WAVESHARE USB TO RS232 TTL Interface Converter Industrial Isolation User Guide

Contents

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Specifications:

- **Product Type:** Industrial Grade Digital Isolated Converter
- **USB Operating Voltage Connector:** 5V USB-B
- **RS232 Connector:** DB9 male
- **RS485/422 Operating Voltage:** 3.3V / 5V
- **TTL (UART) Pins Protection:** TXD, RXD, GND, 5V/3.3V Clamp protection diode, over-voltage/negative-voltage proof, shock resistance
- **Operating Environment Temperature:** -15°C to 70°C
- **Operating Environment Humidity:** 5% to 95%RH
- **Operating System Compatibility:** Mac, Linux, Android, Windows 11 / 10 / 8.1 / 8 / 7

Product Usage Instructions

Software Installation

USB Driver Installation:

1. *The first method:* Download the driver wizard from the Internet and let it automatically detect and install the driver.
2. *The second method to manually* install the driver. Connect the device to the computer via a USB cable and check the device manager for the serial port number with a yellow exclamation mark, indicating that the driver is not installed.

You can download the software installation package on the official website WIKI.

Driver Installation Steps:

1. Extract the downloaded package.
2. Click Next after accepting the agreement.
3. Finish the installation process.

Hardware Test

Test environment: PC with a Windows operating system.

Accessories required for testing:

- [List accessories needed for hardware testing]

Interface Introduction

[Describe the various connectors and indicators on the device]

Modification of RS422 and RS485 Settings

To modify the settings of RS422 and RS485 interfaces, follow these steps: [Describe how to disassemble the case and modify the settings]

Operating Instructions

[Provide detailed steps on how to operate the device for different communication modes]

Frequently Asked Questions (FAQ):

- Q: How can I switch between RS232, RS422, and RS485 modes?
  A: The device features automatic transmission and reception conversion with zero delays. To switch between modes, ensure the appropriate connectors are used and configure the hardware settings accordingly.
- Q: What baud rates are supported by the device?
  A: The device supports baud rates ranging from 300bps to 3Mbps for RS232, RS485/422, and TTL modes.
- Q: How do I know if the driver is successfully installed?
  A: Check the device manager on your computer. If you see the port number available without any errors or warnings, the driver is successfully installed.

Overview

Introduction

USB TO RS232/485/422/TTL, an industrial-grade isolated converter, adopts the original FT232RNL, built-in protection circuits including power isolation, ADI magnetical isolation and TVS, and with aluminum alloy shell design. USB TO RS232/485/422/TTL is easy to operate and features an automatic transmission and reception conversion with zero safety, etc., and can be applied to various industrial control device or applications with high communication requirements.

Feature

- Adopt the original FT232RNL chip, fast, stable and reliable, better compatibility.
- Supports multiple communication interface conversions: USB to RS232, USB to RS485, USB to RS422, USB to TTL.
- 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 antiinterference, and low power consumption.
- Onboard TVS (Transient Voltage Suppressor), effectively suppresses surge voltage and transient spike voltage in the circuit, lightning proof & ESD protection.
- Onboard self-recovery fuse and protection diodes, ensure the current/voltage stable outputs, provide over-current/over-voltage proof, and improve shock resistance.
- A fully automatic transceiver circuit with no delay ensures the USB port communicates with different interfaces fastly and stably, without interfering with each other.
- Onboard TTL serial 3.3V/5V voltage translator, config the TTL level via a switch.
- 3x LEDs for indicating the power and transceiver status.
- High-quality USB-B and R5232 connectors, smoothly plug/pull.
- Industrial grade metal case supports wall-mount and rail-mount installations, solid and beautiful, easy to install.

Parameters

Interface Introduction

RS485/422 Pinout	
Screw Terminal (PIN)	Description
PE	485/422 signal ground
TA	RS422 send differential signal positive RS485 differential signal positive A+
TB	RS422 send differential signal negative RS485 differential signal negative B-
RA	RS422 receive differential signal positive
RB	RS422 receive differential signal negative

TTL (UART) Pinout	
Screw Terminal (PIN)	Description
TXD	TTL transmit data pin, connect to MCU.RXD
RXD	TTL receive data pin, connect to MCU.TXD
GND	Connect to GND
VCC	5V / 3.3V power supply output, configurable via 5V/3.3V level switch
5V/3.3V level switch	TTL level selection

Dimensions


78.00
64.15
84.30
29.87
WAVESHARE
USB TO
RS232/485/422/TTL
Industrial Isolated Converter
RS232
PWR
TXD
RXD
USB
A+
B-
TA
TB
RA
RB
485
422
TTL
TXD
RXD
VCC
5V 3.3V
RXD
24.30
RS232
PWR TXD
USB
Unit: mm

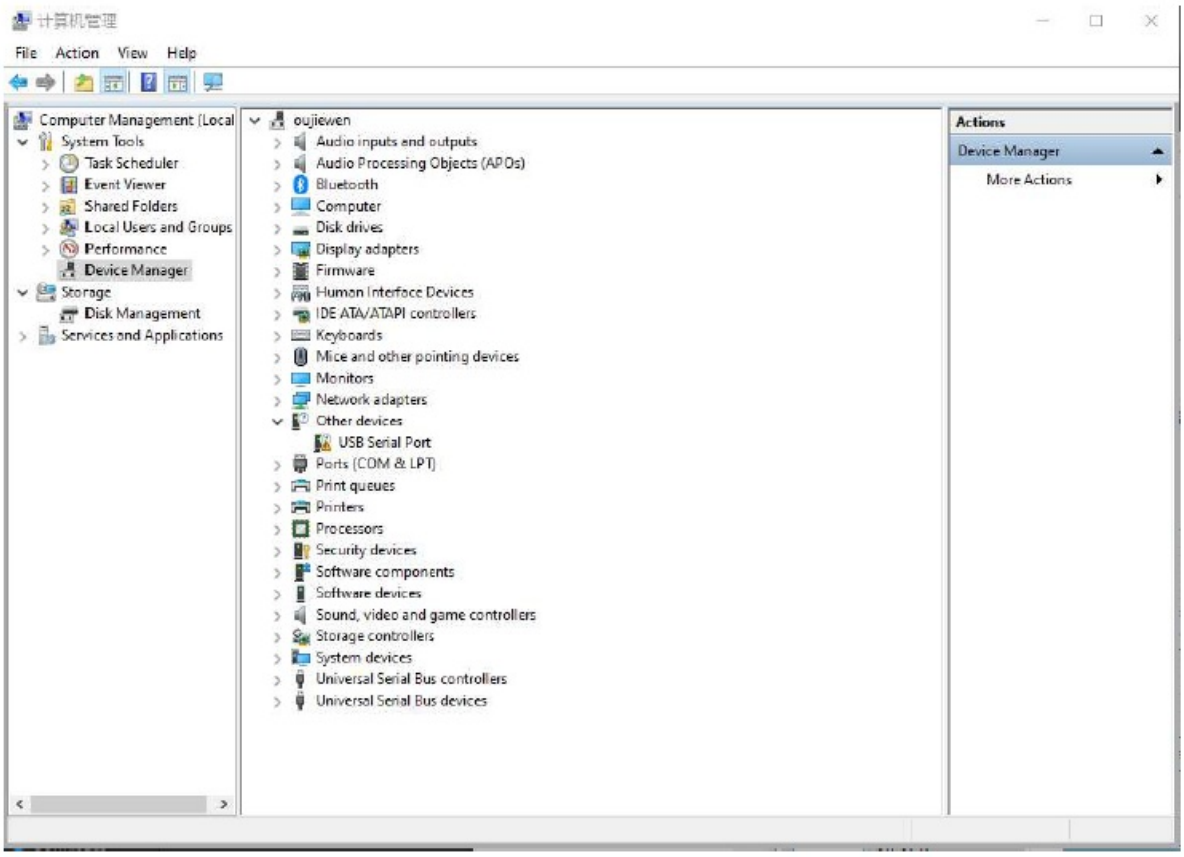
Matching Resistor

Note: The RS422 and RS485 interfaces of USB TO RS232/485/422/TTL also have a built-in 120R enable resistor, which is enabled by default, and the user can disassemble the case to modify the settings as needed.
Modification method: modify the yellow jumper cap at the red frame.

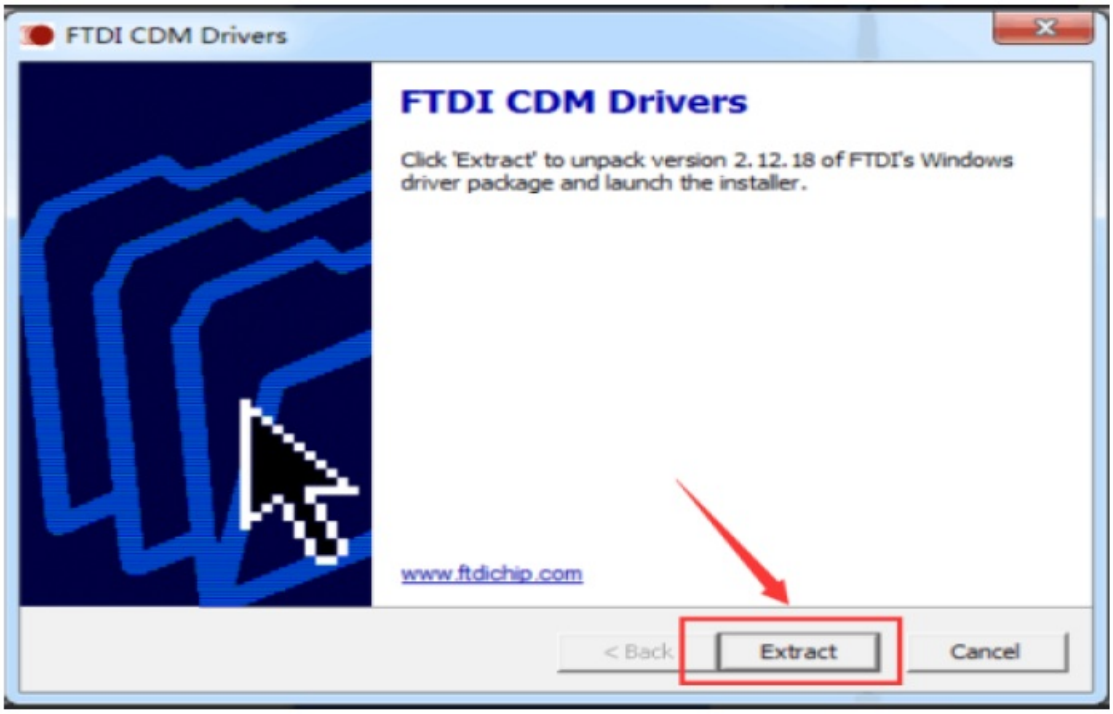
Software Installation

USB Driver Installation

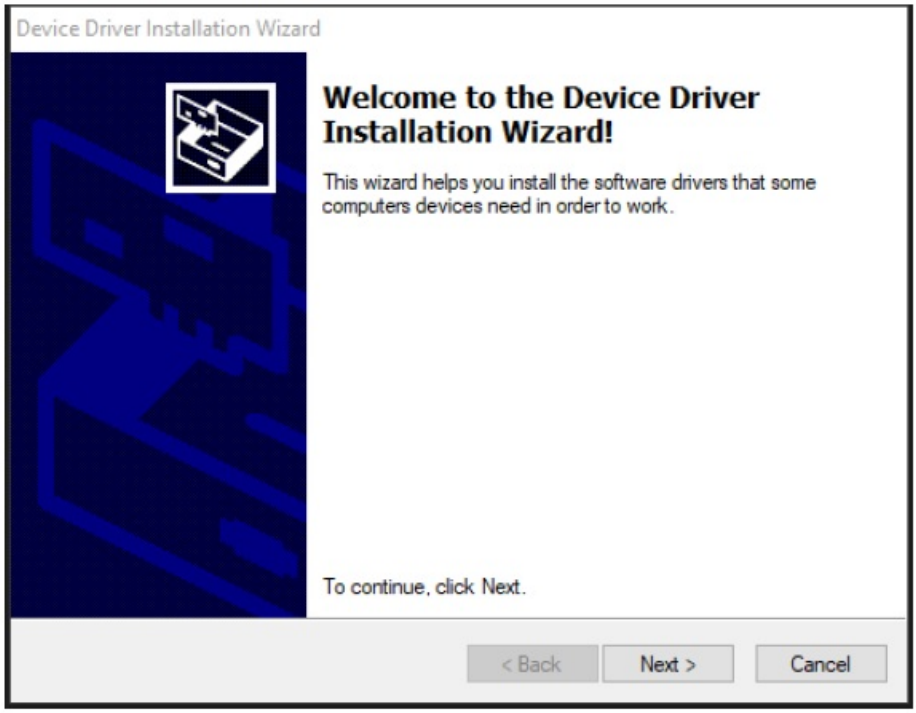
- The first method: download the driver wizard from the Internet, and automatically detect and install the driver.
- The second method: manually install the driver (the following uses WIN7 installation as an example).
- Connect the device to the computer via a USB cable, and check the device manager,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



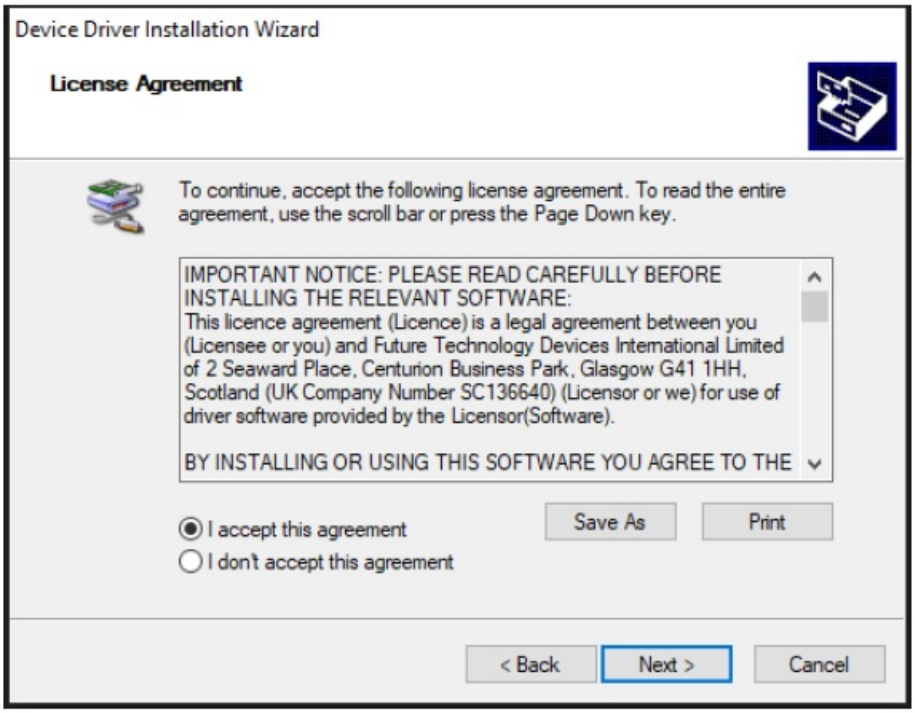
- You can download the software installation package on the official website WIKI.



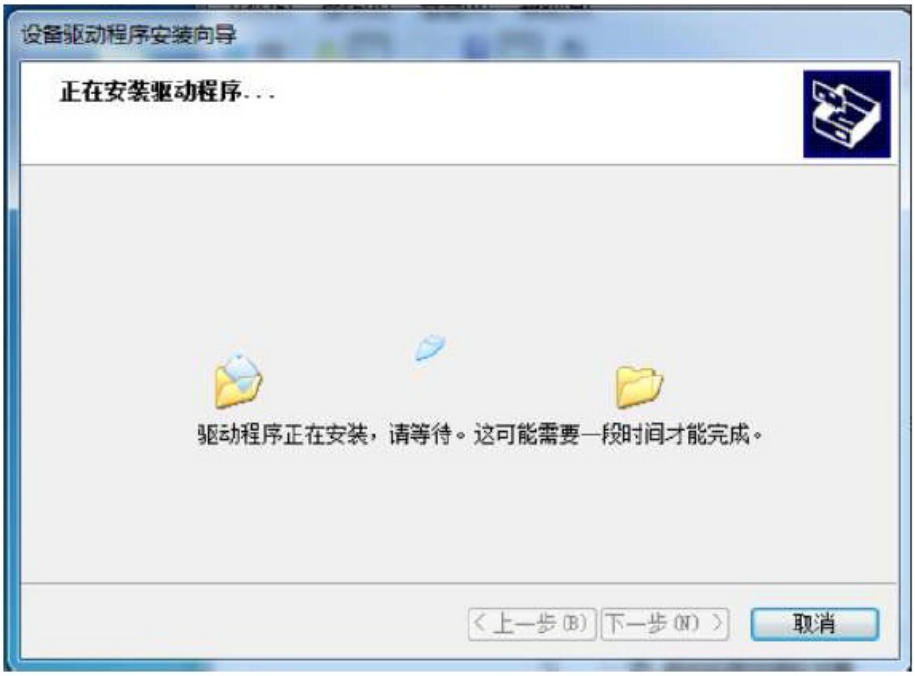
- Click Extract:

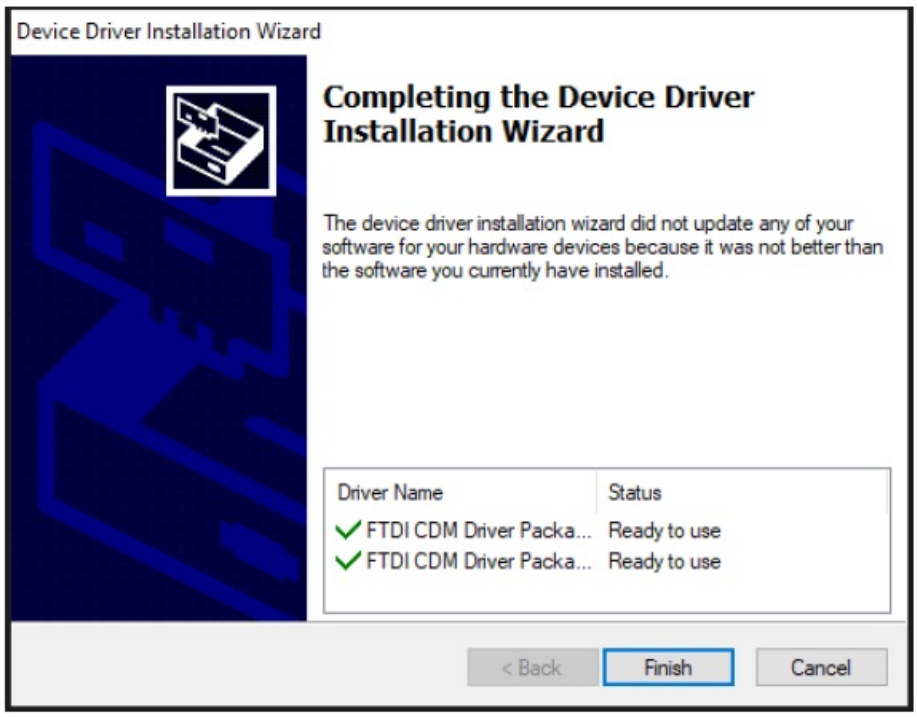


- Click Next:

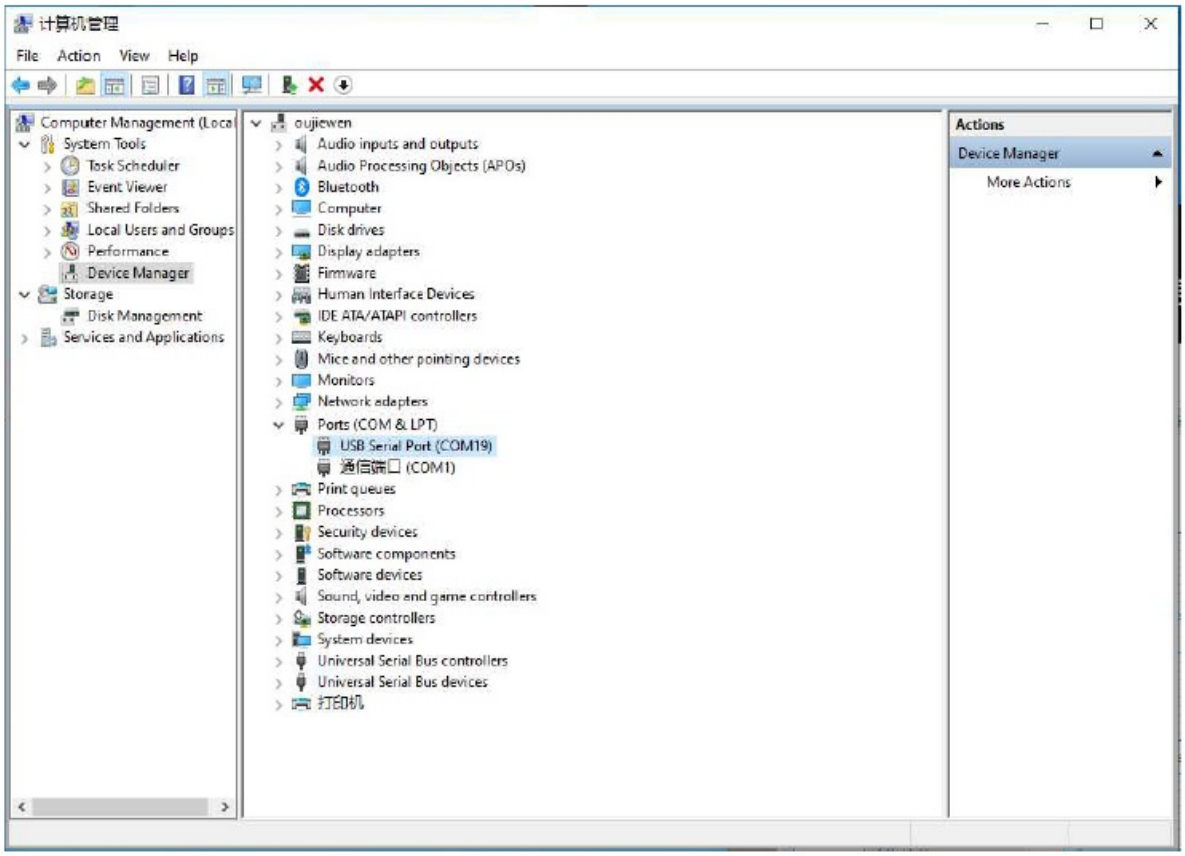


- Check I accept this agreement (A), and then click Next:





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



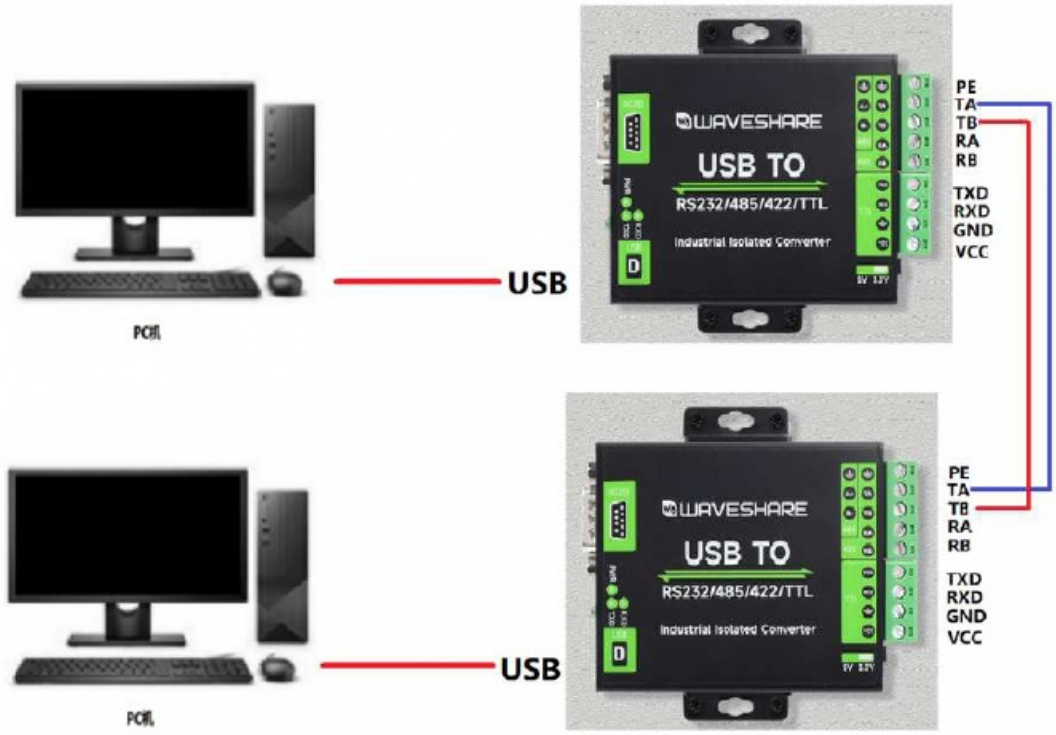
Hardware Test

Test environment: PC (Windows operating system) Accessories required for testing:

- USB TO RS232 485 422 TTL x2
- Several DuPont wires
- USB-A male to USB-B male cable
- DB9 female-to-female cable

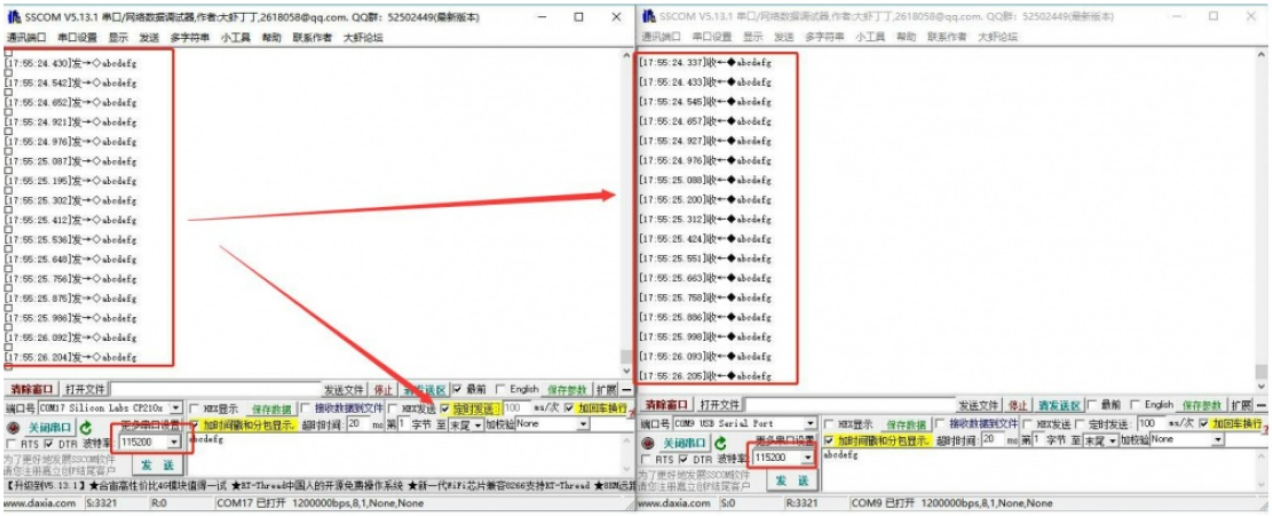
Test USB to RS485 communication

1. Connect the hardware as shown below:

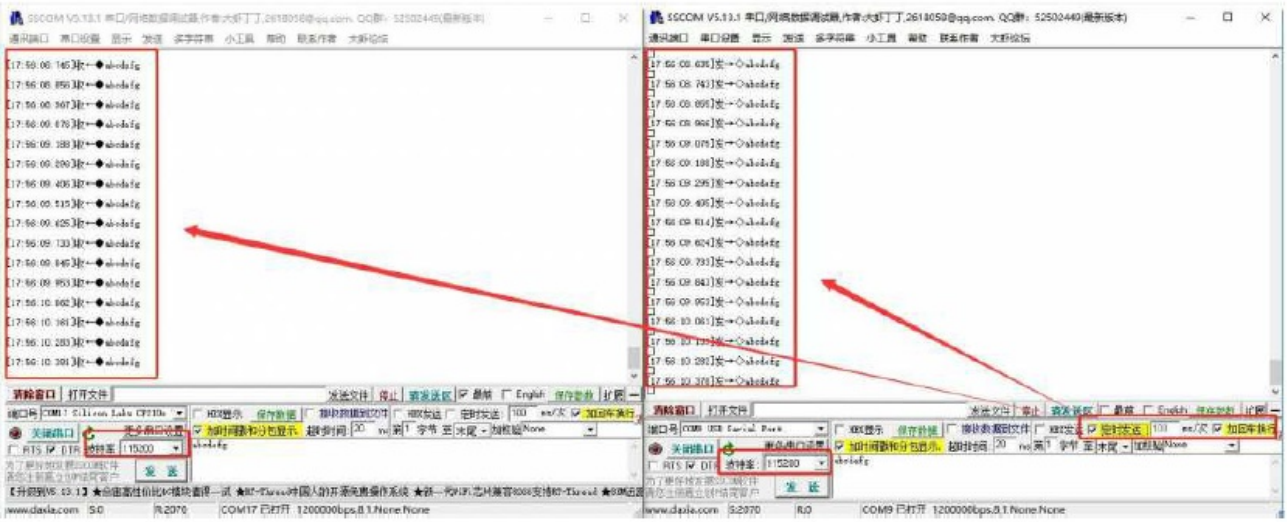


2. Open two sscom software windows, open the corresponding serial port number, set the baud rate to 115200bps, enter the box “abcdefg”, then open the serial port to test sending and receiving: (the same method as the RS232 test).

   First, check the scheduled sending on the left window, and the time can be set to 100ms/time to see if it is sent to the right window normally, there will be no packet loss or garbled characters, and if it is normal, turn off the scheduled sending, as shown in the figure below:

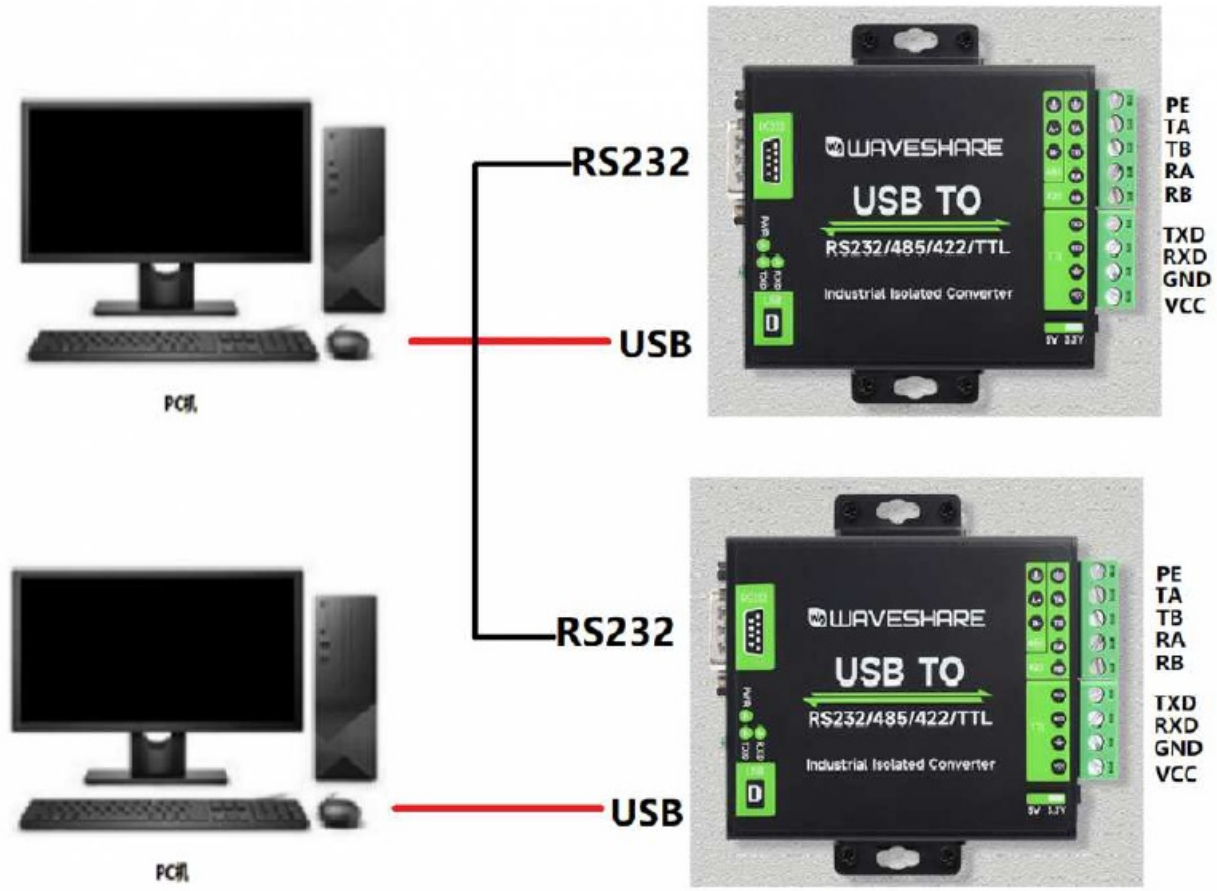


3. Then check the timing sending in the right window, and the time can be set to 100ms/time to see if it is sent to the left window normally, there will be no packet loss or garbled characters, and if it is normal, turn off timing sending, as shown in the figure below



Test USB To RS422 Communication

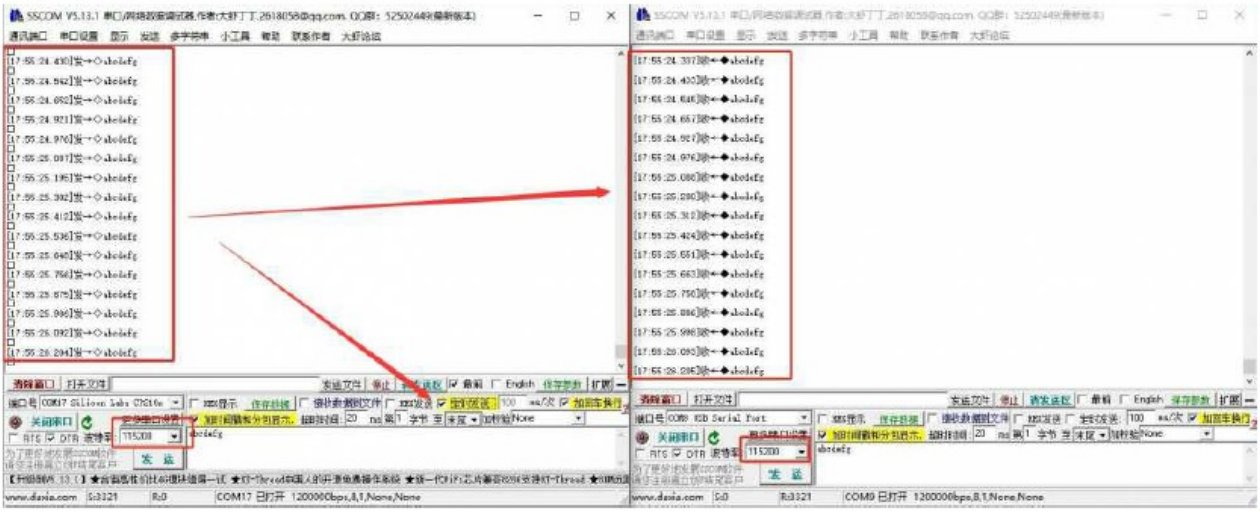
1. Connect the hardware as shown below



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

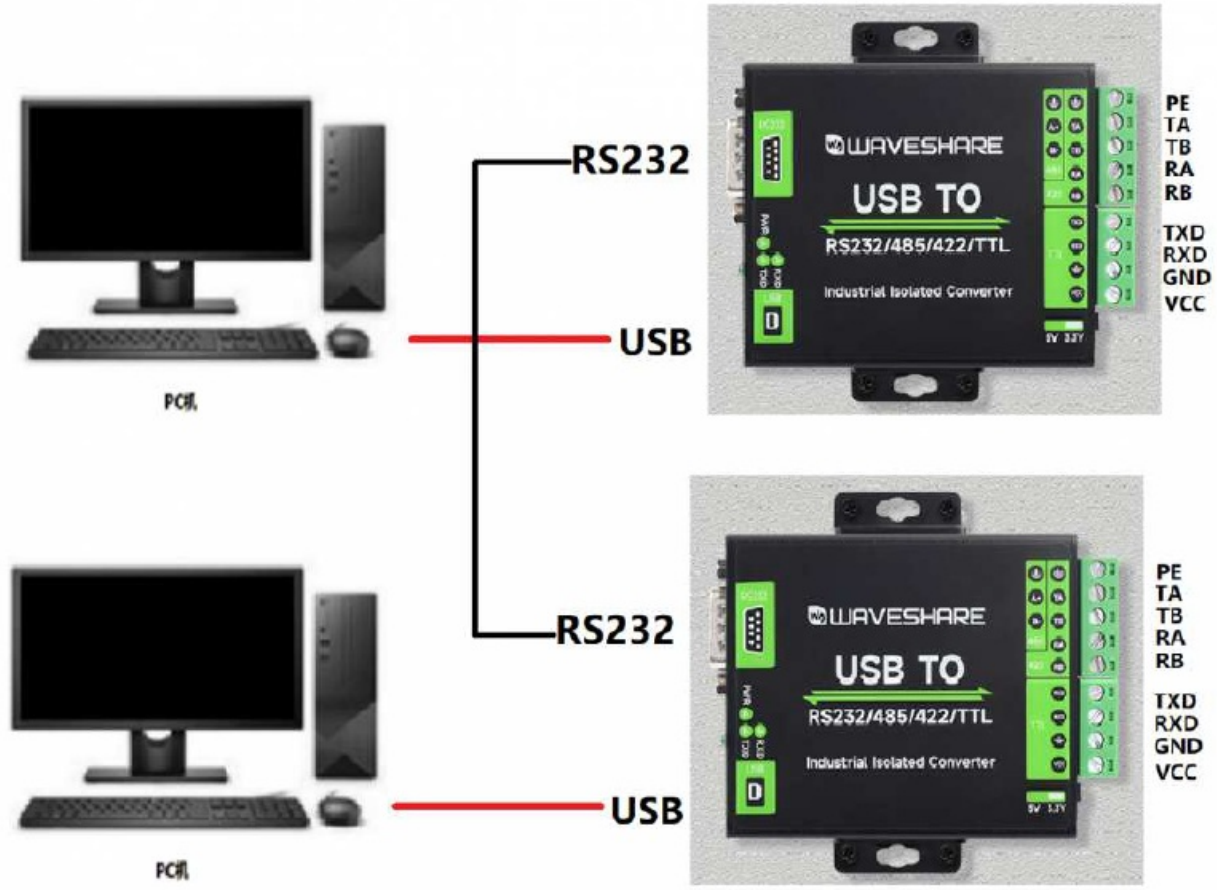
Open two SSCOM windows on the computer, open the corresponding port number, set the same baud rate, and click “Send” at regular intervals to receive and send normally.

The test results are shown in the figure below:

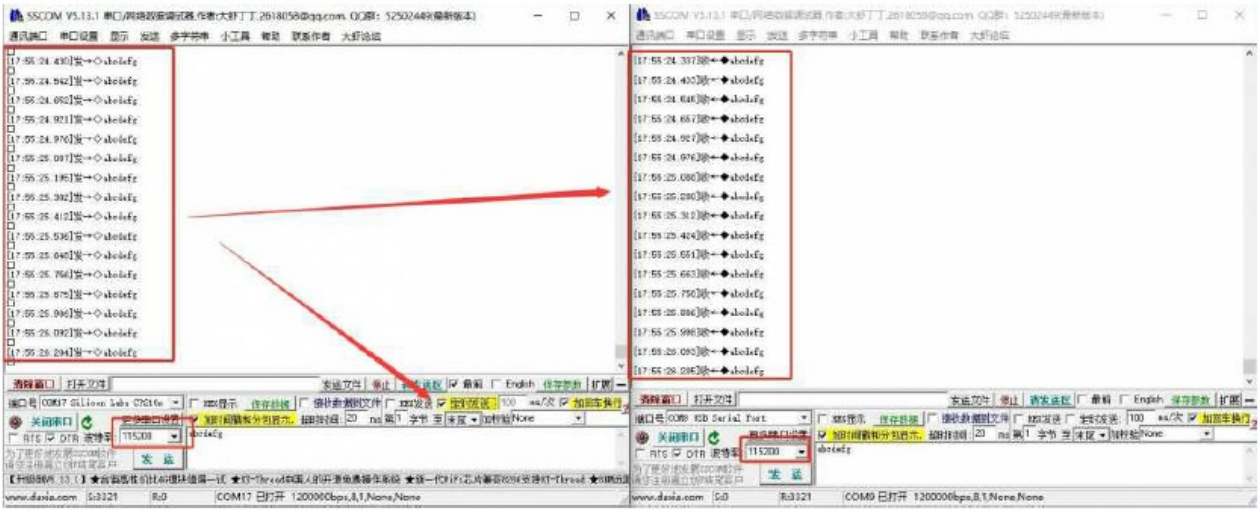


Test USB To RS232 Communication

1. Connect the hardware as shown below



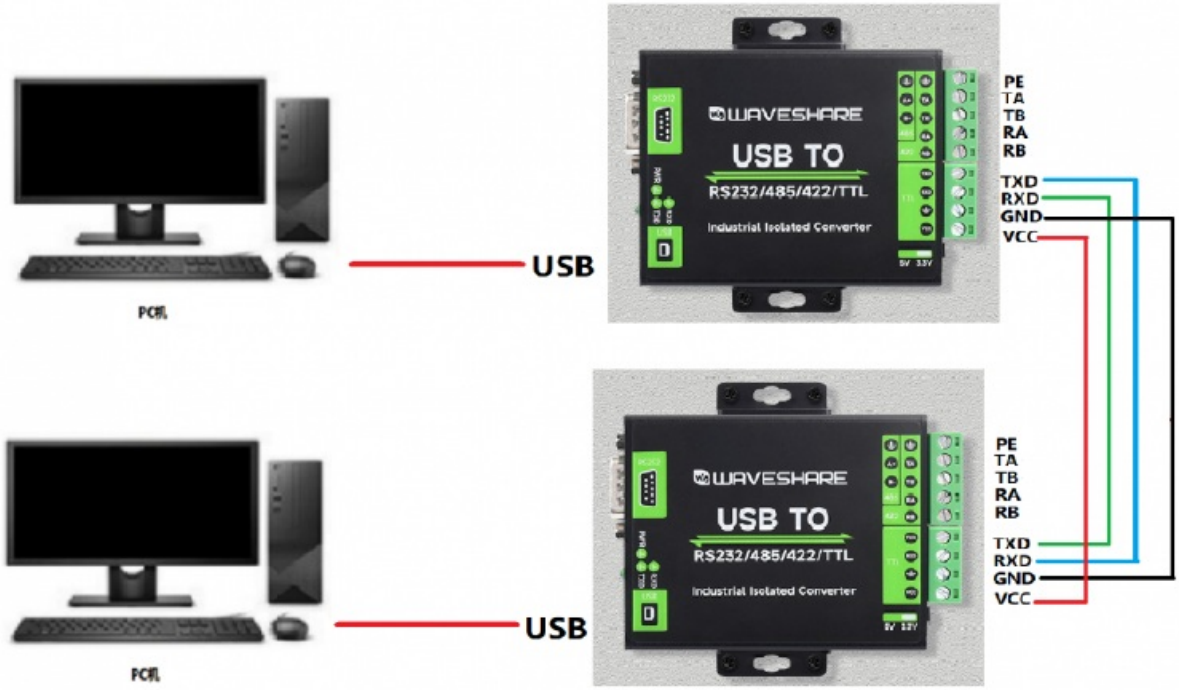
2. Open two sscom software windows, open the corresponding serial port number, set the baud rate to 115200bps, enter the box “abcdefg”, and then open the serial port to perform the sending and receiving test: First, check the scheduled sending on the left window, and the time can be set to 100ms/time to see if it is sent to the right window normally, there will be no packet loss or garbled characters, and if it is normal, turn off the scheduled sending, as shown in the figure below:



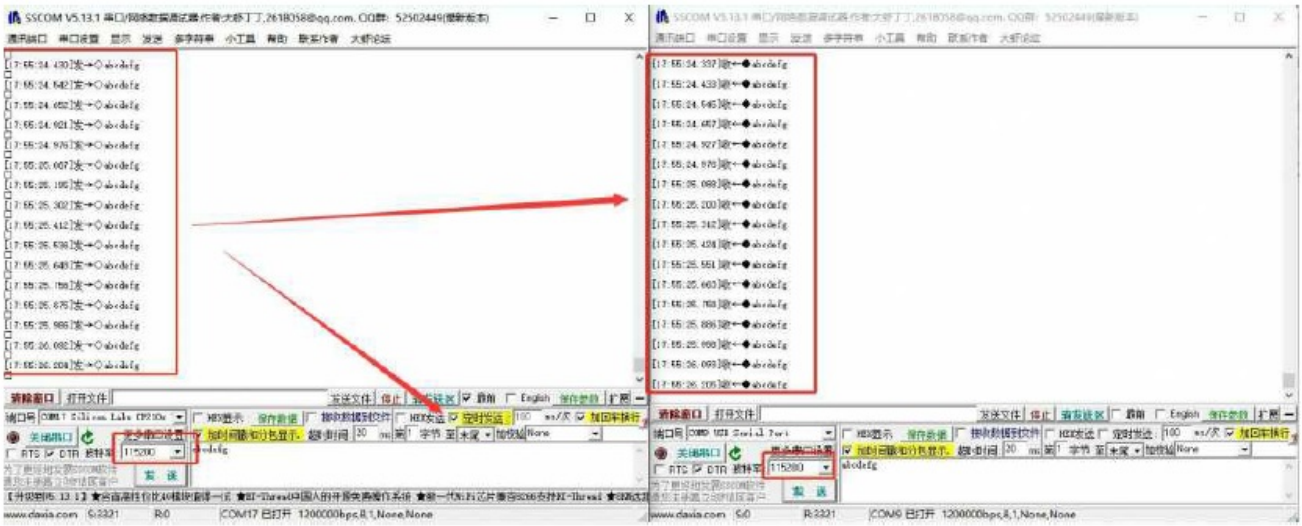
3. Then check the timing sending in the right window, the time can be set to 100ms/time, and see if it is sent to the left window normally, there will be no packet loss or garbled characters, and if it is normal, turn off timing sending, as shown in the figure below:

Test USB To TTL Communication

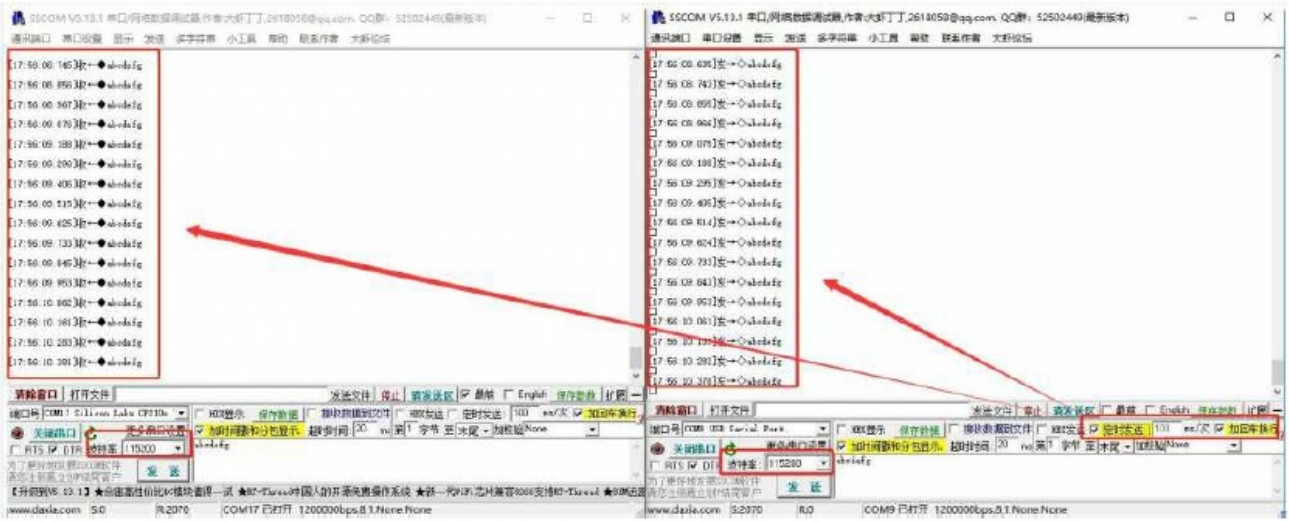
1. Connect the hardware as shown in the figure below



2. Open two sscom software windows, open the corresponding serial port number, set the baud rate to 115200bps, enter the box “abcdefg”, then open the serial port, and perform the sending and receiving test: (the same method as the RS232 test.)
3. Check the scheduled sending on the left window first, and the time can be set to 100ms/time to see if it is sent to the right window normally, there will be no packet loss or garbled characters, and if it is normal, turn off the scheduled sending, as shown in the figure below:



4. Then check the timing sending on the right window, the time can be set to 100ms/time, and check whether it is sent to the left window normally, there will be no packet loss or garbled characters, and if it is normal, turn off timing sending, as shown in the figure below:



Resource

Software

- VCP Driver (or download from FTDI official website):
  - FT232 Driver-Windows-32bit
  - FT232 Driver-Windows-64bit
  - MAC FT232 Driver-MAC-64bit
- Sscom
- Windows
- Sscom Android
- Putty.zip

Datasheet

FT232R.pdf
SP481E SP485E.pdf

Support

If you require technical support, please go to the page and open a ticket.

Documents / Resources

WAVESHARE USB TO RS232 TTL Interface Converter Industrial Isolation [pdf] User Guide
USB TO RS232 TTL Interface Converter Industrial Isolation, USB TO RS232, TTL Interface Converter Industrial Isolation, Interface Converter Industrial Isolation, Converter Industrial Isolation, Industrial Isolation

References

- VCP Drivers - FTDI
- File:USB TO RS232 422 TTl.jpg - Waveshare Wiki
- File:USB TO RS232 485 422 TTL03.JPG - Waveshare Wiki
- File:USB TO RS232 485 422 TTL04.JPG - Waveshare Wiki
- File:USB TO RS232 485 422 TTL05.JPG - Waveshare Wiki
- File:USB TO RS232 485 422 TTL06.png - Waveshare Wiki
- File:USB TO RS232 485 422 TTL07.png - Waveshare Wiki
- File:USB TO RS232 485 422 TTL08.png - Waveshare Wiki
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- File:USB TO RS4852-6.png - Waveshare Wiki
- File:USB TO RS4852-8.png - Waveshare Wiki
- File:USB TO RS4852-9.png - Waveshare Wiki
- Waveshare Wiki
- User Manual