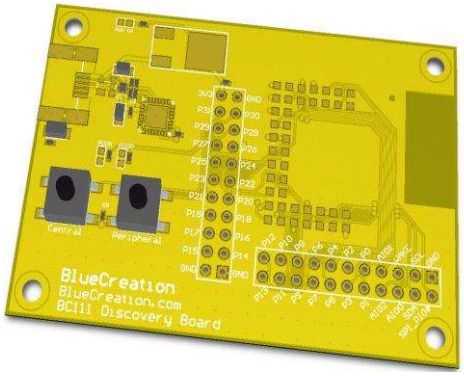
Manual

Key Specifications

- Bluetooth Low Energy dedicated development kit
- 4.0 Bluetooth Low Energy (BLE, Bluetooth SMART) Mode
- Integrates BC111 module and Melody SMART software
- Access to UART via USB (FTDI on board)
- Direct access to GPIOs
- GAP, ATT, GATT, L2CAP and SMP Bluetooth profiles
- FCC, CE, IC and Bluetooth certified

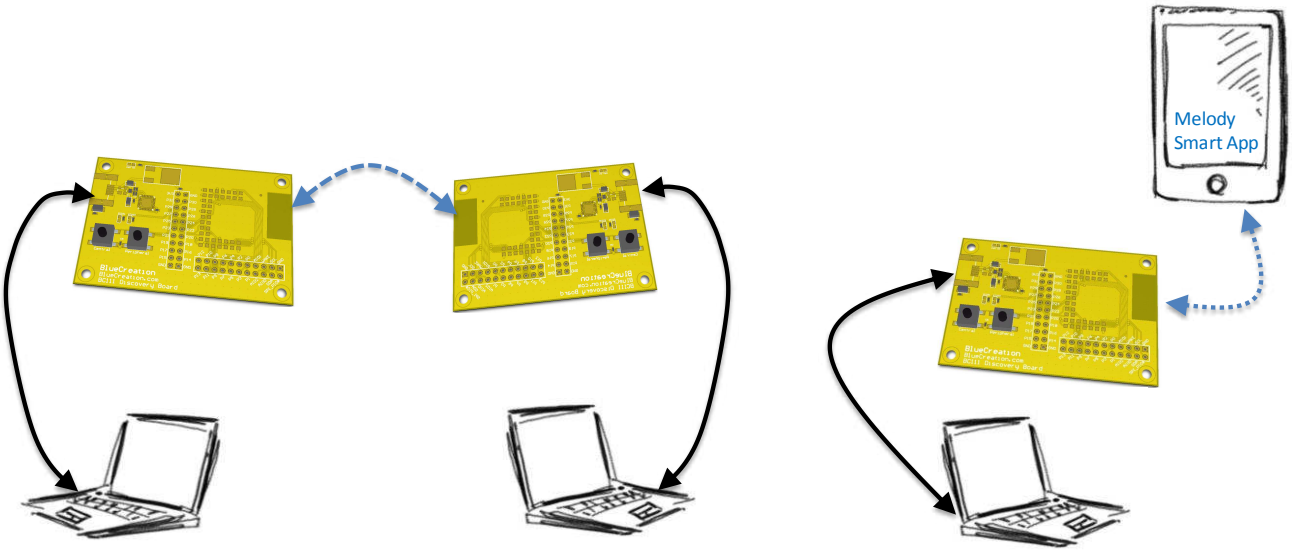


Applications

- Smart Phone Controlled Accessories
- Fitness and Healthcare Accessories
- Smart-Home Controllers
- Smart Appliances
- Remote Controls and Smart TVs
- General Bluetooth Controllers

Description

BC111-DISKIT-001 is a development board that allows engineers to quickly prototype any Bluetooth device using Melody SMART and high level commands. It is the ideal kit to start working with 4.0 Bluetooth Low Energy (BLE, Bluetooth SMART)



Setting Up the Board - Equipment

To start you need to have:

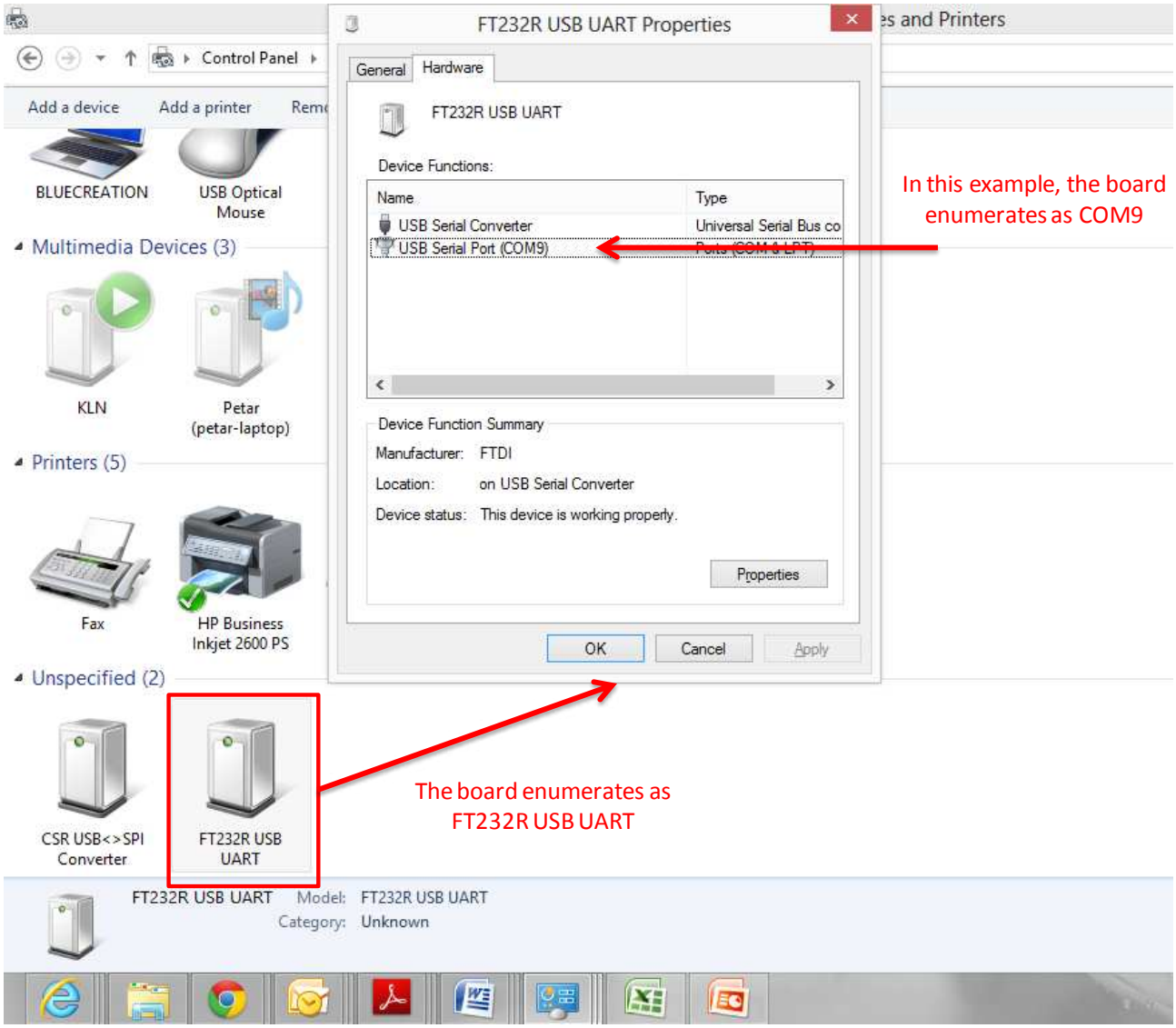
a) The BC111-DISKIT-001 and a USB cable. Please contact sales@blue-creation.com for more information.

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).

Setting up the Board - Steps

Step1: 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.

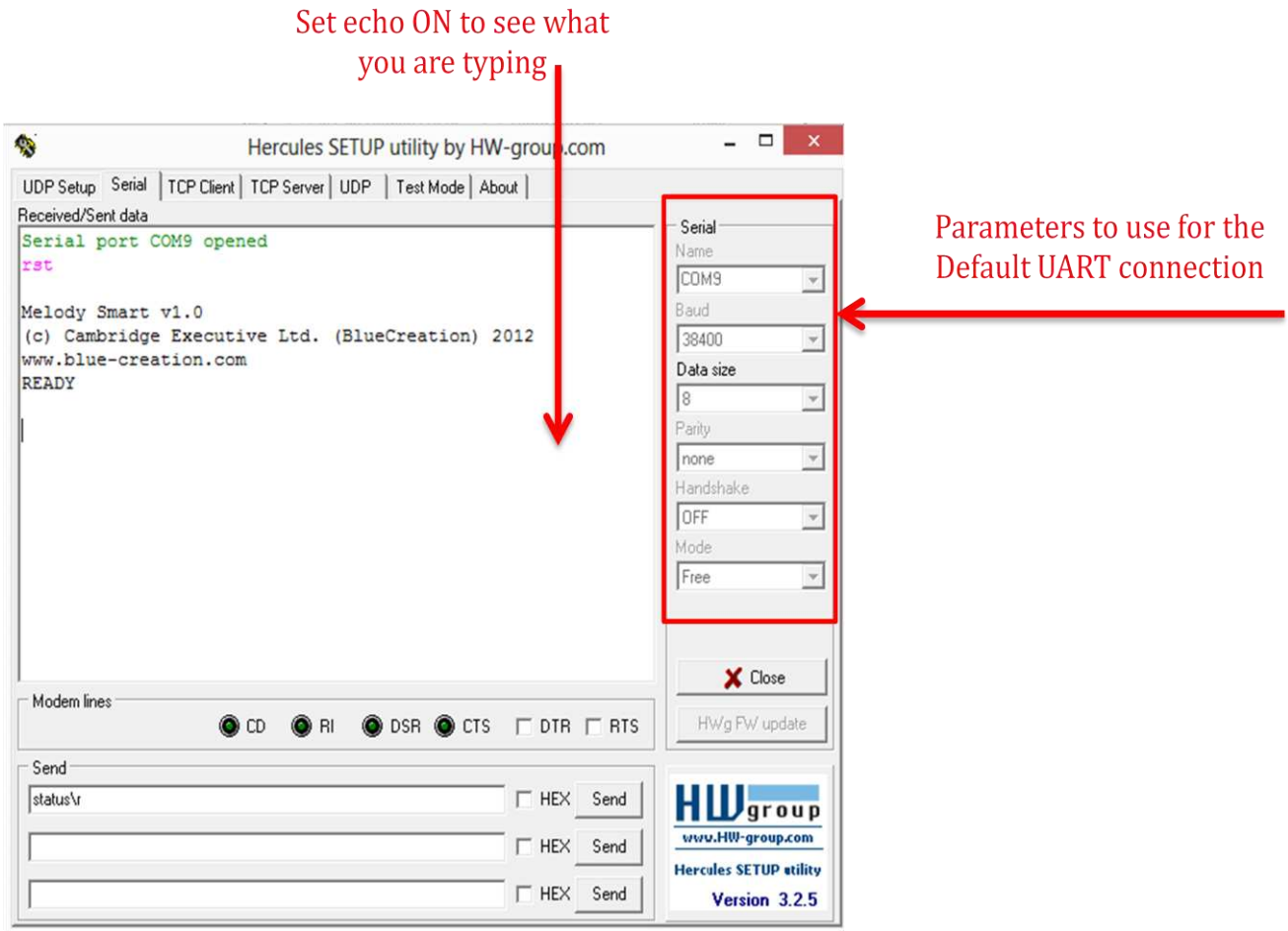
Step2: Go to StartUp/Devices and Printers. You will see your board will be under "FT232 USB UART". When you look at Properties you will see under which COM port it has enumerated.



Step3: Launch your chosen HyperTerminal utility. Please use the following parameters for the UART setting.

- Baud rate : 38400bps
- Data bits : 8
- Stop bits : 1
- Parity bit : No parity
- HW Flow Control : Disabled

In your HyperTerminal Window, type rst and then Enter. You should then see the BlueCreation Prompt. You are now ready to use the board (note that if your typing isn't visible you should enable Echo On). Please refer to the Melody Smart Manual for more information on the different commands you can use to control the board.



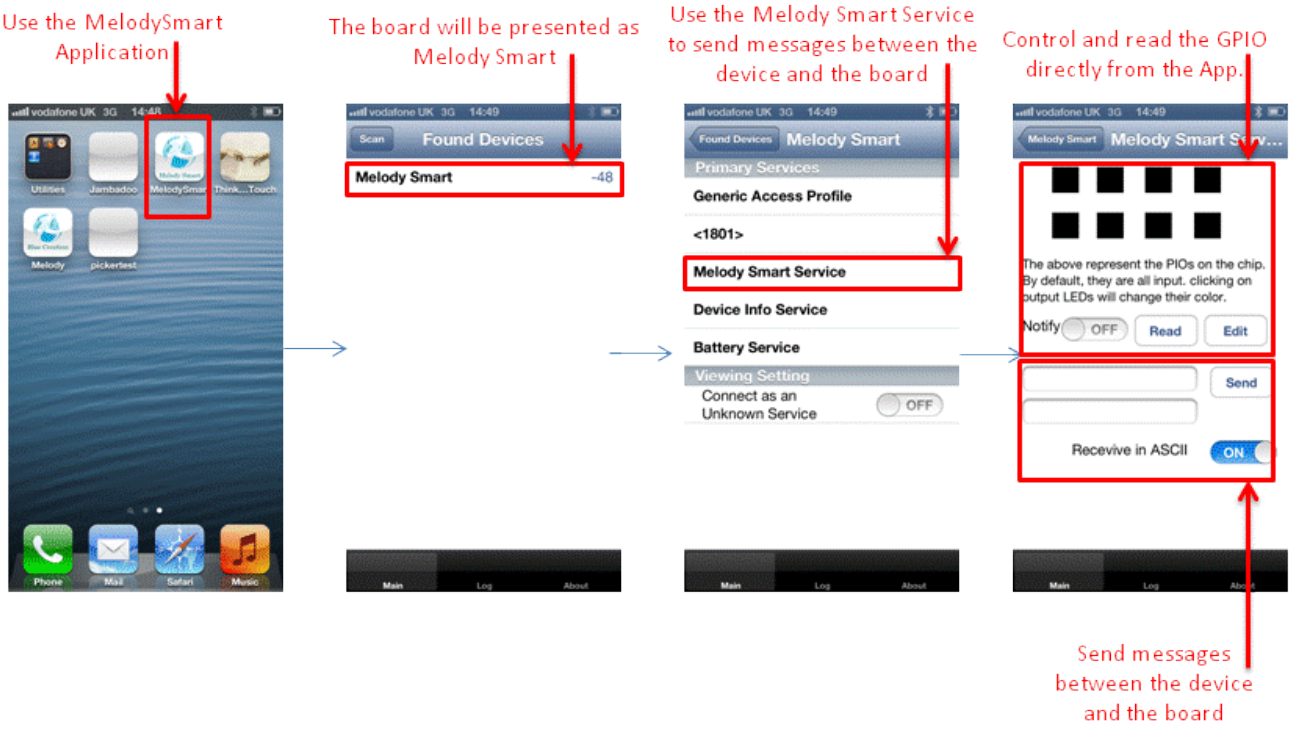
Connecting to an Apple Application - Steps

If you want to use the BlueCreation's iOS sample application (Melody Smart) to connect to your board, please follow the steps below.

Step1: Download Melody Smart app from the iTunes store. You can search 'BlueCreation' directly from your iOS Device. You can also find it under https://itunes.apple.com/ca/app/melody-smart/id548603916?mt=8&ign-mpt=uo%3D2

Step2: Turn on your board. It will be in Advertising mode for 5 minutes on default at boot. After that period you can use the command ADV to enable Advertisement for 30sec. You will see the LEDs Flashing.

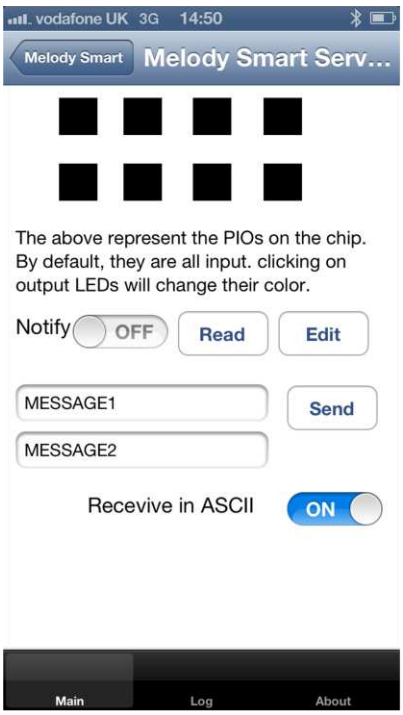
Step3: On your Apple device, launch your Melody Smart Application. You will see a device called Melogy Smart - connect to it by choosing it. Using the Melody Smart Service will allow you to send messages between the device and the board and to control and read the GPIO from the application.



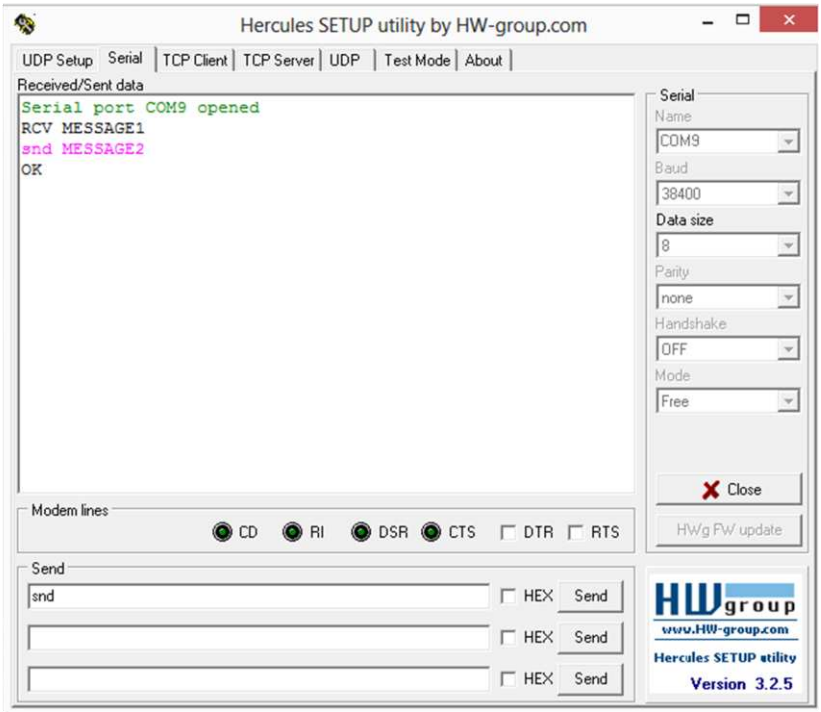
Exchanging messages between Bluetooth enabled device and the board

When you use the upper text box to send <MESSAGE1> from your application, you will receive a notification 'RCV <MESSAGE1>' on the HyperTerminal. When you type in the command 'SND <MESSAGE2>' and Enter you will see on your Melody Smart application the <MASSAGE2> in the lower text box.

This is what you expect to see on the application



This is what you expect to see on the HyperTerminal

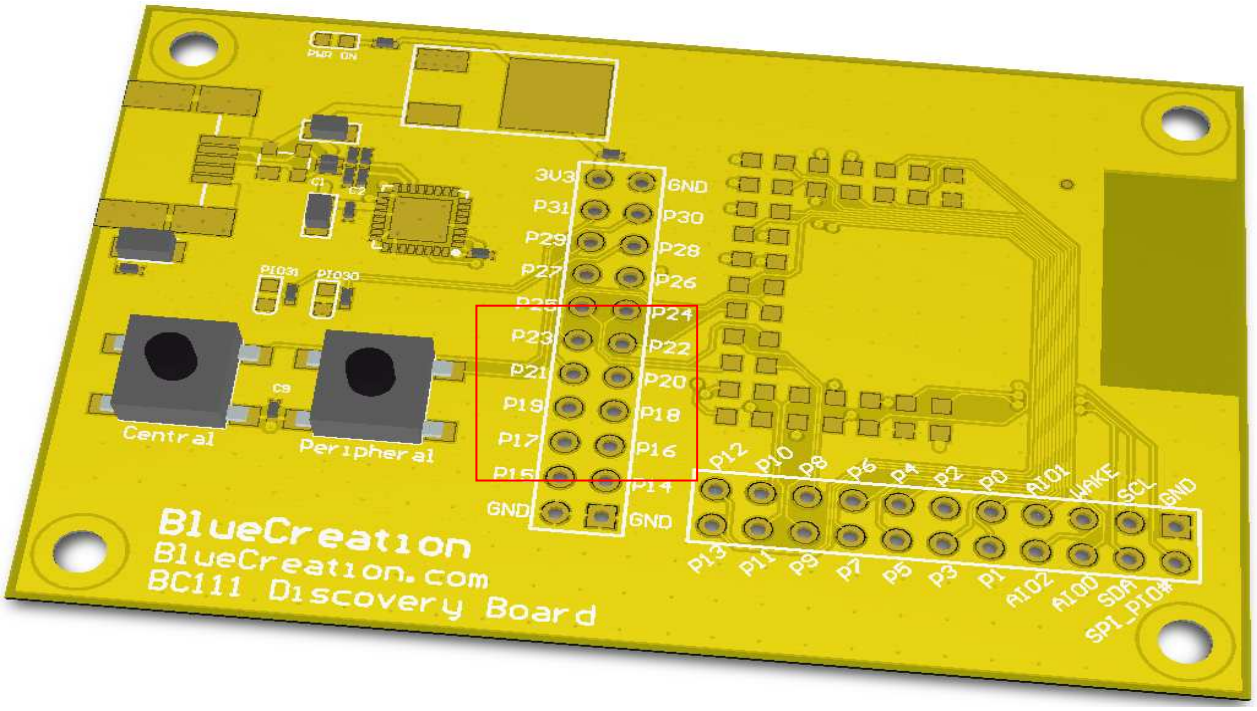


Reading and Operating the GPIOs using Melody Smart app

Reading GPIOs Using Melody Smart

Using the Read button the App. will return the status of the module's GPIOs as mapped here:

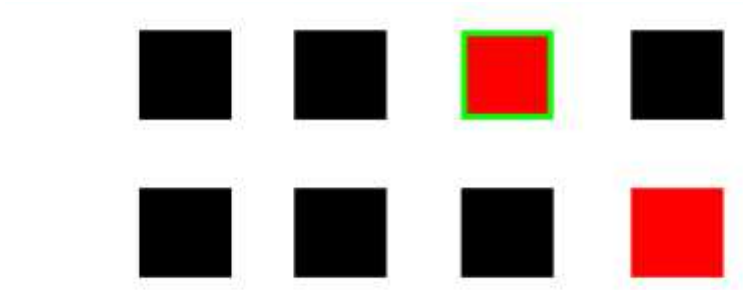
The numbers for the actual GPIOs are clearly marked on the board and are also shown in here



Each box on the represents a GPIO pin and indicates its direction (Input or output) and Logical state (High or low):

- Direction: A **green** border around a square indicates that this PIO is configured as an output rather than an input. By default all PIOs are configured as inputs. No border around the square indicates that this PIO is configured as input.

- Logical State: The PIO state is indicated by the square colour: **black** means logical low and **red** means logical high.



In this example:

P16: Input low
P17: Input low
P18: Input low
P19: Output high
P20: Input high
P21: Input low
P22: Input low
P23: Input low

Controlling GPIOs Using Melody Smart

To change a PIO's logical state from high to low and the other way press on the box representing the PIO.
To change a PIO's direction Press Edit and then press on the PIO - once direction changed press Done.

Connecting 2 Discovery boards - Steps

You can connect 2 BC111 modules and allow them to communicate using 2 Discovery boards. To do so, please follow the steps below.

Step1: Set up each board connecting to a separate PC as is explained in the section titled "Setting up the Board - Steps".

Step2: Once both are set up, connect the two devices by pressing on one board on the Peripheral button (will connect as Slave) and on the other board on the Centre button (will connect as Master). The two devices will be connected and the Leds will stop flickering - the in the Master board the blue Led will be lit and on the Slave the green Led will be lit.

Now you can send messages from one board to another using the HyperTerminal programs on each computer.

Messages from one board
Sending and then receiving

```
rst

Melody Smart v1.0
(c) Cambridge Executive Ltd. (BlueCreation) 2012
www.blue-creation.com
READY

snd MESSAGE-1
OK
RCV MESSAGE-2
```

Messages from the second board
Receiving and then sending

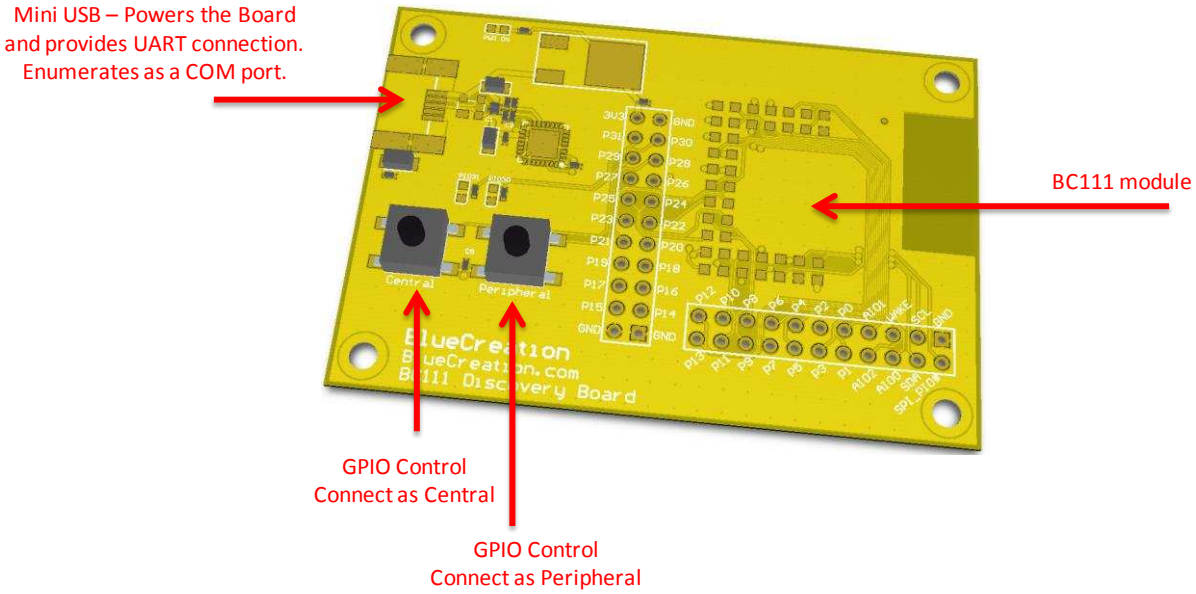
```
rst

Melody Smart v1.0
(c) Cambridge Executive Ltd. (BlueCreation) 2012
www.blue-creation.com
READY

RCV MESSAGE-1
snd MESSAGE-2
OK
```

BC111-DISKIT-001 - Board Layout

The boards layout is explained in the figure below.



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@blue-creation.com.

1) POWER PROBLEMS: Check that the board is Turned ON. When you plug in the USB, the LEDs should light up (ON) or flicker (ON and Advertising), indicating that the board is Turned ON.

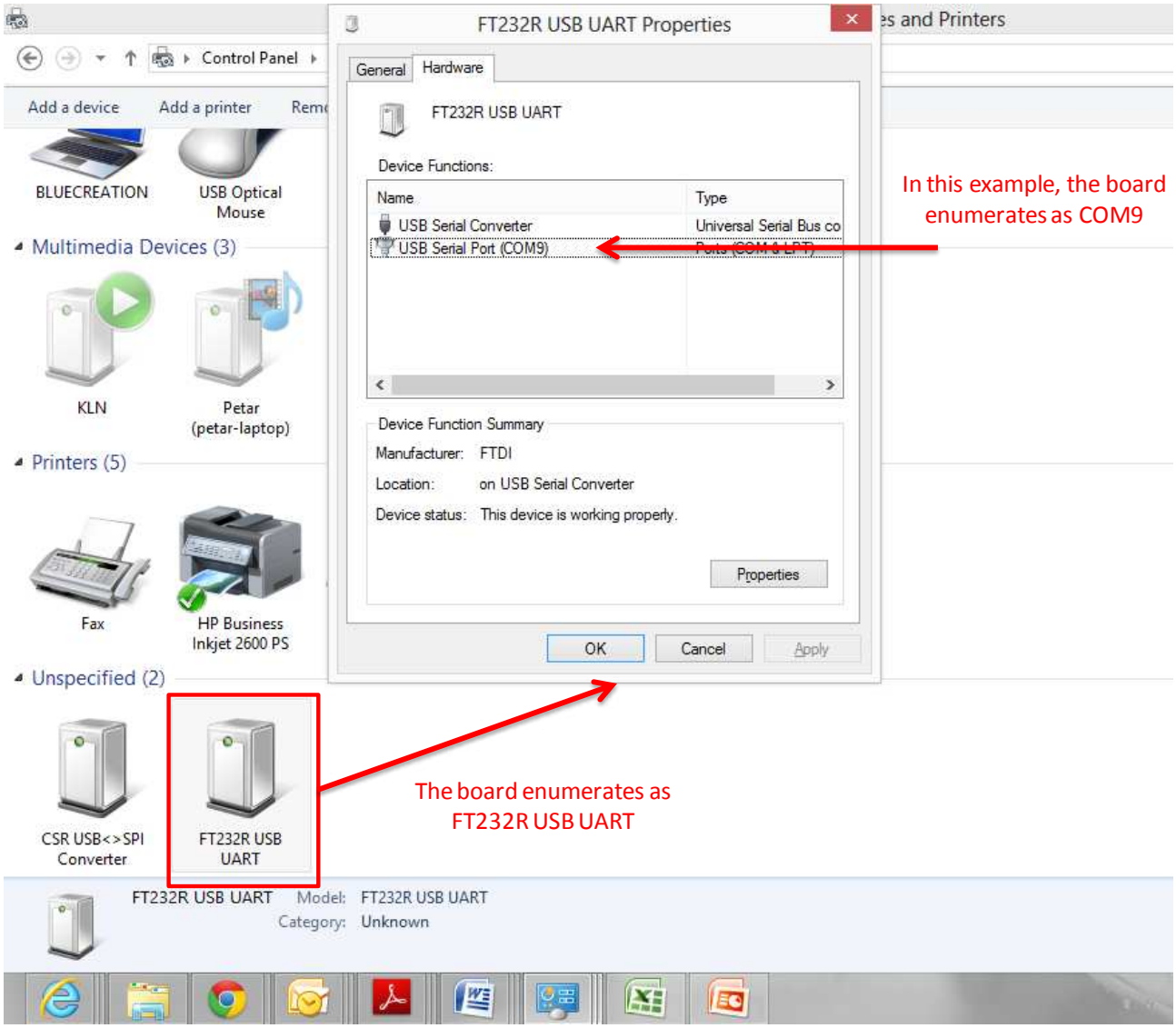
2) FTDI DRIVERS: The PC usually automatically installs the USB FTDI Drivers when you first plug in the board. If the Drivers are not successfully installed, unplug the board; delete any drivers that you have previously installed. Then make sure you have an internet connection and re-plug the board. If 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

3) 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

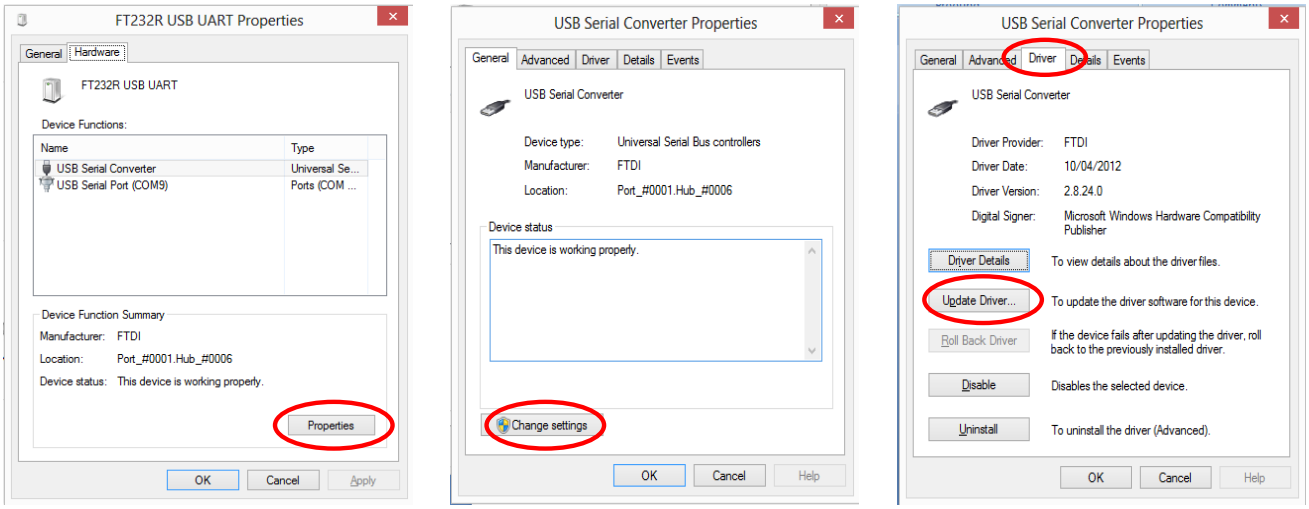
4) BLUETOOTH COMMUNICATION: If you want to connect to your board, make sure that the module is ADVERTISING. When you type STATUS in the command line the module should return 'ADVERTISING ON'. If this is not the case, please type in 'ADV'. Refer to the Melody Smart manual for more options

FTDI Trouble-Shooting

When the board is plugged-In, it should enumerate as a "FT232 USB UART" device and under rightclick->Properties->Hardware it should enumerate as a COM port.



If the device has not enumerated as a COM port, 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.



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):

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

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.

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:

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!