Sensor board datasheet
EB003-00-2
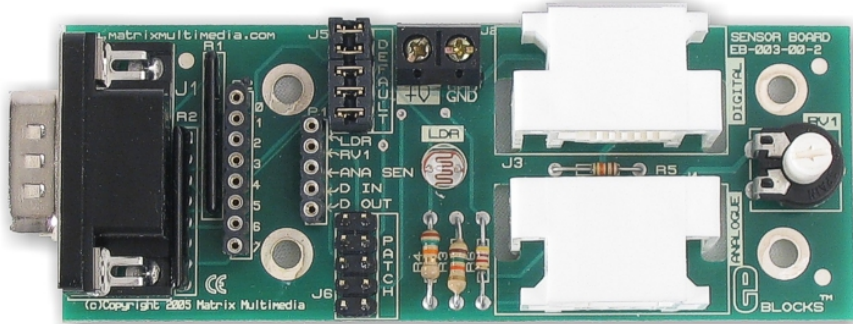
Contents

1. <u>About this document</u>

This document concerns the E-blocks Sensor board code EB003 version 2.

The order code for this product is EB003.

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

This is available as a free download from our web site.

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.

2. <u>General information</u>

1. Description

The Sensor board allows you to connect a range of digital or analogue sensors to any of the I/O ports on the E-Block 'up-stream' boards. It also allows you to use the on-board light sensor and variable resistor for quick system operational checks. There are over 40 sensors in the E-blocks range of sensors varying from simple temperature
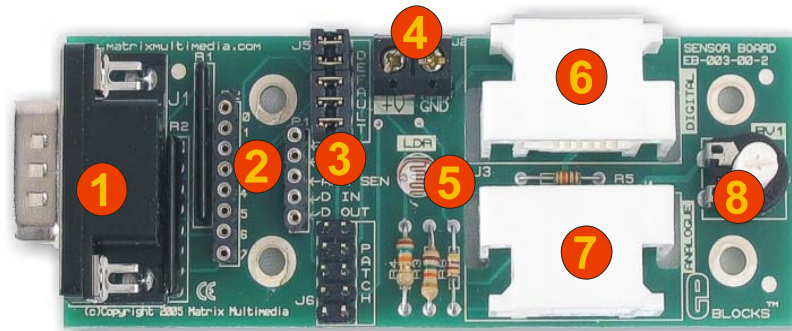
2. Features

- E-blocks compatible
- Full range of external sensor to enable plenty of different and interesting experiments
- On-board light sensor
- Downstream D-type connector
- Compatible with most I/O ports in the E-Block range
- Ease to develop programming code using Flowcode icons.

3. Block schematic

Not supplied.

3. <u>Board layout</u>

EB003-74-1.cdr

1) 9 Way D-type Plug
2) Patch system
3) Link blocks
4) Screw Terminals
5) Light sensor
6) External digital sensor
7) External analogue sensor
8) Potentiometer – for simulating varying analogue voltage

4. <u>Testing this product</u>

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

1. *System Setup*

Multi-programmer board (EB006) with:

EB006 Options	Setting
Power supply	External, 14V
PICmicro device	16F88
SW1 (Fast/Slow)	Don't care
SW2 (RC/Xtal)	Xtal
Xtal frequency	19.6608MHz
Port A	Sensor board EB003
Port B	LCD board EB005
Port C	
Port D	
Port E	
Test program	sensor.hex

EB003 Options	Setting
Patch jumper setting	DEFAULT

EB005 Options	Setting
Patch jumper setting	DEFAULT

2. *Test Procedure*

1) Wire power to all boards.
2) Configure system and board options as above.
3) Download the test program to the Multiprogrammer
4) Check the LCD display shows varying light conditions and status of Variable resistor.

5. <u>Circuit description</u>

The circuit consists of four main devices. The board has a Light Dependant Resistor (LDR) to enable quick analogue light measurements. RV1 is a potentiometer that can provide a varying analogue voltage. This can be used to quickly simulate any sensor input. There are also two connectors, J3 and J4, which are used to connect a wide range of analogue and digital sensors. J3 is the connector used for digital sensors. J4 is used to connect all analogue sensors.There is also a screw terminal that is included on all E-Blocks that allows you connect +V and GND to the system.

1. *Patch System*

The Sensor Board, like all E-Blocks, is designed with flexibility in mind. Therefore the Sensor board can be used with any 'Up-stream' processor board. To facilitate this a patch systems has been used on this board. This patch system allows the use to either select the default setting of the board (generally used for PICmicro ® microcontrollers where – on many devices - the lowest 5 bits on port A are all A/D inputs) or to wire the connector to any pin of the D-Type connector that they require using individual wires.
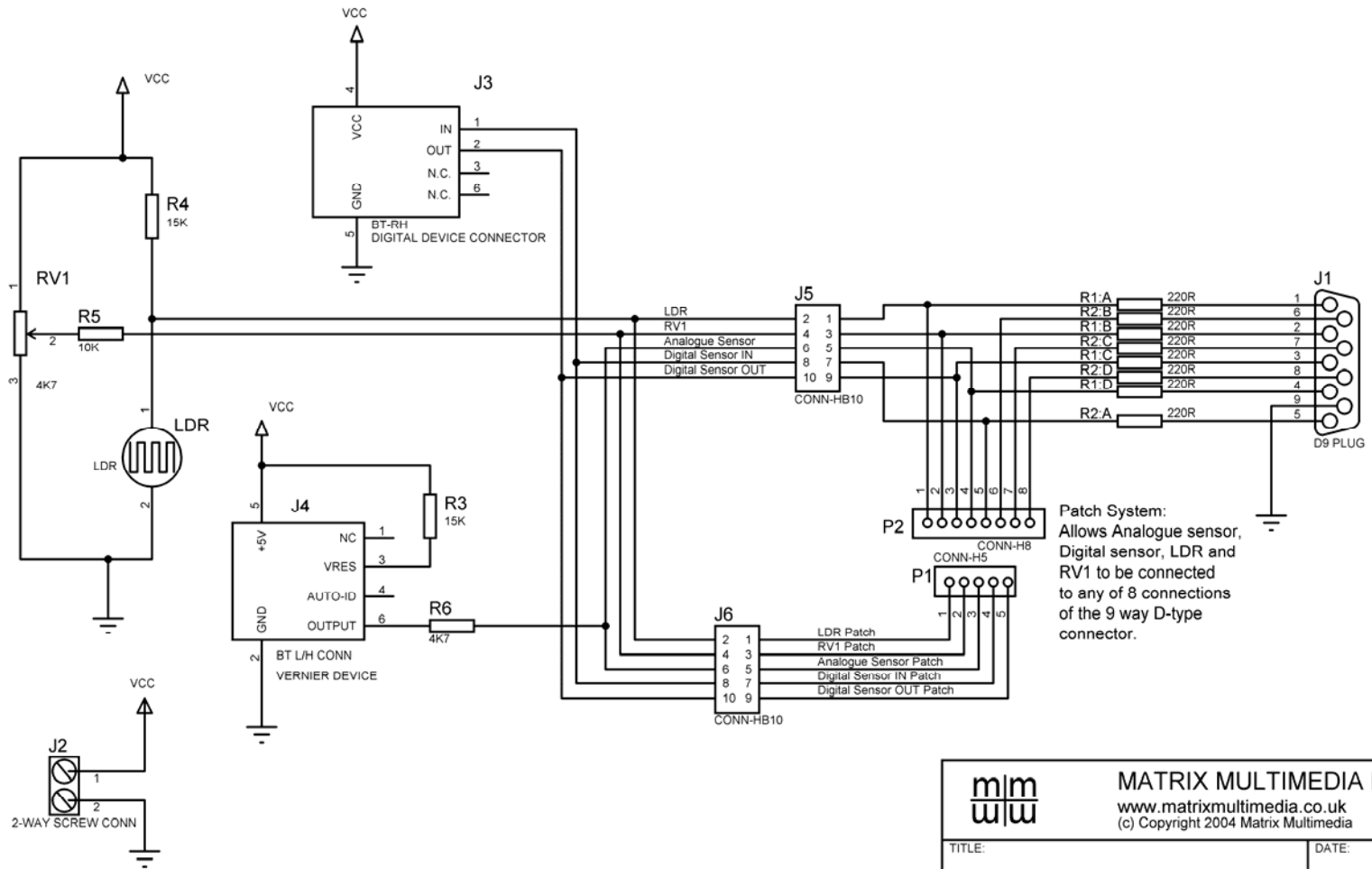
2. *Default settings*

To use the default setting of the Sensor board, the jumper links should be placed on header pins J5. This is labelled "DEFAULT" on the actual PCB. The following table shows the connections for the default setting.

Function	Mapping to bit of D-Type
LDR	Bit 0
RV1 (Variable analogue voltage)	Bit 1
Analogue Sensor	Bit 3
Digital Sensor IN	Bit 4
Digital Sensor OUT	Bit 2

3. *3.3V operation*

The light sensor and variable resistor will operate satisfactorily when the voltage supplied to the board is 3.3V. Some sensors will give a reading with a 3.3V supply – but the reading may not relate to a real world value as the sensors are designed to operate from 5V.

Appendix 1 – Circuit diagram

Patch System:
Allows Analogue sensor,
Digital sensor, LDR and
RV1 to be connected
to any of 8 connections
of the 9 way D-type
connector.

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TITLE:
Sensors Board
EB-003-00-1
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