ZLAN6808-5

8 DI/DO/AI channels 4G Remote IO controller

RS485/ Ethernet /4G remote IO control

ZL DUI 20211008.1.0

Version information

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CATALOGUE

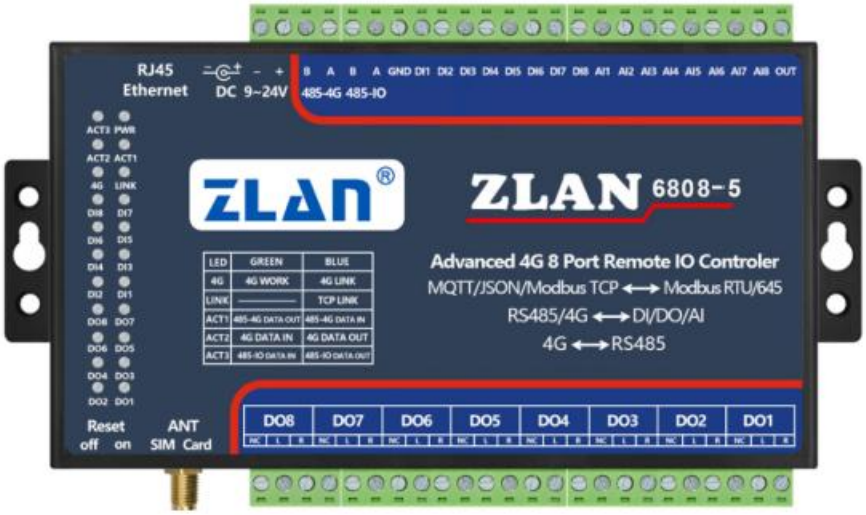
1. Overview

ZLAN6808-5 is an 8-channel 4G remote IO controller launched by Shanghai ZLAN Information Technology Co., LTD., which supports 8-channel DI/DO/AI, that is, digital input, relay output, analog input (including voltage and current). It also supports the serial port server function and connects to a third-party RS485 collector or controller over the RS485 port for remote control. At the same time, the ZLAN6808-5 also supports network ports, which can be used for data transmission and remote control through Ethernet.

DI supports dry node and wet node, with optical coupling isolation. DO is the relay output, with 5A 250V AC or 5A 30V DC control capability; The first four AI inputs support 0 ~ 5V voltage input, and the last four support 4~20mA current input, and the ADC accuracy is 12 bits. The AI properties can be modified according to the needs of 5V voltage, 10V voltage, current type, resistance type and other properties.

Figure 1 ZLAN6808-5 Remote I/O control

The communication mode of ZLAN6808-5 supports 4G, RS485, and Ethernet.



ZLAN6808-5 is divided into four kinds of external interfaces, such as the product front picture:

1. 485-IO: This is an RS485 port through which DI/DO/AI can be read, written, and controlled. Through it to achieve local RS485 control, communication protocol support Modbus RTU protocol. This interface can be searched and configured through ZLVircom's "IO Controller" dialog.
2. Network interface: This interface is a remote control communication mode for 4G Ethernet.
3. 485-4G: RS485 interface, all data from the network interface will be sent to this serial port output. Instead, the serial data received from this interface is forwarded to the network. In addition to the remote IO control function, ZLAN6808-5 also supports the serial port server function, which can be connected to various collection and control devices on the 485-4G interface. This interface can configure parameters of the communication module through ZLVircom's "serial search" function.
4. DI/DO/AI: This is an external control interface that can be controlled by 485-IO and network interfaces, but cannot be controlled by 485-4G.

ZLAN6808-5 is the 4G version, and supports network ports, and has a special watchdog circuit, which can ensure the stable operation of 4G modules for a long time. The default baud rate is 115200bps.

ZLAN6808-5 can be used in:

- Building/access control/security control system;
- Industrial automation System;
- Internet of Things, remote meter reading, information collection, etc.

This section uses ZLAN6808-5 (Ethernet port) as an example. Figure 3 shows the typical application connection. Connect the field input and output devices to the ZLAN6808-5, and then connect the ZLAN6808-5 to the network via a network cable. Then the upper computer can send data to ZLAN6808-5 through Modbus TCP protocol to realize the query input device and control output device.

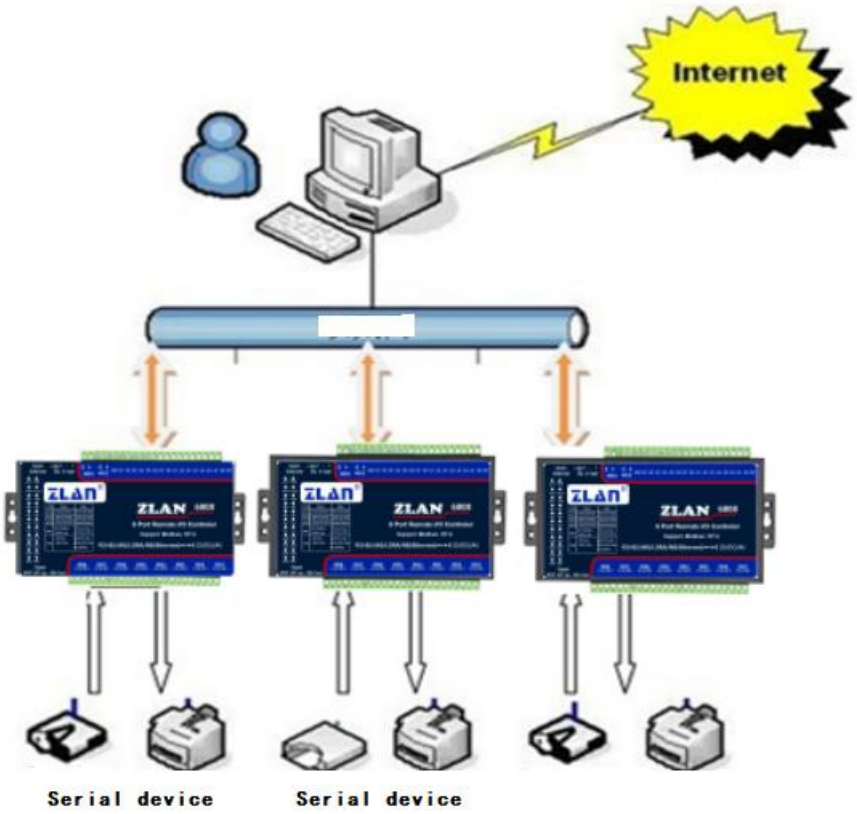


Figure 2 Connection case

2. Functional features

1. Supports eight DI/DO/AI channels and can be controlled remotely or locally.
2. AI supports 12-bit accuracy, and the data is adjusted to ensure accuracy.
3. It also supports the serial port server function to control external third-party RS485 devices over the network.
4. Support DI control DO function, using a pair of ZLAN6808-5 through 4G/LoRa and other communication methods can control each other, easy to use.
5. Support Modbus TCP, Modbus RTU, MQTT, JSON, HTTP and other communication modes.
6. Connect to all types of public clouds, send data in JSON format and control delivery in JSON format.
7. Rich indicators: display DI, DO status, network status, data flow status, etc.
8. I/O controller dialog box or RemoteIO of the control demonstration software ZLVircom through RS485 or TCP/IP can demonstrate the IO control and AI data acquisition of the device.
9. It can provide complete RS485 control instructions and Modbus RTU instructions, which is convenient for engineers to integrate development.
10. You can restore factory Settings with one click, including baud rate, station address, network configuration of communication module, etc.

3. Technical parameters

appearance	
Size:	L x W x H =9.2cm×19.7cm×2.5cm
Serial port parameter	

485-IO Baud rate: The default baud rate is 115200bps, which can be changed by using the RemoteIO software or commands. 485-4G baud rate: The default value is 115200bps. Data bit: 8 bits. Check bit: No check, odd check, even check. Stop bit: 1 bit	
software	
Network protocol:	MODBUS TCP/MQTT/JSON/HTTP
RS485 protocol:	MODBUS RTU
AI input form	
By default, four channels are 0-5V mA and four channels are 4-20MA Current input: 4~20mA Voltage input: 0~5V, 0~10V (need to customize) Resistance input: 0~10K, resistance type temperature and humidity sensor, etc. (need to be customized)	
Power consumption	
Running stable state: 30mA@12V 4G dial status: 60mA@12V DO relay closed, DI input closed (maximum power consumption) : 300mA@12V	
6808-5 4Gargument	
Support mode	Supports 7 modes: B1/B3/B5/B8@FDD LTE B34/B38/B39/B40/B41@TDD-LTE B1/B8 @WCDMA B34/B39@TD-SCDMA BC0@CDMA2000 1X/EVDO B3/B8@GSM

Transmission rate	LTE-FDD：Max 150Mbps（Download）/Max 50 Mbps（up） LTE-TDD：Max130Mbps（Download）/Max 30 Mbps（up） WCDMA：384Kbps（Download）/Max384Kbps（up） TD-SCDMA：Max 4.2Mbps（Download）/Max 2.2 Mbps（up） EDGE：296Kbps（Download）/Max236.8Kbps（up） GPRS：107Kbps（Download）/Max85.6Kbps（up）
SIM card	voltage: 3V, 1.8V; Size: large card (small card can be purchased to use)
Antenna port	50 Ω /SMA suction cup antenna.
6808-5 (Ethernet) Parameters	
Ethernet	10/100M adaptive Ethernet can be connected
Environmental requirement	
Operating temperature:	-40~85℃
Storage temperature:	-45~165℃
Humidity range:	5~95%Relative humidity

4. Hardware description

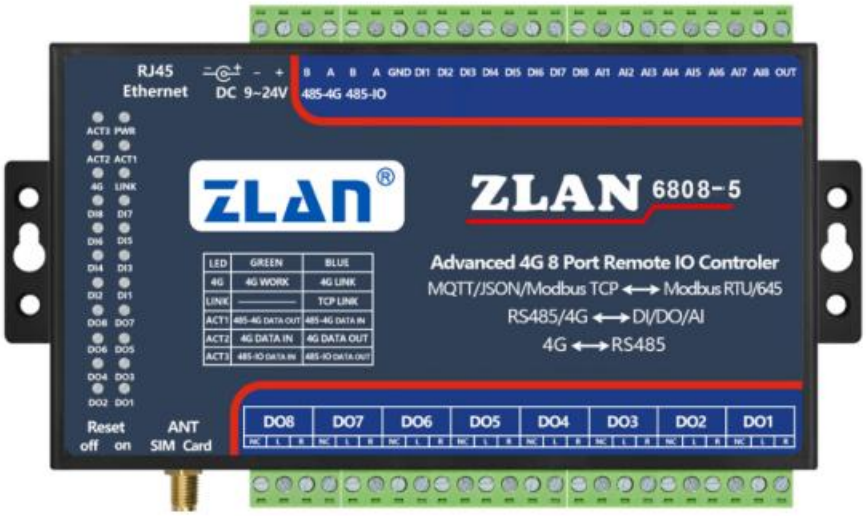


Figure 3 Ports on the ZLAN6808-5ZLAN6808-5 are shown as follows:

Table 1 Ports on the upper side

terminal	Feature
RJ45/Ethernet	10M/100M Ethernet interface for remote IO control over TCP/IP.
DC	DC plug type power input, supply voltage 9 ~ 24V
Power	Terminal type power input, power supply voltage 9 ~ 24V, and DC terminal can be selected to intervene the power supply.
485-4G	RS485 port for transparent transmission of network and serial port, realizing the function of serial port server.
485-IO	RS485 port used to control device I/O and collect DI and AI information.
GND	When entering a dry node, switch the jumper between this terminal and DI1 to DI8 to collect the switch status.
DI1～DI8	8 switch inputs
AI1～AI4	Four 0 to 5V voltage inputs
AI5～AI8	Four 4 to 20mA current inputs
OUT	Test output point, can output 5V level, generally not used.

ZLAN6808-5 Lower ports:

Table 2 Ports on the lower side

Interface	function
ANT	The antenna interface adopts 50 Ω /SMA (female head), and the external antenna must use an antenna suitable for 4G operating band. Zoran can provide a glue stick or a suction cup antenna, which can be sucked into the metal enclosure (the default suction cup antenna lead length is 1.5 meters).
Reset	After you dial ON, the TCP indicator blinks, and then dial back. The device restores to the default Settings.
SIM Card	When installing the SIM card, ensure that the device is not powered

	on. Use a pen tip or screwdriver to push the SIM card out of the slot and push the SIM card face down into the slot.
DO8～DO1	R and L represent the 2 contacts of the relay respectively, where 8 relay outputs are represented. The NC is not connected.

1. 8 Digital Input DI1 to DI8.

Passive switching (dry nodes) and active levels (wet nodes) are supported. The dry node only needs to short-circuit it with GND to collect the 1 signal. When the node is wet, the difference between the active level and GND is as follows:

VCC voltage	Low level range	High level range
24V	0～17V	17～24V
9V	0～3V	3～9V

2. Eight digital output DO1 to DO8.

The output type is relay output (5A@AC250V/DC30V). Setting 1 indicates that the relay is closed.

3. 8 Analog input: The accuracy is 12 bits. By default, the first four inputs are 0 to 5V, and the last four inputs are 4 to 20mA. Any path can be modified in the following way (need to be customized) :
   1) Current signal input: 4~20mA.
   2) Voltage signal input: 0~5V.
   3) Voltage signal input: 0~10V.
   4) Resistance impedance input: such as 0~10k or resistance type temperature and humidity sensors.

   Both voltage and current are relative to GND.

4. Panel light of ZLAN6808-5

Table 3. Indicators

Pilot lamp	Indicator name	green	blue
PWR	Power indicator light		
ACT3	IO communication light	485-IO Interface	485-IO interface data

		data input	is returned, indicating that the sent IO control instruction was correctly identified.
ACT2	Network/telecommunication indicator	The network end (such as 4G) receives data	The network end sends data;
ACT1	Serial communication indicator	485-4G Data output of the RS485 port	This indicator blinks during initialization, indicating that during initialization, the indicator is turned off after initialization.
4G	4G connection indicator	Green nonsense	485-4G RS485 port Data input
LINK	TCP connection Indicator	Indicates that the network cable is properly connected.	Blinking blue indicates that the dial is in progress. Steady blue indicates that the dial is successful. The dial starts 5 seconds after the system is powered on.
DI1 ～ DI8	DI indicator light	On indicates that the input is low or closed.	
DO1～ DO8		On: The relay is closed.	

5. DI/DO/AI Function description

5.1 Connecting Devices Using Vircom

Power on the device and connect the 485-IO port and network port (if the Ethernet port model is the same).

Please download ZLVircom1.605 and above.

Open the main screen device management, if the Ethernet interface model, click the "automatic search" button to find the device, click one of the devices, and then click "IO Controller". For an RS485 port device, tap IO Controller.

Figure 4 How do I go to the IO Controller dialog box

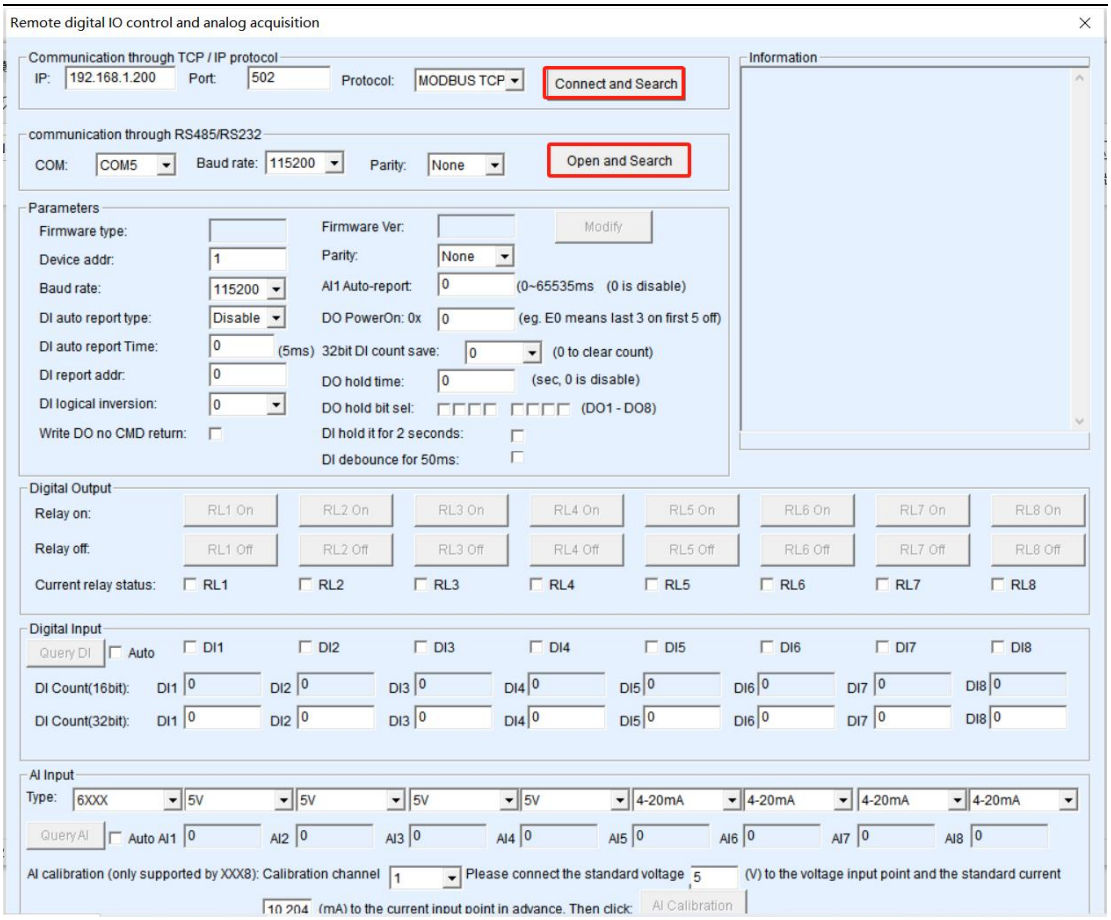


Figure 5 IO Controller dialog box

If it is a network type device, you can connect the device through the "Connect and Search" or "Open and Search" button. It corresponds to the communication in network mode and RS485 mode. For devices in serial port mode, you can only open and search the device in serial port communication mode.

For the network mode, the IP address and port | conversion protocol are already obtained when you select the device, just click "Connect and search". When the TCP connection is established, Vircom obtains the parameters of the device by sending Modbus TCP instructions. In some applications, you can also set the Modbus RTU protocol to communicate through the network port. At this time, you need to double-click the network device in the previous dialog box and change the "conversion protocol" to "none" to support Modbus RTU mode network communication.

For RS485 mode, only need to select the corresponding USB to 485 com port

(connected to the serial cable on the computer in advance), do not need to select the baud rate. If the parity bit has been set before, select the corresponding parity bit. Then click "Open and search". After com port is opened, the parameters of the device are obtained by software Modbus RTU command.

In either case, the device gets the parameters and displays them in a dialog box. Later, you can modify parameters, DO control, DI read, AI read and other tests.

5.2 General Table of Modbus registers

Network interfaces support Modbus TCP commands, and serial ports support Modbus RTU commands. The specific registers and address ranges are as follows:

Table 4. Summary of Modbus registers

Function code	Feature	Address range（ 6042/6002A 4 DI/DO 2AI）	Address range（ 6842/6802/6808-5 8 DI/DO 8 AI）
01/02	Read DI	0~3	0~7（对应 DI1~DI8）
01/02	Read DO	16~19	16~23
05	Set DO	16~19	16~23
15	Set multiple DO	16~19	16~23
04	Read AI	0~1	0~7
04	Read AI high precision values	0~1	32~39
03	Read base parameter	63~67	63~67
03	Read spread parameter	69~84	69~84
03	Read DI 16 bits count	0~3	0~7
03	Read DI 32 bits	256~263	256~271
06	Set parameters	69~84	69~84
06	Set extension parameters	69~84	69~84
06	Set the DI 16-bit	0~3	0~7

	count		
06	Set the DI 32-bit count	256~263	256~271
16	Set the multi-DI 16-bit count	0~3	0~7
16	Set the multi-DI 32-bit count	256~263	256~271
16	Set basic parameters	63~68	63~68
16	Set extension parameters	69~84	69~84

The specific usage is introduced later.

5.3 DO Usage Instructions

DO is the control relay, through Modbus 05/15 instruction (force single coil instruction), write 1 to 16~23 register to pull the relay, write 0 to disconnect the relay. By reading the values of registers 16 to 23 with the 01 instruction, the current DO state can be obtained.

05 Command format is as follows:

Number of bytes	1	1	1	1	1	1	1	1
Name	Device address	05	Start address high	Low start address	Ff or 00	00	CRC high	CRC low

For example, the Modbus RTU command that sets DO1 to be on is:

send-> 01 05 00 10 **ff 00** 8d ff

Back-> 01 05 00 10 **ff 00** 8d ff

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 05 00 10 **ff 00**

Back-> 00 00 00 00 00 0601 05 00 10 **ff 00**

For example, the Modbus RTU command that sets DO1 to be off is:

send-> 01 05 00 10 00 00 cc 0f

Back-> 01 05 00 10 00 00 cc 0f

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 05 00 10 00 00

Back-> 00 00 00 00 00 06 01 05 00 10 00 00

Other instructions are listed below:

- On DO2 01 05 00 11 ff 00 dc 3f
- Off DO2 01 05 00 11 00 00 9d cf
- OnDO3 01 05 00 12 ff 00 2c 3f
- Off DO3 01 05 00 12 00 00 6d cf
- On DO4 01 05 00 13 ff 00 7d ff
- Off DO4 01 05 00 13 00 00 3c 0f
- On DO5 01 05 00 14 ff 00 cc 3e
- Off DO5 01 05 00 14 00 00 8d ce
- On DO6 01 05 00 15 ff 00 9d fe
- Off DO6 01 05 00 15 00 00 dc 0e
- On DO7 01 05 00 16 ff 00 6d fe
- Off DO7 01 05 00 16 00 00 2c 0e
- On DO8 01 05 00 17 ff 00 3c 3e
- Off DO8 01 05 00 17 00 00 7d ce

16 Set multiple coils simultaneously in the following format:

Number of bytes	1	1	1	1	1	1	1	1	1	1
Name	Device address	0x10	Start address high	Low start address	High quantity	Low quantity	Number of bytes	Value (low bit on the right)	CRC high	CRC low

For example, the Modbus RTU command with the first four channels on and then four channels off is as follows:

send-> 01 0F 00 10 00 04 01 0F bf 51

Back-> 01 0f 00 10 00 04 55 cd

The Modbus TCP command is:

send-> 00 00 00 00 00 08 01 0F 00 10 00 04 01 0F

Back-> 00 00 00 00 00 06 01 0f 00 10 00 04

01 Read the DO status command

Number of bytes	1	1	1	1	1	1	1	1
Name	Device address	01	Start address high	Low start address	Length height	Low length	CRC high	CRC low

For example, the Modbus RTU instruction for reading 8 DO states is:

send-> 01 01 00 10 00 08 3c 09

Back-> 01 01 01 **0f** 11 8c

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 01 00 10 00 08

Back-> 00 00 00 00 00 04 01 01 01 **0f**

Here, 0F indicates that the first four channels are closed.

IO Controller dialog control demo:

Figure 6 DO control in the IO controller dialog box

After Vircom successfully connects the device, click RLx to turn on the relay. At the same time, the corresponding DO indicator light of the device is lit, and RL1 is ticked. The function of the RL1 selection box is to obtain the current relay state, because the TCP connection disconnection does not change the current relay state of the device, so when the first communication with the device is established, you can obtain the DO state of the device and then decide whether to close or disconnect.

Note: If there are more than 6808-5 in the same use environment, please configure different station addresses, otherwise the return instruction of the DO control will be

used as the control instruction of another device, and then it will return a same instruction, so repeatedly oscillating.

5.4 DI Usage Instructions

If the read DI is used, the 01 command is used. The address range is 0 to 7, corresponding to DI1 to DI8. The instruction format is as follows：

Number of bytes	1	1	1	1	1	1	1	1
Name	Device address	01	Start address high	Low start address	Length height	Low length	CRC high	CRC low

For example, the Modbus RTU instruction for reading 8 DI is:

send-> 01 01 00 00 00 08 3d cc

Back-> 01 01 01 **80** 50 28

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 01 00 00 00 08

Back-> 00 00 00 00 00 06 01 01 01 **80**

When the DI input is low (note that when the power supply voltage of the device is above 12V, the 5V voltage input is considered low), the corresponding bit returned is 1, and the fourth byte in the return command is 0x80, indicating that the eighth circuit is closed (low).

IO Controller dialog control demo:

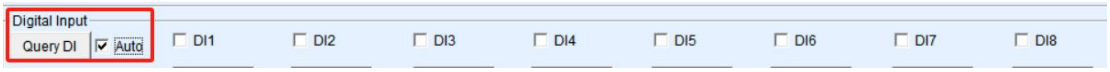


Figure 7 DI read in the IO controller dialog

After Vircom successfully connects to the device, click Query DI Status to query the DI status. When DI is high, the corresponding indicator is on and the corresponding bit returned is 1. Tick DI8 as shown in the figure, indicating that DI8 is in a high level state.

Click the "Automatic" selection box to automatically query the DI status every 1 second and display it.

5.5 DI Counting Instructions

A period when DI changes from high to low and back to high is counted as a count. DI counts are divided into three types: 16-bit count without storage, 32-bit count without storage, and 32-bit count with storage. If no storage device starts from 0 after a pointer is dropped, it keeps counting after a pointer is powered off. Among them, 32-bit no storage count and 32-bit stored count are the same register location, but the Settings are different.

The DI count has been automatically added to the buffeting process, and the buffeting time is 10ms.

Through the Modbus 03 function code, you can read the 16-bit non-storage count by reading the register positions from 0 to 7, and the data is in big-endian format. Through the 03 function code, read 256~271 positions can read 32-bit count, data bit big-endian format.

Number of bytes	1	1	1	1	1	1	1	1
Name	Device address	03	Start address high	Low start address	Length height	Low length	CRC high	CRC low

For example, the Modbus RTU instruction for reading the 16-bit count of DI8 is:

send-> 01 03 00 07 00 01 35 cb

Back-> 01 03 02 01 0a 39 d3

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 03 00 07 00 01

Back-> 00 00 00 00 00 05 01 03 02 01 0a

Here register 7 is read and 01 0a of the returned data represents the value 266.

For example, the Modbus RTU instruction for reading the 32-bit count of DI8 is:

send-> 01 03 01 0E 00 02 a4 34

Back-> 01 03 04 00 00 01 14 fb ac

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 03 01 0F 00 02

Back-> 00 00 00 00 00 07 01 03 04 00 00 01 14

Here 00 00 01 14 represents the value 276.

IO Controller dialog control demo:

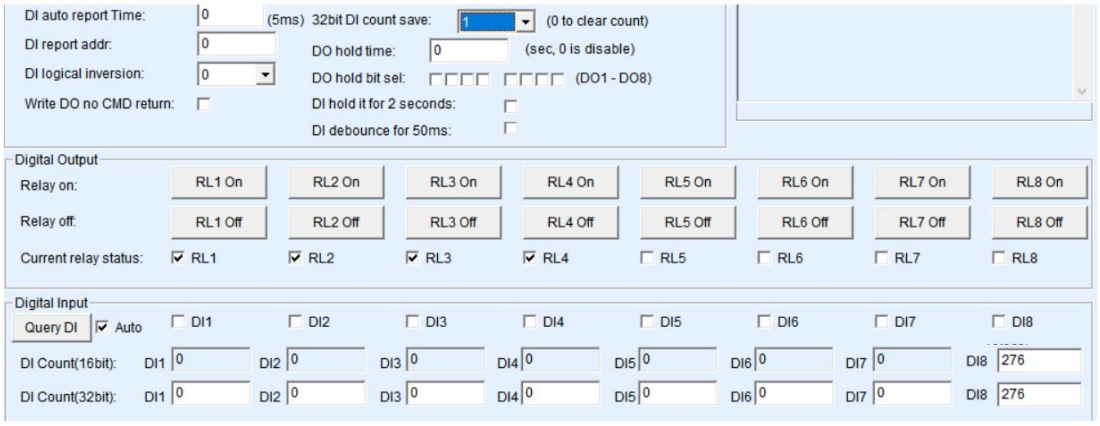


Figure 8 DI count read in the IO controller dialog

After Vircom successfully connects to the device, you can click "Query DI Status" to query the DI count value, including 16-bit and 32-bit values. It is found that the 16-bit and 32-bit values are different, because the 32-bit is stored in the power failure, and the 32-bit count has accumulated 10 values before the power on.

Use the "32-bit DI count save" function in the figure to save or not save the 32-bit count. If you want to clear the saved data, start counting again. You only need to set the "32 Save for DI count" function to 0 to clear the count.

5.6 DI Logical Inversion

In normal condition, when the DI input is low, the corresponding bit is 1. The default DI input is high and low is valid. If the DI input is high, the default bit is 1. If the DI input is low, the default bit is 0. In this case, you can select Logical DI Reversal.

DI reversal also affects the DI count, which is when DI changes from 0 to 1, that is, the high level changes to the low level. If the DI logic is reversed, the count increases by one when it changes from low to high.

The following table describes how to set DI logical inversion.

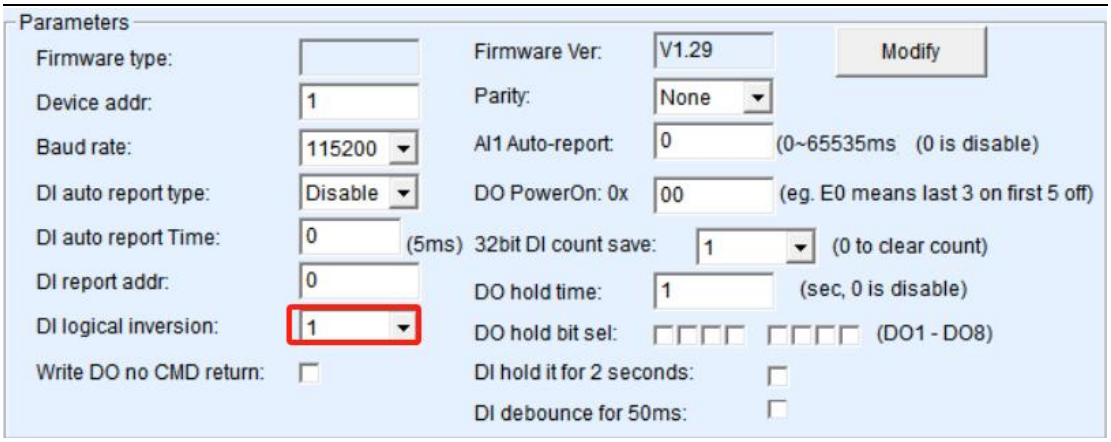


Figure 9 DI reversal Settings in the IO controller dialog box

5.7 AI Usage Instructions

AI can collect analog values of 0~5V, 0~10V, 4~20mA and other types. Which interface corresponds to which type is determined by the hardware at the factory. The above types of AI interfaces are defined as 5V, 10V, and 4 to 20mA respectively.

At present, standard products are divided into the following categories for AI, and the corresponding different types of AI are as follows:

Table 5 Different types of AI

Product Model	Details Model	A11	A12	A13	A14	A15	A16	A17	A18
6XX2	6802/6842/ 6042/6002A	5V	5V	5V	5V	4~20mA	4~20mA	4~20mA	4~20mA
6XX8	6808-5-1/-2/-3/ -5/-8/-7/-9	5V	5V	5V	5V	4~20mA	4~20mA	4~20mA	4~20mA
6XX2-A	6802-A 6842-A 6042-A 6002A-A	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA
6XX8-A	6808-5-1A/ -2A/-3A/ -5A/-8A/- 7A/-9A	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA	4~20mA
6XX2-5V	6802-5V 6842-5V 6042-5V 6002A-5V	5V	5V	5V	5V	5V	5V	5V	5V

	6808-5-X5V								
6XX2-10V	6802-10V 6842-10V 6042-10V 6002A-10V 6808-5-X10V	10V	10V	10V	10V	10V	10V	10V	10V

Use Modbus 04 instruction to read the value of register 0~7, you can get the value of AI1~AI8. Data is stored in big-end format.

Number of bytes	1	1	1	1	1	1	1	1
Name	Device address	04	Start address high	Low start address	Length height	Low length	CRC high	CRC low

For example, the Modbus RTU instruction to read the value of AI8 is:

send-> 01 04 00 07 00 01 80 0b

Back-> 01 04 02 01 82 38 c1

The Modbus TCP command is:

send-> 00 00 00 00 00 06 01 04 00 07 00 01

Back-> 00 00 00 00 00 05 01 04 02 01 82

The specific use of the returned data 01 82 is related to the type of AI. If 01 82 is converted to decimal, it is Vin=386. For different AI types, the formula is as follows:

- 5V：True voltage value = (Vin/ 1024)*5=1.8848;
- 10V：True voltage value = (Vin/ 1024)*10=3.7695;
- 4~20mA：True current = (Ain / 1024)*5/200*1000=9.4238;

IO Controller dialog control demo:

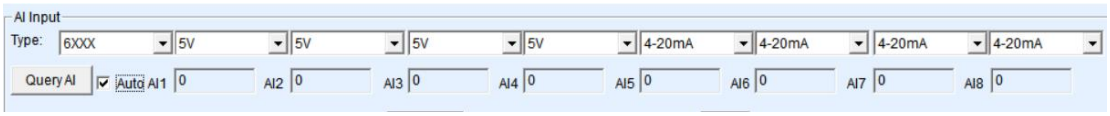


Figure 10 AI read in the IO controller dialog

After Vircom successfully connects the device, you can click "Query AI status"

to query the AI value, or click "Automatic" to query once a second. Before the query, you need to select the purchased model. After selecting the model, the analog interface type of AI1~AI8 is automatically configured according to the standard configuration, so that the real voltage or current value of the interface can be displayed in the numerical dialog box.

5.8 AI uses with high precision

ZLAN6808-5 provides a higher precision AI numerical calculation method. Compared with the ordinary accuracy, no small fluctuations are automatically filtered to 0 voltage, and no small changes in the value are automatically set to the last collection voltage. So the voltage value can be more realistic, but there may be more noise.

Read the contents of 32~39(0x20~0x27) registers using the 04 function code to obtain AI high precision values. The data format is big-endian. This is a 12-bit effective precision value Vh.

The method of calculating the input point voltage is as follows:

Vi = ((((Vh)/1024)-1.0)*(Vri)*2.0)

The calculated input point current is:

Ii=((((Vh)/1024)-1.0)*(Vri)*2.0)/200

Vi (i=1 to 8) is the adjustment coefficient of each route. The default value is 1.0. Registers starting from 0x4a to 0x59 (74 to 89 decimal) can be read using the 03 function code to obtain floating-point (float) large-endian data corresponding to V1 to V8, respectively. For example, float data of 1.063 reads the result as 0x3F88 1062 hexadecimal.

For example, read the adjustment factor of A8:

send-> 01 03 00 58 00 02 45 d8

Back-> 01 03 04 **3f 80 00 00** f7 cf

Where 3f 80 00 00 means 1.0.

Read the Vh of route 8 again:

send-> 01 04 00 27 00 01 81 c1

Back-> 01 04 02 **07 c7** fa 92

Where 07 c7 represents 1991, the voltage obtained by bringing into the formula is:

((((1991)/1024)-1.0)*(1.0)*2.0)= 1.8887。

Vi adjustment coefficient is calibrated after the factory, which can ensure the accuracy of the calculated value of the product.

5.9 The DI is reported automatically

The 6808-5 is a standard MODBUS device and is used in a question-and-answer format, but some users want to get feedback as soon as the DI input changes, that is, the active return function. This section describes the active reporting function of 6808-5. As shown in the figure, set Enable active DI reporting to 1 to enable active DI reporting. The IP address reported by the DI must not be the same as the device IP address. Otherwise, the 05 command is indistinguishable from the return command controlled by the DO.

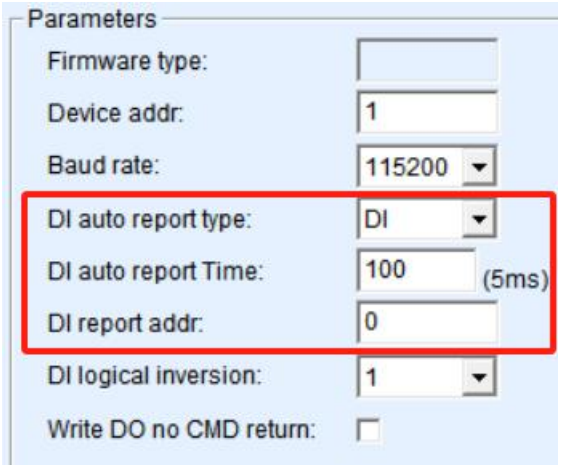


Figure 11 DI actively reports Settings

When the DI status changes, the DI sends the 05 command after active reporting

is enabled. The 05 command can realize the function of the change of DI to control the trigger of the DO of another Modbus device.

Number of bytes	1	1	1	1	1	1	1	1
Name	DI report address	05	Start address high	Low start address	Ff or 00	00	CRC high	CRC low

Examples are as follows:

DI1 Change to high input

00 05 00 10 00 00 CD 2E

DI1 Change to low input

00 05 00 10 ff 00 8C 2E

DI2 Change to high input

00 05 00 11 00 00 9C 1E

DI2 Change to low input

00 05 00 11 ff 00 DD EE

DI3 Change to high input

00 05 00 12 00 00 6C 1E

DI3 Change to low input

00 05 00 12 ff 00 2D EE

DI4 Change to high input

00 05 00 13 00 00 3D DE

DI4 Change to low input

00 05 00 13 ff 00 7C 2E

When Vircom is used to test, the DI is actively reported to update the current DI status. The DI initiative report is sent to both 485-IO and the network (Ethernet, 4G, LoRa, etc.).

When the active reporting time is set to 0, the active reporting time is disabled. When the active reporting time is set to 1, the active reporting of DI changes is enabled. If the value is set to another value, it will be reported periodically. If the value is set to an even number, eight DI's are reported periodically based on 15 commands. If the value is set to an odd number, the DI and AI report at the same time. For details, see the following section in this chapter. If this parameter is set to n and n is a non-zero even number, the DI report time is (n-1) x 5 seconds. For example, configure the first four DI lines to be short connected to GND and the last four lines to be suspended to send the DI to the GND.

Send-> 01 0F 00 10 00 04 01 0F bf 51

5.10 AI's active reporting

The active reporting function of AI is to enable the collected analog quantity to be automatically sent to the upper computer. This method does not need Modbus instruction query on the host computer, and is very useful for network analog monitoring based on Internet.

The value ranges from 0 to 65535. The unit is ms. If the value is set to 0, active reporting is disabled. You can directly set this parameter in the IO controller dialog box.

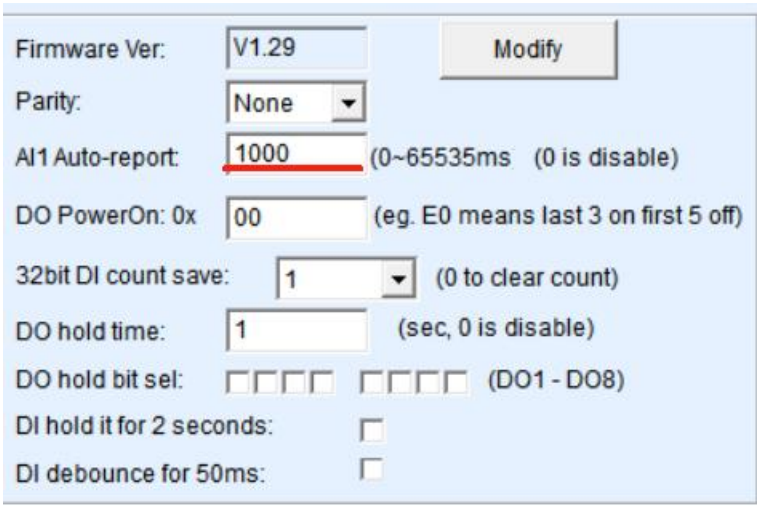


Figure 12 Setting the AI active reporting time in the IO controller dialog box

The instructions actively uploaded by AI are:

- Conversion protocol to Modbus RTU ：01 04 10 H1 L1 H2 L2 H3 L3 H4 L4 H5 L15 H6 L6 H7 L7 H8 L8 C1 C2。
- Conversion protocol to Modbus TCP：：00 01 00 00 00 13 01 04 10 H1 L1 H2 L2 H3 L3 H4 L4 H5 L15 H6 L6 H7 L7 H8 L8

Here H1 L1 represents the collection amount of A1, H2 L2 represents the collection amount of A2, and so on, in big-endian format. C1 and C2 are CRC.

If there is a device parameter search before the AI initiative report, the AI initiative report will pause for 5 seconds, which can prevent the AI initiative report and parameter search conflict.

5.11 The DI and AI are uploaded at the same time

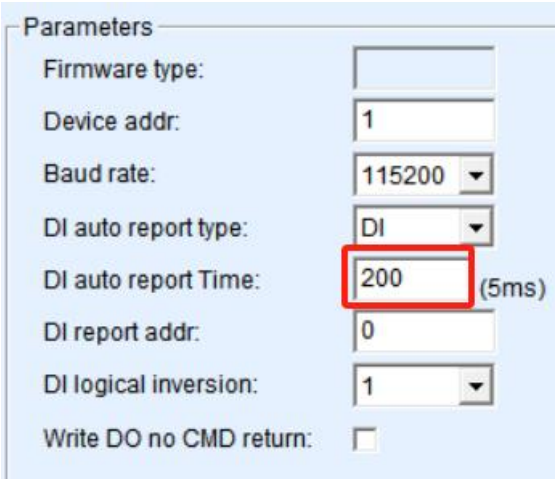


Figure 13 DI and AI actively report Settings at the same time

In the software, if the value of DI active reporting is set to greater than 1 (2 to 255), the value -1 multiplied by 5 is the period for reporting AI and DI. For example, if the value is set to 201, the reporting period is (201-1)*5=1000ms.

This function allows the current AI and DI values to be reported at the same time. The Modbus RTU format is as follows:

00 04 12 03 01 00 00 00 00 00 00 00 00 00 00 03 07 03 08 00 08 c3 83

The first 00 is set for the DI report address. The 04 function code is used to report eight AI registers and eight DI data. 03 01 indicates the data of AI1, and 03 08

indicates the data of AI8. 08 indicates the state of eight DI's. 08 indicates that route 4 is 1.

When the AI and DI report at the same time, the data of the AI and DI can be viewed on the IO controller page at the same time. In this case, you do not need to click Automatic to query the data. AI and DI actively report to 485-IO and network (including Ethernet, 4G, LoRa, etc.) at the same time.

If a device parameter search is performed before the DI and AI report, the DI and AI report will be paused for 5 seconds to prevent a conflict between the DI and AI report and parameter search.

5.12 DO Status After Power-on

Sometimes you want the IO controller to be in the on or off state immediately after powering on. Now you can set this function through the IO Controller dialog box.

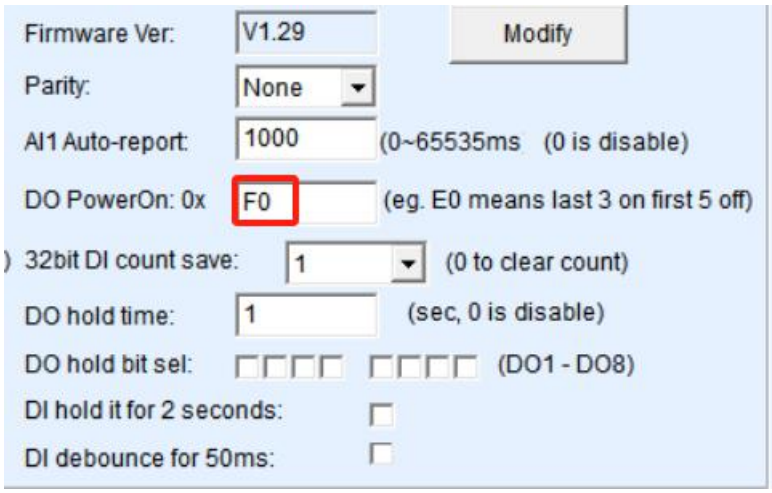


Figure 14 Setting DO configuration after power-on

If the value is set to F0, the front four channels are disconnected and the back four are closed. Each of the eight bits indicates the status of a DO line, and 1 indicates a pull-in.

5.13 DI Controls the DO

Considering that the user needs to control the DO output through the DI input, but the DI input device and the DO output device are far apart, here we take the

Ethernet version as an example, we can connect the two 6808-5 through the Ethernet network to achieve DI remote control DO output.

Since DI active reporting is reported when changes are made, this can be used to send control instructions. The control instruction can set the station address of the controlled device /DO device through "DI report address", and the DI report instruction is exactly 05 set instruction, and the register address will be changed to the address corresponding to DO. Therefore, the DI input can control the DO of another device through active reporting.

For example, DI1 of device 1 controls DO1 of device 2, DI2 of device 1 controls DO2 of device 2, and so on. 6808-5 other sub-models are the same reason, here is not to go into details.

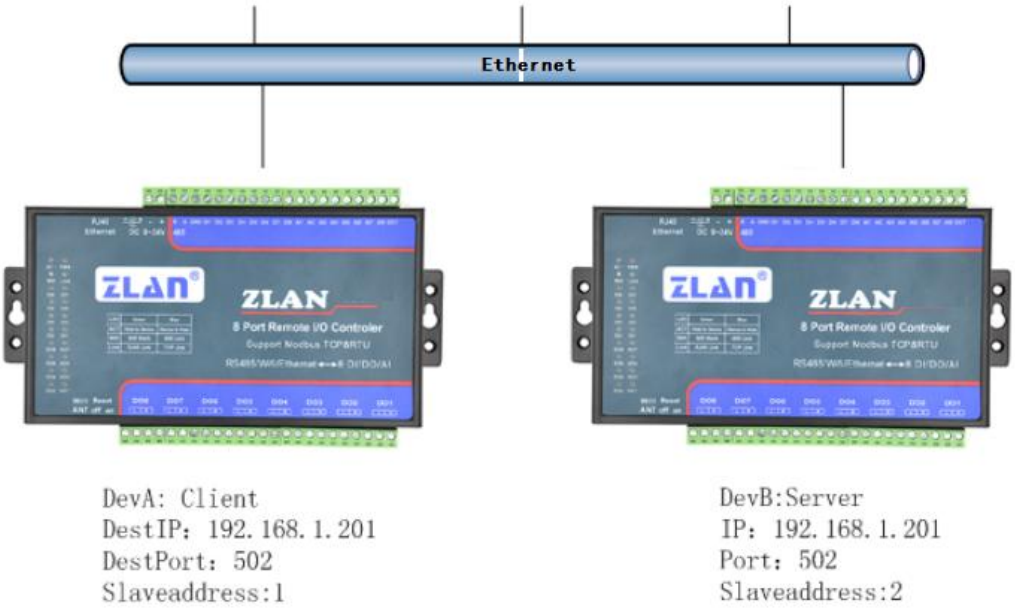


Figure 15 6808-5 Connection control

As shown in the figure, the two 6808-5s are connected together via Ethernet. First, you need to set the two 6808-5 parameters, including the report address and whether to report.

Connect device DevA and search for it in the IO controller dialog box. Set device address to 1. Enter 1 in "Report or Not" to enable this function. DevA Settings are complete.

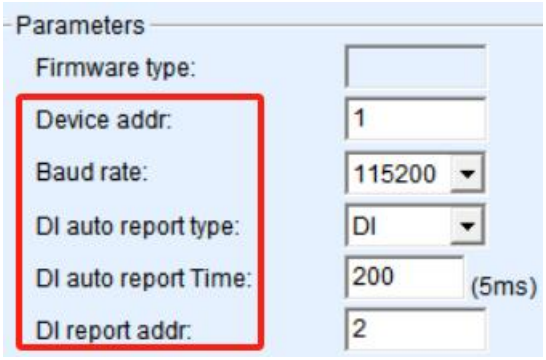


Figure 16 DevA configuration

Then connect the device DevB, search for and set the device address to 2, report whether to set to 1, and report the address to 1 (DevA). With this setup, DevA sends a control DO command to DevB when the DI changes. Similarly, DevB sends a control command to DevA for changes in DI.

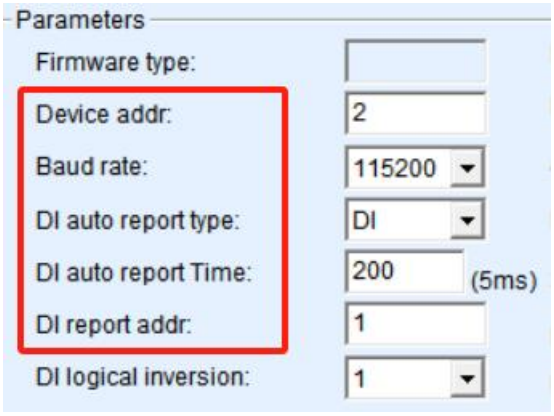


Figure 17 DevB configuration

If you are communicating over a network, configure the DevA and DevB network parameters to establish a TCP connection. DevB works in server mode and sets the working IP address and port. DevA acts as client mode and sets the destination IP address and port of DevA to the IP address and port of DevB.

If the communication is over RS485, you only need to connect the 485-IO serial ports of DevA and DevB.

5.14 DO Data Retention Function

The V16 start version of ZLAN6808-5 supports the DO hold function, that is, if the DO is in the closed state, it needs to continue to give the instruction set to 1, and

once the instruction set to 1 is not received within a certain period of time, it immediately disconnects the DO.

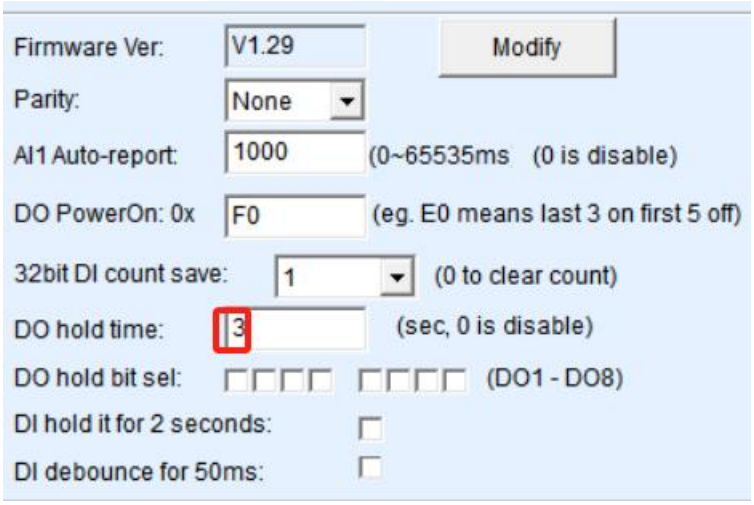


Figure 18 DO hold time

As shown in the figure, if the IO controller software is used, the DO hold time is set to 3 seconds.

Active DI reporting and DO holding time work together to implement reliable DI control DO. The DO terminal is shown in the figure above. Set the address of the station to 2. The DI terminal is set as follows:

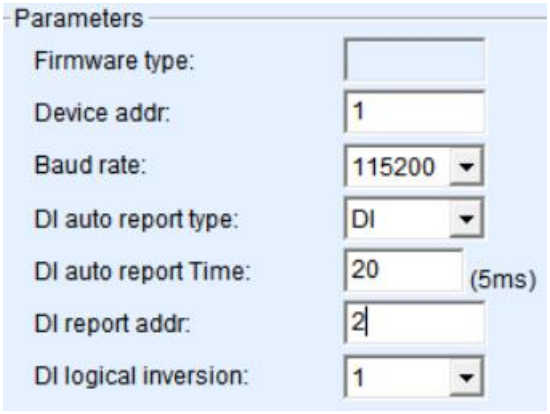


Figure 19 Reliable DI control DO

The site address of the DI device is set to an address other than 2. The DI automatically reports the address as the address of station 2. Set the same baud rate and set the DI report type to DI (that is, the report time is an even number that is not 0). Then adjust the reporting time to 20, and the actual time is 20*5=100ms.

According to the section "DI Report", after the DI report type is set to "DI", eight DI data are uploaded at intervals to implement the DO corresponding to DI control. In this case, the value is 100ms. In this way, the DO end can receive the corresponding instruction that the DO is set to 1. If the DI end is offline or powered off, the DO end will disconnect the DO relay within 3 seconds.

6. Set serial port parameters

Current serial port parameters include baud rate and parity. Set this parameter in the IO Controller dialog box.

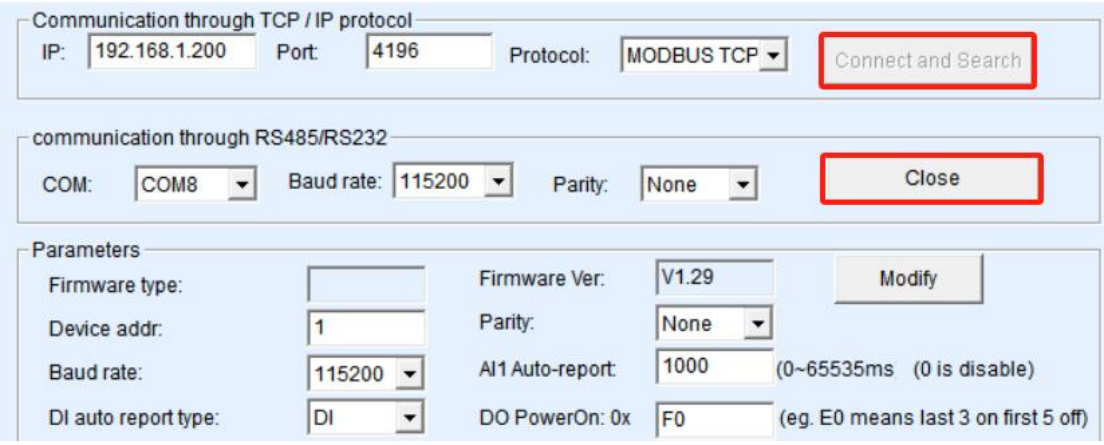


Figure 20 Configuration of serial port parameters in the I/O controller

The baud rate affects only the 485-IO RS485 interface. The baud rate of the network interface and 485-4G is determined by the baud rate set by the network module, 4G module and LoRa module. Not limited by this baud rate.

When communicating through a serial port, it is not necessary to select the appropriate baud rate, because the software will automatically search for all baud rates.

However, the setting of the parity bit can affect the 485-IO serial port, 485-4G serial port, and network module. That is, when the parameter of the ZLAN6000 series is set to parity (not parity), the parity bit of the network module needs to be changed accordingly. Otherwise, the "Open" button of "Network Communication" cannot be opened successfully. You can modify the serial port check bit of the network module in the Edit Device dialog box. As shown in the following picture.

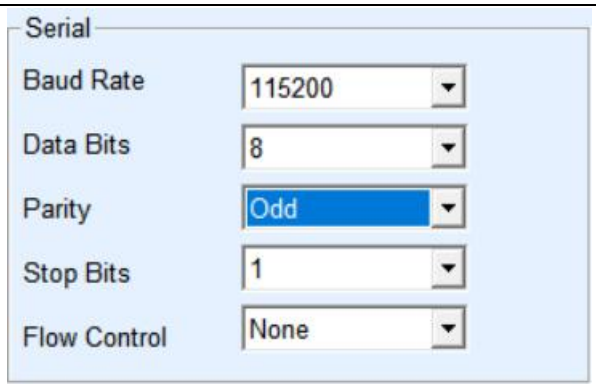


Figure 21 Check bit Settings of the network module

After the parity bit is changed, the parity bit of the 485-IO control device and the 485-4G serial port will be changed accordingly.

Note: When the verification mode is set to Non-None, the verification mode must be selected when the serial port is opened to search for devices. Otherwise, the corresponding device cannot be found. Otherwise, if the device is in No verification mode, you need to search for the serial port in No verification mode. That is, serial port search does not support automatic check bit search. You must specify a check mode.

7. Network-to-serial port function

For different models, the network here can refer to Ethernet, 4G, etc. Different models have different internal communication modules, 6808-5 RS485-4G RS485 interface implementation and network data transparent transmission. Serial port to Ethernet, serial port to 4G.

The baud rate of RS485-4G is adaptive through the serial port parameters of the network module, and is not set. Currently, the baud rate ranges from 1200 to 115200bps and various parity bits are supported.

Users can connect RS485 devices such as meters to the RS485-4G interface. Data can be read and written to the instrument through the network.

8. Configuration method

8.1 Configuration over a Serial Port

Click device management and select serial port search, as shown in Figure 24, the interface for selecting serial port parameters will pop up, as shown in Figure 25, select serial port number, here is COM8, baud rate is 115200, 115200 here is the factory default setting, if the user previously set 6808-5 to other baud rate (such as 9600), you can also search.

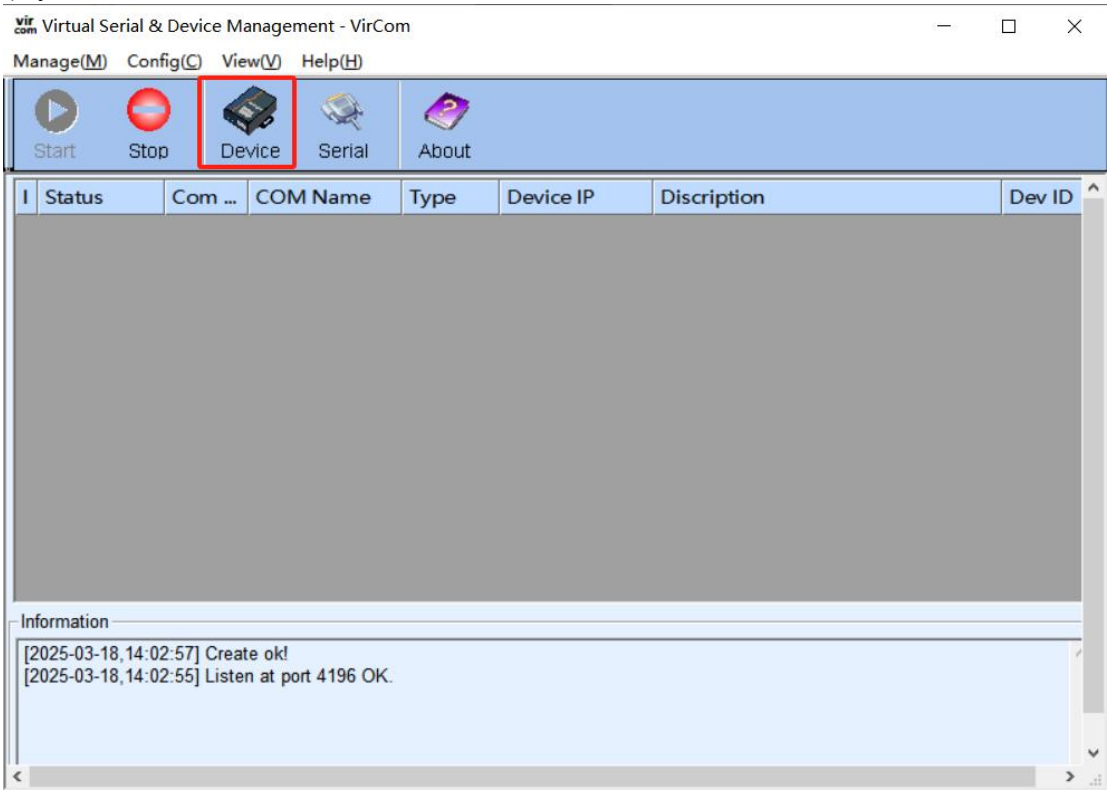


Figure 22 Configuration tool main page

Figure 23 Serial port search page

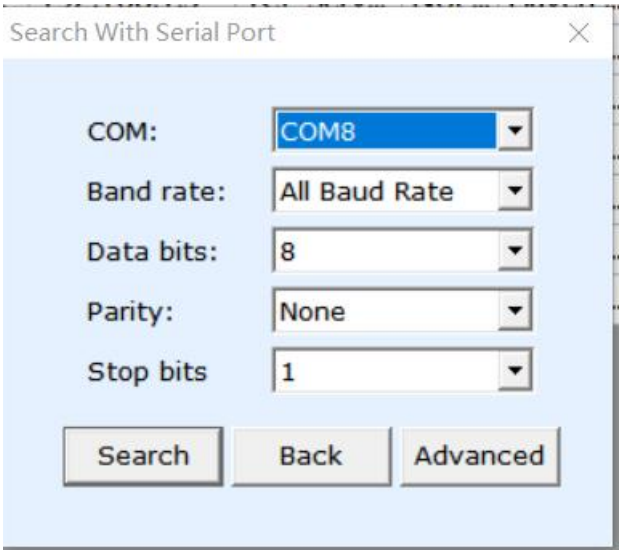


Figure 24 Serial port parameter page

In this case, the configuration tool attempts to communicate with the device. If the communication succeeds, the configuration page is displayed. As shown in Figure 26 below:

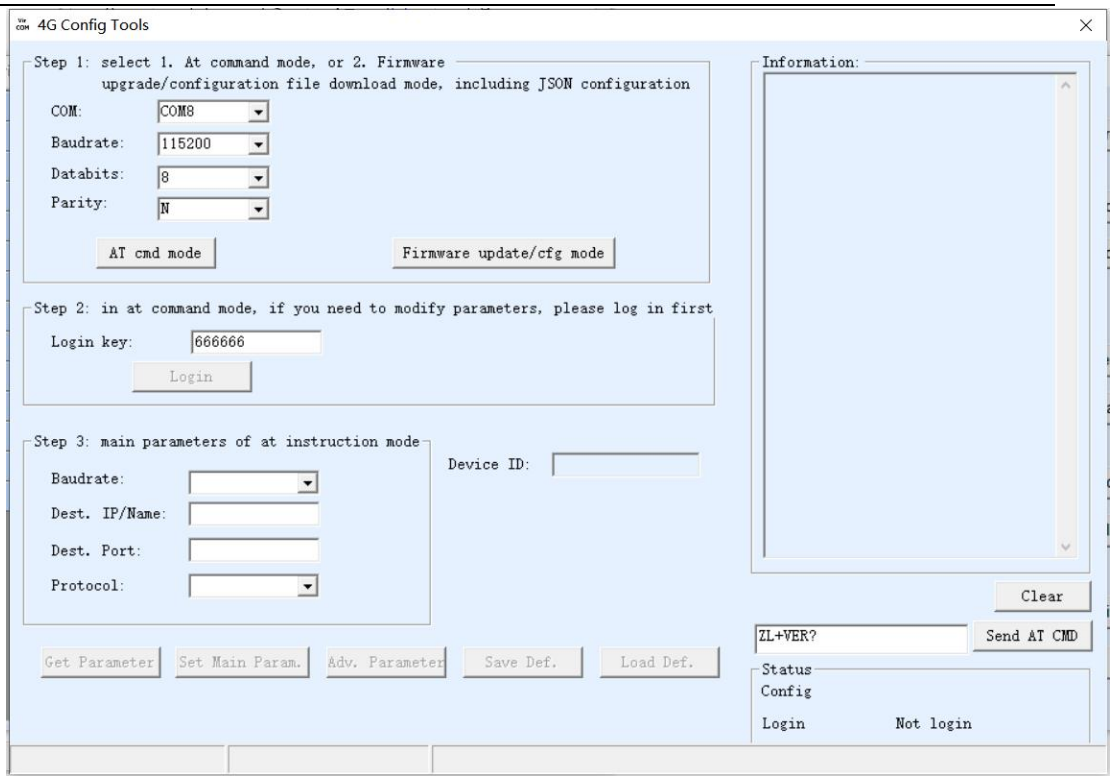


Figure 25 ConfTool interface

Click to enter the AT command mode, the configuration tool will try to communicate with the device, the communication is successful, the AT command return information will be displayed on the right side, and the configuration mode will be displayed as having entered the configuration mode, as shown in Figure 27 below:

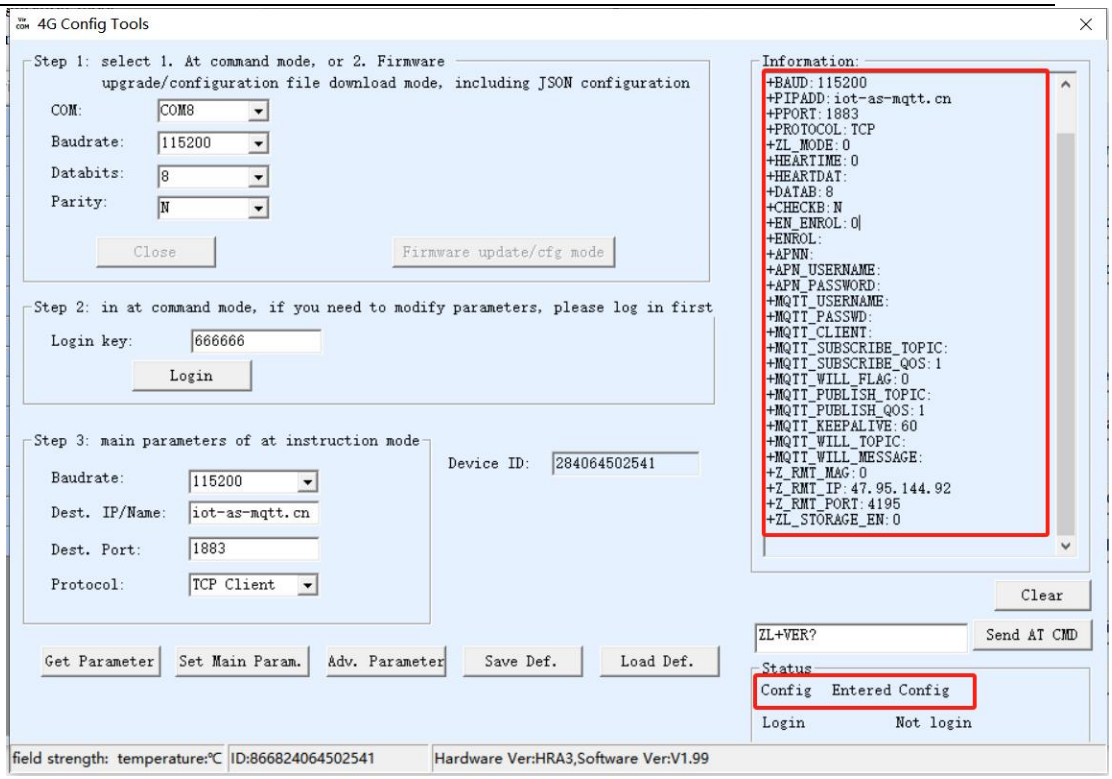


Figure 26 The Configuration mode page is displayed

The default login password is 666666. Before you click Log In, the parameters are read-only and cannot be set or modified. Click the "Login button" :

After LOGIN, the login status changes to Logged in, and +LOGIN OK is displayed on the right, as shown in Figure 28.

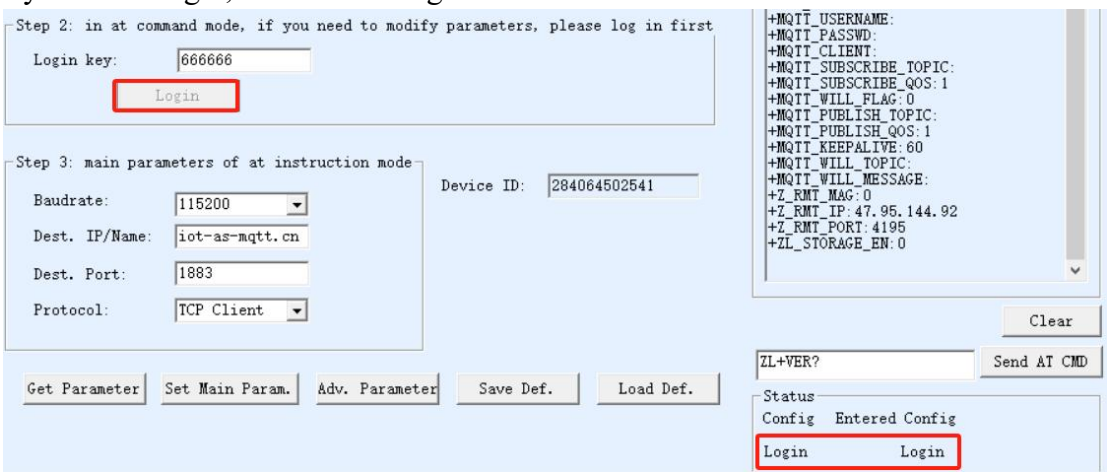


Figure 27 Login page

The main parameters of the AT command mode include the baud rate, destination

IP address, destination port, and protocol. Protocol TCP or UDP is supported. After modifying the corresponding parameters, click "Set parameters" to set the new parameters to the device, and the device will return the parameters successfully set, as shown in Figure 29.

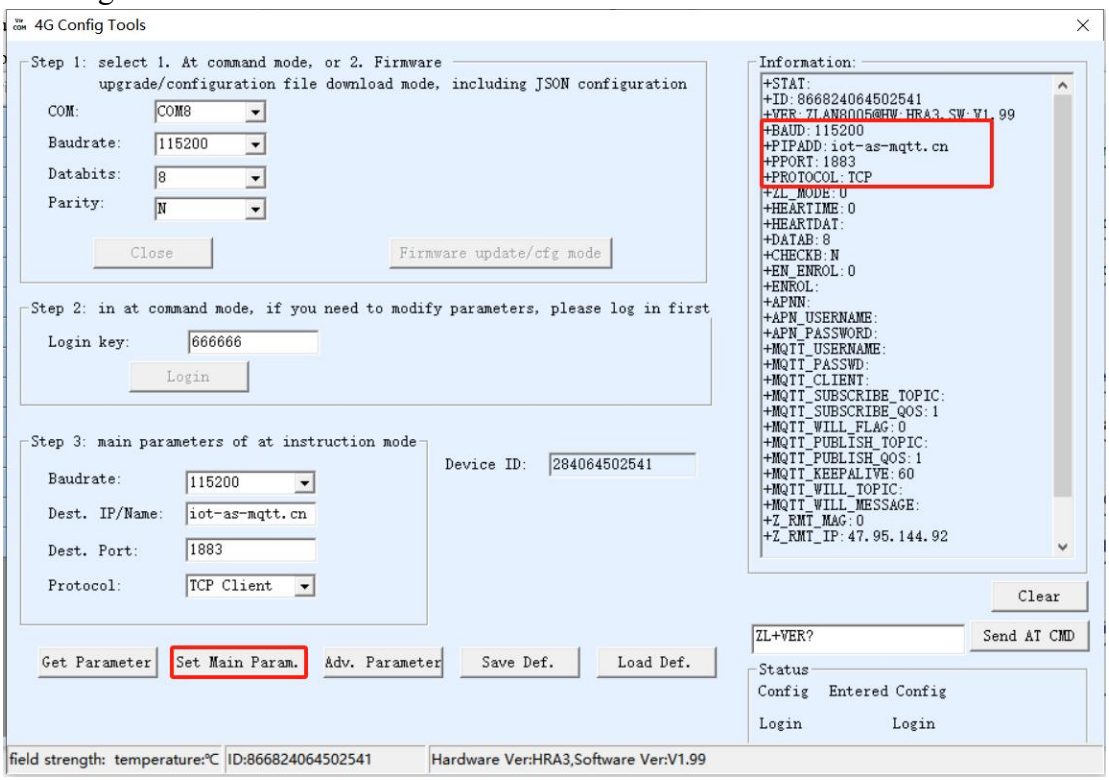


Figure 28 Setting parameters

The "Get Parameters" button can obtain the parameters of the current device, which is obtained by sending the AT instruction. The returned data of the AT instruction is listed on the right. For AT directives, refer to the other sections of this article. Because the "Get parameters" will be automatically executed once after the "open" is successful, it is generally not necessary to click the "Get parameters" button.

Click "Advanced Parameters", and the advanced parameters box is shown in Figure 30. Commonly used parameters are:

1. Heartbeat interval: You can set the heartbeat packet interval to 15s.
2. Heartbeat content: Set the heartbeat packet content.
3. Serial port data bit

4. Serial port verification bit
5. Enable the registration package: Whether to enable the registration package.
6. Registration package content: The content of the registration package sent after connecting to the server.
7. APN: indicates the APN access point name.
8. APN User name
9. APN password
10. MQTT parameters: Set parameters for accessing the MQTT server
11. Remote device management: Connects devices with the remote management function to the remote server

After selecting the parameters, click the button of "Effective Advanced Parameters" and observe the information bar on the right to check whether the Settings returned by the device are consistent with the information filled in, as shown in Figure 31.

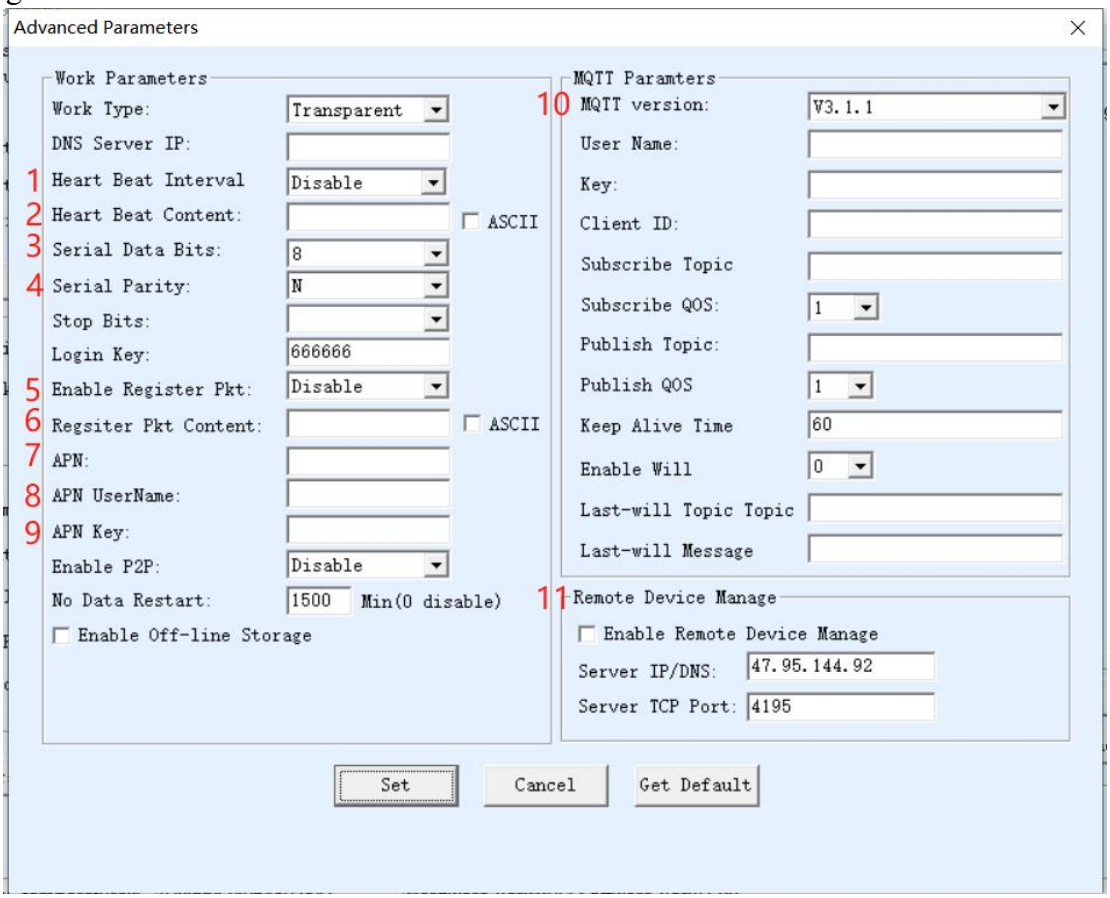


Figure 29 Advanced parameters

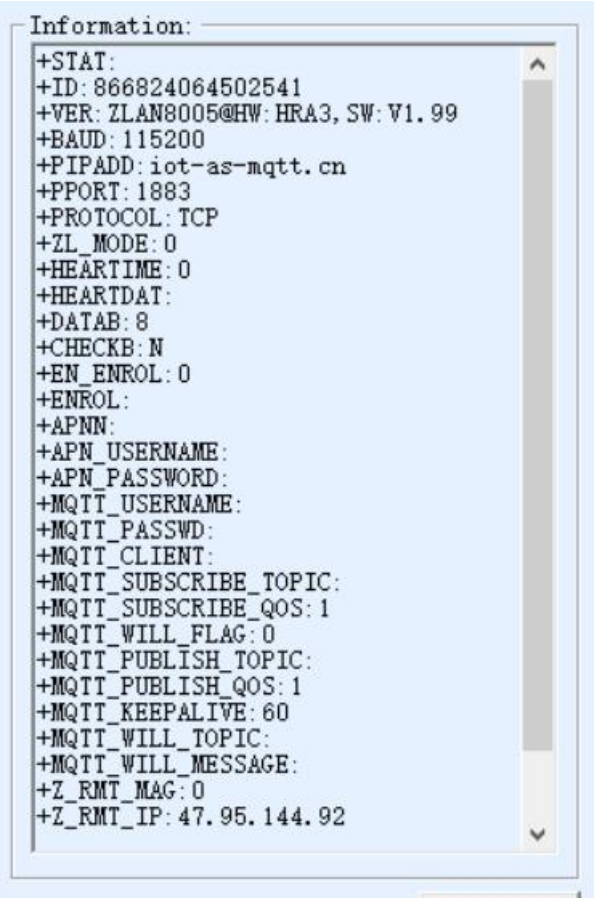


Figure 30 Setting Advanced parameters Return information

8.1.1. Server transparent transmission test

Assuming the following networking structure as shown in the following figure, 8305 is configured to connect to the server ***.***.***.***.***. For details, see section "Configuration Methods". After the configuration is complete, it takes 20 to 40 seconds to connect to the server.

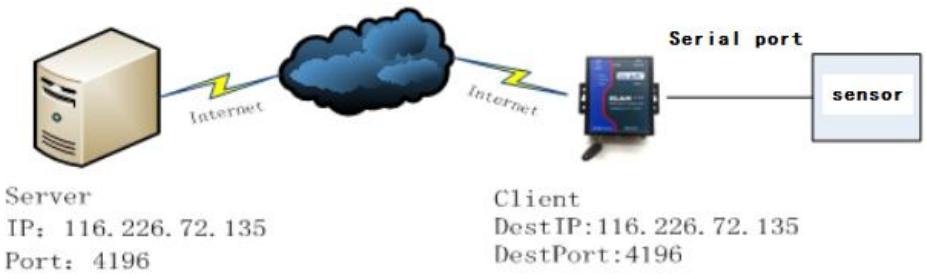


Figure 31 Network structure diagram

We run the TCP tool SocketDlgTest on the server（http://www.zlmcu.com/document/tcp_debug_tools.html）。

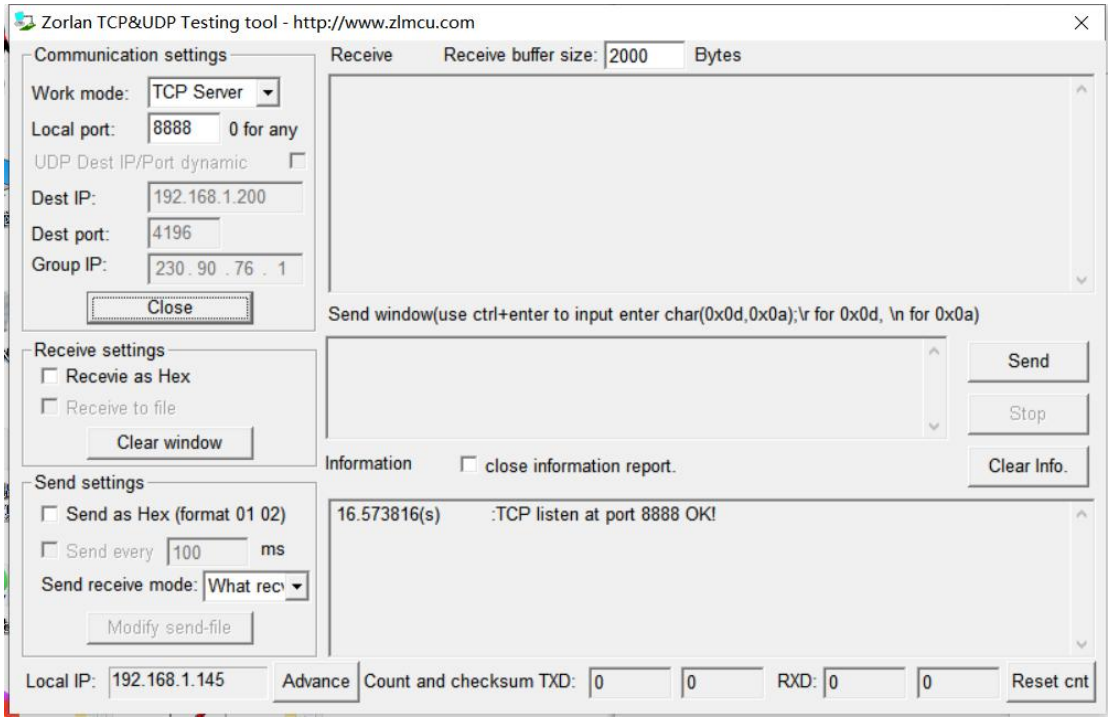


Figure 32 Server-side tools

As shown in the figure, select the local port as 4196 (note that if you run the ZLVircom tool, you need to change the port), and then click the "Open" button. When The 6808-5 device is connected to the server, "The NO... is accepted! ” The information.

Now turn 6808-5 equipment serial connection of the USB 232 serial port, and open a serial port debug tool (http://www.zlmcu.com/document/com_debug_tools.html), and open the correct COM port.

Now the serial port sends data, the server will reply to the corresponding data, and the device receives the reply message from the server through the serial port output, the serial port tool receives the same data here. This demonstrates the bidirectional communication between serial port and 4G network, as shown in Figure 34 below:

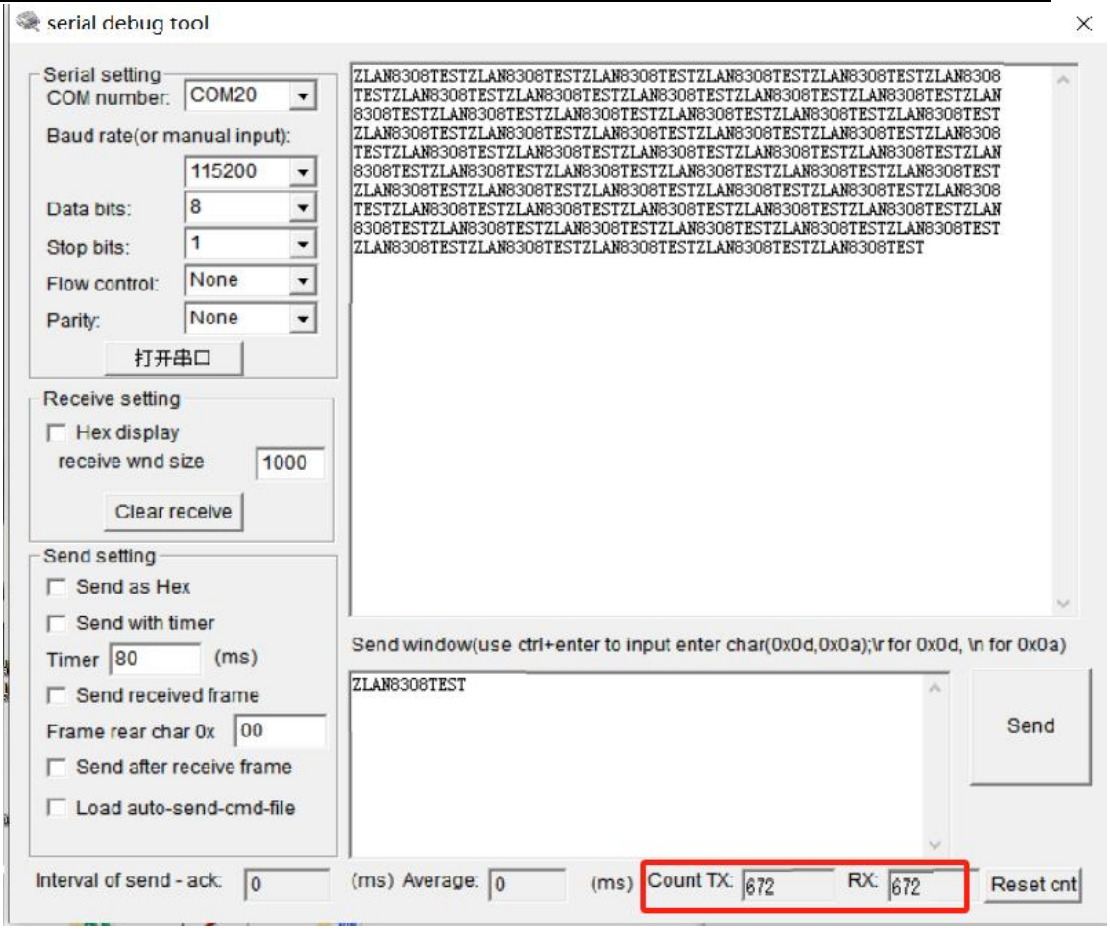


Figure 33 Serial port debugging tool on the device

8.1.2. Modbus Protocol Conversion Test

The configuration parameters are basically the same as those of the non-protocol transparent test. You only need to change the conversion protocol to MODBUS. The MODBUS RTU protocol over the serial port can be converted into the MODBUS TCP protocol over the network, and the MODBUS TCP protocol over the network can be converted into the MODBUS RTU protocol over the serial port.

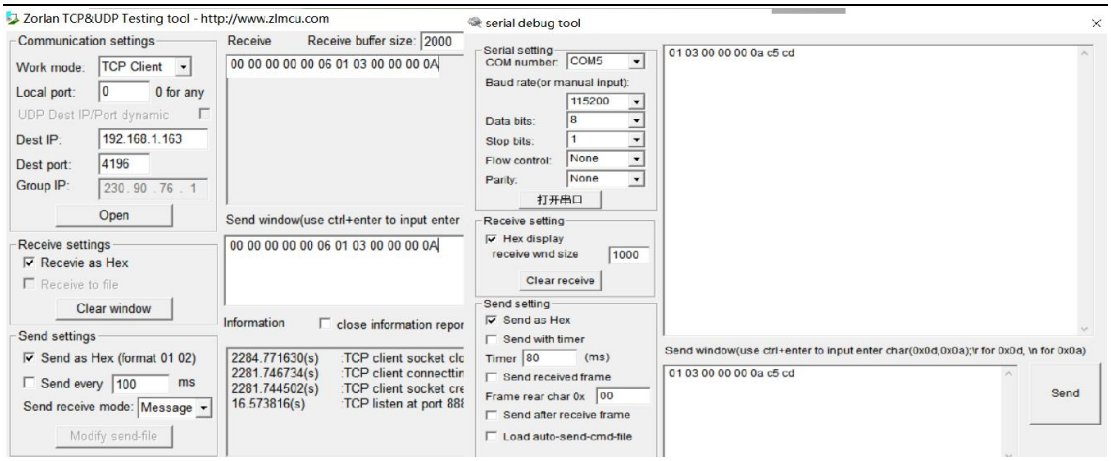


Figure 34 Modbus protocol conversion test

8.1.3. MQTT protocol testing

This test is for connecting Ali Cloud. Create a new subscription topic named zlan_test and a publishing topic named zlan_1 on Alibaba Cloud, as shown in Figure 36. According to the instructions in the fifth step, first fill in the IP and port configurations of the MQTT server and save the parameters, as shown in Figure 37. On the page of advanced parameters, the ID, user name and password of MQTT, including the subject of subscription publishing, and the keepalive time, are entered, as shown in Figure 38. Note that the working mode is selected as MQTT mode.

Figure 35 Alibaba Cloud add topic

Figure 36 Aliyun IP and port

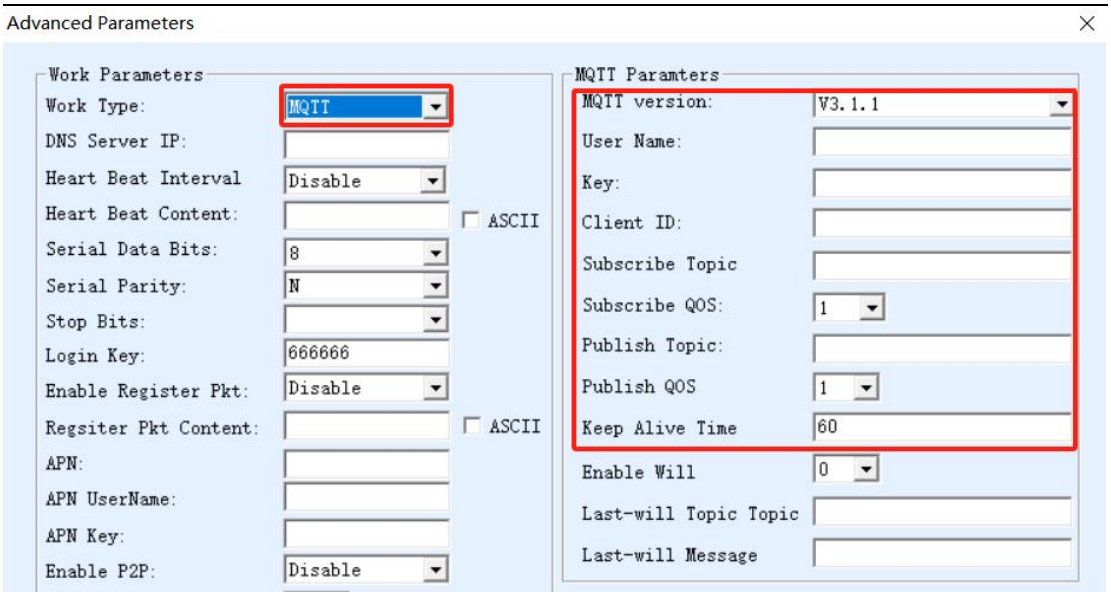


Figure 37 Aliyun MQTT configuration

After the setting, open the Ali Cloud device management interface and enter the log service page to view the information sent from the device, as shown in Figure 39. Data is sent through the serial port of the device, and a message (" ZLAN8308TEST ") is sent to the MQTT server of Aliyun through the theme of zlan_1. The data received by Aliyun is shown in Figure 40. The Aliyun server sends a message (" ALI_send ") to the serial port of the device through the theme of zlan_test. As shown in Figure 41, this completes the MQTT sending and receiving test.

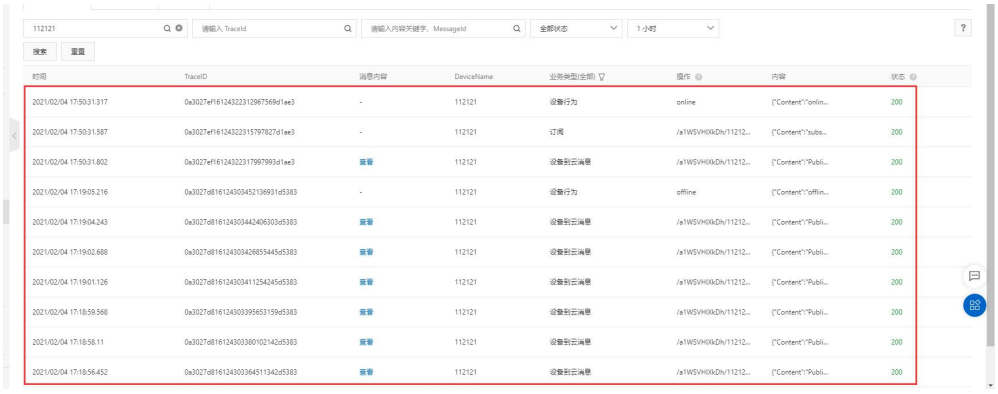


Figure 38 Alibaba Cloud log service

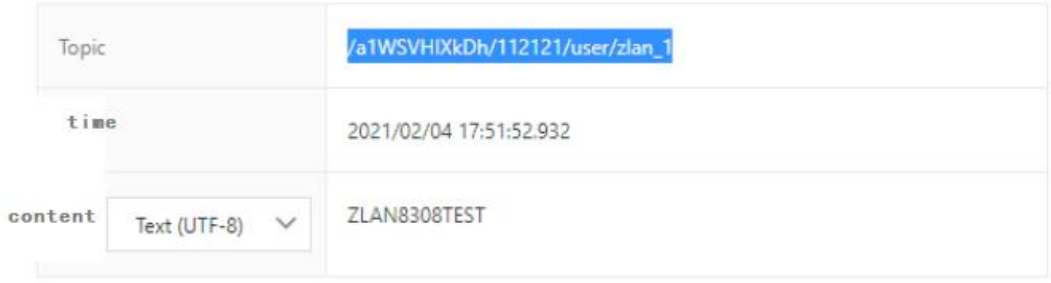


Figure 39 Alibaba Cloud receives serial port data

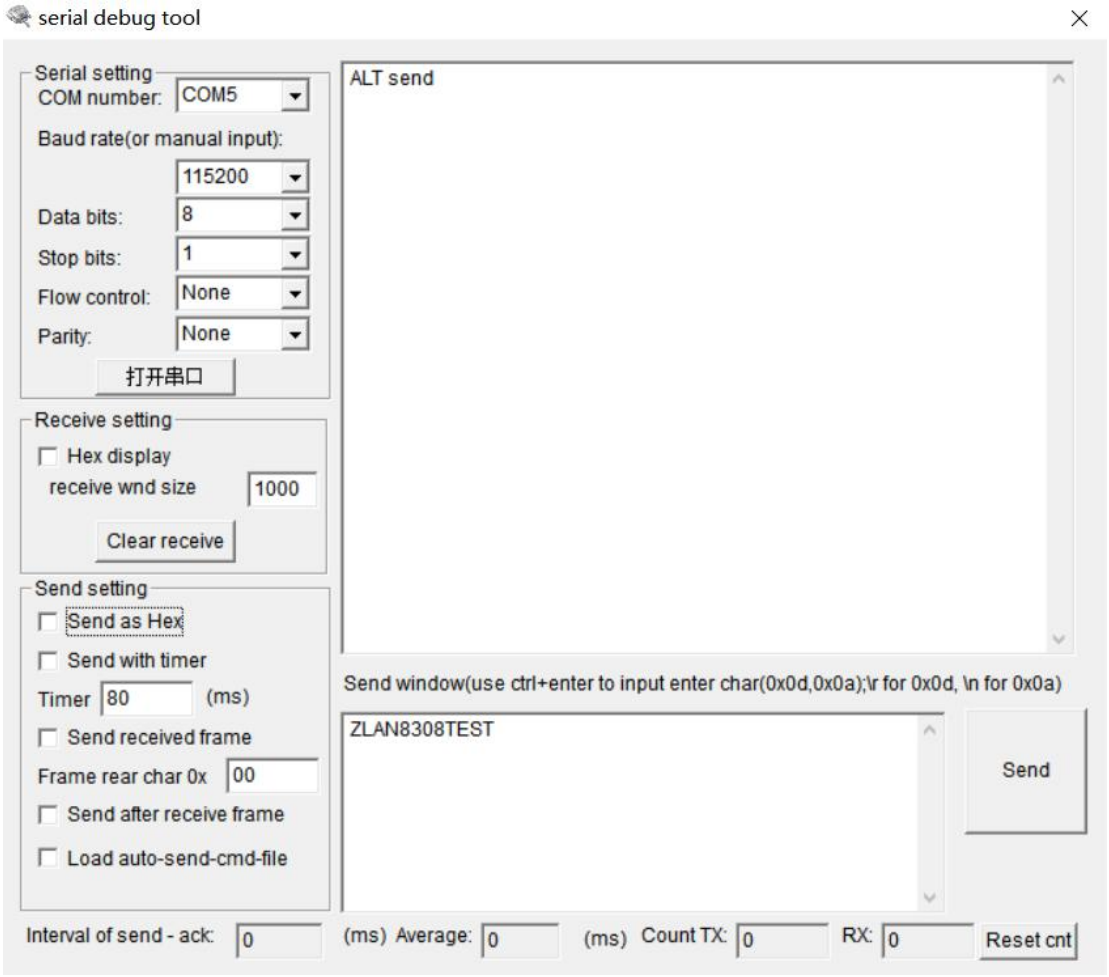


Figure 40 The serial port receives Alibaba Cloud data

8.1.4. Configuring the sending via JSON

Through the above part: Modbus protocol conversion test, configure a simple JSON upload template. The configuration process is shown in FIG. 42, FIG. 43, FIG. 44 and FIG. 45, and the data of some MODBUS nodes is collected and converted into JSON

format for upload.

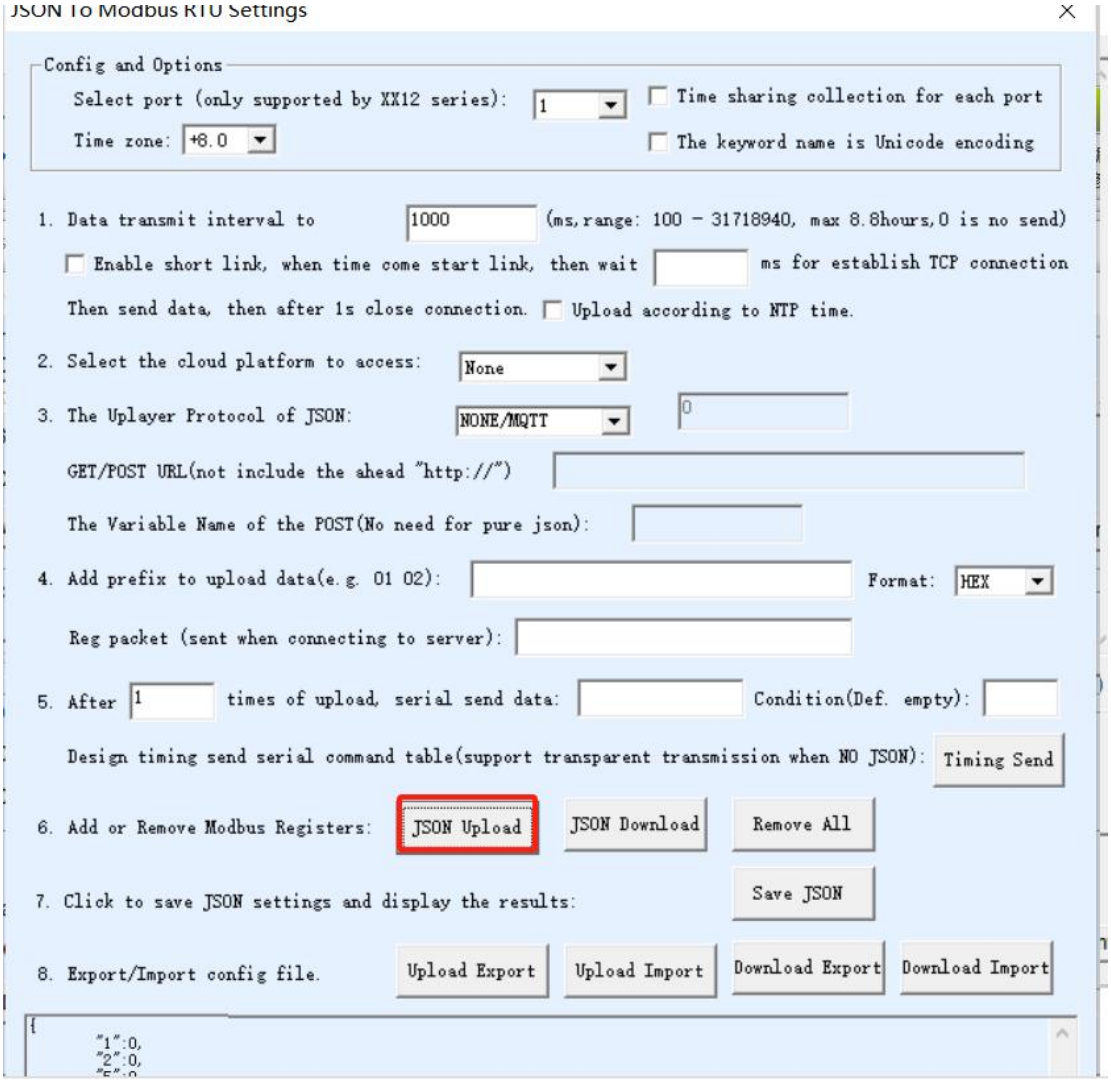


Figure 41 Configuring the JSON upload

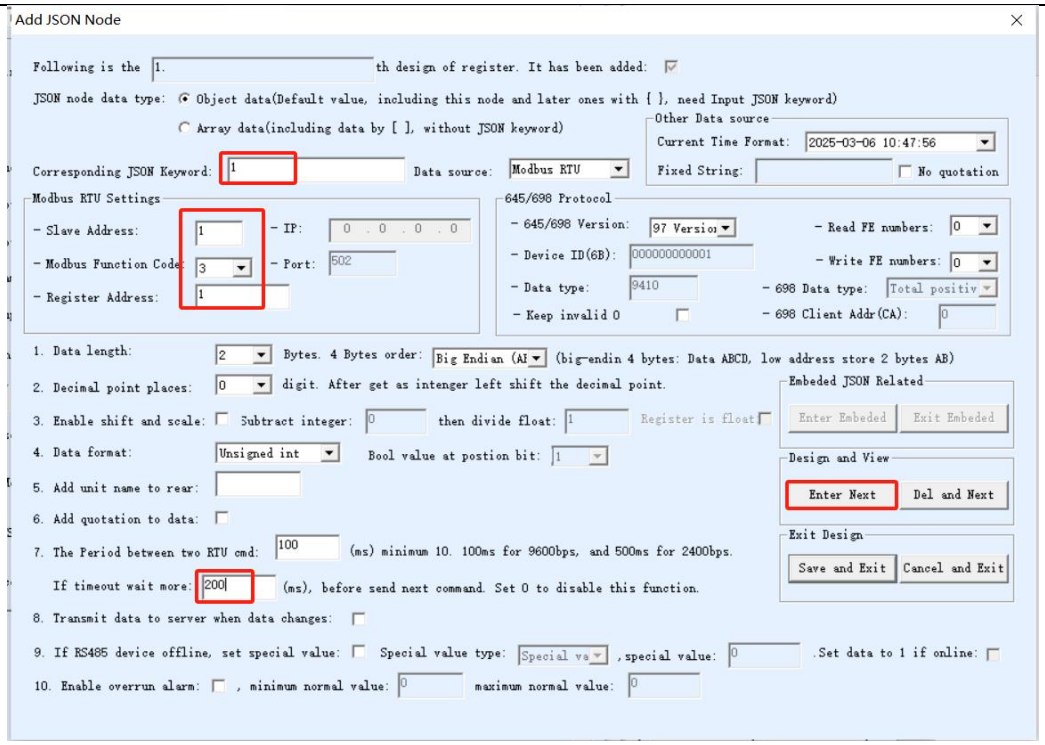


Figure 42 Configure-collected keywords, register addresses and collection intervals

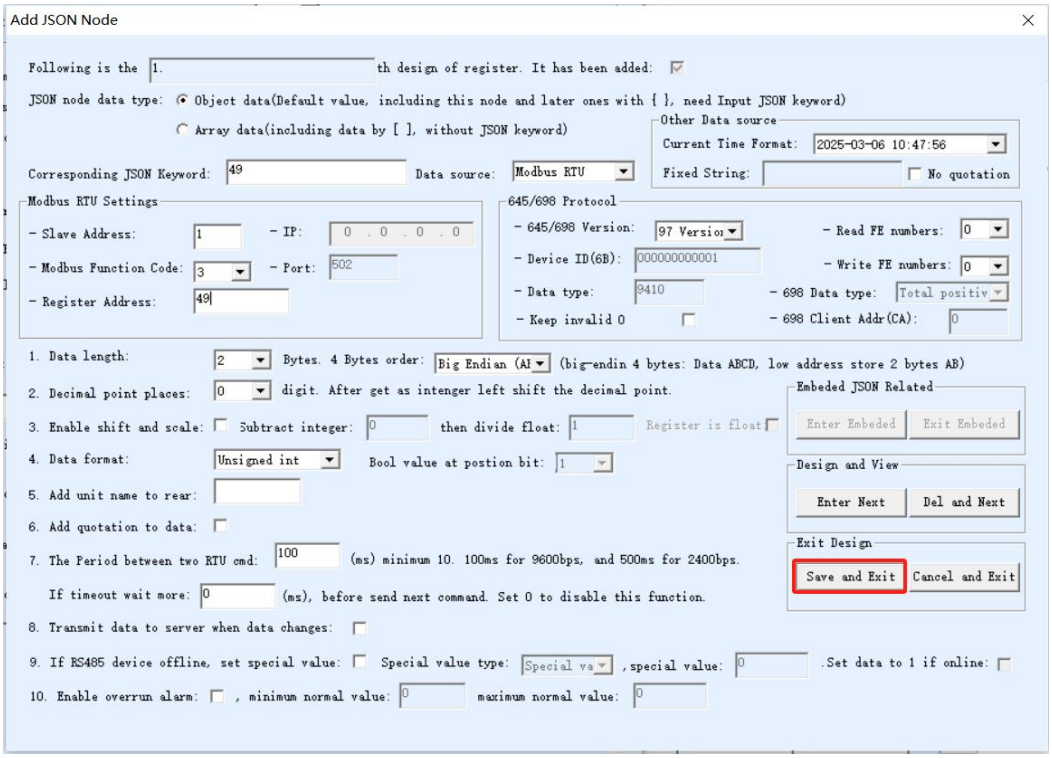


Figure 43 Save the configuration and exit

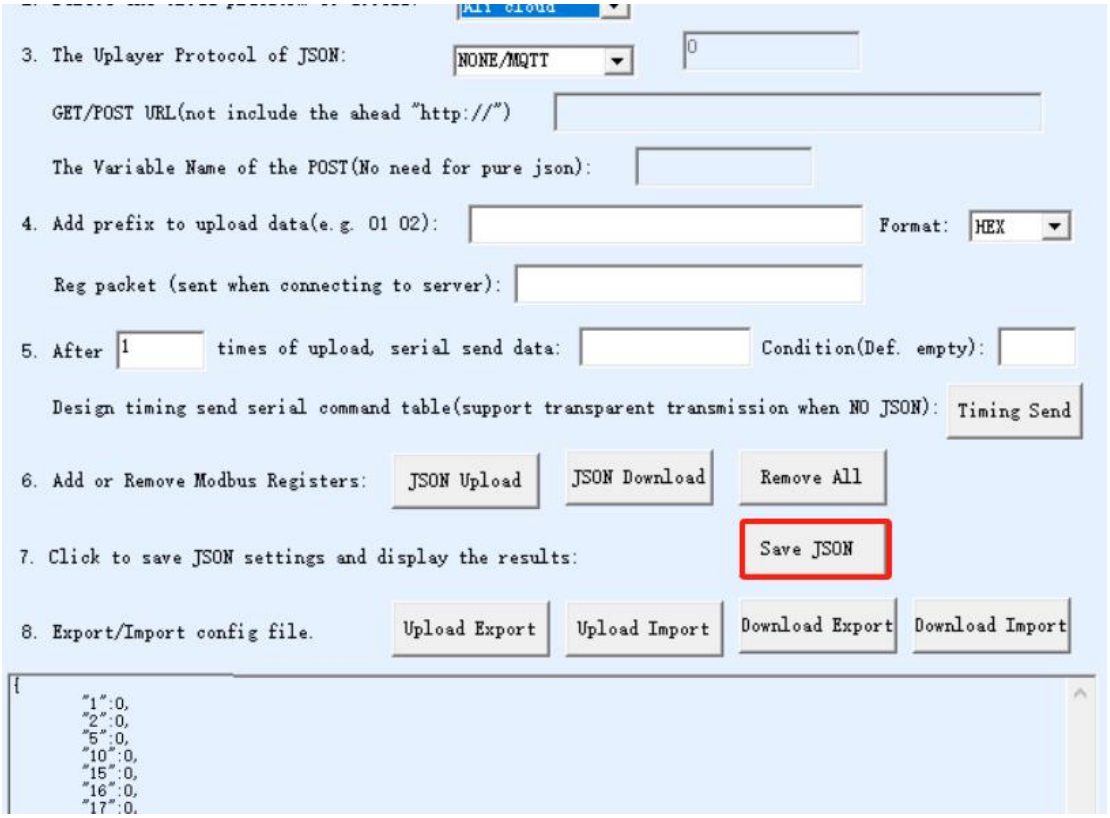


Figure 44 Save the JSON Settings and view the preview JSON format

Configure the MODBUS RTU analog device. Modbus software is used to simulate the MODEBUS Slave device, connect the ZLAN8308 device to the computer through the serial cable, and open the connection of Modbus Slave. The Modbus configuration is shown in Figure 46.

ID = 1: F = 03

	Name	00000
12		12
13		13
14		14
15		15
16		16
17		17
18		18
19		19
20		20
21		21
22		22
23		23
24		24
25		25
26		26
27		27
28		28
29		29
30		30
31		31
32		32
33		33
34		34
35		35
36		36

Figure 45 Filling in simulation data for Modbus

View the JSON sent. By checking the sent JSON data through Alibaba Cloud log service, it can be observed that the collected data is consistent with the Modbus configuration data, which completes a simple MODBUS to JSON test.

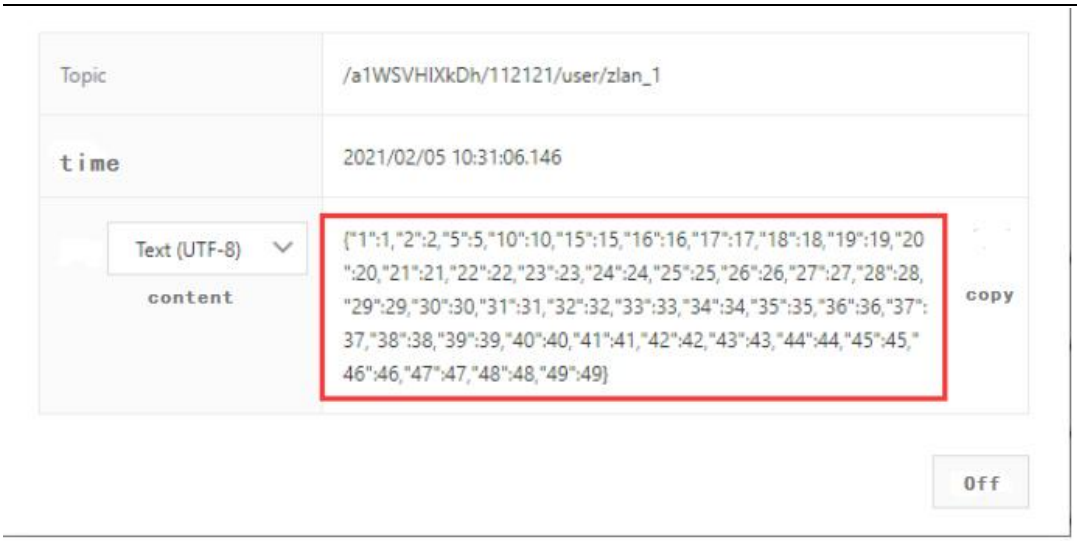


Figure 46 The serial port receives Aliyun data

8.2 Network Port Software Configuration

After clicking the search button, the page shown in Figure 48 is displayed.

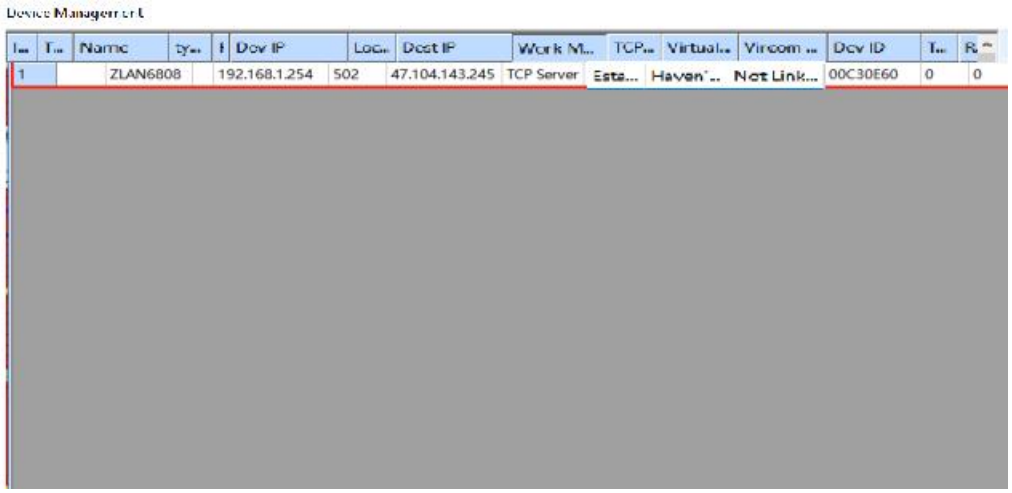


Figure 47 Ethernet configuration page

Double-click any area in the red box to enter the configuration page, as shown in Figure 49.

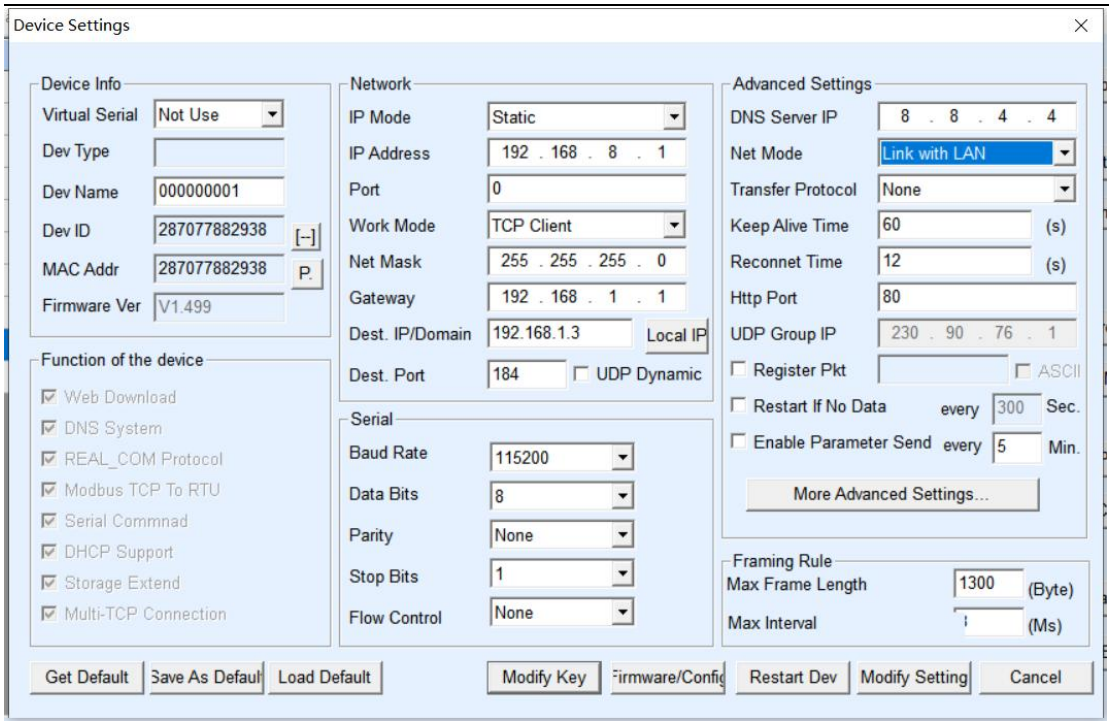


Figure 48 Configuration page

In this interface, the user can set the parameters of the device, and then click "Modify Settings", then the parameters are set to the flash of the device, power failure is not lost. At the same time, the device automatically restarts.

The main parameters are: baud rate, data bit, check bit in serial port Settings; IP address, subnet mask, gateway in network Settings; Sometimes according to the computer software, you also need to configure the working mode of the serial server.

The meanings of other parameters are as follows:

Table 6 Parameter meanings

Parameter name	value range	Contents
virtual serial port	none, created virtual serial port	You can bind the current device to an existing virtual serial port. Add a COM port in Serial Port Management on the home screen.
Device model		Only the model of the core module is displayed
Device name	random	You can give the device an easy-to-read name, up to 9 bytes, support Chinese names.

Device ID		factory unique ID, cannot be modified.
Firmware version		Firmware version of the core module
Functions supported by the device		See Table 3 for features supported by the device
IP mode	static、DHCP	Users can choose between static or DHCP (dynamic IP acquisition)
IP address		IP address of the serial port server
Interface	0～65535	Listening port of the serial port Server in TCP Server or UDP mode. If you use port 0 as the client, you are advised to set port 0 to improve the connection speed. If port 0 is used, the system randomly assigns a local port. The difference between this and non-zero port is: (1) When the local port is 0, a new TCP connection is established with the PC when the module restarts, and the old TCP connection may not be closed, and the device may have multiple fake connections. Generally, the host computer wants to close the old connection when the module restarts; Specifying a non-zero port closes the old connection. (2) If the local port is 0, the TCP connection takes a shorter time to re-establish. When the serial port server is in TCP client mode, it also acts as the TCP server to listen for incoming connections on the port. In this case, the local port number used by the TCP client to connect to the server is Port +1000.
Working mode	TCP server mode, TCP client mode, UDP mode, UDP multicast	When set to TCP server, the serial server waits for the computer to connect. If TCP client is configured, the serial port server initiates a connection to the

	mode	network server specified by the destination IP address.
Subnet mask	For eg.：255.255.255.0	The subnet mask must be the same as that of the local LAN.
Gateway	For eg.：192.168.1.1	It must be the same as the local LAN gateway
Destination IP address or domain name		In TCP client or UDP mode, data is sent to the computer indicated by the destination IP or domain name.
Destination port		In TCP client or UDP mode, data is sent to the destination port of the destination IP address.
Baud rate	300、600、1200、2400、4800、7200、9600、14400、19200、28800、38400、57600、76800、115200、230400、460800、921.6K	Serial port baud rate
Digit bits	5、6、7、8、9	
Check bits	None, Even, Odd, tag, space	
Stop bits	1、2	
Flow control	No flow control, hard flow control CTS/RTS, hard flow control DTR/DCR, soft flow control XON/XOFF	Only available for RS232 serial port
DNS server		If the destination IP address is described by a domain name, enter the IP address of the DNS server. If the IP address mode is DHCP, you do not need to specify the DNS server. The DNS server automatically obtains the IP address from the DHCP server.

Destination mode	Static , dynamic	TCP client mode: In static destination mode, the device automatically restarts after five consecutive failed attempts to connect to the server.
Transfer protocol	NONE 、 Modbus TCP<->RTU 、 Real_COM、TELNET	NONE indicates that data is transmitted transparently from the serial port to the network. Modbus TCP<->RTU will convert Modbus TCP protocol directly into RTU protocol, which is convenient to cooperate with Modbus TCP protocol; RealCOM is designed to be compatible with the older version of the REAL_COM protocol. It is a virtual serial port protocol. However, it is not necessary to select the RealCom protocol when using the virtual serial port. The TELNET protocol allows the network to log in to our device through TELNET to communicate with the serial port
Keepalive timing time	0～255	Heartbeat interval. (1) If the value ranges from 1 to 255 and the device is in TCP client working mode, the device automatically sends TCP heartbeat packets at Keepalive intervals. This ensures the TCP validity of the link. If the value is set to 0, there is no TCP heartbeat. (2) If the value is set to 0 to 254, and the conversion protocol is REAL_COM, the device will send data with length 1 and content 0 at keepalive intervals to implement the heartbeat mechanism in the Realcom protocol. If the value is set to 255, there is no realcom heartbeat. (3) When the value is set to 0 to 254, if the device works on the TCP client, the device will send device parameters to the destination computer at keepalive intervals. If the value is set to 255, no parameter is sent, enabling remote device management.

Disconnected reconnection time	0～255	In TCP client mode, when the connection fails, the TCP connection is re-initiated to the computer at disconnection Reconnection time intervals. The value ranges from 0 to 254 seconds. If the value is set to 255, the reconnection is never performed. Note that the first TCP connection (such as hardware power-on, device restart through zlvircom software, and no data light) is generally carried out immediately, and only after the first connection fails will it wait for the "disconnection reconnection time" to try again, so the "disconnection reconnection time" will not affect the normal connection establishment time between the network and the server.
Web access port	1～65535	Default is 80
Multicast address		Under UDP multicast
Enable registration package		When a TCP connection is established, the registration packet is sent to the computer. The realcom protocol must be selected after the registration package is enabled. TCP server and TCP client modes are supported。
Digit packet length	1~1400	One of the serial port framing rules. Serial port server After receiving data of this length, the serial port sends the received data to the network as one frame.
Packet interval	0～255	Serial frame rule 2. When the data received by the serial port server stops for a period longer than the specified period, the received data is sent to the network as a frame。

1.1.1. Usage method

Power on the device and connect it to the network using a network cable. If Modbus TCP is used, select Modbus TCP as the conversion protocol. Otherwise, select None. The network module of 6808-5 is in TCP server mode and port 502 is used. The user software connects to this IP and port 502 to control the device.

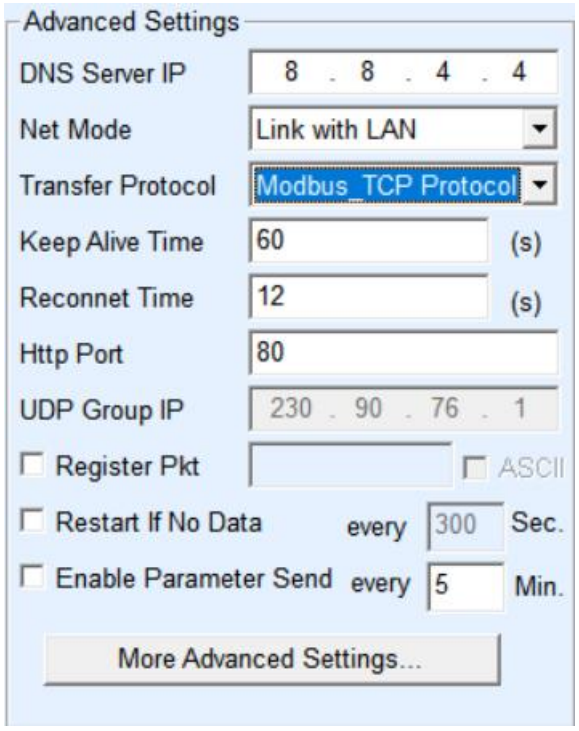


Figure 49 Enabling MODBUS TCP

If the Modbus TCP software/device of the user serves as the Slave station, you need to convert the protocol to Modbus TCP, change the working mode to the client, change the destination IP address to the IP address of the Modbus TCP software/device, and set the destination port to 502, as shown in Figure 51.

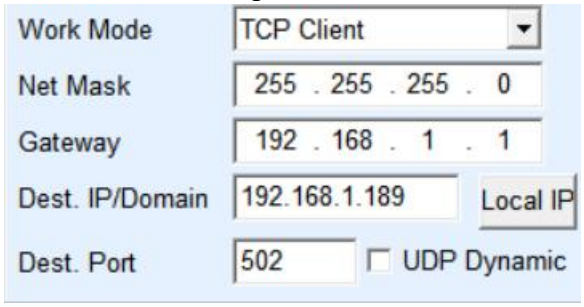


Figure 50 MODBUS TCP as the client

8.3 WEB Configuration Through Network Ports

6808-5 The default device IP address is 192.168.10.1. If you do not know the IP address of the device, ZLVircom software can search the IP of the device.

Change the IP address of the computer to the same network segment as the device, such as 192.168.10.2. If the network cable is directly connected, the IP can also be dynamically obtained (if the IP is not directly connected, the IP may be obtained is not assigned by 8305L). Enter the IP address of the device in the browser to access the login page. The default password is 666666.

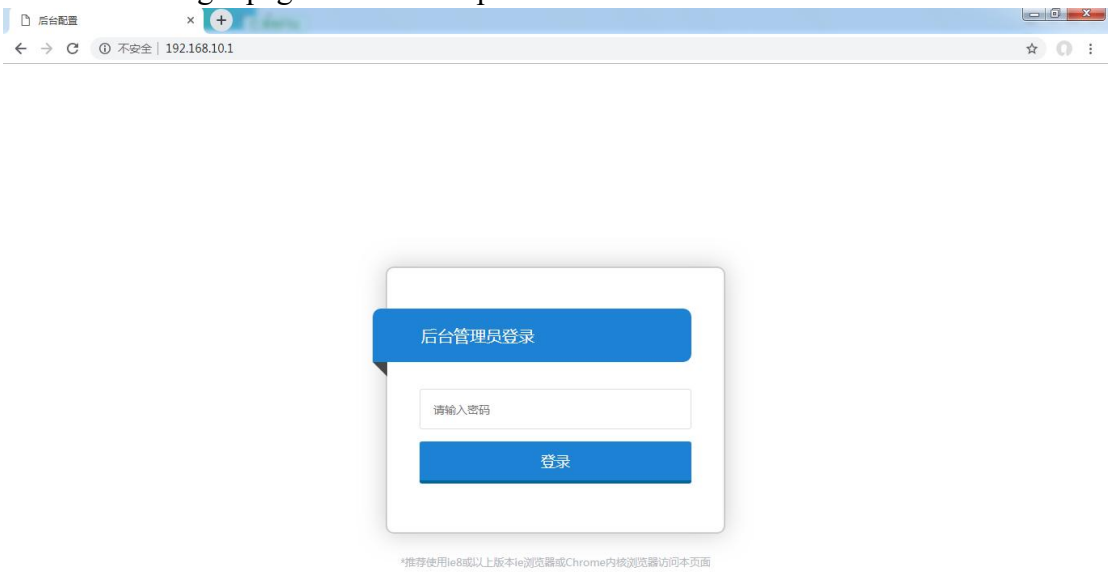


Figure 51 Web login

The main screen displays the current status, working mode, and IP address of the device. The device can work in two modes:

1. 4G router mode: In this mode, 4G and Ethernet are enabled, the serial port can access the Internet through 4G, and the Ethernet port can serve as the WAN port for other devices to access the Internet.
2. 2. Wired mode (4G off) : No 4G function, only serial port to wired network function.

Different device information will be displayed according to different modes. The system status in 4G routing mode is shown as follows:

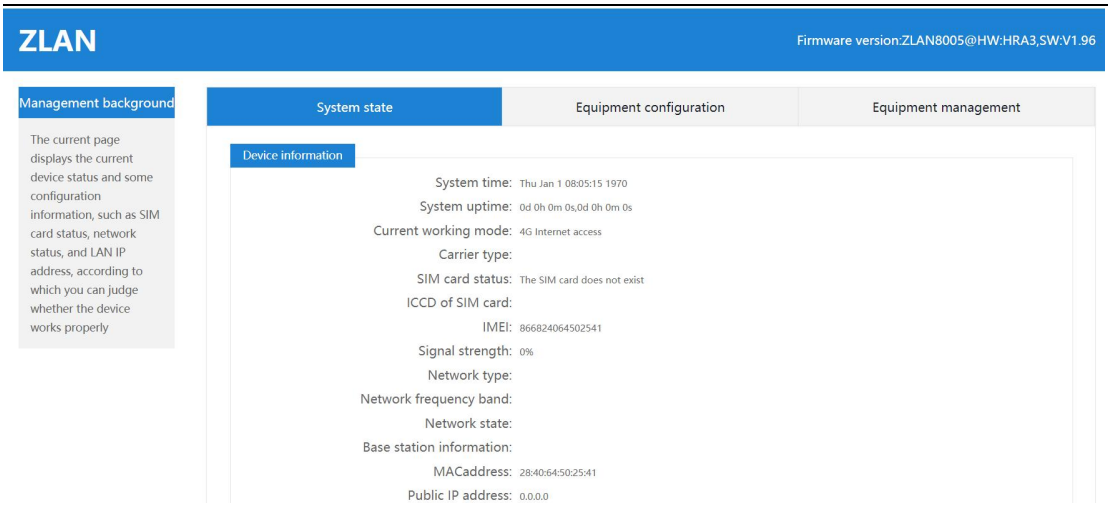


Figure 52 Device information

Click Device Configuration:

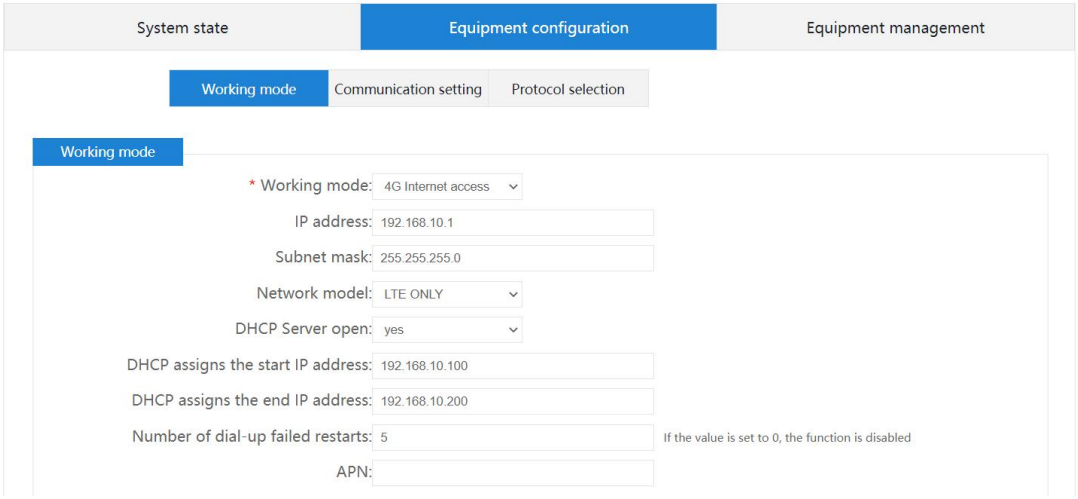


Figure 53 Working mode configuration

Working mode: Here you can choose 4G router mode and wired mode.

Click on Communication Settings.

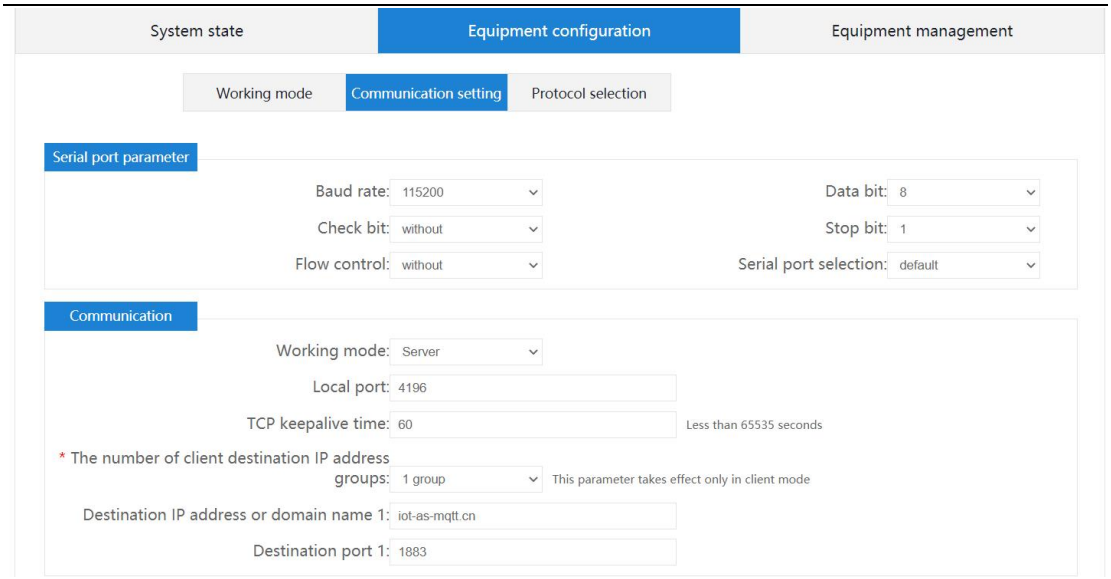


Figure 54 Communication Settings

Here you can configure the serial port parameters, whether the 8305 works on the client or server, the destination IP address and the port. Set heartbeat packets and registration packets.

Click on the agreement to select:

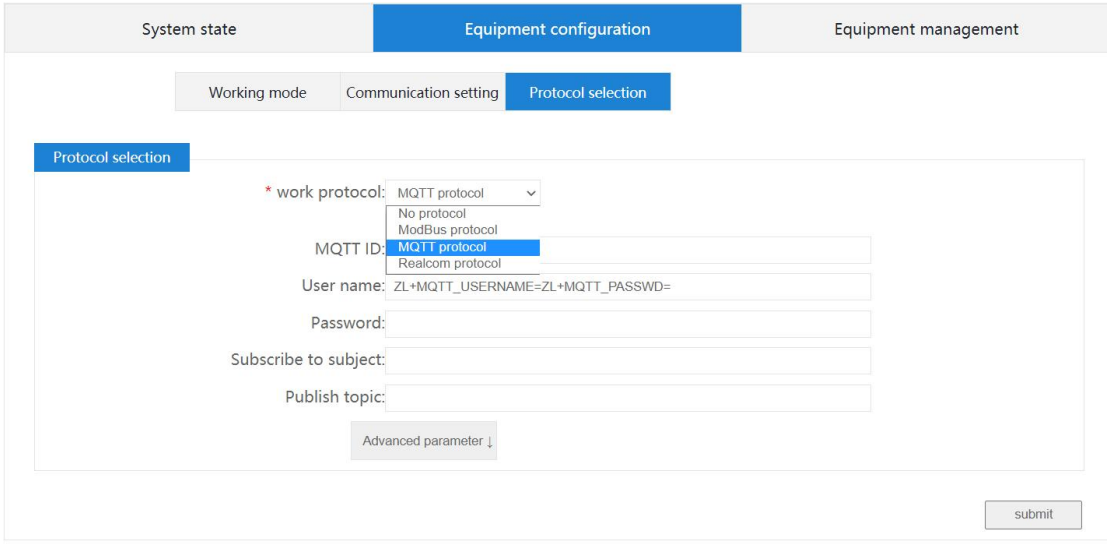


Figure 55 Conversion protocol

这里可以选择如下：

1. No protocol: The serial port and TCP are transmitted transparently.
2. Modbus: The serial port is Modbus RTU and the network is Modbus TCP.
3. MQTT protocol: At this time, the network is MQTT protocol, and the serial port

data will be sent as the payload of MQTT, here you can fill in some parameters related to MQTT. Click the "MQTT Advanced parameters" button to select the configuration of advanced parameters.

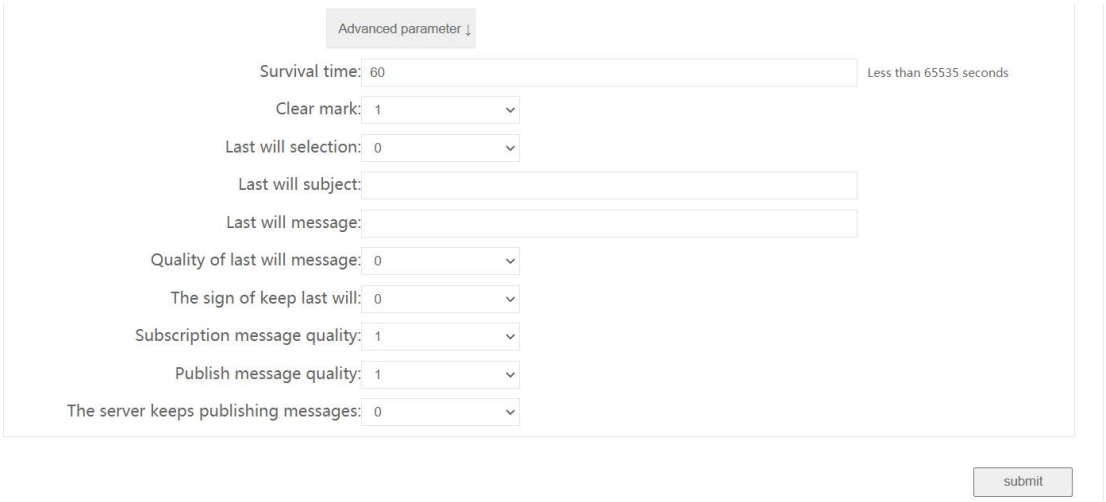


Figure 56 Advanced Modbus parameters

Click on Device Management:

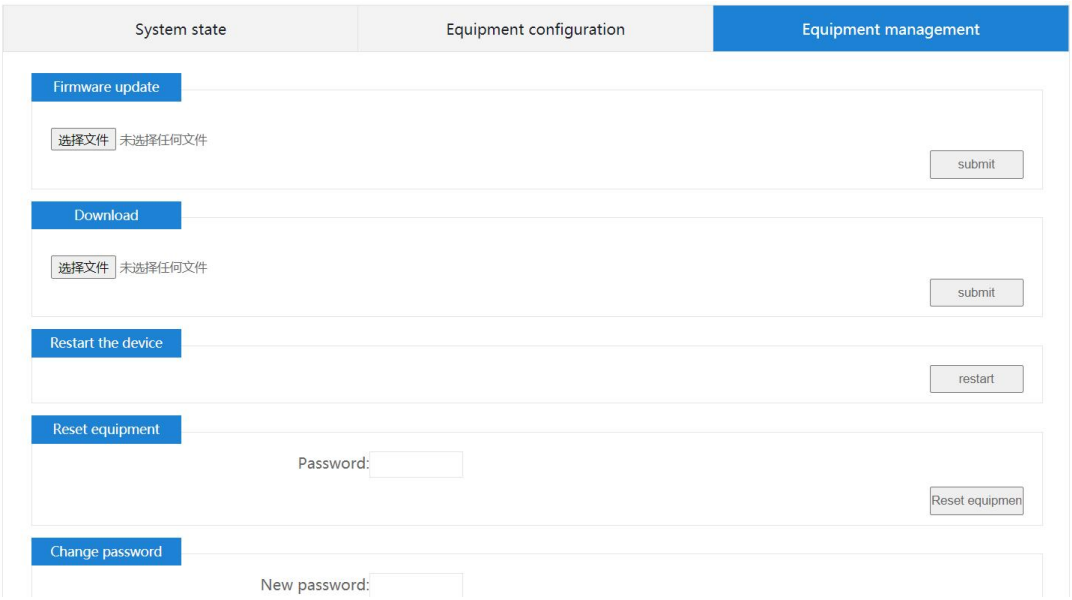


Figure 57 Device management

Here you can update the firmware, restart the device, and change the password.

Notice After the firmware upgrade, if the routing mode is used, the IP address automatically changes to 192.168.10.1.

Appendix 1: Summary of parameters

This chapter mainly covers the technical details of parameter setting and reading. It also helps users to configure and modify parameters with their own software. For common applications, you can skip this section.

Separate the parameters read and set from the register master table as follows.

Table 7. Parameter related read operations

Function code	Feature	Address range（ 6042/6002A 4 DI/DO 2 AI）	Address range（ 6842/6802/6808-5 8 DI/DO 8 AI）
03	Read base parameter	63~68	63~68
03	Read spread parameter	69~84	69~84
06	Set parameters	69~84	69~84
06	Set extension parameters	69~84	69~84
16	Set basic parameters	63~68	63~68
16	Set extension parameters	69~84	69~84

As can be seen from the table, parameters are read using 03 function code and set using 06 and 16 instructions. The parameters are divided into basic parameters and extended parameters, which correspond to registers 63~68 and 69~84 respectively.

Table 8. Base parameter register

Register address	Parameter name	Length (bytes)	Instructions
63(0x3F)	addr/ Device address	1	The high byte of the register value
63(0x3F)	upLoad/ Enable active DI reporting	1	The low byte of the register value, 1 indicates that it is enabled, and 2 to 255 indicates that it is sent

			periodically.
64(0x40)	dst_addr/DI Indicates the reported address.	1	The high byte of the register value
64(0x40)	baud/ Device baud rate	1	The low byte of the register value sets only the baud rate of the 485-IO RS485 interface. 1200 0； 2400 1； 4800 2 9600 3； 19200 4； 38400 5； 57600 6； 115200 7
65(0x41)	ver/ Firmware version	1	High byte of the register value, read only
65(0x41)	Compound parameter setting	1	The low byte of the register value.
66(0x42)	A1UpLoadH/AI Specifies the maximum number of bytes in the report period	1	Bit1:32-bit DI count save, 1 indicates save
66(0x42)	A1UpLoadL/ AI Specifies the minimum period for reporting the file	1	Bit2: DI logical inversion. 1 indicates inversion
67(0x43)	High byte for uploading Uploadh /AI	1	The high byte of the register value

67(0x43)	A2UpLoadL/ AI Specifies the minimum period for reporting the file	1	The low byte of the register value

Table 9. Extend parameter register

Register address	Parameter name	Length (bytes)	Instructions
68(0x44)	dostate/ DO configuration after power-on	1	The higher byte of the register value, 0xF0 indicates the last four aspirates
68(0x44)	checkb/ checkb bit	1	The low byte of the register value.
69(0x45)	baud_UART_0_2/ baud rate for network communication and 485-4G	1	0: no check
69(0x45)	datab/ data bit	1	1: odd check
70(0x46)	stopb/ Stop bit	1	2: parity check
70(0x46)	TCP_LINK_FLAG/ reserved	1	3: Mark
71(0x47)	FirmwareType/ Equipment type	1	4: space
71(0x47)	reserver/ Reserved	1	The high byte register value, currently read-only, is adaptive through the network module and does not need to be set.
72~73 (0x48~0x49)	reserver/ Reserved	4	The low byte of the register value. Leave for further

			expansion.
74~89 (0x4a~0x59)	V1 to V8 is the adjustment factor of each AI route	32	The high byte of the register value is left for later expansion
90（0x5a）	AI calibration status	2	The low byte of the register value. Leave for further expansion.

Appendix 2: AI calibration

Procedure: The following uses RS485-IO serial port communication as an example

1. Send 01 06 00 5a 00 01 68 19 and set AI Calibration Status to 1 to enter the calibration mode.
2. Send 01 04 00 00 00 08 f1 cc to query the data of the 8-way AI. For the received data 01 04 10 02 81 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 95 2D, calculate the value of each channel V1~V8. For example, for the first route.
   a) If the value is 02 81, the value is Vin=641. The input voltage is calculated according to the formula in "AI Usage Instructions" as follows: Vi =(Vin/ 1024)*5, where Vin is 641 and Vi is the known voltage, for example, 3.3V. V1 = Vi/such adjustment coefficient ((Vin / 1024) * 5) = 3.3 / ((641/1024) * 5) = 1.0543525.
   b) V1 is represented as float data and converted to HEX big-endian format 0x3F86 F506.
   c) Write 0x3F86 to the first register 0x4a corresponding to V1 and 0xF506 to the second register 0x4b corresponding to V1. Send 01 06 00 4a 3f 86 38 4e and 01 06 00 4b f5 06 3e 8e.
3. Send 01 06 00 5a 00 00 a9 d9 to exit the calibration mode.

Using the "AI Calibration Function" of ZLVircom's "IO Controller" dialog box, users can calibrate themselves. However, each ZLAN6808-5 equipment has been

professionally calibrated after the factory, if not necessary, the user does not need to calibrate. The calibration steps are as follows:

1. In the model, please select the correct product submodel: Only if you select the correct model, you can determine the AI type of each route is 5V, 10V, 4~20mA. To calibrate.

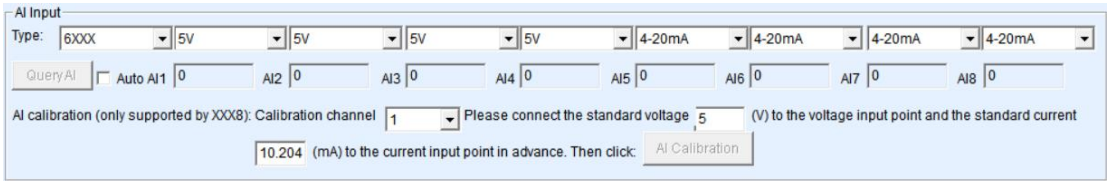


Figure 58 AI calibration

2. Select the path to be calibrated from the number of paths. Because users may not be able to connect eight test points at the same time, it is easier to adjust along the way.
3. Connect the OUT pin of ZLAN6808-5 to the corresponding path number, and the OUT pin is next to the AI8. By default, this OUT provides a reference voltage of 5.0V or a reference current of 10.204mA. If you prepare the standard voltage source and current source by yourself, enter the values in the corresponding input boxes.
4. Click the "AI Calibration" button to start the system calibration. After calibration, the AI value is more accurate. After calibration, the system automatically saves the calibration parameters without restarting.

Appendix 3: Dimensional drawing

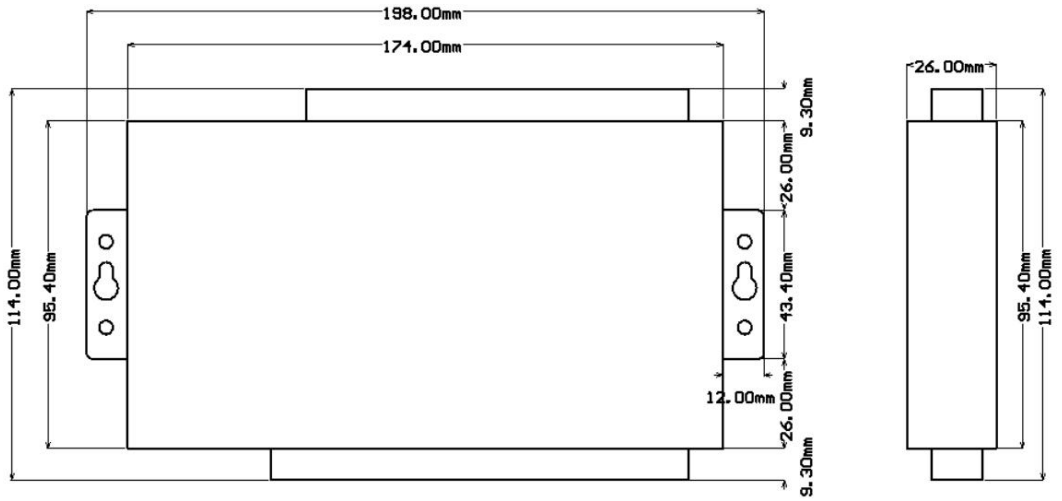


Figure 59 Dimensions of 6808-5

After-sales service and technical support

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