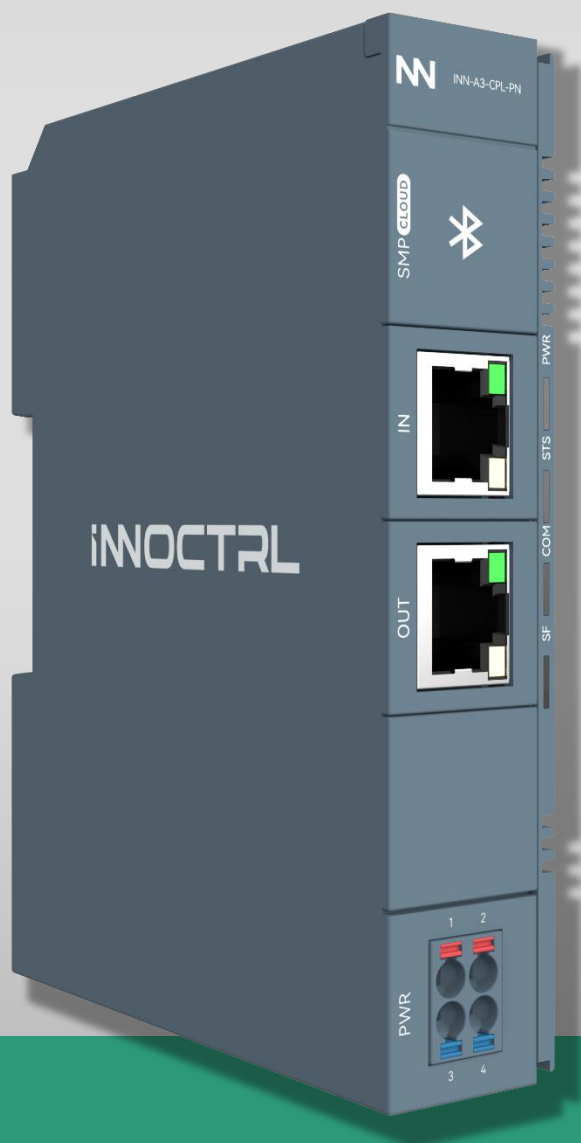


INOCTRL



INN-A3-CPL-PN PN Coupler

User Manual

2026-05-06 | V1.0.1

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1 Document Description

INN-A3-CPL-PN is an innovative PROFINET Coupler with built-in Bluetooth communication function that supports electrical circuit inspection and basic communication testing without the main station equipment, greatly improving troubleshooting efficiency and on-site operation flexibility. This PN Coupler is compatible with mainstream third-party PN master device on the market (such as PLC, control board, etc.). A single PN Coupler module unit can connect up to 32 A-series standard I/O modules to meet the needs of distributed IO layout. The system adopts an expandable power supply architecture. When the number of mounted I/O modules exceeds 6, an additional expansion power supply module is required. Normally, for every 6 additional I/O modules (the specific number depends on the module type), a corresponding power module needs to be added to achieve a flexible and reliable power supply configuration.

1.1 Applicable Standards

Table 1 Certification standards1

Certification name	Command name		Applicable Standards
CE certification	EMC directive	2014/30/EU	● EN 61131-2
	LVD instruction	2014/35/EU	● EN 61010-1 ● EN 61010-2-201
	RoHS Directive	2011/65/EU amended by (EU) 2015/863	● EN IEC 63000

1.2 Version Revision History

Table 2 version revision record2

Revision date	release version	Change history
2026/03/10	V1.0.0	initial version
2026/05/06	V1.0.1	Updated programming examples

1.3 Warranty Description

Under normal use, if the product fails or is damaged, Zhejiang Visual Intelligent Technology Co., Ltd. provides warranty services within the warranty period (please refer to the order form for details of the product warranty period). After the warranty period, repair fees will be charged.

During the warranty period, if the product is damaged due to the following conditions, repair fees will be charged.

- 1) Failure to operate this product according to the regulations in this manual may result in damage to the product.
- 2) Product damage caused by fire, flood, voltage abnormality.
- 3) Product damage caused by using this product for abnormal functions.
- 4) Product damage caused by exceeding the specified use range of the product.
- 5) Secondary damage to the product caused by force majeure (natural disasters, earthquakes, lightning strikes).

The relevant service fees are calculated according to the manufacturer's unified standards. If there is a contract, the contract priority will be used.

Please refer to the "Product Warranty Card" for detailed warranty instructions.

1.4 Safety Precautions

1.4.1 Safety Instructions

When installing, operating, and maintaining the product, please read and comply with the following safety precautions:

- To ensure personal and equipment safety, please follow all safety precautions marked on the product and described in this manual when installing, operating, and maintaining the product.
- The "Caution", "Warning" and "Danger" items in this manual do not represent all the safety precautions that should be observed, but are only supplementary to all safety precautions.
- This product should be used in an environment that meets the design specifications, otherwise it may cause malfunctions. Functional abnormalities or component damage caused by failure to comply with relevant regulations are not covered by the product quality guarantee.
- Our company will not bear any legal responsibility for personal safety accidents, property losses, etc. caused by illegal operation of products.

1.4.2 Security level

This manual will indicate the user's safety level into three categories: danger, warning, and caution.

DANGER 

Indicates that death or serious bodily injury may result if instructions are not followed.

 **WARNING**

Indicates that death or serious bodily injury may result if instructions are not followed.

CAUTION

Indicates that minor bodily injury or equipment damage may result if operations are not carried out as specified.

Please keep this manual in a safe place for reading when necessary, and be sure to give this manual to the end user.

1.4.2.1 When designing the control system

When designing a control system, please read and follow the following safety precautions:

DANGER

- Please be sure to design a safety circuit to ensure that the control system can still work safely when the external power supply fails or the programmable controller fails;
- When the rated load current is exceeded or the load is short-circuited, causing overcurrent for a long time, the module may smoke or catch fire. Safety devices such as fuses or circuit breakers should be installed externally.

WARNING

- Please be sure to set up emergency braking circuits, protection circuits, interlock circuits for forward and reverse operations, and position upper and lower limit interlock switches to prevent machine damage in the external circuit of the programmable controller;
- In order to ensure the safe operation of the equipment, please design external protection circuits and safety mechanisms for output signals related to major accidents; the programmable controller CPU may shut down all outputs after detecting an abnormality in its own system; when part of the controller's circuit fails, its output may be

uncontrolled. To ensure normal operation, it is necessary to design an appropriate external control circuit;

- When the output units such as relays and transistors of the programmable controller are damaged, the output cannot be controlled to ON or OFF state;
- Programmable controllers are designed to be used in indoor, overvoltage level II electrical environments. The power supply system level should have lightning protection devices to ensure that lightning overvoltage is not applied to the power input end or signal input end, control output end and other ports of the programmable controller to avoid damage to the equipment.

1.4.2.2 When installing

When installing the device, please read and follow the following safety precautions:



WARNING

- Only professional maintenance personnel who have received relevant training on electrical equipment and have sufficient electrical knowledge can install this product;
- When disassembling or installing a module, all external power supplies used by the system must be disconnected before proceeding. If the power is not completely disconnected, it may cause electric shock or module failure or malfunction;
- Do not use the programmable controller in the following places: places with dust, oil fumes, conductive dust, corrosive gases, and flammable gases; places exposed to high temperatures, condensation, wind and rain; places with vibrations and shocks. Electric shock, fire, and misoperation can also cause product damage and deterioration;
- The programmable controller is an Open type device. Please install it in a control cabinet with a door lock (control cabinet shell protection > IP20). Only operators who have received relevant training on electrical equipment and have sufficient electrical knowledge can open the control cabinet.

 CAUTION

- When installing, avoid metal shavings and wire ends from falling into the ventilation holes of the controller, which may cause fire, malfunction, and misoperation;
- After installation, make sure there are no foreign objects on the ventilation surface, otherwise it may cause poor heat dissipation, causing fire, malfunction, and misoperation;
- When installing, they should be tightly connected to their respective connectors and the module connection hooks should be locked firmly. If the module is installed improperly, it may cause malfunction, malfunction, and falling off.

1.4.2.3 When wiring

When wiring, please read and follow the following safety precautions:

 DANGER

- Only professional maintenance personnel who have received relevant training on electrical equipment and have sufficient electrical knowledge can perform wiring on this product;
- During wiring work, all external power supplies used by the system must be disconnected before proceeding. If all are not disconnected, it may cause electric shock or equipment failure or malfunction;
- Cable terminals should be well insulated to ensure that the insulation distance between cables will not be reduced after the cables are installed on the terminal block. Otherwise it may cause electric shock or equipment damage.

 CAUTION

- To avoid electric shock, please cut off the power supply before

connecting this product;

- Please refer to the data in the technical specifications for the input power supply specifications of this product. Please provide the power supply strictly in accordance with the data in the technical specifications. If the power supplied is not within the required range, the product will be seriously damaged. Therefore, please regularly check whether the DC power provided by the switching power supply is stable.

1.4.2.4 During operation and maintenance

When operating and maintaining the equipment, please read and comply with the following safety precautions:

CAUTION

- Only professional maintenance personnel who have received relevant training on electrical equipment and have sufficient electrical knowledge can operate and maintain the product;
- Do not touch the terminals when the power is on, otherwise it may cause electric shock or malfunction;
- When disassembling modules or connecting or removing communication cables, all external power supplies used by the system must be disconnected first. Failure to disconnect them all may result in electric shock or malfunction.

1.4.2.5 When scrapped

When scrapping your equipment, please read and follow the following safety precautions:

CAUTION

- Please treat it as industrial waste; when discarding batteries, they should be disposed of separately in accordance with the laws and regulations established by each region;

- Scrapped equipment and products should be processed and recycled according to industrial waste treatment standards to avoid environmental pollution.

2 product information

2.1 Naming rules and nameplate instructions

INN-A 3-CPL-PN

① ② ③ ④ ⑤

Table 3 Naming rules table3

No.	Description
①	Product range INNOCTRL
②	Module classification level: A-series
③	Product generation: 3, third generation product
④	Module classification: • MODD, digital module; • CPL, Coupler; • MODA, analog module; • MODS, serial port module; • ASSY, attachment.
⑤	PN: PROFINET communication

2.2 Technical Specifications

The following table shows the product power specifications:

Table 4 Power supply specification table4

Item		Specification
System power supply	input voltage	24V DC
	Input current	1A
bus powered	Output voltage	5V DC
	Output current	2A
On-site power supply	input voltage	24V DC
	Input current	1A
Power isolation		Not isolated
Power protection		Overcurrent protection, anti-reverse connection protection, surge absorption

2.3 Interface Definition and terminal wiring

2.3.1 Interface Definition

The following is a schematic diagram of the Coupler and interface:

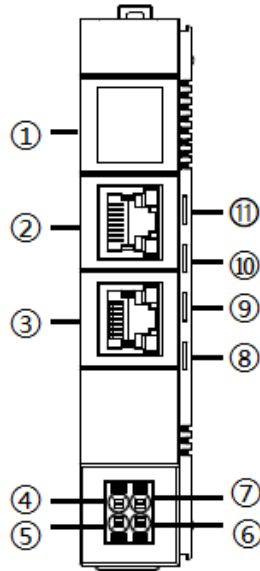


Figure 1 Interface diagram1

The interface is shown in the figure above, and the interface slots and definitions are shown in the table below:

Table 5 Interface Definition table5

No.	Description
①	Bluetooth module.
②	IN: PN input port.
③	OUT: PN output port.
④	On-site power supply is 24V DC, positive power supply.

⑤	On-site power supply GND, power ground.
⑥	System power supply GND, power ground.
⑦	The system is powered by 24V DC, positive power supply.
⑧	SF: Function status indicator, green indicates Bluetooth is connected.
⑨	COM: Communication status indicator, green means sending signal, yellow means receiving signal.
⑩	STS: Equipment status indicator, green means normal, yellow means fault.
⑪	PWR: Power indicator light, green indicates power is on.

2.3.2 Terminal Wiring

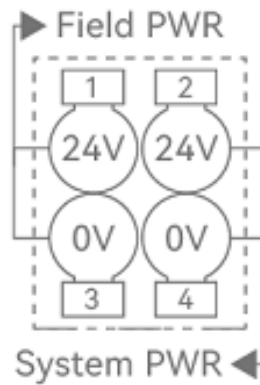


Figure 2 Terminal Wiring diagram2

2.4 environmental regulations

Table 6 Environmental requirements table6

Item	Specification
Working environment temperature	0~55℃
Working environment humidity	10%~90%RH, no condensation
Usage environment	No corrosive, flammable gases, and no serious conductive dust (dust)
Ambient storage temperature	-25~85℃
altitude	≤2000m
Immunity	Power cord 2kV (IEC 61000-4-4)
Overvoltage category	I
EMC anti-interference level	Zone B, IEC61131-2

3 Dimensions and installation

3.1 Module Dimensions

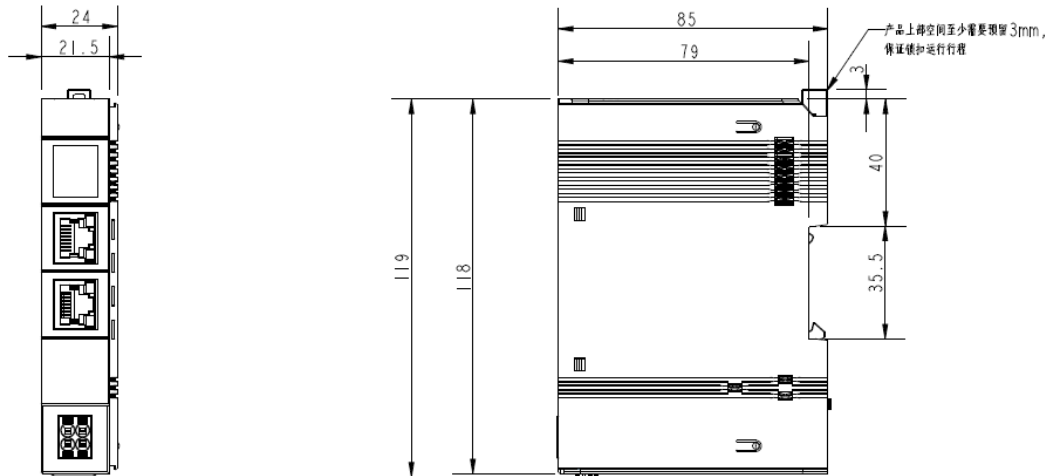


Figure 3 Module Dimensions diagram3

3.2 Equipment installation

3.2.1 Installation

The Coupler is installed on a DIN rail. The DIN rail must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is as shown in the figure below, in millimeters (mm):

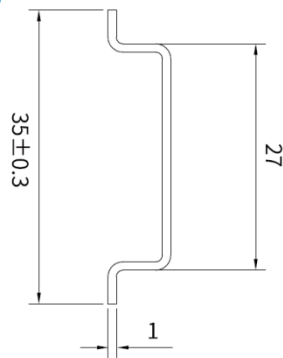


Figure 4 DIN rail diagram4

⚠ CAUTION

If the Coupler is installed on a DIN rail other than those recommended above, the DIN rail buckle may not lock properly.

The assembly between the Coupler and the I/O module is carried out by sliding the top and bottom guide rails as shown in the figure below.

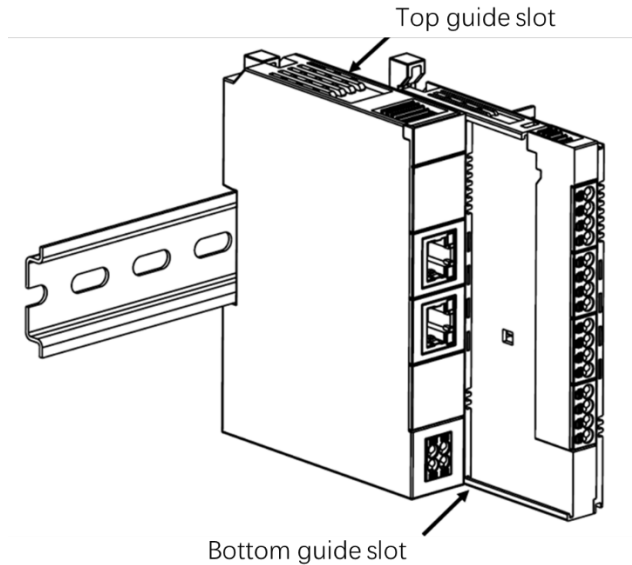


Figure 5 Schematic diagram of Coupler guide groove5

As shown in the figure below, when installing, align the Coupler with the DIN rail and press the module in the direction shown by arrow ① so that the module snaps onto the DIN rail. After the installation is in place, press the protruding guide rail part at the top in the direction shown by arrow ②. When you hear a snapping sound, the installation is complete.

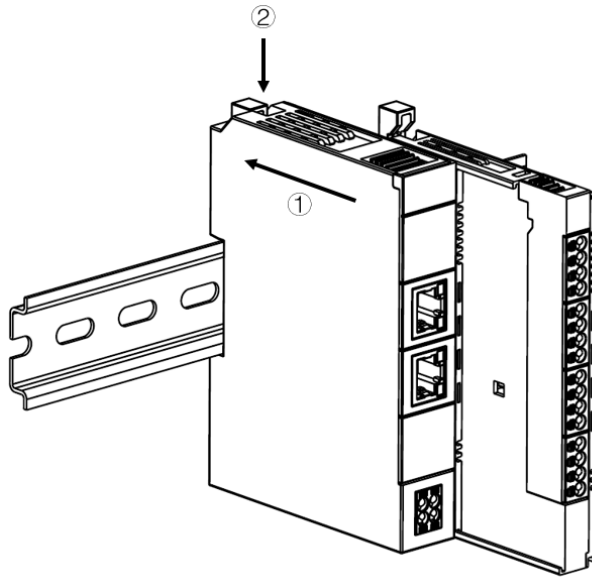


Figure 6 Coupler installation diagram6

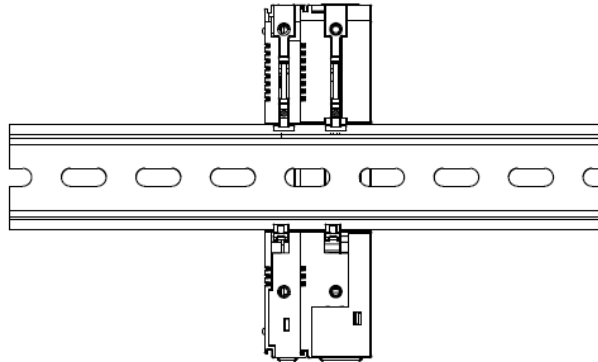


Figure 7 DIN rail buckle diagram7

3. 2. 2 Disassembly

As shown in the figure below, use a flat-blade screwdriver or similar tool to pry up the rail lock, and pull the module straight forward at the buckle position (the raised part). When completed, press down on the top of the lock.

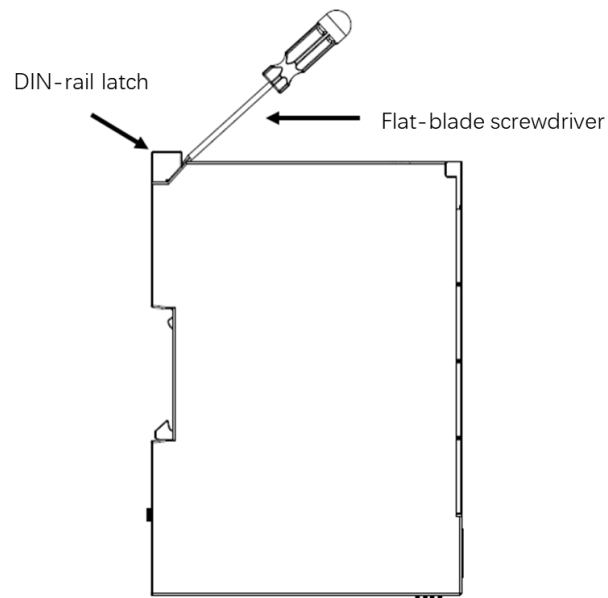


Figure 8 Schematic diagram of prying the guide rail lock8

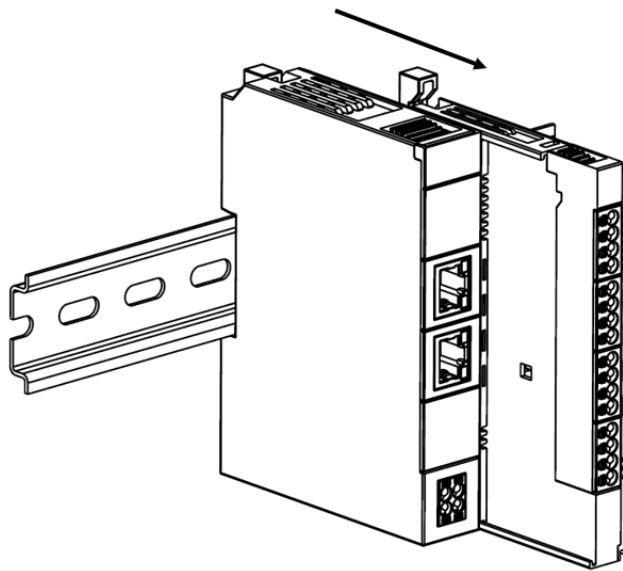


Figure 9 Schematic diagram of pull-out Coupler9

3.3 Electrical Installation

The following table shows the installation specifications of cables and tube terminals:

Table 7 Cable and tube terminal specifications7

Supporting material name	Adaptable wire diameter		Tube type terminal
	mm ²	AWG	Specification
Tubular wire lug	0.75	18	E7508
	1.0	17	E1008
	1.5	15	E1508

4 Programming Examples

This section takes the INN-A3-MODD1600END 16-channel digital input module as an example, using CODESYS as the programming tool to demonstrate the module usage process. The steps are as follows:

- 1) In the CODESYS menu bar, click "Tools" and select "Device Repository".

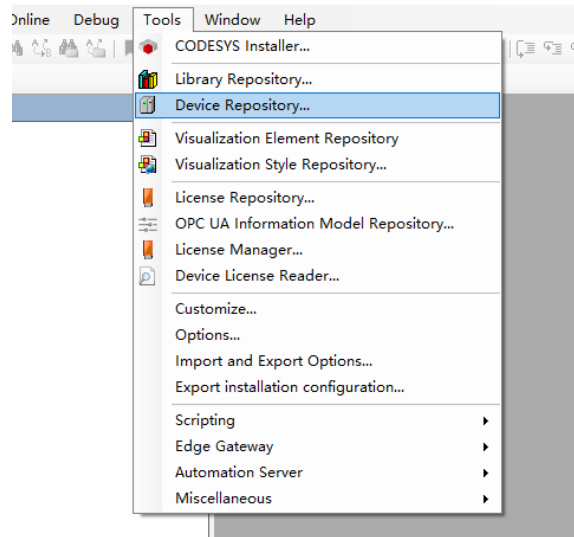


Figure 10 Tools menu drop-down box

- 2) Store the device's .xml file and .bmp icon file in the same local directory. In the "Device Repository" window interface of CODESYS, click "Install", select the .xml format file and open it. After receiving the prompt "The relevant device has been installed in the device repository", click "Close".

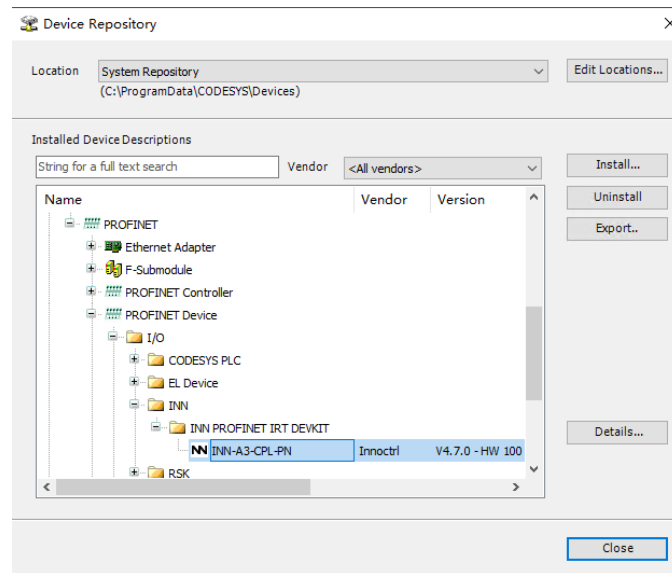


Figure 11 Installing the device into the device repository11

- 3) In the "Devices" window on the left side of CODESYS, right-click "Add Device" on "CODESYS_Control_Win_v3_x64", then click "Ethernet", "Add Device". When finished, just close the window.

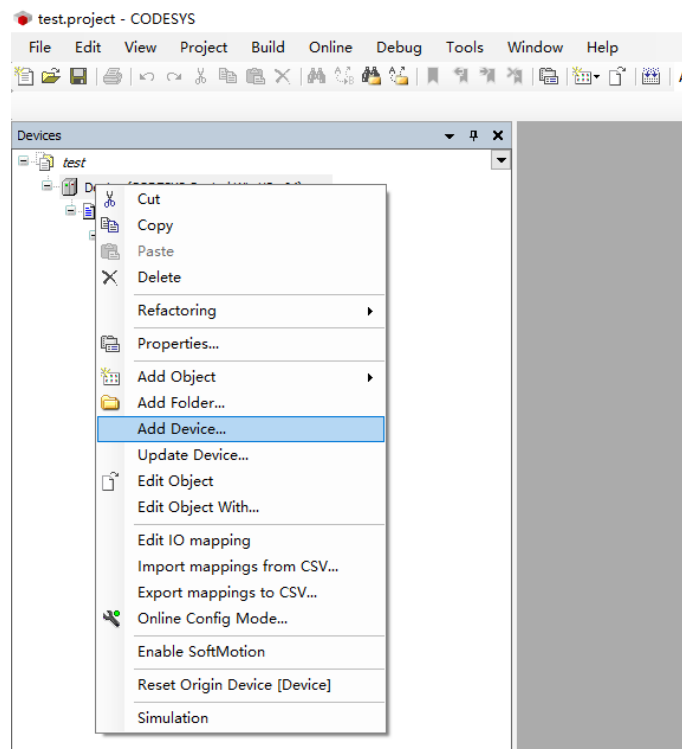


Figure 12 Device window12

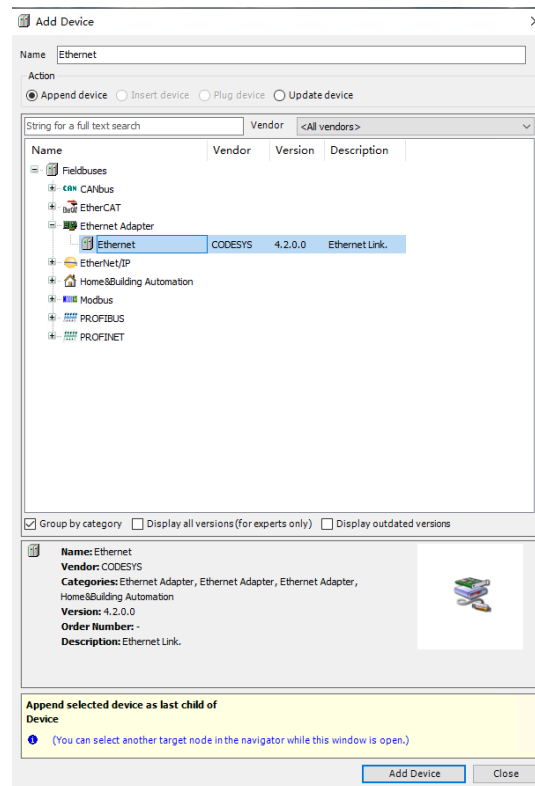


Figure 13 Add Ethernet device13

- 4) In the network settings of the computer system, set the network interface of the machine that is actually connected to the Coupler to a static IP (use an IPv4 address). In the device window of CODESYS, double-click the Ethernet device, then click the "Browse" button after "Network Interface" in the right window, and select the network interface with a static IP set to ensure normal communication. After completing the settings, click "Confirm" to save the network configuration. The interface will automatically synchronize the IP address, subnet mask and default gateway of the network interface.

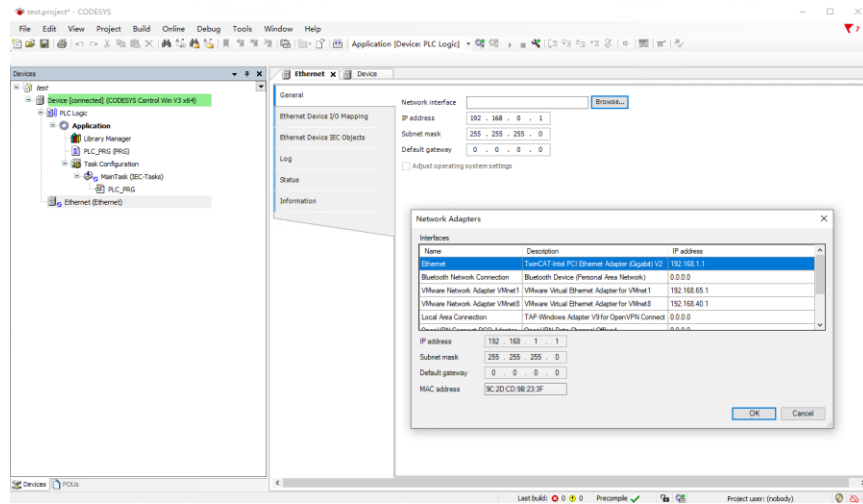


Figure 14 Select network interface

- 5) Right-click the Ethernet device and click "Add Device" in the pop-up menu. Select PN-Controller and click "Add Device" to complete adding the PROFINET master station.

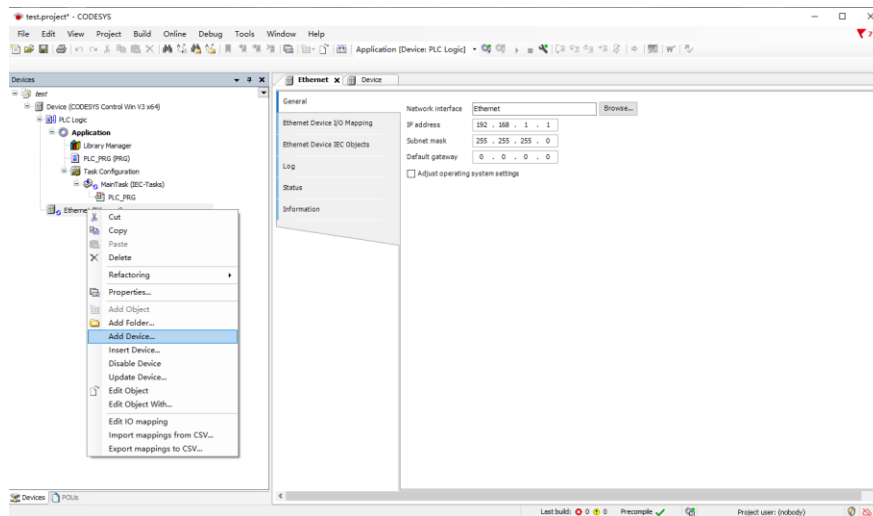


Figure 15 Add device

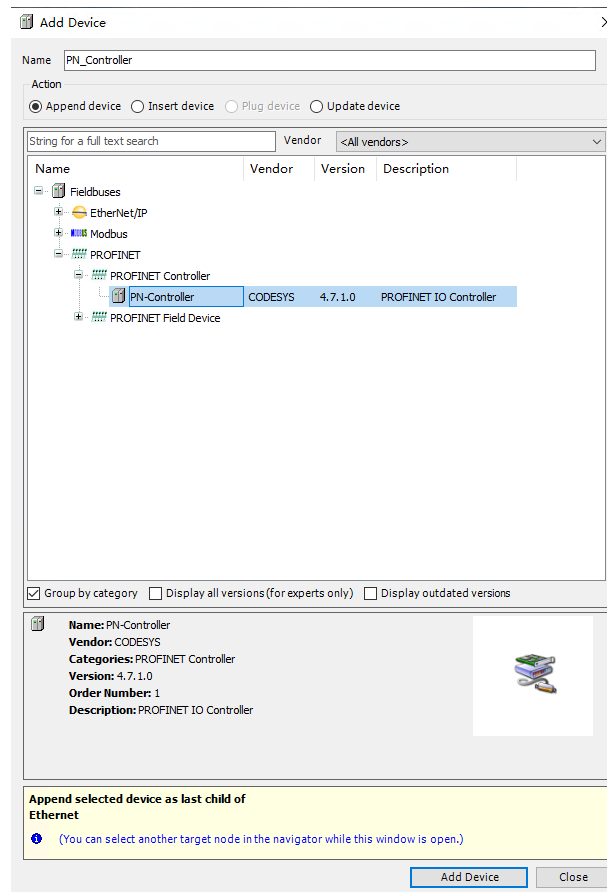


Figure 16 Add PN-Controller16

- 6) Double-click PN-Controller, click to open the "Topology" window on the right, and click the refresh button on the interface to scan the master and slave devices in the network.

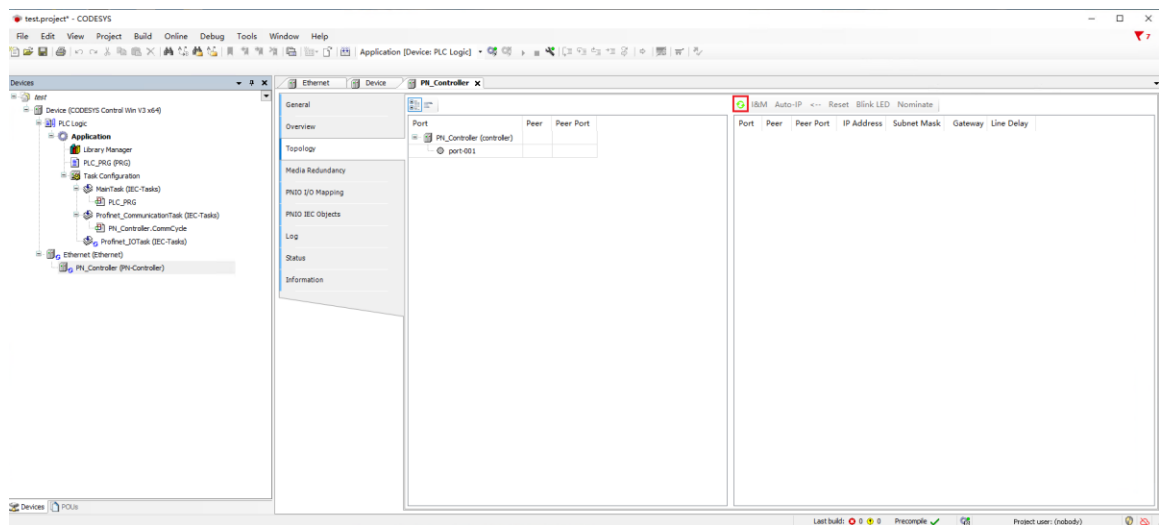


Figure 17 Scanning device17

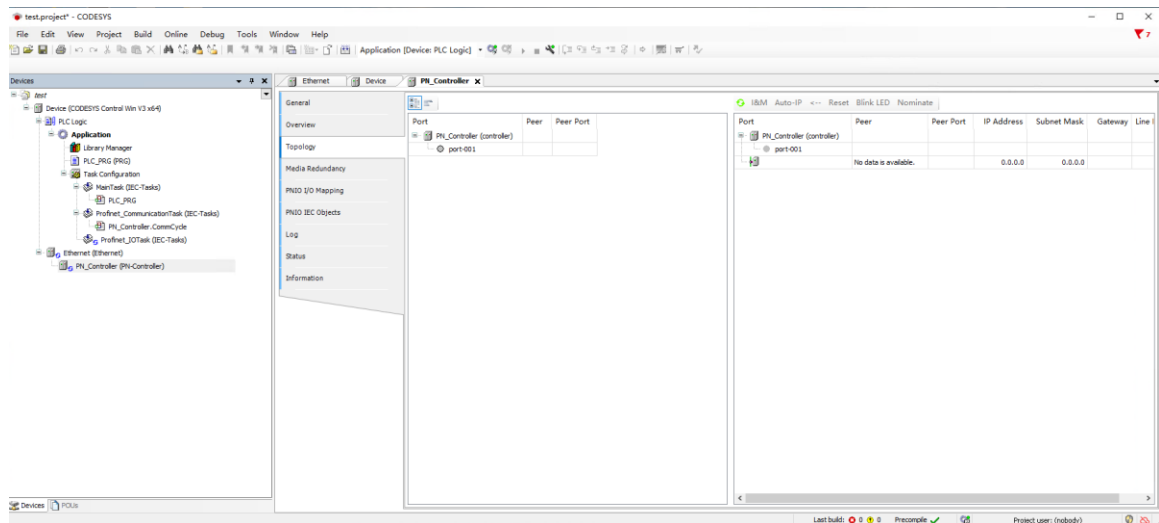


Figure 18 Scan results18

- 7) Select the PN Coupler device, configure the IP address, subnet mask and gateway, and then click the "Specify" button. After completing the configuration, check the port information to confirm that the settings have taken effect.



CAUTION

The IP address set in this step must be in the same network segment as the network interface IP address configured in step

4.

I&M Auto-IP <-- Reset Blink LED Nominate					
Port	Peer	Peer Port	IP Address	Subnet Mask	Gateway
PN_Controller (controller)					
port-001					
	No data is available.		192.168.1.5	255.255.255.0	

Figure 19 Configure device IP19

I&M Auto-IP <-- Reset Blink LED Nominate					
Port	Peer	Peer Port	IP Address	Subnet Mask	Gateway
PN_Controller (controller)					
port-001	inn	port-001			
inn			192.168.1.5	255.255.255.0	
port-001	controller	port-001			
port-002					

Figure 20 Configuration takes effect20

- 8) Right-click the PN-Controller device and click "Scan Device" in the pop-up menu. All PN Couplers and I/O modules will be displayed in the scanning device pop-up window. Click "Copy all devices to project" to add the scanned devices to the current project.

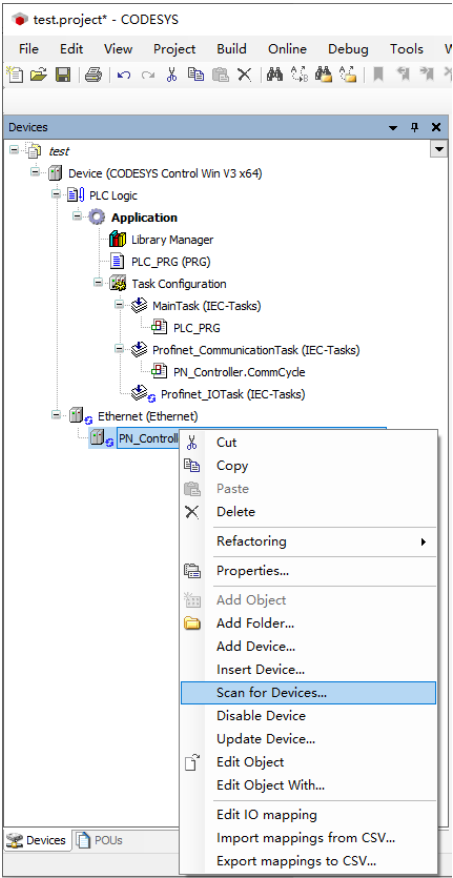


Figure 21 Click "Scan Device"21

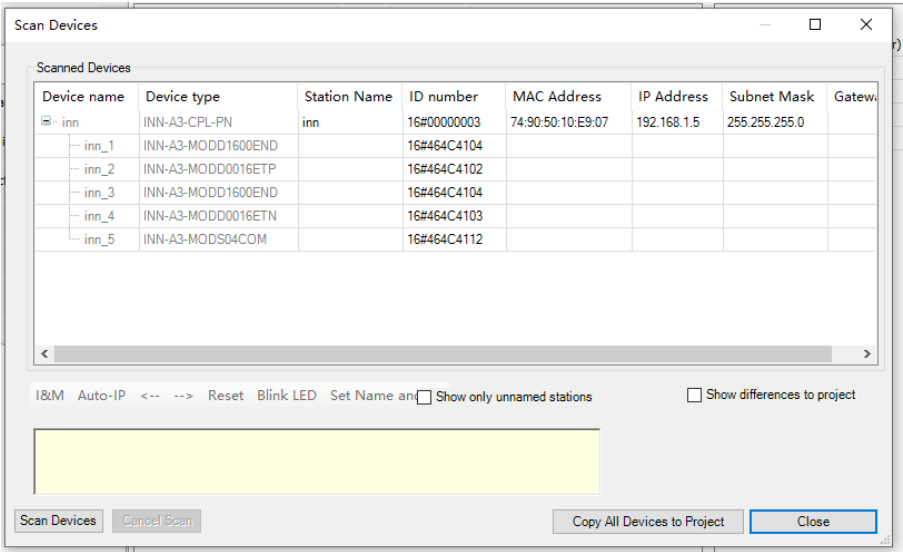
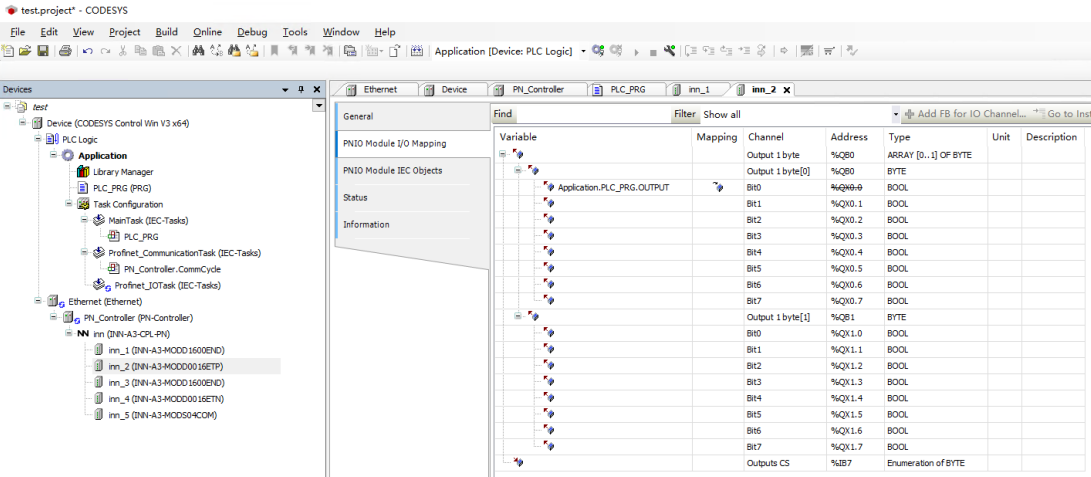
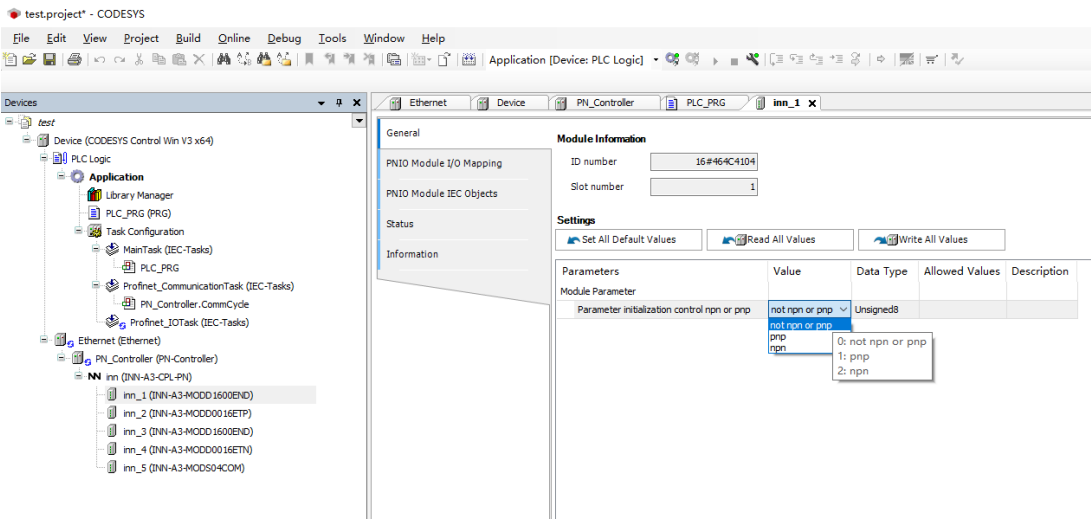


Figure 22 Click "Copy all devices to project"22



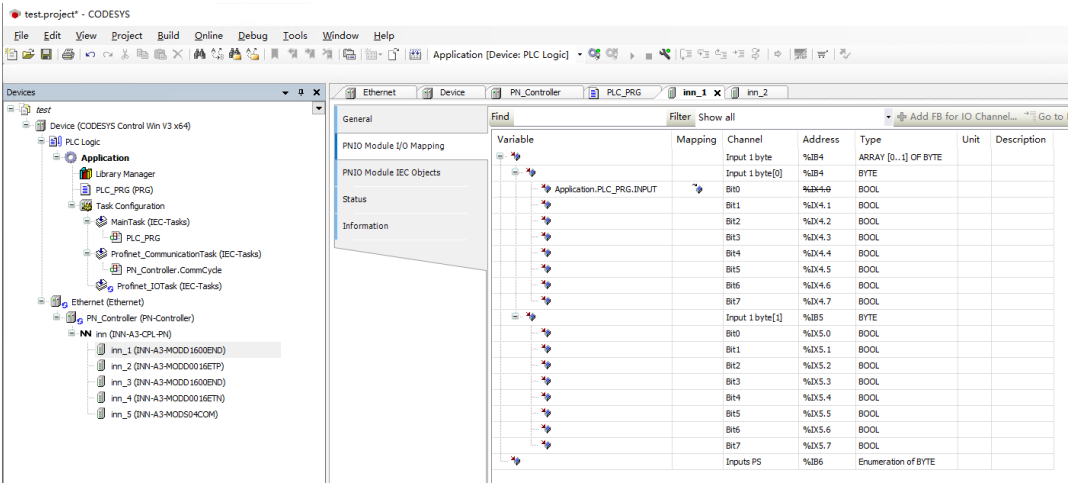


Figure 26 Set input mapping26



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