ZLAN9600/9607 Series CAN/RS485/Ethernet Conversion gateway

RS485 to Ethernet /CAN

CAN to RS485/ Ethernet

Ethernet to CAN/RS485

ZL DUI 20250716.1.0

The following modifications have been made to the document:

Change log

Date	Version number	Document number	Modify content.
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CATALOGUE

1. Overview

CAN (Controller Area Network, Controller Local Area Network) is a serial communication protocol bus for real-time applications, aiming to solve the communication problem among numerous electronic control units (ECUs) inside automobiles. Currently, it has been widely applied in multiple fields such as industrial automation, ships, medical equipment, and intelligent buildings.

Shanghai Zhuolan's CAN products are mainly divided into two categories. One model is ZLAN9600, which includes both RS485 and CAN interfaces and CAN achieve data conversion between RS485 and CAN. Another type of model is ZLAN9607, which includes three interfaces: RS485, CAN and Ethernet, enabling mutual data conversion among the three ports.

The ZLAN 9600/ZLAN 9607 is a data conversion gateway with CAN digital isolation specially designed for industrial environments. It CAN effectively isolate the interference on the CAN bus from affecting the operation of the equipment and ensure the stability of the equipment. Wide voltage range of 9 to 24V, terminal power supply connection, with casing grounding wire.

Figure 1 Installation diagram of the ZLAN9607 guide rail

The ZLAN 9607 features 1 RS485 interface, 1 CAN interface and 1 Ethernet interface. It comes with built-in hanging ears and rail clips, supports three installation methods, is compact in size and easy to install. The data among the three interfaces (RS485/CAN/ network port) of ZLAN 9607 can be freely converted to each other, and it has multiple transmission and filtering modes. This design enhances flexibility and manageability, allowing users to modify the transmission methods between each interface at will according to their own requirements.

The ZLAN 9600 has one RS485 interface, one CAN interface and one Ethernet interface (this Ethernet interface is invalid). Except for the functions related to the Ethernet interface, the rest of the functions are the same as those of ZLAN 9607.

The ZLAN 9600 series supports 2-bit stop bits, 8-bit data bits, four types of check bits: odd, even, space, and tag, and a baud rate of up to 921.6Kbps.

The ZLAN9600 CAN achieve mutual conversion between RS485 and CAN.

ZLAN9607 CAN achieve mutual conversion between TCP/IP protocol and RS485/CAN, supporting TCP server/client /UDP and other modes, and supporting heartbeat packet and registration packet functions.

The ZLAN 9600 series supports CAN baud rates ranging from 40,000 to

1,000,000, and also features CAN frame packaging and custom CAN frame functionality.

ZLAN 9600/9607 can be applied to:

- Power electronics, intelligent meters and energy consumption monitoring;
- As an iot gateway, it serves as a communication bridge between devices and the cloud.
- Remote monitoring of various CAN bus devices;
- Communication interfaces for various configuration software and devices;
- Networking of equipment in the field of access control and security;
- Network information collection for Internet of Things devices;

A typical application connection is shown in Figure 2. The RS485 of the terminal device is connected to the RS485 port of the ZLAN 9607, and the CAN interface is connected to the CAN interface of the 9607. The ZLAN 9607 is connected to the computer via an Ethernet cable. The software on the computer establishes a connection with ZLAN 9607 via TCP/IP, virtual serial port or cloud server. From then on, any data sent by the RS485/CAN device will be transparently transmitted to the software of the computer, and the data sent by the software to the ZLAN 9607 via the network will also be transparently transmitted to the RS485/CAN device.

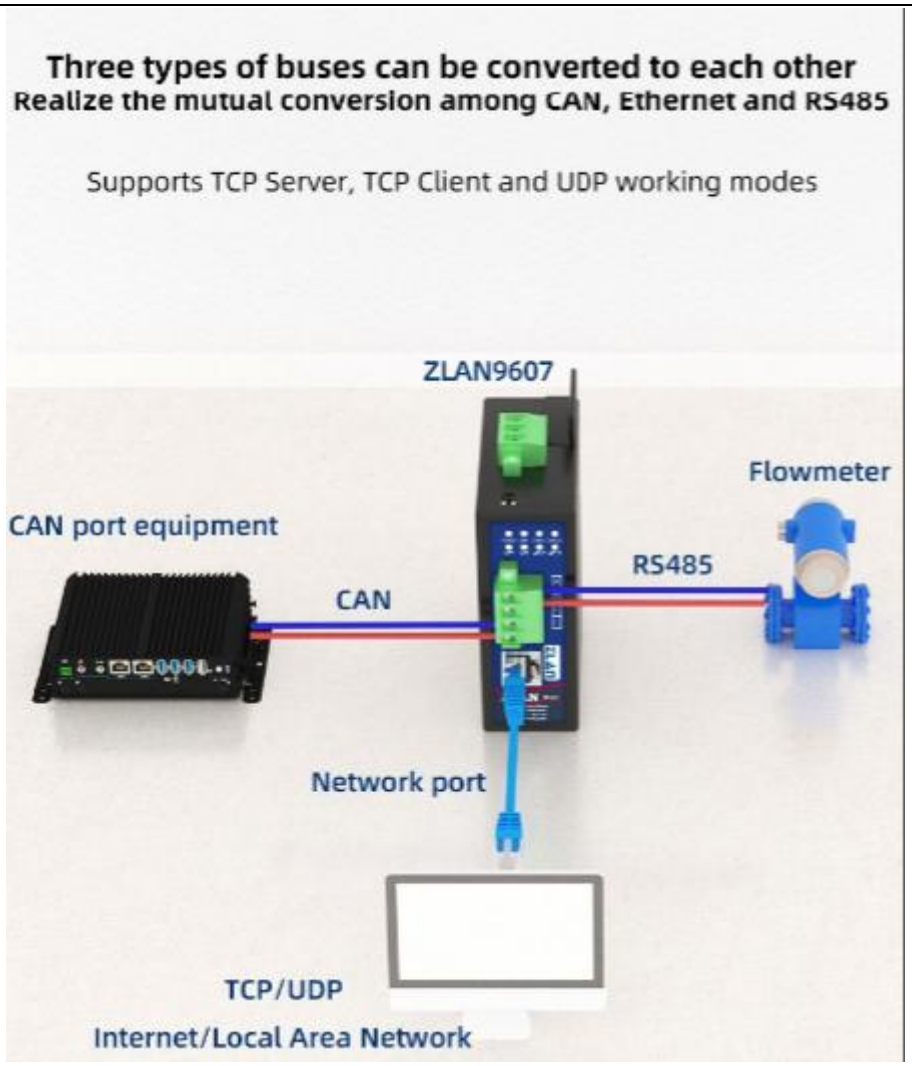

Figure 2 Connection diagram

2. Functional Features

2.1 Hardware Features

The ZLAN 9600 series has the following features:

1. Three installation methods are available: rail-mounted installation, backplate hanging ear installation, and desktop hanging ear fixed installation. It is particularly suitable for industrial guide rail installation. Due to its narrow lateral width, it can save installation space and is more convenient for installation and disassembly.

2. Industrial-grade power supply method: Terminal block connection method, convenient for use in industrial Settings. It can be powered by a wide voltage range of 9 to 24V. With a casing grounding wire, it effectively conducts current interference and surges.
3. CAN interface digital isolation, isolation voltage 1500V. It is suitable for strong interference environments where ordinary CAN servers cannot work properly.
4. Rich panel indicator lights facilitate debugging: In terms of connection, there is not only a NET light indicating whether the network cable is properly connected (only for ZLAN 9607), but also a LINK light indicating the establishment of a TCP connection. In terms of data indicator lights, there are RS485/ network port ACT indicator lights, among which CAN has independent transceiver indicator lights. Convenient for on-site debugging.

2.2 Software Functions

1. Supports CAN frame packaging function, which CAN package the frames received by the CAN interface according to the specified number of bytes and send them to the network port/serial port.
2. It supports three data transmission modes: "No transmission", "CAN frame transparent transmission", and "only data transmission/conversion to CAN frame transmission". Moreover, each interface can be set in one direction separately, which is convenient, flexible and has a wide range of applications.
3. It supports five CAN ID filtering methods: "No filtering", "range acceptance", "range rejection", "whitelist", and "blacklist", which can be flexibly configured according to application scenarios.
4. The 9607 supports TCP server, TCP client, UDP mode, and UDP multicast. When serving as a TCP client, it also supports TCP server-side functions. As a TCP server, it supports up to 30 TCP connections, and as a TCP client, it supports 7 destination ips.
5. The 9607 supports virtual serial ports and is equipped with the Windows virtual serial port & device management tool ZLVirCom.
6. The 9607 supports the function of sending MAC addresses when devices are

connected, facilitating cloud-based device management.

7. The 9607 supports dynamic acquisition of IP and DNS protocol connection domain name server addresses through DHCP.

3. Technical parameters

Table 1 Technical Parameters

Appearance			
Interface	RS485/CAN: Terminal blocks		
Power supply	Terminal block method		
Size	L x W x H =88mm*62mm*33mm (Shell size, excluding interface)		
Communication interface			
Ethernet	(ZLAN 9607 only) 10M/100M, 2 KV surge protection		
Serial Port:	RS485× 1:485A, 485B		
CAN interface	CAN×1: CAN L, CAN H, 1500V digital isolation		
Serial port parameters			
Baud rate	300~921600bps	Check bit	None, odd check, even check, mark, space
Data bit	8	Flow control	No flow control
Software			
Agreement	ETHERNET、IP、TCP、UDP、ARP、ICMP、DHCP、DNS、CAN		
Configuration method	ZLVirCOM tool, 9600_Tool		
Communication method:	(Only ZLAN 9607) TCP/IP direct communication, virtual serial port mode		
Working mode			
(Only ZLAN 9607) TCP client, TCP server, UDP, UDP multicast			
Power supply requirements			

Power supply	9～24V DC，50mA@12V
Environmental requirements	
Operating temperature	-40~85℃
Storage temperature	-45~165℃
Humidity range	5 to 95% relative humidity

4. Instructions for Use

4.1. Hardware Description

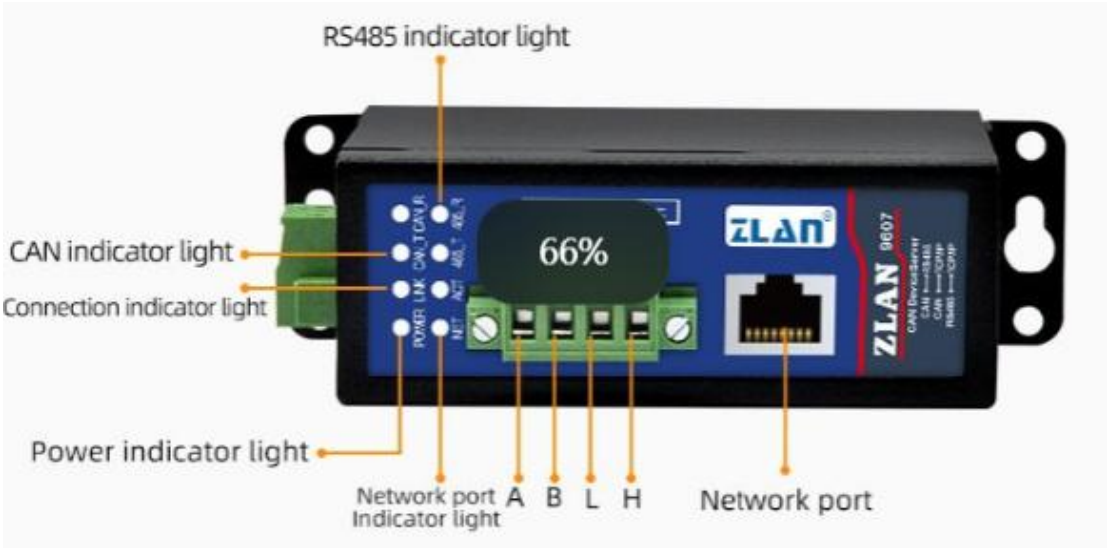

Figure 3 Front view of 9600/9607

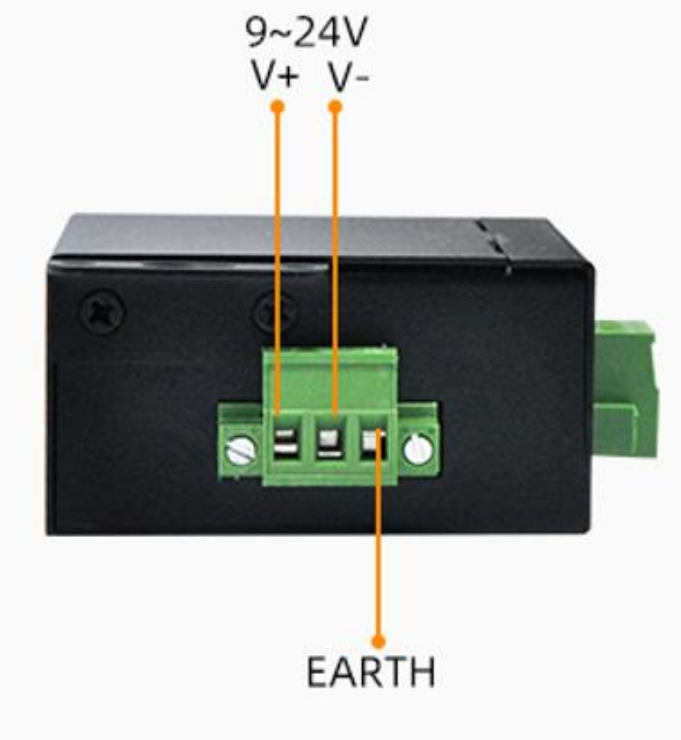

Figure 4 Power interface of 9600/9607

The main view of the ZLAN 9600/9607 is shown in Figure 3 above, and the casing adopts a black radiation-resistant SECC metal casing.

1 **Power input：** The terminal block is a 5.08mm terminal. V+ is connected to 9 to 24V, V- to GND, and there is also the ground of the casing, as shown in Figure 4 above.

2 **RS485：** The ZLAN 9600/9607 has one RS485 serial port. It can be connected to A and B via RS485, where A represents the 485 positive line and A represents the 485 negative line. Theoretically, RS485 can support up to 32 units of load and has a maximum communication distance of 1,200 meters. Generally, it is only necessary to use terminal resistors when the RS485 line exceeds 300 meters. The terminal resistor of RS485 is 120 ohms.

3 **Network port：** (Only ZLAN 9607) Connect network cables and support automatic crossover.

4 **Indicator light：** It is divided into Power, NET, Link, ACT, 485_R, 485_T, CAN_R, CAN_T lights, representing power light, network cable connection light, TCP connection indicator light, 485 receiving data light, 485 sending data light,

CAN receiving data light and CAN sending data light respectively.

Table 2 Meanings of Indicator Lights

"Power lamp"	The power indicator light shows red when the power is connected
"NET lamp"	(Only ZLAN 9607) The network cable connection is normal and the indicator light shows orange
Link light	When a TCP connection is established (or in UDP mode), the Link is green. It can be used to determine whether the serial port server has established a communication link with the upper computer software.
"ACT lamp"	When the network port is sending or receiving data, the indicator light flashes
485_R lamp	When the RS485 interface receives data, the indicator light turns blue.
485_T lamp	When the RS485 interface sends data, the indicator light is green.
CAN_R lamp	When the CAN interface receives data, the indicator light turns blue.
CAN_T lamp	When the CAN interface sends data, the indicator light is green.

The method of debugging communication using indicator lights

1) (Only ZLAN 9607) If the NET light is not orange, the network cable is not properly connected. Please check the network cable.
2) If the Link light is not green (only considering TCP working mode), it indicates that the upper computer software has not established a connection with 9607. Please consider whether the IP address is configured in the same network segment.

5 **Installation Method:** The equipment housing is equipped with 35mm standard guide rail clips and hanging ears. In cases where there are guide rails, the equipment can be directly installed into the guide rails.

Figure 5 Guide rail clips

The installation of the backplate hanging ears of the equipment and the fixed installation of the desktop hanging ears are shown in the following figure:

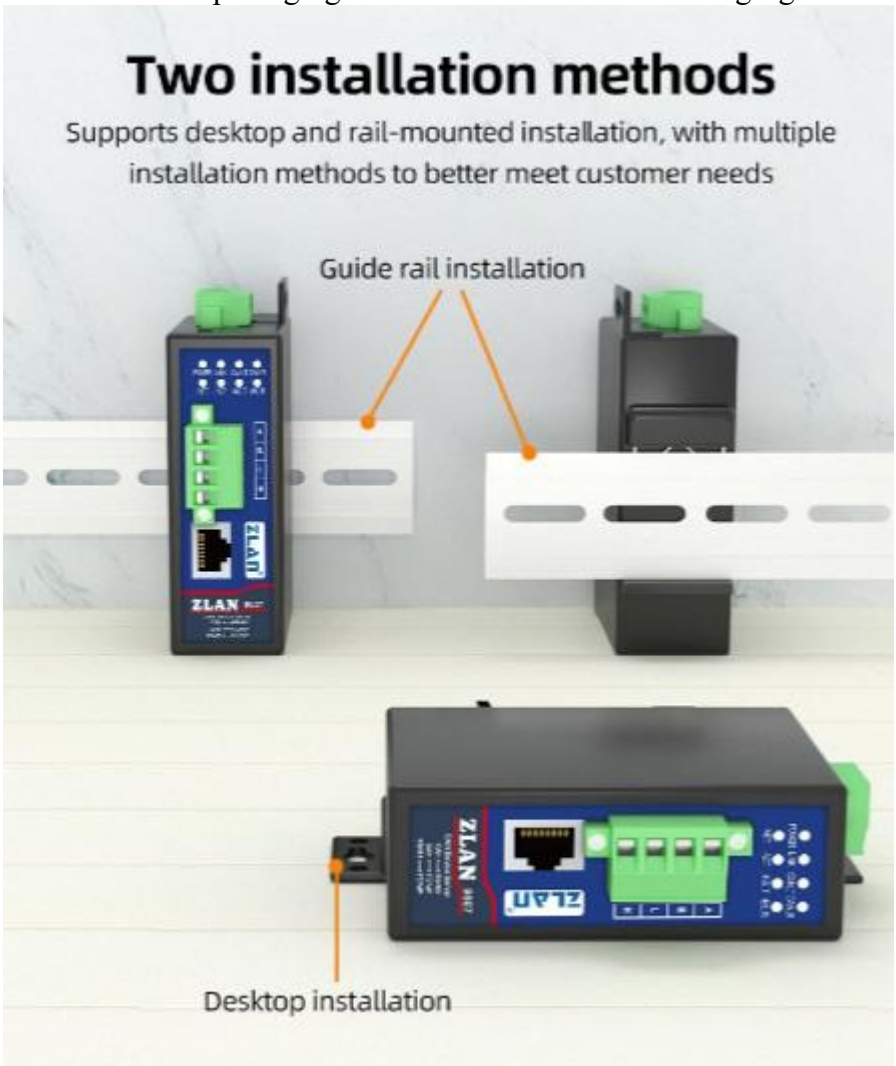

Figure 6 Installation schematic diagram

4.2. Hardware Connection

Generally speaking, ZLAN 9600/9607 needs to be connected to power supply, serial port, CAN and network cable according to the on-site application.

Among them, the power supply can adopt the on-site 2-wire switching power supply or be directly connected to the positive and negative terminals of the power supply.

The RS485 serial port needs to be connected according to the user's serial port device. Connect the positive terminal of 485 to A and the negative terminal to B.

(Only ZLAN 9607) The network port can be connected to a regular network cable. It can be directly connected to a computer or connected to the network through a switch.

4.3. Software installation

4.3.1. ZLVirCom Software installation

ZLVircom can be used to configure parameters such as the network of 9607 devices and to create virtual serial ports. If the virtual serial port function is not required, the no-installation version can be downloaded. Download linkhttp://www.zlmcu.com/download.htm

Table 3 Versions of ZLVircom

Software name	Specifications
ZLVircom Device Management Tool (non-installed version)	The non-installed version does not include the virtual serial port function.
ZLVircom-Device Management Tool (Installation version)	The installed version contains ZLVircom_x64.msi and ZLVircom_x86.msi. 64-bit operating systems install x64, 16-bit operating systems install x86 versions.

Just follow the default prompts when installing. After installation is complete, zlvircom will be launched each time the computer starts up to create a virtual serial port at startup.

4.3.2 Installation of 9600 configuration tool

The 9600_Tool configuration tool CAN be used to configure relevant parameters such as serial ports and CAN ports. You can download it from our company's official website or contact our technical department to obtain it.

After downloading this configuration tool, there is no need for installation. You can directly open and use it. For parameter descriptions and usage methods, please refer to the following text.

4.4. Serial Port /CAN Port Parameter Configuration

After downloading 9600_Tool, connect the device to the computer using an RS485 to USB data cable. The software operation is shown in Figure 7. At the left serial port Settings, set the RS485 serial port parameters of the device. The default factory setting of the device is a baud rate of 115200, 8 data bits, 1 stop bit, and no parity bit. After clicking to open the serial port, users can search for and set the device parameters in this interface, then click Save and set. The software will automatically close the serial port. At the same time, the device will restart and load new parameters.

Note: After modifying the serial baud rate in 9600_Tool, 9607 needs to enter vircom to change the serial baud rate to be consistent; otherwise, it may affect communication.

Figure 79600 Debugging tool diagram

The default factory setting parameter values are as follows:

Table 49600/9607 Default Setting Parameters

Parameter name	Default parameters
CAN configuration	
CAN baud rate	100000
CAN packaging frame rate	50 frames
CAN packaging interval	10ms
Frame ID	0x96

Frame format	Standard frame
Frame type	Data frame
CAN_ID filtering configuration	
Standard frame filtering mode	No filtering
Expand the frame filtering mode	No filtering
Upper limit of range	(Blank
Lower limit of the range	(Blank
List	(Blank
Serial port configuration	
Baud rate	115200
Data bit	8
Stop position	1
Check bit	None
Serial port subpackage length	1024
Serial port subcontracting interval	3
Transmission mode	
CAN-> Serial Port	CAN frame transparent transmission
CAN-> Network port	CAN frame transparent transmission
Network Port -> Serial Port	Transparent transmission
Serial Port ->CAN	CAN frame transparent transmission
Serial port -> Network Port	Transparent transmission
Network Port ->CAN	CAN frame transparent transmission

The detailed meanings of the parameters are as follows:

Table 59600/9607 CAN Detailed Parameter Meanings

CAN baud rate	40000~1000000	The communication baud rate of the CAN interface.
CAN packaging frame rate	0~50	After receiving a certain number of CAN frames, package them and send them to the network port/serial port.
CAN	0~255	If no CAN frame is received within a certain

packaging interval		period of time and the time exceeds the packaging interval, it will be directly packaged and sent to the network port/serial port.
Frame ID	0x01~0x1FFFFFFF(Extended Frame)	User-defined CAN frame ID: When the serial port/network port transmission mode is set to "Convert to CAN frame", the converted CAN frame ID is set for this purpose.
Frame format	0x01-0x7FF(Standard frame)	When the transmission mode of the serial port/network port is set to "Convert to CAN frame", the format of the converted CAN frame is set accordingly for the user-defined CAN frame type.
Frame type	Standard frame/Extended frame	The user-defined CAN frame type is set when the serial port/network port transmission mode is set to "Convert to CAN frame", and the converted CAN frame type is set accordingly.
Standard frame filtering mode	Data frame/remote frame	Mode selection for standard frame filtering.
Expand the frame filtering mode	No filtering/Range acceptance/range rejection/whitelist/blacklist	Mode selection for extended frame filtering.
Upper and lower limits of the range	No filtering/Range acceptance/range rejection/whitelist/blacklist	The upper and lower limits of the range set when the filtering mode is "Range Acceptance"/" Range rejection ". When set to "Range Acceptance", CAN frames that match the set range frame ID will be

		received. When set to "Range Rejection", CAN frames that match the set range frame ID will be rejected. It includes upper and lower limits.
List	0x01~0x1FFFFFFF(Extended Frame)	The filter list Settings when the filtering mode is "whitelist"/" blacklist ". When set to the "whitelist", only CAN frames that match the frame ids on the list will be received. When set to "blacklist", CAN frames that match the frame ids on the list will be rejected.
Transmission mode	Do not transmit /CAN frame transparent transmission/Convert to CAN frame/only transmit data	The setting of the transmission mode: The transmission mode among the three interfaces can be set in one direction separately. If set to "Do not Transmit", no data will be transmitted in this direction. If it is set to "CAN frame Transparent Transmission", CAN frame data will be transmitted in this direction, but the data in this direction must comply with the CAN frame protocol. If set to "Convert to CAN Frame", all the data in this direction will be treated as data fields and combined with the user-defined CAN frame ID/ format/type to form a complete CAN frame. This mode is only available for the serial port/network port ->CAN direction. If set to "Transmit Data Only", the data in this direction will only retain the data field, and the frame ID/ format/type will be cropped. This mode requires that the transmitted data must comply with the CAN frame protocol and CAN only be used in the CAN-> serial port/network port direction.

4.5. CAN port configuration and usage

4.5.1. Basic Parameters of CAN

The basic parameter of CAN is only the baud rate. The baud rate range supported by ZLAN 9600/ZLAN 9607 is 40k to 1000k. When the baud rate is lower than 125k, the terminal resistor dip switch needs to be set to the power supply end, as shown in Figure 8.

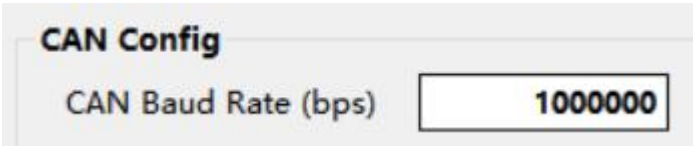

Figure 8 CAN baud rate

Figure 9 Schematic diagram of the resistance switch

4.5.2. CAN frame packaging mechanism

Since the data volume of a single frame at the network end or serial port is much larger than that of CAN, in order to achieve efficient transmission, ZLAN 9600/9607 has added a CAN frame packaging mechanism. Users CAN customize the number of packaging frames and the packaging interval of CAN frames. After receiving the data, the CAN interface cache it first. When either the number of packaging frames or the packaging interval is met, the data is packaged and sent. For example:

Set the packaging frame rate to 50 frames and the packaging interval to 10ms. When the number of cached frames reaches 50 or no new CAN frames are received for 10 consecutive ms, the cached CAN frames will be packaged and sent to the serial port/network port.

Packaging time: Default is 10ms, supported range: 1 to 255.

Packaging frame rate: Default is 50 frames, and the supported range is: 1 to 50.

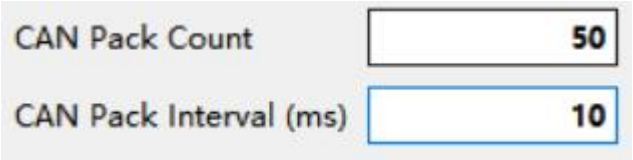

Figure 10 Parameters of CAN frame packaging mechanism

4.5.3. CAN frame filtering

To enhance transmission efficiency and filter out unwanted data on the CAN bus, ZLAN 9600/ZLAN 9607 offers five filtering modes based on CAN frame ID: no filtering/Range acceptance/range rejection/whitelist/blacklist. In addition, the filtering mode can be set separately for standard frames and extended frames.

No filtering: In this mode, all CAN frames are received.

Range acceptance: In this mode, only CAN frames with ids that fall within the user-defined range will be received, while all others will be filtered. The range boundary also belongs to the acceptance range. As shown in Figure 11, CAN frames with ids of 10 and 30 will all be received.

Range rejection: In this mode, CAN frames with ids that fall within the user-defined range will be filtered, and all others will be accepted. The scope boundary also falls within the scope of rejection.

Whitelist: In this mode, CAN frames with ids that match the user's Settings will be received, while the rest will be filtered. The whitelist can be increased by up to 8 at most.

Blacklist: In this mode, CAN frames with ids that match the user's Settings will be filtered out, and all others will be accepted. A maximum of 8 can be set on the blacklist.

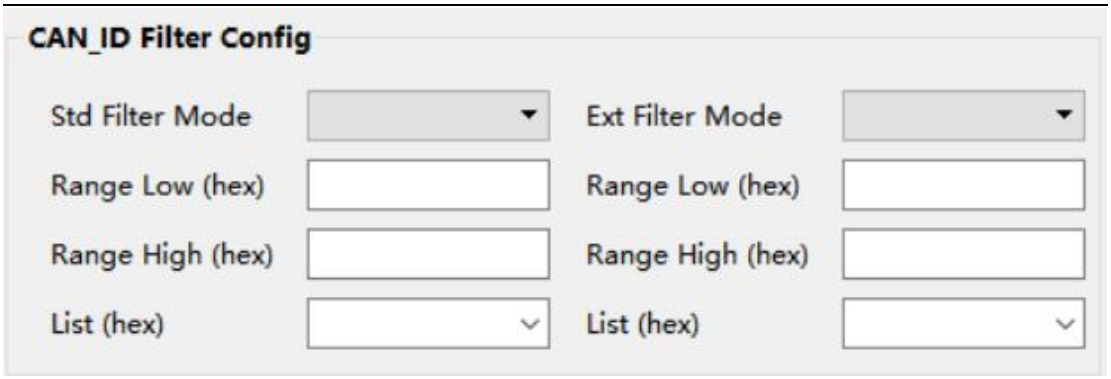

Figure 11 CAN frame filtering parameters

4.5.4. CAN transmission mode

To flexibly adapt to various requirements, the ZLAN 9600 CAN set the transmission mode between CAN and the serial port, and the ZLAN 9607 CAN unidirectionally set the transmission mode of any two interfaces. Among them, the CAN to serial port/network port (only the ZLAN 9607) has three modes: no transmission, CAN frame transparent transmission, and only data transmission.

Do not transmit： As the name suggests, in this mode, all the data received by CAN will not be transmitted to the serial port/network port (only ZLAN 9607). At this point, the CAN interface will not accept any data.

CAN frame transparent transmission： In this mode, the frames received by CAN will be transmitted through the serial port/network port (only for ZLAN 9607). This is the default configuration for ZLAN 9600/9607.

Only transmit data： In this mode, CAN will crop the received frames, retaining only the data field, and then send them to the serial port/network port (only ZLAN 9607). At this time, the CAN packaging mechanism will still be followed. It should be noted that when this mode is enabled in either direction of CAN-> Serial Port/Network Port (ZLAN 9607 only), CAN to serial port/network port (ZLAN 9607 only) will only be able to transmit data domains.

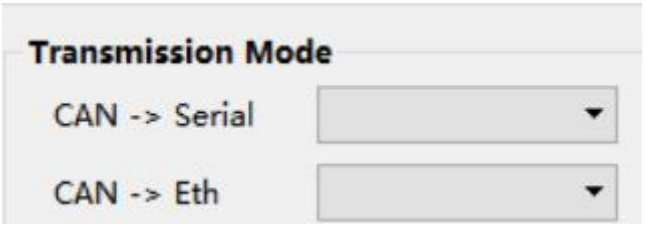

Figure 12 CAN transmission mode

For example, CAN receives an extended data frame: 88 00 02 31 56 01 02 03 04 05 06 07 08. Then the data transmission situation corresponding to the serial port/network port (only ZLAN 9607) is as follows:

Table 6 CAN-> Serial Port/Network Port Data Situation

Transmission mode	Serial port/network port data reception status
Non-transmission mode	No data will be received
CAN frame transparent transmission	88 00 02 31 56 01 02 03 04 05 06 07 08
Only transmit data	01 02 03 04 05 06 07 08

4.6. Serial port configuration usage

4.6.1. Basic Parameters of Serial Port

The basic Settings of a serial port include: baud rate, data bits, stop bits, and check bits.

Baud rate: 300-921600.

Data bit: 8

Stop positions: 1, 2.

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

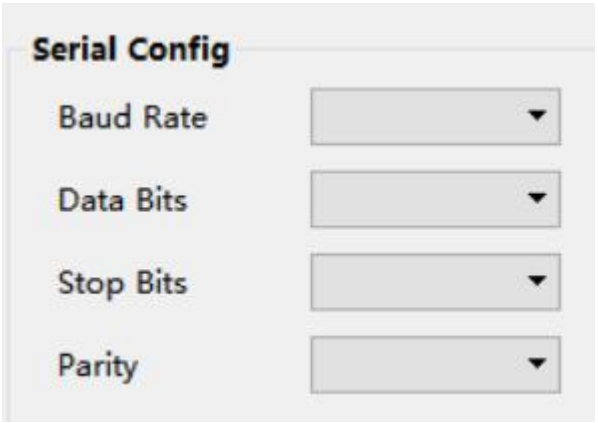

Figure 13 Basic Parameters of the serial port

4.6.2. Serial Port Subcontracting Rules

The ZLAN 9600/ZLAN 9607 supports setting the serial port packet length and interval. The packet length ranges from 0 to 65535 bytes, with a default of 1024 bytes. The packet interval ranges from 0 to 65535 milliseconds, with a default of 3ms.

According to the different baud rates, the subcontracting intervals should be modified accordingly. Take the default setting as an example. When the length of the data received by the serial port exceeds 1024 bytes or no new data is received for 3 consecutive ms, the cached data will be packaged into a data packet and sent to the CAN/ network port.

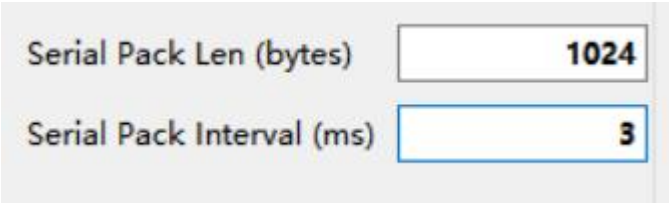

Figure 14 Serial port subcontracting

4.6.3. Serial port transmission mode

To flexibly adapt to various requirements, the ZLAN9607 CAN unidirectionally set the transmission mode of any two interfaces. Among them, the serial port to CAN has three modes: no transmission, CAN frame transparent transmission, and conversion to CAN frame. There are two modes for serial port to network port: no transmission and transparent transmission.

No transmission: At this time, no data received by the serial port will be transmitted to the network port /CAN, which is equivalent to the serial port not receiving any data at this time.

CAN frame transparent transmission: This mode requires that the data received by the serial port must comply with the CAN protocol. The serial port will split the received data into individual CAN frames and transparent them to the CAN interface.

Convert to CAN frame: This mode is only applicable to the serial port to CAN direction. At this time, the serial port will form individual CAN frames of the received data in 8-byte frames, combined with the CAN frame ID/ format/type set by the user, and send them to the CAN interface.

Figure 15 Serial port transmission mode

For example, if the CAN frame ID is set to 0x96, the format is extended frame, and the type is data frame, and the data received through the serial port is: 88 00 02 31 56 01 02 03 04 05 06 07 08, then the data sent through the corresponding CAN interface is as follows:

Table 7 Serial Port -> CAN Data Situation

Transmission mode	CAN port data reception status
Non-transmission mode	No data will be received
CAN frame transparent transmission	88 00 02 31 56 01 02 03 04 05 06 07 08
Only transmit data	88 00 00 00 96 88 00 02 31 56 01 02 03 85 00 00 00 96 04 05 06 07 08

4.7. Network configuration usage (ZLAN 9607)

This configuration mode is only valid for ZLAN 9607 and not for ZLAN9600. Its configuration purpose is to convert serial port /CAN port data into TCP/IP data. Please note

The serial port parameters of the network part should be configured to be the same as those of the 9600_Tool serial port parameters, especially the baud rate should be consistent.

4.7.1. ZLVirCom parameter configuration

After the ZLVircom software is installed and the hardware connection of the device is completed, run the ZLvircom software as shown in the following figure and click "Device Management". Using ZLVircom, you can search for and configure device parameters within different network segments, which is very convenient. As long as the device and the computer running ZLVircom are under the same switch, it can be done.

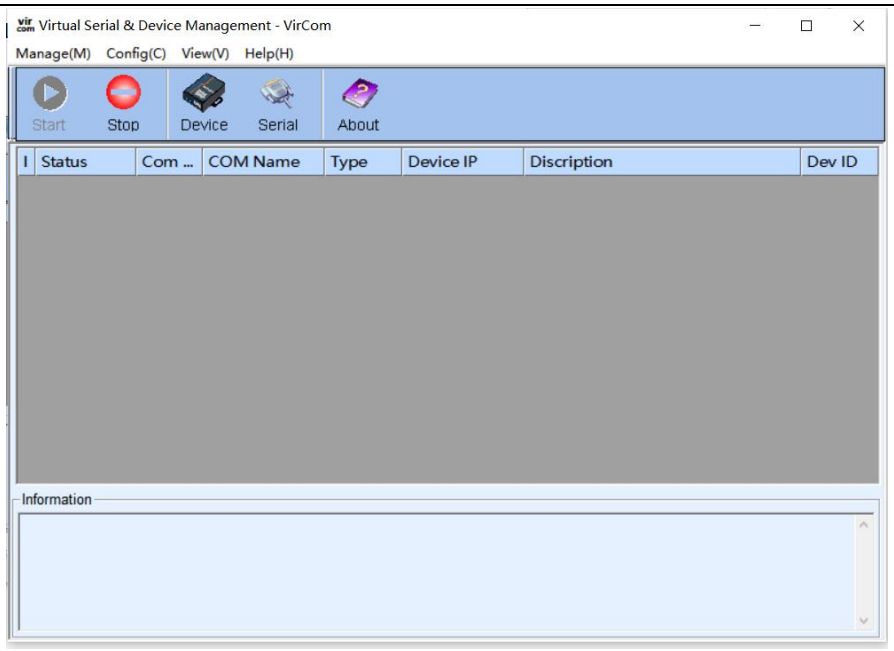

Figure 16 shows the main interface of ZLVircom

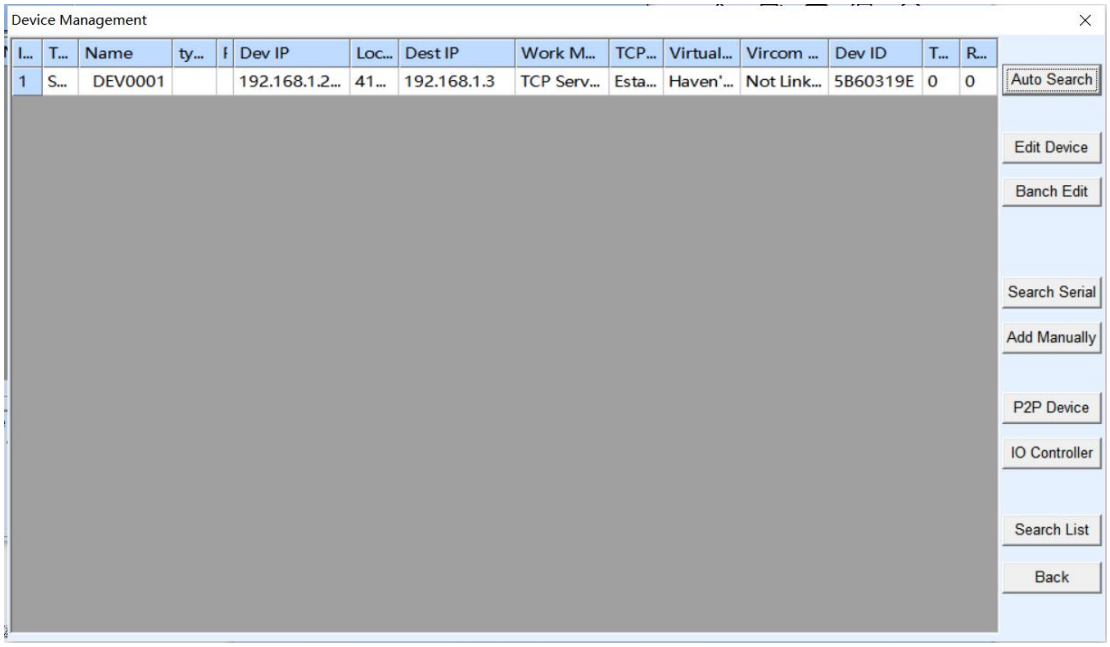

Figure 17 List of Devices

See all the currently online devices from the device list. Click "Edit Device" to configure the parameters.

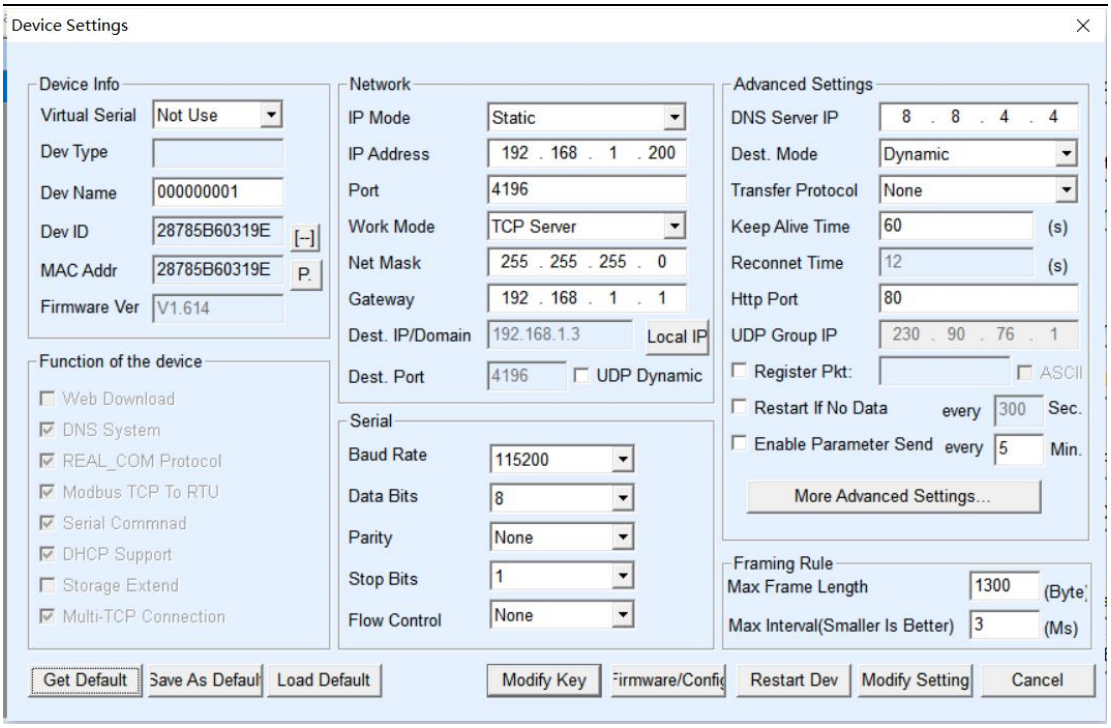

Figure 18 Equipment Parameters

In this interface, users can set the parameters of the device. Then, by clicking "Modify Settings", the parameters will be set to the device's flash and will not be lost in case of power failure. At the same time, the device will automatically restart.

The main parameters configured here are: baud rate, data bits, and parity bits in the serial port Settings. IP address, subnet mask and gateway in network Settings; Sometimes, depending on the computer software, it is also necessary to configure the working mode of the serial port server.

The detailed meanings of the parameters are as follows:

Table 8: Meanings of Network Partial Parameters of 9607

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

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

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

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

		send device parameters to the destination computer at keepalive intervals. If the value is set to 255, no parameter is sent, enabling remote device management.
Disconnected reconnection time	0～255	In TCP client mode, when the connection fails, the TCP connection is re-initiated to the computer at disconnection Reconnection time intervals. The value ranges from 0 to 254 seconds. If the value is set to 255, the reconnection is never performed. Note that the first TCP connection (such as hardware power-on, device restart through zlvircom software, and no data light) is generally carried out immediately, and only after the first connection fails will it wait for the "disconnection reconnection time" to try again, so the "disconnection reconnection time" will not affect the normal connection establishment time between the network and the server.
Web access port	1～65535	Default is 80
Multicast address		Under UDP multicast
Enable registration package		When a TCP connection is established, the registration packet is sent to the computer. The realcom protocol must be selected after the registration package is enabled. TCP server and TCP client modes are supported。

4.7.2. 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 must be the

client. Only then can the client access the server. If both are the client or the server cannot achieve communication.

When the serial port server serves as the client, there must be three corresponding relationships, as shown in the following figure. (1) Working mode correspondence: The working mode of the serial port server is the server mode corresponding to the network tool on the client side. (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 setting it up in this way, the serial port server can automatically connect to the network tool. Once the connection is established, data can be sent and received.

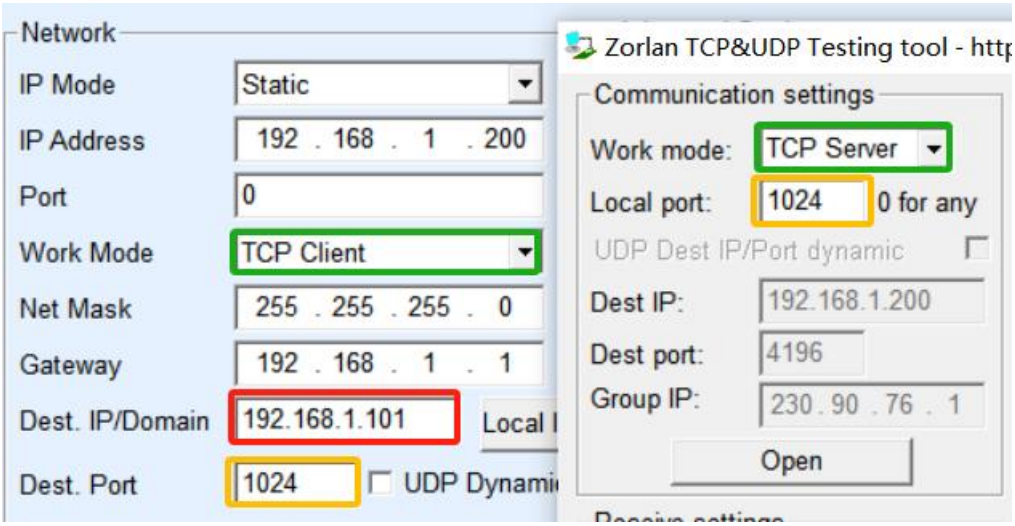

Figure 19 shows the serial port server as the client

1、When in TCP client mode, ZLAN 9607 will proactively initiate a connection to the TCP server (destination ip, port) set by the client to achieve data interaction with the server.

4.7.3. TCP Server Mode

When the serial port server serves as the server, there are also three corresponding relationships, as shown in Figure 20. We will not explain them one by one here. After setting it up in this way, click the Open button of the network tool to establish a TCP connection with the serial port server. Once the connection is established, you can send and receive data.

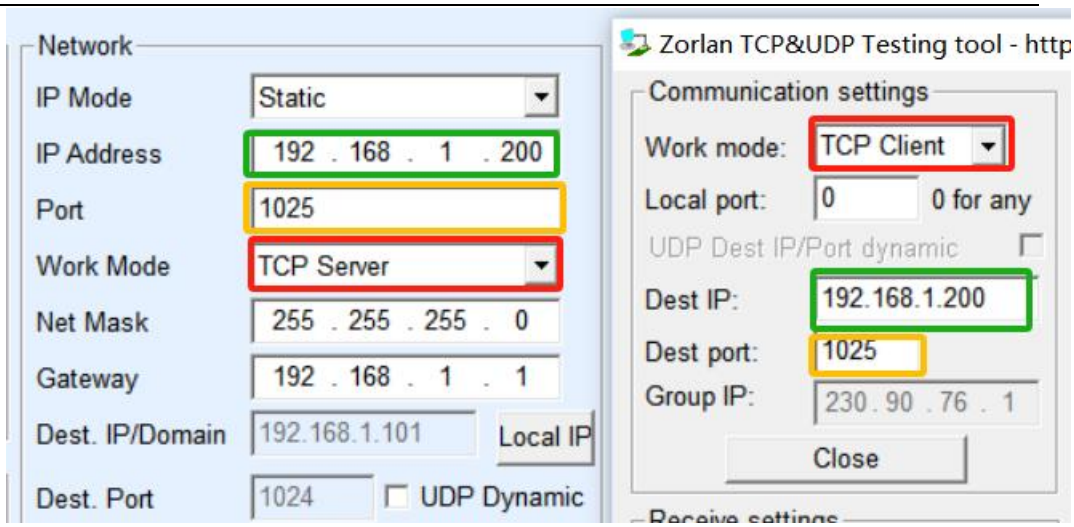

Figure 20: The serial port server serves as the server

When the serial port server serves as the server, it can simultaneously accept 30 TCP connections. The data received through the serial port will be forwarded to all established TCP connections.

4.7.4. UDP MODE

In UDP mode, the parameter configuration is incorrect! Undefined bookmark. As shown, the left side is the configuration of the serial 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 server. As indicated by the blue arrow, the destination IP of the serial server must be the IP address of the computer where the network tool is located, and 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 two-way UDP data communication be guaranteed.

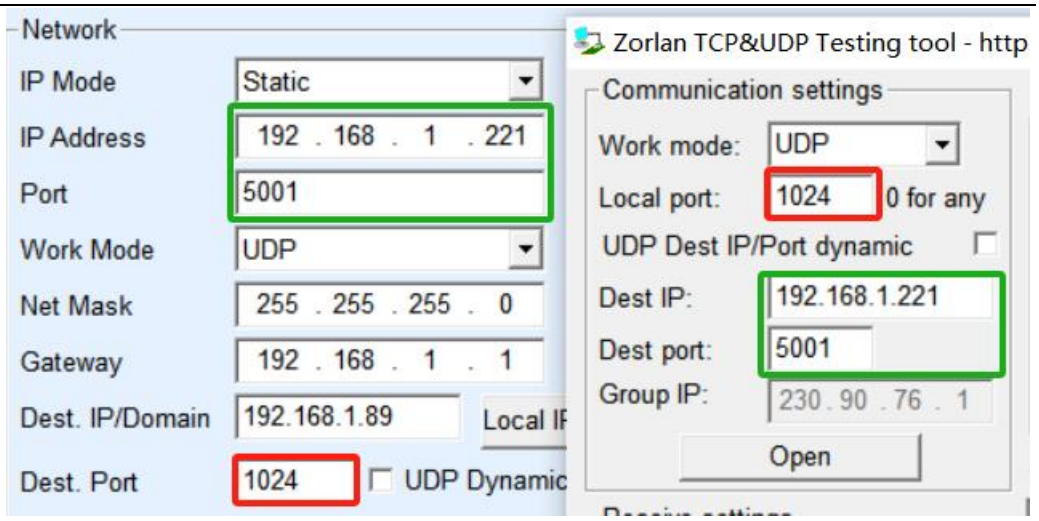

Figure 21 Configuration of UDP mode parameters

4.7.5. Virtual Serial Port Testing

In Figure 22, SocketTest communicates directly with 9607 via TCP. To enable the user's already developed serial port software to also communicate with the device, a virtual serial port needs to be added between the user program and the device. As shown in Figure 22, ZLVircom and the user program are running on a computer. ZLVircom virtualizes a COM port and makes this COM port correspond to this serial server. When the user program enables COM communication, it can be sent to the user's serial port device via ZLVircom9607. The following demonstrates the operation steps:

Figure 22 The Function of the virtual serial port

Click on "Serial Port Management" on the main interface of ZLVircom, then click "Add", and select "Add COM5", where COM5 is the COM port that did not

originally exist on the computer.

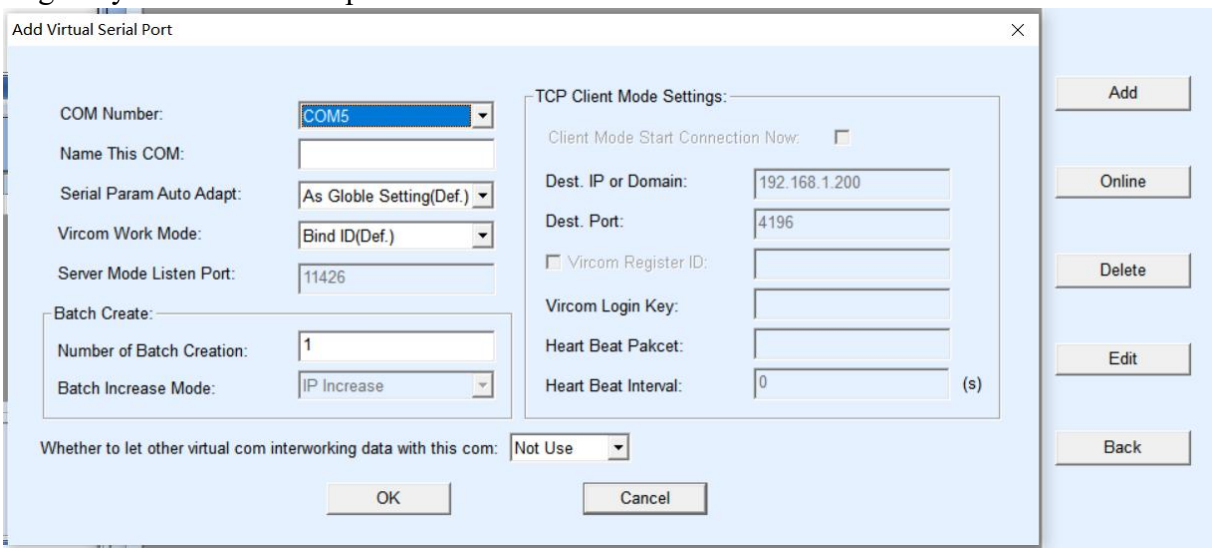

Figure 23 Adds a virtual serial port

Then enter Device Management and double-click the device that needs to be bound to COM5. As shown in Figure 23, select COM5 from the "Virtual Serial Port" list in the upper left corner. Then click "Modify Settings". And return to the main interface of ZLVircom. It can be seen that COM5 has been connected to the device with IP address 192.168.1.200. At this point, COM5 can be used instead of SocketTest for communication.

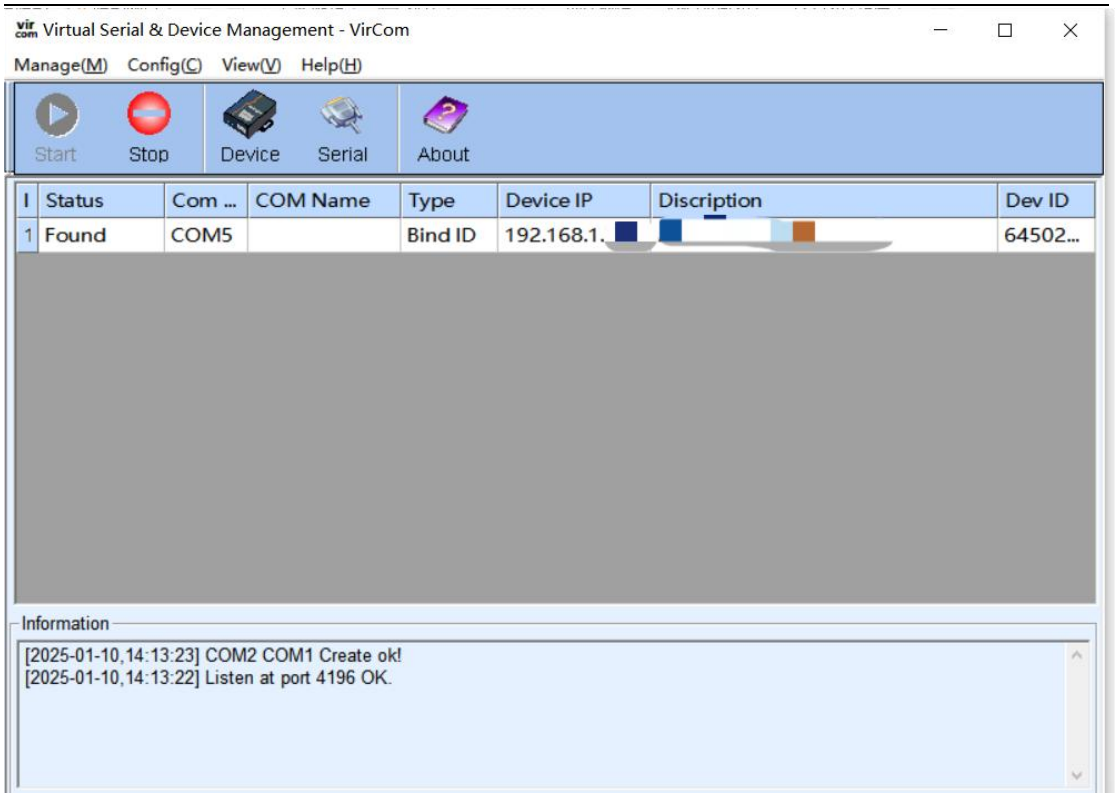

Figure 24 shows that the virtual serial port has been connected

Open ZLComdebug to simulate the user's serial port program, open COM5(the virtual serial port mentioned above), and then open another ZLComdebug to simulate a serial port device, open COM4(hardware serial port). At this point, the data transmission link of COM5 is as follows: COM5ZLVircom serial server network port Serial server Serial port COM4. Conversely, COM4 to COM5 can also transfer data: COM4 serial port server Serial port server network port ZLVircomCOM5. As shown in Figure 24, the data sending and receiving situations of both parties.

If COM4 is replaced with the user's serial port device, COM5 can achieve communication with the user's device.

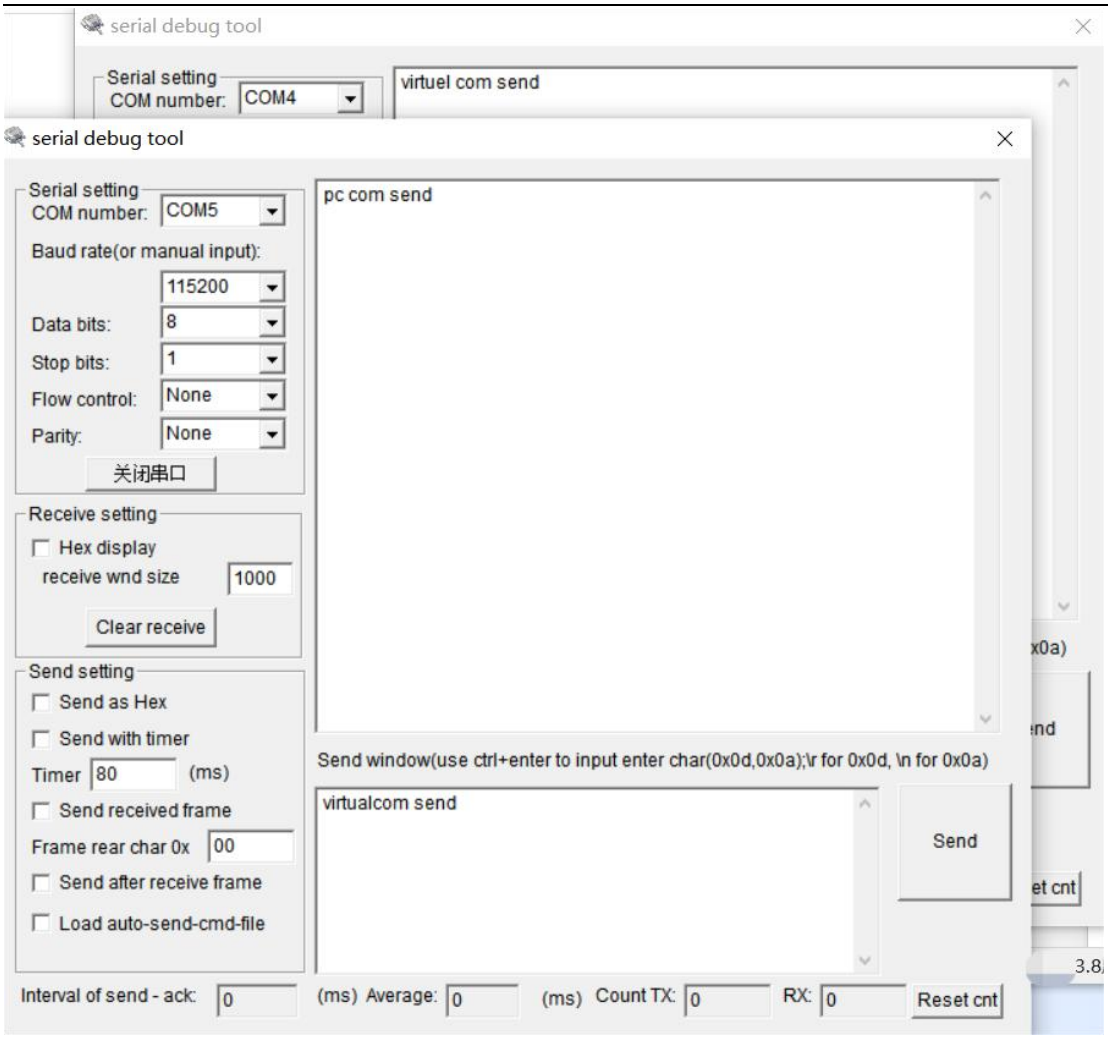

Figure 25: Communication via virtual serial port

4.7.6. Network port transmission mode

To flexibly adapt to various requirements, the ZLAN9607 CAN unidirectionally set the transmission mode of any two interfaces. Among them, there are three modes from the network port to CAN: no transmission, CAN frame transparent transmission, and conversion to CAN frame. There are two modes for network port to serial port: no transmission and transparent transmission.

No transmission: At this time, any data received by the network port will not be transmitted to the serial port /CAN, which is equivalent to the network port not receiving any data at this time.

CAN frame transparent transmission: This mode requires that the data received

by the network port must comply with the CAN protocol. The network port will divide the received data into individual CAN frames and transparent them to the CAN interface.

Convert to CAN frames: This mode is only applicable in the direction from the network port to CAN. At this time, the network port will send the received data into individual CAN frames of 8 bytes each, combined with the CAN frame ID/ format/type set by the user, to the CAN interface.

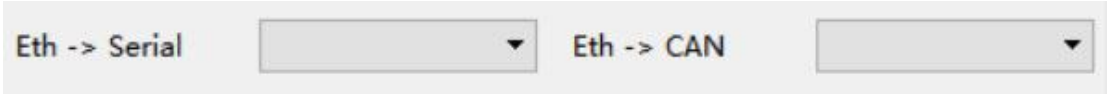

Figure 26 Network port transmission mode

For example, if the CAN frame ID is set to 0x96, the format is extended frame, and the type is data frame, and the data received by the network port is: 88 00 02 31 56 01 02 03 04 05 06 07 08, then the data sent by the corresponding CAN interface is as follows:

Table 9 Network Port -> CAN Data Situation

Transmission mode	CAN port data reception status
Non-transmission mode	No data will be received
CAN frame transparent transmission	88 00 02 31 56 01 02 03 04 05 06 07 08
Only transmit data	88 00 00 00 96 88 00 02 31 56 01 02 03 85 00 00 00 96 04 05 06 07 08

5. Ordering Information

Table 10 Ordering Information

Model	Introduction
ZLAN9600	CAN/RS485 conversion gateway
ZLAN9607	CAN/RS485/ Ethernet conversion gateway

6. After-sales service and technical support

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