

8-CH RS485 TO POE ETH (B)

From Waveshare Wiki

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Overview

Introduction

This is an industrial-grade multifunctional serial port device data collector / IoT gateway with 8-channel RS485 and Ethernet interfaces (optional PoE version). Its unique design, small size, easy installation, cost-effective, suitable for data

8-CH RS485 TO POE ETH (B)



(<https://www.waveshare.com/8-CH-RS485-TO-POE-ETH-B.htm>)

RS485 to ETH module, 8-CH
RS485/Ethernet

8-CH RS485 TO ETH (B)



(<https://www.waveshare.com/8-CH-RS485-TO-ETH-B.htm>)

RS485 to ETH module, 8-CH
RS485/Ethernet

collection, IoT gateway, security IoT and intelligent instrument monitoring and other fields, to meet the needs of various application scenarios.

Parameters Comparison

Model	8-CH RS485 TO ETH (B)	8-CH RS485 TO POE ETH (B)
Product Type	Serial server, Modbus Gateway, MQTT Gateway	
Basic Function	Bi-directional transparent data transmission between RS485 and Ethernet	
Communication Interface	RS485 × 8, Network port × 1	
Power supply mode	Screw terminal DC 7~36V	
	Without PoE port for power supply	With PoE port for power supply
Isolation Protection	Power isolation, signal isolation protection	
Communication Interface		
Ethernet	Common network port	PoE port, supports IEEE 802.3af standard
	10/100M self-adaptive RJ45 interface, 2 KV surge protection	
Serial Port	Isolation type RS485 (4 channels can receive and transmit independently at the same time)	
UART Specifications		
Baudrate	300 ~ 115200 bps	
Parity Bit	none, odd, even, mark, space	
Data Bit	5 ~ 9 bits	
Flow Control	N/A	
Software		
Protocol	ETHERNET, IP, TCP, UDP, HTTP, ARP, ICMP, DHCP, DNS	
Configuration	Host, WEB browser, device management functions library	
Communication Method	TCP/IP direct communication, VCOM	
Operating Mode	TCP server, TCP client (coexisting with TCP server), UDP mode, UDP multicast	
Other		
Operating Temperature	-40℃ ~ 85℃	
Humidity Range	5% ~ 95% relative humidity	
Dimensions	L × W × H: 93.0 × 103.5 × 29.7 mm	

Hardware Description



(/wiki/File:8-CH-RS485-TO-ETH-B-details-inter.png)

Software Features

- Supports TCP server, TCP client, UDP mode, and UDP multicast. When acting as a TCP client, it also supports TCP server-side functions. It supports 30 TCP connections as a TCP server and 7 destination IPs as a TCP client.
- The baud rate supports 1200~115200bps, the data bit supports 5~9 bits, and the check digit can be no check, odd check, even check, mark, or space.
- Supports the function of sending MAC address when the device is connected, which is convenient for cloud management of the device.

- Provides a secondary development kit DLL development library for searching for and configuring devices on the computer side.
- Supports Web browser configuration, obtaining dynamic IP via DHCP, DNS protocol connected domain server address.
- Supports cloud remote search for devices, the configuration of device parameters, and device program upgrades.
- Supports remote viewing of the device's TCP connection status, and serial port data sending and receiving status through software. The virtual serial port supports the data monitoring function.
- Note: This module is 8-channel, and each channel supports the above functions separately

Advanced Software Functions

- Supports Modbus gateway function, support Modbus RTU to Modbus TCP. It can support storage-type Modbus, and can automatically collect device data and store it; it also supports a non-storage mode Modbus gateway.
- Supports multi-host function: In the query mode of one question and one answer, supports that the network port allows multiple computers to access the same serial device at the same time.
- Supports MQTT gateway function.
- Supports JSON to Modbus RTU and 645 device protocols, and supports uploading data in HTTP POST and HTTP GET formats.
- Supports NTP protocol to obtain network time, which is used for serial output, and the latter is used for protocol content upload.
- Supports custom heartbeat package and registration package function: It is convenient to communicate with the cloud and identify devices.
- Supports the function that password authentication is required to establish a connection through TCP to ensure connection security.
- Supports the function of data submission and delivery in HTTP mode, and the cloud can directly use the HTTP GET command to interact with the serial port data of the device.

Applications

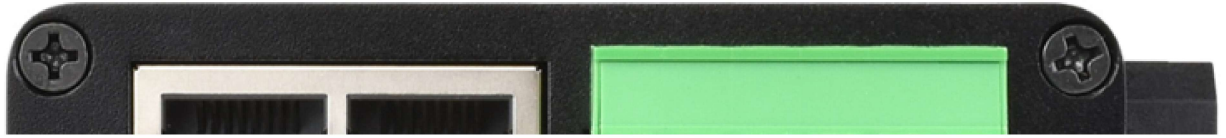
- As an IoT gateway, serving as a communication bridge between devices and the cloud
- Electricity, smart meters, and energy consumption monitoring
- Remote monitoring and program download of various automation PLCs
- Various configuration software and equipment communication interfaces
- Access control security field equipment networking

Quick Test

Hardware Connection

- Here 8-CH RS485 TO POE ETH (B) is taken as an example, and 8-CH RS485 TO ETH (B) is connected in the same way. The following connection diagram is for testing purposes only. If practical applications require consideration of the usage environment, ensure that the module can work properly.

Generally speaking, the serial server only needs to connect the power supply, serial port, and network cable. The power supply is directly connected to the positive and negative terminals. The serial port needs to be connected according to the user's serial port device. Connect 485-1 A to 485-2 A, and 485-1 B to 485-2 B. You can connect a network port with a regular network cable to a computer directly or through a switch to connect to the network.



(/wiki/File:8_CH_RS485_POE_ETH_B_01.png)

Software Installation

Vircom can be used to configure parameters such as device IP and create virtual serial ports. If you don't need the virtual serial port function, you can download the installation-free version of the configuration software only.

- VirCom_en (https://files.waveshare.com/wiki/common/VirCom_en.rar): English version of the configuration software
- Virtual-serial-port (<https://files.waveshare.com/wiki/common/Virtual-serial-port-control3.5.rar>): Virtual serial port driver

To install the driver, you need to unzip it, double-click the software to install. If the virtual serial port is not displayed in Vircom, restart it and check again.

Example Demonstration

TCP Communication Test

Software Preparation

- VirCom_en (https://files.waveshare.com/wiki/common/VirCom_en.rar)

- Serial port debugging assistant (<https://files.waveshare.com/wiki/common/Sscom5.13.1.zip>)

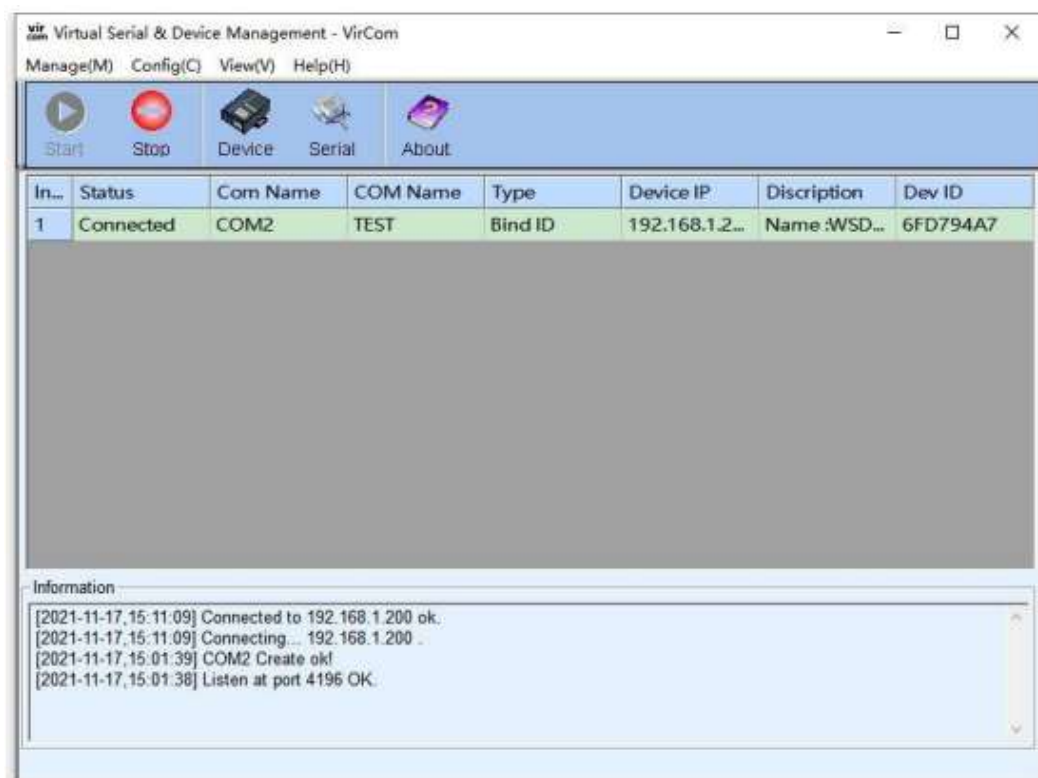
Operation Steps

After Vircom is installed and the device hardware connection is finished, the software is run as shown in the figure, and then you can click "Device Management" as shown in the figure. With Vircom, it is very convenient to search for and configure device parameters in different network segments, as long as the device and the computer running Vircom are under the same switch.



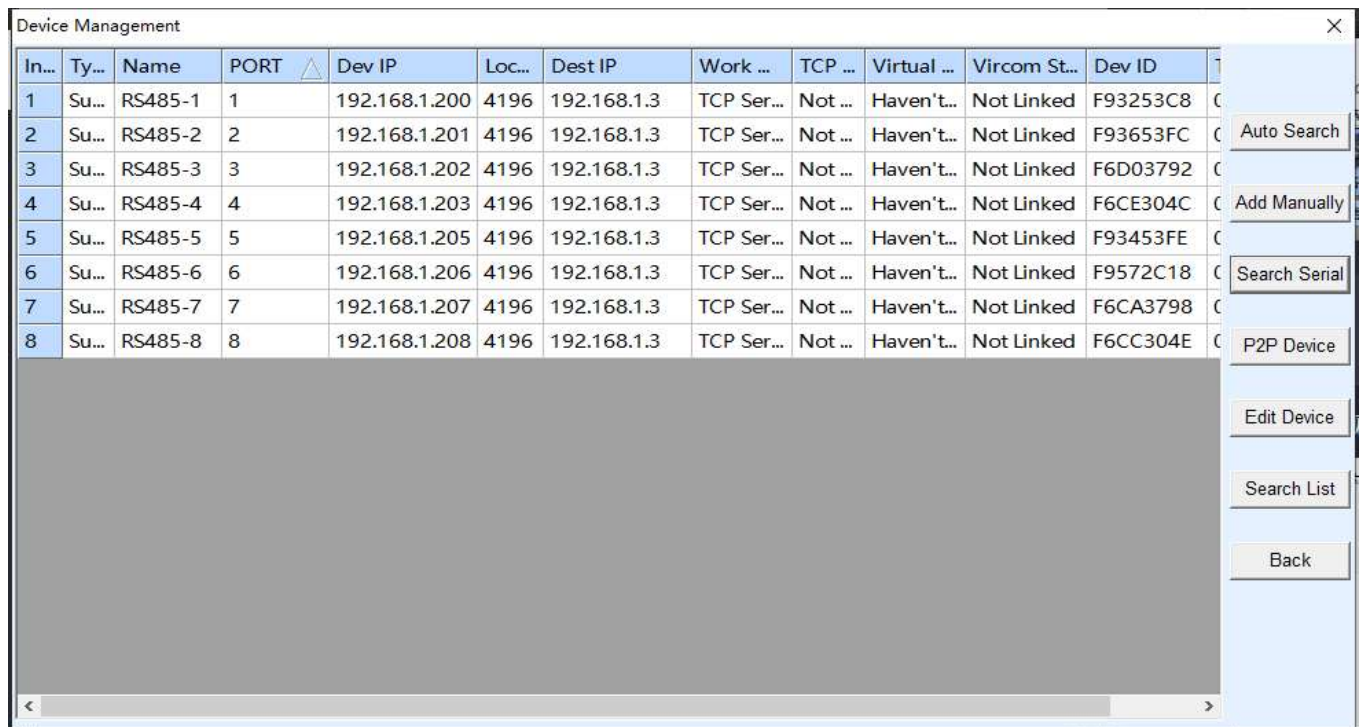
(/wiki/File:8_CH_RS485_POE_ETH_B_03.png)

The serial port to network port and network port to serial port data transparent forwarding function of the serial port server. As shown in the figure below:

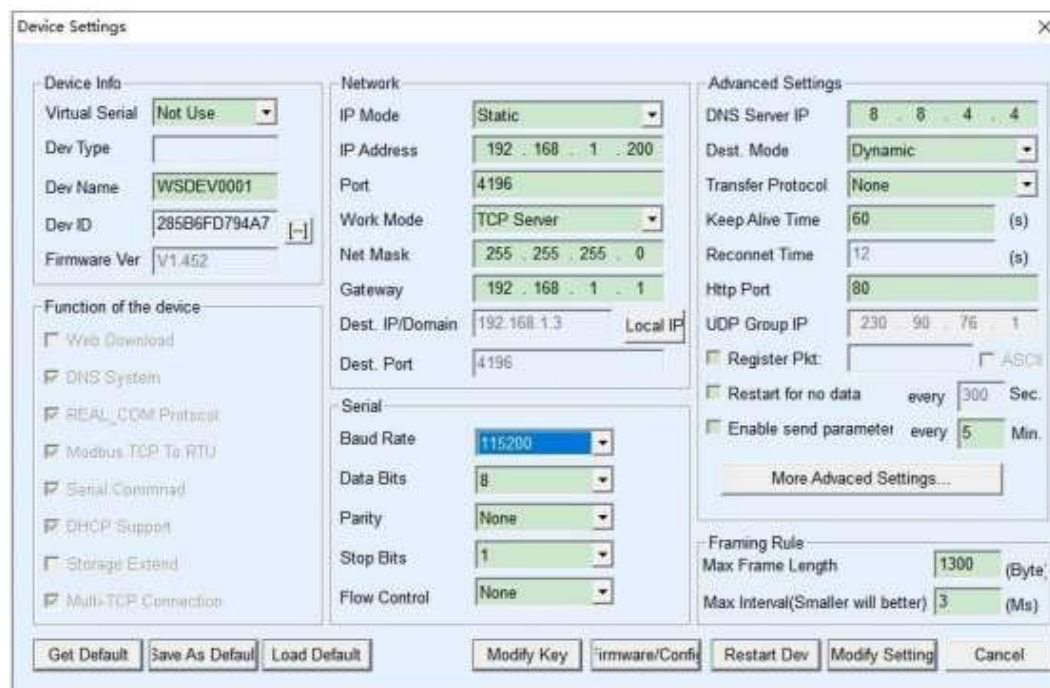


(/wiki/File:RS485_TO_ETH_(B)_Manual_104.png)

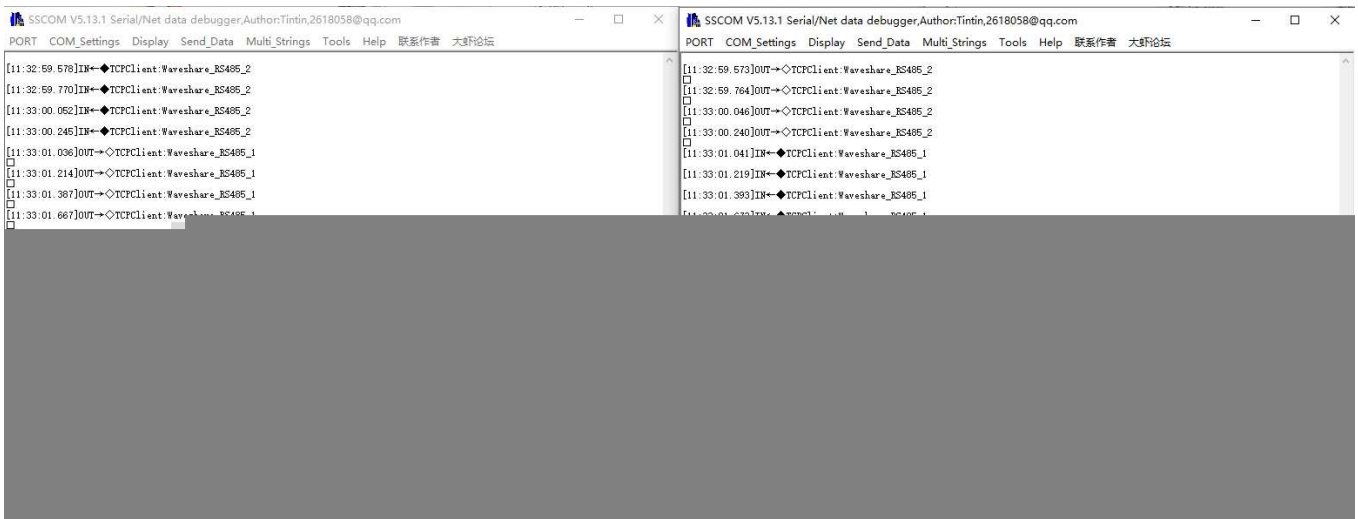
In addition, open two serial port debugging assistant windows, and as a TCP client, fill in the destination IP as the IP of the serial port server (currently 192.168.1.200 and 192.168.1.201), the destination port is 4196, and then click on the "Open" button, as shown below:



(/wiki/File:8_CH_RS485_POE_ETH_B_020.png)



(/wiki/File:RS485_TO_ETH_(B)_Manual103.png)



(/wiki/File:2-CH-RS485-TO-ETH-(B)-4.jpg)

In the serial debugging assistant SSCOM1 set as TCPClient, enter "TCPClient:Waveshare_RS485_1" and click Send, then the data will be transferred to the RS485 interface through the serial server's network port, and then sent to another TCPClient, and then displayed in the serial debugging assistant SSCOM2; conversely, enter "TCPClient:Waveshare_RS485_2" in SSCOM1, click Send, it can also be sent to SSCOM2 and displayed.

Virtual Serial Port Test

The SSCOM2 in the diagram communicates directly with the serial port server via TCP. In order to allow users to communicate with the serial port server using their existing serial port software, a virtual serial port needs to be added between the user program and the serial port server. As shown in the diagram, Vircom and the user program run on the same computer. Vircom virtualizes a COM port that corresponds to the serial port server. When the user program opens the COM communication, it can send data to the user's serial port device through the Vircom serial port server. The following steps demonstrate this operation:



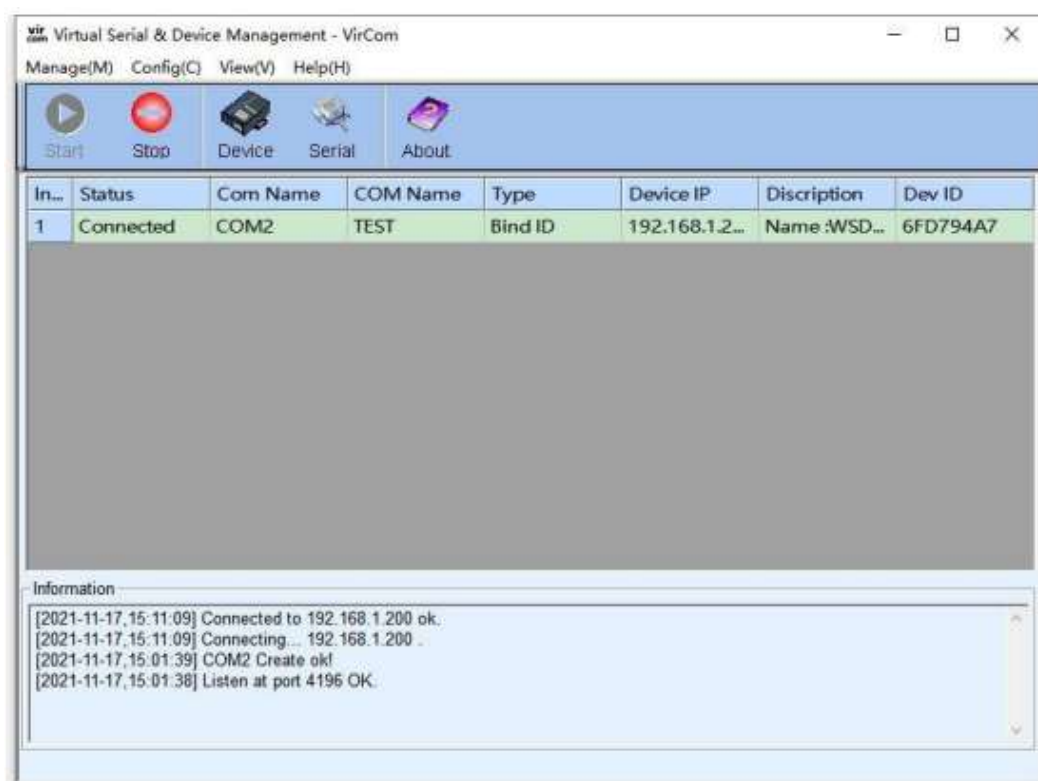
(/wiki/File:8_CH_RS485_POE_ETH_B_04.png)

Click on "Serial Port & Device Management" on the Vircom main interface, then click "Add" and select to add COM2. Among them, COM2 is the newly emerging COM port on the computer.



(/wiki/File:RS485_TO_ETH_(B)_Manual_103.png)

Then enter the device management and double-click the device that needs to be bound to COM2. As shown in the diagram, select COM2 from the Virtual Serial Port list in the top left corner. Then click on "Modify Setting" and then click on "Restart Device". Return to the main interface of Vircom. It can be seen that COM2 has been connected to the device whose IP is 192.168.1.200. In this case, COM2 can be used instead of SSCOM2 for communication.

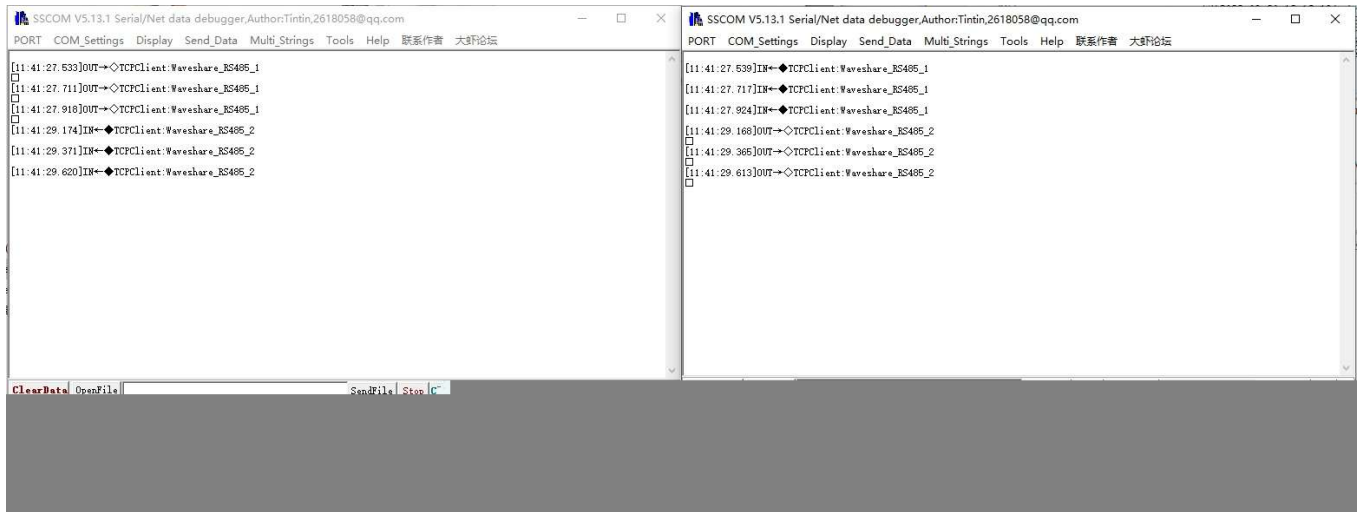


(/wiki/File:RS485_TO_ETH_(B)_Manual_104.png)

Open SSCOM to simulate the user's serial port program, open COM2 (the virtual serial port above), open another SSCOM to simulate a serial port device, and open COM3 (hardware serial port). At this time, the link for COM2 to send data is as follows: COM2 —> Vircom —>

the network port of the serial server —> the serial port of the serial server —> COM3.

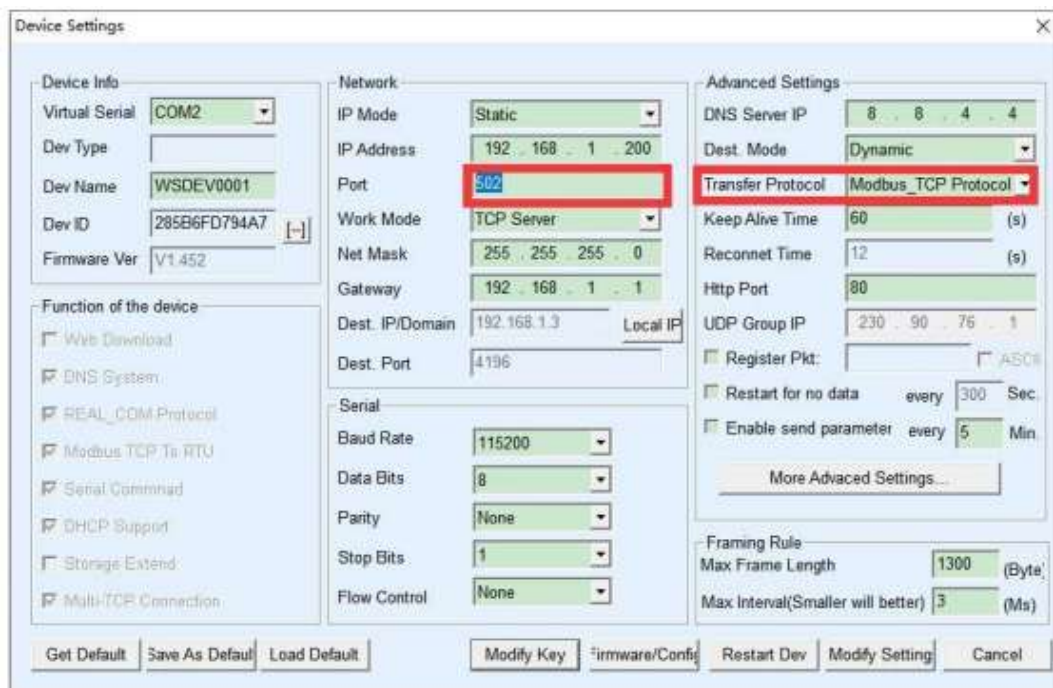
Conversely, data can also be transmitted from COM3 to COM2: COM3 —> the serial port of the serial server —> the network port of the serial server —> Vircom —> COM2. As shown in the figure below, both parties send and receive data. If COM4 is replaced with the user serial device, then COM5 can realize the communication with the user device.



(/wiki/File:2-CH-RS485-TO-ETH-(B)-6.jpg)

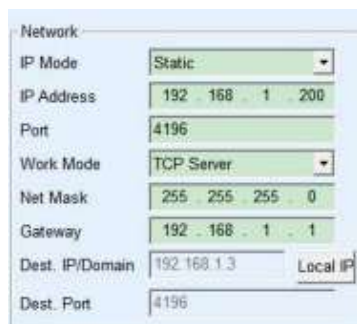
MODBUS TCP Test

By default, the data between the serial port and network port is transparently transmitted. If you need to implement Modbus TCP to RTU conversion, you need to select the Transfer protocol as "Modbus TCP<-->RTU" in the Device Settings dialog, as shown in the diagram below. In this case, the device port automatically changes to 502. Users can connect their Modbus TCP tool to the IP of the serial port server on port 502, and the Modbus TCP commands they send will be converted to RTU commands and outputted through the serial port. For example, if the serial server's Ethernet port receives a Modbus TCP command of 00 00 00 00 0601 03 00 00 0a, the serial port outputs the command of 01 03 00 00 00 0a c5 cd. Note: The serial port may send multiple 01 03 00 00 00 0a c5 cd commands because the default Modbus adopts the storage mode, which will automatically poll the query commands. How to switch to non-storage mode will be explained later.



(/wiki/File:RS485_TO_ETH_(B)_Manual_050.png)

If the user's Modbus TCP software is used as a slave station (Slave), it is necessary to select the conversion protocol, then change the working mode to the client, the destination IP to the IP of the computer where the Modbus TCP software is located, and the destination port to 502, as shown in the figure below.



(/wiki/File:RS485_TO_ETH_(B)_Manual_051.png)

WEB Configuration

Using Vircom, you can search for and configure device parameters in different network segments. For Web configuration, you must first ensure that the computer and the serial server are in the same IP segment, and you need to know the IP address of the serial server in advance. But Web configuration can be done on any computer without Vircom. (Different products have different web interfaces)

1. Enter the IP address of the serial server in the browser, such as <http://192.168.1.200> (<http://192.168.1.200>) to open the following web page:



(/wiki/File:8_CH_RS485_POE_ETH_B_05.png)

2. Enter password in "Password": There is no login password set by default in the factory, you can enter a password at will, and click the Login button to log in. After setting the password to log in, the settings at "Modify Web Login Key" will take effect:


Logout
Chinese

Device Information

Device Name	RS485-1	Firmware Version	V1. 486	Device MAC	04-EE-E8-11-0F-09
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Network Settings

Device IP	192.168.1.200	Device Port	4196	Device Web Port	80
Work Mode	TCP Server	Subnet Mask	255.255.255.0	Gateway	192.168.1.1
Destination IP/DNS	192.168.1.206	Destination Port	4196	IP mode	Static

Serial Settings

Baud Rate	115200	Databits	8	Parity	None
Stopbits	1	Flow control	None		

Advanced Settings

No-Data-Restart	Disable	No Data Restart Time	300 second	5~1270	Reconnect-time	12 second	1~255 second
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Multi-Host Settings

Protocol	None	Instruction Time out	0 32~8000ms	Enable Multi-host	No
RS485 Conflict Time Gap	0 5~255ms				

NOTE: 1. Multi-host is always enabled when Protocol is Modbus TCP to RTU. 2. Time out is always 0 when Multi-host is disabled.
3. Time out only can be set as mulitpy of 32.

Modify Web Login Key

New Key		Input Key Again			
---------	--	-----------------	--	--	--

Submit

(/wiki/File:2-CH-RS485-TO-ETH-(B)-8.jpg)

3. The serial server parameters can be modified on the web page that appears. For the relevant parameters, please refer to Table 4 for the meaning of the parameters.

4. After modifying the parameters, click the "Submit" button.
5. If the configuration web page files are overwritten during the configuration and downloading of MQTT and Jetson Modbus firmware, causing the configuration web page to be inaccessible, please follow these steps to re-download the web page files:
 - ETH configuration interface Web file (https://files.waveshare.com/wiki/8-CH_RS485_TO_POE_ETH_B/8_ch_rs485_waveshare_web.zip) to 8-CH RS485 TO ETH (B)
 - POE ETH configuration interface Web file (https://files.waveshare.com/wiki/8-CH_RS485_TO_POE_ETH_B/8_ch_rs485_waveshare_web_poe.zip) to 8-CH RS485 TO POE ETH (B)
 - The interface web files of the two devices are different, and the corresponding files need to be downloaded.

The screenshot shows the 'Web-config-tool' interface. It has two main sections: 'Webpage directly download mode' and 'Code file download mode'.

Webpage directly download mode:

- Webpage directly in local PC: A dropdown menu showing 'E:\FAQ-QUECTEL\RS485 TO ETH B\2043_waveshare_web_zx'.
- Special configs: A section with a 'Clear all' button and four buttons: 'MB config', 'MQTT config', 'JSON config', and 'Reg packet'.

Code file download mode:

- Select code file: A dropdown menu showing 'C:\firmware.bin'.

Download options:

- Download through the network:**
 - Device IP address or domain: 192.168.10.61
 - Download port (Don't modify): 1092
- Download through serial port:**
 - Serial port: COM1
 - Baudrate: 115200

Device information:

- Device modular type: 2003
- Flash size: 256 KB
- DevID: 285FCAD56BAD
- Bind ID: [button]

A pink arrow points to the 'Download' button at the bottom left. Below the buttons, there is a text instruction: 'Please close the opened webpage of the modular in the browser, before start download.'

(/wiki/File:Web-config-tool.png)

Resources

Documents

- RS485 TO POE ETH (B) MQTT and JSON User Manual ([https://www.waveshare.com/wiki/RS485_TO_POE_ETH_\(B\)_MQTT_And_JSON_User_Manual](https://www.waveshare.com/wiki/RS485_TO_POE_ETH_(B)_MQTT_And_JSON_User_Manual))

Software

- English version of the configuration software (https://files.waveshare.com/wiki/common/VirCom_en.rar)
- Virtual serial port (<https://files.waveshare.com/wiki/common/Virtual-serial-port-control3.5.rar>)
- Sscom serial port debugging assistant (<https://files.waveshare.com/wiki/common/Sscom5.13.1.zip>)

- TCIIP/UDP debugging software (<https://files.waveshare.com/wiki/common/TCP%26UDPDebug.rar>)

Related Application Cases

RS485 TO ETH (B) Connect Alibaba Cloud and EMQX via MQTT ([https://www.waveshare.com/wiki/RS485_TO_ETH_\(B\)_Connect_Alibaba_Cloud_And_EMQX](https://www.waveshare.com/wiki/RS485_TO_ETH_(B)_Connect_Alibaba_Cloud_And_EMQX))

FAQ

Question: What is the power of 8-CH RS485 TO ETH (B)?

Answer:

Answer: 12V 145mA

Question: How to restore the factory settings of 8-CH RS485 TO ETH (B)?

Answer:

Answer: Press RESET for 5 seconds to complete the reset. After the reset, the IP addresses of the two devices will change to 192.168.1.254 and the name will change to WSDEV0001, and then manually modify them

Question: What should I do if the web configuration interface cannot be opened?

Answer:

Other firmware, such as MQTT and Jetson Modbus, which are downloaded for configuration, overwrite the configuration page file, you need to re-download

- ETH configuration interface Web file (https://files.waveshare.com/wiki/8-CH_RS485_TO_POE_ETH_B/8_ch_rs485_waveshare_web.zip) to 8-CH RS485 TO ETH (B)
- POE ETH configuration interface Web file (https://files.waveshare.com/wiki/8-CH_RS485_TO_POE_ETH_B/8_ch_rs485_waveshare_web_poe.zip) to 8-CH RS485 TO POE ETH (B)

Webpage directly download mode
 Webpage directly in local PC:
 ...

Special configs:

Code file download mode
 Select code file:
 ...

Download through the network
 Device IP address or domain:
 Download port (Don't modify):

Download through serial port
 Serial port:
 Baundrate:

Device modual/type: DevID:

Flash size: KB

Please close the opened webpage of the modual in the browser, before start download.

(/wiki/File:Web-config-tool.png)

Question: What are the IP addresses corresponding to 8-CH RS485?

Answer:

The default 8-channel RS485-1~8 correspondence is as follows, which is subject to the search results obtained using VirCom:< br>

RS485-1		192.168.10.200	4196	192.168.1.3
RS485-2		192.168.10.202	4196	192.168.1.3
RS485-3		192.168.1.203	4196	192.168.1.3
RS485-4		192.168.1.201	4196	192.168.1.3

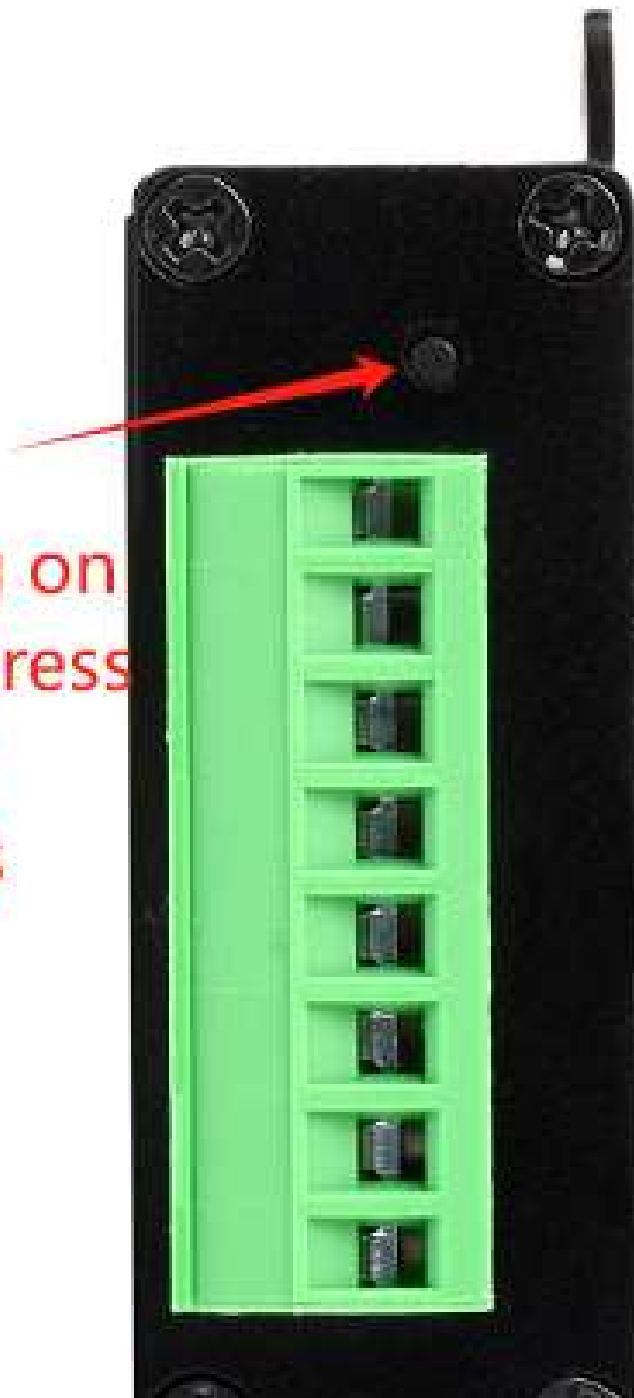
(/wiki/File:485-ip-4ch.png)

Question: How to restore the factory settings?

Answer:

Press and hold the Reset button for 5 seconds, as shown below:

After turning on
the phone, press
and hold for
five seconds



(/wiki/File:Reset-485-4ch.png)

Support

Technical Support

If you need technical support or have any feedback/review, please click the **Submit Now** button to submit a ticket, Our support team will check and reply to you within 1 to 2 working days. Please be patient as we make every effort to help you to resolve the issue.

Working Time: 9 AM - 6 PM GMT+8
(Monday to Friday)

Submit Now (<https://service.waveshare.com/>)

*Retrieved from "[https://www.waveshare.com/w/index.php?title=8-CH_RS485_TO_POE_ETH_\(B\)&oldid=105170](https://www.waveshare.com/w/index.php?title=8-CH_RS485_TO_POE_ETH_(B)&oldid=105170)
([https://www.waveshare.com/w/index.php?title=8-CH_RS485_TO_POE_ETH_\(B\)&oldid=105170](https://www.waveshare.com/w/index.php?title=8-CH_RS485_TO_POE_ETH_(B)&oldid=105170))"*
