EtherNet MPI Adapter
GT100-IE-MPI

User Manual

V 2.0

Rev F

SST Automation

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www.SSTAutomation.com

Important Information

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Table of Contents

1 Product Overview

1.1 Product Function

The GT100-IE-MPI is an adapter designed to enable Ethernet communication for Siemens SIMATIC S7 series PLCs (including S7-200, S7-300, and S7-400) and Siemens CNCs (such as 840D and 840DSL). It also supports data monitoring.

1.2 Product Features

- Supports multi-master communication; the expansion port can connect to touch screens or other master devices.
- Features automatic baud rate detection.
- Automatically queries the master station address and displays the address list.
- Installs directly onto the PPI/MPI/PROFIBUS communication port of a PLC without requiring an external power supply.
- Supports Siemens S7 Ethernet communication drivers, including MicroWIN, STEP 7, WinCC, SIMATIC NET, and Kepware Server (formerly KEPServerEX).
- Supports connectivity to Node-Red.
- Supports up to 16 Ethernet TCP/IP connections, allowing 16 PCs to collect PLC data simultaneously.

1.3 Technical Specifications

[1] DB9 communication port:

- Interface type: TIA/EIA RS-485 compatible, ESD: ±15KV, up to 32 nodes.
- Supported protocols: Siemens S7 bus multi-master protocol (including PPI, MPI, and PROFIBUS).
- Baud rate (bps): 9600, 19200, 45450, 93750, 187500, 500K, 1.5M.

[2] Ethernet port:

- Network port type: 10/100 Mbps auto-sensing network port.
- Supported protocols: S7TCP, 16 TCP/IP connections, and Modbus TCP Server.

[3] Power: 24 VDC (11~30 VDC), 100mA(24VDC).

[4] Operating temperature: 32°F~140°F(0°C ~ 60°C). Humidity: 5%~90% (non-condensing).

[5] Dimensions (W*H*D): 0.67 in *2.56 in *1.29 in (17mm*65mm*33mm).

[6] Installation: Plugs directly into the DB9 communication port of a Siemens S7 PLC.

[7] Protection Level: IP20.

1.4 Related Products

Related products include the GT200-DP-RS, GT200-PN-RS, and GT200-PN-3RS.

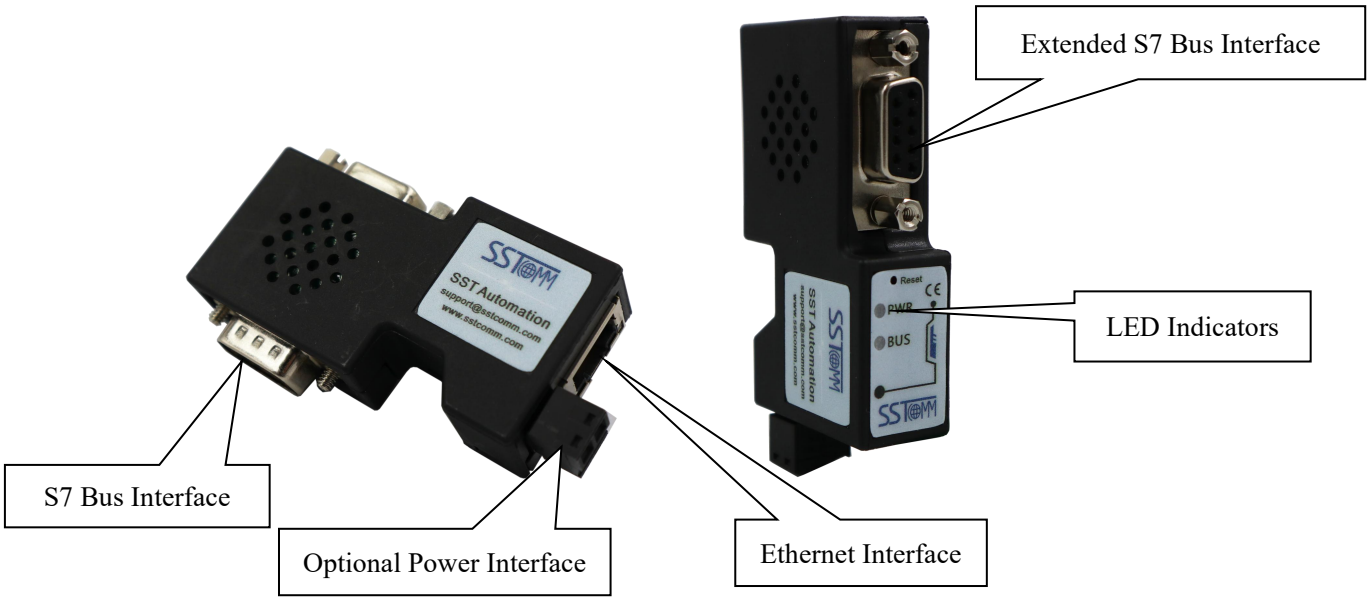
For more information about related products, please visit the SST Automation website: www.sstautomation.com.

1.5 Revision History

Revision	Date	Chapter	Description
V2.0, Rev F	3/13/2026	ALL	Optimize document descriptions
V2.0, Rev E	5/6/2024	Chapter 8	Added instructions for Modbus TCP communication
V2.0, Rev D	6/14/2023	Appendix B	Added instructions to connect Node-Red
V2.0, Rev C	6/9/2023	Appendix A	Added instructions to connect KEPServerEX
V2.0, Rev B	4/11/2023	Chapter 7	Added more details for STEP 7 modeling
V2.0, Rev A	4/3/2023	Chapter 7	Added STEP 7 modeling
V2.0	3/20/2021	ALL	New release

2 Hardware Description

2.1 Product Appearance



Note: The image is for illustrative purposes only. The actual product appearance may vary.

2.2 LED Indicators

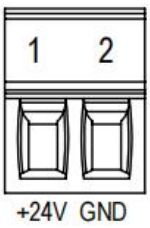
Indicator	States	Indication	Troubleshooting
PWR	ON	Power supply is normal	N/A
	OFF, Flashing	Power supply is abnormal	Check the power supply
BUS	ON	The baud rate is correct and the gateway is functioning normally	N/A
	Flashing (1s)	Station address conflict detected on the S7 bus	Modify the station address of the module through the web page
	Flashes twice at 1Hz after a few seconds interval	Baud rate not detected	Check the PLC communication port
	OFF	Gateway or indicator failure	Contact technical support
	Flashing	Communication response frequency	N/A
Link	ON	Network is connected	N/A
	OFF	Gateway or network failure	Check local and remote network connections
Active	Flashing	Communication is normal with remote devices	N/A
	OFF	No communication	N/A
	ON (not flashing)	Ethernet failure	Contact technical support

2.3 Interface

2.3.1 Power Interface

The power interface is optional and generally not required. It's not recommended to use it. The gateway is powered directly via the S7 bus interface when connected to the PLC. If the PLC itself cannot provide power, you can connect an external power interface to supply power.

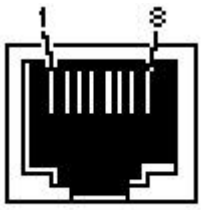
Pin	Function
1	+24V
2	GND



2.3.2 Ethernet Interface

The Ethernet interface uses an RJ-45 connector. The pinout (standard Ethernet signals) is defined as follows:

Pin	Description
S1	TXD+, Transmit Data+
S2	TXD-, Transmit Data-
S3	RXD+, Receive Data+
S4	Bi-directional Data+
S5	Bi-directional Data-
S6	RXD-, Receive Data-
S7	Bi-directional Data+
S8	Bi-directional Data-



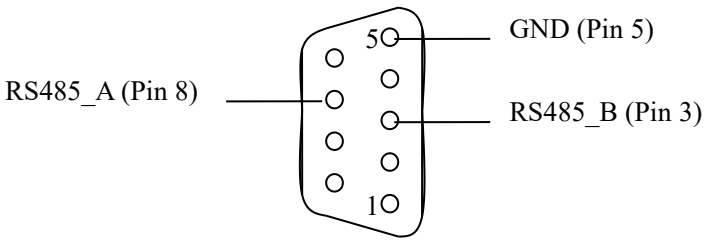
RJ-45 port

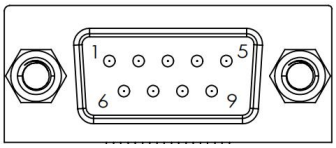
2.3.3 S7 Bus Interface

1) S7 bus interface X1

The X1 interface uses a DB9 male port, which can be plugged directly into the communication port (PPI port, MPI port or PROFIBUS port) of an S7 series PLC. The pin definition of the communication port is the same as that of the PLC, where Pin 3 is RS485 Line B, Pin 8 is RS485 Line A, and Pin 5 is Signal Ground (GND). Pin 7 is the positive of the 24VDC power supply of the PLC, and pin 2 is the ground of the 24VDC power supply. The 24VDC power supply of pin 2/7 is used as the default power supply input. The baud rates supported by the X1 interface include: 9.6K, 19.2K, 45.45K, 93.75K, 187.5K, 500K and 1.5Mbps.

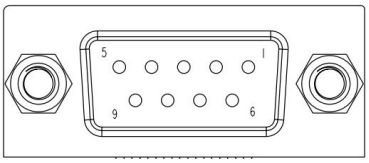
Pin	Function
2	GND of 24VDC
3	RS485, B
5	GND
7	24VDC
8	RS485, A





2) Extended S7 bus interface X2

The X2 interface uses a DB9 female port, which is used to connect Siemens communication equipment (such as Siemens touch screen, CP5611 communication card, etc.). The supported baud rates include 9.6K, 19.2K, and 187.5K.



2.3.4 Reset Button

The reset button is used to restore the gateway to factory settings. Press and hold the button for 5 seconds; release it once the BUS indicator turns solid green. Enter 192.168.1.188 in a web browser address bar to access the configuration interface.

3 Hardware Installation

3.1 Mechanical Dimensions

Size (width * height * depth):

0.67 in *2.56 in *1.29 in (17mm*65mm*33mm)

3.2 Installation Method

The GT100-IE-MPI is mounted by plugging it directly into the DB9 communication port of a Siemens S7 PLC.

4 Quick Start Guide

Basic steps when configuring G100-IE-MPI :

1. Wiring: Refer to Chapter2.3 Interface for wiring details.

    1) Plug the S7 bus interface into the PPI, MPI, or PROFIBUS port of the Siemens PLC.

    2) Connect the gateway's Ethernet port to your PC using a network cable to download the configuration.

    3) Power on the PLC and verify that the gateway's power indicator is active.

2. Configure the gateway using a web browser after connecting it via a network cable.

If the gateway cannot be discovered, please check the following:

- The default factory IP address of the GT100-IE-MPI is 192.168.1.188. Ensure that your computer and the gateway are on the same network segment.
- Test the network connection using the Ping command. For detailed instructions, refer to "How to Use the Ping Command" on the Support page at.www.sstautomation.com.
- If you press and hold the Reset button for 5 seconds, the gateway will restore factory default configuration settings, and the IP address will revert to 192.168.1.188.

3. Enter 192.168.1.188 in your web browser's address bar to configure the gateway. For detailed configuration instructions, please refer to Chapter 5.

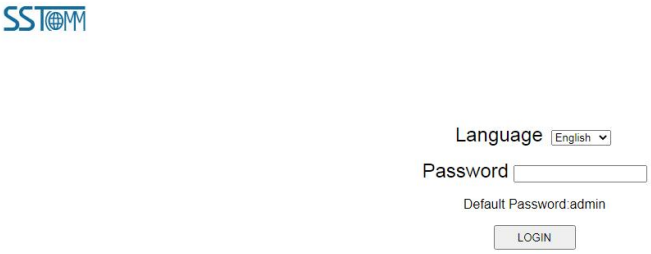
5 Configuration Instructions

5.1 Configuration Interface Description

After connecting the gateway with a network cable, enter http://192.168.1.188/ in your web browser to start the configuration.

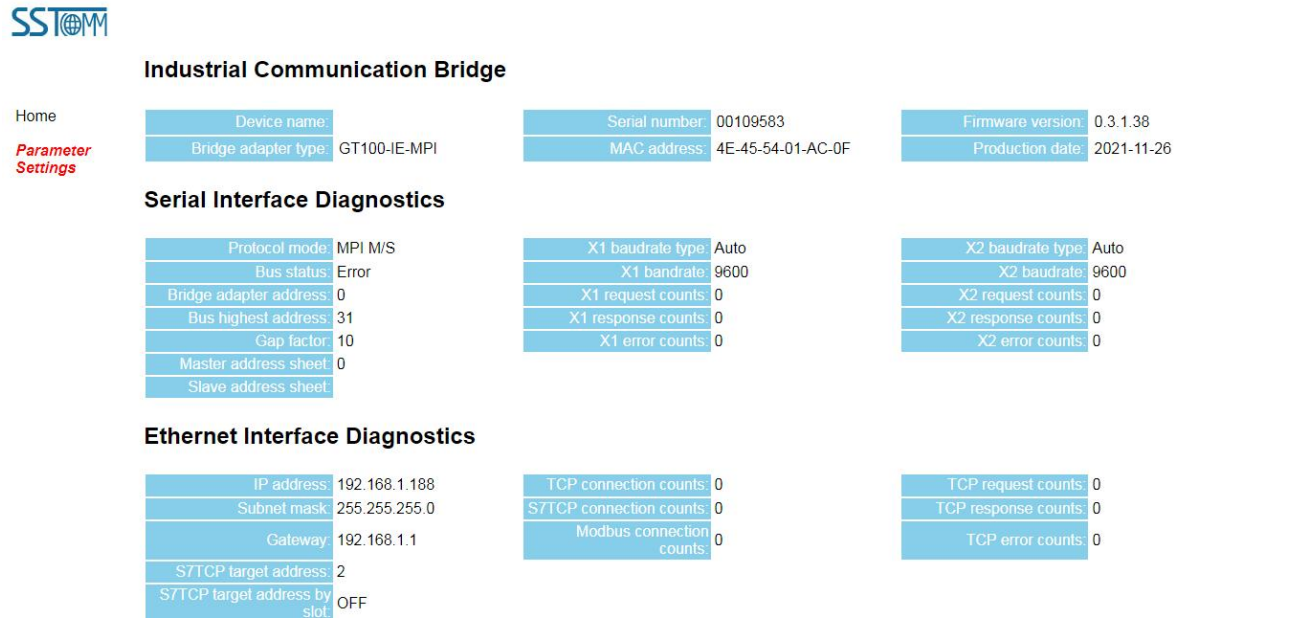
Upon your first visit to the web configuration page, the interface shown below will appear.

The default password is "admin".



5.2 Home

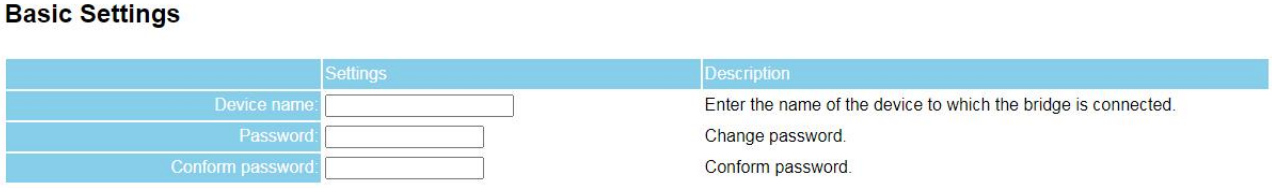
The Home screen displays basic information and diagnostic data for your reference.



5.3 Parameter Settings

5.3.1 Basic Settings

Click "Parameter Settings" in the left menu to access the configuration interface shown below:



Device name: Enter the name of the device to which the bridge is connected.

Password: Change the login password for the web configuration page.

Confirm password: Re-enter the password for verification.

5.3.2 Serial Interface Settings

Serial Interface Settings

	Settings	Description
Protocol mode:	MPI M/S	Select the protocol mode of PLC.
Bridge adapter address:	0	The default is 0,which cannot conflict with other station address on the bus.
Bus highest address:	31	The default is 31.
Gap factor:	10	Range:1-100,the default is 10.
X1 baudrate:	AUTOMATIC	X1 port connects to PLC,the baudrate can be set to be automatic or fixed baudrate.
X2 baudrate:	AUTOMATIC	X2 port connects to HMI,the baudrate can be set to be automatic or fixed baudrate.

Protocol mode: Select the communication protocol used by the PLC. Select "PPI" to connect to the PPI port of an S7-200 PLC. For S7-300 or S7-400 PLCs, select "MPI M/S". If you want to connect PROFIBUS port, please select PROFIBUS.

Bridge adapter address: The default is 0. This address must not conflict with any other station addresses on the bus.

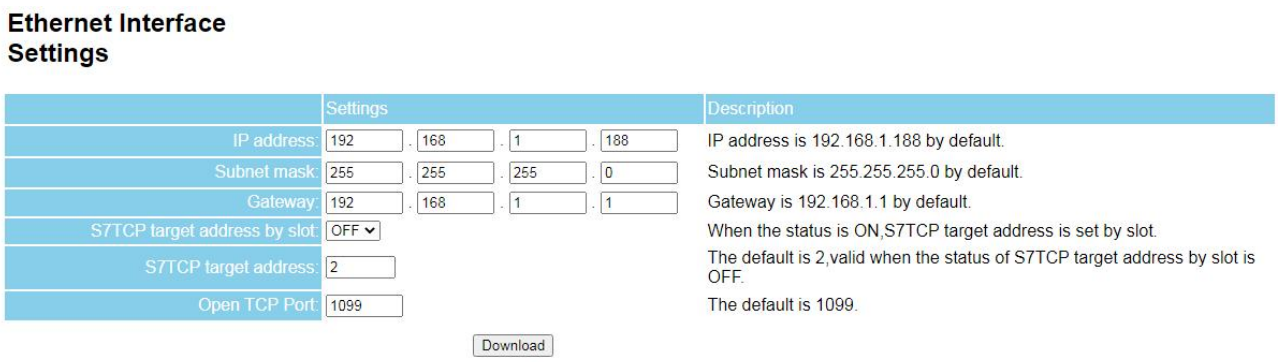
Bus highest address: The default is 31. Modification is generally not required.

Gap factor: The default is 10. Modification is generally not required.

X1 baud rate: Select the baud rate that matches your PLC. The X1 port, which connects to the PLC, supports both automatic detection and fixed baud rate settings.

X2 baud rate: Select the baud rate that matches your PLC. Similar to X1, the X2 port supports either auto-sensing or a fixed baud rate.

5.3.3 Ethernet Interface Settings



IP Address: Configure the IP address of the GT100-IE-MPI.

Subnet Mask: Subnet mask is 255.255.255.0 by default.

Gateway: The default address is 192.168.1.1.

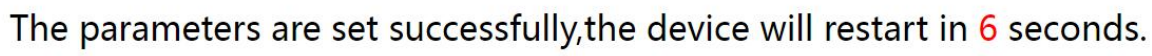
S7TCP target address by slot: When enabled (ON), the target address is defined by the PLC slot number.

S7TCP target address: The default value is 2. This field is active only when "S7TCP Target Address by Slot" is set to OFF.

Open TCP Port: The default is 1099.

5.4 Download

Once parameter settings are complete, click the "Download" button to apply the configuration to the GT100-IE-MPI. A confirmation prompt will appear after clicking "Download"; the new configuration will then take effect.



6 TIA Portal Programming

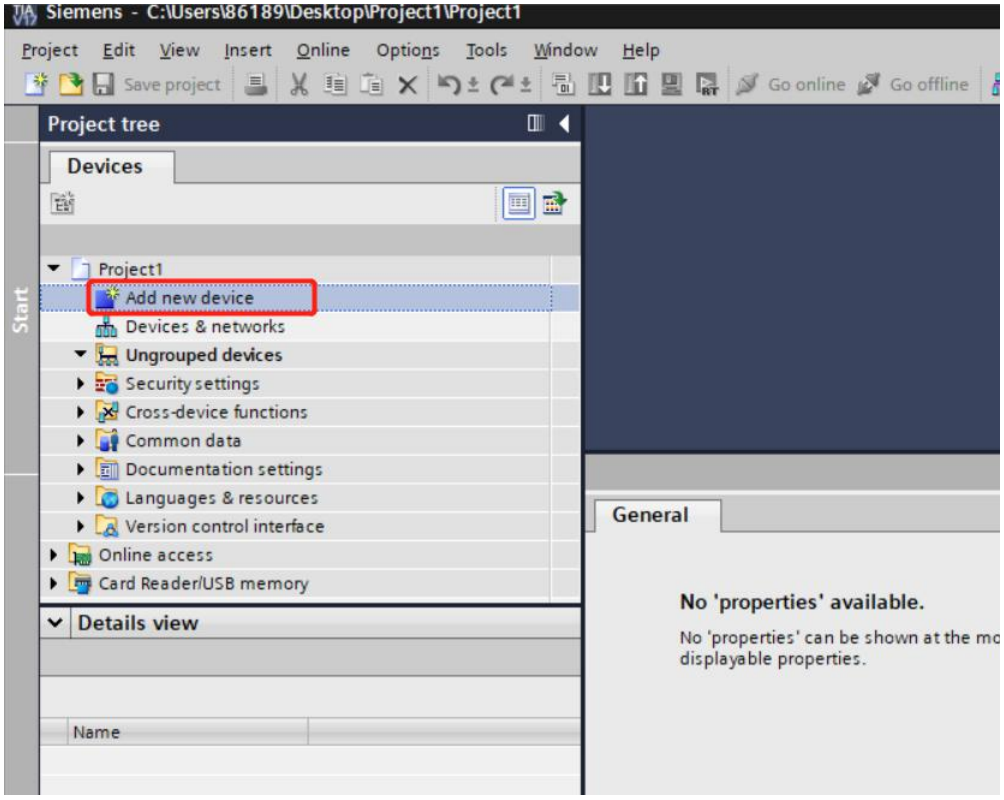
6.1 System Requirements

To program your PLC with TIA Portal using the GT100-IE-MPI, TIA Portal must first be installed on your system. Please refer to Siemens for instructions on how to install TIA Portal.

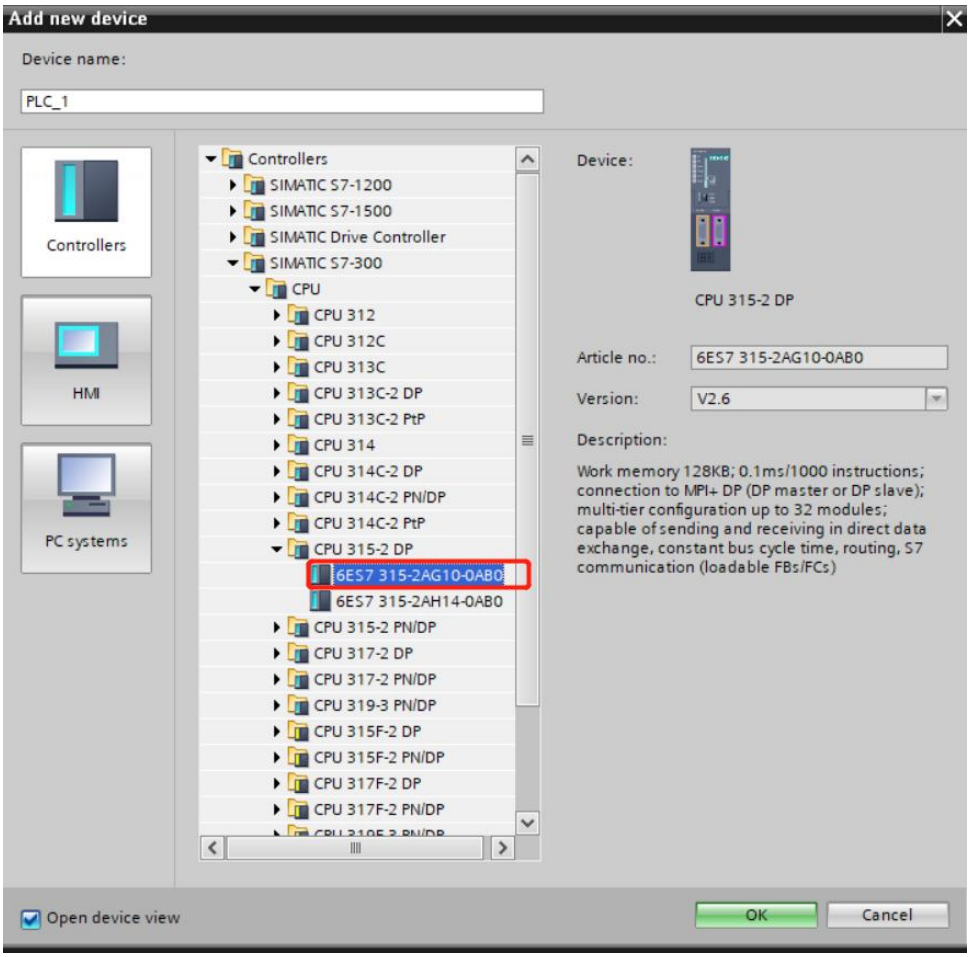
6.2 Programming

Refer to the following instructions to configure the GT100-IE-MPI in TIA Portal.

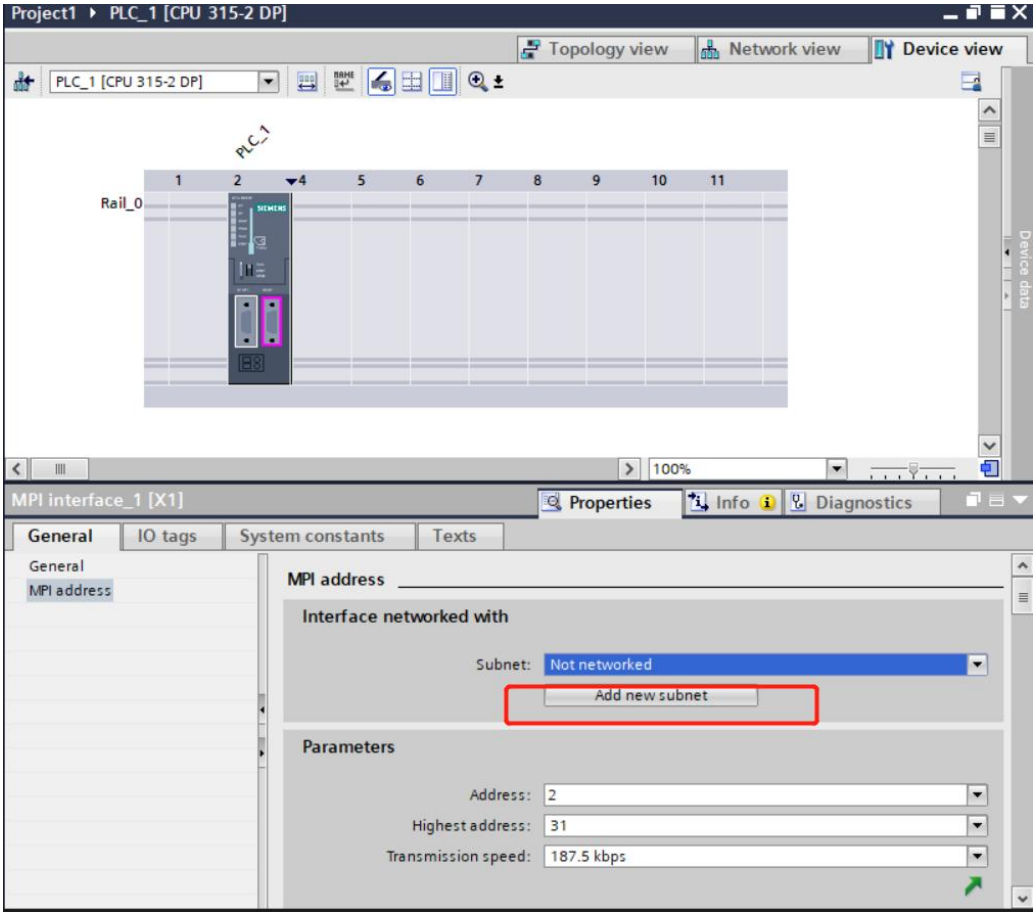
1. Open a new project.
2. Double-click "Add new device".



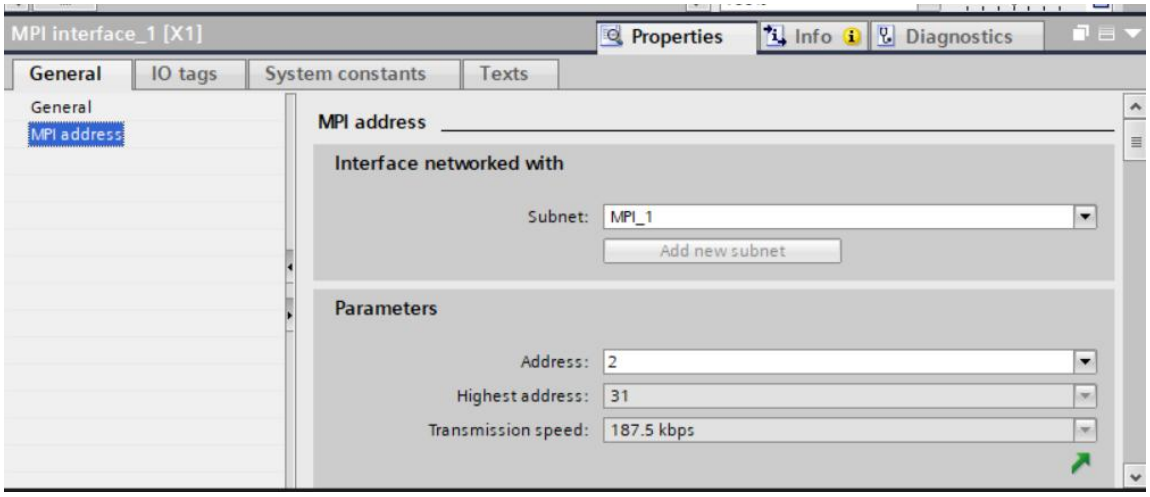
3. Expand the "Controllers" tree and expand the "CPU" folder under "SIMATIC S7 300", then select the actual PLC model you want to connect. Then click "OK".



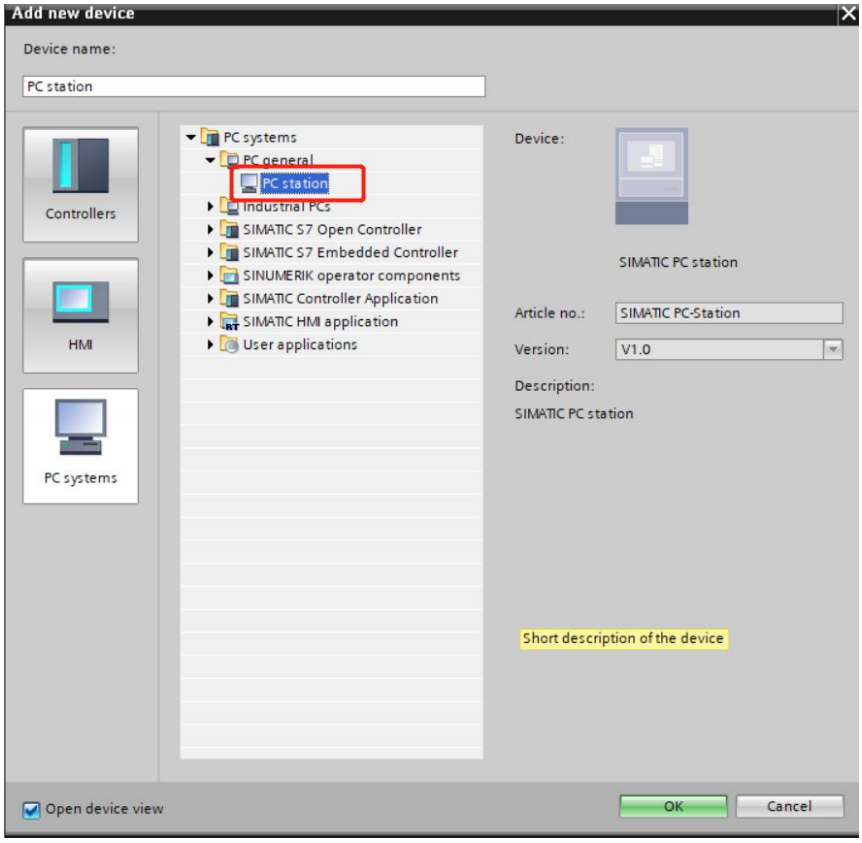
4. Double-click "MPI address", configure it and click "Add new subnet".



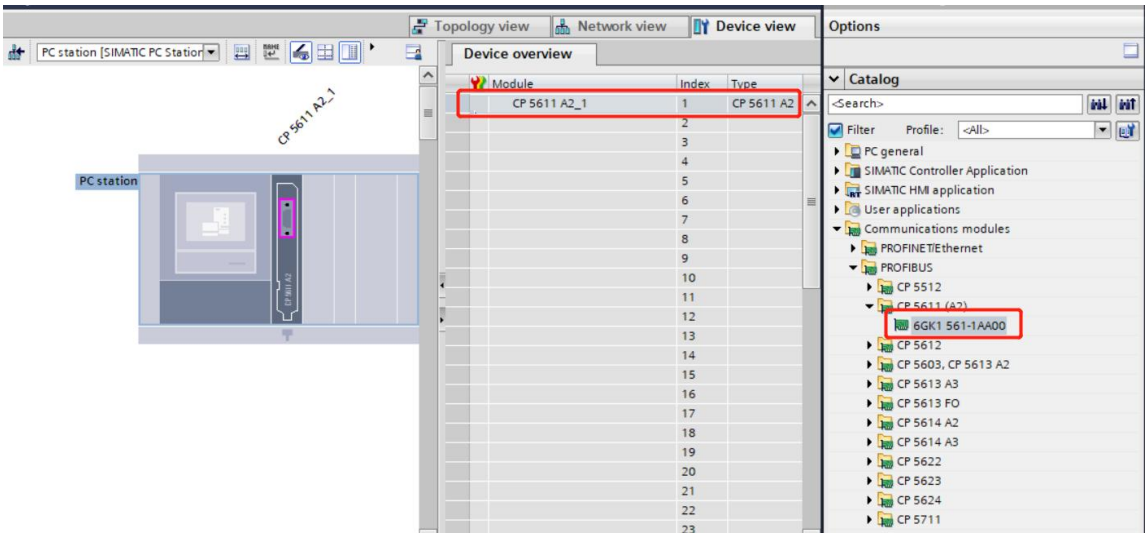
5. It will generate "MPI_1" network. The "Address" should match the MPI address of PLC. The default is 2.



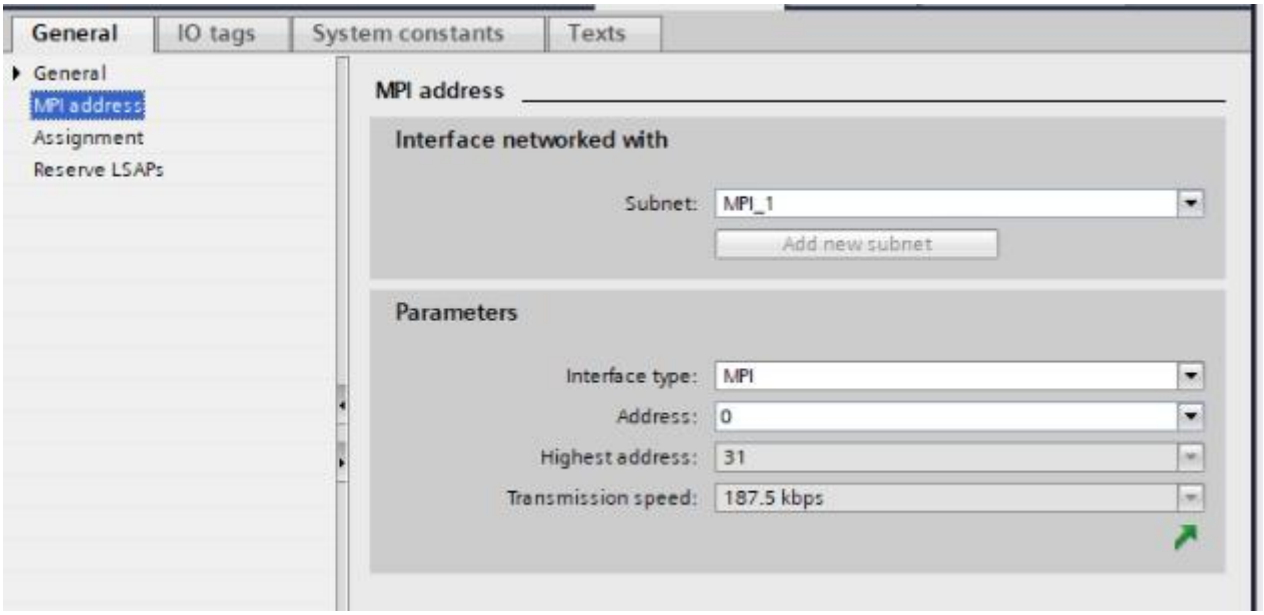
6. Then select "Add new device", select the "PC station" option under the "PC general" folder within the "PC systems" tree. Then click OK.



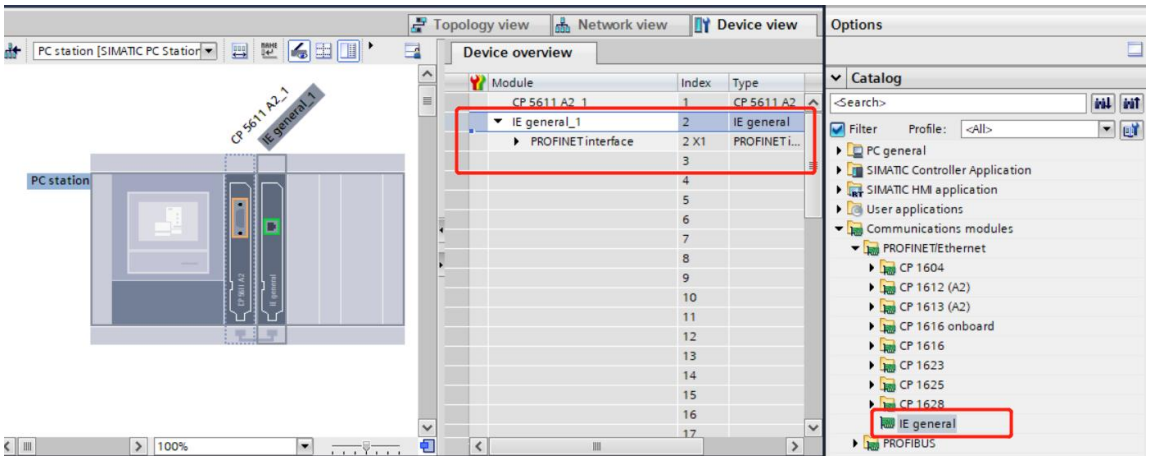
7. Select "Communications modules"->"PROFIBUS"->"CP5611(A2), and drag it to the No.1 slot of PC station.



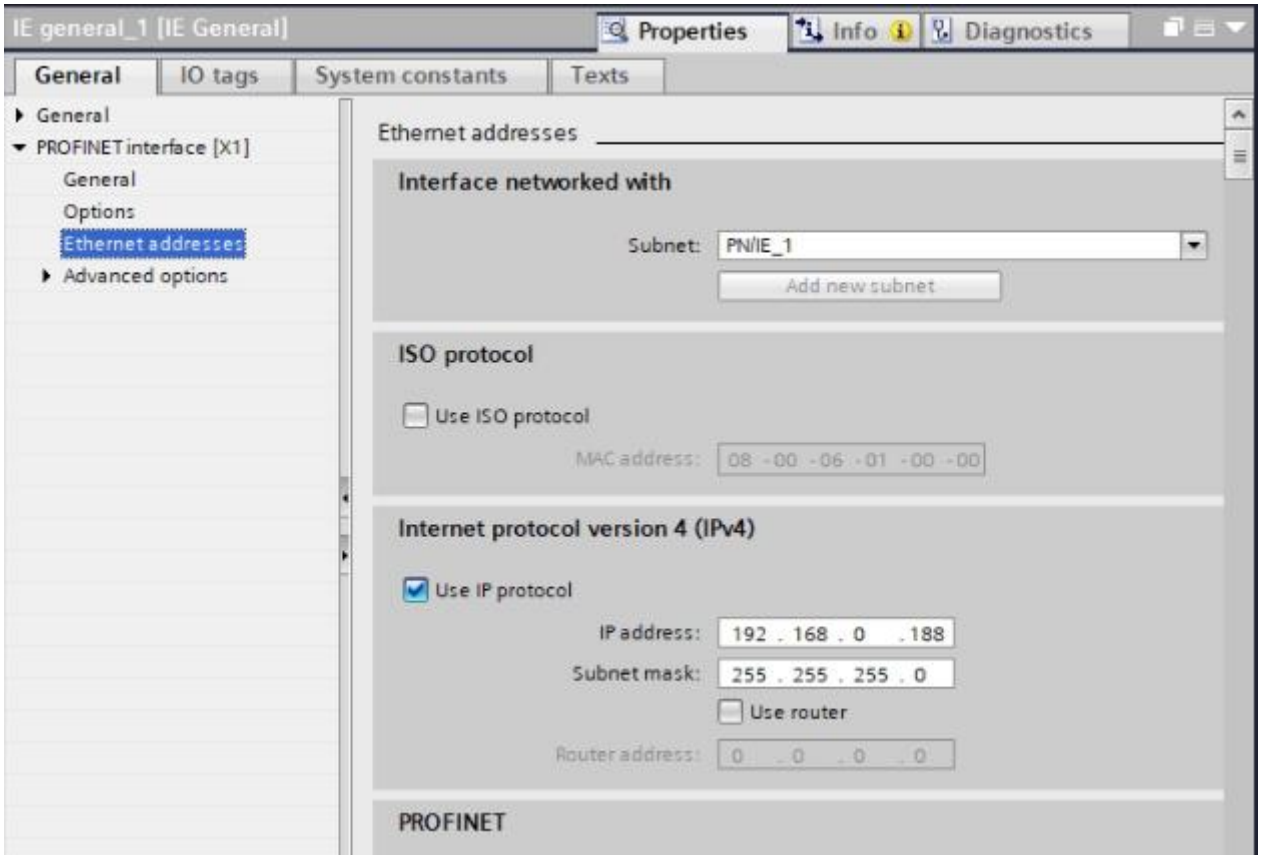
8. Double-click "CP5611A2_A" to start configuring the serial interface parameters. Choose "MPI" for Interface type. Choose "MPI_1" for Subnet, then set the "Address" to the GT100-IE-MPI Module address (The default is 0, and it must not conflict with any other station address on the bus).



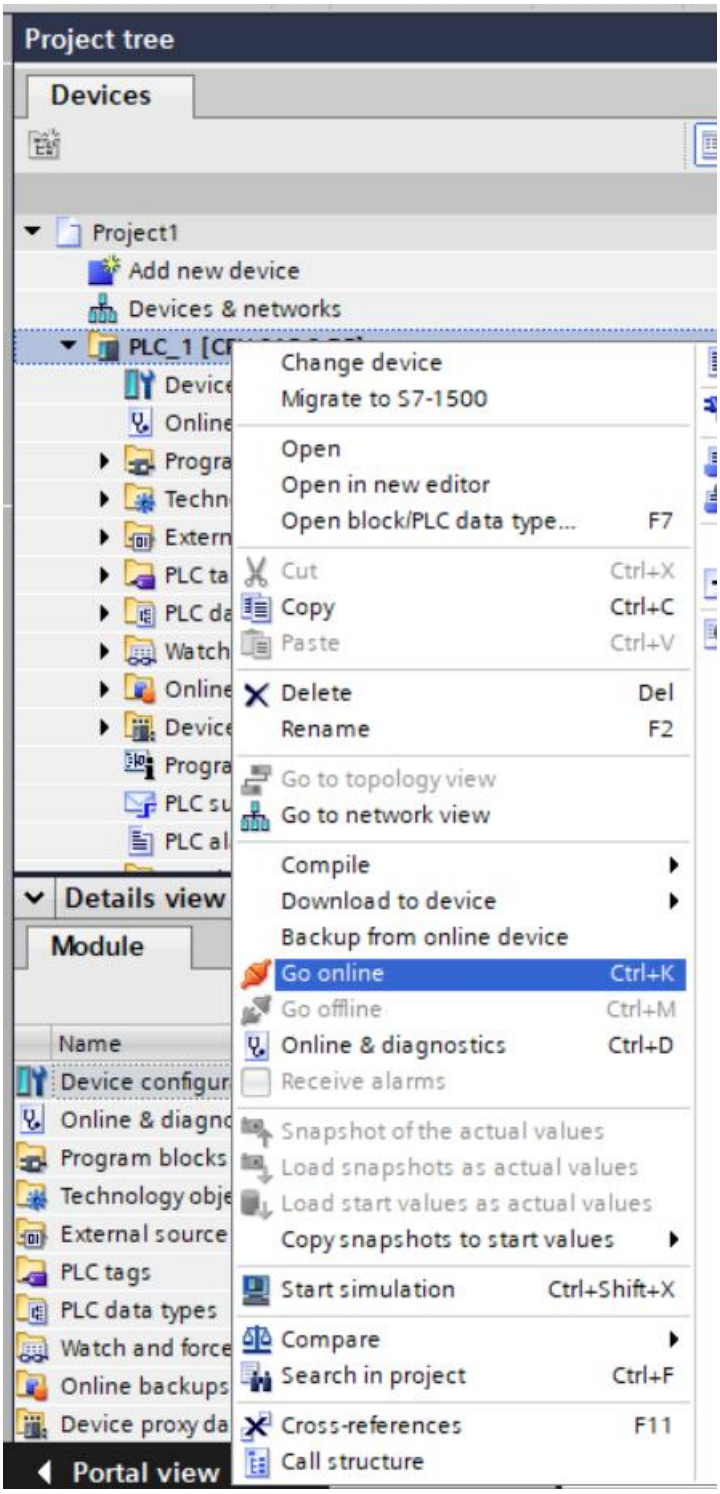
9. Select "Communications modules"->"PROFINET/Ethernet"->"IE general", drag it to the No.2 slot.



10. Double-click "IE general_1" to start configuring the ethernet interface parameters. Click "Add new subnet" and it will automatically generate "PN/IE". Fill in the IP address and Subnet mask of the GT100-IE-MPI (The default, IP address is 192.168.1.188).



11. Right-click "PLC" and select "Go online". In the pop-up window, select "PN/IE" for "PG/PC" interface type, select local network card for "PG/PC Interface". Click "Start search" to locate the PLC. Click "Go online".



12. Right-click "Program blocks", select "Upload from device (software)", then start uploading and downloading the PLC program.

7 STEP 7 Programming

7.1 System Requirements

To program your PLC with STEP 7 using the GT100-IE-MPI, STEP 7 must first be installed on your system. Please refer to Siemens for instructions on how to install STEP 7.

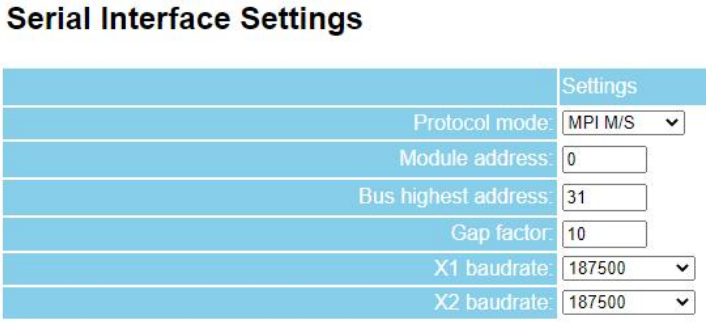
Additionally, please install the STEP 7 driver (Run as administrator) which is available on the GT100-IE-MPI product page.

7.2 Programming

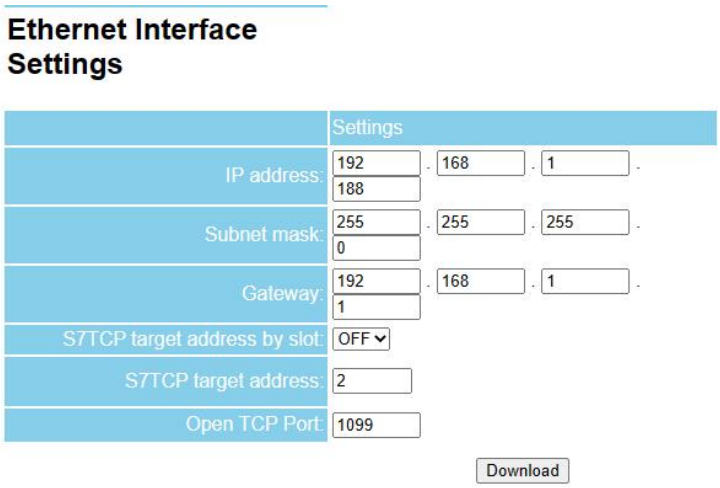
The following procedure will show you how to program your PLC using STEP 7.

1. Set PG/PC interface

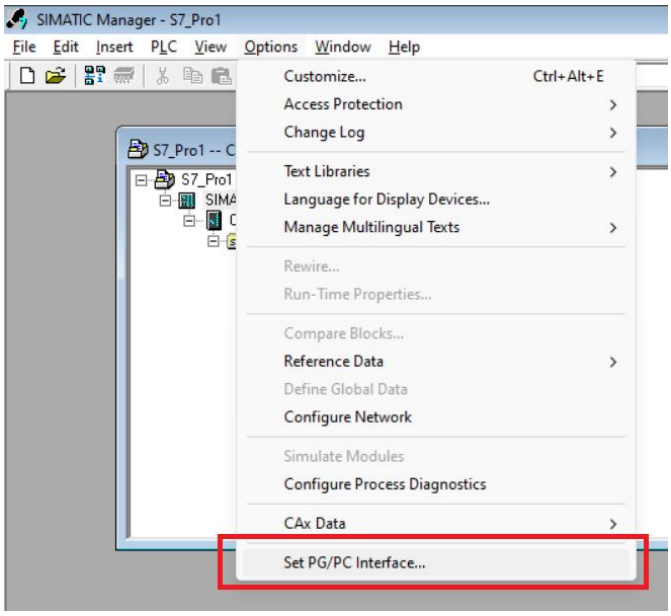
a. Using a web browser, go to the "S7 Bus Interface Parameters" page of the GT100-IE-MPI (See Chapter 5.1). Under 'Serial Interface Settings', set the 'Module address' to the desired MPI address for the GT100-IE-MPI (default is 0). This MPI address must be unique and cannot be the same as the PLC's MPI address.



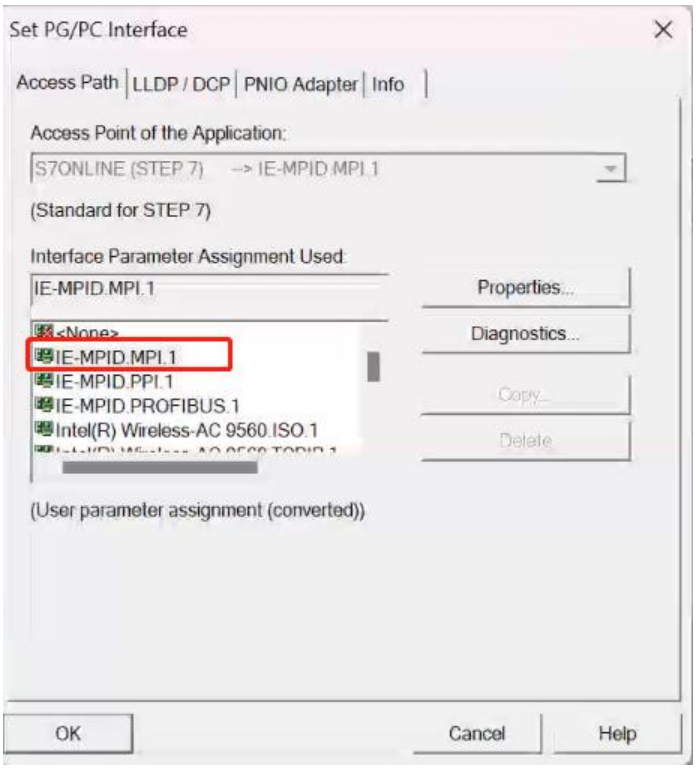
Under 'Ethernet Interface Settings', set the 'S7TCP target address' to the actual PLC's MPI address (default is 2), and click the "Download" button to save the changes.

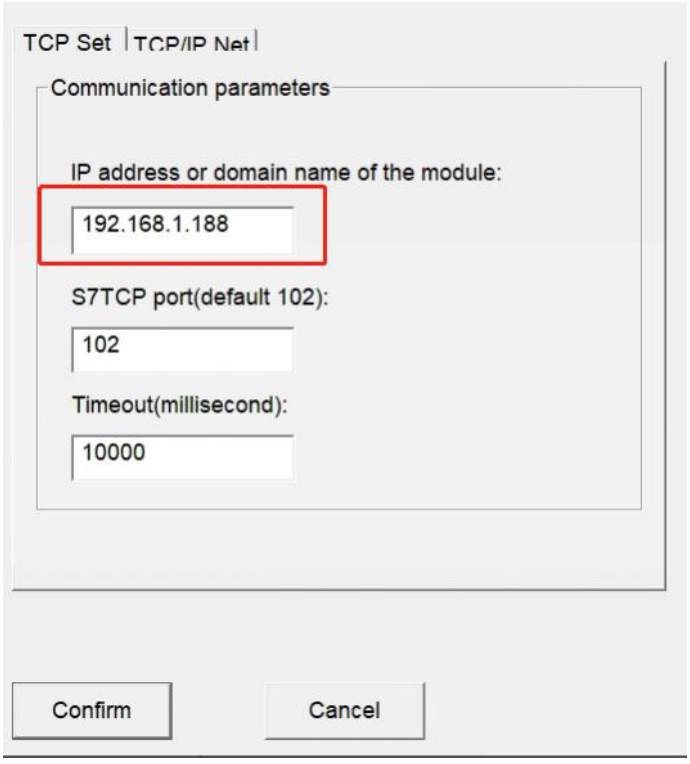


b. Open the STEP 7 programming software, select the menu "Options -> Set PG/PC Interface...".



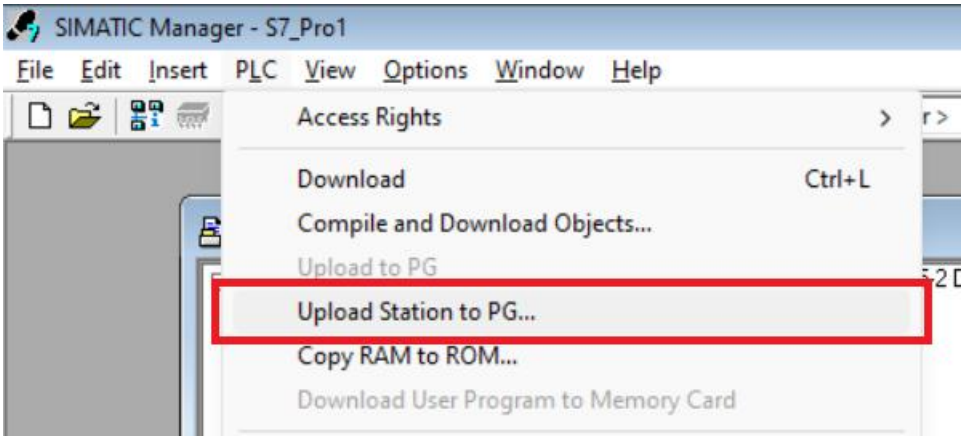
c. Select IE-MPID.MPI.1 in the pop-up dialog box, and then click on Properties to change its IP address so that it is in the same IP subnet as the PC.



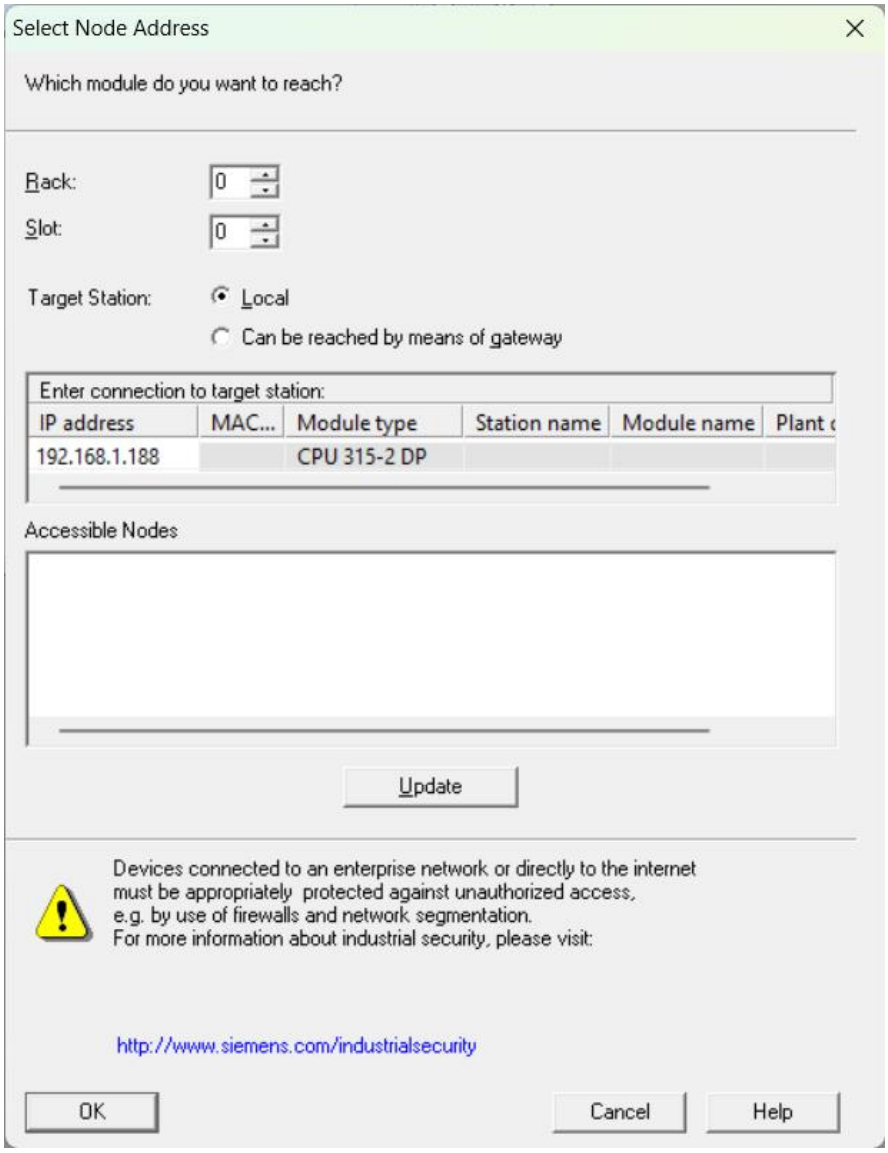


2. Upload Program

a. Select the menu "PLC -> Upload Station to PG..." in the main window of STEP 7 software.



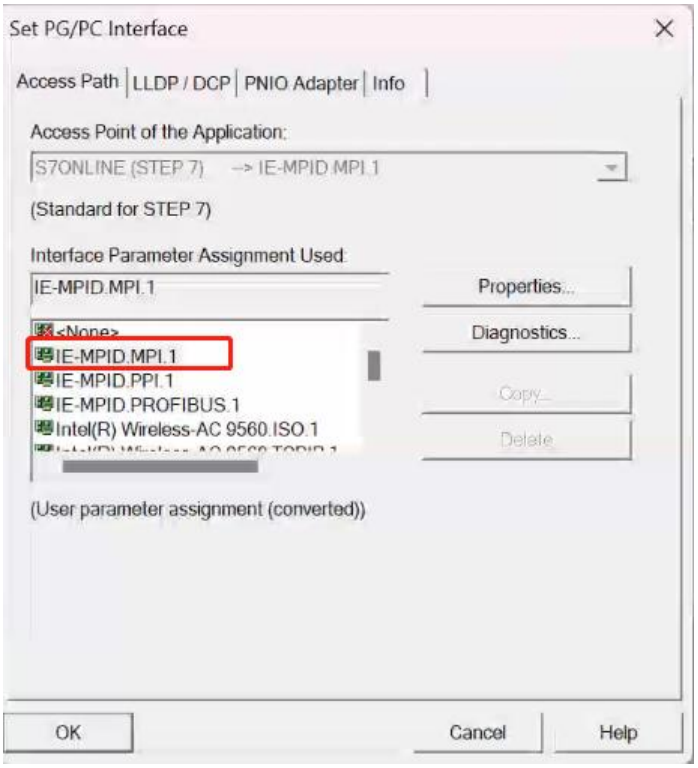
b. Click the "View" button to check the type of the PLC, and then click the "OK" button to upload the program from the PLC.

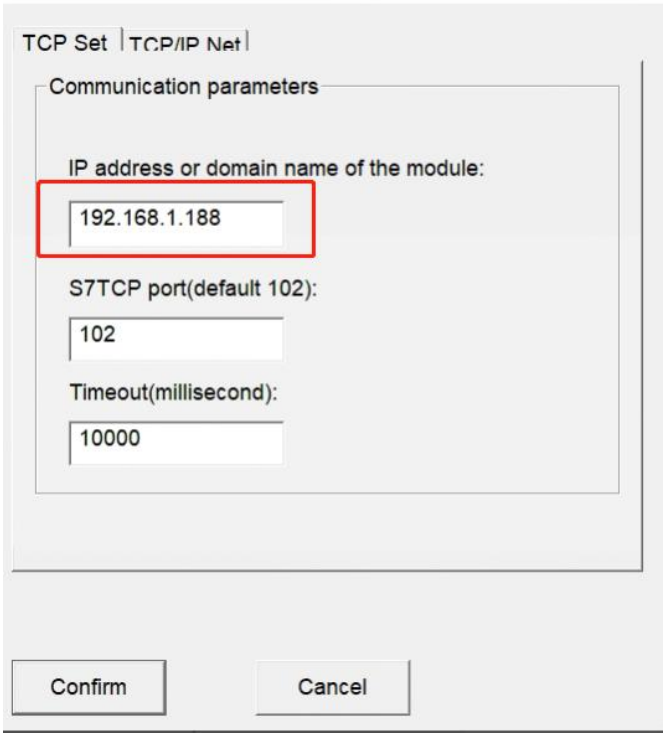


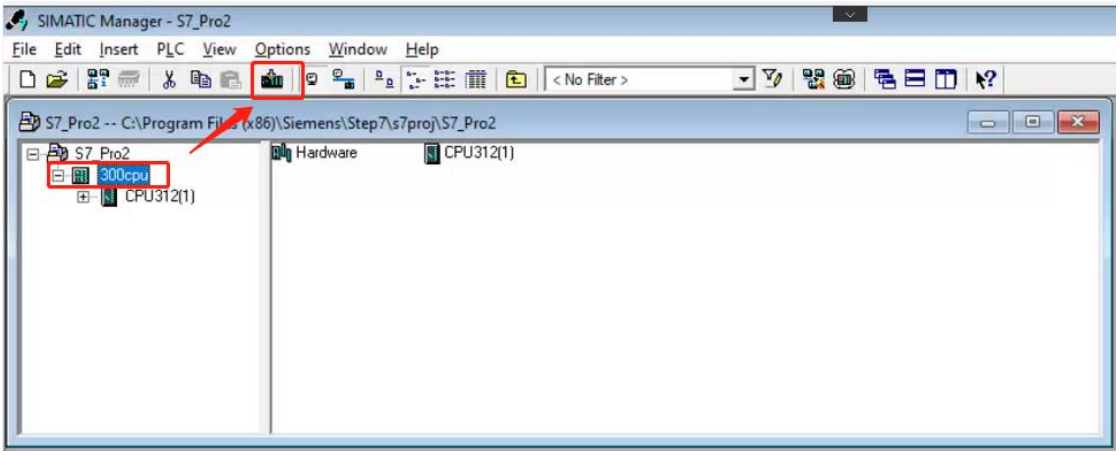
3. Download Program

STEP 7 software will automatically check whether there is an Ethernet connection in the hardware configuration of the current S7-300 Station when performing a download and when monitoring the Network communication interface.

a. Since the GT100IE-MPI driver has already been installed and "IE-MPID.MPI.1" has been selected in the PG/PC settings, you only need to select the S7-300 Station project and click "Download".







b. After clicking on download, a download progress bar will be displayed to confirm that the GT100-IE-MPI connection is working properly.

4. Conclusion

After the S7-300 Station is established, you can start using the GT100-IE-MPI to download and monitor the program (Operate on the S7-300 Station of the STEP 7 project).

Note:

a. You should run as administrator to install the STEP 7 driver and run STEP 7 software.

b. The IP address of IE General in S7-300 Station rack should be the IP address of GT100-IE-MPI.

c. The address parameter of the STEP 7 programming station for GT100-IE-MPI should be pre-set to the MPI station address of the current PLC (the default is 2).

8 Modbus TCP Communication

The GT100-IE-MPI can be configured to function as a Modbus TCP Server, which can be enabled using the Exclink configuration software. This feature is supported on S7-200, S7-300 and S7-400 PLCs. The PLC's Q output area is mapped starting at 0x0001, the I input area is mapped starting at 1x0001, and the M memory area is mapped starting at 3x0001. On S7-300 and S7-400 PLCs, the DB memory area blocks are mapped starting at 4x0001. On S7-200 PLCs, the V memory area is mapped starting at 4x0001.

The mapping address table is listed as below.

Modbus Register Starting Address	S7 Series PLC Starting Address	Data Type	Calculation	Function Code
0x0001	Q0.0	Bit	Q$m.n$ = 0x0001 + m*8 + n	FC1 (Read Coil Status) FC5 (Write Single Coil）
1x0001	I0.0	Bit	I$m.n$ = 1x0001 + (m * 8) + n	FC2 (Read Discrete Input)
3x0001	MW0	Word (2 bytes)	MWm = 3x0001 + m/2 Where m is an even number.	FC4 (Read Input Registers)
4x0001	DBx.DBW0 (S7-300 and S7-400)	Word (2 bytes)	DBx.DBWm = 4x0001 + m/2 Where m is an even number. (x is set through the Exclink configuration software)	FC3 (Read Holding Registers) FC16 (Write Multiple Registers) FC6 (Write Single Register)
	VW0 (S7-200)		VWm = 4x0001 + m/2 Where m is an even number (The V memory area in the Exclink configuration software is configured as DB1)	

Note: Modbus register addresses are expressed in Base-1 notation. If the Modbus TCP Client uses Base-0 notation, then the addresses will need to be offset by one.

Note: Please make sure your PC is configured on the same subnet as the GT100-IE-MPI adapter. For example, if the adapter's IP address is 192.168.1.188, then your PC should be configured to 192.168.1.XXX.

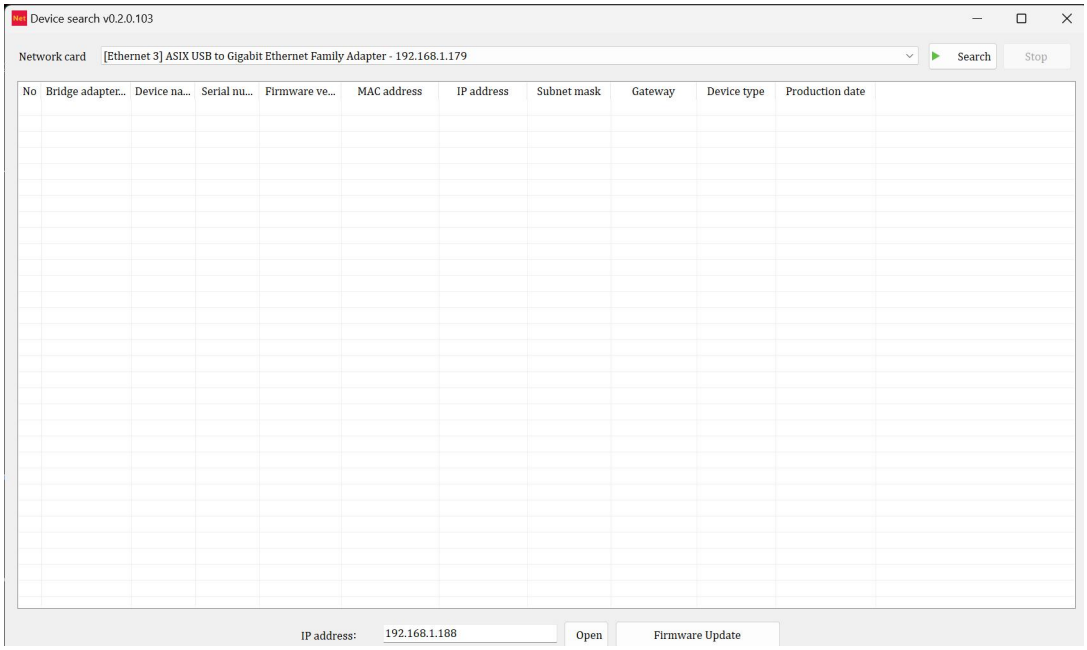
Modbus TCP IP Address: The same IP address as the GT100-IE-MPI
Default: 192.168.1.188

Modbus TCP Slave ID: The same as the station address of your PLC
Default: 2

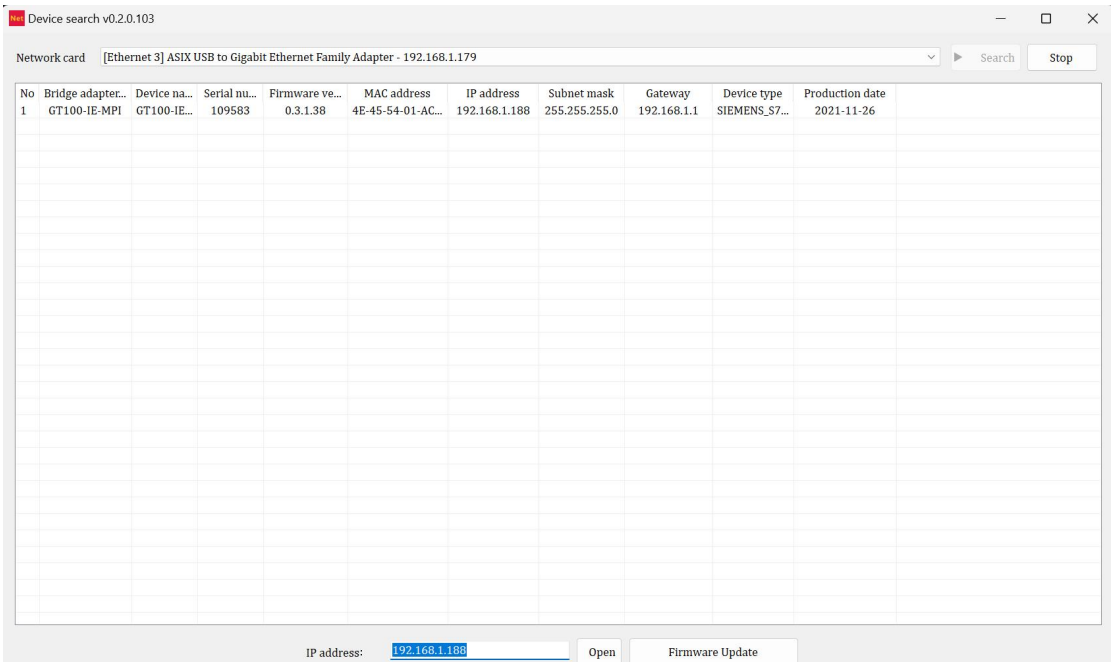
The following example will show how to access data from S7-300 PLC.

1. Open the Exclink software 

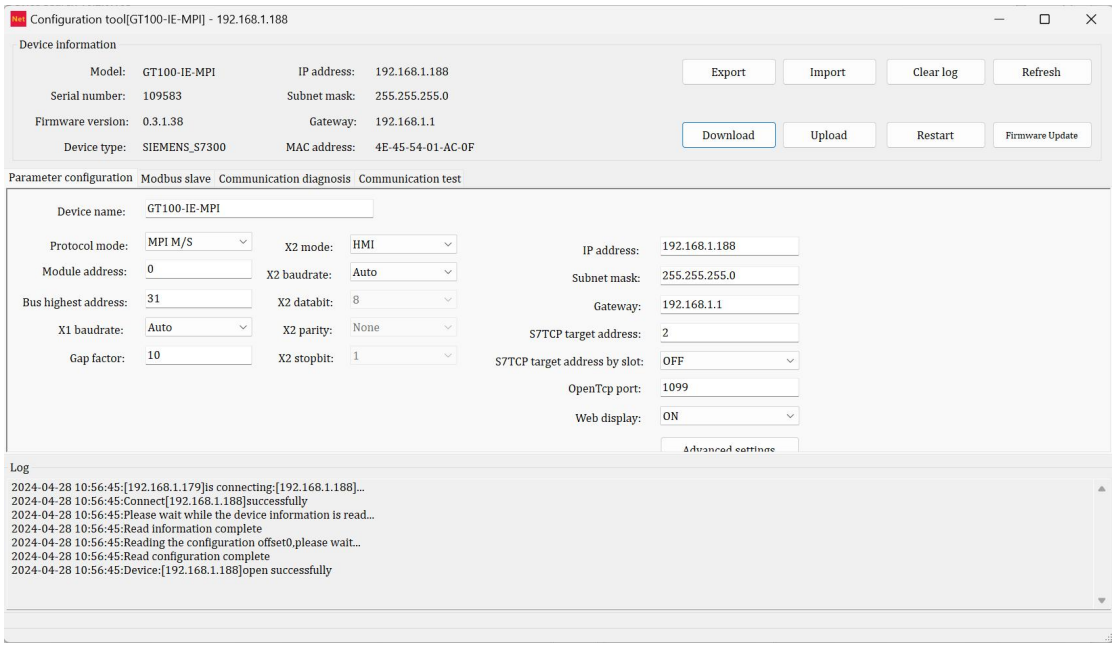
2. Click the "Search" button.



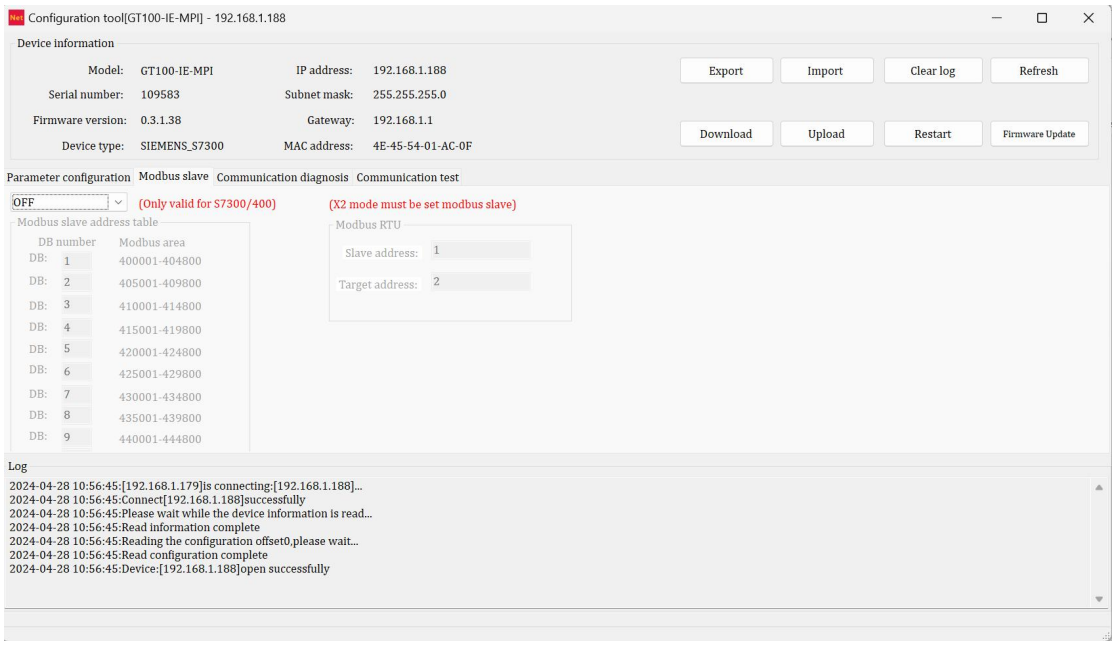
The GT100-IE-MPI is found.



3. Double-click the GT100-IE-MPI to enter into the configuration interface.

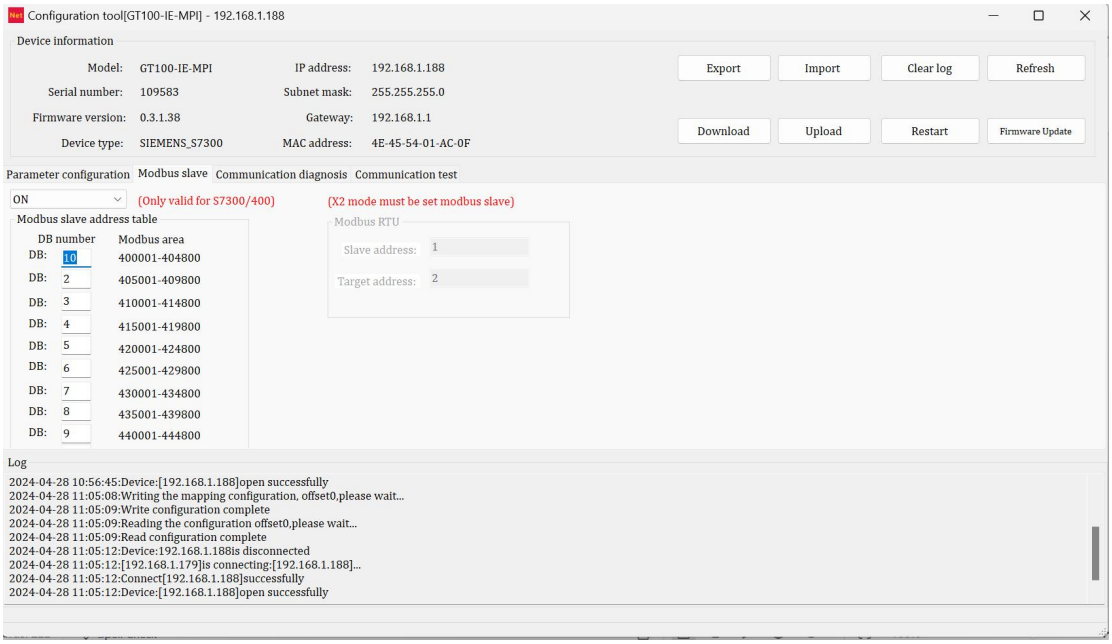


4. Click the Modbus slave Tab.

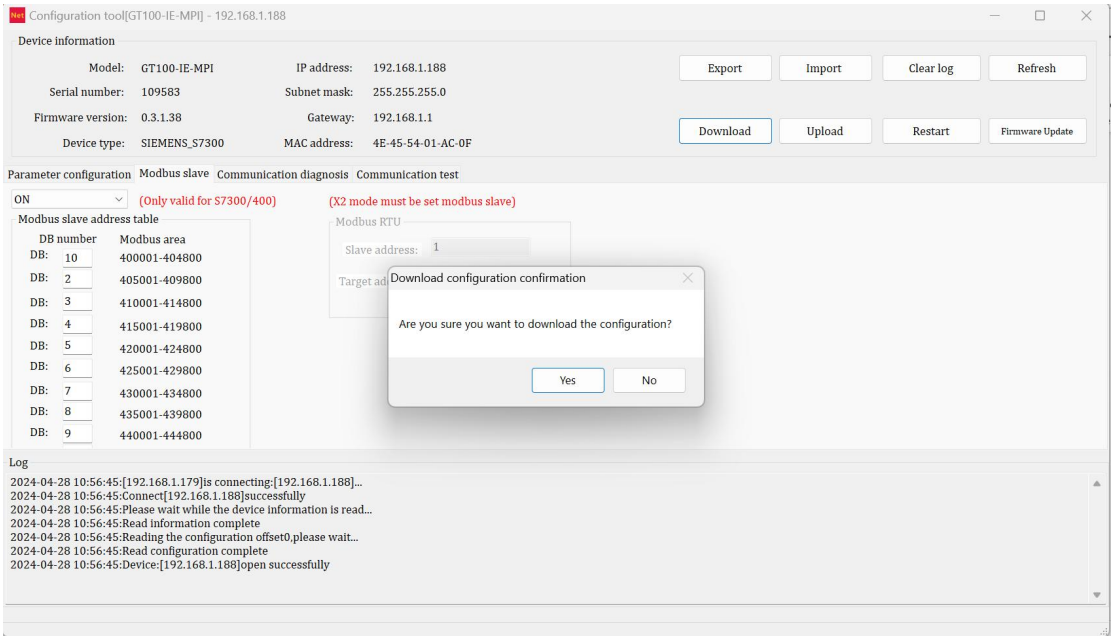


Set the drop-down option to "ON" to enable Modbus TCP, then configure the DB block numbers for the Modbus slave addresses to be mapped to the PLC. In this example, the DB10 block will be mapped to 400001-404800.

Note: Before enabling Modbus TCP, first add the data blocks, such as DB1 and DB2, to the S7 PLC program.

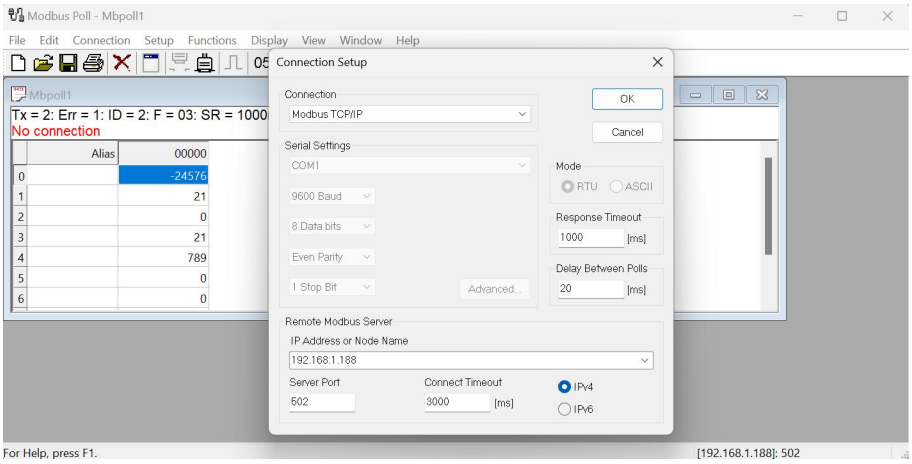


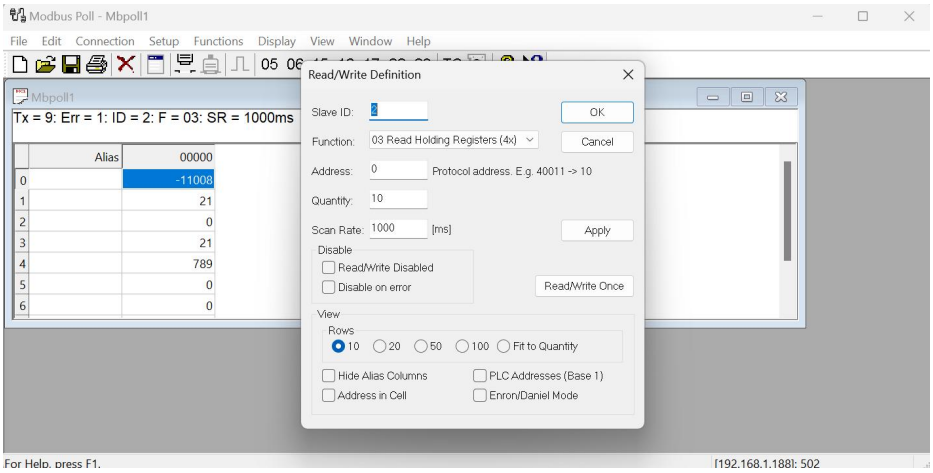
5. When the configuration is done, please click the "Download" button to download the configuration to the GT100-IE-MPI adapter.



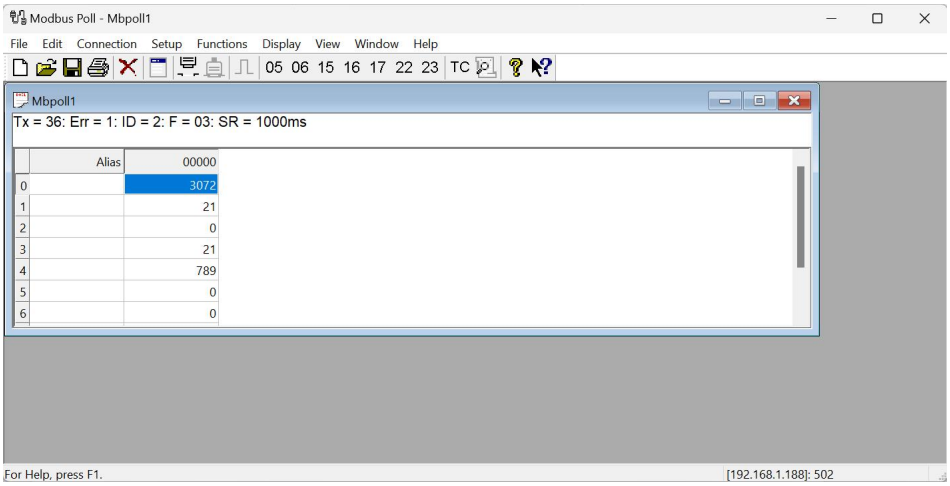
Cick "Yes" to execute. The log at the bottom will show the configuration is downloaded successfully.

6. Use a Modbus TCP Client to connect to the GT100-IE-MPI and read the data.
   In this example, the Modbus Poll acts as a Modbus TCP Client to read the data.
   Connect to IP address 192.168.1.188 and Slave ID 2.

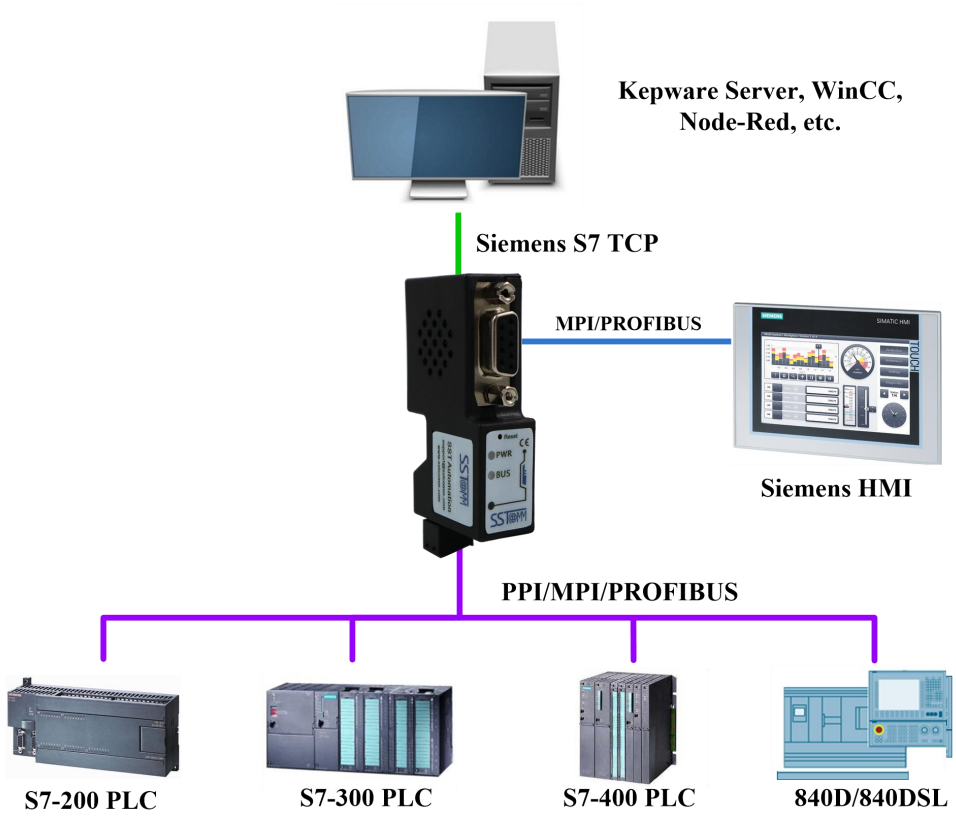




The data can now be read from the S7 PLC using Modbus TCP. Function codes FC6 or FC16 can also be used to write register values to the PLC.



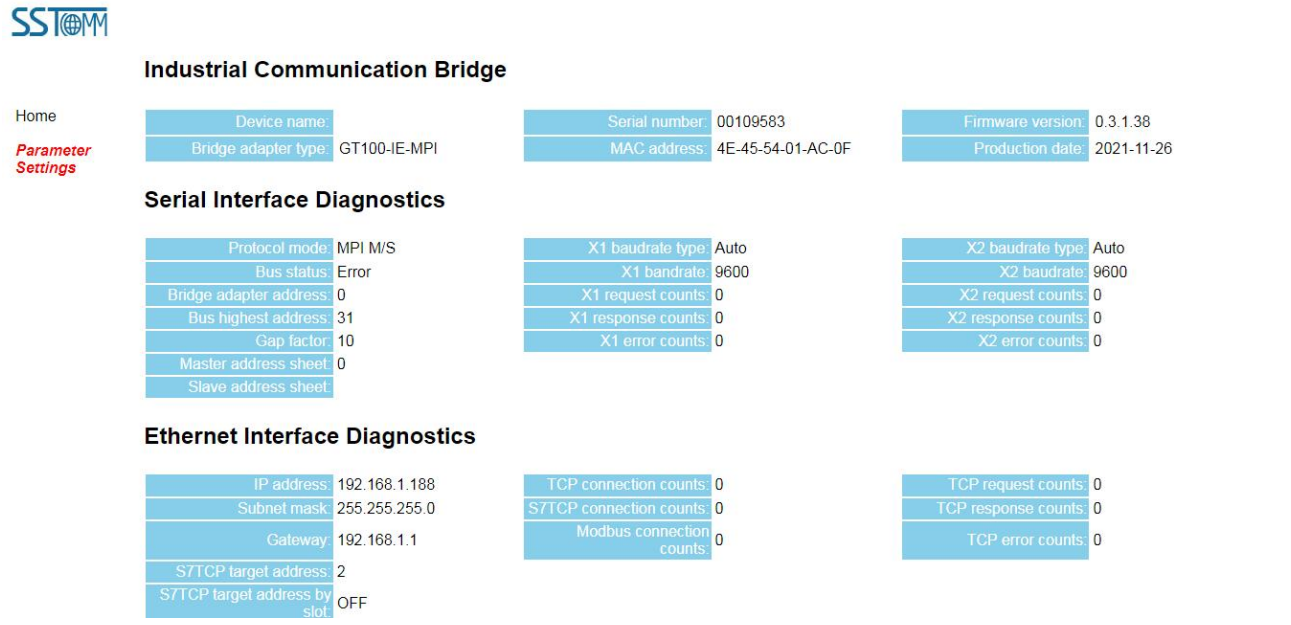
9 Use Case


Kepware Server, WinCC,
Node-Red, etc.
Siemens S7 TCP
MPI/PROFIBUS
Siemens HMI
PPI/MPI/PROFIBUS
S7-200 PLC
S7-300 PLC
S7-400 PLC
840D/840DSL

Appendix

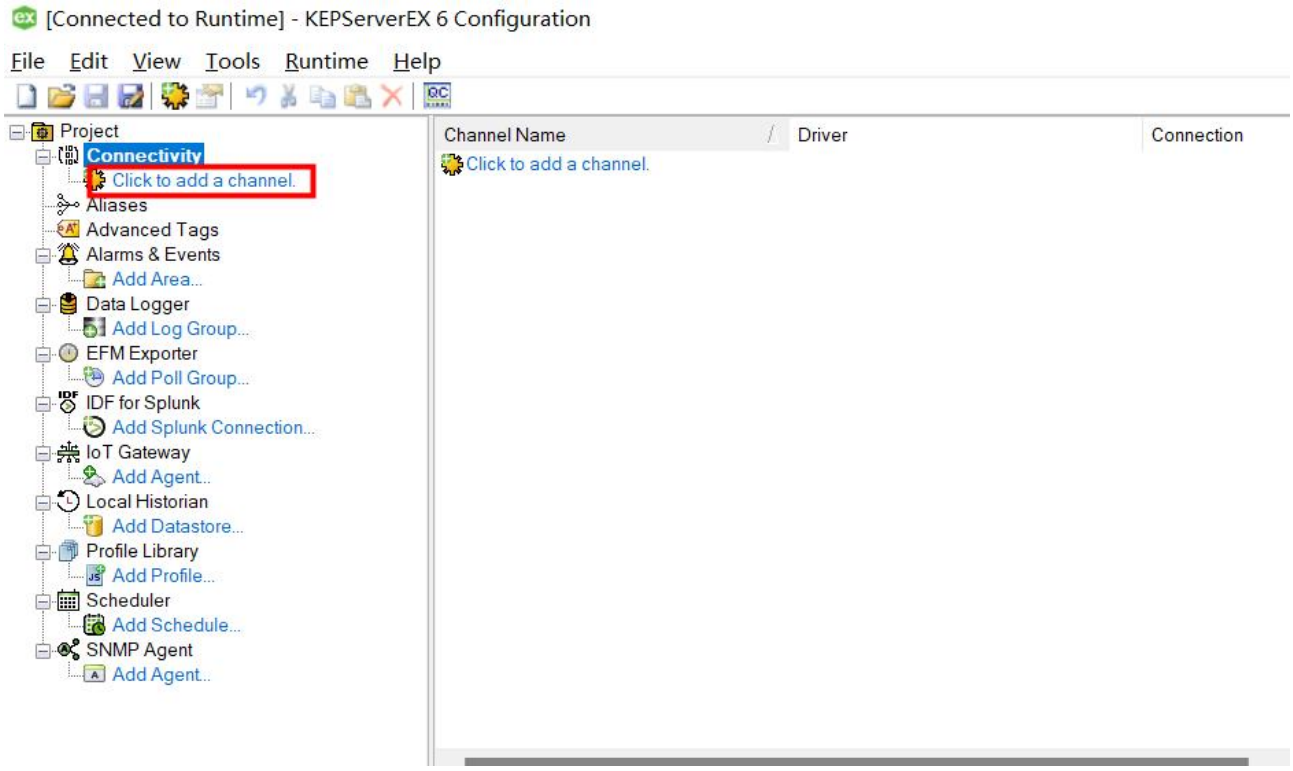
A. How to connect GT100-IE-MPI to KEPServerEX

Firstly, please set S7TCP target address to 2 or other number, and set the IP address on the same subnet as the PC running KEPServerEX. Keep other parameters as default.

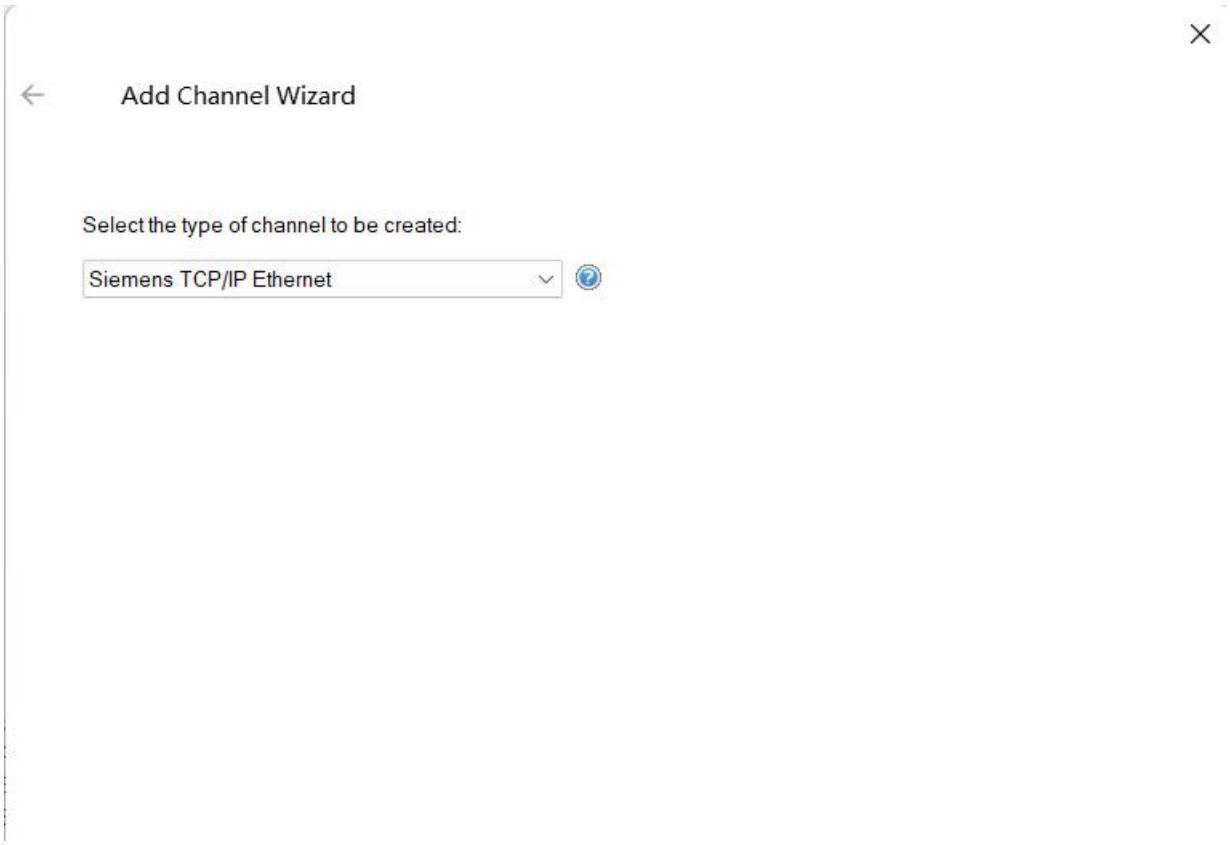


Then start configuring KEPServerEX.

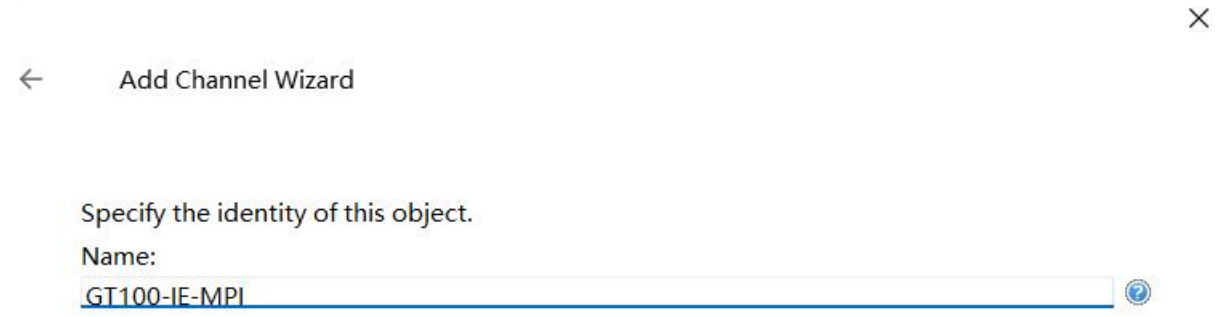
1. Create a new channel.



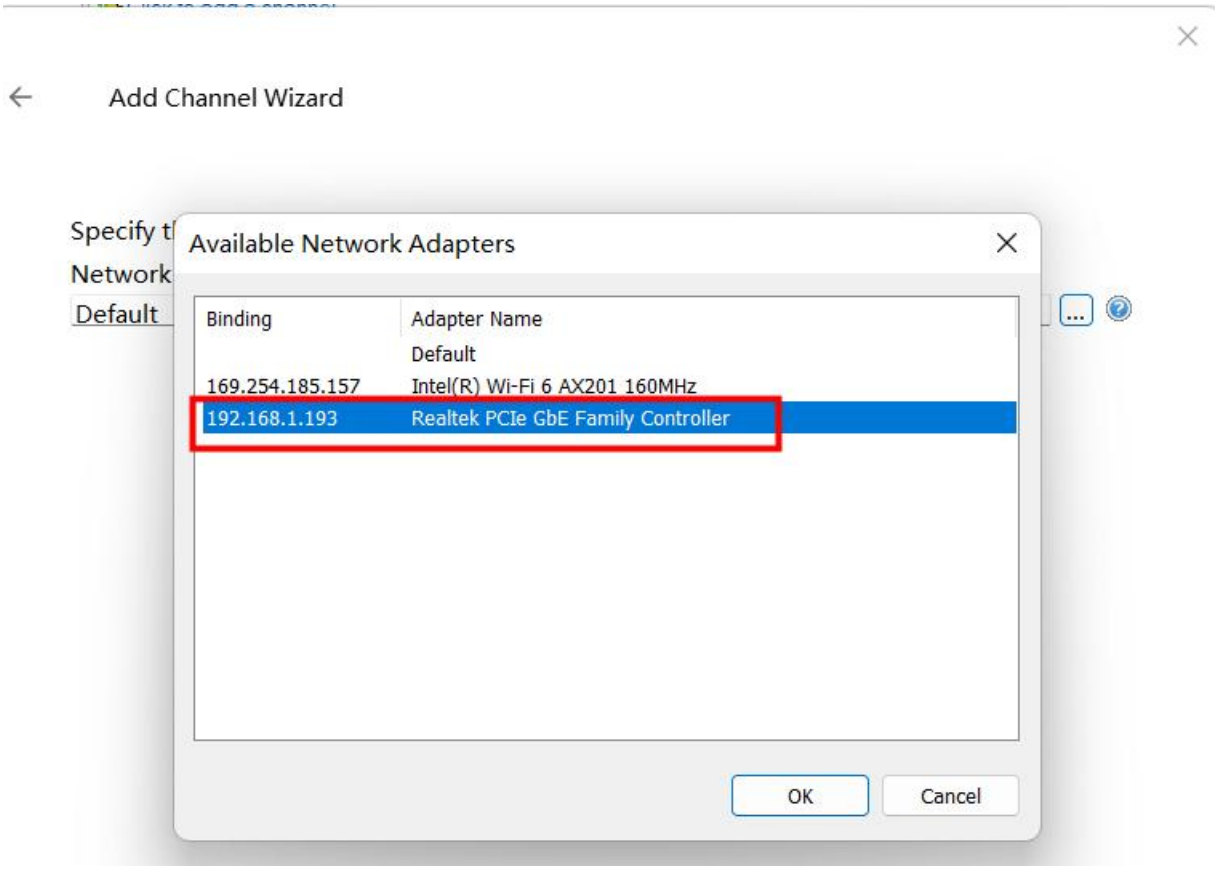
2. Select Siemens TCP/IP Ethernet driver.



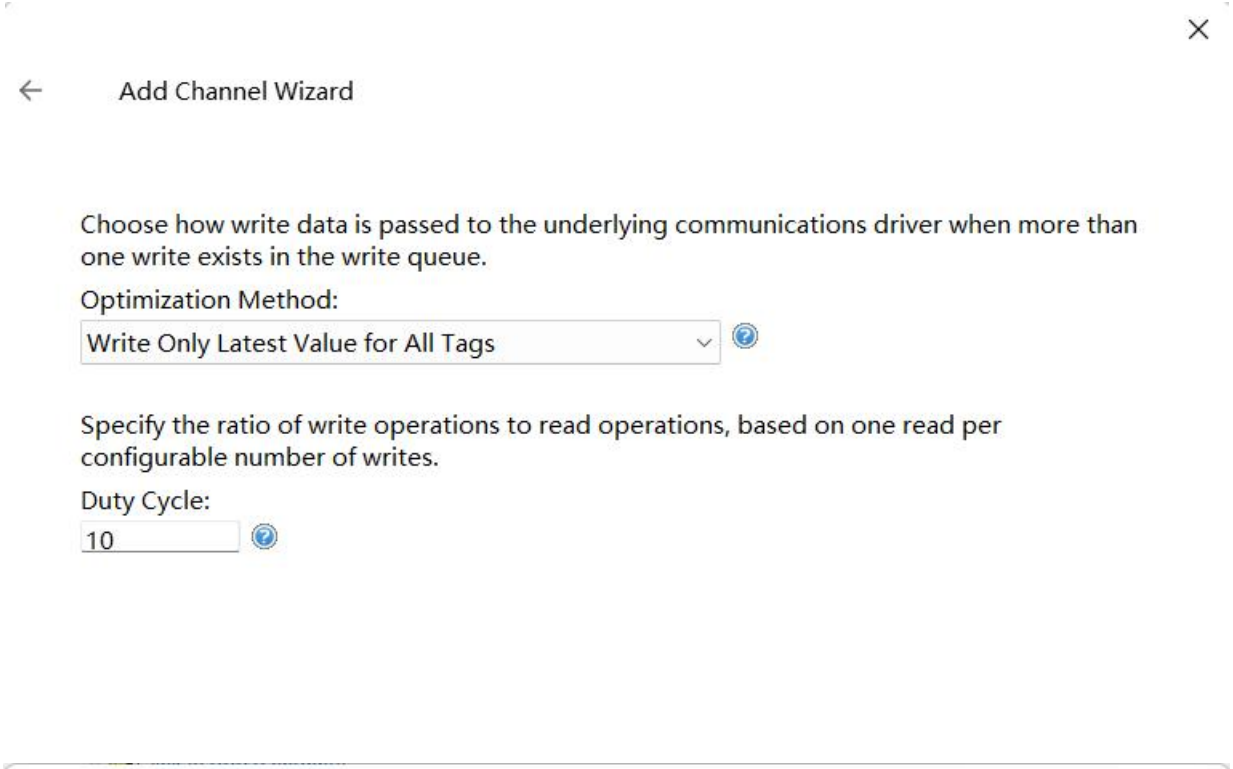
3. Enter a name for the Channel.

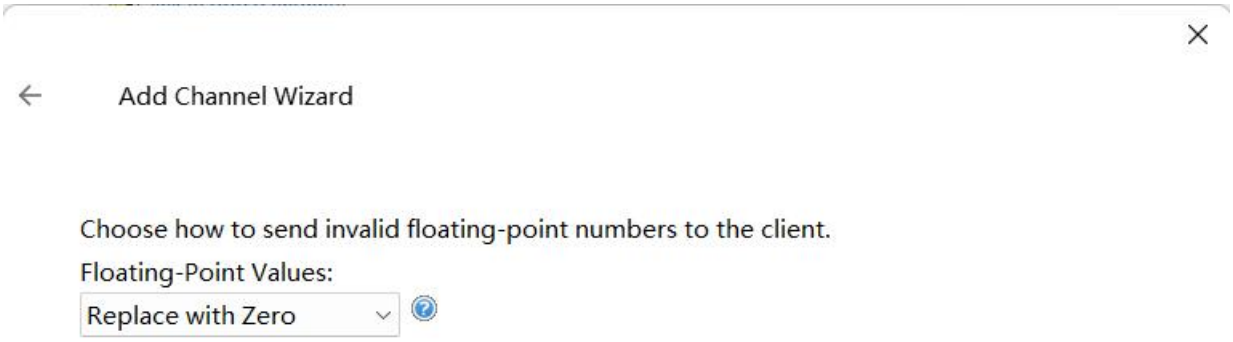


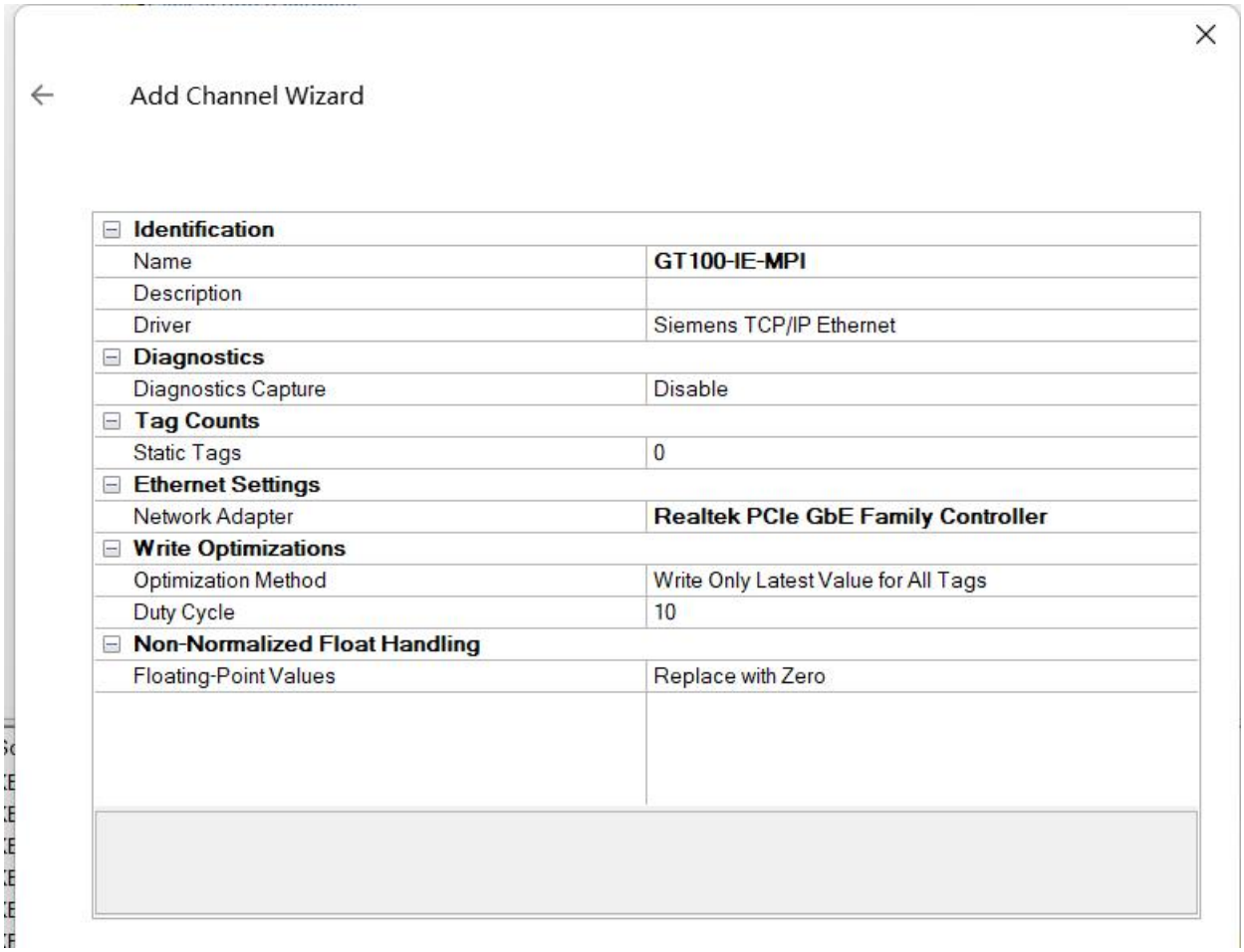
4. Select the network adapters communicating with the GT100-IE-MPI.



Keep other parameters as default.



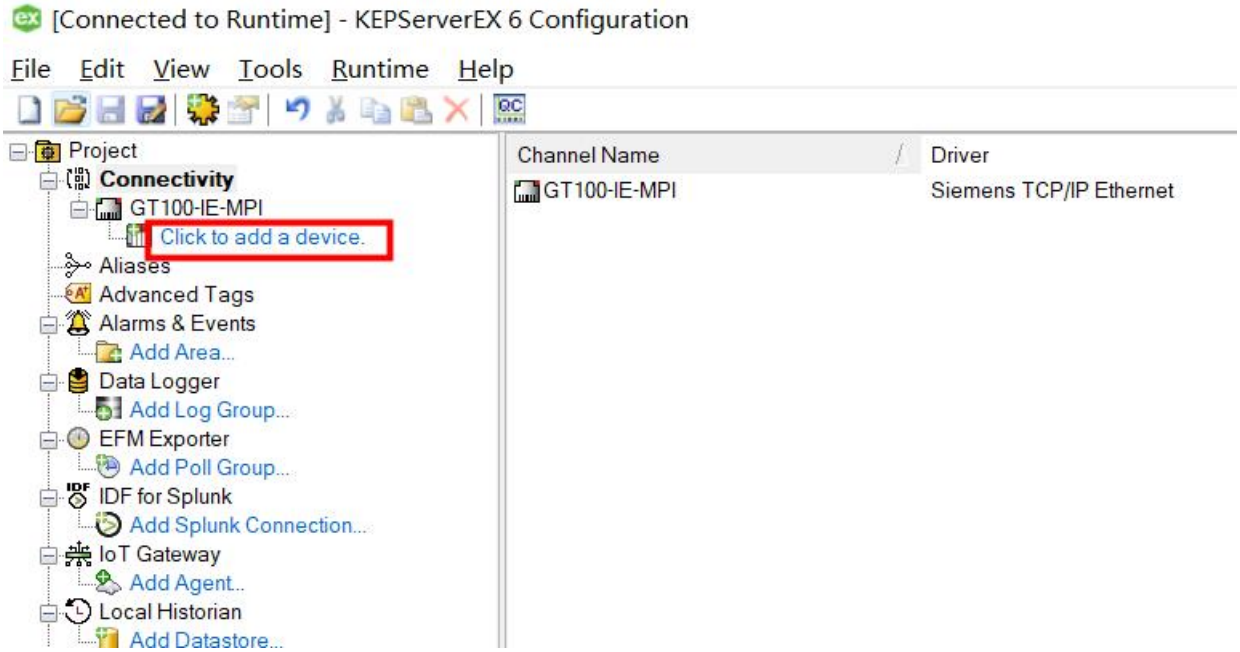




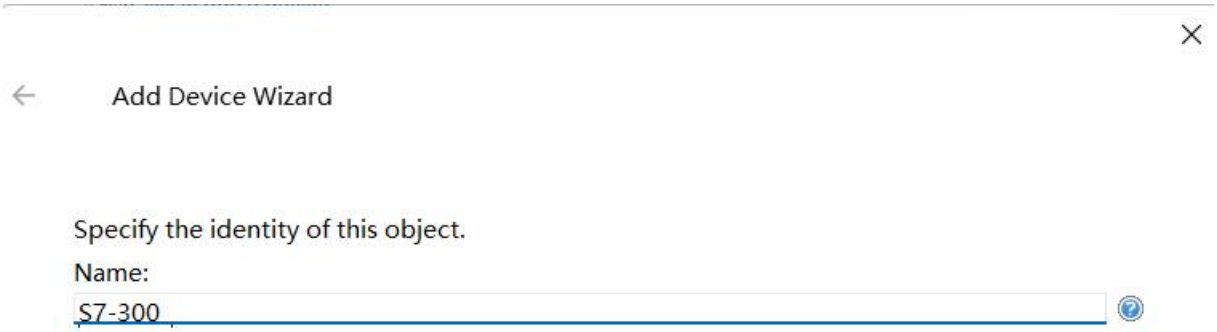
The channel is created successfully.

Then you need to add a device.

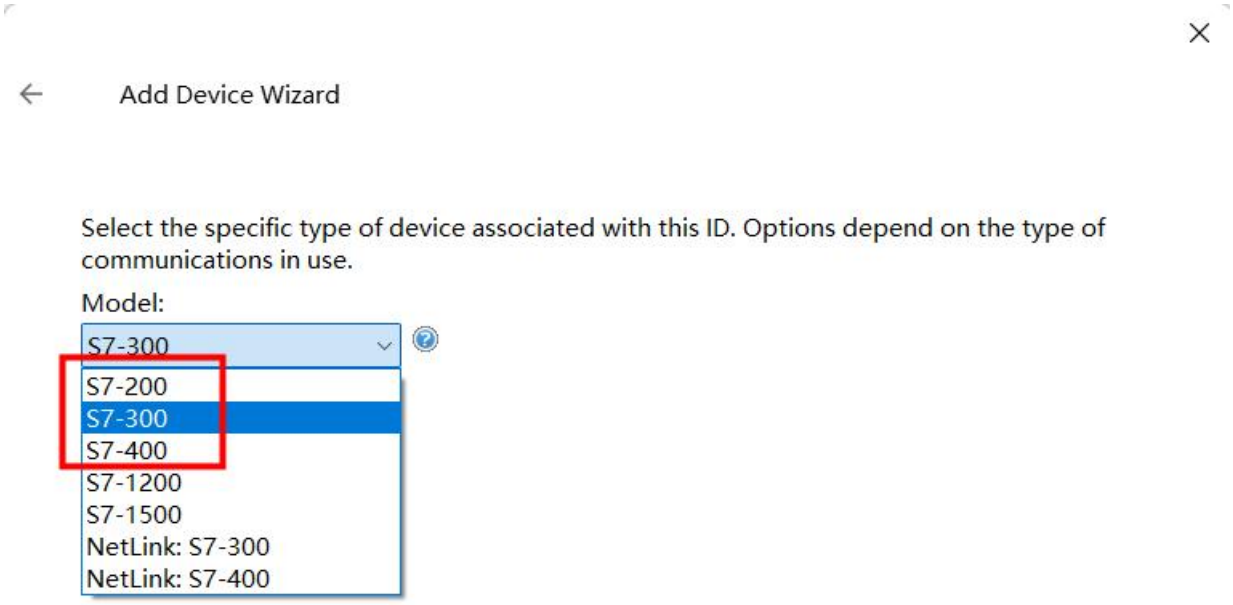
5. Click to add a device.



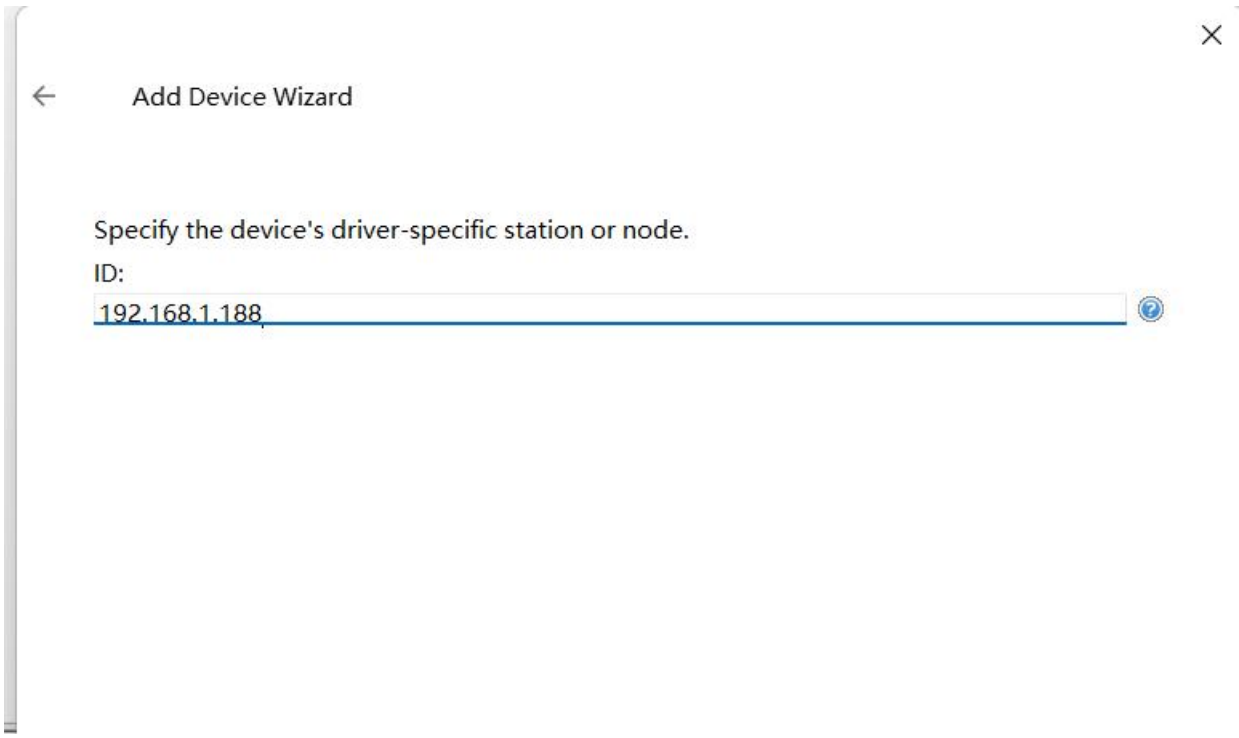
6. Enter a name for the device.



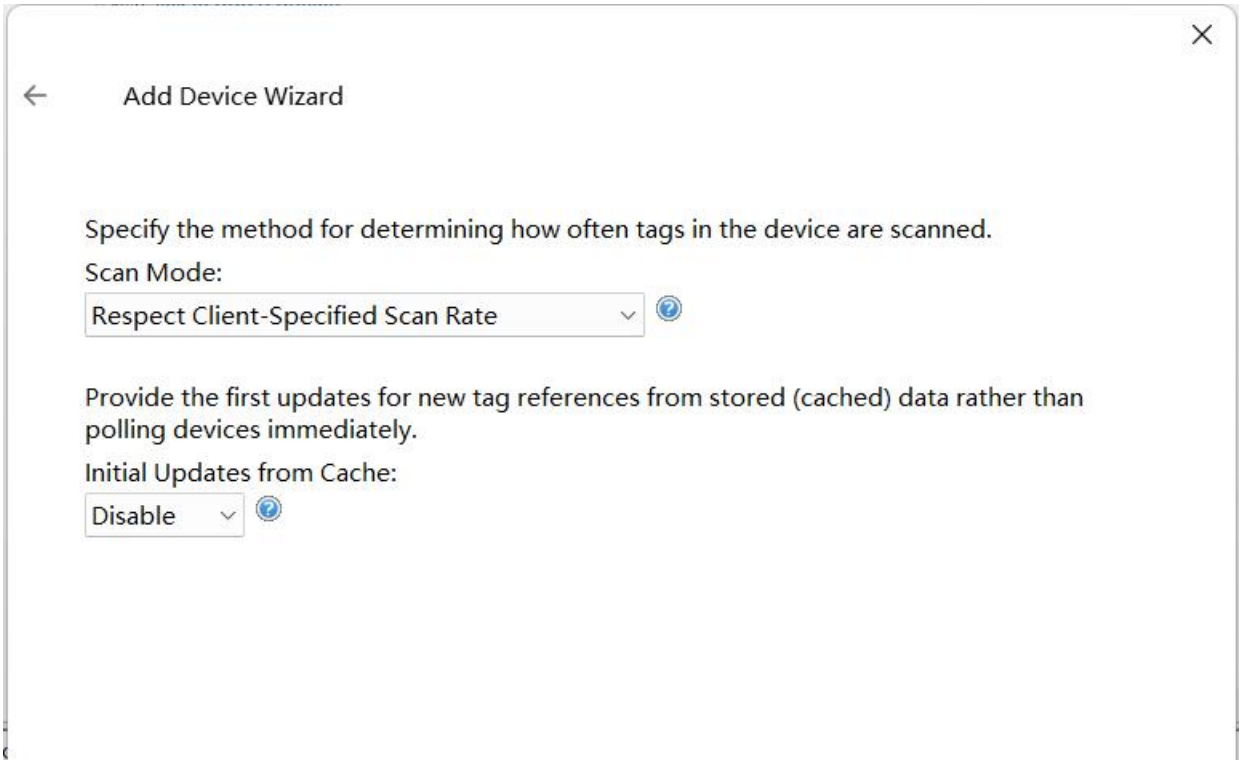
7. Select the actual S7 PLC model. GT100-IE-MPI only supports connecting S7-200, S7-300 and S7-400.

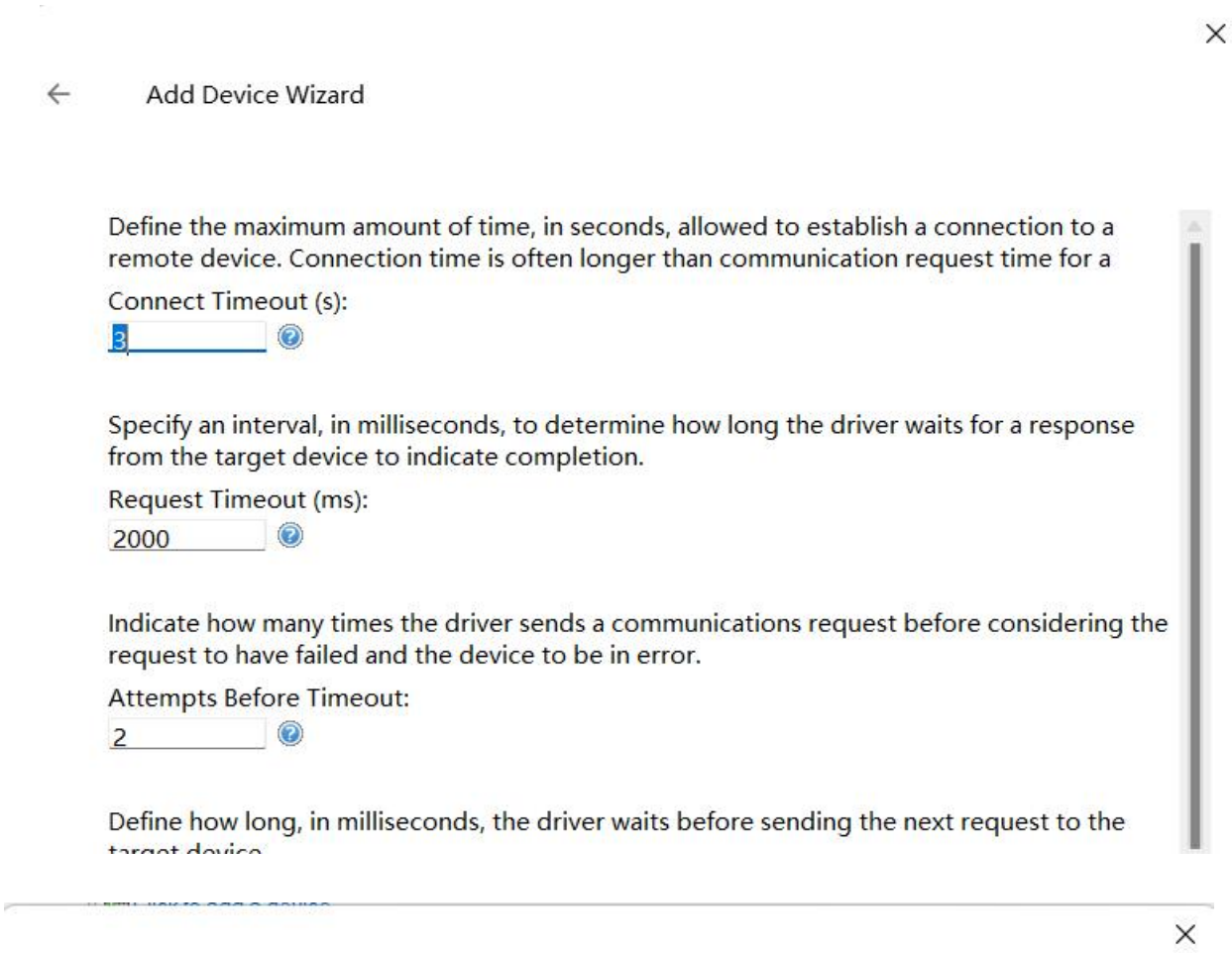


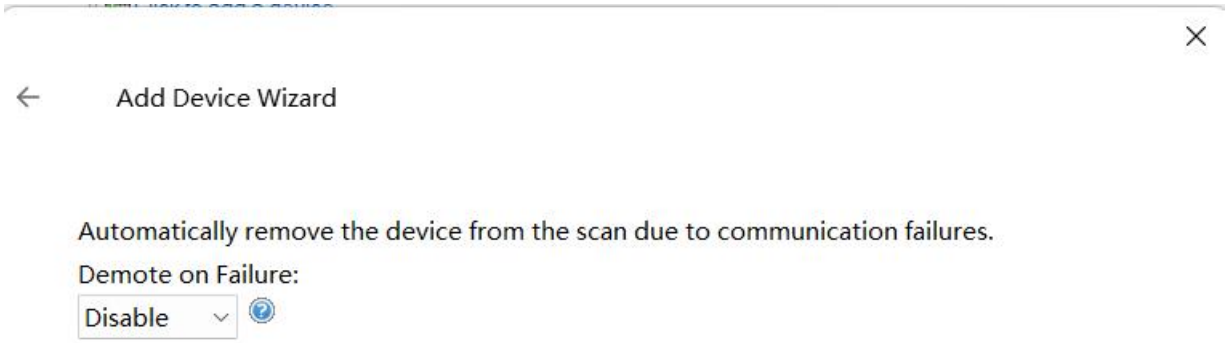
8. Enter a IP address for the GT100-IE-MPI.

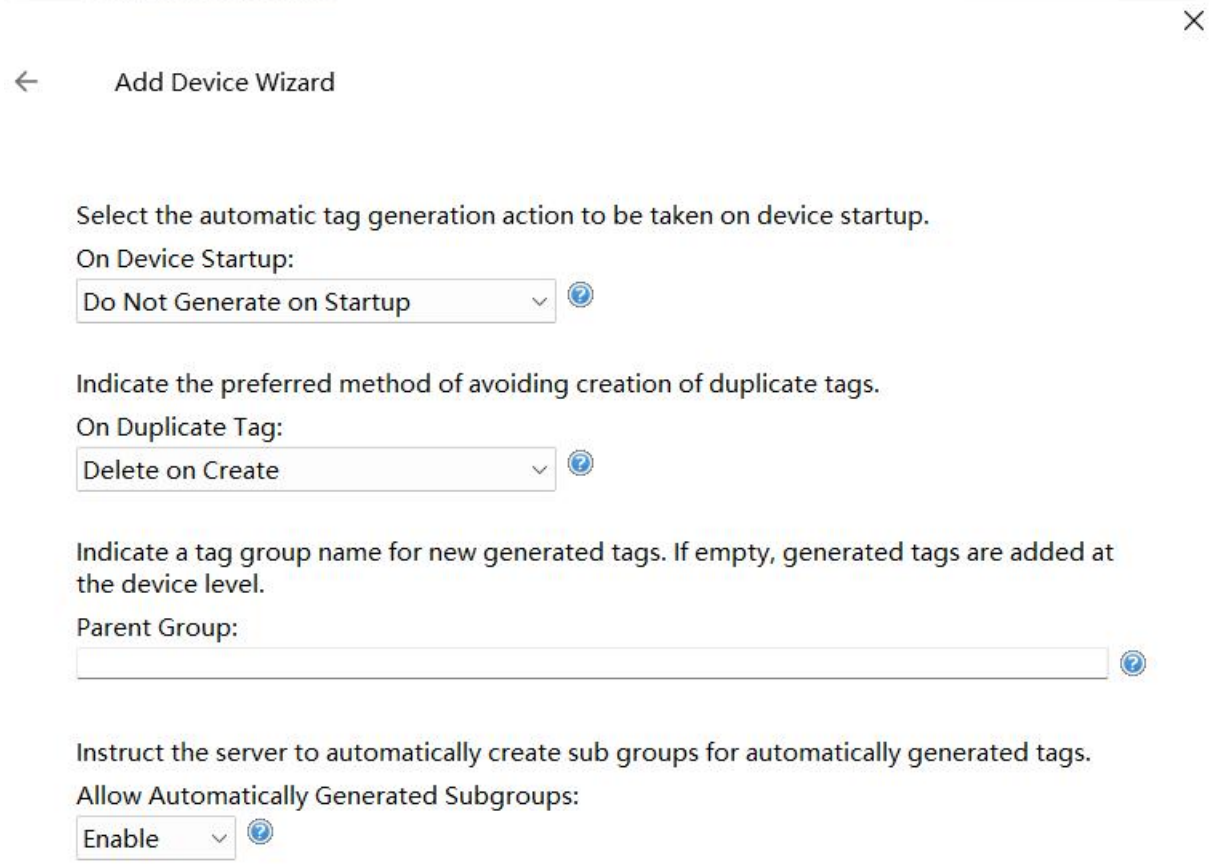


Keep other parameters as default.

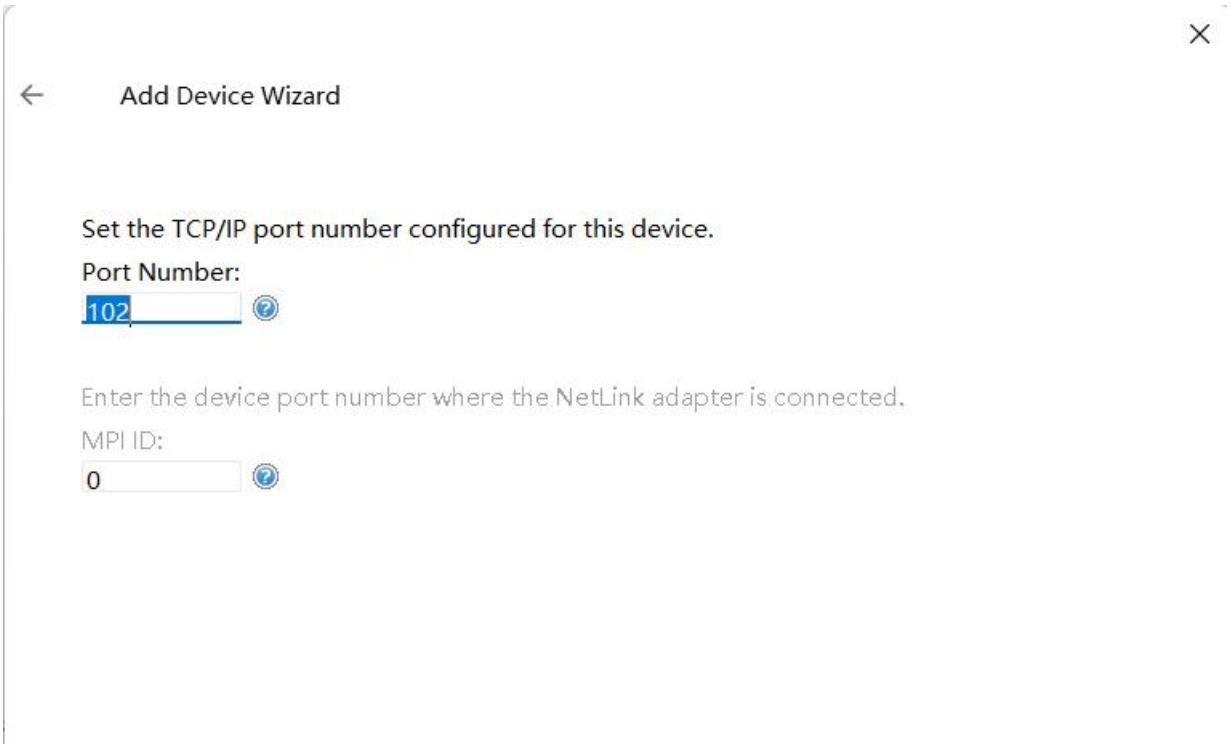



Add Device Wizard
Define the maximum amount of time, in seconds, allowed to establish a connection to a remote device. Connection time is often longer than communication request time for a
Connect Timeout (s):
3
Specify an interval, in milliseconds, to determine how long the driver waits for a response from the target device to indicate completion.
Request Timeout (ms):
2000
Indicate how many times the driver sends a communications request before considering the request to have failed and the device to be in error.
Attempts Before Timeout:
2
Define how long, in milliseconds, the driver waits before sending the next request to the

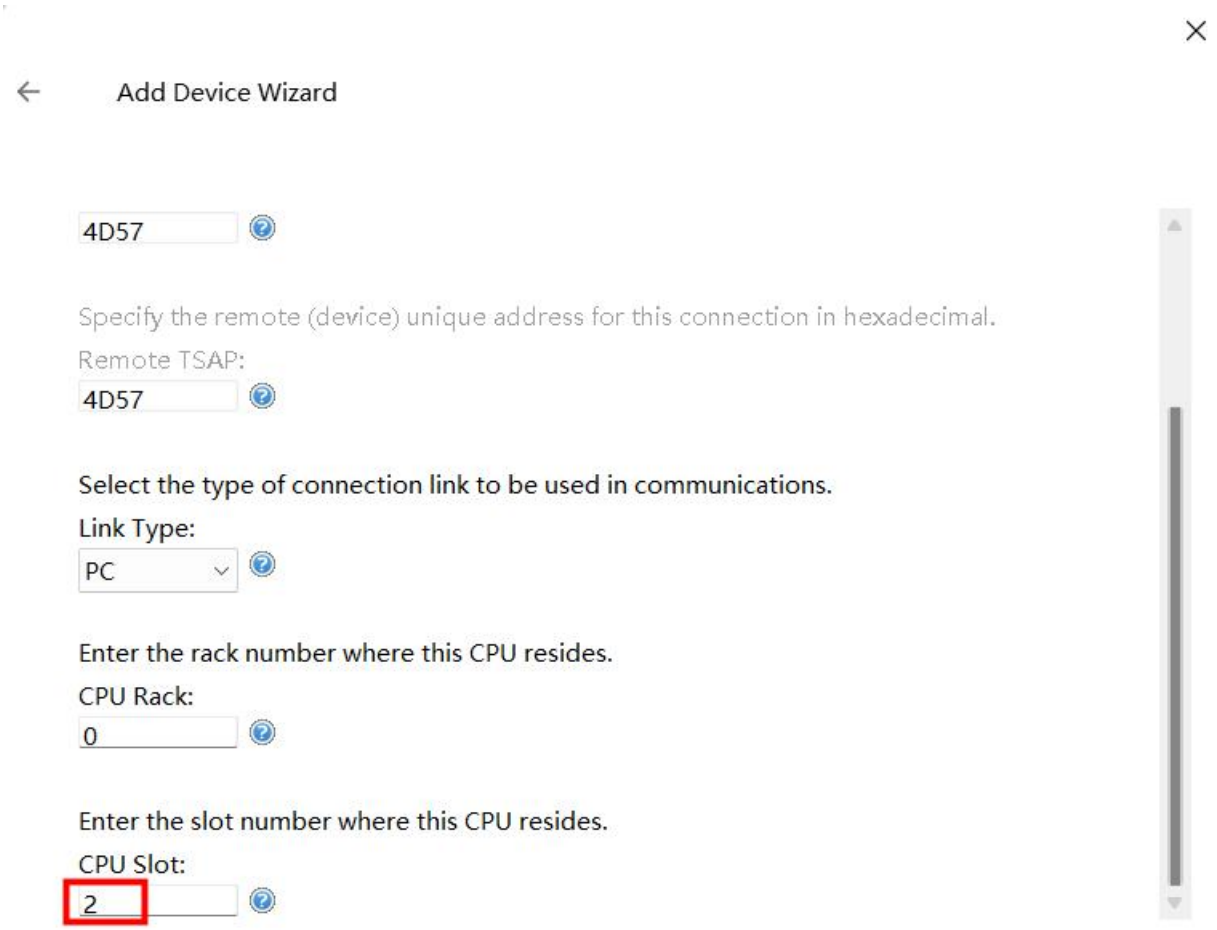

Add Device Wizard
Automatically remove the device from the scan due to communication failures.
Demote on Failure:
Disable


Add Device Wizard
Select the automatic tag generation action to be taken on device startup.
On Device Startup:
Do Not Generate on Startup
Indicate the preferred method of avoiding creation of duplicate tags.
On Duplicate Tag:
Delete on Create
Indicate a tag group name for new generated tags. If empty, generated tags are added at the device level.
Parent Group:
Instruct the server to automatically create sub groups for automatically generated tags.
Allow Automatically Generated Subgroups:
Enable

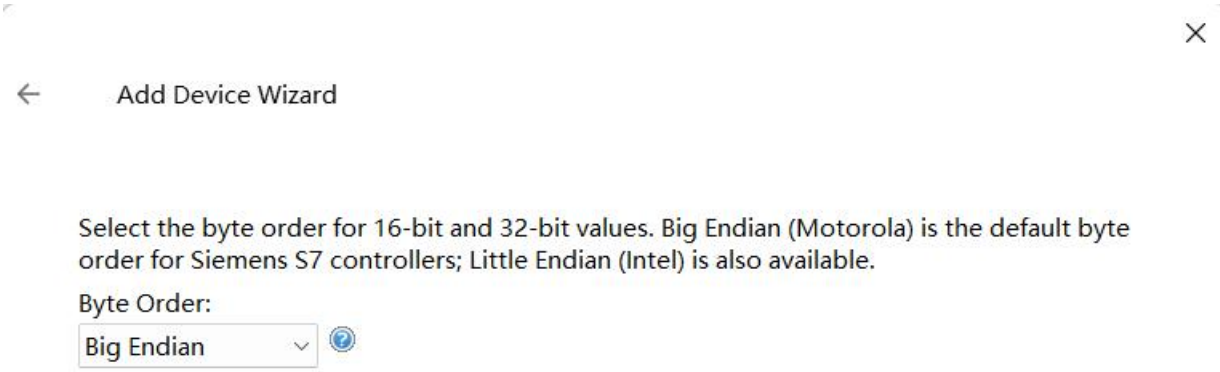
9. Keep the default port as 102. Since it is fixed in S7 communication port in the S7-200/S7-300/S7-400 PLC.



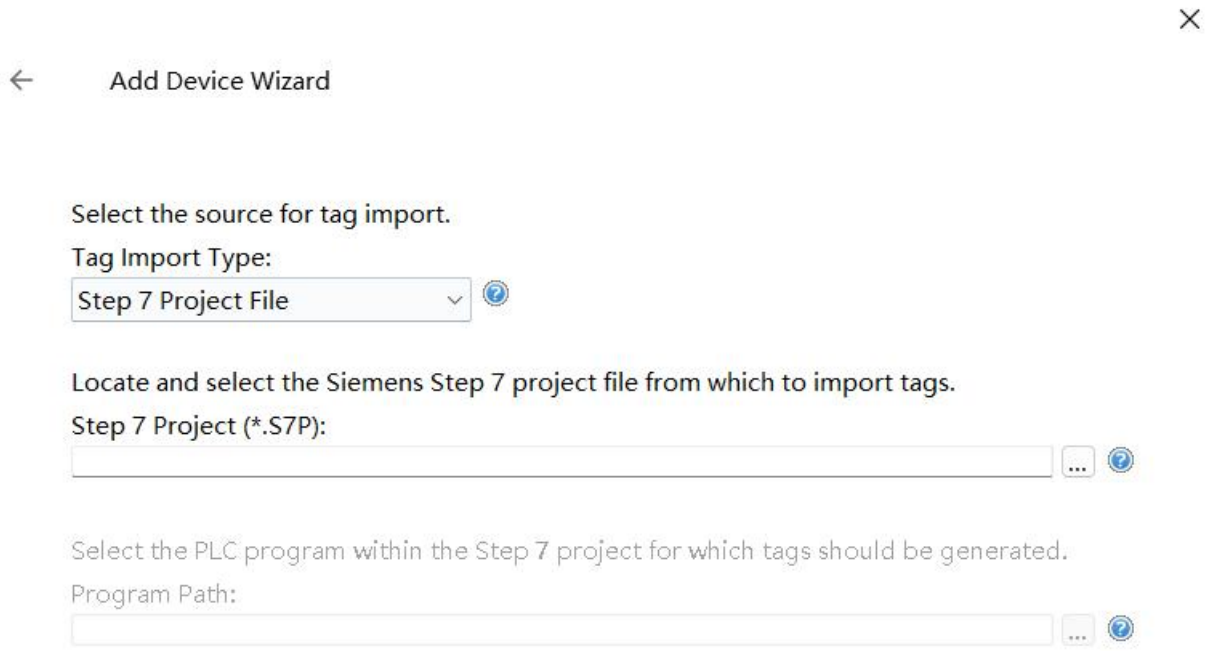
10. Fill in the same address as configured in the S7TCP target address in GT100-IE-MPI. Here is 2.



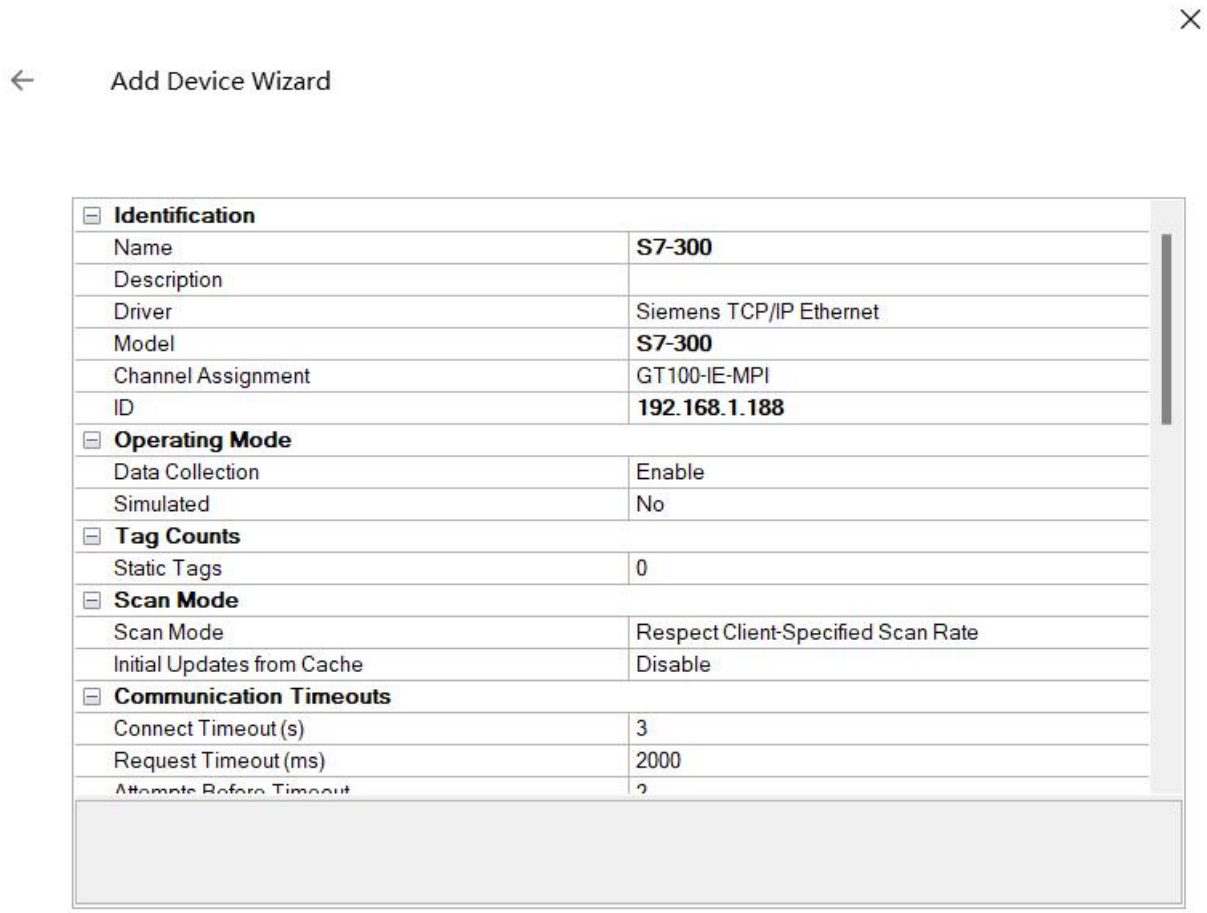
Keep other parameters as default.



11. You can import Step 7 project to generate the tags or do not import and manually create the tag later.

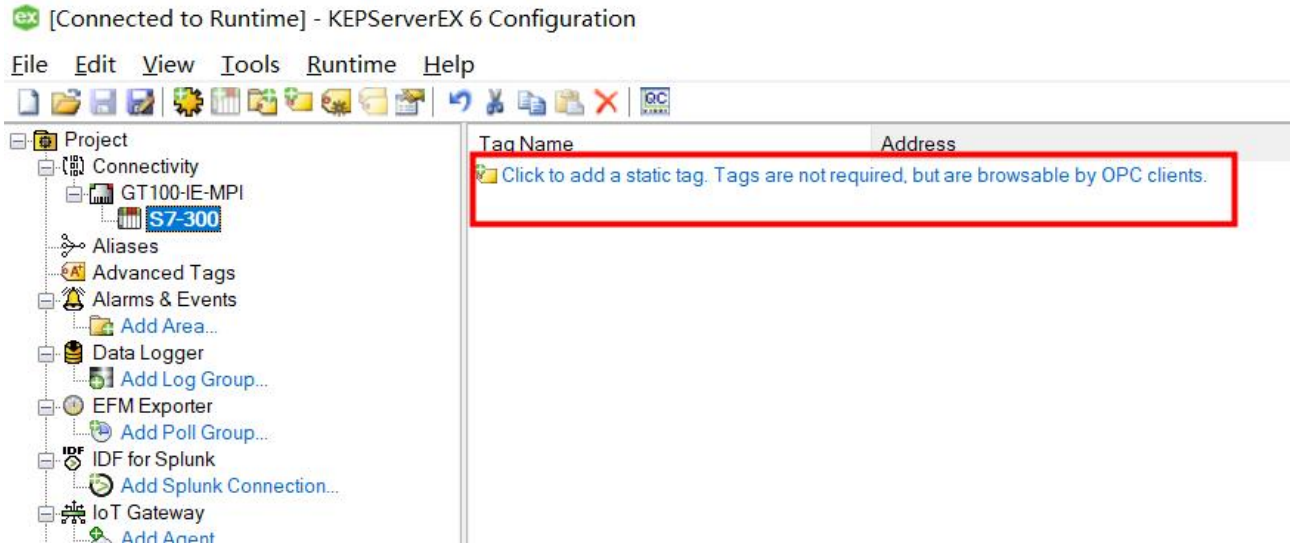


12. Then the device is created successfully. Click ok to close.

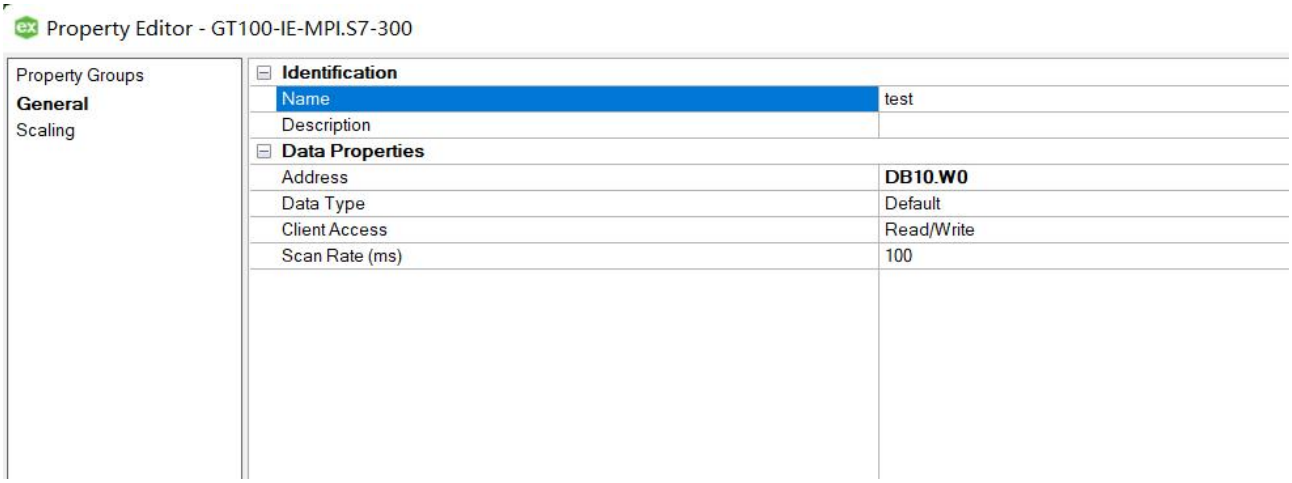


Then you should create the tags or auto generate the tags.

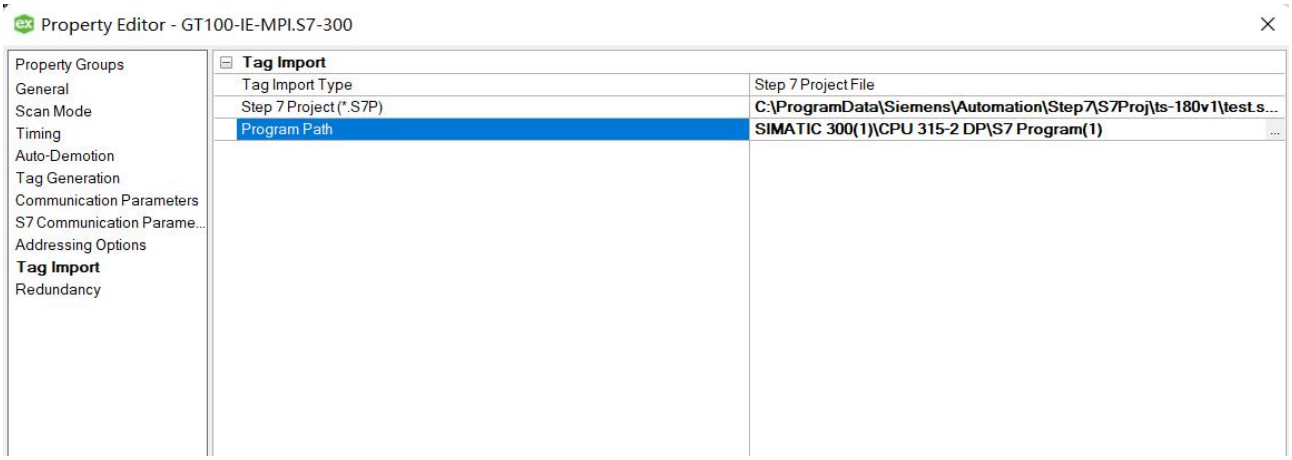
Manually click to add a tag.

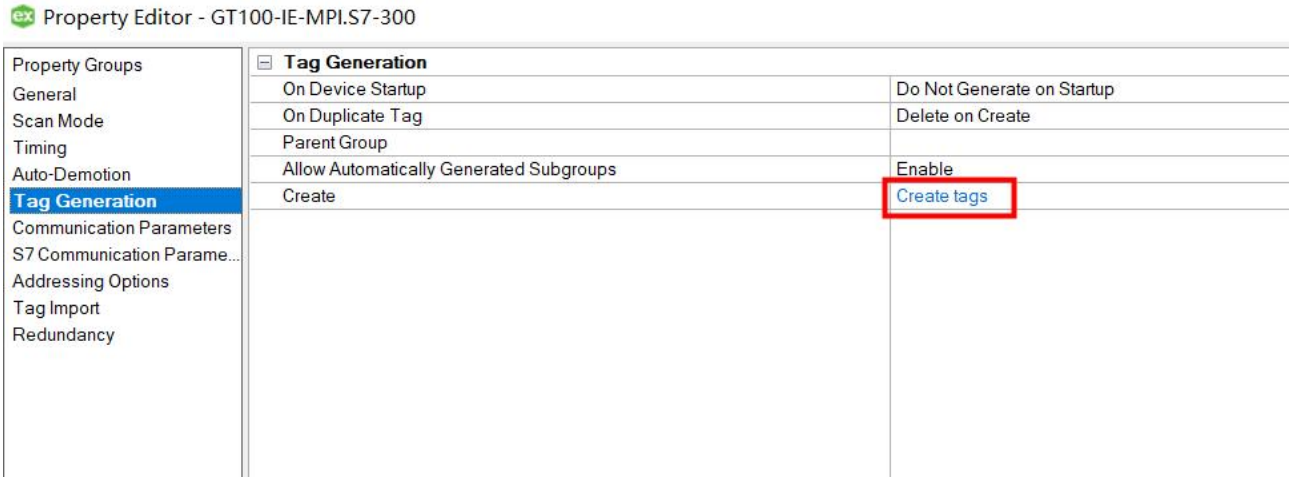


The address should be in the Step 7 project.

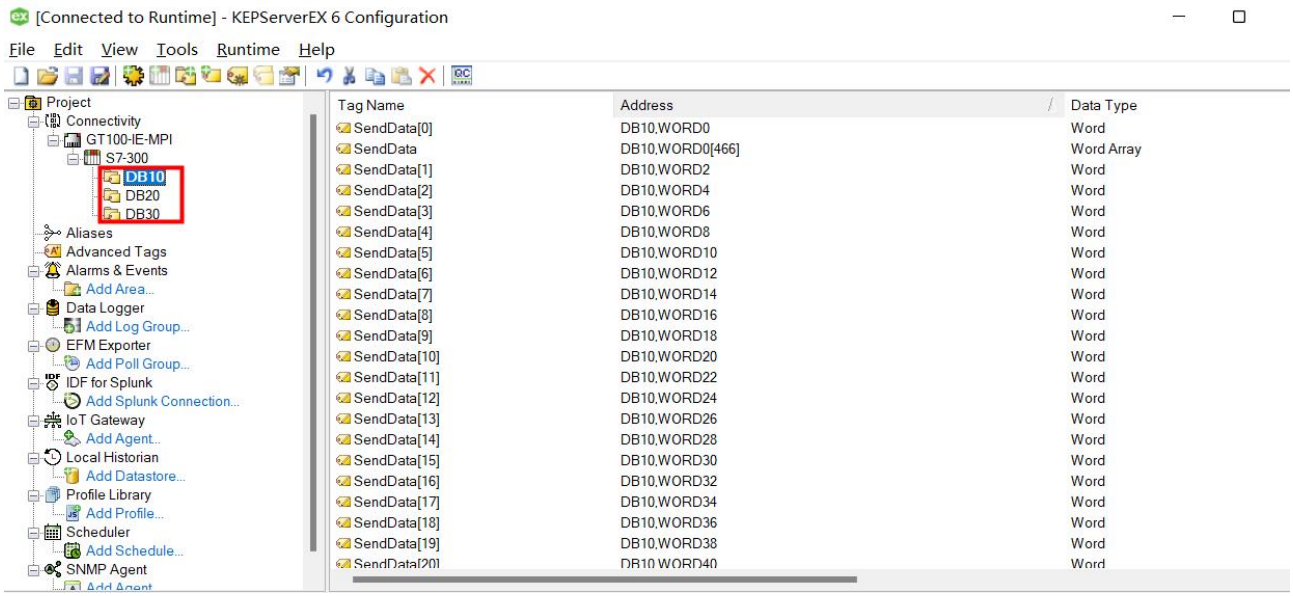


Or, you can select a Step 7 Project file. And move to "Tag Generation" to auto create the tags.

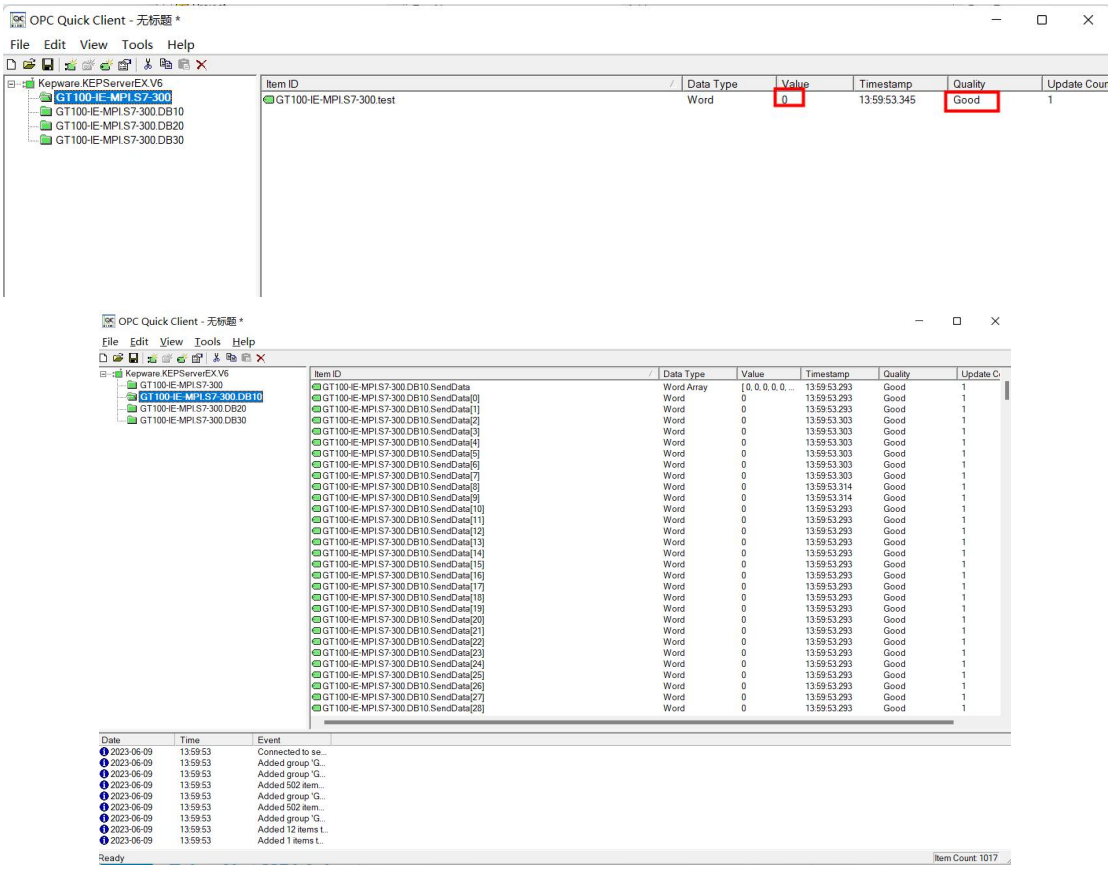




Then, the tags will be created under device S7-300.



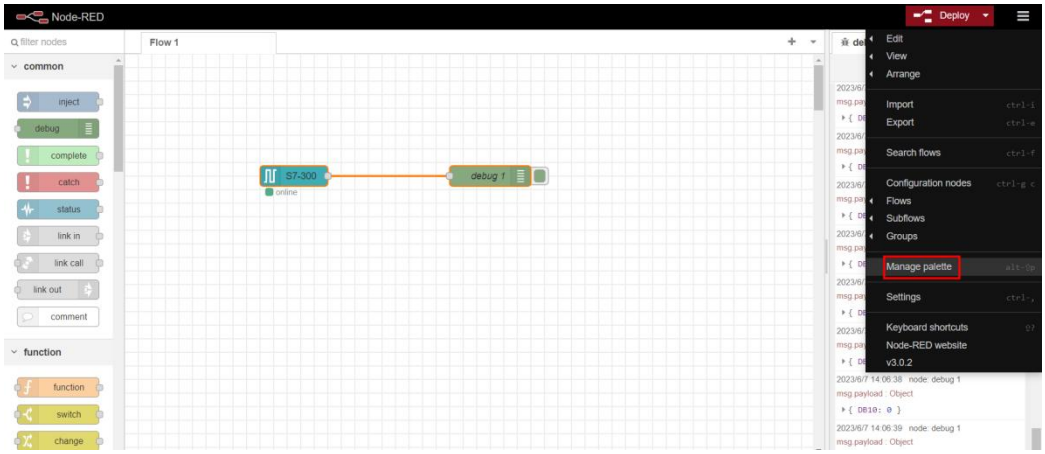
13. Click "QC" Quick Client in the tool bar to review the data.



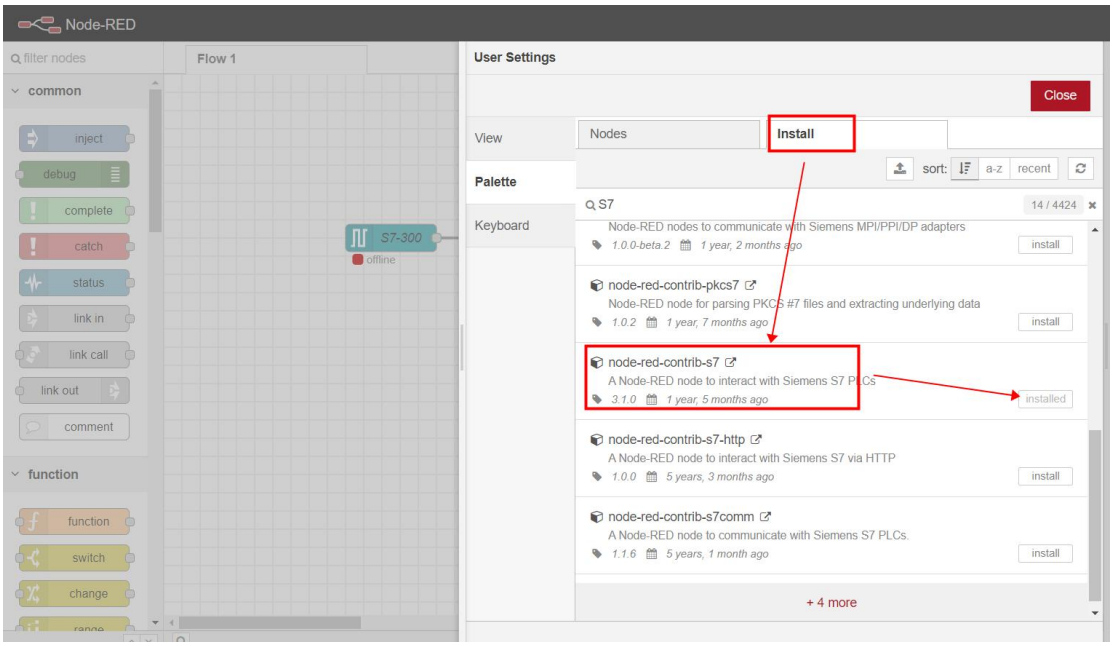
You can see the data value is 0 and Quality is Good. That means the connection is normal.

B. How to connect GT100-IE-MPI to Node-Red

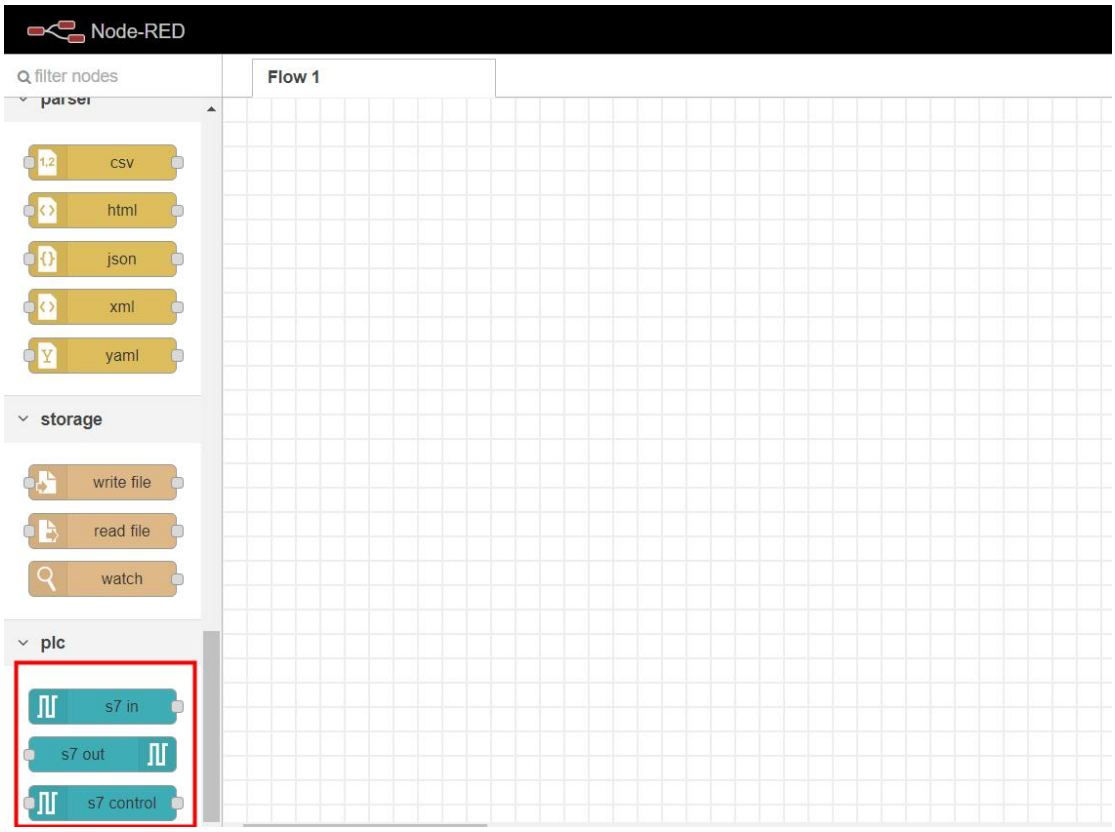
Install the contrib-S7 module. Click the "Manage palette".



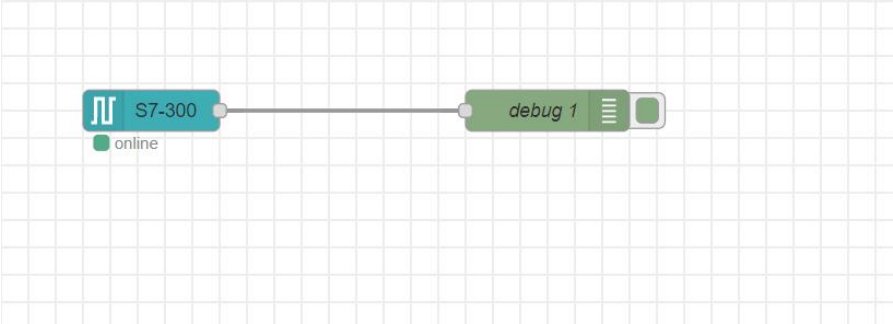
Search S7 in the "Install" area and install node-red-contrib-s7 module.

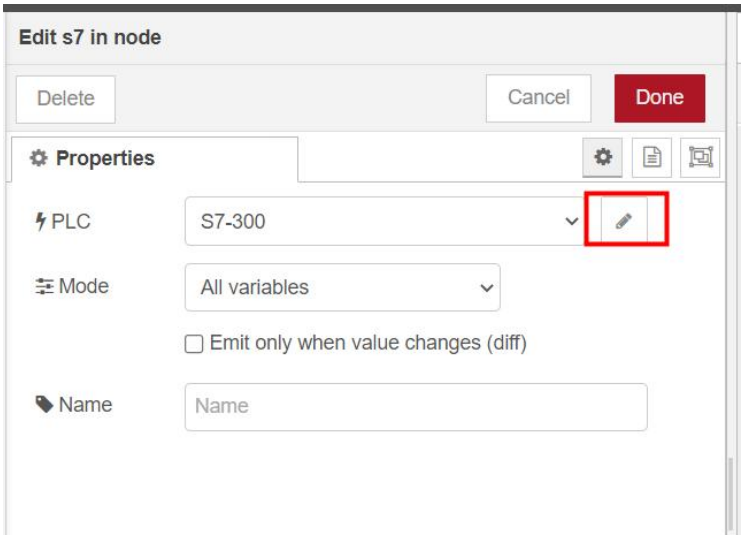


After installation, you will see the new node.



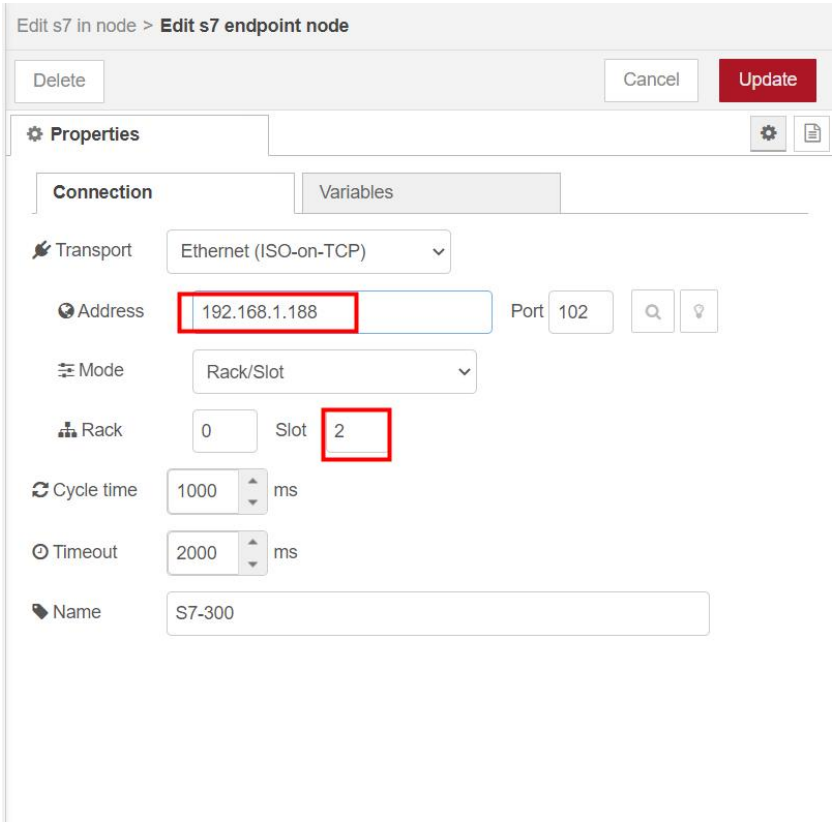
Drag the S7-In and debug module to the panel and connect them.

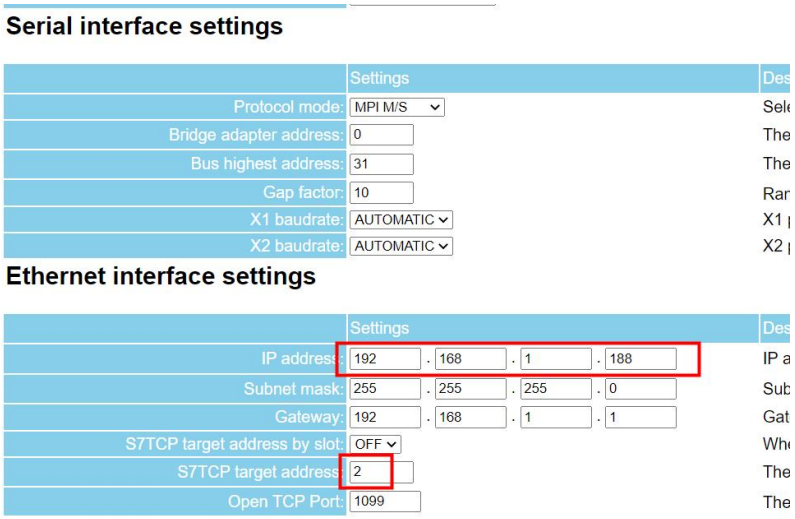




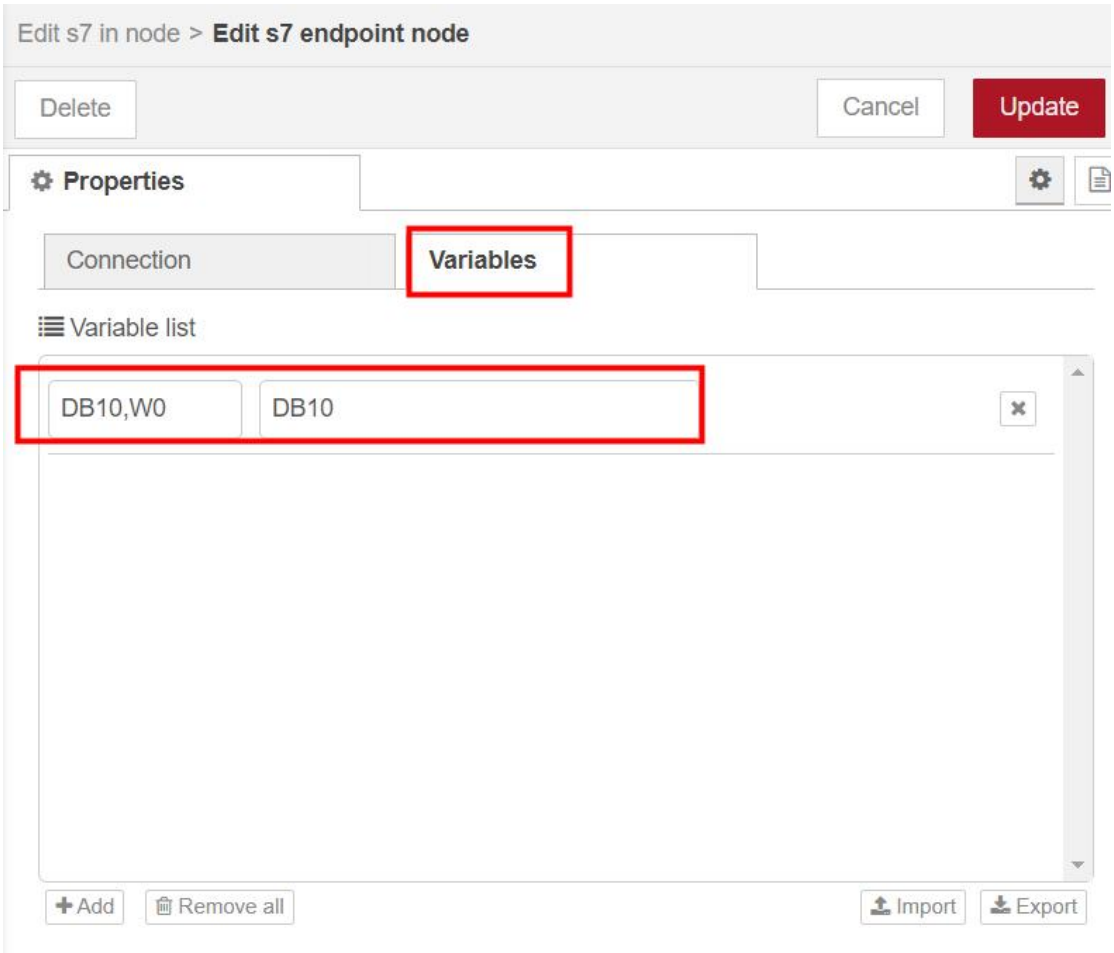
Click the pen to create the new connection. Fill the same IP address and S7TCP target address (Slot 2 as defualt) as GT100-IE-MPI configuration web page.

Please make sure the S7TCP target address is the same as the actual MPI address of the Siemens PLC.



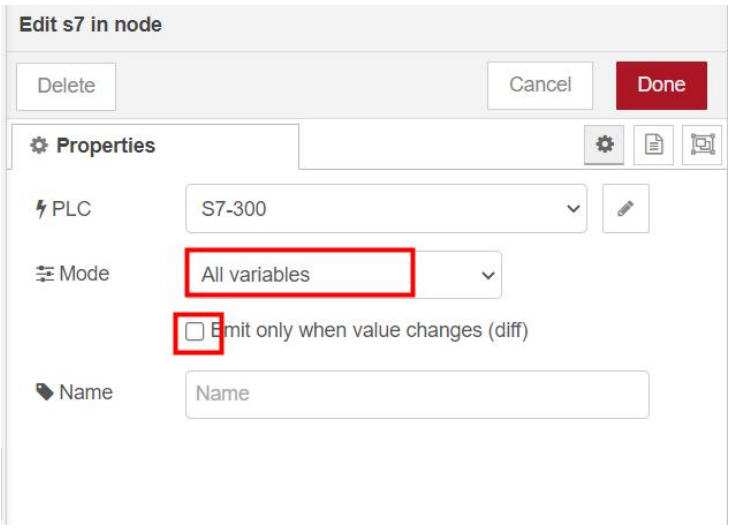


Click Variables, fill in the correct DB address.

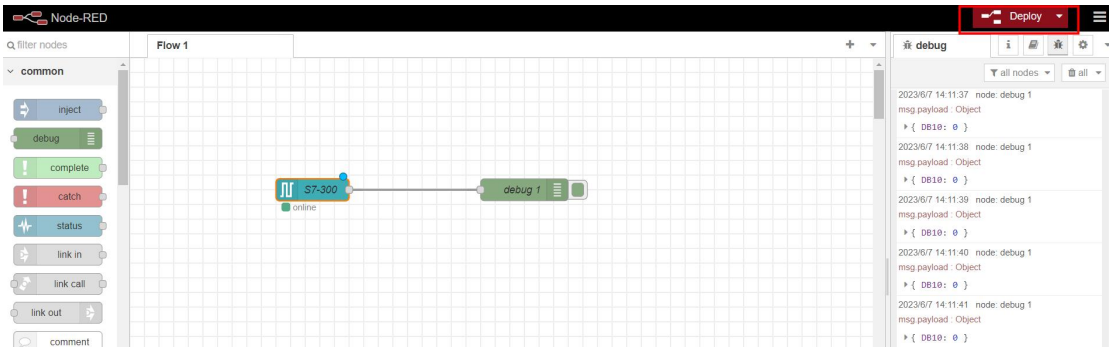


Uncheck the "Emit only when value changes" box to receive the data in cycle or check the box to receive the data when value changes.

Select All variables to read all the variables.



Finally, click Deploy; Node-RED will receive the data cyclically.



Click the debug button, you will see the data.