Sensor board

Contents

About this document

This document concerns the EB003 sensor board.

1. Trademarks and copyright

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2. Disclaimer

The information provided within this document is correct at the time of going to press. Matrix TSL reserves the right to change specifications from time to time.

3. Testing this product

It is advisable to test the product upon receiving it to ensure it works correctly. Matrix provides test procedures for all E-blocks, which can be found in the Support section of the website.

4. Product support

If you require support for this product then please visit the Matrix website, which contains many learning resources for the E-blocks series. On our website you will find:

- How to get started with E-blocks - if you are new to E-blocks and wish to learn how to use them from the beginning there are resources available to help.
- Relevant software and hardware that allow you to use your E-blocks product better.
- Example files and programs.
- Ways to get technical support for your product, either via the forums or by contacting us directly.

Board layout
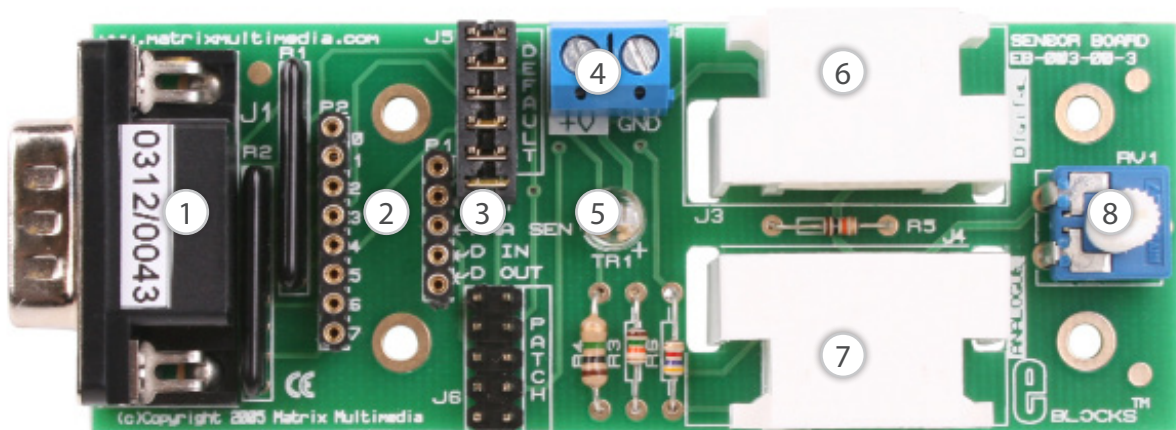
1. 9-way D-type plug
2. Patch system
3. Link blocks
4. Screw terminals
5. Photodiode
6. External digital sensor
7. External analogue sensor
8. Potentiometer - for simulating varying analogue voltage

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General information

The sensor board allows you to connect a range of digital or analogue sensors to any of the I/O ports on the E-blocks upstream boards. It also allows you to use the onboard photodiode and variable resistor for quick system operational checks. There are over 40 sensors in the E-blocks range of sensors varying from simple temperature sensors to heart rate monitors.

1. Features
- E-blocks compatible
- Full range of external sensors
- Onboard photodiode
- Downstream D-type connector
- Compatible with most I/O ports in the E-blocks range
- Easy to develop programming code using Flowcode icons

2. Changelog
V2 - V3: Exchanged non ROHS LDR sensor for ROHS compatible photodiode.

Circuit description

The EB003 sensor board circuit can be observed on page 6.

The circuit consists of four main devices. The board has a photodiode 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 to 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 upstream processor board. To facilitate this, a patch system has been used on the board. This patch system allows the user 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 and 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
Photodiode	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 photodiode 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.
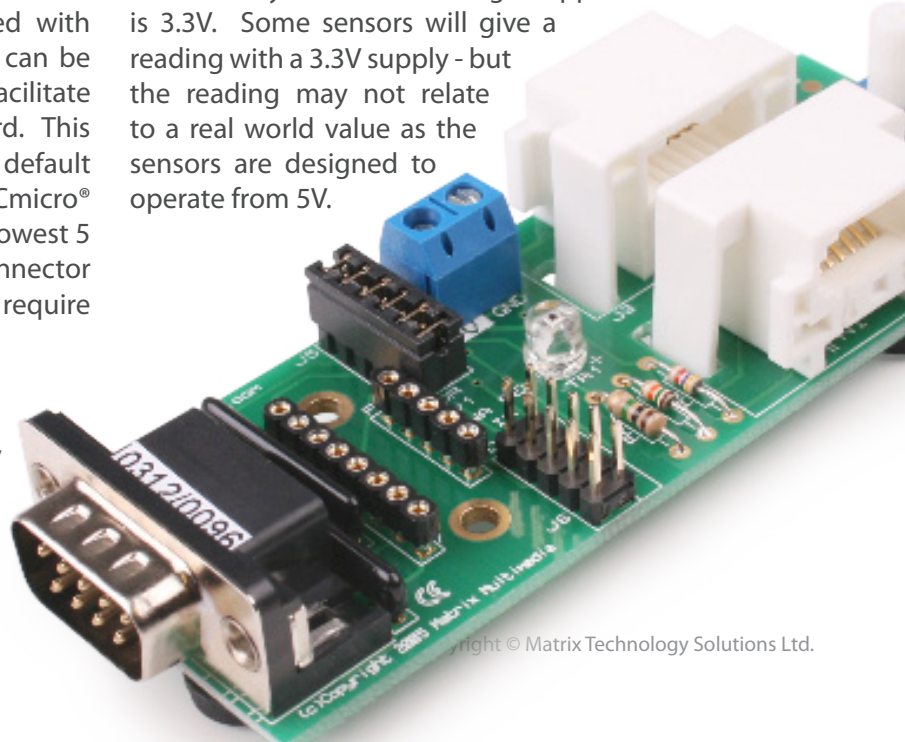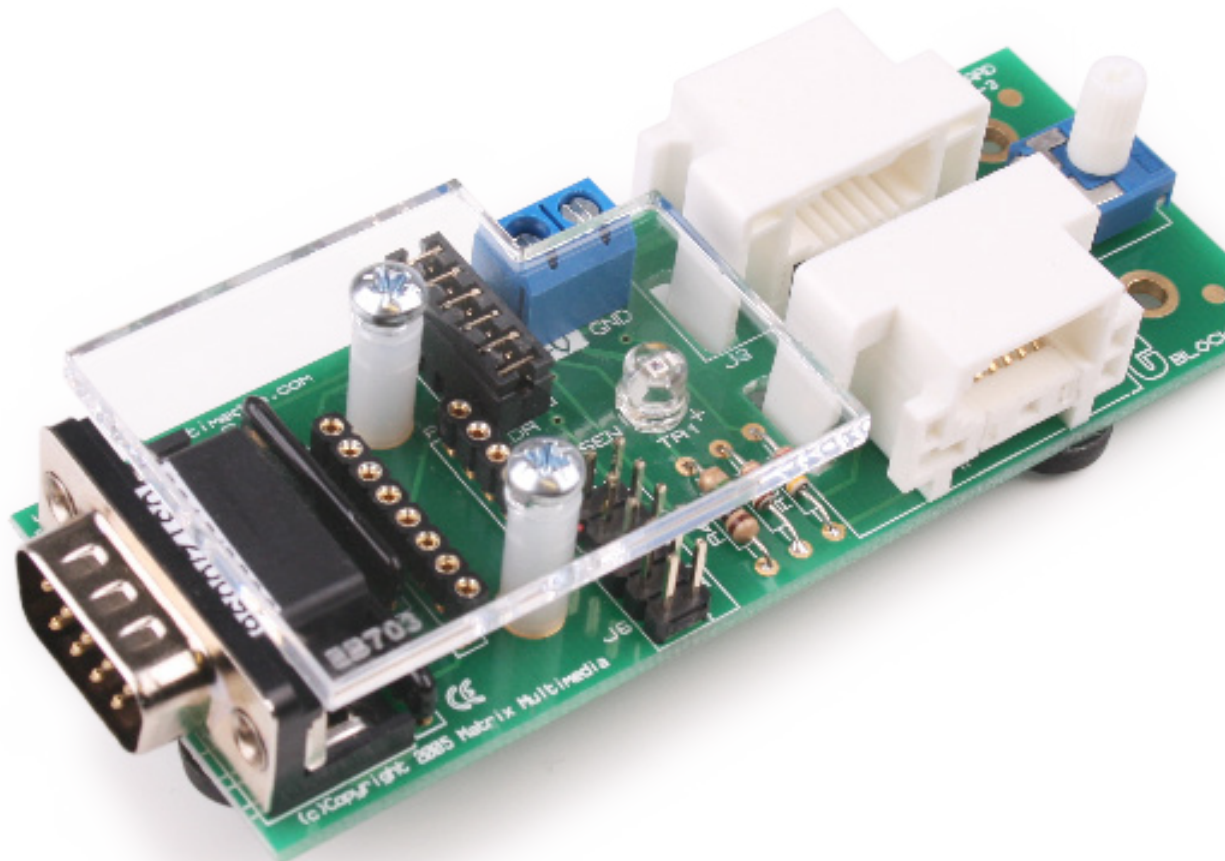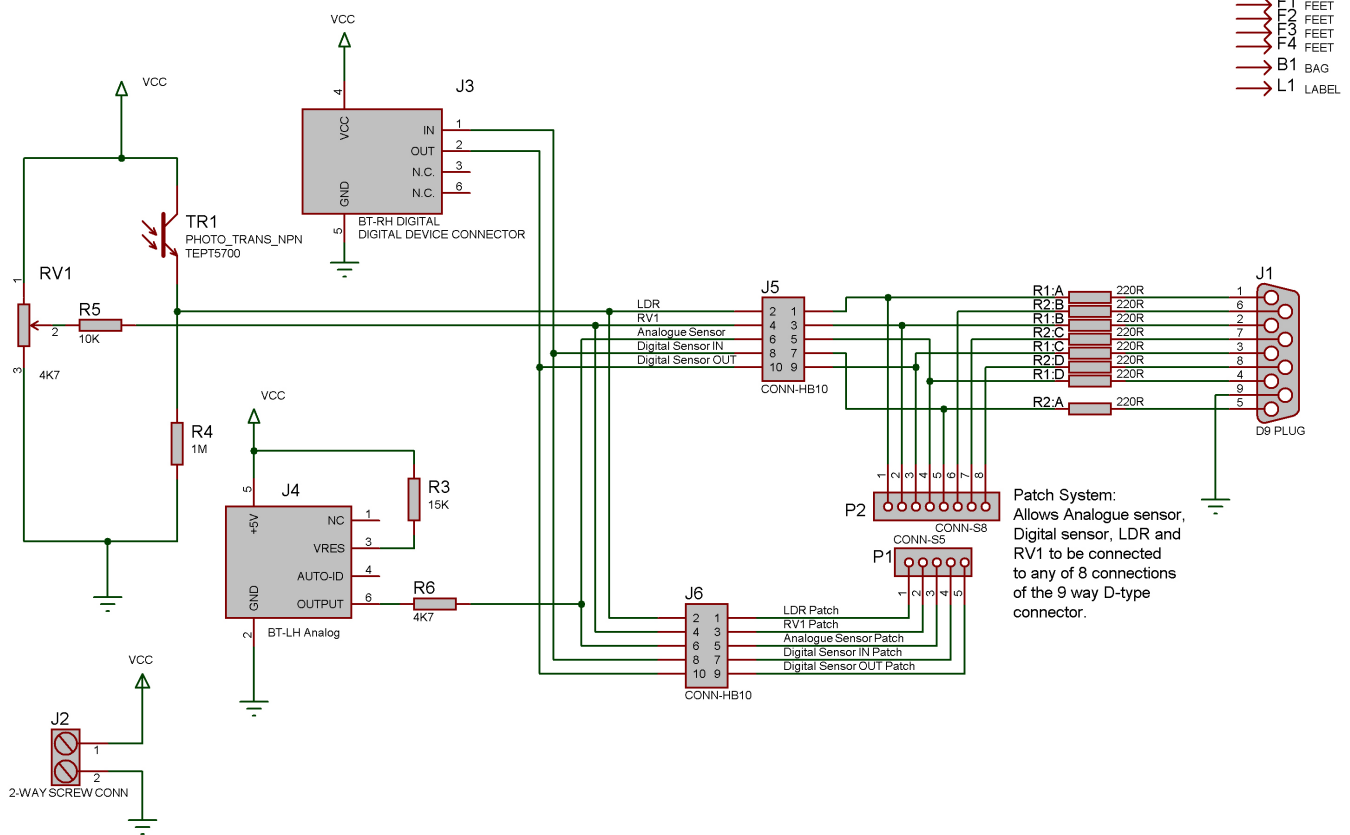
Protective cover

Most of the boards in the E-blocks range can be fitted with a plastic cover as an optional extra. These covers are there to protect your E-blocks board therefore extending the life of the board. The covers also prevent the removal of external components while still allowing for the adjustment of applicable parts on the board.

12mm M3 spacers, anti-slip M3 nuts and 25mm M3 bolts can be used to attached the cover to the board. These are not included but can be bought separately from our website.

The order code for the EB003 sensor board cover is EB703.

Circuit diagram

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