EDM General Installer User's Guide

Rev 2.1   20160108

Contents

1. Overview

The EDM installer can be operated in two modes. One is automatic mode, which installs a pre-programmed image into the eMMC. The other mode is interactive mode, which allows the user to

install a unit from his/her Windows computer.

2. Support Hardware

These are the systems covered in this guide:

System-on-Modules:

- EDM1-CF-IMX6
- EDM1-CF-IMX6SX
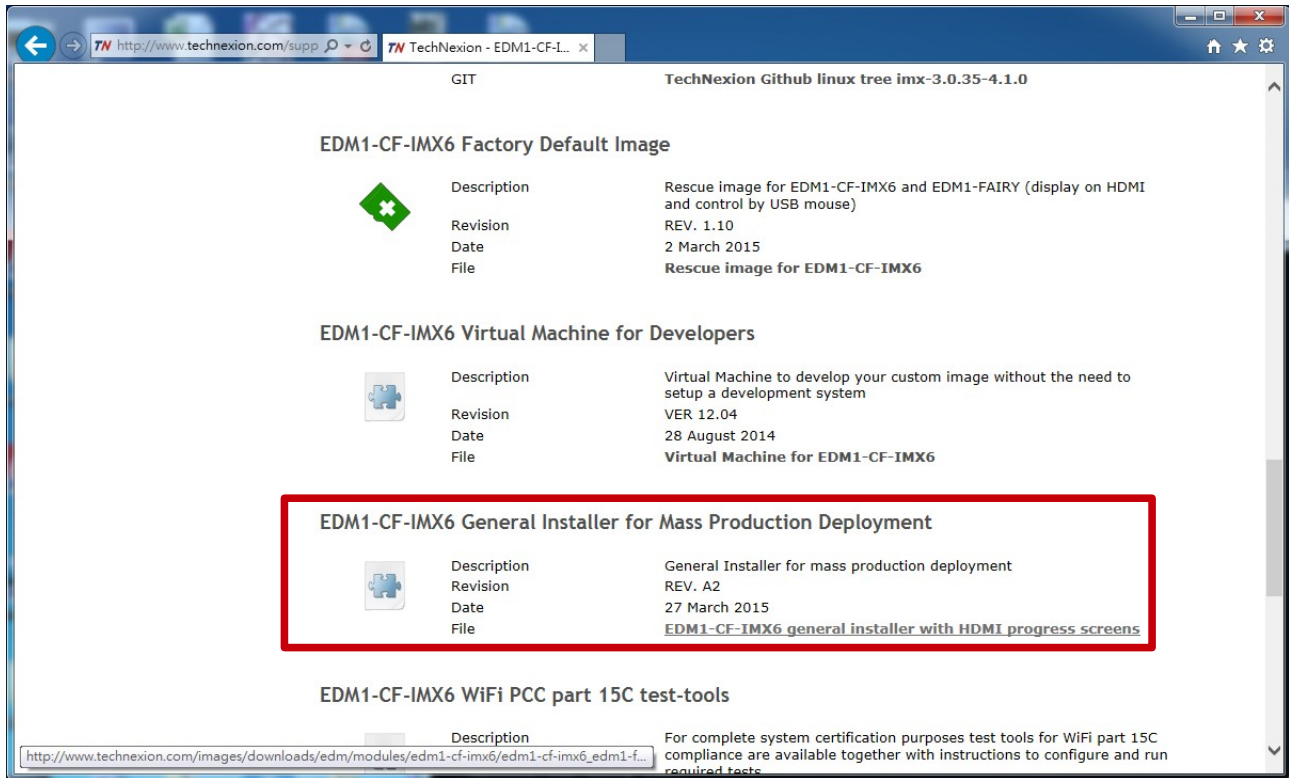- EDM2-CF-IMX6
- PICO-IMX6

Carrier Boards:

- EDM1-FAIRY
- EDM1-GOBLIN
- EDM2-ELF
- Toucan-0700
- PICO-DWARF
- PICO-HOBBIT

3. Download Installer image
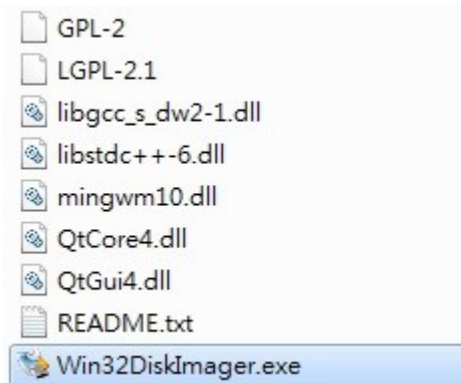
Please visit Technexion download page:
http://www.technexion.com/index.php/support/edm/edm1-cf-imx6

Select the download link of installer image for HDMI or 7-inch LVDS display panel.
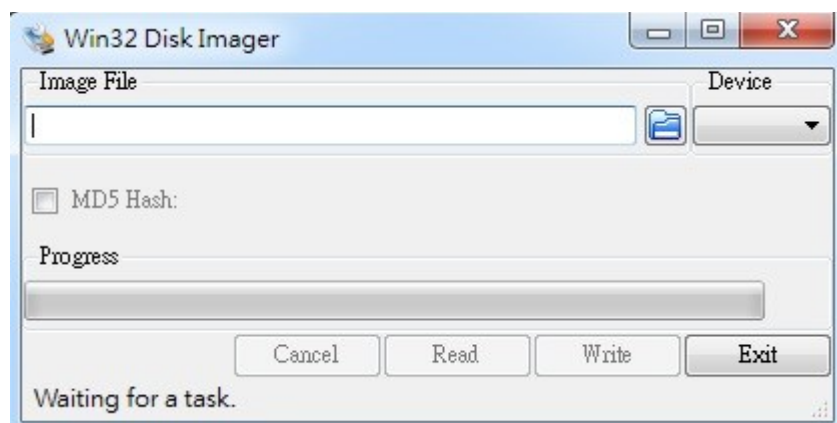
4. Make installer SD

If your PC runs Windows OS:

Please unzip the win32diskimager.zip:

Execute **Win32DiskImager.exe**.

Prepare a microSD card. Insert this microSD card into the card reader of PC.

Choose microSD you insert as "Device".
Select the "edm1-cf-imx6_edm1-fairy_generic-installer_hdmi_xxx.img" as "Image File".
Then, press "Write". **Win32DiskImager** will flash yocto installer image into microSD card.

If your PC runs Ubuntu OS:

Prepare a microSD card. Insert this microSD card into the card reader of PC.

Use 'dd' command to flash yocto installer image into microSD card.

```
 $ sudo dd if=edm1-cf-imx6_edm1-fairy_generic-installer_hdmi_xxx.img of=/dev/sd<partition> bs=1M && sync
```
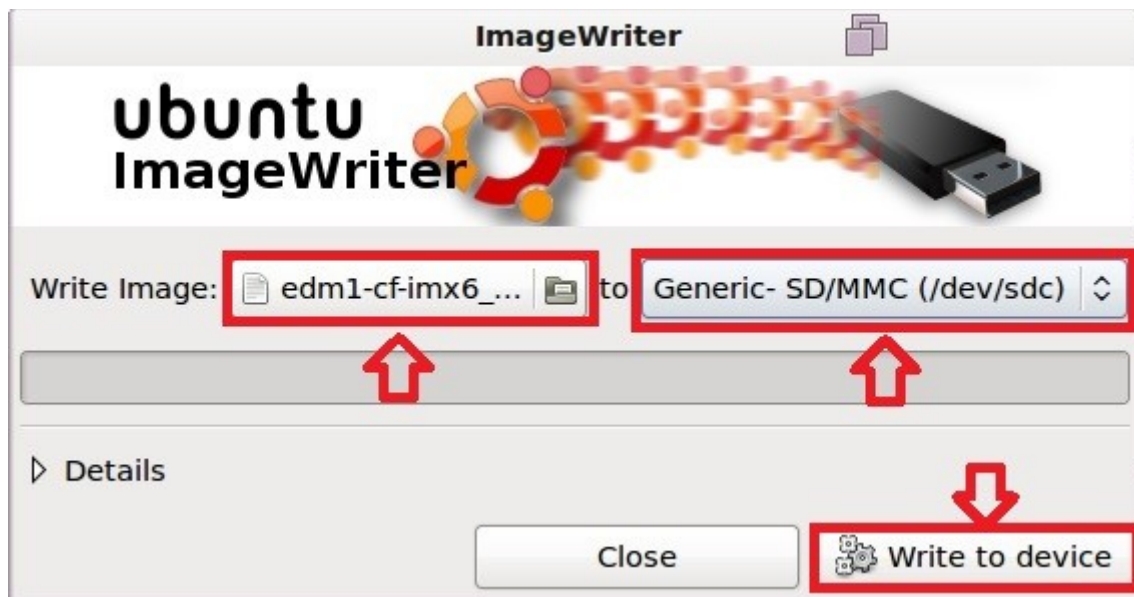
Or

Use "imageWriter" tool.
https://apps.ubuntu.com/cat/applications/precise/usb-imagewriter/
Install "imageWriter":

```
  sudo apt-get install usb-imagewriter
```

Execute "imageWriter":

```
  sudo imagewriter
```


Choose microSD you insert as "Device".
Select the "edm1-cf-imx6_edm1-fairy_generic-installer_hdmi_xxx.img" as "Write Image".
Then, press "Write to device". **imagewriter** will flash Yocto installer image into microSD card.

5. Run installer on target board

5.1 Set up boot mode

Run eMMC installer image will install OS image into eMMC of CPU module.

For EDM1-FAIRY/EDM1-GOBLIN/EDM2-ELF:

Plug "**EDM-MNF-BOOT PCB"** into MNF slot on EDM1-Fairy baseboard.
It will cause EDM1-Fairy boot from external microSD card instead of eMMC.
Then, insert MicroSD card with yocto installer image inside into EDM1-Fairy baseboard.
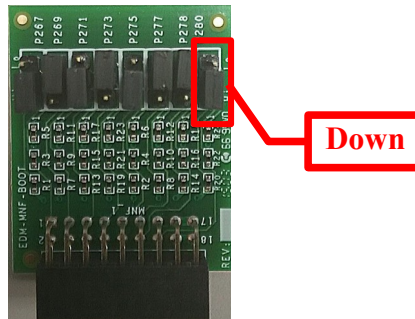
EDM-MNF-BOOT PCB

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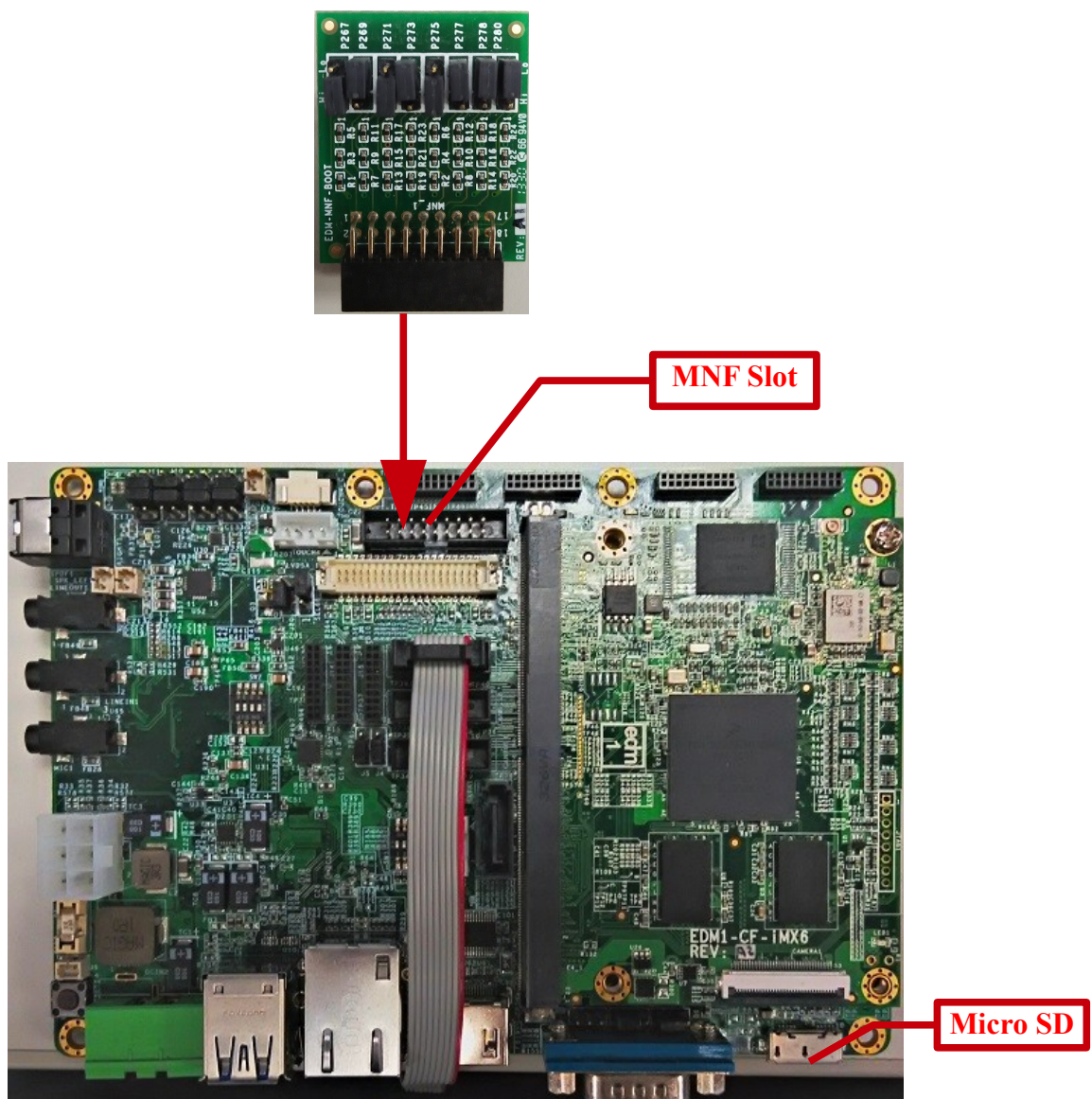
Note: **The rightmost jumper of EDM-MNF-BOOT PCB is different for EDM1-CF-IMX6 and EDM1-CF-IMX6SX.**
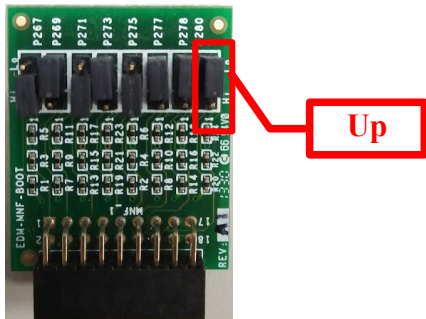
For EDM1-CF-IMX6   **For EDM1-CF-IMX6SX**

For Toucan-0700:

There is on-board eMMC on EDM1-CF-IMX6 CPU module. Run installer on SD card will install pre-built image into eMMC.

Insert the SD card into Toucan baseboard. Hold down "S1" and press "RST" button.
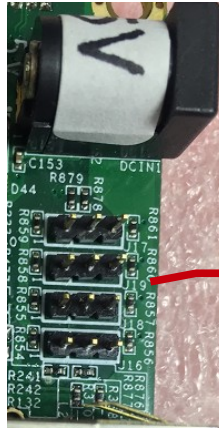(PS. Hold down "S1" button will switch the boot mode to SD card. Then press "RST", the board will reboot from SD card.)

Then, power on target board.

For PICO-IMX6-DWARF:

Take out all jumpers on J16, J17, J18, J19. It will switch boot mode to boot from eMMC/SD card of CPU module:
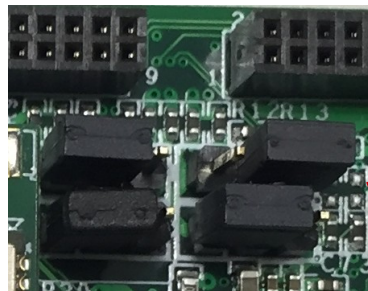

Boot from eMMC of CPU module

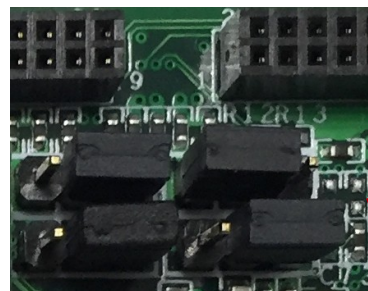Install jumpers as below, and board will boot from SD card of baseboard:

Boot from SD of baseboard

For PICO-IMX6-HOBBIT:

Boot from eMMC of CPU module

Boot from SD of baseboard

5.2 Storage mode

By default there is no pre-programmed image to install in the installer. When run, the installer enters storage mode.

Attach a USB OTG cable to the development kit and attach the other end to a USB host port on a Windows computer. A mass storage device will appear.

Use "**Win32DiskImager**" or "dd" command (see Section 3 "Make installer SD", but this time the device is eMMC, instead of SD card) to burn image to the mass storage device, will install the image into eMMC.

Once the copying has finished, unplug the "**EDM-MNF-BOOT PCB**", remove the SD card and reboot your development kit. If everything is right, your image will now boot.

5.3 Automatic mode

This section describes the technicalities of preparing an installer SD card. The SD card created will install an image for every boot, without any user interaction.

5.3.1 Installer SD card overview

The EDM installer SD card has two partitions. The very first one, is a FAT partition containing boot files, and more importantly the image to be installed. The second partition is the installer it self, and users should not have to touch the second partition.

The quickest way to make a custom installer (each step is explained in more detail further down this document) is:

1. Prepare an image file to be installed

2. Compress it with xz

3. Place it in images/image.xz on the FAT partition.

This way, the installer will install the image.xz into eMMC.

5.3.2 Preparing an image file

The image file is expected to be a compressed block device image. One way to prepare a such image is to first manually prepare one unit where the software works as intended.

Then use the 'dd' command to take a block-by-block copy of the eMMC content to an SD card. In its simplest form:

```
# dd if=/dev/mmcblk1 of=/mnt/sdcard/image
```

In practice there are a few things that can be done more efficiently than a crude copy.

First, the command above copies the whole eMMC to a file on the SD card. You might not use it all. When partitioning your eMMC, leaving some part of the eMMC unpartitionened would decrease the install time. The smaller the eMMC image, the faster it installs.

Second, when copying the eMMC content to a file, only copy the actually used (partitioned) area. One way to do that is

```
bl=`echo pq | fdisk -u /dev/mmcblk1 | grep /dev/ | tail -1 | awk '{print $3}'`
# dd if=/dev/mmcblk1 of=/mnt/sdcard/image bs=$bl count=512
```

The last step is to compress the image file.
On a desktop computer running linux, it can be done by:

```
# xz -9 image
```

This will take some time, depending on the size of image and speed of your computer.

5.3.3 Customizing the installation process

To be written at a later point.

5.3.4 Tips and tricks

The maximum size of the compressed image is about 1GB. There are some tricks to reduce the size of the compressed image.

The most useful one is to fill the unused space in image with zeroes (by default the empty space contains remnants of whatever files has been stored there).

Before creating the image file, fill the device with a large, but empty file:

```
# dd if=/dev/zero of=/media/sdcard/file bs=1M
# umount /media/sdcard
# mount /dev/sdcard /media/sdcard
# rm -f /media/sdcard/file
```

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The unmount/mount step is needed to ensure that the file is written out to the file system, and not just staying in the fs cache.

Then proceed with 'dd' ing the eMMC to an image file. The empty space will then xz-compress very well.