

# RS485 to RS485 Repeater–AMSAMOTION

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## Product Overview

### Product introduction

RS485 to RS485 repeater is an industrial grade high performance RS485 photoelectric isolation repeater which is compatible with EIA/TIA RS485 standard and realizes RS485 signal amplification and long communication distance of bus network, it is used to solve the problem of relay and isolation of RS–485 communication in complex electromagnetic field. The interface adopts photoelectric isolation, and the interior adopts industrial super anti–interference chip to realize the intelligent distinguishing circuit, automatically sensing the direction of data flow, stable signal, safe and reliable communication data, aVOID RS–485 transceiver delay.

### Features

- Designed for industrial automation communications, for range extension of RS485 communication equipment in complex and harsh industrial sites
  - 1 RS485 to 1 RS485, asynchronous half duplex, two–way communication, data transmission completely transparent
  - Built–in DC–DC power isolation module, isolation voltage 1500V
  - The opto–coupler isolates RS485 master–slave network to ensure that data communication is not affected by the common–mode voltage difference
  - TVS transient suppression protection + self–recovery fuse current limiting protection
  - Increase communication distance by 1200m (at 9600bps)
  - Real–time display of data transmission indicator light
  - The power supply circuit adopts anti–reverse connection design
  - It is widely used in signal acquisition and control of industrial field equipment
- 1 RS485 to 1 RS485, asynchronous half duplex, two–way communication, data transmission completely transparent

### Application Scenarios

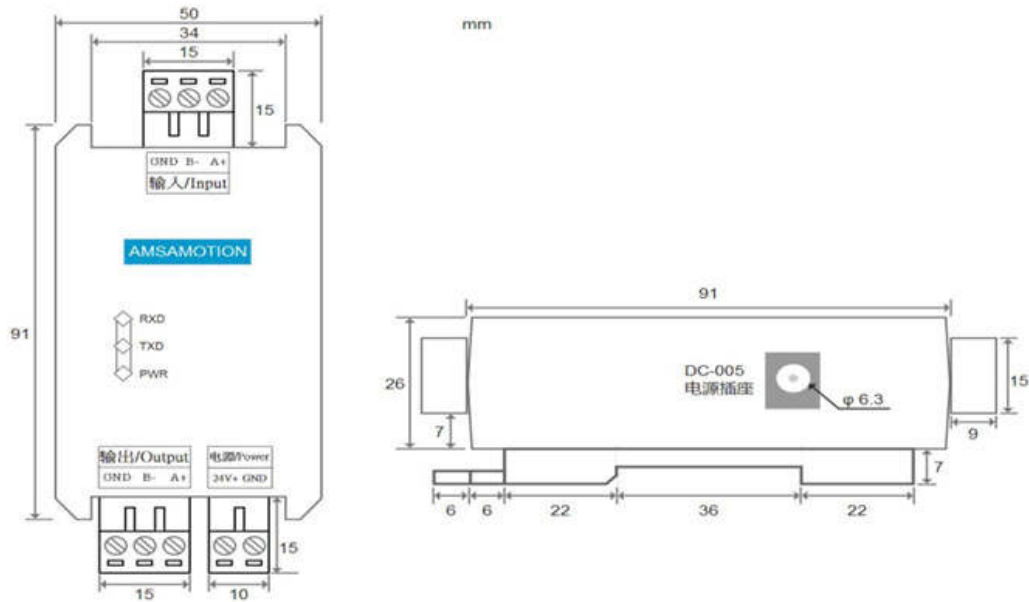
RS485 to RS485 repeater is suitable for: Industrial Automation, Power Collection, security monitoring, building intercom, high–speed charging, Brush Carmen ban, PLC, parking system, Modbus and other 485 bus protocol needs to extend the communication distance of the scene.

### Technical parameters

Interface standard	EIA / TIA compliant RS485 terminal block
Baud rate	0 ~ 115200bps (adaptive)
Communication protocol	not restricted by software protocol
Communication distance	only one repeater is used to extend 1200 (at 9600bps)
Cascade	RS485 interface supports maximum 32 nodes (distance between nodes should be $\leq 10\text{m}$ )
Operating voltage	9V ~ 24V, active design with anti-reverse connection design
Static Power Consumption	0.6W
Working temperature	-20 °C ~ + 70 °C
Storage temperature	-40 °C ~ + 85 °C
Relative humidity	5% ~ 95%
Transmission medium	twisted pair or shielded cable
Installation method	35mm DIN rail
Size	109*60*33

## Product specification

## Installation Dimensions

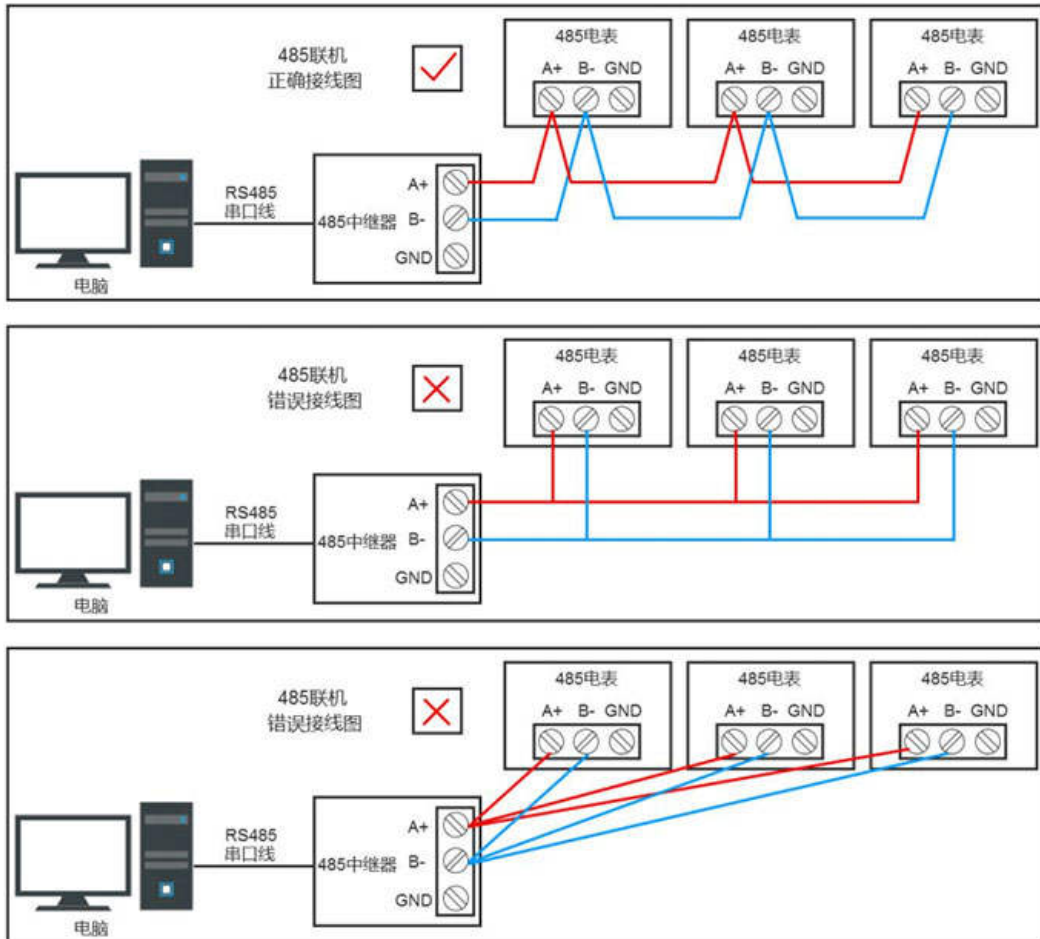


## Terminal Function Description

Function	Name	Account for
Input/Input	A+	Input RS485 positive signal
	B-	Input side RS485 negative signal
	GND	Input RS485 ground
Indicator Light	RXD	Input receiving data indicator
	TXD	Input send data indicator
	PWR	Power Indicator
Output/Output	A+	Output RS485 positive signal
	B-	Output RS485 negative signal
	GND	Output RS485 ground
Power/Power	24V+	DC 24V Power Positive Pole
	GND	DC 24V power supply negative pole
AC power plug and Socket	DC-005	12V/1a, 5.5/2.1 mm power adapter socket

## Diagram of The Connection

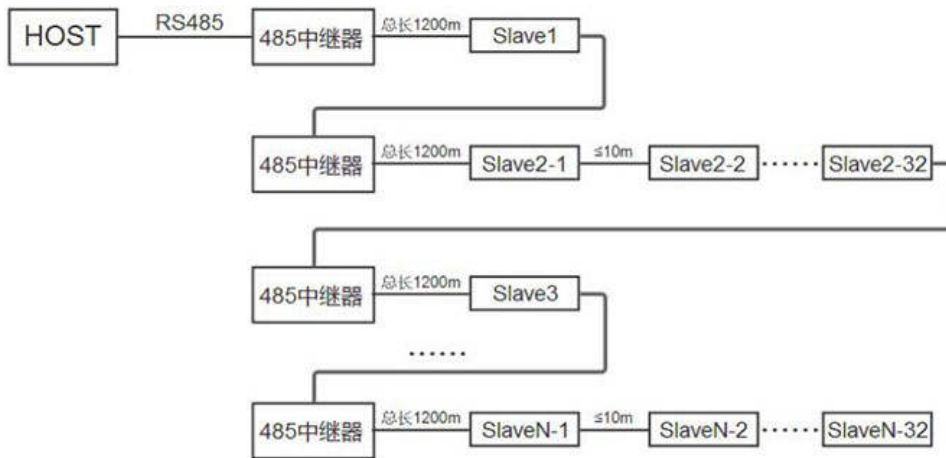
For RS485 to RS485 repeater RS485 signal output, maximum support 128 nodes (485 equipment), The branch length between nodes is not more than 10 meters, the bus length is not more than 1200 meters, the bus connection between nodes is hand-in-hand Mode does not allow forking to star connections (for hubs as a whole), as shown in figure 4.1.



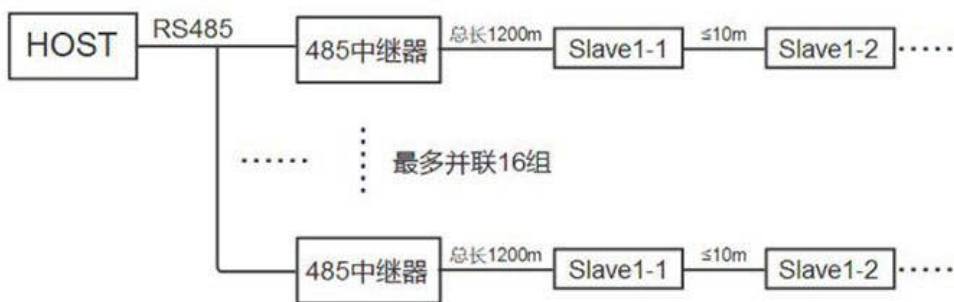
1) single repeater: point-to-point connection of a 485 output device extends the communication distance by 1200m; point-to-multipoint connection of 32485 output devices with adjacent 485 devices not exceeding 10m extends the total bus length by 1200m.



2) Cascade (tree connection) : Connect N 485 repeaters, indefinitely extend RS485 communication distance, extend more 485 devices, a total of 128 devices are supported.



3) parallel: up to 16 485 repeaters are supported and connected to the same 485 input device, and up to 128 devices are supported.



## Recommend debugging methods

After ensuring proper wiring of the equipment and strict compliance with specifications, the following recommended methods can be used for debugging:

1. Common Ground Method: connect all 485 devices GND with a single line or shielded line, effectively avoiding the potential difference that affects communication between all devices.
2. Terminal resistance method: improve communication quality by connecting 120  $\omega$  resistors to "A +" and "B-" on the last 485 device of the bus.
3. Middle section disconnection method: by checking from the middle end whether it is: equipment overload, communication distance is too long, a device damage The impact on the entire communication line.
4. Single wire method: simple and easy to pull a wire to the equipment temporarily, used to eliminate whether due to wiring communications failure.
5. Converter replacement method: carry several converter replacement use, rule out whether the quality of the converter affects communication.
6. Laptop debugging method: ensure that the personal computer laptop is a normal communication device, replace the client computer for communication, if the communication Normal, that customer computer serial port may be damaged.

## Frequently asked questions

1. is the data transfer transparent? Answer: Yes, RS485 to RS485 relay transmission is not limited by protocol, Modbus RTU/ASCLL, BAC NET, Profibus, DP, MPI/PPI.

2. How Do I connect the terminal resistance?A: the beginning and end of the bus (no resistance is required if communication is normal) .
3. Does the repeater need to be configured to work?Answer: Repeater Plug and play, do not need to configure software settings can be used.
4. What is the cause of data loss or error?Answer: check data rate, format of data communication equipment both sides is consistent.

## **Wiring matters needing attention**

- 485 communication lines must be Shielded Twisted Pair, preferably in reserve, with a total length of not more than 1200 meters
- Wiring as far away from the high-voltage wire, try not to parallel with the power line, can not tie together
- 485 bus must be hand-in-hand bus structure, resolutely put an end to star connection and bifurcation connection
- More than 32 controllers or buses longer than 1200 m must use 485 repeaters
- AC power supply equipment and chassis must be grounded, and good grounding
- Connect the GND of all 485 devices with a shielded cable
- If it becomes unstable during communication, connect the last device's A + and a-to a 120 ohm terminal resistor

<https://www.amsamotion.store/2022/02/rs485-to-rs485-repeater.html>