BL600 CABLE REPLACEMENT MODE

Application Note *v1.2*

INTRODUCTION

The goals of the document include the following:

- To explain how to use Laird's BL600 BLE module in cable replacement mode with minimal configuration.

REQUIREMENTS

The following are required to demonstrate the cable replacement feature:

- BL600 devkit (firmware 1.3.57.0 or newer)
- Windows PC
- UWTerminal (Laird's terminal emulation utility)
- iOS device with BLE capability (For example: iPhone 4S or newer, iPad 3 or newer, or an iPad mini)
- BL600 Serial application (downloaded from the Apple Store)

CHECKING FIRMWARE VERSION

To check the firmware version, follow these steps:

1. Attach the BL600 devkit to a USB port on your PC.
2. Run UWTerminal.
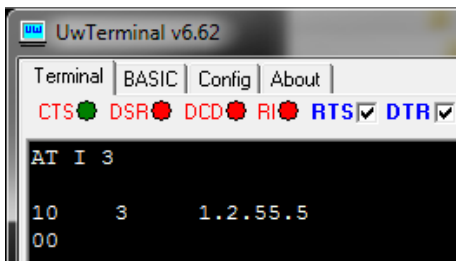3. Once the module is running, type **AT I 3** to display the firmware version (Figure 1).

Figure 1: AT I 3 command returning the firmware version number

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Note: If the firmware version is older than 1.3.57.0, you must upload new firmware. Please contact a Laird representative for the latest engineering or production firmware.

PRE CONFIGURATION

To preconfigure the BL600 devkit, following these steps:

1. On the BL600 devkit, locate the ten way header JP2 (and/or SIO.01-07) which is located nearest to the Temp Sens circuitry.
2. Place a jumper so that SIO7 is pulled high (short pins 8 and 10). See Figure 2.
3. Check that there is a jumper on J6 so that *develop* is selected. See Figure 2.

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1

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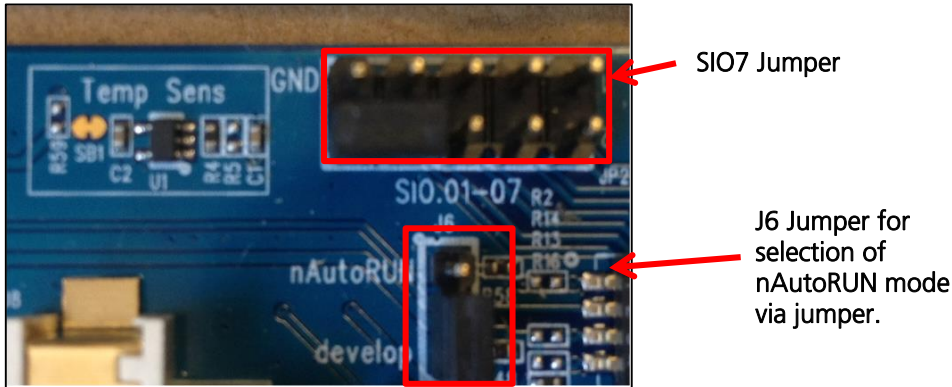Hong Kong: +852 2923 0610

Figure 2: Jumper setting for cable replacement mode operation

4. Download the BL600 Serial application from the Apple store onto your iOS device.
5. Run the BL600 Serial application to display the following screen (Figure 3):

Figure 3: iOS application - BL600 Serial

CABLE REPLACEMENT MODE OPERATION

Note: To complete the following process, the BL600 devkit must still be attached to a USB port on your PC.

To place the module in cable replacement mode, follow these steps:

1. In UWTerminal, select the DTR checkbox. DTR is connected to the module's nAutorun pin on the devkit. Selecting the checkbox ensures that the nAutorun input pin of the module is low and **NOT** in bridge mode.
2. Enter the following command to reset the BL600 module to factory state.

```
AT & F *
```

The following message displays:

```
FFS Erased,Rebooting…
00
```

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2

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3. Enter the following command.

```
AT+CFG 100 0x8107
```

The following response indicates success:

```
00
```

4. To select nAutoRUN mode via UwTerminal, make sure switch USB_DTR – nAutoRUN in CON12 is closed (slide to the right) and in UwTerminal, deselect the DTR checkbox. To select nAutoRUN mode via the jumper on J6, open switch USB_DTR – nAutoRUN and place a jumper as shown in Figure 2. Either of these methods will ensure that the module's nAutorun input pin is high.
5. Reset the module by pressing the reset switch on the devkit. The module is now in cable replacement mode.
6. On your iOS device, assuming it is still running the BL600 Serial application, tap **Connect**. The following line displays:

```
#: Connected to LAIRD BL600
```

There is now a BLE connection between the iOS device and the BL600 module.

7. On UWTerminal, type *hello* and confirm that it appears on your iOS device.
8. On your iOS device, tap the box to the left of the Send button to display the soft keyboard.
9. Type *world* and then tap **Send** or hit **Enter**.
10. Confirm that you see *world* appear on the UWTerminal screen.

Loopback Functionality

With the loopback enabled, any data sent from the iOS device via the VSP service is looped back. This is done by tying TX to RX, and by tying CTS to RTS, as demonstrated below.

With the dev kit already set up for Cable Replacement Mode, to enable loopback:
1. Isolate the UART from the host (FTDI) chip by opening all switches on CON13 (slide to the left) as shown in Figure 4.
2. Using 2 jumpers, link the TX & RX pins (SIO21 & 22), and the CTS & RTS (SIO23 & 24) pins as shown in Figure 4.
3. Type something on your iOS device and press "Send". On the screen you will see the local echo, AND the data as it has been sent back from the BL600. See Figure 5.

Figure 4: Devkit setup for Cable Replacement Mode with Loopback

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Figure 5: Starting application, Connection, Loopback

The iOS BL600 Serial application was deployed to demonstrate the virtual serial port service of the BL600 module. Please contact a Laird representative to obtain the source code for the application so that you can quickly leverage a class to implement similar functionality on your own iOS application.

If you want more control of the module, a *smart* BASIC function called BleVspUartBridge() expedites the transfer of any existing data in the receive buffers of the VSP and UART ports. A sample application is available. With this function, for example, you have the ability to direct the digital output pin to act as a DCD output. This notifies the host that is connected to the UART when there is a connection and when it is safe to send data.

When BleVspUartBridge() is used in an application, the bridge mode can be enabled or disabled at will depending on some GPIO conditions.

ADDITIONAL INFORMATION

Documentation, product information, and software downloads are available from the Embedded Wireless Solutions Support Center: https://laird-ews-support.desk.com/?b_id=1945#docs

Product information can also be accessed from the BL600 product page on the Laird website: http://www.lairdtech.com/products/bl600-series

REVISION HISTORY

Revision	Date	Description	Approved By
1.0	28 Aug 2013	Initial Release	Mahendra Tailor
1.1	10 Jan 2014	Merged two documents	Jonathan Kaye
1.2	12 Jan 2015	Updated Additional Information links for new website	Sue White

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