Using the BT85x Series with Linux and Windows
Relevant to Laird # BT850-SA, BT850-ST, BT851, and associated DVKs

Application Note v1.0

INTRODUCTION

The BT85x Series are Laird’s latest generation of USB HCI Dual Mode (Classic BT and BLE) products based on the Cypress CYW20704 A2 chipset. This application note demonstrates basic operation with the USB Bluetooth radio on a Linux machine and on a Microsoft Windows machine. You must obtain the Bluetooth stack from your preferred solution provider.

REQUIREMENTS

- BT850 development board (Laird part # DVK-BT850-SA or DVK-BT850-ST)
- BT851 USB Bluetooth adapter
- Microsoft Windows 7 or newer
- Ubuntu 16.04 Linux
- Compatible Bluetooth stack

Notes: Ubuntu 16.04 is used as the testing platform (Kernel version 4.4.0-31). The BlueZ stack (v 5.37) is included. The USB driver was also tested in v4.12.6 kernel and v4.4.21-v7 kernel.

The Microsoft Bluetooth stack on Windows 8 or newer supports Bluetooth Low Energy (BLE). Only Classic Bluetooth is supported on Windows 7.
PREPARATION

Before plugging the BT850/BT851 into the computer, it is important to check if there is any existing Bluetooth radio on the computer.

Linux

Before plugging the BT860 development board to the computer, type `hciconfig` to find out if there are any existing Bluetooth radios. If you find one, close it by typing the following: `hciconfig hciX down` (Figure 1).

Typically, `hci0` is the first Bluetooth device on the computer. Superuser permissions should be required.

```
$ hci0: Type: BR/EDR Bus: USB
BD Address: 00:1A:7D:11:88:86 ACL MTU: 1021:7 SCO MTU: 64:1
UP RUNNING
RX bytes:601 acl:0 sco:0 events:38 errors:0
TX bytes:3059 acl:0 sco:0 commands:38 errors:0
```

```
$ sudo hciconfig hci0 down
```

Figure 1: Disable existing computer existing Bluetooth device

Windows

Use the Device Manager feature in the Windows control panel. Right-click on the Bluetooth radio to disable it (Figure 2)

Figure 2: Disable existing computer existing Bluetooth device on a Windows 10 machine
OPERATION

Once the USB Bluetooth radio/adapter is inserted into the computer, it should be automatically recognized by the host computer.

Linux

The USB interfaced radio should be recognized by the host. The BlueZ Bluetooth stack assigns the hci name (Figure 3). Bluetooth operation may require root privilege on the Linux computer.

![Image of hciconfig output]

*Figure 3: BT850/851 is recognized by BlueZ*

Windows

The BT850/851 is recognized as a Generic Bluetooth Adapter. Bluetooth LE Enumerator states that the BLE connectivity is supported (Figure 4).

![Image of Windows Device Manager]

*Figure 4: BT850/BT851 is recognized on a Windows 10 machine*
Operation of Classic Bluetooth in Linux

With the device initialized, you can test Bluetooth functionality from the command prompt. To test scanning, you must have a nearby device (such as a tablet or smartphone) set to be discoverable.

The command to initialize a scan is:

```
hcitool scan
```

When a scan is initialized, the terminal returns found devices in the following format:

```
Scanning ...

[MAC Address]   Friendly_Name
```

If there are discoverable devices nearby, they appear in this list as they are discovered (Figure 5).

![Figure 5: A Laird module is found](image)

To demonstrate the RFcomm connection, a Laird BT900 module was used, which is already configured as discoverable and connectable. Simple secure mode must also be enabled (Figure 6).

![Figure 6: Make a RFcomm connection to the module](image)

Operation of Bluetooth Low Energy in Linux

The hcitool commands to scan Bluetooth Low Energy are distinct from those used in classic Bluetooth connections. To initiate a BLE scan from the terminal, issue the following command:

```
#hcitool lescan
```

The terminal returns the following:

```
LE Scan ...

[MAC Address] - [BLE device]
```
Operation of Bluetooth in Windows

In Windows Settings, select Add Bluetooth or Other device to display the list of Bluetooth devices that are in discoverable mode (Figure 8).

Once the desired device is shown, click on it to connect (Figure 9).
Figure 10: A BLE mice “ELECOM M-BT11BB” is connected

REVISION HISTORY

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