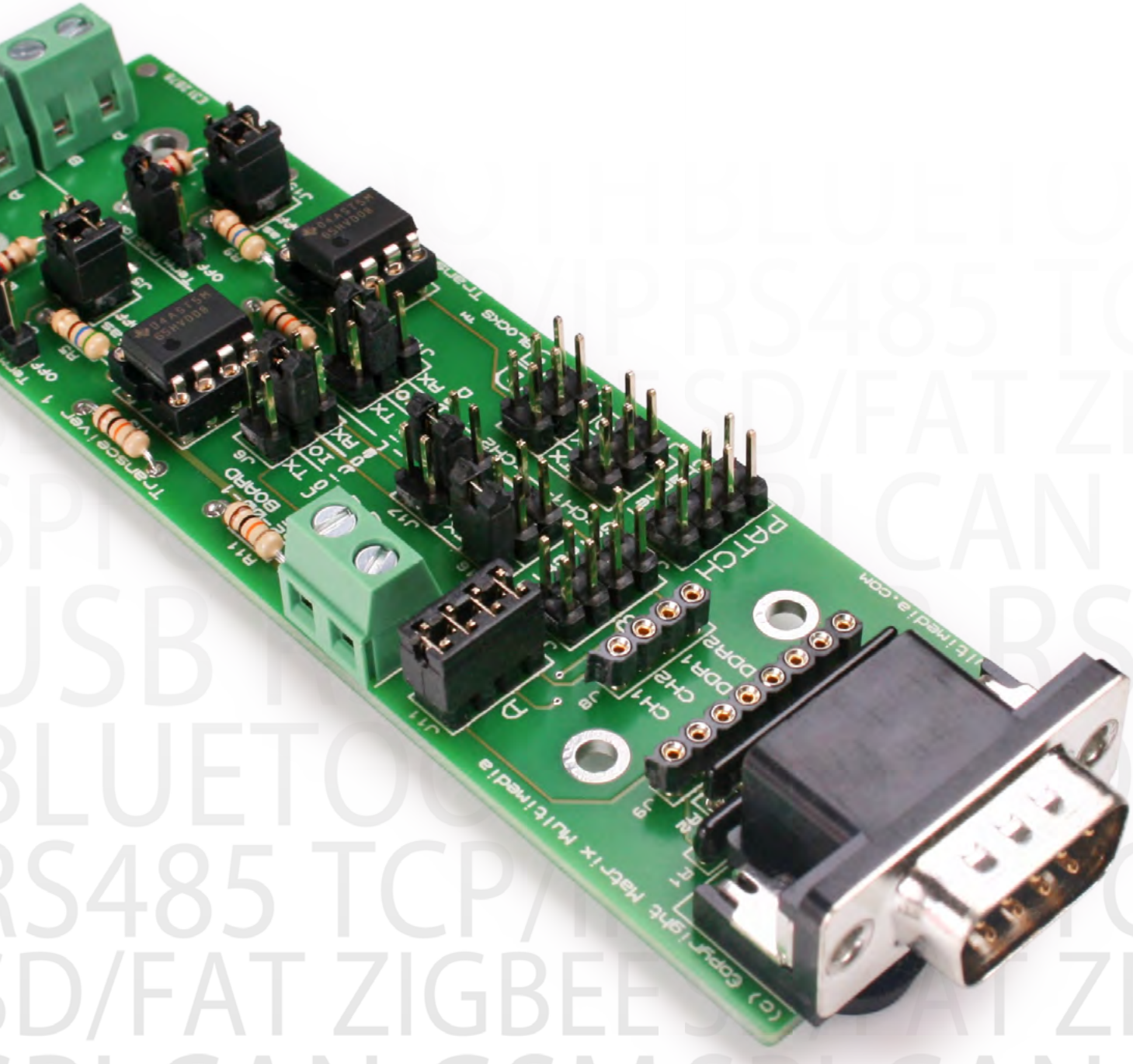
MATRIX

eBLOCKS®

RS485 board



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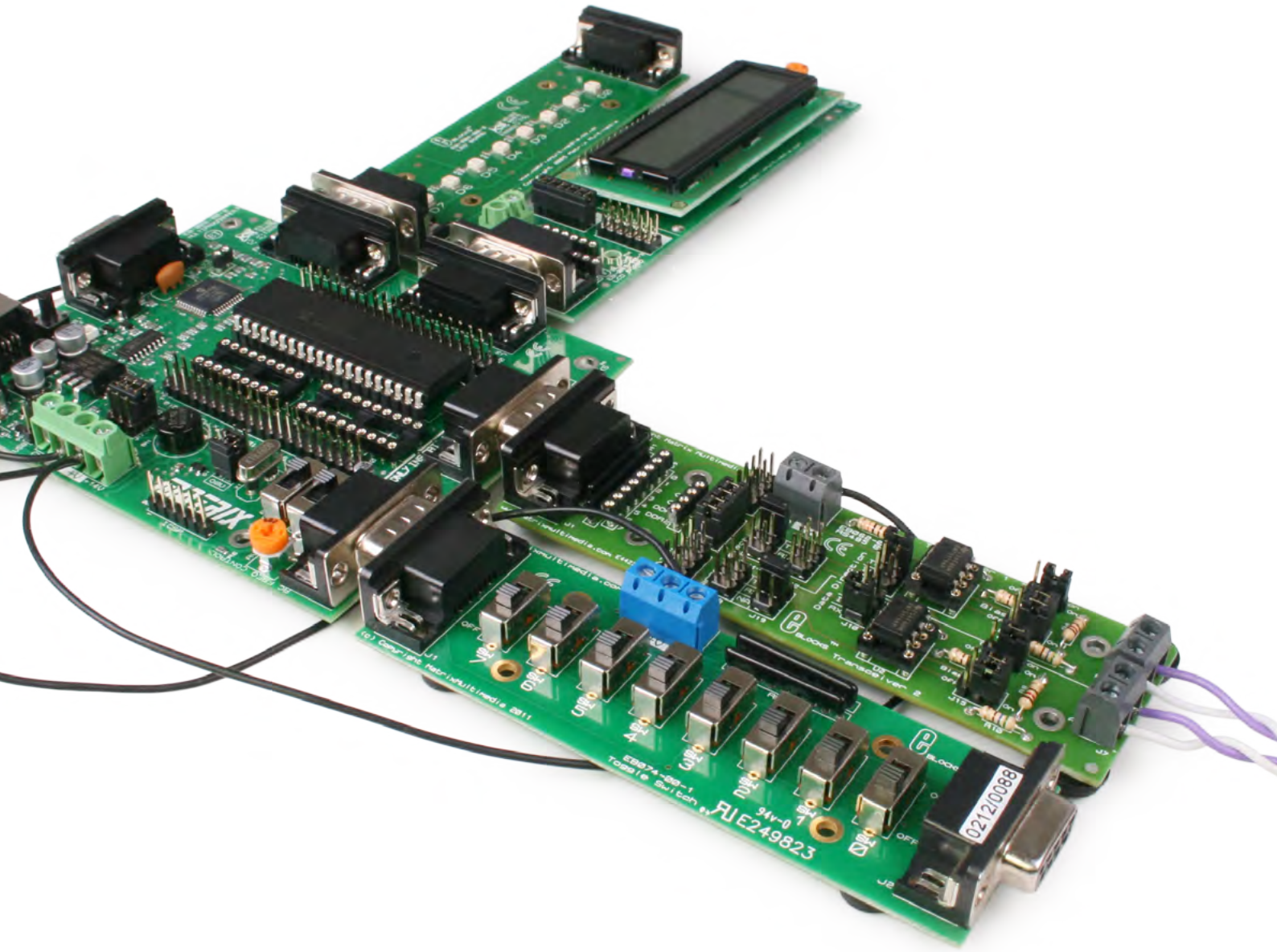


About this document

This document concerns the EB062 E-blocks RS485 board.

1. Trademarks and copyright

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

2. Disclaimer

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

3. Testing this product

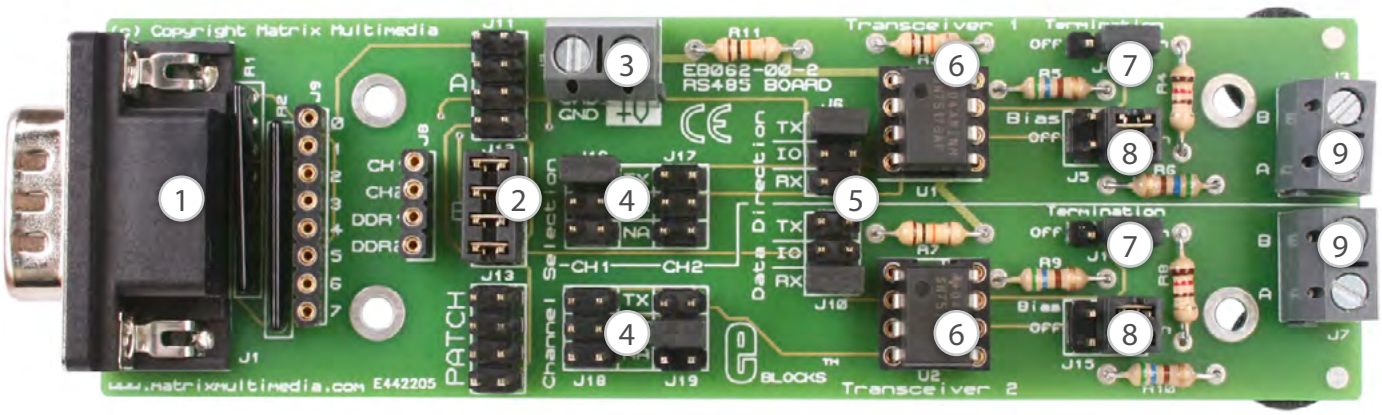
It is advisable to test the product upon receiving it to ensure it works correctly. Matrix provides test procedures for all E-blocks, which can be found in the Support section of the website.

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 screw terminal
4. Transceiver data channel allocation
5. Transceiver data direction control
6. RS485 transceiver IC
7. RS485 termination control
8. RS485 bias control
9. RS485 level screw terminals

General guide for patch settings:

	Jumper A	Jumper B	Jumper C (Patch)
CH1 Signal	BIT5	BIT6	PATCH
CH2 Signal	BIT2	BIT7	PATCH
DDR1 Signal	BIT0	BIT0	PATCH
DDR2 Signal	BIT1	BIT1	PATCH

General information

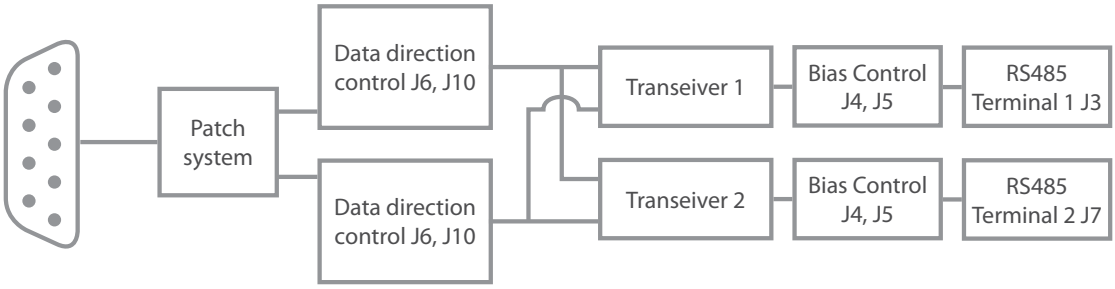
This E-block provides an RS485 interface that can be used to facilitate communication between a microcontroller and third party devices like communications systems or industrial sensors etc. Flowcode macros for driving this E-block are available via the RS232 component or simply the I/O icons depending on your application.

A set of jumper links are available which allow the RS485 E-block 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
- 1 full duplex RS485 connection
- 2 half duplex RS485 connection
- Data rates up to 16Mbps
- Up to 256 transceivers per bus
- 3.3V compatible (if alternate driver chips are retro-fitted)



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 PICmicro, then by selecting the corresponding jumper setting on the RS485 board. This will allow you to configure the correct pin-out for any microcontroller device.

1. Data direction control

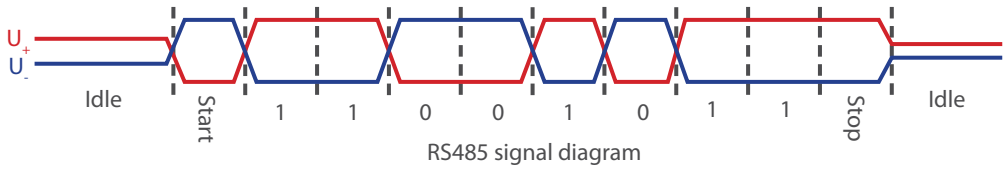
The data direction control jumpers allow for the two transceiver modules to be put into receive or transmit mode. A single transceiver cannot send and receive data at the same time. For bidirectional communications you can either set up one transceiver to be a receiver and the other a transmitter or you can use the I/O settings and control the data direction using an output pin from the upstream microcontroller. Using this method up to two bidirectional half-duplex communications busses can be created using a single RS485 E-block.

2. Channel selection

The channel selection jumpers control the assignment of the data pins to functions on the transceiver chips. This can be used to assign both channels as inputs or outputs or one of each type to allow full duplex communications.

3. Termination and biasing

The termination control jumpers select if a terminating resistor is placed across the RS485 data lines. The termination resistor is required for RS485 nodes that are on the end of a bus or where data reflections need to be attenuated and minimized. Similarly the bias control jumpers select if pull up and pull down resistors are placed onto the RS485 data lines. These resistors can be used to help maintain voltage separation on the active data lines.



RS485 signal diagram

4. RS485 signals explained

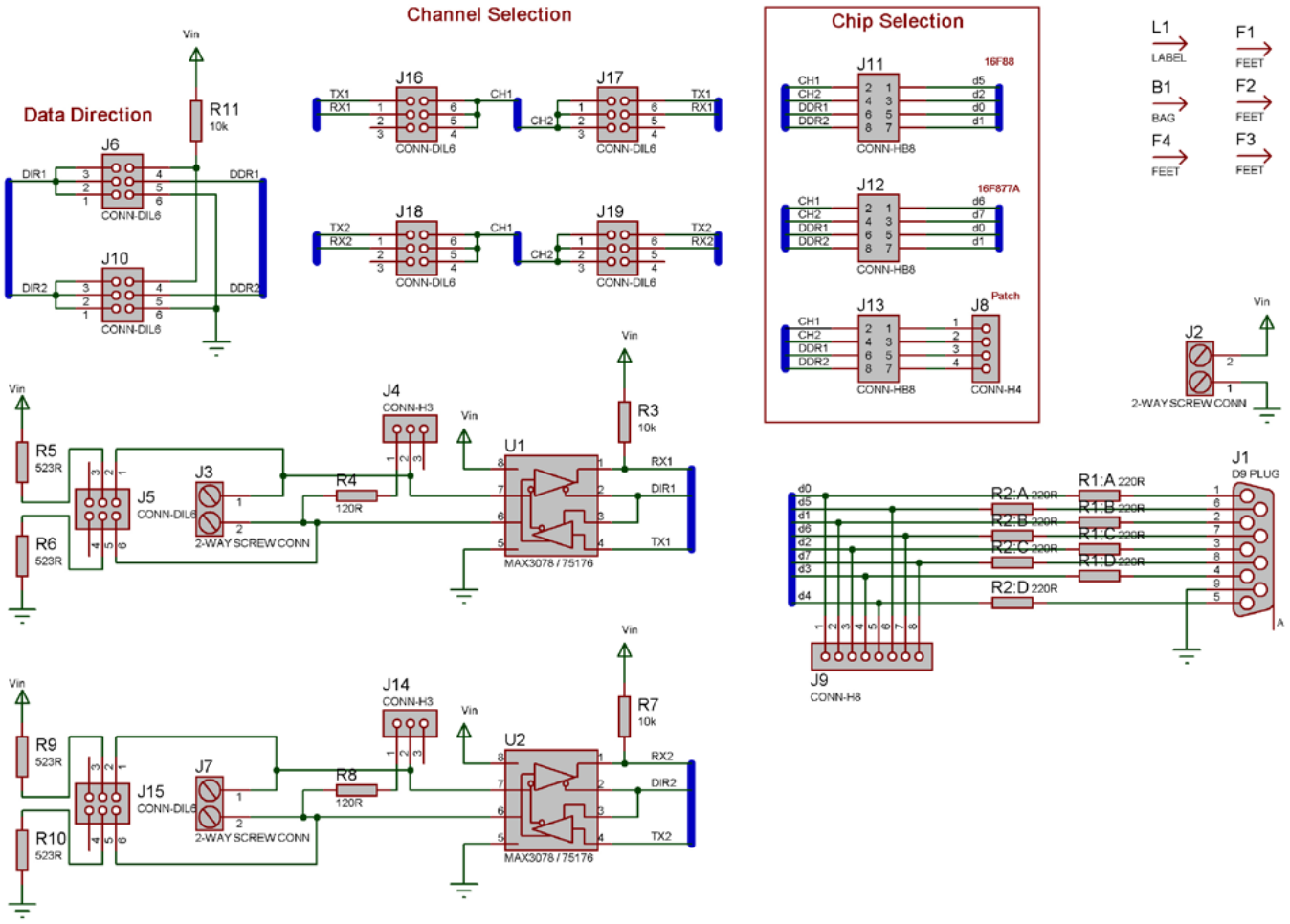
RS485 is often used as it can be used effectively over long distances and in electrically noisy environments. Multiple transceivers may be connected to a RS485 network in a linear of multi-drop configuration. The

signal is a differential signal and is sent along twisted pair wire to help retain noise immunity. The bus should be created as a single line of nodes with termination resistors fitted at each end and should not be connected into star or ring topologies.

5. 3.3V operation

This board comes with 5V driver chips fitted as standard. RS485 by standard is a 5V bus. A 3.3V version of the driver chip is available and can be used to provide 3.3V functionality by replacing the two 75176 driver chips with MAX3078 driver chips.

Circuit diagram



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