



# DATASHEET

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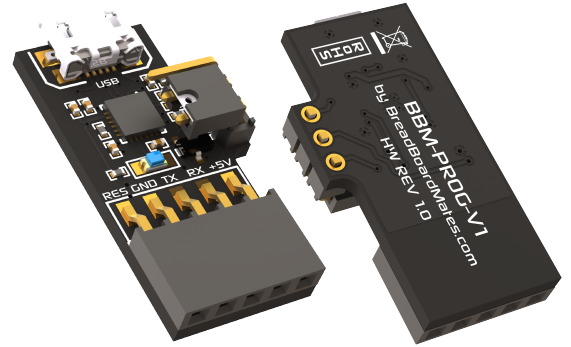
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# Introduction

Mates Programmer (ref. BBM-PROG) 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.

The Mates 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 Mates Programmer has a microUSB Interface, for connecting the programmer to your PC, using a standard microUSB cable. The Mates 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 Mates 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

The Mates 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 Mates Programmer and can also be used for testing and debugging of TIMI applications using the Mates Studio IDE.

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 4D Labs processors.

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 as is used on many of the Arduino boards, or barebone chips. This may also be compatible with other microcontrollers too.

# Hardware Interfaces

The Mates 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 Mates Programmer.

### **GND** (Module Ground)

Device ground pin.

### **TX** (Serial UART Transmit)

TX of the Mates 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 Mates Programmer.

### **RX** (Serial UART Receive)

RX of the Mates 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 Mates Programmer.

### **RESET** (MatesBUS Reset)

This pin is to allow the Mates Programmer to reset the processor on the BBM Device, which is a requirement in the programming sequence.

## Software

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

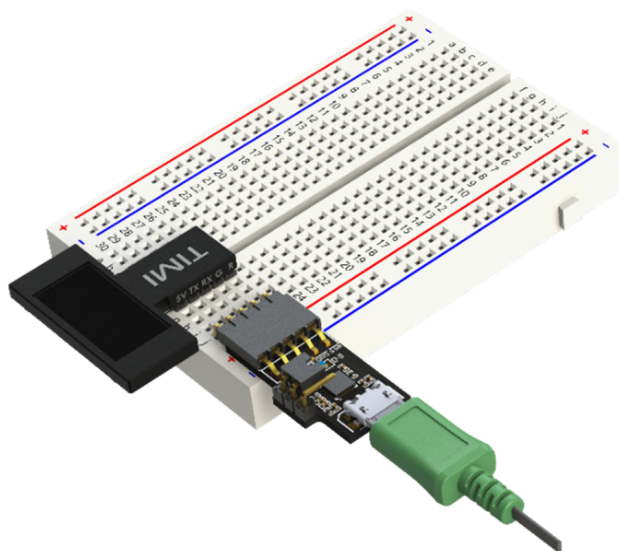
For best results, select the latest 'Universal' Windows Driver available from the [Silicon Labs Website](#)

At the time of writing this, here is the direct [link](#) for the latest driver.

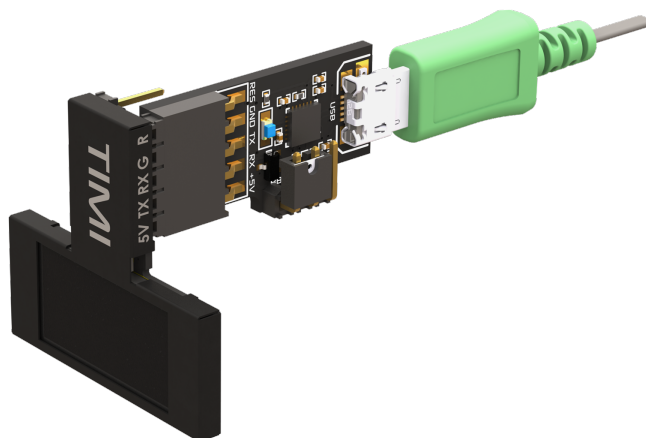
# Typical Connections

## Breadboard Interface with Programmer

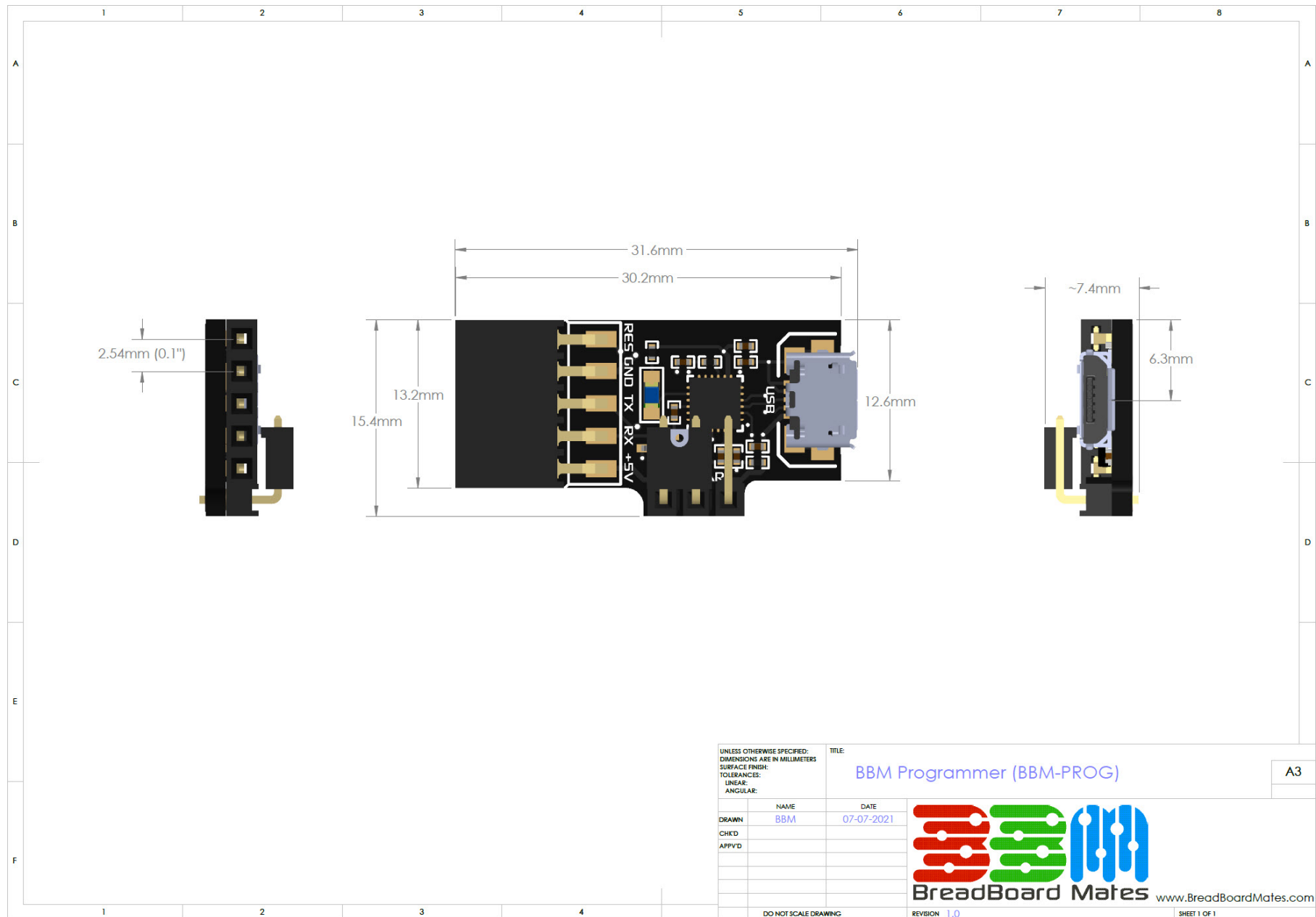
One of the simplest interfaces for programming devices such as TIMI-96, is connecting TIMI-96 to the bottom of a breadboard, connecting the 5-way right angle header into the breadboard next to the H2 header side of TIMI-96, and attaching the Mates Programmer to the 5-way header.



The Mates 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.



# Hardware Drawing



# Hardware Schematic

