RS232 TO RS485/422

From Waveshare Wiki
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Overview

RS232 TO RS485/422, an industrial grade RS232 to RS485/422 isolated converter, boasts industrial grade rail-mount case design and protection circuits such as the built-in power isolation, ADI magnetical isolation, and TVS diode. It is easy to operate RS232 TO RS485/422 as it features zero-delay automatic transmission conversion, faster communication speed, stability, reliability, and safety, which is applicable for scenarios with high communication requirements.

RS232 TO RS485/422



(https://www.waveshare.com/rs232-to-rs485-422.htm)

RS232 TO RS485/422 (F)



(https://www.waveshare.com/rs232-to-rs485-422.htm?sku=26122)

RS232, RS485, RS422

Features

- Onboard SP3232EEN and SP485EEN chips. Fast communication, stable and reliable, better compatibility.
- Stable transmission at the rate of 300~921600bps.
- 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 shockproof performance.
- Onboard 15KV ESD isolation protection and 600W lightning proof & anti-surge protection.
- Onboard 120R terminal resistor on the RS485/RS422 interface, disabled by default, configurable by jumper.
- Onboard power supply screw terminal, allows 5V~36V DC wide-range input.
- 3 LEDs for indicating the power and transceiver status.

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

Version Selection



RS232 TO RS485/422
RS232 DB9 male port

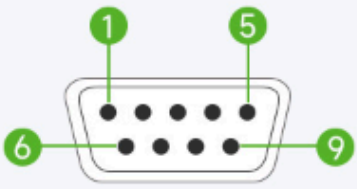
RS232 TO RS485/422 (F)
RS232 DB9 female port

(/wiki/File:RS232_TO_RS485_Selection.png)

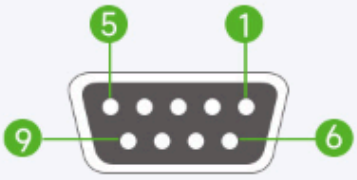
Parameters

PRODUCT TYPE	Active digital isolated RS232 to RS485/422 serial converter	
BAUD RATE	300bps ~ 921600bps	
HOST PORT	RS232	
DEVICE PORT	RS485/422	
RS232	Connector	DB9 male/female
RS485/422	Connector	Screw terminal
	RS485	A+, B-, GND
	RS422	TA, TB, RA, RB, GND
	Direction control	Hardware automatic control
	Protection	600W lightningproof and surge-suppress, 15KV ESD protection (Onboard 120ohm balancing resistor)
	Transmission distance	About 1200m (in low-speed scenario)
	Transmission Mode	Point-to-multipoint (up to 32 nodes, it is recommended to use repeaters for 16 nodes or more)
Indicator	PWR	Red power indicator, lights up when the voltage is detected
	TXD	Green TX indicator, lights up when the RS232 port sends data
	RXD	Blue RX indicator, lights up when the device ports send data back to RS232
ENVIRONMENT REQUIREMENTS	Temperature Range	-40℃ ~85℃
Appearance	Case	Rail-mount ABS case, suitable for 35mm DIN rail
	Dimensions	81.9 × 54.0 × 32.0mm

Onboard Interface



RS232 Male Pinout



RS232 Female Pinout

RS232 Pinout		
DB9 (PIN)	RS232 Male	RS232 Female
2	Receiving data (RXD)	Sending data (TXD)
3	Sending data (TXD)	Receiving data (RXD)
5	GND	GND
1,4,6,7,8,9	N/C	N/C

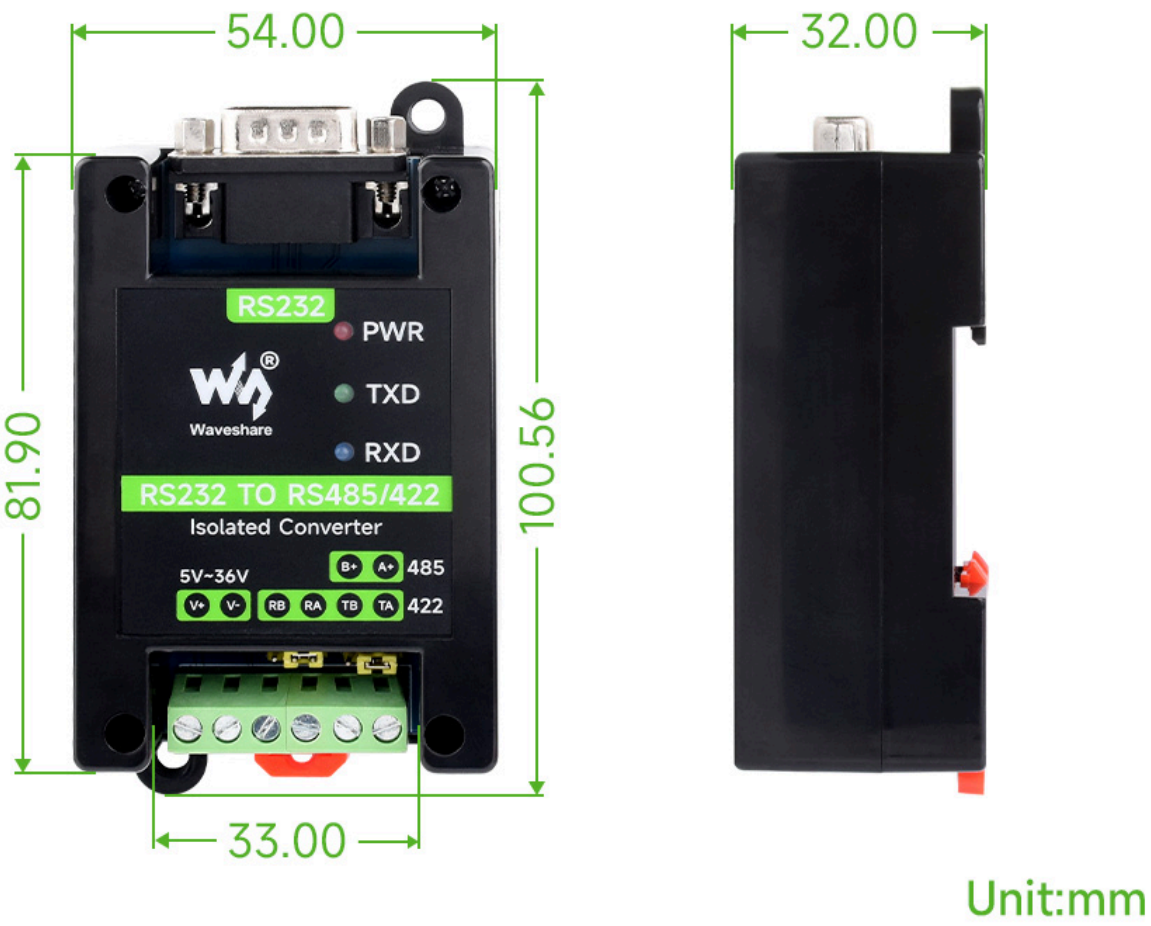


LED Indicators	
PWR	Light up red when power supply is connected
TXD	Blinking green when RS232 port sends data
RXD	Blinking Blue when RS232 port receives data.

RS485/422 Pin Definition						
Interface	V+	V-	RB	RA	TB	TA
RS485	5V~36V Power supply positive	Power supply negative / GND	N/C	N/C	Differential signal negative B-	Differential signal positive A+
RS422	5V~36V Power supply positive	Power supply negative / GND	Receive differential signal negative R-	Receive differential signal positive R+	Send differential signal negative T-	Send differential signal positive T+

(/wiki/File:RS232_TO_RS485-422_interface.png)

Dimensions



(/wiki/File:RS232_TO_RS485-422_Dimensions.jpg)

Function Test

Here we take USB TO 4CH Serial Converter (https://www.waveshare.com/usb-to-4ch-serial-converter.htm) as the example:

RS232 TO RS485 Test

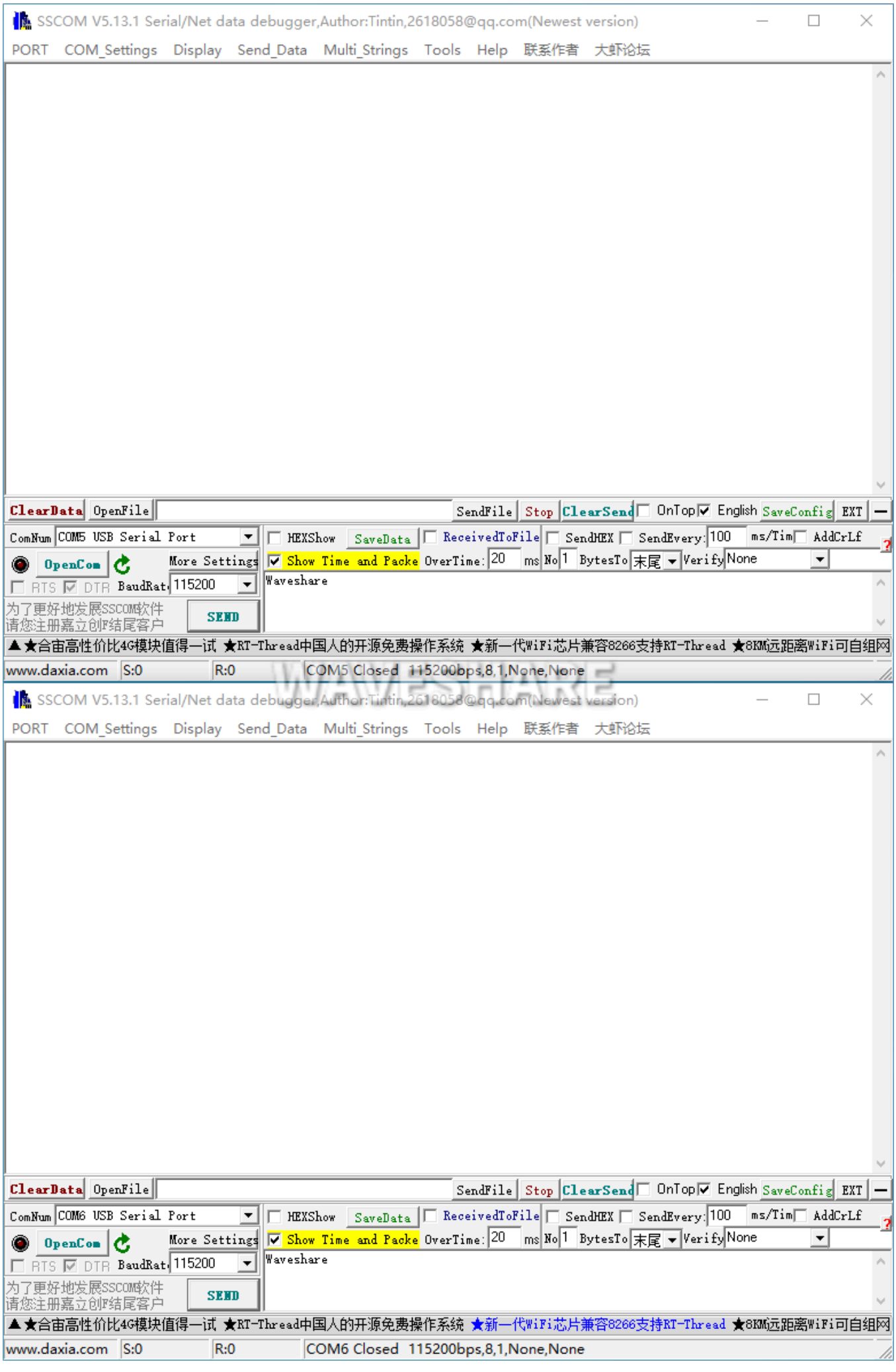
Hardware Connection

RS232 TO RS485/422	USB TO 4CH Serial Converter
RS485 - A+	Port C - TA
RS485 - B-	Port C - TB
RS485 - GND	Port C - GND
RS232 - RXD	Port D - TXD
RS232 - TXD	Port D - RXD

RS232 - GND	Port D - GND

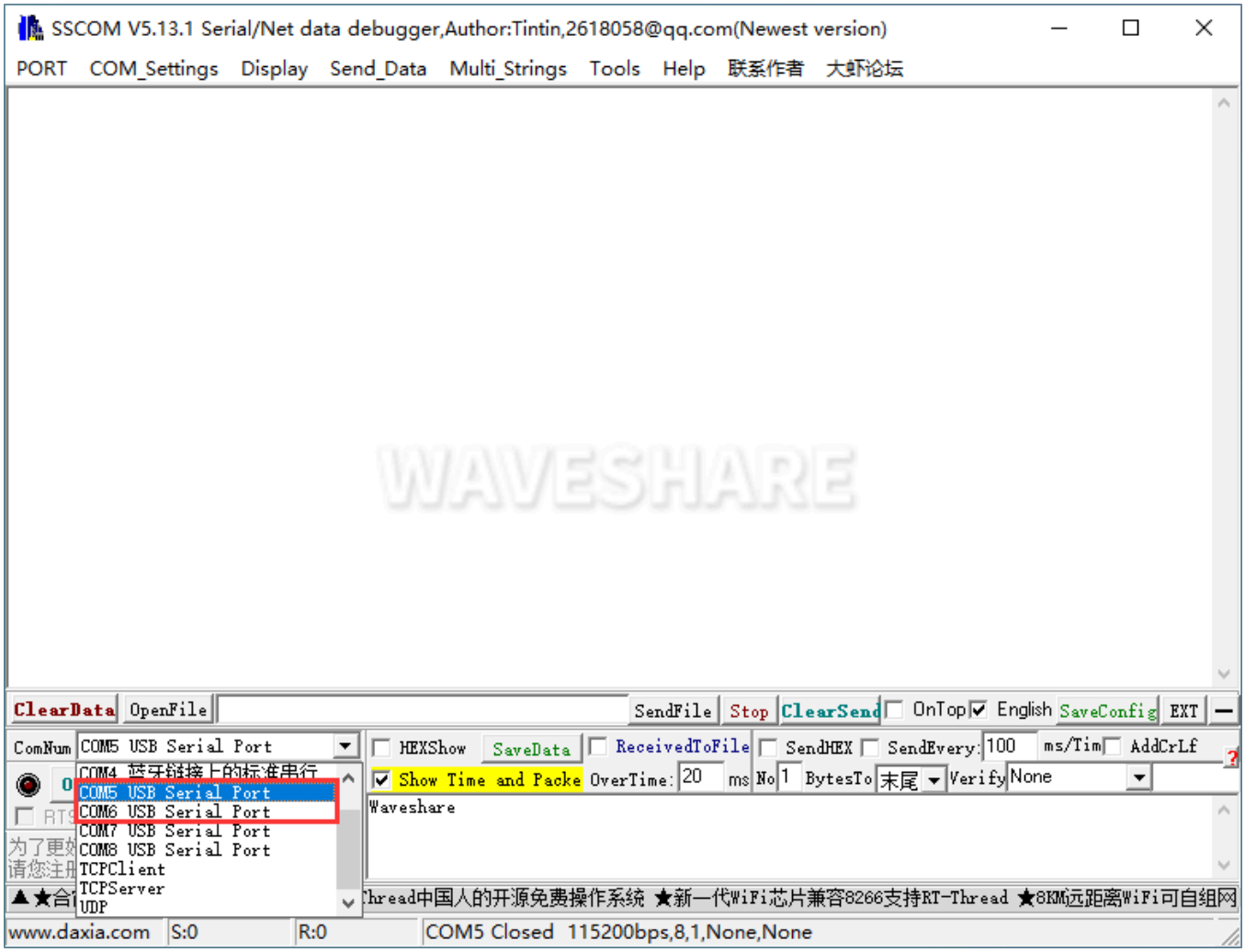
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- Open two SSCOM interfaces.


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WAVESHARE
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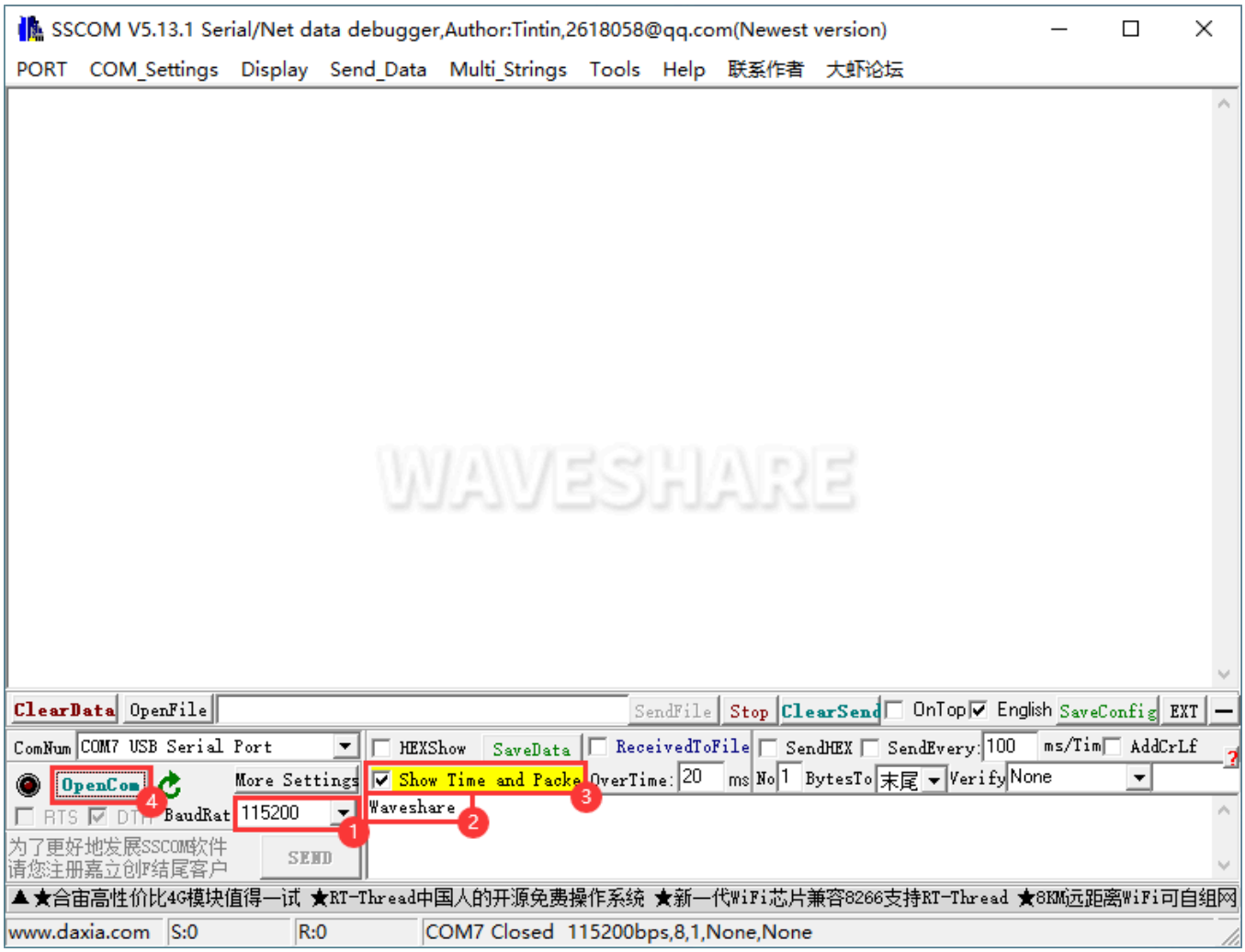
(/wiki/File:USB_TO_4CH_Serial_Converter_07.png)

- Select the COM port corresponding to Port C and Port D of the USB TO 4CH Serial Converter respectively.



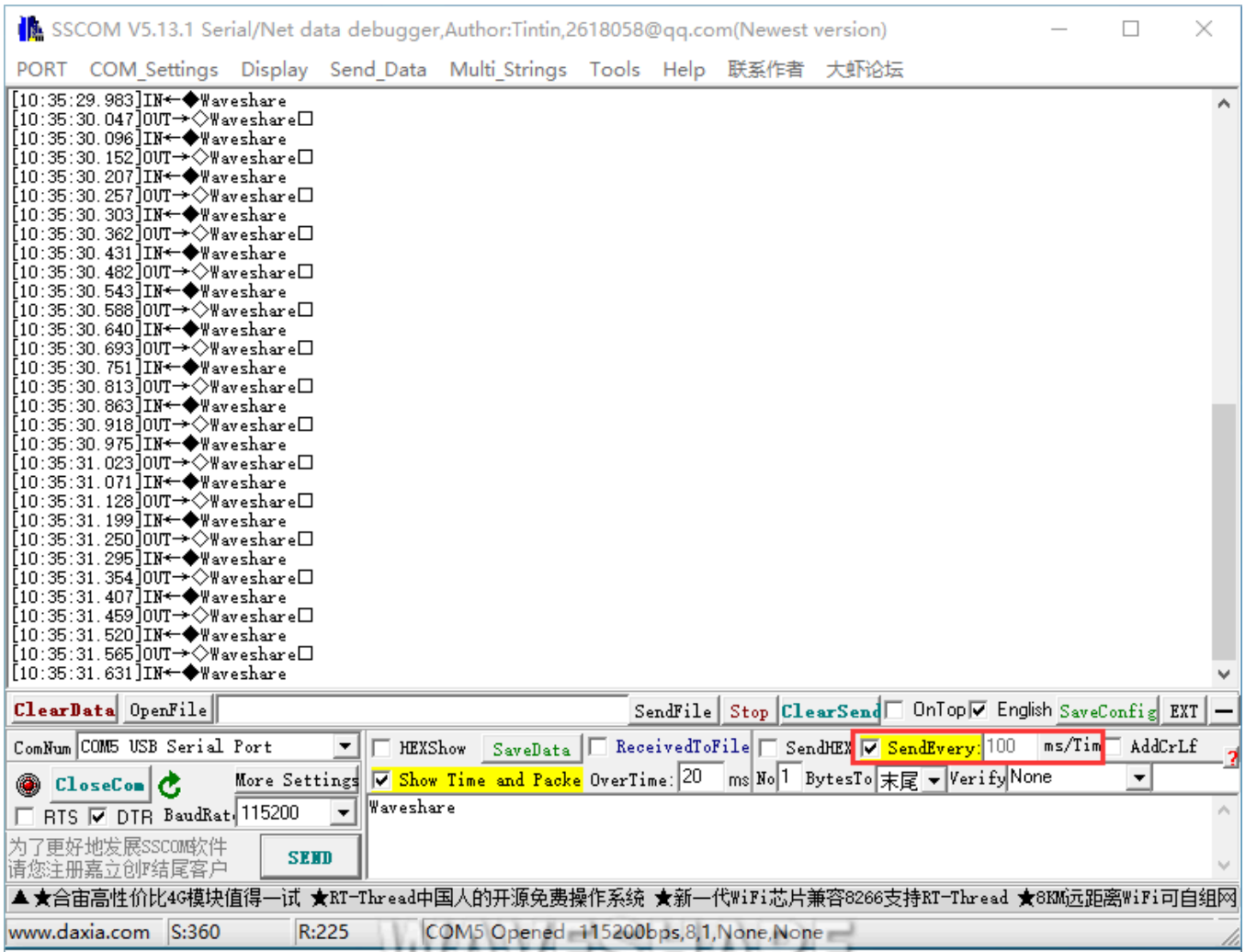
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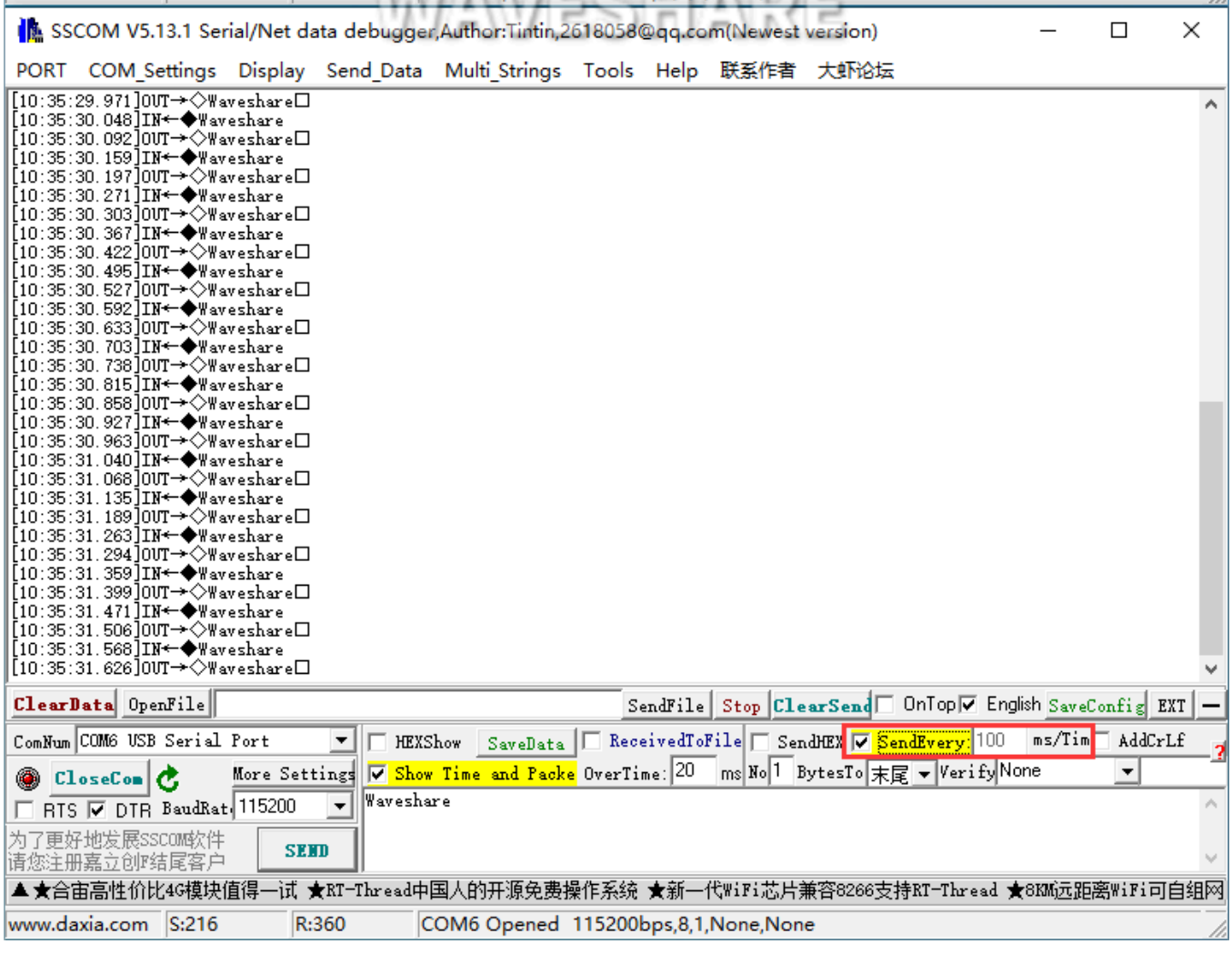
- Input the characters to be sent, select "**Show Time and Packet**" to view it more intuitively, and then click on "**Open COM**".



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[10:35:30.693]OUT→◇Waveshare□
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[10:35:30.918]OUT→◇Waveshare□
[10:35:30.975]IN←◆Waveshare
[10:35:31.023]OUT→◇Waveshare□
[10:35:31.071]IN←◆Waveshare
[10:35:31.128]OUT→◇Waveshare□
[10:35:31.199]IN←◆Waveshare
[10:35:31.250]OUT→◇Waveshare□
[10:35:31.295]IN←◆Waveshare
[10:35:31.354]OUT→◇Waveshare□
[10:35:31.407]IN←◆Waveshare
[10:35:31.459]OUT→◇Waveshare□
[10:35:31.520]IN←◆Waveshare
[10:35:31.565]OUT→◇Waveshare□
[10:35:31.631]IN←◆Waveshare
ClearData OpenFile SendFile Stop ClearSend OnTop English SaveConfig EXT
ComNum COM5 USB Serial Port
HEXShow SaveData ReceivedToFile SendHEX SendEvery: 100 ms/Tim AddCrLf
CloseCom More Settings
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[10:35:30.422]OUT→◇Waveshare□
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[10:35:30.527]OUT→◇Waveshare□
[10:35:30.592]IN←◆Waveshare
[10:35:30.633]OUT→◇Waveshare□
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[10:35:31.263]IN←◆Waveshare
[10:35:31.294]OUT→◇Waveshare□
[10:35:31.359]IN←◆Waveshare
[10:35:31.399]OUT→◇Waveshare□
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[10:35:31.626]OUT→◇Waveshare□
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www.daxia.com S:216 R:360 COM6 Opened 115200bps,8,1,None,None

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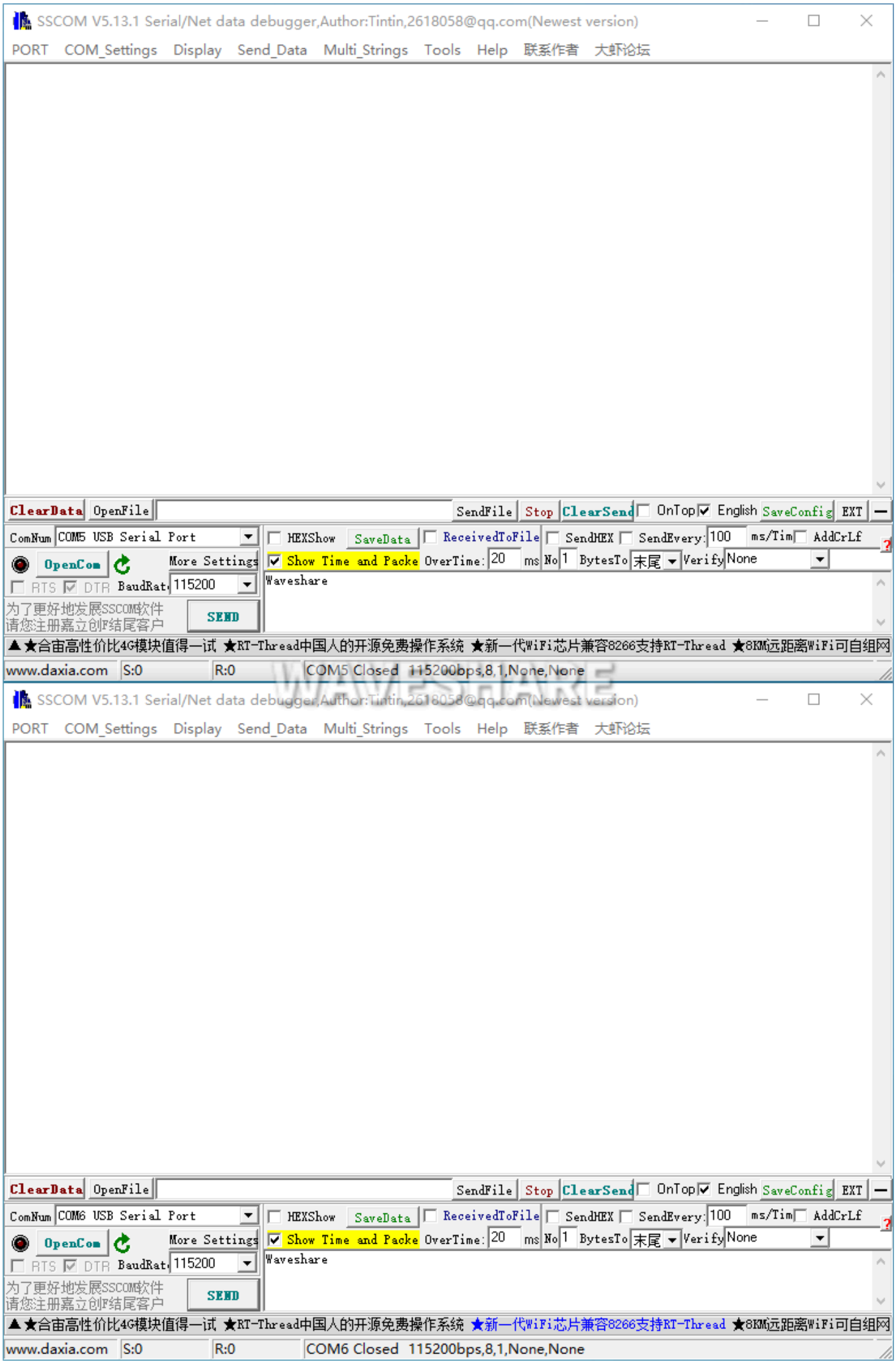
RS232 TO RS422 Test

Hardware Connection

RS232 TO RS485/422	USB TO 4CH Serial Converter
RS422 - TA	Port C - RA
RS422 - TB	Port C - RB
RS422 - RA	Port C - TA
RS422 - RB	Port C - TB
RS422 - GND	Port C - GND
RS232 - RXD	Port D - TXD
RS232 - TXD	Port D - RXD
RS232 - GND	Port D - GND

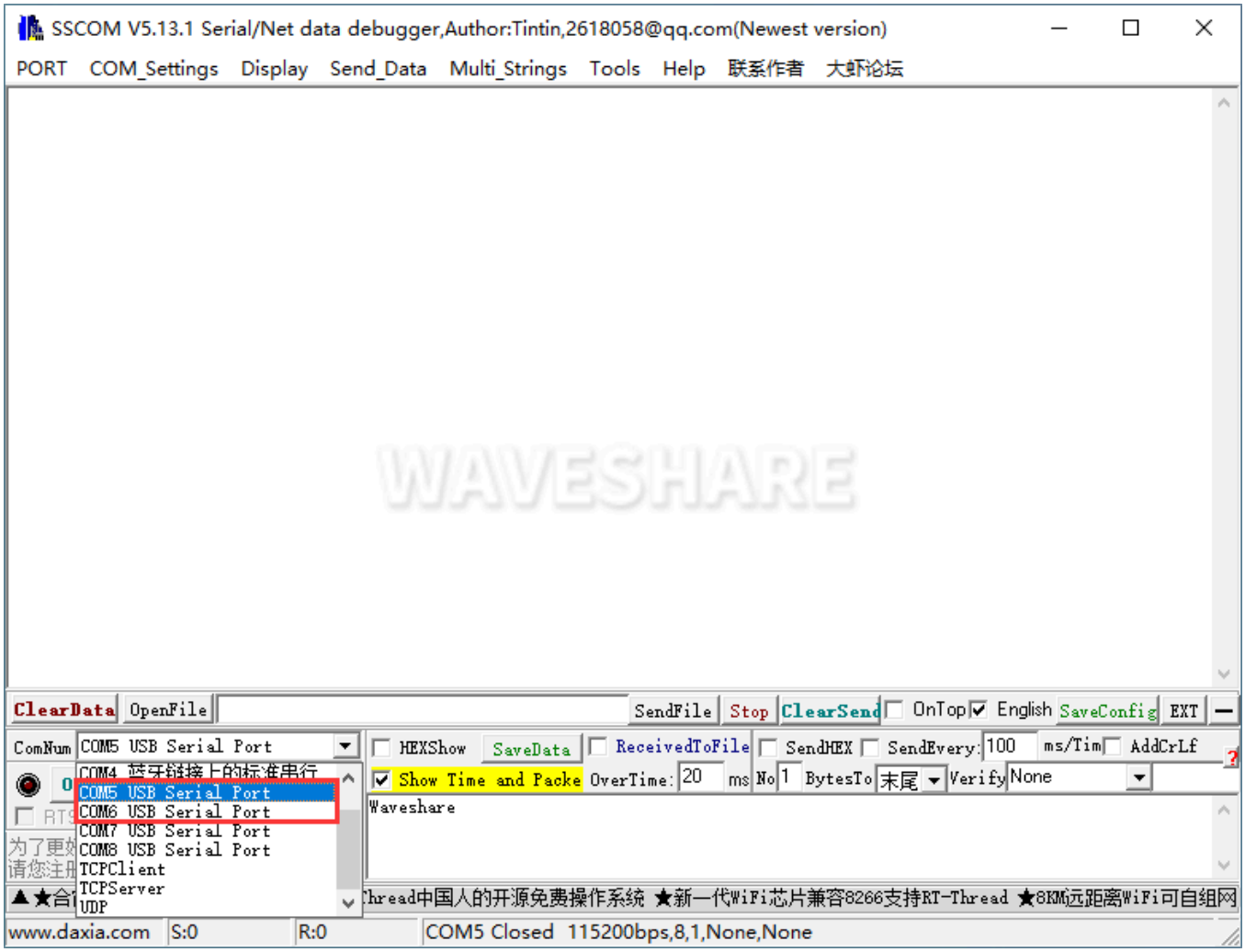
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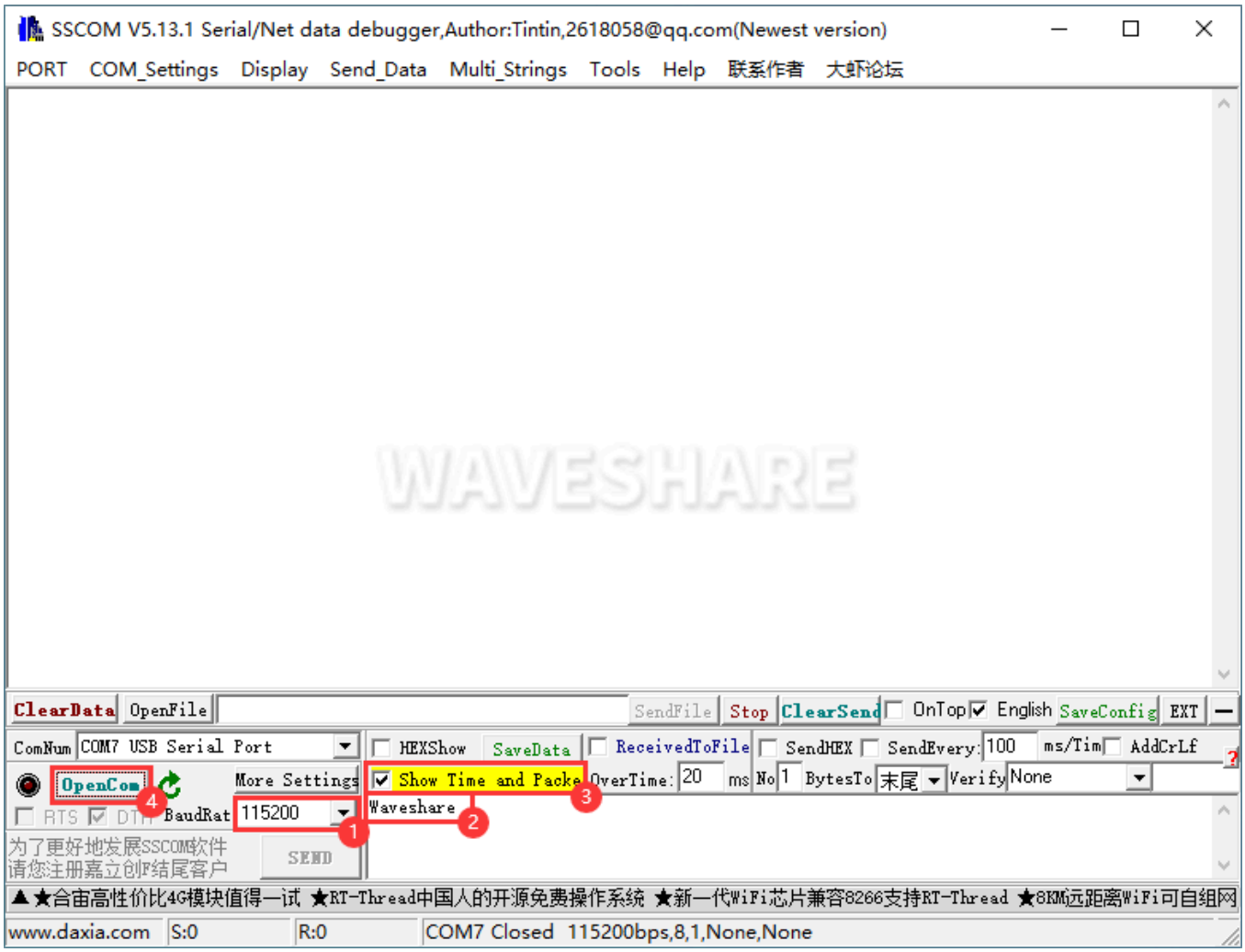
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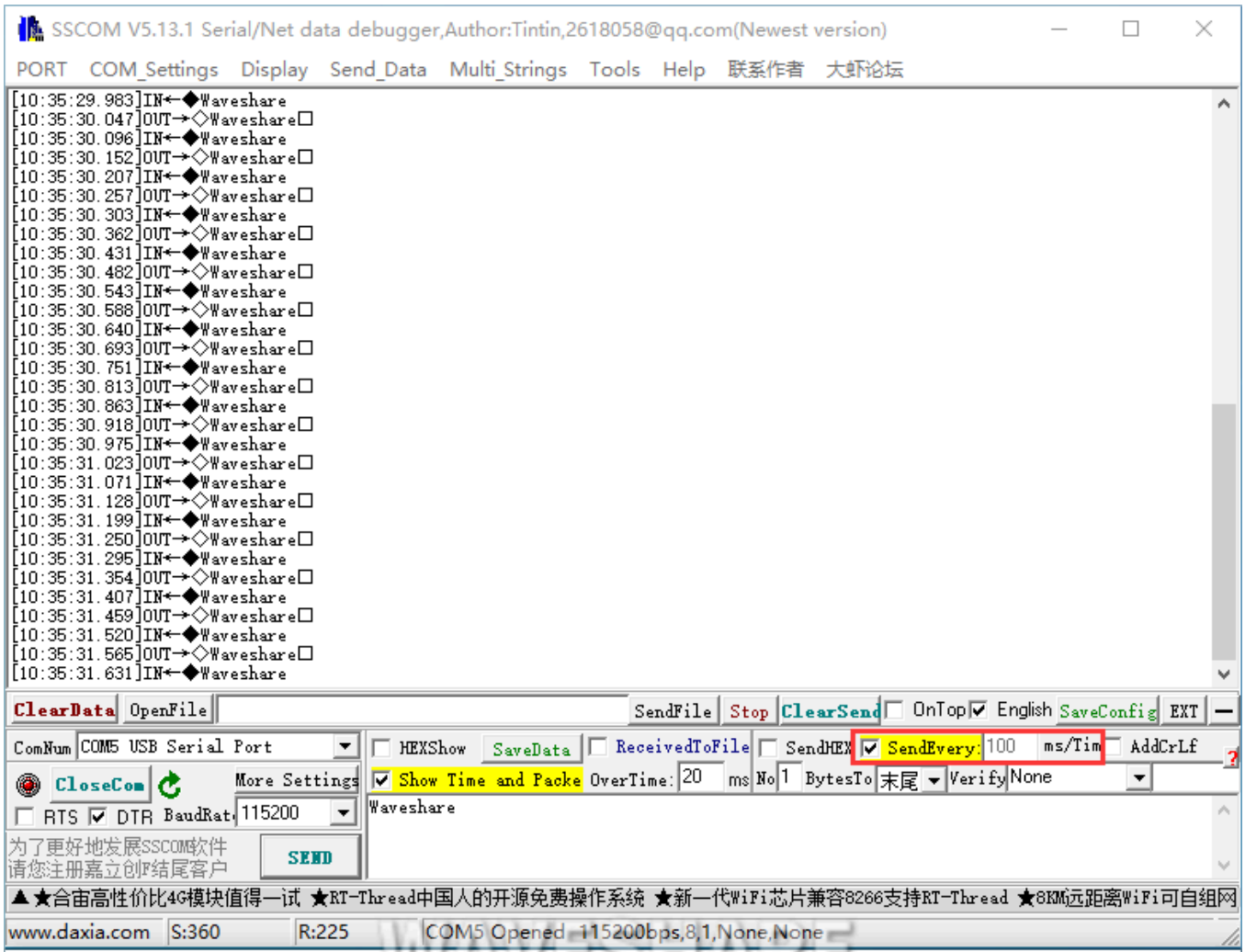
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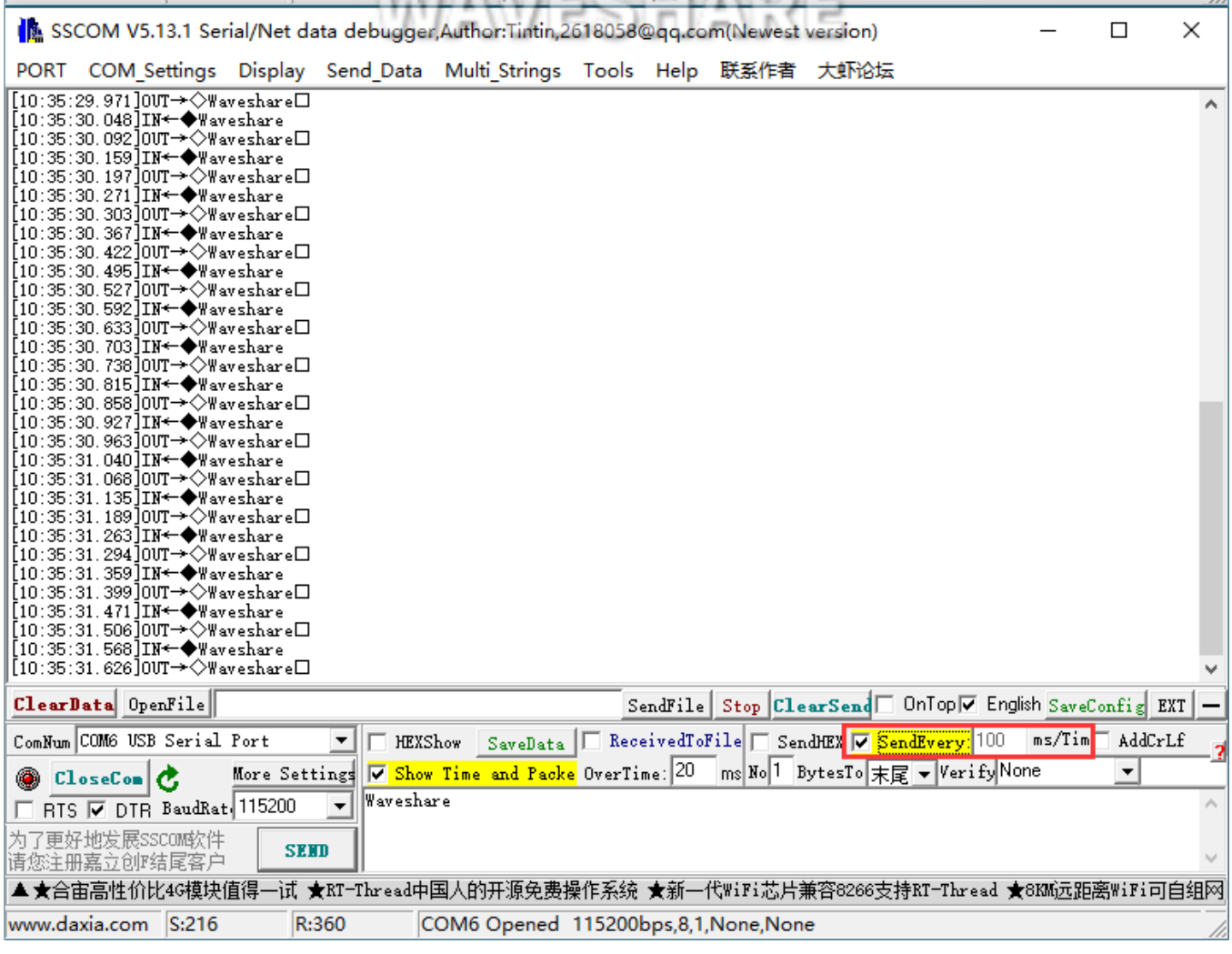
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[10:35:30.963]OUT→◇Waveshare□
[10:35:31.040]IN←◆Waveshare
[10:35:31.068]OUT→◇Waveshare□
[10:35:31.135]IN←◆Waveshare
[10:35:31.189]OUT→◇Waveshare□
[10:35:31.263]IN←◆Waveshare
[10:35:31.294]OUT→◇Waveshare□
[10:35:31.359]IN←◆Waveshare
[10:35:31.399]OUT→◇Waveshare□
[10:35:31.471]IN←◆Waveshare
[10:35:31.506]OUT→◇Waveshare□
[10:35:31.568]IN←◆Waveshare
[10:35:31.626]OUT→◇Waveshare□
ClearData OpenFile SendFile Stop ClearSend OnTop English SaveConfig EXT
ComNum COM6 USB Serial Port
HEXShow SaveData ReceivedToFile SendHEX SendEvery: 100 ms/Tim AddCrLf
CloseCom More Settings
Show Time and Packe OverTime: 20 ms No 1 BytesTo 末尾 Verify None
RTS DTR BaudRat 115200
Waveshare
为了更好地发展SSCOM软件
请您注册嘉立创P结尾客户
SEND
▲★合宙高性价比4G模块值得一试 ★RT-Thread中国人的开源免费操作系统 ★新一代WiFi芯片兼容8266支持RT-Thread ★8KM远距离WiFi可自组网
www.daxia.com S:216 R:360 COM6 Opened 115200bps,8,1,None,None

(/wiki/File:USB_TO_4CH_Serial_Converter_11.png)

Resource

Datasheet

- SP3485E (https://files.waveshare.com/wiki/RS232-TO-RS485-422/SP3485EN.PDF)
- SP3232E (https://files.waveshare.com/wiki/RS232-TO-RS485-422/SP3232EEN.pdf)

FAQ

Question: Is there a built-in 120-ohm termination resistor?

Answer:

Yes, if the 120R matching resistor must be modified, move the jumper cap to the 120R position on the RS485/422 terminal.

Question: What should be done in case of abnormal long-distance communication for RS485/422?

Answer:

Move the jumper cap of RS485/422 to the 120 ohm position.

Question: What should be done in case of abnormal short-distance communication for RS485/422, where the received data shows extra bits or garbled content?

Answer:

Remove the two 120Ω termination matching resistors of RS485/422 and jump the jumper cap to NC.

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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