



*Model: 485DRCI*  
**RS-232 to RS-422/485 Converter**  
*with Triple Isolation*

**Introduction**

The DIN rail mountable Model 485DRCI optically isolates and converts unbalanced, full or half-duplex RS-232 signals to optically isolated, balanced, full or half-duplex RS-422 or RS-485 signals at baud rates up to 115.2 kbps. This unit also surge suppresses the RS-422/485 lines. It also features Send Data Control circuitry which ensures no software control of handshake lines is required in RS-485 mode.

**LEDs**

3 LEDs indicate RS-485 Transmit Data, RS-485 Receive Data, and Power.

**Description**

The 485DRCI has screw down removeable terminal blocks on the RS-422/RS-485 side. The RS-232 input has a DB9 female connector. Transmit (TD), Receive (RD) and Ground are supported on the RS-232 input. The unit is powered by a supply voltage of 10 to 48VDC, which is isolated from all data and signal ground lines. Transmit Data A (-), Transmit Data B (+), Receive Data A (-), Receive Data B (+), and Ground are supported on the RS-422/RS-485 side. Communication features on the 485DRCI are dipswitch selectable on the unit.

**RS-485 Mode with Send Data Control**

Send Data Control recognizes the first bit of data from the RS-232 side, enables the transmitter and disables the receiver. After the last bit of data is sent from the RS-232 side, the timeout waits one character length, then disables the transmitter and enables the receiver. The timeout can be selected with dipswitches or by changing the value of R11 (see Table 2). If the system requires the line to be "turned around" faster, i.e. the slave device starts responding before the transmitter of the 485DRCI is disabled, R11 can be changed to meet the specific baud rate. Termination resistance can be selected with Switch 5 for high baud rates and long cable distances. See B&B Electronics' RS-422/485 Application Note available on the web site. Factory setting: 9600 baud.

**Table 1. Typical Communication Setups**

	Switch 1 TX Enable	Switch 2 RX Enable	Switch 3 2/4 Wire	Switch 4 2/4 Wire
<b>RS-485 2-Wire Mode</b> (half duplex)	On	On	On	On
<b>RS-485 4-Wire Mode</b> (full duplex)	On	Off	Off	Off
<b>RS-422 Mode</b> (full duplex)	Off	Off	Off	Off

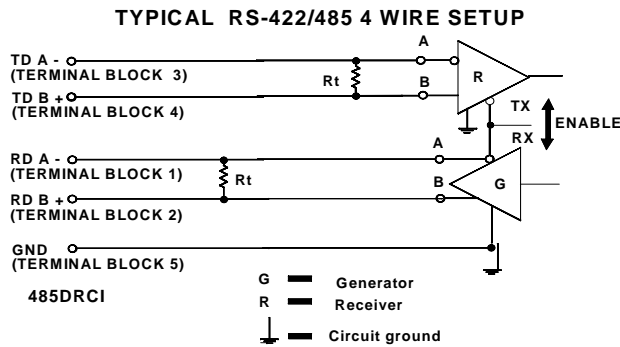
**Table 2. Baud Rate Selection**

	Switch 8	Switch 9	Switch 10	Switch 11	Switch 12	R11	Time (ms)
<b>1200</b>	Off	Off	Off	Off	Off	820kΩ	8.33
<b>2400</b>	On	Off	Off	Off	Off	Not Used	4.16
<b>4800</b>	Off	On	Off	Off	Off	Not Used	2.08
<b>9600</b>	Off	Off	On	Off	Off	Not Used	1.04
<b>19200</b>	Off	Off	Off	On	Off	Not Used	.580
<b>38400</b>	Off	Off	Off	Off	On	Not Used	.260
<b>57600</b>	Off	Off	Off	Off	Off	16kΩ	.176
<b>115200</b>	Off	Off	Off	Off	Off	8.2kΩ	.0868

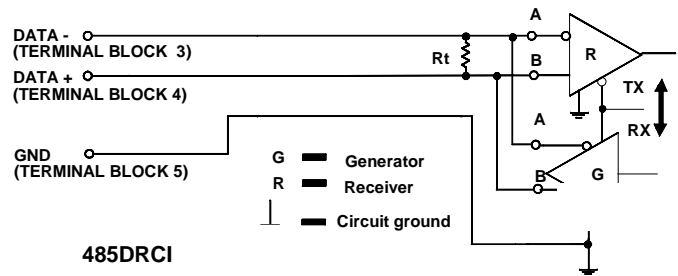


**International Headquarters:** 707 Dayton Road PO Box 1040 Ottawa, IL 61350 USA  
 815-433-5100 Fax 433-5104 [www.bb-elec.com](http://www.bb-elec.com) [orders@bb-elec.com](mailto:orders@bb-elec.com) [support@bb-elec.com](mailto:support@bb-elec.com)

**European Headquarters:** Westlink Commercial Park Oranmore Co. Galway Ireland  
 +353 91 792444 Fax +353 91 792445 [www.bb-europe.com](http://www.bb-europe.com) [orders@bb-europe.com](mailto:orders@bb-europe.com) [support@bb-europe.com](mailto:support@bb-europe.com)



**TYPICAL TWO-WIRE RS-485 SETUP**



In a two-wire setup, switches 3 & 4 should be "ON", making terminal block (3) the Data (-) line and terminal block (4) the Data (+) line.

**DB9 Female Configuration  
 RS-232 (DCE)**

- Pin 2 RD (output)
- Pin 3 TD (input)
- Pin 5 SIG. GND

**Terminal Block Configuration  
 RS-422/485**

- TDA (1) Tx inverted or (-) (output)
- RDA (3) Rx inverted or (-) (input)
- TDB (2) Tx non-inverted or (+) (output)
- RDB (4) Rx non-inverted or (+) (input)
- Iso. GND (5) Isolated RS-422/485 Signal Ground/Common

*Specifications*

- Dimensions: 4.9 x 4.1 x 1.3 in (12.4 x 10.4 x 3.2 cm)
- Temperature Range: -40 to +85 °C (-40 to +185°F)
- Humidity Range: 0 to 95% non-condensing
- Supply Voltage: 10 to 48VDC (+/- 20%) @ 960mW
- Data Rates: 1200 to 115,200 bps  
 2400 to 38400 bps switch selectable
- Connectors: Screw down terminal blocks for RS-422/485 sides,  
 DB9 female on the RS-232 side
- LEDs: Transmit Data, Receive Data and Power
- Isolation: 3-way isolation, 2000V RMS input/output/power supply
- Surge Suppression: 7.5V, bi-directional avalanche breakdown device  
 600W peak power dissipation
- Clamping Time: < 1 picosecond (theoretical)
- Approvals: cUL, Class1 Div2

**Table 3: Switch Setting (Down = ON)**

Switch	ON	OFF
1	TX Send Data	TX Enabled
2	RX Send Data	RX Enabled
3	2 Wire	4 Wire
4	2 Wire	4 Wire
5	Termination In	Termination Out
6	TX Bias Resistors Out	TX Bias Resistors In
7	RX Bias Resistors Out	RX Bias Resistors In
8	2400 Baud	
9	4800 Baud	
10	9600 Baud	
11	19.2 K Baud	
12	38.4 K Baud	

**DECLARATION OF CONFORMITY**

Manufacturer's Name: B&B Electronics Manufacturing Company  
 Manufacturer's Address: P.O. Box 1040  
 707 Dayton Road  
 Ottawa, IL 61350 USA  
 Model Numbers: 485DRCI  
 Description: Industrial Isolated RS-232 to RS-422/485 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



**International Headquarters:** 707 Dayton Road PO Box 1040 Ottawa, IL 61350 USA  
 815-433-5100 Fax 433-5104 [www.bb-elec.com](http://www.bb-elec.com) [orders@bb-elec.com](mailto:orders@bb-elec.com) [support@bb-elec.com](mailto:support@bb-elec.com)

**European Headquarters:** Westlink Commercial Park Oranmore Co. Galway Ireland  
 +353 91 792444 Fax +353 91 792445 [www.bb-europe.com](http://www.bb-europe.com) [orders@bb-europe.com](mailto:orders@bb-europe.com) [support@bb-europe.com](mailto:support@bb-europe.com)