ATC-109N

RS-422/RS-485 Photoelectric Isolation Data Repeater

User's Manual


I、General introduction:

ATC-109N data repeater is a kind of data relay communication product of photoelectric isolated RS-422/RS-485. It can be used with ATC-108 Photoelectric Isolation Interface Converter in combination. ATC-109N data repeater can prolong the communication distance of RS-422/RS-485 bus network and increase the number of RS-422/RS-485 bus network devices. The inner circuit of ATC-109N Photoelectric Isolation Data Repeater can detect data direction and switch to control it automatically, conveniently to form a RS-485 network without any shake hand signal. This kind of RS-485 control is fully transparent and need not amend software for the former network basing on RS-422/485 working modes. The built in photoelectric isolator and DC/DC converter can offer 3500V isolation voltage and the rapid Transient Voltage Suppressor (TVS) can effectively inhibit lightning and ESD, provide 1000W lightning strike and surge protection power on each line, and prevent lightning strike and common code interference.

II、Performance parameter

1. Interface feature: interface is compatible with EIA/TIA RS-485/RS-422 standard

2. Electric interface: RS-422/RS-485 interfaces are DB9 interfaces

3. Transmission media: twisted-pair cable or shielded cable

4. Working mode: asynchronous half or full duplex

5. Signal indication: 3 signal indication lights indicate TXD, RXD and PWR

6. Isolation: isolation voltage 3500VRMS 500VDC sequence

7. Transmission speed: 115.2K BPS to 1.2KM
   38.4K BPS to 2.4KM
   9600 BPS to 5KM

8. Protecting grade: RS-422, RS-485 interface 1000W lightning strike and surge protection on each line

9. Extended distance: 0-5 kilometers (115200-9600BPS)

10. Size: 125mmx54mmx25mm

11. Working environment: -25℃ to 70℃, 5% to 95% relative humidity

III. Circuit function block diagram:
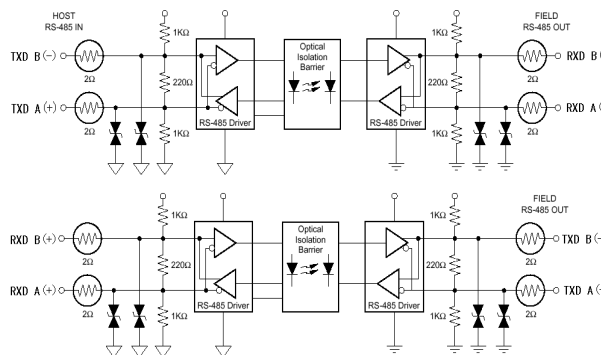
IV.Connector and signal

RS-422/485 Pinout: (6-bit terminal from the left to right))

Terminal No	1	2	3	4	5	6
RS-422	T+	T-	R+	R-	VIN	GND
RS-485	485+	485-	-	-	VIN	GND

V. Installation setup and application:

Please read the User's Manual carefully before installing ATC-109N Photoelectric Isolation Data Repeater. Connect the product's power converter with +9V socket. The Termnal pin shall be connected with RS-422 or RS-485 network equipments according to definition instruction.

ATC-109N Photoelectric Isolation Data Repeater supports following 3 relay communication modes:
1. RS-422/ 4 wire full duplex relay
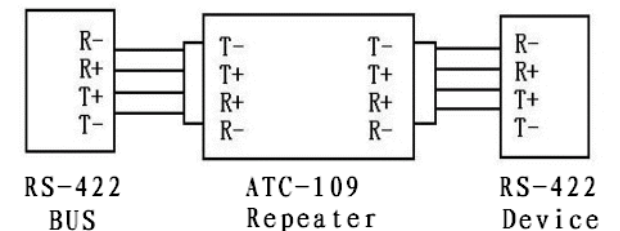2. RS-485/ dual-line half duplex
3. 4 wire RS-485 to 2 wire RS-485 relay
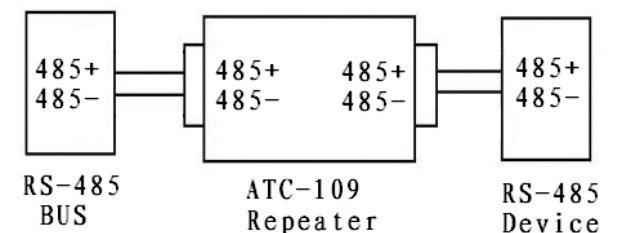**RS-422 to RS-422 relay:** .
RS-485 to RS-485 relay:
4 wire RS-485 to 2 wire RS-485 relay:
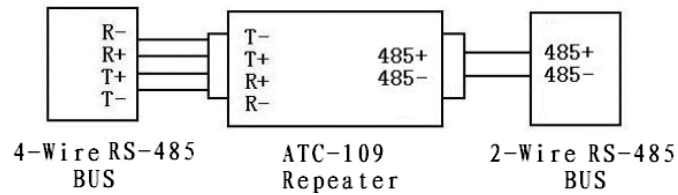
VI. Sketch map for communication connection

1. RS-422 4 wire full duplex data relay

2. RS-485 dual-line half duplex data relay

3. 4- Wire RS-485 to 2-Wire RS-485 data relay

4-Wire RS-485 BUS   ATC-109 Repeater   2-Wire RS-485 BUS

VII. Power and surge grounding protection

1. External power supply:

ATC-109N Photoelectric Isolation Data Repeater can adopt the product's DC9V power adapter for power supply or adopt power from other DC power or device. The power supply voltage is +9---+12V, current 100mA.The connection pins are Terminal :V+,V-

2. Surge grounding protection:

Common repeater has no large energy protector. The transient high voltage induced in interface data line tries to release energy to the ground wire via the minimum resistance route of the device and thus can easily cause damage to interface parts. ATC-109N Photoelectric Isolation Data Repeater can provide 1000W lightning strike and surge protection power on each line. The rapid Transient Voltage Suppressor (TVS) can effectively inhibit lightning and ESD. ATC-109N Photoelectric Isolation Data Repeater terminal Pin FGND is designed for surge grounding protection. The user shall try to avoid hanging by credible grounding to ensure the safety of communication during operation

VIII. Trouble shooting

1. **Data transmission failure:**

A. check to make sure the RS-422 interface is correctly connected

B. check to make sure the RS-485 interface is correctly connected

C. check to make sure the power supply voltage and polarity are correct.

2. Data loss or error:

A. Check the consistency of the data speeds and formats at the both ends of the data communication device.