Opto-isolator board datasheet
EB-035-00-1
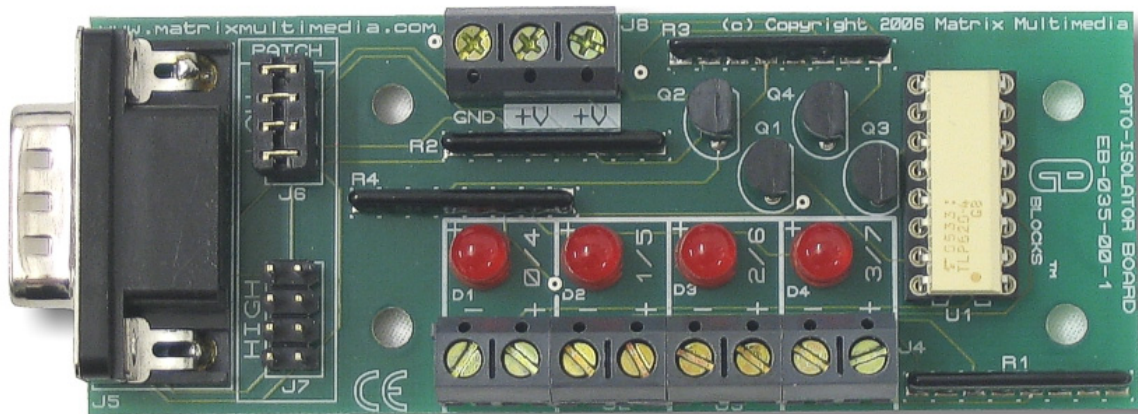
CONTENTS

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

This document concerns the Matrix Multimedia Optoisolator Board code EB035-00-1.

1. Trademarks and Copyright

PIC and PICmicro are registered trademarks of Arizona Microchip Inc.
E-blocks is a trademark of Matrix Multimedia Limited.
EB035 and associated software and documentation are Copyright ©2006 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-block 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
For strategy information for creating 'C' and Assembly code for the Optoisolator board. See members area. This can be found at www.matrixmultimedia.com/eblocks

3. Disclaimer

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

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.co.uk. If you still have any problems please email us at: support@matrixmultimedia.co.uk. When emailing please state the operating system and the version of PPP you are using.

2. <u>General Information</u>

This E-block is designed to allow electrical isolation between circuits. Because the Optoisolator board uses light to transmit information it can be used to protect circuits operating at lower voltages (ie, microcontrollers) from circuit operating at higher voltages (ie, motors).

Optoisolator Rating

The EB035-00-1 optoisolator board creates an interface between an upstream e-block and circuits operating at higher voltages. The on board chip is a TLP620-4 optoisolator. Information on this chip can be found www.isocom.com.

1*. Features*

- Provides the capacity to operate two circuits at different voltage levels.
- Provides the ability to isolate up to four circuits.
- Employs LEDs for instantaneous acknowledgment of board status.
- E-blocks compatible.

A set of jumper links is available for the Optoisolator board. Jumper links provide the user with the ability to control the TLP620-4 with either the HIGH nibble or LOW nibble.

3. <u>Board layout</u>
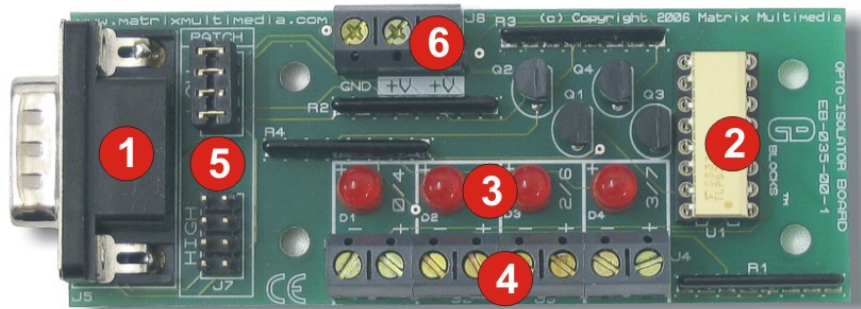
NB. Please ensure the mode selection jumpers are arranged on the board with the metal connection strips positioned horizontally.

1. Downstream 9-way D type connector.
2. TLP620-4.
3. LEDs
4. Output screw terminals
5. High/Low nibble selection
6. Power screw terminals

Patch System
The patch system consists of two DIL connectors. Selecting the DIL connector labelled LOW permits the user to control the optoisolator chip via bits 0 to 3. Selecting the DIL connector labelled HIGH allows the user to control the chip via bits 4 to 7. As stated previously please ensure mode selection jumpers are orientated correctly.

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

The following instructions describe the test procedure for the EB035-00-1 Optoisolator board.

1. System Setup

Multi-programmer board (EB006) with:

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	
Port B	
Port C	EB004 LED board
Port D	Opto-isolator board EB-035
Port E	
Test program	optocode.HEX

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EB035 Options	Setting
Patch jumper setting	LOW nibble

Test Procedure

- Open PPP.
- Open file Optoisolator.HEX.
- Click on "Configure PICmicro.." icon. In Select Chip section click on pull down menu and select the PIC16F877A. This will probably be the bottom choice. Ensure the chip is displayed in the Select Chip section.
- Click 'OK' to close the window and return to PPP.
- Once in PPP click on "Send To PICmicro" icon. A pop up window will inform you of status. If status is ok a "Program Sent And Verified" window will be observed on the screen.
- All LEDs on PORTC should be illuminated.
- Apply voltage (5V – 10V) to each terminal input in turn.
- The corresponding LED (D0 to D3) should turn off.
- Change patch setting.

EB035 Options	Setting
Patch jumper setting	HIGH nibble

.
- Again apply voltage to each terminal input in turn. The corresponding LED (D4 to D7) should switch off.

If all LEDs switch off when the corresponding switch is pressed for both LOW and HIGH nibble settings then the board has pass the test.

5. <u>Circuit description</u>

The EB035 Optoisolator circuit can be observed in Appendix1. From the circuit it can be seen that the main device on the board is the TLP620-4. This is a quad transistor output optoisolator which is powered from the +V output on the EB006 Multiprogrammer board.

The on board optoisolator chip contains four internal LEDs which are illuminated when current flows through their corresponding inputs. This in turn allows current to flow through the corresponding output transistor to ground. In this situation the external transistors (Q1, 2, 3, 4) and their associated LEDs are off.

When no current flows through the internal LEDs the output transistors of the chip are switched off. This allows current to flow into the base of the external transistors (Q1, 2, 3, 4). Subsequently current flows through the external transistors which in turn illuminates their corresponding LED.

Therefore, when the TLP620-4 is in operating mode the external LEDs are not illuminated. When the TLP620-4 is not in operating mode the external LEDs are illuminated.

3.3V Operation

This board is compatible with upstream boards operating off 3.3V.

Appendix 1