

High Speed (115kb) RS-232 to RS-422/485 Optically Isolated Converter With Surge Suppression Model 485HSPR



The 485HSPR is a high speed RS-232 to RS-422/485 converter with optical isolation and surge protection. RS-485 is an enhanced version of the RS-422 Standard that allows multiple drivers and receivers on a 2 or 4-wire system.

The RS-232 port has a female DB-25 connector with pins 2 (TD), 3 (RD), and 7 (Signal Ground) supported. Pins 4 (RTS) and 20 (DTR) are used to power the RS-232 side of the converter. If your port cannot supply this power, a power supply may be connected to the RS-232 pins 25 (+12 VDC) and 12 (ground). The RS-485 DB-25 male connector provides connection for Transmit Data A(-) and B(+), Receive Data A(-) and B(+), and Signal Ground. There is a power jack on the side of the converter which can be used to power the RS-485 side. A power supply is available from B&B as Part # 485PS. Power may also be connected through the 485 connector on pins 25 (+12 VDC) and 12 (ground).

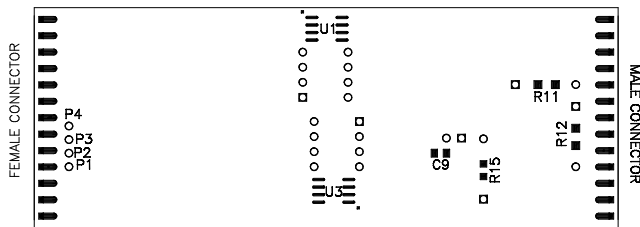
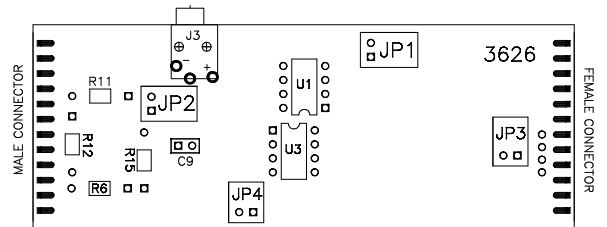


Figure 1



JUMPER SELECTION: DRIVER CONTROL

Jumpers JP1, JP3, and JP4 set the method used to control the RS-422/485 driver. Installing the jumper in position JP1 leaves the driver constantly enabled. This position should be used for RS-422 operation and when the 485HSPR will be the master node of a 4 wire RS-485 system.

Jumper position JP3 allows the driver to be directly controlled from the RS-232 RTS handshake line. The RS-232 device must raise RTS when transmitting out to the RS-422/485 system. When you are through transmitting, RTS must be lowered to allow the 485HSPR to receive and allow other drivers on the line to transmit.

Installing jumper JP4 enables an automatic send data circuit in the 485HSPR that takes care of the control of the RS-422/485 driver. This circuit senses data on Pin 2 (Transmit Data) of the RS-232 side of the converter and turns on the RS-422/485 driver. When the data is through transmitting, the 485HSPR waits one millisecond before shutting of the RS-422/485 driver. This preset time-out allows continuous transmission of data at 9600 baud or higher. If you need to change to a baud rate lower than 9600 baud, or would like to configure the 485HSPR for a specific rate, the time-out can be changed by changing the values of R15 and C9 according to Table 2. If these components need to be changed, you can remove the surface mount components and install new values in appropriate holes provided on the bottom of the board. See Figure 1 for the location of R15 and C9.

	JP1	JP2	JP3	JP4
RS-422 4-Wire Mode	X			
RS-485 2-Wire Mode				
RTS Control		?	X	
Send Data Control		?		X
RS-485 4-Wire Mode				
RTS Control			X	
Send Data Control				X
X = Jumper in place ? = Remove JP2 to enable echo feature				

NOTE: Only 1 of these 3 jumpers can be in place at a time. Which one depends on your configuration.

JUMPER SELECTION: RECEIVER CONTROL

The jumper JP2 (echo) determines when the RS-422/485 receiver will be disabled. Removing this jumper leaves the receiver on at all times. JP2 should be removed for any four wire setup including RS-422 operation. Putting JP2 on disables the receiver whenever the driver is turned on. This is useful in two wire mode when you do not want to see an echo of the data sent from the RS-232 device. Up to 32 receivers can be driven by any one RS-485 driver, allowing you to put together large systems with many drop points. If you are using termination resistors, they should be located at opposite ends of the system.

Figure 3 shows how to interconnect two RS-485 converters in a half-duplex system using two wires. The resistors Rt is optional, depending on line length, baud rate, etc. The resistor Rt should be about the impedance of the line used, which is normally about 120 ohms each. Proper operation of any RS-485 system requires the presence of a return path. The RS-485 Standard recommends that a third wire be used for this. For safety, a 100 ohm, 1/2 watt resistor should be connected between Signal Ground and the "reference wire" at every drop point. While it may be possible to interconnect Signal Grounds directly, this is not recommended due to the danger of circulating currents possibly being present. No wire type or maximum run length is listed in the RS-485 Standard. However, The RS-422 Standard (which is very similar) recommends number 24 AWG twisted-pair telephone cable with shunt capacitance of 16 picofarads per foot, and no more than 4000 feet long.

Table 2			
COMPONENT REPLACEMENTS CHANGING BAUD RATE			
Baud Rate	Time (ms)	Resistor (R15) (ohm)	Capacitor (C9) (mfd)
300	33.3	330K	0.1
600	16.6	160K	0.1
1200	8.33	820K	0.01
2400	4.16	430K	0.01
4800	2.08	200K	0.01
9600	1.04	100K	0.01
19200	.520	56K	0.01
38400	.260	27K	0.01
57600	.176	16K	.01
115200	.0868	8.2K	.01

SPECIFICATIONS:

- Data Rate: Up to 115.2K baud
- Connectors:
- RS-232 Side: DB-25 Female (DCE)
- RS-422/485: DB-25 Male (RS-530 Pinouts)
- Isolation: 2500VAC Optical Isolation of Data Signals & Ground
- Surge Suppression: 7.5V, bi-directional avalanche breakdown device.
- 500W peak power dissipation.
- Clamping time < 1 picosecond (theoretical).
- 6,000 pF maximum capacitance.

Power Requirements:

- RS-232 Side: Port-powered or 12VDC @ 30ma
- Robert M. Paratore, Director of Engineering RS-422/485: 12VDC @ 100ma

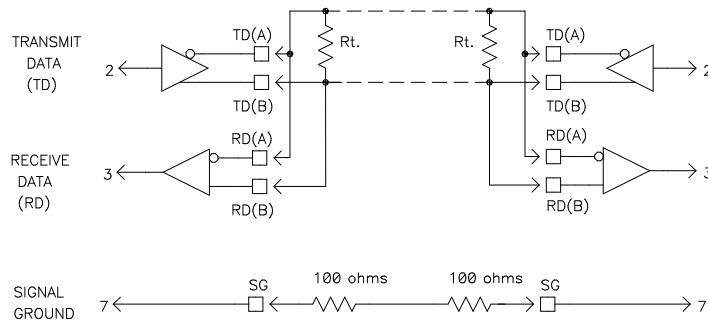


FIGURE 2. INTERCONNECTION DRAWING

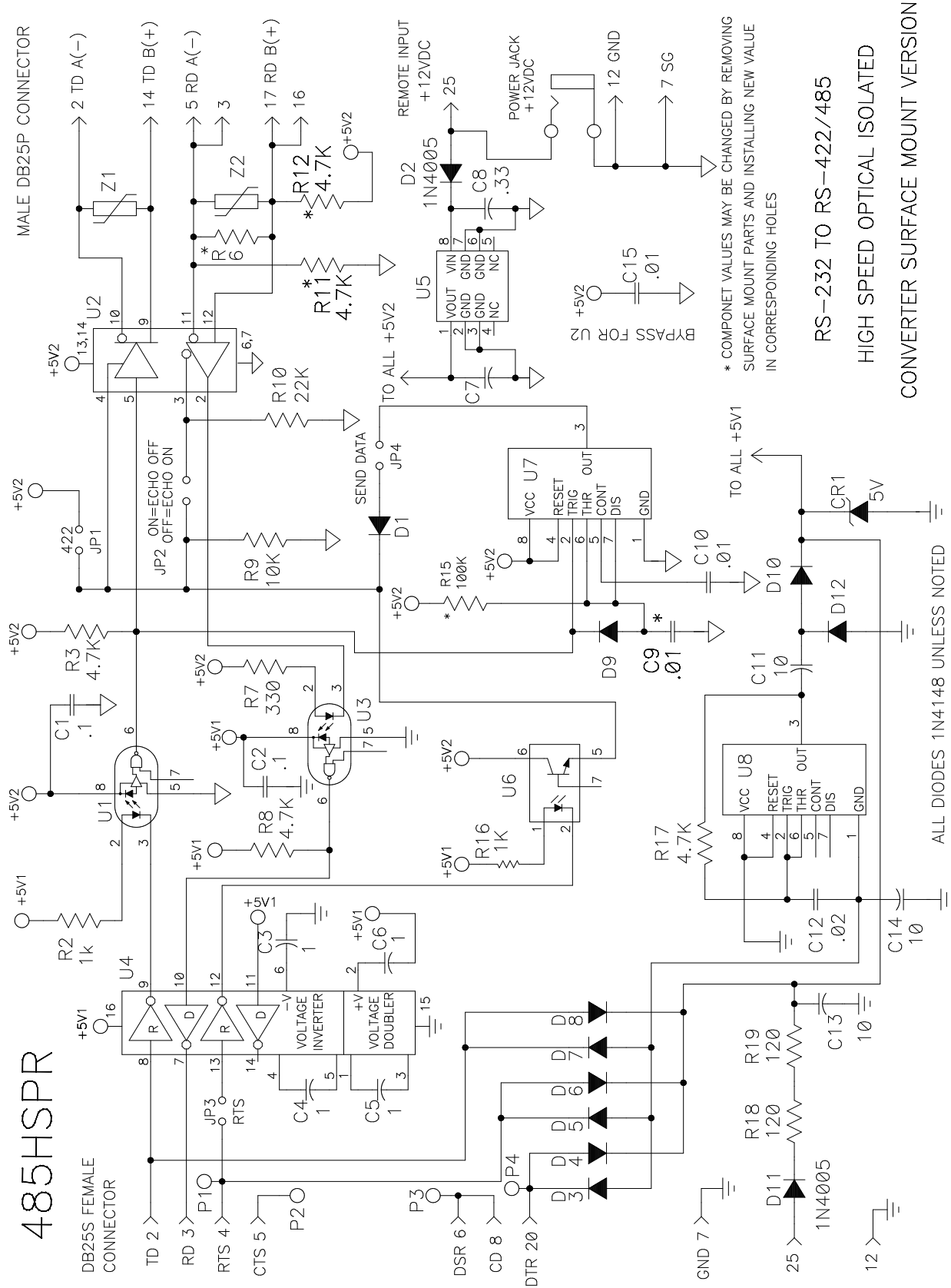
DECLARATION OF CONFORMITY

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

Robert M. Paratore
 Robert M. Paratore, Director of Engineering



485HSPR



RS-232 TO RS-422/485

HIGH SPEED OPTICAL ISOLATED

CONVERTER SURFACE MOUNT VERSION