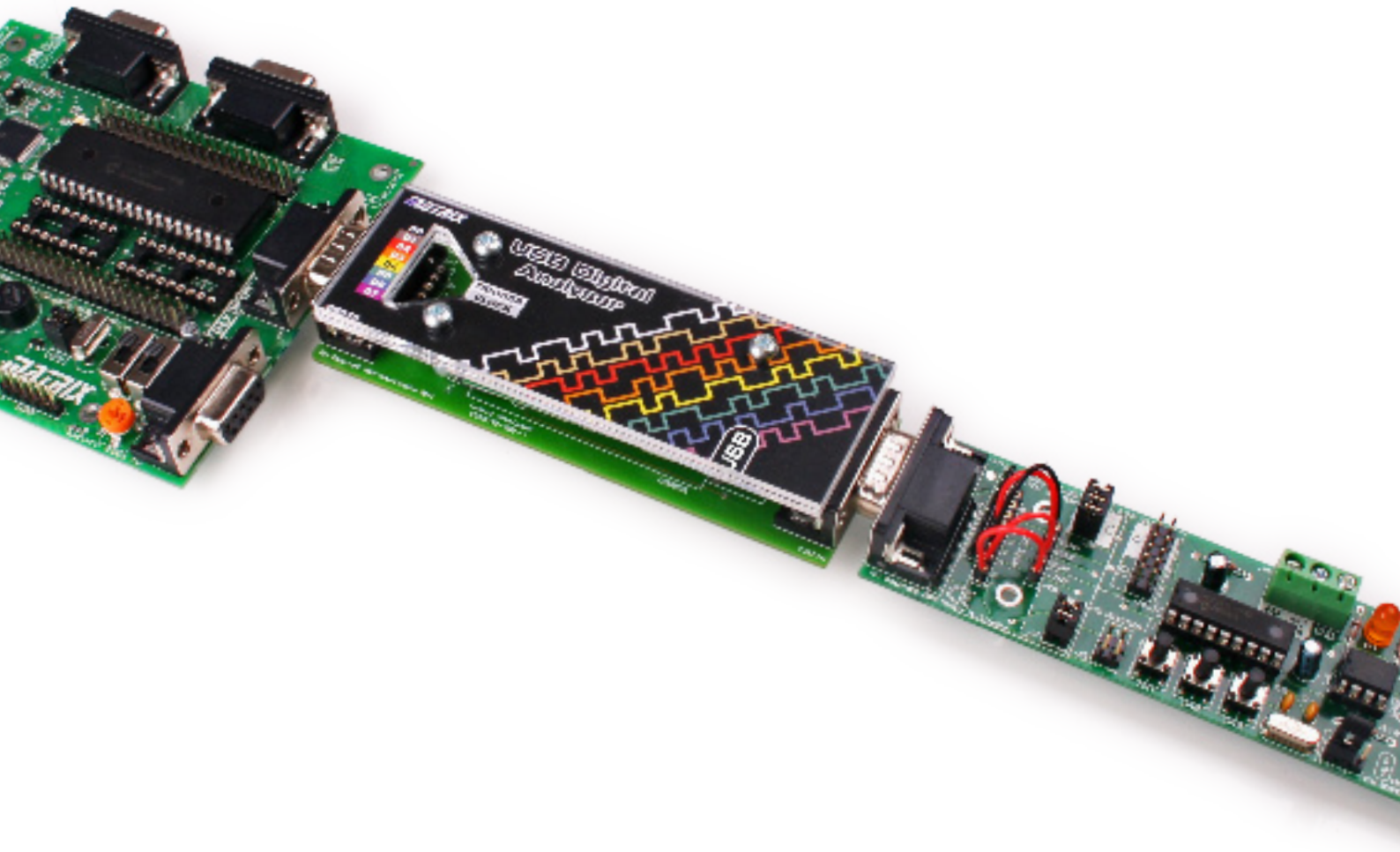
MATRIX

eBLOCKS®

USBee test board

Contents



About this document

This document concerns the EB070 E-blocks USBee 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. Downstream 9-way D-type connector
2. Patch system
3. USBee module
4. USB right angle adaptor
5. Upstream 9-way D-type connector

General information

The board features a USB compatible USBee SX data logger module capable of measuring and recording up to 8 digital signals. The module can read and decode the following types of bus interface: USB, SPI, I²C, asynchronous serial, 1-wire, PS/2, SMBus, I²S, CAN, serial, parallel and custom. The board can also function as a signal generator.

1. Features

- 8-way digital oscilloscope
- Up to 24Msps
- Triggering available on any channel
- Separate external triggering
- Bus / protocol analysis with hexadecimal output
- Export data as binary, text, csv
- Injecting signals or test data
- Inline connection
- 3.3V and 5V compatible
- E-blocks compatible
- USB cable included

2. Connections

The patch system on the board is used to allow the clock and trigger signals to be connected to any of the 8 digital channels or through to another external source

Software

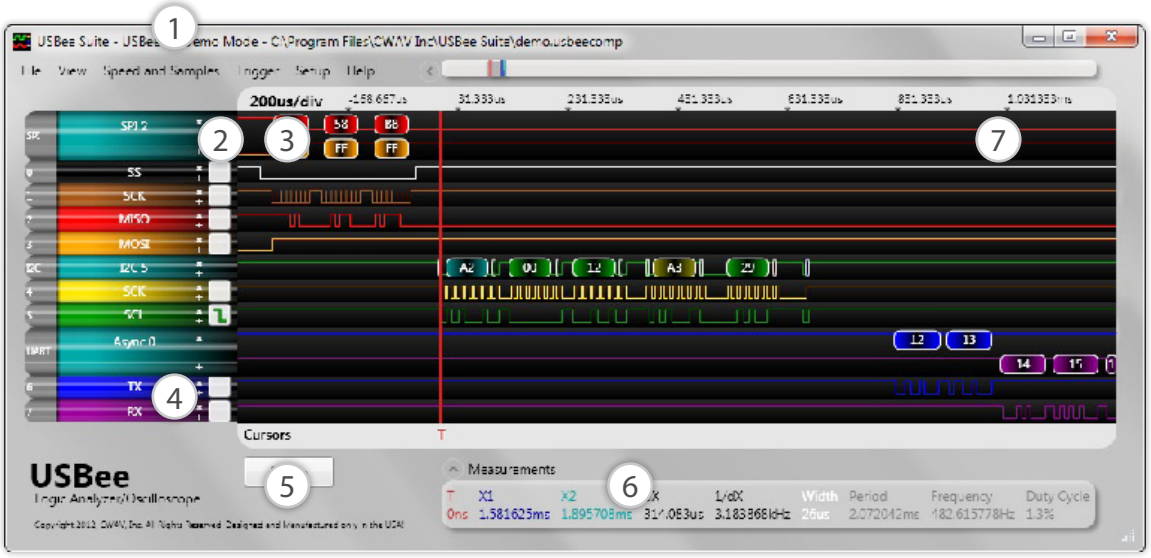
The EB070 USB test pod circuit can be observed on page 5.

1. About the software

The USBee Suite is required to use this product; the software is a powerful electronic signal analysis tool for the USBee test pod. Below is a picture showing the most common aspects of the USB module operation using the USBee Suite software. If you require further help please refer to the USBee documentation included in the USbee software installation.

2. Acquiring the software

The software is available to download from the USBee site: http://www.usbee.com/download.htm. The EB070 uses the USB SX test pod module, meaning you will need to download the appropriate software for this module.



1. Sample control
2. Trigger controls
3. Protocol selection
4. Channel reference
5. Sample button “Demo” suggests USB is disconnected or not installed
6. Measurement reporting
7. Digital scope traces

Using the software

To use the USBee Suite the EB070 needs to be plugged into the PC. If the EB070 device is detected correctly the capture button at the bottom of the software will change from saying "**Demo**" to say "**Capture Once**". From this point a user can run the capture software with the desired settings some important settings will be discussed below:

- Speed and samples

This section has two slider bars which can altered, the **Sample Rate** will record a number of samples per second. The second is the '**Buffer Size**', this is the size of the samples, the bigger the buffer the longer the capture time will be.

- Protocol selection

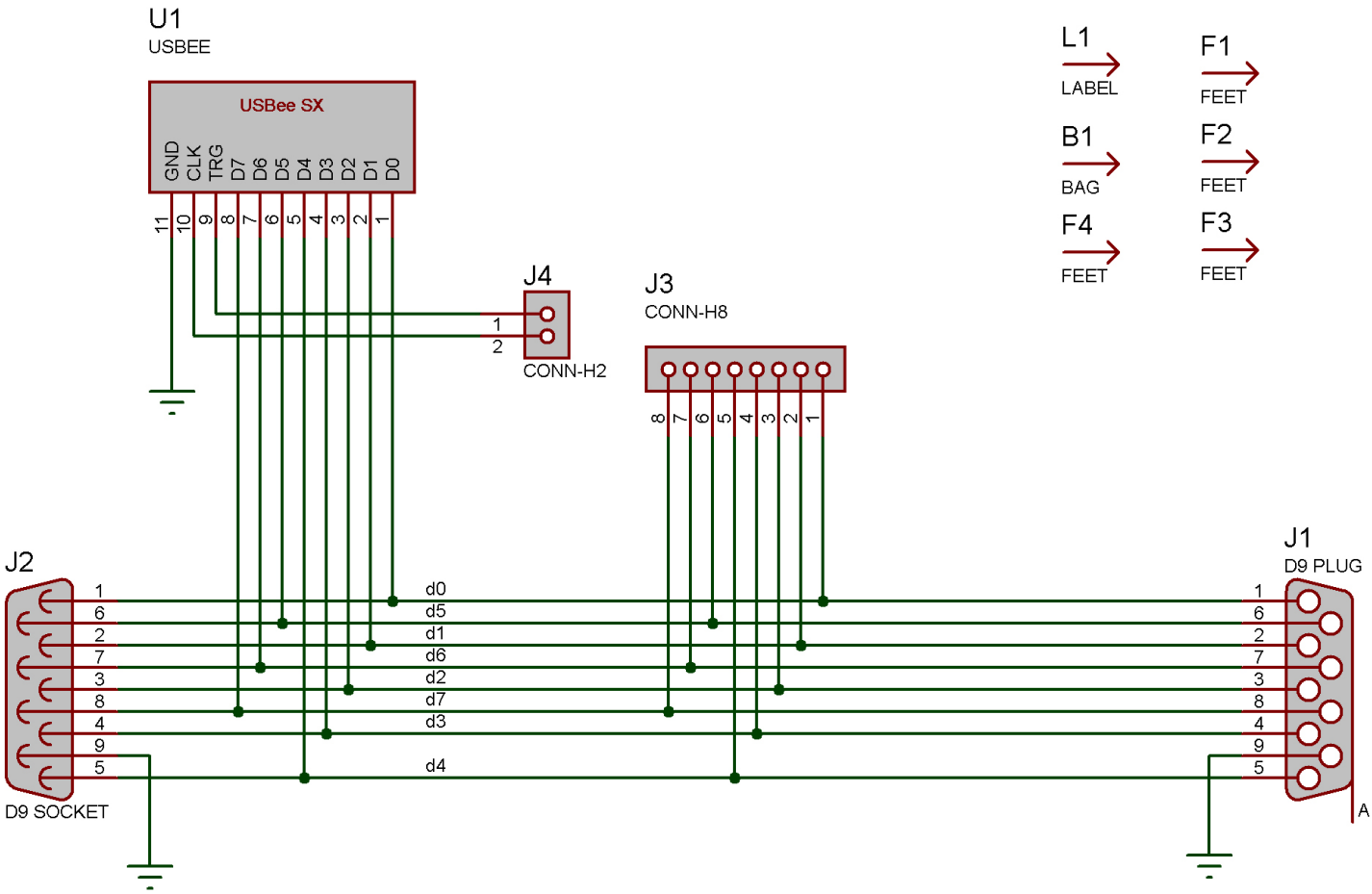
Clicking in this area will open up a protocol selection menu, allowing a user to select the protocol they would like to monitor along with a variety of options associated with that protocol. Below is a summary of the most common protocols used by EB070, for more detailed information please see the USBee Suite help file. *(Note some of the more common protocol setups can be selected in the 'Setup' menu).*

- Async
  - *Signal selection* - use these buttons to select the pins which the UART is on (commonly found on pins 6 & 7).
  - *Data bits* - this option allows a user to select the number of data bits.
  - *Parity* - set the parity bit.
  - *Data format* - this will change the display
  - *TX and RX* - select whether the transmit and return are inverted or not.
  - *Baud rate* - specify a baud rate.
- I^2C
  - *Signal selection* - use these buttons to select the pins which the Clock and Data pins are on.
  - *Data format* - this will change the display of the results upon capture.
- SPI
  - *Signal selection* - use these buttons to select the pins which the Clock, Enable and MOSI/MISO Data are.
  - *MOSI samples* - select whether the Master Out/ Slave In samples are rising or falling edge.
  - *MISO samples* - select whether the Master In/Slave Out samples are rising or falling edge.
  - *Use Enable* - toggle the SPI Enable on or off.
  - *Enable active* - if the Enable is on them toggle whether it is active high or low.
  - *Bits per word* - number of bits per word ensure this is the same as hardware.
  - *Data format* - this will change the display of the results upon capture.
- CAN
  - *Signal selection* - use these button to select the pins which the Clock and Data pins are on.
  - *Bit rate* - type in the correct bit rate of the CAN hardware here.
  - *Minimum ID* - type the lowest ID in hex you want the program to capture.
  - *Maximum ID* - type the highest ID in hex you want the program to capture.
  - *Data format* - this will change the display of the results upon capture.

Once the connections have been set up and the sample and buffer sizes have been set, the user can click the "Capture Once" to run the scan for the allotted time. Once the scan has been run the user can then view the generated waveforms, zooming in and out by left and right clicking on the main view.

For more information on using the USBee Suite, please view its help file by going to Help > Open USBee Suite Manual.

Circuit diagram



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