BT800 Series HID Proxy
Application Note

Laird's BT800 series USB HCI devices support HID proxy mode. With HID proxy function enabled, BT800/BT810/BT820 can connect to a BLE keyboard and mouse without the BT driver being loaded. One typical user scenario is at the computer's BIOS screen. This application note illustrates how to enable this HID proxy function by modifying a few keys in the Bluetooth Persistent Store. The function is not enabled in production.

REQUIREMENTS

- BT800 development board or BT820 USB dongle
- Windows PC

> **Note:** Windows 8 is used in this guide. Windows 7 and XP can be used for the first time modification.

- CSR BlueSuite
- CSR USB driver or CSR USB-SPI adaptor for BT800 development kit.

> **Notes:** 1. CSR BlueSuite is made available only to OEMs under a Laird NDA. OEMs should contact LT-wirelessinfo@lairdtech.com to obtain the NDA. After BlueSuite is installed, PStools can be found under the CSR folder.
>
> 2. CSR USB driver is provided along with the CSR BlueSuite. The CSR USB-SPI adaptor is available at: http://parts.digikey.com/1/parts/1406287-converter-usbspi-dev-sys-1808-1a.html
>
> 3. Due to the proprietary nature of the third party software (CSR BlueSuite) used for HID proxy mode, we only support HID proxy mode for OEMs and NOT for individual customers.

ENABLING THE HIG PROXY FUNCTION

Changing the VID and PID

> **Note:** This step (changing the VID and PID) is only required for the BT820 USB dongle. Please refer to the "*Modifying VID and PID for the BT820*" application note for information on this step.

Installing CSR USB Driver

When the BT800 development board is first plugged in the PC USB port, Windows installs the driver automatically. It is recognized as the "Generic Bluetooth Radio" in the Windows device manager.
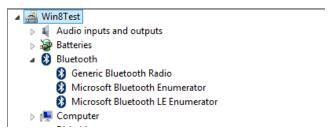

Figure 1: Generic Bluetooth Radio in Device Manager

Complete the following steps to install the CSR USB driver:

1. Right-click on **Generic Bluetooth Radio,** then click **Update Driver Software.**

Figure 2: Contexual Rollout

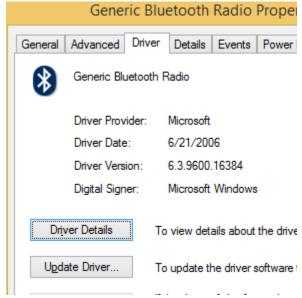2. Select the *Driver* tab and click **Update Driver.**

Figure 3: Update Driver button in Properties panel

3. Click **Browse my computer for driver software.**
4. Click **Let me pick from a list of device drivers on my computer.**
5. Click **Have Disk.**

Figure 4: Have Disk button

6. Navigate to where the CSR driver is located on your computer, and select *CSRBlueCoreUSB.inf.* Proceed through the windows until software installation is complete.
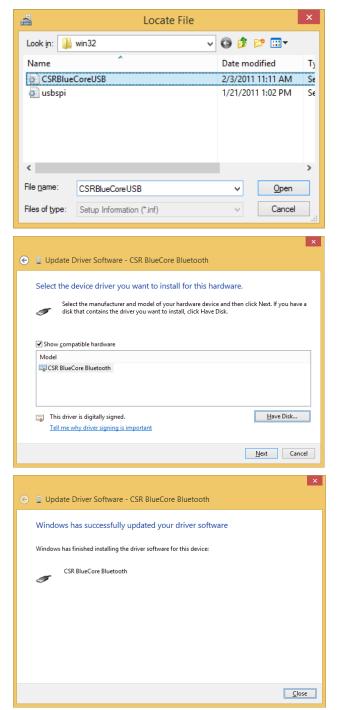

Figure 5: CSR USB Driver installation

The BT800 development board is now recognized as *CSR BlueCore Bluetooth* in Windows device manager. It can be found by expanding "Universal Serial Bus controllers".

Figure 6: CSR BlueCore Bluetooth in Device Manager

You can skip to Open PStools if you are not planning to use the SPI adaptor.

CSR USB-SPI Adaptor

An RJ45 cable comes with the adaptor. Cut the RJ45 cable in half. Plug in the RJ45 jack into the adaptor and connect the open end to the development board.

Figure 7: CSR USB SPI adaptor

Table 1 details RJ45 pins and their corresponding SPI signals.

Table 1: RJ45 to SPI wiring

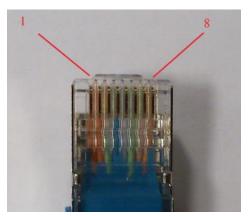| Signal	RJ45 Connector Pin
SPI_CS8	1
SPI_MOSI	5
SPI_CLK	7
SPI_MISO	3
GND	8

Figure 8: Wire numbering in RJ45 jack

Open PStools

After invoking PStools, you must select either USB transport or SPI transport to access the PSkeys.

On the BT800 DVK board, there is a 10-pin header for SPI and WLAN Coexistence and a SPI/PCM switch. Be sure to put SPI/PCM switch on the SPI position before plugging the development board to your PC if an SPI interface will be used for opening PStools.
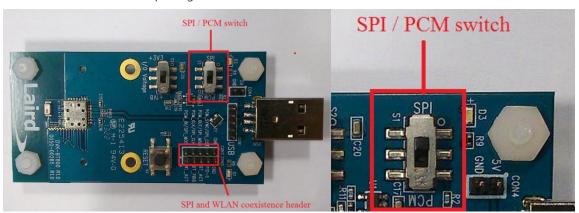

Figure 9: BT800 DVK Board, SPI/PCM switch set to SPI

In PStools, select either USB or SPI transport as shown in Figure 10 and Figure 11.

Figure 10: Selecting USB transport

Figure 11: Selecting SPI transport

PStools first reads all the PSkeys from the module. This process takes about ten seconds and then the screen in Figure 12 appears with *Bluetooth address* highlighted on the list and the MAC address shown on the right.

Note: The Bluetooth address of your module will be different than the one displayed in Figure 12 because this is a unique address. Do not attempt to change it or you might put the module in nonoperational condition.
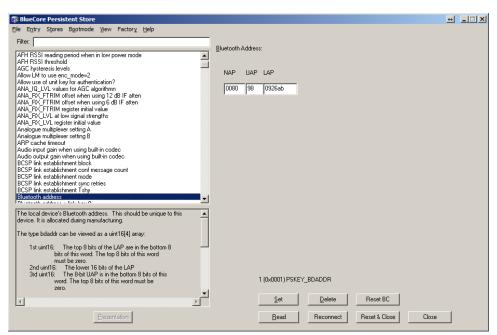

Figure 12: PStools opened successfully

Modifying the pskeys for HID Proxy Mode

There are several pskeys to be modified. To simplify the process, customers can merge the *HCIandHIDKeys.psr*. To do this, follow these steps:

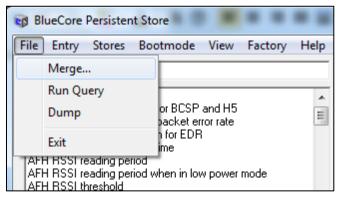1. In the menu bar, select **File > Merge**.

Figure 13: Merge psr file

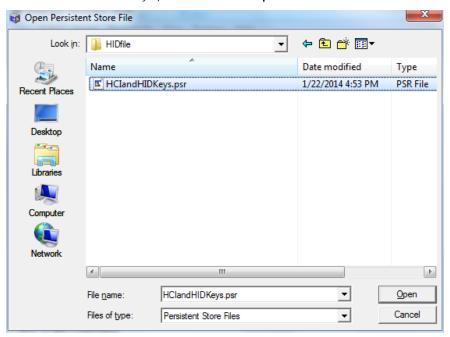2. Select the *HCIandHIDKeys.psr* file and click **Open**.

Figure 14: Select HCIandHIDKeys.psr file

Enabling HID Mode

The HCI and HID mode keys have been written to the module, but HID mode has not yet been selected. You can merge the *EnableHID.psr* file to select HID. However, it is very important to understand that the module must be in HCI mode before Pskeys can be accessed again with pstools if further changes are to be made.
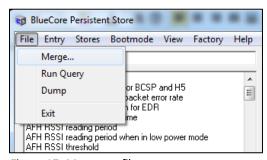
Figure 15: Merge psr file

After the *EnableHID.psr* file is merged, close the pstools and reinsert the BT800 development board or BT820 dongle into to the PC. Beware that omitting "*HCIandHIDKeys.psr" will cause the BT8XX non-operational.* The device is now recognized USB Composite Device.
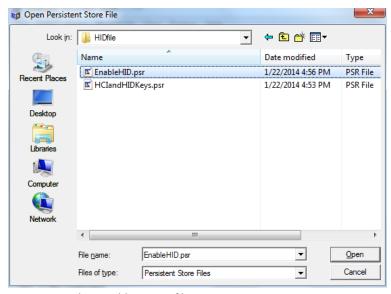

Figure 16: Select EnableHID.psr file

Installing the Switcher Service

There is a service called VFPRadioSupportService provided by CSR. By enabling this service, Windows 8 is able to "switch" the HID device into HCI mode temporarily. Follow these steps to install the service:

1. Copy these two files (VFPRadioSupportService.exe and VFPRadioSupportService_PS.dll) into the **C:\Windows\System32** directory. Note that administrative privileges are probably required.
2. Open a command prompt with Admin rights and navigate to the C:\Windows\System32 directory.

Figure 17: Open Command Prompt with Administrative right

3. Enter *sc create VFPRadioSupportService binPath="C:\Windows\System32\VFPRadioSupportService.exe* to create the service.

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Figure 18: Create system service

4. Plug in the HIDenabled BT8xx device.
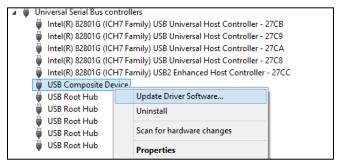5. Open Device Manager, right click **USB Composite Device**, and select **Update Driver**.

Figure 19: Update Driver Software with "CsrRadios_HID.inf"

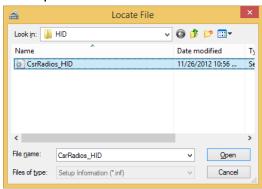6. Navigate to where *CsrRadios_HID.inf* is located and select it.
7. Click **Open**.

Figure 20: Select CsrRadios_HID.inf file

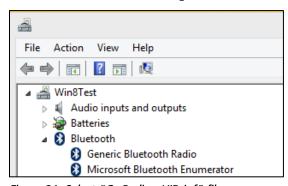The BT8XX device is now recognized as Generic Bluetooth Radio.

Figure 21: Select "CsrRadios_HID.inf" file

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Figure 22: Vfpradiosupportservice service is now running.

8. By updating the driver with the CSR USB driver again as shown in previous section. It is possible to access the pskeys again.
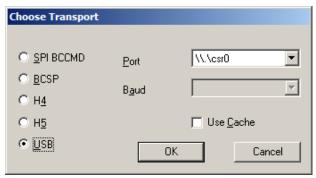

Figure 23: Select USB transport

Enabling the HCI Mode

You can merge *EnableHCI.psr* to select HCI mode. The BT8Xxx is recognized as Generic Bluetooth Radio even after the switcher service has been stopped.
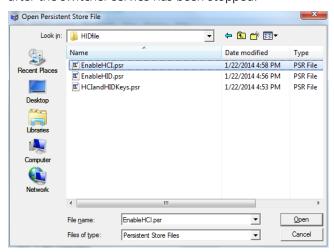

Figure 24: Merge EnableHCI.psr

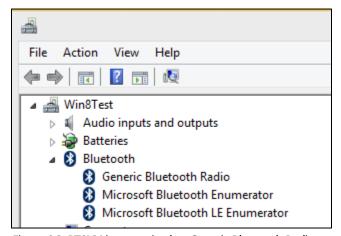*Figure 25: Vfpradiosupportservice service is stopped*

Figure 26: BT8XX is recognized as Generic Bluetooth Radio