

# Product Overview



- Input Voltage 10-48 VDC (56 VDC max)
- Power Consumption 0.5 W (Typical), 1.3W Max
- Duplex multi-mode fiber with ST connectors
- Fiber cable specs needed: 62.5/125 micro-meter, 820 nm wavelength

## Serial Terminal Block Settings

| Terminal | RS-485 2-Wire | RS-422/485 4-Wire | RS-232             |
|----------|---------------|-------------------|--------------------|
| A        | GND           | GND               | GND                |
| B        | Data B (+)    | RD B (+)          | *****              |
| C        | Data A (-)    | RD A (-)          | RS-232 Data Input  |
| D        | *****         | TD B (+)          | *****              |
| E        | *****         | TD A (-)          | RS-232 Data Output |

## LED Indicators

|                 |                                     |
|-----------------|-------------------------------------|
| <b>Receive</b>  | Red, ON when data received on fiber |
| <b>Transmit</b> | Red, ON when data sent on fiber     |
| <b>Power</b>    | Red, ON when power applied          |

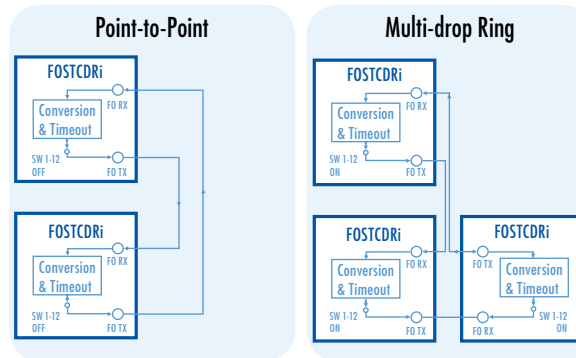
## 2 Set DIP Switches for Baud Rate

| Baud    | Switch Selectable Timeouts |     |     |     | Timeout |
|---------|----------------------------|-----|-----|-----|---------|
|         | DIP Switch Position        |     |     |     |         |
|         | 8                          | 9   | 10  | 11  |         |
| 9.6 K   | OFF                        | OFF | OFF | ON  | 1.3 ms  |
| 19.2 K  | OFF                        | OFF | ON  | OFF | .56 ms  |
| 38.4 K  | OFF                        | ON  | OFF | OFF | .27 ms  |
| 57.6 K  | ON                         | OFF | OFF | OFF | .22 ms  |
| 76.8 K  | ON                         | OFF | ON  | ON  | .14 ms  |
| 115.5 K | ON                         | ON  | ON  | OFF | .10 ms  |

For baud rates not listed above, refer to: [http://www.bb-elec.com/technical\\_library.asp](http://www.bb-elec.com/technical_library.asp)

## 3 Set DIP Switch 12

OFF = Point-to-Point      ON = Multi-drop Ring



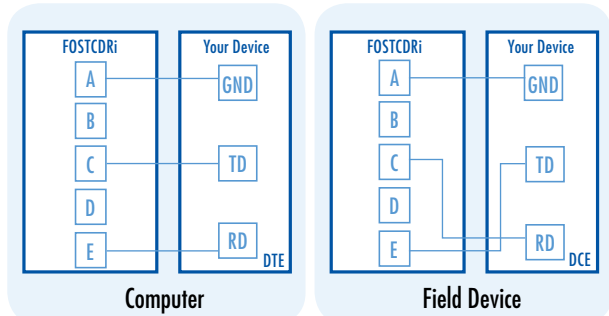
## 4 Multi-drop Mode

Multi-drop mode allows one serial device to communicate with up to 31 others around a fiber optic ring. Data will repeat around the ring until it finally reaches its source. When the data is received by the originator, timeout circuitry will prevent it from being re-transmitted.

| Maximum Converters in a Fiber Ring |        |            |
|------------------------------------|--------|------------|
| Baud Rate                          | RS-232 | RS-422/485 |
| 19.2 kbps and lower                | 32     | 32         |
| 38.4 kbps                          | 16     | 24         |
| 115.2 kbps                         | 2      | 8          |

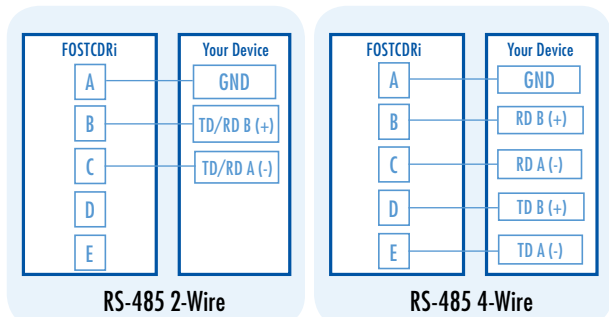
## 5 Wire the Converter

### RS-232



Additional tech notes on RS-232 DTE/DCE connections are located at: [http://www.bb-elec.com/technical\\_library.asp](http://www.bb-elec.com/technical_library.asp)

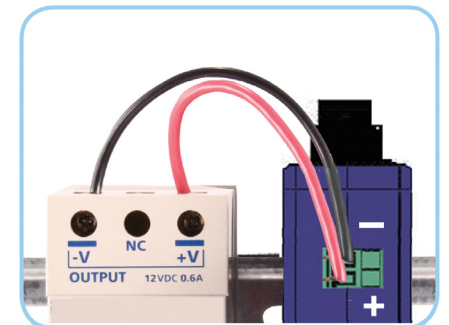
### RS-422/485



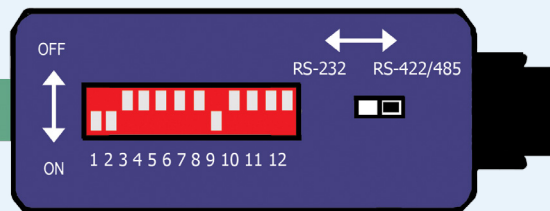
Additional tech notes on RS-422/485 connections are located at: [http://www.bb-elec.com/technical\\_library.asp](http://www.bb-elec.com/technical_library.asp)

## 6 Power the Converter

- Input Voltage 10-48 VDC (56 VDC max)
- Power Consumption 0.5 W (Typical), 1.3W Max



## 1 Set DIP Switches for RS-232/422/485 Mode



| Mode                       | DIP Switch Position |     |     |     |     |     |     |
|----------------------------|---------------------|-----|-----|-----|-----|-----|-----|
|                            | 1                   | 2   | 3   | 4   | 5   | 6   | 7   |
| RS-485 2-Wire, Half-duplex | ON                  | ON  | ON  | ON  | OFF | ON  | OFF |
| RS-485 4-Wire, Full-duplex | ON                  | OFF | OFF | OFF | OFF | OFF | OFF |
| RS-422 Full-duplex         | OFF                 | OFF | OFF | OFF | OFF | ON  | OFF |

If you wish to enable termination, refer to: [http://www.bb-elec.com/technical\\_library.asp](http://www.bb-elec.com/technical_library.asp)

## Troubleshooting

**When using Point to Point mode can I set one of the FOSTCDRi's as 232 and the other as 422 or 485?**

Yes.

**What do the TX Bias and RX Bias switches do?**

They put biasing in or out of the circuit. There is a 1.2k ohm resistor across the transmit pair and the receive pair.

(Applies to RS-422/485 only)

### BIASING

Please review our biasing tech note on our 422/485 application guide.

### CONNECTING A SIGNAL GROUND (COMMON, REFERENCE) ON THE RS-422/485 SIDE

The specifications for most RS-422 and RS-485 devices indicate that the device can withstand a maximum VCM of -7 volts to +12 volts.

The function of the GND connection is to tie the signal grounds of all nodes on a network to one common ground potential. This ensures that the common mode voltage cannot exceed the specified value.

A signal ground is required on the FOSTCDRi because it is an optically isolated device. If you do not have a signal ground (common, reference) on your RS-422/485 device you can connect to the DC power ground of your RS-422/485 device.

**Caution:** Be sure that this is connected correctly.

The FOSTCDRi has the fiber optic transmit light ON in the idle state. If you require the fiber optic transmit light OFF in the idle state you can order the FOSTCDRi-INV. (The FOSTCDRi and the FOSTCDRi-INV will not work together.)

### What is the difference between the FOSTCDRi and the FOSTCDRi-INV?

On the FOSTCDRi we keep the light in the fiber turned on when no data is transmitted and the input signal is in the MARK state (idle). If light is lost or too low, the electrical signals go to the SPACE state. The input signal turns the light Off/On in step with the data. This model has no indicator for Transmit or Receive, if no light is received, the RD output will be positive relative to GND (normally negative), and in RS-422 or RS-485 mode, no light will set the TD(A)- line high relative to TD(B)+. The usual voltage with light in the fiber and no signal sets the B line high relative to A (about 4.4 Volts DC no termination). To check, connect a fiber patch cable from the TX connector into the RX connector.

The FOSTCDRi-INV is the opposite. The fiber is off in the idle state.

Document number – pn8953\_r002\_FOSTCDRi-x\_1312qsg

## Recommended Accessories and Power Supplies

### 35mm DIN Rail to Panel Mount Bracket

<http://www.bb-elec.com/FOSTCDRi/ACC>



DRPM25

### Fiber Optic Cable

<http://www.bb-elec.com/FOSTCDRi/ACC>



DFMM-STST-1M

### Industrial Power Supply

<http://www.bb-elec.com/FOSTCDRi/ACC>



MDR-20-24

## Fast, Easy Answers

- **First, check step 6.**
- **Then use your smart phone to access complete documentation on our web site. Simply scan the code to the right.**



<http://www.bb-elec.com/FOSTCDRi>

**B&B ELECTRONICS**

1-888-948-2248 | Europe: +353 91 792444

[www.bb-elec.com](http://www.bb-elec.com)

707 Dayton Road | PO Box 1040 | Ottawa, IL 61350  
Phone: 815-433-5100 | Fax: 815-433-5109  
[www.bb-elec.com](http://www.bb-elec.com) | E-mail: [info@bb-elec.com](mailto:info@bb-elec.com)

© 2012 B&B Electronics Manufacturing Company

**B&B ELECTRONICS** **QUICK START GUIDE**



## FOSTCDRi & FOSTCDRi-INV Industrial Serial to Multi-mode Fiber Converters

### ✓ First Things First...

Before you begin, be sure you have the following:

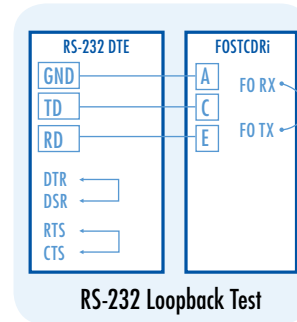
- FOSTCDRi Fiber Converter
- Additional items **required** but not included:
  - 10 - 48 VDC Power Supply
  - Serial Cable
  - Multi-mode Fiber Optic Cable with ST Connectors (62.5/125 micro-meter)

**B&B ELECTRONICS**  
Make The Right Connections

Fast and easy on the web: [www.bb-elec.com](http://www.bb-elec.com)

## 7 RS-232 Loopback Test

1. Configure the converter for RS-232.
2. Set DIP switch 12 to OFF.
3. Cross-connect the fiber optic transmitter to the fiber optic receiver.
4. Connect a PC to the serial port.
5. Using HyperTerminal or a similar program, connect to the appropriate COM port. Make sure that hyper terminal local echo is OFF.
6. Transmit data. If the same character set is returned, the test is good.



## FOSTCDRi & FOSTCDRi-INV Industrial Serial to Multi-mode Fiber Converters

### Information—UL Class 1 Div 2

1. Power, input /output (I/O) wiring must be in accordance with Class 1 Division 2 wiring methods [Article 501.10(B) of the National Electric code, NFPA70] and in accordance with the local authority having jurisdiction.
2. Maximum ambient air temperature 80° C.
3. WARNING – EXPLOSION HAZARD: SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.
4. WARNING – EXPLOSION HAZARD: WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES
5. WARNING – EXPLOSION HAZARD: DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
6. WARNING – THIS APPARATUS IS SUITABLE FOR USE IN CLASS 1 DIVISION 2, GROUPS A, B, C, AND D, OR UNCLASSIFIED AREAS.