BT830 UART HCI Module for Big Windows

Application Note *v1.1*

INTRODUCTION

Laird's BT830 is a UART HCI Bluetooth module. Because there is no EEPROM on board, you must load module-specific settings such as MAC address and Crystal trim at the module initialization stage. This application note explains how to use Cambridge Silicon Radio's BtCLI tool (included in CSR BlueSuite) to 'patch' these settings.

REQUIREMENTS

- BT830 development board
- Windows PC (Windows 7 or 8)
- CSR BlueSuite
- Bluetooth stack which support BCSP or H4 protocol

Notes: CSR BlueSuite is available to customers under a Laird NDA. Contact LT-wirelessinfo@lairdtech.com to obtain the NDA.

After BlueSuite is installed, PStools can be found under the CSR folder.

The BT830 development board interfaces via the board's FTDI USB-UART chip. Windows should install the driver for this automatically when the board is connected and powered. If not, the driver can be downloaded from www.ftdichip.com.

For the purposes of this application note, the BlueSoleil Bluetooth stack was used as the third-party Bluetooth stack. Any qualifying third-party Bluetooth stack may be used. However, this cannot be provided by Laird.

PATCHING WITH BTCLI

BT830 Default Settings

Before any settings are loaded, the BT830's default settings are as follows:

- BCSP transport protocol (Figure 1)
- 115200 bps (8-E-1) UART configuration (Figure 1)
- MAC address – 00025B00A5A5 (Figure 2)

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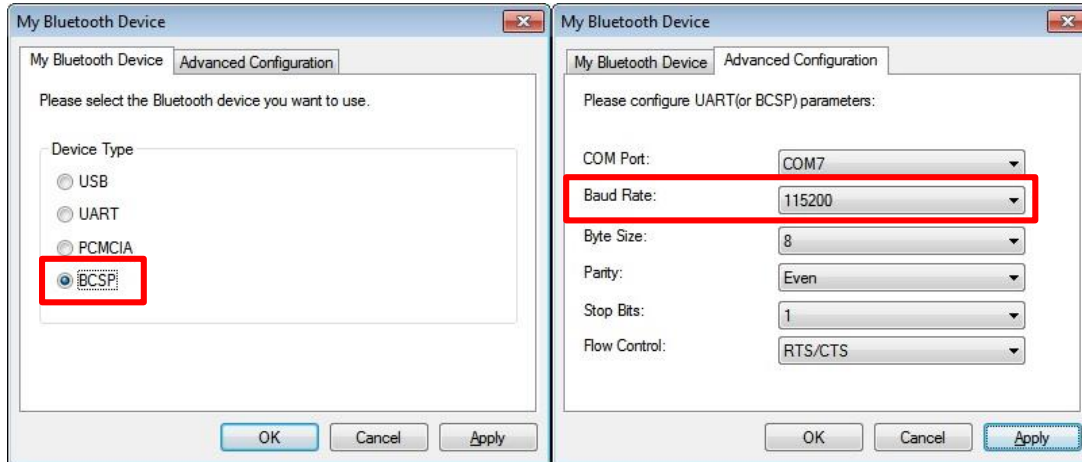Hong Kong: +852 2923 0610

Figure 1: Default UART configuration in BlueSoleil BT stack

Figure 2: Default Bluetooth MAC address shown in BlueSoleil BT stack

Note: The BlueSoleil BT stack is used here as an example of a third-party Bluetooth stack. It is not provided by Laird.

Modifying the Configuration File

Laird has provided a configuration file (BT830_BigWindows.btcli) which includes all of the required settings. You can modify this file to change transport (BCSP / H4) protocol (Figure 3 and Figure 4), UART configurations (Figure 5 and Figure 6), BT/WIFI coexistence scheme (Figure 8), Bluetooth MAC address (Figure 7), and so on.

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```
# Crystal frequency trim
psset 0x01f6 0x000c
sleep 300

# PSKEY_HOST_INTERFACE UART link running BCSP
psset 0x01f9 0x0001
sleep 300

# PSKEY_HOST_INTERFACE UART link running H4
#psset 0x01f9 0x0003
#psset 0x01C0 0x08a8
sleep 300

# PSKEY_LP_XTAL_LVL
```

Figure 3: BCSP transport protocol

```
# PSKEY_HOST_INTERFACE UART link running BCSP
# psset 0x01f9 0x0001
sleep 300

# PSKEY_HOST_INTERFACE UART link running H4
psset 0x01f9 0x0003
psset 0x01C0 0x08a8
sleep 300
```

Figure 4: H4 transport protocol

```
================================================================
#===============================================================
# USER CONFIG PSKEYS
# ******Important, Don't edit all user configure pskeys as below****

# UART baud rate in bits per second ( Default is 115200 )
psset 0x01ea 0x0001 0xc200
sleep 300

# UART baud rate in bits per second ( 921600 bps )
# psset 0x01ea 0x000E 0x1000
sleep 300
```

Figure 5: 115200 bps UART baud rate

```
# UART baud rate in bits per second ( Default is 115200 )
# psset 0x01ea 0x0001 0xc200
sleep 300

# UART baud rate in bits per second ( 921600 bps )
psset 0x01ea 0x000E 0x1000
sleep 300
```

Figure 6: 921600 bps UART baud rate

```
#=====================================
# ***BT_ADDR***
# Bluetooth Address
psset 0x0001 0x0000 0x0000 0x00a4 0x0016
sleep 300
#=====================================
```

Figure 7: Changeable BT MAC address

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```
#==================================================================
# ***For Bluetooth coexistence setting ( Default is disable )***
# Configure co-existence
# PSKEY_COEX_SCHEME(0x2480) set to 3 for Unity 3, 0 to disable
# psset 0x2480 0x0003
# PSKEY_COEX_PIO_UNITY_3_BT_ACTIVE(0x2483) set to PIO[4] with low active
# psset 0x2483 0x0004 0x0000
# PSKEY_COEX_PIO_UNITY_3_BT_STATUS(0x2484) set to PIO[9] with low active
# psset 0x2484 0x0009 0x0000
# PSKEY_COEX_PIO_UNITY_3_WLAN_DENY(0x2485) set to PIO[1]
# psset 0x2485 0x0001 0x0000
#==================================================================
```

Figure 8: Coexistence scheme

Loading the Configuration File

To load the configuration file, launch the BtCLI tool. BtCLI is part of the CSR BlueSuite package.

- For 32-bit Windows – It is located in C:\Program Files\CSR\BlueSuite 2.5.0
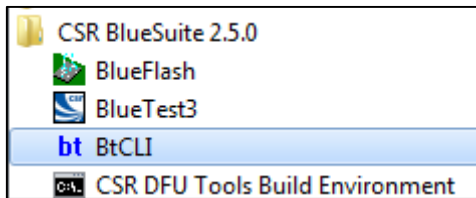- For 64-bit Windows – It is located in C:\Program Files (x86)\CSR\BlueSuite 2.5.0

Figure 9: BtCLI is located in the CSR BlueSuite folder

There are two ways to load the configuration file:

- Use the BtCLI command *exec* from the BtCLI prompt (Figure 10)
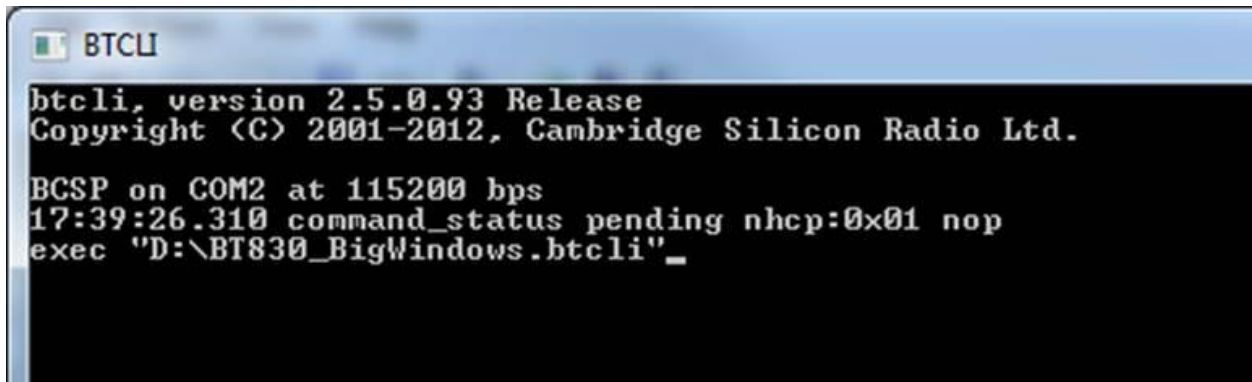- Use the Windows command prompt (Figure 11)

Figure 10: Load the configuration file with "exec" command

Figure 11: Load the configuration file in Windows command prompt

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In either case BtCLI is launched with module default settings (BCSP, 115200 bps) (Figure 12). There is a WARM RESET command in the configuration file; new settings are launched after the warm reset. The development board COM port number can be found in Windows Device Manager (Figure 13).

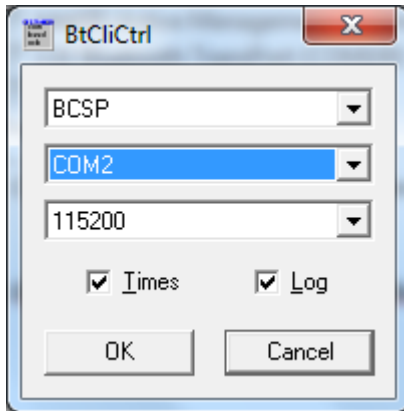**Note:** The BtCLI program may not support a COM port number higher than 20.

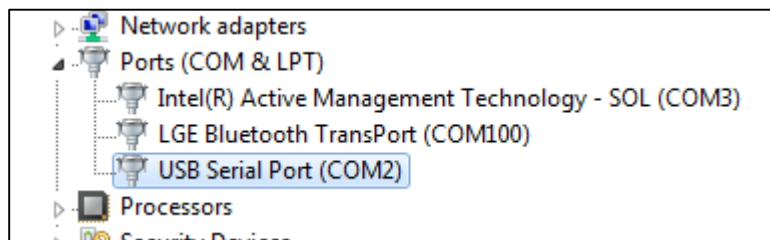*Figure 12: Launch BtCLI Ctrl with module default settings*

Figure 13: COM port number of the BT830 development board

Launch the Bluetooth Stack with New Settings

To confirm the new settings are effective, the configuration file is configured with H4 and 921600 (8-E-1) bps and launches the Bluetooth stack which supports H4 protocol (Figure 14 and Figure 15).
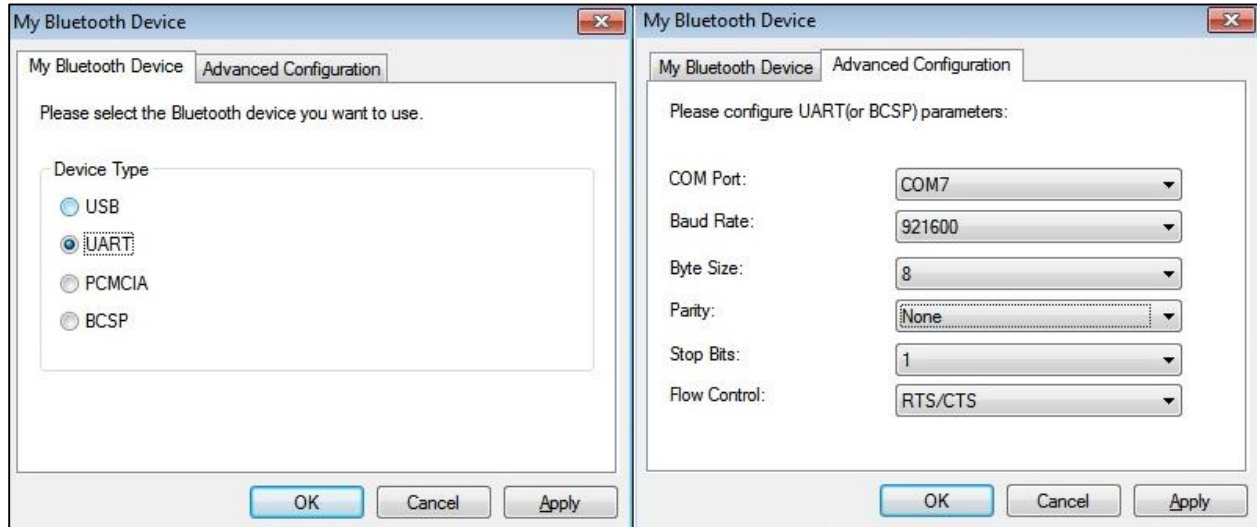
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Figure 14: Default UART configuration in BlueSoleil BT stack
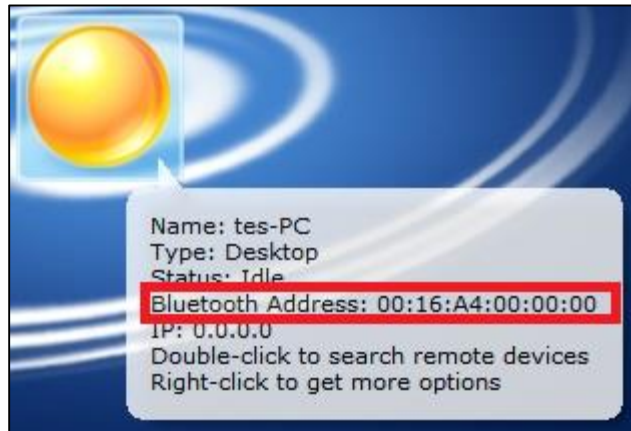
Figure 15: New Bluetooth MAC address in BlueSoleil BT stack

REVISION HISTORY

Revision	Date	Description	Approved By
1.0	24 July 2014	Initial Release	Jonathan Kaye
1.1	21 Apr 2015	Reviewed updates for BT coexistence setting	Jordan Manser

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