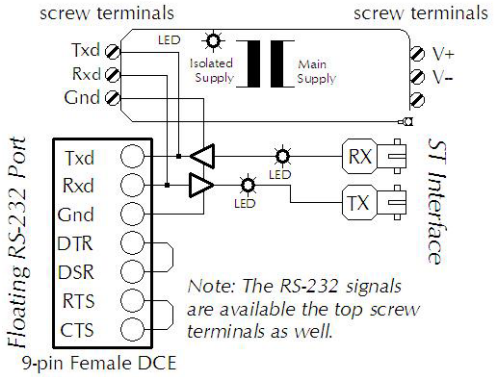
rdc232fos User Manual

Industrial Fiber Optics to RS-232 Serial Converter (Single Mode)

1. Introduction

1.1 Block Diagram



1.2 Product Overview

The rdc232fos 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 communication signal. The rdc232fos uses high quality components to communicate up to 11 km at 1310 nm over 9/125um fibers.

There are 2 ways to access the RS-232 port of the rdc232fos :

(i) via the 9-pin D-Shell female connector (DCE) OR
(ii) via the 3-way screw terminal at the top of the device

Optionally, the RS232 port of the Rdc232fos can have 2500V optical/galvanic isolation from the power supply.

With a floating ground, RS232 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 15 Vdc signal to it will force the fiber optic transmitter on. The light from the transmitter is visible to the naked eye and this allows for a quick check for fiber "continuity". There are also LED indicators for the Txd, Rxd and isolated power.

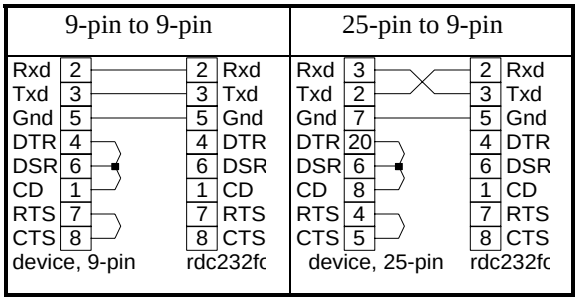
A wide power supply range (9 to 36 Vdc) allows use with 9v, 12v, 15v, 24v power supply or direct from 12v or 24v battery systems.

2. Installation

2.1 RS-232 connection:

The rdc232fos has one 9-pin D-Shell female connector that is configured as 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. Internally, the DTR/DSR pins and RTS/CTS pins are connected to support the use of ribbon cables.

Reverse wiring or short circuits to ground will not damage a standard RS-232 interface. However, be warned that some low-cost devices use transistors to "approximate" an RS-232 signal and may lack this built-in protection. The use of AWG 24 to 28 shielded wire is highly recommended.



Example Cables (DTE to DCE)

2.2 Fiber Optics Connection:

The optical side of the rdc232fos is fitted with 2 ST-compatible bayonet connectors. Note that all fiber optic cables need gentle handling and have a specified minimum bend radius. Please refer to the cable specs for details, and there should be plans to cater for space to neatly coil a 6 inch or 15 cm loop diameter of extra fiber.

2.3 **Power Supply Connection:**
A fuse must be installed in the V+ supply wire. The rdc232fos has internal diodes to provide full reverse supply protection.

2.4 **Testing the Fiber**
Supply a +5 to +15V signal to the Rxd screw terminal as a test signal. For the isolated models, the Gnd of the RS-232 port must be connected. This will force the fiber optic transmitter to turn on. Note that the unit will draw up to 20% more current while performing this test.

3. Technical Specification

3.1 Port Description

3.1.1 **RS-232 (3-wire)**
Signals : Txd, Rxd, Gnd
Working voltage range : +/-9Vdc
Max voltage range : +/-15Vdc
Max surge : +/-25Vdc

3.1.2 **Fiber Optic**
Wavelength : 1310 nm over 9/125um
Connector : ST

3.1.3 **Duplex**
Can be either half or full duplex.
No configuration required.

3.1.4 **Speed**
Up to 230K baud.
No configuration required.

3.1.5 **Character Setting**
Protocol independent.
No configuration required.

3.2 Isolation
As per ISO/IEC 9545

3.2.1 **Fiber Optics**
Intrinsic isolation.

3.2.2 **RS232 to Supply**
"-1p" model : none
"-2p" model : 2500v (galvanic, 3kv test)

3.2.3 **Casing**
Dielectric strength as per DIN VDE 0303/part 2 is 400kv/cm

3.3 Power Supply

3.3.1 **Model rdc232fos-5v-1p**
5Vdc+/-5%; 180 mA normal operation
(200 mA during test mode)

3.3.2 **Model rdc232fos-5v-2p**
5Vdc+/-5%; 260 mA normal operation
(300 mA during test mode)

3.3.3 **Model rdc232fos-dv-2p**
9 to 36 Vdc; 1.44 W (normal operation)
(1.7 W during test mode)

3.3.4 **Model rdc232fos-hv-2p**
38 to 58 Vdc; 1.48 W (normal operation)
(1.7W during test mode)

3.4 Environmental

3.4.1 **Ambient Operating Temperature**
-40C to +65C

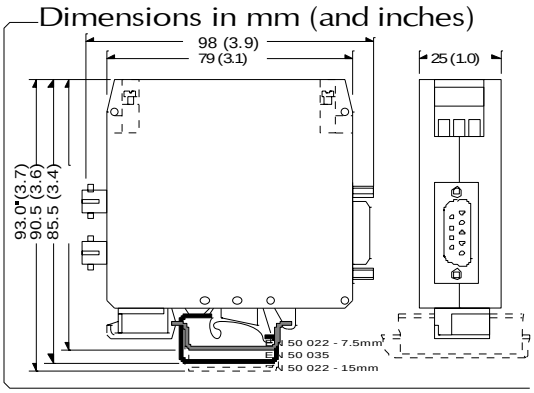
3.4.2 **Ambient Storage Temperature**
-40C to +100C

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 UL94V2

3.5 Mechanical Dimensions



3.5.1 **Height; Width; Depth (See drawing)**

3.5.2 **Weight**
Approx 130g

3.5.3 **Terminal Capacity**
2.5mm strand (12 AWG)

3.5.4 **Mounting Rail**
DIN EN 50022 (35mm Sym)