# Key Specifications

- Bluetooth Certified 4.0 Audio module
- Single Mode: Bluetooth Low Energy (BLE)
- Embedded Bluetooth Protocol Stack
- Supports GATT Profile, Audio, Proximity, and iBeacon
- Supports I2C and UART transparent Data Modes
- Supports audio over BLE with built in CODEC
- Simple UART and GPIO interface for command and control
- Built in USB<>UART converter
- Built in battery holder
- Small form factor (70mm x 50mm x 25mm)
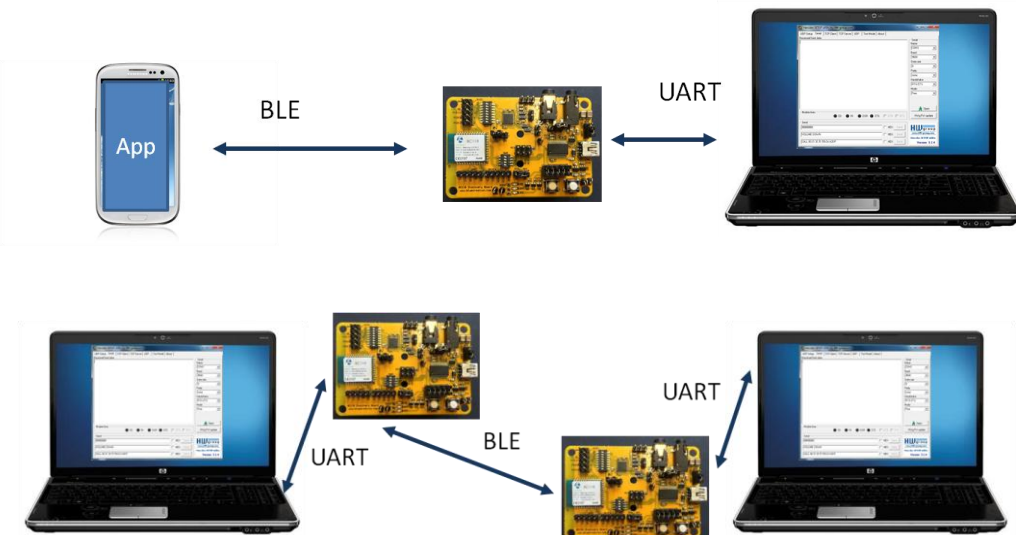- Bluetooth, FCC and CE certified
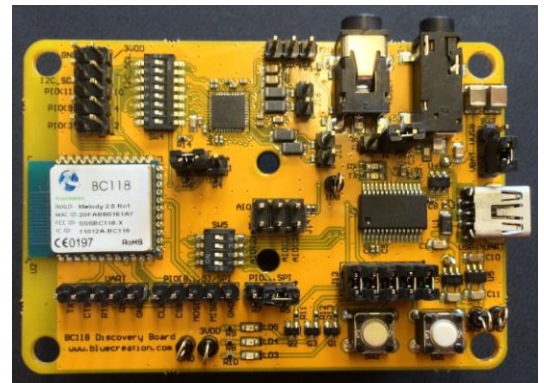
Applications

- Industrial Automation
- Lighting
- Automotive
- Medical Devices
- Wearable Devices
- Sensors, Actuators

Description

The BC118 Discovery Board is an highly flexible easy to use development board for the BC118 ultra low power, small form factor Bluetooth Version 4.0 Certified module.

It comes preloaded with BlueCreation Melody Smart software, and is ideal for developers who want to quickly and cost effectively integrate Bluetooth Low Energy functionality into their products or develop standalone sensors or accessories.

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Setting Up the Board - Equipment

To start you need to have:

a) The BC118 Discovery Board and a USB cable. Please contact sales@bluecreation.com for more information.
b) A computer with and USB port and serial terminal software. On Windows you can use Hercules HyperTerminal utility (http://www.hw-group.com/products/hercules/index_en.html).

Setting up the Board – Steps

Step 1: Ensure that all jumper and switch positions on the board are as indicated in Figure 3.

Step 2: Connect the board to your PC using the USB cable. The board will enumerate as a COM port. Your PC will automatically find and install the required FTDI drivers.

Step 3: Go to Star Menu/Devices and Printers. You will see your board will be under FT232R USB UART. When you look at Properties you will see under which COM port it has enumerated

Step3: Launch your chosen serial terminal utility. Please use the following parameters for the UART setting (these are the default Melody Smart UART parameters). Line endings for your serial terminal should be set to '\r' (carriage return) only.

- Baud rate   : 9600bps
- Data bits   : 8
- Stop bits   : 1
- Parity bit   : No parity
- HW Flow Control   : Disabled

In your serial terminal window, type RST and then hit carriage return/Enter. If you receive an ERR response, make sure your serial terminal is sending only \r as line endings. You should then see the BlueCreation Prompt. You are now ready to use the board. Please refer to the Melody Smart Manual for more information on the different commands you can use to control the board.
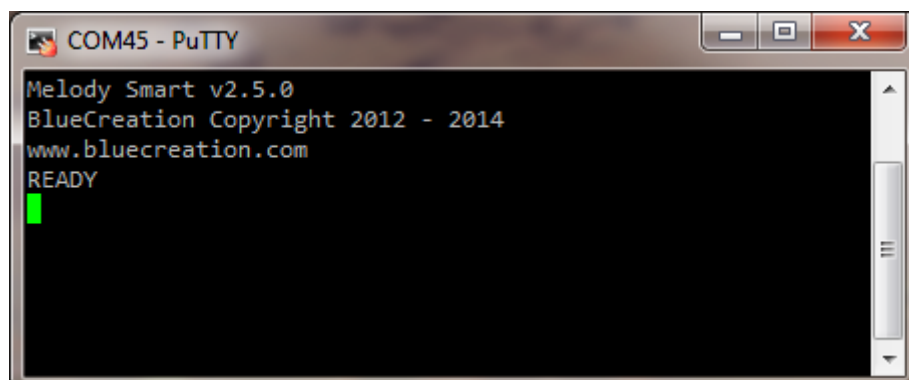

Figure 1: Melody welcome prompt

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Configuring the BC118 Discovery Board v1

The BlueCreation BC118 Discovery Board offers easy hardware configuration via switches and jumpers and access via headers. The Discovery Board also comes with 2 general purpose push-buttons and 3 LEDs and an audio CODEC, microphone in, headphones out, line out and header access to balanced speaker out and balanced/dual microphone in.

Please refer to the figure below as to the positions and names of the different switches, push-buttons, jumpers and headers. Switches and jumpers are annotated in green boxes, push-buttons and LEDs are in yellow boxes, headers are in red, the AIO config/header block in blue.

Switch position meanings, and header pin 1 and pin signals are also printed on the Discovery Kit., whenever space allows. Please ensure that before plugging in the kit, the jumpers and switches are in the positions indicated in the picture below. The following tables explain the functionality of every header, jumper and switch on the board and list the default settings (for switches and jumpers) and functionality (for headers).
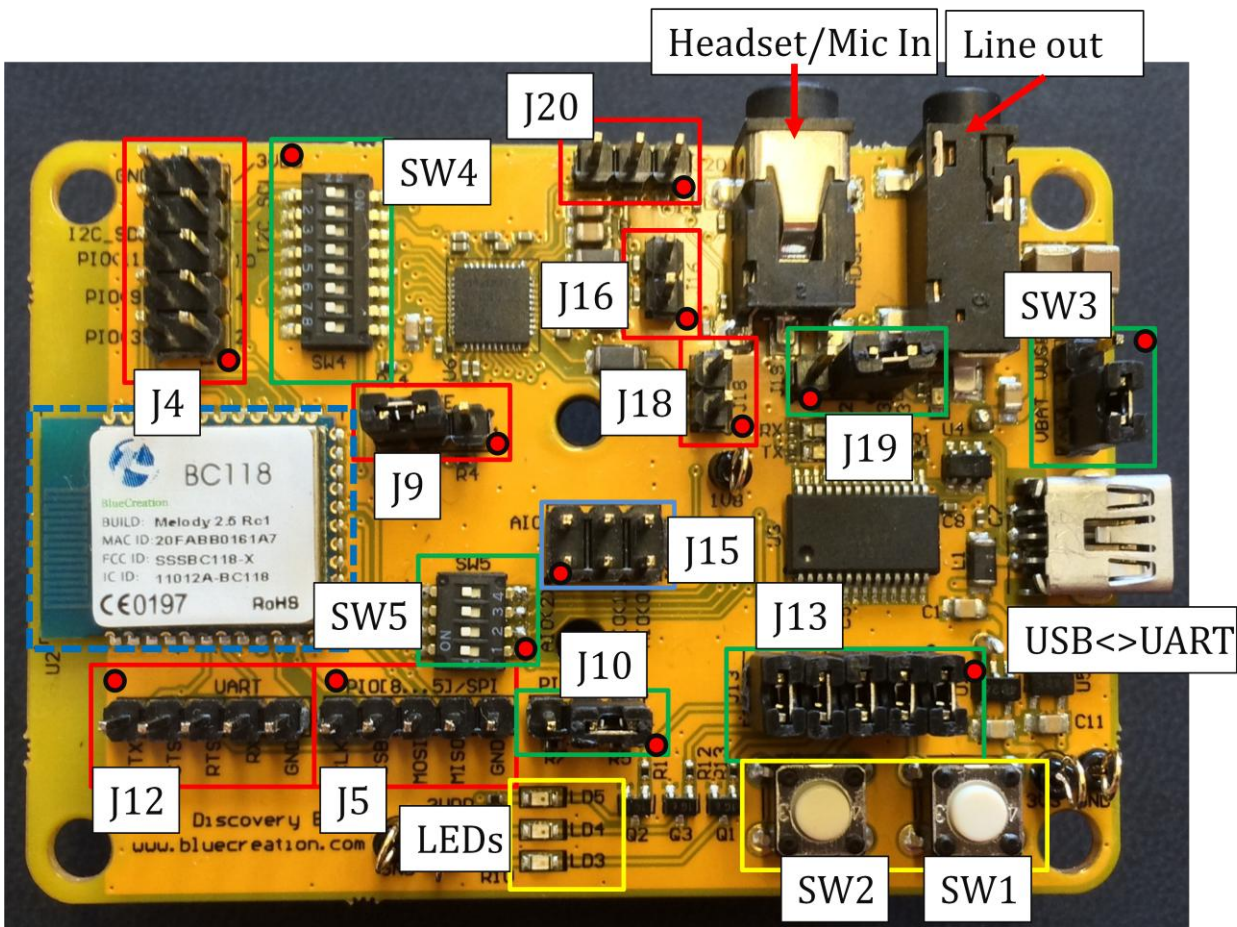

Figure 2: BC118 Discovery Board v1 switches, jumpers, connectors and push button location

Switch	Function	Default
SW3	Select the voltage source for 1V8 generation V_{USB} or V_{BAT}	V_{USB}
SW4.1	When in ON position, connects I2S_SCL line to CODEC	OFF
SW4.2	When in ON position, connects I2S_SDA line to CODEC	OFF
SW4.3	When in ON position, connects PIO7/SPI_MOSI line to CODEC	OFF
SW4.4	When in ON position, connects PIO3 line to CODEC	OFF
SW4.5	When in ON position, connects PIO4 line to CODEC	OFF
SW4.6	When in ON position, connects PIO10 line to CODEC	OFF
SW4.7	When in ON position, connects PIO9 line to CODEC	OFF
SW4.8	When in ON position, connects PIO11 line to CODEC	OFF
SW5.1	When in ON position, connects PIO5/UART_CTS line to UASB<>UART	ON
SW5.2	When in ON position, connects PIO5/UART_RTS line to UASB<>UART	ON
SW5.3	When in ON position, connects UART_RX line to UASB<>UART	ON
SW5.4	When in ON position, connects UART_TX line to UASB<>UART	ON

Table 1: Switch functionality and configuration

Jumper	Function	Default
J10	Select functionality for PIO[5 - 8] - SPI or PIOs. Selecting [1 2] sets functionality to SPI. Selecting [2 3] to PIO	[2 3]
J12	Wake Select. Pin 2 is the module Wake Pin. Selecting [1 2] pulls it high, selecting [2 3] pulls it low.	[2 3]
J13.[1 2]	Connect PIO8/SPI_MISO to SW1	Closed
J13.[3 4]	Connect PIO7/SPI_MISO to SW2	Closed
J13.[5 6]	Connect PIO4 to LD3	Closed
J13.[7 8]	Connect PIO9 to LD4	Closed
J13.[9 10]	Connect PIO10 to LD5	Closed
J14.[1 2]	If AIO configurations enabled, Pin 1 is used to output status. Logical high	Open

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	indicates connected state.	
J14.[3 4]	Can be used to configure module at boot time if AIO configurations are enabled. Open selects: Closed selects: TRS=ON, goes into transparent mode, as set in TRSM	Open
J14.[5 6]	Can be used to configure module at boot time if AIO configurations are enabled. Open selects: Closed selects: CENT=ON at boot time, overriding mode config.	Open
J19	Select 3VDD from USB or Battery. Selecting [1 2] chooses battery, [2 3] chooses USB.	[2 3]

Table 2: Jumper functionality and configuration

Push Button	Functionality	Alternative function
SW1	Exit transparent mode	NA
SW2	None	NA

Table 3: Push-button functionality
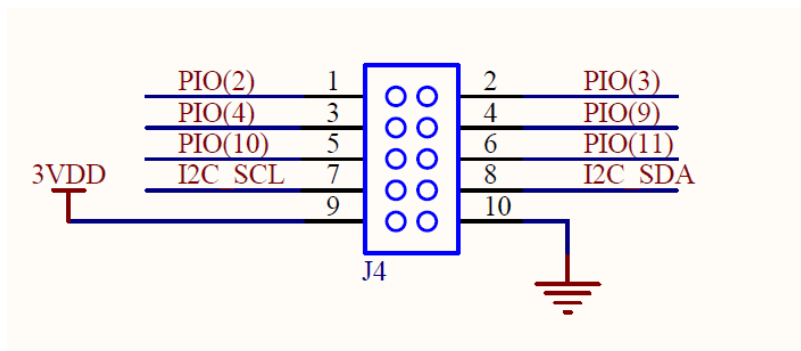
Header Schematics

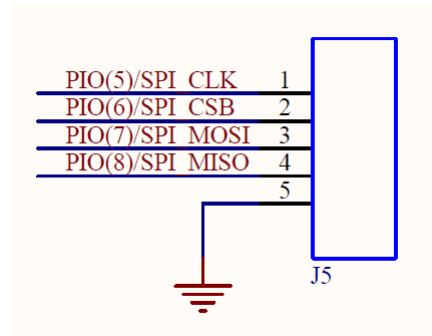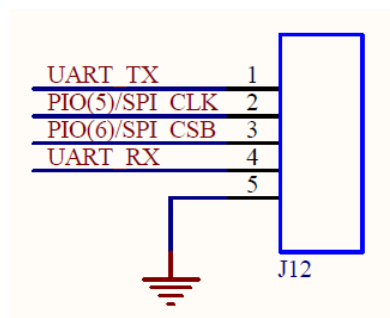**Figure 3: PIO Header (J4)**

Figure 4: SPI/PIO header (J5)

Figure 5: UART header (J12)

Microphone 2 Input (J20)

Pin 1 is V_{DD}, Pin 2 is IN2/DMC, Pin 3 is IN1/DMD

Speaker Out Left Header (J16)

Balanced speaker output; Pin 1 is Negative, Pin 2 is positive.

Speaker Out Right Header (J18)

Balanced speaker output; Pin 1 is Negative, Pin 2 is positive.

Trouble-Shooting

If your board does not seem to work, please check the points below which are the most common problems encountered. If you are still having issues, please contact techsupport@bluecreation.com.

1) POWER PROBLEMS: Check that the board is Turned ON. When you plug in the USB, the LEDs should start flashing indicating that the board is Turned ON. On some of the older boards, only the USB to Module powers the Board so you would need to attach the USB to that port.

2) SWITCH/JUMPER SETTING PROBLEMS: Check that the board has all the switches in the default positions indicated in Table 1 and Table 2.

3) FTDI DRIVERS: The PC usually automatically installs the USB FTDI Drivers when you first plug in the board. If the Drivers are not successfully installed, unplug the board; delete any drivers that you have previously installed. Then make sure you have an internet connection and re-plug the board. If this still does not work, try and plug the board on a different USB port. If this still does not work, you can bypass by using a USB/UART Cable and connecting directly to the RS232 port.

> FTDI driver download: http://www.ftdichip.com/Drivers/VCP.htm

> FTDI driver delete utility: http://www.ftdichip.com/Support/Utilities/CDMUninstaller_v1.4.zip

4) UART SETTINGS: The UART communication will happen with the parameters described at the beginning of this manual. Please check that you have the right UART settings

5) BLUETOOTH COMMUNICATION: If you want to connect to your board, make sure that the module is in discoverable state. When you type STS in the command line the module should return 'STS P ADV'. If this is not the case, please type in 'ADV ON'. Refer to the Melody manual for more options.

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