

## Reversed RS-232 to RS-485 Converter $\text{CE}$

### With SD Control & Keyboard Power

### Model 485CSKR

The RS-232 to RS-485 converter converts unbalanced, full-duplex RS-232 signals to balanced, full or half-duplex RS-485 signals. RS-485 is an enhanced version of the RS-422 balanced line standard. It allows multiple drivers and receivers on a two-wire system.

COMPONENT REPLACEMENTS FOR CHANGING BAUD RATE TIMEOUTS			
Baud Rate	Time (ms)	Resistor (R1) (ohm)	Capacitor (C6) (mfd)
300	33.3	33K	1
600	16.6	16K	1
1200	8.33	82K	.1
2400	4.16	43K	.1
4800	2.08	20K	.1
9600	1.04	10K	.1
19200	.520	5.6K	.1
38400	.260	2.7K	.1
56000	.176	1.6K	.1
115000	.0868	8.2K	.01

**Table 1**

The RS-232 port has a female DB25S connector with pins 2 (TD input) and 3 (RD output) supported. Protective Ground (pin 1) and Signal Ground (pin 7) are also connected. The RS-485 port has a male DB25P connector with the Send Data outputs on pins 2 and 14, and Receive Data inputs on pins 3, 16, 5, and 17. Protective Ground (pin 7) is connected through to the RS-232 connector.

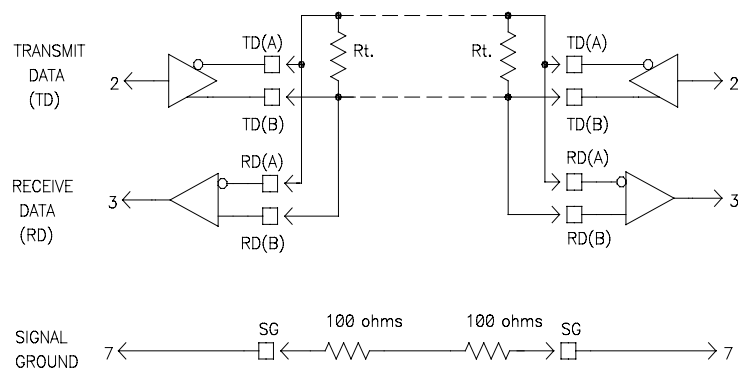
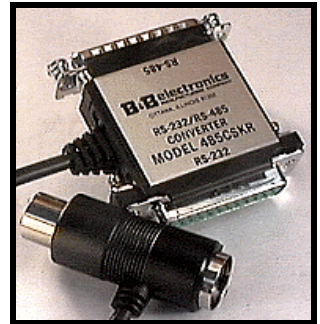


FIGURE 2. INTERCONNECTION DRAWING

Figure 2 shows how to interconnect two RS-485 converters using two signal wires. The resistors  $R_t$  are optional, depending on the line length, baud rate, etc. The resistors should be about the impedance of the line used, but in no case should they be less than 120 ohms each. No special software requirements are needed, since the 485 driver is enabled by the first transition on the RS-232 side of the transmit data (Pin 2) line. Any transition on the TD line keeps the RS-485 driver enabled by preventing the monostable multivibrator from timing out. The transmitter is disabled approximately 1 ms after the last transmitted character. This 1 ms timeout allows continuous transmission of data at 9600 baud or higher. If other baud rates are required, see Table 1.  $R_1$  and  $C_6$  are the two timeout components. Figure 1 shows where these components are located.

The 485CSKR has an internal connection to prevent data transmitted from the RS-232 port from being echoed back to the RRS-232 port. The connection can be cut to have the receiver always enabled. (See Figure 1.) After the connection is cut, a jumper wire from pin 18 to pin 21, on the RS-485 side, can be installed to disable the receiver during transmission. Up to 32 receivers can be driven by any one driver. This allows you to put together large systems with many drop points. The termination resistors should be located approximately at opposite ends of the system.

Proper operation of any RS-485 system requires the presence of a signal return path. The RS-485 Standard recommends that a third wire be used for this. For safety, a 100 ohm resistor should be connected between pin 7 and the "reference" wire at every drop point. While it may be possible to interconnect signal grounds (pin 7's) 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 a shunt capacitance of 16 picofarad per foot and no more than 4000 ft. of distance.

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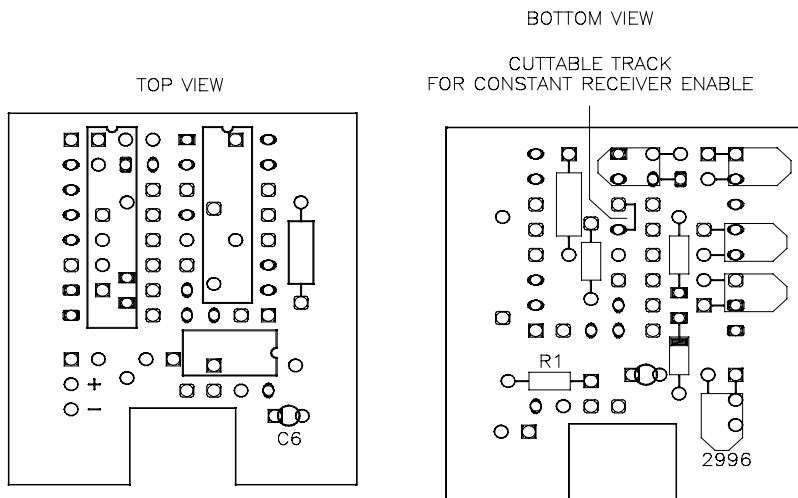
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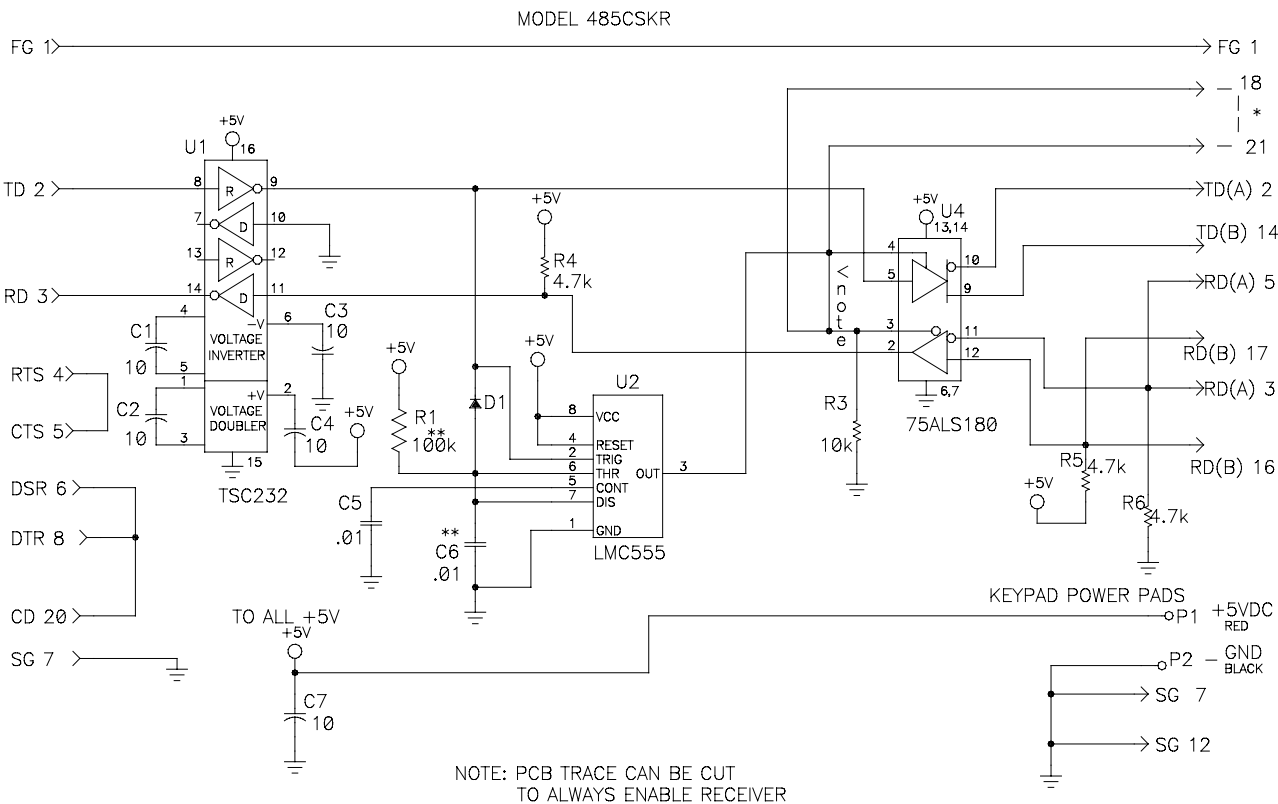
The polarity of the two RS-485 lines must be correct. With no data being sent, the RS-232 line should be negative and the RS-485 "A" terminal should be negative with respect to the "B" terminal. If your equipment uses a "+" and "-" naming scheme, in most cases the "A" line will be connected to the "-" and the "B" line will be connected to the "+".

This converter's power is supplied through a keyboard adapter cable. First, turn off the computer and unplug the keyboard from the back of the computer. Next, plug B&B's adapter into the back of the computer where the keyboard fits. Then plug the keyboard in on top of the adapter socket. If the computer's serial port is a DB-25 male, plug the female RS-232 side of the computer into the serial port.

**Figure 1**



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:	485CSKR
Description:	2-Channel RS-485 Converter w/SD Control
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
 Michael J. Fahrion, Director of Engineering	
	



\*\* CHANGE R1 & C6 FOR BAUD RATES OTHER THAN 9600.

\* AFTER TRACK IS CUT, A JUMPER WIRE FROM PIN 18 TO PIN 21 CAN BE USED TO DISABLE RECEIVER DURING TRANSMISSION

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