USB TO 8CH RS485

From Waveshare Wiki
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> If you are using MacOS, please access via the WCHSerialPort software only; other access methods are not currently supported on MacOS

Overview

USB TO 8CH RS485



(https://www.waveshare.com/usb-to-8ch-rs485.htm)

RS485
USB-C, RS485

Introduction

USB TO 8CH RS485, an industrial USB to RS485 isolated converter with a rail-mount case, features the original CH348L chip and built-in protection circuits such as power isolation, ADI magnetical isolation and TVS. This converter is easier to operate due to its fully automatic transceiver circuit with no delay. Boasting characteristics of fast communication, stability, reliability, and safety, it is an ideal choice for various industrial control devices and applications with high communication requirements.

Features

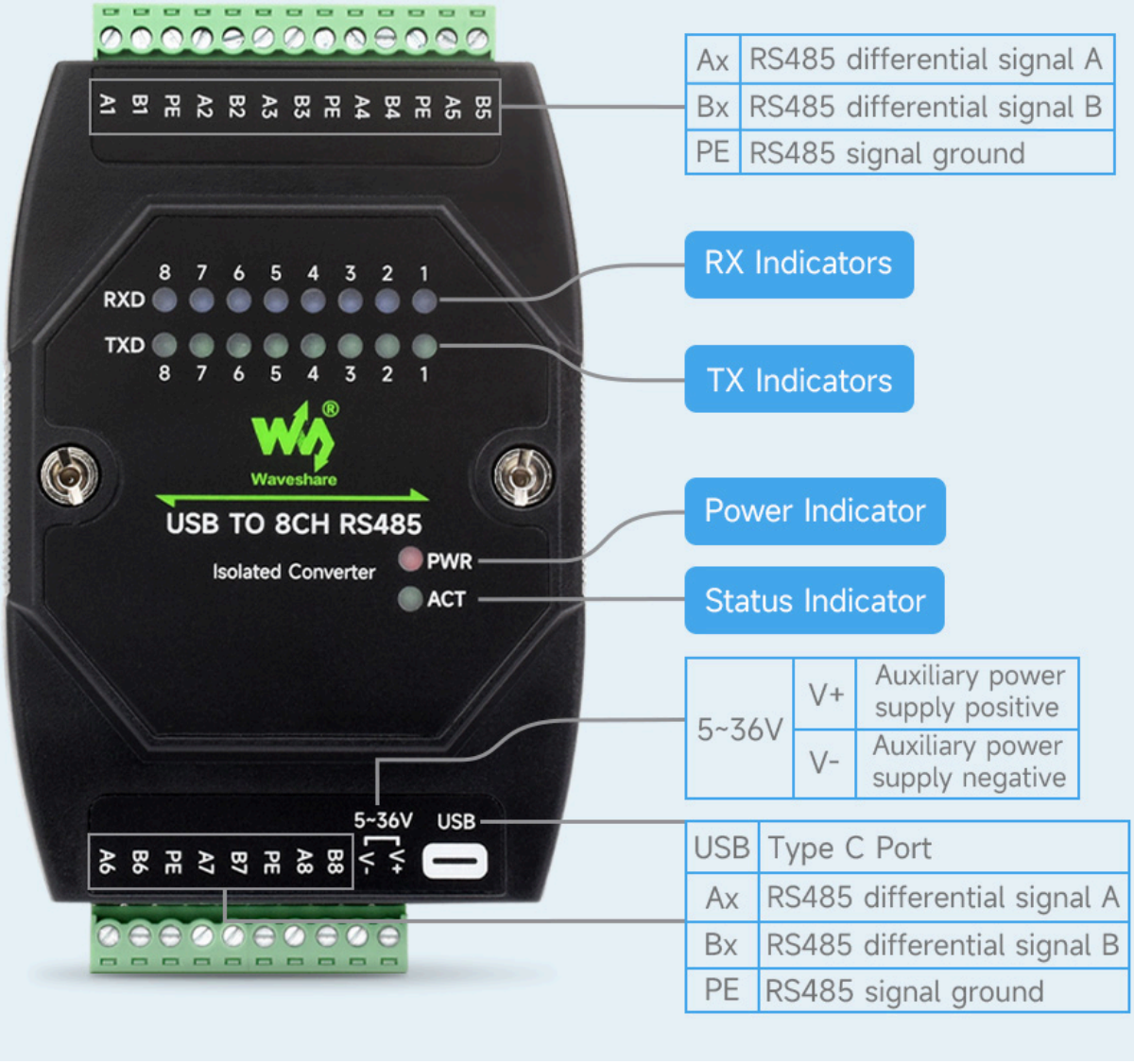
- Supports USB to 8CH RS485, convenient for expanding multiple RS485 industrial serial devices.
- Supports direct power supply via Type-C port, with reserved 5V~36V DC wide voltage screw terminal for auxiliary power input.
- Onboard unibody power supply isolation, provides stable isolated voltage.
- Onboard unibody digital isolation, allows signal isolation, high reliability, strong anti-interference, low power consumption.
- Onboard TVS (Transient Voltage Suppressor), effectively suppress surge voltage and transient spike voltage in the circuit, lightningproof & anti-electrostatic.
- Onboard self-recovery fuse and protection diodes, ensures the current/voltage stable outputs, provides over-current/over-voltage proof, improves shock proof performance.
- Built-in 120R terminal resistor on the RS485 ports, configurable via jumper for flexible switching.
- LEDs for indicating the power, device configuration status and transceiver status.

- Rail-mount case design, support stackable combination, easy to install and safer to use.

Parameters

Product Type	Industrial Isolated USB to RS485 converter	
Host Interface	USB	
Device Interface	RS485	
Power Supply	USB Type-C (5V), screw terminal (5V~36V)	
USB Interface	Operating Level	5V
	Connector	USB-C
	Interface Protection	200mA self-recovery fuse, isolated output
	Transmission Distance	About 5m
Isolated RS485 Interface	Connector	Screw Terminal
	Direction Control	Hardware automatic control
	Protection	600W lightningproof and surge-suppress, 15KV ESD protection (onboard 120R balancing resistor)
	Transmission Distance	About 1.2km (low rate)
	Transmission Mode	Point-to-multipoints (up to 32 nodes, it is recommended to use repeaters for 16 nodes or more)
	Baud Rate	1200bps ~ 921600bps
Indicator	PWR	Red power indicator, lights up when there is USB connection and voltage is detected
	ACT	Status indicator, lights up green when the driver is detected.
	TXD	Green TX indicator, lights up when the USB port sends data
	RXD	Blue RX indicator, lights up when the device ports send data back
Operating Environment	Temperature	-15 ~ 70℃
	Humidity	5% ~ 95%RH
Operating System	MacOS, Linux, Android, Windows 11/10/8.1/8/7	

Onboard Interface


A1 B1 PE A2 B2 A3 B3 PE A4 B4 PE A5 B5
8 7 6 5 4 3 2 1
RXD
TXD
8 7 6 5 4 3 2 1
Waveshare
USB TO 8CH RS485
Isolated Converter
PWR
ACT
5~36V
USB
A6 B6 PE A7 B7 PE A8 B8
V- V+
Ax RS485 differential signal A
Bx RS485 differential signal B
PE RS485 signal ground
RX Indicators
TX Indicators
Power Indicator
Status Indicator
5~36V V+ Auxiliary power supply positive
V- Auxiliary power supply negative
USB Type C Port
Ax RS485 differential signal A
Bx RS485 differential signal B
PE RS485 signal ground

(/wiki/File:USB-TO-8CH-RS485-details-11.jpg)

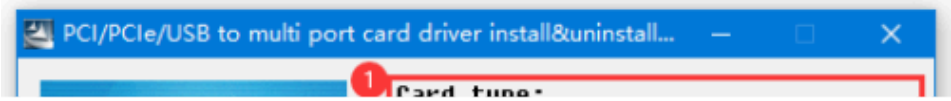
Dimensions



(/wiki/File:USB-TO-8CH-RS485-details-size.jpg)

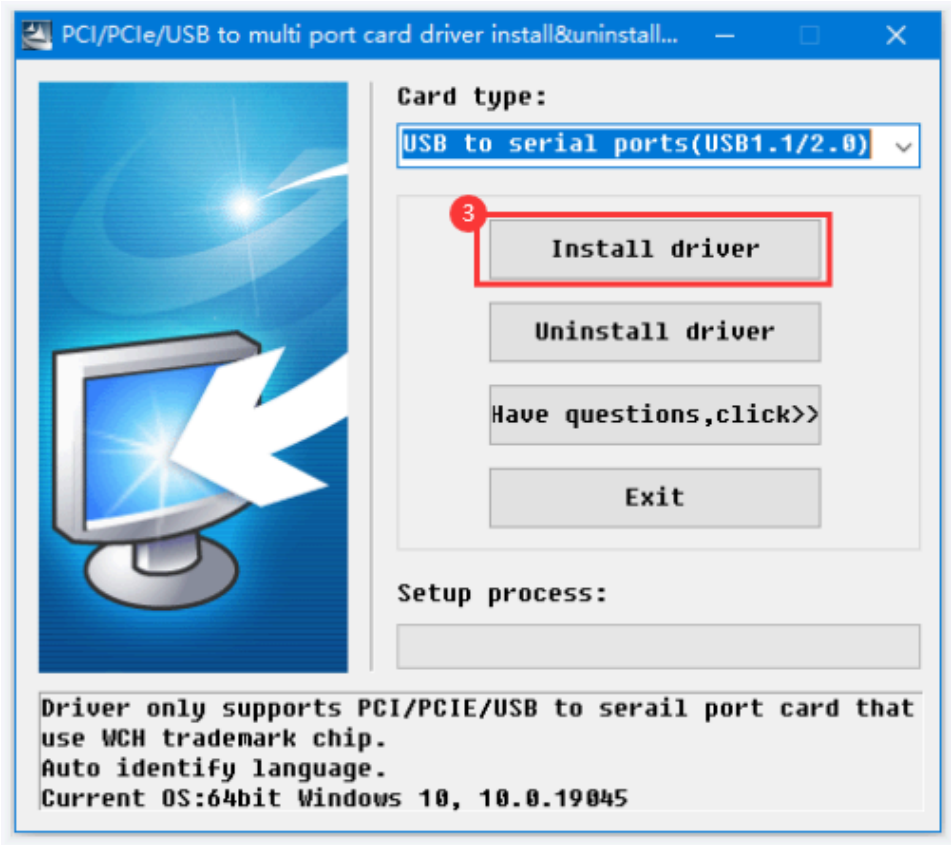
Driver Installation

- First, download the driver file USBMESR (https://files.waveshare.com/wiki/USB-TO-8CH-TTL/USBMSER.rar).
- Double-click **USBMESR.exe** and install it by steps.
- Select **USB to serial ports (USB 1.1/2.0)** as card type.



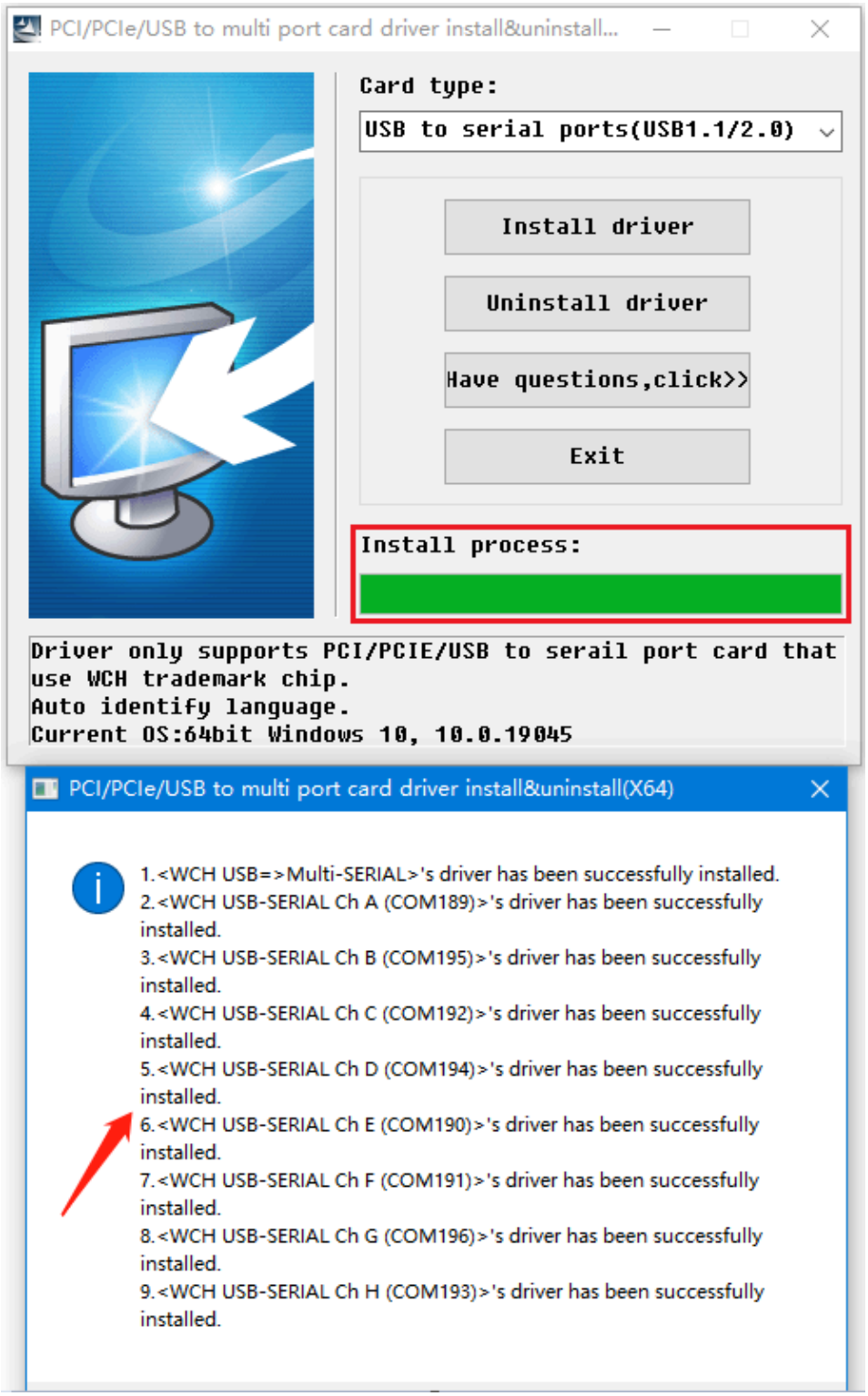
(/wiki/File:USB_TO_8CH_TTL_Driver_2.png)

- Click on **Install Driver**.



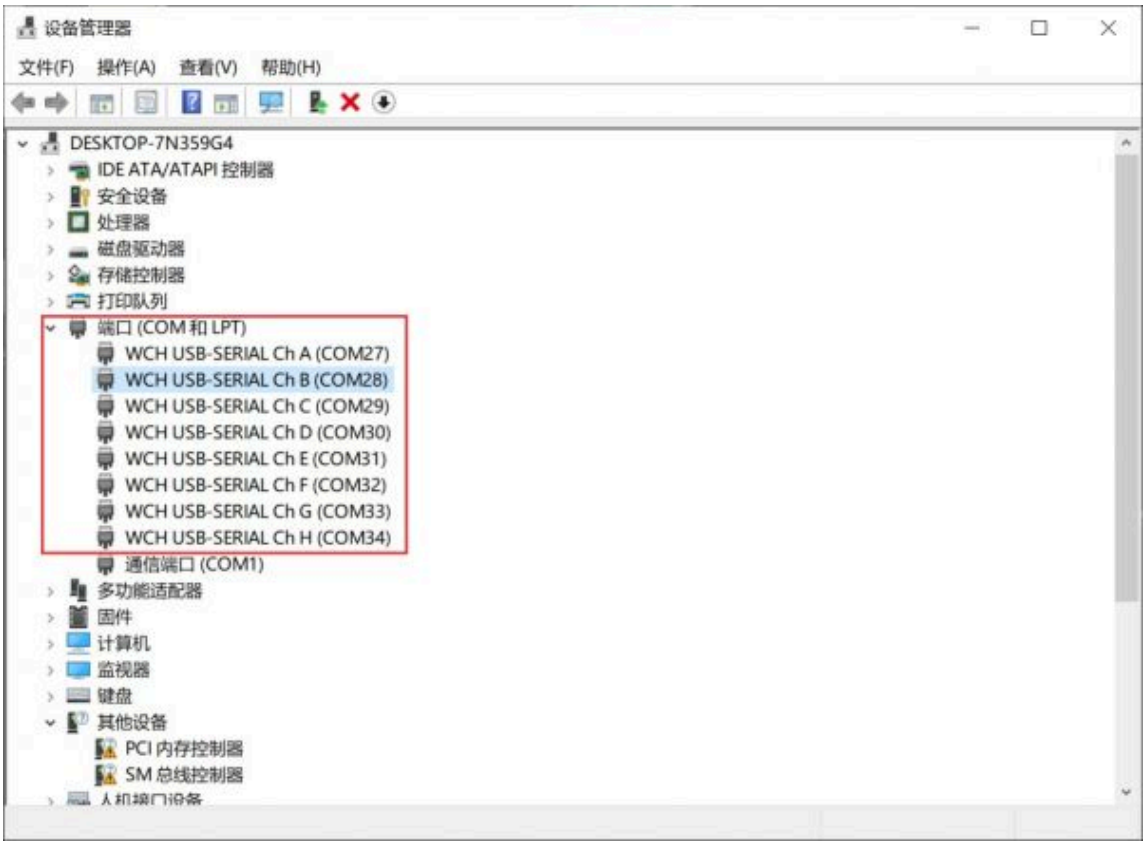
(/wiki/File:USB_TO_8CH_TTL_Driver_3.png)

- When the progress bar is loaded, a pop-up window will appear to indicate that the driver has been installed successfully.



(/wiki/File:USB_TO_8CH_TTL_Driver_4.png)

- After connecting to the computer, you can find the available ports and their corresponding COM port. (Also, you can assign the COM port number through the serial port manager tool).



(/wiki/File:USB_TO_8CH_TTL_Driver_5.jpg)

Communication Operation

- Open SSCOM software (https://files.waveshare.com/upload/2/20/Cktszsss32.zip).
- Generally, it can identify 8 COM port.

RS485 Communication

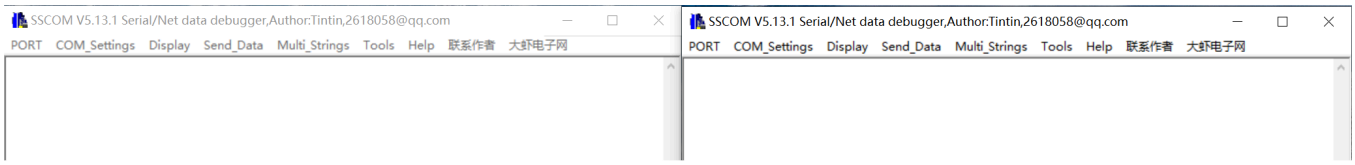
The following displays how to perform the communication between two channels.

Hardware Connection

USB TO 8CH RS485	
A1	A2
B1	B2

Software Operation

- Open two SSCOM interfaces.
- Select the corresponding COM port of channel A and channel B, respectively.



(/wiki/File:USB_TO_8CH_RS485-COM1.png)

- Select the baud rate as **115200**, input the characters you want to send, check **Show time and packet**, and click on **Open COM**.



(/wiki/File:USB_TO_8CH_RS485-COM2.png)

- Select 100ms intervals in two SSCOM interfaces, and you can see they transmit and receive data normally, the effects as shown below:



(/wiki/File:USB_TO_8CH_RS485-COM3.png)

Resource

Datasheet

- CH348L Manual (https://files.waveshare.com/wiki/USB-TO-8CH-TTL/CH348DS1.PDF)

Software and Drivers

- SSCOM Assistant (https://files.waveshare.com/upload/2/20/Cktszsss32.zip)
- Windows USBMESR (https://files.waveshare.com/wiki/USB-TO-8CH-TTL/USBMSER.rar) driver (or download from WCH website (https://www.wch.cn/downloads/USBMSER_exe.html))
- Linux Driver (https://files.waveshare.com/wiki/USB-TO-8CH-RS485/LINUX.zip)

FAQ

Question: In general, is USB power sufficient? When is DC power needed?

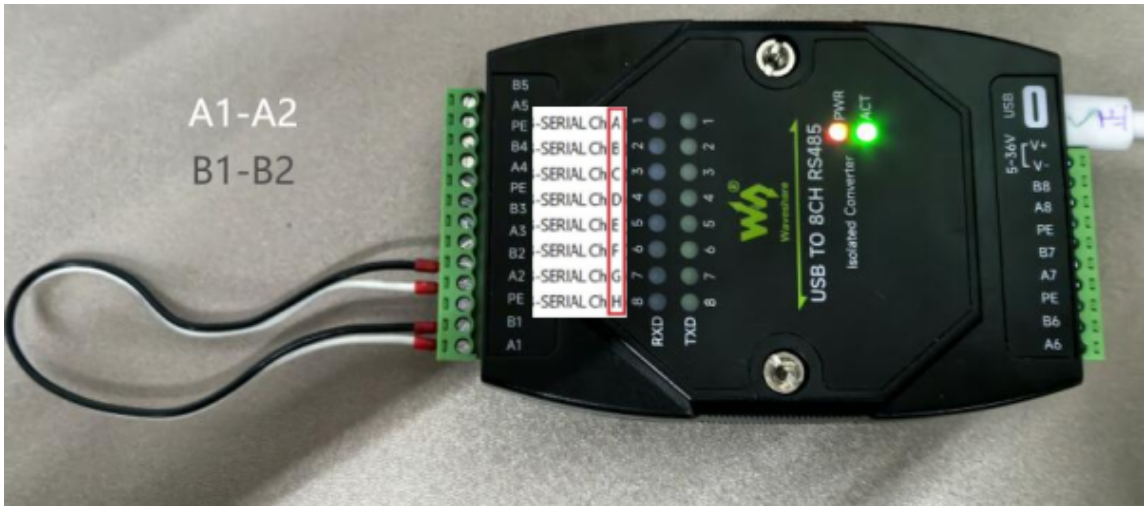
Answer:

- Generally, USB power is sufficient. For some older computers with insufficient USB power, DC power can be used.
- If multiple channels are used simultaneously, multiple devices are connected, and the communication distance is long, causing insufficient drive capability, DC power is needed. TTL power consumption is relatively low.

Question: How to quickly verify whether the module is working properly?

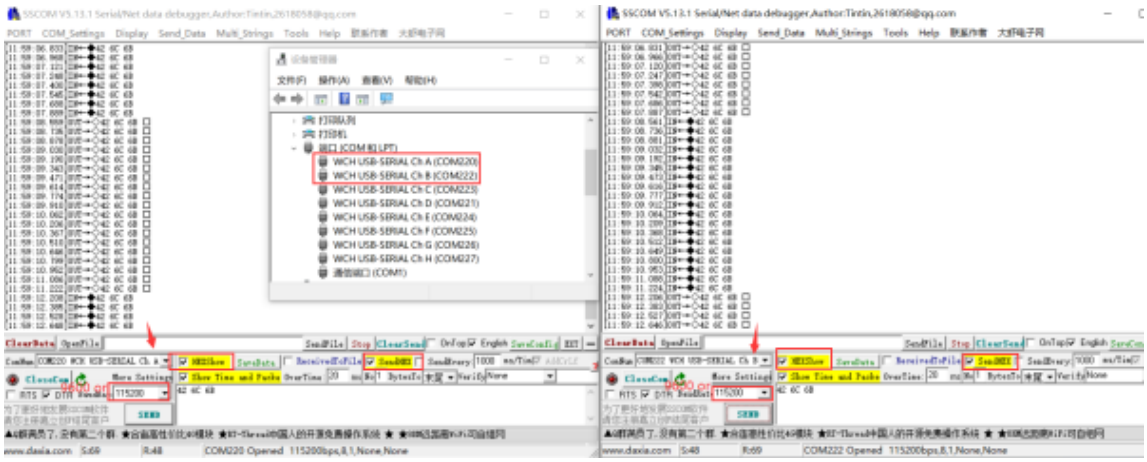
Answer:

- RS485 is half-duplex communication. You can test data transmission and reception by connecting two channels together.
- The following example uses Port1 and Port2 to test data transmission and reception. Ensure the correct COM ports are selected; the corresponding channel indicators will flash.



(/wiki/File:A-H-1-8.png)

- If data is exchanged between the two channels, the module itself is functioning properly.



(/wiki/File:485-8ch-TR.png)

Question: Besides the bundled sscom serial assistant, does it support other industrial control software?

Answer:

- Mainstream serial assistant tools such as SSCOM, SCOM, and PuTTY are supported.
- There are many tools available, and we cannot verify each one. Therefore, we cannot guarantee that other industrial control software will work. Please use the bundled sscom serial tool as a priority.

Question: After connecting the device, why does Linux not show a serial device descriptor (COM port number)?

Answer:

- This is a driver issue. Download the Linux driver (https://files.waveshare.com/wiki/USB-TO-8CH-TTL/USB-8CH-485-linux.zip).
- Compile and load the USB device descriptor using:

```
sudo make install
```

- The figure below is tested on a Raspberry Pi with the 240704 64-bit Bookworm system (https://downloads.raspberrypi.com/raspios_arm64/images/raspios_arm64-2024-07-04/2024-07-04-raspios-bookworm-arm64.img.xz). Different systems may vary; please modify the operations according to your actual situation:

```
pi@xl2025:~/Music/LINUX/driver $ lsusb
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 002: ID 1a86:55d9 QinHeng Electronics USB2.0 To Multi Serial Ports
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
pi@xl2025:~/Music/LINUX/driver $ sudo make clean
rm -rf *.mk .tmp_versions Module.symvers *.mod.c *.o *.ko .*.cmd Module.markers modules.order *
.a *.mod
pi@xl2025:~/Music/LINUX/driver $ sudo make install
make -C /lib/modules/6.6.51+rpt-rpi-2712/build M=/home/pi/Music/LINUX/driver
make[1]: Entering directory '/usr/src/linux-headers-6.6.51+rpt-rpi-2712'
  CC [M]  /home/pi/Music/LINUX/driver/ch9344.o
  MODPOST /home/pi/Music/LINUX/driver/Module.symvers
  CC [M]  /home/pi/Music/LINUX/driver/ch9344.mod.o
  LD [M]  /home/pi/Music/LINUX/driver/ch9344.ko
make[1]: Leaving directory '/usr/src/linux-headers-6.6.51+rpt-rpi-2712'
insmod ch9344.ko || true
mkdir -p /lib/modules/6.6.51+rpt-rpi-2712/kernel/drivers/usb/serial/ || true
cp -f ./ch9344.ko /lib/modules/6.6.51+rpt-rpi-2712/kernel/drivers/usb/serial/ || true
depmod -a
pi@xl2025:~/Music/LINUX/driver $ ls /dev
autofs           gpiomem4      net      serial0     tty26  tty51          ttySC0   vcsu4
block            hwrng         null     shm         tty27  tty52          ttySC1   vcsu5
btrfs-control    i2c-1         port     snd         tty28  tty53          uhid     vcsu6
bus              i2c-11        ppp      spidev0.1   tty29  tty54          uinput   vcsu7
cachefiles       i2c-12        pps0     spidev10.0  tty3   tty55          urandom  vga_arbiter
cec0             initctl       ptmx     stderr      tty30  tty56          v4l      vhci
cec1             input         ptp0     stdin       tty31  tty57          vcio     vhost-net
ch9344_iodev0    kmsg          pts      stdout      tty32  tty58          vc-mem   vhost-vsock
char             kvm           ram0     tty         tty33  tty59          vcs      video19
console          log           ram1     tty0        tty34  tty6           vcs1     video20
cpu_dma_latency  loop0         ram10    tty1        tty35  tty60          vcs2     video21
cuse             loop1         ram11    tty10       tty36  tty61          vcs3     video22
disk             loop2         ram12    tty11       tty37  tty62          vcs4     video23
dma_heap         loop3         ram13    tty12       tty38  tty63          vcs5     video24
dri              loop4         ram14    tty13       tty39  tty7           vcs6     video25
fd               loop5         ram15    tty14       tty4   tty8           vcs7     video26
full             loop6         ram2     tty15       tty40  tty9           vcsa     video27
fuse             loop7         ram3     tty16       tty41  ttyAMA0        vcsa1    video28
gpiochip0        loop-control  ram4     tty17       tty42  ttyAMA10       vcsa2    video29
gpiochip10       mapper        ram5     tty18       tty43  ttyCH9344USB0  vcsa3    video30
gpiochip11       media0        ram6     tty19       tty44  ttyCH9344USB1  vcsa4    video31
gpiochip12       media1        ram7     tty2        tty45  ttyCH9344USB2  vcsa5    video32
gpiochip13       media2        ram8     tty20       tty46  ttyCH9344USB3  vcsa6    video33
gpiochip14       mem           ram9     tty21       tty47  ttyCH9344USB4  vcsa7    video34
gpiomem0         mmcblk0       random   tty22       tty48  ttyCH9344USB5  vcsu     video35
gpiomem1         mmcblk0p1     rfkill   tty23       tty49  ttyCH9344USB6  vcsu1    watchdog
gpiomem2         mmcblk0p2     rtc      tty24       tty5   ttyCH9344USB7  vcsu2    watchdog0
```

(/wiki/File:8-ttl-485-linux.png)

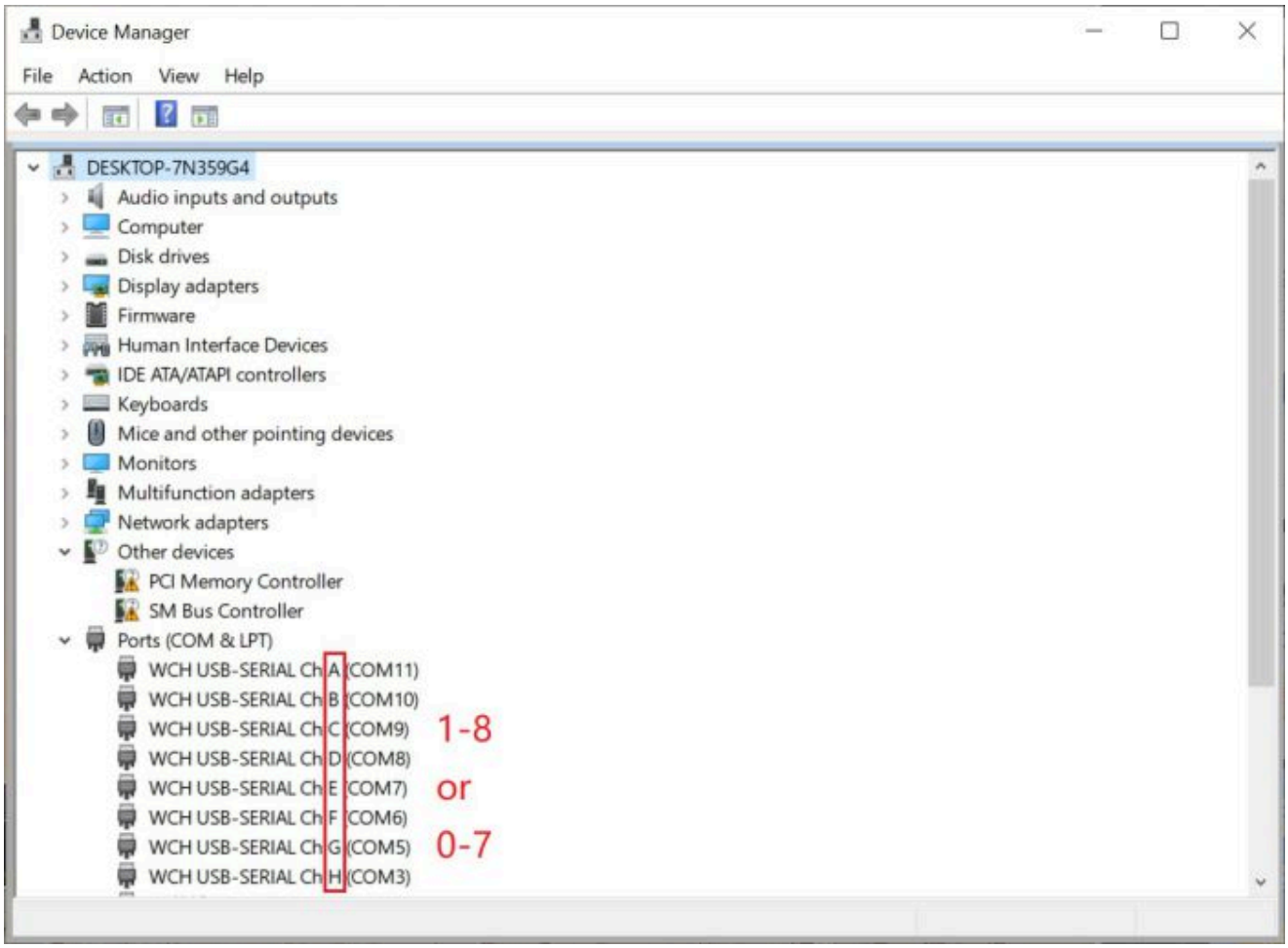
- It is recommended to use tools like cutecom to access the serial port; minicom may experience lag issues

Question: How to check the port numbers after connecting the device to a computer?

Answer:

1. After connecting the device to the computer via USB, open Device Manager.

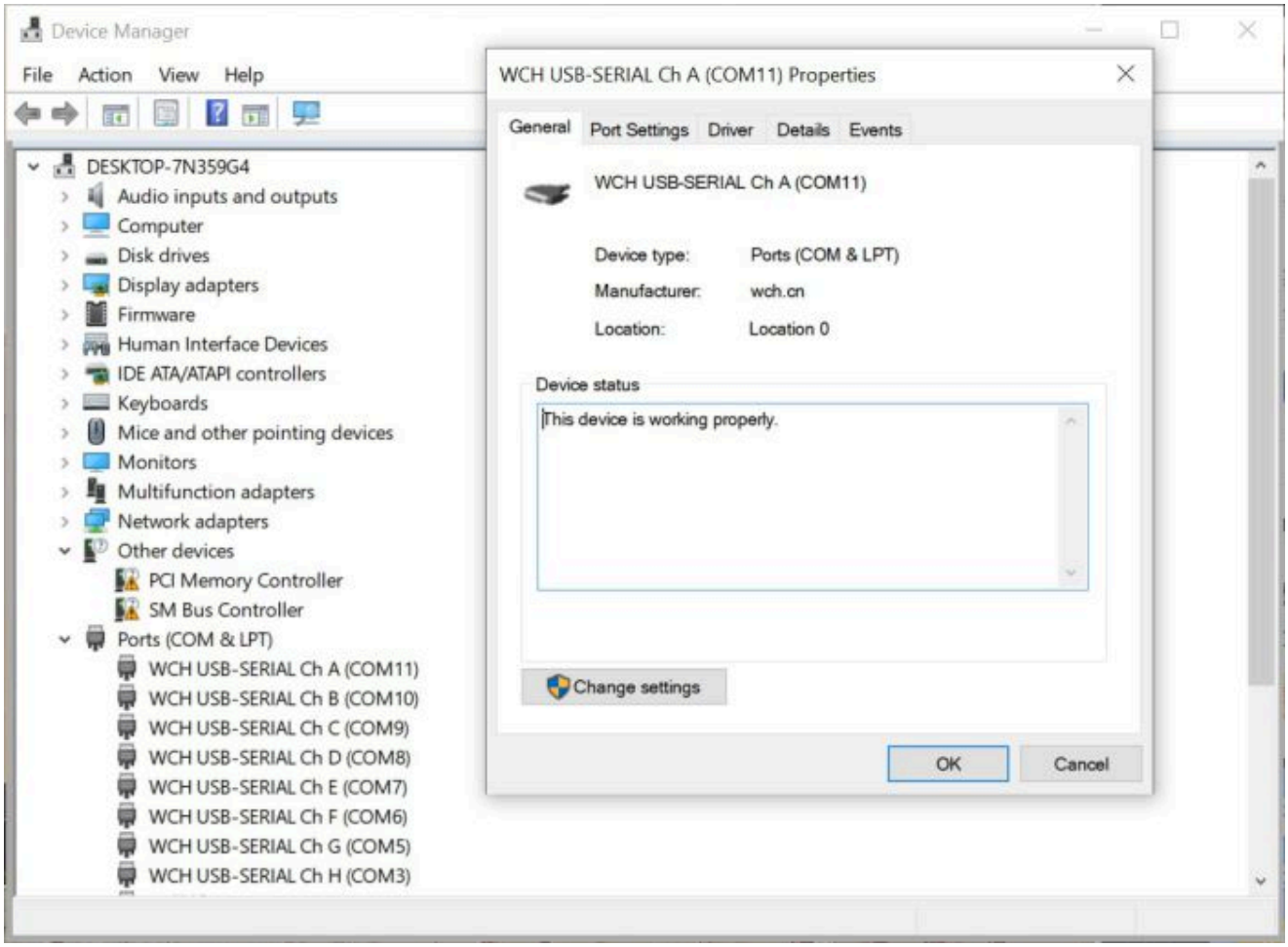
2. Under the "Ports" section, you will see the corresponding serial port numbers.



(/wiki/File:USB_TO_8CH_RS485_FAQ-3.jpg)

3. Right-click on the port you want to view and select "Properties".

4. After entering, you will see more status information about the port, as shown below.



(/wiki/File:USB_TO_8CH_RS485_FAQ-4.jpg)

Question: Is there a detailed installation dimension drawing?

Answer:



(/wiki/File:Usb-8-485.png)

Question: Are all interfaces isolated? What is the isolation protection voltage?

Answer:

- The USB and the eight RS485 channels have signal and power isolation to reduce ground loops, electromagnetic interference, and surges affecting the USB host and RS485.
- The relevant components themselves have an isolation withstand voltage rating of approximately 1kVDC. For very short transient high voltages (instantaneous spikes near 1 kV), they can effectively prevent breakdown, thus reducing the risk of direct damage to the module and the USB host.

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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