

# ATC-107N RS-232/RS-422/RS-485 Industrial Class Wall-mounted Photoelectric Isolation Interface Converter User's Manual

## I. General introduction:

ATC-107N Photoelectric Isolation Interface Converter is compatible with RS-232C, RS-422, RS-485 standards and capable of converting single end RS-232 signal into RS-422 or RS-485 signal of balanced difference. The built in photoelectric isolator can offer 3500V isolation voltage and the grade 2 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. Connect PC, IPC, or portable computer via a DB9 female connector at RS-232 interface, and connect RS-422, RS-485 end via convenient 6-bit plug-in terminal. The RS-485 supports dual-line half duplex, namely, the only two lines of RS-485 shall both send and receive data. Handshake signal (e.g. RTS, Request To Send) usually controls the data direction. The inner circuit of ATC-107N Photoelectric Isolation Interface Converter 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 no software amendment for the former working modes basing on RS-232.

ATC-107N Photoelectric Isolation Interface Converter can provide credible connection for point to point, point to multi-point communication. The point to multi-point allows connecting 128 RS-422 or RS-485 interface devices with data transmission speed of 0-115.2KBPS. The 3 power supply and data flow indication light can indicate malfunction. It supports communication modes including RS-232C to RS-422, RS-232 to RS-485 conversion.

## II. Performance parameter

- Interface feature: interface is compatible with EIA/TIA RS-232C, RS- 485/RS-422 standard
- Electric interface:RS-232C interface RJ-45 connector

- DB9 cable
- RS-422/RS-485 interface DB9 connector or terminal
  - Transmission media: twisted-pair cable or shielded cable
  - Working mode: asynchronous half or full duplex
  - Signal indication: 3 signal indication lights indicate TXD, RXD and PWR
  - Isolation: isolation voltage 3500VRMS/500VDC
  - Transmission speed:
    - maximum 115.2K BPS to 1.2KM
    - 38.4K BPS to 2.4KM
    - 600 BPS to 5KM
  - Protecting grade:
    - RS-232 interface 600W lightning strike and surge protection
    - RS-422,RS-485 interface :
      - 1000W lightning strike and surge protection on each line
  - Transmission distance: 0-5 kilometers (115200-600BPS)
  - Size: 95mmx85mmx26mm
  - Working environment: -25 °C to 70 °C, 5% to 95% relative humidity

## III. Definition of connector and signal

### RS-232 interface Pinout: (DB9 female connector )

DB9 hole	RS-232 definition
PIN2	TXD
PIN3	RXD
PIN5	GND

### 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

### RS-422/485 Pinout: (DB9 male connector)

DB9 PIN	RS-422	RS-485
PIN1	T-	485-
PIN2	T+	485+
PIN3	R+	-
PIN4	R-	-
PIN5	Protection GND	Protection GND

## IV. Installation setup and application:

Please read the User's Manual carefully before installing ATC-107N Photoelectric Isolation Interface Converter. Connect the communication cable of the product with RS-232C interface, power adapter with DC-IN socket, and RS-422/485 end with RS-422 or RS-485 device according to DB9 pin definition or 6-bit terminal definition. Since the inner conversion of ATC-107N interface converter has adopted the self-adapting, the user need not change any setting when completing RS-232 to RS-422/485 conversion and can directly connect device according to RS-422/485 interface definition.

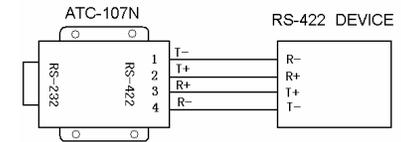
ATC-107N interface converter supports following 4 communication modes:

- point to point/4 wire full duplex
- point to multi-point/4 wire full duplex
- point to point/dual-line half duplex
- point to multi-point/ dual-line half duplex

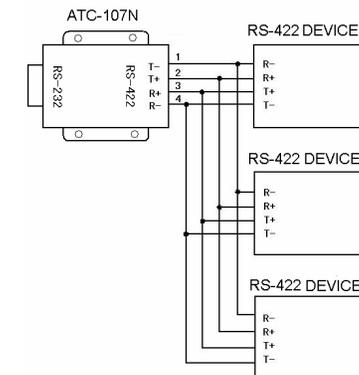
## V. Sketch map for communication connection( take RS-422/485 connecting DB9 PIN for example)

### RS-232 to RS-422 conversion

- RS-232 to RS-422 point to point/4 wire full duplex communication

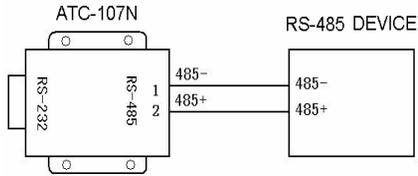


- RS-232 to RS-422 point to multi-point/4 wire full duplex communication

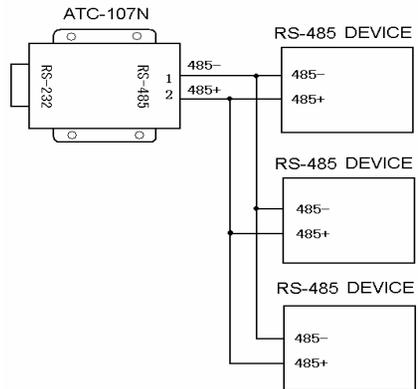


## RS-232 to RS-485 conversion

### 1. RS-232 to RS-485 point to point /dual-line half duplex



### 2. RS-232 to RS-485 point to multi- point /dual-line half duplex



## VI. Power and surge grounding protection

### 1. External power supply:

The inner power supply of ATC-107N Photoelectric isolation Interface converter consists of two parts. RS-232 interface power supply is obtained by one of TXD, DTR, RTS RS-232 signals via DC/DC. (the RS-232 interface signal level TXD, DTR, RTS shall not be lower than  $\pm 5V$ . In case it is lower than  $\pm 5V$ , ATC-108N is recommended) RS-422/485 end is external power supply. It can adopt the product's 9V power adapter for power supply or adopt power from

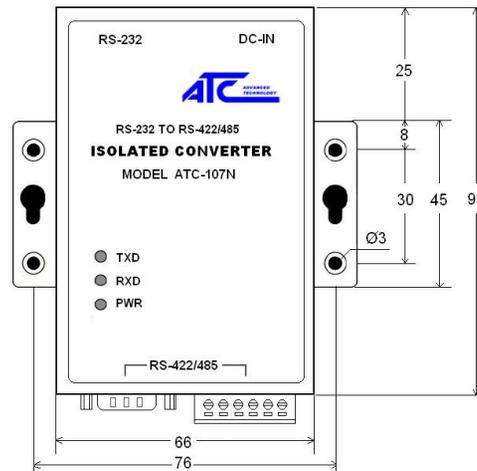
other DC power or device. The power supply voltage is  $+9\text{---}+24V$ , current 200mA. It cannot common ground with RS-232 interface to avoid affecting the photoelectric isolation effect inside ATC-107N Photoelectric Isolation Interface Converter.

### 2. Surge grounding protection:

Common interface converter 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-107N Photoelectric Isolation Interface Converter 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-107N interface converter DB9 pin PIN5 is designed for surge grounding protection. The user shall try to avoid hanging by credible grounding to ensure the safety of communication during operation

## VII. ATC-107N product shape and size: unit: mm



## VIII. Trouble shooting

### 1. Data transmission failure:

- check to make sure the RS-232 interface is correctly connected
- check to make sure the RS-422 interface is correctly connected
- check to make sure the RS-485 interface is correctly connected
- check to make sure the power supply voltage and polarity are correct.
- check to make sure the interface type of the device and interface converter is in the correct conversion mode

### 2. Data loss or error:

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