ZLAN8309 Modbus/BACnet
Iot gateway

RS232/485 to RJ45/WIFI/4G

ZL DUI 20240422.1.0

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Catalogue

1. **Summary**

The ZLAN8309 series is a powerful IoT gateway newly launched by Shanghai ZLAN. This series not only has multiple functions such as data collection, Modbus gateway, BACnet gateway, MQTT gateway, RS485 to JSON and routing, but also provides a variety of sub-models. Meet the needs of different application scenarios.

8309 product sub-models are as follows:

Table 1 ZLAN8309 sub-models

Item No.	Function	Serial port number	mobile network	special agreement
ZLAN8309	WiFi/Eth/CAT1 4G Two serial port server/with router function	2	CAT1 4G	
ZLAN8309-4G(ZLAN8309-E、 ZLAN8309-SA、 ZLAN8309-G)	Wifi/Eth/Full Netcom 4G/Two serial port server/router	2	Full Netcom 4G	
ZLAN8309-5G	Eth/5G/two serial port server/router	2	5G Red Cap	
ZLAN8309-B	BACnet gateway (8309S-B recommended)	1		BACnet

ZLAN8309: Equipped with 4 Ethernet ports and 2 (RS232) RS485/422 serial ports. It also supports WiFi and CAT1 4G communication. The 2-way serial port (PORT) of 8309-2 can use the same IP address, and different serial ports are distinguished by ports; different IP addresses can also be used. The parameters corresponding to each serial port can be set independently. 8309 also has a routing function, which can realize flexible forwarding and management of network data to meet diverse network needs.

ZLAN8309-4G：Like the 8309, it also has 4 Ethernet ports and 2 (RS232) RS485/422 serial ports and supports WiFi and 4G modes. It also has routing functions to achieve flexible forwarding and management of network data. The difference is that the 4G version supports all Netcom 4G mode.

ZLAN8309-5G：It supports serial server and router functions. The biggest highlight is that it is equipped with an advanced 5G Red Cap module. This module

supports 5G independent networking (SA) mode and is compatible with 4G network standards. 5G not only provides higher reliability and ensures the stability and accuracy of data transmission, but also greatly reduces latency, allowing users to enjoy a smoother data interaction experience. In addition, the medium-to-high-speed data transmission rate is also a highlight of the device. It provides users with faster data transmission services and meets the urgent needs of modern applications for efficient data transmission.

ZLAN8309-B：The recommended purchase model is ZLAN8309S-B.

ZLAN8309: The series supports 9~24V wide voltage, terminal type power access, and shell ground wire.

Figure 1 ZLAN8309 series IoT gateway

ZLAN8309/8309-4G/8309-5G can realize the conversion of 2 channels of TCP/IP protocol to serial port. The 2 channels work at the same time and can be configured to different baud rates. It can realize data collection from serial port devices through the network. The network side can use a virtual serial port to connect to serial port software or direct TCP/IP communication software.

ZLAN8309 series supports Modbus RTU to Modbus TCP function and has storage Modbus gateway characteristics. Of course, it can also be used as a non-storage Modbus gateway.

ZLAN8309 series can be used in:

Power electronics, smart meters and energy consumption monitoring;

As an IoT gateway, it serves as a communication bridge between devices and the cloud;

Various configuration software and device communication interfaces;

Networking of equipment in the field of access control and security;

Typical application connections are shown in Figure 2. The original serial device is connected to the serial port of ZLAN8309. The 8309 is connected to the computer through network cable/WiFi or connected to the cloud server through 4G/5G. The software on the computer establishes a connection with 8309 through TCP/IP, virtual serial port or cloud server. After that, any data sent by the serial port device will be transparently transmitted to the computer software, and the data sent by the software to ZLAN8309 through the network will also be transparently transmitted to the serial port device.
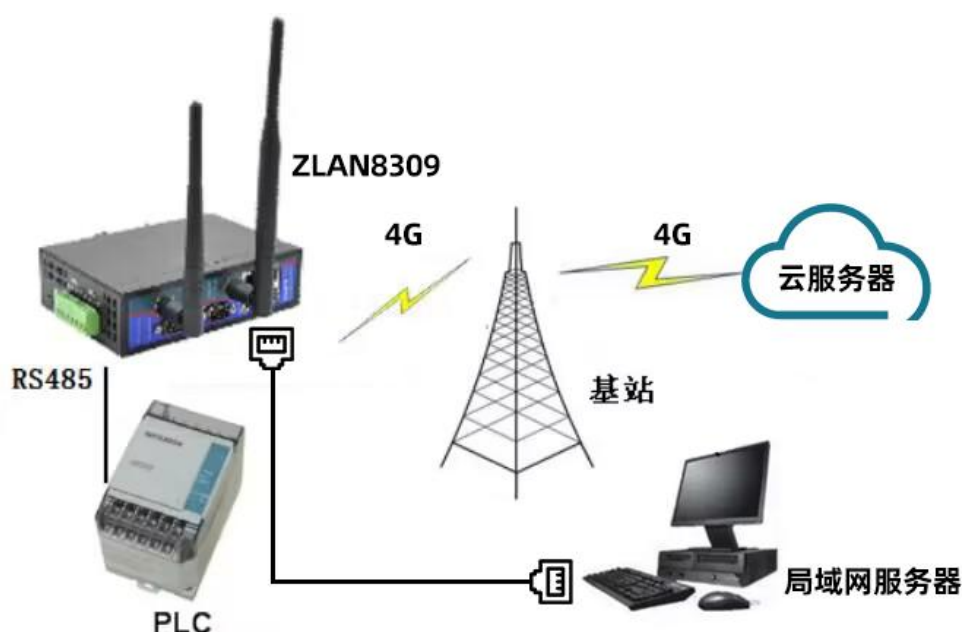

Figure 2 Connection map

2. Function characters

2.1. Hardware characters

ZLAN8309 series character as followings：

1. Various network connection methods: Support network port, WIFI, 4G/5G multiple ways to connect to the network.

2. Industrial grade power supply method: terminal block wiring method, convenient for use in industrial situations. Can be powered by a wide voltage of 9~24V. With shell ground wire, it can effectively guide interference and surge.

3. Rich panel indicators facilitate debugging: It has 4G lights and WiFi lights to indicate the working status of the device, as well as independent LINK lights and ACT lights to indicate TCP link status and data communication status respectively.

Software functions

1. The 2-way serial ports of ZLAN8309/-4G/-5G can be configured with different baud rates and work independently without interfering with each other.

2. ZLAN8309/-4G/-5G supports IP "clone" technology: the 2 serial ports can be distinguished by port or IP. Port differentiation: two IPs can be merged into one IP with different ports, suitable for networks lacking IP; IP differentiation: one IP can be transformed into two IPs with the same port, suitable for applications with fixed port numbers.

3. Supports TCP server, TCP client, UDP mode, and UDP multicast. When acting as a TCP client, it also supports TCP server functions. As a TCP server, it supports up to 30 TCP connections, and as a TCP client, it supports 7 destination IPs.

4. Supports virtual serial port and is equipped with Windows virtual serial port & device management tool ZLVircom.

5. Supports the function of sending MAC address on device connection to facilitate cloud management of devices.

6. Provide a secondary development package DLL development library for searching and configuring equipment on the computer side.

7. Supports Web browser configuration, supports DHCP to dynamically obtain IP, and DNS protocol to connect domain name server addresses.

8. Supports the function of sending MAC address on device connection to facilitate

cloud management of devices.

9. Provide a secondary development package DLL development library for searching and configuring equipment on the computer side.

10. Supports Web browser configuration, supports DHCP to dynamically obtain IP, and DNS protocol to connect domain name server addresses.

2.2. Advanced software functions

Advanced software features supported by the 8309 series as followings：

1. Support Modbus gateway function, support Modbus RTU to Modbus TCP; support ZLMB configurable table Modbus gateway function.

2. ZLAN8309/-4G/-5G supports multi-host function: in the one-question-one-answer query mode, the network port side allows multiple computers to access the same serial port device at the same time. It is also possible to implement multi-host applications in which one serial port is converted to multiple serial ports.

3. Support MQTT gateway function.

4. Supports Modbus RTU, Modbus TCP and 645 instrument to JSON protocols, and supports HTTP POST and HTTP GET formats to upload data.

5. Support NTP protocol to obtain network time for uploading protocol content.

6. Supports custom heartbeat package and registration package functions: it can facilitate communication and device identification with the cloud.

3.Technical parameter

Table 2 8309S Technical parameter

Outline	
Interface：	LAN:RJ45、485：connection terminal 、232：DB9
Power supply：	Terminal method
Size：	length×width×height=150mm×105mm×41mm
Antenna：	WIFI antenna*1, 4G antenna*1. Interface: 50Ω/SMA male
	-5G/-R5G: 5G antenna*2. Interface: 50Ω/SMA male
SIM card	Voltage: 3V, 1.8V; Size: large card (small card can be used in a card holder)
CPU parameter	
Parameter	Main frequency：580M、RAM:64M、FLASH:64M

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Wireless parameters	
Network format	***8309/R**：4G CAT1 Support 3 modes： B1/B3/B5/B8@FDD LTE B34/B38/B39/B40/B41@TDD-LTE 900/1800MHz@GSM Including China Unicom 4G, 2G, China Mobile 4G, 2G and China Telecom 4G networks. ***8309-4G/R4G**:All Netcom 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 Includes China Unicom 4G, 3G, 2G, China Mobile 4G, 3G, 2G and China Telecom 4G, 3G, 2G networks. **8309--E** 4G CAT1 supports EGSM900,DCS1800 LTE-FDD B1.B3.B5.B7.B8.B20 **8309-SA** GSM:GSM850.EGSM900.DCS1800.PCS1900 LTE-FDD B1.B2.B3.B4.B5.B7.B8.B28.B66 **8309-G** GSM:GSM850.EGSM900.DCS1800.PCS1900 LTE-FDD B1.B2.B3.B4.B5.B7.B8.B20.B28.B66.B34.B38.B39.B40.B41 ***8309-5G/R5G**： 5G NR:N1\N3*\N5\N8\N28\N41\N77\N78\N79 4G LTE:LTE-FDD:B1,B3,B5,B8 LTE-TDD:B34,B38,B39,B40,B41
Transmission rate	***8309-4G/-E/-SA/-G:** LTE-FDD：Max 150Mbps（Downward）/Max 50 Mbps（Upward） LTE-TDD：Max130Mbps（Downward）/Max 30 Mbps（Upward） WCDMA：384Kbps（Downward）/Max384Kbps（Upward） TD-SCDMA：Max 4.2Mbps（Downward）/Max 2.2 Mbps（Upward） EDGE：296Kbps（Downward）/Max236.8Kbps（Upward） GPRS：107Kbps（Downward）/Max85.6Kbps（Upward） ***8309-5G/R5G（Theoretical value）：** 5G RedCap：UL/DL,120Mbps/226Mbps 4G LTE：UL/DL,90Mbps/190Mbps
WIFIP parameter	Transmission rate: 300 Mbps Max Wireless standard: 802.11 b/g/n Frequency range: 2.412GHz-2.484GHz
Serial port parameters	
Baud rate:	8309/-4G/-5G:300~921600bps
Data bits:	5～8 bits

Verification:	None, odd parity, even parity, mark, space
Software	
protocol:	ETHERNET、IP、TCP、UDP、HTTP、ARP、ICMP、DHCP、DNS
Configuration method:	ZLVirCOM、WEB
Transformation Agreement:	Modbus TCP、MQTT、JSON、HTTP、BACnet(ZLAN8309-B)
Modbus gateway：	Support multi-host mode, storage mode, pre-configured table (ZLMB) mode
Communication method:	TCP/IP direct communication, virtual serial port mode
Working mode	
TCP server, TCP client (TCP server also coexists), UDP, UDP multicast	
Power requirements	
power supply:	9～24V DC，200ma@12V
Secondary development	
Development platform	Linux environment
development language	C language
Environmental requirements	
Operating temperature:	-40~85℃
storage temperature：	-45~165℃
Humidity range:	5~95% relative humidity

4. Usage

4.1. Hardware specifications

Figure 3 8309 main view

The main view of the ZLAN8309 series IoT gateway is shown in the figure above. The outer shell is made of black radiation-resistant SECC metal shell.

1. DB9 (male): RS232 signal input.

2. RJ45 interfaces (4): 1 WAN port (LAN1), 3 LAN ports (LAN2~4). 3 LAN ports can be used as switches.

3. Antenna: The upper end is a 4G antenna, and the antenna interface uses SMA (male). The external antenna must use an antenna suitable for the 4G/5G working band; the lower end is a 2.4G WiFi antenna, and the antenna interface uses 50 Ω /SMA (male). (The upper and lower antennas of 8309-5G/-R5G are 5G antennas.)

4. Indicator lights: Divided into 4G, WiFi, Link1/2, and ACT1/2 lights, which respectively represent 4G light, WiFi light, TCP connection light, and ACT data active light.

Table 3 Indicator contents

4G	Steady blue means the dialing is not successful, flashing means the dialing is

	successful.
WiFi	The WiFi light flashes/stays on to indicate that the WiFi is working properly.
Link1/2 light	When the TCP connection is established (or in UDP mode), the Link is blue. It can be used to determine whether the serial port server has established a communication link with the host computer software.
ACT1/2 light	The indicator light flashes when the network port sends data to the serial port, or when the serial port sends data to the network port.

Use indicator lights to debug communication methods:

1) If the 4G light is always on, it means that the 4G/5G dial-up has not been successful. Please check the SIM card.

2) If the Link light is not blue (only TCP working mode is considered), the host computer software has not established a connection with the serial port server. Please consider whether the IP address is configured in the same network segment.

3) If the ACT light does not flash, it means there is no data communication. Please check the parameter configuration and serial port connection.

5.

Figure 4 interface picture

The upper interface of ZLAN8309 series is shown in Figure 4:

6.SIM card installation: When installing the SIM card, make sure the device is not powered on. Use a pen tip or a screwdriver to push out the SIM card slot, and push the SIM card metal side down into the card slot.

7. RS485/RS422 signal input: two independent serial ports: PORT1, PORT2. 485 can carry 32 units. The longest communication distance is 1200 meters. Generally, it is necessary to use a terminal resistor when the RS485 line exceeds 300 meters. The 485 terminal resistor is 120 ohms.

8. The lower interface of ZLAN8309 is shown in Figure 5:

Figure 5 Lower interface diagram

9. Power input: The wiring terminal is a 5.08mm terminal, V+ is connected to 9~24V, V- is connected to GND, and there is also the shell ground.

Figure 6 Lower interface diagram

The rear view of ZLAN8309 is shown in Figure 6.

10. Guide rail buckle: It is convenient for users to install the equipment on the guide rail (DIN35mm). If there is a guide rail, the equipment can be installed directly into the guide rail.

4.2 Hardware connection

Generally speaking, the serial port server only needs to connect the power supply, serial port, and network cable.

The power supply can be an on-site 2-wire power supply, which can be directly connected to the positive and negative terminals of the power supply.

The serial port needs to be connected according to the user's serial port device. If you need to connect the first 485 port, just connect the positive terminal of 485 to 1A and the negative terminal of 485 to 1B.

At the same time, the network port needs to be connected to the LAN2~4 port of the 8309, which can be directly connected to the computer or connected to the network through a switch.

4.3 Software installation

ZLVircom can be used to configure parameters such as device IP and create virtual serial ports. If you do not need the virtual serial port function, you can download the installation-free version. Download address:

http://www.zlmcu.com/download.htm

Table 4 ZLVircom version

software name	Specifications
ZLVircom Device Management Tool (non-installed version)	The non-installation version does not include the virtual serial port function.
ZLVircom Device Management Tool (installed version)	The installation version contains ZLVircom_x64.msi and ZLVircom_x86.msi. For 64-bit operating systems, install x64, and for 32-bit operating systems, install the x86 version.

Just follow the default prompts during installation. After the installation is completed, zlvircom will be started every time the computer starts, which is used to create a virtual serial port at boot.

4.4 8309/-4G/-5G Parameter configuration

After ZLVircom is installed and the device hardware connection is completed, run the ZLvircom software and click "Device Management". ZLVircom can be used to search and configure device parameters in different network segments, which is very convenient, as long as the device and the computer running ZLVircom are under the same switch.
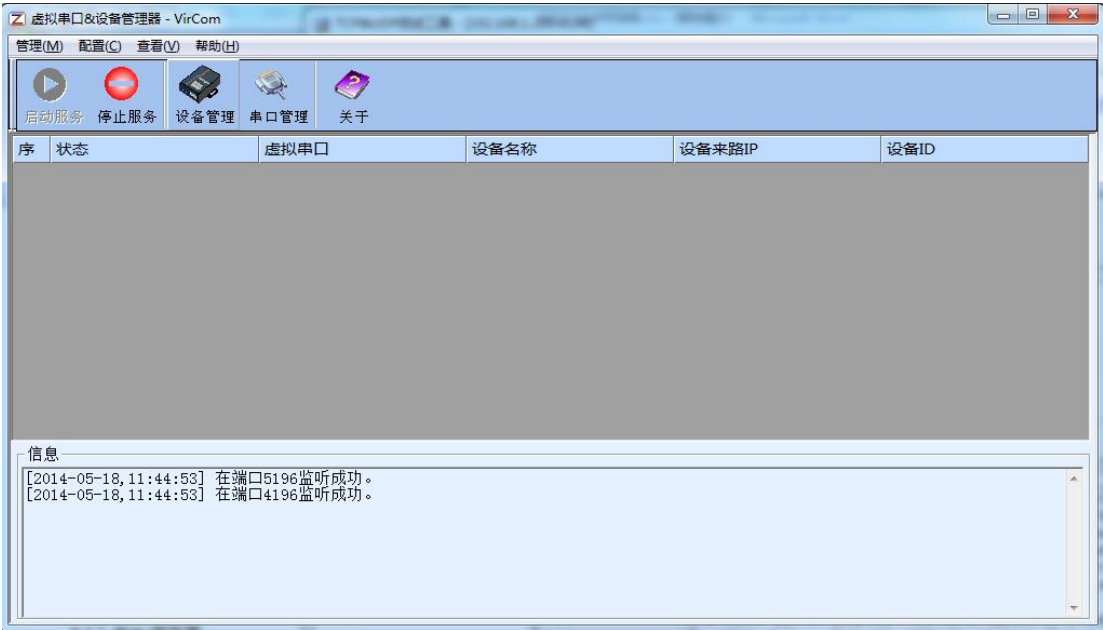

Figure 7 ZLVircom main interface

You can see the list of devices that have found 2 PORTs. Therefore, it is necessary to sort by name so that different PORTs of the same module are in continuous areas. The way to sort is to click "Device Name" in the title bar. When leaving the factory, the PORTs of each device have been named ECF78C-01~ECF78C-02. The ECF78C on the left is the ID of the device, which is the last 6 digits of the ID of the first PORT. -01~-02 indicates which PORT it is. Since the device name can also be modified, if the name has been modified, you can see that the PORT number of the device is 1~2 through the "PORT" list in the list.

Figure 8 Device List

After sorting, the 2 PORTs of the module have been arranged continuously. At this time, start from the first device ECF78C-01 and drag the mouse downward until all 2 PORT devices are selected. Then click "Batch Edit". "Batch editing" will cause 2

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PORTs to be modified at one time with the correct IP and port.
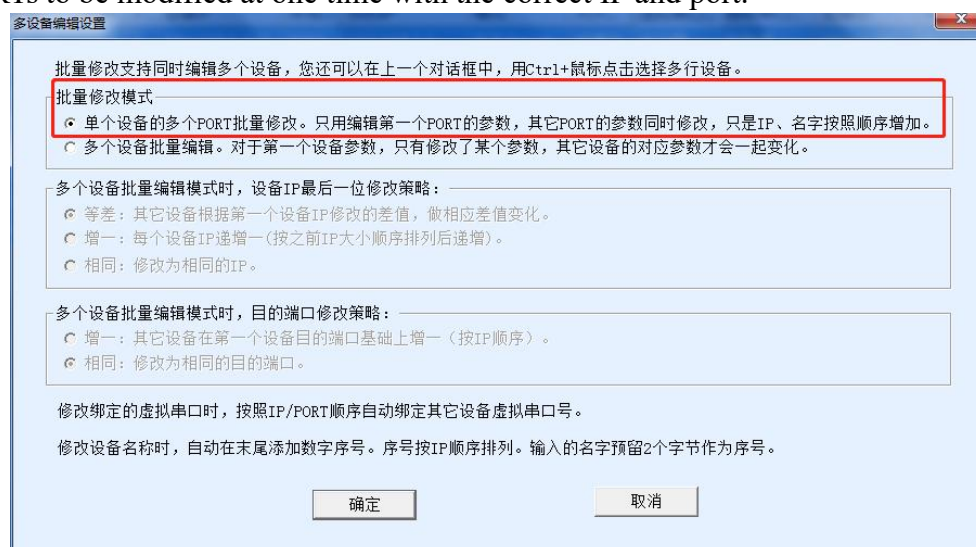

Figure 9 Batch setting options

Since all PORTs 1~2 are selected, the software recognizes that the two PORTs of this module are modified at once, as shown in the figure above. When selecting the batch modification method for 2 PORTs of a single module, you do not need to modify the content of the parameter dialog box. You can modify it directly by clicking "Modify Settings". At this time, although the PORT1 device parameters are not modified, the 2nd PORT will be modified. Modify to the device parameters of PORT1.
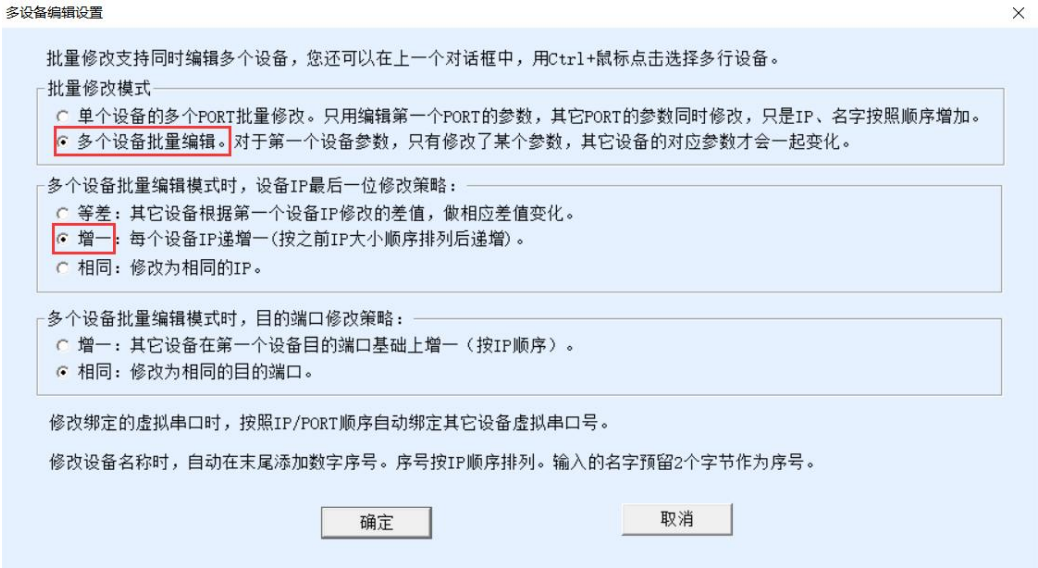
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Figure 10 Parameter dialog box

In the parameter dialog box, the user can choose to modify parameters such as the baud rate. If it is a TELNET-to-serial port, please select the TELNET protocol. Among them, ECF78C-01 is automatically filled in by the software based on the PORT ID and does not need to be filled in by the user. IP address 192.168.1.221 is the first IP address, and port 5001 is the port number of the first PORT. Then click the "Edit Settings" button. The software can batch modify 2 PORTs at one time.

Different PORTs of the same module can also be set to different IPs, but if the port is not fixed and the IP must be modified, it is not recommended to use multiple IPs. Here's how to change it to one PORT and multiple IPs.

First select the PORT number that needs to be modified, then click "Batch Edit"

Figure 11 Multi-IP modification step one

In the batch modification configuration, cancel the "single device multiple PORTs" mode and change it to "multiple devices batch editing". This mode will not intelligently identify IPs and ports.

Figure 12 Multi-IP modification step 2

Select "Increase one" in the IP mode, that is, according to the first IP set, subsequent IPs will automatically increase by 1.

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Figure 13 Multi-IP modification step three

In the modify parameters dialog box, be sure to modify the IP address. If you do not modify it, no operation will be performed. Because this mode will only modify the changed parameters, and unchanged parameters will not be affected.

Figure 14 Multi-IP modification results

Judging from the modification results, there are now two IPs, from 192.168.1.221 to 192.168.1.222.

4.5 Detailed parameter meaning

The detailed meaning is as follows:

Table 5 Parameter meaning

Parameter name	Value range	meaning
Virtual serial port	Unused or created virtual serial port	You can bind the current device to a created virtual serial port. Please add a COM port in "Serial Port Management" on the main interface first.
Device model		Only display the model of the core module
Device name	arbitrary	You can give the device an easy-to-read name, up

		to 9 bytes, and Chinese names are supported.
Device ID		Factory unique ID, cannot be modified.
Firmware version		Firmware version of the core module
Features supported by this device		Refer to Figure 6 for device supported functions
IP mode	static、DHCP	Users can choose between static or DHCP (obtain IP dynamically)
IP address		The IP address of the serial port server
port	0～65535	The listening port when the serial port server is in TCP Server or UDP mode. When acting as a client, it is best to specify the port as port 0, which will help improve the connection speed. When port 0 is used, the system will randomly assign a local port. The difference between this time and the non-zero port is: (1) When the local port is 0, a new TCP connection is re-established with the PC when the module restarts. The old TCP connection may not be closed, and there may be multiple false connections with the device. connect. Generally, the host computer hopes to close the old connection when the module is restarted; specifying a non-zero port will close the old connection. (2) When the local port is 0, TCP reestablishes the connection faster. When the serial port server is in TCP client mode, it also acts as a TCP server to monitor incoming connections on the port. At this time, the local port number used by the TCP client of 8309-2 to connect to the server is "port +1000"

working mode	TCP server mode, TCP client mode, UDP mode, UDP multicast	When set as a TCP server, the serial port server waits for computer connection; when set as a TCP client, the serial port server actively initiates a connection to the network server specified by the destination IP.
subnet mask	Eg：255.255.255.0	Must be the same as the subnet mask of the local LAN.
Gateway	比如：192.168.1.1	Must be the same as the local LAN gateway.。
Destination IP or domain name		In TCP client or UDP mode, the data will be sent to the computer indicated by the destination IP or domain name.
destination port		In TCP client or UDP mode, data will be sent to the destination port of the destination IP。
baud rate	300、600、1200、2400、4800、7200、9600、14400、19200、28800、38400、57600、76800、115200、230400、460800、921.6K	Serial port baud rate
data bits	5、6、7、8、9	
Check digit	None, even, odd, mark, space	
Stop bit	1、2	
flow control	No flow control, hard flow control CTS/RTS, hard flow control DTR/DCR, soft flow control XON/XOFF	Only valid for RS232 serial port
DNS server		When the destination IP is described by a domain name, the DNS server IP needs to be filled in. When the IP mode is DHCP, there is no need to

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		specify a DNS server, it will be automatically obtained from the DHCP server.
Purpose pattern	static, dynamic	In TCP client mode: After using static destination mode, the device will automatically restart after failing to connect to the server for 5 consecutive times.
Transformation Agreement	NONE 、 Modbus TCP<->RTU 、 Real_COM、TELNET	NONE means that the data forwarding from the serial port to the network is transparent; Modbus TCP<->RTU will convert the Modbus TCP protocol directly into the RTU protocol to facilitate cooperation with the Modbus TCP protocol; RealCOM is designed to be compatible with the old version of the REAL_COM protocol. A protocol for virtual serial ports, but when using a virtual serial port, you do not necessarily need to select the RealCom protocol. The TELNET protocol supports the network to log in to our equipment through TELNET to communicate with the serial port.
Keep-alive timer	0～255	Heartbeat interval. (1) When 1 to 255 is selected, if the device is in TCP client working mode, it will automatically send TCP heartbeats every "keep-alive timer". This guarantees TCP validity of the link. When set to 0, there will be no TCP heartbeat. (2) When set to 0~254, when the conversion protocol is selected as the REAL_COM protocol, the device will send a data with a length of 1 and a content of 0 every keep-alive timer to implement the heartbeat mechanism in the Realcom protocol. When set to 255, there will be no realcom heartbeat. (3) When set to 0~254, if the

		device works as a TCP client, the device will send device parameters to the destination computer every keep-alive timer. When set to 255, there will be no parameter sending function, allowing remote device management.
Disconnection and reconnection time	0～255	When in TCP client mode, when the connection is not successful, the TCP connection is reinitiated to the computer every "disconnection and reconnection time". It can be 0~254 seconds. If set to 255, it means never to reconnect. Note that the first TCP connection (such as powering on the hardware, restarting the device through the zlvircom software, and no data light) will generally be made immediately. Only after the first connection fails will the "disconnection and reconnection time" be waited for and then try again, so "Disconnection and reconnection time" will not affect the normal connection establishment time of the network and server.
Web access port	1～65535	The default is 80
The multicast address		Used for UDP multicast
Enable registration package		When the TCP connection is established, the registration packet is sent to the computer. After enabling the registration package, the realcom protocol must be selected. Supports TCP server and TCP client methods.
Packet length	1~1400	One of the serial port framing rules. After receiving the data of this length, the serial port server serial port sends the received data to the network as a

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		frame.
packet interval	0～255	Serial port framing rule two. When the data received by the serial port of the serial port server pauses and the pause time is greater than this time, the received data will be sent to the network as a frame.

The functions supported by the device are explained below:

Table 6 Features supported by the device

Name	illustrate
domain name 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 virtual serial port binding of multiple serial port servers through the Internet. Because the protocol contains the device MAC address, it helps the host computer identify the device. Under normal circumstances, it can not be used.
Modbus TCP to RTU	Modbus TCP to RTU can be realized. It also supports multi-host functionality.
Serial port modification parameters	Supports serial port AT commands to configure and read device parameters.
Obtain IP automatically	Support DHCP client protocol
Multiple TCP connections	When acting as a TCP server, it supports more than 1 TCP connection.
UDP multicast	UDP multicast
Multi-purpose IP	When acting as a TCP client, it supports simultaneous connections to 7 destination IPs.
P2P function	Supports access to devices in any network through P2P traversal technology. Models with an N suffix support this function.
TELNET function	Supports connecting to Zhuolan serial port server through Telnet protocol and monitoring device serial port.

4.6 TCP communication test

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

Figure 15 TCP communication diagram

Assume that the COM port (USB to serial port cable) of the PC is now connected to the serial port of the serial port server, then open the ZLComDebug (http://www.zlmcu.com/download/Comdebug.rar) serial port debugging assistant and open the corresponding COM port diagram 16; Open the TCP&UDP debugging assistant SocketTest (http://www.zlmcu.com/download/SocketTest.rar), and as the TCP client mode, fill in the destination IP as the IP of the serial port server (for example, 192.168.1.200), and the destination port is Select the port of the serial server (4196), and then click the "Open" button as shown in Figure 17. Enter "socket send" in SocketTest and click Send. The data will be transferred to the RS485 interface through the network port of the serial port server, and then sent to ZLComDebug, and then displayed in ZLComDebug; conversely, enter "Comdebug send" in ZLComDebug and click The send can also be sent to socket test and displayed.

This demonstration demonstrates the transparent forwarding function of serial port to network port and network port to serial port data of the serial port server.
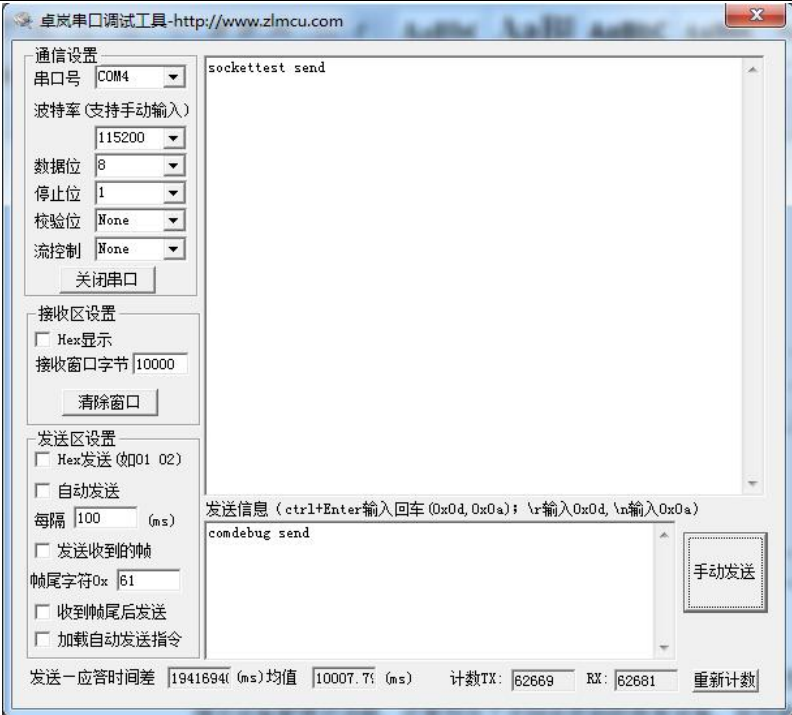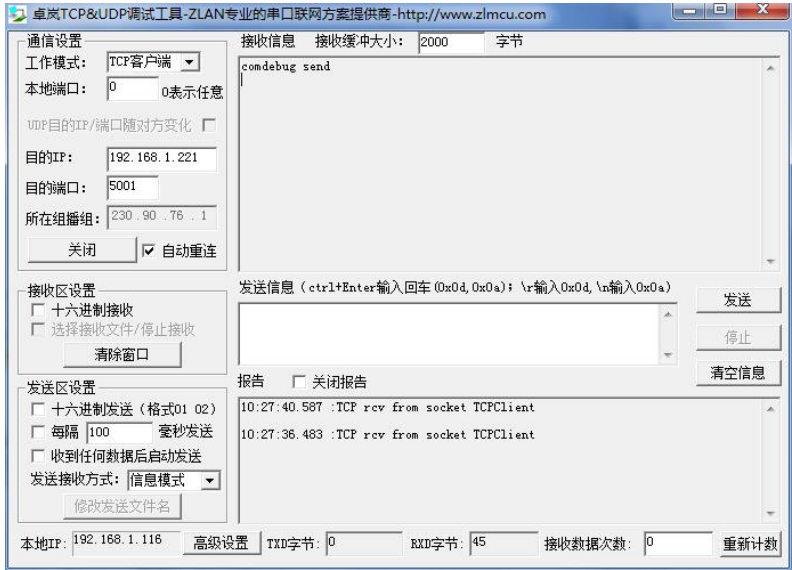
Figure 16 comdebug transceiver interface

Figure 17 sockettest transceiver interface

4.7 Virtual serial port test

Socket Test in Figure 15 communicates directly with the serial port server through TCP. In order to allow the user's already developed serial port software to communicate with the serial port server, a virtual serial port needs to be added

between the user program and the serial port server. As shown in Figure 18, ZLVircom and the user program run on a computer, and ZLVircom virtualizes a COM port so that the COM port corresponds to the serial port server. When the user program opens COM communication, it can be sent to the user's serial port device through the ZLVircom serial port server. This step is demonstrated below:

Figure 18 The function of virtual serial port

Click "Serial Port Management" on the main interface of ZLVircom, then click "Add" and choose to add COM5, where COM5 is a COM port that does not exist on the computer.
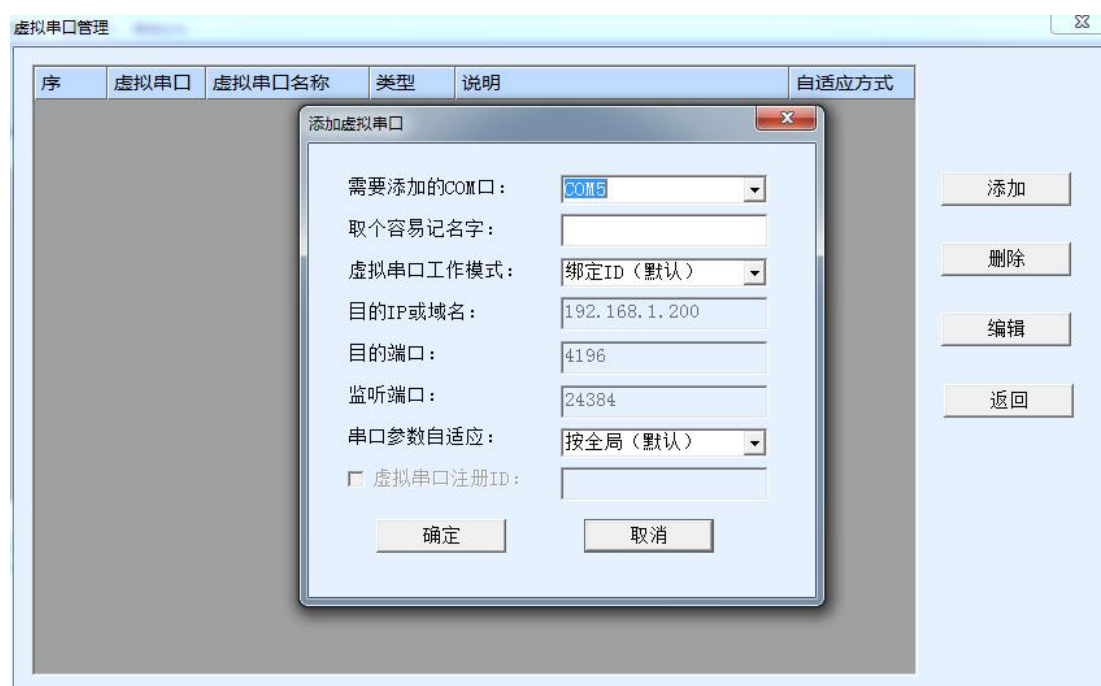

Figure 19 Add virtual serial port

Then enter the device management and double-click the device that needs to be bound to COM5. Select COM5 in the "Virtual Serial Port" list in the upper left corner. Then click "Edit Settings." And return to the main interface of ZLVircom. You can see that COM5 is connected to the device with IP address 192.168.1.211. At this time,

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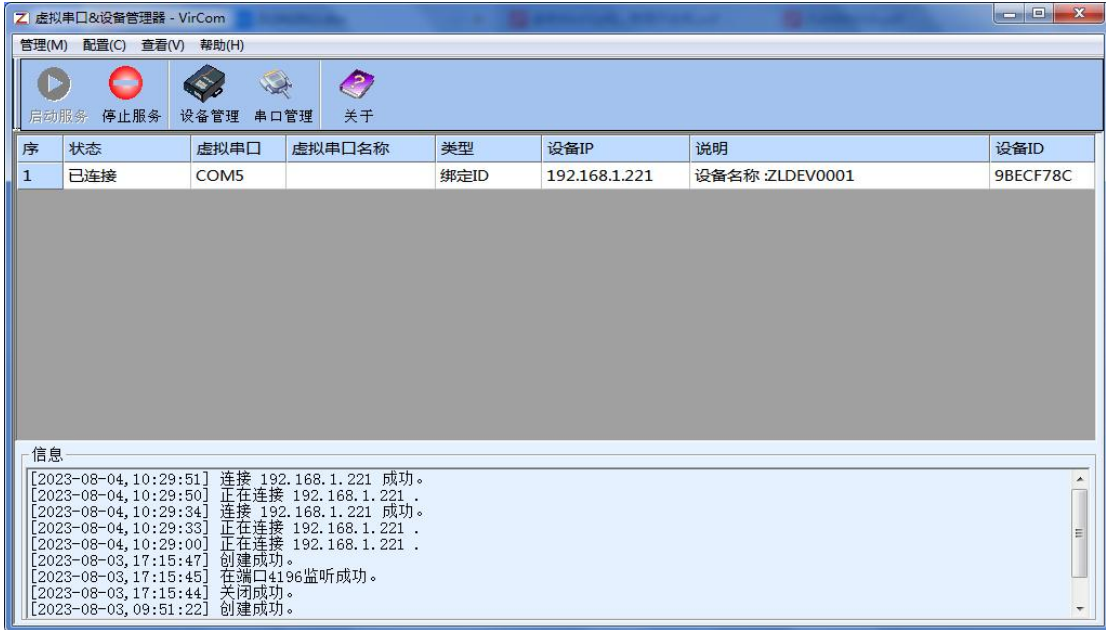COM5 can be used instead of SocketTest for communication.

Figure 20 The virtual serial port has been connected

Open ZLComdebug to simulate the user's serial port program, open COM5 (the virtual serial port above), and open another ZLComdebug to simulate a serial port device, open COM4 (hardware serial port). At this time, the COM5 sending data link is as follows: COM5ZLVircom serial server network port serial server serial port COM4. On the contrary, data can also be transmitted from COM4 to COM5: COM4 serial port server serial port serial port server network port ZLVircomCOM5. As shown in Figure 21, both parties send and receive data.

If COM4 is replaced with a user serial port device, COM5 can communicate with the user device.
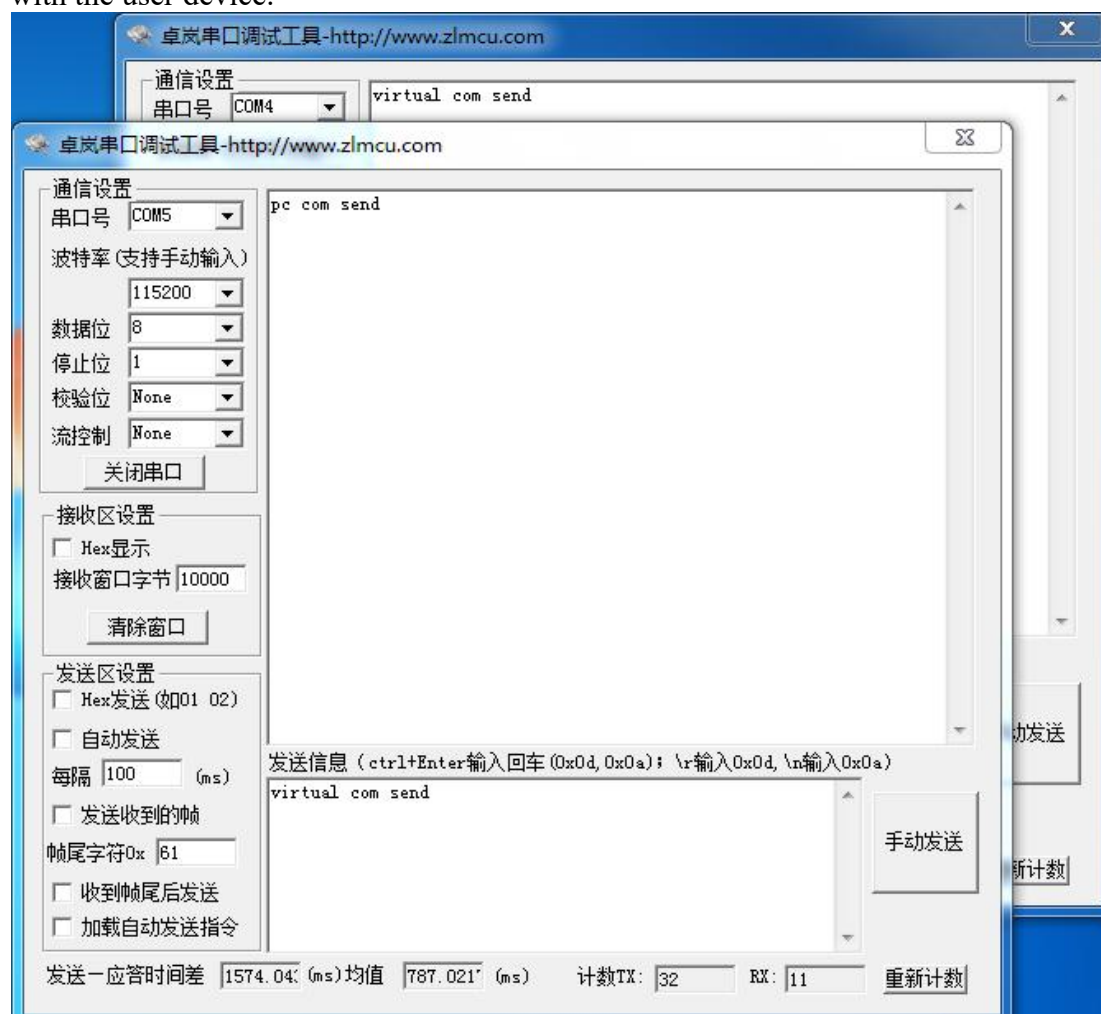

Figure 21 Communication through virtual serial port

4.8 Modbus TCP Testing

By default, serial port and network port data are transmitted transparently. If you need to convert Modbus TCP to RTU, you need to select the conversion protocol as "Modbus TCPRTU" in the device settings dialog box, as shown in Figure 22. At this time, the device port automatically changes to 502. At this time, the user's Modbus TCP tool is connected to the 502 port of the serial server's IP, and the Modbus TCP instructions sent will be converted into RTU instructions and output from the serial port. For example, if the serial server network port receives the Modbus TCP command 00 00 00 00 00 06 01 03 00 00 00 0a, the serial port will output the

command 01 03 00 00 00 0a c5 cd. Note: The serial port may send multiple 01 03 00 00 00 0a c5 cd instructions. This is because the default Modbus uses storage mode and will automatically poll and query instructions. How to switch to non-storage mode will be explained later.

Figure 22 Enable Modbus TCP function

If the user's Modbus TCP software is used as a slave, you need to select the conversion protocol, then change the working mode to client, change the destination IP to the IP of the computer where the Modbus TCP software is located, and the destination port is 502, as shown in the figure 23 shown.

Figure 23Modbus TCP as client.

4.9 Web configuration

ZLAN8309/-4G/-5G also supports using the Web method. For configuration, you need to first ensure that the computer and the serial port server are in the same IP segment, and you need to know the IP address of the serial port server in advance.

But Web configuration can be done on any computer without ZLVircom.

1. Enter the IP address of the PORT1 port of the serial port server in the browser, such as http://192.168.1.221, and open the following web page.
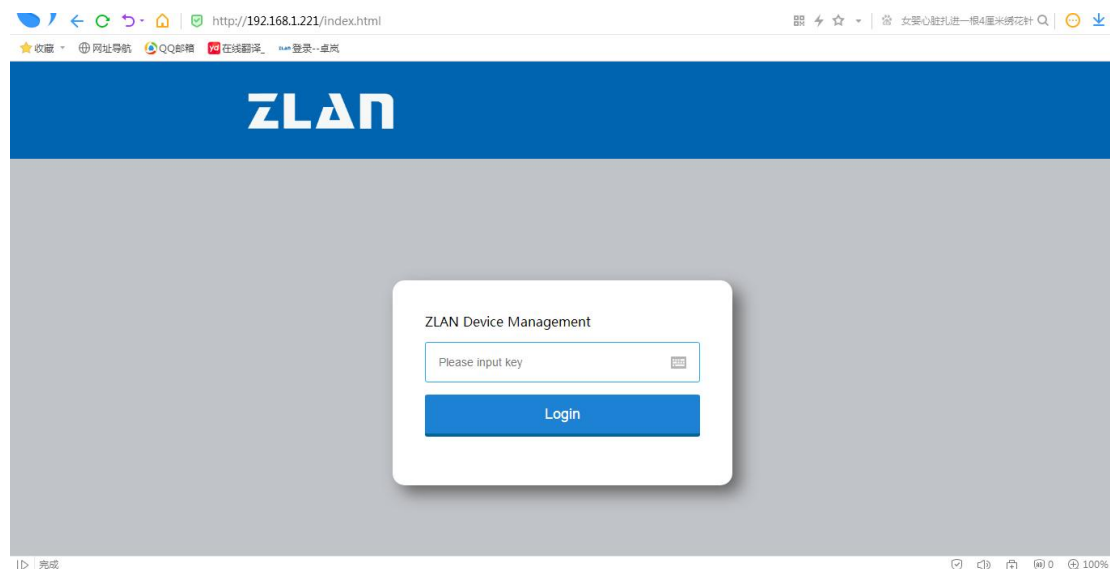

Figure 24 web login page

2. Enter the password in Password: there is no password by default. Click the login button to log in.

Figure 25 Web configuration interface

3. Select the PORT1-2 you want to modify in the web page that appears. Modify the corresponding PORT port parameters and click Submit. For related parameters, please

refer to Table 5 Parameter Meaning.

4. Notes: 1. The IP address of the web page is the IP of the first serial port (PORT1). The IP of the second PORT port cannot enter the web page. 2. Submitting modifications will only submit the parameters of the current PORT port. For example, after modifying the parameters on the PORT2 port page, clicking Submit will only modify the parameters of PORT2.

5.Working mode and conversion protocol

Different serial port server working modes and conversion protocols can be selected in different applications, so that they can be used more stably and reliably, as detailed below.

The use of serial port servers is basically divided into two types: with virtual serial port and non-virtual serial port, as shown in Figure 15 TCP communication diagram and Figure 18 the role of virtual serial port respectively. The user software that needs to be connected with the virtual serial port mode is a serial port interface (COM port), that is, the user software and the user equipment are both serial ports; in the non-virtual serial port mode, the user software communicates directly with TCP/IP, but the user equipment is still a serial port.

In the non-virtual serial port mode, the "conversion protocol part" is divided into 4 modes: transparent transmission, Modbus TCP to RTU, Realcom protocol and TELNET. If the user software is a fixed-protocol Modbus TCP protocol and the host computer is Modbus RTU, you need to select the Modbus TCP to RTU mode; the Realcom protocol is currently only used as a TCP client on a multi-serial server to connect to a server, and the server uses a virtual serial port. The TELNET protocol is suitable for monitoring the serial port of the device when connecting to the Zhuolan module through the Telnet protocol.

The usage is summarized as follows:

Table 7 Network configuration modes

No.	Virtual serial port usage	Equipment operating mode	Conversion protocol	Specifications

1	use	TCP server	none	It is suitable for situations where the user software opens the COM port and actively collects data.
2	use	TCP client	none	It is suitable for situations where the device actively sends data. If you choose a TCP server, there may be a problem that the device cannot be reconnected after being disconnected.
3	none	TCP server	Modbus TCP to RTU	Applicable to user software is Modbus TCP and user equipment is Modbus RTU. And Modbus TCP is used as the master station.
4	none	TCP client	Modbus TCP to RTU	Applicable to user software is Modbus TCP and user equipment is Modbus RTU. And Modbus RTU is used as the master station.
5	use	TCP client	Realcom protocol	When a multi-serial server serves as a TCP client and uses a virtual serial port, it is best to use the Realcom protocol.
6	none	TCP server	Telnet protocol	It is suitable for monitoring the serial port of the device when connecting to the Zhuolan serial port server through the Telnet protocol.
7	none	TCP client	none	It is suitable for connecting a large number of devices to a cloud. And generally the cloud is a public IP server on the Internet.
8	none	TCP server	none	It is suitable for devices and computers on the same local network to monitor locally without the need for cross-Internet communication.

5.1 Virtual Serial Port Mode

If the user software uses the COM port for communication, it must use the virtual serial port mode. Including some PLC software, configuration software, instrument software, etc.

Then check whether the monitoring computer and device are both on the local network:

a) If the computer is a public IP server rented on the Internet, then the device must use TCP client mode to allow the device to connect to the server. At this time, you can choose 2 and 5 in Table 7. If it is a multi-serial port server, you must choose 5.

b) If they are all on the local network (can ping each other), it depends on whether the host computer actively queries or the device actively sends data. If the device actively sends data, you must use the device as a TCP client in method 2, otherwise you can choose method 1.

5.2 Direct TCP/IP communication mode

If there is no need for Modbus TCP protocol conversion or virtual serial port, the user software may directly communicate with the network port of the serial port server through TCP/IP, and the serial port server will convert the TCP/IP data into serial port data and send it to the serial port device.

Generally, users with this type of usage develop their own host computer network communication software, which integrates the analysis of the device's serial communication protocol. This method is more flexible and efficient than virtual serial port. Corresponds to 7 and 8 in Table 7.

In the "TCP Communication Test" section, we briefly describe how the serial port server communicates when it serves as a TCP server. Here we will describe how the TCP client, UDP mode, and multiple TCP connections communicate with computer software. Among the computer software, SocketTest (software that imitates user TCP/IP communication) is used as an example.

Zhuolan serial port to network port module complies with the standard TCP/IP protocol, so any network terminal that complies with this protocol can communicate with the serial port server. Zhuolan Technology provides a network debugging tool (SocketDlgTest program) to simulate the network terminal and Serial server communication.

In order for two network terminals (here, the network debugging tool and the serial server) to communicate, their parameter configurations must be paired.

5.2.1. TCP Client mode

There are two working modes in TCP mode: TCP server and TCP client. No matter which mode is adopted, one party must be the server and the other party must be the client. Then the client can access the server. Both are clients or services. Communication cannot be achieved.

When the serial port server serves as the client, there must be three corresponding relationships, as shown in Figure 26. (1) Working mode correspondence: The working mode of the serial port server is the server mode of the client corresponding to the network tool. (2) IP address correspondence: The destination IP of the serial port server must be the IP address of the computer where the network tool is located. (3) Port correspondence: The destination port of the serial port server must be the local port of the network tool. After this setting, the serial port server can automatically connect to the network tool, and data can be sent and received after the connection is established.

Figure 26 Serial server as client

5.2.2. The client connects to multiple servers

When the Zhuolan serial port server serves as a TCP client, it can connect to 7 destination IP addresses at the same time, and the data sent by the serial port will be sent to 7 destination IP addresses at the same time. If there are not that many servers, the remaining destination IPs will be left vacant. How to use it:

Figure 27 The first destination IP and port

Figure 28 The remaining 2 to 7 IPs and ports

The first IP is set in the device setting interface as shown in Figure 27, where the first IP can be a domain name. For the remaining 2 to 7 destination IPs, click the "More Advanced Options" button in the device settings interface to open more advanced options for settings.

After all 7 destination IPs are set, the connection can be automatically made. If the connection cannot be made, it will wait for the "disconnection and reconnection" time and then reconnect repeatedly.

5.2.3. TCP server mode

When the serial port server serves as the server, there are also three corresponding relationships, as shown in Figure 29, which will not be explained one by one here. After setting up this way, click the Open button of the network tool to establish a TCP connection with the serial port server. After the connection is
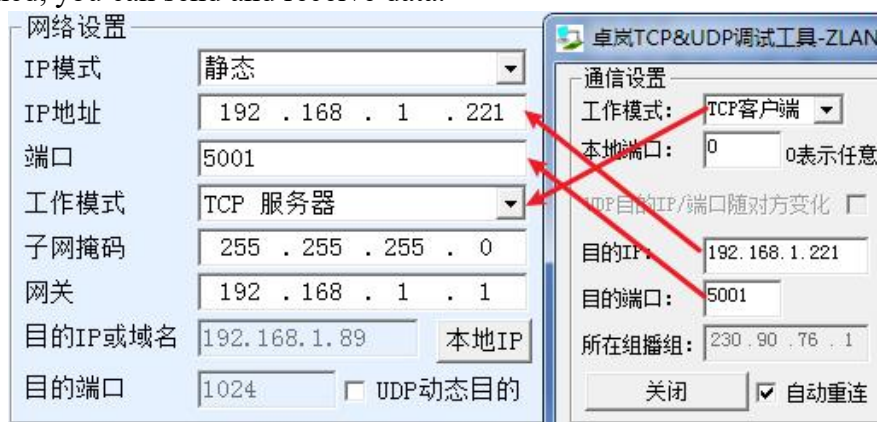
established, you can send and receive data.

Figure 29 Serial server as server

When the serial server serves as the server, it can accept 30 TCP connections at the same time. Data received by the serial port will be forwarded to all established TCP connections. If you need to send data only to the TCP that has recently received network data packets, you need to enable the multi-host function. Please refer to 8.4 Multi-host function.

5.2.4. Act as both client and server

ZLAN serial port server supports accepting TCP connections when the device is in TCP client mode, that is, it also has TCP server function.

Figure 30 is used as both client and server.

By default, when using ZLVircom for configuration, if the working mode is changed to "TCP client" mode, the port (that is, the local port) will automatically become 0 (0 means randomly selecting an idle port). In order to support TCP server

mode, the computer software must know the local port of the device, so a value needs to be specified here. As shown in Figure 30, the computer software can now connect to the 5001 port of 192.168.1.221 for communication, and the device will also act as a client. The end is connected to port 1024 of 192.168.1.189. It should be noted that since local port 5001 is occupied by the server, when acting as a client, the local port of 8309-2 uses "port + 1000", which is the incoming port of the device when the software on 192.168.1.189 sees it. It is 5001+1000=6001.

5.2.5. UDP mode

In UDP mode, the parameter configuration is shown in Figure 31. The left side is the configuration of the serial port server in ZLVircom, and the right side is the setting of the network debugging tool SocketDlgTest. First of all, both must be in UDP working mode. In addition, as indicated by the red arrow, the destination IP and destination port of the network tool must point to the local IP and local port of the serial port server. Indicated by the blue arrow, the destination IP of the serial port server must be the IP address of the computer where the network tool is located, and the destination port of the serial port server must be the local port of the network debugging tool. Only after these network parameters are configured can bidirectional UDP data communication be guaranteed.
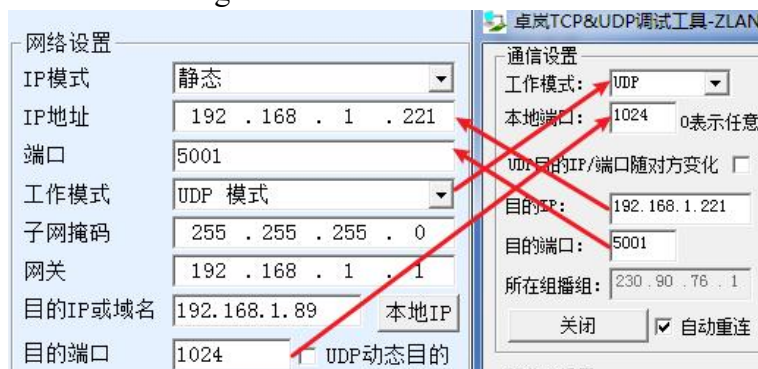

Figure 31 UDP mode parameter configuration

6. Configure the communication mode

If you do not have a network cable and plan to connect the device via WiFi, you need to perform the following steps first:

Turn on WLAN on the lower right side of the computer:

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Figure 32 Hotspot name of 8309

Connect to ZLAN-XXXXXXXX WiFi, the default password is 66666666.

If you have a network cable and plan to connect the device via wire, directly connect the network cable to any network port LAN2~4, open your browser, enter 192.168.8.1 in the address bar, press Enter to confirm, you can open the routing configuration of ZLAN8309 page.

(Using a wired connection requires the computer's Ethernet and ZLAN8309 to be on the same network segment)

Figure 33 Communication method login page

There is no password initially, just click to log in. After logging in, you will enter the configuration page:
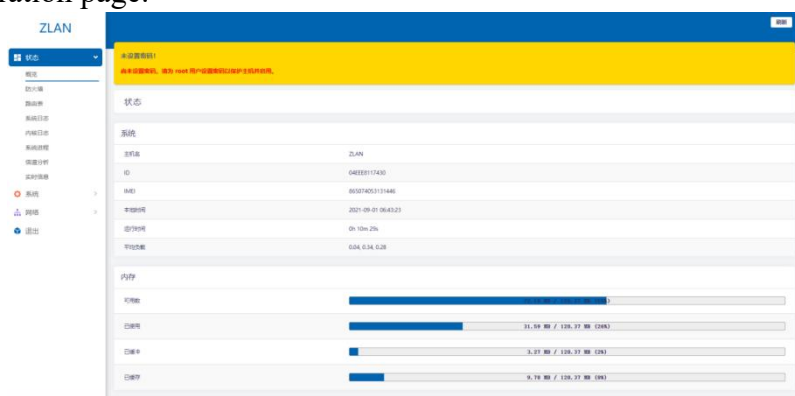
Figure 34 Communication method configuration page

Click Network -> Interface, you can see the current interfaces of the device, mainly LAN port, WAN port, and WAN_4G port.
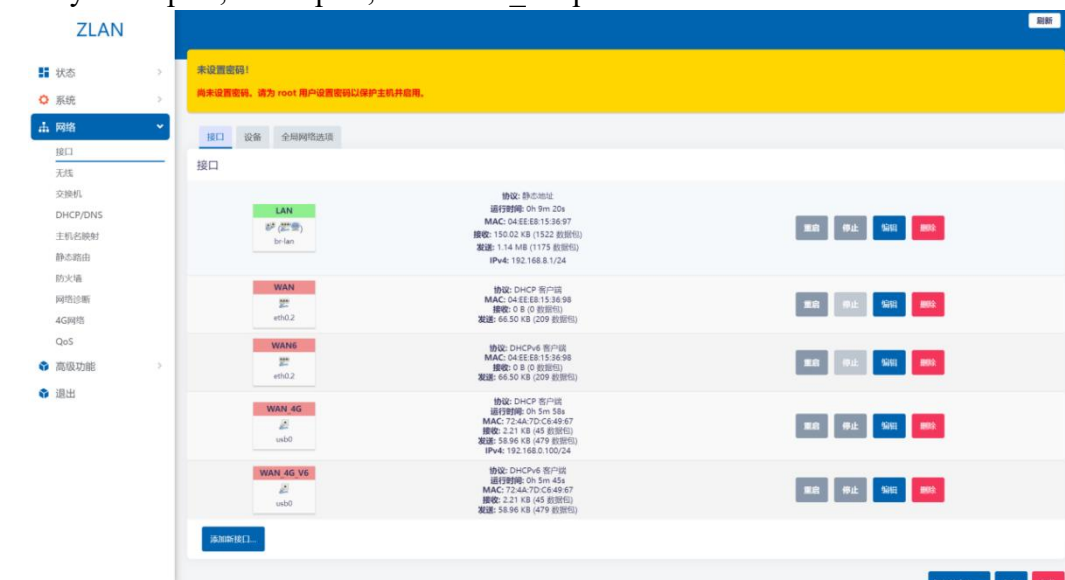

Figure 35 interface page

Initial configuration: Click on the menu bar on the left side of the webpage: Network -> Interface, you can see the interface page shown above. The default mode of WAN port mode is wired priority mode, that is, the WAN port accesses the Internet through a network cable. Relevant parameters can be viewed by clicking Network -> 4G Network.
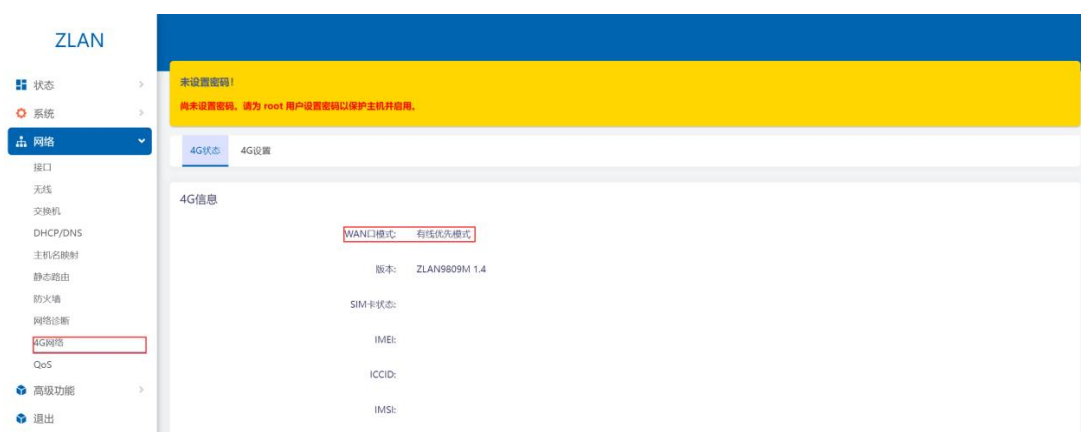

Figure 364G network status

6.1. Network cables connection

6.1.1. LAN port mode

If you use ZLAN8309 as a network port serial port server, you do not need to enter the routing configuration page. Connect any of the 8309's LAN2~4 ports to the company's LAN using a crossover network cable or a direct-connect network cable, and you can communicate with other network devices in the LAN.

6.1.2. WAN port mode

When connecting the WAN port (LAN1) of the 8309 to the company's LAN using a crossover network cable or a direct-connect network cable. In this case, the 8309 and other devices under the LAN port are equivalent to a subnet under the LAN.

The WAN port of 8309 will obtain an IP address from the LAN. At the same time, the serial port IP of 8309 and the LAN are not in the same network segment.

6.2 WiFi Connection

There are two forms of WiFi communication. The first is WiFi relay: In relay mode, the serial port IP of 8309 and other LAN port devices are in a subnet under the LAN just like the wired WAN port mode.

The second type of WiFi bridging: the 8309's serial port IP and LAN port, other devices and the upper-level network will be in the same network segment

6.2.1.WiFi Relay mode

Click the menu bar on the left side of the web page: Network -> Wireless, you can see the wireless overview. The 8309 device is equipped with a 2.4G frequency band wireless network card.
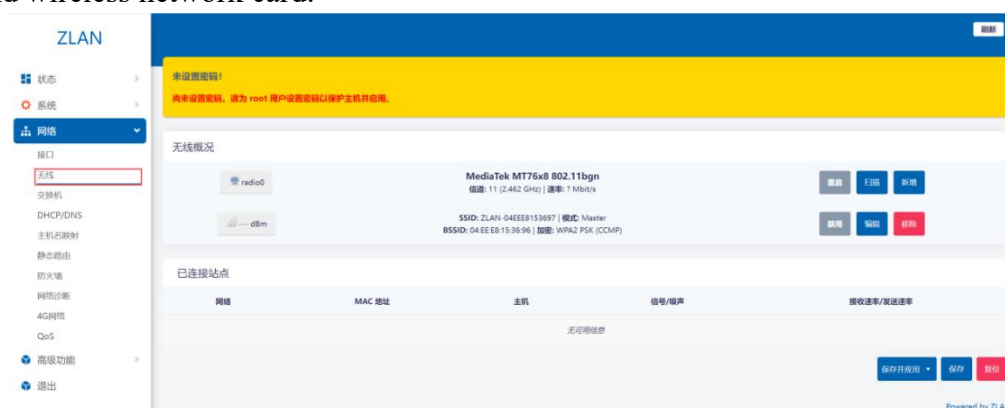
Figure 37 Wireless Overview

WiFi relay mode, that is, 8309 accesses the upper-level network through the upper-level WiFi. Enter the communication method configuration page, click on the left menu bar: Network -> WiFi, click the scan button on the right side of the network card:
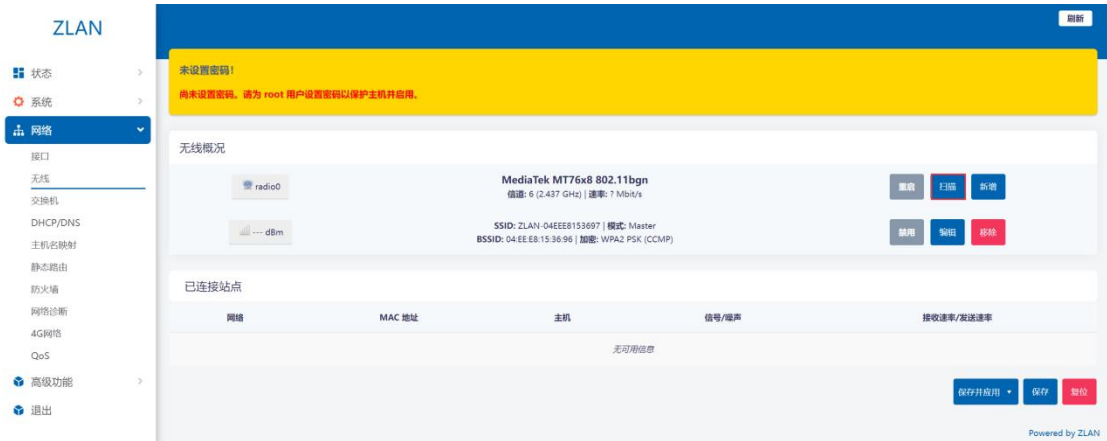

Figure 38 Scan button

Step 2: On the page that opens, select the upper-level network you want to access and click Join Network.

Figure 39 Join the network

Step 3: Enter your superior network password on the page that opens. The default name of the new network interface is wwan. You can modify it yourself. Then click the submit button in the lower right corner, and the second interface will pop up.

Figure 40 Modify the network interface name

The second page has options such as operating frequency, transmission power, etc. When the WiFi version of the device that needs to be connected is older and does not support 802.11/N, the working frequency can be changed to Legacy. Under normal circumstances, there is no need to set any parameters, just click Save.

Figure 41 Interface configuration

After clicking Save, enter the page shown in the figure below. You can see that there is an additional mode in the wireless overview: Client wireless. The web page prompts that there are many unapplied changes in the interface. Click Save and Apply to take effect.
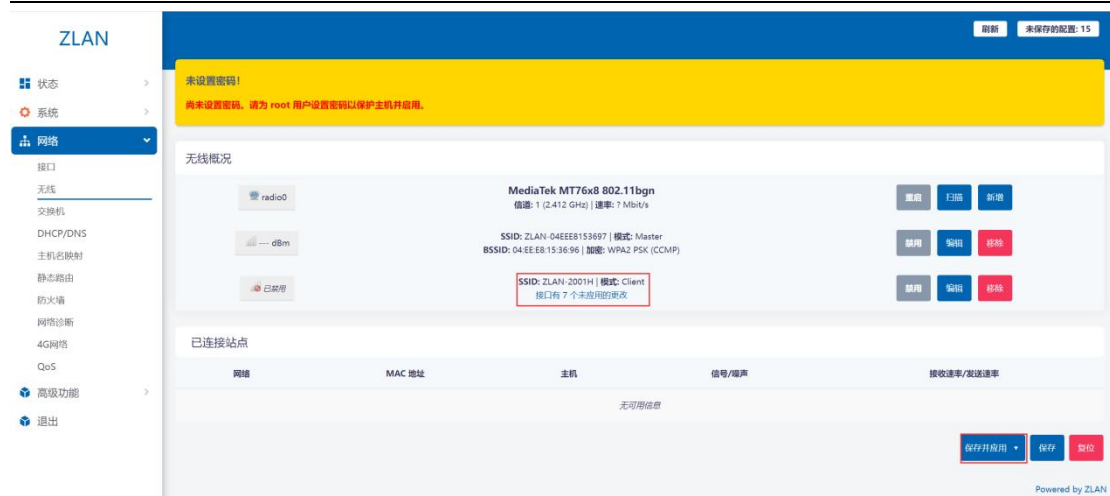
Figure 42 Save button

Step 4: Click on the left menu bar: Network -> Interface. At this time we can see the newly added interface.

Figure 43 Interface page

Step 5: Click on the left menu bar: Network -> 4G Network -> 4G Settings: Set the WAN port mode to wired_mode: (You do not need to perform this step if you already have it)
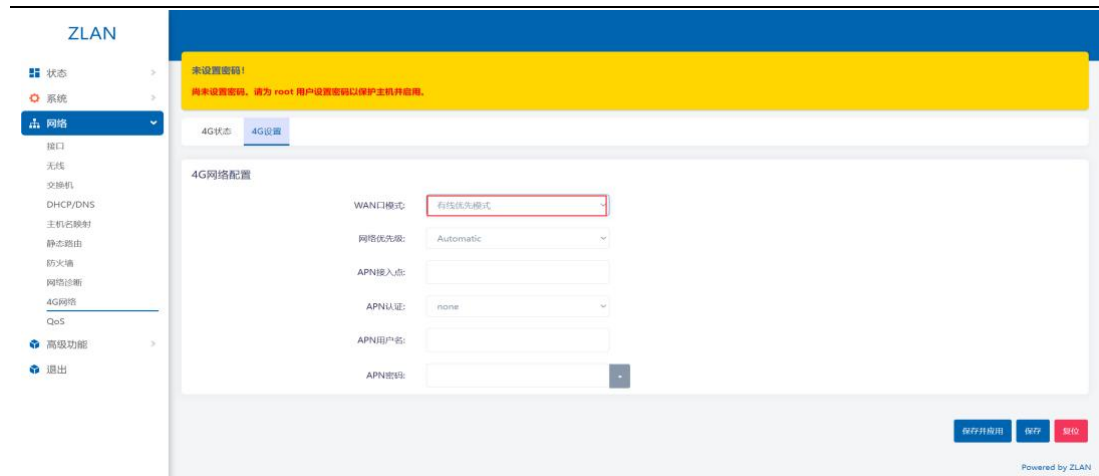
Figure 44 Wired mode

It is worth noting that the serial port IP of 8309 is not in the same network segment as the WiFi upper network.

6.2.2.WiFi bridge connection mode

When the device that requires the 2 serial port IPs of 8309 and other LAN ports is in the same network segment as the upper-level network, the WiFi needs to be set to bridge mode.

Then click Advanced Functions -> Relay, select relay bridging for relay mode, select the name of the AP to be bridged for the upper-level WiFi name, fill in the AP password for the upper-level WiFi password, and select the corresponding encryption method. It is best to set the IP of this device to IP in a different network segment than the superior network port:
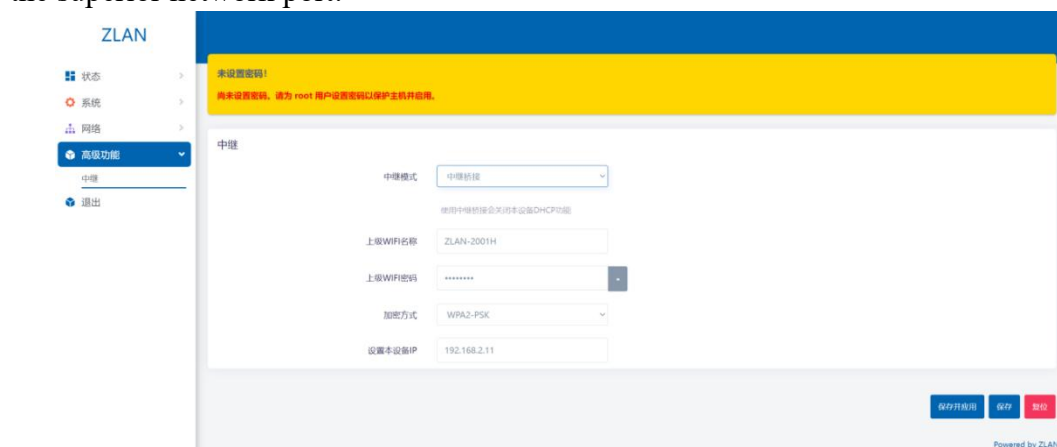

Figure 45 Advanced functions

Step 2: After filling in the information as required, click "Save and Apply" in the lower right corner and wait for the application to be completed. After the relay is successful, menu bar: Network->Wireless:

Figure 46 Overview of relay wireless

The superior WiFi will appear here. If the encryption method also appears, it means the connection to the superior WiFi is successful.

Then click on the menu bar: Network->Interface. Check whether the relay interface has an IP. If there is an IP, the relay has been successful.

Figure 47 relay interface

After the setting is completed, wait for 10 seconds to complete the configuration. At this time, the 8309 can be bridged to the upper-level AP through WiFi, and the 2 serial port IPs of the 8309 can obtain the network segment assigned by the upper-level AP. Can directly communicate with the upper layer network.

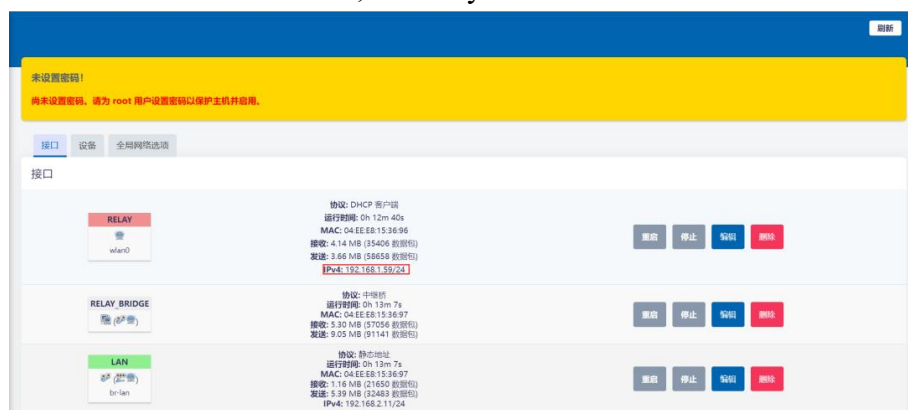| 序	类型	设备名称	型号	P..	设备IP	本地...	目的IP	模式	TCP...	虚拟串...	虚拟串口...	设备ID	TXD	RXD
1	内网	2A74D9-01	2012	1	192.168.1.178	0	192.168.1.119	TCP Client	已建立	未设置	未联通	1A2A74D9	0	0
2	内网	2A74D9-02	2012	2	192.168.1.178	0	192.168.1.119	TCP Client	已建立	未设置	未联通	1A2A74DA	0	0

设备管理

Figure 48 8309 serial port IP

6.3. 4G/5G mode

4G/5G mode, that is, ZLAN8309 connects to the external network by inserting a 4G/5G SIM card.

4G/5G mode supports APN (Access Point Name). The APN access point needs to fill in the APN name, authentication method, user name and password according to the requirements of the APN provider.

Step one: Insert the SIM card and connect the 4G/5G antenna.

Step 2: Click on the left menu bar: Network -> 4G/5G Network -> 4G/5G Settings: Set the WAN port mode to 4G/5G priority mode: (You do not need to perform this step if you already have it) and click on the right Save and set in the lower corner.

Figure 49 4G/5G priority mode

After completion, 8309 can access the external network through 4G/5G, and the serial port IP of 8309 and other devices on the LAN port can access the Internet through 4G/5G.

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7. BACnet advanced functions

If you need a communication gateway that converts BACnet/IP protocol and Modbus protocol, we recommend ZLAN8309S-B, which is compact, low-priced and more cost-effective.

Figure 50 8309S-B Bacnet Gateway

8. Modbusa dvanced functions

The serial port server with Modbus gateway function itself does not have station address and register. It is a communication bridge. It will generate Modbus based on the Salve ID, function code, register number and register quantity in the Modbus TCP command sent by the user software to the Modbus gateway. RTU is specified and output from the serial port. Think of it as a protocol "translator".

8.1 Enable Modbus gateway

First of all, the serial port server should support Modbus gateway, that is, the "Modbus TCP to RTU" function in Table 6 of the functions supported by the device in the device settings dialog box should be checked.

By default, the serial port server is in ordinary transparent transmission mode. If you need to convert to Modbus gateway mode, please select the "Modbus TCPRTU" option in "Conversion Protocol". After that, the device automatically changes the "Port" parameter to 502 (the port of the Modbus server). The Modbus gateway is now enabled.

If the serial port RTU device is used as a slave station, the host computer Modbus TCP software is connected to the 502 port of the Modbus gateway. At this time, the Modbus gateway needs to work in TCP server mode; if the serial port RTU device is used as the master station, the Modbus gateway works on the TCP client, and the destination IP Fill in the IP of the computer where the Modbus TCP software is located, and the destination port is generally 502.

8.2 Storage Modbus gateway

ZLAN8309 can save the contents of the read register inside the gateway, so that the speed of Modbus TCP query can be greatly improved, and the performance is even better when supporting multi-host access.

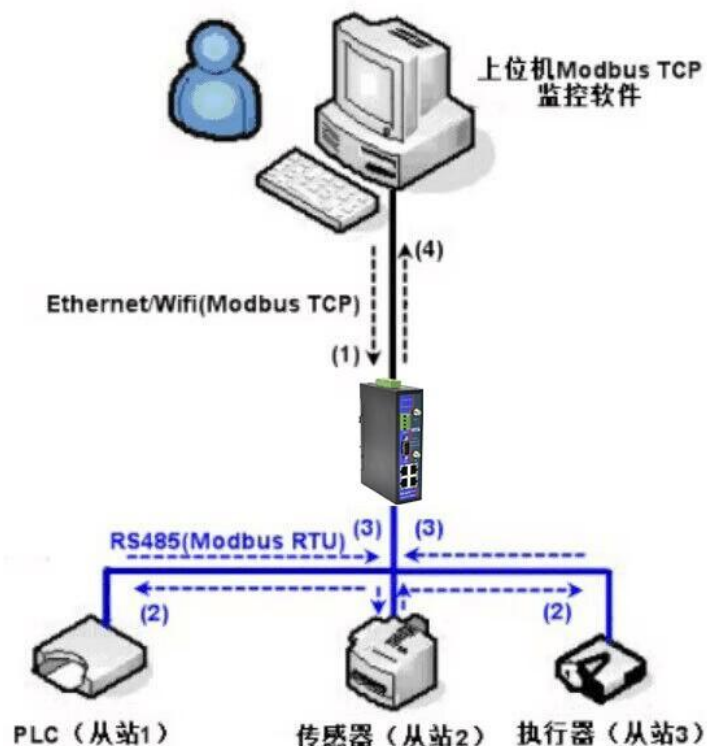Figure 51 Working mode of storage Modbus gateway

As shown in Figure 51: The normal Modbus TCP data flow direction is (1) (2) (3) (4). That is, the Modbus TCP command is first converted into the corresponding command of Modbus RTU, then the device responds to the Modbus RTU command to the Modbus gateway, and then the Modbus gateway is converted into Modbus TCP again and sent to the monitoring host computer.

We know that Modbus TCP is network communication, the transmission speed is very fast, and it can generally respond within 3ms, while Modbus RTU is RS485, which generally only has a speed of 9600bps. It generally takes at least 30ms to send and return an instruction. The query response time of ordinary non-storage Modbus gateways is relatively long. In addition, if there are many host computers querying data at the same time, the serial port will be congested. If the network is compared to a highway and the serial port is compared to a single-plank bridge, then the original method is to pass the traffic volume of the highway on the single-plank bridge.

The register-saving Modbus gateway solves the above problems. It can temporarily save the register data obtained by the query inside the Modbus gateway, so that when the Modbus TCP query comes, the Modbus gateway can return the command immediately, truly taking advantage of the fast characteristics of Modbus TCP. On the other hand, ZLAN8309 can actively send instructions from the serial port to automatically update the content of the currently saved register data and save a copy of the latest register value.

In addition, the module is also a fully automatic configuration-free Modbus gateway. Users do not need to configure the required register addresses, function codes, slave addresses, etc. ZLAN8309 will automatically identify and dynamically add these registers based on the Modbus TCP instructions sent from the network port.

ZLAN8309 can show good response speed when monitoring multiple computers. No matter what the baud rate of the serial port is, it can generally respond to the host within 3ms. And it shows good real-time update speed of serial port data.

The register-saving Modbus gateway is a true Modbus TCP to Modbus RTU conversion. It truly takes advantage of Modbus TCP's fast speed and the ability to query multiple hosts at the same time.

Note that when the serial port server serves as a TCP client, it does not have storage type function and will automatically switch to non-storage type.

The following lists the characteristics of storage Modbus:

1. The first Modbus TCP query command is non-storage type. Because you must wait for the RTU device to return data slowly before you can reply to the register content of the network port.

2. If a specific command is no longer queried by the network-side host computer within 5 seconds, the command will be automatically deleted and will no longer be sent from the serial port to the RTU device.

3. Currently, 10K Modbus cache can be stored. For ordinary single-register queries, approximately 500 instructions can be stored at the same time.

4. When multiple instructions are being queried at the same time, they are sent in order. The first instruction is sent, the first instruction response waits for 485 anti-collision time (refer to the multi-host part), the second instruction is sent... Return to the first instruction after the last instruction is responded to.

8.3 Disable storage functions

Although storage Modbus has a fast response speed, some users do not want the RTU device to receive a large number of query instructions, which affects the internal processing speed of the instrument. At this time, the storage function can be turned off.

The method to disable the storage type is to click the "More Advanced Options" button in the "Parameter Configuration" dialog box and select Simple Modbus TCP to RTU. Then go back to device settings and click Modify settings.

Note that when using the Web method to configure the conversion protocol, the default is a non-storage Modbus gateway.
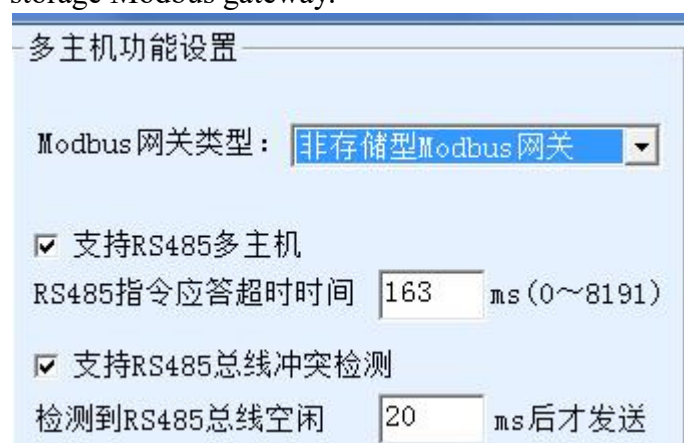

Figure 52 Settings of the new version of zlvircom

8.4 Multiple host function

The "RS458 multi-host support" and "RS485 bus conflict detection function" shown in Figure 52 are Zhuolan's multi-host functions. They are generally enabled and disabled at the same time. After enabling it, the device that converts the protocol to Modbus TCP will have the storage Modbus gateway function, otherwise it will be a non-storage Modbus gateway; if the conversion protocol is None, the user-defined RS485 protocol can generally have a serial port device that multiple hosts can access at the same time. function, which cannot be realized in a pure RS485 network, because multiple master stations sending at the same time will cause conflicts on the RS485 bus. The multiple hosts of Zhuolan serial port server can "coordinate" the RS485 bus to achieve the purpose of multi-host access.
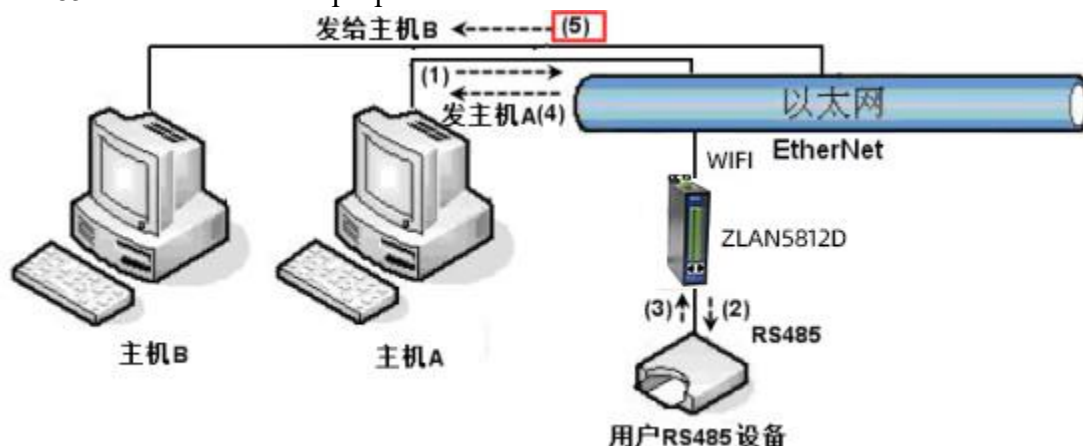

Figure 53 Multi-host function demonstration

As shown in Figure 53, in normal mode, when two hosts: host A and host B are connected to the serial port server at the same time, host A sends the (1) command, the RS485 device receives the (2) command, and the RS485 device returns (3) command, but the network port of the serial port server will send (4) to host A and (5) to host B at the same time. Since host B did not send a query, but it also received the response command (5), host B may cause a communication exception error. In multi-host mode, there will only be command (4) but not command (5), because the serial port server will automatically remember the host that needs to be returned, and will only return the command to the nearest communicating host. Host A's query will only reply to A, Host B queries and replies to Host B.

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Another function is that in normal mode, if host A and host B send data at the same time, the instructions will be merged on the RS485 bus, making it impossible to recognize them normally; in multi-host mode, the serial port server can schedule A and B to use the bus. Sequence, thus effectively solving the conflict problem of simultaneous access by multiple machines.

When the conversion protocol is "None", the multi-host function is not enabled by default. When you need to enable multiple hosts, please click "More Advanced Options" in the device configuration dialog box, and then check "RS485 Multi-host Support".

8.5 Multiple host parameters

The meanings of "RS458 multi-host support" and "RS485 bus conflict detection function" are introduced below.

Figure 54 RS485 multi-host support

The RS485 command response timeout is: the maximum time interval between the serial port of the serial port server starting to send this command and receiving the response. The time filled in should be greater than the actual maximum time interval. Because if it is determined to have timed out, the next instruction will be sent.
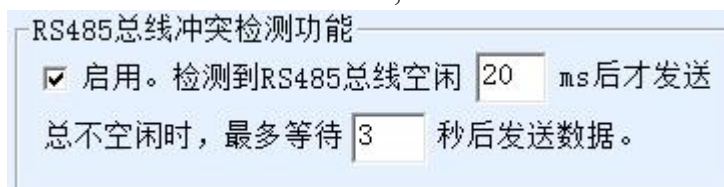

Figure 55 RS485 anti-collision idle time

RS485 bus conflict time: Indicates how many milliseconds the serial port server waits after receiving the reply to the first command before sending the second

command. This parameter actually defines the speed of command polling. This value is recommended to be above 20ms. The parameter "Maximum waiting time 3 seconds" generally does not need to be modified.

When the user uses ZLVircom to select the conversion protocol as "After Modbus TCP to RTU" ZLVricom will automatically check the above two enable boxes (unless the user manually enters the advanced options to remove them), and the above two times will also be automatically configured according to the baud rate . However, if the user's Modus command is relatively long or the conversion protocol is "None", these two parameters need to be configured manually.

The following introduces the recommended values for setting the above parameters:

1. Figure 55 shows the "RS485 bus anti-collision time", which can generally be set to twice the "packet interval" in the lower right corner of the parameter configuration interface, but the minimum cannot be less than 20.

2. Figure 54 shows the "RS485 command response timeout", which is generally determined based on the command length of the incoming and outgoing response. If the sent command is N bytes and the response is M bytes, then the recommended value is: "Data Packet Interval" $\times$ (N+M+5)+100.

8.6 Non-storage multi-host

Non-storage Modbus must be used in some places. This is because when an event occurs, the PLC reads the register data, but the data read is the previous data collected by the storage type, which is logically incorrect. , so it must also support non-storage Modbus collection. But on the other hand, it also needs to support multiple hosts at the same time. You only need to select the Modbus gateway type as a non-storage Modbus gateway.
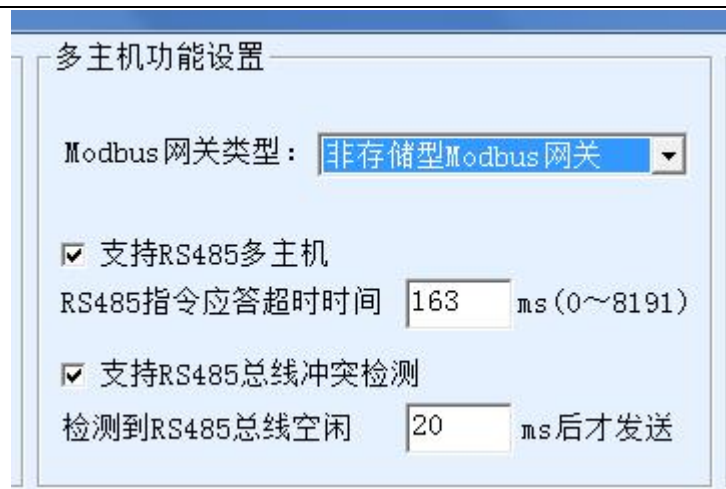
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Figure 56 Multi-host non-storage setup

8.7 Modbus under multi-purpose IP

As shown in Figure 53, if the serial port device (RTU device) serves as the master station, and the network port device (Modbus TCP device) serves as the slave station, and there are multiple network port slave devices at the same time. At this time, you can let the serial port server serve as a client to connect to these multiple network port devices at the same time according to the method described in the client's connection to multiple servers.

The function that needs to be implemented at this time is: when the serial port RTU sends a command, it can be sent to multiple network port devices. The network port device uses the Slave ID field to identify whether to send it to itself. Only the network port device corresponding to the Slave ID responds. The network port response is sent to the serial port server and then converted into an RTU command from the serial port output to the RTU device.

What needs to be noted at this time is that you need to remove the two check marks shown in Figure 55: "RS485 bus anti-collision time" and Figure 54: "RS485 command response timeout time". Otherwise, the above forwarding function cannot be realized.

Another application method is: although the serial port server serves as a client to connect to multiple network port devices, the RTU device is not the master station. The network port device still sends first, and the RTU device responds (as a slave

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station). At this time, the "RS485 bus anti-collision time" and "RS485 command response timeout time" still need to be checked, so that the function of multiple hosts accessing an RTU device at the same time can be realized.

For the new version of ZLVircom, you can directly select "Device serves as slave station for the client" in the Modbus gateway type to complete the above settings.
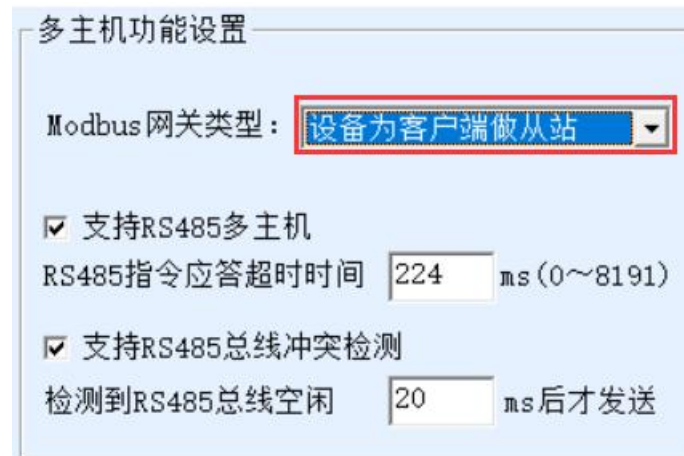

Figure 57 Settings of the new version of zlvircom

9. MQTT Gateway

Please refer to the use of MQTT gateway function《MQTT gateway usage》
http://www.zlmcu.com/document/Usage_of_MQTT_Gateway.html。

《ZLAN MQTT and JSON to Modbus gateway usage》
http://www.zlmcu.com/document/MQTT&JSON_to_Modbus.html；

10 . Modbus RTU/645 protocol to JSON

For Modbus RTU to JSON and related JSON usage，please take reference on

《JSON data collection gateway》
http://www.zlmcu.com/document/jsondata.html；

《ZLAN cloud and the use of acquisition equipment》
http://www.zlmcu.com/document/zlancloud.html；

《645 meter sends the method in JSON format》
http://www.zlmcu.com/document/645_Instrument_JSON.html；

《ZLAN MQTT and JSON to Modbus gateway usage》

http://www.zlmcu.com/document/MQTT&JSON_to_Modbus.html；

11 . Router function

For routing functions of the 8309, please refer to the 《9809M usage》

http://www.zlmcu.com/download/ZLAN9809M.pdf；

12 . Secondary development function

ZLAN8309 is developed based on Linux system. Zhuolan Company provides a rapid development method, which allows users to directly write their own programs in C language and transfer them to the 8309S for execution using the SCP protocol.

If you have any relevant secondary development needs, please contact our technical staff.

13 . Ordering information

Table 9 Ordering Information

Sub model	Function	introduce
ZLAN8309	Two serial port server/router	WiFi/Eth/CAT1 4G /Two serial port server/router
ZLAN8309-4G	Two serial port server/router	Wifi/Eth/All Netcom 4G/Two serial port server/router
ZLAN8309-5G	Two serial port server/router	Eth/5G Red Cap/Two serial port server/router
ZLAN8309-R	Router	Wifi/Eth/CAT1 4G/Router
ZLAN8309-R4G	Router	Wifi/Eth/All Netcom 4G/Router
ZLAN8309-R5G	Router	Eth/5G Red Cap/Router
ZLAN8309-B	Serial server/BACnet gateway	The recommended model is ZLAN8309S-B

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14 . After sales and service

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