

ZLAN6808-1 to 9
models

8 ports DI/DO/AI
Remote IO
Controller

4G/CAT1/RS485/Ethernet/LoRa/NB remote
IO controller



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1. Summary

ZLAN6808 is an 8-channel remote IO controller launched by Shanghai ZLAN Information Technology Co., LTD. It supports 8-channel DI/DO/AI, that is, digital input, relay output, analog input (including voltage and current). In addition, it supports the serial port server function. A third-party RS485 collector and controller can be connected to the RS485 port for remote control.

DI supports dry and wet nodes with optical coupling isolation. DO is the relay output, with 5A 250V AC or 5A 30V DC control ability; The first four AI inputs support 0 to 5V voltage input, and the last four inputs support 4 to 20mA current input. ADC accuracy is 12 bits.



Chart 1 ZLAN6808 Collector

The ZLAN6808 supports 4G, CAT1, RS485, Ethernet, LoRa, Zigbee, and NB

communication modes. The corresponding sub-models are as follows:

Chart 1. ZLAN6808 sub models

Model No.	Communication	Interface	Protocol	Specifications
ZLAN6808-8	4G CAT1 GSM/GPRS/ RS485	4G CAT1 support 3 modes: B1/B3/B5/B8@FDD LTE B34/B38/B39/B40/B41@TDD-LTE B3/B8@GSM including Unicom 4G, 2G, Mobile 4G, 2G and telecome 4G Internet. Transmissio n rate	Modbus TCP/ Modbus RTU/ JSON/ MQTT	Support 4G CAT1communication or 2G
ZLAN6808-1	RS485	None	Modbus RTU	Only support RS485
ZLAN6808-3	Ethernet TCP UDP/RS485	Ethernet	Modbus TCP/ Modbus RTU/ JSON/ MQTT	
ZLAN6808-7	LoRa/RS485	LoRa	Modbus RTU	
ZLAN6808-5	4G 7 modes communications /RS485	4G communications	Modbus TCP/ Modbus RTU/ JSON/ MQTT	

ZLAN6808-2	NB/RS485	NB-IoT	Modbus TCP/ Modbus RTU/ JSON/ MQTT	
ZLAN6808-9	ZigBee/RS485	Zigbee	Modbus RTU	

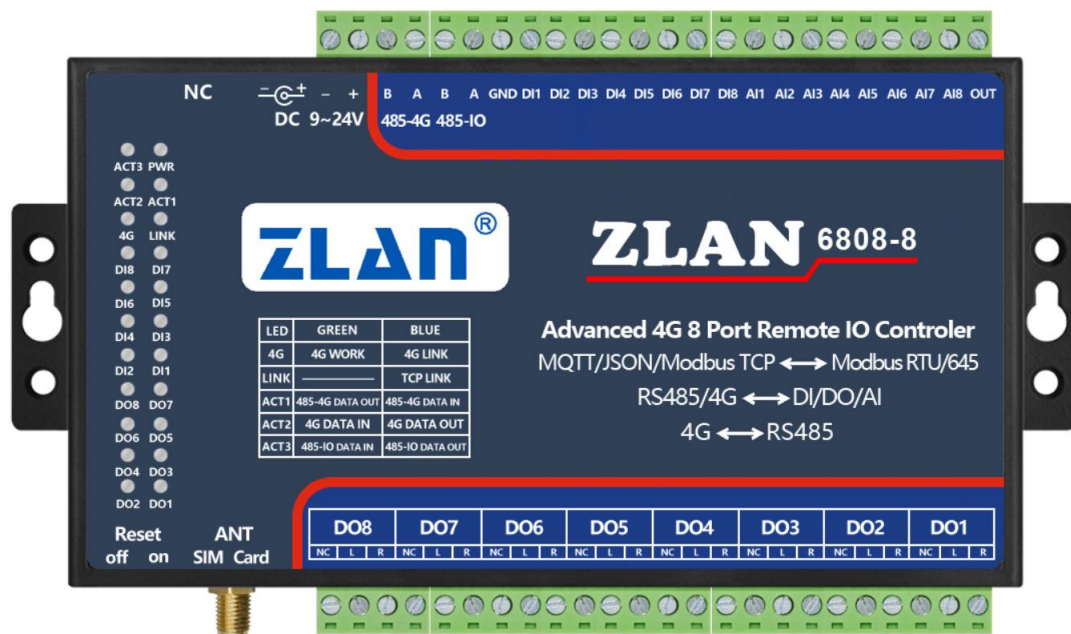


Chart 2 ZLAN6808-8 Front View

ZLAN6808 includes 4 interface as followings:

1. **485-IO:** This is an RS485 port, through which you can read, write, and control the DI/DO/AI. Through it to achieve local RS485 control, communication protocol support Modbus RTU protocol.
2. **LAN Interface:** This interface is a remote control communication mode, which can be 4G CAT1, Ethernet, LoRa, NB-iot, Zigbee, etc., depending on the different sub-models, please refer to the above table. The 6808-1 does not support network interfaces and has only local RS485 control.

3. 485-4G: RS485 interface, All the data from the network interface is sent to this serial port output. Otherwise, the serial port data received from this interface is forwarded to the network. That is, ZLAN6808 supports serial port server function in addition to remote IO control function, and can be connected to various acquisition and control devices on 485-4G interfaces.
4. DI/DO/AI: This is the external control interface, which can be controlled by 485-IO and network interface, but cannot be controlled by 485-4G.

ZLAN6808-8/5 is 4G version, There is a special watchdog circuit to ensure the stable operation of 4G modules for a long time. Zlan6808-7 is LoRa. The default baud rate is 9600bps for ports 485-4g. In other cases, the default baud rate is 115200bps.

ZLAN6808 applications:

- Building/access control/security control system;
- Industrial automation system;
- IoT, remote meter reading, information collection, etc.

This section uses zLAN6808-3 (Ethernet interface) as an example. Figure 3 shows the typical application connections. Connect the onsite input and output devices to the ZLAN6808, and then connect the ZLAN6808 to the network through network cables. Then the upper computer can send data to ZLAN6808 through Modbus TCP protocol to query the input device and control the output device.

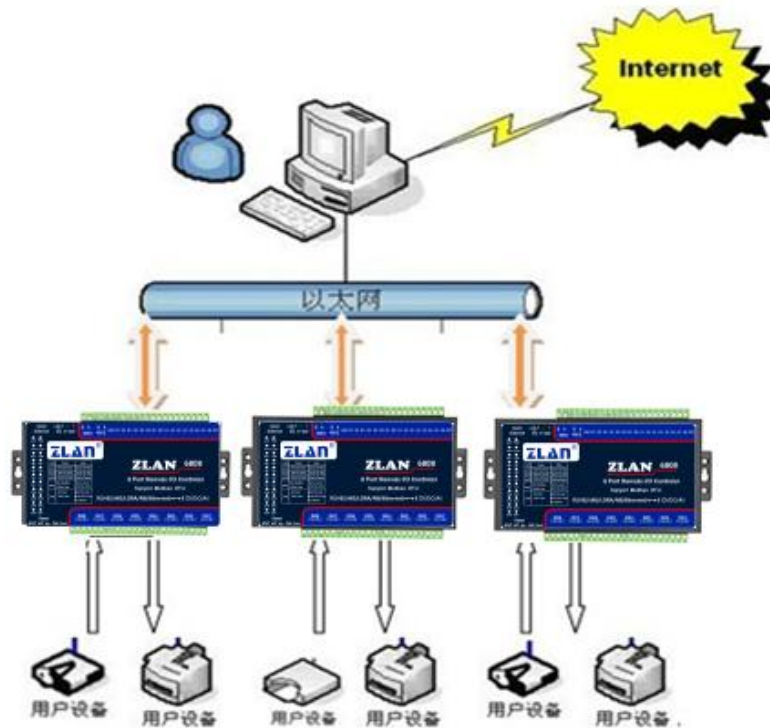


Chart 3 Connection sample

2. Function

1. Supports eight DI/DO/AI ports for remote or local control.
2. AI support 12 bit accuracy, data after strict tuning, to ensure accuracy.
3. In addition, it supports the function of a serial port server to control third-party external RS485 devices over the network.
4. Support DI control DO function, use a pair of ZLAN6808 through 4G/LoRa communication couplets can control each other, easy to use.
5. The sub-model supports 4G, CAT1, RS485, Ethernet, LoRa, NB and other communication media.
6. Supports Modbus TCP, Modbus RTU, MQTT, JSON, and HTTP communication modes.
7. Connects to various public clouds and sends data in JSON format and delivers control in JSON format.

8. Various indicators: display DI and DO status, network status, and data flow status.
9. Provides the DEMONSTRATION software RemoteIO for controlling IO and AI data over RS485 or TCP/IP.
10. The RemoteIO configuration tool allows you to flexibly configure parameters such as slave address and baud rate.
11. Can provide complete RS485 control instructions and Modbus RTU instructions, convenient for engineers to integrate development.
12. It can restore factory Settings with one click, including baud rate, station address, network configuration of communication module, etc.

3. Technical parameters

Outline	
Size:	L x W x H =9.2cm×19.7cm×2.5cm
Serial port parameter	
485-IO baud rate: default baud rate is 115200bps, revise via RemoteIO software or instructions.	
485-4G baud rate: Except for zLAN6808-7, which is 9600bps, other sub-models are 115200bps.	
Data bits: 8 bits, 485-4G support 8 and 7 bits.	
Parity bit: NONE, 485-4G Parity is supported.	
Stop bit: 1	
Software	
Ethernet protocol:	MODBUS TCP/MQTT/JSON/HTTP
RS485 protocol:	MODBUS RTU
AI	
current input: 4~20mA	
voltage input: 0~5V, 0~10V (need customized)	
resistance input: 0~10K, Resistance temperature and humidity sensors, etc. (customized)	

Power consumption (relay in non-close state)	
Steady state of operation: 30mA @12V	
4G Dial-up state: 60mA@12V	
DO Relay closure, DI input closure (maximum power consumption): 300mA@12V	
6808-8 (4G CAT1) parameter	
Transmission rate	LTE: Max 10Mbps (downside) /Max 5 Mbps (upload) GPRS: 85.6Kbps (downside) /Max85.6Kbps (upload)
SIM card	Voltage: 3V, 1.8V; size: big card (Small card can buy card cover to use)
antenna interface	50 Ω /SMA Glue stick antenna or suction cup antenna is optional
6808-3 (Ethernet) parameter	
Ethernet	Connects to 10/100M adaptive Ethernet
6808-7 (LoRa) version parameter	
Respond speed	9600bps in the default wireless configuration, sending and receiving 1 byte of data takes 70 milliseconds.
Transmission distance	There is no shelter outside 6km~8km, and about 5 floors are passed through indoors.
Frequency range	410MHz~525MHz
wireless channel	115
Reception sensitivity	-140dbm
Transmission power	20dbm
Modulation method	LoRa™ Patented modulation technology
Antenna connection	External SMA male antenna, sucker antenna 1 m; Operating frequency: 490MHz
Environment	
Operating temperature:	-40~85℃

Storage temperature:	-45~165℃
Humidity range:	5~95% Relative humidity

4. Hardware

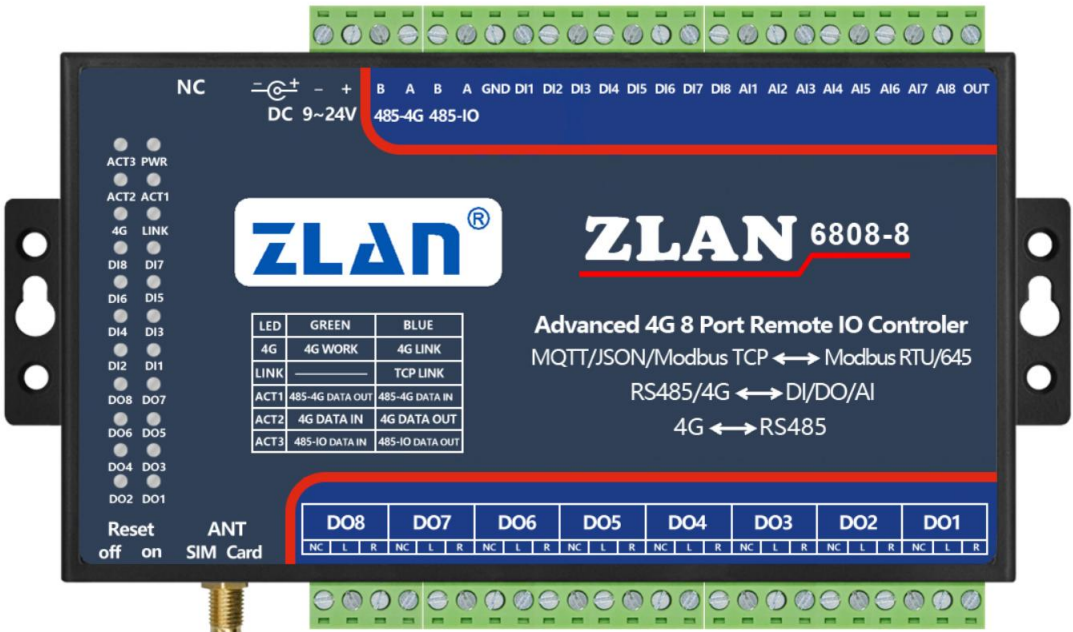


Chart 4 ZLAN6808-8

ZLAN6808 Figure 5-1 shows the ports on the upper side:

Chart 2 upper side port

Terminal	Function
RJ45/NC	6808-3 (Ethernet) : 10M/100M Ethernet interface, Remote I/O control through TCP/IP. Other sub-models: NC, invalid.
DC	DC plug power input, power supply voltage 9 ~ 24V.
Power supply	Terminal type power input, power supply voltage 9 ~ 24V, or DC terminal.
485-4G	RS485 port for transparent transmission of network and serial port, realizing serial port server function.

485-IO	RS485 port for controlling DEVICE I/O and collecting DI and AI information.
GND	When the dry node is input, connect the switch between the terminal and DI1 to DI8 to obtain the switch status.
DI1~DI8	8 ports switch inputs
AI1~AI4	4 inputs of 0 ~ 5V voltage
AI5~AI8	4 inputs of 4 to 20mA current
OUT	Test output point, can output 5V level, generally not used.

ZLAN6808 The following figure shows the ports:

Chart 3 Side interface

Interface	Function
ANT	ZLAN6808-8(4G): The antenna interface is 50 Ω /SMA (female head), and the external antenna must be suitable for 4G working band. Zhuo LAN can provide glue stick or suction cup antenna, the suction cup can be attached to the metal shell of the chassis (the default suction cup antenna lead length is 1.5 meters). ZLAN6808-7 (LORA) : is a 1 meter suction cup antenna.
Reset	After you dial ON, the TCP indicator blinks. After you dial back, the device restores to the default configuration. The default baud rate of LORA is 9600bps, and that of other versions is 115200bps.
SIM Card	When installing the SIM card, ensure that the device is not powered on. Using a pen tip and a screwdriver, lift the SIM card slot out and push the SIM metal face down into the slot.
DO8~DO1	R and L respectively represent the two contacts of the relay, and here represent the 8-way relay output. NC is not connected.

1. 8 channels of digital input DI1~DI8。

Supports passive switching quantity (dry node) and active level (wet node). The dry node only needs to short-connect it to GND to collect 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. 8 ports Digital output DO1~DO8。

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

3. 8 channels of analog input: accuracy is 12 bits. By default, the first 4 channels are 0 ~ 5V voltage input, and the last 4 channels are 4~20mA. Any path can be modified as follows (custom required):

- 1) Current signal input: 4~20mA。
- 2) Voltage signal input: 0~5V。
- 3) Voltage signal input: 0~10V。
- 4) Resistive impedance input: For example, 0 to 10k or resistance t/h sensors.

Both voltage and current are relative to GND.

4. ZLAN6808 panel lights

Chart 4. Indicator light

Indicator light	Light name	Green	Blue
PWR	power supply		
ACT3	IO communication lights	485-IO Interface data entry	485-IO Interface data is returned, indicating that the sent IO control instruction is correctly identified.
ACT2	Network/remote communication indicator	The network (for example, 4G) receives data	The network (for example, 4G) sends data. The indicator blinks during initialization and is off after initialization.
ACT1	Serial port communication	485-4G RS485 Interface data output	485-4G RS485 Interface data entry

	indicator		
4G	4G Connection indicator light	6808-8 (4G) : Green is meaningless 6808-7 (LOAR) : Blinking green: The module is working.	6808-8 (4G) : Blinking blue The dialing is in progress. Steady blue The dialing is successful. The dialing starts 5 seconds after the system is powered on. 6808-7 (LOAR) : The device receives a network message.
LINK	TCP Connection indicator light	6808-8 (4G) : Green is meaningless. 6808-3 (Ethernet) : Indicates that the network cable is properly connected.	The TCP connection is steady on; The Reset button is in the Reset state, and the Reset succeeds. Blinking blue for 3 seconds.
DI1 ~ DI8	DI Indicator light	On: Indicates that the input is in the low level or on state.	
DO1 ~ DO8		On indicates the closed state of the relay.	

5. MODBUS instructions

Through the 485-IO RS485 port, you can control THE DO and read the DI/AI using Modbus RTU commands.

5.5 DI Usage instructions

MODBUS register as followings:

Chart 5 DI Register Chart

Register address	Channel	Instructions	Describe	Property
00001	1	01	No.1 DI value	read-only

00002	2	01	No.2 DI value	read-only
00003	3	01	No.3 DI value	read-only
00004	4	01	No.4 DI value	read-only
00005	5	01	No.5 DI value	read-only
00006	6	01	No.6 DI value	read-only
00007	7	01	No.7 DI value	read-only
00008	8	01	No.8 DI value	read-only

Read single coil group instruction 0x01, read DI state, instruction format is as follows:

number of bytes	1	1	1	1	1	1	1	1	1
Name	Device address	Instruction Type	initial address high	initial address low	length high	Length low	CRC high	CRC low	

For example, read 8:

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

Return-> 01 01 01 **80** 50 28

When DI input is low, the corresponding bit is returned as 1.

5.6 DO Usage instructions

MODBUS register Chart as followings:

Chart 6 DO Register Chart

Register address	zone	Channel	Instructions	Describe	Property
00016		1	01/05	No.1 DO value	Read only
00017		2	01/05	No. 2 DO value	Read only
00018		3	01/05	No.3 DO value	Read only
00019		4	01/05	No. 4 DO value	Read only
00020		5	01/05	No.5 DO value	Read only
00021		6	01/05	No.6 DO value	Read only
00022		7	01/05	No.7 DO value	Read only

00023	8	01/05	No.8 DO value	Read only
-------	---	-------	---------------	-----------

Set DO by imposing the single coil instruction 0x05 in the following format:

Bytes No.	1	1	1	1	1	1	1	1
Name	Device address	Instruction Type	initial address high	initial address low	length high	Length low	CRC high	CRC low

For example, set DO1 to on

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

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

Use the 01 instruction to read the current coil state, the same as the DI instruction.

Enumerating instructions are as follows:

1 Close(DO1) 01 05 00 10 ff 00 8d ff

Return: 01 05 00 10 ff 00 8d ff

1 Disconnect 01 05 00 10 00 00 cc 0f

Return: 01 05 00 10 00 00 cc 0f

2 Close(DO2) 01 05 00 11 ff 00 DC 3f

Return: 01 05 00 11 ff 00 DC 3f

2 Disconnect 01 05 00 11 00 00 9d cf

Return: 01 05 00 11 00 00 9d cf

3 Close (DO3) 01 05 00 12 ff 00 2c 3f

Return: 01 05 00 12 ff 00 2c 3f

3 Disconnect 01 05 00 12 00 00 6d cf

Return: 01 05 00 12 00 00 6d cf

4 Close(DO4) 01 05 00 13 ff 00 7d ff

Return: 01 05 00 13 ff 00 7d ff

4 Disconnect 01 05 00 13 00 00 3c 0f

Return: 01 05 00 13 00 00 3c 0f

5.7 AI Usage instructions

MODBUS register Chart as followings:

Chart 7 AI register chart

Register address	Channel	Instructions	Describe	Property
00000	1	04	No.1 AI value	Read only
00001	2	04	No.2 AI value	Read only
00002	3	04	No.3 AI value	Read only
00003	4	04	No.4 AI value	Read only
00004	5	04	No.5 AI value	Read only
00005	6	04	No.6 AI value	Read only
00006	7	04	No.7 AI value	Read only
00007	8	04	No.8 AI value	Read only

Get data by reading hold register instruction 0x04, instruction format:

Bytes	1	1	1	1	1	1	1	1
Name	device address	Instructio n Type	initial address high	initial address low	Length high	Length low	CRC high	CRC low

For example, read 8 registers at once:

Send -> 01 04 00 00 00 08 f1 cc

Return-> 01 04 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 b4 54 cb

The 01 b4 obtained here is the value of AI8, which is 436 in decimal notation, and its true voltage value is $692 \times 5 / 1024 = 2.129$ (V). If it is the latter 4-channel current type, it needs to be converted to the current value, and the corresponding current value is $692 \times 5 / 1024 / 100 = 0.02129$ (A) = 21.29 (mA).

5.8 AI High precision use

ZLAN6808 Provides higher precision AI numerical calculation methods.

Chart 8 AI original 12-bit value

Register address	Channel	Instructions	Describe	Property
00032	1	04	No.1 AI value	Read only
00034	2	04	No.2 AI value	Read only
00036	3	04	No.3 AI value	Read only
00038	4	04	No.4 AI value	Read only
00040	5	04	No.5 AI value	Read only
00042	6	04	No.6 AI value	Read only
00044	7	04	No.7 AI value	Read only
00046	8	04	No.8 AI value	Read only

Use function code 04 to read the registers starting from 0x20 (decimal 32), which correspond to 12-bit precision values from AI1 to AI8. The data format is big-endian. For example, if X=03 A2 is obtained, the decimal value is 930.

Read the error adjustment register value for each channel:

Chart 9 AI adjusted value

Register address	Channel	Instructions	Describe	Property
00074	1	03	No.1 AI value	Read only
00076	2	03	No.2 AI value	Read only
00078	3	03	No.3 AI value	Read only
00080	4	03	No.4 AI value	Read only
00082	5	03	No.5 AI value	Read only
00084	6	03	No.6 AI value	Read only
00086	7	03	No.7 AI value	Read only

00088	8	03	No.8 AI value	Read only
-------	---	----	---------------	-----------

Use the function code 03 to read the register starting with 0x4A (decimal 74), corresponding to VREF1 to VREF8 big-ended data, for example, 1.063 float data read the result of 0x3F88 1062 hex.

Send -> 01 03 00 4a 00 02 e5 dd

Return -> 01 03 04 **3F 88 10 62** fa 24

When the original 12-bit accuracy data X of AI read is less than 1024, it is calculated as 1024, and the true values of A1~A4 are calculated according to the following formula:

$$V = (((X/1024.0) - 1.0) * VREF[i] * 2.0)$$

In the formula above, VREF[i] is VREF1~VREF8.

Current Type A5~A8 refer to the current value:

$$A = (((X/1024.0) - 1.0) * VREF[i]) / 100$$

5.9 DI and AI upload the same time actively

In RemoteIO, if a value between 2 and 255 is entered in Enable DI active reporting in Figure 12, DI+AI data is reported at an interval of 2 to 255ms. Format is as follows:

01 04 12 03 01 00 00 00 00 00 00 00 00 00 00 03 07 03 08 00 08 d3 52

Eight AI registers and one DI data are reported using function code 04. 03 01 indicates the data of AI1, and 03 08 indicates the data of AI8. 00 08 is the DI data. 00 08 indicates that route 4 is closed.

5.10 TCP connection disconnect and reset

When the TCP connection is disconnected (TCP LINK is off), you can disconnect the previously closed relay at the same time.

Enable this function by writing: 01 06 00 45 00 01 59 df. Write 01 06 00 45 00 00 98 1f to turn this off. It takes effect immediately without restart.

6. Software instructions

All versions of the 6808 use two pieces of software: RemoteIO and ZLVirCom. RemoteIO software is used to control device DO and check DI and AI information. The use page of all versions is the same. ZLVirCom software is used to configure remote communication parameters. The configuration page of each version is different. For details, see the corresponding configuration tutorial. For details on how to use the two software, see Chapter 7 and Chapter 8.

7. Remote IO Function testing

7.9 Testing Software Function Description

RemoteIO software is a tool for testing and configuring 6808 devices:

(<http://www.zlmcu.com/download/RemoteIO.zip>) , See The interface in Figure 5.



Chart 5 Testing software

The software interface is divided into five parts.

The first part is the communication setting of remote IO controller, IP and port need not be set, the conversion protocol must be set to MODBUS RTU, click search device, click connect to control the device after searching the device, note: this function only supports 6808-3(Ethernet version).

The second part is 6808. After connecting the RS485 bus device to the 485-IO

RS485 interface of the device, open the corresponding serial port number and click Search device to search the device.

The third part is the 6808 control part, after the normal search device, you can control the DO output, obtain the DI input, analog input information collection through this part.

The fourth part is advanced parameter setting, you can set the advanced parameters of the device;

Part 5 is the information report area.

For details, see section 2-6 of this chapter.

7.10 Ethernet search device

Only 6808-3 is supported here. Connect the 6808-3 (Ethernet) to the LAN through the network cable, as shown in the following figure. Click the "Search device" button to search for the 6808 device in the LAN.

6042/6842通信

IP: 192.168.1.200 端口: 502 转换协议: MODBUS RTU

设备名	IP	端口	工作模式	转换协议	串口参数
ZLAN8005A	192.168.10.1	0	模式错误!	MODBUS RTU!	正确!
ZLDEV0001	192.168.1.201	4196	TCP Server	MODBUS RTU!	正确!
能油测试	192.168.1.141	4196	TCP Server	MODBUS RTU!	正确!
ZLAN6808	192.168.1.254	502	TCP Server	MODBUS RTU!	正确!

连接 搜索设备

Chart 6 Ethernet Search

You can see that some devices appear in the list bar, followed by IP address, port number, working mode, conversion protocol, serial port parameters. Note that the device must work in TCP Server mode and convert to Modbus RTU (no protocol).

Select the 6808 device that you want to control from the list. The IP address and port number are automatically filled in the corresponding editing box. Click Connect to connect to the TCP connection.

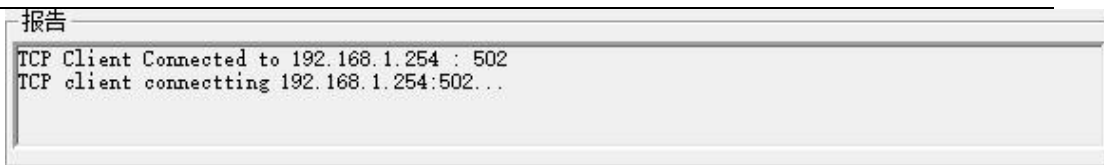


Chart 7 Observation report area

In the report area, the message "TCP Client Connected to..." "TCP is established successfully. After the connection is successful, the software will automatically detect the device station address and make the "advanced parameters" button available, and the LINK light will turn blue steady on. You can then test the 6808 using the buttons in the control area.

7.11 RS485 search device

This is for sub-models other than 6808-3. Connect the serial to RS485 cable of the 6808 to port 485-IO of the 6808. Select the serial port number in Remote IO's serial port selection box, without selecting baud rate (considering customers may forget the baud rate of the device, so we check baud rate automatically by software), then click Search Device and wait for the software to search device. If a device is found, a message "Found device" is displayed in the report box. Advanced parameters change from gray to a configurable state. See Figure 8 and Figure 9 for details.

6002/6802通信

串口：

COM4

波特率：

1200

关闭串口

搜索设备

6042/6002/6842/6802 参数设置

设备地址：

1

高级参数

控制

RL1开

RL2开

RL3开

RL4开

RL5开

RL6开

RL7开

RL8开

RL1关

RL2关

RL3关

RL4关

RL5关

RL6关

RL7关

RL8关

继电器状态

RL1

RL2

RL3

RL4

RL5

RL6

RL7

RL8

DI输入

查询DI状态

DI1

DI2

DI3

DI4

DI5

DI6

DI7

DI8

AI输入

查询AI状态

AI1

0

AI2

0

AI3

0

AI4

0

AI5

0

AI6

0

AI7

0

AI8

0

报告

Chart 8 Before search device

6002/6802通信

串口：

COM4

波特率：

115200

关闭串口

搜索设备

6042/6002/6842/6802 参数设置

设备地址：

1

高级参数

控制

RL1开

RL2开

RL3开

RL4开

RL5开

RL6开

RL7开

RL8开

RL1关

RL2关

RL3关

RL4关

RL5关

RL6关

RL7关

RL8关

继电器状态

RL1

RL2

RL3

RL4

RL5

RL6

RL7

RL8

DI输入

查询DI状态

DI1

DI2

DI3

DI4

DI5

DI6

DI7

DI8

AI输入

查询AI状态

AI1

0

AI2

0

AI3

0

AI4

0

AI5

0

AI6

0

AI7

0

AI8

0

报告

已搜索到设备

Chart 9 device has been located

Once the device is found, simple tests can be performed in the controlled area.

7.12 Advanced parameter

Click “advanced parameter” , as picture

Chart 10 advanced parameter

Firmware version: 6808 firmware version

Device address: Device slave address representing 6808 (Modbus address).

Baud rate: 6808 Working baud rate

DI report address: Refer to section 5 of the chapter.

AI 1/2 Active reporting: Set the active reporting time of AI1 and the active reporting time of AI2. Note:

Modify the parameters and click the "Set" button to complete the modification.

At this time, you will be prompted to restart the device for the modification to take effect. Note:

- (1) If only AI1 or AI2 is set to proactively report data, only the analog data collected by AI1 or AI2 is proactively uploaded according to the specified reporting period. If parameters are set for AI1 and AI2, the simulation quantity collected by AI1-AI8 is reported according to the

minimum reporting period.

- (2) As the upper computer software indicates that it has not been modified, the 6808 does not need to be restarted. You can use the device after changing the parameters.
- (3) Advanced parameters may fail to be configured at 1200 baud rate. You are advised to configure parameters at other baud rates and then change the baud rate to 1200.

7.13 DI Take the initiative to upload

The 6808 is a standard MODBUS device and is used in a q&A format, but some users want feedback as soon as the DI input changes, which is an active return feature. The 6808's active reporting function is described here. Set as shown in Figure 11 (refer to Chapter 6 for setting method), set "Whether to report actively" to 1, and enable the function. The report address is set anywhere from 0 to 255 and will be filled in the address field in the feedback instruction. If the user wants to go back to the original q&A format, set the "do I report voluntarily" to 0. If this parameter is set to a value between 2 and 255, changes are automatically reported. The interval is between 2 and 255.



Chart 11

Active report instruction is actually control DO instruction, field is the same. So for clarification, the unsolicited stack address is set to 0 by default. Use this field to distinguish between active upload of DI changes and return of DO controls. Note: As

you can see, the first byte here (the station address) is 00, because we set the reporting address to 0, the content of this byte is what is set.

Examples as followings:

DI1 input

00 05 00 10 ff 00 8C 2E

DI1 no input

00 05 00 10 00 00 CD 2E

DI2 input

00 05 00 11 ff 00 DD EE

DI2 no input

00 05 00 11 00 00 9C 1E

DI3 input

00 05 00 12 ff 00 2D EE

DI3 no input

00 05 00 12 00 00 6C 1E

DI4 input

00 05 00 13 ff 00 7C 2E

DI4 no input

00 05 00 13 00 00 3D DE

7.14 AI active report

The active reporting function of AI is to automatically send the simulation data to the upper computer. This method does not require the upper computer to query Modbus instructions, which is very useful for internet-based network simulation monitoring.

Here, you can set the reporting time of A1 and A2. The value ranges from 0 to

65535 in ms. If the value is set to 0, active reporting is disabled. Click "Advanced Parameters" on RemoteIO and the dialog box shown in Figure 12 will pop up. Note the RemoteIO software version must be 2014.12.22 or later. The firmware version must be V5 or later.

Chart 12

Set the active reporting time of AI1 and AI2. In addition, if only AI1 or AI2 is set to actively report data, only the simulated data collected by AI1 or AI2 will be actively uploaded according to the specified reporting period. If parameters are set for AI1 and AI2, the simulation quantity collected by AI1-AI8 is reported according to the minimum reporting period. The format of data reported is the same as that returned by Modbus query.

(1) If only A1 or A2 is set, the upload instruction is:

Convert the protocol to an instruction that is timeless: aa 04 02 xx yy c1 c2

The conversion protocol is Modbus TCP to RTU: s1 s2 00 00 00 05 aa 04 02 xx yy

Aa indicates the device address (which can be set by advanced parameters), XX YY is a reported AI quantity, and c1 and C2 are the voltage values in hexadecimal. S1 S2 is the serial number of Modbus TCP.

A1 and A2 upload instructions are the same, so the user should know whether the upload is from A1 or A2, since only one of A1 and A2 is allowed to upload. Note that

when only A2 is selected, the unsolicited value in the RemoteIO program is displayed in the fetch box for A1.

(2) If A1 and A2 are set to upload at the same time, the upload instruction is:

The protocol is converted to none: aa 04 04 x1 y1 x2 y2 c1 c2.

Transfer protocol from Modbus TCP to RTU: s1 s2 00 00 00 07 aa 04 04 x1 y1 x2 y2.

Here, x1 y1 represents the collection quantity of A1, and X2 y2 represents the collection quantity of A2. If A1 and A2 are set at the same time, the data packets are reported in a small period.

1.5 Two Devices are connected

Considering that the user needs to control the DO output through DI input, but the DI input device is far from the DO output device, we take the Ethernet version as an example, we can connect two 6808 through the Ethernet network to achieve DI remote control of the DO output. The DI input can only control the corresponding DO. For example, DI1 of device 1 controls DO1 of device 2, DI2 of device 1 controls DO2 of device 2, and so on. The same is true for other versions of the 6808, which will not be described here.

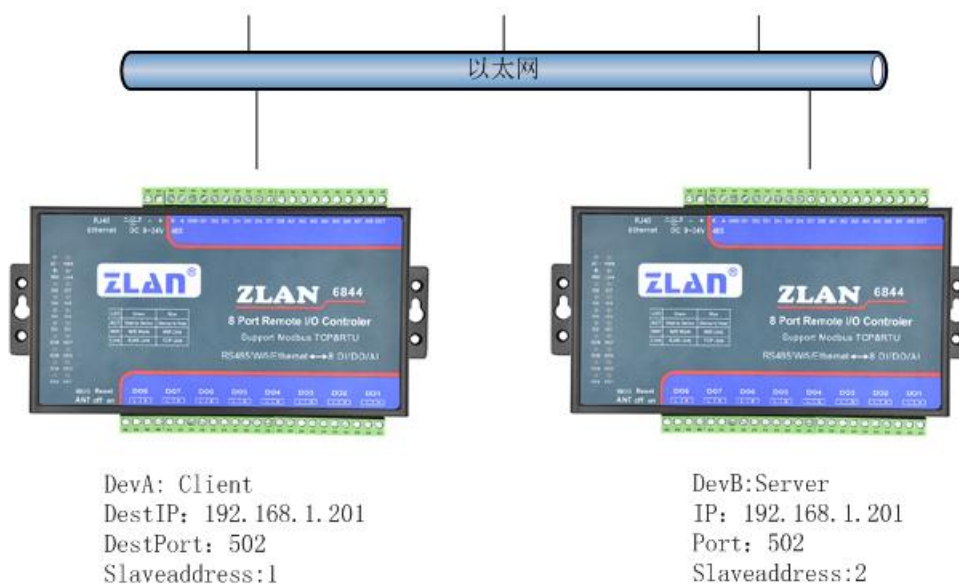


Chart 14 6808 two device connection control

As shown in Chart 14 6808 connection control, the two 6808s are connected together through Ethernet. First, two 6808s need to be set, as shown in Figure 15 DevA configuration, where the address to report and whether to report. Follow the software instructions in the previous chapter.

6808 all versions use the following two software: RemoteIO and ZLVirCom.

RemoteIO software is used to control device DO and check DI and AI information. The use page of all versions is the same.

ZLVirCom software is used to configure remote communication parameters. The configuration page of each version is different. For details, see the corresponding configuration tutorial.

For details on how to use the two software, see Chapter 7 and Chapter 8.

RemoteIO function test content, search for and connect device DevA, enter "Advanced Parameters", set device address to 1, set "Report" to 1 to enable this function, "report Address" is the remote 6808 device address to be controlled, set this parameter to 2. DevA setup is complete.



Chart 15 DevA configuration

Then search for and connect device DevB, enter advanced parameters, set device address to 2, report to 1, and report to 1 (DevA). When DevA's DI changes, a control DO is sent to DevB. In the same way, DevB's DI changes send a control instruction to DevA.



Chart 16 DevB configuration

Configure parameters for DevA and DevB to establish a TCP connection. If DevB works in server mode, set the working IP address and port number. If DevA works in client mode, set the destination IP address and port number of DevA to DevB's IP address and port number.

1.6 Control zone introduction



Chart 17 control zone

The control area is divided into three parts as shown in Figure 17:

The first part from the top is the DO output control part. Click the corresponding button to control the output of the corresponding DO, and display the DO output status in the box below.

The second part is the display box of DI input status. Click "Query DI status" to realize the query.

The third part is to display the voltage value of AI analog quantity acquisition and conversion, ai1-AI4 acquisition voltage value range is 0-5V; Ai5-ai8 collection current range is 4-20mA. Note: Please do not exceed the corresponding maximum voltage measurement to avoid damage to the equipment.

8. ZLVirCom Configuration software use tutorial

Each version of ZLAN6808 uses the RS485 interface of 485-4G to configure the remote communication module. The upper computer software used for configuration is ZLVirCOM.

Download ZLVirCom configuration tool
(<http://www.zlmcu.com/download/ZLVirCom.zip>) 。

Once download ZLVirCom, Do not install, can be opened directly to use.

Open ZLVircom (The following is referred to as configuration tool) , the configuration tool main window is displayed.

Click Device Management and select serial port search, as shown in Figure 19. The interface for selecting serial port parameters pops up, as shown in Figure 20. Select serial port number (COM20, baud rate 115200), 115200 is the factory default setting.

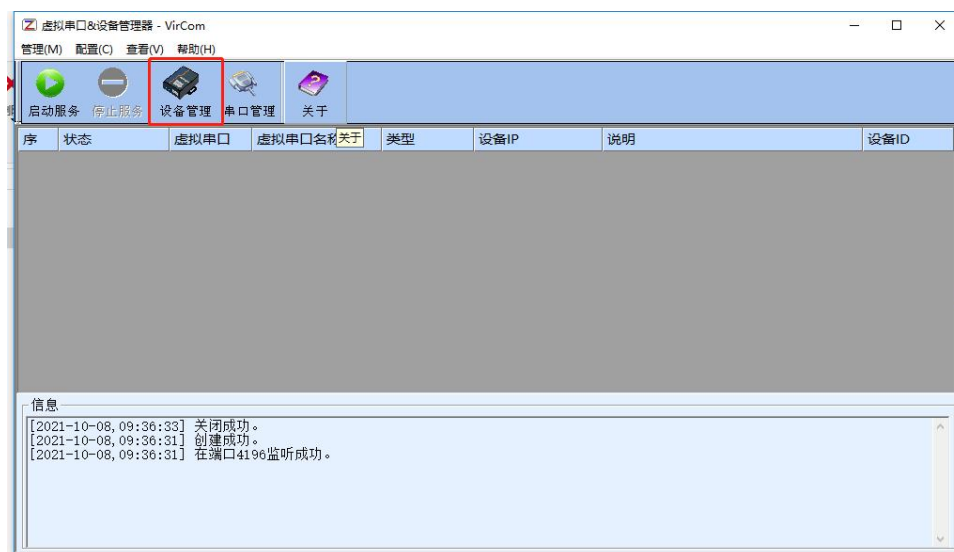


Chart 18 Configuration tool home page

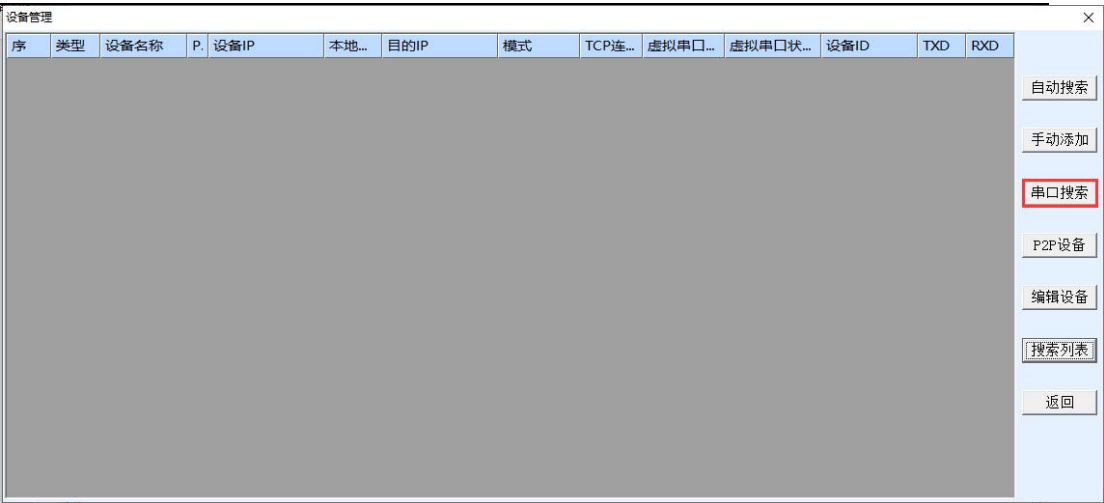


Chart 19 Serial port Search page



Chart 20 Serial Port Parameters

The 6808 configuration screen is different for different models.

1.17 ZLAN6808-8(4G)

Select and click the "Search" serial port. At this time, the configuration tool attempts to communicate with the device. If successful, the configuration page is displayed. See Figure 21 below:

第一步: 选择 1. AT指令模式, 或 2. 固件升级/配置文件下载模式, 含JSON配置等

串口: COM15
波特率: 115200
数据位: 8
校验位: N

进入AT指令模式 固件/配置文件模式

第二步: AT指令模式时, 如需修改参数请先登陆

登录密码: 666666
登录

第三步: AT指令模式的主要参数

波特率:
目的IP或域名:
目的端口:
协议:

获取参数 设置参数 高级参数

信息

清空

状态
配置模式:
登陆状态: 未登录

Chart 21 ConfTool Page

Click to enter the AT command mode, and the configuration tool will try to communicate with the device. If the communication is successful, the return information of THE AT command will be displayed on the right side, and the configuration mode will be displayed as entering the configuration mode, as shown in Figure 22 below:

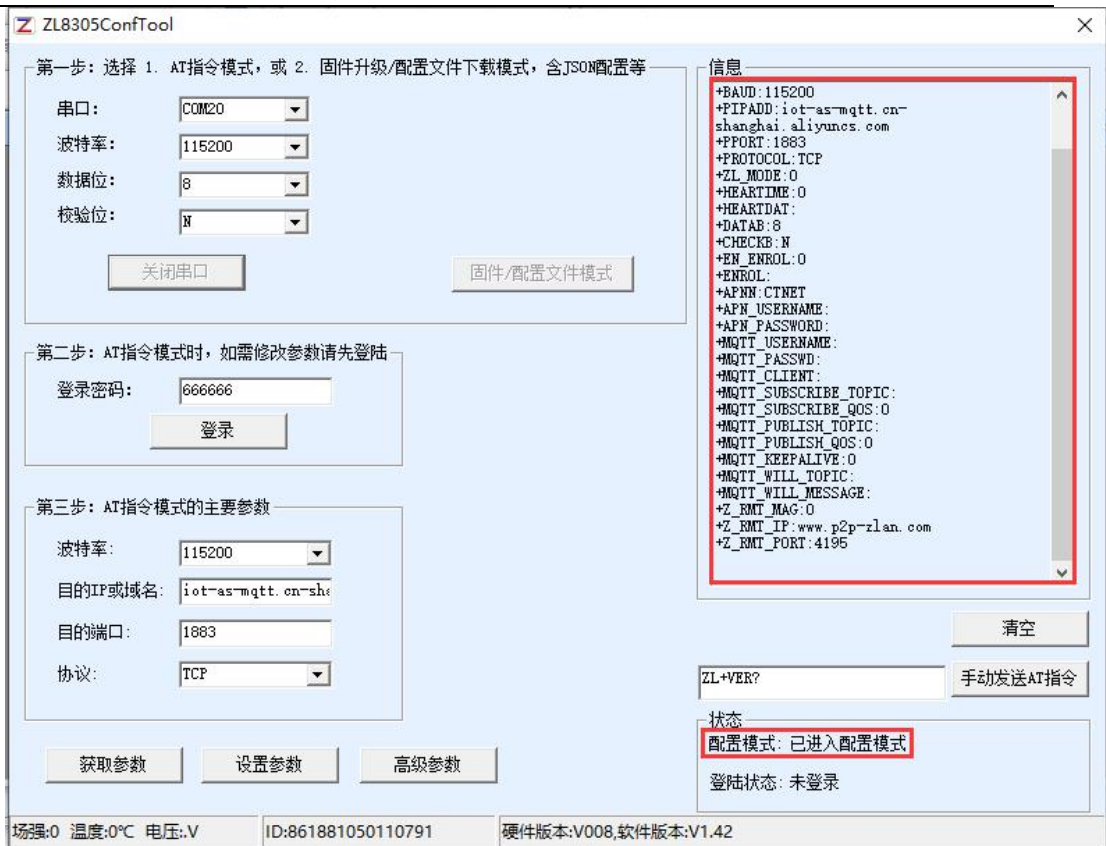


Chart 22 configuration mode page is displayed

The default login password is 666666. The parameters are read-only and cannot be set or modified before you click Log in. Click the "Login Button":

You can see that after LOGIN, the LOGIN status changes to "Logged in" and the message "+LOGIN OK" appears on the right, as shown in Figure 23.

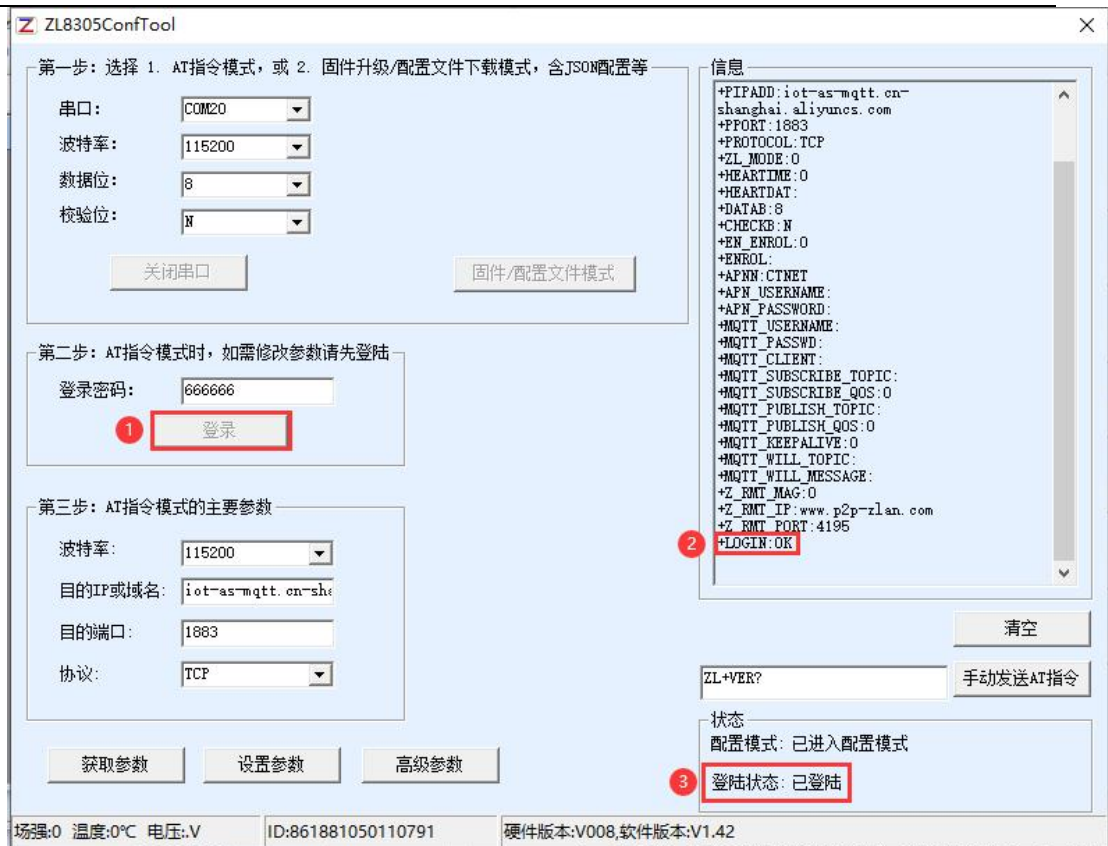


Chart 23 Login in page

The main parameters of the AT instruction mode include baud rate, destination IP address, destination port, and protocol. Protocol Supports TCP or UDP. 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 24.

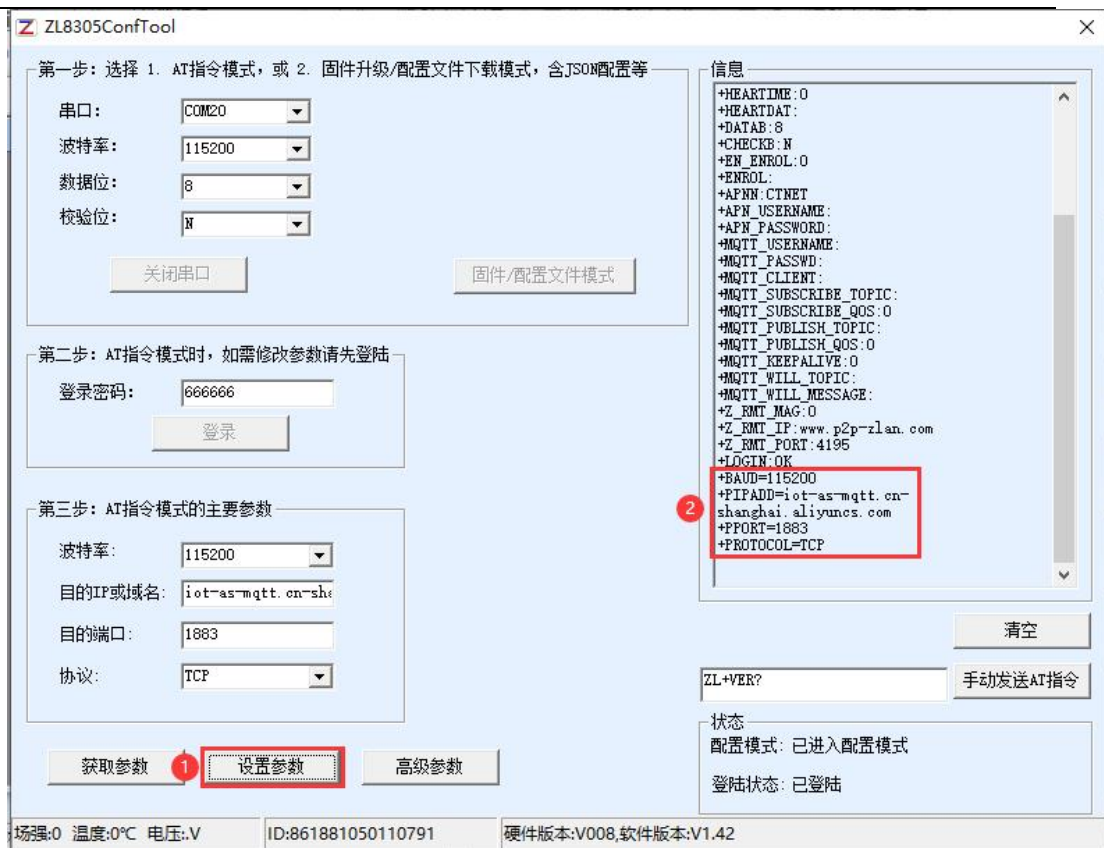


Chart 24 Set the parameters

The "Get Parameters" button can obtain the parameters of the current device. The parameters are obtained by sending AT instruction. The data returned by AT instruction is listed on the right. Refer to other sections of this article for the AT directive. Since the "Get Parameters" button will be automatically executed once the "open" is successful, it is generally not necessary to click the "Get Parameters" button.

Click "Advanced Parameter", the advanced parameter box is shown in Figure 25, and the commonly used parameter is:

1. Heartbeat interval: You can set heartbeat packets with an interval of 15 seconds.
2. Heartbeat content: Set the content of the heartbeat packet.
3. Serial port data bits
4. Serial port parity bit
5. Enable registration package: Whether to enable the registration package

6. Registration Package Contents: The contents of the registration package sent after connecting to the server.
7. APN: APN access Point Name.
8. APN User name
9. APN password
10. MQTT parameter: Set the parameters for accessing the MQTT server
11. Remote device management: Connects a device with the remote management function to a remote server

After selecting the parameters, click the "Take Effect advanced Parameters" button, and observe the information bar on the right to check whether the Settings returned by the device are consistent with the entered information, as shown in Figure 26.

高级参数

工作参数

工作模式: 双向透传

DNS服务器IP:

心跳间隔: 禁用

心跳内容:

串口数据位: 8

串口校验位: N

登陆密码:

启用注册包: 禁用

注册包内容:

APN: CTNET

APN用户名:

APN密码:

MQTT参数

MQTT版本: V3.1.1

用户名:

密码:

客户端ID:

订阅主题:

订阅质量: 0

发布主题:

发布质量: 0

保活时间: 0

遗嘱主题:

遗嘱信息:

远程设备管理

☐ 启用远程设备管理

远程服务器IP或域名: www.p2p-zlan.com

远程服务器端口: 4195

生效高级参数

取消

恢复默认值

Chart 25 Advance parameter

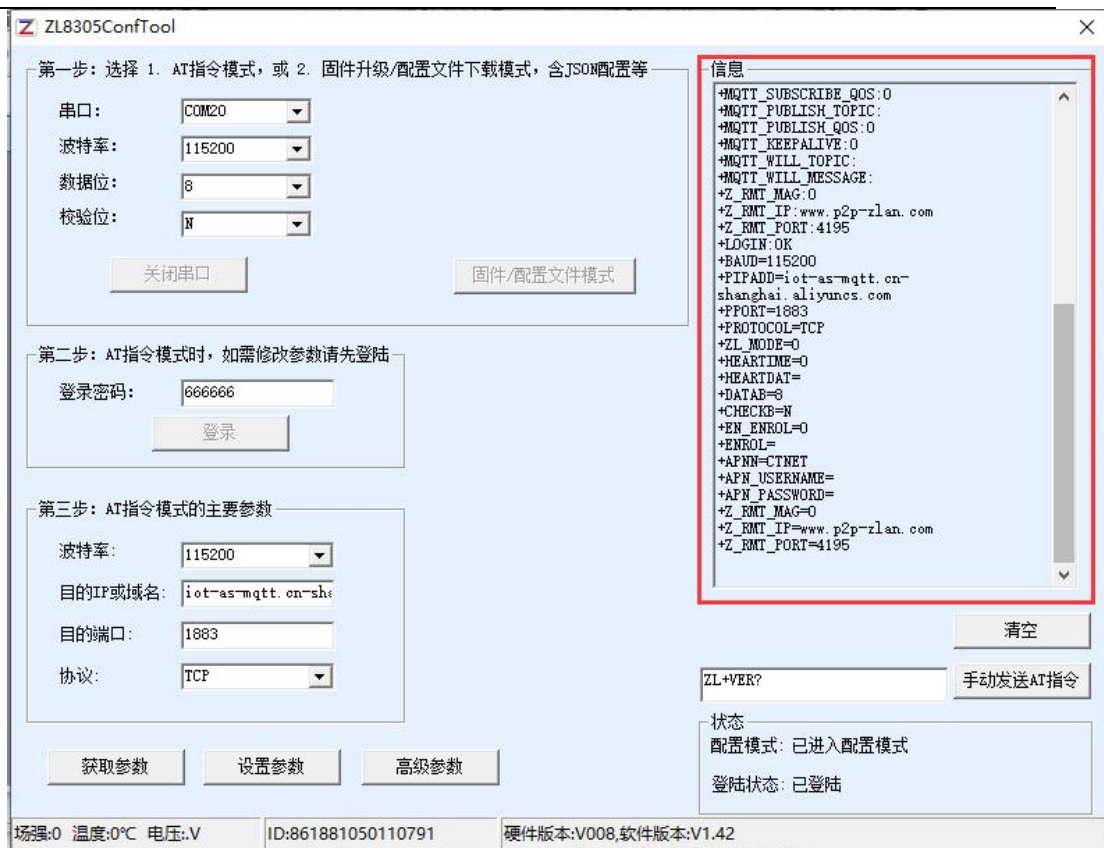


Chart 26 Setting advanced parameters Information is returned

1.18 ZLAN6808-7(LORA)

After clicking search, the page shown in Figure 27 can be entered after the device is searched.

LoRa Firmware version: Current firmware version.

Spreading factor: 6~12, If the size is larger, the data transfer is slower.

bandwidth: 125~500KHz。

Encoding rate: 1~4。

Frequency: 410~525, default is 477MHz, default antenna 490MHz, So try to stay within spectrum among 470~510。 For different LoRa networks,

Different frequencies are used to distinguish different communications and prevent tampering.

Baud rate: LORA set baud rate for the serial port communication of the module

Check bit: Set the check bit for the serial port communication of the LORA module. Currently, space is not supported. Do not set this bit.

Modify parameters: Click the Modify parameter button after modifying parameters.

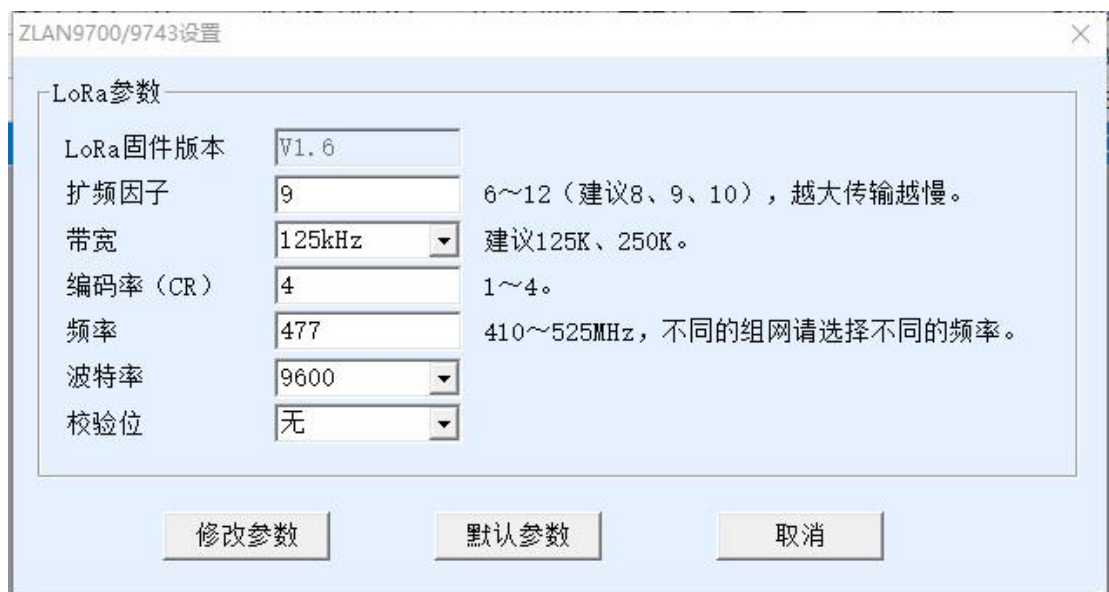
Default parameter: device factory parameter.

Note:

Communication between modules, must be spread factor, bandwidth, coding rate, frequency, these four parameters are completely consistent, otherwise it cannot be communicated.

The data bit is fixed at 8 bits and the stop bit is fixed at 1 bit.

After the modification is complete, power on the device again.



The screenshot shows a configuration window titled "ZLAN9700/9743设置". Inside, there is a section labeled "LoRa参数" (LoRa Parameters). The parameters are listed in a table-like format with input fields and dropdown menus, and some have explanatory text to the right.

Parameter	Value	Notes
LoRa固件版本	V1.6	
扩频因子	9	6~12 (建议8、9、10), 越大传输越慢。
带宽	125kHz	建议125K、250K。
编码率 (CR)	4	1~4。
频率	477	410~525MHz, 不同的组网请选择不同的频率。
波特率	9600	
校验位	无	

At the bottom of the window, there are three buttons: "修改参数" (Modify Parameters), "默认参数" (Default Parameters), and "取消" (Cancel).

Chart 27 LORA configuration page

1.19 ZLAN6808-3(Ethernet)

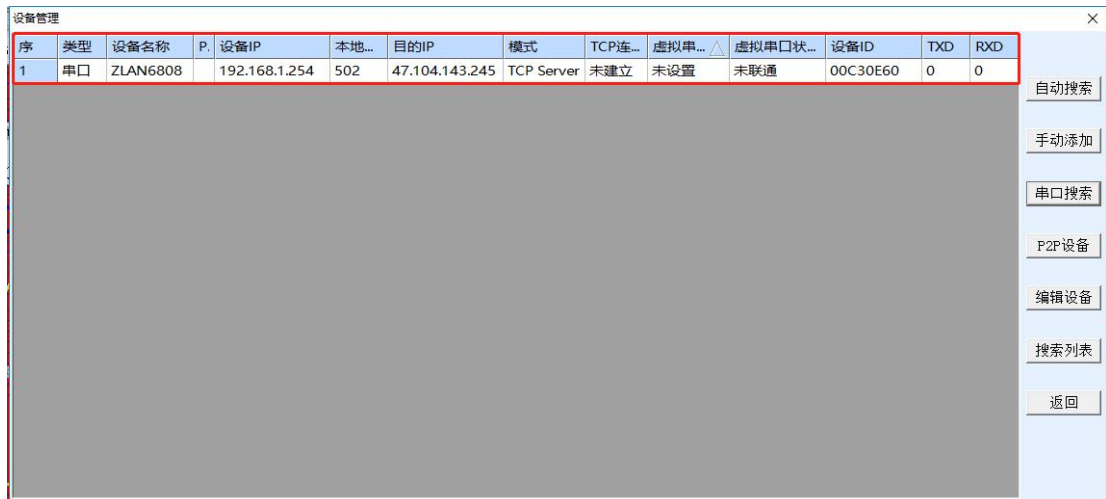


Chart 28 Ethernet configuration page



Chart 29 Configuration page

After clicking the search button, the page shown in Figure 28 is displayed.

Click any area in the red box to enter the configuration page, as shown in Figure 29.

On this interface, users can set device parameters and click "Modify Settings" to set the parameters in the flash of the device. The parameters will not be lost during

power failure. At the same time, the device automatically restarts.

The main parameters are as follows: Baud rate, data bit, parity bit in serial port Settings; IP address, subnet mask, gateway in network Settings; Sometimes it is necessary to configure the working mode of the serial server according to the computer software.

The meanings of other parameters are described as follows:

Chart 10 Parameter meaning

Parameter name	Range	Meaning
Virtual serial port	No used on 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 main window.
Device model		Only the core module model is displayed
Device name	Random	You can give the device an easy-to-read name that is up to 9 characters long and supports Chinese names.
Device ID		Unique factory ID, which cannot be changed.
Firmware version		Firmware version of the core module
The functions supported by the device		For details, see Table 11
IP mode	static、DHCP	Users can choose static or DHCP (dynamically obtain IP)
IP address		IP address of the serial port server

Port	0~65535	Serial port Server Listening port when the serial port Server is 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 port and non-zero port is as follows : (1) when the local port is 0, a new TCP connection will be established with the PC when the module restarts. The old TCP connection may not be closed, and the device may have multiple false connections. Generally, the upper computer wants to close the old connection when the module restarts. Specifying a non-zero port closes an old connection. (2) When the local port is 0, the TCP connection takes longer to establish. When the serial port server is in TCP client mode, it also acts as the TCP server and listens for the connection on the port. The local port number used by the TCP client to connect to the server is Port +1.
Working mode	TCP server mode, TCP client mode, UDP mode, UDP multicast mode	When the TCP server is configured, the serial port server waits for the computer to connect. When the serial port server is set as a TCP client, the serial port server proactively initiates a connection to the network server whose destination IP address is specified.

Subnet mask	Eg. : 255.255.255.0	The subnet mask must be the same as that of the local LAN.
Gateway	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 address 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	1200、2400、4800、 7200、9600、14400、 19200、28800、38400、 57600、76800、115200、 230400、460800	serial port baud rate support 1200、2400、 4800、9600、19200、38400、57600、115200
Digit bits	5、6、7、8	
Check bits	None, even, odd, mark, space	Spaces are not supported
Stop bits	1、2	
Flow control	No flow control, hard flow control CTS/RTS, hard flow control DTR/DCR, asthenosphere control XON/XOFF	
DNS server		If the destination IP address is described by a domain name, enter the DNS server IP address. If THE IP address mode is DHCP, the

		DNS server is automatically obtained from the DHCP server.
Objective mode	Static, dynamic	In TCP client mode: In static destination mode, the device automatically restarts after five consecutive attempts to connect to the server fail.
Conversion protocol	NONE 、 Modbus TCP<->RTU、 Real_COM	NONE indicates that data is transparently forwarded from the serial port to the network. Modbus TCP<->RTU converts Modbus TCP to RTU. RealCOM is designed to be compatible with the old REAL_COM protocol. It is a virtual serial port protocol. However, you do not need to select RealCOM when using the virtual serial port.
Keepalive time	0~255	Heartbeat interval. (1) If the value is set to 1 to 255 and the device works in TCP client mode, the device automatically sends the TCP heartbeat at keepalive Time. This ensures the TCP validity of the link. If the value is set to 0, the TCP heartbeat is unavailable. (2) When the value is set to 0 to 254, when the REAL_COM protocol is selected as the transfer protocol, the device will send a data with 1 length and 0 content every other keepalive time to realize the heartbeat mechanism in Realcom protocol. When set to 255, there will be no RealCom heartbeat. (3) When the value is set to 0 to 254, if the

		device works on the TCP client, the device sends device parameters to the destination computer at intervals. If 255 is set to 255, no parameter is sent and remote device management can be implemented.
Reconnection time of disconnection	0~255	In TCP client mode, if the connection fails, TCP connections are re-initiated to the computer at each Disconnection Reconnection time. The value ranges from 0 to 254 seconds. If 255 is set, the reconnection is never performed. Notice The first TCP connection (for example, hardware power-on, device restart through zlvircom, and no data indicator) is usually made immediately. After the first connection fails, the system waits for reconnect time and tries again. Therefore, reconnect time does not affect the normal connection establishment time between the network and the server.
Web access port	1~65535	Default is 80
Multicast address		UDP multicast
Enabling the Registration Package		This registration packet is sent to the computer when a TCP connection is established. You must select the RealCOM protocol after enabling the registration package. Supports TCP server and TCP client.

Packet length	1~1400	One of the rules for serial framing. Serial port server After receiving data of this length, the serial port sends the received data as a frame to the network.
Packet interval	0~255	Serial port framing rule two. When the data received by the serial port of the serial server stops and the stop time is longer than this period, the serial port sends the received data as a frame to the network.

The following describes the functions supported by the device:

Chart 11 Functions supported by the device

Name	Instructions
Web download	Support through web pages to control serial output instructions, only the suffix W products have this function.
domain system	The destination IP can be a domain name (such as the WWW server address at the beginning)
REAL_COM protocol	A non-transparent serial port server protocol, suitable for multiple serial port servers to bind virtual serial ports over the Internet. Because the protocol contains the MAC address of the device, it helps the upper computer to identify the device. In general, you can not use it.
Modbus TCP to RTU	Only model 4 with the third digit supports this function. Modbus TCP can be converted to RTU. It also supports multiple hosts.
Serial Port Modification Parameters	Supports serial port AT commands to configure and read device parameters.
Automatic access to IP	Support DHCP Client protocol

Storage extended EX function	Subsequent extension
Multi TCP connection	The TCP server supports more than one TCP connection
IO terminal control	Model 4 supports any custom instruction to control up to 8 IO outputs
UDP broadcast	UDP broadcast
Multi purpose IP	A TCP client can connect to seven destination IP addresses at the same time
Proxy server	Supports the proxy server function (specific model required)
SNMP function	Supports SNMP to Modbus RTU. Only the suffix ending with -SNMP supports this function
P2P function	Supports access to devices in any network through P2P traversal technology. Models with suffix N support this function

1.20 ZLAN6808-9(Zigbee)

RESET switch: Enter ZigBee configuration mode when dialing on. Click the serial port to search for the device and enter the page as shown in the following figure.

1. Node address: The address is also called the ZigBee station address. In ZigBee networking, devices on the same network have unique addresses that cannot be repeated. The value ranges from 0000 to 65535. Notice The central node is fixed to 0000 and cannot be changed to an address other than 0000. The broadcast node is 65535 (hex FFFF). For common applications, set it to 0001, 0002, or 0003.

2. Network ID: Network ids must be the same. The value ranges from 0 to 255

3. Network type: can be configured as mesh network, star network, chain network, peer network; The first three networks must have one central node, and the network types in the same network must be the same. Configure peer network for

common applications.

4. Node type: ZigBee networks have different nodes, including centers, relay routes, and terminals. The central coordinator is the central node of the network, which is responsible for initiating, organizing, maintaining and managing the network. A relay router is responsible for relaying data. The terminal node only sends and receives data on the local node. Generally, one central node is set, and the others are set as trunk routes. The trunk route can be configured on any peer network.

5. Sending mode: it can be divided into broadcast mode, active mode and point-to-point mode. When broadcasting, all ZigBee modules in the same network can be received without target address; In the master-slave mode, the central node must have a destination address when sending the packet. The destination address is 2 bytes before the packet. The non-central node directly sends the packet to the central node without the address. When sending point-to-point, two bytes of the destination address must be prefixed to the instruction. Generally, set it to broadcast mode.

6. Channel (wireless frequency point) : It can be set to different frequencies, ranging from 0 to 15. It is recommended to use 14 or 15 to avoid interference with wifi. The radio frequency points on the same network must be the same.

7. Data source address: Whether to output the source address when receiving data. NO OUTPUT indicates NO OUTPUT, HEX indicates hexadecimal OUTPUT, and ASCII indicates characters OUTPUT.

8. Address encoding: When the sending mode is configured as master slave or point-to-point, 2 bytes of address must be added before the command. Here is the encoding mode of the address: ASCII code or HEX (hexadecimal). HEX is generally used.

9. Baud rate: communication baud rate1, 200~115200

10. Digit Bits: 8、9。

11. Check bits: none, even check, odd check, mark, space

12. Note

1. All devices on a communication network must be of the same network type.
2. On a communication network, all devices must have the same network ID.
3. In a communication network, all devices must work at the same frequency.

The screenshot shows a software window titled "ZLAN9500设置" (ZLAN9500 Settings). It contains two main sections: "Zigbee参数" (Zigbee Parameters) and "串口参数" (Serial Port Parameters). The Zigbee section includes fields for Node Address (0), Network ID (0), Network Type (Peer-to-peer), Node Type (Relay), Transmission Mode (Broadcast), Channel (14), Data Source Address (No output), and Address Encoding (HEX). The Serial Port section includes fields for Baud Rate (9600), Data Bits (8), and Parity (None). At the bottom, there are three buttons: "修改参数" (Modify Parameters), "默认参数" (Default Parameters), and "取消" (Cancel).

Zigbee参数	
节点地址	0
网络ID	0
网络类型	对等网
节点类型	中继路由
发送模式	广播
信道	14
数据源地址	不输出
地址编码	HEX

串口参数	
波特率	9600
数据位	8
校验位	无

Figure Zigbee Configuration page

You can click Default Parameters to restore the default parameters. However, note that the Node address of multiple devices whose parameters are restored to default must be set to different values. Otherwise, the communication fails. Click "Modify Parameters" to set the parameters inside the device.

9. Usage

2.20 ZLAN6808-7(LORA) Usage method

- (1) Install the antenna on the antenna interface of the device. The suction cup antenna can be attached to the surface of the metal chassis.
- (2) If there is only one LoRa network, this parameter is not required. To prevent

interference with other users, you are advised to set a special frequency. The frequency can be any value from 470 to 510. If the baud rate is not 9600, configure it accordingly.

- (3) Connect all LoRa devices to 9-24 V DC power supplies. You should see the Power light red.
- (4) Data received by the SERIAL port (RS485) on one LoRa device is sent to the serial port of another LoRa device.

Please refer to the official manual of ZLAN9700 for detailed usage.

(<http://www.zlmcu.com/download/ZLAN9743.pdf>)

2.21 ZLAN6808-3(Ethernet) Usage

Power on the device and connect it to the network using a network cable

9.20.1. TCP Communication testing.

After configuring device parameters, you can use the serial port tool or TCP debugging tool to test TCP connection communication.



Chart 30 TCP Communication Map

Now suppose the PC COM port (USB to RS232 line) and serial port serial port server connection, then open the ZLComDebug (<http://www.zlmcu.com/download/Comdebug.rar>) serial debugging assistant, The corresponding COM port figure 31comDebug interface is displayed; Open TCP&UDP debugging assista

<http://www.zlmcu.com>

nt SocketTest (<http://www.zlmcu.com/download/SocketTest.rar>), and as a way of

TCP client, Enter the destination IP address as the IP address of the serial port server (currently 192.168.1.200) and the destination port as 4196. Then click the "Open" button. Figure 32 Receiving and Sending interface of SocketTest

Enter "Socket Send" in SocketTest and click Send. The data will be transferred to RS232 through the network port of the serial server, and then sent to ZLComDebug, which will be displayed in ZLComDebug; Conversely, enter "Comdebug send" in ZLComDebug and click "Send" to send the socket test and display it.

This section describes how to transparently forward data from serial port to network port and network port to serial port on a serial server.

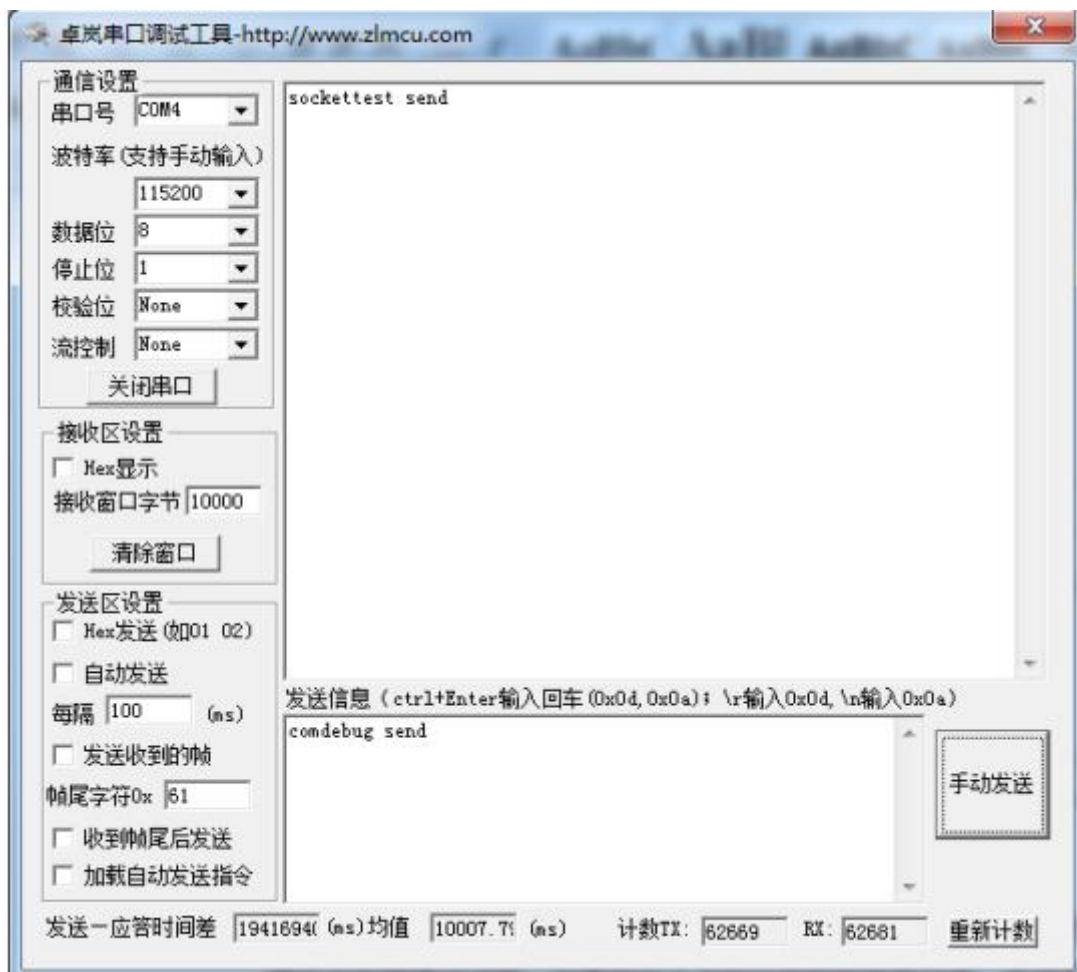


Chart 31comdebug Send and receive page

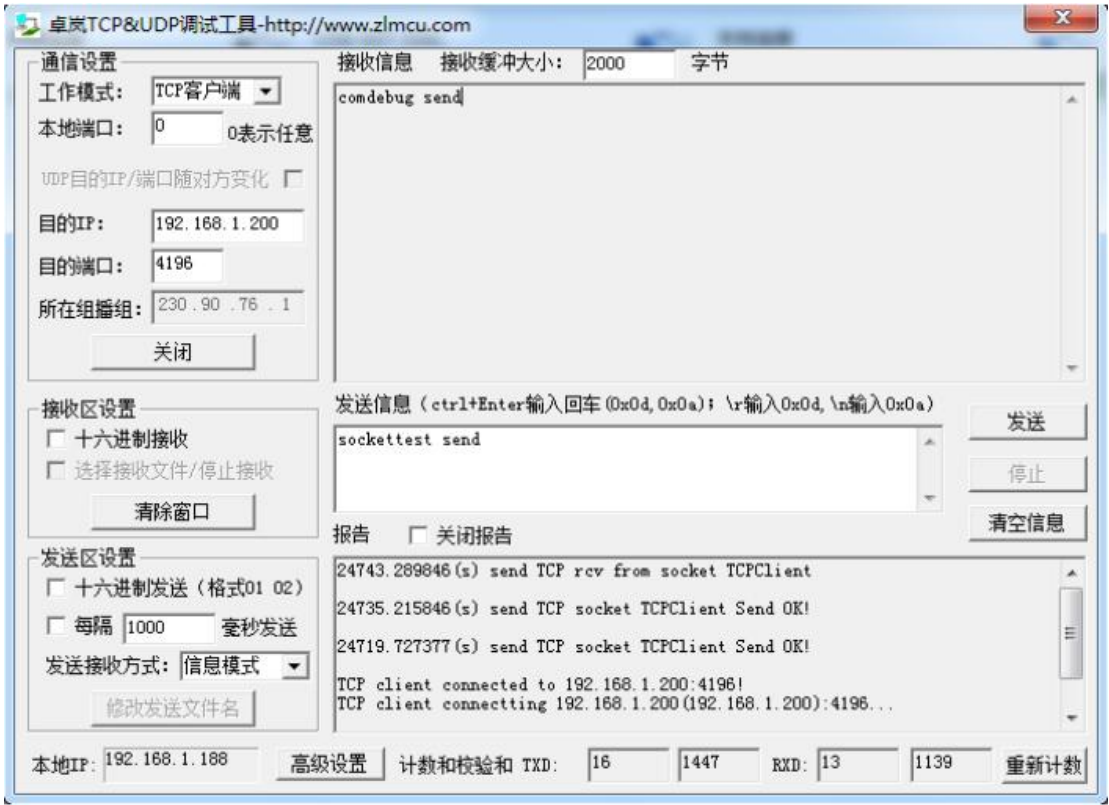


Chart 32 sockettest Send and receive page

9.20.2. Virtual serial port testing

The SocketTest in Figure 30 communicates directly with the serial server through TCP. In order to make the serial port software developed by the user also communicate with the serial server, a virtual serial port needs to be added between the user program and the serial server. As shown in Figure 33, ZLVircom and the user program run on the same computer. ZLVircom virtualizes a COM port and makes this COM port correspond to the serial server. When the user program opens COM communication, it can send to the user serial port device through ZLVircom serial port server. This is illustrated below:

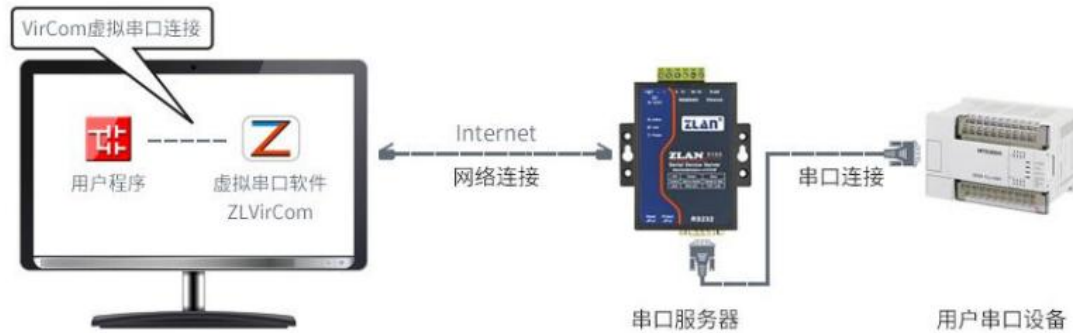


Chart 33 Functions of the virtual serial port

Click "Serial port Management" on ZLVircom main interface, and then click "Add" to select add COM5, where COM5 is the COM port that does not exist in the computer originally.

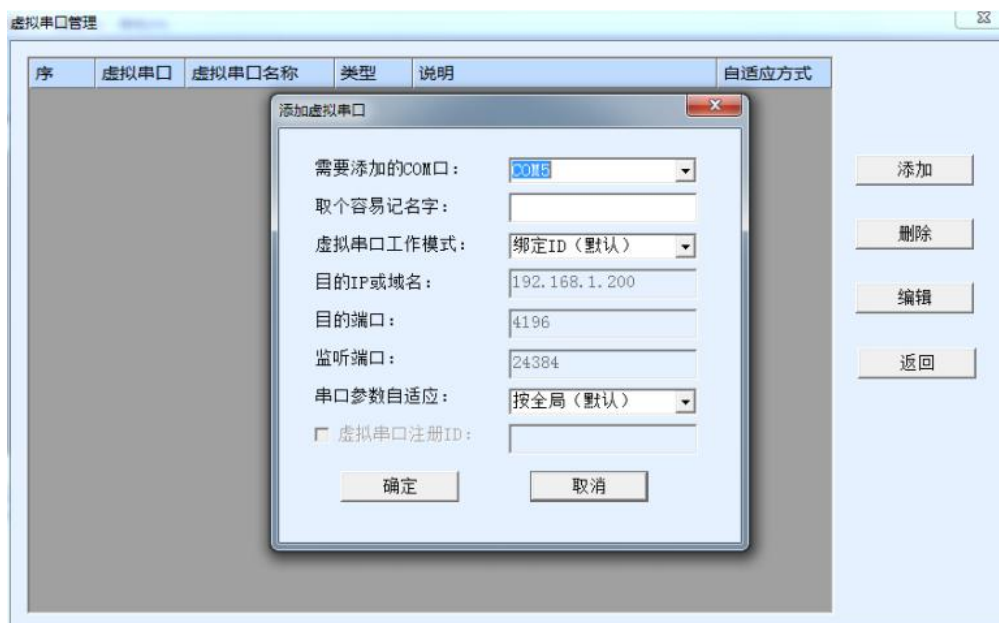


Chart 34 Adding a Virtual Serial Port

Then go to Device Management and double-click the device that you want to bind to COM5. As shown in Figure 34, select COM5 from the virtual Serial Port list in the upper left corner. Then click "Modify Settings". Return to the main interface of ZLVircom. You can see that COM5 is connected to the device whose IP address is 192.168.1.200. COM5 can be used instead of SocketTest for communication at this time.

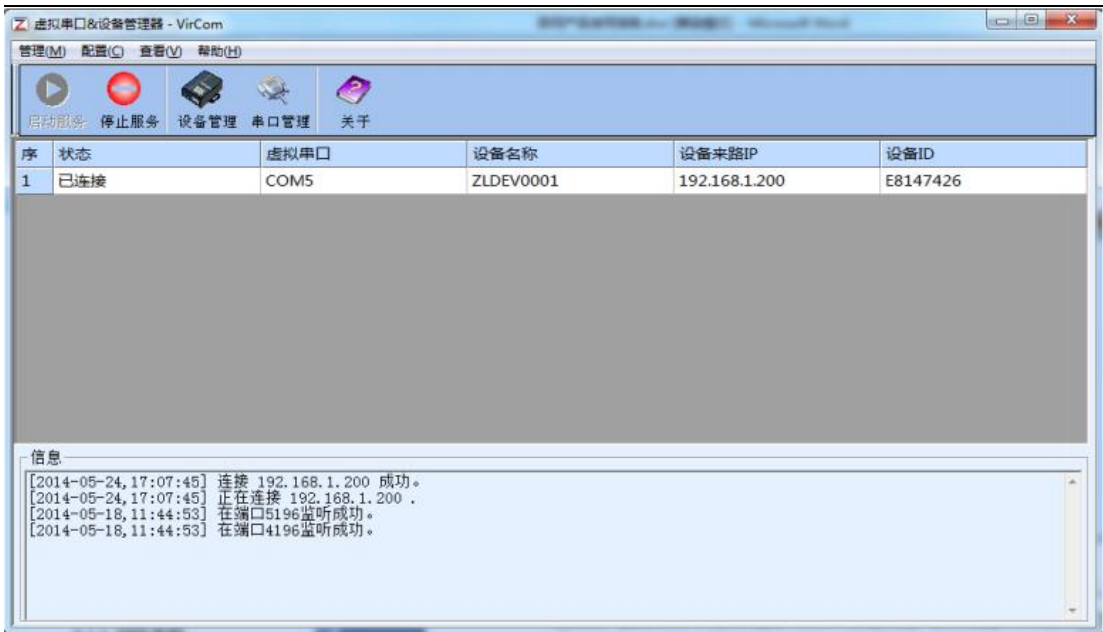


Chart 35 The virtual serial port is connected

Open ZLComdebug to simulate the user's serial port program, open COM5(virtual serial port above), and open another ZLComdebug to simulate a serial port device, open COM4(hardware serial port). In this case, COM5 sends data links as follows: COM5->ZLVircom-> Serial server network port -> Serial server string ->COM4. Conversely, COM4 to COM5 can also transmit data: COM4-> serial server serial port -> serial server network port ->ZLVircom->COM5. Figure 36 shows the sending and receiving of data by both parties.

If COM4 is replaced by user serial port equipment, COM5 can realize communication with user equipment.

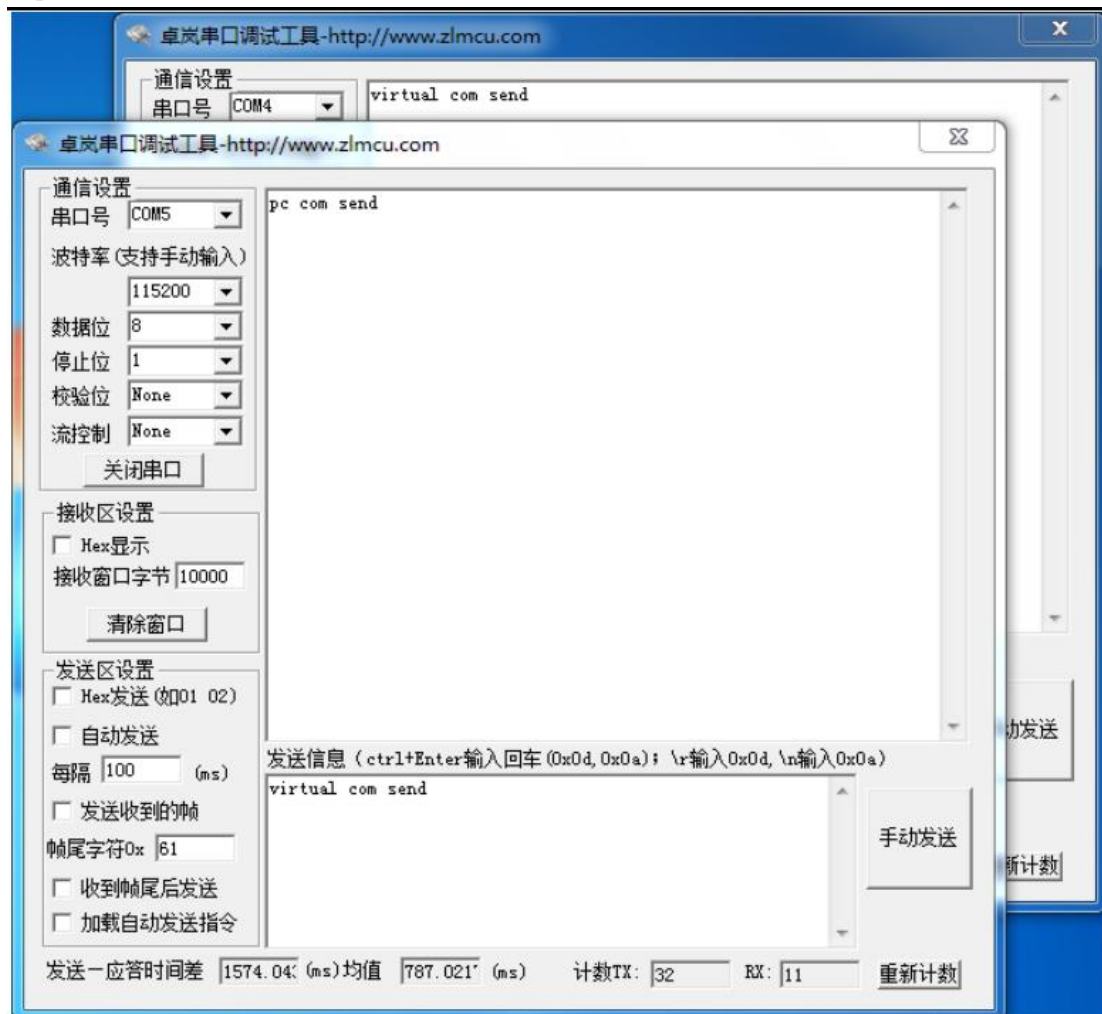


Chart 36 Communicates through the virtual serial port

9.20.3. Modbus TCP testing

By default, data is transparently transmitted through serial ports and network ports. To convert Modbus TCP to RTU, select Modbus TCP RTU in the device Settings dialog box, as shown in Figure 37. In this case, the device port automatically changes to 502. When the Modbus TCP tool is connected to port 502 of the IP address of the serial port server, the Modbus TCP command sent by the user is converted to RTU command and output from the serial port. For example, after the serial port server receives the Modbus TCP command 00 00 00 00 06 01 03 00 00 0A, the serial port outputs 01 03 00 00 00 00 0A C5 CD command. Note: The serial port may send

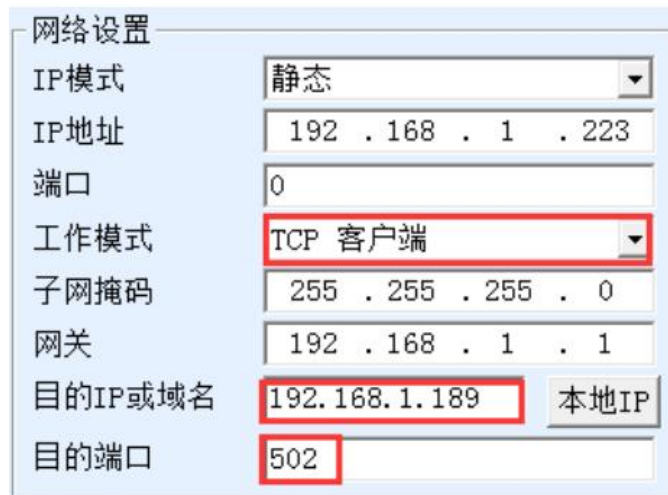
multiple 01 03 00 00 00 00 A C5 CD commands. This is because the default Modbus uses storage mode and will automatically train query commands. How do I switch to non-storage.



高级选项	
DNS服务器IP	8 . 8 . 4 . 4
目的模式	动态
转化协议	Modbus_TCP 协议
保活定时时间	60 (秒)
断线重连时间	12 (秒)
网页访问端口	80

Chart 37 Start MODBUS TCP Function

If the Modbus TCP software is used as a Slave, you need to change the working mode to client, the destination IP address to the IP address of the computer where Modbus TCP software is installed, and the destination port to 502 after selecting the conversion protocol, as shown in Figure 38.



网络设置	
IP模式	静态
IP地址	192 . 168 . 1 . 223
端口	0
工作模式	TCP 客户端
子网掩码	255 . 255 . 255 . 0
网关	192 . 168 . 1 . 1
目的IP或域名	192.168.1.189 本地IP
目的端口	502

Chart 38 MODBUS TCP being client side

Please refer to the official manual ZLSN2003B for specific usage.

(<http://www.zlmcu.com/download/ZLSN2003B.pdf>)

2.22 ZLAN6808-8(4G) Usage

9.20.4. Server transparent transport test

Suppose you have the following networking structure as shown below , 8305 configuration is connection to server***.***.***.***'s *** port. Perform the following operations in the Serial Port Configuration section. After the configuration is complete, power on the server again. It takes 20 to 40 seconds to connect to the server.



Chart 39 Networking diagram

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



Chart 40 Server-side tools

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

Now turn 6808 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 when the serial port sends data, the corresponding data will be returned on the server side, and the serial port tool will receive the same data from the device receiving the message from the server. This demonstrates serial to 4G network two-way communication, as shown in Figure 41 below:

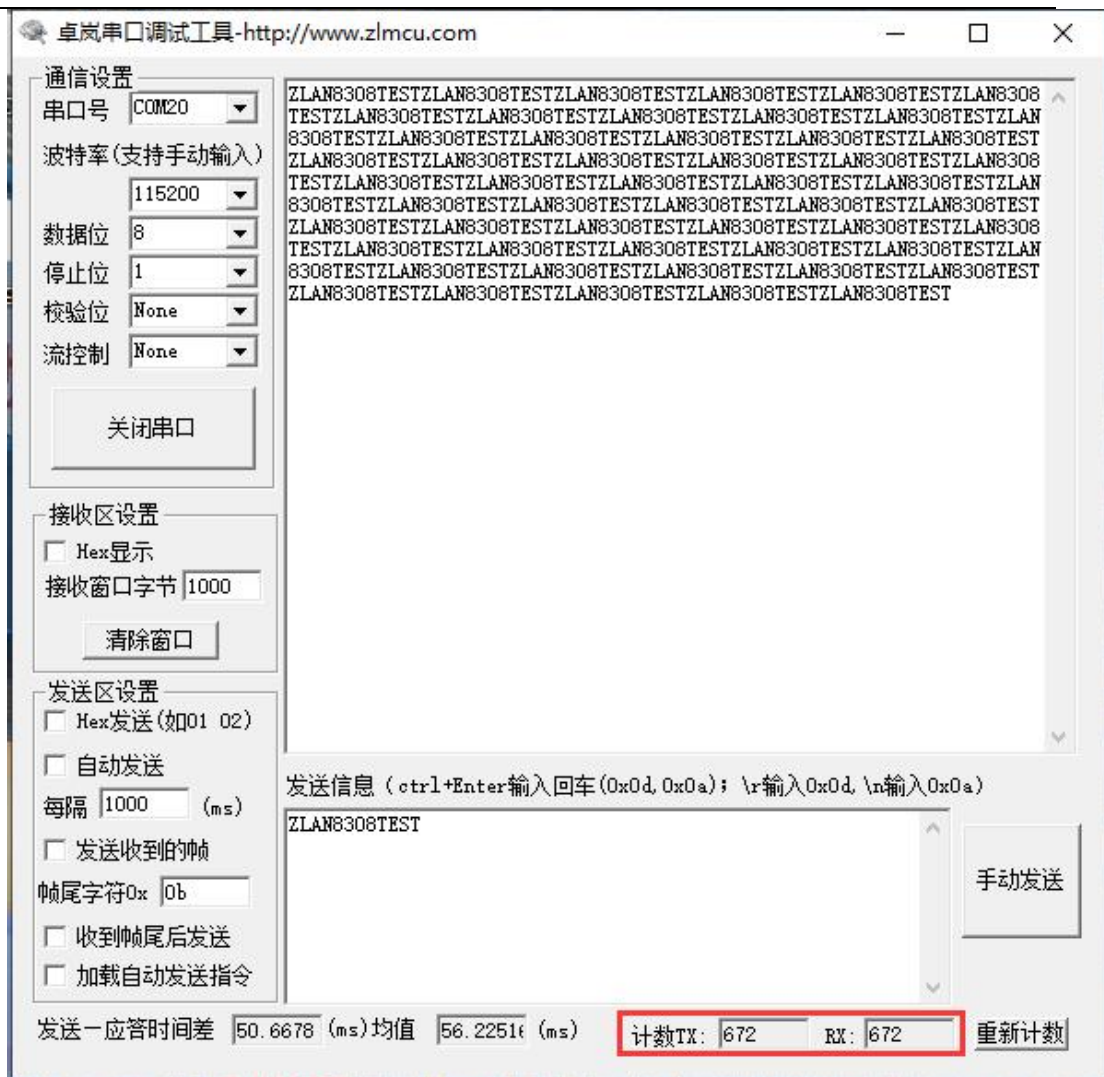


Chart 41 Device serial port debugging tool

9.20.5. Modbus Protocol transformation test

The configuration parameters are the same as those for the pass-through test without protocol. You only need to change the conversion protocol to MODBUS. You can convert MODBUS RTU over the serial port to MODBUS TCP over the network, and MODBUS TCP over the network to MODBUS RTU over the serial port.

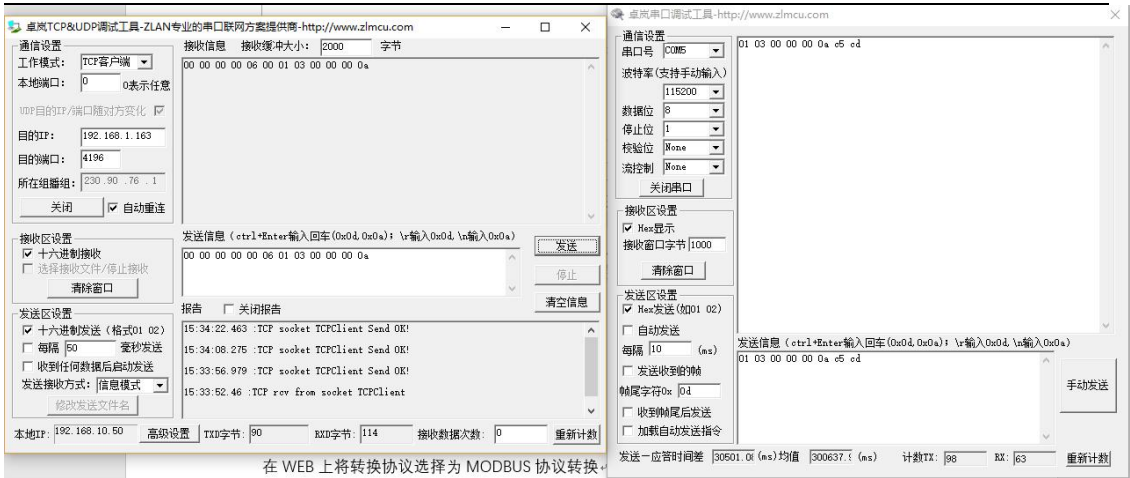


Chart 42 Modbus Protocol transformation test

9.20.6. MQTT protocol testing

This test is to connect ali cloud test. Create a subscription topic named zlan_test and a publish topic named zlan_1 on Ali Cloud, as shown in Figure 43. According to the instructions in Step 5, first fill in the IP and port configuration of the MQTT server and save the parameters, as shown in Figure 44. On the advanced parameter page, the ID, user name and password of MQTT, including the subject of subscription and publication, and the keepalive time will be filled in, as shown in Figure 45.

自定义 Topic	操作权限	描述
/a1WSVHIXkDh/\${deviceName}/user/zlan_test	订阅	-
/a1WSVHIXkDh/\${deviceName}/user/zlan_1	发布	-

Chart 43 Ali Cloud add theme

ZL8305ConfTool

第一步: 选择 1. AT指令模式, 或 2. 固件升级/配置文件下载模式, 含JSON配置等

串口: COM20
波特率: 115200
数据位: 8
校验位: N

关闭串口 固件/配置文件模式

第二步: AT指令模式时, 如需修改参数请先登陆

登录密码: 666666
登录

第三步: AT指令模式的主要参数

波特率: 115200
目的IP或域名: iot-as-mqtt.cn-sha
目的端口: 1883
协议: TCP

获取参数 设置参数 高级参数

信息

```
+MQTT_USERNAME:112121@a1WSVHXkDh
+MQTT_PASSWD:2C7C619DA11986F041BD699CB04
1300ADD336E96
+MQTT_CLIENT:132|
securemode=3, signmethod=hmacsha1, timesta
mp=123|
+MQTT_SUBSCRIBE_TOPIC:/a1WSVHXkDh/11212
1/user/zlan_test
+MQTT_SUBSCRIBE_QOS:1
+MQTT_PUBLISH_TOPIC:/a1WSVHXkDh/112121/
user/zlan_1
+MQTT_PUBLISH_QOS:1
+MQTT_KEEPALIVE:60
+MQTT_WILL_TOPIC:
+MQTT_WILL_MESSAGE:
+Z_RMT_MAG:0
+Z_RMT_IP:www.p2p-zlan.com
+Z_RMT_PORT:4195
+LOGIN:OK
+BAUD=115200
+PIPAD=116.233.175.29
+PPORT=1883
+PROTOCOL=TCP
+BAUD=115200
+PIPAD=iot-as-mqtt.cn-
shanghai.aliyuncs.com
+PPORT=1883
+PROTOCOL=TCP
```

清空

ZL+VER? 手动发送AT指令

状态

配置模式: 已进入配置模式
登陆状态: 已登陆

场强:0 温度:0°C 电压:V ID:861881050110791 硬件版本:V008,软件版本:V1.42

Chart 44 Ali Cloud IP and port

高级参数	
工作参数	
工作模式:	双向透传
DNS服务器IP:	
心跳间隔:	禁用
心跳内容:	
串口数据位:	8
串口校验位:	N
登陆密码:	
启用注册包:	禁用
注册包内容:	
APN:	CTNET
APN用户名:	
APN密码:	
远程设备管理	
☐ 启用远程设备管理	
远程服务器IP或域名:	www.p2p-zlan.com
远程服务器端口:	4195
MQTT参数	
MQTT版本:	V3.1.1
用户名:	112121@a1WSVHXkDh
密码:	86F041BD699CB041300ADD336E96
客户端ID:	thod=hmacsha1,timestamp=123
订阅主题:	HXkDh/112121/user/zlan_test
订阅质量:	1
发布主题:	WSVHXkDh/112121/user/zlan_1
发布质量:	1
保活时间:	60
遗嘱主题:	
遗嘱信息:	

生效高级参数 取消 恢复默认值

Chart 45 Ali Cloud MQTT configuration

After setting, open the Ali Cloud device management interface and enter the log service page to view the information sent on the device, as shown in Figure 46. Data is sent through the serial port of the device, and a message (" ZLAN8308TEST ") is sent to the MQTT server of Ali Cloud through the theme of ZLAN_1. Ali Cloud receives the data as shown in Figure 47. Ali Cloud server sends a message (" ALI_send ") to the serial port of the device through the theme of ZLAN_test. As shown in Figure 48, this completes the MQTT send and receive test.

时间	TraceId	消息内容	DeviceName	业务类型(主键)	操作	内容	状态
2021/02/04 17:50:31.317	0a30274f1612432231296766d1ea3	-	112121	设备行为	online	["Content":"onlin...	200
2021/02/04 17:50:31.587	0a30274f16124322315797827d1ea3	-	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"sub...	200
2021/02/04 17:50:31.802	0a30274f16124322317997993d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200
2021/02/04 17:19:05.216	0a30274f161243223136931d1ea3	-	112121	设备行为	offline	["Content":"offin...	200
2021/02/04 17:19:04.243	0a30274f1612432231406303d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200
2021/02/04 17:19:02.688	0a30274f161243223159654d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200
2021/02/04 17:19:01.126	0a30274f161243223112542d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200
2021/02/04 17:18:59.568	0a30274f161243223159653d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200
2021/02/04 17:18:58.11	0a30274f161243223102142d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200
2021/02/04 17:18:56.452	0a30274f161243223102142d1ea3	设备	112121	设备行为	./a1WSVHXkDh/112121...	["Content":"Publ...	200

Chart 46 Ali Cloud log service

Topic	时间	内容
/a1WSVHXkDh/112121/user/zlan_1	2021/02/04 17:51:52.932	ZLAN8308TEST

Chart 47 Ali Cloud receives serial port data

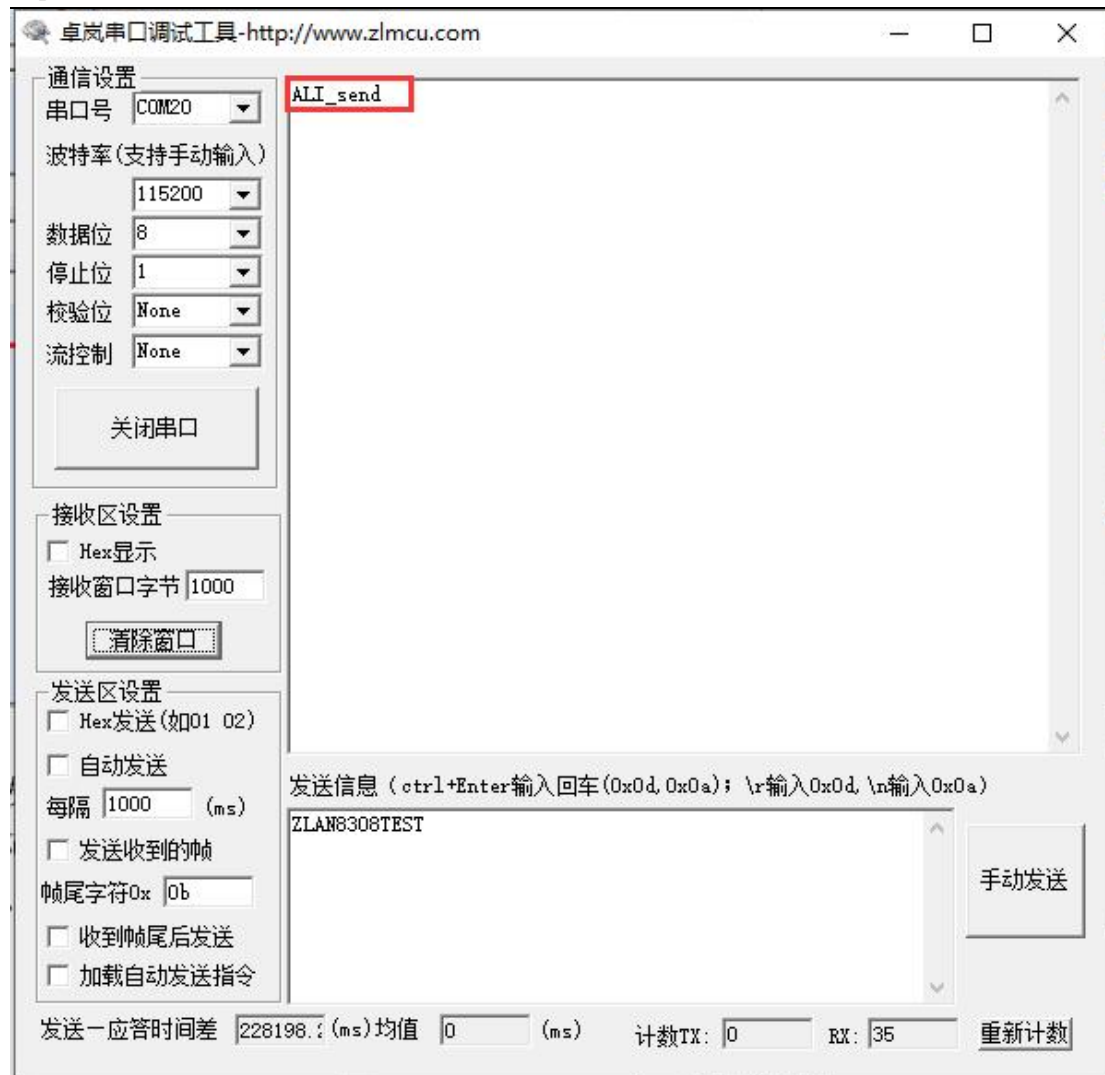


Chart 48 serial port receives ali Cloud data

9.20.7. Configuration JSON upload

Through the above part: Modbus protocol conversion test, simple JSON sending template was configured. The configuration process is shown in Figure 49, Figure 50, Figure 51 and Figure 52, and the data of some Modbus nodes were collected and converted to JSON format for sending.

JSON转Modbus RTU设置

1. 上发服务器时间: 毫秒 (范围100~31718940, 最大8.8小时)

2. 选择接入的云平台:

3. JSON的上层协议:

GET或者POST的域名加地址 (不含前面的http://):

POST变量名 (纯json无需填):

4. 上发数据增加帧头 (如01 02): 帧头格式:

5. 上发 次后串口同时输出指令 (如01 02): 输出条件 (默认空)

6. 添加或删除Modbus寄存器:

7. 点击保存JSON设置并展示结果:

8. 导出/导入EXCELL格式文件配置:

```
{
  "1":0,
  "2":0,
  "5":0,
  "10":0,
  "15":0,
  "16":0,
  "17":0,
  "18":0,
  "19":0,
  "20":0,
  "21":0,
  "22":0,
  "23":0,
  "24":0,
```

Chart 49 configuration JSON upload

添加JSON节点

下面是第 1 个JSON关键词的设置。已经添加 ☒

该JSON数据节点类型：
☒ 对象数据（默认值，用{}来包含本节点数据和后续节点，需要设置关键词）
☐ 数组数据（用[]来包含，无关键词名称）

其它来源参数
固定字符串： ☐ 不加引号

对应JSON关键词 1 数据来源选择：Modbus RTU

Modbus RTU设置
- 从站地址：1
- Modbus功能码：3
- 寄存器地址：1

645协议
- 645版本：645 97版 FE个数：0
- 设备ID号：000000000001 (6字节)
- 数据标识：9410 (例如填9410表示上月总电能)

1. 数据长度：2 字节。4字节顺序：大端 (Inverse) (大端4字节：数据ABCD，低地址放高2字节AB，高地址放低2字节CD)
2. 保留小数点位数：0 位，即：数据为整形时得到的整数小数点左移的位数。
3. 启用平移和缩放：☐ 读取的寄存器数据减去整数：0 再除以浮点数：1
4. 数据格式：无符号整型 布尔值所在位位置：1
5. 数据后增加单位：
6. 数据用引号包含：☐
7. 串口轮询间隔：200 (ms)必须大于10ms。
8. 采集数据有变化，则立即触发上报：☐
9. RS485设备离线数据清零：☐，如果设备在线，则不管寄存器内容，强制设置为1：☐

JSON嵌套相关操作
设计嵌套JSON 返回上一级
设计或查看下一个
进入下一个 删除并到下一个
退出设计
保存全部并退出 取消全部

Chart 50 Configure the key words, register address and collection interval

添加JSON节点

下面是第 39 个JSON关键词的设置。已经添加 ☒

该JSON数据节点类型：
☒ 对象数据（默认值，用{}来包含本节点数据和后续节点，需要设置关键词）
☐ 数组数据（用[]来包含，无关键词名称）

其它来源参数
固定字符串： ☐ 不加引号

对应JSON关键词：49 数据来源选择：Modbus RTU

Modbus RTU设置
- 从站地址：1
- Modbus功能码：3
- 寄存器地址：49

645协议
- 645版本：645 97版 FE个数：0
- 设备ID号：000000000001 (6字节)
- 数据标识：9410 (例如填9410表示上月总电能)

1. 数据长度：2 字节。4字节顺序：大端 (Inverse) (大端4字节：数据ABCD，低地址放高2字节AB，高地址放低2字节CD)
2. 保留小数点位数：0 位，即：数据为整形时得到的整数小数点左移的位数。
3. 启用平移和缩放：☐ 读取的寄存器数据减去整数：0 再除以浮点数：1
4. 数据格式：无符号整型 布尔值所在位位置：1
5. 数据后增加单位：
6. 数据用引号包含：☐
7. 串口轮询间隔：200 (ms)必须大于10ms。
8. 采集数据有变化，则立即触发上报：☐
9. RS485设备离线数据清零：☐，如果设备在线，则不管寄存器内容，强制设置为1：☐

JSON嵌套相关操作
设计嵌套JSON 返回上一级
设计或查看下一个
进入下一个 删除并到下一个
退出设计
保存全部并退出 取消全部

Chart 51 Save the configuration and exit

JSON转Modbus RTU设置

1. 上发服务器时间: 1000 毫秒 (范围100~31718940, 最大8.8小时)

2. 选择接入的云平台: 阿里云

3. JSON的上层协议: NONE/MQTT

GET或者POST的域名加地址 (不含前面的http://):

POST变量名 (纯json无需填):

4. 上发数据增加帧头 (如01 02): 帧头格式: HEX

5. 上发 1 次后串口同时输出指令 (如01 02): 输出条件 (默认空)

6. 添加或删除Modbus寄存器: JSON上发 JSON下发 删除全部

7. 点击保存JSON设置并展示结果: 保存JSON设置

8. 导出/导入EXCELL格式文件配置: 上发导出配置 上发导入配置 下发导出配置 下发导入配置

```
{
  "1":0,
  "2":0,
  "5":0,
  "10":0,
  "15":0,
  "16":0,
  "17":0,
  "18":0,
  "19":0,
  "20":0,
  "21":0,
  "22":0,
  "23":0,
  "24":0,
}
```

Chart 52 save JSON configuration, view the preview in JSON format

9.20.8. Configure MODBUS RTU Analog devices

The Modbus Slave software is used to simulate the MODEBUS Slave device. Connect the ZLAN8308 device to the computer through the serial cable, and enable the Modbus Slave connection. The Modbus Slave configuration is shown in Figure 53.

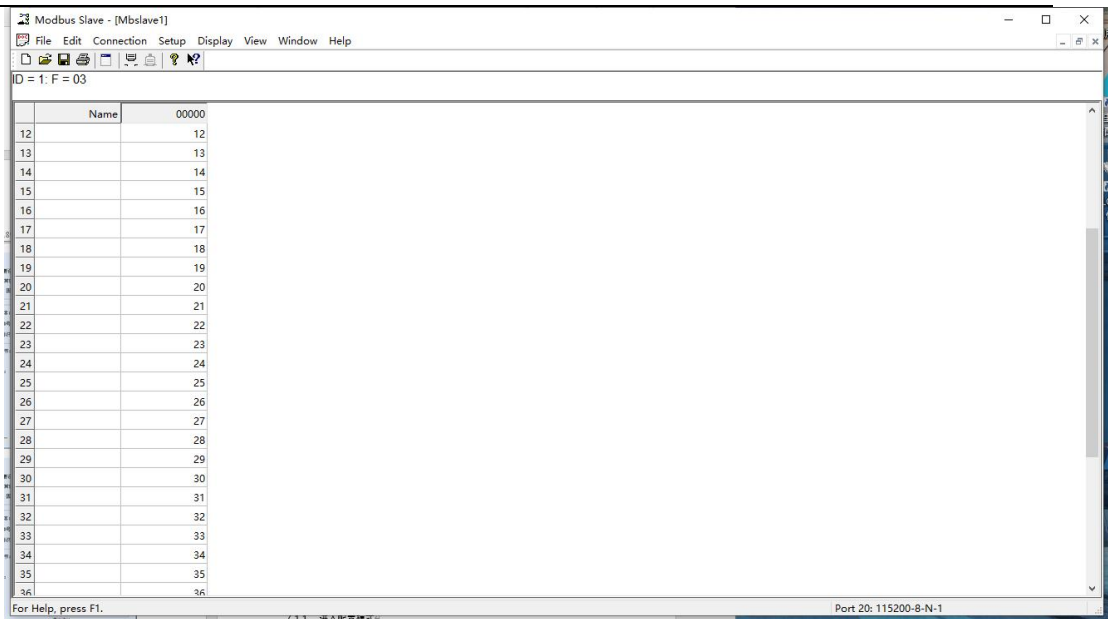


Chart 53 Modbus SlaveFill in analog data

9.20.9. Check upload JSON

Through ali Cloud log service, you can check the JSON data sent on it. It can be observed that the collected data is consistent with the data configured by Modbus Slave, which completes the simple Modbus to JSON test.

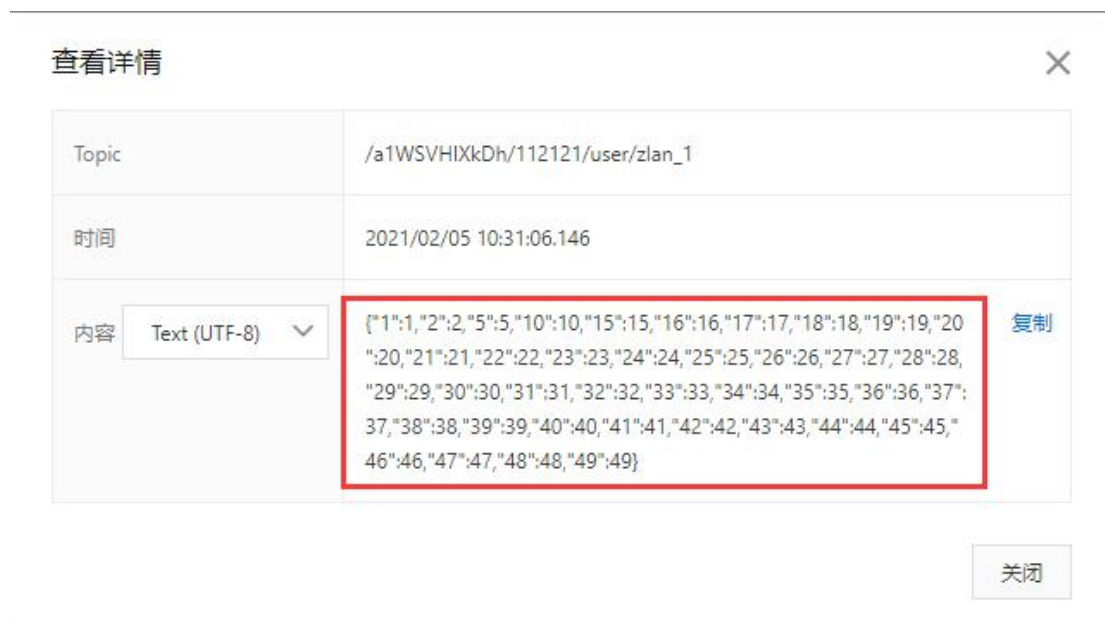


Chart 54 serial port receives ali Cloud data

9.20.10. AT Instruction

➤ Enters configuration mode

Instructions: REQUEST CFG MODE

Function: To enter the configuration mode, send this command during the device startup phase, and enter the configuration mode after the device is started.

Return: CFG MODE\r。

➤ Login in

Instruction: ZL+LOGIN=666666\r\n

Function: login in, Modify device parameters only after login.

Return: +LOGIN:OK\r\n(success)或+LOGIN:NG\r\n(fail)

➤ Retrieves the device state

Instruction: ZL+STAT?\r\n

Function: Query the signal strength, temperature, and voltage of the device

Return: +STAT: intensity, temperature, voltage\r\n **Obtaining Serial Port**

Parameters

Instructions: ZL+BAUD?\r\n

Function: Obtain baud rate

Return: +BAUD:n\r\n, n indicates specific baud rate

➤ Obtain check bits

Instruction: ZL+CHECKB?\r\n

Function: Obtain check bits

Return: +CHECKB:N/O/E\r\n

N:None

O:Even parity check

E:Odd parity

➤ **Obtain data bits**

Instructions: ZL+DATAB?
\r\n

Function: obtain data bits

Return: +DATAB:5/6/7/8
\r\n

➤ **Configure serial port parameter**

Instruction: ZL+BAUD=n
\r\n

Function: configure baud rate, N indicates the value to be set

Return: +BAUD:n
\r\n

➤ **Setting the check bit**

Instruction: ZL+CHECKB= N/O/E
\r\n

Function: set check bits

Return: +CHECKB:N/O/E
\r\n

N:None

O:Even parity check

E:Odd parity

➤ **Set data bits**

Instruction: ZL+DATAB=5/6/7/8
\r\n

Function: Set data bit

Return: +DATAB:5/6/7/8
\r\n **Obtains destination IP and domain name**

Instructions: ZL+PIPADD?\r\n

Function: Obtain the destination IP address or domain name

Return: +PIPADD=ip\r\n

➤ **Obtain destination port**

Instruction: ZL+PPORT?\r\n

Function: Obtain destination port

Return: +PPORT=n\r\n

➤ **Obtain device working mode**

Instruction: ZL+PROTOCOL?\r\n

Function: Obtain device working mode

Return: +PROTOCOL=TCP/UDP\r\n

➤ **IP Obtain DNS server**

Instruction: ZL+PDNS?\r\n

Function: Obtains DNS server IP address

Return: +PDNS=ip\r\n

➤ **Set destination IP and domain name**

Instruction: ZL+PIPADD=ip\r\n

Function: set destination IP or domain name

Return: +PIPADD=ip\r\n

➤ **Configure destination port**

指令: ZL+PPORT=n\r\n

作用: 设置目的端口

返回: +PPORT=n\r\n

➤ **Set working mode**

Instruction: ZL+PROTOCOL=TCP/UDP\r\n

Function: set working mode

Return: +PROTOCOL=TCP/UDP\r\n

➤ **Set DNS server IP**

Instruction: ZL+PDNS=ip\r\n

Function: set DNS server IP address

Return: +PDNS=ip\r\n **check register contents**

Instructions: ZL+ENROL?\r\n

Query registration package contents (default registration package in hexadecimal)

Return: +ENROL:1234567890\r\n

➤ **Whether to enable the registration package**

Instruction: ZL+EN_ENROL?\r\n

Querying whether the registration package is enabled (1 is enabled, and 0 is disabled)

Return: +EN_ENROL:1\r\n

➤ **Set register pack contents**

Instruction: ZL+ENROL=123456\r\n

Set the registration package content (the default registration package is in

hexadecimal format) 0X12 0X34 0X56

Return: +ENROL:123456\r\n

➤ **Enable/disable registration package**

Instruction: ZL+EN_ENROL=1\r\n

Enable/disable registration package. 1 indicates enable and 0 indicates disabled

Return: +EN_ENROL:1\r\n

➤ **Query the remote management function**

Instruction: ZL+Z_RMT_MAG?\r\n

Query whether the remote management function is enabled. 1 indicates that the remote management function is enabled, and 0 indicates that the remote management function is disabled

Return: + ZL+Z_RMT_MAG:1\r\n

➤ **Opens the remote management function**

Instructions: ZL+Z_RMT_MAG=1\r\n

Enable/Disable The remote management function. 1 indicates that the remote management function is enabled, and 0 indicates that the remote management function is disabled

Return: + ZL+Z_RMT_MAG:1\r\n

➤ **Queries the IP address of the remote management server**

Instruction: ZL+Z_RMT_IP ?\r\n

Query the remote management server IP *****

Return: + ZL+Z_RMT_IP =*****\r\n

➤ **Queries the port of the remote management server**

Instruction: ZL+ Z_RMT_PORT ?\r\n

Query the remote management server port****

Return: + ZL+ Z_RMT_PORT =****\r\n

➤ **Set up the remote management server IP**

Instruction: ZL+Z_RMT_IP =*****\r\n

Set up the remote management server IP

Return: + ZL+Z_RMT_IP:*****\r\n

➤ **Sets the remote management server port**

Instructions: ZL+ Z_RMT_PORT =****\r\n

Set the port of the remote management server

Return: + ZL+ Z_RMT_PORT:**** \r\n

➤ **Sets MQTT user name**

Instruction: ZL+ MQTT_USERNAME =****\r\n

Set MQTT user name

Return: + ZL+ MQTT_USERNAME:**** \r\n

➤ **Sets MQTT password**

Instruction: ZL+ MQTT_PASSWD =****\r\n

Set MQTT password

Return: + ZL+ MQTT_PASSWD:**** \r\n

➤ **Set MQTT Client side ID**

Instruction: ZL+ MQTT_CLIENT =****\r\n

Set MQTT client side ID

Return: + ZL+ MQTT_CLIENT:**** \r\n

➤ **Set MQTT published theme**

Instructions: ZL+ MQTT_PUBLISH_TOPIC =****\r\n

Set MQTT published theme

Return: + ZL+ MQTT_PUBLISH_TOPIC:**** \r\n

➤ **Set MQTT subscribe theme**

Instruction: ZL+ MQTT_SUBSCRIBE_TOPIC =****\r\n

Set MQTT subscribe topic

Return: + ZL+ MQTT_SUBSCRIBE_TOPIC:**** \r\n

➤ **Set MQTT subscribe quality**

Instruction: ZL+ MQTT_SUBSCRIBE_QOS =1\0\r\n

Set MQTT subscribe quality 1\0

Return: + ZL+ MQTT_SUBSCRIBE_QOS: 1\0\r\n

➤ **Set MQTT published quality**

Instruction: ZL+ MQTT_PUBLISH_QOS =1\0\r\n

Set MQTT published quality 1\0

Return: + ZL+ MQTT_PUBLISH_QOS: 1\0\r\n

➤ **Set MQTT Package live**

Instruction: ZL+MQTT_KEEPLIVE=****\r\n

Set MQTT alive time

Return: + ZL+ MQTT_KEEPLIVE:**** \r\n

➤ **Set MQTT offline wish theme**

Instruction: ZL+ MQTT_WILL_TOPIC=****\r\n

Set MQTT offline wish theme

Return: + ZL+ MQTT_WILL_TOPIC:**** \r\n

➤ **Set MQTT offline wish message**

Instruction: ZL+ MQTT_WILL_MESSAGE=****\r\n

Set MQTT offline wish message

Return: + ZL+ MQTT_WILL_MESSAGE:**** \r\n

Please check details based on 《ZLAN8308》 product manual

(<http://www.zlmcu.com/download/ZLAN8308.pdf>).

2.23 ZLAN6808-9(Zigbee) Usage

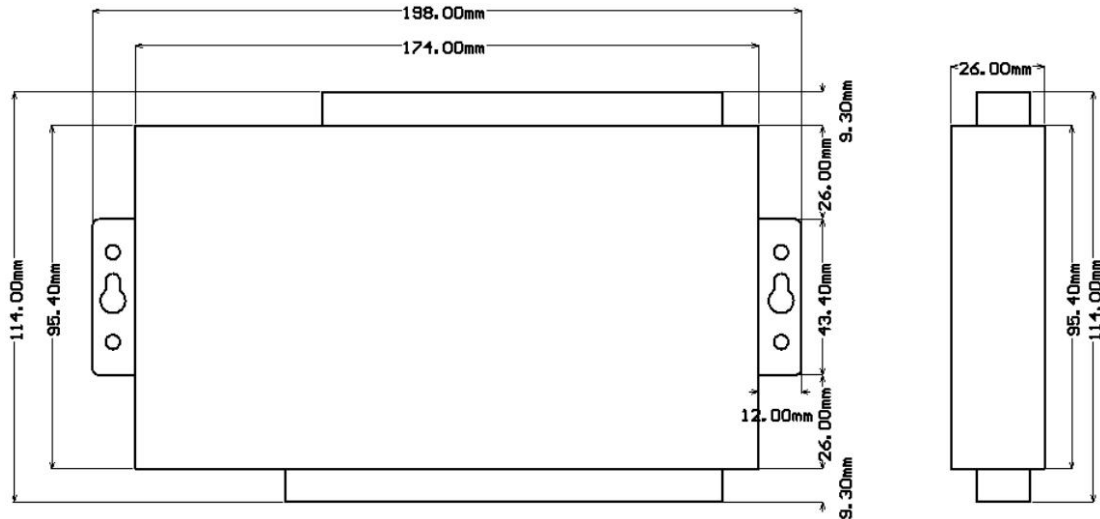
(1) Install the antenna on the antenna interface of the device. The suction cup antenna can be attached to the surface of the metal chassis.

(2) If the baud rate is not 9600, set Zigbee parameters.

(3) Connect all devices to 9-24 V DC power supply. You should see the Power light red.

(4) The data from the Zigbee device is then sent to other Zigbee devices.

10. Size Drawing



Drawing 55 6802/6842/6844Size drawing

11. After sales service and technical support

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