Introduction

These four channel TTL/CMOS converters make easy connections between TTL equipment and RS-232 ports and operate at data rates up to 115.2 kbps. Use these converters with almost any micro-controller or programmable logic controller (PLC) that supports TTL.

Model BB-232LPTTL converts RS-232 to 5 Vdc TTL/CMOS compatible levels.

Model BB-232LPTTL33 converts RS-232 to 3.3 Vdc TTL/CMOS compatible levels.

The models convert two channels (TX and RX) in each direction (bi-directional) from RS-232 to TTL/CMOS signals. And two channels are used to convert from TTL/CMOS to RS-232 signals.

The converters support TD, RD, RTS, and CTS. The RS-232 side is a DB9S female connector; The TTL/CMOS side is a DB9P male connector.

Both models are powered from the RS-232 data and handshake lines by signals on pins 7(RTS), 4 (DTR), and 3(TD). These lines can be either high or low, but must be present to power the converter. Pin 5 is Signal Ground for both connectors.

NOTE:
It is important that TTL/CMOS logic, and only TTL/CMOS logic (0 to +5 Vdc for the BB-232LPTTL, and 0 to +3.3 Vdc for the BB-232LPTTL33) is used for the TTL/CMOS side of the converter. The maximum sinking current for one TTL/CMOS output is 3.2 mA. The maximum source current for one TTL/CMOS is 1 mA. Signal levels are inverted by the converters. Please refer to the table.

Features

- Converts 2 channels in each direction from TTL (“Transistor Transistor Logic”) to RS-232
- Baud rates up to 115.2 kbps
- Powered from RS-232 data/handshake lines - no power supply required
- 5 and 3.3TTL options

Ordering Information

<table>
<thead>
<tr>
<th>Model No.</th>
<th>RS-232 Connector</th>
<th>TTL Connector</th>
<th>TTL Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB-232LPTTL</td>
<td>DB9 Female</td>
<td>DB9 Male</td>
<td>5 V</td>
</tr>
<tr>
<td>BB-232LPTTL33</td>
<td>DB9 Female</td>
<td>DB9 Male</td>
<td>3.3 V</td>
</tr>
</tbody>
</table>

Accessories – Sold Separately

BB-9PAMF6 – Serial cable, DB9 male to DB9 female, 1.8 m (6 ft)
BB-MMNM9 – Null modem adapter, DB9 male / DB9 male

All product specifications are subject to change without notice.
Specifications

Serial / TTL Technology

RS-232 Connector  DB9 female
RS-232 Signals  TD, RD, RTS, CTS
TTL Connector  DB9 male
TTL Signals  2 Input/2 Output channels, GND
TTL Logic  CMOS
Vdc Level  BB-232LPTTL: 5V  BB-232LPTTL33: 3.3V
Data Rate  115.2 kbps, maximum

Power

Source  Port-powered from RS-232 data/handshake lines
Power Consumption  <40 mA

Mechanical

Dimensions  5.29 x 3.33 x 1.74 cm (2.08 x 1.31 x 0.66 in)
Enclosure  Plastic, In-line
Weight  36.2 g (0.08 lb)

Meantime Between Failures (MTBF)

MTBF  BB-232LPTTL: 5833353  BB-232LPTTL33: 1674682
Calculation Method  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

Regulatory – Approvals / Standards / Directives

FCC Part 15, Class B Emissions, CE, UKCA
CE - Directives  2014/30/EU – Electromagnetic Compatibility
                 2011/65/EU – amended by (EU) 2015/863 Reduction of Hazardous Substances (RoHS)
                 2012/19/EU – Waste Electrical and Electronic Equipment (WEEE)
CE - Standards  EN 55032 (Class B) – Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements
                EN 55024 - Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement

Pin-outs

<table>
<thead>
<tr>
<th>RS-232 DB9S Female</th>
<th>Function</th>
<th>TTL/CMOS DB9P Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 (Input)</td>
<td>TD</td>
<td>3 (Output)</td>
</tr>
<tr>
<td>2 (Output)</td>
<td>RD</td>
<td>2 (Input)</td>
</tr>
<tr>
<td>7 (Input)</td>
<td>RTS</td>
<td>7 (Output)</td>
</tr>
<tr>
<td>8 (Output)</td>
<td>CTS</td>
<td>8 (Input)</td>
</tr>
<tr>
<td>5 (Signal Gnd)</td>
<td>GND</td>
<td>5 (Signal Ground)</td>
</tr>
</tbody>
</table>

Polarity

<table>
<thead>
<tr>
<th>5 Vdc TTL/CMOS Input</th>
<th>3.3 Vdc TTL/CMOS Input</th>
<th>RS-232 Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (&lt;0.8 V)</td>
<td>Low (&lt;0.8 V)</td>
<td>+5.0, minimum +9.0, typical</td>
</tr>
<tr>
<td>High (&gt;2.0 V)</td>
<td>High (&gt;2.0 V)</td>
<td>-5.0, minimum +9.0, typical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 Vdc TTL/CMOS Output</th>
<th>3.3 Vdc TTL/CMOS Output</th>
<th>RS-232 Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>+3.45, minimum</td>
<td>+2.4, minimum</td>
<td>Low (0.2 V)</td>
</tr>
<tr>
<td>+4.6, typical</td>
<td>+3.0, typical</td>
<td></td>
</tr>
<tr>
<td>+0.55, maximum</td>
<td>+0.55, maximum</td>
<td>High (&gt;2.4 V)</td>
</tr>
<tr>
<td>+0.1, typical</td>
<td>+0.1, typical</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions – BB-232LPTTL, BB-232LPTTL33

[Dimensions diagram]

BB-232LPTTL
BB-232LPTTL33