FS Series Remote IO User Manual

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Foreword

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Scope of Application

The Manual is applicable for FS Series Remote IO System.

Brief Introductions

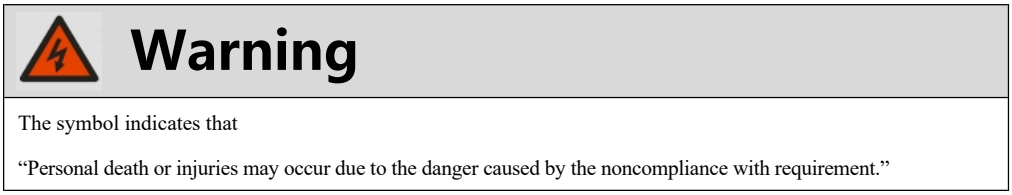
The Manual mainly describes the technical specifications, installation and commissioning of FS Series Remote IO Module, including:

- System Overview: It mainly describes product order information and production composition, system structure, product transportation and storage environment of FS Series Remote IO Module;
- Production Introduction: It provides the technical parameters of FS Series Remote IO Module;
- Guidance for Installation and Removal: It describes how to install and remove the FS Series Remote IO Module;
- M&E Drawing: Dimensional Drawing and Electrical Wiring Diagram of the FS Remote Module
- User Guide: Describe the connection and communication between the FS Series Remote IO Module and each main PLC through examples.

Precautions

The Manual describes the usage of the FS Series Remote IO Module under WELL-LINK in details. Reader of this Manual is expected to be the personnel having engineering experience. Decowell is not responsible for any consequent caused by or relating to the usage of the Manual.

Please carefully read the precautions relating to the device before any trial use of the device. The user is expected to follow the safety preventive measures and operation procedures on and in respect of installation and commissioning of the device. Refer to the following symbols and notes for information about any potential danger and damage caused by the erroneous operation of the device.



Note

The symbol indicates that

"Minor or medium injury may be caused to human and/or device damage may occur due to the danger caused by the noncompliance with requirement."

Prompt

The symbol indicates

"any necessary supplement or explanation for description of operation."

Applicable Object

With provision of information on and in respect of installation and commissioning of the FS Series Remote IO Module, this Manual is compiled for the engineers, installation staff, maintenance staff and electricians having the general knowledge of automation.

Recycling and Disposal

Please contact the certified service station which is qualified for disposal of the electronic wastes so as to assure that the recycling and disposal of the old device are consistent with the requirement for environment protection.

Online Support

Except for the Manual, more product information is available from the official website.
http://www.welllinkio.com

1 Overview of FS Series Remote IO System

1.1 Definition of Remote IO

Remote IO is also called the distributive IO. It is the electronic device that frequently uses the transmission technology (e.g. industrial Canbus) to send to and receive from the main electronic device (e.g. DCS, PLC and PC) the input/output signal in the process or in the factory automation.

1.2 Composition of FS Series Remote IO Module

The FS Series Remote IO Module mainly consists of the module system indicator, system power source, output/input channel, communication interface, IO channel indicator, etc. See Fig.1-2 for details.

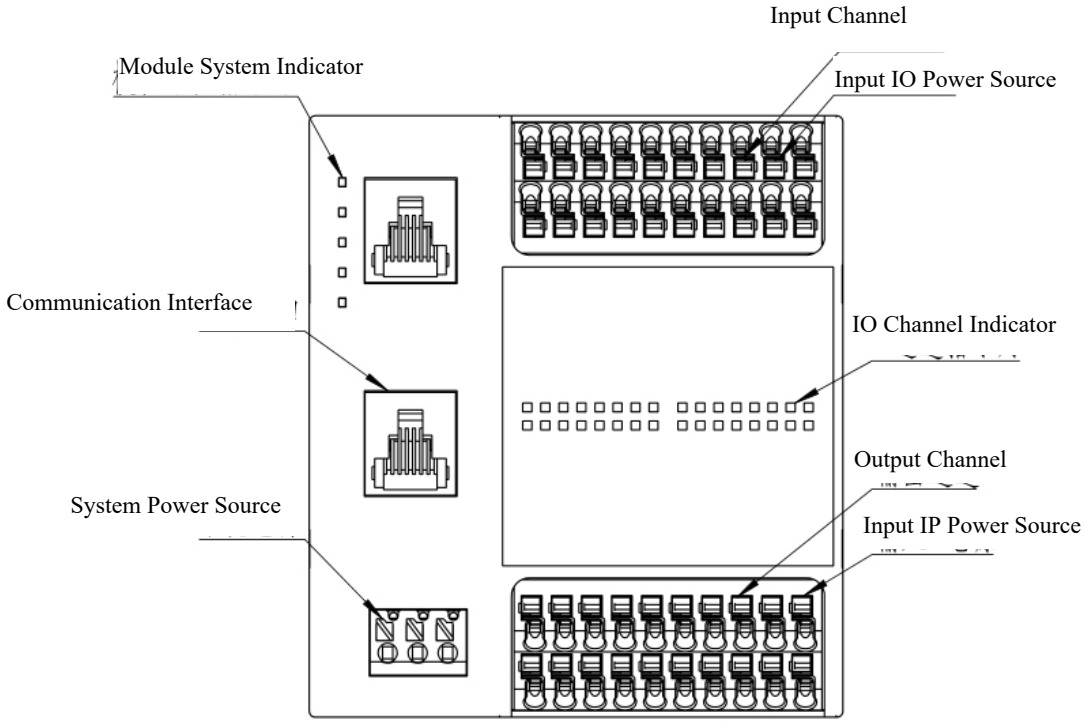


Fig. 1-2 Composition of FS Series Remote IO Module

1.3 Characteristics of FS Series Remote IO Module

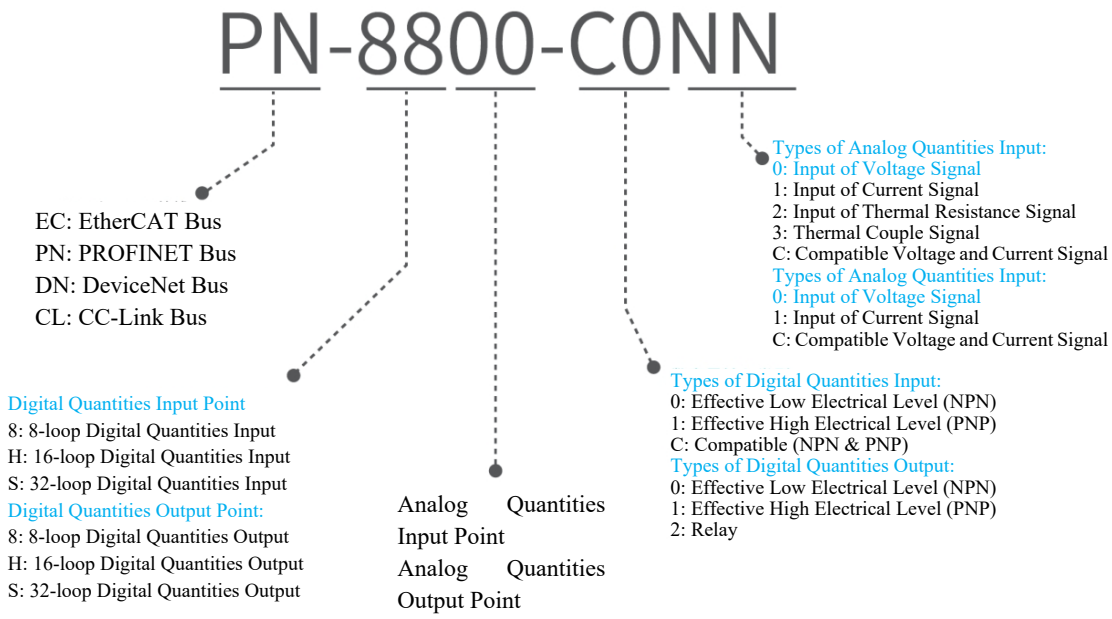
The FS Remote IO adopts the one-piece structural design which indicates the communication interface, input/output IO interface, system and IO indicators, etc. Its advantages include high degree of integration, various communication protocols, compact size and easy operation.

1.4 Application Field of FS Series Remote IO Module

The FS Series Remote IO Module is widely used in various fields, e.g. new energy, lithium, non-standard automation, robot, numerical control machine, intelligent garage, logistics sorting, education device, environment protection, heating system, etc.

2 Parameters of FS Series Remote IO Module

2.1 Naming Rules for FS Series Remote IO Module



2.2 Parameters of Module Communication Protocol Interface

It mainly provides parameters of the module including the bus protocol, interface type, interface mode and baud rate.

2.2.1 PROFINET Protocol

Parameters of PROFINET Module Communication Protocol Interface	
Bus Protocol	PROFINET
Interface Type	Industry EtherNET
Interface Mode	2×RJ45
baud rate	100Mbps
Communication Distance	100m (Interstation Distance)
Electrical Isolation	Provided

Descriptions of PN Module System Indicators

No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	Power supply is normal.
				OFF	Disconnected or Erroneous
2	RUN	Operation Indicator	Green	ON	device is running and communication is normal.
				OFF	The system is power off or abnormal.
3	SF	---	---	---	---
4	BF	System Fault Indicator	Red	ON	Communication is abnormal.
				OFF	device is running and communication

					is normal.

Descriptions of PN2 Module System Indicators

No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	Power supply is normal.
				OFF	Disconnected or Erroneous
2	RUN	Operation Indicator	Green	ON	device is running and communication is normal.
				OFF	The system is power off or abnormal.
3	SF	---	---	---	---
4	BF	System Fault Indicator	Red	ON	Communication is abnormal.
				OFF	device is running and communication is normal.
5	MT	Maintenance Indicator	Green	Flashing 5HZ	The indicator is flashing during upgrading or transmission.
				Flashing 1HZ	The indicator is flashing when pressing down the Reset button.
				ON	Resetting is completed.
				OFF	The device is not in the maintenance status.

2.2.2 EtherCAT Protocol

Parameters of EtherCAT Module Communication Protocol Interface	
Bus Protocol	EtherCAT
Interface Type	Industry EtherNET
Interface Mode	2×RJ45
baud rate	100Mbps
Communication Distance	100m (Interstation Distance)
Electrical Isolation	Provided

Descriptions of EtherCAT Module System Indicator

No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	The power supply is normal.
				OFF	Disconnected or Erroneous
2	RUN	Operation Indicator	Green	ON	The device is in OP status and the running is normal.
				OFF	The device is in INIT status or the initial status.
				Flashing	The device is in PRE-OP status and the communication initialization is completed.
				Flashing Once	The device is in SAFE-OP status. SDO and

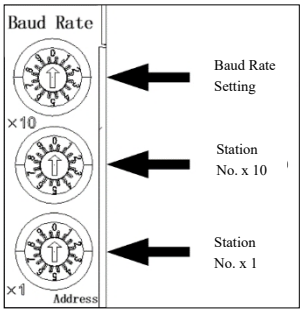
					PDO are disabled.
3	ERR	System Fault Indicator	Red	ON	The application controller is faulty.
				OFF	No Error
				Flashing Twice	Process Data Watchdog Timeout/EtherCAT Watchdog Timeout
				Flashing Once	Local Error
				Flashing	Configuration Error

2.2.3 CC-Link Protocol

- Parameters of CC-link Module Communication Protocol Interface

Parameters of CC-Link Module Communication Protocol Interface	
Bus Protocol	CC-Link
Working Mode	CC-Link Remote IO Station
Link Mode	Shielded Twisted Pair
Baud Rate	156kbps～10Mbps
Address Configuration	1～64
Electrical Isolation	Provided

- CC-Link Remote IO Module Dial Setting



CC-Link Baud Rate Setting		
Dial Position No.	Baud Rate	Transmission Distance
0	156kbps	1200m
1	625kbps	600m
2	2.5Mbps	200m
3	5Mbps	150m
4	10Mbps	100m

Descriptions of CC-Link Module System Indicators

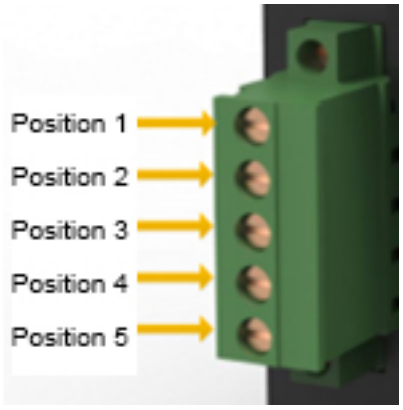
No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	The power Supply is normal.
				OFF	The device is disconnected from power or faulty.
2	RUN	Operation Indicator	Green	ON	The device is running and the communication is normal.
				OFF	Link is not established.
3	ERR	System Fault Indicator	Red	ON	Module communication is abnormal.
				OFF	Module communication is Normal.

2.2.4 DeviceNet Protocol

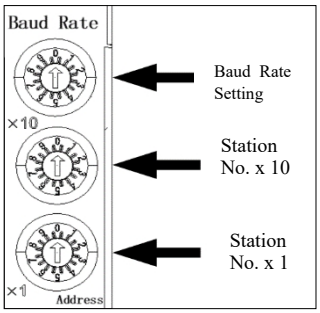
- Parameters of DeviceNet Module Communication Protocol Interface

Parameters of DeviceNet Module Communication Protocol Interface	
Bus Protocol	DeviceNet
Link Mode	Shielded Twisted Pair
Baud Rate	125kbps/250kbps/500kbps
Address Configuration	0～63
Electrical Isolation	Provided

- Definition of DeviceNet Remote IO Module Communication Interface

DeviceNet Communication Interface	Position No.	Signal	Definition
	1	V+	Positive Electrode
	2	CH	Positive Data Signal
	3	SLD	Shielded Wire
	4	CL	Negative Data Signal
	5	V-	Negative Electrode

- DeviceNet Remote IO Module Dial Setting



DeviceNet Baud Rate Setting	
0	125kbps
1	250kbps
2	500kbps

Definition of DeviceNet Module System Indicator

No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	The power supply is normal.
				OFF	The device is disconnected from power or faulty.
2	RUN	Operation Indicator	Green	ON	The device is running and the communication is normal.
				OFF	Link is not established.
3	ERR	System Fault Indicator	Red	ON	Module communication is abnormal.
				OFF	Module communication is Normal.

2.2.5 CC-Link IE Field Basic Protocol

Parameters of CC-Link IE Field Basic Module Communication Protocol Interface	
Bus Protocol	CC-Link IE Field Basic
Interface Type	Industry EtherNET
Interface Mode	2×RJ45
Baud Rate	100Mbps
Communication Distance	100m (Interstation Distance)
Electrical Isolation	Provided

Definition of CC-Link IE Field Basic Module System Indicators

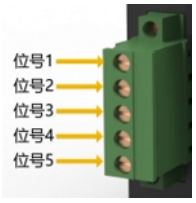
No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	The power supply is normal.
				OFF	The device is disconnected from power or faulty.
2	RUN	Operation Indicator	Green	ON	The device is running and the communication is normal.
				OFF	Link is not established.
				Flashing	Detect the signal about restoring the factory setting.
3	ERR	System Fault Indicator	Red	ON	Module communication is abnormal.
				OFF	Module communication is normal.

2.2.6 CANopen Protocol

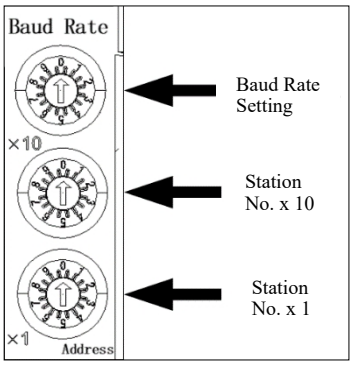
- Parameters of CANopen Module Communication Protocol Interface

Parameters of CANopen Module Communication Protocol Interface	
Bus Protocol	CANopen
Link Mode	Shielded Twisted Pair
Baud Rate	10kbps～1Mbps
Address Setting	Dial Switch Setting
Communication Distance	The max. Communication distance relies on the baud rate.
Electrical Isolation	Provided

- Definition of CANopen Remote IO Module Communication Interface

CANopen Communication Interface	Position No.	Signal	Signal Definition
	1	+V	Positive Electrode
	2	CH	Positive Data Signal
	3	SLD	Shielded Wire
	4	CL	Negative Data Signal
	5	-V	Negative Electrode

- CACANopen Remote IO Module Dial Setting



CANopen Baud Rate Setting	
0	10kbps
1	20kbps
2	50kbps
3	100kbps
4	125kbps
5	250kbps
6	500kbps
7	1000kbps

Definition of CC-Link IE Field Basic Module System Indicators

No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	The power supply is normal.
				OFF	The device is disconnected from power or faulty.
2	RUN	Operation Indicator	Green	ON	The module is in the operation status and the communication is normal.
				OFF	The module is in the initialization status.
				1 Long Flash and OFF	The module is disabled.
				5HZ Quick Flash	The module is in the pre-operation status.
3	ERR	System Fault Indicator	Red	ON	The module is faulty.
				OFF	The module is in the operation status.

2.2.7 EtherNet/IP Protocol

Parameters of EtherNet/IP Module Communication Protocol Interface	
Bus Protocol	EtherNet/IP
Interface Type	Industry EtherNET
Interface Mode	2×RJ45
Baud Rate	100Mbps
Communication Distance	100m (Interstation Distance)
Electrical Isolation	Provided

Definition of EtherNet/IP Module System Indicators

No.	Indicator	Name	Color	Status	Definition
1	POWER	Power Indicator	Green	ON	The power supply is normal.
				OFF	The device is disconnected from power source or faulty.
2	MS	Module Status Indicator	Green	ON	The device operation is normal.
				1HZ Flashing	The device is in the standby status and not configured.

			Red and Green	1HZ Flashing	Self-inspection: The device is being tested for energization.
				OFF	The device is not provided with power source.
			Red	ON	Main Fault: The device has significant fault leading to non-recoverable result as found in the test.
				1HZ Flashing	No Power Source: The device is not provided with power source.
3	NS	Network Status Indicator	Green	ON	Linked: The device has at least 1 established link.
				1HZ Flashing	No Link: The device has not established link.
			Red and Green	1HZ Flashing	Self-inspection: The device is being tested for energization.
				OFF	The device is disconnected from power source or has no IP address.
			Red	ON	Repeated IP Address
				1HZ Flashing	Link Timeout: 1 or more link timeout targeting the device
4	MT	Maintenance Status Indicator	Green	Flashing 5HZ	The indicator is flashing in the process of upgrading.
				Flashing 1HZ	The indicator is flashing when pressing down the Reset Button.
				ON	Resetting is completed.
				OFF	The device is not in the maintenance status.

2.3 Technical Parameters of Module Input/Output Channel

2.3.1 XX-8800-C0NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-8800-C0NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
XX-8800-C2NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-8800-C0NN
Product Name	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	38mA
Input Channel Parameters	
Number of Input Channel	8
Input Signal Type	NPN&PNP Compatible (Transistor)
NPN Signal Electrical Level	0～5V
PNPSignal Electrical Level	15～30V
Single-channel Current Consumption	5mA
Port Protection	Over-voltage Shock Protection
Electrical Isolation	AC500V
Output Channel Parameters	
Number of Output Channel	8
Input Signal Type	NPN (Transistor)
Rated Electrical Level	0V(Max: 1.5V)
Single-channel Rated Current	Max：0.5A (Total Output Current of 8 Channels at the same time: 2A)
Port Protection	Over-voltage and Over-current Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.2 XX-8800-C1NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-8800-C1NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)

XX-8800-C2NN	8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-8800-C1NN
Product Name	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	38mA
Input Channel Parameters	
Number of Input Channel	8
Input Signal Type	NPN&PNP Compatible (Transistor)
NPN Signal Electrical Level	0～5V
PNP Signal Electrical Level	15～30V
Single-channel Current Consumption	5mA
Port Protection	Over-voltage Shock Protection
Electrical Isolation	AC500V
Output Channel Parameters	
Number of Output Channel	8
Input Signal Type	PNP (Transistor)
Rated Electrical Level	24V(18～36V)
Single-channel Rated Current	Max：0.5A (Total Output Current of 8 Channels at the same time: 2A)
Port Protection	Over-voltage and Over-current Protection

Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.3 XX-8800-C2NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-8800-C2NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
XX-8800-C2NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-8800-C2NN
Product Name	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (Relay)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	38mA
Input Channel Parameters	
Number of Input Channel	8
Input Signal Type	NPN&PNP Compatible (Transistor)

NPN Signal Electrical Level	0～5V
PNP Signal Electrical Level	15～30V
Single-channel Current Consumption	5mA
Port Protection	Over-voltage Shock Protection
Electrical Isolation	AC500V
输出通道参数	
Number of Output Channel	8
Input Signal Type	Relay (Remain ON)
Rated Electrical Level	240VAC/30VDC
Single-channel Rated Current	5A
Port Protection	Over-voltage and Over-current Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.4 XX-HH00-C0NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-HH00-C0NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
XX-8800-C2NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)

XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Model Parameters

Technical Parameters	
Model	XX-HH00-C0NN
Product Name	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	40mA
Input Channel Parameters	
Number of Input Channel	16
Input Signal Type	NPN&PNP Compatible (Transistor)
NPN Signal Electrical Level	0～5V
PNP Signal Electrical Level	15～30V
Single-channel Current Consumption	5mA
Port Protection	Over-voltage Shock Protection
Electrical Isolation	AC500V
Output Channel Parameters	
Number of Output Channel	16
Input Signal Type	NPN (Transistor)
Rated Electrical Level	0V (Max: 1.5V)
Single-channel Rated Current	Max：0.5A (Total Output Current of 8 Channels at the same time: 2A)
Port Protection	Over-voltage and Over-current Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃

Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.5 XX-HH00-C1NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-HH00-C1NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
XX-8800-C2NN	8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-HH00-C1NN
Product Name	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	40mA
Input Channel Parameters	
Number of Input Channel	16
Input Signal Type	NPN&PNP Compatible (Transistor)
NPN Signal Electrical Level	0～5V
PNP Signal Electrical Level	15～30V
Single-channel	5mA

Current Consumption	
Port Protection	Over-voltage Shock Protection
Electrical Isolation	AC500V
Output Channel Parameters	
Number of Output Channel	16
Input Signal Type	PNP (Transistor)
Rated Electrical Level	24V (18～36V)
Single-channel Rated Current	Max: 0.5A (Total Output Current of 8 Channels at the same time: 2A)
Port Protection	Over-voltage and Over-current Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.6 XX-S000-CNNN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-S000-CNNN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
XX-8800-C2NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP) 16-channel digital quantities output (PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-HH00-C0NN
Product Name	32-channel digital quantities input (NPN&PNP)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	40mA
Input Channel Parameters	
Number of Input Channel	32
Input Signal Type	NPN&PNP Compatible (Transistor)
NPN Signal Electrical Level	0～5V
PNP Signal Electrical Level	15～30V
Single-channel Current Consumption	5mA
Port Protection	Over-voltage Shock Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.7 XX-0S00-N0NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-0S00-N0NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (NPN)
XX-8800-C1NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (PNP)
XX-8800-C2NN	8-channel digital quantities input (NPN&PNP) 8-channel digital quantities output (Relay)
XX-HH00-C0NN	16-channel digital quantities input (NPN&PNP) 16-channel digital

	quantities output (NPN)
XX-HH00-C1NN	16-channel digital quantities input (NPN&PNP)16-channel digital quantities output (PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-0S00-N0NN
Product Name	32-channel digital quantities output (NPN)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	40mA
Output Channel Parameters	
Number of Output Channel	32
Input Signal Type	NPN (Transistor)
Rated Electrical Level	0V (Max: 1.5V)
Single-channel Rated Current	Max: 0.5A (Total Output Current of 8 Channels at the same time: 2A)
Port Protection	Over-voltage and Over-current Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

2.3.8 XX-0S00-N1NN

Note: XX means that the Bus Protocol can be selected (e.g. PN, EC, CL, CI, CA, etc.). Input/output parameters and external dimensions in the module shall be consistent.

- XX-HH00-C1NN One-piece Module Model

Model	Descriptions
XX-8800-C0NN	8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(NPN)

XX-8800-C1NN	8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(PNP)
XX-8800-C2NN	8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(继电器)
XX-HH00-C0NN	16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(NPN)
XX-HH00-C1NN	16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(PNP)
XX-S000-CNNN	32-channel digital quantities input (NPN&PNP)
XX-0S00-N0NN	32-channel digital quantities output (NPN)
XX-0S00-N1NN	32-channel digital quantities output (PNP)

- Module Parameters

Technical Parameters	
Model	XX-0S00-N1NN
Product Name	32-channel digital quantities output (PNP)
Bus Protocol	PROFINET, EtherCAT, CC-Link, DeviceNet CC-Link IE Field Basic, CANopen
Rated Input Voltage	24V (18～36V)
Current Consumption	40mA
Output Channel Parameters	
Number of Output Channel	32
Input Signal Type	PNP (Transistor)
Rated Electrical Level	24V (18～36V)
Single-channel Rated Current	Max: 0.5A (Total Output Current of 8 Channels at the same time: 2A)
Port Protection	Over-voltage and Over-current Protection
Electrical Isolation	AC500V
Physical Parameters	
Dimensions	90mm×100mm×45.4mm
Working Temperature	-10～55℃
Storing Temperature	-25～85℃
Relative Humidity	95% No Condensation
Protection Grade	IP20

3 Module Installation

3.1 Basic Knowledge

The Protection grade applicable to FS Series Module is IP20, indicating that FS Series Module can only be installed for the guide rail, control cabinet, electrical operation room and any other dry environment (Protection Grade: IP20). The machine cabinet, control cabinet or control room shall be provided with the safety measures so as to prevent electric shock and fire spread.

FS Series Module can be installed onto the guide rail that complies with EN 60715 (35×7.5 mm or 35×15 mm). The guide rail shall be separately grounded in the control cabinet except that the guide rail is installed on the grounded galvanized installation plate. In this circumstance, the guide rail will be waived from the separate grounding.

3.2 Installation Clearance

The minimum clearance must be maintained upon installation and removal of FS Series Module as shown in Fig.3-1.

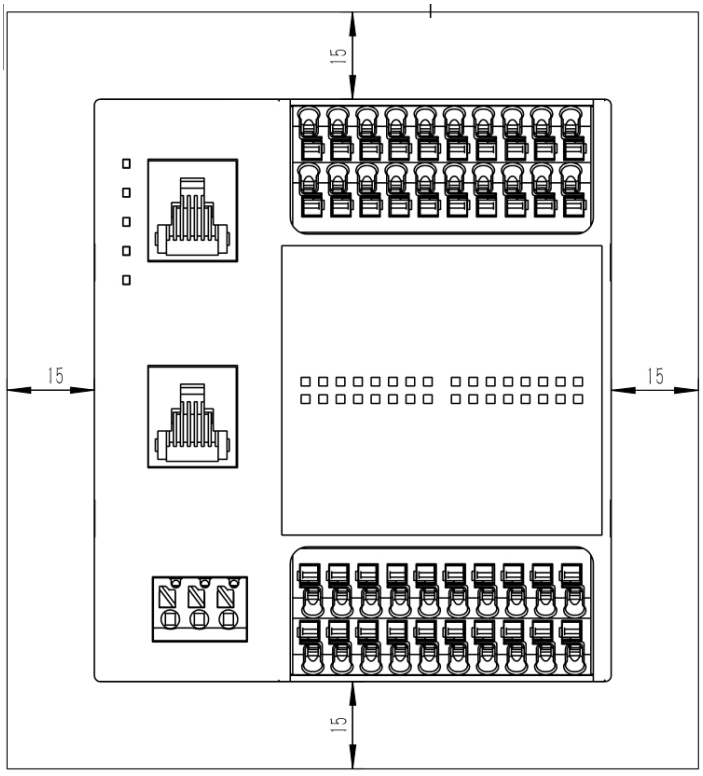


Fig. 3-1 Min. Clearance for Installation

3.3 IO Installation and Removal of IO Module

3.3.1 IO Installation of IO Module

1. Pull out the rail buckle under the module with a slotted screwdriver;
2. Hang the module onto the DIN35 guide rail, and the lower guide rail buckle is pushed inside and locked with a slotted screwdriver as shown in Fig.3-2.

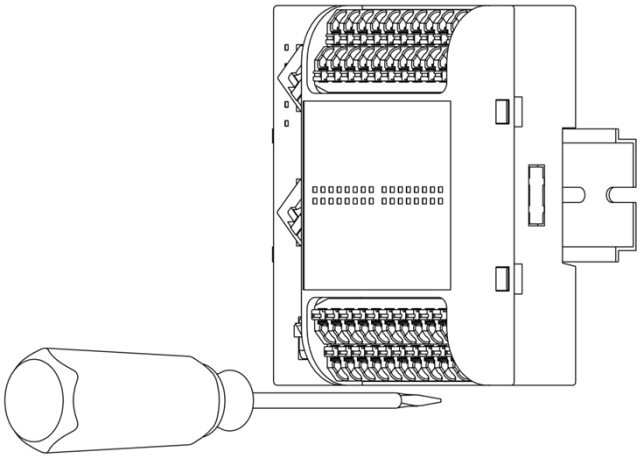


Fig.3-2 Installation of Module

3.3.2 Removal of IO Module

1. Pull out the guide rail buckle under the module with a slotted screwdriver;
2. Put out the module slightly and form an angle with the DIN35 guide rail before the module pushed upward as shown in Fig.3-3.

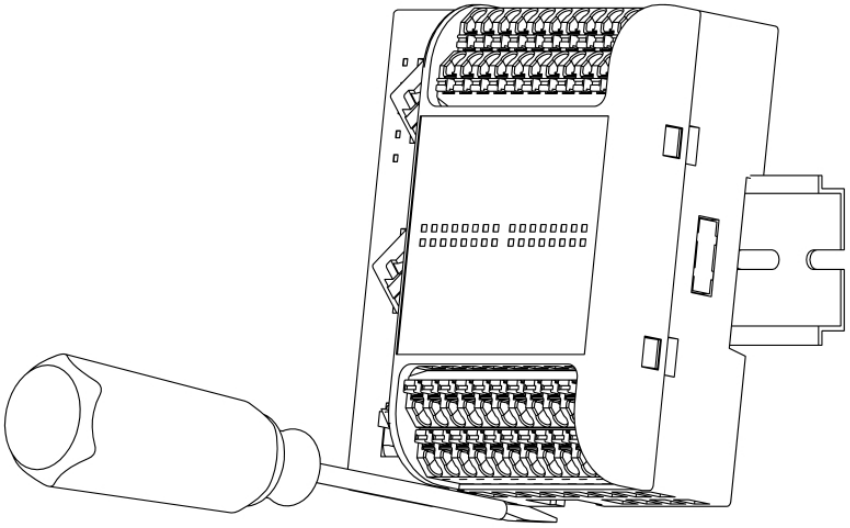


Fig.3-3 Removal of Module

4 Dimension Drawing and Wiring Diagram for Module

4.1 Dimension Drawing for Module

External dimensions of all modules in FS series shall remain consistent with equal length, width and height.

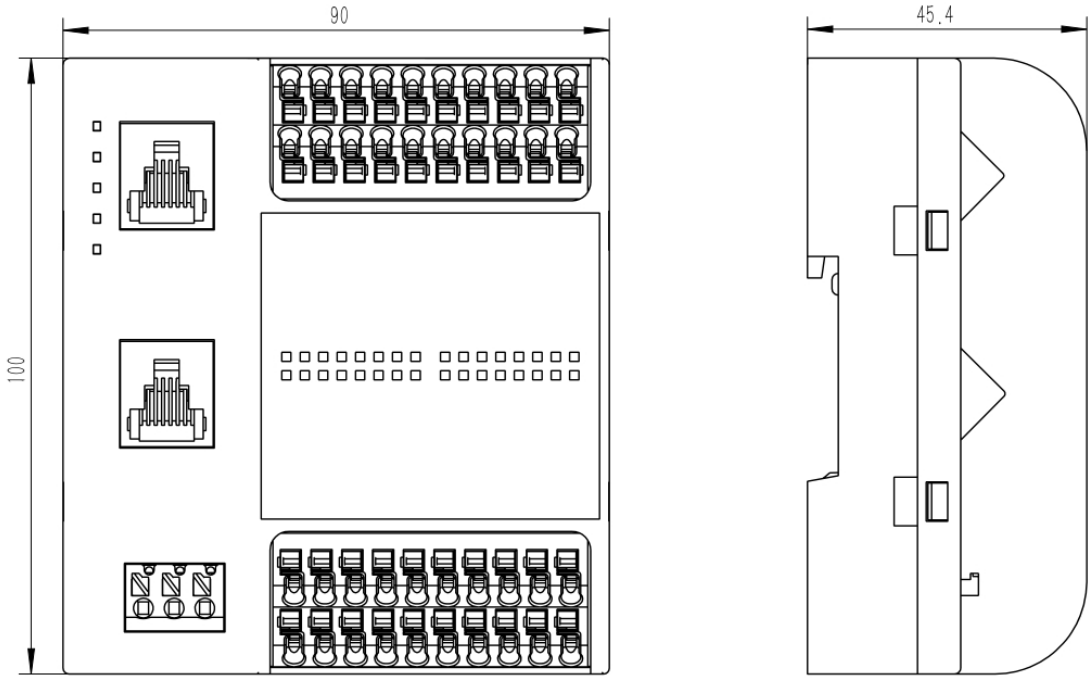


Fig.4-1 Dimension Drawing for Module

4.2 Wiring Diagram for Module Power Source

See Fig.4-3 for the wiring diagram of EtherCAT, PROFINET, CC-Link and CC-Link IE Field Basic Bus Remote IO Module Power Source in FS series.

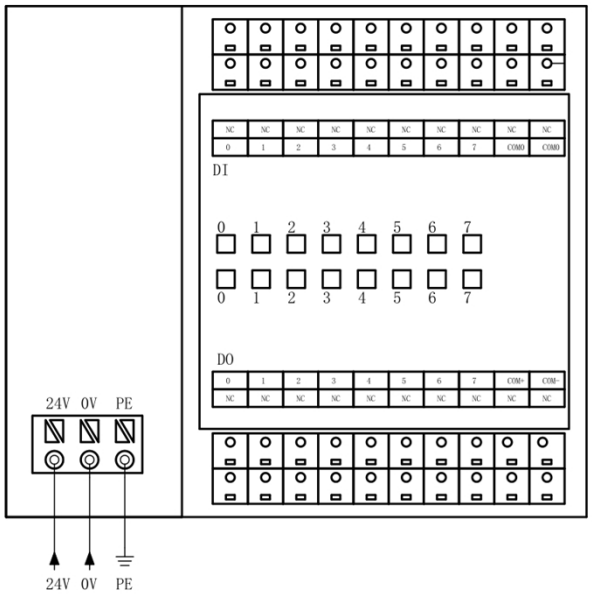


Fig.4-3 Wiring Diagram for Power Source

In FS series, the wiring diagram for DeviceNet Bus Remote IO Module is inconsistent with modules of other bus protocols as shown in Fig.4-4.

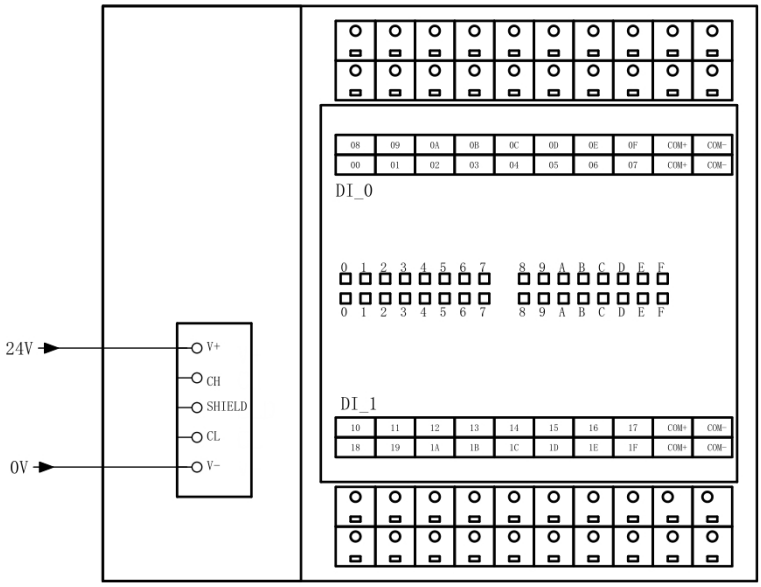


Fig.4-4 Wiring Diagram for Power Source

4.3 Wiring Diagram for Digital Quantities Input Channel

In the FS Series Remote IO Modules, all input channels support NPN and PNP. However, only one signal type (NPN or PNP) can be used in the process of operation.

4.3.1 Wiring Diagram for NPN Signal for Digital Quantities Input Channel

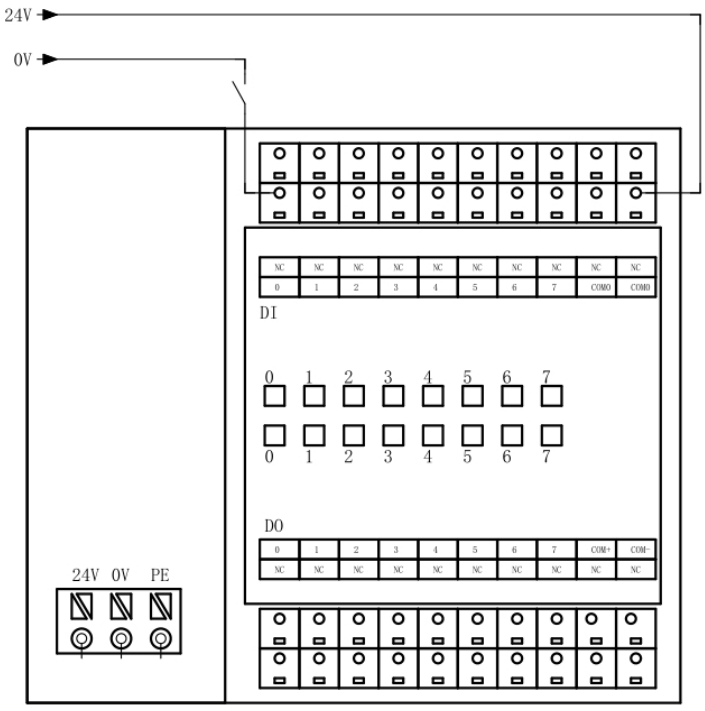


Fig. 4-5 NPN Wiring for Digital Quantities Input Channel

4.3.1 Wiring Diagram for PNP Signal for Digital Quantities Input Channel

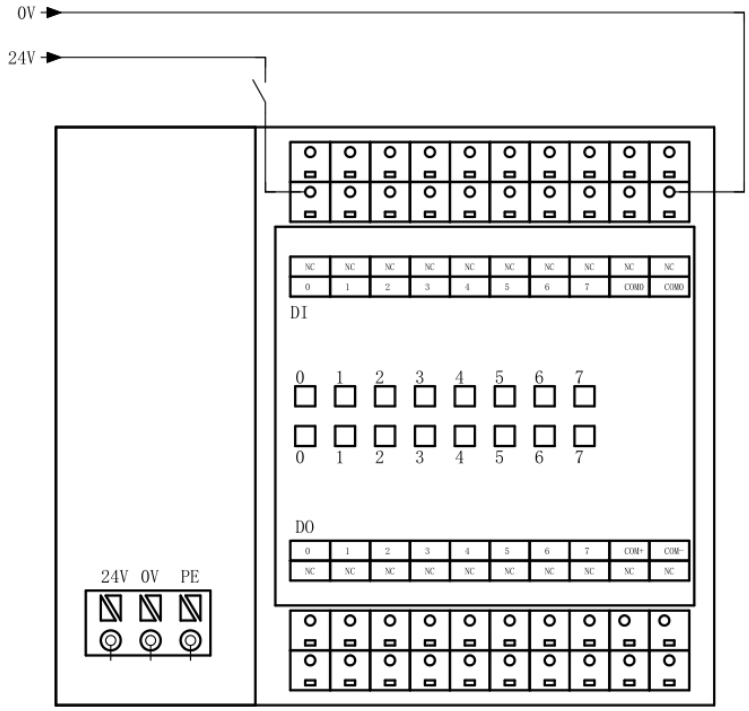


Fig. 4-5 PNP Wiring for Digital Quantities Input Channel

4.4 Wiring Diagram for Digital Quantities Output

4.4.1 NPN Wiring Diagram for Digital Quantities Output

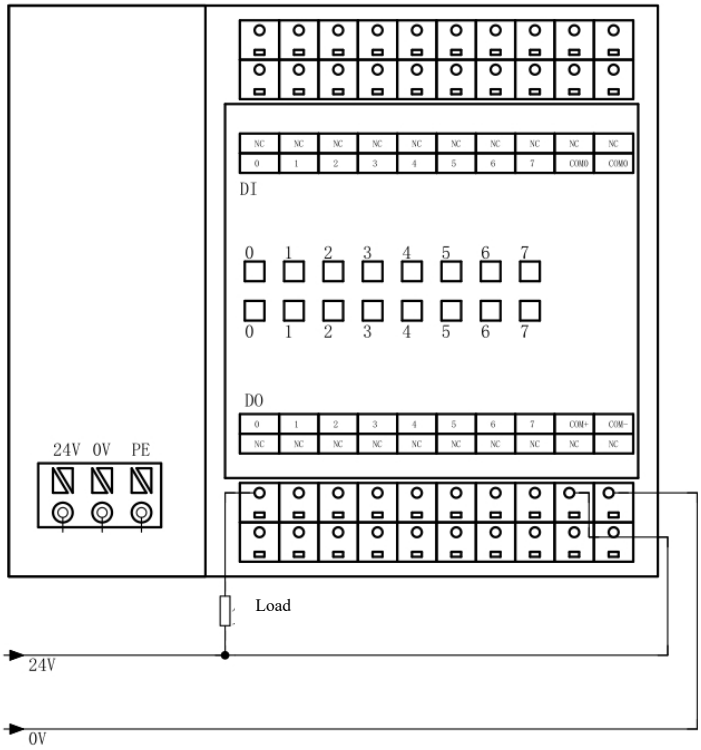


Fig.4-6 NPN Wiring for Digital Quantities Output Channel

4.4.2 PNP Wiring Diagram for Digital Quantities Output

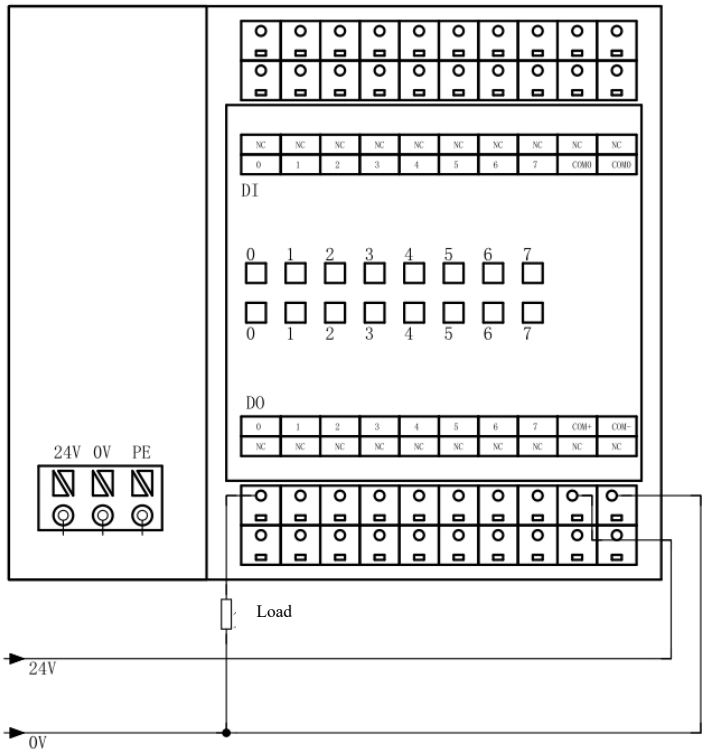


Fig.4-6 PNP Wiring for Digital Quantities Output Channel

4.5 Wiring Diagram for Relay Output

4.5.1 Wiring Diagram for Relay Output DC Load

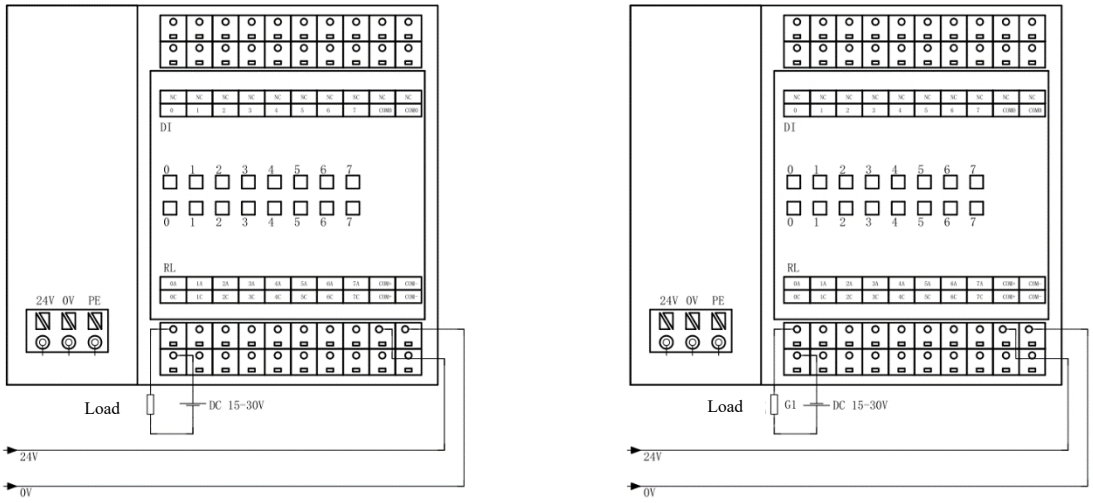


Fig.4-7 Wiring Diagram for Relay Output DC Load

4.5.2 Wiring Diagram for Relay Output AC Load

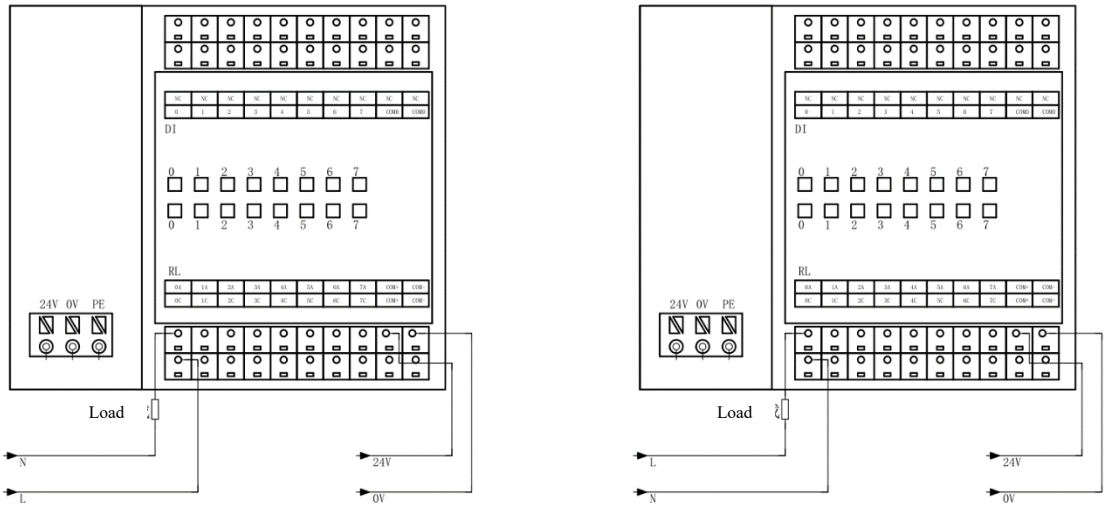


Fig.4-8 Wiring Diagram for Relay Output AC Load

5 FS IO Configuration

The chapter mainly introduces the links between FS Series Remote IO Module and the current main PLC in industrial field and the configuration thereof, including the configuration of the programming software and the parameter configuration of some modules.

5.1 Link between EtherCAT Protocol IO Module and PLC

5.1.1 Link between TwinCAT3 and EtherCAT Protocol IO Module and Configuration

1. See Fig. 5-1-1 for the communication link diagram.

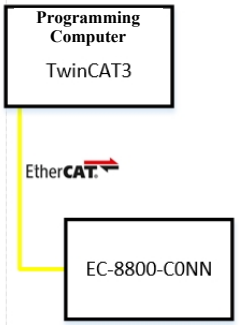


Fig. 5-1-1 Communication Link Diagram

2. Hardware configuration is shown in Table 5-1-2.

Table 5-1-2 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	TwinCAT3 Installed
EC-8800-C0NN	1	EtherCAT Protocol 8DI/8DO Module
Network Cable	>1	

3. Installation of XML Description File

The XML description file is installed to TwinCAT3 as shown in Fig. 5-1-3. The default folder is (C:\TwinCAT\3.1\Config\Io\EtherCAT).

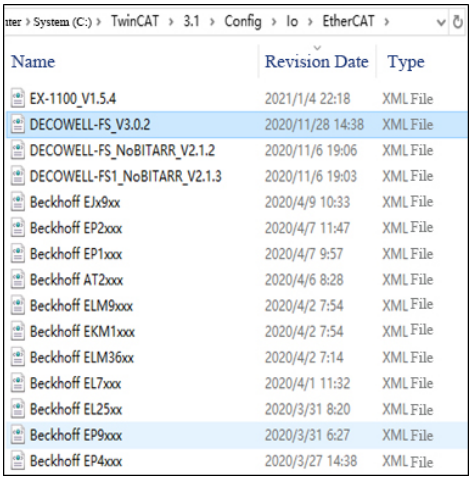


Fig. 5-1-3 Installation of XML Description File

4. New Project and device Configuration

Open the TwinCAT software and select “File”>Create>Project as shown in Fig.5-1-4. Select “TwinCAT projects” in the window of the new project as shown in Fig. 5-1-5.

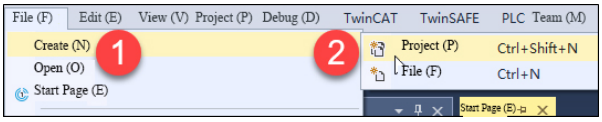


Fig. 5-1-4 New Project

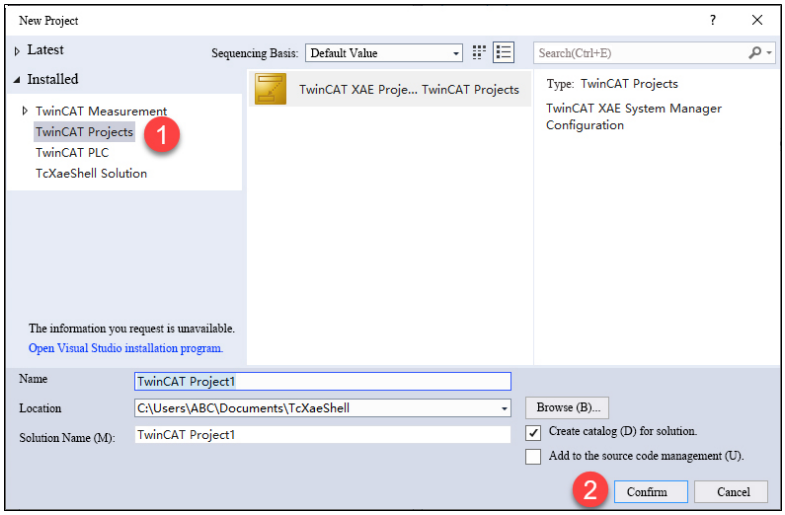


Fig. 5-1-5 Selection of TwinCAT Project

IO that is connected with the programming computer will be scanned into the project and click “I/O”>“Devices”>“Scan” in the project tree as shown in Fig. 5-1-6. The hardware configuration that is scanned is shown in Fig. 5-1-7.

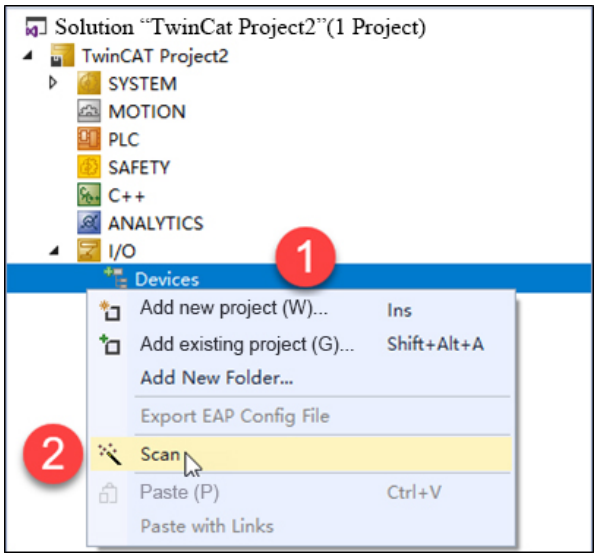


Fig. 5-1-6 Scan Device for IO

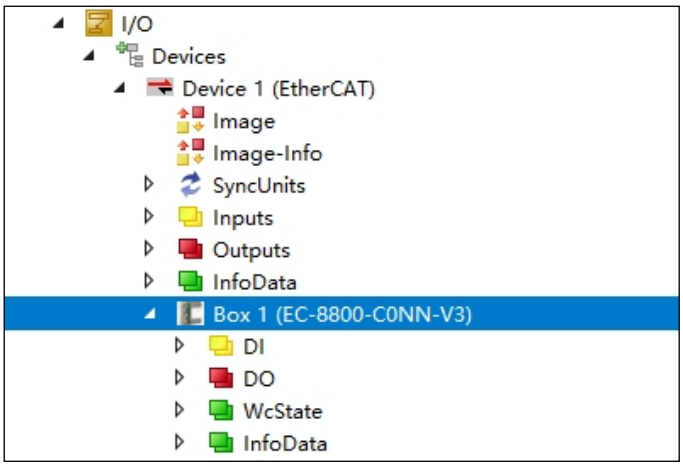


Fig. 5-1-7 Hardware Configuration

5.1.2 IO Module Link and Configuration of CODESYS and EtherCAT Protocol

1. See Fig. 5-1-8 for the communication link diagram.

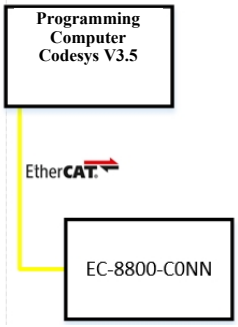


Fig. 5-1-8 Communication Link Diagram

2. See Table 5-1-2 for hardware configuration.

Table 5-1-2 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	Codesys V3.5 Installed
EC-8800-C0NN	1	EtherCAT Protocol

		8DI/8DO Module
Network Cable	>1	

3. Installation of XML Description File

Open CODESYS V3.5 software and select “Tool”>“Device Memory Library” from the Menu Bar as shown in Fig. 5-1-9.

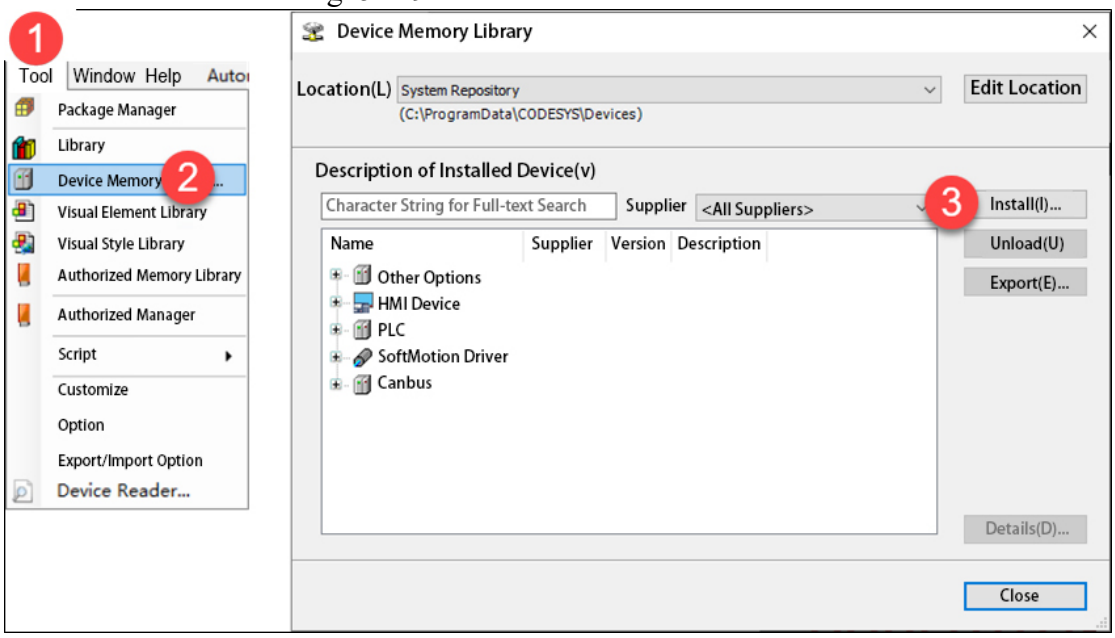


Fig. 5-1-9 Installation of XML Device Description File

4. New Project and Device Configuration

Open CODESYS V3.5 software and select “New Project”>“Project”>“Standard project” as shown in Fig. 5-1-10.

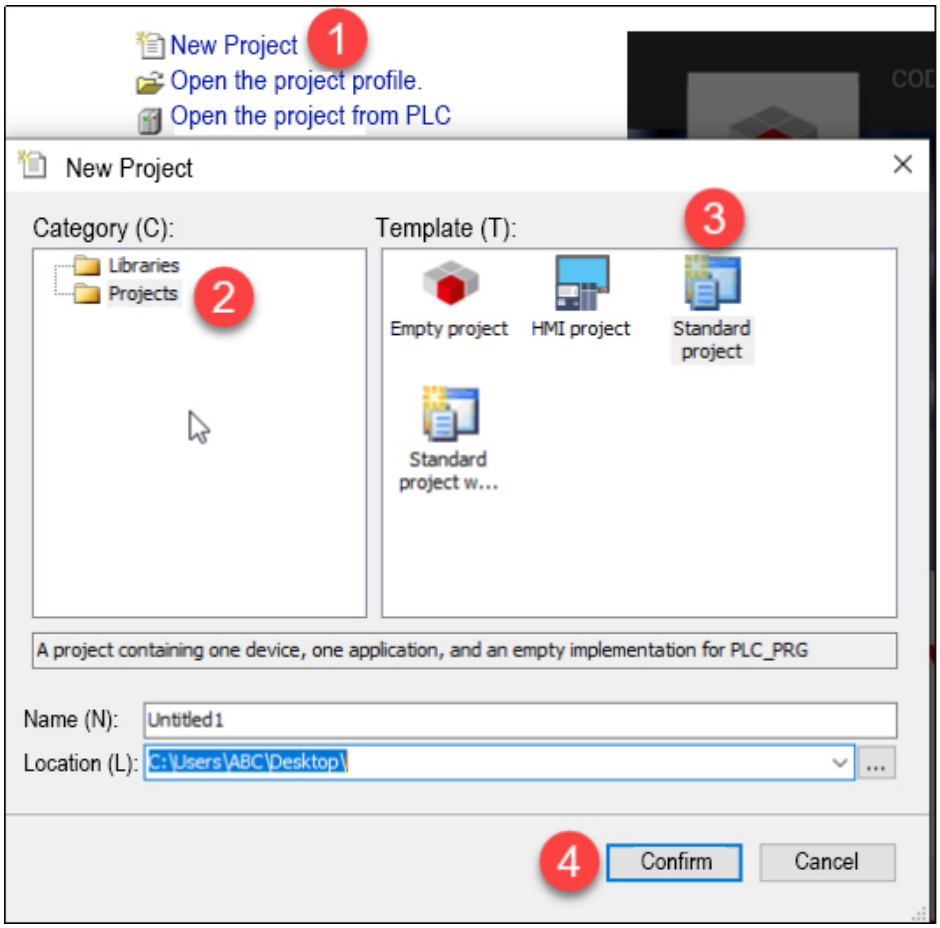


Fig. 5-1-10 New Project

Select “CODESYS SoftMotion Win V3” in the Device from the window of Standard Project and select the Structural Text (ST) for the PLC_PRG programming language as shown in Fig. 5-1-11.

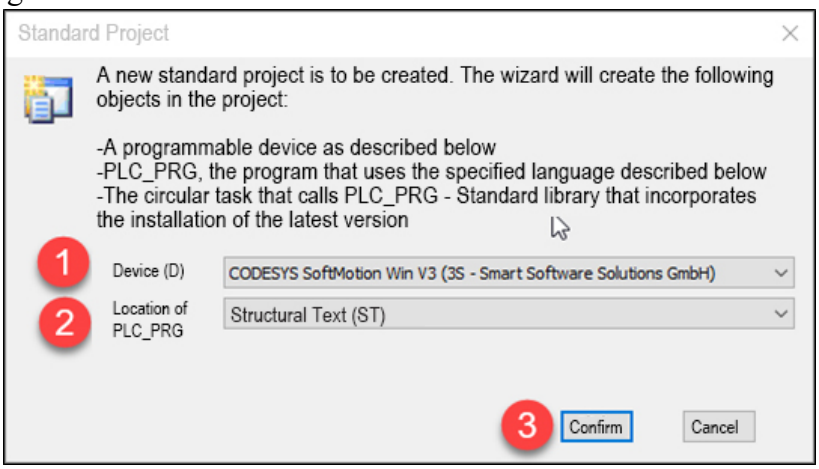


Fig. 5-1-11 Selection of Device and Programming Language

Note: Softmotion can be provided with Drive and IO. The Control however can only be provided with IO rather than the Drive.

Select “Device(CODESYS SoftMotion Win V3)”>“Add Device” in the device tree as shown in Fig. 5-1-12. And select the “Canbus”>“EtherCAT”>“EtherCA“Device (CODESYS SoftMotion Win V3)”>“Add Device” T Master” in the window of Add

Device as shown in Fig. 5-1-13.

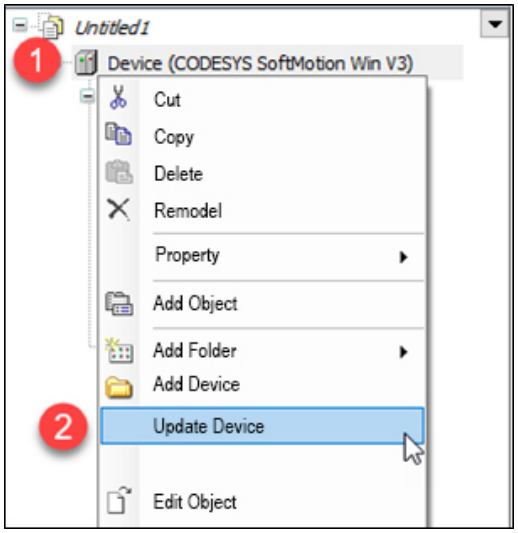


Fig. 5-1-12 Addition of Device

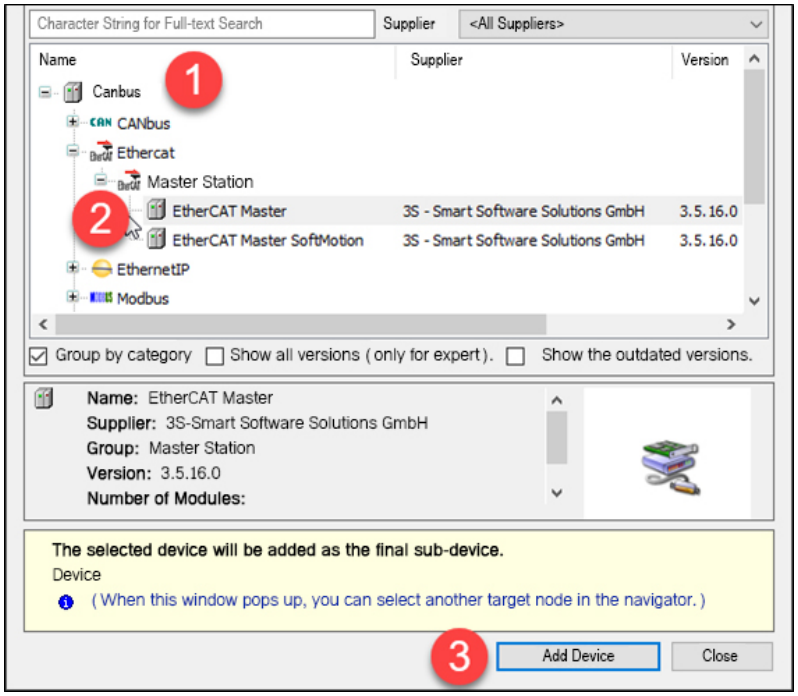


Fig. 5-1-13 Selection of EtherCAT Bus

Assign ethernet for EtherCAT Master and double click the "EtherCAT_Master">"EtherCAT NIC Setting"> "Browse" in the device tree as shown in Fig. 5-1-14.

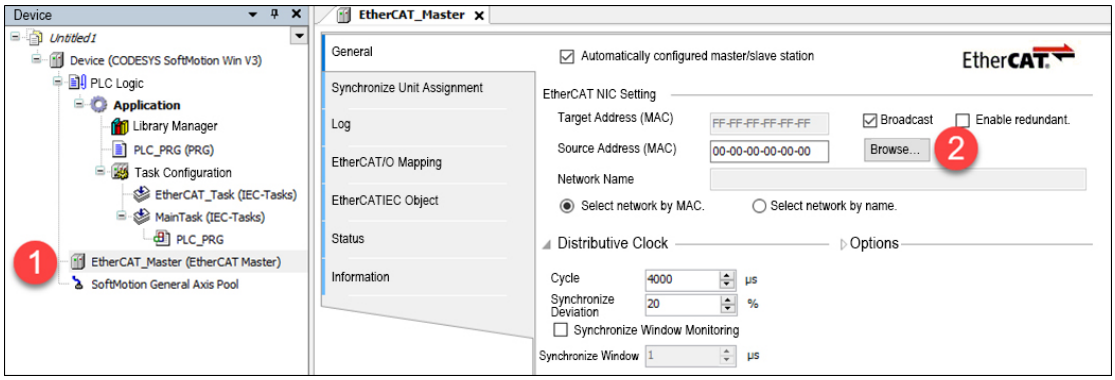
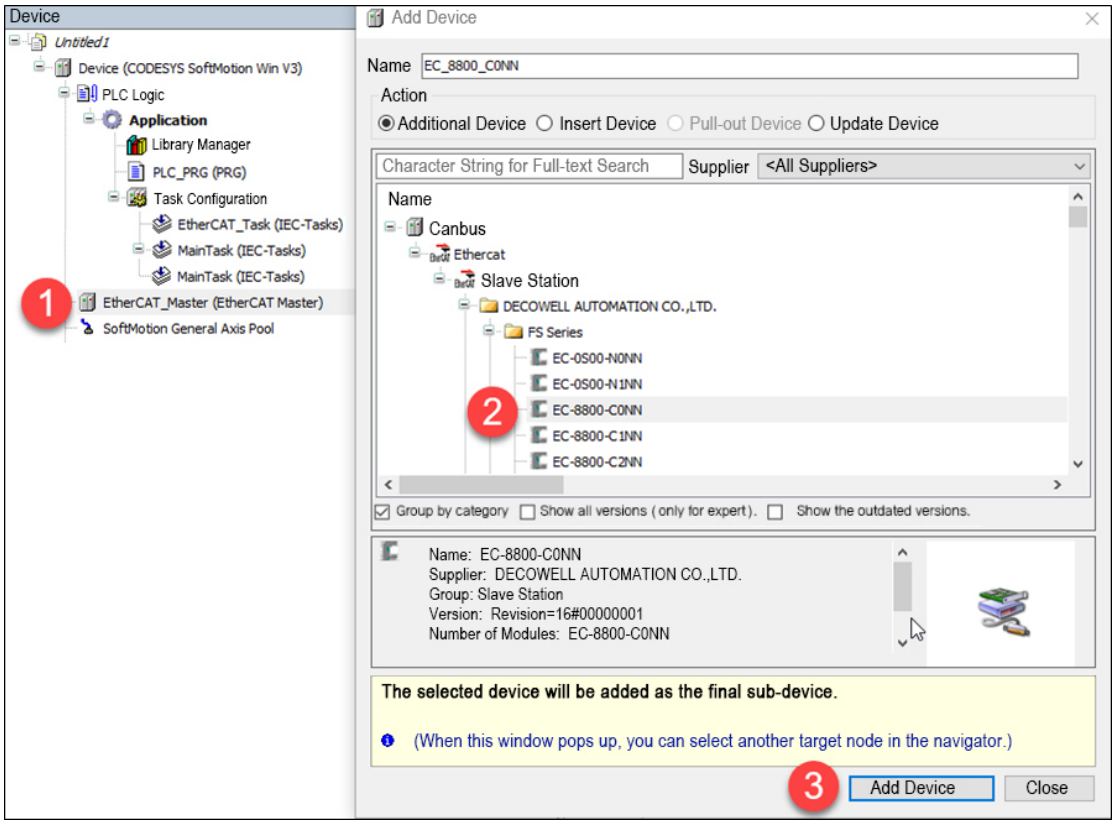


Fig. 5-1-14 Assignment of Ethernet

Note: The project shall be downloaded into the controller before assignment of the ethernet.

Manually add IO module into the device tree and click “EtherCAT Master”>“Add Device” via right click. Select “EC-8800-C0NN” in the window of Device as shown in Fig. 5-1-15.



5. Programme Download and Monitoring

Select “Online”>”Log in” in the Menu and confirm the download before enabling the programme. Select the “Debug”>“Enable” in the Menu.

5.1.3 IO Module Link and Configuration of Sysmac Studio and EtherCAT Protocol

1. See Fig. 5-1-16 for the communication link diagram.

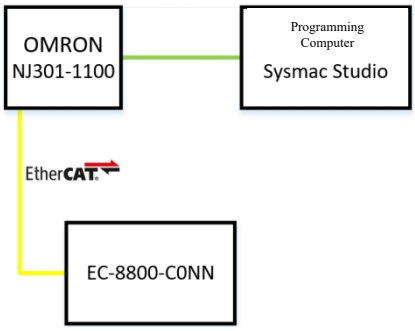


Fig. 5-1-16 Communication Link Diagram

2. See Table 5-1-3 for the hardware configuration.

Table 5-1-3 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	Sysmac Studio
Controller	1	NJN301-1100
EC-8800-C0NN	1	EtherCAT Protocol 8DI/8DO Module
Network Cable	>1	

3. Installation of XML Description File

XML description file is installed into the Sysmac Studio as shown in Fig. 5-1-17.

Default Folder:

C:\ProgramFiles(x86)\OMRON\SysmacStudio\IODeviceProfiles\EsiFiles\UserEsiFiles)

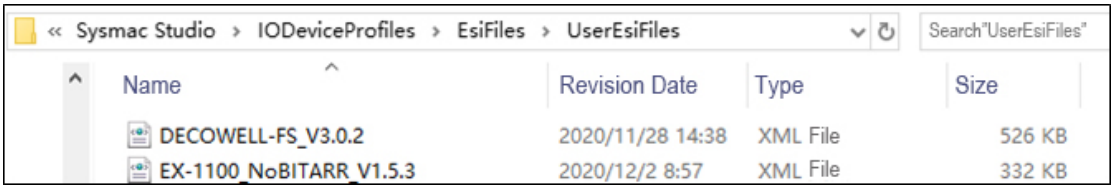


Fig. 5-1-17 Installation of XML Description File

4. New Project and Device Configuration

Open Sysmac Studio and select the “New Project” which will be configured with the device model and version number as shown in Fig. 5-1-18.

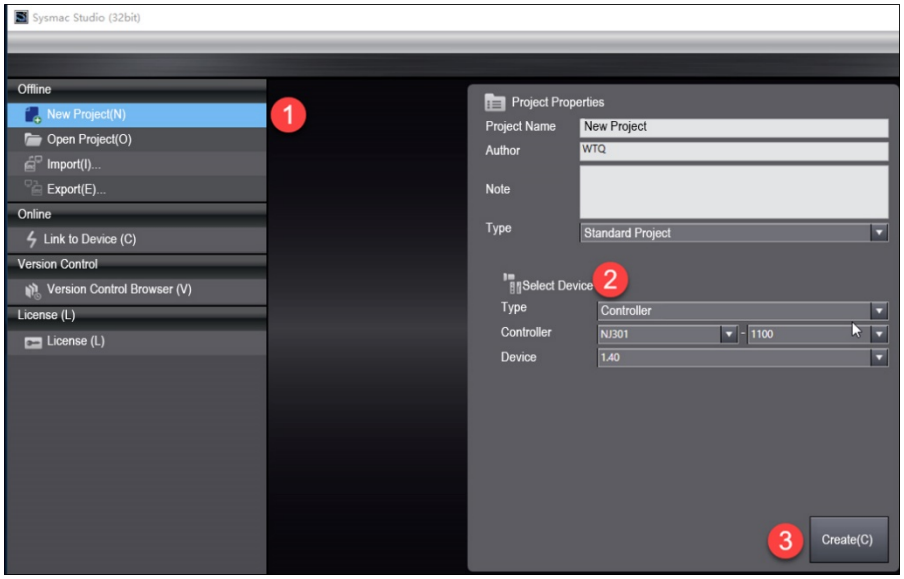


Fig. 5-1-18 New Project

Add the adapter and double click “EtherCAT” in the multi-view browser. Select “FS Series” in the Toolbox and further select “EC-8800-C0NN-V3” under the Toolbox as shown in Fig. 5-1-19.

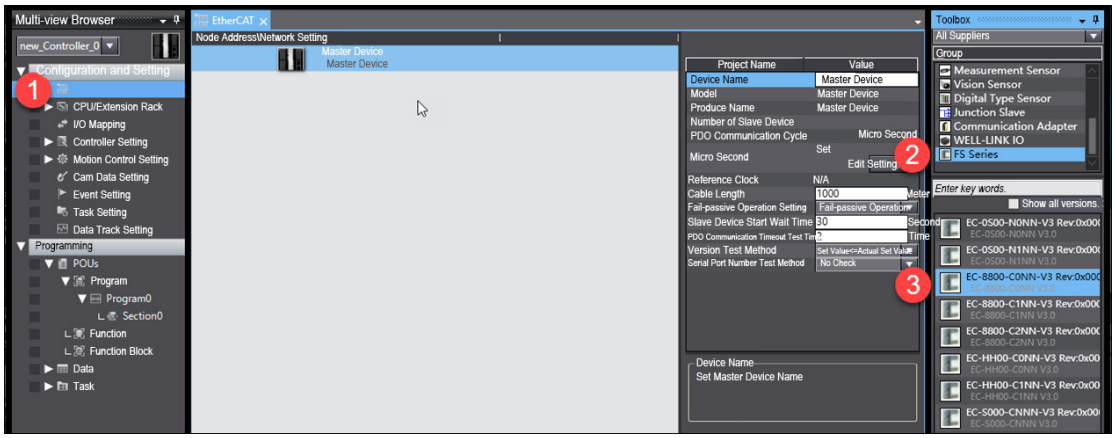


Fig.5-1-19 Addition of Module

Click the Online icon, place the mouse on the icon of the master device and perform the right click. Select the write-in from the device node address (the default node of the WELL-LINK EtherCAT slave device is 0, so the node number must be set), as shown in figure 5-1-20.

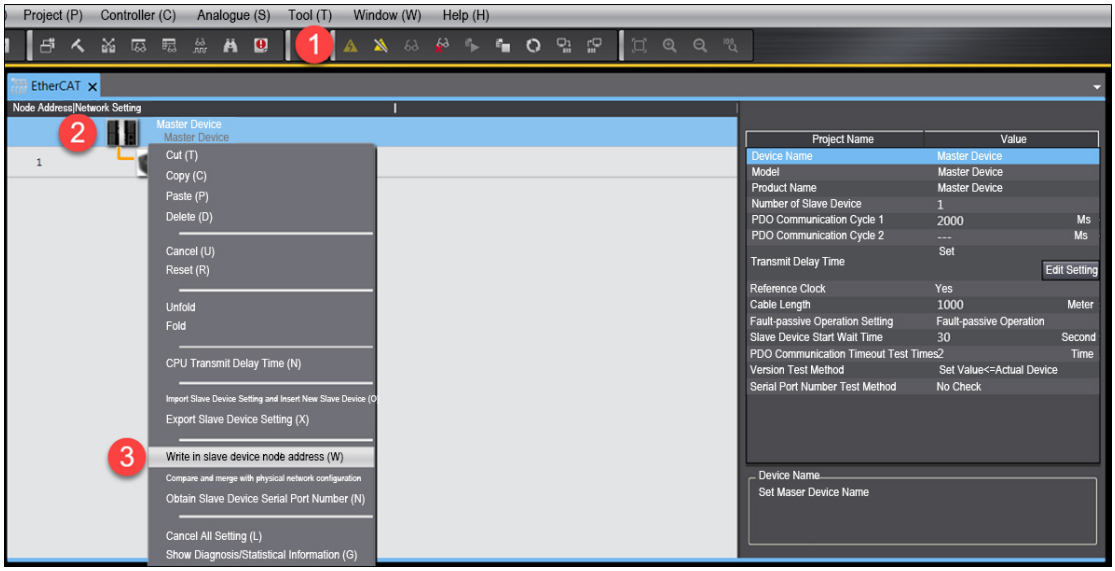


Fig. 5-1-20 Write-in of Node Address

Note: The device needs to be restarted after write-in of the node address, and then the node address will take effect.

The program will be downloaded into the Control after restart of the device. Select “Controller”>“Transmission”>“Transmission to Controller (T)” as shown in Fig. 5-1-21.

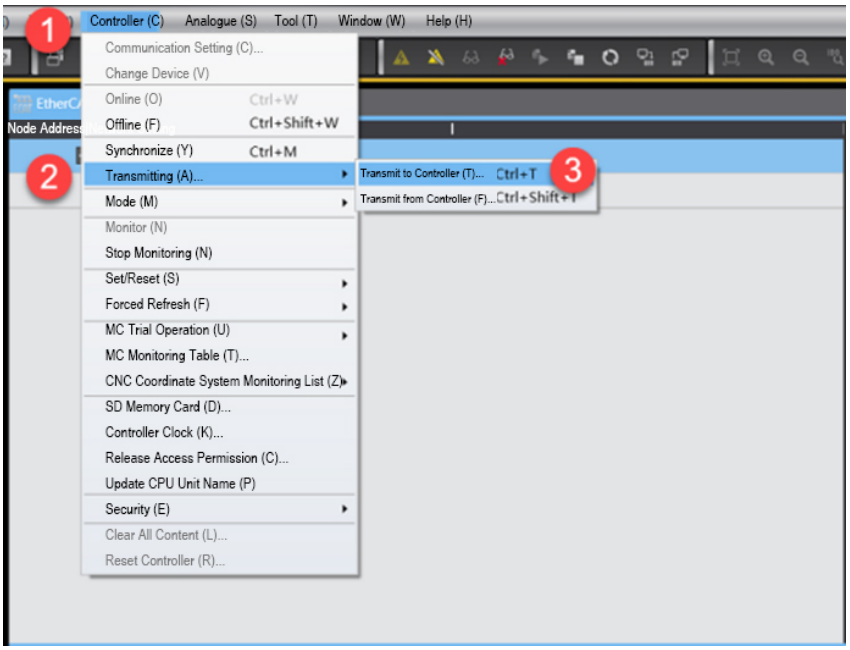


Fig.5-1-21 Program Download

5.2 IO Module and PLC Link (PN Module) of PROFINET Protocol

5.2.1 IO Module Link and Configuration of TIA Portal and PROFINET Protocol

1. See Fig. 5-2-1 for the communication link diagram.

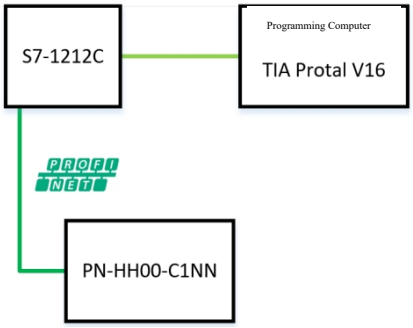


Fig. 5-2-1 Communication Link Diagram

2. See Table 5-2-1 for hardware configuration.

Table 5-2-1 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	TIA Portal V16 Installed
Controller	1	S7-1212C
PN-HH00-C1NN	1	PROFINET Protocol 16DI/16DO Module
Network Cable	>1	

3. Installation of GSD File

Open TIA Portal V16 and select “Option”>“Support Device Description File (GSD)” in the Menu as shown in Fig. 5-2-2.

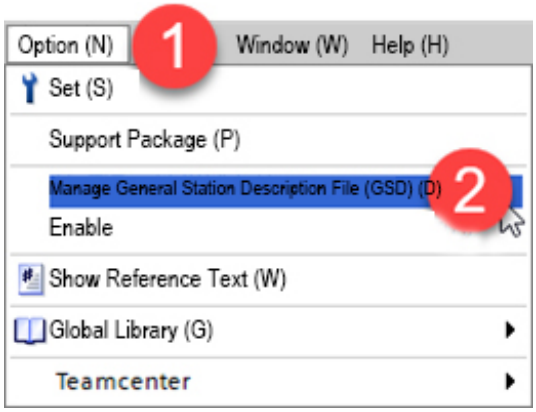


Fig.5-2-2 Installation of GSD File

4. New Project and Device Configuration

Open TIA Portal V16 and select the new project which will be configured as shown in Fig.5-2-3.

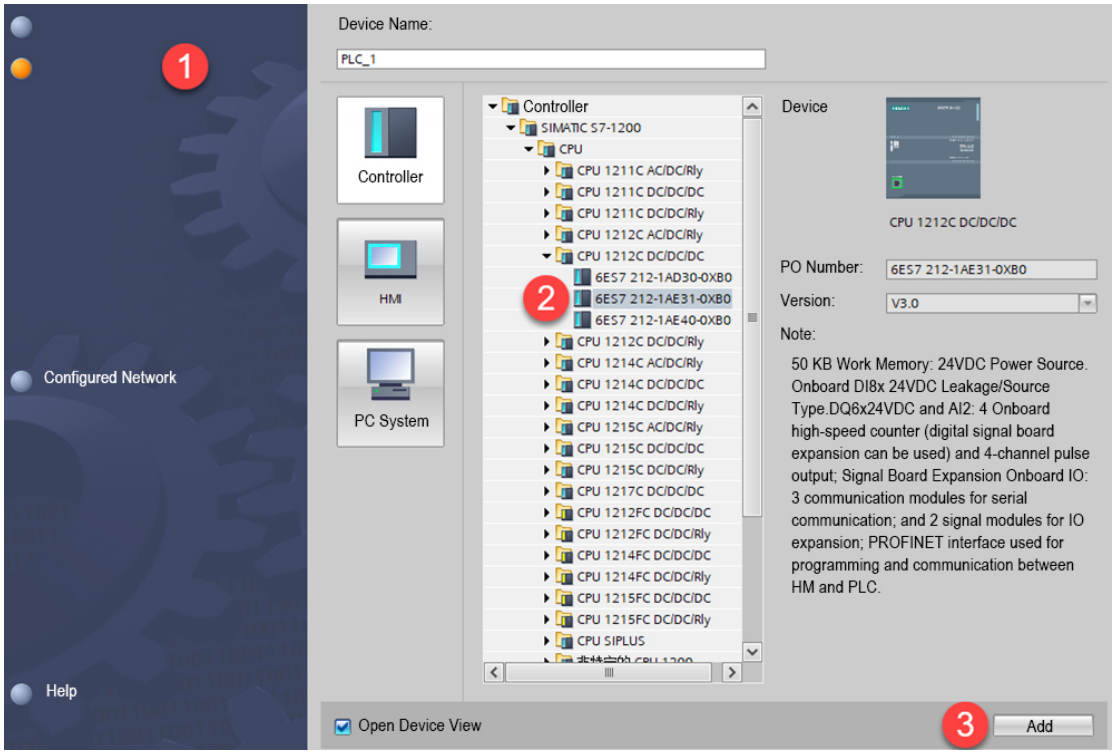


Fig.5-2-3 New Project

In regards of the device configuration, you can shift to the network view window and unfold the hardware catalog on the right side. Select and drag PN-HH00-C1NN into the network view as shown in Fig.5-2-4.

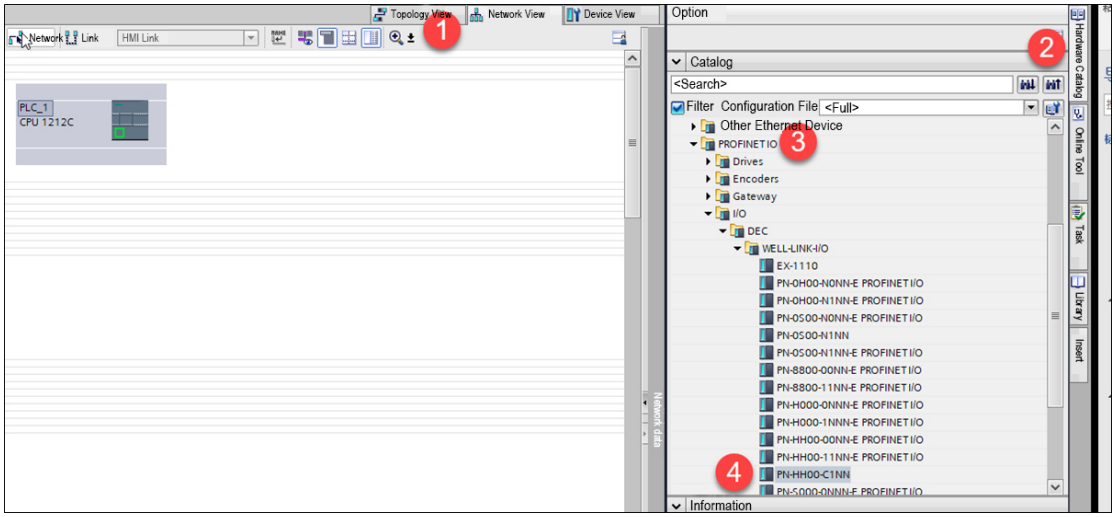


Fig.5-2-4 Device Configuration

In the network view, the Controller will be assigned to the Remote IO Module. Click the “Unassigned” in the IO Module and select PLC_1.PROFINET Interface_1 as shown in Fig. 5-2-5.

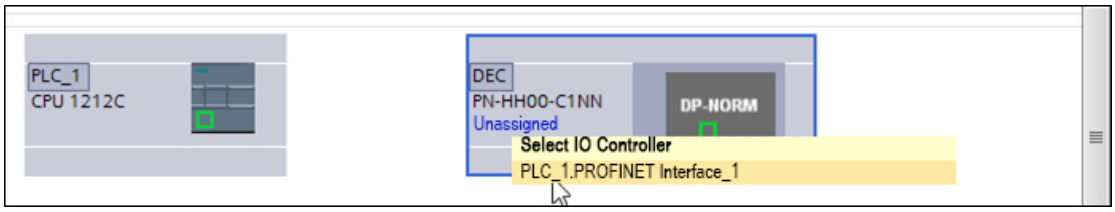


Fig.5-2-5 Assignment of IO Controller

Set IP address for IO Module. Double click the module in the device view and enter the attribute view as shown in Fig.5-2-6.

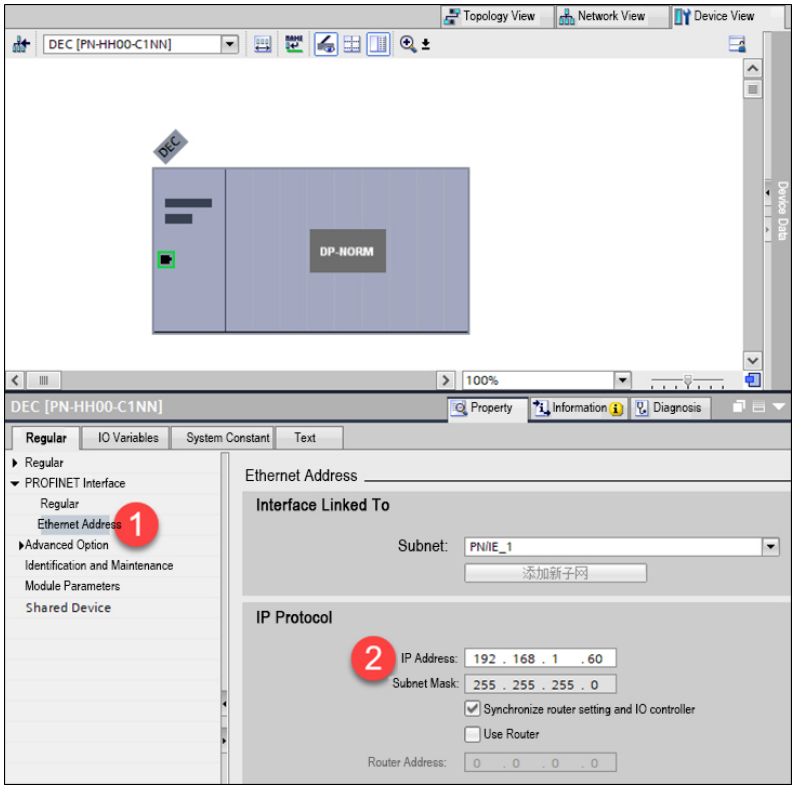
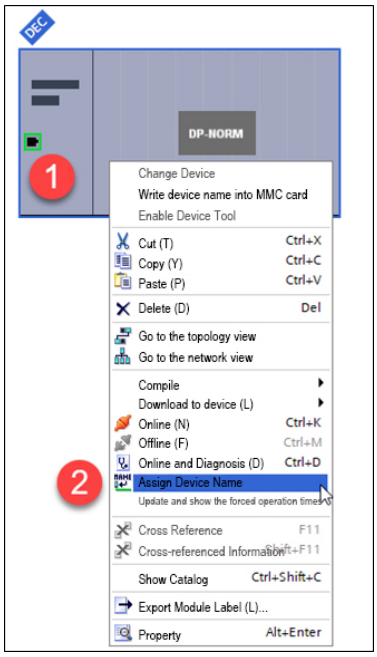


Fig.5-2-6 Assignment of IP Address

Assign the device name for the Remote IO Module. Select the “Assign Device Name” in the module with right click as shown in Fig. 5-2-7. Select the interface type, update the list and assign the device name as shown in Fig. 5-2-8.



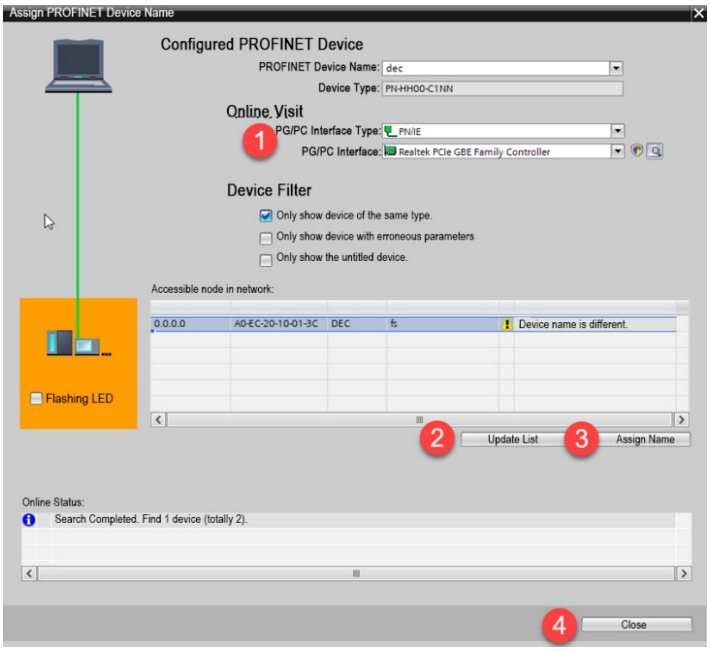


Fig. 5-2-7 Assignment of Device Name **Fig.5-2-8 Write-in of Device Name**

Select and download all the devices in the network view as shown in Fig. 5-2-9. After download of the program, start and operate CPU. Then shift to the online monitoring of communication and and assure the normality. See Fig.5-2-10 for details.

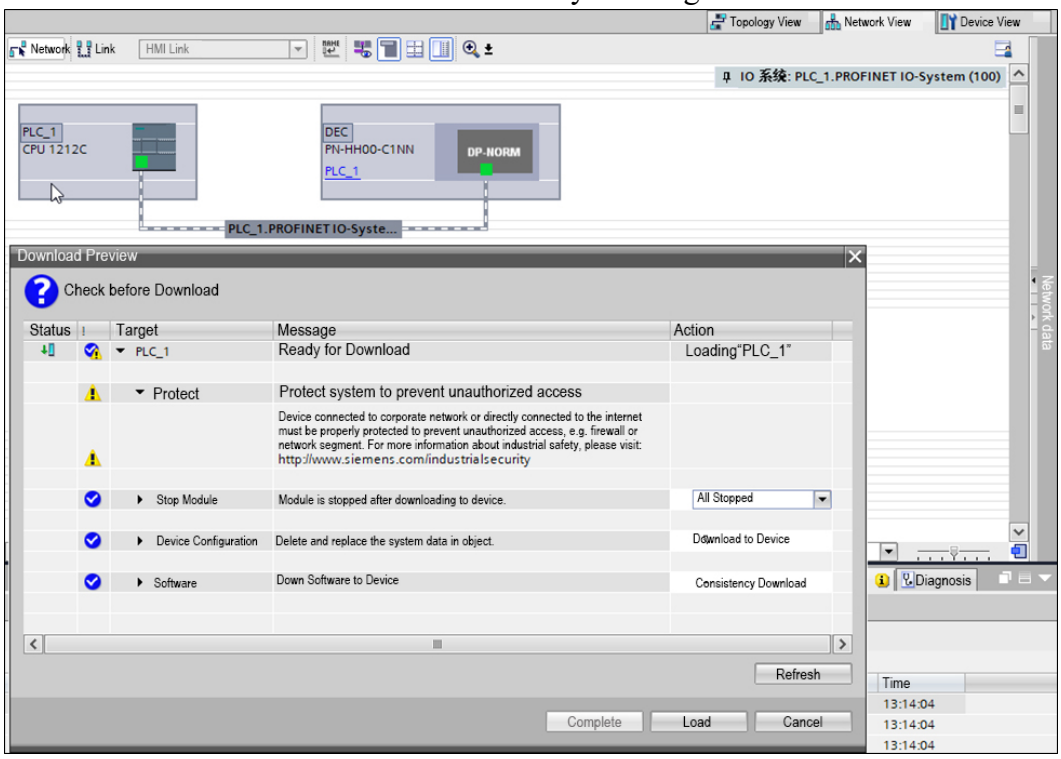


Fig.5-2-10 Program Download

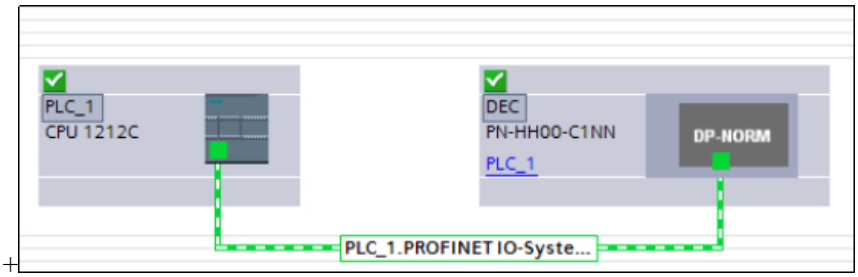


Fig.5-2-11 Device Monitoring

5.2.2 IO Module Link and Configuration of Step7 smart and PROFINET Protocol

1. See Fig. 5-2-12 for the communication link diagram.

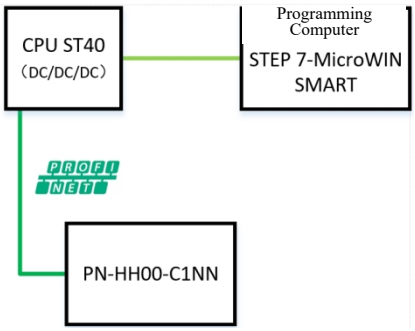


Fig. 5-2-12 Communication Link Diagram

2. See Table 5-2-2 for hardware configuration.

Table 5-2-2 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	STEP7-MicroWIN SMART Installed
Controller	1	CPU ST40(DC/DC/DC)
PN-HH00-C1NN	1	PROFINET Protocol 16DI/16DO Module
Network Cable	>1	

3. Installation of GSD File

Open STEP7-MicroWIN SMART and select “GSDML Administration” in the Menu as shown in Fig.5-2-13.

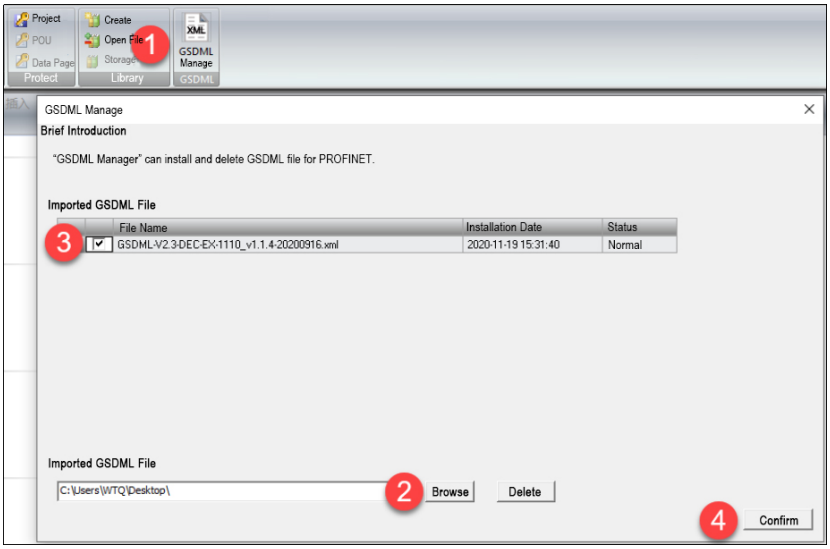


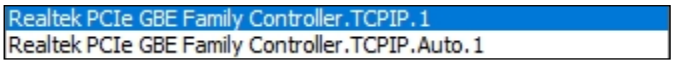
Fig.5-2-13 Installation of GSD File

4. Assignment of Device Name

Select “Tool”>“Search PROFINET Device” in the Menu. Select the network card connected to the Module in the window and search the device. Select the module in the network and edit the device name as shown in Fig. 5-2-14.

Note:

①When selecting the network card, the same network card will have 2 options as shown in the figure below. It is required to select the network card without Auto.



②After assignment of device name, be noted that the used device name must be consistent with the aforesaid assigned name upon IO Module configuration. Otherwise, PLC cannot normally communicate with the IO Module.

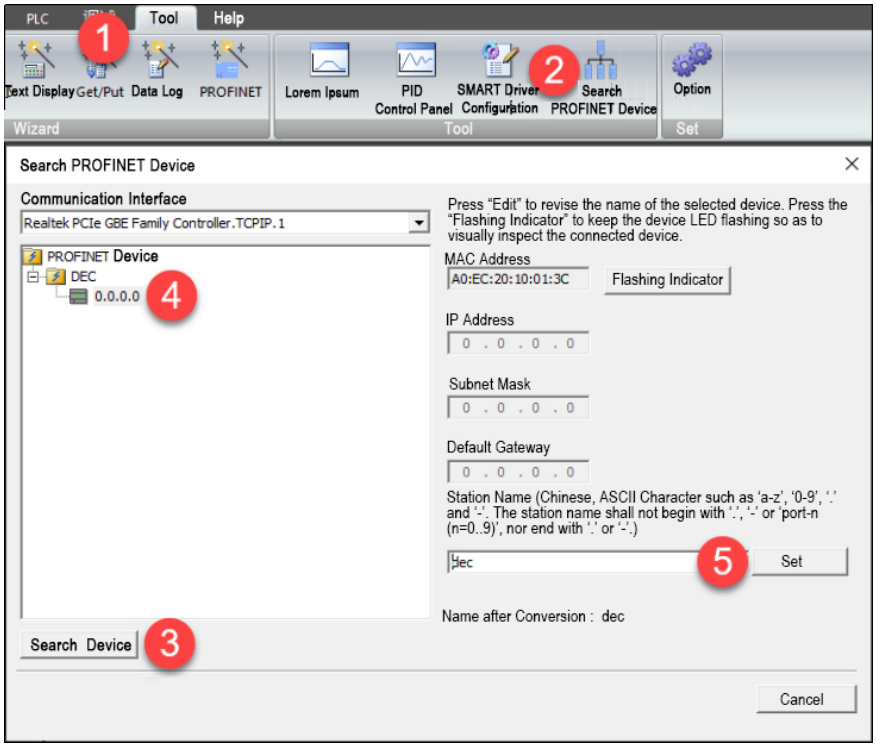


Fig. 5-2-14 Assignment of Device Name

5. New Project and Device Configuration

Select “Tool”>“PROFINET” in the Menu and then select PLC role as the controller as shown in Fig. 5-2-15. Add IO Module and assign the device name (consistent with the assigned device name as mentioned in Step 4) and the IP address so as to confirm the creation. See Fig. 5-2-16 for details.

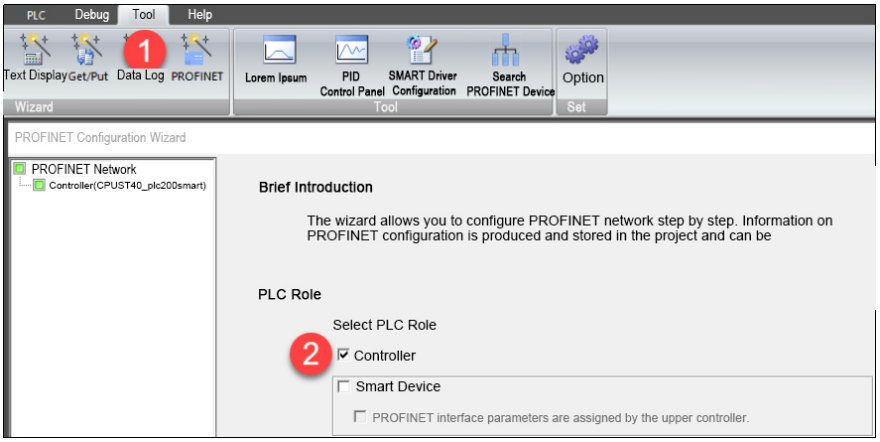


Fig.5-2-15 Selection of PLC Role

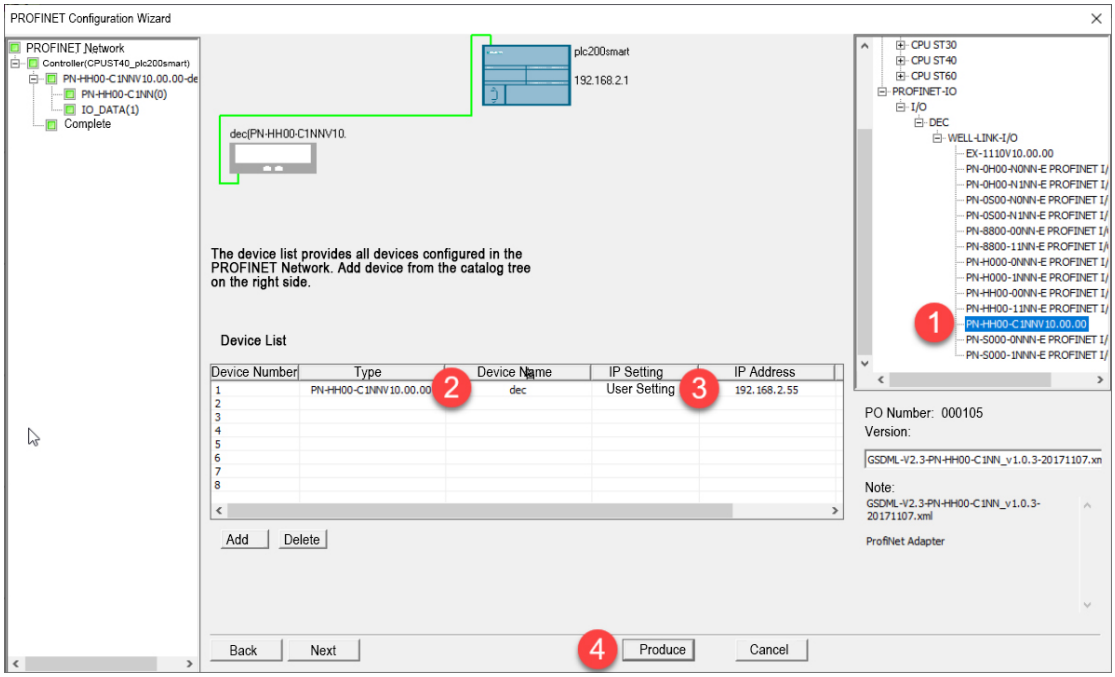


Fig. 5-2-16 Assignment of Device Name and IP Address

6. Program Download

Select "PLC">"Download" in the Menu and select "Search CPU" in the communication window. Select PLC requiring for program download and download the program.

Note: When PROFINET communication of 200 SMART configured by STEP 7-MicroWIN SMART, the CPU firmware version of PLC shall be at least (≥) V2.4. If the firmware version equals (=) V2.3, the firmware can be directly upgraded online. If the firmware version is below (<) 2.3, such firmware must be updated with the memory card in CPU.

5.2.3 IO Module Link and Configuration of Step7 and PROFINET Protocol

1. See Fig. 5-2-17 for the communication link diagram.

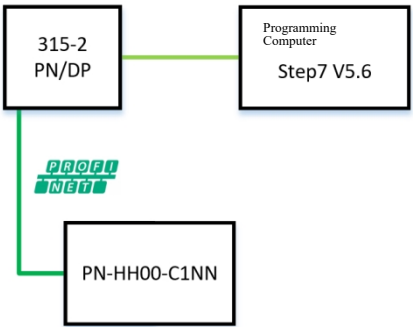


Fig. 5-2-17 Communication Link Diagram

2. See Table 5-2-3 for hardware configuration.

Table 5-2-3 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	Step7 V5.6 Installed
Controller	1	315-2 PN/DP
PN-HH00-C1NN	1	PROFINET Protocol

		16DI/16DO Module
Network Cable	>1	

3. Installation of GSD File

Create the new project. Click “SIMATIC300” and double click “Hardware”. In the HW Config window, select “Option”>“Install GSD File” in the Menu as shown in Fig. 5-2-18.

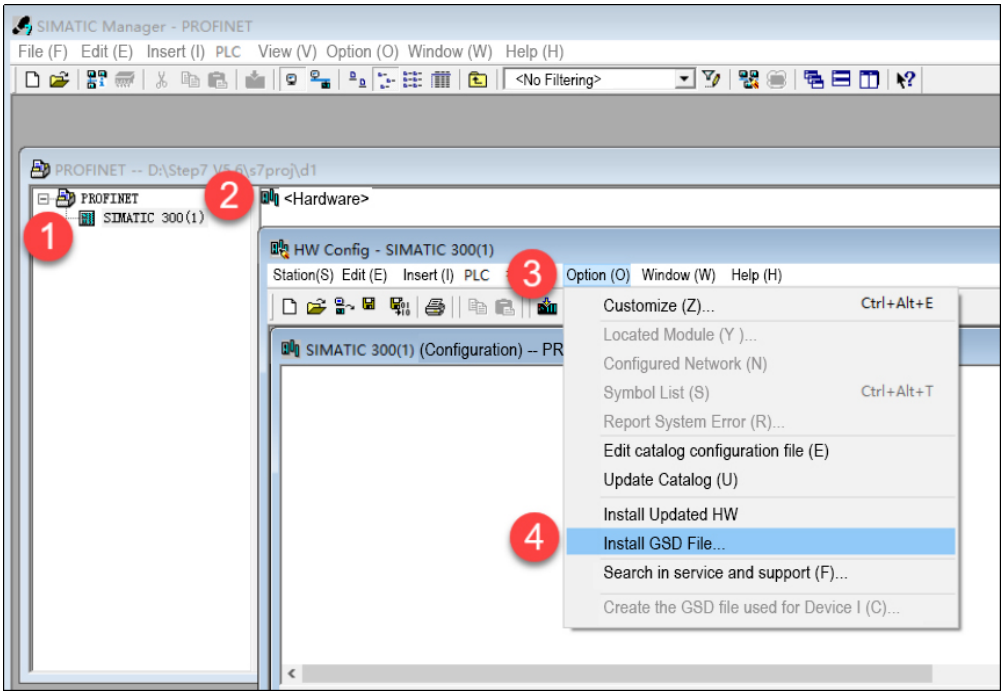


Fig. 5-2-18 Installation of GSD File

4. New Project and Device Configuration

Open SIMATIC Manager and select “New Project” in the Menu. Name the project and select the save path as shown in Fig.5-2-19/

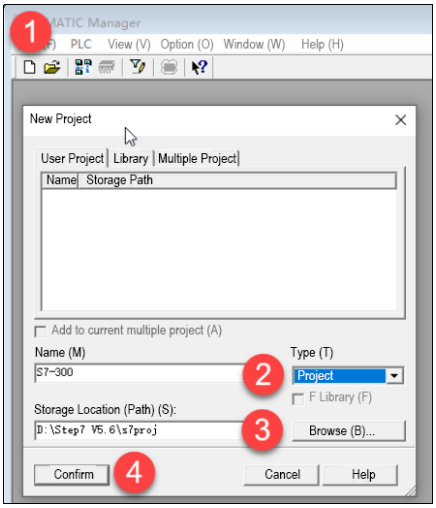


Fig.5-2-19 New Project

Add station 300 to the project as shown in Fig. 5-2-20. Click the newly added station 300, select "Hardware", and enter the HW config configuration interface as shown in Fig. 5-2-21. Add RACK RL of RACK 300 as shown in Fig. 5-2-22. Add the CPU module, select the version V2.6 of CPU315-2 PN/DP of CPU-300 in the right window of HW config, and drag it to slot 2 of the rack with the mouse as shown in Fig. 5-2-23. In the attribute interface of the Ethernet interface, other IP addresses can be used as needed. Here, the default IP address and subnet mask are used. Select the

Create button, and create a new subnet Ethernet (1). Click OK. See Fig. 5-2-24 for details.

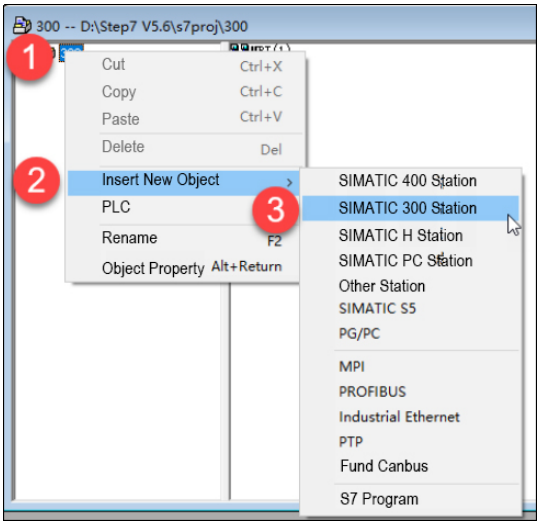


Fig. 5-2-20 Addition of Station 300

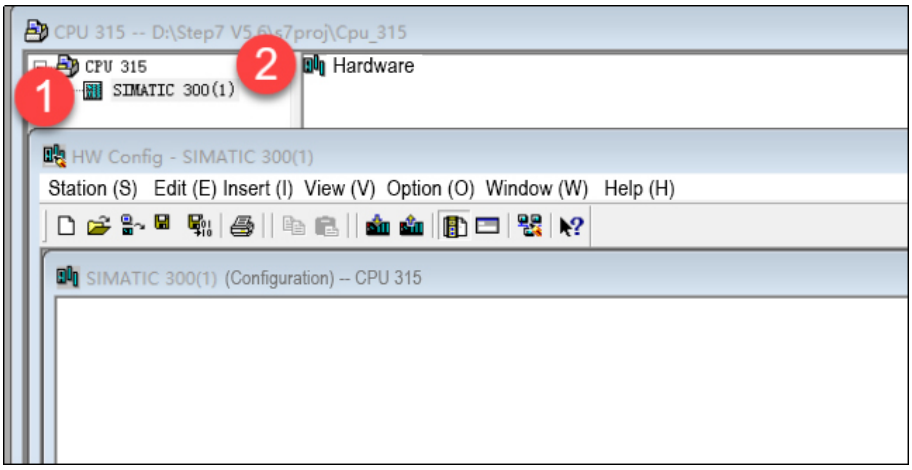


Fig. 5-2-21 HW Config Interface

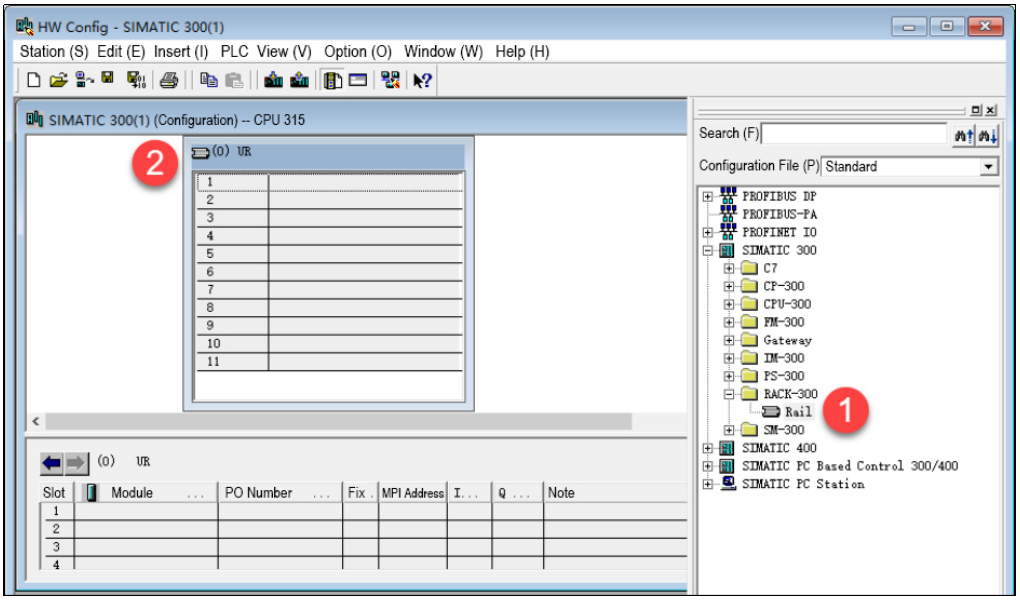


Fig. 5-2-22 Addition of Rack Rl

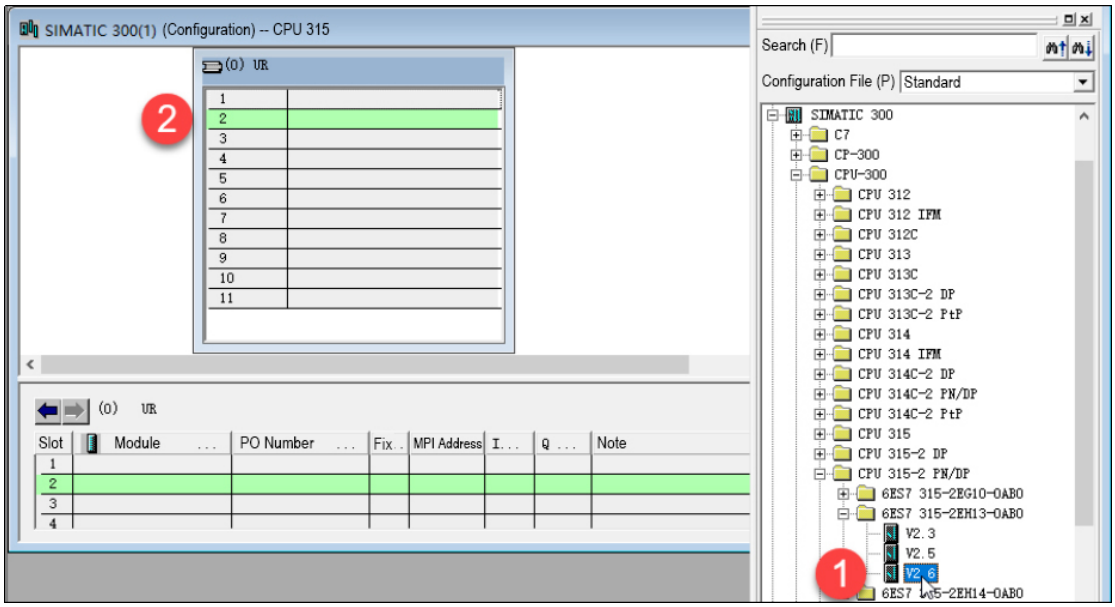


Fig.5-2-23 Add CPU Module into Framework

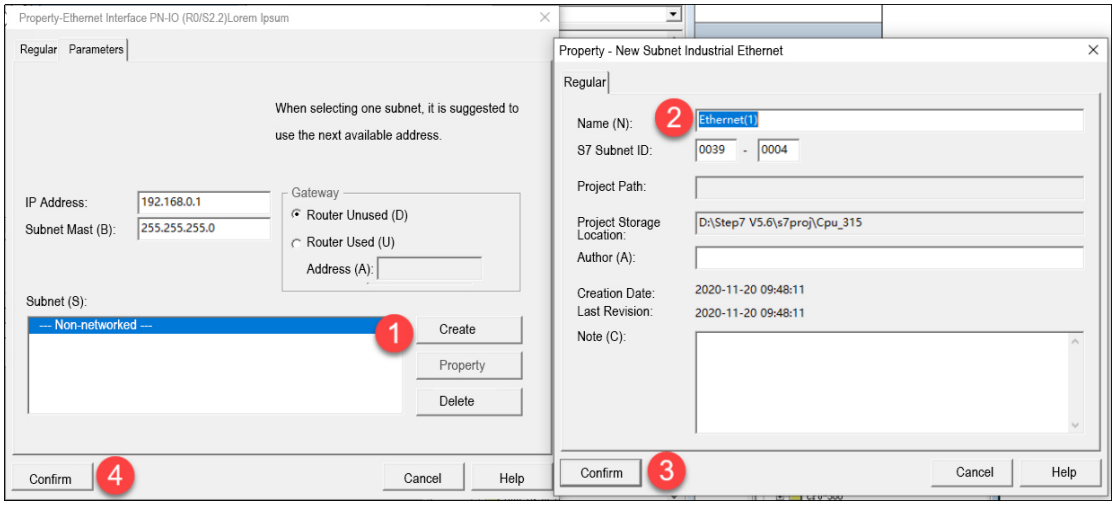


Fig 5-2-24 Add Ethernet in subnet

In Ethernet (1), Set I/O device station config. Select PN-HH00-C1NN on the right side and drag under Ethernet(1) subnet, as shown in Fig. 5-2-25

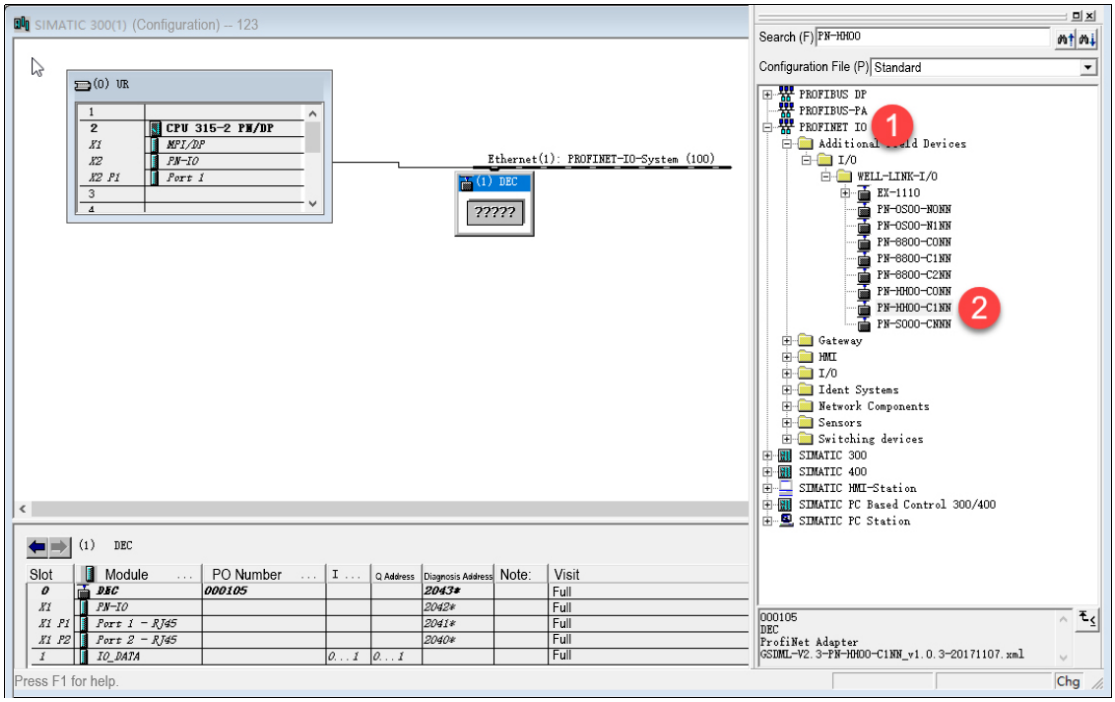


Fig. 5-2-25 Add IO Module into Ethernet（1）subnet

Change I/O device station IP address, double click DEC module from subnet.

Select "Ethernet" in the attribute window, and the IP address can be modified from it, as shown in Fig. 5-2-26

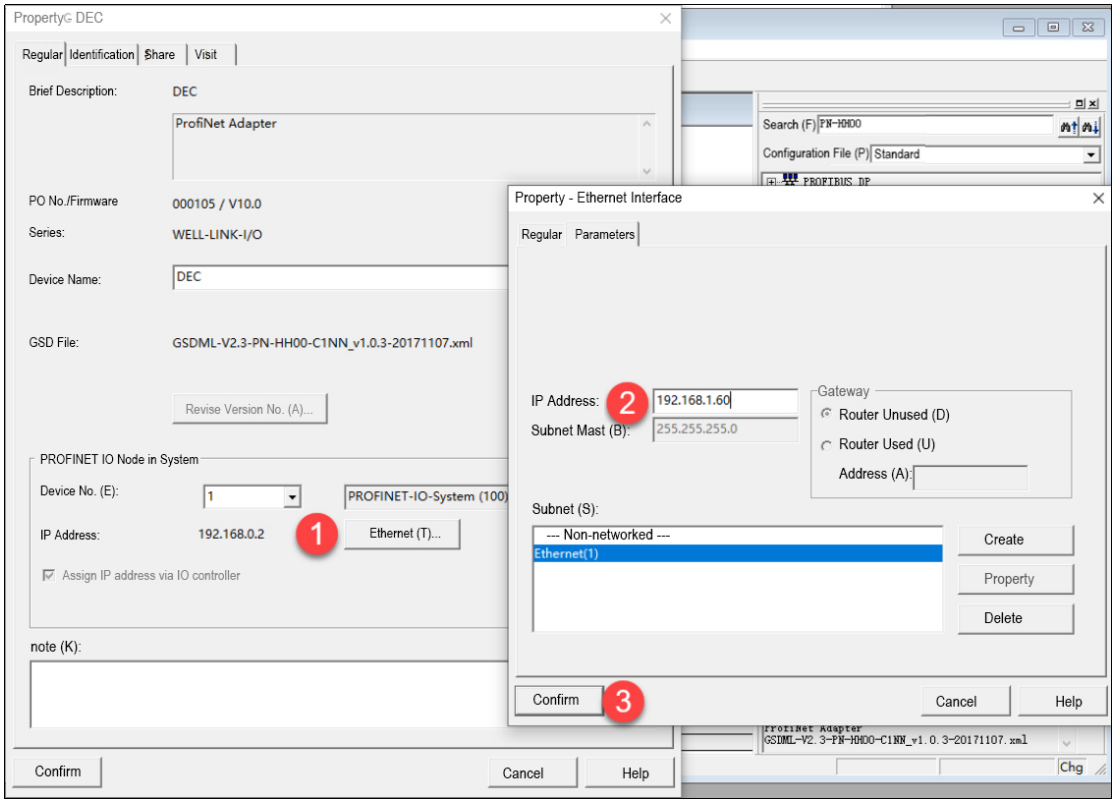


Fig. 5-2-26 Change Module IP address

Set the device name of the IO module, select the subnet icon, select "PLC" from Menu, select "Ethernet" > "Assign Device Name", as shown in Fig. 5-2-27. In the assign device name window, select the name to be assigned, and press the "Confirm Name" button, as shown in Fig. 5-2-28.

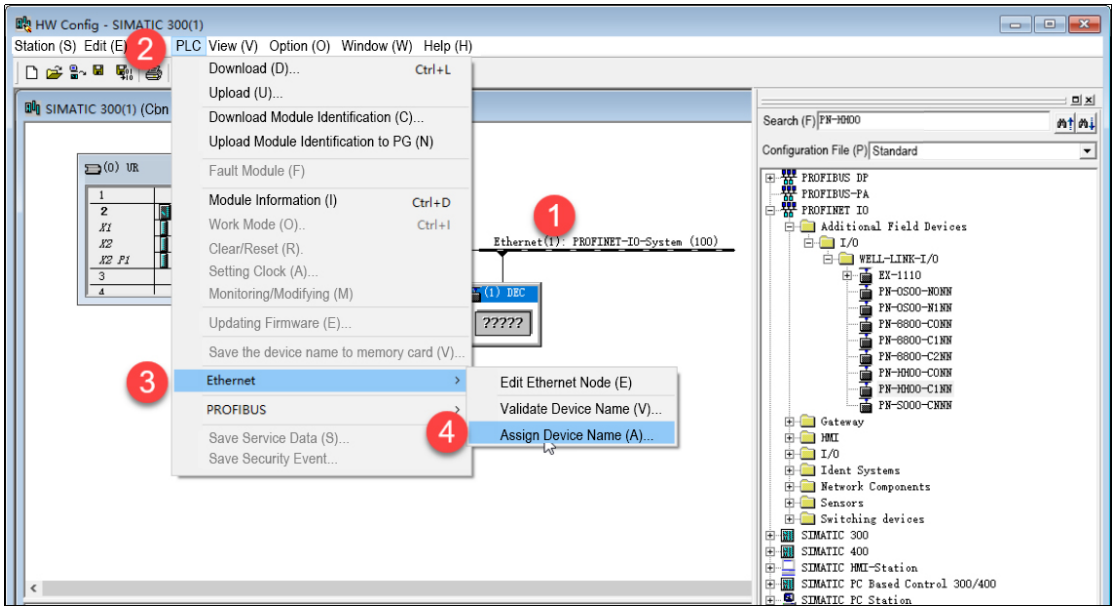


Fig. 5-2-27 Select Assign Device Name

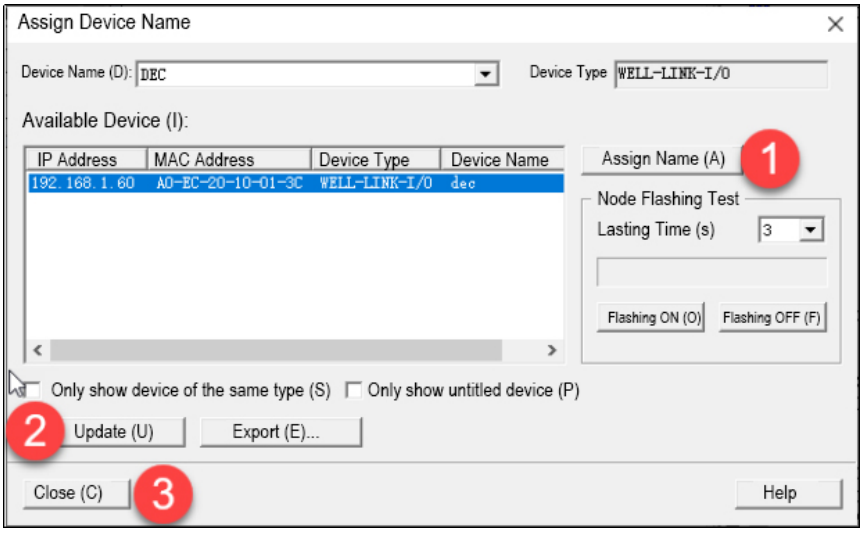


Fig. 5-2-28 Assign Device Name

Check if the name is assigned successfully, select the subnet icon, select "PLC" from the Menu, and select "Ethernet "> "Verify Device Name", as shown in Fig. 5-2-29.

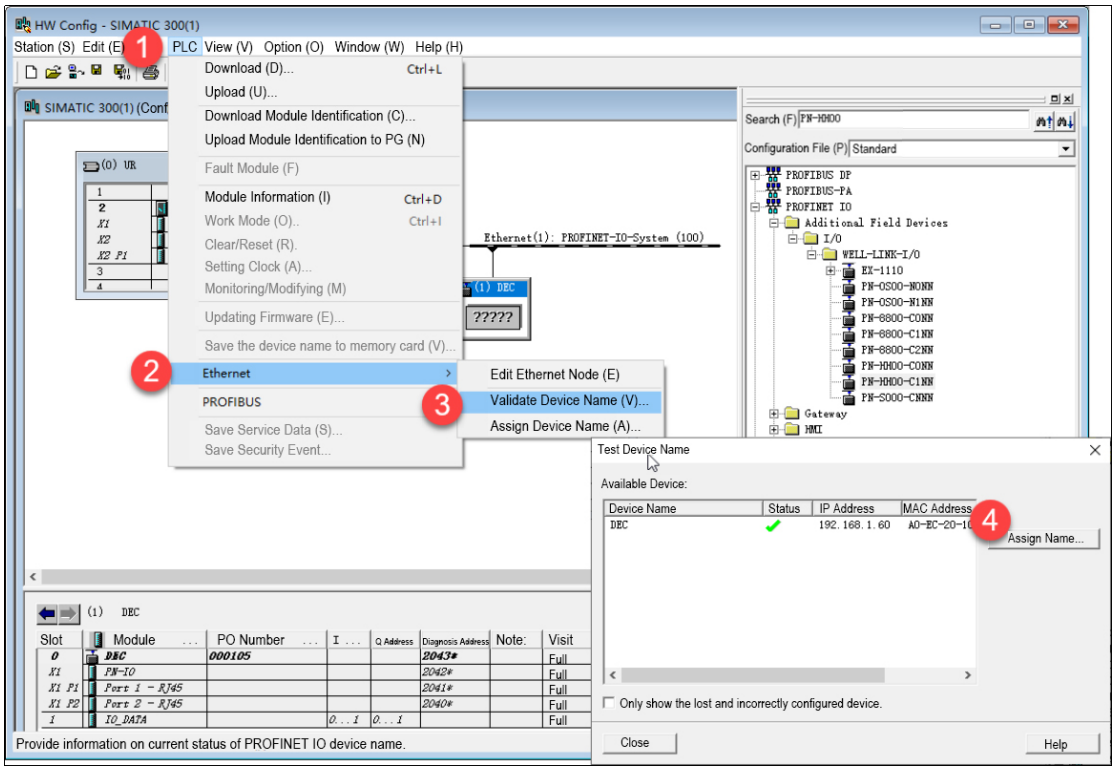


Fig.5-2-29 Verify Device Name

5.2.4 Connection of CODESYS and PROFINET Protocol IO Module and Other Configurations

1. Connection of CODESYS and PROFINET Protocol IO Module and other configurations

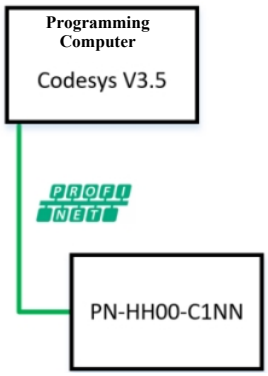


Fig.5-2-30 Communication Connection Diagram

2. See Table 5-2-4 for hardware configuration.

Table 5-2-4 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	Codesys V3.5 Installed
PN-HH00-C1NN	1	PROFINET Protocol 16DI/16DO Module
Network Cable	＞1	

3. Installation of GSD File

Open CODESYS V3.5, select "Tool" > "Device Memory Library" from Menu as shown as in Fig. 5-2-31.

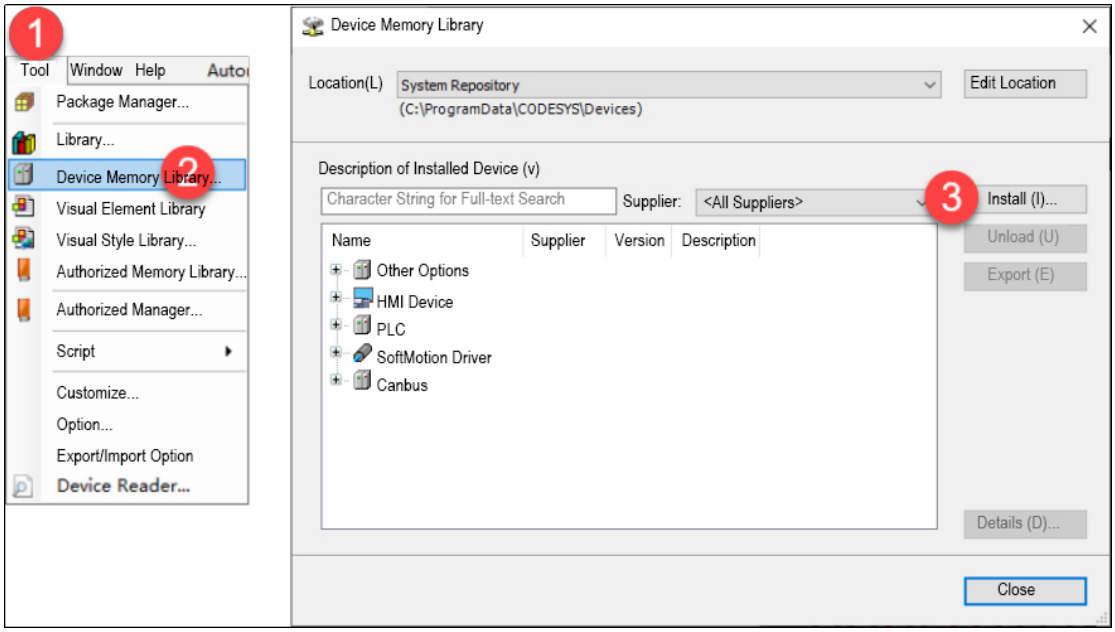


Fig. 5-2-31 Installation of GSD File

4. New Project and Device Configuration

Open CODESYS V3, select “New Project”>“Project”>“Standard Project” as shown as Fig. 5-2-33.

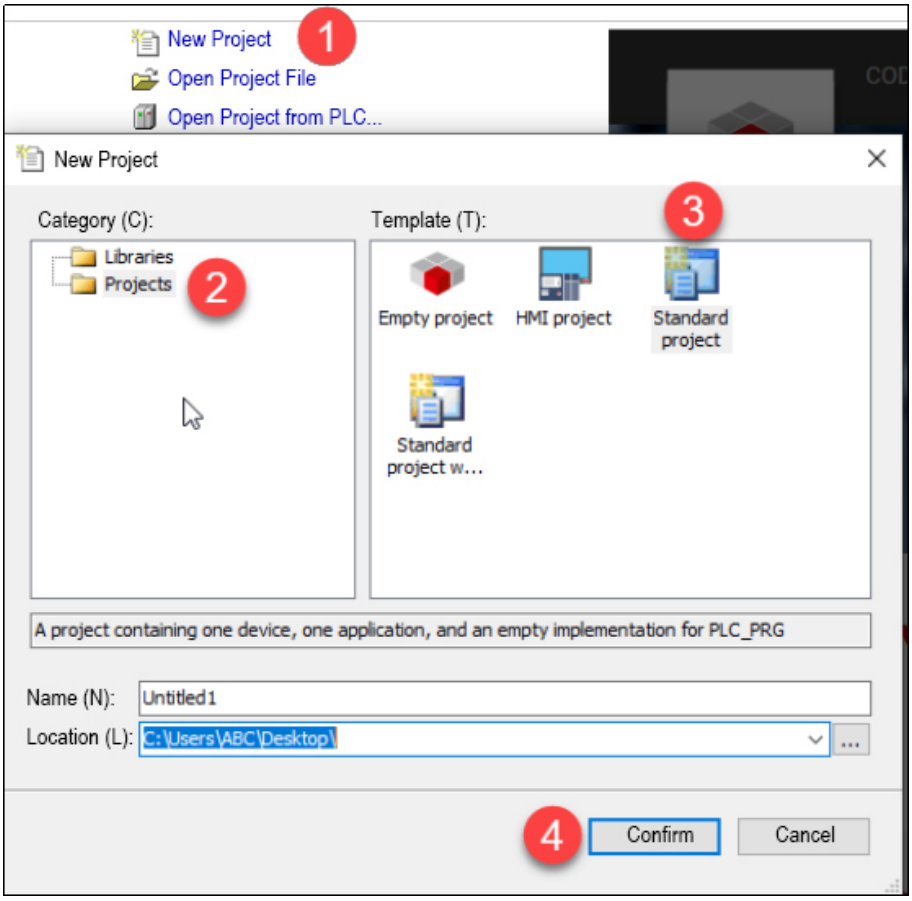


Fig. 5-2-33 New Project

Select " CODESYS SoftMotion Win V3" in the standard project window. Select "Structured Text" (ST) for PLC_ PRG programming language as shown in Fig. 5-2-34.

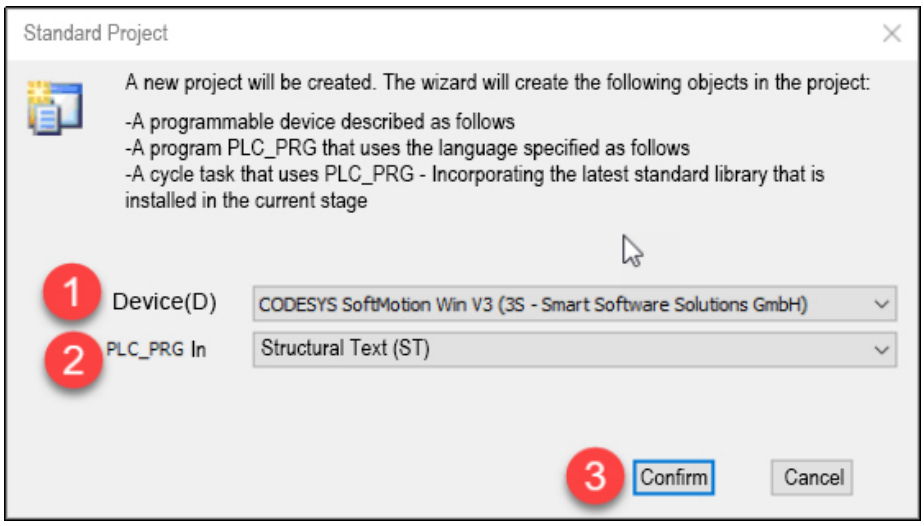


Fig. 5-2-34. Select Device and Programming Language

In the device tree, select " Device (CODESYS SoftMotion Win V3") > "Add Device", add the Ethernet adapter and PROFINET IO Master Station respectively, as shown in Fig. 5-2-35 and Fig. 5-2-36.

Note: Configure PROFINET IO in the original CoDeSys software. If error, then it means the miss of Library, user needs to double-click the Library Manager and select to download the missing Library in the Library Manager window. The overall process requires the network connection. In addition, the IP address and network segment of the network interface connected to the IO device, to prevent that the IP address of the IO device is not sharing the same network while setting.

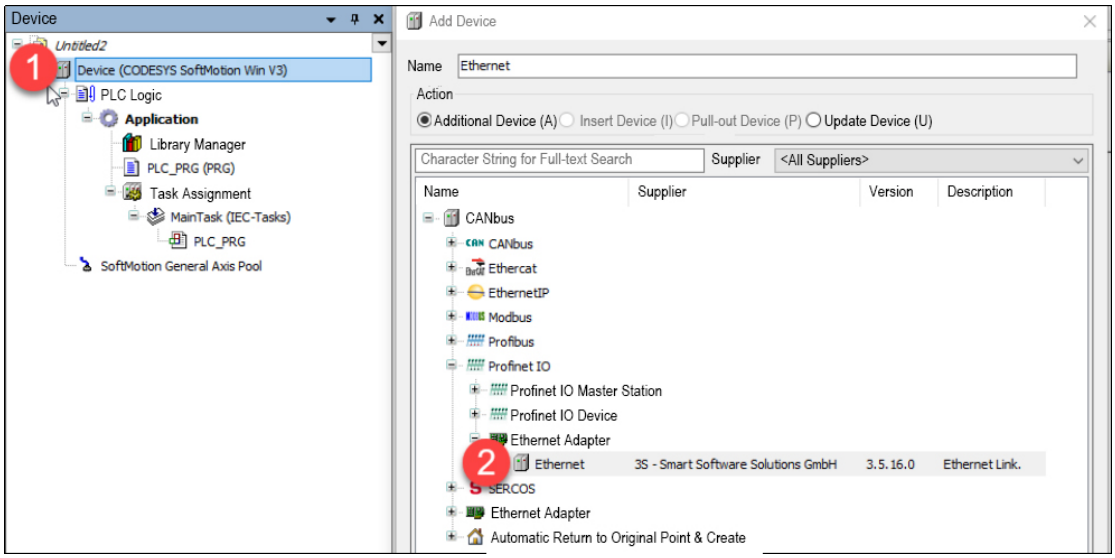


Fig. 5-2-35 Add Ethernet Adaptor

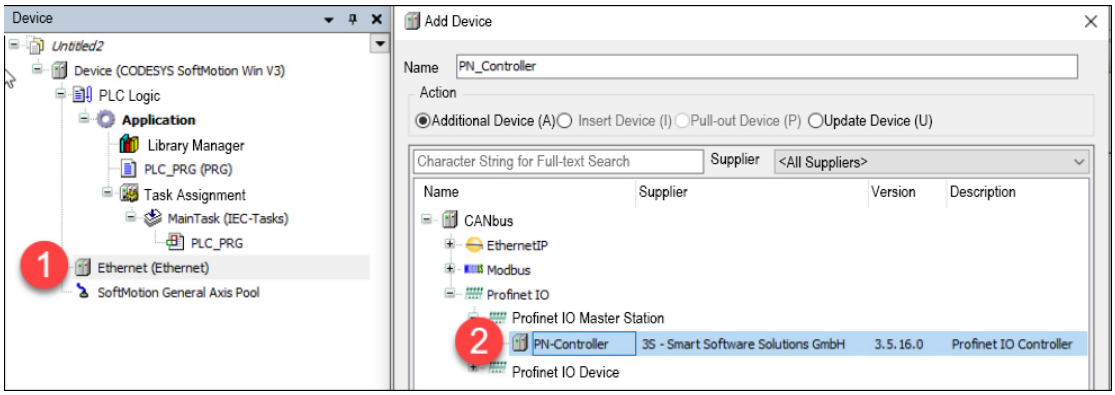


Fig.5-2-36 Add PROFINET IO Master Station

Double click "Ethernet" in the device tree to allocate the Ethernet port and set the IP parameters of the PROFINET IO main station, as shown in Fig. 5-2-37 and Fig. 5-2-38.

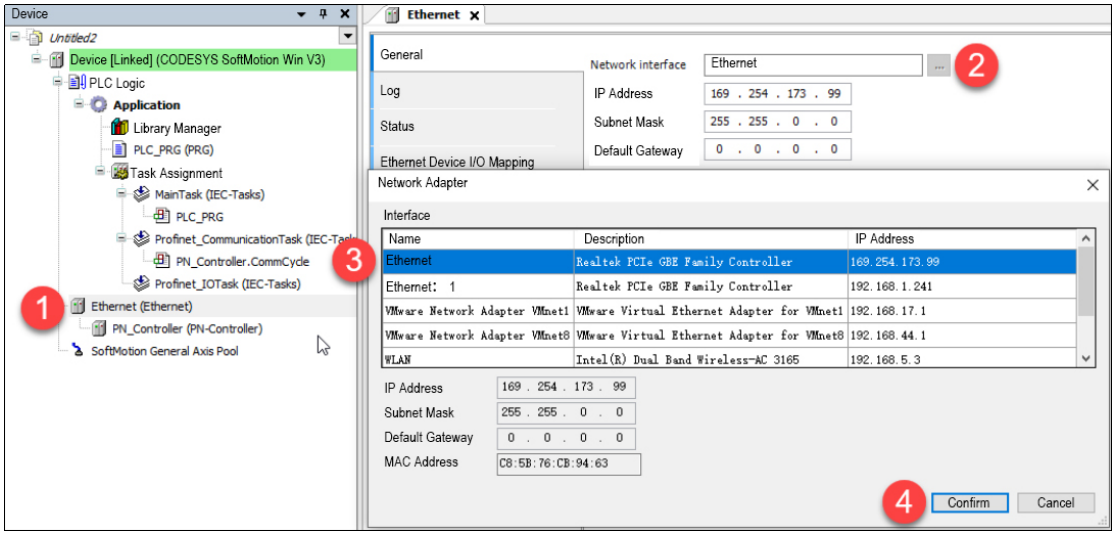


Fig. 5-2-37 Ethernet Port

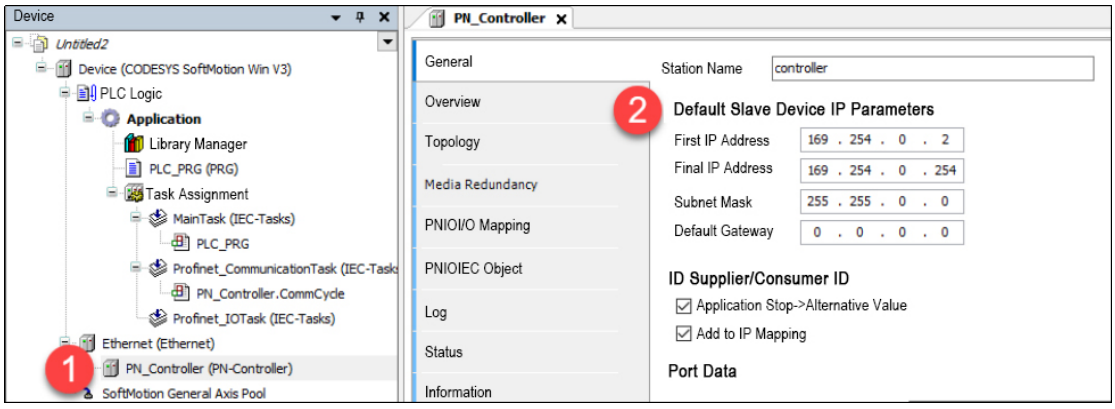


Fig.5-2-38 Set PROFINET IO Main Station IP

Download the program to the Controller and start running, and then exit. Right click PN_ Controller, select "Scan Device", in the device window, select the Module, and assign the device name and IP address, as shown in Fig. 5-2-39. Copy the device to the project, as shown in Fig. 5-2-40.

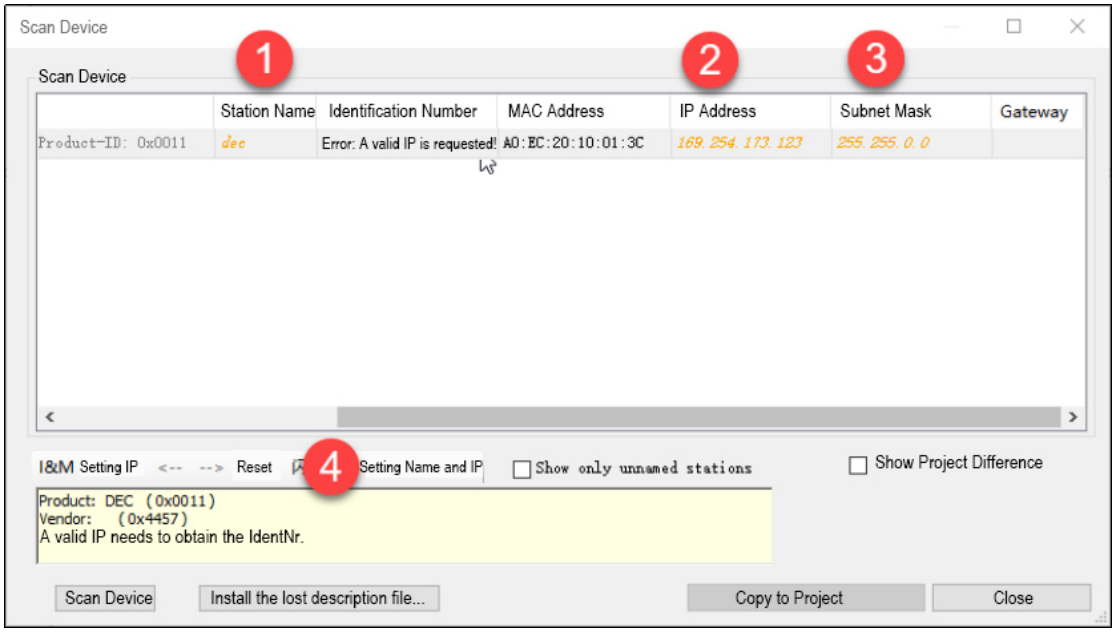


Fig. 5-2-39 Assign Name and IP Address

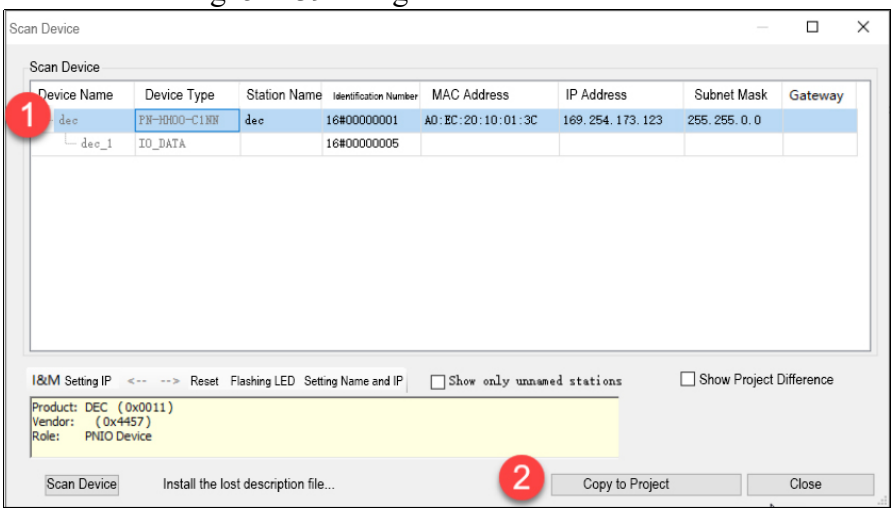


Fig. 5-2-40 Copy Device to Project

5. Program Download and Device Monitor

Download the project to the controller, and start running and monitoring, shown as Fig. 5-2-41.

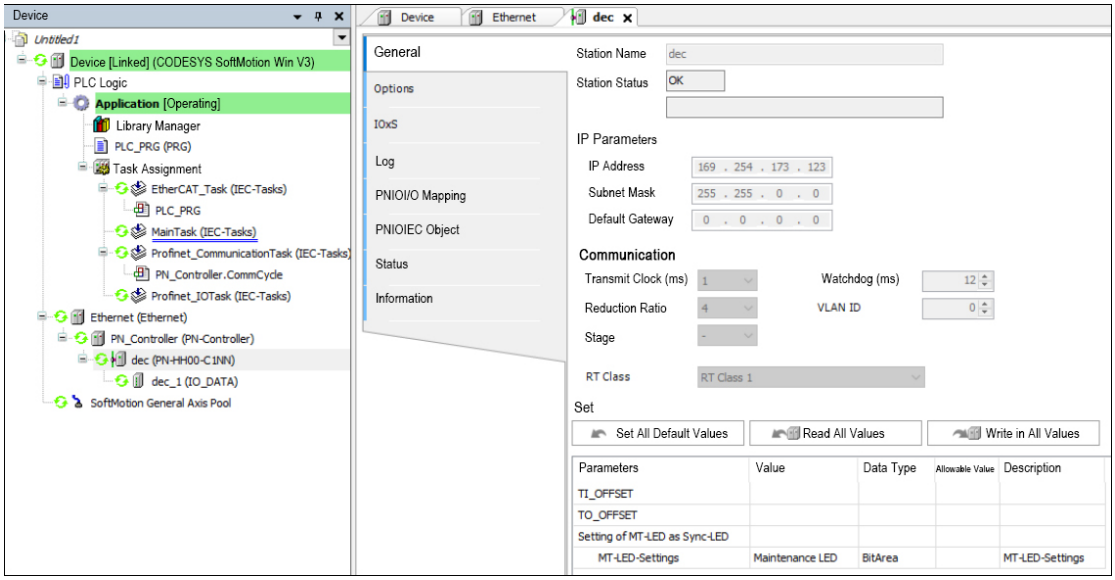


Fig. 5-2-41 Program Download and Monitoring

5.3 Connection between CC-Link IE Field Basic Protocol IO Module and PLC

5.3.1 GX-Works2 and CC-Link IE Field Basic Protocol IO Module Connection and Configuration

1. See Fig. 5-3-1 for communication link diagram.

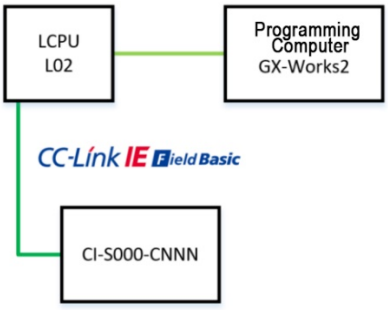


Fig. 5-3-1 Communication Link Diagram

2. See Table 5-3-1 for hardware configuration.

Table 5-5-1 Hardware Configuration

Hardware	Qty	Note
Programming Computer	1	GX-Works2 Installed
Controller	1	L02
CI-HH00-C0NN	1	CC-Link IE Field BasicProtocol 16DI/16DOModule
Network Cable	>1	

3. Installation of File Description

Open GX-Works2 programming software, select "Tools" > "Configuration File "> "login" in the Menu bar, as shown in Fig. 5-3-1, and select the Description File to be installed.

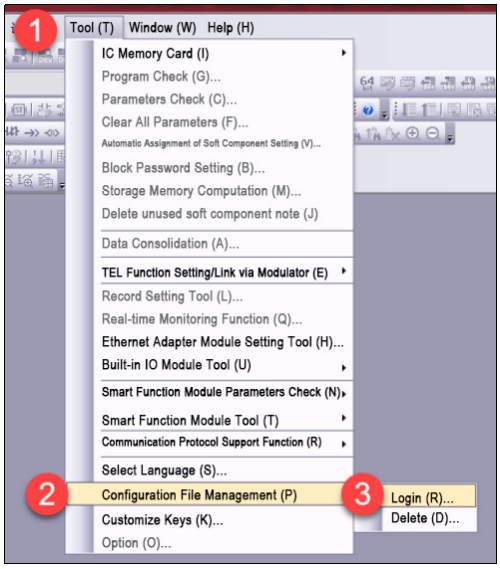


Fig.5-3-1 Installation of Description File

4. New Project

Open GX-Works2 software, select "Project" > "New" in the Menu, and select PLC series, CPU model and programming language. Take L Series CPU as an example here, as shown in Fig. 5-3-2.

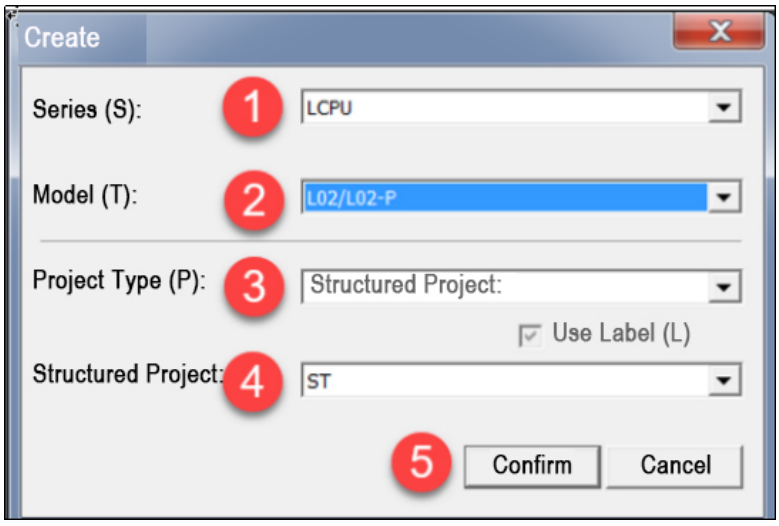


Fig.5-3-2 Select PLC Type

CC-Link IE Field Basic parameter setting： select "Parameters" > "PLC parameters" from the left navigation, select "Built-In Ethernet Port Setting" in the L parameter setting window, and set the IP and sub mask(code) of the PLC Main station. then, click "CC-Link IE Field Basic" as shown in Fig. 5-3-3

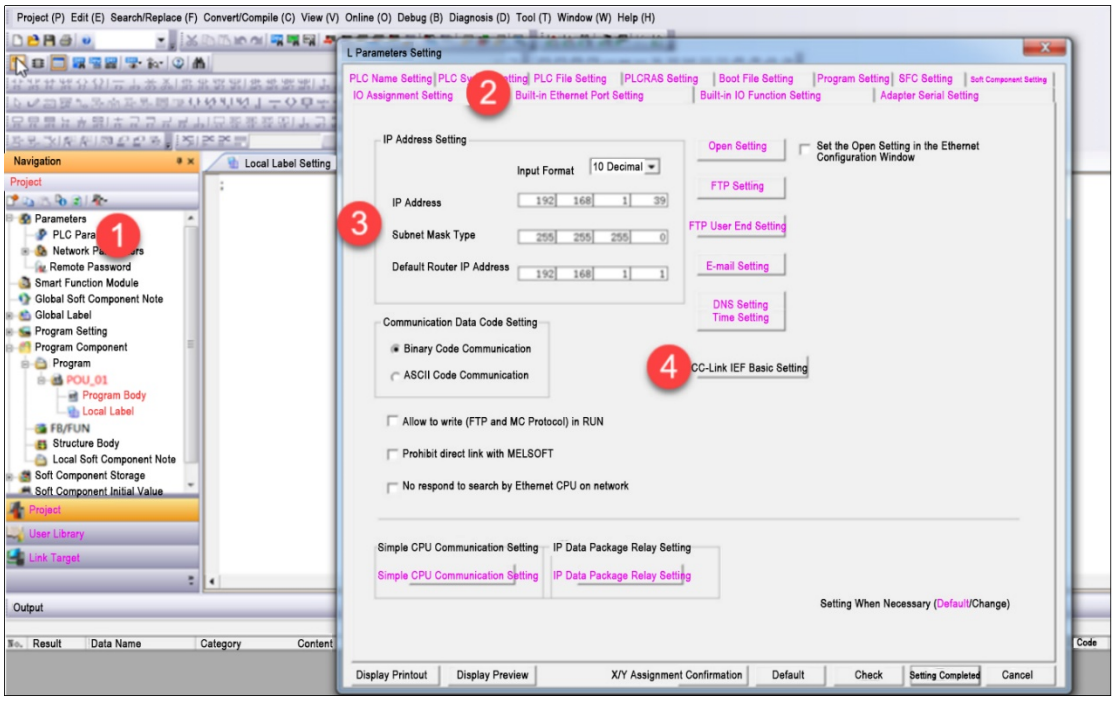


Fig.5-3-3 Set PLC IP Address and Sub-net Mask

From CC-Link IE Field Basic setting window， tick CC-Link IE Field Basic. Click network configuration settings, as shown in Fig. 5-3-4.

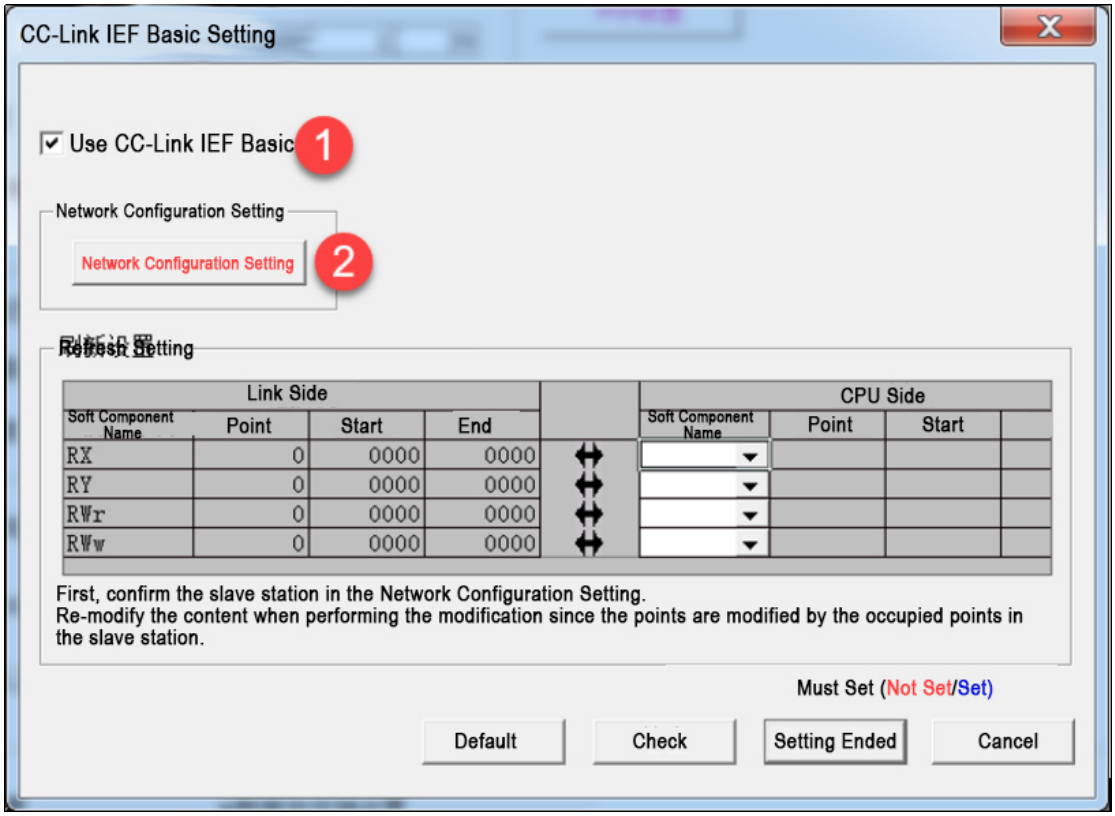


Fig. 5-3-4 Network Configuration Setting

Add Module 1: Manually, from CC-Link IE Field Basic configuration window. Drag the IO module (right side) to the CPU at the bottom left for configuration, as shown in Fig. 5-3-5.

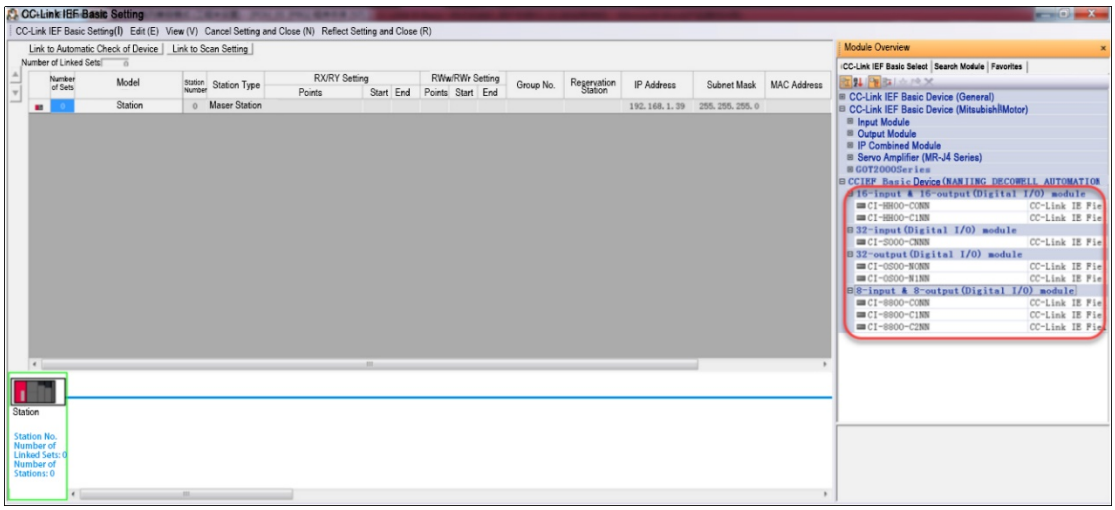


Fig. 5-3-5 Manual Addition of Module

Module Addition 2: Scan the modules in the network into the device configuration, and select "Automatic Detection of Connected Devices" in the CC-Link IE Field Basic configuration window, as shown in Fig. 5-3-6.

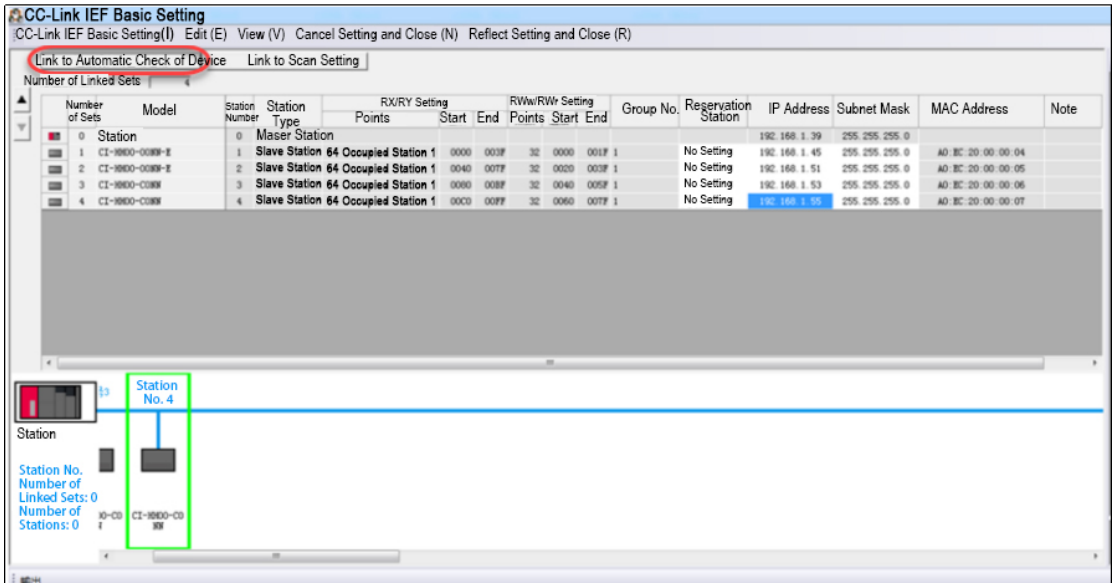


Fig. 5-3-6 Scan Module in Network

Modify the Module IP address (the default IP address is 192.168.1.88). From the CC-Link IE Field Basic configuration window, double-click the module IP address bar to modify the IP address. After the modification, right-click module the IP address and select "online" > "Reflect the Communication Settings of the Station" to complete the IP address modification, as shown in Fig. 5-3-7. Finally, click "Reflect the Settings and Close" as shown in Fig. 5-3-8.

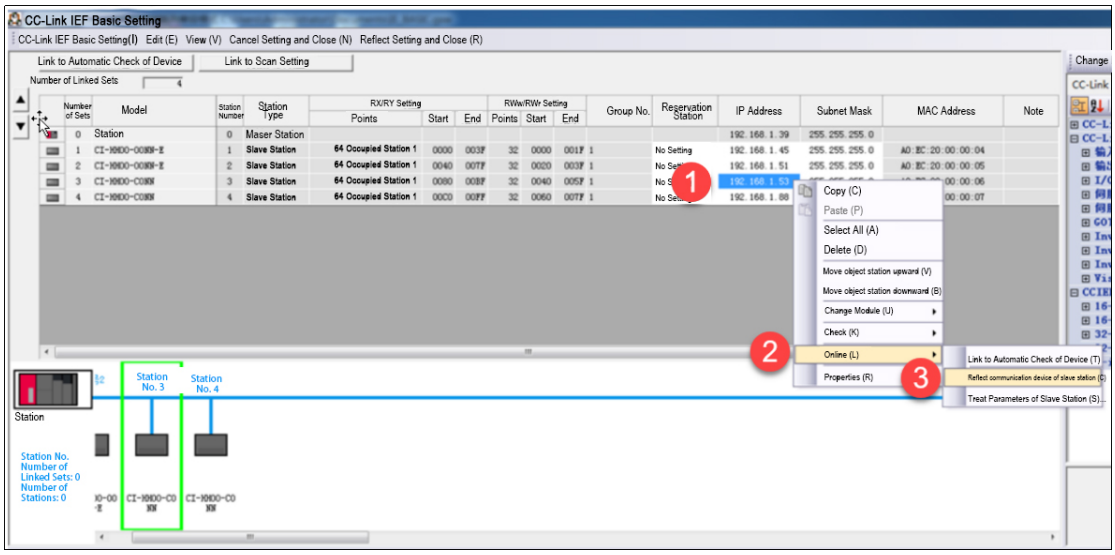


Fig. 5-3-7 Modification of Module IP Address

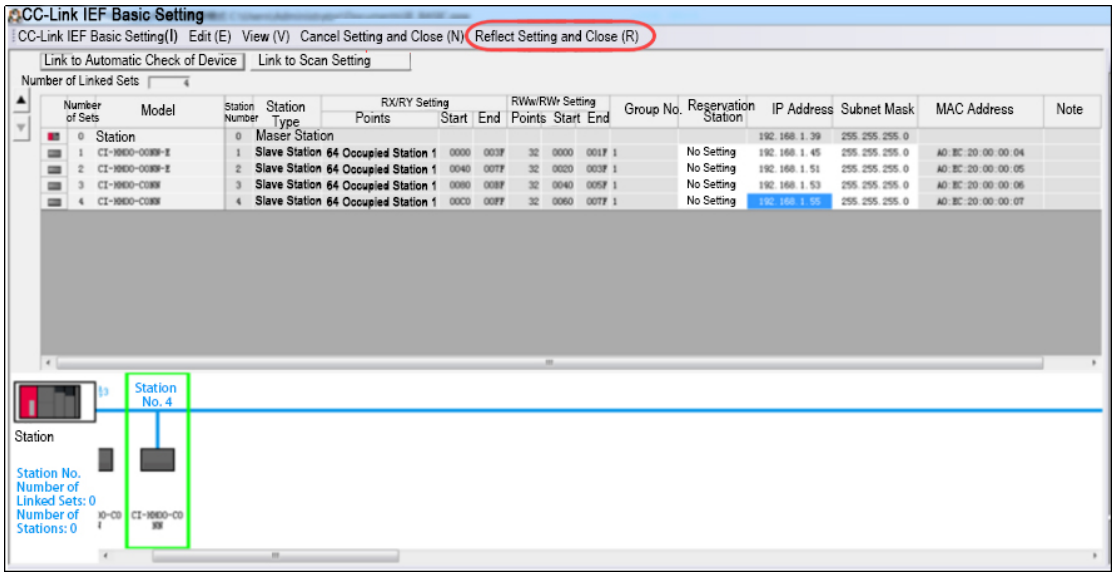


Fig. 5-3-8 Reflection of Setting and Closing

For IO mapping configuration, set the starting point of the input and output of the Remote IO Module from the CC-Link IE Field Basic configuration window as shown in Fig. 5-3-9.

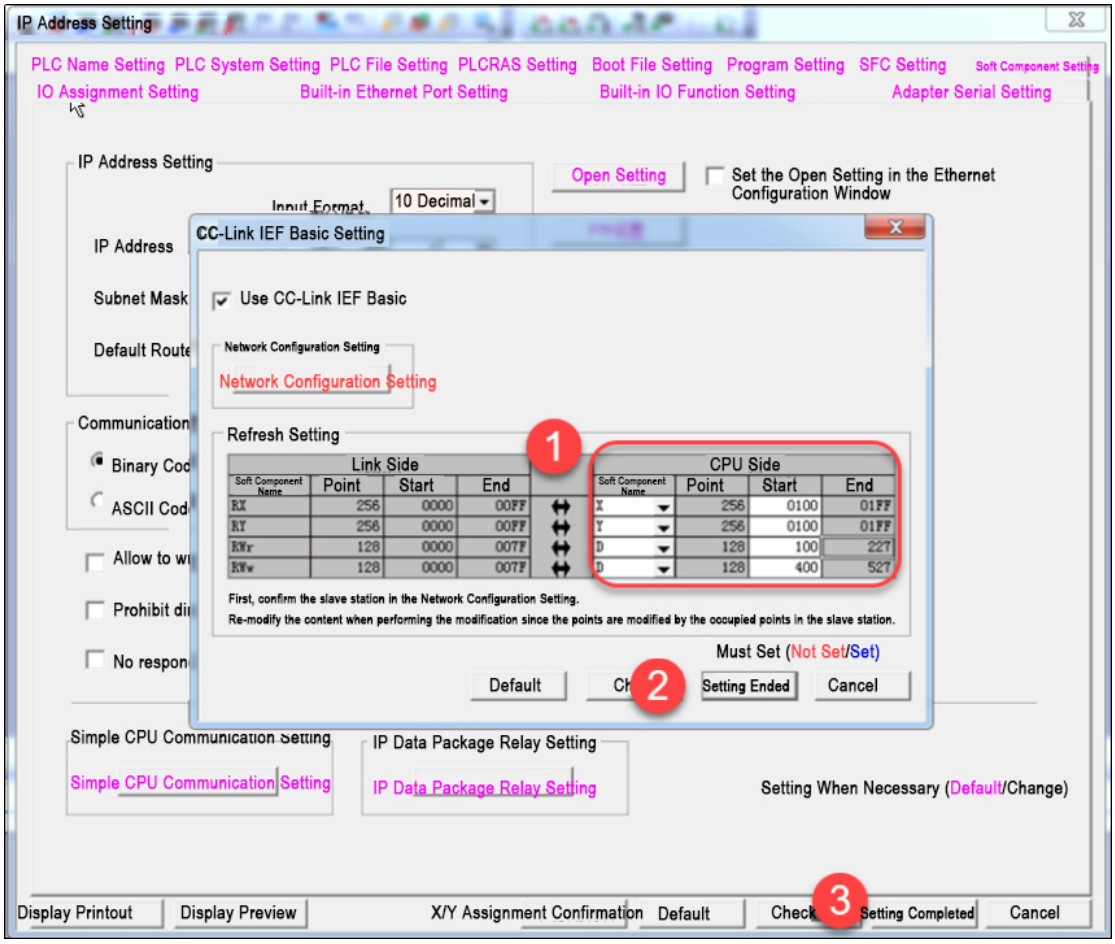


Fig. 5-3-9 IO Mapping Configuration

5. CC-Link IE Field Basic output point reflection method: each slave occupies 64 points, as 64DI and 64DO. The input and output points set here related to starting points X100 and Y100. The reflection of slave station IO points is shown in Fig. 5-3-10.

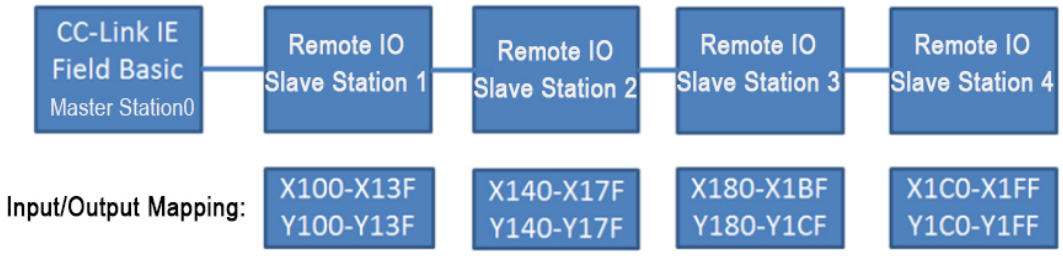


Fig. 5-3-10 Slave Station IO Point Mapping

6. Communication Status Diagnosis

After the parameter configuration setting, the communication status can be tested through online diagnosis after downloading the project to the PLC. Select "Diagnosis" > "CC-Link IE Field Basic Diagnosis" from the Menu, and check the slave station status of IO module from the CC-Link IE field Basic diagnosis window, as shown in Fig. 5-3-11.

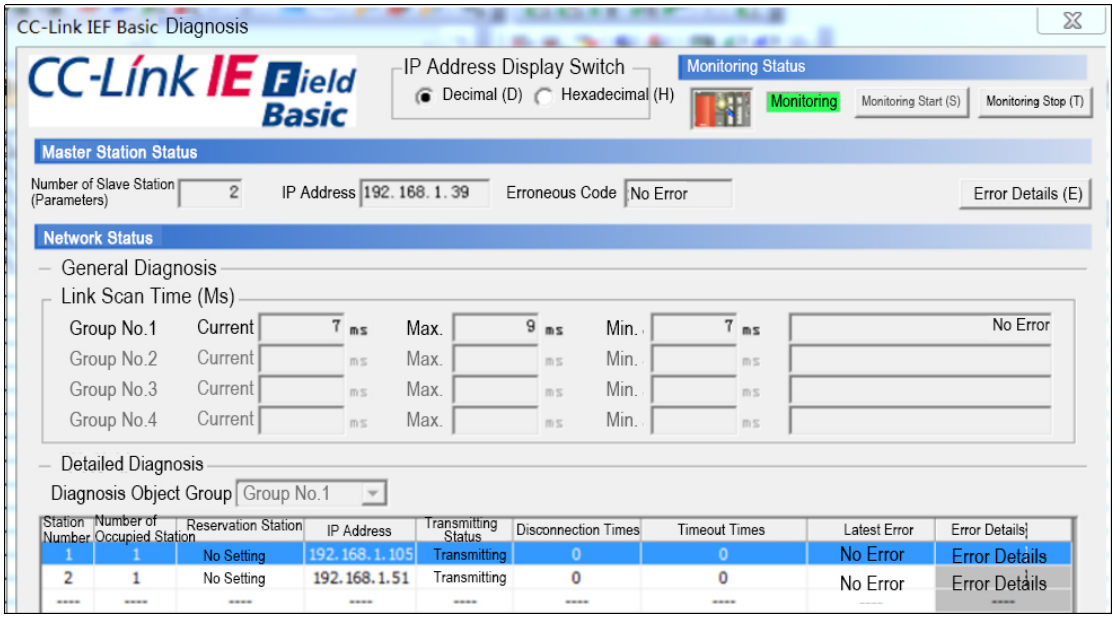


Fig. 5-3-11 Communication Status Diagnosis

5.4 IO Module and PLC Link of CC-Link Protocol

5.4.1 IO Module Link and Configuration of GX-Works2 and CC-Link Protocol

1. See Fig. 5-4-1 for communication link diagram.

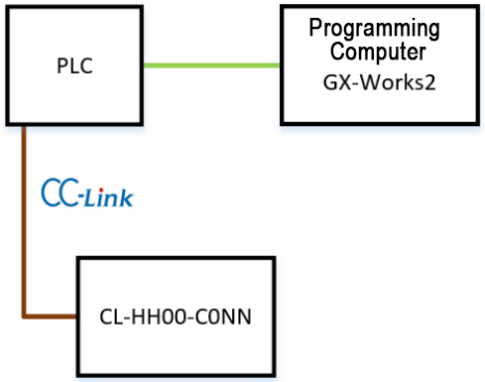


Fig. 5-4-1 Communication Link Diagram

2. See Table 5-4-1 for hardware configuration.

Table 5-4-1 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	GX-Works2 Installed
PLC	1	Support CC-Link protocol
CL-HH00-C0NN	1	CC-Link Protocol 16DI/16DO Module
CC-Link Communication Wire	>1	

3. New Project and Communication Parameters Configuration

Open GX-Works2, select the actual onsite CPU Type, and then "Parameters" > "Network Parameters >" CC-Link " in the navigation (left side) of the project. Set CC link slave station setting parameters in the CC-Link parameter setting window, as shown in Fig. 5-4-2 and the CC link Network Parameters, as shown in Fig. 5-4-3.

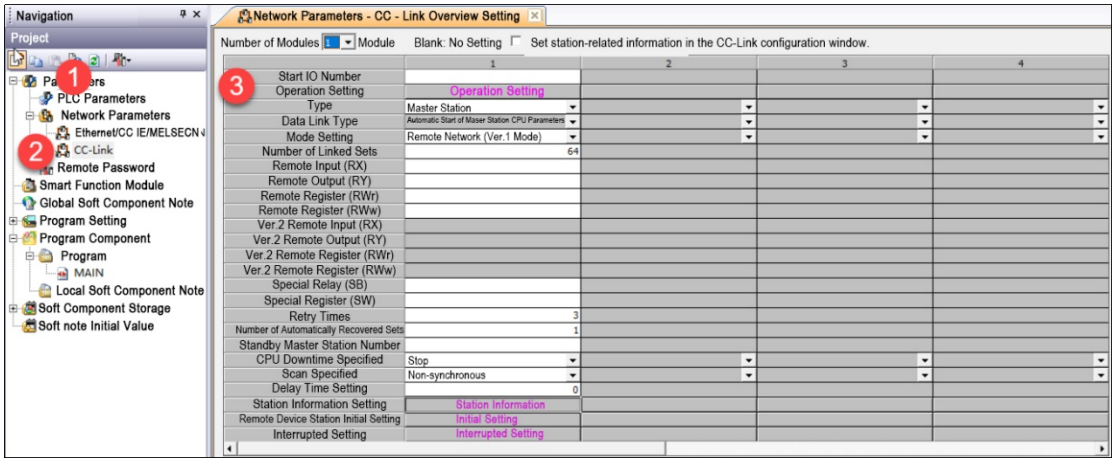


Fig. 5-4-2 Open CC-Link Parameter Setting Window

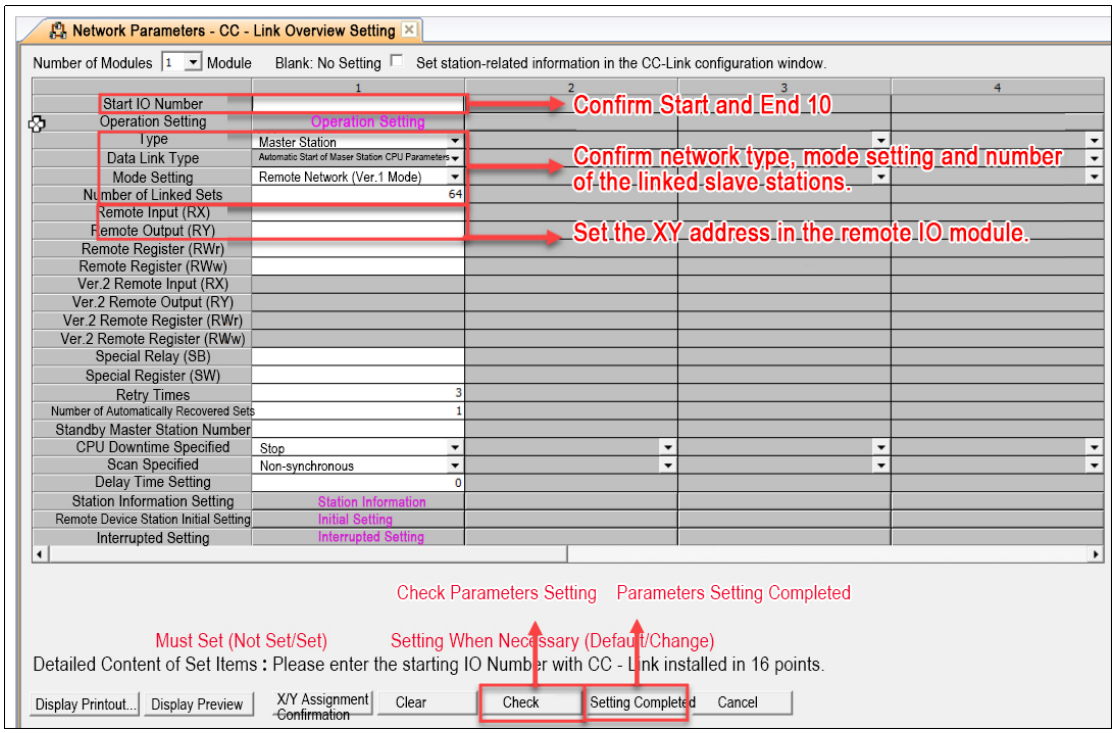


Fig. 5-4-3 CC-Link Parameter Setting

4. CC-Link Module Communication Address Assignment

FS series CC-Link protocol remote IO modules use CC-Link as remote IO stations. Each module includes 32DI and 32DO (specified in Mitsubishi CC link protocol). Module address assignment and usage are shown in Fig. 5-4-4.

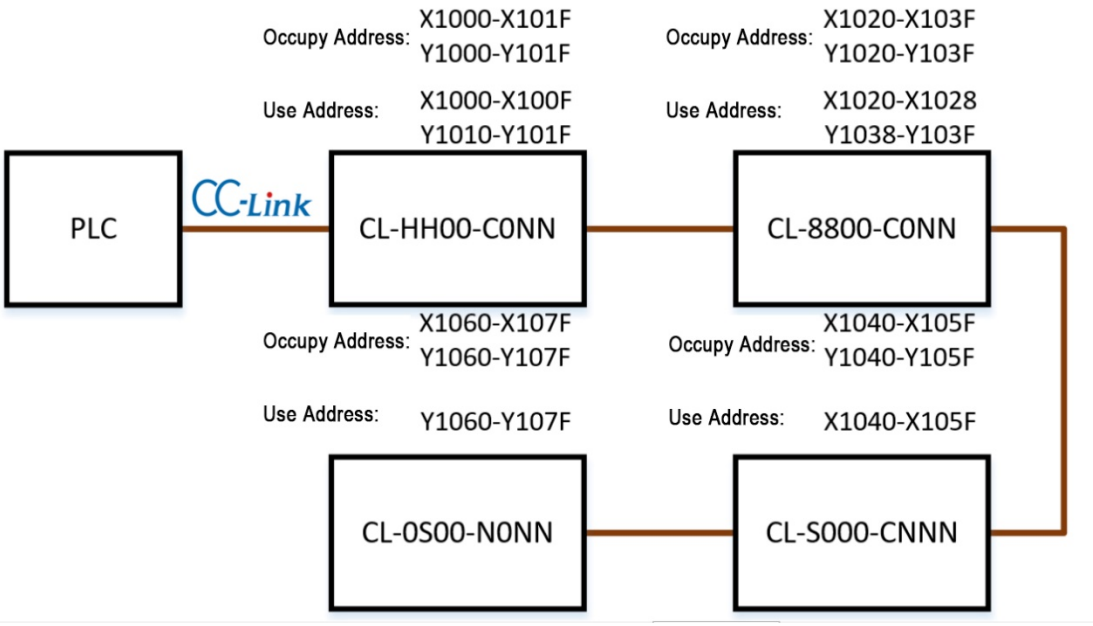


Fig. 5-4-4 CC-Link Address Assignment

5.5 IO Module and PLC Link of DeviceNet Protocol

5.5.1 IO Module Link and Configuration of CX-one and DeviceNet Protocol

Note: CX one and EX-101 includes manual and Auto modes. Please refer to Fig. 5.3.1 for detail 4 and detail 5.

1. See Fig. 5-5-1 for the communication link diagram.

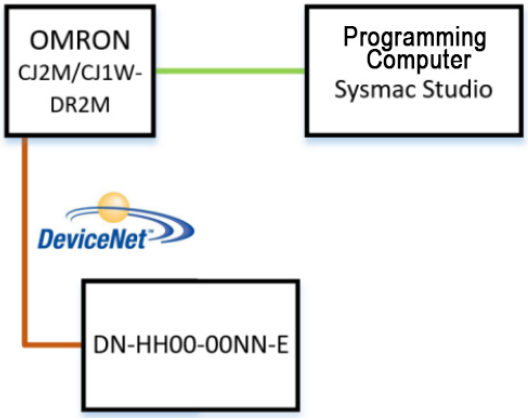


Fig. 5-5-1 Communication Link Diagram

Note: The power interface of DeviceNet adapter needs to be connected to the DC24V power supply separately， and the two terminal modules in the network shall add with the terminal resistance, shown in Fig. 5-5-2 below.

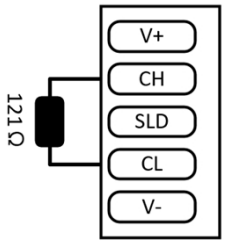


Fig. 5-5-2 Terminal Resistance Wiring

2. See Table 5-5-1 for hardware configuration.

Table 5-5-1 Hardware Configuration

Hardware	QTY	Remark
Programming Computer	1	CX-one
Controller	1	CJ2M/ CJ1W-DR2M
DN-HH00-C0NN	1	DeviceNet Protocol 16DI/16DO Module
DeviceNet 通讯线	>1	

3. Installation of EDS File

Open CX-Integrator configuration software, and select "Tool" > "DeviceNet Tool" > "Edit Configuration File" > "Supplier ID// Device Type List" in the Menu as shown in Fig. 5-5-3.

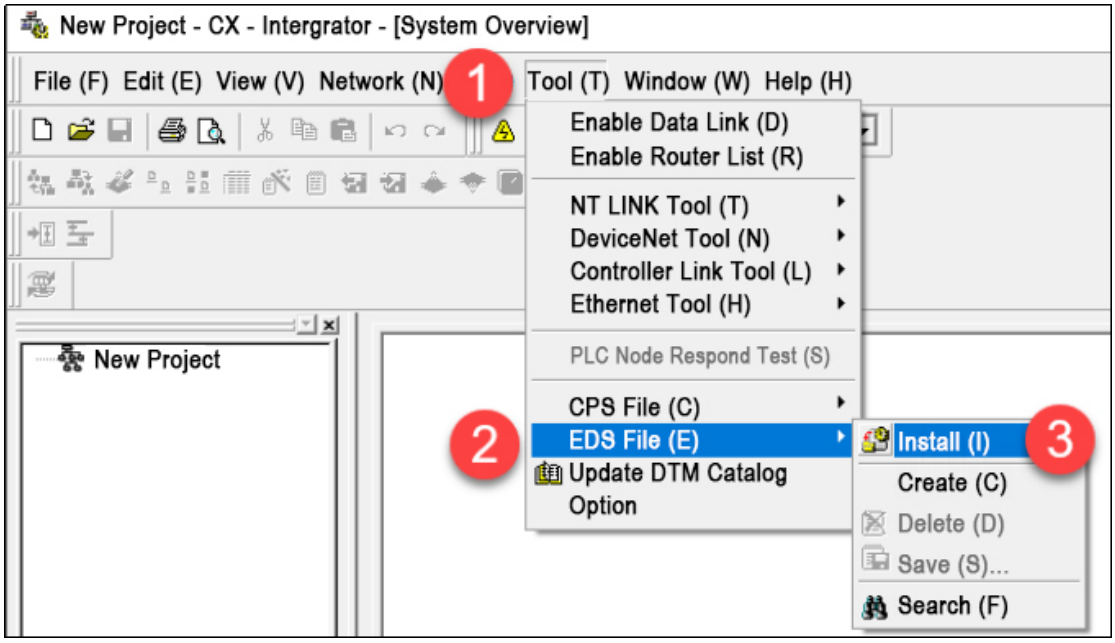


Fig.5-5-3 Installation of EDS File

4. Device Configuration (Automatic Scanning)

Open CX-Integrator configuration software, select "Network" > "Communication Setting" in the menu, and select the PLC model as " CJ2M（CPU Type：CPU31)" as shown in Fig.5-5-4.

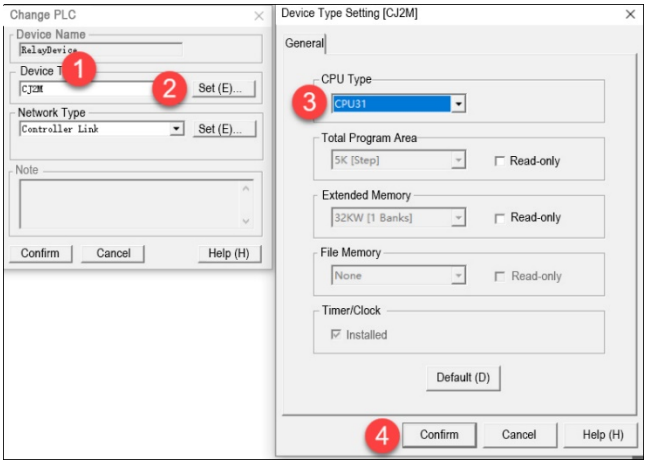


Fig.5-5-4 Set CPU Configuration

As for the Auto scanning, Click "Online Working Button"， Double- Click DeviceNet[CJ1W-DRM21] Network（-）, Node (1), unit (0), and name the network to confirm the transmission, as shown in Fig.5-5-5. Double click DN-HH00-C0NN, then you can check if OMRON PLC scanned to DN-HH00-C0NN slave station.

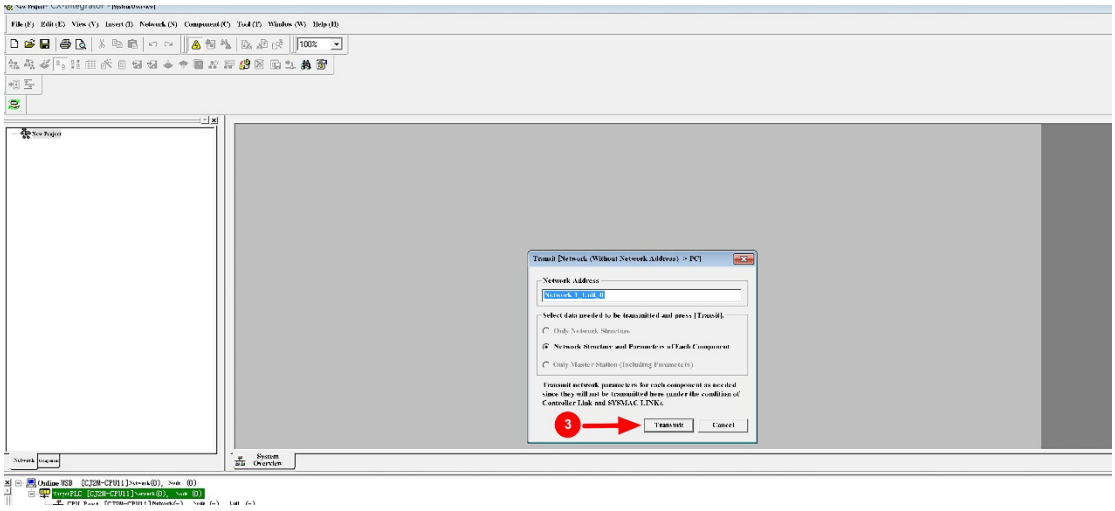


Fig.5-5-5 Automatic Scanning

5. Device Configuration (Manual)

Right click "New Project". Select "add network". Select "DeviceNet" shown as in Fig.5-5-6.

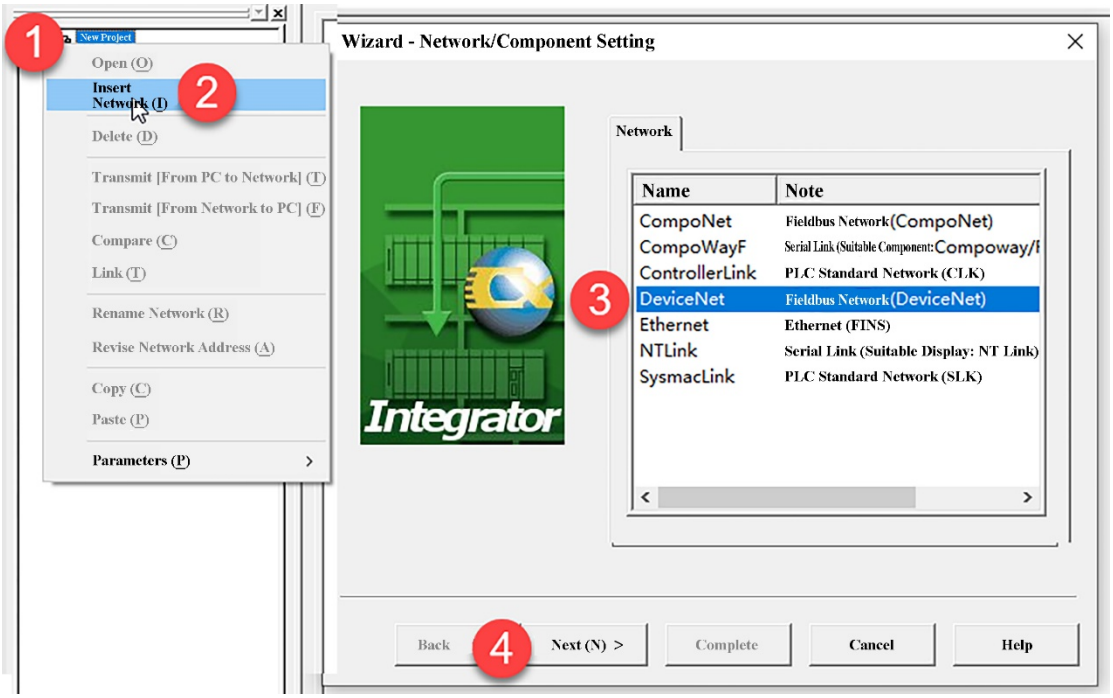


Fig.5-5-6 Addition of Network

From network, add DeviveNet communication module CJ1W-DRM21 first, then add IO devices, right-click the network Fig. label > "Insert component", and select DN-HH00-C0NN in the guild window, as shown in Fig.5-5-7.

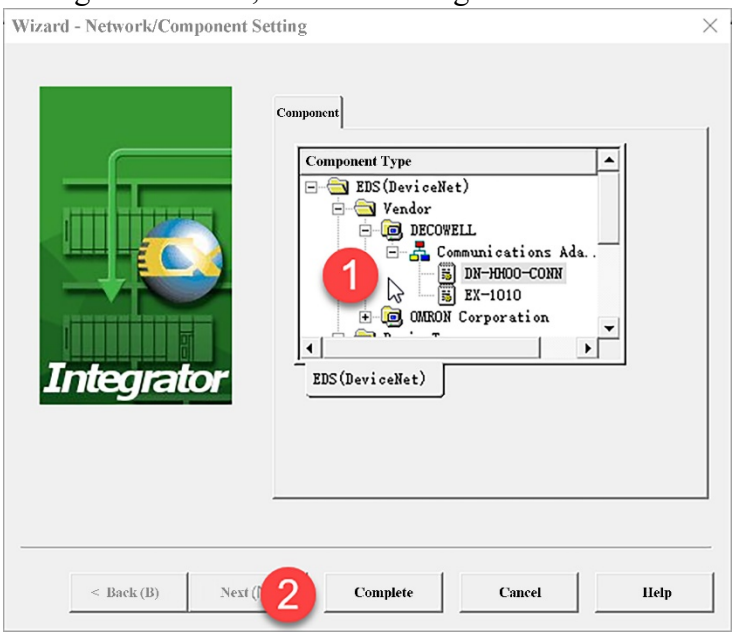


Fig.5-5-7 Addition of Remote IO Module

6. Download of Configuration Information

Right-Click “CJ1W-DR2M”Fig. Label，select “Parameter”>“Edit ” as shown in Fig.5-5-8.

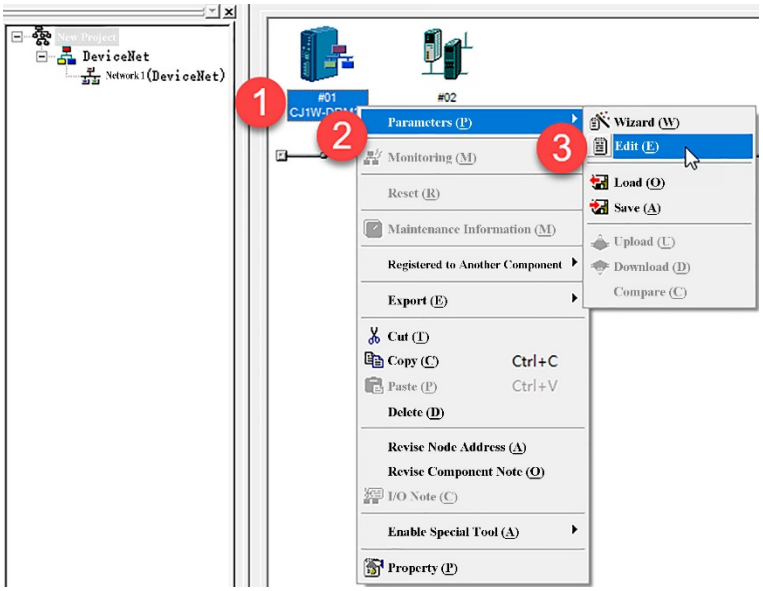


Fig.5-5-8 Open Parameter Edit

In the Edit Device Parameters window, select the "registration button" to set the Remark book from the slave station as shown in Fig.5-5-9. After successful registration, you can see the internal address of the PLC of the input and output of the slave station IO module. Finally, click the "Download" to download the configuration information to the PLC as shown in Fig.5-5-10. After downloading, you can see that the NET RUN light on the adapter is lit, and the SYS light flashes once per second.

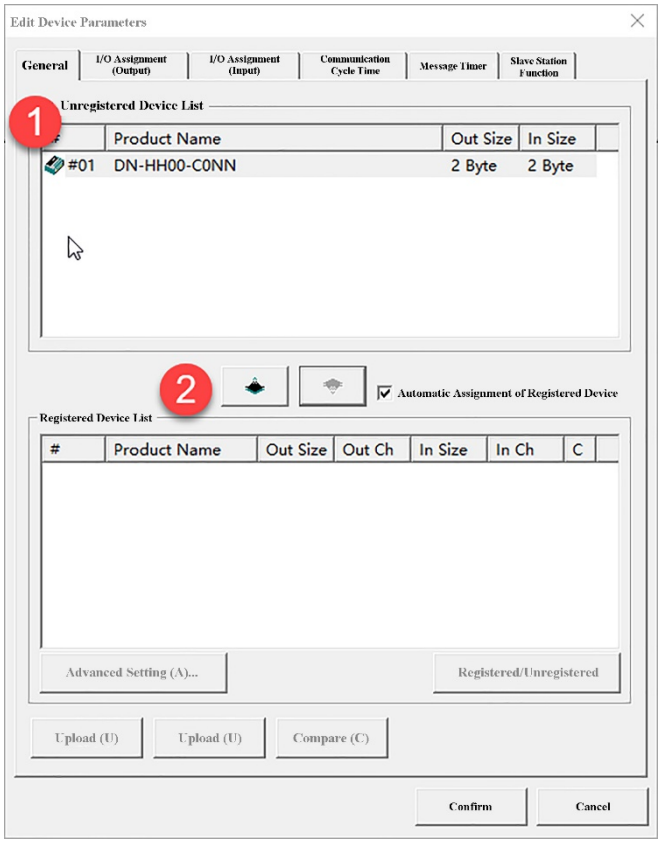


Fig.5-5-9 Slave Station Device Registration

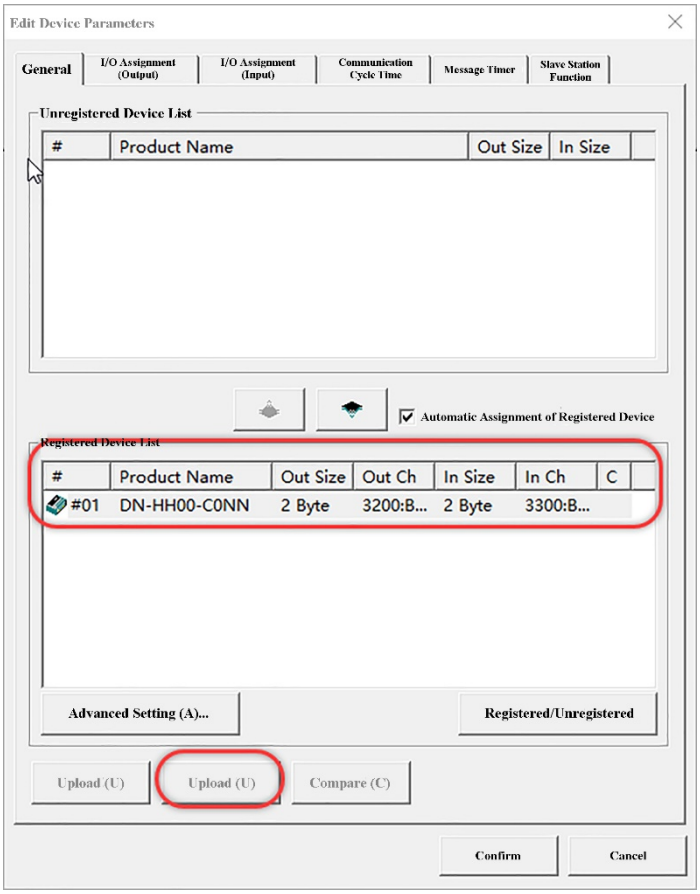


Fig. 5-5-10 Configuration Download

5.6 IO Module and PLC Link of CANopen Protocol

5.6.1 IO IO Module Link and Configuration of AutoShop and CANopen Protocol

1. See Fig.5-6-1 for the communication link diagram.

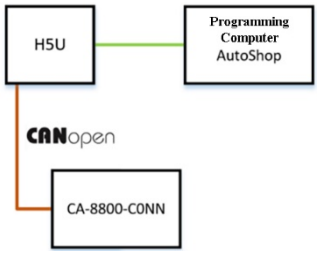


Fig.5-6-1 Communication Link Diagram

Note: The power interface on the CANopen adapter needs to be separately connected to the DC24V power supply, and the two terminal modules needs to add with the terminal resistance in the network. The connection of the terminal resistance is shown in Fig. 5-6-2 below.

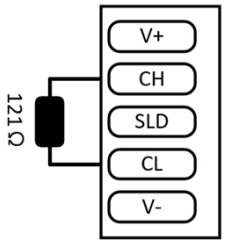


Fig.5-6-2 Terminal Resistance Connection

2. See Table 5-6-1 for hardware configuration.

Table 5-6-1 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	AutoShop
Controller	1	H5U-A8
CA-8800-C0NN	1	CANopen Protocol 8DI/8DO Module
Communication Wire	>1	

3. Installation of EDS File

Open the AutoShop programming and create the project, select the related CPU Type, right-click " CAN （CANopen） " in the left, then select "add CAN configuration", double-click the CANopen configuration, and right-click the blank area in the right CANopen device list to select "Import EDS", as shown in Fig.5-6-3.

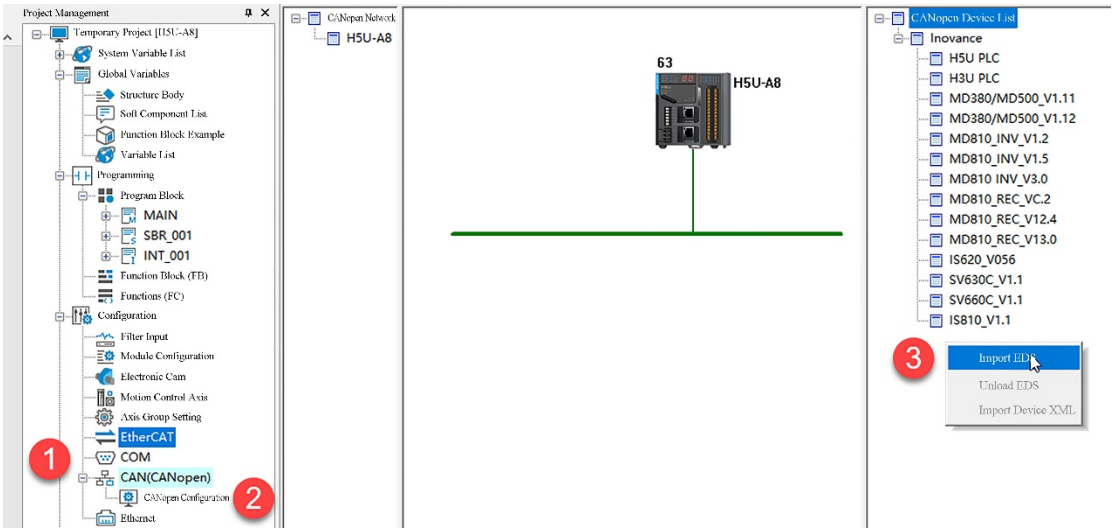


Fig.5-6-3 Installation of EDS File

4. Project Creation

Open AutoShop software, select the actual model corresponding to H5U and create the project. Double click " CAN （CANLink） " in the left configuration of the project, change the protocol type to CANopen, and set the communication rate to 125kbps as shown in Fig.5-6-4.

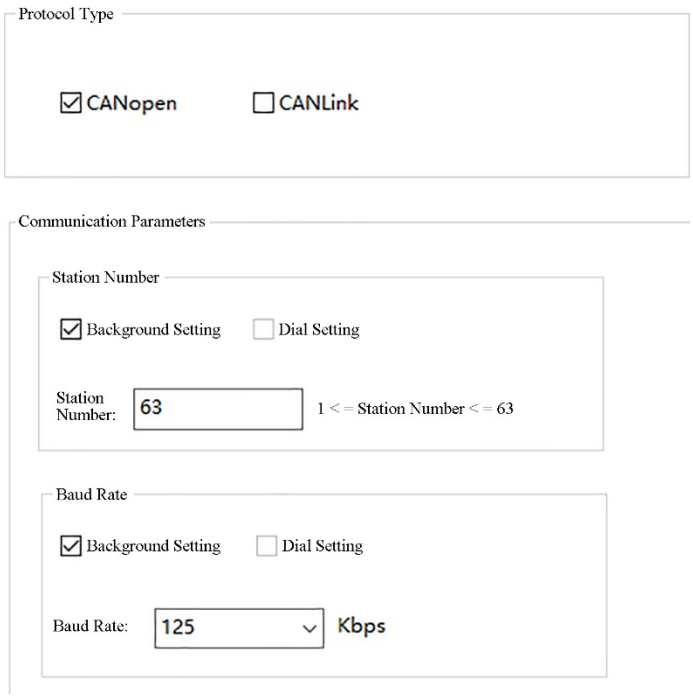


Fig.5-6-4 CANopen Communication Parameter Setting

Right click " CAN (CANLink)" of the project configuration on left side, select "add CAN configuration", and CA-8800-C0NN module in CANopen configuration, as shown in Fig.5-6-5.

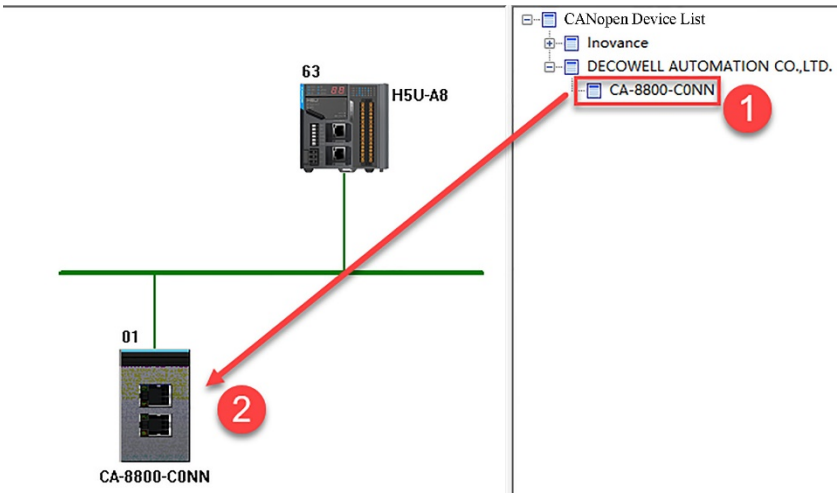


Fig. 5-6-5 Addition of CANopen Module

Double click the CA-8800-C0NN module in the configuration and configure the node ID (Note: the node ID must be consistent with the address set by the actual address dial switch, otherwise the normal communication will not be influenced), as shown in Fig.5-6-7, check the IO mapping address of the actual CANopen module, as shown in Fig.5-6-8.

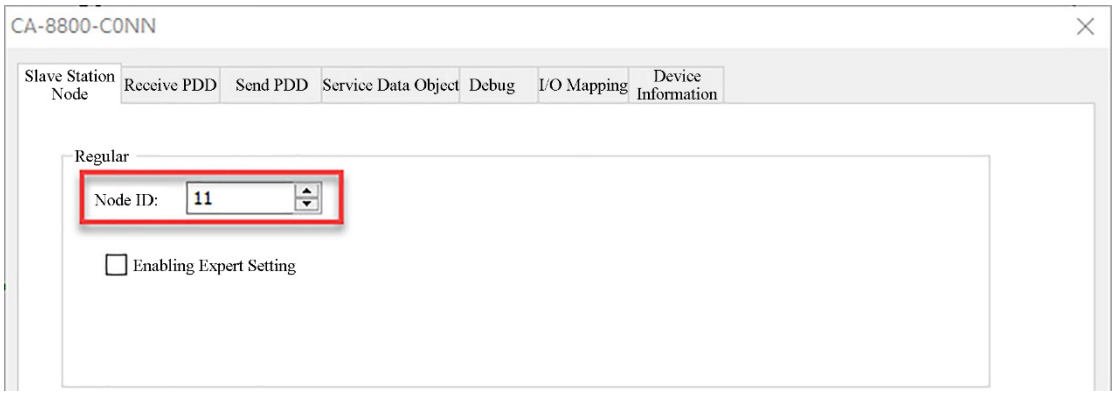


Fig. 5-6-7 Node ID Setting

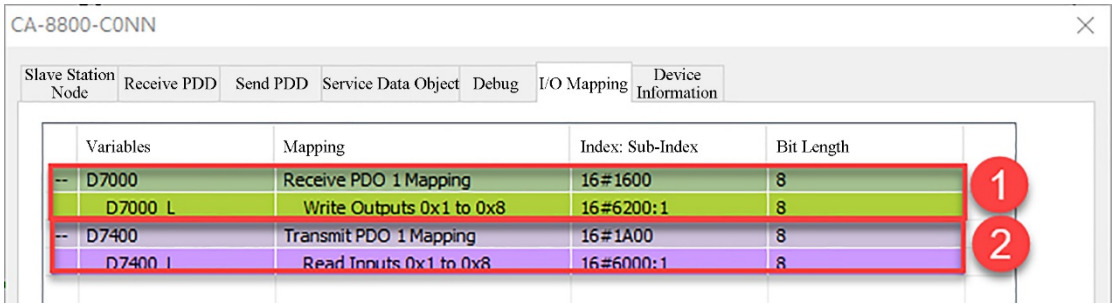


Fig.5-6-8 IO Address Mapping

Note: In the case, D700 _ L stores the value of 8 channels of digital output. D7400_ L stores the value of 8 channels of digital input.

5.6.2 IO IO Module Link and Configuration of InoProShop and CANopen Protocol

1. See Fig. 5-6-9 for the communication link diagram.

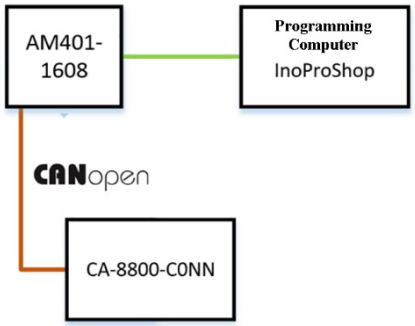


Fig. 5-6-9 Communication Link Diagram

Note: The power interface on the CANopen adapter needs to be separately connected to the DC24V power supply, and the two terminal modules needs to add with the terminal resistance in the network. The connection of the terminal resistance is shown in Fig. 5-6-10 below.

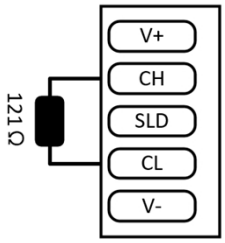


Fig.5-6-10 Terminal Resistance Wiring

2. See Table 5-6-2 for the hardware configuration.

Table 5-6-2 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	InoProShop
Controller	1	AM401-1608
CA-8800-C0NN	1	CANopen Protocol 8DI/8DO Module
Communication Wire	>1	

3. Installation of EDS File

Open the InoProSho programming software, select "Tool"> "Device Library" from the Menu. Select "Install" in the device library window, and select the EDS file to be installed, as shown in Fig.5-6-11.

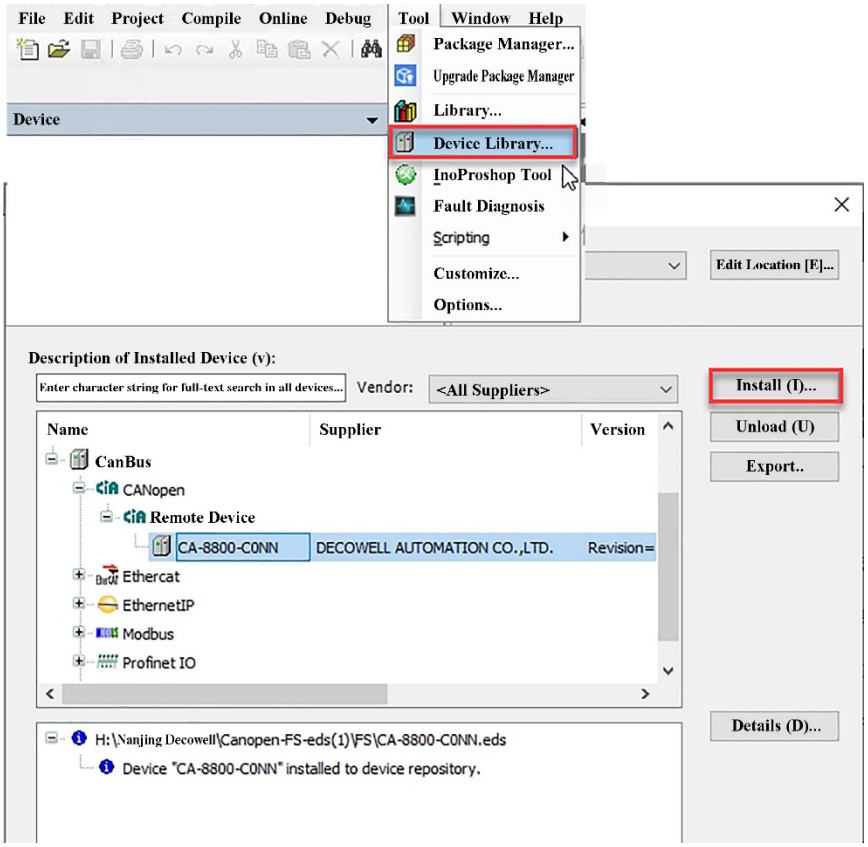


Fig.5-6-11 Installation of EDS File

4. Project Creation

Open the InoProShop programming software to create the project, select the actual related CPU Type, double-click to open " LocalBus Config " in the project configuration on the left, and click CPU to select "CANopen Master", as shown in Fig.5-6-12.

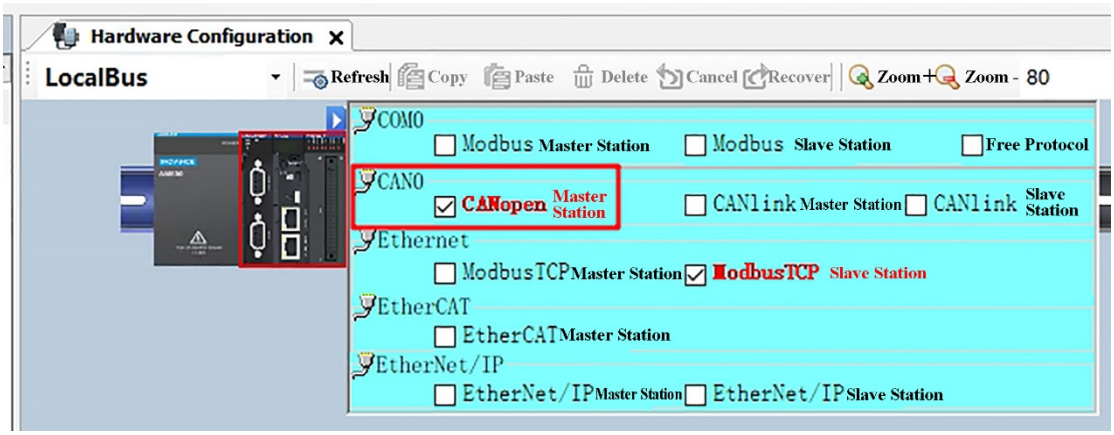


Fig.5-6-12 CANopen Configuration

From the left side device list, double-click "CANOPEN (CANopen Master)" to configure the CANopen Master Station Communication Parameter，as shown in Fig.5-6-13

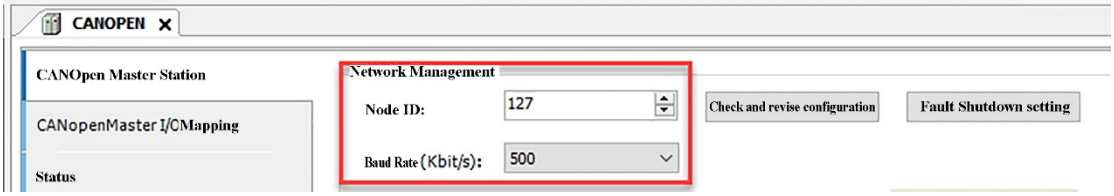


Fig.5-6-13 CANopen Master Communication Parameter Configuration

Double-click "Network Configuration" from configuration window. Add "CA-8800-C0NN" in the third-party manufacturer in the CANopen list from network devices list as shown in Fig.5-6-14.

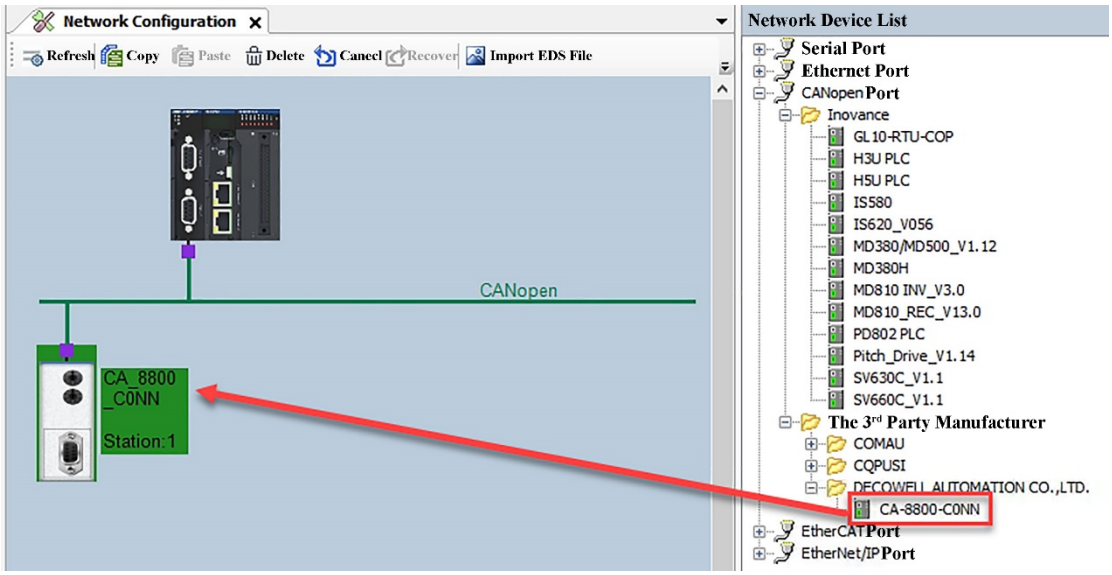


Fig.5-6-14 Addition of CANopen Module

From the device list, double-click CA-8800-C0NN module, and configure the node ID (the node ID must be consistent with the address set by the actual address dial switch, otherwise normal communication will be influenced), as shown in Fig.5-6-15. Check the IO mapping address of the actual CANopen module, as shown in Fig.5-6-16.

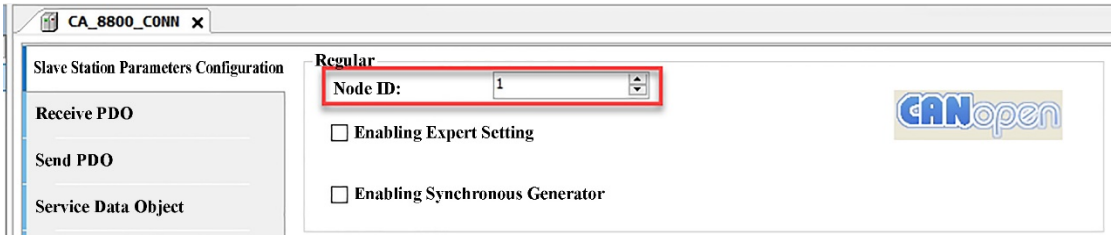


Fig. 5-6-15 Node ID Setting

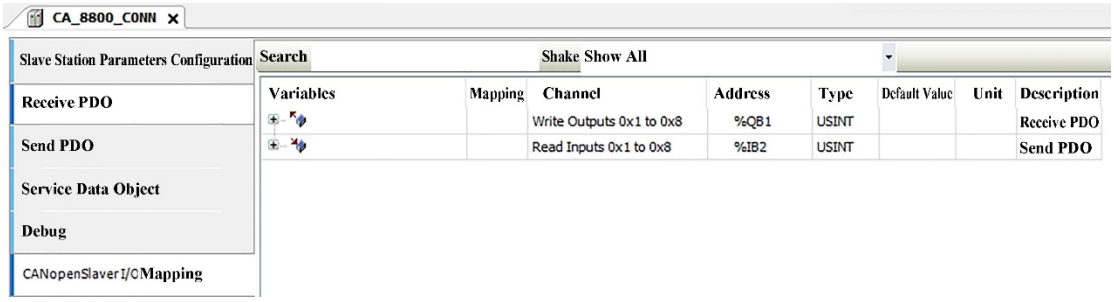


Fig. 5-6-16 IO Address Mapping

5.7 IO Module and PLC Link (E12 Module) of EtherNet/IP Protocol

5.7.1 IO Module Link and Configuration of KV STUDIO and EtherNet/IP Protocol

1. See 5-7-1 for the communication link diagram.

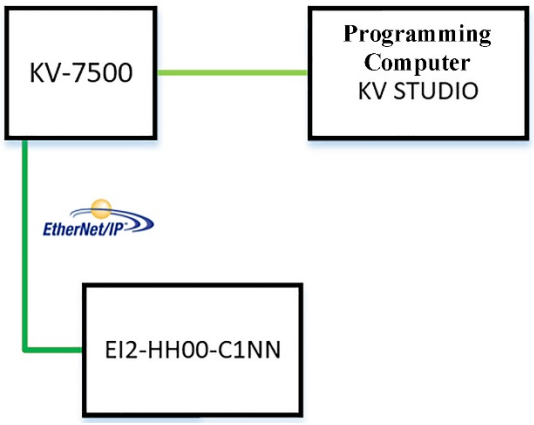


Fig. 5-7-1 Communication Link Diagram

2. See Table 5-7-1 for the hardware configuration.

Table 5-7-1 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	KV STUDIO, IP Setting Tool Software
PLC	1	KV-7500
EI2-HH00-C1NN	1	EtherNet/IP Protocol 16DI/16DO Module
Communication Wire	>1	

3. Module IP Address Setting

Open IP Setting Tool, select the network card connected to the module and scan the online IO module as shown in Fig.5-7-2.

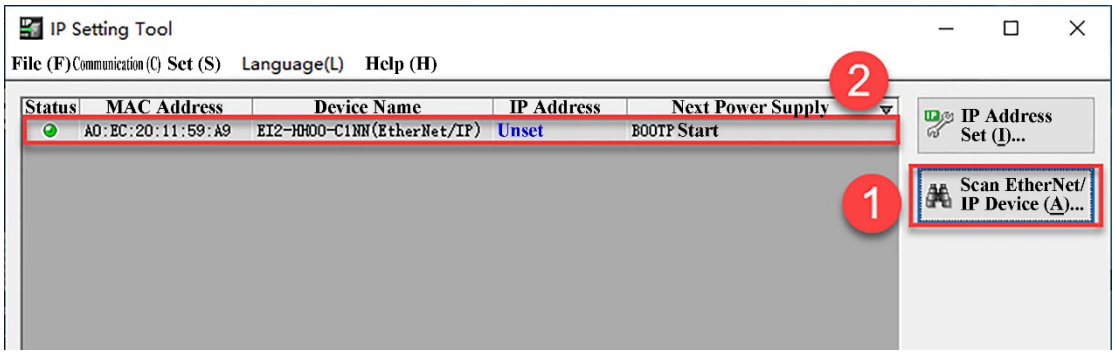


Fig.5-7-2 Scan Online IO Module

Select the module IP needs to be modified in the scan list (Note: the module factory default is BOOTP startup, and there is no IP address. After setting the IP address, please select fixed IP startup), as shown in Fig.5-7-3.

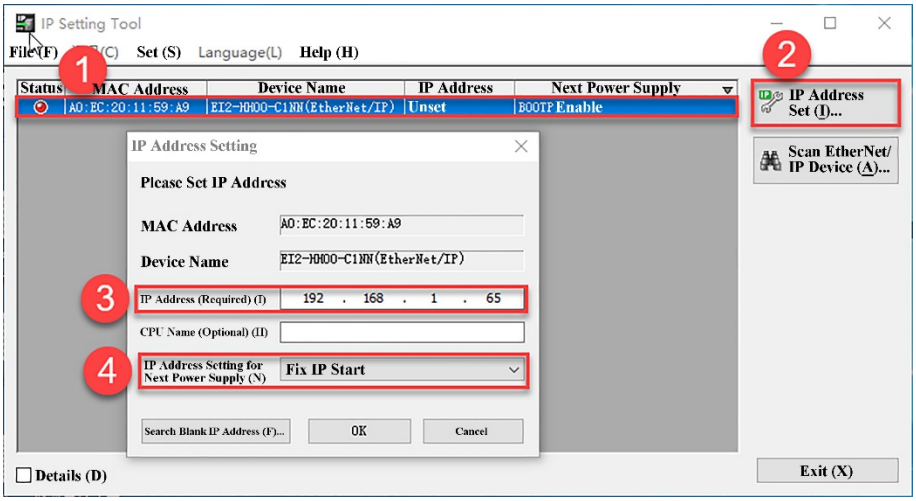


Fig. 5-7-3 IP Address Setting

Advice: The module does not have an IP address as default. Before configuring, first set the IPv4 of the PC network card to the same network segment as the IP of the module requiring for setup.

4. Installation of EDS File

Open KV STUDIO, create new project, double click "EtherNet/IP " in the project device tree to open the EtehrNET/IP setting window, and select "EDS File" > "login" from menu, as shown in Fig.5-7-4.

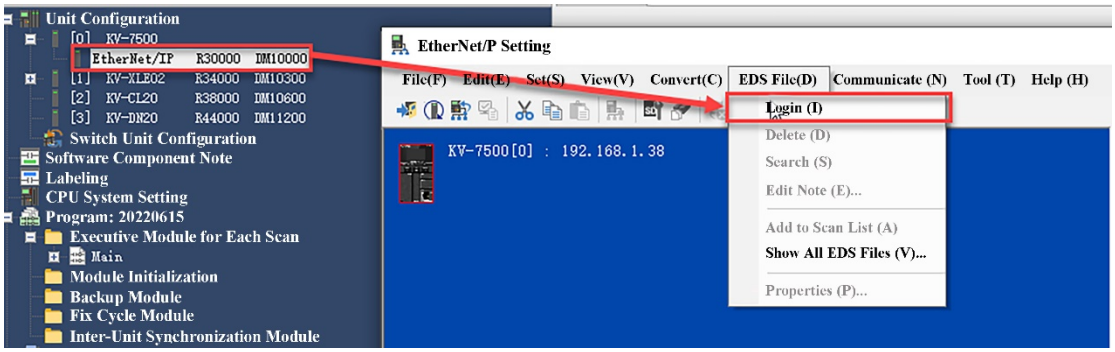


Fig. 5-7-4 Installation of EDS File

5. New Project and Device Configuration

Open KV STUDIO, create new project. Double-click “EtherNet/IP” and open EtehrNET/IP setting window from project device tree. Manually add EI2-HH00-C1NN into EtherNet/IP list as shown in Fig.5-7-5.

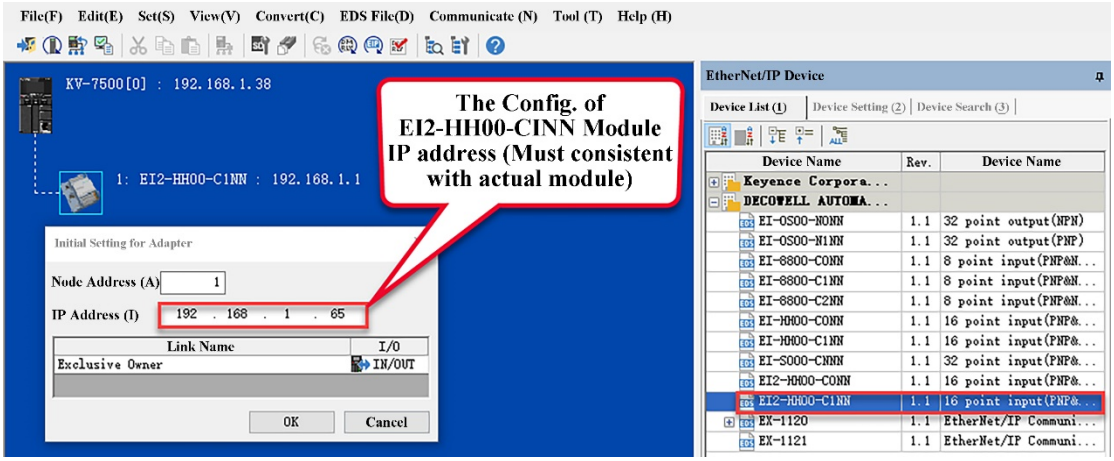


Fig.5-7-5 Manually add EI2-HH00-C1NN into EtherNet/IP list

Scan online at **EI2-HH00-C1NN** adapter (first ensure that the online module and PLC are in the same network segment). Select “File ”>“Auto Config.” from EtherNet/IP setting window menu as shown in Fig.5-7-6.

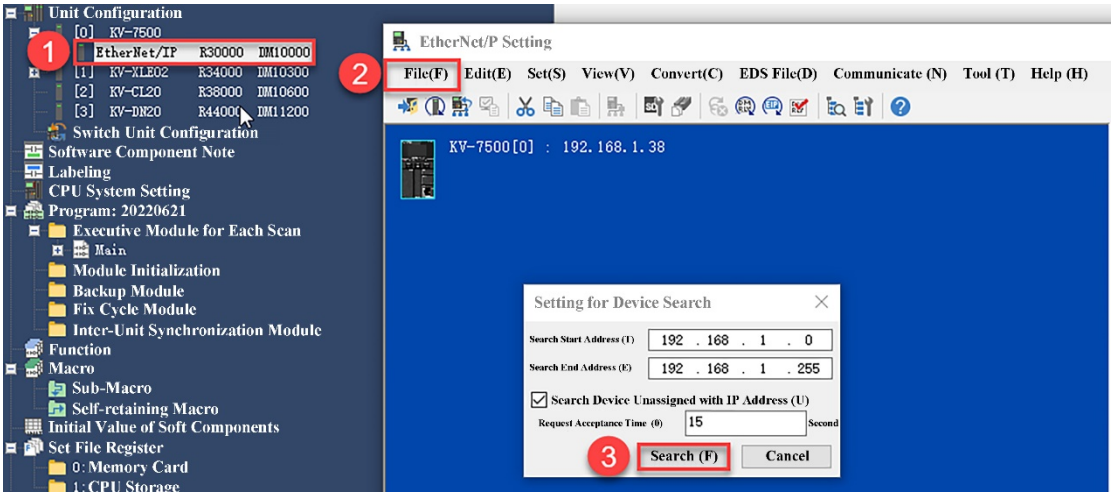


Fig.5-7-6 Online scan EI2-HH00-C1NN Module

Apply the configuration, download the configuration and program to the PLC, and monitor the module operation status, as shown in Fig.5-7-7.

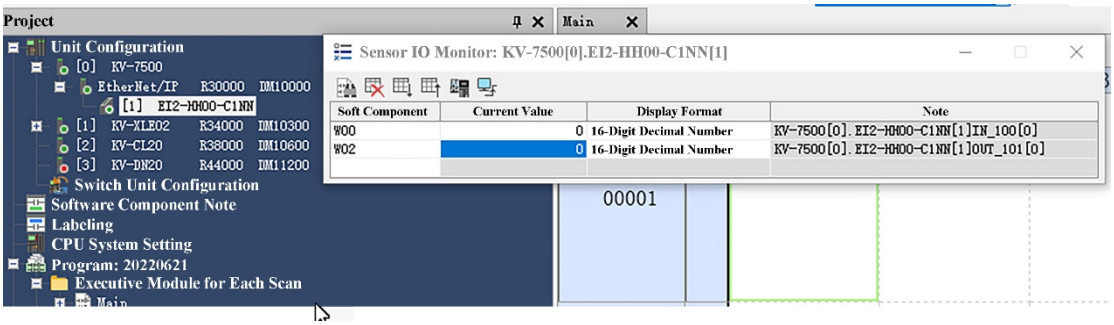


Fig.5-7-7 Operating and Monitoring

5.7.2 IO Module Link and Configuration of Machine Expert and EtherNet/IP Protocol

1. See Table 5-7-8 for the communication link diagram.

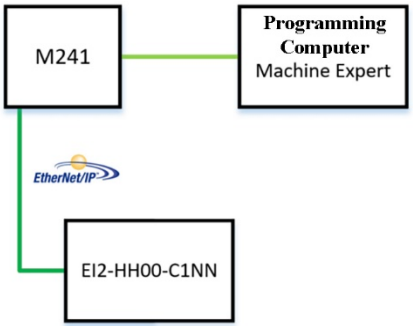


Fig.5-7-8 Communication Link Diagram

2. See Table 5-7-8 for the hardware configuration.

Table 5-7-8 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	Machine Expert,IP Setting Tool
PLC	1	M241
EI2-HH00-C1NN	1	EtherNet/IP Protocol 16DI/16DO Module
Communication Wire	>1	

3. Module IP Address Setting

Open IP Setting Tool. Select the network card connected to the module and scan the online IO module, as shown in Fig.5-7-9.

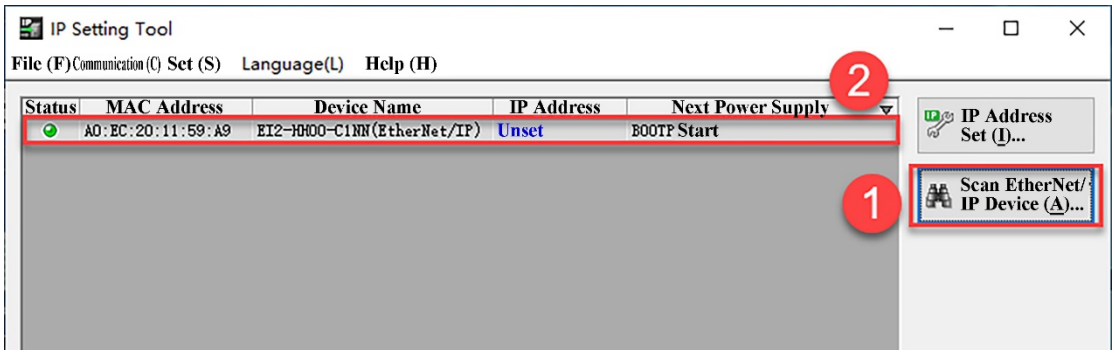


Fig.5-7-9 Scan Online IO Module

Select the module IP needs to be modified in the scan list (Note: the module factory default is BOOTP startup, and there is no IP address. After setting the IP address, please select fixed IP startup), as shown in Fig.5-7-10.

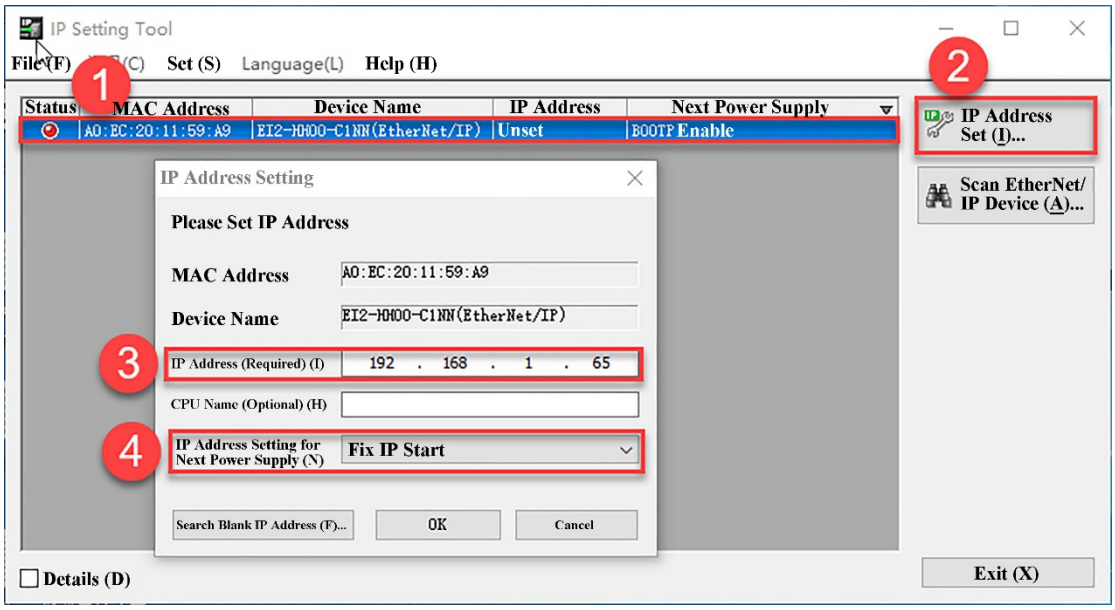


Fig.5-7-10 IP Address Setting

Advice: The module does not have an IP address as default. Before configuring, first set the IPv4 of the PC network card to the same network segment as the IP of the module requiring for setup.

4. Installation of EDS File

Open the machine expert V2.0 programming, select "Tool" > "Device Memory Library" from the menu, select "Install" in the device Memory Library window, as shown in Fig.5-7-2. Select " EI2-HH00-C1NN " under the EDS folder and confirm the installation.

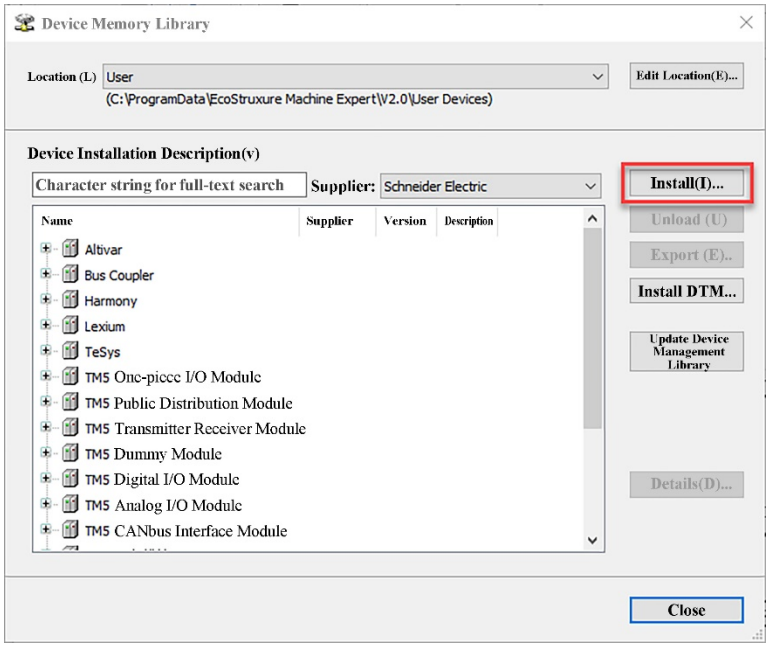


Fig.5-7-11 Installation of EDS File

5. New Project and Device Configuration

Open Machine Expert V2.0, create a project, and right-click " EtherNET_1" under the device tree to select "add Device", as shown in Fig.5-7-12.

From the add device window, select " Protocol Manager" > "Industrial Ethernet

Manager", as shown in Fig.5-7-13. Right-click "_ (Industrial Ethernet Manager) >" add Device "under the device tree. Select the supplier “DECOWELL AUTOMATION CO.,LTD” in the device window. Select “ EI2-HH00-C1NN” in the device category as shown in Fig.5-7-14.

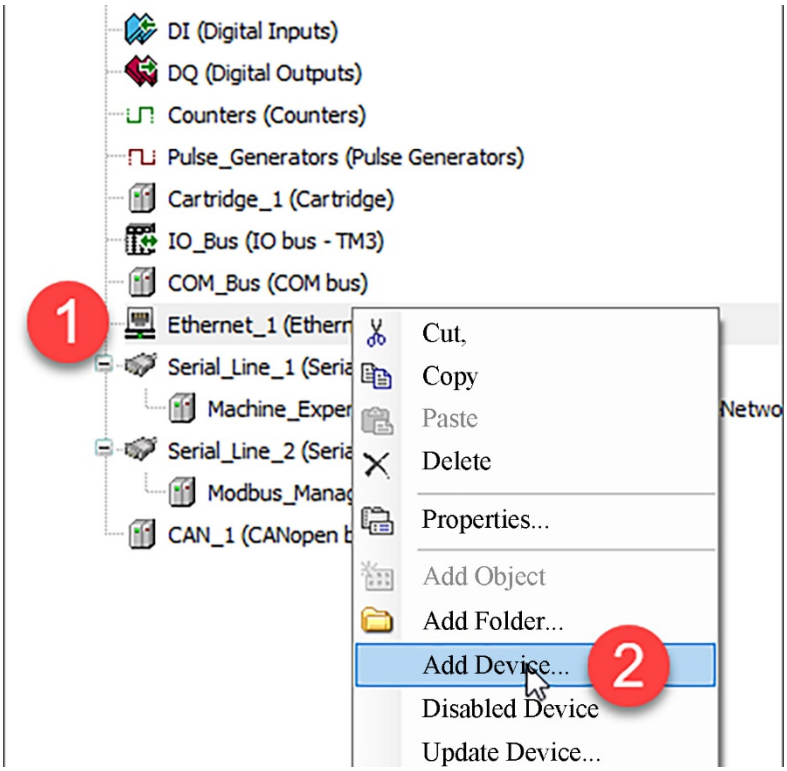


Fig.5-7-12 Addition of Device

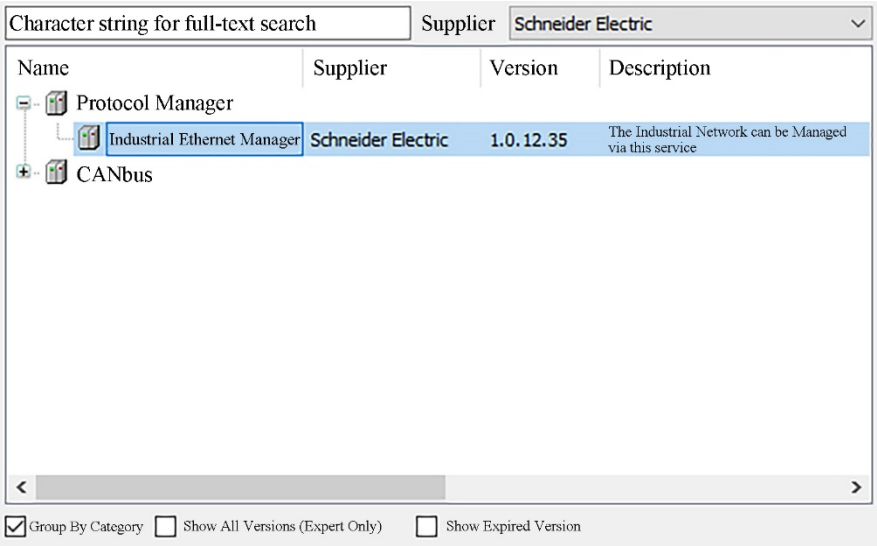


Fig.5-7-13 Add Industrial Ethernet Manager

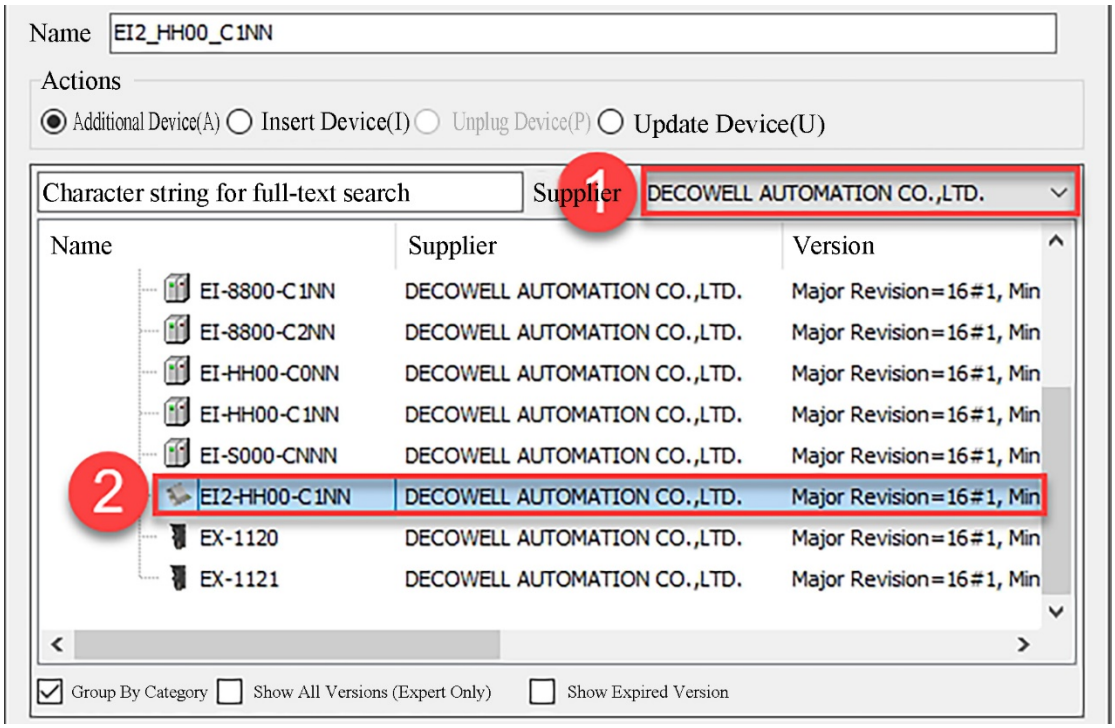


Fig.5-7-14 Add EI2-HH00-C1NN

To configure EI2-HH00-C1NN Parameter, double-click "EI2-HH00-C1NN" from device tree and configure the IP address as the fixed IP address as shown in Fig.5-7-15.

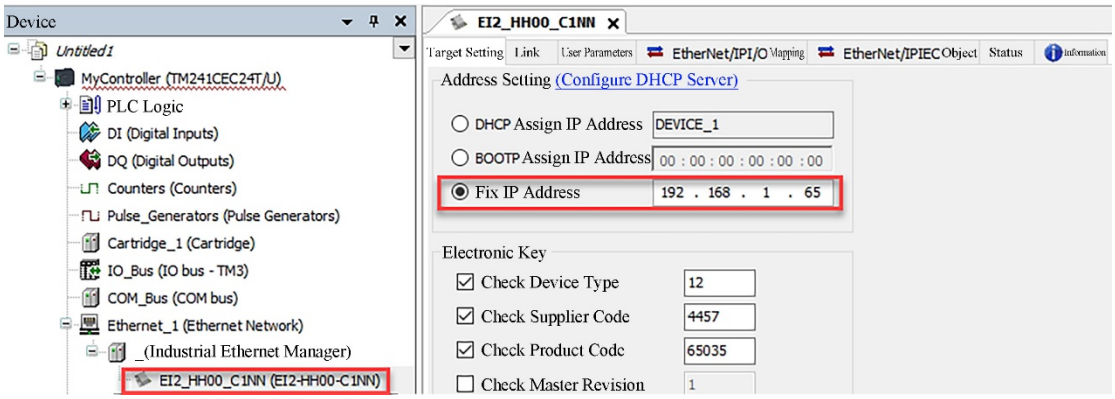


Fig.5-7-15 Configuration of IP Address

Check the IO address mapping. Double-click "EI2-HH00-C1NN" from the device tree and perform IO Mapping from EtherNet/IP as shown in Fig. Fig.5-7-16.

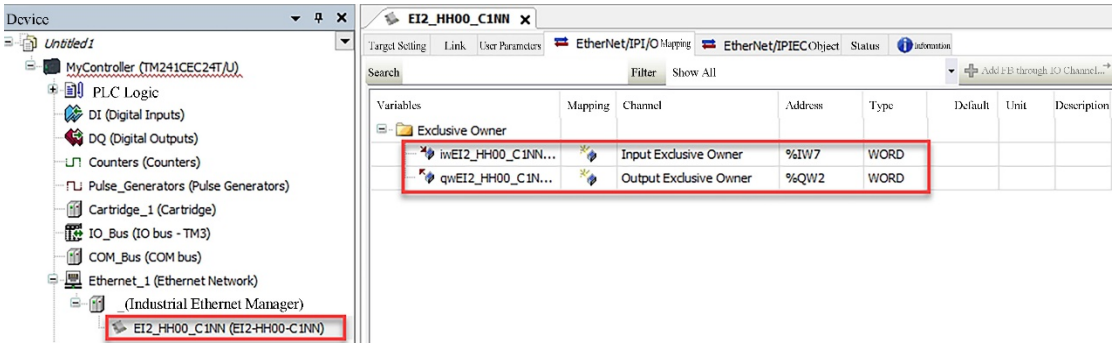


Fig.5-7-16 IO Address Mapping

5.7.3 IO Module Link and Configuration of CODESYS and EtherNet/IP Protocol

1. See Fig. 5-7-8 for the communication link diagram.

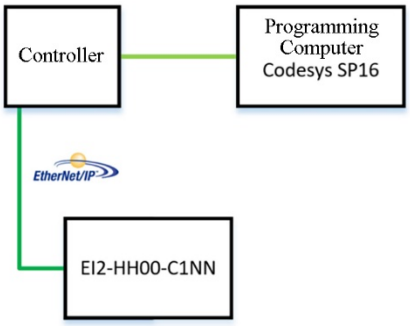


Fig. 5-7-17 Communication Link Diagram

2. See Table 5-7-3 for the hardware configuration.

Table 5-7-3 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	Codesys SP16,IP Setting Tool
PLC	1	
EI2-HH00-C1NN	1	EtherNet/IP Protocol 16DI/16DO Module
Communication Wire	>1	

3. Module IP Address Setting

Open IP Setting Tool, select the network card connected with module, and scan the online IO Module as shown in Fig.5-7-18.

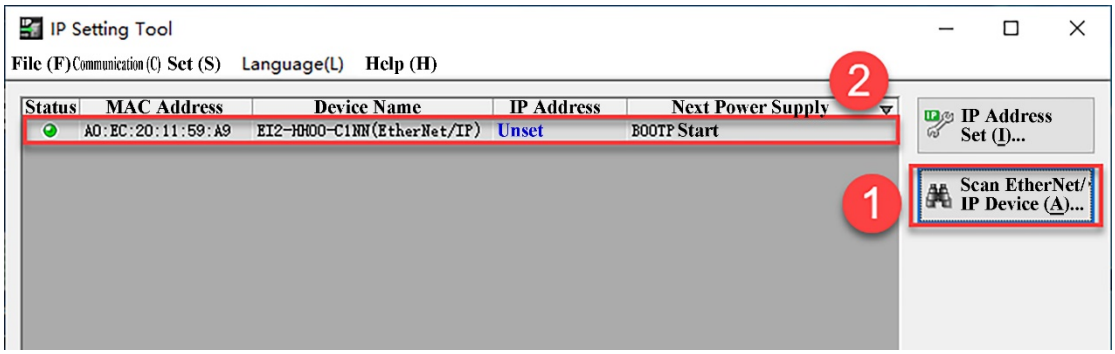


Fig.5-7-18 Online Scan IO Module

Select the module IP needs to be modified in the scan list (Note: the module factory default is BOOTP startup, and there is no IP address. After setting the IP address, please select fixed IP startup), as shown in Fig.5-7-1.

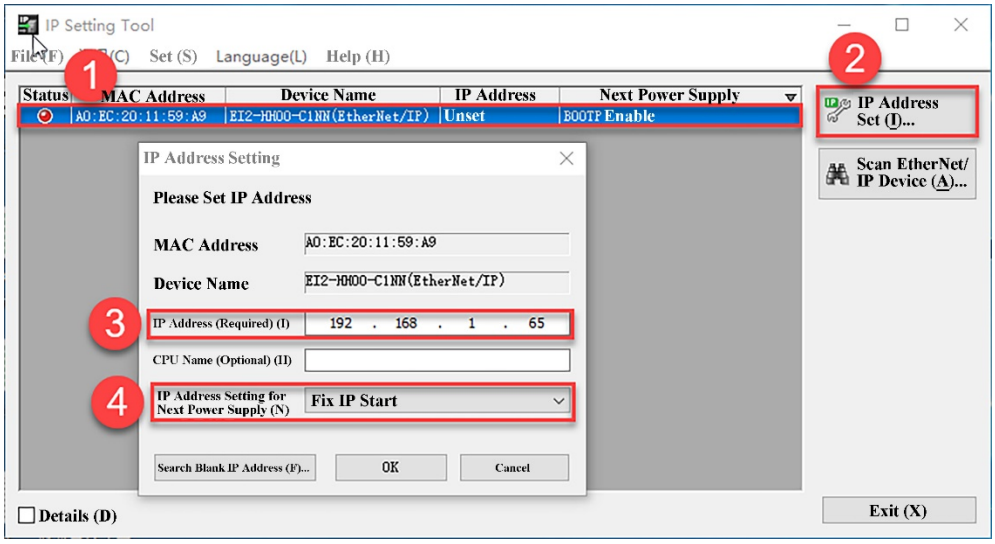


Fig. 5-7-19 IP Address Setting

Advice: The module does not have an IP address as default. Before configuring, first set the IPv4 of the PC network card to the same network segment as the needed IP of the module.

4. Installation of EDS File

Open the CODESYS SP16 programming, select "Tool" > "Device Memory Library" from the menu, select "Install" in the device Memory Library window, as shown in Fig.5-7-20, and select "EI2-HH00-C1NN" under the EDS folder and confirm the installation.

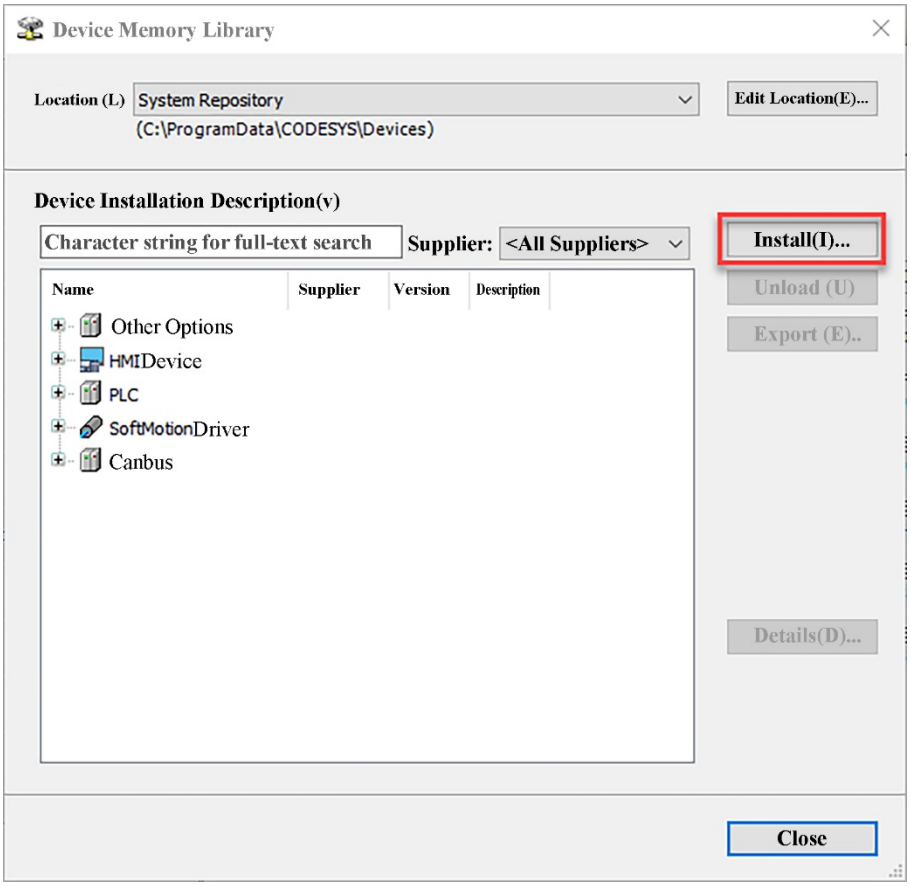


Fig.5-7-20 Installation of EDS File

5. New Project and Device Configuration

Open CODESYS SP16, create project, select “add device” and right click under device tree, and select “Ethernet” under add device window, as shown in Fig.5-7-21.

Select “add device” and right click “Ethernet” from device tree and select “EtherNet/IP Scanner” from the add device window as shown in Fig.5-7-22.

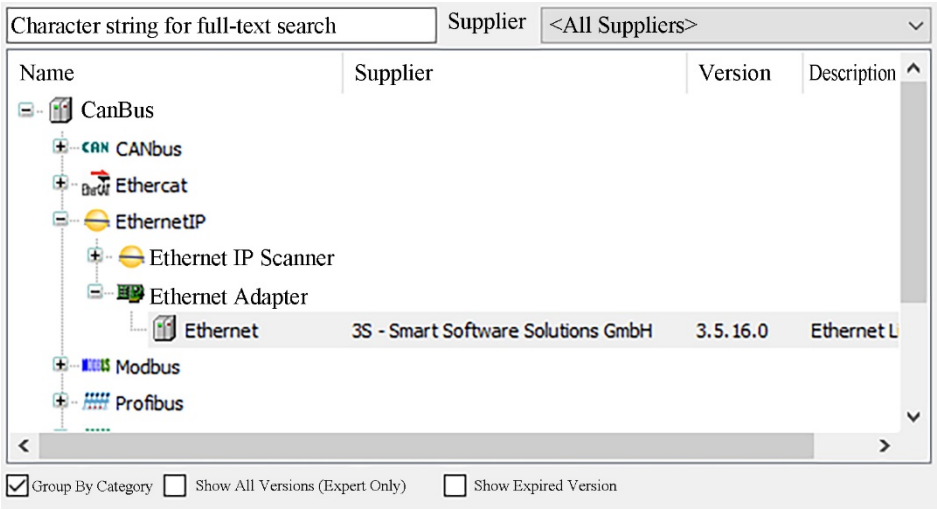


Fig.5-7-21 Add Ethernet Adapter

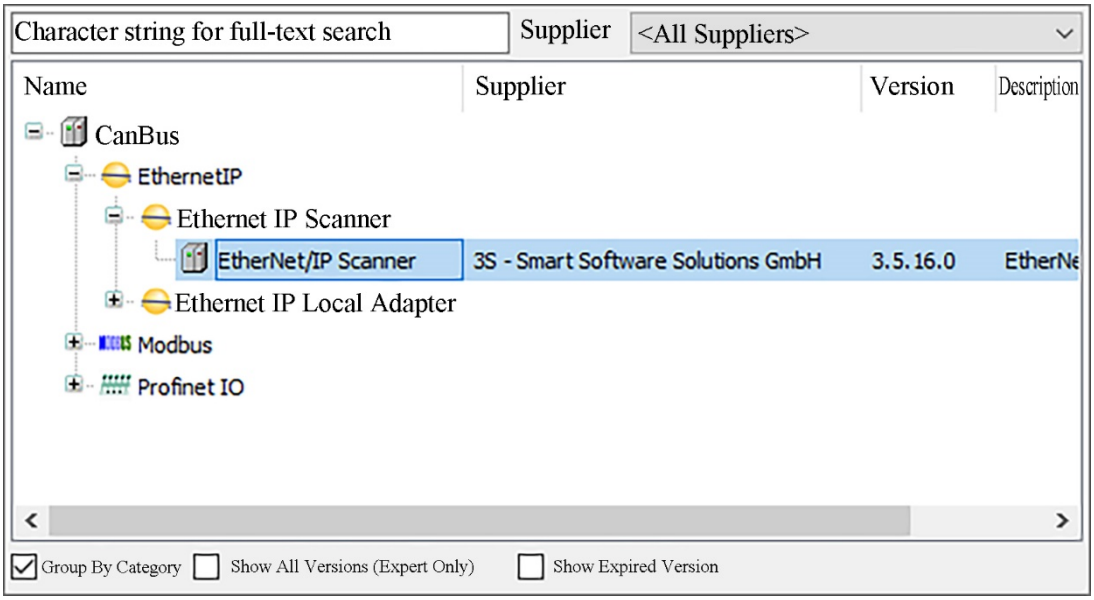


Fig.5-7-22 Add Ethernet IP Scanner

Configure the network card of the Ethernet adapter, double click "Ethernet" under the device tree, and open the page to select the network card that required to communicate with the EtherNet/IP slave station as shown in Fig.5-7-23.

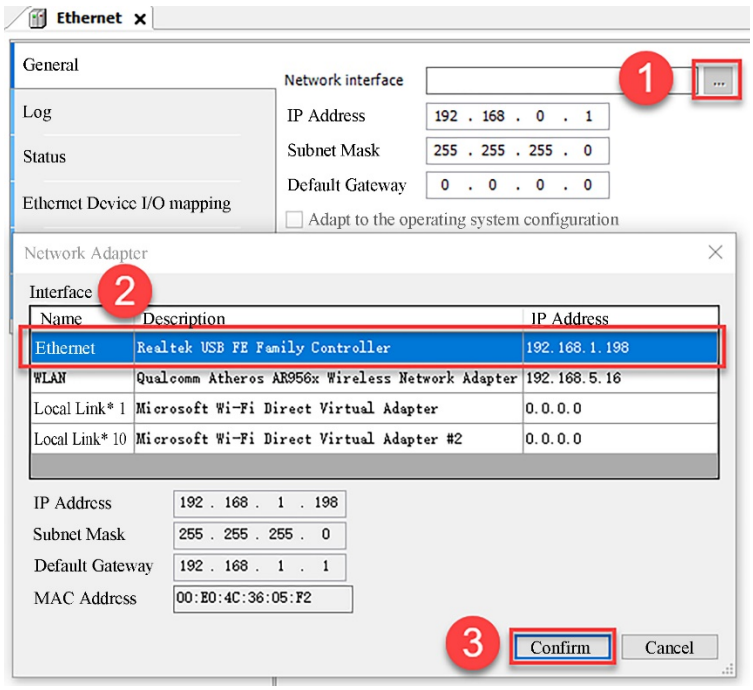


Fig.5-7-23 Configure Netcard of Ethernet Adapter

Right click "EtherNet_IP_Scanner" under the device tree, select "add device", and select " EI2-HH00-C1NN " in the add device window as shown in Fig.5-7-24.

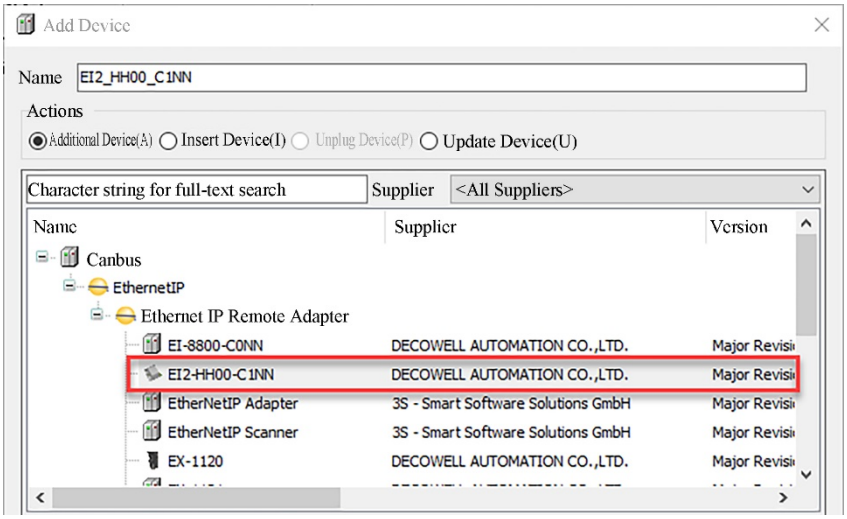


Fig.5-7-24 Add EI2-HH00-C1NN Module

Configure EI2-HH00-C1NN adapter IP address. Double-click “EI2-HH00-C1NN” from device tree. Fill the IP address (the IPS address shall keep consistence with the actual Module configuration) as shown in Fig.5-7-25.

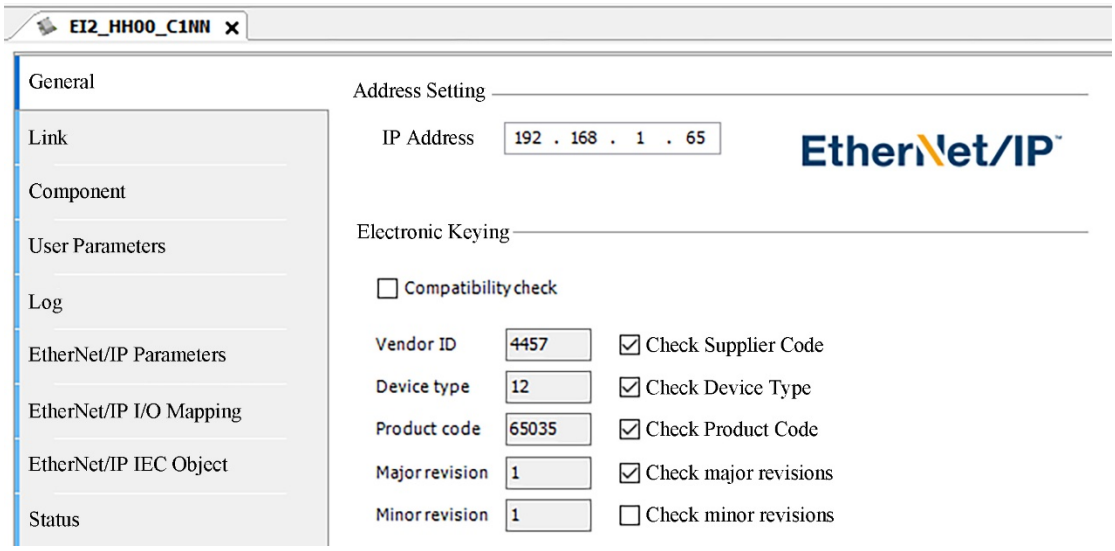


Fig.5-7-25 Configuration of EI2-HH00-C1NN Module IP Address

Check the IO address mapping. Double-click "EI2-HH00-C1NN" from device tree. Perform mapping under EtherNet/IP I/O as shown in Fig.5-7-26.

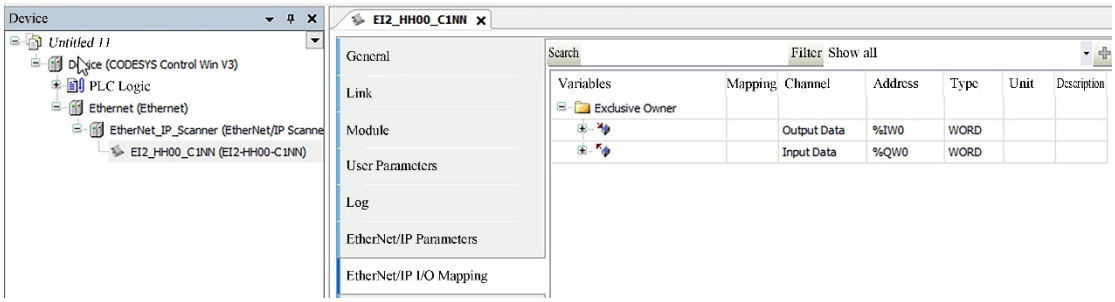


Fig.5-7-26 Check IO Address Mapping

5.7.4 IO Module Link and Configuration of Sysmac Studio and EtherNet/IP Protocol

1. See Fig. 5-7-27 for the communication link diagram.

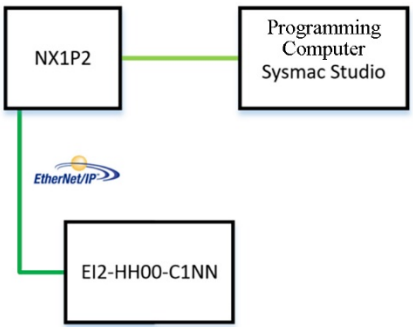


Fig.5-7-27 Communication Link Diagram

2. See Table 5-7-4 for the hardware configuration.

Table 5-7-4 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	Sysmac Studio,IP Setting Tool
NX1P2	1	
EI2-HH00-C1NN	1	EtherNet/IP Protocol

		16DI/16DO Module
Communication Wire	>1	

3. Module IP Address Setting

Open the IP Setting Tool, select the network card connected to the module, and scan the online IO module as shown in Fig.5-7-28.

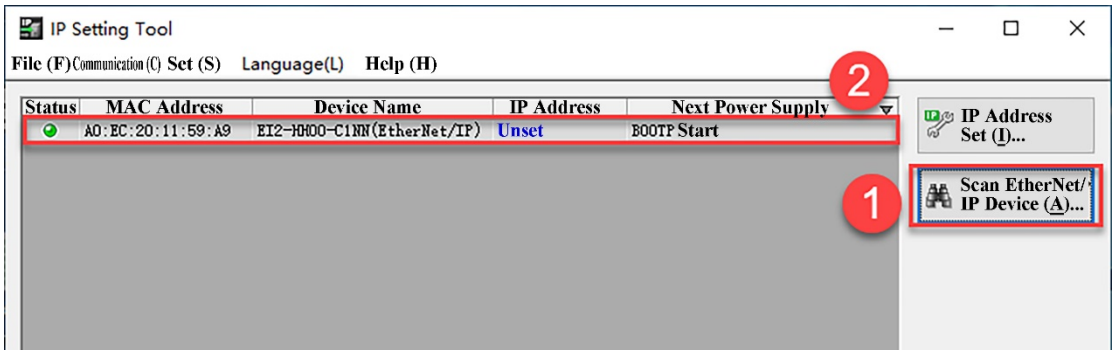


Fig.5-7-28 Online Scan IO Module

Select the module IP needs to be modified in the scan list (Note: the module factory default is BOOTP startup, and there is no IP address. After setting the IP address, please select fixed IP startup), as shown in Fig. Fig.5-7-29.

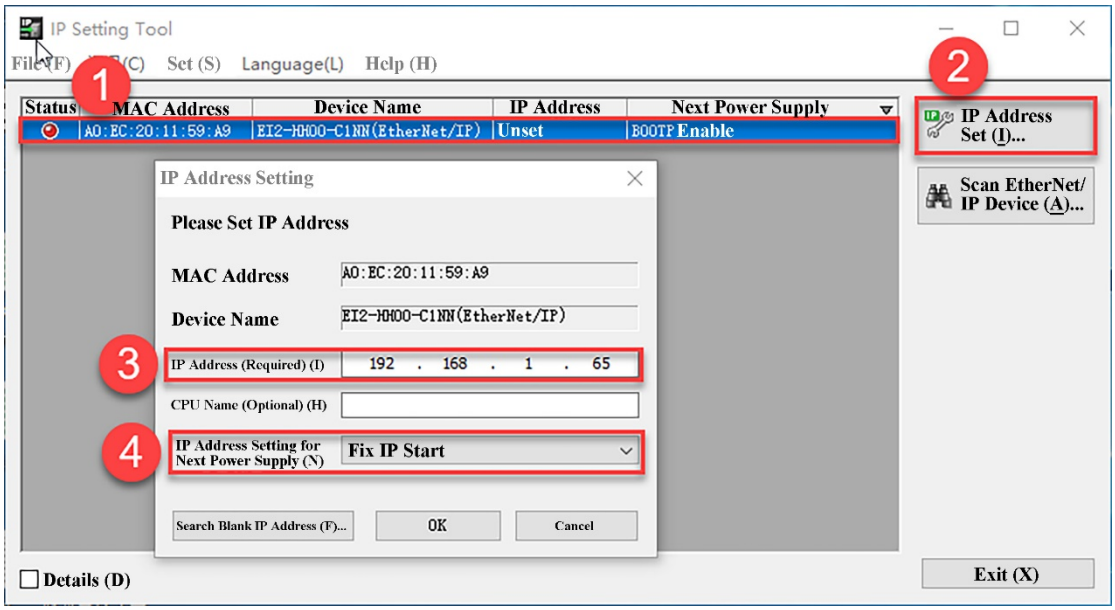


Fig.5-7-29 IP Address Setting

Advice: The module does not have an IP address as default. Before configuring, first set the IPv4 of the PC network card to the same network segment as the needed IP of the module.

4. New Project and Device Configuration

Open the Sysmac Studio programming and creation project. Configure the EtherNet/IP port to a fixed IP address (consistent with the actual PLC port IP) as shown in Fig.5-7-30.

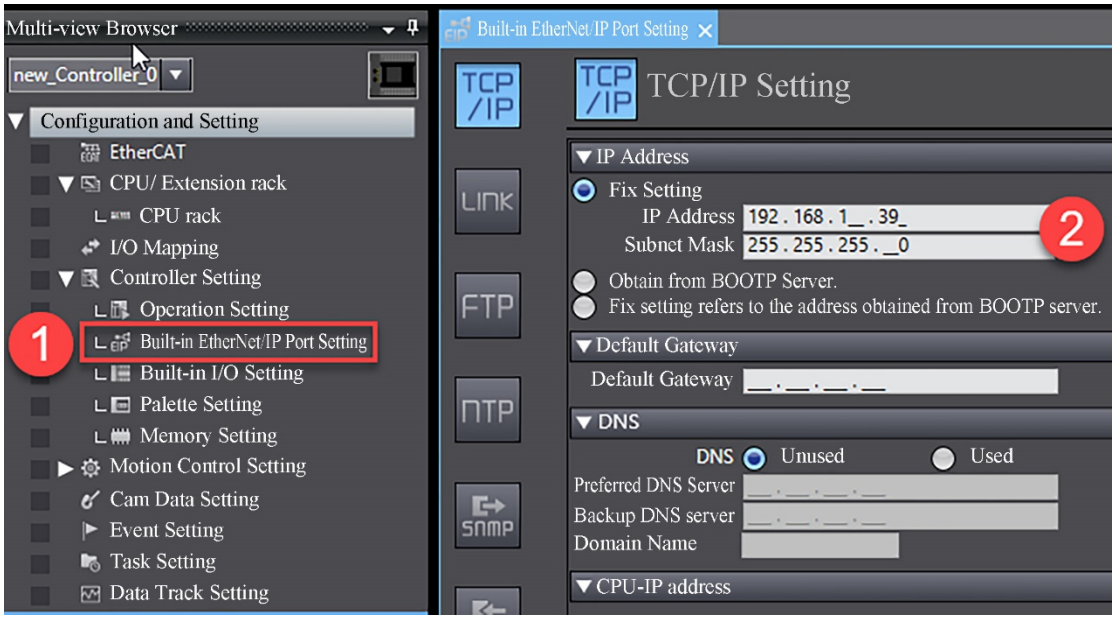


Fig.5-7-30 EtherNet/IP Portal Setting

Create all variables, and set input and output variables in overall variables. The variables length requires to be consistent with the actual length of input and output bytes in the module, as shown in Fig.5-7-31.

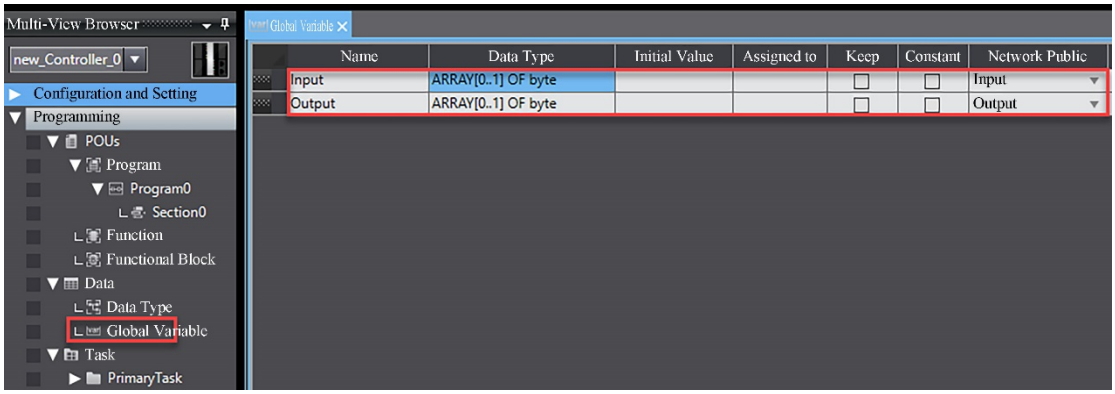


Fig.5-7-31 Create Overall Variables

Select "Tool" > "EtherNet/IP connection settings" from the menu, and double click the node address in the EtherNet/IP list window to open the EtherNet/IP port setting link settings window as shown in Fig.5-7-32.

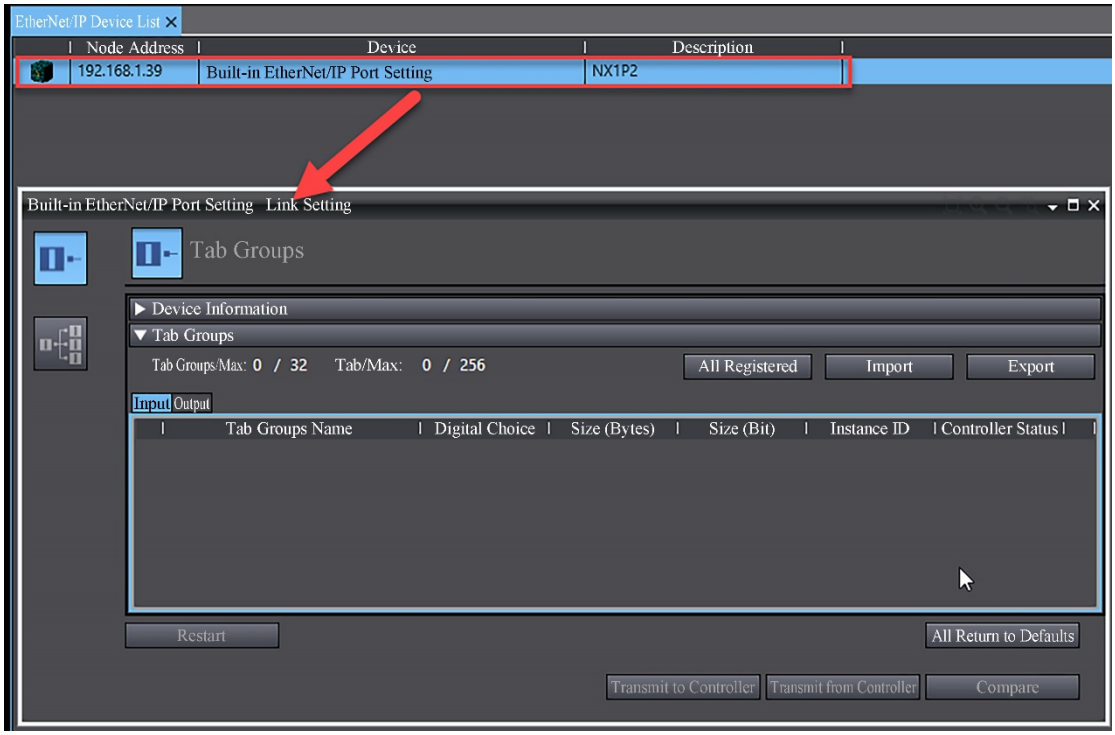


Fig.5-7-32 Open the EtherNet/IP Port Setting Link Setting Window

Register variables, select the "Tag Group" window in the built-in EtherNet/I port setting link setting window, and click "Register all" to register the newly created overall variables, as shown in Fig.5-7-33.

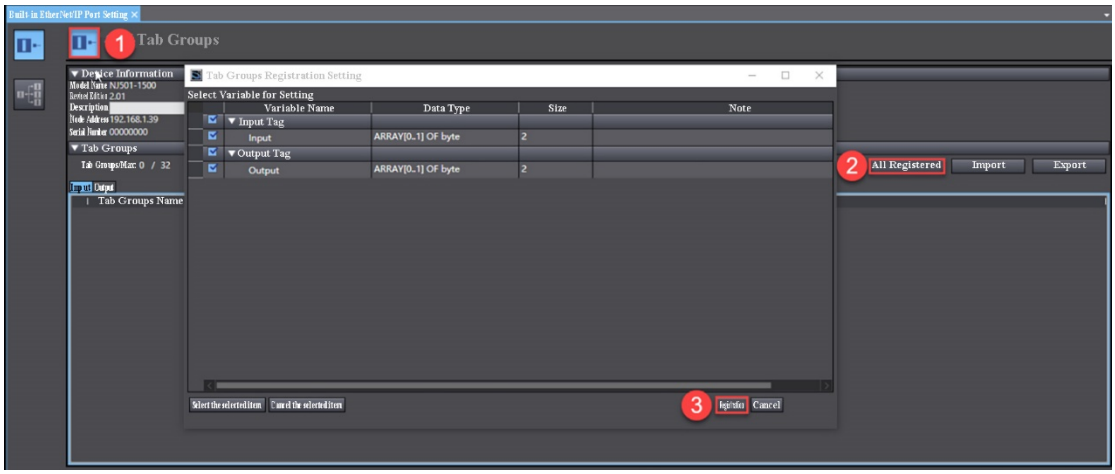


Fig.5-7-33 Register Overall Variables

Install EDS files, right-click in the blank area of the toolbox on the right side of the opened built-in EtherNet/IP port setting link setting window and select "display EDS library", as shown in Fig.5-7-34. In the EDS Library window, select "Install" and open the EDS file to be installed as shown in Fig.5-7-35.

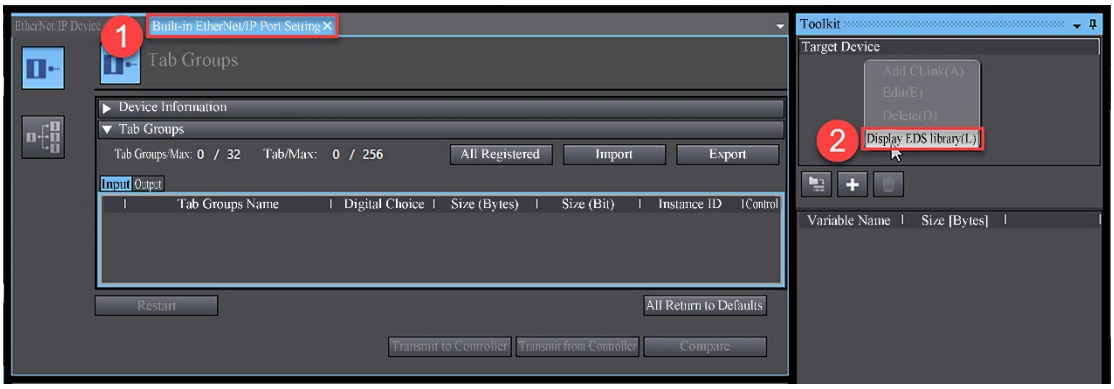


Fig.5-7-34 Showing of EDS Library

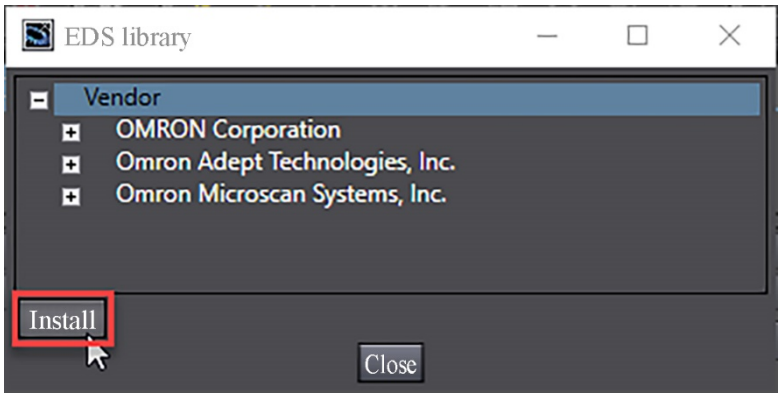


Fig.5-7-35 Installation of EDS File

Add the required linked device and configuration parameters, and select "add Target Device" in the toolbox, as shown in Fig.5-7-36. The user is required to fill in the EtherNet/IP slave IP address, slave type and revision. Afterwards, press the "Add" button in the lower left corner of the motor.

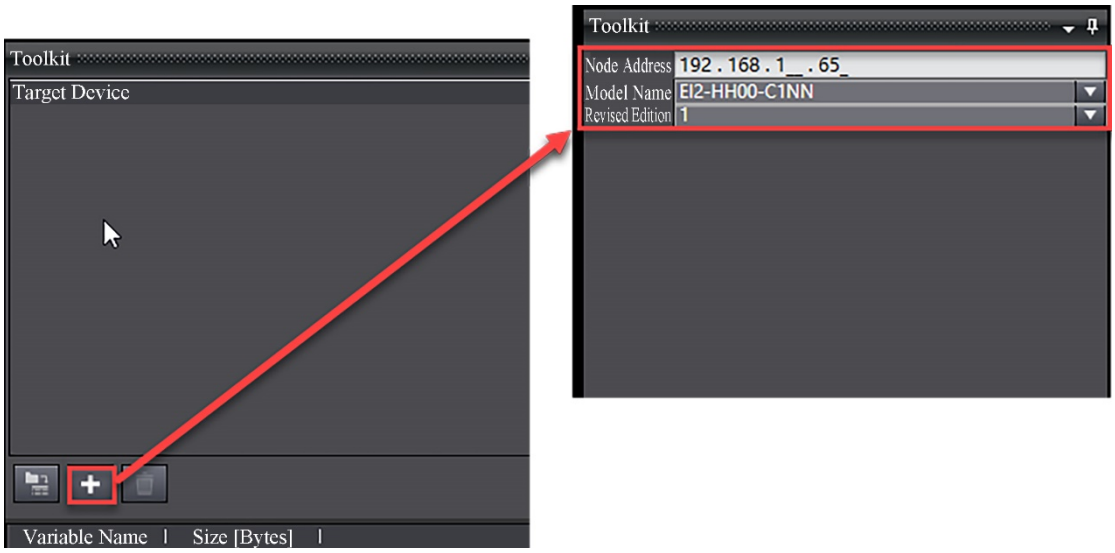


Fig.5-7-36 Add Target Device

Drag and link the target device "192.168.1.65 EI2-HH00-C1NN version 1" in the toolbox, as shown in Fig.5-7-37.

Configure the target device parameters. EI2-HH00-C1NN input target variable is 100,

output target variable is 101, input and output byte size are both 10, and the starting variable selects the overall variable after registration as shown in Fig.5-7-38.
Turn PLC to online, and then to programming mode. Select "Transmit to Controller" as shown in Fig.5-7-39.

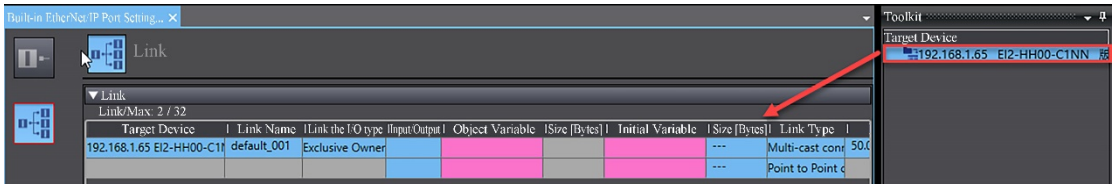


Fig.5-7-37 Add Connected Device

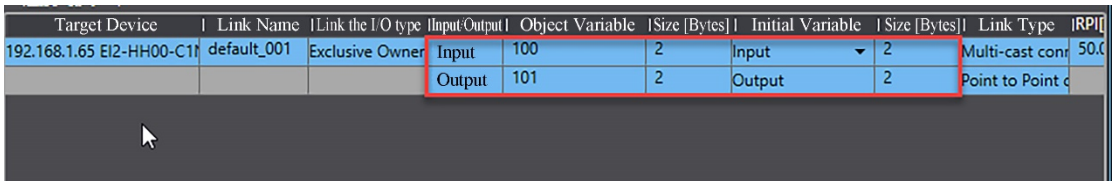


Fig.5-7-38 Configuration of Target Device Parameters

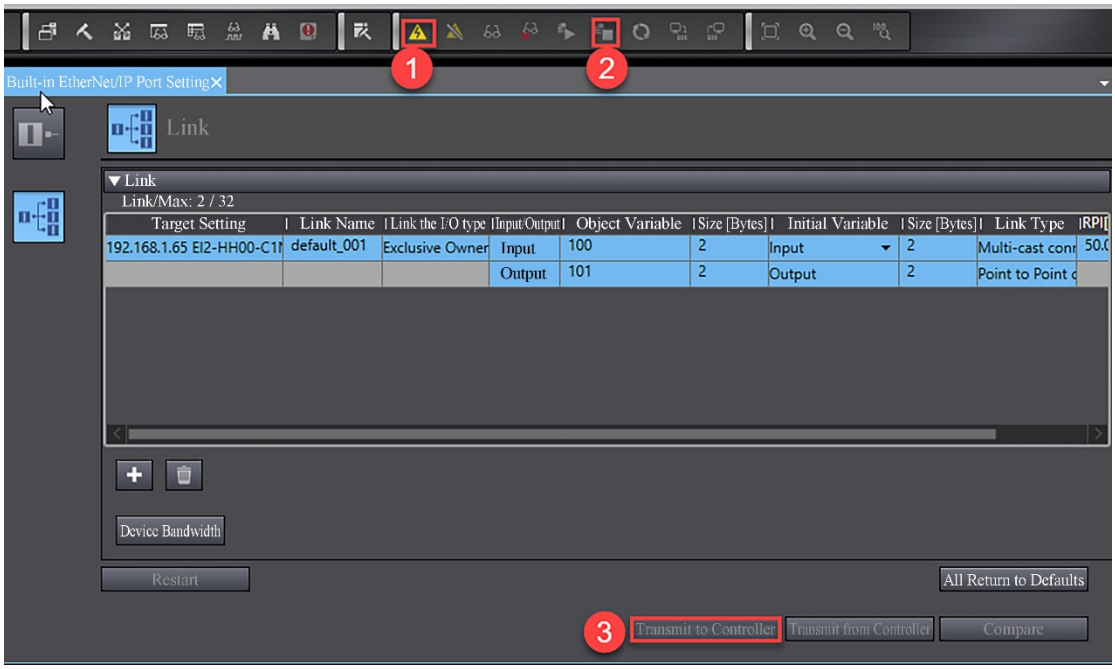


Fig.5-7-39 Transmit EtherNet/IP Configuration to Controller

5.7.5 IO Module Link and Configuration of RSLogix 5000 and EtherNet/IP Protocol

1. See Fig.5-7-40 for the communication link diagram.

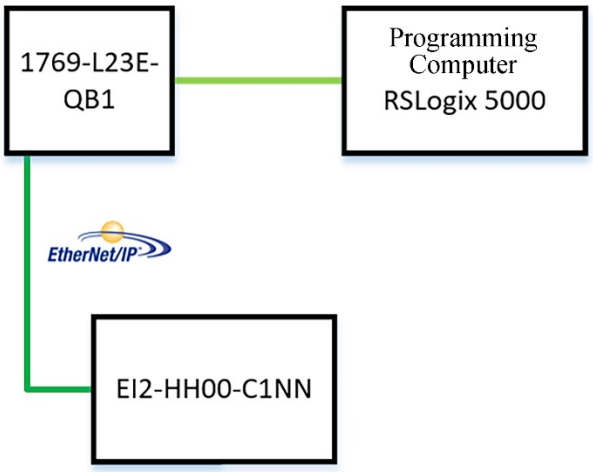


Fig.5-7-40 Communication Link Diagram

2. See Table 5-7-5 for hardware configuration

Table 5-7-5 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	RSLogix 5000,IP Setting Tool
1769-L23E-QB1	1	Version: V20
EI2-HH00-C1NN	1	EtherNet/IP Protocol 16DI/16DO Module
Communication Wire	>1	

3. Module IP Address Setting

Open IP Setting Tool, select the network card connected with Module, and scan the online IO Module as shown in Fig. 5-7-41.

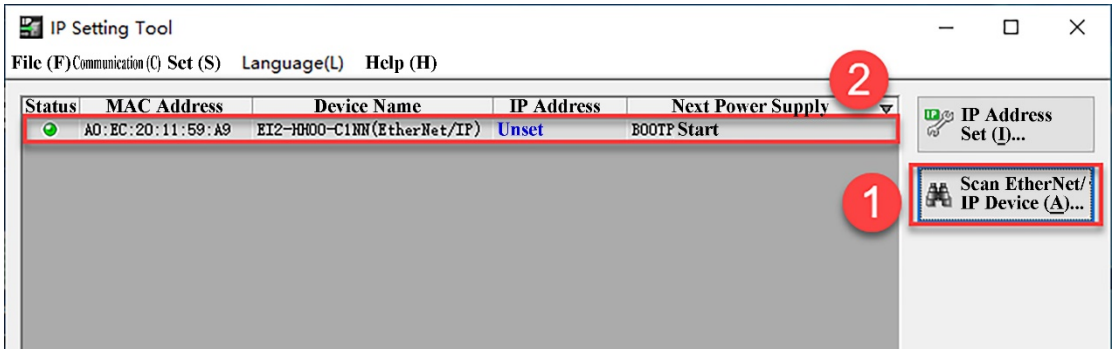


Fig.5-7-41 Scan Online IO Module

Select the module IP needs to be modified in the scan list (Note: the module factory default is BOOTP startup, and there is no IP address. After setting the IP address, please select fixed IP startup) as shown in Fig. 5-7-42.

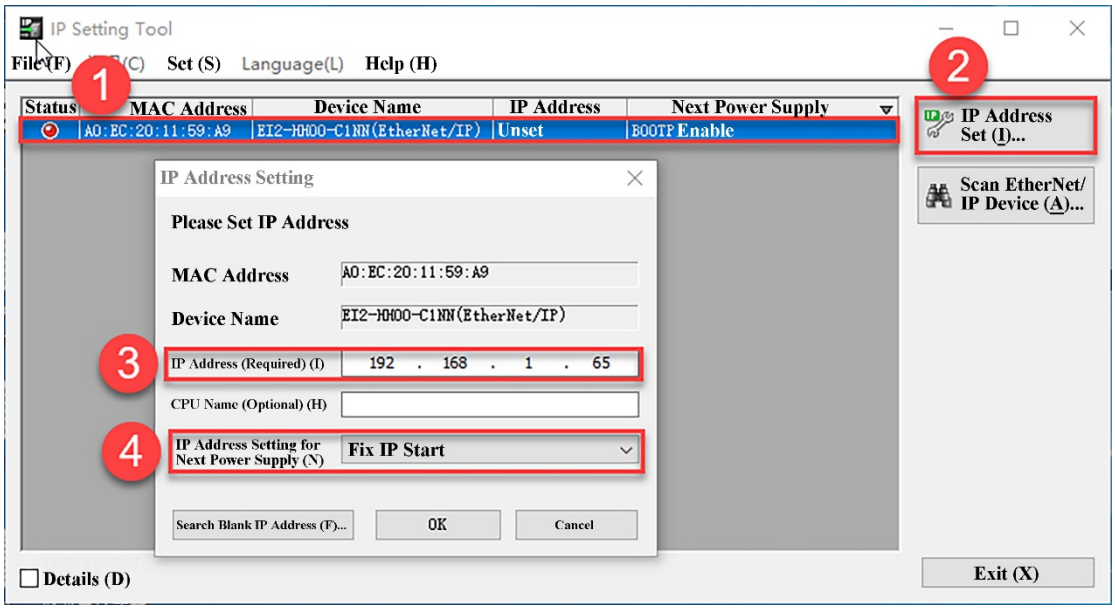


Fig.5-7-42 IP Address Setting

Advice: The module does not have an IP address as default. Before configuring, first set the IPv4 of the PC network card to the same network segment as the IP of the module requiring for setup.

4. Installation of EDS File

Open RSLogix 5000, select "Tool" > "EDS Hardware Installation Tool (D)" from the menu as shown in Fig.5-7-43. Select the specified folder in the EDS installation window as shown in Fig.5-7-44.

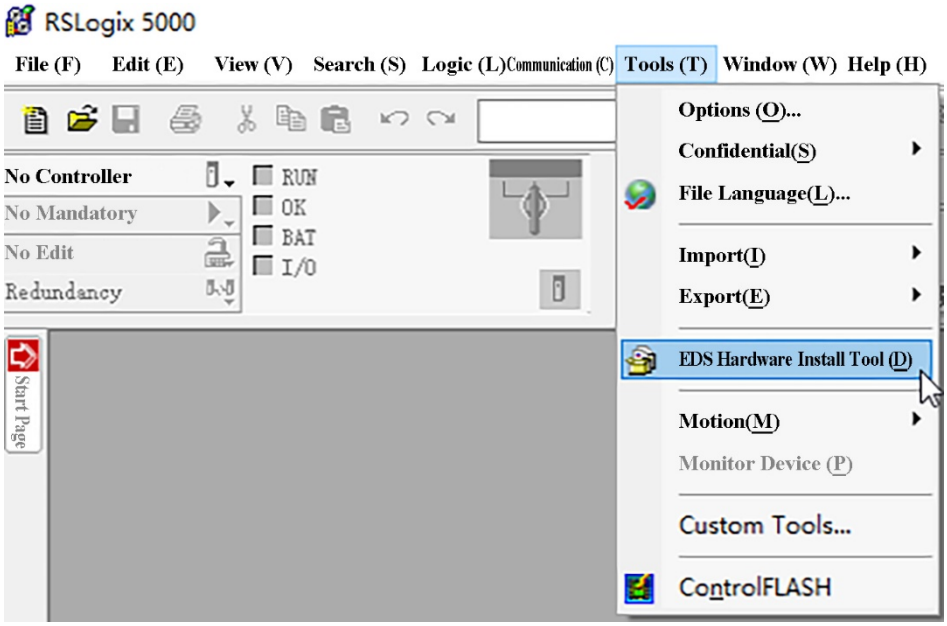


Fig.5-7-43 Install EDS File

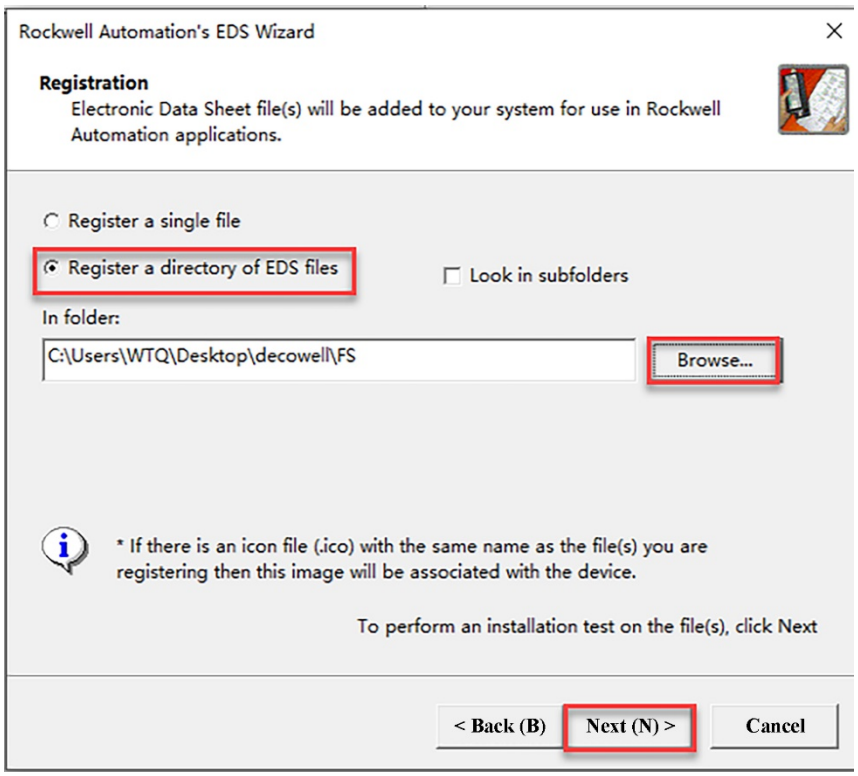


Fig.5-7-44 Select EDS Folder Path

5. New Project and Device Configuration

Open RSLogix 5000. Select new project and its' CPU and version as shown in Fig. 5-7-45.

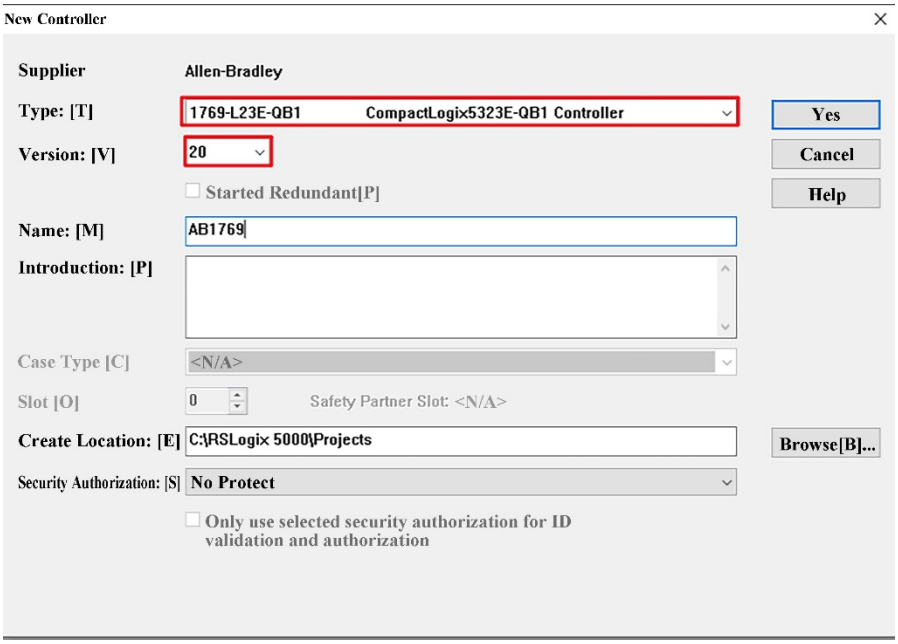


Fig.5-7-45 New Project

Configure EtherNet/IP communication. Select Ethernet and right-click "New Module" in the controller manager as shown in Fig.5-7-46.

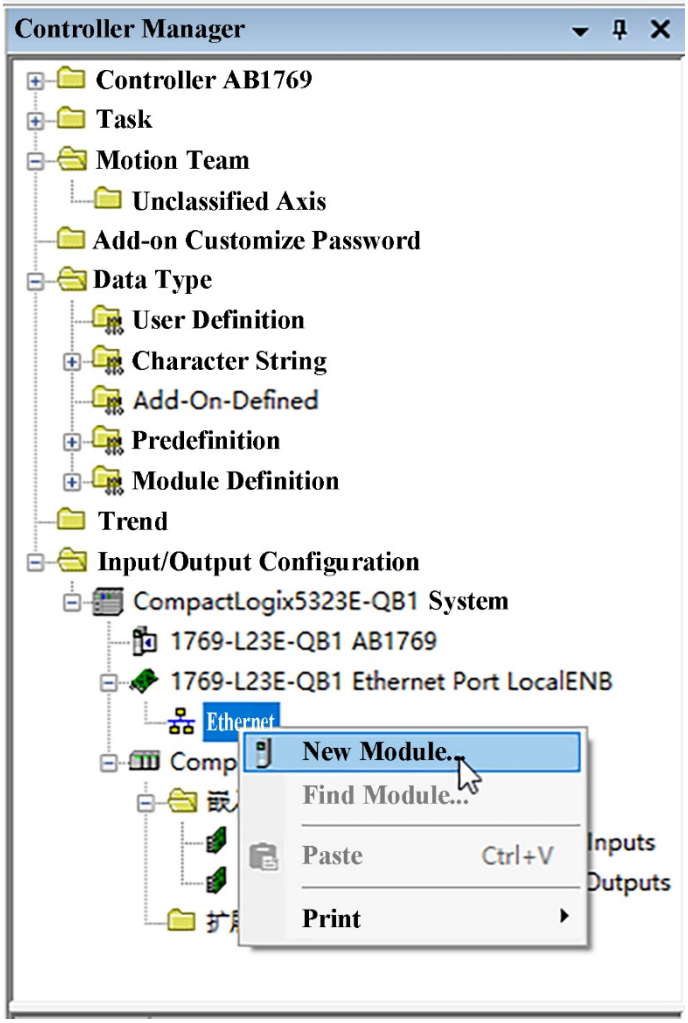


Fig. 5-7-46 New Module

。Add IO Module. Select DECOWELL from the filter, then select actual IO Module Type as shown in Fig.5-7-47.

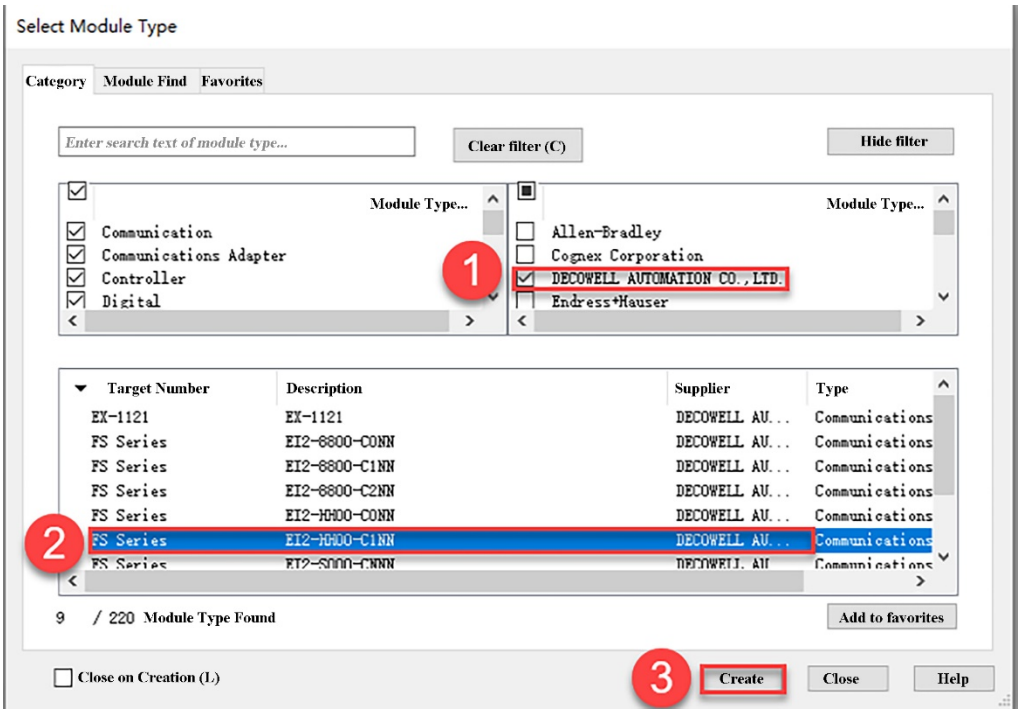


Fig.5-7-47 Selection of IO Module

Configure Module name and IP address. The IP address must be consistent with the actual address. Otherwise it will be unable to link. See Fig.5-7-48 for details.

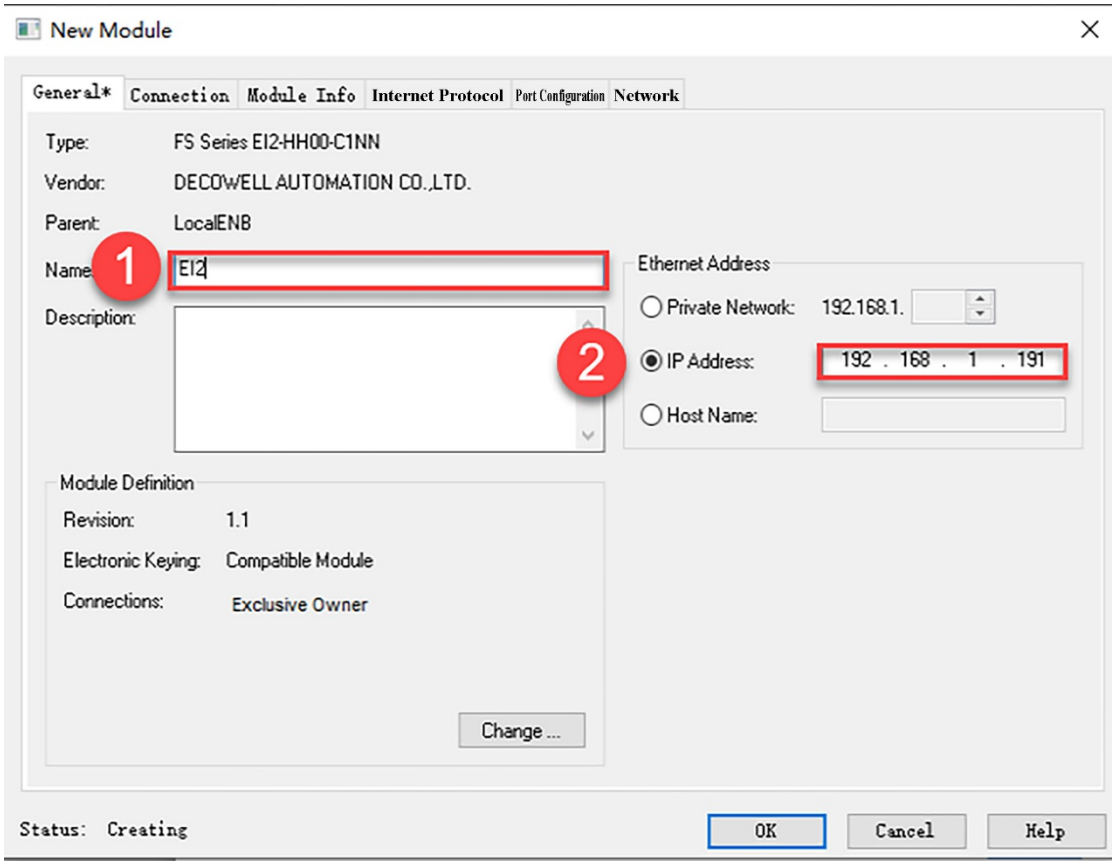


Fig.5-7-48 Edit Module IP and Name

Select to communicate with the online PLC and download the program. Select "Communication" >" Activity Item" from the menu. Select the online CPU as shown

in Fig.5-7-49. Download the program to the PLC as shown in Fig.5-7-50.

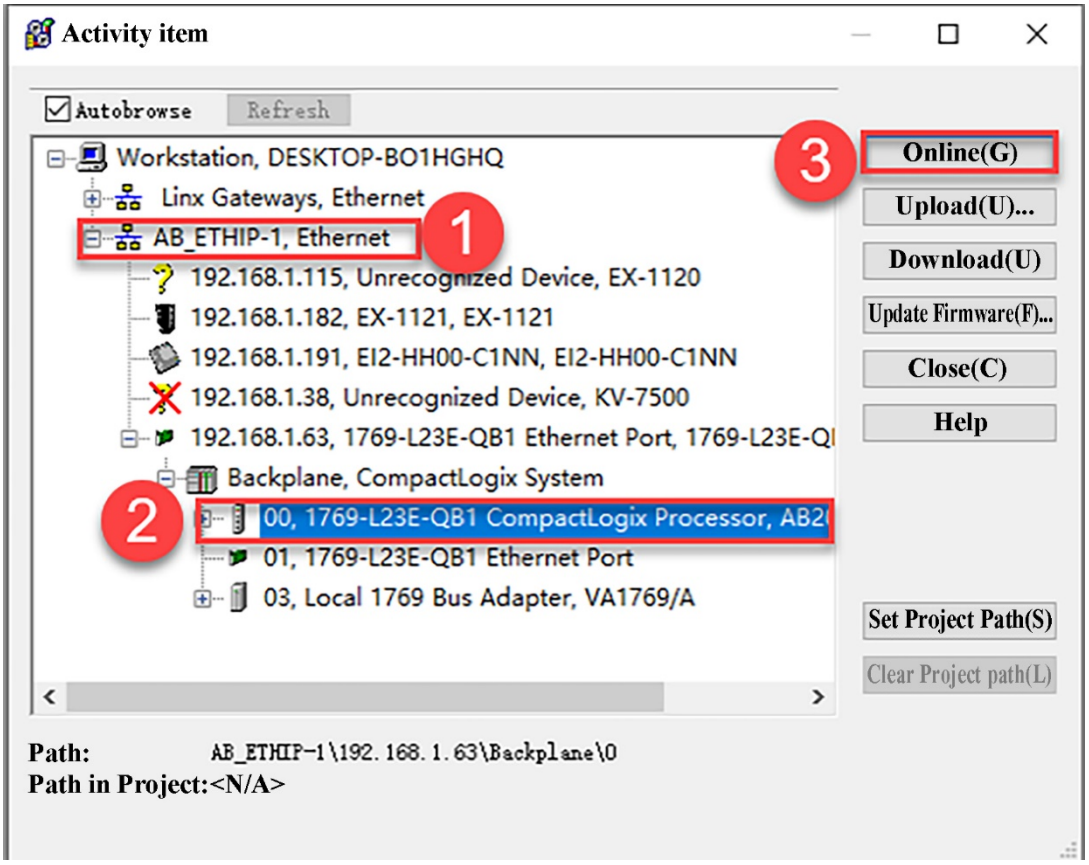


Fig.5-7-49 Select to Communicate with Online PLC

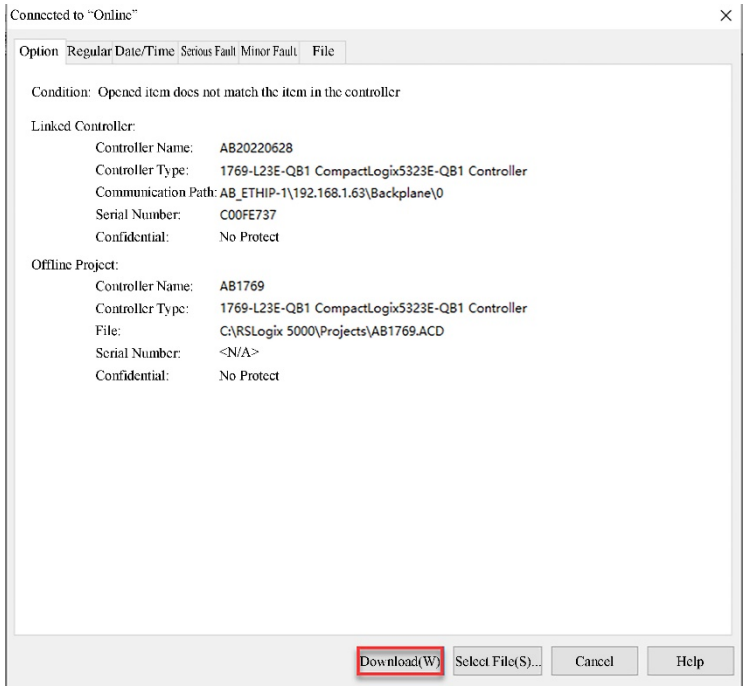


Fig.5-7-50 Download Program to PLC

Monitor whether the communication is working normally. Turn the CPU to the online status, and monitor whether the EI2-HH00-C1NN communication is normal. See Fig.5-

7-51 for details.

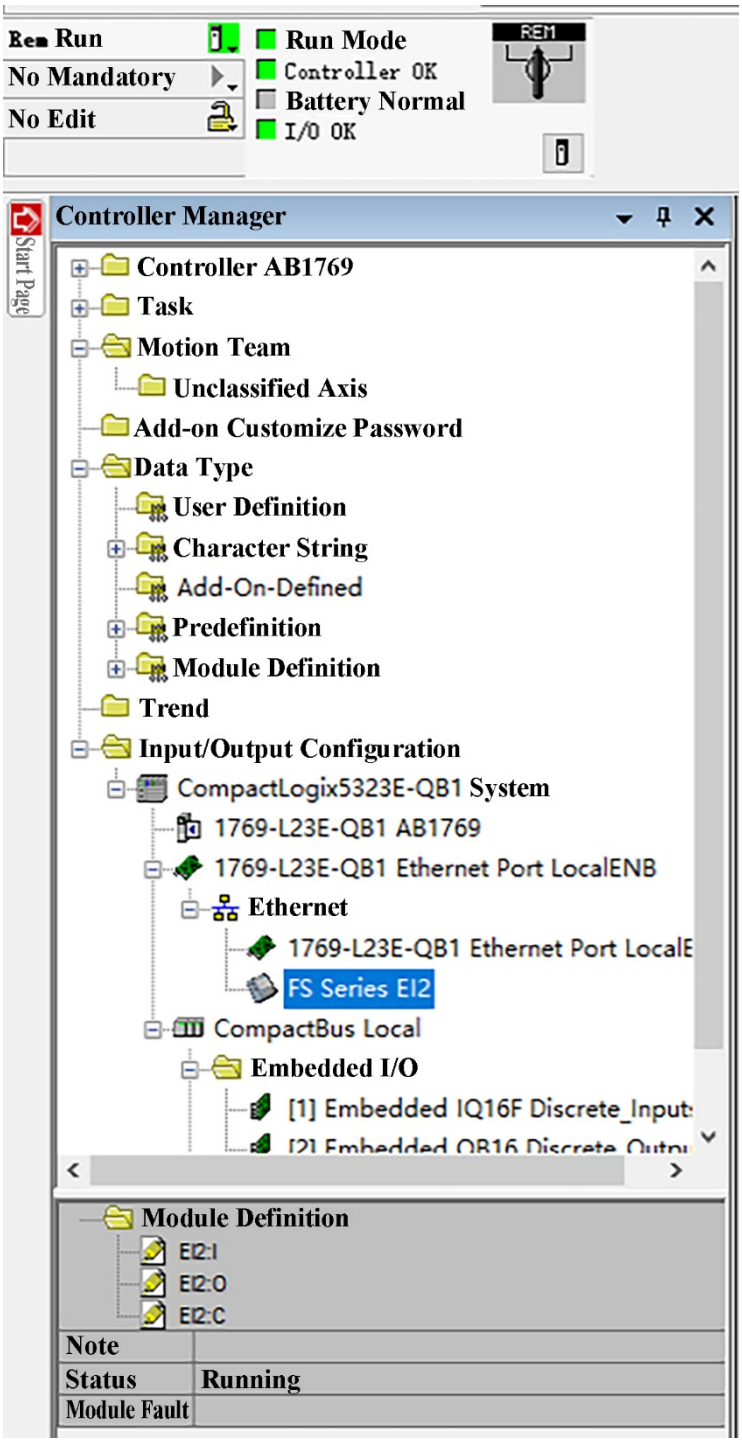


Fig.5-7-51 Monitor Module Operation Status

5.8 IO Module and PLC Link of PROFINET Protocol

5.8.1 IO Module Link and Configuration of TIA Portal and PROFINET Protocol

1. See Fig. 5-8-1 for the communication link diagram.

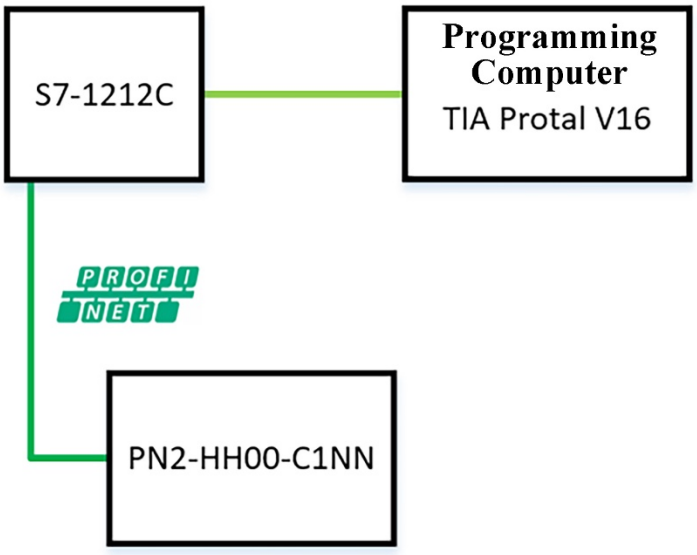


Fig. 5-8-1 Communication Link Diagram

2. See Table 508-1 for the hardware configuration.

Table 5-8-1 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	TIA Portal V16 Installed
Controller	1	S7-1212C
PN2-HH00-C1NN	1	PROFINET Protocol 16DI/16DO Module
Network Cable	>1	

3. Installation of GSD File

Open TIA Portal V16 and select “Options” > “Support Device Description file (GSD)” from the menu bar, as shown in Fig.5-8-2.

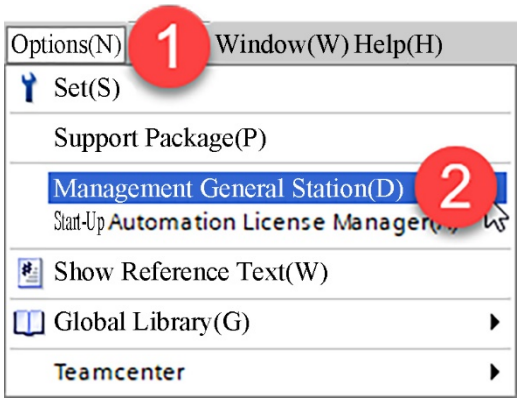


Fig.5-2-2 Installation of GSD File

4. New Project and Device Configuration

Open TIA Portal V16, select New project and configure as shown in Fig.5-2-3

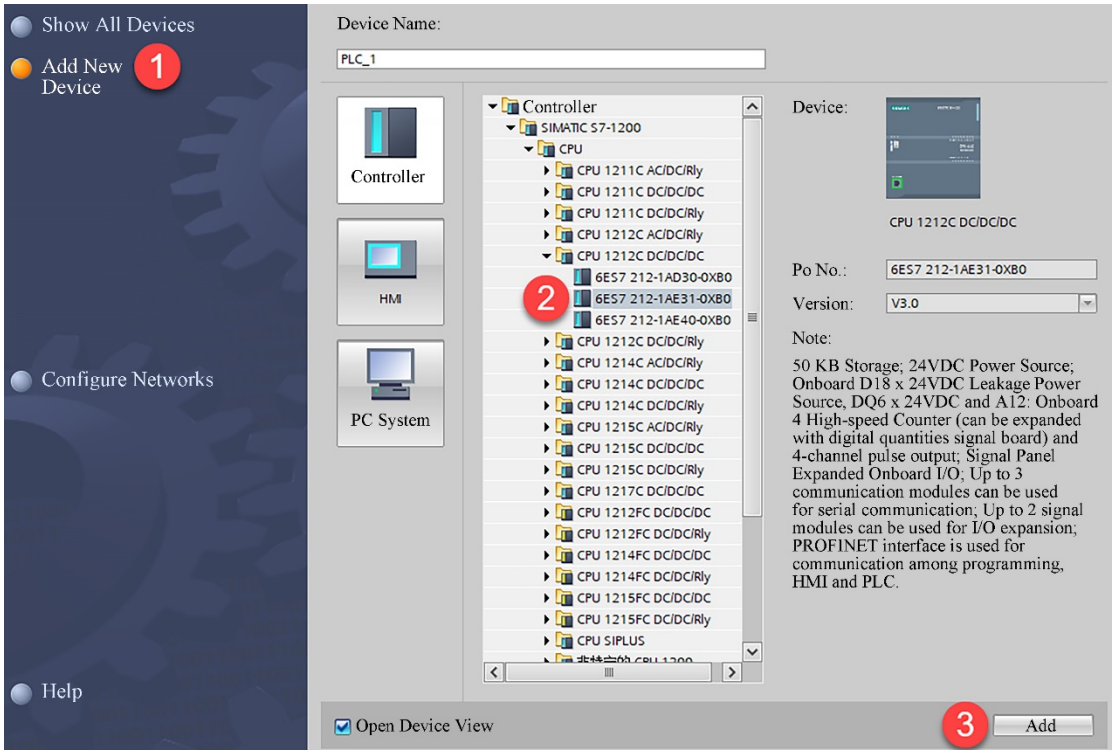


Fig.5-2-3 New Project

Configure device, switch to the network view, unfold the hardware category on the right, select PN2-HH00-C1NN and drag it to the network view as shown in Fig.5-8-4.

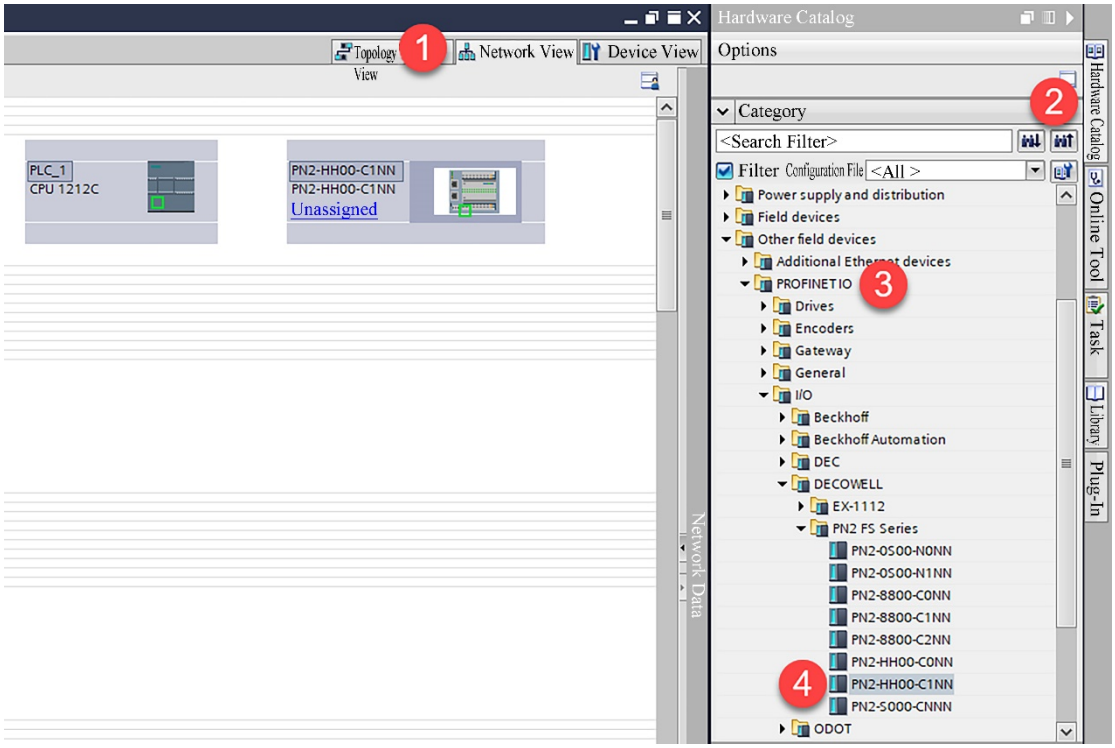


Fig. 5-8-4 Device Configuration

Assign a controller to the remote IO module in the network view. Click "Unassigned" in the IO module and select PLC_ 1. PROFINET interface_ 1, as shown in Fig.5-8-5.

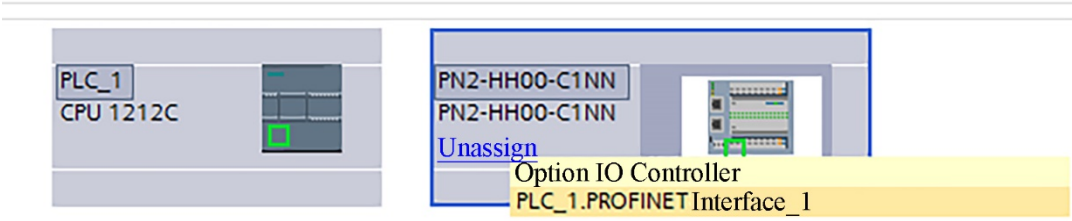


Fig.5-8-5 Assign IO Controller

Configure IO Module IP address. Double-click Module and enter attribute view in the device view as shown in Fig.5-8-6.

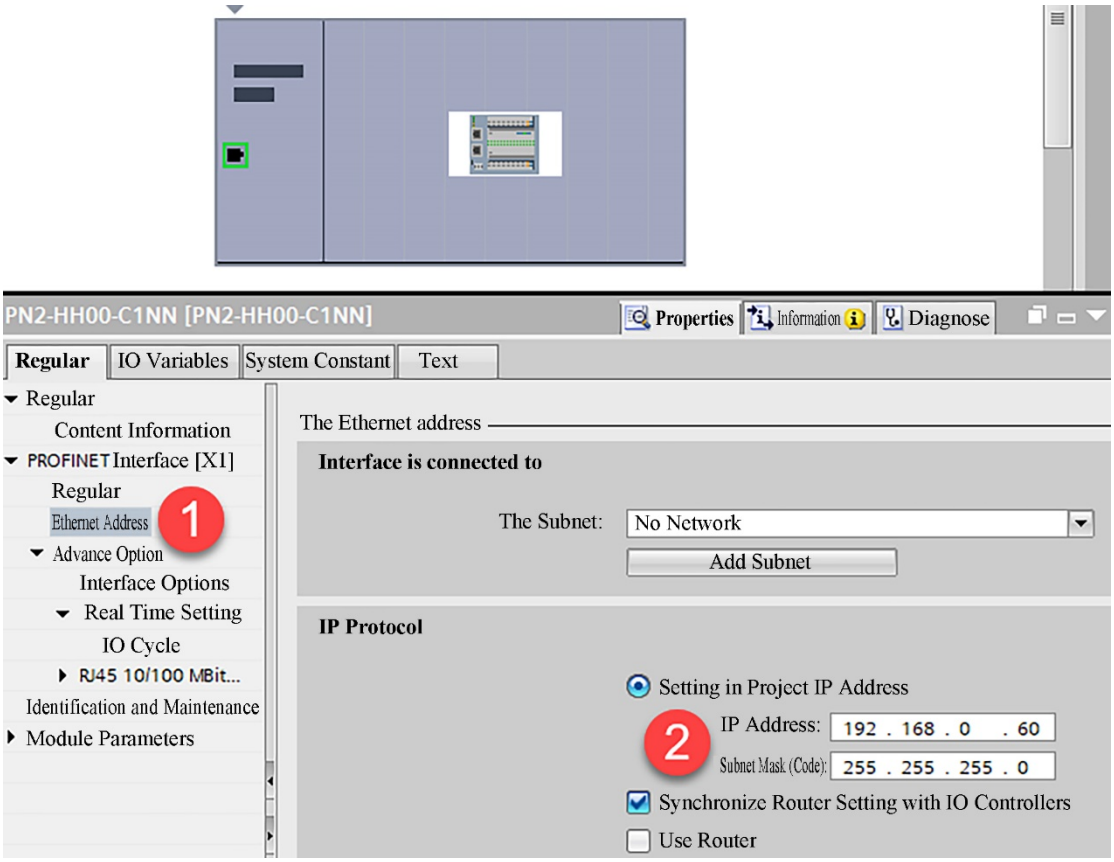
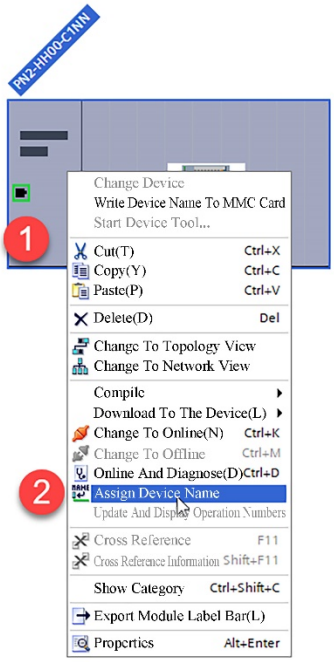


Fig. 5-8-6 Assignment of IP Address

The remote IO Module assigns the device name. Right-click the module and select "Assign Device Name" as shown in Fig.5-8-7. Select the interface type and update the list and assign the name as shown in Fig.5-8-8.



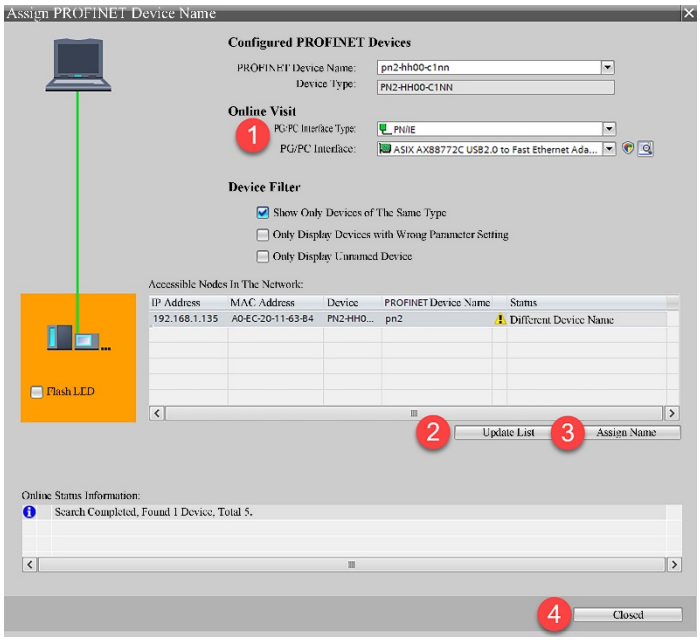


Fig.5-8-7 Assign Device Name Fig.5-8-8 Write-in of Device Name

As for the module input / output IO port parameter configuration, double click "PN2-HH00-C1NN" in the network view and configure the input filtering time (3ms as default, and the range is 0.5ms-10ms) as shown in Fig.5-8-9. When the CPU is in STOP status, the module output status (the default output is 0, FALSE, which can be configured to output 0/1 or maintain the previous value) as shown in Fig.5-8-10.

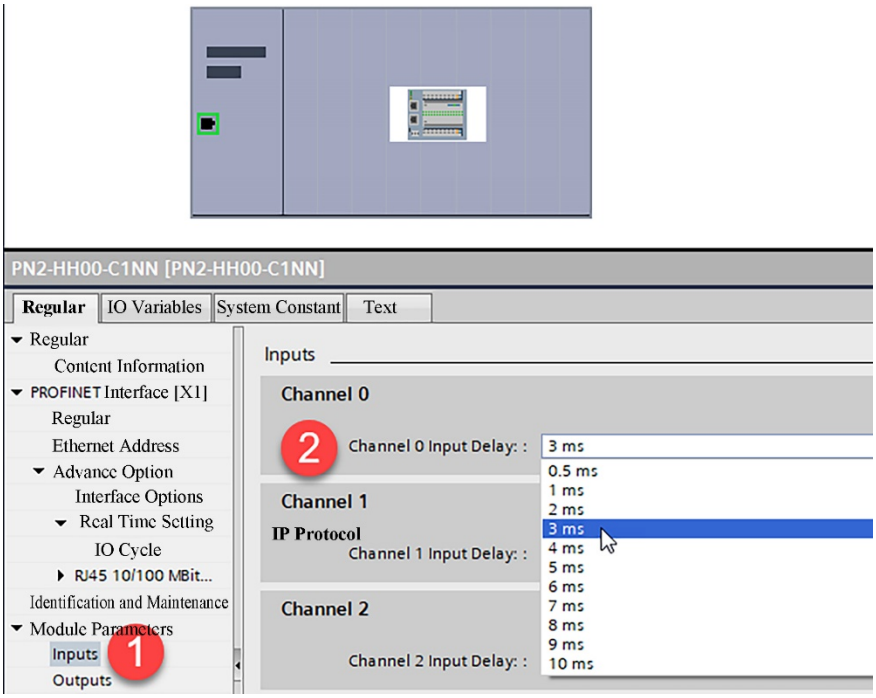
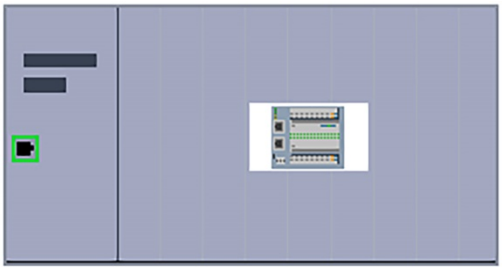


Fig.5-8-9 Configuration Module Input Channel Filtering Time



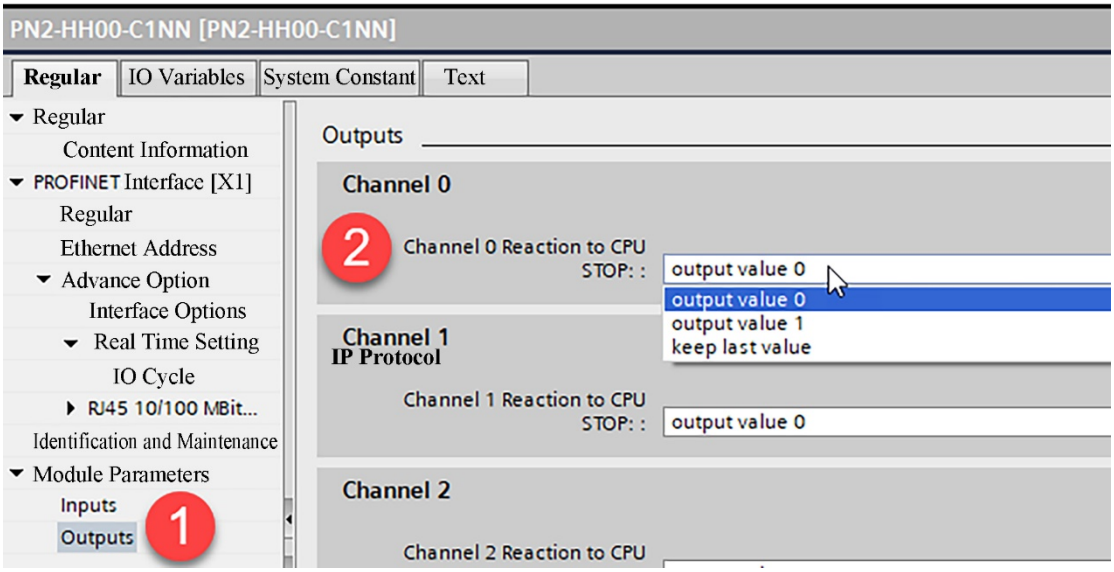


Fig.5-8-10 Configuration of Module Output Channel Parameter

Select all devices in the network view and download to PLC. After downloading the program, start the CPU and monitor the device status.

5.8.2 IO Module Link and Configuration of Step7 smart and PROFINET Protocol

1. See Fig. 5-8-11 for the communication link diagram.

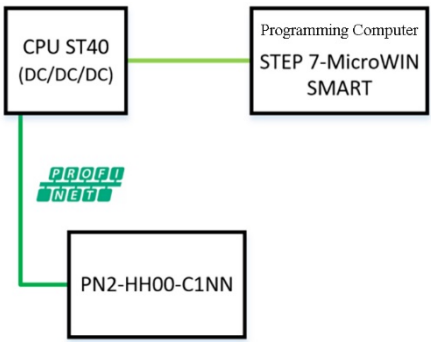


Fig.5-8-11 Communication Configuration Diagram

2. See Table 5-8-2 for the hardware configuration.

Table 5-8-2 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	STEP7-MicroWIN SMART Installed
Controller	1	CPU ST40(DC/DC/DC)
PN2-HH00-C1NN	1	PROFINET Protocol 16DI/16DO Module

Network Cable	>1	

3. Installation of GSD File

Open STEP7-MicroWIN SMART. Select “GSDML Manage” from Menu as shown in Fig.5-8-12.

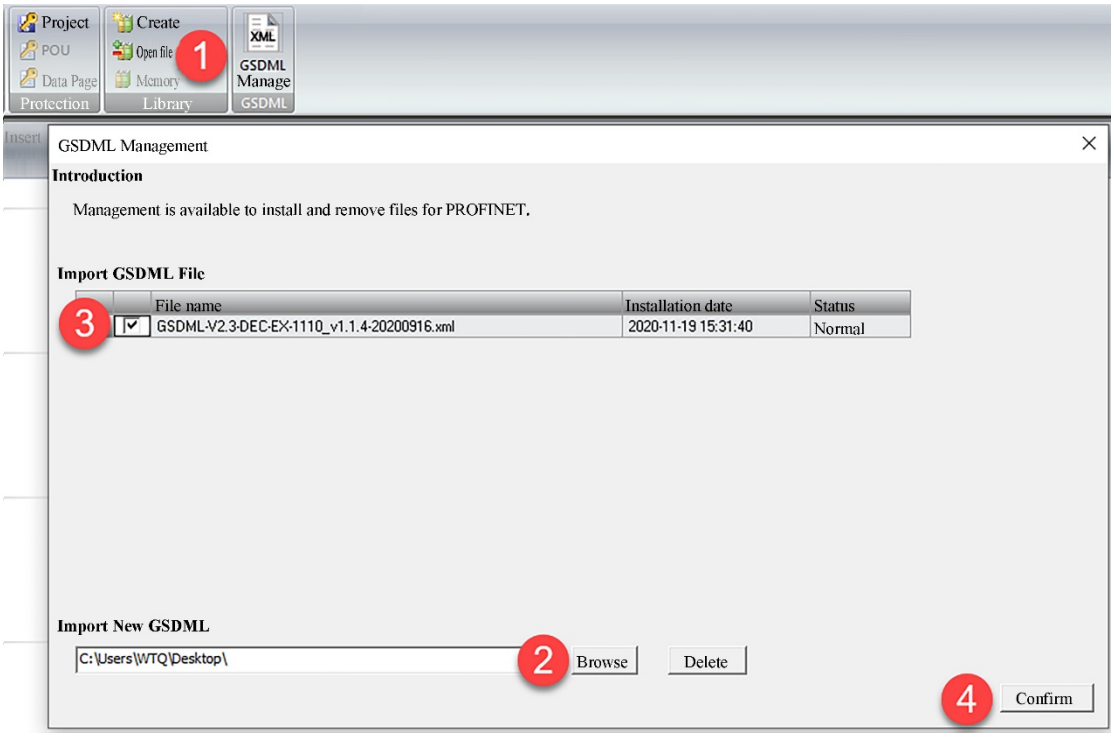


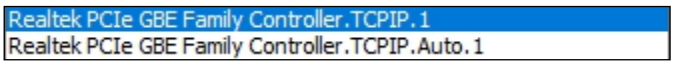
Fig. 5-8-12 Installation of GSD File

4. Assignment of Device Name

Select "Tool" > "Search PROFINET device" from the menu, select the network card connected to the module in the window and find the device, select the Module in the network and edit its device name as shown in Fig.5-8-13.

Note:

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



② After the device name is assigned, please note that when configuring the IO module, the device name must be consistent with the name assigned above, otherwise the PLC will not be able to link with the IO module normally.

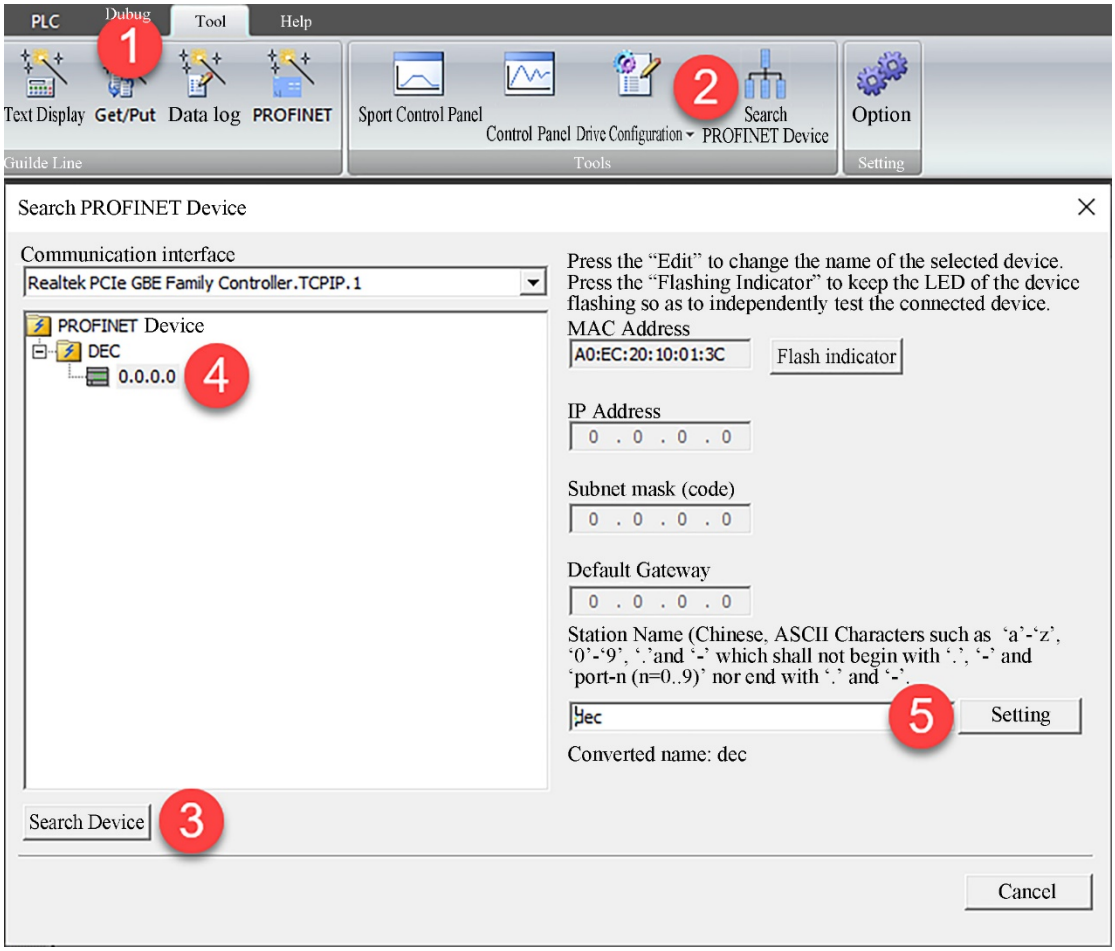


Fig.5-8-13 Assignment of Device Name

5. New Project and Device Configuration

Select "Tool" > "PROFINET" from the menu. Select the PLC role as the controller as shown in Fig.5-8-14. Add the IO Module, assign the device name (should consistent with the device name assigned in step 4 above) and IP address, and confirm assigned successful, as shown in Fig.5-8-15.

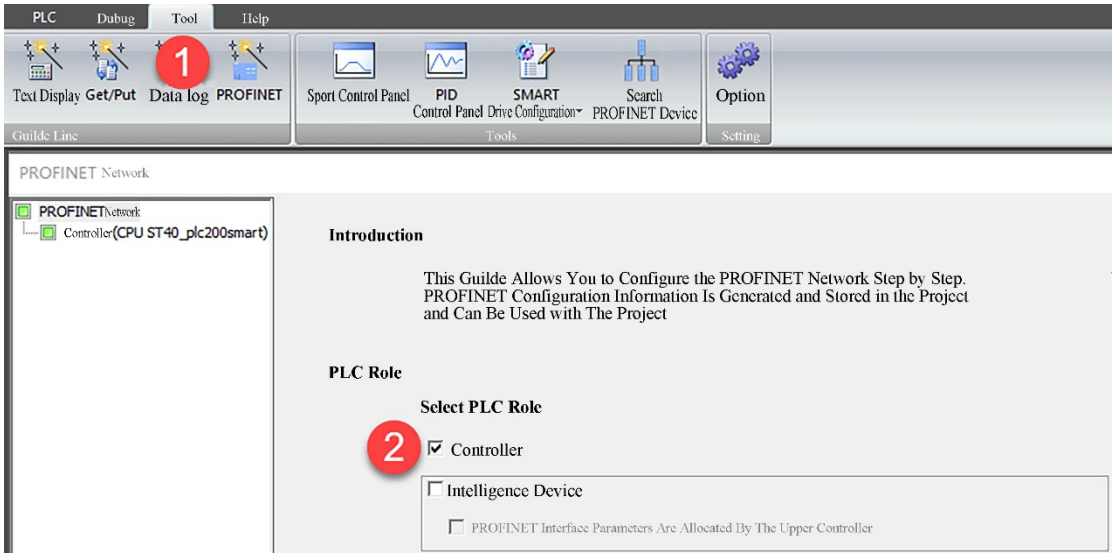


Fig.5-8-14 Selection of PLC Role

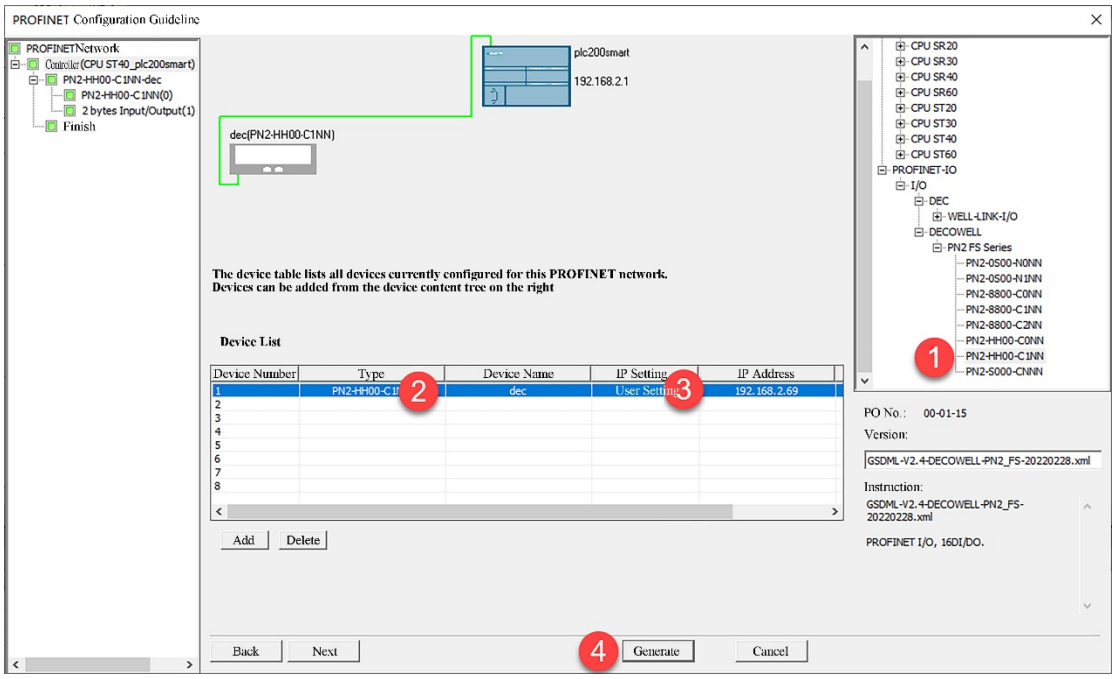


Fig. 5-8-15 Assignment of Device Name and IP Address

As for the module input / output IO port parameter configuration and in the PROFINET, configure the input filtering time (3ms as default, and the range is 0.5ms-10ms) in the guide window as shown in Fig. 5-8-16. When the CPU is in STOP, and the module is in output status (the default output is 0, FALSE, which can be configured to output 0/1 or maintain the previous value), as shown in Fig. 5-8-17.

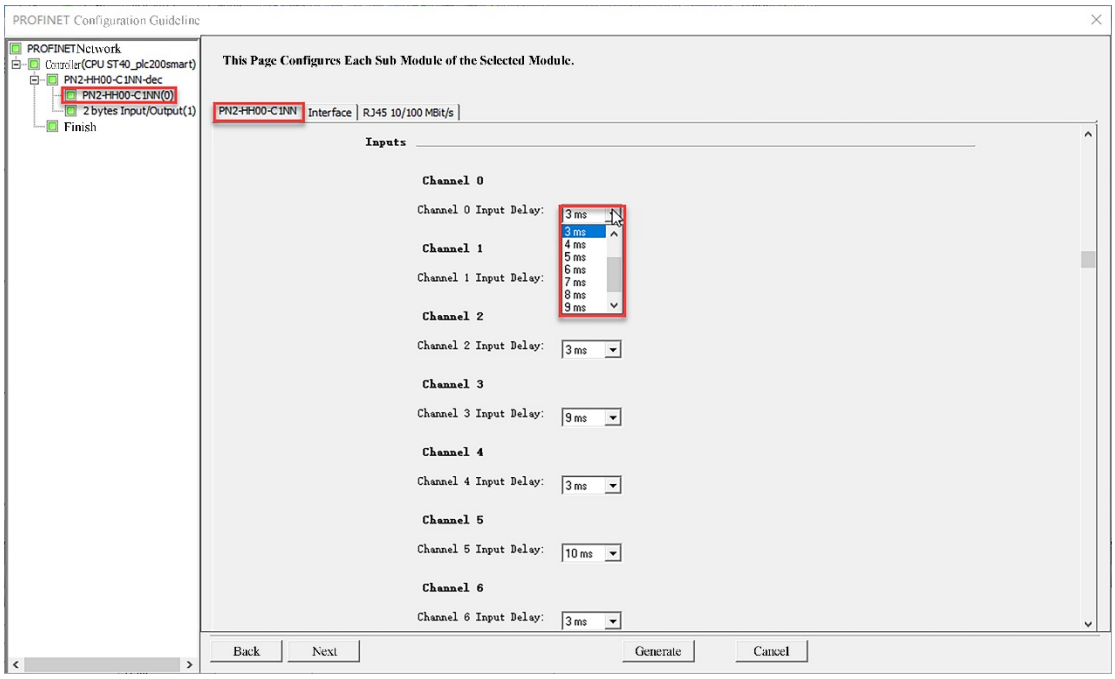


Fig.5-8-16 Configuration Module Input Channel Filter Time

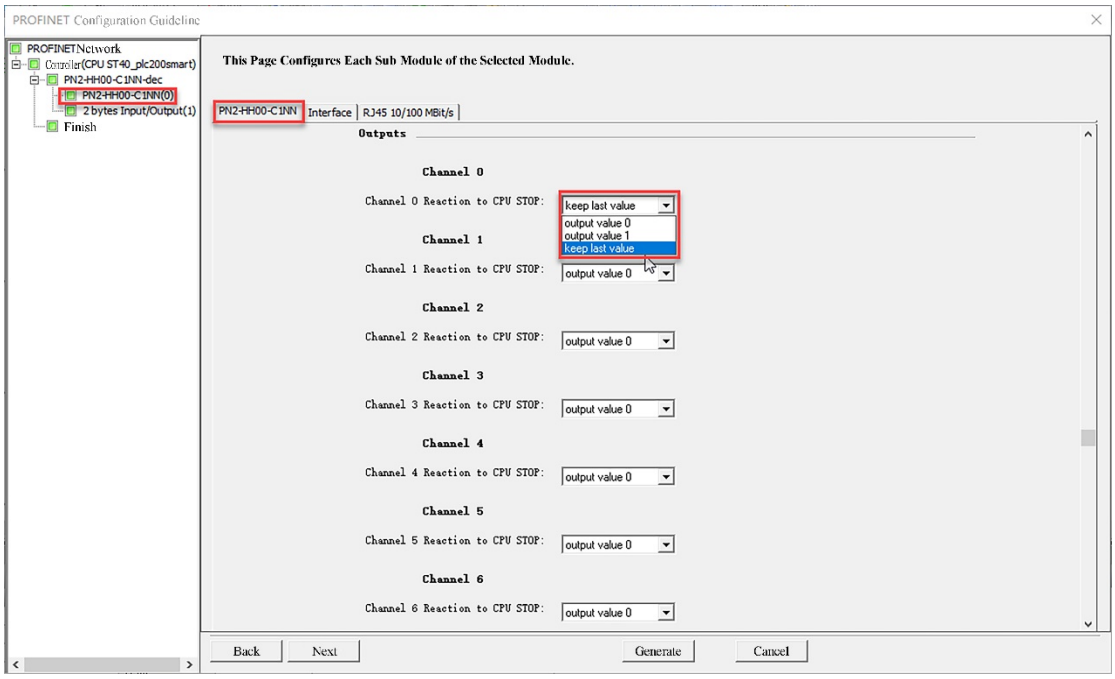


Fig.5-8-17 Configuration Module Output Channel Parameter

6. Program Download

Select "PLC" > "Download" from the menu, select "Search CPU" in the communication window, select the PLC that needs to download the program, and download the program.

Note: when using **STEP 7-MicroWIN SMART** configure **200 SMART** PROFINET, the CPU firmware version of PLC must be ≥ V2.4. For firmware = **V2.3**, the firmware can be upgraded online directly. For firmware ＜ 2.3, the firmware must be updated in the CPU using a memory card.

5.8.3 IO Module Link and Configuration of Step7 and PROFINET Protocol

1. See Fig.5-8-18 for the communication link diagram.

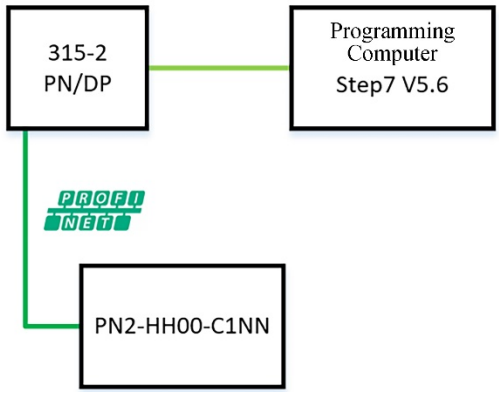


Fig.5-2-18 Communication Link Diagram

2. See Table 5-8-3 for the hardware configuration.

Table 5-8-3 Hardware Configuration

Hardware	QTY	Note
Programming Computer	1	Step7 V5.6 Installed
Controller	1	315-2 PN/DP

PN2-HH00-C1NN	1	PROFINET Protocol 16DI/16DO Module
Network Cable	>1	

3. Installation of GSD File

After create new project, click “SIMATIC300”. Double-click “Hardware”. Select “Options”>“Install GSD File” from menu in the HW Config. Window as shown in Fig.5-8-19.

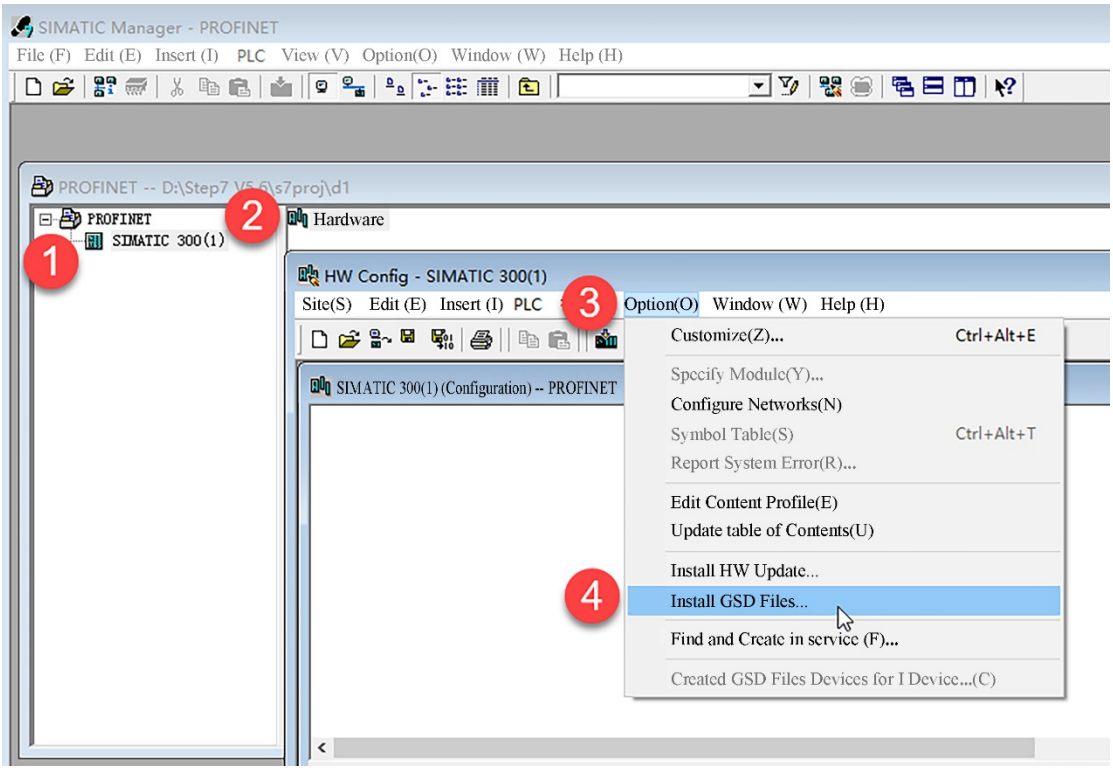


Fig. 5-8-19 Installation of GSD File

4. New Project and Device Configuration

Open SIMATIC Manager. Select “New project ” from menu and name the project. Select project save path as shown in Fig.5-8-20.

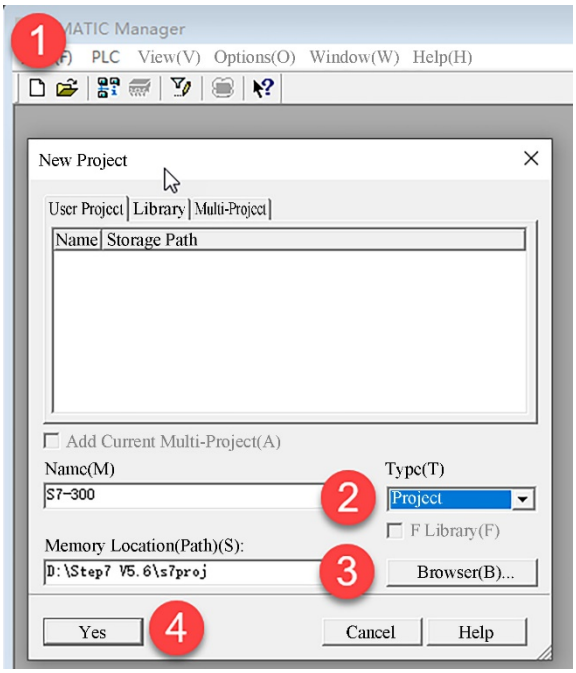


Fig. 5-8-20 New Project

Add station 300 to the project as shown in Fig. 5-8-21. Click the newly added station 300, select "Hardware", and enter the HW config configuration interface as shown in Fig. 5-8-22. Add RACK Rl of RACK 300 as shown in Fig. 5-8-23. Add the CPU module, select the version V2.6 of CPU315-2 PN/DP of CPU-300 in the right window of HW config, and drag it to slot 2 of the rack with the mouse as shown in Fig. 5-8-24. In the attribute interface of the Ethernet interface, other IP addresses can be used as needed. Here, the default IP address and subnet mask are used. Select the Create button, and create a new subnet Ethernet (1). Click OK. See Fig. 5-8-25 for details.

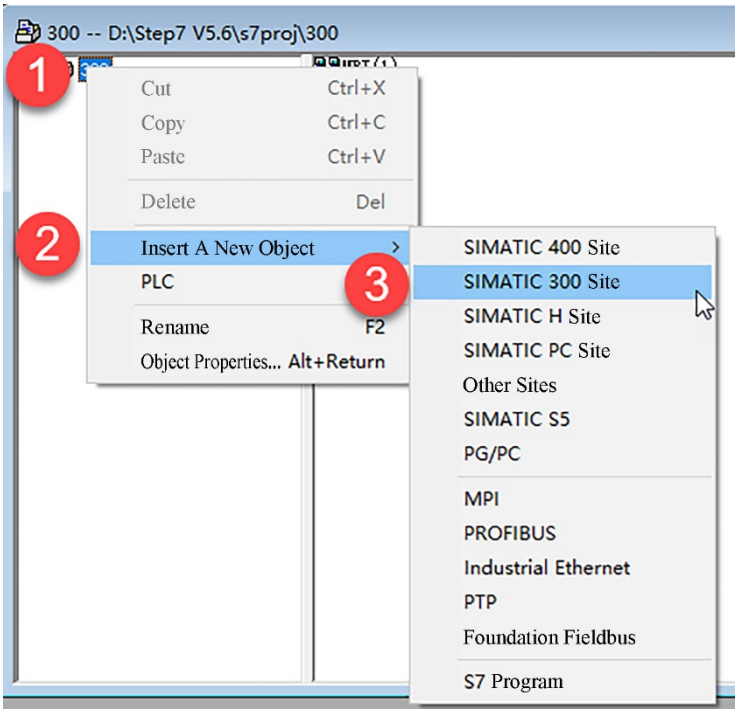


Fig.5-8-21 Add Station 300

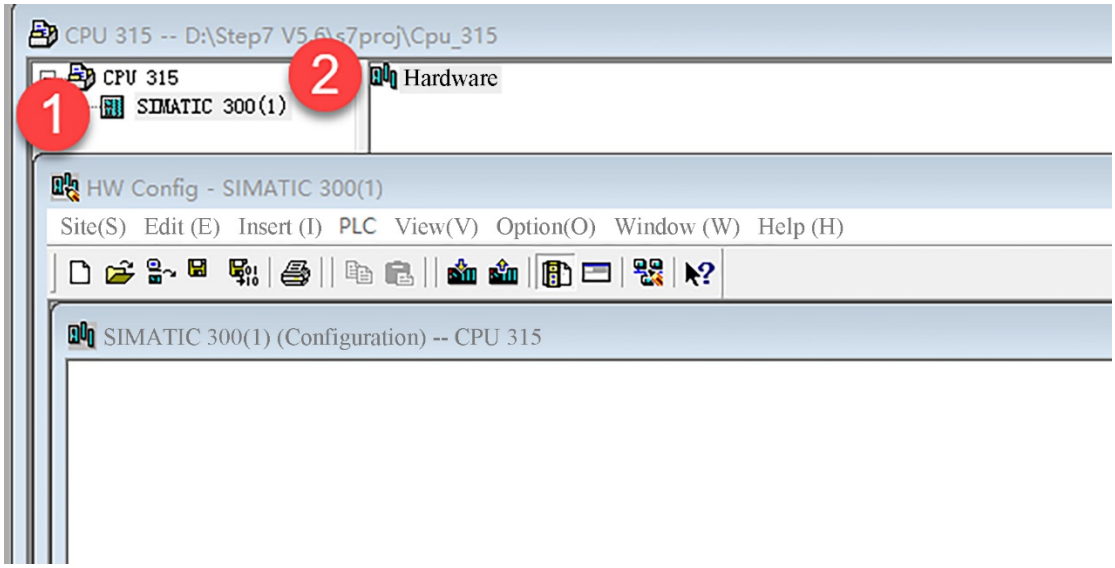


Fig.5-8-22 HW Config Interface

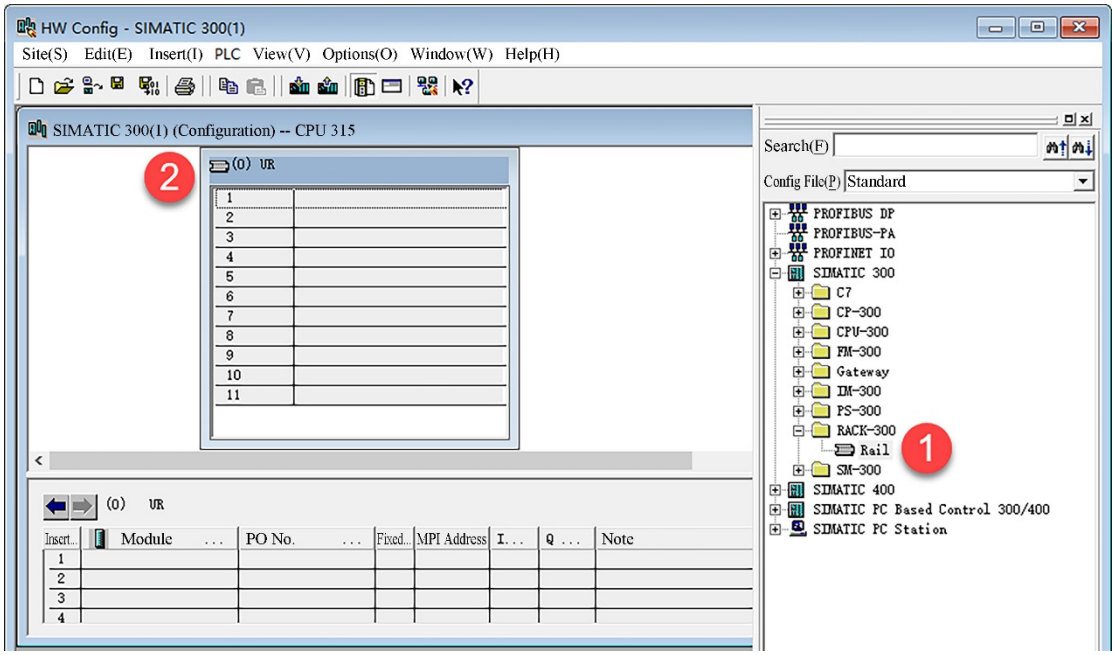


Fig.5-8-23 Add Rack Rl

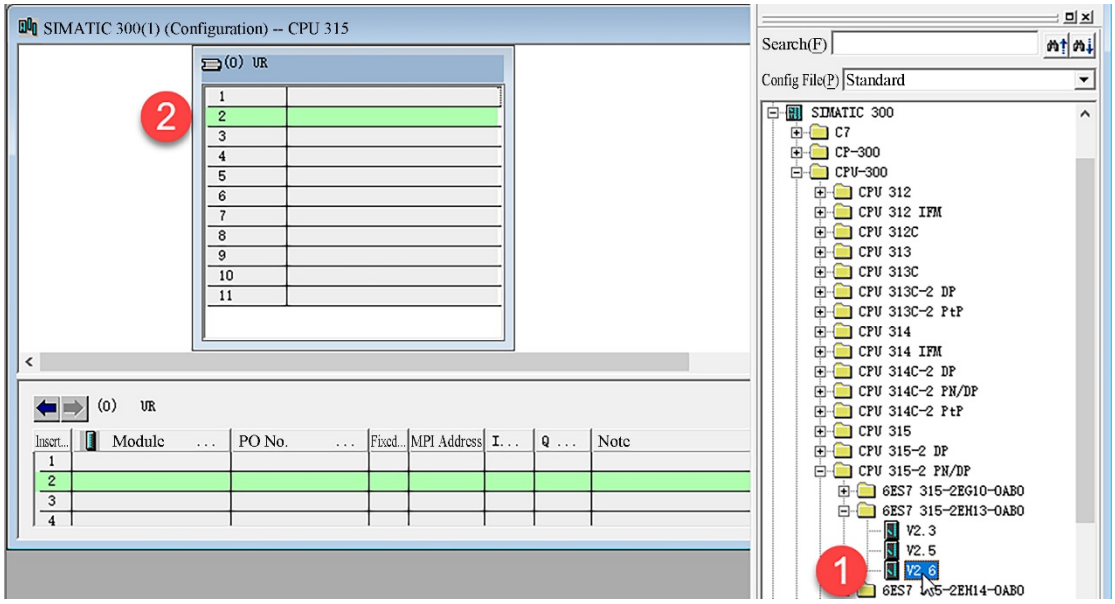


Fig.5-8-24 Add CPU Module to Rack

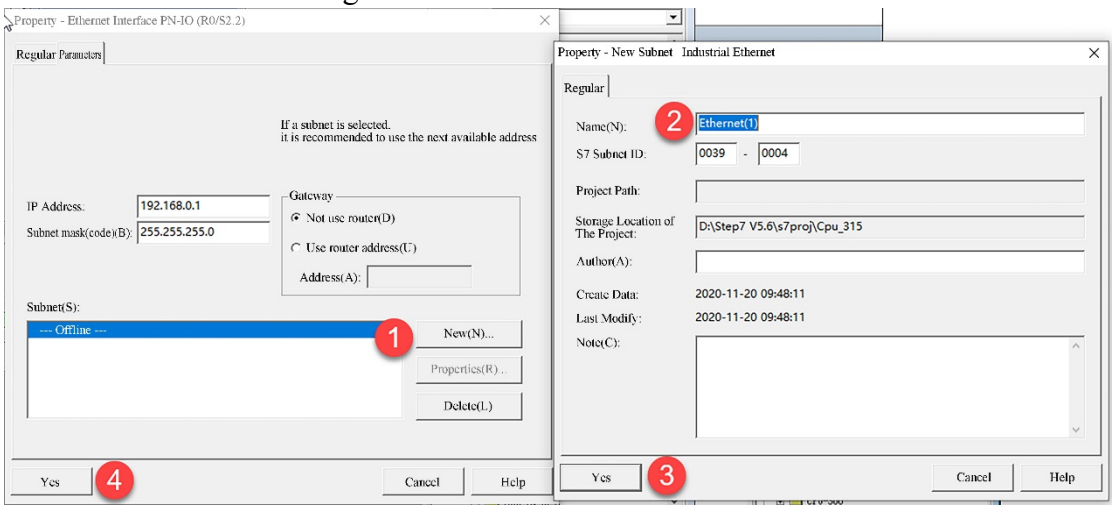


Fig.5-8-25 Add Ethernet Subnet

Configure IO Device Station in Ethernet (1). Select PN2-HH00-C1NN on the right and drag it to the Ethernet (1) subnet, as shown in Fig.5-8-26.

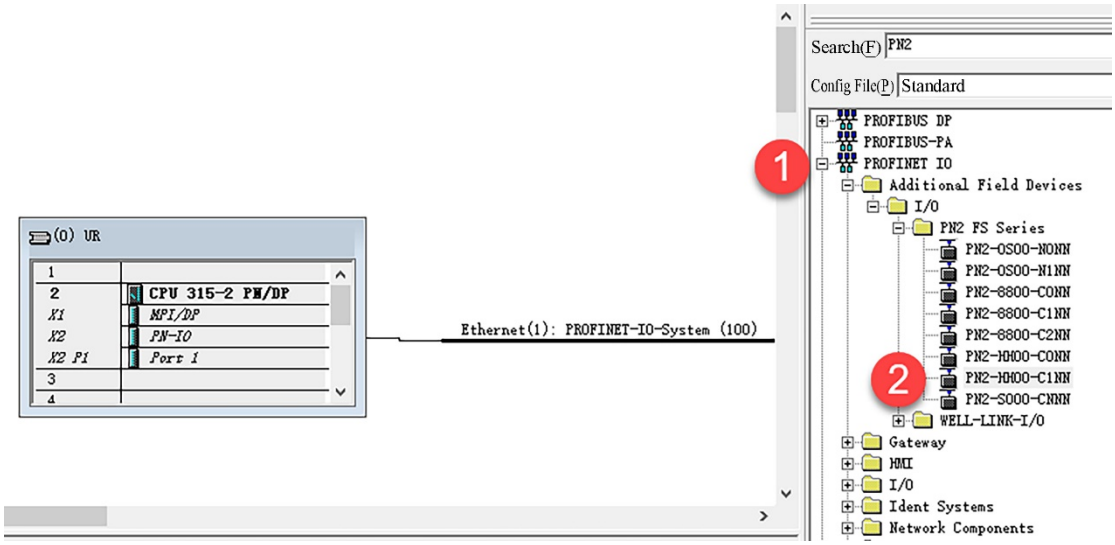


Fig.5-8-26 Add IO Module into Ethernet(1) Subnet

Modify the IP address of the IO device station, double click PN2-HH00-C1NN Module in the subnet, select "Ethernet" in the attribute window, and modify the IP address from it , as shown in Fig.5-8-27.

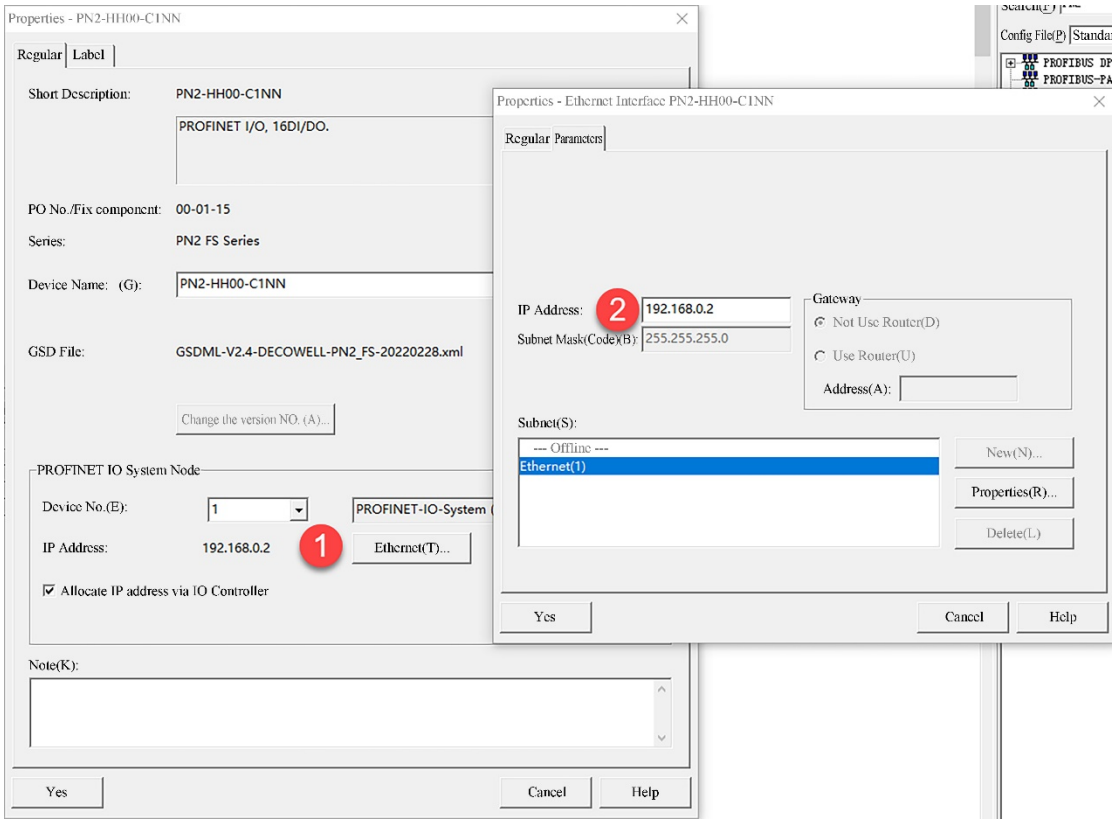


Fig.5-8-27 Modify Module IP Address

Set the device name of the IO module, select the subnet icon, select "PLC" from the menu, select "Ethernet" > "assign device name", as shown in Fig.5-8-28. In the assign device name window, select the name to be assigned, and press the "confirm name" button, as shown in Fig.5-8-29.

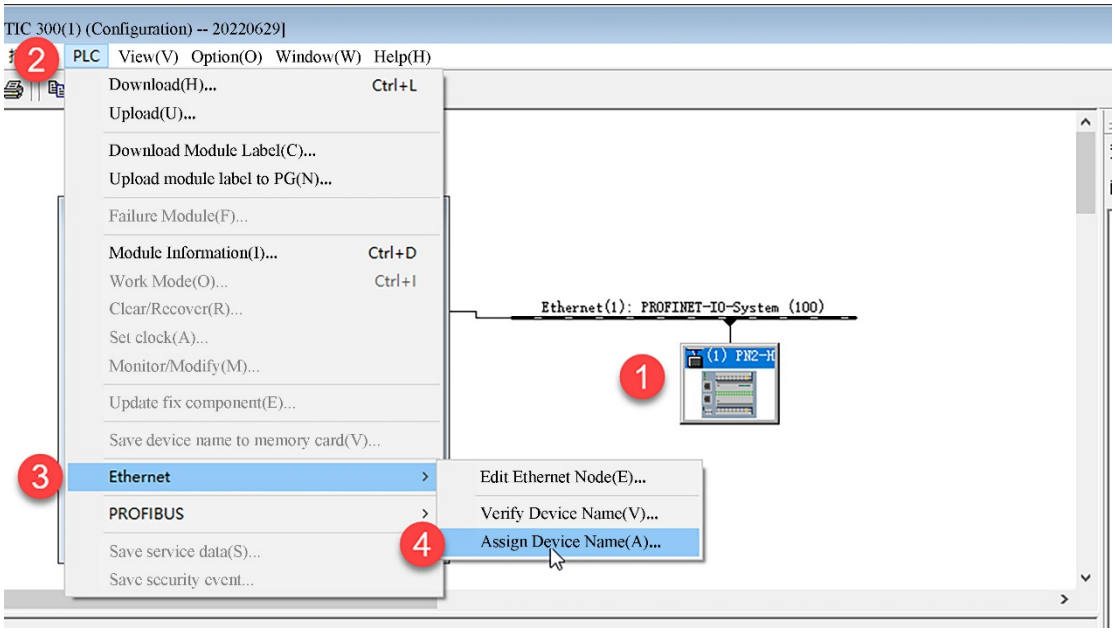


Fig.5-8-29 Assign Device Name

As for the module input / output IO port parameter configuration, configure the input filtering time (3ms as default, and the range is 0.5ms-10ms) in the module slot. When the CPU is in STOP status, the module output status (the default output is 0, FALSE, which can be configured to output 0/1 or maintain the previous value), as shown in Fig. 5-8-30.

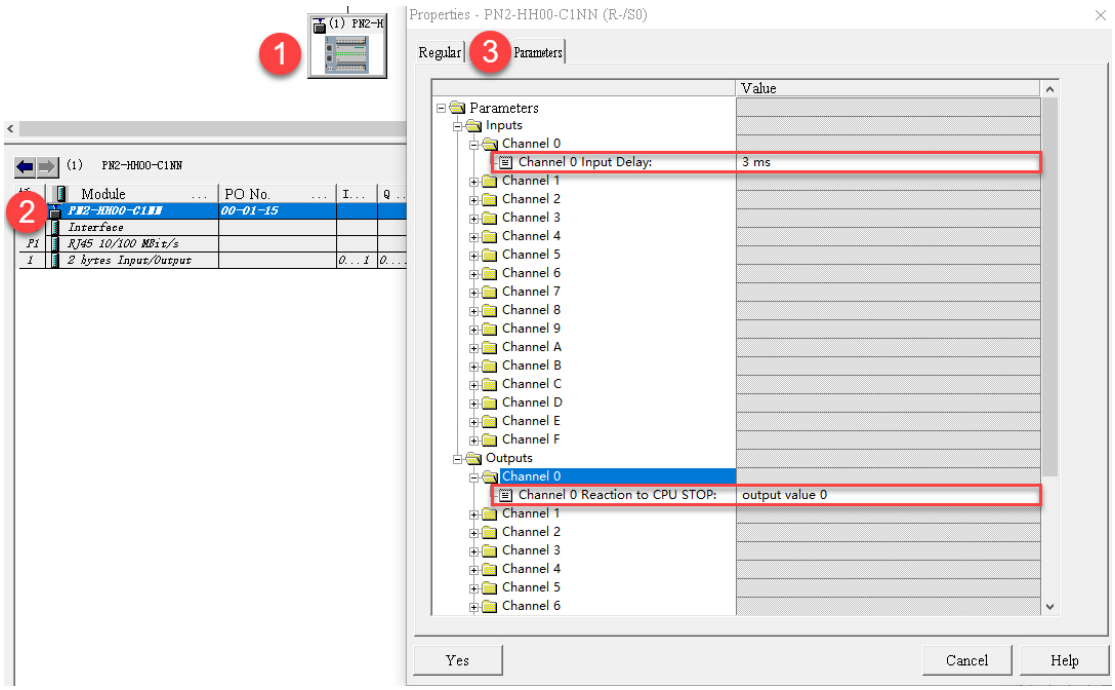


Fig. 5-8-30 Module Input/Output IO Port Parameters Configuration

Annex

Summary of PO Details of FS Series Products

FS One-piece-PROFINET Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
PN-8800-C0NN	PROFINET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (NPN)	00-01-01
PN-8800-C1NN	PROFINET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (PNP)	00-01-02
PN-8800-C2NN	PROFINET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-01-03
PN-HH00-C0NN	PROFINET 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (NPN)	00-01-04
PN-HH00-C1NN	PROFINET 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (PNP)	00-01-05
PN-S000-CNNN	PROFINET 32-channel digital quantities input (NPN&PNP)	00-01-08
PN-0S00-N0NN	PROFINET 32-channel digital quantities output (NPN)	00-01-09
PN-0S00-N1NN	PROFINET 32-channel digital quantities output(PNP)	00-01-10
FS One-piece-EtherCAT Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
EC-8800-C0NN	EtherCAT 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(NPN)	00-02-01
EC-8800-C1NN	EtherCAT 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(PNP)	00-02-02
EC-8800-C2NN	EtherCAT 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-02-03
EC-HH00-C0NN	EtherCAT 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(NPN)	00-02-04
EC-HH00-C1NN	EtherCAT 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(PNP)	00-02-05
EC-S000-CNNN	EtherCAT 32-channel digital quantities input(NPN&PNP)	00-02-08

EC-0S00-N0NN	EtherCAT 32-channel digital quantities output(NPN)	00-02-09
EC-0S00-N1NN	EtherCAT 32-channel digital quantities output(PNP)	00-02-10
FS One-piece-CC-Link Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
CL-8800-C0NN	CC-LINK 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(NPN)	00-03-01
CL-8800-C1NN	CC-LINK 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(PNP)	00-03-02
CL-8800-C2NN	CC-LINK 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-03-03
CL-HH00-C0NN	CC-LINK 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(NPN)	00-03-04
CL-HH00-C1NN	CC-LINK 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(PNP)	00-03-05
CL-S000-CNNN	CC-LINK 32-channel digital quantities input(NPN&PNP)	00-03-07
CL-0S00-N0NN	CC-LINK 32-channel digital quantities output(NPN)	00-03-08
CL-0S00-N1NN	CC-LINK 32-channel digital quantities output (PNP)	00-03-09
FS One-piece-DeviceNet Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
DN-8800-C0NN	DEVICENET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (NPN)	00-04-01
DN-8800-C1NN	DEVICENET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (PNP)	00-04-02
DN-8800-C2NN	DEVICENET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-04-03
DN-HH00-C0NN	DEVICENET 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (NPN)	00-04-04
DN-HH00-C1NN	DEVICENET 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (PNP)	00-04-05
DN-S000-CNNN	DEVICENET 32-channel digital quantities input(NPN&PNP)	00-04-08

DN-0S00-N0NN	DEVICENET 32-channel digital quantities output (NPN)	00-04-09
DN-0S00-N1NN	DEVICENET 32-channel digital quantities output (PNP)	00-04-10
FS One-piece- CC-Link IE Field Basic Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
CI-8800-C0NN	CC-Link IE Field Basic 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (NPN)	00-06-01
CI-8800-C1NN	CC-Link IE Field Basic 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(PNP)	00-06-02
CI-8800-C2NN	CC-Link IE Field Basic 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-06-03
CI-HH00-C0NN	CC-Link IE Field Basic 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (NPN)	00-06-04
CI-HH00-C1NN	CC-Link IE Field Basic 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (PNP)	00-06-05
CI-S000-CNNN	CC-Link IE Field Basic 32-channel digital quantities input (NPN&PNP)	00-06-06
CI-0S00-N0NN	CC-Link IE Field Basic 32-channel digital quantities output (NPN)	00-06-07
CI-0S00-N1NN	CC-Link IE Field Basic 32-channel digital quantities output(PNP)	00-06-08
FSOne-piece-PROFINET Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
PN2-8800-C0NN	PROFINET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(NPN)	00-01-11
PN2-8800-C1NN	PROFINET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output(PNP)	00-01-12
PN2-8800-C2NN	PROFINET 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-01-13
PN2-HH00-C0NN	PROFINET 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(NPN)	00-01-14
PN2-HH00-C1NN	PROFINET 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output(PNP)	00-01-15

PN2-S000-CNNN	PROFINET 32-channel digital quantities input(NPN&PNP)	00-01-18
PN2-0S00-N0NN	PROFINET 32-channel digital quantities output(NPN)	00-01-19
PN2-0S00-N1NN	PROFINET 32-channel digital quantities output(PNP)	00-01-20
FS One-piece-EtherNet/IP Communication Protocol Digital Quantities Input/Output Module		
Model	Descriptions	PO No.
EI2-8800-C0NN	EtherNet/IP 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (NPN)	00-05-11
EI2-8800-C1NN	EtherNet/IP 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (PNP)	00-05-12
EI2-8800-C2NN	EtherNet/IP 8-channel digital quantities input(NPN&PNP)8-channel digital quantities output (Relay)	00-05-13
EI2-HH00-C0NN	EtherNet/IP 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (NPN)	00-05-14
EI2-HH00-C1NN	EtherNet/IP 16-channel digital quantities input(NPN&PNP)16-channel digital quantities output (PNP)	00-05-15
EI2-S000-CNNN	EtherNet/IP 32-channel digital quantities input (NPN&PNP)	00-05-16
EI2-0S00-N0NN	EtherNet/IP 32-channel digital quantities output (NPN)	00-05-17
EI2-0S00-N1NN	EtherNet/IP 32-channel digital quantities output (PNP)	00-05-18