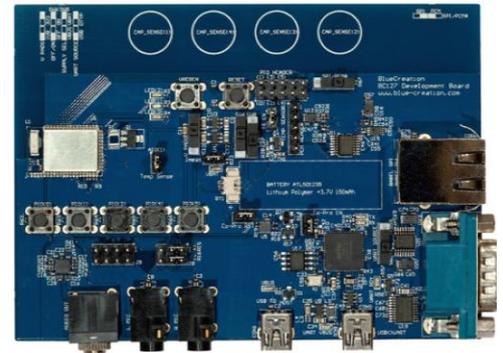




## Key Specifications

- Flexible Multi-Profile Audio Bluetooth development kit
- Dual Mode Bluetooth and Bluetooth Low Energy
- Integrates BC127 module and Melody software
- Access to UART via RS232 or USB (FTDI on board)
- SPDIF, PCM, I2S, I2C and PIO easy access headers
- Line In, Mic In and Amplified Audio out via 3mm Jack
- Highly flexible and configurable board using buttons/switches
- HFP 1.6, PBAP, A2DP1.2, AVRCP1.4, SPP 1.0
- Supports iAP1 and IAP2 protocols for connection to iPods®, iPads® and iPhones®
- Supports APTX, AAC, SBC and MP3

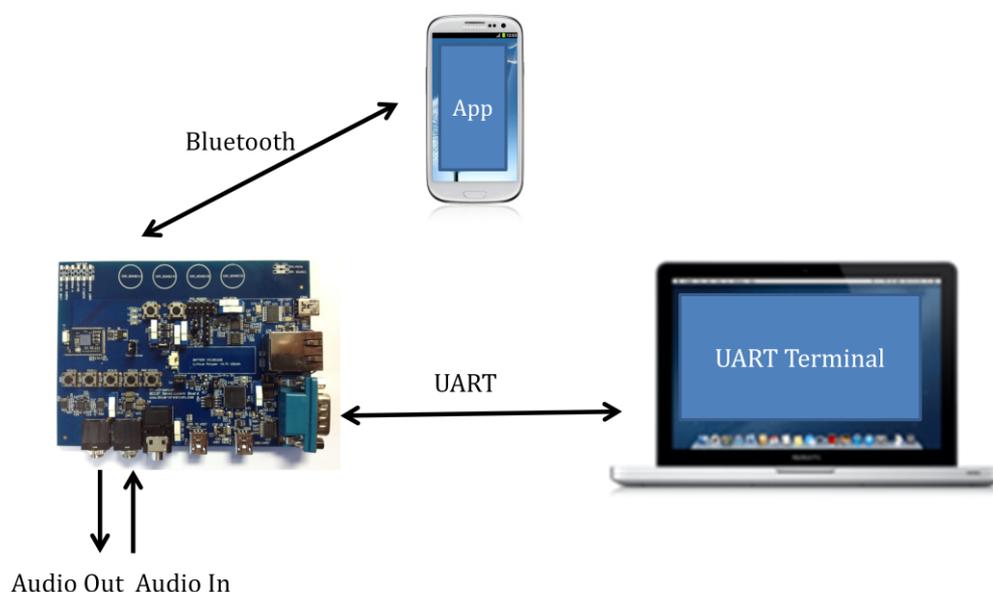


## Applications

- Audio devices
- Wireless speakers
- Music gateways
- Automotive multimedia systems

## Description

BC127-DEVKIT-001 is a development board that allows engineers to quickly prototype any Bluetooth device using Melody and high level commands. It is the ideal kit to start working with Bluetooth





# Setting Up the Board - Equipment

To start you need to have:

- a) The BC127-DEVKIT001 and a USB cable. Please contact [sales@blue-creation.com](mailto:sales@blue-creation.com) for more information.
- b) A PC or any other processor with a USB or parallel port. You should have a HyperTerminal installed on your laptop. You can install for example Hercules HyperTerminal utility ([http://www.hw-group.com/products/hercules/index\\_en.html](http://www.hw-group.com/products/hercules/index_en.html)).

# Setting up the Board - Steps

Step1: Connect the board to your PC using the USB cable. The board will enumerate as two COM ports. Your PC will automatically find and install the required FTDI drivers.

Step2: Go to StartUp/Devices and Printers. You will see your board will be under Dual RS232-HS. When you look at Properties you will see under which COM port it has enumerated. Choose the lower COM port number.

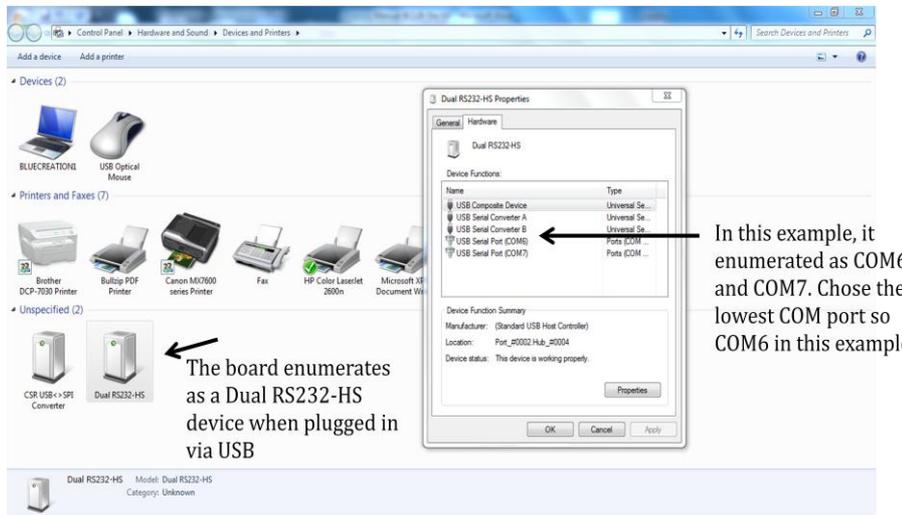


Figure 1: Determining COM port

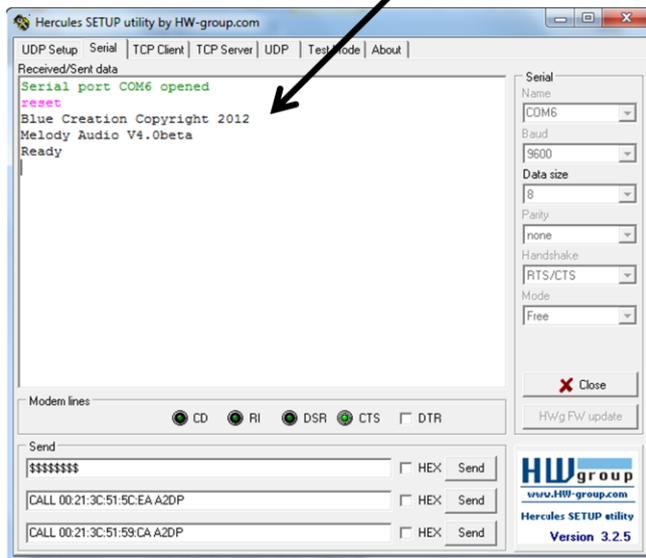
Step3: Launch your chosen serial terminal utility. Please use the following parameters for the UART setting (these are the parameters by default).

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



In your serial terminal window, type Reset and then Enter. If you receive an ERROR 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 Manual for more information on the different commands you can use to control the board.

Set echo ON to see what you are typing



Parameters to use for the Default UART connection

Figure 2: Melody welcome prompt

## Connecting to an Android Application

If you want to use the BlueCreation Android sample application to connect to your board, please follow the steps below.

Step1: Download [Melody Android](#) from the Google Play store. You have to search 'BlueCreation' directly from your Android phone.

Melody Android: <https://play.google.com/store/apps/details?id=com.bluecreation.melodyandroid>

If you would like to evaluate BLE functionality, you will also need to download [MelodySmart Android](#): <https://play.google.com/store/apps/details?id=com.bluecreation.melodysmartandroid>

You can also look at the other applications BlueCreation offer here: <https://play.google.com/store/apps/developer?id=BlueCreation>

Step2: Turn on your board. It will be discoverable and connectable. You will see the LEDs Flashing. On your Android Phone, Go to Settings/Bluetooth. You will see a device called 'BlueCreation-XXXXXX'. X's will be substituted for a character in 0 -9 and A-F. Pair to it. You will see on your HyperTerminal the pairing and



connection identification.

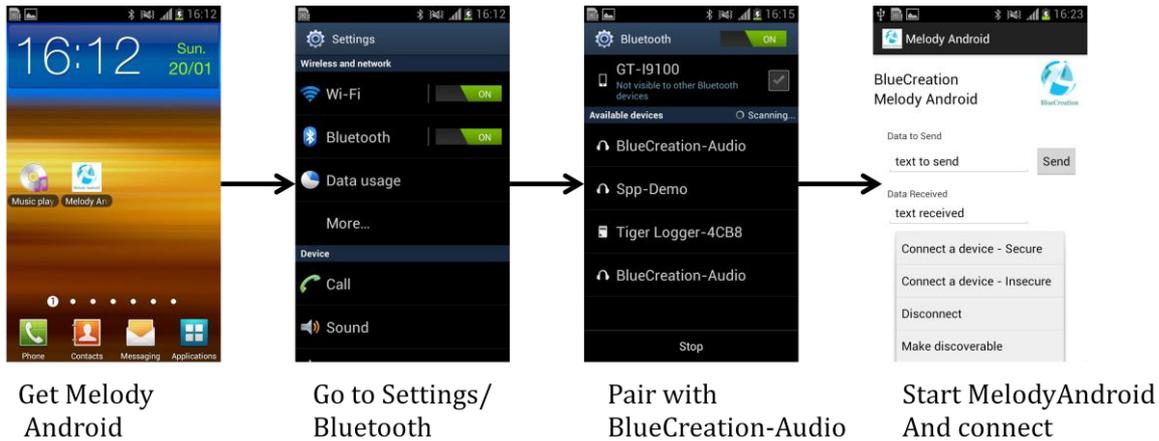


Figure 3: Android Bluetooth Discovery, Pairing and SPP connection

Step3: Launch your Application. You can then connect an SPP link to your board and exchange text messages. When you send a message from your application, you will receive a notification 'RCV SPP 'text to send' on the HyperTerminal. And when you type in the command 'SEND 'text received'', you will see on your Android application a notification that says 'text received'.

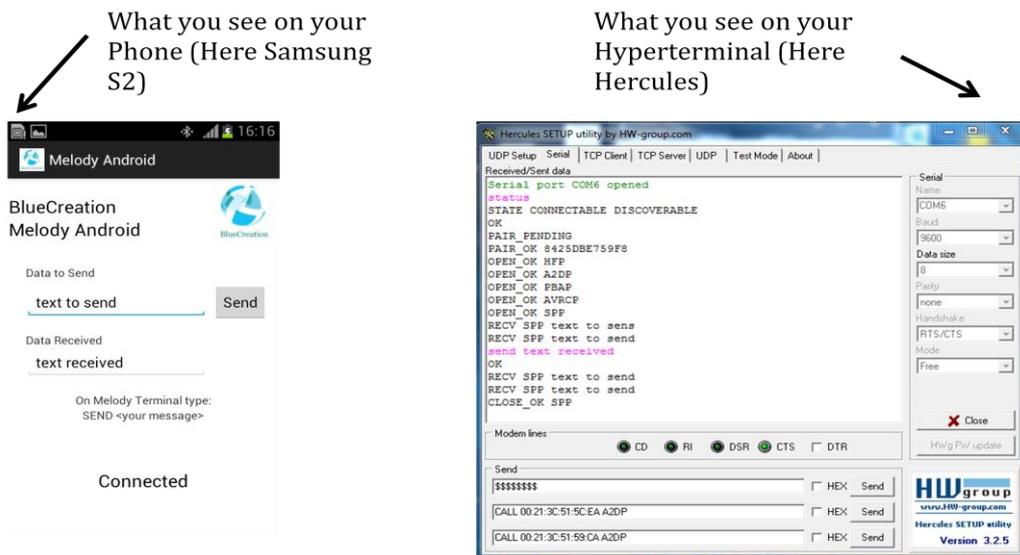


Figure 4: Android: Sending and receiving text data with Melody Android



# Connecting to an iOS application<sup>1</sup>

If you want to use the BlueCreation iOS sample application to connect to your board, please follow the steps below.

Step1: Get the source code for Melody iOS from BlueCreation. You can then compile and load the application on your iPod®, iPad® or iPhone®.

Step2: Turn on your board. It will be discoverable and connectable. You will see the LEDs Flashing. On your iOS Phone, Go to Settings/Bluetooth. You will see a device called 'BlueCreation-XXXXXX'. X's will be substituted for characters in 0 - 9 and A-F. Pair to it. You will see on your HyperTerminal the pairing and connection identification.

Step3: Launch your Application. You should be already connected and can exchange messages with your application. When you send a message from your application, you will receive a notification 'RECV IAP 'text to send' on the HyperTerminal. And when you type in the command 'SEND 'text received'', you will see on your iOS application a notification that says 'text received'.

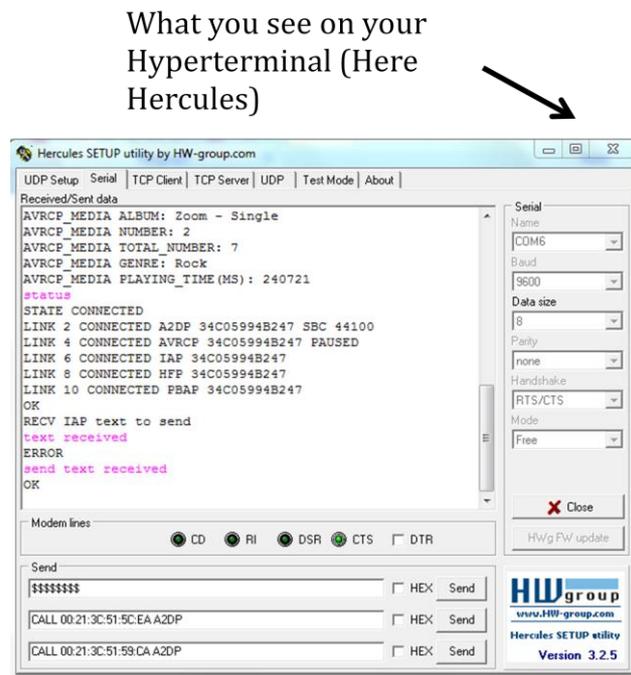
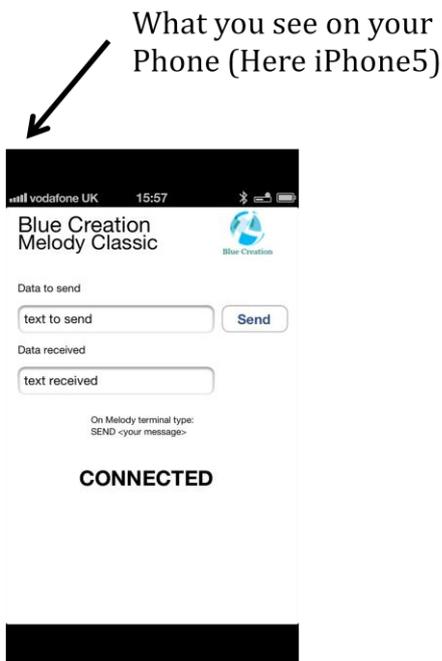


Figure 5: iOS sendind and receiving test data with Melody app

<sup>1</sup> Only on BC127-MFI-DEVKIT running Melody MFI



# Configuring the BC127 DevKit v3

The BlueCreation BC127 Development Kit offers easy hardware configuration via switches and jumpers and access via headers. The DevKit also comes with 6 general purpose push-buttons and a module reset button.

Please refer to the figure below as to the positions and names of the different switches, push-buttons, jumpers and headers. Switches are annotated in yellow boxes, push-buttons are in green boxes, jumpers are in purple and headers are in red. Board connectors are in light blue boxes.

Switch position meanings are also printed on the Dev Kit silk screen. Please note that the white box in the silk screen indicates the switch position for the setting indicated.

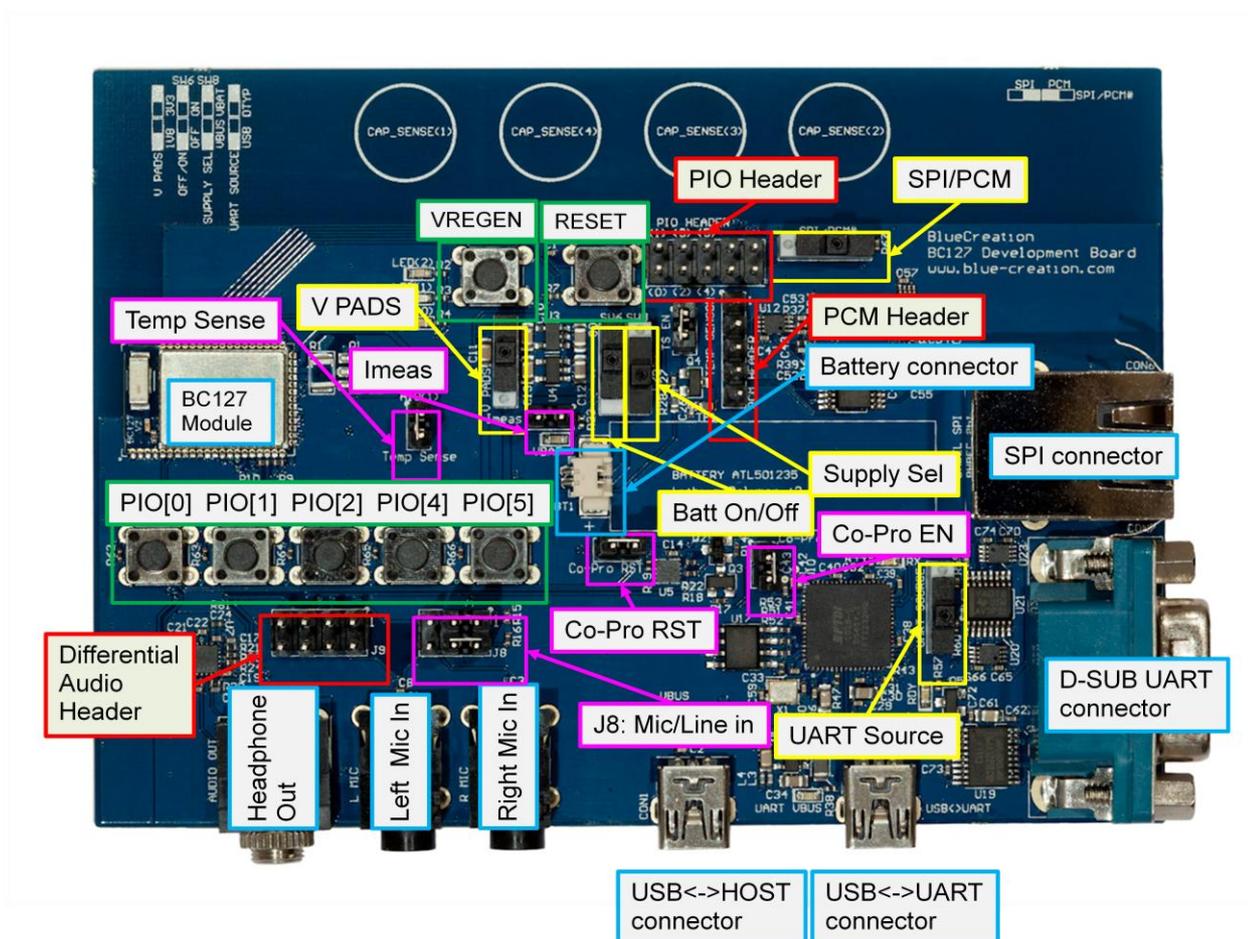


Figure 6: BC127 Development Kit v3 switches, jumpers, connectors and push button location



Switch	Function	Position Top (Right)	Position Bottom (Left)	Default
V PADS	Select the pads voltage	3.3V	1.8V	Top
Batt On/Off	Connect battery to board. When on battery, this is equivalent to switching on/off	On	Off	Bottom
Supply Sel	Select the board/module supply	Vbat	Vbus (USB)	Bottom
UART Source	Select which connector to use for UART communication	D-SUB	USB<->UART	Bottom
SPI/PCM	Select if you would like to use the BC127 lines as SPI or PCM lines.	SPI	PCM	Right

Table 1: Switch functionality and configuration

Jumper	Function	Configuration	Default
Temp Sense	Connects the thermistor to AIO[1]. The BC127 DevKit board has a built in thermistor which you can use. Alternatively, it can use an external one.	Closed: Use built in thermistor Open: Disconnect thermistor/ Use external by connecting to PIN 1	Open
Imeas	This is a current measurement point for the BC127 DevKit while running on battery. <sup>2</sup>	Closed: battery current flows normally Open: battery current is cut-off from board. Please complete circuit with current measurement equipment if you want to measure battery.	Closed
Co-Pro RST	Connects the Apple Co-Processor RST line to the BC127 module via PIO[4].	Closed: use this when using Apple Co-Pro in a non-Melody environment. Open: Disconnects Co-Pro reset line. Decouples PIO[4] from CoPro. Use this if using Melody Audio or not using Apple Co-Pro.	Open
Co-Pro EN	Connects the Apple Co-Processor Enable line to the BC127 module.	Closed: Leave this closed when using Co-Pro Open: Leave this open if not using Co-Pro	Closed

<sup>2</sup> Please note that the currents measure here is not reflective of BC127 module currents as they are the total DevKit current.



J8: Mic/Line in	Select inputs to be Microphone (w/ microphone bias applied) or Line in.	Microphone: Bridge [PIN1 and PIN3] and [PIN2 and PIN4]  Line in: Bridge [PIN3 and PIN5] and [PIN4 and PIN6]	Microphone
--------------------	---	---	------------

Table 2: Jumper functionality and configuration

Push Button	Functionality <sup>3</sup>	Alternative function
PIO[0]	Volume up	NA
PIO[2]	Volume down	NA
PIO[2]	Play/Pause/Answer/End/Call	NA
PIO[4]	AVRCP Backward	Connects to Co-Pro RST via Co-Pro RST jumper
PIO[5]	AVRCP Forward	NA
VREGEN	Long press resets into Source mode.	Powers up module when configured for battery operation.
RESET	Resets module in hardware	

Table 3: Push-button functionality

Header	Functionality <sup>4</sup>	Pinout
PIO Header	Exposed GPIO's for external connection and probing.	Figure 7
PCM Header	Exposed PCM bus (digital audio) <sup>5, 6</sup> For I2S/PCM/SPDIF multiplexing see Table 5.	Figure 8

Table 4: Header functionality

## PIO Header

<sup>3</sup> Please note that this functionality reflects the Melody 5.0 functionality at the time of release of this manual. Please refer to the latest Melody Manual to confirm this.

<sup>4</sup> Please note that this functionality reflects the Melody 5.0 functionality at the time of release of this manual. Please refer to the latest Melody Manual to confirm this.

<sup>5</sup> The PCM header can be used to output audio if the SPI/PCM switch is in the appropriate position and software supports it. Please refer to Melody manual to configure Melody appropriately.

<sup>6</sup> Please note that the PCM header cannot be used for programming the module even if the appropriate switch position is selected.



### PIO HEADER

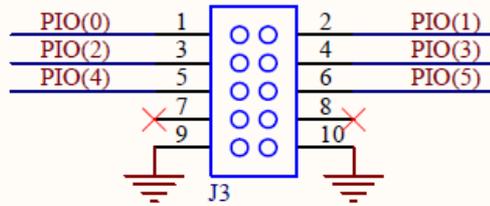


Figure 7: PIO Header pinout

## PCM Header

If you want to use the digital audio output capabilities of the BC127 on the BC127 dev kit you need to enable the PCM output via the PCM/SPI switch. The PCM header is used to output all digital audio formats.

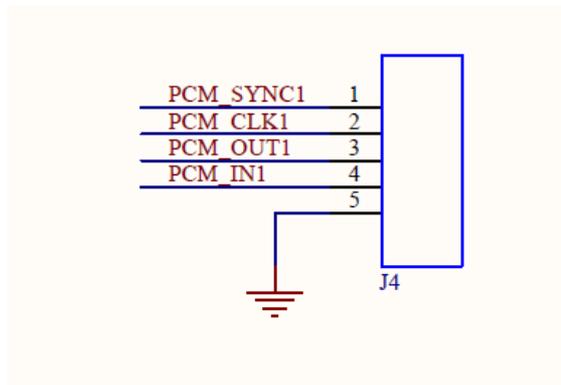


Figure 8: PCM Header pinout

PCM	I2S	SPDIF
PCM_OUT	SD_OUT	SPDIF_OUT
PCM_IN	SD_IN	SPDIF_IN
PCM_SYNC	WS	-
PCM_CLK	SCK	-

Table 5: PCM port multiplexing



## Trouble-Shooting

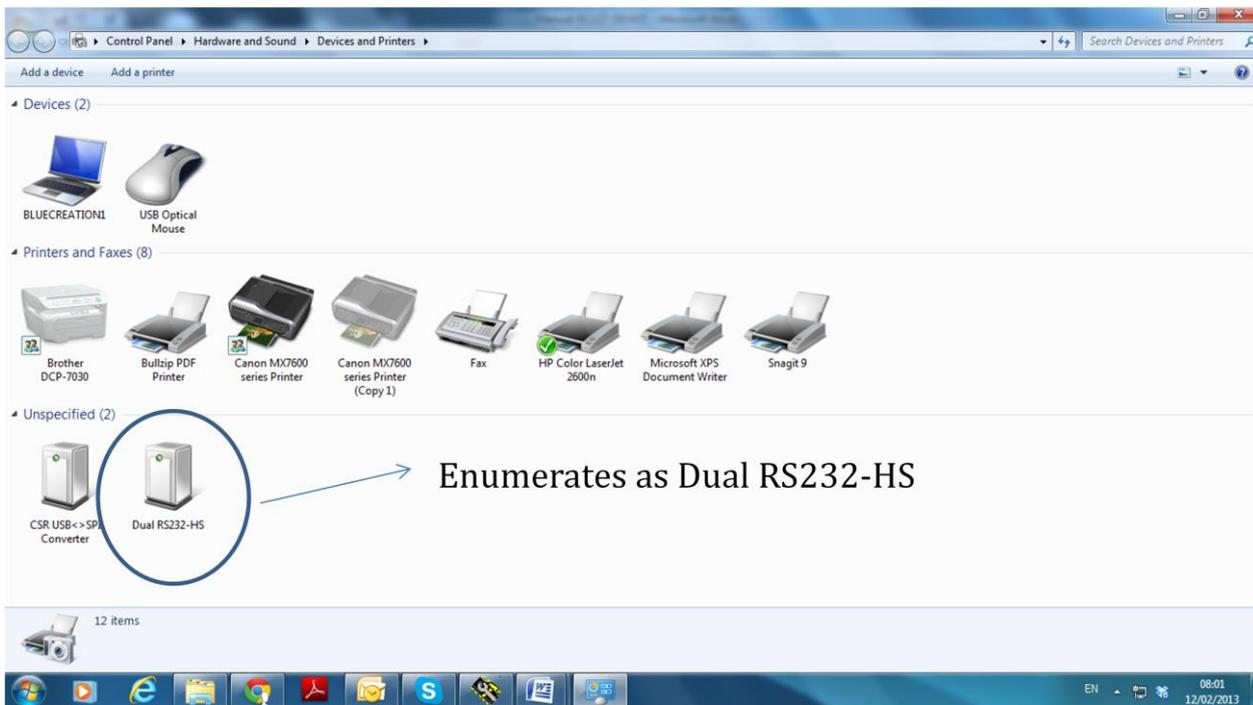
If your board does not seem to work, please check the points below which are the most common problems encountered. If you are still having issues, please contact [techsupport@bluecreation.com](mailto:techsupport@bluecreation.com).

- 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. You will need to set Switch1 to Low. Refer to FTDI Trouble Shooting section
- 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 STATUS in the command line the module should return 'DISCOVERABLE CONNECTABLE'. If this is not the case, please type in 'DISCOVERABLE ON'. Refer to the Melody manual for more options

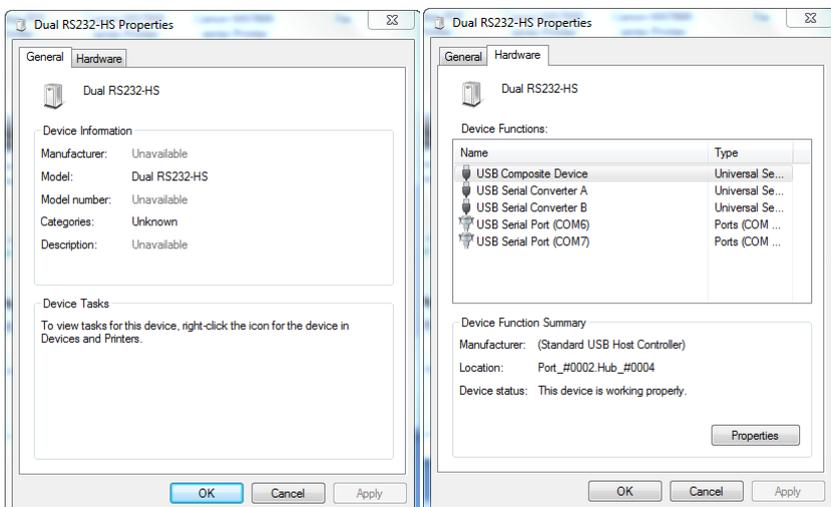


# FTDI Trouble-Shooting

When the board is plugged-In, it should enumerate as a Dual RS232-HS device.



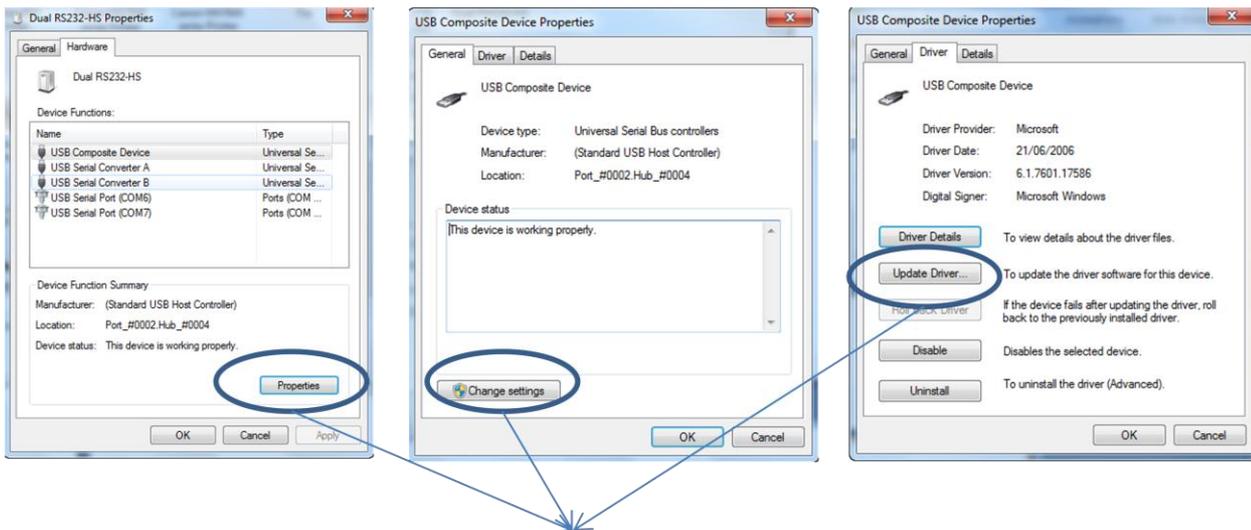
If you right click Property or double click on the Dual RS232-HS icon, you should see the following window.





Manual Rev B

If the device has not enumerated as 2 COM ports, then you need to re-install the driver. This is done by going to Properties/Change Settings/Update Driver as in the figure below. You can also try Properties/Change Settings/Un-install. When you plug the board back in, the PC will look on Internet for the drivers.



### Properties/Change settings/Update Driver

If the FTDI driver still does not work, you might want to erase all registers. this can be done by following the instructions below. Source: [http://forums.parallax.com/showthread.php/139524-FTDI-Driver-problems-with-Windows-7-64-bit-\(Also-uninstalling-drivers-COM-entries\)](http://forums.parallax.com/showthread.php/139524-FTDI-Driver-problems-with-Windows-7-64-bit-(Also-uninstalling-drivers-COM-entries))

Step1) If you need to clean a previous install of the FTDI driver from your system and/or clear any COM Ports added to the registry then you should obtain the CDM Uninstaller from the following link:

[http://www.ftdichip.com/Support/Util...aller\\_v1.4.zip](http://www.ftdichip.com/Support/Util...aller_v1.4.zip)

Extract the contents of this ZIP file into a folder on your desktop or elsewhere and run the CDMuninstallerGUI.exe file.

You should see the following dialogue box which already has the FT232R Product/Vendor IDs in the box.



Manual Rev B



Click the "Add" button to add this Product/Vendor ID to the list of devices to remove. Optionally you can check the "Generate log file" checkbox for a record of what operations were performed and which COM Port entries were removed. Now press the "Remove Devices" button. Once completed you should restart your computer so that the O/S can clean things up. You should then be ready to re-install your drivers as listed above.



Step2) Download the latest driver from the ftdi website at the following link:



## Manual Rev B

<http://www.ftdichip.com/Drivers/VCP.htm>

In the row for Windows in the comments column are the words setup executable, which is a link to download the setup installer. This is the preferred method for installing this driver. When running the driver, if you do not see the command window above re-run it. If after three tries you still have not seen it you may have another issue such as insufficient permissions, anti-virus software or even malware preventing the install.

Hope this helps. Sometimes driver installations don't go as planned and the reasons may not be anything we can diagnose and/or help with. However this guide covers those we can help with. Take care!