

PPK-BL600 – Programming jig for BL600 modules

Quick Start Guide – Using PPK-BL600 to program and configure loose BL600 modules

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
- PPK-BL600 Programing Jig **
- USB A to mini B cables (2 x cables included)
- BL600 User Manual
- FTDI Drivers http://www.ftdichip.com/Drivers/VCP.htm (for some versions of Windows)

** The latest BL600 firmware and upgrade documentation is available at <u>http://www.lairdtech.com/BLDownloadVerify.aspx?DOCID=2147488346</u>. Note that you must log in to the Bluetooth Software Center to download this file. Contact support for a login account.

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)

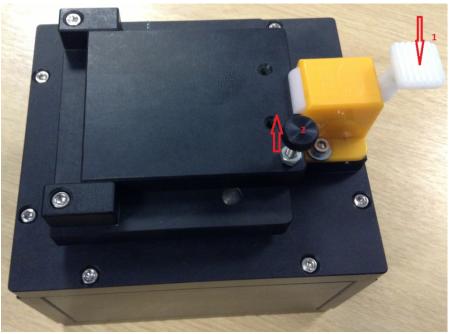


Figure 1: BL600 programing Jig

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

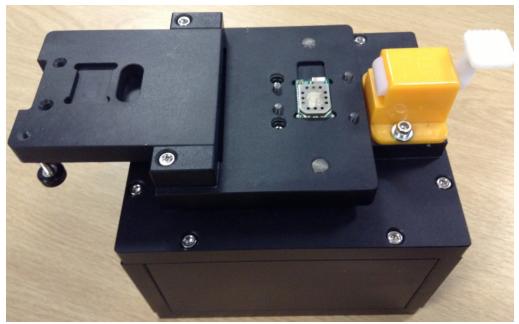


Figure 2: BL600 module placement on the programming jig

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

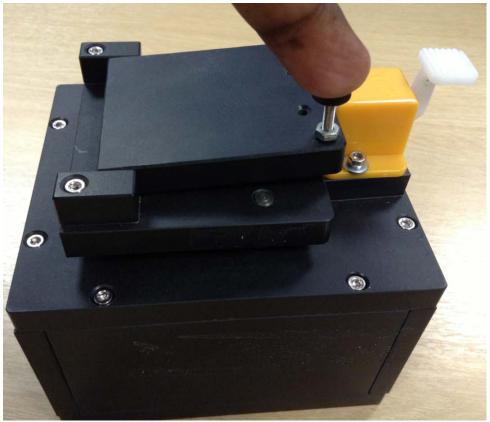


Figure 3: BL600 latched in place on programming jig

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



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.

WWTerminal v6.60	
Terminal BASIC Config About	
OK Cancel Quit	
CDM ⓑ ▼ Poll for port T cp Socket Line Terminator C CR C LF C CR LF C LF CR Handshaking CTS/RTS ▼	If you just want to enter the BASIC tab and you do not have a comport, please select Tcp Sockat' and then unlick. Client'so that streaming communications happen over a tcp/ip connection from within a smattBASIC application
✓ Trace/Log BASIC comms traffic in Terminal Window Log Filename	Vise AT+FWRH Command 70 Max AT+FWRH Command Len

Figure 5: UW Terminal COM port settings

UwTerminal v6.60	
Terminal BASIC Config About	
CTS DSR DCD RIC RTS DTR BREAK	LocalEcho 🔽 LineMode 🔽 Clear ClosePort
Right-click for pop-up menu for more	-
Right-click for pop-up menu for more at	options.
00	

Figure 6: Communications OK, AT responds with 00

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).

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

🗖 J-Lin	ik V 🛛 Firmware update 🛛 🔛
?	A new firmware version is available for the connected emulator. Do you want to update to the latest firmware version ? NOTE: Updating to the latest firmware version is strongly recommended. New features / improvements may not be available without a firmware update.

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):

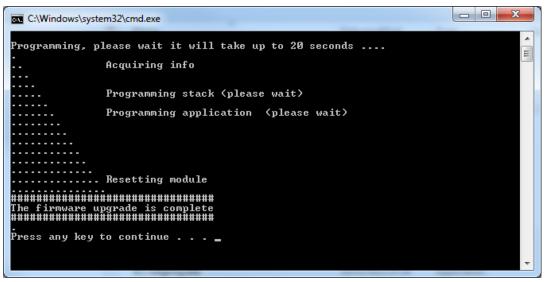


Figure 9: Firmware upgrade window

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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UwTerminal v6.60	
Terminal BASIC Config About	
OK Cancel Quit Comport COM Poll for port C Top Socket Baudrate 9600 Line Terminator Parity None C LF Data Bits C LF CR Handshaking CTS/RTS	If you just want to enter the BASIC tab and you do not have a comport, please select Trop Socket' and then untick 'Client'so that streaming communications happen over a tcp/ip connection from within a smattBASIC application
✓ Trace/Log BASIC comms traffic in Terminal Window Log Filename	✓ Use AT+FWRH Command /70 Max AT+FWRH Command Len

Figure 10: COMMS settings

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

WVTerminal v6.60	
Terminal BASIC Config About	
CTS DSR DCD RIC RTS DTR BREAK	LocalEcho 🗸 LineMode 🗸 Clear ClosePort
Right-click for pop-up menu for more (options.
Right-click for pop-up menu for more of	options.
at	
00	

Figure 11: COMMS OK

- 4. Select the COM port for the BL600 programing jig at 9600N81.
- 5. Send the string *AT13* as shown in Figure 12:

🛄 UwTe	erminal	v6.60				x
		C Config About	AK 🕅 LocalEcho	IV LineMode IV	Clear ClosePort	
at i	3					
10 00	3	1.2.54.0				

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.

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**.

XCompile
XCompile + Load
XCompile + Load + Run

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 +++.

UwTerminal v6.60			
Terminal BASIC Config About			
CTS DSR DCD RI RTS DTF	BREAK 🔲 LocalEcho 🔽 LineMo	de 🔽 Clear Close	Port:
AT+FWRH "01108060681B4E01000	004000100FB3001004E008060F	FFF520300001	00001" ^
AT+FWRH "00FB400300525824000	110CF3000009000FA306700000	1E8220000011	0CF30"
AT+FWRH "00009000FA306D00000	1E82200000110D230000001008	5204E1B0110F	820CC"
AT+FWRH "1B8480FFFF48130000A	11B000000000400FBC01300484	14E444C45524	24C52"
AT+FWRH "41445654494D4F55540	00110CD20ED04D23000000000B	D14F634C61BC	61B01"
AT+FWRH "10CE211000FB0010001	B000A4164766572742073746F7	070656420766	96120"
AT+FWRH "74696D656F757400CC2	1AE1BE5210080C920BE0001100	110D23000000	10085"
AT+FWRH "208D1B0110873012008	D1B0110873100003A190110873	00900161B011	08730"
AT+FWRH "06004E1B0110D230000	00100F634E71BE71B0110C9201	E1301100110D	23000"
AT+FWRH "000000F634031C031C0	1108060FFFF520232000400010	0FB300200524	30110"
AT+FWRH "D2300000000E822008	0CD20E20CE922320001100110C	E211000FB000	30002"
	6000110CF3006009001E521008		
	45F5550415353CC21191CE6210		
	110CE211000FB00030002000A0		
	10080C920B30C0110D23000000	000E8220080C	9206C"
AT+FWRH "0C01108910F724481C0	110FD10F510"		
AT+FCL			
+++ DONE +++			+
[COM5:9600,N,8,1]{cr}		Tx 34317	Rx 2081

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.

UwTerminal v6.23	
Terminal BASIC Config About	
	ClosePort
AT I 0 10 0 BL600r2 AT I 13	
10 13 0B41 1483 ??? Cross Compiler [XComp_BL600r2_0B41_1483.exe] not found ???	
??? Please save a copy to the same folder as UwTerminal.exe ?? ??? If you cannot locate the file, please contact the supplier	

Figure 15: Cross Compiler Error

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

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 Laird website at http://www.lairdtech.com/Products/Embedded-Wireless-Solutions/Bluetooth-Radio-Modules/BL600-Series

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