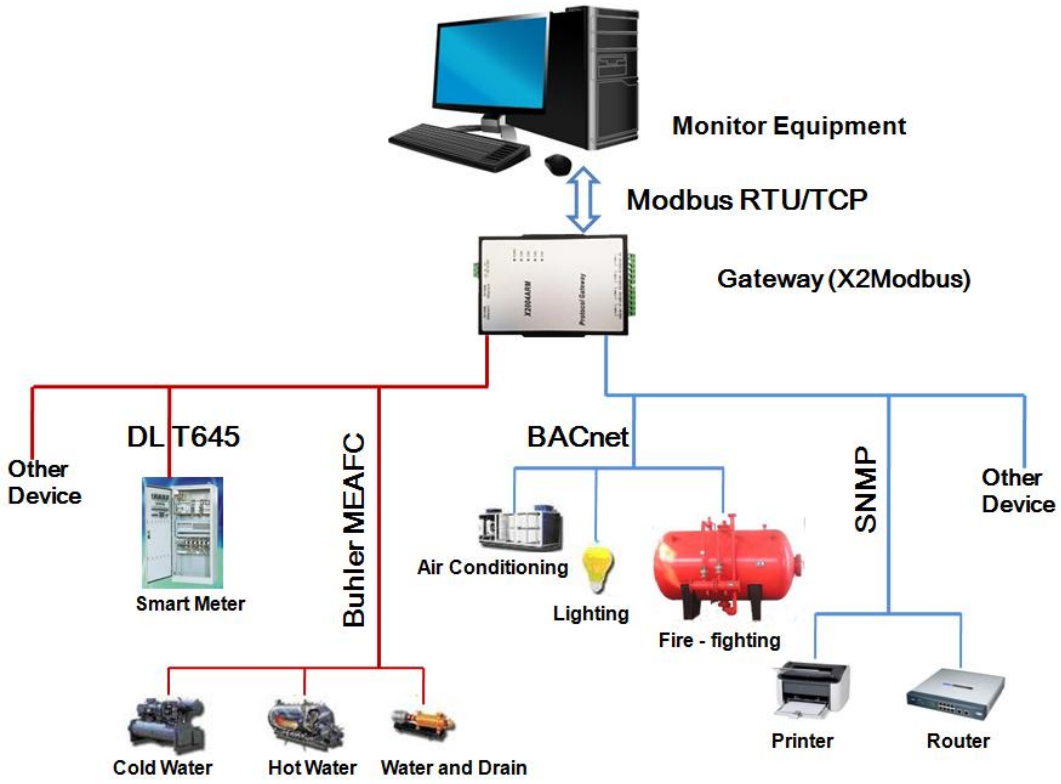
X2Modbus Gateway

User Manual

Product model: MOD2004-ARM

MOD1022-ARM



Shanghai Sunfull Automation Co., LTD

Table of Contents

1 Preface

1.1 Disclaimer

 Due to the product version upgrade or other reasons, this manual content may change. This manual is to cooperate with Sunfull hardware gateway (X2Modbus) is used, the company to provide accurate information in this manual.

1.2 Technical Support

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

  http://www.bacnetchina.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 gatewayacquisition end and forward the Modbus register base address is from 1 (Base1) .

- **Working principle:**

  X2Modbus is equivalent to a communication bridge, will other non-standard communication protocol to the Modbus standard communication protocol, makes the PC software of support the Modbus protocol (such as Siemens WinCC, Wonderware Intouch, and control of kingview and force control configuration software) throughhardware 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 English,and easy to add any language if the user required.

  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 exchange function.

  8.Support the user permission management.

2.2 Operation Platform

- Support Windows XP/2000/2003/Win 7/Win8,
- WEB with above IE8 version,Opera、Safari of apple、Google Chrome and firefox.

2.3 Supported Registered Type and Quantity

Gateway support ModbusTCP server and ModbusRTU servers, the two common types of server support register, gateway limit points to 1024 .

Modbus register type	Modbus register number
0x（Coil Stauts）	256
1x（Input Stauts）	256
4x（Holding Register）	256
3x（ Input Register）	256

2.4 Application Fields

Hardware gateway is used to solve the Citect, ifixes, RSVIEW, WINCC, kingview, easy control, etc 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.

2.5 Feature of Hardway

Produce model: MOD2004-ARM

-Windows CE/32 Bit 400MHz RISC ARM926EJ;

-DC24,7W;

-Three layers of isolation;

-2Ethernet port ,4RS485;

-Size: 140 x 116 x 30 mm, weight: 500 g;

-aluminum alloy shell, installation method: wall, guide rail type;

Produce model: MOD1022-ARM

-Windows CE/32 Bit 400MHz RISC ARM926EJ

-DC24,7W

-Three layers of isolation

-1Ethernet port ,2RS485,2RS232

-Size: 169x 94x 28mm, weight: 400 g

-aluminum alloy shell, installation method: wall, guide rail type

3 Configuration And Operation

X2Modbus upper machine is running on the PC configuration software, used to configure project, configure the project to the lower machine hardware gateway, also can be used alone on the PC of course, there is no time limit on the version need to purchase a USB - KEY encryption soft dog or authorization.

Open the program runs file X2Modbus. exe, run into the main interface, as the following figure 3-1.

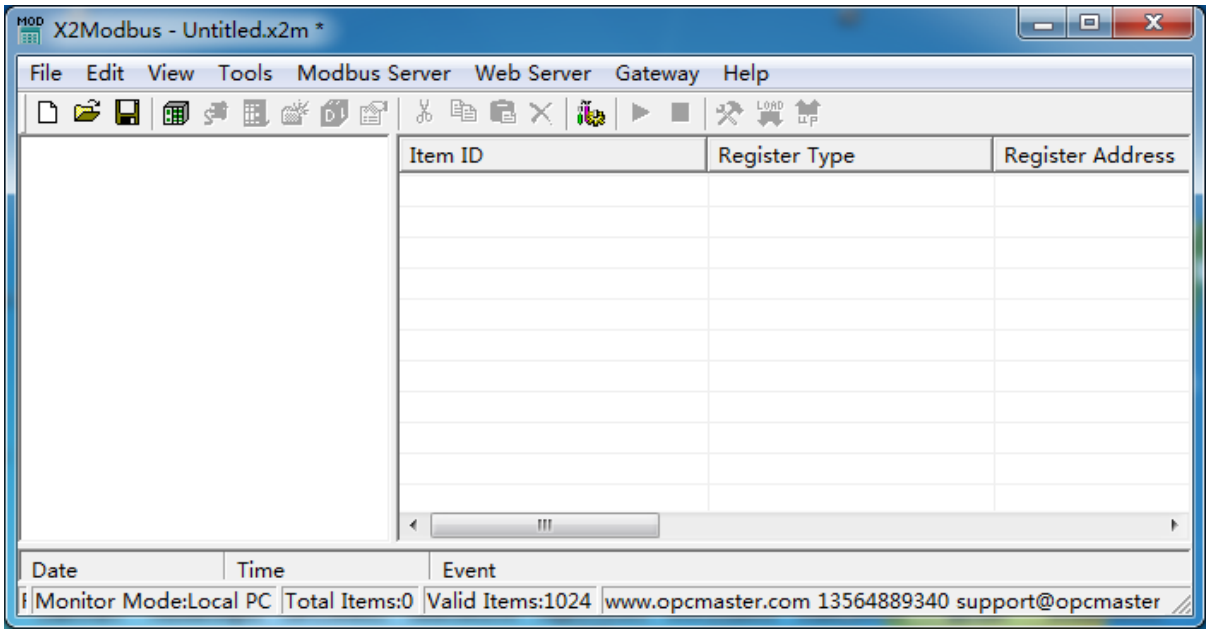


Figure 3-1 Main interface

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..

3.1 Language Setting

In the main program interface, click the "view" menu select "language Setting", as the following figure 3-1-1.

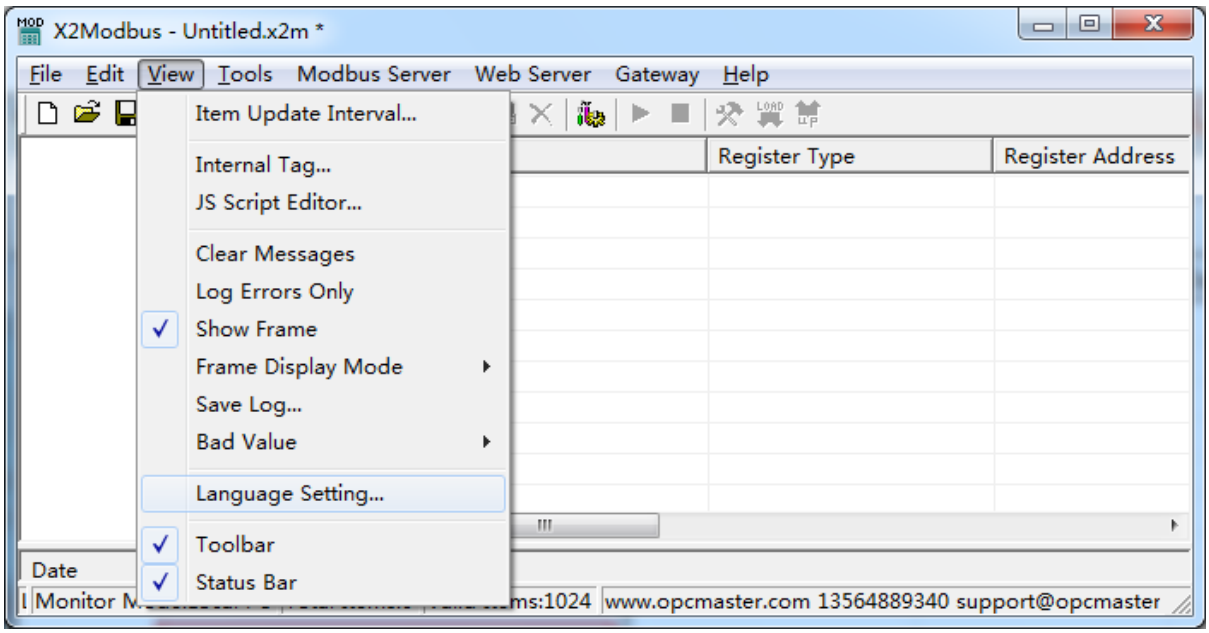


Figure 3-1-1 Select Language setting

In the pop up dialog, select manipulation language, as the following figure 3-1-2.

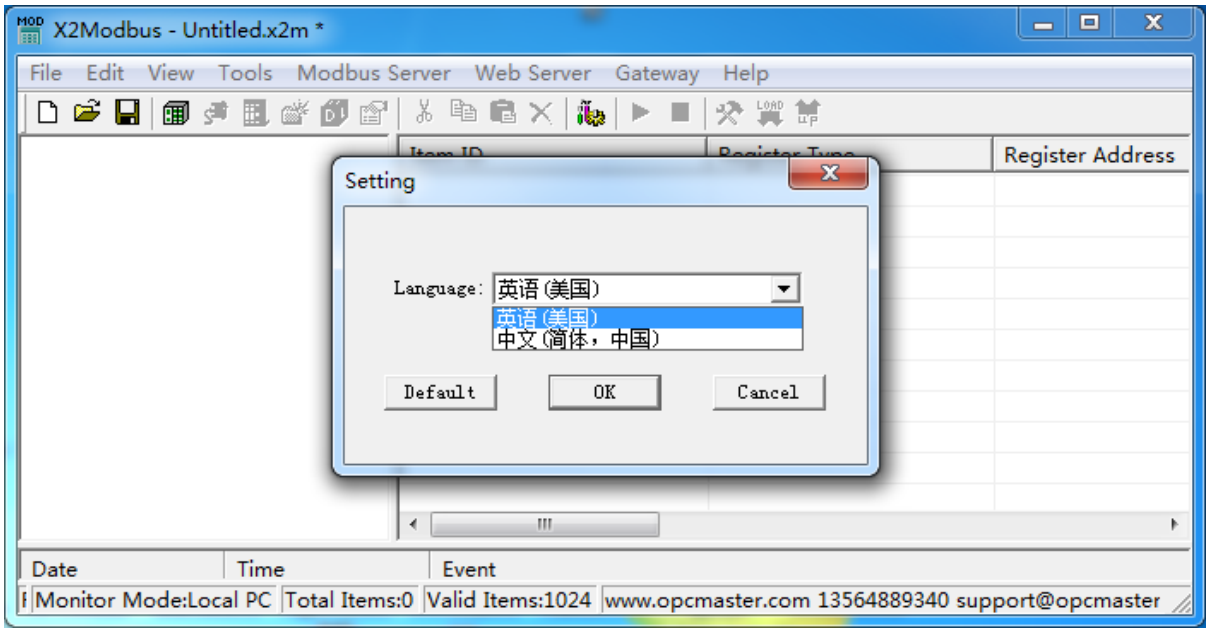


Figure 3-1-2 select manipulation language

3.2 Select monitoring mode

Under toolbar "Monitor Model", can choose to monitor mode, or in the status bar on the bottom of the double click "monitor model" can switch mode, as shown in figure 3-2. The **local mode** refers to a pure software running on PC X2ModbusRuntime gateway program. exe, realize the protocol conversion function on the PC, can be used for the simulation on PC; Gateway pattern is refers to the gateway, hardware configuration on the PC engineering uploaded to the gateway, hardware implementation in hardware gateway

protocol conversion function, can also be on the PC monitor hardware gateway communication status.

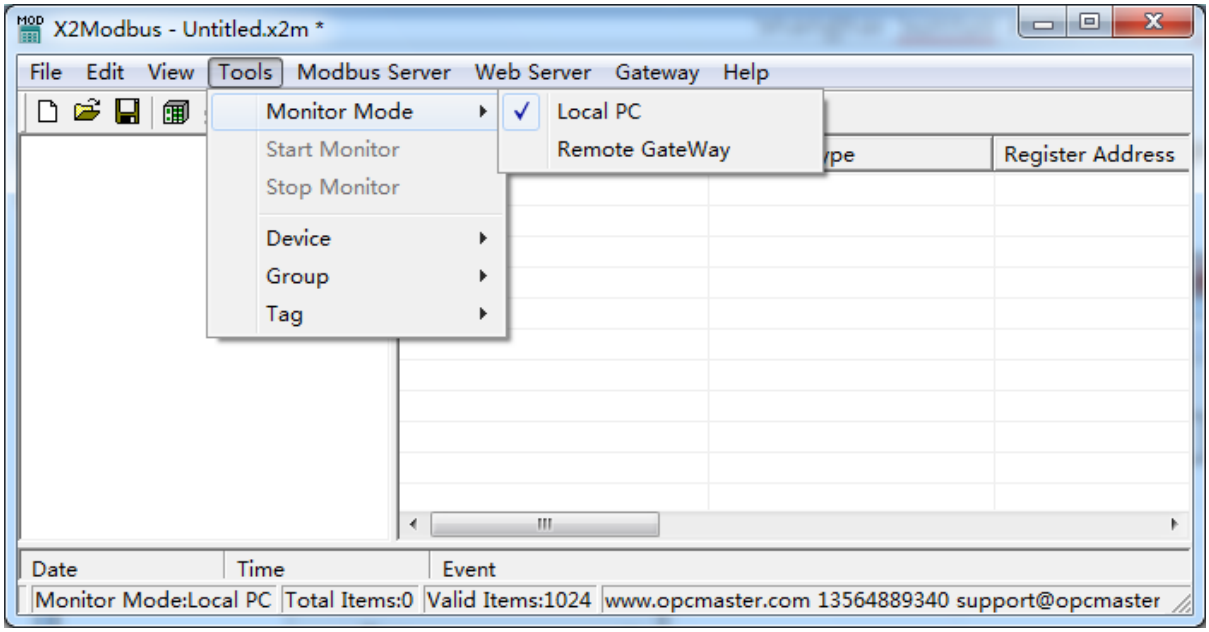


Figure 3-2 Select Monitor Model

3.3 New Driver

Click edit to choose "New driver" or click on the toolbar icon , as following figure 3-3-1.

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.

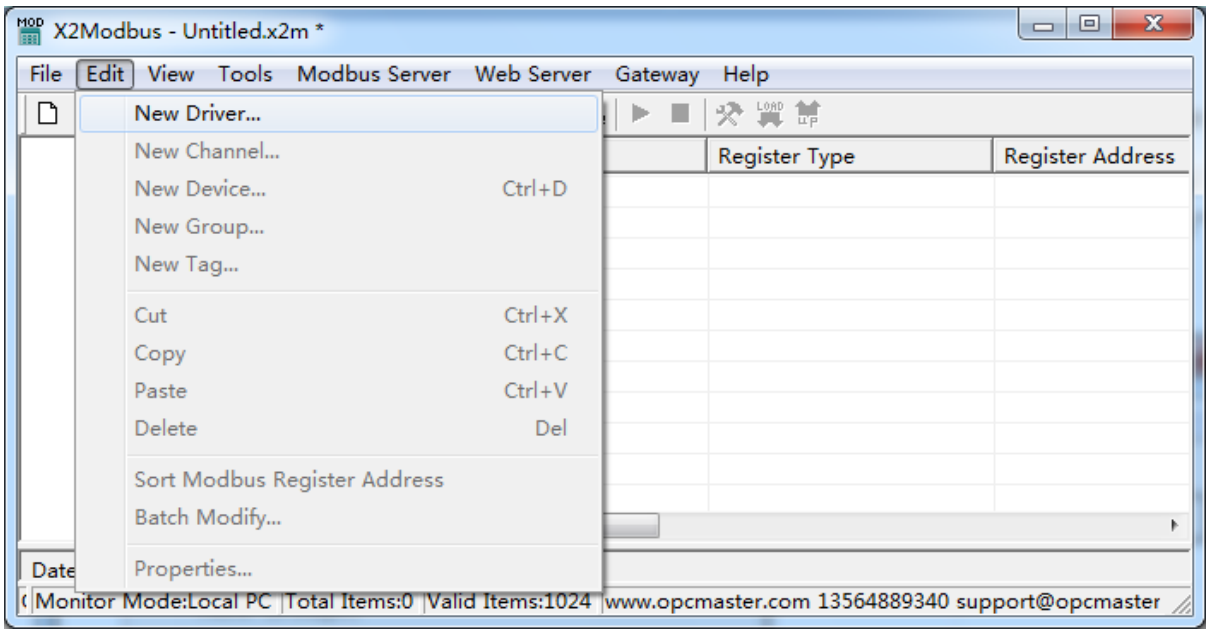


Figure 3-3-1 New Driver

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

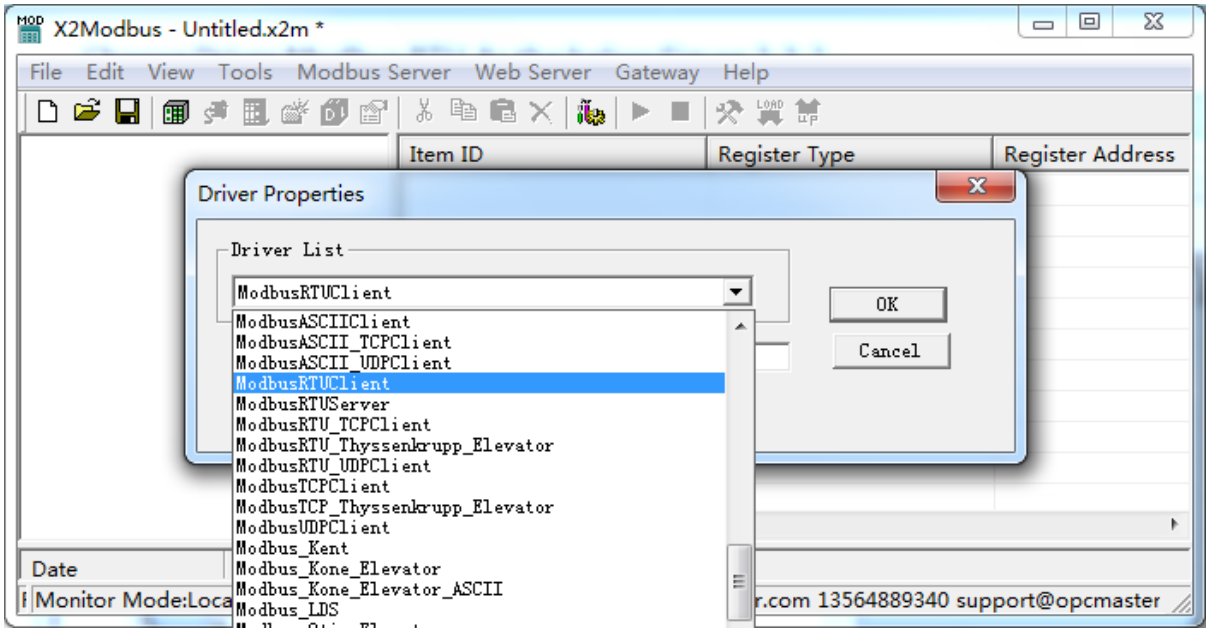


Figure 3-3-1 New Driver

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

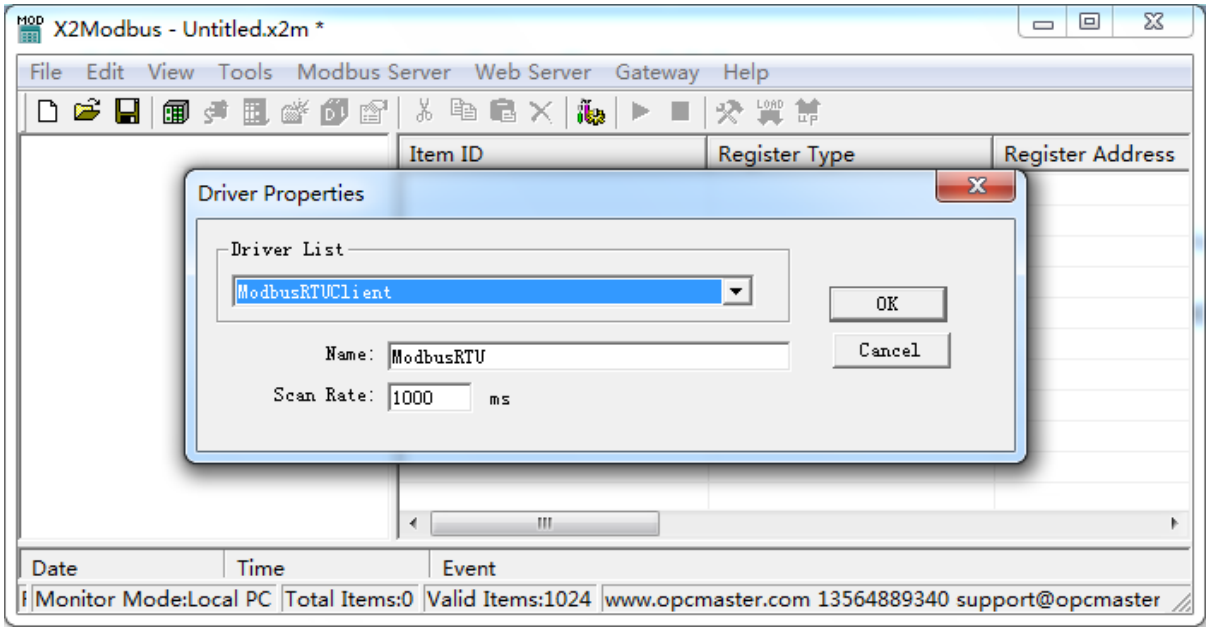


Figure 3-3-3 Drive Properties

Input driver name in the name of the project, the default polling time is 1000 milliseconds, the user can according to the actual situation, change the polling time. Choose ModbusRTU Driver. As the below Figure 3-3-4.

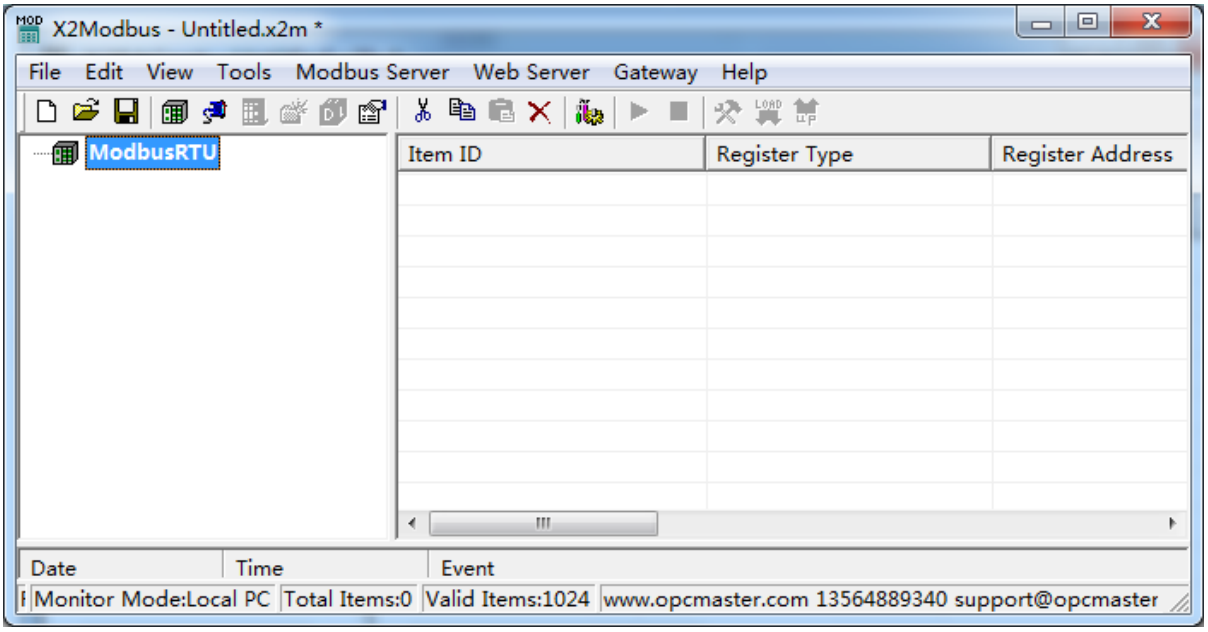


Figure 3-3-4 Choose ModbusRTU Drive

3.4 New Channel

In the current drive, right click to select "New Channel" or click on the toolbar  .As the following figure 3-4-1.

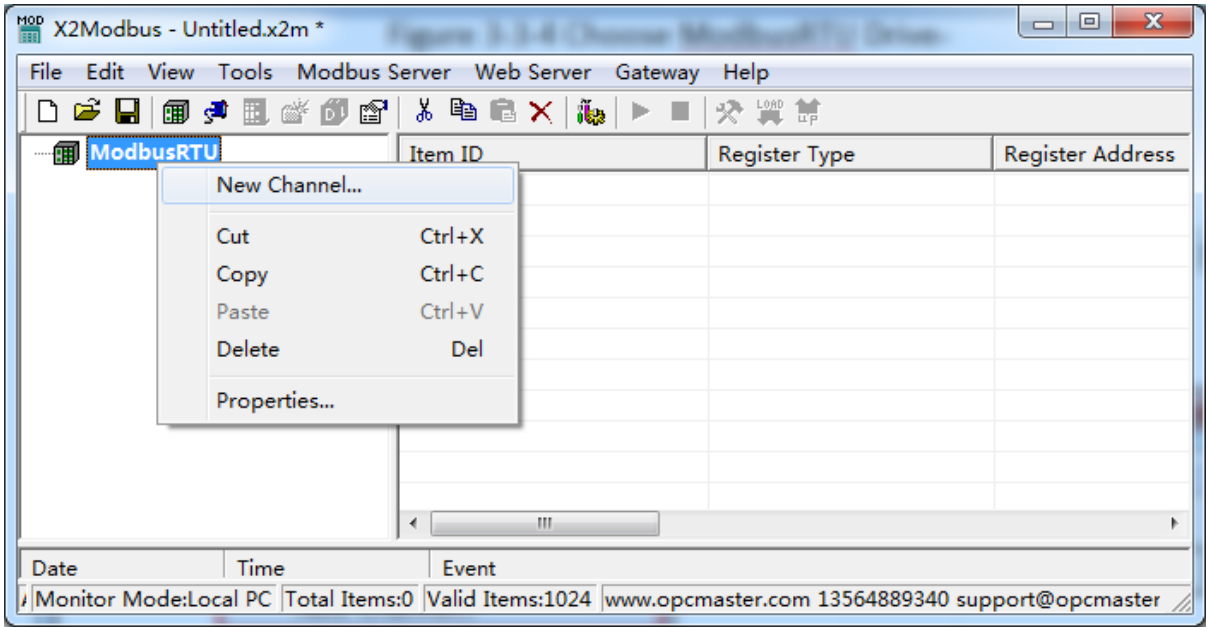


Figure 3-4-1 New Channel

In the pop up window, according to corresponding set by the driver communication protocol channel names can be arbitrary naming.As the following figure 3-4-2.

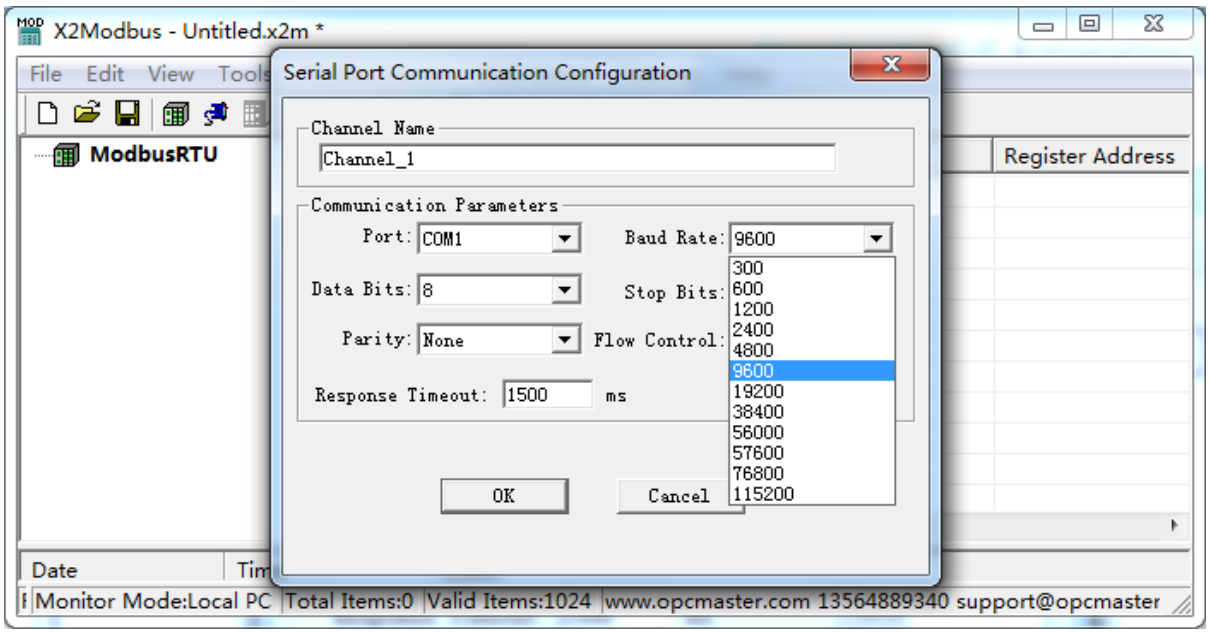


Figure 3-4-2 Set communication parameters

Because of this acquisition terminal decodes the Modbus Slave data collected from the station, so setting up the serial communication parameters with Modbus Slave in the parameter. When communication normal circumstances, the time set longer does not affect the communication speed. If the device response speed is slow, in order to avoid communication failure, suggest can set up a bit longer. As the following figure 3-4-3.

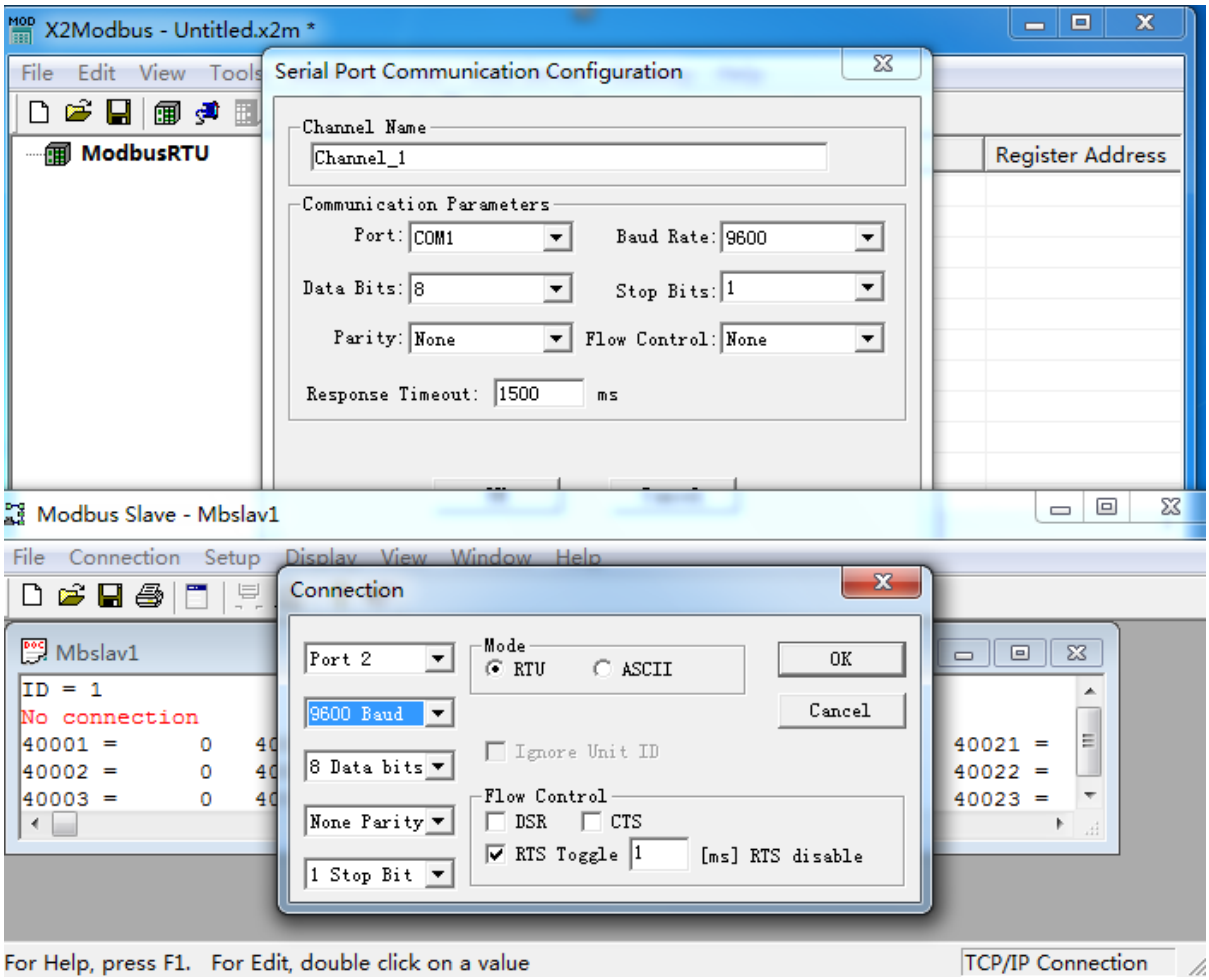


Figure 3-4-3 Channel parameters are consistent

Completed the construction of the new channel. As the following figure 3-4-4.

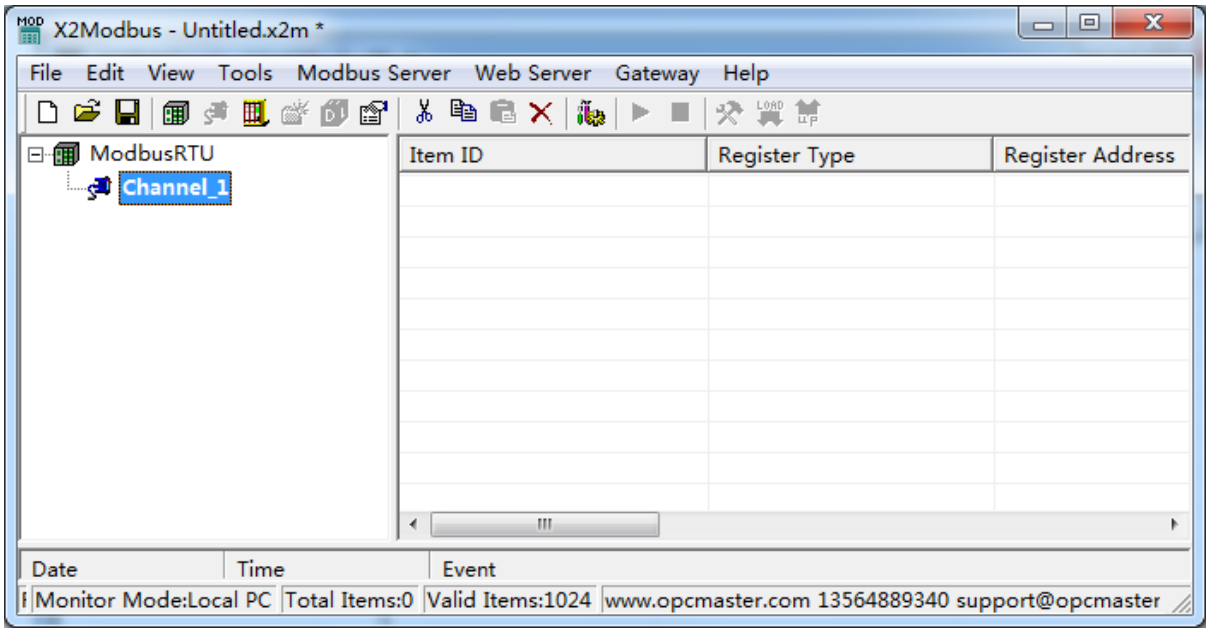


Figure 3-4-4 Channel to complete

3.5 New Device

In the current Channel, Right-click to choose "New Device", or click on the toolbar  .As the following figure 3-5-1.

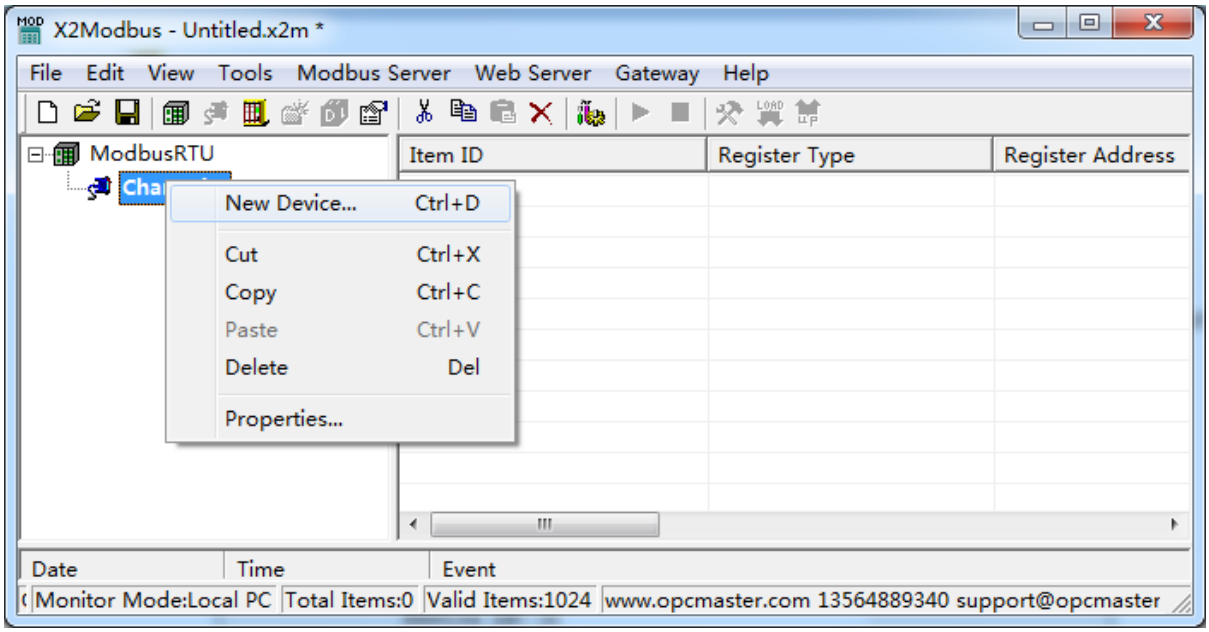


Figure 3-5-1 New Device

In the pop-up dialog box set equipment related properties. As the following figure 3-5-2.

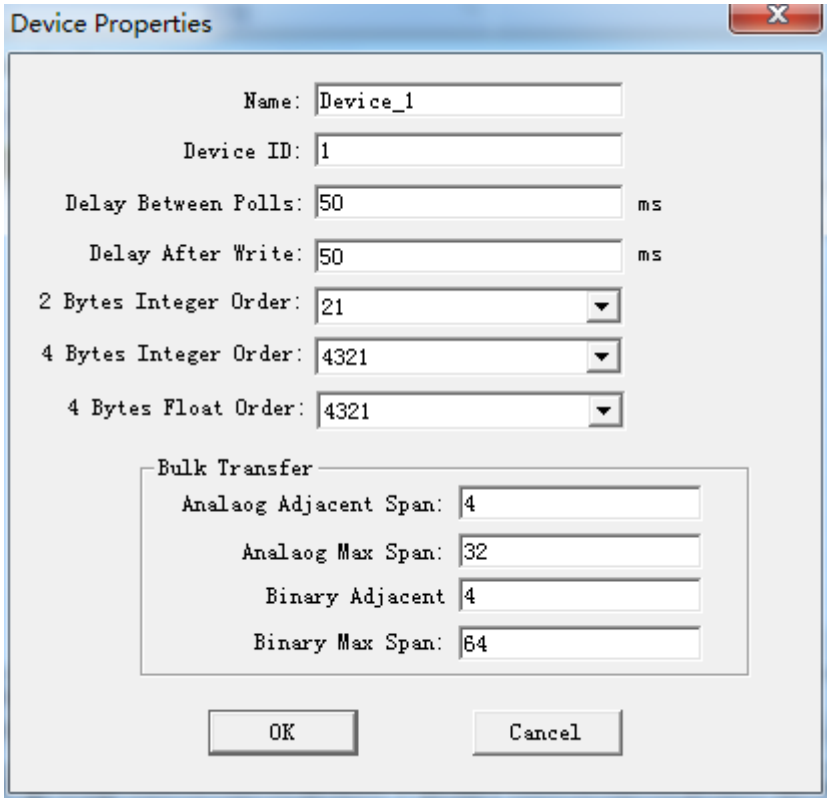


Figure 3-5-2 Device Properties

These properties 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, in the process of communication, clearly feel communication data is not correct, can adjust these parameters for debugging .As the following figure 3-5-3.

Under the support package set of communication protocol, in order to improve the communication speed, type, also register under continuous register address, package can be implemented group communication. Packet communication when the device does not support group, should be wrapped set parameter is set to 0. In addition, when the device response time is slow, you can set the time interval between data frame and the frame, the default frame interval to 50 microseconds. As the following figure 3-5-4.

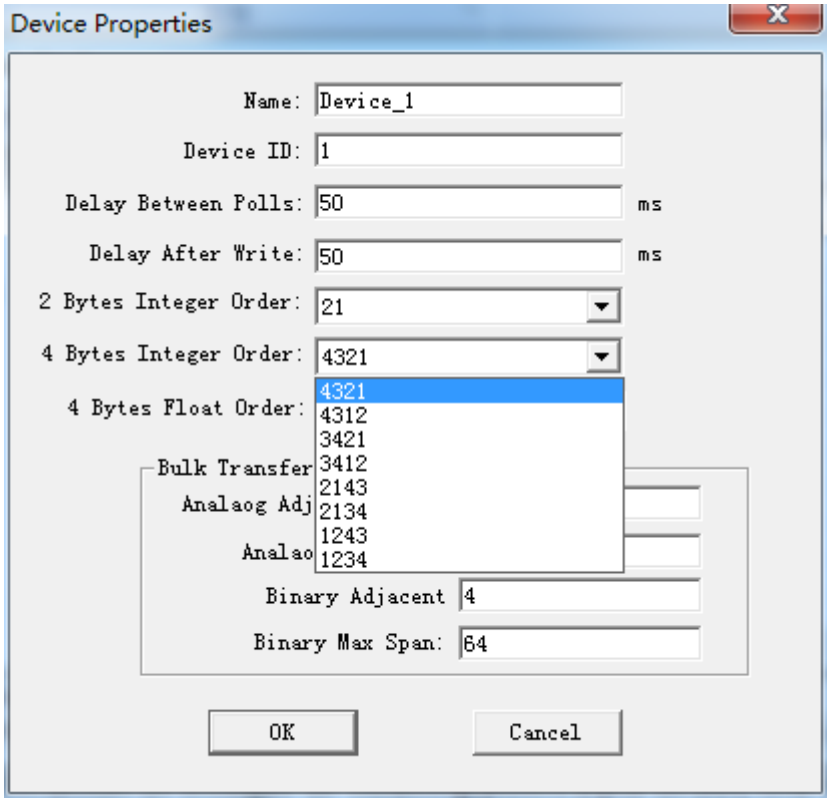


Figure 3-5-3 Byte order

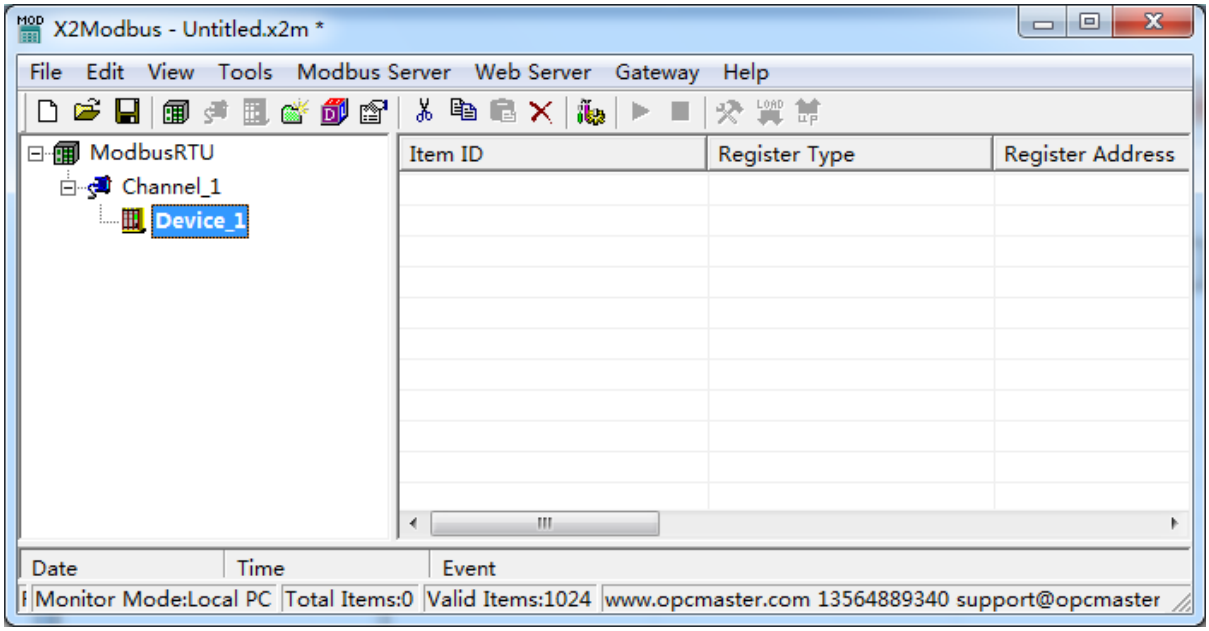


Figure 3-5-4 Device to Complete

3.6 New Tag

Can directly add tabs (also can be set up first, and then in the group of new labels), right click on the selected equipment to choose the new tag or click on the toolbar .As the following figure 3-6-1.

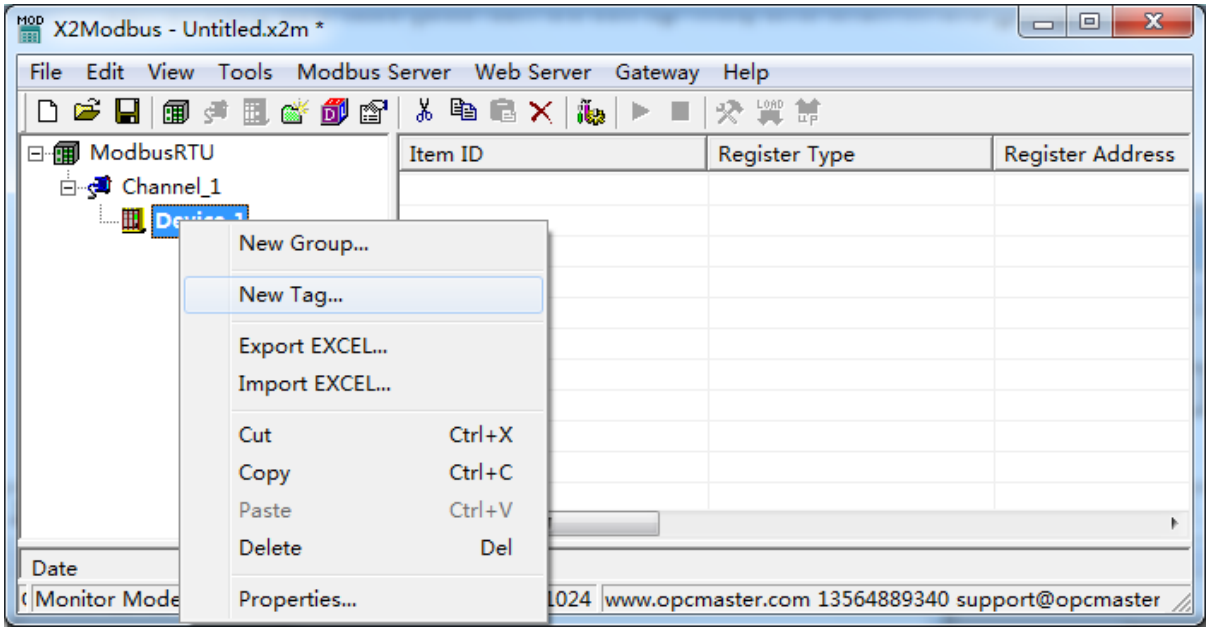


Figure 3-6-1 New Tag

Or right-click on the right side of the edit box blank space, add a new tag.As the following figure 3-6-2.

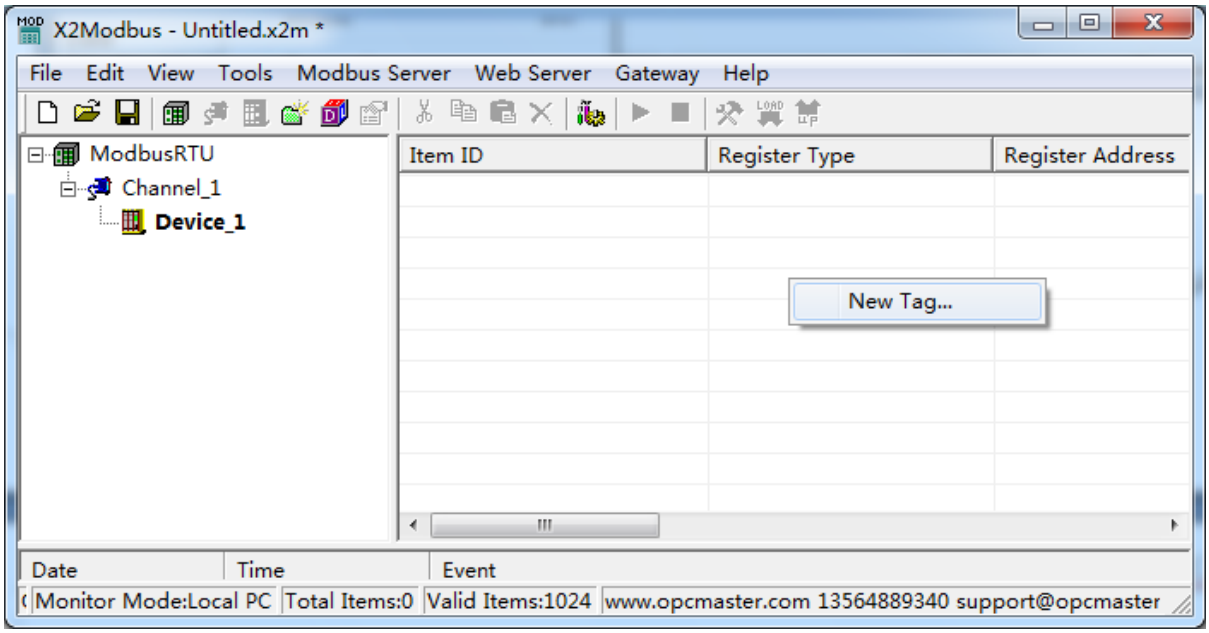


Figure 3-6-2 New Tag

In the pop-up dialog box Settings collection to the end and forward parameters.As the following figure 3-6-3.

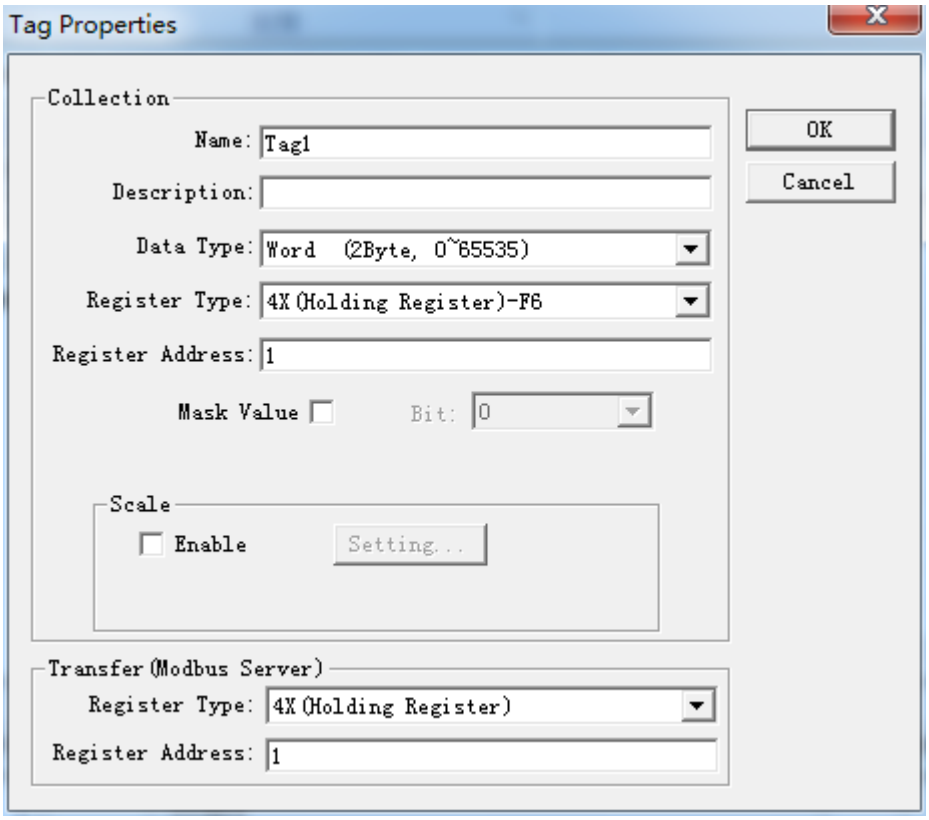


Figure 3-6-3 Tag Properties

In the tag attributes set up to collect the name, data type, type of register, register address. Above select register address is 4x0001 collection end, data type is Word type. When the data type is Short, the Word, under the condition of Long or DWord, according to a value. For some special data can also enable linear transformation function to implement the data of the linear amplification and narrow. Note the Modbus register address of the initial address begins with 1.

Click “Mask Value”, you can pick up a byte 0-15.As the following figure 3-6-4.

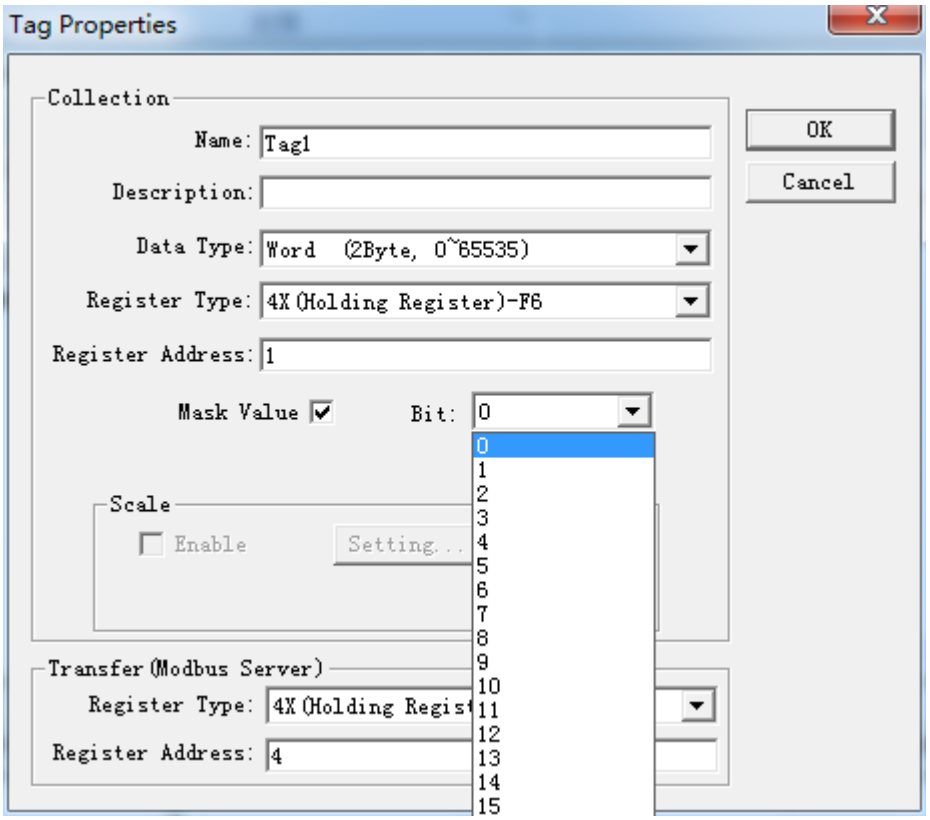


Figure 3-6-4 Mask Vaule

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 3-6-5.

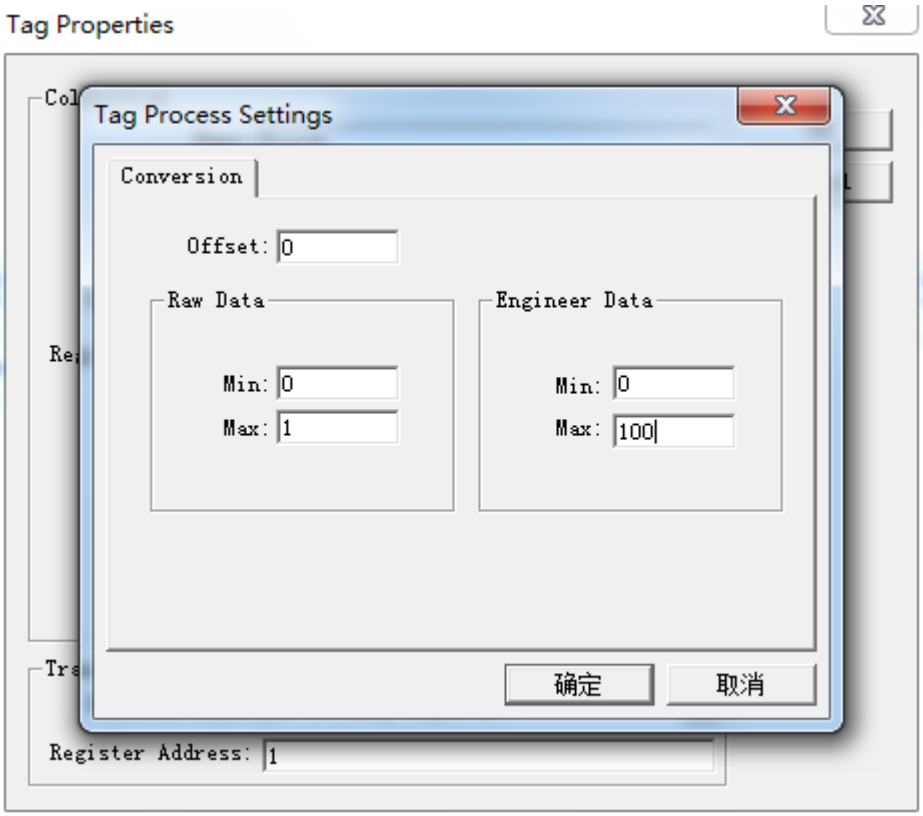


Figure 3-6-5 Tag Process Settings

Can continue the above steps to add them one by one, it is recommended to use copy and paste the toolbar, also can use Ctrl + C and Ctrl + V, Click copy toolbar button, or right-click to choose to copy.

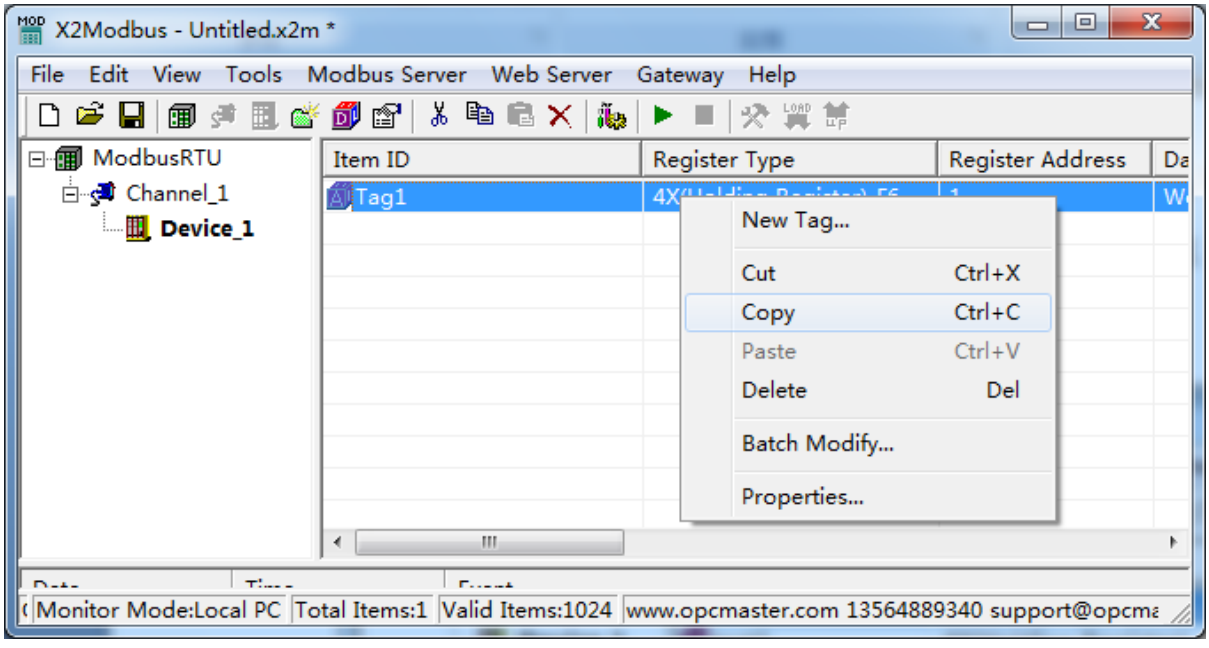


Figure 3-6-6 Copy Tag

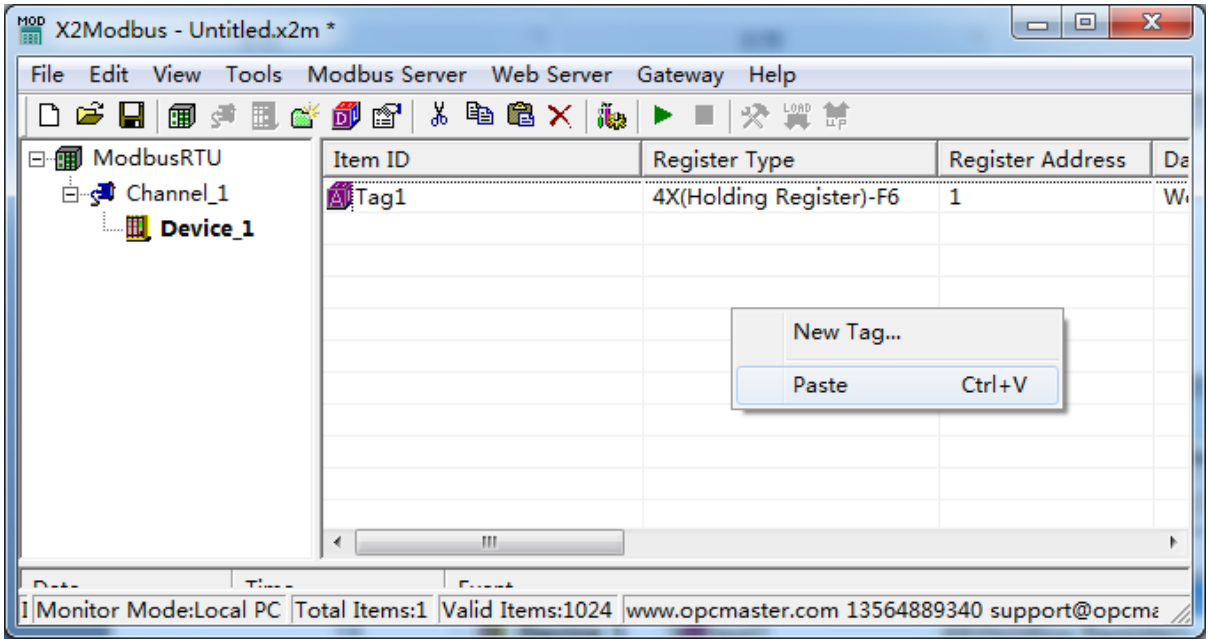


Figure 3-6-7 Paste Tag

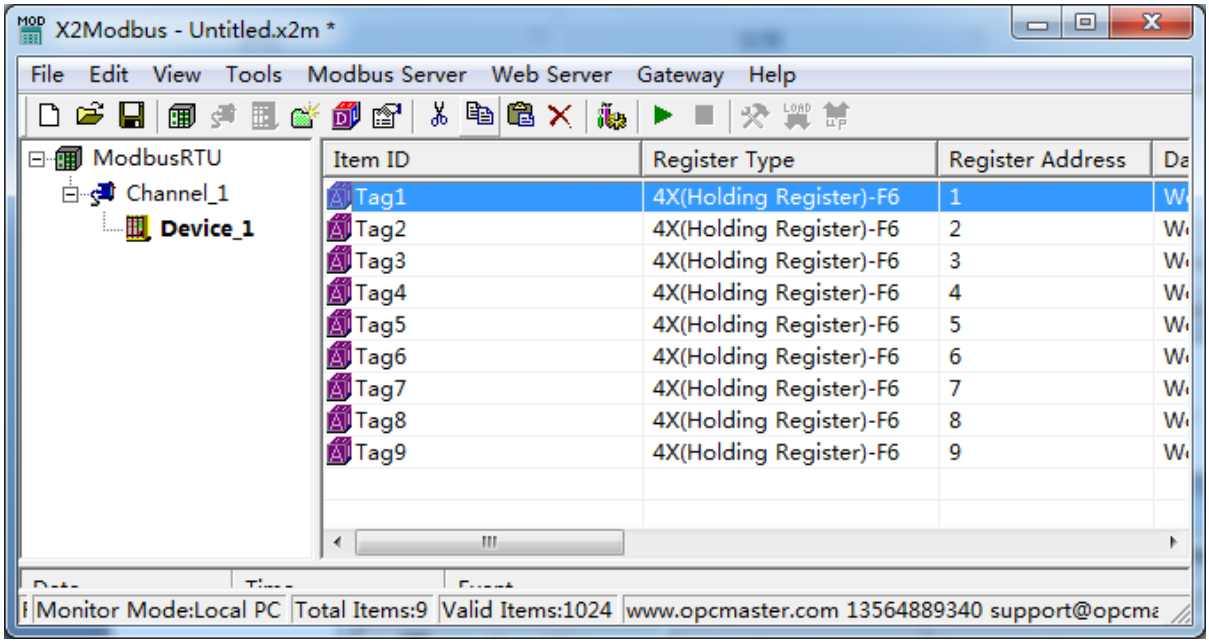


Figure 3-6-8 Complete the tag

Also can be edited in the EXCEL table then edit engineering through the import and export function. As the figure 3-6-9.

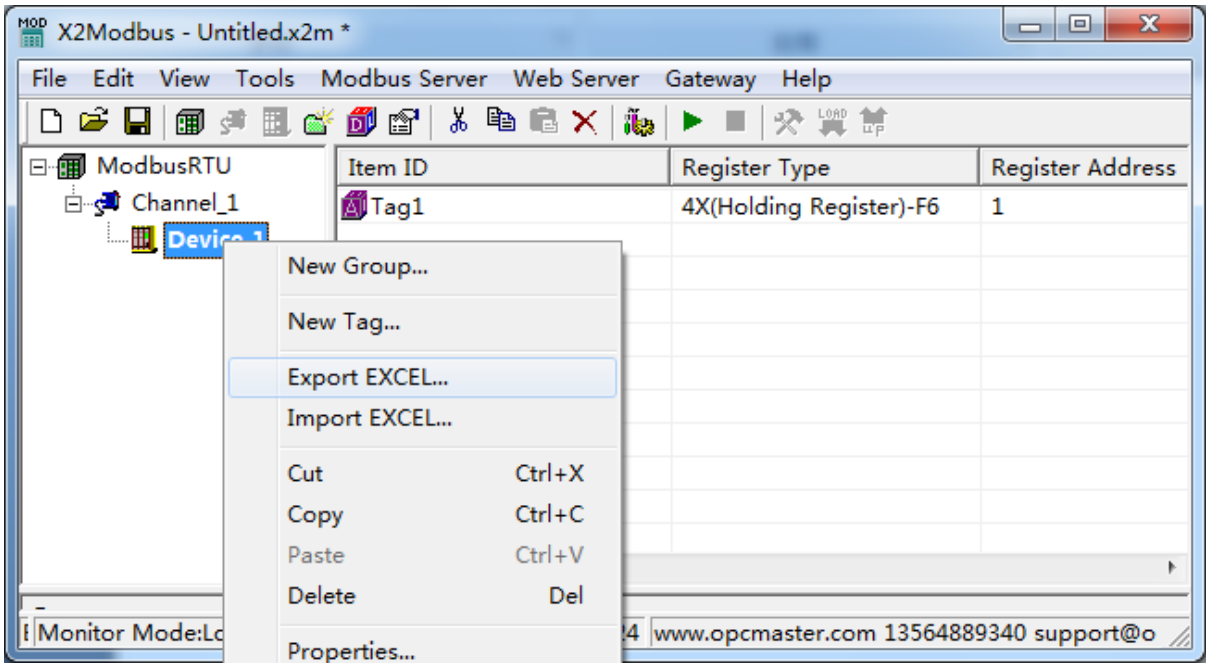


Figure 3-6-9 Export EXCEL

Click on the following, we select export EXCEL . As the following figure 3-6-10.

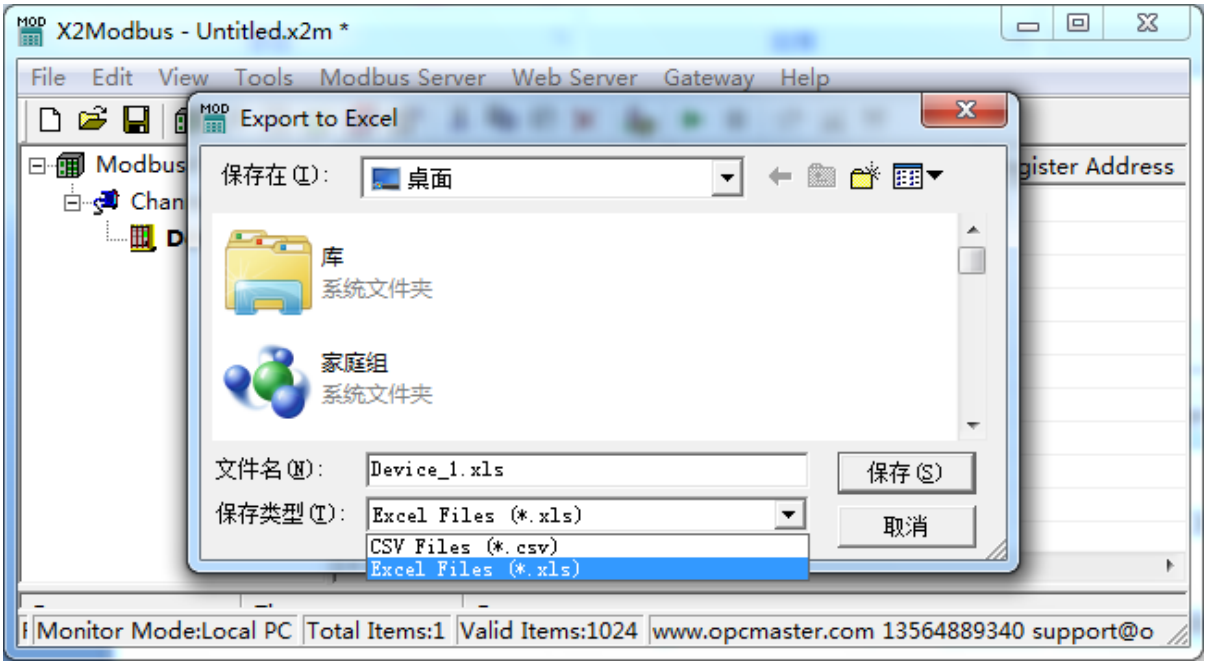


Figure 3-6-10 save the EXCEL

Save the completed, open the EXCEL for editing.

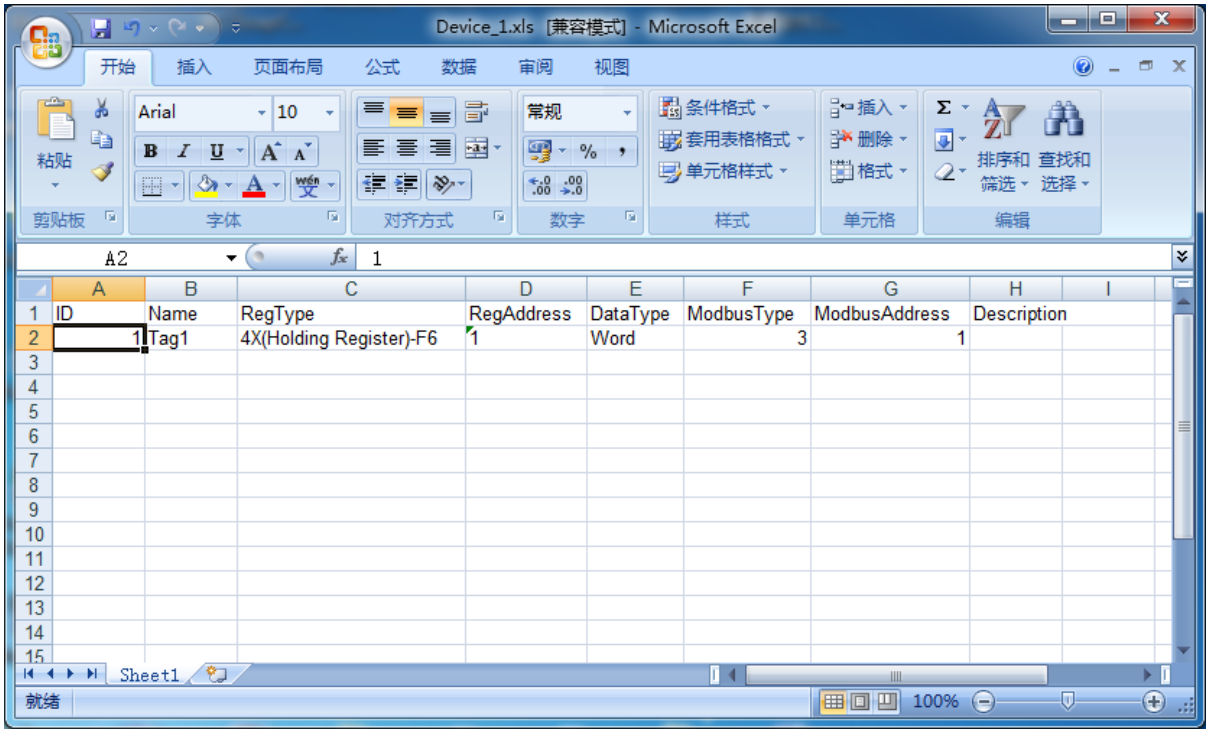


Figure 3-6-11 Open the EXCEL

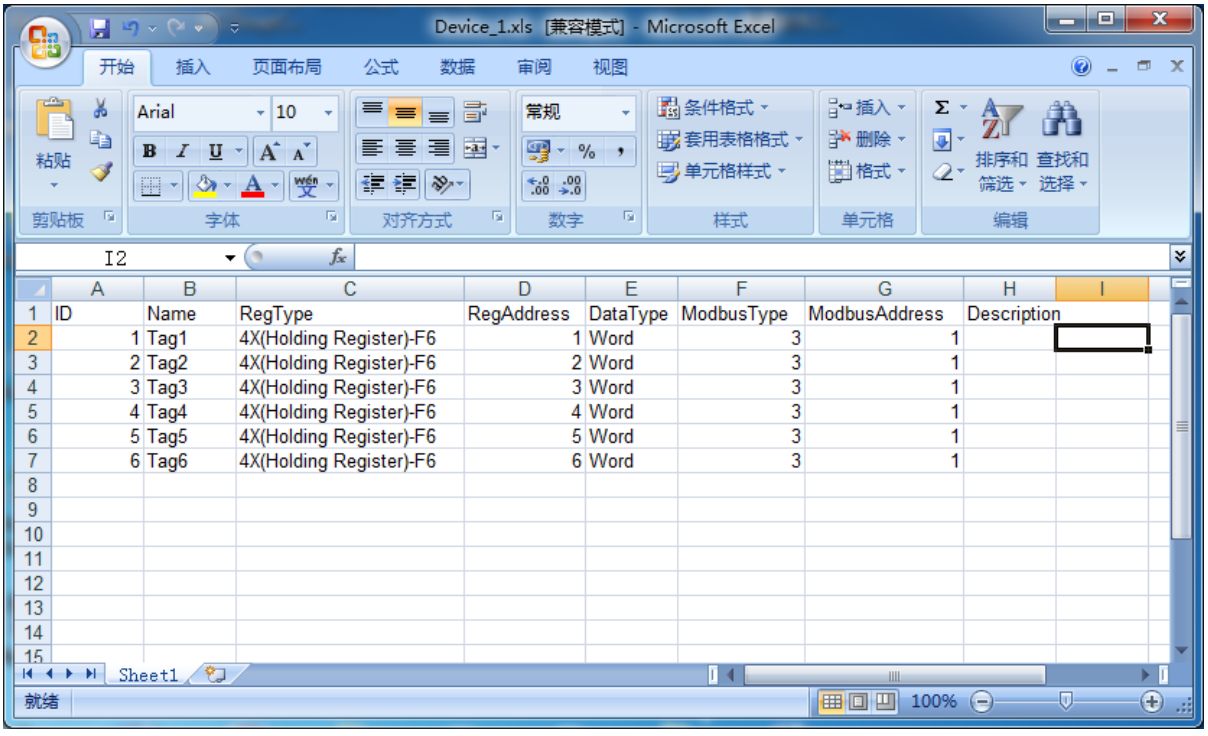


Figure 3-6-12 Edit the EXCEL

After completion of editing, choose import the edited EXCEL.As the following figure 3-6-13.

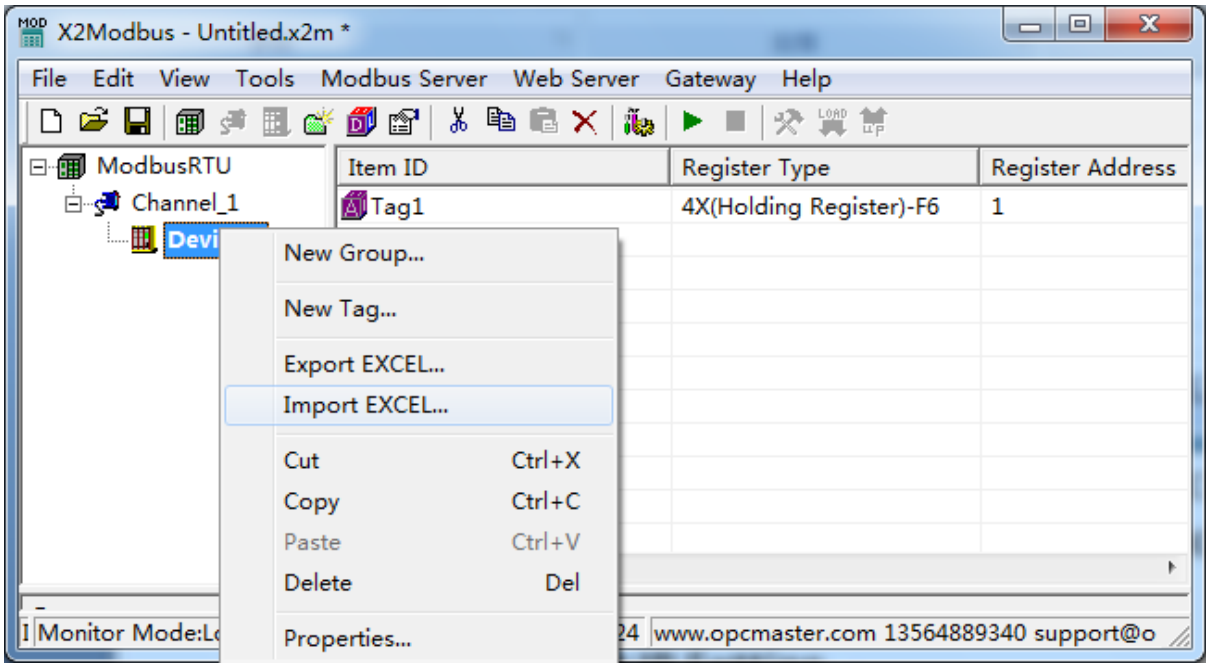


Figure 3-6-13 Import EXCEL

The import is complete, the following figure 3-6-14.

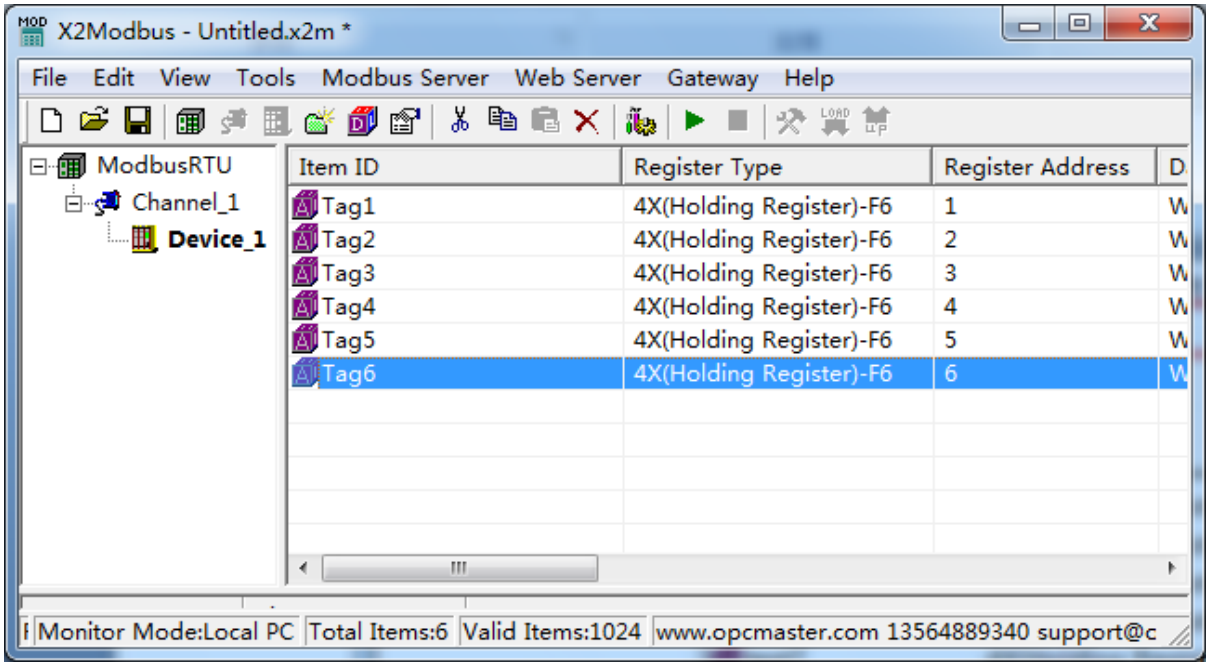


Figure 3-6-14 Complete the import

3.7 Modbus TCP Setting

Modbus server support Modbus TCP and Modbus RTU protocol. Click on the menu bar "Modbus server" option "Modbus TCP" from the parameter Settings. As the following figure 3-7-1.

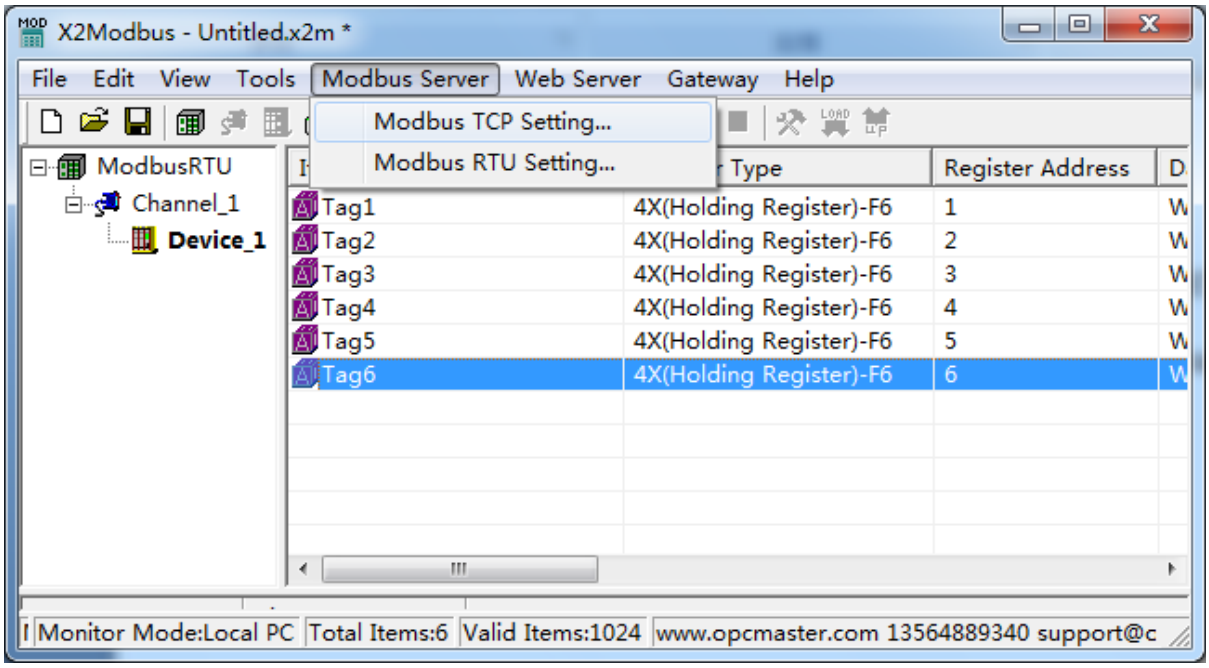


Figure 3-7-1 Modbus TCP Setting

The factory default is supported Modbus TCP protocol Modbus server, and the port number is 502 by default. As the following figure 3-7-2.

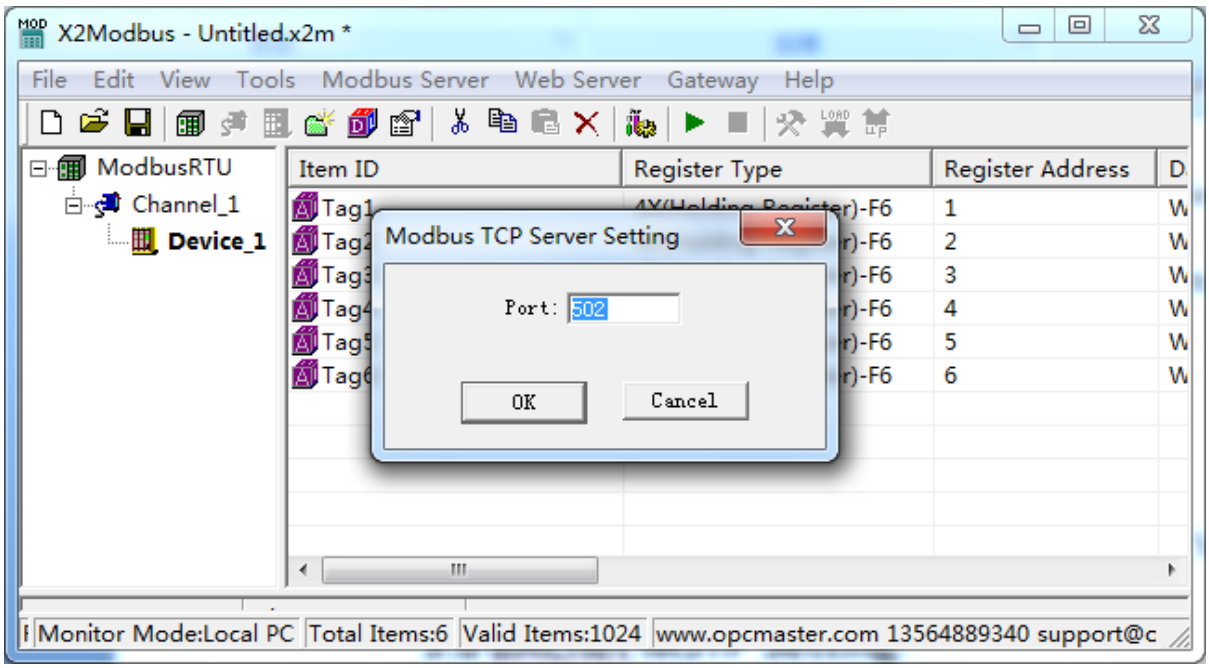


Figure 3-7-2 Modbus TCP Server

3.8 Modbus RTU Setting

Click on the menu bar "Modbus Server" option "Modbus RTU Setting" from the parameter

Settings. As the following figure 3-8-1.

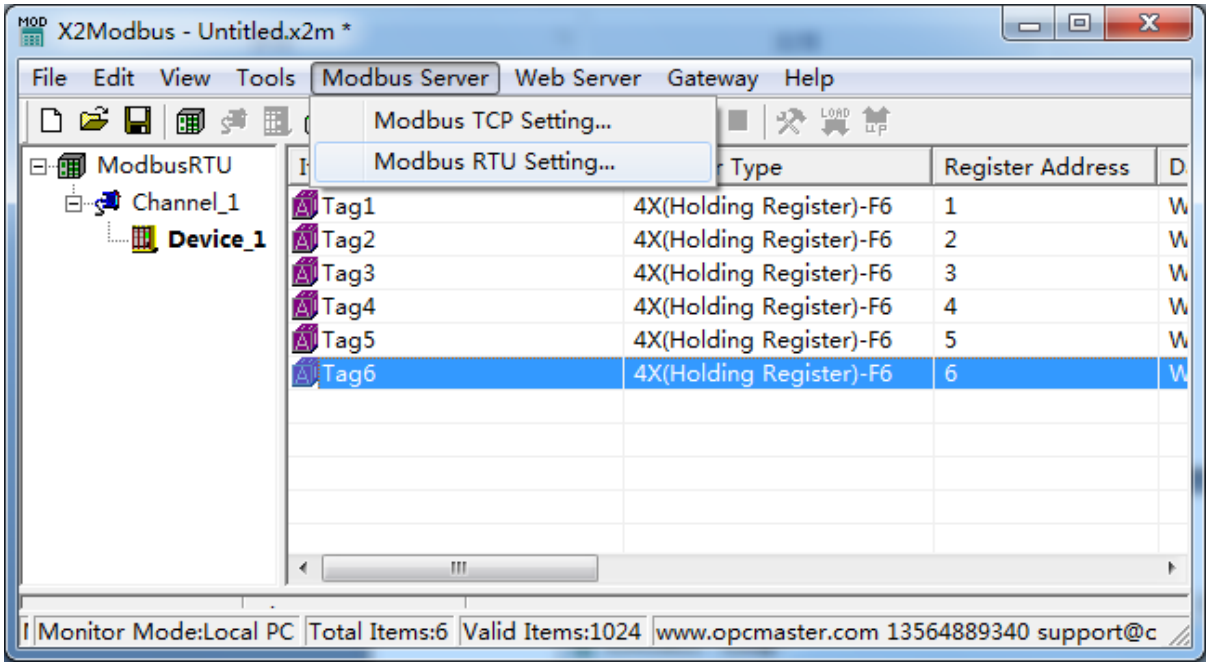


Figure 3-8-1 Modbus RTU Setting

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 3-8-2.

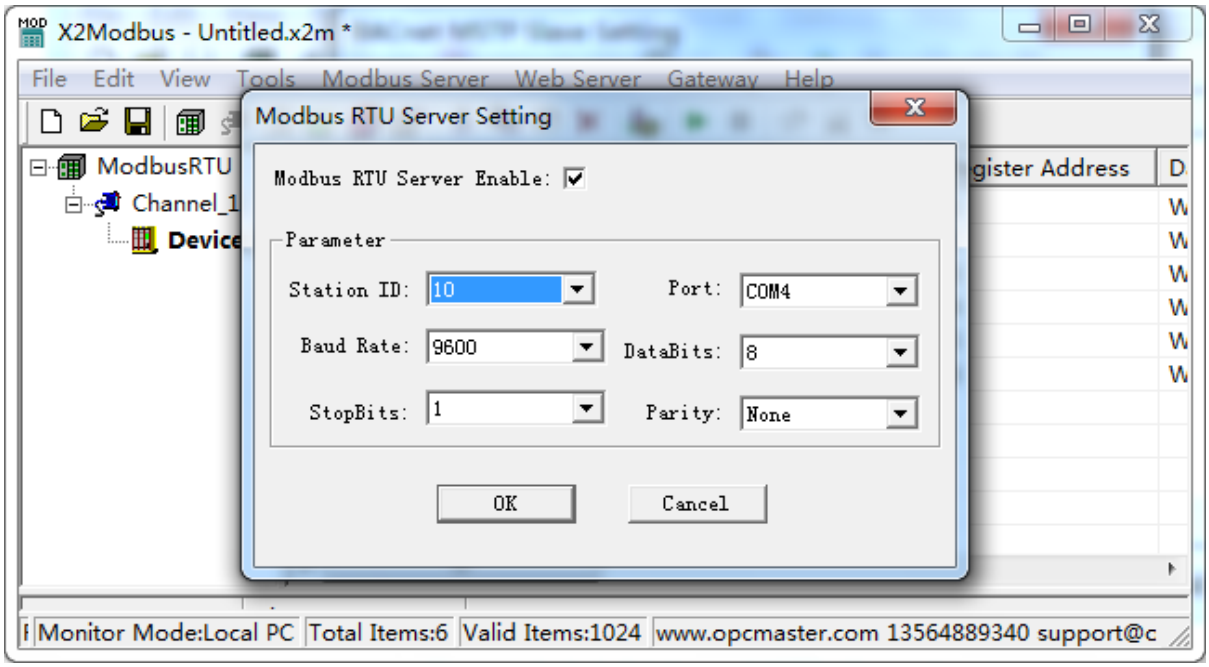


Figure 3-8-2 Modbus RTU Setting

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

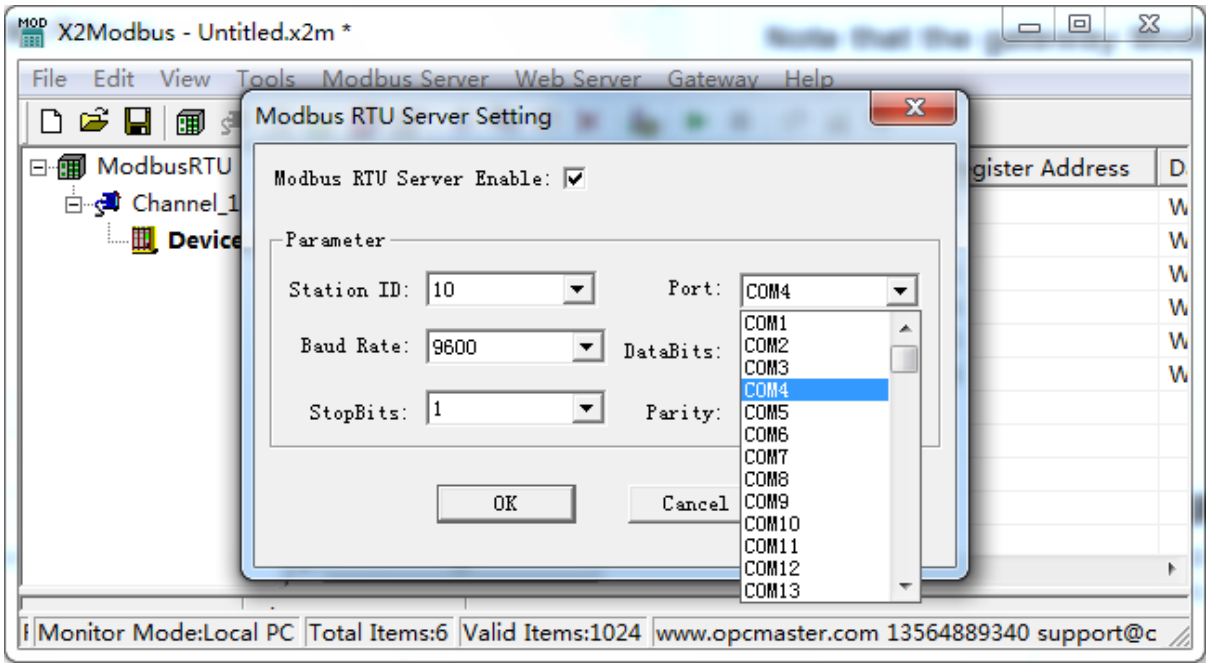


Figure 3-8-3 Port Setting

3.9 X2ModbusRuntime

Engineering after configuration is complete, click "Tools" menu bar select "Start Monitor" or click on the toolbar ▶,below the 3-9-1.Start X2ModbusRunTime runtime program, you just need to start the program background normal use, we can realize the function of the gateway conversion on the PC.

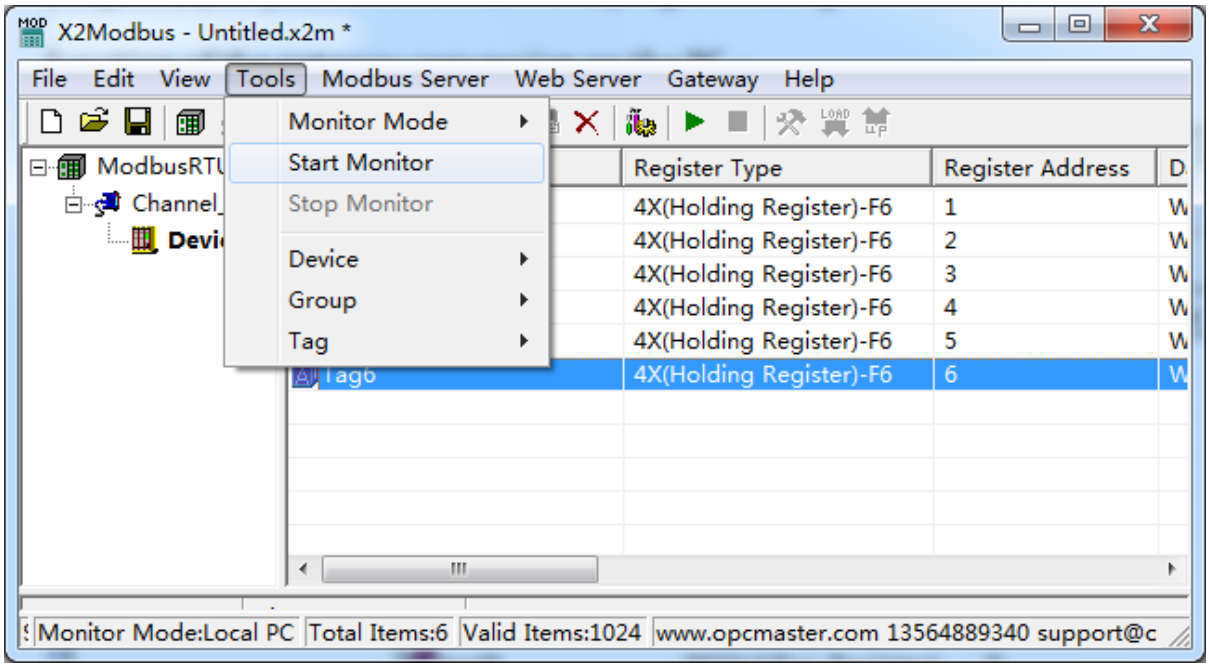


Figure 3-9-1 Start Monitor

X2ModbusRunTime run successfully. We can view the running log .As the Figure 3-9-2.

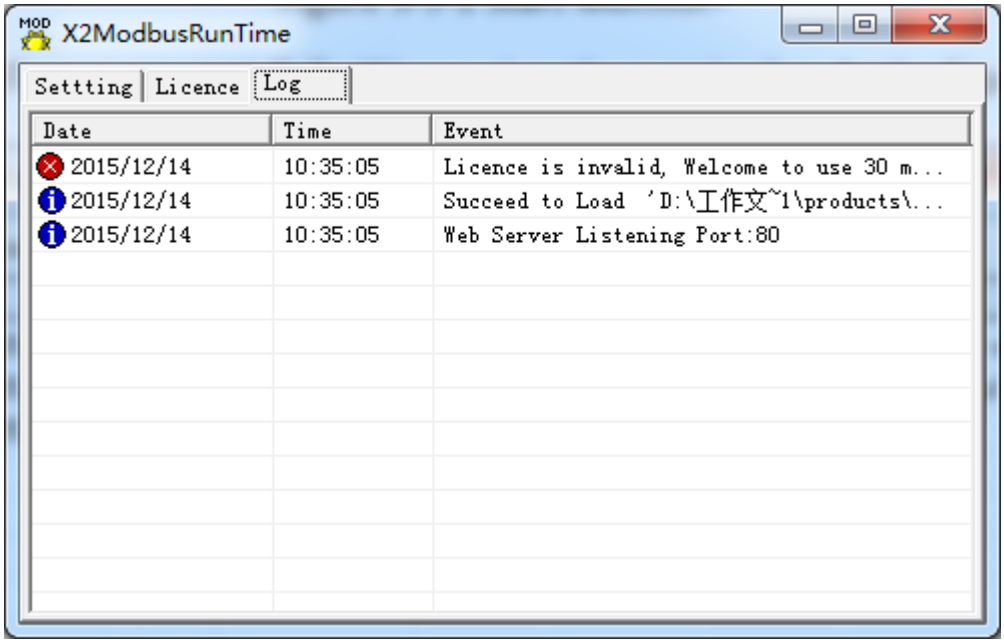


Figure 3-9-2 Log

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

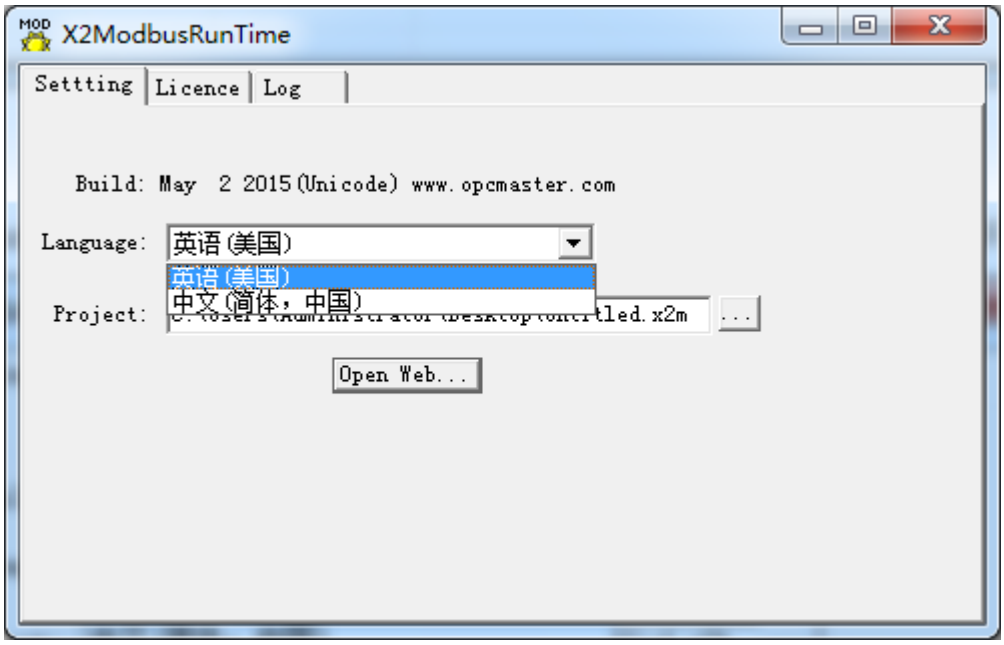


Figure 3-9-3 Choose Operating Language

User if use soft authorization, to authorize X2ModbusRunTime machine code can be copy to the company, get the corresponding registration code after paste directly to the registration code text box, and then click the "register". As the Figure 3-9-4.

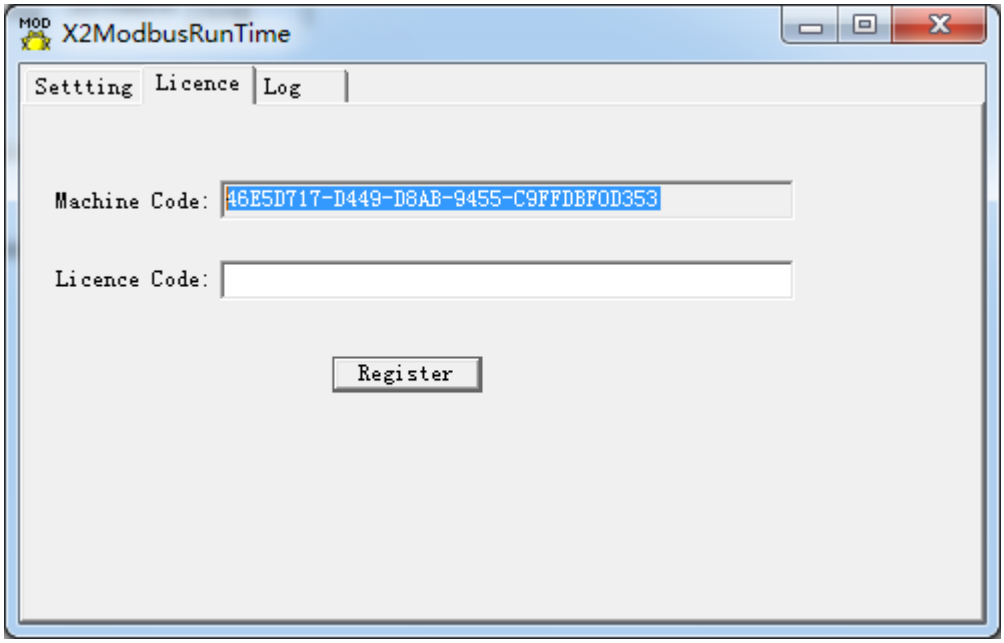


Figure 3-9-4 Soft Authorization

Note: if you are using a USB - KEY encryption dog authorization, you don't need the operation.

Return procedure monitoring interface, can see some real time data on the device and the data on the interface is consistent, As the Figure 3-9-5.

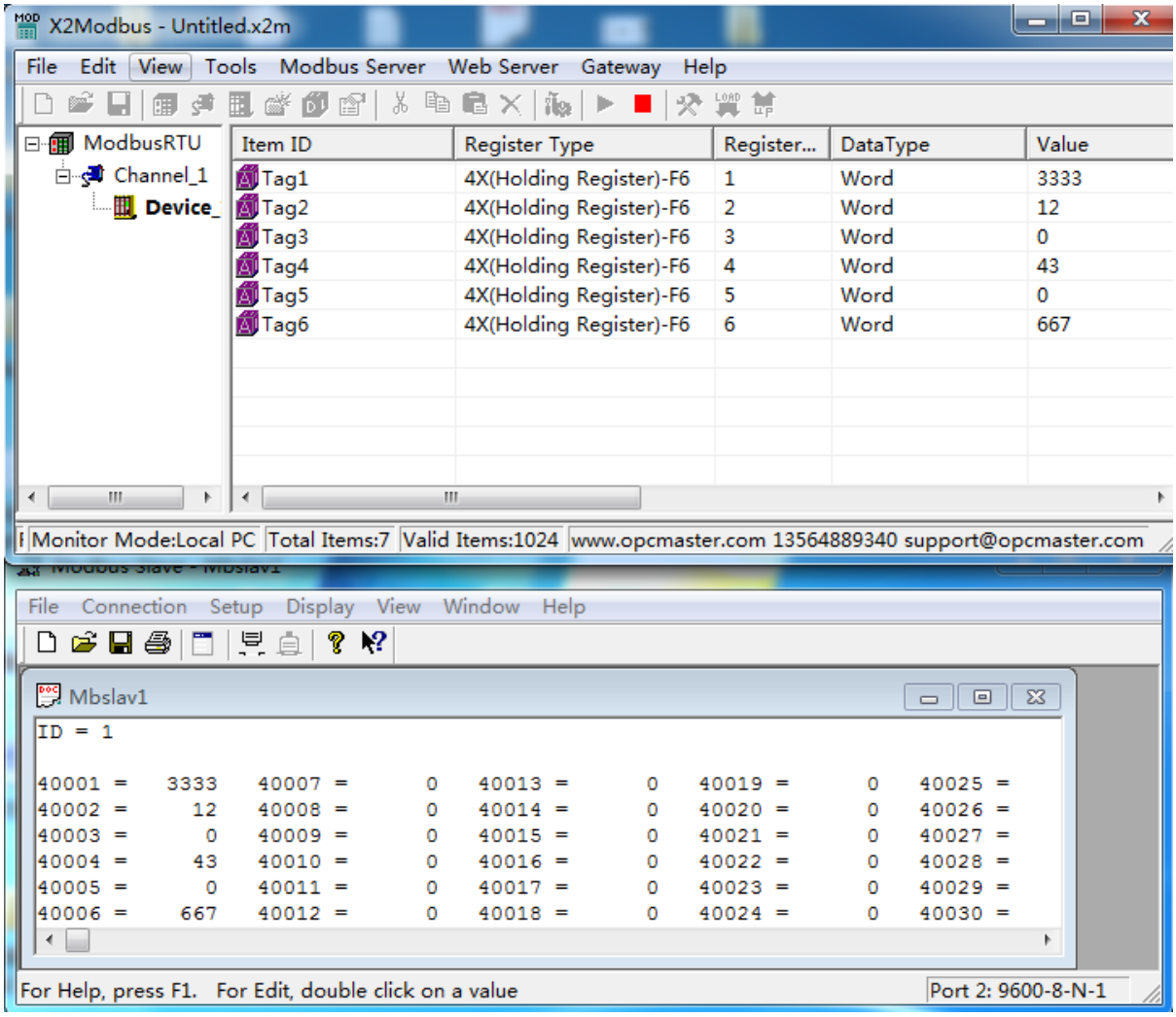


Figure 3-9-5 Successful Communication

3.10 Upload the project

Note: uploading the engineering in the gateway monitoring model is effective.

Configuration after the project, after the PC test no problem, upload project to the next bit machine in the gateway, the gateway mode, click on the menu bar "gateway" to choose "upload project" or click on the toolbar ,As the Figure 3-10-1.

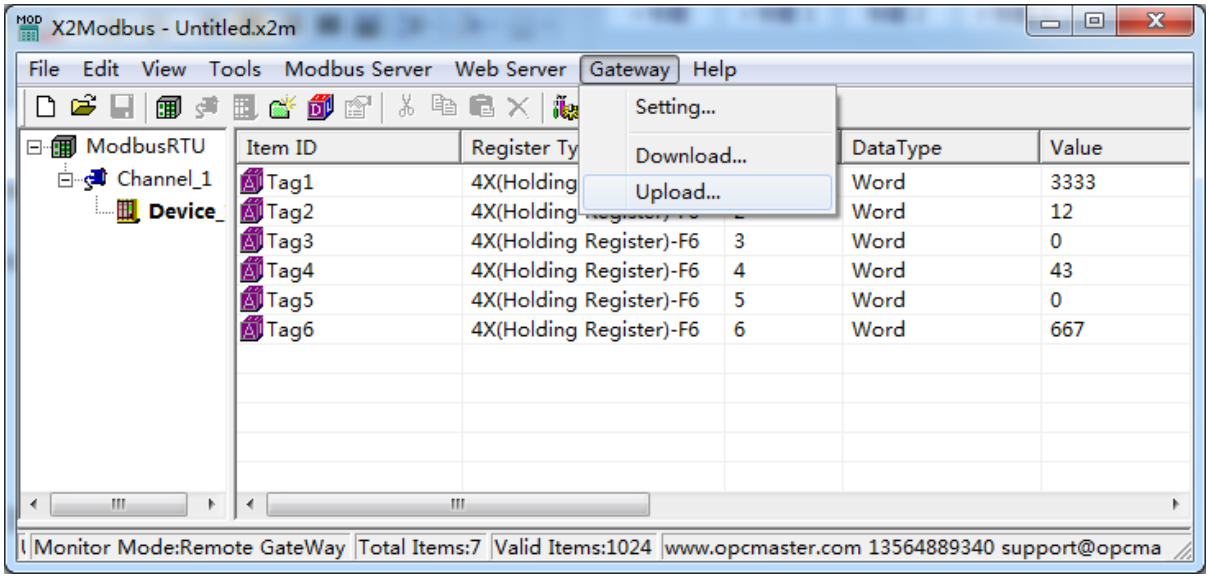


Figure 3-10-1 Upload the project

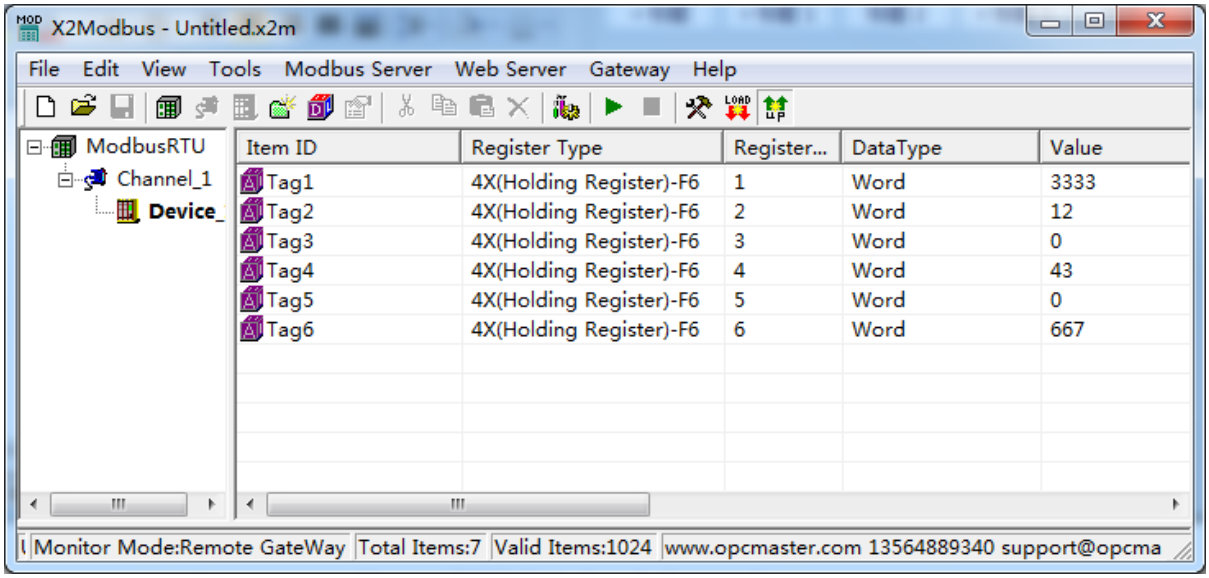


Figure 3-10-2 Upload the project

In the pop up dialog box enter the gateway IP address. Factory default gateway IP address is 192.168.1.88. Click the "Upload". As the Figure 3-10-3.

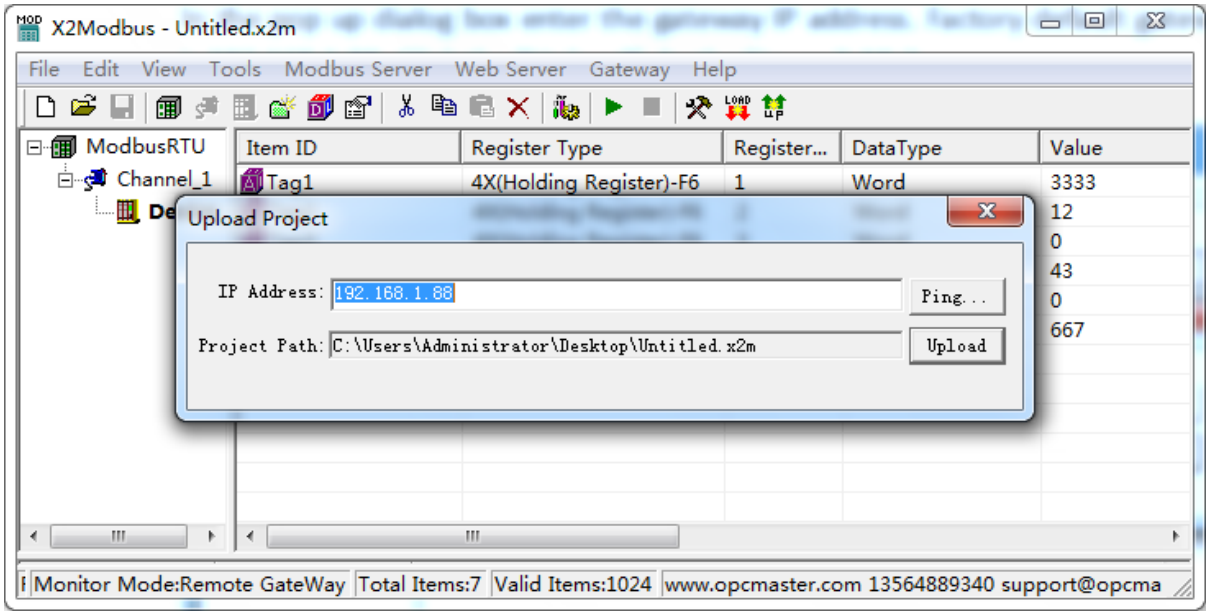


Figure 3-10-3 Upload the parameter Settings

After upload, the pop-up dialog prompt succeed to upload. As the Figure 3-10-4.

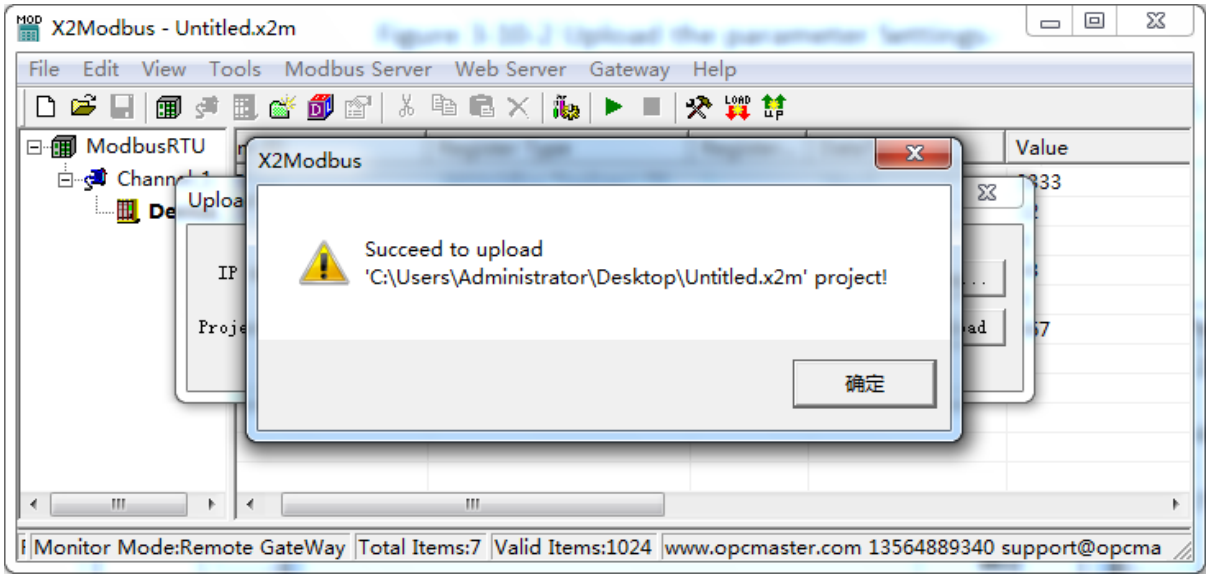


Figure 3-10-4 Succeed to upload

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.

3.11 Download Project

Note: uploading the engineering in the gateway monitoring model is effective.

Download project refers to the project configuration to last time to download from the hardware gateway to the PC, can edit engineering and view real-time data on the PC, easy to debug. Click on the "Gateway" choose "Download Project" or click on the toolbar  , the user name: admin password: admin123456. As the figure 3-11-1.

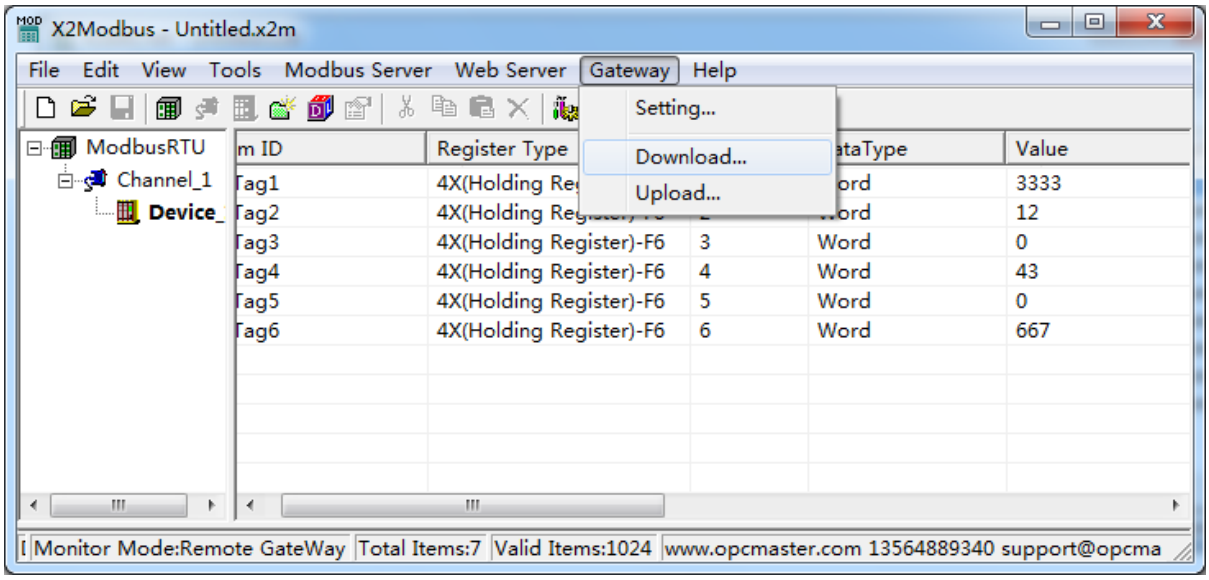


Figure 3-11-1 Download Project

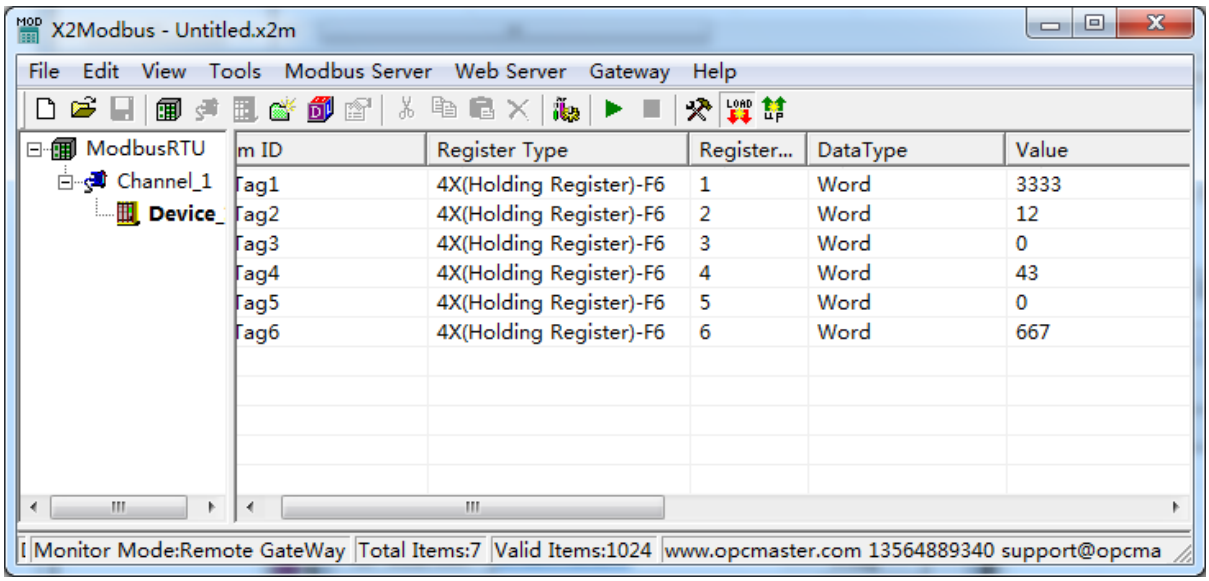


Figure 3-11-2 Download Project

In the pop up dialog box enter the gateway IP address, can be downloaded from the gateway of the current project, as the figure 3-11-3.

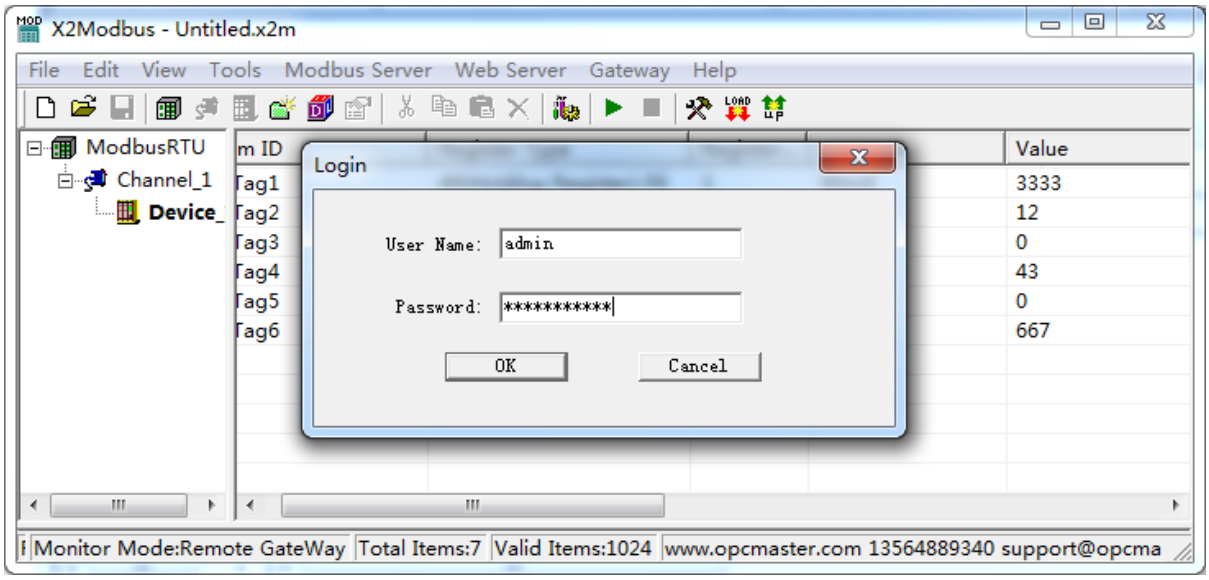


Figure 3-11-3 Login

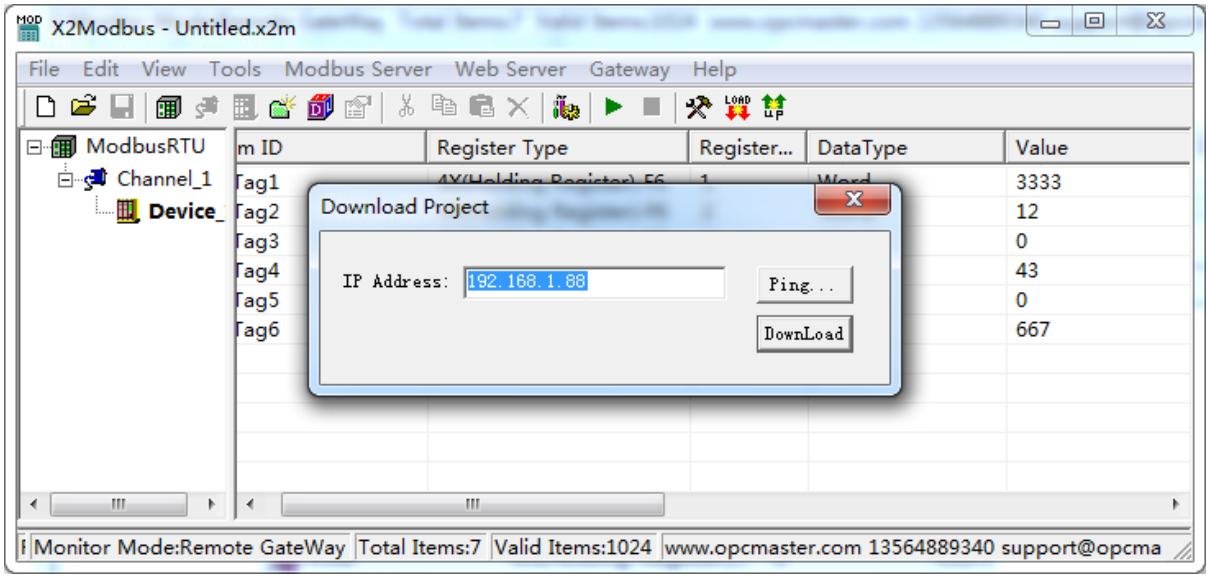


Figure 3-11-4 Download Project

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

3.12 Gateway Setting

Choose the menu bar under the Gateway Setting,as the following figure 3-12-1.

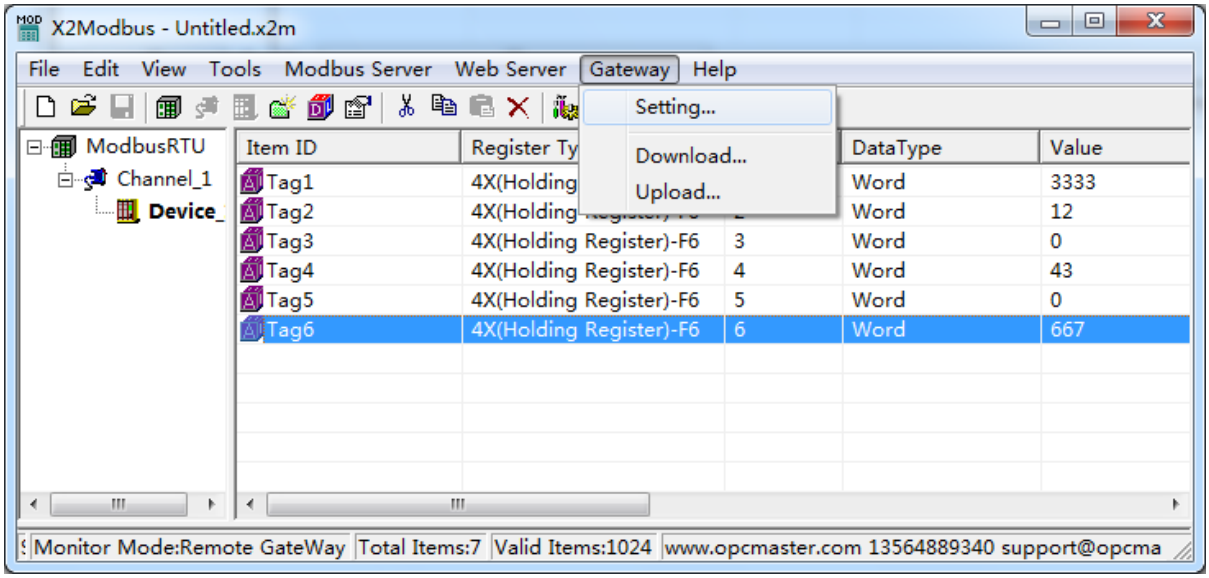


Figure 3-12-1 Gateway Setting

The user name: admin password: admin123456. As the figure 3-12-2.

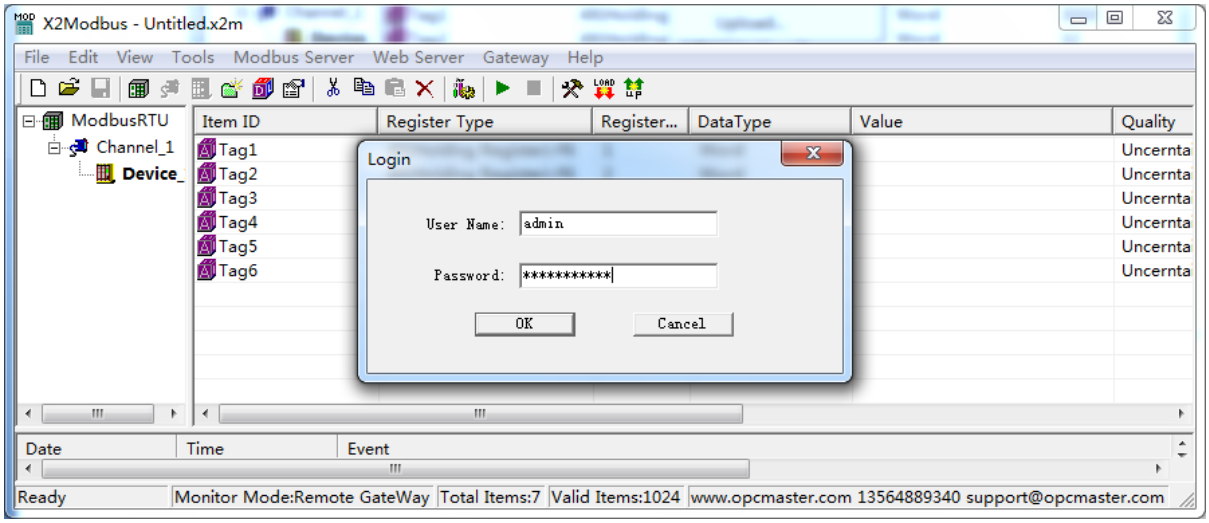


Figure 3-12-2 Login

Ethernet Setting: Here the gateway IP address can be changed, also can login gateway page to browse the gateway properties. As the figure 3-12-3.

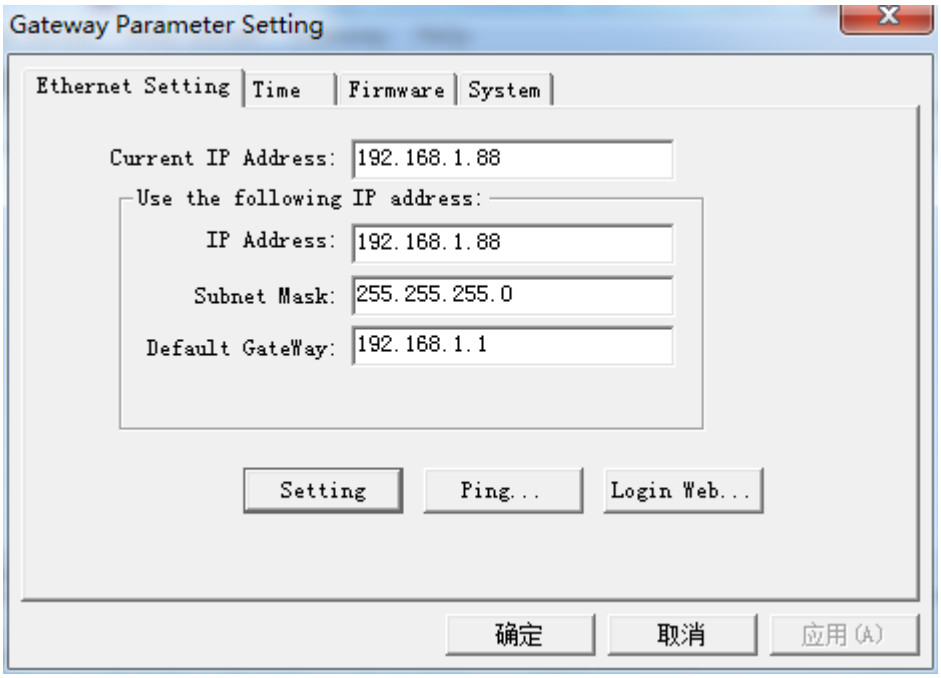


Figure 3-12-3 Ethernet Setting

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

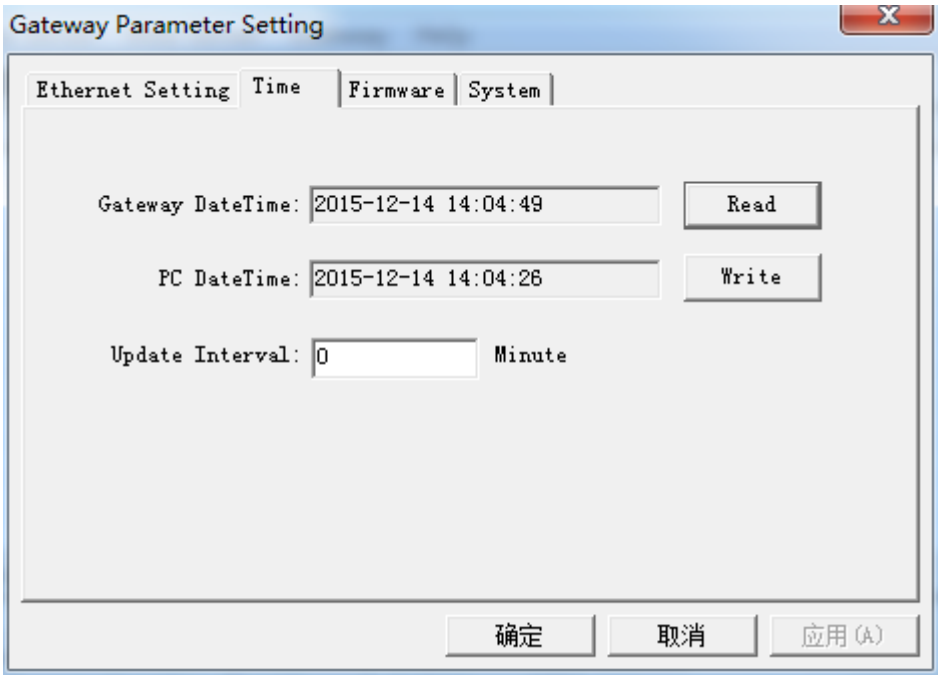


Figure 3-12-3 Time

Firmware: Click Refresh read gateways firmware information.

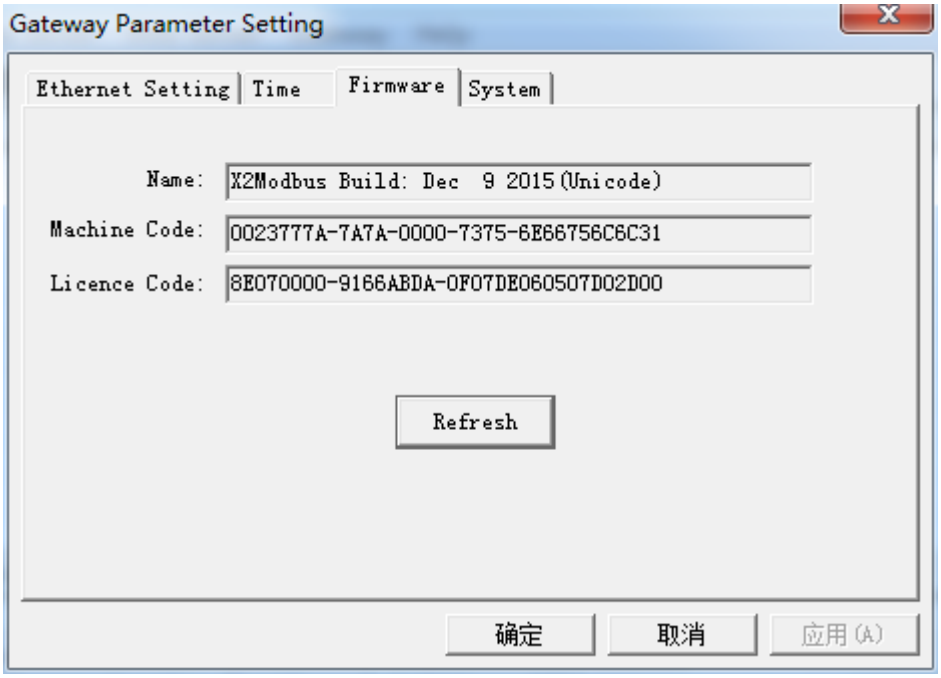


Figure 3-12-3 Firmware

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

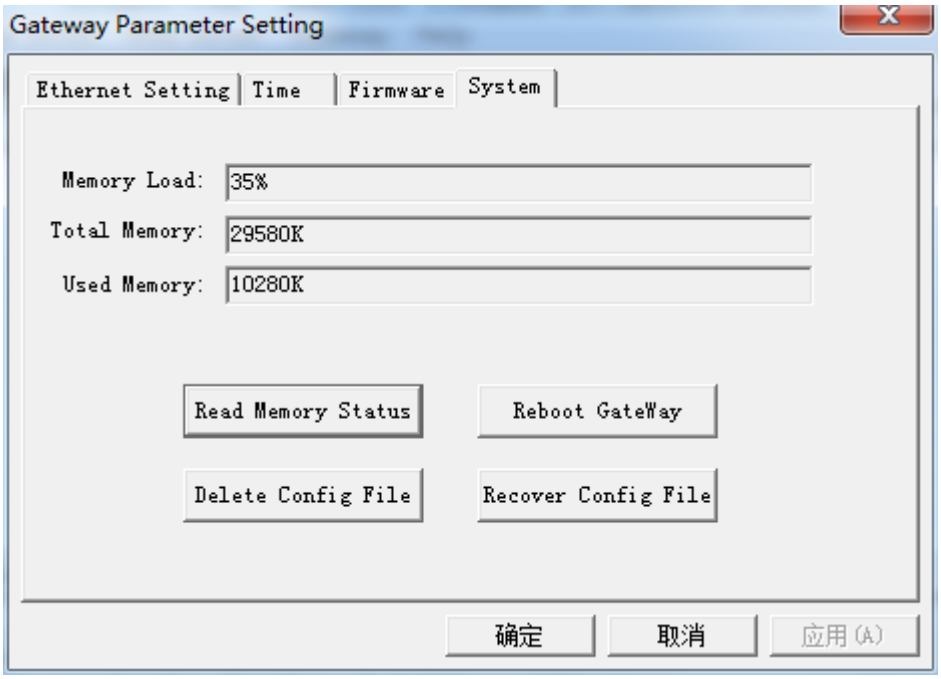


Figure 3-12-4 System

3.13 Internal Tag

Click on the menu bar under the View of Internal Tag, as the figure 3-13-1.

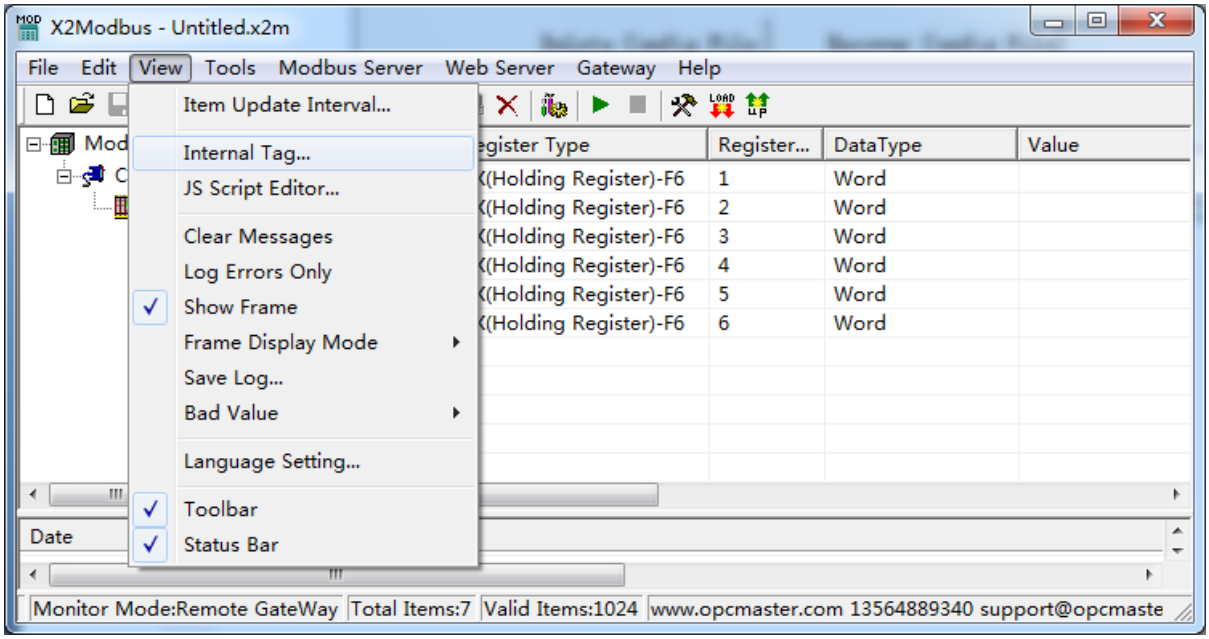


Figure 3-13-1 Internal Tag

State of the internal tag said acquisition terminal equipment: Online or Offline. For every new device can produce an internal variable. As the figure 3-13-2.

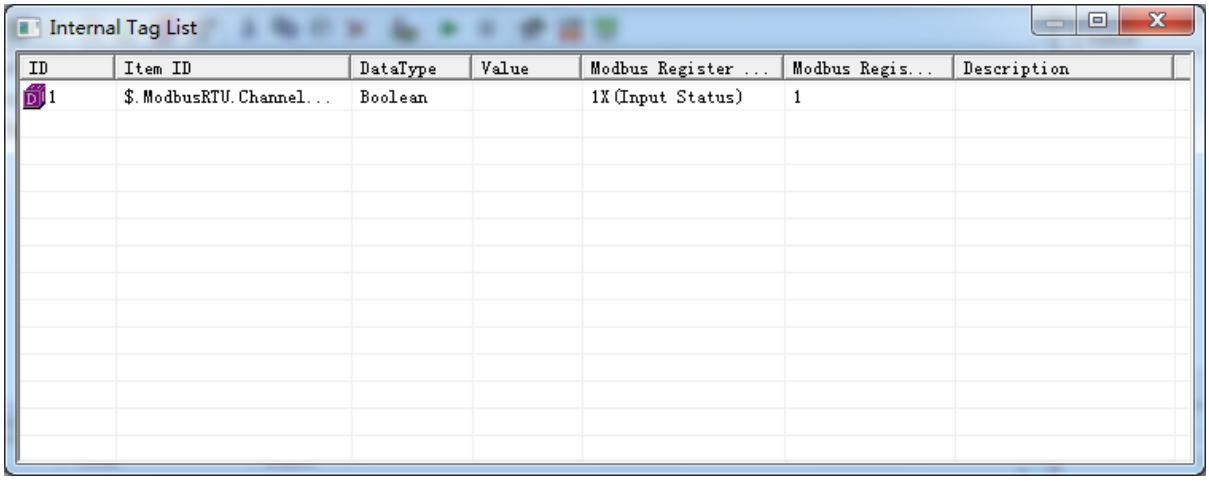


Figure 3-13-2 Internal Tag List

Right click on the label can change the label attribute. As the figure 3-13-3.

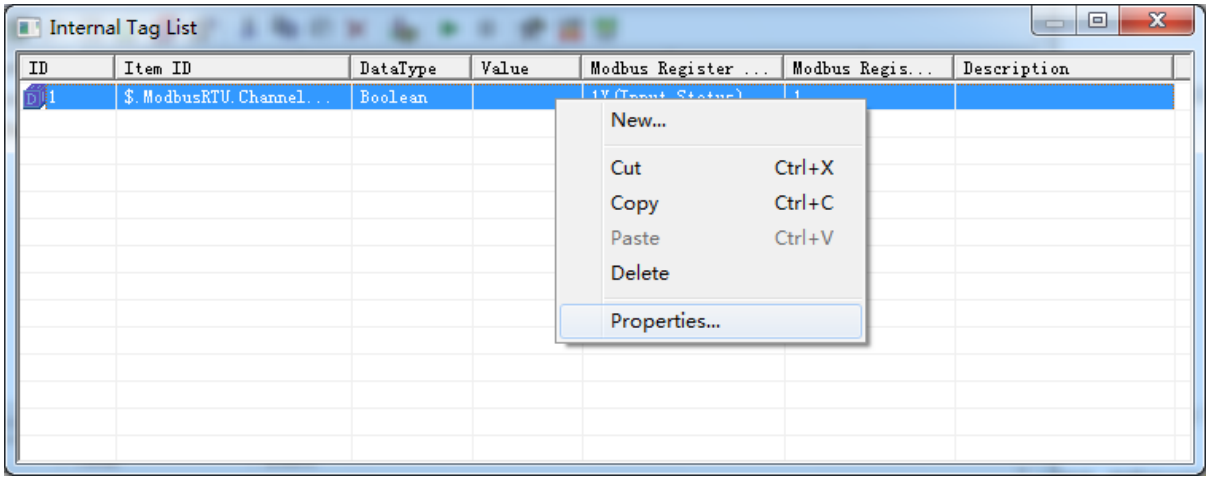


Figure 3-13-3 Tag properties

According to your own need to edit the label attribute.

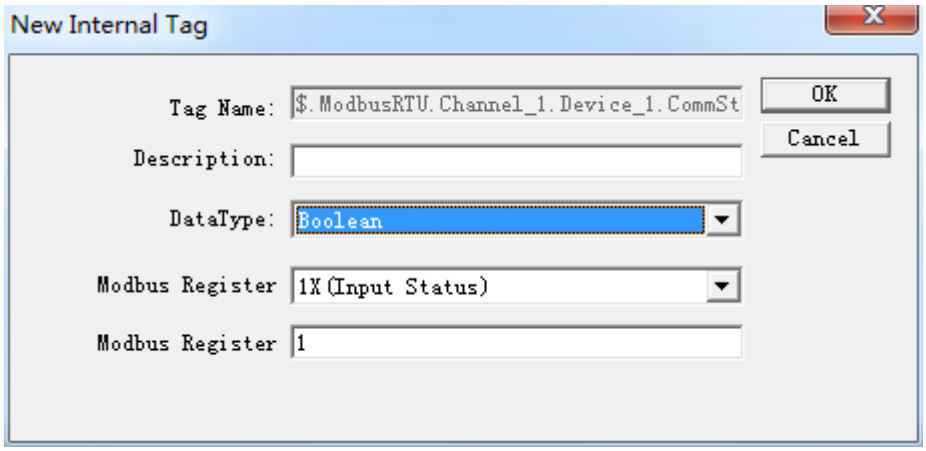


Figure 3-13-4 Edit Tag properties

3.14 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 3-14-1.

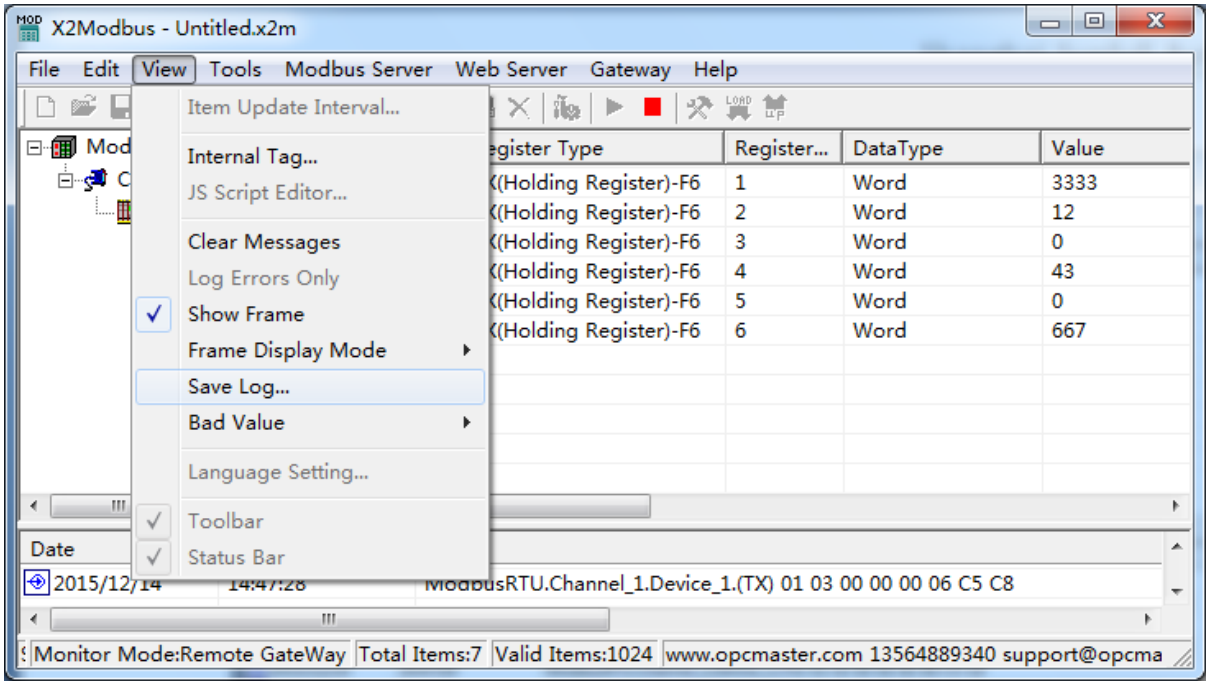


Figure 3-14-1 Save Log

Or right click on the below box.

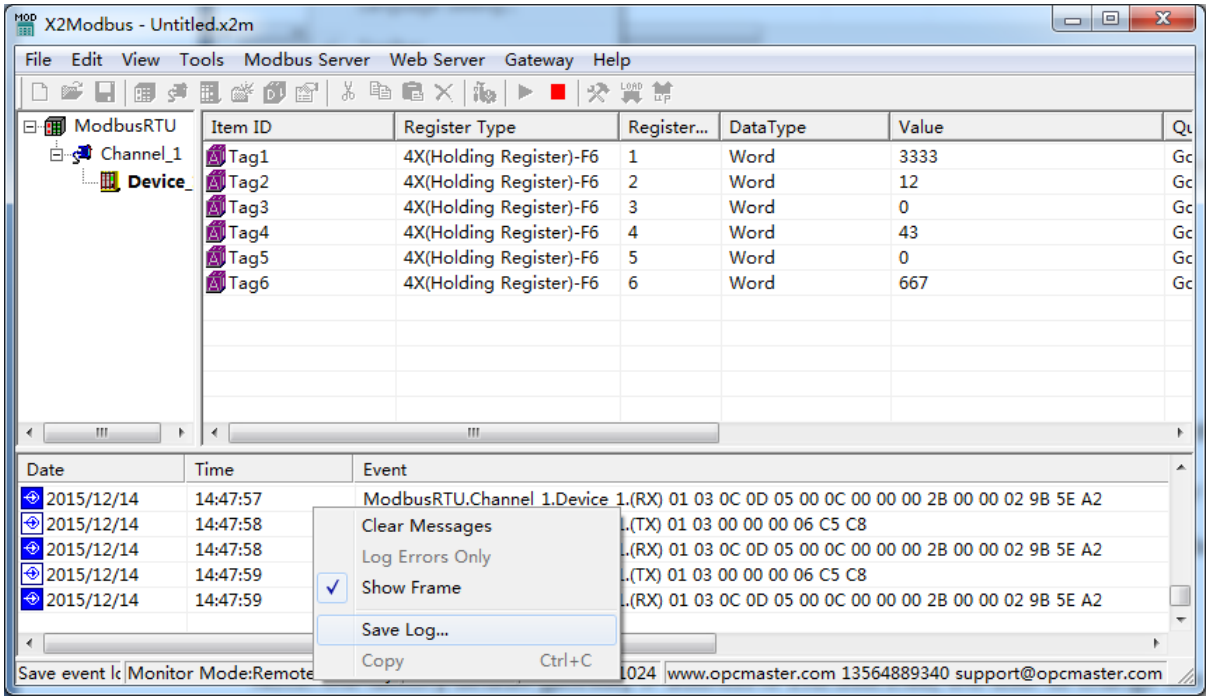


Figure 3-14-1 Save Log

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. As the figure 4-1.

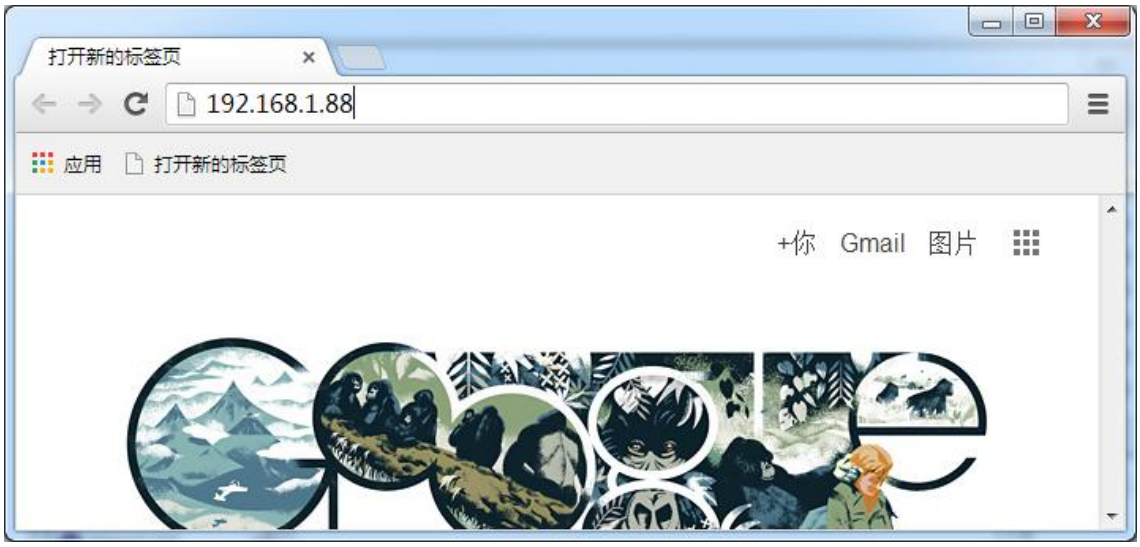


Figure 4-1 Enter the gateway IP address

In the pop up window enter the user name and password,As the Figure 4-2.

Figure 4-2 User Login

Pay attention to the factory default user name "admin", the password for "admin123456", the user can add in the user management after landing successful individual account.

Real-time data： Check the equipment real-time data on the web, as the Figure 4-3.

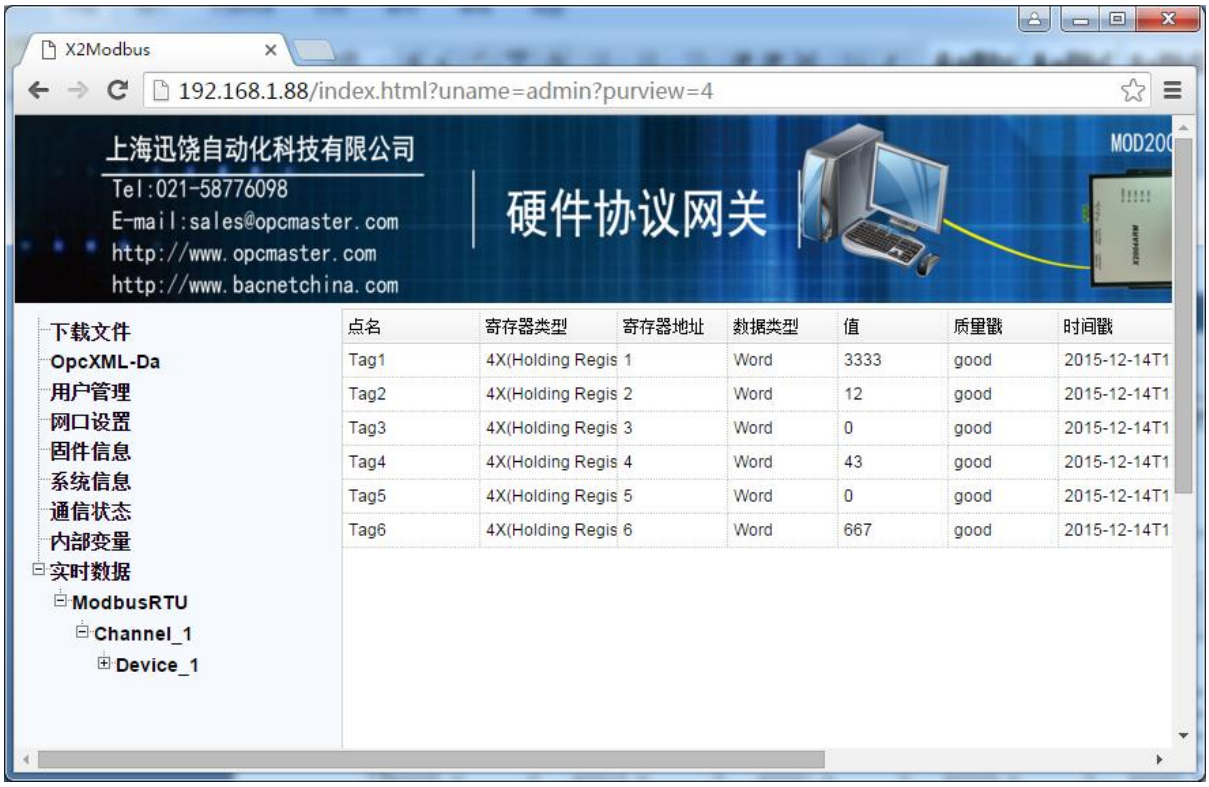


Figure 4-3 real-time data

Can also proceed to write value on a web page,as the figure 4-4.

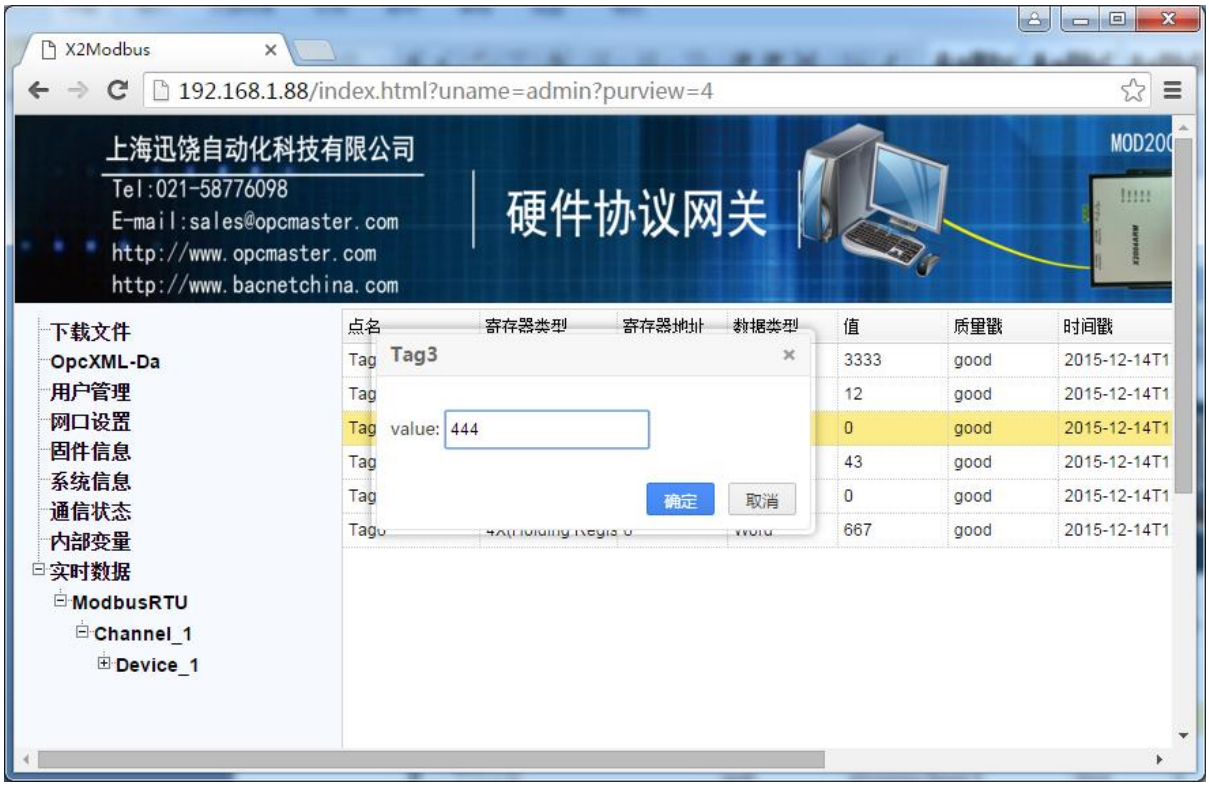


Figure 4-4 Write value

5 Modbus Client

Transferred out of the Modbus protocol can support ModbusTCP and ModbusRTU, here we

use the Modbus Poll software to access our X2Modbus by way of TCP.

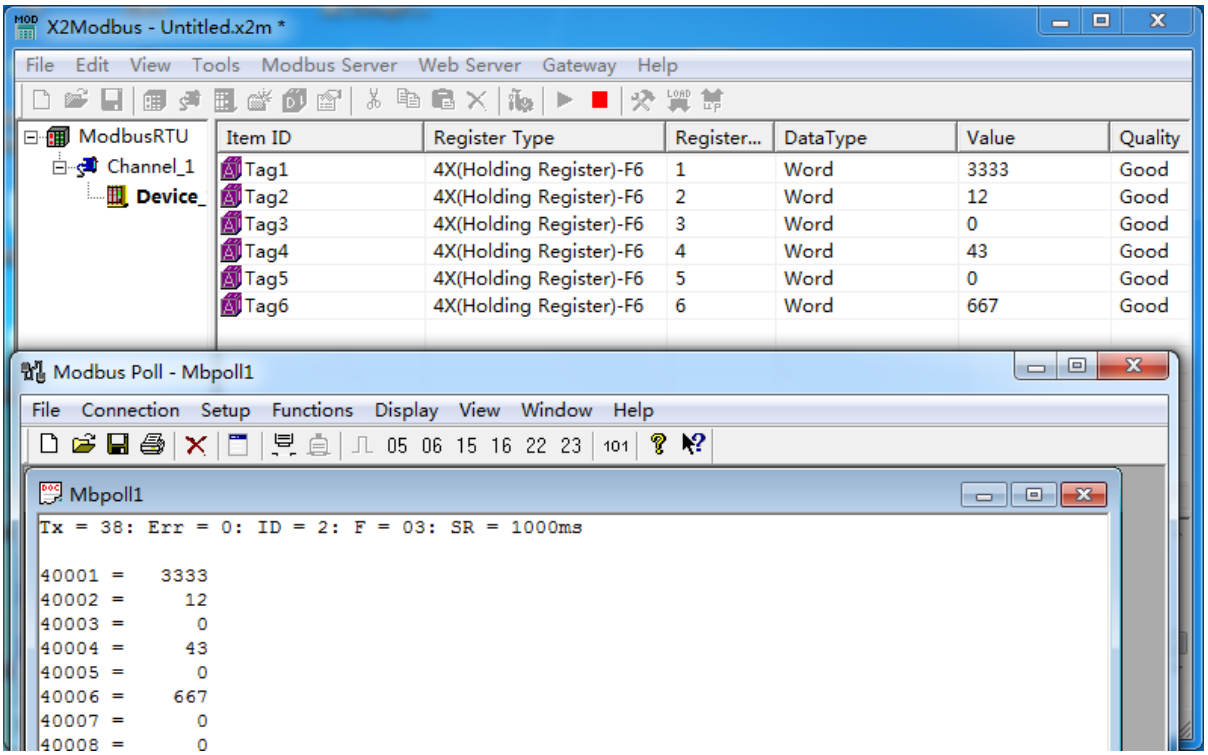


Figure 5-1 Modbus Client