

Bluetooth FBC-1701 User Guide

FCC Compliance statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement: This device has been evaluated for RF exposure for Human in reference to ANSI C95.1

(American National Standards Institute) limits. The evaluation was based on ANSI C95.1. At least 28cm (11.02") of separation distance between this device and the user's body must be maintained at all times.

Any changes or modification to the product not approved by FCL Tech could void the user's authority to operate this device.

This Bluetooth module has been certified as modular device, and if conditions described on FCC certificate is met, further transmitter test will not be required. However, the integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

This Bluetooth module must be operated with an antenna provided with this module (Antenna part number: 95XKAA15, Manufacturer: WNC). The antenna characteristics directly affect the radiated output power and ultimately its continued compliance with the regulations. No other antenna can be used with this Bluetooth module.

If conditions cannot be met, then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the integrator will be responsible for re-evaluating the product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labelling

The final end product must be labelled in a visible area with the following: "Contains FCC approved module **FCC ID: 2AK7S-FBC1701**".

Manual Information to the End User: The end user manual shall include all required regulatory information/warning as shown in this manual.

Contents

1	Revision History.....	2
2	Purpose	2
3	Scope	2
4	Equipment Requirement	2
5	Equipment Set Up	3
5.1	Equipment Set Up Using EVT2.x as a fixture	3
6	Bluetooth ID Advertisement Enabled/Disabled	3
6.1	Bluetooth Connection	4
6.2	Serial Communication.....	4
6.2.1	Communicate With Terragraph Digital Board via serial cable.....	4
6.2.2	Communicate With Terragraph Digital Board Wirelessly via Bluetooth.....	4

1 Revision History

Date	Name	Description
5/9/2017	Hung Phan	Initial release

2 Purpose

This document provides instructions how to enable/disable Bluetooth and establish connection

3 Scope

This document intended for internal usage in Facebook only.

4 Equipment Requirement

- Terragraph Digital Board, EVT2.x
- FBC-1701 Bluetooth Device
- PDA Bluetooth Enabled Device

5 Equipment Set Up

5.1 Equipment Set Up Using EVT2.x as a fixture

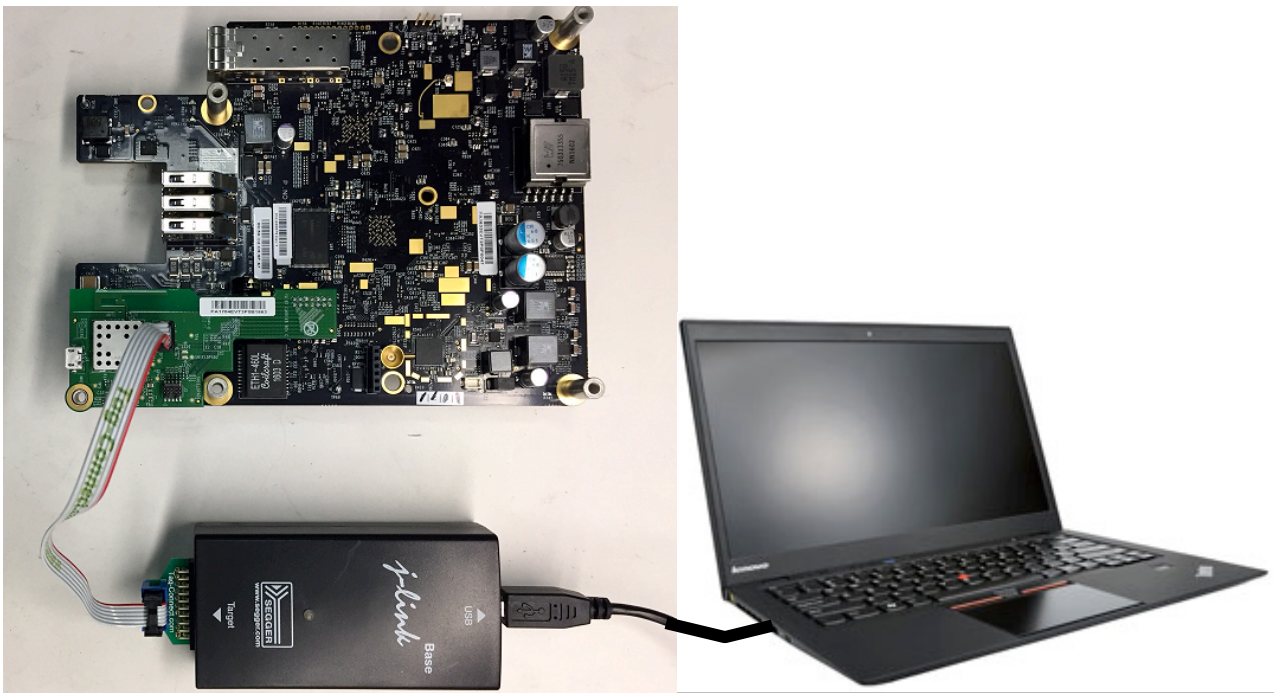


Fig. 1: Equipment Set Up Using EVT2.0 as a fixture

6 Bluetooth ID Advertisement Enabled/Disabled

1. Establish Ethernet connection between EVT and test PC.
2. Log in EVT via NIC 0 IP Address using Ethernet
3. Copy the script “ble-cmd” onto EVT’s directory /data/root
4. Follow steps as shown in screen shot to enable or disable BT ID advertise

```
fe80::3a3a:21ff:feb0:cd2 - PuTTY
terragraph:~# ls -l
total 8
-rw-r--r-- 1 root root 473 Apr 12 2017 ble-cmd.sh
-rwxrwxrwx 1 root root 790 Jun 1 07:23 rtc-powerdown.sh
terragraph:~# chmod +x ble-cmd.sh
terragraph:~# ls -l
total 8
-rwxr-xr-x 1 root root 473 Apr 12 2017 ble-cmd.sh
-rwxrwxrwx 1 root root 790 Jun 1 07:23 rtc-powerdown.sh
terragraph:~# mount -o remount, rw /
terragraph:~# ./ble-cmd.sh atbleon
Programming the BT module
terragraph:~# ./ble-cmd.sh atbleoff
Programming the BT module
terragraph:~#
```

Change file “ble-cmd.sh” to executable file

This command set the file executable

This command turns ON BT ID

This command turns OFF BT ID

6.1 Bluetooth Connection

It requires a Bluetooth enabled device, iPhone OR Android Phone OR MAC Laptop to perform Bluetooth connection.

1. Download the app called “Bluefruit” from Apple Store onto a Bluetooth enabled smart device.
2. Start “Bluefruit” app on smart device and perform a scan for Bluetooth devices nearby. The BT board should have ID name as “ dfu-Terragraph”.
3. Select the BT ID to establish Bluetooth connection. Once it connected the blue LED on BT board should be lit on which indicates the Bluetooth radio is functional correctly.

6.2 Serial Communication

The Bluetooth board allows user to communicate with Terragraph Digital Board via a serial cable OR via Bluetooth wirelessly.

6.2.1 Communicate With Terragraph Digital Board via serial cable

1. Plug BT board onto console port on a terragraph digital board
2. Connect a mini USB Serial Cable between BT board and laptop
3. On laptop open a terminal which corresponding to COM port numerated for BT board.
4. Apply power to terragraph digital board the booting up diagnostics data should stream out and shown on the terminal. If no diagnostics data show up on terminal, the BT board could be bad.

6.2.2 Communicate With Terragraph Digital Board Wirelessly via Bluetooth

1. DO NOT connect the USB serial cable onto BT board for this test.
2. Follow Section 6.3 above to establish Bluetooth connection
3. Select UART tab on “Bluefruit” App, from here user can use log in terragraph digital board and send commands to communicate.

6.2.2.1 BT Modes Test

The Bluetooth board has two operational modes that are Command Mode and UART Data mode. The UART Data mode is used when communicate with terragraph digital board. In Command Mode user can send command to change parameters of the Bluetooth. The current firmware supports a few commands to set Bluetooth parameters. Follow steps below to use Bluetooth in command mode.

6.2.2.1.1 BT Command Mode Test

1. On UART screen on Bluefruit enter “+++” and press “send” to toggle between CMD Mode and UART Mode, as demonstrated in Fig. 4

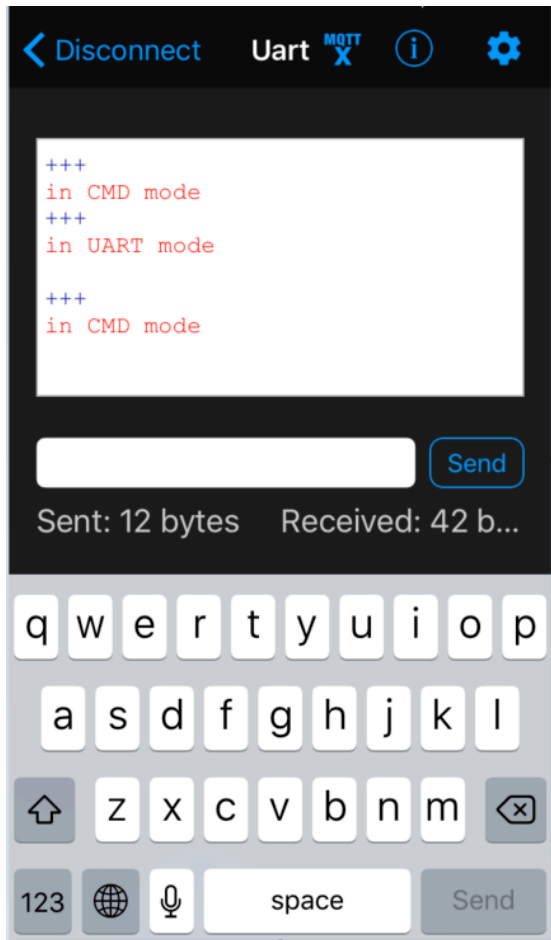


Fig. 4: UART and CMD Modes Toggle

2. While in CMD Mode user can make change to certain parameters of the Bluetooth board with follow commands:
 - "at+ gapdevname = new ID" (Use this command to change Bluetooth ID)
 - ""atevtreset" (This command resets EVT, Terragraph system)

6.2.2.1.2 BT UART Mode Test

1. While in UART Mode user can communicate with Terragraph EVT through console port.
2. Log in EVT using username "root" and password "facebook", and issue command "lspci". If the response is as shown in screen below, the UART Mode test is passed

