

RS-422/485 Line Repeater With Surge Suppression

Model 485RPTR



Introduction

The 485RPTR can extend RS-485 data lines an additional 4000 feet. The 485RPTR can expand an existing RS-485 system greater than the 32 node limitation defined by the RS-485 Standard. A typical setup using the 485RPTR as an RS-485 repeater is shown in Figure 3. The unit has surge suppression on both sides to dampen any transient voltage spikes.

The 485RPTR uses terminal blocks on each side of the device and supports Transmit Data (A) and (B), Receive Data (A) and (B), Signal Ground, and Protective Ground. Switch positions are the same for both switches on the 485RPTR (e.g. switch position 3 on both switches is 9600 baud).

Connection

The 485RPTR can operate in two-wire half-duplex systems, four-wire half-duplex systems, or full-duplex systems (see Figures 1 and 2). The 485RPTR can also operate as a four-wire to two-wire converter (Figure 2). By connecting one side of the 485RPTR as a two-wire device and one side as a four-wire device, equipment meant for a point-to-point RS-422 interface can be connected directly to an RS-485 two-wire multi-drop system.

As a good practice, protective ground (Prot.GND) should be tied to a good frame (chassis, green wire, or earth) ground. The RS-422/485 Application Note explains how to use termination resistance and how to ground RS-422/485 systems. The Application Note is available on B&B's web site or one can be mailed to you free of charge upon request.

Operation

When no data is being transmitted through the 485RPTR, the receivers are enabled on both sides of the device. As data is received on one side of the 485RPTR, the opposite driver is enabled. When the 485RPTR receives the falling edge of the last data bit, it waits one character time to disable the driver. This timeout period is factory preset for about one millisecond to accommodate a baud rate of 9,600 bits per second. The timeout period can be selected with dipswitches by removing the cover. The preset baud rate dipswitch settings available on the 485RPTR should accommodate most systems. Alternative timeouts can be achieved by turning the baud rate dipswitches OFF (for recommended baud rates timeouts see table 2) and placing a specified value through hole resistor (R7 & R26) and/or through hole capacitor (C2 & C7). Through hole resistor values for time-out periods are given in Table 2.

The 485RPTR is set up at B&B in two-wire mode (switch positions 7 & 8 are ON) at a baud rate of 9600 (switch position 3 is ON).

Specifications

Data Rates: Up to 460.8K baud.
Temperature Rating: 0°C to +80°C
Power Requirements: 9 to 14VDC @ 60mA
Dimensions: 3.8"L x 2.4"W x 1.0"H
FCC Approved Class A

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Table 1. Baud Rate Selection

	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	R7 & R26	Time (ms)
1200	OFF	OFF	OFF	OFF	OFF	OFF	820kΩ	9.02
2400	ON	OFF	OFF	OFF	OFF	OFF	Not Used	4.73
4800	OFF	ON	OFF	OFF	OFF	OFF	Not Used	2.20
9600	OFF	OFF	ON	OFF	OFF	OFF	Not Used	1.10
19200	OFF	OFF	OFF	ON	OFF	OFF	Not Used	.62
38400	OFF	OFF	OFF	OFF	ON	OFF	Not Used	.29
57600	OFF	OFF	OFF	OFF	OFF	ON	Not Used	.17
76800	ON	OFF	ON	ON	OFF	OFF	Not Used	.15
115200	ON	ON	ON	OFF	OFF	OFF	Not Used	.11
153600	OFF	OFF	OFF	OFF	OFF	OFF	6.2kΩ	.07
230400	OFF	OFF	OFF	OFF	OFF	OFF	4.3kΩ	.05
460800	OFF	OFF	OFF	OFF	OFF	OFF	2kΩ	.02

Table 2. Typical Setups

	Position 7 TX Enable	Position 8 RX Enable
RS-485 2-Wire Mode (half duplex)	ON	ON
RS-485 4-Wire Mode (full duplex)	ON	OFF
RS-422 Mode (full duplex)	OFF	OFF

FIG. 1 FOUR WIRE SETUP

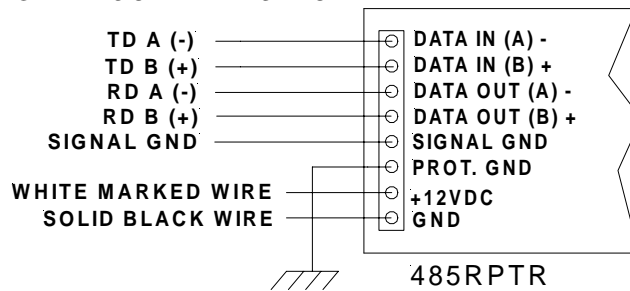


FIG. 2 485RPTR AS A FOUR WIRE TO TWO WIRE CONVERTER

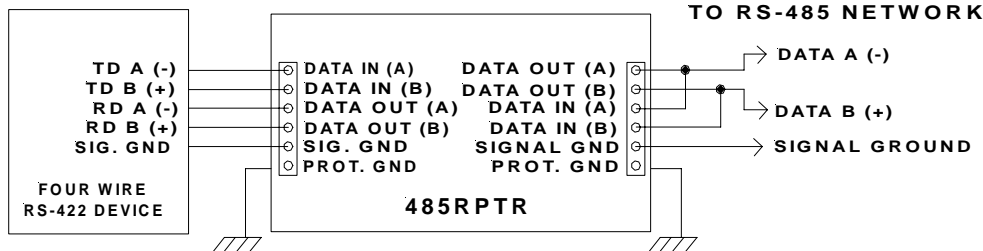
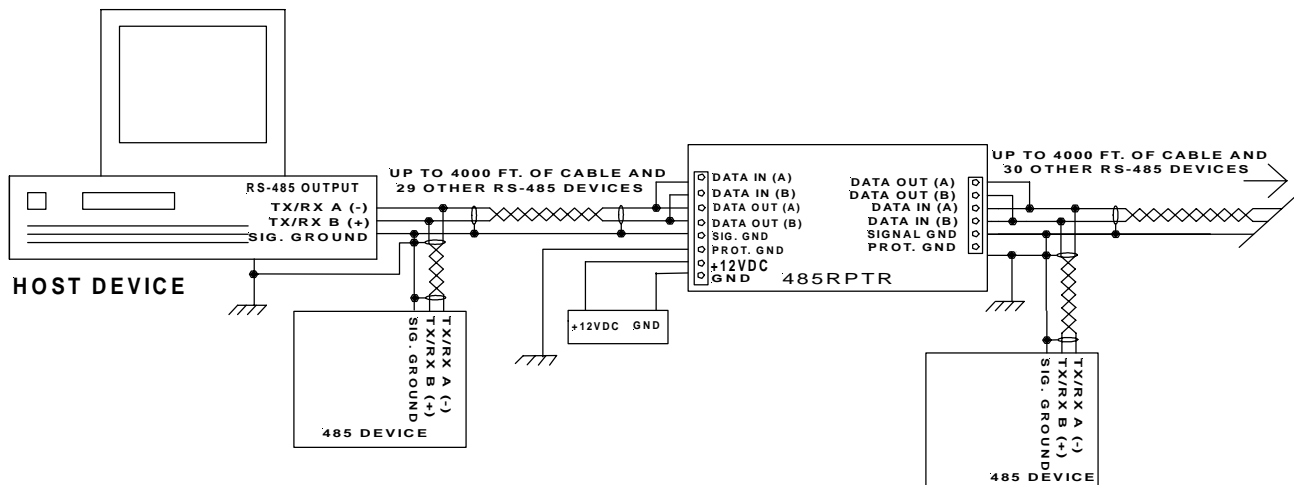


Fig. 3 485RPTR AS A TWO WIRE RS-485 REPEATER



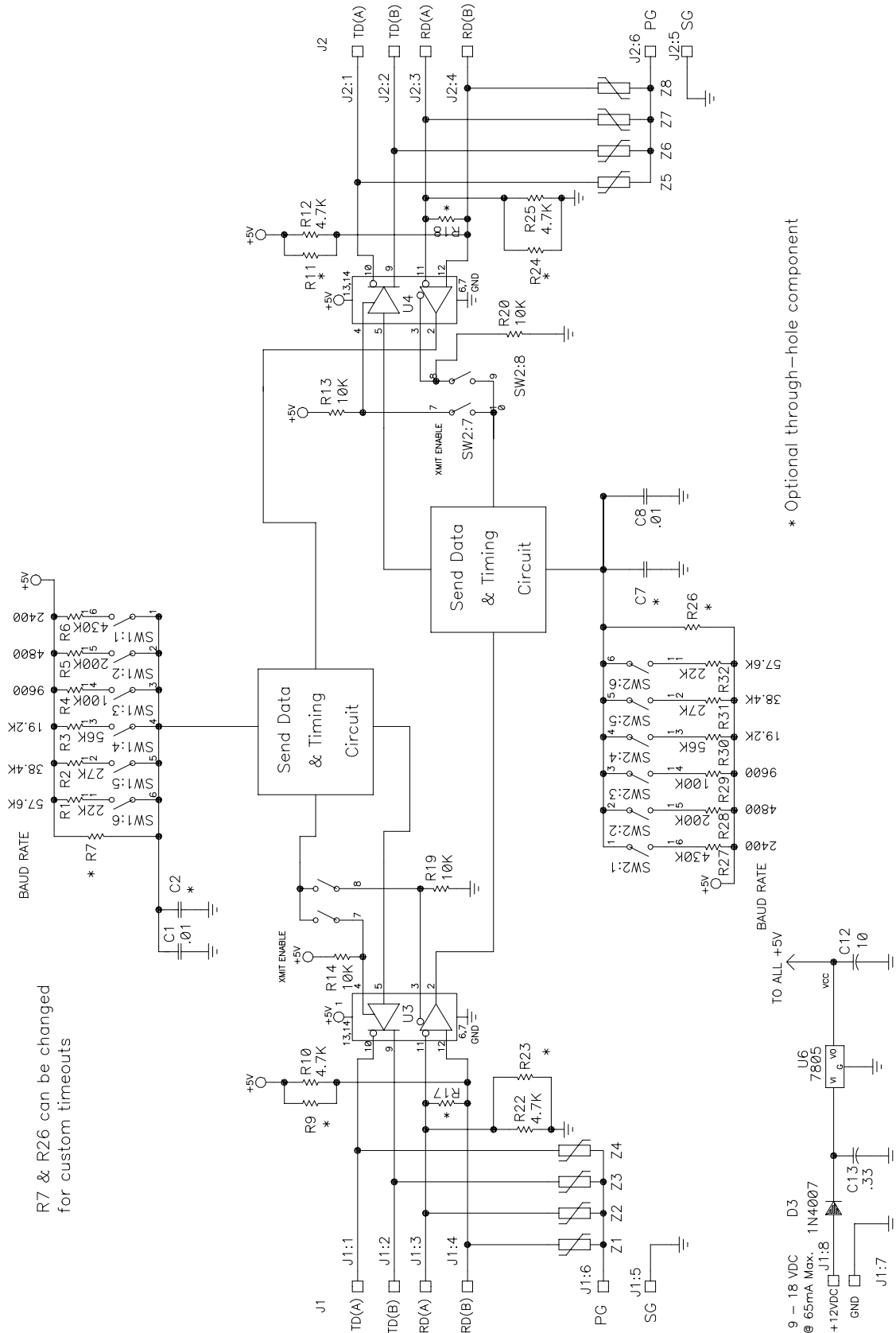
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R7 & R26 can be changed for custom timeouts

* Optional through-hole component

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