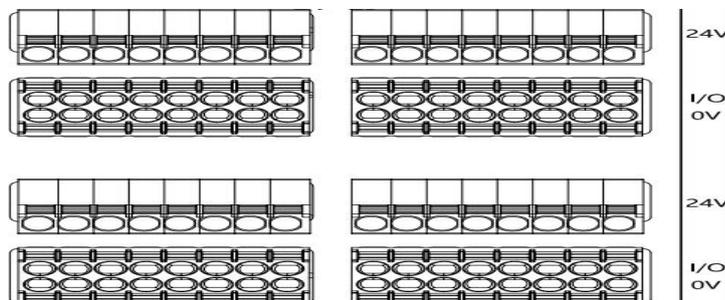
illustrate
1、Input and output signal types support: three-wire PNP, two-wire PNP, dry contact;
2、Pin +24V single output current maximum 350mA. The total current of the module is <4A;
3、The total current of each 8 channels (1~8, 9~16, 17~24, 25~32) is <1A;

4.1. Size
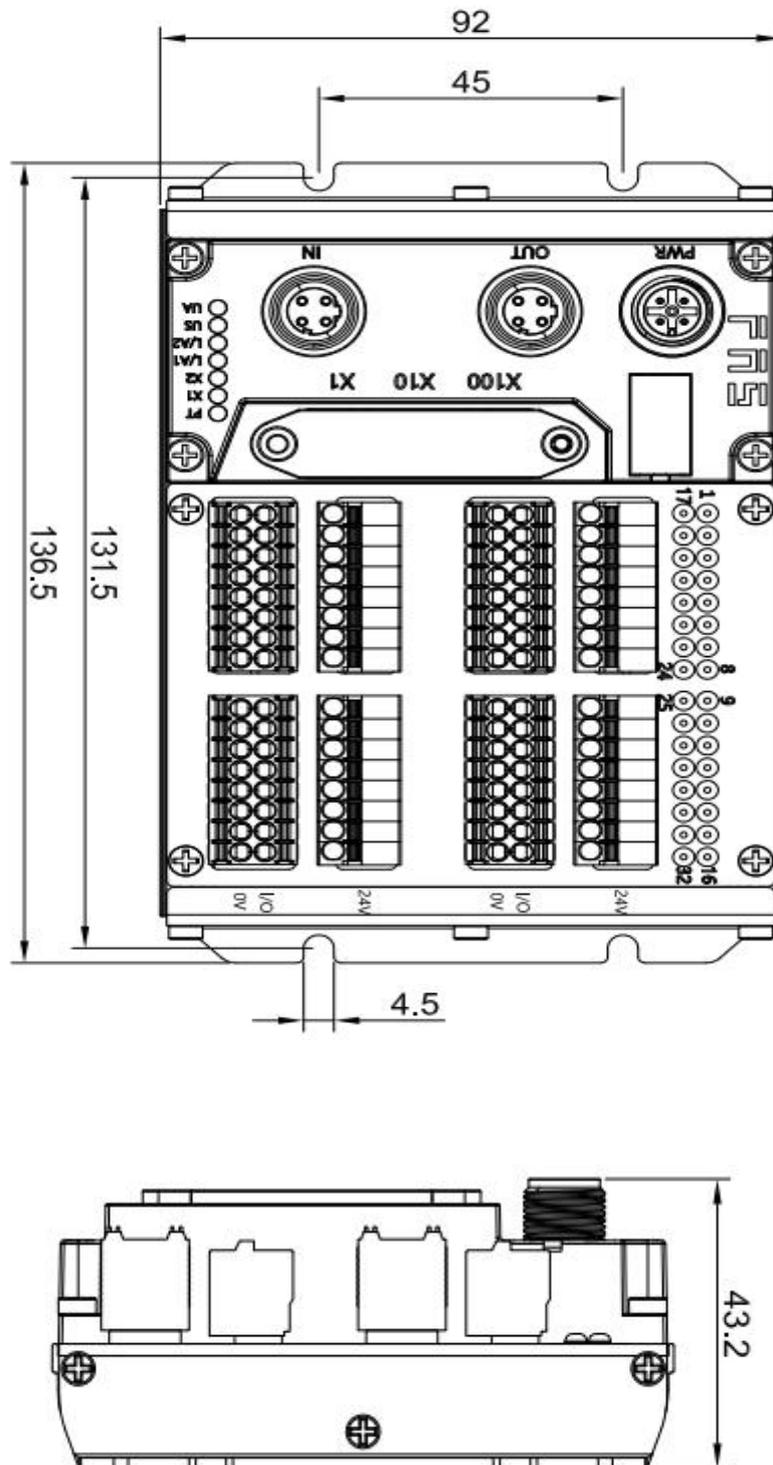
4.2 mechanical data

Shell material	Aluminum shell
Shell rating conforms to IEC 60529	IP54
power interface	A-Code
input port/output port	M12，A-Code(8*femlae)
Size(W*H*D)	136.5mm*92mm*52.7mm
installation type	Screw fixing or DIN35 guide rail snap-on
Weight	about 670g

4.3. Operating conditions

operating temperature	-5°C ～ 80°C
storage temperature	-25°C ～ 85°C

4.4. electrical data

voltage	18~30V DC，symbol EN61131-2
voltage fluctuation	＜1%
Operating current at supply voltage 24V	<130mA

4.5 network port

Poet	2 x 10Base-/100Base-Tx
port connection	M12，D-Code
IEEE 802.3 Compliant Cable Type	Shielded twisted pair, min. STP CAT 5/STP CAT 5e
data transfer rate	10/100 M bit/s
cable length	100m
flow control	half working condition/full working condition(IEEE 802.3-PAUSE)

5 integrated

5.1 Module dial code and IP address configuration

5.1.1 reset

1.powered off the device , dial 900

2. Power on the device and wait for 10 seconds;

3.The device is powered off, dial the code to the state before setting

4.Power on the device and restore the factory state

5.1.2 Protocol switching settings

1.powered off the device , dial **900**；

2.Power on the device and wait for 10 seconds;

3.powered off the device，dial **X100** when the become **0~2** , protocol is **EIP**；**X10** and **X1** are **IP** address.

When dial X100 is 3, the protocol is PN; X10 and X1 are 0

When the dial X100 is 5~7, the protocol is CIEBS; X10 and X1 are IP addresses.

4. The device is powered on, and the protocol switching and IP setting are automatically completed;

5.1.3 PN address configuration

1.After setting the IP address in the configuration software, assign the device name to automatically complete the IP address setting；

5.1.3 EIP address configuration

1.Address range:：**1~254**；

2.Dial code range: X100 range 0~2, X10 range 0~9, X1 range 0~9；

3.The network segment is modified in the FAS_PCT software, see the software instruction for details；

4. The default network segment is 192.168.1.xxx, and the network segment can be modified in the FAS_PCT software. For details, please refer to the software instruction; for example:：

5.1.4 CIEBS address configuration

Dial：**X100=1, X10=2, X1=5**When the default network segment, the IP is **192.168.125** After adjusting the dial code, it needs to be powered on again;

1.address range：**1~254**；

2.Dial code range: X100 range 5~7, X10 range 0~9, X1 range 0~9；

3.The dial value minus 500 is the actual address；

4.The default network segment is 192.168.3.xxx, and the network segment can be modified in the FAS_PCT software. For details, see the software instruction manual;

example：

Dial code: When X100=7, X10=2, X1=5 default network segment, the IP is 192.168.225. After the dial code is adjusted, it needs to be powered on again;

5.2 data mapping

EIP Communication protocol Process input data									
Bit	Function Description	Functional description							
		Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	1~8 signal input 0=disconnect, 1=connector	8th way	7th way	6th way	5th way	4th way	3th way	2th way	1th way
1	9~16 signal input 0=disconnect, 1=connector	16th way	15th way	14th way	13th way	12th way	11th way	10th way	9th way
2	16~24 signal input 0=disconnect, 1=connector	24th way	23th way	22th way	21th way	20th way	19th way	18th way	17th way
3	25~32 signal input 0=disconnect, 1=connector	32 th way	31th way	30th way	29th way	28th way	27th way	26th way	25 th way
4	module status			US 过压	UA over voltage	Operating temperature	US Under voltage	UA Under voltage	US over voltage

EIP Communication protocol Process input data									
Bit	Function Description	Functional description							
		Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	1~8 signal output 0=disconnect, 1=connector	8th way	7th way	6th way	5th way	4th way	3th way	2th way	1th way
1	9~16 signal output 0=disconnect, 1=connector	16th way	15th way	14th way	13th way	12th way	11th way	10th way	9 th way
2	16~24 signal output 0=disconnect, 1=connector	24th way	23th way	22th way	21th way	20th way	19th way	18 th way	17th way
3	25~32 signal output 0=disconnect, 1=connector	32th way	31th way	30th way	29th way	28th way	27th way	26th way	25th way

PROFINET 通讯协议 过程检测数据

module	status description	Functional description							
		Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Device Status	module status				US overvoltage	uA overvoltage	Operating temperature	US Under voltage	UA Undervoltage

PROFINET Communication protocol process output data

字节	Function Description	Functional description							
		Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Standardoutput 01-08	8th way	7th way	6th way	5th way	4th way	3th way	2 th way	1th way
1	Standardoutput 09-16	16th way	15th way	14th way	13th way	12th way	11th way	10th way	9th way
2	Standardoutput 17-24	24th way	23th way	22 th way	21th way	20th way	19th way	18th way	17th way
3	Standardoutput 25-32	32 th way	31th way	30th way	29th way	28 th way	27th way	26th way	25 th way

PROFINET Communication protocol process output data

Bit	Function Description	Functional description							
		Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Standardinput 01-08	8th way	7th way	6th way	5 th way	4 th way	3th way	2th way	1th way
1	Standardinput 9-16	16th way	15th way	14th way	13th way	12 th way	11th way	10th way	9th way
2	Standardinput 17-24	24 way	23 th way	22th way	21th way	20th way	19th way	18th way	17th way
3	Standardinput 25-32	32 way	31th way	30th way	29 th way	28 th way	27 th way	26 th way	25 th way

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CIEBS Protocol

| RY | 64 | 00000 | 0003F | ⬍ | 指定软元 ∨ | Y | ∨ | 64 | 100 | 177 |

RY area

CIEBS Communication protocol process input data								
Functional description								
Function Description	Y107	Y106	Y105	Y104	Y103	Y102	Y101	Y100
1~8 signal output 0=disconnect, 1=connector	8 th way	7th way	6 th way	5th way	4th way	3th way	2th way	1th way
Function Description	Y117	Y116	Y115	Y114	Y113	Y112	Y111	Y110
9~16 signal output 0=disconnect, 1=connector	16th way	15th way	14th way	13 th way	12th way	11th way	10th way	9 th way
Function Description	Y127	Y126	Y125	Y124	Y123	Y122	Y121	Y120
17~24 signal output 0=disconnect, 1=connector	24 th way	23th way	22th way	21th way	20th way	19 th way	18 th way	17 th way
Function Description	Y137	Y136	Y135	Y134	Y133	Y132	Y131	Y130
25~32 signal output 0=disconnect, 1=connector	32th way	31th way	30 th way	29th way	28th way	27 th way	26 th way	25 th way

| RX | 64 | 00000 | 0003F | ⬍ | 指定软元 ∨ | X | ∨ | 64 | 100 | 177 |

RX area

CIEBS Communication protocol process output data								
Function Description								
Function Description	X107	X106	X105	X104	X103	X102	X101	X100
1~8 signal output 0=disconnect, 1=connector	8 th way	7th way	6th way	5th way	4th way	3th way	2th way	1th way
Function Description	X117	X116	X115	X114	X113	X112	X111	X110
9~16 signal output 0=disconnect, 1=connector	16 th way	15th way	14th way	13 th way	12th way	11th way	10th way	9 th way
Function Description	X127	X126	X125	X124	X123	X122	X121	X120
17~24 signal output 0=disconnect, 1=connector	24th way	23 th way	22 th way	21 th way	20th way	19th way	18 th way	17th way
Function Description	X137	X136	X135	X134	X133	X132	X131	X130
24~31 signal output 0=disconnect, 1=connector	32 th way	31th way	30th way	29 th way	28th way	27 th way	26 th way	25 th way

RWR area

| RWr | | 32 | 00000 | 0001F | | 指定软元 ∨ | D | ∨ | 32 | 100 | 131 |

CIEBS Communication protocol process detection data								
Functional description								
Function Description	D107	D106	D105	D104	D103	D102	D101	D100
				US overvoltage	UA overvoltage	operating temperature	US Under voltage	UA Under voltage

RWW Area not in use

5.3 PLC Integration Tutorial

5.3.3 Integration in Siemens S7-1200 Portal (PN) 1. Install GSD file

2、In PLC---Device Configuration---Network View---Hardware Catalog, select the module and drag it in, click "Unassigned", and select the PLC to be connected;
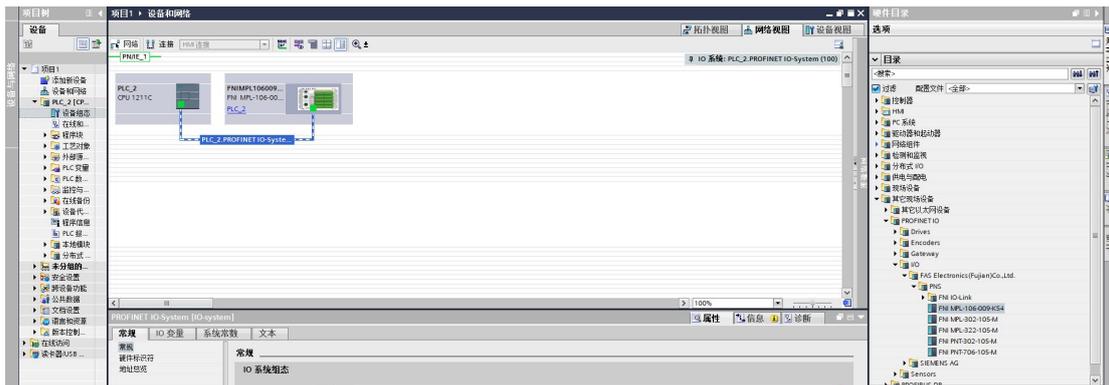
3、Double-click the module to enter the configuration,
Slot function configuration: In the hardware catalog--module, select the required data and drag it into the slot of the device overview window;
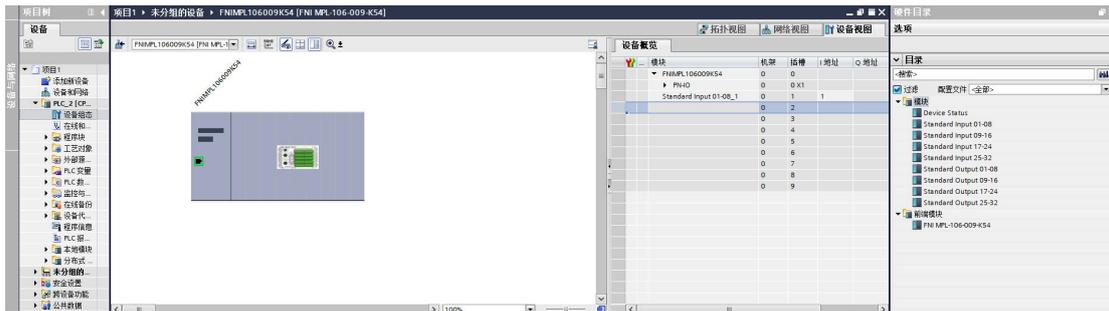
4. Assign module PN name: PLC switches to the online state, select "ungrouped device" --- click the module name --- select online and diagnosis --- function --- assign PROFINET device name --- -Select the module to be assigned in the list (should be selected according to the physical MAC)---click "Assign 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 the PLC in the window --- right-click the blank space of the toolbox on the right and select "Show EDS library", click "Install" in the pop-up window, and select the EDS file Install
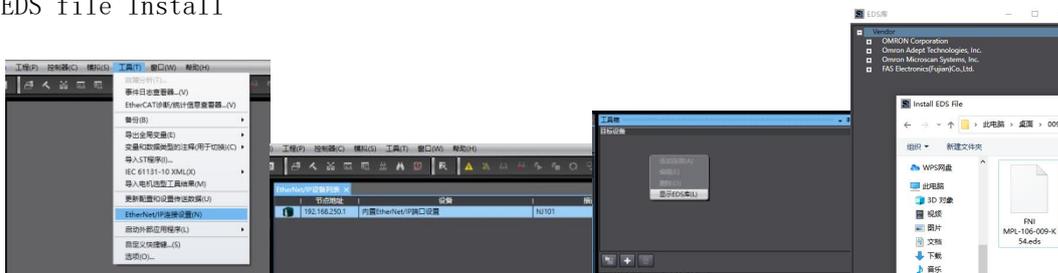
2、Create a module: Click "+" in the toolbox window, fill in the module IP address, model name, version, click "Add" at the bottom, and the module is created

4 Create variable associations:
（1）Programming – data – global variables to create two arrays, output 4 bytes, input 5 bytes,

The corresponding input and output should be configured in the network disclosure;
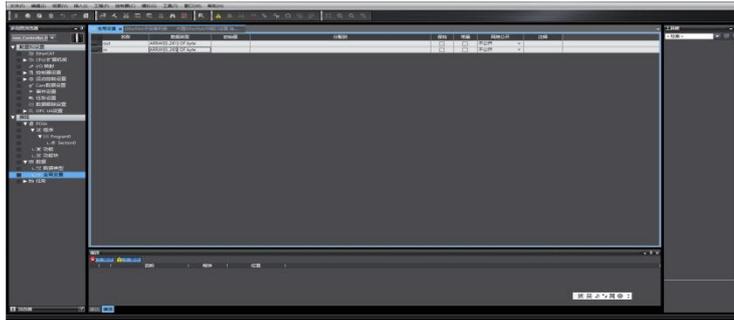
In the built-in ETHERNET/IP port setting window -- select the first icon (label) on the left --- click "Register All"

(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 Output, the target variable must be filled with 101,100; then select the corresponding starting variable, and go online after completion. Select "Transfer to Controller", and the configuration is complete!
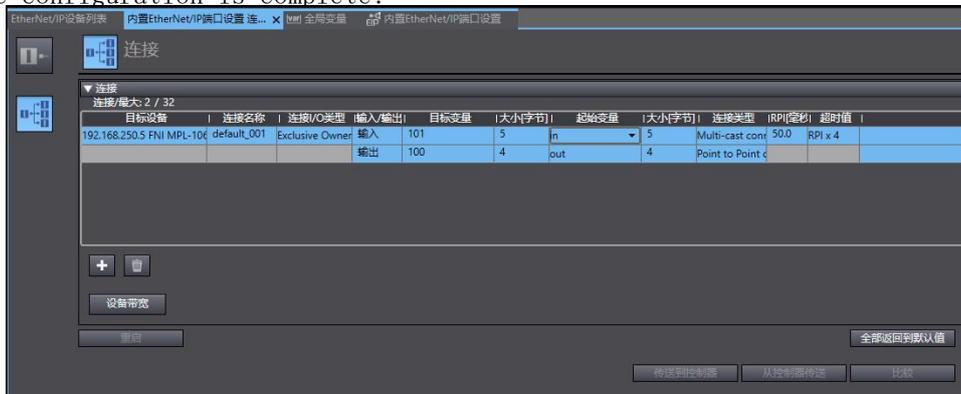
5.3.4 integrated in mitsubishi fx5u
work2（CCIEBS）

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1、 Install the CCSP file: first open GX WORKS 3-tools-configuration file management-login-CSPP file (you must close the project to import the file)
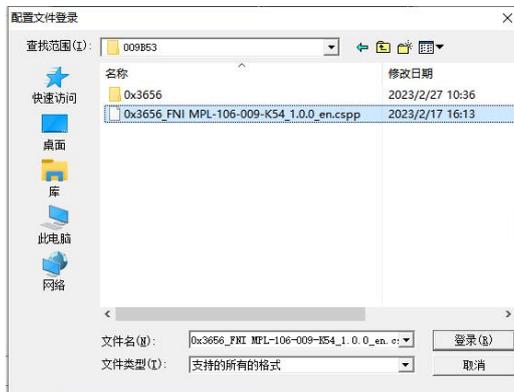
2、Click Project on the left - Parameters - FX5UCPU - Module Parameters - Ethernet Port, Basic Settings - Self Node Settings. Set self-node IP
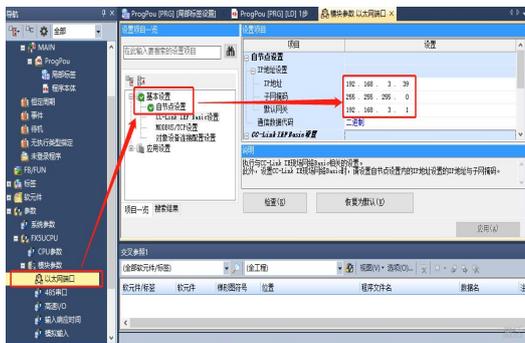
3、Click CC-Link IEF Basic Settings - select whether to use CC-Link IEF Basic - click

4、Click CC-Link IEF Basic Settings-Select Network Configuration Settings-Detailed Settings;
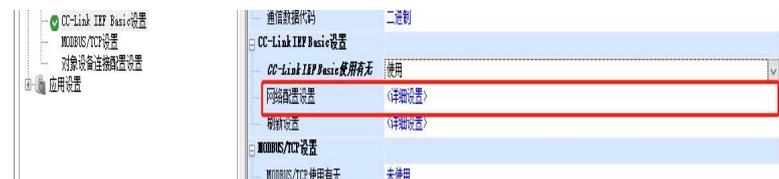
5. Automatic detection of connected devices - 4 stations are occupied, IP address is set with a DIP switch - reflect the settings and close

6. Refresh target selection specified device-device name M-allocated device address-apply, the configuration is complete! M-分配软元件地址-应用，组态完成！

6 appendix

6.1. order code

Product number	order code
FNI MPL-106-009-K54	009B53