BBM Programmer
DATASHEET

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Document Revision History

Revision Number	Date	Description
0.1	07/07/2021	Initial Draft
0.2	19/07/2021	Formatting Update
1.0	28/07/2021	Initial Public Release

Hardware Revision History

| Revision Number	Date	Description
1.0	15/01/2021	Initial Revision

About Breadboard Mates

Breadboard Mates (aka BBM) is an Australian start-up company and was established in 2020 with the aim to bring breadboard friendly display products to the market, cutting down the time and components required to develop or experiment with electronics.

Hobbyist to Professional, BBM products can be utilised for development or education or anything in between. Development of projects / applications is made incredibly easy with the help of the revolutionary Mates Studio IDE.

The Mates Studio IDE is unlike any other, it offers 4 different programming methods with interchangeable pages and widgets, and helps speed up development for stand alone, host driven or PC tethered applications.

Breadboard Mates is constantly working on new product ideas, so keep a watch on the breadboardmates.com website for new product releases.
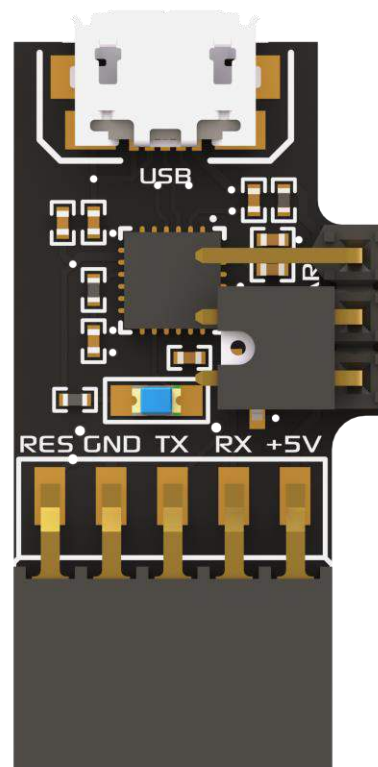
Product Description

BBM-PROG (ref. BBM Programmer) is a simple USB programmer for BBM products, providing a simple 5-way programming interface, and selection option for programming other devices such as 'barebones' Arduino (Atmel) processors.

Product Features

The BBM Programmer offers a simple connection for a MatesBUS compatible device, such as the TIMI-96, connecting to one side (5-pins) of the MatesBUS interface, allowing easy programming of the BBM device using the Mates Studio IDE.

Hardware Detail

The BBM Programmer has a microUSB Interface, for connecting the programmer to your PC, using a standard microUSB cable. The BBM Programmer then utilises a standard 5-pin interface for programming the 4D Labs processors found on BBM products, such as the TIMI-96. This 5-pin interface is one side of the MatesBUS Interface.

The BBM-Programmer does not come with the microUSB cable, this can be purchased from virtually any hardware/computer store.

The MatesBUS Interface is made up of 2 rows of 5 pins, 0.1" (2.54mm) pitch, spaced 0.3" (7.62mm) apart, ideal for direct plug into a breadboard, or compatible adaptor or development board.
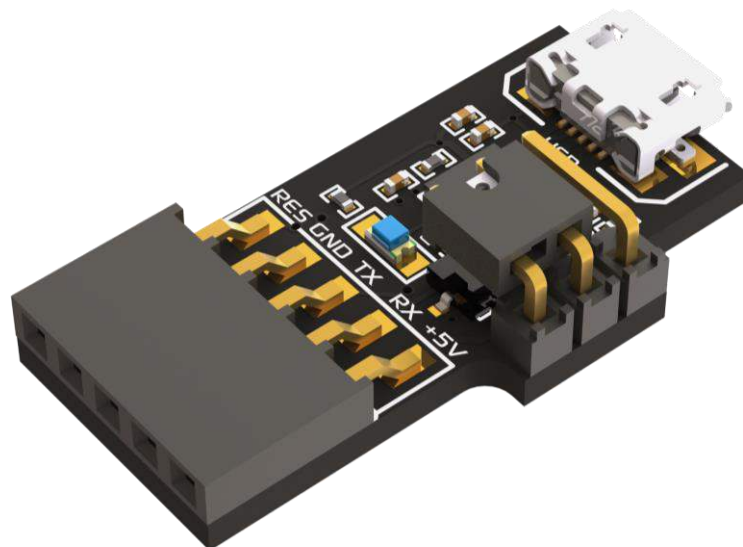
Programming Hardware

Programming Hardware - Overview

The BBM Programmer is a USB to Serial programmer for application and firmware updates, which programs both the Processor Flash memory, along with the on-board SPI Flash memory of BBM products, such as the TIMI-96.

The Programmer, dubbed BBM-Prog, is the official BBM Programmer and can also be used for testing and debugging of TIMI applications using the Mates Studio IDE.

Programming Hardware – Detail

The BBM-PROG utilises the Silicon Labs CP2104 USB to UART bridge, and uses the TIMI's Serial UART to load applications, firmware/PmmC and media content.
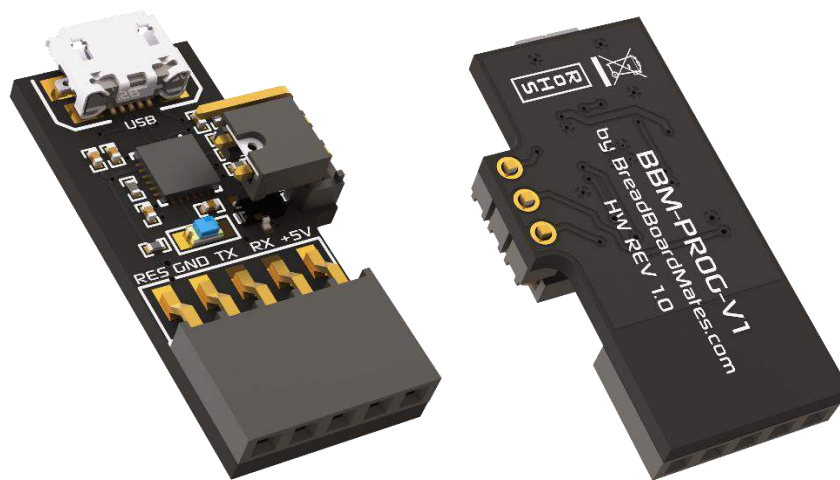
The BBM-PROG features a 3-pin jumper with shunt, which is present to change the way the programmer handles the Reset line, utilised by TIMI and other devices.

TIMI requires the jumper to be positioned like the image above, closest to the 5-way female header. This makes the programmer compatible with programming the 4D Labs Pixxi-28 processor.

If the jumper is placed on the 2 pins closest to the USB connector, this will make the programmer compatible with programming Atmel chips, such is used on many of the Arduino boards, or barebone chips. This may also be compatible with other microcontrollers too.

Hardware Interfaces

The BBM Programmer has a microUSB Interface, for connecting the programmer to your PC, using a standard microUSB cable. It then has a 5-way interface for connecting to a compatible BBM device that is to be programmed. The 5-way interface is one half of the standard MatesBUS interface, found on many BBM products.

5-Pin System Pins

+5V (Device Supply Voltage)
MatesBUS supply voltage pin. This pin supplies the MatesBUS device with 5VDC from this BBM Programmer.

GND (Module Ground)
Device ground pin.

TX (Serial UART Transmit)
TX of the BBM Programmer connects to RX of the BBM device, this is the 3.3V Asynchronous Serial UART Transmit for communications between the device connected and the BBM Programmer.

RX (Serial UART Receive)
RX of the BBM Programmer connects to TX of the BBM device, this is the 3.3V Asynchronous Serial UART Receive for communications between the device connected and the BBM Programmer.

RESET (MatesBUS Reset)
This pin is to allow the BBM Programmer to reset the processor on the BBM Device, which is a requirement in the programming sequence.

Software

The BBM Programmer features a Silicon Labs USB to Serial converter, and the driver required for this can be found directly from the Silicon Labs website.

For best results, select the latest 'Universal' Windows Driver available from the Silicon Labs Website:

https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers

At the time of writing this, here is the direct link for the latest driver:

https://www.silabs.com/documents/public/software/CP210x_Universal_Windows_Driver.zip
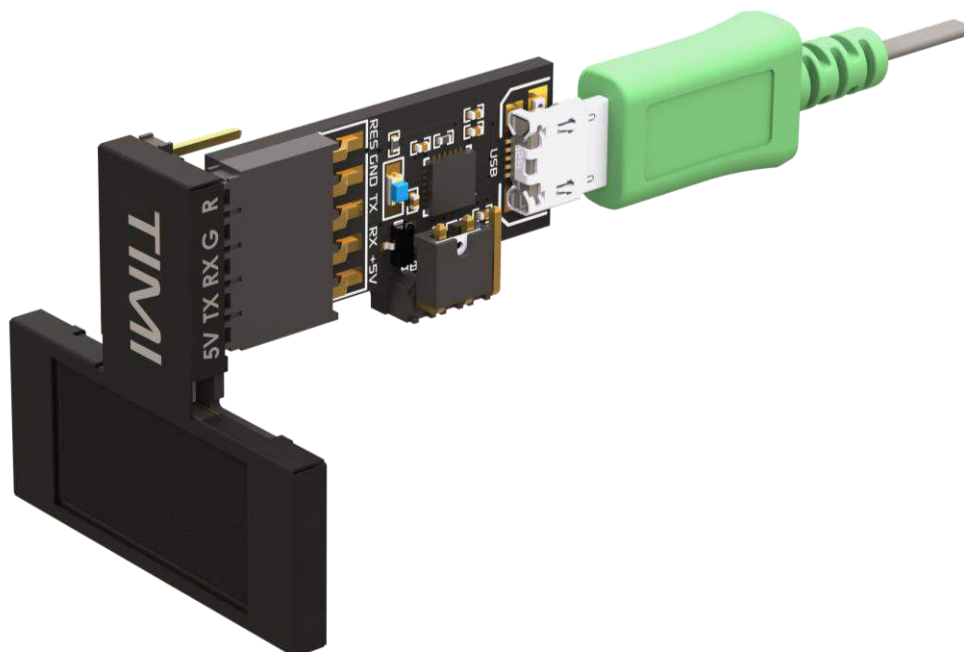
Typical Connections
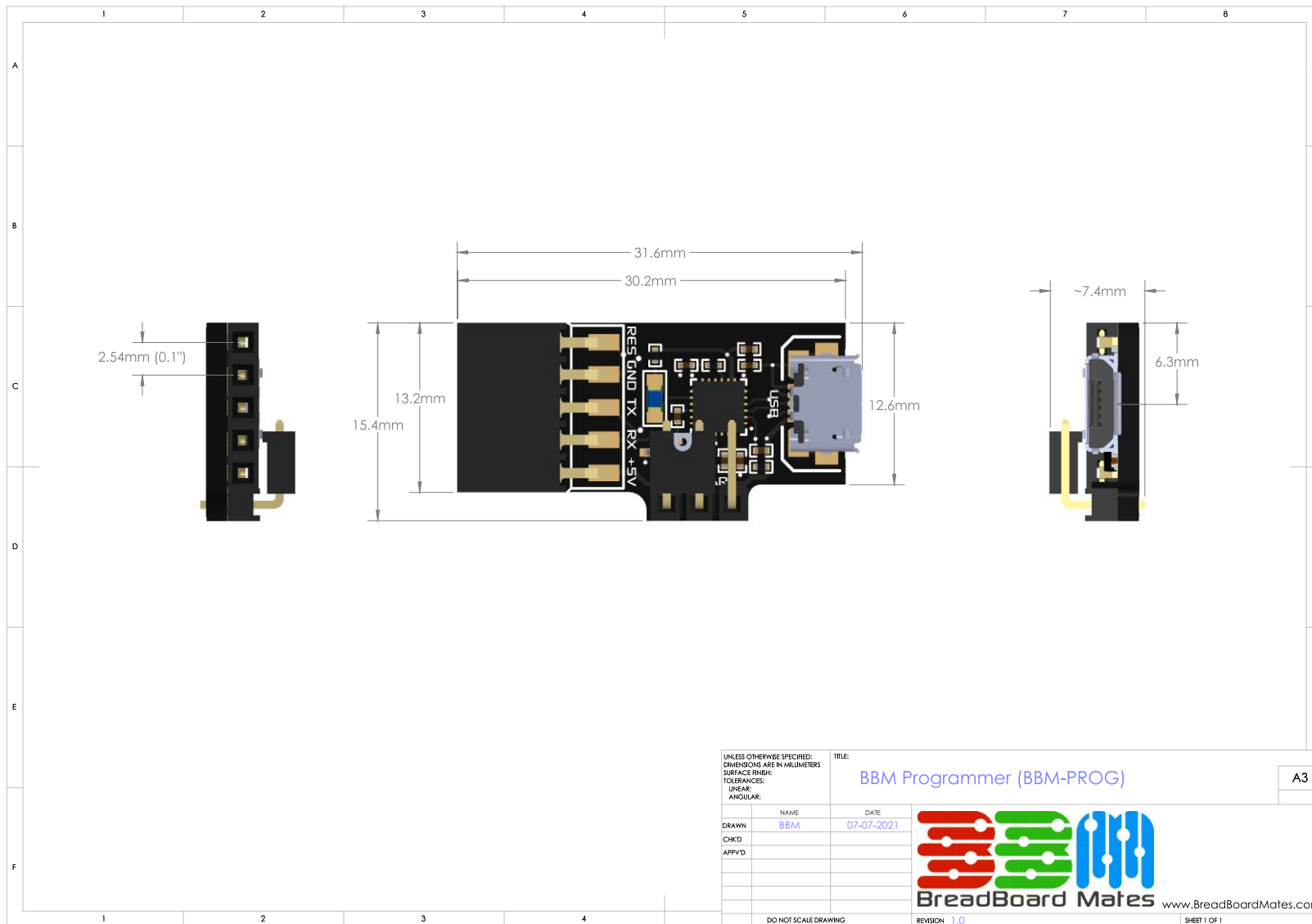
Breadboard Interface with Programmer

One of the simplest interfaces for programming devices such as TIMI-96, is connecting TIMI-96 to the bottom of a breadboard, connecting the 5-way right angle header into the breadboard next to the H2 header side of TIMI-96, and attaching the BBM Programmer to the 5-way header.
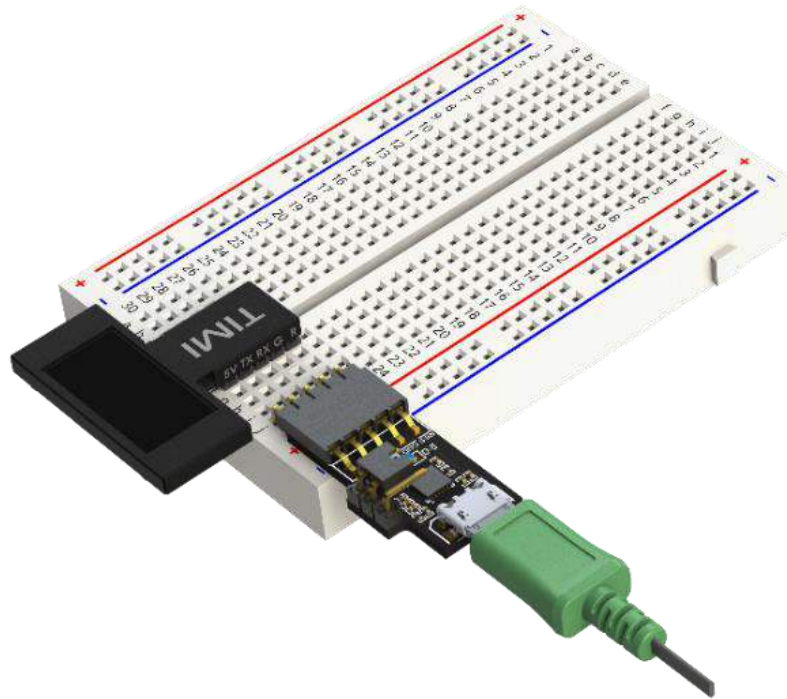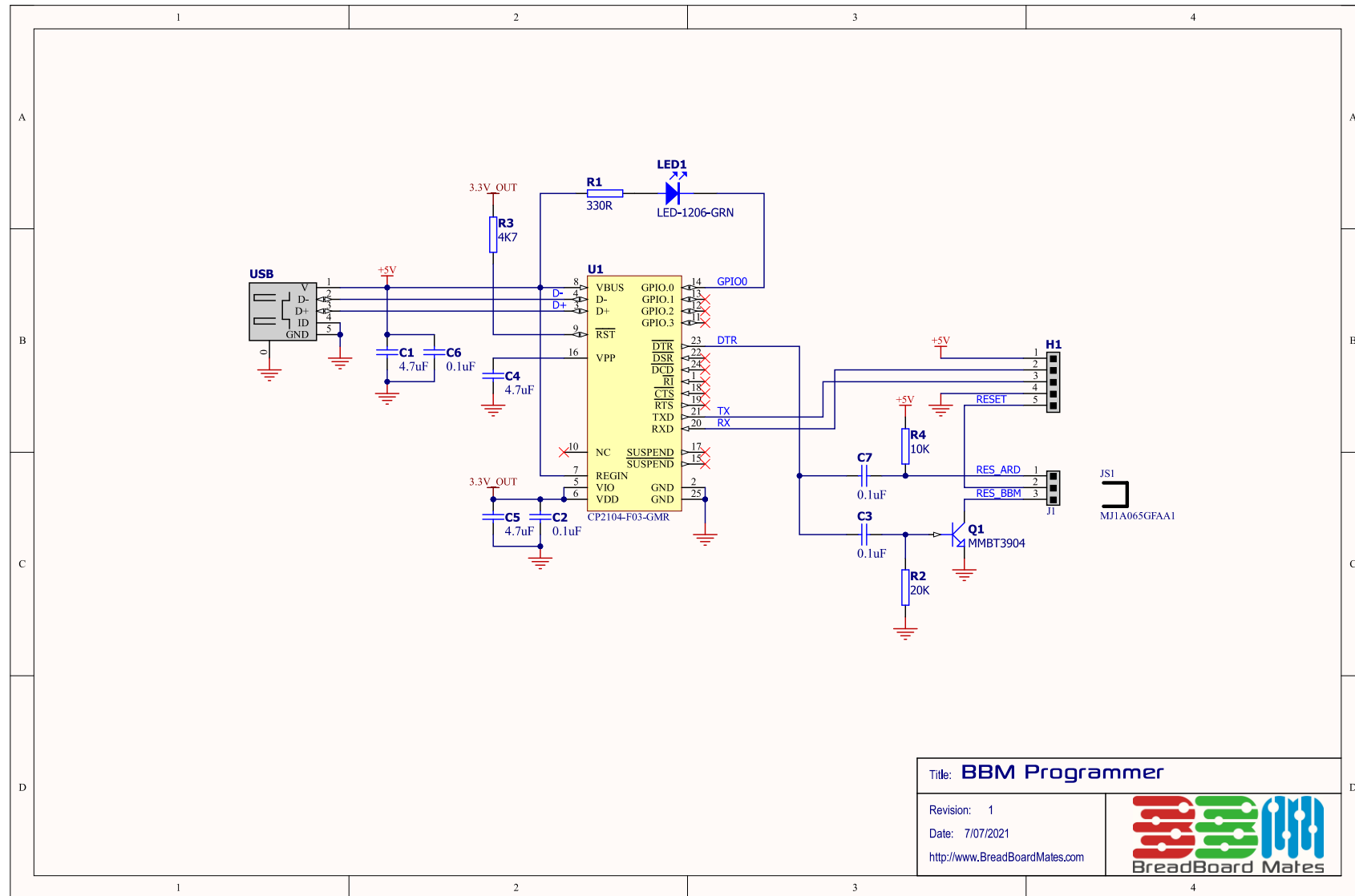

The BBM Programmer can also be directly connected to the appropriate row of 5 male pins on BBM products such as TIMI-96 if direct programming is desired instead.

31.6mm
30.2mm
~7.4mm
2.54mm (0.1")
13.2mm
15.4mm
12.6mm
6.3mm

RES GND TX RX +5V
USB

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:	TITLE: BBM Programmer (BBM-PROG)	A3

	NAME	DATE
DRAWN	BBM	07-07-2021
CHK'D		
APPV'D		

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Hardware Schematic

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