



## ECD232IR9 USERS MANUAL

9-WIRE RS-232 TO RS-232 ISOLATED REPEATER  
(TXD/ RXD, DTR/DSR, RTS/CTS, CD, RI, SIGNAL GROUND)

### 1. INTRODUCTION

#### 1.1. Product Over-view

For robust operation, the ECD232ir9 is the ultimate isolation device for your RS-232 industrial applications. It provides the following unique combination of features:

It provides both isolation and full modem support by isolating all 8 standard RS-232 signals: TXD/RXD, DTR/DSR, RTS/CTS, CD, RI.

With a floating field signal ground, cable runs up to 50m can be guaranteed with quality, low-capacitance cable like Beldon 1422A at 42pF/m.

2.5kv optical/galvanic isolation is provided between the field and host data lines (power supply is 3kv test, optical is 5kv test)

For rapid troubleshooting, LED indicators are provided for TXD, RXD, DTR, DSR SIGNALS.

### 2. INSTALLATION

#### 2.1. Plan your wiring

##### 2.1.1. Determining the connection type:

The ECD232IR9 has two 9-pin connectors. One is configured as a standard "AT" style DTE COM port, while the other is a DCE port. From your computer (or local device) use a modem cables (as shown below). The ECD232IR9 supports all 9 wires normally used. The DTE/DCE port design allows the isolator to be easily by-passed for test purposes. This is a mixed blessing, as some users may by-pass the isolator and forget to restore it later!

**Standard RS-232 interface devices cannot be damaged by reverse wiring or short-circuits to ground.** Be warned that some low-cost devices use transistors to approximate an RS-232 signal and this built-in protection may be lacking. Also watch out for PLC ports which treat pin 1 or 9 of a 9-pin socket special by supplying a frame ground or +5v supply for hand terminals.

9-pin to 9-pin	25-pin to 9-pin	
	Rxd 3	2 Rxd
	Txd 2	3 Txd
	Gnd 7	5 Gnd
	DTR 20	4 DTR
	DSR 6	6 DSR
	RTS 4	7 RTS
	CTS 5	8 CTS
	CD 8	1 CD
	RI 22	9 RI

device, 25-pin                      rdc232ir9 (DCE)

**Example Cables (device to DCE)**

**Cable from your local device to the ECD232ir9:**

For DCE ports, the transmit data signal (Txd) is actually the sink (destination) for a remote transmit data signal. Common sense would prefer to call it "receive data". DTE to DCE cables use a straight through (1 to 1) configuration. You can use a standard modem cable as purchased at most computer shops.

#### **Cable from the ECD232ir9 to your remote device:**

Consult your product documentation and make this cable as if you had a 9-pin port on your local device.

##### 2.1.2. Planning the panel wiring:

**Power Supply:** A fuse should be installed in the V+ supply wire to prevent damage should you accidentally reverse wire the unit.

**RS-232 Connection:** The RS-232 connection is wired on one side as a modem cable (straight-through) and the other side as a "null-modem" (crossover). 24 to 28 AWG shielded wire is suggested.

**RS-232 Ground Wires:** On the top of the ECD232ir9 you will find four ground related terminals. The terminal labeled "shd1" connects to the metal shell on the DCE port, while that labeled "shd2" connects to the metal shell on the DTE port. It is *best to not* use this terminal and ground your shield only at the remote end of the cable. *Never* ground the shield at both ends of a cable. *Never* ground both the DCE and DTE cable shields grounds together at the ECD232IR9 – this violates the isolation of the isolator. Only 1 can be connected to maintain isolation.

The terminal labeled "Surge" is only of use on the ECD232IR9 with transient surge diodes installed. By factory default, this terminal is connected internally to the floating Port #2 (DTE) RS-232 ground. To maintain a floating port, it should *not* be connected externally.

The terminal labeled "Gnd2" is the same as the pin #5 on the RS-232 DTE port #2. It is completely isolated from either the V-/0v "ground" and the RS-232 ground from the DCE port. The "Gnd2" terminal should normally *never* be connected to any external ground. It is there to allow easy connection of a jumper wire from either the Shd2 or Surge terminal to the RS-232 signal ground to allow this end of the RS-232 link to remain floating. You can also use it for a voltage meter ground during measurement of the RS-232 signals.

**RS-232 Lightning Protection:** If required, the RS-232 field wires can be protected by standard lightning protection devices. EC Data suggests a level of 15v or 16v. Since all lightning protection devices add capacitance to the wire and dampen the signal, it is best to add external surge protection only if the ECD232IR9 does not have the surge protection (option -tz) installed.



### 3. TECHNICAL SPECIFICATION

#### 3.1. Port Description

- 3.1.1. **RS-232**; Per RS-232-E; Signals: Txd, Rxd, Gnd; DTR, DSR, RTS, CTS, CD & RI. 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 up to 57K baud; operates independent of baud rate; 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 (Similar to ISO/IEC 9549)

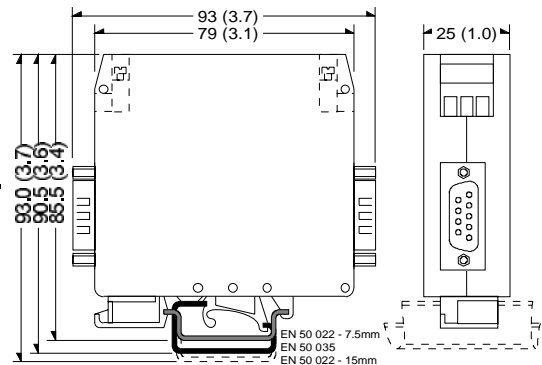
- 3.2.1. **RS-232 to RS-232**; 2.5Kv (optical, 5Kv test)
- 3.2.2. **RS-232 (Port #2 - floating) to Supply**; 2.5Kv (galvanic, 3Kv test)
- 3.2.3. **RS-232 (port #1 - grounded) to Supply**; 500v (galvanic, 3Kv test) with 3-port isolation option only (-3p). 2-port isolation option (-2p) has no isolation here.
- 3.2.4. **Casing**; dielectric strength per DIN VDE 0303/part 2 is 400kV/cm

#### 3.3. Power Supply

- 3.3.1. **Model ECD232IR9-5v-2p**; 5vdc  $\pm 5\%$ ; 80mA
- 3.3.2. **Model ECD232IR9-5v-3p**; 5vdc  $\pm 5\%$ ; 150mA
- 3.3.3. **Model ECD232IR9-24v-3p**; 24vdc  $\pm 5\%$ ; 65mA

#### 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**; 130g.
- 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)