



RS-232/RS-485/RS-422 Passive Opto-Isolated Interface Converter

Model No. GM-10127-B

I. General

GM-10127-B 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 GM-10127-B 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 RS-485.

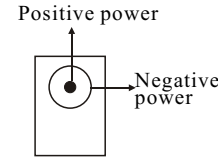
II. Performance Parameters

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: $\pm 15\text{KV}$ 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: $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$, 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 GM-10127-B 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; +/ - = receiving; RXD+ / RXD- = receiving +/ -; 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-.

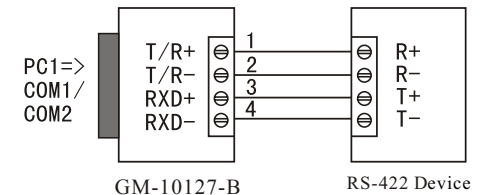
The GM-10127-B Passive Opto-Isolated Interface Converter supports the following four communication modes:

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

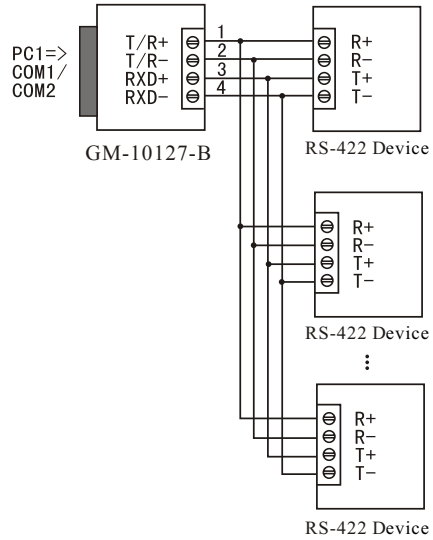
V. Communication Connection Diagram

Conversion from RS-232 to RS-422

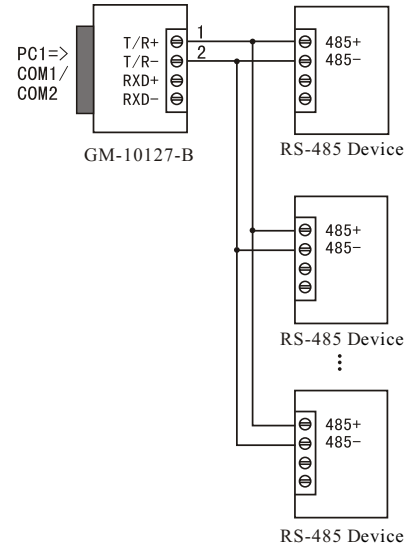
1. RS-422 point-to-point/four-wire FDX communication



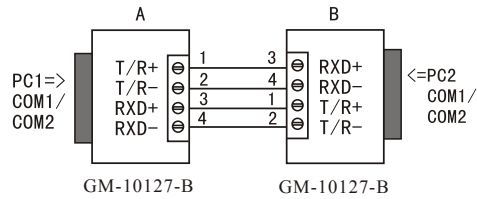
2. RS-422 point-to-multipoint/four-wire FDX



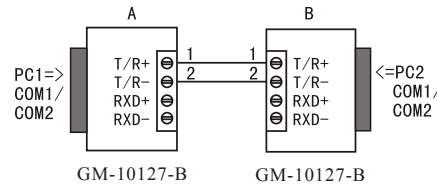
2. RS-485 point-to-multipoint/two-wire FDX



3. Full-duplex communication connection between GM-10127-B interface converters

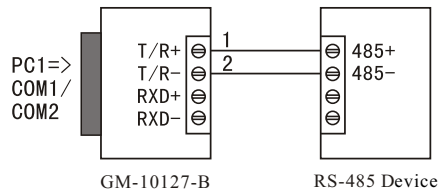


3. Half-duplex communication connection between GM-10127-B interface converters



Conversion from RS-232 to RS-485

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



VI. Fault and Troubleshooting

1. Failure in data communication

- Check whether RS-232 port is wired correctly.
- Check whether RS-485/RS-422 output interface is wired correctly.
- 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.