

USB TO TTL

From Waveshare Wiki
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Overview

Specification

USB TO TTL



(<https://www.waveshare.com/usb-to-ttl.htm>)

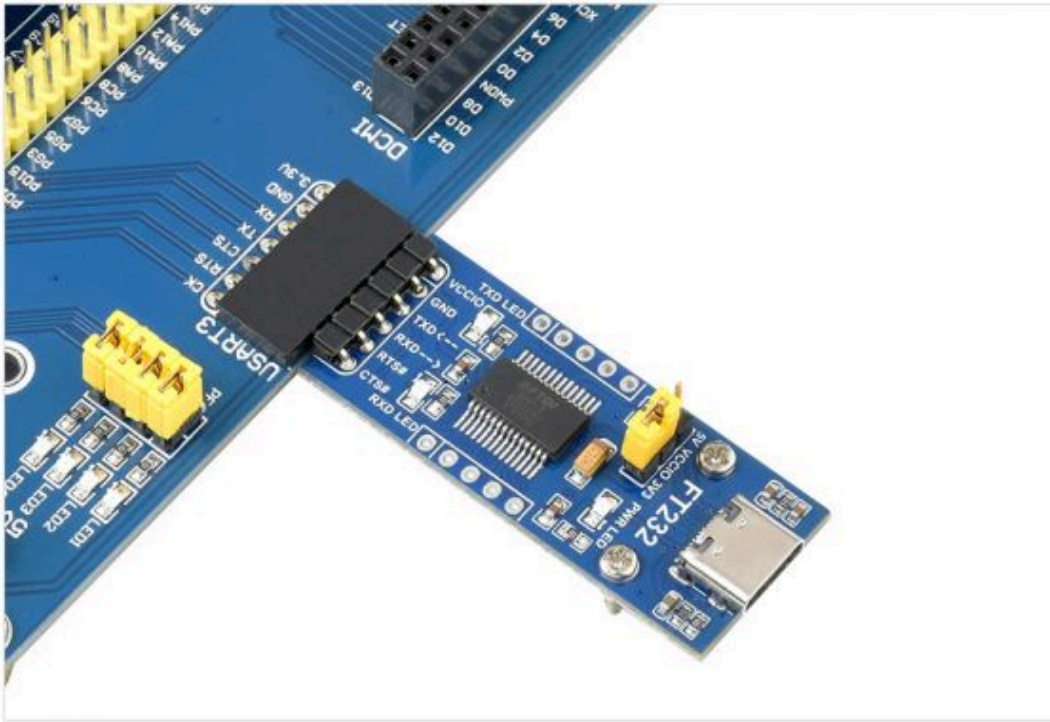
USB TO UART solution with USB Type A connector

Item	Parameters
Model	USB to UART TTL
Power Supply	5V
Baudrate	300bps ~ 3Mbps
UART (TTL)	5V/3.3V

OS Support

Support Win7/8/8.1/10/11, Mac, Linux, Android, WinCE...

Interface Description



(/wiki/File:FT232_USB_UART_Board_Spec01.jpg)

Pin	Function	Input/Output
VCCIO	5V or 3.3V available for external devices (via jumper cap)	-
GND	Ground	-
TXD	Serial data transmit pin, connect to MCU.RX	Output
RXD	Serial data receive pin, connect to MCU.TX	Input
RTS#	Request to send, connected to MCU.CTS	Output
CTS#	Clear to send, connected to MCU.RTS.	Input
RI#	Ring indicator, used to detect whether the external device is ringing, low active	Input
DCD#	Data carrier detection, low active	Input
DTR#	Data terminal is ready for controlling external devices, low active	Output
DSR#	Dataset is ready for detecting whether the external device is ready, low active	Input
RESET#	FT232 reset pin, low active (pull low the RESET pin, FT232 reset)	Input
CBUS0- CBUS4	I/O pin	Output/Input

Function Description

FT232 USB UART Board is a UART module that converts the USB interface to the TTL level. This module enables data communication by connecting the USB interface of a computer or other device to TTL logic-level devices such as microcontrollers, sensors, etc.

More (<https://www.waveshare.com/usb-to-ttl.htm>)

How to Use

Windows

Driver

There are two drivers for FT232: VCP and D2XX.

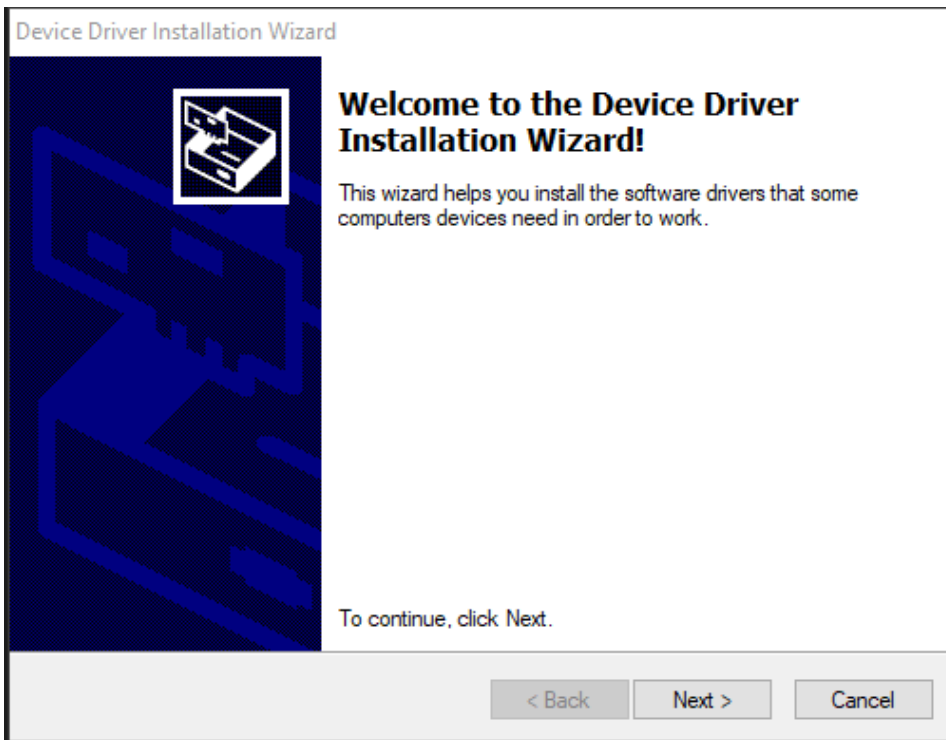
- VCP (Virtual COM Port): The PC side will be recognized as a serial port, using the serial protocol.
- D2XX driver: The PC side will be recognized as a USB port and needs to be operated using API functions.
- This product provides a VCP example, so we will only discuss the installation of the VCP driver below.
 - Download the driver: FT32 driver-Windows 64 bits (https://files.waveshare.com/upload/f3/FT232_Driver_64.zip)

The following is an example of the driver installation steps for the Windows 10 64-bit system:

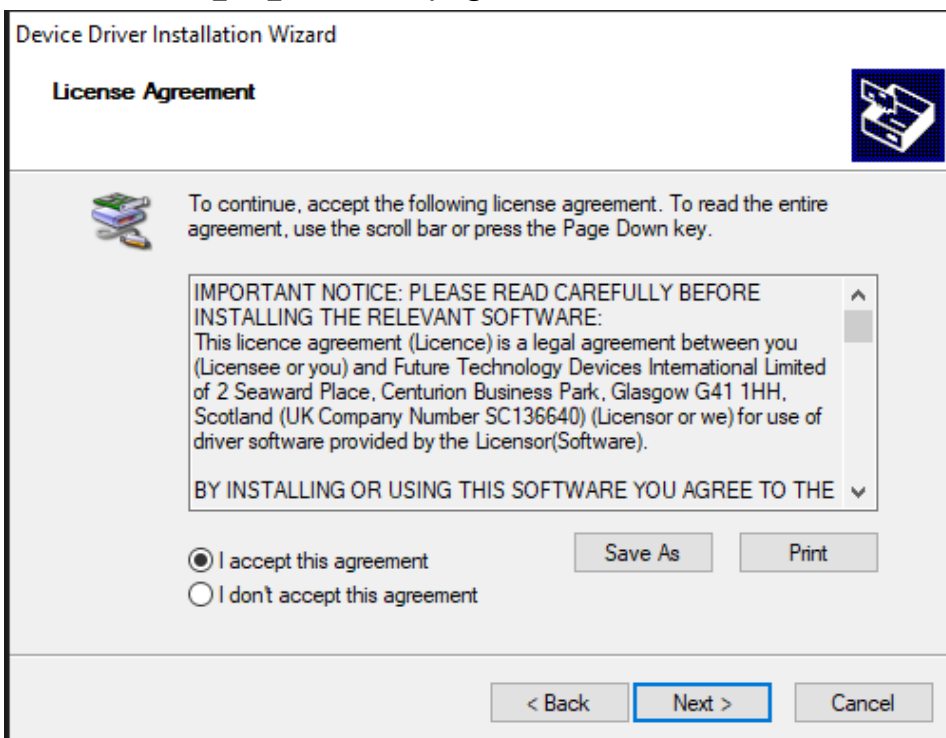
- amd64
- i386
- Static
- dp-chooser.exe
- dpinst.xml
- dpinst-amd64.exe
- ftd2xx.h
- ftdibus.cat
- ftdibus.inf
- ftdiport.cat
- ftdiport.inf
- licence.txt



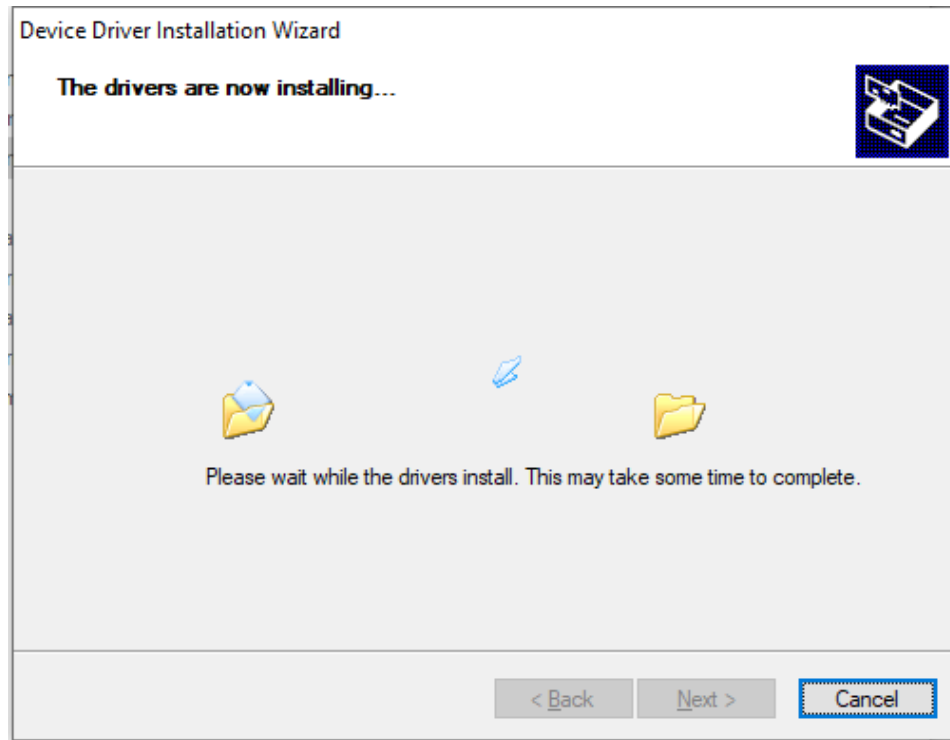
(/wiki/File:Ft232_driver_2.png)



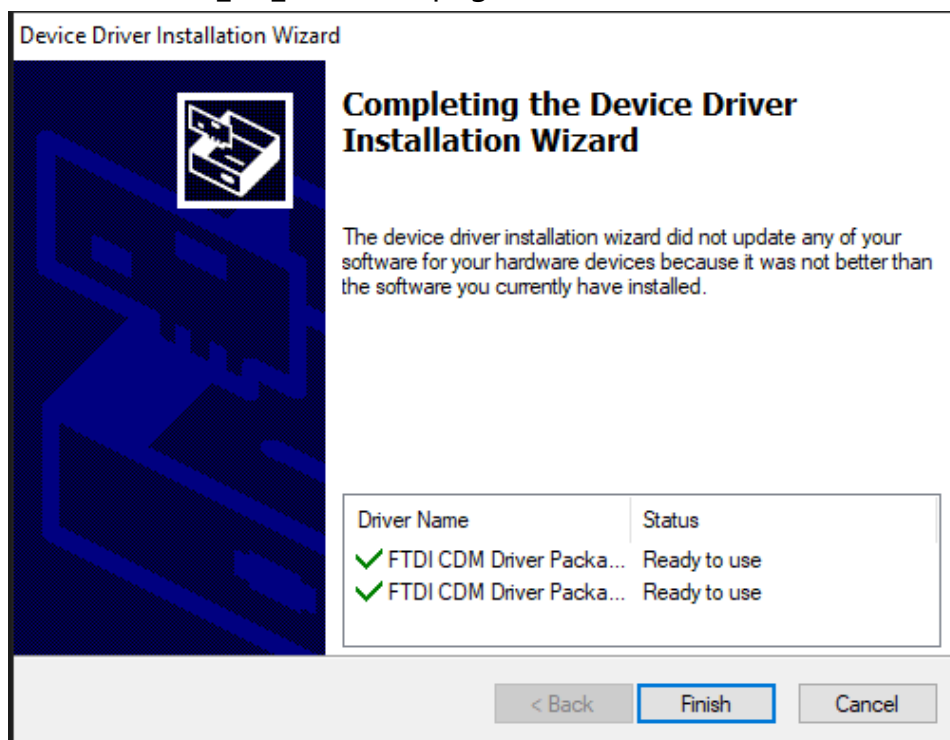
(/wiki/File:USB_TO_RS4825-5.png)



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



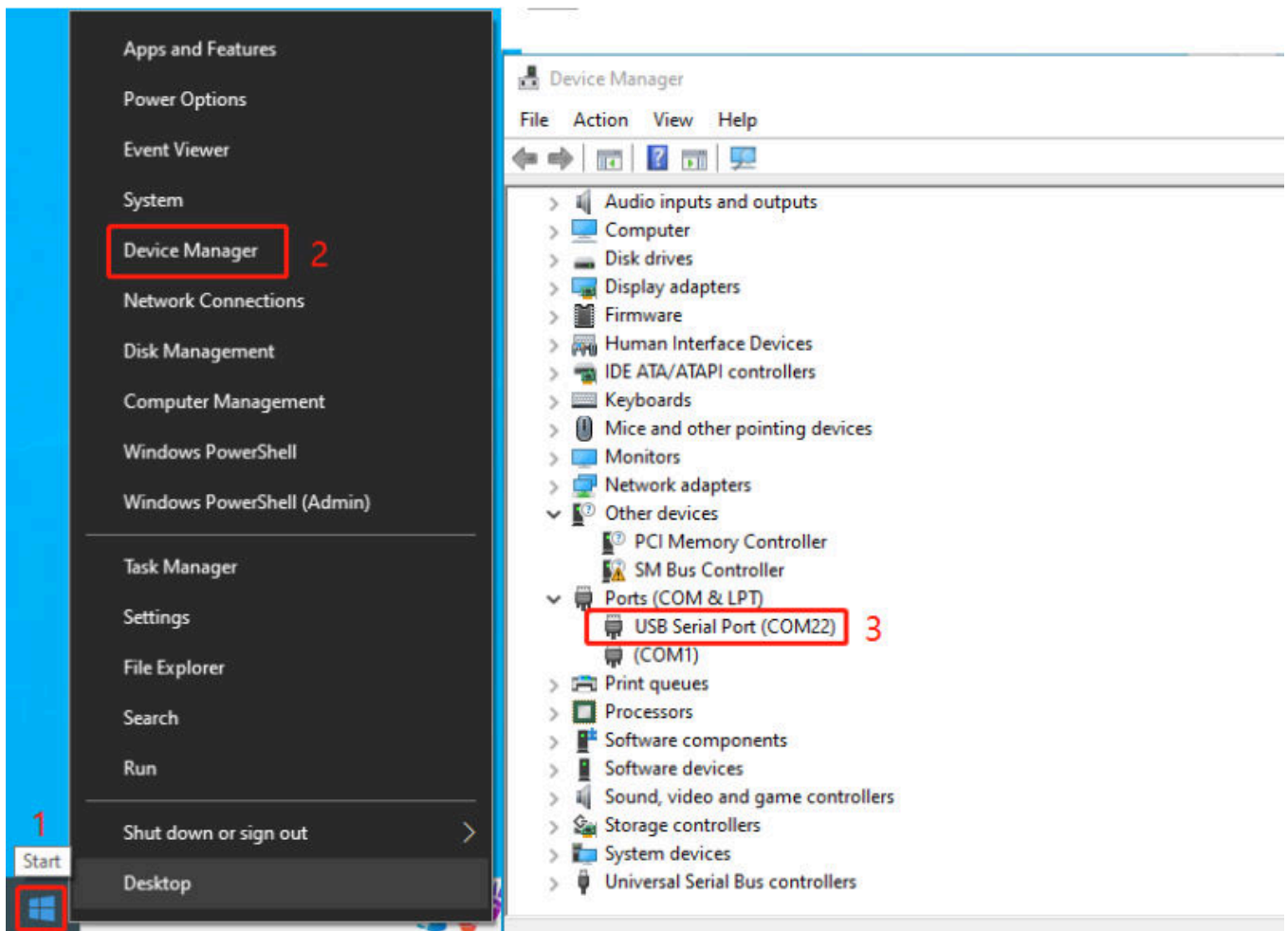
(/wiki/File:USB_TO_RS4852-7.png)



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

Device Connection

- Connect the FT232 USB UART Board to the PC.
- After installing the driver program, connect the FT232 USB UART Board to the USB port of the PC, and the PC finds the new hardware.
- Right-click the Windows on the left corner of the PC, choose "Device Manager", and you can see as shown below:

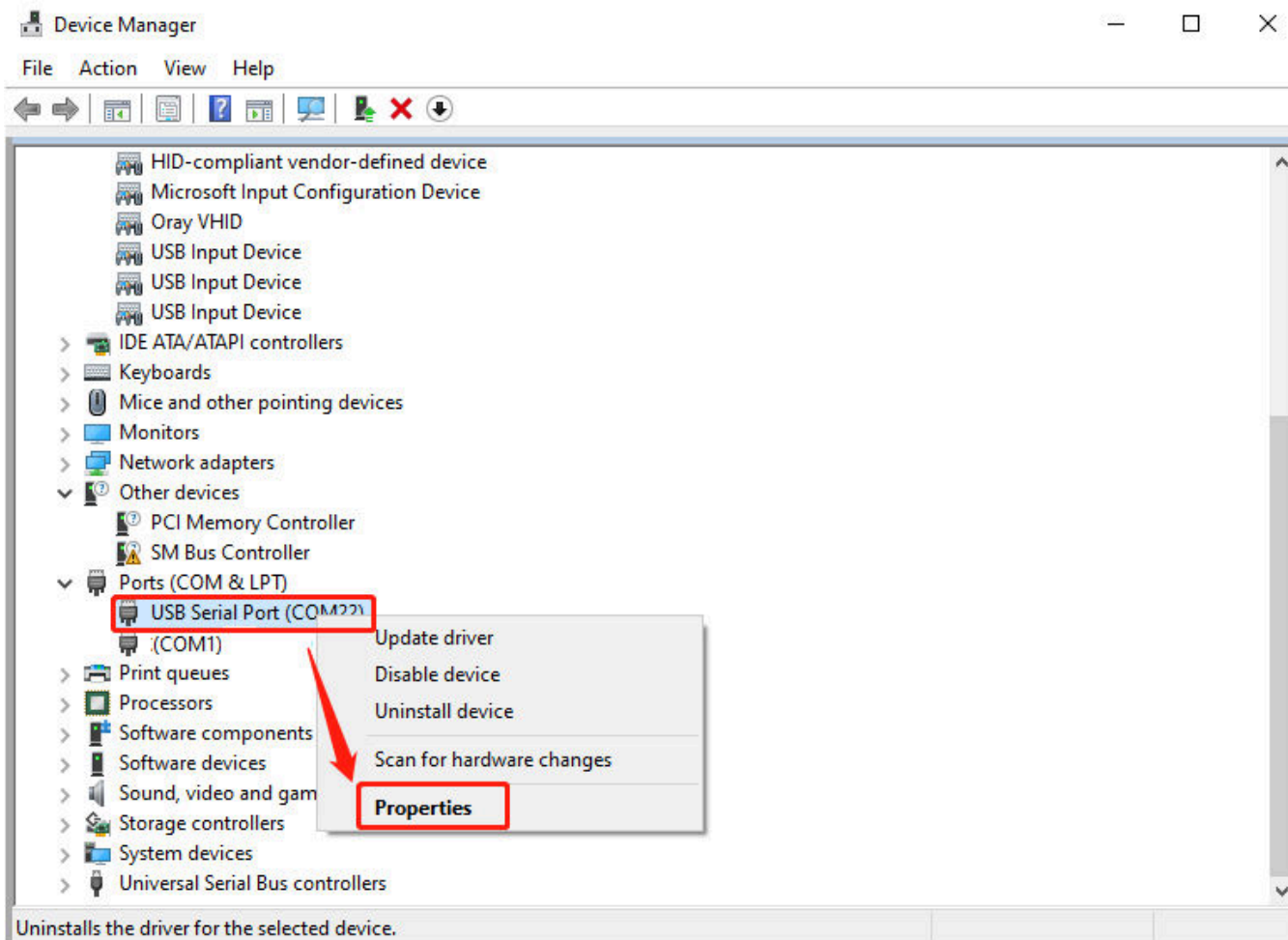


(/wiki/File:FT232_USB_UART_Board10.png)

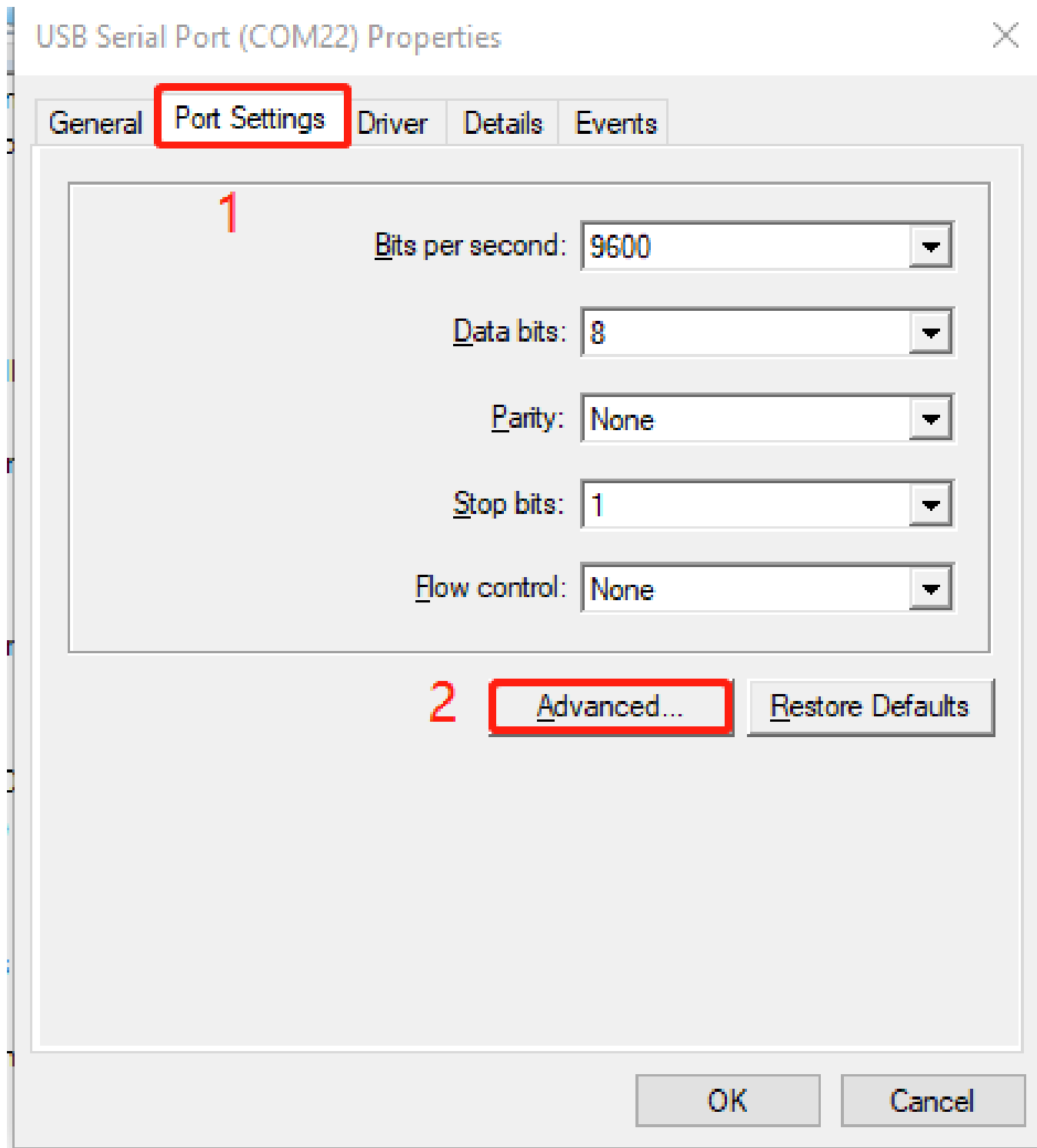
COM Port Setting (Optional)

The COM Port may change, you can configure it to the specified COM port by the following steps, as follows:

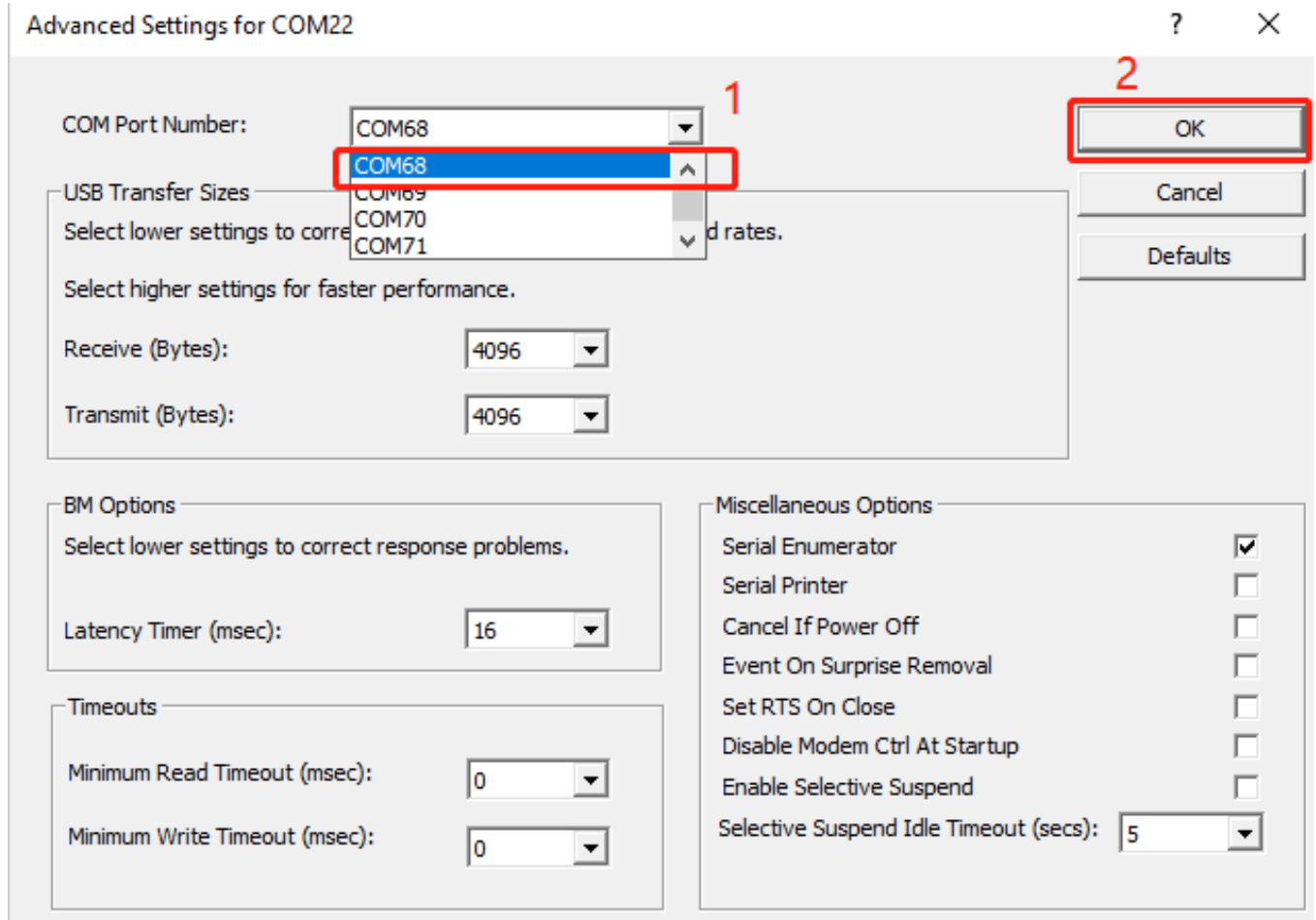
Right-click the COM port in the above figure, click "Port Settings" in the window, then click "Advanced, select the required (not occupied by other) COM port number from the down menu. (not occupied by other devices):



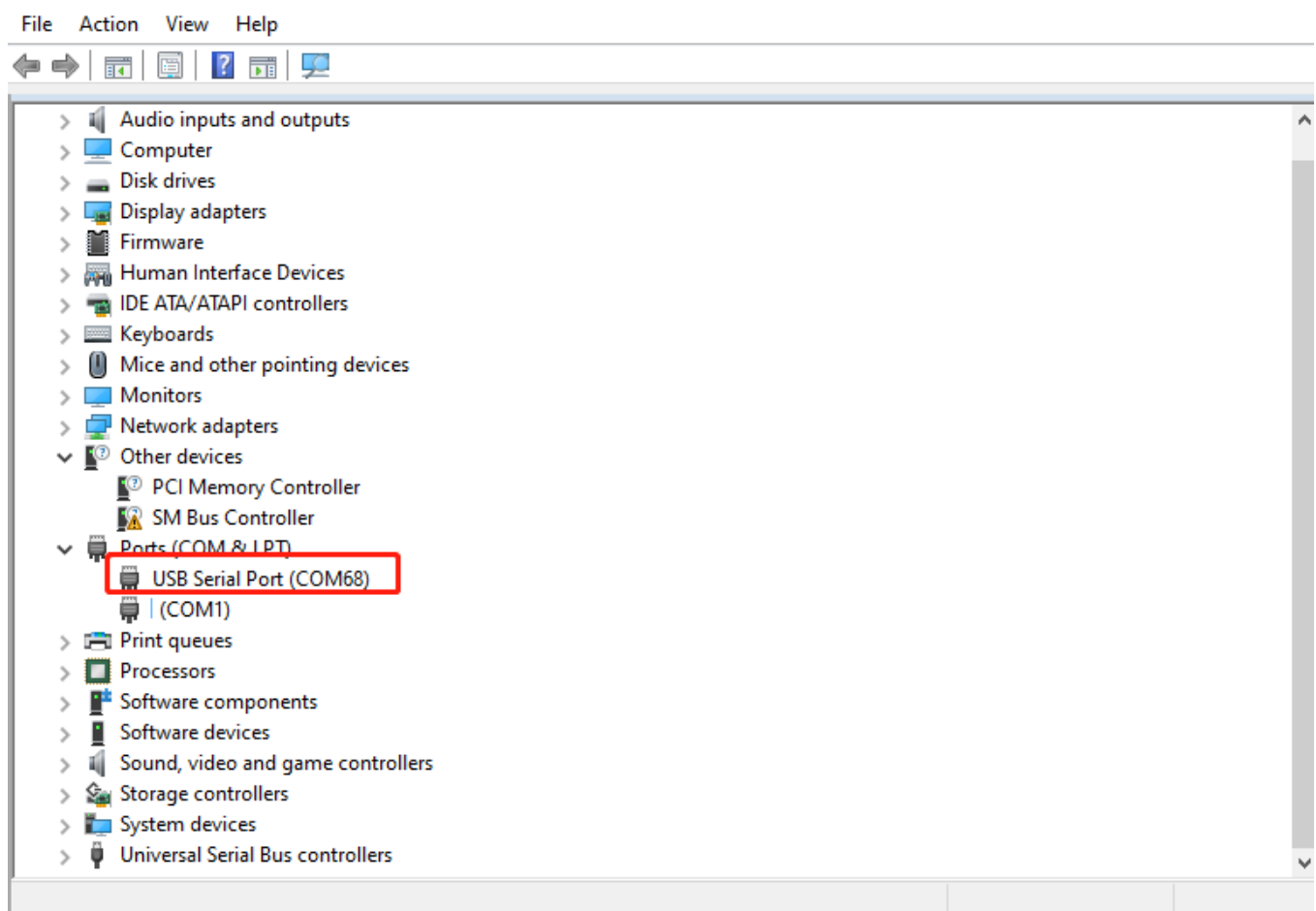
(/wiki/File:Ft232_com_1.png)



(/wiki/File:Ft232_com_2.png)



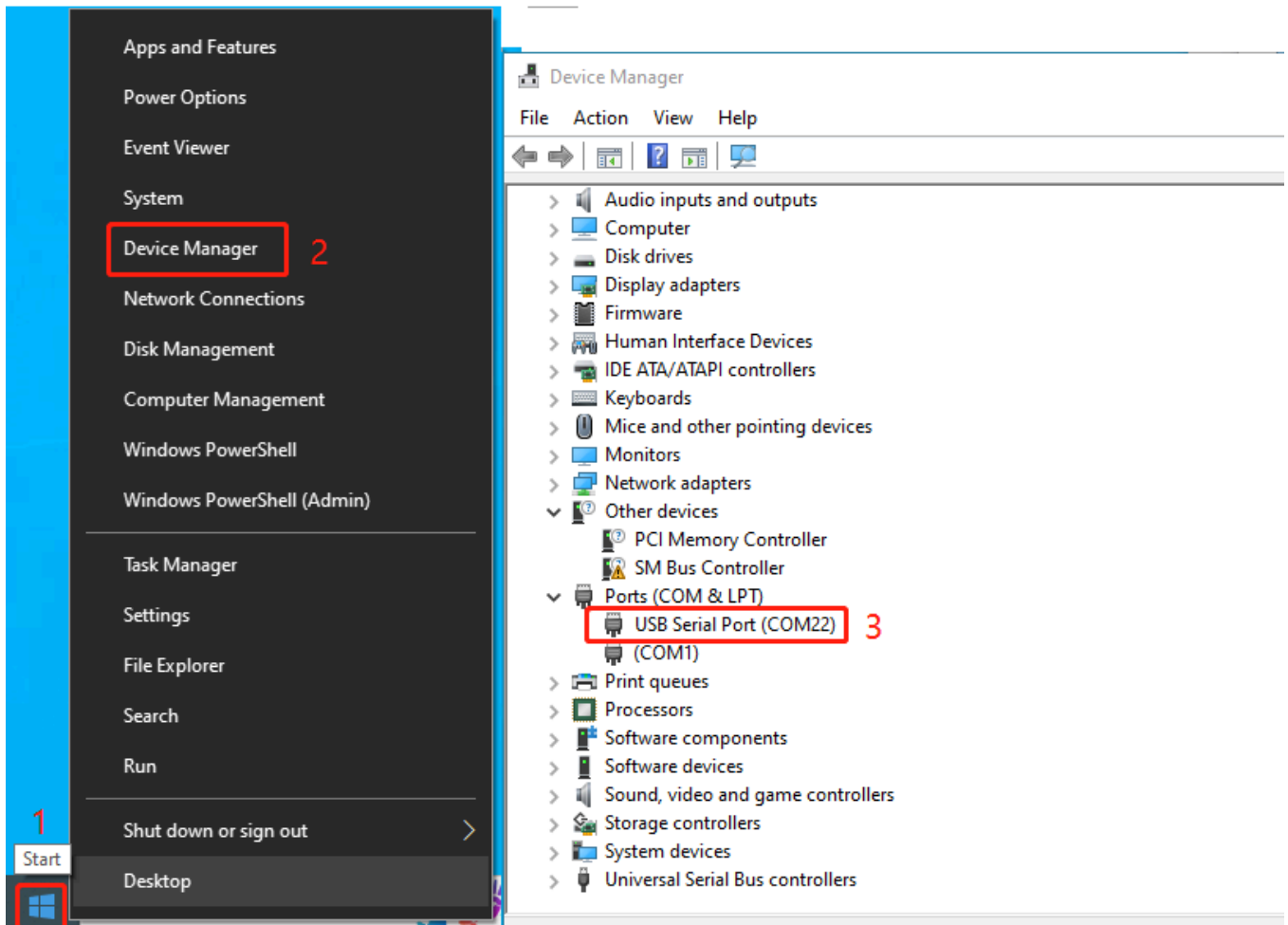
(/wiki/File:Ft232_com_3.png)



(/wiki/File:Ft232_com_4.png)

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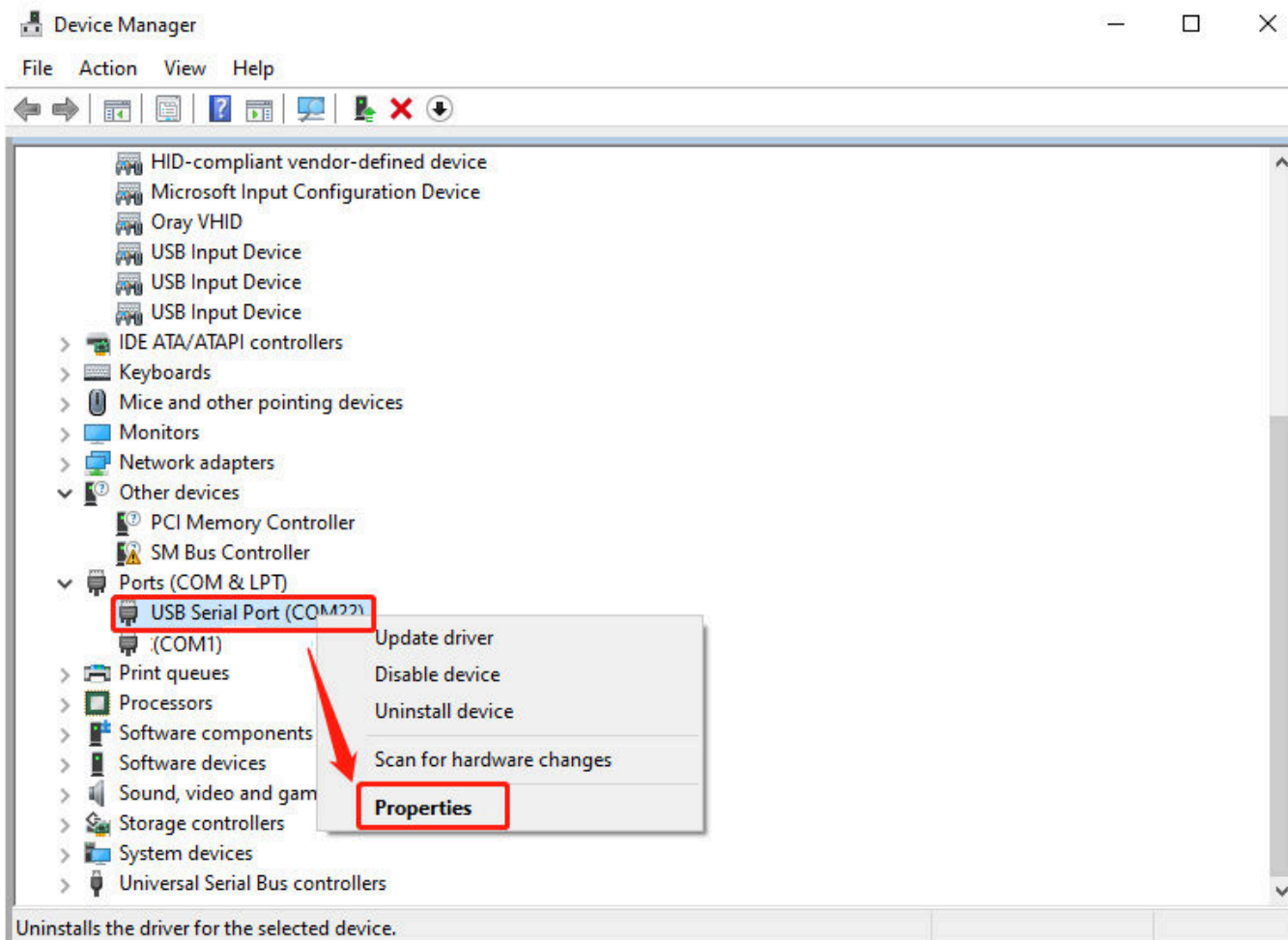


(/wiki/File:FT232_USB_UART_Board10.png)

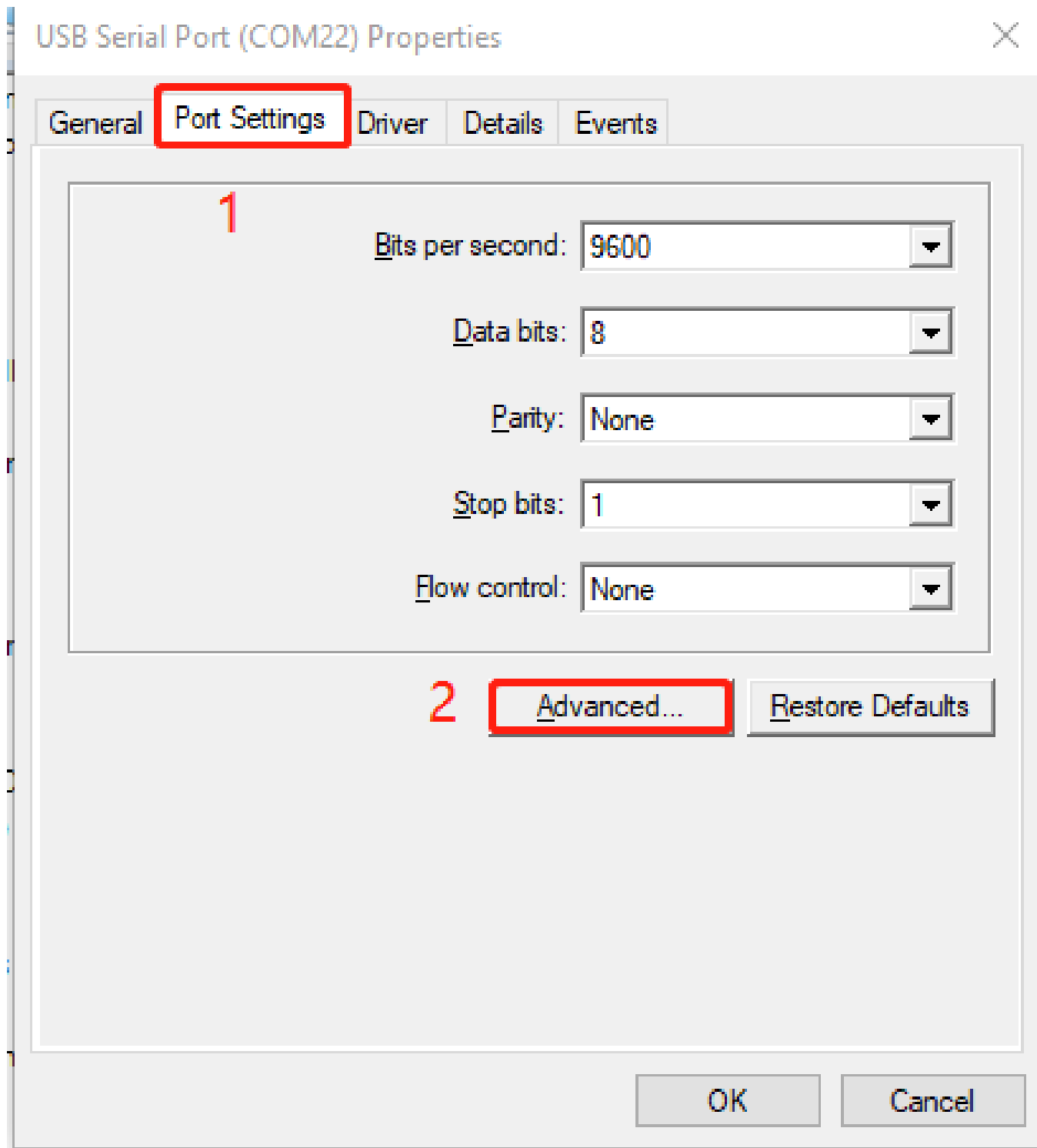
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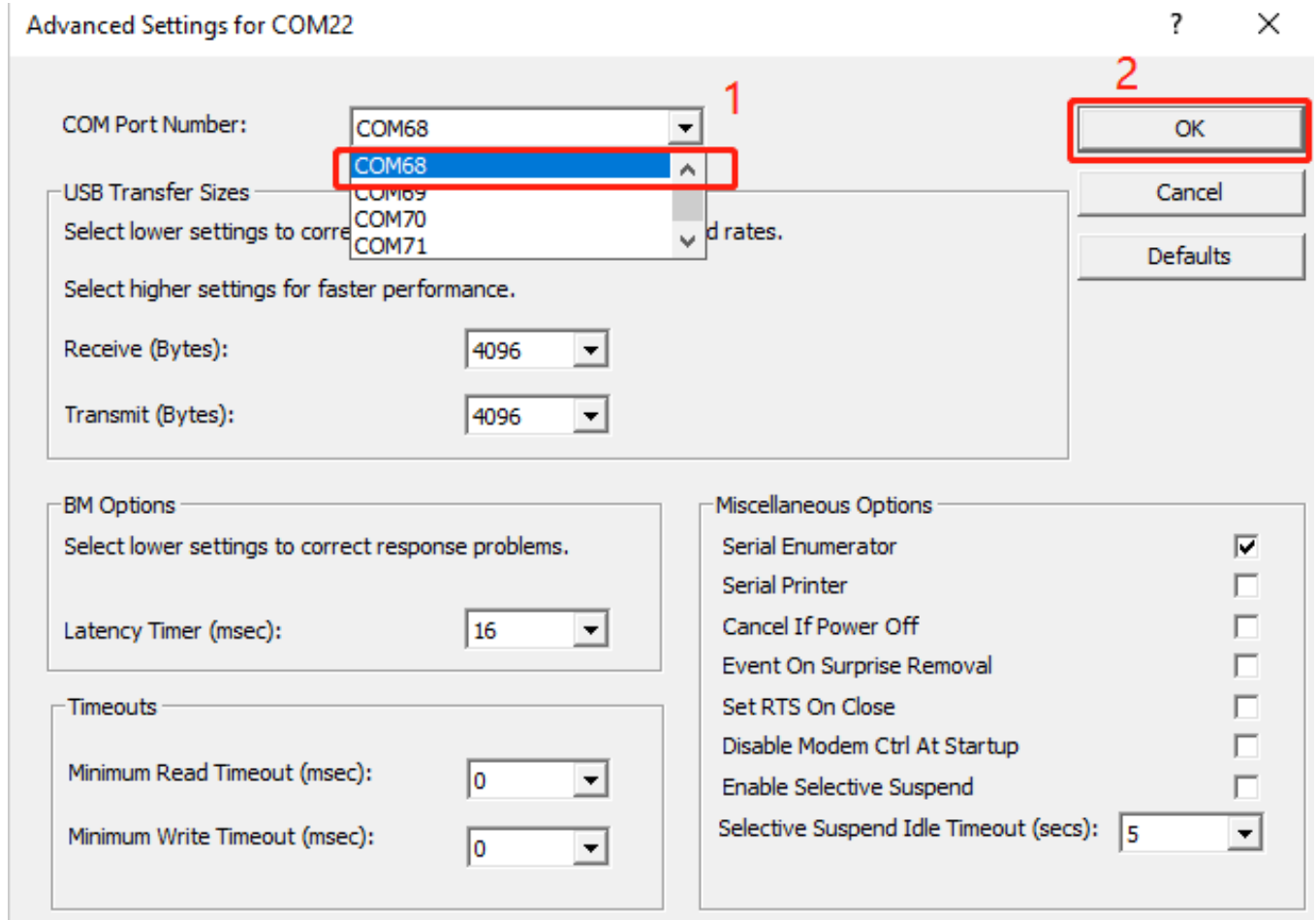
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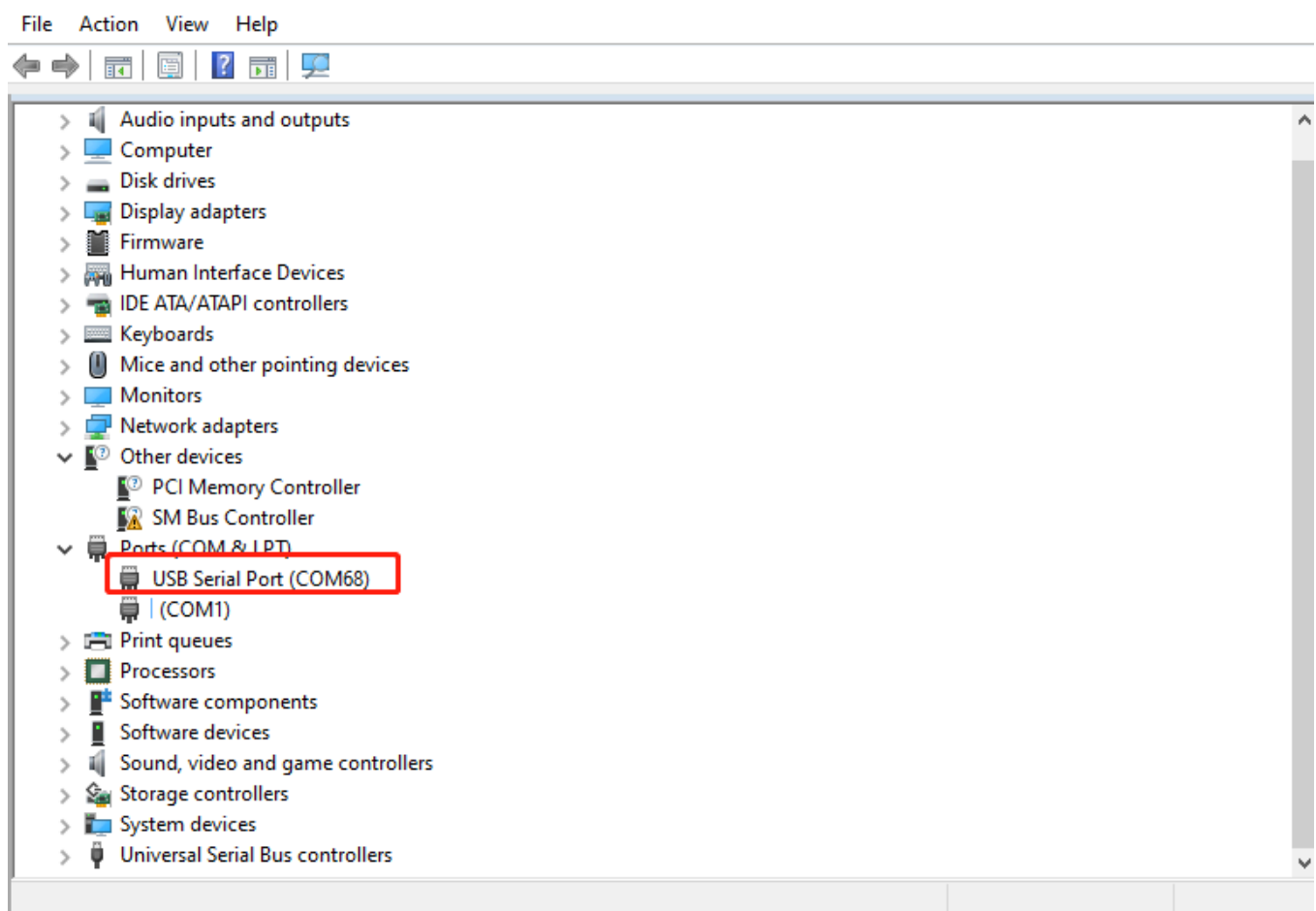
(/wiki/File:Ft232_com_1.png)



(/wiki/File:Ft232_com_2.png)



(/wiki/File:Ft232_com_3.png)



(/wiki/File:Ft232_com_4.png)

Linux

Take RPI as an example, use the default driver, connect the device, and query the serial device name through the following command:

```
lsusb
ls /dev/ttyUSB*
```

```
hhhhh@hhhhh:~$ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 004: ID 0484:5750 Specialix 7H Custom Human interface
Bus 001 Device 005: ID 0403:6001 Future Technology Devices International, Ltd FT232 Serial (UART) IC
Bus 001 Device 002: ID 2109:3431 VIA Labs, Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
hhhhh@hhhhh:~$ ls /dev/ttyUSB*
/dev/ttyUSB0
```

(/wiki/File:FT232_USB_UART_Board11.png)

For example, use minicom (https://www.waveshare.com/wiki/Raspberry_Pi_Tutorial_Series:_Serial) to open UART0, input the following command line:

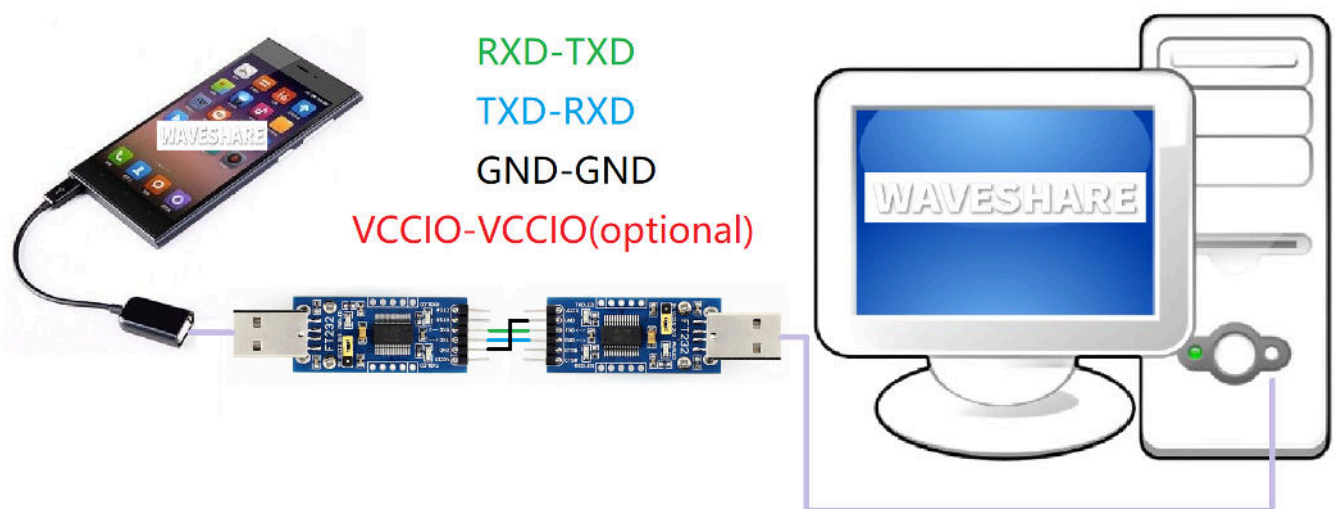
```
sudo minicom -D /dev/ttyUSB0
```

The mainstream Linux systems, such as Raspbian, Ubuntu, and CentOS, generally come with FT232 drivers and can be connected to use. You can also install Linux drivers to some Linux systems lacking FT232.

Android

For example, connect the Android phone to the PC with FT232:

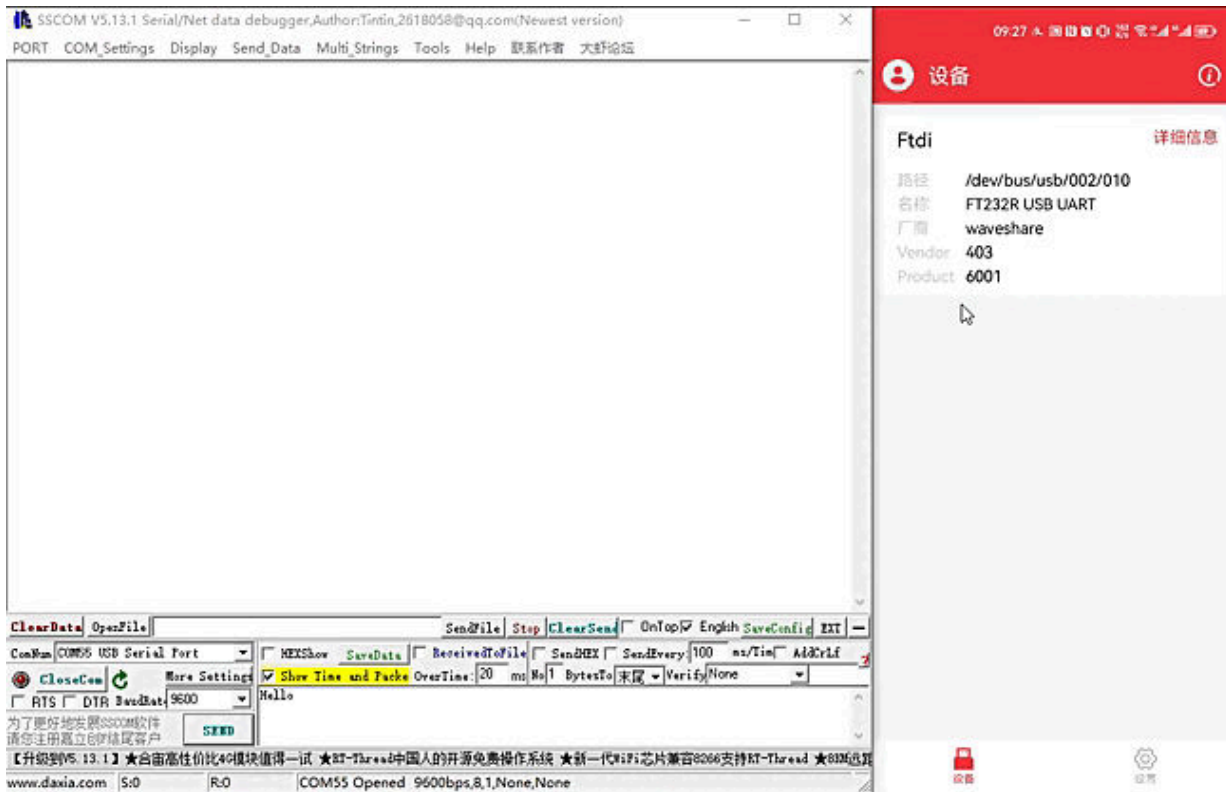
- Connect the USB port of FT232 to the USB port of the Android phone with the OTG adapter cable, and then connect to another FT232 and computer via the USB port.



(/wiki/File:FT232_USB_UART_Board12.png)

- Download SerialTool_Android (https://files.waveshare.com/upload/e/ef/SerialTool_Android.zip) to the Android device, unzip it, and then install it.

- Whether to allow the APP to visit the USB device, click OK.
- Input the string to be sent in the Android serial tool, the computer can receive the corresponding on the sscom, and vice versa.



(/wiki/File:FT232_USB_UART_Board_15.gif)

Android serial port assistant used here has integrated Android drivers, no need to install additional drivers; you can also use FTDI Android source code directed development can drive FT232 APP.

MacOS

1. Click to download the driver (https://files.waveshare.com/upload/6/6e/MAC_FT232_Driver_D2XX1.4.24.7z).
2. Driver installation guide: Click here to see the tutorial (https://files.waveshare.com/upload/7/75/AN_134_FTDI_Drivers_Installation_Guide_for_MAC_OSX.pdf).
3. After installing, you can open SSCOM (MAC can directly download the serial debugging assistant online).

Resources

- FT32 USB UART Board Schematic (<https://files.waveshare.com/upload/c/c2/FT232-USB-UART-Board-type-A-Schematic.pdf>)
- USB TO TTL Schematic (<https://files.waveshare.com/upload/b/bf/USB-TO-TTL-Schematic.pdf>)
- Datasheets (/wiki/FT232_Datasheets)
- Software (/wiki/FT232_Software)

- Android serial port assistant apk source code details (<https://github.com/freyskill/SerialPortHelper>)

FAQ

Question:What is the maximum baud rate for USB TO TTL?

Answer:

The FT232RNL can reach up to 3Mbps.

Question:Why did WIN7 driver installation fail?

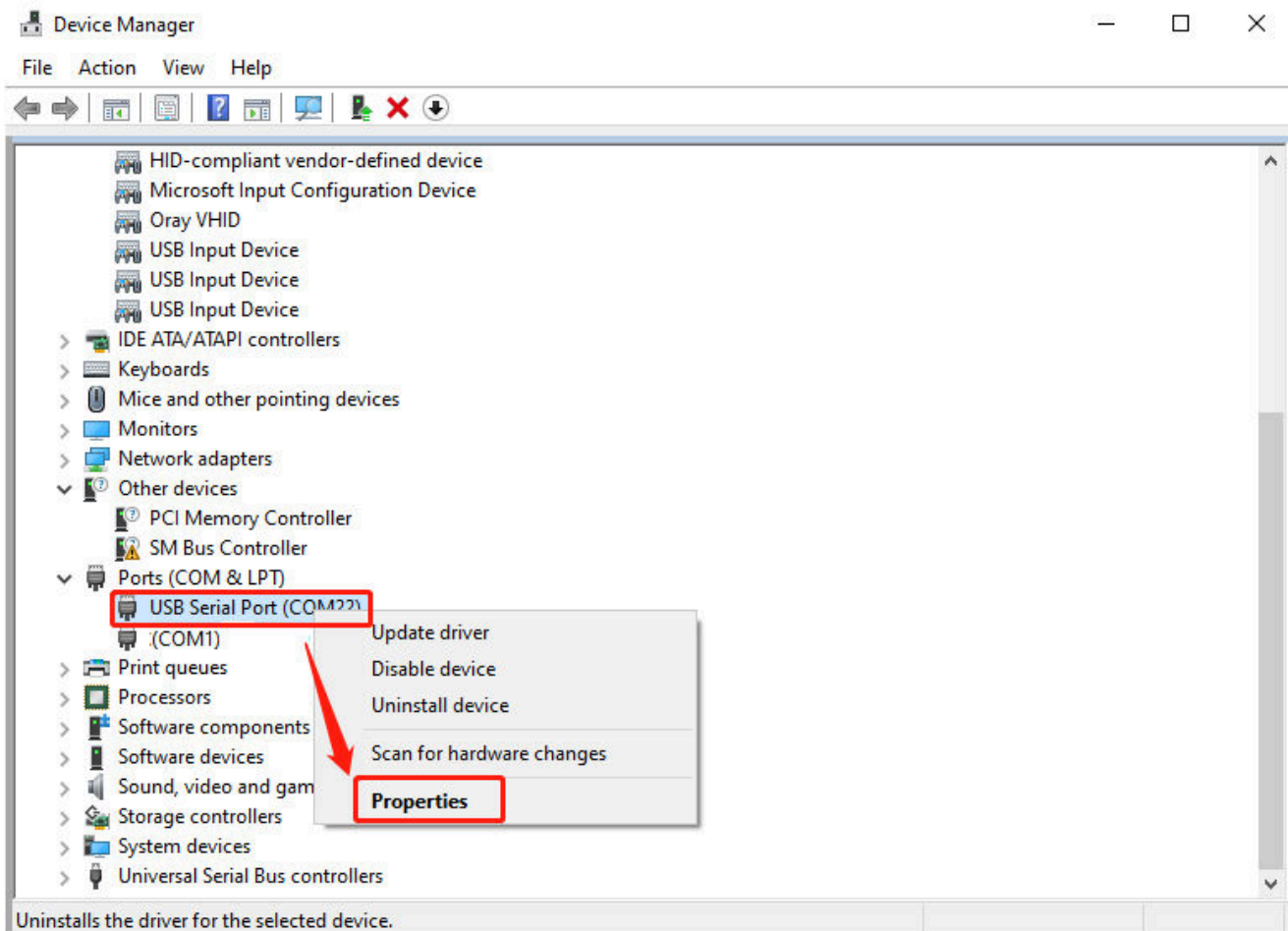
Answer:

Install this driver (https://files.waveshare.com/upload/0/0c/CDM_v2.08.30_WHQL_Certified.zip).

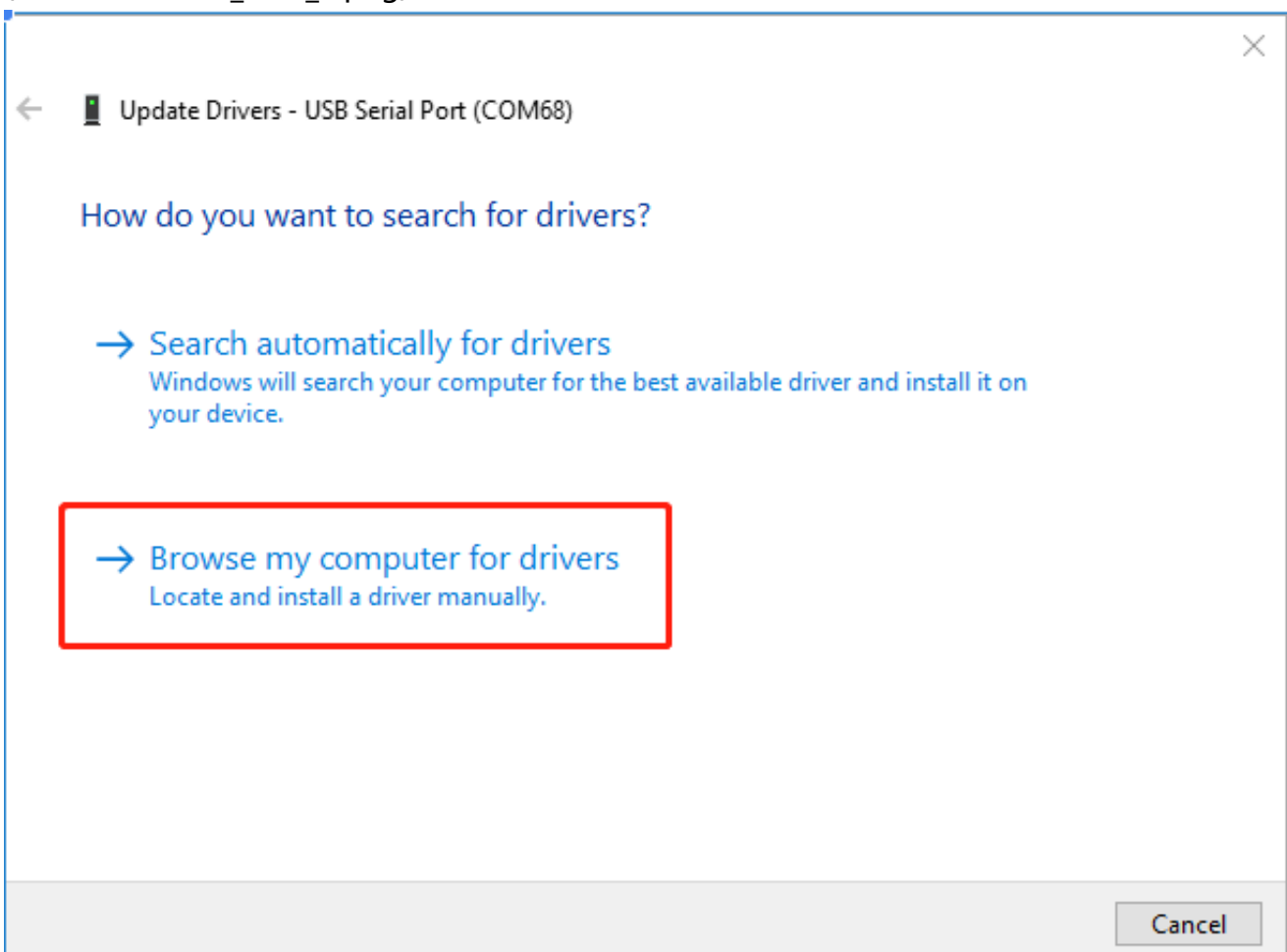
Question:The USB Serial Converter exclamation warning appears?

Answer:

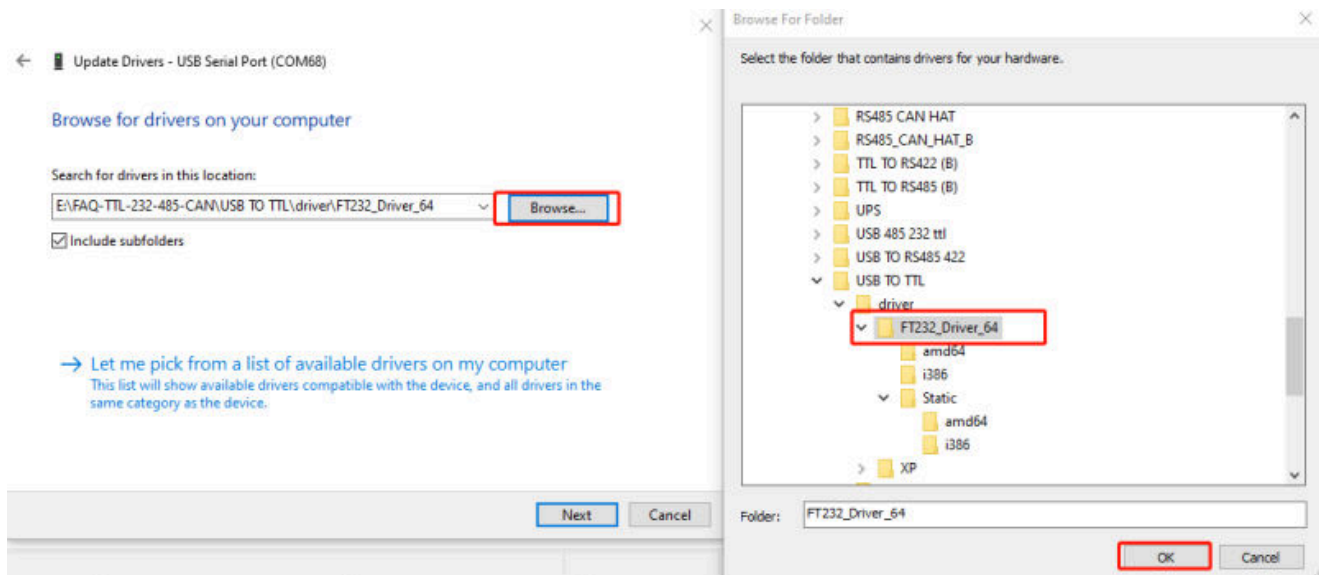
You can manually install this driver: FT232 Driver WIN11 64 (https://files.waveshare.com/upload/9/9e/FT232_Driver_WIN11_64%281%29.zip).



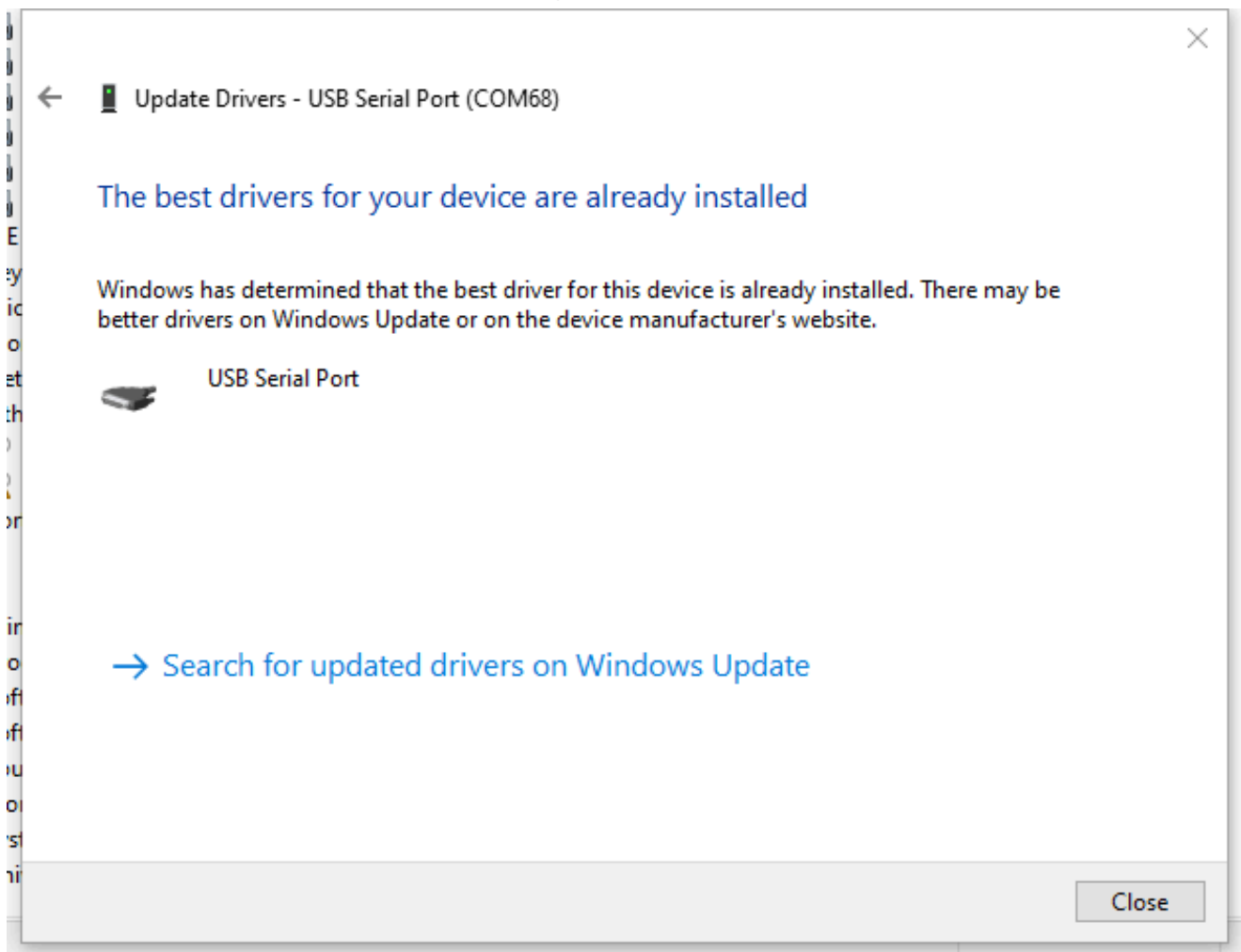
(/wiki/File:Ft232_com_1.png)



(/wiki/File:FT232_USB_UART_Boar_21.png)



(/wiki/File:FT232_USB_UART_Boar_22.png)



(/wiki/File:FT232_USB_UART_Boar_23.png)

Question:Does this module support win8.1, win10 and other operating systems?

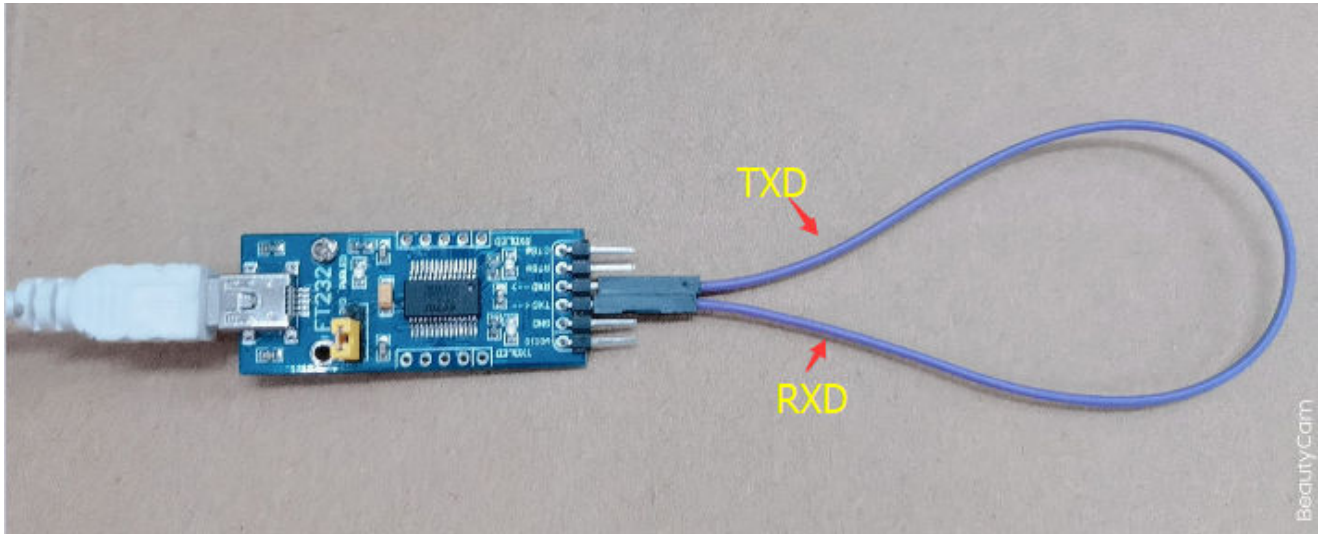
Answer:

The FT232 USB UART Board adopts the official FT232 original chip from FTDI, which can support a variety of operating systems. The drivers for different systems can be downloaded from the official website: www.ftdichip.com/FTDrivers.htm

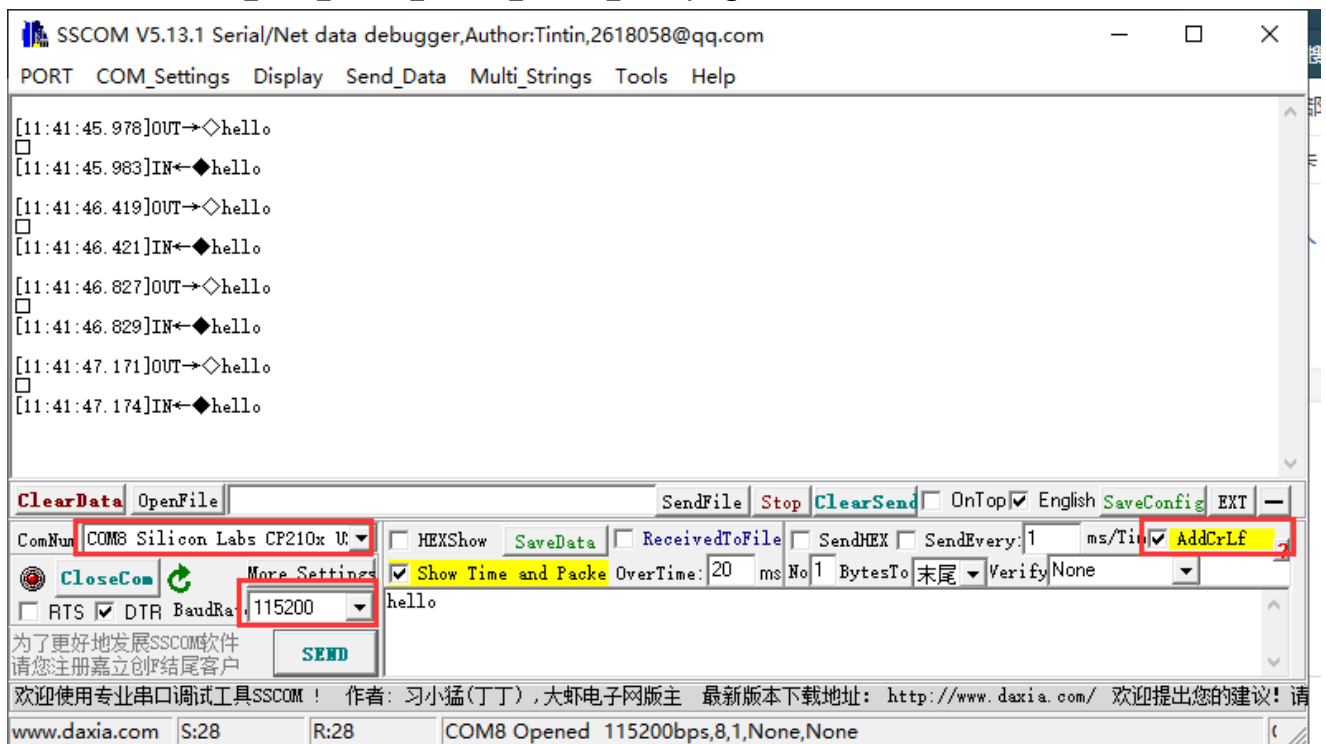
Question: Is there any way to judge whether the FT232 function is normal?

Answer:

You can short-circuit TXD and RXD, and then send data in the serial port debugging assistant (https://files.waveshare.com/upload/8/84/Sscom_%286%29.7z) Windows to see if there is corresponding data returned, if there is, the function is normal; as shown below:



(/wiki/File:FT232_USB_UART_Board_(mini)_FAQ.png)

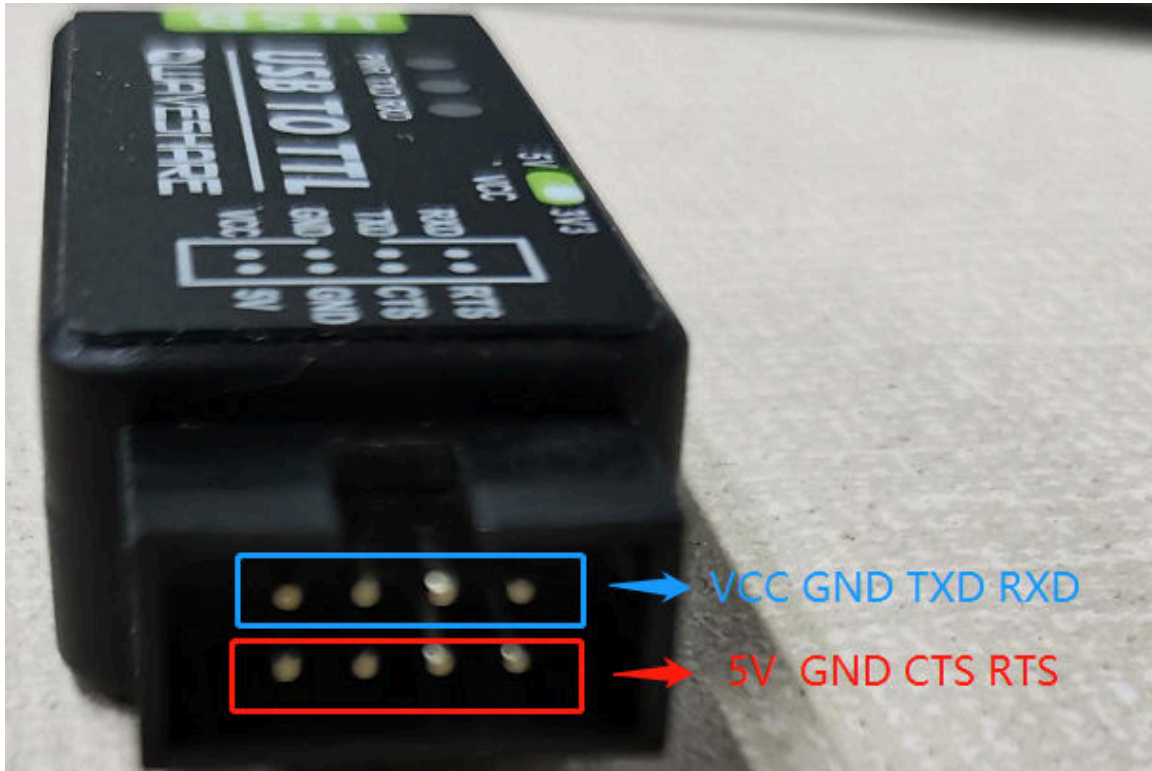


(/wiki/File:FT232_USB_UART_Board_06.png)

Question:Two rows of pins, which row is VCC GND TXD RXD; which row is 5V GND CTS RTS?

Answer:

The label faces up, the upper row is VCC GND TXD RXD; the lower row is 5V GND CTS RTS, as shown in the figure:



(/wiki/File:FT232_USB_UART_Board_(mini)_FAQ03.png)

Question:What is the humidity and temperature range of the USB TO TTL?

Answer:

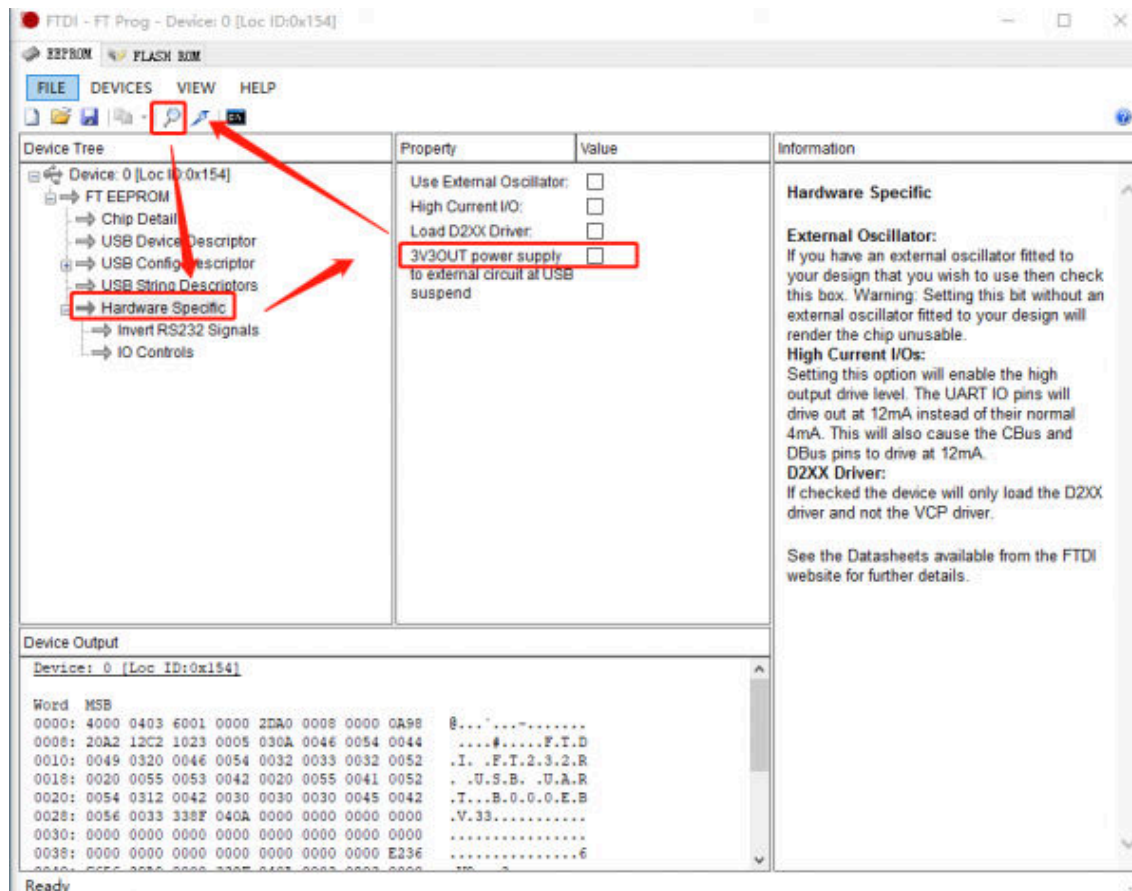
Temperature range: -15°C~70°C

Humidity range: 5%RH~95%RH

Question:How to deal with continuous blinking of TXD and RXD lights due to insufficient power supply when using 3.3V to power an external device?

Answer:

Disconnect the power to the external TTL device. A USB serial device should appear. Open the FTDI programming tool (https://files.waveshare.com/upload/c/c2/FT_Prog_FT232RN.zip), scan for devices, click to program the device, and upon successful programming, it indicates enabling a strengthened 3.3V supply current to the external device.



(/wiki/File:FT232_USB_UART_Board_FAQ00.png)

Question:What may cause damage to the FT232 chip?

Answer:

1) Overvoltage and overcurrent, electrostatic reverse connection, harsh environment, electromagnetic interference, and other conditions may cause IC damage:

- Overvoltage and overcurrent: When the FT232 chip receives an excessive voltage shock, the connected circuit or peripherals consume more current than its specification range, and the current protection mechanism inside the chip may cause damage.
- Electrostatic reverse connection: When reverse voltage appears between the pins, or when subjected to electrostatic discharge, its internal circuit may be damaged.
- Harsh environment: Using FT232R under high, low, or humid temperature conditions, especially without proper heat dissipation measures, may lead to chip performance degradation, short circuits, or even damage.
- Electromagnetic Interference: A strong electromagnetic interference environment may affect the normal operation of the chip, causing performance problems or even damage.

2) To reduce the risk of chip damage, the following precautions are recommended:

- Use proper supply voltage and current, and avoid over-current and over-voltage conditions.
- Avoid electrostatic discharge, use anti-static measures, such as wearing electrostatic gloves.
- Provide sufficient heat dissipation and temperature control to avoid use under extreme temperature conditions.
- Using Industrial grade products (<https://www.waveshare.com/usb-to-rs232-485-ttl.htm>), with the protection of shell, isolation, overcurrent, and overvoltage, it can resist electromagnetic to a certain extent interference.

Question:Can USB be connected to a microcontroller for use?

Answer:

- USB typically cannot be connected to a microcontroller.
- Unless the microcontroller runs Linux, Android, Windows 11/10/8.1/8/7, etc. systems.
- Usually, UART is connected to the microcontroller, and USB is connected to computers, industrial control machines, and other devices.

Question:Why can't it be recognized by the computer?

Answer:

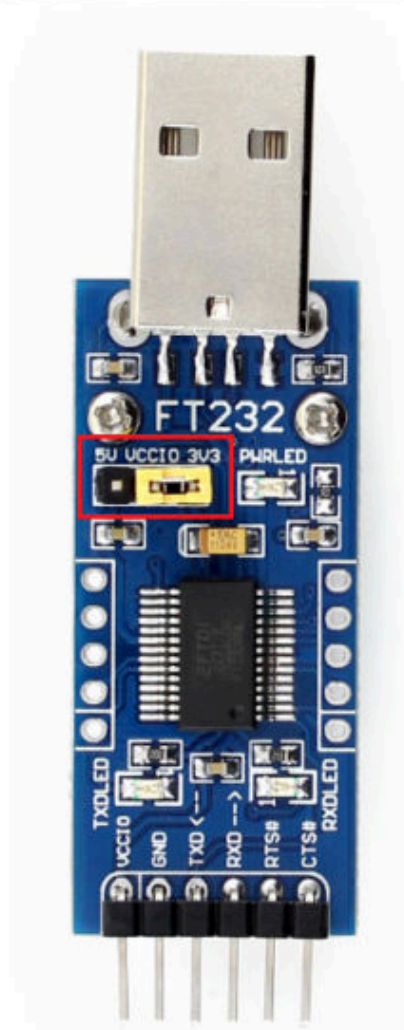
Please refer to the following steps to compare and debug:

- Install the driver.
- Replace the USB cable.
- Replace the USB port.
- Replace the computer.

Question:Is this a TTL 3.3 or 5v?

Answer:

You can switch between 3.3V and 5V TTL levels with a jumper cap or switch.



(/wiki/File:FT232_USB_UART-faq02.png)

Question: FT232 driver is installed, but the question mark, no com port?

Answer:

Clear the com port cache: run "regedit", navigate to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\COM Name Arbiter and delete it.

Beware of knock-offs

Please note that we've found some poor copies of this item in the market. They are usually made of inferior materials and shipped without any testing.

You might be wondering if the one you're watching or you've purchased in other non-official stores is original, feel free to contact us.

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=USB_TO_TTL&oldid=67698)"*
