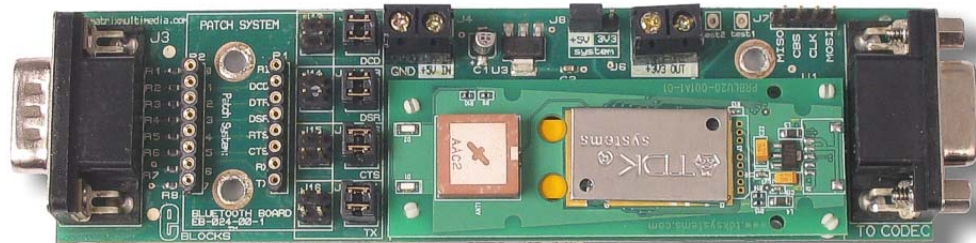


Bluetooth board EB024-00-2 Technical datasheet



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Appendix 1 Circuit Diagram

1. About this document

This document concerns the E-blocks Bluetooth board code EB024 version 2.

The order code for this product is EB024.

1. **Trademarks and copyright**

PIC and PICmicro are registered trademarks of Arizona Microchip Inc.
E-blocks is a trademark of Matrix Multimedia Limited.

2. **Other sources of information**

There are various other documents and sources that you may find useful:

Getting started with E-Blocks.pdf

This describes the E-blocks system and how it can be used to develop complete systems for learning electronics and for PICmicro programming.

PPP Help file

This describes the PPP software and its functionality. PPP software is used for transferring hex code to a PICmicro microcontroller.

C and assembly strategies

Not provided for this product.

3. **Disclaimer**

The information in this document is correct at the time of going to press. Matrix Multimedia reserves the right to change specifications from time to time. This product is for development purposes only and should not be used for any life-critical application.

4. **Technical support**

If you have any problems operating this product then please refer to the troubleshooting section of this document first. You will find the latest software updates, FAQs and other information on our web site:

www.matrixmultimedia.com . If you still have problems please email us at: support@matrixmultimedia.co.uk.



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2. General information

Description

This E-blocks™ board contains a TDB BLU2i V2 module which adds Bluetooth functionality to your E-blocks system. The class 1 Bluetooth module has a transmit power of 6dBm which should give a 100 yard transmission range at a data transfer rate of 100Kbps. The module is programmed using the serial I²C protocol, with an AT command superset, and can be interfaced to any microcontroller with a UART facility. The module is capable of supporting a range of Bluetooth protocols including LAP, Data, and the headset profile. A compatible E-blocks CODEC board for establishing headset audio transfer is available. Flowcode macros to support the use of this board are available.

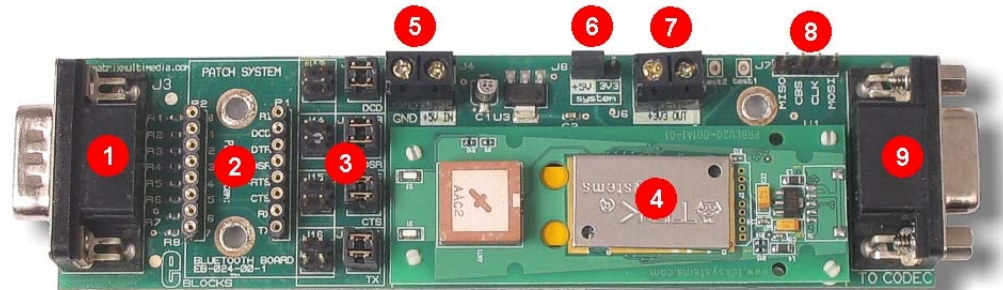
Features

- E-blocks compatible
- Low cost
- Provides a Bluetooth interface for all your projects
- I²C interface
- 100 yard range
- Supports most Bluetooth protocols



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3. Board layout



1. D-type E-blocks connector - to Programmer board
2. Patch system
3. Connection jumpers
4. BLU2i V2 module
5. Power in screw terminals - +5 Volts and Ground for EB024 power supply
6. operating voltage selector – 3.3V/5V voltage out selector
7. Power out screw terminal – for powering CODEC board and other peripherals.
8. BLU2i programmer connector
9. D-type E-blocks connector – to CODEC board

4. Testing this product

The following program will test the circuit. The test files can be downloaded from www.matrixmultimedia.com.

The following instructions explain the steps to test your USB232 board. The instructions assume that PPP is installed and functional. It also assumes that you are confident in sending a program to the PIC via the Multiprogrammer.

These programs require a PICmicro Multiprogrammer board (EB-006) with a 40-pin PIC16F877A device. They also require a PC with FTDI drivers installed, MProg 2.3 software, a spare USB port and Hyperterminal.

The program will enable you to fully test the functionality of the board.

1. System Setup

Master system:

EB006 Options	Setting
Power supply	External, 14V
PICmicro device	16F877A
SW1 (Fast/Slow)	Don't care
SW2 (RC/Xtal)	Xtal
Xtal frequency	19.6608MHz
Port A	Switch board EB007
Port B	LCD display EB005
Port C	Bluetooth board EB024
Port D	
Port E	
Test program	BT_MASTER.HEX

EB005 Options	Setting
J3,J4	DEFAULT

EB024 Options	Setting
J7	No link block
J8	5V
J13 / J9	J9 Horizontal
J14 / J10	J10 Horizontal
J15 / J11	J11 Horizontal
J16 / J12	J12 Horizontal
Address (set by software)	00809094BA05

Slave system:

EB006 Options	Setting
Power supply	External, 14V
PICmicro device	16F877A
SW1 (Fast/Slow)	Don't care
SW2 (RC/Xtal)	Xtal
Xtal frequency	19.6608MHz
Port A	Switch board EB007
Port B	LCD display EB005
Port C	Bluetooth board EB024

Port D	
Port E	
Test program	BT_SLAVE.HEX

EB005 Options	Setting
J3,J4	DEFAULT

EB024 Options	Setting
J7	No link block
J8	5V
J13 / J9	J9 Horizontal
J14 / J10	J10 Horizontal
J15 / J11	J11 Horizontal
J16 / J12	J12 Horizontal

Connect “+V” from the Screw terminal of the Switch board to “+V” of the Multiprogrammer, the LCV board, and the Bluetooth board – 5V input.

2. Test Procedure

1. Before the test unit has been connected, connect both systems as described and apply the power to the Master EB-006 E-Block and press “RESET” – “init.done” will be displayed on the Master LCD.
2. A series of dots on the Master LCD will show the progress of the Master System boot procedure. The message “setup” will indicate a successful boot, and then the screen will go blank.
3. Connect +5V to unit under test and then connect it to Port C of the Slave System. LED’s on Bluetooth module will light briefly which indicate that the Module is ‘alive’. Press “RESET” on the Slave EB-006.
4. “rx.done.” will be displayed on the Slave LCD, then the screen will go blank and a series of dots will indicate progress. This will end with “connected”, followed by the messages “sending...” and “press A0”. This whole sequence should take approximately 10 seconds.
5. While this is happening, the Master LCD will display “PAIR 0 xxx”, “RING xxx” and “CONNECT xxx” messages (where “xxx” is a 12-digit number), and finally “*Unit passed*”. At this stage, both the Master and Slave Bluetooth modules will have D2 on the module lit.
6. Press “A0” on the Switch E-Block of the Slave System. This will reset the test unit. The Slave LCD should display “*** DONE ***” and the Master LCD should display “^^^” and “NO CARRIER”. Also, the D2 LEDs on the Bluetooth modules should turn off.
7. Remove the test EB-024 unit from the Slave System and repeat the above from step 3. There is no need to re-boot the Master System, although the Master LCD display can be cleared by pressing A0 on the Master Switch E-Block if required.

3. Possible problems

1. If the Slave Bluetooth module does not have power (or is not working for any reason), the Slave LCD will display “rx.done.f0” at step 4.
2. If the Master System boot fails, the LCD will display “init.done” and the screen will go blank. The progress dots will not appear.
3. If the Slave module fails to “discover” the Master module, the Slave display will stall at 4 dots and finally a message “error 6” will be displayed. Possible causes are that the Master Bluetooth module...
 - i. ...is no longer powered
 - ii. ...has not completed boot-up successfully
 - iii. ...is not the one with address “00809094BA05”
 - iv. ...remains connected to another Bluetooth module (the D2 LED will be on)
4. Reset the Master System and wait for a successful boot-up to recover.

5. Circuit description

Max 3002 Chip

Covers the 5V I/O from the PICmicro Multiprogrammer in to 3.3V for the Codec board.

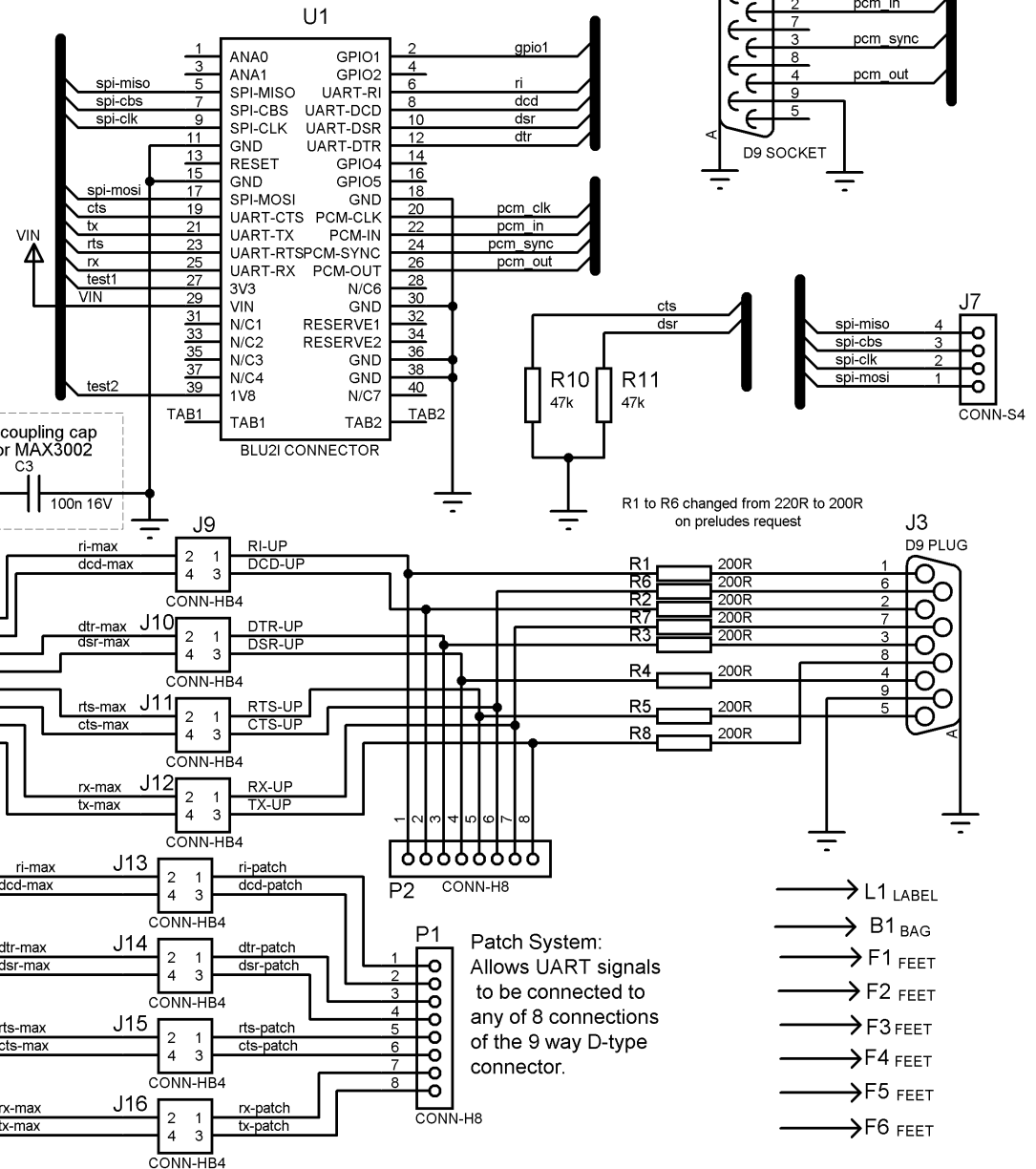
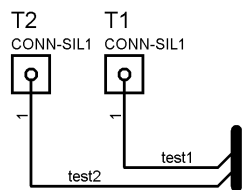
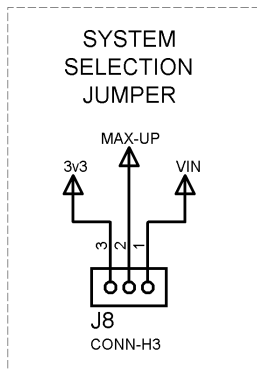
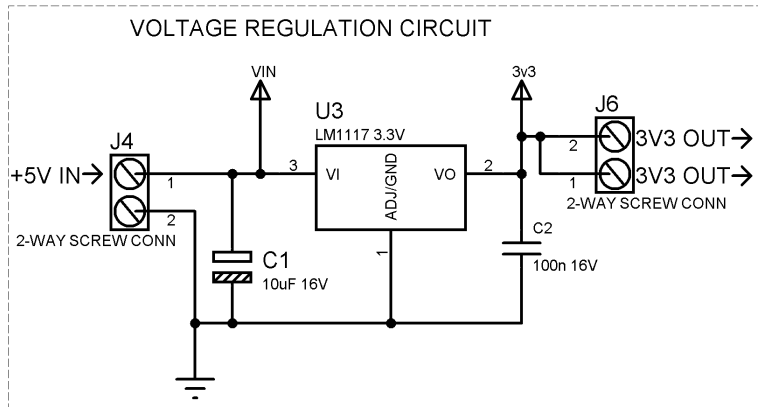
U1 Blui Connector

Connects the Blui V2 Bluetooth Module to the Circuit Board



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Appendix 1 – Circuit diagram



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<p>TITLE: E-Blocks Bluetooth Board EB-024-00-2</p>	<p>DATE: 16/04/07</p> <p>PAGE: 1/1</p>
<p>BY: Conor Carr</p>	<p>REV: 1</p>