

# **User's Guide**

for

## **BRS232**

17 February 2004

From

# **SoftBaugh**

*Custom Software, Firmware, Hardware,  
and Project Management Consulting*

4080 McGinnis Ferry Road  
Suite 604  
Alpharetta, Georgia 30005

### **Disclaimer:**

All software, hardware, firmware and related documentation is provided "AS IS" and without warranty or support of any kind and SoftBaugh expressly disclaims all other warranties, express or implied, including, but not limited to, the implied warranties of merchantability and/or fitness for a particular purpose. Under no circumstances shall SoftBaugh be liable for any incidental, special or consequential damages that result from the use or inability to use the software, firmware, hardware or related documentation, even if SoftBaugh has been advised of the liability.

Unless otherwise stated, software written and copyrighted by SoftBaugh remains the sole property of SoftBaugh. You may not modify this software or distribute it, in whole or in part, to any other party.

## Table of Contents

<b>1. BRS232 OVERVIEW .....</b>	<b>3</b>
1.1 FEATURES .....	3
1.2 FREQUENTLY ASKED QUESTIONS .....	3
1.3 NOTATION .....	3
1.3.1 Boards, Components and Pins.....	3
1.3.2 Jumpers.....	3
<b>2. BOARD OPTIONS.....</b>	<b>5</b>
2.1 J1.....	5
2.2 J2.....	6
2.3 J3.....	6
2.4 J4.....	6
2.5 J5.....	7
2.6 SERIAL PORT WITH HANDSHAKING.....	7
2.7 DUAL SERIAL PORT WITHOUT HANDSHAKING.....	7
<b>3. RS232 INTERFACE OPTIONS.....</b>	<b>8</b>
3.1 ALWAYS ON .....	8
3.2 DISABLED .....	8
3.3 AUTO POWERDOWN.....	8

## Table of Tables

TABLE 2-1 BRS232 J1 .....	5
TABLE 2-2 BRS232 J2 .....	6
TABLE 2-3 BRS232 J3 .....	6
TABLE 2-4 BRS232 J4 .....	7
TABLE 2-5 BRS232 J5 .....	7
TABLE 3-1 RS232 ALWAYS ON .....	8
TABLE 3-2 RS232 DISABLED .....	8
TABLE 3-3 RS232 AUTO-POWERDOWN .....	8

## Table of Figures

FIGURE 2-1 BRS232 BOARD OPTIONS .....	5
---------------------------------------	---

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## 1. BRS232 Overview

The BRS232 allows a convenient RS-232 serial interface for use with our breadboard series of evaluation systems. The BRS232 uses Texas Instruments MAX3243, which consists of three line drivers, five line receivers, and a dual charge pump circuit with +/- 15kV ESD (HBM) protection pin to pin (serial-port connection pins, including GND).

### 1.1 Features

The key features of this product are:

- Texas Instruments MAX3243
- 1  $\mu$ A standby current
- Operates up to 250 kbit/s
- Auto-powerdown
- Serial mouse drivability

### 1.2 Frequently Asked Questions

Our website contains up-to-date information on all our products, including Frequently Asked Questions at the bottom of each product page. Please visit our website to review the Frequently Asked Questions for this and all our products if you encounter difficulty not addressed in this manual.

### 1.3 Notation

Throughout SoftBaugh documentation, we follow a standard convention to identify boards, jumpers, other components, and pins.

#### 1.3.1 Boards, Components and Pins

The following notation is used to identify boards, components, and pins:

*Board:Component.Pin*

**Example:**

BRS232:J1.5 identifies the Ground pin the DB9 connector.

Where obvious from the context, the *Board:* portion may be omitted. If an entire component rather than a single pin is being identified, then the *.Pin* portion is omitted.

#### 1.3.2 Jumpers

Unless otherwise noted, pin 1 on a jumper is always square (observed from underneath), and the silkscreen designator for the jumper is near pin 1. Where ambiguity could exist, a small '1' is placed near pin 1. Pins are numbered across the short axis of the jumper first, and then down the long axis.

Jumper settings are indicated by the following notation:

*Jumper.Pin-Pin*  
*Jumper.Open*

**Example:**

J20.1-2

A jumper block is to be placed across pin 1 and pin 2 on J20.

In the special case of two-pin jumpers, such as those used to route power or measure current, the entire jumper may be treated as a SPST switch, and "opened".

**Example:**

J18.Open

J18 is left open, with no jumper block. In other sources this is referred to as "hanging" the jumper.

## 2. Board Options

The BRS232 allows for a single UART with full handshaking or two UARTs without handshaking.

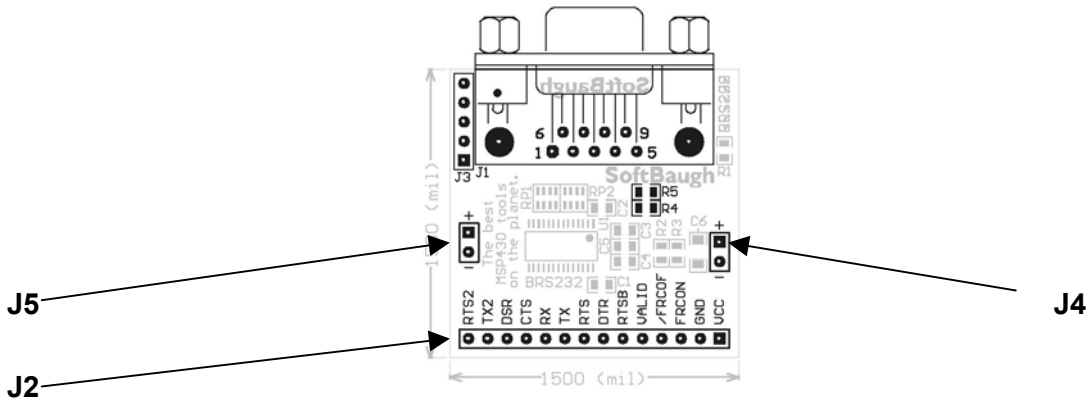


Figure 2-1 BRS232 Board Options

### 2.1 J1

DB9 Connector

Table 2-1 BRS232 J1

Pin	Usage
1	NC
2	RX232
3	TX232
4	DTR232
5	GND
6	DSR232
7	RTS232
8	CTS232
9	NC

## 2.2 J2

MAX3243 Signals

**Table 2-2 BRS232 J2**

Pin	Name	Serial One Usage	Serial Two Usage
1	VCC	Power	Power
2	GND	Ground	Ground
3	FORCEON	Force ON pin	N/A
4	/FORCEOFF	/Force OFF pin	N/A
5	VALID	Valid RS232 signal pin	N/A
6	RTSB	ROUT2B pin	N/A
7	DTR	DTR pin	DTR2 pin
8	RTS	RTS pin	N/A
9	TX	TX pin	N/A
10	RX	RX pin	N/A
11	CTS	CTS pin	N/A
12	DSR	DSR pin	RX2 pin
13	TX2	N/A	TX2 pin
14	RTS2	N/A	RTS2 pin

## 2.3 J3

MAX3243 Signals

This header is used for the dual RS232 feature. While full handshaking is not supported, RTS2 and DTR2 allow some use of serial port outputs (Example: MSP430 BSL operation).

**Table 2-3 BRS232 J3**

Pin	Usage
1	TX2_232
2	RX2_232
3	RTS2_232
4	DTR2_232
5	GND

## 2.4 J4

Power Supply Header One

Populate either J4 or J5 depending on offset of solderless breadboard.

**Table 2-4 BRS232 J4**

<b>Pin</b>	<b>Usage</b>
1	VCC
2	GND

## 2.5 J5

Power Supply Header Two

Populate either J4 or J5 depending on offset of solderless breadboard.

**Table 2-5 BRS232 J5**

<b>Pin</b>	<b>Usage</b>
1	VCC
2	GND

## 2.6 Serial Port with Handshaking

The BRS232 ships to the customer in this condition.

## 2.7 Dual Serial Port without Handshaking

To implement the second serial port perform the following:

- 1.) Remove R4 and R5
- 2.) With an extra DB-9 connector solder J3.1 to DB9.3 and J3.2 to DB9.2

### 3. RS232 Interface Options

This section of the user's guide describes the MAX3243s flexible control options for power management.

#### 3.1 Always On

This mode will not provide the greatest power savings, but is the most convenient for starting projects:

**Table 3-1 RS232 Always On**

Item	Usage	Condition	Remarks
J2.3	FORCEON	VCC	
J2.4	/FORCEOFF	VCC	

#### 3.2 Disabled

If communication is not required, the ICL3221 can be disabled in the lowest-power mode by using the following settings:

**Table 3-2 RS232 Disabled**

Item	Usage	Condition	Remarks
J2.3	FORCEON	X	
J2.4	/FORCEOFF	GND	

#### 3.3 Auto Powerdown

As originally shipped, the BRS232 permits operation with the MAX3243 in "auto-powerdown" mode. This mode provides the greatest power savings while still being able to communicate.

**Table 3-3 RS232 Auto-Powerdown**

Item	Usage	Condition	Remarks
J2.3	FORCEON	GND	
J2.4	/FORCEOFF	VCC	