

# EDM Yocto 1.7 Pre-Built Image User's Guide

Rev 1.1 20150917



***TechNexion***

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## 1. Boot Yocto image

### 1.1 Supported hardware

These are the systems covered in this guide:

System-on-Modules:

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

Carrier Boards:

- EDM1-FAIRY
- EDM1-GOBLIN
- EDM2-ELF
- Toucan-0700

### 1.2 Install Yocto Pre-Built image into eMMC

Please refer to the document “Yocto\_pre-built\_image\_installation\_guide.pdf”.

## 2. Memory layout of the yocto image

Section	Description
MBR	Partition information
SPL	First stage u-boot image
u-boot.img	
Partition 1 (FAT32) Under /boot directory <ul style="list-style-type: none"><li>◆ uEnv.txt</li><li>◆ zImage</li><li>◆ dtb</li></ul>	<ul style="list-style-type: none"><li>◆ u-boot.img: Second stage u-boot image</li><li>◆ uEnv.txt: U-boot environment, you can set display type in this plain text.</li><li>◆ dtb: linux device tree file, it's platform-specific.</li></ul>
Partition 2 (EXT3) rootfs	Yocto rootfs

## 3. Debug Console for Toucan

For all boards, the default debug console is output to ttymxc0, except Toucan. The debug console of Toucan-0700 is output to ttyUSB0 by default. We recommend to use USB-to-Serial cable (with Prolific or FTDI chip) on Toucan.

## 4. Change display settings

Display settings can be changed by modifying uEnv.txt.

The eMMC corresponds to /dev/mmcblk2. uEnv.txt is in /dev/mmcblk2p1.

```
root@edm-fairy-imx6:~# mkdir -p /mnt/temp
root@edm-fairy-imx6:~# mount /dev/mmcblk2p1 /mnt/temp/
```

```
root@edm-fairy-imx6:~# vi /mnt/temp/uEnv.txt
```

```
displayinfo=video=mxcfb0:dev=hdmi,1280x720M@60,if=RGB24 fbmem=28M
mmcargs=setenv bootargs console=${console},${baudrate} root=${mmicroot} ${display
bootcmd_mmc=run loadimage;run mmcboot;
uenvcmd=run bootcmd_mmc
```

Replace the red string with:

**For HDMI 720P:**

```
video=mxcfb0:dev=hdmi,1280x720M@60,if=RGB24 fbmem=28M
```

**For HDMI 1080P:**

```
video=mxcfb0:dev=hdmi,1920x1080M@60,if=RGB24 fbmem=28M
```

**For 7 inch LVDS panel:**

```
video=mxcfb0:dev=ldb,1024x600@60,if=RGB24
```

**For 7 inch TTL panel:**

```
video=mxcfb0:dev=lcd,800x480@60,if=RGB24
```

**For dual display for HDMI and LVDS:**

```
video=mxcfb0:dev=hdmi,1280x720M@60,if=RGB24 video=mxcfb1:dev=ldb,1024x600@60,if=RGB24
```

**Note:**

1. Because i.mx6sx lacks VPU, the freescale proprietary video decoder can't be used in video playback.
2. For now, EDM1-CF-IMX6SX doesn't support HDMI output, and it only supports to output to LVDS 7-inch panel now.

## 5. Calibrate Resistive Touch Panel

For 4-wire resistive touch panel, the touch panel is connected to touch screen controller "ADS7846". The calibration data is generated from ts\_calibrate (the calibration utility of [tslib](#)). The calibration data is fed to ADS7846 driver while booting to apply the calibration, so xinput calibration wouldn't be needed.

```
more /etc/init.d/touch_cal.sh
```

```
#!/bin/sh
CALFILE="/pointercal"

if [ -e $CALFILE ] ; then
```

```
TOUCH_INPUT=`cat /proc/bus/input/devices | grep -A9 'ADS7846 Touchscreen' | grep 'Sysfs' | grep -o 'input[0-9]`
if [ "$?" == "0" ];then
    cat ${CALFILE} > /sys/class/input/${TOUCH_INPUT}/calibration
    echo -e "\nFeed calibration data to ADS7846 driver\n"
fi
fi
exit 0
```

### Generate calibration data:

The calibration data would be expected to be placed on the path “ / ”.

```
root@edm-fairy-imx6:~# export TSLIB_CALIBFILE=/pointercal
```

Check the input device number for ADS7846

```
root@edm-fairy-imx6:~# cat /proc/bus/input/devices | grep -A9 'ADS7846 Touchscreen' | grep
'Sysfs' | grep -o 'input[0-9]'
input1
```

Here we get the input device number “input1” for ADS7846. For different platform, the input device number may be different.

Clean the old calibration data.

```
root@edm-fairy-imx6:~# echo '0 0 0 0 0 0 0 0' > /sys/class/input/input1/calibration
```

Apply the new calibration data immediately.

```
root@edm-fairy-imx6:~# cat /pointercal > /sys/class/input/input1/calibration
```

## 6. Test WIFI and Bluetooth

The yocto qt5 image utilize “[connman](#)” as network manager.

The default settings for connman in the image is to turn WIFI and bluetooth on.

Please check:

```
more /var/lib/connman/settings
```

```
[global]
OfflineMode=false

[WiFi]
Enable=true
Tethering=false

[Bluetooth]
Enable=true
Tethering=false
```

### Test wifi:

Run “connmanctl” in interactive mode.

```
root@edm-fairy-imx6:~# connmanctl
```

Scan and list the wifi hotspots, then register the agent to handle user requests.

```
connmanctl> scan wifi
Scan completed for wifi

connmanctl> services
  hotspot      wifi_4439c4970d84_544543484e4558494f4e_managed_psk

connmanctl> agent on
Agent registered
```

Connect to the hotspot and enter the passphrase.

```
connmanctl> connect wifi_4439c4970d84_544543484e4558494f4e_managed_psk

Agent RequestInput wifi_4439c4970d84_544543484e4558494f4e_managed_psk
  Passphrase = [ Type=psk, Requirement=mandatory, Alternates=[ WPS ] ]
  WPS = [ Type=wpspin, Requirement=alternate ]
  Passphrase?
Connected wifi_4439c4970d84_544543484e4558494f4e_managed_psk
```

Quit the interactive mode of “connmanctl”.

```
connmanctl> quit
```

Test if wifi actually works.

```
root@edm-fairy-imx6:~# ping www.google.com
PING www.google.com (203.66.124.251): 56 data bytes
64 bytes from 203.66.124.251: seq=0 ttl=59 time=4.905 ms
64 bytes from 203.66.124.251: seq=1 ttl=59 time=12.278 ms
64 bytes from 203.66.124.251: seq=2 ttl=59 time=4.307 ms
```

For the next boot, connman will automatically connect to the hotspot you used before.

Clean the stored settings of hotspot.

```
root@edm-fairy-imx6:~# rm /var/lib/connman/*/settings
```

Switch on/off wifi.

```
root@edm-toucan-imx6:~# connmanctl disable wifi
Disabled wifi
```

```
root@edm-fairy-imx6:~# connmanctl enable wifi
Enabled wifi
```

### **Test bluetooth:**

Make sure bluetooth device for testing is able to be scanned.

Load bluetooth firmware into BT chip via UART and need to wait 5~10 sec to complete.

### **For EDM1-CF-IMX6:**

```
root@edm-fairy-imx6:~# brcm_patchram_plus -d --timeout=6.0 \
--patchram /lib/firmware/brcm/bcm4330.hcd --baudrate 3000000 --no2bytes --tosleep=2000 \
--enable_hci /dev/ttyMXC2 > /dev/null 2>&1 &
```

### **For EDM1-CF-IMX6SX:**

```
root@edm-goblin-imx6sx:~# brcm_patchram_plus -d --timeout=6.0 \
--patchram /lib/firmware/brcm/bcm4330.hcd --baudrate 3000000 --no2bytes --tosleep=2000 \
--enable_hci /dev/ttyMXC3 > /dev/null 2>&1 &
```

Check if interface “hci” device node exist.

```
root@edm-fairy-imx6:~# hciconfig -a
hci0:  Type: BR/EDR  Bus: UART
       BD Address: 43:30:A0:00:00:00  ACL MTU: 1021:8  SCO MTU: 64:1
       DOWN
       RX bytes:574 acl:0 sco:0 events:27 errors:0
       TX bytes:411 acl:0 sco:0 commands:27 errors:0
       Features: 0xbf 0xfe 0xcf 0xfe 0xdb 0xff 0x7b 0x87
       Packet type: DM1 DM3 DM5 DH1 DH3 DH5 HV1 HV2 HV3
       Link policy: RSWITCH SNIFF
       Link mode: SLAVE ACCEPT
```

Bring hci interface up.

```
root@edm-fairy-imx6:~# hciconfig hci0 up
```

Scan the bluetooth device.

```
root@edm-fairy-imx6:~# hcitool -i hci0 scan
Scanning ...
00:1F:20:7E:21:6C    Logitech Bluetooth Mouse M555b
```

## **7. Switch audio output**

The default audio output for HDMI pre-built image is HDMI audio and for LVDS pre-built image is SGTL5000.

List the available audio output sink in the system.

```
root@edm-fairy-imx6:~# LANG=C pactl list sinks | grep 'Name: ' | cut -d" " -f2
alsa_output.platform-sound-hdmi.27.analog-stereo
alsa_output.platform-sound-spdif.26.analog-stereo
alsa_output.platform-sound.25.analog-stereo
```

Set audio output to HDMI.

```
pacmd set-default-sink alsa_output.platform-sound-hdmi.27.analog-stereo
```

Set audio output to SGTL5000 audio codec.

```
pacmd set-default-sink alsa_output.platform-sound.25.analog-stereo
```

Set audio output to SPDIF.

```
pacmd set-default-sink alsa_output.platform-sound-spdif.26.analog-stereo
```

Play sound.

```
gst-launch-1.0 filesrc location=/unit_tests/audio8k16S.wav ! decodebin ! pulsesink
```

Change the audio output permanently:

The audio settings for output are in the bottom of /etc/pulse/default.pa.

vi /etc/pulse/default.pa

```
### Make some devices default
#set-default-sink output
set-default-sink alsa_output.platform-sound-hdmi.27.analog-stereo
#set-default-sink alsa_output.platform-sound.25.analog-stereo
#set-default-sink alsa_output.platform-sound-spdif.26.analog-stereo
```

## **8. Adjust backlight for LVDS panel**

**For EDM1-CF-IMX6:**

Brightness is from 0 to 7.

```
echo 0 > /sys/class/backlight/backlight_lvds.33/brightness
```

**For EDM1-CF-IMX6SX:**

Brightness is from 0 to 7.

```
echo 0 > /sys/class/backlight/backlight2.18/brightness
```



## 9. Test MIPI camera

```
gst-launch-1.0 imxv4l2src device=/dev/video0 ! 'video/x-raw,  
format=(string)UYVY,width=640,height=480,framerate=(fraction)30/1' ! imxv4l2sink
```

**Note:**

Because i.mx6sx lacks MIPI interface, EDM1-CF-IMX6SX doesn't support MIPI camera.