

Pre-built OS Image Installation Guide

Rev 3.4 20170619



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1. Supported Products

These are the systems covered in this guide:

System-on-Modules

- EDM1-CF-IMX6
- EDM1-IMX6P
- EDM1-IMX6PLUS
- EDM1-CF-IMX6SX
- PICO-IMX6
- PICO-IMX6POP
- PICO-IMX6UL-EMMC
- PICO-IMX6UL-NAND
- PICO-IMX7D

Carrier Boards

- EDM1-FAIRY
- EDM1-GOBLIN
- EDM2-ELF
- PICO-DWARF
- PICO-HOBBIT
- PICO-NYMPH
- PICO-PI

Fanless Computing

- TEK3-IMX6
- TEK3-IMX6UL

Panel Computing

- TEP-0500/TEP-0700 -IMX6UL
- TEP-1010/TEP1560 -IMX6
- TC-07x0/TC-1000

2. Download Pre-Built OS image

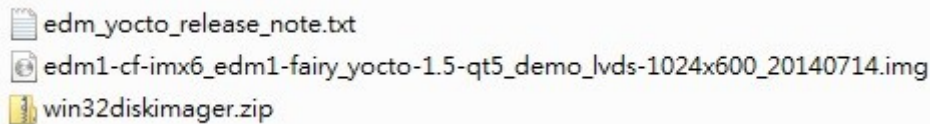
Please visit TechNexion download page:

ftp://ftp.technexion.net/demo_software

Choose the product you have. There are prebuilt images for different OS, e.g. Android, Ubuntu, or Yocto with different displays as primary.

3. Make eMMC installer

Unzip the file you download.



There are three files:

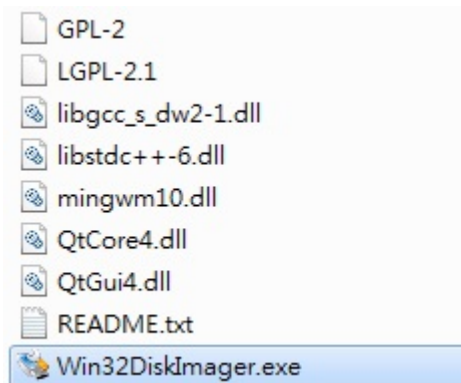
edm_yocto_release_note.txt

edm1-cf-imx6_edm1-fairy_yocto-1.5-qt5_demo_lvds-1024x600_2014xxxx.img

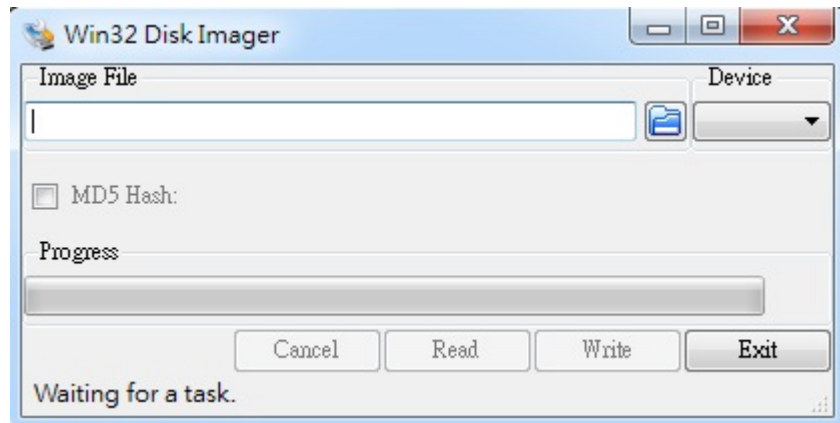
win32diskimager.zip

If your PC runs Windows OS:

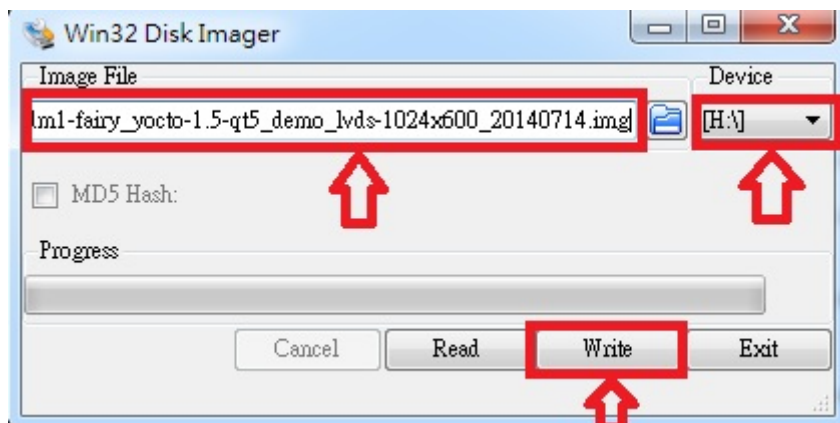
Please unzip win32diskimager.zip:



Execute **Win32DiskImager.exe**.



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



Choose microSD under “Device”.

Select “**edml-cf-imx6_edml-fairy_yocto-X.X-qt5_demo_lvs-1024x600_201YMMDD.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=edml-cf-imx6_edml-fairy_yocto-1.5-qt5_demo_lvs-1024x600_2014xxxx.img of=/dev/sd<partition> bs=1M && sync
```

Or

Use “imageWriter” tool.

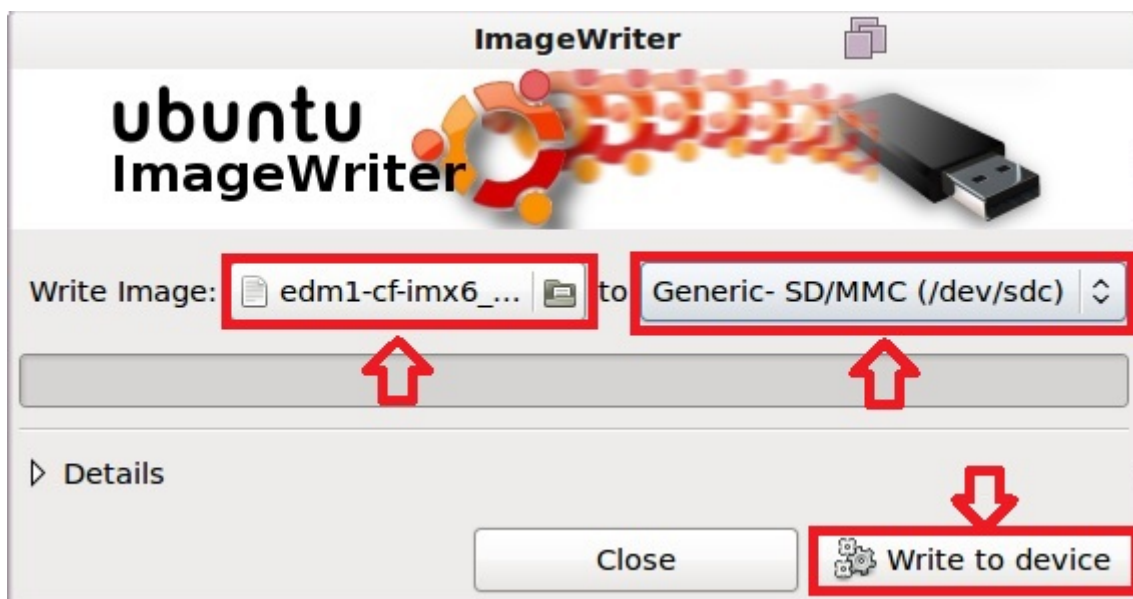
<https://apps.ubuntu.com/cat/applications/precise/usb-imagewriter/>

Install “imageWriter”:

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

Execute “imageWriter”:

```
sudo imagewriter
```



Choose microSD you insert as “Device”.

Select “**edm1-cf-imx6_edm1-fairy_yocto-1.5-qt5_demo_lvds-1024x600_2014xxxx.img**” as “Write Image”.

Then, press “Write to device”. **imagewriter** will flash Yocto installer image into microSD card.

4. Set up boot mode to run installer image on target board

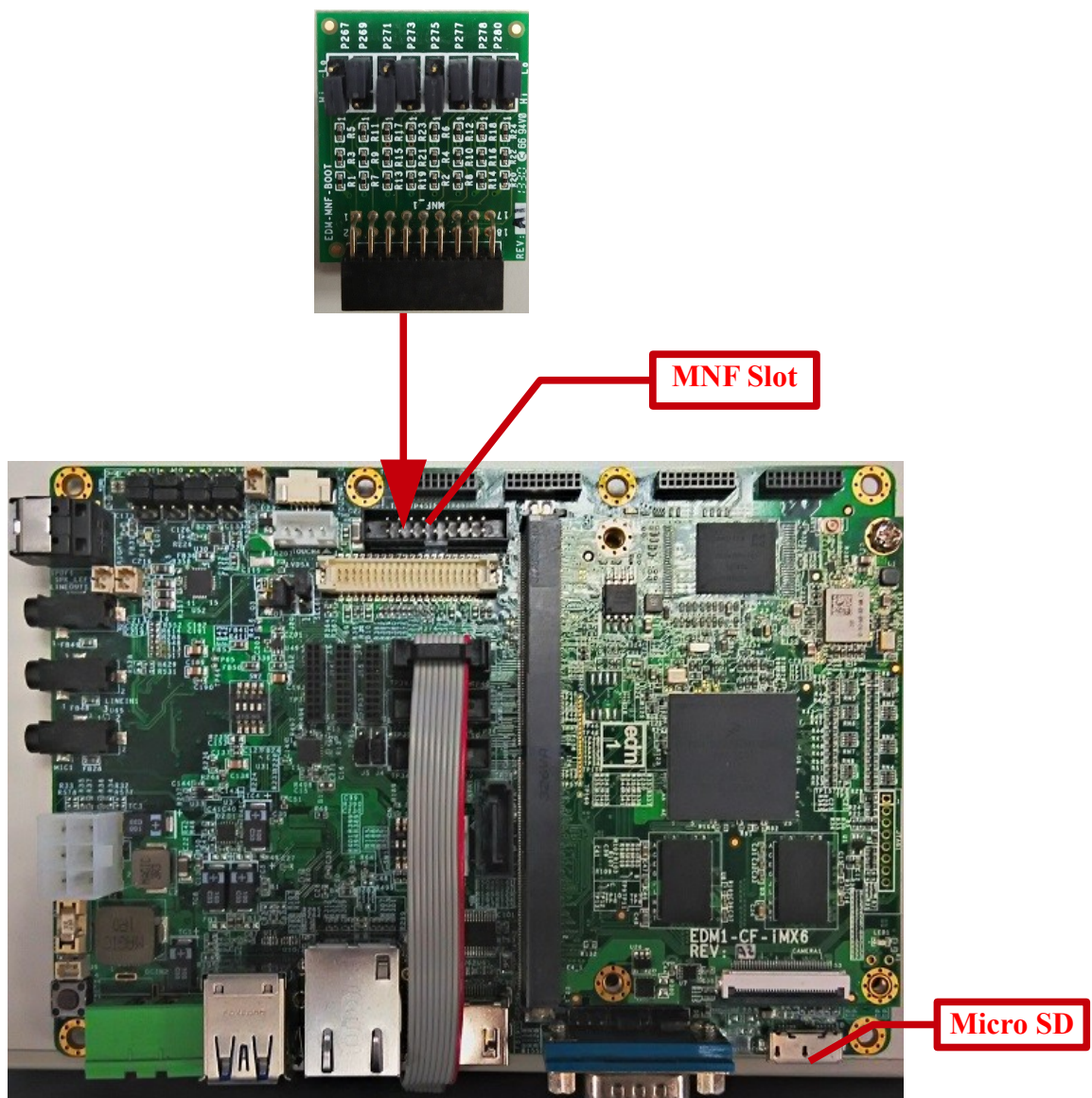
Switch the boot mode to boot from SD card of baseboard to run the installer image.
The installer image will install OS image into the eMMC on CPU module.

4.1 Platforms based on i.MX6Solo/DualLite/Dual/Quad/QuadPlus/SoloX

4.1.1 EDM1-CF-IMX6 with FAIRY/GOBLIN/ELF

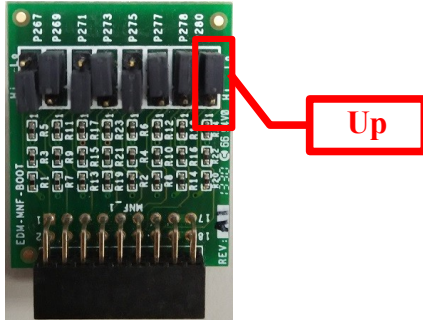
Plug “EDM-MNF-BOOT PCB” into MNF slot on EDM1-Fairy baseboard.
It will cause EDM1-Fairy boot from external microSD card instead of eMMC.
Then, insert MicroSD card with yocto installer image inside into EDM1-Fairy baseboard.

EDM-MNF-BOOT PCB

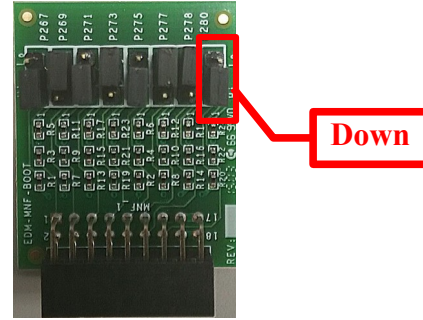


Note: The rightmost jumper of EDM-MNF-BOOT PCB is different on EDM1-CF-IMX6 and EDM1-CF-IMX6SX.

For EDM1-CF-IMX6



For EDM1-CF-IMX6SX



4.1.2 TC-07x0/TC-1000

Insert the SD card into the TC-07x0 system. Hold down “S1” and press “RST” button.

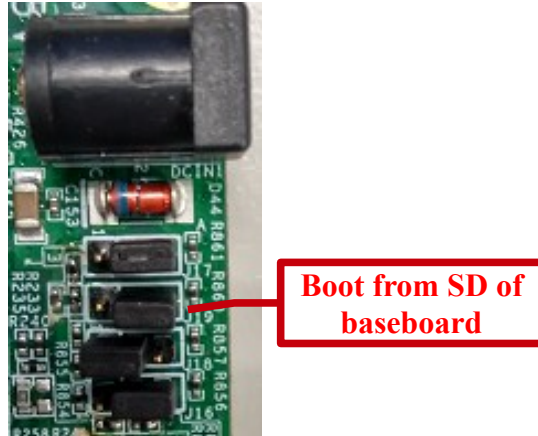
(PS. Hold down “S1” button will switch the boot mode to SD card. Then press “RST”, the board will reboot from SD card.)



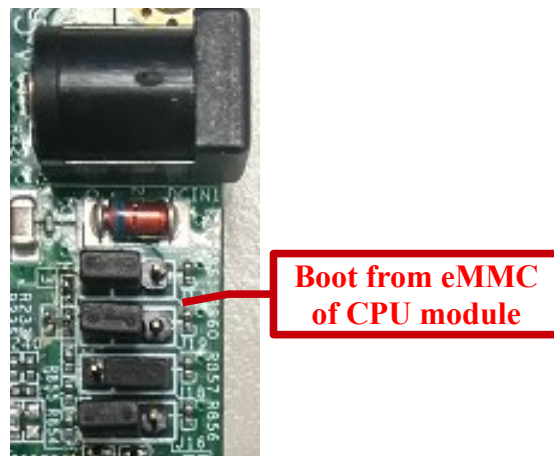
Then, power on your unit.

4.1.3 PICO-IMX6_DWARF

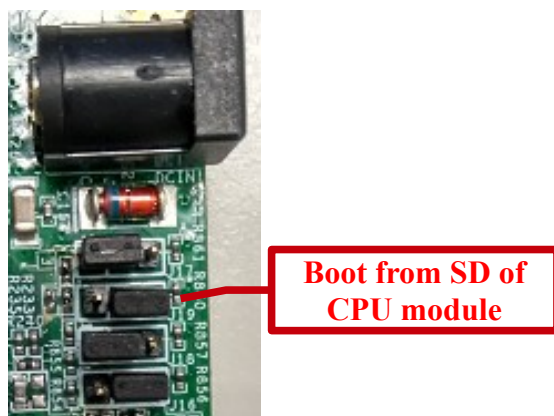
Install jumpers as below, and board will boot from SD card of baseboard:



Install jumpers as below, and board will boot from eMMC card of CPU module:

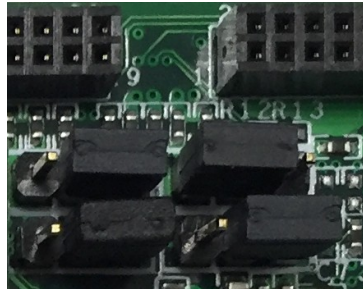


Install jumpers as below, and board will boot from SD card of CPU module:



4.1.4 PICO-IMX6_HOBBIT

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



**Boot from SD of
baseboard**

Install jumpers as below, and board will boot from eMMC card of CPU module:



**Boot from eMMC
of CPU module**

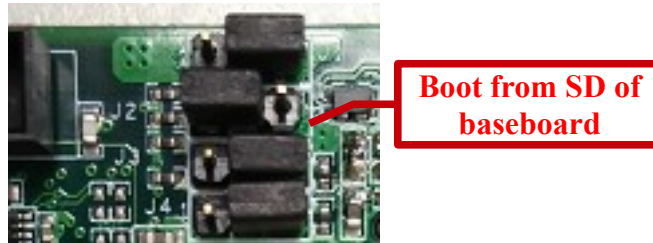
Install jumpers as below, and board will boot from SD card of CPU module:



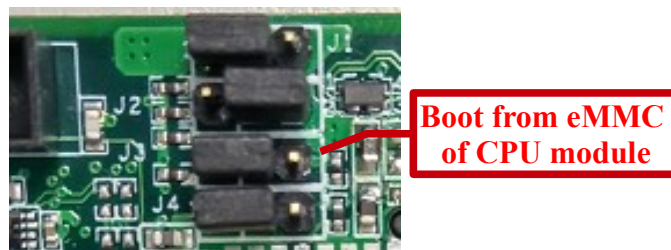
**Boot from SD of
CPU module**

4.1.5 PICO-IMX6_NYMPH

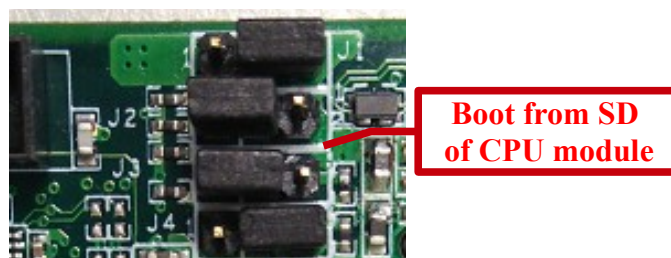
Install jumpers as below, and board will boot from SD card of baseboard:



Install jumpers as below, and board will boot from eMMC card of CPU module:



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



4.1.6 TEK3-IMX6/TEP-IMX6

Insert the SD card into the TEK3-IMX6. Hold down “S1” and press “RST” button.

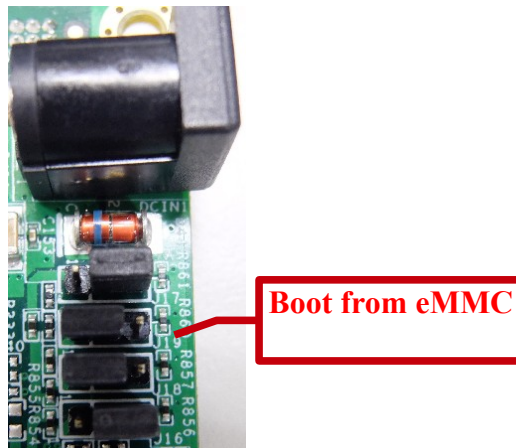
(PS. Hold down “S1” button will switch the boot mode to boot from SD card. Then press “RST”, the board will reboot from SD card.)



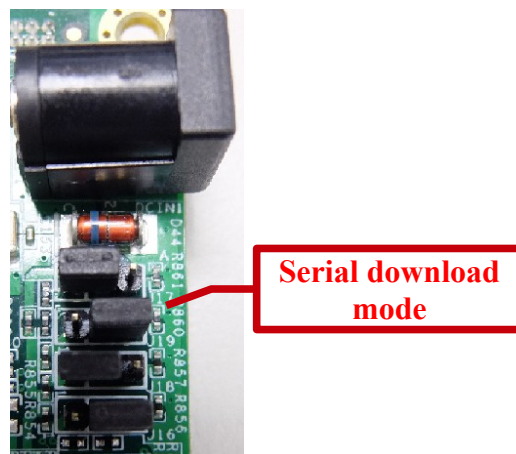
4.2 Platforms based on i.MX6UL

4.2.1 PICO-IMX6UL-EMMC_DWARF

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

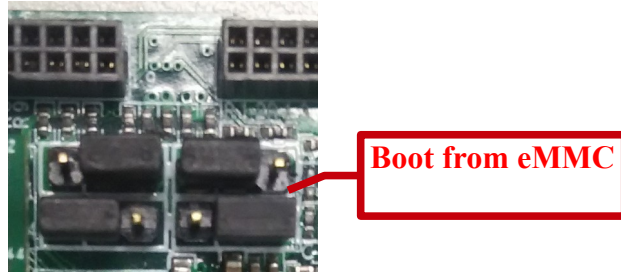


Install jumpers as below, and board will boot from NAND of CPU module:

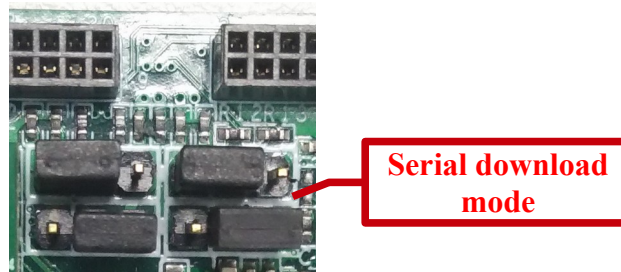


4.2.2 PICO-IMX6UL-EMMC_HOBBIT

Install jumpers as below, and board will boot from eMMC of CPU module:

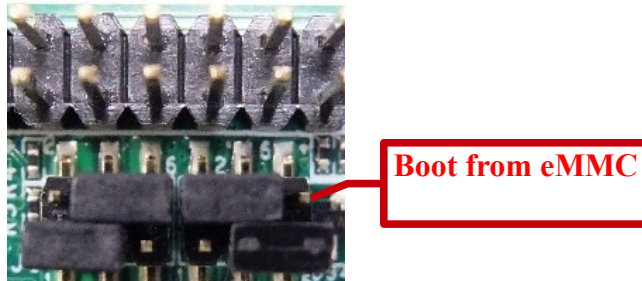


Install jumpers as below, and board will boot from serial boot loader:

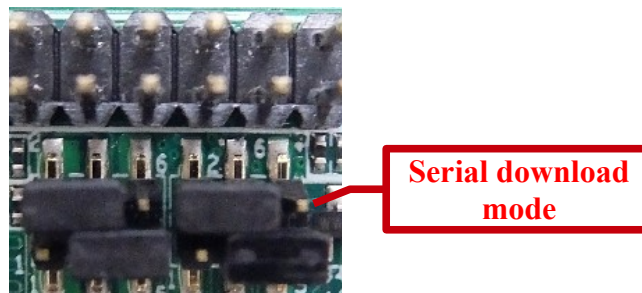


4.2.3 PICO-IMX6UL-EMMC_PI

Install jumpers as below, and board will boot from eMMC of CPU module:

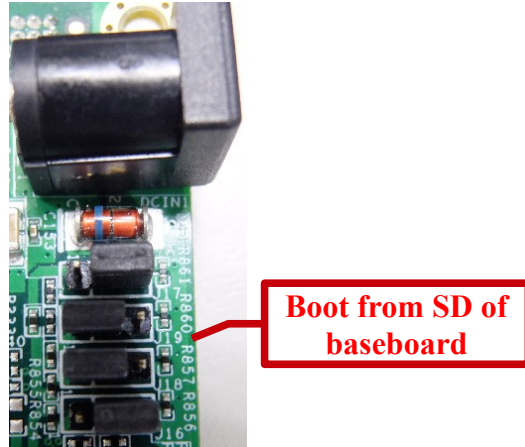


Install jumpers as below, and board will boot from serial boot loader:

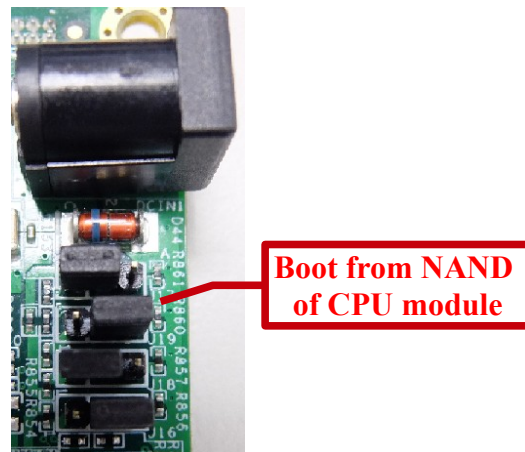


4.2.4 PICO-IMX6UL-NAND_DWARF

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

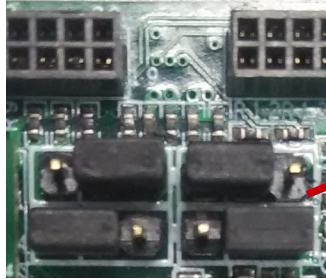


Install jumpers as below, and board will boot from NAND of CPU module:



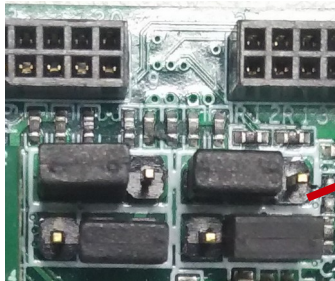
4.2.5 PICO-IMX6UL-NAND_HOBBIT

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



**Boot from SD of
baseboard**

Install jumpers as below, and board will boot from NAND of CPU module:

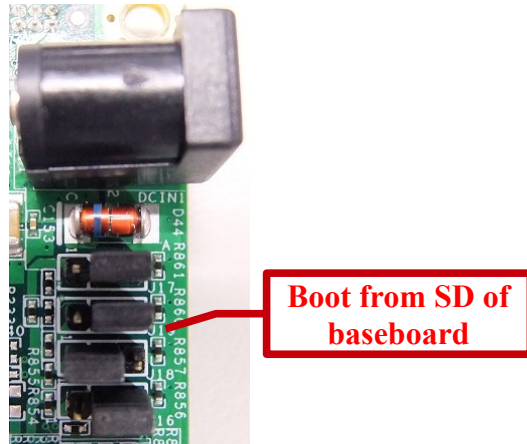


**Boot from NAND
of CPU module**

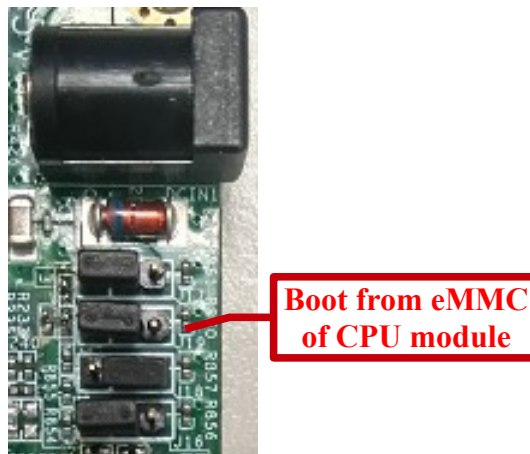
4.3 Platforms based on i.MX7D

4.3.1 PICO-IMX7D_DWARF

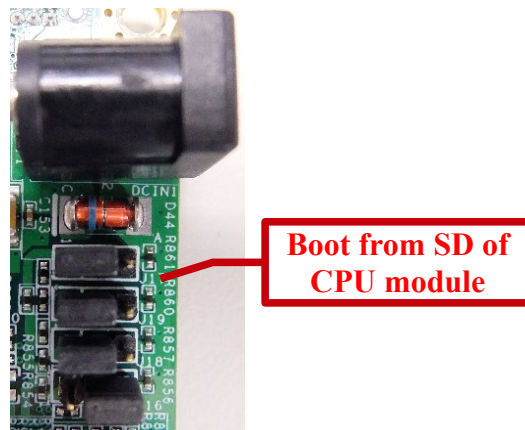
Install jumpers as below, and board will boot from SD card of baseboard:



Install jumpers as below, and board will boot from eMMC card of CPU module:

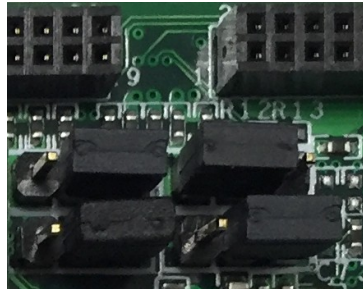


Install jumpers as below, and board will boot from SD card of CPU module:



4.3.2 PICO-IMX7D_HOBBIT

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



**Boot from SD of
baseboard**

Install jumpers as below, and board will boot from eMMC card of CPU module:



**Boot from eMMC
of CPU module**

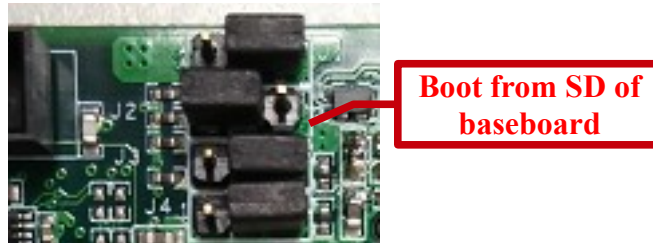
Install jumpers as below, and board will boot from SD card of CPU module:



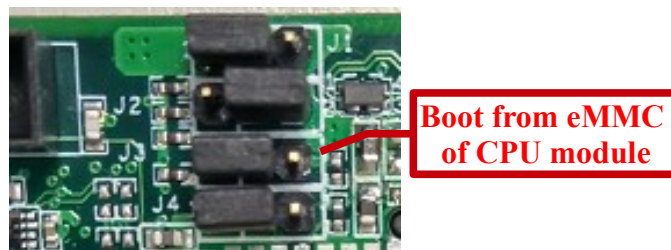
**Boot from SD of
CPU module**

4.3.3 PICO-IMX7D_NYMPH

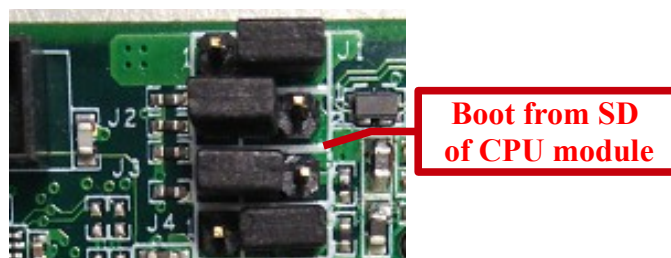
Install jumpers as below, and board will boot from SD card of baseboard:



Install jumpers as below, and board will boot from eMMC card of CPU module:

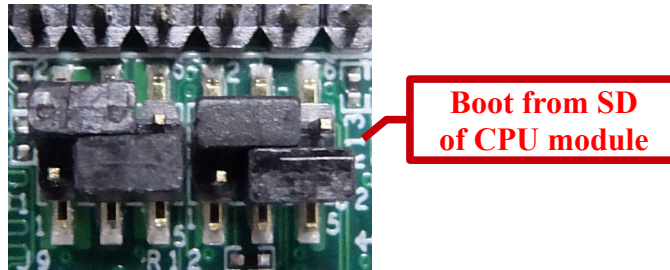


Install jumpers as below, and board will boot from SD card of CPU module:

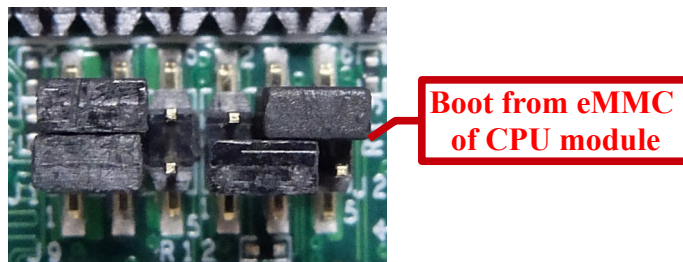


4.3.4 PICO-IMX7D_PI

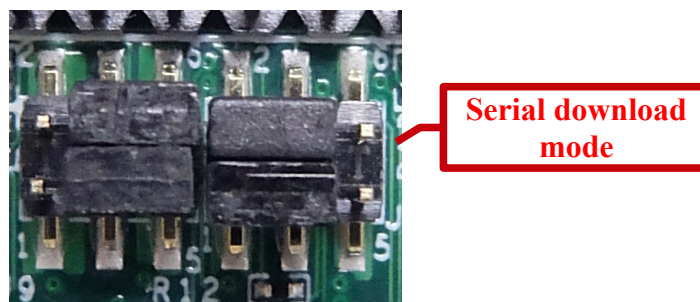
Install jumpers as below, and board will boot from SD card of CPU module:



Install jumpers as below, and board will boot from eMMC of CPU module:

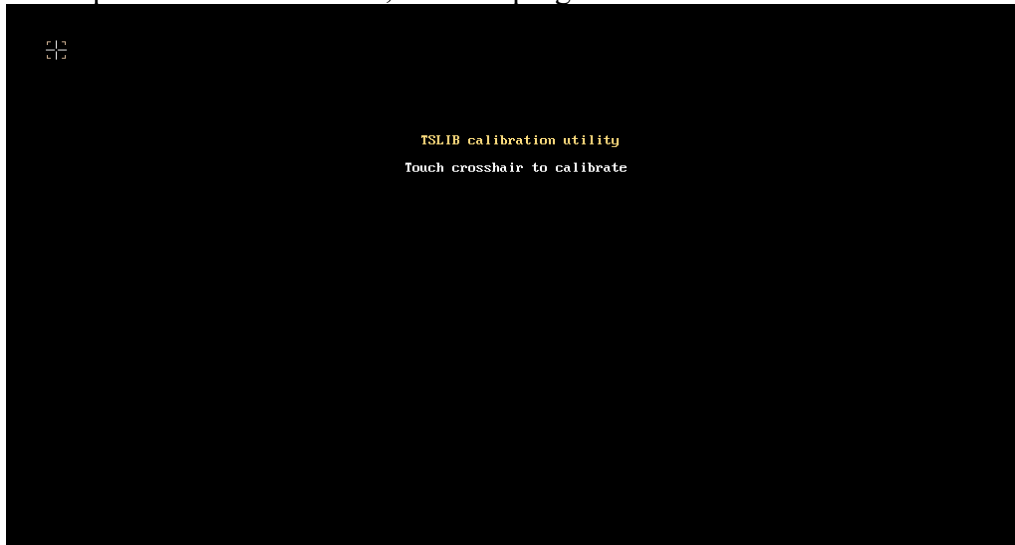


Install jumpers as below, and board will boot from serial boot loader:



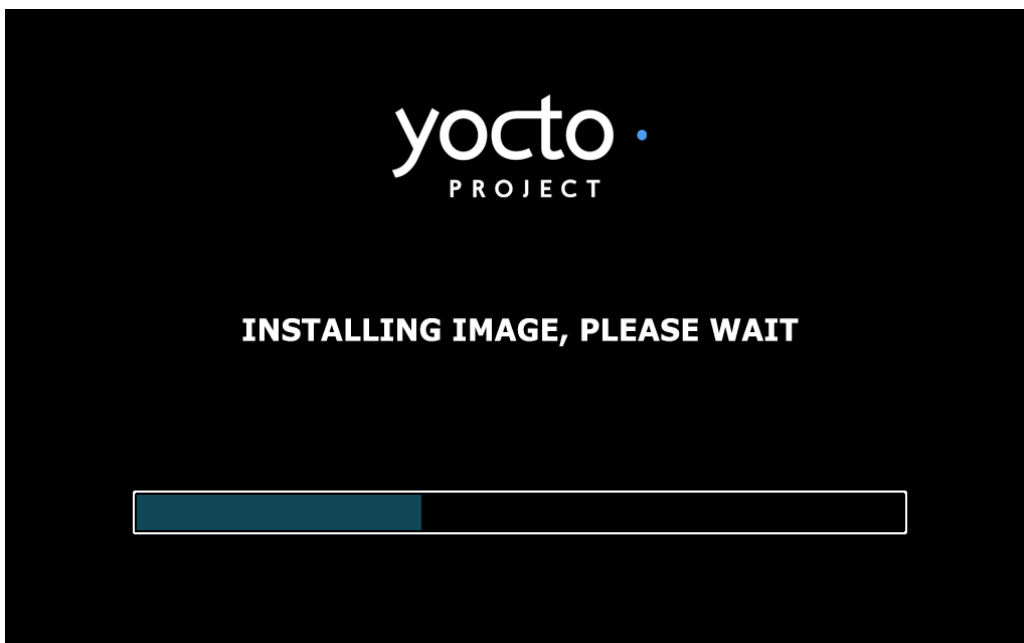
5. Resistive touch calibration

If the touch panel is resistive touch, installer program will enter into calibration mode first.



(Capacitive touch panels don't need to be calibrated.)

After calibration is done, the installer program will start to flash Yocto image to eMMC.



Wait until the installation completes.



Please remove microSD card and switch boot mode to “boot from eMMC”. Then, reboot the board.

Note:

For EDM1-FAIRY/EDM1-GOBLIN/EDM2-ELF, it needs to remove the “EDM-MNF-BOOT PCB” to switch boot mode to “boot from eMMC”.

For PICO-DWARF/PICO-HOBBIT/PICO-NYMPH/PICO-PI, it needs to adjust the boot jumpers to switch boot mode to “boot from eMMC”.

6. Use USB-OTG intaller tool to program eMMC

The method that we introduce in **Section 4. Set up boot mode to run installer image on target board** requires the target board with SD card slot. For some boards, there is no SD card slot. Then USB-OTG installer may be the another choice for you to program the target image into eMMC.

Download USB-OTG installer tool from TechNexion FTP:

ftp://ftp.technexion.net/development_resources/development_tools/installer/pico-imx7-imx6ul-imx6ull_otg-installer_20170112.zip

The supported platforms are as follows:

- PICO-IMX6UL-EMMC
- PICO-IMX6ULL-EMMC
- PICO-IMX7-EMMC

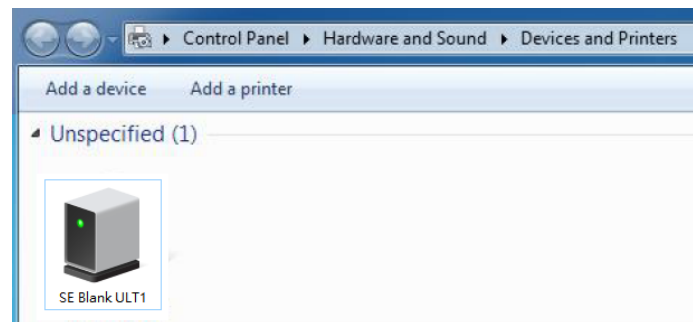
Installation from both Windows and Linux platforms are supported.

6.1 Run USB-OTG installer on Windows host

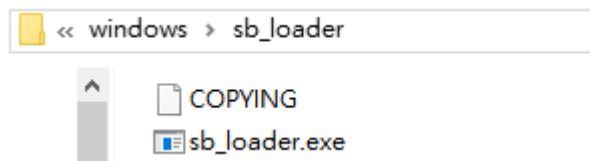
First attach a USB Type C peripheral cable to the board, and the other end to the host PC.

Then, Set the boot jumpers to serial download mode (please refer to **Section 4. Set up boot mode to run installer image on target board**).

Power up the board, and verify that a "SE Blank ULT1" device appears as below:



Extract the zip file of USB-OTG installer tool.



Run “**sb_loader.exe**” via “**cmd.exe**”, and specify the boot image by different platform:

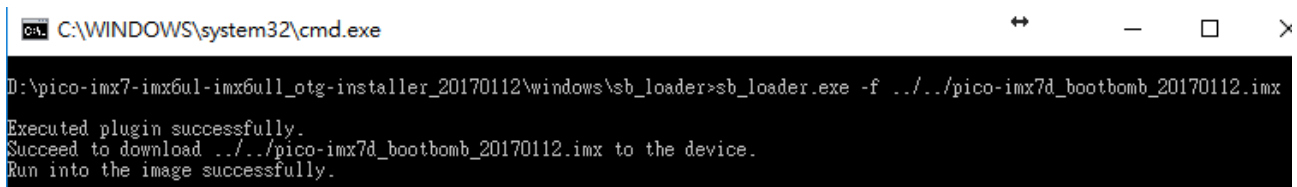
For PICO-IMX6UL-EMMC/PICO-IMX6ULL-EMMC:

```
$ sb_loader.exe -f ../../pico-imx6ul_bootbomb_20160510.imx
```

For PICO-IMX7-EMMC:

```
$ sb_loader.exe -f ../../pico-imx7d_bootbomb_20170112.imx
```

If the loader pushes the image to the board via USB-OTG cable successfully as below, the eMMC will be mounted as a mass storage device and appear under windows.



```
C:\WINDOWS\system32\cmd.exe
D:\pico-imx7-imx6ul-imx6ull_otg-installer_20170112\windows\sb_loader>sb_loader.exe -f ../../pico-imx7d_bootbomb_20170112.imx
Executed plugin successfully.
Succeed to download ../../pico-imx7d_bootbomb_20170112.imx to the device.
Run into the image successfully.
```

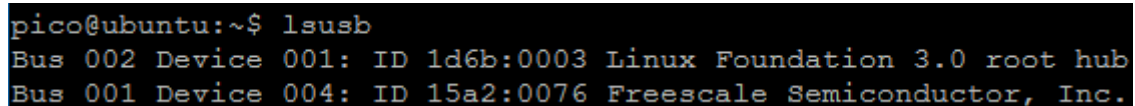
Then, use the WinDiskImager to flash target image into mass storage device(actually it's eMMC on the CPU module). Please refer to **Section 3. Make eMMC installer** to understand how to use WinDiskImager, but this time the device is eMMC, instead of SD card.

6.2 Run USB-OTG installer on Linux host

First attach a USB Type C peripheral cable to the board, and the other end to the host PC.

Then, Set the boot jumpers to serial download mode (please refer to **Section 4. Set up boot mode** to run installer image on target board in this document).

Power up the board, and verify that a "**Freescall Semiconductor, Inc.**" device appears as below:



```
pico@ubuntu:~$ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 004: ID 15a2:0076 Freescall Semiconductor, Inc.
```

Extract the zip file of USB-OTG installer tool.

Run “**imx_usb**” and specify the boot image by different platform:

For PICO-IMX6UL-EMMC/PICO-IMX6ULL-EMMC:

```
$ sudo ./imx_usb ../../pico-imx6ul_bootbomb_20160510.imx
```

For PICO-IMX7-EMMC:

```
$ sudo ./imx_usb ../../pico-imx7d_bootbomb_20170112.imx
```

If the loader pushes the image to the board via USB-OTG cable successfully as below, the

eMMC will be mounted as a mass storage device.

```
pico@ubuntu:/media/sf_Test_image/pico-imx7-imx6ul-imx6ull_otg-installer_20170112/linux$ sudo ./imx_usb ../pico-imx7d_bootbomb_20170112.imx
[sudo] password for pico:
config file <./imx_usb.conf>
vid=0x066f pid=0x3780 file_name=mx23_usb_work.conf
vid=0x15a2 pid=0x004f file_name=mx28_usb_work.conf
vid=0x15a2 pid=0x0052 file_name=mx50_usb_work.conf
vid=0x15a2 pid=0x0054 file_name=mx6_usb_work.conf
vid=0x15a2 pid=0x0061 file_name=mx6_usb_work.conf
vid=0x15a2 pid=0x0063 file_name=mx6_usb_work.conf
vid=0x15a2 pid=0x0071 file_name=mx6_usb_work.conf
vid=0x15a2 pid=0x007d file_name=mx6_usb_work.conf
vid=0x15a2 pid=0x0080 file_name=mx6_usb_work.conf
vid=0x15a2 pid=0x0076 file_name=mx7_usb_work.conf
vid=0x15a2 pid=0x0041 file_name=mx51_usb_work.conf
vid=0x15a2 pid=0x004e file_name=mx53_usb_work.conf
vid=0x15a2 pid=0x006a file_name=vybrid_usb_work.conf
vid=0x066f pid=0x37ff file_name=linux_gadget.conf
config file <./mx7_usb_work.conf>
parse ./mx7_usb_work.conf
15a2:0076(mx7) bConfigurationValue =1
Interface 0 claimed
HAB security state: development mode (0x56787856)
== work item
filename ../pico-imx7d_bootbomb_20170112.imx
load_size 0 bytes
load_addr 0x00000000
dcd 1
clear_dcd 0
plug 1
jump_mode 2
jump_addr 0x00000000
== end work item
Setting boot_data_ptr to 0
```

The mass storage device appears as /dev/sde under linux:

The capacity of /dev/sde corresponds to the size of eMMC.

```
pico@ubuntu:/media/sf_Test_image/pico-imx7-imx6ul-imx6ull_otg-installer_20170112/linux$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda           8:0    0   25G  0 disk
? ? sda1     8:1    0 24.3G  0 part /
? ? sda2     8:2    0    1K  0 part
? ? sda5     8:5    0   76M  0 part [SWAP]
sdb           8:16   0  300G  0 disk
? ? sdb1     8:17   0  300G  0 part /home/pico/workspace
sdc           8:32   0  500G  0 disk
? ? sdc1     8:33   0  500G  0 part /home/pico/workspace2
sde           8:64   1   3.6G  0 disk
```

Then, it's easy to use “dd” command to flash target image into eMMC.

```
$ sudo dd if=image.img of=/dev/sdX bs=1M oflag=dsync
```

7. Debug Console

Debug Port for TC-07x0/TC-1000 :

The debug console of TC-07x0 is output to ttyUSB0 by default. We recommend to use USB-to-Serial cable (with Prolific or FTDI chip) on TC-07x0.