X2EIP User Manual

Shanghai Sunfull Automation Co., LTD

Singapore Milesgo IIoT Pte Ltd

Content

1 Preface

1.1 Disclaimer

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1.2 Technical Support

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2 Overview

2.1 Feature

- **Functional description**:

  X2EIP is a powerful protocol conversion gateway, where X represents different communication protocols from each company, 2 is a homophone of To representing conversion, and EIP is the final standard protocol supported, which is the Ethernet/IP protocol. Users can configure according to the communication protocol of the on-site device and convert it to the standard Ethernet/IP protocol. After running the simulation on the PC without any errors, upload it to the hardware protocol conversion gateway.

- **Working principle:**

  X2EIP is equivalent to a communication bridge that converts other non-standard communication protocols into the Ethernet/IP communication protocol.This enables devices that support the Ethernet/IP protocol (such as the PLC series from Company AB) to communicate with different devices through a hardware protocol gateway, facilitating system integration..

- Advantage:

  1. Easy to Configure and Operation.
  2. Support Java Script.
  3. Support Chinese and English language to facilitate user operation.
  4. Support PC simulation with X2EIP.
  5. Support the User review data and communication status. And download files and X2EIP software from website.
  6. Support different protocol transfer to Ethernet/IP Protocol.
  7. Gateway support analog linear transformation, support function, high and low byte exchange function.

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8. Support the user permission management.

2.2 Operation Platform

- Support Win 7/Win8/Win10/ XP/2000/2003
- WEB browser with Google Chrome、IE9 and above、Opera、Safari、and firefox

2.3 Applicable product models

EIP1002-ARM, EIP2004-ARM, EIP2004-A9.

2.4 Supported Registered Type and Number

The register types and points supported by the gateway are dynamically al located.EIP1002-ARMsupports 512 points, EIP2004-ARM supports 1024 points, and EIP12004-A9 supports 2048 points.

2.5 Application Fields

The EIP gateway supports multiple protocol conversions and is used to solve the problem of integrating other manufacturers' equipment into the AB series PLC. For example, in building automation, it includes DDC, central air conditioning, precision air conditioning, elevators, fire protection, lighting control systems, electricity meters, water meters, and PLCs from other manufacturers.

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3 Configuration And Operation

X2EIP is a configuration software running on the PC. It used to configure project, upload the project to the machine hardware gateway. Finally, monitor by hardware gateway. X2EIP also can be used alone on the PC .

Double click X2EIP. exe(It is recommended to run as an administrator), open the main interface, as the following figure 3-1.

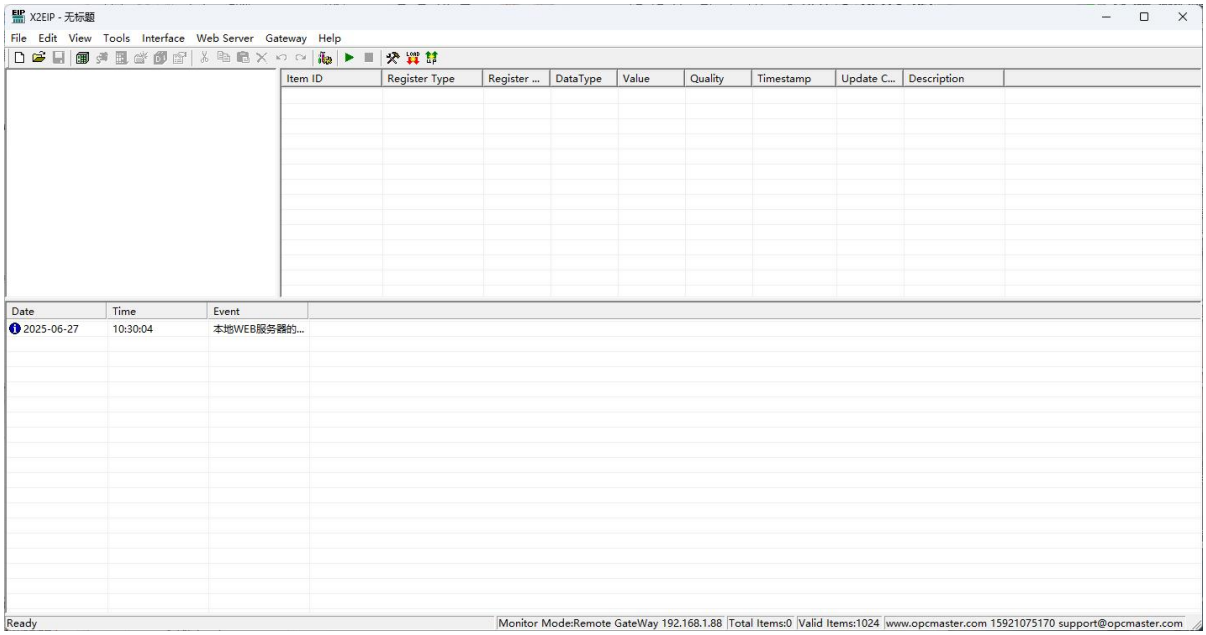

Figure 3-1 Main interface

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3.1 New Driver

Click edit to choose "New driver" or click on the toolbar icon , as following figure 3-1-1. Here as X covers many of the agreement, we choose the Modbus RTU protocol as an example. If you need to understand other protocol configuration, please click "help" menu under "Communication Manual", open the Communication Manual - Ch. PDF.

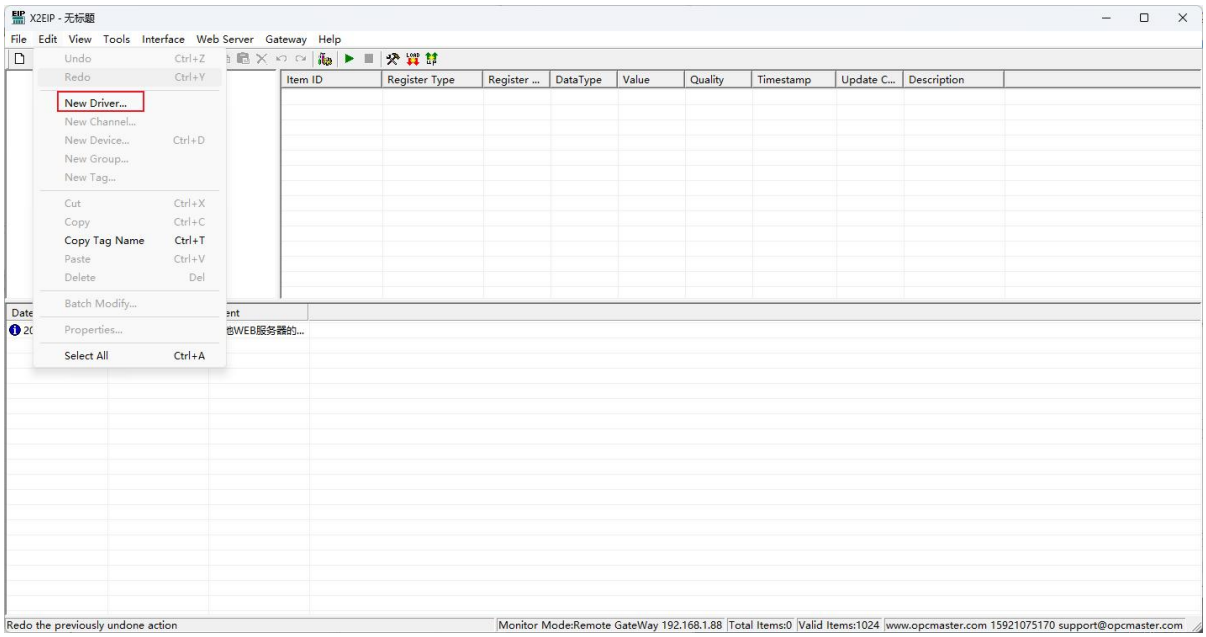

Figure 3-1-1 New Driver

Choose Driver Modbus RTU. As the below Figure 3-1-2.

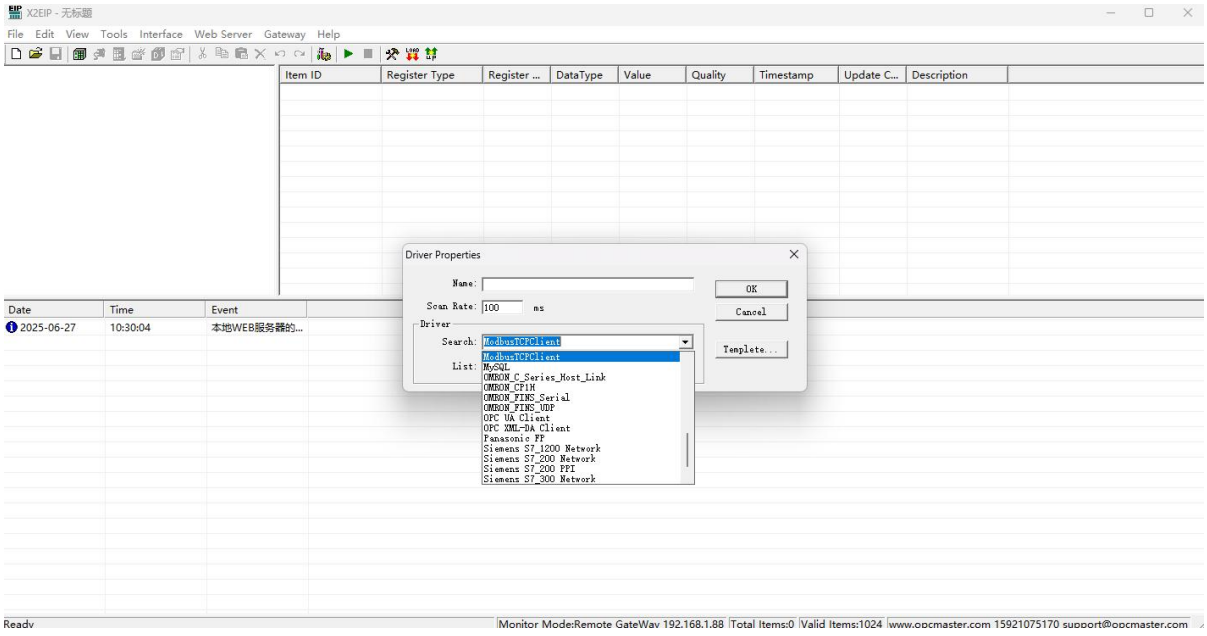

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Figure 3-1-2 Choose driver

Edit drive properties. As the below Figure 3-1-3.

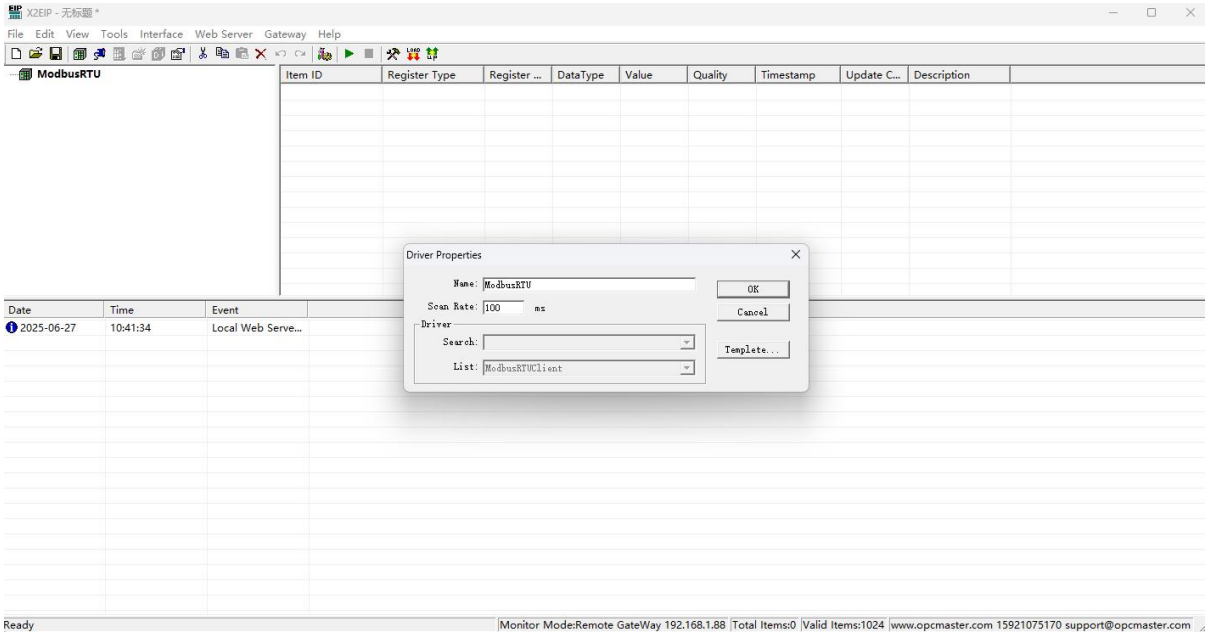

Figure 3-1-3 Driver Properties

Input driver name in the name of the project, the default Scan Rate is 1000 milliseconds. Scan Rate can adjust the frequency of access to all devices. If the time required to access all the devices is greater than the set scan rate, this time is invalid. if the time required to access all the devices is less than the set scan rate, the waiting time needs to reach the set scan rate for the next visit. user can according to the actual situation, change the scan rate.

After finish adding driver, as the below figure 3-1-4.

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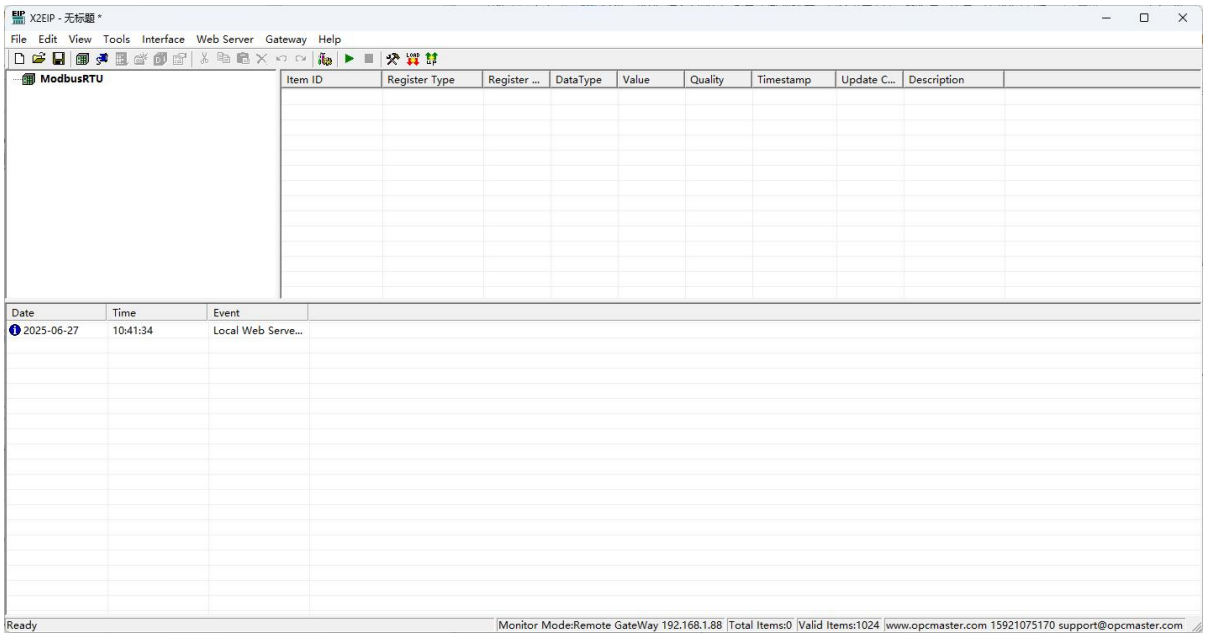

Figure 3-1-4 finish adding driver

3.2 New Channel

In the current driver, right click to select "New Channel" or click on the toolbar  .As the following figure 3-2-1.

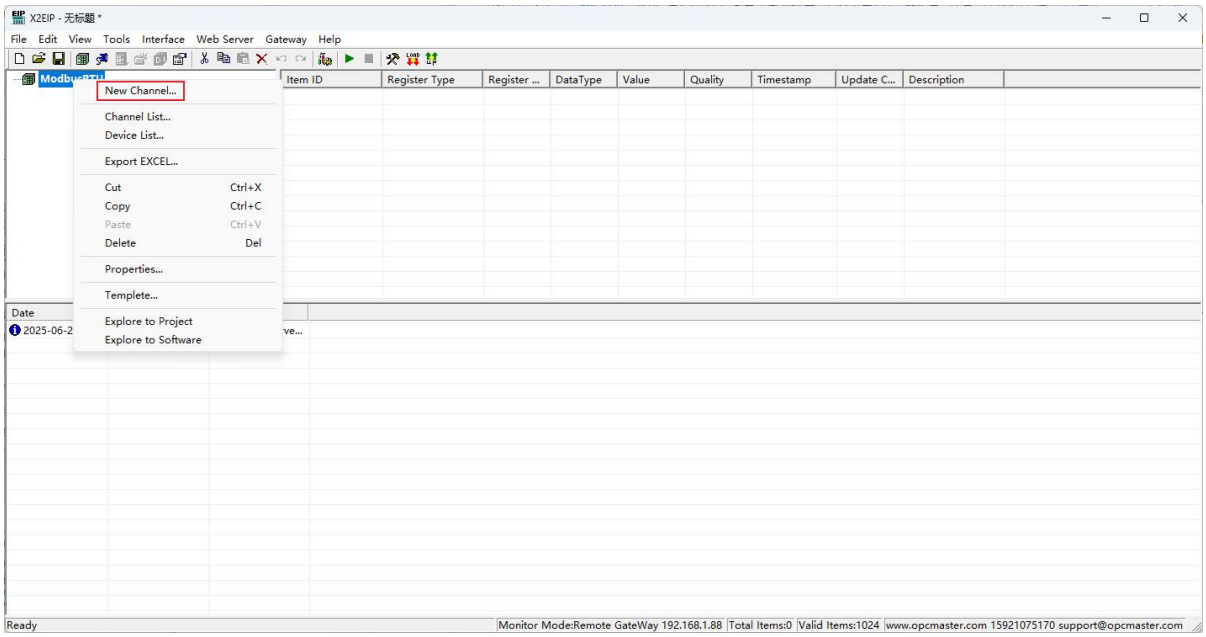

Figure 3-2-1 New Channel

In the pop up window, according to corresponding set by the driver communication protocol channel names can be arbitrary naming. As the following figure 3-2-2.

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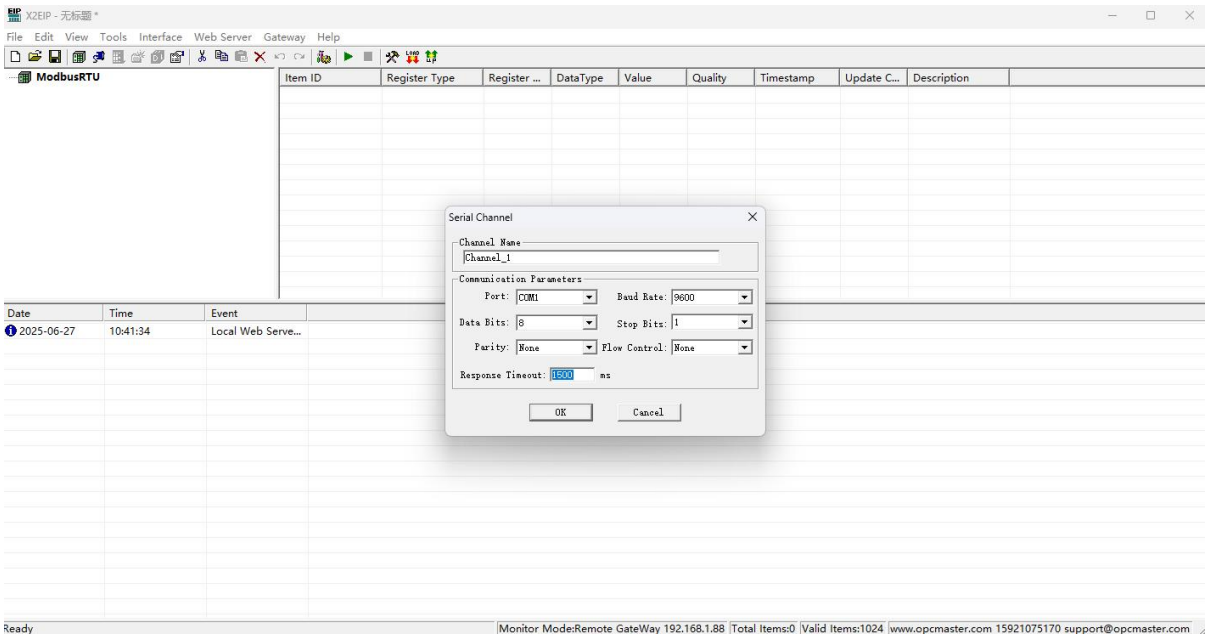

Figure 3-2-2 Set communication parameters

Since the acquisition terminal is intended to collect data from Modbus slave stations, so the setting of the setting of serial communication parameters should be consistent with the parameters in Modbus Slave.

When communication is normal, response timeout set longer does not affect communication speed. If the response speed of the device is relatively slow, it is recommended to set up a bit longer to avoid communication failure, As the following figure3-2-3.

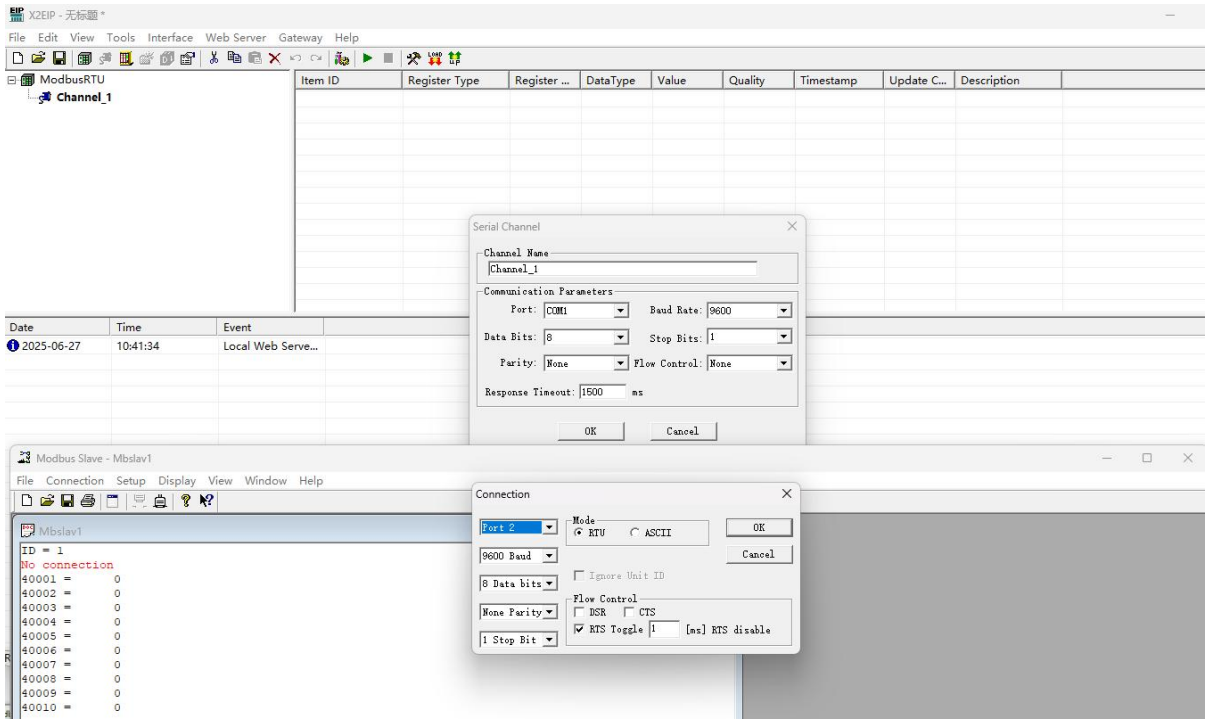

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Figure 3-2-3 Channel parameters are consistent

After finish adding the channel, As the following figure 3-2-4.

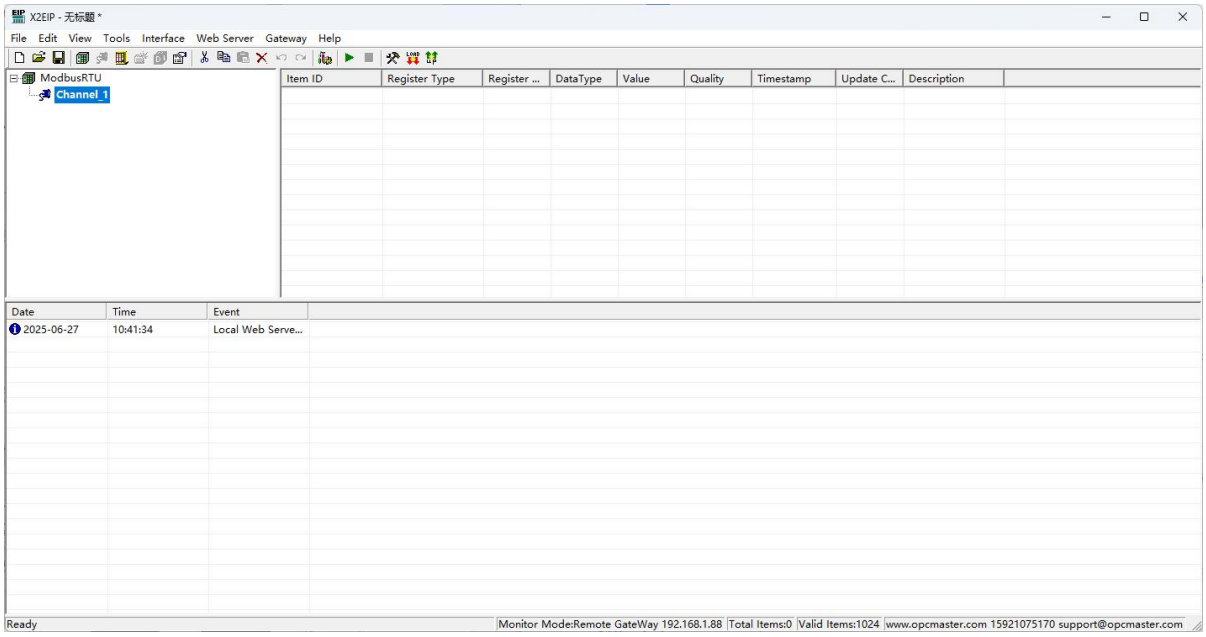

Figure 3-2-4 finish adding Channel

3.3 New Device

In the current Channel, Right-click to choose "New Device", or click on the toolbar  . As the following figure 3-3-1.

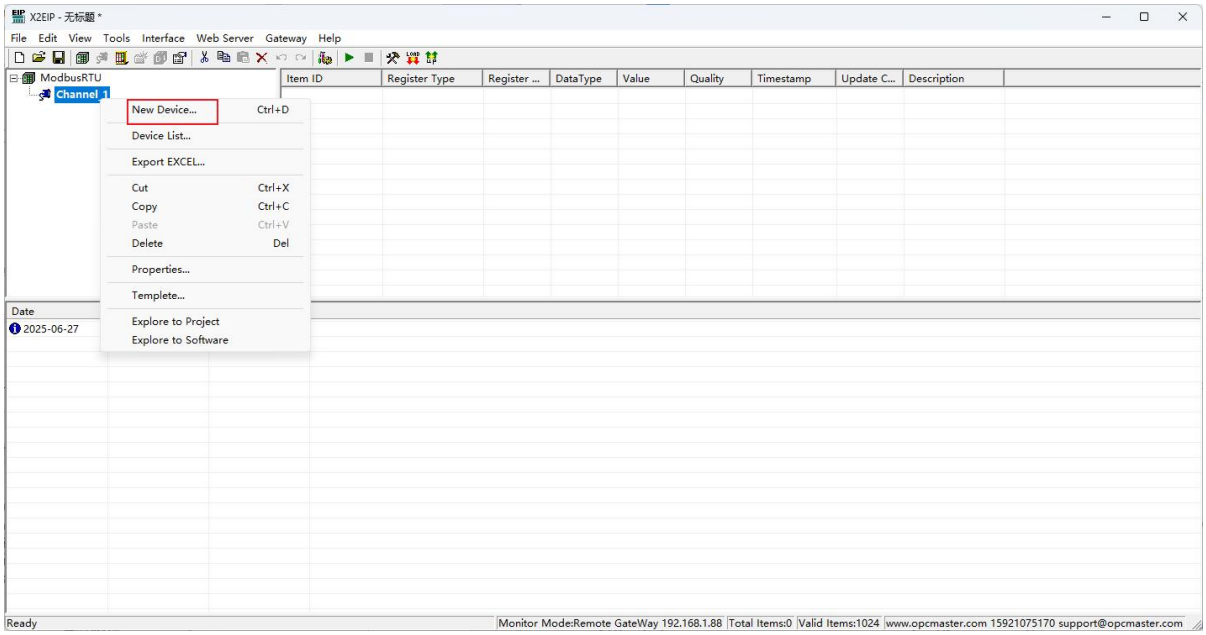

Figure 3-3-1 New Device

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In the pop-up window set device properties , As the following figure 3-3-2.

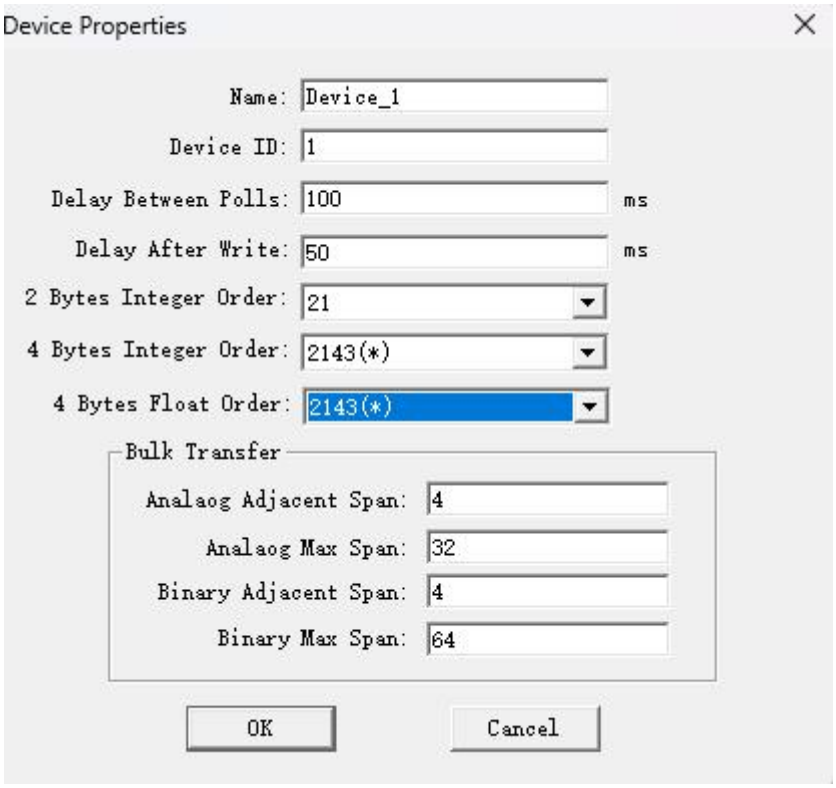

Figure 3-3-2 Device Properties

Device ID: The Modbus slave station address of the collected device (within the range of 0 to 255).

Delay Between Polls: The interval time between sending the next frame request and the previous frame request. The longer the interval time, the slower the device's reading speed will be. This parameter is usually set by default and will affect the overall communication speed.

Delay After Write: After the write value command is issued normally, after this interval, the point can be read separately from the device, usually by default.

Byte order: 2-byte order is used for parsing Word and Short data types, with a default of 21; The 4-byte order is commonly used for parsing two data types, Dword and Long, with 2143 and 4321 being commonly used. Floating point order is the parsing order for two data types, Float and Double, commonly used in 2143 and 4321. Byte order adjustment function

It can be used in conjunction with actual equipment on site for data transmission,

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such as adjusting the order of high and low positions in some electricity meters during data transmission, which will be used for this function.

Packet Assembly: In order to improve communication speed when the collected device supports the communication protocol of Packet Assembly, the Adjacent Span and Max Span can be adjusted to achieve Packet Assembly communication under the same register type and continuous register addresses. When the device does not support Packet Assembly communication, the parameters of Packet Assembly should be set to 0.

After finish adding the device, As the following figure 3-3-3.

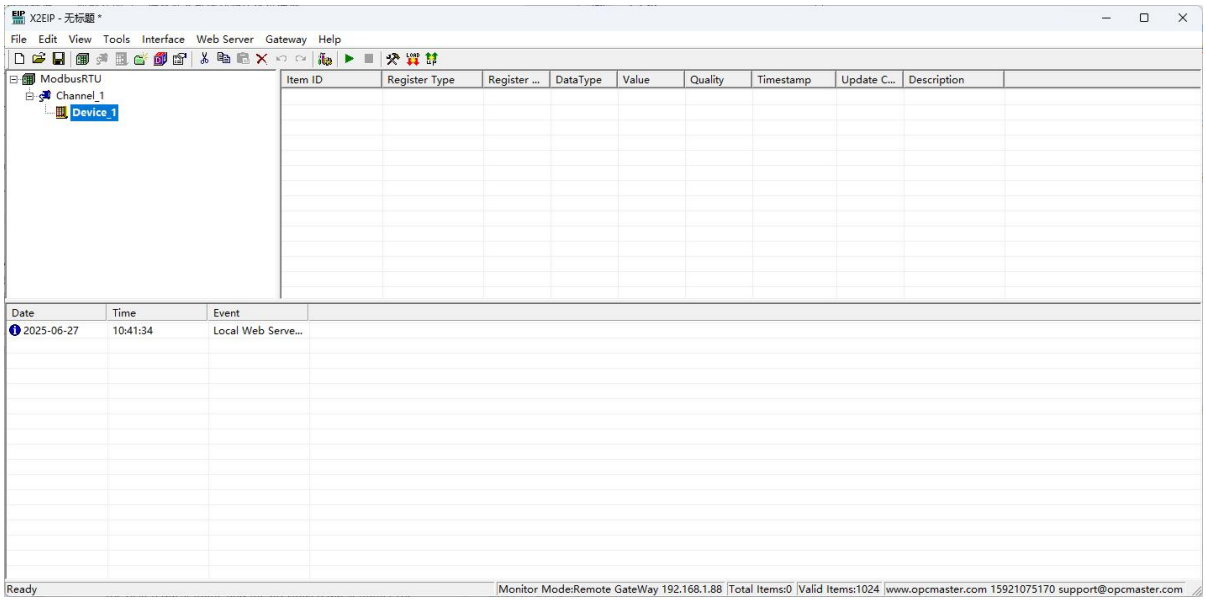

Figure 3-3-3 finish adding the device

3.4 New Tag

In the current Channel, Right-click to choose directly add tag (also add group first, and then new tag in the group), or click on the toolbar , As the following figure 3-4-1.

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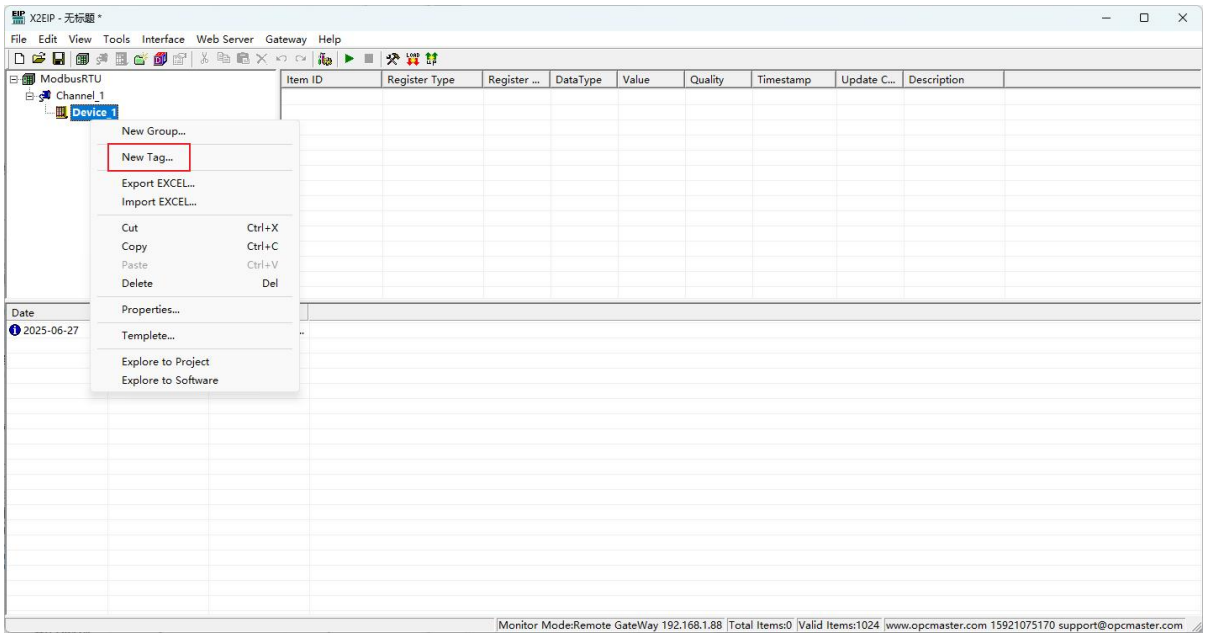

Figure 3-4-1 New Tag

In the pop-up dialog box , Set the parameters of collection and transfer(Modus Server). .As the following figure 3-4-2.

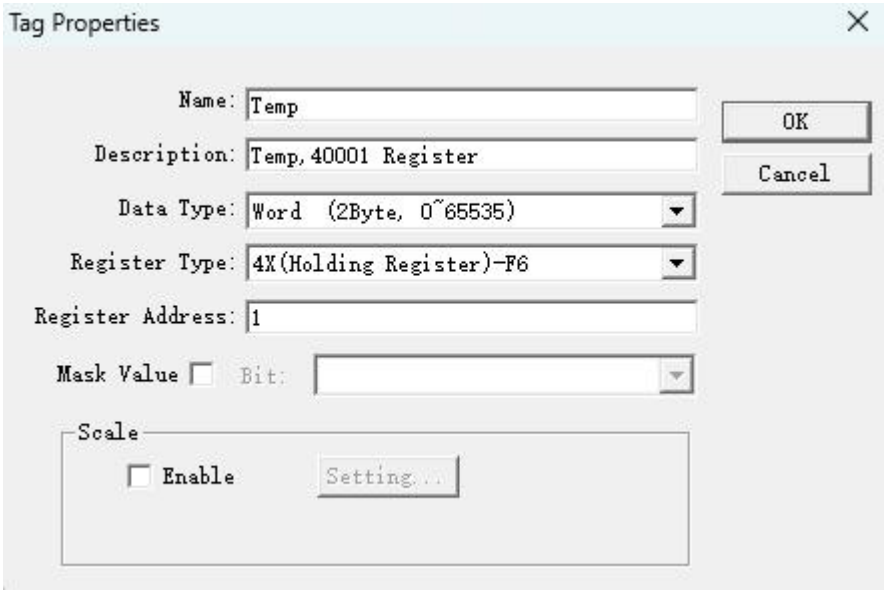

Figure 3-4-2 Tag Properties

Set the tag name, data type, register type and register address of the acquisition end in the tag attribute. The register address of the acquisition end selected in the above figure is 4X0001, and the data type is Word type. Additionally, when the data type is Short, Word, Long or DWord, the data bit values can be taken according to bytes. For some special data, the linear conversion function can be enabled to achieve linear amplification and reduction of the data.

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Click "OK" to complete the addition of the tag, as shown in Figure 3-4-3.

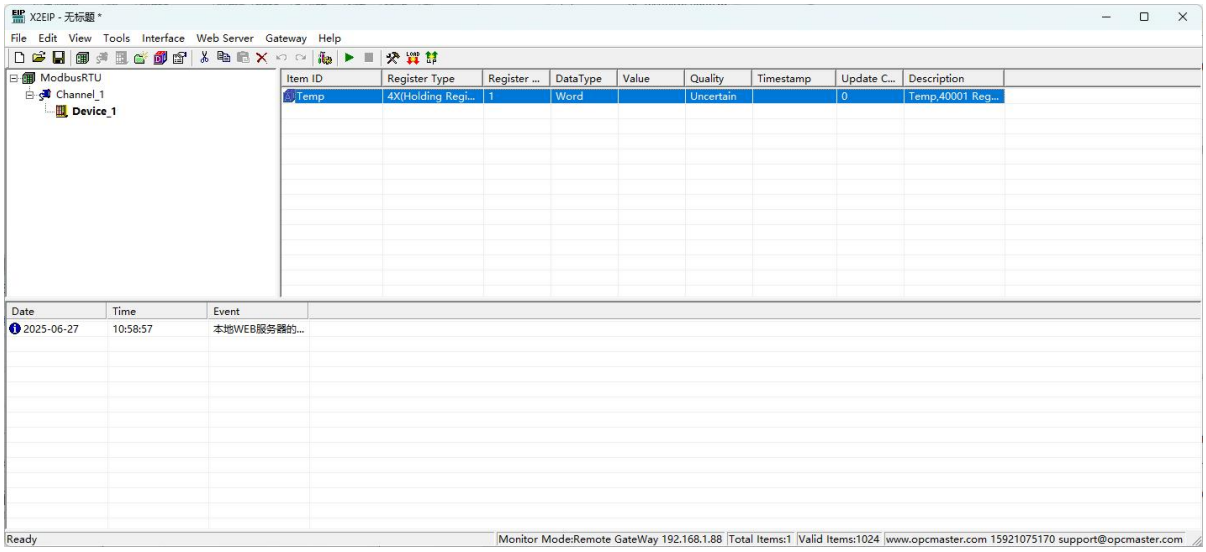

Figure 3-4-3 Finish adding a tag

You can continue to add steps one by one, and suggest using the copy and paste of the toolbar. Select a tag to copy, click the copy button in the toolbar, or choose the copy on the right button, or use shortcut key Ctr+C and Ctrl+V, as the following figure 3-4-4。

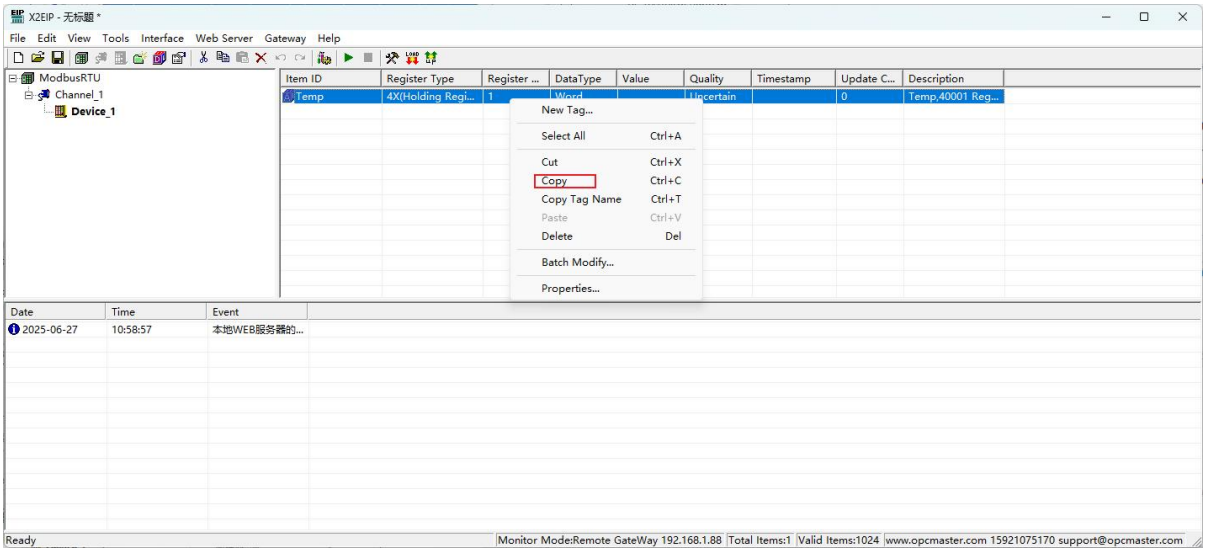

Figure 3-4-4 Copy Tag

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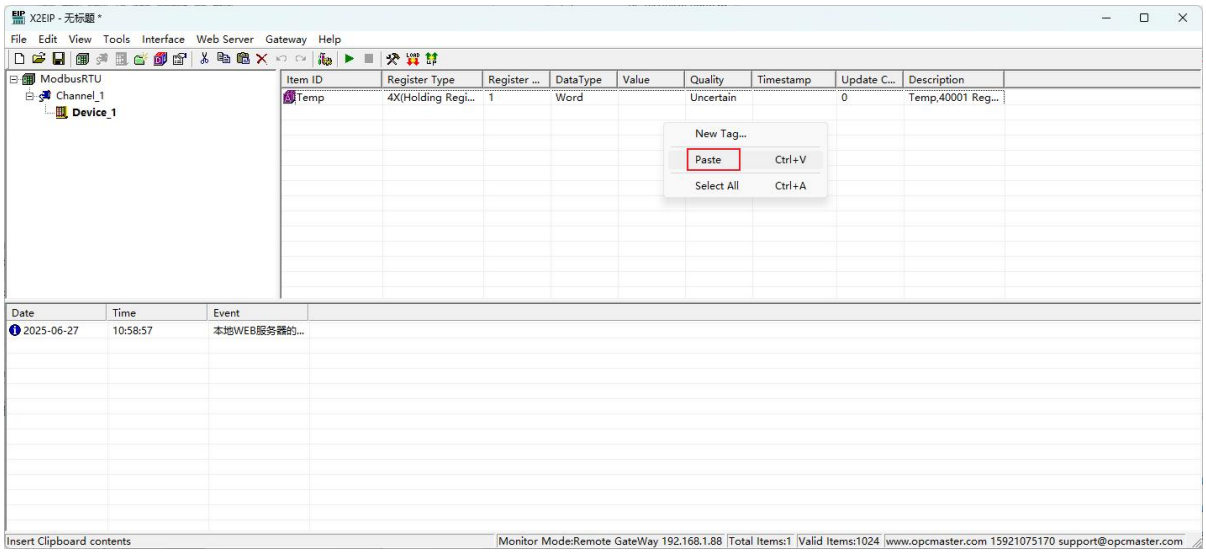

Figure 3-4-5 Paste Tag

It will automatically add new tags. The parameters of the new tags (such as the addresses of Modbus registers) will be automatically generated accordingly. The settings need to be made based on the actual situation on site, as shown in Figure 3-4-6.

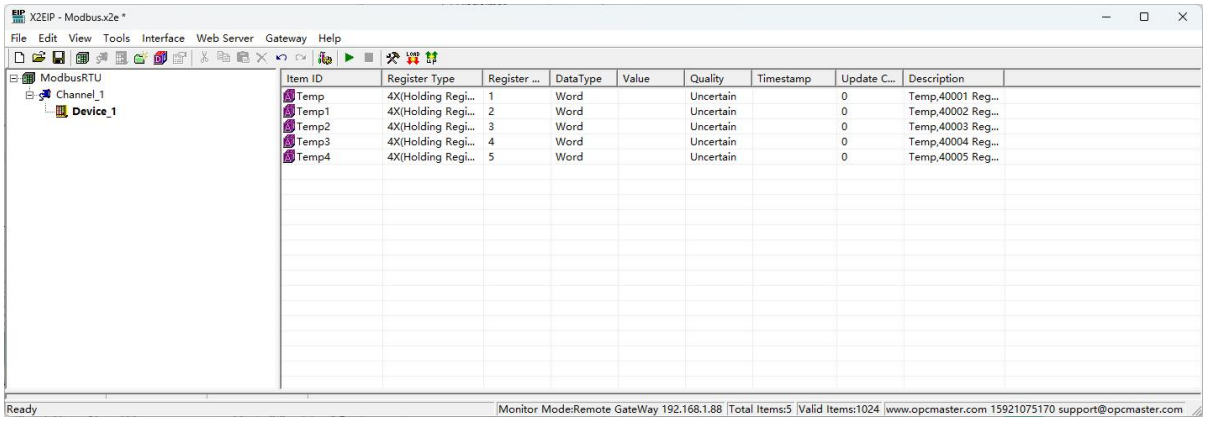

Figure 3-4-6 Copy tags completed

It can also be edited in the EXCEL table, and then edit the engineering point by importing excel and exporting excel functions.

Right-click the device to choose “Export EXCEL”, As the figure 3-4-7. Save as xls file.

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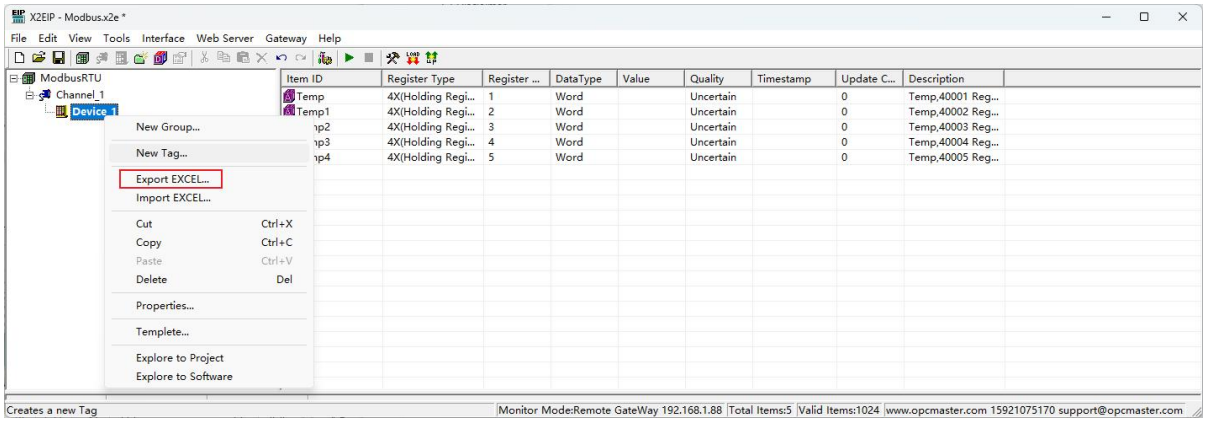

Figure 3-4-7 Export EXCEL

Save the completed, open the EXCEL for editing.

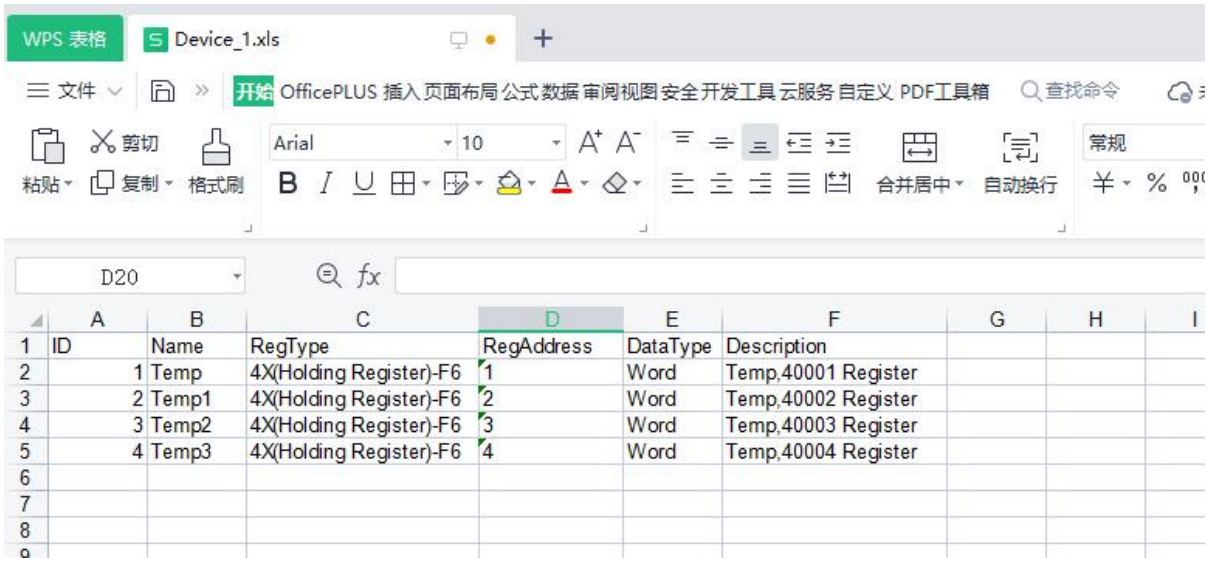

Figure 3-4-8 Open the EXCEL

After editing the Excel file, As the figure 3-4-9.

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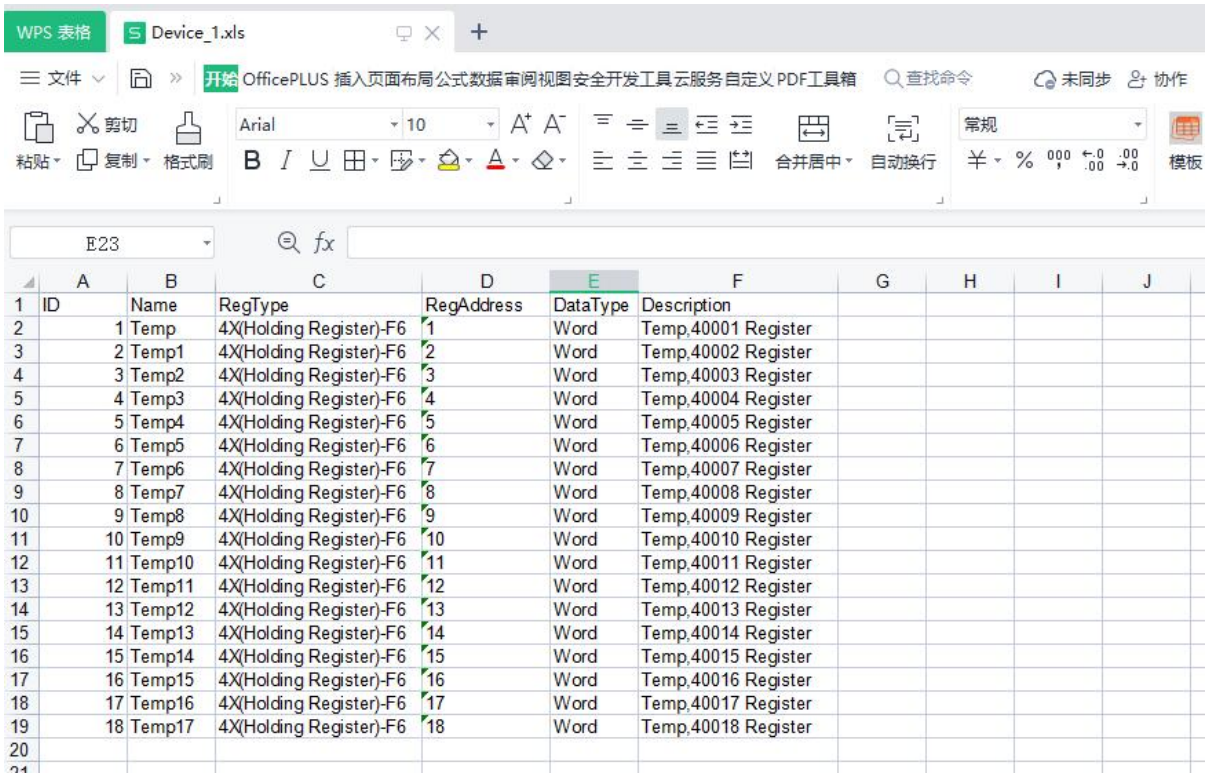

	A	B	C	D	E	F	G	H	I	J
1	ID	Name	RegType	RegAddress	DataType	Description				
2	1	Temp	4X(Holding Register)-F6	1	Word	Temp,40001 Register				
3	2	Temp1	4X(Holding Register)-F6	2	Word	Temp,40002 Register				
4	3	Temp2	4X(Holding Register)-F6	3	Word	Temp,40003 Register				
5	4	Temp3	4X(Holding Register)-F6	4	Word	Temp,40004 Register				
6	5	Temp4	4X(Holding Register)-F6	5	Word	Temp,40005 Register				
7	6	Temp5	4X(Holding Register)-F6	6	Word	Temp,40006 Register				
8	7	Temp6	4X(Holding Register)-F6	7	Word	Temp,40007 Register				
9	8	Temp7	4X(Holding Register)-F6	8	Word	Temp,40008 Register				
10	9	Temp8	4X(Holding Register)-F6	9	Word	Temp,40009 Register				
11	10	Temp9	4X(Holding Register)-F6	10	Word	Temp,40010 Register				
12	11	Temp10	4X(Holding Register)-F6	11	Word	Temp,40011 Register				
13	12	Temp11	4X(Holding Register)-F6	12	Word	Temp,40012 Register				
14	13	Temp12	4X(Holding Register)-F6	13	Word	Temp,40013 Register				
15	14	Temp13	4X(Holding Register)-F6	14	Word	Temp,40014 Register				
16	15	Temp14	4X(Holding Register)-F6	15	Word	Temp,40015 Register				
17	16	Temp15	4X(Holding Register)-F6	16	Word	Temp,40016 Register				
18	17	Temp16	4X(Holding Register)-F6	17	Word	Temp,40017 Register				
19	18	Temp17	4X(Holding Register)-F6	18	Word	Temp,40018 Register				
20										

Figure 3-4-9 Edit the EXCEL

Back to X2EIP software, Right-click the device to choose “Import Excel”, find the edited Excel file to import. As the following figure 3-4-10.

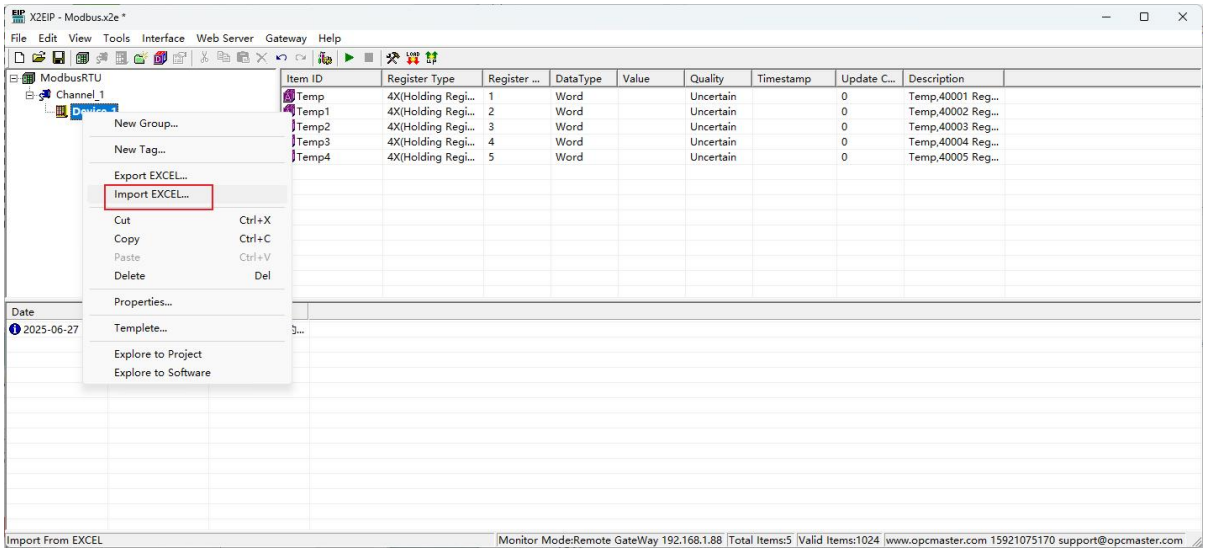

Figure 3-4-10 Import EXCEL

The import is complete, the following figure 3-4-11.

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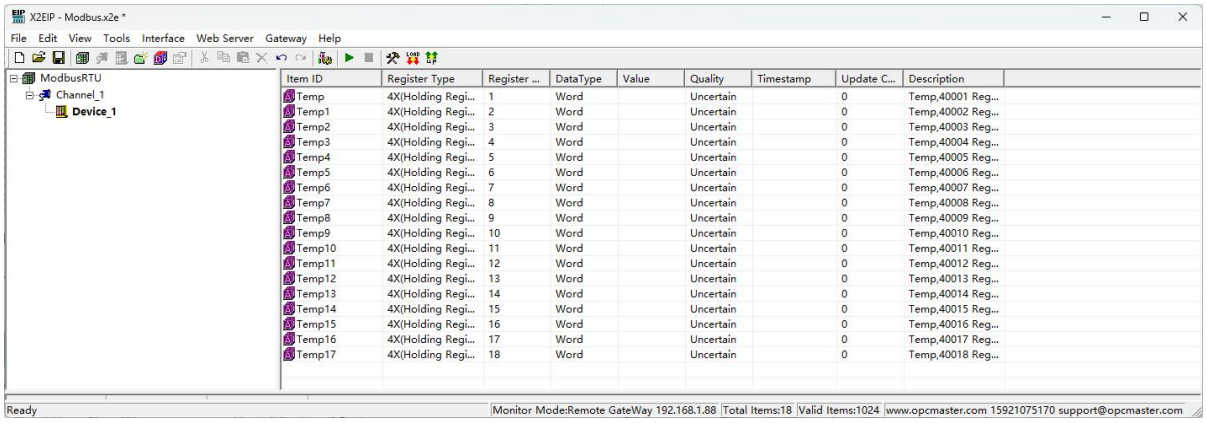

Figure 3-4-11 Complete the import

3.5 EtherNet/IP Server(Slave station)Setting

3.5.1 EtherNet/IP Setting

Click on the menu bar "Interface", then select "EtherNet/IP Server"as the figure 3-5-1-1.

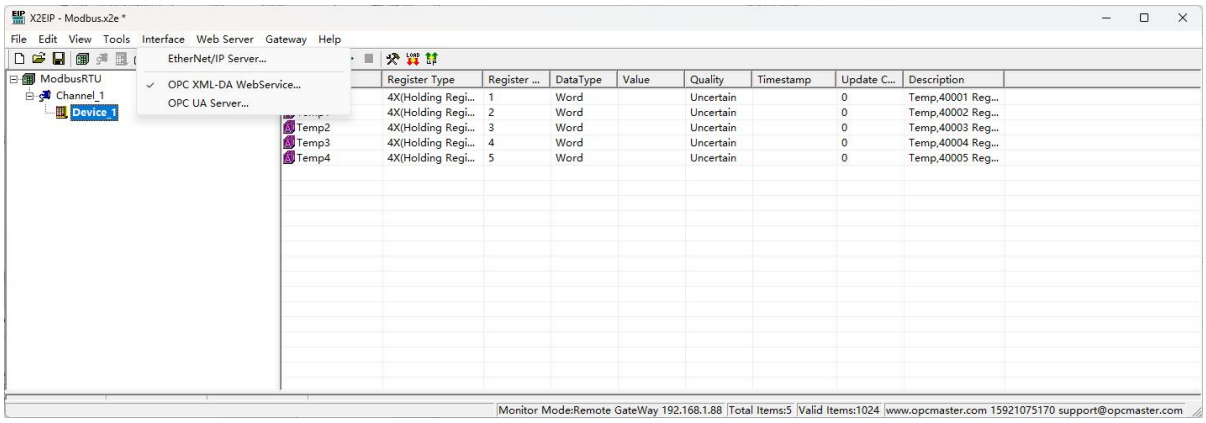

Figure 3-5-1-1 Select EtherNet/IP Server

In the popped-up dialog box, set the EtherNet/IP Server settings. The port number is fixed at 44818. As the figure 3-5-1-2.

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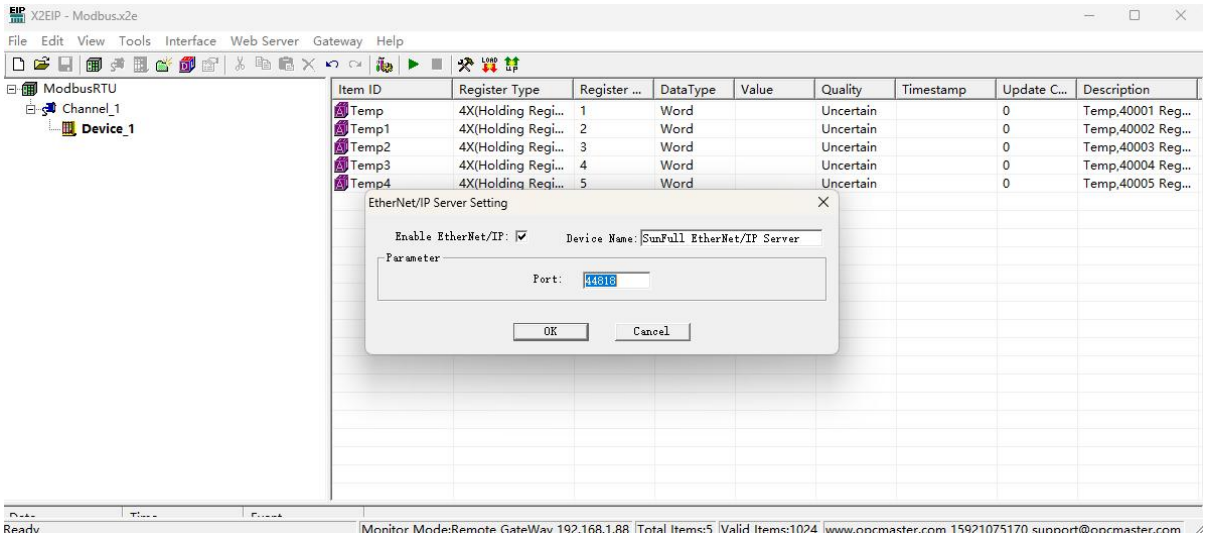

Figure 3-5-1-2 Parameter setting

3.6 Local PC Monitor

After completing the project configuration, click the menu bar "Tools" to select "Start Monitor" or click the toolbar icon , as shown in figure 3-6-1 below.

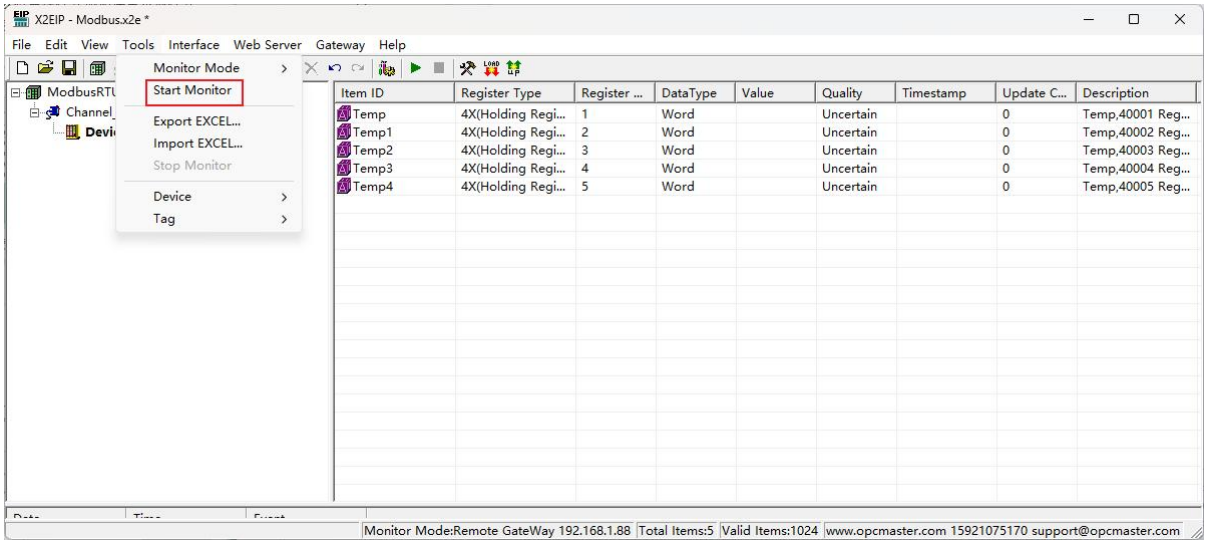

Figure 3-6-1 Select start Monitor

Note: The X2EIPRuntime program will only be enabled when using the soft gateway on a PC or during simulation.

Then the X2EIPRuntime runtime program will be started. In the local mode, it can only simulate data acquisition but cannot perform data forwarding. As shown in figure 3-6-2.

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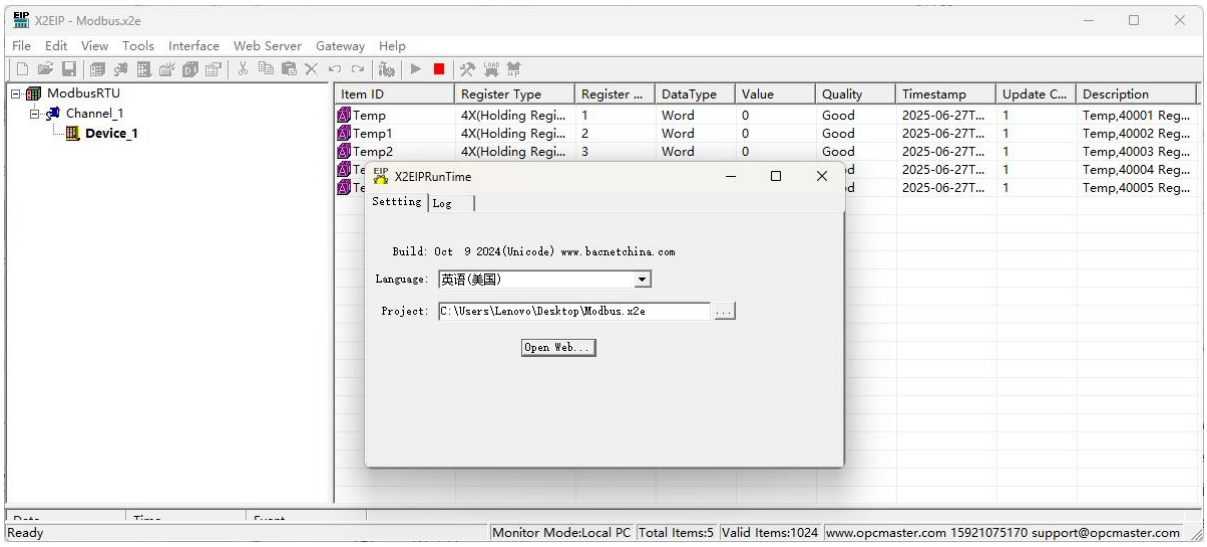

Figure 3-6-2 X2EIP Runtime Main Interface

In the X2ProfinetRunTime program, you can view the operation log and switch the operating language. You can also switch the operating language of X2ProfinetRunTime. Additionally, you can click the "Open Webpage" button to quickly log in to the Web server to view the data. If the IE browser opens a blank page, simply refresh the page, as shown in figure 3-6-3.

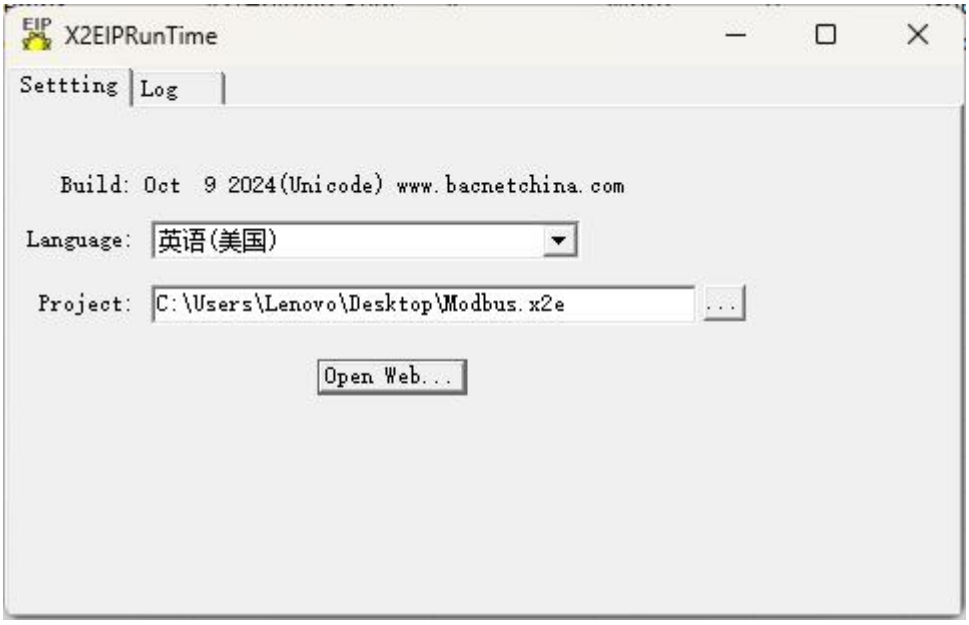

Figure 3-6-3 Open Webpage

Return procedure monitoring interface, can see some real time data on the device and the data on the interface is consistent, As the Figure 3-6-4.

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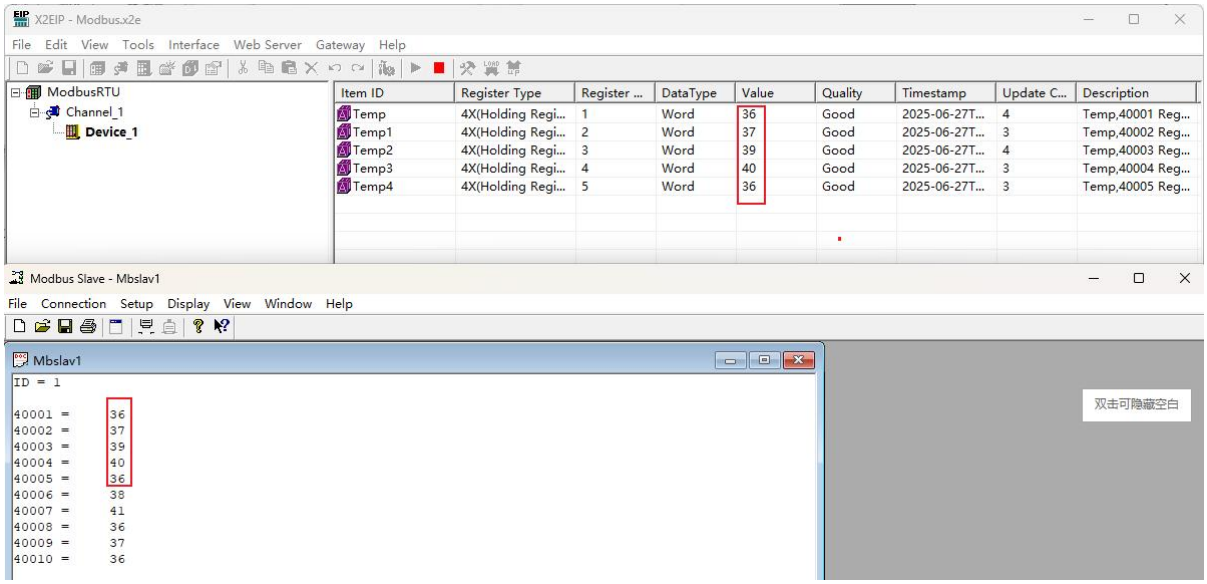

Figure 3-6-4 Successful Communication

3.7 Upload the project(Remote Gateway Monitor Mode)

Before uploading project, we must ensure that the monitoring mode is Remote Gateway mode, and the specific mode switching operation is as follows.

- on the menu bar , monitor mode under the tool need to be chosen “Remote Gateway”.
- Double click the “Monitor Mode” of the status bar at the bottom of the software can also switch monitoring mode.

After Configuring the project, the project can be uploaded to the hardware gateway to debug by starting monitor.

If the project is modified, it is necessary to upload the project to the gateway for debugging until there is no problem, finally monitor by hardware gateway.

You can see "Monitoring Mode: Gateway 192.168.1.88". This IP is the IP of the current uploaded project. When users forget the IP of the last uploaded project, by opening this project, they can see the IP of the last uploaded project. This function is to help users remember the IP used during the last upload of the project.As the Figure 3-7-1.

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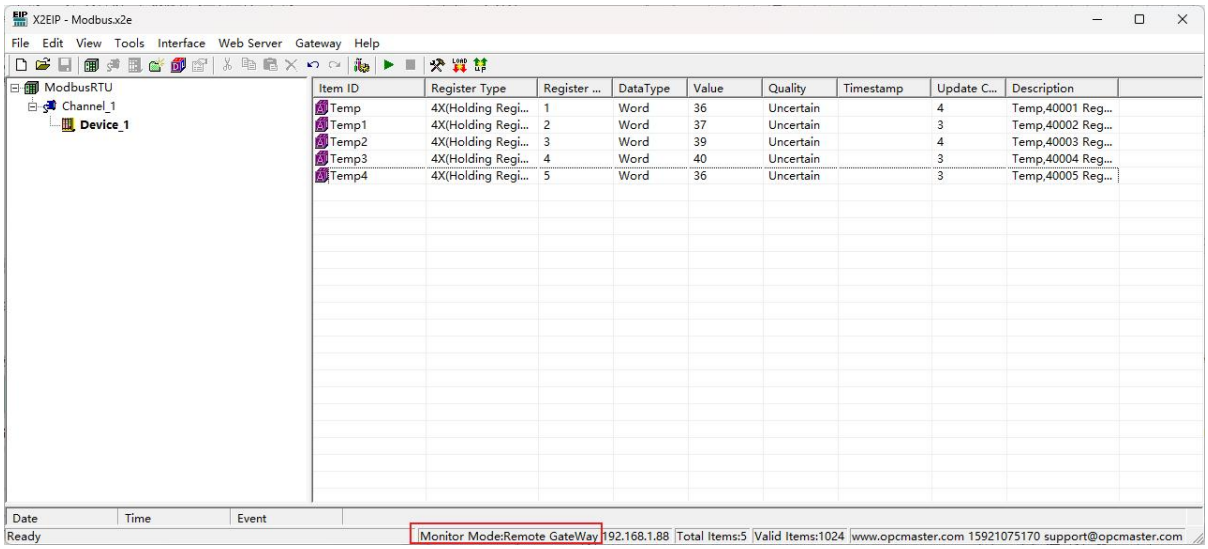

Figure 3-7-1 Select Gateway Mode

Click on the menu bar "Gateway" to choose "Upload…" or click on the toolbar  ,As the Figure 3-7-2.

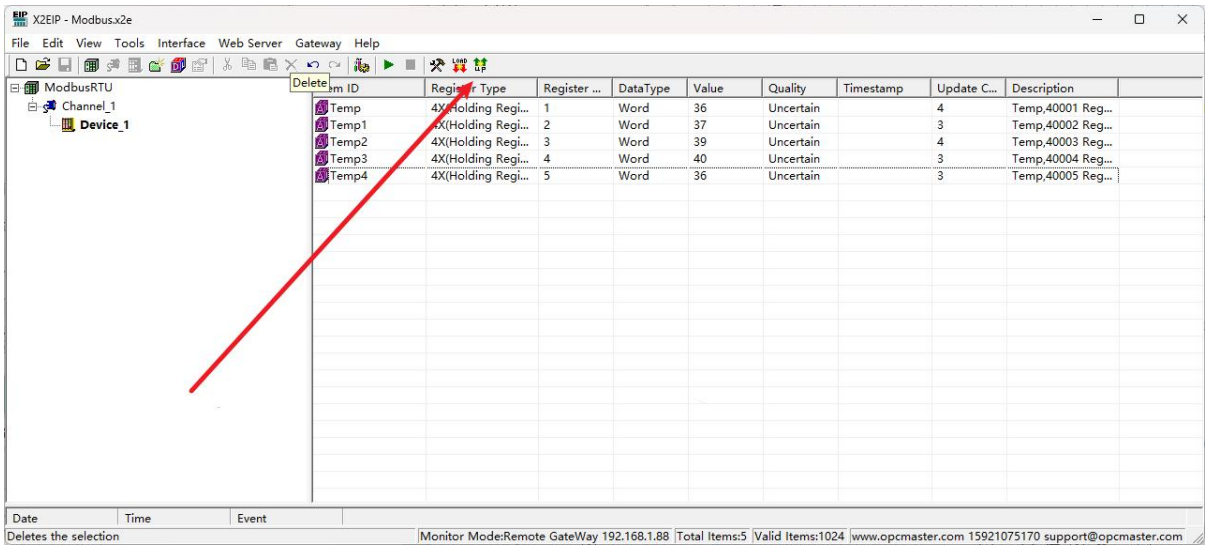

Figure 3-7-2 Select Upload project

In the pop up dialog box enter the gateway IP address, click the "Upload"，As the Figure 3-7-3.

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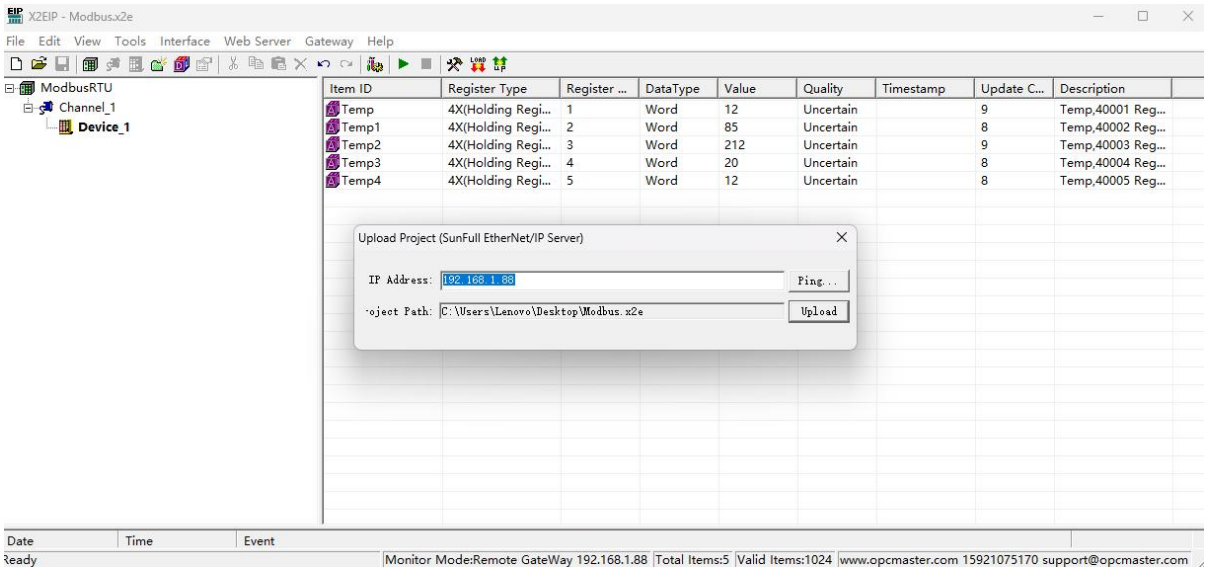

Figure 3-7-3 Upload

After uploading, the pop-up dialog prompt succeed to upload. As the Figure 3-7-4.

If uploading is failed, it will also pop up the failure prompt box.

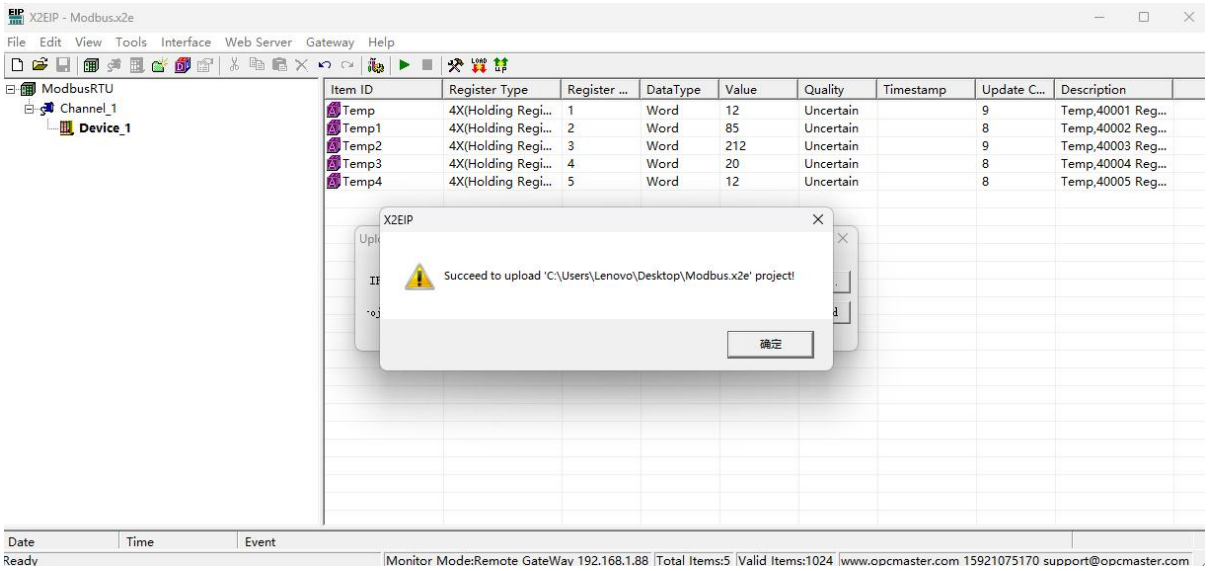

Figure 3-7-4 Succeed to upload

Note: the IP address of the gateway must be correct, the factory default gateway IP address is 192.168.1.88, the IP address of the PC to set up to the same network segment, Ping can be uploaded after successful.

3.8 Gateway Setting

Choose the menu bar under the Gateway Setting, as the following figure 3-8-1.

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milesgoiiot@gmail.com / sales@opcmaster.com

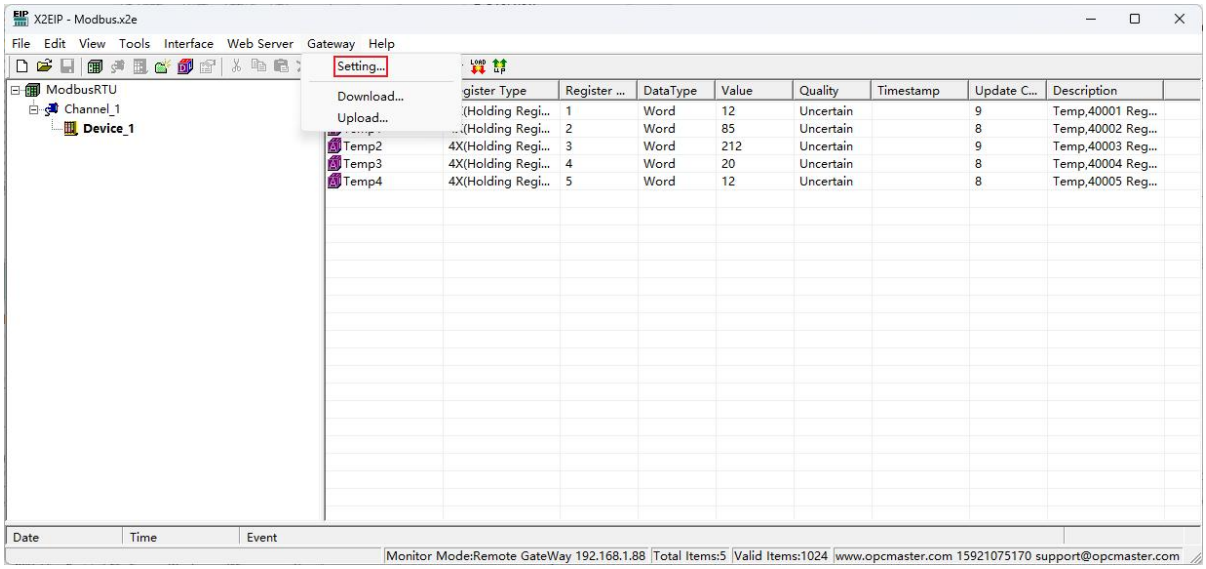

Figure 3-8-1 Gateway Setting

Ethernet Setting: The IP address of the hardware gateway can be changed. The factory default IP address of the gateway is 192.168.1.88, the default subnet mask is 255.255.255.0, and the default gateway is 192.168.1.1.

After setting is completed, click "OK" to proceed. The "Ping" function is used to test whether the current IP address can be successfully pinged. The "Login to Webpage Function" allows you to log in to the WEB server where the gateway is located. As the figure 3-8-2.

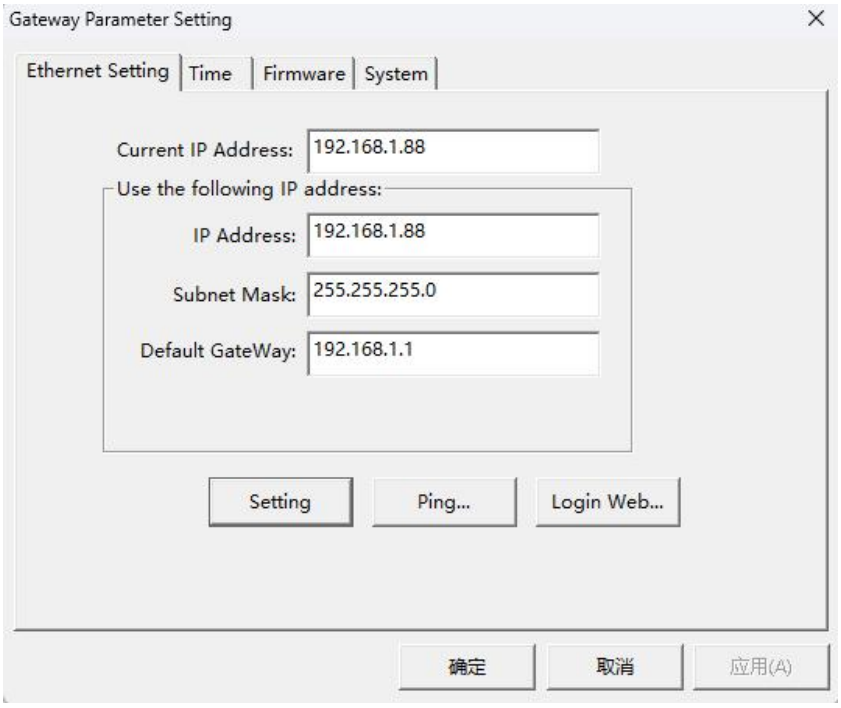

Figure 3-8-2 Ethernet Setting

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milesgoiiot@gmail.com / sales@opcmaster.com

Time: Read the gateway or written to a local PC time.

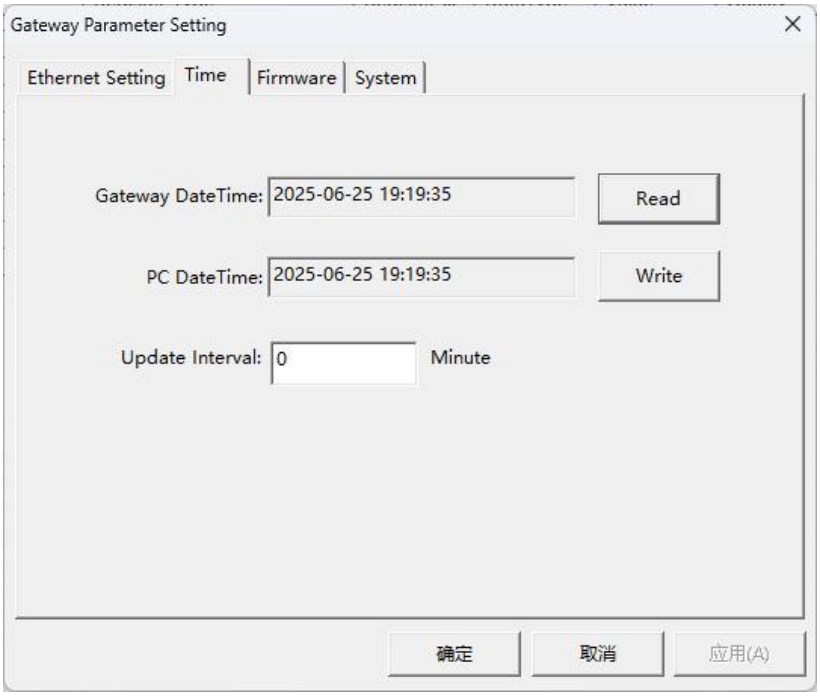

Figure 3-8-3 Time

Firmware: Click Refresh read gateways firmware information.

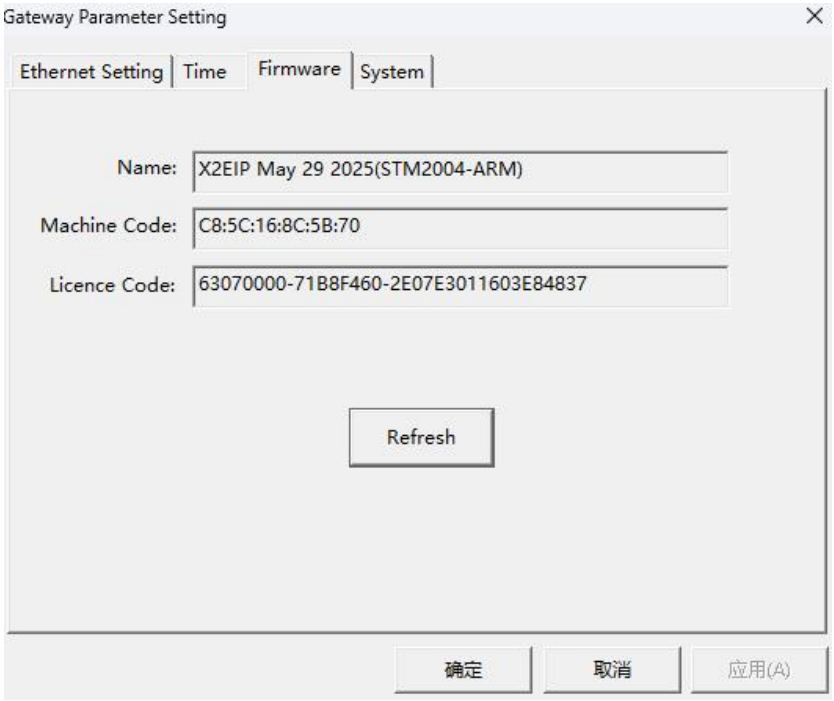

Figure 3-8-4 Firmware

System: Read Memory Status, Reboot Gateway, Delete Config File and Recover Config File.

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milesgoiiot@gmail.com / sales@opcmaster.com

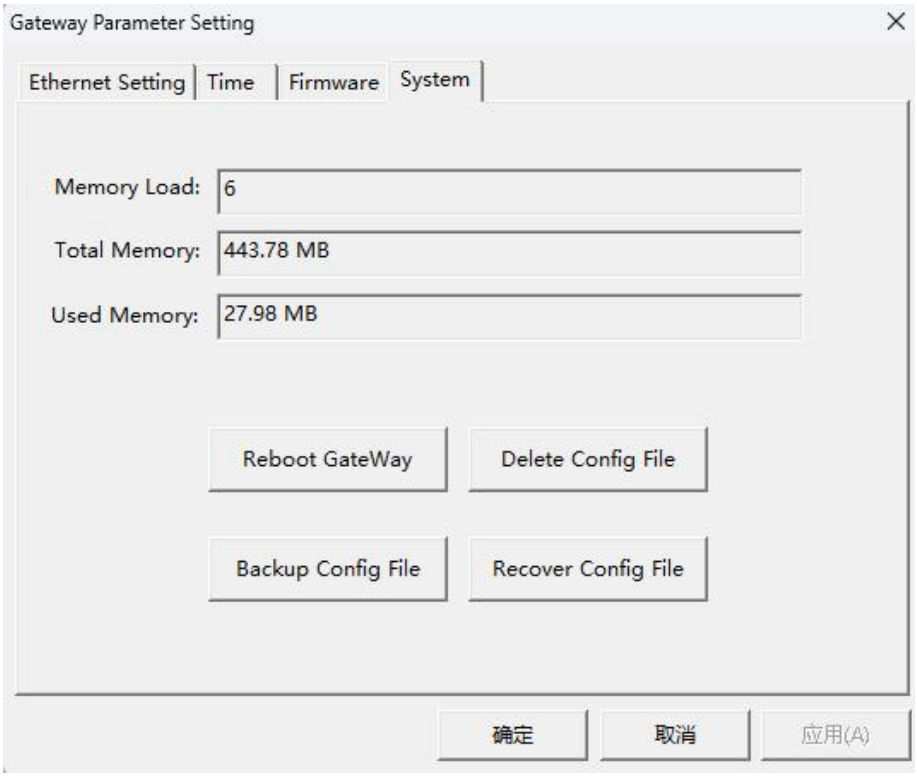

Figure 3-8-5 System

3.9 Download Project

Before uploading project, we must ensure that the monitoring mode is Remote Gateway mode, and the specific mode switching operation is as follows.

- on the menu bar , monitor mode under the tool need to be chosen “Remote Gateway”.
- Double click the “Monitor Mode” of the status bar at the bottom of the software can also switch monitoring mode.

Download project is to download the last configuration project from the hardware gateway to PC, and edit the project and view real-time data on the PC to facilitate user debugging. Click on the "Gateway" choose "Download ", user name: admin, password: admin123456. As the Figure 3-9-1.

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milesgoiiot@gmail.com / sales@opcmaster.com

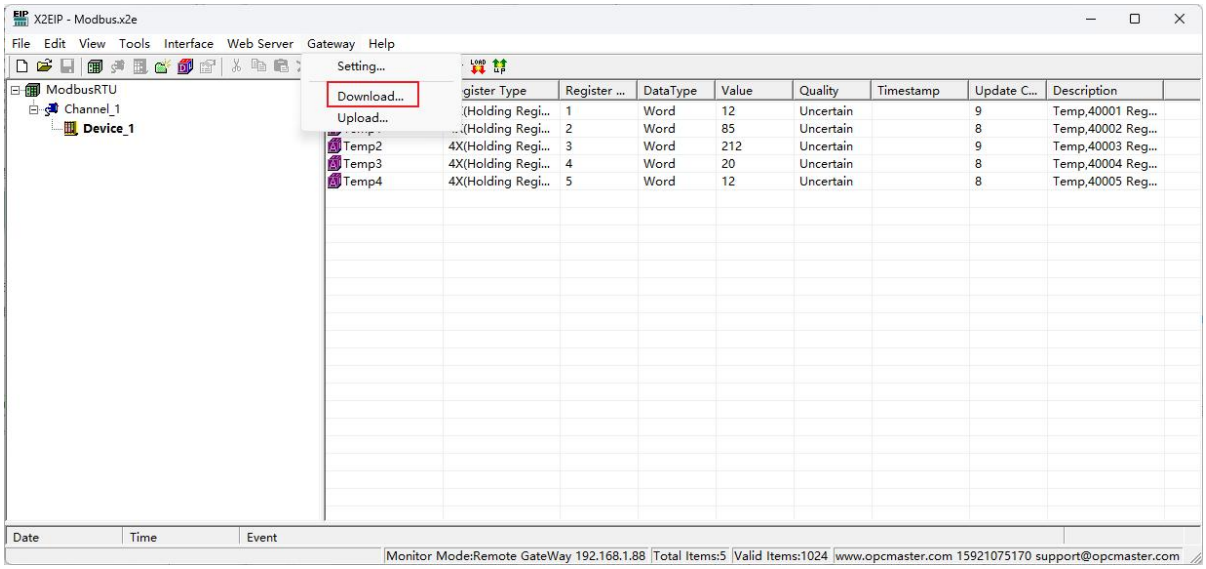

Figure 3-9-1 Download Project

In the pop up dialog box enter the gateway IP address, can be downloaded from the gateway of the current project, as the figure 3-9-2.

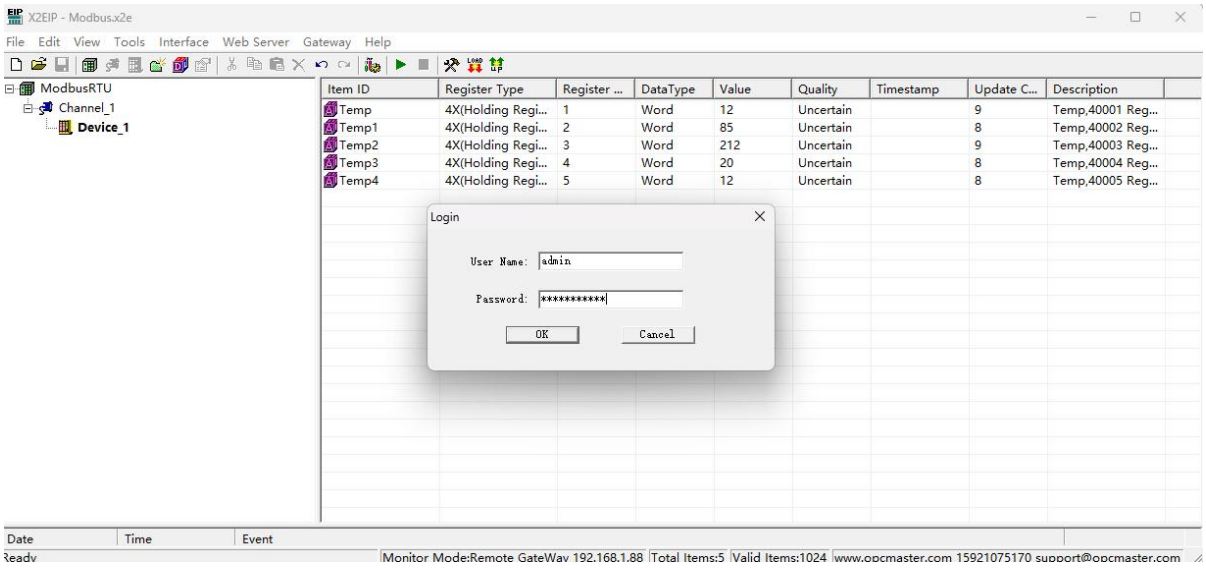

Figure 3-9-2 Login

Users can also through the WEB server log in to the gateway, download the project.

3.10 Software Licence

The hardware gateway has been authorized at the factory.

The configuration software is used to configure the project and provide 30 minutes of local simulation monitoring for debugging. After configuring the project,

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upload it to the gateway and monitor it through the hardware gateway, so the software does not require authorization.

3.11 Timer Group and Timer

3.11.1 Timer Group

The function of timing group list is to facilitate users to manage points in the same time period, and to place timed points at the same time point in a group, which is convenient for users to view and manage. The timing group list refers to the internal clock of the gateway, so before using the timer function, please calibrate the time of the gateway first.

Click on the "View" item in the menu bar, and in the pop-up dialog box, select "Timer Group" , then you can enter the timer group list, as shown in figure 3-11-1-1 below:

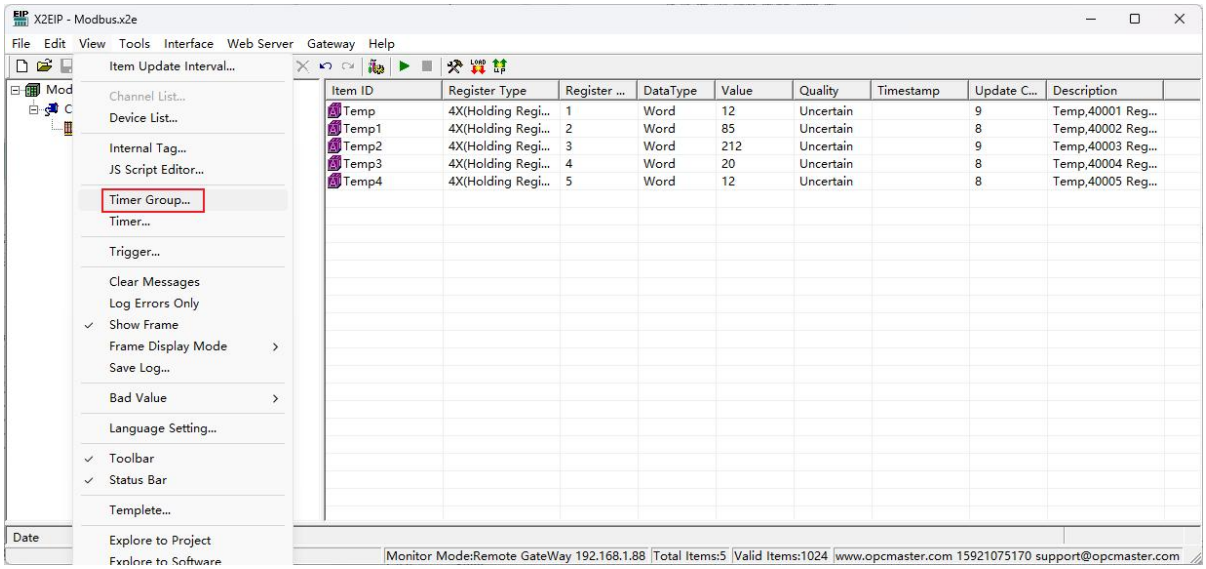

Figure 3-11-1-1 Timer Group List Menu Bar

In the pop-up "Timer Group" dialog box, right-click and select "New Timer Group", as shown in figure 3-11-1-2.

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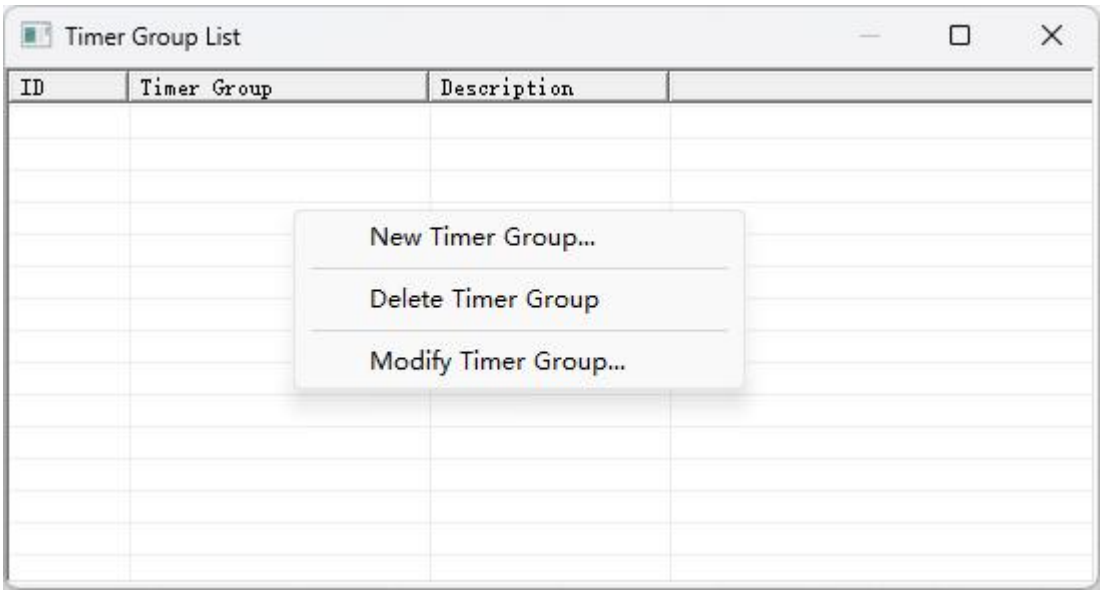

Figure 3-11-1-2 New Timer Group

In the pop-up "Timer Group" dialog box, set the corresponding properties, double click the tag to complete the add. **Note that the selected point must be controlled.**

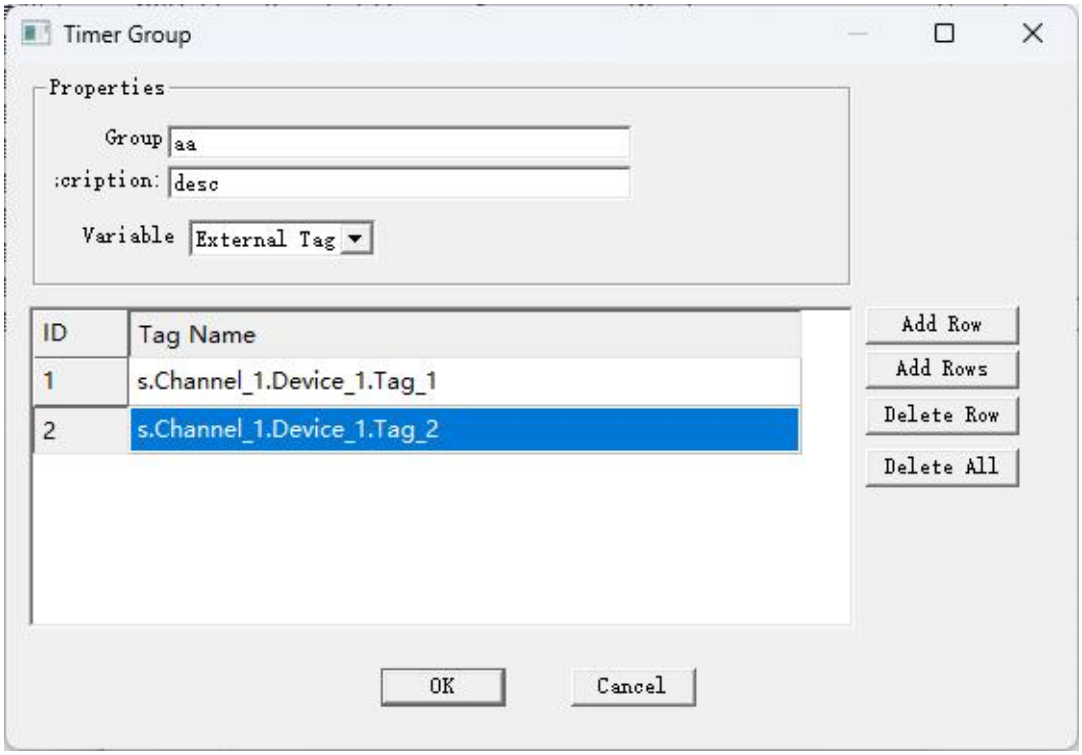

Figure 3-11-1-3 Finish to New Timer Group

After clicking "OK", back to the timer group list dialog box, you can see the just set timer group, as shown in figure 3-11-1-4.

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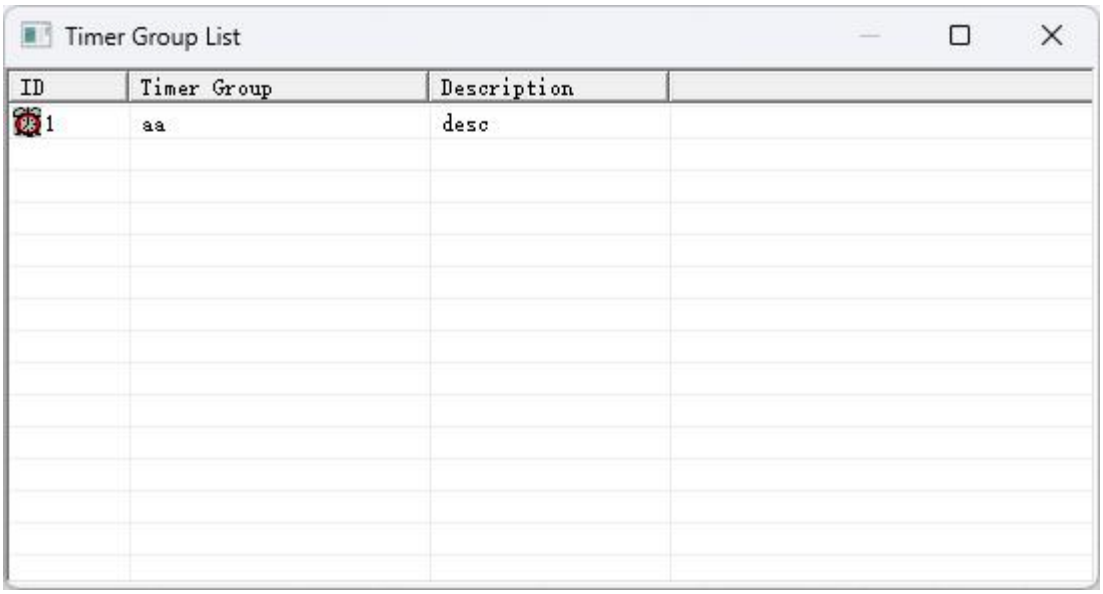

Figure 3-11-1-4 Finish to Set Timer Group

Repeating the above steps, users can add multiple timed group lists according to actual requirements. Right- click can be edited or deleted on the timing group.

3.11.2 Timer

The timer function is to edit the timer and manage the timer when the timer is grouped. The operation steps are as follows:

Click the “View” menu, and select the "Timer" in the pop-up dialog, as shown in figure 3-11-2-1.

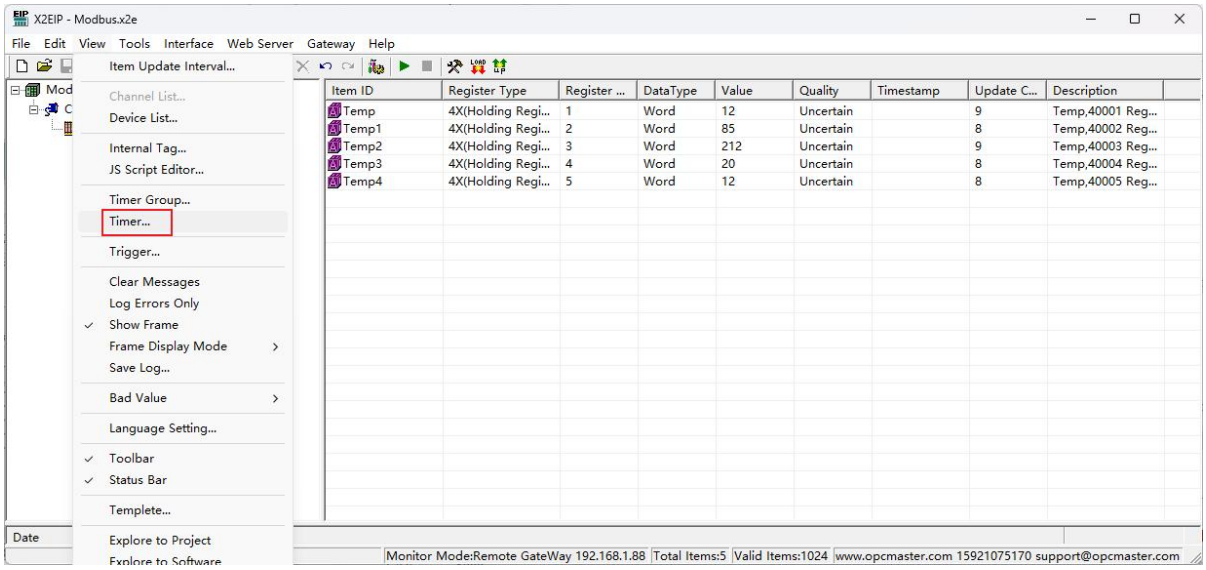

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Figure 3-11-2-1 Finish to Set Timer Group

After selecting the timer in the monitor object, the "Timer" dialog box is popped out, with its properties as shown in figure 3-11-2-2.

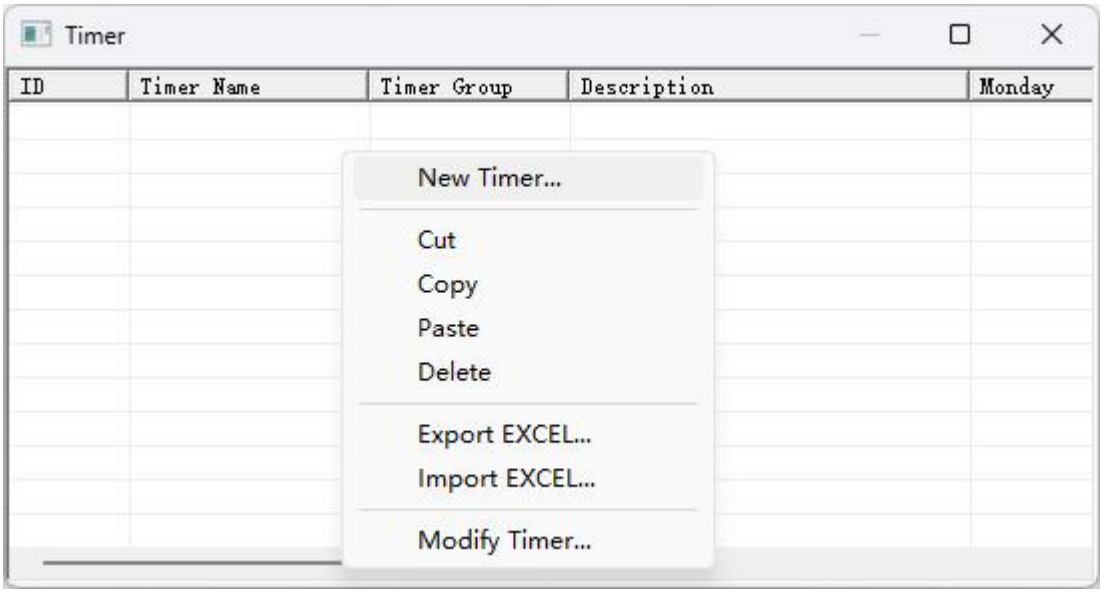

Figure 3-11-2-2 Timer

Right click the blank, select "New Timer" in the pop-up list, open the timer edit window, and its related properties are:

1) Timer Group: select the timer group.

2) Monday to Sunday: can be single or multiple selections, tick, tick timer is only carried out in time.

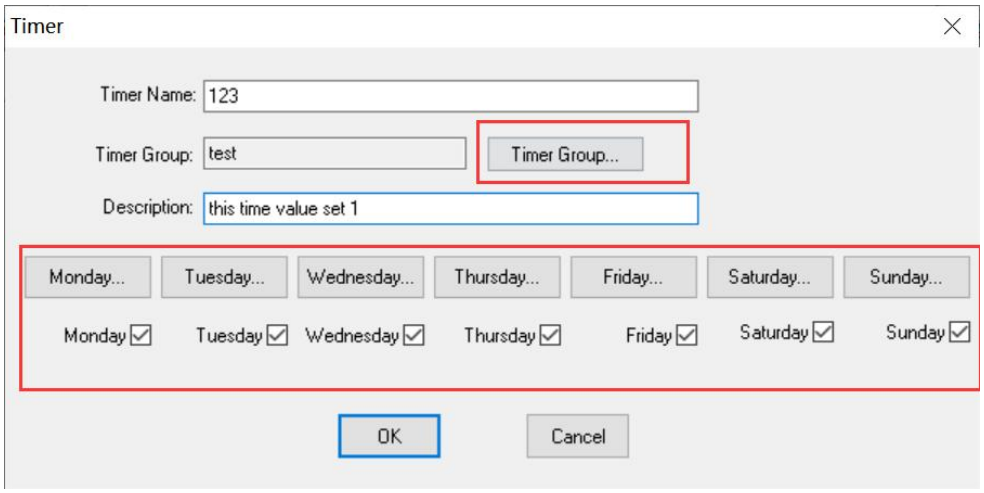

Figure 3-11-2-3 Timer Group Edit

3) time: range 00: 00: 00-23: 59: 59.

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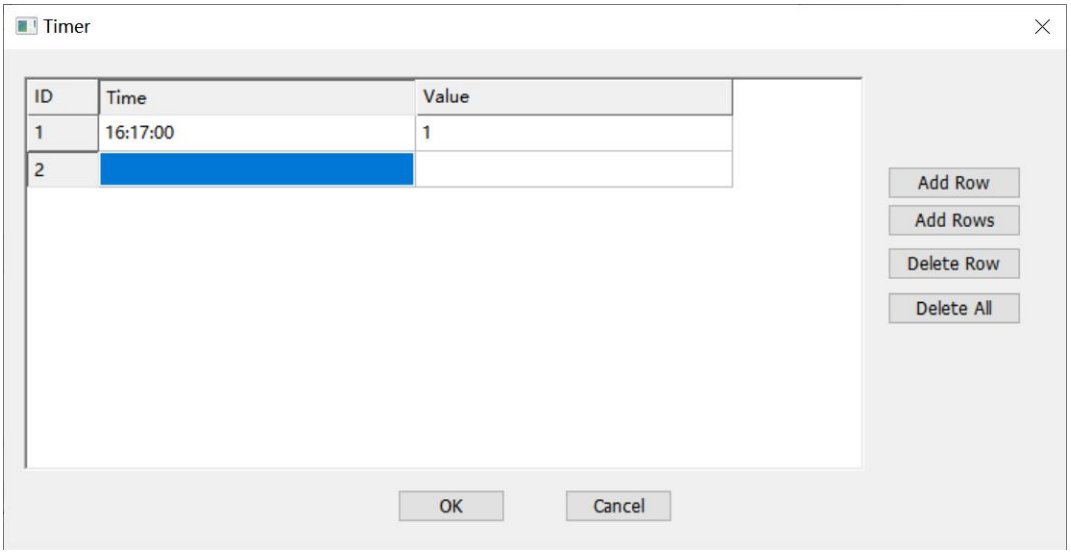
4) value: at the time, the value will set to 1.



3.12 Trigger

The command group function is a new good time sequence for group management. The specific operation steps are as follows: Click the “View” menu, and select the "Trigger" in the pop-up dialog, as shown in figure 3-12-1

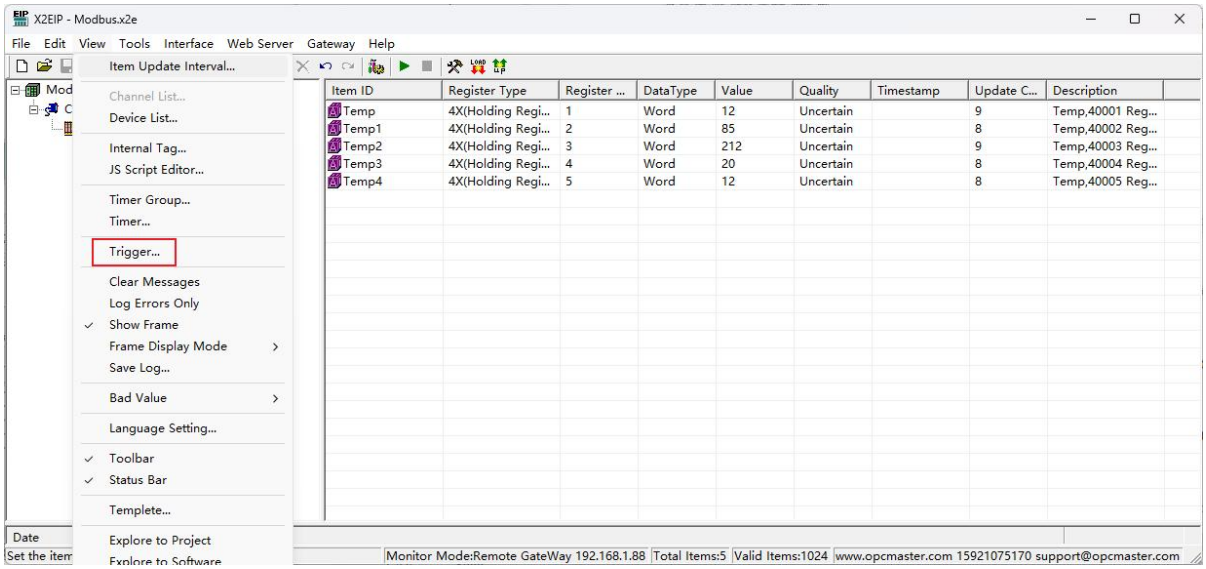


Figure 3-12-1 Select Trigger

After selecting the "Trigger" in the "View", the "Trigger" dialog box is popped out, as shown in figure 3-12-2.

Note: It will set “Source” tag value to “Target” tag value when “Source” value changed.

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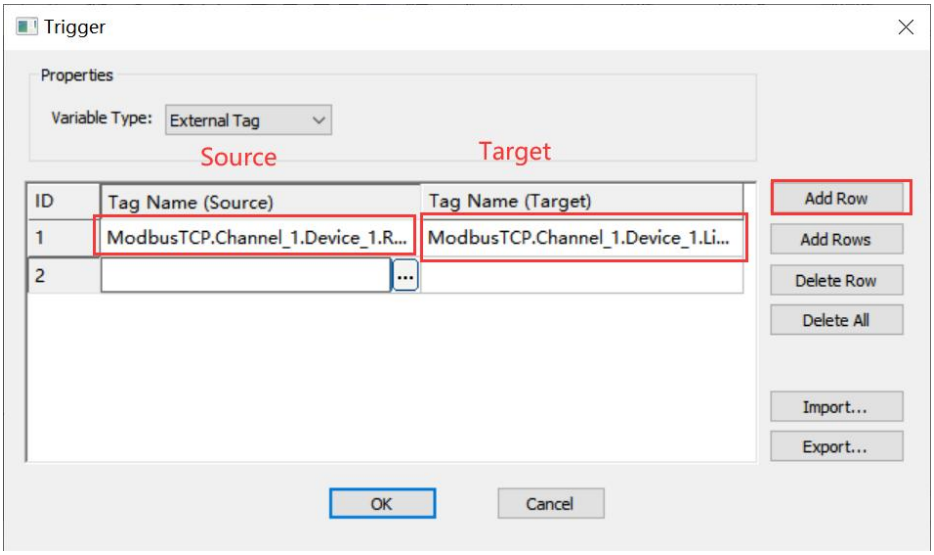

Figure 3-12-2 New Trigger

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4 WEB Server

Gateway with a WEB server, the default port is fixed for 80. Users can through the browser can log on to the WEB server, in a WEB page can modify hardware gateway IP address, serial interface communication mode, view real-time data, download X2EIP PC configuration software and engineering documents, etc.

Note: the factory default gateway IP address is 192.168.1.88, the user to change the IP address for the first time, users only need to direct connect a network cable and gateway. Need to set the PC and gateway to the same network segment, and then in the browser input 192.168.1.88 complete gateway IP address changes.

In the pop up window enter the user name and password to login, As the Figure 4-1.

Username: admin

Password: admin123456

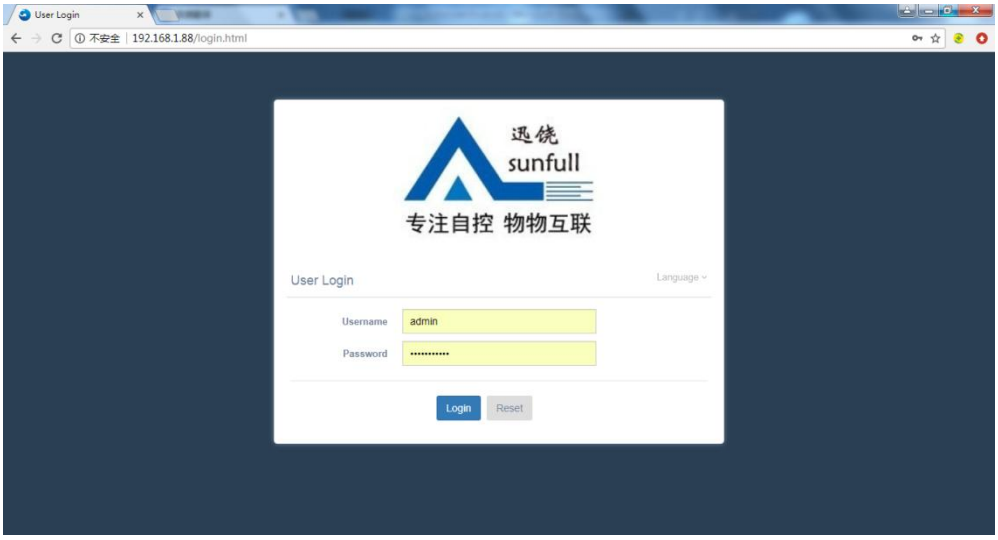

Figure 4-1 Login

4.1 Download

Click “Download”, you can download the following files, As the Figure 4-1-1.

Add:28 Senang Crescent,#05-11,Bizhub 28,Singapore 416601 Tel: +65 80385403 URL: www.bacnetchina.com
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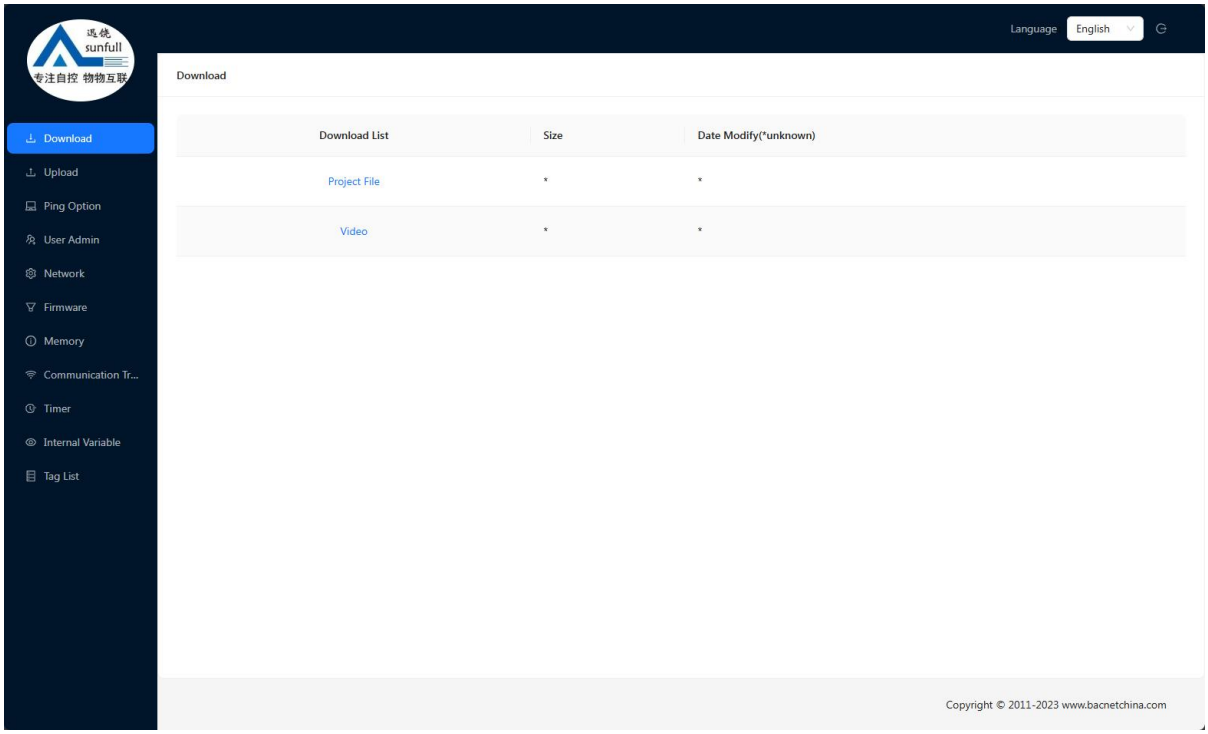

Figure 4-1-1 Download

4.2 User Admin

Users can manage their landing accounts by adding, modifying, deleting, and so on, as shown in figure 4-2-1 below.

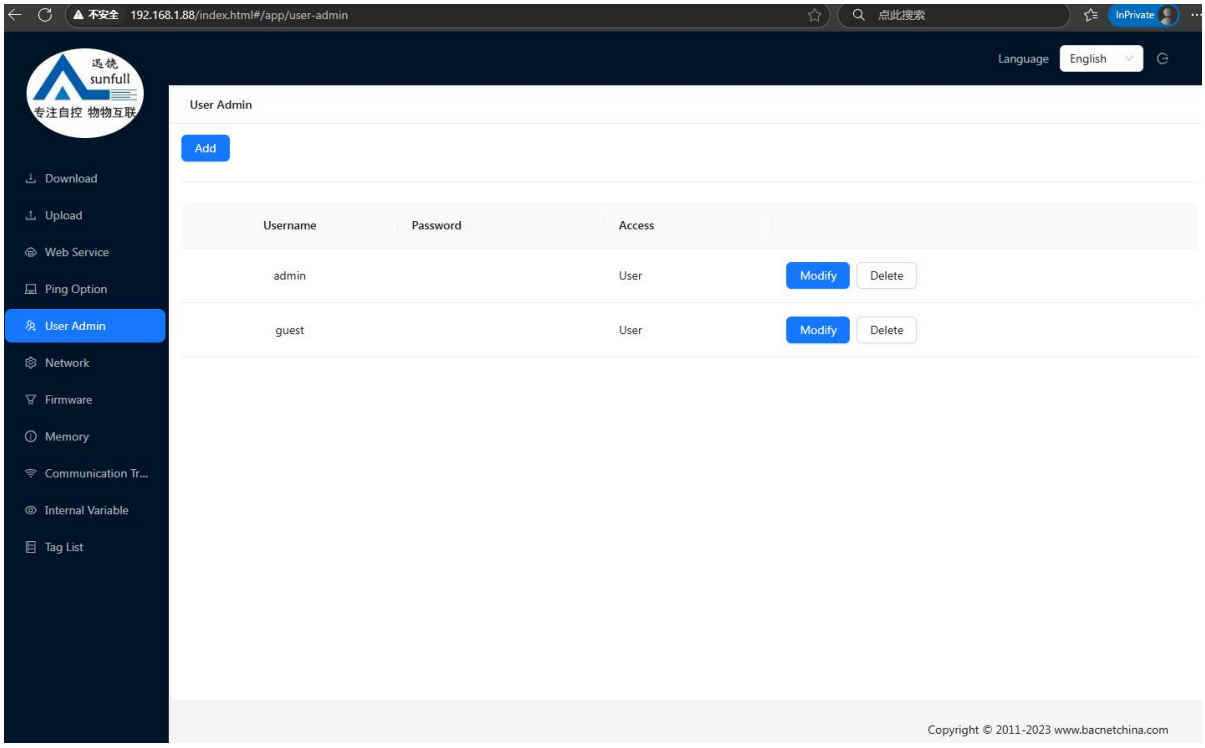

Figure 4-2-1 User Admin

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milesgoiiot@gmail.com / sales@opcmaster.com

4.3 Network

Click “Network”, you can set gateway IP address, as shown in figure 4-3-1 below.

- Ethernet 1: 172.24.13.88
- Ethernet 2: 192.168.1.88(Communication port)

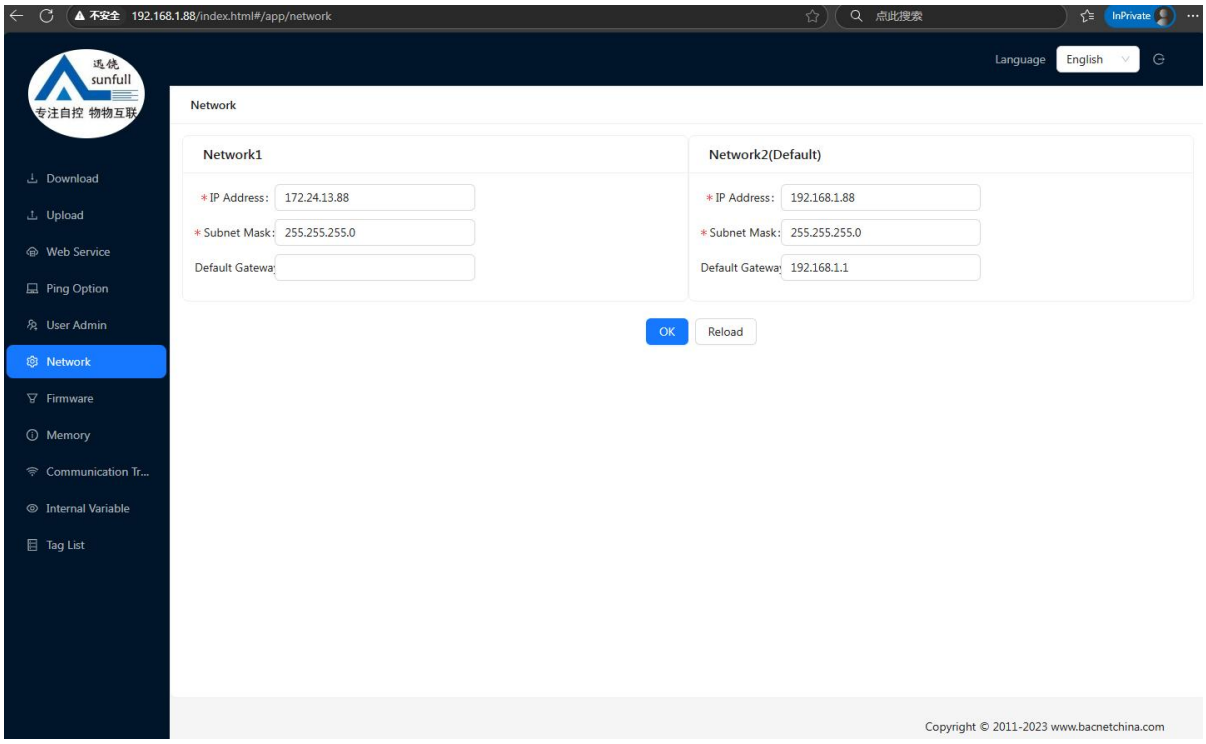

Figure 4-3-1 Network

4.4 Firmware

In this page, user can view the firmware version information, machine code and license key.

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milesgoiiot@gmail.com / sales@opcmaster.com

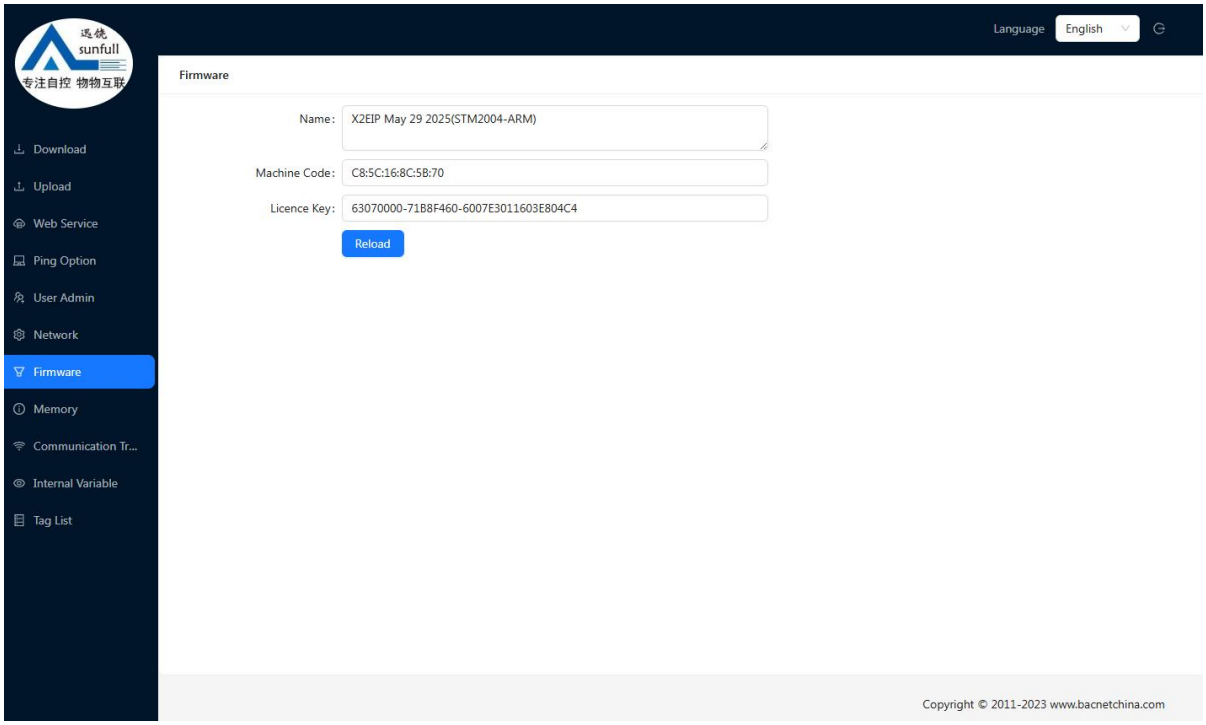

Figure 4-4-1 Firmware

4.5 Memory

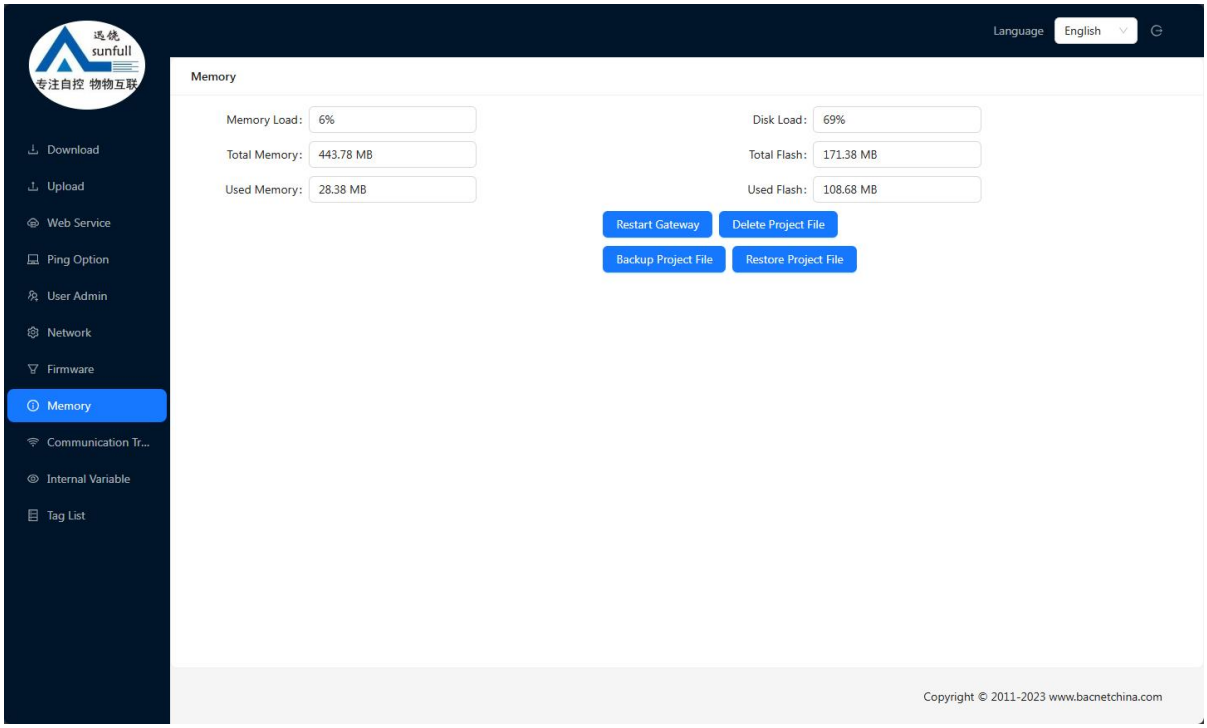

Figure 4-5-1 Memory

1. check the system memory usage. (this function automatically refreshes the gateway memory information every 5S).

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milesgoiiot@gmail.com / sales@opcmaster.com

2. Restart Gateway (remote restart the current gateway).

3. Delete Project File (delete the current gateway configuration project).

4. Backup Project File (can backup the current project to the isolation area).

5. Restore Project File (restore a project that has been backed up by the user).

The project can be backed up to the isolation area, which has 2 advantages.

First, it prevents the wrong operation from uploading the wrong project and can be quickly restored.

Two, it is easy to debug. Once the project is modified, it can be quickly restored.

4.6 Communication Traffic

In addition, the real-time dynamic data frame can be viewed in the web page to facilitate the user to understand the real-time communication state intuitively. Through the analysis of the data frame, the cause of the failure can be found, which brings great convenience to the user.

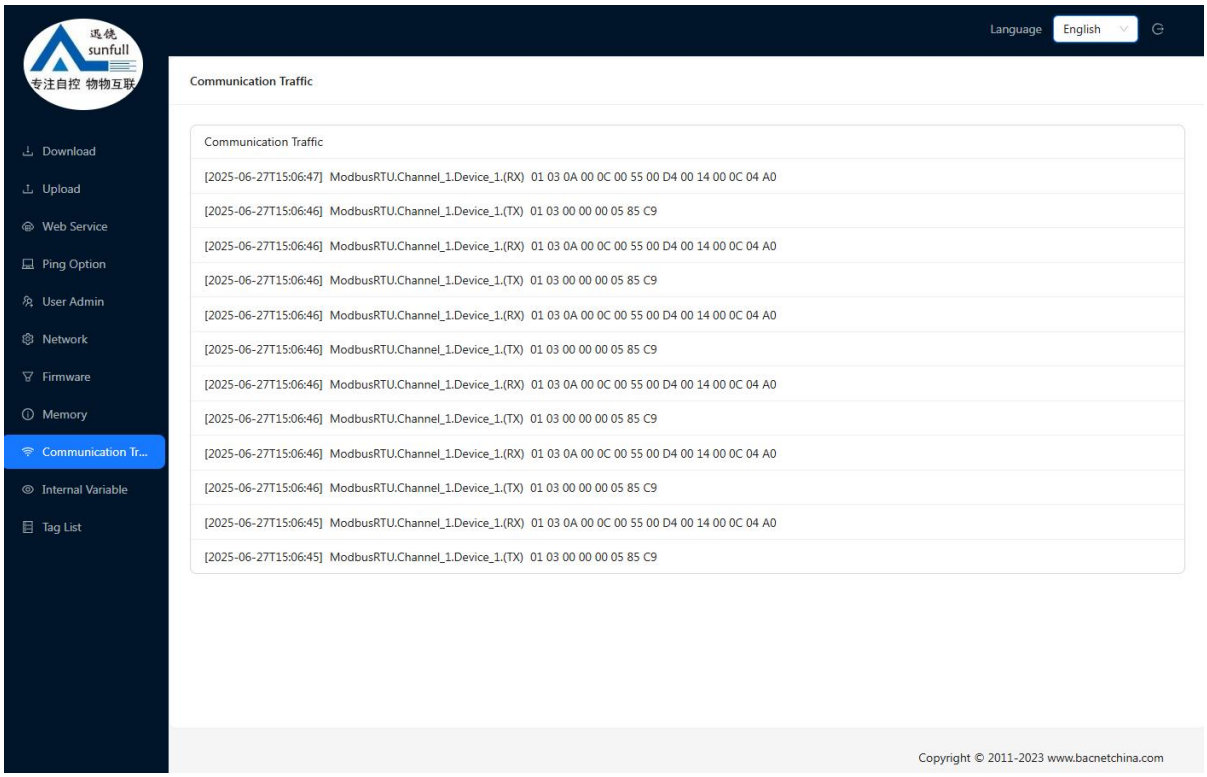

Figure 4-6-1 Communication Traffic

4.7 Internal Variable

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milesgoiiot@gmail.com / sales@opcmaster.com

You can query the device's off-line status, newly created internal variables, and the system date and time that comes with the system, as shown in figure 4-7-1 below.

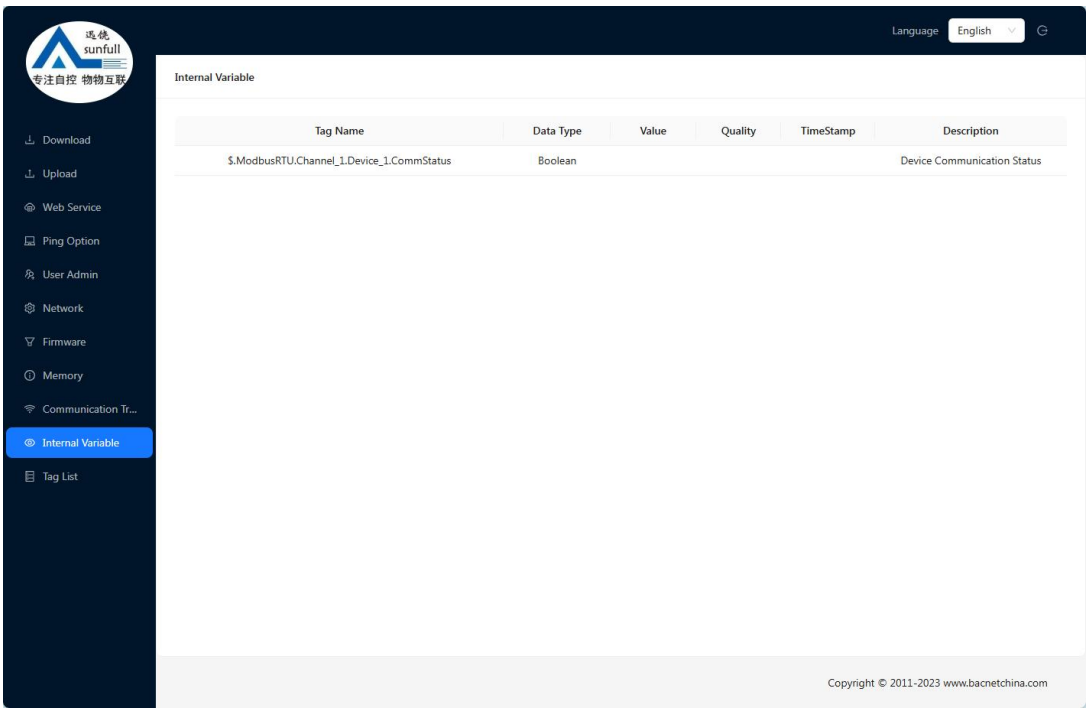

Figure 4-7-1 check the real-time data

4.8 Real-time Data

Check the equipment real-time data on the web, as the Figure 4-8-1.

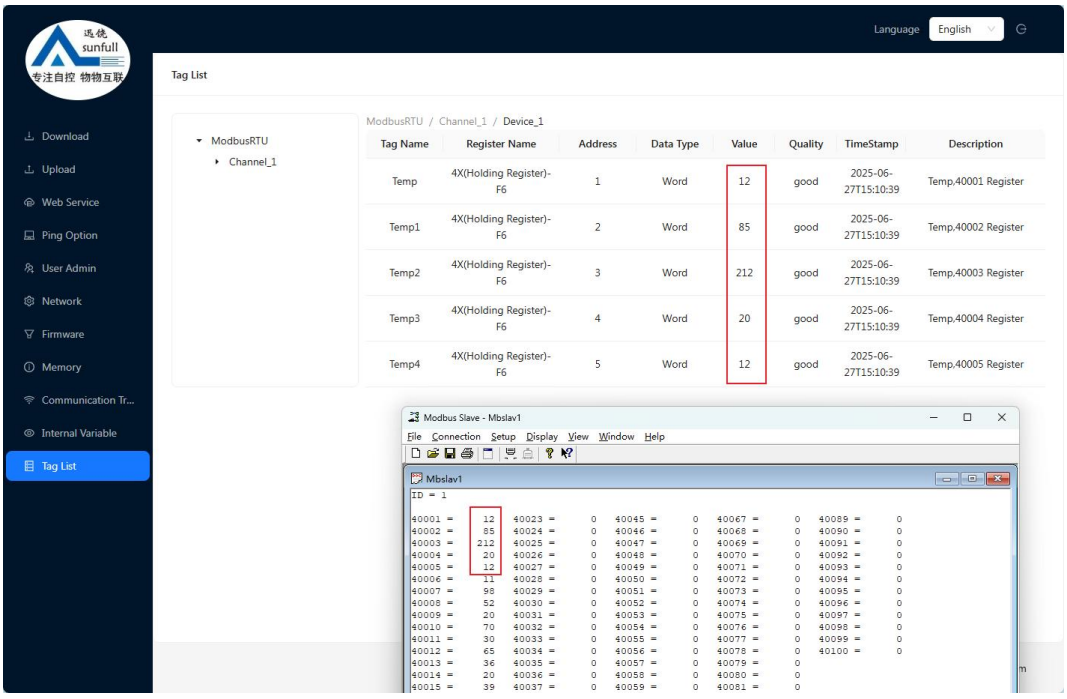

Figure 4-8-1 Real-time data

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milesgoiiot@gmail.com / sales@opcmaster.com

Click the tag, in the pop-up window user can also write value on a web page, as the Figure 4-3-2.

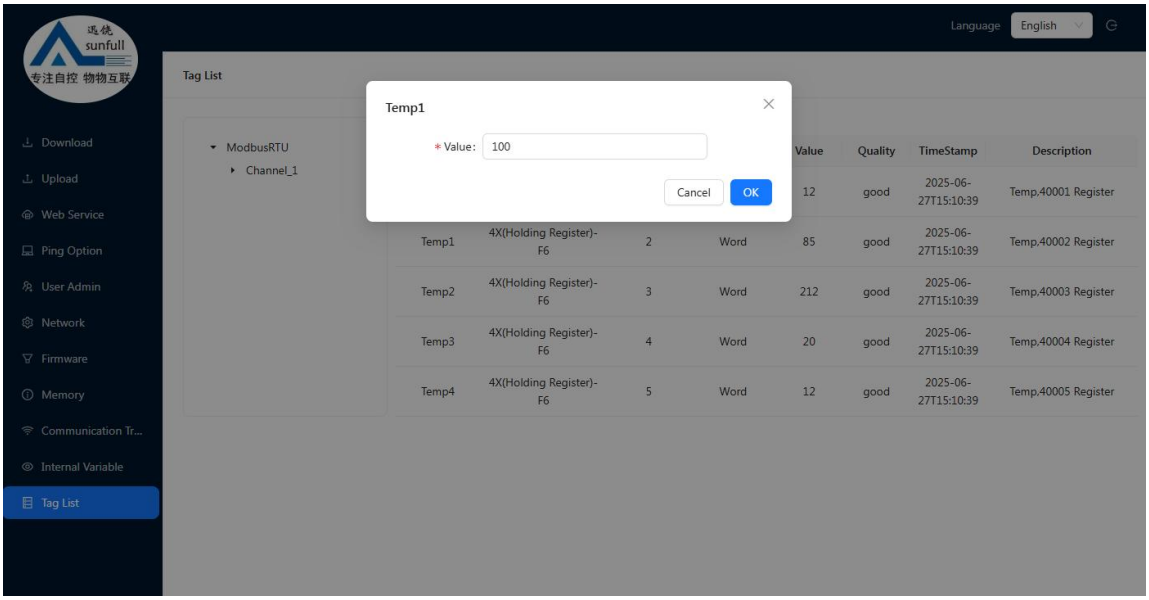

Figure 4-8-2 Write value

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milesgoiiot@gmail.com / sales@opcmaster.com

5 EtherNet/IP client（Master Station）Access

5.1 Third-party PLC tool testing

The third-party testing tool reads the EIP gateway, as shown in the figure 5-1-1.

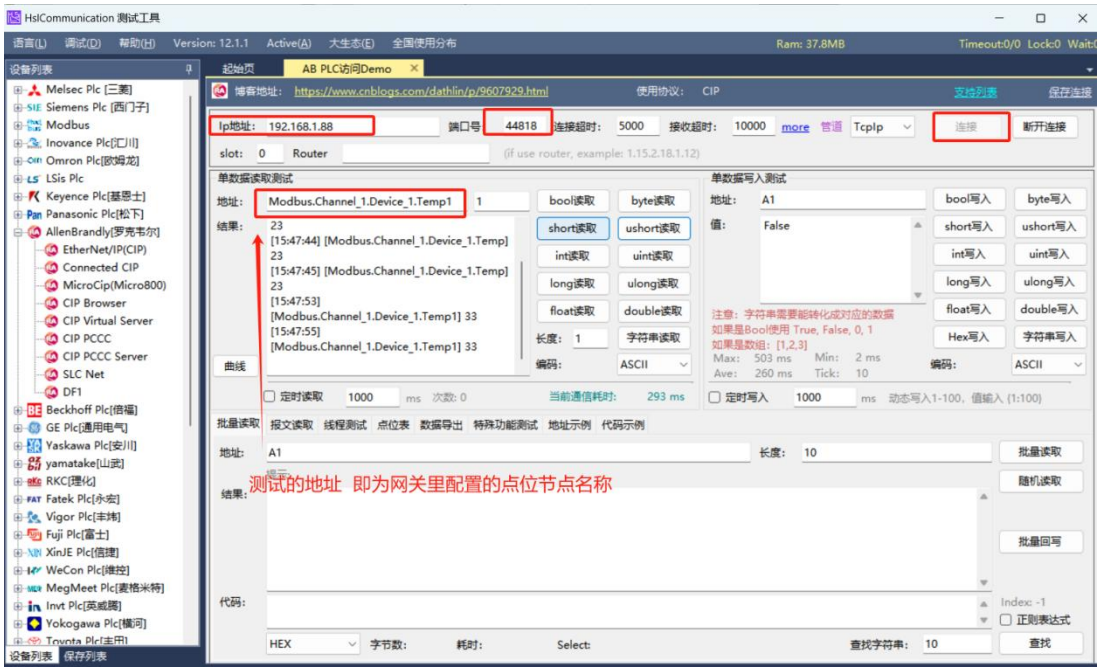

Figure 5-1-1 Third party tool testing

5.2 AB PLC Testing

The Ethernet/IP forwarded by this gateway is based on the UCMM connection method and can be treated as a ControlLogix series PLC. Other AB PLCs in the network can use MSG instructions to read and write variables in this gateway. Details are as follows.

1. Single point read/write method

Create new variables Read_Tag and Write_Tag in the programming software Studio5000 (select Message for the DataType option), with customizable variable names to ensure uniqueness.

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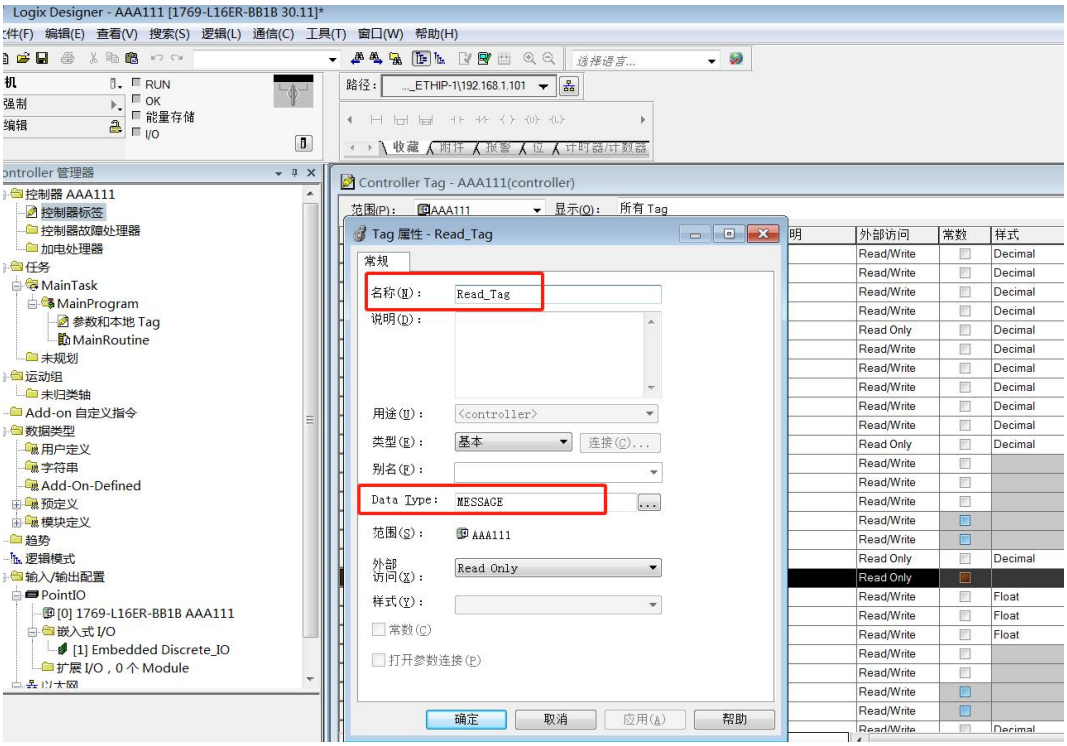

Figure 5-2-1 Define data variables

Create a new variable ReadData for reading variable values from the EIP gateway and the original variable WriteData for writing to the EIP gateway (the DataType key can be INT, DINT, LINT, REAL). The four array types correspond to the arrays in the EIP gateway as follows:

INT type corresponds to Bool and Short types in the gateway;

DINT corresponds to the Word and Long types in the gateway;

LINT corresponds to the Dword type in the gateway;

REAL array corresponds to the Float type.

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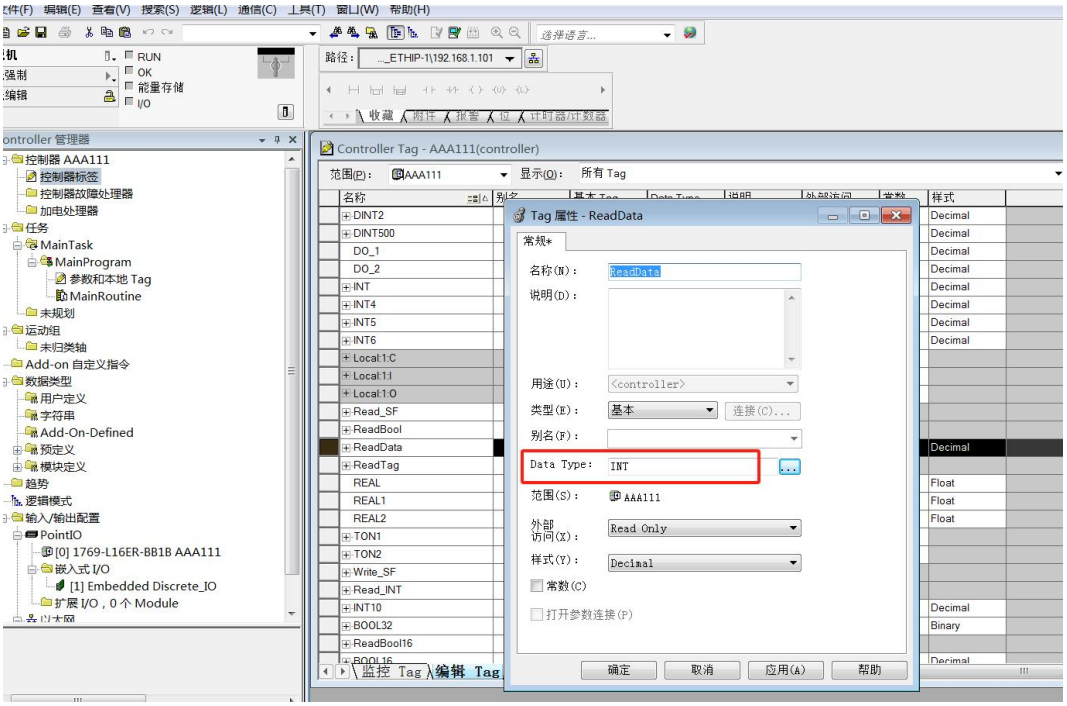

Figure 5-2-2 Define data variables

Use the MSG instruction in the PLC program block, select the Read_Tag point, configure the relevant properties as shown in Figure 5-2-3, select the CIP read data message type, the source element is the variable name to be read from the EIP gateway, use 1 for the number of elements, and the target element is the PLC variable used to store data. Here, select the newly created ReadData point.

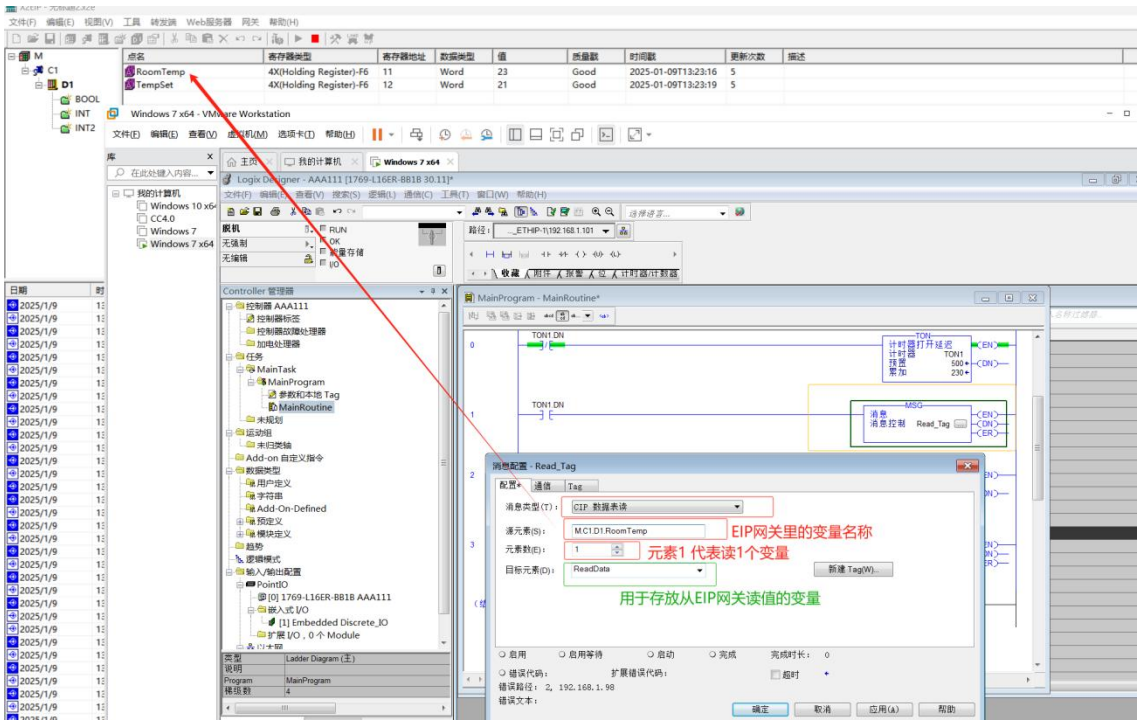

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Figure 5-2-3 Define MSG instruction to read data attributes

Fill in "2, plus EIP gateway IP address" in the communication properties. In this example, AB 1769 CompactLogix series PLC is used to read, and fill in "2192.168.1.98" here. Please use commas in English and do not check the connected items, as shown in Figure 5-2-4. In addition, if using AB ControlLogix series PLC, the communication path also needs to be preceded by the Ethernet communication module name, such as "EN2P, 2192.168.1.98".

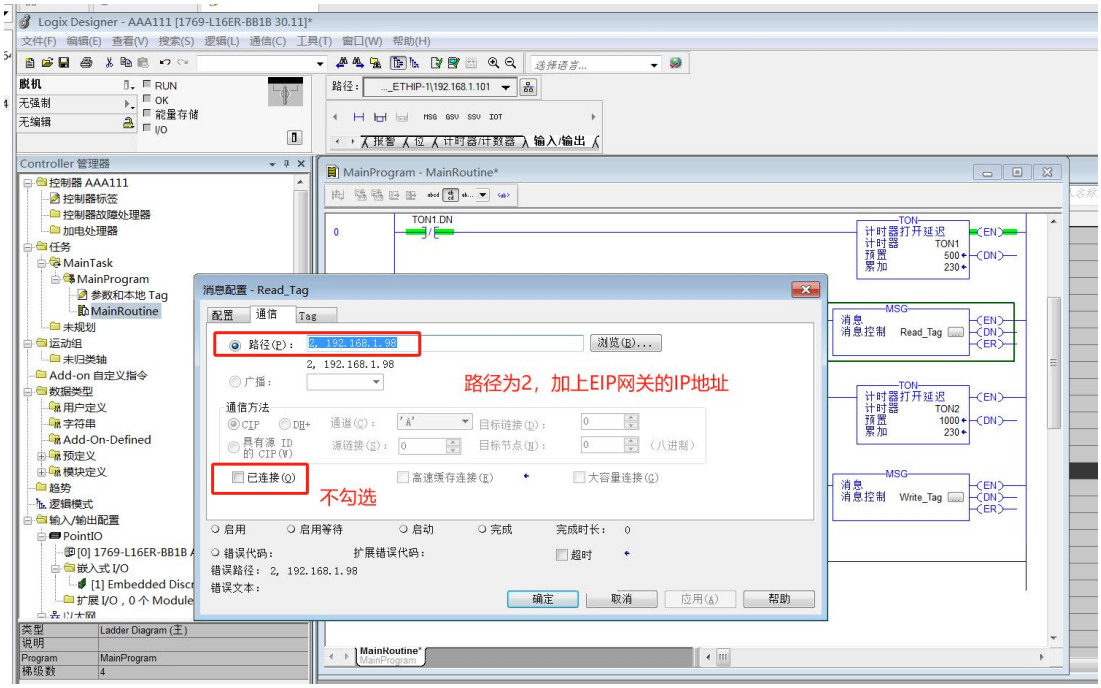

Figure 5-2-4 MSG command communication attribute

On the contrary, the MSG instruction can be used to select the Write_Tag point to write values to the EIP gateway point. The configuration properties are shown in Figure 5-2-5, and the message type is set to CIP to write data. The source element is a variable in the PLC. Here, the previously created WriteData point is selected, and the number of elements is 1. The target element is the controlled point name in the EIP gateway, and the communication properties are consistent with Figure 5-2-4.

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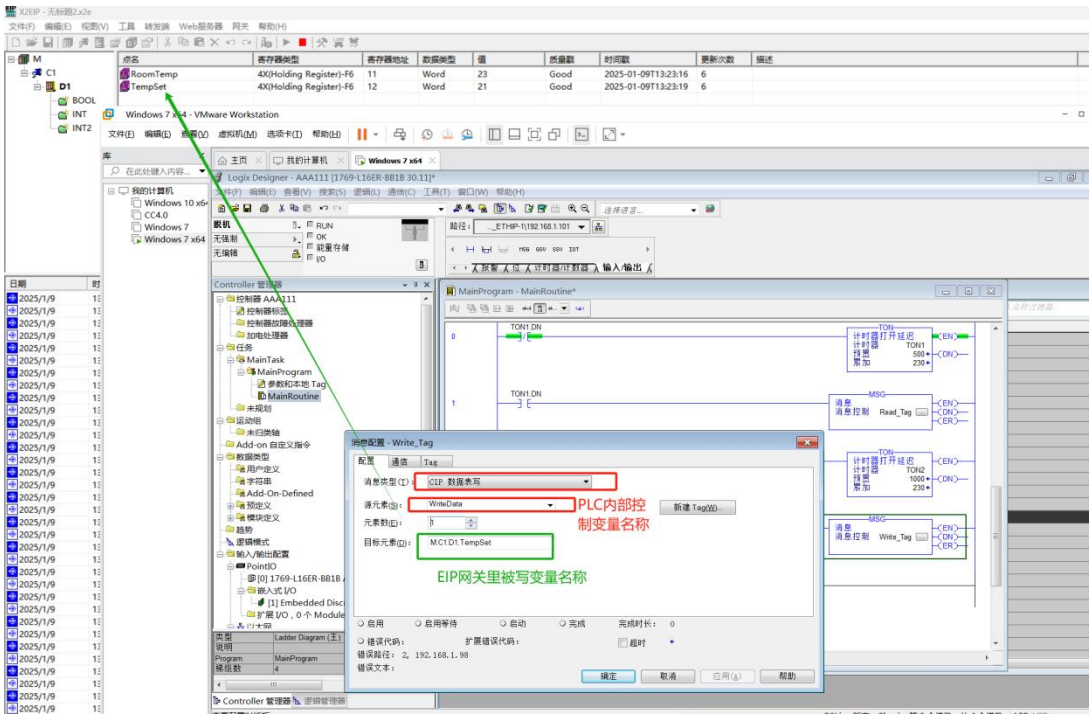

Figure 5-2-5 Define MSG instruction to write data attributes

After downloading the program to the PLC, it was monitored that the variable values in the variable table were consistent with the variables in the EIP gateway, as shown in Figure 5-2-6.

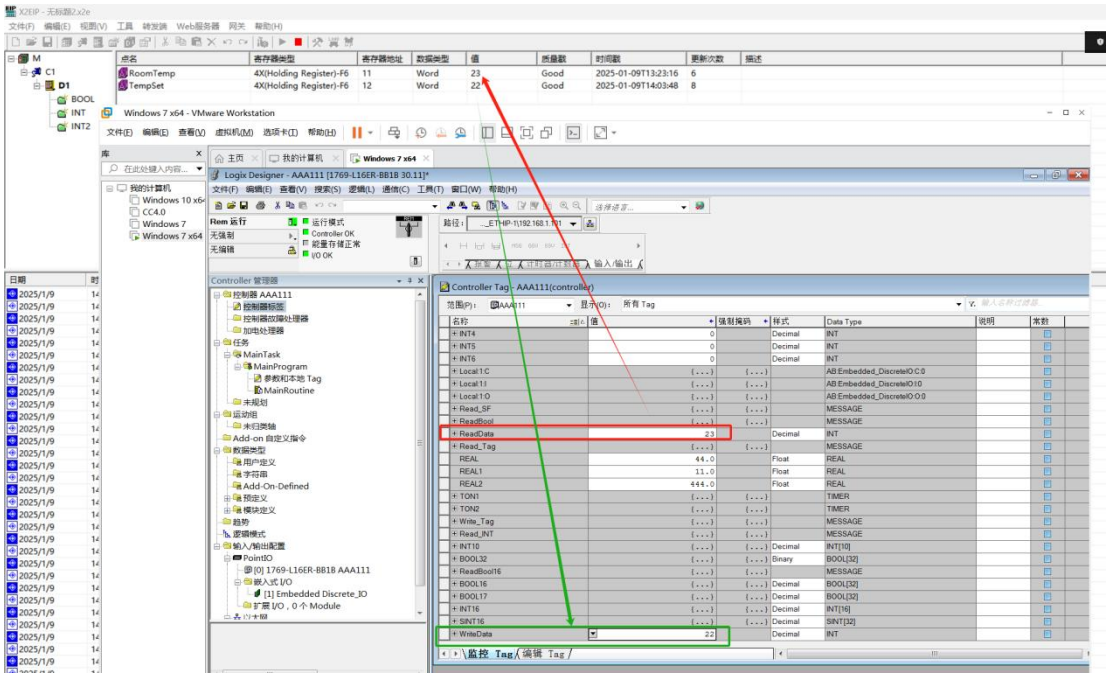

Figure 5-2-6 Monitoring Variable Table

2. Array read and write methods

The EIP gateway supports array variable types, making it convenient for PLCs to

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read and write through arrays, which can greatly improve communication speed. This method requires adding a Group under the device in the EIP gateway, and placing variables of the same data type under this Group. The variable names need to use an underscore "_" and a combination of numerical numbers as suffixes, such as Tag_0, Tag_1, Tag_2,... Note that the numerical numbers start from 0 and cannot be empty, as shown in Figure 5-2-7.

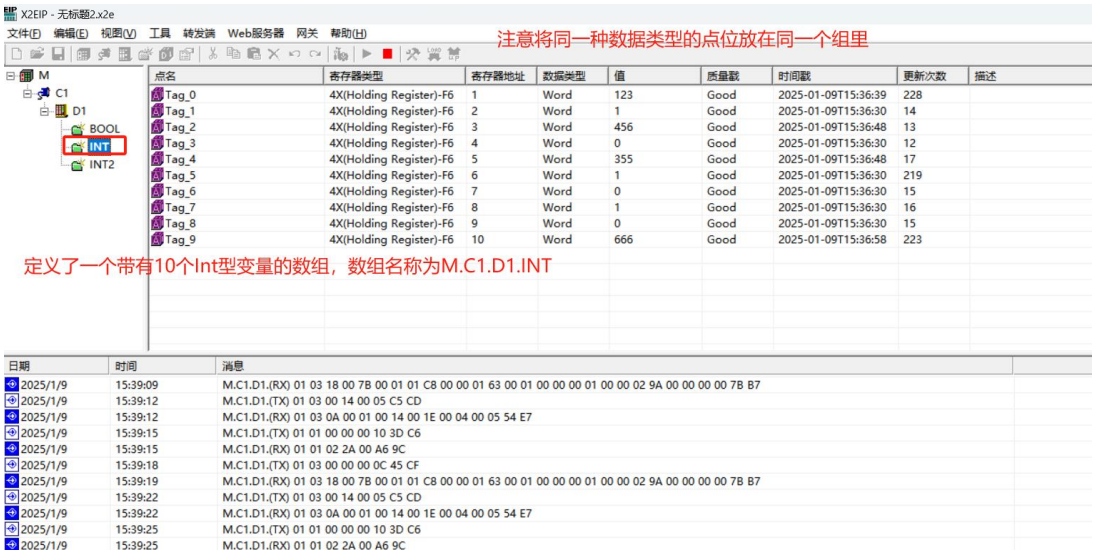

Figure 5-2-7 Create a group within the gateway

Create new variables ReadArray and WriteArray in the programming software Studio5000 (select Message for the DataType option), with customizable variable names to ensure uniqueness, as shown in Figure 5-2-8.

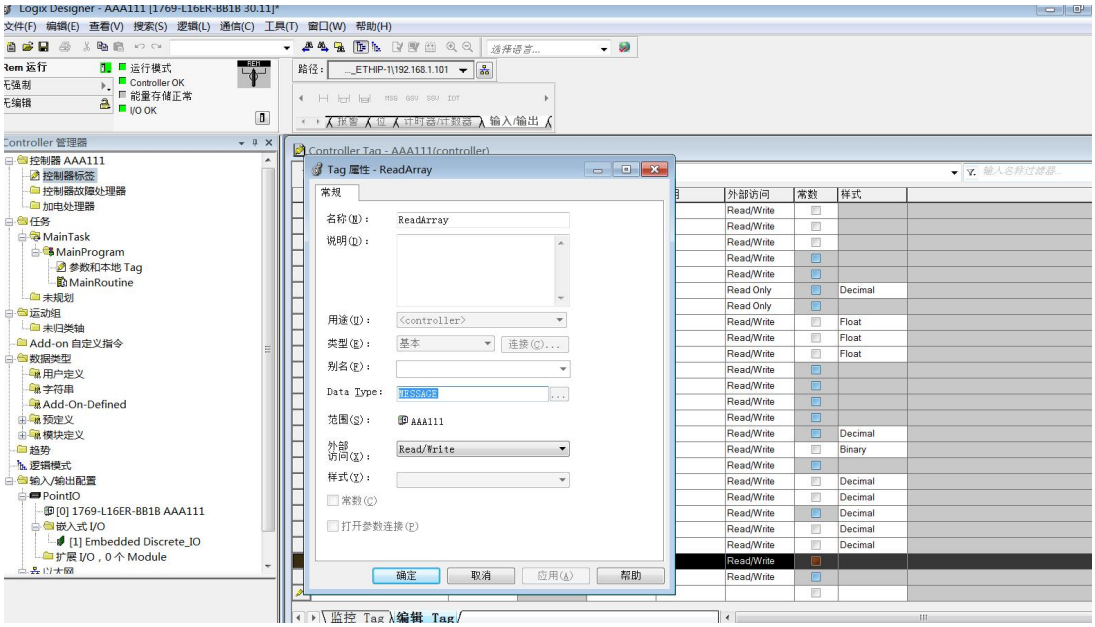

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Figure 5-2-8 Define data variables

Create a new array variable ReadArrayData for reading variable values from the EIP gateway and the original array variable WriteArrayData to be written to the EIP gateway (the DataType key can be represented by INT [*], DINT [*], Lint [*], REAL [*], where * represents the number of array elements), as shown in Figure 5-2-9. The correspondence between these four array types and the arrays in the EIP gateway is as follows:

INT type arrays correspond to Bool and Short type arrays in the gateway;

DINT arrays correspond to Word and Long arrays in the gateway;

LINT type array corresponds to the Dword type array in the gateway;

REAL array corresponds to the Float array in the gateway.

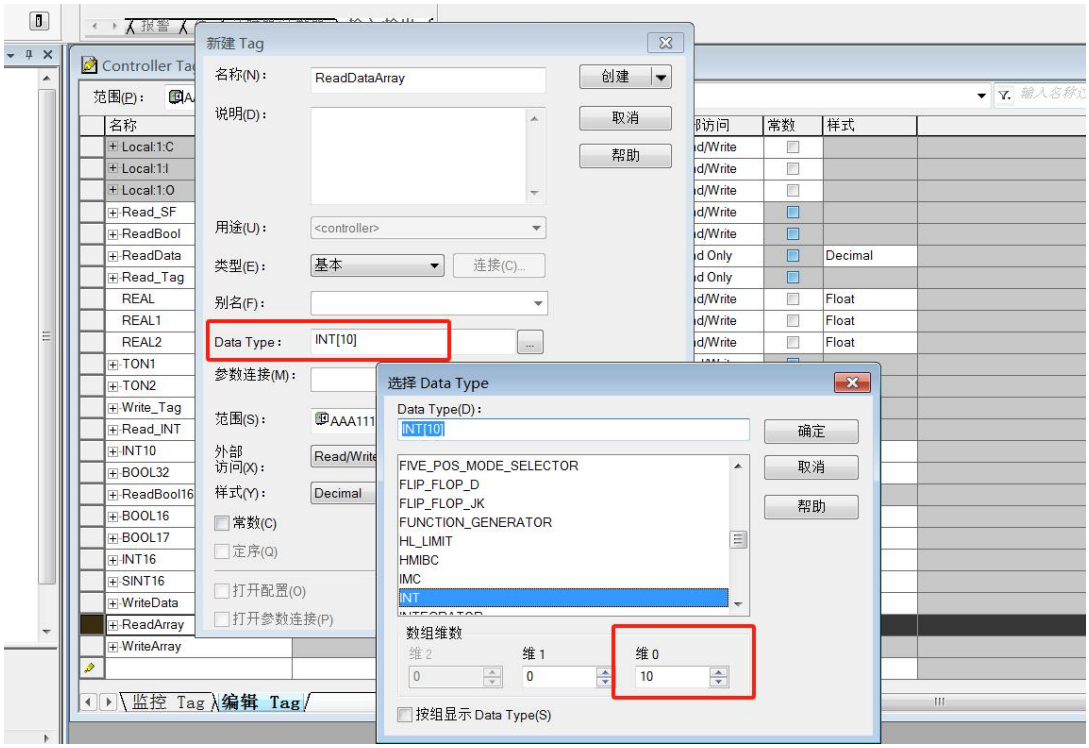

Figure 5-2-9 Define array type variables

Use the MSG instruction in the PLC program block, select the ReadArray point, configure the relevant properties as shown in Figure 5-2-10, select CIP to read data as the message type, the source element is the name of the array variable to be read from the EIP gateway, the number of elements represents the number of array

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variables to be read, and the target element is the PLC array variable used to store data. Here, select the newly created ReadDataArray array variable.

Note that the source element here is the array name M.C1.D1.INT in the EIP gateway, which means reading from the first element M.C1.D1.INT [0]. If reading from the middle position of the array, specific array element positions can be added, such as M.C1.D1.INT [5], which means reading from the fifth element of the array.

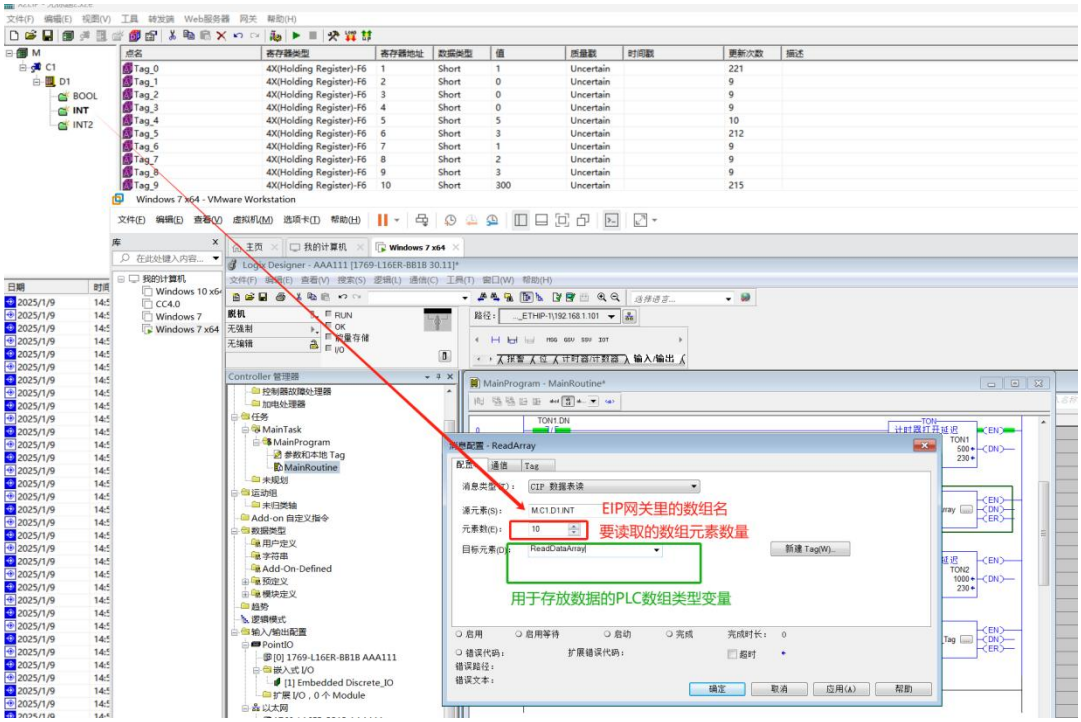

Figure 5-2-10 Define MSG instruction to read array type data properties

Fill in "2, plus EIP gateway IP address" in the communication properties. In this example, AB 1769 CompactLogix series PLC is used to read, and fill in "2192.168.1.98" here. Please use commas in English and do not check the connected items, as shown in Figure 5-2-11. In addition, if using AB ControlLogix series PLC, the communication path also needs to be preceded by the Ethernet communication module name, such as "EN2P, 2192.168.1.98".

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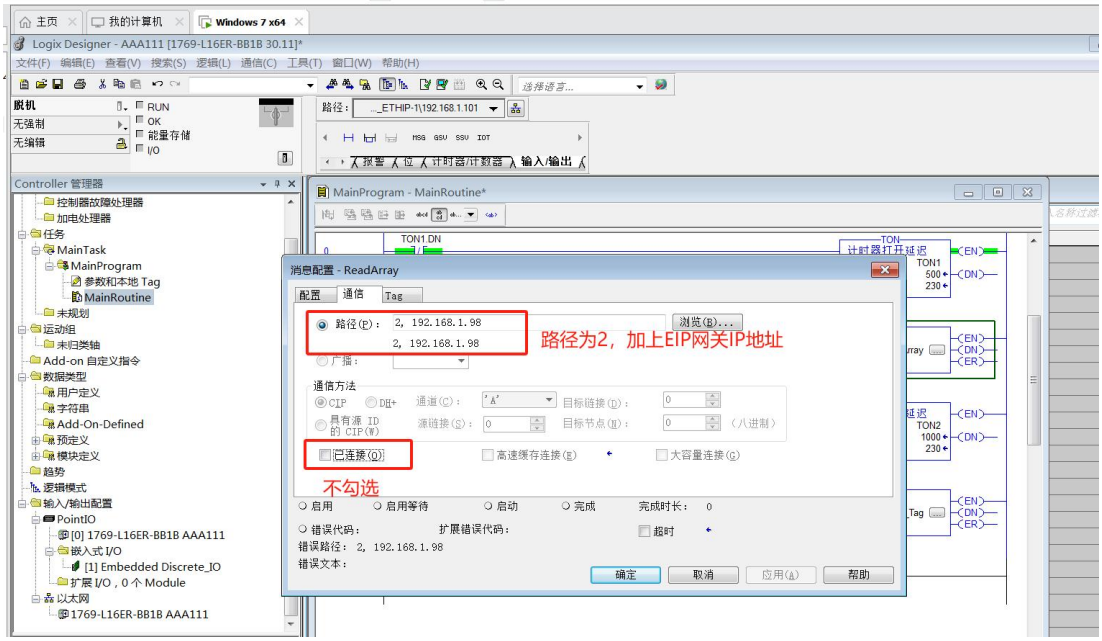

Figure 5-2-11 Define MSG instruction communication properties

On the contrary, the MSG instruction can be used to select the WriteArray point to write values to the EIP gateway array point. The configuration properties are shown in Figure 5-2-12, and the message type is set to CIP to write data. The source element is the array variable name in the PLC. Here, the previously created WriteDataArray point is selected, and the number of elements to be written to the array variable is the number of target elements in the EIP gateway. The communication properties are consistent with Figure 5-2-11.

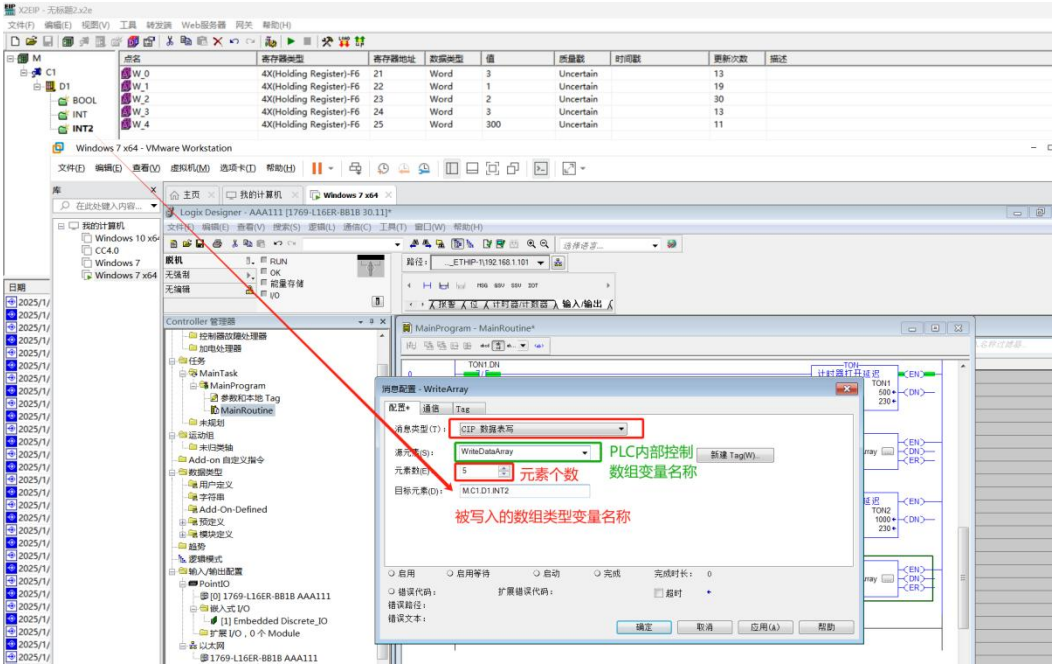

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Figure 5-2-12 Define MSG instruction to write data attributes

After downloading the program to the PLC, it was monitored that the variable values in the variable table were consistent with the variables in the EIP gateway, as shown in Figure 5-2-13.

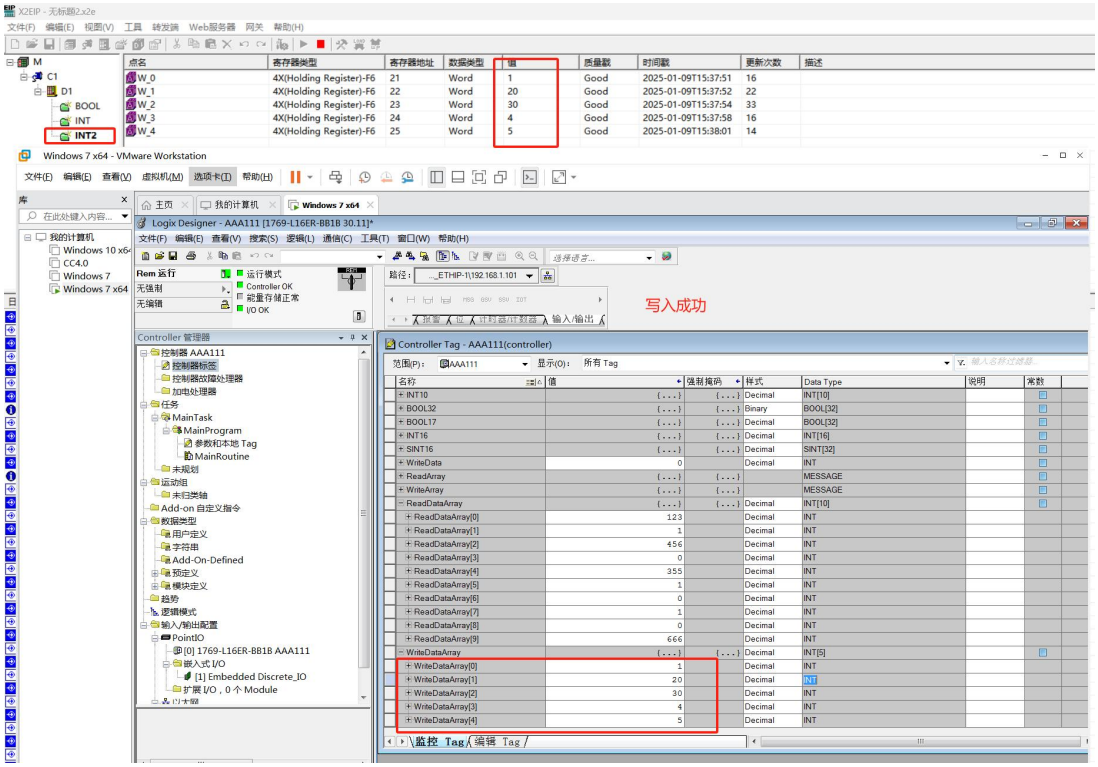

Figure 5-2-13 Monitoring variable table

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6 JS Script Editor

Hardware gateway also has JS script editor. Users can achieve some logic control by editing script language. There are some common functions in the script editor. The user can select some functions to edit the language. After the editor is complete, click "Syntax Check", and the syntax will be checked automatically. If there are any grammatical errors, it will prompt which specific line of grammar has problems.

6.1 Operation steps

Click the menu bar view to select the JS script editor, or click the toolbar to open the script editor, as shown in figure 6-1-1.

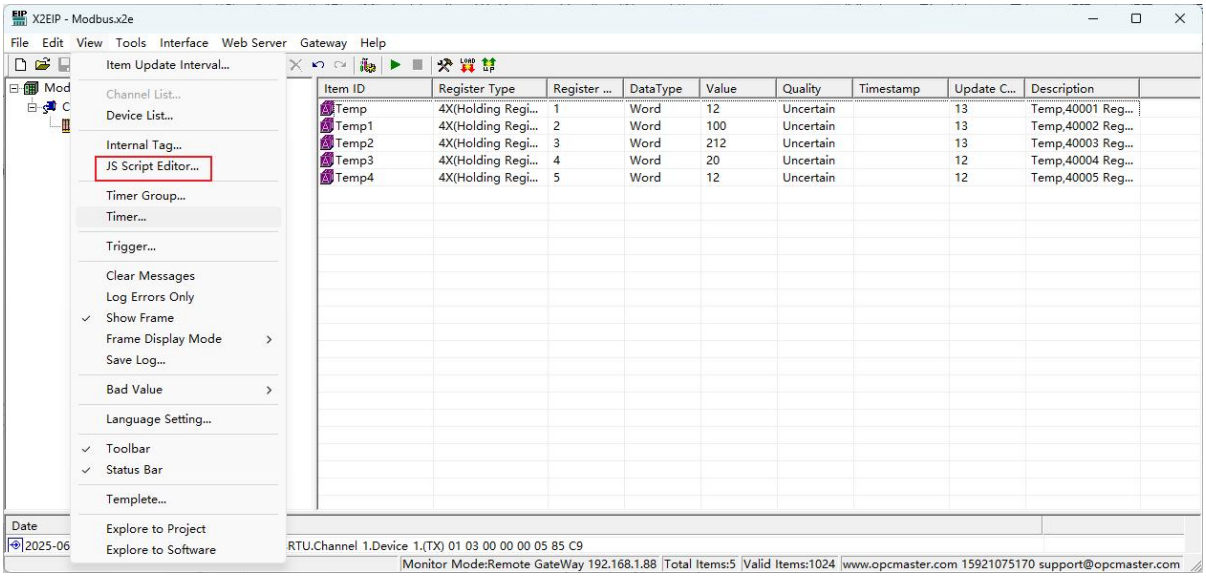

Figure 6-1-1 Open JS Script editor

Right click on the script editor to choose “New JS Script”, as shown in figure 5-1-2.

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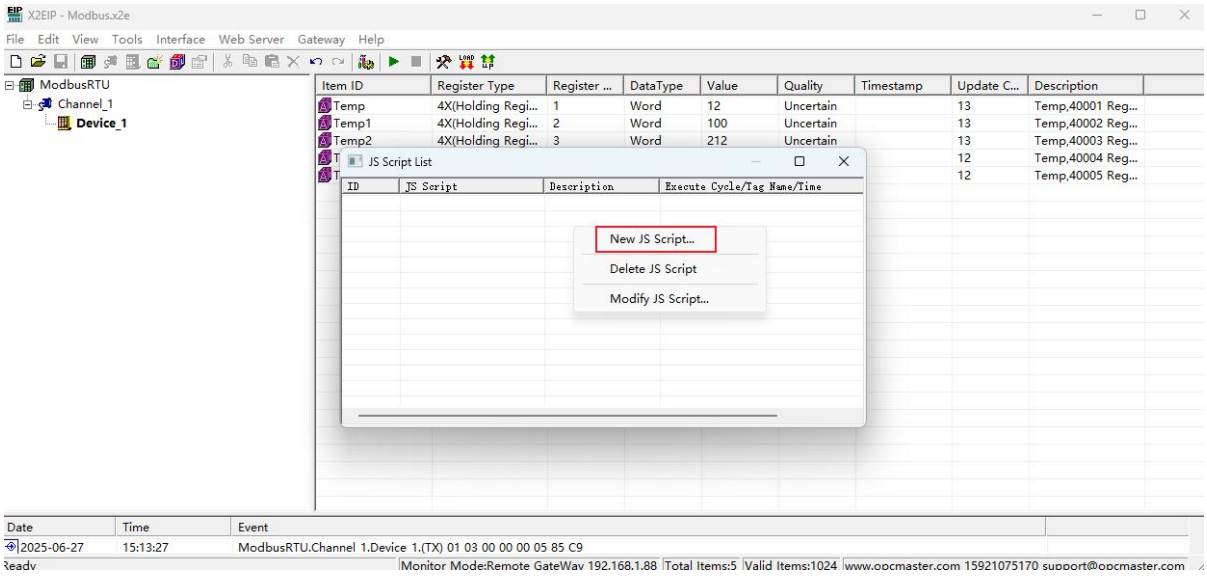

Figure 6-1-2 New JS Script

Open to see JS editing script, as shown in figure 6-1-3 below.

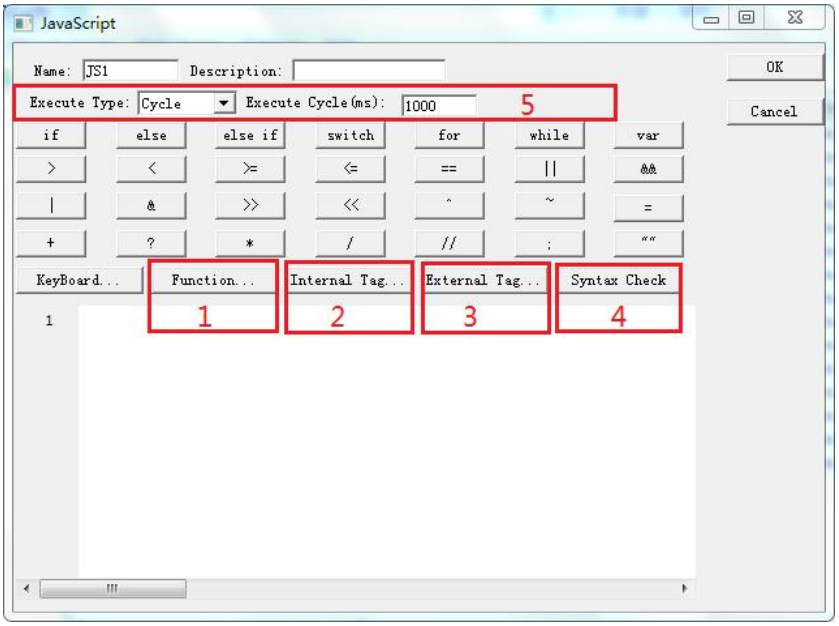

Figure 6-1-3 JS Script Editor

For detailed operation steps, please refer to the JavaScriptEditor-Ch.pdf manual in the Help folder of the software.

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7 Common Problems

7.1 Hint ” Failed to call ‘http://192.168.1.88/soap’ WEB server!”

When starting monitor in the Local PC monitor mode, the error message is constantly prompted in the print message bar ” Failed to call ‘http://192.168.1.88/soap’ WEB server!”. There are three main reasons for this situation:

- The first possibility is that the current monitoring mode is gateway mode, which needs to be adjusted to Local PC monitor mode.
- The second possibility is that the port number of the current WEB server is occupied by other applications on the local computer.
- The third possibility is that the X2EIPRuntime program is closed, and only needs to restart the monitor.

7.2 Pay attention to the difference of “Upload” and “Download”

It is particularly reminded that after the completion of the project configuration on PC, the project will be uploaded to the gateway through the button "Upload project". When you look at the project in the gateway, you download the project inside the gateway to the configuration software through the button "download project" .

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