

Upgrading BL652 Firmware via JTAG

BL652 Module

Application Note

v1.0

INTRODUCTION

The goals of this document include the following:

- To detail the setup procedure for interfacing with the DVK-BL652
- To explain the method of upgrading the BL652 firmware over the JTAG interface.

REQUIREMENTS

- Laird DVK-BL652 or equivalent (with USB to JTAG connection to the BL652 Module)
- 1X USB-A to USB-Micro cable
- UwTerminalX, provided by Laird at <https://github.com/LairdCP/UwTerminalX/releases>
- Desired firmware package, found in the Software Downloads tab of the [BL652 Product Page](#)

For verification, you will need:

- Laird DVK-BL652 (or equivalent RS-232 to serial connection to the BL652 Module)
- FTDI USB to Serial drivers for DVK-BL652 (found at <http://www.ftdichip.com/FTDrivers.htm>)

OVERVIEW

To upgrade the module, you must use Laird's development board or your own equivalent implementation to provide a JTAG access to the module.

Initial Setup using BL652 Dev Kit DVK-BL652

To set up, complete the following steps.

1. Configure the BL652 development kit to the following settings:
 - DC/USB power source switch (SW4) – USB
 - VCC_1V8/VCC_3V3 switch (SW5) – VCC_3V3
 - CR2033/VCC_3V3/1V8 switch (SW6) – VCC_3V3
2. Connect USB1 of the DVK-BL652 to your PC via the included USB-A to USB Micro cable.

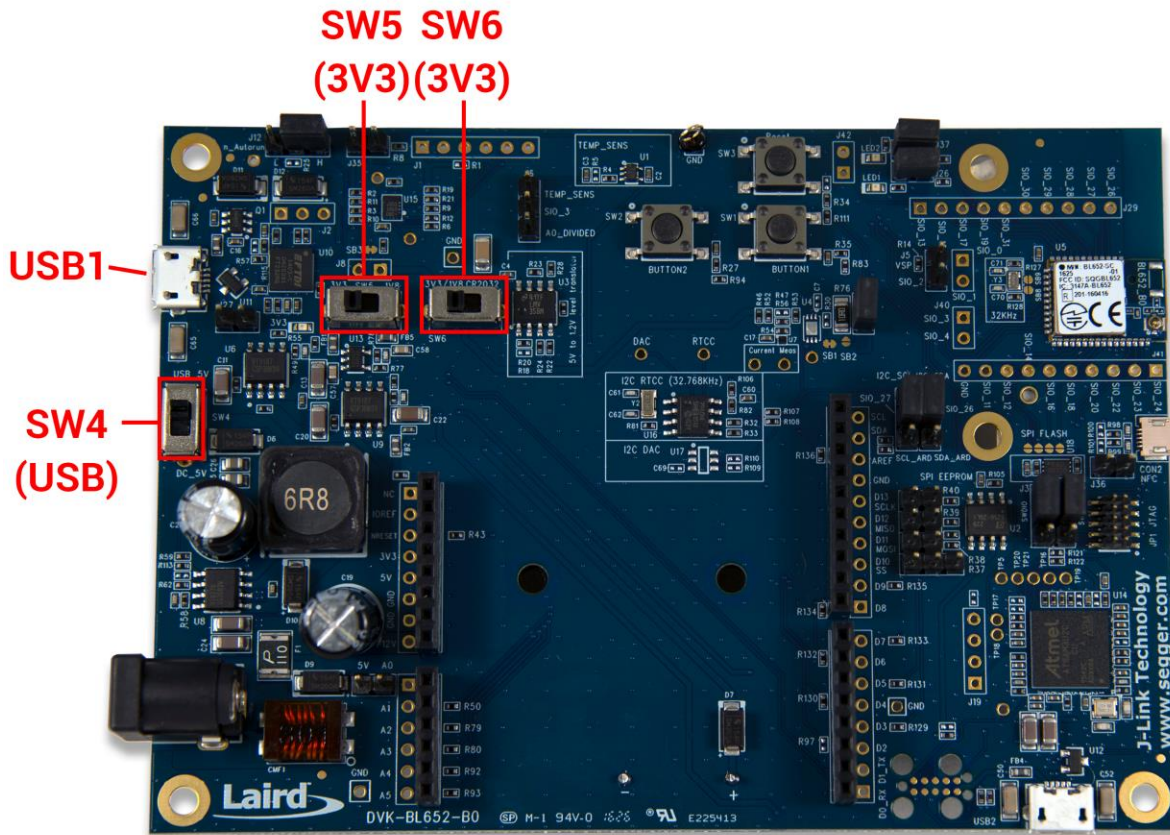


Figure 1: BL652 development board

3. Install the FTDI USB to Serial driver (found at <http://www.ftdichip.com/FTDrivers.htm>).
4. Ensure that the Windows Device Manager displays a new virtual COM port for the USB to Serial adapter.
5. Launch UwTerminalX (available at <https://github.com/LairdCP/UwTerminalX/releases>)
6. From the Update tab in UwTerminalX, click **Check for Updates** to ensure you're using the latest version of UwTerminalX with support for the BL652.
7. From the Config tab in Device drop-down menu, select **BL652** to populate the baud, parity, stop bits, data bits, and handshaking settings. If "BL652" is not a selectable device because you have an older version of UwTerminalX, set the following:
 - Baudrate: 115200
 - Parity: None
 - Stop Bits: 1
 - Data Bits: 8
 - Handshaking: CTS/RTS
8. In the Port dropdown, select the COM port associated with your DVK-BL652.

Note: If you have a cable connected to the USB2 port (at the bottom of [Figure 2](#)), it will also have installed another COM port, do not select that one.

9. At the top of the screen, click **OK**.

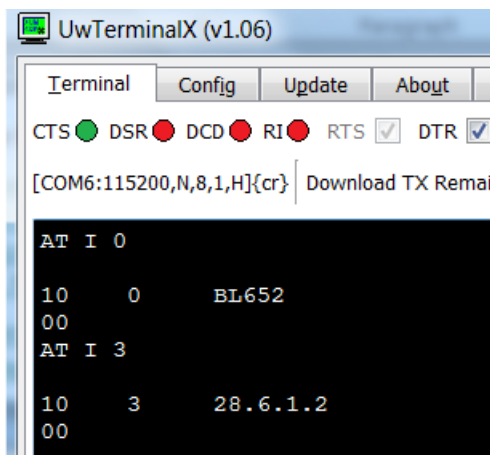
CHECKING FIRMWARE VERSION

Once the module has been connected, type AT I 0 to confirm you are connected to a BL652.

Type AT I 3 to display the firmware version (Figure 2).

Note: If your development board is pre-programmed with an autorun application, you need to manually place the BL652 module into interactive mode. To do this, complete the following:

- Ensure the J12 jumper is positioned on pins 1-2
- In UwTerminalX, make sure the DTR checkbox on the terminal tab is unchecked
- Press the reset button on the module (or on UwTerminalX, check and uncheck the BREAK checkbox which results in a reset of the module). Now your module should be in interactive mode.



```
UwTerminalX (v1.06)
Terminal Config Update About
CTS DSR DCD RI RTS DTR
[COM6:115200,N,8,1,H]{cr} Download TX Remai
AT I 0
10 0 BL652
00
AT I 3
10 3 28.6.1.2
00
```

Figure 2: AT I 3 command returning the firmware version number

Now close UwTerminalX before proceeding to the next section.

Warning: Upgrading the firmware clears any programs, configuration keys or data stored on the module.

Downloading and Installing the J-Link Driver If the J-Link driver is already installed on your PC, you may skip this section and 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 from:
http://www.segger.com/jlink-software.html?step=1&file=JLink_476a



Figure 3: J-Link Driver download page

2. Run the executable to install the J-Link software; the serial port driver option is not required.
3. Unplug the USB cable from USB1 port and plug it into USB2 port on the DVK-BL652 (see below). Installation proceeds automatically.

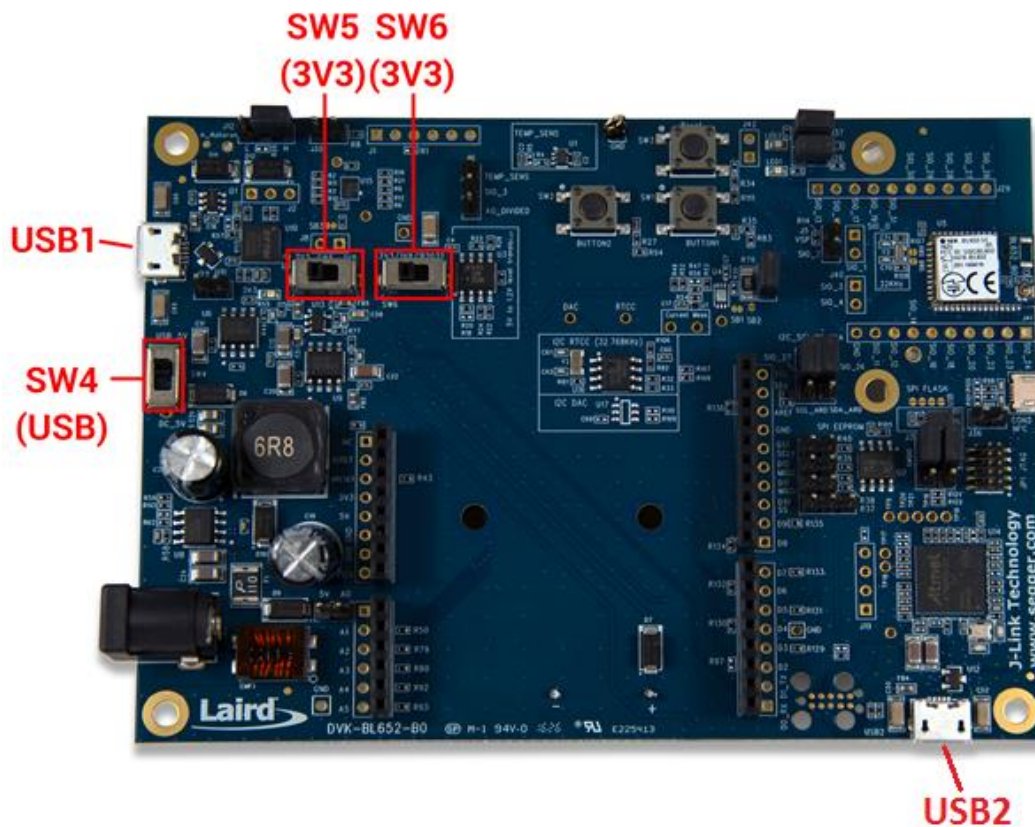


Figure 4: BL652 Development board showing the JTAG USB2 port

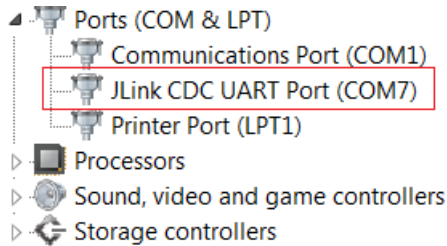


Figure 5: Device manager shows that the J-Link driver is correctly installed

If the J-Link driver is successfully installed, *JLink CDC UART Port (COMx)* appears in the device manager. Do not use this port to check for BL652 version number as this virtual COM port is not connected through to the module.

Firmware Upgrade Procedure

The upgrade package is provided as a .zip file, so decompress into a new folder of your choice. The filename will be of the form:

1. ITSE01052_02_BL652_Firmware_For_Upgrade_vW_X_Y_Z-rN.zip where W,X,Y,Z is the version number of the firmware and -rN is an optional suffix that will be present if the zip file has new content apart from the firmware image, like for example corrections in the user guide or other documentation.

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 **_DownloadFirmwareJlink .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 6):



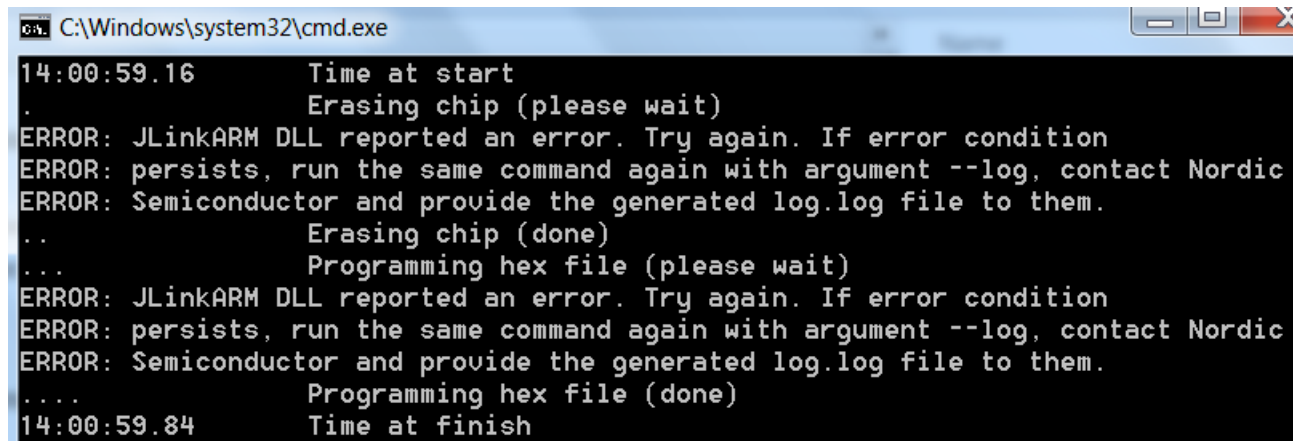
Figure 6: J-Link firmware update dialog

4. Click **Yes** to update the J-Link firmware. The BL652 firmware upgrade process resumes automatically and displays a command prompt box.
5. When the BL652 firmware download completes, the console window displays the following:

```
..          Acquiring info
...
17:29:04.82      Time at program start
                Erasing chip (please wait)
                Erasing chip (done)
                Programming hex file with worm (please wait)
                Programming hex file with worm (done)
17:29:12.69      Time at program finish
.....
#####
The firmware upgrade is complete
#####
```

Figure 7: Firmware upgrade is in progress

6. If you see the following error (see figure 8 below) when attempting to download the firmware, please check that the jumper positions on J3 and J4 on the BL652 development board are correct.



```
C:\Windows\system32\cmd.exe
14:00:59.16      Time at start
                Erasing chip (please wait)
ERROR: JLinkARM DLL reported an error. Try again. If error condition
ERROR: persists, run the same command again with argument --log, contact Nordic
ERROR: Semiconductor and provide the generated log.log file to them.
                Erasing chip (done)
                Programming hex file (please wait)
ERROR: JLinkARM DLL reported an error. Try again. If error condition
ERROR: persists, run the same command again with argument --log, contact Nordic
ERROR: Semiconductor and provide the generated log.log file to them.
                Programming hex file (done)
14:00:59.84      Time at finish
```

Figure 8: J-Link error message due to wrong jumper position on J3 and J4

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

1. Cycle power to the module.
2. Unplug the cable from USB2 port and plug it into the USB1 port.
3. Open UwTerminalX (or any other terminal emulator).
4. Select the COM port (associated with USB1) for the BL652 devkit at 115200N81.
5. Send the following command string: AT I 3
6. Use the response string to confirm the version numbers match with the version in the filename of the zip file.

Note: Please note there is at least one space between the 'I' and 3.

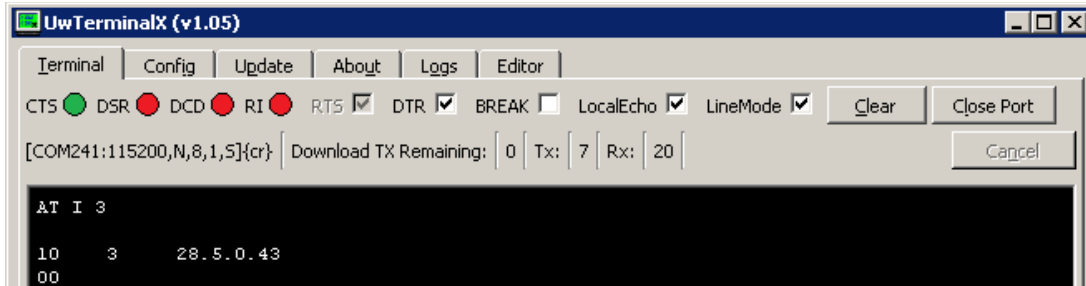


Figure 9: Confirming the new firmware with AT I 3 in UwTerminalX

FURTHER INFORMATION

Further information relating to the BL652 module is available from the Laird Embedded Wireless Solutions Support Center at https://laird-ews-support.desk.com/?b_id=14216, as well as the Laird website at <http://www.lairdtech.com/products/bl652-ble-module>.

REVISION HISTORY

Version	Date	Notes	Approver
1.0	14 October 2016	Initial Release	Jonathan Kaye