# Professional +3V to +5.5V, 250kbps, RS-232 Interface with Configurable Handshaking

Suitable for use in a variety of microcontroller and robotic projects, this RS-232 interface board provides a small and simple way to convert TTL and CMOS UART signal levels to those required by EIA/TIA-232 and V.28/V.24 specifications for RS-232 transmission at guaranteed minimum speeds of 250kbps.

Figure 1-1. RL001 RS-232 Interface Board.
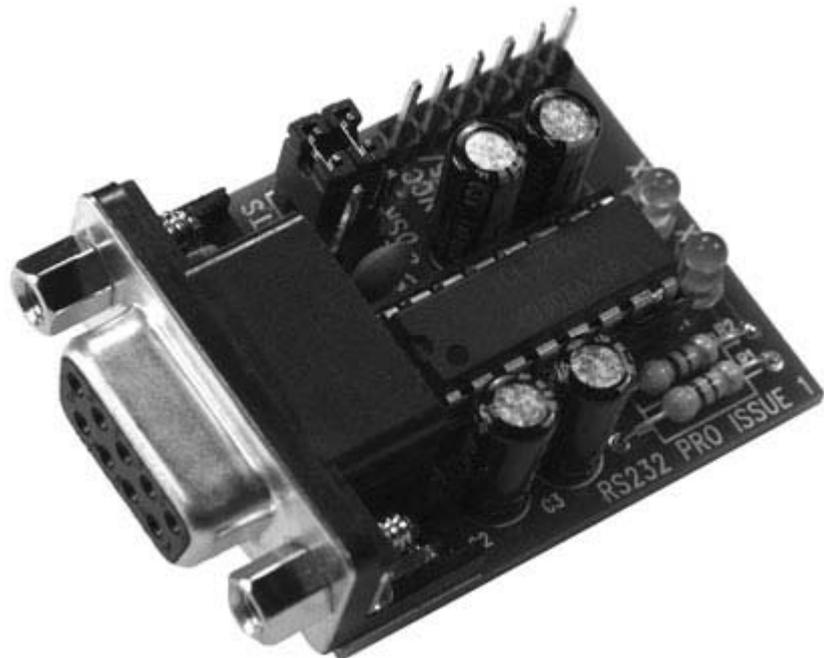
2. Features

- 3.0V to 5.5V powered.
- Meets EIA/TIA-232 and V.28/V.24 specifications at 3V.
- 250kpbs guaranteed minimum data rate.
- Supports RTS/CTS or DTR/DSR hardware handshaking.
- RS-232 compatible down to 2.7V.
- Low power requirements (typically less than 10mA in normal use).
- Receive and transmit status LEDs.
- 15kV ESD protected IC (Human Body Model).
- Operating temperature 0ºC to 70ºC.
- Small board size measuring just 32mm x 38mm (1.26" x 1.50").

3. Pin Descriptions

PIN	FUNCTION
V_{CC}	Power supply input (3.0V to 5.5V).
CTS/DSR	Handshaking from TTL/CMOS device.
TXD	Data from TTL/CMOS device.
RXD	Data to TTL/CMOS device.
RTS/DTR	Handshaking to TTL/CMOS device.
GND	Ground connection.

4. Configuring Hardware Handshaking

When sending or receiving, handshaking allows the flow of data to be controlled to prevent data from being sent if the receiver is not ready. This can also be known as flow control. Hardware handshaking uses positive and negative voltages along dedicated pins or cables to signal whether data can be transmitted or not. This prevents the handshaking signals from interfering with the data.

The two common methods of hardware handshaking is request to send/clear to send (RTS/CTS) and data terminal ready/data set ready (DTR/DSR). Both methods work in similar ways and are both supported by this interface board.

The hardware handshaking signals can be configured by jumper links on the 6-pin header labeled J3. The corner pins are labeled with their function with the middle pins allowing for the handshaking signals to be converted to TTL/CMOS levels. By fitting a jumper across two labeled functions the handshaking method is looped allowing for any request to be immediately accepted.
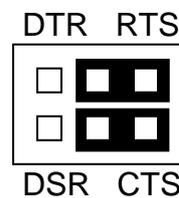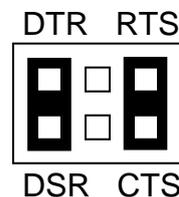
Figure 4-1. Configured for RTS/CTS Handshaking.

DTR   RTS

DSR   CTS

Figure 4-2. RTS/CTS and DTR/DSR Looped.

DTR   RTS

DSR   CTS

5.   Troubleshooting

- Measure the voltage between pins V_{cc} and GND to check that it matches the supply voltage of the TTL/CMOS device (this voltage should be between +3V and +5.5V).

- Perform a loopback test by connecting TXD to RXD (this may be done with one of the configuration jumpers) and supplying suitable power and grounding. With a standard straight through serial cable attached to the board and to a PC any character transmitted from the PC should also be received by the PC.

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