

ZLAN5207M

DIN-rail serial device server

/Modbus Gateway

RS485 to TCP MQTT JSON ModbusTCP

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1. Overview

ZLAN5207M It is specially designed for industrial environment RS485 Device data collector/IoT gateway, serial port server, Modbus Gateway, MQTT Gateway, RS485 change JSON And other functions in one.

it has 2 individual RS485 It adopts the guide rail installation method, which is easy to install. 2 Compared with the serial port server, the width is reduced to the original 1/4 About 100mm, small size. It adopts terminal block power supply. 9~24V Wide voltage input.

ZLAN5207M It uses a high temperature flame retardant alloy plastic shell, which is more resistant to high temperature than ordinary plastic shells.

Temperature characteristics, measured 110 It does not deform under °C environment; it has flame retardant properties, and it is immediately extinguished when away from the fire source, and it will not support combustion.

It can meet the fire protection requirements of industrial sites.



picture1 ZLAN5207M

ZLAN5207M With industrial-grade high and low temperature working temperature range, it can withstand static electricity, group pulses, surges, etc.

EMCTested. Works stably and reliably.

When used as a common serial port server, ZLAN5207M The network port is connected to the Ethernet, and the host computer software can use TCP/UDP Send data to the ZLAN5207M of RS485 On the interface; RS485 Data received on the interface is also transmitted to TCP In virtual serial port mode, the serial port software connected to the virtual serial port does not need to be modified, just open ZLVircom The virtual serial port can be used.

When as Modbus When the gateway is used, ZLAN5207M support Modbus TCP change Modbus RTU, so as to realize the use of the host computer Modbus TCP Agreement RS485 of Modbus RTU Equipment data collection. On the contrary, if RS485 The terminal can also be used as a master station. ZLAN5207M Support for more advanced Modbus Gateway functionality, including configurable Modbus Gateway ZLMB, Storage type Modbus Gateway, etc., fully meet Modbus The various configurations and usages of the gateway. The multi-host function it supports allows multiple computer master stations to access a RS485 Slave device.

When as MQTT When the gateway is used, the device can transmit serial port data in a transparent manner. MQTT Protocol upload MQTT Server, supported servers include Baidu Cloud MQTT, Ali Cloud MQTT, China Mobile OneNet Platform, etc. Supports collecting Modbus RTU Or non-standard serial port data is parsed as JSON The format is encapsulated in MQTT Upload in data package.

support JSON Upload the collected data in the format, and the data will be collected automatically. Modbus RTU, 645meter97Version, 645meter07Versions, various non-standard RS485 protocol, Modbus TCP Etc. Users can use ZLVircom Configure the uploaded data format and JSON Keywords. Upload can support MQTT protocol, HTTP POST protocol, HTTP GET Protocol, transparent transmission protocol, and various non-standard network protocols. ZLAN5207M With reset button, convenient JSON Reset parameters when format error occurs.

Support edge computing functions, including: data over-limit alarm, data translation and scaling, data change upload, device offline alarm, device autonomous collection, device automatic connection, etc. JSON Functions are used together.

in addition ZLAN5207M NModel Support P2P way to connect to the Internet without going through a server. ID to connect the device.

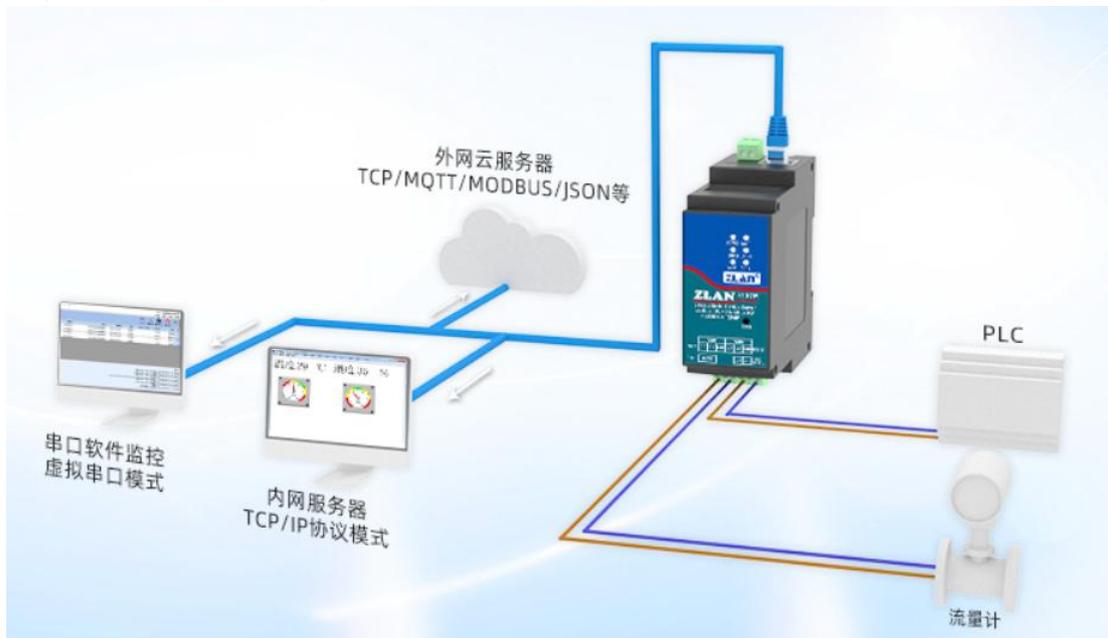
ZLAN5207M It has powerful IoT gateway functions and is very suitable for various industrial fields. RS485 Instruments and sensors collect data, including data collected through local networks or uploaded to cloud servers for autonomous collection and uploading.

ZLAN5207M Applicable to:

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

- Electricity, smart meters and energy consumption monitoring;
- Various types of automation PLC Remote monitoring and program download;
- Various configuration software and equipment communication interfaces;
- Networking of equipment in the field of access control and security;

Typical application connection is shown in the figure 2As shown. The original serial port device RS485 and ZLAN5207M of RS485 Port connection, 5207M Connect to the computer via a network cable. The software on the computer is connected via TCP/IP mode, virtual serial port mode or cloud server and 5207M After that, any data sent by the serial device will be transparently transmitted to the computer software, and the software will be sent to the computer software through the network. ZLAN5207M The data is also transparently transmitted to the serial port device.



picture2Connection diagram

2.Features

2.1 Hardware Features

ZLAN5207M It has the following features:

1. Guide rail design: suitable for installation inside industrial cabinets.
2. Small size: Compared with ordinary serial port servers, it is smaller in width and does not take up space.
3. With reset button: convenient for resetting parameters. JSON Recovery from format errors.
4. Terminal power supply, 9~24V Wide voltage input, with reverse connection and reverse power protection. Built-in self-recovery fuse

Wire and pressure sensitive protection against surges.

5. Terminal type RS485 Interface, support 32 Slave device, baud rate support 300~921.6 kbps.

6. Rich panel indicator lights facilitate debugging: In terms of connection, there are indicators TCP Connection established LINK Light; There is a data activity indicator light on the data indicator light.

2.2 Software Features

- 1 support TCP Server, TCP Client, UDP model, UDP Multicast. TCP The client supports both TCP Server-side functionality. TCP Server Support 30 individual TCP Connect as TCP Client Support 7 Purpose IP.
- 2 Baud rate support 300~921.6 kbps, support custom baud rate. Data bit support 5~9 The parity bit can be none, odd, even, mark, or space. MAC Address function, convenient for cloud management of
- 3 devices. Provides secondary development package for computer-side search and device
- 4 configuration DLL Development libraries.
- 5 support Web Browser configuration and support DHCP Dynamic acquisition IP, DNS Protocol connection domain name server address.
- 6 Support remote search of devices, configuration of device parameters, and device program upgrades in the cloud. Support remote viewing
- 7 of device status through software TCP Connection status, serial port data sending and receiving status. Virtual serial port supports data monitoring function.

2.3 Advanced software features

5207M Supported advanced software features are:

- 1 support Modbus Gateway function, support Modbus RTU change Modbus TCP. Can support storage type Modbus, can automatically collect device data and store it; it also supports non-storage mode Modbus Gateway; Support ZLMB Configurable table Modbus Gateway function. Support multi-host function: In the query mode of one question and one
- 2 answer, the network port allows multiple computers to access the same serial port device at the same time. It can also realize multi-host application of one serial port to multiple serial ports. Support MQTT Gateway functionality.
- 3
- 4 support JSON change Modbus RTU, Modbus TCP and 645 Instrument protocol, support HTTP POST, HTTP GET Format to upload data.
- 5 support NTP The protocol obtains the network time, which is used for serial port output and the latter for protocol content sending. Supports custom
- 6 heartbeat package and registration package functions: It can facilitate communication with the cloud and device identification.

- 7 supportTCPEstablishing a connection requires password authentication to ensure connection security.
- 8 supporthttpData submission and distribution functions can be used directly in the cloudhttpofGETInstructions interact with the serial port data of the device.

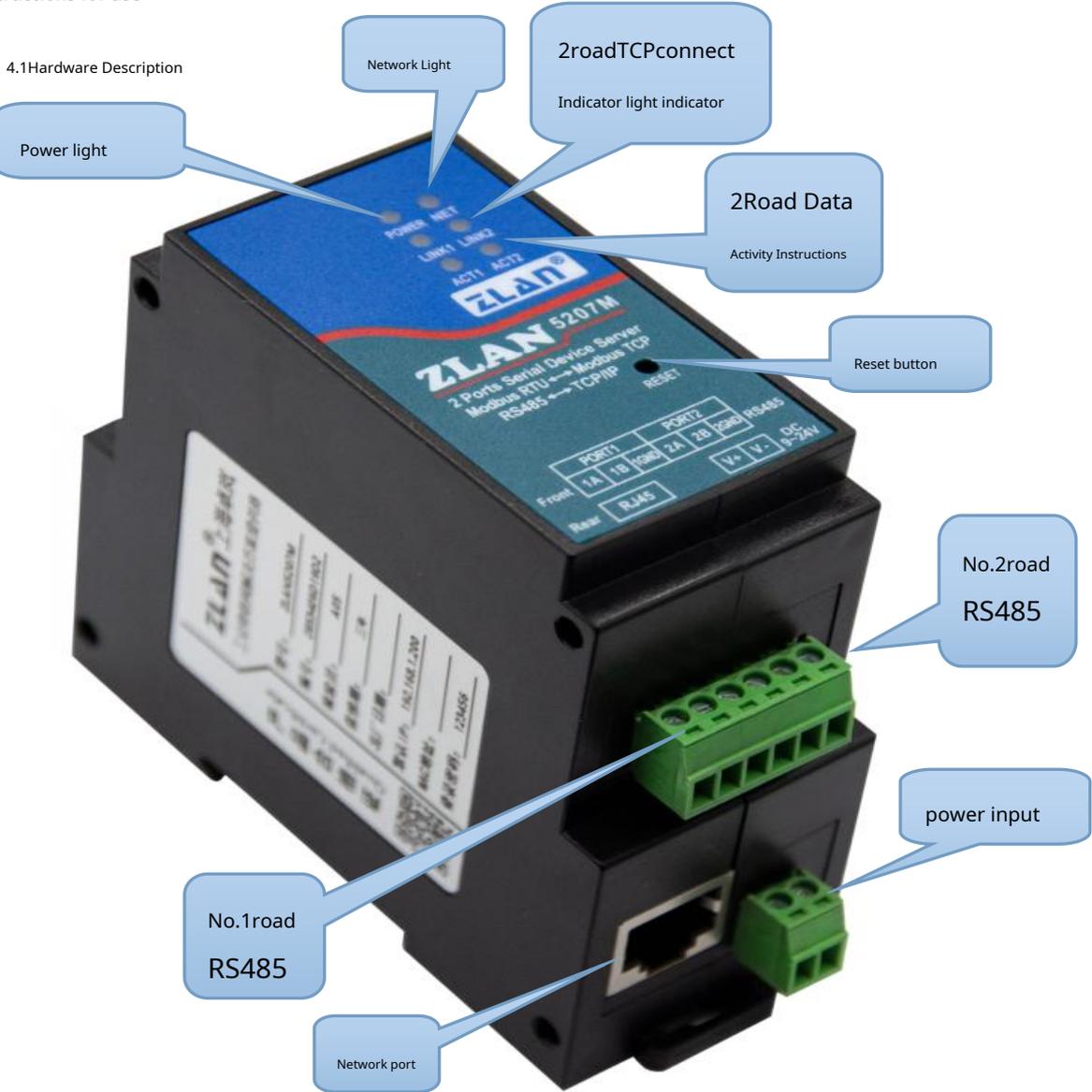
3. Technical Parameters

surface1 Technical Parameters

shape			
Serial port interface:	RS485:3.5mmTerminals		
Number of serial ports:	2Each unit can work independently and configure baud rate separately		
Power interface:	3.5mmTerminals		
Reset:	One-touch factory reset		
Housing Material:	Alloy flame retardant plastic		
size:	L x W x H:37.6 x 83.6 x 89.2mm		
Installation method:	35mmDIN rail installation		
Communication interface			
Ethernet:	RJ45interface,10M/100M, supports automatic cross line detection (MDI/MDIX)		
Serial Port:	RS485×2:485A,485B,GND		
Serial port parameters			
Baud rate:	300~921.6Kbps, Customizable baud rate	Verification:	None, Odd, Even, Mark, Space
Data bits:	5~9Bit	Flow Control:	No flow control, soft flow control
software			
Operating mode:	TCPserver,TCPClient (at the same timeTCPThe server also coexists),UDP, UDPMulticast,UDPDynamic Mode		
Conversion Protocol:	Modbus TCP,MQTT,JSON,RealComprotocol,HTTP		
ModbusGateway:	Supports multi-host mode, storage mode, pre-configured tables (ZLMB)model		
JSONGateway:	Device supportModbus RTU,Modbus TCP,DLT-645; Server SupportHTTP POST/GET,MQTT, transparent transmission, custom protocol; Pan and zoom, offline alarm, over-limit alarm, change upload, data format conversion;		
IPand geocoding:	Static orDHCP,supportDNSAnalysis		
communication method:	TCP/IPDirect communication, virtual serial port mode		
Number of connections:	TCPserver:30indivual;TCPClient:7PurposeIP		
Configuration method:	ZLVirCOMtool,WEBBrowser (customizable web pages), device management Function library, serial portATCommand configuration, device cloud management (ZL Cloud)		

Other software features:	Custom registration packet heartbeat packet, sent on connectionID,NTP,built-inTCPHeartbeat
hardware	
Input voltage:	9~24V DC
Input Current:	30mA@12V DC
EMCElectromagnetic Compatibility:	Static electricity (GB/T17626.6-2018):touch8KV,non contact15KV; Fast group pulse (GB/T17626.4-2018): Power Supply ±4KV, signal ±2KV; surge(GB/T 17626.5-2008): Power Supply ±4KV, signal ±2KV.
Environmental requirements	
Operating temperature and humidity:	- 40~85°C5~95% RH
Storage temperature and humidity:	- 45~100°C5~95% RH

4. Instructions for use



picture3Main view

ZLAN5207MThe main view of the serial port server is shown above.35mmStandard DIN rail

- 1 housing. **power input:**Terminals:3.5mmTerminal. Input voltage9~24V.



picture4Power supply, network port, serial port1、 Serial port2

- 2 **RS485:** use RS485 catch 485B and 485A. That is, among which 485B express 485 Negative line, 485A express 485 positive line; 485 Loadable 32. The longest communication distance 1200 Meter. General RS485 Line Exceeded 300 It is necessary to use terminal resistance only when the 485 The terminal resistance is 120ohm. **Network port:** Connect the network cable and support automatic crossover.
- 3
- 4 **Indicator Lights:** Divided into Power, NET, Link, Active (ACT). The lights represent power, network cable connection light, connection indicator, and data indicator.
- 5 **Reset:** Press the button above 5 seconds, the module will reset to 192.168.1.254 of IP. If you need to disable JSON Configurations such as these can be restarted when the button is pressed, and various downloaded configuration files will not be loaded.

surface2Indicator light meaning

Powerlamp	Power Indicator
NETlamp	The network cable is connected and the indicator light turns orange
Linklamp	when TCP After the connection is established (or in UDP model), Link Green. Can be used to determine the serial port Whether the server has established a communication link with the host computer software.
Activelamp	When the Ethernet port sends data to the serial port or when the serial port sends data to the Ethernet port, the indicator light is blue.

Use indicator lights to debug communication method:

1)ifNETIf the light is not orange, the network cable is not connected properly. Please check the network cable.

2)ifLinkThe light is not green (consider onlyTCPWorking mode), the host computer software has not established a connection with the serial port server, please considerIPAre the addresses configured in the same network segment?

3)ifActiveIf the light is not blue, there is no data communication. 6

installation method: The device housing has35mmStandard guide rails. If there are guide rails, the equipment can be directly installed on the guide rails.



picture5Back of the device

4.2Hardware Hookup

Generally speaking, the serial port server only needs to connect the power supply, serial port, and network cable. The power supply can be2
The power supply of the line 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.485Receiving485A,485Negative to 485BThat's it.

The network port is connected to a common network cable and can be directly connected to a computer or connected to the network through a switch.

4.3Software Installation

ZLVircomAvailable for devicesIPConfiguration of parameters such as , and creation of virtual serial port.
If the virtual serial port function is not needed, you can download the installation-free version. Download address: <http://www.zlmcu.com/download.htm>

surface3 ZLVircomVersion

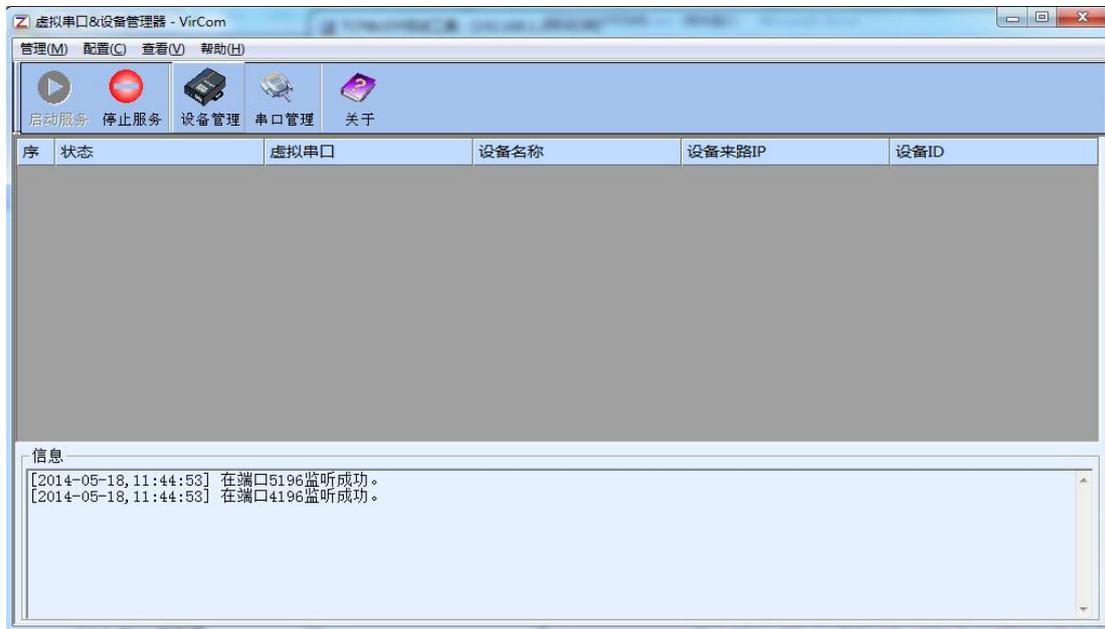
name of software	illustrate
ZLVircomDevice Management Tool (Non-installation version)	The non-installation version does not include the virtual serial port function.
ZLVircom-Device Management Tool (Installation Version)	Installation version, which containsZLVircom_x64.msiand ZLVircom_x86.msi.641-bit operating system installationx64,

	321-bit operating system installationx86Version.
--	--

When installing, just follow the default prompts. After installation, it will start every time the computer starts zlvir.com, used to create a virtual serial port when booting.

4.4Parameter configuration

ZLVircomAfter the installation is complete and the device hardware is connected, runZLVircomThe software is shown in the figure, then click "Device Management" as shown in the figure.ZLVircomIt is very convenient to search and configure device parameters in different network segments.ZLVircomAll computers can be connected to the same switch.



picture6 ZLVircomMain interface

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	自动搜索
1	内网	ZLDEV0001	2007	1	192.168.1.200	4196	192.168.1.3	TCP Server	未建立	未设置	未联通	FADE547A	0	0	
2	内网	ZLDEV0002	2007	2	192.168.1.201	4196	192.168.1.3	TCP Server	未建立	未设置	未联通	FAD47B34	0	0	

picture7Device List

You can see all the devices currently online from the device list. Click "Edit Device" to configure the parameters.PList1~2express2Road serial port, thisportThe logo cannot be modified.IP And the device name can be modified.



picture8Device parameters

In this interface, users can set the parameters of the device, and then click "Modify Settings" to set the parameters to the device. The data will not be lost when the power is off. The device will automatically restart.

The main configuration parameters here are: baud rate, data bit, check bit in the serial port settings; IP Address, subnet mask, gateway; sometimes, depending on the computer software, it is also necessary to configure the working mode of the serial port server.

The detailed meanings of other parameters are as follows:

surface4Parameter meaning

parameter name	Ranges	meaning
Virtual Serial Port	Virtual string not used or created mouth	You can bind the current device to a created virtual serial port. Please add it in the "Serial Port Management" on the main interface firstCOMmouth.
Device Model		Only display the core module model
Device Name	Any	You can give the device a human-readable name, up to 9 Words Section, support Chinese names.
equipmentID		Factory only ID, Unchangeable.
Firmware version		Core module firmware version
The device supports Function		Reference Table 5 Device supported features

IPmodel	Static,DHCP	The user can select static orDHCP(Dynamic acquisitionIP)
IPaddress		Serial port serverIPaddress
port	0~65535	<p>The serial port server is inTCP ServerorUDPMode monitoring Listen port. When acting as a client, it is best to specify the port as0port, It is helpful to improve the connection speed when using0The system will follow the port The machine is assigned a local port. The difference between this and the non-zero port yes:(1) The local port is0When the module is restarted andPC Rebuild a newTCPConnection, oldTCPconnect May not be closed, and the device may have multiple false connections. Generally, the host computer hopes to close the old connection when the module is restarted; Specifying a non-zero port will close old connections.2) The local port is0 hour,TCPRe-establishing the connection takes less time.</p> <p>The serial port server is inTCPIn client mode, it also acts as TCPThe server listens for connections on port.TCPClient The local port number used to connect to the server is "port +1" .</p>
Operating mode	TCPServer mode,TCP Client mode,UDPmodel, UDPMulticast	<p>Set asTCPWhen the server is on, the serial port server waits for the computer Connect; Set toTCPWhen the client is Towards the goalIPTThe specified network server initiates the connection.</p>
Subnet Mask	For example:255.255.255.0	Must be the same as the subnet mask of the local area network.
Gateway	for example:192.168.1.1	Must be the same as the local LAN gateway.
PurposeIPor domain name		<p>existTCPClient orUDPIn this mode, data will be sent to the destination IPor the computer indicated by the domain name.</p>
Destination Port		<p>existTCPClient orUDPIn this mode, data will be sent to the destination IPThe destination port of the</p>
Baud rate	300,600,1200,2400, 4800,7200,9600, 14400,19200,28800, 38400,57600,76800(Right now 921.6Kbps) 、 115200, 230400,460800	Serial port baud rate
Data bits	5,6,7,8,9	

Check Digit	None, Even, Odd, Mark, Empty grid	
Stop bits	1,2	
Flow Control	No flow control, hard flow control CTS/RTS、 Hard flow control DTR/DCR、 Soft Fluidics XON/XOFF	Hard flow control is only for RS232 Serial port valid
DNS server		When the purpose IP when describing by domain name, you need to fill in this DNS clothes Server IP. exist IP Mode is DHCP No need to specify DNS server, it will automatically DHCP Server acquisition.
Purpose Mode	Static, dynamic	TCP In client mode: After using static destination mode, the device Connect to server continuously The device will automatically restart after the first failure.
Conversion Protocol	NONE , Modbus TCP<->RTU, Real_COM	NONE Indicates that data forwarding from the serial port to the network is transparent; Modbus TCP<->RTU will Modbus TCP Agreement Direct Convert to RTU Agreement, convenience and Modbus TCP protocol Cooperate; Real_COM For compatibility with old versions REAL_COM protocol is designed for virtual serial port mode, but When using a virtual serial port, you do not necessarily need to select RealCom protocol.
Keep-alive time	0~255	Heartbeat interval. 1) Select 1~255 If the device is At TCP In client working mode, it will automatically Scheduled time "TCP This ensures the link TCP Validity. Set to 0 When TCP Heartbeat. 2) Set as 0~254 When the conversion protocol is selected as REAL_COM Protocol, every keep-alive timer, the device A length of 1 Contents 0 data, to achieve Realcom The heartbeat mechanism in the protocol. Set to 255 There will be no realcom Heartbeat. 3) Set as 0~254 If Prepared for TCP Client, the device will keep alive every time The device parameters will be sent to the destination computer. Set to 255 hour The function of sending no parameters can realize remote device management.

Disconnection reconnection time	0~255	InTCPIn client mode, if the connection is not successful, "Disconnection reconnection time" to re-initiate theTCPeven can be0~254seconds, if set255, then it means Never reconnect. Note the firstTCPConnection (such as Hardware power on, throughzlvir.comSoftware restarts the device, no data The light is on) will usually be connected immediately, only after the first connection fails It will wait for the "disconnection reconnection time" before trying again, so The "reconnection time" will not affect the normal operation of the network and server. The connection establishment time.
Web access port	1~65535	The default is80
Multicast address		UDPUsed for multicast
Enable Registration Package		whenTCPWhen the connection is established, the registration packet is sent to the computer. After enabling the registration package, you must selectrealcomProtocol. Support TCPServers andTCPClient mode.
Packet length	1~1400	One of the serial port framing rules. The serial port server receives the long After receiving the data, the received data is sent to the network as a frame superior.
Packet Interval	0~255	Serial port framing rule 2. When the serial port of the serial server receives data If a pause occurs and the pause time is greater than this time, the received The received data is sent to the network as a frame.

The functions supported by the device are explained as follows:

surface5Device supported features

name	illustrate
Web Download	Supports controlling serial port output commands through web pages, only the suffix isWThe products have Function.
Domain Name System	PurposeIPIt can be a domain name (for example,wwwserver address).
REAL_COMprotocol	A non-transparent serial port server protocol suitable for multi-serial port serversInternet Bind the virtual serial port. Because the protocol contains the deviceMACSo the address is Helps the host computer to identify the device. Generally, it can be ignored.
Modbus TCPchangeRTU	Only model3Position4This function can be achievedModbus TCPchange

	RTU. It also supports multi-host functionality.
Modify the parameters of the serial port	Support serial port AT Instructions to configure and read device parameters.
Automatic acquisition IP	support DHCP Client Protocol
Storage expansion EX Function	Subsequent expansion
many TCP connect	As TCP The server supports more than 1 individual TCP connect.
I/O Port Control	Model No. 3 Position 4 Models support any custom instructions to control 8 individual I/O output.
UDP Multicast	UDP Multicast
Multi-Purpose IP	As TCP Support simultaneous connections when client is connected 7 Purpose IP.
Proxy Server	Supports proxy server functionality (requires specific models).
SNMP Function	support SNMP Change Modbus RTU Protocol. Only the suffix -SNMP Only support This function.
P2P Function	Support by P2P The traversal technology enables access to devices in any network. Suffix: N The models support this function.

4.5 TCP Communication test

After configuring the device parameters, you can use the serial port tool, TCP Debugging tools TCP Connect communication test.

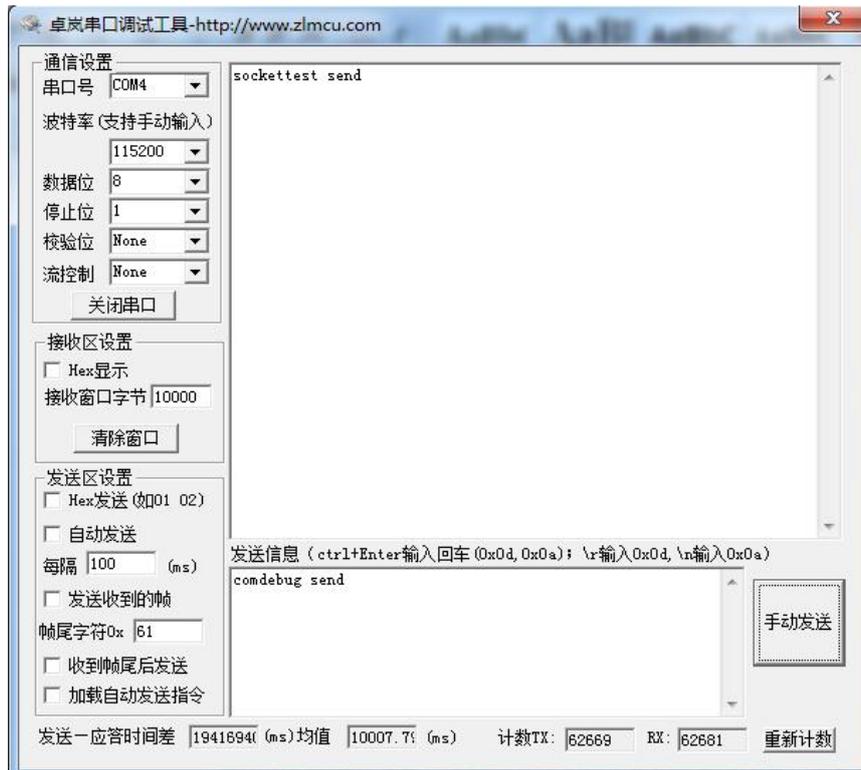


picture9 TCP Communication diagram

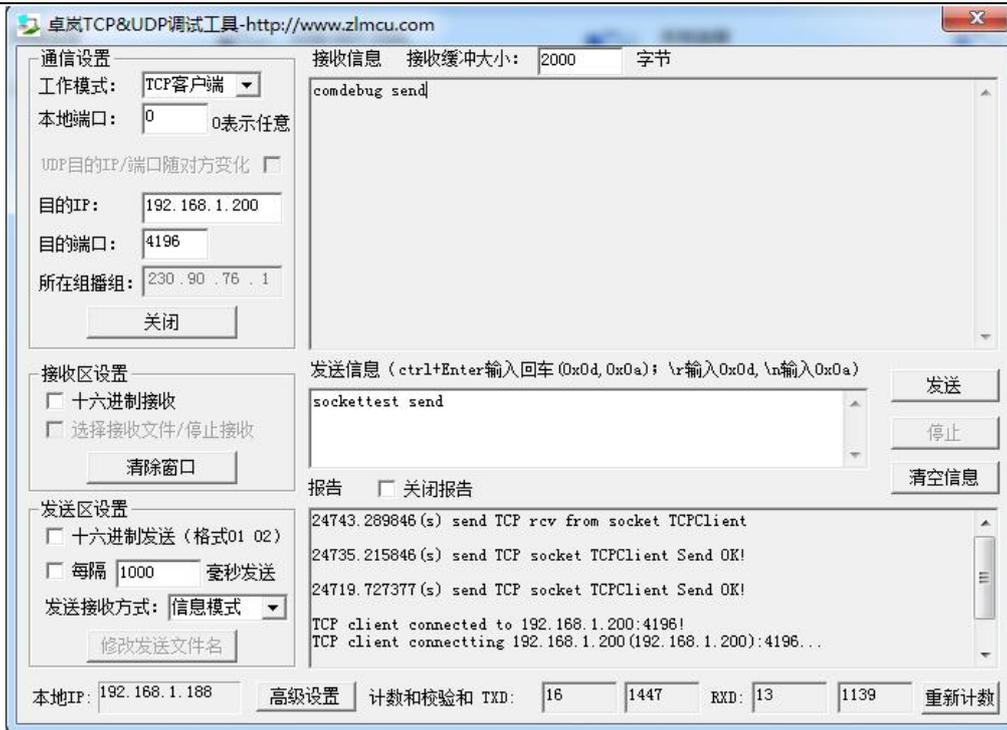
Assume now PC Machine COM mouth (USB change RS485 cable) and the serial port of the serial server, then open ZLComDebug (<http://www.zlmcu.com/download/Comdebug.rar>) Serial port debugging assistant, and open the corresponding COM Mouth map 5; Open TCP & UDP Debug Assistant SocketTest (<http://www.zlmcu.com/download/SocketTest.rar>), and as TCP Client mode, fill in

Write the purposeIPFor serial port serversIP(Currently192.168.1.200), the destination port is 4196, then click the "Open" button.SocketTestEnter "socket send"Click Send, and the data will be transferred to the serial server through the network port.RS485interface, and then sent to ZLComDebug, then in ZLComDebugIn turn,ZLComDebugEnter "Comdebug send", click Send to send tosocket test, and display it.

The serial device server has the function of transparently forwarding data from serial port to network port and network port to serial port.



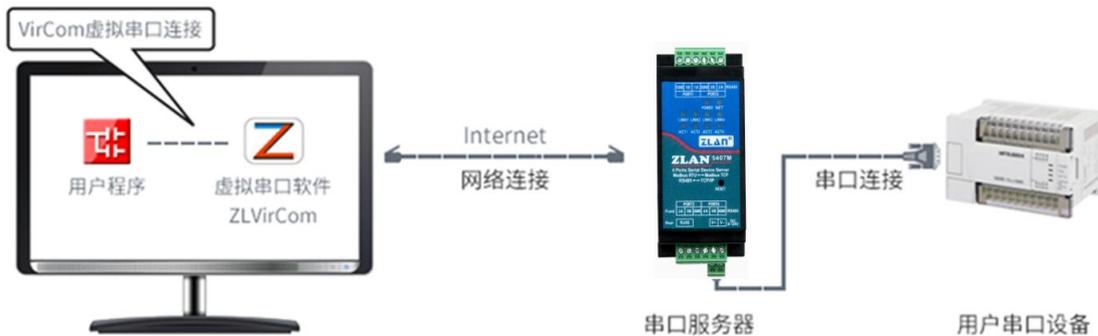
picture5 comdebugSend and receive interface



picture11 sockettestSend and receive interface

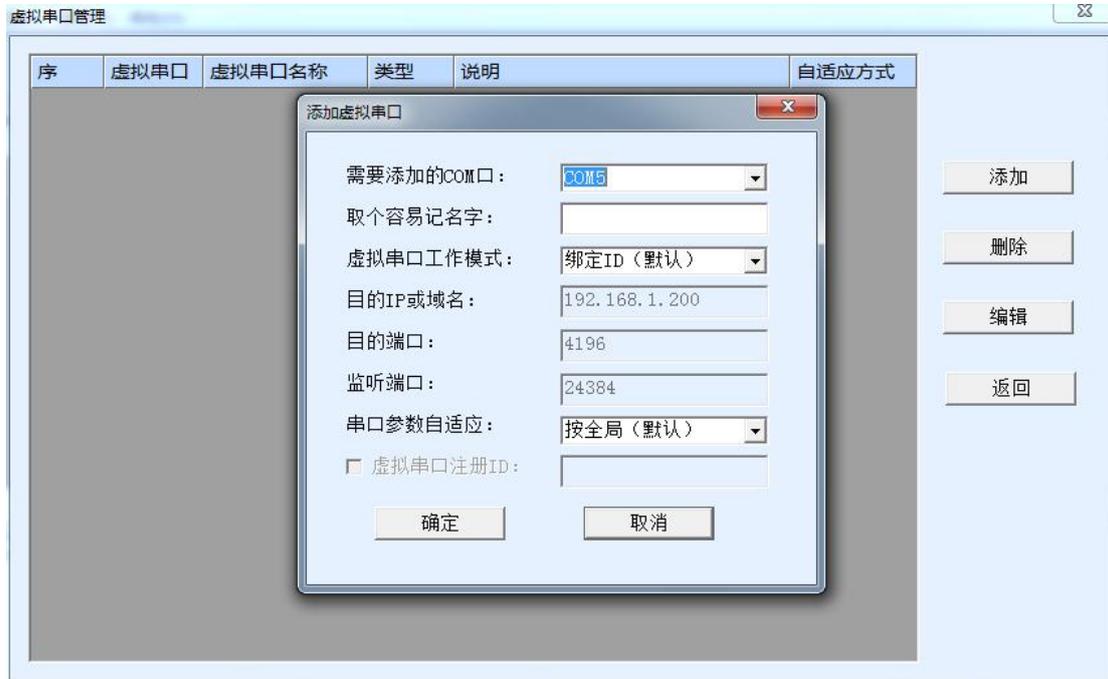
4.6 Virtual serial port test

In the pictureSocketTestis throughTCPTo communicate directly with the serial port server, in order to enable the user's already developed serial port software to communicate with the serial port server, it is necessary to add a virtual serial port between the user program and the serial port server. As shown in the figure,ZLVircomand user programs run on one computer, ZLVircomVirtual OneCOMMouth, let thisCOMThe port corresponds to this serial port server. When the user program opensCOM Communication can be done throughZLVircom-Serial port server - send to the user's serial port device. The following demonstrates the operation steps:



picture12The role of virtual serial port

Click ZLVircom Click "Serial Port Management" on the main interface, then click "Add" and select Add COM5, in COM5 The computer didn't exist. COM mouth.



picture6Add a virtual serial port

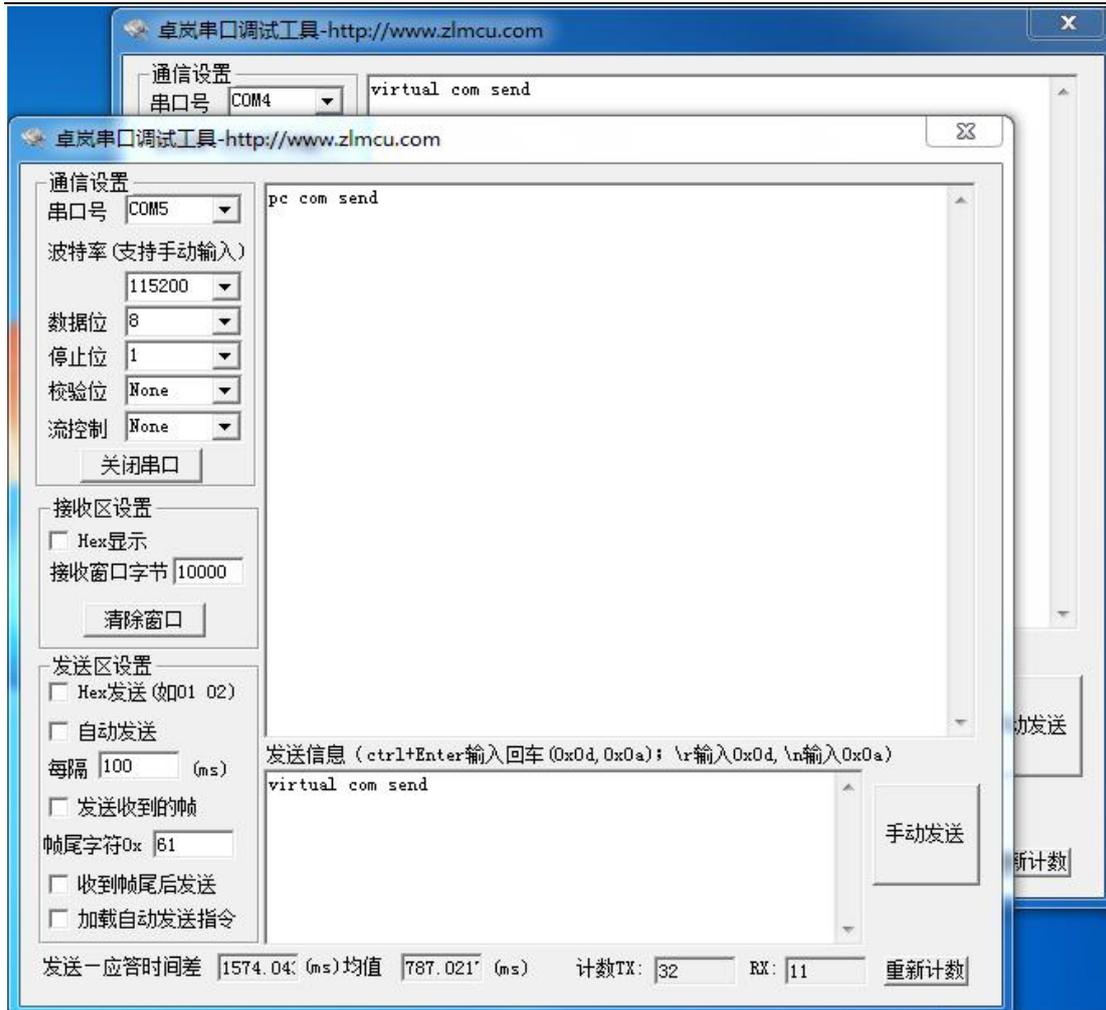
Then go to Device Manager and double-click the required COM5As shown in the figure, select the device to be bound. COM5. Then click "Edit Settings". and return ZLVircom You can see the main interface of COM5 Already and IP for 192.168.1.200 The device is connected. You can now use COM5 replace SocketTest to communicate.



picture7The virtual serial port has been connected

OpenZLComdebugTo simulate the user's serial port program, openCOM5(The virtual serial port above), open anotherZLComdebugTo simulate a serial port device, openCOM4(Hardware serial port).COM5The link for sending data is as follows:COM5-ZLVircom-Serial server network port-Serial server serial port-COM4.on the contrary,COM4arriveCOM5It can also transfer data:COM4-Serial port server serial port-Serial port server network port-ZLVircom-COM5As shown in the figure8It shows the data sending and receiving of both parties.

IfCOM4If it is changed to user serial port device,COM5It can realize communication with user equipment.



picture8Communicate via virtual serial port

4.7 Modbus TCPtest

By default, serial port and network port data are transmitted transparently. Modbus TCP change RTU, you need to select the conversion protocol as "Modbus TCP--RTU, as shown in the figure 9A as shown. At this time, the device port automatically changes to 502, at this time the user's Modbus TCP The tool is connected to the serial server IP of 502 Port, sending Modbus TCP The command will be converted to RTU The command is output from the serial port. For example, the serial server receives 00 00 00 00 00 06 01 03 00 00 00 0a of Modbus TCP Command, the serial port outputs 01 03 00 00 00 0a c5 cd Note: The serial port may send multiple 01 03 00 00 00 0a c5 cd instruction, this is because the default Modbus If the storage mode is used, query commands will be automatically polled. How to switch to the non-storage mode will be explained later.



picture9EnableModbus TCPFunction

If the userModbus TCPThe software is used as a slave (Slave), you need to change the working mode to client based on the conversion protocol.IPChange toModbus TCPComputer where the software is locatedIP, the destination port is502, as shown in the figure10shown.

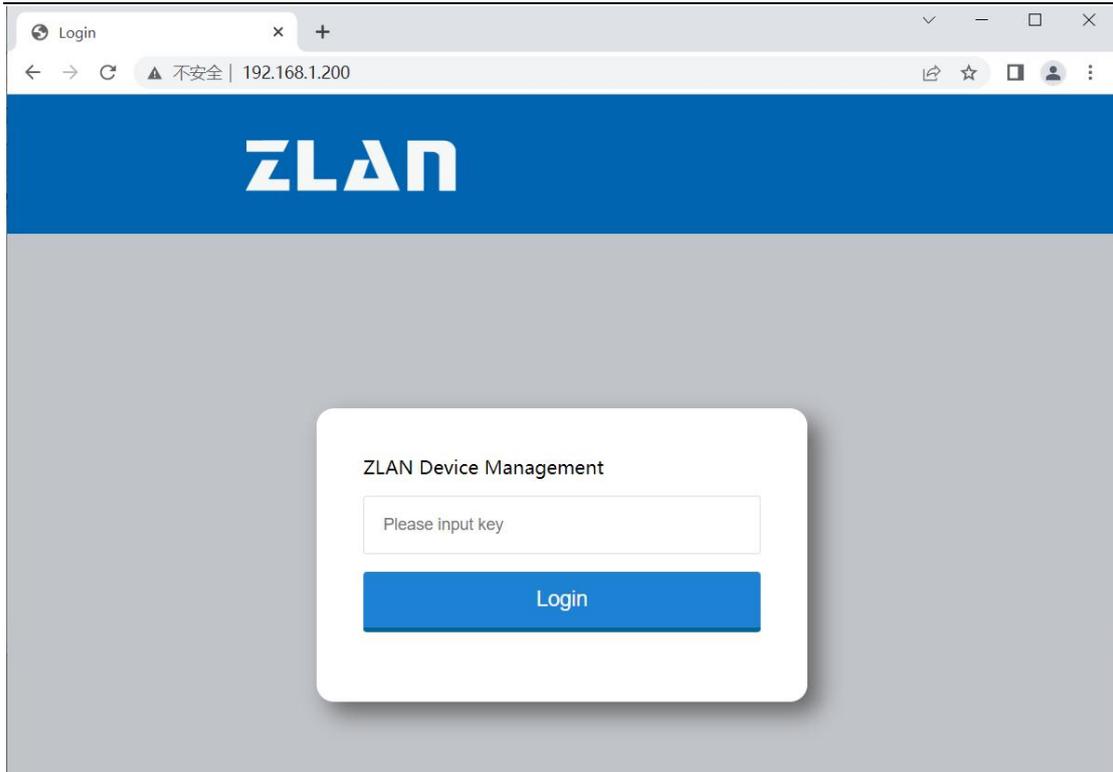


picture10 Modbus TCPBe a client.

4.8 WebMode Configuration

useZLVircomYou can search and configure device parameters in different network segments.WebThe configuration mode requires that the computer and the serial port server are in the sameIPsegment, and the serial port server needs to be known in advanceIPaddress. ButWebConfiguration can be done on any machine withoutZLVircomon a computer.

1.Enter the serial server'sIPaddress, e.g.http://192.168.1.200, open the following web page.



picture11

2.existPasswordEnter a password: The default is no password. ClickloginButton to log in.



picture12 WebConfiguration interface

3.The serial port server parameters can be modified in the web page that appears. For related parameters, please refer to the table4Parameter meaning.

4.After modifying the parameters, click the "Submit Changes" button.

5.Working mode and conversion protocol

Different serial port server working modes and conversion protocols can be selected in different application scenarios, so that they can be used more stably and reliably. The following is a detailed introduction.

There are basically two types of serial port servers: with virtual serial port and without virtual serial port, as shown in the figure.9 TCP Communication diagrams and graphs12The function of the virtual serial port is shown in the figure. The user software that needs to be connected with the virtual serial port is the serial port interface (COMport), that is, both the user software and the user device are serial ports; in the case of non-virtual serial ports, the user software is directlyTCP/IPCommunication but the user device is still serial port.

In non-virtual serial port mode, the "conversion protocol part" is divided into transparent transmission,Modbus TCP changeRTUandRealcomprotocol3If the user software is a fixed protocolModbus TCPCooperation

The lower machine is Modbus RTU. When you need to select Modbus TCP, change RTU to Modbus TCP. The protocol is currently only used in multi-serial port servers as TCP. Used when the client connects to a server and the server uses a virtual serial port.

The usage is summarized as follows:

surface6 Network Configuration Mode

serial number	Virtual Serial Port use	Equipment working mode Mode	Conversion Protocol	illustrate
1	use	TCPserver	none	Suitable for user software to open COM mouth. Active data collection scenarios.
2	use	TCPClient	none	Suitable for scenarios where the device actively sends data. If you select TCP, the server can be disconnected and unable to reconnect question.
3	Do not use	TCPserver	Modbus TCPchangeRTU	Applicable to user software is Modbus TCP, the user device is Modbus RTU. and Modbus TCP. The situation of being the main station.
4	Do not use	TCPClient	Modbus TCPchangeRTU	Applicable to user software is Modbus TCP, the user device is Modbus RTU. and Modbus RTU. The situation of being the main station.
5	use	TCPClient	Realcomprotocol	Multi-port serial server as TCPclient. When using a virtual serial port, it is best to use Realcomprotocol.
6	Do not use	TCPClient	none	Suitable for a large number of devices connected. A cloud-based approach. And generally, the cloud is Internet. A public network IP server.
7	Do not use	TCPserver	none	Applicable to both devices and computers on the same local network, monitoring locally. No need to cross Internet communication.

5.1. Virtual serial port mode

If the user software is using COM port, you must use the virtual serial port mode. PLC software, configuration software, instrument software, etc.

Check whether the monitoring computer and device are in the local network:

a) If the computer is in Internet A public network, if the device is using a server, then it must use TCP Client mode. The device can connect to the server.

② and ⑤. If it is a multi-serial port server, you must select ⑤.

b) All in the local network (can ping). If the device sends data actively, you must use the device to do TCP. The client can choose method ②, otherwise you can choose method ①.

5.2. Direct TCP/IP Communication Mode

If not needed, Modbus TCP Protocol conversion does not require a virtual serial port. In this case, the user software may communicate directly with the network port of the serial server. TCP/IP Communication, the serial port server will convert TCP/IP data into serial port data and send it to the serial port device.

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

The section "Communication Test" briefly describes the serial port server as a TCP client. Here we will describe how to communicate with the server. TCP client, UDP mode, multiple TCP. How to connect and communicate with computer software. SocketTest (Imitate user TCP/IP communication software) as an example.

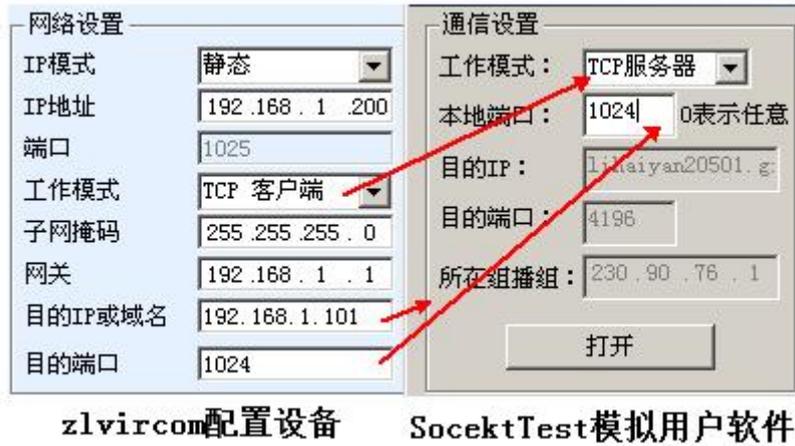
ZLAN serial port server complies with the standard TCP/IP Protocol, so any network terminal that complies with the protocol can communicate with the serial port server. ZLAN Technology provides a network debugging tool (SocketDlgTest Program) to simulate a network terminal to communicate with the serial port server.

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

TCP Client Mode

There are two working modes in this 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. Only then can the client access the server. If both parties are the client or the server, communication cannot be achieved.

When the serial device server acts as a client, it must have the corresponding relationship, Figure 13As shown. (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 purpose of the serial port server IP must be the computer where the network tool is located IP Address, (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 send and receive data after the connection is established.



picture13Serial Device Server as Client

5.2.2. Client connects to multiple servers

When the ZLAN serial device server is used as TCP Clients can connect simultaneously to multiple servers. If there are not so many servers, the remaining purposes will be vacant. The usage is as follows:



picture14The first purpose IP and Port



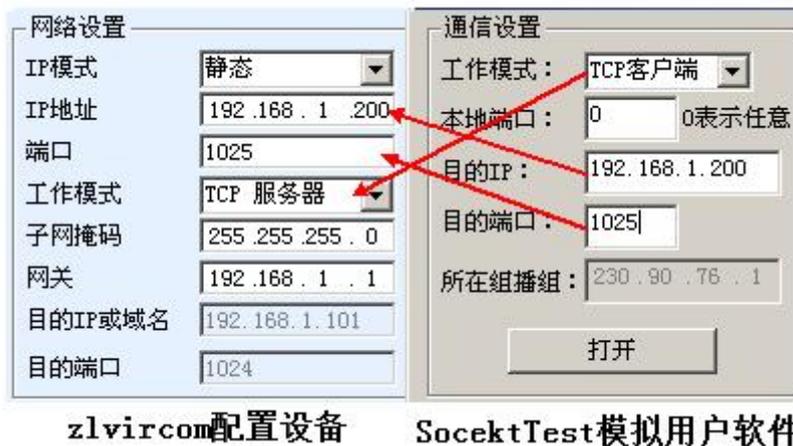
picture15Remaining2~7individualIPand Port

FirstIPAs shown in the figure14The device settings interface shown in the figure shows the firstIPCan be a domain name. The remaining2~7PurposeIPClick the "More advanced options" button in the device settings interface to open more advanced options for settings.

all7PurposeIPAfter the settings are completed, you can connect automatically. If you cannot connect, you will wait for the "disconnection and reconnection" time and reconnect repeatedly.

TCP Server Mode

When the serial device server is used as a server, there are also3The corresponding relationship is shown in Figure16After setting up, click the open button of the network tool to establish a connection with the serial port server.TCPConnection. After the connection is established, data can be sent and received.



picture16Serial port server as server

When the serial port server is used as a server, it can accept30individualTCPThe data received by the serial port will be forwarded to all establishedTCPIf you need to send data only to the most recent network packet recipient,TCP, you need to enable the multi-host function, please refer to7.4Multi-host capability.

5.2.4. Acting as both client and server

ZLAN serial port server supports TCP. The client side can also accept TCP connection, that is, also has TCP Server functionality.

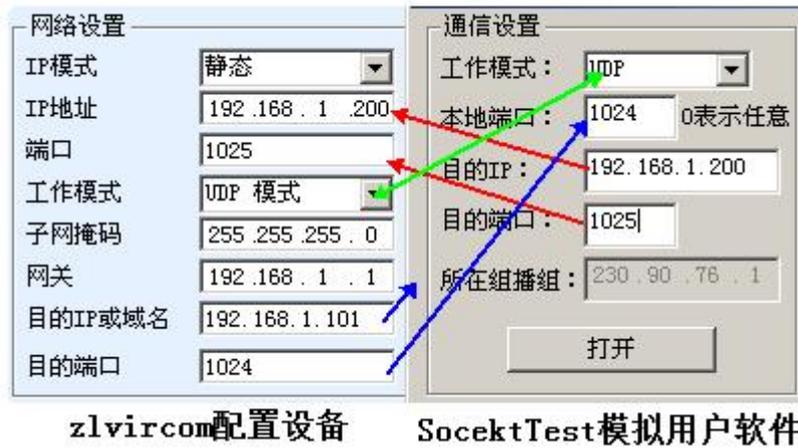
网络设置	
IP模式	静态
IP地址	192 . 168 . 1 . 200
端口	1024
工作模式	TCP 客户端
子网掩码	255 . 255 . 255 . 0
网关	192 . 168 . 1 . 1
目的IP或域名	192.168.1.189 本地IP
目的端口	1024

picture17 Acting as both client and server

By default, it is used ZLVircom. When configuring, if you change the working mode to "TCP Client mode, the port (that is, the local port) will automatically become 0. (In order to support TCP in server mode, the computer software must know the local port of the device, so a value needs to be specified here, as shown in the figure 17. As shown, the computer software can now connect 192.168.1.200 of 1024. The device also connects as a client 192.168.1.189 of 1024. **Port. Required Notice** The local port 1024 is occupied by the server, so when acting as a client, the local port is "port + 1", that is 192.168.1.189. The software on the device sees that the port is 1024+1=1025.

5.2.5. UDP model

exist UDP. In this mode, the parameter configuration is shown in the figure 18. As shown, on the left is ZLVircom. The configuration of the serial port server in the middle, and the network debugging tool on the right SocketDlgTestFirst, both must be UDP Working mode. Also indicated by the red arrow is the purpose of the network tool. The destination port must point to the local port of the serial server. IP and local port. The purpose of the serial port server is indicated by the blue arrow. IP must be the computer where the network tool is located. IP. The destination port of the serial server must be the local port of the network debugging tool. Only after these network parameters are configured can bidirectional communication be guaranteed. UDP data communication.



picture18 UDPMode parameter configuration

5.3. Equipment couplet method

If the host computer is not Socket program (SocketDlgTest) is not a virtual serial port, but two devices are connected through the network port. The configuration method is similar. First, the user needs to connect the two devices and computers are connected to the same LAN. ZLVircom The purpose of connecting the computer is only for configuration. After the configuration is completed, the computer does not need to be connected.

Click ZLVircom Device Management, find this Equipment, as shown in Figure 20 Then click "Device Edit" to configure the device. Device couplets can be divided into TCP Couplets and UDP Couplet. If it is TCP Couplet mode, the parameters of the two devices are as shown in the figure 19 The parameters indicated by the arrows must correspond, as shown in Figure 19 The corresponding method of connecting the two machines is the same. TCP After the connection is successful, you can check the connection status by returning to the "Device Management" dialog box, as shown in the figure 20 If the status of both devices is "connected", it means that the two devices are TCP The link has been established.



picture19 TCPDevice couplet parameter configuration

序	网络	设备名称	设备IP	目的IP	模式	TCP连接	虚拟串口号	虚拟串口状态
1	内网	ZLDEV0001	192.168.1.201	192.168.1.200	TCP Client	已建立	未设置	未联通
2	内网	ZLDEV0001	192.168.1.200	192.168.1.1	TCP Server	已建立	未设置	未联通

picture20 TCPDevice pairing success check

in the case of UDP the configuration parameters are shown in the figure. twenty one As shown, the parameters corresponding to the arrows must be one-to-one. UDPs long as the parameters are configured correctly, there is no need to check the connection status, and the data to be sent will be automatically sent to the specified device.



picture21 UDPDevice couplet parameter configuration

Finally, it is necessary to remind you that if the devices are connected, in addition to setting the network port parameters as above, you must also set the correct serial port parameters. Mainly, the baud rate of the serial port server needs to be consistent with the baud rate of the user's device. After this setting, the user's device can send data to each other through the serial ports of the two serial port servers.

6. Equipment debugging

6.1. Network physical connection

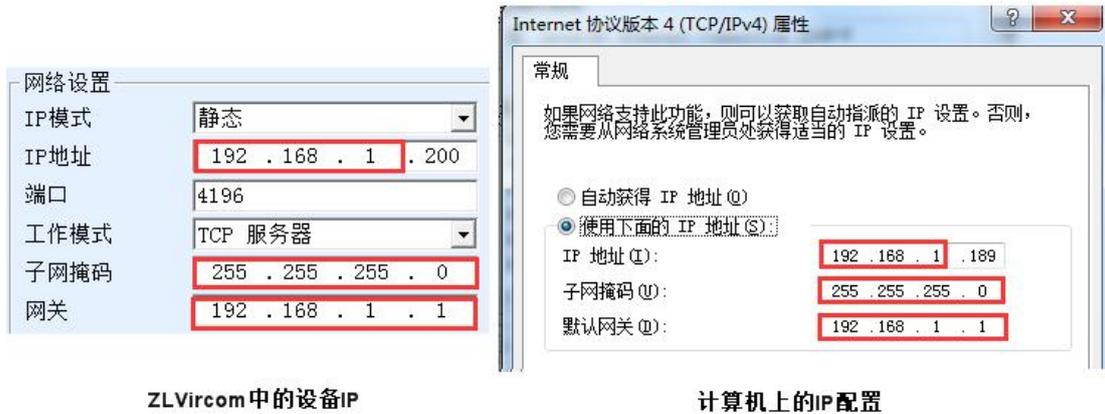
The serial device server can use a crossover cable or a straight cable to connect to a switch or directly connect to a computer network port.

After the connection is established, the first step is to check NETIs the light on? If not, please check whether the network cable is connected properly.

6.2. networkTCPconnect

When the device is dynamically acquired IP When using the network port, you cannot connect directly to the computer network port. DHCP The server can be used (generally DHCP The server is the router in the LAN).

Please specify when connecting directly IP. The computer also needs to specify a fixed IP.



ZLVircom中的设备IP

计算机上的IP配置

picture29Configured in the same network segment

Whether connected directly or through a switch, when configured as static IP when the device and computer are in the same network segment (unless they are communicating across gateways), as shown in the figure 9 shown.

because ZLVircom Supports cross-segment search and configuration, so the ones that can be searched but cannot communicate are generally IP. The address is not configured, you can use ZLVircom Configure the devices in the same network segment.

Use after configuration 4.5 TCP Communication test or 4.6 The steps for virtual serial port testing can be seen in the establishment TCP. When connecting Link, the light turns blue. Link Light blue can also be passed ZLVircom See, as in the device management list, if TCP. If the connection column is "established", it means Link. The light is blue, as shown in the picture twenty two. This can facilitate remote diagnostics.

序	类型	设备名称	P.	设备IP	本地...	目的IP	模式	TCP连...	虚拟串口...	虚拟串口状...	设备ID	TXD	RXD
1	内网	ZLDEV0001		192.168.1.200	1024	192.168.1.189	TCP Client	已建立	未设置	未联通	B25ED458	88	44

picture twenty two Connection status and data sending and receiving status

6.3.Data sending and receiving

when Link. After the light is on, data can be sent and received between the software and the serial port server. Active. The light will come on and will generally last at least 1. The data will also be output from the serial port of the serial server, but whether the output data is correct depends on whether the correct serial port parameters (baud rate, data bit, stop bit, check bit) are configured.

The serial port device will generally respond to the correct command. Once there is a response (the serial port sends data to the network port), Active. If it is not, please check the serial port parameters or whether there is any problem with the serial port line connection.

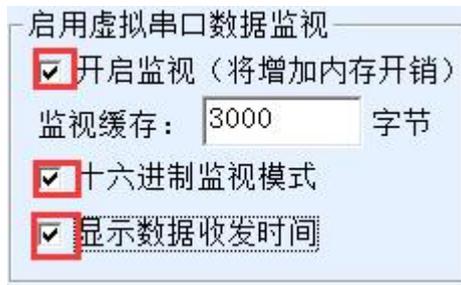
To facilitate remote debugging ZLVircom It also supports remote viewing of data transmission and reception, as shown in the figure twenty two. As shown,

one of them TXDI It is the amount of data sent by the serial port of the serial server. When refreshing the device list, if this value changes, it means that data has been sent. Active The light will also come on; if you see RxDI If this value changes, it means that the serial port device has returned data. Active It will light up.

6.4. ZLVircomRemote monitoring data

When using a virtual serial port, ZLVircom Supports real-time capture of data sent and received by the virtual serial port. It is convenient for users to debug the system. The usage is as follows:

Assuming that now 4.6 The virtual serial port test method establishes the communication of the virtual serial port. Now you need to monitor the data passing through the virtual serial port. Open ZLVircom Menu / Configuration / Software Configuration / Open vircom Configuration dialog box.



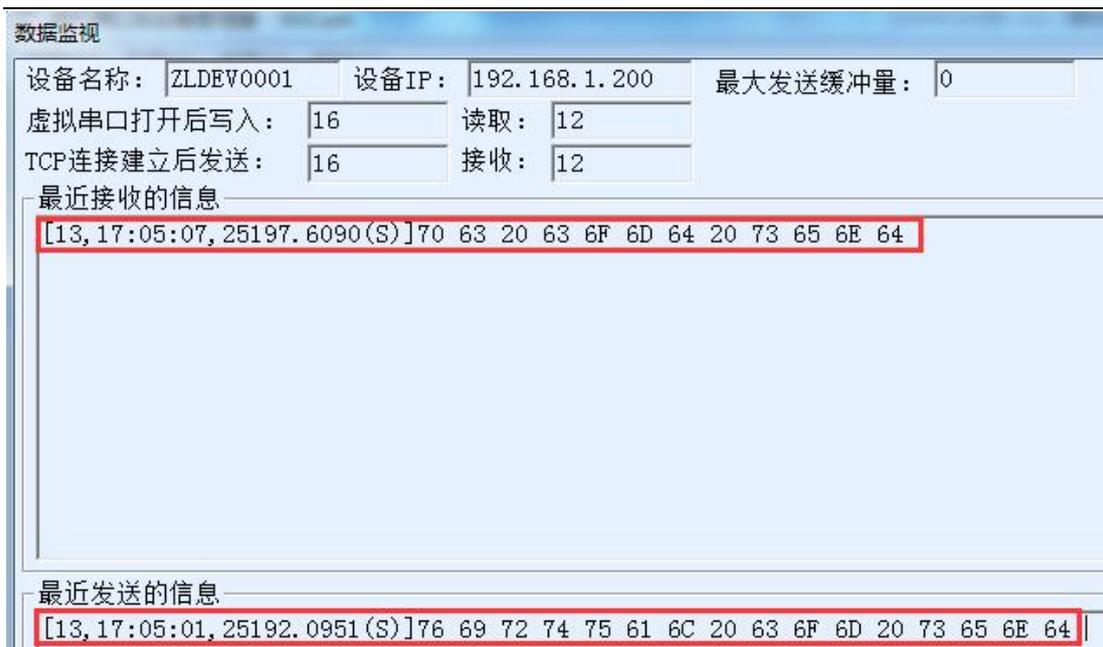
picturetwenty threeEnableZL VirocmMonitoring

In the monitoring mode, display the data transmission and reception time. 3 Check the options in front of it, as shown in the figure 25. Then click OK. Assuming that data has been sent and received before, now select a virtual serial port to be monitored in the main interface, and then select Menu/View/Monitor, as shown in the figure 26.



picturetwenty fourOpenZL VirocmMonitoring

From the opened dialog box, you can see the instructions sent by the host computer and the instructions returned by the device, as shown in the figure 25. This function can facilitate on-site communication debugging.



picture25Monitor sent and received data

7. ModbusAdvanced Features

bringModbusThe serial port server with gateway function does not have station address and register. It is a communication bridge.ModbusGatewayModbus TCPInstructionsSalve ID, function code, register number, register quantity generationModbus RTUSpecify and output from the serial port. It can be regarded as a protocol "translator".

7.1.EnableModbusGateway

First of all, the serial port server should supportModbusThe gateway is the device settings dialog box.5 "Modbus TCPchangeRTU"The feature should be ticked.

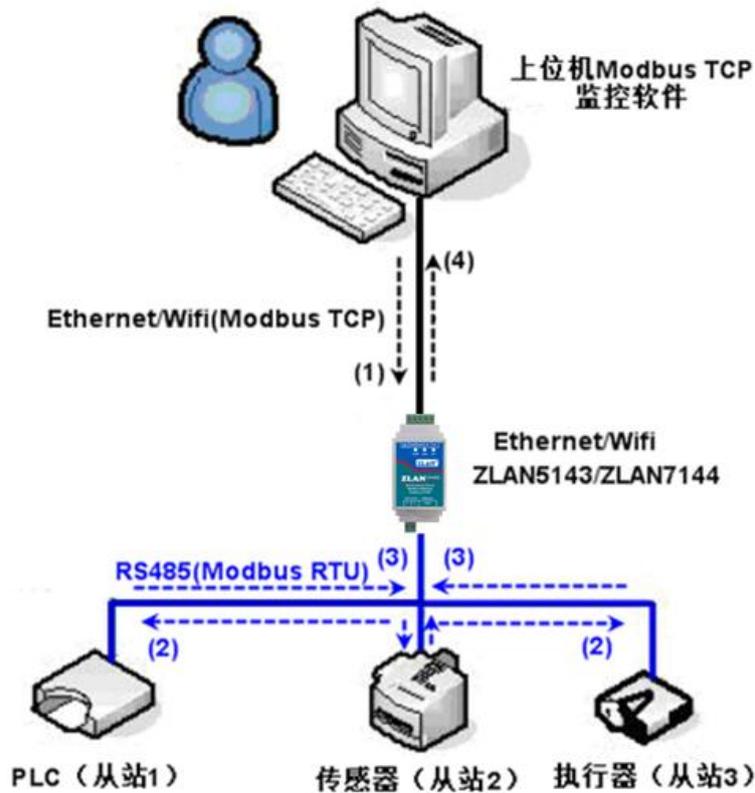
By default, the serial port server is in normal transparent transmission mode. If you need to convert toModbusGateway mode, please select "Modbus TCP--RTUThis option. After that, the device automatically changes the "Port" parameter to502 (Modbusserver's port).ModbusThe gateway is enabled.

Serial PortRTUIf the device is a slave, the host computerModbus TCPSoftware ConnectionModbus Gateway 502Port, at this timeModbusThe gateway needs to work onTCPSTerver mode; if the serial portRTUAs the master station,ModbusThe gateway works onTCPClient, and purposeIPfillModbus TCPSoftware Location

Computer IP, the destination port is usually 502.

7.2.Storage Modbus Gateway

A new generation ZLAN5207M (Ending with 3 are storage type) are register storage type Modbus Gateway, with ordinary ZLAN5142 (The end is 2 or 0 are all non-storage type) compared to ZLAN5207M The contents of the read register can be saved inside the gateway, so Modbus TCP The query speed can be greatly improved, and the performance is even better when supporting multi-host access.



picture26StorageModbusGateway Working Mode

As shown in Figure 26: Normal Modbus TCP The data flow direction is (1)-(2)-(3)-(4). That is, first Modbus TCP The command is converted to Modbus RTU The corresponding command, and then the device responds Modbus RTU Instructions to Modbus Gateway, then Modbus The gateway is again transformed into Modbus TCP Send to the monitoring host computer.

We know Modbus TCP It is network communication with very fast transmission speed, usually 3ms You can answer within, and Modbus RTU yes RS485, usually only 9600bps speed, generally sending and returning a command takes at least 30ms. Such ordinary non-storage method Modbus The query response time of the gateway is relatively long. In addition, if there are many host computers querying data at the same time, the serial port will be congested.

If we compare it to a highway and the serial port to a single-plank bridge, then the original method is to pass the traffic of the highway on the single-plank bridge.

Register-saving Modbus Gateway (ZLAN5207M) solves the above problems. It can temporarily save the register data obtained by querying Modbus. Inside the gateway, Modbus TCP. When the query comes, Modbus. The gateway can return the command immediately, Modbus TCP. On the other hand, ZLAN5207M. You 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, ZLAN5207M is a fully automatic configuration-free Modbus Gateway, users do not need to configure the required register addresses, function codes, slave addresses, etc. ZLAN5207M will be sent according to the network port Modbus TCP. Instructions automatically identify and dynamically add these registers.

When monitoring multiple computers, ZLAN5207M can show good response speed, no matter what the baud rate of the serial port is, it can generally 3ms. The upper level responds to the data. And it shows a good speed of real-time update of serial port data.

Register-saving Modbus. The gateway is truly Modbus TCP change Modbus RTU, it really worked. Modbus TCP. The advantages are fast speed and simultaneous query of multiple hosts.

Note that when the serial port server is used as TCP. When the client is not available, it will automatically switch to non-storage mode.

The following storage types are listed Modbus Features:

1. Article 1 Modbus TCP. The query command is a non-storage type. Because it must wait RTU. The device can reply the register content to the network port only after returning data slowly.

2. If a particular instruction is in 5. If there is no more query from the host computer on the network within seconds, the command will be automatically deleted and will no longer be sent from the serial port to RTU equipment.

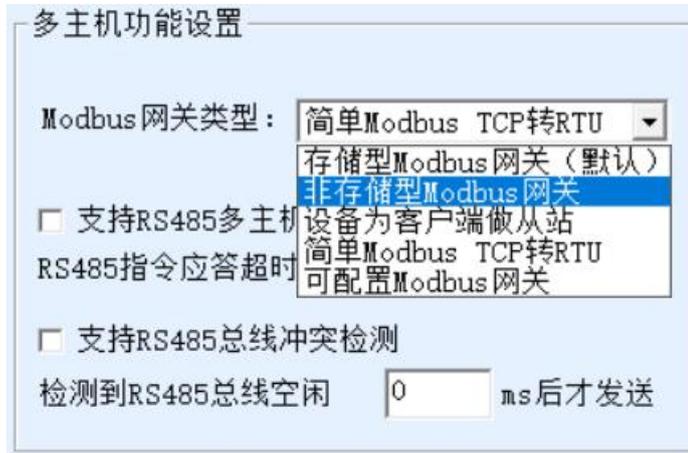
3. Currently can store 10K of Modbus. The cache, for a normal single register query, stores approximately 500 Instructions.

4. When multiple commands are being queried at the same time, they are sent in order, first command sent - first command response - wait 485 Anti-collision time (refer to the multi-host section) - the second command is sent... After the last command is responded to, it returns to the first command.

7.3. Disable storage feature

Although storage type Modbus has a faster response speed, but some users do not want RTU. The device does not want to receive a large number of query instructions, which will affect the internal processing speed of the instrument. In this case, the storage function can be turned off.

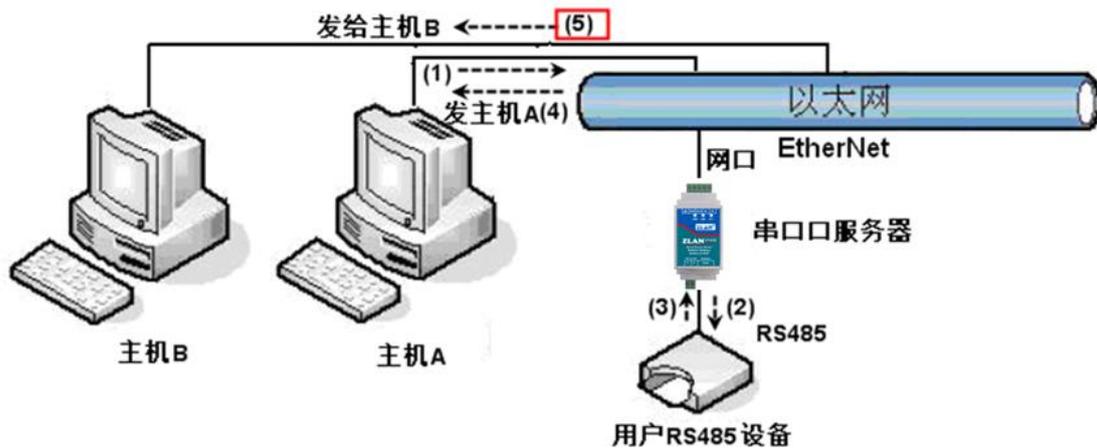
To disable the storage type, click the "More Advanced Options" button in the "Parameter Configuration" dialog box. As shown, select non-storage type Modbus Gateway.



picture27Disable storage feature

7.4. Multi-host capability

As shown in Figure 27, the "RS485 Multi-host support" and "RS485 The bus conflict detection function" is the multi-host function of ZLAN. They are generally enabled and disabled at the same time. After enabling, the conversion protocol is Modbus TCP. The device has storage type Modbus Gateway function, otherwise non-storage type Modbus Gateway; if the conversion protocol is None, it can generally be customized by the user. The protocol also has the function of multiple hosts accessing serial devices at the same time, which is in the pure RS485. This is not possible in a network, because multiple masters sending at the same time will cause RS485 bus conflict. The multiple hosts of ZLAN serial port server can RS485 The bus is "coordinated" to achieve multi-host access.



picture28Multi-host function demonstration

As shown in Figure 28, in normal mode, when two hosts, A and B, connect to the serial port at the same time

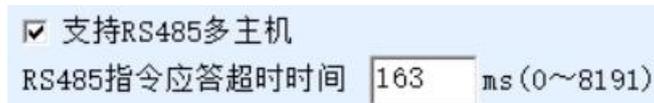
Server, at this time the hostA send (1) instruction, RS485 The device receives (2) instruction, RS485 Equipment Returns (3) command, but the serial port server will send the command at the same time (4) To the hostA and (5) Send to hostB. Because the hostB No query was sent, but it also received a reply command (5) So, the hostB Communication errors may occur. In multi-host mode, only commands (4) There will be no instructions (5) Because the serial port server will automatically remember the host to be returned, it will only return the command to the host with the most recent communication. A Inquiries are only replied to A, hostB Query reply to hostB.

Another function is that in normal mode, the hostA and hostB at the same time, sending data will RS485 The command merge on the bus cannot be recognized normally; the serial port server can schedule in multi-host mode A, B The order of using the bus can effectively solve the conflict problem of multiple machines accessing at the same time.

When the conversion protocol is "None", the multi-host function is not enabled by default. To enable multi-host, click "More Advanced Options" in the device configuration dialog box and check "RS485 Multi-host support".

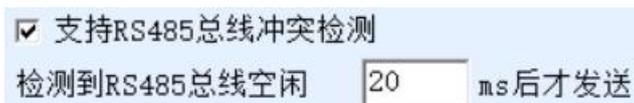
7.5. Multi-host parameters

RS485 Multi-host support" and "RS485 The meaning of "bus conflict detection function" is introduced as follows.



picture29 RS485 Multi-host support

in RS485 The command response timeout is the maximum time interval from the serial port server sending this command to receiving the response. The time filled in should be greater than the actual maximum time interval, because if it is judged as a timeout, the next command will be sent.

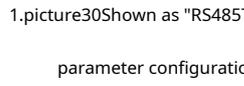
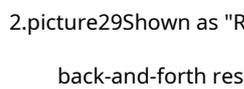


picture30 RS485 Anti-collision idle time

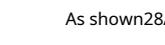
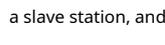
RS485 Bus conflict time: Indicates how many milliseconds the serial port server waits after receiving the reply of the first command before sending the second command. This parameter actually defines the speed of command polling. 20ms "Maximum waiting time" The parameter "seconds" generally does not need to be modified.

When the user uses ZLVircom Select the conversion protocol as "Modbus TCP change RTU after" ZLVircom The above two enable boxes will be automatically checked (unless the user manually enters the advanced options to remove them), and the above two times will be automatically configured according to the baud rate. Modus If the command is long or the conversion protocol is "None", you need to manually configure this 2 parameters.

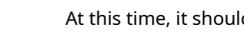
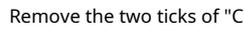
The following are recommended values for the above parameters:

1.  The bus anti-collision time 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.  The command response timeout is generally determined by the length of the back-and-forth response command. NBytes, the response is Mbytes, the recommended setting value is: "Packet Interval" × (N+M+5) + 100.

7.6. Multi-Purpose IP Next Modbus

As shown in  and , if the serial device (RTU Device) is the master station, and the network port device (Modbus TCP Device) is a slave station, and there are multiple network port slave devices at the same time. 5.2.2 The method introduced by the client connecting to multiple servers allows the serial device server to connect to multiple network port devices at the same time as a client.

The function that needs to be implemented at this time is: RTU After sending the command, it can be sent to multiple network port devices. The network port devices can Slave ID The field identifies whether it is sent to yourself. Slave ID The corresponding network port device responds. The network port response is sent to the serial port server and converted into RTU The command is sent from the serial port to RTU equipment.

At this time, it should be noted that the  and  Remove the two ticks of "Command response timeout". Otherwise, the above forwarding function cannot be realized.

Another application method is: although the serial port server is used as Client Connect multiple network devices, but RTU The device is not the master station, and the network port device still sends first. RTU The device responds (as a slave). Then, RS485 Bus Anti-Conflict Time" and "RS485 The two check boxes "Command response timeout" still need to be checked, so that multiple hosts can access one RTU Functionality of the device.

7.7. Configurable Modbus Gateway

About Configurable Modbus Gateway ZLMB, please refer to Modbus Four types of gateways http://www.zlmcu.com/document/Modbus_Gateway.html .

8. Registration packet and heartbeat packet

Registration packets and heartbeat packets are a function suitable for communication between devices and cloud software.

8.1.Registration Package

The definition of a registration package is that when the computer software and the serial port server module (hereinafter referred to as the module) establish TCPWhen connecting, the module will first send a string of codes to the software so that the software can know which module is communicating with it. This string of codes is the registration packet.

The registration package is very suitable for IoT monitoring because cloud software generally runs onInternetThe modules are scattered in various collection and monitoring points. It is very important to make the cloud software recognize the modules, which is necessary to realize the communication of the Internet of Things.

Shanghai ZLAN's serial device server provides the following multiple registration reporting methods.

8.1.1.Send on connectionMACAddress

Send on connectionMACAddress: This method is not only for4Model (e.g.5143), ordinary models are also supported. Its method is to connect its ownmacThe address is sent to the cloud.MACThe address is unique, so the device can be uniquely identified. This method is simple and does not require the preparation of a registration package for each device, so it is simple and effective. How to use it: In the device settings dialog box, click "More advanced options" and find "TCPSend when createdMACAddress", tick the front, then return to the settings interface and click "Modify settings".



picture31Send on connectionMACAddress

8.1.2. Realcomprotocol

RealcomThe protocol is a mature protocol that contains registration packets and heartbeat packets. Users can use this protocol to implement the registration packet and heartbeat packet functions.RealcomThe protocol method is: in the "Device Settings" dialog box, select "Conversion Protocol" asREAL_COMProtocol", note that the Enable Registration Package part needs to be blank and unchecked.

转化协议	REAL_COM 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
所在组播地址	230 . 90 . 76 . 1
<input type="checkbox"/> 启用注册包:	<input type="checkbox"/> ASCII

picture32Enablerealcomprotocol

EnableRealcomThe protocol will no longer be a transparent transmission communication, it has the following characteristics:

1. When the device and the cloud are established TCPA After connecting, the device automatically sends a hexadecimal registration packet FA 07 13 02 FA 02 MAC[5] MAC[4] MAC[3] MAC[2] MAC[1] MAC[0] FA FF .one of them MAC[5]~MAC[0]It is equipment MAC address.
2. When the device sends data to the network, it will automatically increase FA01 01 of 3 Bytes header prefix.
3. Every time the keep-alive timer expires, the device sends a 00 of 1 Bytes of heartbeat packet. REAL_COMThe protocol contains MACThe address can be used as a registration package for the device. However, due to its fixed format, it can only be designed by cloud software. REALCOMThe protocol is compatible with this approach.

8.1.3. Custom Registration Package

The custom registration package method allows users to fill in an arbitrary registration package format. The method is: in the device settings interface, configure as follows:

转化协议	REAL_COM 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
所在组播地址	230 . 90 . 76 . 1
<input checked="" type="checkbox"/> 启用注册包:	31323334 <input type="checkbox"/> ASCII

picture33Setting up the registration package

andREAL_COMThe difference between the protocols is that the registration package is enabled here and filled in 31 32 33 34 Such registration package information. Note that this is in hexadecimal, which means that the data actually sent is a string 1234If you need to display the string, click the "ASCII" options.

When the device and cloud software are connected, it can automatically send 31 32 33 34The hexadecimal registration package.

This registration package method is more flexible and allows the device to adapt to the existing cloud registration package format; however, the registration package does not contain MACSuch wildcards require configuring different registration packages for each device, which is cumbersome. MACAddress and REALCOMThe configuration of each device is the same in both methods, but due to MAC Different registration packages are naturally different.

The maximum registration packet length is 33Bytes. This method supports UDPMode registration packet and heartbeat packet.

8.1.4. Configuration Files

Zhuo Lan's 5143The series supports the serial port server to write a configuration file, so as to realize the user's fully customized registration package, and can use MACAddress wildcards can solve the trouble of writing custom registration packages for each device, and there is no limit on the length of the registration package.

8.2. Heartbeat Packet

Heartbeat packets are mainly used to detect whether the communication link is disconnected. The implementation method is that the device sends a heartbeat packet data to the server software at regular intervals. After receiving this data, the server will discard it and will not treat it as valid communication data.

The heartbeat packet has two main functions: first, it can let the host computer software know that the device is active; second, if the device fails to send a heartbeat, it is in TCPThe client device will automatically re-establish TCP connection, so it is a means of restoring network communication.



picture34Keep-alive time

As shown in the figure, the sending time of the heartbeat packet is set by the "keep-alive timer".

8.2.1. Hidden Heartbeat

Even if no heartbeat packet is set, the ZLAN device is in TCPThe implicit heartbeat function is also enabled when the client is connected. So the implicit heartbeat function means that the device sends data, but the server does not actually receive the heartbeat data. Therefore, it cannot play the first function of the heartbeat packet, that is, the server detects whether the device is active or not.

However, since the device actually sends data, it can play the second function of the heartbeat packet, that is, to detect the device. TCP Check if the connection is normal. Once disconnection is detected, it can be automatically reestablished. TCP connect.

8.2.2. REALCOM protocol

like 8.1.2 Realcom The agreement states, REALCOM The protocol can send a 00 of 1 Byte data, this data is realcom Heartbeat packet of the protocol.

8.2.3. Custom heartbeat packet

First follow 8.1.3 Fill in the registration package by customizing the registration package. Then add the heartbeat package as follows: Click the "More Advanced Options" button in the device settings, IP and the second line of the port, write 16 Binary heartbeat packet, and change the option on the right to "Parameter Packet Purpose".



picture35 Custom Registration Package

Note that the total of registration packets and heartbeat packets should be less than 33 Bytes. The first line is actually the registration packet.

9. httpd Client communication function

This function is used to send the serial port server's uploaded data directly to the web. The server program of the architecture can simplify the software development workload in the cloud.

When IoT collection terminals and web server (httpd) when interacting with programs, if the data can be http of GET and POST. The standard format of the instruction is submitted to web server, then web server can use the existing php/asp. The language processes and stores the data. This saves the user from having to develop web application program interface workload.

In order to support this function, you need to download a httpd.txt. Download the configuration file using zlvir.com. This is achieved through the firmware upgrade function.

Zhuo Lan httpd Features of the client communication function include:

1. Device: Supports GET/POST. Directly convert serial port data into http format that can be directly recognized by the server.

2. WebServer sends:WebThe server can alsoGET/POSTThe command sends the required data to the serial port server, and the valid data content can be output from the serial port of the serial port server. When the serial port server receives the data, it can also giveWebA specific response from the server indicating that the data was received.
- 3.Supports arbitrary conversion between hexadecimal and string input and output data, convenientWebThe server sends data in character format, and the serial port outputs hexadecimal data to control the serial port device.

For more information, please refer to ZhuolanhttpdClient Communication Methods" document.

10.MQTTGateway

aboutMQTTFor the use of gateway function, please refer toMQTTHow to use the gateway» http://www.zlmcu.com/document/Usage_of_MQTT_Gateway.html .MQTT andJSONchangeModbusGateway Usage» http://www.zlmcu.com/document/MQTT&JSON_to_Modbus.html ;

11. JSONchangeModbus RTU

aboutJSONchangeModbus RTUand relatedJSONFor usage, please refer toJSONData Collection Gateway» <http://www.zlmcu.com/document/jsondata.html> ; "Use of ZhuoLan Cloud and Collection Equipment" <http://www.zlmcu.com/document/zlancloud.html> ;645InstrumentJSONFormat submission method» http://www.zlmcu.com/document/645_Instrument_JSON.html ; Zhuo Lan MQTT andJSONchangeModbusGateway Usage» http://www.zlmcu.com/document/MQTT&JSON_to_Modbus.html ;

12.NTPTime function

aboutNTPFor information on how to obtain and use time, please refer to:NTPTime module usage » http://www.zlmcu.com/document/zlan_NTP.html .

13.Network port modification parameters

Modifying the network port parameters is achievedzlvir.comThe function of searching for devices and modifying device parameters is similar to that of software.

Manage devices and modify parameters through the network port of the serial device server. Suitable for users who integrate search and configuration functions into user software.

The network port parameters are modified through "UDP" This is achieved through the "Management Port Protocol", for example:

1. The computer software sends the destination port in the network as 1092 of UDP Broadcast data packet. When the device receives the data packet, it will return its information to the computer software to achieve the purpose of searching for the device.
2. Computer software to the device 1092 Port forwarding UDP Modify the parameter command to achieve the purpose of modifying device parameters.

For a detailed introduction to network port modification parameters, please refer to "ZLAN Networking Products UDP Management Port Protocol" document. You can also use 14 This is implemented by the device management function library of the device management function library.

14. Device management library

This function is suitable for users who need to integrate device management functions into their own software.

The "UDP" The management port protocol has been integrated into the device management function library ZLDevManageInside. This is a DLL of windows The platform's development library can be used VC, VB, Delphi And other development tools call.

Provide detailed API Interface introduction document and VC transfer Demo Case. It can realize device search, parameter modification, P2P Function calls, etc.

You can get the development library from the ZLAN official website: <http://zlmcu.com/download.htm> Search for "Device Management Function Library" on the page. For details, please refer to "ZOLAN WinP2p and Device Management Development Library»

15. Modify the parameters of the serial port

Users can read and set parameters by sending commands to the serial port of the serial server. It is suitable for users who choose chip or module-level products to be controlled and configured through the serial port. The parameters that can be set include: IP Address, baud rate, device name, working mode, etc. After the new parameters are set, the serial server can be restarted through the serial port command.

ZLAN serial port commands have the following characteristics:

1. Serial port command uses 10 There are 1 byte of data preamble, so there is no need to distinguish between communication data and commands by pulling down or raising the configuration pin, nor is there any need to switch between command mode and communication mode.

It is more flexible and convenient to use.

2.The command set includes multiple command formats such as saving parameters, not saving parameters, and restarting the device.

3.Can realize a variety of applications, such as reading the serial port serverMACFor example, to change the serial port server working mode,TCPThe server switches toTCPIn client mode, you can actively connect to the server;TCPThe client switches toTCPYou can disconnect from the server when you log in to the server.

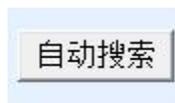
For detailed operation methods of serial port parameter modification, please refer to《Serial port modification parameters and hardwareTCP/IPProtocol Stack

16.Remote device management

Remote device management refers toZLVircomThe software can maintain and manage the device, including restarting the device, modifying parameters, and upgrading firmware.ZLVircomUser who manages the device.

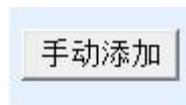
forZLVircomSoftware, as long as the device can be found in the device list, remote management can be performed. Remote management of devices can be divided into the following situations:

1.Automatic search: The device and the computer are on the same switch. In this case, whether they are in the same network segment or not, the computerZLVircomThe way to search for devices is:ZLVircomSend a broadcast query - all devices will reply with their own parameters after receiving the queryZLVircomTool. This method searches all devices at once.



picture36Auto Search

2.Manual adding: There are two cases:



picture37add manually

a)Large routers divide the network: In some large networks, broadcast packets are divided by routers, so that broadcast packets cannot reach the device end, butpingequipmentIPAll are connected. In this case, you usually need to add it manually to solve the problem. The manual adding method is to click "Manual Add" in the "Device Management" dialog box to add the head and tailIPYou can query the devices one by one.

b)Public network server queries internal network devices: The serial port server is in the internal network and acts asTCPServer mode,zlvir.comOn the public networkIPOn the server. In this case, you need to

Make a 1092ofUDPThe port mapping is mapped to the deviceIP,Then zlvir.comManually add this device.IPIt is the public network on the device sideIP.

3. TCPClient: Device asTCPWhen the client isIP (116.15.2.3)of4196 Port InitiationTCPOnce the connection is established, it will automatically send a message to the destination port (here4196)of UDPPort (note notTCPport) to send its own parameter system, so thatzlvir.comOn this computer (116.15.2.3) can search for the device. If the destination port is not4196You need to modifyzlvir.com The default parameter receiving port is to modify the menu/configuration/software configuration/default listening port, and then startzlvir.comIf pop-upTCPIf there is a port conflict, ignore it and continue executing.

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	116.15.2.3 本地IP
目的端口	4196

picture38Client

4.Scheduled sending parameters: Even inTCPFor a serial port server in server mode, you can also check the "Send parameters regularly" function to set the5Minutes to send parameters to the destinationIP(here it is116.15.2.3) destination port. The port on this server receives the parameterszlvir.comThese devices can be managed.

工作模式	TCP 服务器	保活定时时间	60	(秒)
子网掩码	255 . 255 . 255 . 0	断线重连时间	12	(秒)
网关	192 . 168 . 1 . 1	网页访问端口	80	
目的IP或域名	116.15.2.3 本地IP	所在组播地址	230 . 90 . 76 . 1	
目的端口	1024	<input type="checkbox"/> 启用注册包:		<input type="checkbox"/> ASCII
串口设置		<input type="checkbox"/> 启用无数据重启	每隔 300	(秒)
波特率	115200	<input checked="" type="checkbox"/> 启用定时发送参数	每隔 5	(分钟)

picture39Scheduled sending parameters

To facilitate device identification, if remote management is required, please give the device an easy-to-remember name.

17. Firmware upgrade method

ZLAN5207M You can upgrade each other's programs, but you cannot upgrade each other's programs.
P2P This method can be used to upgrade the firmware of devices found in the device list through search or other methods.

- 1 Obtained from ZhuolanZLSN2003Firmware files such as 1.539(2003).BIN.
- 2 existZLVircomIn the tool, search for the device that needs to be upgraded, and then enter the device parameter editing dialog box. First click "Restart Device" once.



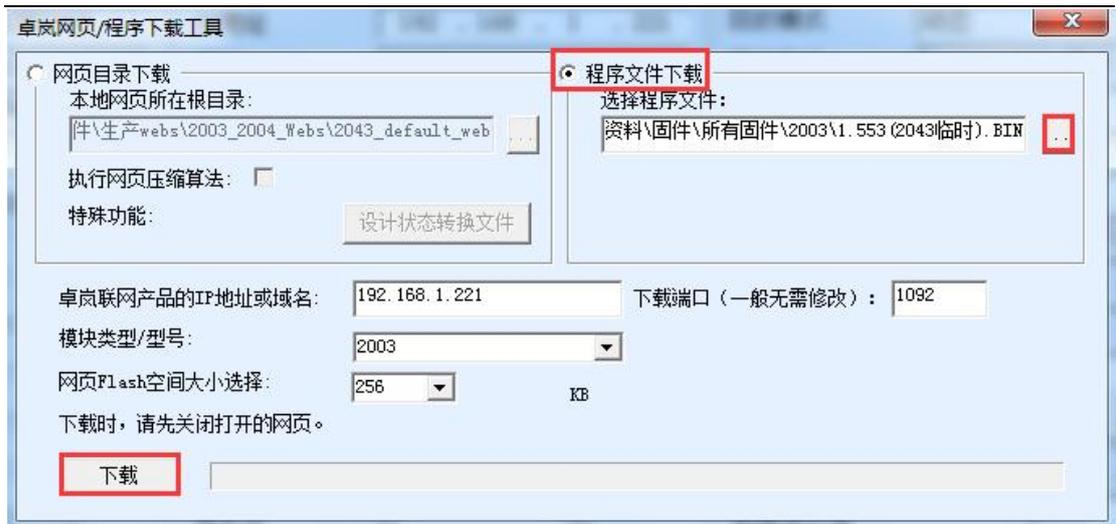
picture40Upgrade button

After the device restarts, search for the device again in the same way and enter the dialog box again. Click the "Upgrade Firmware" button in the lower right corner of the dialog box.



picture41Upgrade button

- 3 As shown43As shown, select the "Program File Download" radio option. In the program file, select the firmware file. IPThe address part has been automatically filled in, no need to write it again, the module type/model has been automatically selected. Then click Download.



picture42 ZLSN2003Firmware upgrade method

- 4 At this point the download progress bar starts to move, and the download time is approximately 30. During the download process, you will see the device ACT. The light flashes, and at the end of the download, you can see LINK. The light flashes a few times. Then the program pops up "Transfer Completed". LINK. Do not power off the device when the light is blinking. **Notice:** Here is just the transfer completed, write flash. Process Requirement: 3 seconds or so, at this time LINK. The light will flash, please do not turn off the power during this period.
- 5 After downloading is complete, the program will restart automatically without powering off. If the operating indicator light flashes, please LINK. Light flashing stops. 30. If the power is on for more than 1 second, re-energize. Web Configuration interface update: After
- 6 the firmware upgrade, the module's internal configuration webpage also needs to be updated, otherwise it will no longer be accessible. Web Configuration, but does not affect communication. web. It is also possible not to download web pages. Web. The method is as follows: 43. As shown, change the "Program File" download mode to "Web Directory Download". And select the root directory of the local web page as the directory where the web page files to be downloaded are located (this directory can be obtained from ZLAN), click Download, and download all files in the local web directory to the file system inside the device.



picture43 ZLSN2003 webUpgrade Method

7 Notice:

7.1 If the download fails, it will not damage the device, so just restart the download. LINK When the light is flashing, please do not cut off the power, otherwise the device will be damaged.

7.2 pass ZLVircom Check the firmware version number to know the new firmware Whether the download has been successful.



picture44 Check the firmware version after upgrading

18. Ordering Information

surface8 Ordering Information

model	illustrate
ZLAN5207M	Ordinary model
ZLAN5207MN	bring P2P Function

19. After-sales service and technical support

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