

# **BRD-RS232-TTL-1**

## **Peripheral Board**

## **Technical Manual**

Date: November 24, 2010

Document Revision:1.02



**BiPOM Electronics**

16301 Blue Ridge Road, Missouri City, Texas 77489  
Telephone: 1-713-283-9970. Fax: 1-281-416-2806  
E-mail: [info@bipom.com](mailto:info@bipom.com)  
Web: [www.bipom.com](http://www.bipom.com)

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#### WARRANTY:

BiPOM Electronics warrants RS232 adapter for a period of 1 year. If the board becomes defective during this period, BiPOM will at its option, replace or repair the board. This warranty is voided if the product is subjected to physical abuse or operated outside stated electrical limits. BiPOM Electronics will not be responsible for damage to any external devices connected to RS232 adapter. BiPOM Electronics disclaims all warranties express or implied warranties of merchantability and fitness for a particular purpose. In no event shall BiPOM Electronics be liable for any indirect, special, incidental or consequential damages in connection with or arising from the use of this product. BiPOM Electronics' liability is limited to the purchase price of this product.

# TABLE OF CONTENTS

<b>1. OVERVIEW</b>	<b>4</b>
<b>2. SPECIFICATIONS</b>	<b>4</b>
<b>3. FUNCTIONAL BLOCKS</b>	<b>5</b>
<b>4. BOARD LAYOUT</b>	<b>11</b>
<b>5. SCHEMATICS</b>	<b>12</b>

## 1. Overview

BRD-RS232-TTL-1 RS232 to TTL Converter is a multi function board for converting the RS232 port of MINI-MAX boards, PC's or any other RS232 devices to TTL/CMOS level. Useful when breadboarding or when interfacing with devices, such as GPS, Bluetooth, Zigbee and other modules that supports only TTL RS232.

## 2. Specifications

BRD-RS232-TTL-1 board has the following configuration:

- DB-9 connector for data communications with a microcontroller board or with a Personal Computer.
- 12-pin single row header for UART-0 connections.
- Four LED's to indicate the status of the UART-0 signals.
- Two 10-pin single row headers for XBee XB24-ACI-001 ZigBee module connections (Zigbee module is optional).
- 2.1mm Power Jack for power source connection.
- Dimensions are 2.85 X 1.45 inches (7.24 X 3.68 centimeters).
- 0° - 70° C operating, -40° - +85° C storage temperature range.

### 3. Functional Blocks

Figure 1 shows the block diagram of the BRD-RS232-TTL-1 board

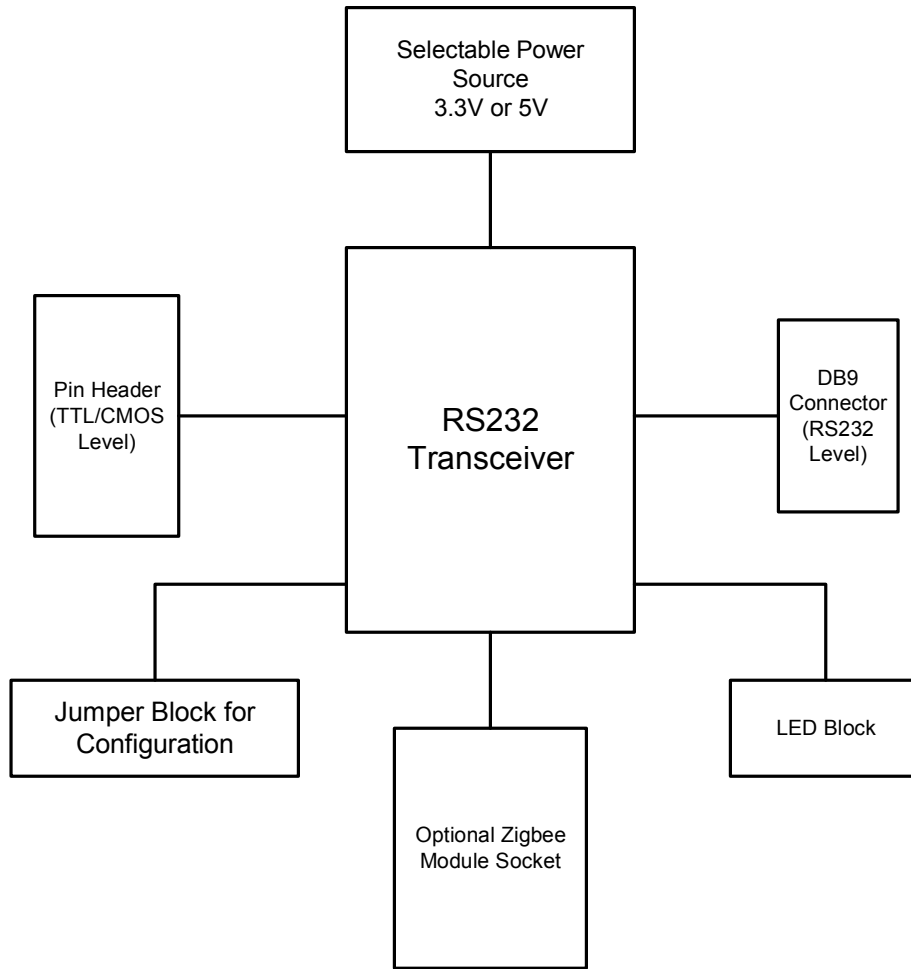


Figure 1

BRD-RS232-TTL-1 can be configured for the following modes:

### **PC Mode**

In this mode, DB9 connector is connected to a computer's serial port. PC's Receive (RXD) and Transmit (TXD) signals appear on the pin header as TTL/CMOS level signals.

As an option, this mode can be used to connect a Zigbee module to the PC.

Jumpers J2, J4, J6, J9 should be installed to select PC Mode.

External power supply ( BiPOM part#: PWR-6VDC-1A-P ) is required to operate BRD-RS232-TTL-1 in PC mode. You can obtain this product from BiPOM web:

<http://www.bipom.com/products/us/851734.html>

### **GadgetPC Mode**

In this mode, GadgetPC TTL/CMOS level signals from GadgetPC's console port appear as RS232 level signals on DB9 connector. This mode is useful for monitoring GadgetPC's console using a terminal program on a PC.

This mode typically does NOT support the Zigbee module option.

Jumpers J8 should be installed to select GadgetPC Mode.

Figure 2 shows how BRD-RS232-TTL-1 is connected to GadgetPC and to MINI-MAX/AVR-AU boards:

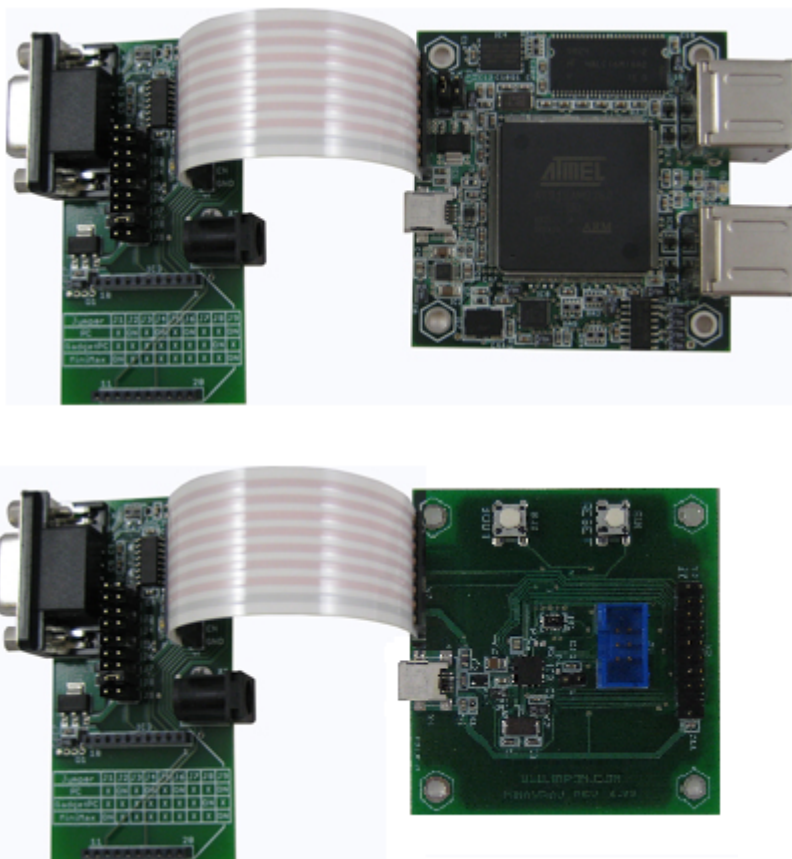


Figure 2

## MINI-MAX Mode

In this mode, RS232 level Receive and Transmit signals from the serial port of various BiPOM MINI-MAX boards appear as TTL/CMOS level signals on the pin header. This mode is useful for connecting MINI-MAX boards to various serial devices that accept TTL/CMOS level RS232.

Optionally, this mode can be used for connecting a Zigbee module to a MINI-MAX board.

Jumpers J1 and J9 should be installed to select MINI-MAX Mode.

Figure 3 shows how BRD-RS232-TTL-1 is connected to a MINI-MAX/51-C2 and MINI-MAX/51-F:

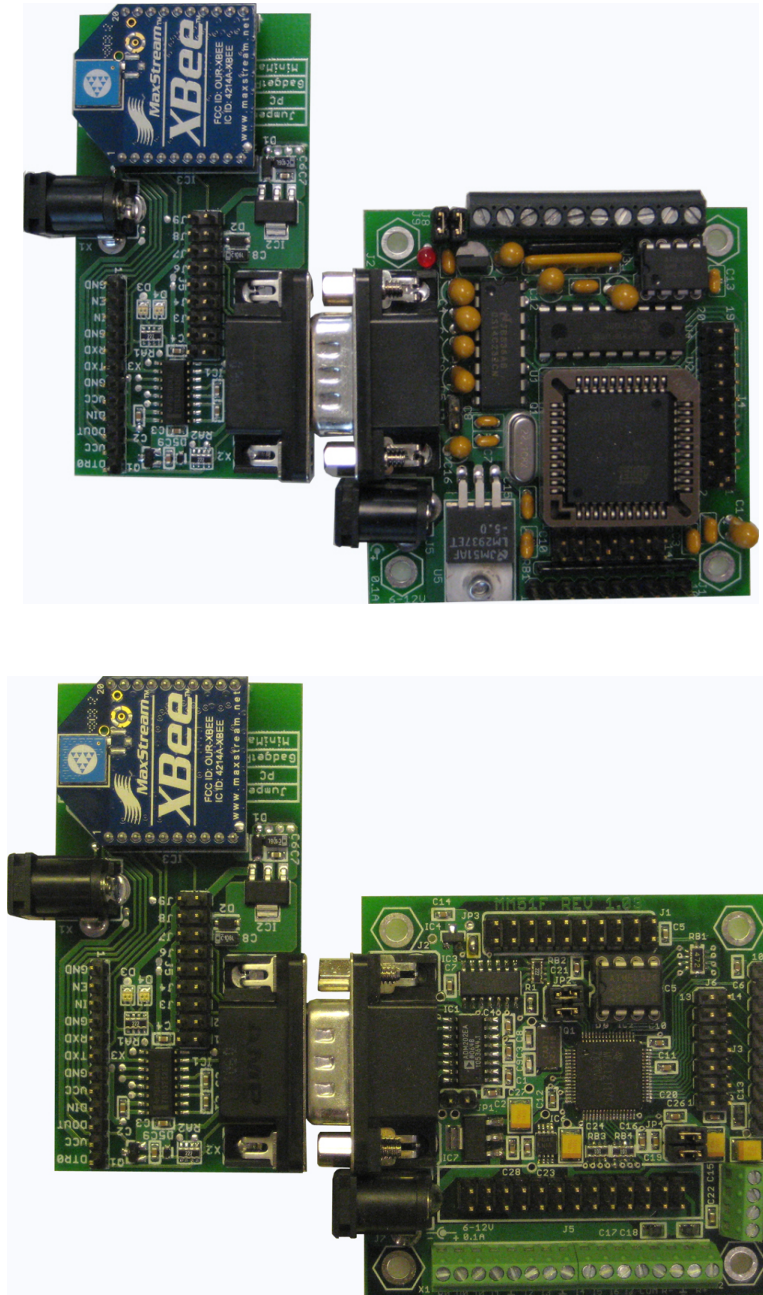


Figure 3

### **DB9 connector**

Table 1 shows the pin assignments for the 9-pin D-SUB receptacle female connector (X2).

**DB-9 connector (X2)**

Pin	Name	Signal
9	-	Not connected
8	CTS	Clear to Send output
7	RTS	Request to Send input
6	DSR	Data Set Ready output
5	GND	Ground
4	DTR	Data Terminal Ready input
3	TXD	Data output
2	RXD	Data input
1	-	Not connected

Table 1

### **Zigbee Option**

Figure 4 shows the Zigbee module option installed. The popular XBee or XBee Pro Zigbee modules can be installed on BRD-RS232-TTL-1 to connect the Zigbee module to a PC, a microcontroller board or other system.

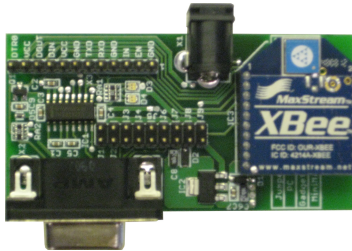


Figure 4



### **Power and UART-0 connector**

Power and UART-0 logic level signals are available on a 12-pin male connector X3. Table 2 shows the pin assignments for the connector

**Power and UART-0 connector (X3)**

Pin	Signal
6	TXD0
5	RXD0
4	<b>GND</b>
3	Not connected
2	Not connected
1	<b>GND</b>
12	DTR0
11	<b>VDC (+5V or 3.3V)</b>
10	DOUT (RTS/DTR)
9	DIN (CTS/DSR)
8	<b>VDC (+5V or 3.3V)</b>
7	<b>GND</b>

Table 2

### **Jumpers**

Table 3 show the jumper assignments

**Jumper assignments**

Name	Operations if installed
<b>J1</b>	MINI-MAX powers the board through DB9 connector. <b>When J1 is installed, the board should NOT be powered with an external adapter. This will cause damage to the board and to the MINI-MAX !!!</b>
<b>J2</b>	PC controls DTR pin of Zigbee module (Zigbee module is optional)
<b>J3</b>	DSR handshake line from PC is converted
<b>J4</b>	CTS handshake line from PC is converted
<b>J5</b>	DTR handshake line from PC is converted
<b>J6</b>	RTS handshake line from PC is converted
<b>J7</b>	Input voltage ( VCC ) is connected to pin header
<b>J8</b>	Regulated 3.3 Volts ( VDD ) is connected to pin header
<b>J9</b>	Selects 3.3V power for RS232 transceiver

Table 3

### **Power Supply**

External power supply should be able to supply from 4 to 16 Volts DC at 60 mA current. We recommend using BiPOM power supply PWR-6VDC-1A-P. You can obtain this product from BiPOM web:

<http://www.bipom.com/products/us/851734.html>

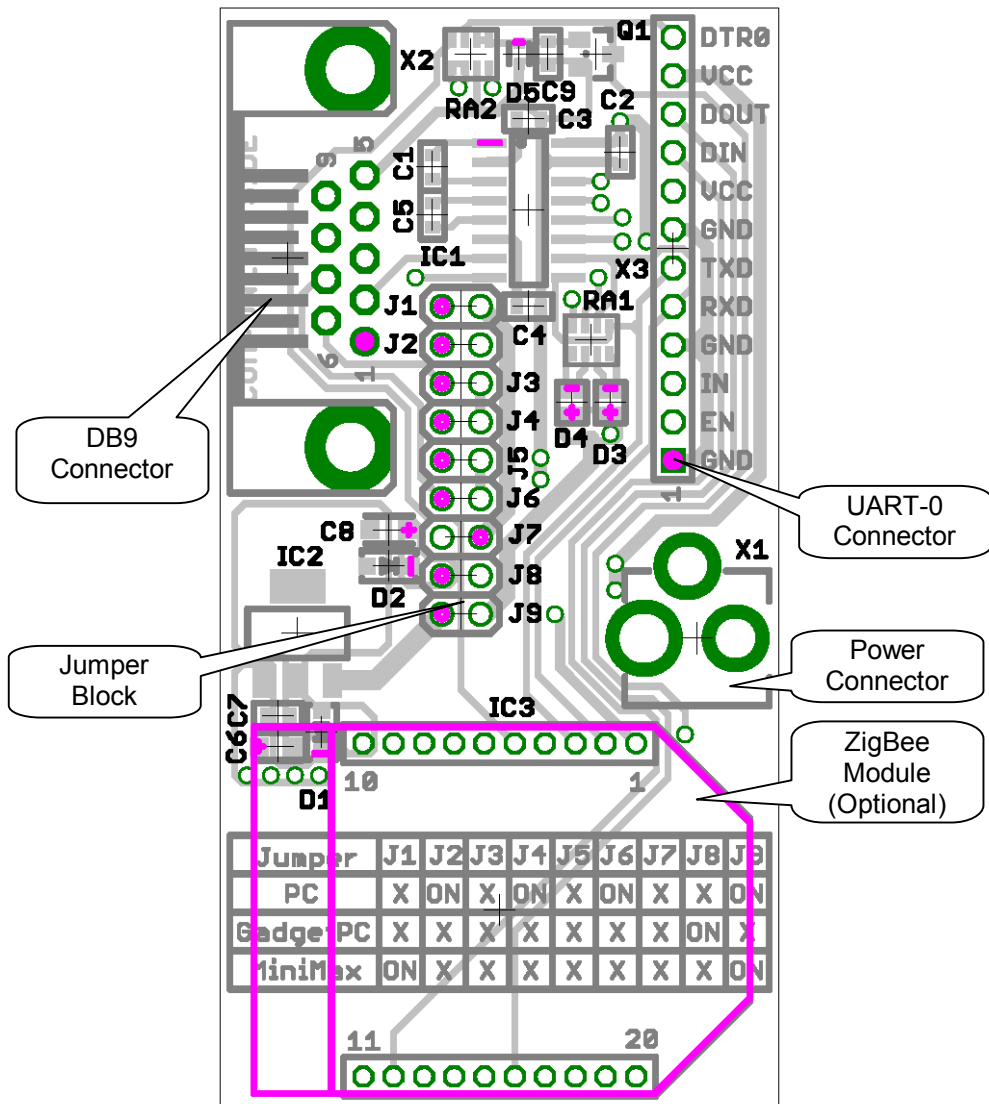
**WARNING:** Correct polarity should be observed when applying external DC supply to the connector.

### LED Table

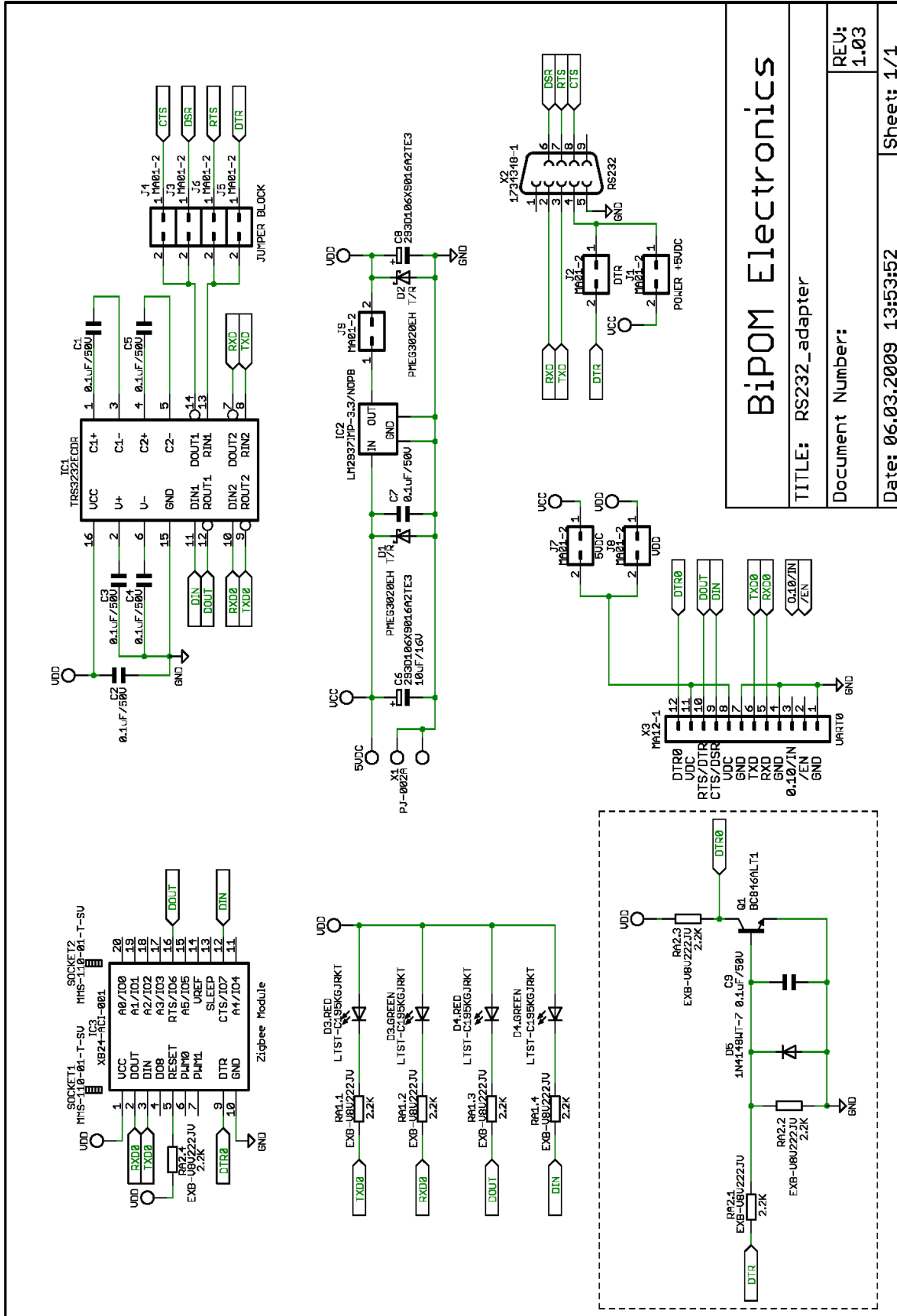
LED	Color	Description
D3	RED	Red if there is activity on Transmit line ( TXD )
D3	GREEN	Green if there is activity on Receive line ( RXD )
D4	RED	Red if there is activity on the jumper selected handshake line (CTS or DSR )
D4	GREEN	Green if there is activity on the jumper selected handshake line (RTS or DTR)

## 4. Board Layout

Layout of the BRD-RS232-TTL-1 board is shown below:



# 5. Schematics



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TITLE: RS232\_adapter

Document Number:

Date: 06.03.2009 13:53:52

REU: 1.03

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