USB TO RS485/422

From Waveshare Wiki
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Overview

USB TO RS485/422



(https://www.waveshare.com/usb-to-rs485-422.htm)

FT232 RS485 RS422
RS422, RS485

Introduction

USB TO RS485/422, an industrial-grade USB to RS485/422 isolated converter, adopts the original FT232RNL, an industrial rail case design, built-in protection circuits such as power isolation, ADI magnetic coupling isolation, and TVS. USB TO RS485/422 is easy to operate, and can automatically transmit and receive without delay. It features fast communication speed, stability, reliability, and safety, which can be applied to various industrial control devices or applications with high communication requirements.

Features

- Onboard Original FT232RL and SP485EEN chip. Fast communication, stable and reliable, better compatibility.
- Onboard unibody power supply isolation, provides stable isolated voltage and needs no extra power supply for the isolated terminal.
- Onboard unibody digital isolation, allows signal isolation, high reliability, strong anti-interference, and low power consumption.
- Onboard TVS (Transient Voltage Suppressor), effectively suppresses surge voltage and transient spike voltage in the circuit, lightning-proof & anti-electrostatic.
- Onboard self-recovery fuse and protection diodes, ensure the current/voltage stable outputs, provide over-current/over-voltage proof, and improve shock resistance.
- Onboard 15KV ESD isolation protection and 600W lightning-proof & anti-surge protection.
- Onboard 120R terminal resistor on the RS485/RS422 ports, disabled by default, configurable by jumper.
- 3x LEDs for indicating the power and transceiver status.

- Industrial rail-mount ABS case design, small in size, easy to install, and cost-effective.

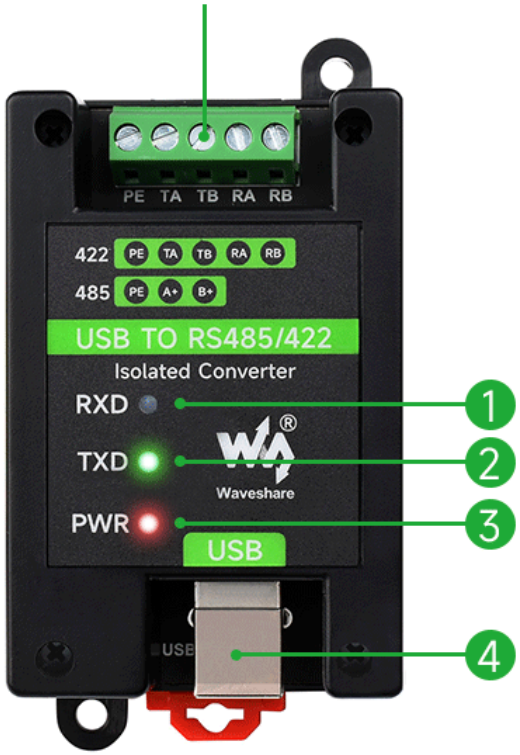
Specification

Model	Industrial grade isolated USB to RS485/422 converter	
Baud Rate	FT232RNL	300bps ~ 3Mbps
Host Port	USB	
Device Port	RS485/422	
USB Port	Operating Voltage	5V
	Interface Type	USB-B
	Connector	200mA self-recovery fuse, ESD protection
	Transmission Distance	About 5m
RS485/422 Interface	Interface	Screw Terminal
	RS485 Interface	A+, B-, PE
	RS422 Interface	TA, TB, RA, RB, PE
	Direction Control	Hardware automatic control
	Interface Protection	600W lightningproof, anti-surge, and 15KV ESD protection (onboard 120R balancing resistor)
	Transmission Distance	About 1200m (at low rates)
	Transmission Mode	Point-to-multi points (up to 32 nodes, it is recommended to use repeaters for 16 nodes or more)
Indicator	PWR	Red power indicator, lights up when there is a USB connection and voltage is detected
	TXD	Green TX indicator, light up when the USB port sends data
	RXD	Blue RX indicator, lights up when the device ports send data back
Operating Environment	Temperature Range	-15℃ ~ 70℃
	Humidity Range	5%RH~95%RH
Operating System	Mac, Linux, Android, WinCE, Windows 10 / 8.1 / 8 / 7 / XP	
Appearance	Enclosure	Rail-mount ABS case, suitable for 35mm DIN rail
	Outline Dimensions	81.9 × 54.0 × 32.0mm

Interface Introduction

Interface	PE	TA	TB	RA	RB
RS422	Signal ground	Send differential signal positive T+	Send differential signal negative T-	Receive differential signal positive R+	Receive differential signal negative R-

RS485	Signal ground	Differential signal positive A+	Differential signal negative B-	NC	NC



(/wiki/File:USB-TO-RS485_422-intro.gif)

1	2	3	4
RXD: Blinking Blue Data Receiving	TXD: Blinking Green Data Transmitting	PWR: Light up Red Power Connected	USB&Power: Connecting to the USB port of the host

(/wiki/File:USB-TO-RS485_422-intro-bottom.png)

120R Matching Resistor Setting Description



(/wiki/File:USB-422-485-NC.png)

Description: The RS422 and RS485 interfaces of this product also have a built-in 120R enabling resistor, which is disabled by default, and the user can remove the case to modify the settings as needed.
Modification method: Modify the yellow jumper cap at the red frame.

Dimensions

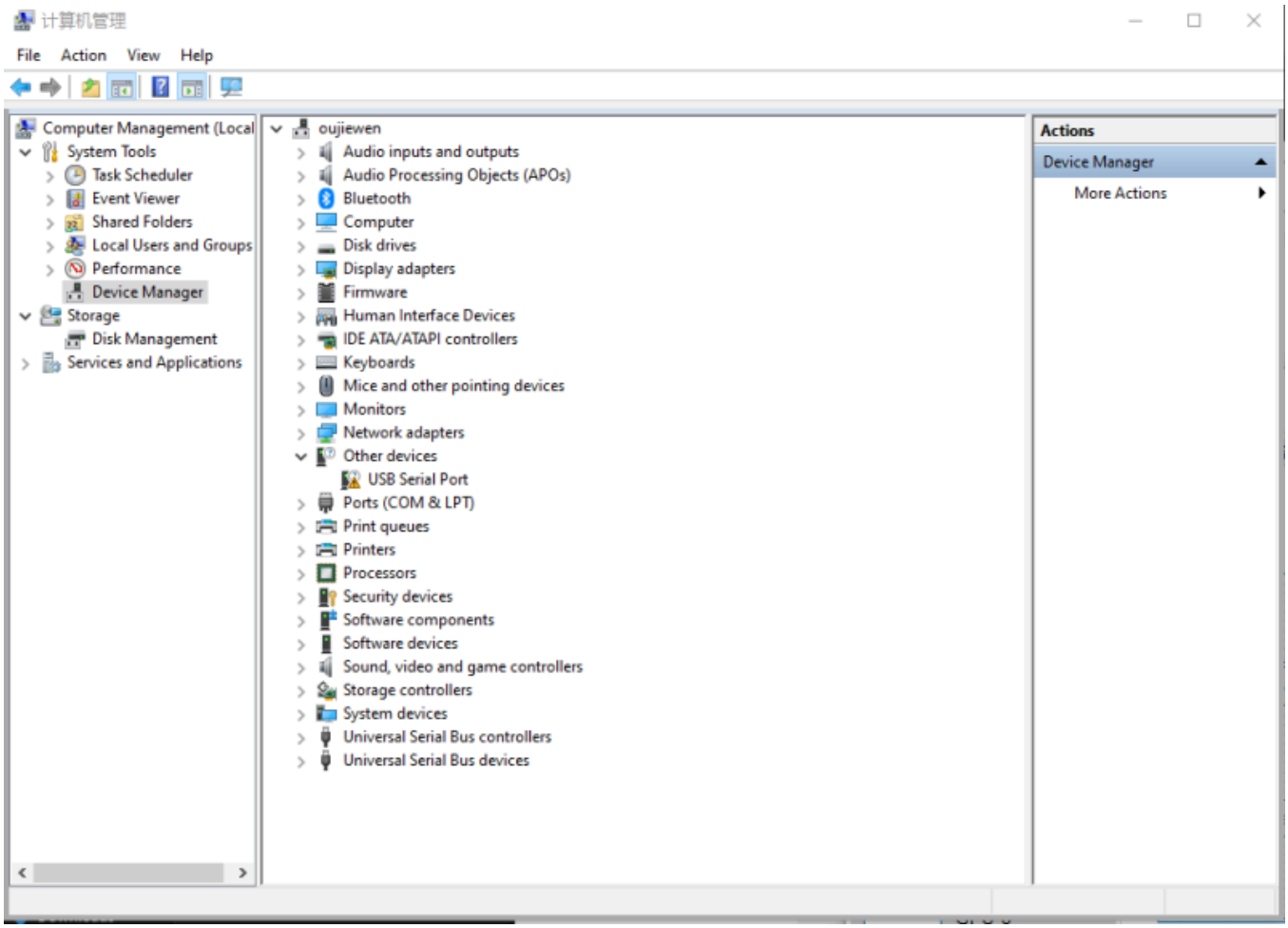


(/wiki/File:USB_TO_RS485701.jpg)

Software Installation

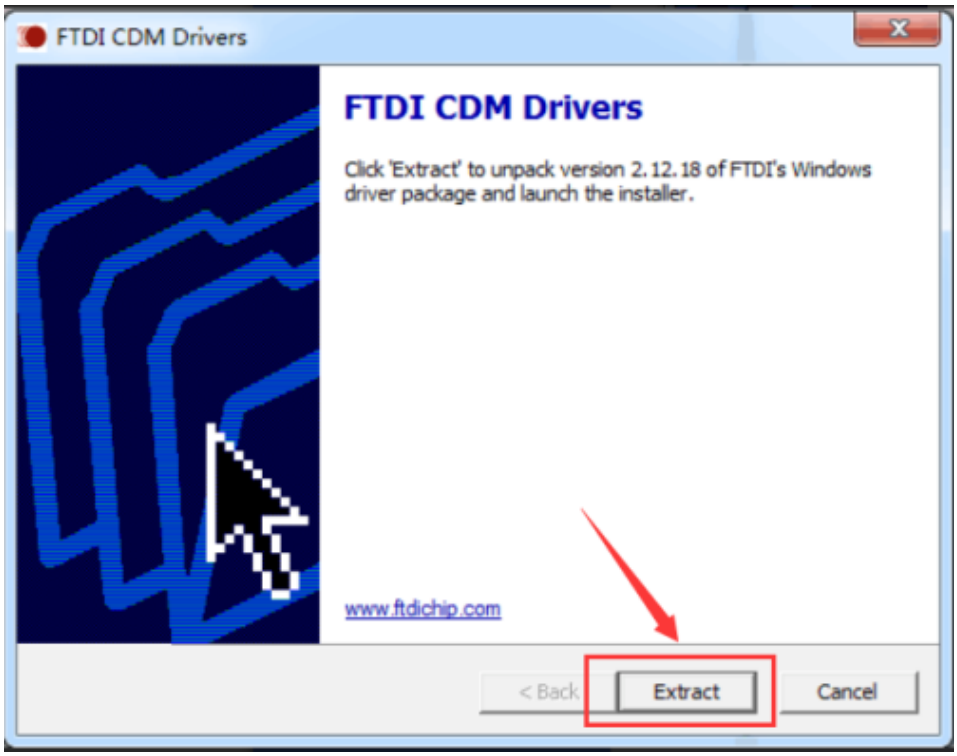
USB Driver Installation

- The first method: download the driver wizard from the Internet, and automatically detect and install the driver.
- The second method: Manually install the driver (the following uses WIN7 installation as an example).
- Connect the device to the computer via a USB cable, and check the device manager, the serial port number has a yellow exclamation mark, indicating that the driver is not installed.



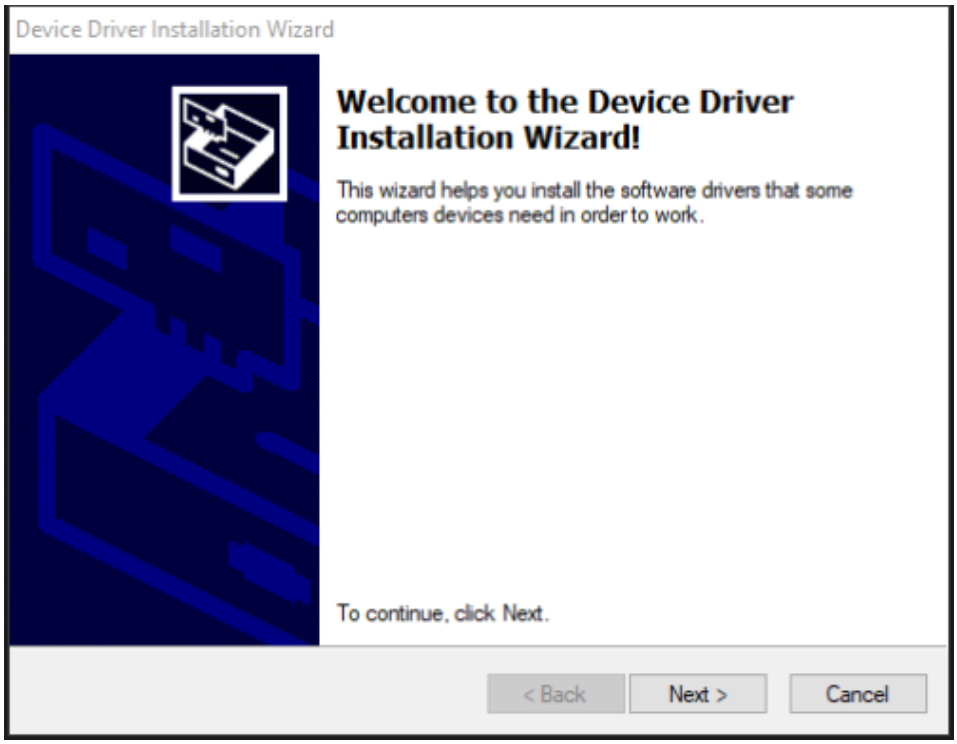
(/wiki/File:USB_TO_RS4852-2.png)

- You can download the software installation package on the official website WIKI, (There must be a path here) Double-click  (/wiki/File:USB_TO_RS485-3.png).



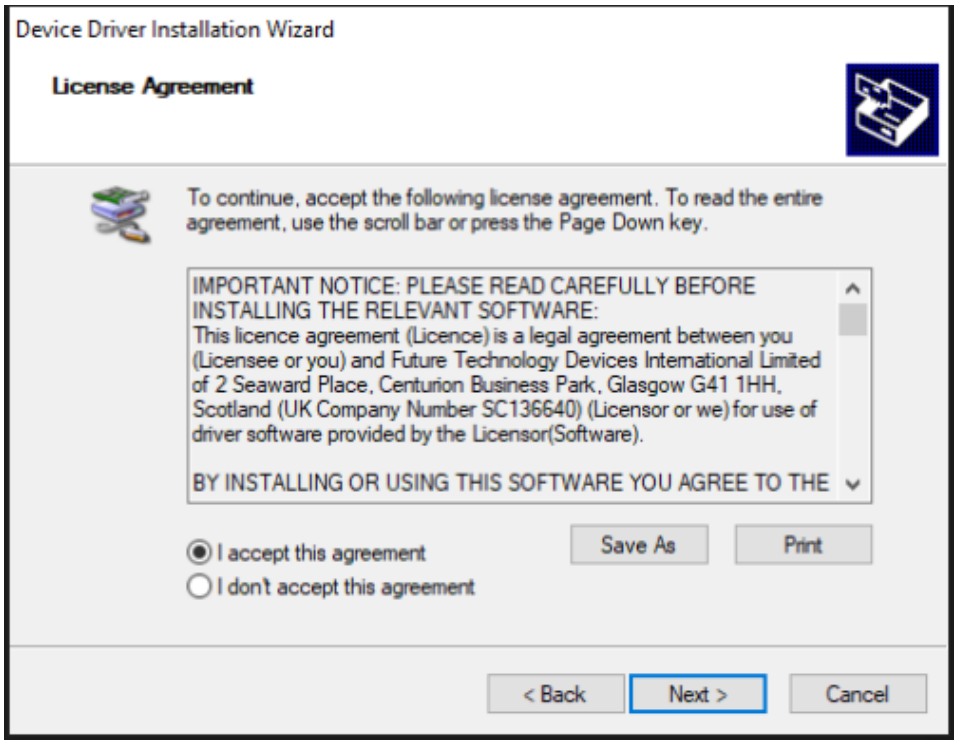
(/wiki/File:USB_TO_RS485-4.png)

- Click Extract:



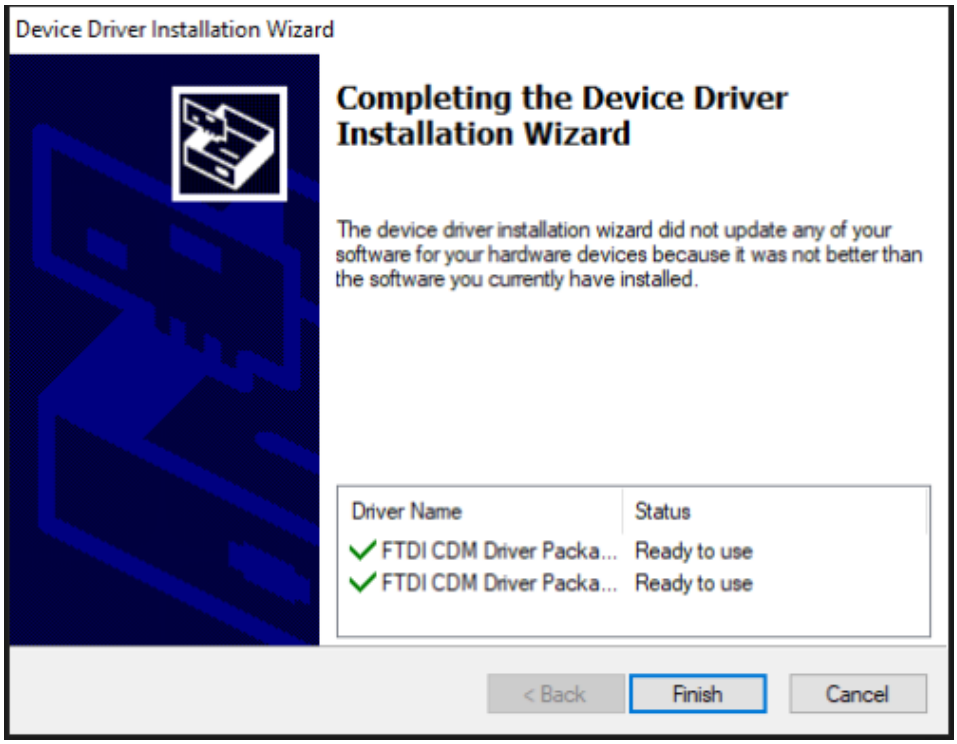
(/wiki/File:USB_TO_RS4825-5.png)

- Click Next:



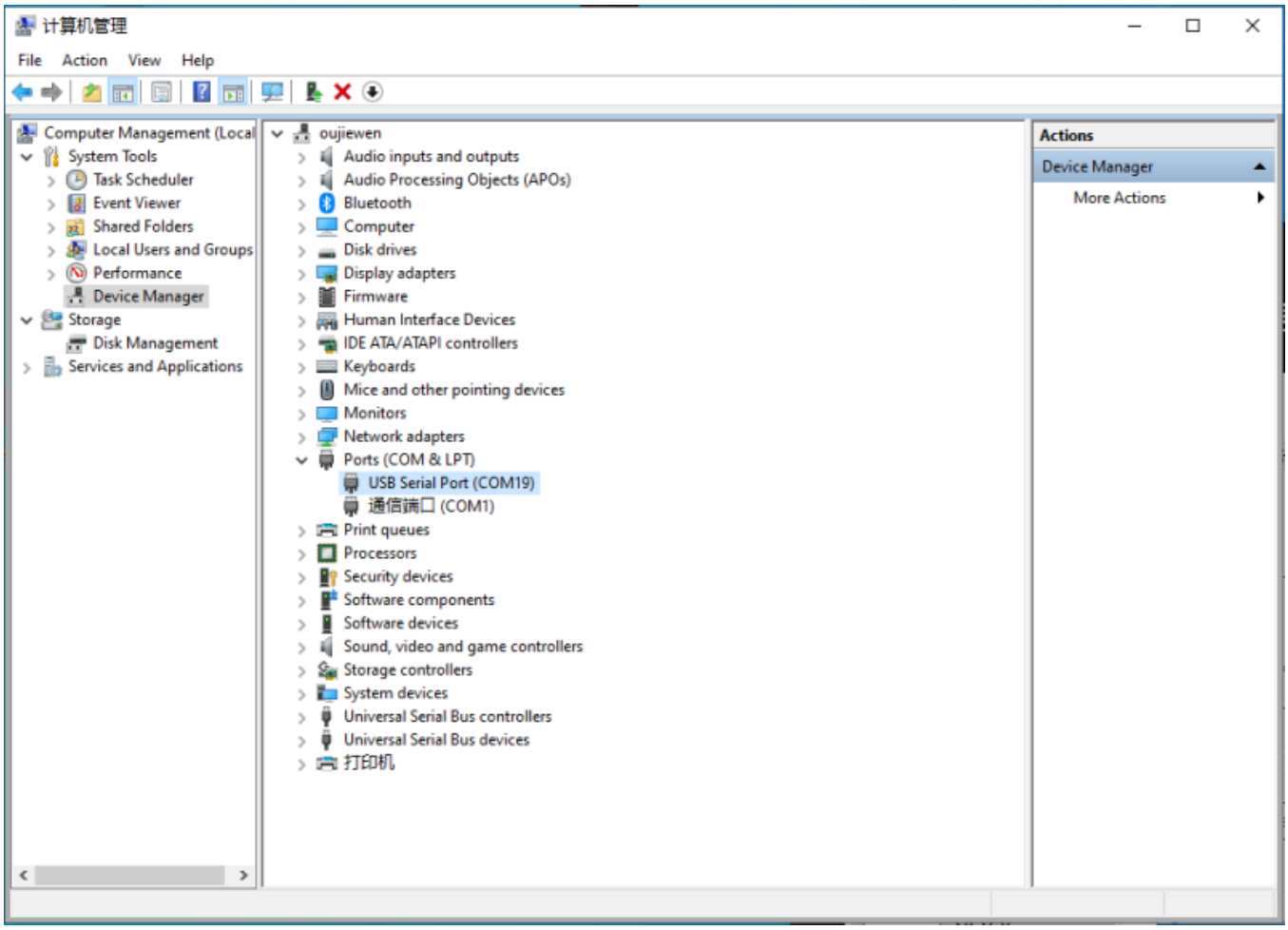
(/wiki/File:USB_TO_RS4852-6.png)

- Check I accept this agreement (A), and then click Next:



(/wiki/File:USB_TO_RS4852-8.png)

- Click Finish, and check the computer device manager at this time, you can see that the port number is already available for normal use.



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Hardware Test

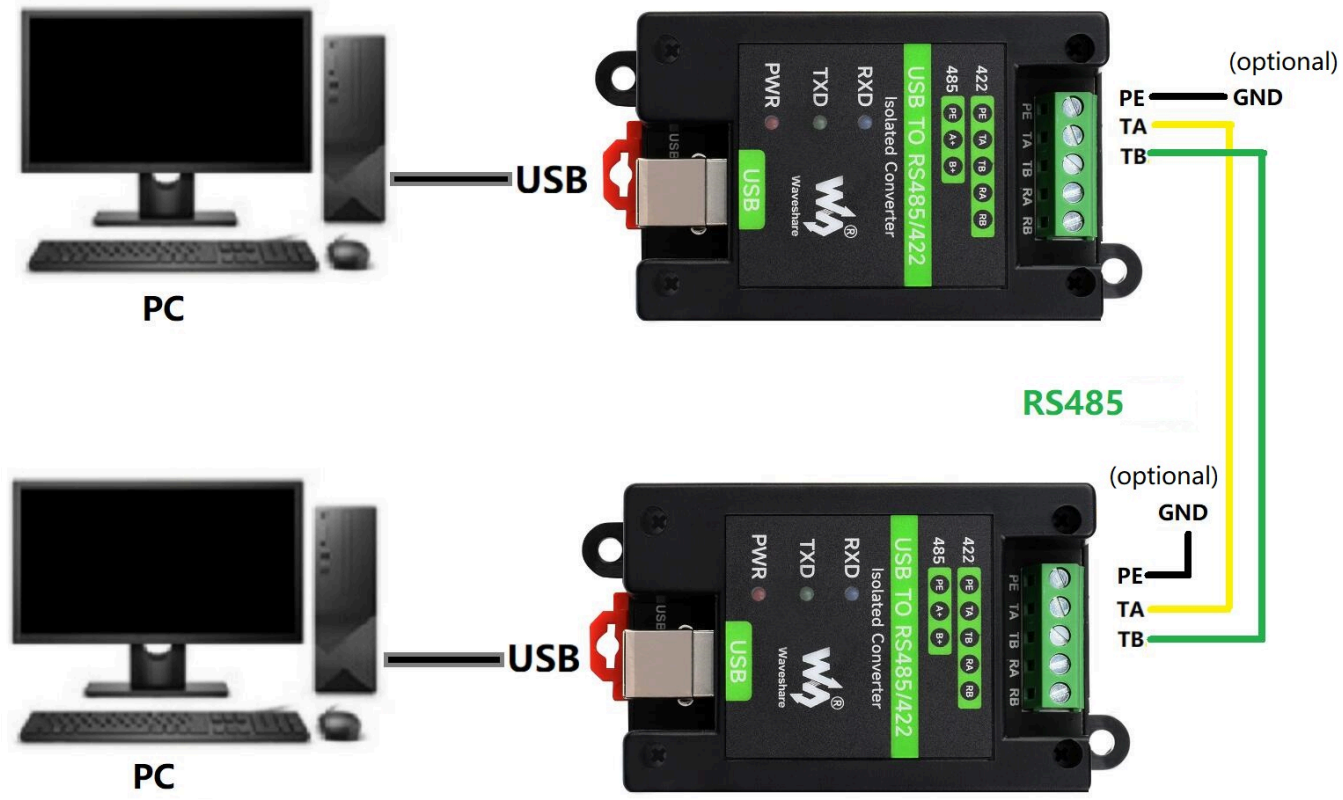
Test environment: PC (Windows system)

Required accessories:

- USB TO RS485/422 x 2pcs
- Adapter cable

RS485 test

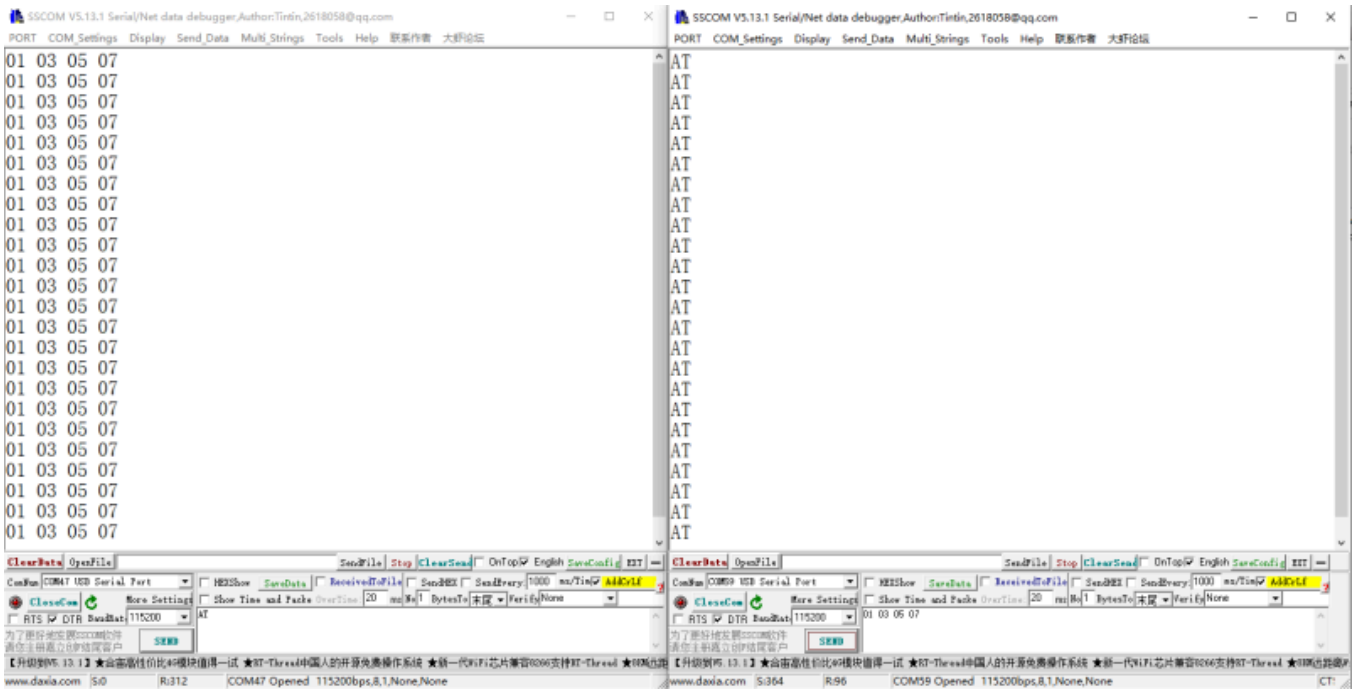
- Connect the RS485 interface of the USB TO RS485/422 module, that is, connect TA --> TA to TB --> TB. The hardware connection diagram is as follows:



(/wiki/File:USB-TO-RS485_422-RS485Test1.JPG)

Note: The RS485 interface of this product also has a built-in 120R enabling resistor, which is turned on by default. Users can remove the case to modify the settings according to their needs. If signal isolation is required, PE can also be connected to the ground.

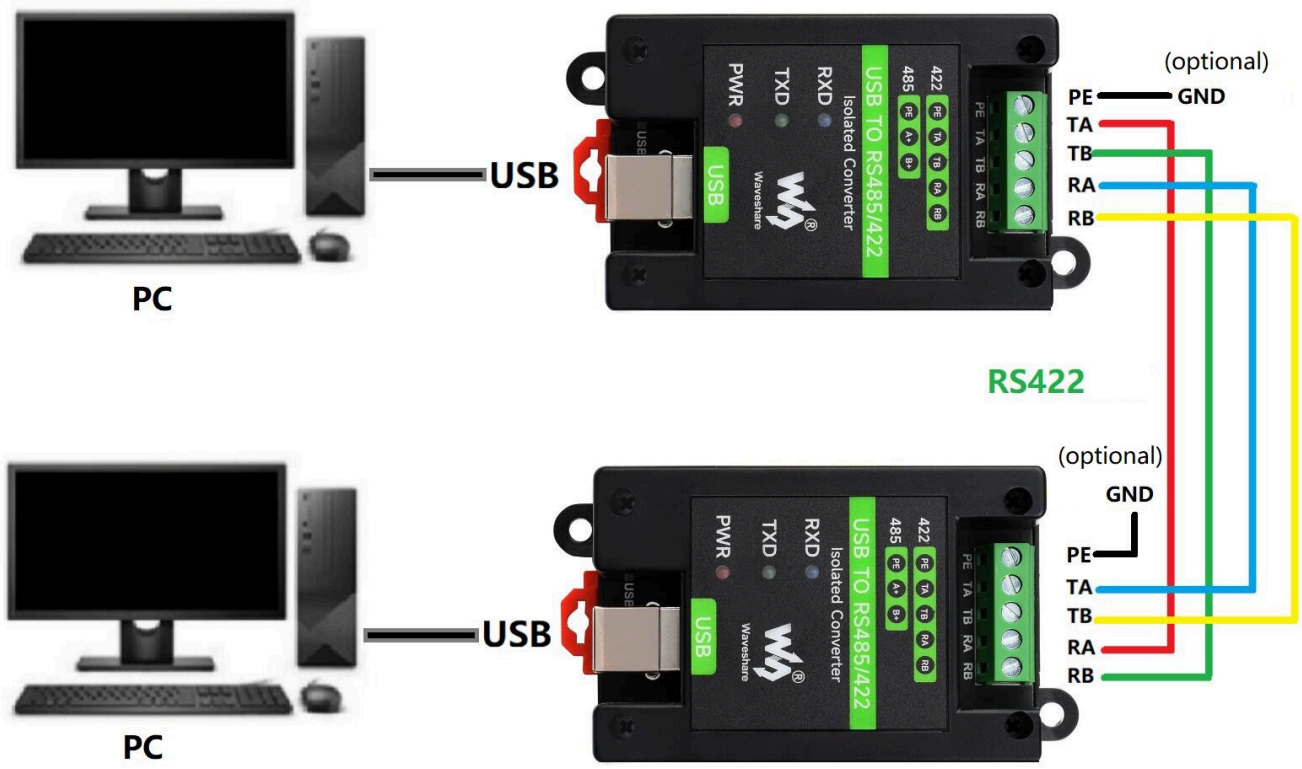
- Open two SSCOM serial port debugging assistants on the computer, open the corresponding port number, set the same baud rate, and click Send at regular intervals to receive and send normally. The test results are shown in the figure below:



(/wiki/File:USB_TO_RS4852-11.png)

RS422 Test

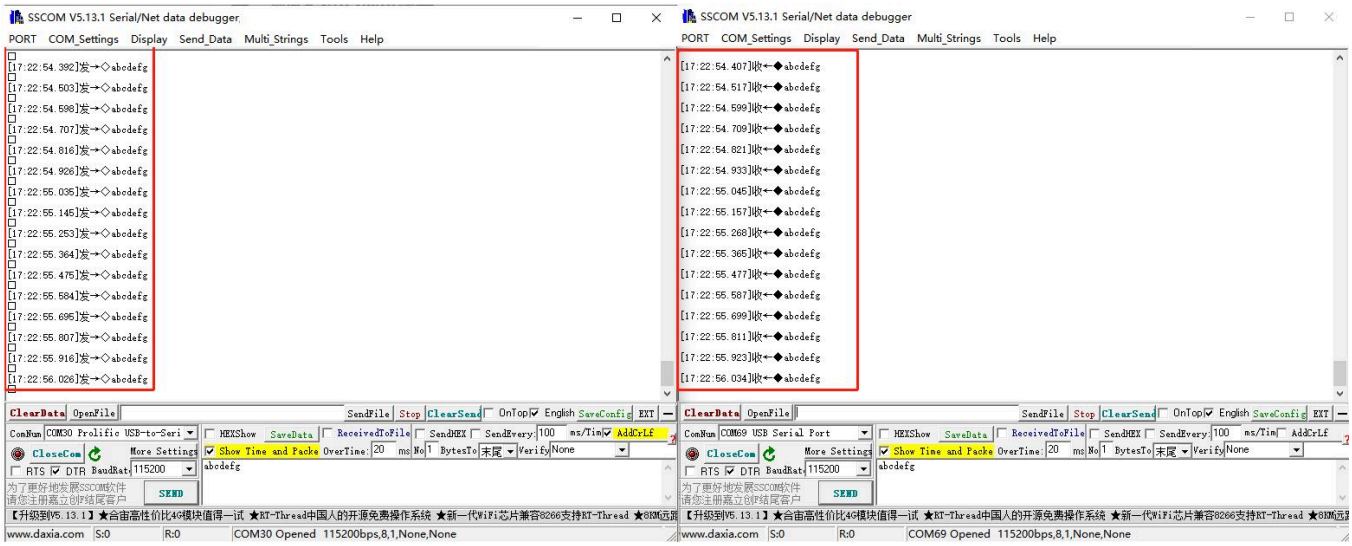
- Connect two sets of USB TO RS485/422 together for communication. When the RS422 interface is connected, cross-connection is required, as shown in the figure below:



(/wiki/File:USB-TO-RS485_422-RS485Test202.JPG)

Note: The RS485 interface of this product also has a built-in 120R enabling resistor, which is turned on by default. Users can remove the case to modify the settings according to their needs. If signal isolation is required, PE can also be connected to the ground.

- On the PC, open two SSCOM, open the corresponding port number, set the same baud rate, and click Send at regular intervals to send and receive normally. The screenshot of the software is shown below:



(/wiki/File:RS232_TO_RS485_(B)_Spec07.jpg)

Resource

Software

- VCP Driver (or download from FTDI official website (https://ftdichip.com/drivers/vcp-drivers/)):
  - FT232 Driver-Windows-32bit (https://files.waveshare.com/upload/2/2c/FT232_Driver_32.zip)
  - FT232 Driver-Windows-64bit (https://files.waveshare.com/upload/f/f3/FT232_Driver_64.zip)
  - MAC FT232 Driver-MAC-64bit (https://files.waveshare.com/upload/6/6e/MAC_FT232_Driver_D2XX1.4.24.7z)
- Sscom Windows (https://files.waveshare.com/upload/5/5f/Sscom.7z)
- Sscom Android (https://files.waveshare.com/upload/2/21/Sscom_Android.zip)
- Putty.zip (https://files.waveshare.com/upload/5/56/Putty.zip)

Datasheet

- DS_FT232RN.pdf (https://files.waveshare.com/upload/c/c5/DS_FT232RN.pdf)
- FT232R.pdf (https://files.waveshare.com/upload/b/b5/FT232R.pdf)

- SP481E SP485E.pdf (https://files.waveshare.com/upload/b/b3/SP481E_SP485E.pdf)

Drawing

- 3D drawing (https://files.waveshare.com/wiki/USB-TO-RS485-422/3D/USB%20TO%20RS485%20422.zip)

FAQ

Question: It cannot be used on non-windows systems, how to solve it?

Answer:

- If you encounter a system other than windows that cannot be used normally, you can enter the official website link below and use it after installing the corresponding system driver: https://www.ftdichip.cn/Drivers/D2XX.htm (https://www.ftdichip.cn/Drivers/D2XX.htm)

Question: Does it support Linux system?

Answer:

- Compatible with multiple systems, support Win7/8/8.1/10, Mac, Linux, Android, WinCE, and other systems.

Question: What should I do if the short-distance communication of RS485 is abnormal?

Answer:

- Remove the 120-ohm terminal resistor of RS485.

Question: Does the module have a 120-ohm balance resistor on board?

Answer:

Yes, if you need to modify the 120R resistor, you can remove the case for setting, see the yellow jumper cap at the red box in the picture below:

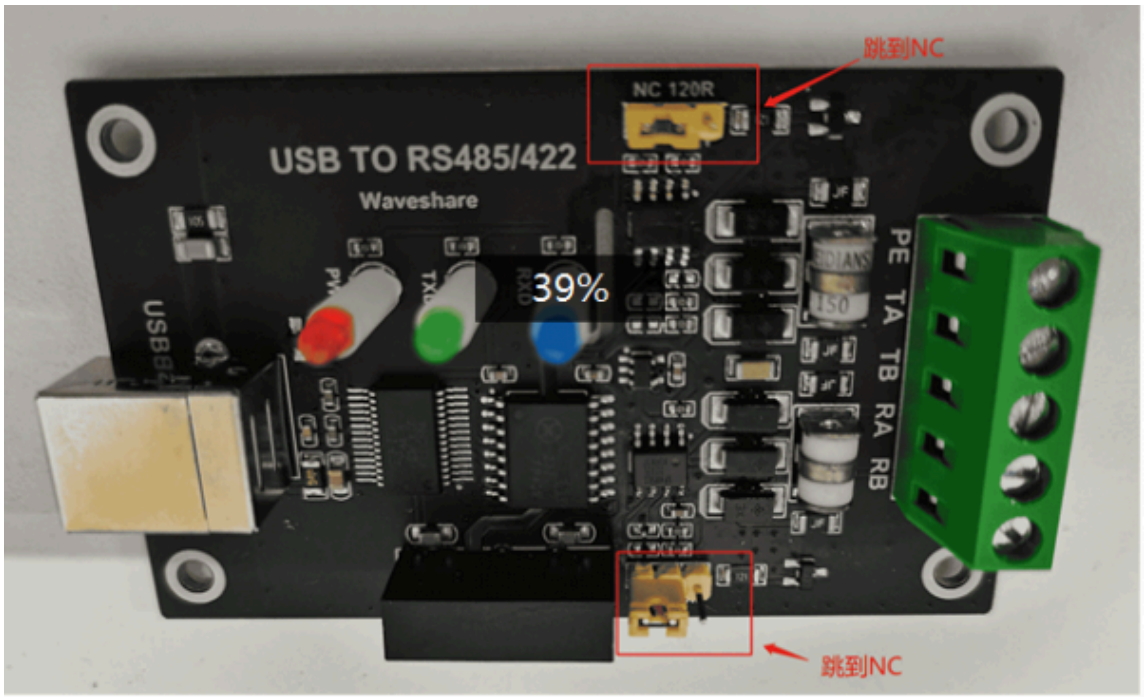


(/wiki/File:USB-422-485-NC.png)

Question: What should I do if the RS485 short-distance communication is abnormal, and the received data will have more than 0 or messy code?

Answer:

- Remove the two 120Ω terminal matching resistors of RS422/RS485, and connect the jumper cap to NC.

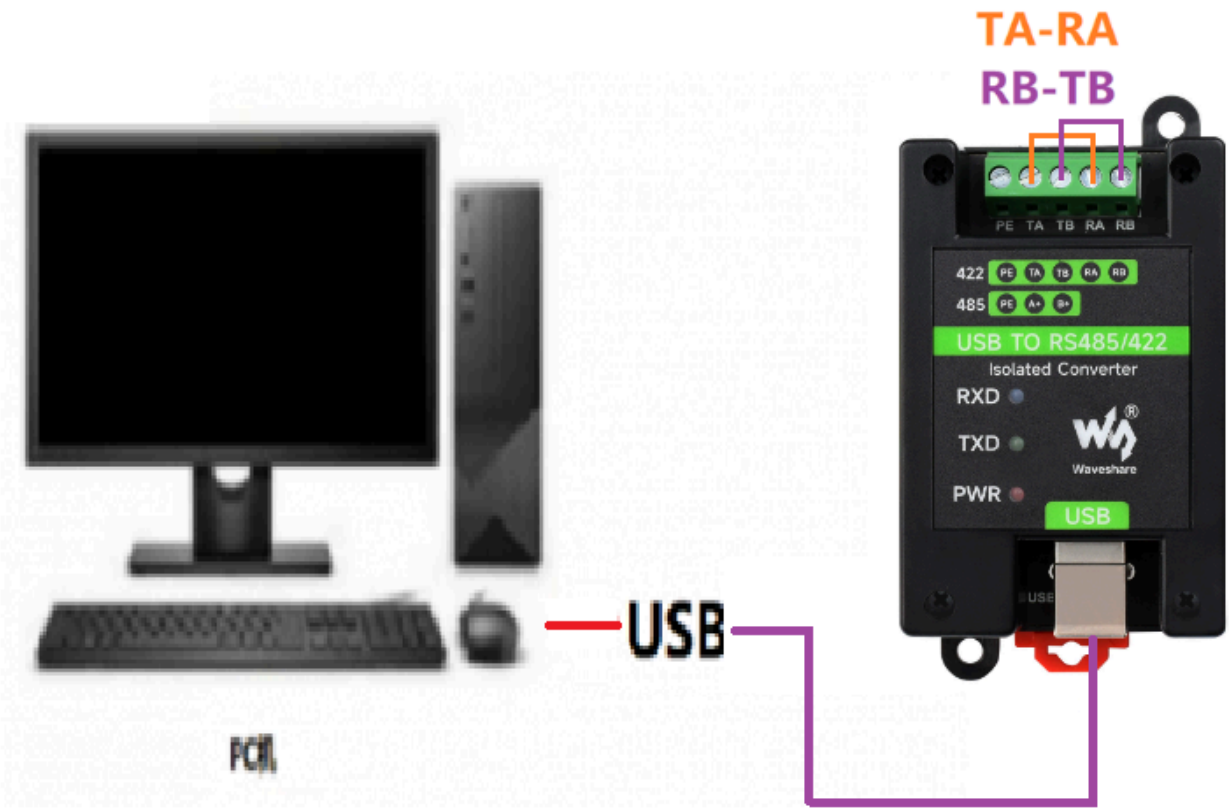


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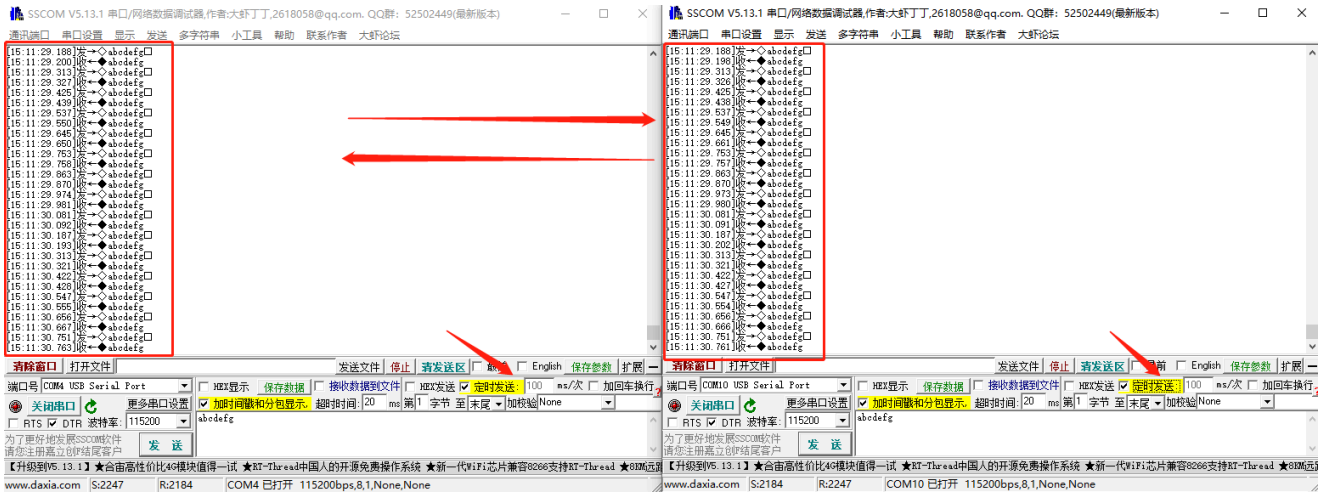
Question: How to confirm the module function is normal

Answer:

RS422 is a full-duplex communication, you can loopback test to confirm the module function:



(/wiki/File:USB_TO_RS485-422_FAQ08.png)



(/wiki/File:USB_TO_RS485-422_FAQ09.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/)

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