

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 8M Nano

Supported boards:

- EVK board and Platform

3 Working with the i.MX 8M Nano Board

3.1 Board hardware

The figures below show the different components of the i.MX 8M Nano board.

Contents

1 Overview	1
2 Hardware Requirements	1
3 Working with the i.MX 8M Nano Board	1
3.1 Board hardware.....	1
3.2 Board images.....	3
3.3 Flashing board images.....	4
3.4 Booting.....	6
3.4.1 Booting with single MIPI-to-HDMI/MIPI panel display.....	6
3.4.2 Booting with single MIPI-to-HDMI display with MCU image.....	7
3.5 Board reboot.....	7
4 Revision History	8



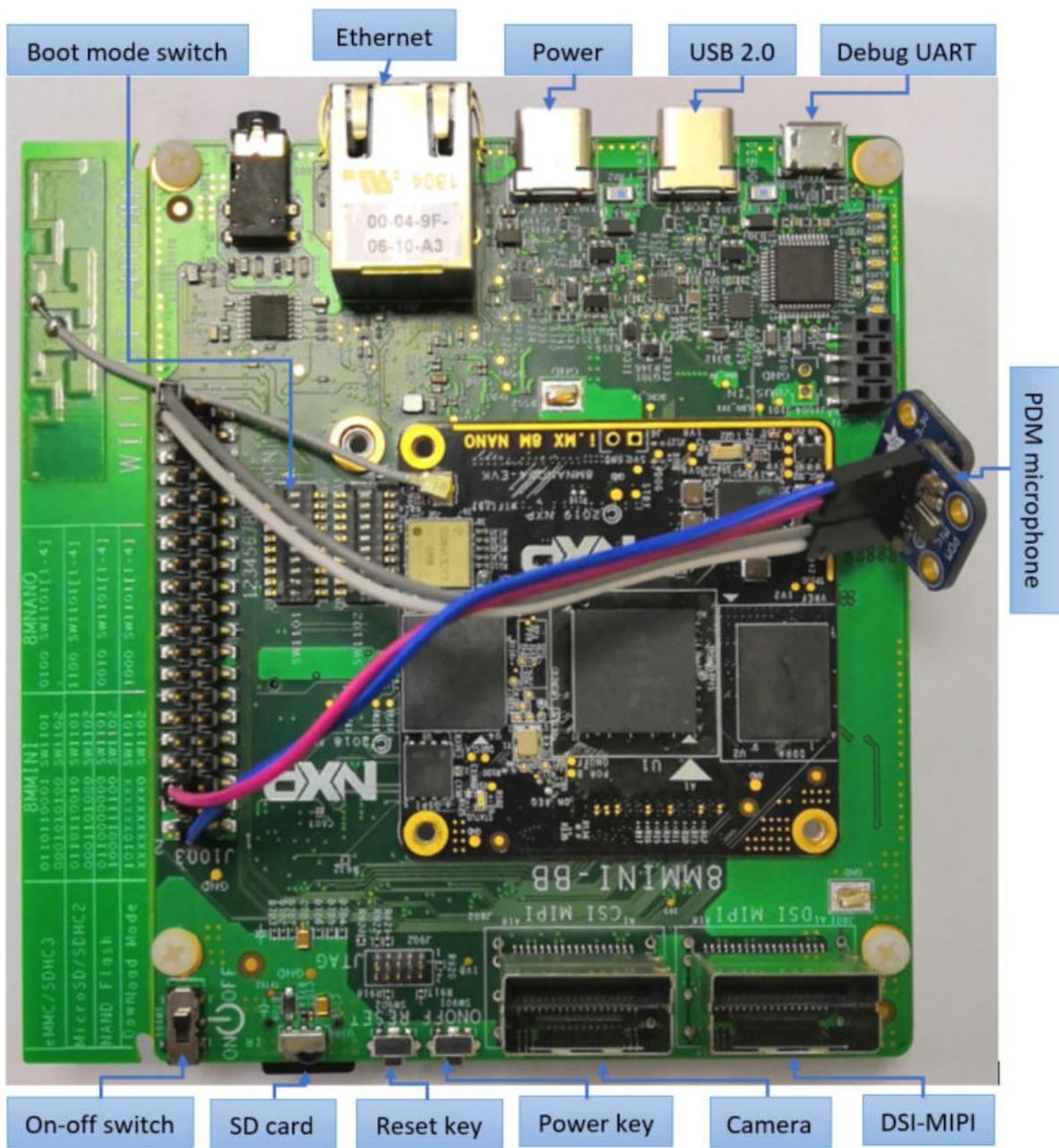


Figure 1. i.MX 8M Nano board



Figure 2. i.MX mini SAS cable with DSI-to-HDMI adapter



Figure 3. i.MX MIPI panel



Figure 4. i.MX MIPI camera

NOTE

- To test the MIPI-DSI to HDMI display, use the i.MX mini SAS cable to connect the DSI-to-HDMI adapter to the "HDMI DSI" port.
- To test the MIPI panel display, connect the i.MX MIPI panel to the "MIPI DSI" port.
- To test the camera, connect the i.MX CSI MIPI Camera to the "Camera" port.
- The BCM 1MW Wi-Fi/bluetooth module is used on the i.MX 8M Nano EVK DDR4 Board.

3.2 Board images

The table below describes the location in the board partitions of the software images in `android_p9.0.0_2.3.1_image_8mnevk.tar.gz`.

Table 1. Board images

Image name	Download target
u-boot-imx8mn.imx	32 KB offset of MMC for a board with DDR4 on it.
u-boot-imx8mn-trusty.imx	32 KB offset of MMC for a board with DDR4 on it.
u-boot-imx8mn-evk-uuu.imx	Bootloader used by UUU for i.MX 8M Nano board with DDR4 on it. It is not flashed to MMC.
imx8mn_mcu_demo.img	5120 KB offset of MMC.
partition-table.img	0 offset of MMC. If the actually size of your SD card is larger than 13 GB, use the default partition-table.img.
partition-table-7GB.img	0 offset of MMC. If the actually size of your SD card is larger than 7 GB, use this image as partition-table.img.
partition-table-28GB.img	0 offset of MMC. If the actually size of your SD card is larger than 28 GB, use this image as partition-table.img.
boot.img	boot_a and boot_b partitions
vbmeta-imx8mn.img	vbmeta_a and vbmeta_b partitions to support DDR4 and MIPI-to-HDMI output.
vbmeta-imx8mn-rpmsg.img	vbmeta_a and vbmeta_b partitions to support DDR4, MIPI-to-HDMI output and MCU image.
vbmeta-imx8mn-mipi-panel.img	vbmeta_a and vbmeta_b partitions to support DDR4 and MIPI panel output.
system.img	system_a and system_b partitions.
vendor.img	vendor_a and vendor_b partitions.
dtbo-imx8mn.img	dtbo_a and dtbo_b partitions to support DDR4 and MIPI-to-HDMI output.
dtbo-imx8mn-rpmsg.img	dtbo_a and dtbo_b partitions to support DDR4, MIPI-to-HDMI output and MCU image.
dtbo-imx8mn-mipi-panel.img	dtbo_a and dtbo_b partitions to support DDR4 and MIPI panel output.

3.3 Flashing board images

The board image files can be flashed into the target board using Universal Update Utility (UUU).

For the UUU binary file, download it from github: [uuu release page on github](#).

To achieve more flexibility, two script files are provided to invoke UUU to automatically flash all Android images.

- uuu_imx_android_flash.sh for Linux OS
- uuu_imx_android_flash.bat for Windows OS

For this release, these two scripts are validated on UUU 1.2.135 version. Download corresponding version from github:

- For Linux OS, download the file named "uuu".
- For Windows OS, download the file named "uuu.exe".

Because the two script files will directly invoke UUU, make sure that UUU is in a path contained by the system environment variable of "PATH".

Perform the following steps to download the board images:

1. Download the UUU binary file from github as described before. Install UUU into a directory contained by the system environment variable of "PATH".
2. Make the board enter serial download mode.
For Rev. C2 boards, change the first four bits of board's sw1101 to 1000 (from 1-4bit) to enter serial download mode.
3. Power on the board. Use the USB cable on the board OTG port to connect your PC with the board.
4. Decompress release_package/android_p9.0.0_2.3.1_image_8mnevk.tar.gz, which contains the image files and uuu_imx_android_flash tool.
5. Execute the uuu_imx_android_flash tool to flash images.

The uuu_imx_android_flash tool can be executed with options to get help information and specify the images to be flashed. For i.MX 8M Nano board, related options are described as follows.

Table 2. Options for uuu_imx_android_flash tool

Option	Description
-h	Displays the help information of this tool.
-f soc_name	Specifies the SoC information. For i.MX 8M Nano, it should be "imx8mn". This option is mandatory.
-a	Only flashes slot a. If this option and "-b" option are not used, slots a and b are both flashed.
-b	Only flashes slot b. If this option and "-a" option are not used, slots a and b are both flashed.
-c card_size	Specifies which partition table image file to flash. For 8M Nano, it can be followed with "7" or "28". If this option is not used, default "partition-table.img" is flashed.
-m	Flashes the MCU image. If this option is not used, the MCU image is not flashed.
-d dev	Specifies some images with "dev" in its name. For i.MX 8M Nano, it can be "rpmmsg", "mipi-panel". If this option is not used, default dtbo and vbmeta images are flashed.
-tos	Flashes the U-Boot image with Trusty OS integrated into it.
-e	Erases user data after images are flashed.
-D directory	Specifies the directory in which there are the images to be flashed. If this option is not used, images in the current working directory are flashed.
-t target_dev	Specifies the target device. For i.MX 8M Nano, it can be "emmc" and "sd". If this option is not used, images are flashed to eMMC.
-daemon	Run UUU in Daemon mode. This option is used to flash multiple boards of the same type.
-i	If the script is executed with this option, no images will be flashed. The script loads U-Boot to RAM and executes to fastboot mode. this option is used for development.

Obviously, "-m" and "-d rpmmsg" should be used together.

- On Linux system, open the shell terminal. For example, you can execute a command as follows:

```
> sudo ./uuu_imx_android_flash.sh -f imx8mn -a -tos -e
```

- On Windows system, open the command line interface in administrator mode. The corresponding command is as follows:

```
> .\uuu_imx_android_flash.bat -f imx8mn -a -tos -e
```

When the command above is executed, the default images will be flashed into eMMC slot a for 8M Nano

NOTE

- Do not use "-tos" together with "-t sd", because the Trusty OS cannot boot from the SD card.
- Do not use "-tos" together with "-d" option, because only the default dtb image has trusty nodes.
- To flash the SD card, execute the tool with "-t sd". To flash eMMC, it does not need to use -t option.
- If your SD card is 16 GB or the on-board eMMC is used as the boot device, it does not need to use -c option.
- If your SD card is 32 GB, execute the tool with "-c 28".
- If your SD card is 8 GB, execute the tool with "-c 7".
- To test the image with Trusty OS, execute the tool with "-tos".
- To test MIPI-DSI to HDMI output with DDR4 on board, no need to use -d option.
- To test MIPI-DSI to HDMI output with DDR4 on board and MCU image, execute the tool with "-d rpmsg".
- To test MIPI panel output with DDR4 on board, execute the tool with "-d mipi-panel".
- uuu_imx_android_flash.bat generates a temporary file under the current working directory. Make sure you have Write permission under the current working directory.
- If uuu_imx_android_flash.bat is used to flash images on a remote server through samba, you need to map the remote resource to the local environment first. Take the following command as an example:

```
> net use z: \\10.193.108.179\daily_images
```

"z" in the command represents an available drive letter. It can be other available drive letter.

6. Wait for the uuu_imx_android_flash execution to complete. If there is not any error, you will get information on the command window indicating that images are already flashed.
7. Power off the board.
8. Change boot device as eMMC or SD card. For Rev. C2 boards:
 - To boot from eMMC, change sw1101 to 0100000000 and change sw1102 to 0000000000.
 - To boot from the SD card, change sw1101 to 1100000000 and change sw1102 to 0000000000.

3.4 Booting

After downloading the images, boot the board by connecting it to the power supply.

3.4.1 Booting with single MIPI-to-HDMI/MIPI panel display

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

```
U-Boot > setenv bootargs console=ttyMX1,115200 earlycon=ec_imx6q,0x30890000,115200 init=/init
androidboot.console=ttyMX1 androidboot.hardware=freescale cma=800M@0x400M-0xb80M
androidboot.primary_display=imx-drm firmware_class.path=/vendor/firmware transparent_hugepage=never
loop.max_part=7 androidboot.wificountrycode=CN
U-Boot > saveenv
```

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

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

3.4.2 Booting with single MIPI-to-HDMI display with MCU image

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

```
U-Boot > setenv bootargs console=ttyMX1,115200 earlycon=ec_imx6q,0x30890000,115200 init=/init
androidboot.console=ttyMX1 androidboot.hardware=freescale cma=800M@0x400M-0xb80M
androidboot.primary_display=imx-drm firmware_class.path=/vendor/firmware transparent_hugepage=never
loop.max_part=7 androidboot.wificountrycode=CN
U-Boot > setenv bootcmd "bootmcu && boota mmc0" # for SD boot
U-Boot > setenv bootcmd "bootmcu && boota mmc1" # for emmc boot
U-Boot > saveenv
```

NOTE

If other dtbo image is used, do not add "bootmcu" to "bootcmd". Use the following command to recover bootcmd:

```
U-Boot > setenv bootcmd "boota mmc0" # for SD boot
U-Boot > setenv bootcmd "boota mmc1" # for emmc boot
U-Boot > saveenv
```

For how to use the Wi-Fi Country Code, see <https://community.nxp.com/docs/DOC-342877>.

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. 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 download and setup, reboot the board and wait for the Android platform to boot up.

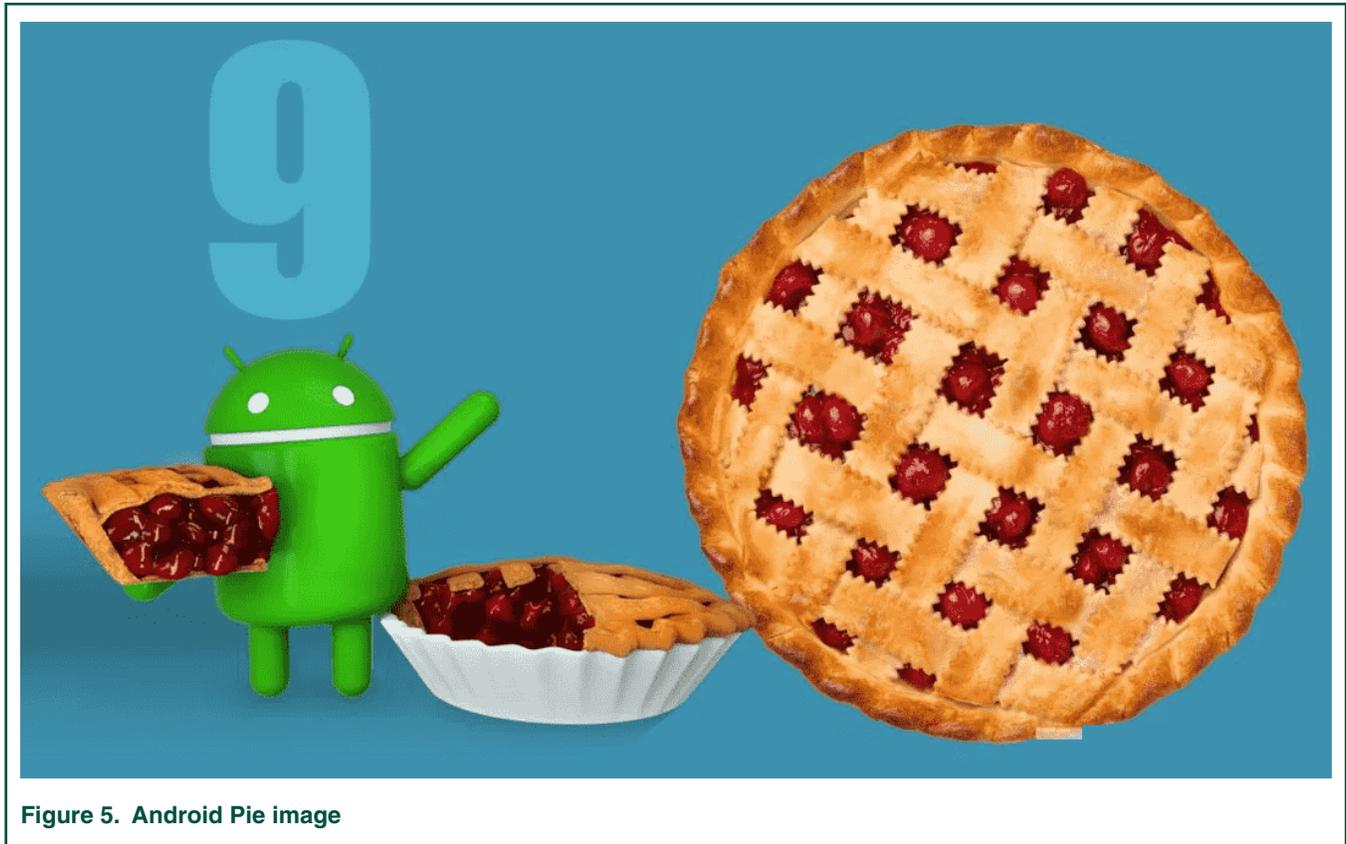


Figure 5. Android Pie image

4 Revision History

Table 3. Revision history

Revision number	Date	Substantive changes
P9.0.0_1.0.0-beta	11/2018	Initial release
P9.0.0_1.0.0-ga	01/2019	i.MX 8M, i.MX 8QuadMax, and i.MX 8QuadXPlus GA release.
P9.0.0_2.0.0-ga	04/2019	i.MX 8M, i.MX 8QuadMax, and i.MX 8QuadXPlus GA release.
P9.0.0_2.3.0	08/2019	i.MX 8M Mini, i.MX 8M Quad, i.MX 8M Nano, and i.MX 8QuadXPlus Alpha release.
P9.0.0_2.3.1	11/2019	i.MX 8M Nano GA release.

How To Reach Us

Home Page:

nxp.com

Web Support:

nxp.com/support

Information in this document is provided solely to enable system and software implementers to use NXP products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits based on the information in this document. NXP reserves the right to make changes without further notice to any products herein.

NXP makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does NXP assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in NXP data sheets and/or specifications can and do vary in different applications, and actual performance may vary over time. All operating parameters, including "typicals," must be validated for each customer application by customer's technical experts. NXP does not convey any license under its patent rights nor the rights of others. NXP sells products pursuant to standard terms and conditions of sale, which can be found at the following address: nxp.com/SalesTermsandConditions.

While NXP has implemented advanced security features, all products may be subject to unidentified vulnerabilities. Customers are responsible for the design and operation of their applications and products to reduce the effect of these vulnerabilities on customer's applications and products, and NXP accepts no liability for any vulnerability that is discovered. Customers should implement appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP, the NXP logo, NXP SECURE CONNECTIONS FOR A SMARTER WORLD, COOLFLUX, EMBRACE, GREENCHIP, HITAG, I2C BUS, ICODE, JCOP, LIFE VIBES, MIFARE, MIFARE CLASSIC, MIFARE DESFire, MIFARE PLUS, MIFARE FLEX, MANTIS, MIFARE ULTRALIGHT, MIFARE4MOBILE, MIGLO, NTAG, ROADLINK, SMARTLX, SMARTMX, STARPLUG, TOPFET, TRENCHMOS, UCODE, Freescale, the Freescale logo, Altivec, C-5, CodeTEST, CodeWarrior, ColdFire, ColdFire+, C-Ware, the Energy Efficient Solutions logo, Kinetis, Layerscape, MagniV, mobileGT, PEG, PowerQUICC, Processor Expert, QorIQ, QorIQ Qonverge, Ready Play, SafeAssure, the SafeAssure logo, StarCore, Symphony, VortiQa, Vybrid, Airfast, BeeKit, BeeStack, CoreNet, Flexis, MXC, Platform in a Package, QUICC Engine, SMARTMOS, Tower, TurboLink, UMEMS, EdgeScale, EdgeLock, eIQ, and Immersive3D are trademarks of NXP B.V. All other product or service names are the property of their respective owners. AMBA, Arm, Arm7, Arm7TDMI, Arm9, Arm11, Artisan, big.LITTLE, Cordio, CoreLink, CoreSight, Cortex, DesignStart, DynamiQ, Jazelle, Keil, Mali, Mbed, Mbed Enabled, NEON, POP, RealView, SecurCore, Socrates, Thumb, TrustZone, ULINK, ULINK2, ULINK-ME, ULINK-PLUS, ULINKpro, µVision, Versatile are trademarks or registered trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere. The related technology may be protected by any or all of patents, copyrights, designs and trade secrets. All rights reserved. Oracle and Java are registered trademarks of Oracle and/or its affiliates. The Power Architecture and Power.org word marks and the Power and Power.org logos and related marks are trademarks and service marks licensed by Power.org.

© NXP B.V. 2018-2019.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 14 November 2019

Document identifier: AQSUG

