

Three methods to change firmware on KC Wirefree Bluetooth modules.

- **SPI Firmware Load (All modules, including Low Energy)**

All modules can load a complete fresh firmware image using the SPI interface. This is a factory load, and will require a BT Address to be assigned after loading the image firmware. This method uses our own kcFwLoader.exe application, which is capable of loading Audio, Data, and Low Energy images. Also, it can easily assign a Bluetooth address.

- **USB Firmware Update (BlueAudio modules)**

Our kcGateway and kcHeadset audio firmware editions are configured to use the USB port for device firmware updates (DFU). This method uses the DfuWizard.exe application from the BlueSuite toolkit.

- **UART Firmware Update (BlueData modules)**

Our kcKeyboard and kcSerial data firmware editions are configured to use the UART port for device firmware updates (DFU). This method uses the DfuWizard.exe application from the BlueSuite toolkit.

BlueSuite toolkit applications

http://www.kcwirefree.com/docs/BlueSuite_2.6.2.zip

This CSR utility toolkit includes several utility applications for loading firmware, updating firmware, testing hardware, and accessing register settings in flash memory. Some applications need SPI access only, while others can operate in the DFU mode (using USB or UART as originally configured by KC Wirefree). It also includes a full set of device drivers for DFU mode operation and SPI devices.

SPI Firmware Load

DROP DOWN SELECTION boxes will select the Uart Port (optional), the Firmware Image, and the Spi Port to use.

The OPEN/CLOSE button opens and closes the selected Uart port.

The UART button opens a Uart dialog box to change baud and other terminal settings.

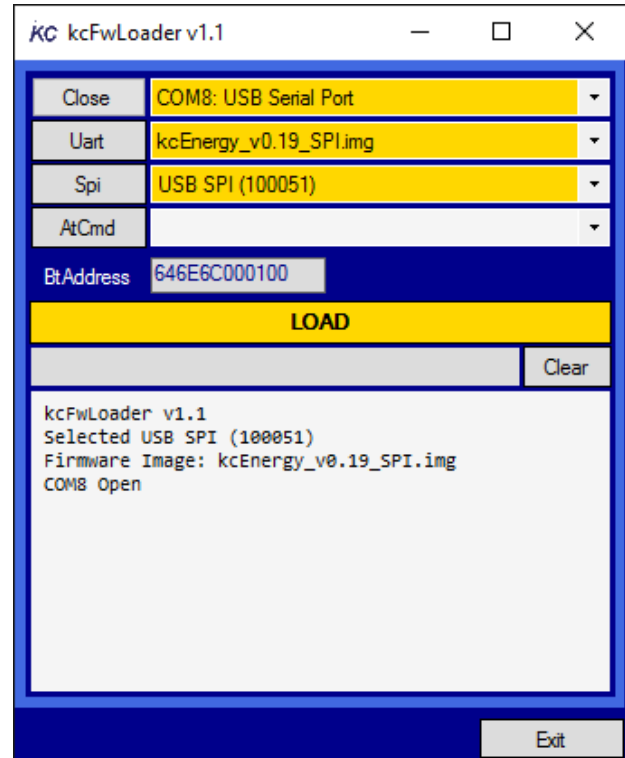
The SPI button performs a device reset using the SPI port. A quick method to determine if the SPI is properly configured and connected to the Bluetooth device.

The ATCMD button is a terminal command entry box. It will send the command string via Uart to the Bluetooth device.

The LOAD button starts a firmware image load.

The BTADDRESS box contains the Bluetooth Address to load following a successful image load. The first six digits are assigned to KC Wirefree, and the second six digits are uniquely assigned to each Bluetooth device.

<http://www.kcwirefree.com/docs/kcFwLoader.zip>

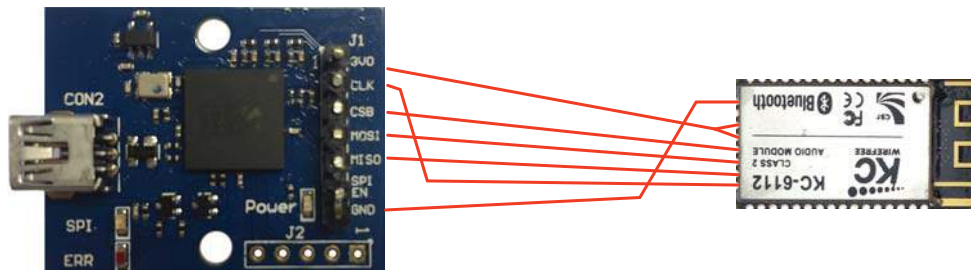


SPI Adapter

This CSR USB-SPI adapter is available from Digikey, Arrow, and Future Electronics. It device operates at 3.0V signal levels. If you experience any connectivity problems, you may need to substitute the 3.0V LDO regulator for a 3.3V LDO regulator. This 3.3V regulator fits: AP2112K-3.3TRG1.

Part Number: DK-USB-SPI-10225-1A Cost: Under \$15

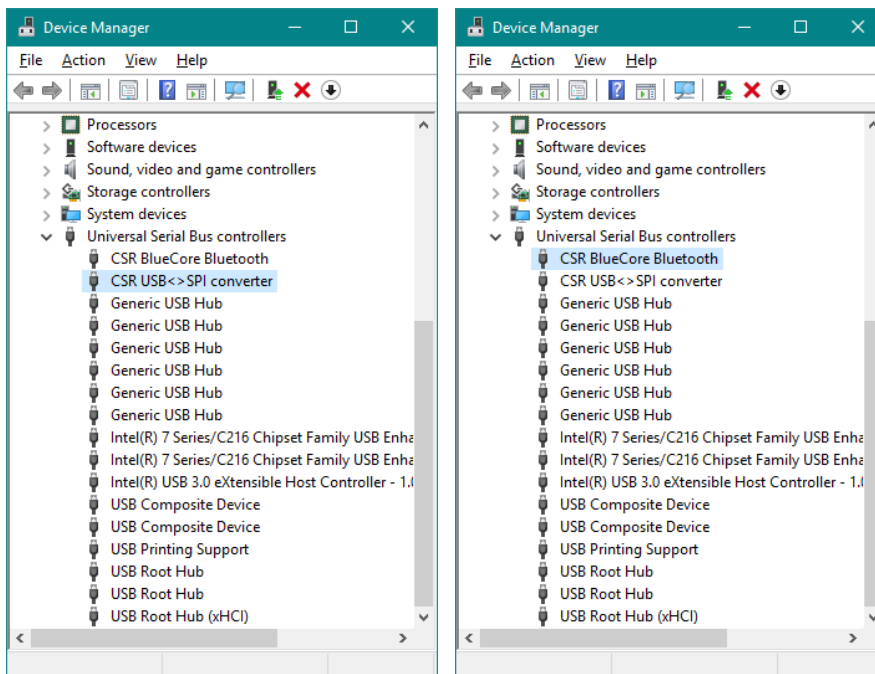
Simple connections from SPI to module: CLK↔CLK, CSB↔CSB, MOSI↔MOSI, MISO↔MISO, GND. Power module separately or from SPI Adapter. Module needs ENABLE pin held HIGH during programming.



USB Firmware Upgrade (Typically kcAudio firmware)

SETUP

1. Install BlueSuite tools.
2. Run `\BlueSuite 2.6.2\drivers\win64\DPInst.exe` to install USB SPI device driver.
3. Power up Demo board or module (USB/Recharge is not plugged in yet).
4. Enter DFU mode. Firmware editions may vary, but typically issue AT Dfu command via Terminal program using the Uart interface to the module. Alternatively, hold PIO 2 HIGH during power up (cannot be charging).
5. Connect USB cable from PC to Demo board or module. D+, D-, and GND.
6. Verify that the Demo board or module is recognized in Device Manager. If the new USB device is not recognized, see the manual device driver installation instructions at the end of this document.



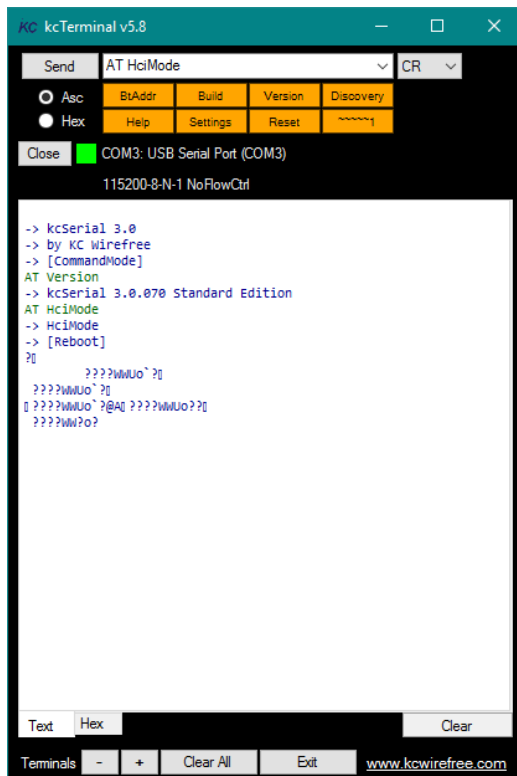
LOAD

7. Launch DFUWizard.exe firmware upgrade program.
8. Select USB transport option.
9. Find KC Wirefree DFU file (such as `kcSerial_v3.0.070_KC21.dfu`).
10. Start DFU procedure.
11. Reset

UART Firmware Upgrade (Typically kcSerial firmware)

SETUP

1. Install BlueSuite tools.
2. Connect all 4 UART module pins to a PC COM port, typically using a USB-UART adapter.
Note: if connecting directly to a PC Serial COM port, you will need a TTL voltage level shifter. (Flow control pins may not be necessary).
3. Power up module, and open COM port using a terminal application to communicate with module UART.
4. Issue AT HciMode command. Module will Reboot and output ?@A?@A?@A ... or similar.
Note: UART settings for HCI/DFU mode change to 115200-8-N-1.
5. Close COM port in terminal application.



```

KC kcTerminal v5.8
Send AT HciMode CR
Asc BtAddr Build Version Discovery
Hex Help Settings Reset
Close COM3: USB Serial Port (COM3)
115200-8-N-1 NoFlowCtrl

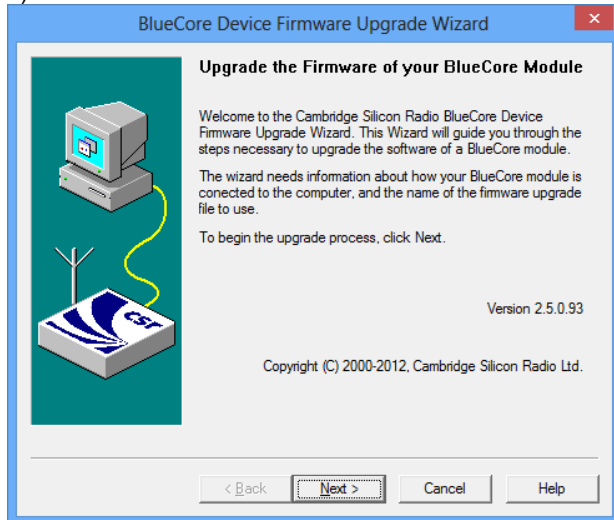
-> kcSerial 3.0
-> by KC Wirefree
-> [CommandMode]
AT Version
-> kcSerial 3.0.070 Standard Edition
AT HciMode
-> HciMode
-> [Reboot]
?@
  ????mUo' ?@
  ????mUo' ?@
  || ????mUo' ?@A? ????mUo'??@
  ????mUo'o?
  
```

LOAD

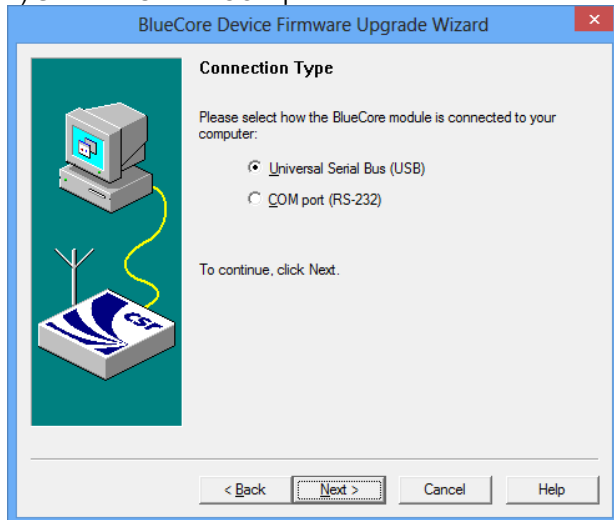
6. Launch DFUWizard.exe firmware upgrade program.
7. Select COM port transport option.
8. Select COM port number.
9. Find KC Wirefree DFU file (such as kcSerial_v3.0.070_KC21.dfu).
10. Start DFU procedure.
11. Reset

Device Firmware Upgrade Wizard

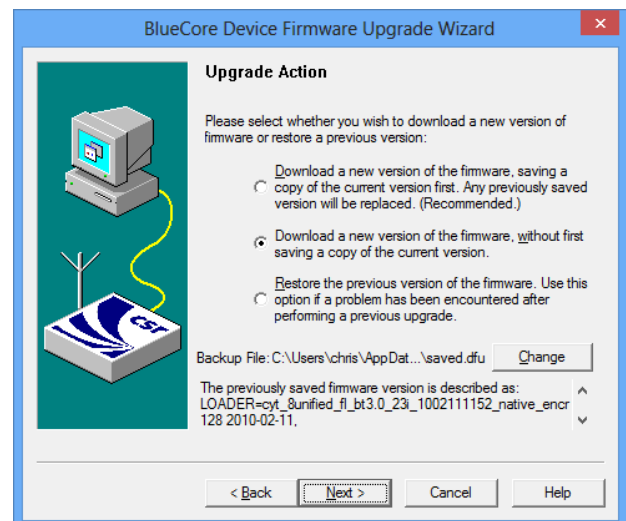
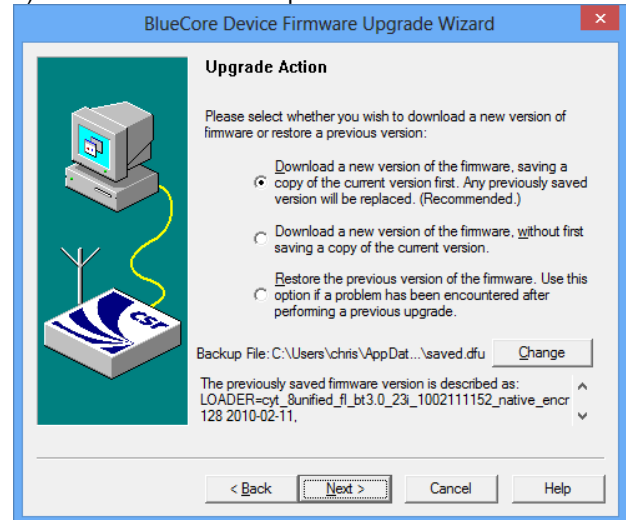
1) LAUNCH DFUWizard.exe



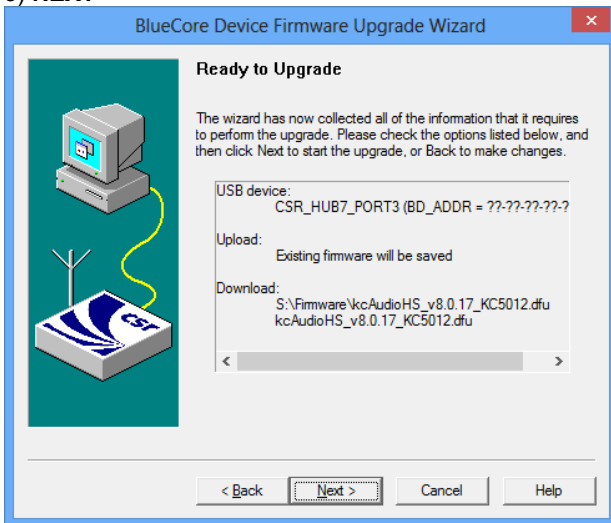
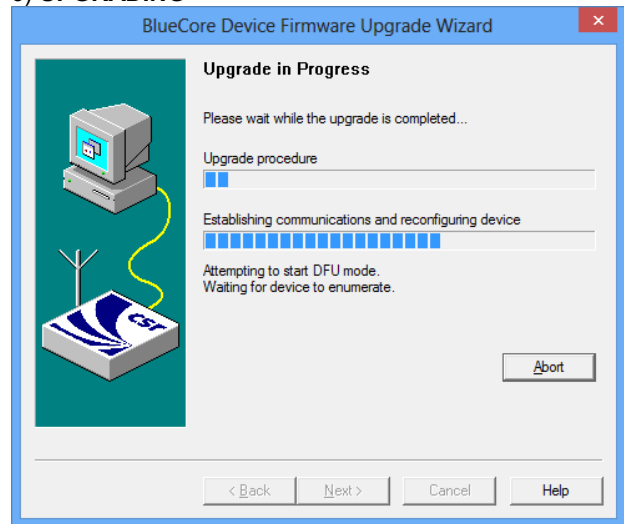
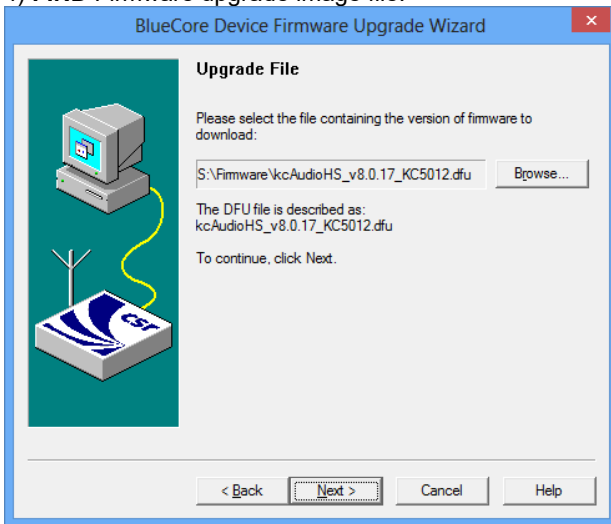
2) SELECT USB or COM port.



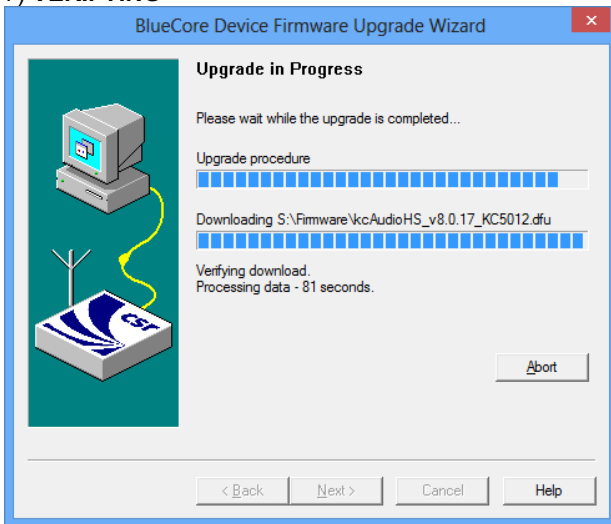
3) SELECT A download option.



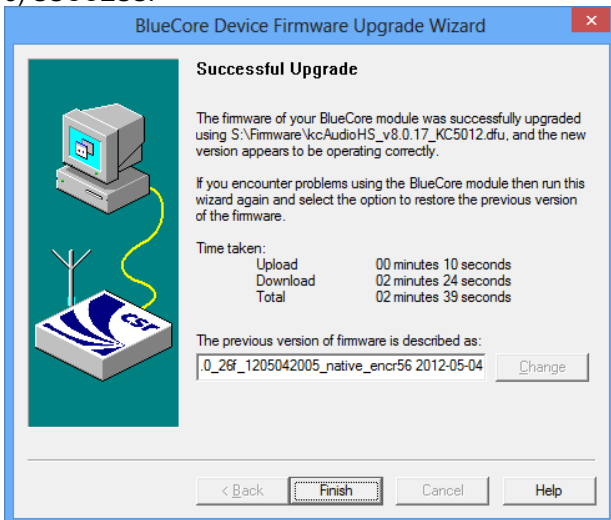
4) FIND Firmware upgrade image file.



7) VERIFYING

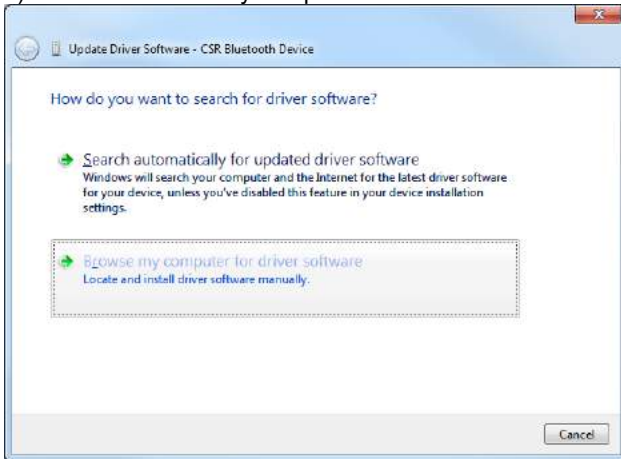


8) SUCCESS!

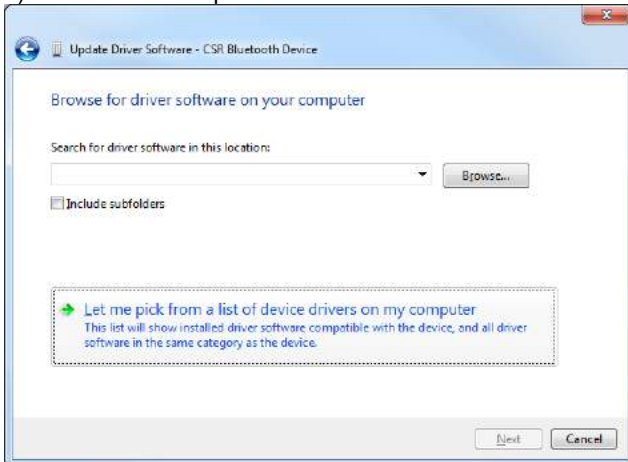


USB Manual Driver Installation

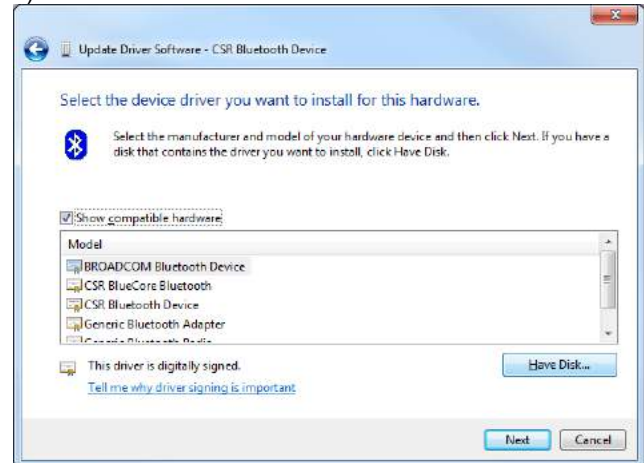
1) **SELECT** Browse my computer for driver software.



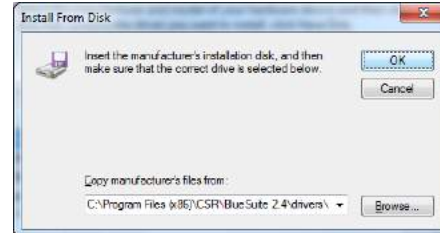
2) **SELECT** Let me pick from a list of device drivers...



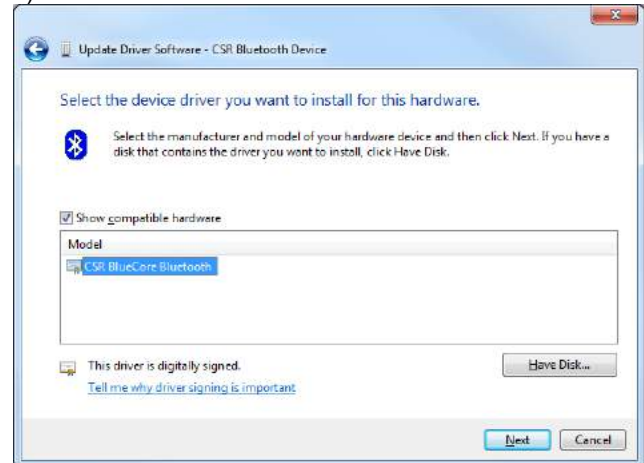
3) **SELECT** Have Disk.



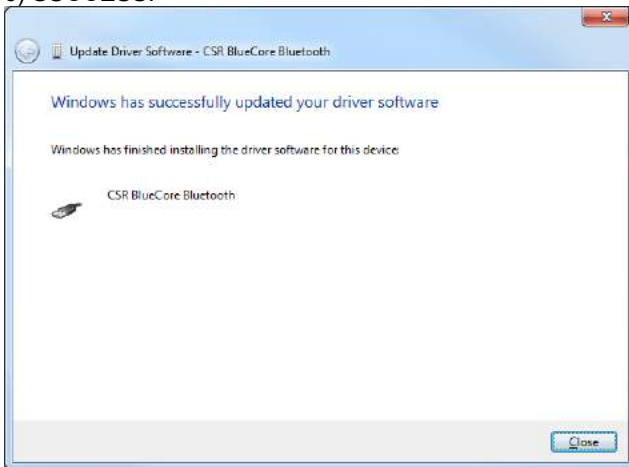
4) **FIND** \CSR\BlueSuite 2.4\drivers\win64\CSRBlueCoreUSB.inf



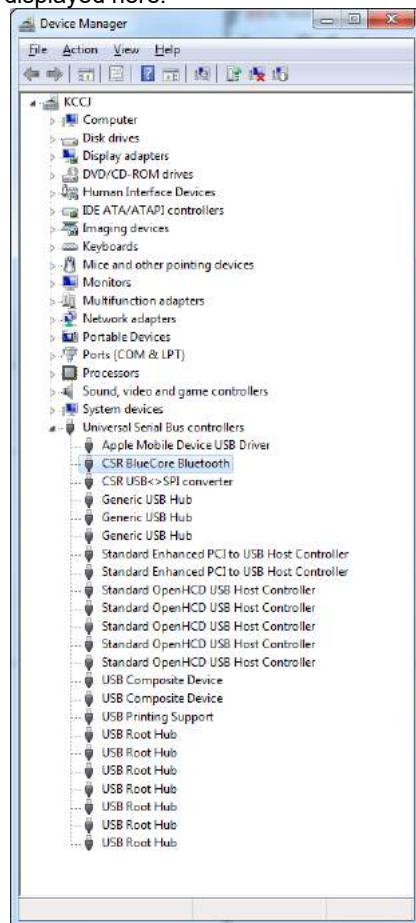
5) **SELECT** CSR BlueCore Bluetooth driver.



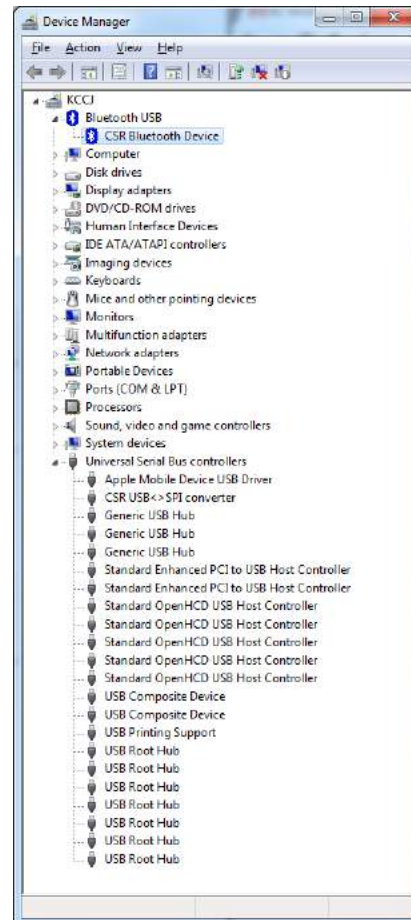
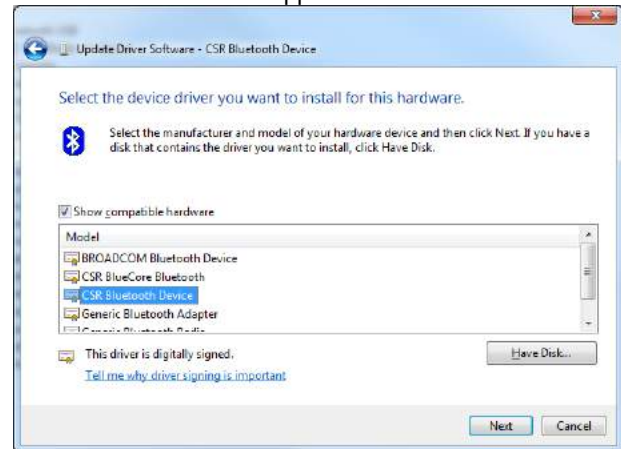
6) **SUCCESS!**



7) **VERIFY** Device Manager recognizes *CSR BlueCore Bluetooth*, or *CSR BlueCore Device in DFU mode* when it is in DFU mode, and is located in the Universal Serial Bus controllers section. BlueSuite can access the BlueCore device displayed here.

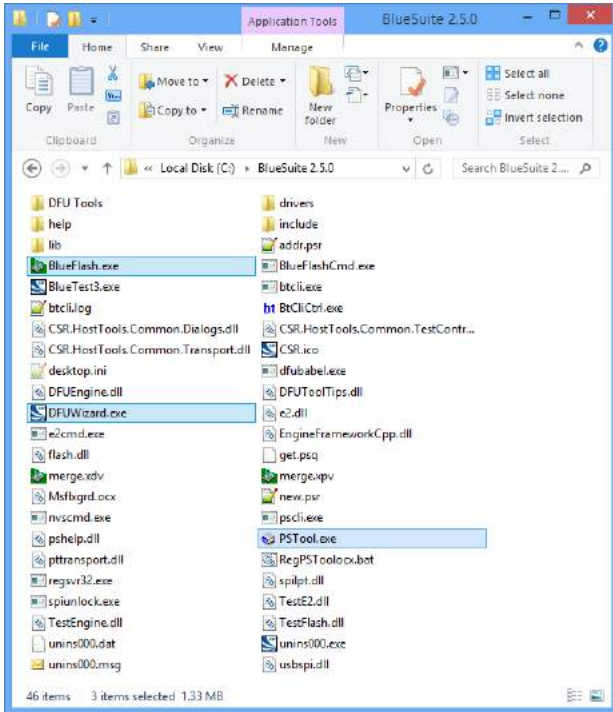


8) **NOTE** If using the *CSR Bluetooth Device* driver, the device is displayed in the Bluetooth USB section, and is usable as a standard Bluetooth dongle device by the system, but cannot be used with the BlueSuite application tools.



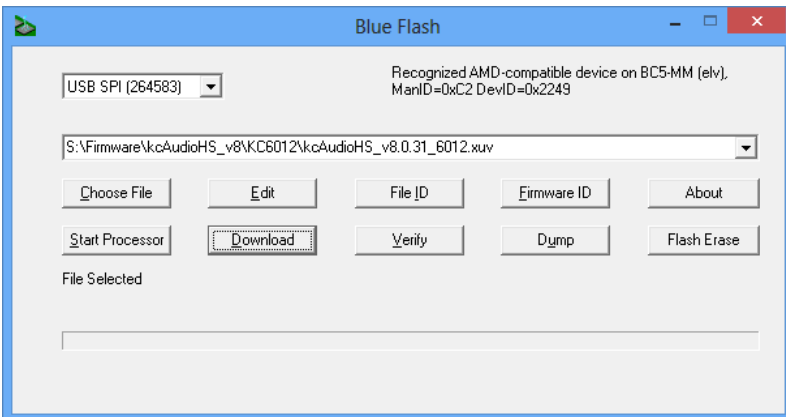
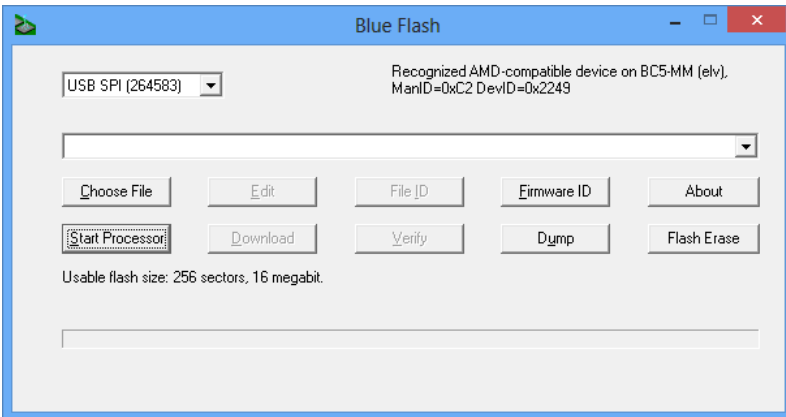
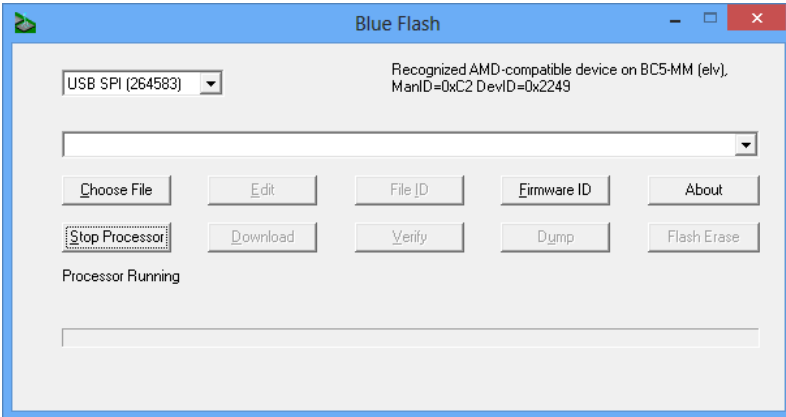
BlueSuite Tools Overview

Applications: BlueFlash.exe, BlueTest3.exe, DFUWizard.exe, PSTools.exe



BlueFlash

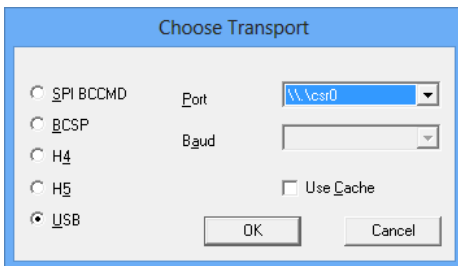
BlueFlash loads binary firmware image files (*.xuv) using the SPI interface.



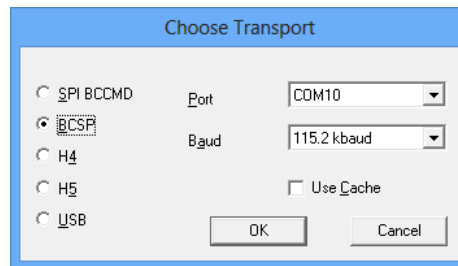
PSTools

PSTools provides direct access to firmware configuration registers within the flash memory. Please contact KC Wirefree for specific register details if access is necessary. PSTools can access the module using the USB (audio modules) or UART (data modules) interface, when the device is in DFU/HCI mode.

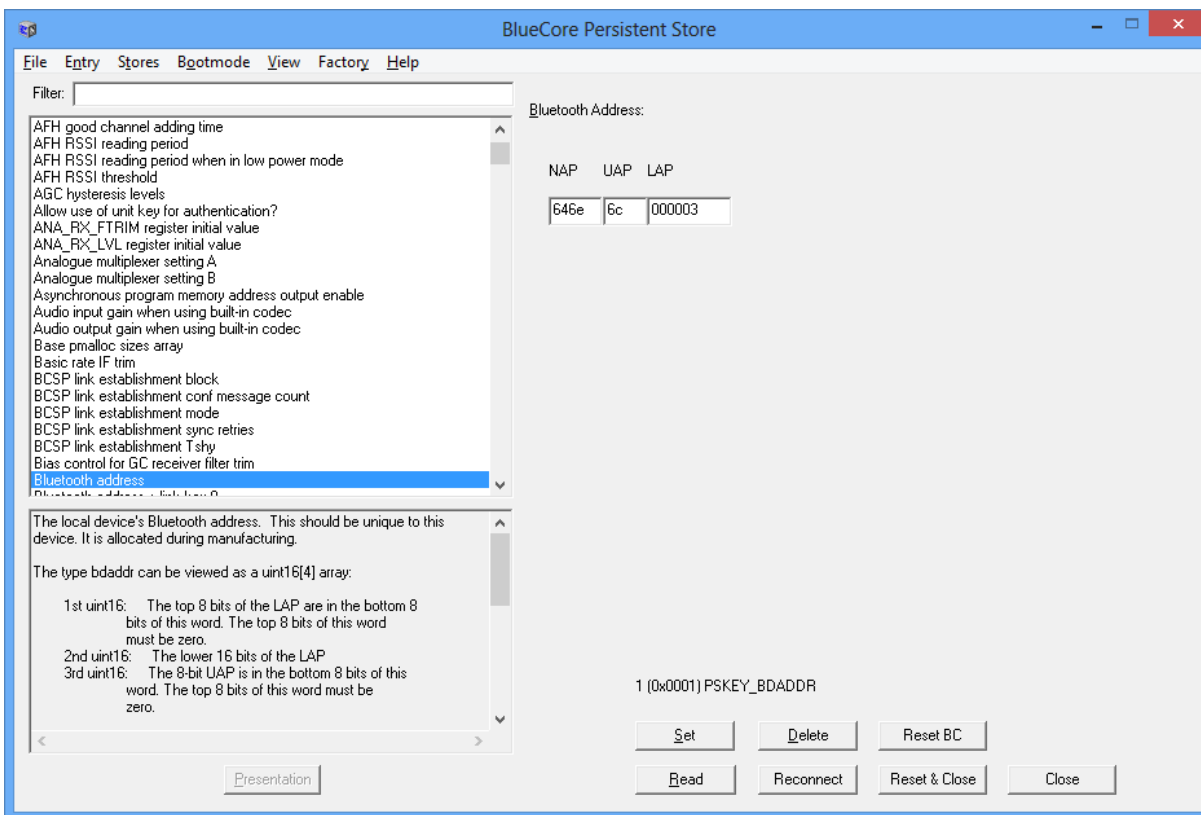
Using USB mode:



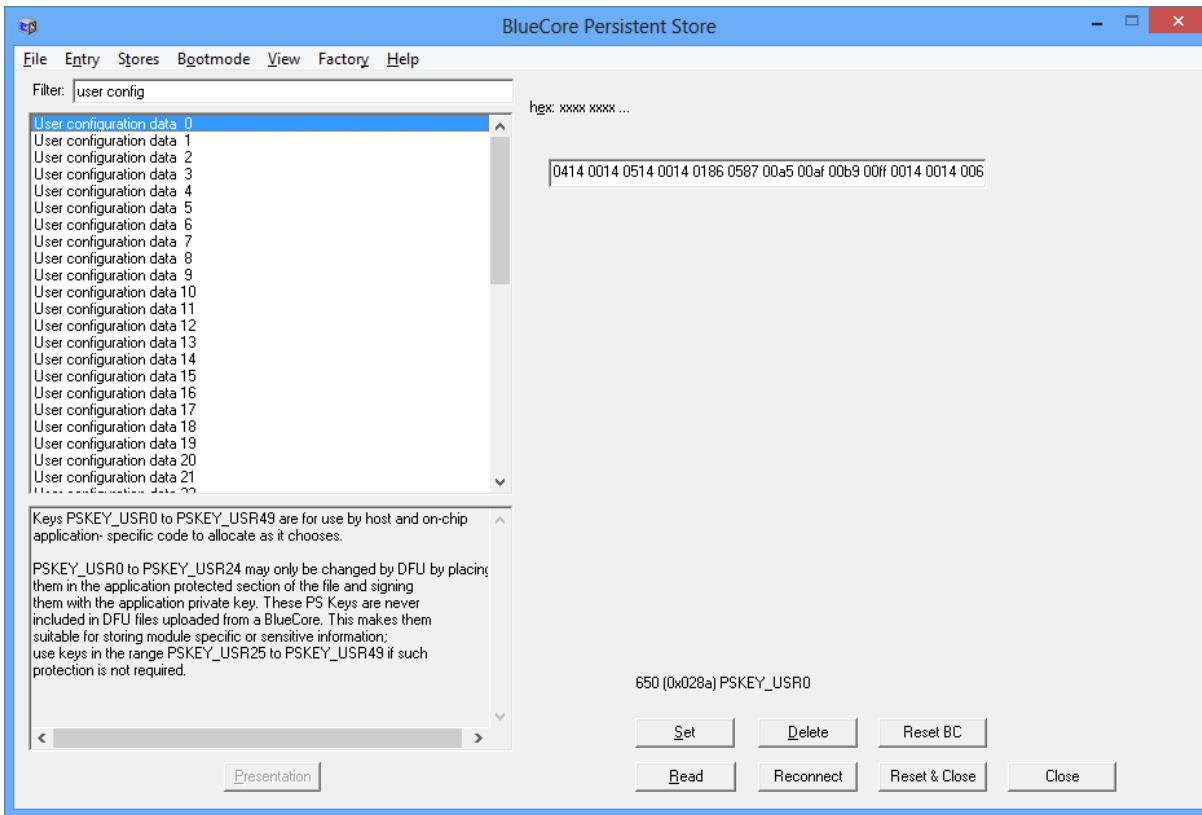
Using UART mode:



Accessing flash memory configuration registers (Read, Set, Delete, Close):



User configuration registers are here:



Contact Information

KC Wirefree Corporation
2640 W Medtronic Way
Tempe, Arizona 85281

Phone	(602) 386-2640
Website	www.kcwirefree.com
Sales/Tech Support	sales@kcwirefree.com