

2-CH RS485 TO ETH (B)

From Waveshare Wiki

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Overview

Introduction

This is a 2-ch RS485 device data acquirer/IoT gateway designed for the industrial environment. Dual RS485 can work simultaneously without interfering with each other. It combines multi functions in one, including serial server, Modbus gateway, MQTT gateway, RS485 to JSON, and network switch. The module features dual RS485 and dual Ethernet ports (PoE function optional), uses a DC port (outer diameter: 5.5mm, inner diameter: 2.1mm), and a screw terminal for power input. The case with rail-mount support is small in size, easy to install, and cost-effective. It is suitable for

RS485 POE ETH



(<https://www.waveshare.com/product/rs232-485-422-to-poe-eth-b.htm>)

RS485 ETH



(<https://www.waveshare.com/product/2-ch-rs485-to-eth-b.htm>)

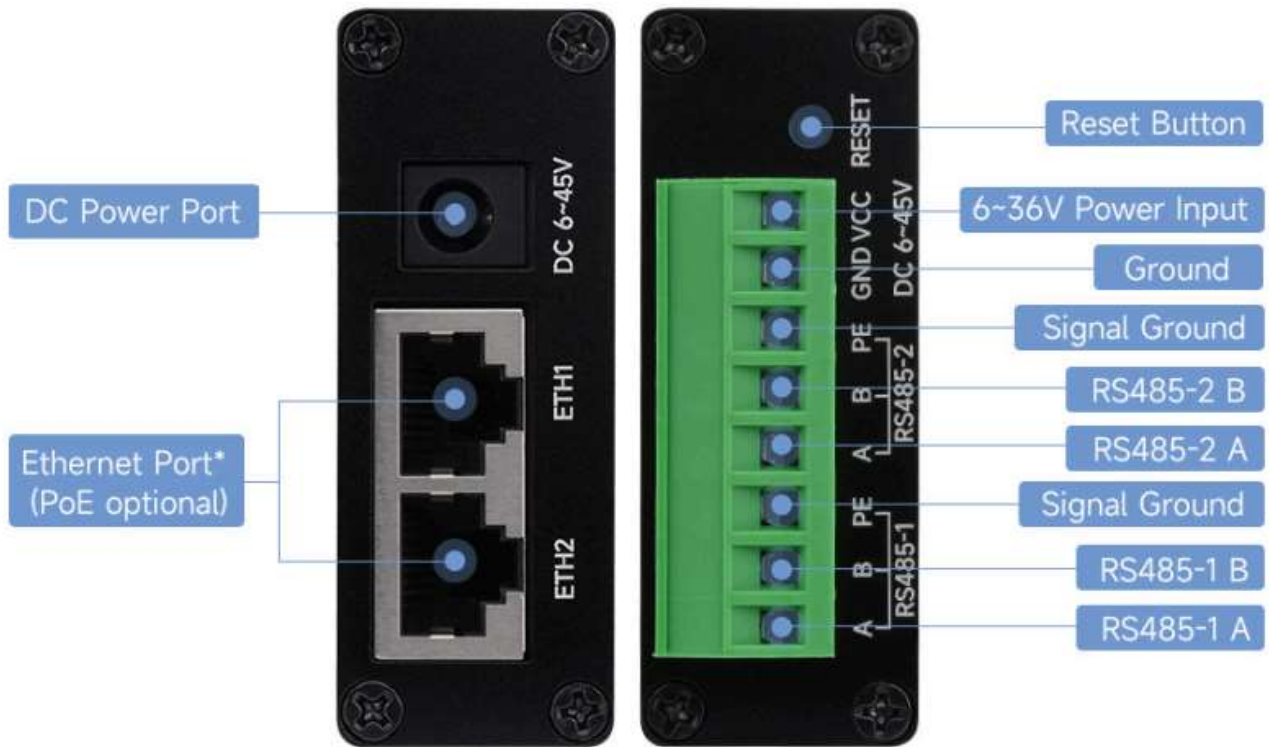
RS485 to ETH
2-CH RS485, Ethernet

applications like data acquisition, IoT gateway, safety & security IoT, and intelligent instrument monitoring...

Parameters Comparison

	2-CH RS485 TO ETH (B)	2-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 × 2, Ethernet port × 2	
Power Supply	DC 5.5 power port, 6 ~ 45V DC screw terminal	
	No PoE network port power	Powered with PoE network port
Isolation Protection	Power isolation, Signal isolation	
COMMUNICATION		
Ethernet	Common network port	PoE port, support IEEE 802.3af standard
	10/100M self-adaptive RJ45 interface, 2 KV surge protection	
Serial port	Isolated RS485 (2 channels can work independently at the same time to send and receive)	
SERIAL SPECIFICATION		
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, UDP multicast	
ENVIRONMENT REQUIREMENT		
Operating Temperature	-40℃ ~ 85℃	
Humidity Range	5% ~ 95% relative humidity	
Dimensions	L × W × H: 78 × 72.5 × 24.2 mm	

Hardware Description



***Note**

The two Ethernet ports have the same function. either one can be used for network communication, while the other one can be used for router cascading.



Indicator Description	
PWR	Power indicator
NET	Network indicator, blinking when connected to Ethernet
LINK1	Lights up when establishing channel 1 connection
ACT1	Lights up when channel 1 is data transmittig
LINK2	Lights up when establishing channel 2 connection
ACT2	Lights up when channel 2 is data transmittig

(/wiki/File:2-CH_RS485_TO_ETH_(B)02.png)

Software Feature

- Support TCP server, TCP client, UDP mode, and UDP multicast. When used as a TCP client, it also supports TCP server 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 parity bit can be in five ways: no parity, odd parity, even parity, mark, and space.
- Supports the function of sending MAC address on device connection, which is convenient for cloud management of devices.
- Provides a secondary development kit DLL development library for searching and configuring devices on the computer side.
- Support Web browser configuration, support DHCP to obtain IP dynamically, and DNS protocol to connect domain name server address.
- Support cloud remote search for devices, configure device parameters, and upgrade device programs.
- Support viewing the TCP connection status, and the data sending and receiving of the serial port. The virtual serial port also supports the monitoring function.

Note: This module is a dual channel, and each channel enjoys the above functions separately.

Advanced Software Function

- Support Modbus gateway function, support Modbus RTU to Modbus TCP. It can support storage-type Modbus, which can automatically collect and store device data; it also supports non-storage-mode Modbus gateways.
- Support multi-host function: In the query mode of one question and one answer, it supports the network port to allow multiple computers to access the same serial port device at the same time.
- Support MQTT gateway function.
- Support JSON to Modbus RTU and 645-meter protocol, support upload data in HTTP POST, HTTP GET format.
- Support NTP protocol to obtain network time, which is used for serial port output, and the latter is used for protocol content upload.
- Supports custom heartbeat package and registration package functions: It can facilitate communication with the cloud and device identification.
- Supports the function that TCP requires password authentication to establish a connection to ensure connection security.
- Support the data transmission and delivery function with HTTP, and the cloud can directly use the GET command of HTTP to communicate with the serial port of the device.

Application

- For connecting the device and the cloud terminal as the IoT gateway.
- Electricity, smart instruments, and energy consumption monitor.
- Remote monitoring and program download for various automation PLCs.
- Various configuration software and equipment communication interfaces.

- Networking of equipment in the field of access control and security.

Quick Test

Hardware Connection

Here is an example of 2-CH RS485 TO POE ETH (B). 2-CH RS485 TO ETH (B) is connected in the same way.

Generally, a serial port server only requires power, a serial port, and an Ethernet connection. The power supply can be a local 2-wire power source, which can be directly connected to the positive and negative terminals of the power supply. The serial port needs to be connected according to the user's serial device. Connect 485-1 A to 485-2 A and 485-1 B to 485-2 B. The Ethernet port is connected using a regular Ethernet cable and can be directly connected to a computer or connected to a network via a switch.



(/wiki/File:2-

CH_RS485_TO_ETH_03.jpg)

Software Installation

Vircom can be used to configure the parameters such as the device IP and create the virtual serial port. If there is no serial port function, you can download the non-installation config software.

- VirCom en (https://files.waveshare.com/upload/4/42/VirCom_en.rar)
- Virtual-serial-port (<https://files.waveshare.com/upload/0/08/Virtual-serial-port-control3.5.rar>)

Driver installation needs to be decompressed, double-click the software to install, if the virtual serial port in Vircom is not displayed, restart and check again.

Examples

TCP Communication

Software Preparation

- Vircom (https://files.waveshare.com/upload/4/42/VirCom_en.rar)
- Sscom (<https://files.waveshare.com/upload/b/b3/Sscom5.13.1.zip>)

Steps

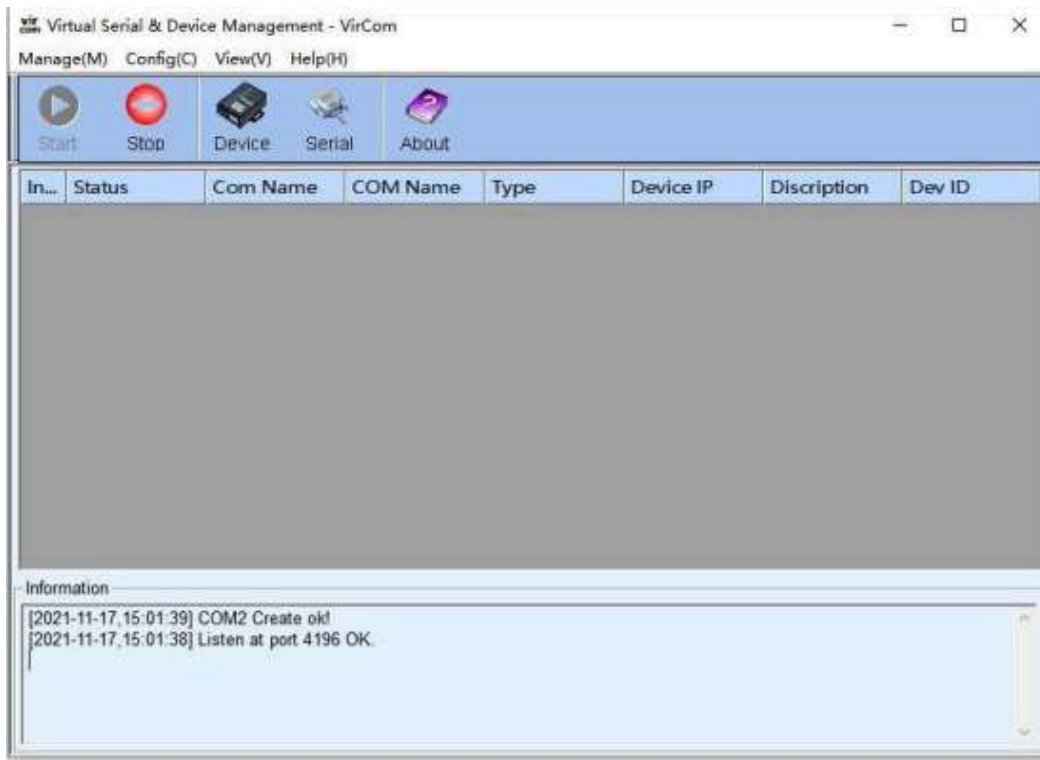
After Vircom is installed and the device hardware is connected, run the software as shown in the figure, and then click on "Device Management" as shown in the figure. It is very convenient to use Vircom to search and configure device parameters in different network segments, as long as the device and the computer running Vircom are under the same switch.



(/wiki/File:2-CH_RS485_TO_ETH_05.jpg)

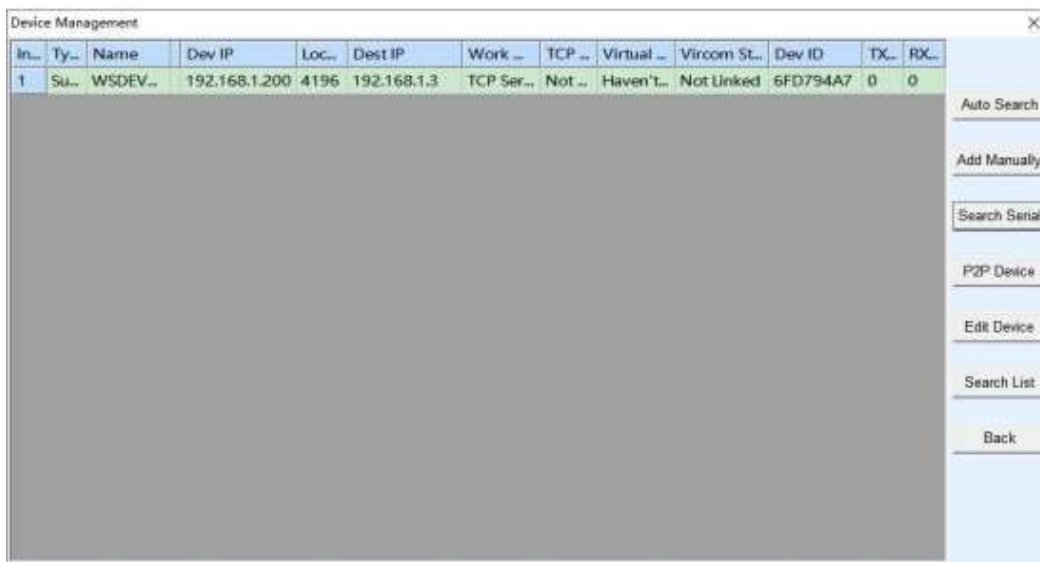
UART to ETH and ETH to UART of the serial server and the data transparent forwarding

function is shown below:

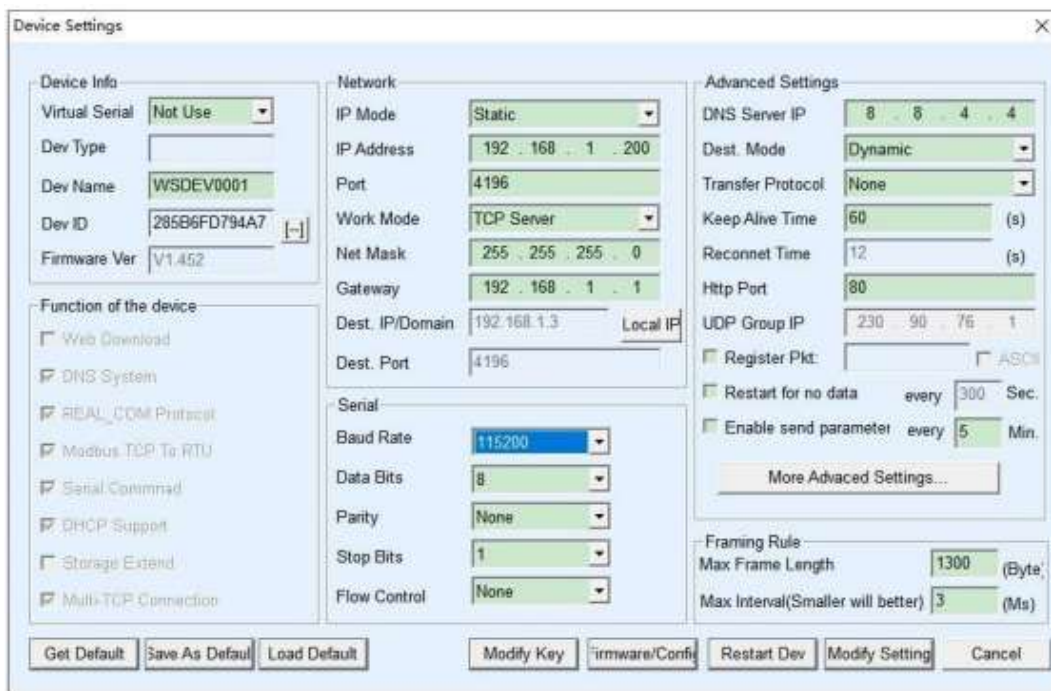


(/wiki/File:RS485_TO_ETH_(B)_Manual100.png)

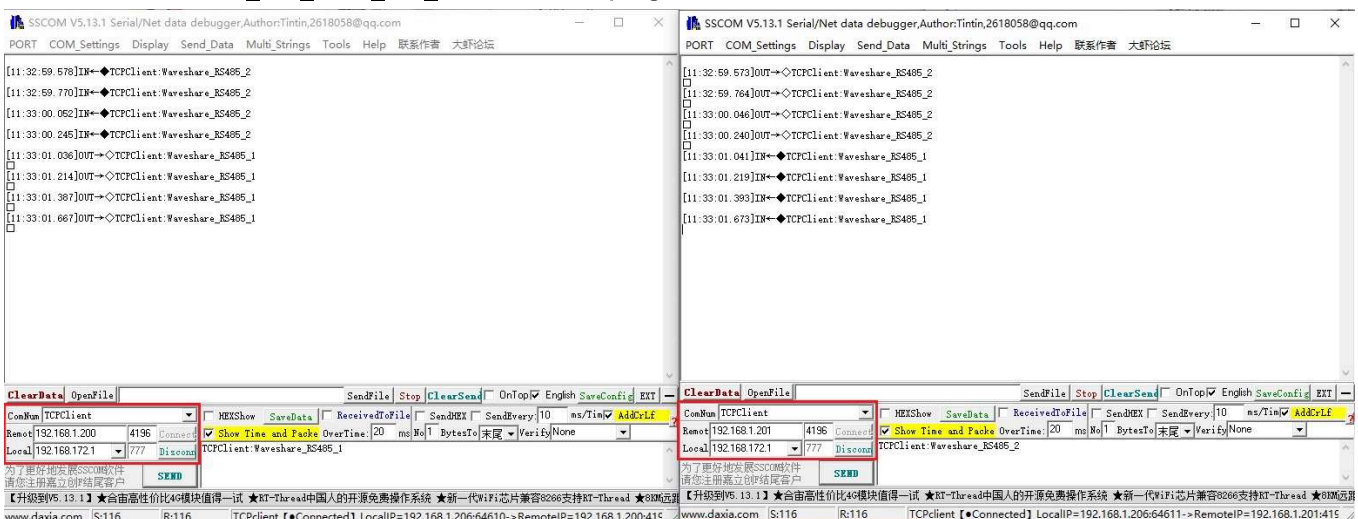
In addition, you need to open another serial assistant window as the TCP client. Enter the target IP as the IP of the serial server (192.168.1.200 and 192.168.1.201), the target port 4196, and click "Open". As shown below:



(/wiki/File:RS485_TO_ETH_(B)_Manual102.png)



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



(/wiki/File:2-CH_RS485_TO_ETH_step.jpg)

If you input "TCPClient:Waveshare_RS485_1" in SSCom1, which is set as TCPClient, and click Send, the data will be transferred to the RS485 interface through the network port of the serial server and then sent to another TCPClient. Then it will be displayed in SSCom2 of the serial debugging assistant; conversely, input "TCPClient:Waveshare_RS485_2" in SSCom1 and click Send to send it to SSCom2, and it will be displayed.

Virtual Serial Port Test

SSCom2 in the figure communicates directly with the serial port server through TCP. In order to enable the user's already developed serial port software to communicate with the serial port server, a virtual serial port needs to be added between the user program and the serial port server. As shown in the figure, Vircom, and user programs run on one computer, and Vircom virtualizes a COM port, making this COM port correspond to the serial port server. When the user program opens the COM communication, it can be sent to the user's serial

device through the Vircom serial server. The following demonstrates this operation step:



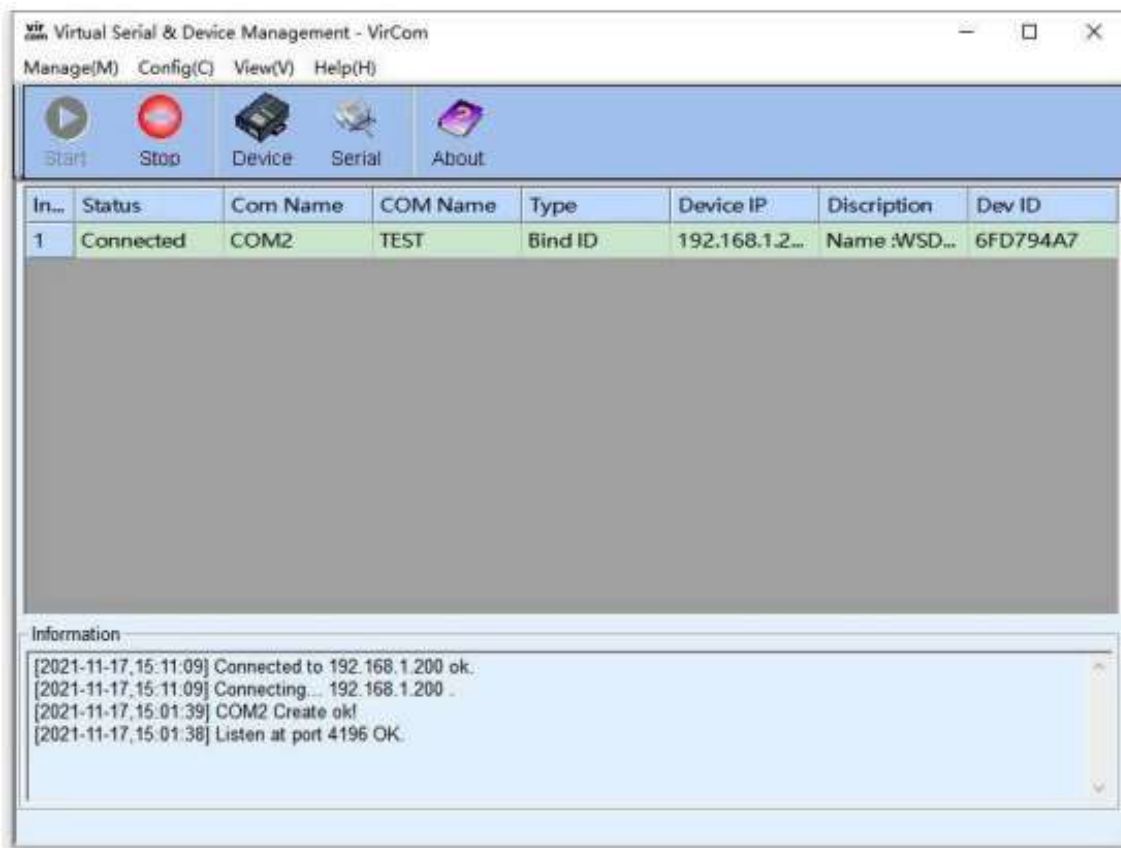
(/wiki/File:2-CH_RS485_TO_ETH_Test.jpg)

Click the "UART management" in the Vircom interface, click "add", and then choose COM2. Among them, COM5 is the COM port that did not exist in the computer.

The screenshot shows the 'Add Virtual Serial Port' dialog box. It has two main sections: 'COM Number' and 'TCP Client Mode Settings'.
In the 'COM Number' section, the 'COM Number' dropdown is set to 'COM2', 'Name This COM' is 'TEST', 'Serial Param Auto Adapt' is 'As Globle Setting(Def.)', 'Vircom Work Mode' is 'Bind ID(Def.)', and 'TCP Server Mode Listen Port' is '22343'. There is also a 'Batch Create' section with 'Number of Batch Creation' set to '1' and 'Batch Increase Mode' set to 'IP Increase'.
In the 'TCP Client Mode Settings' section, 'Client Mode Start Connection Now' is checked. 'Dest. IP or Domain' is '192.168.1.200', 'Dest. Port' is '4196', and 'Vircom Register ID' is empty. 'Vircom Login Key' is empty, 'Heart Beat Pakcet' is empty, and 'Heart Beat Interval' is '0 (s)'.
At the bottom, there are 'OK' and 'Cancel' buttons.

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

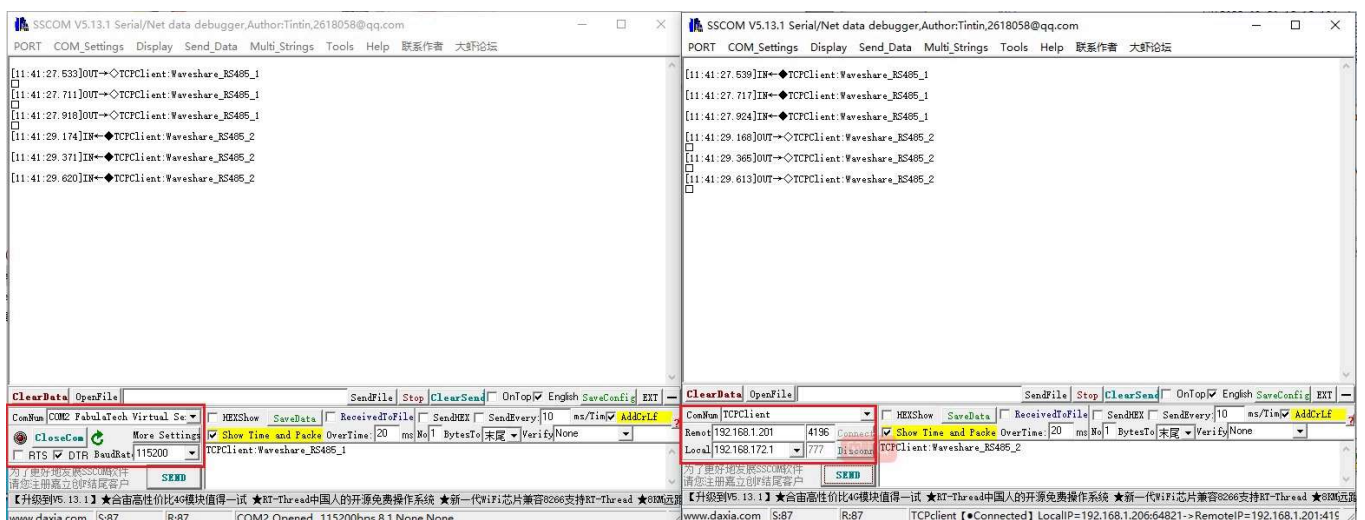
Then enter the device management, and double-click the device that needs to be bound to COM2. As shown in the figure, select COM2 in the "Virtual Serial Port" list in the upper left corner. Then click "Modify Settings", click "Restart Device" and return to the main interface of Vircom. It can be seen 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 data link sent by COM2 is as follows: COM2 → Vircom → the network port of the serial server → the serial port of the serial server → COM3.

Conversely, COM3 to COM2 can also transmit data: 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. The following figure shows how both sides send and receive data. If COM4 is replaced with a user serial device, COM5 can be used to communicate with the user device.

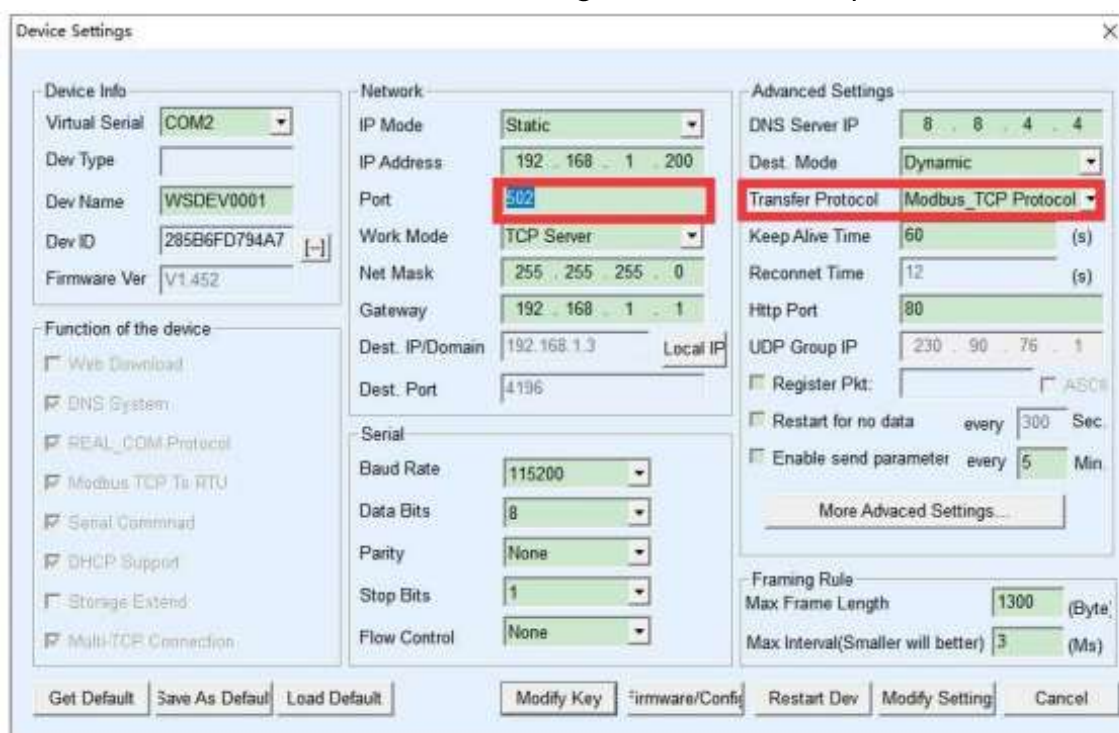


(/wiki/File:2-ch_rs485_to_eth_step2.jpg)

MODBUS TCP Test

By default, the data between the serial port and network port is transparently transmitted. If you need to convert Modbus TCP to RTU, you need to select the conversion protocol as "Modbus TCP <--> RTU" in the device settings dialog box, as shown in the figure below. At this time, the device port automatically changes to 502. At this time, the user's Modbus TCP tool is connected to the IP port 502 of the serial server and the sent Modbus TCP command will be converted into an RTU command and output from the serial port. For example, if the serial port server network port receives the Modbus TCP command of 00 00 00 00 00 0601 03 00 00 0a, the serial port outputs the command of 01 03 00 00 00 0a c5 cd.

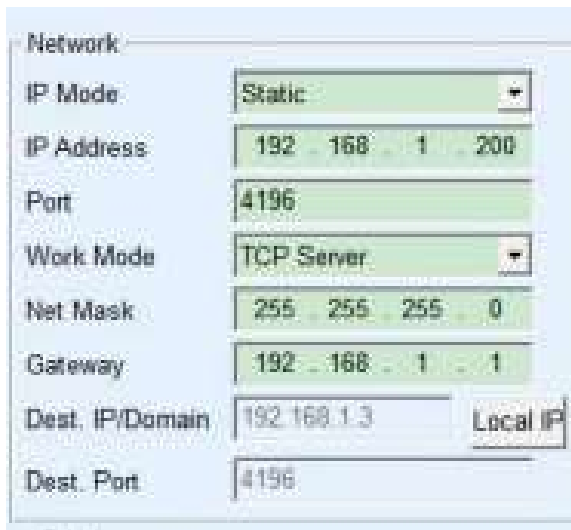
Note: The serial port may send multiple 01 03 00 00 00 0a c5 cd commands because the default Modbus adopts the storage mode, which will automatically train the query commands. How to switch to non-storage mode will be explained later.



(/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:



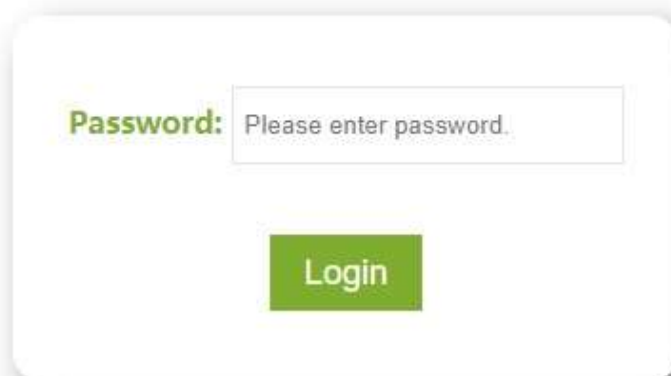
(/wiki/File:RS485_TO_ETH_(B)_Manual_051.png)

WEB Configuration

Using Vircom, you can search 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.

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

2-CH RS485 TO POE ETH (B)




(/wiki/File:2-CH-RS485-TO-ETH-

www.waveshare.com

(B)-7.jpg)

2. Enter a 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 webpage login password" will take effect:


WAVESHARE
 share awesome hardware

Logout

Chinese

Device Information

Device Name	WSDEV001	Firmware Version	V1.452	Device MAC	28-B6-8C-F4-91-D3
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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	192.168.1.3	Destination Port	4196	IP mode	Static

Serial Settings

Baudrate	1200	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	1~255 second
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Multi-Host Settings

Protocol	None	Instruction Time out	0	32~8000ms	Enable Multi-host	No
RS232/485/422 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 multiply of 32.

Modify Web Login Key

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

Submit

(/wiki/File:RS232_b_Manual_00512.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 Modification" button.

5. If configuring and downloading MQTT and Jetson Modbus firmware overwrites the configuration interface web page file, resulting in the configuration web page not opening, follow these steps to re-download the web page file:

- Configuration Interface Web File (https://files.waveshare.com/upload/0/0b/2_ch_rs485_waveshare_web.zip) for 2-CH RS485 TO ETH (B).
- Configuration Interface Web File (https://files.waveshare.com/upload/1/19/2_ch_rs485_waveshare_web_poe.zip) for 2-CH RS485 TO POE ETH (B).
- The interface web files are different for the two devices, so you need to download the corresponding files.

Webpage directly download mode

Webpage directly in local PC:

E:\FAQ-QUECTEL\RS485 TO ETH B\2043_waveshare_web_zx

Special configs:

Code file download mode

Select code file:

C:\firmware.bin

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 modual/type: 2003

Flash size: 256 KB

DevID: 285FCAD56BAD

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

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

Resource

Document

- 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

- Vircom (https://files.waveshare.com/upload/5/54/VirCom_en.zip)
- SSCOM (<https://files.waveshare.com/upload/b/b3/Sscom5.13.1.zip>)
- TCP/IP/UDP debug tool (<https://files.waveshare.com/upload/7/75/TCP%26UDPDebug.zip>)

- Virtual serial port control (<https://files.waveshare.com/upload/0/08/Virtual-serial-port-control3.5.rar>)

Related Application

- RS485 TO ETH (B) Connect Alibaba Cloud And EMQX ([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 2-CH RS485 TO ETH (B)?

Answer:
12V 110mA.

Question:What should I do if I can't open the web configuration interface?

Answer:

Configuration download MQTT and other firmware such as Jetson Modbus overwrite the configuration interface web file and need to be downloaded again.

- Configuration Interface Web File (https://files.waveshare.com/upload/0/0b/2_ch_rs485_waveshare_web.zip) for 2-CH RS485 TO ETH (B).
- Configuration Interface Web File (https://files.waveshare.com/upload/1/19/2_ch_rs485_waveshare_web_poe.zip) for 2-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 ☐ Download through serial port ☒

Device IP address or domain:

Download port (Don't modify):

Serial port:

Baudrate:

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:How to restore the 2-CH RS485 TO ETH (B) device to factory settings?

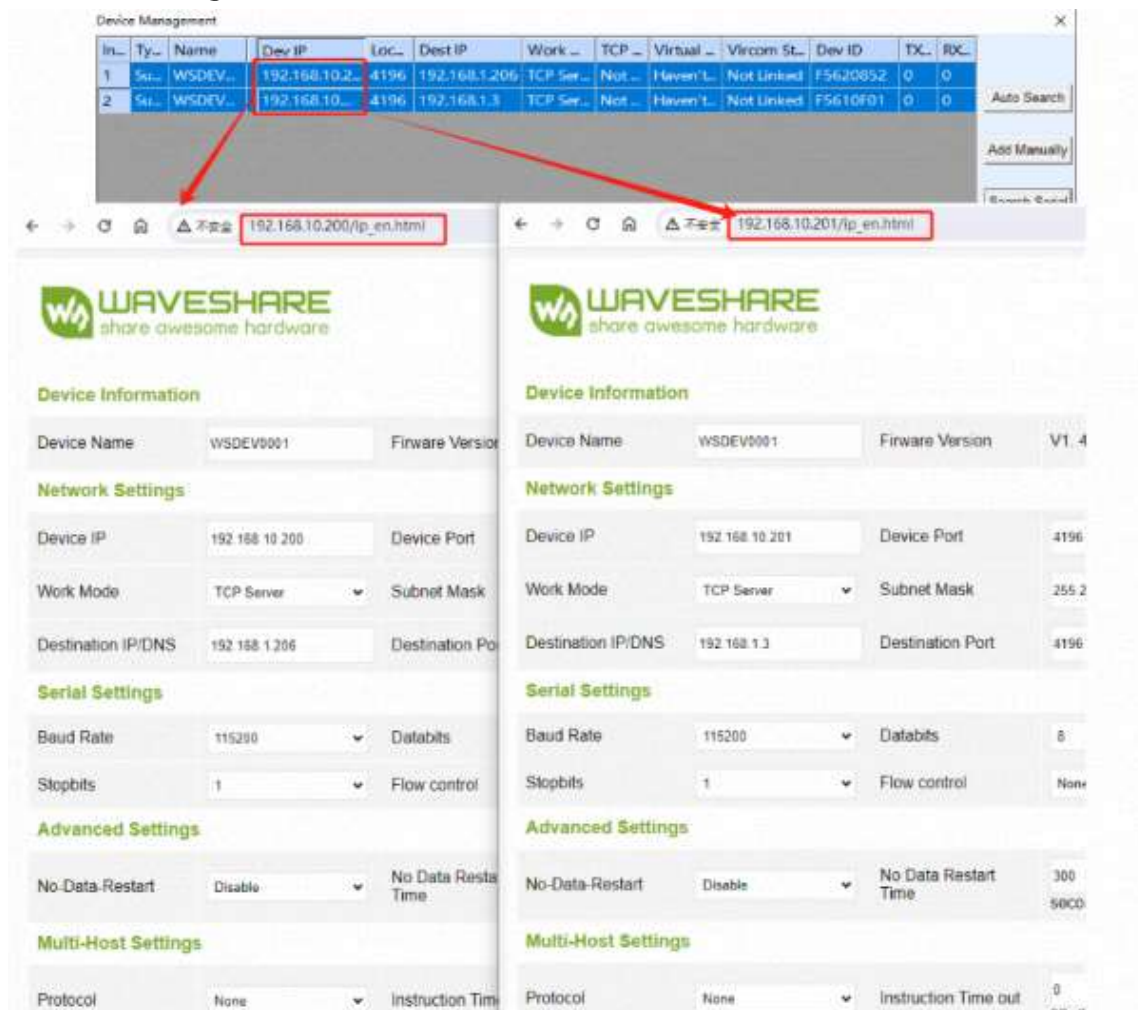
Answer:

Press and hold the RESET button for 5 seconds. This will complete the reset process. After the reset, the IP addresses of both devices will change to 192.168.1.254, and their names will change to WSDEV0001. You can then manually modify the settings as needed.

Question:How to obtain the IP address of the corresponding webpage and configure the serial settings for each channel individually through the webpage?

Answer:

Each channel corresponds to a separate webpage configuration interface, which can be searched using Vircom.

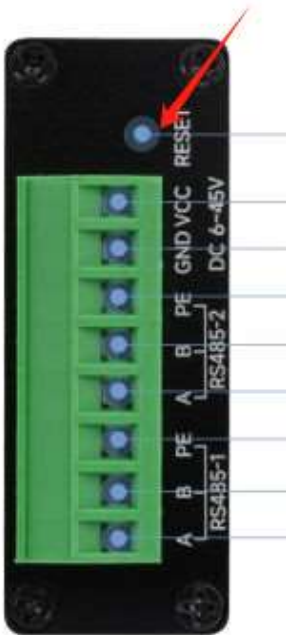


(/wiki/File:2-CH_RS485_TO_ETH_(B)FAQ09.png)

Question:I try and change the IP address with no success. It always defaults to 192.168.1.254.

Answer:

1)Please press RESET for 5 seconds to complete the reset. After reset, the IP addresses of the two devices will become 192.168.1.254 and the names will become WSDEV0001, and then you can modify it manually.



(/wiki/File:2-CH_RS485_TO_ETH_(B)_FAQ.png)

2) If it still doesn't work, consider it to be a firmware problem. Please refer to the steps to upgrade the latest firmware for comparison testing:

https://www.waveshare.com/wiki/RS485_TO_ETH_B_burns_firmware

(https://www.waveshare.com/wiki/RS485_TO_ETH_B_burns_firmware)

Question: How to cascade POE power supply?

Answer:

The first stage needs to obtain PoE before it can provide PoE to the subsequent stage. This is because initially, the power sourcing equipment (PSE) supplies the powered device (PD) with two different voltages between 2.8 and 10V. The controller can only operate after recognizing the detection voltage. If the devices are directly cascaded, the voltage might not be detected, causing them not to function.

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/>)

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([https://www.waveshare.com/w/index.php?title=2-CH_RS485_TO_ETH_\(B\)&oldid=90534](https://www.waveshare.com/w/index.php?title=2-CH_RS485_TO_ETH_(B)&oldid=90534))"*
