BB-422LP9R

Port-powered RS-232 to RS-422 Converter

Features

- Converts RS-232 TD and RD to balanced RS-422 signals
- Extends data up to 1.2 km (4000 ft)
- Data rate: up to 115.2 kbps baud
- Port-powered from RS-232 handshake lines (DTR, RTS)
- Inline installation
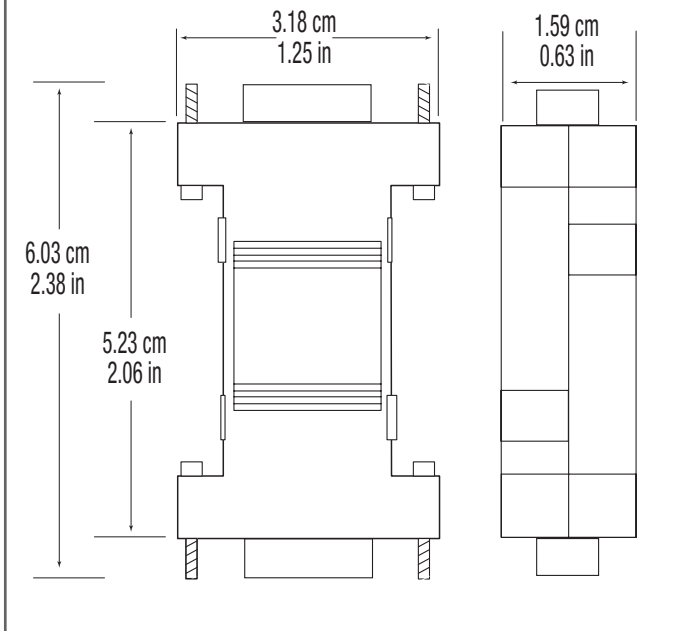- 4.7K Ohm biasing resistors
- FCC, CE certifications

Introduction

Model BB-422LP9R is a port-powered, two-channel RS-232 to RS-422 converter. It converts TD and RD RS-232 lines to balanced RS-422 signals. The unit is powered from the RS-232 handshake lines DTR and RTS.

Do You Need An Externally Powered Converter?

If you need an externally powered converter, Model# BB-4WSD9R is a suitable option.

Ordering Information

Model No.	RS-232 Connector	RS-422 Connector	Power
BB-422LP9R	DB9 Female	DB9 Female	RS-232 Handshake Lines DTR & RTS

Accessories – Sold Separately

BB-9PAMF6 - Serial Cable, DB9M to DB9F, 1.8 meters (6 ft)

Mechanical Diagram

Units - cm/in

3.18 cm
1.25 in

1.59 cm
0.63 in

6.03 cm
2.38 in

5.23 cm
2.06 in

Specifications

Serial Technology	
Data Rate	Up to 115.2 Kbps baud
RS-232 Connector	DB9 female
RS-422 Connector	DB9 female
Biasing Resistors	4.7k Ohms
Power	
Source	Port-powered from RS-232 handshake lines
Mechanical	
Dimensions	6.2 x 3.3 x 1.1 cm (2.4 x 1.3 x 0.43 in)
Enclosure	Plastic
Weight	81.6 g (0.18 lb)
Environmental	
Operating Temperature	0 to +70 °C (+32 to +158 °F)
Storage Temperature	40 to +85 °C (-40 to +185 °F)
Operating Humidity	0 to 95%, non-condensing
Meantime Between Failures (MTBF)	
MTBF	3020199 hours
Calculation Method	MIL 217F Parts Count Reliability Prediction
Regulatory – Approvals / Standards / Directives	
FCC, CE	
CE – Directives	2014/30/EU - Electromagnetic Compatibility Directive (EMC) 2011/65/EU - Amended by (EU) 2015/863 Reduction of Hazardous Substances Directive (RoHS) 2012/19/EU - Waste Electrical and Electronic Equipment (WEEE)
CE – Standards	EN 55032 Class A - Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements EN 55024 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement EN 61000-6-1 - Generic Immunity Standard for Industrial Environments

Operation Tips

Model BB-422LP9R is powered from the RS-232 handshake lines DTR and RTS. One of these handshake lines must be asserted (high) in order to power the unit. (See Table 1). The RS-422 driver is enabled when RTS is asserted. RTS must be asserted in order to transmit data. The RS-422 receiver is always enabled. If DTR is always asserted and RTS is used to control the driver, Model BB-422LP9R can be used as an RS-232 to RS-485 4-wire converter. To ensure reception, it is recommended that DTR is asserted.

In order to maximize the amount of power available to the RS-422 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 to 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.

Table 1. Handshake Lines & Port-Powering

RTS State	DTR State	Functions Possible (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		

Connections

Model BB-422LP9R can be connected in three different types of systems: RS-422 (Figure 1), four-wire RS-485 (Figure 1), and two-wire RS-485 (Figure 2). Regardless of the system, Model BB-422LP9R must be connected with the proper polarity. With no data is being sent and the driver enabled, the RS-232 line should be negative and TD(A) should be negative with respect to TD(B).

Proper operation of any RS-422 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 piece of 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.
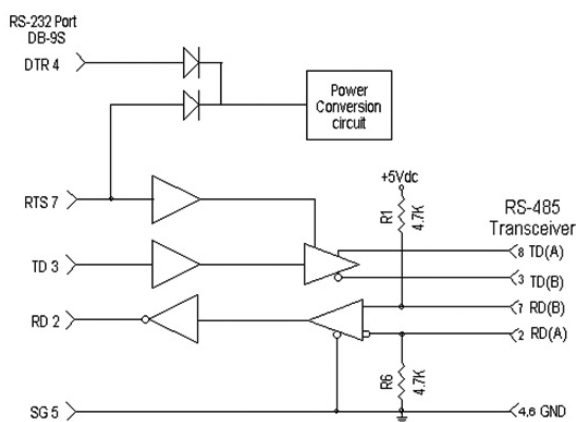

Table 2. Pin-outs
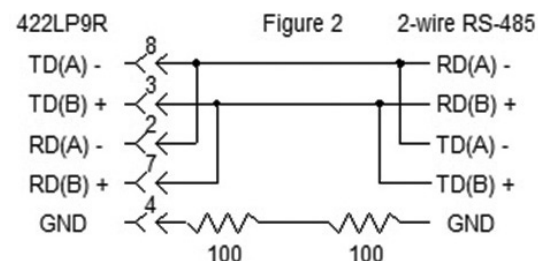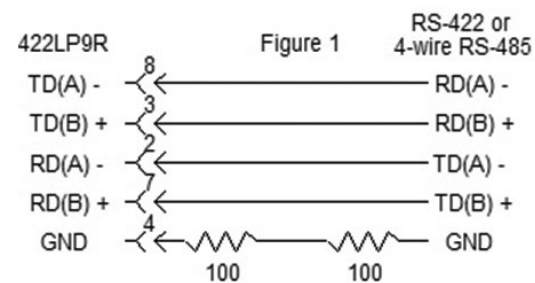
Signal	DB9S Pin#
Transmit Data A (-)	8
Transmit Data B (+)	3
Receive Data A (-)	2
Receive Data B (+)	7
Signal Ground	4, 6

Biasing Resistors

The RS-422/RS-485 receiver biasing resistors are 4.7K Ohm resistors. The resistors are labeled R1 and R6 (see Figure 3). Refer to Advantech's "RS-422/485 Application Note" for more information on biasing (available on website).

Figure 3

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