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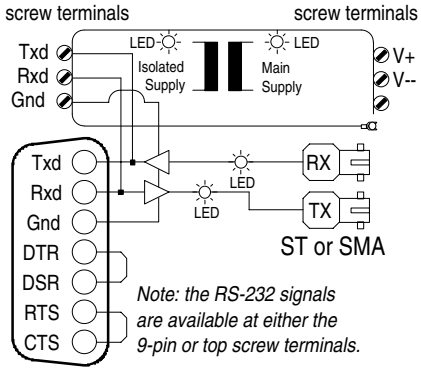
ECD 232FO USERS MANUAL

RS-232 TO FIBER OPTIC CONVERTER

1. INTRODUCTION

1.1. Block Diagram



9-pin Female RS-232 DCE

1.2. Product Over-view

The ECD232fo is designed specifically for use in industrial panel applications. It provides the following unique combination of features:

Fiber optics provides an intrinsically 100% galvanically isolated, noise-free, lightning immune data communications signal. The ECD232fo uses high-quality Hewlett-Packard (HP) components to communicate up to 4km at 820nm over 62.5/125, 100/140, or 50/125 µm fibers. ST or SMA connectors are available.

The ECD232fo has two RS-232 ports - a 9-pin d-shell and 3 compression screw terminals. These are actually independent ports and you connect a 2nd device to the 2nd port. It has 2 main uses; 1) You can connect a notebook computer to the 2nd port to monitor the communications or introduce "noise" to test your error recovery, and 2) during factory or lab testing, you can run 3-wire RS-232 cables between your ECD232fo units instead of making a lot of short-use fiber test cables.

Optionally, the RS-232 ports of the ECD232fo can have 2500v optical/galvanic isolation from the power supply. (Note the 2 RS-232 ports always share the same ground).

With a 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)

For rapid troubleshooting and to simplify installation, you can treat the Rxd screw terminal as a test signal. Connecting a +5 to +15vdc signal to it will force the fiber optic transmitter on. Visible even with the naked eye, this allows very quick checking of fiber "continuity".

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.

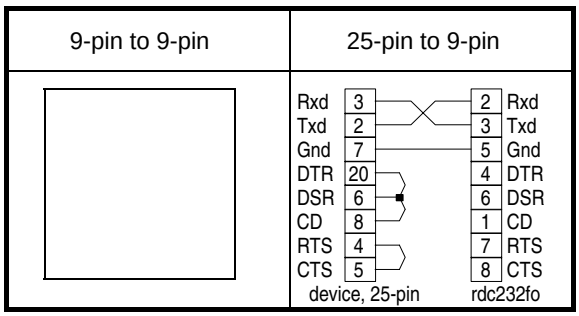
Use of one 9-pin female "DCE like" port allows use of ribbon cables from 9-pin computer ports.

2. INSTALLATION

2.1. RS-232 connection:

The ECD232fo has one 9-pin female connectors configured in a standard DCE COM port. This means you can use a 9-pin ribbon cable to connect it to your standard 9-pin computer ports. Internal to the ECD232fo the DTR/DSR pins and RTS/CTS pins are connected to support the use of ribbon cables.

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. 24 to 28 AWG shielded wire is suggested.



Example Cables (DTE to DCE)

2.2. Fiber Optics Connection:

The ECD232fo has either 2 ST-compatible bayonet connectors (option -st) or 2 SMA threaded connectors (option -sma). Note that all fiber optic cables need gentle handling and have a specified minimum bend radius. Please refer to your cable specs for details, but you should plan on providing space to neatly coil a 6 inch or 15cm loop diameter of extra fiber.

2.3. Power Supply Connection:

A fuse must be installed in the V+ supply wire. Models with 2-port isolation (-2p) have internal diodes to provide full reverse supply protection. Models without isolation (-1p) have internal diodes which will attempt to blow this fuse if you reverse wire the power supply.

2.4. Testing your fiber:

Supply a +5 to +15 volt signal to the Rxd screw terminal as a test signal. For the isolated models you will also need to connect the Gnd screw terminal. This will force the fiber optic transmitter on. Note that the unit will use about 3 times the normal supply current during this test mode.

3. TECHNICAL SPECIFICATION

3.1. Port Description

3.1.1. **RS-232**; 3-wire RS-232; Signals: Txd, Rxd, Gnd; Working voltage range ±9vdc; Max voltage range ±15vdc; Max surge ±25vdc

3.1.2. **Fiber Optics**; 820nm over 62.5/125, 100/140, or 50/125 µm fibers. ST or SMA connectors.

3.1.3. **Duplex**; Operation can be either half or full-duplex; No configuration required

3.1.4. **Speed**; Tested to 115K baud; No configuration required

3.1.5. **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. **Fiber Optics**; intrinsic full isolation

3.2.2. **RS-232 to Supply**; ; model "-1p" none ; model "-2p" 2500v (galvanic, 3Kv test)

3.2.3. **Casing**; dielectric strength per DIN VDE 0303/part 2 is 400kV/cm

3.3. Power Supply

3.3.1. **Model ECD232fo-5v-1p**; 5vdc ±5%; 50mA normal operation (120mA during test mode)

3.3.2. **Model ECD232fo-5v-2p**; 5vdc ±5%; 90mA normal operation (200mA during test mode)

3.3.3. **Model ECD232fo-dv-2p**; 9 to 36vdc; 0.75w normal operation (1.5w during test mode)

3.4. Environmental

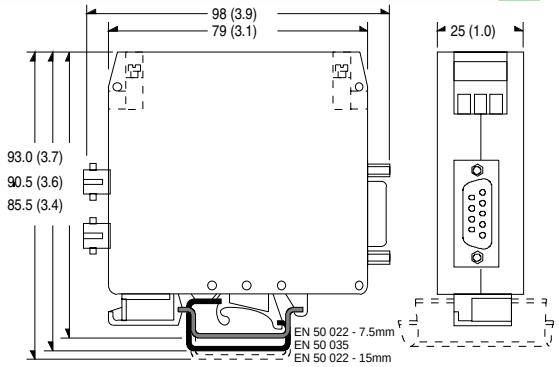
3.4.1. **Ambient Operating Temperature**; 0C to +60C

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)* Note: removal from a DIN EN 50025 rail is difficult.