

RDC 232IR3 USERS MANUAL

RS-232 TO RS-232 ISOLATED REPEATER
(3-WIRE : TXD, RXD, SGND)

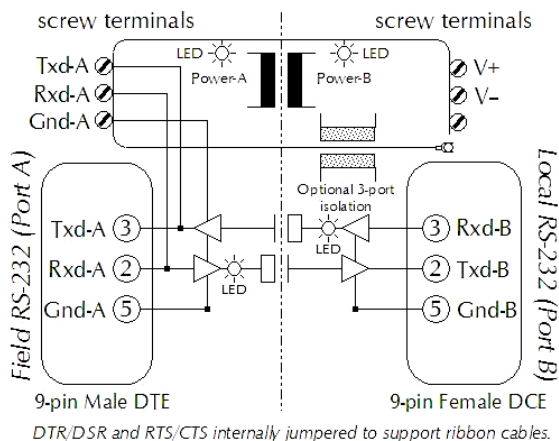
1. INTRODUCTION

1.1 Product Overview

For robust operation, the rdc232ir3 is an essential component of your industrial applications. It provides the following unique combination of features:

- ❑ It isolates and protects the RS-232 data signals TXD and RXD, supporting the common 3-wire RS-232 cables with pins 2, 3, & 5 (or 2, 3, & 7).
- ❑ With Port A's floating ground, RS-232 cable runs up to 50m can be guaranteed with quality, low-capacitance cable like Beldon 1422A at 42 pF/m. (RS-232 requires less than 2500pF per signal wire.)
- ❑ Over 2500 Vrms of optical isolation between Ports A and B (5 KV test isolation) and 2500 Vrms galvanic isolation between Port A and the power supply (3 KV test isolation). The full isolation 3-port "3p" option also has 2500 Vrms of galvanic isolation between port B and power supply.
- ❑ For rapid troubleshooting, there are LED indicators for the Txd, Rxd, input power and isolated power.
- ❑ Wide power supply range (9 to 36 Vdc) allows use with 9, 12, 15 and 24 Vdc power supplies or direct from 12 or 24 Vdc battery systems.
- ❑ Port A has both a 9-pin d-sub shell connector (AT style) and large capacity compression screw terminals, giving maximum flexibility in installation in panels and terminal boxes.
- ❑ The 9-pin female "DCE like" port (on Port B) allows the use of ribbon cables from 9-pin computer ports.
- ❑ 600 W (600w for 1ms with less than 1psec response to over-voltage) transient suppressor diodes are installed on Port A, and on Port B with the 3-port "3p" isolation option.

1.2 Block Diagram



2. Installation

2.1 Making Standard Cables

The rdc-232ir3 has one 9-pin male (DTE) and one 9-pin female connector (DCE) that are configured as a standard "AT" style COM port. This combination of male/female ports allows the rdc232ir3 to be by-passed for testing purposes (but don't leave it that way! ☹)

Since Port "A" of the rdc232ir3 (male/pins with Txd-A, Rxd-A, Gnd-A) is like the standard 9-pin "AT" port of a computer, *make this cable per the wiring diagram in the manual for your device.*

Port B of the rdc232ir3 (female/sockets with Txd-B, Rxd-B, Gnd-B) looks like a 9-pin "modem" or DCE port.

The following figures below illustrate some possible common connections :

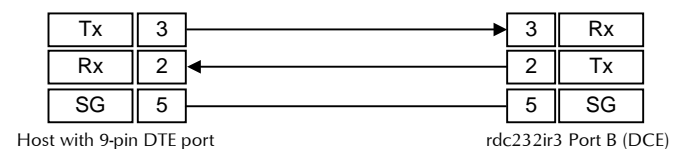


Figure 1 : Host with 9-pin DTE to Port B

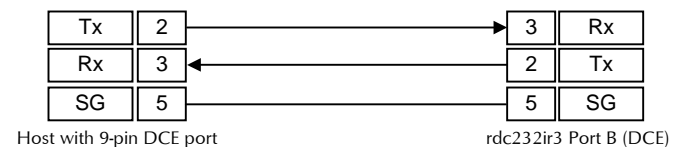


Figure 2 : Host with 9-pin DCE to Port B

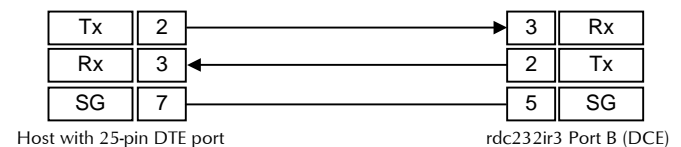


Figure 3 : Host with 25-pin DTE to Port B

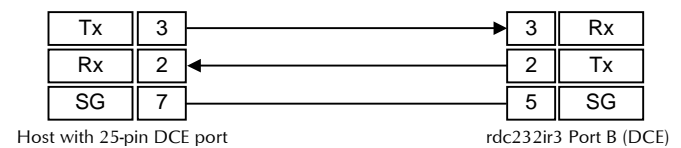


Figure 4 : Host with 25-pin DCE to Port B

Standard RS-232 interface devices cannot be damaged by reverse wiring or short-circuits to ground. But be warned that some low-cost devices use transistors to approximate an RS-232 signal and this built-in protection may not be there.

1. Compression screw terminals:

Port A also has Txd-A, Rxd-A and Gnd-A signals available as screw terminals along the top casing. They will hold wires with lugs or ferrules up to 2.5 mm². These may be more effective in some system designs.

2. Planning the panel wiring:

Power Supply: A fuse should be installed in the V+ supply wire. Models with full 3-port isolation have internal diodes to provide full reverse wire protection. Models with partial 2-port isolation have internal diodes which will attempt to blow this fuse should you reverse wire the power supply.

RS-232 Connection: The RS-232 connection is wired as described above. You may need to jumper the DTR/DSR or RTS/CTS pins in the host. end of the cable - this depends on your application software (it never hurts to do it!). 24 to 28 AWG shielded cable with a shield drain wire is suggested. Ground the shield only at the remote end (not at the rdc232ir3!).

RS-232 Lightning Protection: If required, the RS-232 field wires can be protected by standard lightning protection devices. RDC suggests 15 or 16 V surge protection - but if you expect lightning problems, then RS-232 is a bad standard to use. It is both limited in distance and very sensitive to capacitance > 2500pF - and all good lightning protection devices will add 10,000pF or more.

3. TECHNICAL SPECIFICATION

3.1 Port Description

- 3.1.1 RS-232
 3-wire signals : Txd, Rxd, Gnd
 Working voltage range : ±9 Vdc
 Max voltage range : ±15vdc
 Max surge : ±25vdc
- 3.1.2 Duplex
 Operation can be either half or full-duplex
 No configuration required
- 3.1.3 Speed
 Tested to 115200 bps.
 No configuration required.
- 3.1.4 Character Setting
 Operates with any combination of parity, data, stop, and start bits. No configuration required.

3.2 Isolation (Per ISO/IEC 9549)

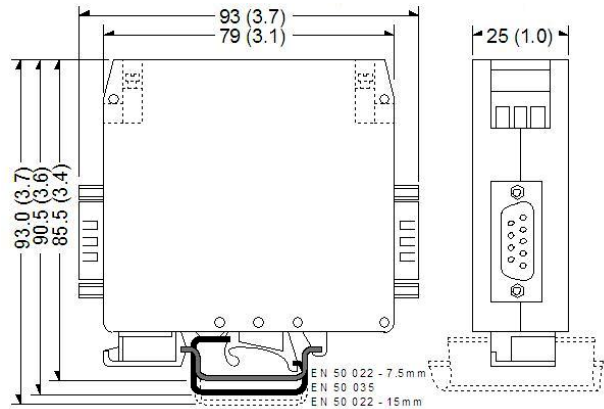
- 3.2.1 Port A to Port B : 2.5 KV (optical, 5 KV test)
- 3.2.2 Port A to Supply : 2.5 KV (galvanic, 3 KV test)
- 3.2.3 Port B to Supply
 Option "-2p" : None
 Option "-3p" : 2500 Vrms
- 3.2.4 Casing
 Dielectric strength per DIN VDE 0303/part 2 is 400kV/cm

3.3 Power Supply

- 3.3.1 Option "5v" : 0.75 W Nominal (150 mA @ 5 Vdc)
- 3.3.2 Option "-dv" : 0.75 W Nominal (32 mA @ 24 Vdc)
- 3.3.3 Option "-av" : 0.75 W Nominal (32 mA @ 24 Vac)
- 3.3.4 Option "-hv" : 0.75 W Nominal (16 mA @ 48 Vdc)

3.4 Environmental

- 3.4.1 Ambient Operating Temperature : -20C to +65 C
 - 3.4.2 Ambient Storage Temperature : -40C to +100 C
 - 3.4.3 Relative Humidity :10 to 90%, non condensing
 - 3.4.4 Casing
 Fungus and termite resistant
- Flame characteristics
 Self-extinguishing per UL 94 V2



3.5 Mechanical Dimensions

- 3.5.1 Height; Width; Depth (See drawing).
- 3.5.2 Weight : 130 g.
- 3.5.3 Terminal Capacity
 2.5mm strand (12 AWG)
 4.0mm solid (12 AWG)
- 3.5.4 DB9 Connectors
 30µ gold pins, 500 insertion cycles
- 3.5.5 Mounting Rail
 DIN EN 50022 (35mm sym)
 DIN EN 50025 (32mm asym)
 Note: removal from a DIN EN 50035 rail is difficult.