Zoom™ DM3730 Torpedo Development Kit
User Guide

Logic PD // Products
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Revision History

REV	EDITOR	DESCRIPTION	APPROVAL	DATE
A	JCA	-Initial release	JCA	07/20/11
B	SO	-Throughout: Updated with information regarding inclusion of DM3730 Torpedo + Wireless SOM; updated screenshots to reflect new LogicLoader version; -Section 7: Removed information regarding hold-down clip; provided links to the appropriate Mechanical Hold-Down Scenarios White Papers for this information; -Added Section 8; -Added Figure 9.2: ETM Connector on DM3730 Torpedo + Wireless SOM; -Added Figure 9.4: ETM Adapter Board Connected to DM3730 Torpedo + Wireless SOM; -Added Section 10; -Section 12.10: Added note regarding IDC to DB9 adapters included with kit; -Added Section 12.11; -Appendix A: Removed link to *DM37x Android Froyo 2.2 BSP User Guide*; added link to *DM3730 Android Gingerbread 2.3.4 BSP User Guide*	KJH, NJK	03/29/12
C	SO	-Throughout: Updated baseboard references to Torpedo Launcher 3; updated pictures of baseboard and DM3730 Torpedo + Wireless SOM; updated screenshots to reflect new LogicLoader version; -Section 1.3: Added callouts for JP5 and J31; -Table 6.1: Added jumper location for JP5	KJH	07/27/12

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1   Introduction

This user guide continues where the QuickStart Guide ended by providing additional hardware details about the Zoom DM3730 Torpedo Development Kit. The purpose of this document is to present information that may be useful after you've unpacked your kit, run through the demo, and are ready to begin development work. This document also points you to other resources depending upon your specific development needs.

1.1   Scope of Document

This user guide does not provide detailed instructions for the software included with the kit. Please refer to the specific user guides for each respective software product for additional information. A list of additional documentation is available in Appendix A.

1.2   Requirements

It is assumed that the QuickStart Guide has been read in its entirety. See Appendix A for a link to the QuickStart Guide.

The following items will be needed for the procedures described in this document:

■   Zoom DM3730 Torpedo Development Kit registered on Logic PD's website[1]

■   Host PC (the procedures in this document were tested using a Windows 7 host PC)

■   An available serial or USB port

■   SD card reader

■   SD card

■   Active Internet connection

■   Serial cable (included in development kit)

■   USB A to USB mini-B cable (included in development kit)

■   Terminal emulation program (e.g., Tera Term as described in Section 2.3)

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[1] http://support.logicpd.com/auth/register_product.php

1.3   Torpedo Launcher 3 Baseboard Features Diagram

GPS antenna
connector and
cable

Battery connector

60-pin LCD connector

Video select
jumper (JP2)

Jumper JP3

HDMI port

Power measurement
USB port

USB OTG port

SD card slot
(on bottom of baseboard)

Stereo line-out jack

Stereo line-in jack

J31

Bootable SD card slot
(on bottom of baseboard)

Power-in jack

LEDs:
Power on
LED1
LED2
Charging

Debug UART
USB port

Camera
connector

LCD power
jumper (JP1)

RS232 serial
debug port

S-video
connector

Ethernet jack

Jumper JP5

Power on-off
switch

USB host ports:
USB2 (left)
USB3 (right)

User buttons (left to right):
Reset (S1)
Sysboot0 (S3)
Sysboot5 (S4)
GPIO1 (S6)
GPIO2 (S7)
Soft power on/Suspend (S2)

2 Connect Development Kit to PC

In order to begin development work, the development kit needs to be connected to a host PC. You can use either a serial cable (Section 2.1) or a USB mini-B cable (Section 2.2); both cables are included in the development kit.

2.1 Connect Using Serial Cable

1. Connect the null-modem serial cable to the serial port connector on the baseboard and to an empty COM port on your host PC. See Figure 2.1.

2. Connect the regulated 5V power supply to the appropriate power adapter for the location in which you are using the development kit.

3. Plug the power adapter into an electrical outlet and the 5V line output connector into the power-in connector on the baseboard. See Figure 2.1.

Power cable

Serial cable

Figure 2.1: Connect Serial Cable

4. Before powering on your kit, you will have to install a terminal emulation program to communicate with the development kit. Please proceed to Section 2.3 for details.

2.2 Connect Using USB Mini-B Cable

1. Connect the USB mini-B cable to the debug UART USB port on the baseboard and to an empty USB port on your host PC. See Figure 2.2.

   NOTE: The baseboard is equipped with an FTDI virtual COM port (VCP) chip that causes the USB device to appear to your computer as an additional COM port. Settings for the terminal emulation program will remain the same; however, a driver must be installed on your computer for proper operation. A link to the driver and instructions for using the USB-to-UART VCP chip can be found in Logic PD's *USB-to-UART VCP Chip Driver ReadMe*.[2]

2. Connect the regulated 5V power supply to the appropriate power adapter for the location in which you are using the development kit.

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[2] http://support.logicpd.com/downloads/910/

3. Plug the power adapter into an electrical outlet and the 5V line output connector into the power-in connector on the baseboard. See Figure 2.2.
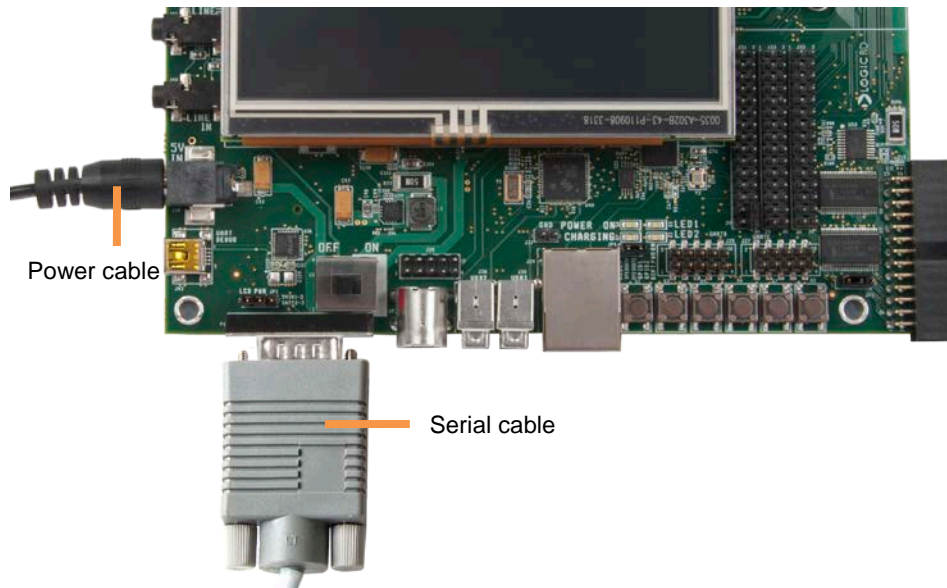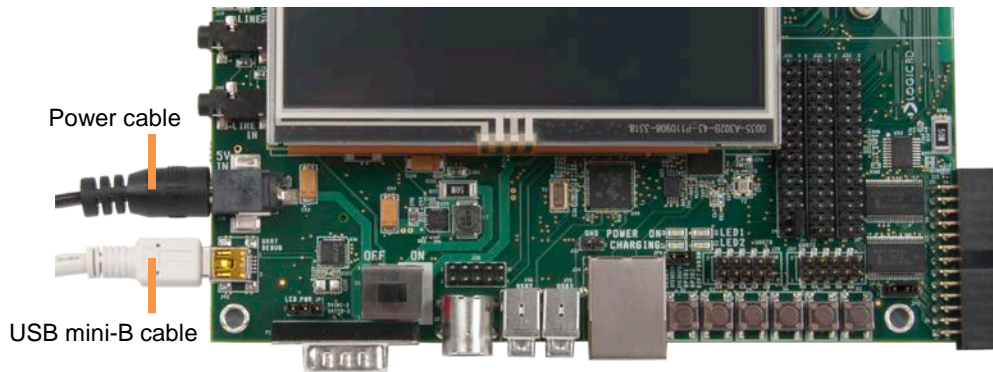

Figure 2.2: Connect USB Mini-B Cable

4. Before powering on your kit, you will have to install a terminal emulation program to communicate with the development kit. Please proceed to the next section for details.

2.3   Install Terminal Emulation Program

The Zoom DM3730 Torpedo Development Kit is designed to communicate with terminal emulation programs using the included null-modem serial cable. The terminal emulation program must support binary transfers in order to download software to the kit. Although Logic PD does not support any particular terminal emulation program, we suggest using Tera Term for Windows (Tera Term is not available for Linux users). Tera Term can be downloaded for free from Logic PD's website. To install Tera Term:

1. Download the ZIP file[3] from Logic PD's website and extract the contents.

2. After extracting the contents, locate the *teraterm-x.xx.exe* file and double-click it.

3. Follow the on-screen instructions to install Tera Term.

2.3.1   Setup Tera Term

All Tera Term settings are controlled by an .ini file that you can modify as needed to make your time in Tera Term as efficient as possible (for example you can preset the port settings).

1. Start the Tera Term program.

2. From the menu, select Setup > Serial port.

3. Select the appropriate COM port for your workstation and then change the port settings to:
   a. Baud rate: **115200**
   b. Data: **8 bit**
   c. Parity: **None**
   d. Stop: **1 bit**
   e. Flow control: **None**

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[3] http://support.logicpd.com/downloads/240/
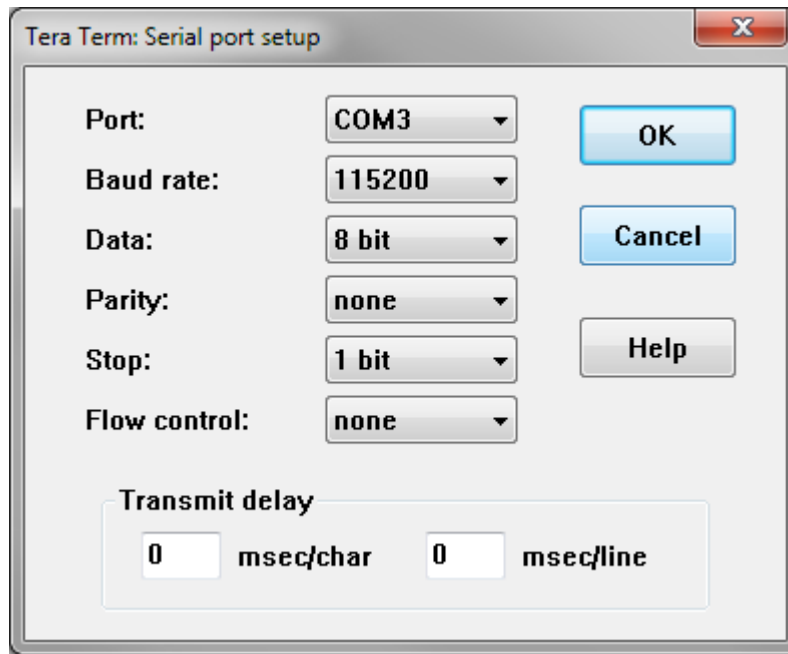
Figure 2.3: Tera Term Serial Port Settings
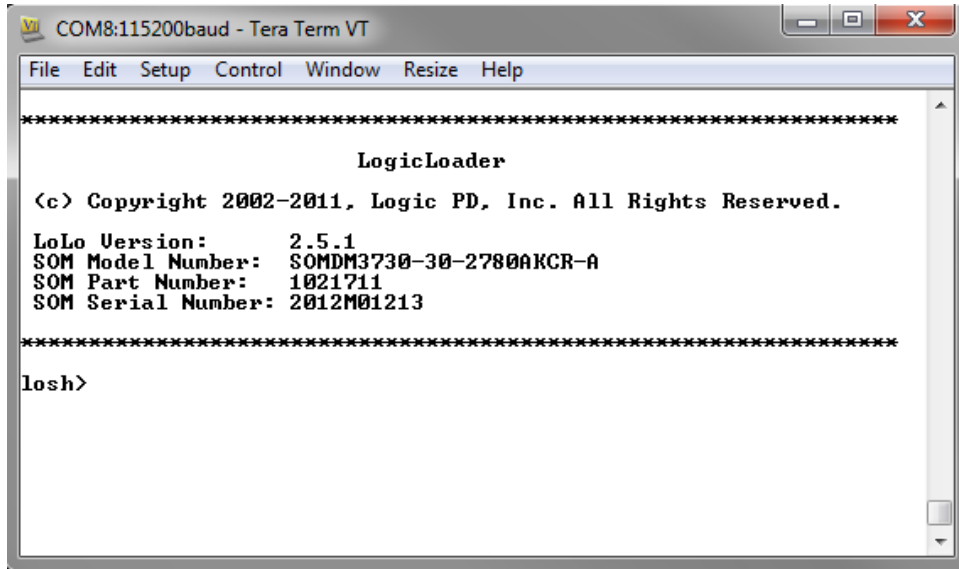
4. Click OK.

2.4 Boot into LogicLoader

LogicLoader is a bootloader program created by Logic PD that provides the capability for loading operating systems (OS) and applications. In addition, it provides a full suite of commands for interfacing to the System on Module (SOM). These commands load OSs, configure hardware platforms, bring up hardware, customize applications, perform tests, and manage in-field devices.

1. Make sure the development kit is set up as described in Section 2.1 or Section 2.2.

2. Remove the pre-built OS image SD card from the baseboard, if one is inserted. This step is important because LogicLoader boots from onboard flash.

3. Start the terminal emulation program on your host PC.

4. Verify that the serial port settings are correct (see Figure 2.3 in the previous section).

5. Move the power switch to the ON position to boot the development kit.

6. In your host PC's terminal emulation program, you should see a LogicLoader screen similar to that below (version numbers and other details may differ from what is shown).

Figure 2.4: LogicLoader losh> Prompt

7. You are now ready to work with the DM3730 Torpedo SOM or the DM3730 Torpedo + Wireless SOM using LogicLoader. For more information on LogicLoader and its capabilities, please see the LogicLoader documentation provided by Logic PD. These documents are available on Logic PD's website and their download locations are referenced in Appendix A of this document.

3   Format a Bootable SD Card

The DM3730 processor supports booting from SD and several procedures in this document walk you through a process using a bootable SD card. This section describes how to format an SD card so the Zoom DM3730 Torpedo Development Kit will recognize it as a bootable device.

A requirement of the processor is that the SD card must be formatted without an extended partition to boot properly. The built-in Windows formatting tool is not always able to do this. Logic PD has found that the HP USB Formatting Tool version 2.0.6 appears to be the best tool for formatting an SD card so it can be used to boot a processor based on OMAP3 technologies (e.g., DM3730, AM3703). **NOTE:** If you are using Linux or have access to a Linux box, you can find instructions in Texas Instruments' (TI) *SD/MMC format for OMAP3 boot* wiki article.[4]

The most recent version of the tool available on HP's site does not seem to work as well as version 2.0.6. As such, the tool needs to be downloaded from any number of third-party websites. To find these websites, perform a Google search for: **HP Formatting Tool 2.0.6**. **NOTE:** As with downloading anything from the Internet, use caution in what sites you visit and what you download. Logic PD has no association with any of these websites and makes no guarantees to their validity or the usability of downloads from their sites.

1. After the HP USB Formatting Tool version 2.0.6 has been installed on your host PC, insert an SD card into your USB card reader, connect the card reader to your host PC, and open the formatting tool. **IMPORTANT NOTE:** Remember that formatting an SD card will erase its entire contents; back-up the SD card's contents before continuing or select a card that doesn't contain vital information.

2. Select the SD card device and FAT32 from the *File System* drop-down menu. Click Start.

---
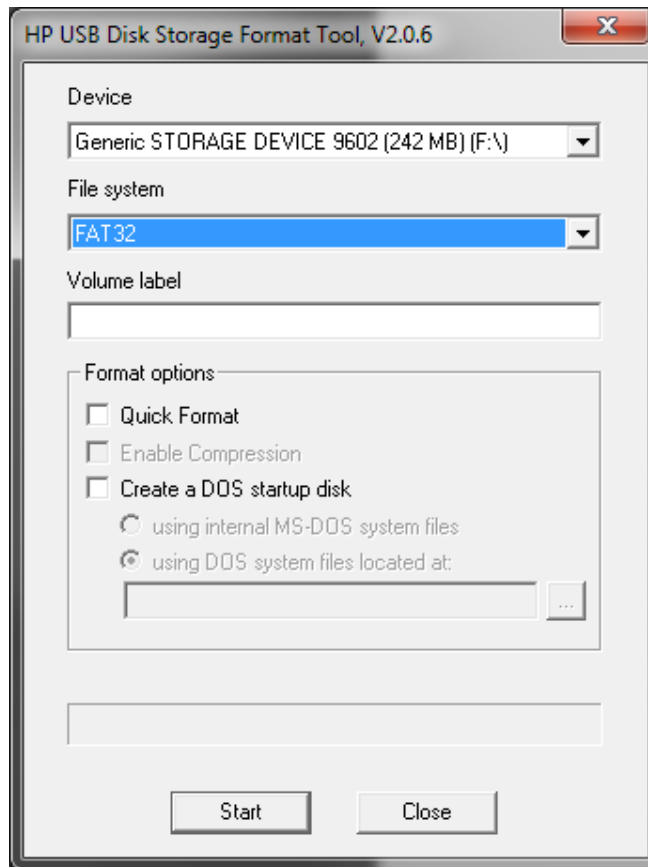
[4] http://processors.wiki.ti.com/index.php/MMC_Boot_Format

3. You will receive a warning that the contents of the card will be erased. Assuming you have backed up the contents of the SD card, click Yes.
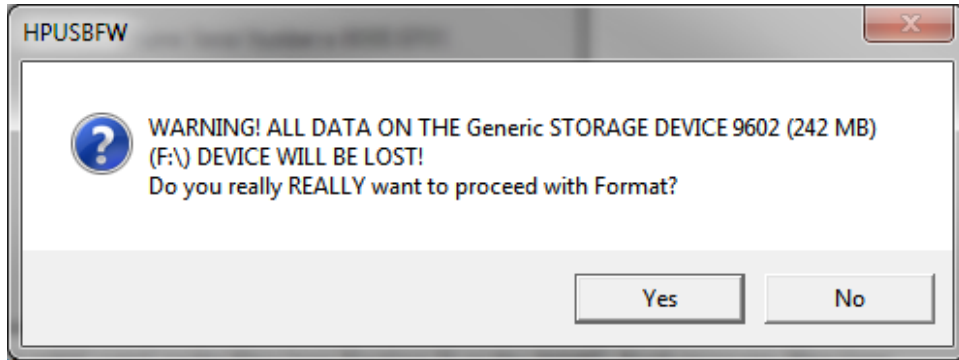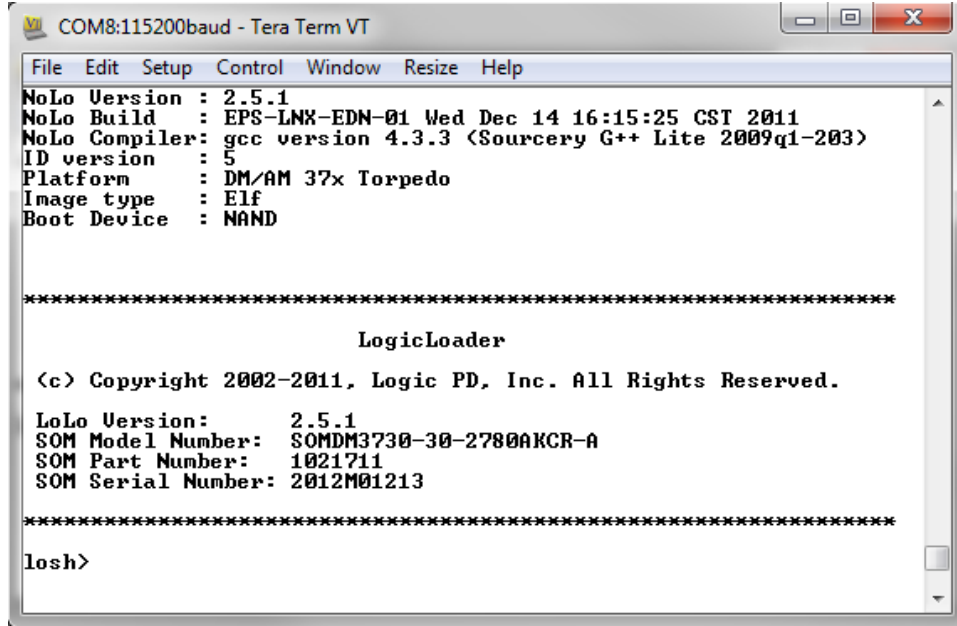
4. When formatting completes, you will receive a confirmation screen with the new file system type and the space allocation on the card, similar to the window shown below.
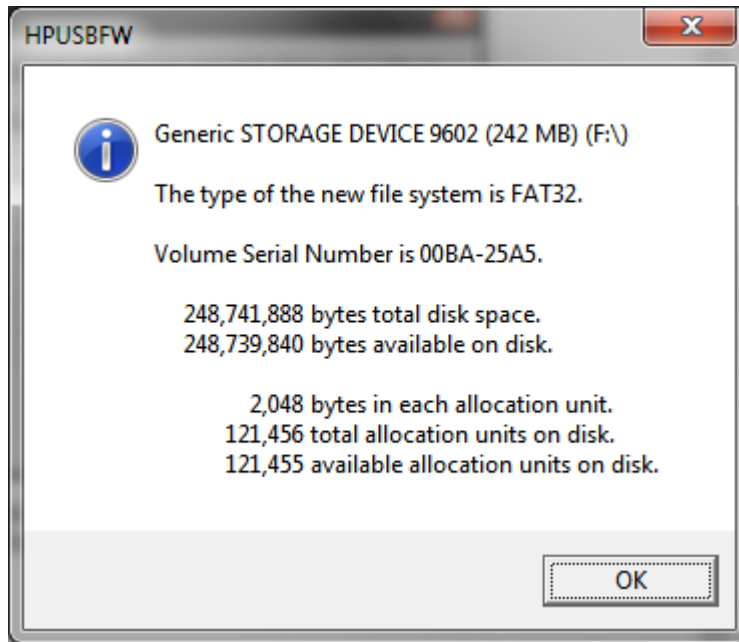
You are now ready to add LogicLoader files (see Section 4) to the SD card and boot from SD.

4 Update LogicLoader

1. Power on your kit and hold down the **v** key on the keyboard. Doing this will provide specific boot information in the LogicLoader output. For instance, in the image below, you see that the image type is Elf and it booted from NAND. This is a helpful trick to use to determine if your development kit is booting from the onboard NAND flash or the SD card.

2. Take note of what LogicLoader version number appears in this welcome prompt. This will help you know if you need to upgrade to a new version.

3. Power off your kit.

4.1 Download New Version of LogicLoader
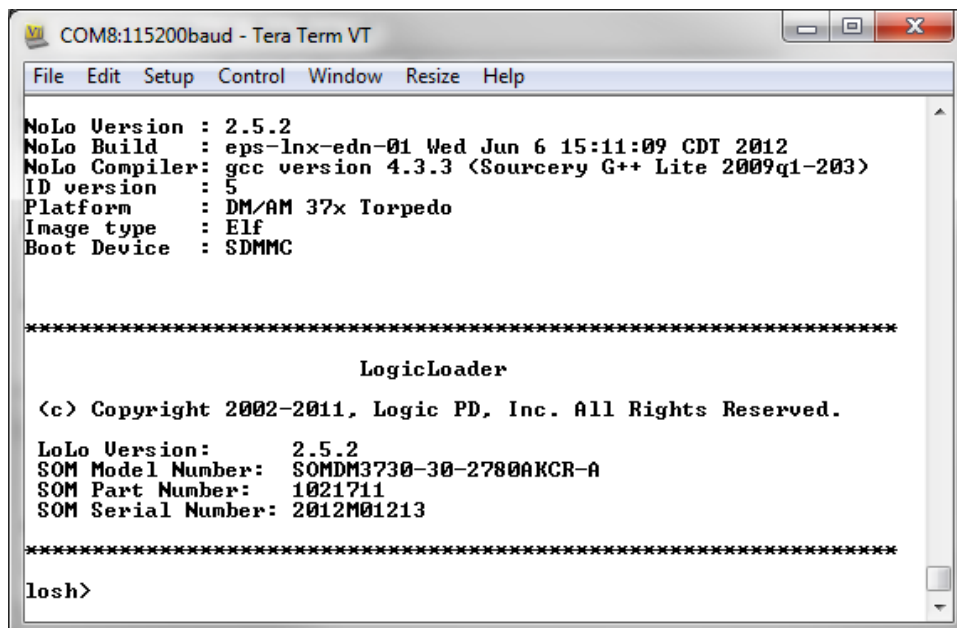
1. Log into Logic PD's [downloads page](http://support.logicpd.com/auth/)[5] using your username and password.

2. Click on the **All Downloads** link under the *DM3730 Torpedo Development Kit* heading.

3. Scroll down until you find the section header *LogicLoader Bootloader/Monitor*.

4. Click on the **+** icon next to the **LogicLoader for DM3730 / AM3703 SOMs** link; this expands the list of all available LogicLoader versions. If the current version is newer than what is on your DM3730 Torpedo SOM or DM3730 Torpedo + Wireless SOM, you should update.

5. Click on the version number marked *(current)* and save the file to your host PC.

6. After the ZIP file finishes downloading, extract all files of the folder to a location on your host PC that you can access later on.

Now that you have downloaded the latest version of LogicLoader to your computer, you can update LogicLoader on your development kit using a bootable SD card.

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[5] http://support.logicpd.com/auth/

4.2 Update LogicLoader using a Bootable SD Card

1. Prepare a bootable SD card as described in Section 3.

2. Locate the LogicLoader files that you downloaded to your host PC in Section 4.1.

3. Copy the *MLO* file from that folder to the SD card. **IMPORTANT NOTE: This file must be the first added to the SD card for the kit to boot properly.**

4. Next, copy the *lboot.elf* file to the SD card.

5. Remove the SD card from your USB card reader and insert it into the bootable SD card slot on your Zoom DM3730 Torpedo Development Kit (see Section 1.3 for its location).

6. Slide the power switch to the ON position; you should see a screen similar to that shown below. **HINT:** You can hold down the **v** key on the keyboard during boot-up to verify the *Boot Device* is SDMMC, indicating the kit booted from the SD card.

```
COM8:115200baud - Tera Term VT

File  Edit  Setup  Control  Window  Resize  Help

NoLo Version : 2.5.2
NoLo Build   : eps-lnx-edn-01 Wed Jun 6 15:11:09 CDT 2012
NoLo Compiler: gcc version 4.3.3 (Sourcery G++ Lite 2009q1-203)
ID version   : 5
Platform     : DM/AM 37x Torpedo
Image type   : Elf
Boot Device  : SDMMC


*****************************************************************

                        LogicLoader

 (c) Copyright 2002-2011, Logic PD, Inc. All Rights Reserved.

 LoLo Version:       2.5.2
 SOM Model Number:   SOMDM3730-30-2780AKCR-A
 SOM Part Number:    1021711
 SOM Serial Number:  2012M01213

*****************************************************************

losh>
```

Notice that the LogicLoader Version number now shows the version you downloaded from the Logic PD website. This is because you have booted from the SD card containing that version.

7. Because NoLo and LogicLoader reside in NAND, it is necessary to erase the old LogicLoader before updating to a new one. Type **`erase /dev/nand0 B0 B4096`** and press **Enter**.
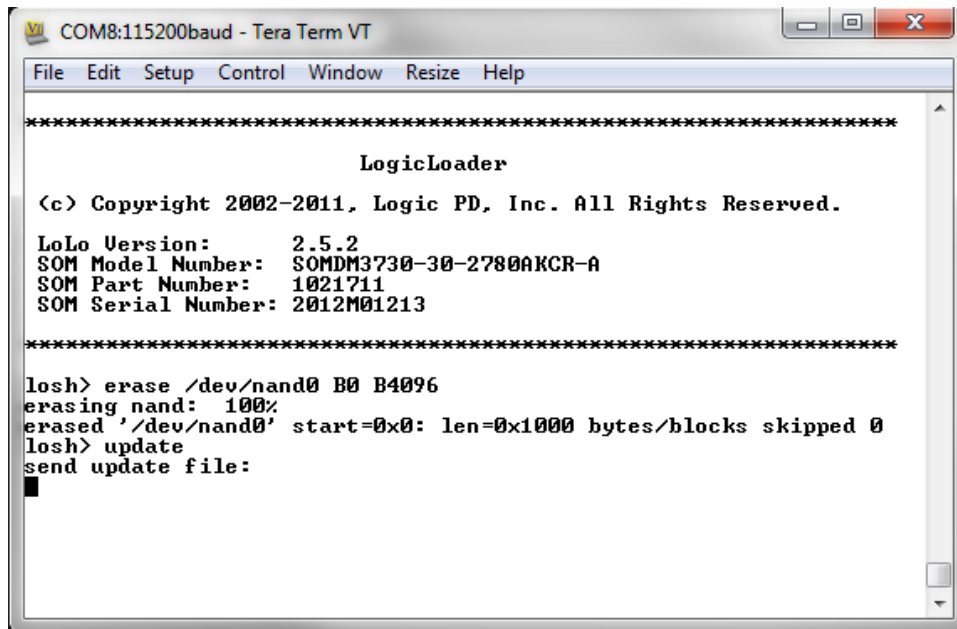
```
COM8:115200baud - Tera Term VT

File  Edit  Setup  Control  Window  Resize  Help

****************************************************************

                        LogicLoader

 (c) Copyright 2002-2011, Logic PD, Inc. All Rights Reserved.

 LoLo Version:      2.5.2
 SOM Model Number:  SOMDM3730-30-2780AKCR-A
 SOM Part Number:   1021711
 SOM Serial Number: 2012M01213

****************************************************************

losh> erase /dev/nand0 B0 B4096
erasing nand:  100%
erased '/dev/nand0' start=0x0: len=0x1000 bytes/blocks skipped 0
losh> █
```

Because the kit was booted from SD, you will not be warned that you are erasing locked areas in NAND. You now have a blank flash device to update to.

8. Type **`update`** and press **Enter**. Your screen should look similar to that included below.

```
COM8:115200baud - Tera Term VT

File  Edit  Setup  Control  Window  Resize  Help

****************************************************************

                        LogicLoader

 (c) Copyright 2002-2011, Logic PD, Inc. All Rights Reserved.

 LoLo Version:      2.5.2
 SOM Model Number:  SOMDM3730-30-2780AKCR-A
 SOM Part Number:   1021711
 SOM Serial Number: 2012M01213

****************************************************************

losh> erase /dev/nand0 B0 B4096
erasing nand:  100%
erased '/dev/nand0' start=0x0: len=0x1000 bytes/blocks skipped 0
losh> update
send update file:
█
```
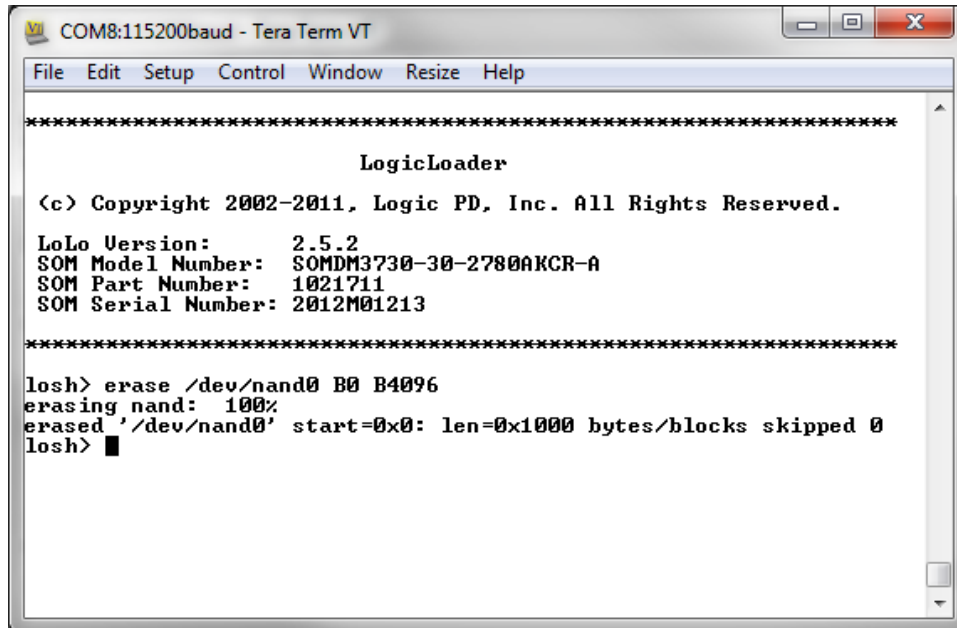
9. LogicLoader is waiting for you to send the new version over the serial port. From the menu toolbar, select File > Send file... to send the new LogicLoader version to your kit.
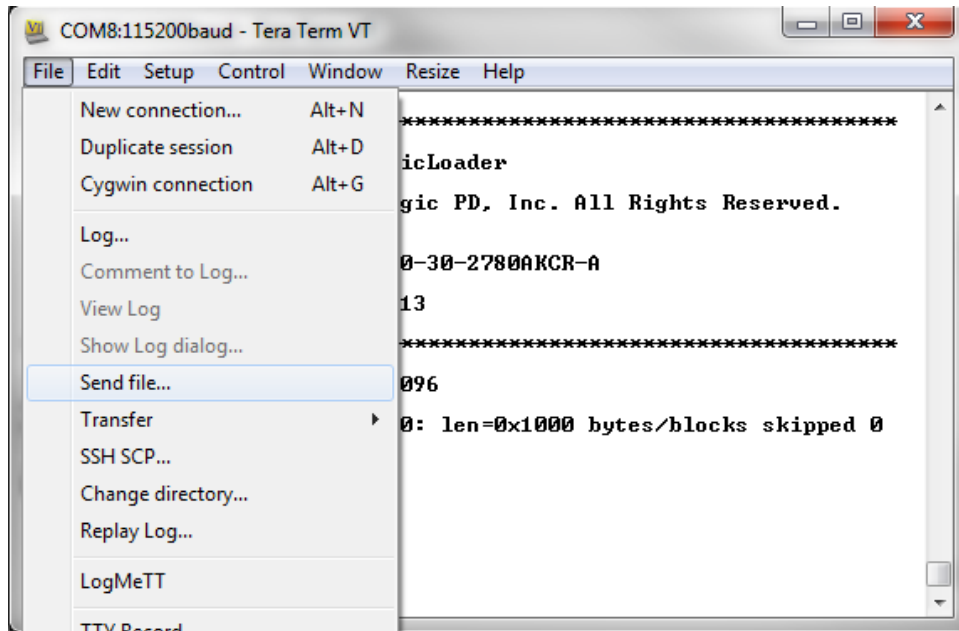
10. Navigate to the location where you extracted the LogicLoader files and select the file that includes *nolo_lolo_NAND.upd.* This file contains both NoLo and LogicLoader components necessary for updating LogicLoader. If you do not see a file that includes *nolo_lolo_NAND.upd*, please refer to the *Release_Notes.txt* file included in the LogicLoader version download for special instructions.

11. Verify that the "Binary" checkbox is checked. Click Open.
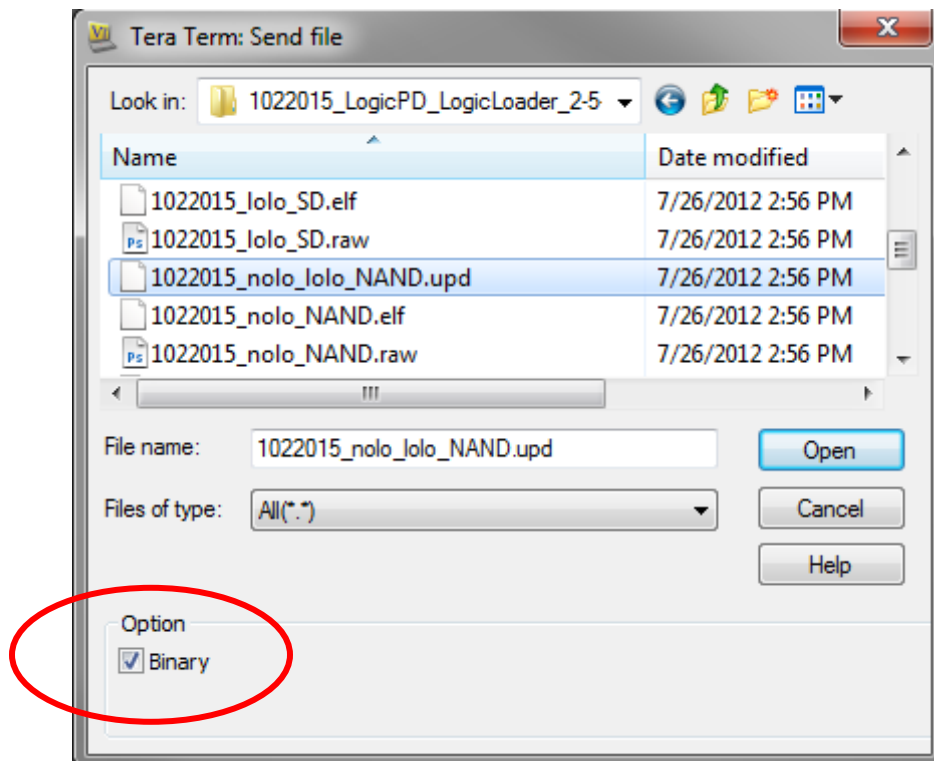
12. Tera Term will begin sending the file to the DM3730 Torpedo SOM or the DM3730 Torpedo + Wireless SOM.
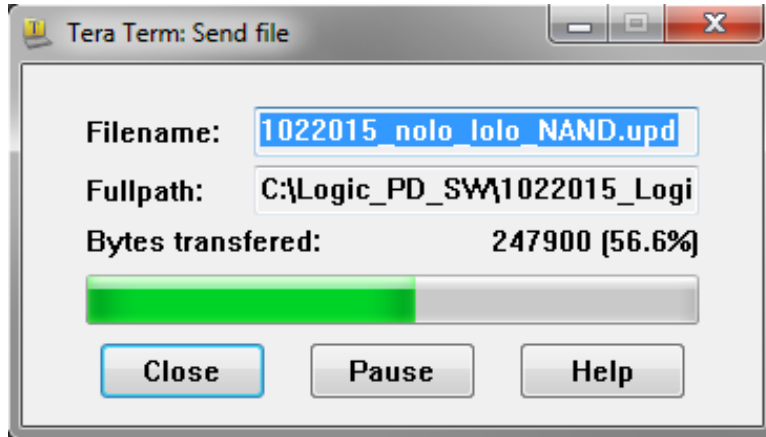
13. Verify that the download was successful by waiting for an `update done` message to appear.
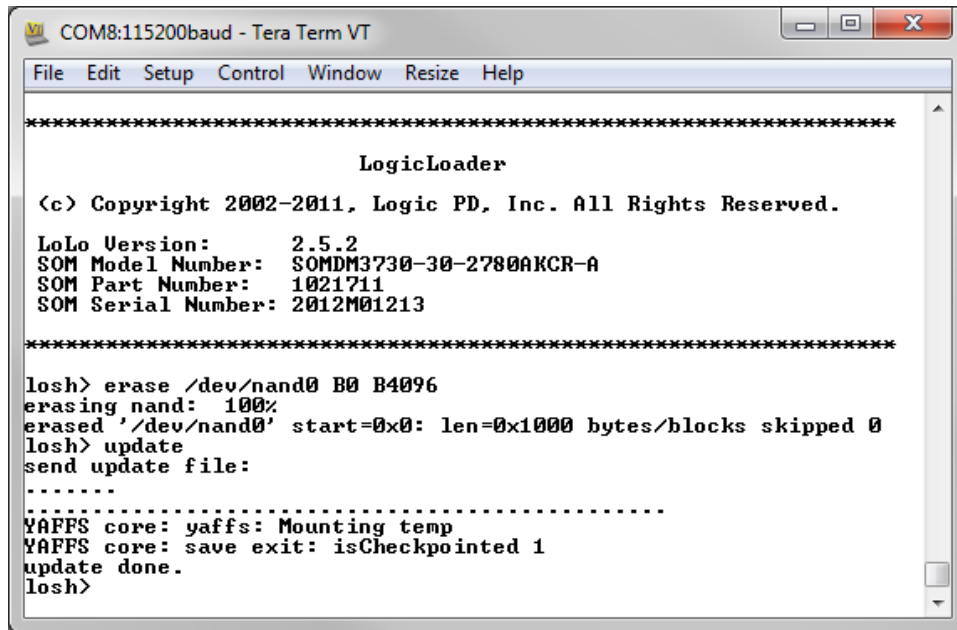
14. Remove the SD card from your development kit and press the RESET button on the baseboard.

15. If the new version number is displayed when the development kit boots, you now have the latest and greatest version of LogicLoader installed on your kit.

```
COM8:115200baud - Tera Term VT
File  Edit  Setup  Control  Window  Resize  Help

NoLo Version : 2.5.2
NoLo Build   : eps-lnx-edn-01 Wed Jun 6 15:04:36 CDT 2012
NoLo Compiler: gcc version 4.3.3 (Sourcery G++ Lite 2009q1-203)
ID version   : 5
Platform     : DM/AM 37x Torpedo
Image type   : Elf
Boot Device  : NAND


*****************************************************************
                        LogicLoader

  (c) Copyright 2002-2011, Logic PD, Inc. All Rights Reserved.

   LoLo Version:        2.5.2
   SOM Model Number:    SOMDM3730-30-2780AKCR-A
   SOM Part Number:     1021711
   SOM Serial Number:   2012M01213

*****************************************************************
losh> █
```

Note that the first section of the banner says the *Image Type* is Elf and the *Boot Device* is NAND.

5 Wattson™

Wattson is a power measurement and performance monitoring application now standard on all Logic PD Zoom™ Development Kits.

The application delivers real-time graphical feedback and data-logging capabilities without the need for external oscilloscopes and meters. Wattson guides you to the lowest power and highest performance software combination for your product.

Wattson is instrumental in helping you minimize power in run, idle, standby, suspend, and system-off states, maximizing battery life in the end application. Wattson is independent of the system, allowing power measurement even when the SOM is in deep-sleep states like suspend and even off.

Wattson runs on Windows and Linux PCs, enabling software development on Windows CE and Linux-based products.

5.1 How to Get Wattson

1. Wattson is available for download from Logic PD's website. The links below will launch the download for your specific OS.
    □ [Wattson for Windows Installer](http://support.logicpd.com/downloads/1436/)[6] (ZIP file)
    □ [Wattson for Linux Installer](http://support.logicpd.com/downloads/1438/)[7] (tar.gz file)

2. Extract the ZIP or tar.gz file. In Linux, the following command will extract the tar.gz:

```
$ tar –xvf wattson_linux.tar.gz
```

In that folder, you will find a *HOW TO INSTALL* document containing installation instructions.

3. Once Wattson is installed on your host PC, a *Wattson User Guide* is available from the Start > Logic PD > Wattson User Guide menu or within the Wattson application under the *Help* menu.

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[6] http://support.logicpd.com/downloads/1436/
[7] http://support.logicpd.com/downloads/1438/

5.2   Connect Kit to PC for Wattson

For Wattson to interact with the DM3730 Torpedo Development Kit, use the included USB A to USB mini-B cable to connect the power measurement USB port on the baseboard to an available USB port on your host PC. See Figure 5.1.
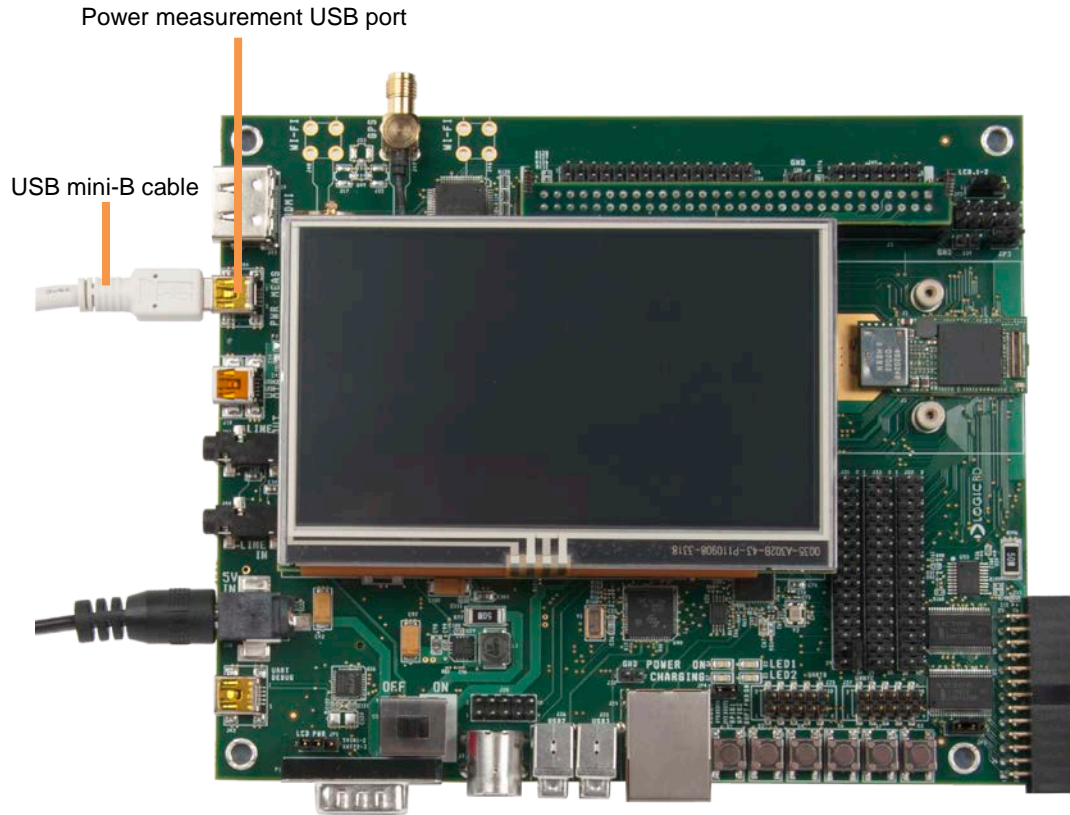

Figure 5.1: Connect USB mini-B Cable for Wattson

6   Baseboard Jumper Descriptions

The baseboard jumpers should be set according to the use case as described in Table 6.1.

Table 6.1: Torpedo Launcher 3 Baseboard Jumper Descriptions

Ref Des	Jumper Location	Description
JP1	Across pins 1-2	LCD backlight voltage is supplied directly from the 5V power supply. This setting should only be used when the kit is plugged into a wall and will be stationary or for displays that draw a large amount of current.
	Across pins 2-3	LCD backlight voltage is supplied from the MAIN_BATTERY power rail. This setting should be used for normal operation. When the battery is charging, the backlight voltage will be automatically supplied by the charging source. This is the default setting.
JP2	Across pins 1-2	This sets the LCD connector (J3) as active. This is the default setting.
	Across pins 2-3	This sets the HDMI connector (J43) as active.
JP3	Across pins 1-2 (ON)	Reserved for future use (RFU)
	Only on pin 1 or 2 (OFF)	RFU. This is the default setting.
JP5	Across pins 1-2	This setting is used to switch between a 8-bit and 12-bit camera interface on connector J6. 8-bit mode is default with the jumper across pins 1-2; 12-bit mode is set with the jumper across pins 2-3.
J31	Across pins 28-30	UARTC transceiver chip is disabled. This setting should be used when the DM3730 Torpedo + Wireless SOM is being used. This is the default setting.
	Only on pin 28 or 30	UARTC transceiver chip is enabled. This setting should be used when the DM3730 Torpedo SOM is being used and voltage shifted signals need to be accessed via header J27.

7   SOM Hold-Down Clip

The DM3730 Torpedo Development Kit includes a SOM hold-down clip that demonstrates a method of securing the SOM to a baseboard in the field. For mechanical drawings of this clip and other example retention methods, please see the *Torpedo SOM Mechanical Hold-Down Scenarios White Paper*[8] or the *DM3730/AM3703 Torpedo + Wireless SOM Mechanical Hold-Down Scenarios White Paper*.[9]

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[8] http://support.logicpd.com/downloads/1279/
[9] http://support.logicpd.com/downloads/1481/

8 Connect Antennas to the DM3730 Torpedo + Wireless SOM

IMPORTANT NOTE: The antenna connectors on the DM3730 Torpedo + Wireless SOM are very fragile. Take extreme care when connecting and disconnecting the antennas. If antenna movement is likely in an end-product design, Logic PD suggests designing in supports or reinforcements for the antennas and cables on the baseboard in order to prevent damage to the connectors.

8.1 Wi-Fi/Bluetooth Antennas

The DM3730 Torpedo Development Kit includes two Wi-Fi/Bluetooth antennas for use with the DM373 Torpedo + Wireless SOM. One antenna provides support for 802.11b/g/n Ethernet or Bluetooth signals, while the other provides support for 802.11a/n Ethernet signals. Only connect the antennas if 802.11 Ethernet or Bluetooth is required for your demo or development efforts.

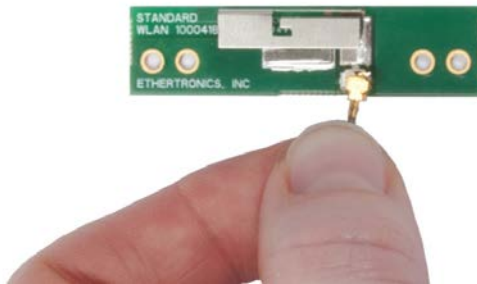1. Connect one W.FL-to-U.FL cable to each dual-band Wi-Fi/BT antenna.

Figure 8.1: Assemble Wi-Fi Antenna

2. For 802.11b/g/n Ethernet or Bluetooth support, connect one antenna to the 2.4 GHz antenna connector at reference designator J7. See Figure 8.2 for the antenna connector location on the bottom of the DM3730 Torpedo + Wireless SOM.

Figure 8.2: 2.4 GHz Antenna Connector on DM3730 Torpedo + Wireless SOM

3. For 802.11a/n Ethernet support, connect one antenna to the 5 GHz antenna connector at reference designator J6. See Figure 8.3 for the antenna connector location on the bottom of the DM3730 Torpedo + Wireless SOM.

Figure 8.3: 5 GHz Antenna Connector on DM3730 Torpedo + Wireless SOM

IMPORTANT NOTE: When you have connected the appropriate antennas and are ready to attach the DM3730 Torpedo + Wireless SOM to the baseboard, ensure the 2.4 GHz antenna is routed away from the LCD screen. In addition, ensure the 5 GHz antenna connector does not short neighboring components by routing the antenna directly to the side or to the top of the SOM.

8.2   GPS Antenna

The DM3730 Torpedo Development Kit also includes a GPS antenna for use with the DM3730 Torpedo + Wireless SOM. Only connect this antenna if GPS connectivity is required for your demo or development efforts.

1. Insert the GPS antenna into the connector on the baseboard and tighten the screw nut.

Figure 8.4: Assemble GPS Antenna

2. Connect the GPS W.FL-to-SMA cable on the baseboard to the GPS antenna connector at reference designator J8. See Figure 8.5 for the antenna connector location on the bottom of the DM3730 Torpedo + Wireless SOM.
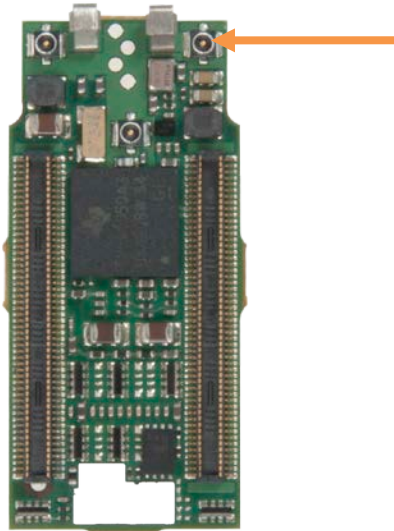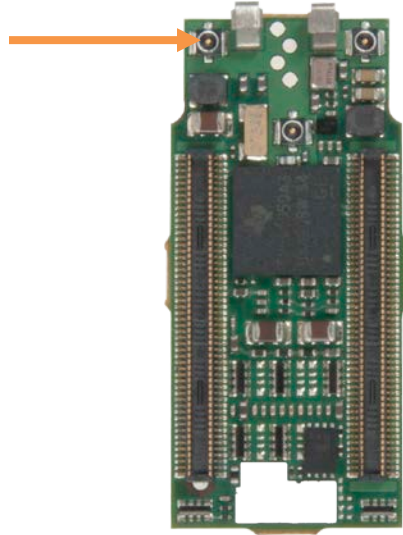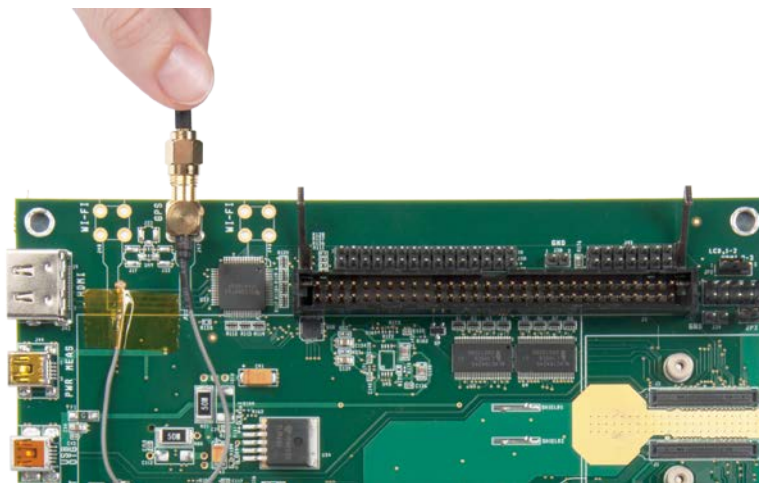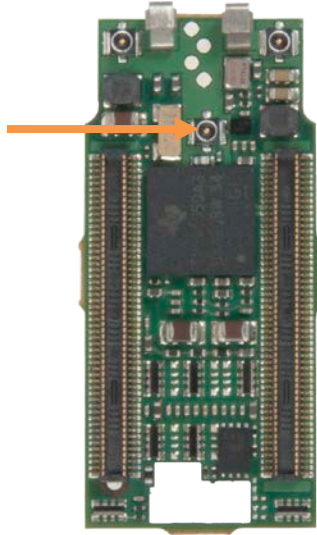

Figure 8.5: GPS Antenna Connector on DM3730 Torpedo + Wireless SOM

9 Connect the ETM Adapter Board to the SOM

The Embedded Trace Macrocell™ (ETM) adapter board provides debug and trace features for the ARM processor. Only connect the ETM adapter board if you need to debug the SOM using an ETM interface external debug tool. **NOTE:** The SOM hold-down clip cannot be attached if using the ETM adapter board.

1. Locate the ETM connector on the SOM. See Figure 9.1 for the location of this connector on the DM3730 Torpedo SOM. See Figure 9.2 for the location of this connector on the DM3730 Torpedo + Wireless SOM.
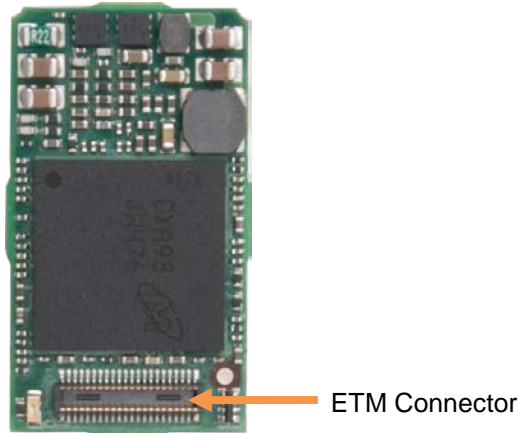
ETM Connector

Figure 9.1: ETM Connector on DM3730 Torpedo SOM
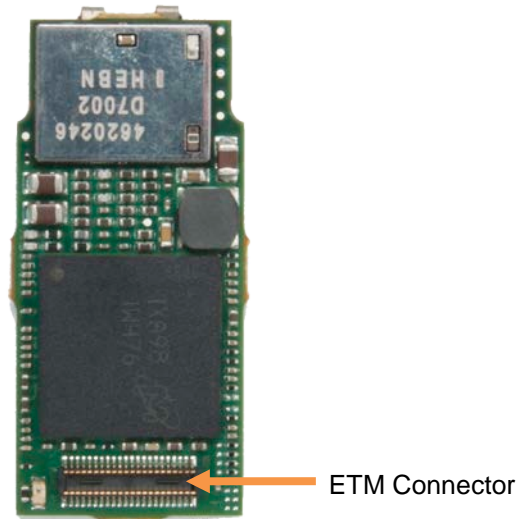
ETM Connector

Figure 9.2: ETM Connector on DM3730 Torpedo + Wireless SOM

2. Position the ETM adapter board so that the Logic PD name on the adapter board is oriented the same way as the Logic PD name on the baseboard.

3. Make sure the connector on the bottom of the ETM adapter board aligns correctly with the connector on the SOM.

4. Press straight down on the ETM adapter board directly over the connectors to mate the two boards. See Figure 9.3 for the final position of the connected ETM adapter board to the DM3730 Torpedo SOM. See Figure 9.4 for the final position of the connected ETM adapter board to the DM3730 Torpedo + Wireless SOM.
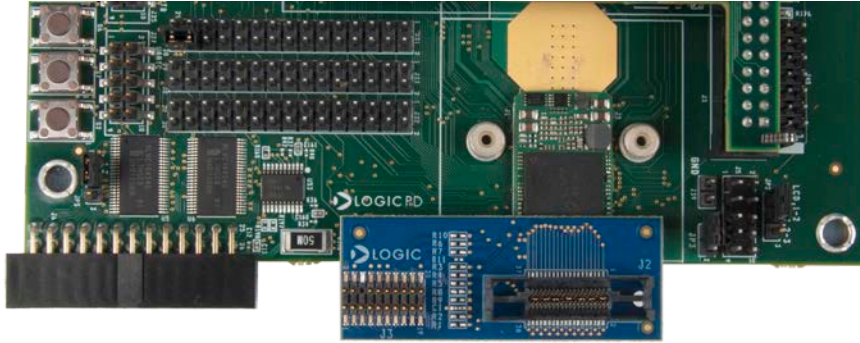

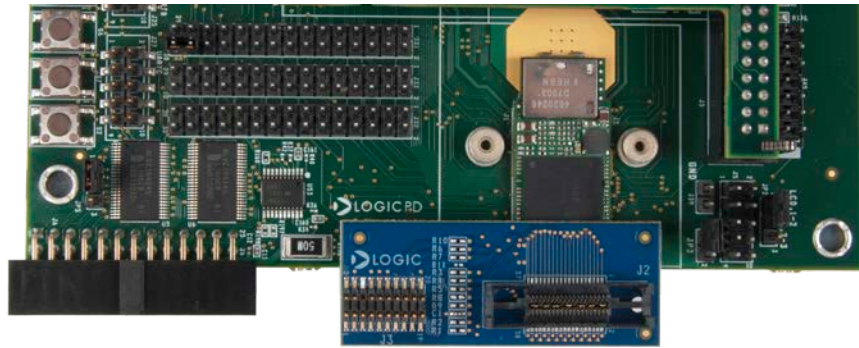*Figure 9.3: ETM Adapter Board Connected to DM3730 Torpedo SOM*

Figure 9.4: ETM Adapter Board Connected to DM3730 Torpedo + Wireless SOM

10 Powering Down and Waking Up the Development Kit

This section provides information on how to power down and wake up the DM3730 Torpedo Development Kit depending on the OS being used. **NOTE:** Section 12.11 provides a more in-depth discussion of the baseboard user buttons noted below.

10.1 Android

- To power down the development kit when using the Android OS, press and hold the S2 button on the Torpedo Launcher 3 Baseboard. When the *Phone Options* pop-up menu appears, select **Power off**.

- The development kit will enter suspend mode after several minutes of inactivity or when the S2 button is pressed. To wake the development kit from suspend mode, press and hold the S2 button for more than one second.

10.2 Linux

- To power down the development kit when using the Linux OS, use either the *poweroff* or *reboot* command.

- The development kit will enter suspend mode after ten minutes of inactivity or when the S2 button on the Torpedo Launcher 3 Baseboard is pressed. To wake the development kit from suspend mode, press and hold the S2 button for more than one second or touch the screen.

10.3 Windows CE

- To power down the development kit when using the Windows CE OS, turn the power switch on the Torpedo Launcher 3 Baseboard to the **OFF** position.

- The development kit will enter suspend mode after eleven minutes of inactivity, when the S2 button on the Torpedo Launcher 3 Baseboard is pressed, or by selecting Start > Suspend on the Windows CE display. To wake the development kit from suspend mode, press and hold the S2 button for more than one second or touch the screen.

11 Using Displays with the Development Kit

When using displays with the DM3730 Torpedo Development Kit, JP1 and JP2 jumpers must be set for the proper voltage source and output display (LCD or HDMI).

JP1 selects the power source (5V or battery) for the LCD backlight (not relevant for HDMI). We recommend running the backlight off the battery for most applications and display types. Please keep in mind that running the backlight off the battery may affect the battery charging rate, depending on the backlight power requirements.

Table 11.1: LCD Backlight Jumper JP1 Settings

Jumper JP1 Location	Display Type / Notes
Across pins 1–2	Jumper position when running off the 5V power supply.
Across pins 2–3	Jumper position when running off the battery power supply. **NOTE:** This is the default setting out of the box.

JP2 selects between LCD and HDMI operation. Both interfaces share the same LCD bus from the DM3730 Torpedo SOM and the DM3730 Torpedo + Wireless SOM; the LCD interface is 16-bit, while the HDMI interface is 24-bit. Only one interface can be used at a time.

Table 11.2: LCD/HDMI Jumper JP2 Settings

Jumper JP2 Location	Display Type / Notes
Across pins 1–2	Jumper position when using an LCD display. **NOTE:** This is the default setting out of the box.
Across pins 2–3	Jumper position when using the HDMI display.

12   Baseboard Hardware Specifications

This section describes peripherals or connectors that are located on the Torpedo Launcher 3 Baseboard.

12.1   10/100 Ethernet PHY

The baseboard uses a SMSC LAN9221 Ethernet MAC+PHY to provide an easy-to-use networking interface. The controller is connected to the GPMC bus of the processor and uses uP_nCS1 for chip access.

12.2   USB

The baseboard supports two USB 2.0 high-speed host ports through an NXP ISP1763A controller that is connected to the 16-bit GPMC memory bus; the controller uses uP_nCS6 for chip access. All ports can operate at up to 480 Mbit/sec.

12.3   Touch

Touch is supported by a TI TSC2004 connected on the SOM's I2C3 interface. The TSC2004 provides support for 4-wire touch.

12.4   LCD

The connector located at reference designator J3 provides Logic PD's standard 60-pin LCD connection. The header located at reference designator J5 can be used to expand the LCD to 24-bit (Logic PD Display Kits do not support this mode).

12.5   Camera

The camera port of both the DM3730 Torpedo SOM and the DM3730 Torpedo + Wireless SOM is provided on J6.

12.6   HDMI

The baseboard provides support for video-only HDMI on J43.

12.7   SPI Flash

An SPI flash device, Atmel AT25160BN-SH, is connected to McSPI1 on the baseboard. This can be used for customer storage.

12.8   Audio

Line-in and line-out connections are available on the baseboard through J40 and J41, respectively.

12.9   MMC/SD

The baseboard has support for two MMC/SD ports through memory card slots at J21 and J29. J21 is connected to SD1 of the processor, which is the main card slot. This slot offers boot capabilities, depending on the boot configuration of the SOM. It also can operate at either 1.8V or 3.0V. J29 is connected to SD3 of the processor; this port can only operate at 1.8V.

IMPORTANT NOTE: Currently, most SD cards generally only support 3.0V operation. Please take note of the card's operating condition before trying to use the J29 SD card slot.

12.10 UARTs

The baseboard provides access to three UART ports. UARTA is used as the debugging port; it goes through a transceiver and is available on P1. UARTB and UARTC are available as voltage-level translated signals (J25 and J27) or as 1.8V signals (J33). If used as 1.8V signals, U24 and U25 should be disabled by pulling nPWRDOWNB and/or nPWRDOWNC low.

NOTE: Two IDC to DB9 adapters are included in the kit. The adapters can be used to connect J25 and J27 to a COM port on your host PC.

12.11 User Buttons

The baseboard provides six user buttons. The functionality of each user button is outlined in the table below.

Table 12.1: Baseboard User Button Functionality

Button	Description
S1: MSTR_nRST	Resets the processor.
S2: PWRON	Puts the development kit into suspend mode and wakes the development kit from suspend mode.
S3: GPIO_2	Back button for the Android demo image.
S4: GPIO_7/SYS_BOOT0	Menu button for the Android demo image; also allows the boot mode source to be changed. Consult each SOM *Hardware Specification* for more details.
S6: GPIO_181/SYS_BOOT5	Home button for the Android demo image; also allows the boot mode source to be changed. Consult each SOM *Hardware Specification* for more details.
S7: GPIO_178	Search button for the Android demo image.

13   Power

The baseboard utilizes a TI BQ24032ARHL lithium-ion charger to allow for the following power options: battery, 5V DC, and USB.

13.1   Battery Power

The DM3730 Torpedo Development Kit comes with a lithium-ion battery pack that connects at reference designator J20. With a valid battery voltage on this connector (2.7V–4.5V), the baseboard will derive all other necessary voltages and drive the SOM.

13.1.1   Battery Charging

The battery can be charged through either the 5V DC input (J18) or the USB1_VBUS input (J19). Charging through the 5V DC input is done automatically when the 5V power supply is connected and the battery level is below the charging threshold. Charging through USB1_VBUS requires software to enable USB charging.

13.2   5V Power

The DM3730 Torpedo Development Kit is designed to run off of battery power or the 5V input. The 5V input is also used to provide a charge to the BATT_IN rail on the baseboard. The charge-path circuit allows in-system charging of a single-cell lithium-ion battery source when power is applied to the 5V supply.

Appendix A: Additional Documentation

Documentation Overview Flowchart

- *DM3730/AM3703 Torpedo SOM Documentation Overview*
  http://support.logicpd.com/downloads/1418/

- *DM3730/AM3703 Torpedo + Wireless SOM Documentation Overview*
  http://support.logicpd.com/downloads/1485/

Software Documentation

- *LogicLoader v2.5 User Guide*
  http://support.logicpd.com/downloads/1428/

- *LogicLoader v2.5 Command Description Manual*
  http://support.logicpd.com/downloads/1440/

- *DM3730 Android Gingerbread 2.3.4 BSP User Guide*
  http://support.logicpd.com/downloads/1517/

- *DM37x Linux BSP User Guide*
  http://support.logicpd.com/downloads/1431/

- *DM37x Windows Embedded CE 6.0 BSP User Guide*
  http://support.logicpd.com/downloads/1423/

Hardware Documentation

- *Zoom DM3730 Torpedo Development Kit QuickStart Guide*
  http://support.logicpd.com/downloads/1420/

- Zoom DM3730 Torpedo Development Kit Hardware Design Files
  (BOM, schematic, and layout files for all boards included in the kit)
  http://support.logicpd.com/downloads/1442/

- *DM3730/AM3703 Torpedo SOM Hardware Specification*
  http://support.logicpd.com/downloads/1432/

- *DM3730/AM3703 Torpedo + Wireless SOM Hardware Specification*
  http://support.logicpd.com/downloads/1479/