






**OMC System Software  
High-performanceHMI  
PNCon User Manual  
IM41S95-E**

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Symbol Definition	
	<b>WARNING:</b> Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	<b>RISK OF ELECTRICAL SHOCK:</b> Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	<b>ESD HAZARD:</b> Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	<b>ATTENTION:</b> Identifies information that requires special consideration.
	<b>TIP:</b> Identifies advice or hints for the user.

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# PNCon User Manual

## Section 1 Terms

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Abbreviation/ Terms	Description
PROFINET	PROFINET is an international and open field bus standard.
PN	Abbreviation for PROFINET.
GSDML	GSDML file is configuration file of PROFINET device.
DBM	DBM file is the final file of PROFINET configuration software which provides to hardware.
PBC	PBC file is the engineering configuration file generated by PNCon.
PROFINET IO Controller	The control system (PLC, PC) can control automation tasks.
PROFINET IO Device	It generally refers to the field device, which controlled and monitored by the IO controller. An IO device may contain several modules or sub-modules.

## Section 2 System Application Overview

The network device can be compartmentalized to PROFINET IO controller and PROFINET IO device on the basis of PROFINET specifications. PROFINET IO controller can manage and initiate communication with PROFINET IO device. The communication module connects standard PROFINET slave station device into system. Through E-BUS and controller communication, in-system control station and operation station can realize message both-way communication with other control system and intelligent device, and make heterogeneity device as subsystem of SUPCON DCS.

PNCon software is the software to configure PROFINET communication module (interface module). And the PNCon software is mainly used to configure hardware of PROFINET module in OMC system. Table 2-1 indicates the match software and communication module in system. Generally, COM723-S are used as communication modules.

**Table 2-1 PROFINET communication module (interface module)**

System	Match Software	Match Communication Module (Interface Module)	Communication Module Reference Section
OMC	High-performanceHMI (V3.20.01.17 or later revision)	COM723-S11	Refer to <i>COM723-S11 User Manual</i> .

### System Index

- Communication Interface: 1 channel PROFINET interface.
- Supported communicate rate of PROFINET: 10/100Mbps.
- Input total data of all PN slave stations is no longer than 3.5k bytes and the PN slave stations are connected by one communication module (interface module).
- Input data of single PN slave stations is no longer than 512 bytes and the PN slave stations are connected by one communication module (interface module).
- Output total data of all PN slave stations is no longer than 3.5k bytes and the PN slave stations are connected by one communication module (interface module).
- Output data of single PN slave stations is no longer than 256 bytes and the PN slave stations are connected by one communication module (interface module).
- System can connect up to 64 slave station devices, of which a maximum of 8 Siemens PLC devices are used to communicate with the Fetch/Write and S7Comm protocols.
- The maximum length of input and output data from a single module of slave station is 255 bytes.

## Section 3 PROFINET Configuration Management

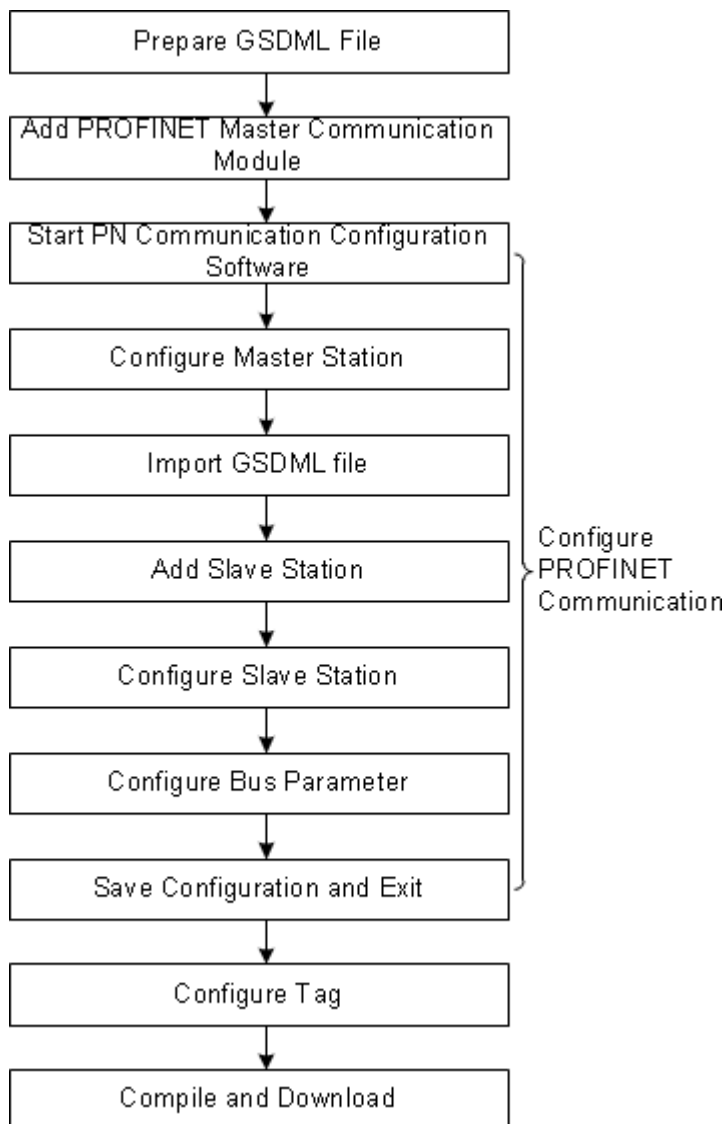
### Software (PNCon) Usage

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User can configure the PROFINET site, view and set the basic properties of station, add submodules to the slave station and set the parameter information of module with the PROFINET configuration management software (PNCon).

The station types of PROFINET include master and slave. When the system is configured, the PROFINET communication module acts as the master station of PROFINET and the various PROFINET IO devices act as slave station of PROFINET.

#### 3.1 Work Flow of Configuration



**Figure 3-1 Configure flow chart**

## 3.2 Prepare GSDML File

Before configuring the PROFINET communication module, please prepare the GSDML file provided by the supplier of PROFINET devices and carefully read the operation manuals about devices.


## 3.3 Add PROFINET Communication Module

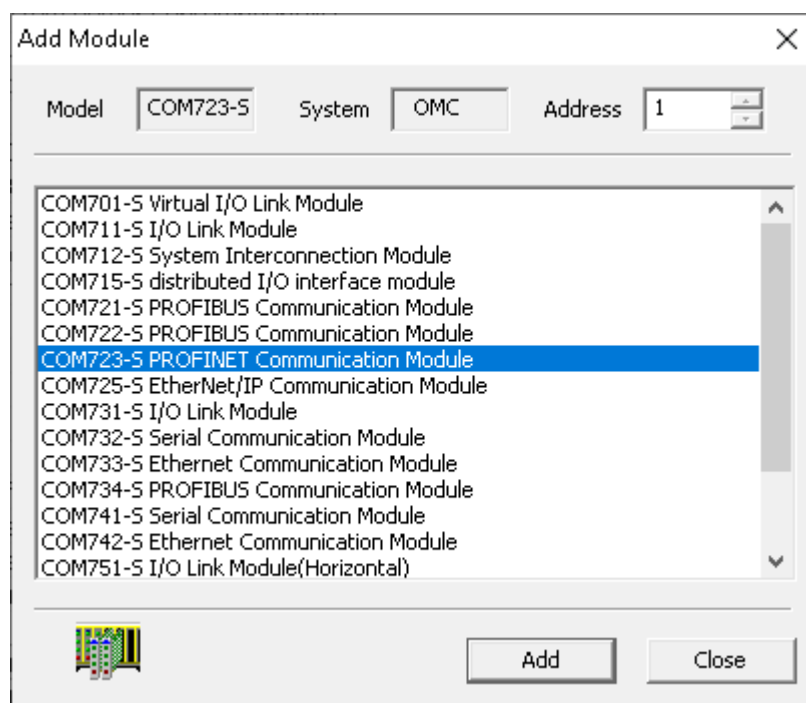
### OMC

Click **Start > OMC > VFExplorer** to run system configuration software, or click its icon on the desktop to run the software directly.

After run the “configuration management software”, load the corresponding project, select the corresponding controller and double click “hardware configuration” to enter into hardware configuration interface.

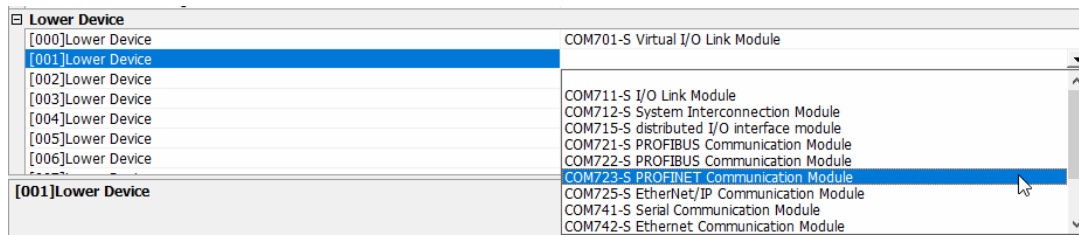
There are two approaches to add “COM723-S”:

1. Select the main controller, right click and then select “add” or “operate/add” in the menu or directly click the  in the tool bar, then a dialogue box shown in Figure 3-2 will pop up. Select “COM723-S PROFINET communication module” and corresponding address, then click “add” to finish the adding process.



**Figure 3-2 Add COM723-S**

2. After selecting the controller, add the subordinate device at the subordinate device list at the right view, as shown in the following figure.



**Figure 3-3 Add COM723-S**



**Attention:**

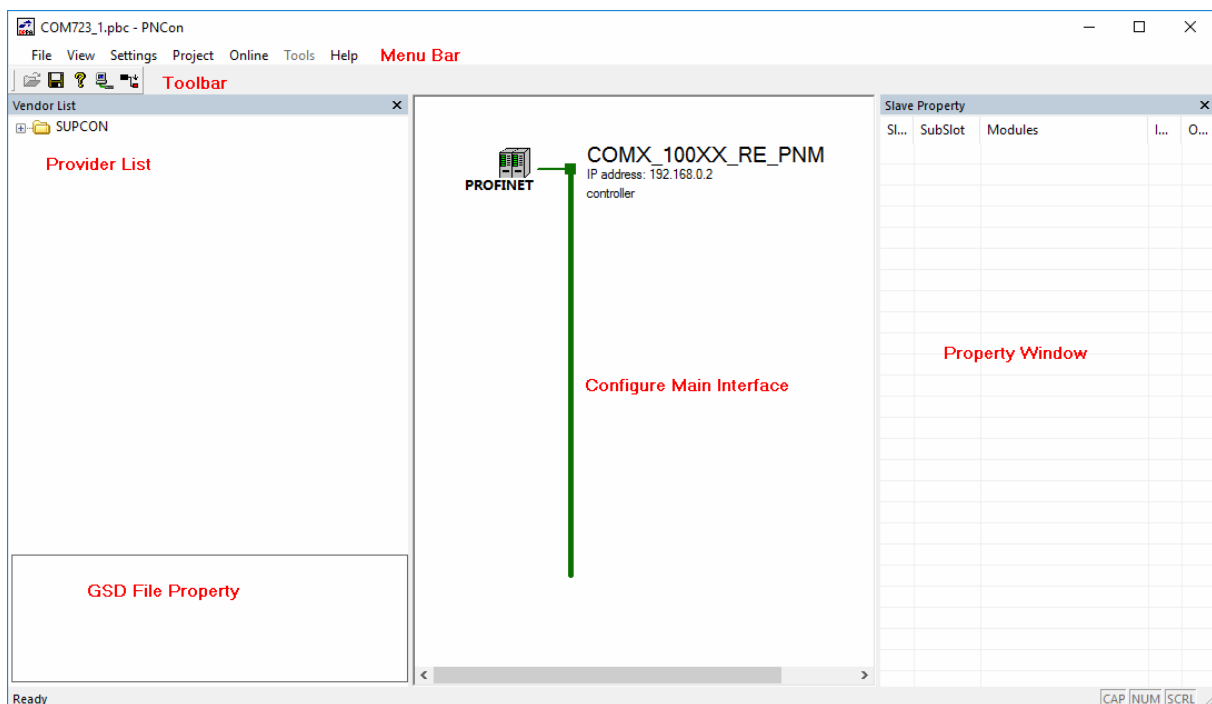
The address set when adding COM723-S into hardware configuration, i.e. the address of COM723-S in the E-BUS node is the same as the address jumper in the base. The scope is 1~7.

## 3.4 PROFINET Communication Configuration

This section will configure a PROFINET communication module as a PROFINET master station. The example will use ET200SP as slave station and describes how to use PNCon for configuring PROFINET.

### 3.4.1 Start PN Communication Configuration Interface

In hardware configure software of OMC, select the PROFINET master interface module and select “Communication Configuration” in its right menu to login PNCon software shown as following figure.



**Figure 3-4 PN communication configuration interface**



### 3.4.2 Master Station Configuration

Use the left button to select the master station, select the menu **Settings/Master Configuration**, or double-click the master station icon to open the master configuration dialog as shown below. The default master IP address is 192.168.0.2. If the master address needs to be modified, modify it directly in the "IP address" dialog in the figure below.

**Figure 3-5 Master station configuration**

Configure the master station according to the table below and click "OK" to save the master configuration.

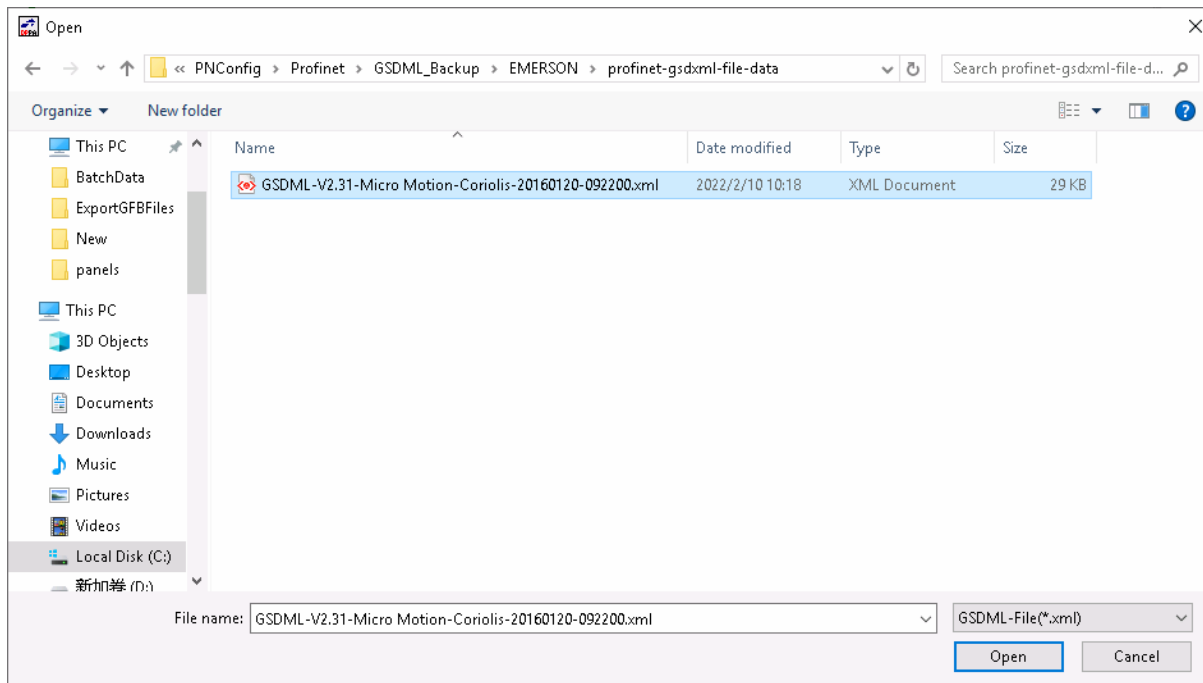
**Table 3-1 Master station configuration**

Item	Description
Description	Description of field device
IP address	Master IP is "192.168.0.2" by default. Modify this field according to the actual configuration.
Redundancy mode	If the device is working in S2 redundancy mode, select "General S2". If the device is working in R1 redundancy mode, select "General R2".
Topology Scan*	If you need to scan the slave station topology, select "ON". If the station topology needs manual configuration, select "OFF".

\*Only COM723-S supports topology scan function. Select ON for Topology Scan field and download the configuration, then the COM723-S will start scanning.

### 3.4.3 Import GSDML File

In the PNCon software interface, select the menu command **File/Import GSDML File**, and the Import File Selection dialog will pop up. Select the device description file to be imported (such as the device description file of ET200SP.....), as shown in Figure 3-6. Click the "Open" button to complete the import of device description file. If the imported device description file already exists, the software will prompt whether to replace it.




**Figure 3-6 Select GSDML file**

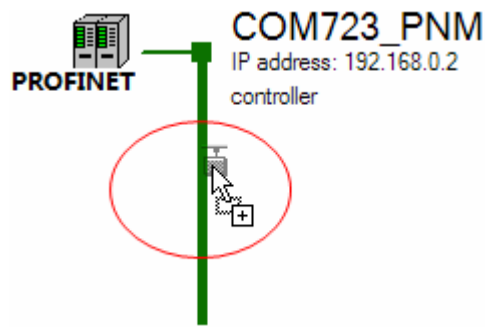
Restart the PNCon software after the import is complete and make the newly imported device description file take effect.

### 3.4.4 Add Slave Station

There are three methods to add slave station.

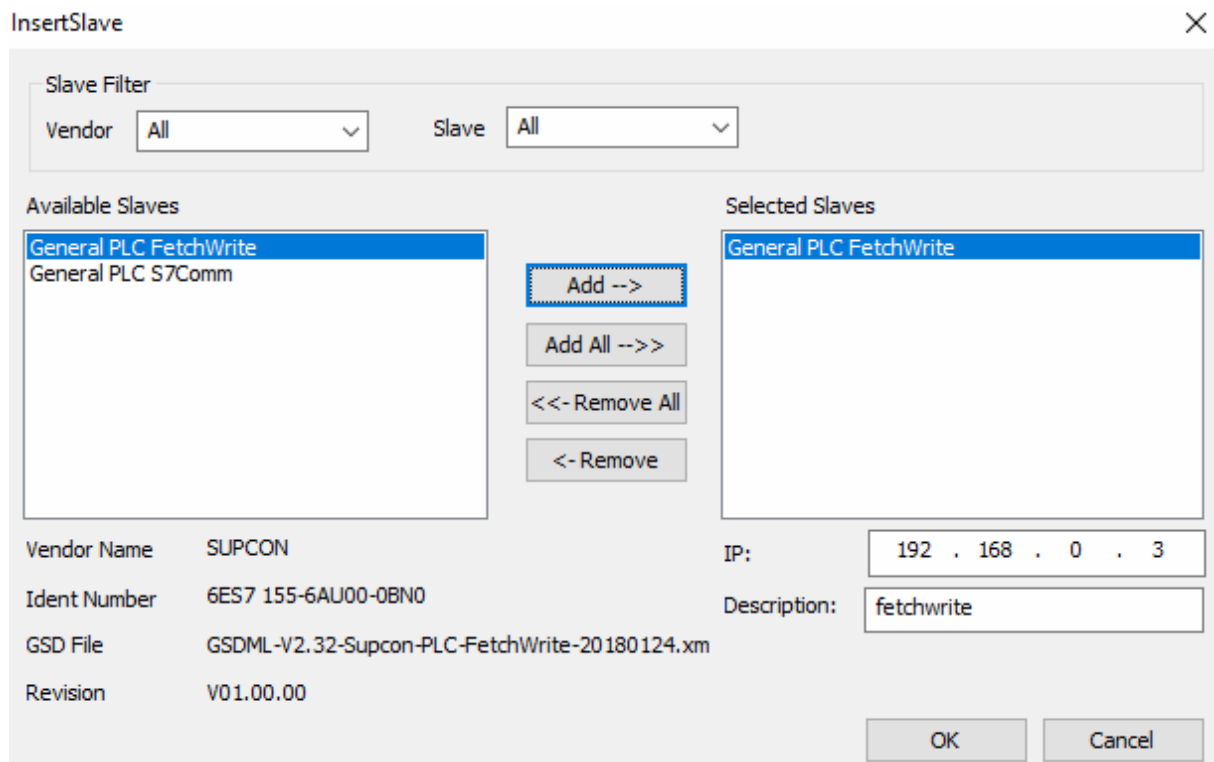
#### Method 1

Click toolbar button . Point to DP bus, and the mark which in the figure below will be appearing.



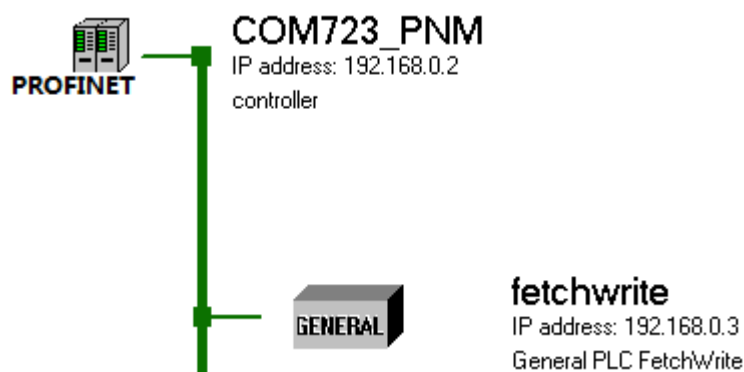
**Figure 3-7 Add slave station**

Click the mark to popup “Insert Slave” dialog box, and select “General PLC FetchWrite”. Click “Add” to add it to “Selected Slaves”. Configure “Station” of “General PLC FetchWrite” as 192.168.0.3, and the “Description” of “General PLC FetchWrite” as “fetchwrite”, shown as following figure.



**Figure 3-8 Insert slave station 1**

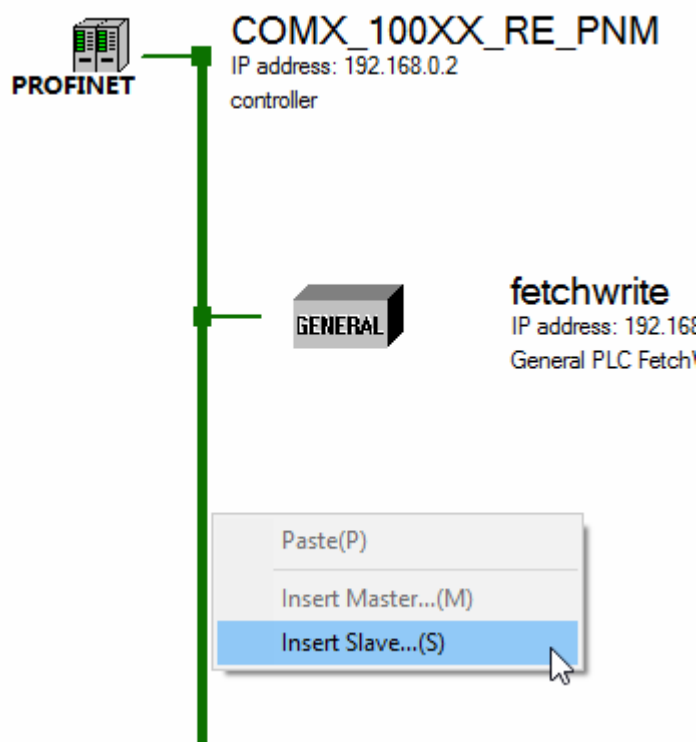
After adding slave station, PNCon configuration interface is shown below.



**Figure 3-9** PNCon configuration interface after adding slave station

### Method 2

Right-click PN bus, and select “Insert Slave Station” to popup “Insert Slave Station” configuration interface.

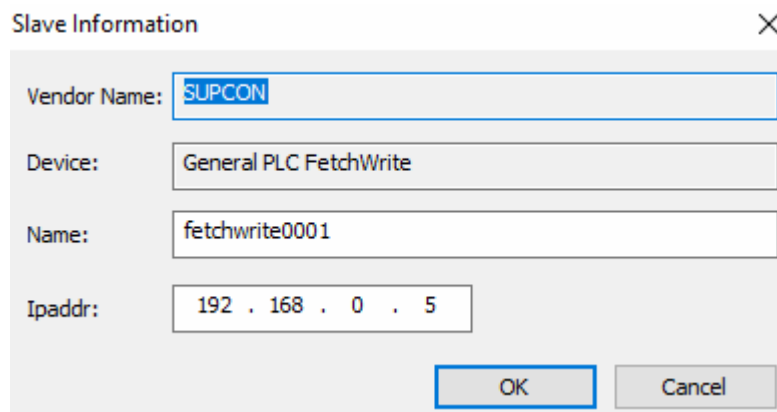


**Figure 3-10** Select “Insert Slave Station”

Other operations are similar to operations in “Method1”.

### Method3

Select slave needed to add from provider list, for example “General PLC FetchWrite”. Push the mouse and drag the selected slave to PN bus, then popup “Slave Information” dialog box shown as following figure. Configure “Address” as 192.168.0.5, “Device Name” as “fetchwrite”. Click “OK” to add the selected slave.

A screenshot of a 'Slave Information' dialog box. The dialog has a title bar with a close button (X). It contains four input fields: 'Vendor Name' with the text 'SUPCON', 'Device' with 'General PLC FetchWrite', 'Name' with 'fetchwrite0001', and 'Ipaddr' with '192 . 168 . 0 . 5'. At the bottom right are 'OK' and 'Cancel' buttons.

Slave Information

Vendor Name: SUPCON

Device: General PLC FetchWrite

Name: fetchwrite0001

Ipaddr: 192 . 168 . 0 . 5

OK Cancel

**Figure 3-11 Slave station information 1**

The result is similar to the result of “**method1**”.

### 3.4.5 Configure Slave Station



**Attention:**

For different PN slaves have different characteristics, when setting slaves, it is necessary to refer to the instructions of slave devices. For configuration methods of S7-300 PLC etc. as slaves, please refer to “Application Examples of PN Slave”.

Take "fetchwrite" as an example.

Use left mouse button to select the "fetchwrite", select menu **Settings\Slave Configuration**, or double click the slave icon to open configuration interface. Or select the slave, right-click on it and select "Slave Configuration".

Configuration General PLC S7Comm <s7comm>

IO Device: General PLC S7Comm  
Vendor: SUPCON  
Gsdml file: GSDML-V2.32-Supcon-PLC-S7Comm-20220125.xml

Device ID: 0xFFFF  
Vendor ID: 0x0888

Configuration  
General  
Modules  
Station Timing  
Description  
Device Info  
Module Info

Name of station: s7comm

Device type: General PLC S7Comm

IP address: 192 . 168 . 0 . 4

Network mask: 255 . 255 . 255 . 0

Gateway address: 0 . 0 . 0 . 0

MRP Domain: mrpdomain-1

MRP Ring Role: Node not in MRP

MRP Ring Port1: no port

MRP Ring Port2: no port

OK Apply Cancel

**Figure 3-12 Slave station configuration interface**

## Configuration

### 1. General Settings

The "General Settings" screen is shown in Figure 3-12. Configure the fields according to the table below.

Item	Description
Name of station	Name of the slave station
IP address	IP address of the slave station
MRP Domain MRP Ring Role MRP Ring Port <sup>Note1</sup>	<p>Specify these fields according to the network structure.</p> <ul style="list-style-type: none"> <li>If the device is not in an MRP ring network: Set the MRP domain name and MRP ring role (as Node not in MRP)</li> <li>If the device is a switch in an MRP ring network: Set the MRP domain name and MRP Role (as "Manager" or "Manager (auto)"); Configure the "MRP Ring Port1" and "MRP Ring Port2" for the device to access the MRP ring network.</li> <li>If the device is a device of another type in an MRP ring network: Set the MRP domain name and MRP Role (as "Client"); Configure the "MRP Ring Port1" and "MRP Ring Port2" for the device to access the MRP ring network.</li> </ul>


Note 1: Only COM723-S supports MRP ring network.

Note 2: When replacing the manager in MRP domain, delete the old manager first.

### 2. Module Settings

Click "Module" on the left of the list to switch to the "Module Settings" page, as shown below.

Configuration General PLC S7Comm <s7comm> ✕



IO Device: General PLC S7Comm  
 Vendor: SUPCON  
 Gsdml file: GSDML-V2.32-Supcon-PLC-S7Comm-20220125.xml

Device ID: 0xFFFE  
 Vendor ID: 0x0888

Configuration  
 General  
 Modules  
 Station Timing  
 Description  
 Device Info  
 Module Info

Slot	SubSlot	Modules	Inputs	Outp...
0		General PLC S7Comm [6ES7 155-6AU00-0BN0]	0	0
	1	General PLC S7Comm		
	32768	PN-IO		
	32769	Port 1		
	32770	Port 2		
1		32 Bytes Input 32 Bytes Output	32	32
	1	32 Bytes Input 32 Bytes Output		

Use of slots: 2/65
add module
add submodule
remove

State of data length: input 38/580, output 38/324, input/output 76/904

Submodule details

Dataset: Parameter
Display mode: Decimal

Name	Value	Data type	Data range
Slot Setting	2 132 0 0 0 0 0 0		
Transport size	Byte	Integer8	2
Area	Data blocks (DB)	Integer8	0x84
DB number	0	Integer16	0..65535
Start addr	0	Integer32	0..16777215

OK
Apply
Cancel

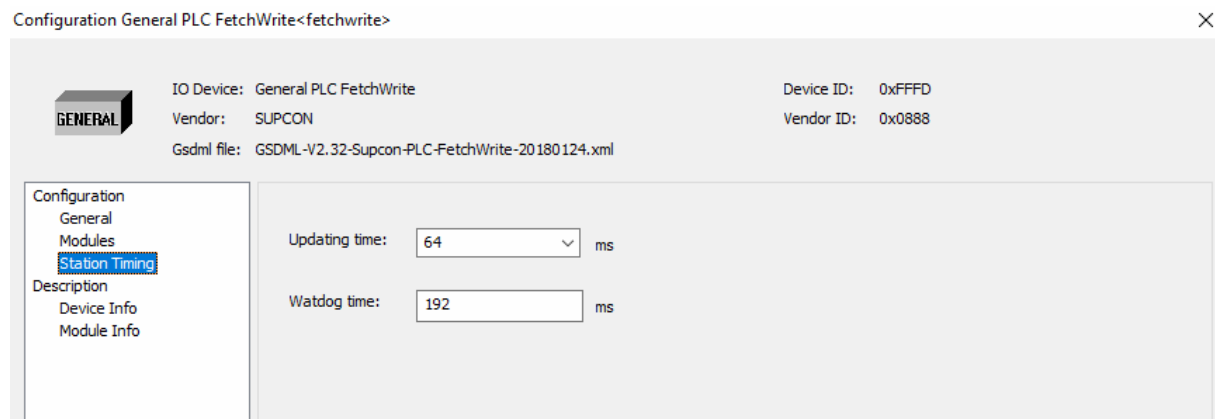
**Figure 3-13 Slave module settings**

Select the added module and click "Add Module" button to add a module. Click on the module and the model number of module can be replaced in the drop-down list.

Select the added submodule and the lower list will show the parameter details of the submodule and configure the parameter data. Click the "Add Submodule" button to add a new submodule under the same module.

### 3. Cycle Settings

Click "Cycle Settings" on the left of list to switch to the "Cycle Settings" page, as shown below. The page is used to configure the real-time data communication cycle and watchdog timeout time of the device. The communication cycle defaults to 64ms, the minimum is 8ms and the maximum is 512ms. The timeout value is three times of communication cycle.




**Figure 3-14 Slave cycle settings**

## Description

The "Description" interface is used to display device information and module information of the device. It can be switched through the directory list on the left. The parameters cannot be modified.

### 3.4.6 Save Configuration and Exit

After configuring the PN communication in PNCon software, select  button or menu **File\Save** to save configuration, close the PNCon software and go back to hardware configuration software "VFIOBuilder".

## 3.5 Reset Topology Scan

After manually specifying or automatically scanning the PROFINET topology, you can clear the existing PROFINET topology and regenerate it.

Select "Online > Reset Topology Scan" command in the menu bar to generate the topology based on the latest PROFINET network.



Tips:

Only COM723-S supports "Reset Topology Scan" function.

## 3.6 Tag Configuration

After completing the hardware configuration as mentioned in the previous paragraph, return to the "VFIOBuilder".

### Update Configuration



In the VFIOBuilder software, select the corresponding “COM723-S”, and select “Update configuration” by right click or select **Operate (O)/ Update Configuration** to update the communication configuration. The following figure shows the updated configuration.

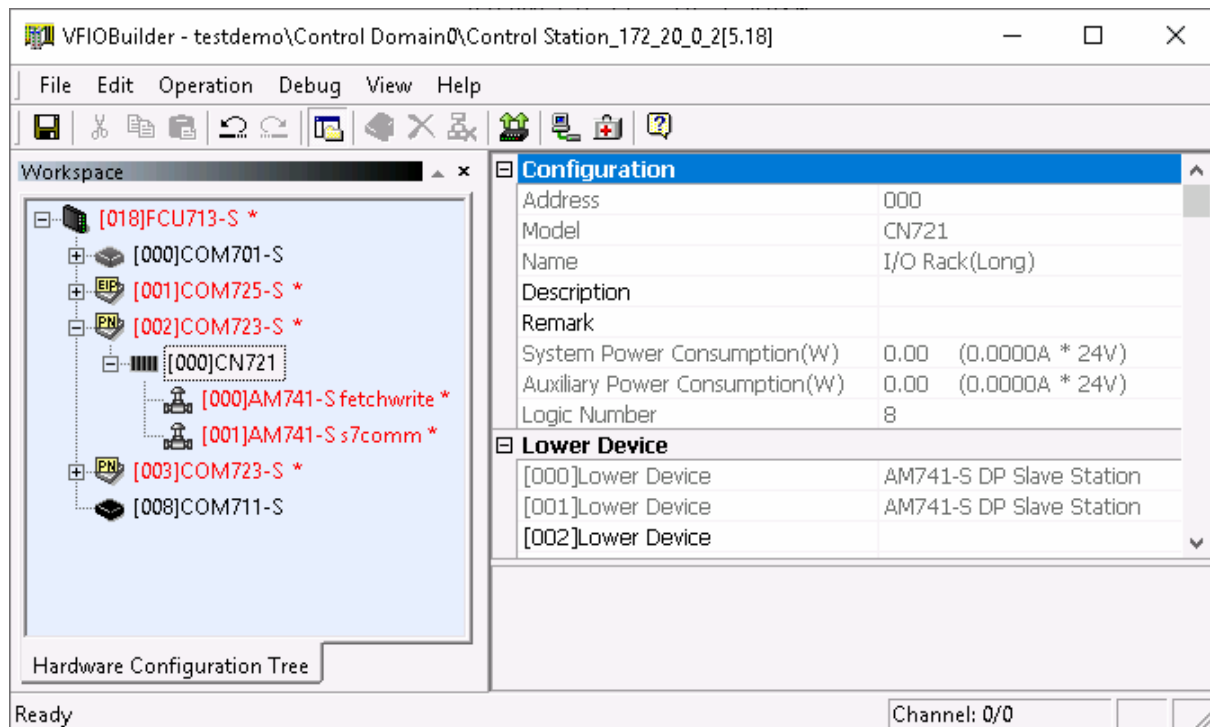



Figure 3-15 Interface shows the updated communication configuration

### Save Hardware Configuration

After completing the hardware configuration of COM723-S, click  button to save the hardware configuration.

After configuring the PN communication in above, close PNCon and go back to hardware configuration software.

After completing the hardware configuration as mentioned in the previous paragraph, return to the “Configuration Management Software” interface, and double click “tag table” to enter the “Tag Configuration Software” interface.

### Add Tag

#### 1. Add Tags Automatically

In the “Tag Configuration Software” interface, select **Operate (O)/ Scan channel tag/ Communication tag strategy** to enter into the communication tag strategy configuration interface.

In the “Communication Tag Strategy” interface, unfold the tree type structure in the left view and find the slaves and slots to be added to the hardware configuration as shown in Figure 3-16.

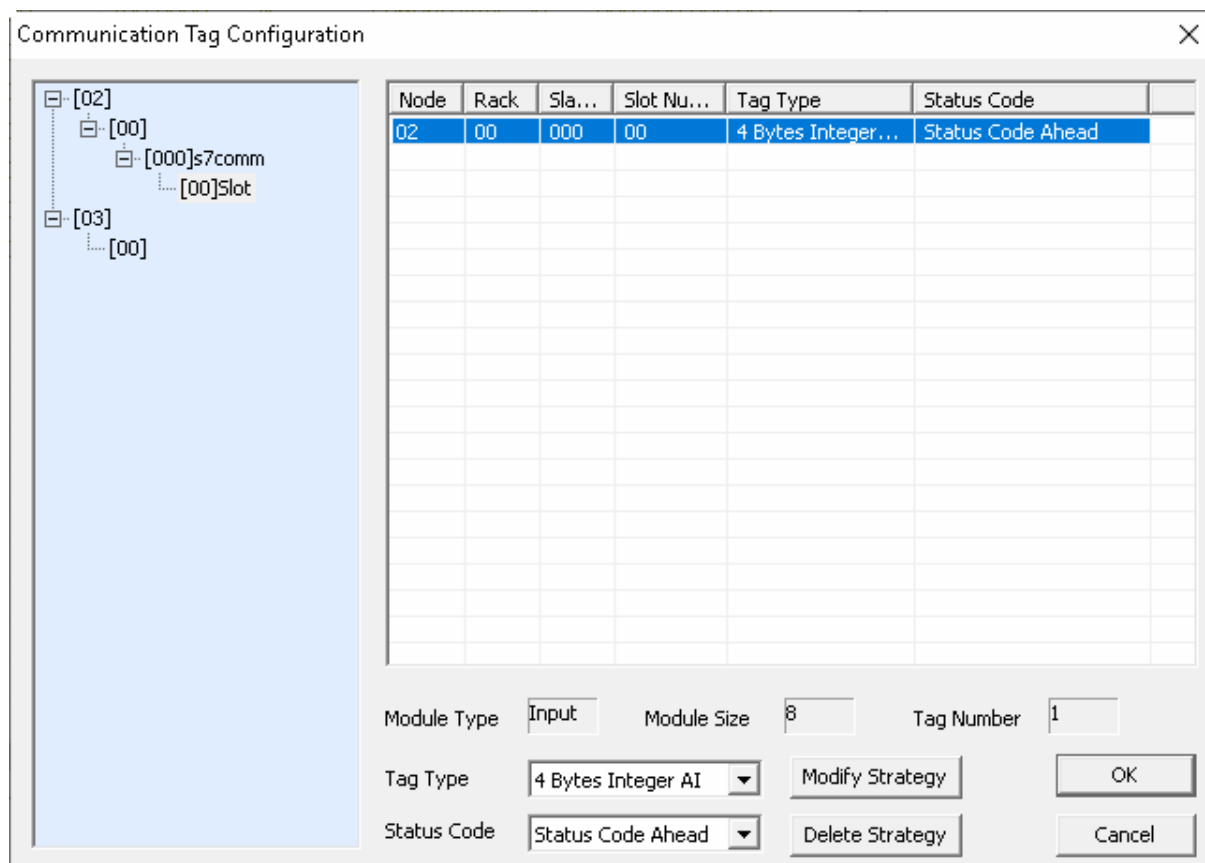
Add tag strategy: select the tag strategy where needs adding tag strategy, select

corresponding tag type in “tag type” column in the lower window, select corresponding status code type in the “status code” column, and click “Add strategy” button to add the tag strategy.

Modify the existing tag strategy: select the tag strategy to be modified, modify the "tag type" or "status code" through pull down menu, and click "change strategy" button to finish change.

Delete the existing tag strategy: select the tag strategy to be deleted, and click “delete strategy” button to delete it.

After finishing configuration of all tag strategy, click “confirm” button to finish configuration of communication tag strategy and go back to “tag configuration software” interface.



**Figure 3-16 Configuration of the communication tag strategy**

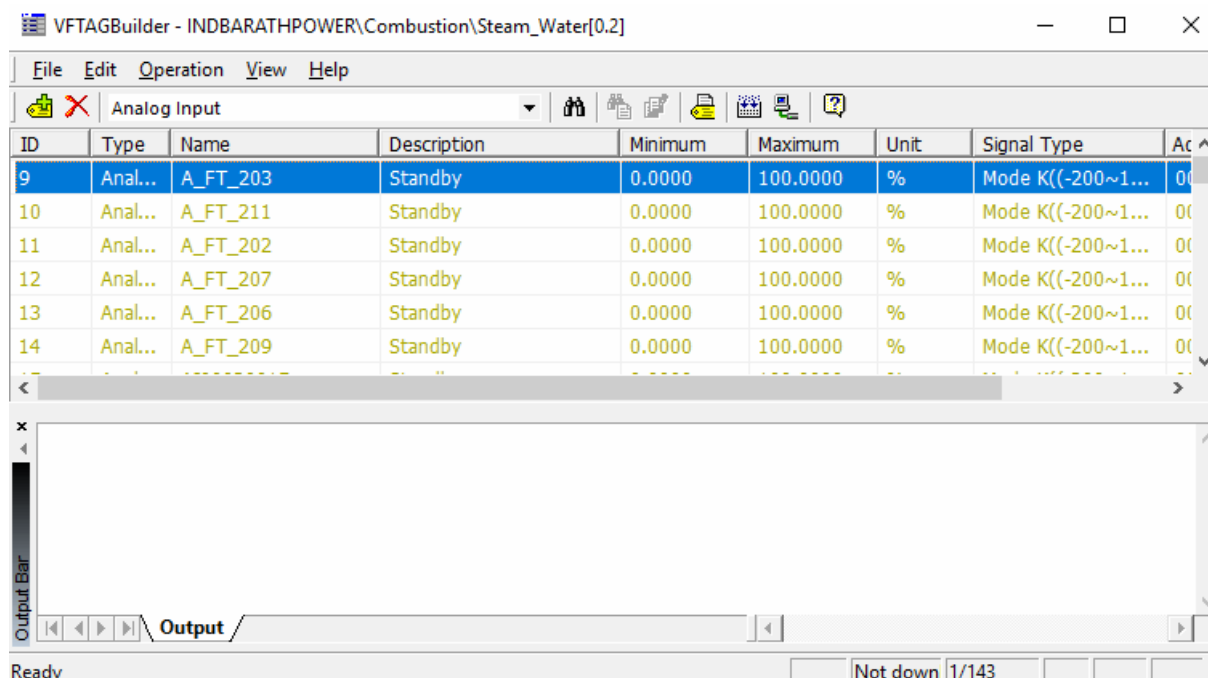


**Attention:**

## One slot, one tag strategy.


Take fetchwrite configuration in the previous paragraph as example to add one tag strategy as shown in Figure 3-16.

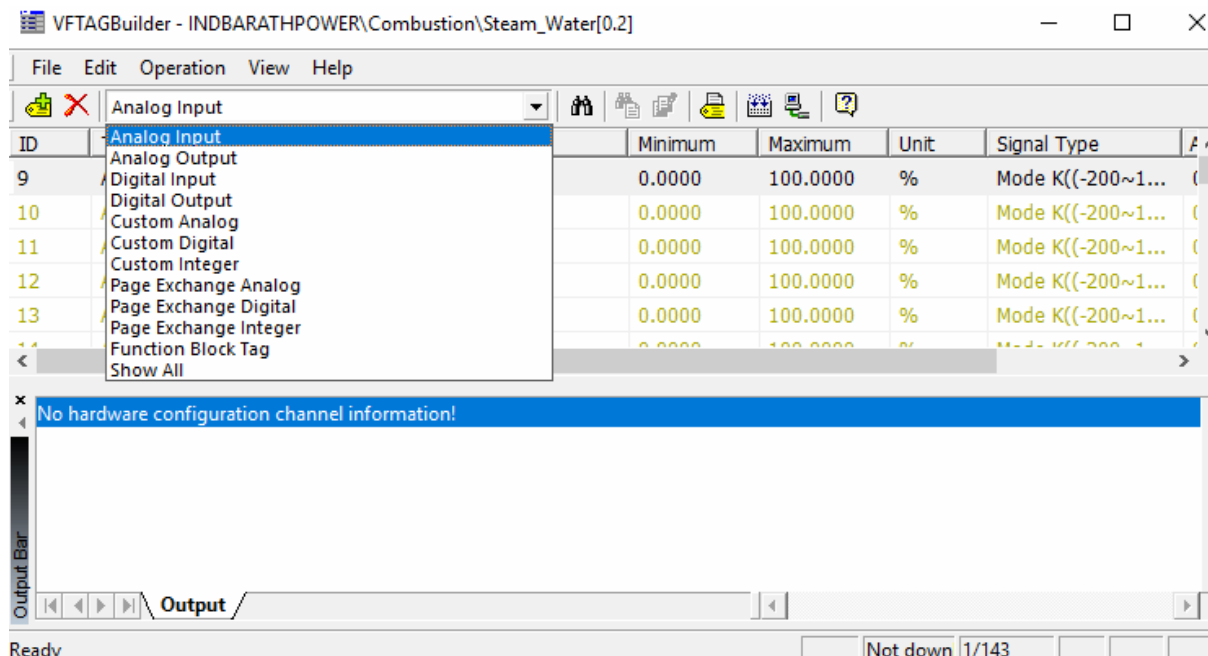
When return to “Tag Configuration Software”, select **Operation/Scan Tags from Channel**. Select “Scan All” or “Scan New Added”. After finishing scanning tag, the interface is as shown in Figure 3-17.



**Figure 3-17 Interface after finishing scanning tag**

## 2. Add and Modify Tags by Manual

In “tag configuration software” interface, select the corresponding tag type through the pull down menu in the upper window to switch to the window of the corresponding tag type as shown in Figure 3-18. For example, select “Analog in” to enter AI tag window and click  button to add a new AI tag.



**Figure 3-18 Interface of selecting tag**

When carry out tag configuration of PROFINET communication module COM723-S, corresponding communication tag in “tag type”. Take AI tag as example as shown in the figure below.

<b>Basic Properties</b>	
Number	10
Name	AI12100010
Type	Analog Input
Description	Standby
<b>Input Channel Settings</b>	
Tag Type	Communication AI Tag
Communication Node No.	000
Communication Rack No.	000
Slave Station Address	000
Data Block No.	000
The Offset Address of the Tag in the Data Block	000
APL Tag	No
<b>Communication Parameter Settings</b>	
Data Type	INT
Signal Properties	Actual Value
Status Code Location	No Status Code
Data Format	No Conversion
<b>Signal Conversion Process</b>	
<b>Desirable Operating Range</b>	
<b>Output Range Settings</b>	
<b>Input Original Code Settings</b>	
Input Original Code Maximum	100.0000
Input Original Code Minimum	0.0000
<b>Alarm Settings</b>	
<b>Interlock Output Settings</b>	
<b>Tag Fault Safety Processing</b>	
<b>Cold Start Mode</b>	
<b>Supervision Settings</b>	

Figure 3-19 Set the AI tag

Select corresponding tag and set the tag parameter in the parameter column at the right side of the tag window.

### Instruction of Communication Tag

- Parameter instruction of AI/AO tags
  - “Input/output channel settings” column
    - Communication node number: the node address of COM723-S in the E-Bus, i.e. COM723-S address set in hardware configuration.
    - Communication rack number: corresponds to the bus number under COM723-S which is fixed at 0.
    - Slave address: PN slave or MPI slave address.
    - Data block number: slot number in hardware configuration.
    - The offset address of tag in data block: the offset address of analog tag in data block with byte as unit.
  - Instruction of Communication Tag

- Data type: “2 bytes integer (signed)”, “2 bytes integer (unsigned)”, “4 bytes integer (signed)”, “4 bytes integer (unsigned)” and “4 bytes floating-point number” three types. Select according to the actual signal type.
- Communication signal status code settings: “no status code”, “status code at front” and “status code at back” three options. Select option according to the actual signal. Generally, select “no status code” for PN slave signal.
- Communication data format conversion selection: determine whether convert the format of the big and small ends.
- “Input/output original code settings” column: set the upper and lower limits of the original code of the communication signal in slave. The original code varies based on different slaves. For example, the upper and lower limit of the original code of Siemens S7-300 series is usually 0 and 27648.

## 2. Parameter instruction of DI/DO tags

<b>Basic Properties</b>	
Number	45
Name	DI12100045
Type	Digital Input
Description	Standby
<b>Input Channel Settings</b>	
Tag Type	Communication DI Tag
Communication Node No.	000
Communication Rack No.	000
Slave Station Address	000
Data Block No.	000
The Offset Address of the Tag in the Data Block	000
APL Tag	No
<b>Signal Conversion Process</b>	
<b>Alarm Settings</b>	
<b>Tag Fault Processing</b>	
<b>Cold Start Mode</b>	
<b>Supervision Settings</b>	
<b>SOE Settings</b>	

[-] <b>Basic Properties</b>	
Number	45
Name	DI12100045
Type	Digital Input
Description	Standby
[-] <b>Input Channel Settings</b>	
[-] Tag Type	
Communication Node No.	000
Communication Rack No.	000
Slave Station Address	000
Data Block No.	000
The Offset Address of the Tag in the Data Block	000
APL Tag	No
[-] <b>Signal Conversion Process</b>	
[-] <b>Alarm Settings</b>	
[-] <b>Tag Fault Processing</b>	
[-] <b>Cold Start Mode</b>	
[-] <b>Supervision Settings</b>	
[-] <b>SOE Settings</b>	

**Figure 3-20 Set the DI tag**

“Input/output channel settings” column


- Communication node number: the node address of COM723-S in the E-Bus, i.e. COM723-S address set in hardware configuration.
- Communication rack number: corresponds to the bus number under COM723-S which is fixed at 0.
- Slave address: PN slave or MPI slave address.
- Data block number: slot number in hardware configuration.
- The offset address of tag in data block: the offset address of switch value tag in data block with bit as unit.

### 3.7 Compile and Download

After completion of setting, close the hardware configuration window, go back to the software interface of the configuration management, save the configuration set, and select to compile and download in proper order. The system configuration download can be divided into online and offline download.

- **Online download:** When there is no major change in configuration and the online device is not modified, carry out online download. Online download can ensure that the unmodified device, its commands and relation between the commands and the tag remain unchanged.
- **Offline download:** When there is major change in the configuration, for example, modification to the hardware structure of the system and the system forbids the user to carry out online download to ensure site safety. When it is ensured that there will be no major problem, offline download can be selected.

### 3.8 PROFIBUS Online Diagnose and Device Management

Diagnose and Management in PNCon only can be valid in “Debug Mode Online”. The status can be achieved by select the command of **Online/ Debug Mode** or click . The main interface of configuration is shown below.

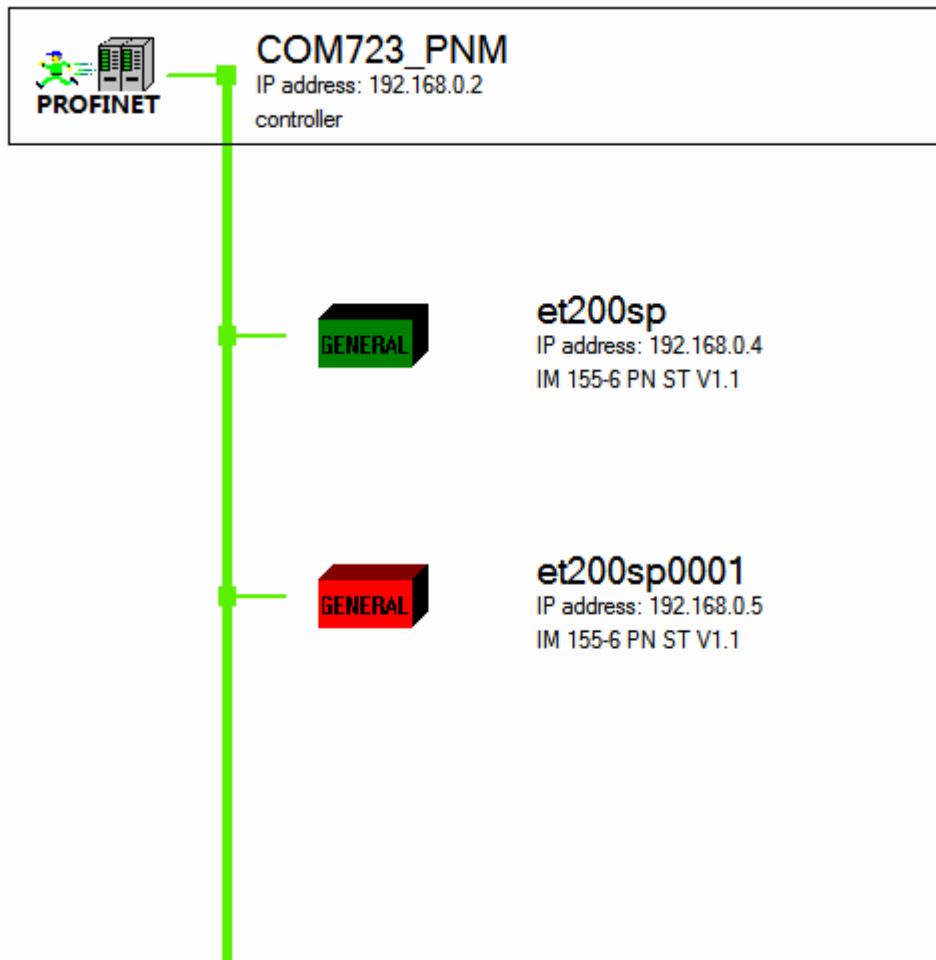








Figure 3-21 Debug mode

Table 3-2 shows the instruction of icons in above figure.

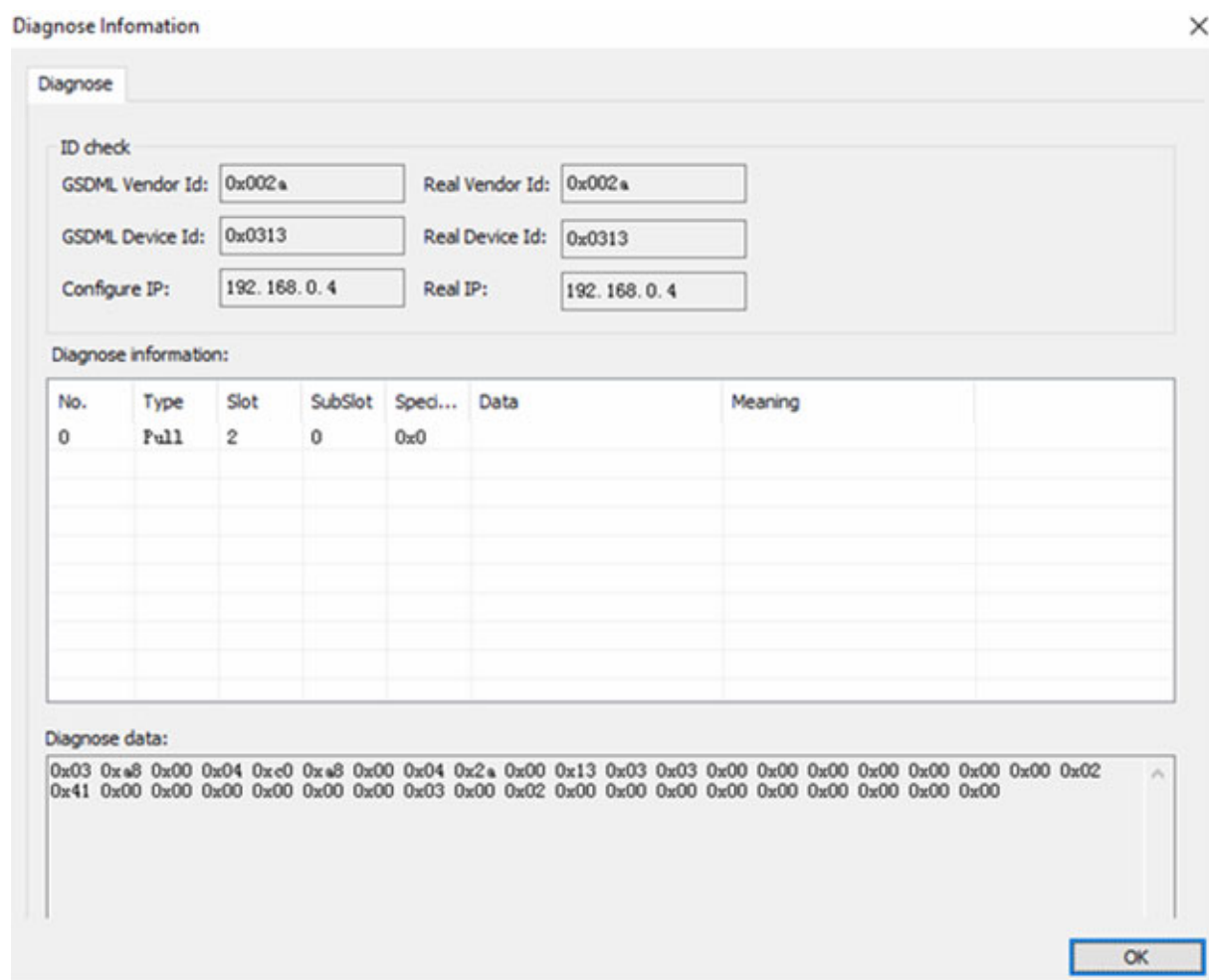
Table 3-2 Icon instruction

Icon	Description
	Slave icon in non debug mode.
	Slave icon in debug mode, and the slave is communicating normally.
	Slave icon in debug mode, and the slave is communicating abnormally (slave dropped or instrument unmatched).
	Master icon in non-debug mode.

Icon	Description
	In debug mode, the PROFIBUS master communicates normally.
	In debug mode, the PROFIBUS master communicates abnormally(IP conflict, etc.).

### 3.8.1 Online Diagnose

Select the slave icon and select "Online/Diagnose" in the menu bar, or right-click the slave icon to select "Diagnose", and the "Diagnose Information" screen shown below will pop up to view the diagnostic information.



**Figure 3-22 Slave diagnose information**

### 3.8.2 Livelist

Select master station icon, select “Online/Livelist” in menu bar, or right click master icon and select “Livelist”, and the “LiveList for PN” interface will pop up. Click “Update” to update device,



and devices online will be displayed in “Device Address”, as shown below.

Net scan ×

Device list: update

MAC Address	Device type	Device name	IP Address	Protocol	Device id	Vendor id	Device role
28:63:36:0...	ET200SP	et200sp	192.168.0.4	DCP	0x0313	0x002a	I0-Devic...
00:1b:1b:1...	ST-300	pn-io	192.168.0.4	DCP	0x0101	0x002a	I0-Contr...
00:1b:1b:0...	ST-400 CP	pn-io	192.168.0.3	DCP	0x0201	0x002a	I0-Contr...
08:57:00:e...	SIMATIC-PC	wangfangjie	172.20.0...	DCP	0x0202	0x002a	I0-Contr...
00:00:00:7...	SUPCON	controller	192.168.0.2	DCP	0x3344	0x1122	I0-Contr...

Figure 3-23 PN bus list interface

### 3.8.3 I/O Real-time Data

In debug mode, select slave icon, select “Online/I/O Real-time Data”, or right click slave icon select “I/O Real-time Data”, pops up “I/O Real-time Data” interface below. Click “Update” button, the input and output data will be display real time.

I/O Monitor ×

Inputs Outputs

I/O Data

dec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
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23																
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27																
28																
29																
30																
31																
32																
33																
34																
35																
36																
37																
38																
39																
40																

Update  
  
hex  
OK

Figure 3-24 I/O Real-time Data

### 3.9 Other Functions

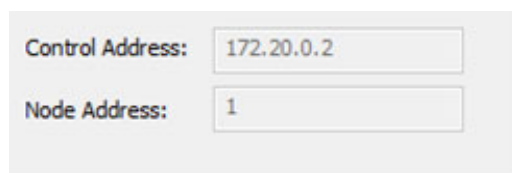
Table 3-3 shows the functions instruction of other menu items.

**Table 3-3 Other Menu Functions introduction**

Menus	Submenus	Function Description
Settings	Preference	Look over GSD file path and type.
Project	Property	Used to fill general property and communication property, communication property in different systems are different.
Help	About	Display matched system of software, revision of software, copyright of software etc. information.

#### Project Property

Select “Project/ Property” in menu bar, then popup “Project Property” window. Click “Communication” in configuration tree to view communication property. And the communication property is various in various systems.



Control Address: 172.20.0.2

Node Address: 1

**Figure 3-25 OMC Communication Property**

## Section 4 Application Examples of PN Slave

### 4.1 Configure Procedures of S7-300 PLC

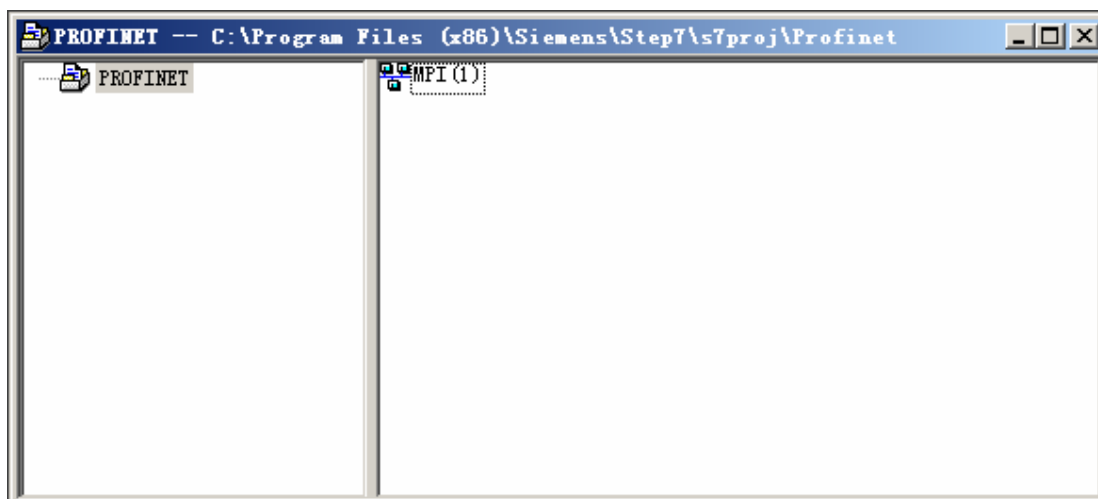
This section takes Siemens S7-300 PLC CPU315-2DP as an example to introduce how to connect Siemens PLC as PROFINET slave to the OMC system through COM723-S. The example uses configuration of 2 bytes input and 2 bytes output.

This section only introduces the configuration of the data exchange of PROFINET, and the programming of S7-300 PLC is not included.

#### 4.1.1 Configure S7-300 PLC Operational Steps

1. Create new project

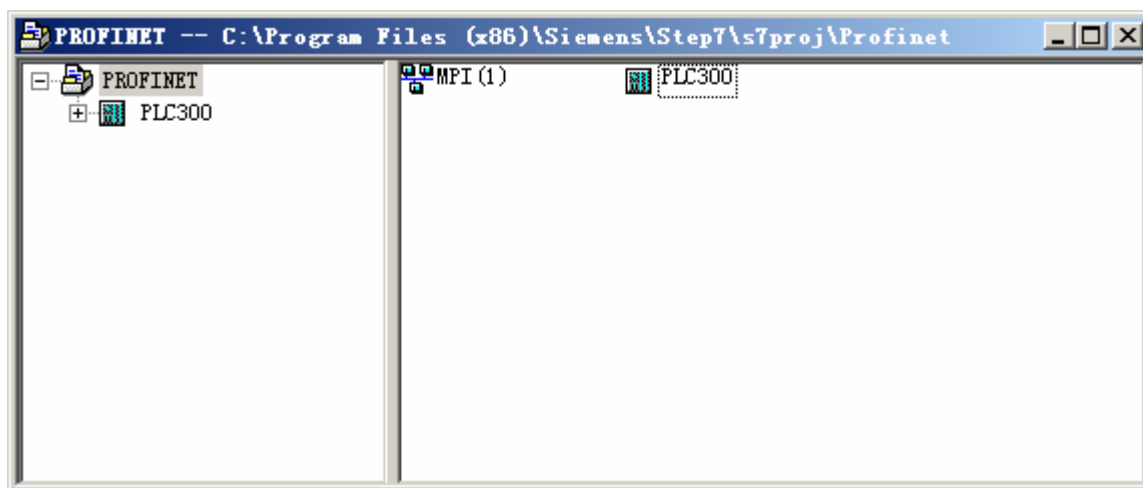
Open the Step7 system configuration software. As shown in Figure 4-1, select **"File/New"** and enter the project name, e.g. PROFINET.



*Figure 4-1 New project interface*

1. Create station

Add the S7-300 station "PLC300": insert a S7-300 station and select the menu **Insert/Station/ SIMATIC 300 Station** and name it: PLC300.



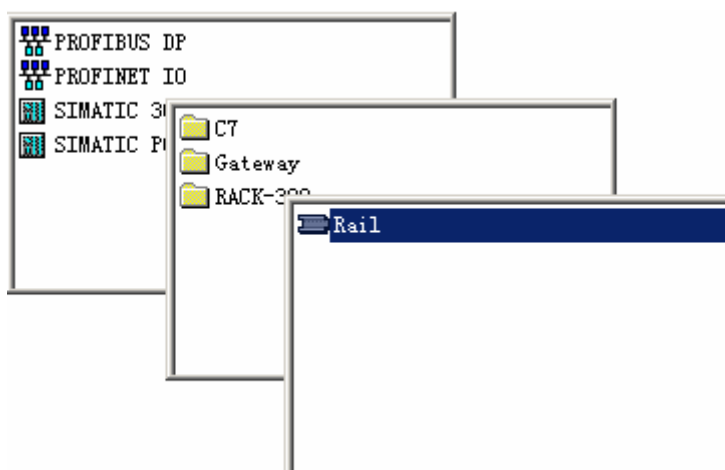
**Figure 4-2 Add S7-300 station "PLC300"**

## 2. Hardware configuration

Select the icon "PLC300" and select "Edit/Open Object" or double click the icon to open the hardware configuration tool. Select menu "View/Catalog".

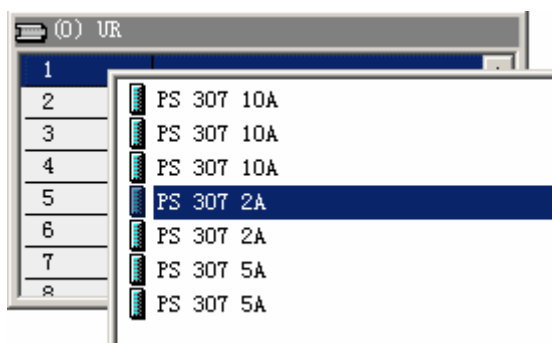
Next we will add the various components of the S7-300 station "PLC300".

- Rack



**Figure 4-3 Add rack**

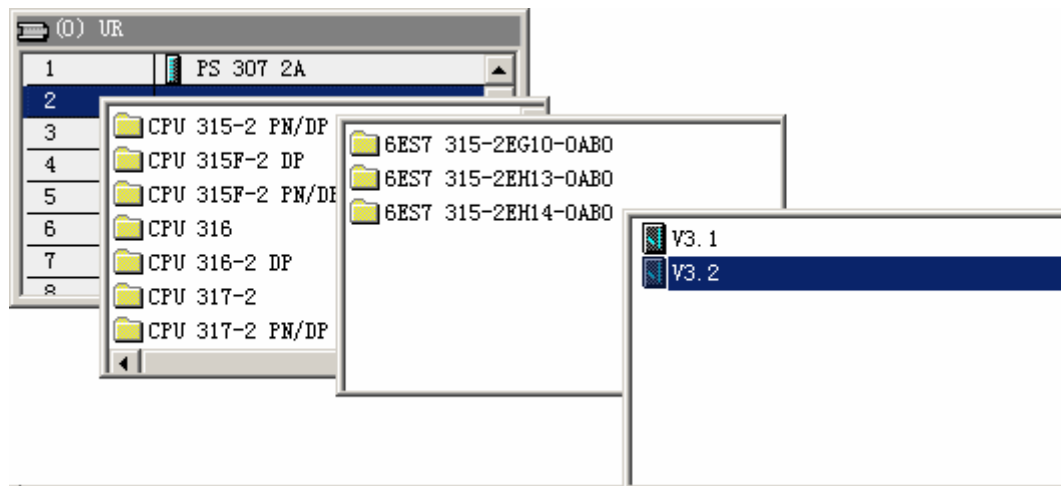
- Power Supply



**Figure 4-4 Add power supply**

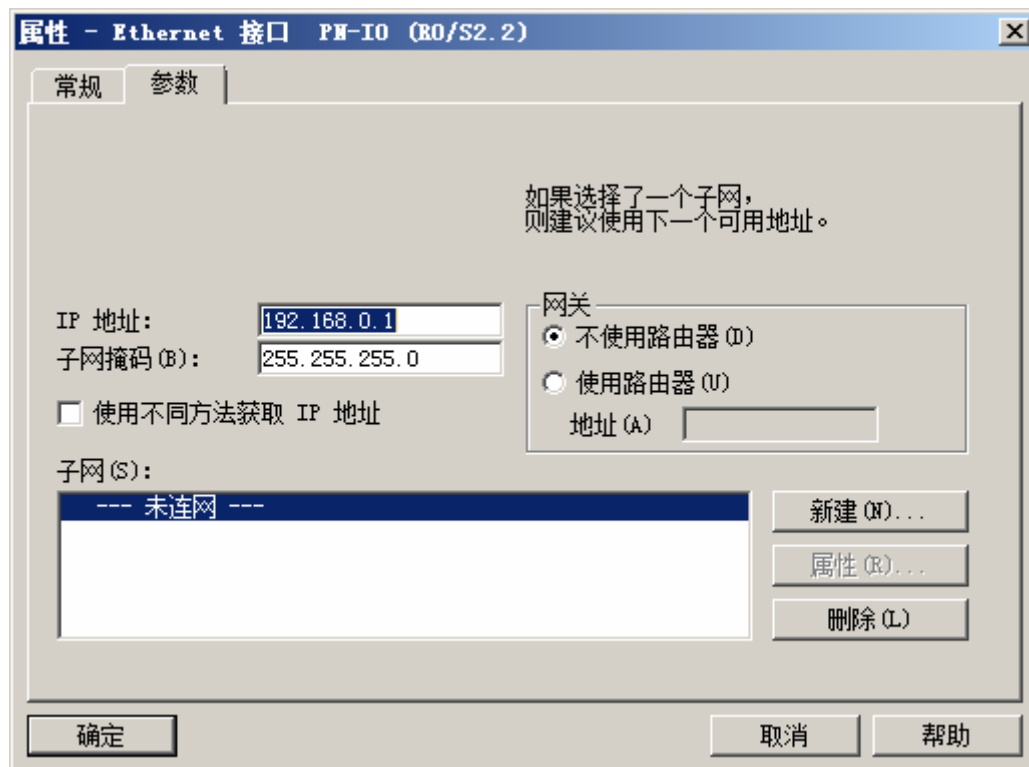
- CPU

Select a kind of CPU, e.g. CPU315-2DP.



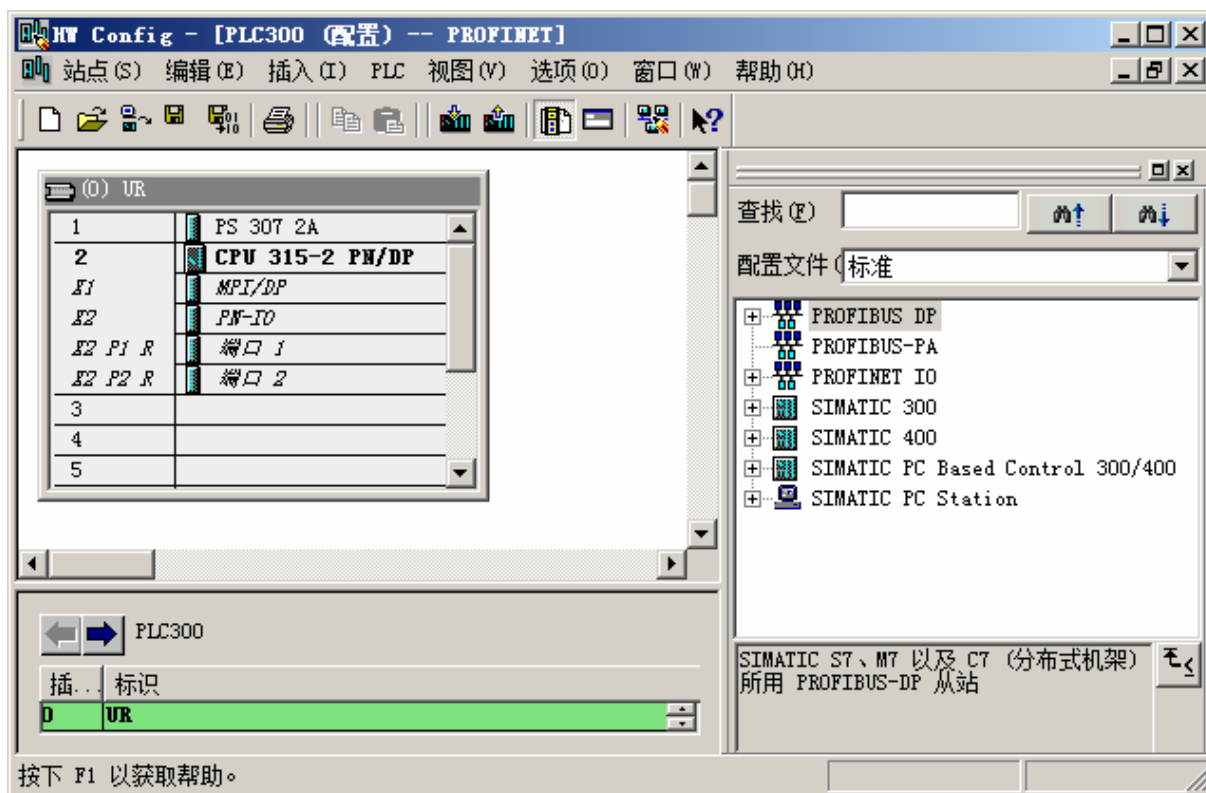
**Figure 4-5 Add CPU**

After selecting the CPU, software will display the interface shown in Figure 4-6.



**Figure 4-6 Configure the communication network**

Click "OK" and the interface is shown in Figure 4-7.



**Figure 4-7 Configuration result**

### 3. PLC hardware configuration

- Configuration

IN the window shown below, double-click the icon "PN-IO" to open the window shown in Figure 4-8.

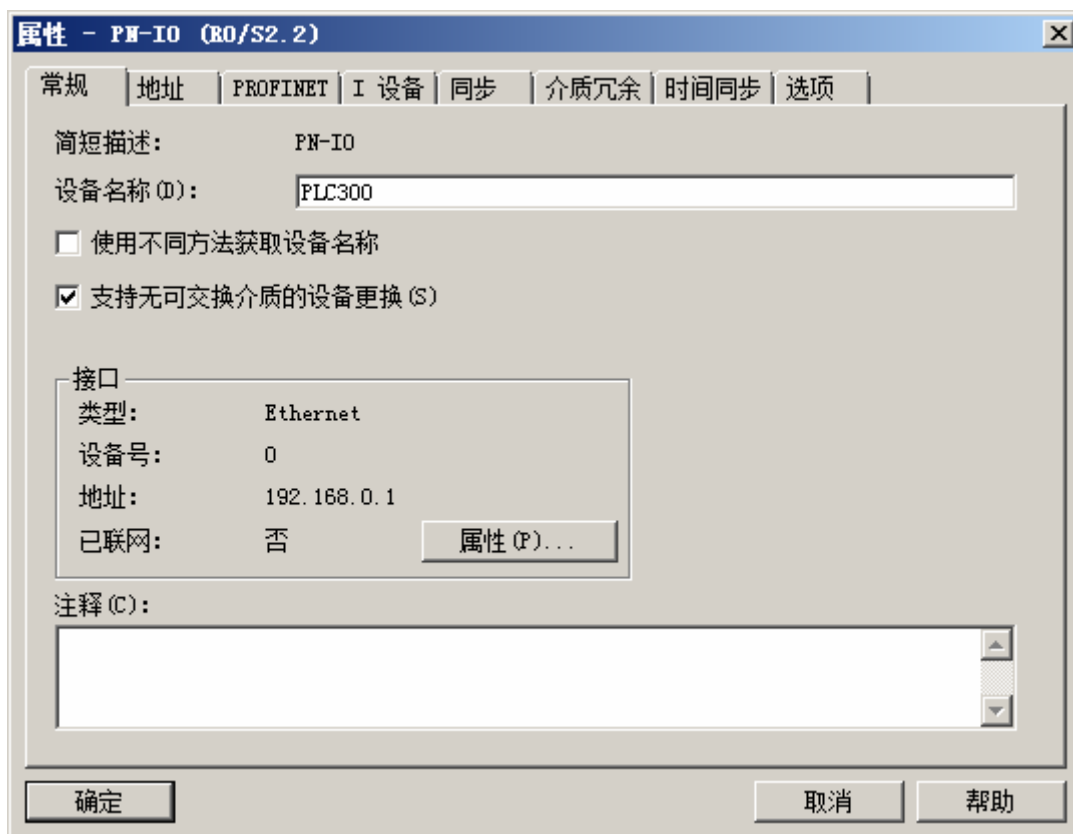


Figure 4-8 Property settings-name

Name: PLC300.

Select the "Property" button, open the window shown in , set the IP address, click the "New" button to add a subnet, and then click "OK".

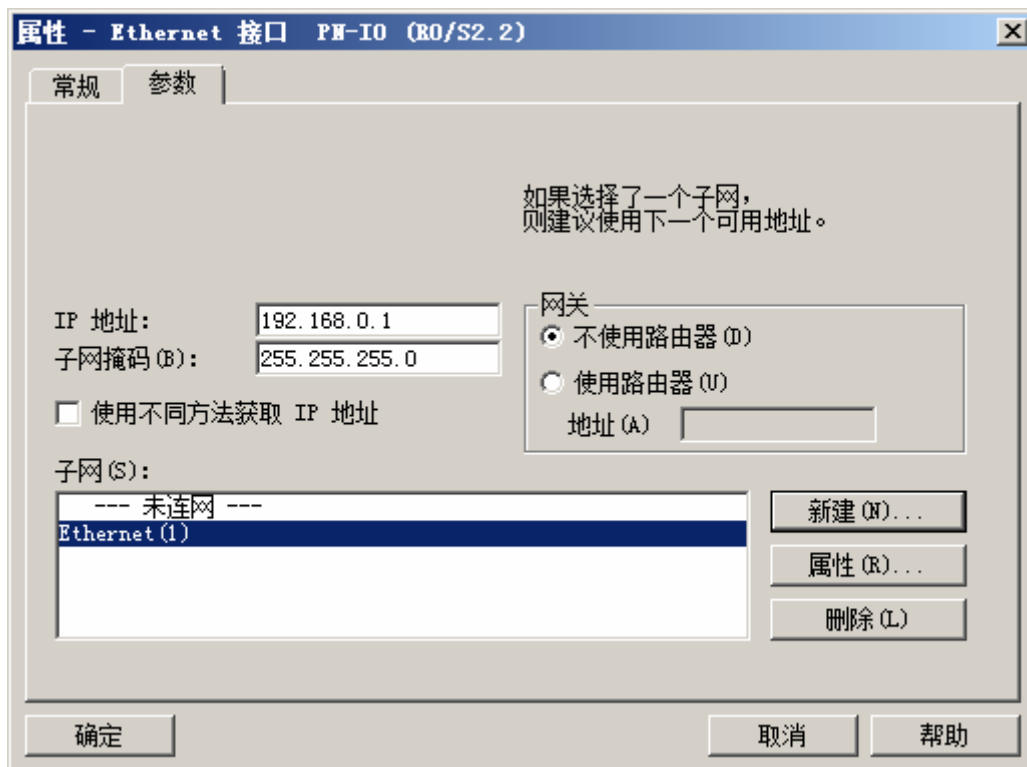
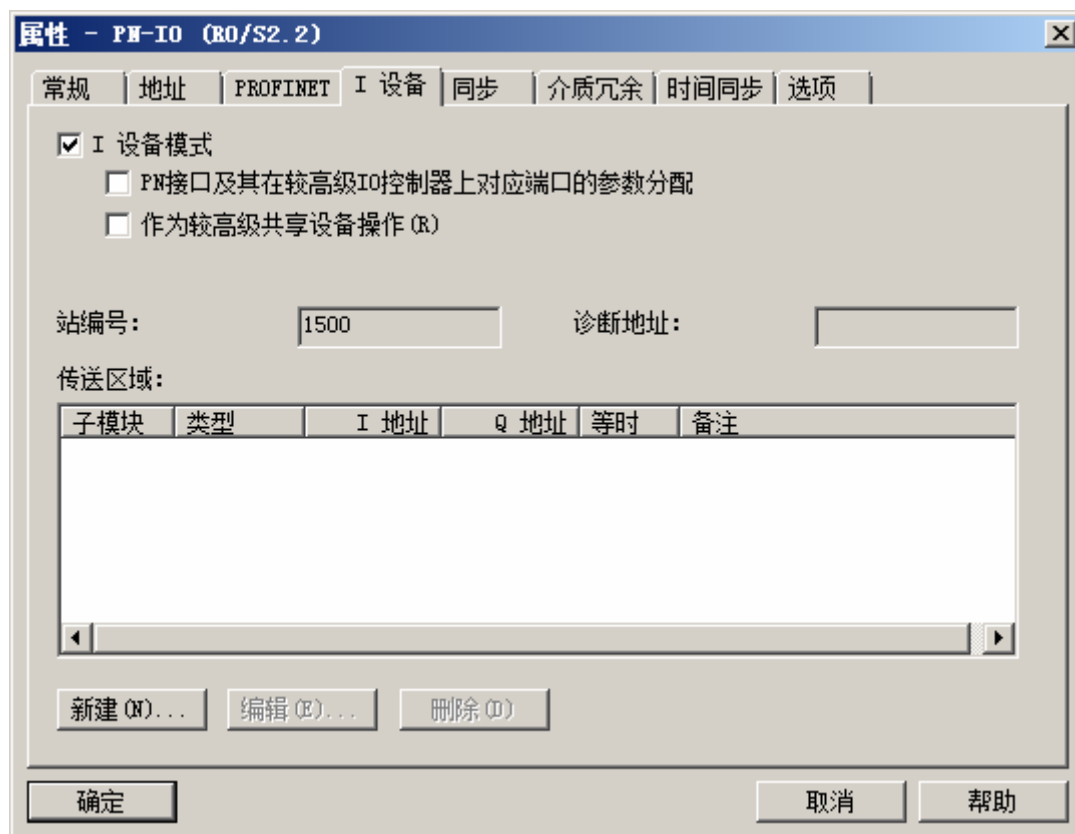


Figure 4-9 Property settings-operation mode

Select the "I Device" tab in the interface shown in Figure 4-8, open the module configuration interface, and tick "I Device Mode".



**Figure 4-10 I device settings interface**

Then click the "New" button below to configure the transfer area and configure the I/O modules according to actual requirements.



传送区属性

较高级 PN 伙伴: IO 控制器

插槽:

2

子插槽 (B):

1000

地址类型 (D):

输出

本地: I 设备

传送区类型 (T):

应用程序

选择 I/O (S)...

地址类型 (T):

输入

输入

起始 (A):

256

长度 (L):

1

过程映像 (P):

---

输出

起始:

长度 (B):

过程映像 (G):

I/O

模块/子模块 (M):

输出地址 (U):

输入地址 (I):

注释 (C):

确定

取消

帮助

Figure 4-11 Property settings-configure module

As shown in the figure below, two modules are added to the transfer area: module1 is the input module, the transfer area length is 2 bytes, and the start address is 256. Module 2 is output module, and its transfer area length and start address are the same as module 1.

传送区域:

子模块	类型	I 地址	Q 地址	等时	备注
1000	应用程序	256..257		否	
1001	应用程序		256..257	否	

新建 (N)...

编辑 (E)...

删除 (D)

Figure 4-12 Configured transfer area



- Tips:
- The input length of single device is up to 512 bytes and the output length is up to 256 bytes.

The maximum input and output length is 3.5K for the entire system.

---

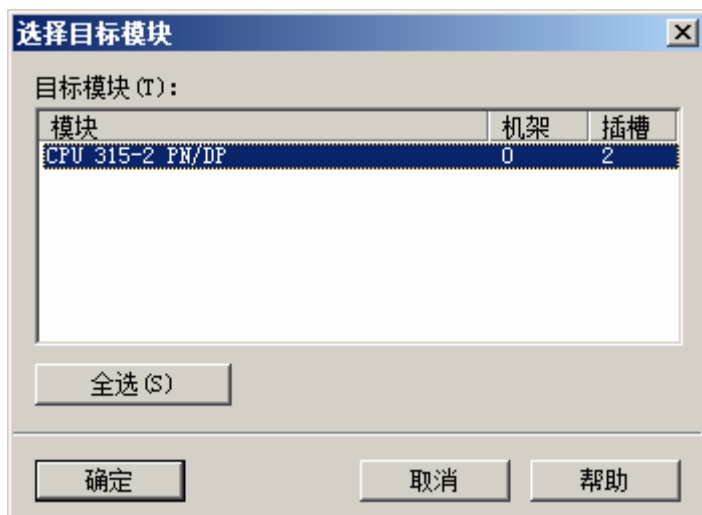
**The maximum length of input and output data from a single module of the slave station is 255 bytes.**

---

After adding the input and output modules, complete the configuration of the transfer area and click "OK".

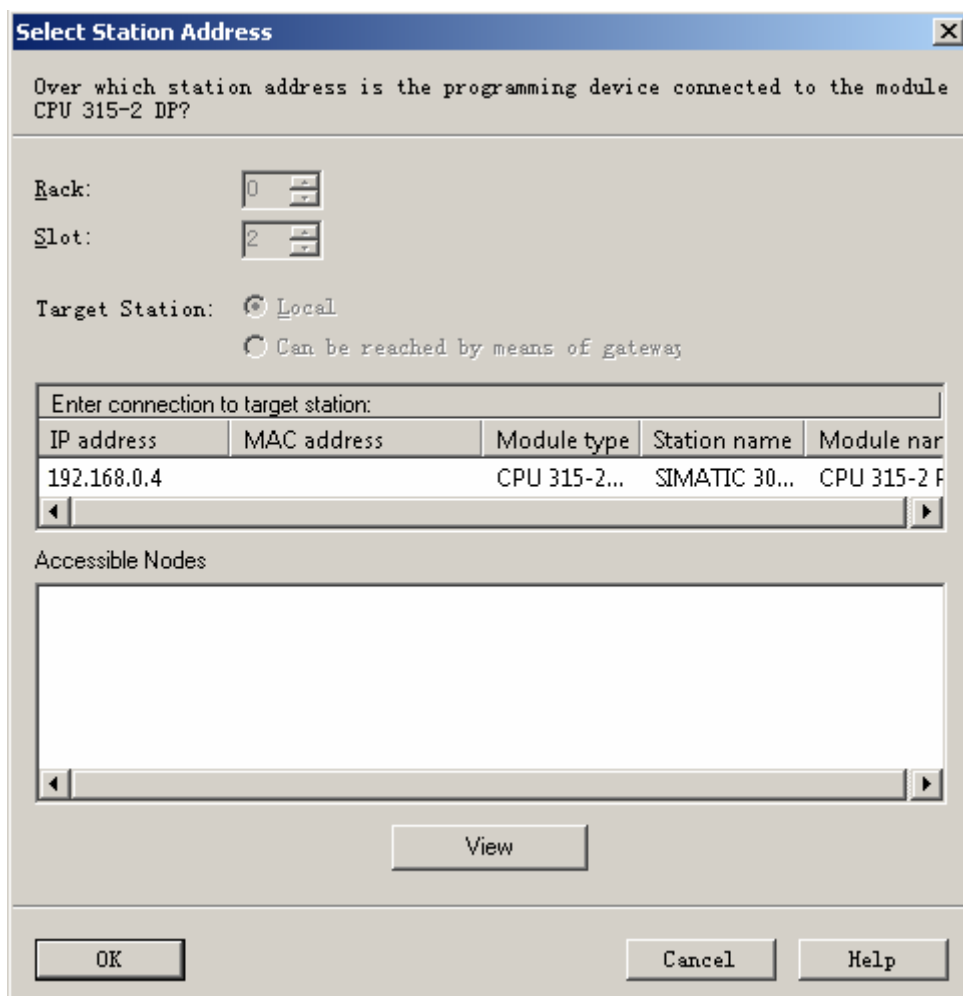
- Download

Select "PLC/Download" to download the configuration information.



**Figure 4-13 Select module**

Click "Select All" and then click "OK".

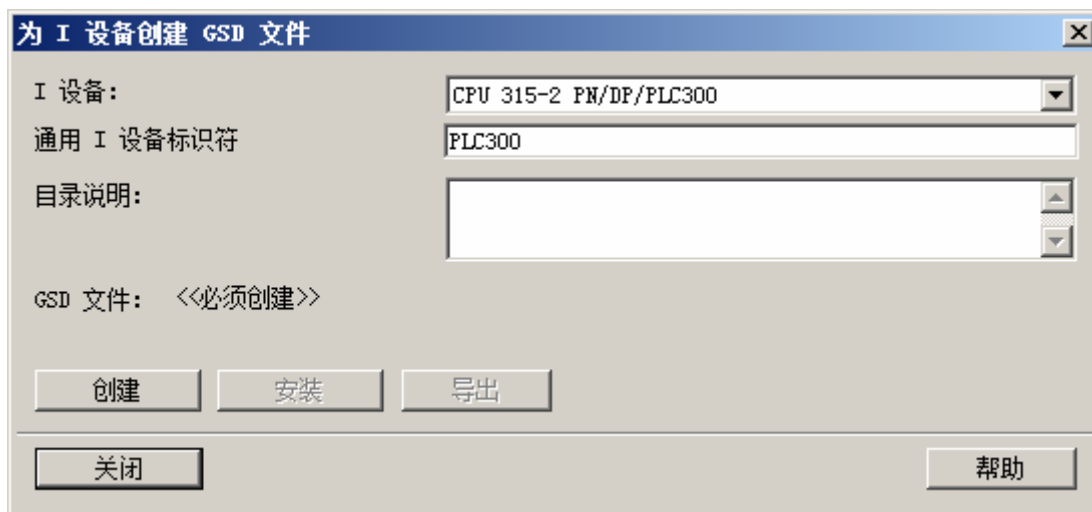


**Figure 4-14 Select station address**

Click "OK".

- Export GSDML File

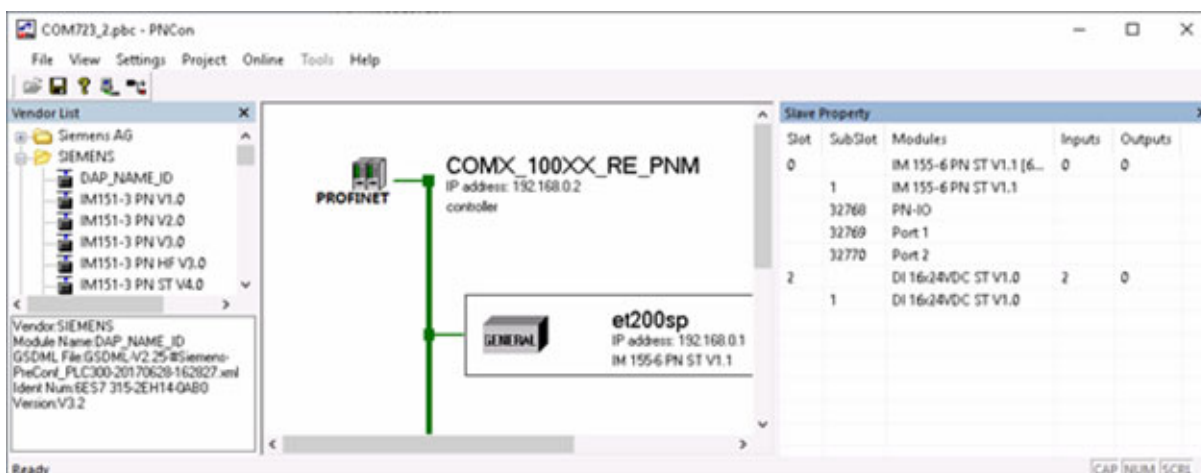
Select the menu **Option/Create GSD File for I Device**, click the **Create** and **Export** button, select the storage address, generate and export the file.



**Figure 4-15 Export GSDML file**

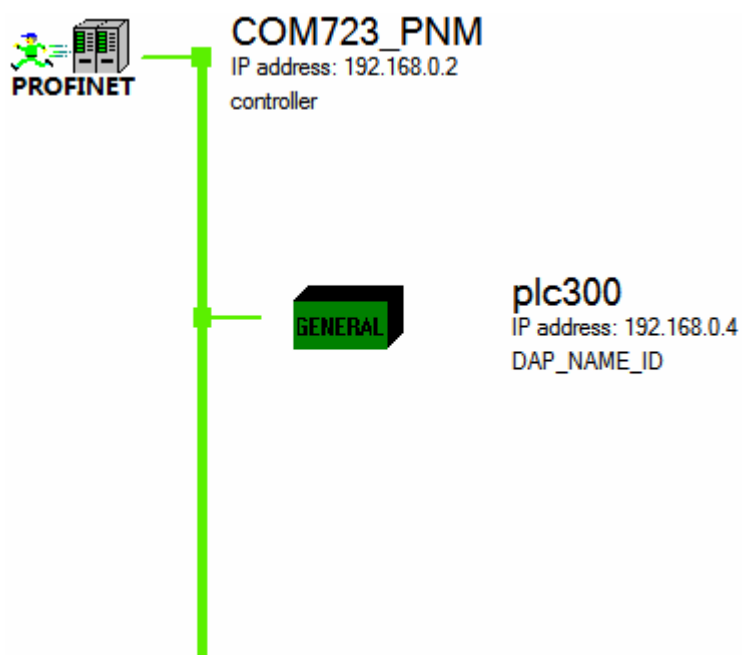
## 4.2 Configure PRFONET Master Interface Module

Export the GSDML file in the STEP7 software, import it according to the user manual of the PRFONET master interface card, restart the PNCon software as prompted, and add a series of work of PLC300 station. The final interface is shown below.



**Figure 4-16 Add station**

After completing the communication configuration, save the configuration file and exit to the tag. When all the settings are completed, close the hardware configuration window, return to the configuration management software interface, save the configured configuration, and select to compile and download. For details, please refer to 3.4~3.7. After the configuration download is completed, reopen the PNCon software interface and turn on the debug mode. If the following picture shows green, it means that the configuration is successful and the device is in real-time data exchange.



**Figure 4-17 Successful configuration**



## Section 5 Application Examples of Common PLC Fetch/Write Communication

The Fetch/Write protocol is a publicly available communication protocol from Siemens for use by third parties and data communication with PLCs.

Some Siemens PLC devices do not support the slave function of PROFINET and exchange data by Fetch/Write.

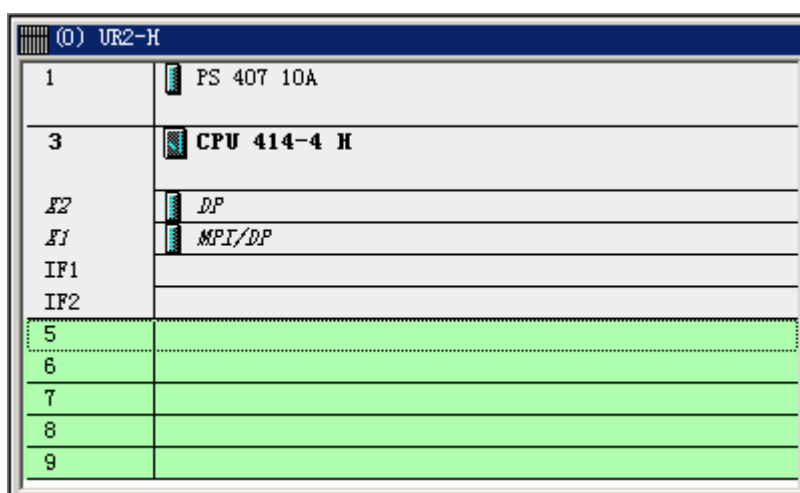
This chapter uses CPU414-4H as example to explain how to use Fetch/Write to enable COM723-S communication module and CPU414-4H to communicate data.

### 5.1 Configure S7-400 PLC Operation Steps

The premise of using Fetch/Write communication is to add an Ethernet communication module that supports this function.

#### 1. New Project

- 1) Create a new project in STEP7 and add PLC400. The process is similar to adding PLC300. For details, please refer to 4.1. After the addition is completed, the PLC400 hardware configuration interface is as shown below. Whether the power supply and other components select redundant components, please configure according to the actual situation.



**Figure 5-1 Configuration result**

- 2) Add the Ethernet communication module CP443-1.

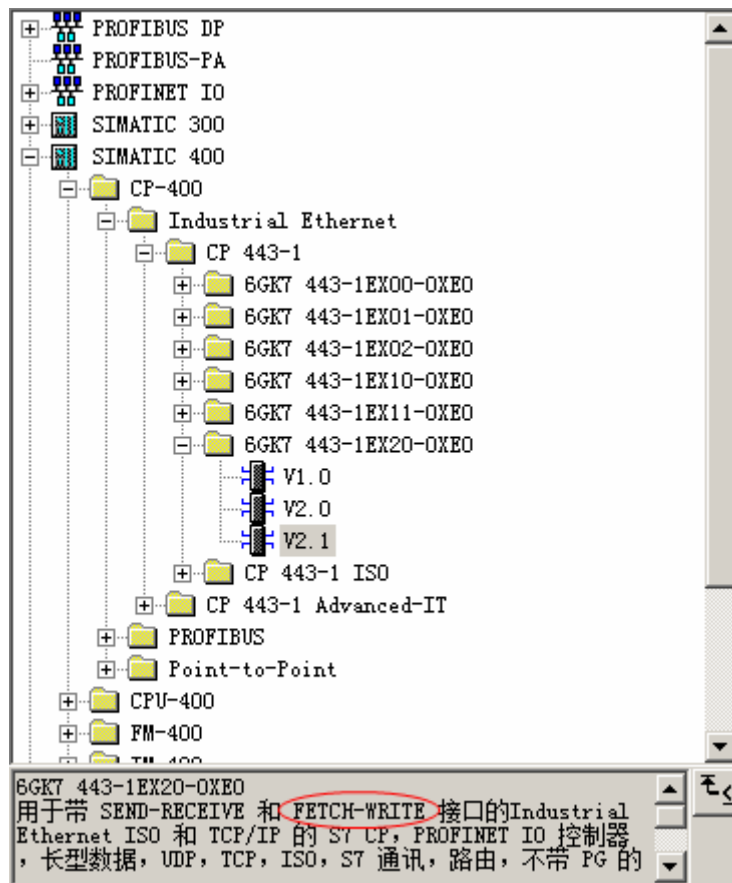


Figure 5-2 Add a communication module with Fetch/Write interface

- 3) Modify the IP address, add a subnet, and then save the changes and close the hardware configuration interface of the PLC400.

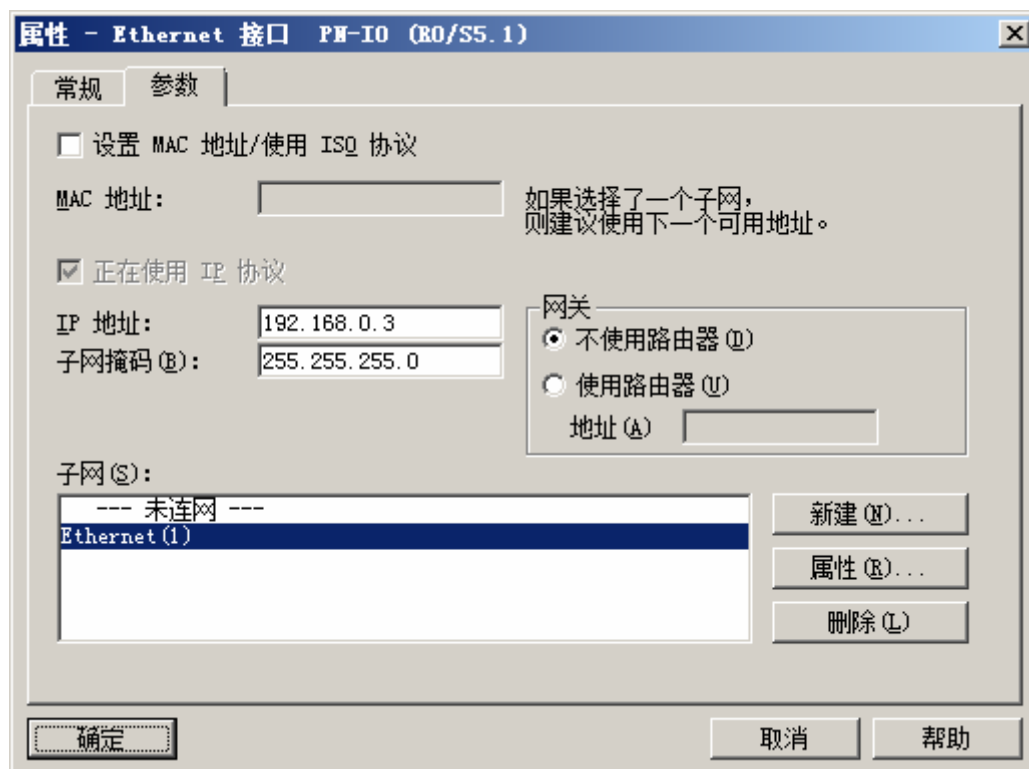
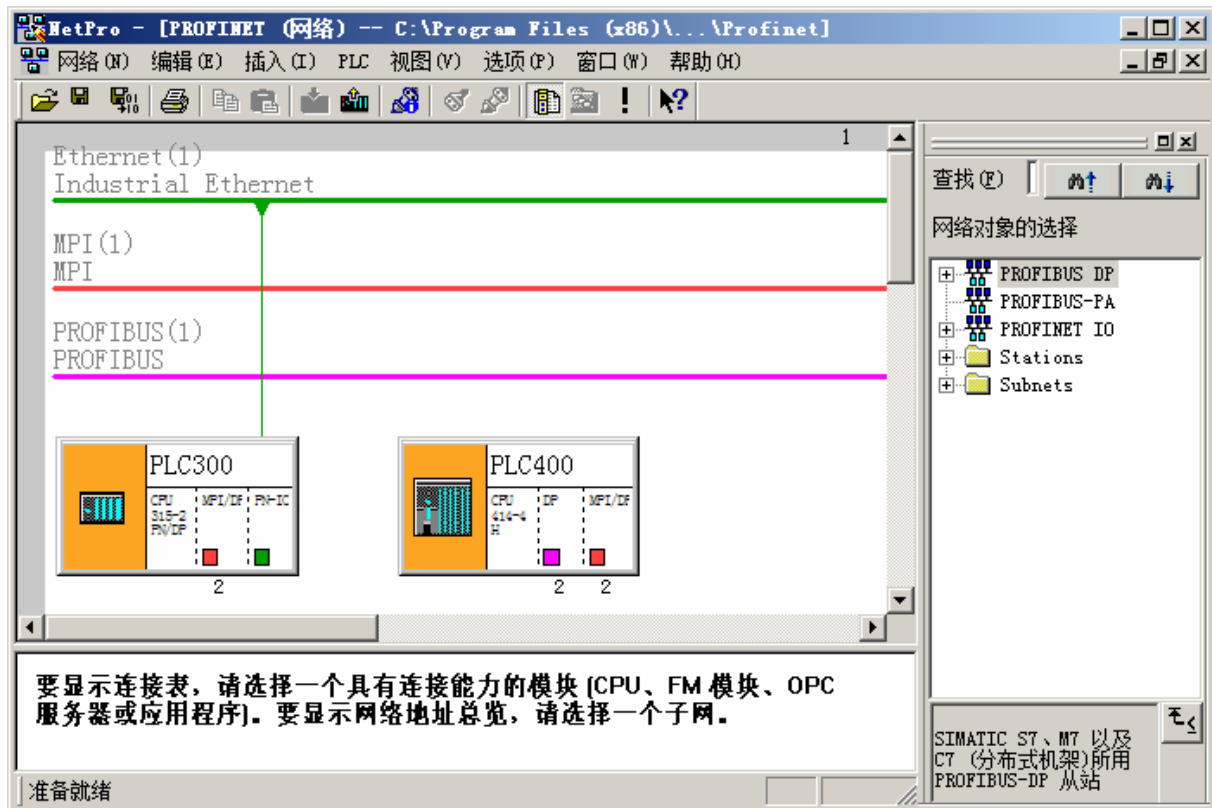


Figure 5-3 Add subnet

- 4) Select the PLC400 icon in the STEP7 configuration software interface and select the menu command **Option/Configuration Network**. The configuration interface of configuration network is shown in the figure below for Fetch/Write connection configuration.

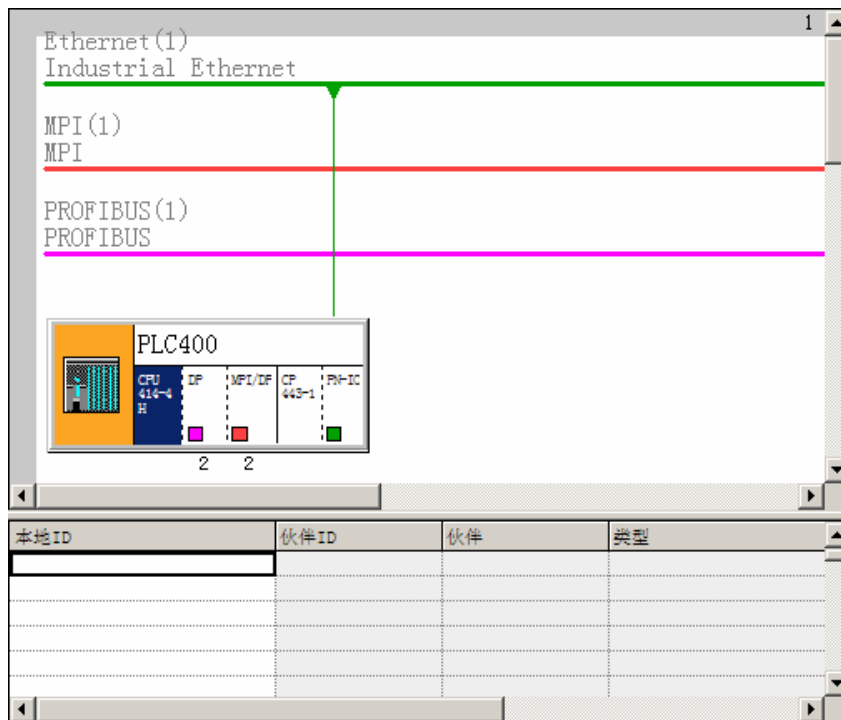


**Figure 5-4 Configuration interface of configuration network**

## 2. Fetch Connection Configuration

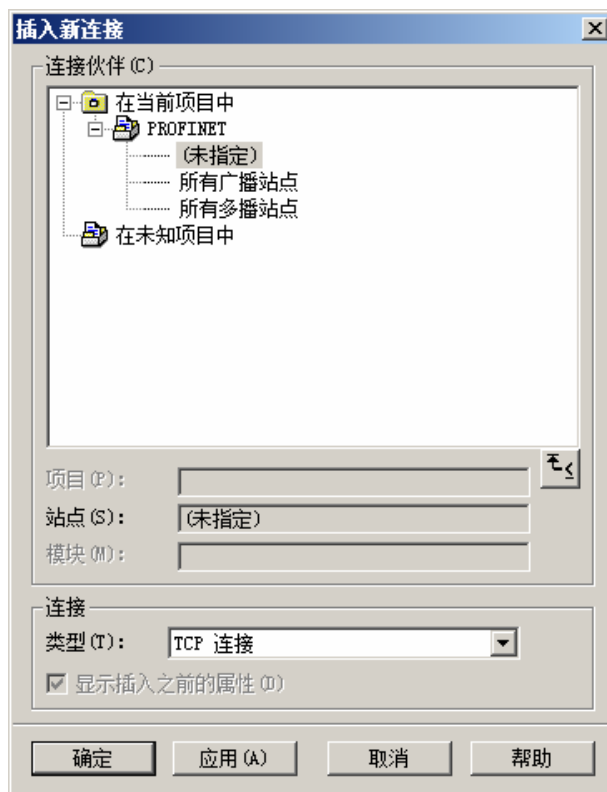
- 1) In the interface shown in Figure 5-4, select CPU414-4H in the PLC400 station, and the lower part displays the list of objects connected to the CPU, as shown in the figure below.





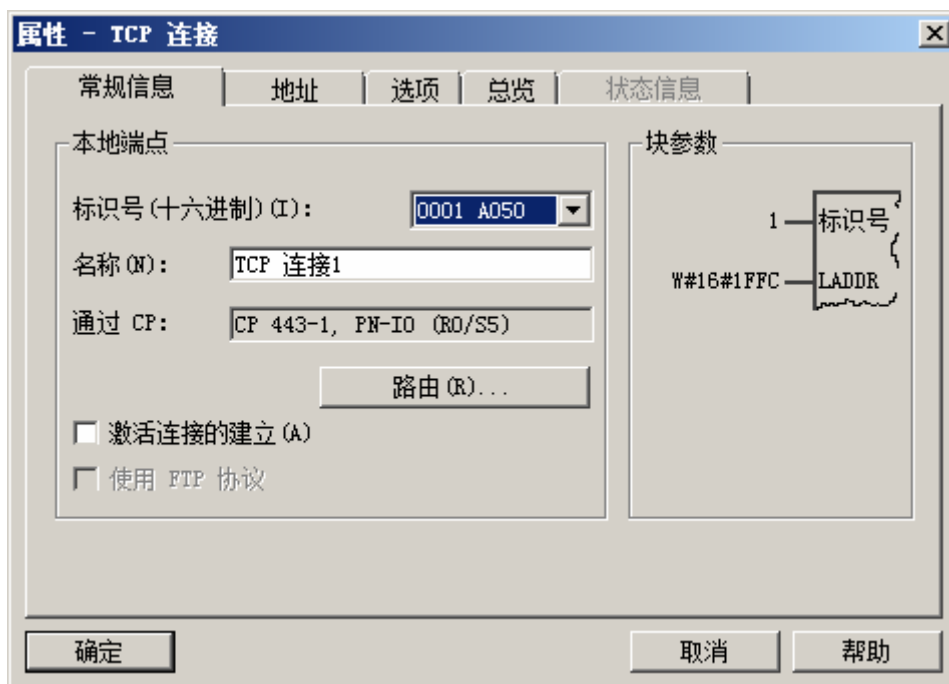
**Figure 5-5 CPU connection object list**

- 2) Double-click the blank cell in the Local ID column of list below, and the pop-up window is shown in Figure 5-6. Select the communication object as "(unspecified)" and select the communication type as TCP connection.



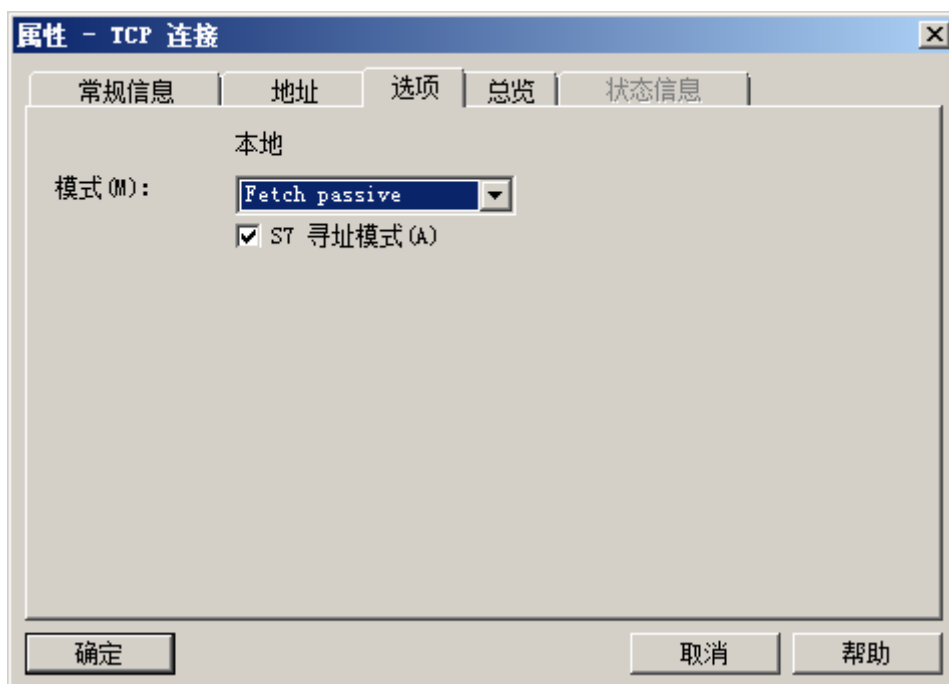
**Figure 5-6 New connection**

- 3) Click "OK" to confirm and the property window settings will pop up, as shown in the figure below.



**Figure 5-7 Communication property interface**

- 4) Switch to the "Option" tab, specify the local port number corresponding to the FETCH function, select "Fetch passive" mode, and click "OK".

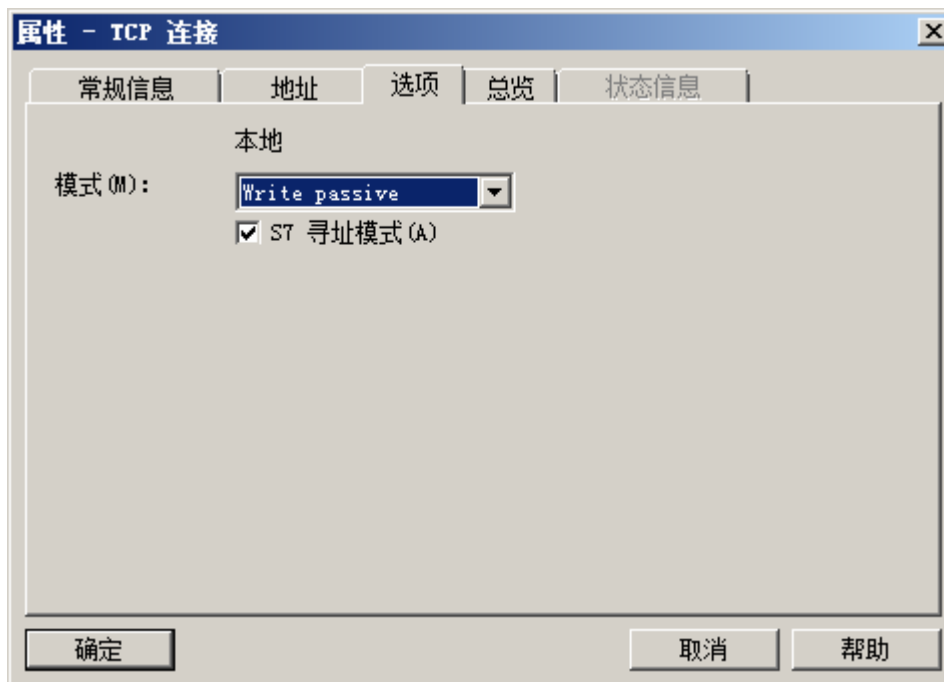


**Figure 5-8 Select Fetch communication mode**

### 3. Write Connection Configuration

- 1) In the interface shown in Figure 5-5, double-click the blank cell in the Local ID column of the list below to pop up the new connection window. Select the communication object as "(unspecified)", select the communication type as TCP connection, and click "OK".
- 2) In the pop-up communication property interface, switch to the "Option" tab, specify the local port number corresponding to the Write function, select "Write passive" mode and

click "OK".



**Figure 5-9 Select Write communication mode**

4. Close the configuration network configuration interface and return to the STEP7 configuration software interface. In the left tree list, select "PROFINET > PLC400 > CPU414-4 H > S7 program > block" as shown in the figure below. Then right-click in the blank space on the right side of screen and choose "Insert New Object > Database" from the shortcut menu to add a new DB block.



**Figure 5-10 Add data block to the right-click menu**

5. Double-click the new data block DB1, and add custom variables in the pop-up window, as shown in Figure 5-11. Save the changes after completion.

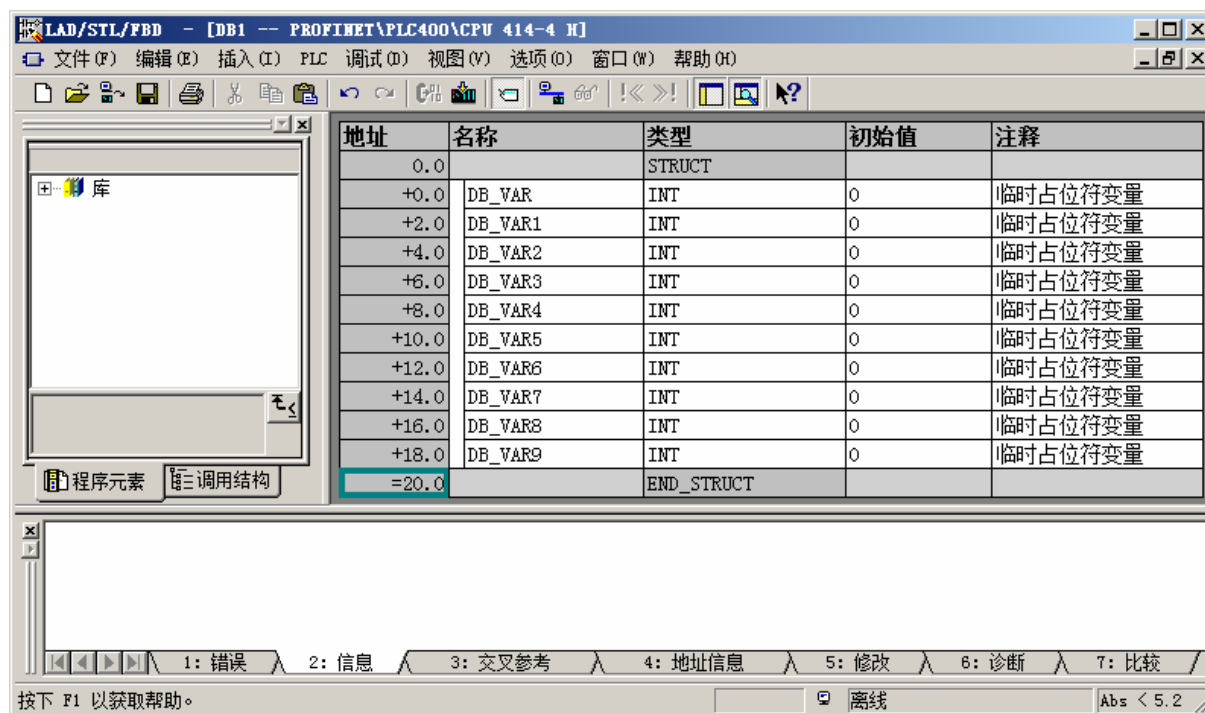


Figure 5-11 Add custom variables

- Return to the STEP7 configuration software interface, select the menu command **PLC/Compile and Download Object** to download the configuration and complete the configuration.

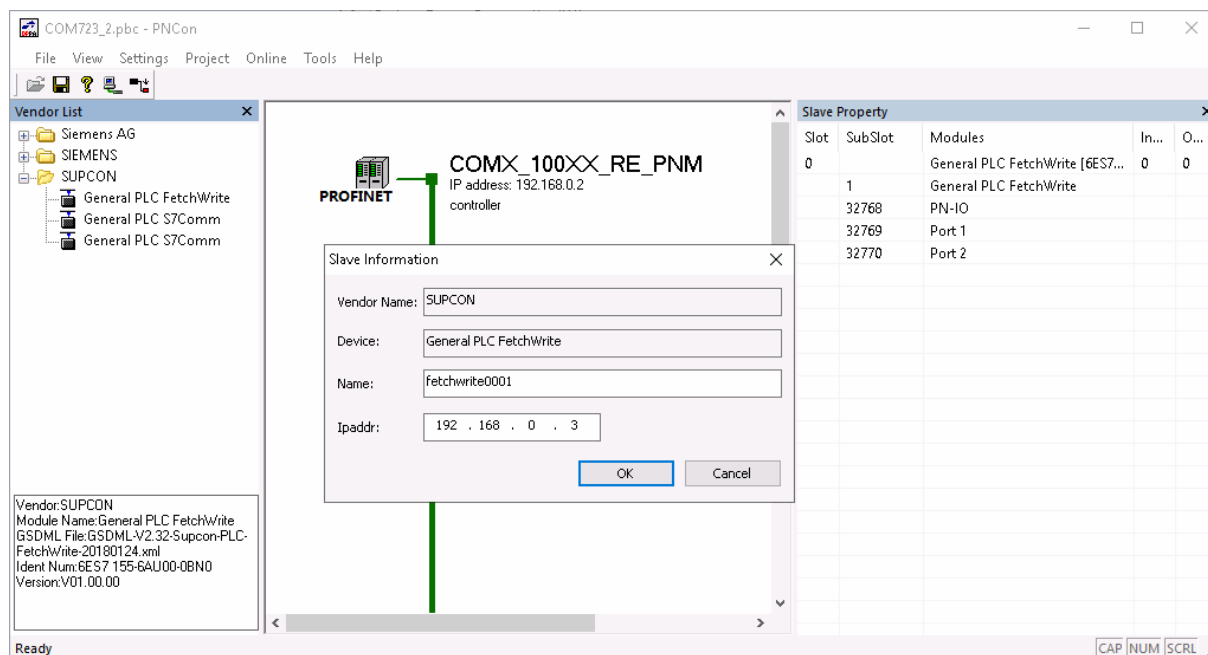
## 5.2 Configure PRFONET Master Interface Module

- In the PNCon software, select the " SUPCON > General PLC FetchWrite " device from the list of vendors on the left, drag and drop to the main configuration interface, set the device name, IP address and add the device in the pop-up dialog box.



### Tips:

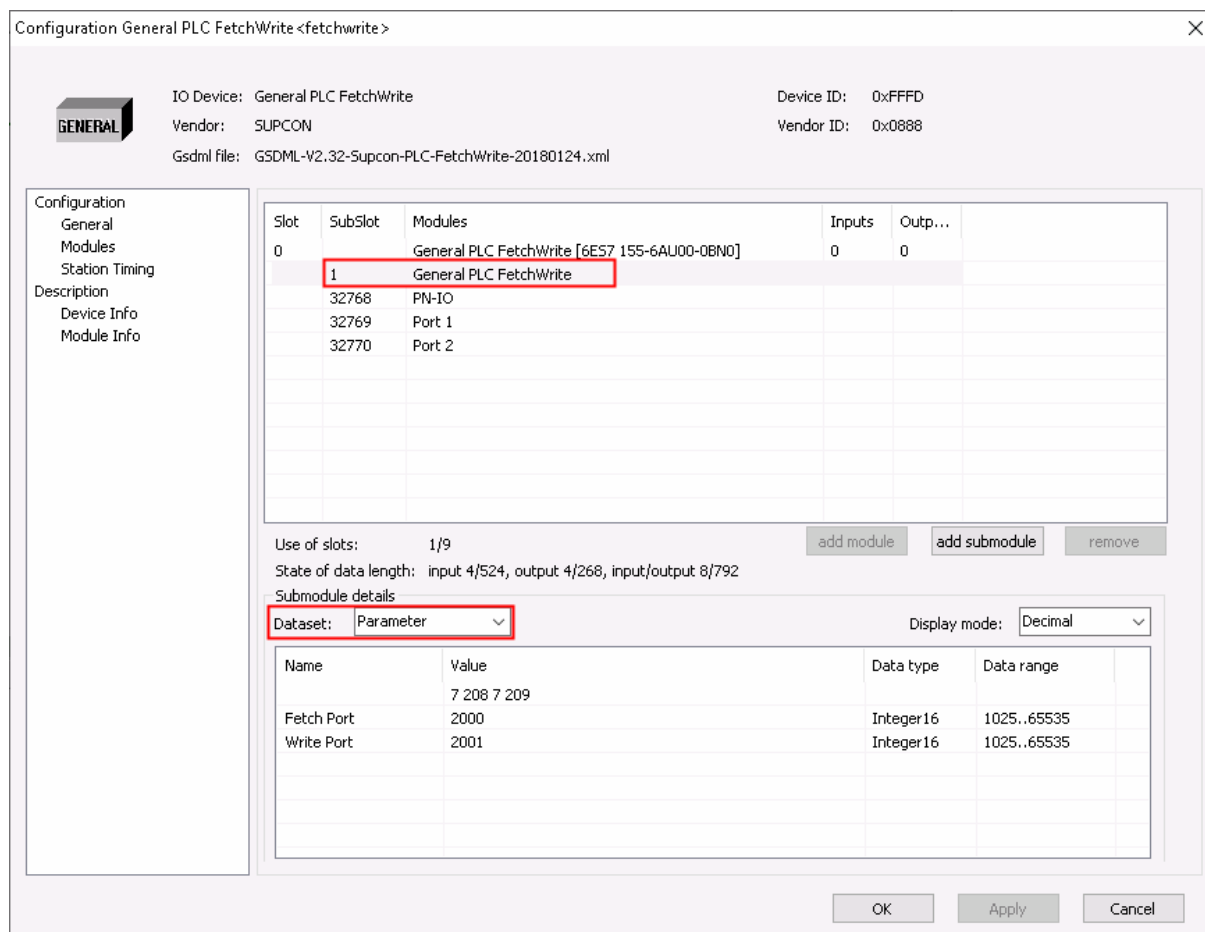
In normal configuration, the IP address of the General PLC FetchWrite device in the PNCon software, the Fetch/Write port IP address set in the STEP 7 configuration network, and the IP address configured by the actual PLC should be consistent.



**Figure 5-12 Add General PLC FetchWrite**

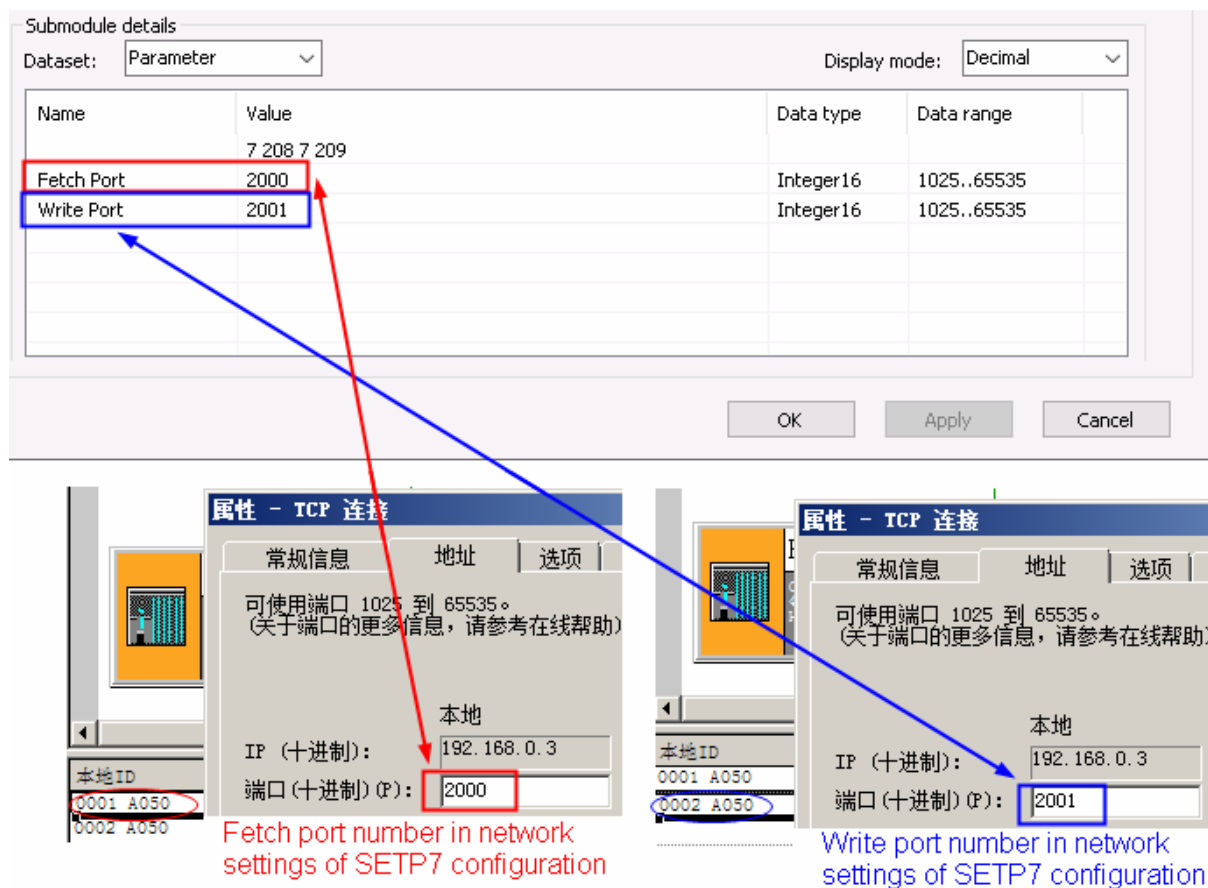
## 2. Configure port

- 1) Use the left mouse button to select the slave, select the menu **Settings\Slave Configuration**, or double-click the General PLC FetchWrite module to open the instrument configuration interface, select "Configuration > Module" in the list on the left. The module configuration interface is displayed on the right, as shown in Figure 5-13. Select the submodule "General PLC FetchWrite" in the figure and select the data type as "Parameter". The lower list shows the parameter items of the module.



**Figure 5-13 General PLC FetchWrite configuration interface**

- 2) Click the values of Fetch Port and Write Port to modify, confirm that the port numbers of Fetch and Write are consistent with the Fetch/Write port number set in the STEP 7 configuration network, as shown in the following figure.

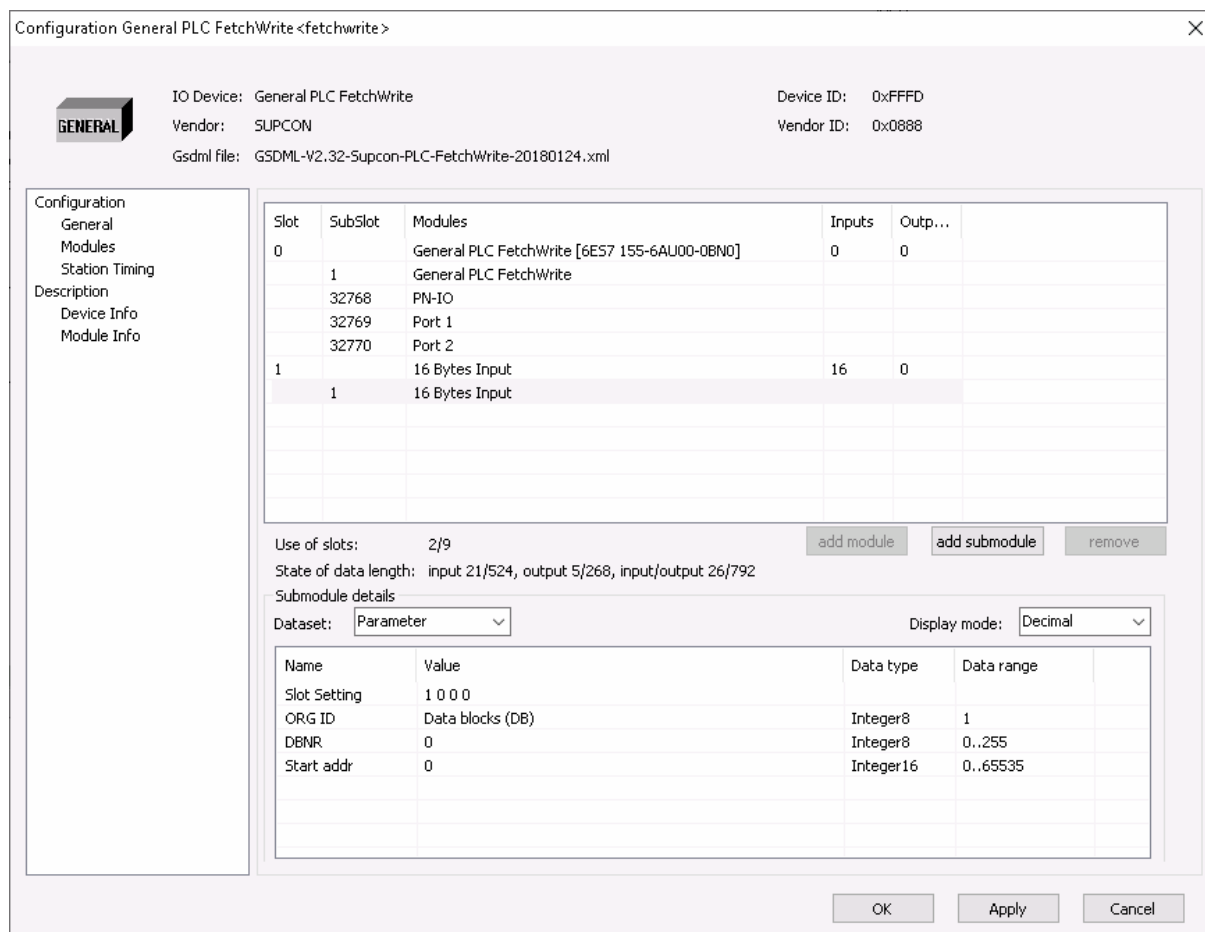


**Figure 5-14 Set Fetch/Write port number**

- 3) In the interface shown in Figure 5-13, select the module "General PLC FetchWrite [6ES7 155-6AU00-0BN0]", click the "Add Module" button to add the read/write module, and set the parameters.

The meaning of parameters of the read and write module is as follows:

- ORG ID: the type of data area, currently supports BD blocks.
- DBNR: the number of DB block.
- Start addr: the starting position of data operation.



**Figure 5-15 Add read/write module**

- 4) When all the settings are completed, close the hardware configuration window, return to the configuration management software interface, save the configured configuration, and select to compile and download. For details, please refer to 3.4~3.7. After the configuration download is completed, reopen the PNCon software interface and turn on the debug mode. If the following picture shows green, it means that the configuration is successful and the device is in real-time data exchange.



**Figure 5-16 Successful configuration**



## Section 6 Application Examples of Common PLC S7Comm Communication

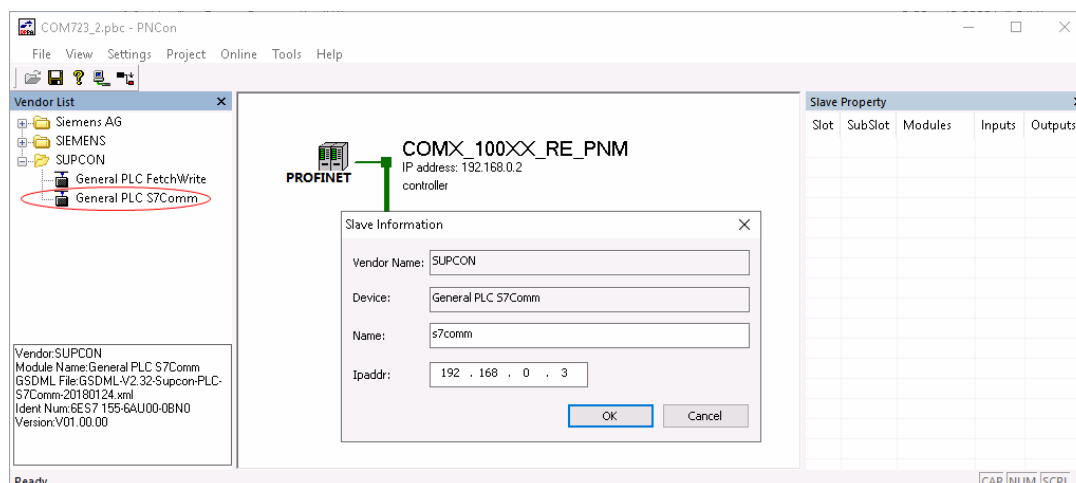
S7Comm communication is another alternative to fetch/Write.

### 6.1 Configure S7-400 PLC Operation Steps

The PLC does not need to be configured when there is corresponding DB block data and the configuration is in operation.

### 6.2 Configure PRFONET Master Interface Module

1. In the PNCon software, select the "SUPCON > General PLC S7Comm" device from the list of vendors on the left, drag and drop to the main configuration interface, set the device name, IP address, and add the device in the pop-up dialog box.



**Figure 6-1 Add General PLC S7Comm**

2. Use the left mouse button to select the slave station, select the menu **Settings\Slave Configuration**, or double-click the slave module to open the configuration interface, select **Configuration > Module** in the list on the left. The module configuration interface is displayed on the right, as shown in the figure below. Select the general PLC S7Comm module in the right interface, and then set the "Data type" to "Parameter" to set the rack and slot.



#### Tips:

The settings of the racks and slots need to be consistent with the configuration in STEP7.

Configuration General PLC S7Comm<s7comm>

**GENERAL**

IO Device: General PLC S7Comm      Device ID: 0xFFFE  
 Vendor: SUPCON      Vendor ID: 0x0888  
 Gsdml file: GSDML-V2.32-Supcon-PLC-S7Comm-20180124.xml

Configuration  
 General  
 Modules  
 Station Timing  
 Description  
 Device Info  
 Module Info

Slot	SubSlot	Modules	Inputs	Outp...
0		General PLC S7Comm [6ES7 155-6AU00-0BN0]	0	0
	1	General PLC S7Comm		
	32768	PN-IO		
	32769	Port 1		
	32770	Port 2		

Use of slots: 1/9      add module      add submodule      remove

State of data length: input 4/524, output 4/268, input/output 8/792

Submodule details

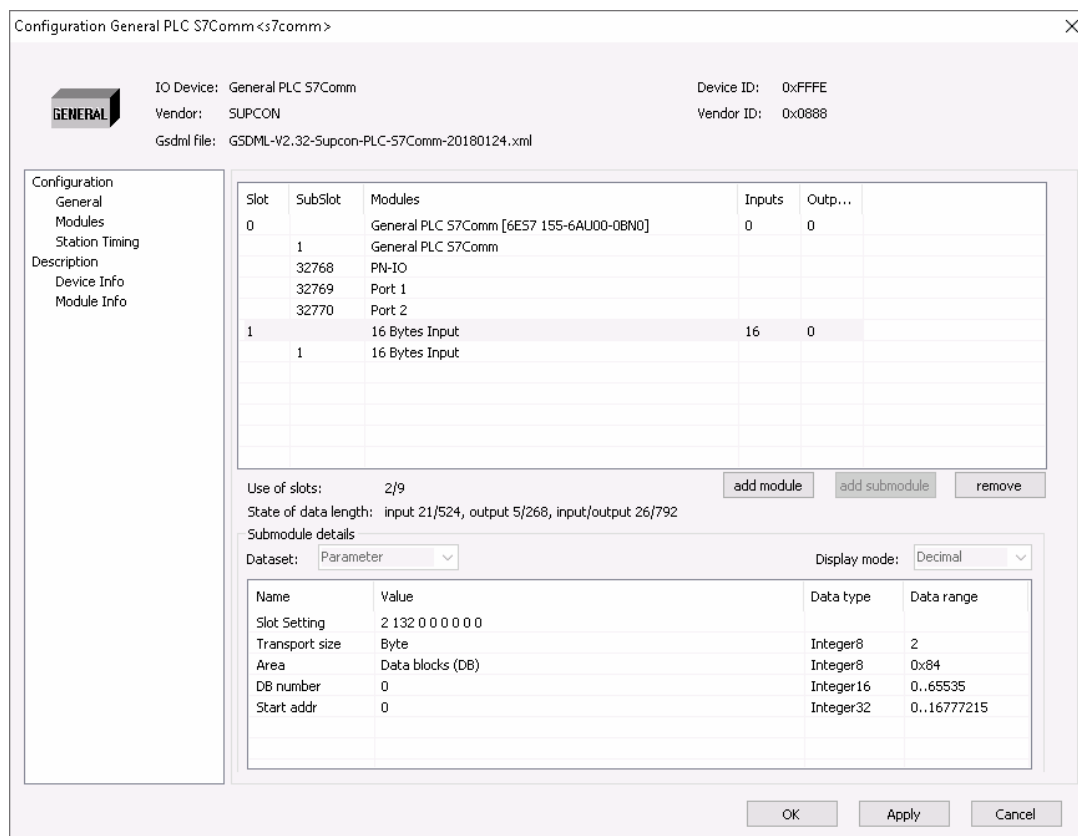
Dataset: Parameter      Display mode: Decimal

Name	Value	Data type	Data range
Physical addr setting	0 0		
Rack	0	Integer8	0..255
Slot	0	Integer8	0..255

OK      Apply      Cancel

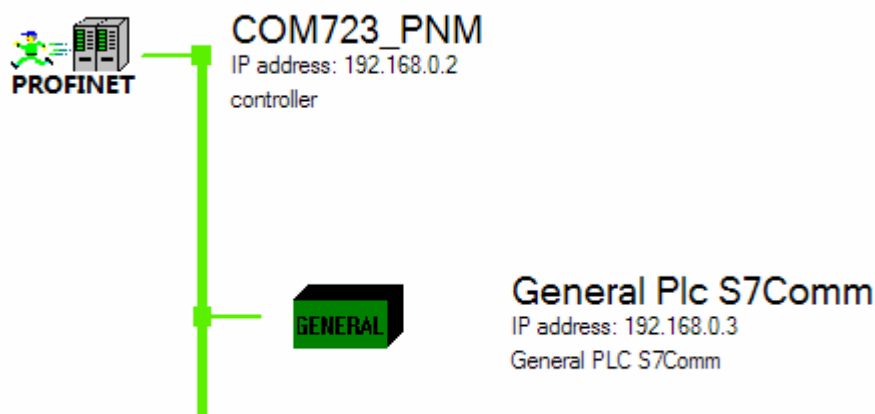
**Figure 6-2 General PLC S7Comm module configuration**

- In the interface shown in Figure 6-2, select General PLC S7Comm to add a read/write module for parameter setting. The parameter of the read and write module are defined as follows:
  - Transport size: the data type of read and write. The default is Byte and cannot be modified.
  - Area: the default is Data blocks and cannot be modified.
  - DB number: the serial number of data block. Click to modify.
  - Start addr: the starting address of module. Click to modify.



**Figure 6-3 Add read/write module**

4. When all the settings are completed, close the hardware configuration window, return to the configuration management software interface, save the configured configuration and select to compile and download. For details, please refer to 3.4~3.7. After the configuration download is completed, reopen the PNCon software interface and turn on the debug mode. If the following picture shows green, it means that the configuration is successful and the device is in real-time data exchange.



**Figure 6-4 Successful configuration**

## Section 7 Revision

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*Table 7-1 Retrofit list of the version*

Document Version	Applicable Module Model	Remarks
V1.0 (20230301)	OMC High-performanceHMI V4.70.00.00	First release
V1.1 (20230830)	OMC High-performanceHMI V5.10.00.00-M	Updated screenshots.