SL User Manual

Jiangsu Ziqing Information Technology Co., Ltd

V2.0

catalogue

1 Product Introduction

ANYLINK | 爱联科® The SL-4G edge computing Gateway is a secure and stable data acquisition and conversion device. It is an intelligent device integrating data acquisition, industrial personal computer and cloud services, and has the following functions:

- Supported communication links: RS-485;
- Supported networking methods: LTE Cat.1, WiFi;
- Supported alarm methods: faults can be alerted through multiple channels such as SMS, email, WeChat, etc;
- Secure and stable cloud services;
- Gateway configuration method: Remote configuration through cloud platform, configuration through mobile WeChat scanning, and configuration of various parameters through computer configuration software E Master.

Figure 1-1 Appearance of SL-4G

2 Hardware Introduction of SL-4G

2.1 Technical Parameters

Hardware specifications	
CPU	ML307A
RTC	1 built-in clock (NTP network timing)
storage	3MB RAM； 1MB FLASH
telecommunications	4G; WIFI-2.4G;BLE
Serial port	1-channel RS-485
RESET	DEF short circuit recovery serial port default communication parameters
Electrical specifications	
rated voltage	DC9~30V
rated power	2W
Environmental requirements	
ambient humidity	5%～95%
operation temperature	-30℃～+75℃
Seismic resistance	10-25Hz (2G/30 minutes in X, Y, Z directions)
Cooling method	Natural air cooling
other	
protection grade	IP51
Fixed method	DIN rail slot fixation
Dimensions	89.8×71.5×29.5 (mm)
Whole machine weight	100g

Table 1 Technical Parameters

2.2 Product Shipping List

(1) 1 ANYLINK | 爱联科® SL-4G data acquisition gateway;

(2) 1 4G suction cup extension antenna, 1 WIFI suction cup extension antenna;

(3) One RS-485 communication and power connection terminal;

(4) RS-485 communication, DEF reset wiring terminal 1;

2.3 Interface Description

This product interface includes: power interface, antenna interface, and serial communication interface.

- Power interface: power terminal block, used to connect power supply and ANYLINK | 爱联科® supply power to SL-4G;
- 4G antenna interface: used for 4G wireless communication;
- WIFI antenna interface: used for WiFi antenna
- Serial communication interface: Data communication is achieved through RS-485.
- USB port: firmware burning interface

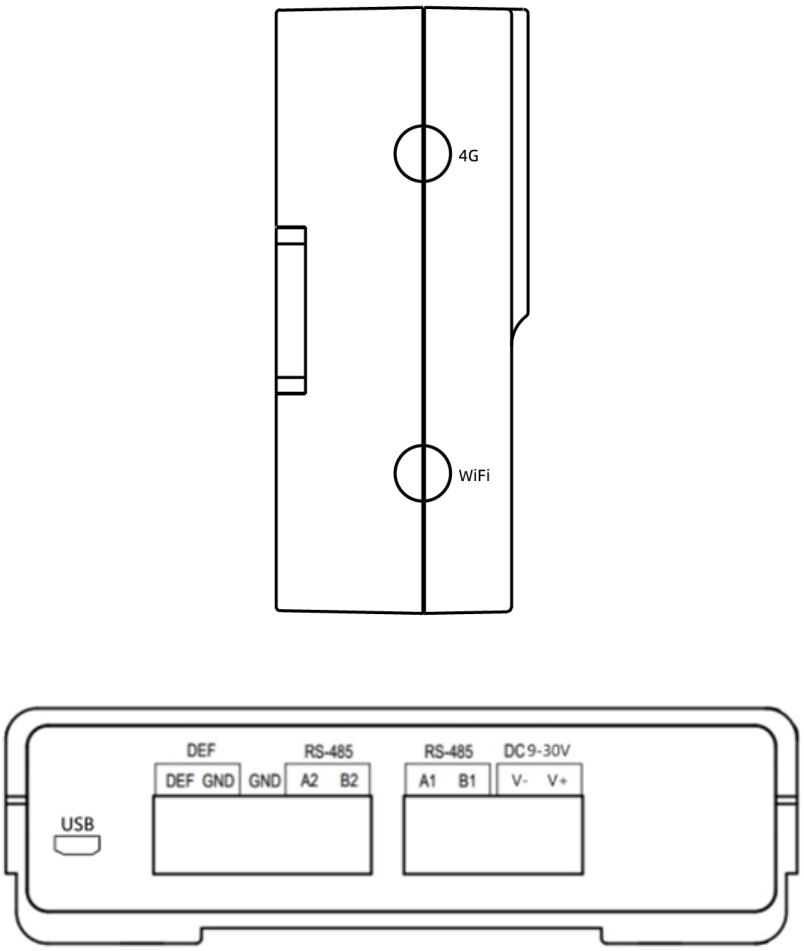


Figure 2-1 ANYLINK | 爱联科® SL-4G interface

Note: The WIFI version RS485-2 is not available.

2.4 Operation steps

The ANYLINK | 爱联科® steps for using SL-4G for data collection are as follows:

(1) Take out the ANYLINK | 爱联科® SL-4G edge computing gateway, and fix the 4G sucker extension antenna on the 4G antenna interface. If WIFI is supported, fix the WIFI sucker antenna on the WIFI antenna interface.

(2) Short circuit the DEF and GND of the gateway, and connect the USB port of the computer to the RS-485 terminal of the gateway through USB to RS-485 conversion. *(If using remote configuration or mobile configuration, skip this step)*

(3) According to the voltage specifications indicated on the power interface, connect the DC 12V/24V power adapter and power terminal to the power supply, and then power it on.

(4) Run the gateway configuration software on the computer, set communication parameters, configure data collection items, and alarm rules, and download them to SL. Refer to Chapter 3 for specific operations. *(If using remote configuration or mobile configuration, skip this step)*

(5) Log in to the cloud platform to manage devices.

3 E Master

Before using the collection device, it is necessary to connect the ANYLINK | 爱联科® SL-4G to a computer for configuration, and the computer tool is the client of E Master.

3.1 Introduction to E Master

Open the E Master software as shown in the following figure.

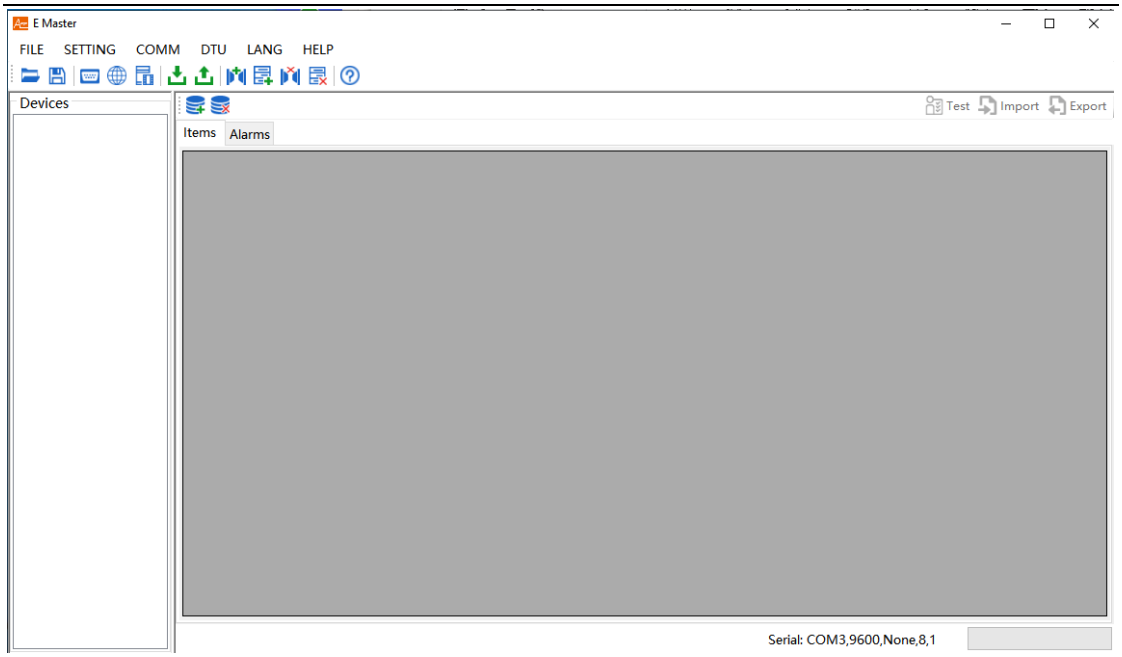


Figure 3-1 E Master Main Interface

3.1.1 Menu Bar

1 file

Open: Open an existing E Master project file.

Save: Save the current configuration of E Master as a project file, with the default path being SEMaster/Data.

Save as: Save the current configuration of the E Master as a project file.

Exit: Launch E Master software.

2 Configuration

System parameters: System parameter configuration is mainly used to configure cloud platform address, operator, network type, Sim card type, APN information, etc. This information can be transmitted to SL through a serial port cable. The system parameter dialog box is shown in the figure.

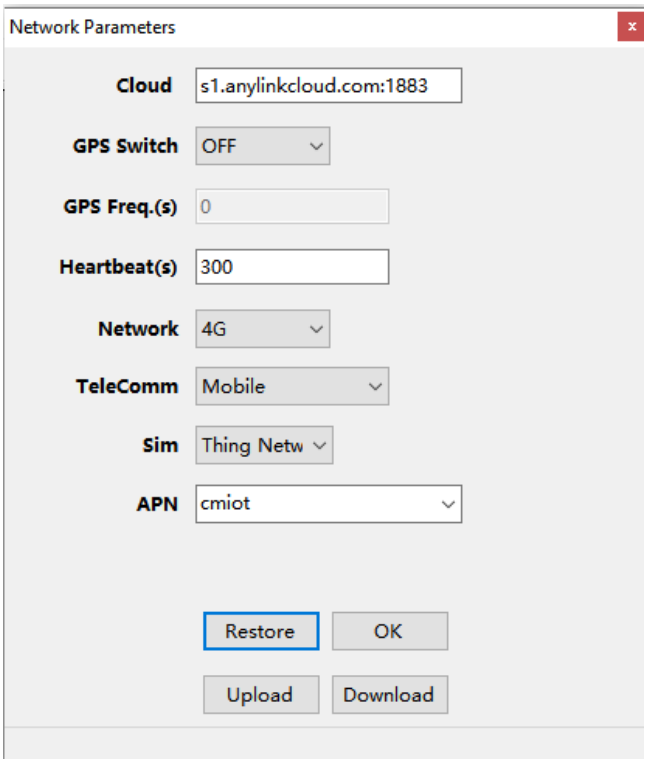


Figure 3-2 System parameter configuration

project	parameter	notes
Cloud platform address	Upload address for data collected by Anylink SL-4G	
Operator	The operator information of the SIM card used	
Network	Information on the network types supported by the SIM used	
Sim card type	The SIM card used is a regular phone card or an IoT network card	
APN	The APN information of the SIM card used will be automatically generated based on the selection of the above information.	
GPS enabled		Default no GPS module
GPS collection	The frequency of SL uploading GPS	

	information to the server	
heartbeat	Frequency of detecting connection status between SL and cloud servers	

Table System Parameter Configuration Instructions

The 'restore' button refers to restoring the network parameters of SL to factory settings; The 'Upload' button refers to uploading the network parameters of the SL connected to the computer to the computer end; The 'Download' button refers to downloading the network parameters of the computer to the connected SL.

3 Communication

- set up

Used to set communication parameters between the E Master of the computer and the Anylink SL-4G. The dialog box is shown in the figure. After the serial port parameters are set, you can click the "Test" button. If the parameters are set correctly, the test will be prompted as successful. After setting the parameters correctly, click the "Save" button to activate the current configuration parameters.

Note: At the port, select the com port for the current USB to serial connection, which is usually connected to SL using a USB to 232 serial connection. The Com port can be viewed by right clicking on Computer - Management - Device Manager - Ports. The other parameters such as baud rate and verification do not need to be modified.

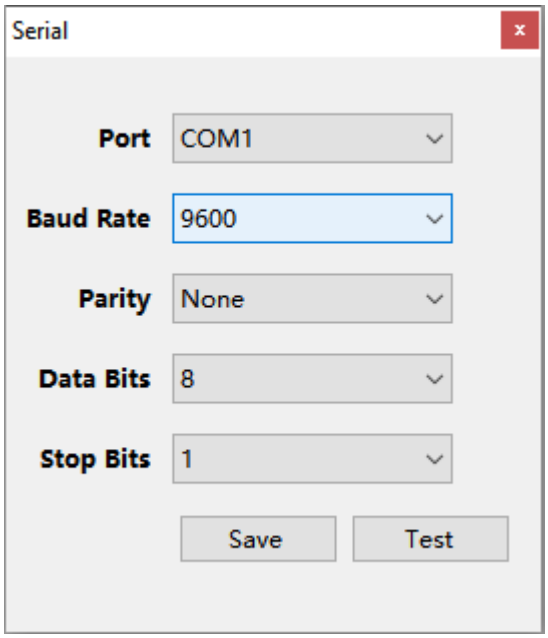


Figure 3-3 Image serial port settings

Table Serial Port Setting Instructions

project	parameter	notes
port	The port number of the serial cable connecting the computer and SL	
Baud rate		Default 9600bps
check		Default None
Data bits		Default 8
stop bit		Default 1

- Upload

Uploading includes uploading network parameters, uploading data configuration, and uploading all three options. Uploading network parameters means only uploading the network parameter configuration of SL to the computer end; Uploading data item configuration means only uploading SL's data item configuration to the computer end; Upload everything including the first two.

- download

The download includes downloading network parameters, downloading data configuration, and downloading all three options. Downloading network parameters

means downloading only the network parameter configuration on the computer side to SL; downloading data item configuration means downloading only the data item configuration on the computer side to SL; downloading all includes the first two.

- system state

Mainly displays some operational status of the current SL.

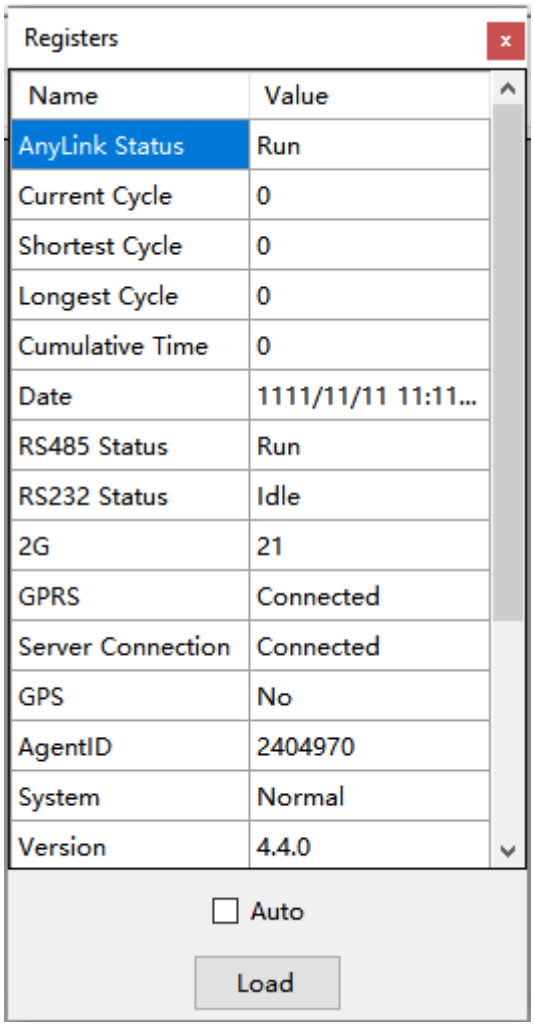


Figure 3-4 Graph Register Status

4 languages

Used to switch between Chinese and English versions of software.

5 Help

About: Used to view information such as the current version of EMaster.

3.1.2 Toolbar

Table 3-3-3 Toolbar Description

project	function	project	function
	Open SL project file		Add channels
	Save SL project		Add equipment
	Computer serial port configuration		Delete Channel
	Network parameter configuration		Delete device
	system state		Add data items
	Download data item configuration		Delete data item
	Upload data item configuration		about
	Test whether the data collection is correct		Import data items
	derived data item		

3.2 Configuring SL with E Master

The usage steps are as follows

(1) After connecting the computer and Anylink SL-4G through the serial port cable, open the computer device manager and view the current port information.

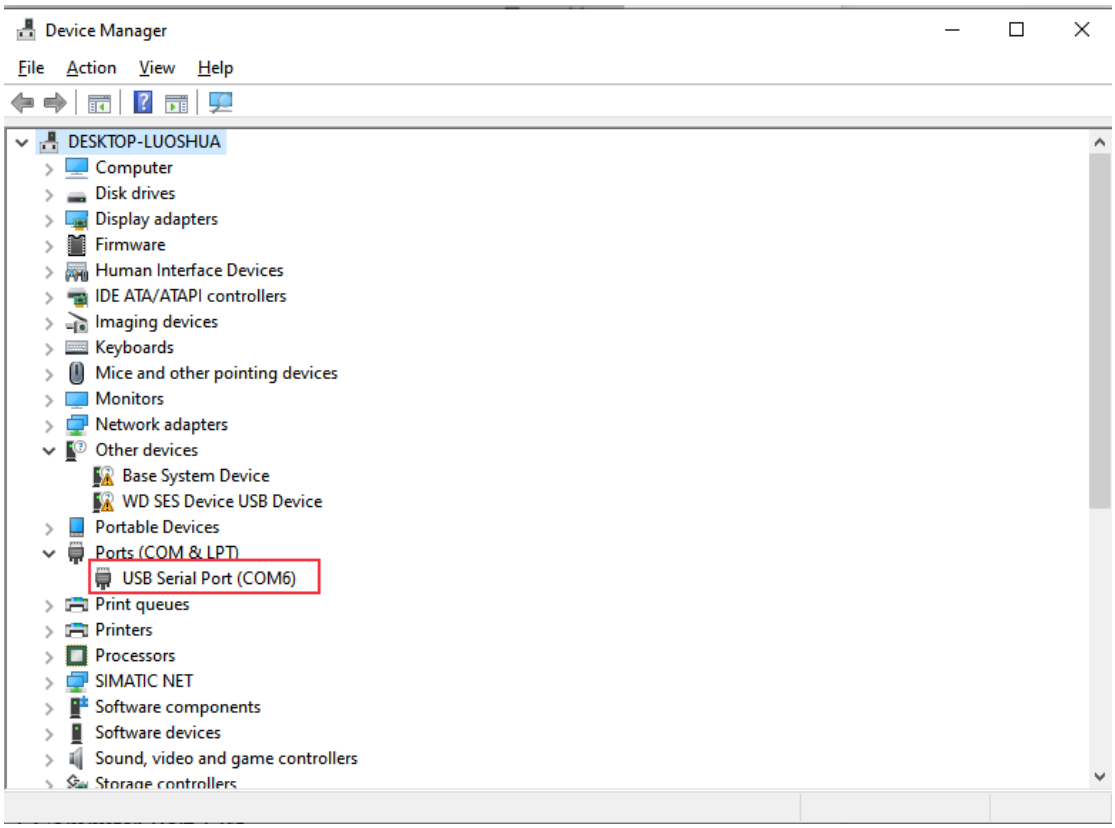


Figure 3-5 Computer Port List

(2) Open SE Master software, as shown in the following figure.

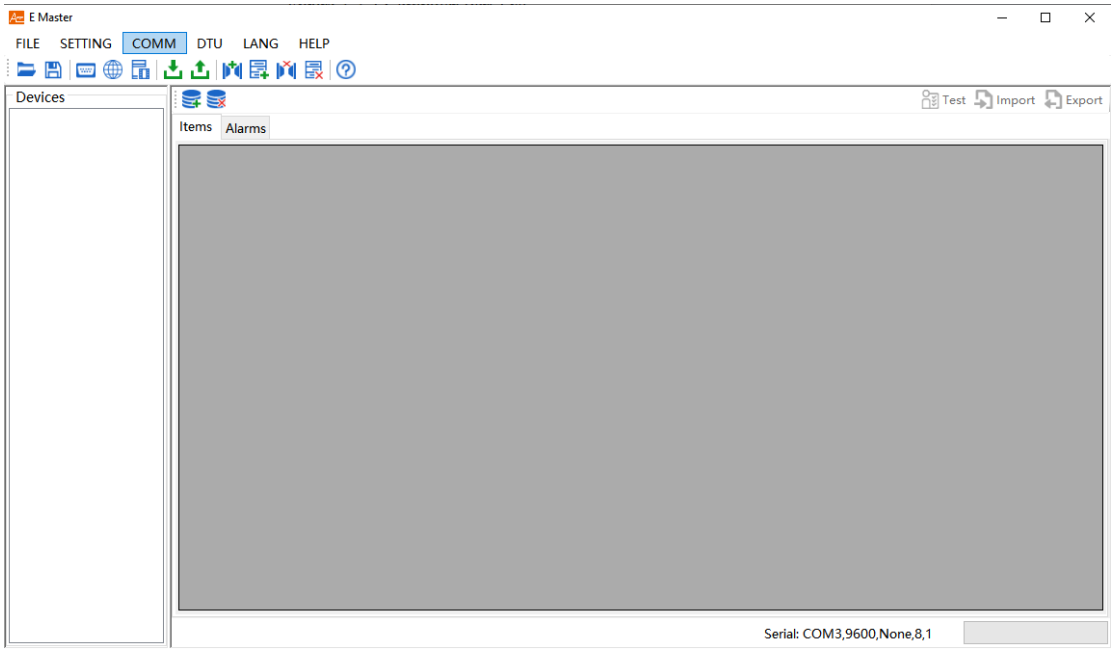


Figure 3-6 E Master Main Interface

(3) Open the "Serial Port Configuration" in the toolbar, and a dialog box will pop up as shown in the figure below. Set the port number to "COM6" and use default parameters for others. Click the "Test" button, and it will prompt that the test is successful. Click the "Save" button to proceed to the next step. If the test fails, please check the serial port parameters, wiring, and whether the SL is powered on.

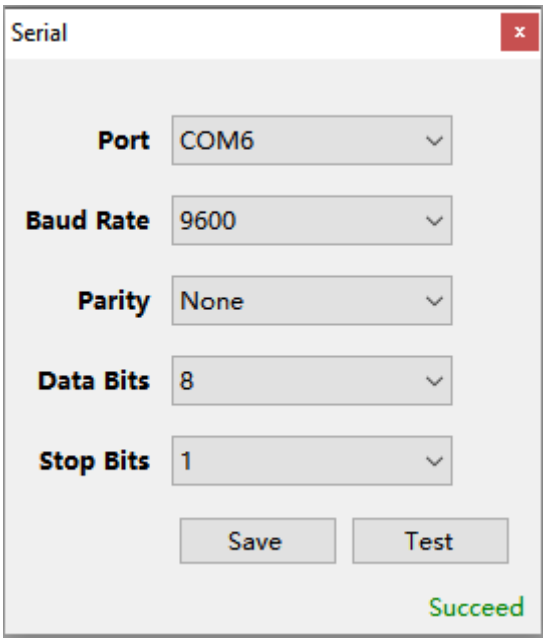


Figure 3-7 Serial Port Settings

(4) Add channels

Click on the "Add Channel" icon in the toolbar, and the following dialogue will pop up. Select the device and driver type as needed, and fill in the parameters. Serial communication parameters such as serial port number, baud rate, parity check, data bits, and stop bits vary depending on the type of device. The following channels are the device and driver types for Modbus RTU.

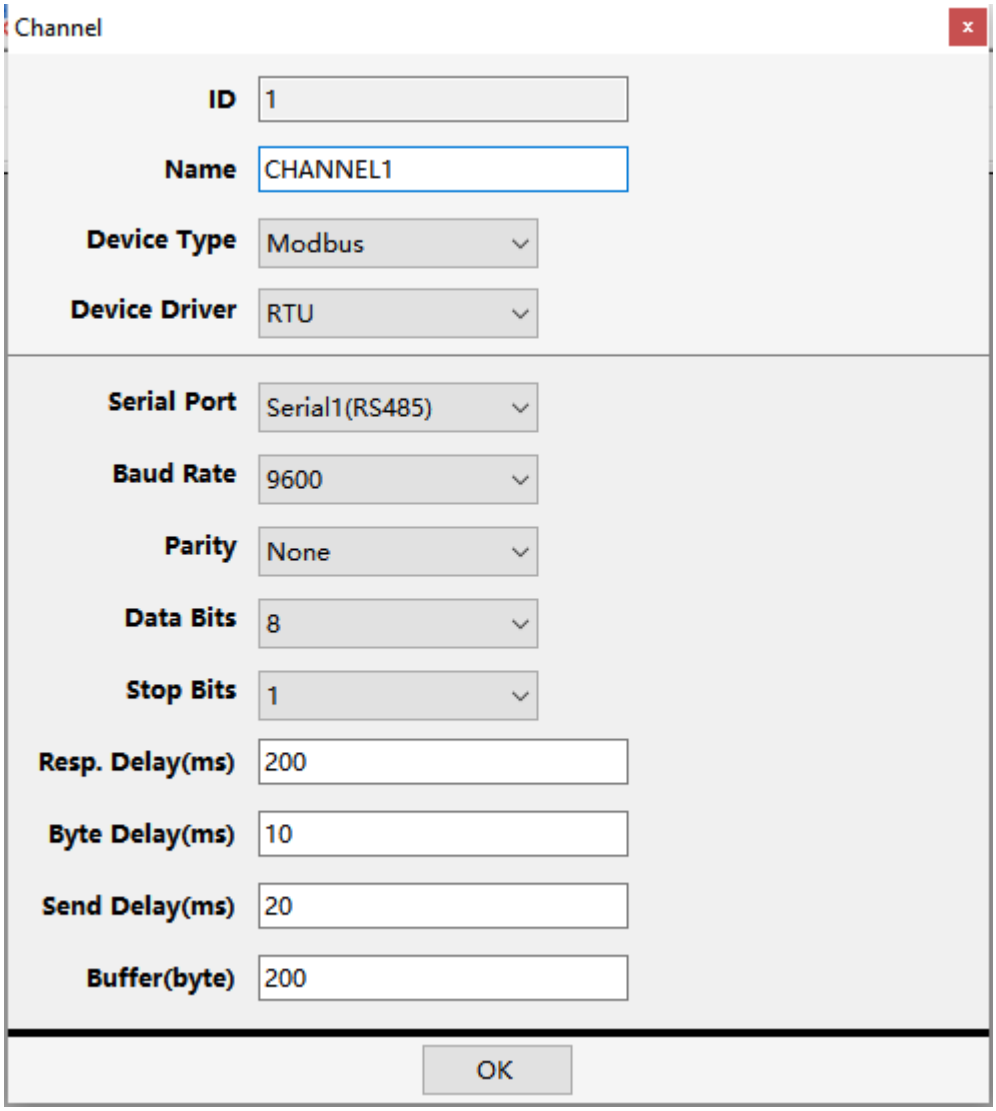


Figure 3-8 Channel Parameters

- The opening method for deleting channels is to right-click on the channel name and select the delete option to delete channel information.
- The opening method for modifying channels is to double-click the channel name or right-click on the channel name and select the edit option to edit the channel information.

(5) Add equipment

Click on the "Add Device" icon in the toolbar, and the following dialogue will pop up. Fill in the parameters as needed.

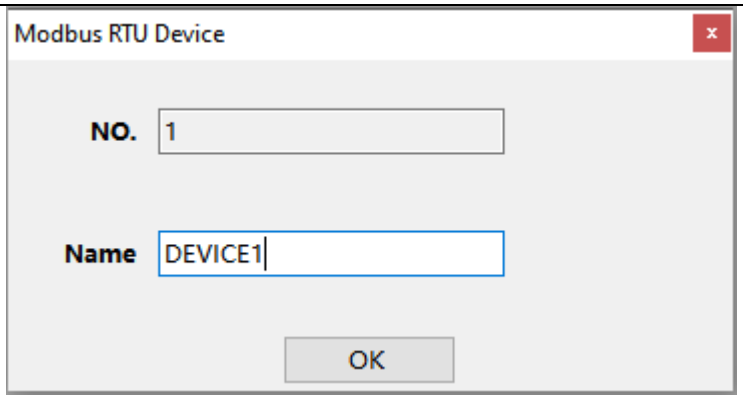


Figure 3-9 Equipment Name

- The opening method for deleting a device is: in the device information list, select the device to be deleted, right-click and select the "Delete" option, or click the "" button in the quick navigation bar to delete the device.
- The opening method for modifying device names is: in the device information list, select the device whose name needs to be modified, right-click and select the "Edit" option to edit the device name.

(6) Add data items

Click on "Add Data Item" in the toolbar, and the following dialog box will pop up. Fill in according to the device parameter information to be read.

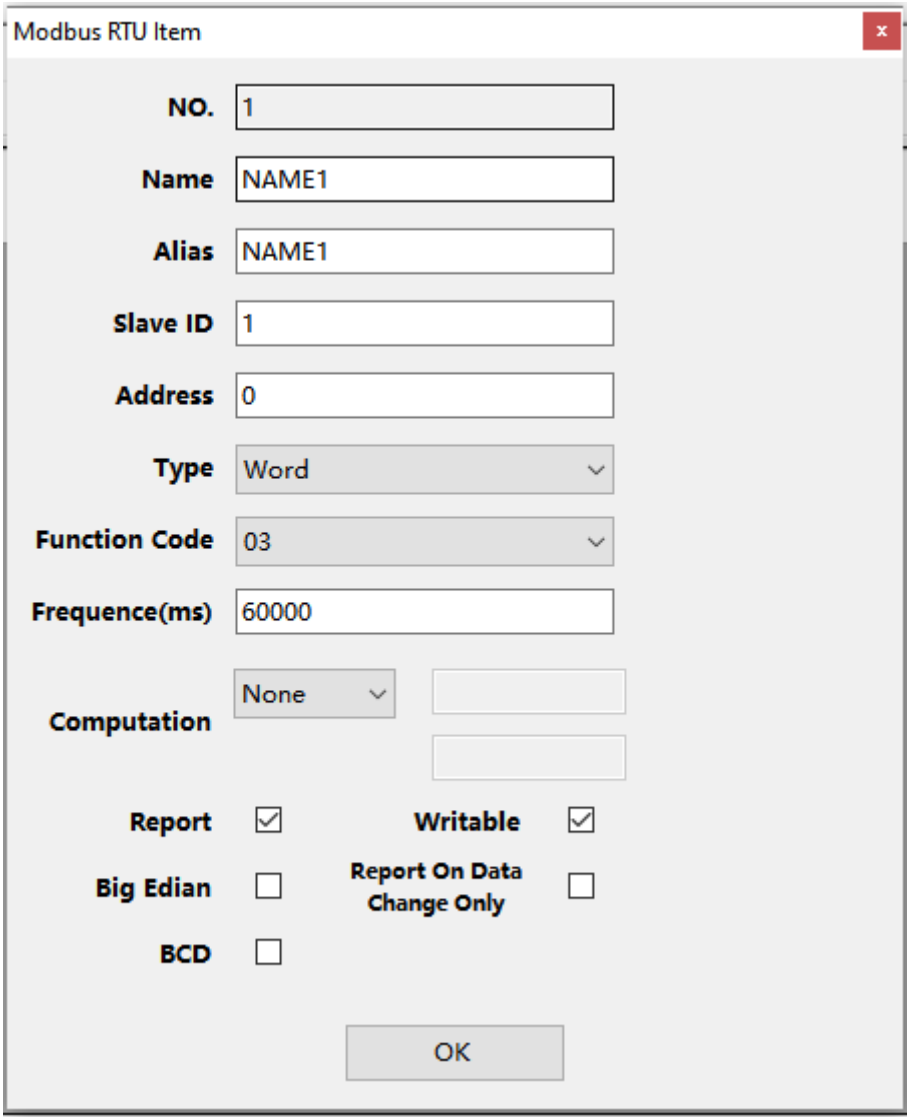


Figure 3-10 Data Item Configuration

Table 3-3-1 Data Item Configuration Parameters

data item attribute	describe
name	The name of the data item, such as "CPU", "temperature 1", etc
alias	Namely, data item aliases such as "liquid level", "oil temperature", etc
From station number	The data item's slave station ID is the corresponding PLC slave station address for that data item

data address	The PLC variable address corresponding to this data item
data type	The data type corresponding to this data item, such as Boolean, Word, Dword, etc
function code	This data item corresponds to the function code of the PLC
Additional operations	Perform multiplication, masking, and linear operations on the value of the current data item
Frequency (milliseconds)	The collection frequency of the data item, in milliseconds
report	It means whether the data collected by the data point has been uploaded to the cloud (selecting it means uploading the data to the remote end)
Writable	Indicates that the value in the PLC memory corresponding to the data point can be rewritten (select to rewrite)
Big end	If selected, it is the big end; if not selected, it is the small end
Change upload	Indicate whether the data collected from this data point will only be uploaded when the numerical value changes (if selected, it will only be uploaded when the numerical value changes, if not selected, all will be uploaded)

- Modify the opening method of data items: In the data item list, double-click the data item that needs to be modified, and in the data item configuration dialog box that pops up, you can modify the content of each attribute of the data item.
- The opening method for deleting data items: As shown in the figure below, click on the leftmost side of the data item list, select the data item,  and click the "" button on the quick navigation bar to delete the data item.

	NO.	Name	Alias	Slave ID	Address	Type	Function Code
	1	1	11	1	0	Word	03
▸	2	2	22	1	1	Word	03

Figure 3-11 Data Item List

(7) Set alarm rules for configuring alarm rules for added data items.

➢ The opening method for adding alarm rules is: click "Alarm" to switch to the alarm configuration list, click the "" button, and a dialog box as shown in the following figure will pop up. Enter the alarm name, select the data item and alarm condition to which it belongs, enter the L1 and L2 values, select the alarm level, add the alarm description, and after completing the configuration, click the "OK" button to save the alarm configuration information

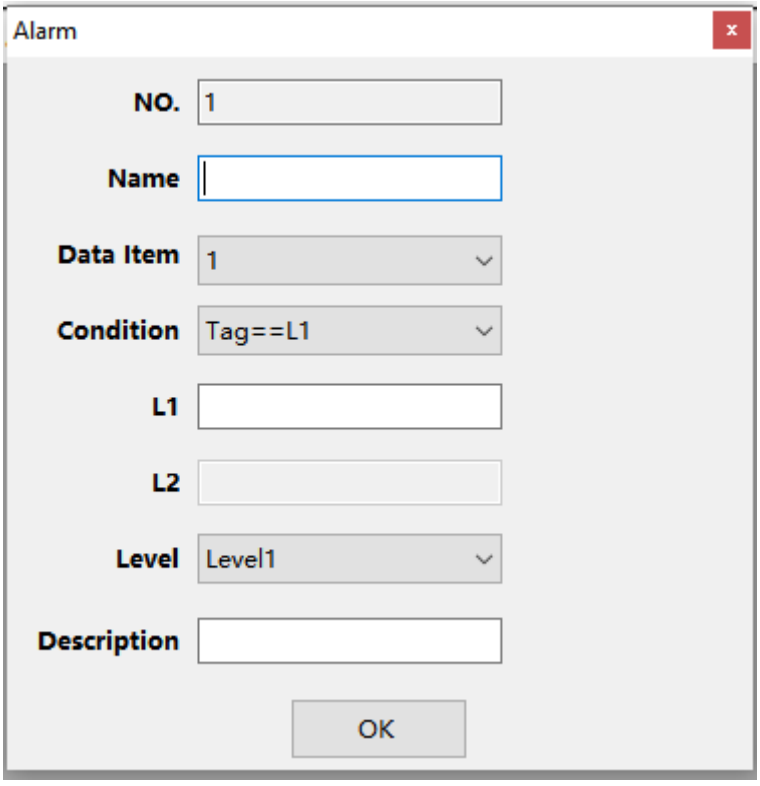


Figure 3-12 Alarm Item Configuration

➢ The opening method for deleting alarm rules is as shown in the following figure. Click on the leftmost part of the alarm information list, select the alarm rule, and click the "" button on the quick navigation bar to delete the alarm rule.

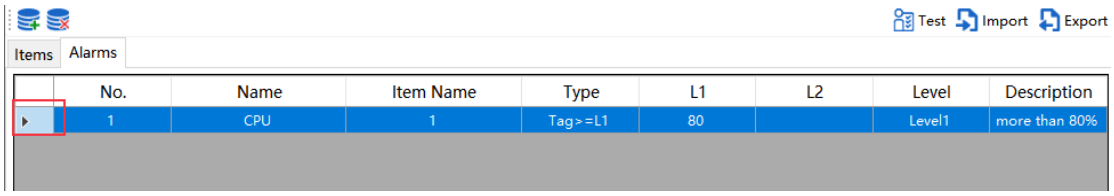


Figure 3-13 Alarm Item List

8 derived data item

Click the "Export" button on the toolbar to export a CSV file containing information about configuration data items. You can add or modify data items in the CSV file.

Attention: The sequence, name, alias, etc. cannot be repeated and cannot exceed the length limit, with a maximum length of 9 Chinese characters.

9 Import data items

You can import the configured CSV file into SEMaster

(10) Download data item configuration

When configuring the channels, devices, and data items of SL, you need to click on "Download Data Items" in the toolbar to successfully download them. You can click on the "Test" icon in the upper right corner to view the collection results of the configured data items, as shown in the figure. If the status is good, it indicates successful collection; If it is bad, it indicates that the collection has failed. Please check the communication parameters, data point addresses, and other parameters, modify them, and download the data again for testing.

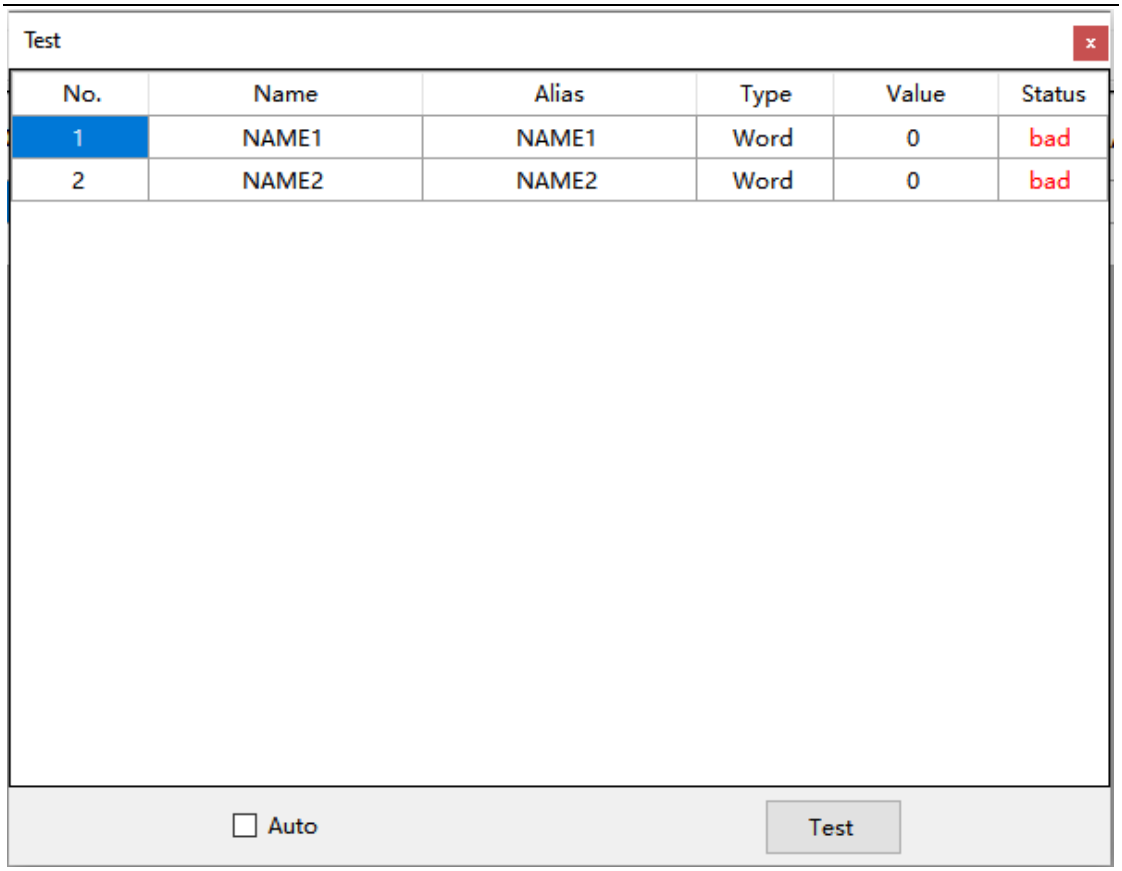


Figure 3-14 Test dialog box

If you need to download network parameters at the same time, you can select "Communication" - "Download" - "Download All" in the menu bar to download all network parameters and data item configuration information to the Anylink SL-4G.

(11) Other operations:

- Save function: After configuring network information and data item information, click on the "File" - "Save" option, or click the "Save" button to generate the following two files in the software root directory.

Figure 3-15 Engineering Documents

- Open function: For saved information, click Open and load a file named "config" to open the saved configuration information.
- System status: Click on the "Communication" - "System Status" menu, or click

the "  " button to open the window shown in the following figure. Click the "Read" button to obtain the system status information.

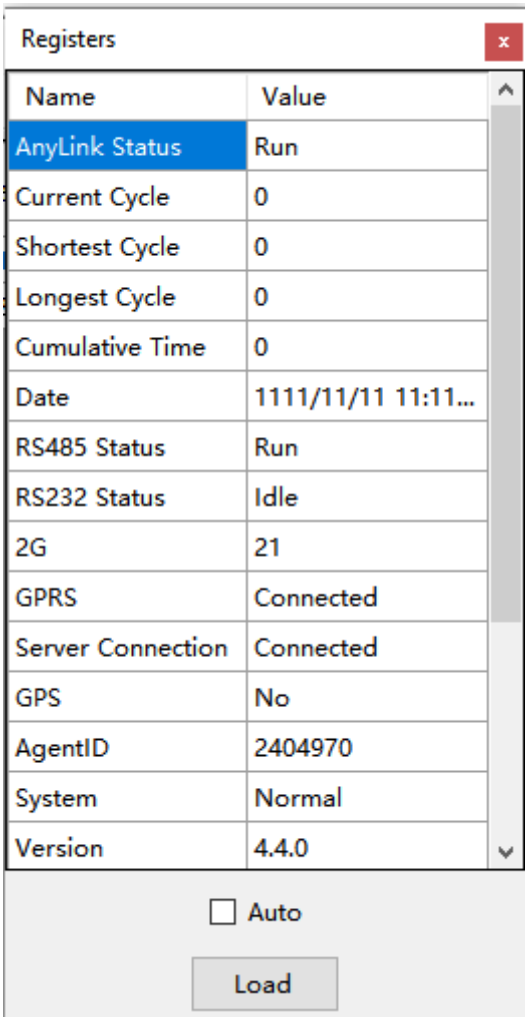


Figure 3-16 SL System Status

(12) Configure DLT645_2007 electric meter:

➢ Click on the "Add Channel" icon in the toolbar, and the following dialogue will pop up. Select the device type and driver type of DLT465_2007, and fill in the parameters. The serial communication parameters such as serial port number, baud rate, parity check, data bit, and stop bit are set based on the currently collected PLC parameters.

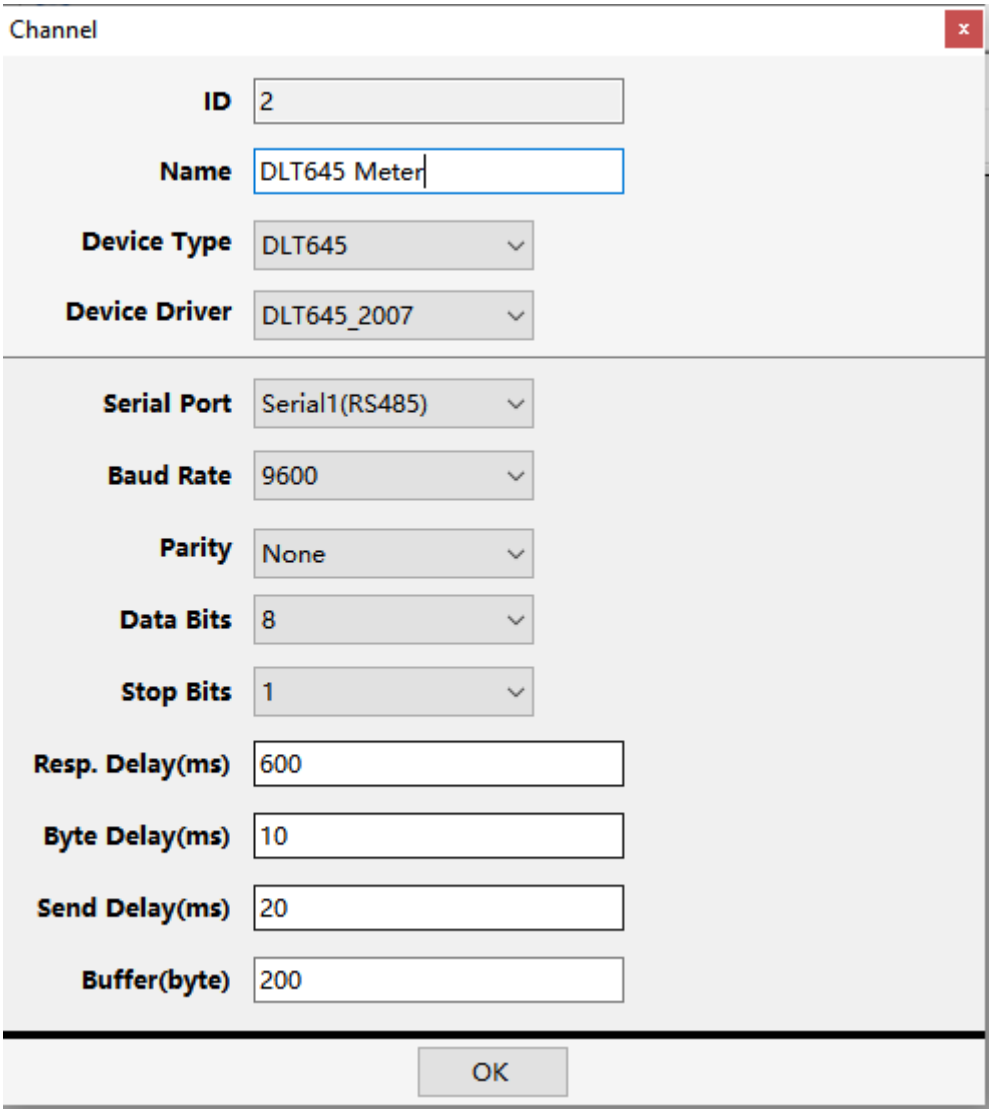


Figure 3-17 DLT645 Meter Channel Parameters

➢ Add equipment

Click on the "Add Device" icon in the toolbar, and the following dialogue will pop up. Fill in the parameters as needed.

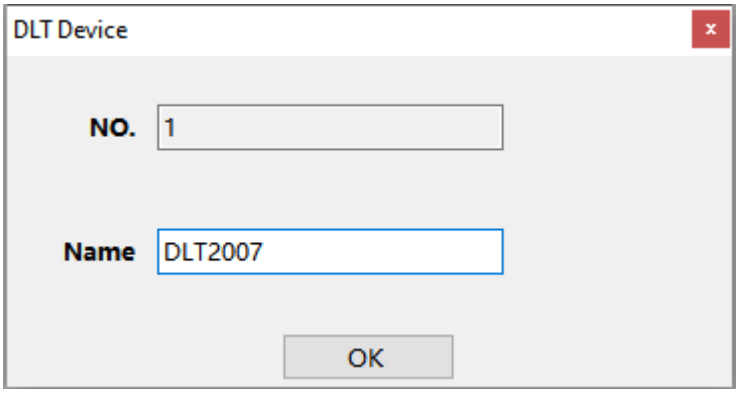


Figure 3-18 Equipment Name

➢ Add data items

Click on "Add Data Item" in the toolbar, and the following dialog box will pop up. Fill in according to the device parameter information to be read. The address field is the current address of the electricity meter, filled in with a BCD code with a specification of 12 from 0 to 9. The data identifier can be selected from the drop-down list, and the data identifier code will be automatically displayed after selection. The minimum frequency period is 60000 milliseconds. If the memory address is writable, you can check 'writable' to perform remote write control operations. If you need to change the upload, you can check it. After adding the data items, click the OK button.

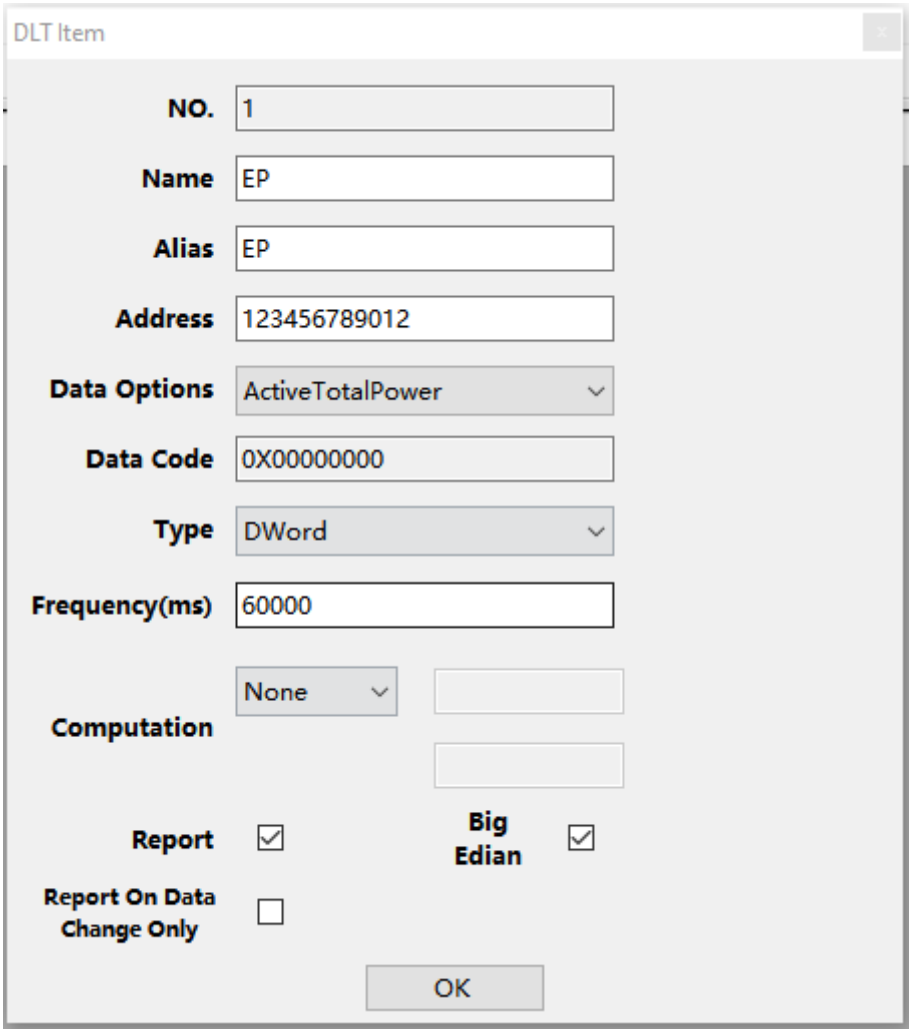


Figure 3-19 Data Item Configuration

(Note: Other operations refer to the previous section on Modbus RTU and are consistent.)

4 WiFi Distribution Network Steps

The first step is to enter the distribution network mode. After the module is powered on and the NET light flashes rapidly, long press the rest button next to the 4G antenna interface, or the platform issues a command to enter the Bluetooth distribution network. When the WiFi indicator light flashes rapidly, it indicates that it has entered the distribution network mode. If it is not flashing, it indicates that it is no longer in the distribution network mode (long press the reset button to clear the original password and enter the Bluetooth distribution network mode. To enter the Bluetooth distribution network mode, the original hotspot information must be cleared. If the distribution network is successful, it will exit the Bluetooth distribution network mode).

The second step is to configure the APP network. Open the Hot and Cold Pass APP, click on "More", select the device network, choose the Bluetooth corresponding to the serial number, click on "Add", enter the WiFi information that needs to be connected, click on "Next", and then click on "Finish".

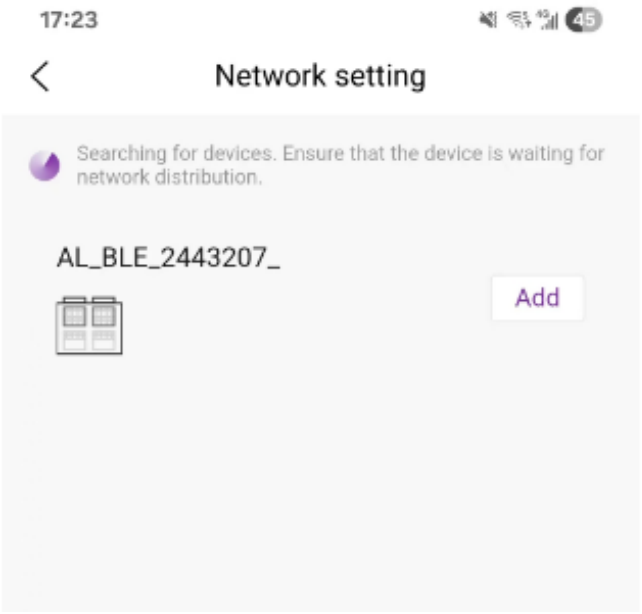


Figure 4-1 Equipment Distribution Network Interface

The third step is to check the distribution network situation. When the WiFi indicator light is constantly on, it indicates that the distribution network has been successfully connected to the designated WiFi network.

(Note: The WiFi indicator light can indicate the current WiFi networking status. A constant off state indicates that the gateway is not connected to the WiFi network, a flash state indicates that it is in the distribution network state, and a constant on state indicates that it has been connected to the WiFi network.)

5 Log in to the cloud platform to manage devices

ANYLINK | 爱联科® After completing the configuration of SL-4G, you can log in to the cloud platform for device management.

5.1 Login to the cloud platform with account and password

Open the browser and enter the cloud platform address in the address bar“ https://hvac.anylink.io/ ”Open the login interface of the cloud platform.

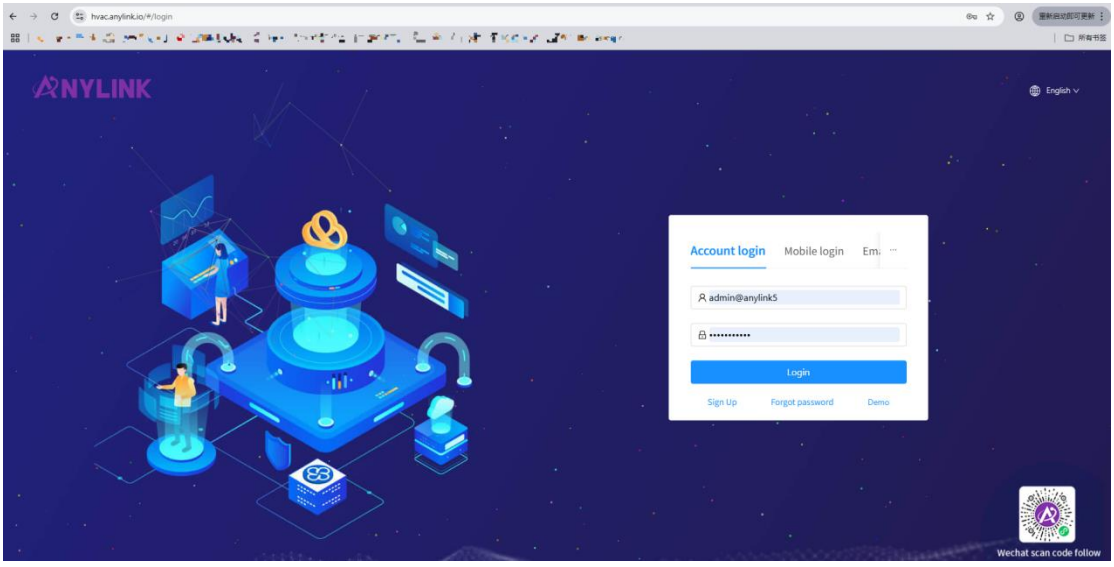


Figure 5-1 Platform login interface

Please consult the module supplier for login username and password.

5.2 Viewing Data in Cloud Platforms

After successful login, the collected data can be viewed in the gateway management menu.

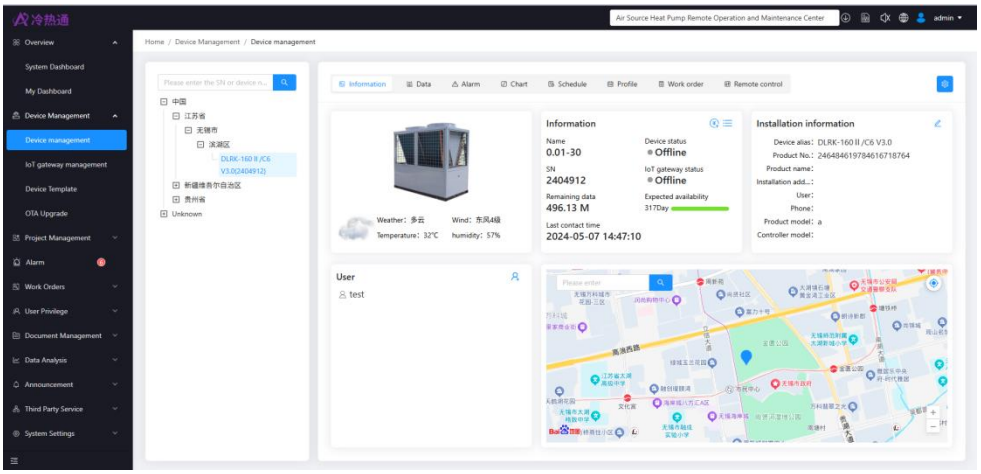


Figure 5-2 Gateway Management Interface

Appendix Frequently Asked Questions

1 How to configure Modbus data point addresses ending in H or containing A/B/C/D/E/F.

Solution:

(1) If the Modbus data point address has ended in H, please remove H and add 0x before the address;

(2) If the Modbus data point address contains A/B/C/D/E/F, add 0x before the address.

(3) If the Modbus data point address has ended in H, remove H and convert the address (hexadecimal) to decimal.

give an example:

2012H， The configuration data item is filled in with 0x2012;

1A3D， The configuration data item is filled in 0x1A3D;

56E7H， The configuration data item is filled in 0x56E7.

2012H， The configuration data item is to fill in 8210.

2 According to the device point table configuration Modbus, the data value was successfully read, but the value is incorrect.

Solution:

(1) Check if the data type of the configured Modbus data points is correct, such as signed numbers/double digits/floating-point numbers.

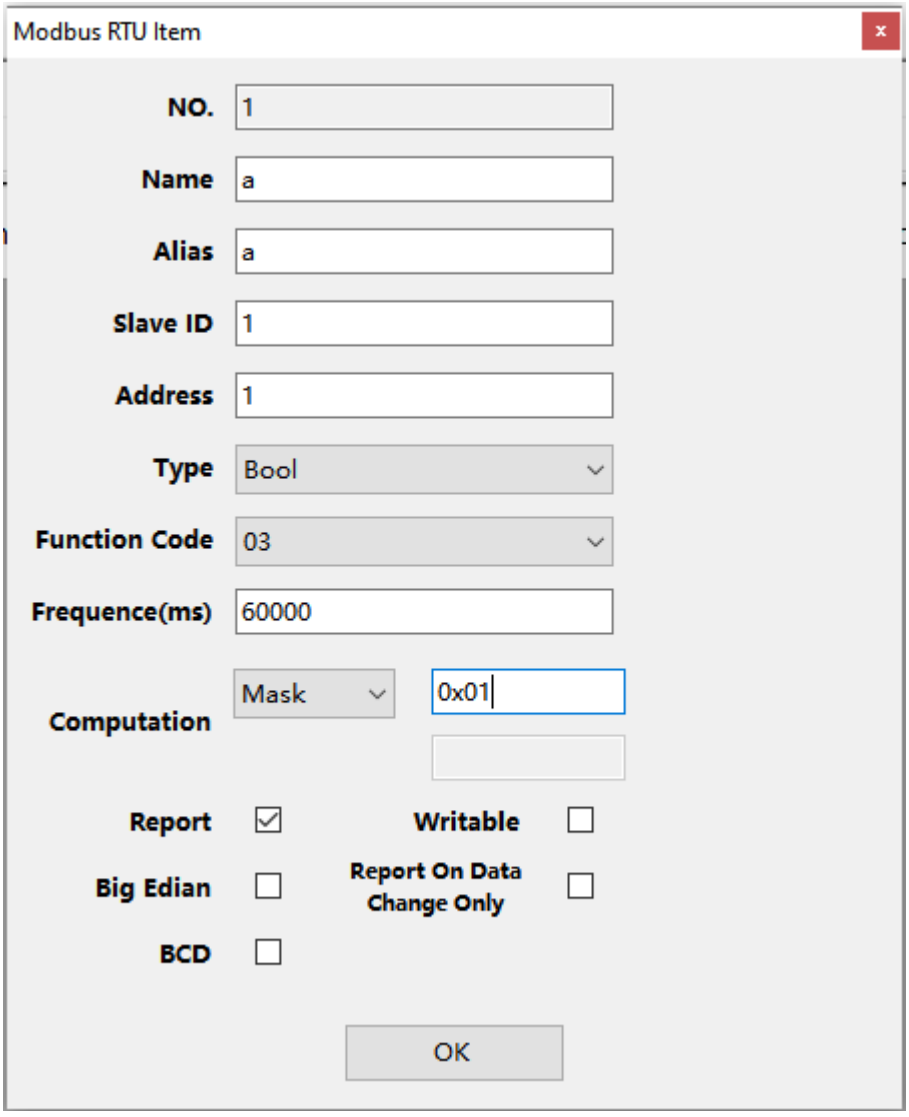
(2) Subtract 1 from the Modbus address and send it to check if it is correct.

(3) For data items that occupy two registers, you can check the "big end" option in the data item configuration and issue it to check if it is correct.

3 How to configure a data item with many bits in a byte (bit0, bit1... bit16).

Solution: Fill in the address of the byte for the data address, select boolean as the data type, 03 as the function code, and mask as the additional operation. If it is bit0, fill

in 0x01 in the blank space. bit1—0x02，bit2—0x04，bit3—0x08，bit4—0x10，bit5—0x20，bit6—0x40，bit 7—0x80，bit8—0x100，bit9—0x200，bit10—0x400，bit11—0x800，bit12—0x1 000，bit13—0x2000，bit14—0x4000，bit15—0x8000。



4 Configure Modbus according to the device point table, and read the data value to display bad.

Solution: Check if the data type of Modbus data points is correct, such as slave ID, channel parameters, function code, type, data address, and wiring

5 Serial port test. Click test and receive a message indicating that the test has failed.

Solution:

1. Check if the port number selection is correct;
2. Short circuit DEF and GND;
3. It may be a USB to serial cable fault or a 485 port fault in the SL
4. Check if the net light and 485 light of SL are flashing. If they are not flashing, there may be a power supply problem. If the power supply is too high, it may cause SL to burn out and need to be repaired at the factory. If the power supply is too small, it may cause the program to not run completely.

6 After configuring all data items, click on "Test", and the test interface will display small horizontal bars with "---" as the exception.

Solution:

(1) Check if the total number of data items and alarm items exceeds 500, delete any that exceed, and reissue. SL only supports data items up to 500.

(2) Power off and restart SL, reopen E Master, and download data item configuration again.

please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

For more information, please visit www.anylink.io

Address: 11th Floor, Beichuang Technology Park, 401 Xingyuan North Road, Wuxi City, Jiangsu Province
Website: www.AnyLink.io
Phone: 0510-82602929
Fax: 0510-82608960
Jiangsu Ziqing Information Technology Co., Ltd
Efficient IoT Solution for HVACR