Quick Operating Manual

USR-SH800

Integrated Screen of IOT

Edge computing, network management

Built-in configuration, rich in protocols

Open source system, simple configuration

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Catalogue

1. Product introduction

The USR-SH800 is a high-performance 10.1-inch IoT all-in-one display with outstanding advantages. Its exceptional core configuration features the RK3568 chip, equipped with a 4-core 64-bit ARM architecture CPU running at up to 2.0GHz for smooth operation. Built-in WukongEdge edge applications integrate edge computing, configuration, and other functions, enabling easy setup for data collection, computation, and reporting, combined with configuration for local display. The CPU includes an AI neural network processor (NPU) with 1.0 TOPS computing performance, supporting various AI development tools and interfaces.

On the system side, it comes pre-installed with Linux Ubuntu 20.04, offering a desktop environment for convenient development. It boasts rich hardware interfaces and robust drivers, including multiple serial ports, USB 3.0, HDMI, and more, catering to diverse application scenarios. The flexible installation options support both rail and bracket mounting for quick and easy setup. Whether in terms of performance, functionality, system, hardware, or installation, the USR-SH800 demonstrates superior quality and practicality, making it an ideal choice for IoT applications.

2. Unpack

USR-SH800 factory neutral packaging, there is a small label on the outer packaging box, as a delivery and warehousing inspection use, marked with SN and product model; the packaging box mainly contains products and accessories, accessories table is as follows:

Product type	Accessories	Explain
USR-SH800（EW）	12V/3.3A power supply, WiFi antenna, Screw, Mounting ear, Terminal *4, Certificate	WiFi version

Physical drawing:

3. Hardware connection

3.1. Interface introduction

RS485/RS232 interface introduction:

Serial number	Definition	Property	Describe	
1	3.3V	output	3.3V voltage output	
2	TX/A	output	TX/A	
3	RX/B	Input	Receive (RX/B)	
4	GND	Ground electrode	Ground electrode	

Introduction to the network port:

Serial number	Definition	Property	Describe	
1	WAN/LAN	Default WAN	WAN/LAN switchable	
2	LAN	Default LAN		

3.2. Hardware operating instructions

1. After unpacking, take out the equipment and connect it to WiFi antenna (SH800-EW WiFi version);

2. To configure the SH800 by directly connecting it to a PC:

（1）Connect one end of an Ethernet cable to the LAN port of the SH800, and the other end to your computer;

（2）Set the PC's Ethernet connection to obtain an IP address automatically (DHCP);
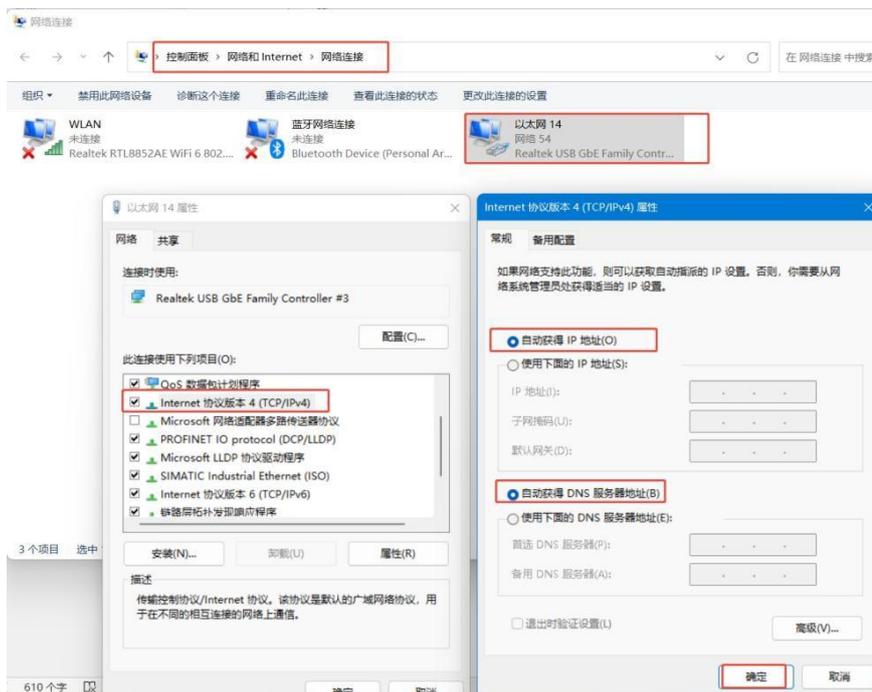
（3）Connect the power cable properly and power on the device after completing all connections;

（4）Under the default condition of the product, the configuration screen is displayed in full - screen mode after power - on;
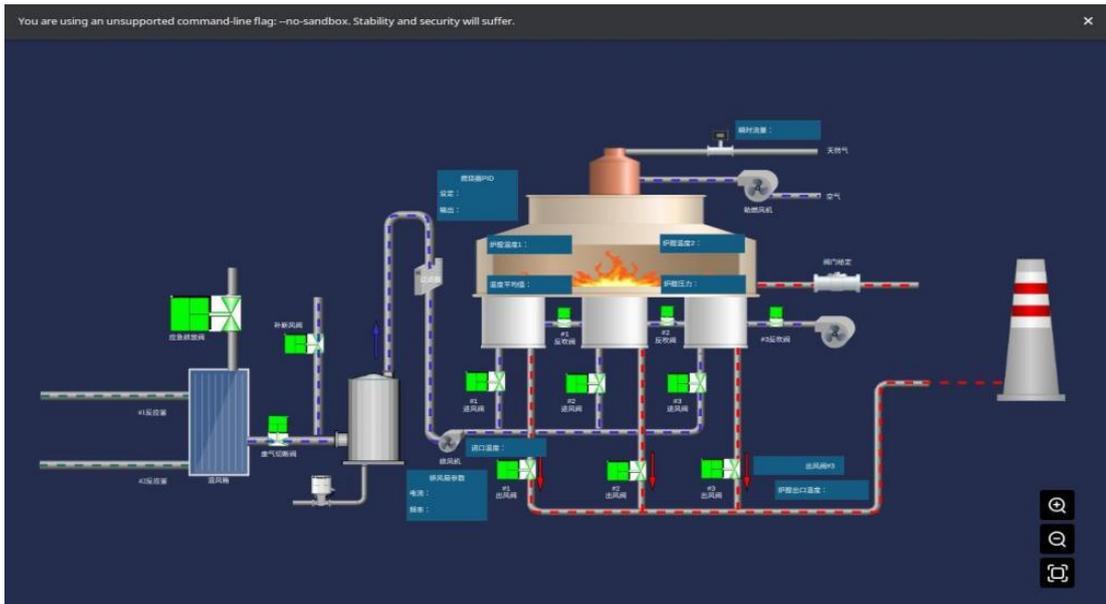
（5）**If you want to enter the Ubuntu desktop, long press the screen, and then click the cross icon that pops up. You can exit the full-screen configuration mode. After minimizing the browser, you can enter the Ubuntu desktop to perform operations. At this point, the device has been successfully started.**

（6）**To restart the configuration in full - screen mode on the desktop, you just need to open the minimized interface from the desktop, find the three - dot button in the browser, and maximize the window.**
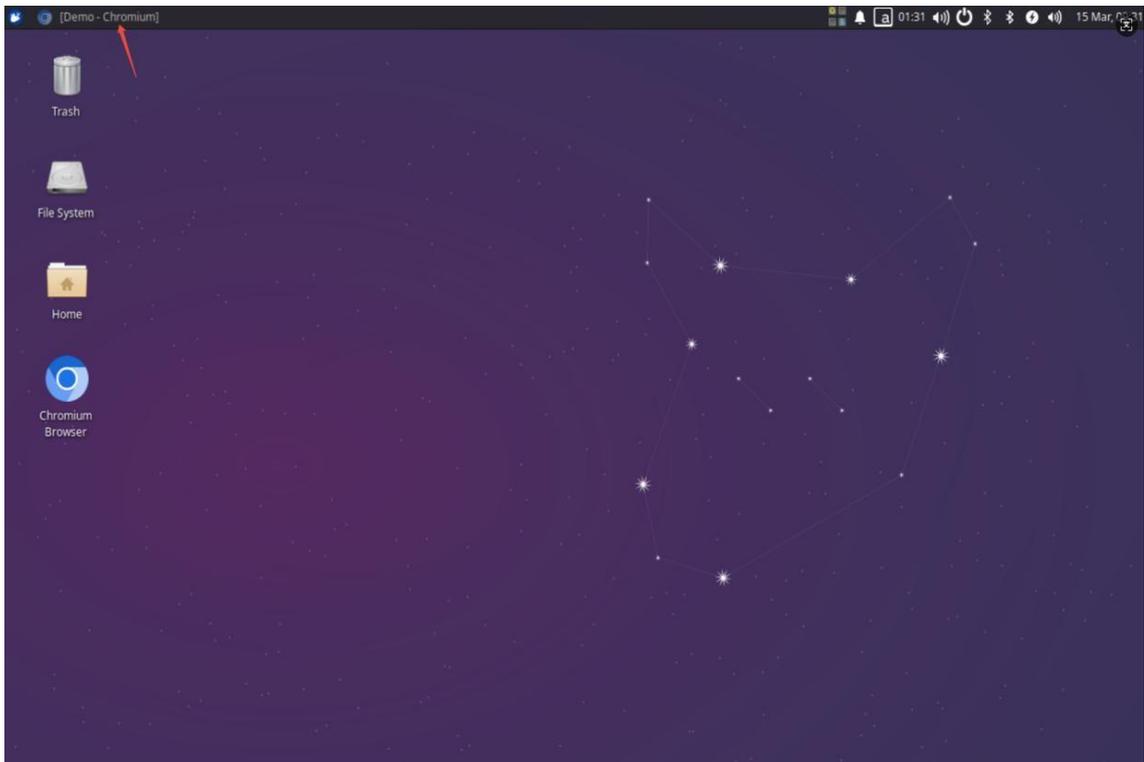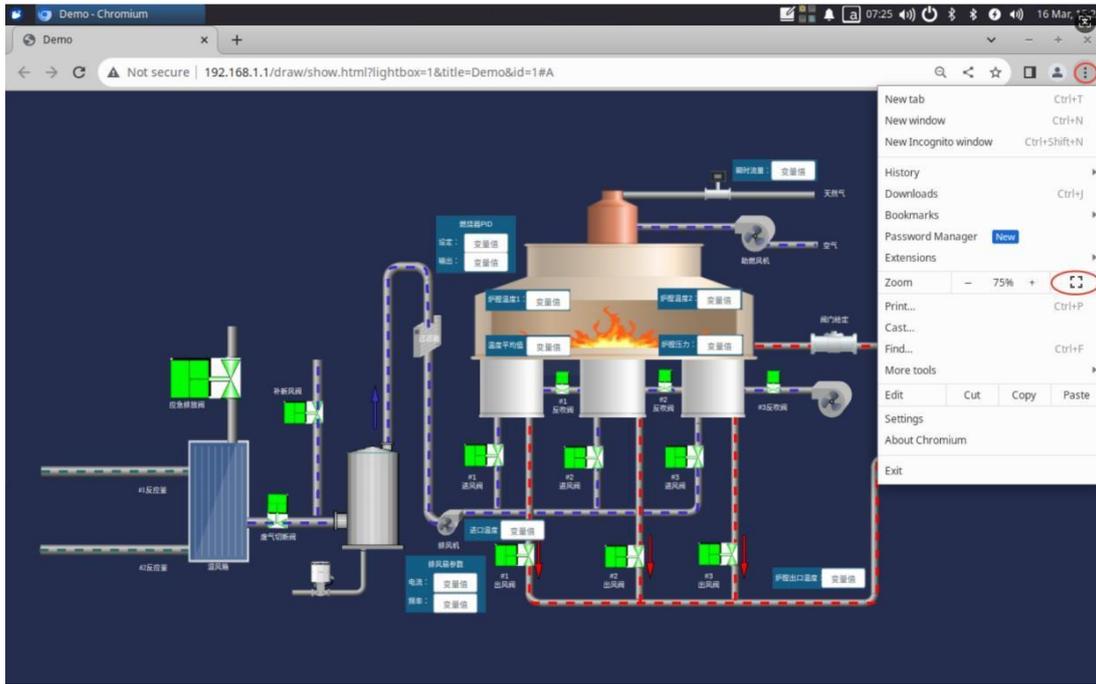
4. Application Parameter Configuration

SH800 has built-in WukongEdge, which is enabled by default. WukongEdge function

parameters are mainly configured through built-in WEB. This chapter mainly introduces network

parameter configuration, edge calculation parameter configuration, configuration function editing

and parameter association.

Note: During use, if WukongEdge is turned off, the built-in WEB cannot be activated.

4.1. Open the WEB interface

WEB interface is an important tool for application parameter configuration. SH800 has two ways to
open WEB interface:

● Directly connect the computer into the built-in WEB:

1.hardware connection refer to chapter 3.2;

2. After the device is powered on and fully started, open the browser on the computer side and enter
the IP address of the LAN port(default192.168.1.1);

3. Enter user name (default admin) and password (default admin) in the web login interface, which
can be modified after logging in;

4.Device basic information and network connection status can be seen on the overview interface.
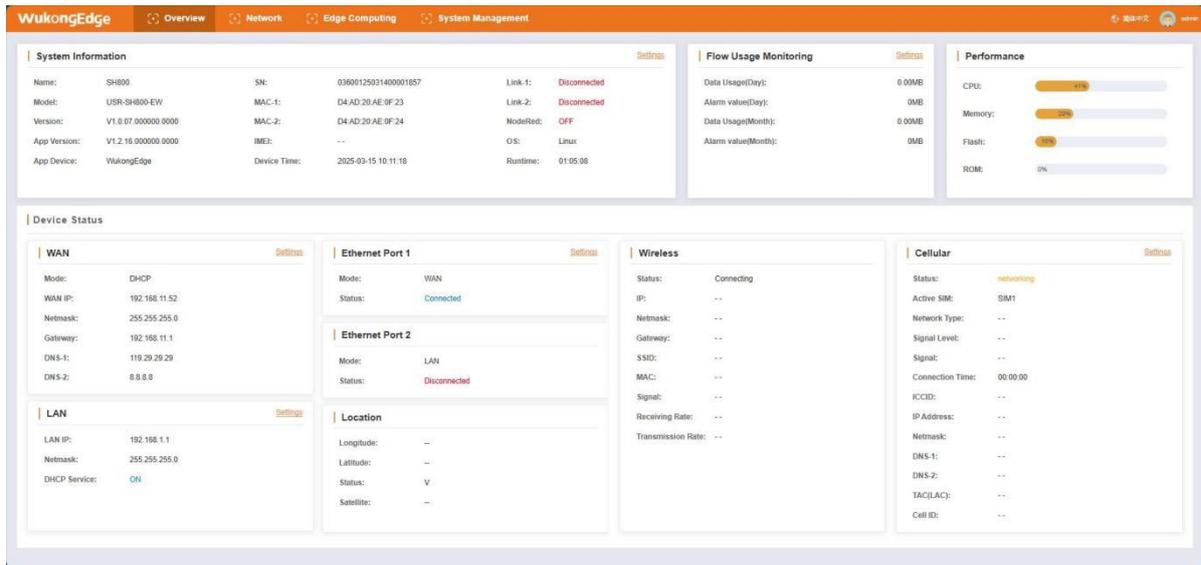
- Open the built-in WEB based on your own screen(you can also access the mouse and keyboard directly)

1. Hardware connection:access mouse and keyboard through USB interface (use peripheral operation, if direct touch screen operation,ignore this step);

2. Power on the equipment. After the equipment is completely started, press and hold the

    configuration interface and click the "X" to exit the configuration interface;
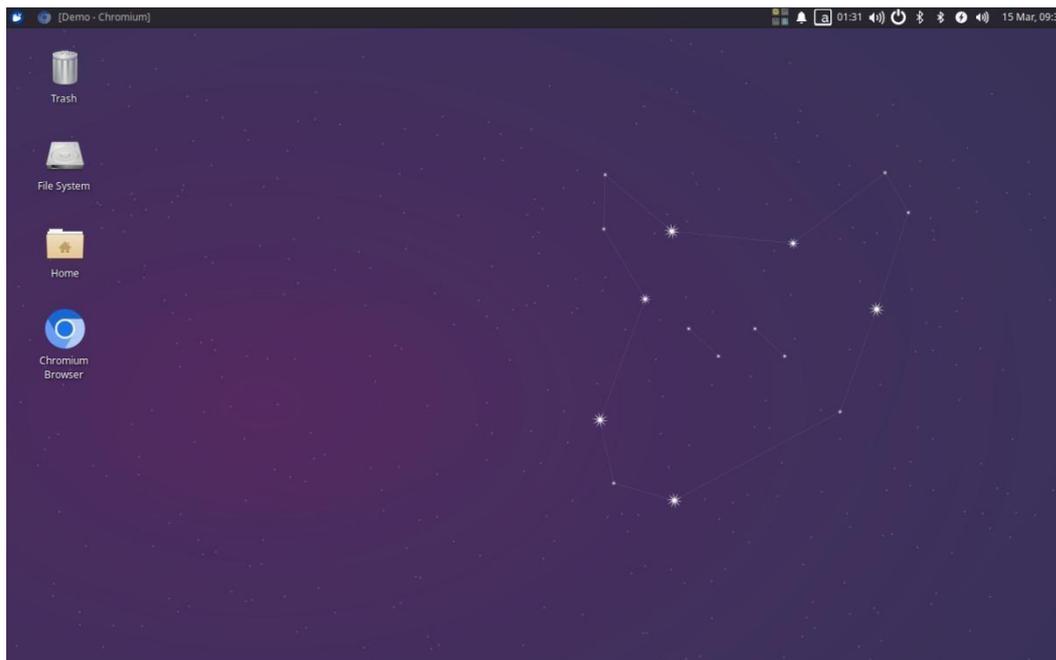
3. Open the browser on the desktop and enter the IP address of the LAN port(default192.168.1.1);
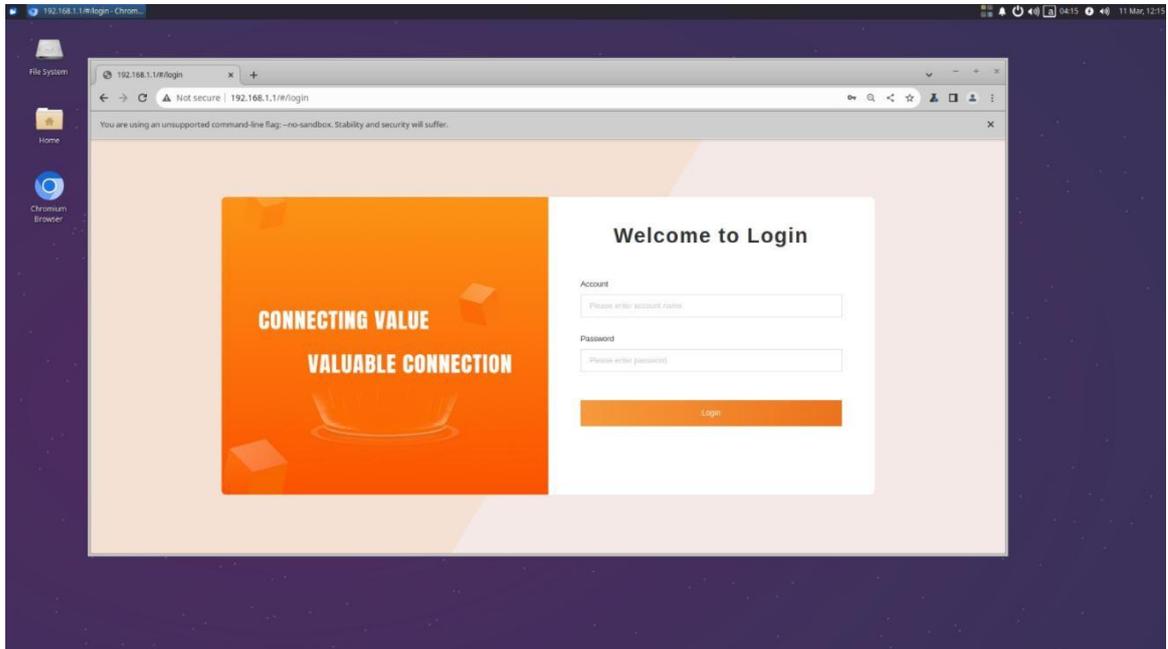
4. Enter user name (default admin) and password (default admin) in the web login interface, which can be modified after logging in;
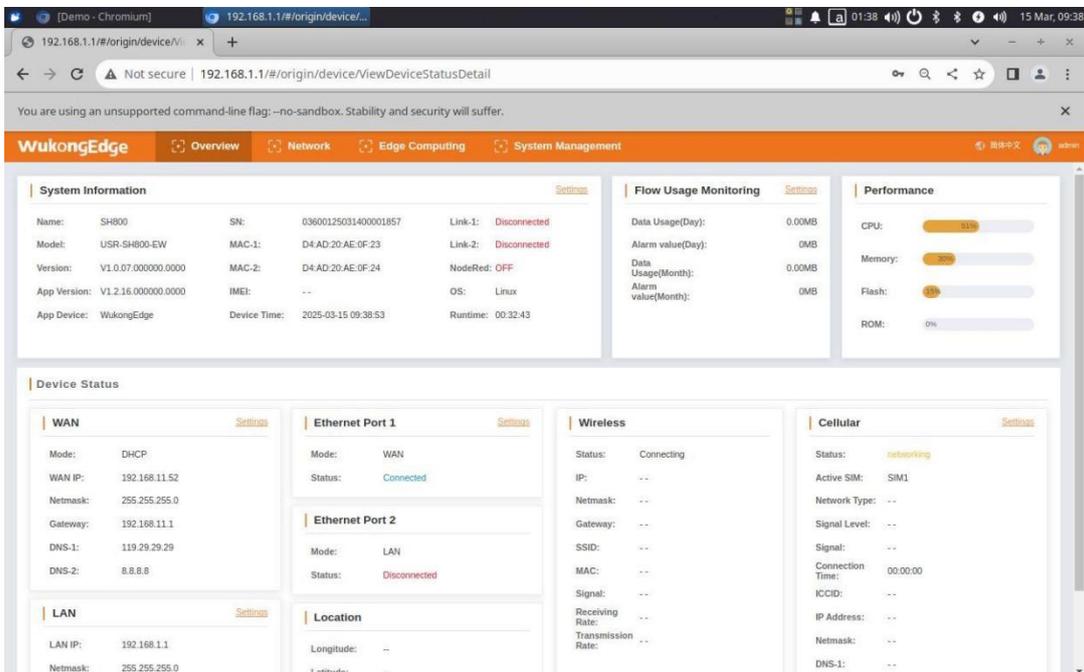
5. Basic information and network connection status of the equipment can be seen in the overview interface.

4.2. Network configuration

1. WiFi connection, need to open the web page "network-> wireless client " interface, click the search button,search WiFi AP hot spot, wait for the search to complete, click the input box, there will be a drop-down box pop-up, you can directly select the AP side, you can also enter the hot spot in the input box for fuzzy search to filter.After selecting AP, configure encryption method and click Apply. (It takes effect immediately after clicking the "Apply" button, check connection status in over view interface)
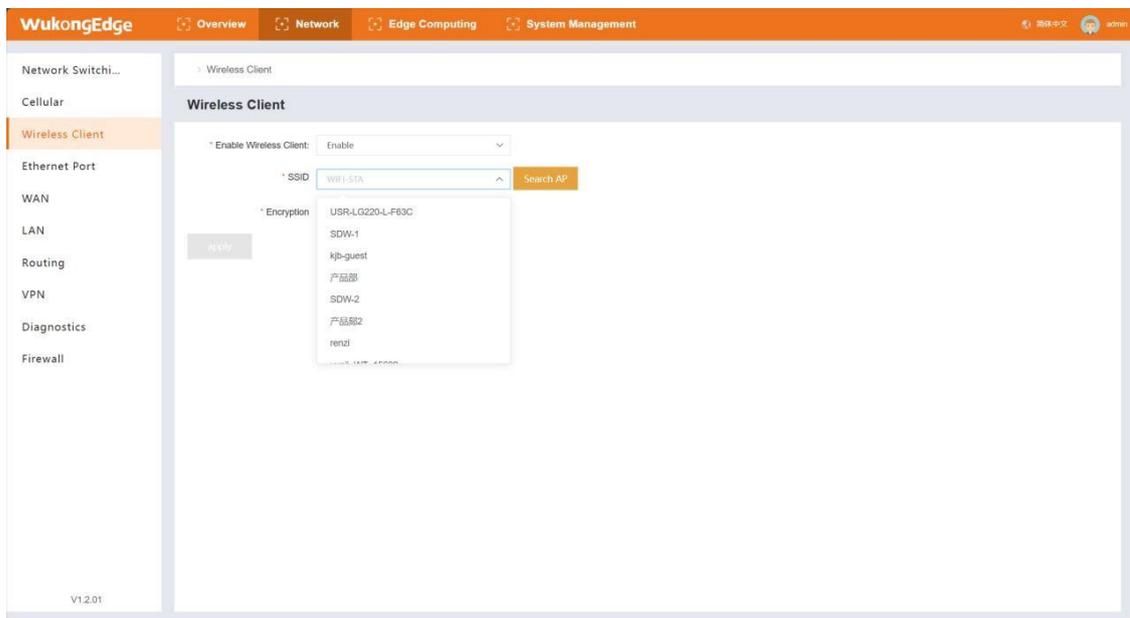
2. Other web applications can be used with reference to WukongEdge Manual (Link: [Manual] WukongEdgeManual.pdf).

4.3.   Data collection

This chapter mainly introduces the data acquisition part of the edge calculation function, which relies on the point configuration and uses Modbus Slave to test the data acquisition.

Before the function test, install Modbus Slave software on the computer; the function test steps are as follows:

1.Hardware connection: connect the computer and the device LAN port through the network cable (refer to Section 3.2);

2. Power on the equipment, wait for the equipment to be fully started (display configuration interface), and enter WEB interface (refer toSection4.1);
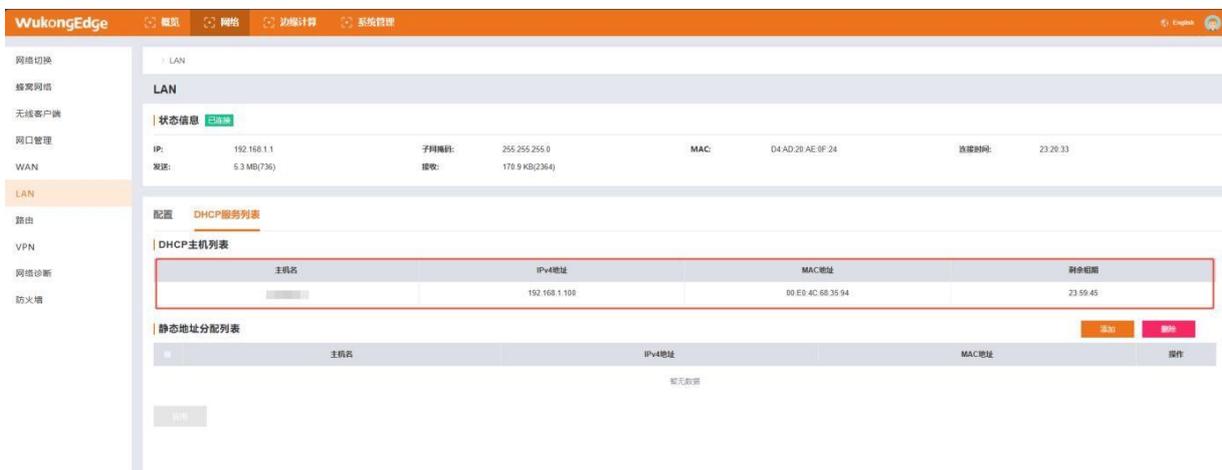
3. Find "Network-> LAN-> DHCP Service List" to view the IP address assigned by the device to the computer;

4. Find the "Edge Calculation-> Data Point" interface, click the "Add" button of the slave, configure the slave information in the pop-up window, where the acquisition protocol selects Modbus_TCP, and Fill in the IP address of the computer being queried.
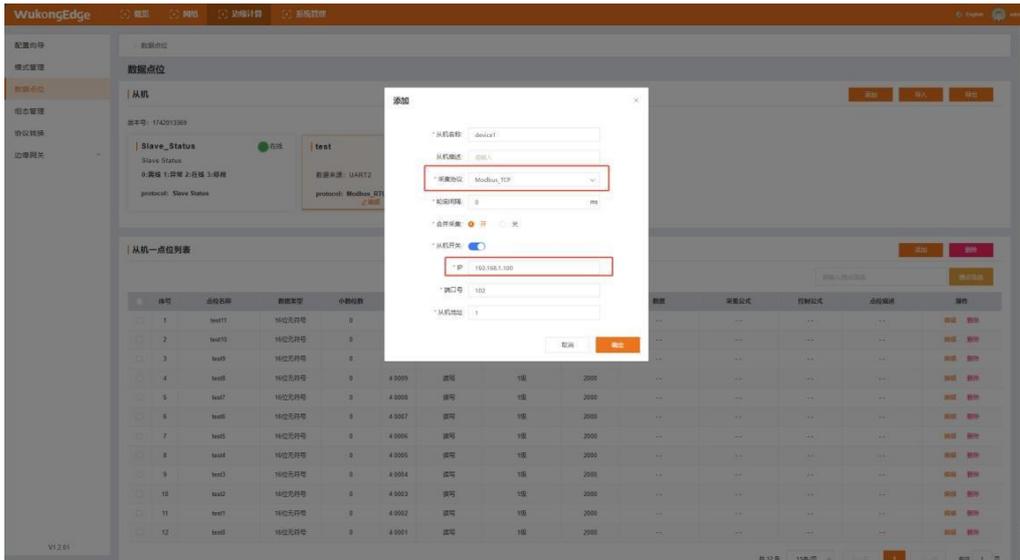
5. After the slave is added, select the slave and click the Add button in the Slave-Point List interface to add points. In the pop-up window, configure the point information. For the convenience of later configuration display, add 12 data at a time for this test. The specific operation is that the point name is "test", the register is "40001", the data type is "16-bit unsigned", and the number of points is "12". Other defaults will be generated in the point table after clicking OK.
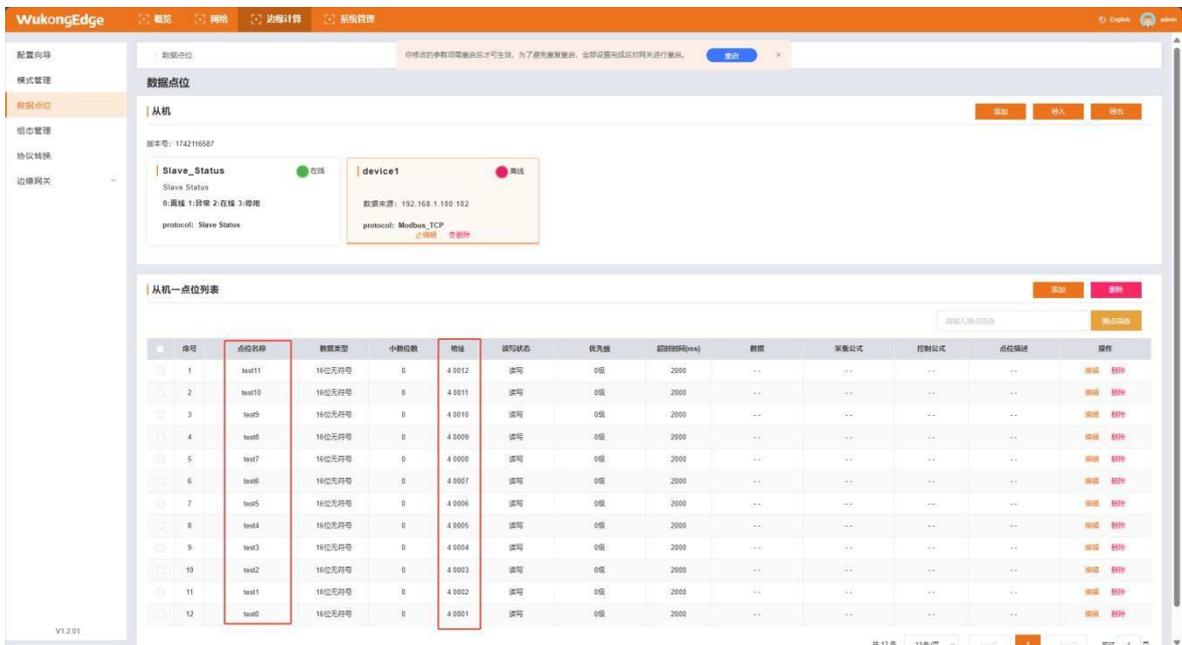
6. At this point, the slave and point configuration is completed, and the device is restarted according to the web page prompt;

7. Open Modbus Slave software on the computer, find "Slave Definition" in "Setup" and open it, Slave ID is configured as 1, Funtionis configured as " 03 Holding Register(4x)",Address is configured as 0, Quantity is configured as 12, and others remain default;
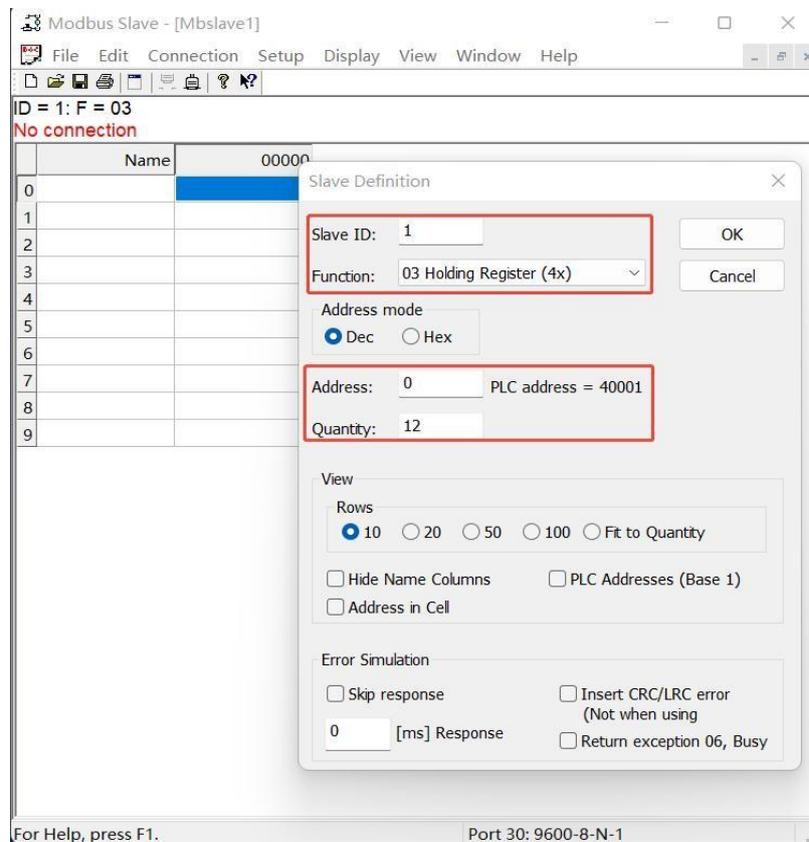
8. Find "Connection" in the menu bar, and configure it as shown in the following figure (IP address and port are consistent with device slave configuration). Click OK to complete the configuration, and the word "No connection" disappears, indicating that the device has been successfully connected to Modbus Slave;
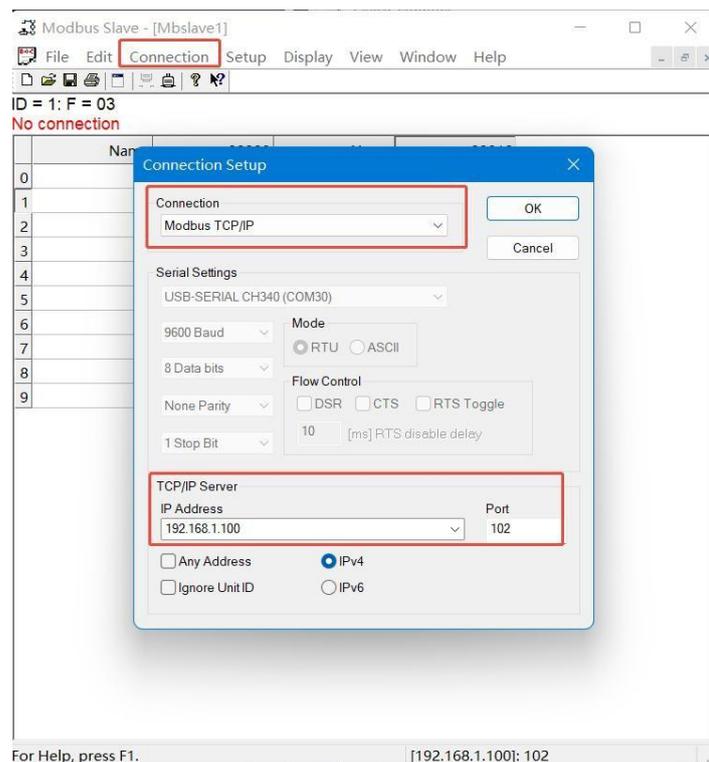
9. In the main boundary of Modbus Slave tool, select the first point, double-click to open the data configuration pop-up, check "Auto increment", click OK, the first data in Modbus Salve will automatically change, other data will do the same operation, until all the 12 points are configured for automatic change.
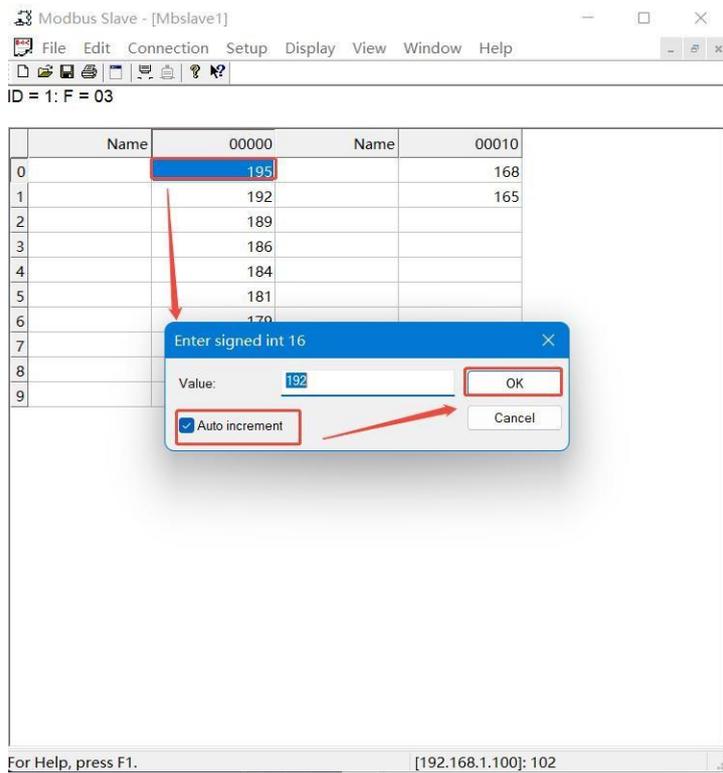
10. Return to the WEB interface of the device. In the "Edge Calculation-> Data Points" interface, you will see that the slave is online, and the corresponding points have all acquired data. The data acquisition test is completed.
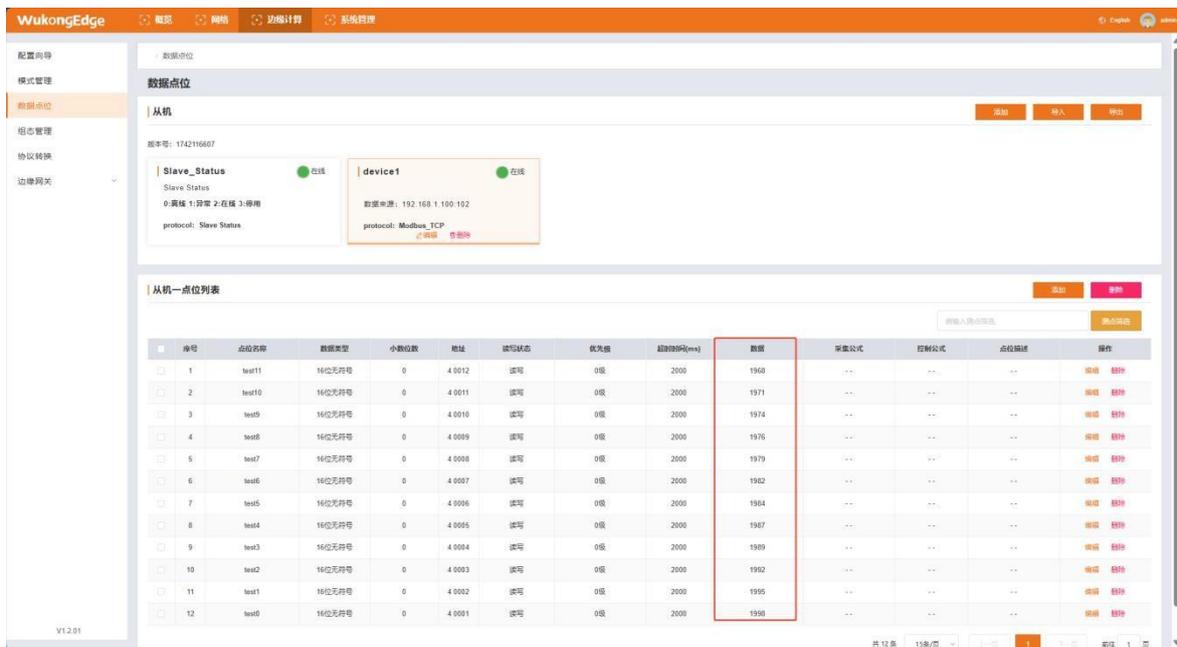
4.4. Data reporting

After data collection is completed, the data can be transmitted to the server for data processing and display through the data reporting function. This chapter will describe the reporting operation in combination with the data obtained in the "Data Collection" chapter. Make sure you download Network Debugging Assistant on your PC before you start.

1. Continue to operate on the device that has completed the data acquisition operation, open the built-in web page, and find "Edge Computing-> Edge Gateway-> Data Reporting";

2. Click the "Create" button to create a group, fill in the group name, and select the uplink channel. In this example,"Link 1" is selected for reporting;

3. Configure the reporting rules, for example, select "Periodic Reporting", and configure the reporting cycle time to be 5s after it is enabled;
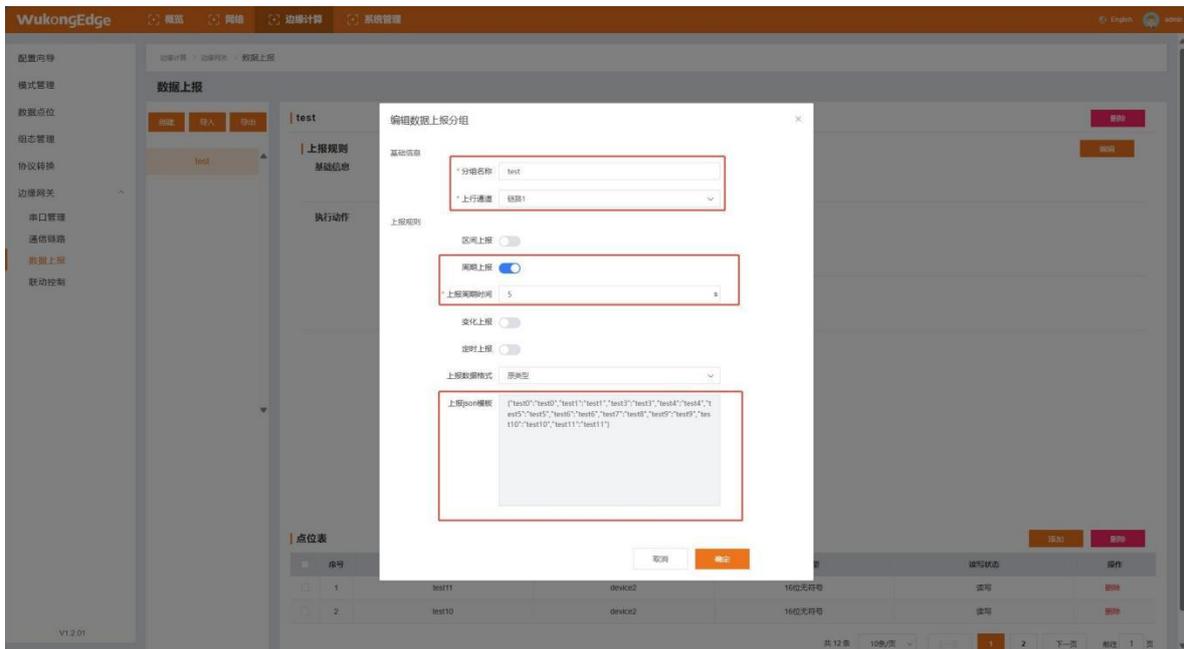
4. Configure the reporting template, which should meet the requirements of Json format;

5. After creating a reporting group, select the group, click the Add button in the Point List, and pull the points that need to be reported in the group;

6. Select the slave in the pop-up window, then select the point, click OK;

7. Note that after adding points, it is necessary to ensure that the point name of value in the submission template is consistent with the name of the pulled point;
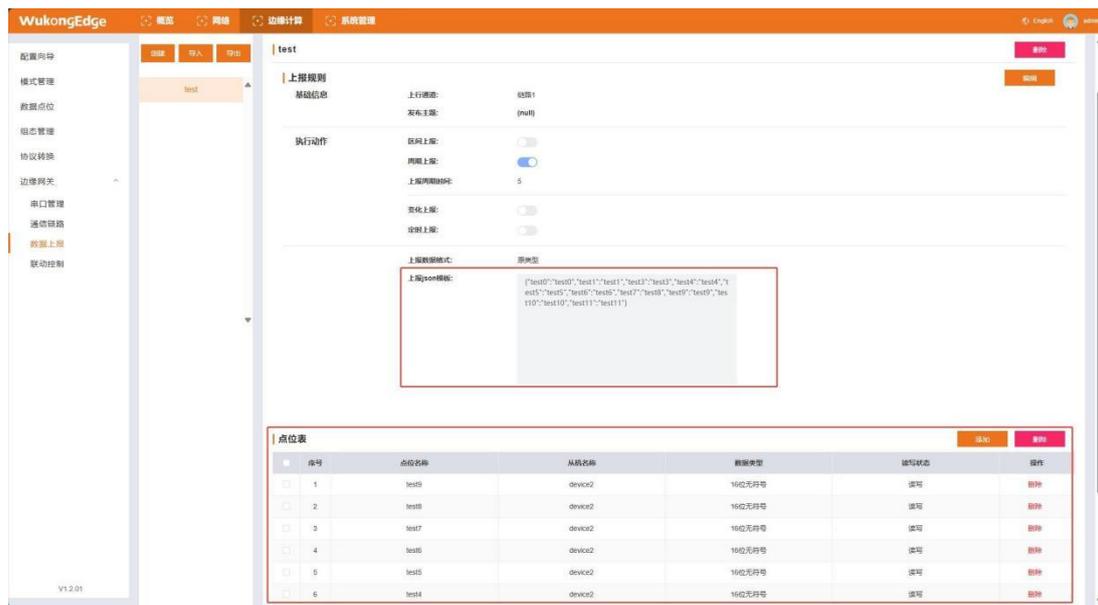
8. After completing the grouping report, you need to configure the communication link and find the "Edge Computing-> Edge Gateway-> Data Report" interface;

9. Open "Link 1", configure the communication protocol as TCP, fill in the computer IP address, set the remote port as 8234, default other parameters, click Apply and restart the device;
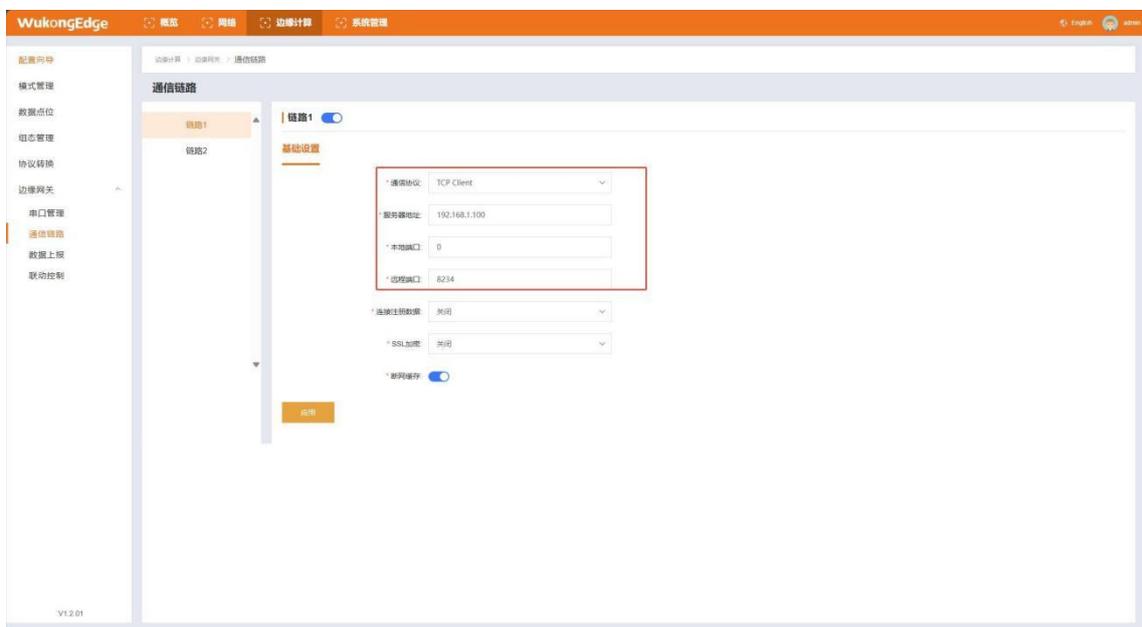
10. Open the network debugging assistant on the computer side, set it to TCP Server, set the local address to the computer address, set the port number to 8234, and open the monitoring;

11. After the device is restarted, it will be connected to the computer and report the data according to the cycle of 5s;

12. Verification of data reporting function is completed.

4.5. Configuration application

The configuration function of equipment mainly realizes the local visualization of equipment acquisition data, which is convenient for on-site data monitoring and management. Equipment configuration application also needs to be combined with data acquisition. After completing data acquisition test, you can continue to experience configuration application.

4.5.1. Configuration design

1. Open the "Edge Calculation-> Configuration Management" interface in the web page, find "Create", click Create New Configuration;

2. Select the new configuration, find the "Configuration Design" button, click to enter the configuration editing interface;
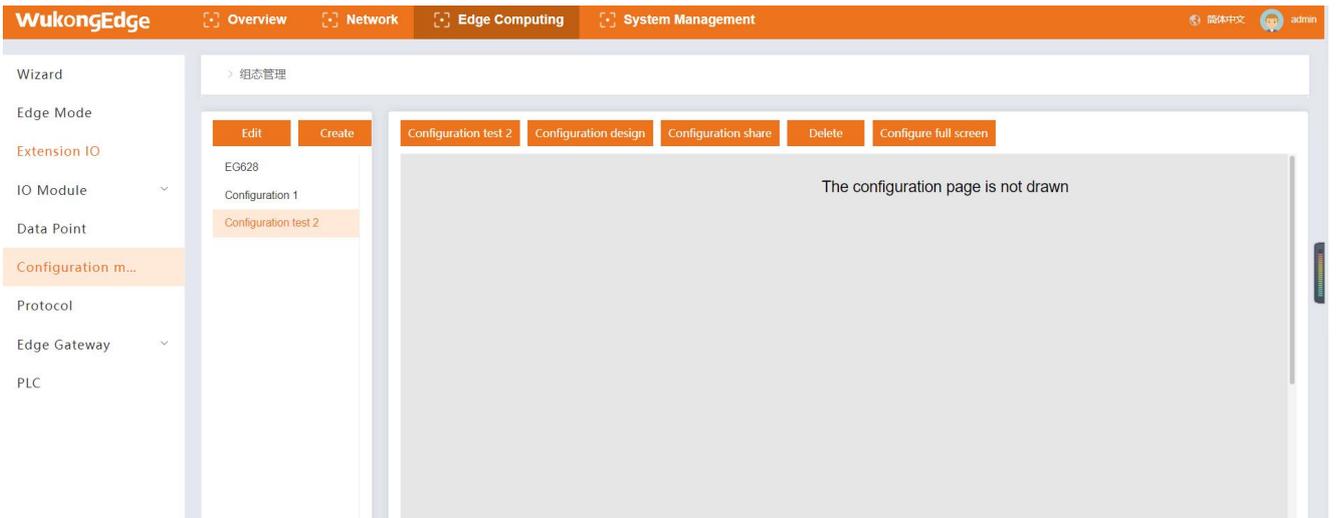
3. Configuration design is carried out in the configuration design interface. Design is carried out through the component library and gallery on the left side of the design interface. You can also copy the pictures for design. At the same time, you can export and import the configuration completed by design.

4. After the configuration is completed, bind the points. Select the variable value in the configuration, and the data source will be displayed on the right side. Select the slave and point to bind (slave and data are added in the edge acquisition point table, refer to the data acquisition chapter);

5. After completing the binding of all variable values, save the configuration, click the "Save" button, wait for "All changes have been saved" to be displayed at the top of the page, and then close the configuration design interface;

6. Return to the built-in web page configuration management interface, refresh the web page, select the new configuration, the edited configuration screen will be displayed, if the data has been successfully collected, the actual data display will be seen;

7. The configuration design is completed to this test. If you want to configure full-screen view on the computer, you can click the interface "Configure full-screen" to view it. If you need to configure full-screen display directly on the equipment screen, refer to the next chapter.

4.5.2. Configure full screen startup

The full-screen configuration startup function refers to the function that, after the device is powered on, the full-screen display of the configuration is directly carried out. As shown in the figure above, by default, the first configuration in the configuration group is displayed. The full-screen configuration display function can be turned on and off through the configuration management interface.
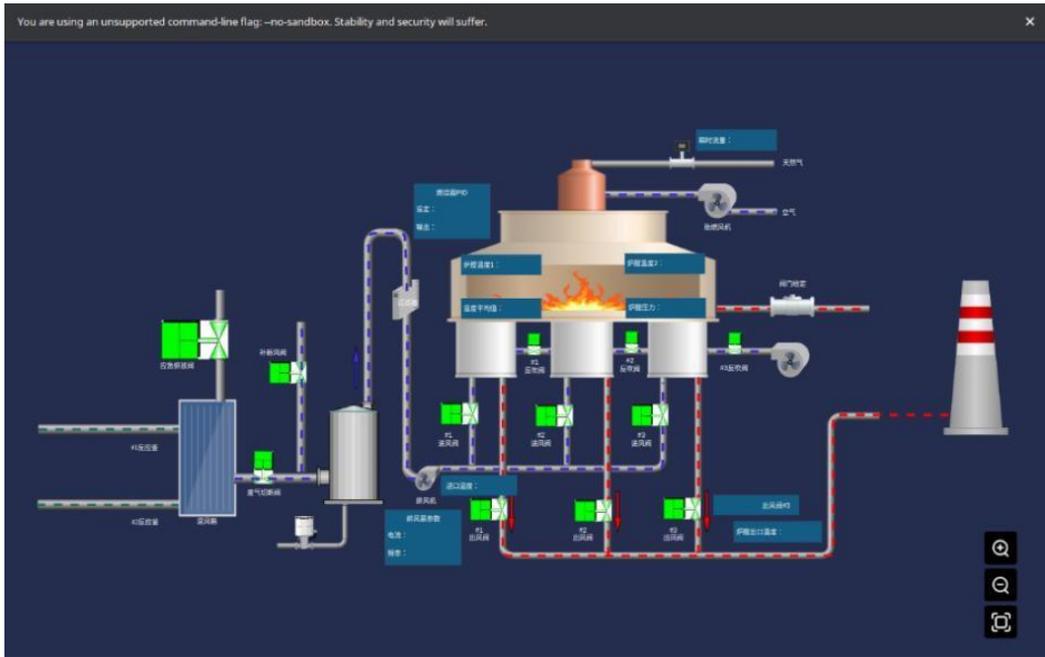
4.6. Else

SH800 has built-in WukongEdge application architecture, including edge computing, network management, built-in configuration and PLC functions. For specific function applications,please refer to WukongEdge manual.

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