



# ECD 232IR3 USERS MANUAL

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

## 1. INTRODUCTION

### 1.1. Product Over-view

For robust operation, the ECD232ir3 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 #2's floating ground, RS-232 cable runs up to 50m can be guaranteed with quality, low-capacitance cable like Beldon 1422A at 42pF/m. (RS-232 requires less than 2500pF per signal wire.)

Over 2500v optical isolation between port #1 and #2 (5kv test isolation) and 2500v galvanic isolation between port #2 and the power supply (3kv test isolation). The full isolation 3-port model also has isolation between port #1 and power supply.

For rapid troubleshooting, there are LED indicators for the Txd, Rxd, input power and isolated power.

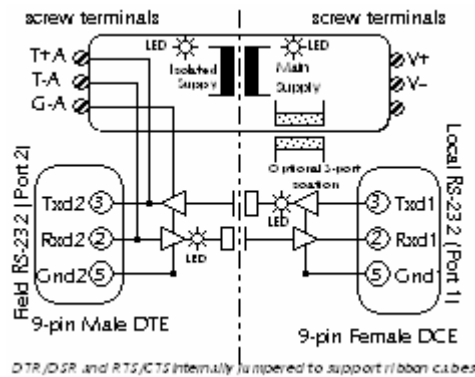
Wide power supply range (9 to 36vdc) allows use with 9v, 12v, 15v, 24v power supplies or direct from 12v or 24v battery systems.

Field port #2 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 allows use of ribbon cables from 9-pin computer ports.

600 watt transient suppresser diodes are installed on port #2, and on port #1 in the 3-port isolation model. (600w for 1ms with less than 1psec response to over-voltage)

### 1.2. Block Diagram



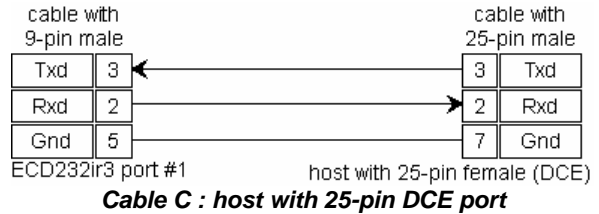
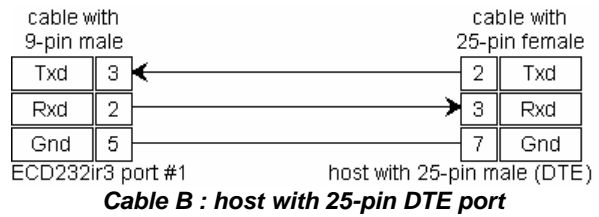
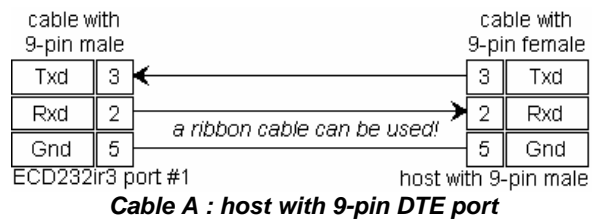
## 2. INSTALLATION

### 2.1. Making Standard Cables

The ECD232ir3 has one 9-pin male (like DTE) and one 9-pin female connector (like DCE) configured as in a standard "AT" style COM port. This combination of male/female ports allows the ECD232ir3 to be bypassed for testing purposes.

Since the ECD232ir3 port #2 (Port "A", 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.*

The ECD232ir3 port #1 (female/sockets with Txd-B, Rxd-B, Gnd-B) looks like a 9-pin "modem" or DCE port. Follow the appropriate wiring diagram below.



**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.

### 2.2. Compression screw terminals:

The floating RS-232 port #2 also has Tx2, Rx2, and Gnd2 signals available as screw terminals along the top. They will hold wires with lugs or ferrules up to 2.5mm<sup>2</sup>. These may be more effective in some system designs.

### 2.3. 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 ECD232ir3!).

**RS-232 Lightning Protection:** If required, RS-232 field wires can be protected by standard lightning protection devices. EC Data suggests 15v or 16v 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 RS-232; Signals: Txd, Rxd, SGnd; Working voltage range  $\pm 9\text{vdc}$ ; Max voltage range  $\pm 15\text{vdc}$ ; Max surge  $\pm 25\text{vdc}$
- 3.1.2. **Duplex;** Operation can be either half or full-duplex; No configuration required
- 3.1.3. **Speed;** Tested to 115K baud; 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)

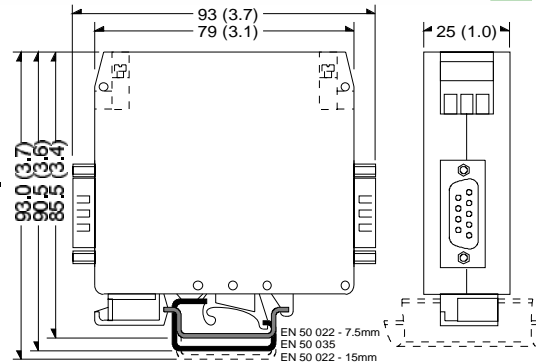
- 3.2.1. **Port #2 to Port #1;** 2.5Kv (optical, 5Kv test)
- 3.2.2. **Port #2 to Supply;** 2.5Kv (galvanic, 3Kv test)
- 3.2.3. **Port #1 to Supply;** model "-2p" none ; model "-3p" 500v
- 3.2.4. **Casing;** dielectric strength per DIN VDE 0303/part 2 is 400kV/cm

#### 3.3. Power Supply

- 3.3.1. **Model ECD232ir3-5v-2p;** 5vdc  $\pm 5\%$ ; 60mA
- 3.3.2. **Model ECD232ir3-5v-3p;** 5vdc  $\pm 5\%$ ; 90mA
- 3.3.3. **Model ECD232ir3-dv-3p;** 9 to 36vdc; 0.75w

#### 3.4. Environmental

- 3.4.1. **Ambient Operating Temperature;** 0C to +60C
- 3.4.2. **Ambient Storage Temperature;** -40C to +100C
- 3.4.3. **Relative Humidity;** 10 to 90%, non condensing
- 3.4.4. **Casing;** fungus and termite resistant
- 3.4.5. **Casing; flame characteristics:** self-extinguishing per UL 94 V2



#### 3.5. Mechanical Dimensions

- 3.5.1. **Height; Width; Depth** (See drawing).
- 3.5.2. **Weight,** 100g.
- 3.5.3. **Terminal Capacity;** 2.5mm strand (12 AWG)
- 3.5.4. **Mounting Rail;** DIN EN 50022 (35mm sym) DIN EN 50025 (32mm asym) Note: removal from a DIN EN 50025 rail is difficult.