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PPK-BL600 – **Programming Jig for BL600 Modules**

Quick Start Guide

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 <u>BL600 page</u> 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 <u>BL600 page</u> 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 <u>BL600 product page</u>.

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

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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.

OK Cancel	Quit	
Comport C Tcp Socket	COM 🗧 🔽 🗖 Poll for port Baudrate 9600 💌	If you just want to enter the BASIC tal and you do not hav a comport, please
Line Terminator	Parity None 💌	select 'Top Socke and then untick
C LF	Stop Bits 1 💌	"Client" so that
C CR LF	Data Bits 8 👻	communications
C LF CR	Handshaking CTS/RTS -	happen over a tcp/ connection from
		within a smartBASI application
		🔽 Use AT+FWRH Command
🔽 Tra	ce/l.og.BASIC.comms traffic in Terminal Window	70 Max AT+FWRH Command Len
1º 110	Son 20g binono commo damo in ricominiar miniori	

Figure 5: UW Terminal COM port settings



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	nk 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).

C:\Windows\system32\cmd.exe	x
Programming, please wait it will take up to 20 seconds	
. Acquiring info	
···· Programming stack (please wait)	
Programming application (please wait)	
Kesetting module ####################################	
Press any key to continue	.

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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C Comport C UM B ▼ Poin for point enter the and you of a comport C Top Socket Baudrate 9600 ▼ a comport Line Terminator Parity None ▼ select T C CR C F Stop Bits 1 ▼ C CR LF Data Bits 8 ▼ happen or connect C LF CR Handshaking CTS/RTS ▼ within a septing	i just want to
Baudrate 3500	ne BASIC tal u do not hav
Line terminator Parity None Parity None P	iport, please
C LF Stop Bits 1 Ulent C CR LF Data Bits 8 commu C LF CR Handshaking CTS/RTS comme within a sapple	then untick
C CR LF Data Bits 8 ▼ happen or C LF CR Handshaking CTS/RTS ▼ within a sapple	ent' so that treaming
CLECR Handshaking CTS/RTS	nunications
within a sppl	ection from
	a smartBASI oplication
☑ Use AT+FWRH Comm	mmand
70 Max AT+FWRH Com	mmand 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).

🖳 UwTerminal v6	5.60				-		X
Terminal BASIC	Config About		BREAK	LocalE cho 🔽	LineMode	Clear ClosePort	
Right-click Right-click at 00	for pop-up for pop-up	menu for	more (more (options.			

Figure 11: COMMS OK

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

Terminal BASIC Config About CTS DSR DCD RI RTS DTR BREAK CocalEcho ClineMode Clear ClosePo	
	t
at i 3	
10 3 1.2.54.0 00	

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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Quick Start Guide

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 RIC RTS DTR BREAK CLocalEcho Lin	eMode V Clear ClosePort
AT+FWRH "01108060681B4E01000004000100FB3001004E0080	60FFFF52030000100001"
AT+FWRH "00FB400300525824000110CF3000009000FA306700	00001E82200000110CF30"
AT+FWRH "00009000FA306D000001E82200000110D230000001	.0085204E1B0110F820CC"
AT+FWRH "1B8480FFFF48130000A11B000000000400FBC01300)48414E444C4552424C52"
AT+FWRH "41445654494D4F5554000110CD20ED04D23000000	000BD14F634C61BC61B01"
AT+FWRH "10CE211000FB0010001B000A416476657274207374	6F707065642076696120"
AT+FWRH "74696D656F757400CC21AE1BE5210080C920BE0001	.100110D2300000010085"
AT+FWRH "208D1B0110873012008D1B0110873100003A190110	87300900161B01108730"
AT+FWRH "06004E1B0110D23000000100F634E71BE71B0110C9	201E1301100110D23000"
AT+FWRH "000000F634031C031C01108060FFFF520232000400	0100FB30020052430110"
AT+FWRH "D23000000000E8220080CD20E20CE9223200011001	10CE211000FB00030002"
AT+FWRH "000A0DCC21061CE62106000110CF3006009001E521	.0080C920B30C0110CE21"
AT+FWRH "1000FB00060008004C545F5550415353CC21191CE6	2106000110CF30060090"
AT+FWRH "01E5210080C920B30C0110CE211000FB0003000200	0A0DCC212F1CE6210600"
AT+FWRH "0110CF3006009001E5210080C920B30C0110D23000	000000E8220080C9206C"
AT+FWRH "OC01108910F724481C0110FD10F510"	
AT+FCL	
+++ DONE +++	
ICOM59600 N 8 1 V cr \	Ty 3/317 By 3091

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**.

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 <u>BL600 page of</u> the Laird <u>Embedded Wireless Support site</u>. Information is also available from the <u>BL600 product page</u> 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