

Model: FOSTCDR  
**Industrial DIN Rail Mounted  
 Fiber Optic to RS-232/422/485 Converter**



**Features**

- ✓ **DIN Rail Mount for use in industrial applications**
- ✓ **Wide Operating Temperature (-40 to 85 C, -40 to 176 F)**
- ✓ **MODBUS ASCII or RTU Compatible**
- ✓ **Extends communications up to 1.2 km / 2.5 Miles**
- ✓ **2-Way 2,000 V Isolation**
- ✓ **EMI / RFI Protection**

**Functional Description**

The FOSTCDR provides the most versatile connection possible between any asynchronous full or half-duplex serial equipment using dual multi-mode fiber optic cable. The converter can also be set up in a multi-drop mode to allow one serial device to communicate with multiple devices around a fiber ring. The FOSTCDR is capable of handling data rates up to 115.2 kbps (RS-232) or 460 kbps (RS-422/485). The unit supports mixed standards, allowing you to replace other converters and isolators and add the EMI / RFI protection inherent to fiber optic communications. The fiber optic connections are via two female straight tip (ST) connectors. RS-232/422/485 connections use a terminal block. An external 10 – 30 VDC power supply is required (not included).

**Ordering Information**

Model Number	Description
FOSTCDR	Multi-mode Fiber Optic to RS-232/422/485 Converter
Accessory Items	
DR-30-12	12 VDC 2 A DIN Rail Power Supply
PS5R-A12	12 VDC 600 mA DIN Rail Power Supply
PS5R-A24	24 VDC Din Rail Power Supply
FOP3MST	3 meter ST Fiber Optic Cable



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## Operation

- Figure 1 shows the wiring connections used to extend and isolate an RS-232 circuit. This example depicts a DTE to DCE circuit with DB9 connectors. In this example, SW1-6 should be "off". All other switches have no effect on RS-232. Refer to B&B's FOSTCDR FAQ for detailed information. A link is contained at the end of this section. The FOSTCDR supports RS-232 TD, RD, and Ground. If your RS-232 devices require additional control signals, the 232FLSTor 9PFLST should be used. Contact B&B's Technical Support via telephone (1-800-346-3119) or e-mail ([support@bb-elec.com](mailto:support@bb-elec.com)) for more information.
- Positions one through 5 of SW1 are used to determine the timeout of the RS-485 driver. A specific time must be set to tell the hardware how long to wait for data on the fiber side before turning off. Set the timeout for one character time. Refer to Table 1 for switch settings. In some cases, R10 must be removed and a through-hole resistor (R9) installed. Contact B&B's Technical Support for more information.
- Figure 2 shows the wiring connections used for 2-Wire RS-485. Refer to Tables 1 and 2 for DIP Switch settings. Refer to the FOSTCDR FAQ for detailed information.
- Figure 3 shows the wiring connections used for 4-Wire RS-485 or RS-422. Refer to Tables 1 and 2 for DIP Switch settings.
- Normal bias before termination is 3.8 to 4.0 VDC, Data (+) to (-). Refer to B&B's RS-422/485 Application note for more information regarding biasing. A link is contained at the end of this section.
- Figure 4 shows a typical point-to-point configuration. Set SW1-6 to the "off" position.
- The FOSTCDR is capable of multi-drop ring operation. A multi-drop configuration is a ring of FOSTCDR's. Figure 5 shows a typical set up. Set SW1-6 to the "on" position for each converter in the ring. SW1-6 routes fiber optic receive data to the fiber optic transmitter in addition to the conversion circuitry. The data repeats around the fiber ring until it reaches the source, where it is blocked based on the time-out selected. Refer to Table 3 for the recommended maximum number of converters in multi-drop configuration.
- The factory default for the LED emitter is to have the light ON in the idle state. Contact B&B's technical support if you need to interconnect with devices that have the light OFF in the idle state.
- The FOSTCDR connector-to-connector power budget is 12.1 dB based on a 62.5/125 μM cable.
- Figure 6 is a mechanical drawing. It also contains information concerning DIP Switch orientation.
- FOSTCDR FAQ: [http://www.bb-elec.com/tech\\_articles/faq\\_fostcdr.asp](http://www.bb-elec.com/tech_articles/faq_fostcdr.asp)
- RS422/485 Application Note: [http://www.bb-elec.com/tech\\_articles/rs422\\_485\\_app\\_note/table\\_of\\_contents.asp](http://www.bb-elec.com/tech_articles/rs422_485_app_note/table_of_contents.asp)

Figure 1 – Extend and Isolate RS-232

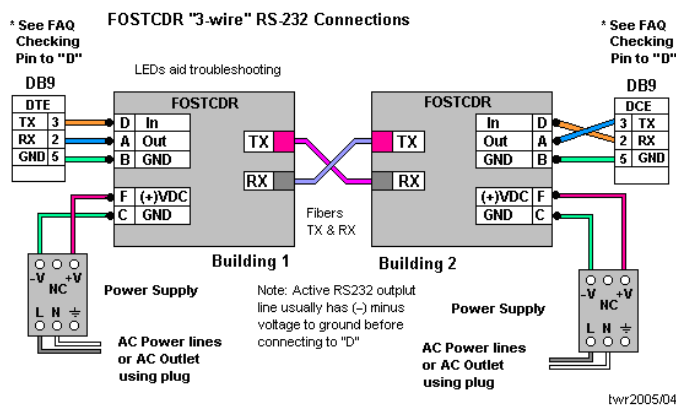
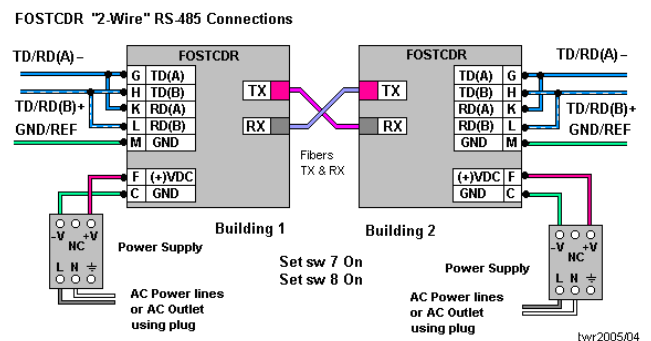


Figure 2 – 2-Wire RS-485



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Figure 3 – 4-Wire RS-485 or RS-422

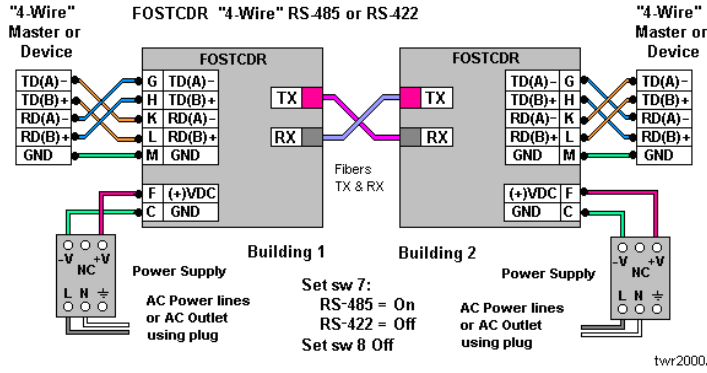


Figure 4 – Point-to-Point

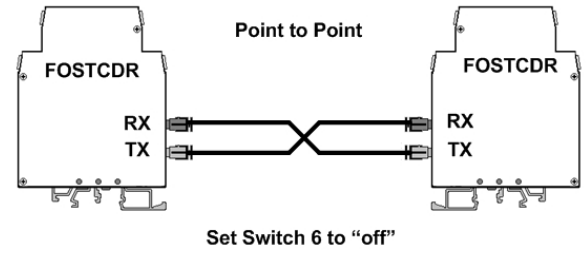


Figure 5 – Multi-drop Fiber Optic Ring

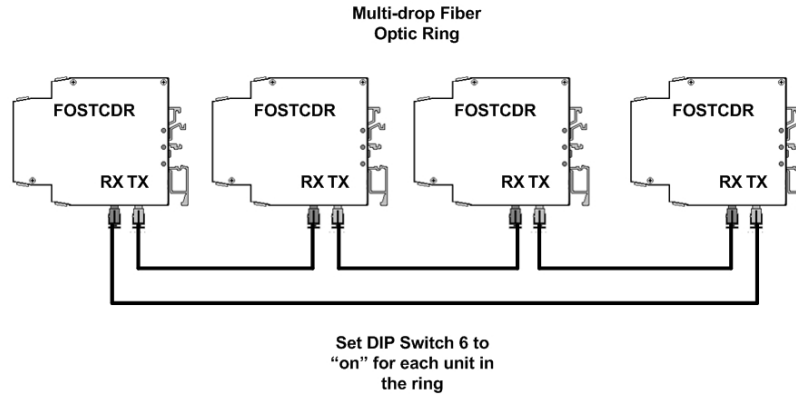
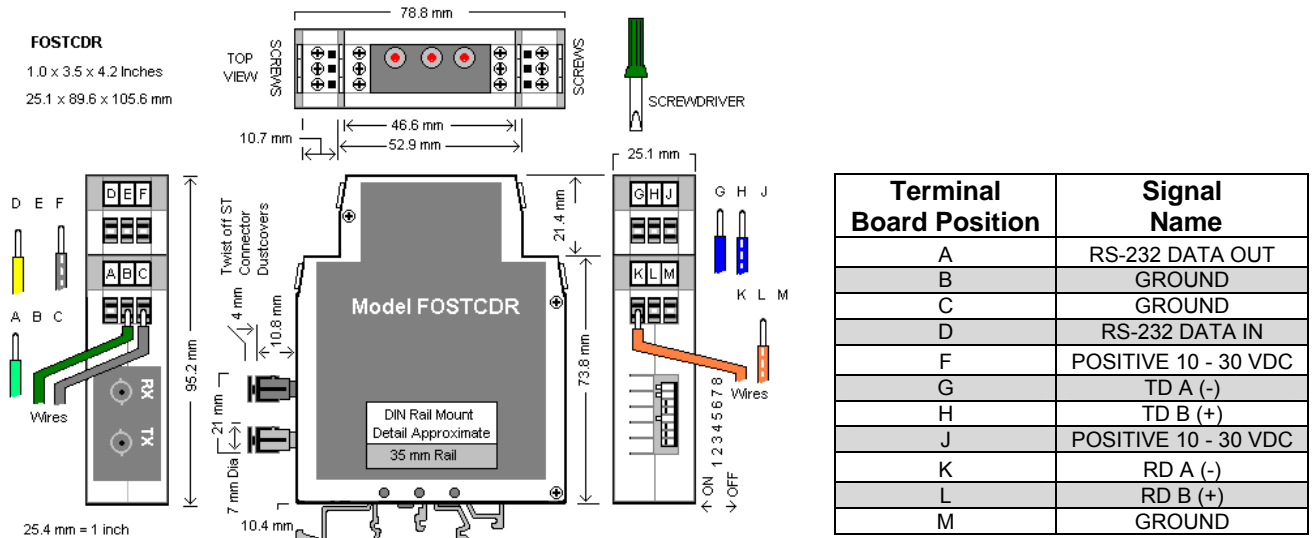


Figure 6 – Mechanical Drawing and Terminal Board Layout



**Table 1 – 485 Data Rate / Timeout Selection**

Baud Rate	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	R9 Value	Time (ms)
1200	ON	OFF	OFF	OFF	OFF	820 kΩ	8.20
2400	ON	OFF	OFF	OFF	OFF	430 kΩ	4.30
4800	OFF	OFF	OFF	OFF	ON	Not Used	2.20
9600	OFF	OFF	OFF	ON	OFF	Not Used	1.30
19.2 k	OFF	OFF	ON	OFF	OFF	Not Used	0.56
38.4	OFF	ON	OFF	OFF	OFF	Not Used	0.27
57.6	ON	OFF	OFF	OFF	OFF	Not Used	0.22
76.8	ON	OFF	ON	ON	OFF	Not Used	0.14
115.2	ON	ON	ON	OFF	OFF	Not Used	0.10
153.6	ON	OFF	OFF	OFF	OFF	6.2 kΩ	0.06
230.4	ON	OFF	OFF	OFF	OFF	4.3 kΩ	0.04
460.8	ON	OFF	OFF	OFF	OFF	2.2 kΩ	0.02

Note: This table is not applicable to RS-232 or RS-422

**Table 2 – Mode Selection**

	SW1-7	SW1-8
RS-485 2-Wire	ON	ON
RS-485 4-Wire	ON	OFF
RS-422	OFF	OFF


**Table 3 -  
Maximum Converters in a  
Fiber Optic Ring**

Baud Rate (kbps)	RS-232	RS-422/485
460.8	N/A	2
230.4	N/A	4
115.2	2	8
57.6	8	16
38.4	16	24
19.2 and below	32	32

**Specifications**

Input Power Requirement	10 – 30 VDC at 140 mA (max)
Isolation	2-Way, 2000 V
Fiber Optic Connections	Multi-mode ST Female
Copper Connections	Terminal Block
Operating Temperature	-40 to +80 C (-40 to +176 F)
Operating Humidity	0 to 95% Non-condensing
LED Indicators	TD, RD, Power
Dimensions	11x5.9x2.5 cm (4.3x2.3x0.95 in)
DIN Mount	35 mm
Data Rate (RS-232)	115.2 kbps
Data Rate (RS-422/485)	560.8 kbps
Optic Wavelength	820 nm
Fiber TX Launch Power	-17 to -10 dBm (-13 dBm typical)
Minimum Required Fiber Rx Power	-25.4 dBm to -24 dBm
Maximum Receiver Power	-10 dBm
Coupled Power Budget	12.1 dBm
Fiber Range	4 km (2.5 miles)
End to End Delay	2000 ns typical (2650 ns max) / Point-to-Point RS-232
End to End Delay	550 ns typical (1000 ns max) / Point-to-Point RS-422/485
End to End Skew	900 ns typical (1100 ns max) / Point-to-Point RS-232
End to End Skew	50 ns typical (120 ns max) / Point-to-Point RS-422/485
Maximum Fiber Ring Length	8 km (5 miles)
Delay between Rx & Tx on Fiber Ring	52 μs
Approvals	CE

**CE Declaration of Conformity**

Manufacturer's Name:	B&B Electronics
Manufacturer's Address:	707 Dayton Road Ottawa, IL 61350 USA
Model Number:	FOSTCDR
Description:	DIN Mount Fiber Optic Converter
Type:	Light Industrial ITE Equipment
Application of council Directive:	89/336/EEC
Standards:	EN 55022 EN 61000-6-1 EN 61000 (-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11)
 Michael J. Fahrion, Director of Engineering	



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