

## Product End of Life Notification

Date: December 27<sup>th</sup>, 2011

### Product Being Discontinued

Model Number	Description
422OISPR	422 OPTO ISO CONV W/SURGE SUPP

### Replacement Product

Model Number	Description
4WSD25OTB	ISOLATED INLINE 485 CONVERTER, 25 PIN VERSION.

### Orders will be accepted and shipped until the following dates

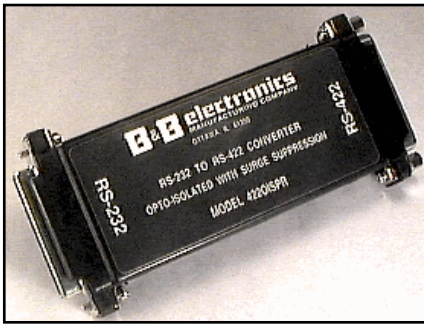
Last Time Buy:	April 1 <sup>st</sup> , 2012
Last Time Ship:	April 30 <sup>th</sup> , 2012

The replacement product is not an exact match. Please refer to the attached documentation for differences.


Contact us immediately if you have any special needs for this product or have any other concerns.

Thank You,

Brian Foster, Product Manager  
[bfoster@bb-elec.com](mailto:bfoster@bb-elec.com)

**Model 422OISPR**

## Reversed RS-232 to RS-422 Optically Isolated Converter

With DB-25 Connectors & Surge Suppression 

The RS-232 to RS-422 converter converts unbalanced RS-232 signals to balanced RS-422 signals. The RS-422 Standard uses a balanced voltage digital interface for cable lengths of 4000 feet. Ten receivers can be connected to any one driver for use in multi-drop systems.

The RS-232 port uses a female DB-25 connector with pins 2 (TD input) and 3 (RD output) supported. Power for the RS-232 side of the isolated converter is taken from the voltage, high or low, on the handshaking lines: pin 4 (RTS) and pin 20 (DTR). Pins 4 and 5 (CTS) are tied together. Pins 20, 6 (DSR), 8 (CD), and 20 are tied together.

The isolated RS-422 side of the converter has a male DB-25 connector to connect to the user's cables. Pin 2, TD (A), and pin 14, TD (B), are the RS-422 output. Pin 5, RD (A), and pin 17, RD (B), are the RS-422 input. For the RS-422 side of the converter, twelve volts DC is supplied through a power jack. A power supply is available from B&B Electronics. Surge suppression is provided for the RS-422 side across TD (A), TD (B) and also across RD (A), RD (B). The surge suppressor is a 7.5 V, bi-directional avalanche breakdown device, with 500W peak power dissipation and 1 picosecond (theoretical) clamping time. Surge suppressors add a maximum of 6000 picofarads.

### Interconnection of the converter with another RS-422 device:

1. The polarity of the two RS-422 lines must be correct. With no data being sent, the RS-232 line should be negative and the RS-422 "A" terminal should be negative with respect to the "B" terminal.
2. The wire recommended in the RS-422 Standard is number 24 AWG copper conductor, twisted-pair telephone cable with a shunt capacitance of 16pF per foot.
3. For long runs and/or high data rates, it is recommended that the wires be terminated with a resistor at the receive end. The twisted pair usually has an impedance of about 100 ohms, therefore a 100 ohm resistor is normally used for the termination. In no case should the termination resistor be less than 90 ohms.
4. The RS-422 driver has the ability to drive 10 RS-422 receivers connected in parallel. A system of multiple receivers may require some experimentation with location and size of termination resistors, line lengths, grounding, etc.

### To make the converter work:

1. The RS-232 side of the converter derives its power from pins 2 (TD), 4, 5, 6, 8, and 20. This converter has been tested with all the RS-232 power derived from pin 2, however, it is recommended that at least one additional handshake line be connected to the converter to provide power for the RS-232 side of the converter. The voltage level that exists on the handshake line does not matter. The converter will be able to derive power from the lines either in the positive or negative voltage state.

NOTE: When using an external supply, the supply should be connected only to specifically labeled power inputs (power jack, terminal block, etc.). Connecting an external power supply to the handshake lines may damage the unit. Contact technical support for more information on connecting an external power supply to the handshake lines.

2. The RS-422 side of the converter must be connected to a 12VDC 100 mA power supply. A power jack is provided on the RS-422 side of the converter to make this connection. To ensure proper isolation, the ground of the RS-422 side must not be connected to RS-232 side of the Signal Ground (pin 7) on the RS-232 side of the converter.

### 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:	422OISPR
Description:	Reversed Opt. Isolated RS-232/422 Converter w/Surge Suppressors
Type:	Light industrial ITE equipment
Application of Council Directive:	89/336/EEC
Standards:	EN 50082-1 (IEC 801-2, IEC 801-3, IEC 801-4) EN 50081-1 (EN 55022, IEC 1000-4-2) EN 61000 (-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11) ENV 50204 EN 55024



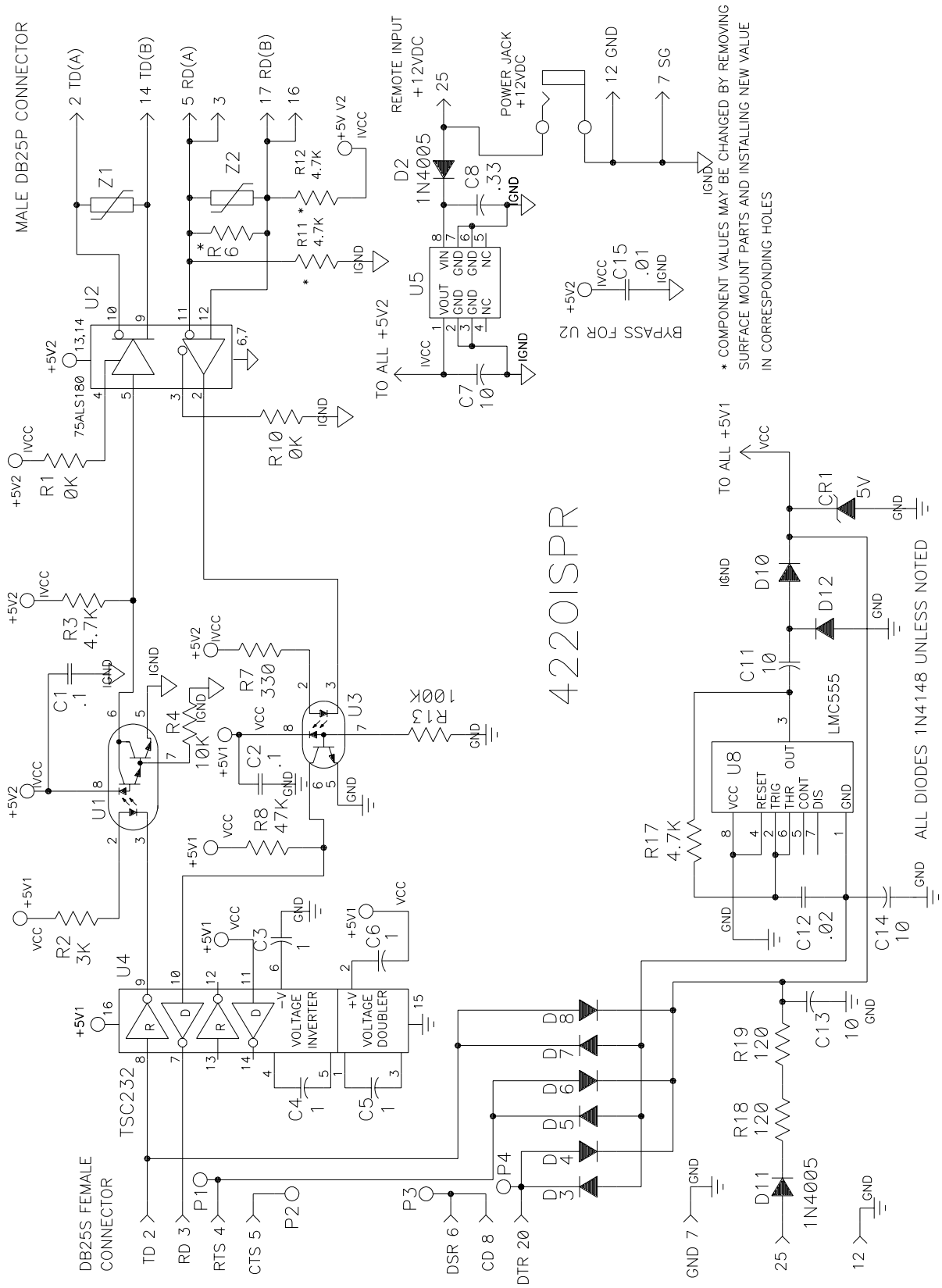
William H. Franklin III, Director of Engineering



**B&B electronics**  
MANUFACTURING COMPANY

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Models: 4WSD9OTB/4WSD25OTB

## Isolated Universal Converters

RS-232, 4-wire RS-422, 2-wire or 4-wire RS-485



### Features

- ✓ **High Speed Communications.** Supports data rates up to 115.2 kbps.
- ✓ **Extended communications.** Supports distances up to 4000 ft (1200 m).
- ✓ **Removable terminal blocks for easy RS-422/RS-485 connections.**
- ✓ **Switchable modes.** Supports 2-wire RS-485, 4-wire RS-485, and full duplex RS-422.
- ✓ **Automatic RS-485 driver control.** External software modifications are not required.
- ✓ **2000 VAC isolation.** Reliable in harsh electrical conditions.

### Functional Description

Isolates and converts RS-232 signals into RS-422 / RS-485 signals and vice versa. Unlike other converters, external software is not required to control data flow. The RS-232 input is wired for DCE and interfaced through a female DB25 or DB9 connector. RS-422 or RS-485 signals are connected to a removable terminal block. External power is applied to separate removable terminal block. A 10 – 48 VDC power supply (not included) is required.

### Ordering Information

Model Number	Description
4WSD9OTB	Converter with female DB9 RS-232 Connector
4WSD25OTB	Converter with female DB25 RS-232 Connector
7175	Power 2-position Terminal Block – one included
7372	Data 5-position Terminal Block – one included
9PAMF6	6ft. Serial Cable DB9M to DB9F
485PS2	120 VAC to 12 VDC Power Supply
PS2EU-1000	220/240 VAC to 12 VDC Power Supply; 2-Prong Euro Plug
PS2UK-1000	220/240 VAC to 12 VDC Power Supply; 3-Prong UK Plug



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## Operation

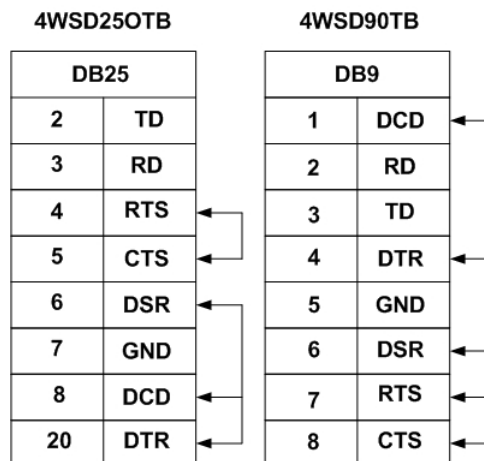
- Configure operating mode using guidance in Table 1.
- Common Applications are discussed in Figures 1 through 3.
- RS-232 connection requires RD, TD, and Signal Ground. The remaining signals are looped back within the converter as shown in Table 2.
- In half duplex operation, the receiver is enabled when not transmitting (Echo Off).
- In RS-422 mode, the driver is always enabled.
- In RS-485 mode, the RS-485 driver is automatically enabled during each space state by the presence of an RS-232 signal. When the RS-232 data is in a mark or idle state, the RS-485 driver is disabled and the RS-485 data lines are held in a mark state by the bias provided by a 4.7K  $\Omega$  resistor. The value of this resistor may need to be changed depending on the termination used.
- Refer to B&B Electronics' RS-422/RS-485 Application Note for detailed information concerning RS-422 and RS-485 networks. This document is available for download at [http://www.bb-elec.com/tech\\_articles](http://www.bb-elec.com/tech_articles).
- The loopback test mode switch is used with hyper terminal to verify the operation of the converter. Additional troubleshooting guidance is available at [http://www.bb-elec.com/technical\\_library.asp](http://www.bb-elec.com/technical_library.asp).

**Table 1 – Operating Mode Switch Settings**

Switches	Switch 1 (Tx)	Switch 2 (Rx)	Switch 3 (bridge)	Switch 4 (bridge)
<b>Operating Mode</b>				
RS-485 2-Wire Mode (half duplex)	RS-485	Echo Off	2-Wire	2-Wire
RS-485 4-Wire Mode (full duplex)	RS-485	Echo On	4-Wire	4-Wire
RS-422 4-Wire Mode (full duplex)	RS-422	Echo On	4-Wire	4-Wire
Loopback Test Mode*	As Desired	Echo On	2-Wire	2-Wire

- Used with HyperTerminal or another terminal program to confirm operation of data through converter.

**Table 2 – RS-232 Pin-out**



Loop back jumpers  
are pre-wired within  
the converter

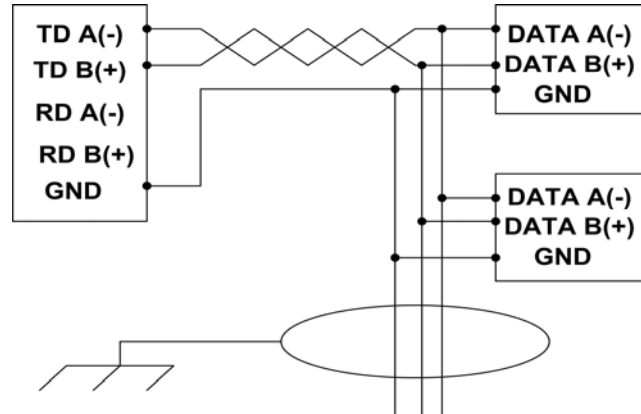


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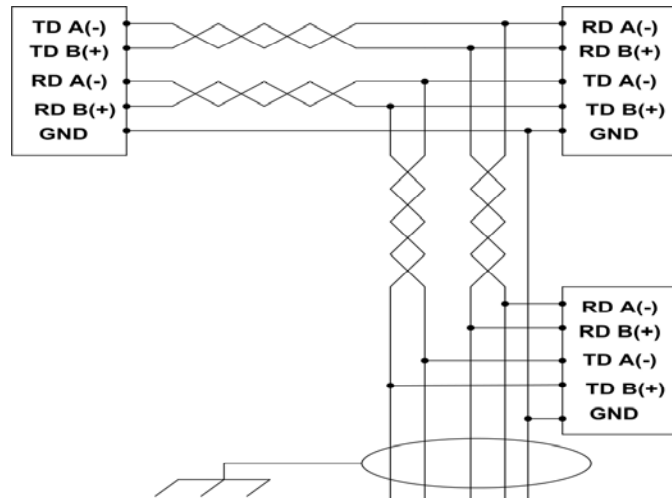
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**Figure 1: 2-Wire RS-485**

- Used to connect several RS-485 devices with minimal wire.
- Devices communicate one at a time.
- Units are normally in receive mode.
- When data is requested, the addressed device waits one delay time before responding.
- After transmitting, the device reverts to receive.
- Switch settings are: Switch 1: RS-485, Switch 2: Echo Off, Switches 3 and 4 to 2-Wire.

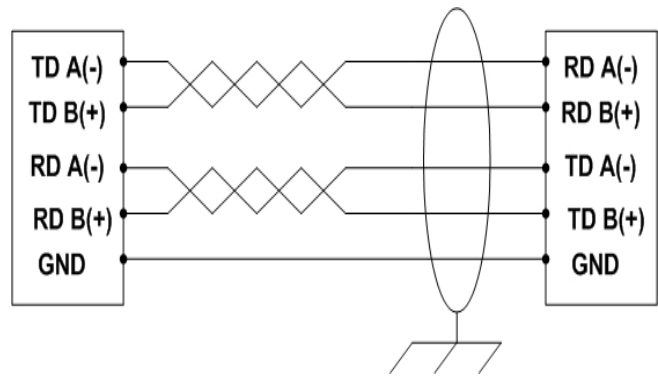
**Figure 2: 4-Wire RS-485**

- Used for 4-Wire Master/Slave circuits.
- Each device is polled, allowing faster response time.
- Addressed devices can receive while responding to a request.
- When used as a Master in a single master system, Switch 1 may be set RS-422 since it is the only transmitter.
- When used as a slave, the RS-232 device must provide addressability. Select RS-485 mode in this situation.
- Biasing is provided by the end-of-line slave.
- Switch settings for this mode are : Switch 1: RS-485, Switch 2: Echo On, Switches 3 and 4: 4-wire.





**Figure 3: 4-wire RS-422**

- Used as the master in a master/slave circuit with receive only slaves.
- Full-duplex communications.
- Requires a twisted pair for transmit, a twisted pair for receive, and a ground reference wire.
- Switch settings are: Switch 1: RS-422, Switch 2: Echo On, Switches 3 and 4: 4-wire.



## Specifications

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 Number:	4WSDxxOTB
Description:	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	
	

Input Power Requirement	10 – 48 VDC
Isolation	2000 VAC
Current Draw	28 mA at 12 VDC (typical)
RS-232 Connection	DB9/DB25
RS-422/RS-485 Connection	Removable Terminal Block
Data Rate	Up to 115.2 kbps
Operating Temperature	32 – 158°F (0 - 70°C)
LED Indicators	TD and RD
Dimensions (4WSD9OTB)	3.9 x 1.7 x 0.9 in 9.8 x 4.3 x 2.3 cm
Dimensions (4WSD25OTB)	3.9 x 2.2 x 0.9 in 9.8 x 5.5 x 2.3 cm
Approvals	CE



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