NXP Semiconductors

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Android™ Quick Start Guide

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1 Overview

This document guides you through the processes of downloading and running this release package. It only explains how to download and run the default release image with default configuration. For details on using the release package, see the *Android™ User's Guide* (AUG) included in this release package.

2 Hardware Requirements

The hardware requirements for using this release package are as follows:

Supported system-on-chips (SoCs):

- i.MX 7ULP

Supported boards:

- EVK Rev. B board

3 Working with the i.MX 7ULP EVK Board

3.1 Board hardware

The figure below shows the different components of the i.MX 7ULP EVK Rev. B board.

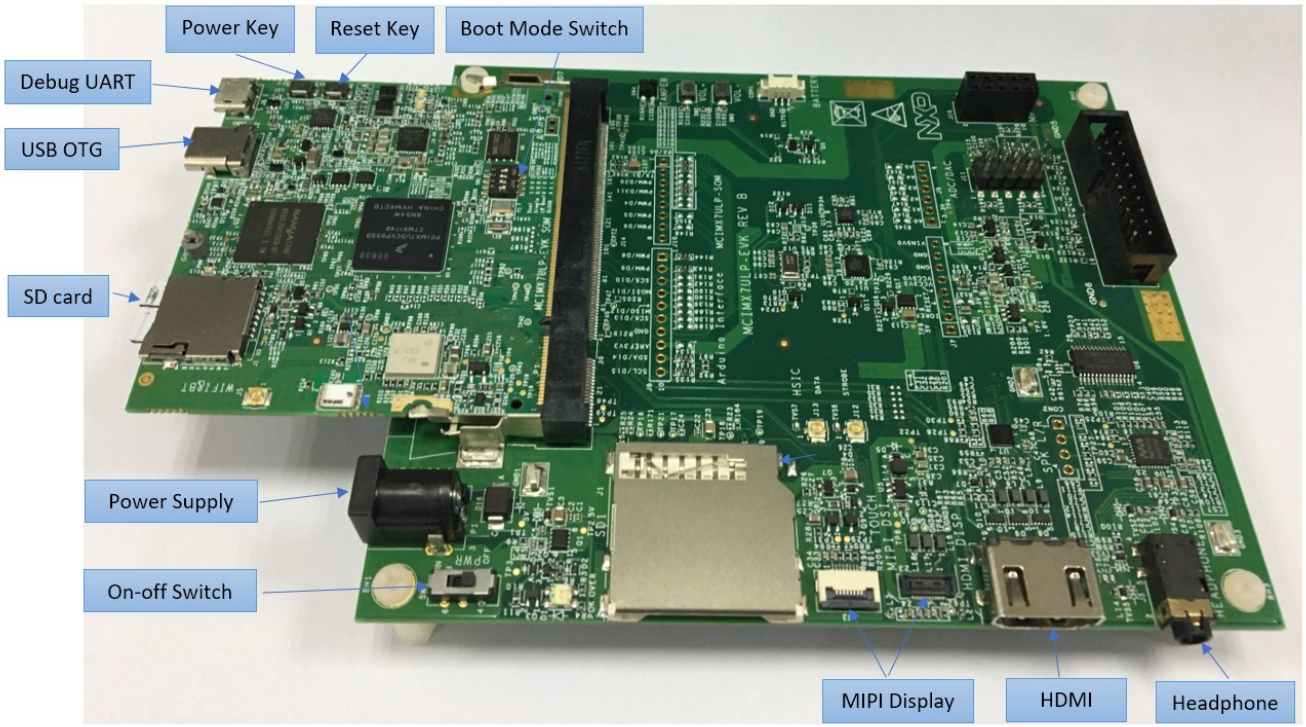

Figure 1. i.MX 7ULP EVK board

The i.MX 7ULP EVK Rev. B board needs the following hardware rework to support the MIPI Display:

- Remove the resistors: R41 (0 ohm), R43-R46 (0 ohm), R51 (0 ohm)
- Populate the resistors: R30-R35 (0 ohm)
- After rework, the HDMI display is not supported any more.

3.2 Board images

The table below describes the location in the board partitions of the software images in android_o8.1.0_1.4.0_7ulp-ga_image_7ulpevk.tar.gz.

Table 1. Board images

Image name	Download target
u-boot-imx7ulp.imx	SD 1st 8 MB block.
boot-imx7ulp.img	SD 1st partition.
recovery-imx7ulp.img	SD 2nd partition.
system.img	SD 3rd partition.
vendor.img	SD 9th partition, holding platform binaries.

Table continues on the next page...

Table 1. Board images (continued)

vbmeta-imx7ulp.img	SD 12th partition, holding verification data.
partition-table.img	Program to first 17k, and then back up to last 17 KB of the SD card. GPT table image for 8 GB SD card.
partition-table-14GB.img	Program to first 17k, and then back up to last 17 KB of the SD card. GPT table image for 16 GB SD card.
partition-table-28GB.img	Program to first 17k, and then back up to last 17 KB of the SD card. GPT table image for 32 GB SD card.
imx7ulp_m4_demo.img	0K offset of NOR flash.

3.3 Flashing board images

The board images can be flashed to the target board by using the MFGTool. The release package includes MFGTool for i.MX 7ULP in android_o8.1.0_1.4.0_7ulp-ga_tools.tar.gz. The MFGTool is mfgtools.zip.

NOTE

The MFGTool only works in Windows OS environment.

Perform the following steps to flash the board images:

1. Unzip the mfgtools.zip file to a selected location. The directory is named MFGTool-Dir in this example.
2. If the directory does not exist, create the "android/evk" directory under the <MFGTool-Dir>/Profiles/Linux/OS Firmware/files path.
3. Copy the following files from release_package/android_o8.1.0_1.4.0_7ulp-ga_image_7ulpevk.tar.gz to your <MFGTool-Dir>/Profiles/Linux/OS Firmware/files/android/evk directory.
   - u-boot-imx7ulp.imx
   - boot-imx7ulp.img
   - system.img
   - recovery-imx7ulp.img
   - partition-table.img
   - imx7ulp_m4_demo.img
   - vendor.img
   - vbmeta.img

   NOTE

   - Do not replace other files in files directory and OS firmware directory.
   - If your SD card is 8 GB, use the default partition-table.img.
   - If your SD card is 16 GB, copy partition-table-14GB.img and rename it to partition-table.img.
   - If your SD card is 32 GB, copy partition-table-28GB.img and rename it to partition-table.img.
   - To test MIPI Display output, copy boot-imx7ulp-mipi.img, recovery-imx7ulp-mipi.img, and vbmeta-imx7ulp-mipi.img, and rename them to boot-imx7ulp.img, recovery-imx7ulp.img, and vbmeta-imx7ulp.img.

4. Change the board's SW1 (boot mode) to 01xx (from 1-4 pin) to enter flash mode.
5. Power on the board. Use USB cable on the board OTG port, and connect a computer running Windows OS with the board. Connect the debug UART with the computer to watch the boot processing.

   NOTE

   - There are two USB ports on the i.MX 7ULP EVK board: A micro USB receptacle for USB to UART, and a USB-C receptacle for USB OTG. The

USB to UART can be referenced as debug UART, and the USB OTG can be referenced as USB in the hardware image above. The debug UART can be used to watch the log of the hardware boot processing.

- There are two UART consoles in the i.MX 7ULP EVK board. One is for Arm Cortex-M4 core and the other is for Arm Cortex-A7 core. To check Android boot information, choose the Arm Cortex-A7 console.
- The SD Card should be plugged in after the board is powered on.

6. Double-click the *.vbs file under your `MFGTool-Dir` directory according to the target device as shown in the following table.

Table 2. MFGTool VBS file

Target device and boot storage	VBS file
i.MX 7ULP EVK SD	mfgtool2-android-mx7ulp-evk-sd.vbs

7. Click Start to start flashing images.

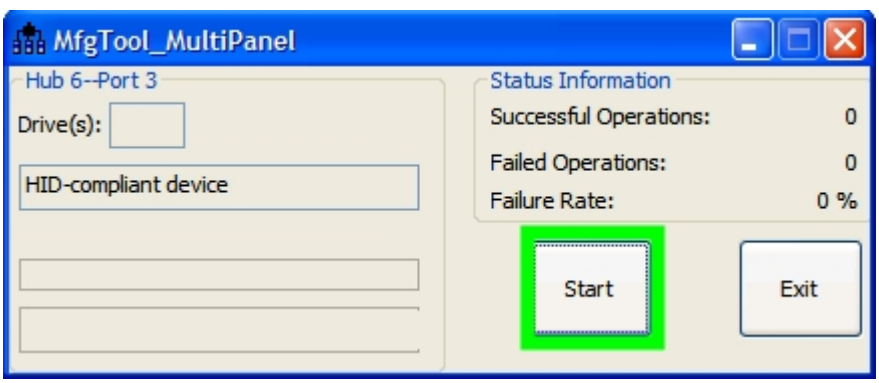

Figure 2. Starting flash

The figure below shows flashing in progress, and the status bar shows the flash status. The flash may take one to two minutes depending on the host machine.

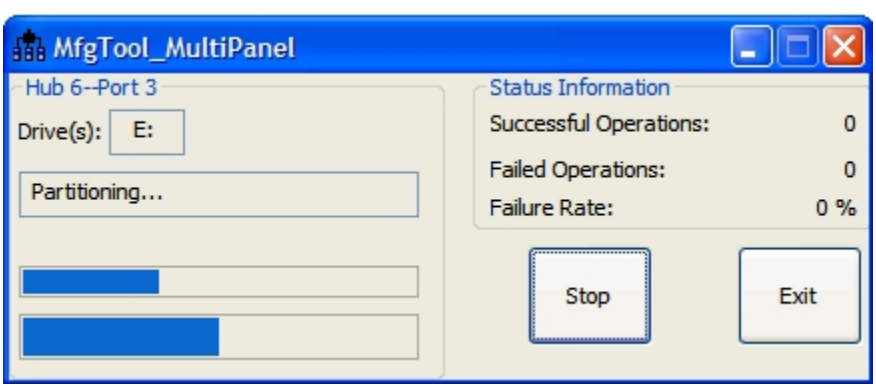

Figure 3. Download status

The figure below shows the tool when the flash is complete.

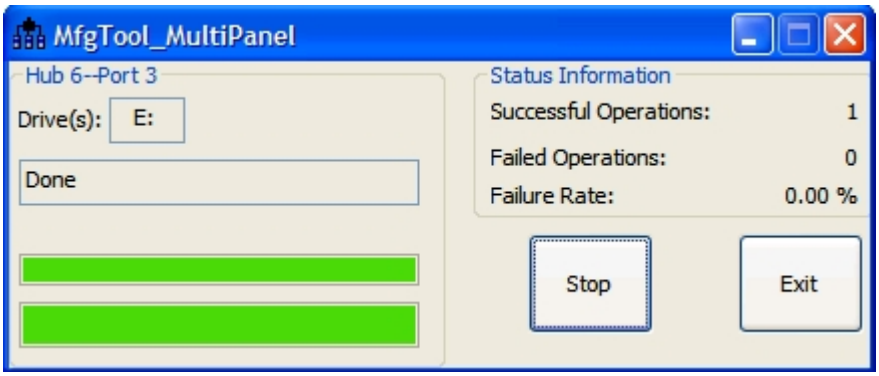

Figure 4. Download complete

8. Click Stop and disconnect the USB cable.
9. Change SW1 (boot mode) to 1001 (from 1 bit to 4 bit). Change SW1 to switch the board back to SD boot mode.

3.4 Booting with single display: HDMI/MIPI display

In the U-Boot prompt, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootargs console=ttyLP0,115200 init=/init androidboot.console=ttyLP0
consoleblank=0 androidboot.hardware=freescale vmalloc=128M cma=448M
U-Boot > saveenv
```

With the settings above, the Android platform does not start the shell console. To disable selinux, append "androidboot.selinux=permissive" to the U-Boot's bootargs. The Boot environment variables are as follows:

```
U-Boot > setenv append_bootargs androidboot.selinux=permissive
U-Boot > saveenv
```

3.5 Board reboot

After you have completed flashing and setup, reboot the board and wait for the Android platform to boot up.

Figure 5. Android Oreo image

4 Revision History

Table 3. Revision history

Revision number	Date	Substantive changes
N7.1.2_1.1.0_7ULP-PRC	06/2017	Initial release
O8.1.0_1.4.0_7ULP-ga	06/2018	i.MX 7ULP GA release

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