

RS-232/RS-485/2 port

Instruction manual for UT-502 industrial high performance photoelectric isolated interface converter

I. Summary

UT-502 is an RS-232C and RS-485 compatible industrial photoelectric isolated interface converter designed to convert a single-end RS-232 signal to a double-balanced differential 2-port/RS signal. The built-in photoelectric isolator can provide isolating voltage up to 2500Vrms and it has a high-speed transient voltage suppressor which is designed to protect the 2-port/RS-485 interface. The advanced TVS (TRANSIENT VOLTAGE SUPPRESSOR) presents a high-impedance state under normal conditions, and it can fast reduce the resistance across two ends while it's withstanding transient high-power impulse so as to absorb the high current and clamp the voltage across it to a preset value, thus preventing the components in the next stage from being damaged. This suppressor can suppress lightning and ESD (electro-static discharge) with lightning surge protection power of 600W for each line as well as surge voltage and transient over-voltage on the lines caused for any reason. Very small inter electrode capacitance can ensure high speed data transmission of RS-485 interface. RS-232 side is connected to RS-232C compatible interface through a DB9 female connector, and RS-485 side is connected to a 10-bit wiring terminal. The converter equips with automatic data transceiver without delay, and the unique I/O circuit can automatically control the direction of data flow without any handshake signal (such as RTS/DTR). Both 2-port photoelectric isolated half-duplex (RS-485) mode switch without jumper setup and plug&play can be achieved. This converter can support any existing communication software and interface hardware, eliminating the need to change the software for previous RS-232 based operation mode.

UT-502 industrial photoelectric isolated interface converter can provide reliable connection for point-to-point or point-to-multipoint communication. Maximum 128 RS-485 interface devices can be supported for the point-to-multipoint communication. Data rate can be up to 300-115.2KBPS, and the power indicators and data traffic indicators can be used for error indication. RS-232 to 2-port/RS-485 conversion is supported.

II. Performance parameters

- Interface: Compatible with RS-232 and RS-485 standards of EIA/TIA
- Electric connection: DB9 female connector (RS-232 side) to 10-bit wiring terminal (RS-485 side)
- Protection class: +/-15KV ESD protection for RS-232 interface; Dedicated DC/DC module, 600W lightning strike and surge protection for each RS-485 line.
- Isolation voltage: continuous 2.5KVrms/500VDC isolation
- Operation mode: Asynchronous half-duplex
- Signal indication: 5 signal indicators - one for power (PWR), two for transmission (TXD) and two for reception (RXD)
- Transmission media: twisted-pair cable or shielded cable
- Communication rate: 115.2KBPS for distance of 300m
38.4KBPS for distance of 2.4Km
9600 BPS for distance of 5Km
- Dimension: 117mmX80mmX25mm
- Working environment: -40°C to 85°C, relative humidity of 5% to 95%
- Communication distance: 0-5 KM (115200bps-9600bps)

III. Connector and signal RS-232C bay-line distribution

DB 9 Female (PIN)	RS-232C Interface signal
1	Earth protection
2	Receive data SIN(RXD)
3	Send data SOUT (TXD)
4	Data terminal ready DTR
5	Ground signal GND
6	Data setting ready DSR
7	Request send RTS
8	Clear send CTS

RS-485/RS-422 output signal and connector end bay-line distribution

Wiring terminal (PIN)	Output signal	RS-485 half-duplex connection
1	T/R+	RS-485 (A+)
2	T/R-	RS-485 (B-)
3	RXD+	None
4	RXD-	None
5	N/A	None
6	N/A	None
7	N/A	None
8	N/A	None
9	VCC	POWER 10-48VDC INPUT
10	GND	GND

IV. Hardware installment and application

Please read this manual before installing UT-502 photoelectric isolated interface converter. Connect the supplied communication cable to DB9 universal connector of the RS-232 side, connect power supply to the power terminal, and 10-bit wiring terminal is used for output terminal. 2-ports/RS-485 communication can be achieved automatically without jumper setup using twisted cable or shielded cable, so it's convenient to install and disassemble the converter. T/R+ T/R- means send, VCC means input or output power supply, GND means common grounding wire, point-to-point and point-to-multipoint half-duplex communication use two wires D1+,D1- or D2+,D2-.

UT-502 interface converter supports the following communication modes:

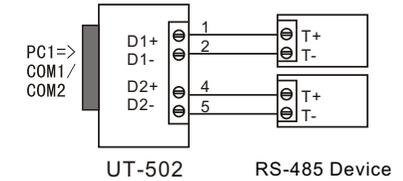
- Point-to-point / two-wire half-duplex
- Point-to-multipoint / two-wire half-duplex

A matching resistor (120 Ohm 1/4W) should be connected to the wire terminal to prevent signal reflection and interference when the converter is used for half-duplex communication.

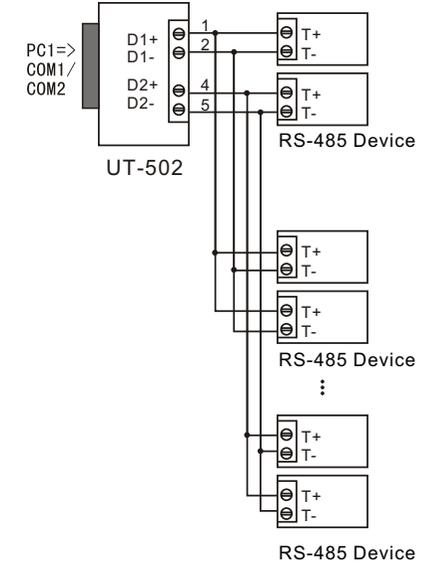
V. Communication connection diagram

RS-232 to RS-485 conversion

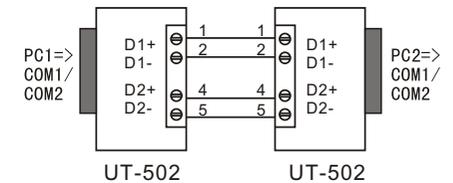
1) RS-485 point-to-point/ two-wire half-duplex communication



2) RS-485 point-to-multipoint/ two-wire half-duplex communication



3) Any one group D1 or D2 is necessary to be connected for half-duplex communication between UT-502 interface converters



VI. Errors & Solutions

1) Data Communication Failure

- Check the connection of RS-232 interface
- Check the connection of RS-485 output
- Check the power supply
- Check terminal connection
- Check receive indicator and see if it flashes
- Check send indicator and see if it flashes

2) Data loss or error

- Check consistency between data communication devices' rate and format