Using BlueNor EV BT832X Evaluation Boards

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Introduction

EV BT832X V1 or newer has the same footprint as that of Arduino UNO R3. It is not an Arduino UNO R3 compatible board. Many UNO R3 shields can be used with EV BT832X.

- It is preloaded with firmware for evaluating transmission performance of BlueNor Bluetooth module.
- Firmware can be developed for other applications. You need development environment as recommended by Nordic for nRF52. A Nordic nRF52 DK is recommended for programming this evaluation board.
- If not used on board, all GPIO pins are available at connectors. Whenever possible, with firmware configuration, pin function can be compatible with that of Arduino UNO R3. You may use UNO R3 shields with EV BT832X.

Hardware Description

EV-BT840F V3 schematics can be downloaded from http://www.fanstel.com/download-document/. The same main board is used for BT832X and BT840F. Pins in solid dots are not used in EV-BT832X. Descriptions of hardware are the followings.

1. J17, mini USB connector. The first DC power input and USB connection.
2. J16, micro USB connector. The second DC power input. Connect portable smartphone charger to this port. Power consumption of EV BT832X is too low to prevent auto powering down of most portable smartphone charger. It has circuitry to generate periodic load to prevent auto powering down of some portable smartphone chargers.
3. J18, up to 3.6V DC input to module directly, no voltage regulator on board. Module power consumption can be measured using a current meter (on J19) or an oscilloscope (on J20) across an 1 ohm resistor. SW6 must be OFF to disconnect UART pins for module current measurement.
4. Set S1 to High for AT command mode, to Low for Data mode. AT command firmware is required, not preloaded in stocked evaluation boards.

5. Reset button
6. J1. Power, ground and reset connection to Arduino UNO R3 shields or Fanstel shields.
7. J5 GPIO pins
8. 4 buttons for testing
9. J3. Not used for BT832X. Break-out pins for additional nRF52840 GPIO pins.
10. J4, J5, J2. Connectors for GPIO pins
11. J21. Ground connection
12. JS1. 10-pin debug-in connection to Nordic nRF52 DK.
13. JS2. 4-pin SWD connector
14. J13 for use with shields
15. LED 5. Power-on indicator
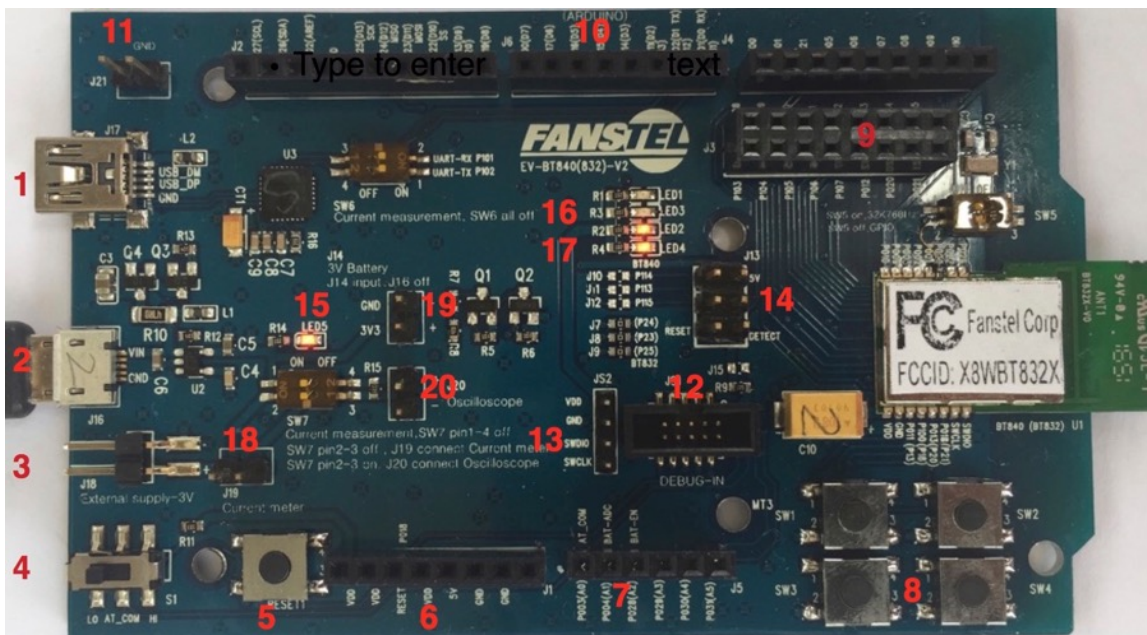
16. LED 2. Bluetooth connection indicator for preloaded firmware. Steady-on when connected.
17. LED 4, Bluetooth command reception indicator for pre-loaded firmware. It toggles upon receipt of a Bluetooth command. Blinking LED 4 light to indicate continuing reception of Bluetooth command from the far end.
18. J19 for power consumption measurement. Set SW7 pin 2/3 to OFF and connect a current meter.
19. J14, 3V battery input
20. J20, use an oscilloscope for current measurement across an 1-ohm resistor.

Using EV-BT832X with Preloaded Range Measurement Firmware

EV-BT832X is preloaded with firmware for Bluetooth range measurement. A **Slave** board can connect to a smartphone and up to 4 **Master** boards. A smartphone is not required for measuring range between 2 modules.

A **Slave** board and a **Master** board are required for range measurement.
1. Powering up both **Master** and **Slave** boards. If you use a portable smartphone charger, connect to the micro USB port.
2. LED 2 is ON to indicate connection between **Master** and **Slave**.
3. Each board sends a command every second.
4. LED 4 toggles ON/OFF when a valid Bluetooth command is received. A consistent toggling of LED light is an indication for almost error-free data transmission. When signal is weak or interference is high, some toggling is missed.
5. Measure the maximum range that LED 4 stop toggling for a few seconds.
6. LED 2 is OFF to indicate disconnection between **Master** and **Slave**.
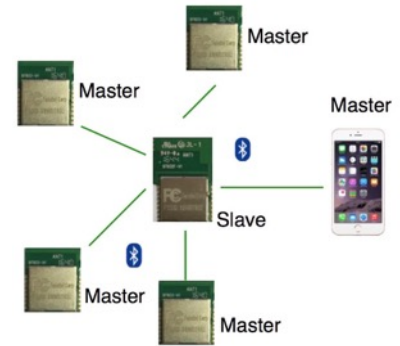
Measuring Bluetooth Range with a Smartphone
Nordic app *nRF Connect* can be used to check connectivity with an Android or antiphon.

Re-Programming with AT Command Firmware
AT Command firmware for BT832X is available for download at
http://www.fanstel.com/download-document/

A Nordic nRF52 DK is required for programming the firmware.

Developing and Testing Your Firmware
You can use Nordic development environment to develop and download firmware into EV BT832X.