

# 9-pin Port-Powered RS-232 to RS-485 Converter

Model 485LP9TB

B+B SMARTWORX

Powered by

ADVANTECH

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- + Powered from RS-232 handshake lines – no power supply needed
- + Extends RS-232 signals to 1.22 km (4000 ft)
- + Automatic Send Data Control - no software drivers needed
- + Communicate at baud rates to 115.2 kbps (maximum)
- + Optional external powering

Model 485LP9TB is a port-powered, two-channel converter. It converts TD and RD RS-232 lines to balanced RS-485 signals. The unit can be powered from the RS-232 handshake lines, DTR and RTS. If port-powering the unit, one of these handshake lines must be asserted (high) in order to power the unit (See Table 1). DTR must be asserted to receive data. The RS-485 driver is enabled when RTS is asserted and disabled when RTS is disasserted. The RS-485 receiver is disabled when the driver is enabled and is enabled when the driver is disabled.

To maximize the amount of power available to the RS-485 driver, the RS-232 **handshake lines are not looped back** (tied together). As a result, the following handshake lines will appear as disasserted (low): CTS, DCD, and DSR. Care should be taken to ensure that any software being used does not require any of these handshake lines be asserted. If existing software requires any of the handshake lines to be asserted, you can loop back the required handshake lines in your cable.

## ORDERING INFORMATION

| MODEL NUMBER | RS-232 CONNECTOR | RS-485 CONNECTOR | OUTPUT        | OPTIONAL EXTERNAL POWER? |
|--------------|------------------|------------------|---------------|--------------------------|
| 485LP9TB     | DB9 Female       | Terminal Block   | RS-485 2-wire | Yes                      |

## ACCESSORIES - SOLD SEPARATELY

**SMi6-12-V-ST\*** - Power Supply, 12 VDC, 6 Watt, Stripped and Tinned, International AC Input, International AC Blades

**9PAMF6** - Serial Cable – DB9M--DB9F, 1.8 m (6 ft)

**Table 1. Handshake Lines & Port-Powering**

| RTS State | DTR State | Functions Possible<br>(when using port-power) |
|-----------|-----------|---|
| Low       | Low       | None  |
| Low       | High      | Receive Data                                  |
| High      | Low       | Transmit Data                                 |
| High      | High      | Transmit Data                                 |

\* NOTE: Low = disasserted and High = asserted

## Automatic Send Data Control Explained

As operating systems become more complex, it is increasingly difficult to control an RS-485 driver with standard software and the RTS line. This is especially true in Windows and multi-tasking operating systems. With Advantech B+B SmartWorx' Automatic Send Data Control circuit, driver control is in the converter hardware, so you do not have to work with software at all.

The circuit monitors data flow and enables the driver during transmission and automatically disables it when no data is being sent. There is no need to rework software or install new drivers. Most Advantech B+B SmartWorx RS-232 to RS-485 converters and RS-485 serial cards include Automatic Send Data Control.

## Why use an "optional" power supply with a port-powered converter?

Simply put, all RS-232 ports are not created equal. Many laptop PCs, for example, deliberately reduce power to the RS-232 port to save the battery. And, if you are working at the distance limits of RS-422 or 485, you might need an extra boost. For the majority of applications though, the converter's port powering is sufficient to accomplish the task.

All product specifications are subject to change without notice.  
485LP9TB\_0718

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ADVANTECH

orders@advantech-bb.com |  
eSales@advantech-bb.com

Headquarters: 707 Dayton Rd, PO Box 1040 Ottawa, IL 61350 USA (815)433-5100 or (800)346-3119/Toll Free Fax (815)433-5104  
European Office: Westlink Commercial Pk, Oranmore Co. Galway Ireland +353 91 792444 Fax +353 91 792445

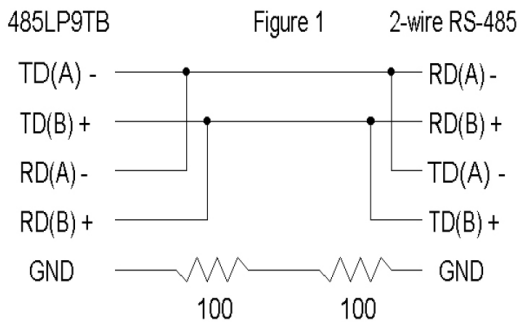
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## Connections

A typical two-wire RS-485 connected is shown in Figure 1. Regardless of the system, Model 485LP9TB must be connected with the proper polarity. With no data being sent and the driver enabled, the RS-232 line should be negative and the TD(A) should be negative with respect to TD(B).

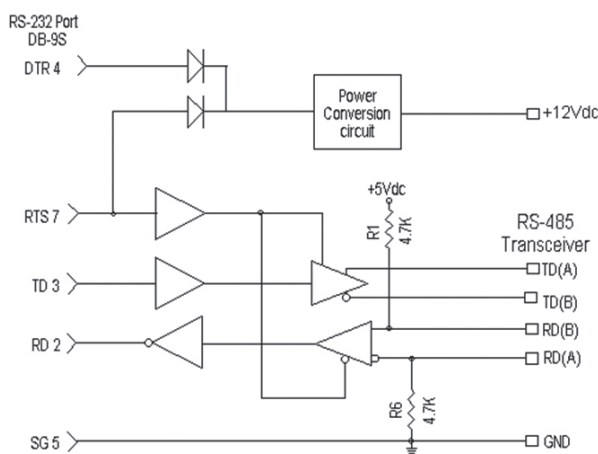


Proper operation of any RS-485 system requires the presence of a signal return path between the signal grounds of the equipment at each end of an interconnection. This circuit reference may be established by a third conductor connecting the common leads of devices, or it may be provided by connections in each equipment to an earth reference. When the circuit reference is provided by a third conductor, the connection between the signal grounds and the third conductor should contain some resistance (e.g. 100 Ohms) to limit circulating currents when other ground connections are provided for safety.

## Biasing Resistors

The biasing resistors for the RS-485 receiver are 4.7K Ohm resistors. These resistors are labeled R1 and R6 (See Figure 2). Refer to B+B SmartWorx RS-422/RS-485 Application Note for further information on biasing.

Figure 2



## SPECIFICATIONS

| SERIAL TECHNOLOGY                |   |
|----------------------------------|---|
| Data Rate                        | 115.2 kbps maximum  |
| RS-232 Connector                 | DB9 female  |
| RS-485 Connector                 | Terminal Block board  |
| Biasing Resistors                | 4.7k Ohms   |
| POWER                            |   |
| Source                           | Port-powering: from RS-232 handshake lines.<br>External power option, 12-16 VDC   |
| Power Connector                  | Terminal block  |
| Input Voltage                    | 12 VDC  |
| Power Consumption                | 40mA maximum  |
| MECHANICAL                       |   |
| Dimensions                       | 8.7 x 3.2 x 1.6 cm (3.4 x 1.3 x 0.6 in)   |
| Enclosure                        | Plastic   |
| Weight                           | 81.6 g (0.18 lb)  |
| MEANTIME BEFORE FAILURE (MTBF)   |   |
| MTBF                             | 8532569 hours   |
| MTBF Calc. Method                | MIL 217F Parts Count Reliability Prediction   |
| APPROVALS, DIRECTIVES, STANDARDS |   |
| FCC                              |   |
| CE - Directives                  | 2014/30/EU - Electromagnetic Compatibility Directive<br>2011/65/EU - Reduction of Hazardous Substances (RoHS)<br>2012/19/EU - Waste Electrical and Electronic Equipment (WEEE)  |
| CE - Standards                   | EN 55032 Class A - Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements<br>EN 55024 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement<br>EN 61000-6-4 + A1 - Generic Emission Standard for Industrial Environments (Class A)<br>EN 61000-6-2 - Generic Immunity Standard for Industrial Environments |

## MECHANICAL

