TTL TO RS422 (B)

From Waveshare Wiki
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Overview

Full-Duplex RS422



(https://www.waveshare.com/ttl-to-rs422-b.htm)

Half-Duplex RS485



(https://www.waveshare.com/ttl-to-rs485-b.htm)

RS485, TTL

TTL TO RS422 (B) is an industrial-grade rail-mounted electrically isolated TTL-to-RS485 serial converter.

Feature

- Compatible with TTL/RS485 standard, converting the TTL signal into a balanced differential RS485 signal, supporting full-duplex communication.
- Compatible with 3.3V ~ 5V TTL signal level, with anti-reverse connection and anti-over-voltage circuit on the power supply side.
- 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 and is anti-electrostatic.
- Onboard resettable fuse and protection diodes, ensure the current/voltage stable outputs, provide over-current/over-voltage protection, and improve shock resistance.
- On-board RS485 input and output 120R resistors with built-in jumper caps for switching enable.

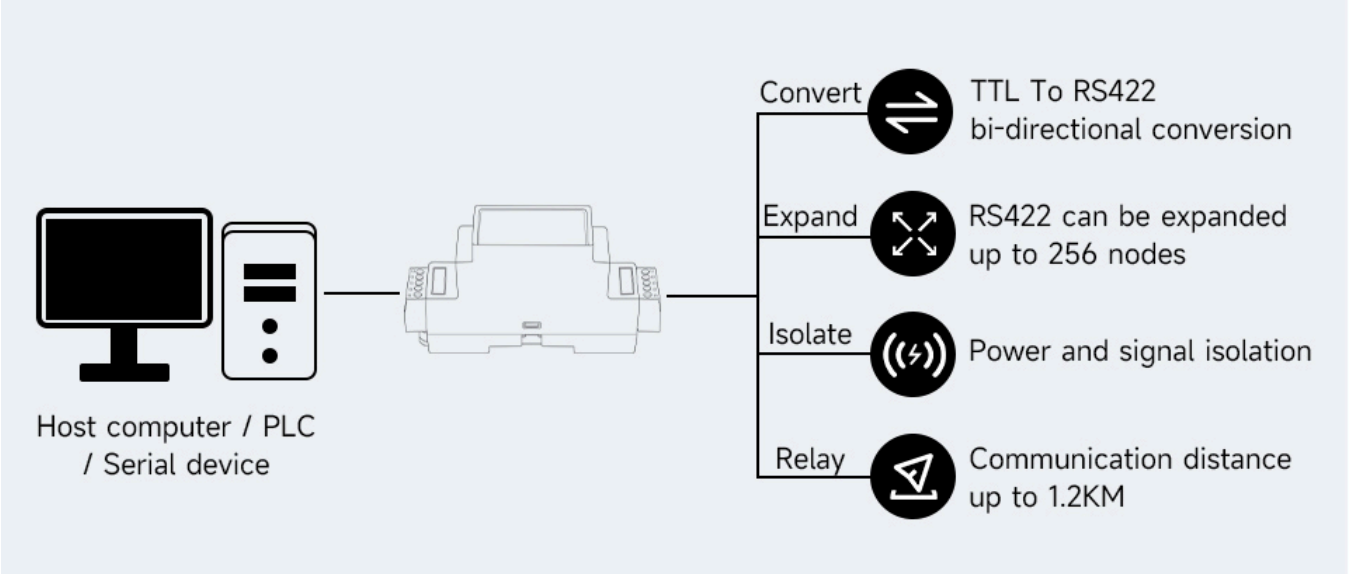
- Industrial rail-mount ABS case design, small in size, easy to install, and cost-effective.

Parameters

Model	Galvanic isolated TTL to RS422 converter	
Power Port	Power Supply	3.3V ~ 5V
	Interface Protection	anti-over-discharge, reverse-proof
Device Interface	Compatible with TTL / RS485 standard	
TTL Interface	Interface Type	Screw terminal
	Transmission Distance	less than 10m
	Transmission Model	Point to point
RS422 Interface	Interface type	Screw terminal
	Interface Protection	Provide 600W lightningproof, surge-suppress and 15KV ESD protection
	Terminal Resistance	120R, enabled/disabled via jumper (inside the case)
	Transmission Distance	About 1200m
	Transmission Mode	Point-to-multipoint (Up to 32 nodes can be connected, and relays are recommended for more than 16 nodes)
Product Appearance	Case	Rail-mount ABS case, suitable for 35mm DIN rail
	Dimensions	91.6 × 58.7 × 23.3mm

Basic Function

Convert TTL signal to balanced differential RS422 signal, which can be used for interface conversion, and node expansion, and can also be used to extend the communication distance.



(/wiki/File:TTL_TO_RS42209.jpg)

Interface Introduction



(/wiki/File:TTL_TO_RS422020.jpg)

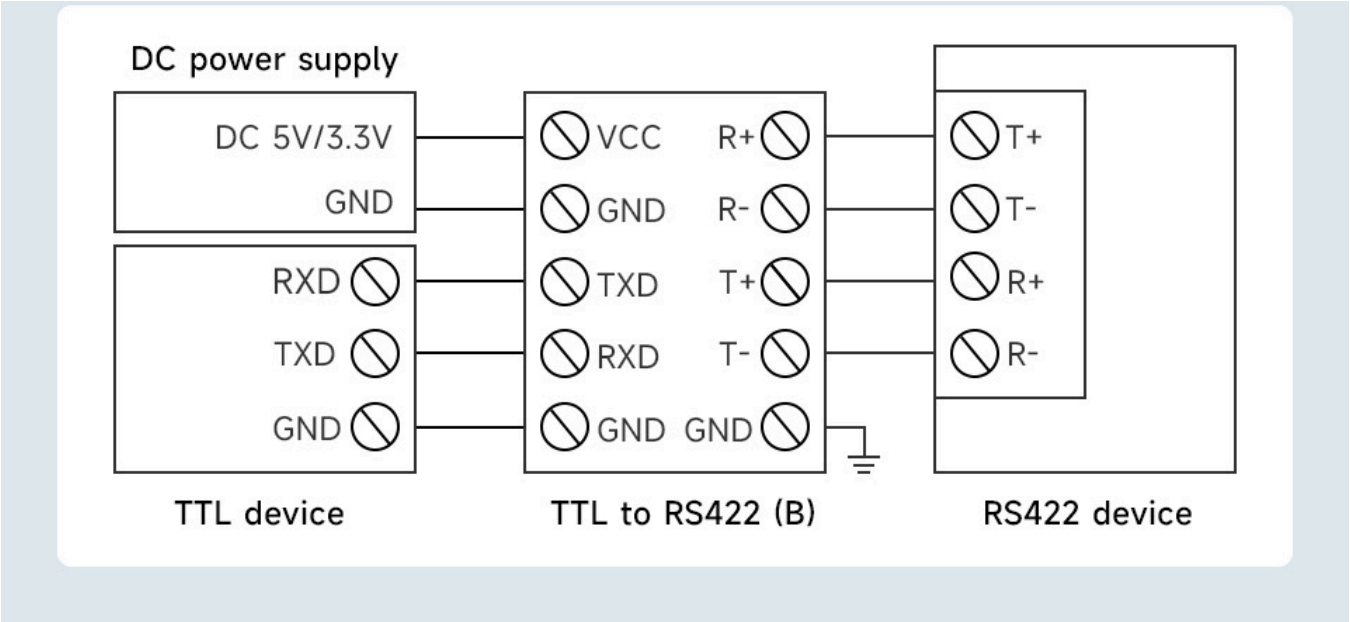
TOP SIDE SCREW TERMINAL		BOTTOM SIDE SCREW TERMINAL	
VCC	Power Input DC 3.3V~5V power supply	R+	RS422 differential signal receive positive
GND	Ground	R-	RS422 differential signal receive negative
TXD	TTL transmit data pin	T-	RS422 differential signal transmit negative RS485 differential signal negative (B-)*
RXD	TTL receive data pin	T+	RS422 differential signal transmit positive RS485 differential signal positive (A+)*
GND	TTL signal ground	GND	RS485/422 signal ground

(/wiki/File:TTL_TO_RS422021.png)

* Note: the TTL TO RS422 (B) is designed to be used with RS422 devices, however, it is also possible to be used with RS485 devices (yet only sending is available). It is recommended to use TTL TO RS485 (B) (/wiki/TTL_TO_RS485_(B)).

Communication Connection Diagram

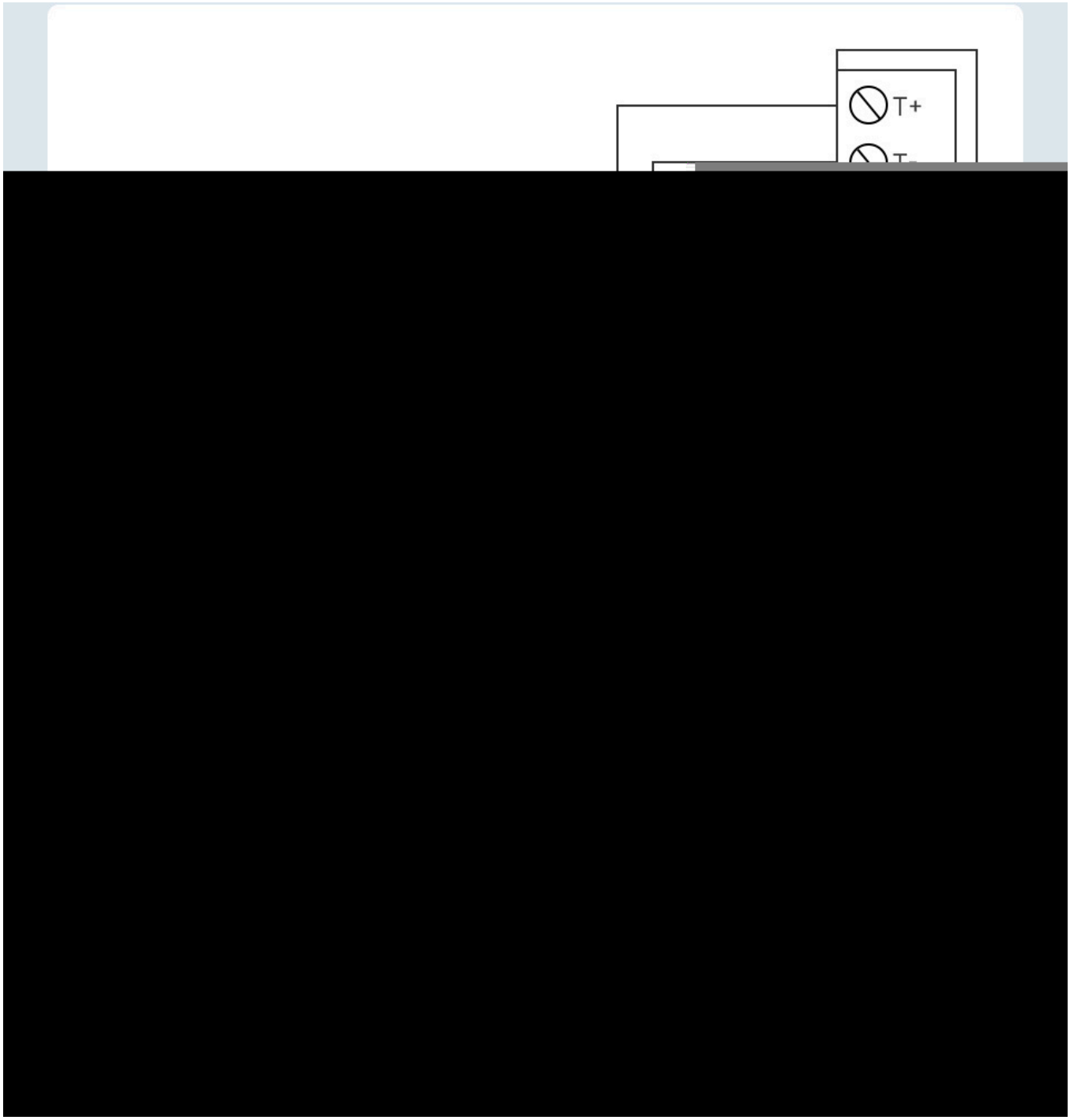
TTL convert to RS422, point to point, full duplex communication, suitable for interface conversion



(/wiki/File:TTL_TO_RS422_030.jpg)

TTL convert to RS422, point-to-multipoint, full duplex communication,

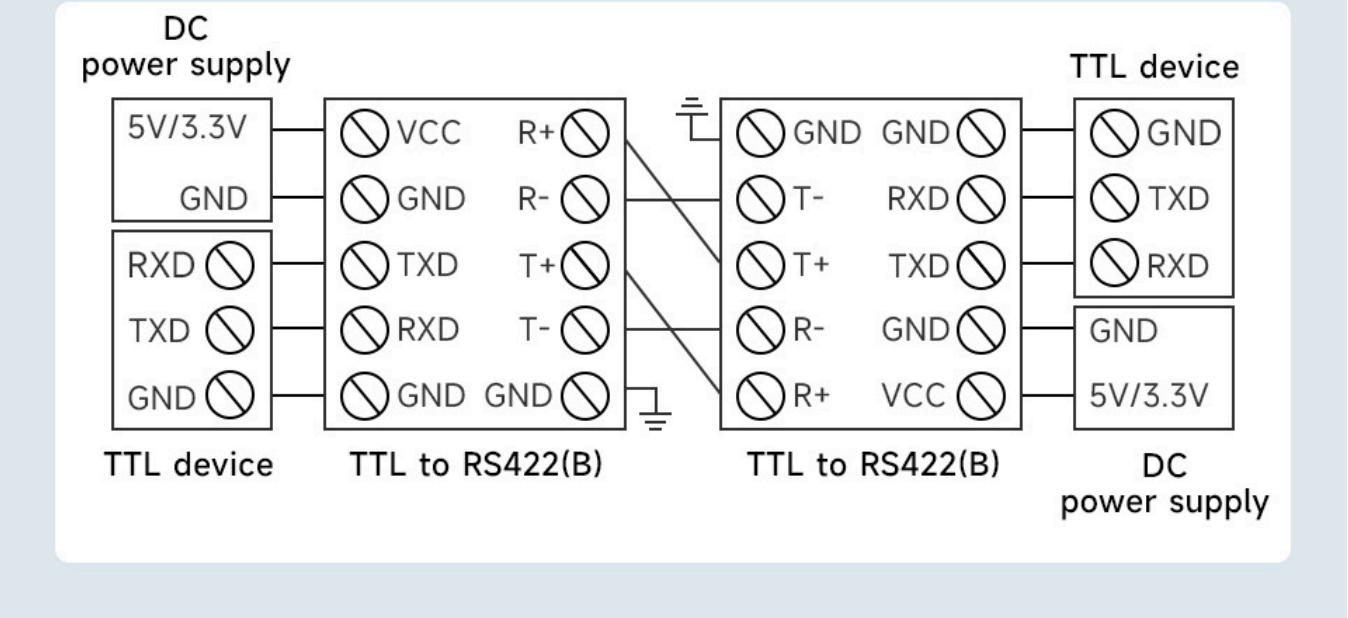
suitable for expanding nodes



(/wiki/File:TTL_TO_RS422_031.jpg)

Two groups TTL to RS422 conversion, point-to-point, full duplex communication, suitable for extending the communication distance of

TTL



(/wiki/File:TTL_TO_RS422_032.jpg)

Dimensions

(/wiki/File:TTL_TO_RS422_(B)010.jpg)

Hardware Test

Test Note

Test Environment: PC (Windows).

Accessories required for testing:

- TTL TO RS422 (B) --this product
- USB TO TTL (https://www.waveshare.com/usb-to-ttl-b.htm) - not included
- USB TO RS485/RS422 - not included

Test Hardware Connection

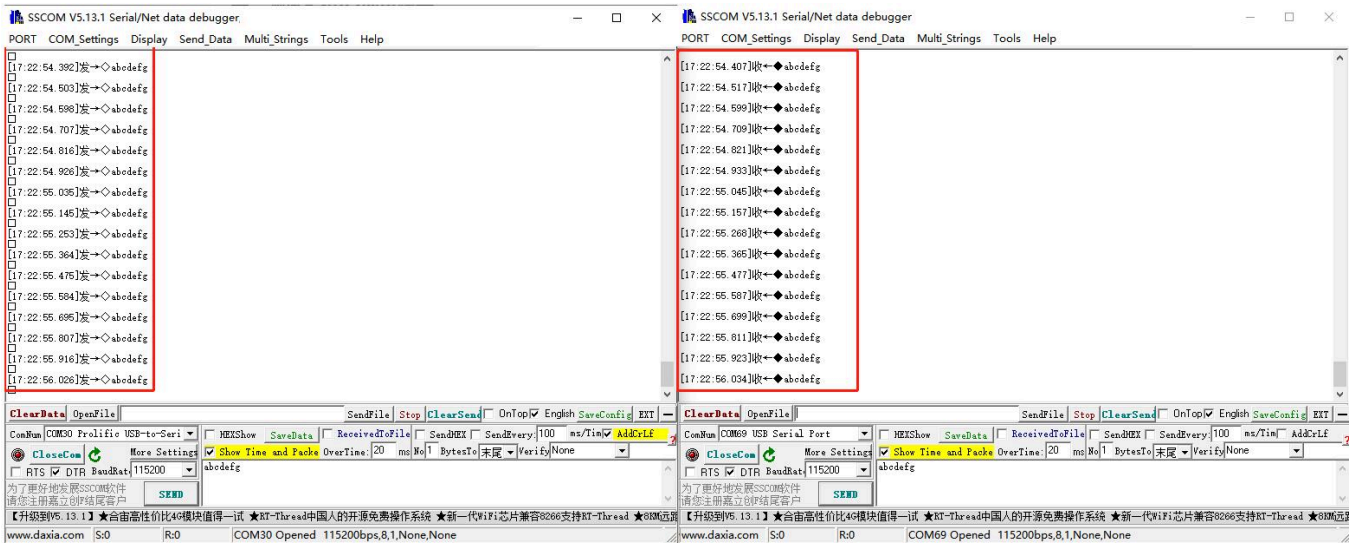
Connect the RS422 interface of TTL TO RS422 (B) to the PC with the USB to RS422 conversion cable. Connect the TTL interface of TTL TO RS422 (B) to the TTL interface of USB TO TTL, and then connect the USB port of USB TO TTL to the same PC for the self-transmission tests. The schematic diagram of the hardware connection is as follows:



(/wiki/File:TTL_TO_RS422_(B)_090.png)

Note: The RS422 interface of this product also has two built-in 120R enabling resistors, which are enabled by default. Users can remove the case to modify the settings according to their needs. If signal isolation is required, GND can also be connected to the ground wire.

On the PC, open two SSCOM serial port debugging assistants, 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 test is as follows:



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

Resource

Software

- Sscom.7z (https://files.waveshare.com/upload/5/5f/Sscom.7z)

FAQ

Question: What is the operating temperature range for TTL TO RS422 (B)?

Answer:

-15~70°C

Question: What is the maximum rate (baud rate) of TTL TO RS422 (B)?

Answer:

We have tested 921600bps and it can work stably.

The hardware itself has no special limitations to the use of rate but mainly depends on the access to the TTL and RS422 devices, as well as the communication environment and communication distance.

Question: Does it support node configuration and does it support Modbus?

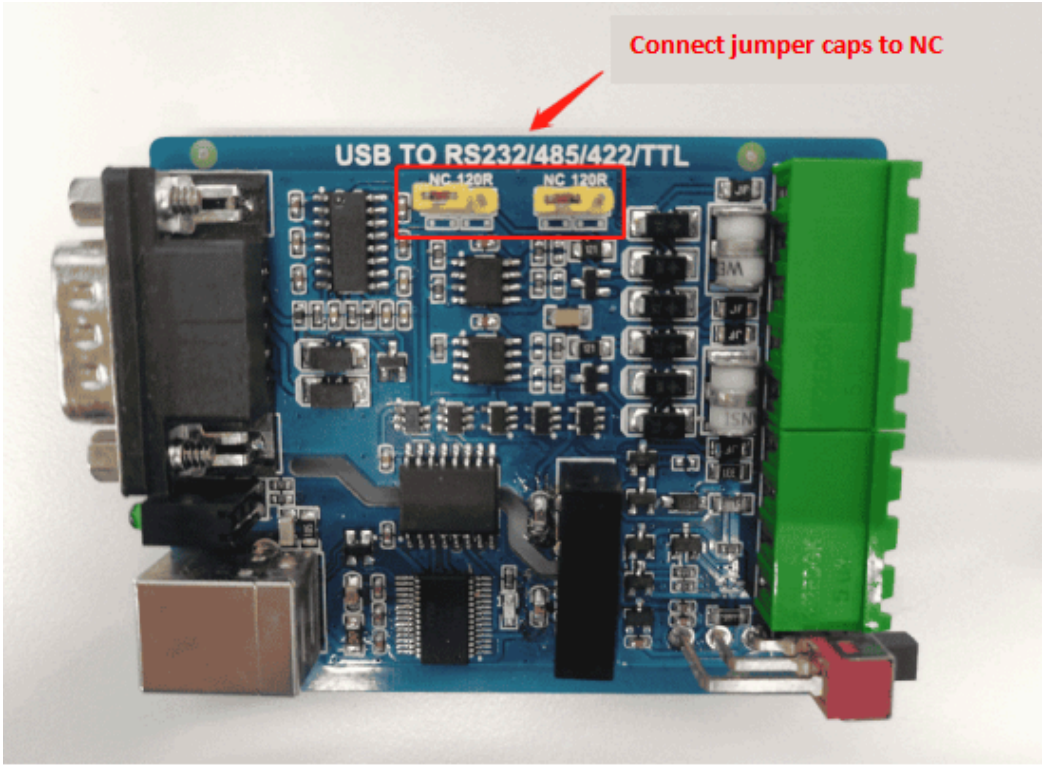
Answer:

- The module only provides a physical layer pure hardware level converter, without the need to configure parameters such as baud rate and nodes. Modbus communication requires implementation at the protocol layer.
- It supports the connection of Modbus devices (Modbus sensors, instruments, etc.). Understanding the Modbus protocol involves knowledge of Modbus function codes and data formats. Modbus has multiple function codes, with each code corresponding to a specific operation, such as reading coil status, reading input status, reading holding registers, etc.

Question: What should I do if there are issues with short-distance RS485 communication in which I'm receiving extra 0s or garbled data?

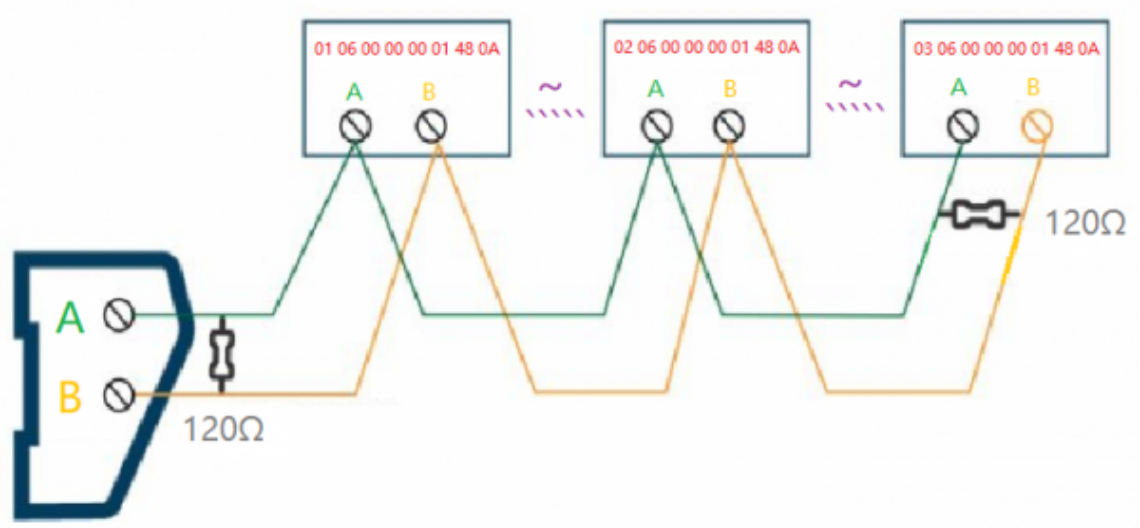
Answer:

- In general, the short-distance communication can be removed from RS422/RS485's two 120Ω terminal, and connect jumper caps to NC.



(/wiki/File:USB_TO_RS232_faq.png)

- When multiple devices connect to the RS485 serial bus over a long distance, in general, we add 120Ω matching resistors to the first and last devices on the RS485 bus.



(/wiki/File:RS485_TO_WIFI-ETH-02.png)

Question: What is the powerconsumption, at 5V of the "TTL TO RS422 (B)"?

Answer:

The power consumption of this 5V is 0.12W.

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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