Port-Powered RS-232 to RS-422 Converter

Model BB-422LP9R

www.advantech.com

FEATURES

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

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.

SPECIFICATIONS

SERIAL TECHNOLOGY	
Data Rate	115.2 kbps maximum
RS-232 Connector	DB9 female
RS-422 Connector	DB9 female
Biasing Resistors	4.7k Ohms
POWER	
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)
MEANTIME BETWEEN FAILURE (MTBF)	
MTBF	3020199 hours
MTBF Calc. Method	MIL 217F Parts Count Reliability Prediction
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
APPROVALS / CERTIFICATIONS	
FCC, CE	
2014/30/EU	Electromagnetic Compatibility Directive (EMC)
2011/65/EU	Reduction of Hazardous Substances Directive (RoHS)
2012/19/EU	Waste Electrical and Electronic Equipment (WEEE)
EN 55032 Class A - Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements	
EN 55024 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement	
EN 61000-6-4 + A1 - Generic Emission Standard for Industrial Environments (Class A)	
EN 61000-6-2 - Generic Immunity Standard for Industrial Environments	

ORDERING INFORMATION

MODEL NUMBER	RS-232 CONNECTOR	RS-422 CONNECTOR
BB-422LP9R	DB9 Female	DB9 Female

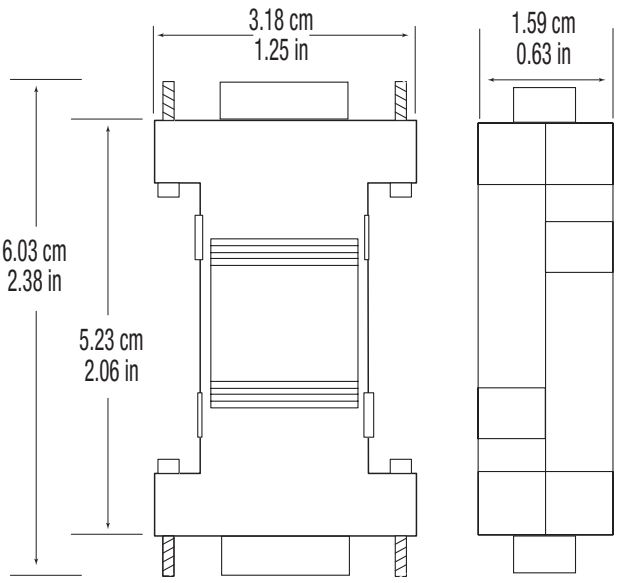
ACCESSORIES - optional, sold separately

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

Do You Need An Externally Powered Converter?

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

MECHANICAL DIAGRAM



All product specifications are subject to change without notice.
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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 the 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 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

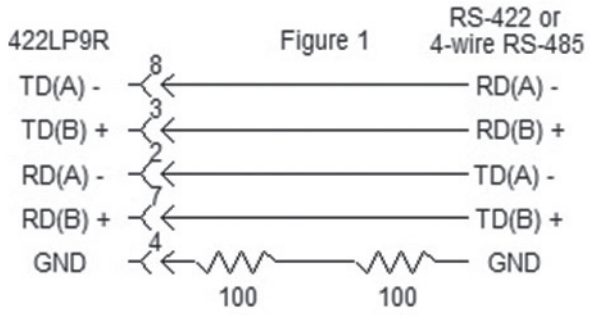
RTS State	DTR State	Functions Possible (when using port-power)
Low	Low	None
Low	High	Receive Data
High	Low	Transmit Data
High	High	Transmit Data

* NOTE: Low = disasserted and High = asserted

Connections

Model BB-422LP9R can be connected in three different type 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.



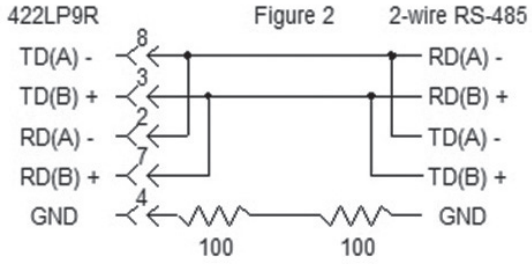


Table 2. Pin-outs

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 the Advantech B+B SmartWorx RS-422/485 Application Note for more information on biasing (available on website).

Figure 3