

Grove - XBee Carrier

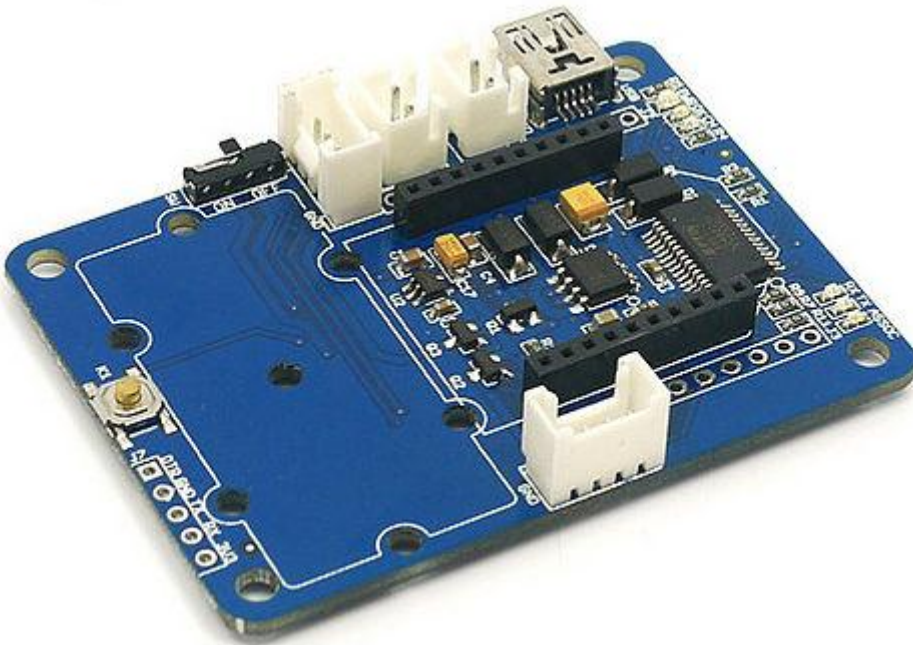
Introduction

Grove - XBee Carrier is a **Wireless Sensor Network (WSN)** base board designed for Bee series and Grove units. It is primarily suitable for standalone Bee Nodes like [RFBee](#), [Wifi Bee](#) which have **ATMega328** onboard and **XBee** (Zigbee) modules. It is compatible with [RFBee](#), [Wifi Bee](#), [XBee](#) and [Bluetooth Bee](#). Besides a Bee receptacle, there are also two Grove connectors. The board can be powered by a [lithium battery](#) or through USB cable. You can use a Wireless charger, [Solar Panel](#) or the USB cable to charge the battery. The **FT232RL** chip onboard helps in downloading the program to Bee Module directly.

Bees which do not have **ATMega328** like [Bluetooth Bee](#) can only be configured by using on-board **FT232RL**(USB to UART). These Bees are not suitable for standalone applications.

The on-board **FT232RL** can be used like any other **3.3V USB to UART** interface when not connected to any Bee Modules. This is useful for programming a 3.3V MCU through Serial Port.

Model: [SLD71385P](#)



Grove - XBee Carrier

Features

- Bees Compatible Receptacle
- Two Grove Connector - One for I2C and other for D6,D5
- Two Grove Place Holders
- On-Board Charge Controller [CN3063](#)
- On-Board 3.3V LDO Lownoise Micropower Regulator - [RT9167A_33PB](#)
- On-board FT232RL UBS-UART IC
- LEDs for PWR, Charge Indication and UART transmission.

- Power Switch
- Reset Button

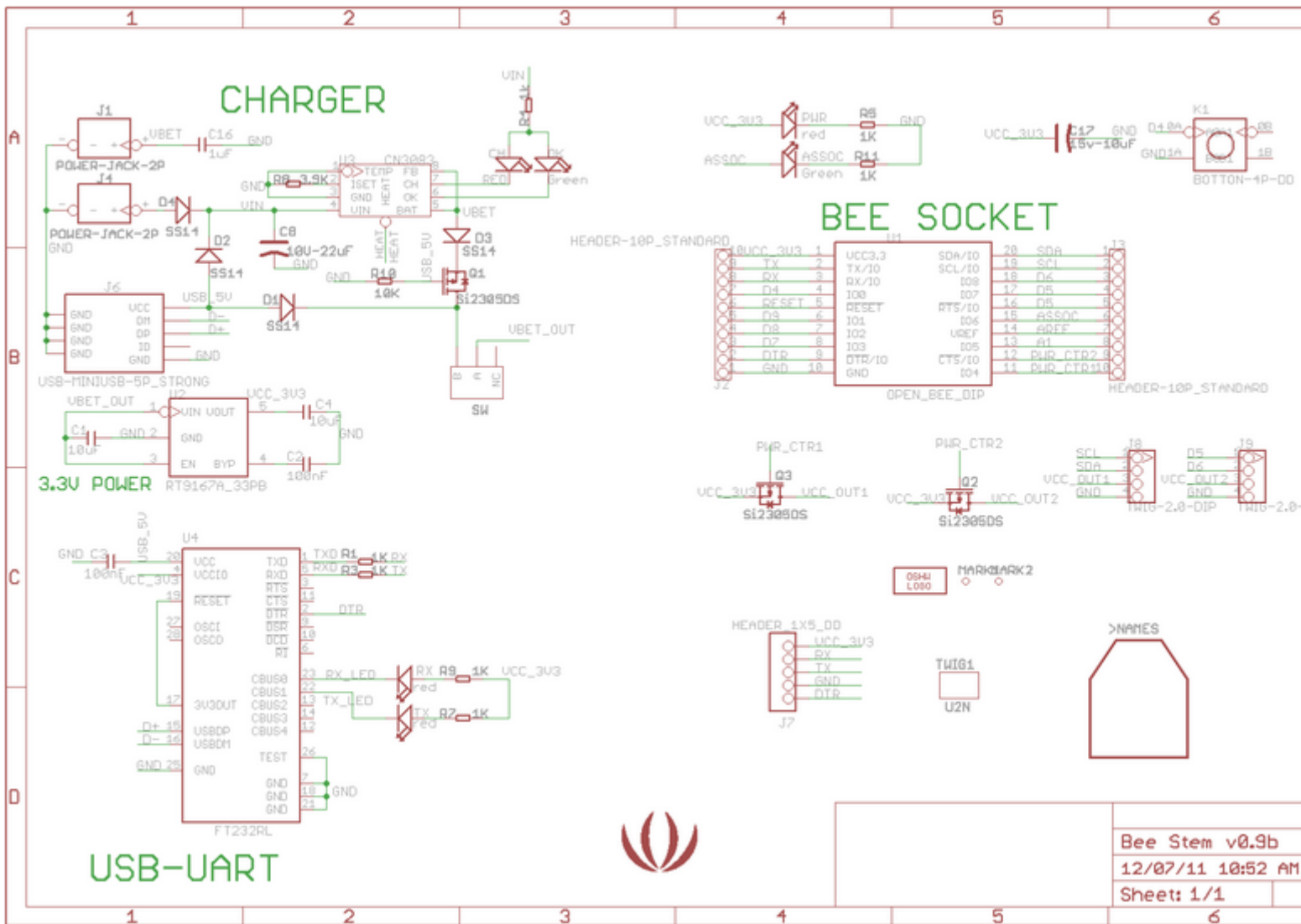
Application Ideas

- Wireless Sensor Network with Standalone Bee Node like [Wifi Bee](#).
- As a configuration aid for Bees using FT232RL.
- Charger for Lithium Ion Cells using on-board charge controller.
- As a FT232RL based 3.3v USB-UART.

Cautions

- Insert the Bees in the proper direction. Use the Bee outline on the silk-screen.

Schematic



Specification

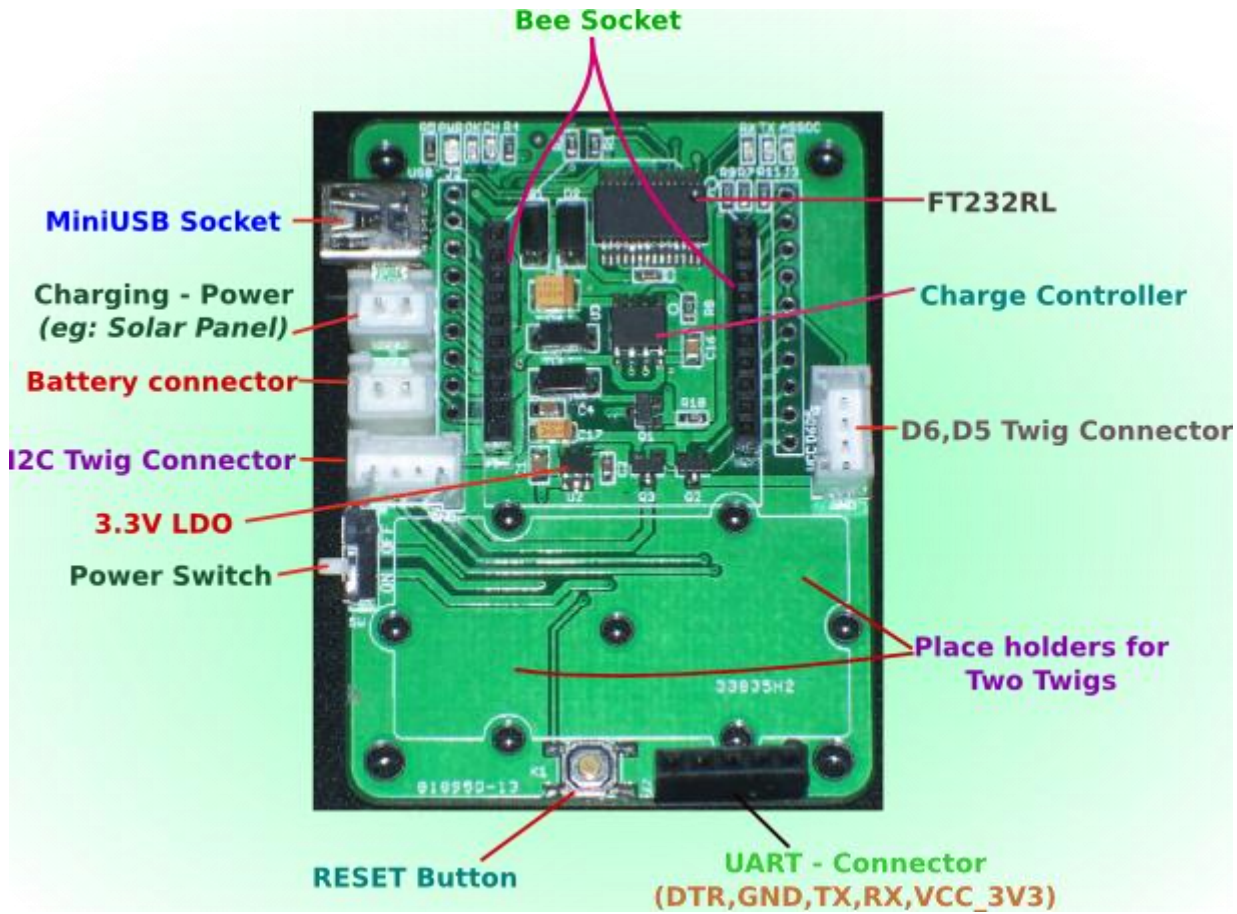
Key Specification

Item	Minimum	Typical	Maximum
Operating Voltage	3.0V	3.3V	3.6V
Charge Controller	CN3063.		
CHARGER (Charging Voltage for LiPo Battery)	4.4V to 6V (as per CN3063 Spec)		

3.3V LDO
I/O Logic

Low Noise and Micropower type. Suitable for Battery Application.
3.3V Logic

Hardware & Pin definition



Mechanical Dimensions

Grove - XBee Carrier is of 63.11mm x 46.86mm size.



Usage

When using an RFBee, the following pinouts apply for using the arduino IDE

Pin 5 is the Grove connector for I/O - Yellow wire
Pin 6 is the Grove connector for I/O - White wire
[Note: you can use the [x2 Grove cable](#) with the white and yellow wires swapped on one to access both I/O.

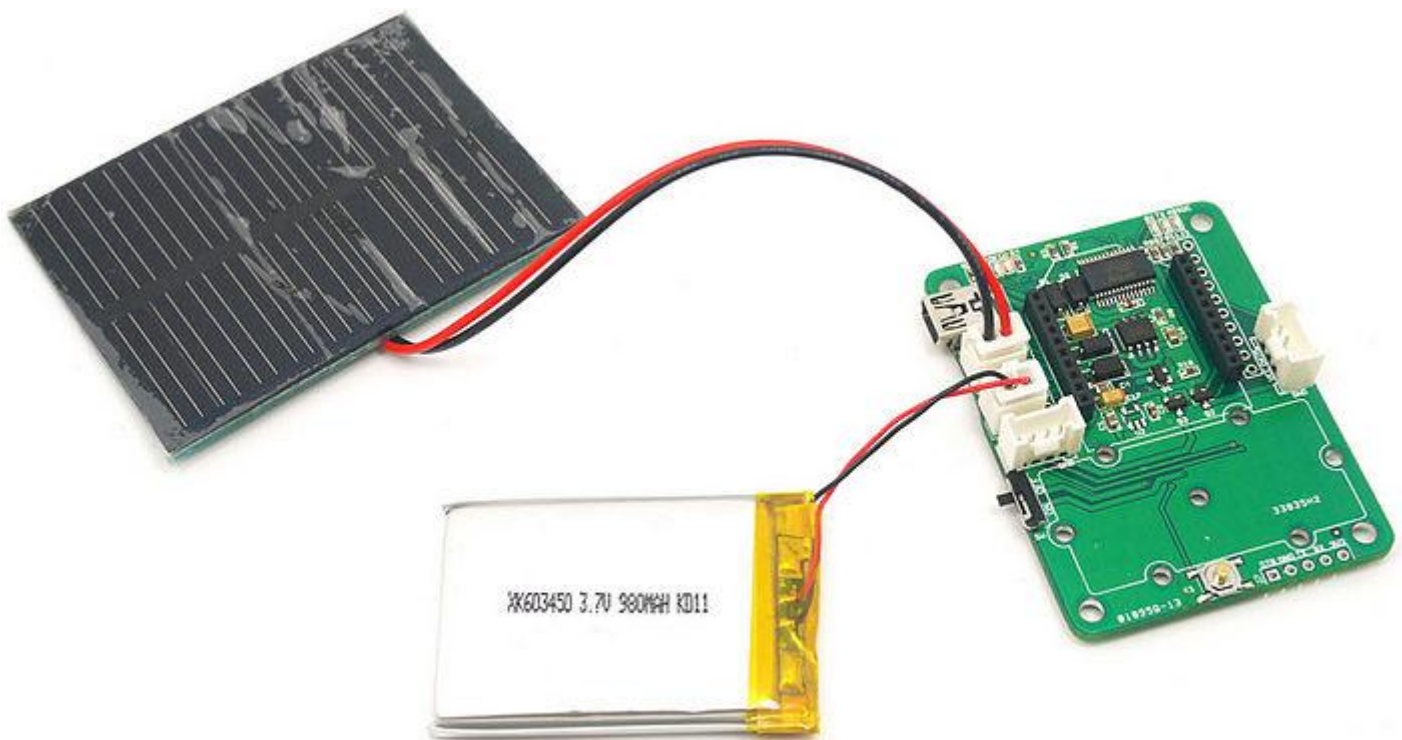
Pin 16 may need to be driven low to provide enough power to the I/O Grove [via mosfet]
Pin 17 may need to be driven low to provide enough power to the I2C Grove [via mosfet]

Hardware Installation

Charging

Now you can choose a suitable battery for your application from [SeedStudio Batteries and Chargers](#)

1. Connect a 3.7v LiPo battery to **BAT** JST-socket.
2. Connect a power source like Solar Panel to **CHARGER** JST-Socket.
3. The Battery will be continuous charged. The end of charging would be indicated by LED marked 'OK'.



 Grove - XBee Carrier - Connected to [LiPo Battery](#) & Charged By [Solar Panel](#)

Working with Standalone Bee Nodes

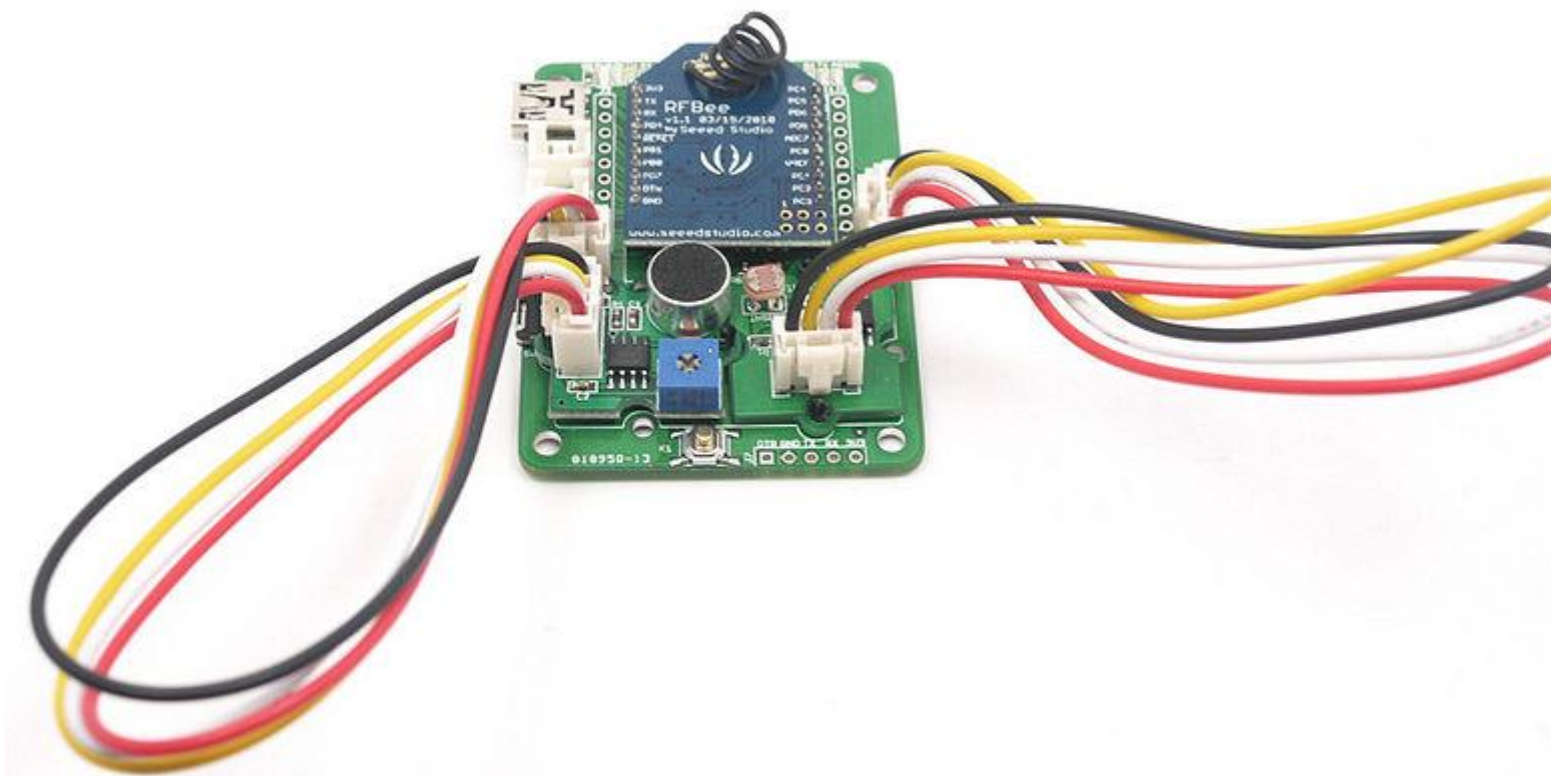
Bee Nodes are standalone Arduino Compatible Wireless Nodes. [SeedStudio](#) has two such Node - [Wifi Bee](#) and [RFBee](#).

- The following image illustrated the connection of [WiFi Bee](#) to **Grove - XBee Carrier**.
- Any Groves can be connected to the Grove sockets provided.
- The programming of WiFi Bee's onboard **AtMega328P** is carried by connecting to PC through USB port. (FT232RL is used)



Grove - XBee Carrier - Connected to [Wifi Bee](#) and Powered By USB

- Refer [Wifi Bee usage documentation for programming examples](#)



Grove - XBee Carrier - Connected to [RFBee](#) and Grove units

Working with Bee Modules

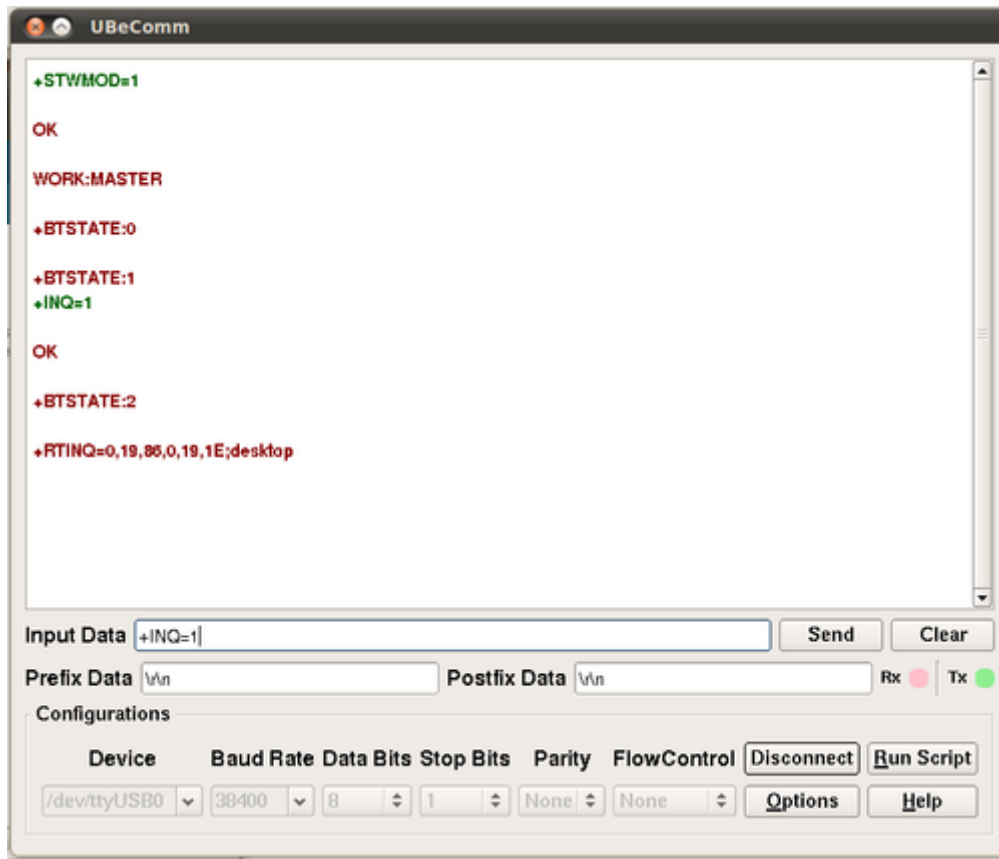
This section is about those Bee modules which do not have a MCU pre-programmed with Arduino bootloader. They mostly act just like a wireless trans-receiver. These **Bee Modules** like Bluetooth Bee, etc.. can communicate with PC as well. In this case **Grove - XBee Carrier** acts like a carrier for these Bees providing necessary power, communication interface with PC through FT232RL USB to UART.

- In the below example [Bluetooth Bee](#) is connected to **Grove - XBee Carrier** and configured using USB-UART



 Grove - XBee Carrier Connected to [Bluetooth Bee](#)

- The communication of Bluetooth Bee and PC is captured with a serial port terminal application.
- You can see the commands and their reply in the screenshot below.
- The Bluetooth Bee was put into INQ mode and it even has detected a Bluetooth device in the vicinity.



- For more information on using [Bluetooth Bee](#), consult the [Bluetooth Bee Commands documentation](#).

Programming

```

/*
  Test code for use with an XBee Carrier & an RF Bee

  Turns on PD5 (eg: grove relay) on for one second, then off for one second, repeatedly.
*/

void setup()
{
  // initialize the digital pin as an output [Pin 5 is the Grove connector for I/O
  pinMode(5, OUTPUT);

  // These lines are needed to ensure that the relay will pull in [provides power to the
  Grove]
  pinMode(16, OUTPUT);
  digitalWrite(16, LOW);
}

void loop() {
  digitalWrite(5, HIGH); // set the LED on
  delay(1000);           // wait for a second
  digitalWrite(5, LOW);  // set the LED off
  delay(1000);           // wait for a second
}
  
```

Bill of Materials (BOM) /parts list

Part	Quantity	Value	Package
ASSOC,OK	2	Green	D0603
C1,C4	2	10uF	0805
C2,C3	2	100nF	0603
C8	1	10V-22uF	AVX-B
C16	1	1uF	0805

C17	1	15v-10uF	AVX-A
CH	1	RED	D0603
D1,D2,D3,D4	4	SS14	D2010
J1,J4	2	POWER-JACK-2P	POWER-JACK-2P
J2,J3	2	HEADER-10P_STANDARD	2.54_10P
J6	1	USB-MINIUSB-5P_STRONG	MINI_STRONG
J7	1	HEADER_1X5_DD	CK_1X5
J8,J9	2	GROVE-2.0-DIP	2.0_1X4
K1	1	BOTTON-4P-DD	BTN-S
PWR	1	red	D0805
Q1,Q2,Q3	3	Si2305DS	SOT23
R1-R,R5-R,R9,R9	6	1K	0603
R4	1	1k	0603
R8	1	3.9K	0603
R10	1	10K	0603
RX,TX	2	red	D0603
SW	1		008-SW-3P-DIP
U1	1	OPEN_BEE_DIP	CCBEE-PRO
U2	1	RT9167A_33PB	SOT23-5
U3	1	CN3083 or CN3063	SOP8
U4	1	FT232RL	SSOP28

FAQ

Is the charger on the XBee Carrier OK to use with LiPo cells with no built in overcharge/over-discharge circuitry?

Please list your question here:

Support

If you have questions or other better design ideas, you can go to our [forum](#) or [wish](#) to discuss.

Version Tracker

Revision	Descriptions	Release
v0.9b	Initial public release	13th July 2011

Bug Tracker

Bug Tracker is the place you can publish any bugs you think you might have found during use. Please write down what you have to say, your answers will help us improve our products.

Additional Idea

The Additional Idea is the place to write your project ideas about this product, or other usages you've found. Or you can write them on Projects page.

Resources

- [Grove - XBee Carrier V0.9b Eagle Files](#)
- [CN3063](#) - Charger controller for Lithium batteries (charging using solar panel)
- [RT9167A_33PB](#) - 3.3V LDO Lownoise Micropower Regulator
- [Si2305DS](#) - P-Channel 1.25-W, 1.8-V (G-S) MOSFET.

How to buy

- Buy **Grove - XBee Carrier** from SeeedStudio Bazaar - [here](#)

See Also

- [Wifi Bee](#)
- [RFBee](#)
- [UartSBee Documentation on FT232RL Application](#)

Licensing

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