



# RS-232 SERIAL INTERFACE PHOTOELECTRIC ISOLATOR



**User Manual**  
DA-70163

## **I. Summary**

With adoption of advanced photoelectric isolation technology, RS-232 Serial Interface Photoelectric Isolator, also named Serial Isolator, can offer best protection for RS-232 serial interface devices with elimination of damages possibly caused up by grounding loop voltage, surge, lightning induction, hot plug, etc.

Normally, RS-232 damages are hardware damages of communication devices, for which more than 90% of the reasons are bad circumstances including non-grounding at both ends of the devices, several surges, lightning induction, static interference, hot plug, electromagnetic interference, etc. For example, if device A is connected to device B with RS-232 interface, when there is a voltage margin of above 50V between their grounding wires, the communication will gets unstable. RS-232 Serial Interface Photoelectric Isolator can tolerate a peak voltage margin of transient 2,500 Vrms for 500VDC on a continuous base, and at the same time, it is able to absorb static and electromagnetic interference for protection of RS-232 devices.

As the electric and grounding loop between the two ends of RS-232 devices are completely blocked by the advanced isolation technology adopted by us, therefore, the electric signal from one end has been turned into optical signal for transmission to the other end, and the optical received by the other end will be converted back into electric signal again. In this way, the communication devices are well protected from the interference and damages possibly caused by power grounding loop or surge, therefore, obvious improvement of the reliability and stability of the communication system are achieved.

Our products are now being widely used in the applications of point-to-point RS-232 communication system, UNIX multi-user system, monitor control system, program control exchanger charging terminal, satellite receiver, ATM etc for the industries of electricity, insurance, telecommunications, railway, post office, financial, banking, securities, program controlling, etc.

## II. Technical parameters

**Interface:** conforming to EIA RS-232 and CCITT V2.4 asynchronous protocols

**Connector:** DB9 connectors for both ends

**Transmission mode:** Asynchronous, full duplex, full transparent

**Isolation voltage:** 2,500Vrms impulse or 500 VDC continues

**Transmission rate:** 300BPS-57, 600BPS

**Power:** from RS-232 interface (TXD, RTS or DTR)

**Measurements:** 63\*33\*17 mm

**Weight:** 30g

**Working environments:** -40 degrees to 85 degrees

**Relative humidity:** 5% to 95%

## III. Connector and signal

Pin distribution at RS-232 DTE end

DB9 Female (PIN)	RS-232C Interface Signal
1	Empty
2	Signal out SOUT(TXD)
3	Signal in SIN(RXD)
4	Empty
5	Signal grounding GND
6	Empty
7	Empty
8	Empty
9	Ring indication RI

Pin distribution at RS-232 DCE end

DB9 Male(PIN)	RS-232C Interface Signal
1	Protection grounding cable
2	Signal in SIN(RXD)
3	Signal out SOUT(TXD)
4	Data terminal readyDTR
5	Signal grounding GND
6	Data device readyDSR
7	Request sendingRTS
8	Clear sendingCTS
9	Ring indicationRI

## **IV Connector and signal**

Conforming to EIA RS-232 and CCITT V2.4 standards. 2-3 pin for data sending and receiving, 7-8 pin for RTS and CTS, 4-1 pin for DTR and DCD, 6 pin for DSR and 5 pin for GND. RS-232 interface (TO DTE): Connector: DB-25/9 hole-shaped connector to be used. Signal: interior signal cables are separated.

### **1. Model selection**

First of all, you have to get a clear idea of which signal cables are used by your RS-232 system, then you can select the proper model isolator to protect your communication system. For example, for the terminal of the traditional 2, 3 and 5 lines, you can select the isolator which supports 3-line-2-cable 1-receive-1-send mode. And for the 5 line terminal of 2, 3, 4, 5 and 7, you can select the isolator which supports 5-line-4-cable 2-receive-2-send mode.

### **2. Connection method**

RS232 optic isolator can be connected in series with between the serial connection cable of the previous RS-232 and the RS-232 interface, and either end is OK but you have to pay attention to the direction indicated by TO DTE or TO DCE. Generally speaking, PC user and multi-user are DTE devices; MODEM and terminal are DCE devices, however this general rule dose not apply to all situations. To decide DTE or DCE devices, you have to base your conclusion on the signal cable of your devices RS-232 interface. For example, it is DTE for the signal output from DB25 interface pin 2, while its receiving input is DCE.

Therefore, if crossed RS-232 cable is used to connect two DTE devices (e.g. terminal and multi-users), you have to connect the TO DTE end to the device and TO DCE end to the cable, no matter which side, and your RS232 optic isolator is connected.

## V. Application areas

- Various kinds of multi-user systems such as UNIX
- Protection of multi-user terminal and host
- Protection of satellite receiver
- Protection of multi-user cards
- Protection of ATM connected with RS-232 devices without public grounding
- Protection of MODEM and routers

## VI. Application diagram

