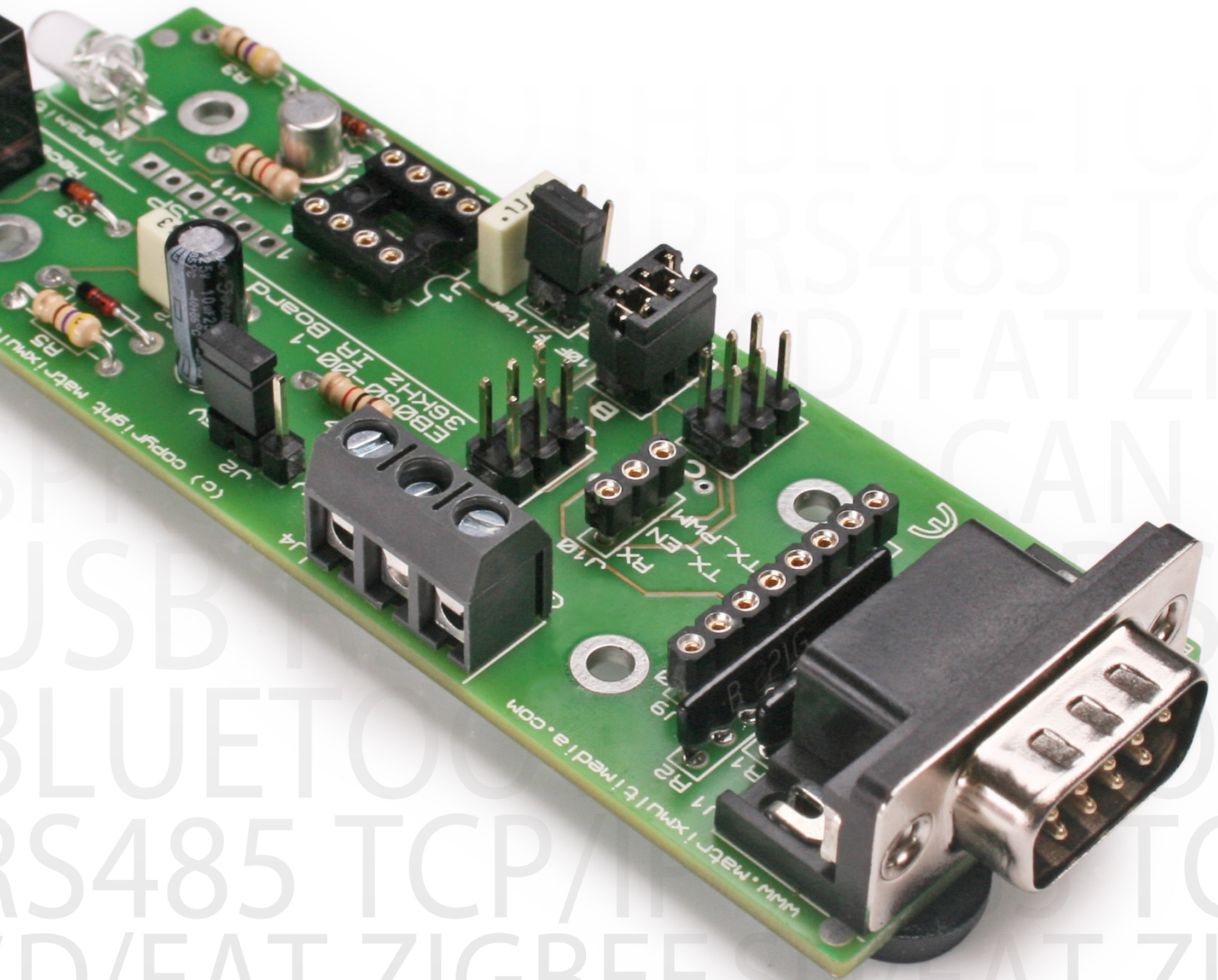


EBLOCKS[®]

RC5 Infrared board



About this document

This document concerns the EB060 E-blocks RC5 Infrared board.

1. Trademarks and copyright

PIC and PICmicro are registered trademarks of Arizona Microchip Inc. E-blocks is a trademark of Matrix Technology Solutions Ltd.

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

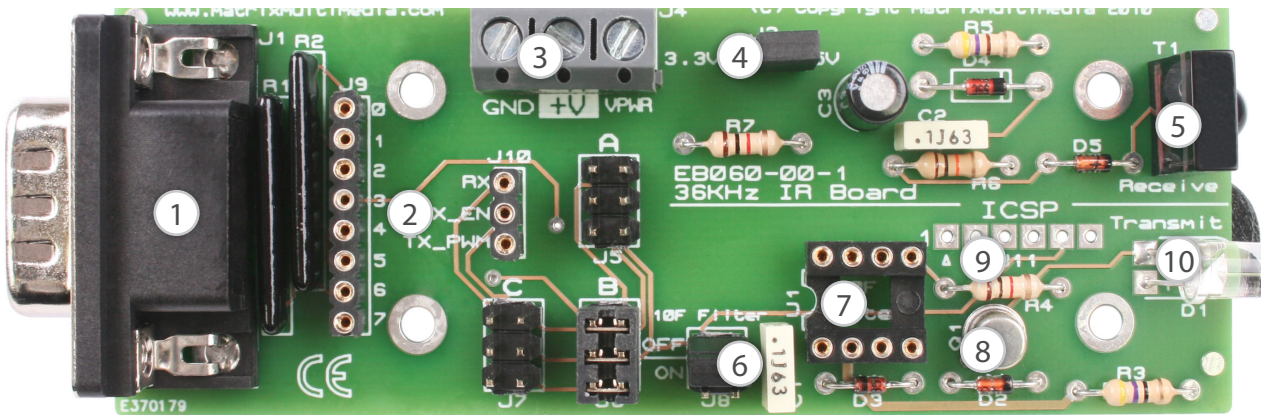
for all E-blocks, which can be found in the Support section of the website.

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 downstream D-type connector
2. Patch system
3. +V and +VPWR screw terminals
4. Voltage selection jumper
5. Filtered IR receiver and demodulator

6. PWM modulation source selection
7. PIC10F socket
8. Transmission PWM modulation and amplification
9. ICSP header for PIC10F
10. IR emitter

General guide for patch settings:

	Jumper A	Jumper B	Jumper C
RX Signal	BIT2	BIT6	PATCH
TX Signal	BIT5	BIT7	PATCH
PWM Signal	BIT3	BIT2	PATCH

General information

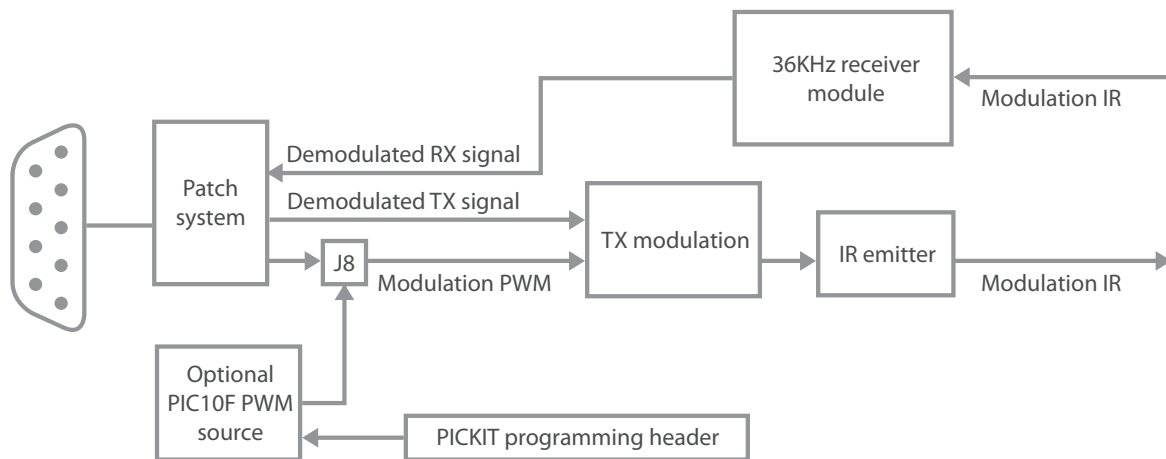
This E-block provides an infrared interface that can be used to facilitate communication between the microcontroller and third party devices like standard IR remote controls, televisions, stereos, mobile communications systems etc. Flowcode macros for driving this E-block are available.

A set of jumper links are available which allows the IR E-blocks to easily be set for all microcontroller port configurations.

Flowcode macros that make this device easier to use are available.

1. Features

- E-blocks compatible
- Highly sensitive 36KHz filtered infrared receiver
- Unfiltered infrared transmitter
- Flowcode macros available
- Compatible with the common RC5 standard of infrared communications



Circuit description

The design of this product enables you to use this device with many standard microcontroller devices. This is achieved by identifying the pins on the microcontroller, then by selecting the corresponding jumper setting on the IR board. This will allow you to configure the correct pin-out any microcontroller device.

1. IR receiver module

The IR receiver module is a TSOP1236, which contains a photo detector and preamplifier in a single package. It also contains an internal filter, which allows only incoming IR signals that are modulated with a 36KHz carrier to be detected. As the module does most of the work it makes the incoming signal for the microcontroller very clean and easy to interpret.

2. IR transmitter modulation

The IR transmission is handled by a single IR LED emitted combined with a transistor to boost the working current. The IR LED is driven by the PWM signal so that carrier

frequency is dictated by altering the period of the PWM output signal. The PWM output is enabled or disabled by the transmission enable line allowing for simple control of the output signal and allowing modulation to automatically happen.

3. Optional PIC10F device

There is space on the board to allow for a PIC10F device to be inserted and programmed using a PICKIT programmer. The PIC10F can then be used to generate the PWM signal leaving your microcontroller free to simply control the transmit enable line. The Flowcode program to drive this PIC can be obtained through our website.

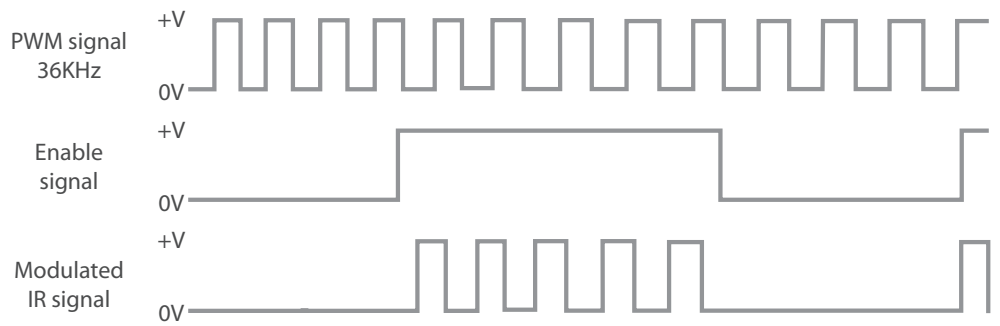
4. IR signal modulation explained

IR signals usually use some form of carrier frequency modulation to allow for more robust communications to take place without allowing noise to enter the system from other light sources. The common method is to

simply use a repeating frequency when the IR is sending a logical 1 and to have no transmission when sending a logic 0. This can be seen in the diagram shown on the right.

5. 3.3V operation

The board is fully compatible with upstream boards operating off 3.3V. When operating the board at 5V only the +V power rail needs to be connected to the device. When operating the board at 3.3V both the +V and +VPWR connections need to be connected up the correct screw



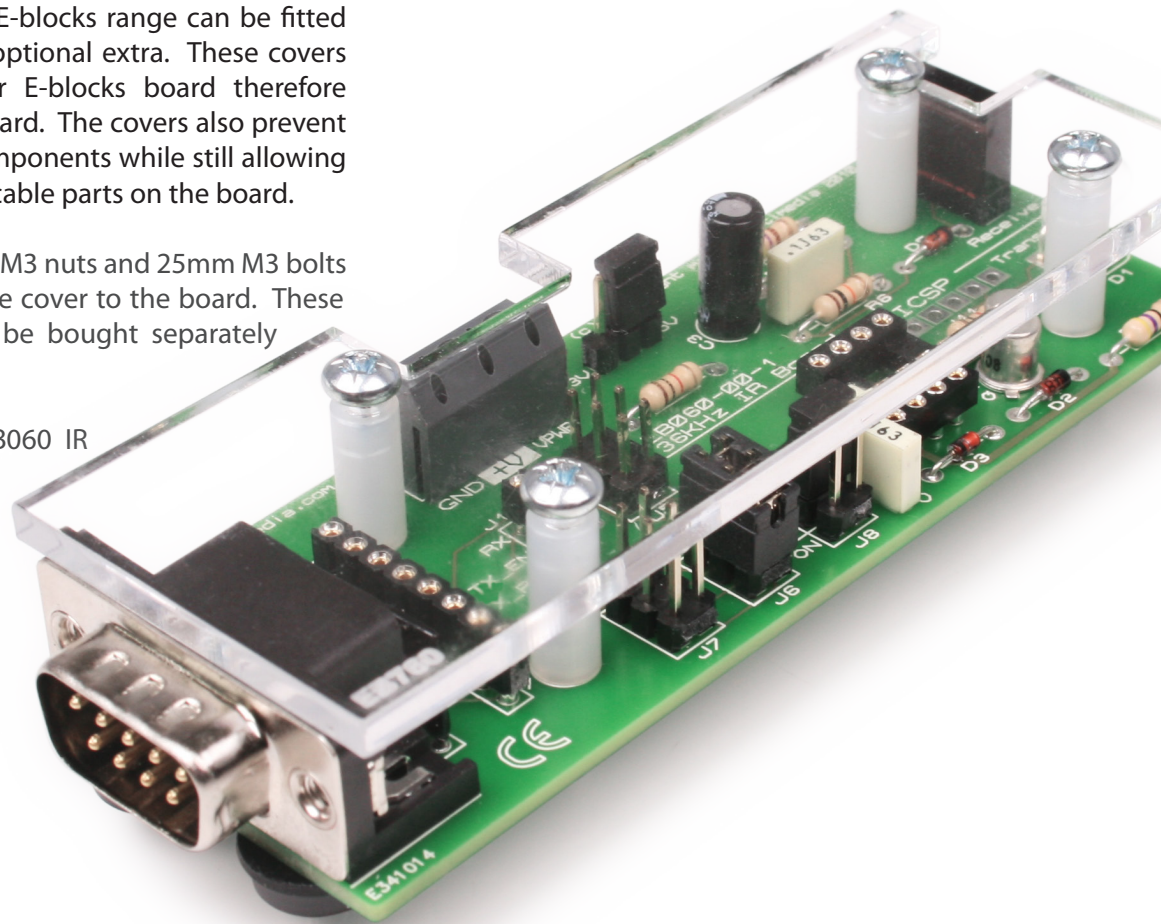
terminal input. Care should be taken to ensure that the voltage control jumper is set to the 3.3V position before any voltage is connected to the board to avoid damage to the integrated circuits fitted onto the board.

Protective cover

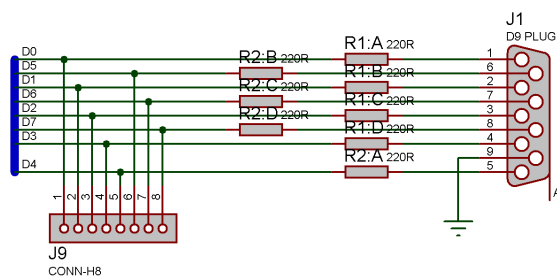
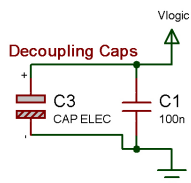
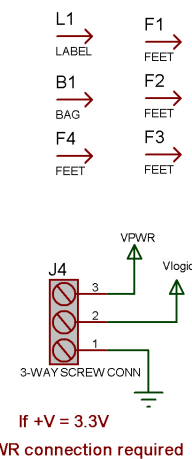
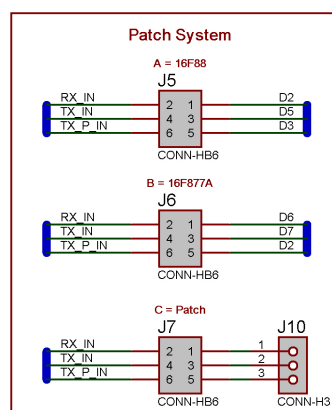
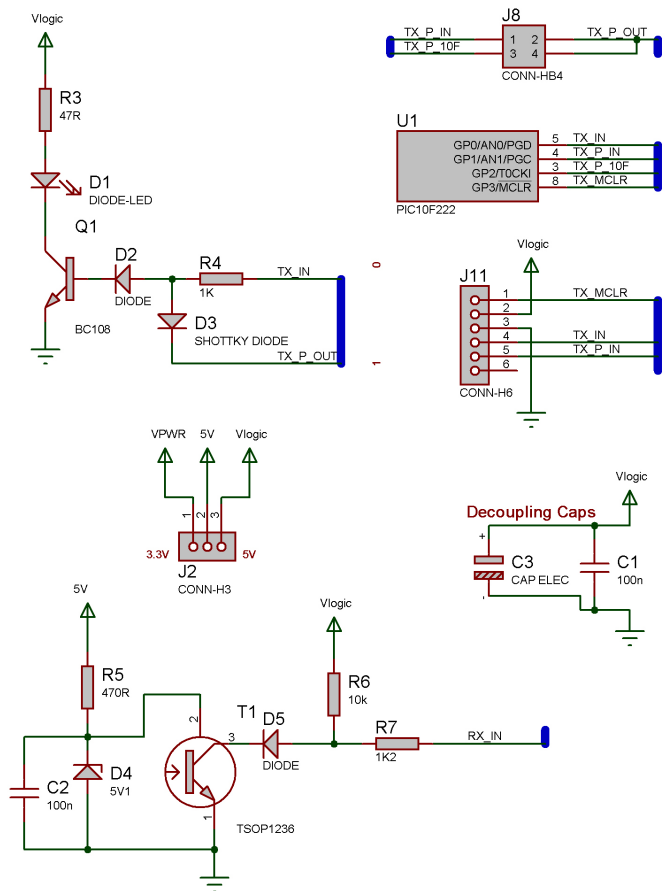
Most of the boards in the E-blocks range can be fitted with a plastic cover as an optional extra. These covers are there to protect your E-blocks board therefore extending the life of the board. The covers also prevent the removal of external components while still allowing for the adjustment of applicable 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 EB060 IR RC5 board is EB760.



Circuit diagram





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