



MaaXBoard
(AES-MC-SBC-IMX8M-G)
Android Software
Development Guide
V1.0

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Regulatory Compliance:

- ◆ MaaXBoard single board computer has passed the CE & FCC certification.

Revision History

Version	Note	Author	Release Date
V1.0	Initial version	Sandy	20200326

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Chapter 1 Build Environment Setup

1.1 Setup Build Environment

To setup the build environment requirements:

- ◆ Hardware: At least 300GB of disk space and 8GB of RAM
- ◆ Software: Ubuntu 64bit OS, 18.04 LTS version or later LTS version (Ubuntu Desktop or Ubuntu Server version). You could also run the Ubuntu 64 bit OS on virtual machine.

The following packages are required for the development environment. The required packages can be installed using the bash script below:

```
sudo apt install git-core gnupg flex bison gperf build-essential zip
sudo apt install curl zlib1g-dev gcc-multilib g++-multilib libc6-dev-i386
sudo apt install lib32ncurses5-dev x11proto-core-dev libx11-dev lib32z-dev
sudo apt install ccache libgl1-mesa-dev libxml2-utils xsltproc unzip
sudo apt install uuid uuid-dev liblz-dev liblzo2-2 liblzo2-dev lzop
sudo apt install u-boot-tools mtd-utils android-tools-fsutils
sudo apt install openjdk-8-jdk gdisk
sudo apt install device-tree-compiler
sudo apt install m4 libz-dev
```

Note: You may need to run `sudo apt update` first if the installation failed or can't find specific packages.

For other installation package that may need, refer to Android source code website:

<https://source.android.com/setup/build/requirements>.

After the installation, check the version of JAVA, if the version is not 1.8.0 or higher, update it.

```
java -version
openjdk version "1.8.0_242"
OpenJDK Runtime Environment (build 1.8.0_242-8u242-b08-0ubuntu3~18.04-b08)
OpenJDK 64-Bit Server VM (build 25.242-b08, mixed mode)
```




















Set Git account info, change the "Your name" and "Your mail@company.com" to your actual name and e-mail.

```
git config --global user.name "Your name"
git config --global user.email "Your mail@company.com"
```

Chapter 2 Get Source Code

Avnet provides an entire Android source code package, please visit www.embest-tech.com or connect with your local Avnet FAE.

The source code package is divided into smaller files like following, copy the files to develop folder to combine them, then extract it.

 all.md5sum	 p9.0_android_imx8.tar.gz.aj
 p9.0_android_imx8.tar.gz.aa	 p9.0_android_imx8.tar.gz.ak
 p9.0_android_imx8.tar.gz.ab	 p9.0_android_imx8.tar.gz.al
 p9.0_android_imx8.tar.gz.ac	 p9.0_android_imx8.tar.gz.am
 p9.0_android_imx8.tar.gz.ad	 p9.0_android_imx8.tar.gz.an
 p9.0_android_imx8.tar.gz.ae	 p9.0_android_imx8.tar.gz.ao
 p9.0_android_imx8.tar.gz.af	 p9.0_android_imx8.tar.gz.ap
 p9.0_android_imx8.tar.gz.ag	 p9.0_android_imx8.tar.gz.aq
 p9.0_android_imx8.tar.gz.ah	 p9.0_android_imx8.tar.gz.ar
 p9.0_android_imx8.tar.gz.ai	

Execute the following instructions:

```
cat p9.0_android_imx8.tar.gz.a* > p9.0_android_imx8.tar.gz  
tar -zxvf p9.0_android_imx8.tar.gz
```

Chapter 3 Compile Android Image

Go to p9.0_android_imx8 path, execute the following instructions:

```
embest@Embest-tech:~/p9.0_android_imx8$ source build/envsetup.sh  
embest@Embest-tech:~/p9.0_android_imx8$ lunch em_sbc_imx8m-userdebug  
embest@Embest-tech:~/p9.0_android_imx8$ make -j8 2>&1 | tee build-log.txt
```

Chapter 4 Burn the Image

The default version of MaaXBoard support SD Card. Avnet Manufacturing Services also provide eMMC version for users to customize. To burn the system image to the eMMC, refer to MaaXBoard EMMC Burning Guide.

4.1 Generate Entire System Image

After the compilation, the output files will be generated under the path:

p9.0_android_imx8/out/target/product/em_sbc_imx8m. Files used in burning are listed in following table:

Image file	Description
u-boot-imx8mq.imx	Bootloader for MaaXBoard
boot.img	Boot image for MaaXBoard
system.img	System Boot image for MaaXBoard
vendor.img	Vendor image for MaaXBoard
partition-table-7GB.img	GPT table image for 8 GB SD card and eMMC
partition-table.img	GPT table image for 16 GB SD card
partition-table-28GB.img	GPT table image for 32 GB SD card
dtbo-imx8mq.img	Device Tree image for MaaXBoard to support MIPI panel output.
vbmeta-imx8mq.img	Android Verify Boot metadata image for MaaXBoard to support MIPI panel output.
dtbo-imx8mq-hdmi.img	Device Tree image for MaaXBoard to support HDMI output.
vbmeta-imx8mq-hdmi.img	Android Verify Boot metadata image for MaaXBoard to support HDMI output.
dtbo-imx8mq-lvds.img	Device Tree image for MaaXBoard to support MIPI-to-LVDS output.
vbmeta-imx8mq-lvds.img	Android Verify Boot metadata image for MaaXBoard to support MIPI-to-LVDS output.
dtbo-imx8mq-emmc.img	Device Tree image on eMMC for MaaXBoard to support HDMI output.
vbmeta-imx8mq-emmc.img	Android Verify Boot metadata image on eMMC for MaaXBoard to support HDMI output.

Copy above image files and the bash script generate_android9.0_image.sh to the same folder in Ubuntu. Open terminal, run the following command to view the help of script.

```
./generate_android9.0_image.sh -h
```

1. To generate 8G SD card image, support MIPI-DSI screen

```
sudo ./generate_android9.0_image.sh -c 7 -mipi
```

2. To generate 8G SD card image, support HDMI screen

```
sudo ./generate_andoid9.0_image.sh -c 7 -hdmi
```

3. To generate 8G SD card image, support LVDS screen

```
sudo ./generate_andoid9.0_image.sh -c 7 -lvds
```

4. To generate 8G eMMC image, support HDMI screen

```
sudo ./generate_andoid9.0_image.sh -c 7 -emmc
```

5. To generate 16G SD card image, support MIPI-DSI screen

```
cp partition-table.img partition-table-14GB.img
```

```
sudo ./generate_andoid9.0_image.sh -c 14 -mipi
```

6. To generate other type of image, refer to the help of script.

When the execution finished, it will generate an entire system image:

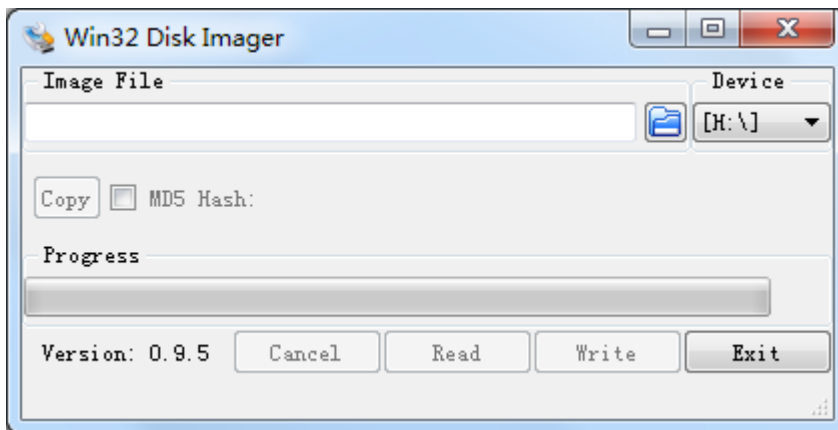
android_rel_imx8m_mipi_YYYY_MM_DD.img (YYYY_MM_DD is the date of generate)

Copy this file to Windows, then you can use Win32 Disk Imager to burn it into SD card. (Refer to User manual).

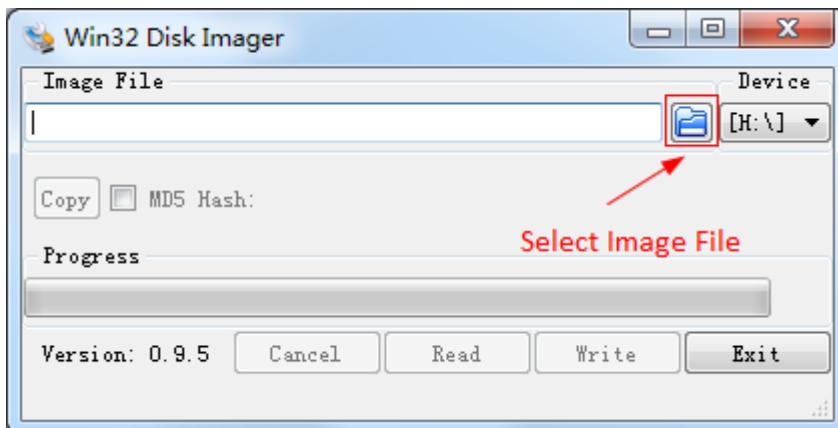
4.2 Read Entire Image

4.2.1 Read the Image from SD Card

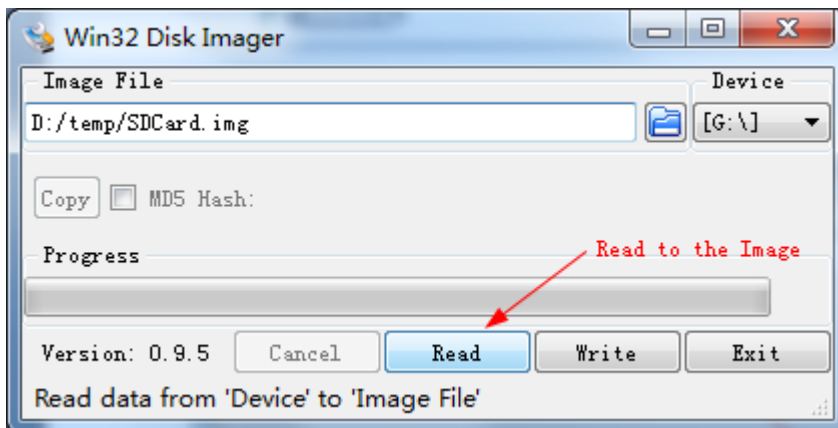
1. Connect the SD Card to Windows system, then run Win32 Disk Imager.



2. Select the destination of image file, such as: D:/temp/SDCard.img.



3. Click "Read" button to read the content of SD Card to img file.



When the progress finished successfully, you will get an entire SD Card Image.

Chapter 5 Appendix

5.1 Hardware

For the detail hardware introduction, please refer to MaaXBoard Hardware User Manual.

5.2 Software

MaaXBoard support Linux Debian system and Android system, for the detail software introduction, please refer to related user manual.

◆ Linux

- ◆ MaaXBoard Linux Software Release Note
- ◆ MaaXBoard Linux Software User Manual
- ◆ MaaXBoard Linux Software Development Guide

◆ Android

- ◆ MaaXBoard Android Software Release Note
- ◆ MaaXBoard Android Software User Manual
- ◆ MaaXBoard Android Software Development Guide

5.3 Android Develop

- ◆ <https://android.googlesource.com/>
- ◆ <https://developer.android.com>