DECOWELL®

Industrial Signal Processing Expert

SD Series IO-Link IP67 IO

User Manual

DECOWELL Industrial Intelligence makes reliable partners

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Preface

Profile

Thank you for purchasing the DECOWELL SD seriesIP67 I/O!

SD series products are high-protection I/O launched by Dekewell, with a protection level of up to IP67. It supports mainstream fieldbus protocols such as PROFINET, EtherCAT, EtherNet/IP, CC-Link, CC-Link IE Field Basic, Modbus TCP, etc. A single module supports up to 16 signal points, and the signal types include digital input and output, analog input and output. The fully sealed miniaturized design and compact structure are easy to integrate and install. With the flexible connection of the extension cable, it is waterproof and dustproof. It is suitable for application scenarios that require long-term stable operation and use in various severe industrial environments. It has strong anti-interference ability and is widely used in automobiles, lithium batteries, logistics, metallurgy, printing and other industries.

This manual mainly describes the specifications, features and usage of the module. Please read it carefully before use so that you can use this product more clearly and safely.

CONTENTS

Safety precautions

Security Statement

01. Please read and follow these safety precautions before installing, operating and maintaining the product.

02. To ensure personal and equipment safety, please follow all safety precautions marked on the product and described in the manual when installing, operating and maintaining the product.

03. The “Tips”, “Notice”, “Warnings” and “Dangers” in this manual do not represent all the safety matters that should be followed, but only serve as a supplement to all safety precautions.

04. This product should be used in an environment that meets the design specifications. Otherwise, it may cause malfunctions. Functional abnormalities or component damage caused by failure to comply with relevant regulations are not within the scope of product quality assurance.

05. DECOWELL does not assume any legal responsibility for personal safety accidents, property losses, etc. caused by illegal operation of products.

Security Level Definition

Tips

This mark indicates "necessary supplement or explanation for the description of the operation".

Notice

This mark indicates "the danger caused by failure to operate as required may result in minor or moderate personal injury and equipment damage."

Warning

This mark indicates "hazards caused by failure to follow the instructions may result in personal injury or death."

Warning in control system design

01. Safety circuits must be designed to ensure the control system maintains safe operation during external power failures or expansion module malfunctions;

02. When the output circuit is over currented for a long time due to exceeding the rated load current or load short circuit, the module may smoke or catch fire. Safety devices such as fuses or circuit breakers should be installed externally.

Notice in control system design

01. Emergency stop circuits, protective circuits, interlock circuits for forward/reverse operations, and upper/lower limit interlock switches to prevent equipment damage must be installed in the external circuitry of expansion modules;

02. To ensure the safe operation of the equipment, please design external protection circuits and safety mechanisms for output signals related to major accidents;

03. When the output units such as relays and transistors of the expansion module are damaged, their outputs cannot be controlled to the ON or OFF state;

04. The expansion module is designed for use in indoor electrical environments with overvoltage level II. The power system level should be equipped with lightning protection device to ensure that lightning-induced overvoltage is not applied to the power input terminals, signal input terminals, control output terminals and other ports of the expansion module to avoid damage to the equipment.

1. Product Information

1.1 Product naming

Master:

SD EC-8 IOL-M12-00

① ②③ ④ ⑤ ⑥

NO.	Name	Description Definition
①	Product Series Name	SD Series
②	Bus protocol	PN:PROFINET EC:EtherCAT
③	Number of channels	8 channels
④	IOL identification	IO-Link Protocol
⑤	Terminal Type	Standard M12 interface
⑥	Reserve	No definition

Slave:

SD IOL - 8 8 0 0 - M12

① ② ③④ ⑤ ⑥ ⑦

NO.	Name	Description Definition
①	Product Series Name	SD Series
②	IOL identification	IO-Link Protocol
③	Number of input channels	0: no input 4: 4channel input 8:8-channel input H:16channel input
④	Number of output channels	0: None output 4: 4 channel output 8:8-channel output H:16 channel output
⑤	Input channel signal type	0:NPN input 1:PNP input N:None input signal
⑥	Output channel signal type	0:NPN input 1:PNP input N:None input signal
⑦	Terminal Type	Standard M12 interface

1.2 Component Description

1.2.1 Master Station IOL Component Description

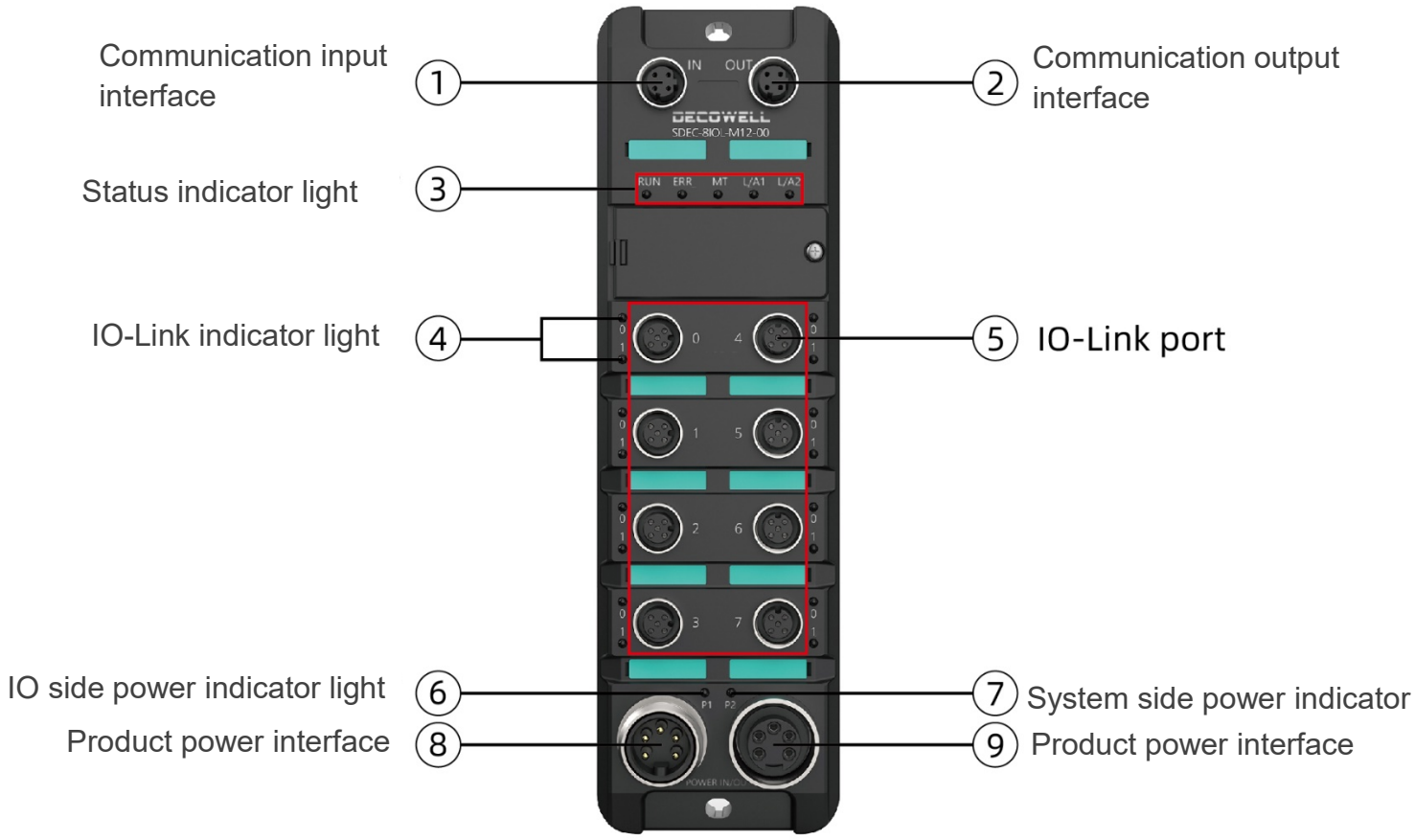


Figure 1-2-1-1 SDEC component description diagram

SDEC Parts Description Table

NO.	Name	Function Definition	
1	Communication input interface	IN	For communication input and output, please refer to the pin definition 3.2 Terminal Definition
2	Communication output interface	OUT	
3	Status indicator	MT	Working normally (off)
			Reset completed (lit)
			The reset button flashes when pressed (1Hz

			flashes)
			Module upgrade flashes (5Hz flashes)
		RUN	The device is in INIT state (off)
			The device is in PREOPERATIONAL state (flashing)
			The device is in SAFEOPERATIONAL state (single flash)
			The device is in OPERATIONAL state (on)
		ERR	The device is in serious communication or application controller error（Flash）
			Application watchdog timeout (flashes twice)
			The slave device application automatically changed the EtherCAT state due to a local error (flashes once)
			General configuration error (flashing)
			The EtherCAT communication of the device is in working state (off)
		L/A1	The network port is not connected (off)
			Network port connection (on)
			Network port data communication (flashing)
		L/A2	The network port is not connected (off)
			Network port connection (on)
			Network port data communication (flashing)
4	IO-Link Indicator	0	The port is configured as IO-Link and is searching for IO-Link devices (LED flashes green)
			IO-Link communication is normal (LED is always green)
			PIN4 and L- are short-circuited or overloaded (LED is always red)

			IO-Link communication error, hardware error or port conflict (LED flashes red)
			The port is configured as DI/DO. At this time, PIN4 is high level (LED green + red/yellow is always on) The port is configured as DI/DO, or INACTIVE. At this time, PIN4 is low level (LED green + red/yellow off)
		1	Digital input, PIN2 is high level (LED green + red/yellow is always on) Digital input, PIN2 is low level (LED green + red/yellow off)
5	IO-Link Port	For IO-Link data transmission, please refer to the pin definition3.3 Terminal Definition	
6	IO side power indicator	Used to show whether there is power input or output	
7	System side power indicator		
8	Product power interface	POWER IN	For power input and output, please refer to3.2 Terminal Definition
9		POWER OUT	

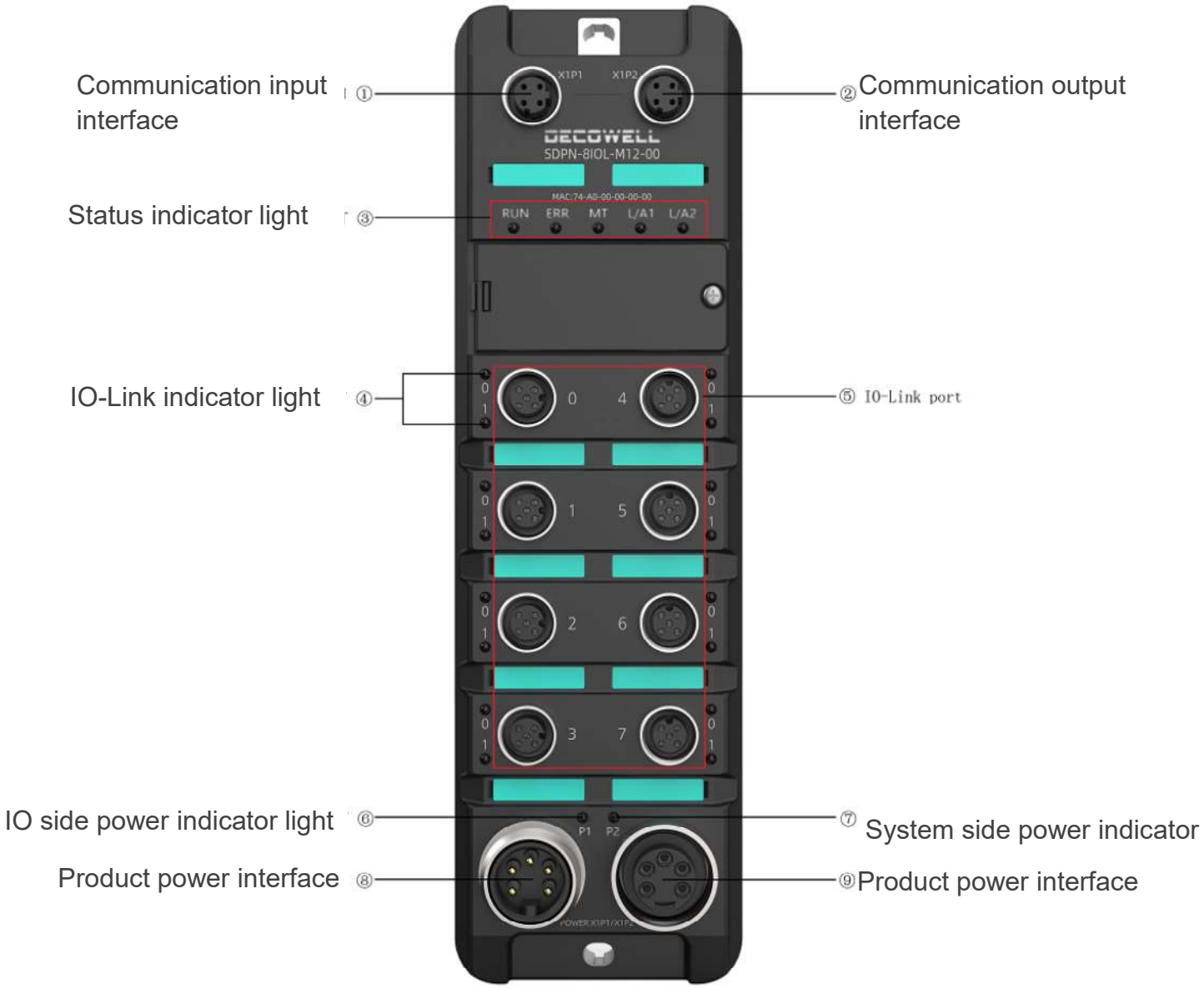


Figure1-2-1-2 SDPN component description diagram

SDPN Parts Description Table

NO.	Name	Function Definition	
1	Communication input interface	IN	For communication input and output, please refer to the pin definition 3.2 Terminal Definition
2	Communication output interface	OUT	
3	Status indicator	MT	Working normally (off)
			Reset completed (lit)
			The reset button flashes when pressed (1Hz flashes)
			Module upgrade flashes (5Hz flashes)
		RUN	Communication is normal, data transmission is

			normal (green light is on)
			Communication stops, data transmission stops (green light off)
		ERR	The network is not connected or a warning occurs (red light is on)
			Network connection, PN communication abnormality (flashing red light)
			Network connection, PN communication is normal (red light off)
		L/A1	The network port is not connected (off)
			Network port connection (on)
			Network port data communication (flashing)
		L/A2	The network port is not connected (off)
			Network port connection (on)
			Network port data communication (flashing)
4	IO-Link Indicator	0	The port is configured as IO-Link and is searching for IO-Link devices (LED flashes green)
			IO-Link communication is normal (LED is always green)
			PIN4 and L- are short-circuited or overloaded (LED is always red)
			IO-Link communication error, hardware error or port conflict (LED flashes red)
			The port is configured as DI/DO. At this time, PIN4 is high level (LED green + red/yellow is always on) The port is configured as DI/DO, or INACTIVE. At this time, PIN4 is low level (LED green + red/yellow off)
		1	Digital input, PIN2 is high level (LED green + red/yellow is always on) Digital input, PIN2 is low level (LED green + red/yellow off)
5	IO-Link Port	For IO-Link data transmission, please refer to the pin definition 3.3 Terminal Definition	
6	IO side Power indicator	Used to show whether there is power input or output	
7	System side Power indicator		
8	Product power interface	POWER IN	For power input and output, please refer to 3.2 Terminal Definition
9		POWER OUT	

1.2.2 IO-Link Hub Slave Component Description

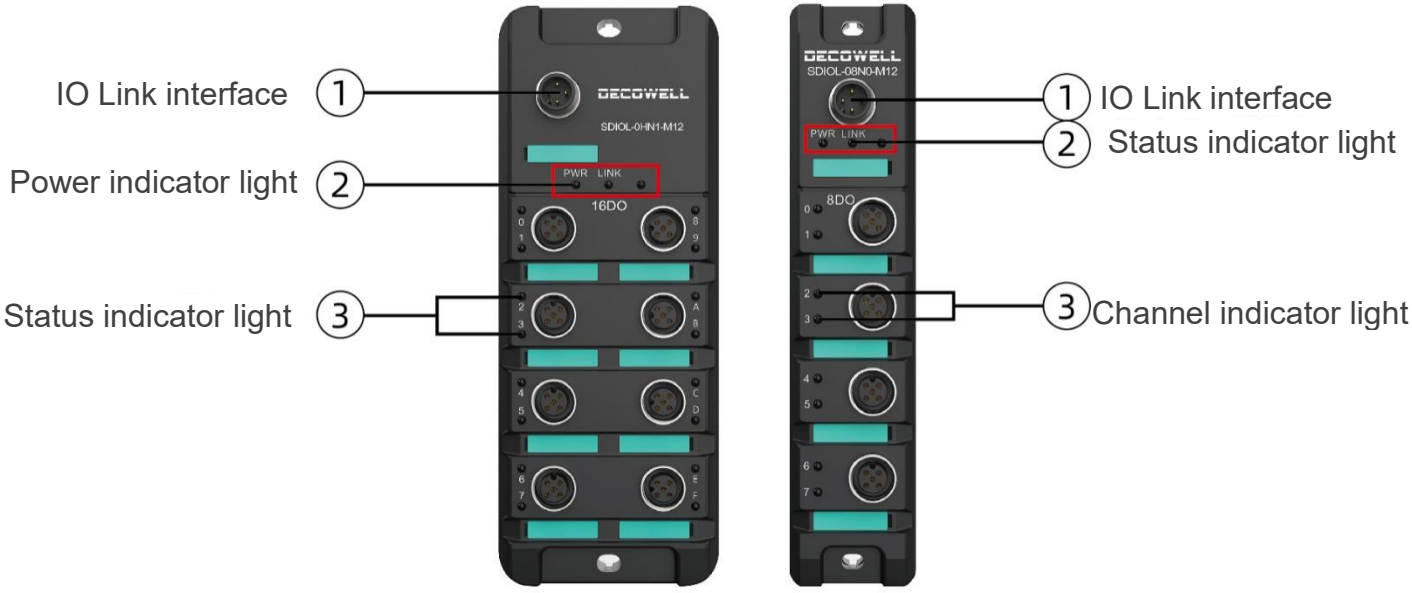


Figure 1-2-2-1Component Description Diagram

Parts Description Table

NO.	Name	Function Definition	
1	IO-Link interface	For IO-Link data transmission, see the definition for details 3.2 Terminal Definition	
2	power supply indicator lights	PWR	The device is powered on (green light)
			The device is not powered on (off)
	Status indicator	LINK	Communication is normal (green light flashes once every two seconds)
			Communication error (green flashing)
3	Channel indicator light	Input/output signal (steady green)	

1.3 Technical specifications

1.3.1 Technical parameters of the master station

SDEC-8IOL-M12-00

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66×221×29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Power parameters	
Power supply interface	2×7/8” 5pin, needle end + hole end
US standard voltage	24 VDC (18…30 VDC)
US current sum	5A
UA standard voltage	24 VDC (18…30 VDC)
UA current sum	8A
Rated power consumption	45mA
Electrical isolation	US and UA:24VIsolation, 0Visolation
Technical Parameters	
Communication Protocol	EtherCAT
Bus communication interface	2×M12 D-code 4pin, hole end
Maximum transmission	100 meters
Communication rate	10/100 Mbit/s
Digital input	16×PNP, Type 3
Digital output	8×PNP
Configurable input/output	yes
IO-Link Version	V1.1.2
IO-link transmission rate	COM1, COM2, COM3 (4.8 kbps\38.4 kbps\230.4 kbps)
IO-link port quantity/type	8-way CLASS A
Signal connection interface	8×M12 D-code 5pin, hole end
Maximum communication	20m
IO-Link port external 24VSupply current (Pin1Pins	2A
Troubleshooting	support

SDPN-8IOL-M12-00

Basic parameters

Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66×221×29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Power parameters	
Power supply interface	2×7/8” 5pin, needle end + hole end
US standard voltage	24 VDC (18…30 VDC)
US current sum	5A
UA standard voltage	24 VDC (18…30 VDC)
UA current sum	8A
Rated power consumption	89mA
Electrical isolation	US and UA:24VIsolation, 0Visolation
Technical Parameters	
Communication Protocol	PROFINET
Bus communication interface	2×M12 D-code 4pin, hole end
Maximum transmission	100 meters
Communication rate	10/100 Mbit/s
Digital input	16×PNP, Type 3
Digital output	8×PNP
Configurable input/output	yes
IO-Link Version	V1.1.2
IO-link transmission rate	COM1, COM2, COM3 (4.8 kbps\38.4 kbps\230.4 kbps)
IO-link port quantity/type	8-way CLASS A
Signal connection interface	8×M12 D-code 5pin, hole end
Maximum communication	20m
IO-link port external 24V power supply current (Pin1)	2A
Troubleshooting	support

1.3.2 Hub slave technical parameters

SDIOL-801N-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	65.0x35.9x220.0 mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	16mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of input terminals	8
Input signal type	PNP,Type 1
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Input filter time	0~10ms (default 3ms)
Input Impedance	none
Isolation	yes
Product Features	Input filtering, short circuit prevention

SDIOL-800N-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	36x160x23mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	51mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of input terminals	8
Input signal type	NPN, Type1
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Input filter time	0~10ms (default 3ms)
Input Impedance	none
Isolation	yes
Product Features	Input filtering, short circuit prevention

SDIOL-08N0-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	36x160x23mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	30mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of outputs	8
Output signal type	NPN
Output Current	Maximum single channel: 0.5A, 8 channels simultaneous output max: 2A
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Load Type	Resistive load, inductive load, lamp load
Isolation	yes
Troubleshooting	Low pressure,Overheating diagnosis
Product Features	Single channel short circuit protection

SDIOL-08N1-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	36x160x23mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	30mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of outputs	8
Output signal type	PNP
Output Current	Maximum single channel: 0.5A, 8 channels simultaneous output max: 2A
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Load Type	Resistive load, inductive load, lamp load
Isolation	yes
Troubleshooting	Low pressure,Overheating diagnosis
Product Features	Single channel short circuit protection

SDIOL-8800-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66x171x29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	58mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of outputs	8
Number of inputs	8
Input signal type	NPN, Type1
Output signal type	NPN
Output Current	Maximum single channel: 0.5A, 8 channels simultaneous output max: 2A
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Input filter time	0~10ms (default 3ms)
Load Type	Resistive load, inductive load, lamp load
Isolation	yes
Troubleshooting	Low pressure,Overheating diagnosis
Product Features	Single channel short circuit protection

SDIOL-8811-M12

Basic parameters	
Protection level	IP679 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66x171x29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	72mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of outputs	8
Number of inputs	8
Input signal type	PNP, Type1
Output signal type	PNP
Output Current	Maximum single channel: 0.5A, 8 channels simultaneous output max: 2A
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Input filter time	0~10ms (default 3ms)
Load Type	Resistive load, inductive load, lamp load
Isolation	yes
Troubleshooting	Low pressure,Overheating diagnosis
Product Features	Single channel short circuit protection

SDIOL-H00N-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66x171x29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	86mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of inputs	16
Input signal type	NPN, Type1
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Input filter time	0~10ms (default 3ms)
Input Impedance	none
Isolation	yes
Product Features	Input filtering, short circuit prevention

SDIOL-H01N-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66x171x29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Power parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	19mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of inputs	16
Input signal type	PNP, Type1
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Input filter time	0~10ms (default 3ms)
Input Impedance	none
Isolation	yes
Product Features	Input filtering, short circuit prevention

SDIOL-0HN0-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66x171x29m
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Technical Parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	43mA
Communication Protocol	IO-Link 1.1.3
Interface slots	8×M12, female, 5-pin, A-coded
Number of outputs	16
Output signal type	NPN
Output Current	Maximum single channel: 0.5A, 8 channels simultaneous output max: 2A
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Load Type	Resistive load, inductive load, lamp load
Isolation	yes
Troubleshooting	Low pressure,Overheating diagnosis
Product Features	Single channel short circuit protection

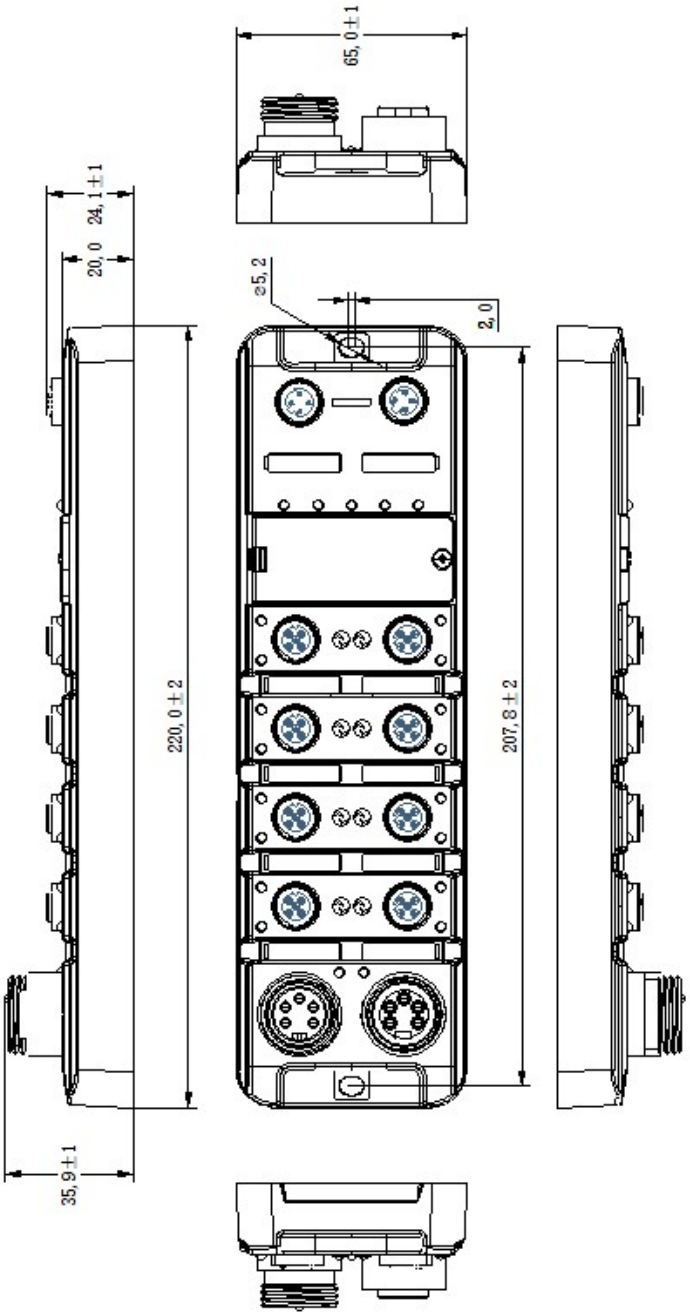
SDIOL-0HN1-M12

Basic parameters	
Protection level	IP67 (bolt tightened))
Appearance Material	PA6+gf30%
Dimensions	66x171x29mm
Storage temperature	-40℃…+85℃
Operating temperature	-25℃…+70℃
Power parameters	
Standard voltage	24 VDC (18…30 VDC)
Rated power consumption	58mA
Communication Protocol	IO-Link 1.1.2
Interface slots	8×M12, female, 5-pin, A-coded
Number of outputs	16
Output signal type	NPN
Output Current	Maximum single channel: 0.5A, 8 channels simultaneous output max: 2A
Communication rate	COM2 (38.4Kbps)
Minimum cycle time	3ms
Load Type	Resistive load, inductive load, lamp load
Isolation	yes
Troubleshooting	Low pressure,Overheating diagnosis
Product Features	Single channel short circuit protection

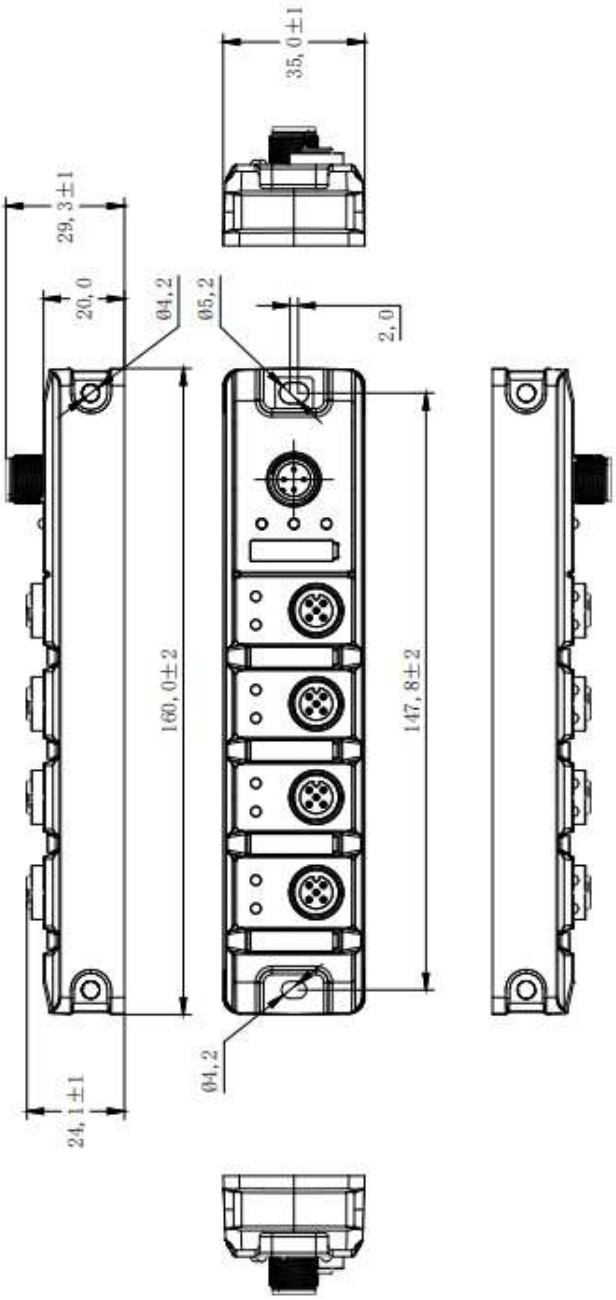
2. Mechanical Installation

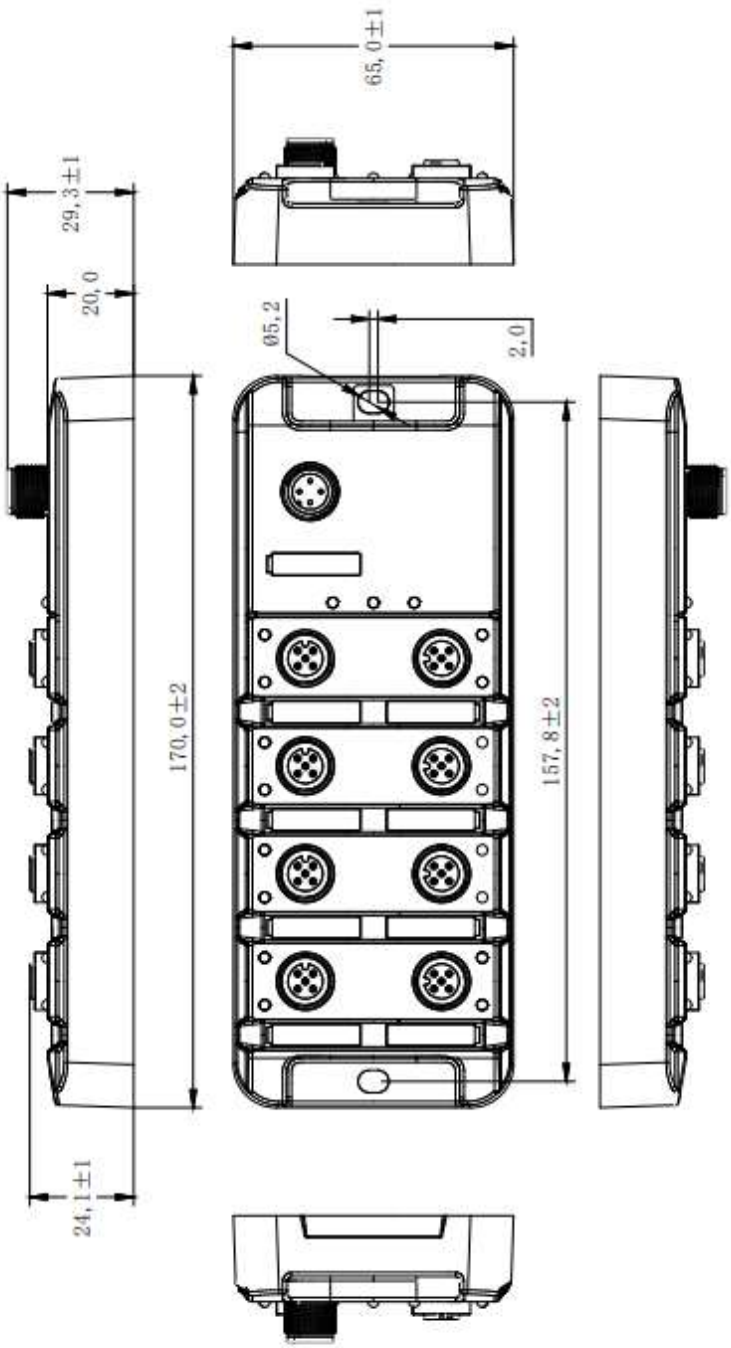
2.1 Installation dimensions

2.1.1 Master station installation dimensions



2.1.2 Hub slave installation dimensions



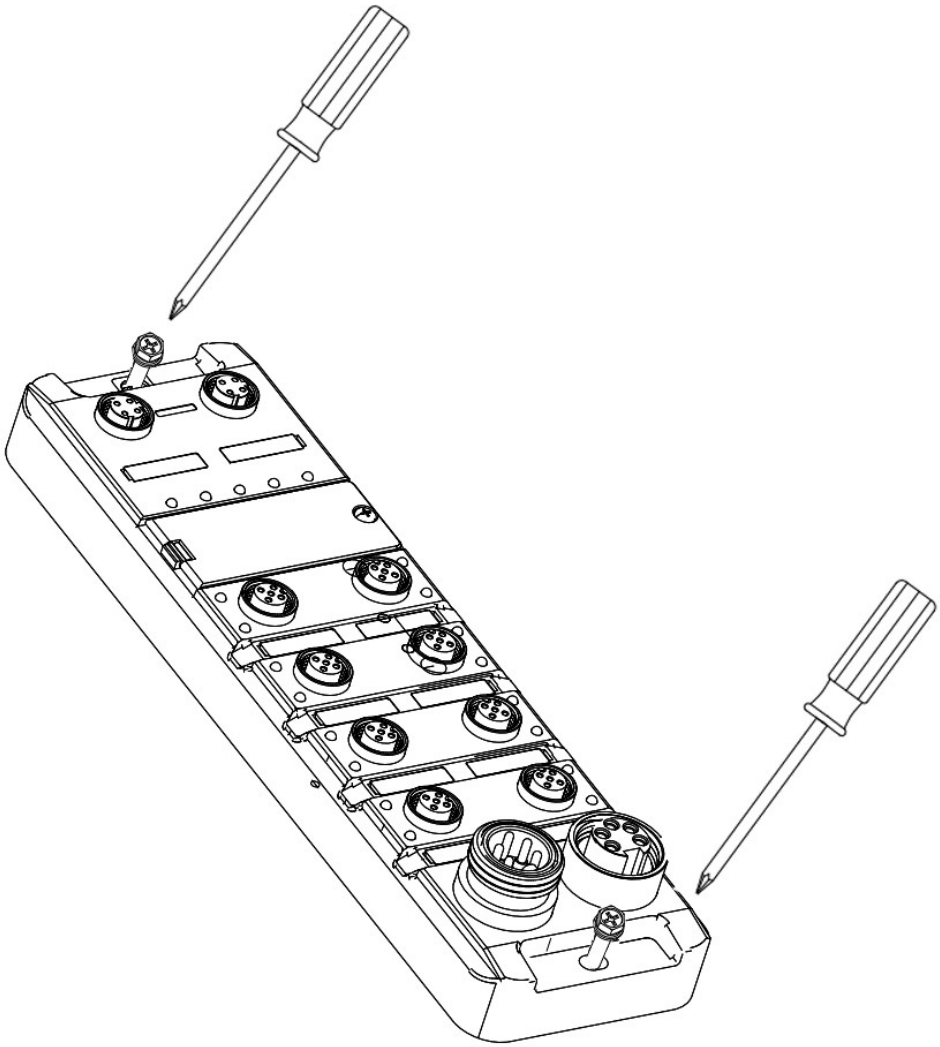

65,0±1
29,3±1
20,0
Ø5.2
2,0
170,0±2
157,8±2
24,1±1

2.2 Installation Method

2.2.1 Main station installation layout

Install:

Use cross-slot hexagonal head combination screws for installation (the screws are M6*25, and the screw gasket diameter is 11mm).



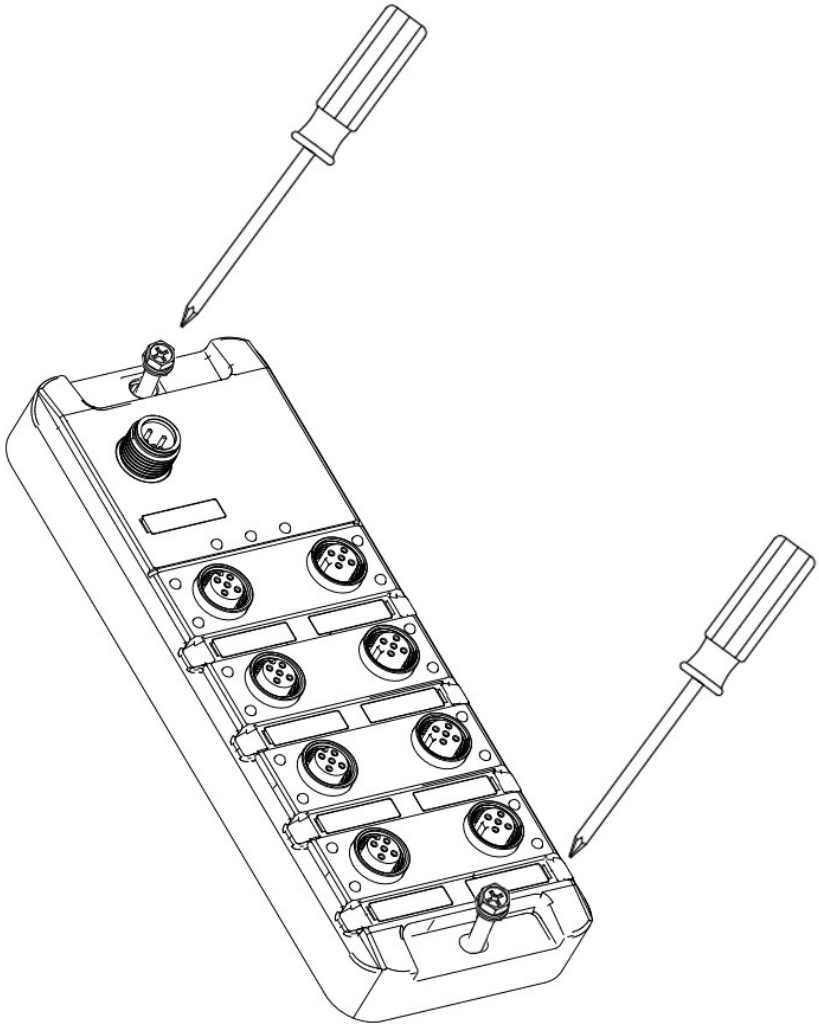
Disassembly:

Use a Phillips screwdriver to unscrew the M6 screws and remove the module.

2.2.2 Hub slave installation layout

Install:

Use cross-slot hexagonal head combination screws for installation (the screws are M6*25, and the screw gasket diameter is 11mm).



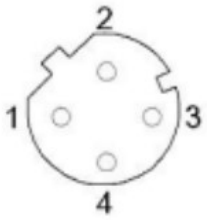
Disassembly:

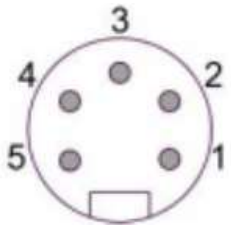
Use a Phillips screwdriver to unscrew the M6 screws and remove the module.

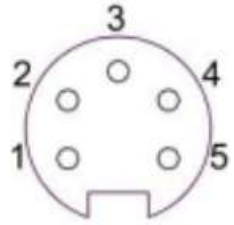
3. Electrical installation

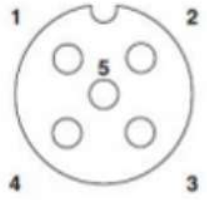
3.1 Terminal Definition

3.1.1 Master terminal definition

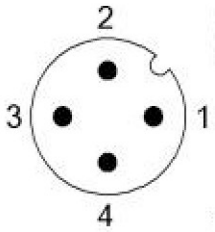
Communication port pin definition		
	**Pin**	**Function**
	1	Tx+ Transmit data+
	2	Rx+ Receive data+
	3	Tx - Transmit Data -
	4	Rx - Receive Data -

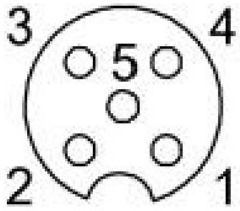
Power input pin definition		
	**Pin**	**Function**
	1	Auxiliary power supply UA-0V
	2	System and signal load power supplyUS-0V
	3	Functional grounding FE
	4	System and signal load power supply US+ DC24V
	5	Auxiliary power supply UA+ DC24V

Power output pin definition		
	**Pin**	**Function**
	1	Auxiliary power supplyUA-0V
	2	System and signal load power supplyUS-0V
	3	Functional grounding FE
	4	System and signal load power supply US+ DC24V
	5	Auxiliary power supply UA+ DC24V

IO-Link Pin Definition		
	**Pin**	**Function**
	1	DC24V power supply
	2	DI signal
	3	GND, reference potential
	4	C\Q, IO-Link data transmission channel; DI/D0 Configurable
	5	Not used

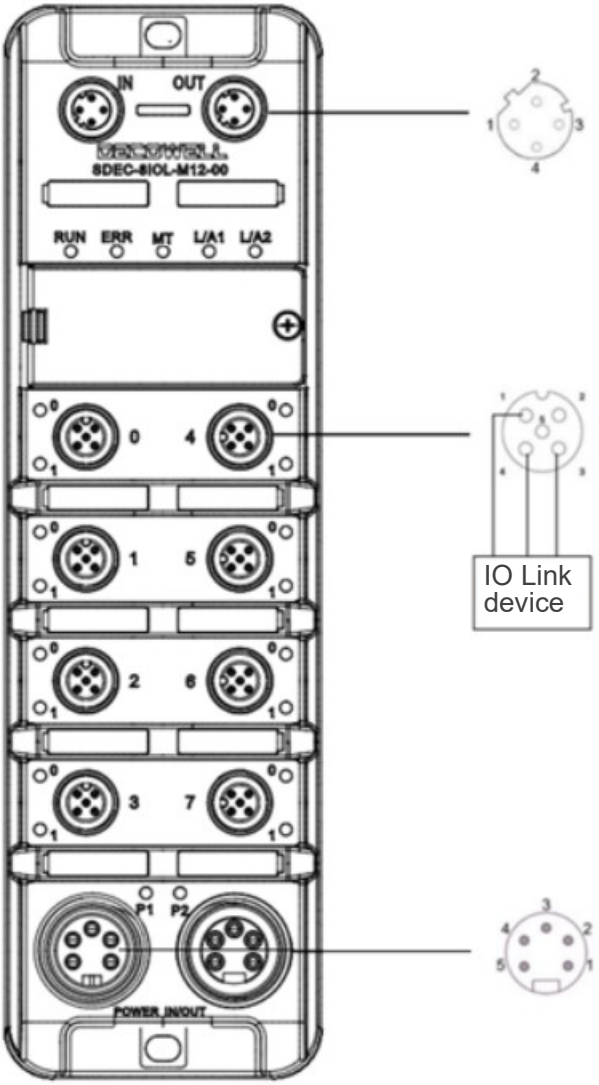
3.1.2 Hub slave terminal definition

IO-Link Pin Definition		
	**Pin**	**Function**
	1	DC24V power supply
	2	Not used
	3	GND, reference potential
	4	C\Q, IO-Link data transmission channel

IO Port Pin Definition		
	**Pin**	**Function**
	1	DI:DC24V; DO:NC
	2	Input or output 2
	3	GND
	4	Input or output 1
	5	Protective ground PE

3.2 Terminal Wiring

3.2.1 Master station IOL wiring

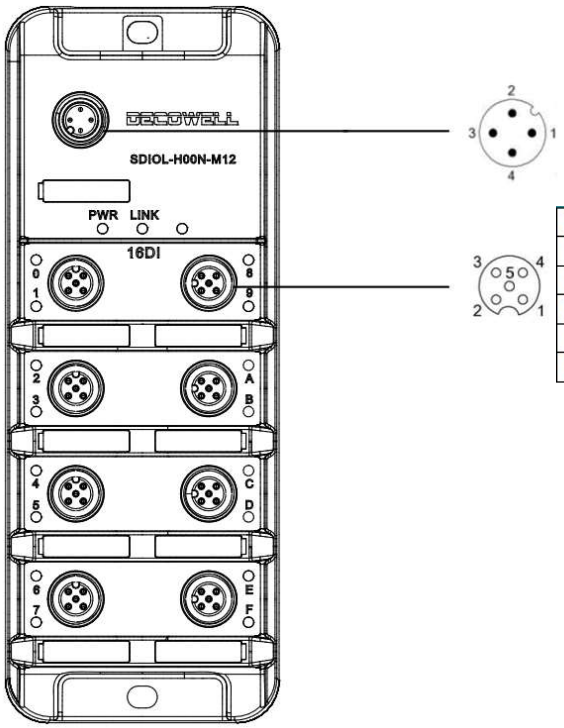


Pin	Function
1	Tx+ Transmit data+
2	Rx+ Receive data+
3	Tx - Transmit Data -
4	Rx - Receive Data -

Pin	Function
1	DC24V power supply
2	DI signal
3	GND, reference potential
4	C\Q, IO-Link data transmission channel; DI/D0 Configurable
5	Not used

Pin	Function
1	UA - 0V
2	US - 0V
3	Functional grounding FE
4	US + 24V
5	UA + 24V

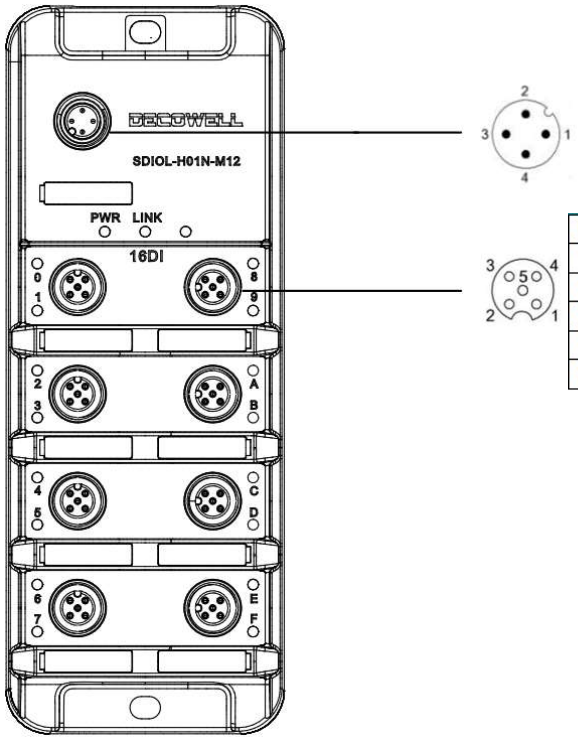
3.2.2 Hub slave input NPN wiring



Pin	Function
1	DC24V power supply
2	Not used
3	GND, reference potential
4	C\Q, IO-Link data transmission channel

Pin	Function
1	DC24V;
2	Input or output 2
3	GND
4	Input or output 1
5	Protective ground PE

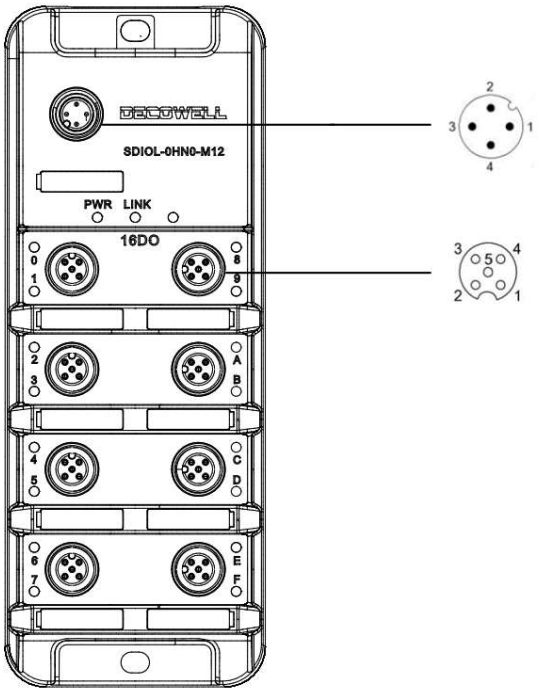
3.2.3 Hub slave input PNP wiring



Pin	Function
1	DC24V power supply
2	Not used
3	GND, reference potential
4	C\Q, IO-Link data transmission channel

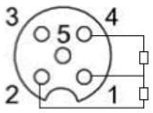
Pin	Function
1	DC24V;
2	Input or output 2
3	GND
4	Input or output 1
5	Protective ground PE

3.2.4 Hub slave output NPN wiring

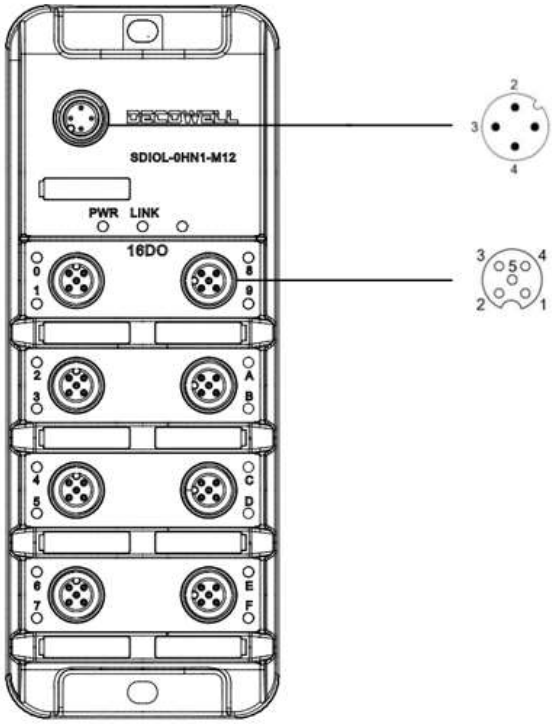


Pin	Function
1	DC24V power supply
2	Not used
3	GND, reference potential
4	C\Q, IO-Link data transmission channel

Pin	Function
1	DC24V;
2	Input or output 2
3	GND
4	Input or output 1
5	Protective ground PE

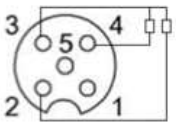


3.2.5 Hub slave output PNP wiring



Pin	Function
1	DC24V power supply
2	Not used
3	GND, reference potential
4	C\Q, IO-Link data transmission channel

Pin	Function
1	NC
2	Input or output 2
3	GND
4	Input or output 1
5	Protective ground PE



4. Product Use Cases

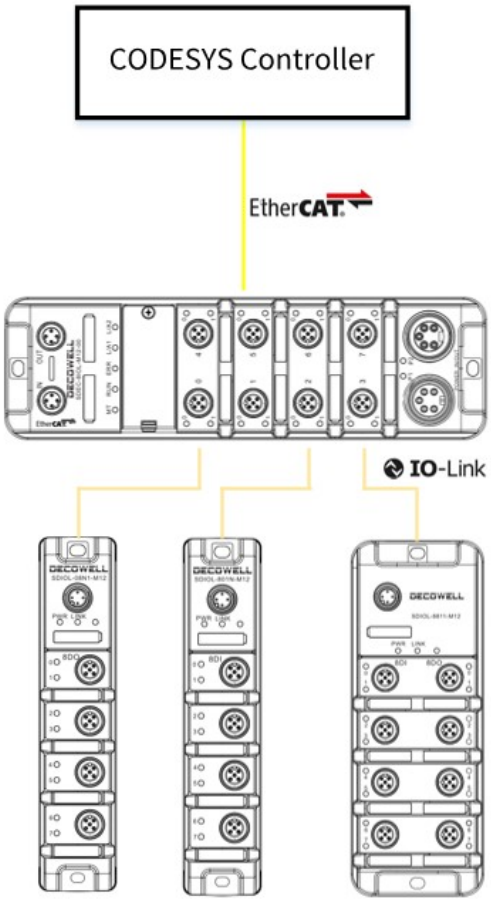
4.1 SDEC-8IOL-M12-00 Use Case

4.1.1 Connection and configuration of CODESYS and SDEC-8IOL-M12-00

1. Hardware Configuration

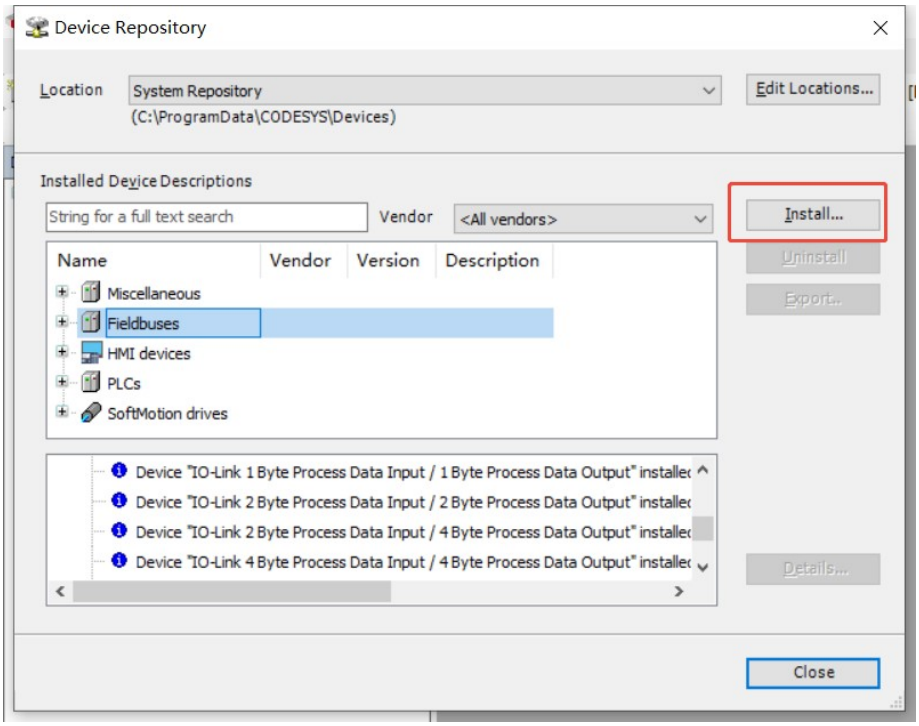
Module Model	quantity
CODESYS Controller	1
SDEC-8IOL-M12-00	1
SDIOL-8811-M12	1
SDIOL-801N-M12	1
SDIOL-08N1-M12	1

2. Network topology diagram

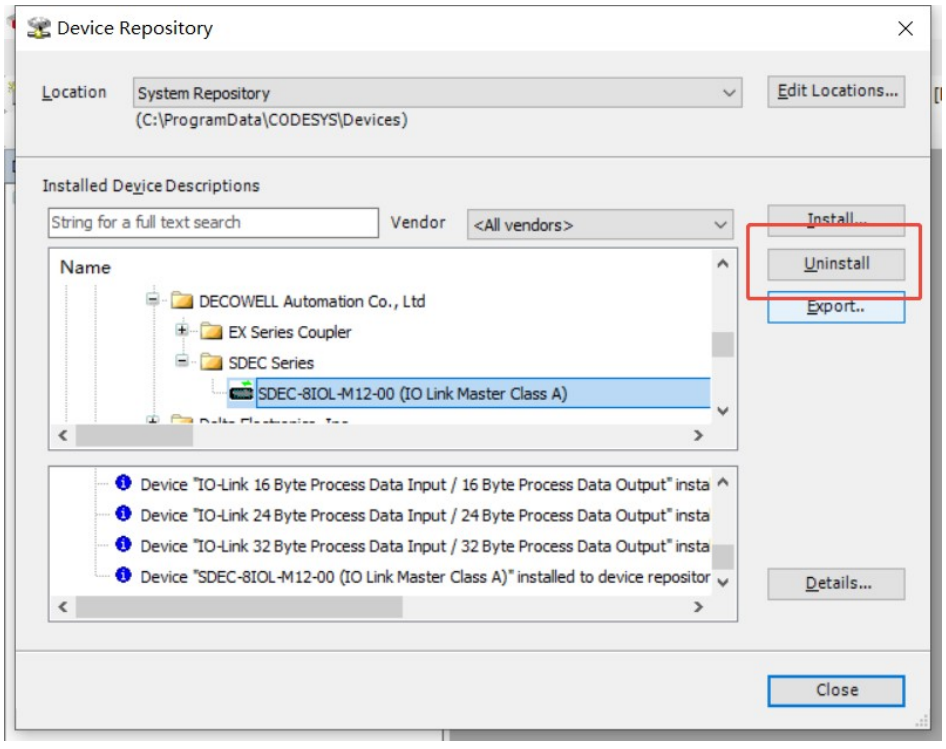


3. Install and uninstall XML

(1)Open the CODESYS programming software, select "Install" in the Device Library window, and select the file type to be installed as "EtherCAT XML Device Description Configuration File" in the Device Description File window.

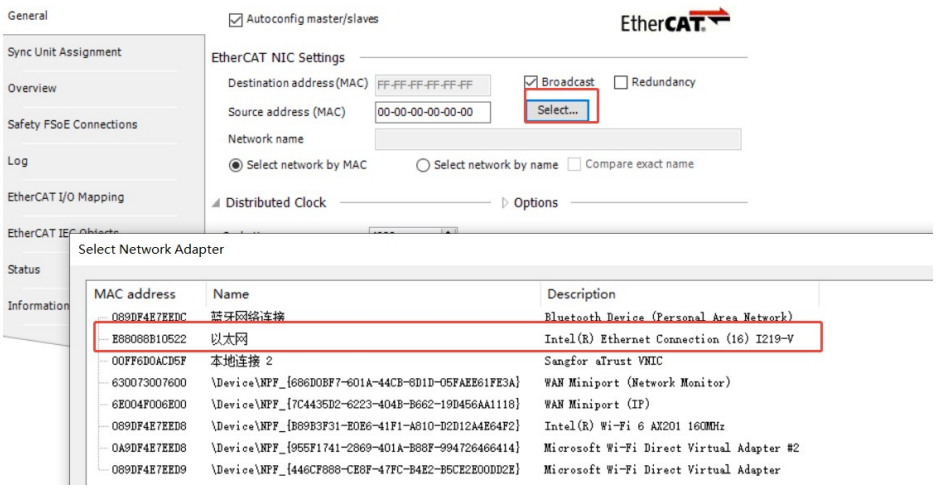


(2)In the device library, select the EtherCAT slave XML file that needs to be uninstalled.



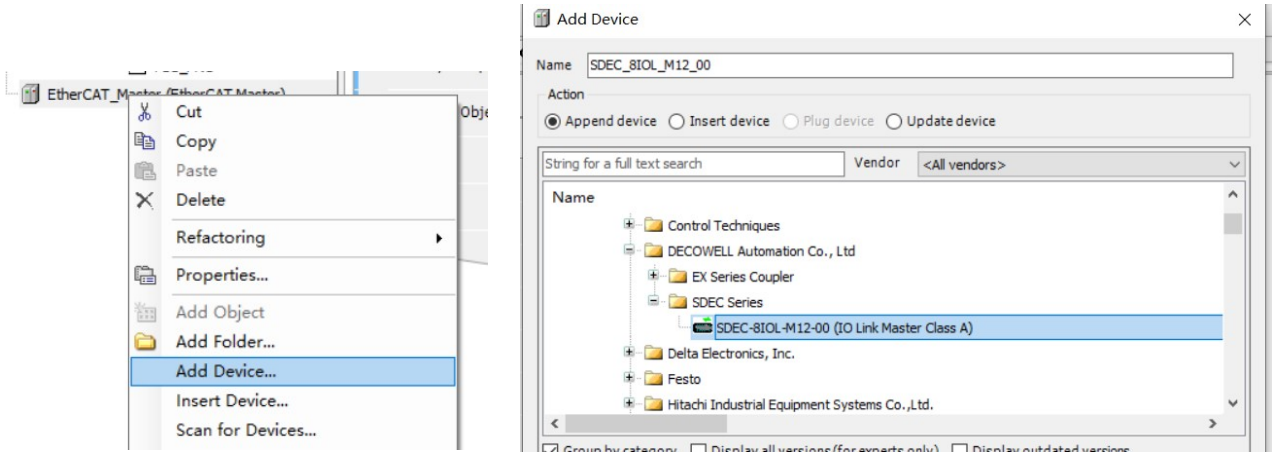
4. Create project and configuration

Open the CODESYS programming software to create a project, right-click "Device" to add EtherCAT Master to the project tree, and configure its EtherCAT communication port parameters.



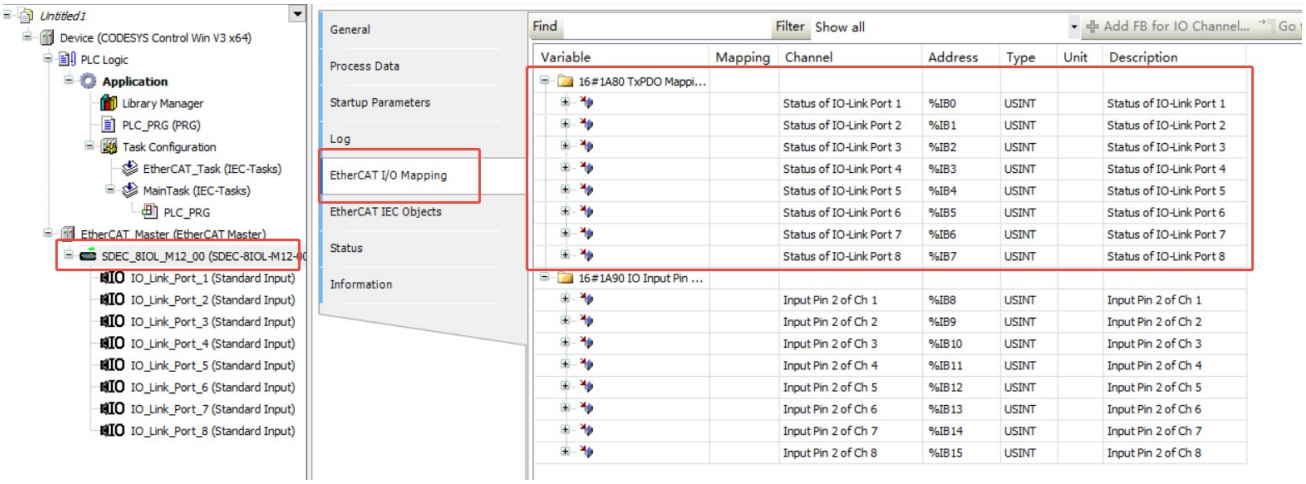
Manually add IO modules:

Right-click "EtherCAT_Master" in the project tree and select "Add Device". Add SDEC-8IOL-M12-00 in the device library. Right-click the SDEC_8IOL_M12_00 module in the project tree and select "Insert Device". Select the module that matches the bytes in the actual module.



Tip: The port number of the IO-Link slave configuration plug-in device must be consistent with the actual port number.

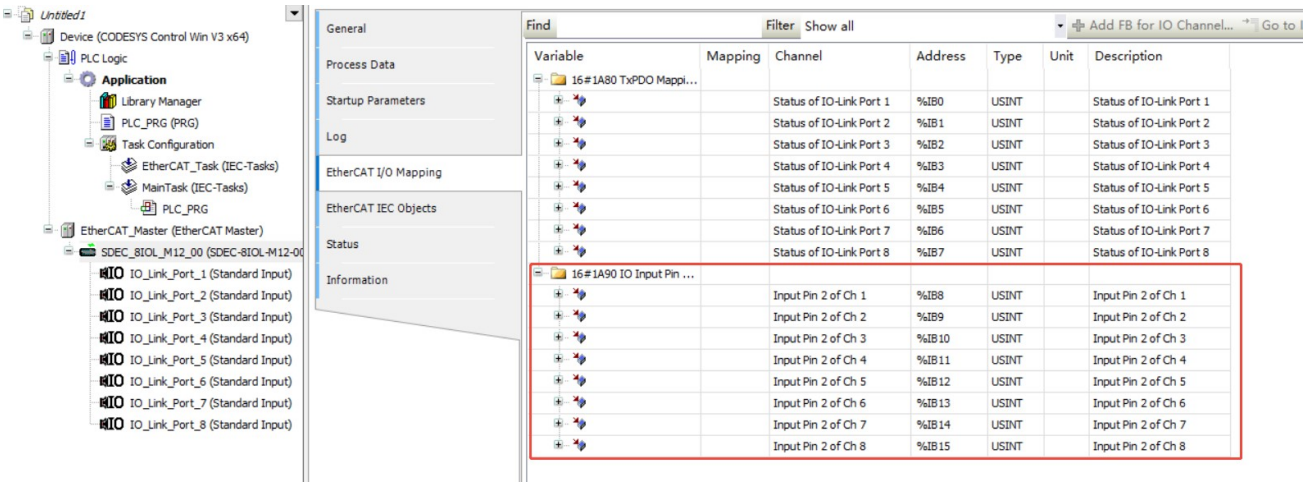
5. Check the IO-Link slave port status



The complete status code and its meaning are shown in the following table. The status is presented by the combination of the high and low 4-bit status codes.

The lower four bits	The meaning of the high four
0x_0 Port disabled	0x1_ Watchdog detected
0x_1 Port in std dig in	0x2_ internal Error
0x_2 Port in std dig out	0x3_ invalid Device Id
0x_3 Port in communication OP	0x4_ invalid Vendor Id
0x_4 Port in communication COMSTOP	0x5_ invalid IO-Link Version
	0x6_ invalid Frame Capability
	0x7_ invalid Cycle Time
	0x8_ invalid PD in length
	0x9_ invalid PD out length
	0xA_ no Device detected

6. PIN2 input status



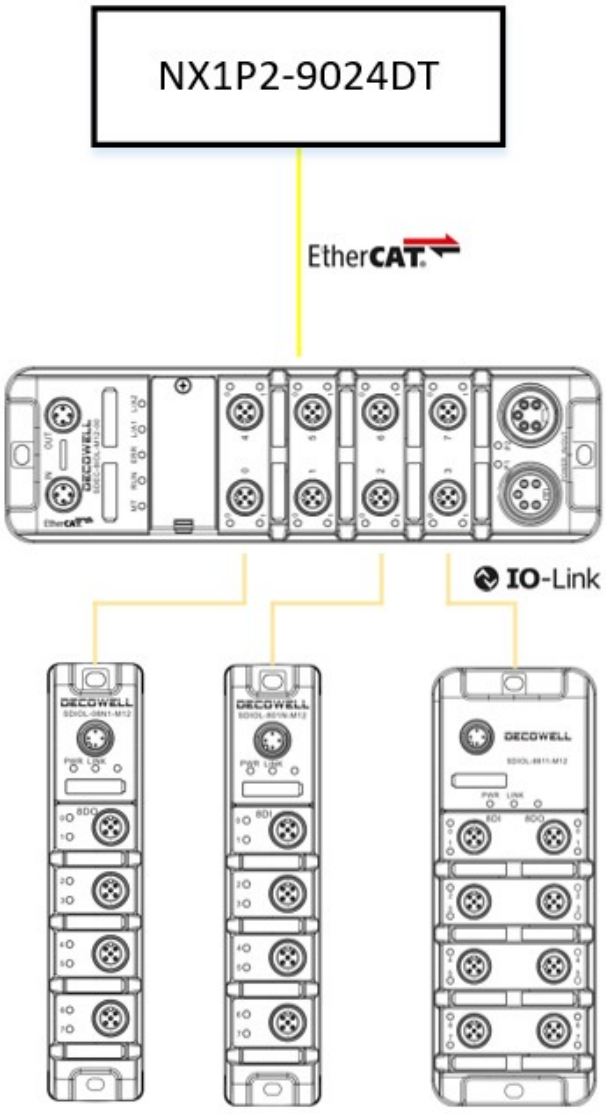
PIN2 in SDEC_8IOL_M12_00 only supports digital input. If input reverse is not set, 1 is high level and 0 is low level.

4.1.2 Connection and configuration between Sysmac Studio and SDEC-8IOL-M12-00

1. Hardware Configuration

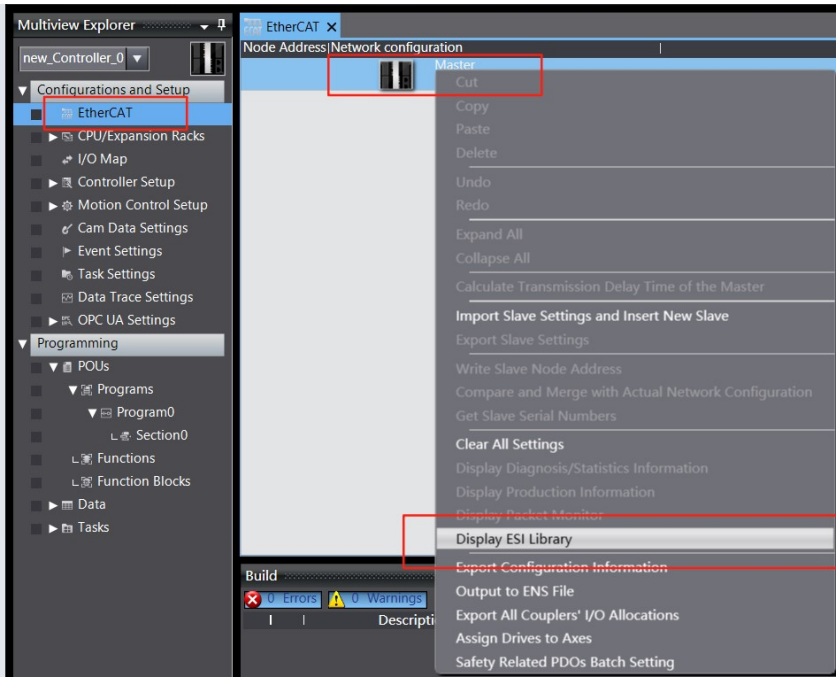
Module Model	quantity
NX1P2-9024DT	1
SDEC-8IOL-M12-00	1
SDIOL-8811-M12	1
SDIOL-801N-M12	1
SDIOL-08N1-M12	1

2. Network topology diagram

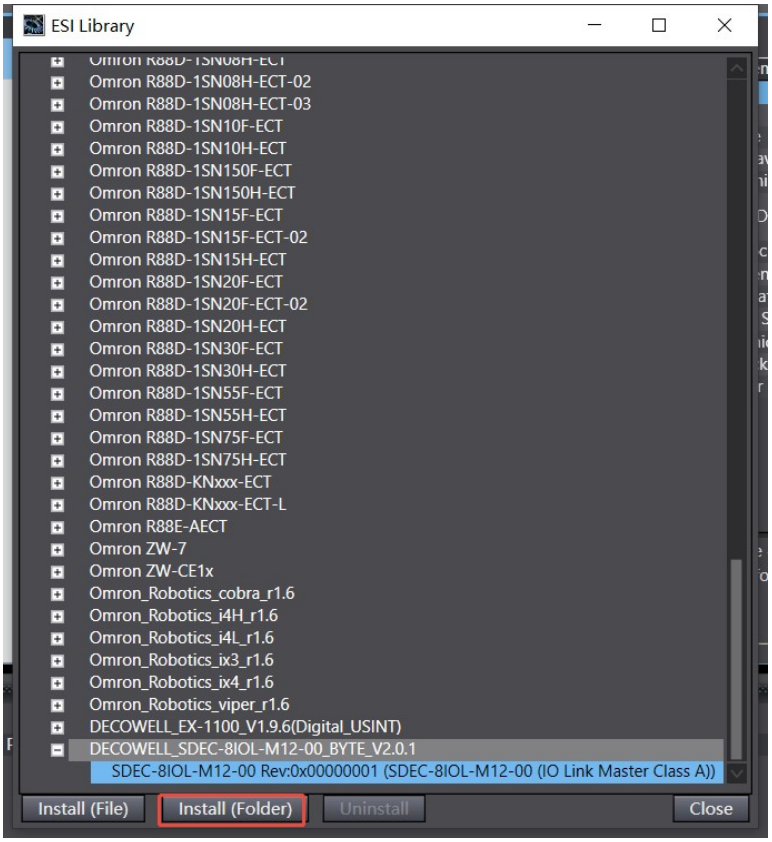


3. Install and uninstall XML

(1)Install the XML file. In the ESI library, select the EtherCAT XML file you want to install.



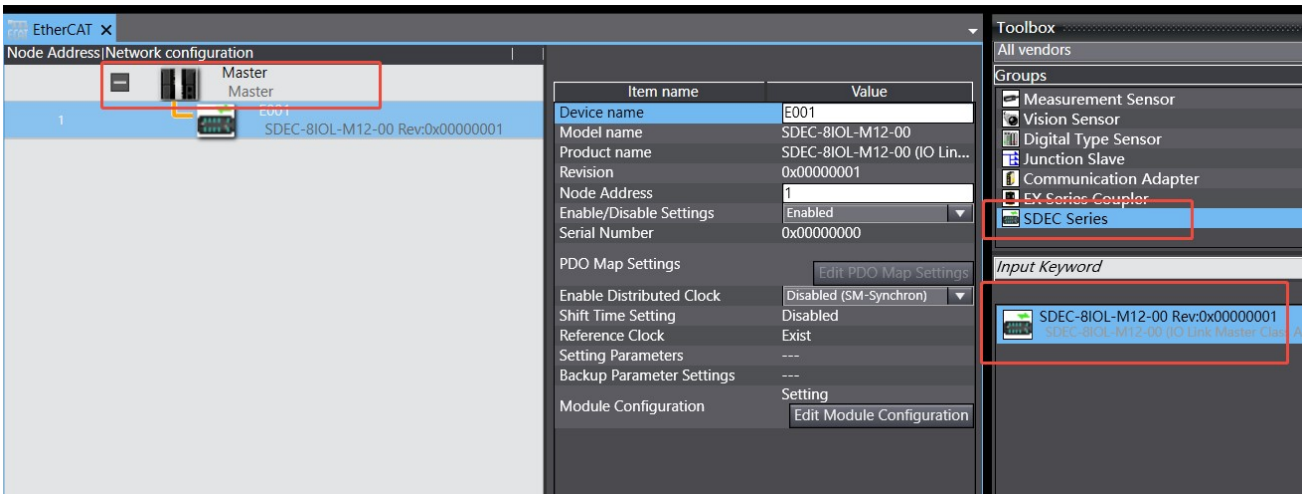
(2)Uninstall XML files. In the ESI library, select the EtherCAT XML file that needs to be uninstalled.



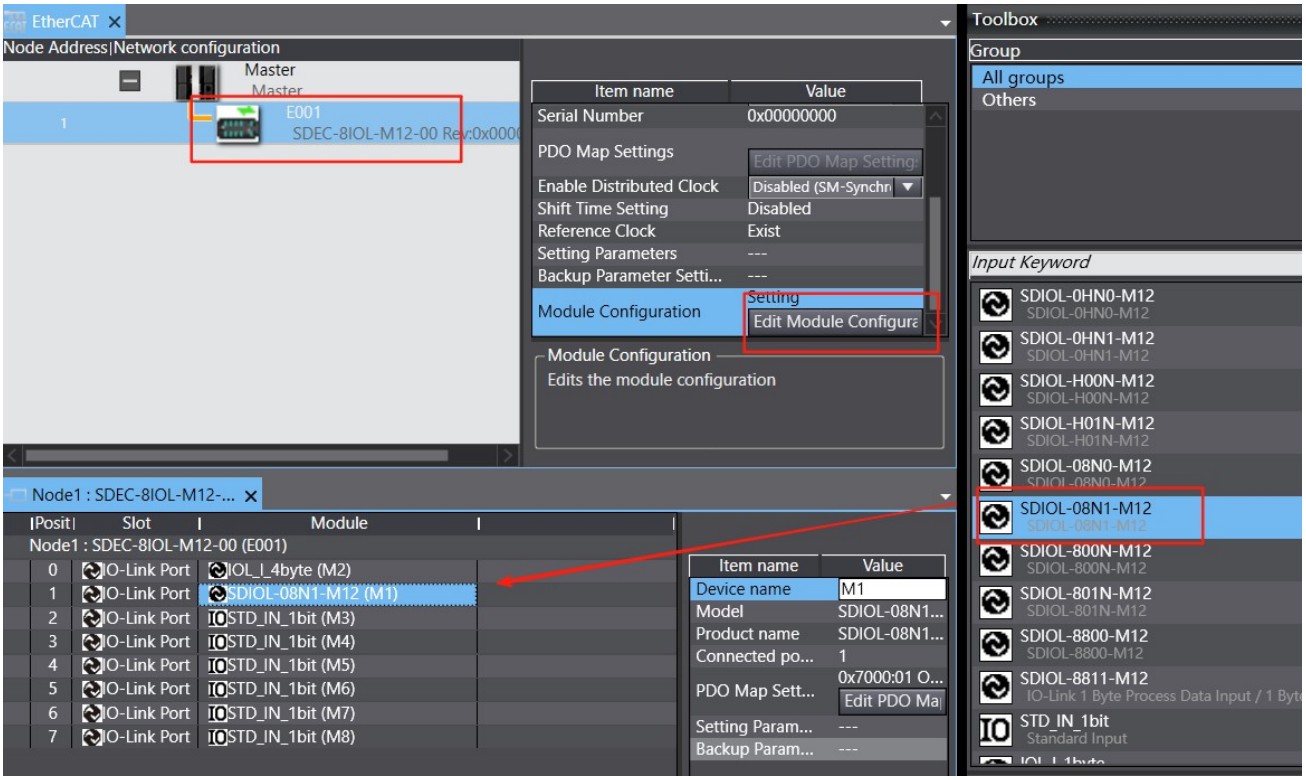
4. Create project and configuration

Manually add IO modules:

Double-click "EtherCAT" and add the SDEC_8IOL_M12_00 module in the EtherCAT window.



Add an IO-Link slave. In the EtherCAT window, select the SDEC_8IOL_M12_00 module in the node, click "Edit Module Configuration", and configure the module model in the slot (the slot model must be consistent with the actual connection).

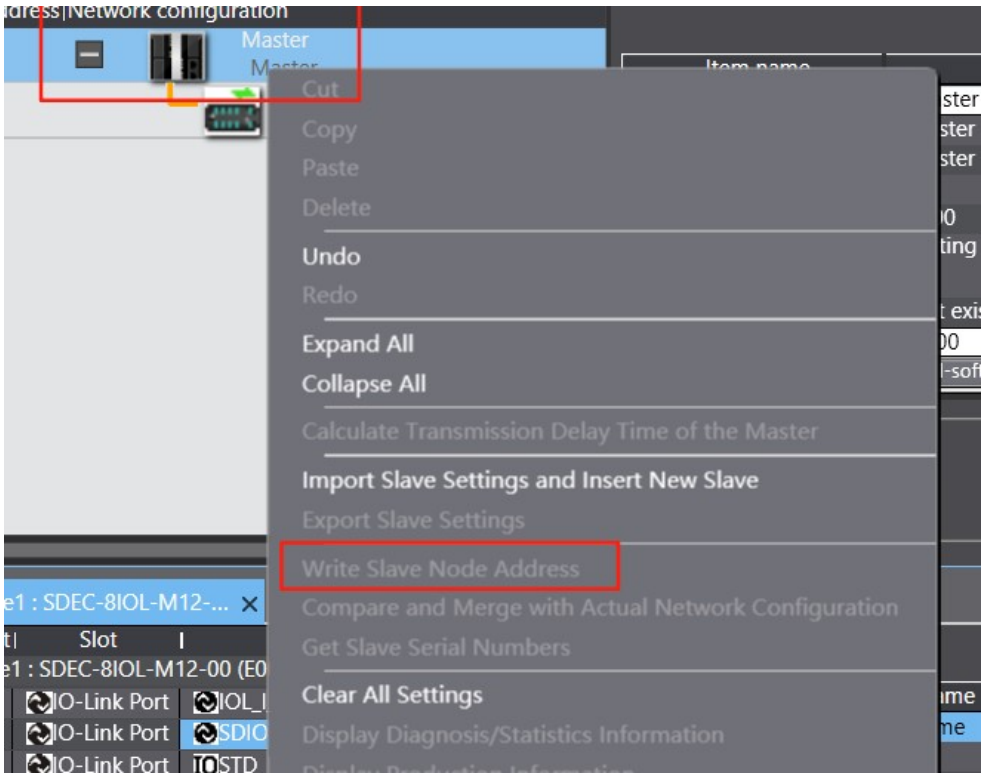


Note: Slot type selection: STD_IN_1bit/STD_OUT_1bitWhen SDECThe master

station's pin4Configured as an input/output port.

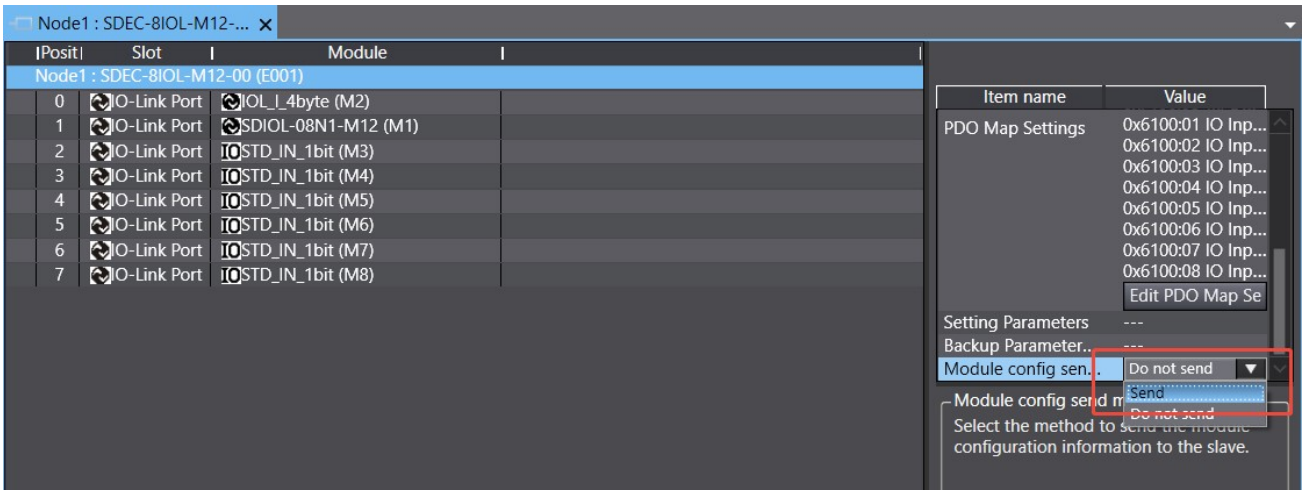
Node settings:

After going online, right-click the master device and select "Write Device Node Address".



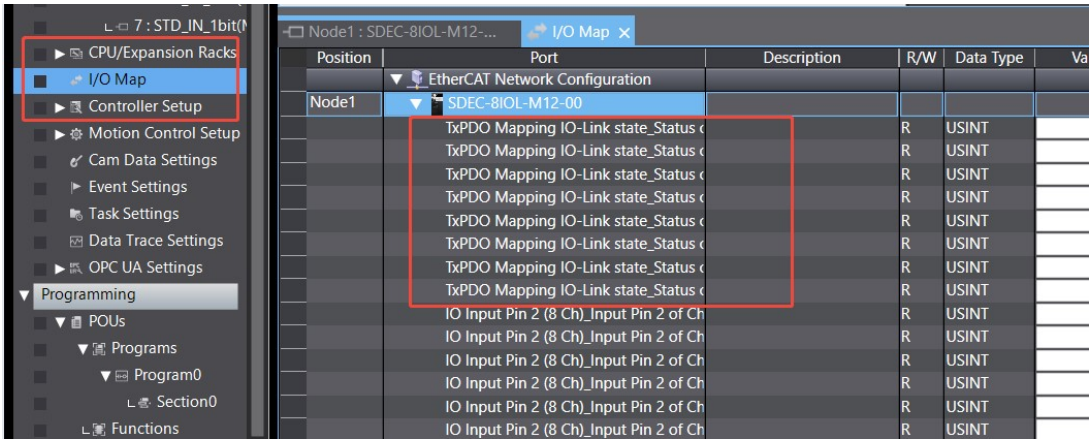
Note: After the node address is written, the device needs to be restarted for the node address to take effect.

Note: Modify the module configuration sending method: Send



Download the program to the PLC and go online to monitor its running status.

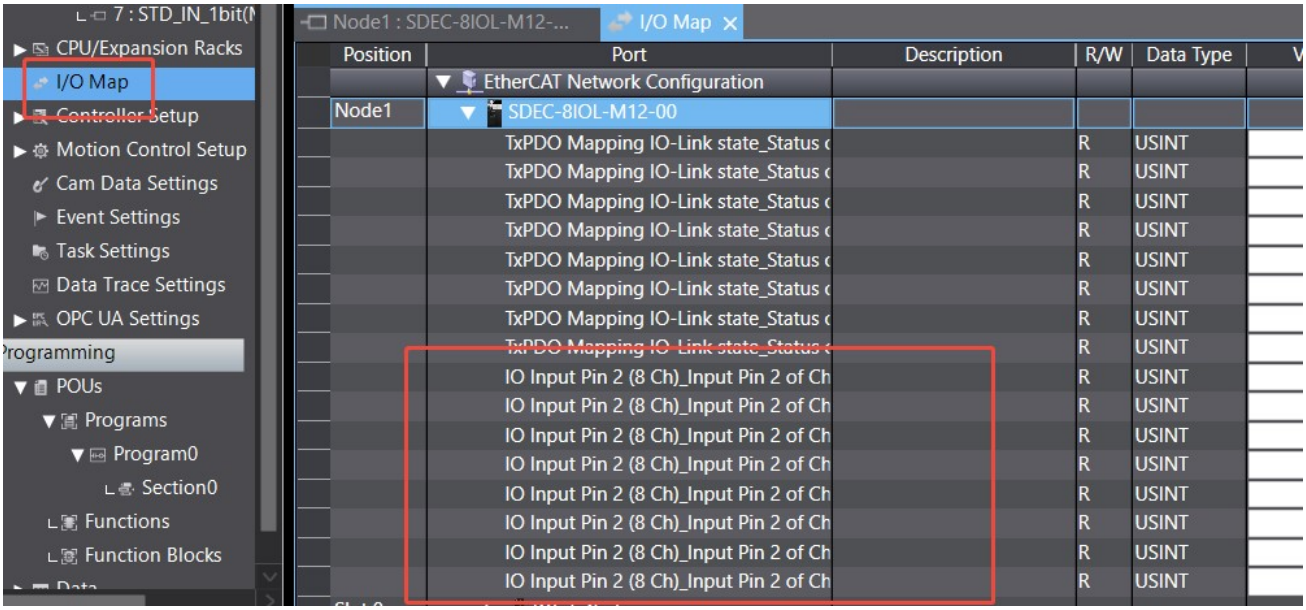
5. Check the IO-Link slave port status



The complete status code and its meaning are shown in the following table. The status is presented by the combination of the high and low 4-bit status codes.

The lower four bits	The meaning of the high four
0x_0 Port disabled	0x1_ Watchdog detected
0x_1 Port in std dig in	0x2_ internal Error
0x_2 Port in std dig out	0x3_ invalid Device Id
0x_3 Port in communication OP	0x4_ invalid Vendor Id
0x_4 Port in communication COMSTOP	0x5_ invalid IO-Link Version
	0x6_ invalid Frame Capability0x7_ invalid Cycle Time
	0x8_ invalid PD in length
	0x9_ invalid PD out length
	0xA_ no Device detected

6. PIN2 input status



PIN2 in SDEC_8IOL_M12_00 only supports digital input. If input reverse is not set, 1 is high level and 0 is low level.

4.2 SDPN-8IOL-M12-00 Use Case

4.2.1 Connection and configuration between TIA Portal and

SDPN-8IOL-M12-00

1. The communication connection diagram is shown in Figure 4-2-1-1:

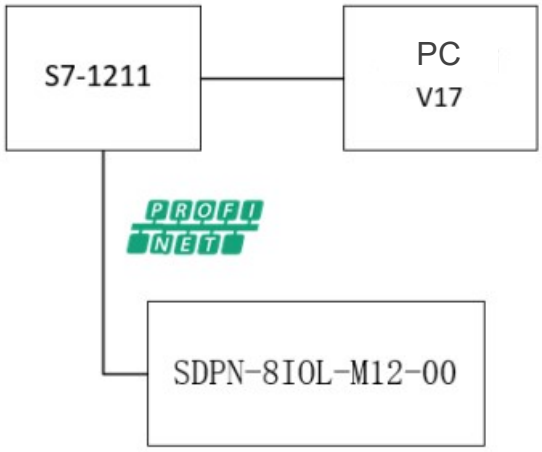


Figure 4-2-1-1 Communication connection diagram

2. The hardware configuration table is shown in the following table:

Hardware	Quantity	Remark
Programming Computer	1	Installing TIA Portal V16
Controller	1	S7-1211C
SDPN-8IOL-M12-00	1	PROFINET protocol Master module
IO-Link communication cable	several	

3. Install the GSD file, open TIA Portal V17, and select "Options" > "Support Device Description File (GSD)" from the menu bar, as shown in Figure 4-1-1-2:

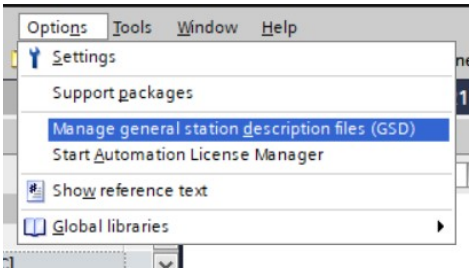


Figure 4-1-1-2 Installing GSD file

4. New project and equipment configuration

Open TIA Portal V17, select New Project and configure, as shown in Figure 4-1-1-3 below:

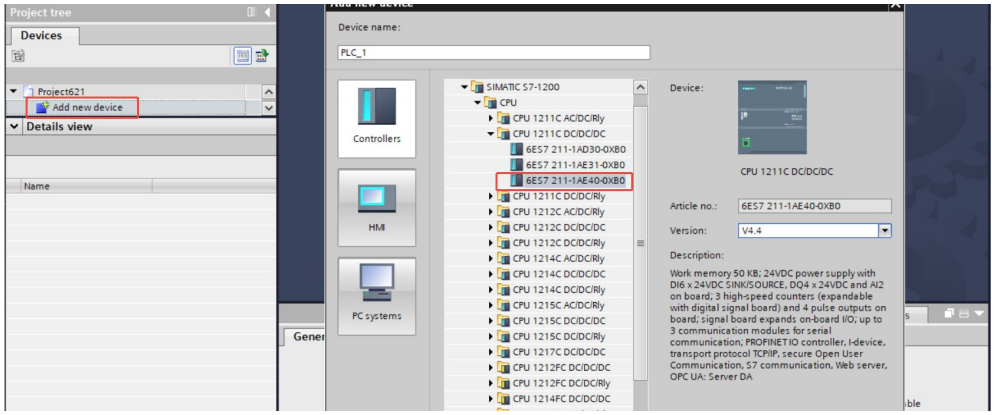


Figure 4-1-1-3 Create a new project and select the PLC model

Switch to the network view window, expand the hardware directory on the right, select SDPN-8IOL-M12-00 and drag it to the network view, as shown in Figure 4-1-1-4 below:

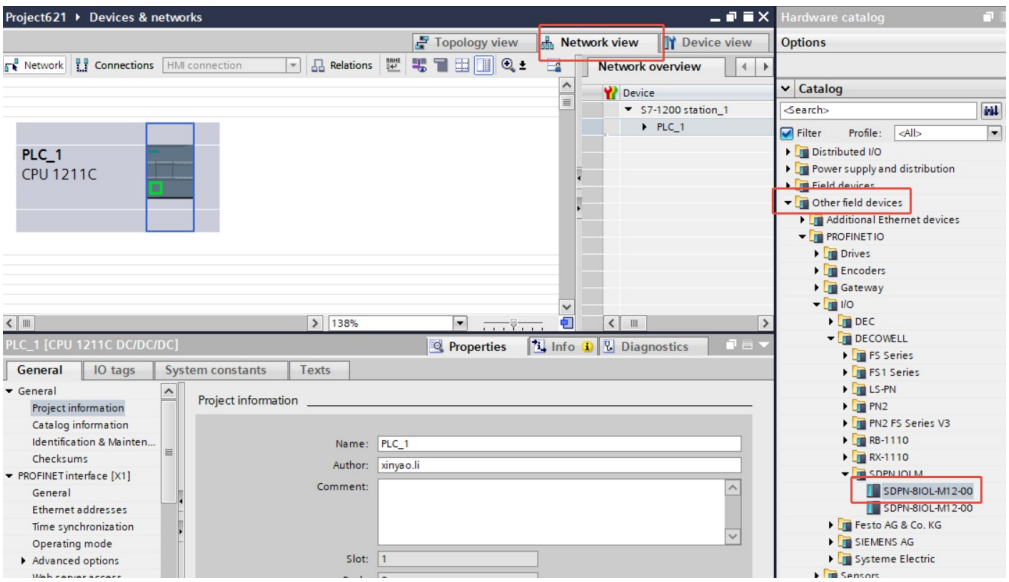


Figure 4-1-1-4 Add SD Master StationIn the network view, assign a controller to the remote IO module, click "Unassigned" in the IO module, and select PLC_1.PROFINET Interface_1, as shown in Figure 4-1-1-5 below:

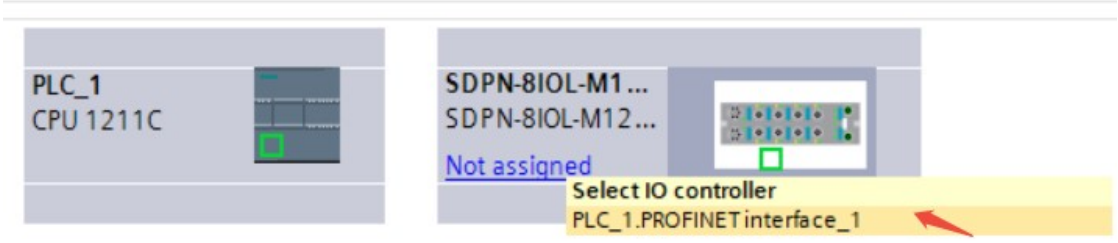


Figure 4-1-1-5 Assign IO controller

To set the IP address of the I/O module, in the device view, double-click the module to enter the property view, as shown in Figure 4-1-1-6 below:

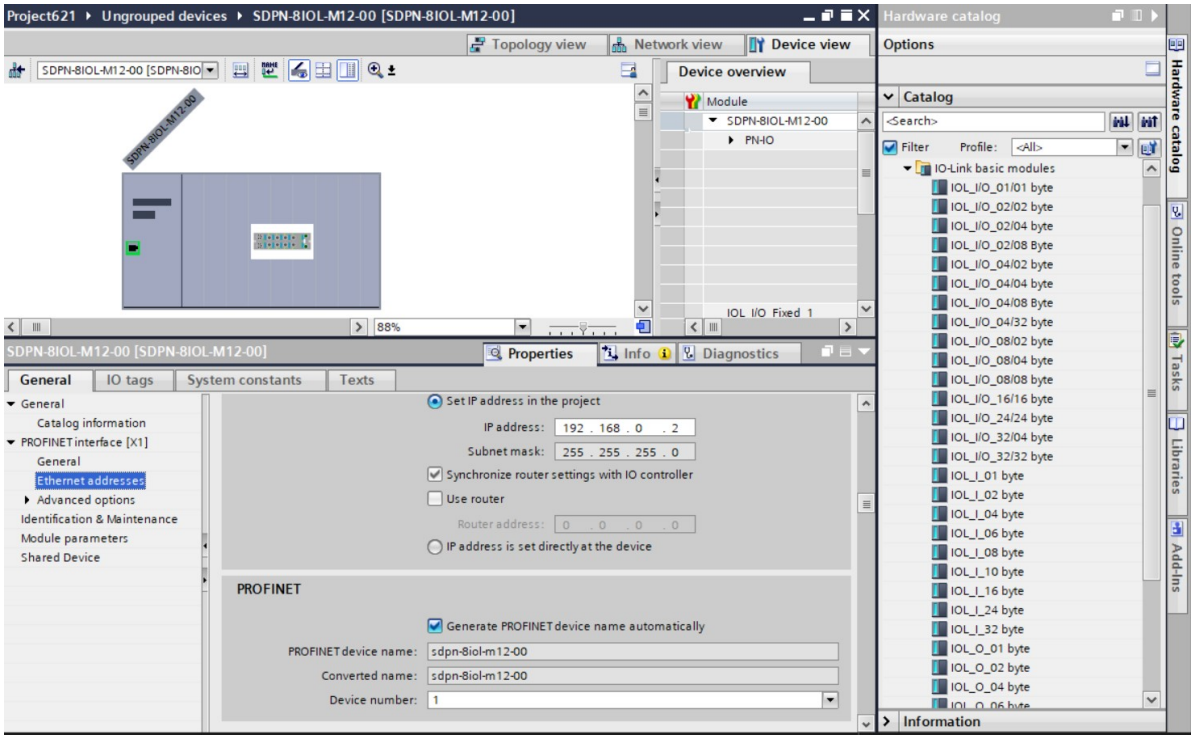


Figure 4-1-1-6 Allocating IP addresses

Add SD slave, click Device View, select the corresponding master station port in the Device View , add SD slave in the hardware directory on the right. The specific operation is shown in Figure 4-1-1-7 below:

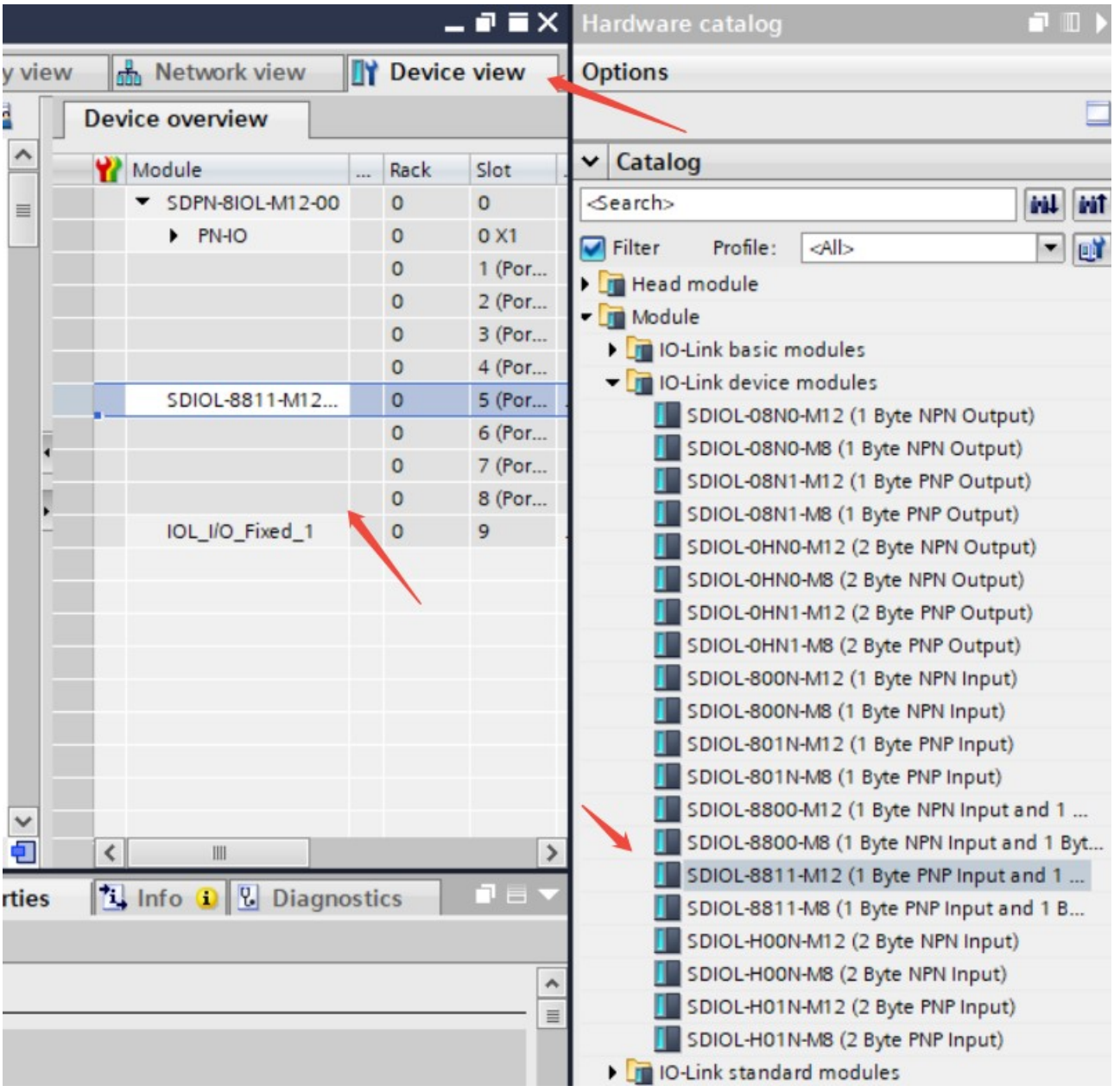


Figure 4-1-1-7Add SD Slave

Assign device name to remote I/O module, right click the module and select "Assign device name" as shown in the figure 4-1-1-8.Select the interface type and update the list and assign a name as shown in Figure 4-1-1-9As shown:

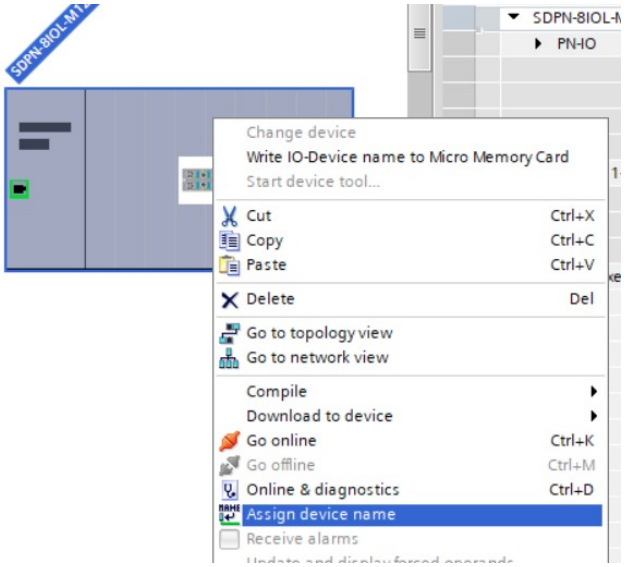


Figure 4-1-1-8Assigning a Device Name

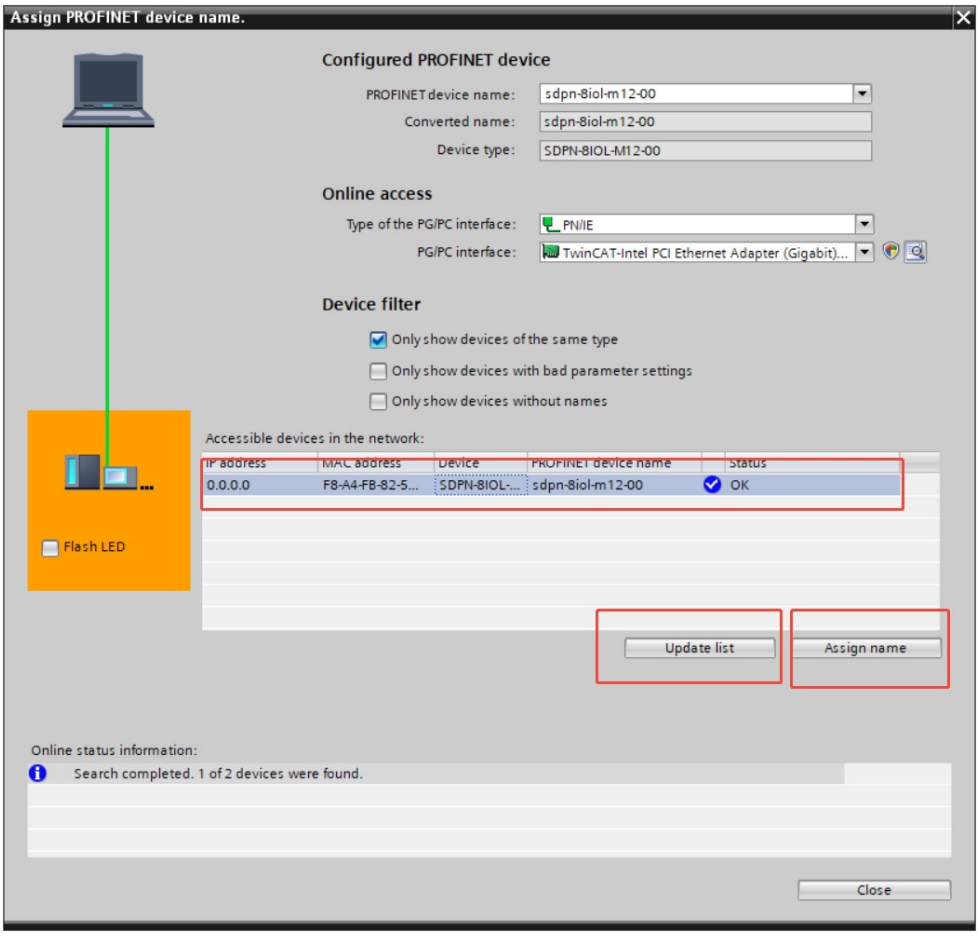


Figure 4-1-1-9Write device name

Select all devices in the network view and download them, as shown in Figure 3-1-10 below. After the program is downloaded, start the CPU and switch to online monitoring to see if the communication is normal, as shown in Figure 4-1-1-11 below:

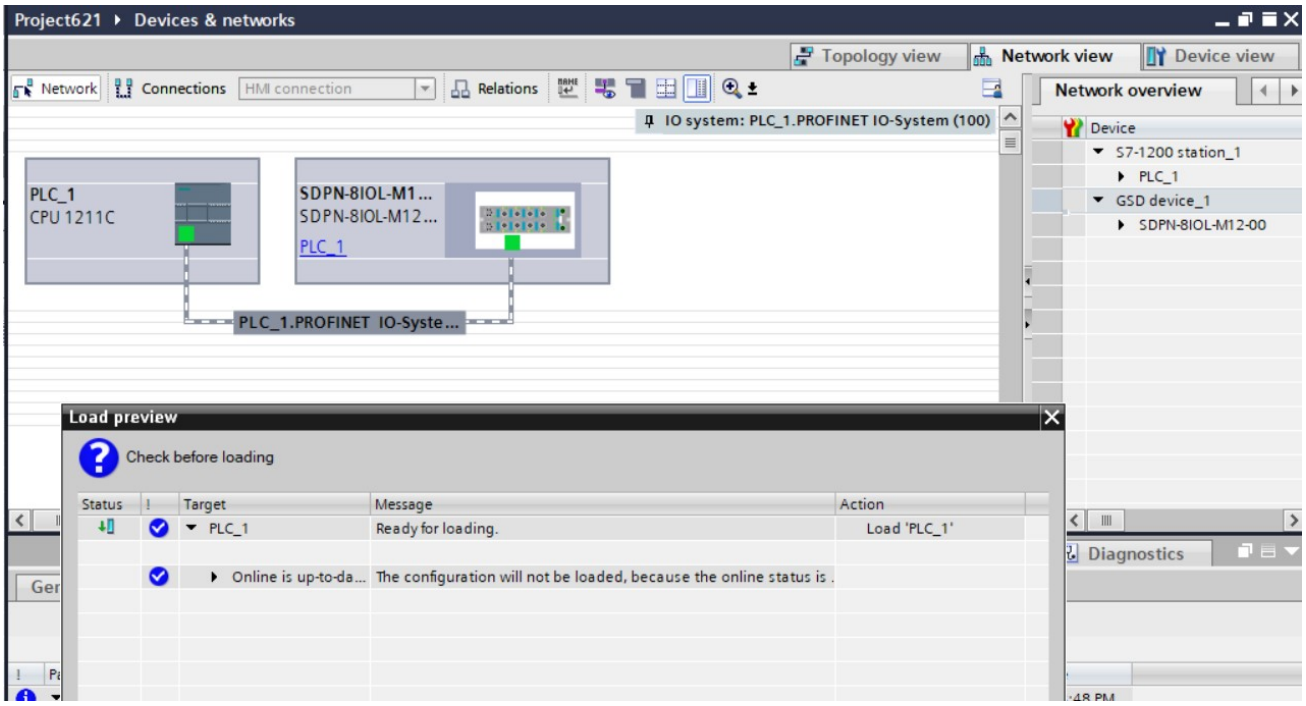


Figure 4-1-1-10Program Download

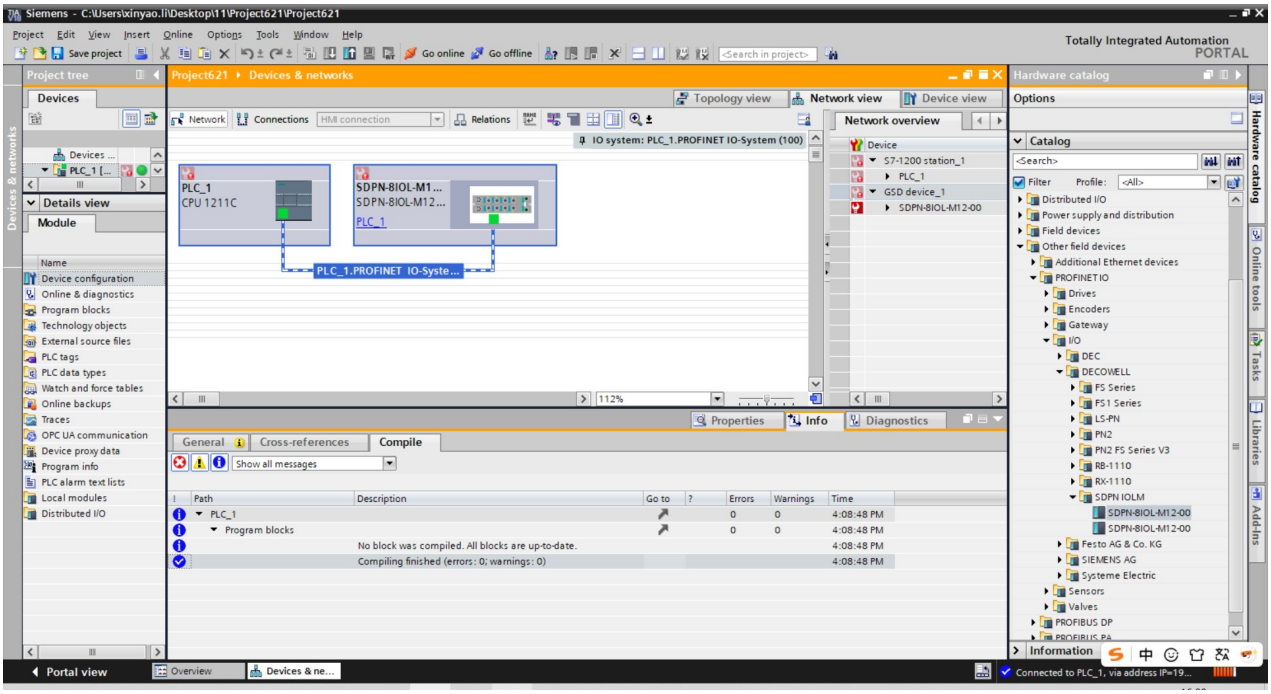


Figure 4-1-1-11Equipment Monitoring

4.2.2 Connection and configuration of STEP7-Microwin and SDPN-8IOL-M12-00

1. The communication connection diagram is shown in Figure 4-2-2-1:

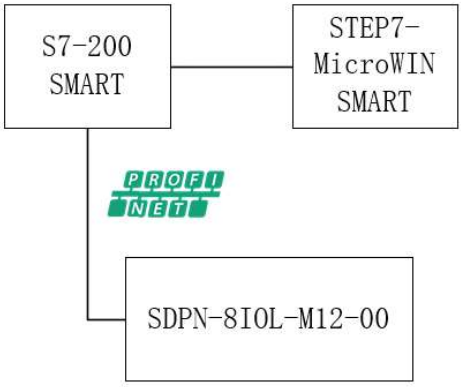


Figure 4-2-2-1 Communication connection diagram

2. The hardware configuration table is shown in the following table:

hardware	quantity	Remark
Programming Computer	1	Installing STEP7-MicroWIN SMART
Controller	1	S7-200 SMART
SDPN-8IOL-M12-00	1	PROFINET protocol Master module
IO-Link communication cable	several	

3. Install GSD file

Open STEP7-MicroWIN SMART and select “GSDML Management” in the menu bar, as shown in Figure 4-2-1-2 below.

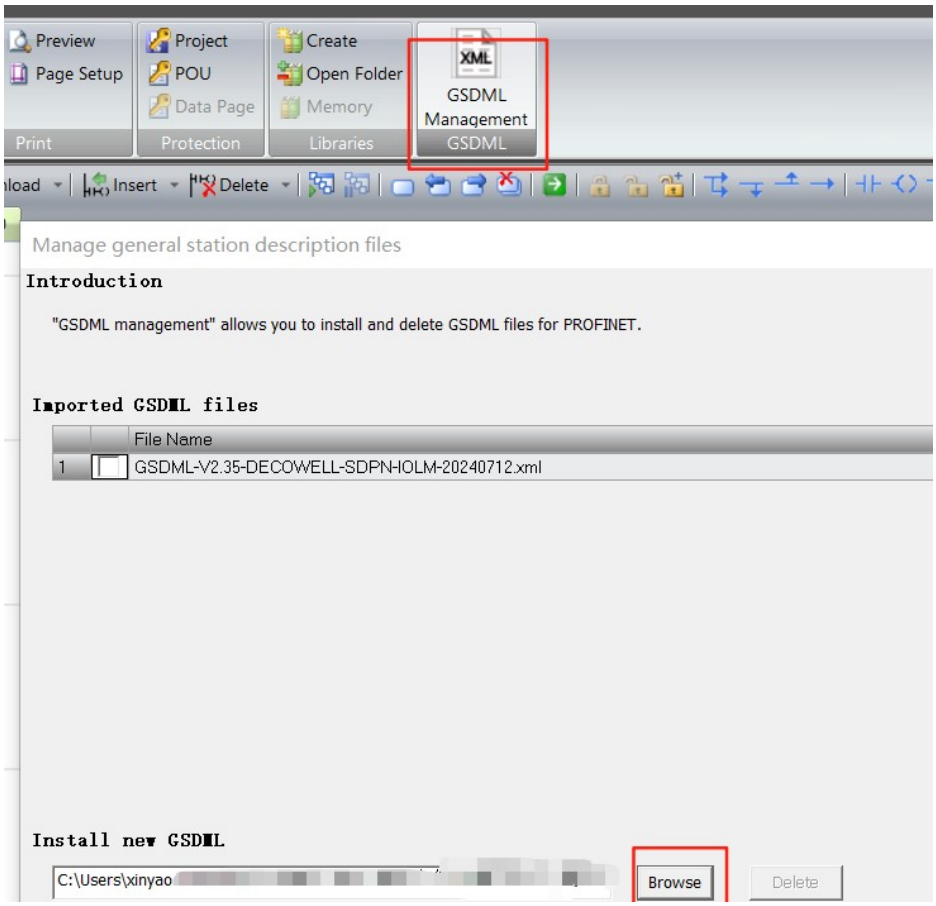


Figure 4-2-2-2 Installing GSD file

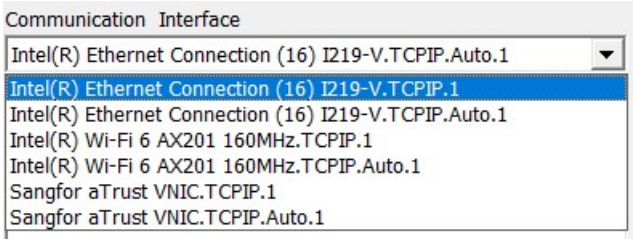
4. Assign device name

Select "Tools" > "Find PROFINET Device" in the menu bar, and select the module to be connected in the window.

Select the network card and search for the device, select the module in the network and edit its device name, as shown in Figure 4-2-1-3 below.

Notice:

①When selecting a network card, two options will appear for the same network card, as shown in the figure below. Here, select the network card without Auto.



②After the device name is assigned, please note that when configuring the IO module, the device name used must be the same as the name assigned above.

Otherwise, the PLC will not be able to communicate with the IO module normally.

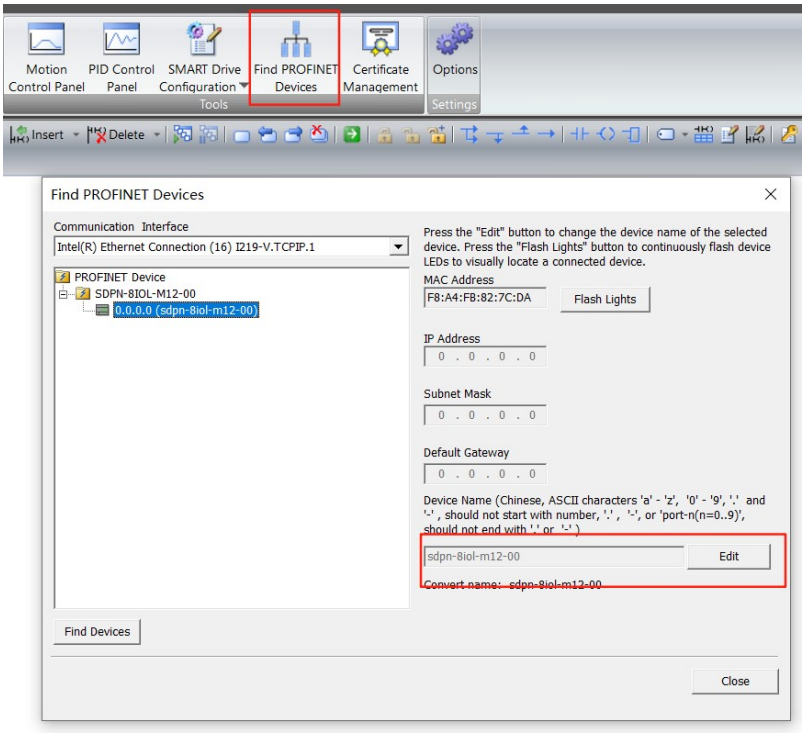


Figure 4-2-2-3 Assigning device name

5. New project and equipment configuration

Select "Tools" > "PROFINET" in the menu bar, select the PLC role as controller, as shown in Figure 4-2-1-4, add a master station and assign a device name (which must be consistent with the device name assigned in step 4 above) and an IP address..

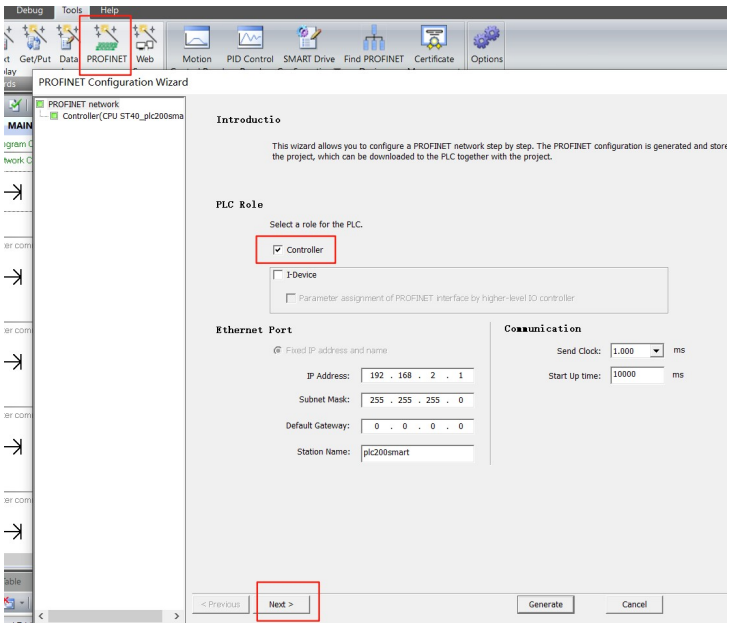


Figure 4-2-2-4 Select PLC role as controller

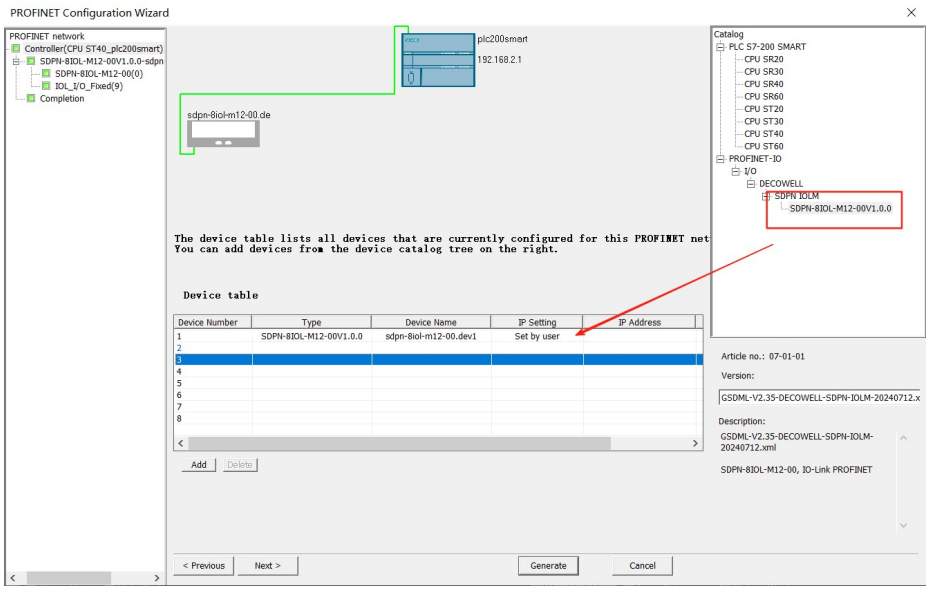


Figure 4-2-2-5 Adding a master station and assigning an IP address

Add a slave module, click the master, delete the port 1 object, add a slave module in the directory on the right, and finally click Generate, as shown in Figure 4-2-1-6 and Figure 4-2-1-7:

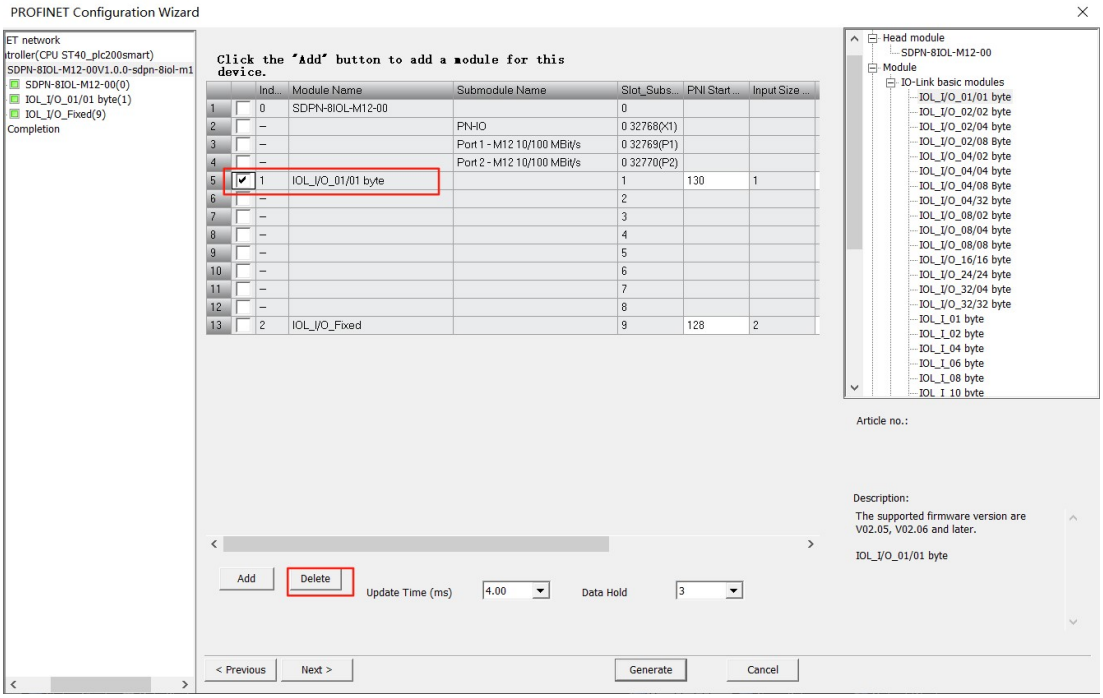


Figure 4-2-2-6 Deleting Port 1 Object

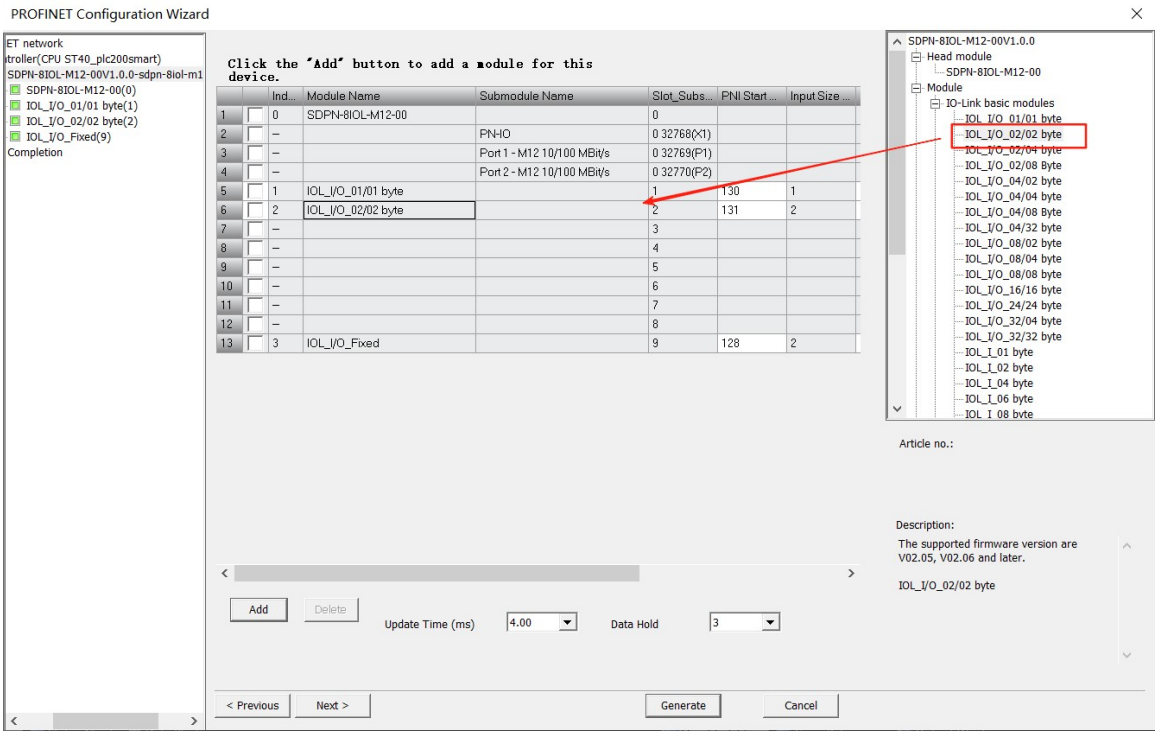


Figure 4-2-2-7 Add slave module and click Generate

6. Program download

Select "PLC" > "Download" in the menu bar, and select "Search CPU" in the communication window.

The PLC that needs to download the program, and download the program.

4.2.3 Connection and configuration of STEP7 and SDPN-8IOL-M12-00

1. The communication connection diagram is shown in Figure 4-2-3-1:

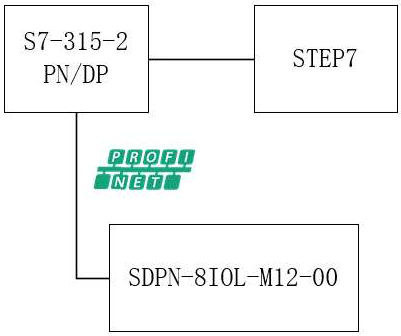


Figure 4-2-3-1 Communication connection diagram

2. The hardware configuration table is shown in the following table:

hardware	quantity	Remark
Programming Computer	1	Install STEP7
Controller	1	S7-315-2 PN/DP
SDPN-8IOL-M12-00	1	PROFINET protocol Master module
IO-Link communication cable	several	

3. Install GSD file

After creating a new project, click "SIMATIC300", double-click "Hardware", and in the HW Config window, select "Options" > "Install GSD File" from the menu bar as shown in Figure 4-2-3-2 below:

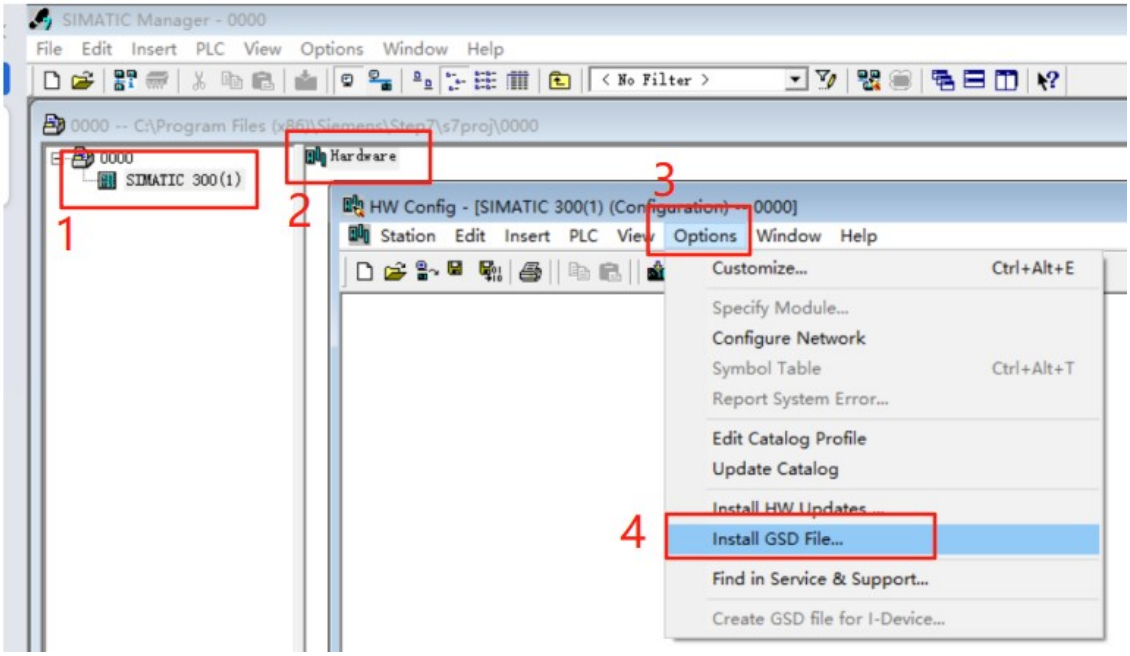


Figure 4-2-3-2 Installing GSD file

4. New project and equipment configuration

Open SIMATIC Manager, select "New Project" in the menu bar, name the project and select the project save path, as shown in Figure 4-2-3-3 below:

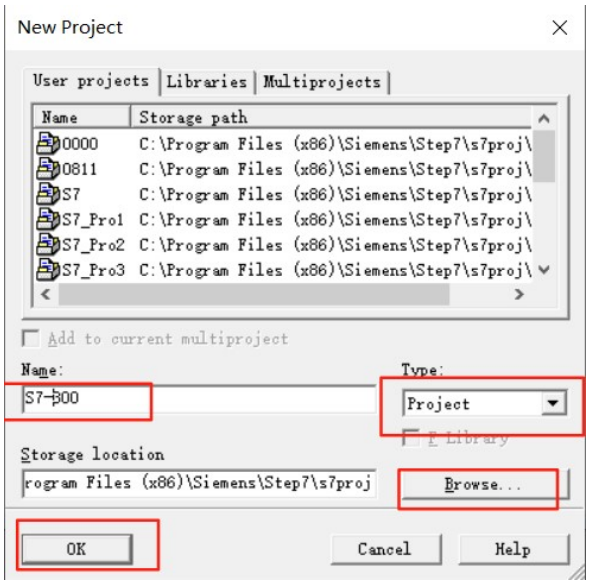


Figure 4-2-3-3 New construction project

Add 300 sites to the project, as shown in Figure 4-2-3-4. Click the newly added 300 site, select "Hardware", and enter the HW Config configuration interface, as shown in Figure 4-2-3-5. Add the rack Reil of RACK 300, as shown in Figure 4-2-3-6. Add the CPU module, select the CPU315-2 PN/DP version V2.6 of CPU-300 in the right window of HW Config, and use the mouse to drag it to slot 2 of the rack, as shown in Figure 4-2-3-3-7. In the properties interface of the Ethernet interface, you can use other IP addresses as needed. Here, use the default IP address and subnet mask, and select the New button to create a new subnet Ethernet (1) and click OK, as shown in Figure 4-2-3-8.

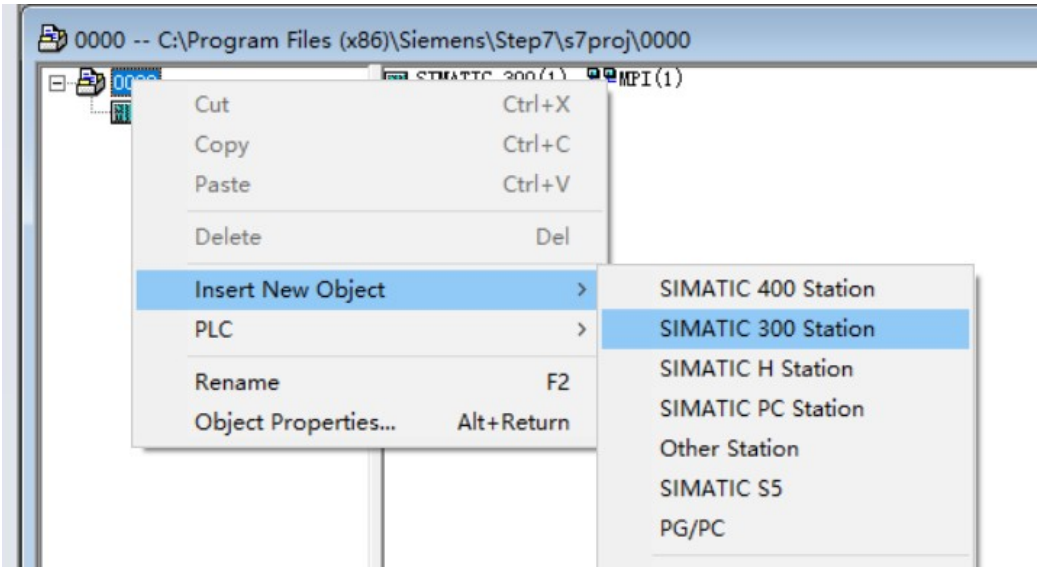


Figure 4-2-3-4 Add 300 sites

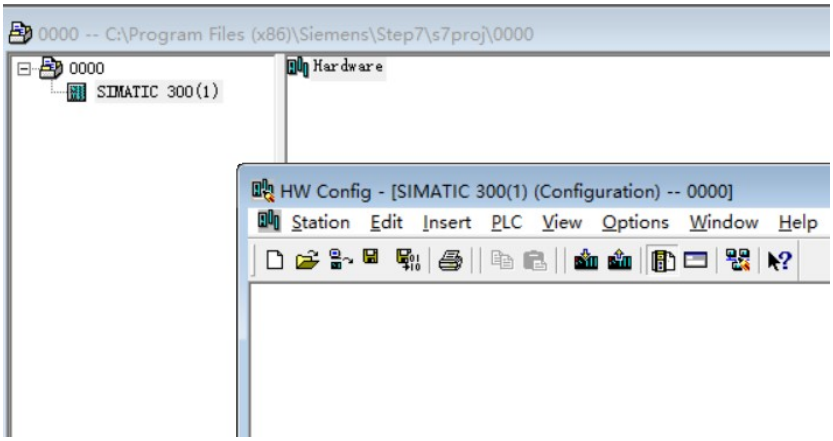


Figure 4-2-3-5 Entering the HW Config interface

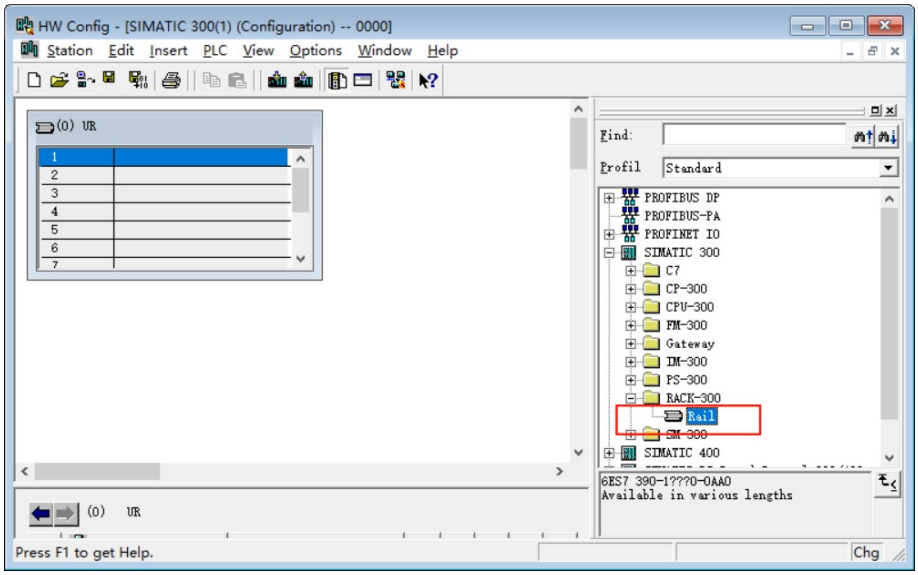


Figure 4-2-3-6 Adding a rack Reil

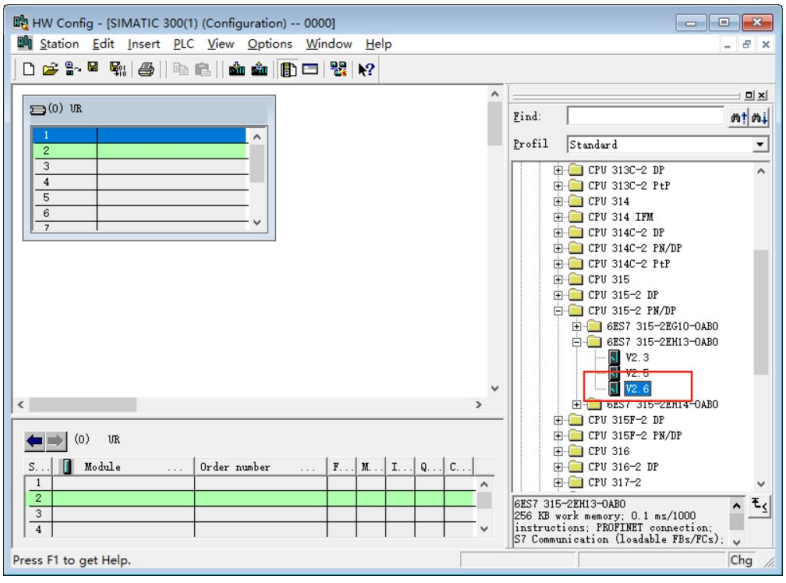


Figure 4-2-3-7 Adding a CPU module to the rack

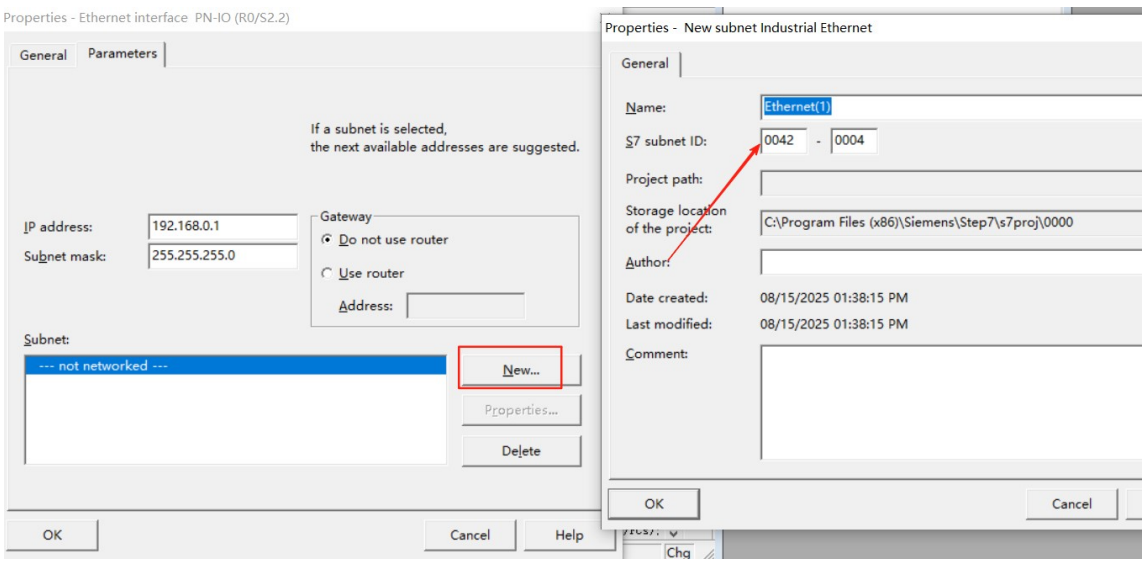


Figure 4-2-3-8 Add Ethernet subnet

In Ethernet (1), configure the I/O device station, select SDPN-8IOL-M12-00 on the right and drag it to the Ethernet (1) subnet, as shown in Figure 4-2-3-9:

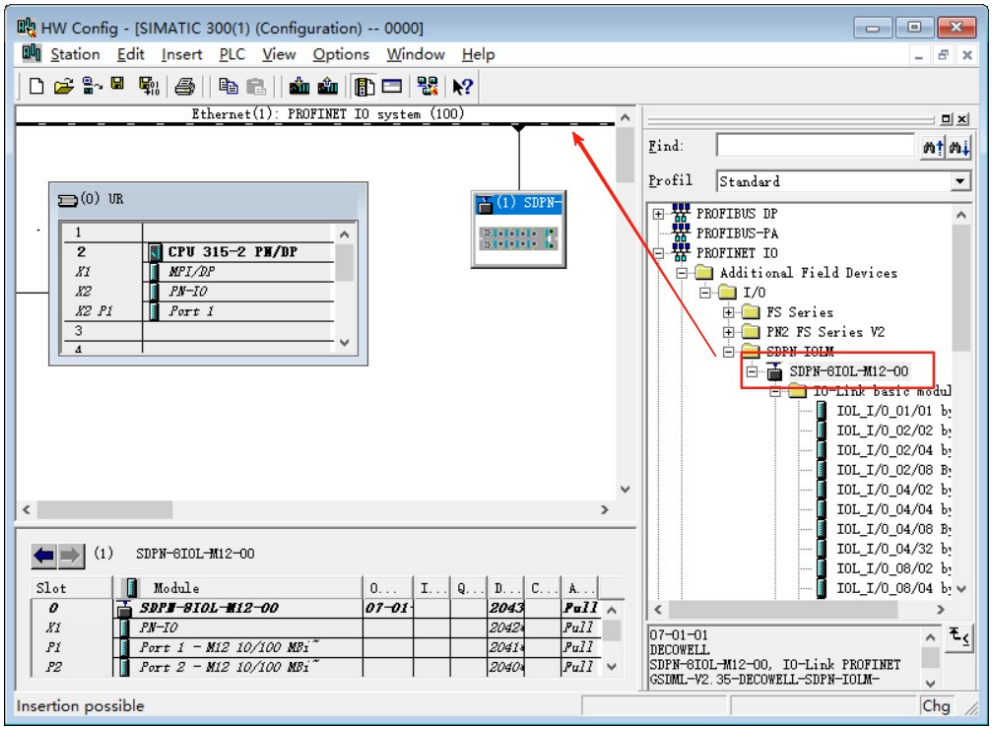


Figure 4-2-3-9 Add IO to Ethernet (1) subnet

Double-click the SD master station, select the master station port 1 object information and click Delete, as shown in Figure 4-2-3-10 below:

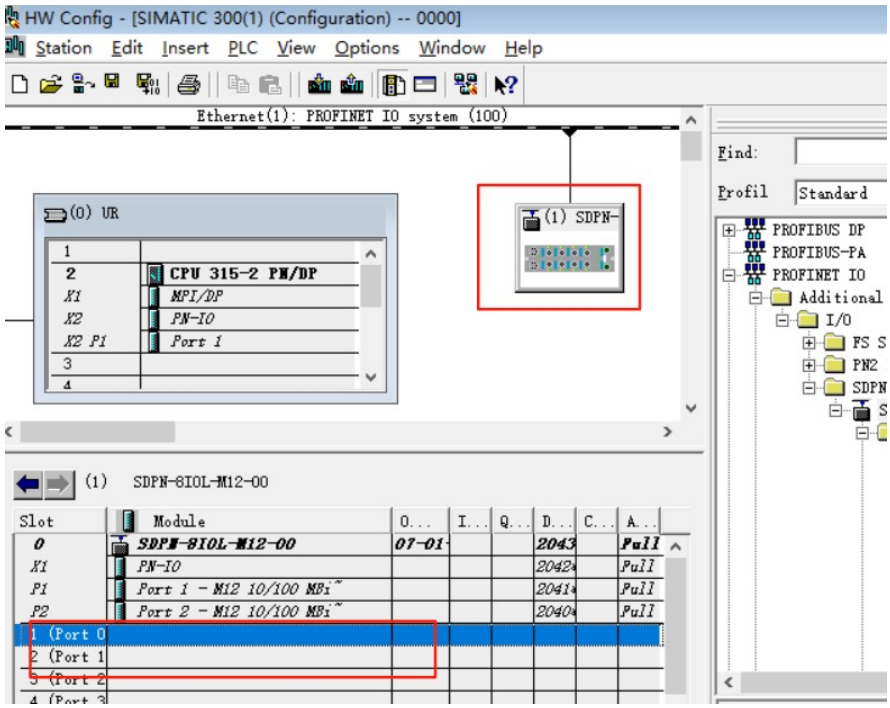


Figure 4-2-3-10 Delete port 1 information

Add a slave module, expand the SDPN-8IOL-M12-00 on the right, and drag the SD slave into the card slot on the left side, as shown in Figure 4-2-3-11 below:

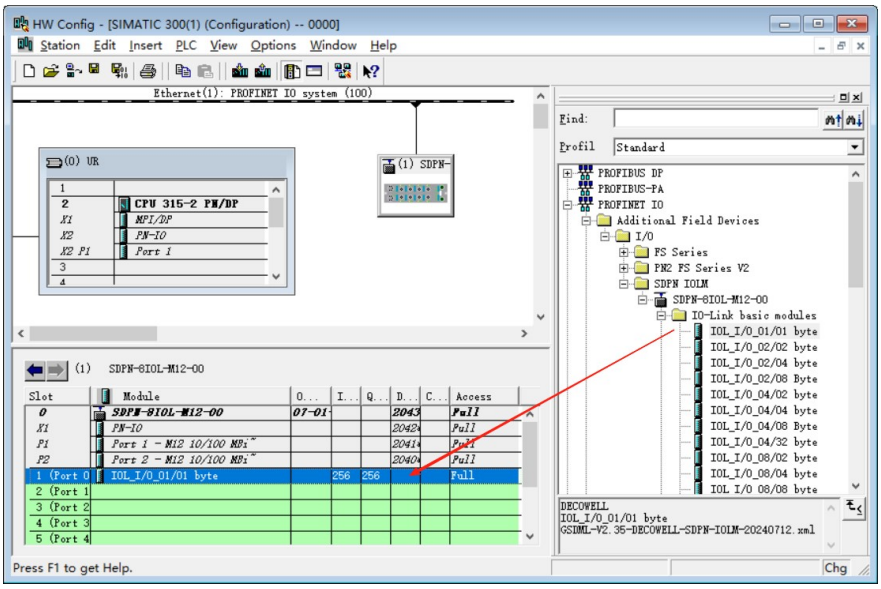


Figure 4-2-3-11 Adding slave module

Modify the IP address of the SD master station, double-click the SDPN-8IOL-M12-00 master station in the subnet, select "Ethernet" in the property window, and modify the IP address in the Ethernet property window, as shown in Figure 4-2-3-12 below:

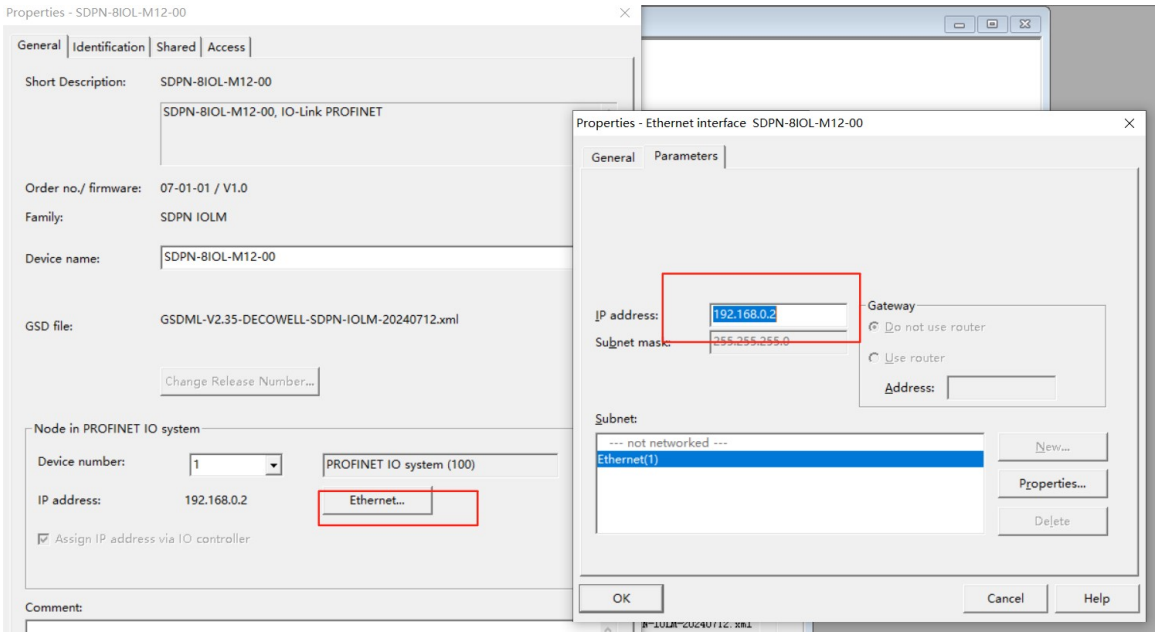


Figure 4-2-3-12 Modify module IP address

To set the device name of the IO module, select the subnet icon, select "PLC" in the menu bar, select "Ethernet" > "Assign Device Name", as shown in Figure 4-2-3-13, in the Assign Device Name window, select the name to be assigned and press the "Confirm Name" button.

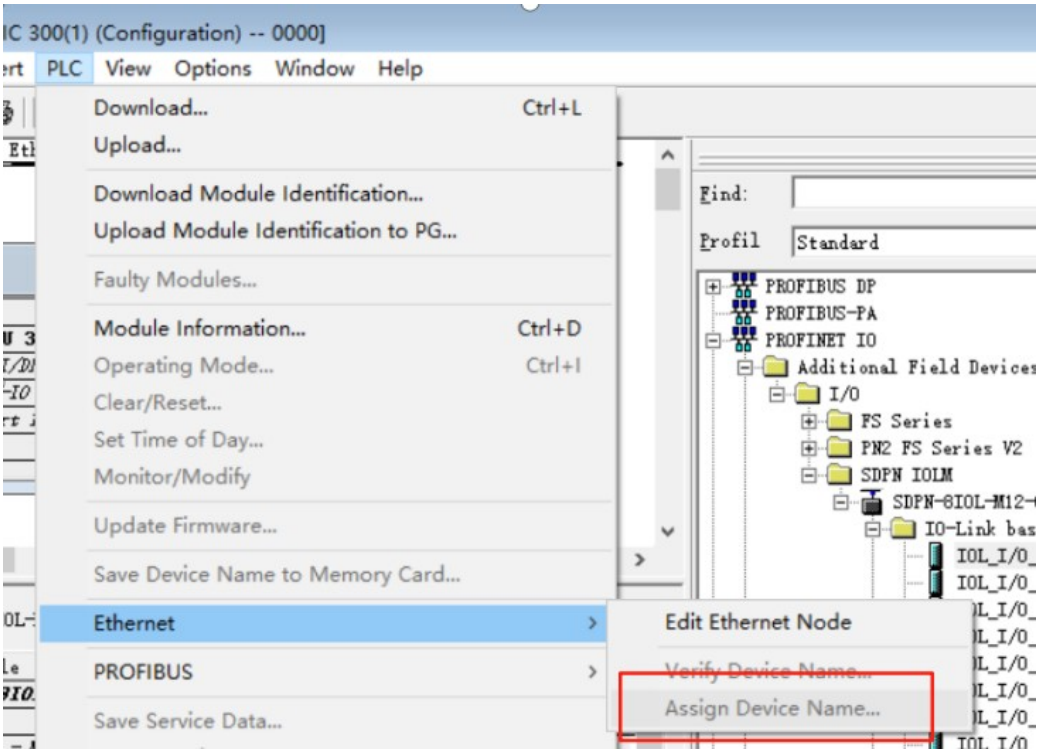


Figure 4-2-3-13 Assigning device name

Check whether the name is assigned successfully, select the subnet icon, select "PLC" in the menu bar, select "Ethernet" > "Verify Device Name", as shown in Figure 4-2-3-14 below:

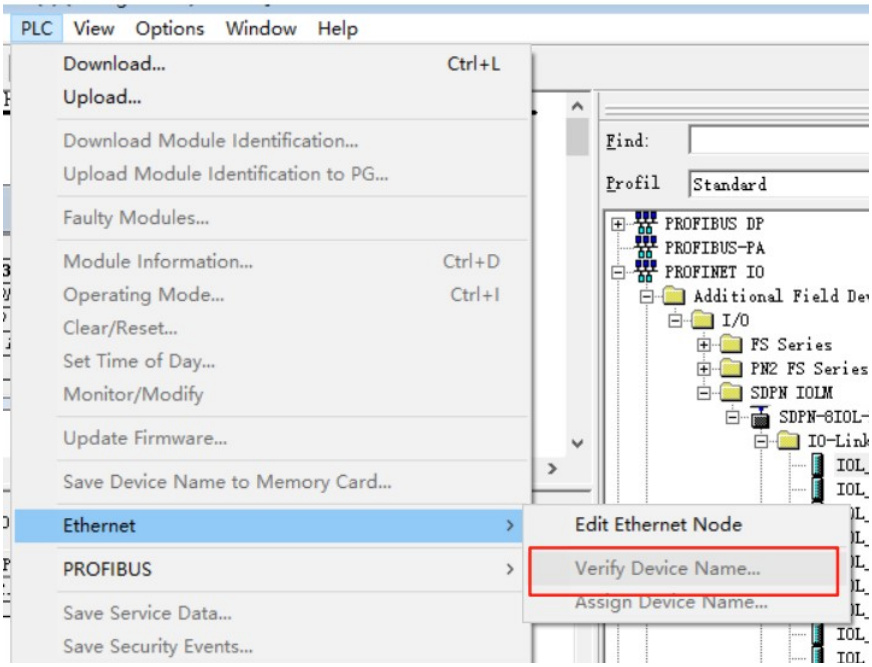


Figure 4-2-3-14 Verify device name

5. SD EC Object List

5.1 Process data

5.1.1 Communication status of IO-Link channel

Data name	What the data means	Data Types
Status of IO-Link Port (1~8)	The communication status between the master and slave is displayed in Bit 0-3 0x_0 Invalid port 0x_1 Input mode 0x_2 Output mode 0x_3 Communication OP 0x_4 Communication failure Bit4-7 0x1_ Watchdog no error 0x2_ Buffer Overflow 0x3_ Invalid device ID 0x4_ Invalid device vendor ID 0x5_ Invalid version 0x6_ Invalid frame function 0x7_ Invalid cycle time 0x8_ Invalid input process data length 0x9_ Invalid output process data length 0xA_ Device not detected	USINT

5.2.2 Pin2 status monitoring

Data name	What the data means	Data Types
Input Pin2 (ch1-8)	0x00 No reverse 0x01 Reverse	USINT

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