

## 2CH-HUB-RS485

## 4CH-HUB-RS232/485

## 4CH-HUB-RS485

## 8CH-HUB-RS485

# User Manual

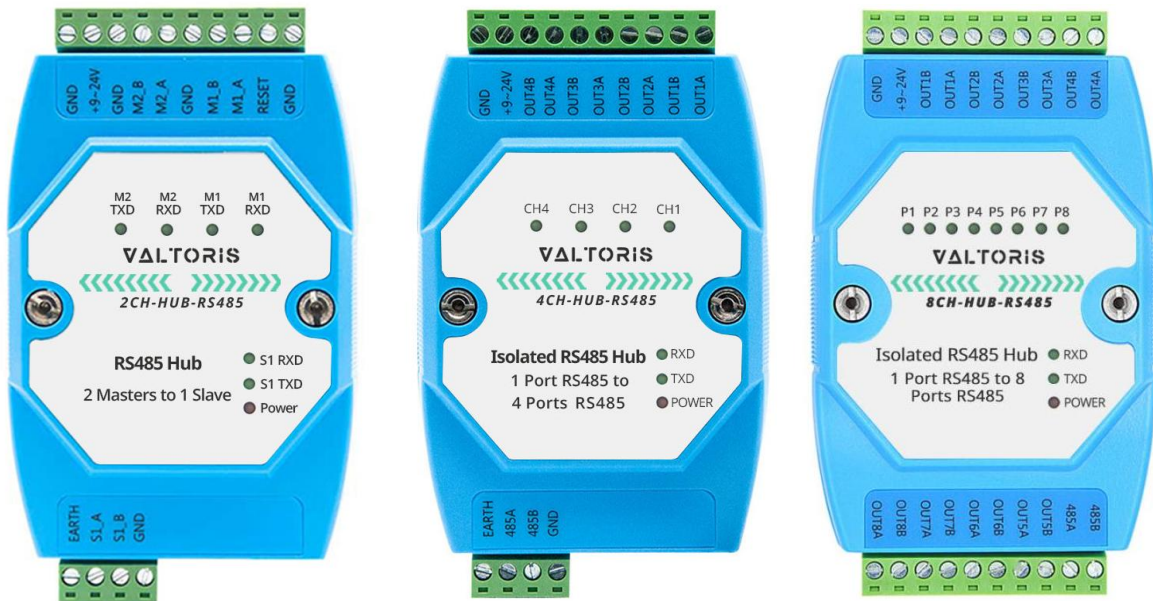


Figure 1

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# 1. Overview

In the industrial field environment, we need to convert RS232 to RS485 interface type, and also need RS485 to implement functions such as multi-channel expansion/isolation/relay. This series of hubs can meet the requirements.

## 1.1 Hub Selection Guide

Table 1 Hub Selection Guide

Model	2CH-HUB-RS485	4CH-HUB-RS485	4CH-HUB-RS232/485	8CH-HUB-RS485
<b>Product Brief</b>	2-channel active RS485 caching hub	4-channel active RS485 caching hub	4-channel active RS485/232 expansion isolation hub	8-channel active RS485 expansion isolation hub
<b>Physical interface</b>	RS-485 port 3PIN flange head*3	RS-485 port 2PIN flange head*5	RS-232 end DB9 female head (hole type)*1, RS-485 port 2PIN flange head*5	RS-485 port 2PIN flange head*9
<b>Transmission rate</b>	1200~460800bps	300-460800bps (adaptive)	0~200Kbps (adaptive)	300-460800bps (adaptive)
<b>Isolation protection</b>	/	Isolation voltage RS485 Isolation voltage: 2500V Static protection RS485: 12KV	Isolation voltage RS485 Isolation voltage: 2500V Static protection RS485: 12KV	Isolation voltage RS485 Isolation voltage: 2500V Static protection RS485: 12KV
<b>Interface parameters</b>	Data bit 8 Check bits None/Odd/Even/Mark/Space Stop position 1/2			
<b>Support nodes</b>	Each RS485 port supports a maximum of 32 nodes			
<b>Transmission distance</b>	RS232: 15m; RS485: 1200 meters (at 9600bps); The higher the communication speed, the shorter the distance			
<b>Transmission medium</b>	Ordinary wire, twisted pair or shielded wire			
<b>Working method</b>	Asynchronous half duplex			
<b>Power consumption</b>	DC9-24V 12V@30mA			

Operating Temperature	-45°C~+85°C
Humidity	<95%RH
Size (Length x Width x Height)	121mm * 72mm * 34mm

## 2. Instruction

### 2.1 2CH-HUB-RS485

**2CH-HUB-RS485** is an industrial grade caching RS485 hub with two masters and one slave, one master and two slaves.

Two modes are used for scenarios where two RS485 hosts read data from one RS485 slave and one RS485 host reads data from two RS485 slaves. Adopting a rail type installation, easy to install, compact in size, terminal type power supply connection.

When there are two masters and one slave, two hosts can schedule and read one RS485 slave station; When there is one master and two slaves, one master can read two slave stations, and the data sent to one of the master stations cannot be received from the slave station bus; RS485 device communication with different baud rates can be achieved.

Simple configuration, stable and reliable, adaptable to multiple standard baud rates and other serial port parameters, supporting three separate serial port settings. At the same time, it also supports address filtering function, which can help users filter out unnecessary data.

#### 2.1.1 Application method

##### 1. Two masters and one slave: Two master stations communicate with the same slave station, and the data does not conflict

In the application field of industrial Internet of Things, it is often encountered that multiple RS485 hosts need to monitor the same RS485 slave at the same time. However, due to the limitations of

protocols such as MODBUS RTU, if two RS485 host devices are directly connected to the RS485 bus without processing, it will cause data conflicts:

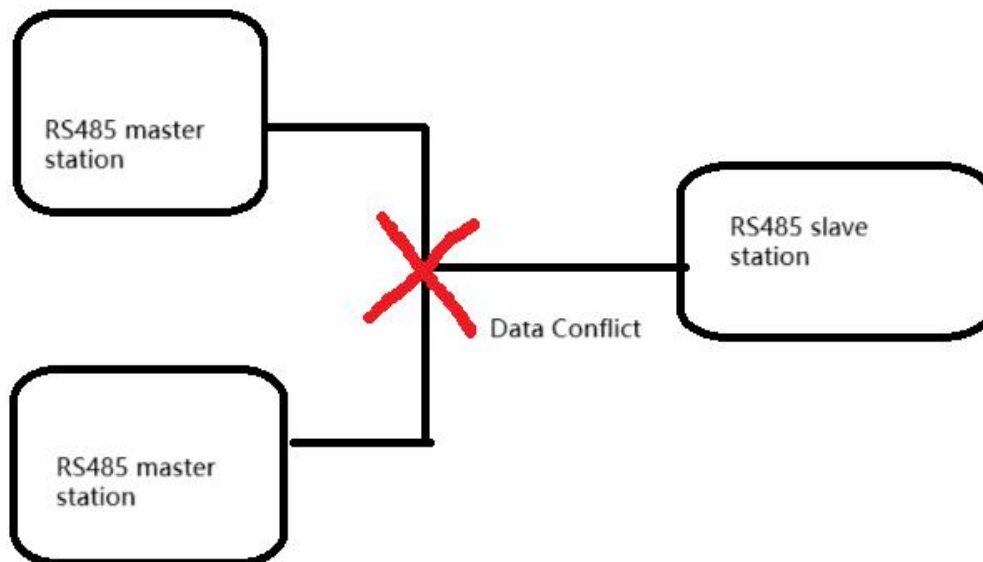


Figure 2 Schematic diagram of data conflict

Cache type RS485 hub can independently collect data from slave stations, confirm which master station the data comes from, read data from slave stations and send it back to the corresponding master station, ensuring that data is not lost. The device has data filtering, priority processing mechanisms, etc., which can ensure that data does not conflict in the above situations.

## 2. One master and two slaves: Each RS485 interface is independent of each other, and parameters can be set separately

In the application field of industrial Internet of Things, sometimes it is necessary to have two RS485 serial ports for communication, but the parameters are inconsistent and cannot be changed due to various reasons. Communication is not possible when the serial port parameters are inconsistent:

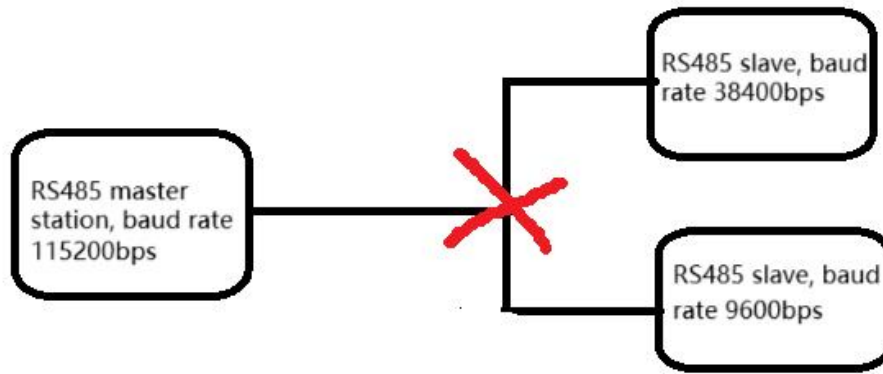


Figure 3 Inconsistent serial port parameters

Cache type RS485 hub, with three non interfering RS485 serial ports, each port's parameters can be independently set without affecting communication.

### 2.1.2 Interface Description



Figure 4 Front view of 2CH-HUB-RS485

Name	Instructions
GND,+9-24V	9-24VDC power supply terminal input
M2_A, M2_B	The A/B lines of RS485 at Master 2 station
M1_A, M1_B	The A/B lines of RS485 at Master 1 station
S1_A, S1_B	The A/B lines of RS485 at Slave 1 station
RESET	Shorting the device to the adjacent GND pin can reset the device parameters.
EARTH	Connected to the ground. Not connected does not affect communication.

### 2.1.3 Description of panel indicator lights

POWER	Power indicator light, always red after power on
M2 TXD M2 RXD	The transmit/receive indicator light on Master 2 station Flashing green: Serial port is transmitting data.
M1 TXD M1 RXD	The transmit/receive indicator light on Master 1 station Flashing green: Serial port is transmitting data.
S1 TXD S1 RXD	The transmit/receive indicator light on Slave 1 station Flashing green: Serial port is transmitting data.

### 2.1.4 Upper computer software description

The cache type RS485 hub configuration tool is used to configure different mode applications and serial port parameters. After opening the configuration software, the interface is shown as follows:

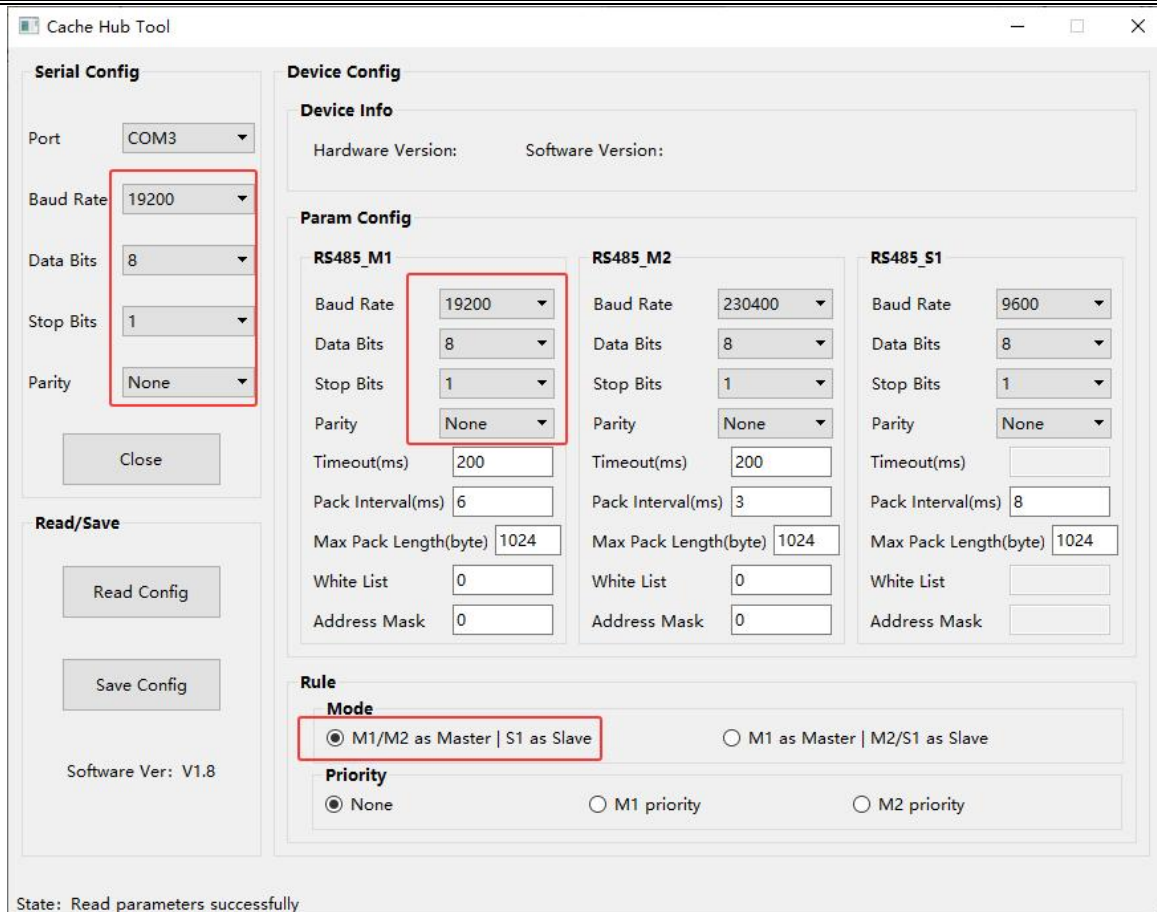


Figure 5 Upper computer software

2CH-HUB-RS485 M1 is configured with a serial port. After wiring, fill in the corresponding serial port parameters, click "Open Serial Port", and after successful opening, click the "Read Parameters" button to obtain all the parameters of the device. After modifying the parameters, click the "Save and Set" button. When the status prompt is "Configuration Complete", it means that the settings have been successfully set.

### 2.1.5 Special Function Parameter Description

**Two masters and one slave:** The equipment connected to M1 and M2 is the master station, and the equipment connected to S1 is the slave station.

**One master and two slaves:** the device connected to M1 is the master station, and the devices connected to M2 and S1 are slave stations.

**Subcontracting time:** When the current time minus the time of the last data reception is greater than the subcontracting time, it is considered as A frame of data packet is successfully received, and data that

exceeds the time limit will be allocated to the next frame.

For the commonly used 9600bps baud rate, a packet splitting interval of 8 is recommended. The configuration software will automatically select the corresponding packet splitting interval based on the baud rate, and users generally do not need to modify it.

Baud Rate	Subcontracting time (ms)
115200-460800	3
57600-115199	4
28800-57599	5
14400-28799	6
9600-14399	8
7200-9599	9
4800-7199	10
2400-4799	20
1200-2399	40
600-1199	80
300-599	160

**Timeout:** If the master station sends a query command and receives a reply command from the slave station within this time, then Process the line, otherwise issue the next instruction.

**Whitelist:** If the first byte of the reply data is the same as this value, it will be forwarded to the main station, and the priority of the whitelist will be determined.

Above the address mask and needs to be used in conjunction with the address mask, otherwise it is generally invalid. Whitelist is usually available Used to filter station addresses for Modbus reply commands.

**Address mask:** The first byte of the data sent & this value=the first byte of the received data&this value, then it will be converted Send to the main station, otherwise no processing will be carried out. The priority of the address mask is lower than that of the whitelist.

For example, as shown in the figure below, it means that Master Station 1 only receives data from Station Address 1, and Master Station 2 only receives data from Station Address 2.

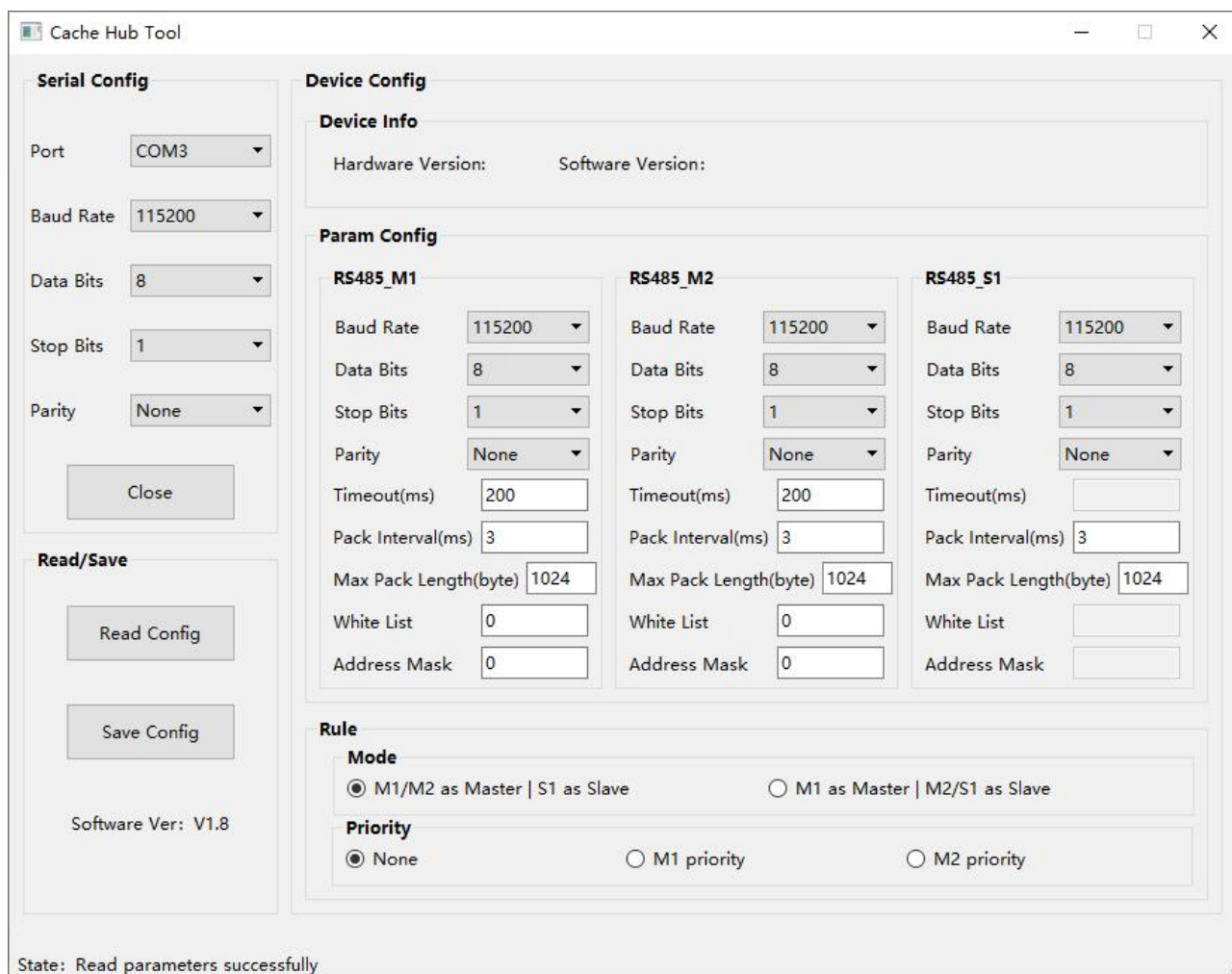


Figure 6 Default Parameters

### 2.1.6 Restore factory settings

Short circuit the RESET and GND interfaces of the device for at least 5 seconds to restore the factory default parameters.

## 2.2 4CH-HUB-RS485

**4CH-HUB-RS485** is an 4 ports industrial isolation RS485 hub, can extending 8 channels RS485 slave ports through 1 channel RS485 master port. It can effectively implement relay, extension and

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isolation of RS485 network.

The master-port end of 4CH-HUB-RS485 provides isolation RS485, the slave-portend extends 4 channels isolation RS485 interface.

Generally, RS485 wiring requires a daisy-chain connection, avoiding a star connection centered on the master station. However, in some cases, a star connection is necessary for convenience. In such cases, using an RS485 hub can effectively isolate interference between multiple RS485 connections.

**4CH-HUB-RS485** active isolated RS485 hub is specifically designed for harsh industrial environments, making it particularly suitable for applications requiring high reliability and security. Its Optocoupler isolation function effectively isolates RS485 master and slave devices from each other, preventing damage caused by ground potential differences, static electricity, lightning strikes, and surges. It also effectively prevents ground loops caused by ground potential differences between the master and slave devices, thus avoiding damage to the RS485 devices.

**4CH-HUB-RS485 have 3 main application styles:**

- **Isolation:** effectively isolate master and slave ends of RS485 network; meanwhile isolate 4 slave stations.
- **Relay:** can effectively extend communication distance of RS485 network.
- **Extension:** can implement 1 channel RS485 extending to 4 channels RS485, multiply the numbers of RS485 devices in the network.

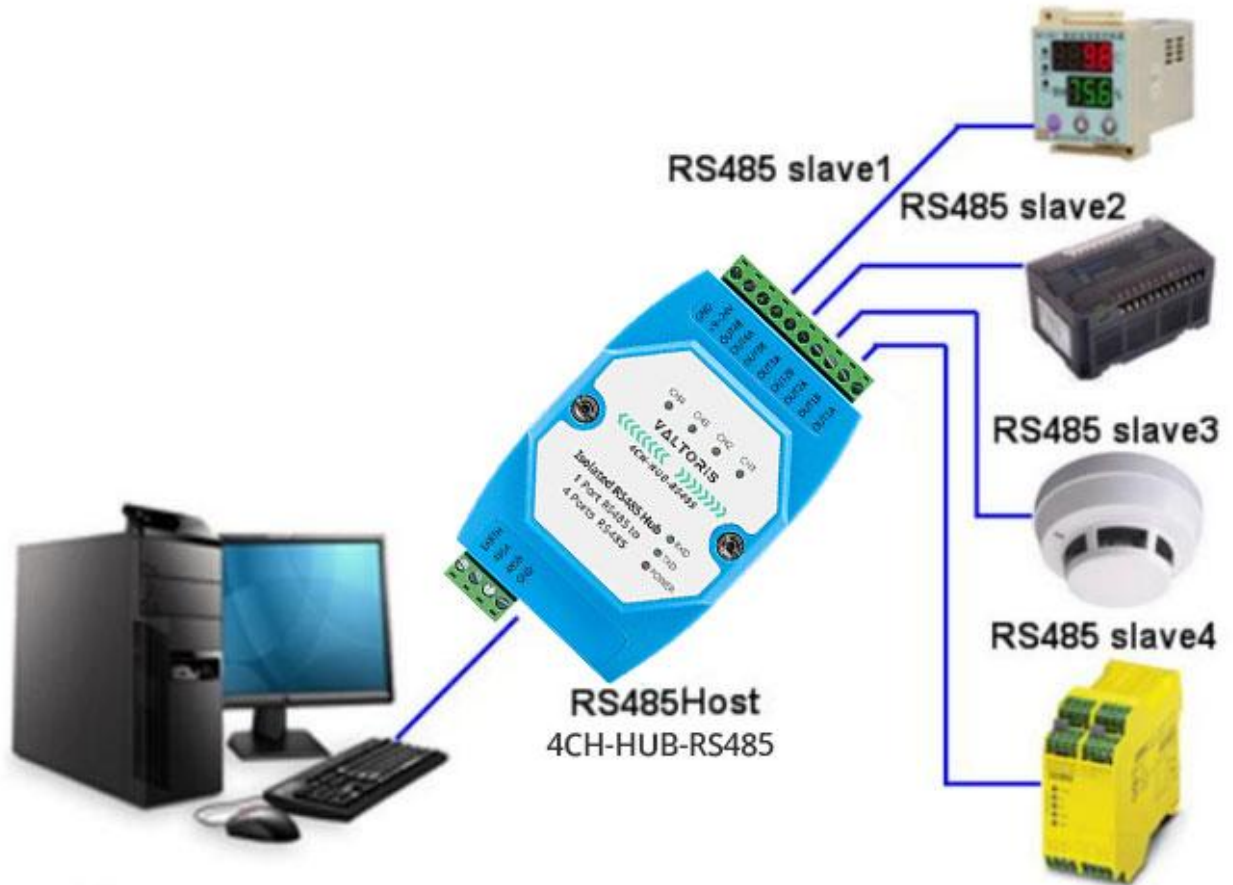


Figure 7 4CH-HUB-RS485 connection diagram

The front view of 4CH-HUB-RS485 is shown as figure 8, the interface instructions are as below:

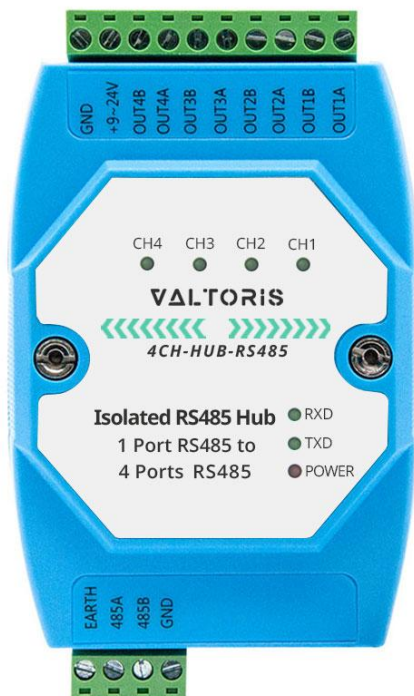


Figure 8 4CH-HUB-RS485 Front View

## 2.2.1 Interface Description

Name	Instruction
EARTH	Shell grounding, for RS485 lightning and big current drainage, can be non-connected.
485A, 485B	RS485 main port
OUT1A, OUT1B	RS485 slave port 1
OUT2A, OUT2B	RS485 slave port 2
OUT3A, OUT3B	RS485 slave port 3

OUT4A, OUT4B	RS485 slave port 4
GND, +9~24V	Power supply terminal input

## 2.2.2 Description of panel indicator lights

POWER	Power indicator light, always red after power on
TXD	Main RS485 data transmission indicator light
RXD	Main RS485 receiving indicator light
CH1	1st RS485 slave station input data indication
CH2	2st RS485 slave station input data indication
CH3	3st RS485 slave station input data indication
CH4	4st RS485 slave station input data indication

## 2.3 4CH-HUB-RS232/485

**4CH-HUB-RS232/485** is an industrial grade isolated 4-port RS485 hub that can expand 4 RS485 slave ports through one RS485/232 main port. It can effectively achieve relay, expansion, and isolation of RS485 networks, and can also serve as an active isolation type RS232 to RS485 converter.

The main port of the 4CH-HUB-RS232/485 device provides both isolated RS485 and RS232 interfaces, and four isolated RS485 interfaces are extended from the port.

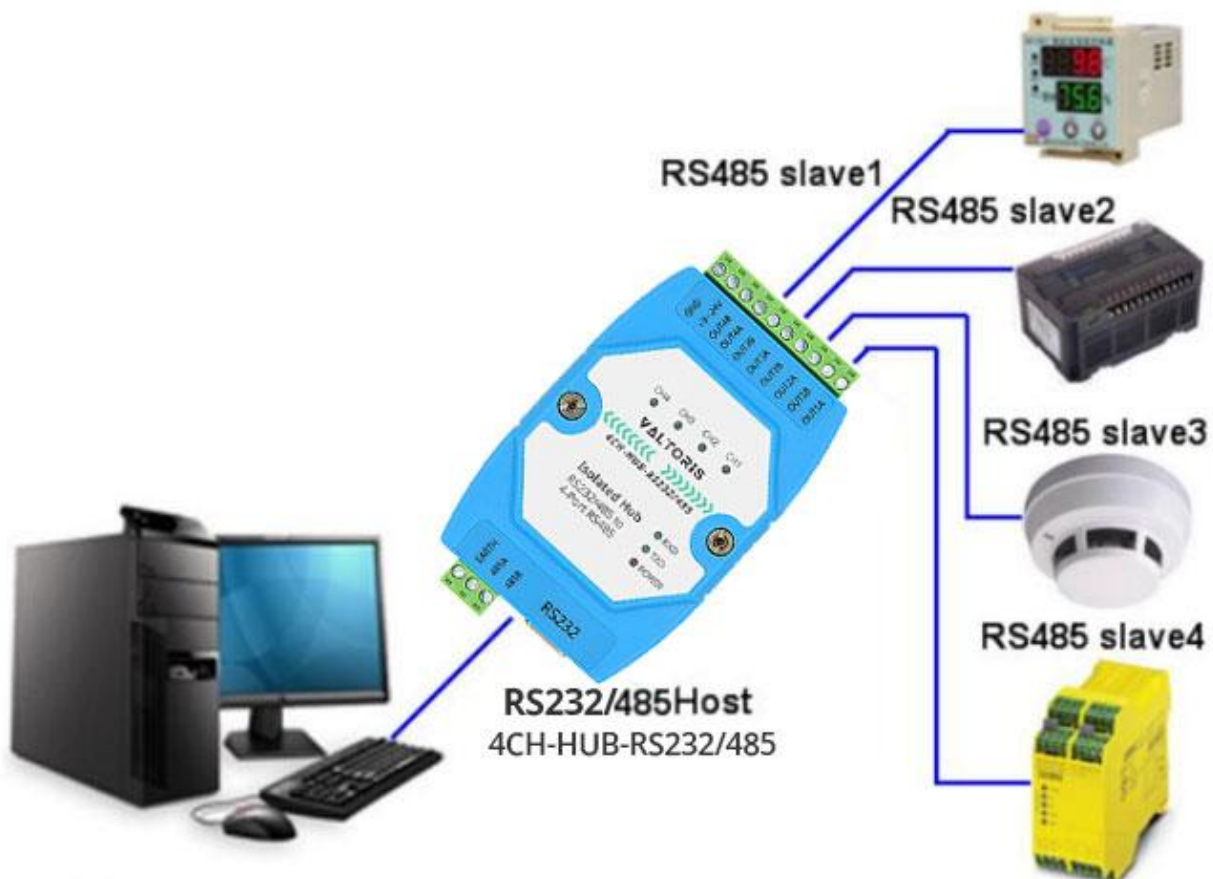
When wiring RS485, it is generally required to use a hand in hand connection method to avoid star shaped connections centered around the main station. However, in some cases, for convenience, a star shaped connection is required. In this case, using an RS485 HUB can effectively isolate the interference between multiple RS485 connections.

**4CH-HUB-RS232/485** active isolation RS485 hub product is specifically designed for harsh industrial environments, making it particularly suitable for situations that require high reliability and safety. The

photoelectric isolation function can effectively isolate the RS485 master and slave devices from each other, avoiding damage to the RS485 master and slave devices caused by ground potential differences, static electricity, lightning strikes, and surges. At the same time, it also effectively avoids damage to the RS485 devices caused by ground current caused by ground potential differences between the master and slave devices.

**4CH-HUB-RS232/485 have 4 main application styles:**

- **Isolation:** effectively isolate the master and slave ends of the RS485 network; Simultaneously isolate 4 slave stations.
- **Relay:** It can effectively extend the communication distance of RS485 network.
- **Expansion:** It can achieve the expansion from 1 RS485 to 4 RS485 channels, doubling the number of RS485 devices in the network.
- **Conversion:** It can also achieve the conversion from 1 RS-232 to 4 RS485 channels.



**Figure 9 4CH-HUB-RS232/485 Connection diagram**

The front view of 4CH-HUB-RS232/485 is shown as figure 10, the interface instructions are as below:

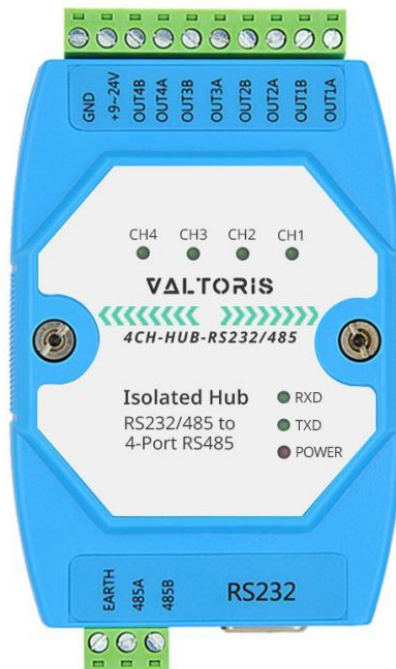


Figure 10 4CH-HUB-RS232/485 Front View

### 2.3.1 Interface Description

Name	Instruction
EARTH	Shell grounding, for RS485 lightning and big current drainage, can be non-connected.
485A, 485B	RS485 main port
RS232	Choose one of RS232 main port and RS485 main port to use
OUT1A, OUT1B	RS485 slave port 1
OUT2A, OUT2B	RS485 slave port 2

OUT3A, OUT3B	RS485 slave port 3
OUT4A, OUT4B	RS485 slave port 4
GND, +9~24V	Power supply terminal input

### 2.3.2 Description of panel indicator lights

POWER	Power indicator light, always red after power on
TXD	Main RS232/485 data transmission indicator light
RXD	Main RS232/485 receiving indicator light
CH1	1st RS485 slave station input data indication
CH2	2st RS485 slave station input data indication
CH3	3st RS485 slave station input data indication
CH4	4st RS485 slave station input data indication

## 2.4 8CH-HUB-RS485

**8CH-HUB-RS485** device is an industrial grade isolated 8-port RS485 hub that can expand from one RS485 main port to eight RS485 slave ports. It can effectively achieve relay, expansion, and isolation of RS485 networks.

**8CH-HUB-RS485** main port provides isolated RS485, and 8 isolated RS485 interfaces are extended from the port.

When wiring RS485, it is generally required to use a hand in hand connection method to avoid star shaped connections centered around the main station. However, in some cases, for convenience, a star shaped connection is required. In this case, using an RS485 HUB can effectively isolate the interference between multiple RS485 connections.

**8CH-HUB-RS485** active isolation RS485 hub product is specifically designed for harsh industrial

environments, making it particularly suitable for situations that require high reliability and safety. The photoelectric isolation function can effectively isolate the RS485 master and slave devices from each other, avoiding damage to the RS485 master and slave devices caused by ground potential differences, static electricity, lightning strikes, and surges. At the same time, it also effectively avoids damage to the RS485 devices caused by ground current caused by ground potential differences between the master and slave devices.

**8CH-HUB-RS485 have 3 main application styles:**

- **Isolation:** effectively isolate the master and slave ends of the RS485 network; Simultaneously isolate 8 slave stations.
- **Relay:** It can effectively extend the communication distance of RS485 network.
- **Expansion:** It can achieve the expansion from 1 RS485 to 8 RS485 channels, doubling the number of RS485 devices in the network.

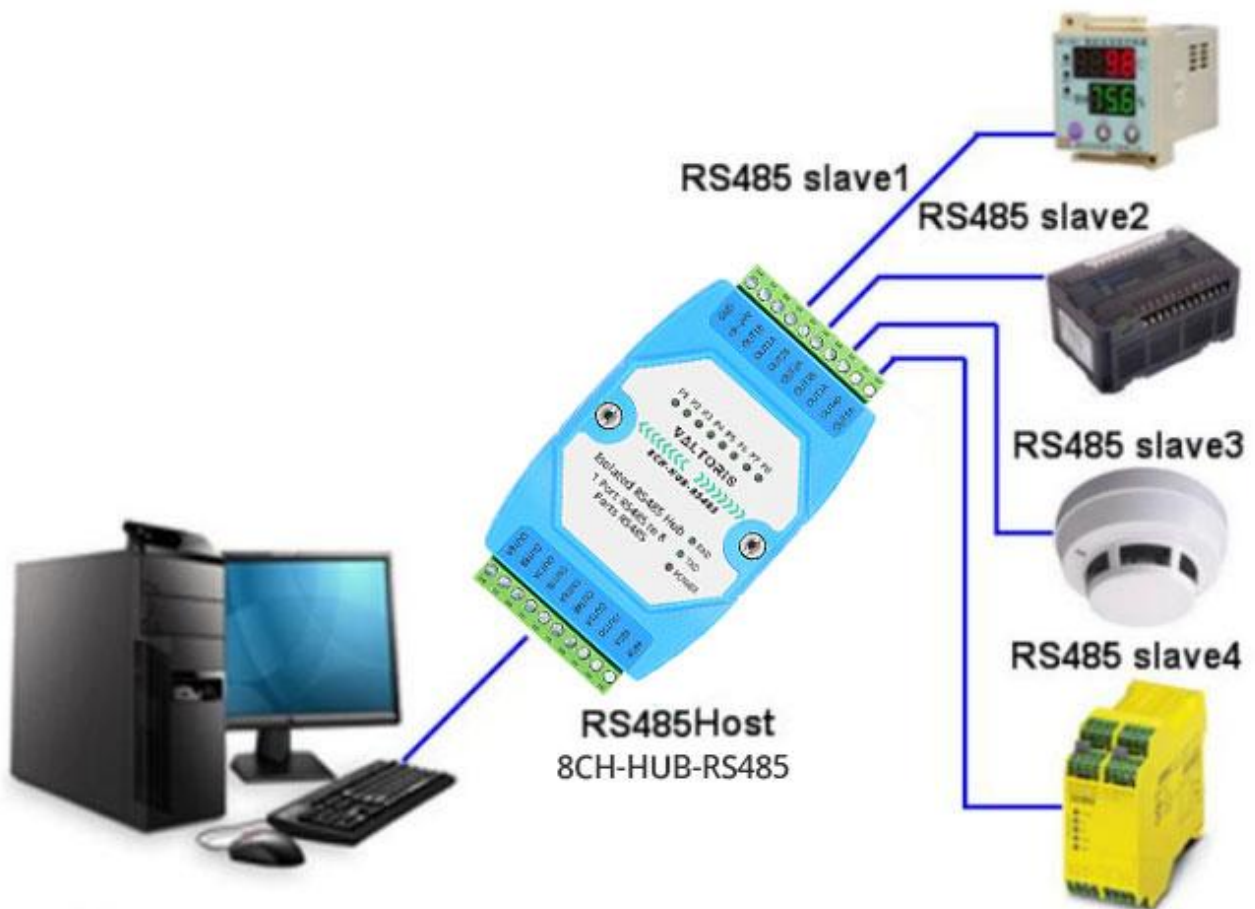


Figure 11 8CH-HUB-RS485 Connection diagram

The front view of 8CH-HUB-RS485 is shown as figure 12, the interface instructions are as below:

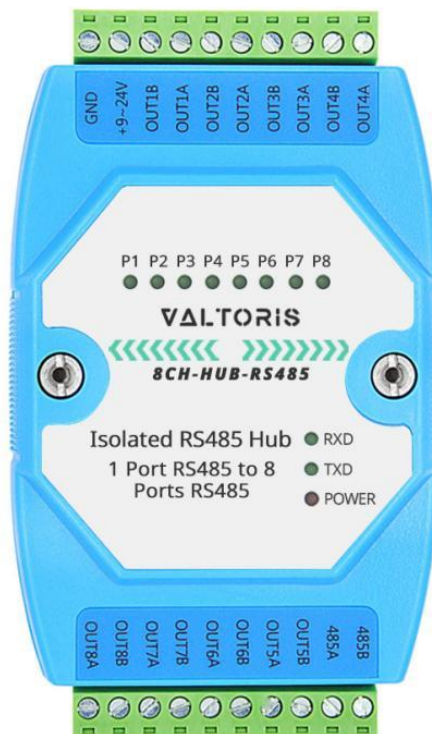


Figure 12 8CH-HUB-RS485 Front View

### 2.4.1 Interface Description

Name	Instructions
GND、+9~24V	Power terminal input
485A、485B	RS485 main port
OUT1A、OUT1B	RS485 slave port 1
OUT2A、OUT2B	RS485 slave port 2
OUT3A、OUT3B	RS485 slave port 3
OUT4A、OUT4B	RS485 slave port 4
OUT5A、OUT5B	RS485 slave port 5
OUT6A、OUT6B	RS485 slave port 6
OUT7A、OUT7B	RS485 slave port 7
OUT8A、OUT8B	RS485 slave port 8

## 2.4.2 Description of panel indicator lights

<b>POWER</b>	Power indicator light, always red after power on
<b>TXD</b>	Main RS232/485 data transmission indicator light
<b>RXD</b>	Main RS232/485 receiving indicator light
<b>CH1</b>	1st RS485 slave station input data indication
<b>CH2</b>	2st RS485 slave station input data indication
<b>CH3</b>	3st RS485 slave station input data indication
<b>CH4</b>	4st RS485 slave station input data indication
<b>CH5</b>	5st RS485 slave station input data indication
<b>CH6</b>	6st RS485 slave station input data indication
<b>CH7</b>	7st RS485 slave station input data indication
<b>CH8</b>	8st RS485 slave station input data indication

## 3. After-sales service and Technical Support

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