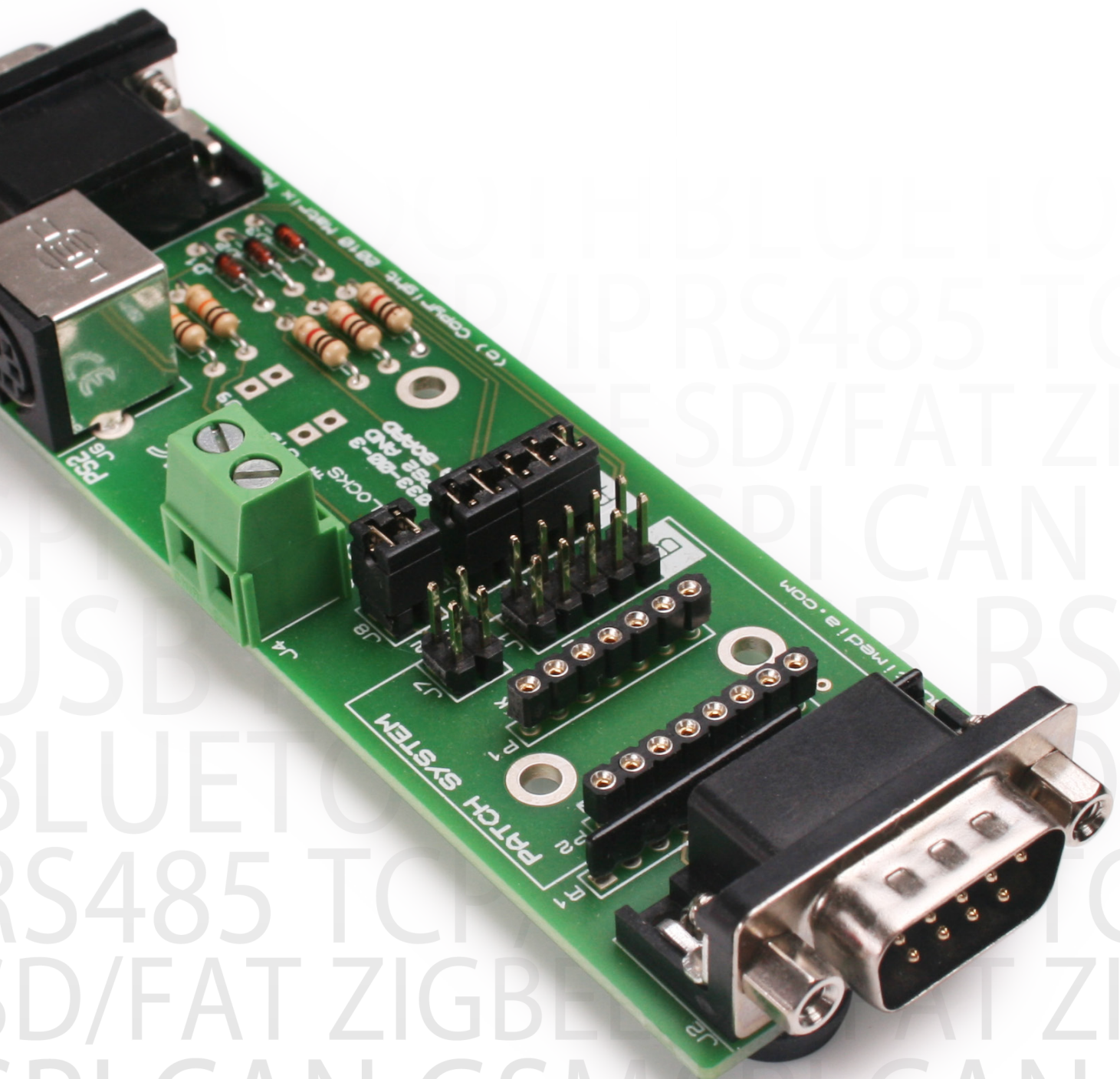


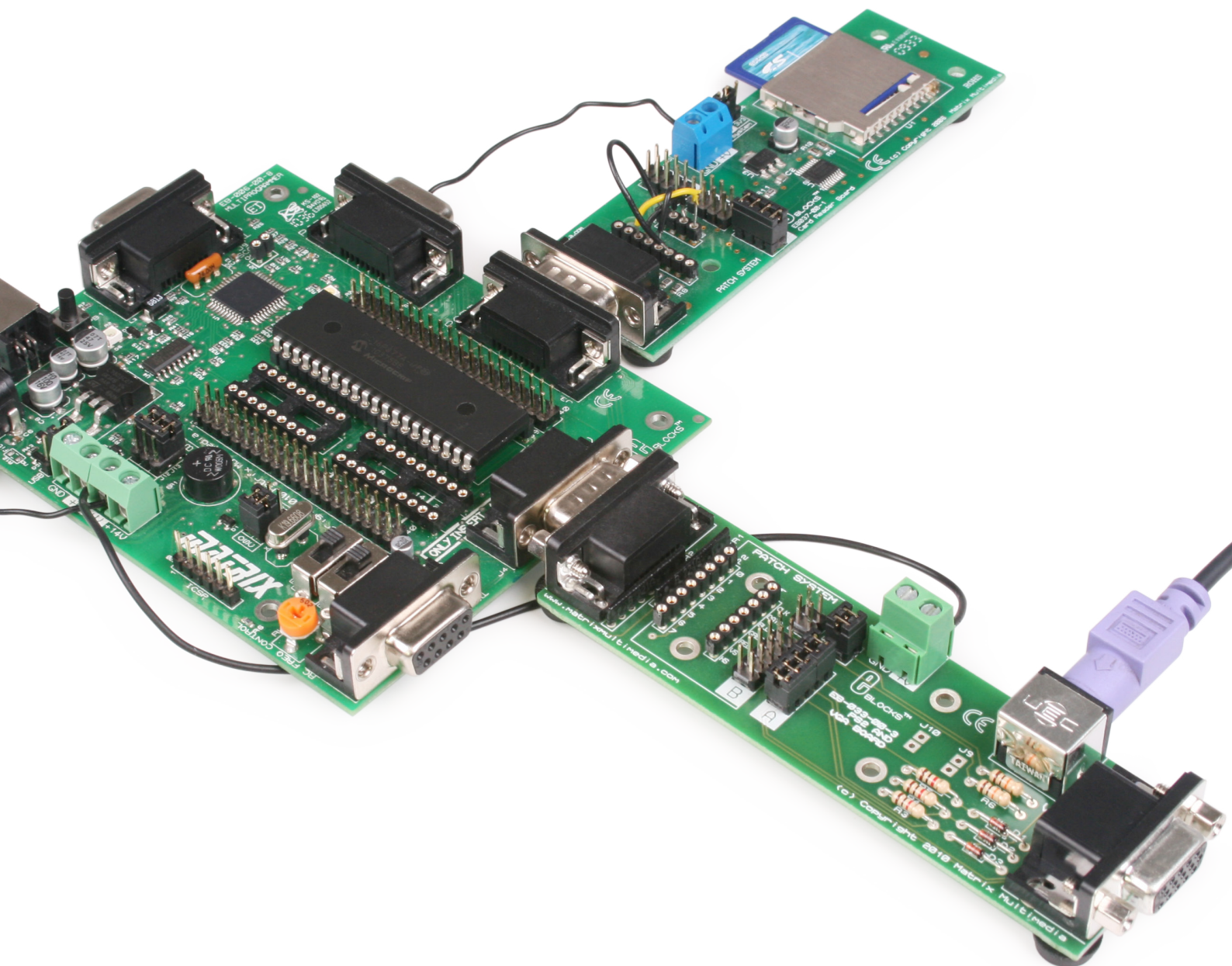
# **EBLOCKS<sup>®</sup>**

PS/2 and SVGA board



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# About this document

This document concerns the EB033 E-blocks PS/2 and SVGA 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

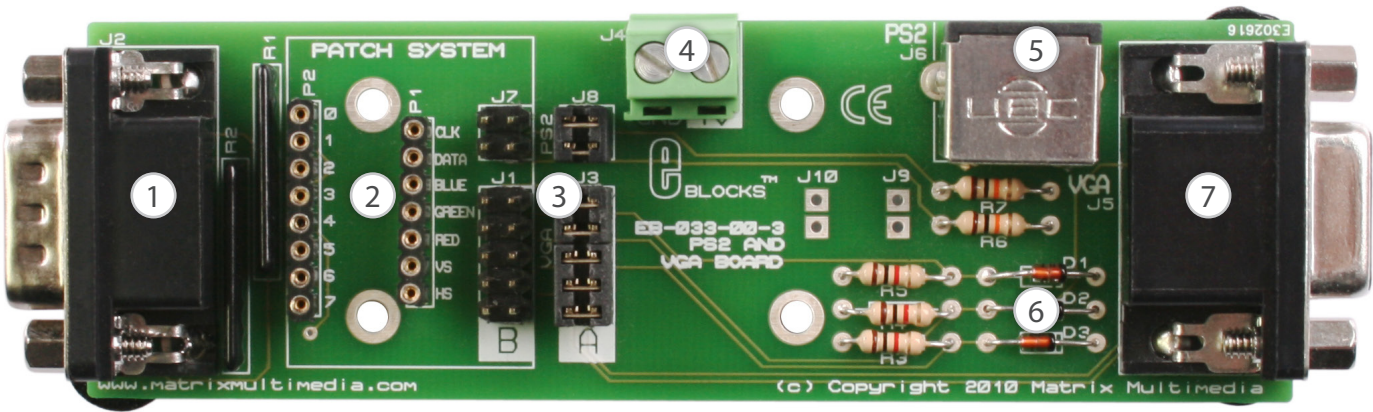
for all E-blocks, which can be found in the Support section of the website.

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



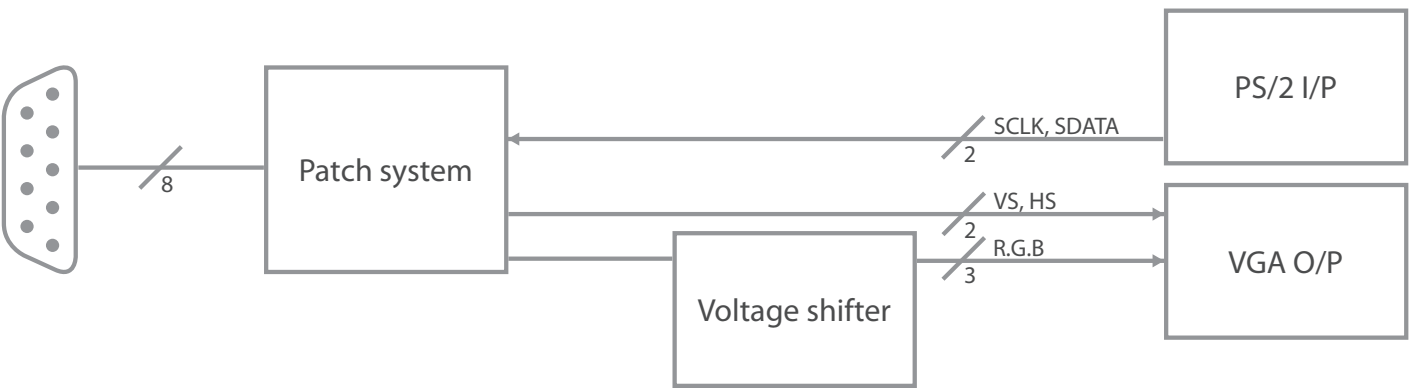
1. 9-way downstream D-type connector
2. Patch system
3. Mode selection jumper pins
4. Power screw terminals
5. PS/2 port
6. Voltage shifter 5V to 0.7V
7. SVGA port

JUMPER AT A		JUMPER AT B
Signal	Pin	
SDATA	0	Patch system
SCLK	1	
BLUE	2	
GREEN	3	
RED	4	
VS	5	
HS	6	

# General information

This E-block allows investigation of PS/2 devices such as keyboards and mice, as well as VGA, SVGA etc. outputs for computer monitors. The main function of this E-block is to add the capabilities of inputting and outputting PC based information.

A set of jumper links are available which allow the PS/2 SVGA E-block to be easily set for all PICmicro® microcontroller devices. With the patch system available on board makes this board compatible with numerous other controller devices.



1. Features
  - PS/2 serial data and serial clock
  - VGA horizontal and vertical sync controls
  - VGA red, green and blue controls
  - Voltage shifter for RGB signals

## Circuit description

The circuit as can be seen in the circuit diagram on page 6 is made up of four sections: connectors, voltage shifter, PS/2 port and SVGA port.

### 1. Connectors

The design of this product is to enable you to use it with many standard PICmicro® microcontroller devices. Other microcontroller devices can also be used to integrate with the PS/2 and SVGA connections. The patch system allows any combination on connections to be made allowing for a fully flexible compatible with any microcontroller or embedded system.

Jumper setting A and B are used for selecting the appropriate pins for SCLK and SDATA the dedicated PS/2 lines and VS, HS, R, G and B the dedicated VGA lines.

The following table illustrates the pin allocation settings:

JUMPER AT A		JUMPER AT B
Signal	Pin	
SDATA	0	Patch system
SCLK	1	
BLUE	2	
GREEN	3	
RED	4	
VS	5	
HS	6	

### 2. Voltage shifter

The voltage shifter that is used on this board is a directional 5V to 0.7V converter. The device consists of pairs of resistors and diodes, one for each of the SVGA colour data lines. The chip is used to convert the voltages sent

from the PICmicro® or other microcontroller into a level that will not damage the SVGA monitor. The resistors are powered via +V and the diodes are connected to ground to reduce the voltage.

### 3. PS/2 port

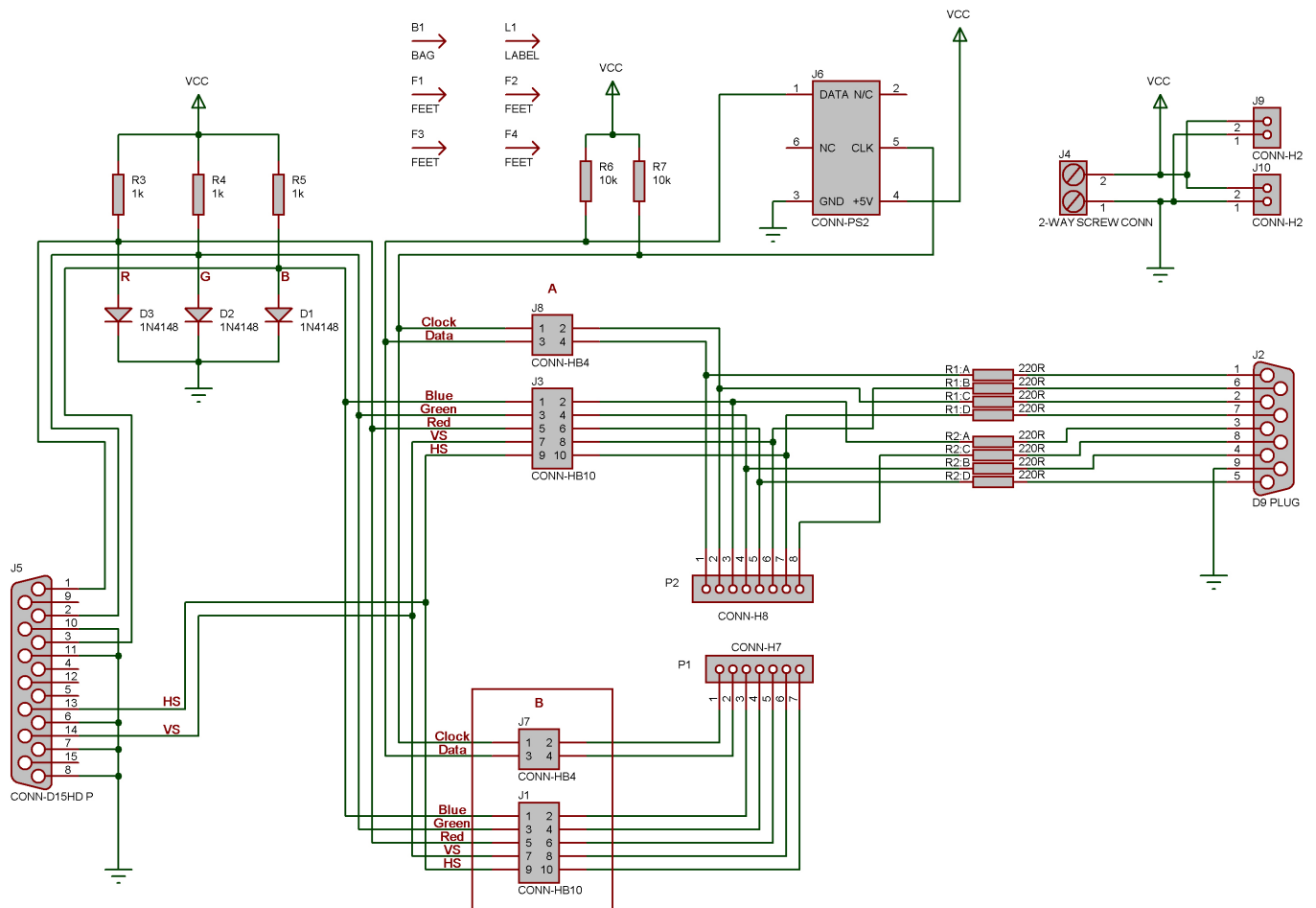
The PS/2 port allows a PS/2 device such as a keyboard or mouse to be connected to the EB033 board. The data lines that are connected to the PS/2 port are the SCLK and SDATA lines. The PS/2 protocol allows for the external device to control most of the handshaking and data transferring. When a external PS/2 device is writing data via the serial connection lines there is a clock signal and synchronized with this is a data line which has the

following scheme: one start bit (logic 0), eight data bits, one parity bit (odd parity) and one stop bit (logic 1).

### 4. SVGA port

The SVGA port allows a VGA/SVGA device such as a computer monitor to be connected to the EB033 board. The data lines that are connected to the VGA port are the VS, HS, Blue, Green and Red, lines. The VGA protocol specifies that the controller handles all of the timing information regarding sync pulse and data output. The data is sent out in a stream in the middle of the vertical sync pulse routine. However horizontal sync pulses must always be sent even when not sending data.

# Circuit diagram





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