X2Modbus 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

- Email：support@opcmaster.com
- TEL：+86 021-58776098
- website：http://www.opcmaster.com/english

  http://www.bacnetchina.com/english

Add:28 Senang Crescent,#05-11,Bizhub 28,Singapore 416601 Tel: +65 80385403 URL: www.bacnetchina.com
milesgoiiot@gmail.com / sales@opcmaster.com

2 Overview

2.1 Feature

- **Functional description：**

  X2Modbus is a very powerful protocol conversion gateway, where X represents different communication protocols,2 is the To harmonics said conversion, the Modbus is ultimately support the standard protocol is Modbus protocol. The user can according to the field device configuration, communication protocol of into the standard Modbus protocol. After the PC simulation run correctly, uploaded to the protocol conversion gateway hardware. Note that this gateway acquisition end and forward the Modbus register base address is from 1 (Base1) .

- **Working principle:**

  X2Modbus is equivalent to a communication bridge, support different kinds of communication protocol to convert to the Modbus standard communication protocol, makes the PC software of support the Modbus protocol through hardware protocol gateway can communicate with each other and different equipment, easy 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 X2Modbus.
  5. Support the User review data and communication status. And download files and X2Modbus software from website.
  6. Support different protocol transfer to Modbus Protocol.
  7. Gateway support analog linear transformation, support function, high and low byte

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exchange function.

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

Modbus-Lite series:MOD1001-Lite, MOD1002-Lite, MOD2004-Lite, MOD2004-A9(Lite)

Modbus-ARM series:MOD1001-ARM, MOD1002-ARM, MOD2004-ARM, MOD2004-A9

MBus to Modbus gateway series:MOD1001-MBus, MOD1002-MBus, MOD1010-MBus, MOD1011-MBus

2.4 Supported Registered Type and Number

Gateway support ModbusTCP server and ModbusRTU servers, the two common types of server support register. MOD2004-ARM limit points to 1024 .MOD1002-ARM limit points to 256

Register Type	Number of Registers			
	1001/1010	1002/1011	2004 (Lite/ARM)	2004-A9/ 2004-A9(Lite)
0X（Read and Write）	256	512	1024	2048
1X（Read only）	256	512	1024	2048
4X（Read and Write）	256	512	1024	2048
3X（Read only）	256	512	1024	2048

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2.5 Application Fields

Hardware gateway is used to solve some upper systems with Modbus protocols are unable to connect to some of the less common configuration software control equipment. For example, in the industrial control configuration software to access support Modbus TCP protocol network controller, through hardware gateway into standard Modbus protocol, for supporting Modbus client software for a visit.

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3 Configuration And Operation

X2Modbus 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. X2Modbus also can be used alone on the PC .

Double click X2Modbus. exe(It is recommended to run as an administrator), open the main interface, as the following figure 3-1.

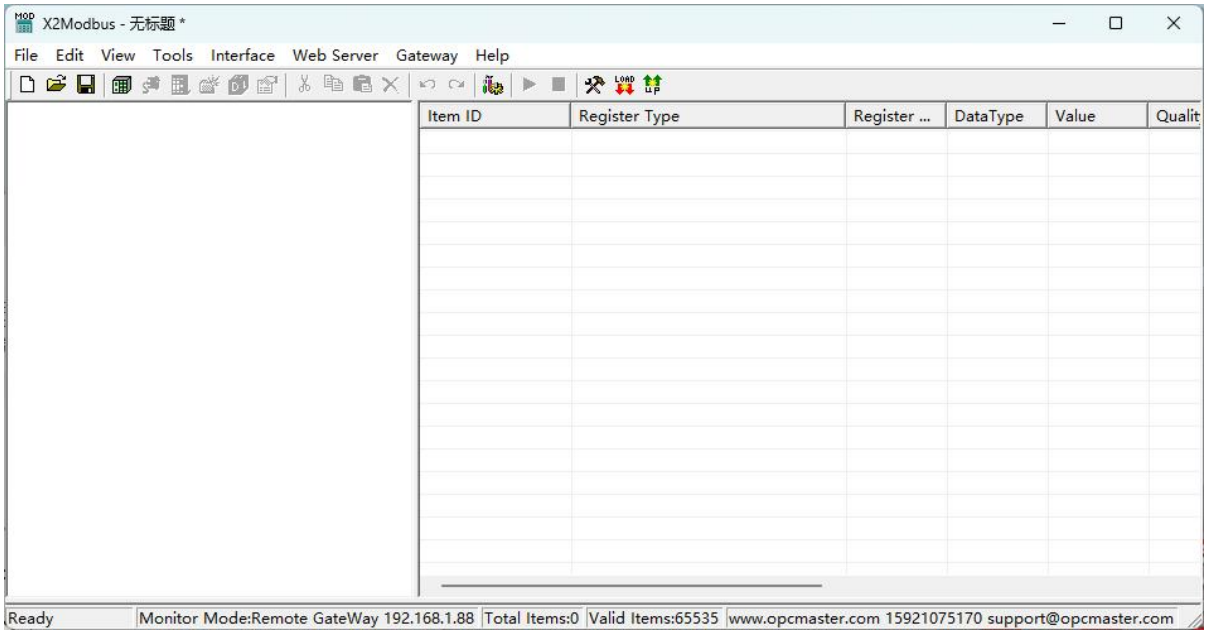

Figure 3-1 Main interface

Note: the PC configuration software X2Modbus and upload project can be downloaded from inside the gateway, operation steps, please see the WEB server 4 chapters.

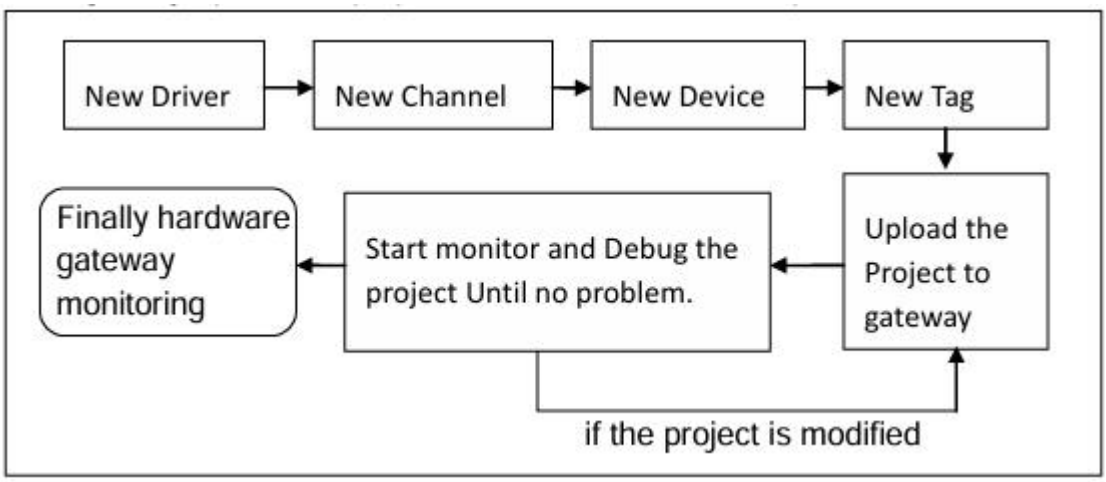

Figure 3-2 Simple operation flow

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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.

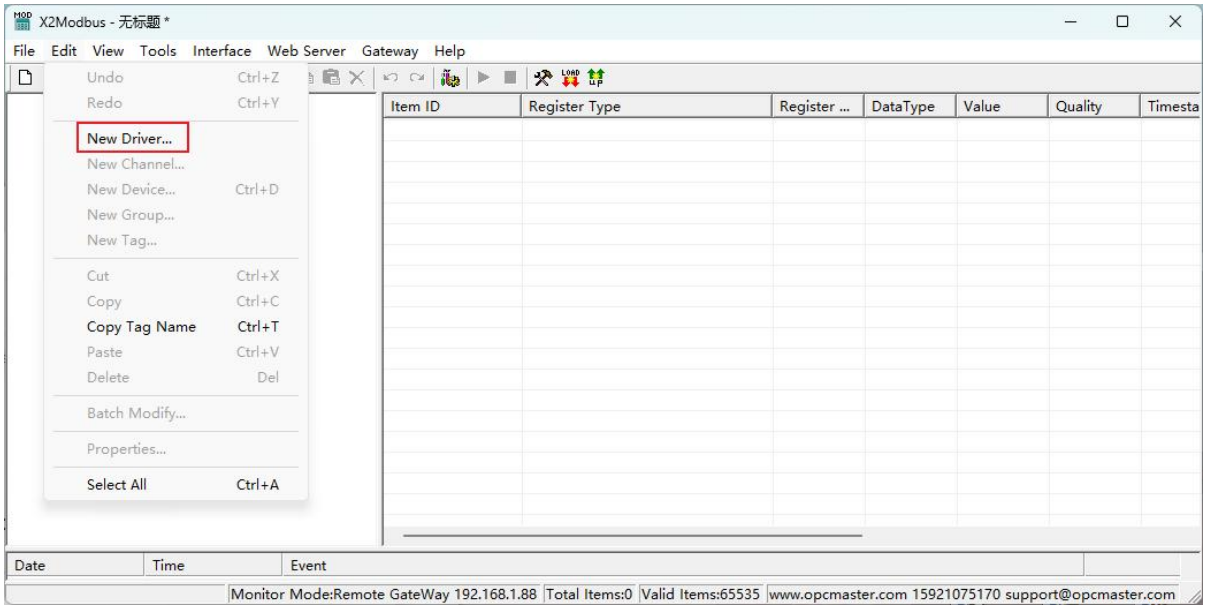

Figure 3-1-1 New Driver

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

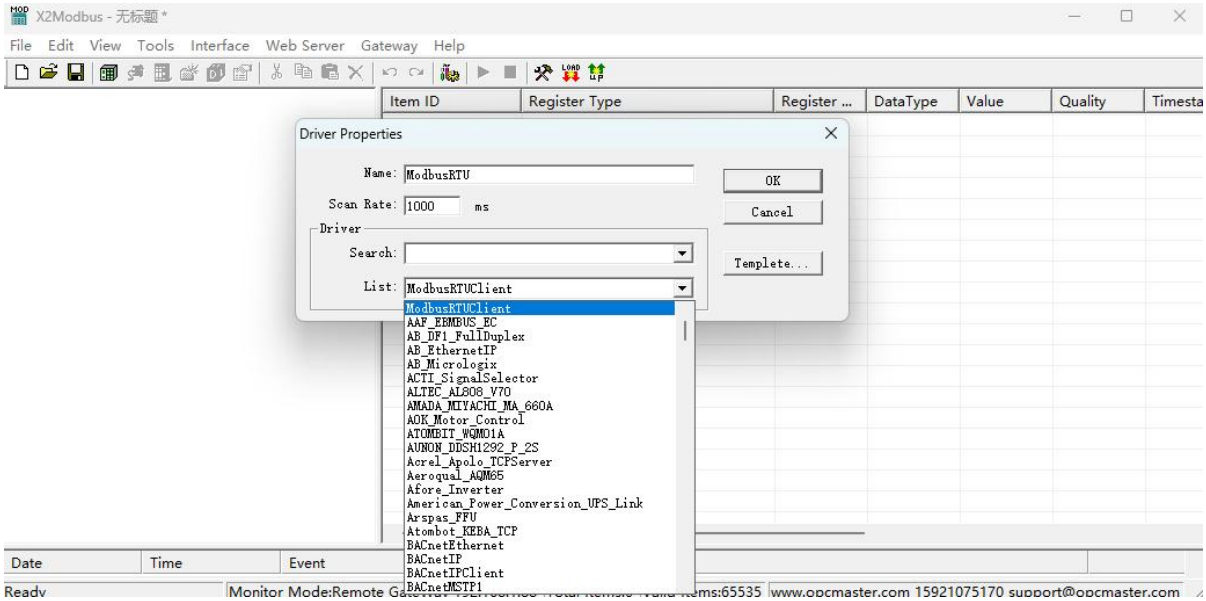

Figure 3-1-2 choose driver

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

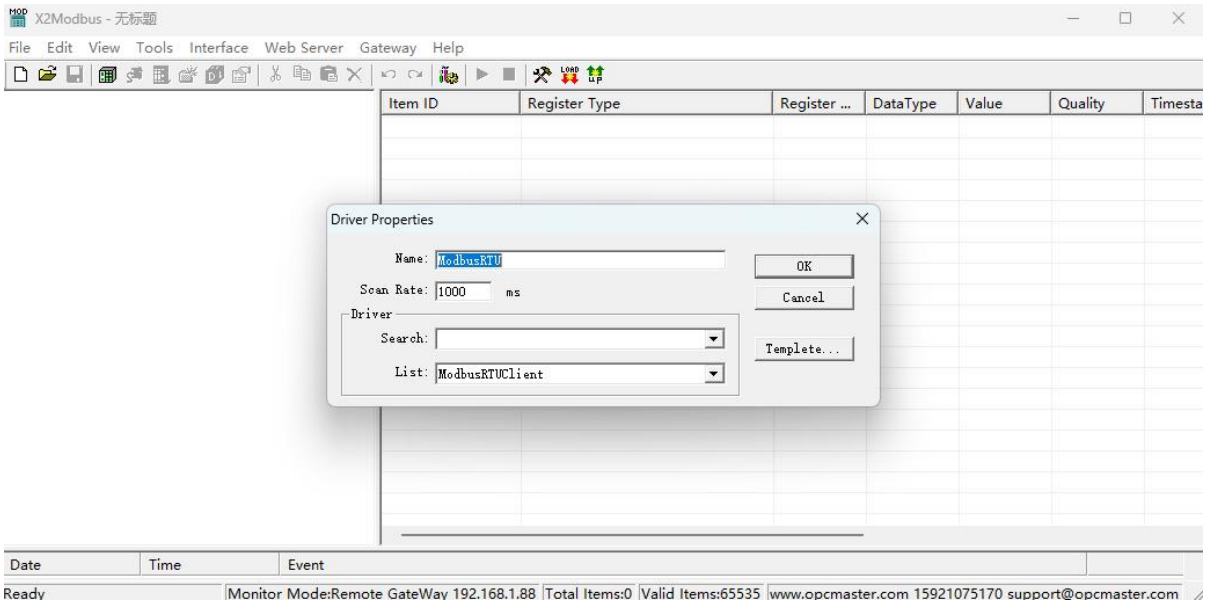

Figure 3-1-3 Driver Properties

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 3-1-3.

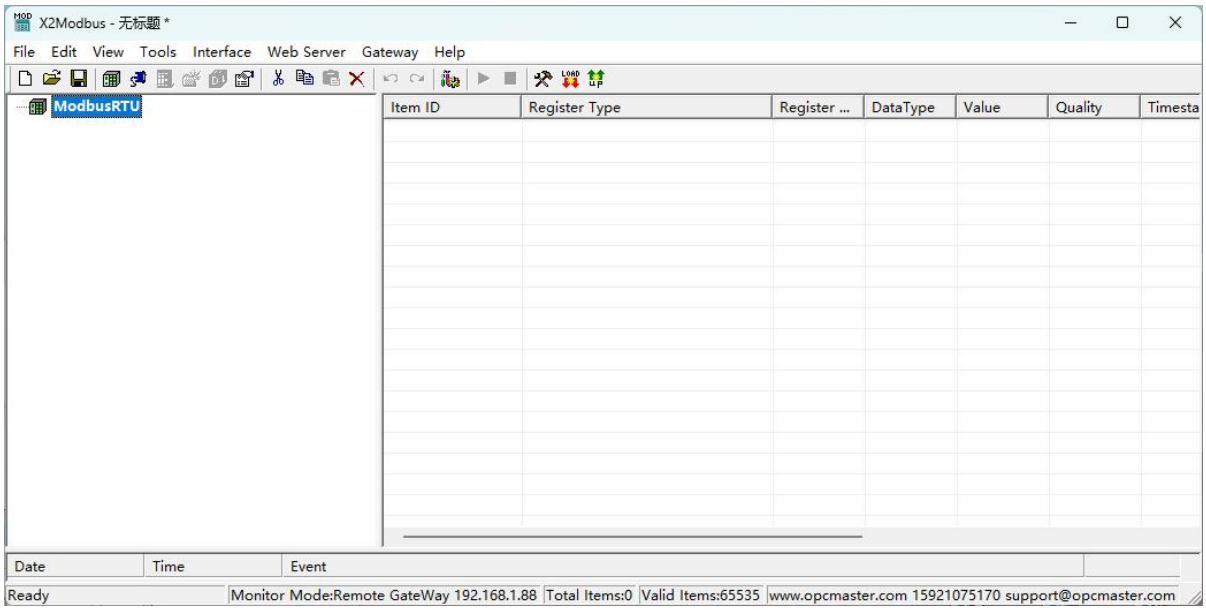

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Figure 3-1-3 finish adding driver

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.

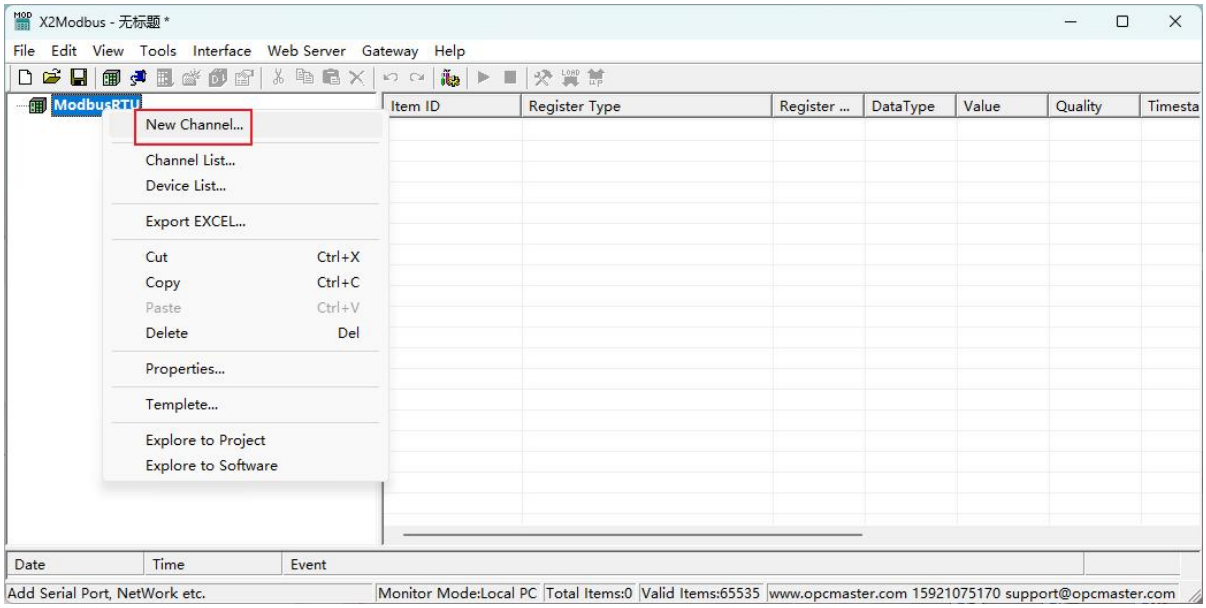

Figure 3-2-1 New Channel

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.

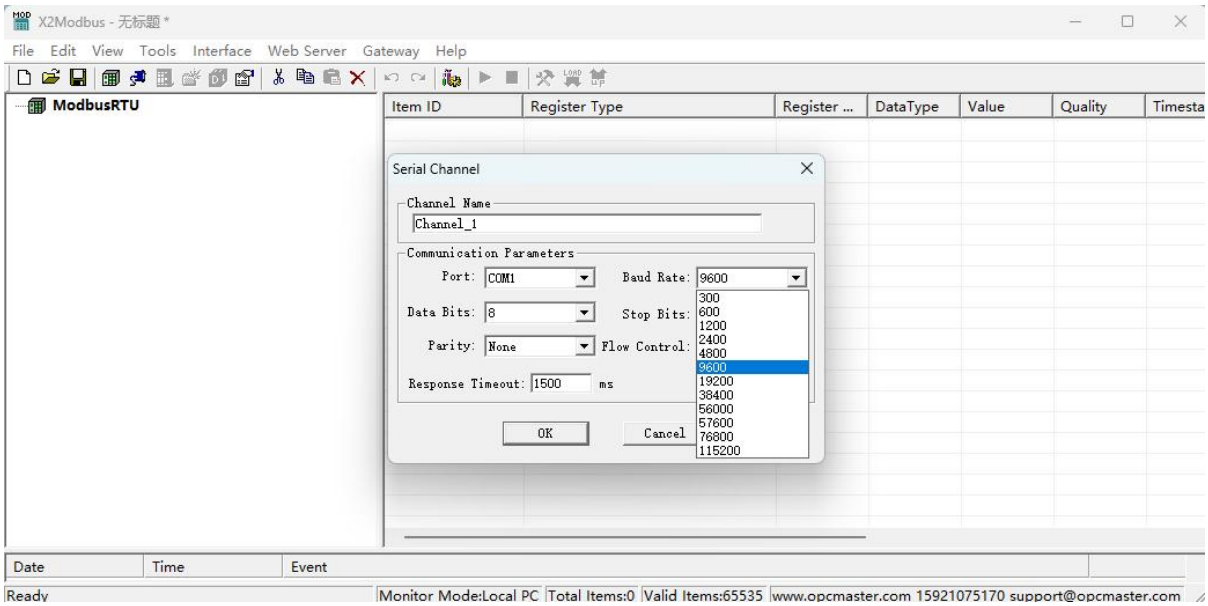

Figure 3-2-2 Set communication parameters

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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 figure

3-2-3.

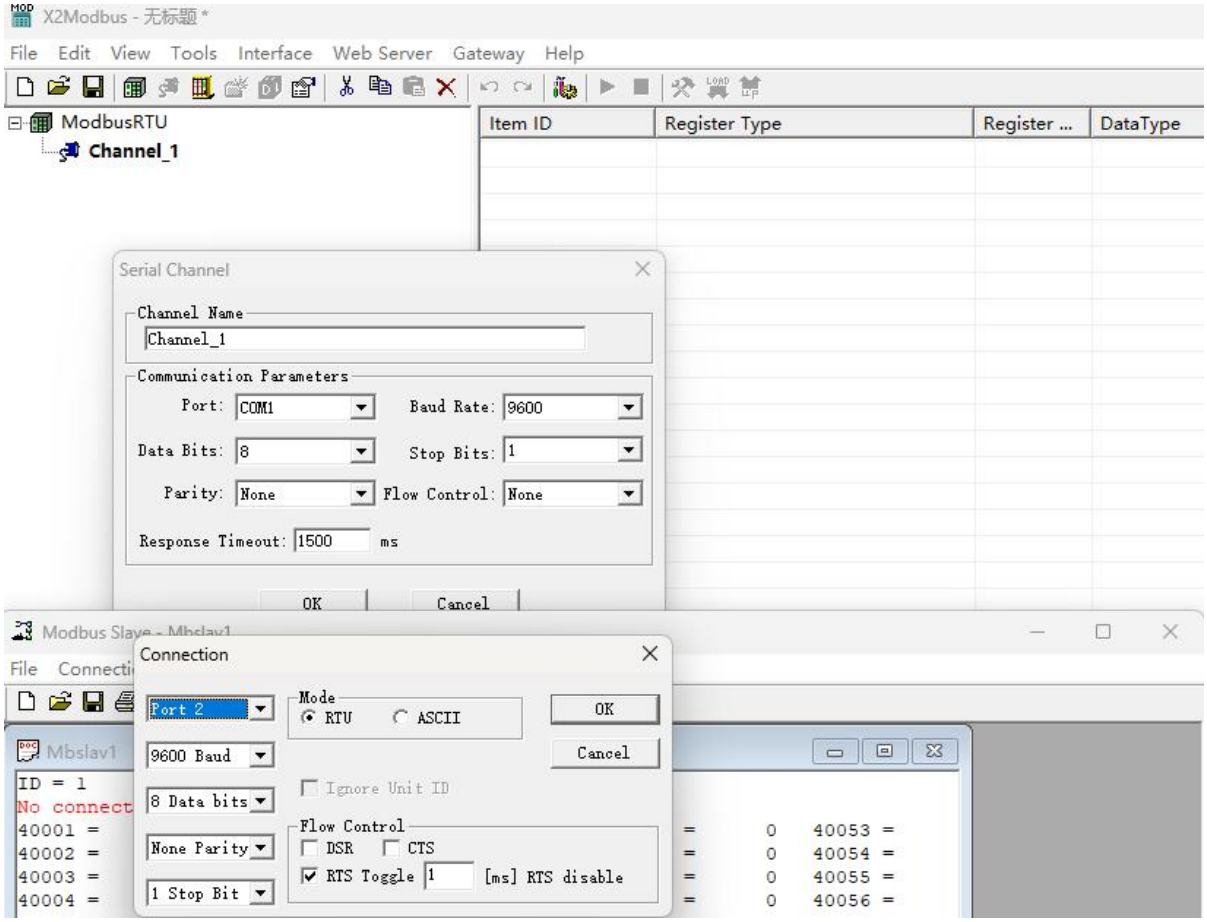

Figure 3-2-3 Channel parameters are consistent

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

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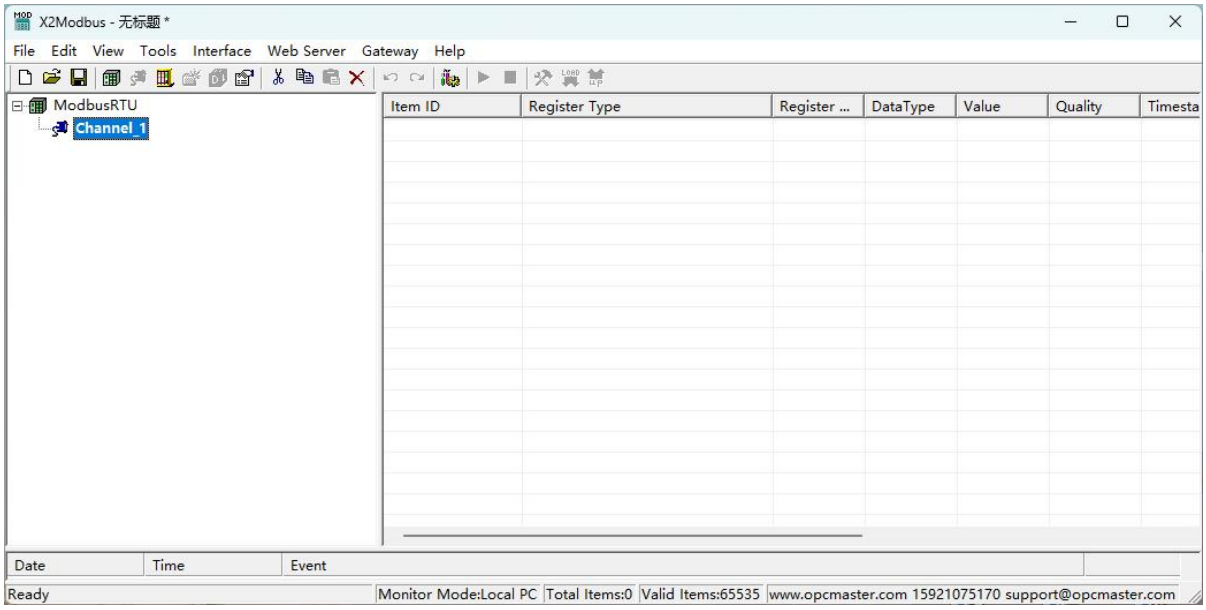

Figure 3-2-4 finish adding Channel

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.

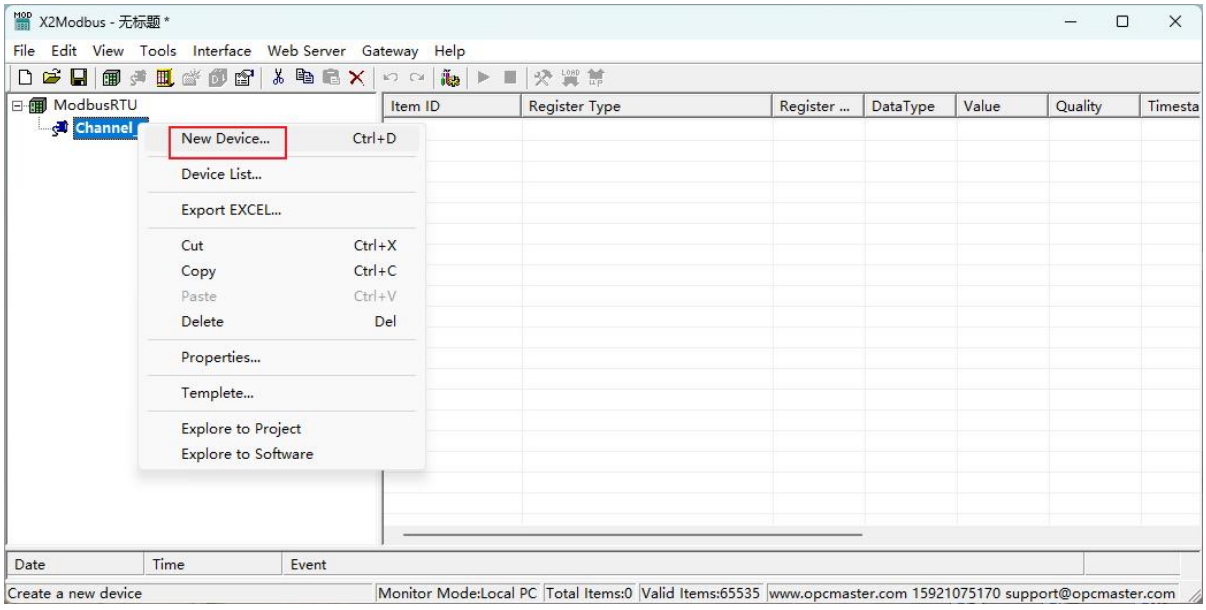

Figure 3-3-1 New Device

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

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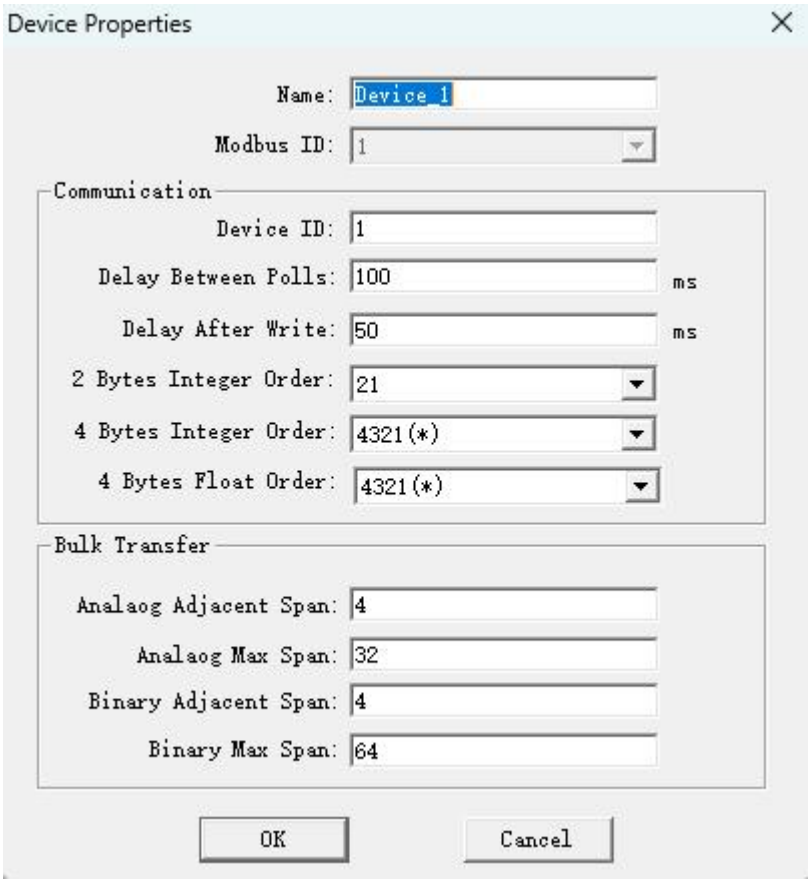

Figure 3-3-2 Device Properties

In order to improve the communication speed, the packet register communication can be realized under the continuous register address. When the device does not support packet communication, the parameters of the group package should be set to 0. In addition, when the response time of the device is slow, you can set the time interval between the data frame and the frame (that is Delay Between Polls) . The default of Delay Between Polls is 100 microseconds. As the following figure 3-3-3.

2 Bytes Integer Order, 4Bytes Integer Order, and 4 Bytes Float Order means the combination of integer or floating point byte order, the default is 4321. These parameters are used in combination with field devices for data transmission.For example, some meters adjust the sequence of high and low byte in the transmission of data, which will be used at this time. The default parameters are generally used, As the following figure 3-3-3.

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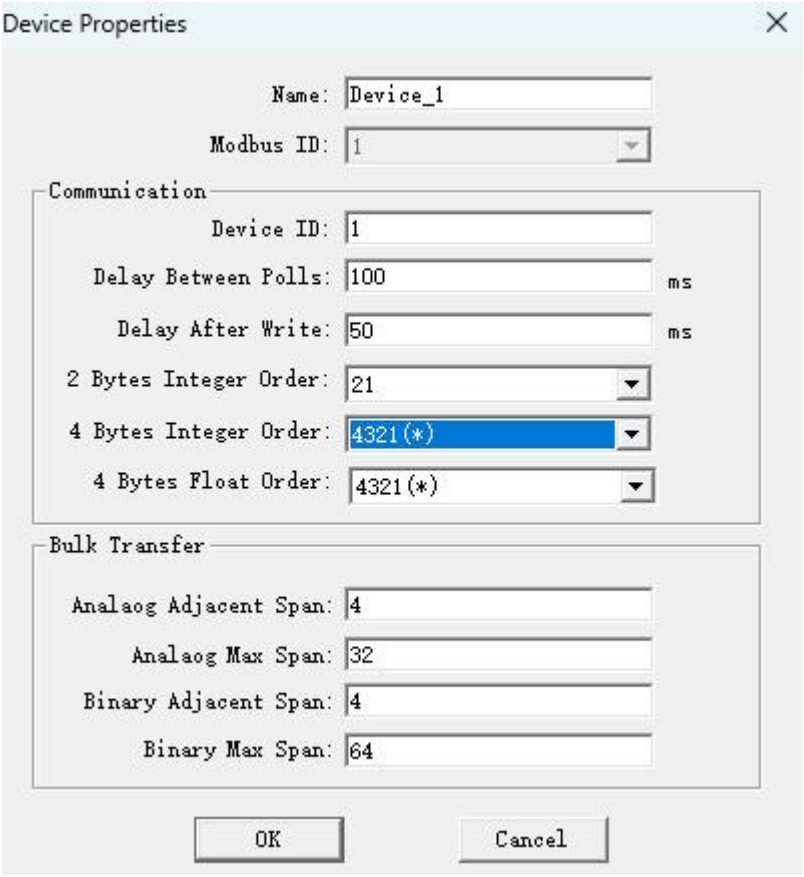

Figure 3-3-3 Byte order

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

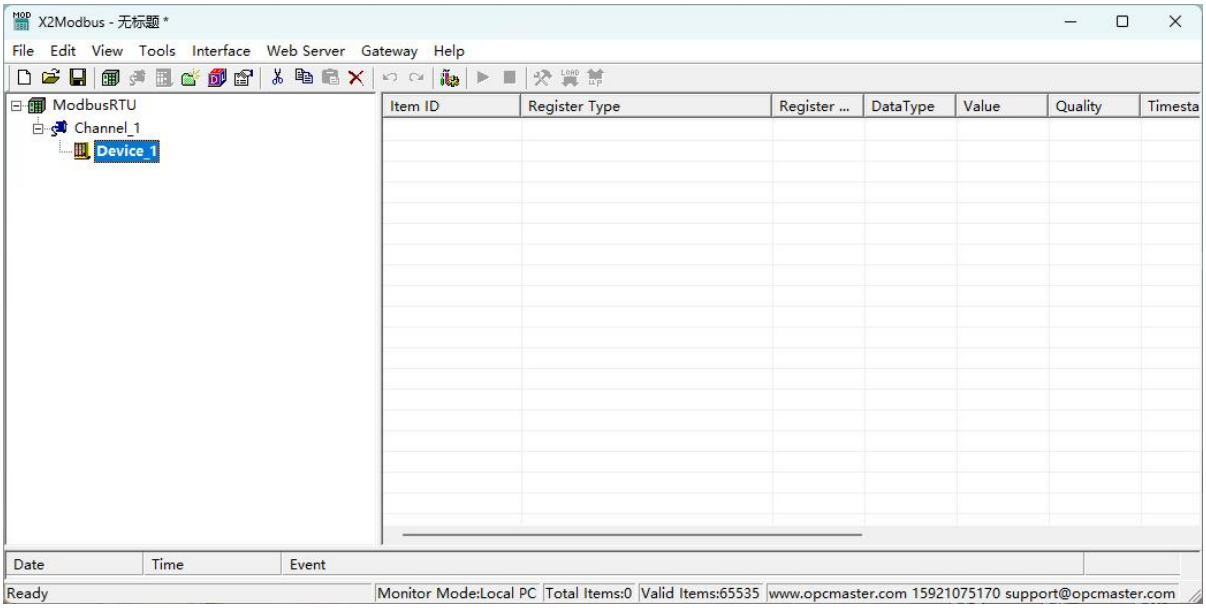

Figure 3-3-4 finish adding the device

3.4 New Tag

In the current Channel, Right-click to choose directly add tag (also add group first,

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and then new tag in the group), or click on the toolbar , As the following figure 3-4-1.

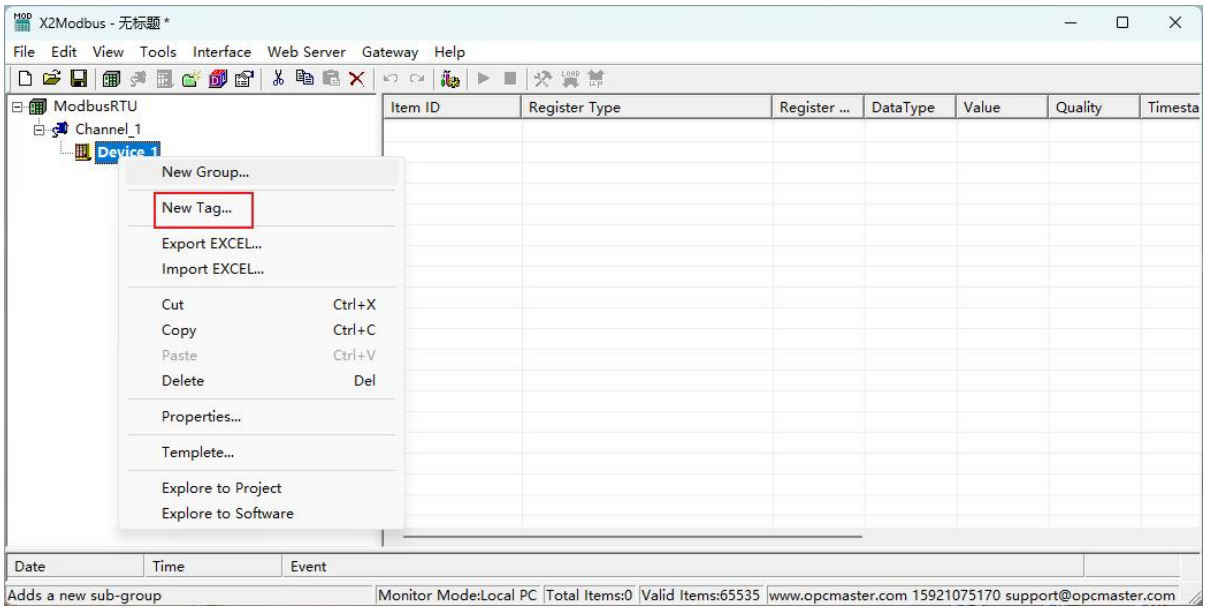

Figure 3-4-1 New Tag

Or right-click on the right side of the edit box blank space, add a new tag.As the following figure 3-4-2.

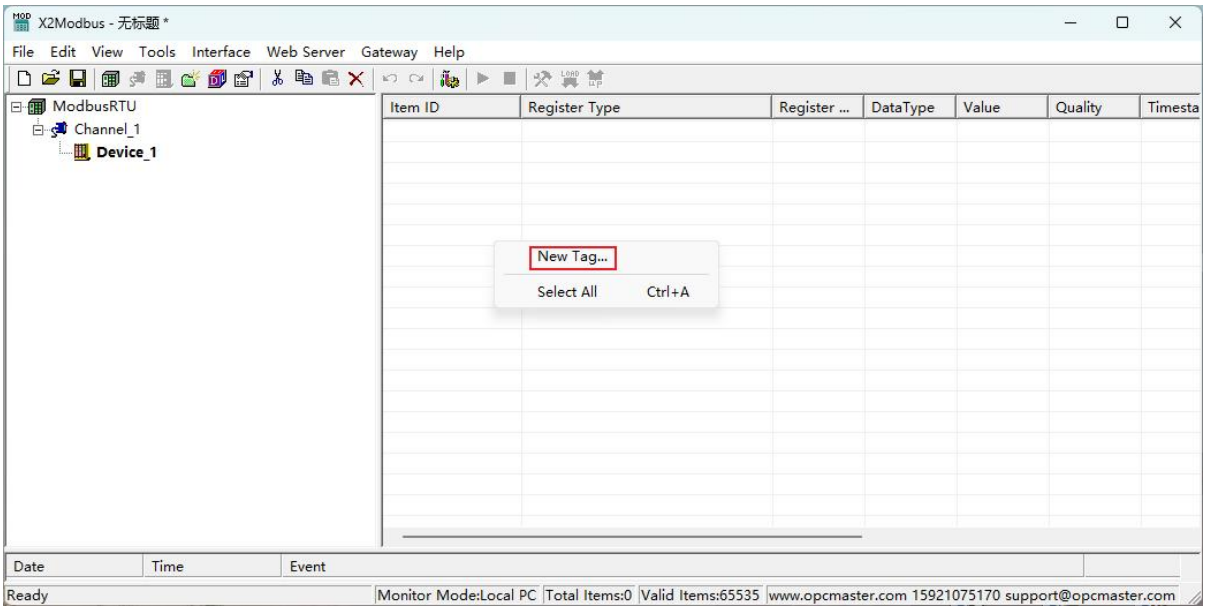

Figure 3-4-2 New Tag

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

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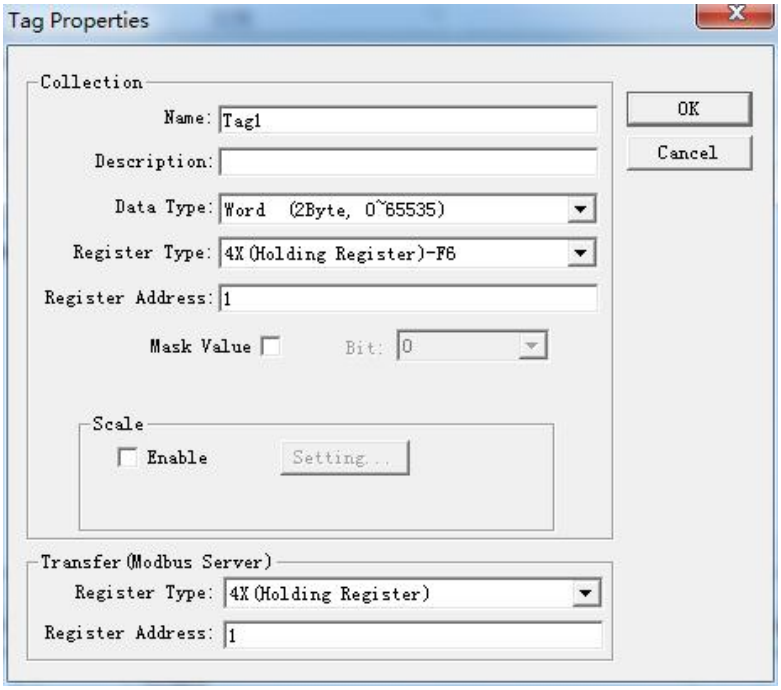

Figure 3-4-3 Tag Properties

In the tag properties pop-up window ,fill in the Name, Description, Data type, register, Register Type, Register address etc. As above figure, a register address of collection end is 40001 , data type is Word .

When the data type is Short, Word, Long or DWord, can be valued by byte data bits. Click “Mask Value”, you can pick up a byte 0-15. As the following figure 3-4-4.

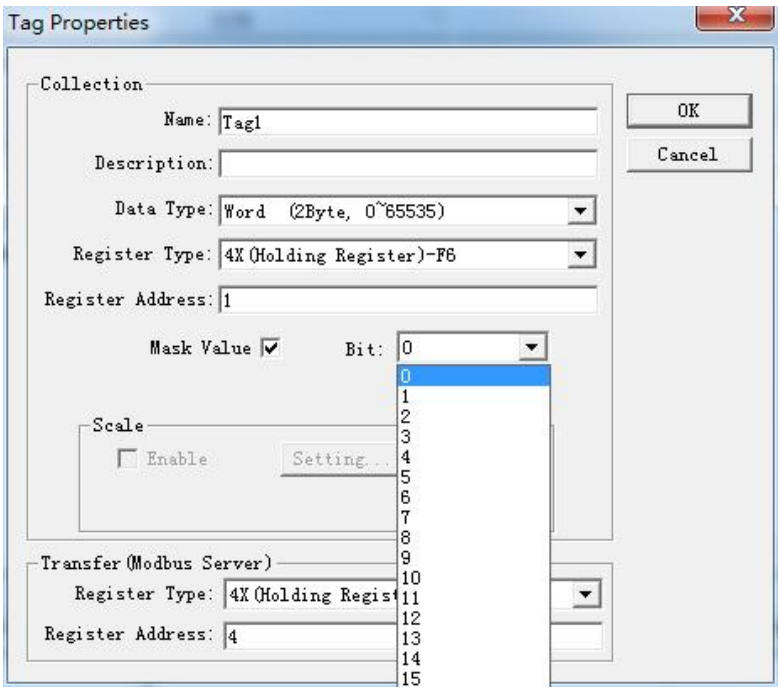

Figure 3-4-4 Mask Vaule

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For some special data, we can also enable the linear transformation function to realize the linear amplification and reduction of data. Note that the initial address of the BACnet server's address is from 0. As above figure, the value of the Modbus register is collected and stored in the AV0 address of the BACnet server.

The supported type of registers are 0X, 1X, 3X, 4X. For the 0X and 4X register types, 0x (Coil Status) -F5 and 4x (Holding Register) -F6 are generally chosen by default. A write function code Behind the bar line.

Click “Scale”, You can do the linear transformation, and two minimum value is invalid, you just need to set a maximum. To expand 100 times, Raw Data is set to 1, Engineer Date can be set to 100. As the following figure 3-4-5.

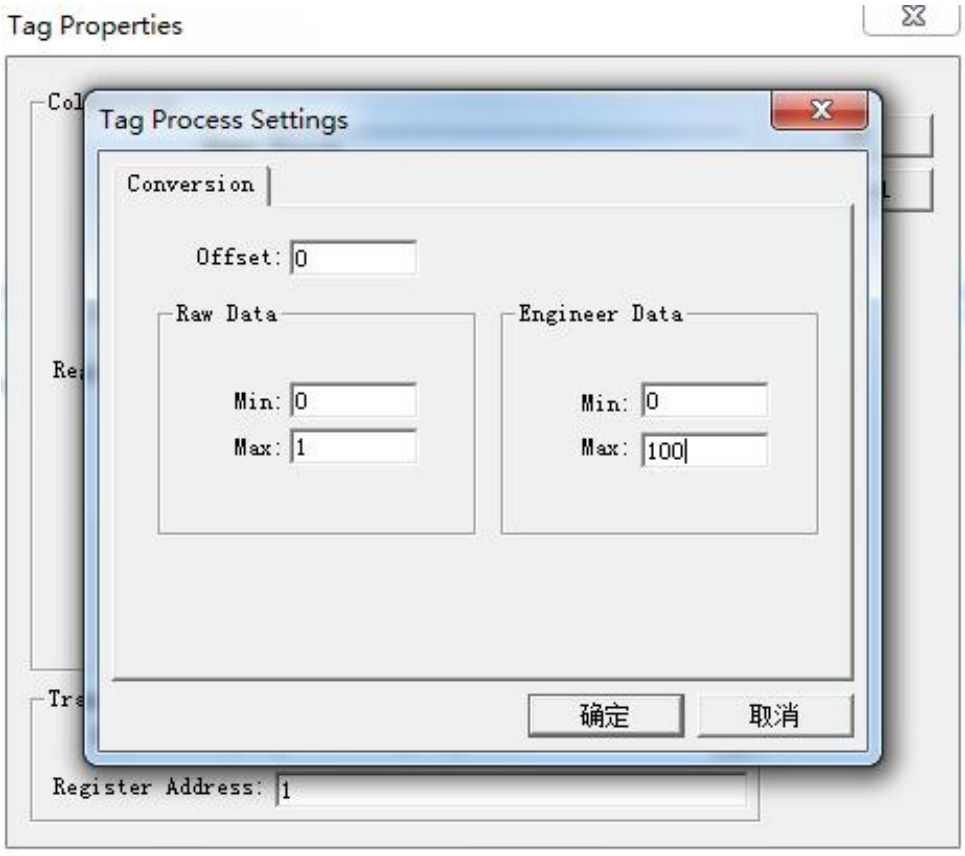

Figure 3-4-5 Tag Process Settings

After finish adding a tag, As the following figure 3-4-6.

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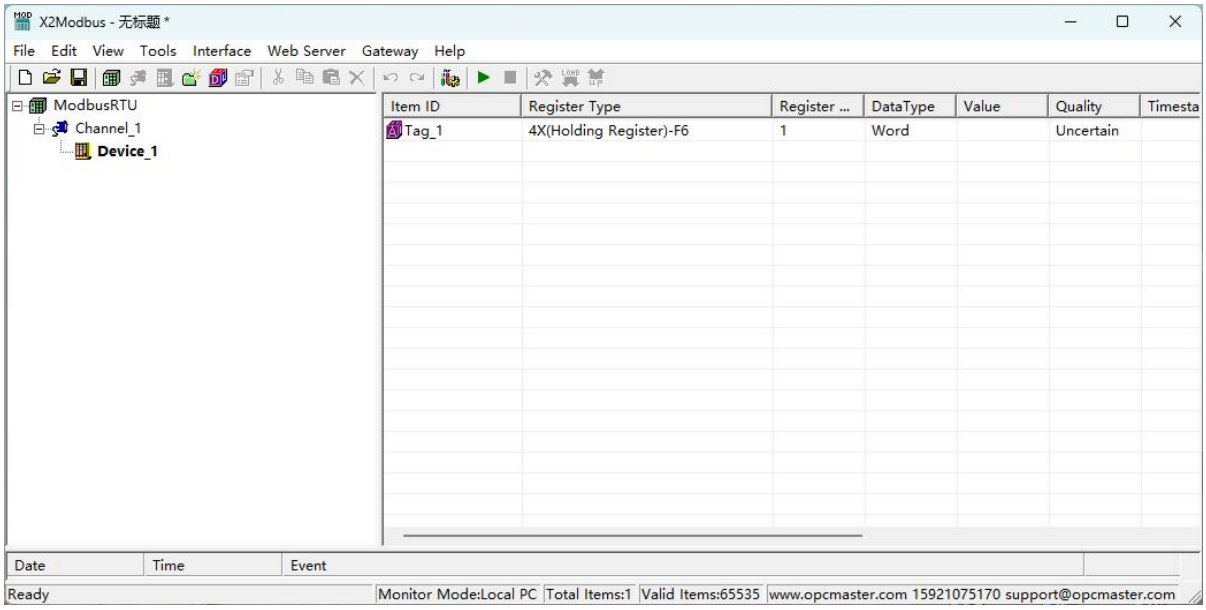

Figure 3-4-6 finish adding a tag

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 3-4-7。

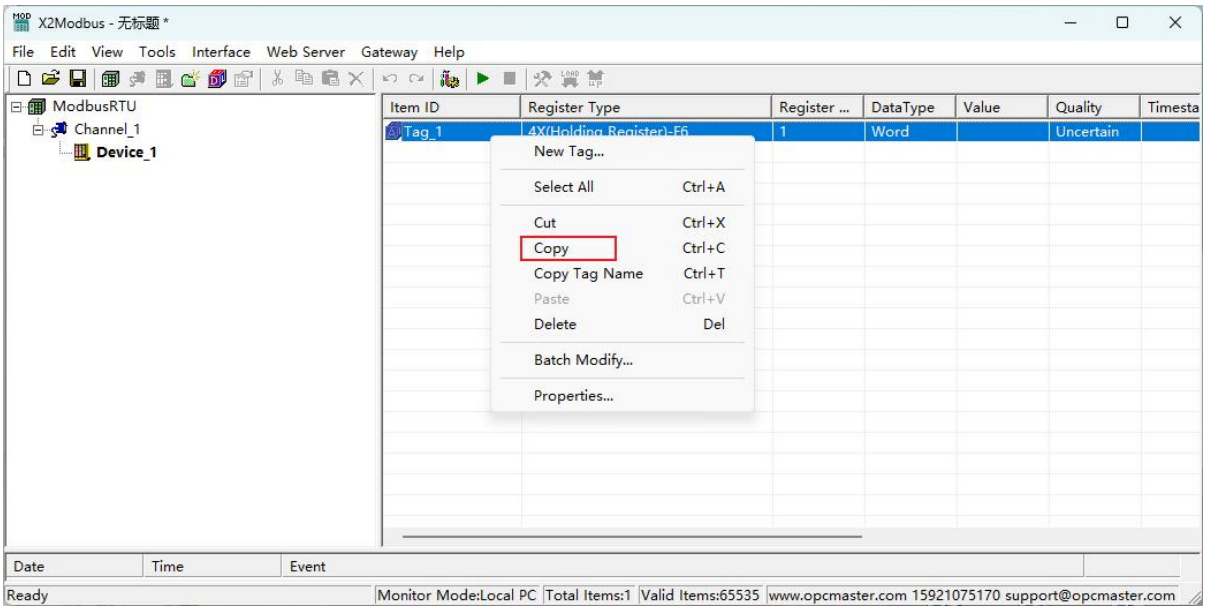

Figure 3-4-7 Copy Tag

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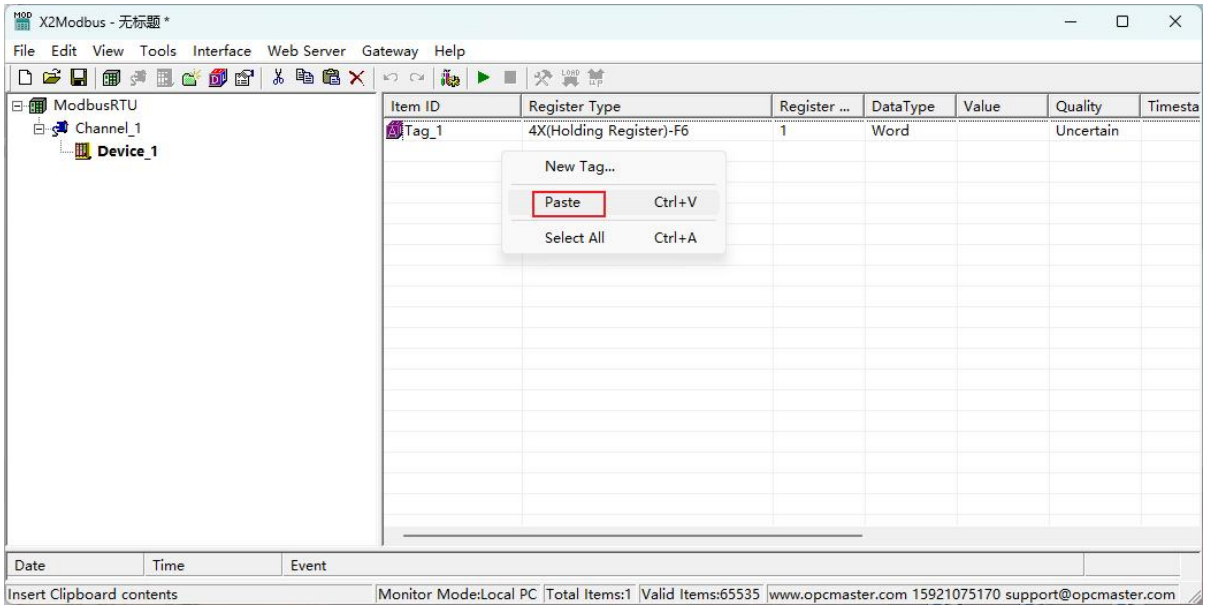

Figure 3-4-8 Paste Tag

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 3-4-9. Save as xls file.

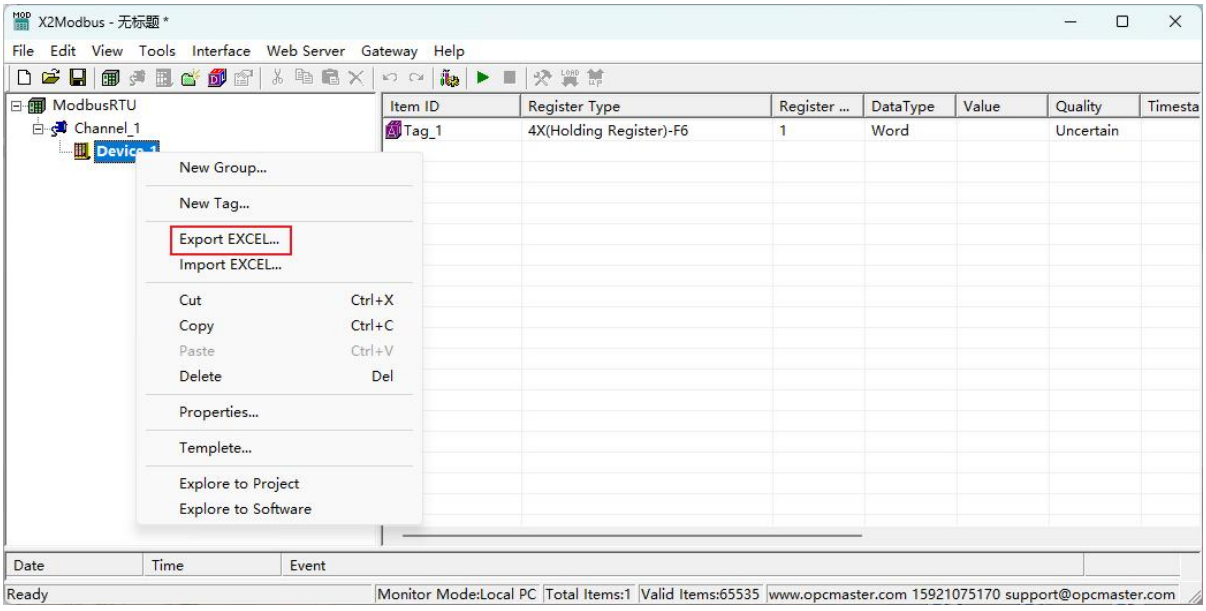

Figure 3-4-9 Export EXCEL

Save the completed, open the EXCEL for editing, As the figure 3-4-10.

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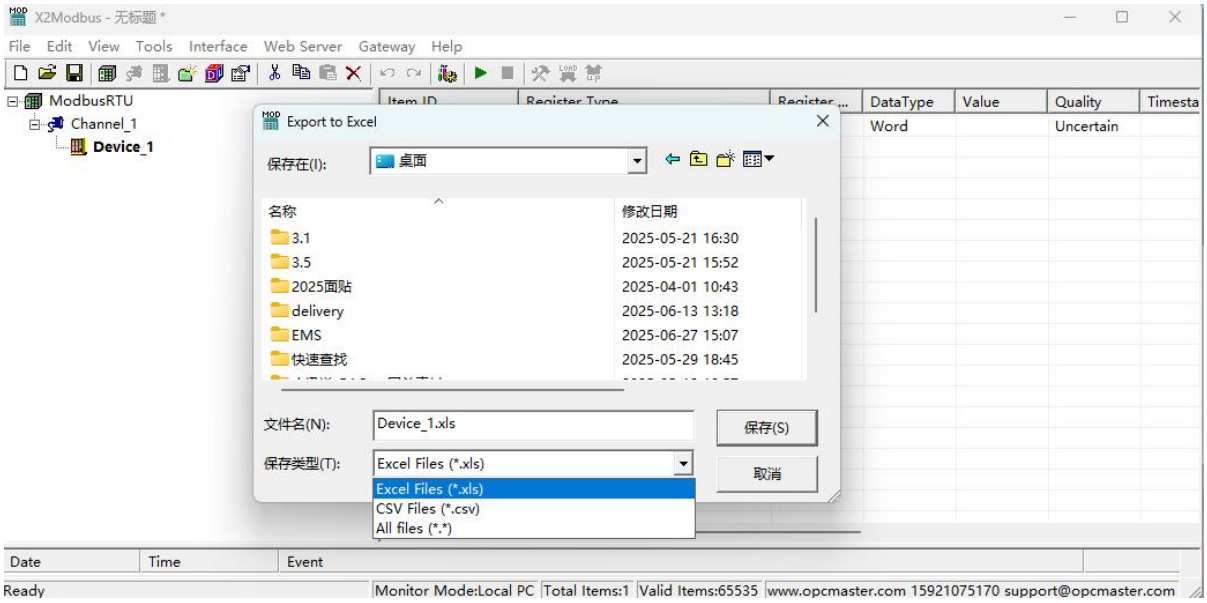

Figure 3-4-10 save the EXCEL

Save the completed, open the EXCEL for editing.

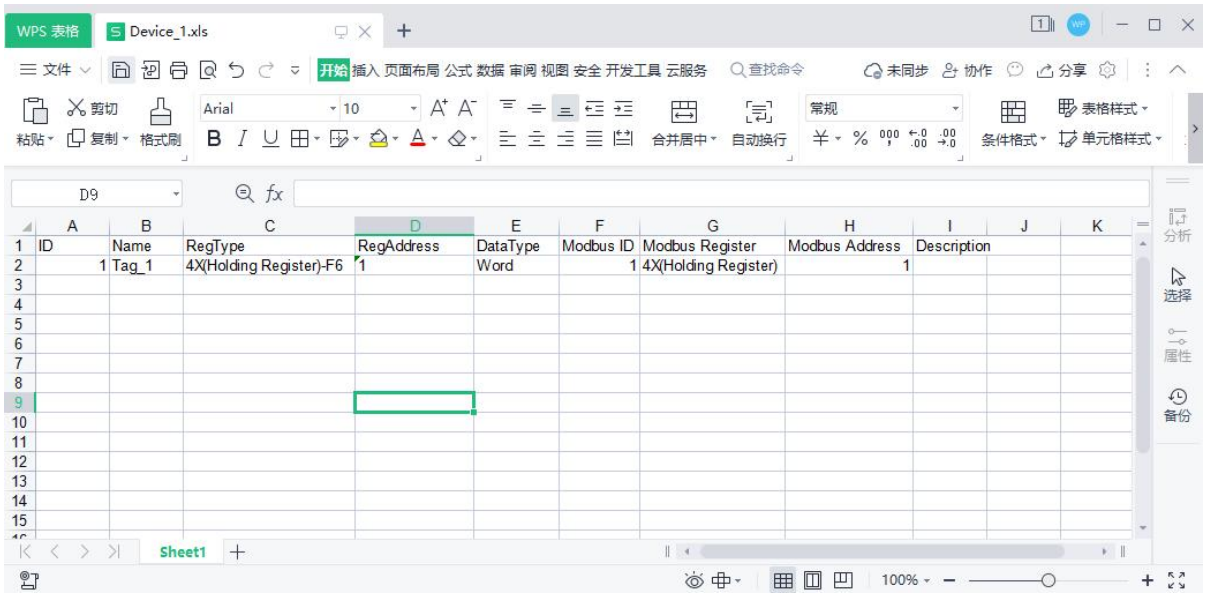

Figure 3-6-11 Open the EXCEL

After editing the Excel file, As the figure 3-4-12.

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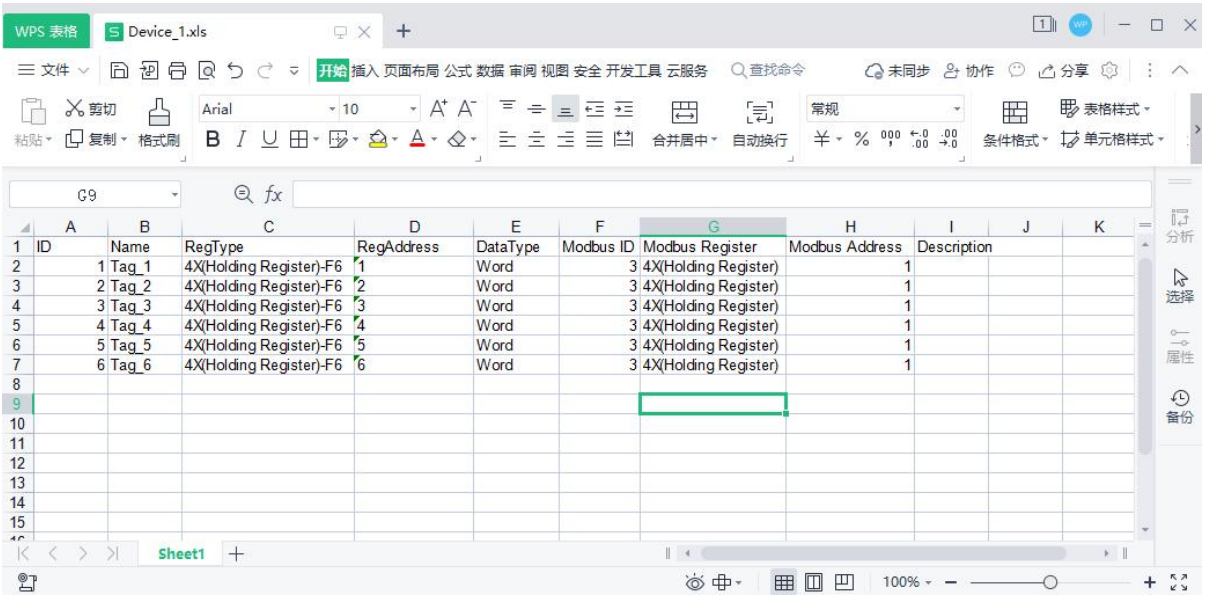

	A	B	C	D	E	F	G	H	I	J	K
1	ID	Name	RegType	RegAddress	DataType	Modbus ID	Modbus Register	Modbus Address	Description		
2	1	Tag_1	4X(Holding Register)-F6	1	Word	3	4X(Holding Register)	1			
3	2	Tag_2	4X(Holding Register)-F6	2	Word	3	4X(Holding Register)	1			
4	3	Tag_3	4X(Holding Register)-F6	3	Word	3	4X(Holding Register)	1			
5	4	Tag_4	4X(Holding Register)-F6	4	Word	3	4X(Holding Register)	1			
6	5	Tag_5	4X(Holding Register)-F6	5	Word	3	4X(Holding Register)	1			
7	6	Tag_6	4X(Holding Register)-F6	6	Word	3	4X(Holding Register)	1			

Figure 3-4-12 Edit the EXCEL

Back to X2Modbus software, Right-click the device to choose “Import Excel”, find the edited Excel file to import. As the following figure 3-6-13.

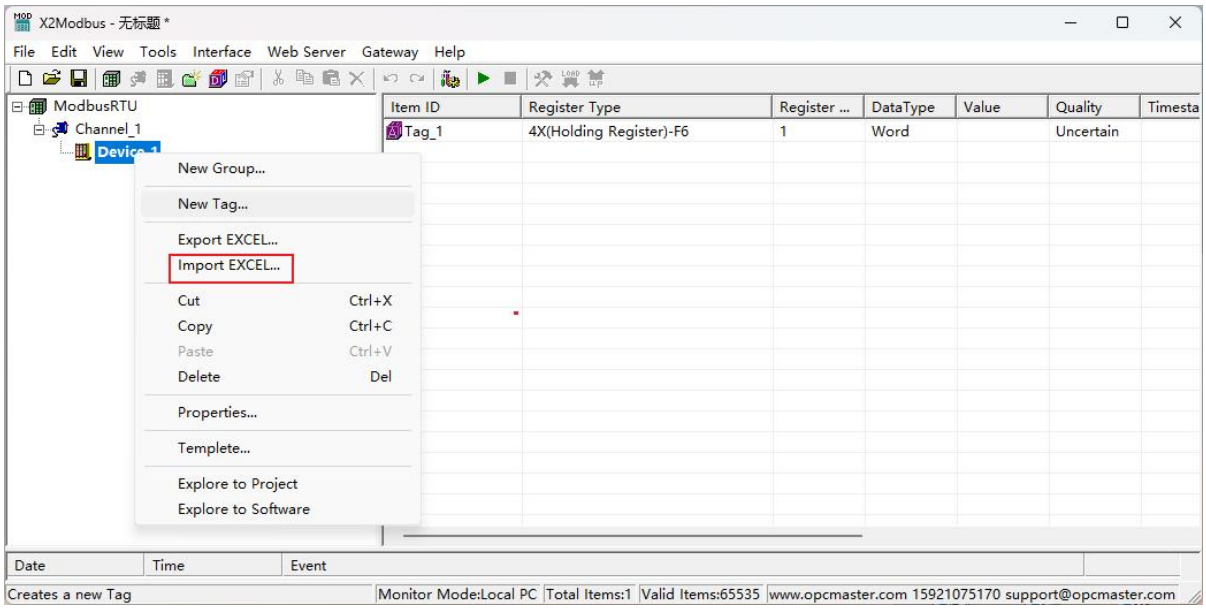

Figure 3-6-13 Import EXCEL

The import is complete, the following figure 3-4-14.

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milesgoiiot@gmail.com / sales@opcmaster.com

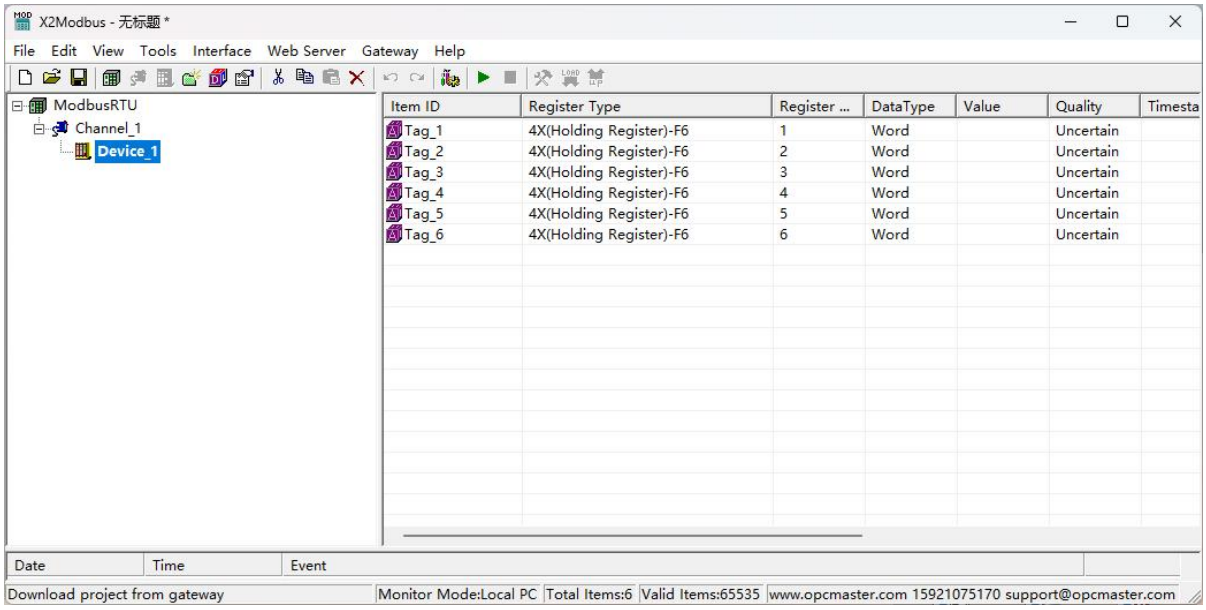

Figure 3-4-14 Complete the import

3.5 Modbus Server

3.5.1 Modbus TCP Setting

Modbus server support Modbus TCP and Modbus RTU protocol. Click on the menu bar "Interface" option "Modbus TCP Setting" .As the following figure 3-5-1-1.

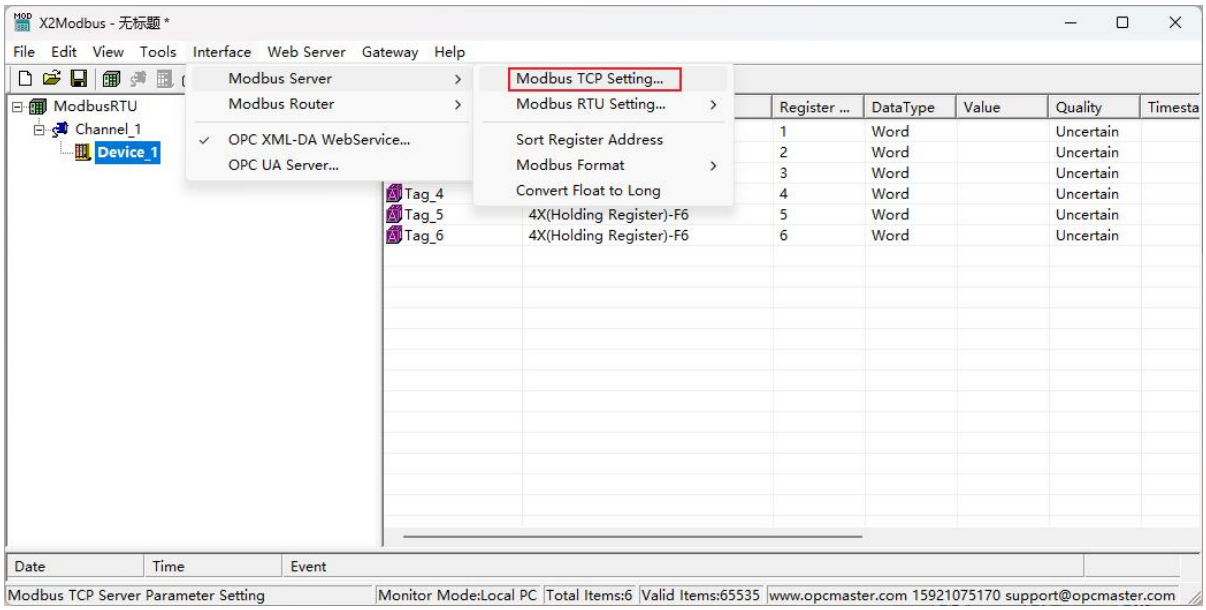

Figure 3-5-1-1 Modbus TCP Setting

The gateway default is supported Modbus TCP protocol Modbus server, and the port number is 502 by default. As the following figure 3-5-1-2.

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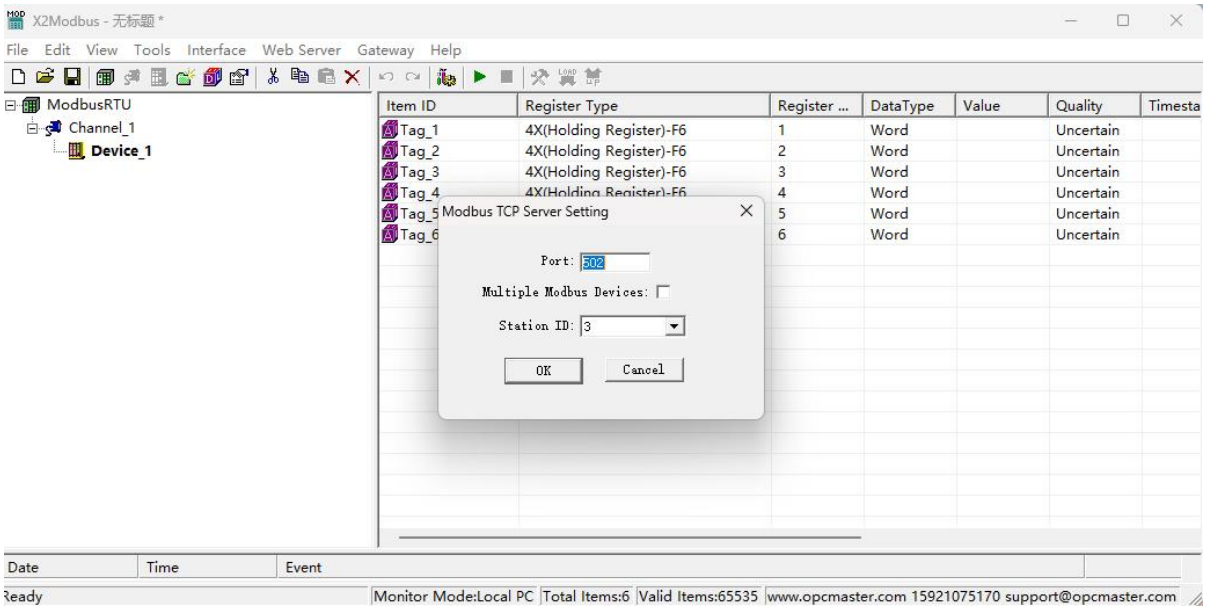

Figure 3-5-2 Modbus TCP Server

3.5.2 Modbus RTU Setting

Click on the menu bar "Modbus Server" option "Modbus RTU Setting" . As the following figure 3-5-2.

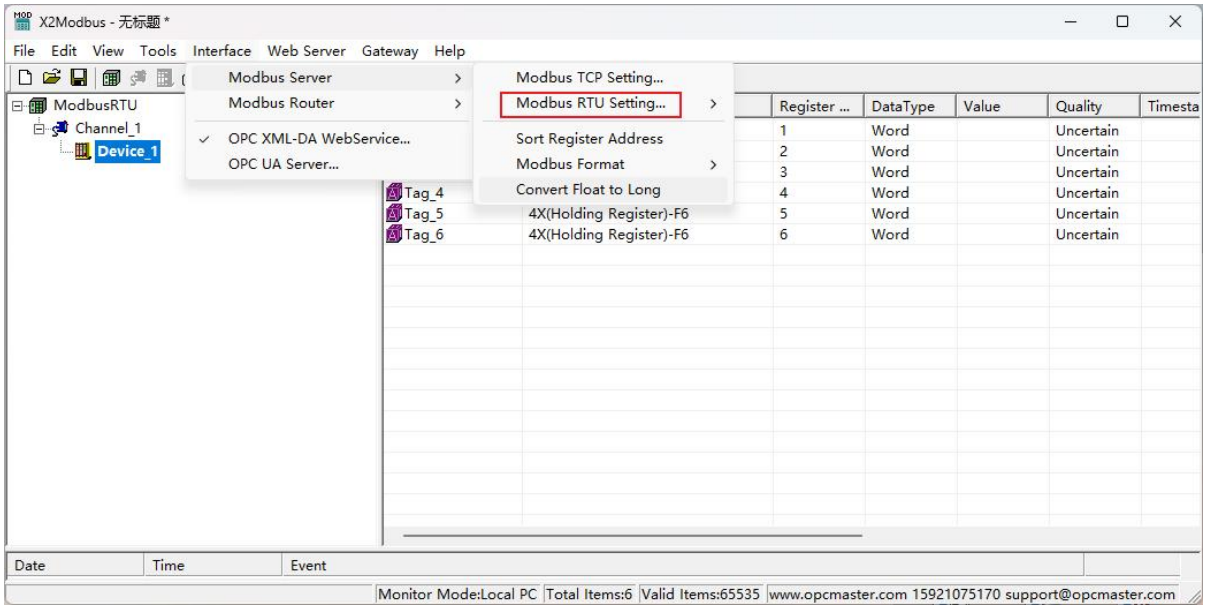

Figure 3-5-2-1 Modbus RTU Setting

Note in this dialog, need to check on the Modbus RTU Enable Server, just said the Modbus RTU service effectively, and we can set up the Modbus RTU service station, port number, baud rate of communication and other communications parameters. As the figure 3-5-2-2.

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milesgoiiot@gmail.com / sales@opcmaster.com

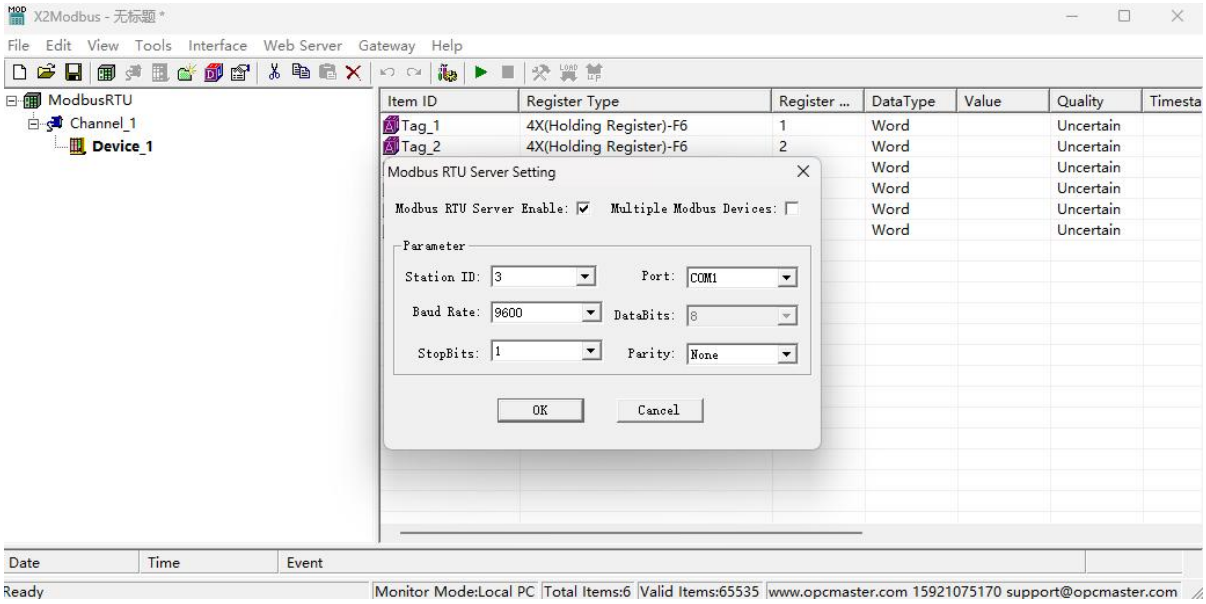

Figure 3-5-2-2 Modbus RTU Setting

Note that the gateway Modbus RTU server port number is 1 ~ 4.

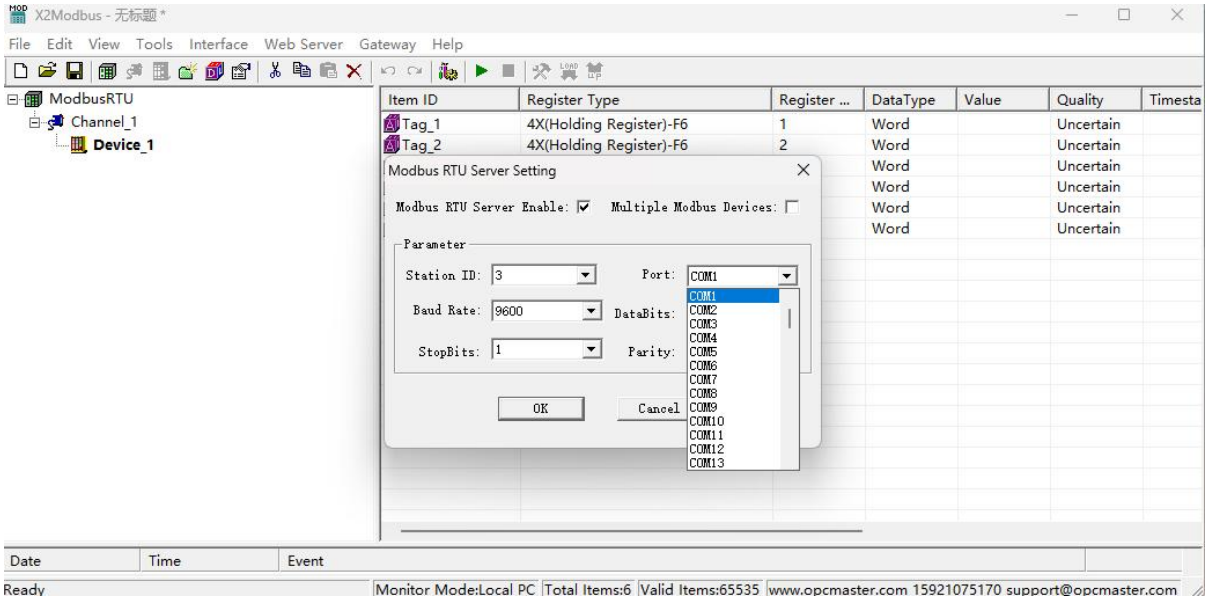

Figure 3-5-2-3 Port Setting

3.6 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.

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After Configuring the project, the project can be uploaded to the hardware gateway(MOD2004-ARM/MOD1002-ARM) 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.click on the menu bar "Gateway" to choose "Upload…" or click on the toolbar ,As the Figure 3-6-1.

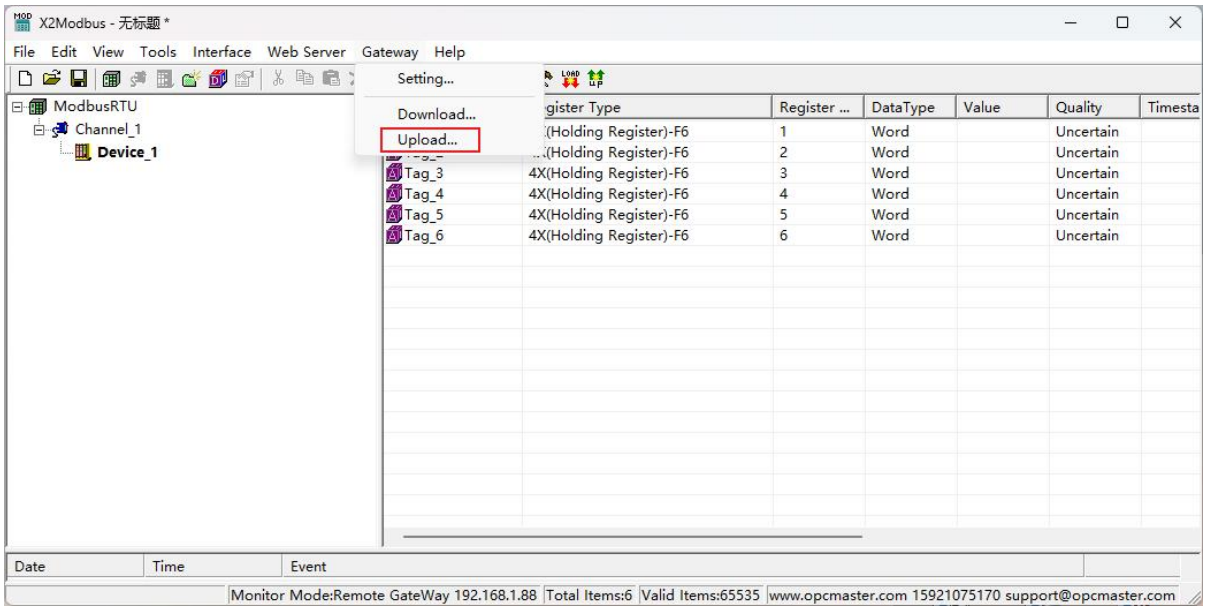

Figure 3-6-1 Upload the project

In the pop up dialog box enter the gateway IP address, click the "Upload"，As the Figure 3-6-2.

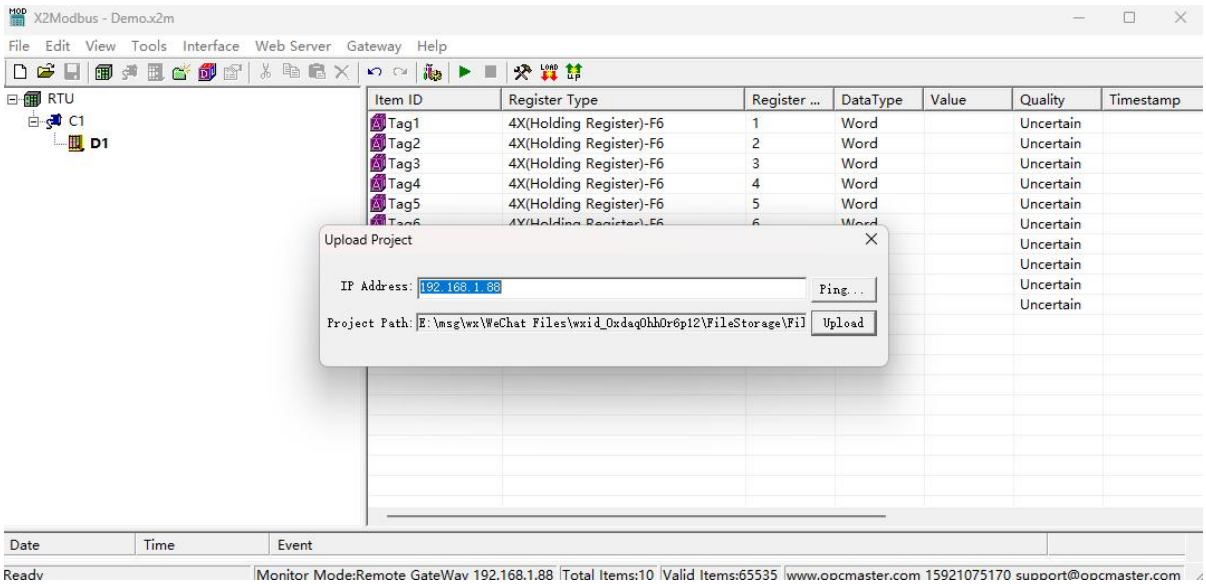

Figure 3-6-2 Upload

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milesgoiiot@gmail.com / sales@opcmaster.com

After uploading, the pop-up dialog prompt succeed to upload. As the Figure 3-6-3.

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

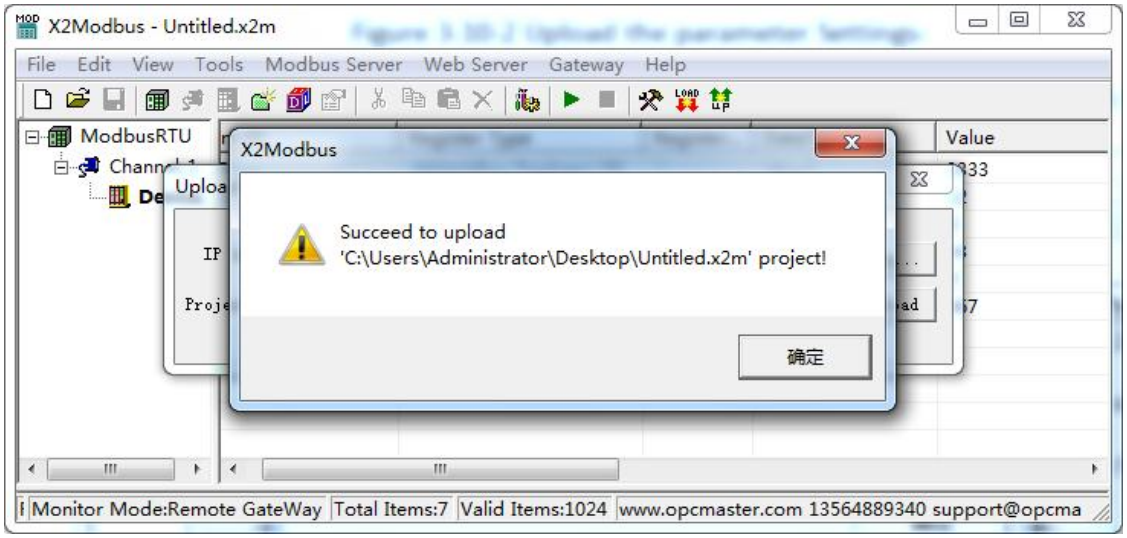

Figure 3-6-3 Succeed to upload

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.

After uploading the project, click the menu bar "Tools" to select "Start Monitor" or click the toolbar icon ▶,you can see real time data on the device. As the Figure 3-6-4, The collected data is consistent with the slave simulated data.

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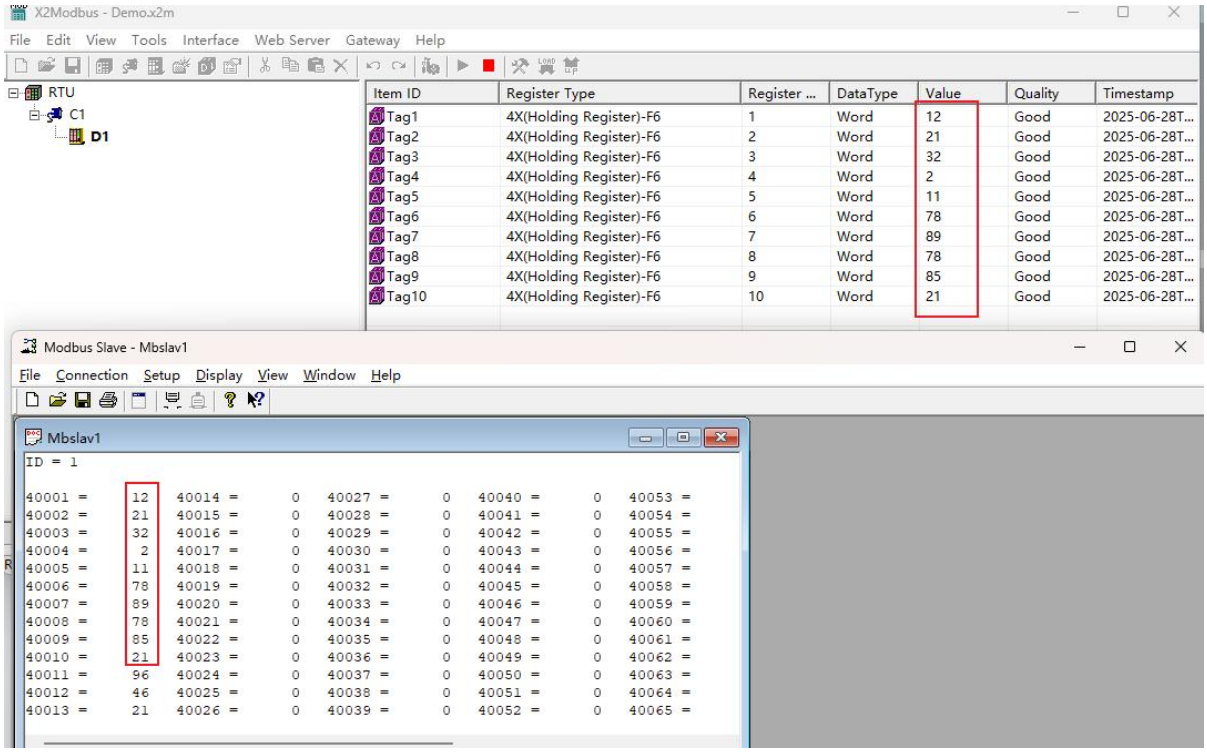

Figure 3-6-4 Remote gateway monitor

3.7 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 3-7-1.

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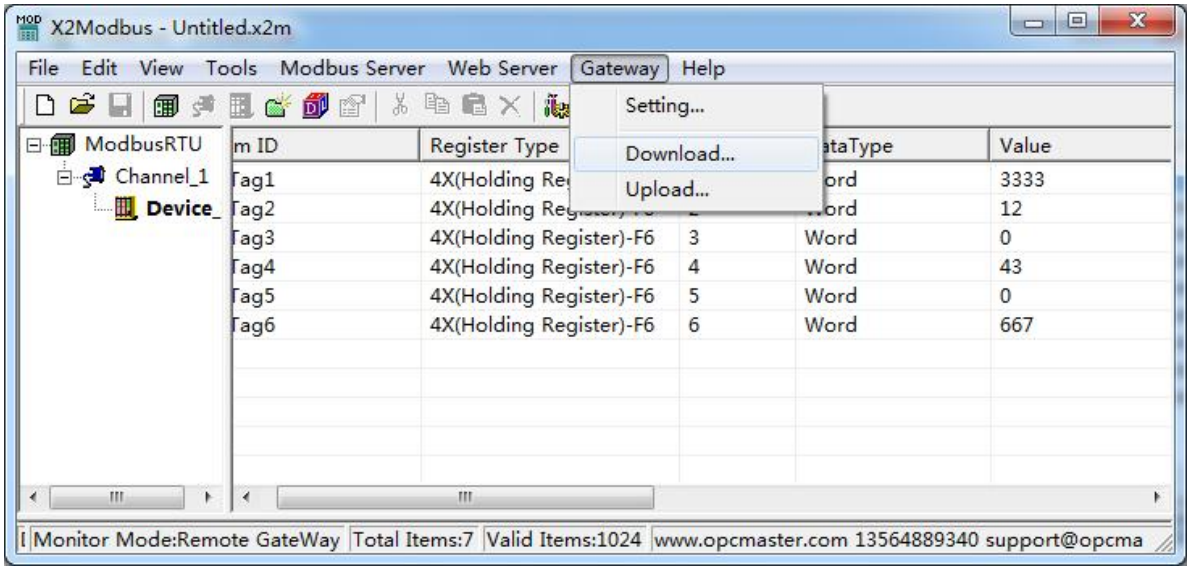

Figure 3-7-1 Download Project

In the pop up dialog box enter the gateway IP address, can be downloaded from the gateway of the current project, as the figure 3-7-2.

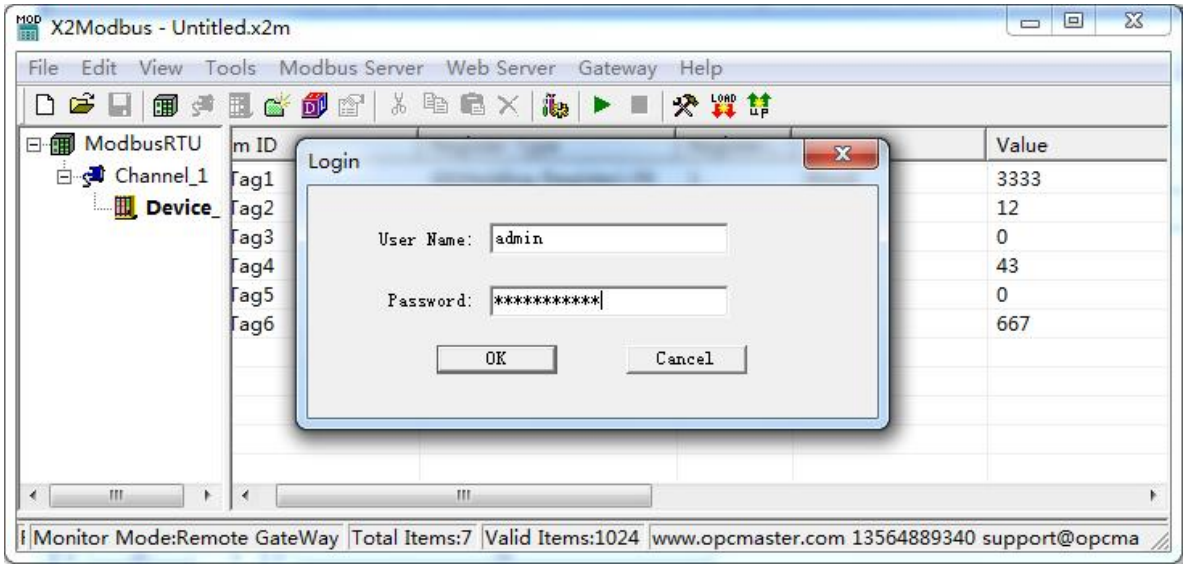

Figure 3-7-2 Login

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

3.8 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 3-8-1 below. It will start the X2BACnetRunTime.exe program. User only need to start the program in the background to realize the function of gateway conversion on PC.

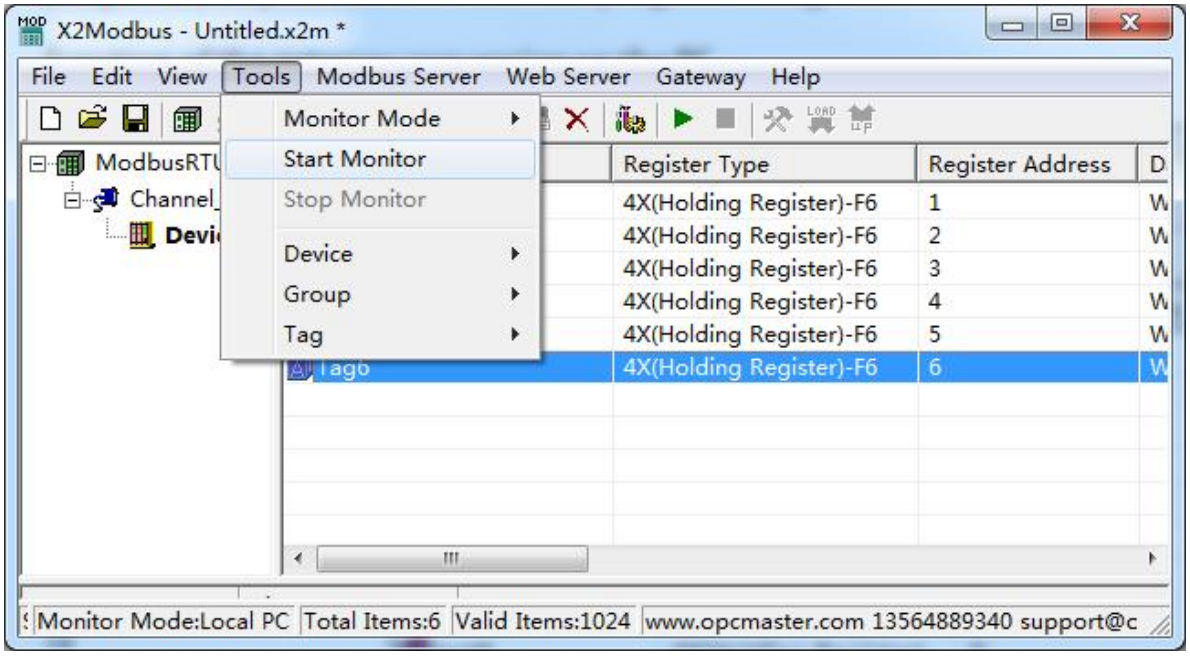

Figure 3-8-1 Local PC Monitor

X2ModbusRunTime run successfully. We can view the running log .As the Figure 3-8-2.

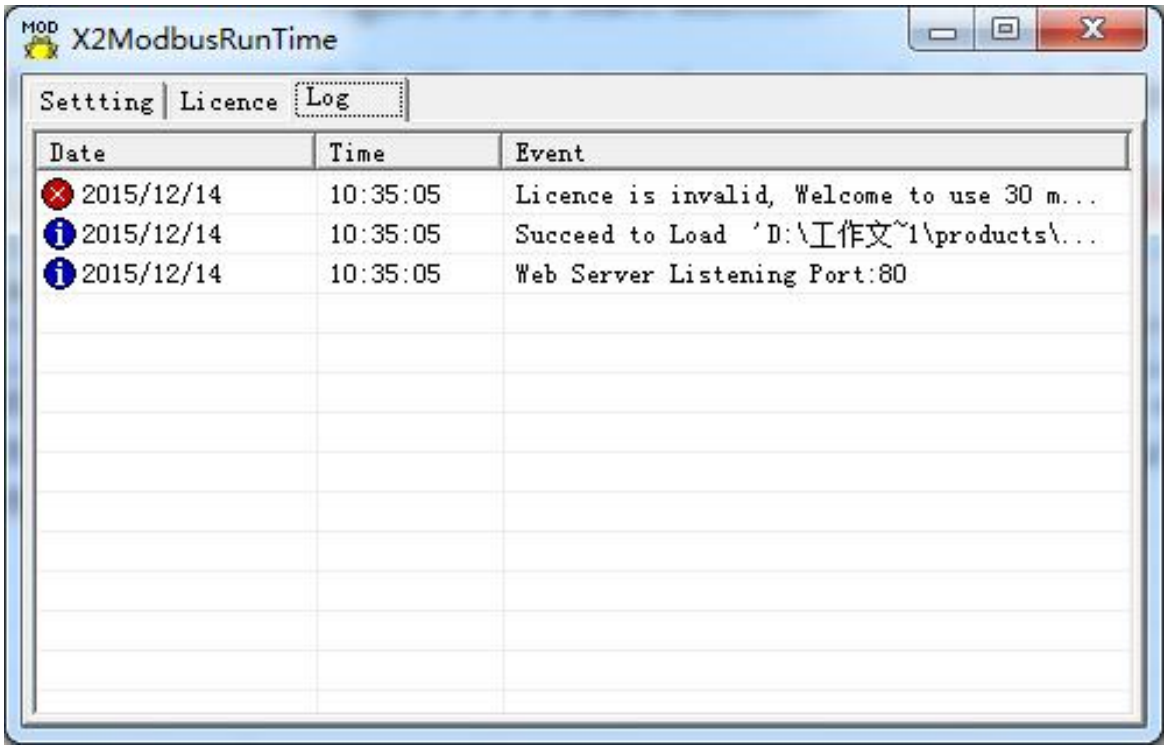

Figure 3-8-2 Log

In X2ModbusRunTime programs, can choose operating language, as the Figure 3-9-3.

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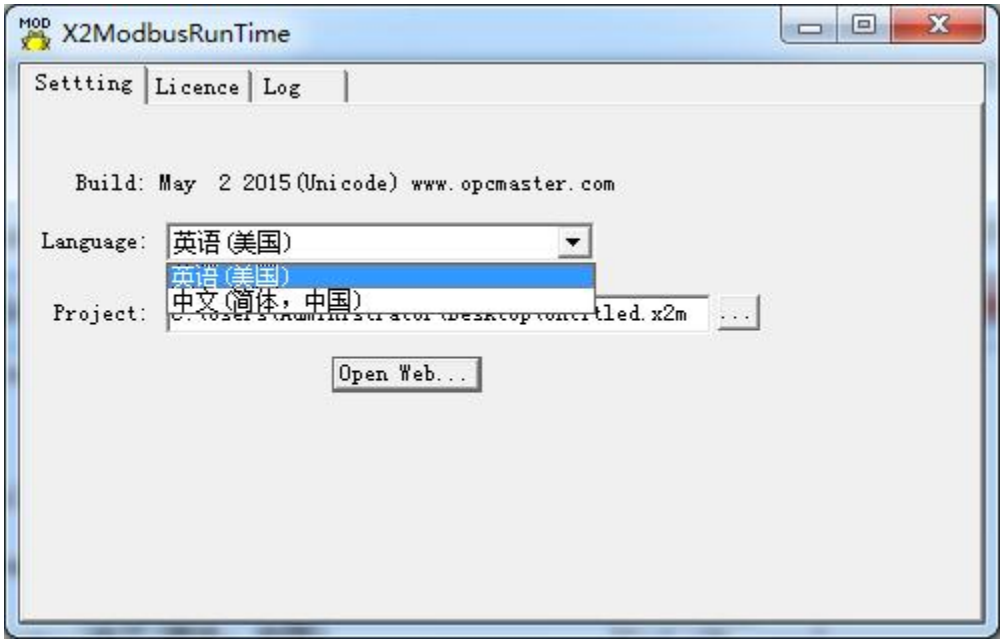

Figure 3-8-3 Choose Operating Language

Return procedure monitoring interface, can see some real time data on the device and the data on the interface is consistent, As the Figure 3-8-4.

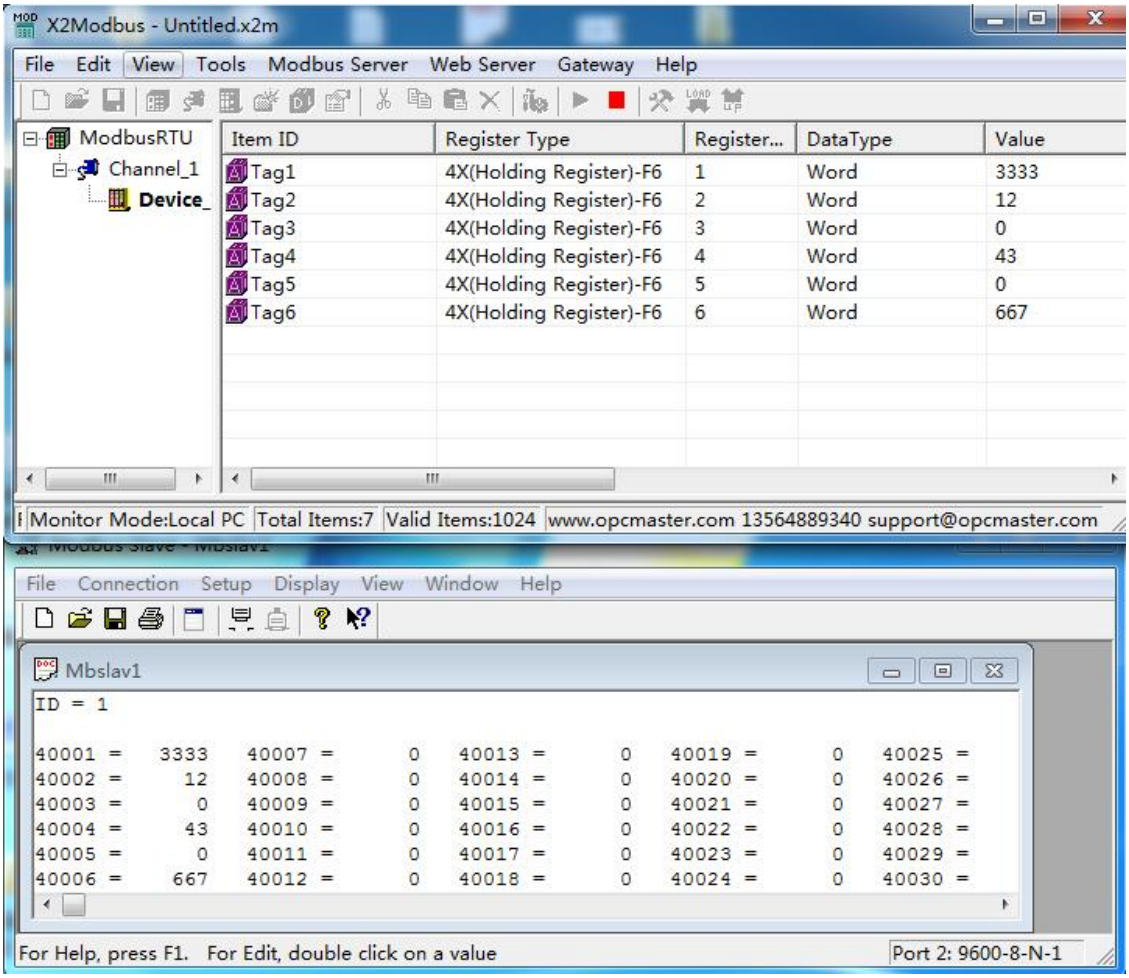

Figure 3-9-4 Successful Communication

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3.9 Gateway Setting

Choose the menu bar under the Gateway Setting, as the following figure 3-9-1.

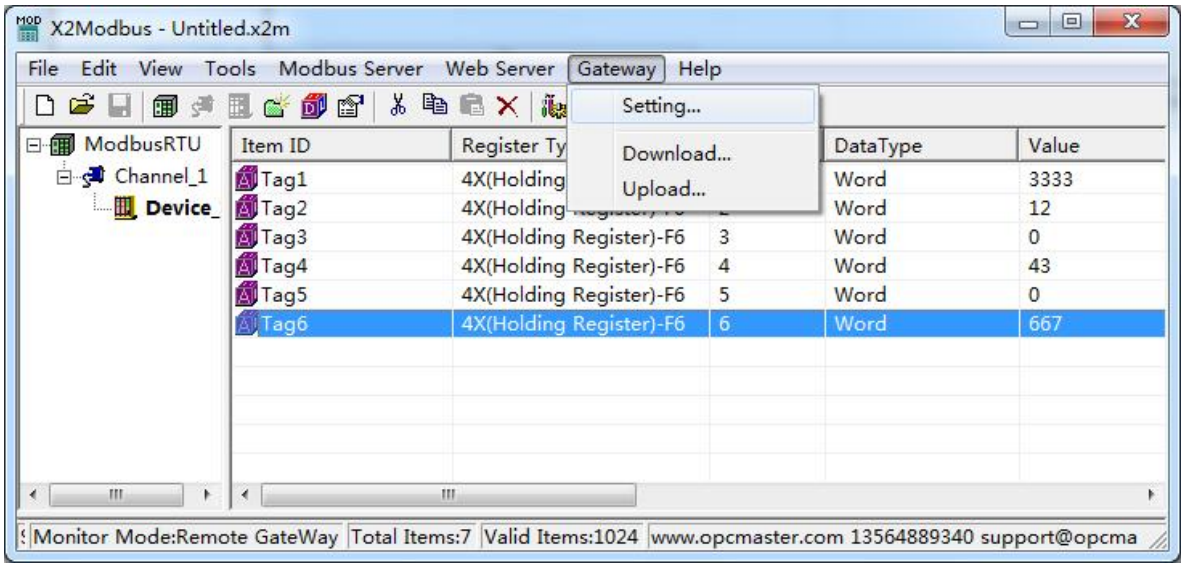

Figure 3-9-1 Gateway Setting

The user name: admin password: admin123456. As the figure 3-9-2.

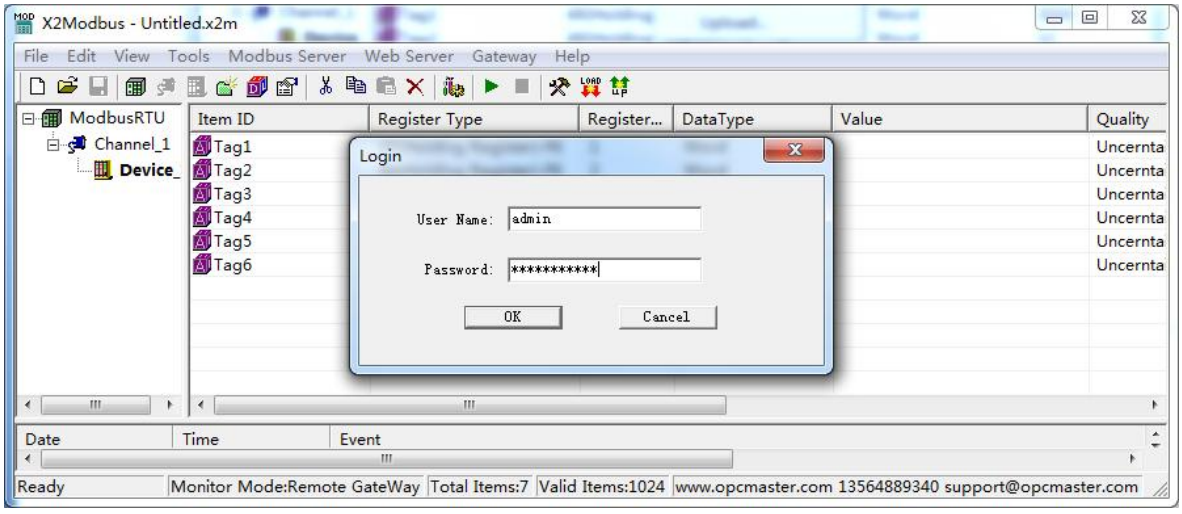

Figure 3-9-2 Login

Ethernet Setting: Here the gateway IP address can be changed, also can login gateway page to browse the gateway properties. As the figure 3-9-3.

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milesgoiiot@gmail.com / sales@opcmaster.com

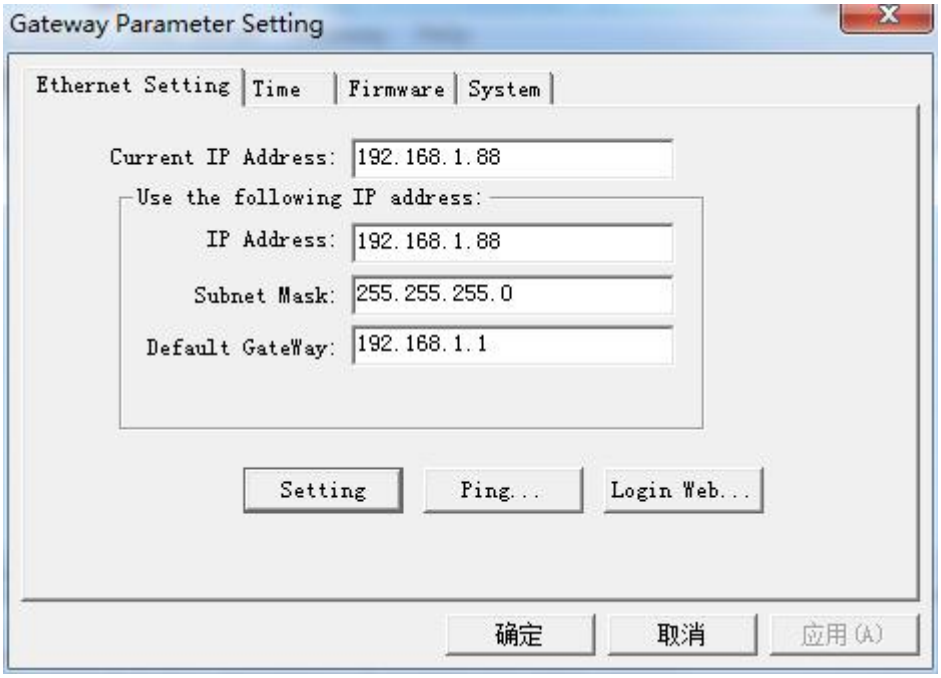

Figure 3-9-3 Ethernet Setting

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

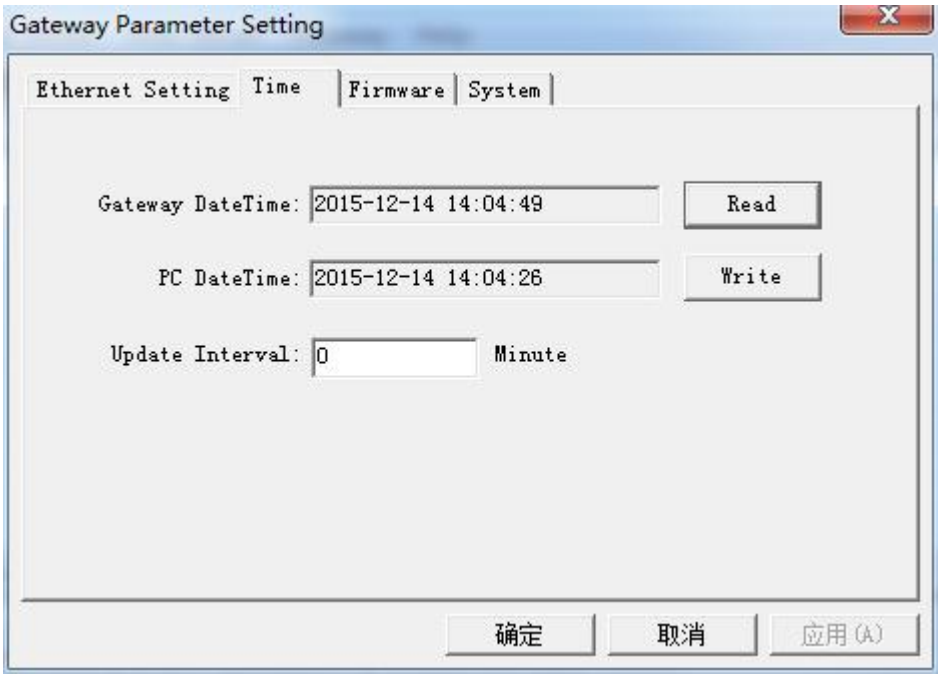

Figure 3-9-3 Time

Firmware: Click Refresh read gateways firmware information.

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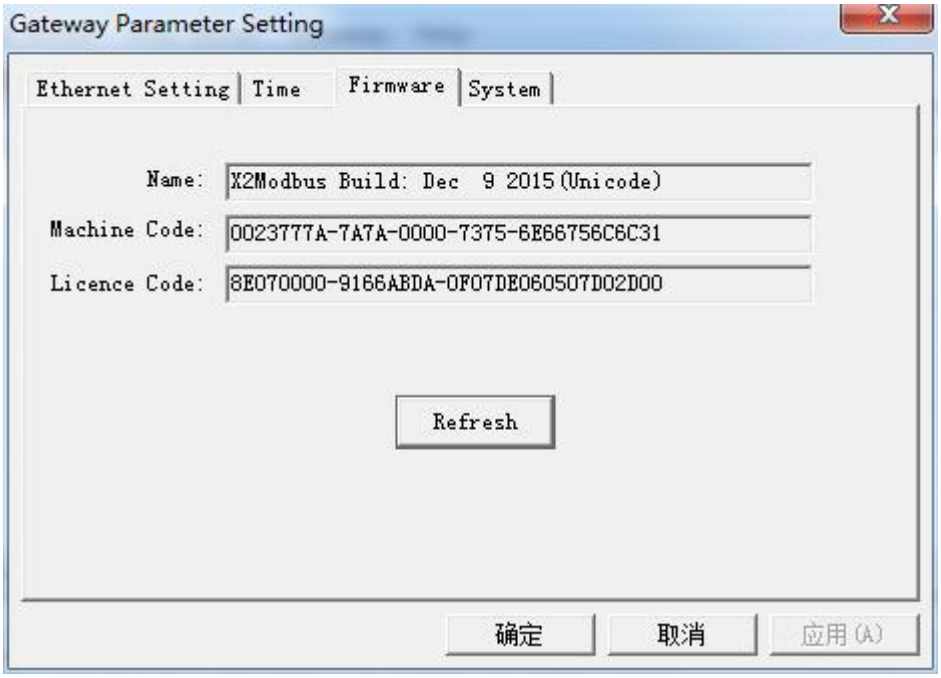

Figure 3-9-3 Firmware

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

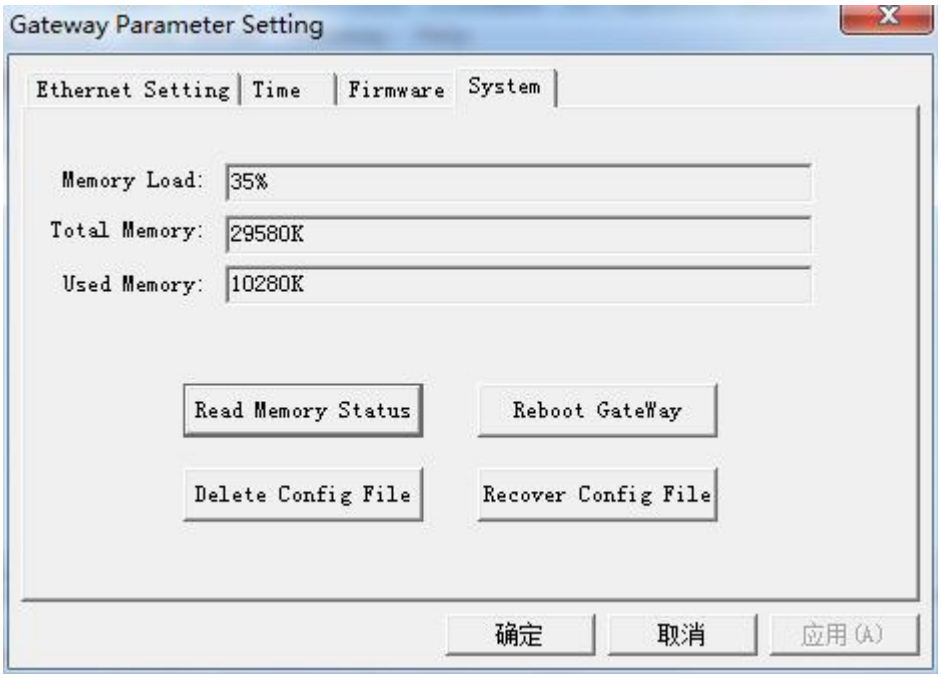

Figure 3-9-4 System

3.10 Internal Tag

Click on the menu bar under the View of Internal Tag, as the figure 3-10-1.

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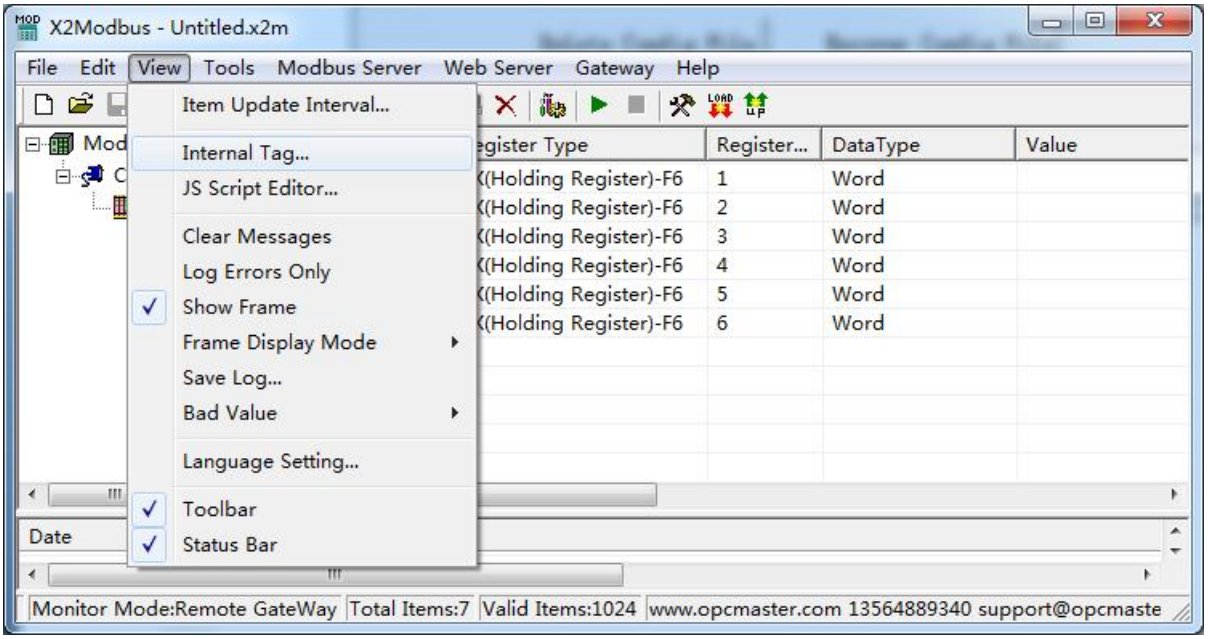

Figure 3-10-1 Internal Tag

State of the internal tag said acquisition terminal equipment: Online or Offline. For every new device can produce an internal variable. As the figure 3-10-2.

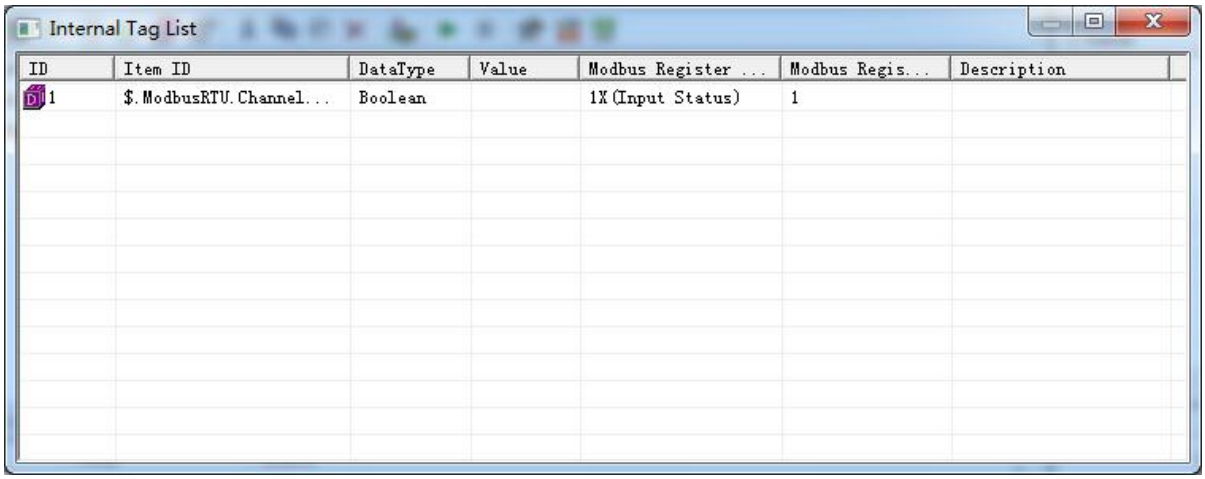

Figure 3-10-2 Internal Tag List

Right click on the label can change the label attribute. As the figure 3-10-3.

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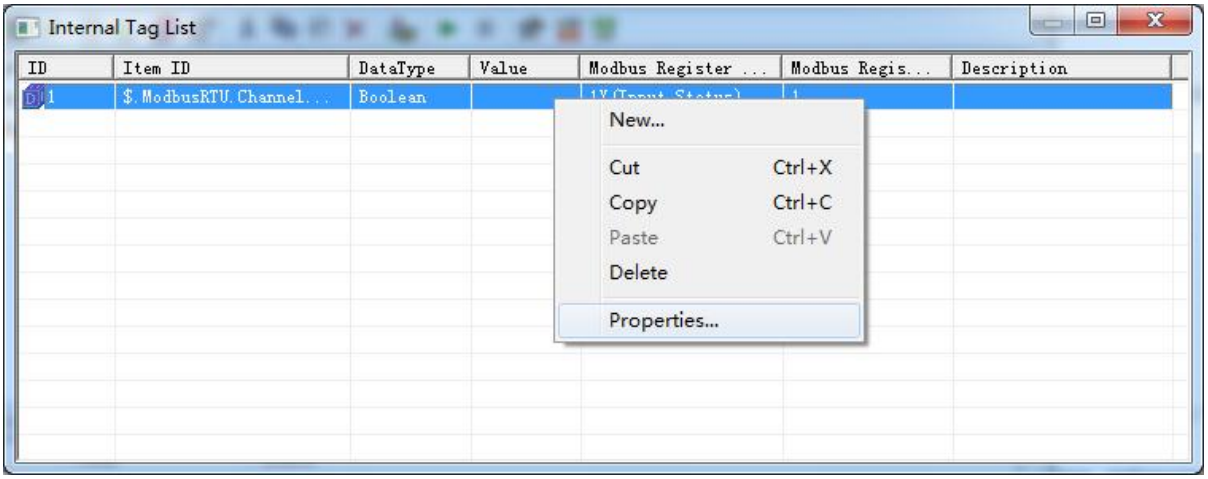

Figure 3-10-3 Tag properties

According to your own need to edit the label attribute.

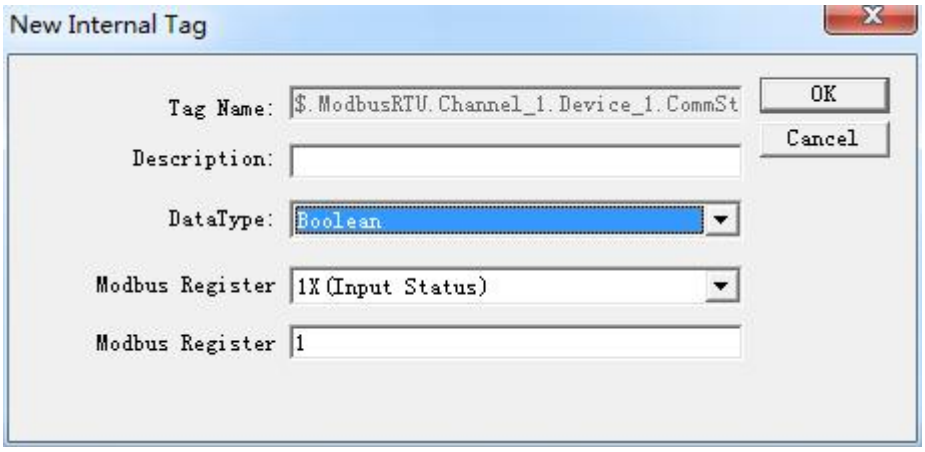

Figure 3-10-4 Edit Tag properties

3.11 Save Log

Configuration interface has a store log function, convenient debugging engineer in the gateway communication abnormal cases to analyze communication message, quick and easy to find fault. As the figure 3-11-1.

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milesgoiiot@gmail.com / sales@opcmaster.com

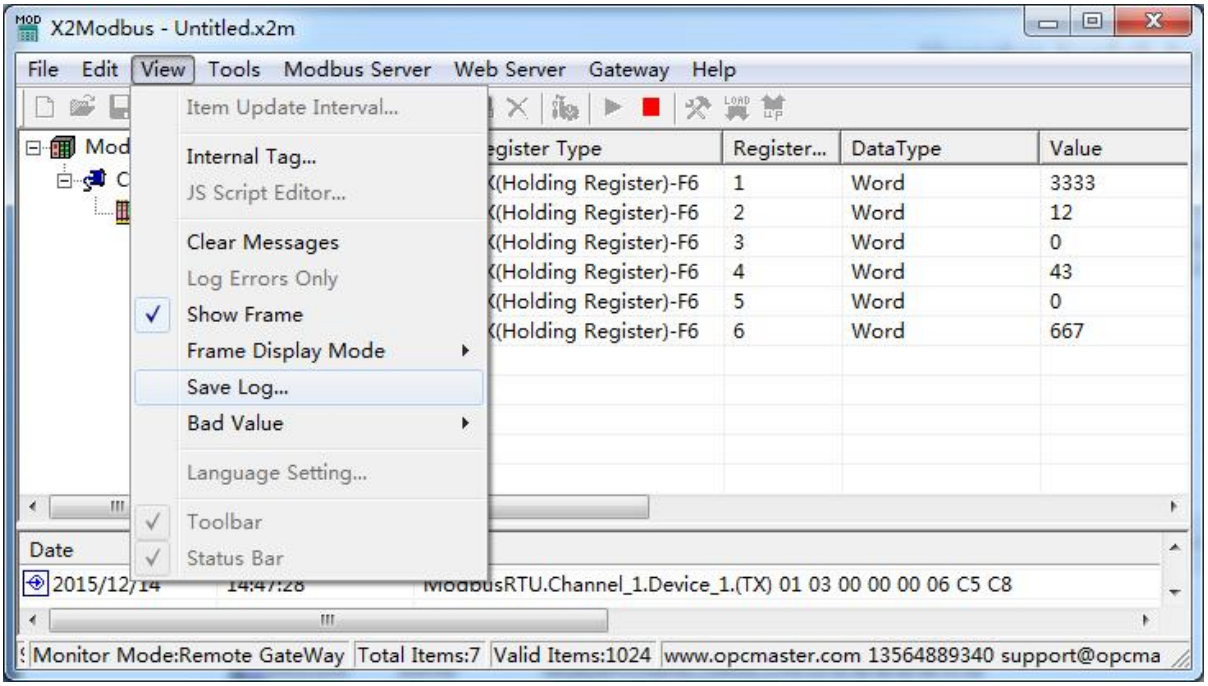

Figure 3-11-1 Save Log

Or right click on the below box.

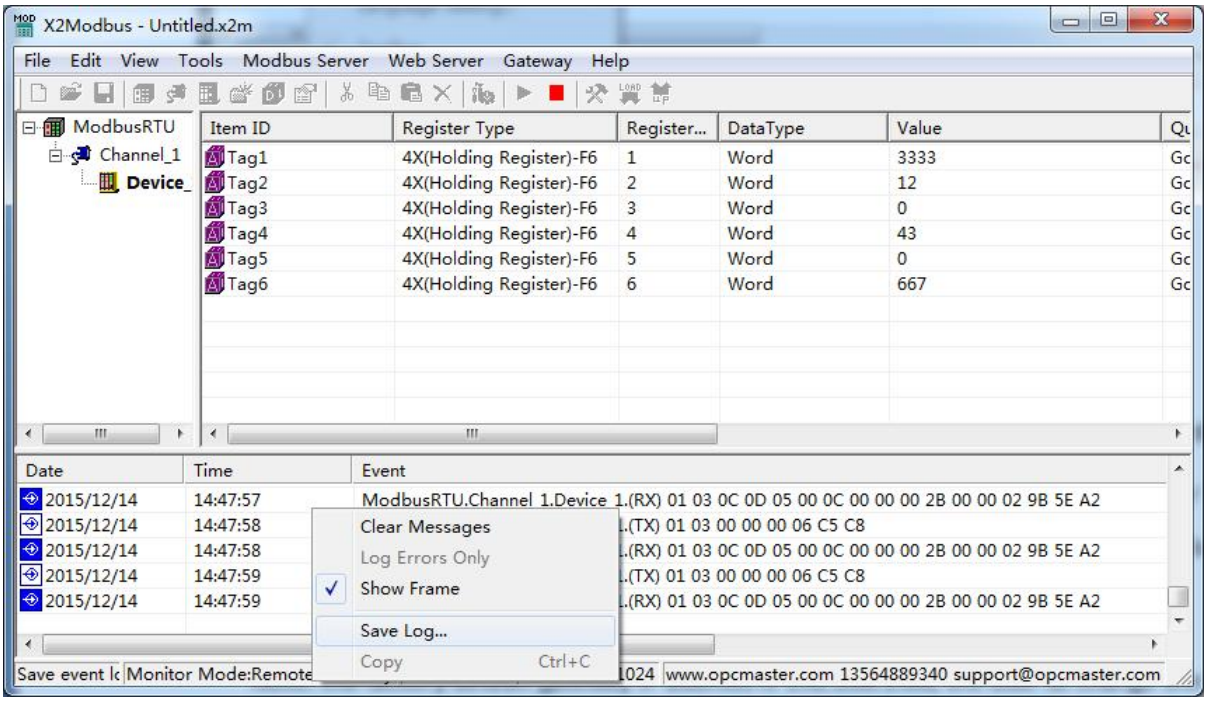

Figure 3-11-1 Save Log

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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 X2Modbus 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

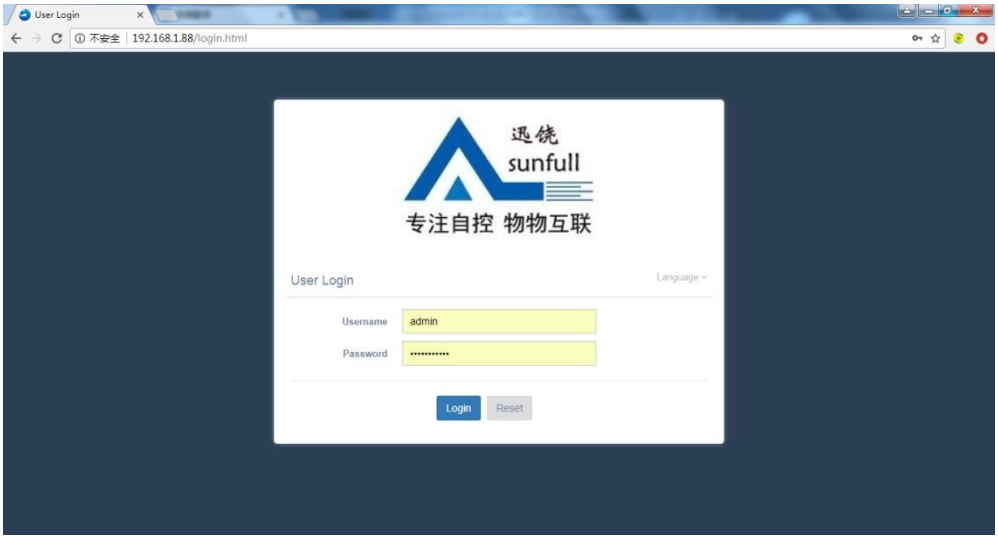

Figure 4-1 Login

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
milesgoiiot@gmail.com / sales@opcmaster.com

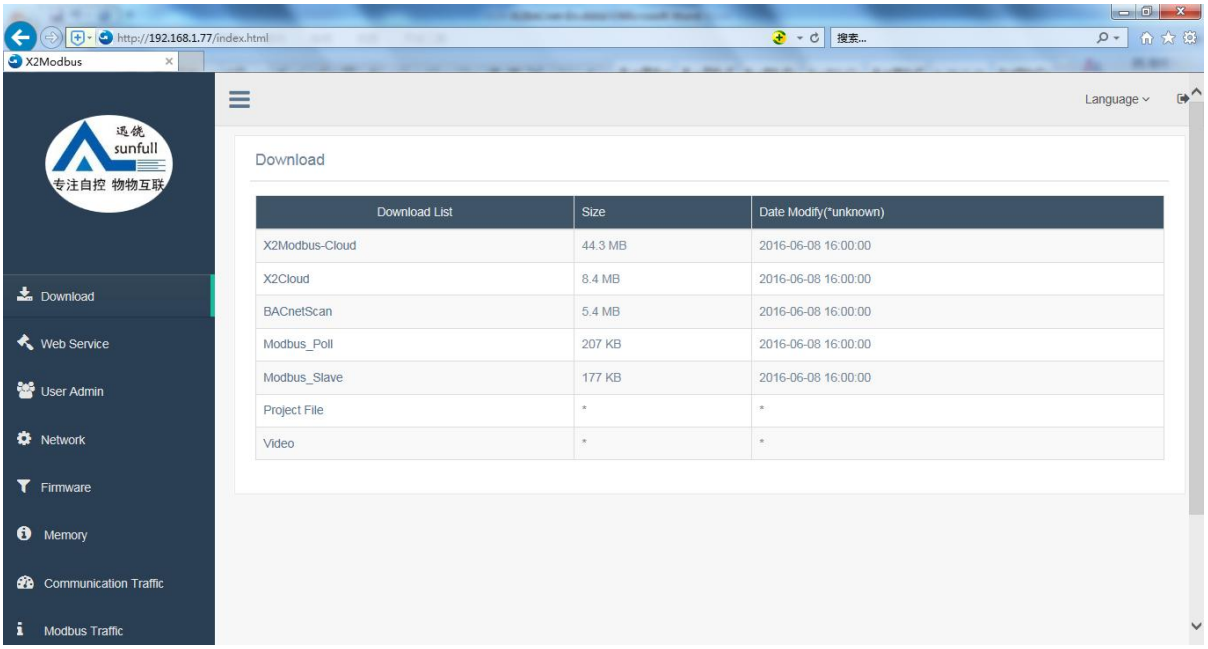

Figure 4-1-1 Download

X2Modbus: Configuration Software

X2Cloud: upload the project to the cloud

BACnetSCan: the tool of Scanning BACnet device

Modbus_Poll: the tool that simulate Modbus master station

Modbus_Slave: the tool that simulate Modbus Slave station

Project Files: the last configuration project that Upload to gateway

4.2 Network

Click “Network”, you can set gateway IP address, as shown in figure 4-2-1 below.

◆ Ethernet 1: 172.24.13.88

◆ Ethernet 2: 192.168.1.88(Communication port)

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milesgoiiot@gmail.com / sales@opcmaster.com

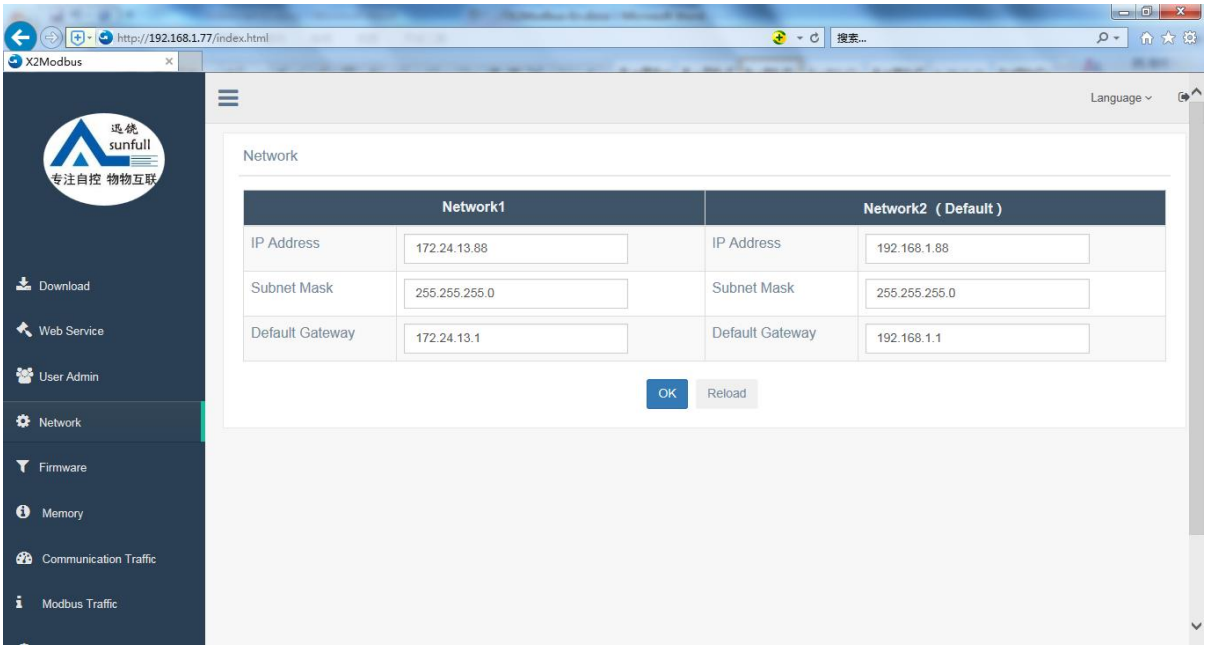

Figure 4-2-1 Network

4.3 User Admin

Users can manage their landing accounts by adding, modifying, deleting, and so on, as shown in figure 4-3-1 below.

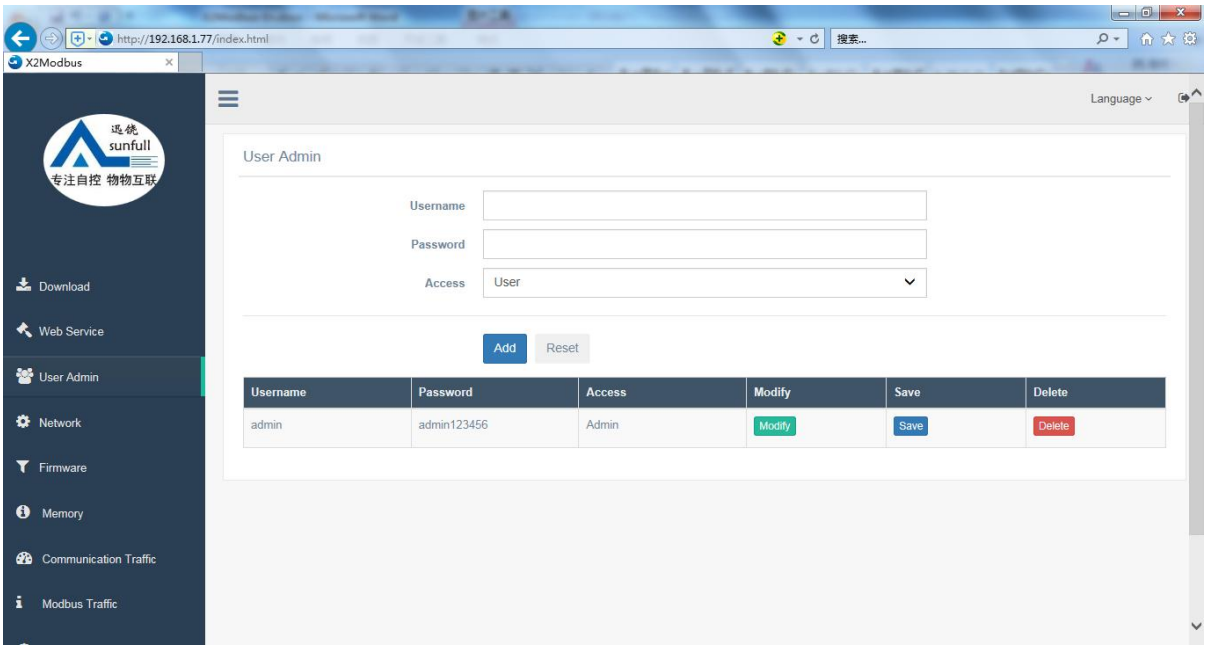

Figure 4-3-1 User Admin

4.4 Firmware

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

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milesgoiiot@gmail.com / sales@opcmaster.com

license key.

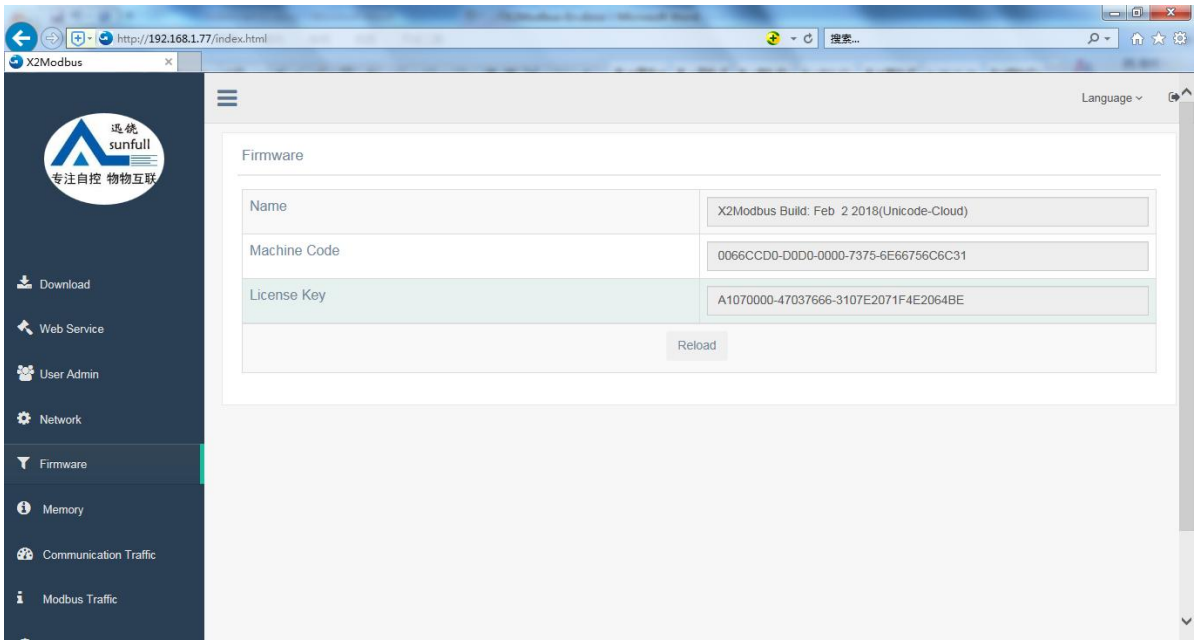

Figure 4-4-1 Firmware

4.5 Memory

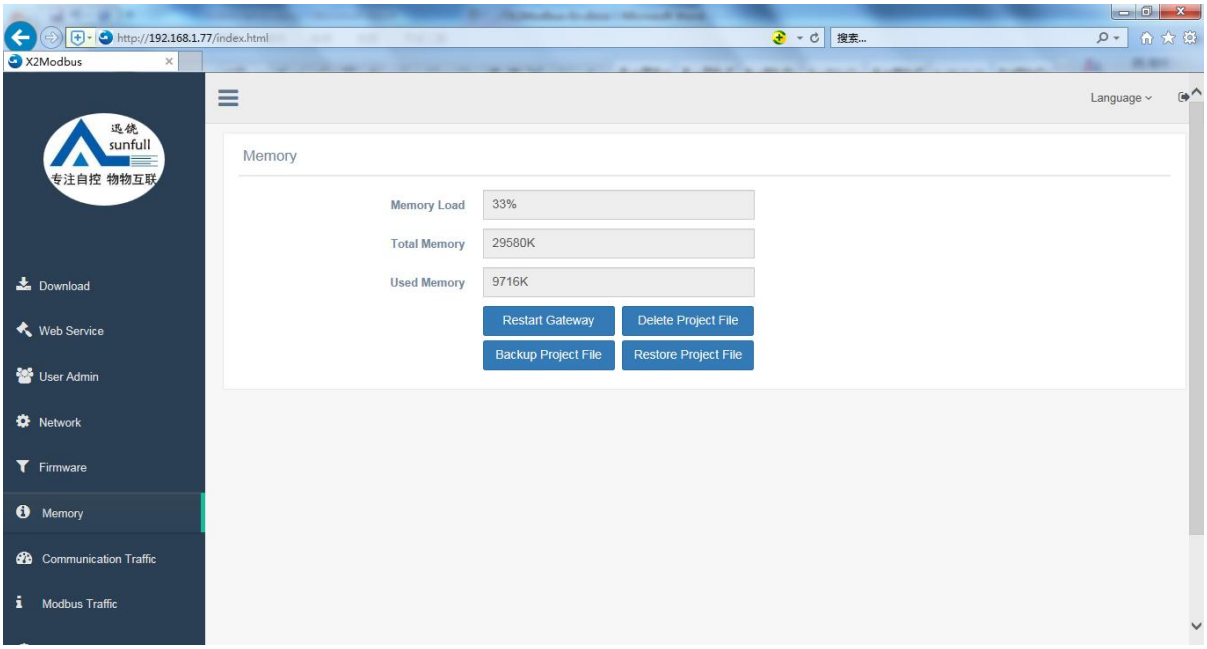

Figure 4-5-1 Memory

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

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

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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.

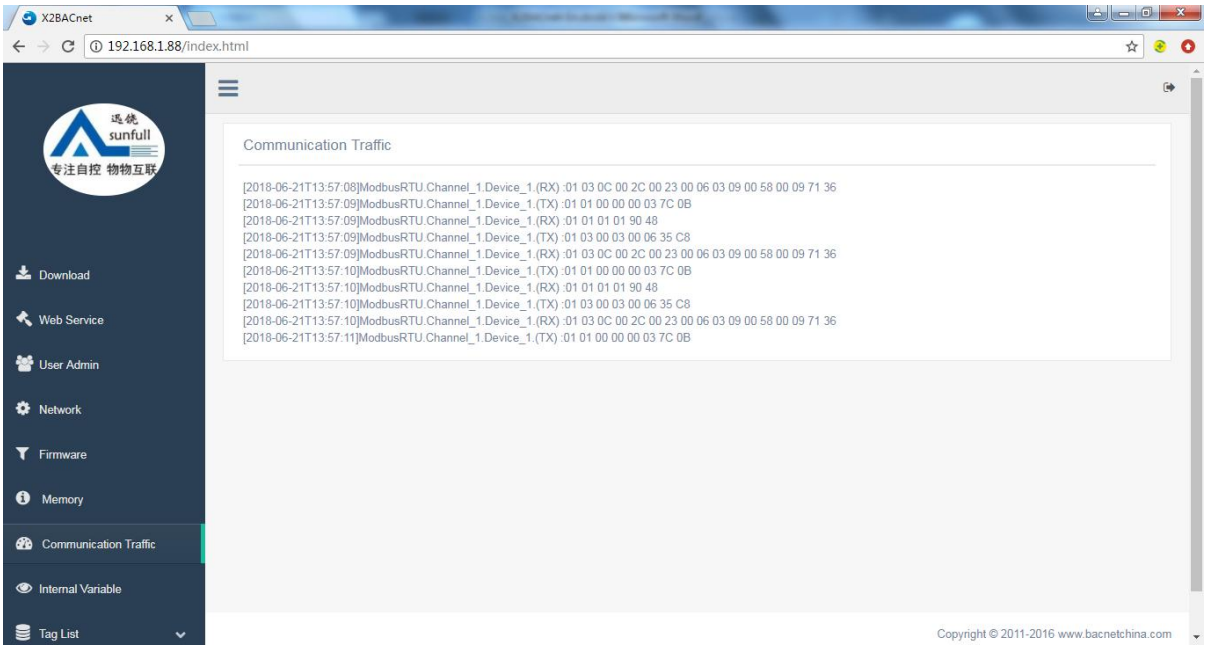

Figure 4-6-1 Communication Traffic

4.7 Real-time Data

Check the equipment real-time data on the web, as the Figure 4-7-1.

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milesgoiiot@gmail.com / sales@opcmaster.com

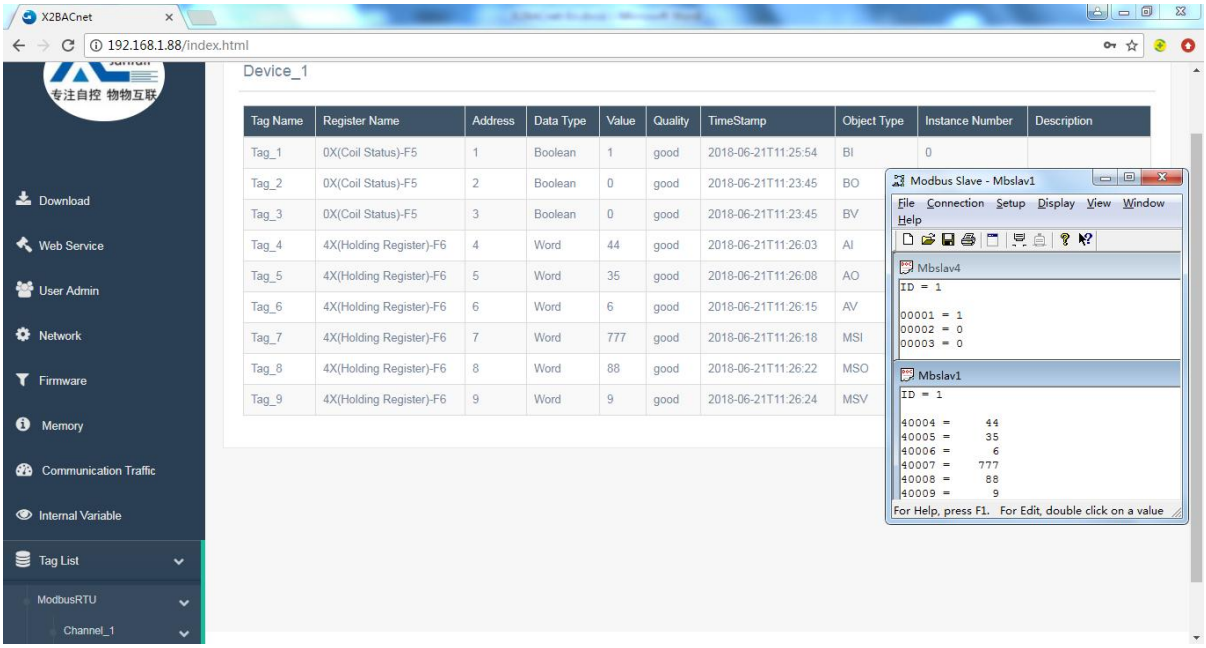

Figure 4-7-1 Real-time data

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

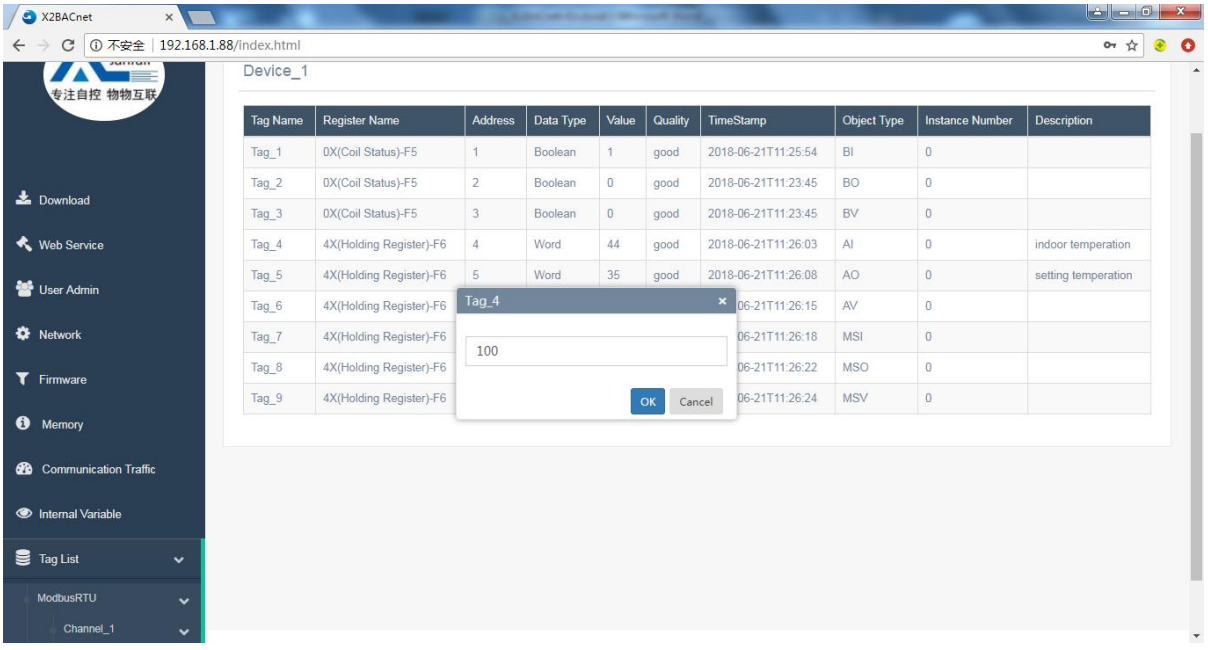

Figure 4-3-2 Write value

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milesgoiiot@gmail.com / sales@opcmaster.com

5 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.

5.1 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 5-1-1.

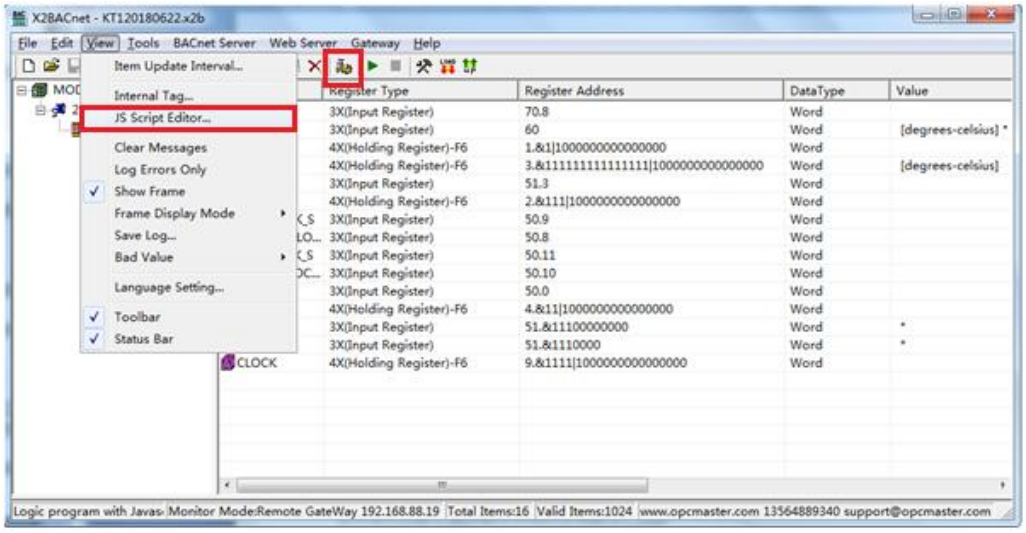

Figure 5-1-1 Open JS Script editor

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

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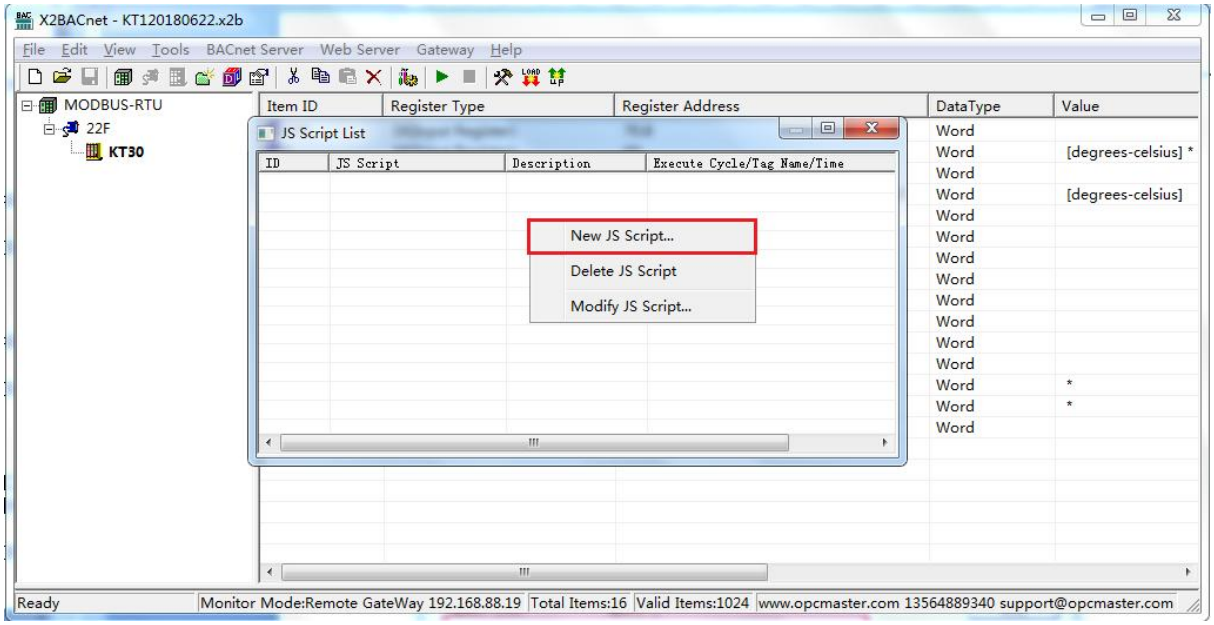

Figure 5-1-2 New JS Script

Open to see JS editing script, as shown in figure 5-1-3 below.

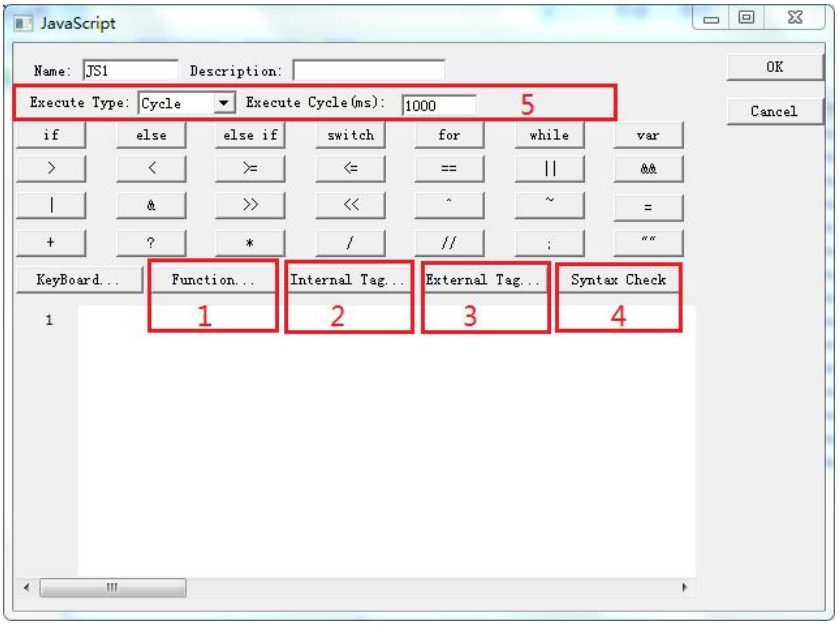

Figure 5-1-3 JS Script Editor

1. Function

Users can choose different functions to implement logical functions. See the 5-2 chapter for specific functions. As shown in figure 5-1-4.

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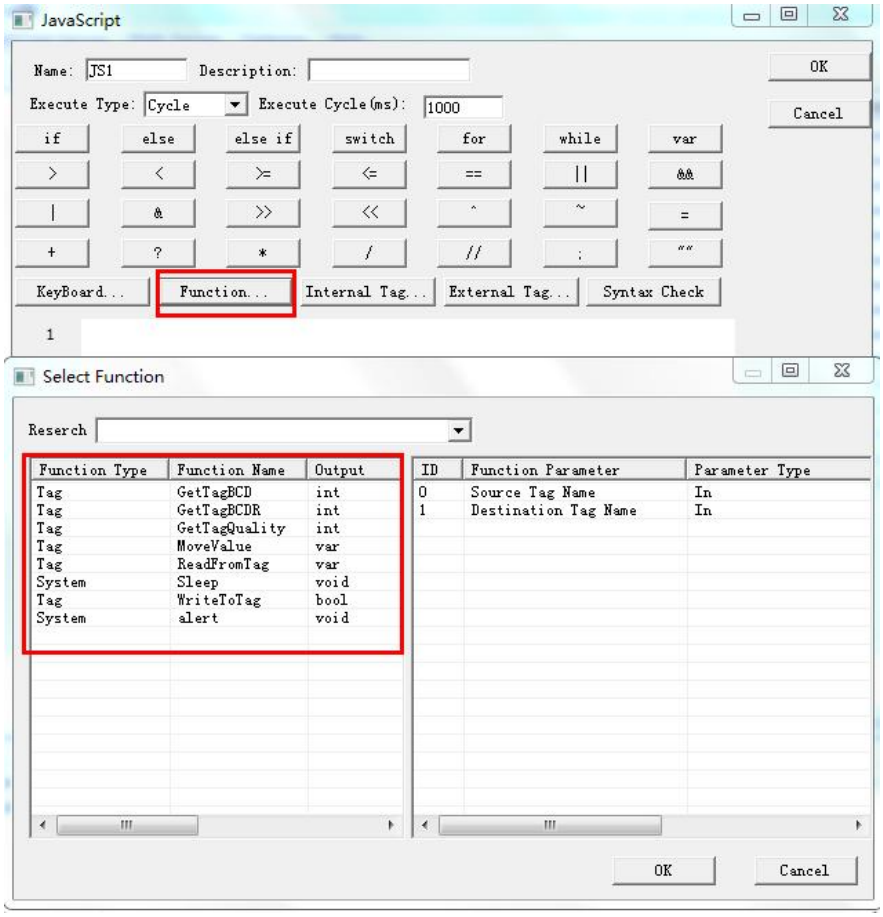

Figure 5-1-4 select Function

2. Internal Tag

Users can use the " Internal Tag" function to build a new variable and related functions, used to receive or store variable data, such as taking the current value of Tag, and mapping to a new internal variable. In the script editor, click the "Internal Tag", or In menu bar click “view” to select “Internal Tag”, open the window of Internal tag list. In the pop-up window, right click “New” ,as shown in figure 5-1-5.

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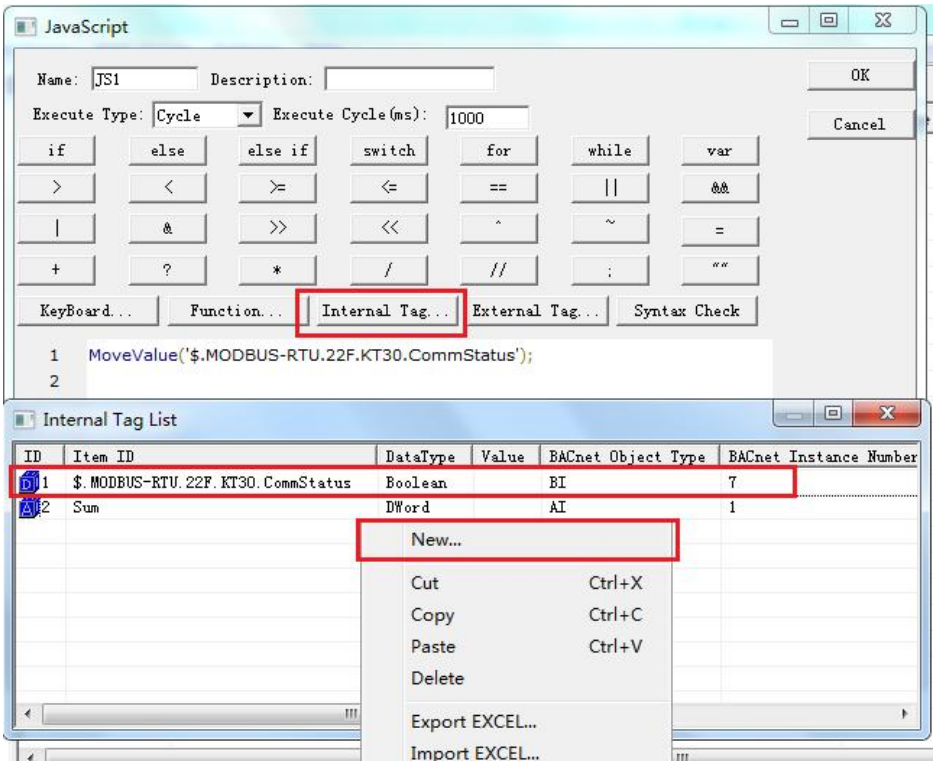

Figure 5-1-5 New Internal tag

Note: in the above figure, there is an internal variable BI point that address is 7, which represents the communication state of the Device"KT30". at least one point is communicated normally under the device, the value of the internal variable is 1, if all the points under the device are not normal (that is, the device is off-line), this internal change The value of the quantity is 0. If there are currently N devices, it will automatically generate N internal variables. Users should avoid duplication of register addresses when configuring the project.

In the pop-up window, set the variable related properties. If you want to quickly view the current value of the internal variable, you can click the menu bar "view" option and select the "internal variable" to see the real time data in the pop-up window, as shown in figure 5-1-6.

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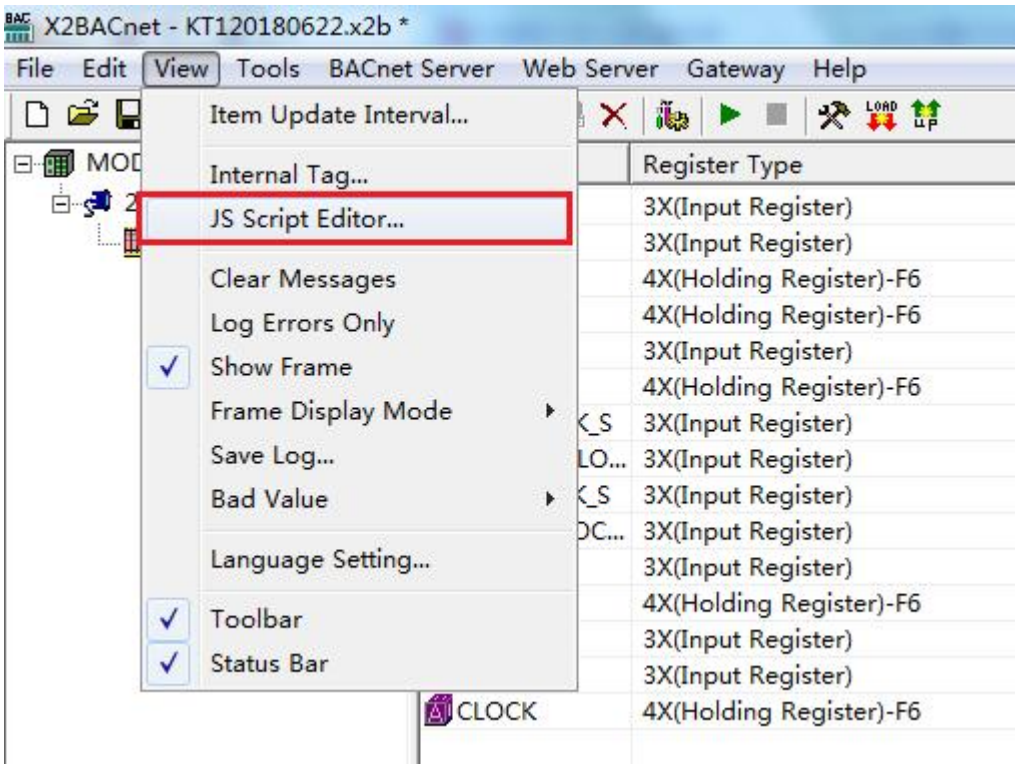

Figure 5-1-6 Open Internal tag to check real-time data

Click on the internal variable, as shown in figure 5-1-7.

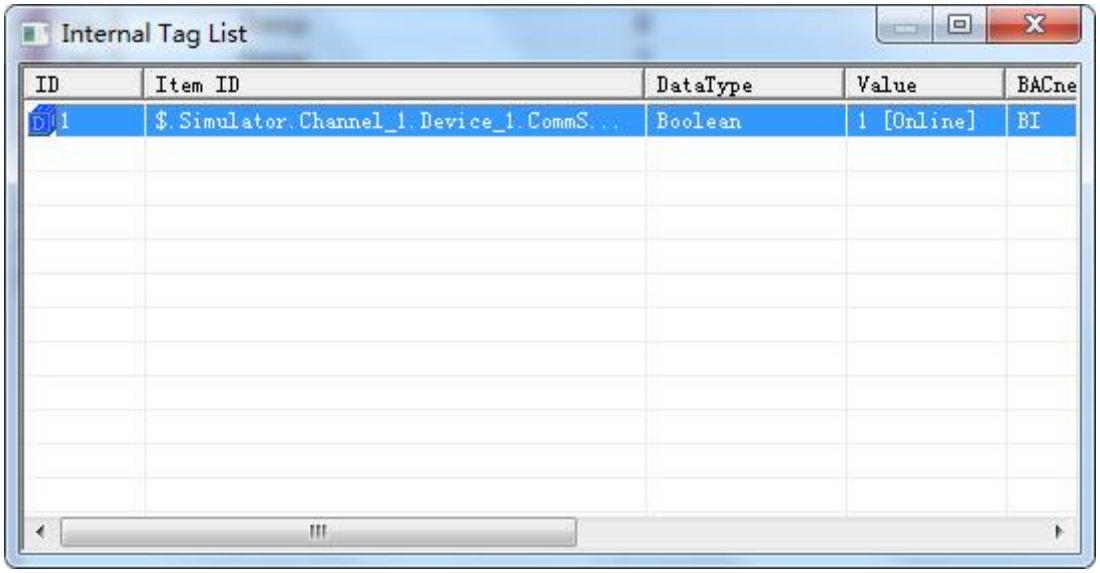

Figure 5-1-7 real-time data

3. external variables

In addition, users can also use relevant functions for logical control according to the changes in the data of external variables, such as different logical controls based on the range of numerical changes of an external variable. In the script editor, click "external variables", and double-click on a variable in the expanded variable table, as shown in figure 5-1-8.

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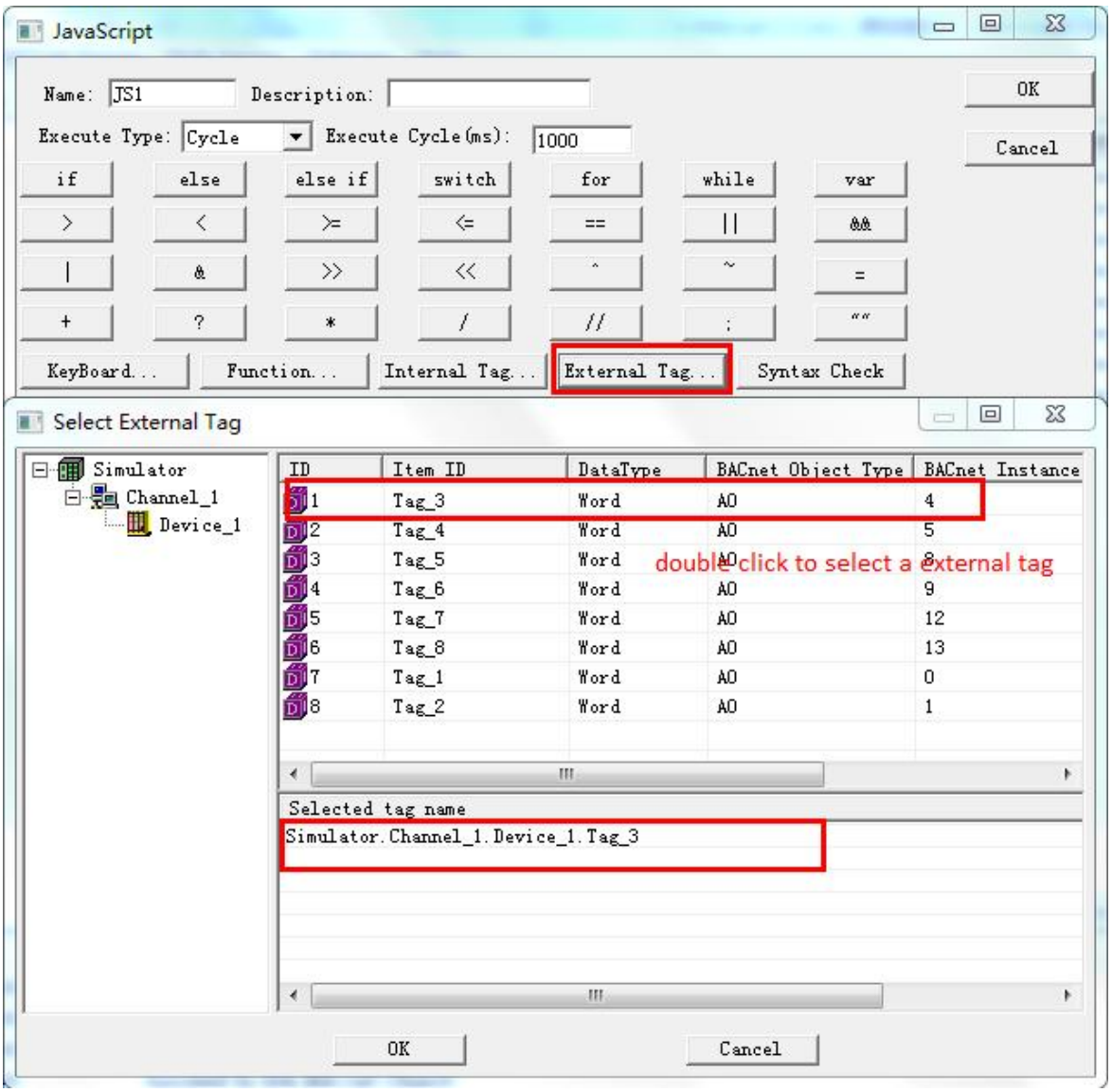

Figure 5-1-8 select the external tag

4. grammar check

After completing the programming, users can check the grammatical error with the syntax check function, and give hints if the program has problems.

5. execution mode

✧ execution mode selection cycle, cycle (MS): 1000, which represents a script execution every 1000ms.

✧ change of execution mode. Roll call needs input. The following figure 5-1-9, which assigns the value of internal variable VarName_1 to the return Tag_3 and Tag, The initial value of the internal variable VarName_1 can be assigned to batch names.

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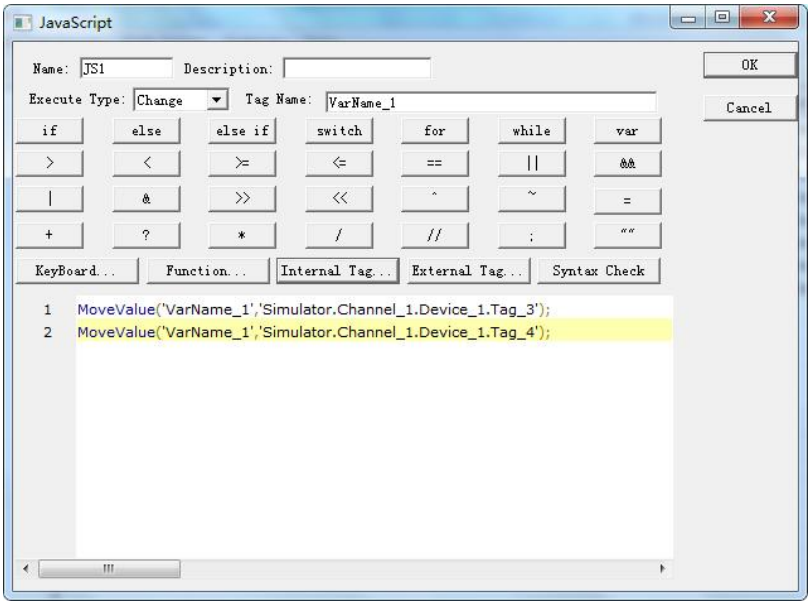

Figure 5-1-9 change script

Note:

- In order to prevent the mistake, you can point out external variables, or internal variables in the script force box, double click to select a name and then copy it from the script box to the top name box.
- Only when the value of internal variable VarName_1 changes, can script be executed to save resources.

✧ execution mode selection timing, select a time point, after the arrival of this time, the implementation of the script. It can be applied to the timing switchgear.

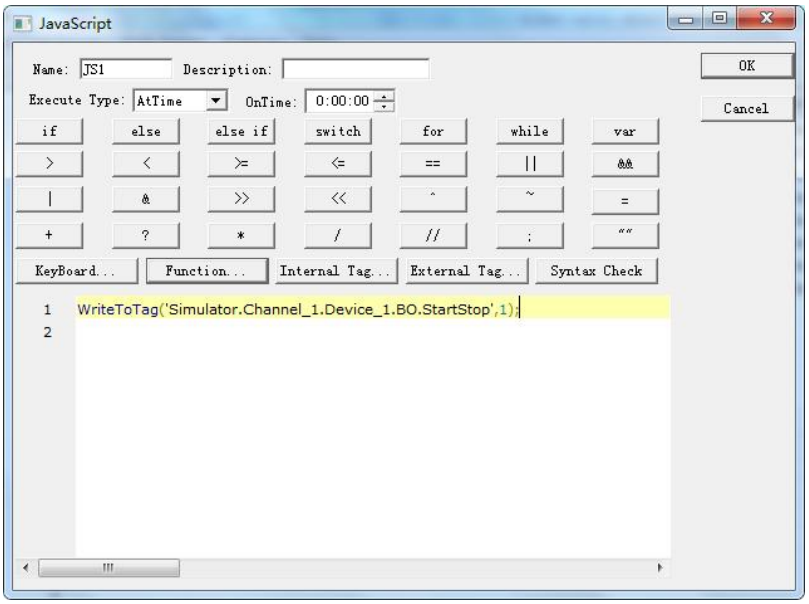

Figure 5-1-10 timing switchgear

5.2 Function description

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The commonly used functions in the JS script editor are as follows:

Operating function

5.2.1 ReadFromTag

It is a value function from Tag.

Grammar:

Var szValue = ReadFromTag ("ModbusRTU.Channel_1.Device_1.tag_1");

5.2.2 WriteToTag

It is a write value to a Tag function, used to assign an external variable to a Tag, to perform a write operation on the device, or to assign a new internal variable to the user.

Grammar:

var szValue = 100;

WriteToTag('ModbusRTU.Channel_1.Device_1.tag_1',0); //write the value to the ‘tag_1’

5.2.3 GetTagQuality

It is a quality stamp from Tag.

The results returned conformed to the OPC specification. That is, Good returns 192, Bad returns 0, Uncertainn is 64, indicating that the value is not assigned and has not been updated.

Var varQuality = GetTagQuality ('szTagName'); //where 'szTagName' is selected from external variables.

5.2.4 MoveValue

It is implements the transfer of source data to destination data and data transfer between different points.

Grammar:

MoveValue ('Source Tag Name', 'Destination Tag Name'); //Source Tag Name is the name of the source data point, and Destination Tag is the destination data name.

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The parameters here can be either external variables or internal variables. As shown in figure 5-1-9.

MoveValue function application scenario:

(1) the gateway collection side can access and control each other (no matter what protocol can be interchanged).

Gateway acquisition gateway uses two COM ports to collect different ModbusRTU slave devices, one for collecting temperature points of air conditioning equipment, and one for collecting IO modules. According to the temperature of the air conditioner, the IO module is controlled by the output of a sound and light alarm, that is, the MoveValue function can be used for logical editing, and the data of two acquisition terminals are accessed and controlled by each other.

(2)use one internal variable point to control all external variables.

MoveValue ('internal variable', 'external variable 1' ');

MoveValue ('internal variable', 'external variable 2' ');

MoveValue ('internal variable', 'external variable 3' ');

MoveValue ('internal variable', 'external variable 4' ');

MoveValue ('internal variable', 'external variable n' ');

This is the realization that when the internal variables change, the external variable 1-N can change at the same time.

For example, if you change the temperature on the interface, the setting temperature of the N thermostat of the gateway will be changed together.

5.2.5 GetTagBCD

It is used to get the BCD code of a label.

Grammar:

Var mBCD = GetTagBCD ('szTagName');

If the single register (Word, Short) value is 4660 (0x1234), the GetTagBCDR function is used to get BCD data to be decimal number 1234.

If the double register (Dword, Long) value is 305419896 (0x12345678), the GetTagBCDR function is used to get BCD data to be decimal number 12345678.

5.2.6 GetTagBCDR

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It is used to get the BCD code of a tag, but the value is BCD code with high and low inversion.

Grammar:

Var mBCDR = GetTagBCDR ('szTagName');

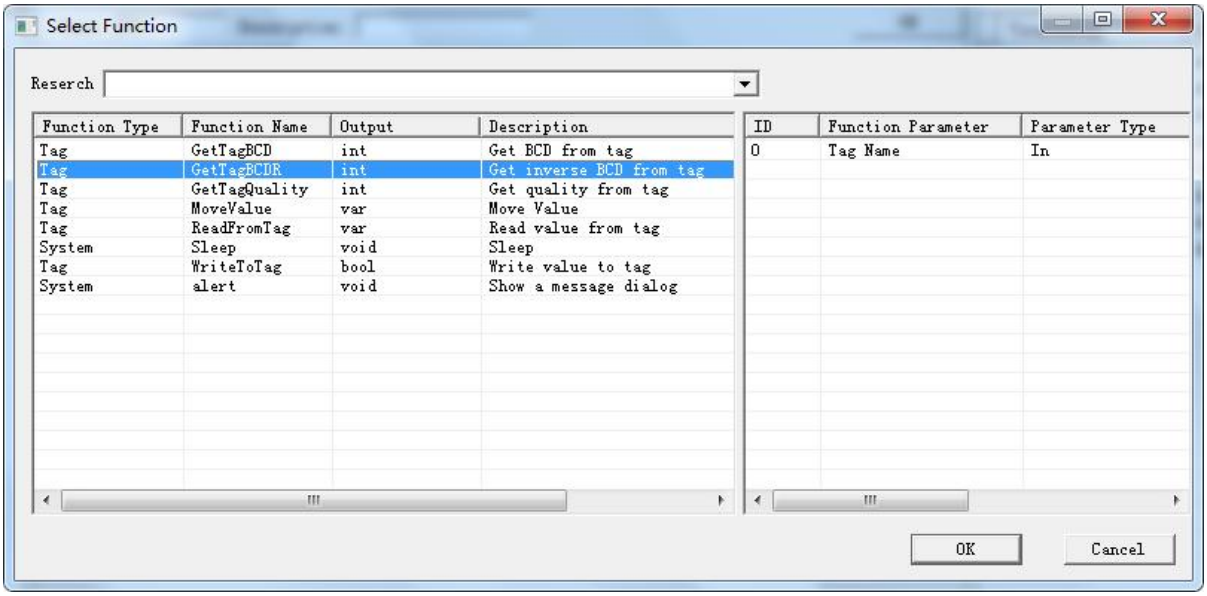

figure 5-2-6-1 Get BCDR

If the single register (Word, Short) value is 4660 (0x1234), the GetTagBCDR function is used to get BCD data to be decimal number **3412**.

If the double register (Dword, Long) value is 305419896 (0x12345678), the GetTagBCDR function is used to get BCD data to be decimal number **56781234**.

For an example:

If you need to get the BCD code of'Simulator.Channel_1.Device_1.Tag_1', assign it to T1. Get the'Simulator.Channel_1.Device_1.Tag_2'inverse BCD code and assign it to T2. The code is shown as shown in figure 5-2-6-2.

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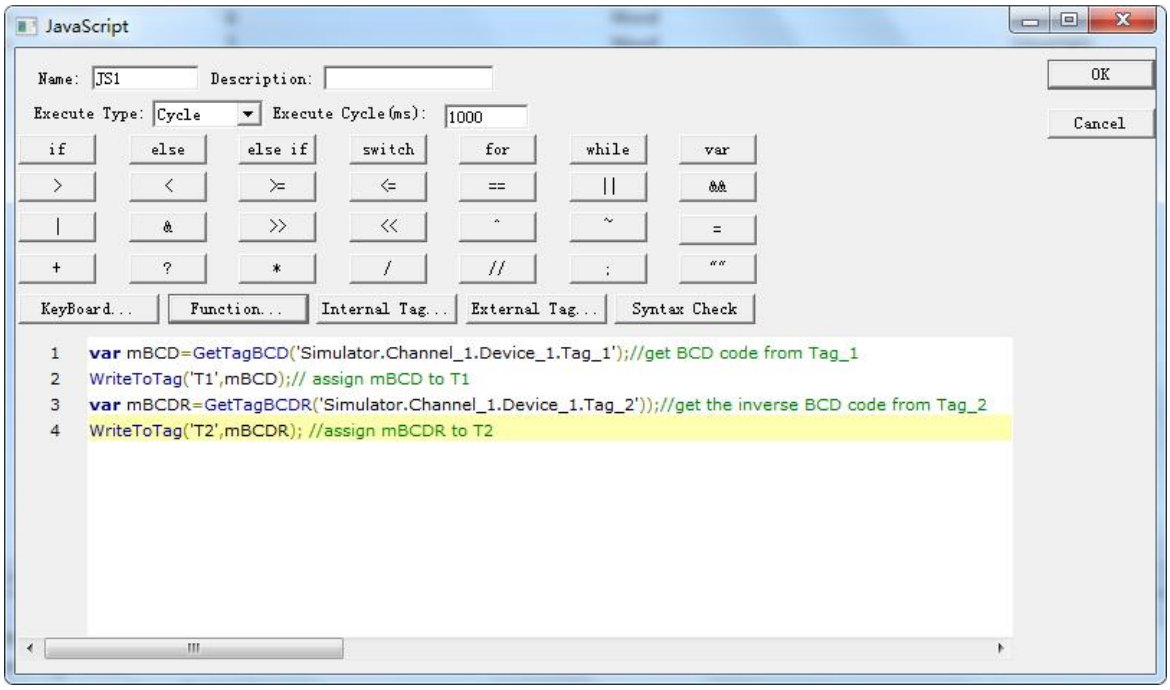

figure 5-2-6-2 Get BCD

Start monitor later, in the Internal tag list value display is as the figure 5-2-6-3.

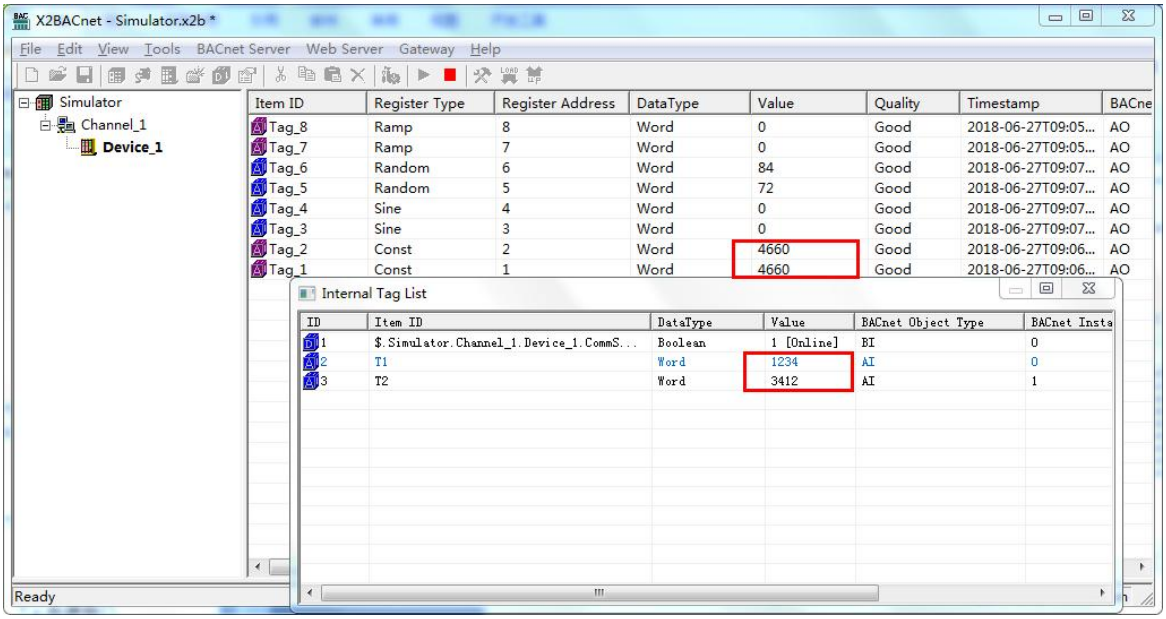

figure 5-2-6-3 check BCD value

System function

The output string of alert () function is mainly used for debugging. The results returned are displayed on the log of Runtime.exe. It can also be displayed on the state of the web communication.

Grammar:

For example, the return value of the output quality stamp

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Alert (varQuality.toString ());

The Sleep (1000) function is used for latency, indicating a delay of 1 seconds. Unit milliseconds.

5.3 Example

Open the script editor to reduce the current value of Tag " Simulator.Channel_1.Device_1.Tag_1" by 20 times and map it to the internal variable T1.

```
var szValue=ReadFromTag('Simulator.Channel_1.Device_1.Tag_1');
var newValue=Number(szValue);//String strongly transformed integer
newValue=newValue*0.5;
WriteToTag("T3",newValue.toString());
```

The script editor supports all mathematical calculations, such as taking random numbers between 0-255.

Examples are as follows:

```
Var Rand = Math.round (Math.random () * 255);
Alert (rand.toString ());
```

Note: Excute Type represents how long the execution of a script!

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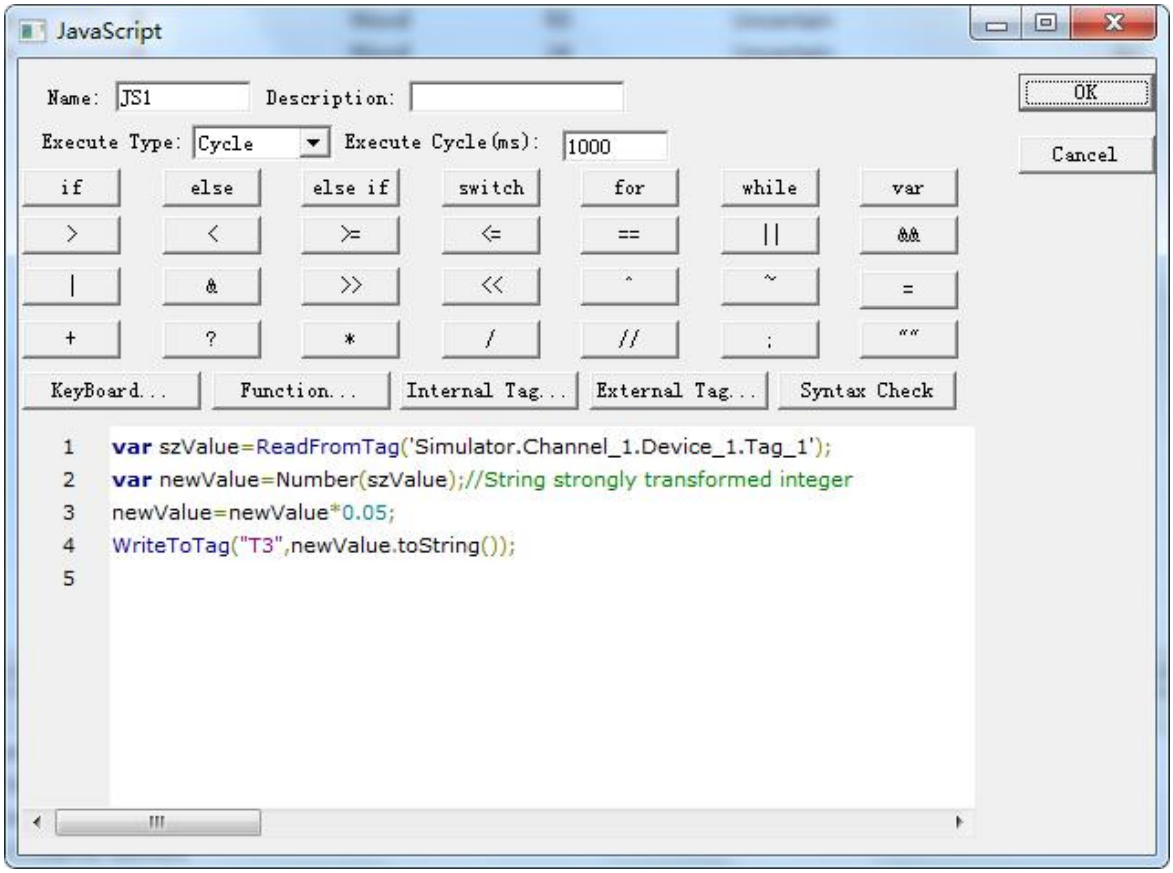

Figure 5-3-1 script example

View the T1 real-time data under the internal variables in the View menu bar. As shown in figure 5-3-2.

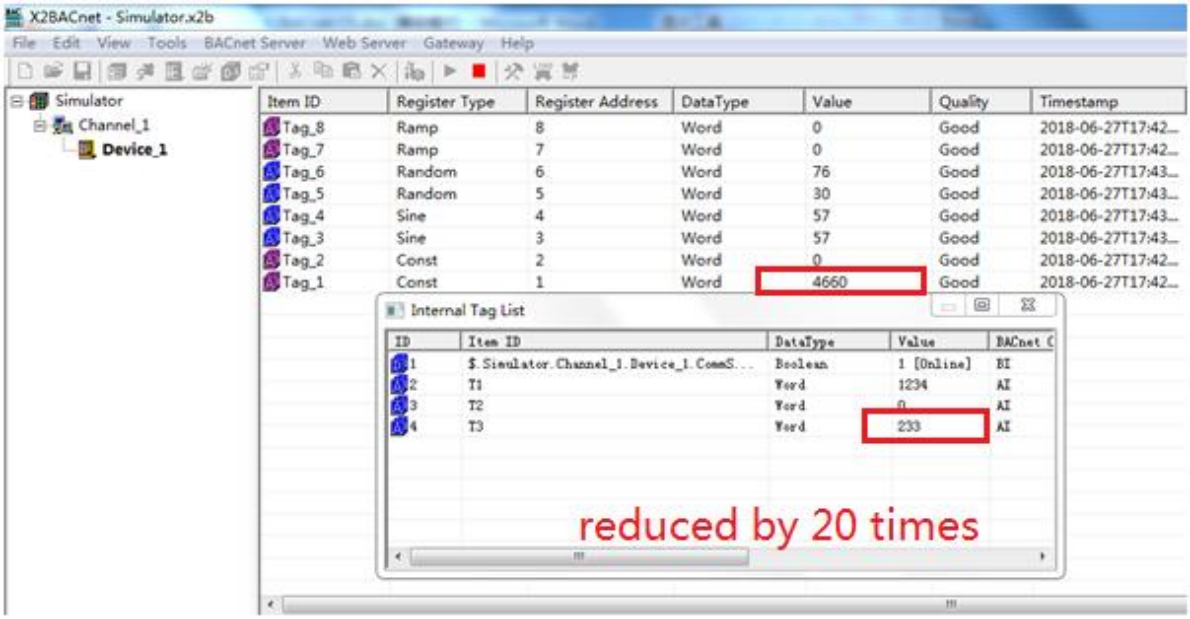

Figure 5-3-1 reduced by 20 times

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6 Common Problems

6.1 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 X2ModbusRuntime program is closed, and only needs to restart the monitor.

6.2 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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