RS-232/RS-485/RS-422
Passive Opto-Isolated Interface Converter
Model: UT-2127

Ⅰ. General

UT-2127 Passive Opto-Isolated Interface Converter, which is RS-232C, RS-422 and RS-485 compatible, can convert single-ended RS-232 signals to balanced differential RS-422 or RS-485 signals. The built-in optoelectronic isolator can provide isolation voltage up to 2500 Vrms. A fast-reacted transient voltage suppressor is equipped and designed to protect the RS-422/RS-485 interface. The currently advanced transient voltage suppressor (TVS) is adopted. The TVS tube is under a high impedance state in normal conditions, but if both ends of the TVS tube are experiencing a transient high energy impact, the TVS tube can reduce impedance on both sides at a very high speed and absorb a big current so that the voltage on both sides can be suppressed to a preset value, thus protecting the rear circuit elements from damage caused by the transient high voltage impact.

This TVS protector can effectively suppress lightning and ESD, provide 600 W of lightning surge protection power for each wire, and protect against surge voltage and transient voltage on the lines due to various reasons. The extremely small inter-electrode capacitance ensures high-speed transmission of RS-422/RS-485 interface. The RS-232 interface is connected to a compatible RS-232C standard port through the connector with a DB9 female PIN while the RS-422 and RS-485 ports serve as the output ports through the 6-pin binding post. The converter has an internal automatic zero-delayed transmitting, receiving, and conversion function and a unique I/O circuit for automatic control of data stream direction. Conversion with FDX mode (RS-422) or HDX mode (RS-485) can be achieved without either the need of handshaking signals (such as RTS, DTR) or the setup of a jumper. This product is plug-and-play to ensure compatibility with all existing communication software and interface hardware without the need to modify the software for the previous RS-232 based working mode.

The UT-2127 Passive Opto-Isolated Interface Converter can provide reliable connection by point-to-point or point-to-multipoint communication. For point-to-multipoint communication, each converter can be connected to thirty-two RS-422 or RS-485 interface devices. The converter has a data communication rate up to 300 - 115.2 Kbps and supports communication and conversion from RS-232 to RS-422 as well as from RS-232 to RS485.

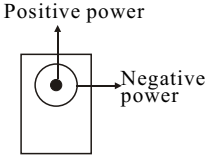
Ⅱ. Performance Parameters

1. Features of interface: The interface is compatible with RS-232C, RS-485/RS-422 of EIA/TIA.
2. Electrical interface: RS-232 is connected to a connector with DB9 (female) while RS-422/RS-485 interface serves as an output terminal through a 6-pin binding post.
3. Protection level: ±15KV ESD protection for RS-232 and 600W lightning surge protection for RS-422, RS-485 interfaces
4. Isolation level: Isolation voltage up to 2500 Vrms, 500 DC continuous
5. Working mode: Asynchronous HDX or FDX
6. Transmission medium: Twisted-pair or shielded wire
7. Transmission rate: 115.2 Kbps ~ 300 m
   38.4 Kbps ~ 600 m
   9600 bps ~ 1.2 km
8. Overall dimensions: 61 mm x 41 mm x 21 mm
9. Operating environment: -40℃ ~ 85℃, 5% ~95% RH

Ⅲ. Connector and Signal

RS-232C PIN configuration

DB9 Female (PIN)	Positive power RS-232C Interface Signal
1	PGND
2	Transmit Data SOUT(TXD)
3	Receive Data SIN (RXD)
4	Data Terminal Ready DTR
5	Signal Ground GND
6	Data Set Ready DSR
7	Request To Send RTS
8	Clear To Send CTS
9	Ring Indicate RI



DC power supply (5-12V/20mA) may be used in the event of low voltage at serial port.

PIN configuration for RS-485/RS-422 output signals and connection terminal

6-pin Connection Terminal	Output Signal	RS-422 FDX Connection	RS-485 HDX Connection
1	T/R+	Transmitting (A+)	RS-485(A+)
2	T/R-	Transmitting (B-)	RS-485(B-)
3	RXD+	Receiving (A+)	N/C
4	RXD-	Receiving (B-)	N/C
5	SGND	SGND wire	SGND wire
6	SGND	SGND wire	SGND wire

Ⅳ. Hardware Installation and Application

Prior to the installation of UT-2127 Passive Opto-Isolated Interface Converter, please read this User's Manual carefully. Connect this product to the RS-232 port. This product adopts universal DB9 connector as the input end and 6-pin binding post as the output end. RS-485 or RS-422 communication can be automatically realized without the setup of a jumper and the twisted-pair or shielded wire may be used, making it simple for connection and dismantle. In this product, T/R+T/R- = transmitting; A+/B- = receiving; RXD+/RXD-= receiving A+/B-; and SGND = common earth wire. Point-to-point/point-to-multipoint/HDX communication is connected to T/R+ and T/R- while Point-to-point/point-to-multipoint/FDX communication is connected to T/R+, T/R-, RXD+, RXD-.

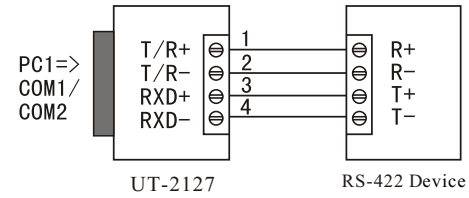
The UT-2127 Passive Opto-Isolated Interface Converter supports the following four communication modes:

1. Point-to-point/four-wire FDX
2. Point-to-multipoint/four-wire FDX
3. Point-to-point/two-wire HDX
4. Point-to-multipoint/two-wire HDX

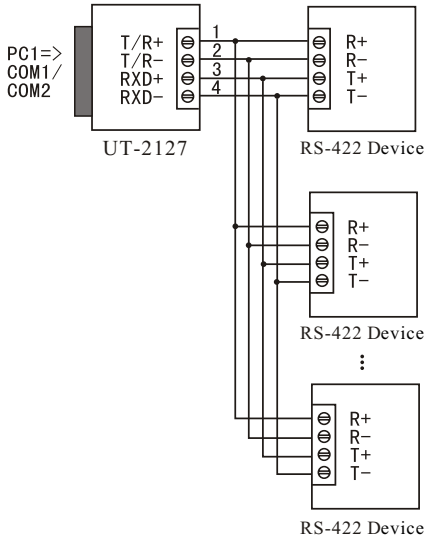
Ⅴ. Communication Connection Diagram

Conversion from RS-232 to RS-422

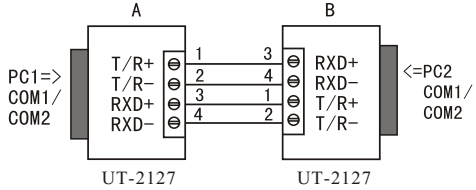
1.RS-422 point-to-point/four-wire FDX communication



2. RS-422 point-to-multipoint/four-wire FDX

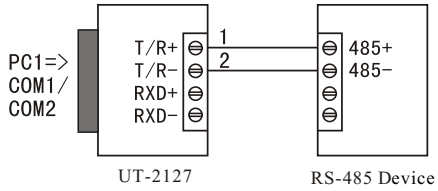


3. Full-duplex communication connection between UT-2127 interface converters

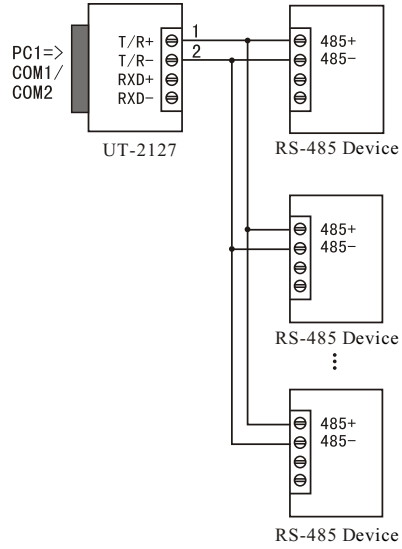


Conversion from RS-232 to RS-485

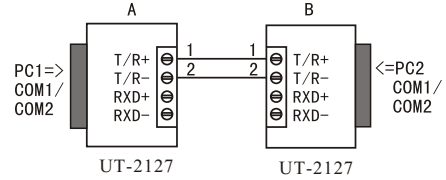
1.RS-485 point-to-point/two-wire FDX communication



2. RS-485 point-to-multipoint/two-wire FDX



3. Half-duplex communication connection between UT-2127 interface converters



Ⅵ. Fault and Troubleshooting

1. Failure in data communication

A. Check whether RS-232 port is wired correctly.

B. Check whether RS-485/RS-422 output interface is wired correctly.

C. Check whether the connection terminal is connected properly.

2. Data loss or error

Check whether data rate and format are consistent at both ends of data communication device.