

User manual

Product model: NET30-MPI



1. Application scenario

The industrial communication bridge (hereinafter referred to as the bridge) mainly provides hardware support for industrial equipment networking projects, helps the upper terminal collect the data of the lower industrial equipment (mainly PLC, but not limited to PLC equipment) through Ethernet, and then makes statistics and Analysis on these data.

The bridge is dedicated to Siemens s7300/400 series plc and supports Siemens 840D and other cnc systems.

2. Installation and parameter setting

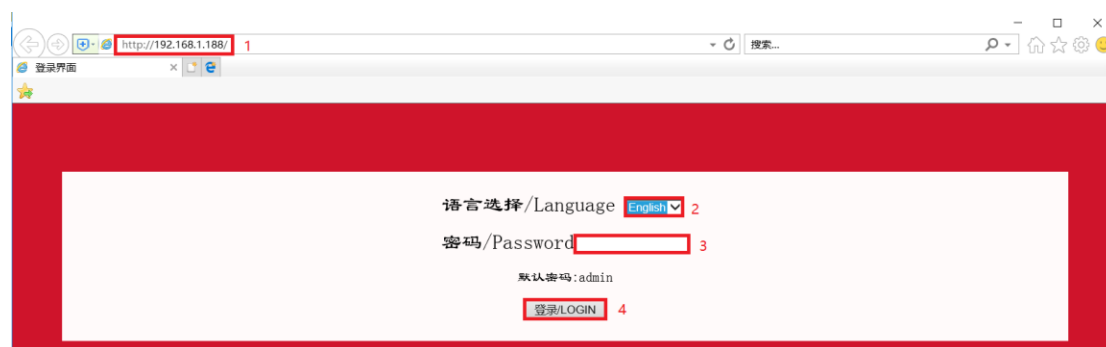
The user can directly plug the bridge into the communication port of PLC; If the touch screen was originally inserted into the communication port of PLC, you can unplug the touch screen first, and then insert the touch screen into the expansion port of the bridge after the bridge is inserted.

After installation, we connect the computer with the bridge through the network cable. We can set the parameters of the bridge by logging in to the web page or the parameter setting tool. In order to meet different needs of users, the web page interface of the bridge supports Chinese and English; In order to make it easier for users to manage field devices in practical application, the bridge opens the [device name] parameter, and users can name the field devices connected by the bridge.

2.1 Web page description

Before setting the bridge parameters through the web page, the IP address of the computer needs to be set in the same network segment as the IP address of the bridge (the IP address at the factory is 192.168.1.188).

After setting the IP address of the computer correctly, open the browser (take IE browser as an example), enter the IP address of the bridge in the address bar of the browser: 192.168.1.188 (take the factory IP as an example), and click enter to open the login interface of the bridge:



Select Chinese or English as the display interface through [Language], enter the correct login password in the [Password], and click the [Login] button to open the home page of the bridge:

Industrial Communication Bridge

Home | **Parameter setting**

Device name: 00111661 | Device name: 00111661 | Firmware version: 0.3.1.38
 Bridge adapter type: NET30-MPI | MAC address: 4E-45-54-01-B4-2D | Production date: 2022-04-04

Serial interface diagnosis

Protocol mode:	MPI M/S	X1 baudrate type:	Auto	X2 baudrate type:	Auto
Bus status:	Run	X1 baudrate:	187500	X2 baudrate:	19200
Bridge adapter address:	0	X1 request counts:	0	X2 request counts:	0
Bus highest address:	31	X1 response counts:	0	X2 response counts:	0
Gap factor:	10	X1 error counts:	0	X2 error counts:	0
Master address sheet:	0,3				
Slave address sheet:					

Ethernet interface diagnosis

IP address:	192.168.1.188	TCP connection counts:	0	TCP request counts:	0
Subnet mask:	255.255.255.0	S7TCP connection counts:	0	TCP response counts:	0
Gateway:	192.168.1.1	Modbus connection counts:	0	TCP error counts:	0
S7TCP target address:	2				
S7TCP target address by slot:	OFF				

System diagnosis

Device running time: 00:0H-4M

Click [Parameter setting] on the left side of the navigation page to see the parameter setting of the bridge:

Basic settings

Home | **Parameter setting**

Settings	Description
Device name:	Enter the name of the device to which the bridge is connected.
Password change:	Change Password.
Password confirm:	Confirm Password.

Serial interface settings

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

Ethernet interface settings

Settings	Description
IP address:	IP address is 192.168.1.188 by default.
Subnet mask:	Subnet mask is 255.255.255.0 by default.
Gateway:	Gateway is 192.168.1.1 by default.
S7TCP target address by slot:	When the status is ON, S7TCP target address is set by slot.
S7TCP target address:	The default is 2, valid when the status of S7TCP target address by slot is OFF.
Open TCP Port:	The default is 1099.

Download

The parameters are described as follows:

[Device name]: The field equipment connected by the bridge can be named, such as No. 1 aircompressor, or can choose not to set;

[Password change]/[Password confirm]: To modify the login password, you must ensure that the characters entered twice are consistent. If they are inconsistent or not set, the login password is the default login password: admin;

[Protocol mode]: It can be set as MPI M/S (when the bridge is inserted into the MPI port of PLC) or PROFIBUS (when the bridge is inserted into the DP port of PLC);

[Bridge adapter address]: Set the station address of the bridge, which does not conflict with the station address of other devices on the bus;

[Bus highest address]: Set the highest station address that the bus can recognize the equipment, which is recommended to be default;

[Gap factor]: Recommended to be default;

[X1 baudrate]: It can be set to automatic state: the bridge can automatically identify the baudrate of communication with PLC, and the baudrate can also be manually set according to the actual baudrate of PLC;

[X2 baudrate]: It can be set to automatic state: the bridge automatically identify the baudrate of communication with the touch screen, and the baudrate can also be manually set according to the actual baudrate of touch screen. This parameter is only meaningful for the bridge type;

[IP address]: Set the IP address of the bridge;

[Subnet mask]: Set the subnet mask of the bridge;

[Gateway]: Set the gateway of the bridge;

[S7TCP target address by slot]: On state: s7tcp target address is determined by slot number;

[S7TCP target address]: When [S7TCP target address by slot] is Off state, the parameter only works. Set the s7tcp target address manually;

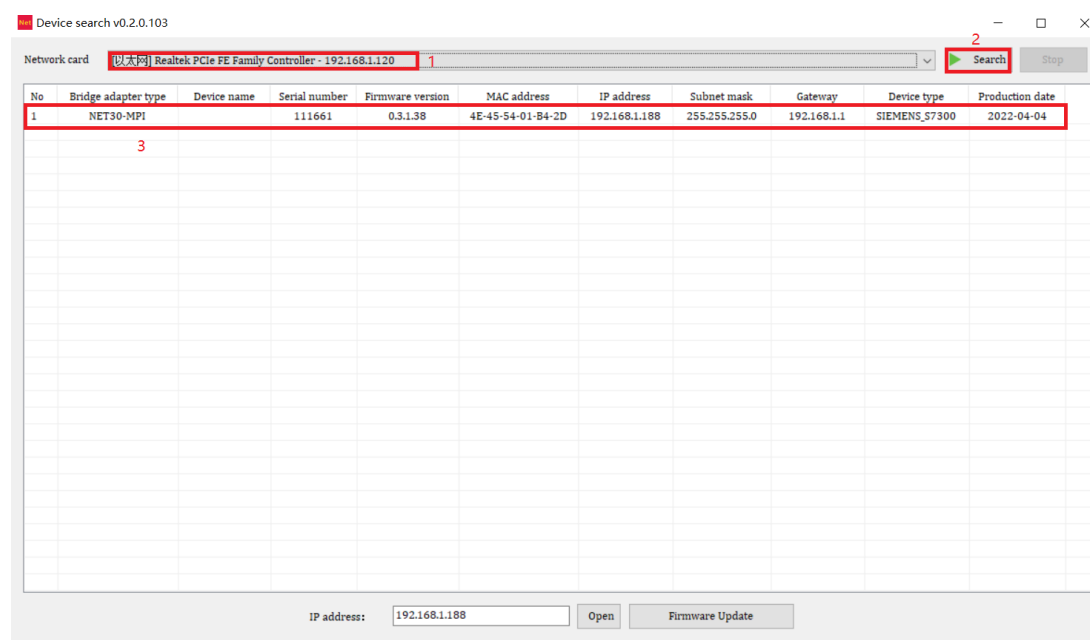
[Open TCP Port]: Recommended to be default;

After modifying the parameters, click the [Download] button.

2.2 Parameter setting tool description

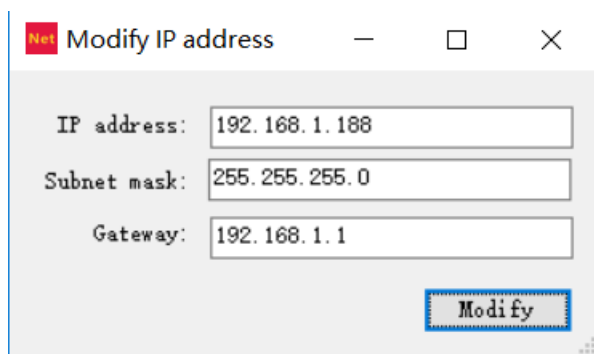
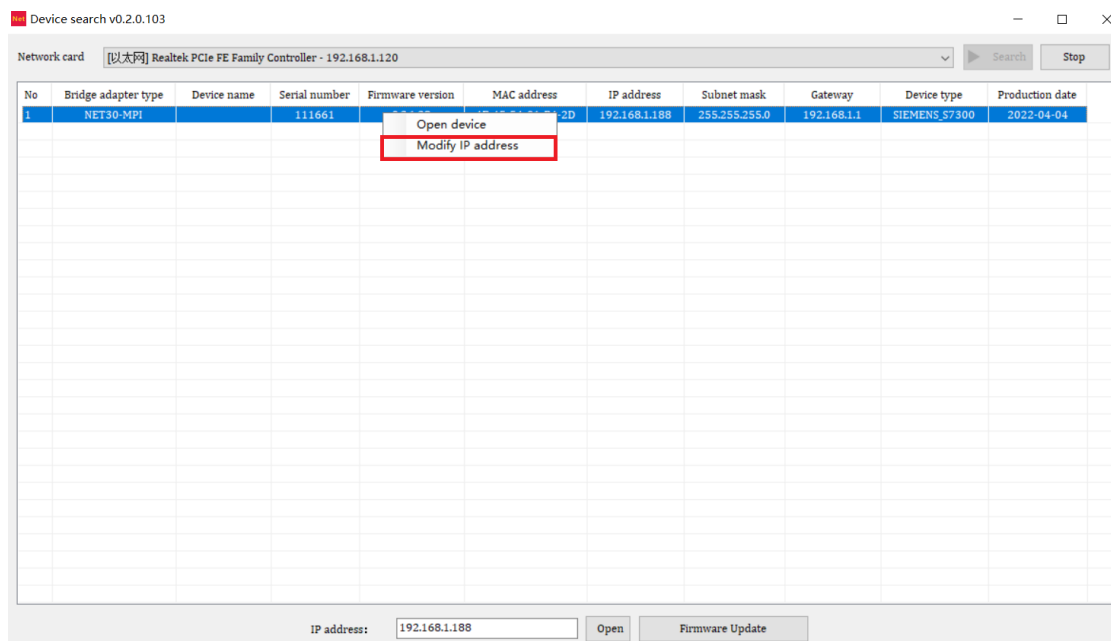
2.2.1 Search device

Open the parameter configuration tool exlink, select the network card connected between the computer and the bridge, and click the [Search] button to search for the bridge;



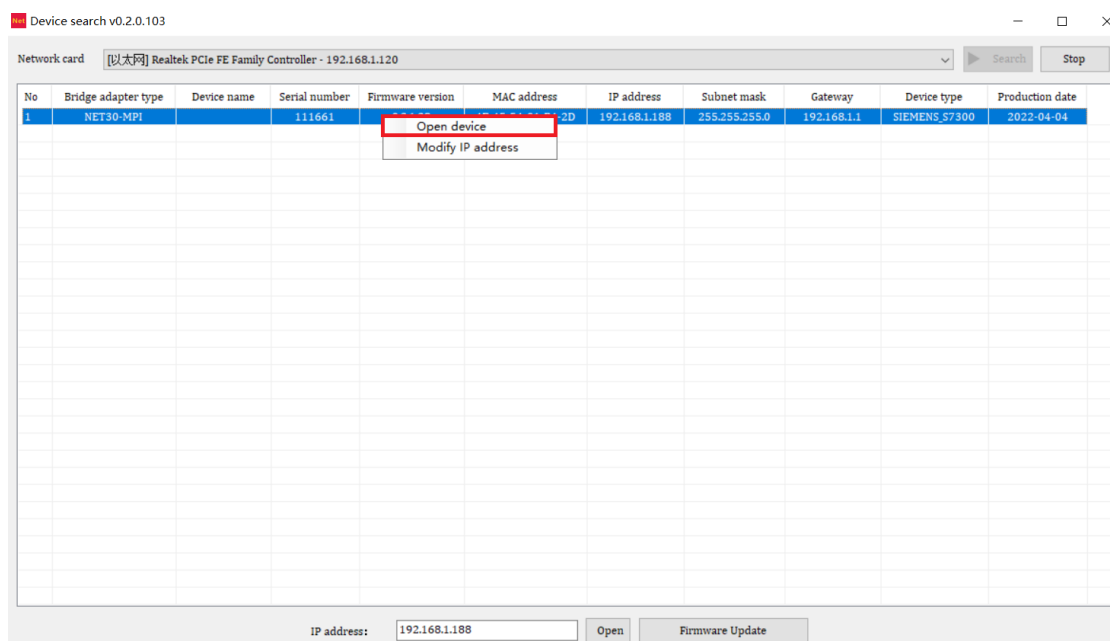
2.2.2 Modify IP address

If you want to modify the bridge IP address, subnet mask and gateway parameters, you can select the bridge, right-click and select [modify IP address]. In the pop-up dialog box, enter the IP address, subnet mask and gateway you want to modify, and then click [Modify];



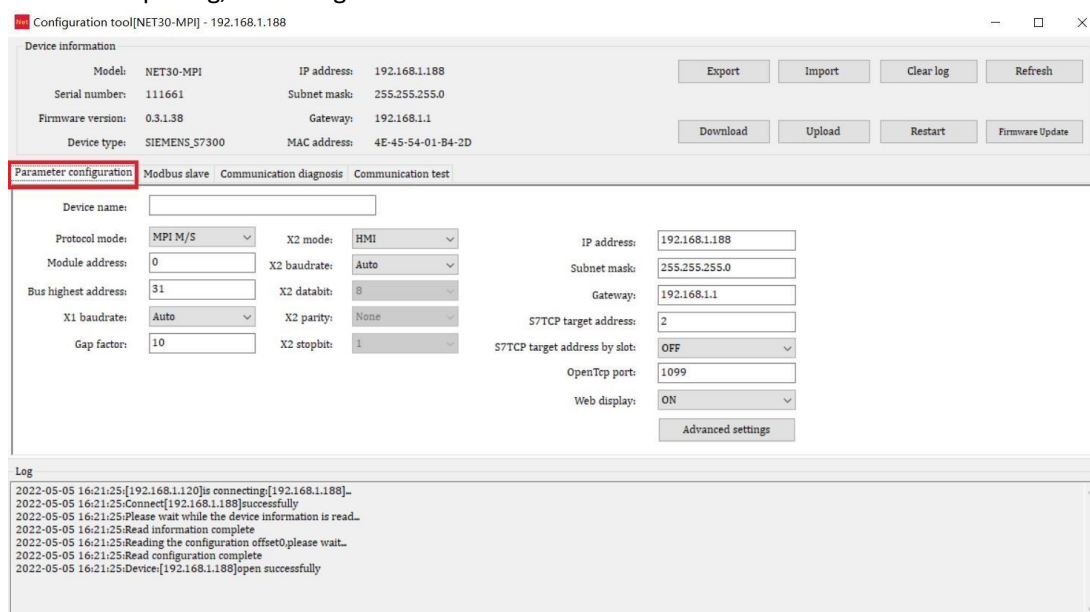
2.2.3 Open device

Select the bridge, right-click the mouse and select [Open device] to enter the parameter configuration, Modbus slave, Communication diagnosis and Communication test pages of the bridge;



2.2.4 Configuration interface

After opening, the configuration interface is as follows:



The parameters are described as follows:

[Device name]: The field equipment connected by the bridge can be named, such as No. 1 air compressor, or can choose not to set;

[Protocol mode]: It can be set as MPI M/S (when the bridge is inserted into the MPI port of PLC) or PROFIBUS (when the bridge is inserted into the DP port of PLC);

[Module address]: Set the station address of the bridge, which does not conflict with the station address of other devices on the bus;

[Bus highest address]: Set the highest station address that the bus can recognize the

equipment, which is recommended to be default;

[Gap factor]: Recommended to be default;

[X1 baudrate]: It can be set to automatic state: the bridge can automatically identify the baudrate of communication with PLC, and the baudrate can also be manually set according to the actual baudrate of PLC;

[X2 baudrate]: It can be set to automatic state: the bridge automatically identify the baudrate of communication with the touch screen, and the baudrate can also be manually set according to the actual baudrate of touch screen. This parameter is only meaningful for the bridge type;

[IP address]: Set the IP address of the bridge;

[Subnet mask]: Set the subnet mask of the bridge;

[Gateway]: Set the gateway of the bridge;

[S7TCP target address by slot]: On state: s7tcp target address is determined by slot number;

[S7TCP target address]: When [S7TCP target address by slot] is Off state, the parameter only works. Set the s7tcp target address manually;

[Open TCP Port]: Recommended to be default;

[Web display]: Off state: Web page configuration is not available;

After modifying the parameters, click the [Download] button.

2.2.5 Diagnosis interface

Select the [Communication diagnosis] option page and open the diagnosis interface to view the operation of the bridge:

Configuration tool[NET30-MPI] - 192.168.1.188

Device information

Model: NET30-MPI IP address: 192.168.1.188
 Serial number: 111661 Subnet mask: 255.255.255.0
 Firmware version: 0.3.1.38 Gateway: 192.168.1.1
 Device type: SIEMENS_S7300 MAC address: 4E-45-54-01-B4-2D

Parameter configuration Modbus slave **Communication diagnosis** Communication test

Address table:	Master/M	Slave/S	polling:
0	M	1	2
10			
20			
30			
40			
50			
60			
70			
80			
90			
100			
110			
120			

Protocol mode: MPI M/S
 Bus status: RUN
 X1 baudrate type: Auto
 X1 baudrate: 187500
 X1 request counts: 0
 X1 response counts: 0
 X1 error counts: 0

Protocol mode: HMI
 X2 baudrate type: Auto
 X2 baudrate: 187500
 X2 request counts: 0
 X2 response counts: 0

TCP connection counts: 1
 S7TCP connection counts: 0
 Modbus connection counts: 0
 Tool connection counts: 1
 TCP request counts: 0
 TCP response counts: 0
 TCP error counts: 0
 Untreated counts: 6

Tcp forced shutdown: 0
 Tcp resource usage: use[1+0]/24 void:23 lead
 Tcp resource usage: use[0]/50 void:50
 Tcp recycling: 0

Count reset

Log

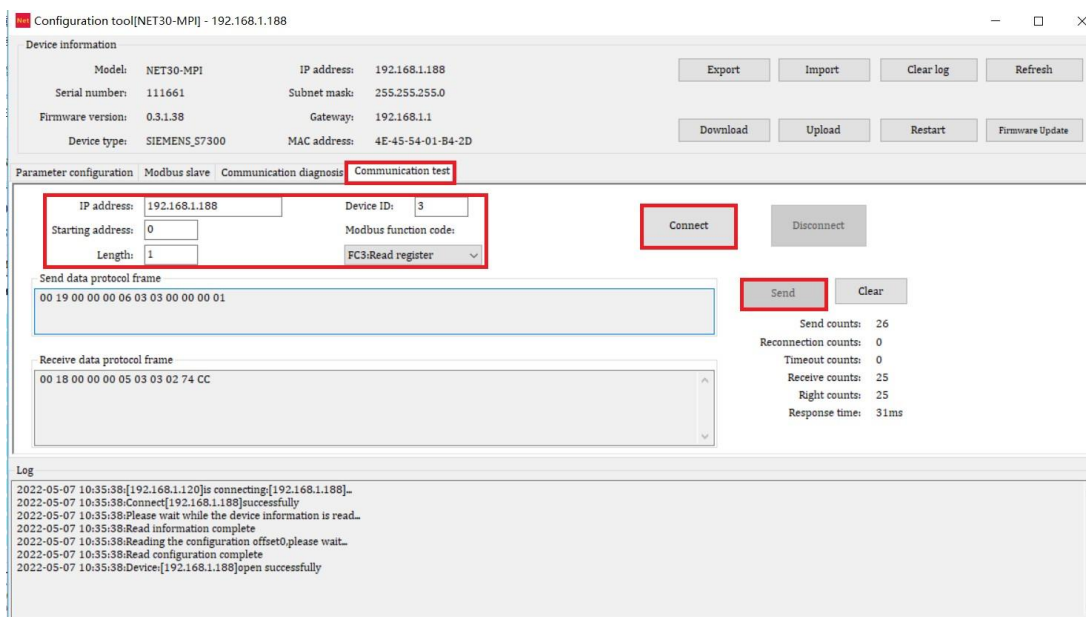
```

2022-05-07 10:35:38[192.168.1.120]is connecting[192.168.1.188]-
2022-05-07 10:35:38:Connect[192.168.1.188]successfully
2022-05-07 10:35:38:Please wait while the device information is read...
2022-05-07 10:35:38:Read information complete
2022-05-07 10:35:38:Reading the configuration offset0,please wait...
2022-05-07 10:35:38:Read configuration complete
2022-05-07 10:35:38:Device[192.168.1.188]open successfully
  
```

2.2.6 Test interface

Select the [Communication test] option page, open the test interface, set the communication

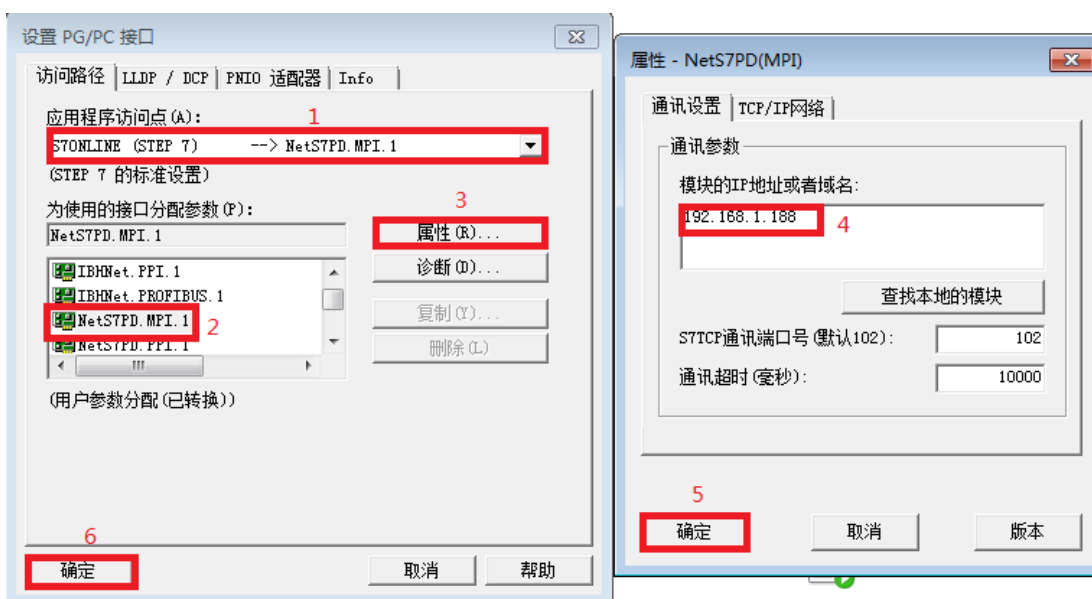
parameters, and click the **[connect]**, **[send]** button to test the Modbus TCP communication between the bridge and the PLC;



3. Programming software communication

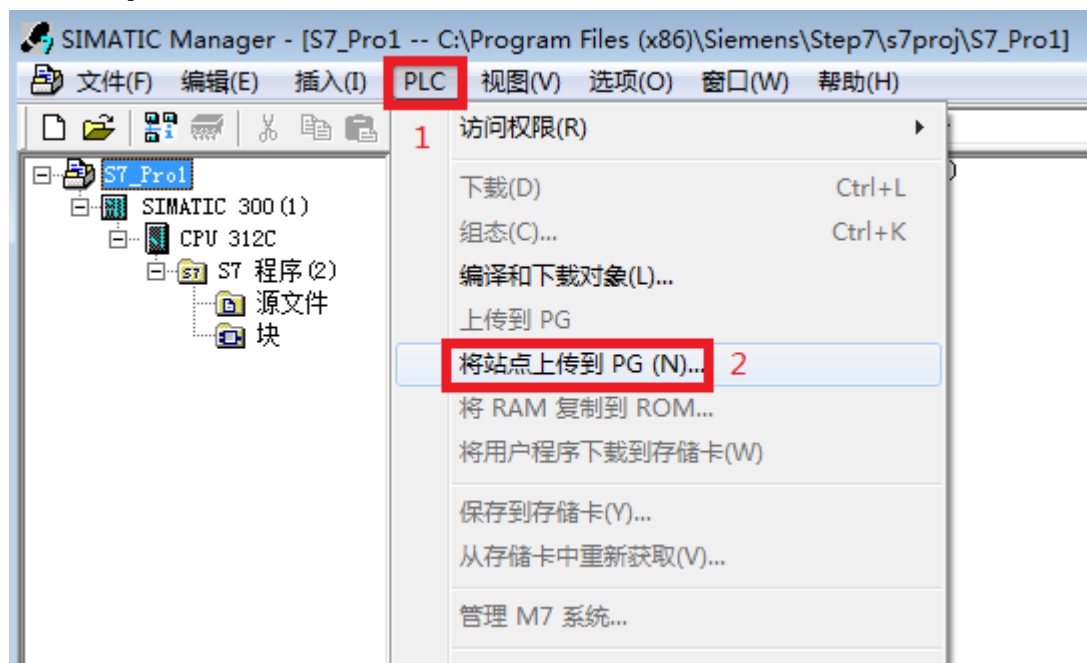
3.1 Set PG/ PC interface

Open **[set PG / PC interface]** in the control panel, select S7online (STEP7) in **[application access point]**, point to the programming driver, click **[attribute]**, enter the IP address of the bridge in the pop-up dialog box, and click **[OK]**.

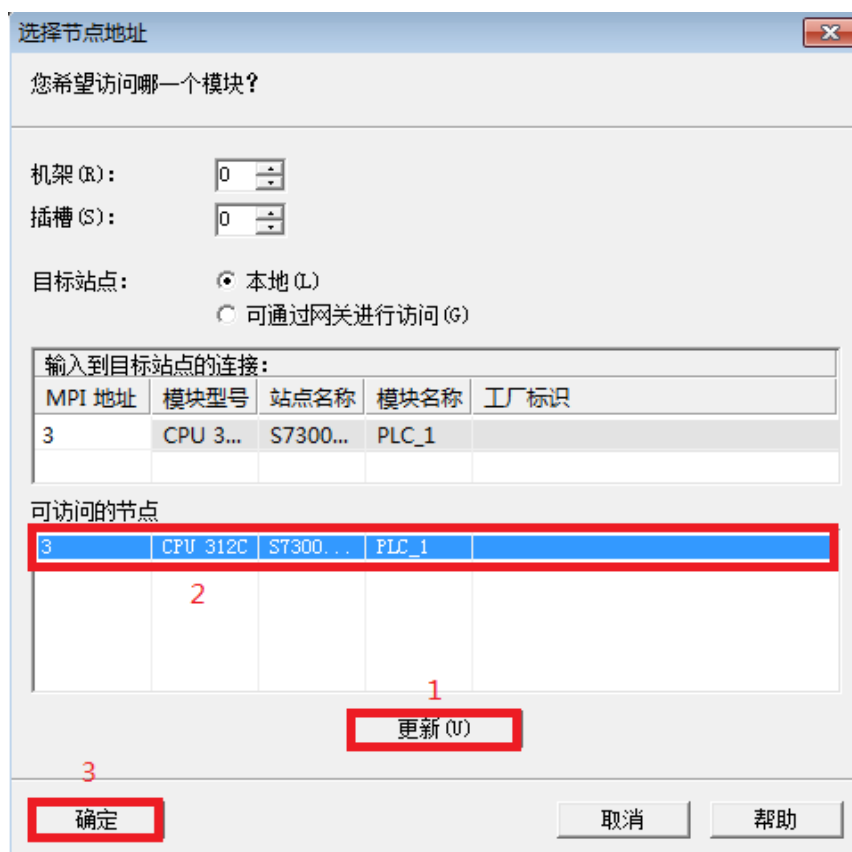


3.2 Step7 programming

Open Siemens programming software STEP7, create a new project, and select **[PLC] - [upload site to PG..]** in the menu bar;



In the pop-up dialog box, click the **[view]** button to search for the online PLC equipment. After selecting the equipment, click the **[OK]** button to upload the PLC program.

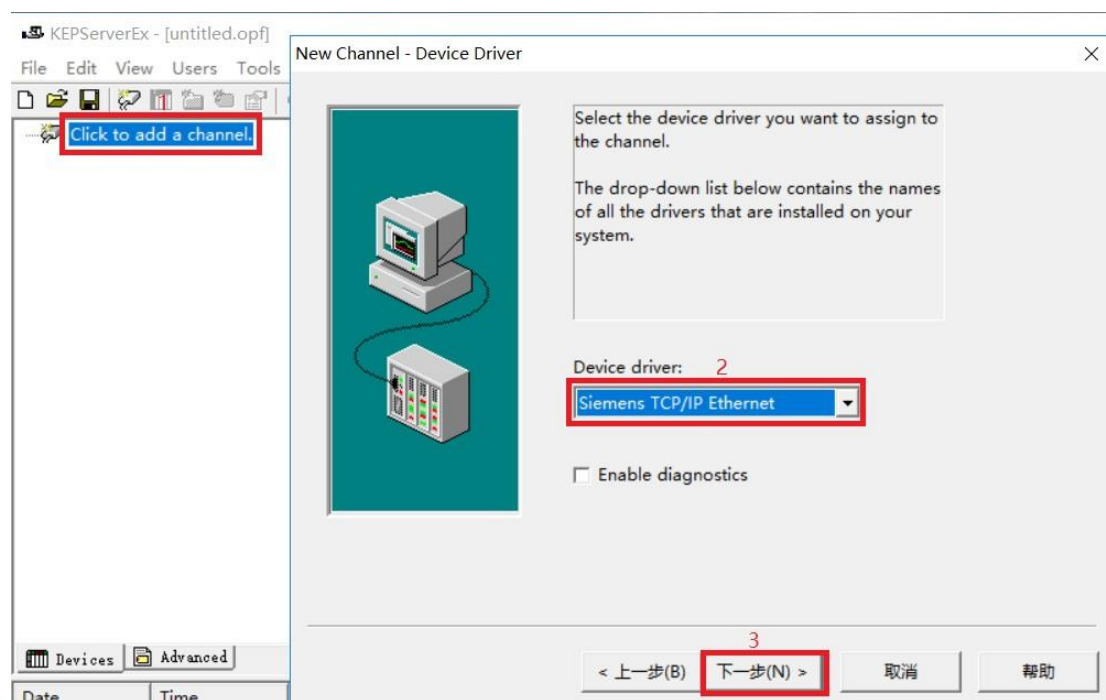


3. Configuration software communication

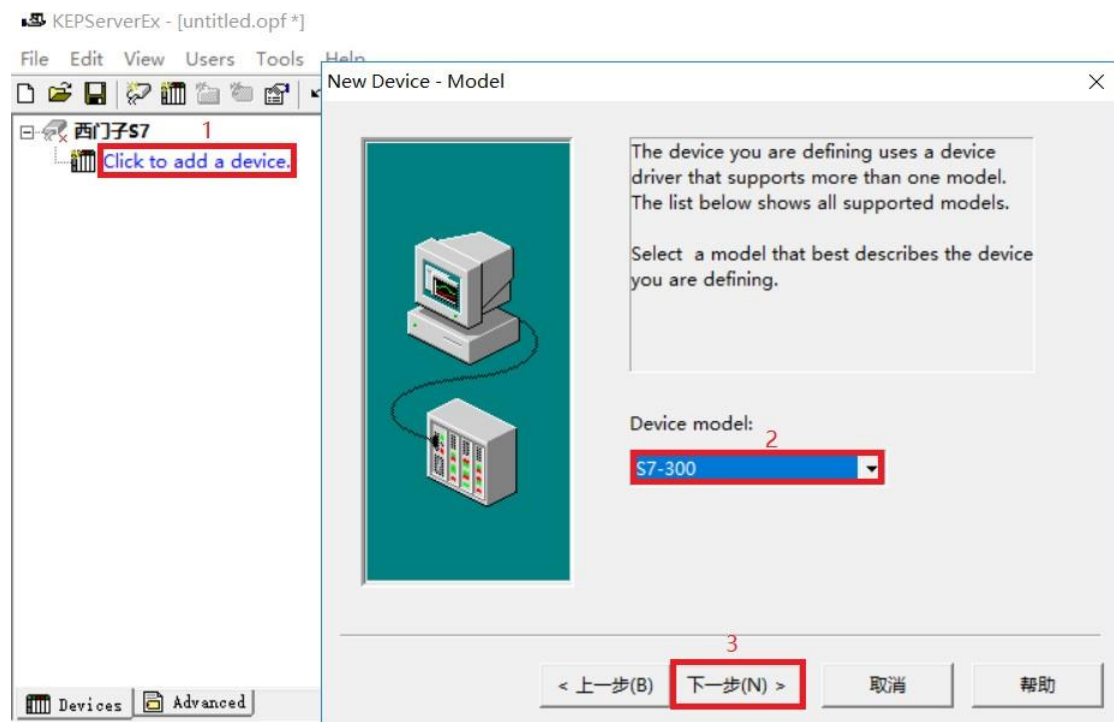
Using the standard configuration software, users can collect equipment data through Siemens S7TCP protocol (the following are driven by this protocol as an example) or Modbus TCP protocol.

a. KEPServerEX communication

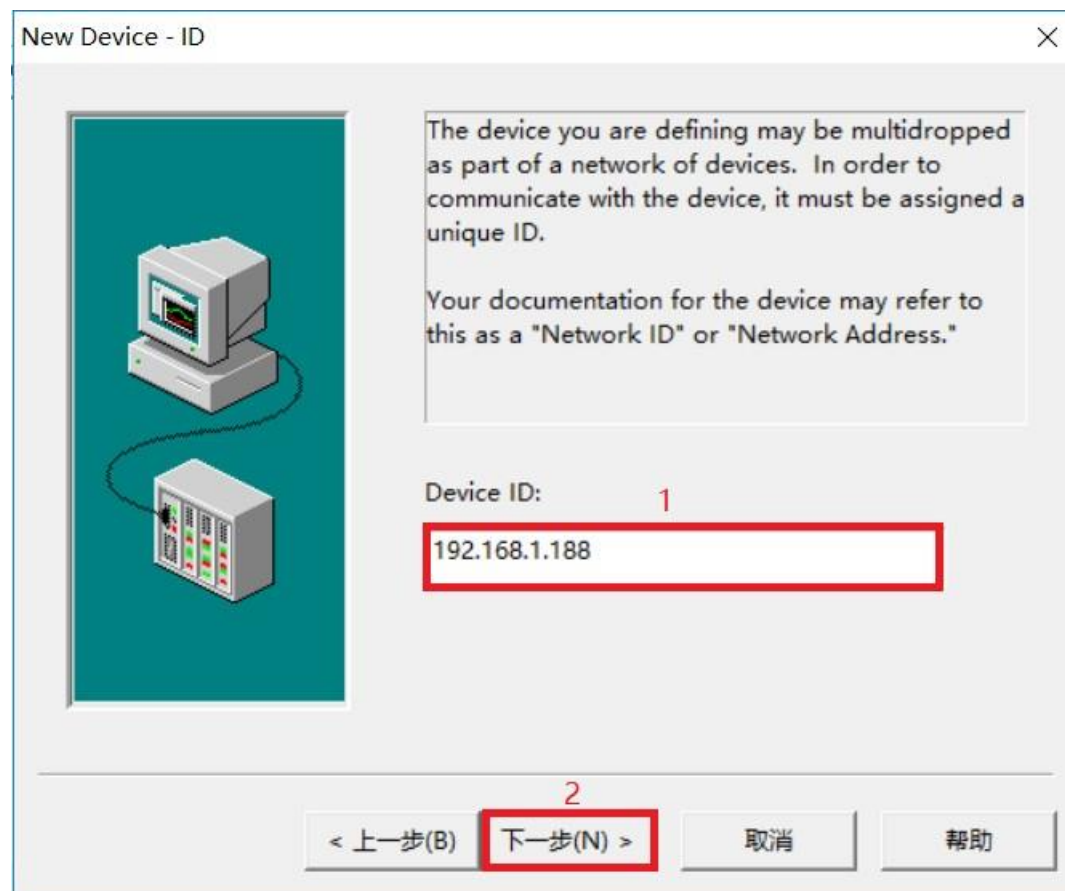
Create a new channel, select the Siemens TCP / IP Ethernet driver, and click the [next] button. Other parameters default until the channel is established;



Create a new device, select S7-300 in [device model], and click [next];



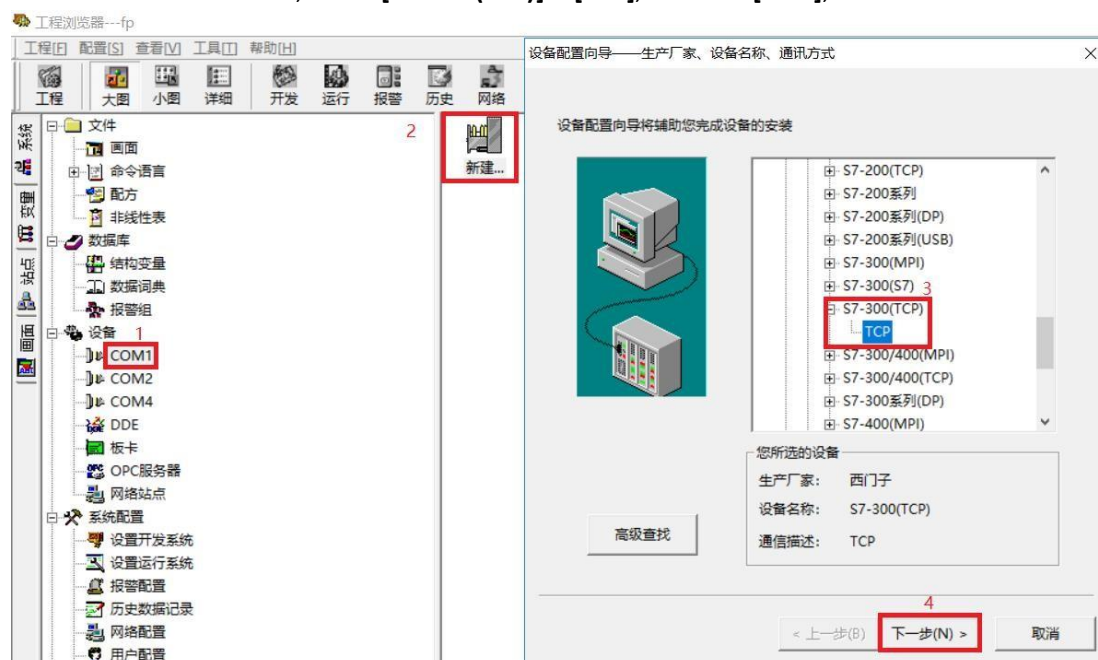
Enter the IP address of the bridge at **[device ID]**, which is 192.168.1.188 by default, and click **[next]**;



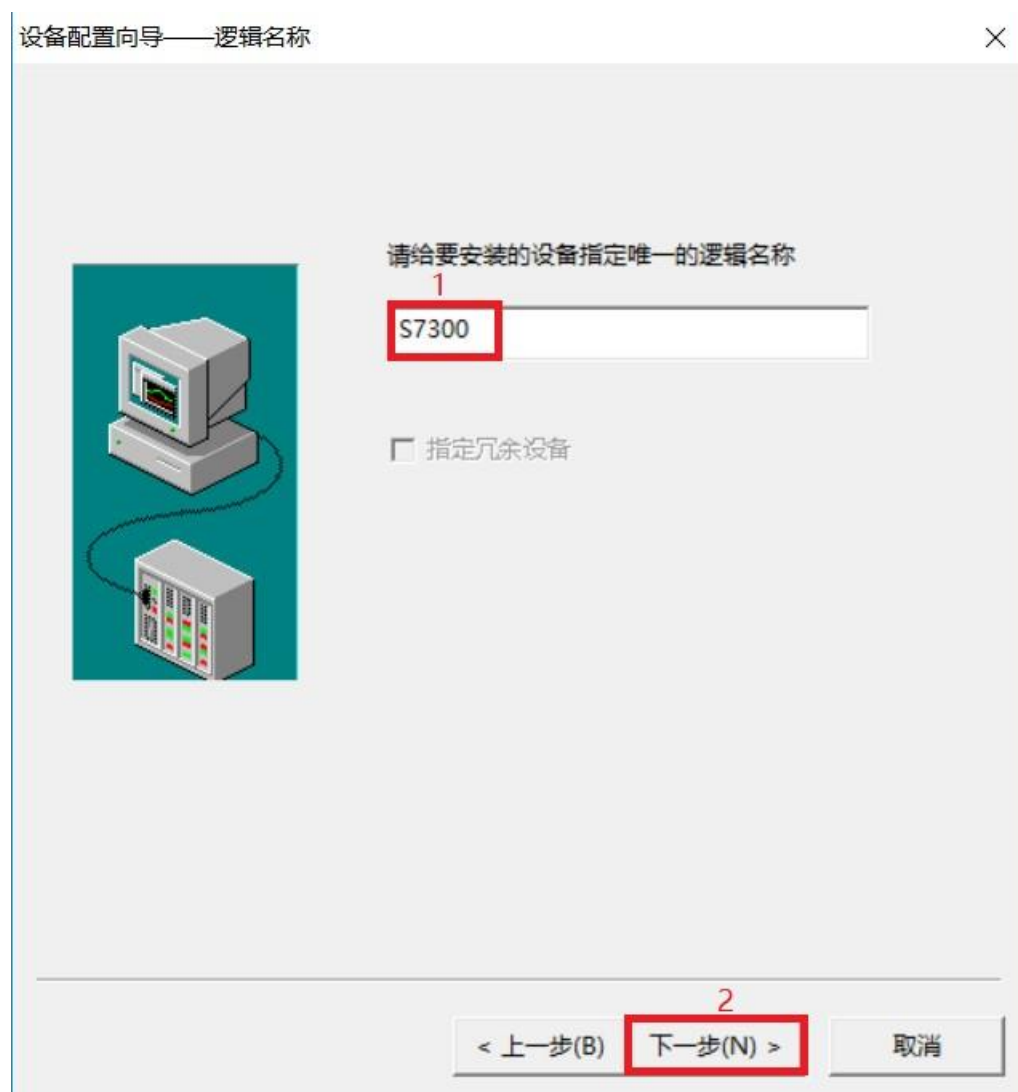
The following steps can be completed by default.

b. KingView communication

Create a new device, select **[S7-300 (TCP)]** -- **[TCP]**, and click **[next]**;



Set any equipment name and click **[next]**;



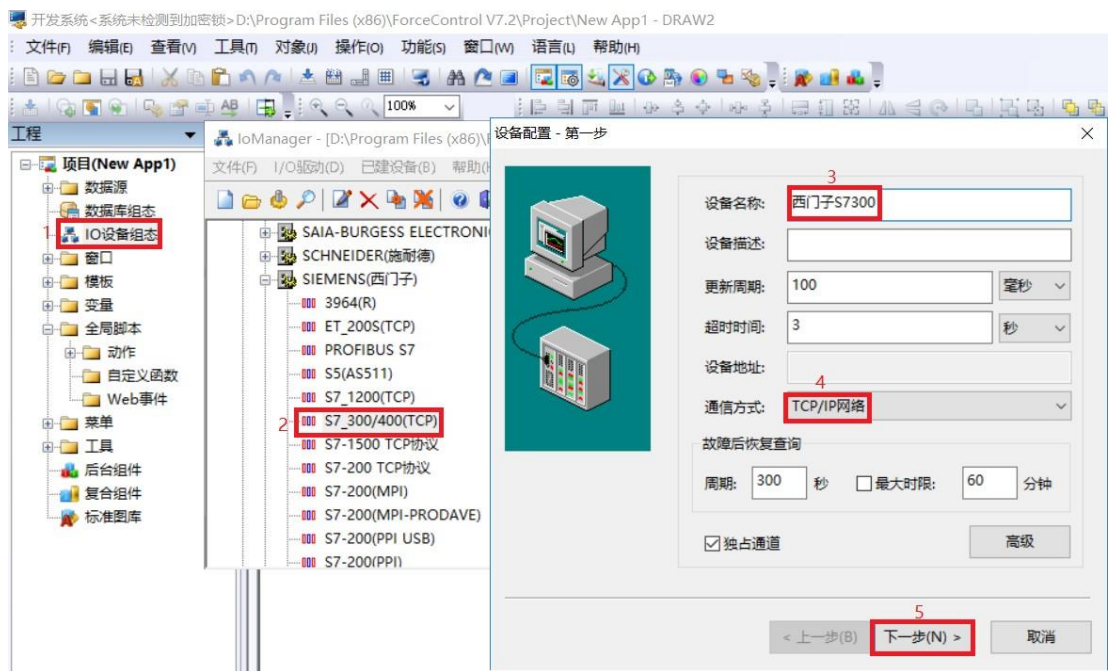
Enter the address of the bridge in the format of [IP address:CPU rack No.: CPU slot No.], the default is 192.168.1.188:0:2, and click [next];



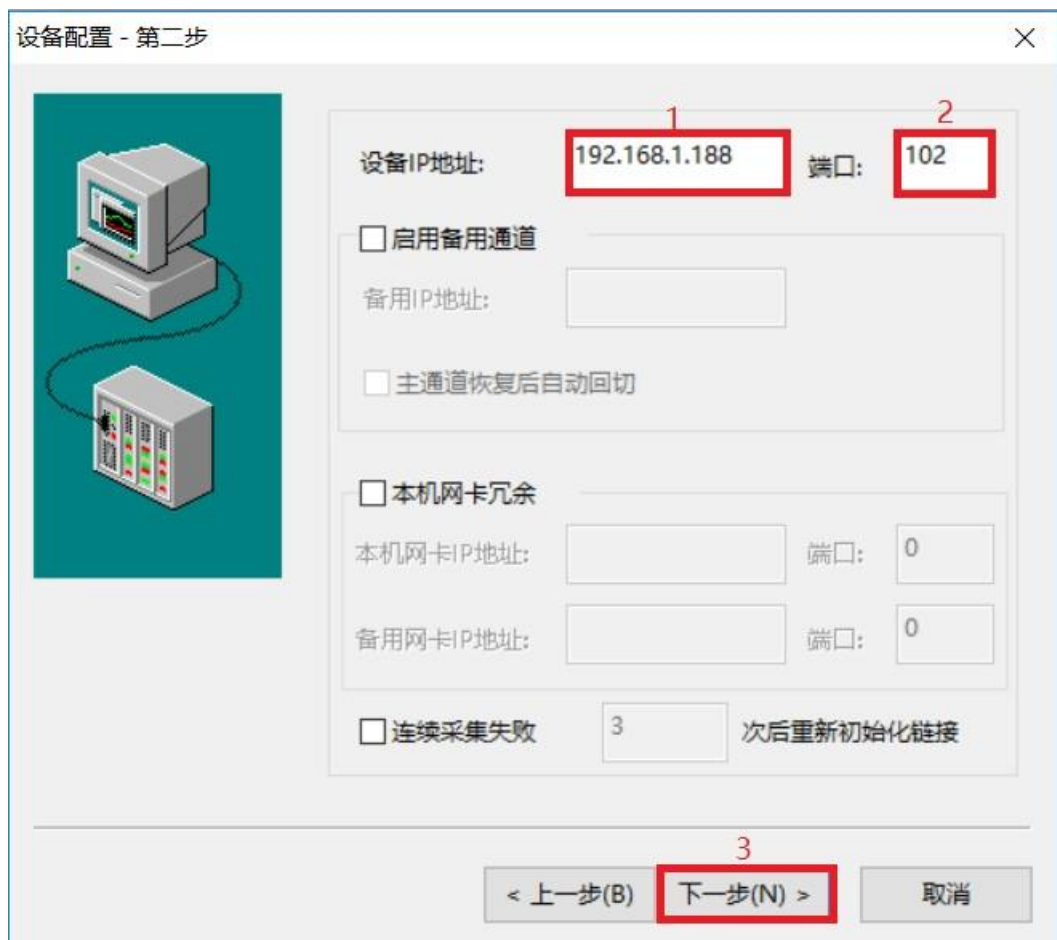
The following steps can be completed by default.

c. ForceControl communication

Create a new IO device, select S7-300/400 (TCP) protocol driver, select TCP/IP network in **[communication mode]** in device configuration, and click **[next]**;



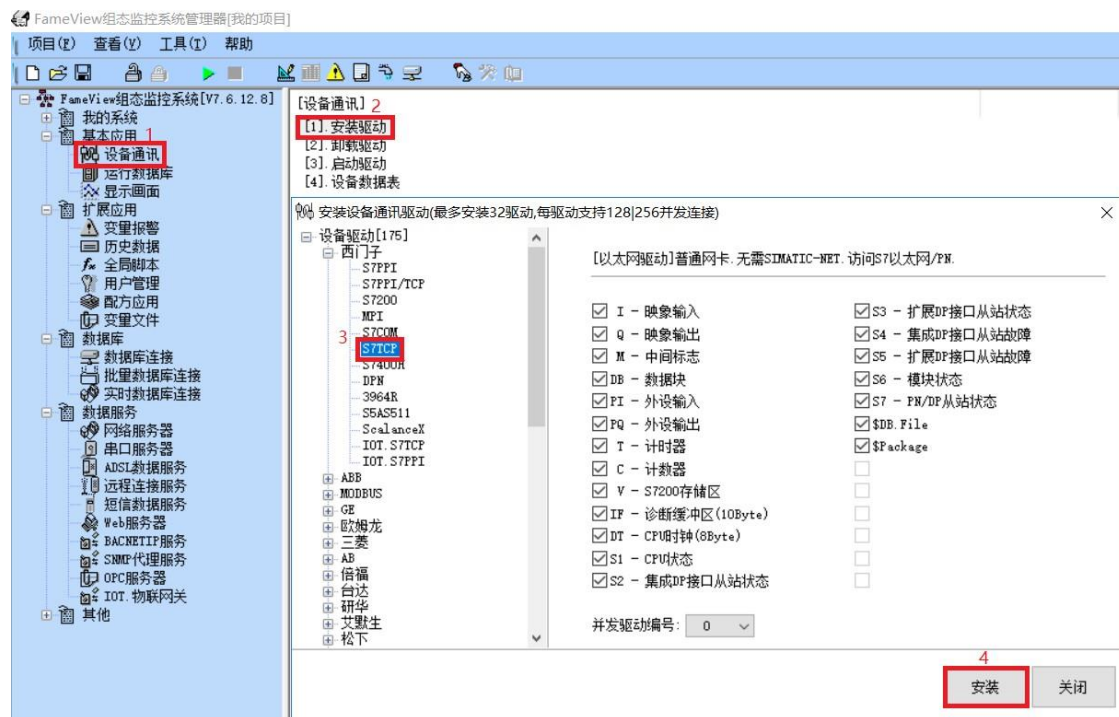
Enter the IP address of the bridge in **[device IP address]** and the port number of the bridge in **[port]**, which is 102 by default. Click the **[next]** button;



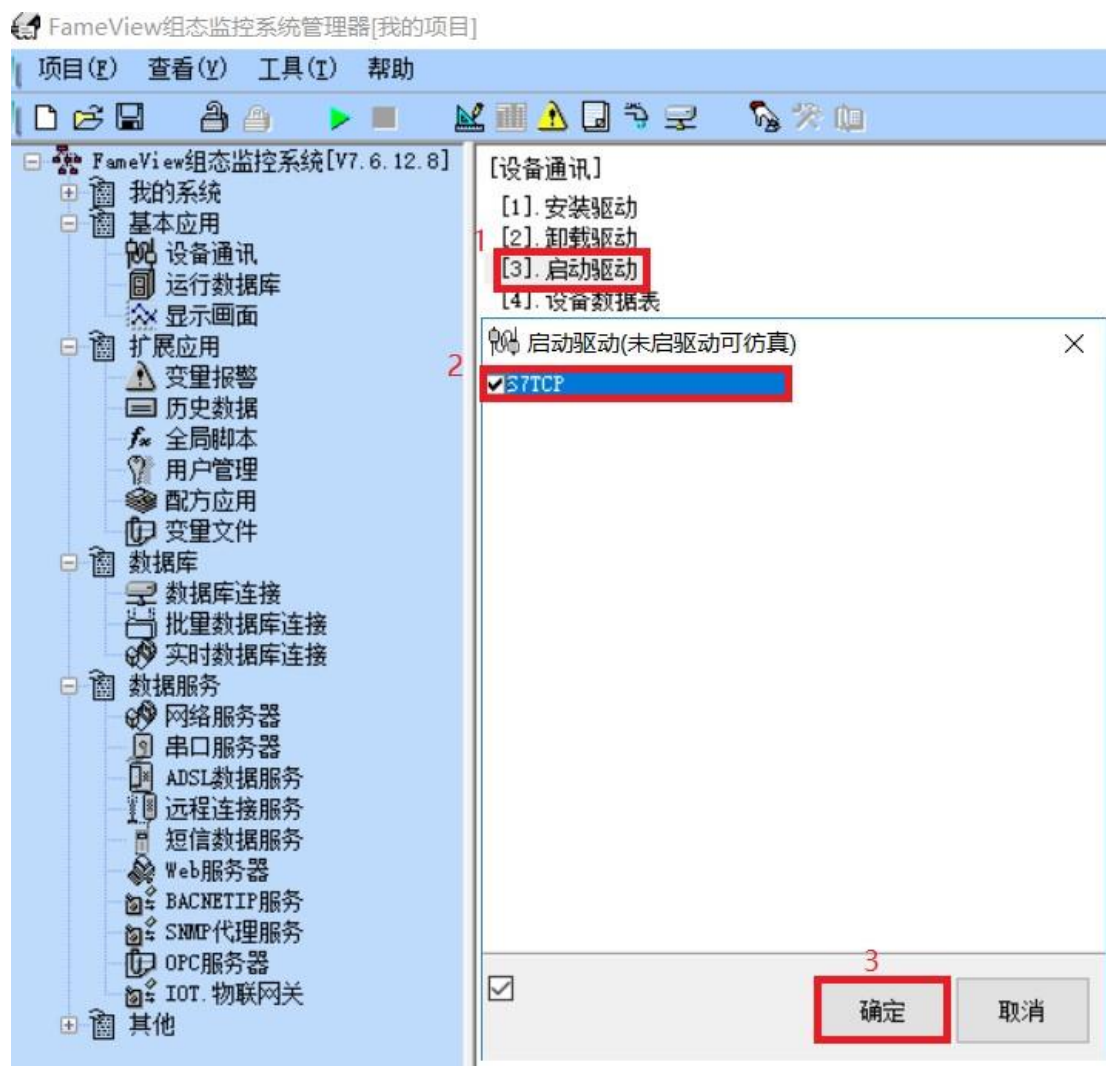
The following steps can be completed by default.

d. FameView communication

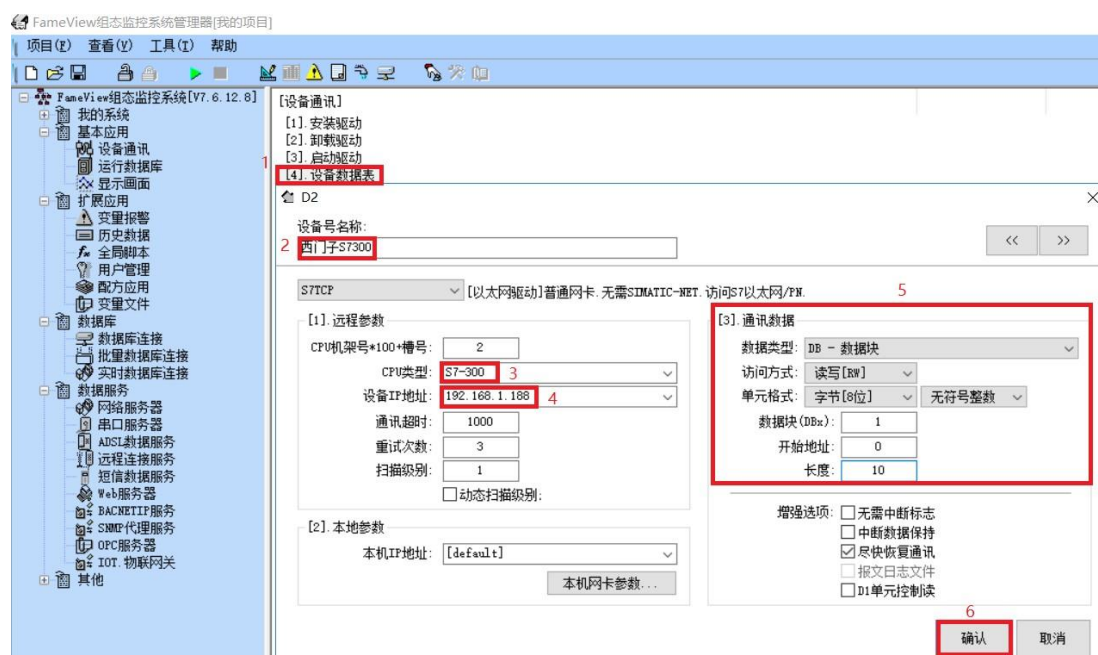
Select **[install driver]** under **[device communication]**, select S7TCP driver, and then click **[install]**;



After selecting the driver to be started, click the **[OK]** button;

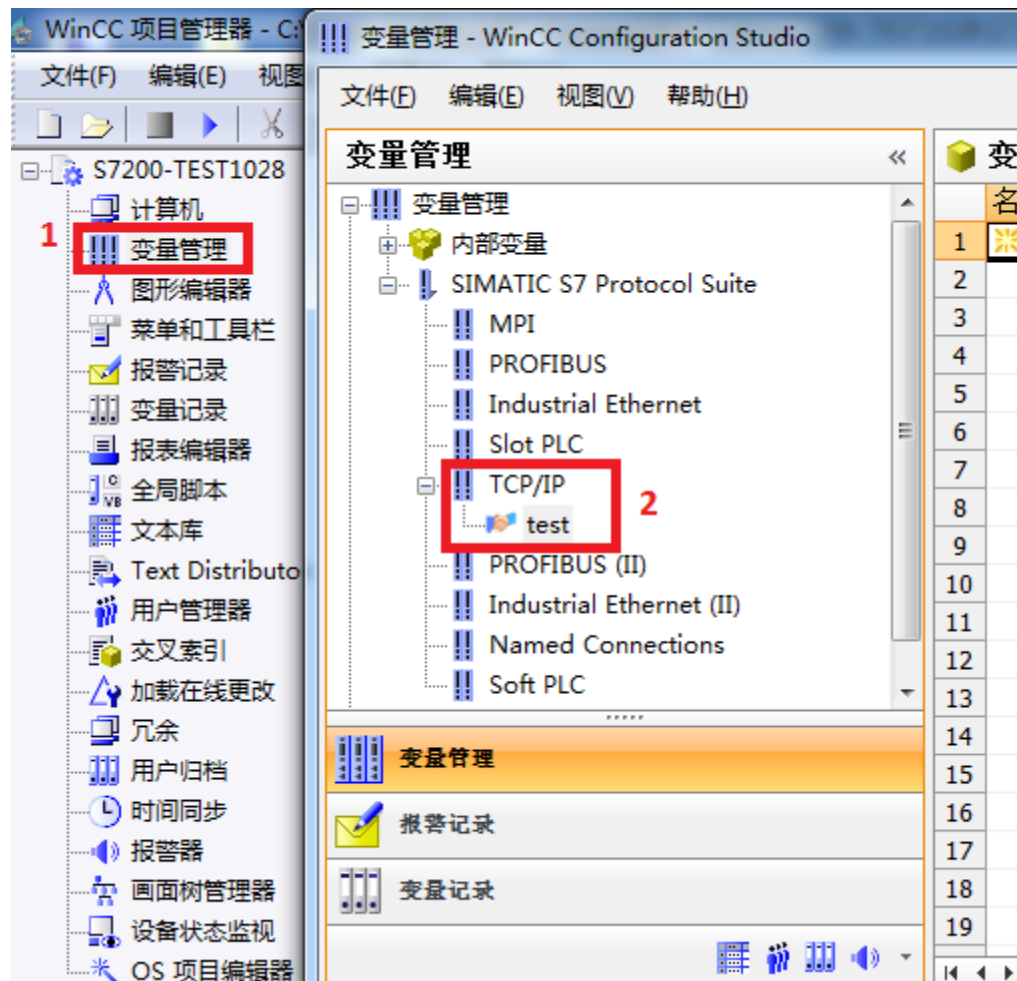


Create a new [equipment data table], select S7-300 in [CPU type], enter the IP address of the bridge in [equipment IP address], set the communication data, and click the [confirm] button.



e. WINCC communication

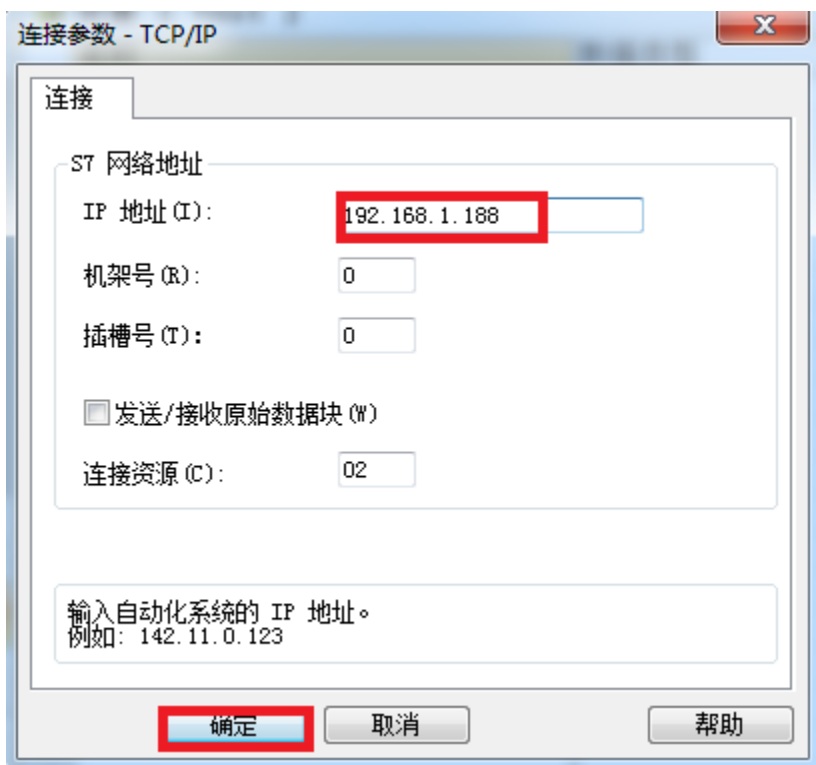
Create a new project, double-click variable management, create a new connection under [TCP/IP] driver protocol, and name the connection, for example: test;



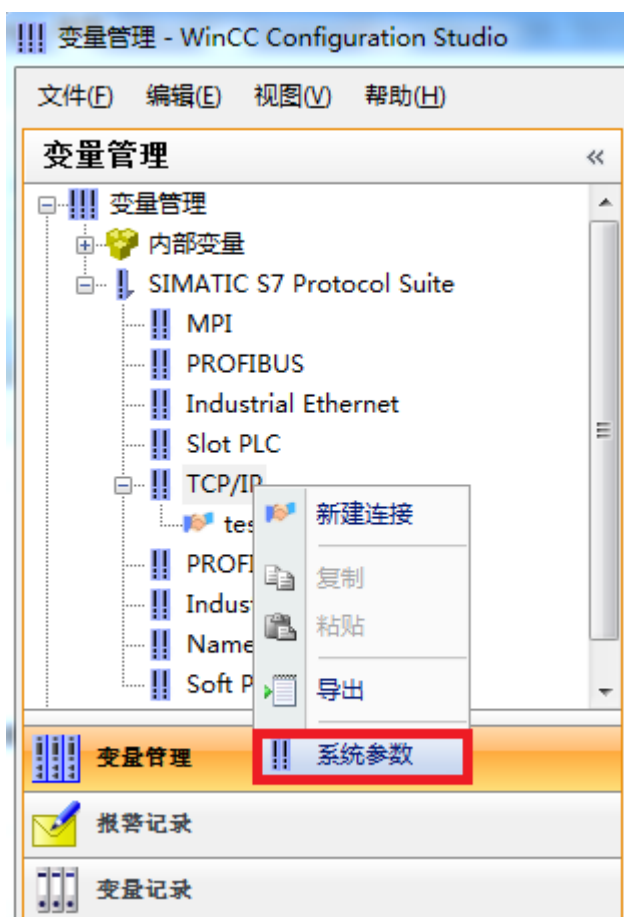
Right click the newly created connection [test] and click the [connection parameters] button;



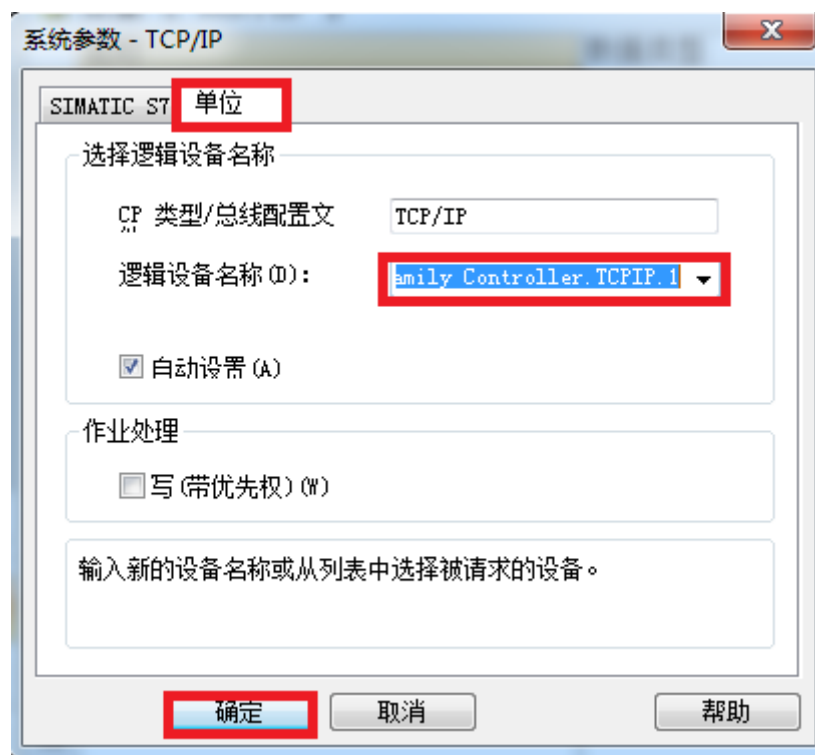
In the pop-up dialog box, enter the IP address of the bridge in [IP address], and click [OK];



Right click [TCP/IP] and click [system parameters];



In the pop-up dialog box, select the [unit] option page, [logical device name] select the network card of the computer (the suffix is TCP/IP, do not select the network card with auto), and click the [OK] button.



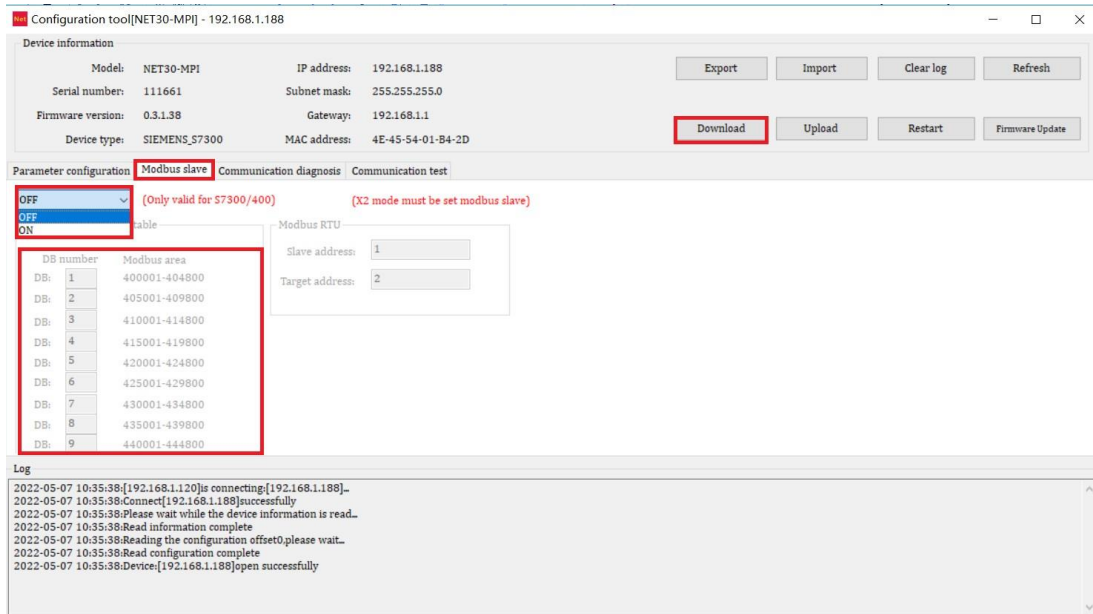
4.ModbusTCP communication

1. Correspondence table between PLC internal register address and MODBUS address

Modbus address	PLC internal register	Data type	Calculation formula	MODBUS function number	Maximum number of instructions
000001~	Q0.0~	Bit	$Qm.n = 000001 + m*8 + n$ ①	FC1(Read coil)	S7-200:119 S7-300:784
050001~	M0.0~		$Mm.n = 050001 + m*8 + n$	FC5(Write coil)	FC5:1
100001~	I0.0~		$Im.n = 100001 + m*8 + n$	FC2(Read input)	S7-200:119 S7-300:784
400001~	DBx.DBW0~	Word	$DB1.DBWm = 400001 + m/2,$ M is an even number ②	FC3(Read multiplication register)	FC3:111
450001~	MW0~		$MWm = 450001 + m/2, M is$ an even number	FC16(Write multiplication register) FC6(Write single multiplication register)	FC16:111 FC6:1

Note description:

- ①:Such as Q1.5,the corresponding MODBUS address is:Q1.5=000001+8*1+5=000014;
 ②:Such as DB1.DBW100,the corresponding MODBUS address is:DB1.DBW100=400001+100/2=400051;
 By default:Modbus area:400001-450000 corresponds to DB1 data block of Siemens 300plc, you can also freely specify corresponding multiple DB data blocks and modify them through exlink tool:



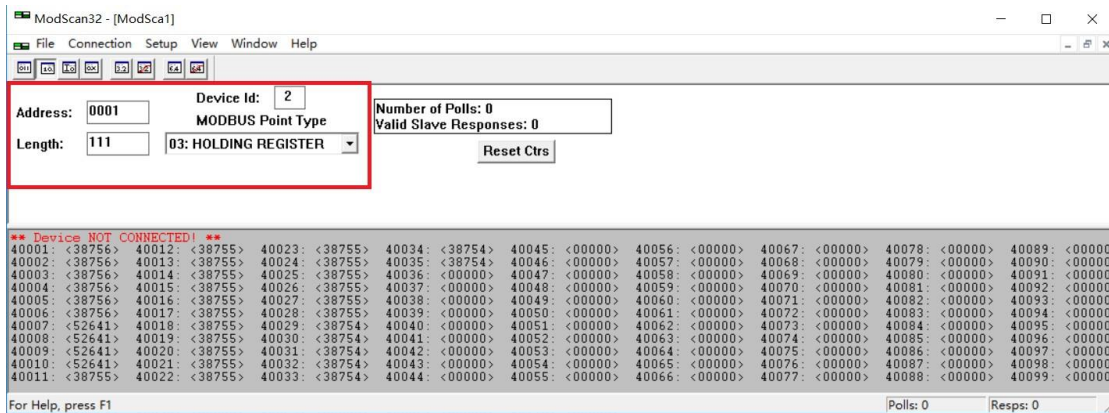
Open [MODBUS slave mapping table] and specify the corresponding relationship between multiple DB block numbers and MODBUS address area;

By default, the Modbus address of DB2.DBW100 is: $DB2.DBW100=405001+100/2=405051$; You can modify the DB block number as required.

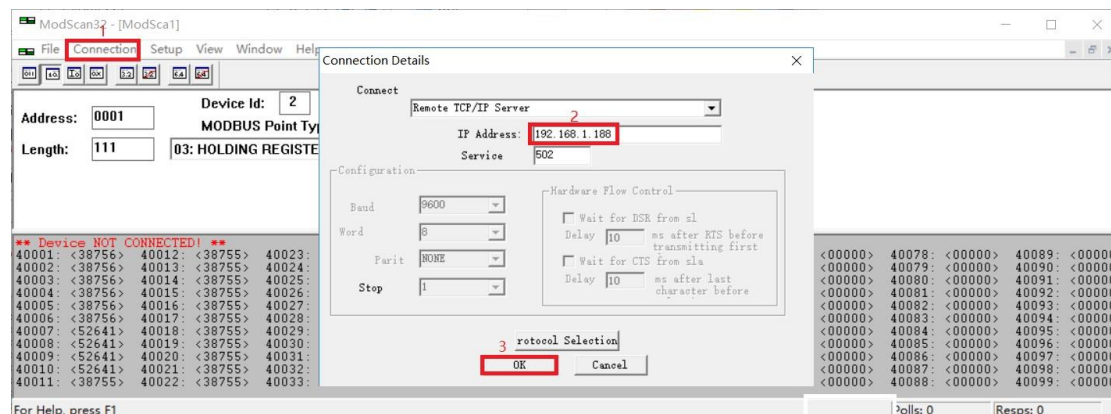
2.ModScan32 test

Open the software and set the data to be tested. For example, read 111 words from 400001.

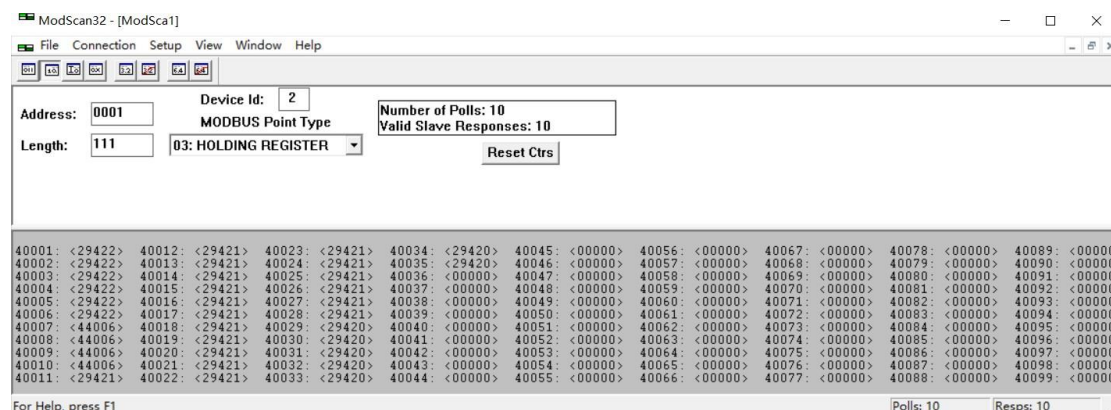
The settings are as follows:



Select [connection] - connect in the menu bar, enter the IP address of the bridge at [IP address] in the dialog box, and click [OK];



The normal test screen is as follows:



6. Technical parameter

Basic parameters	Product Name:	Industrial communication bridge
	Product model:	NET30-MPI
	Description:	Siemens S7-300/400 840D ethernet communication
Product appearance	Shell color:	Industrial black
	Communication indicator:	Pwr/Bus
	Ethernet indicator:	Link/Active
	Reset button:	Reset
	Size (L*W*H):	65*30*17mm
	Weight:	60g
	Installation method:	Communication port plug-in

Industrial communication bridge NET30-MPI

Power Supply	Power supply mode:	PLC communication port direct power supply/ external power supply DIP2
	Voltage:	24VDC/100mA
Communication port Com1	Interface type:	DSUB9F (RS485)
	Transmission rate:	9.6/19.2/187.5K/500K/1.5M BPS
	Communication protocol:	MPI/PROFIBUS
	Supporting equipment:	Siemens S7300/400 PLC
Communication port Com2	Interface type:	DSUB9M (RS485)
	Transmission rate:	9.6/19.2/187.5K/500K/1.5M BPS
	Communication protocol:	MPI/PROFIBUS
	Supporting equipment:	Siemens, Mcgs, Eview, Proface, Kinco etc. hmi
Ethernet communication port	Interface type:	RJ45
	Transmission rate:	10/100M
	Communication protocol:	S7TCP/ModbusTCP
	TCP connections counts:	16
Upper computer software	Programming software:	STEP7/TIA
	Configuration software:	WinCC, MCGS, KingView, ForceControl, FameView, Ifix, Intouch, Labview etc.
	OPC software:	Kepware OPC, Matricon OPC
Parameter configuration	Parameter tool:	EXCLINK
	Web browser:	Default IP:192.168.1.188
Work environment	Temperature:	-20~85°C
	Humidity:	95% non condensing

Industrial communication bridge NET30-MPI

Authentication	Electromagnetic compatibility:	2014/30/EU
	CE	YES

