# PPK-BL600 – Programming Jig for BL600 Modules

*Quick Start Guide*                                                          *v1.1*

## INTRODUCTION

PPK-BL600 is a compact programing jig intended for downloading firmware and *smart* BASIC application on to a loose BL600 module. The programing jig provides JTAG and UART access to the module through two dedicated mini USB connectors.

## REQUIREMENTS

- PC running Windows XP or later
- UWTerminal Version 6.50 or later available from the BL600 page of the Embedded Wireless Support site.
- PPK-BL600 Programing Jig  **
- USB A to mini B cables (2 x cables included)
- BL600 User Manual available from the BL600 page of the Embedded Wireless Support site.
- FTDI Drivers http://www.ftdichip.com/Drivers/VCP.htm (for some versions of Windows)

** The latest BL600 firmware and upgrade documentation is available on the software downloads tab of the BL600 product page.

## FIRMWARE DOWNLOAD

This section provides a step by step guide on how to download and upgrade firmware within Laird's loose BL600 BLE module using PPK-BL600 programing jig.

## INITIAL SETUP

Before initiating a firmware upgrade, you must setup the Programing Jig by following the steps below:

1.  Release the latch by pushing the white lever (1) down and lifting the handle (2). (Figure 1)



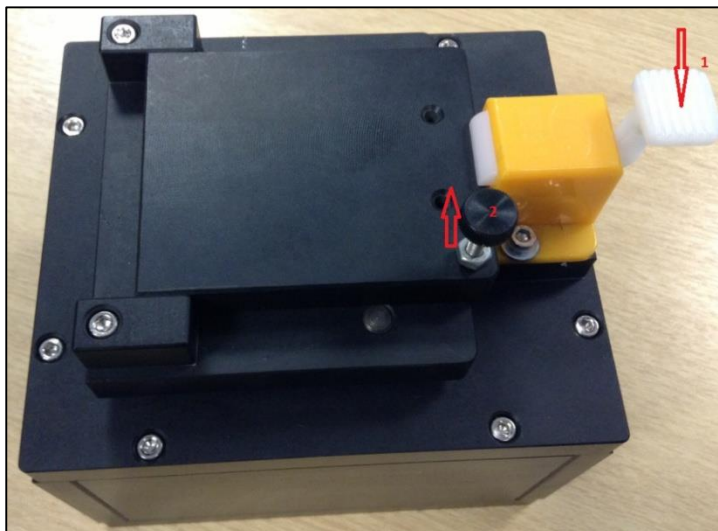*Figure 1: BL600 programing Jig*

2.  Place a BL600 module on the programmer (Figure 2).

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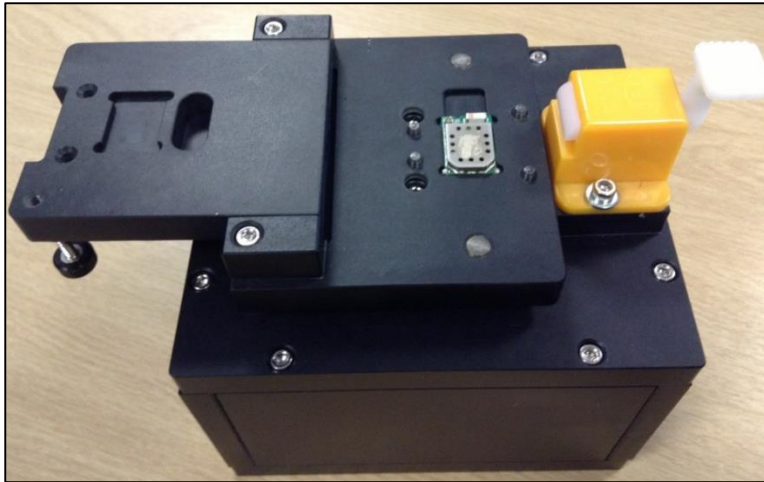Hong Kong: +852 2923 0610

*Figure 2: BL600 module placement on the programming jig*

3. Close the cover and gently press down the lever until the latch is in place (Figure 3).
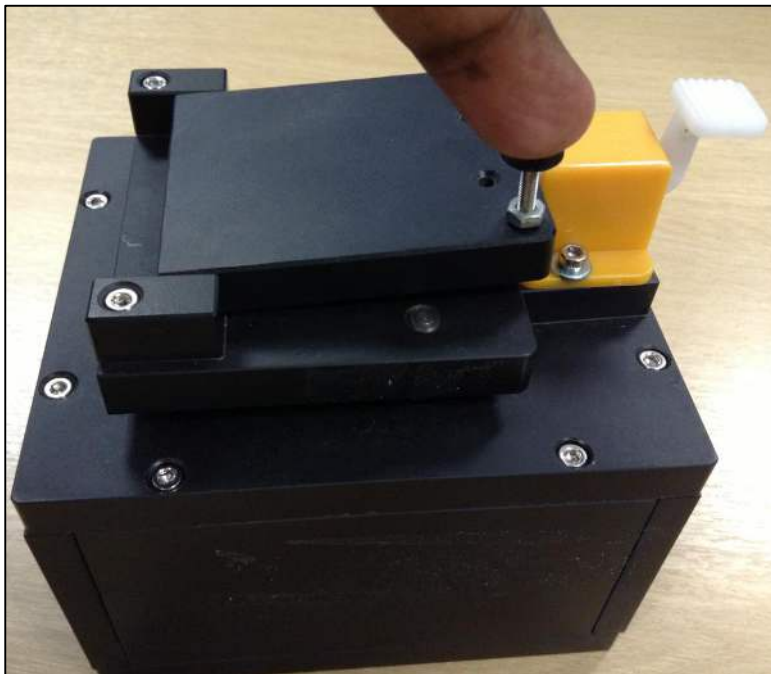

*Figure 3:  BL600 latched in place on programming jig*

4. Now connect the BLE Programing Jig (labelled as USB) to your PC and install the FTDI USB to Serial driver. The driver for the FTDI USB to Serial chipset on the Programing Jig can be found at http://www.ftdichip.com/FTDrivers.htm

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*Figure 4: Connecting programming jig to a PC USB port*

To verify that your hardware and software are properly configured, ensure that the Windows Device Manager displays a virtual COM port and that the BL600 is able to send AT commands and receive responses. Use UW Terminal to check that the module is communicating. If you send an AT command at 9600,N,8,1 communications setting and it responds with "00", then it is working properly. See Figure 5 and Figure 6.
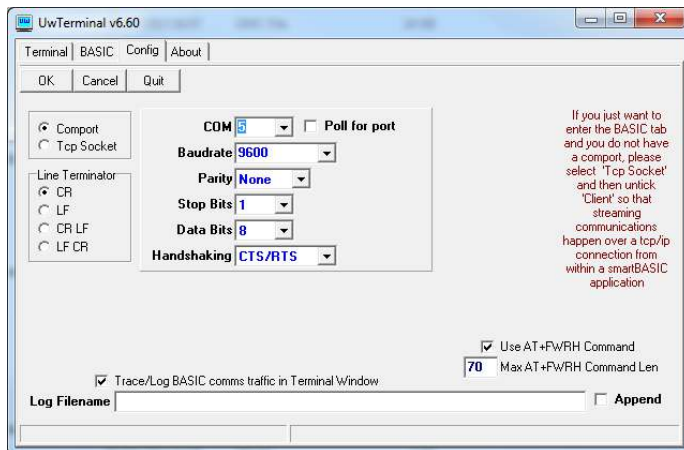

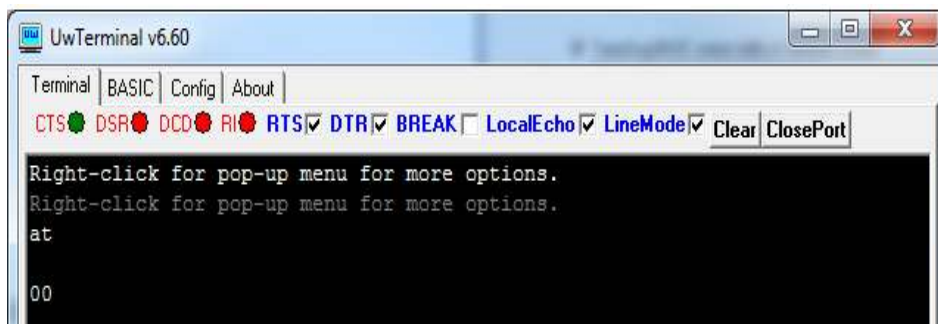*Figure 5: UW Terminal COM port settings*


*Figure 6: Communications OK, AT responds with 00*

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## DOWNLOADING AND INSTALLING THE J-LINK DRIVER

This procedure has been successfully tested on Win XP SP3 and Win 7 SP1. If the J-Link driver is already installed on your PC, you may proceed to the Firmware Upgrade Procedure section.

To download and install the J-Link driver, follow these steps:

1. Download the Windows drivers for the J-Link at the following address:
   http://www.segger.com/jlink-software.html?step=1&file=JLink_476a
2. You may need to enter the J-Link serial number to download the driver package from the Segger website. You will find a 9-digit SEGGER serial number printed on the Jig. It should appear on the rear panel of the programming jig in the top-left corner. Run the executable to install the J-Link software; the serial port driver option is not required.
3. Connect the J-LINK cable to the programming jig (Figure 7).



*Figure 7: J-LINK cable connecting to programming jig*

4. Plug the J-Link into a USB port of your PC. Installation proceeds automatically. Wait for confirmation that the device is successfully installed.

## FIRMWARE UPGRADE PROCEDURE

To complete the firmware upgrade procedure, follow these steps:

1. If the upgrade package is formatted as a zip file, then decompress into a new folder of your choice.

   **Note:**  Do not decompress into an existing folder, as there is potential for confusion with regards to firmware upgrade files. We recommend you decompress the zip file into a folder with the same name as the zip filename.

2. In the decompressed folder, launch _DownloadFirmware_vA_B_C_D.bat (either double-click it or launch it from a command prompt console window).

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3. If the J-Link firmware is outdated, the following dialog box displays (Figure 8):



*Figure 8: J-Link Firmware update dialog*

4. Click Yes to update the J-Link firmware. The BL600 firmware upgrade process resumes automatically and displays a command prompt box.
5. When the BL600 firmware download completes, the console window displays the following (Figure 9).
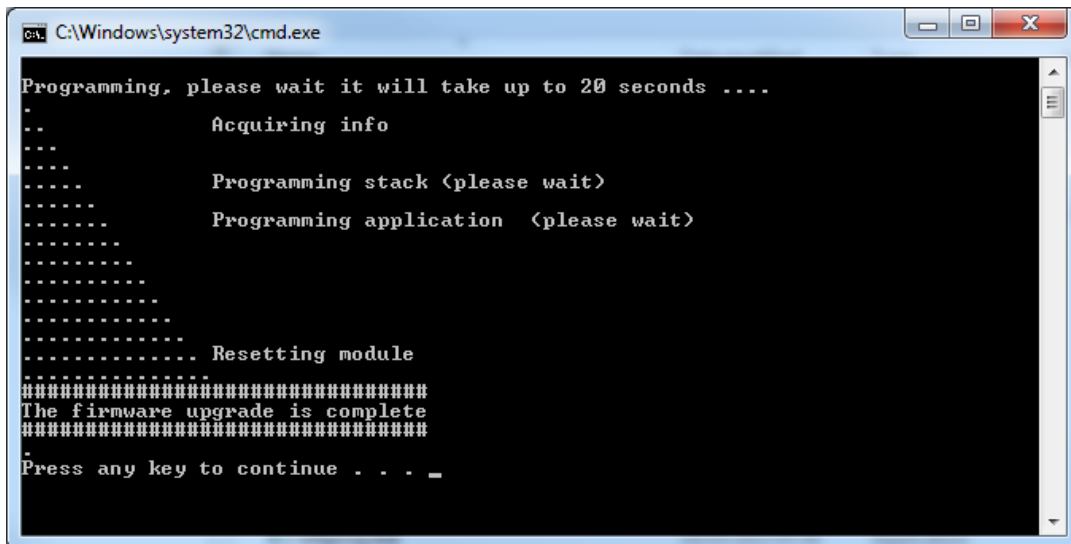


*Figure 9: Firmware upgrade window*

6. Press any key to proceed.

To check that the new version number matches the firmware upgrade package version, follow these steps:

1. Open UwTerminal (or any other terminal emulator).
2. Configure the COM port (the port number in device manager) with the following settings, as shown in Figure 10:

   Baudrate – 9600
   Stop Bits – 1
   Data Bits – 8
   Handshaking – None

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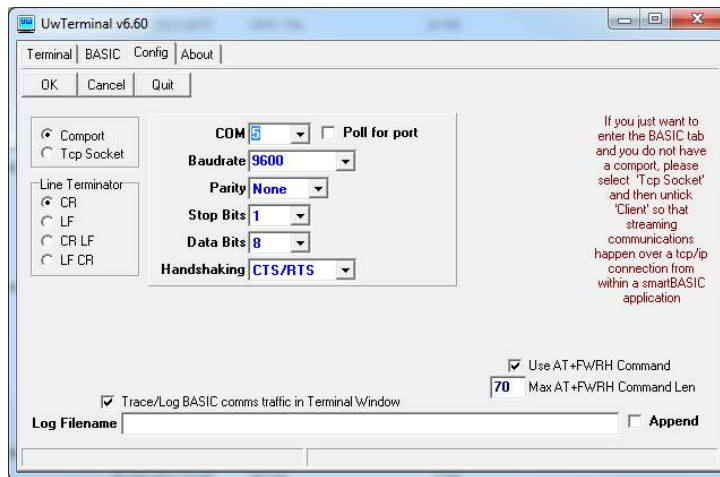*Figure 10: COMMS settings*

3. Confirm you can communicate with the development board by typing *at* followed by a return. The module responds with *00* (Figure 11).
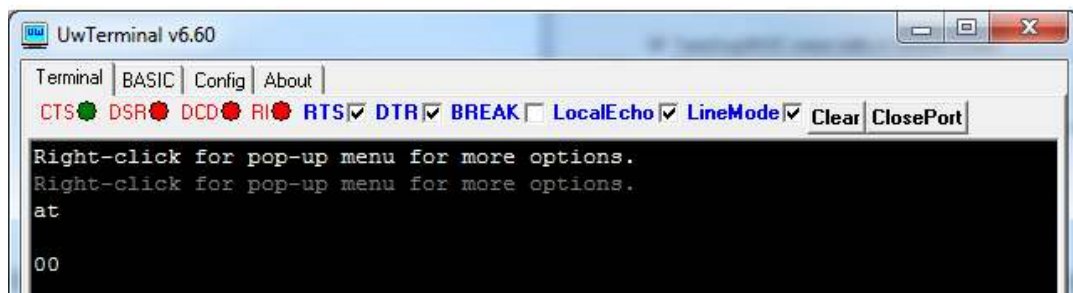

*Figure 11: COMMS OK*

4. Select the COM port for the BL600 programing jig at 9600N81.
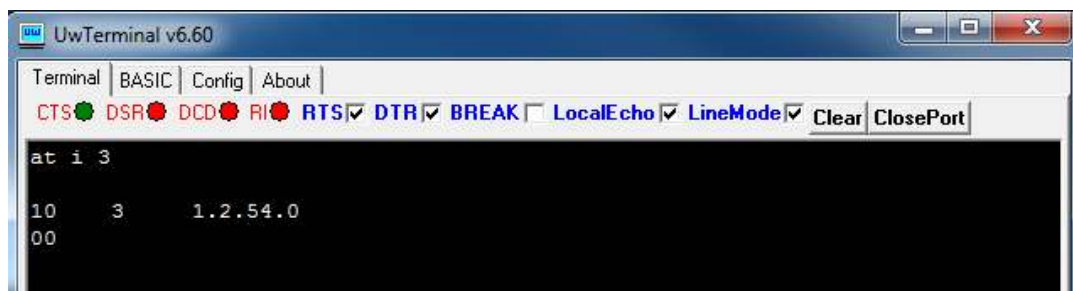5. Send the string *AT I 3* as shown in Figure 12:


*Figure 12: Issuing AT I 3 to check firmware version*

**Note:** Please note there is at list one space between the 'i' and '3'.

6. Use the response string to confirm the version numbers match.

## LOADING A *SMART*BASIC APPLICATION

**Note:** When swapping between profiles on the same device, it may be necessary to clear any existing pairings on the module and iOS device. On the module, this can be done with the command **at+btd***; and on the iOS device this can be done in Bluetooth settings.

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To load a *smart* BASIC application, follow these steps:

1. Ensure the cross compiler is located in the same folder as UWTerminal. Its name is similar to XComp_BL600r2_CA0D_1DA6, where *CA0D_1DA6* indicates a hash key. Each firmware version requires its corresponding cross compiler with a matching hash key.
2. To compile and load a *smart* BASIC application, right-click in the main UWTerminal window and select **XCompile + Load**.
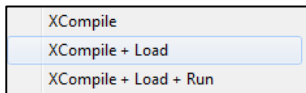

*Figure 13: Right-click menu*

3. Locate and open your **.sb** application or one of the sample applications located in the supplied *smart* BASIC *_sample_Apps* folder. When the application is successfully compiled and loaded, the console displays **+++ DONE +++.**
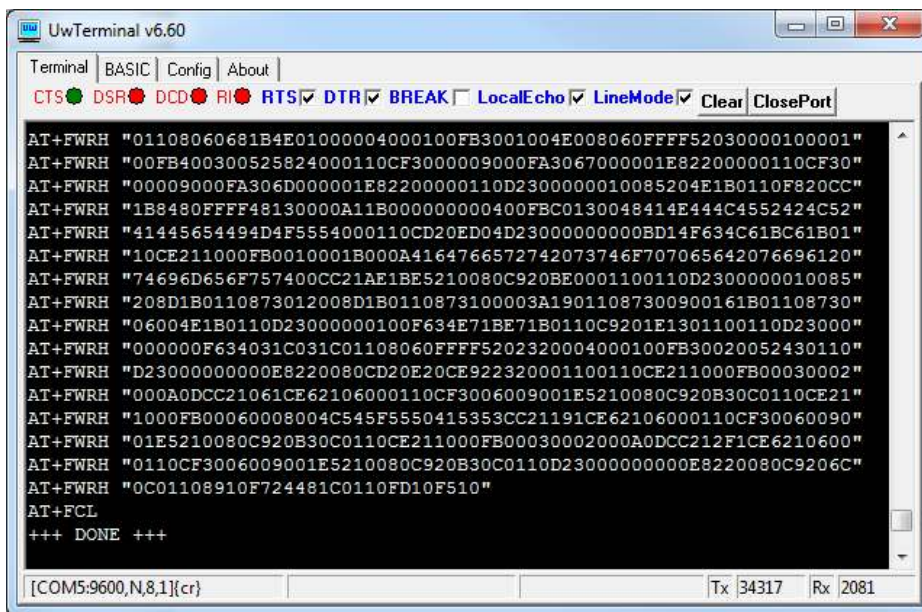

*Figure 14: Compiled and Loaded*

If the correct version of cross compiler is not present, an error displays.

4. Locate the correct version and place it in the same folder as UWTerminal.
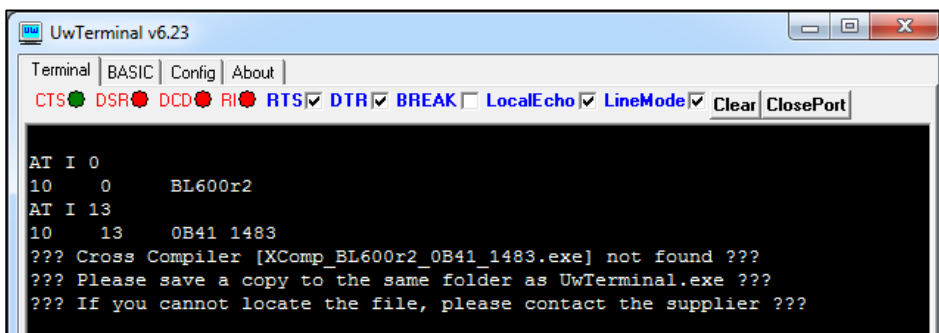

*Figure 15: Cross Compiler Error*

5. Confirm that the application (in our case upass.vsp.sb) is loaded using **at+dir**.

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> **Note:** The file extension is truncated from files copied onto the BL600 module. Therefore, when **upass.vsp.sb** is copied to the device, its name becomes *upass*..
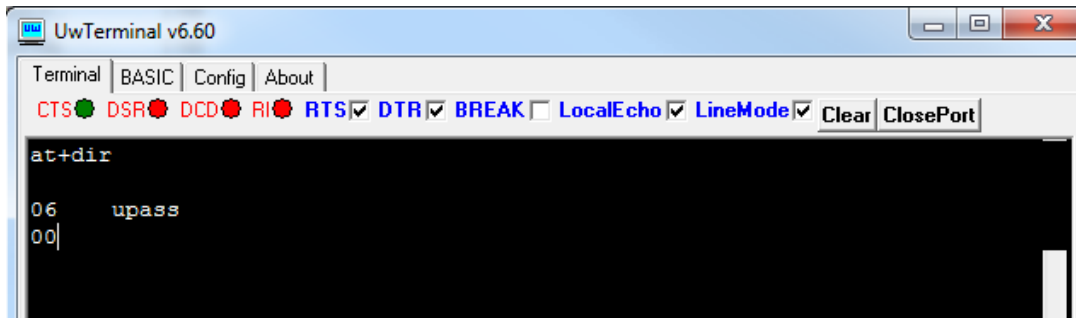

*Figure 16: Directory showing "upass" app loaded*

## FURTHER INFORMATION

Further information relating to firmware and the use of UWTerminal is available from the BL600 page of the Laird Embedded Wireless Support site. Information is also available from the BL600 product page of the Laird website.

## REVISION HISTORY

| Revision | Date | Description | Approved By |
|---|---|---|---|
| 1.0 | 23 Sept. 2013 | Initial Release | Jonathan Kaye |
| 1.1 | 03 Apr 2013 | Formatting edits; updated website links; updated footer | Sue White |
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