

# THSCM101 Start Guide

Rev. 1.40

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## 1.1 What you need for i.MX 8M Mini EVK

- i.MX 8M Mini EVK
  - 8MMINILPD4-EVKB
    - CPU board
    - Power supply
    - USB micro-B cable
- Micro SD card
  - 32GByte
- i.MX 8M Mini SD card image for THSCM101
  - Request the latest SD card image to THine Solutions.  
<https://www.thinesolutions.com/support-request>
- THSCM101
  - Camera board
  - Mini SAS cable
- MIPI DSI to HDMI adaptor card
  - IMX-MIPI-HDMI
  - Mini SAS cable
- Display and HDMI cable
  - Display with HDMI port
  - HDMI cable
- PC
  - Windows10
  - SD card interface

## 1.2 i.MX 8M Mini EVK SD card preparation

**Step 1** : Get .bz2 file of SD card image for i.MX 8M Mini EVK.

- Request the latest SD card image to THine Solutions.  
<https://www.thinesolutions.com/support-request>

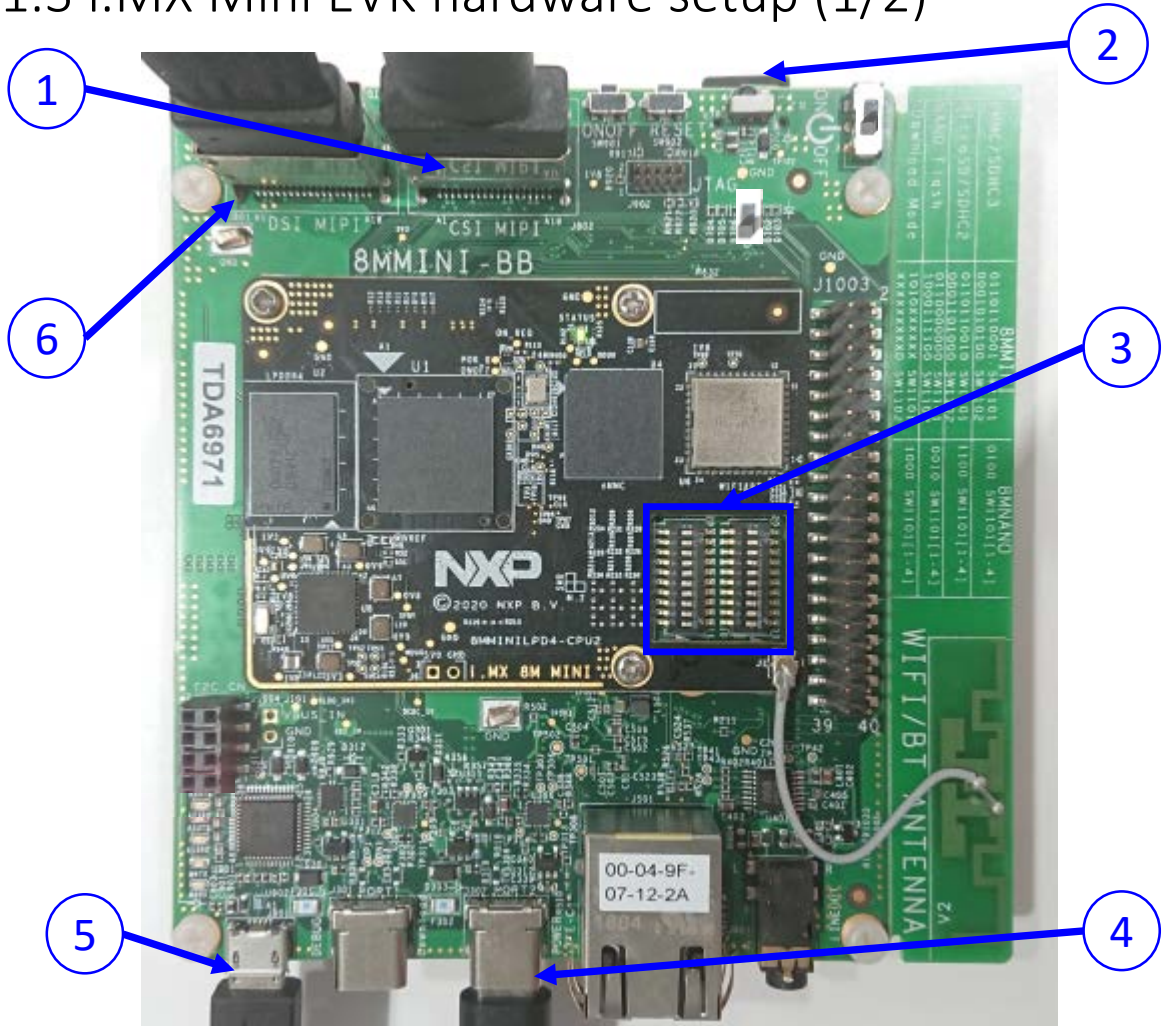
**Step 2** : Decompress

- Decompress the .wic file from .bz2 file.

**Step 3** : Write

- Write the SD card image file, .wic to the micro SD card by using disk image writer application software such like “Win32 Disk Imager”.

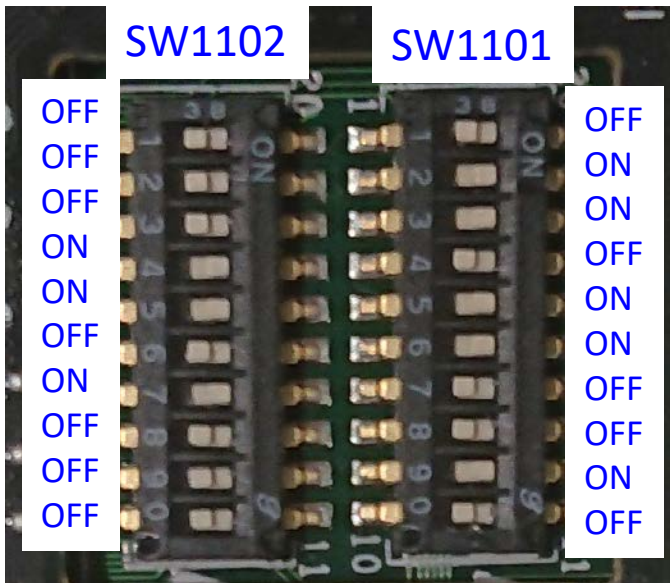
## 1.3 i.MX Mini EVK hardware setup (1/2)



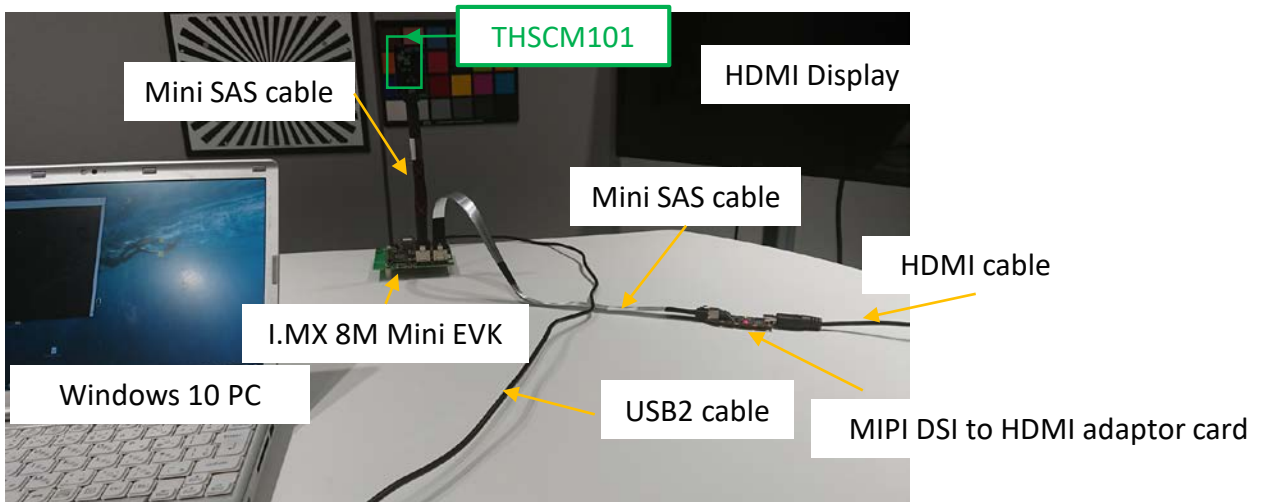
- ① Connect THSCM101 to i.MX 8M Mini EVK via Mini SAS cable
- ② Insert the micro SD card
- ③ Set BOOT switches (SW1101 and SW1102). See next page.
- ④ Connect AC adaptor to the power
- ⑤ Connect the PC to i.MX 8M Mini EVK via USB2 cable
- ⑥ Connect MIPI DSI to HDMI adaptor card via Mini SAS cable
  - Connect the adaptor card to monitor via HDMI cable

## 1.3 i.MX Mini EVK hardware setup (2/2)

Set BOOT Switches (SW1101 and SW1102) for MicroSD/SDHC BOOT mode.

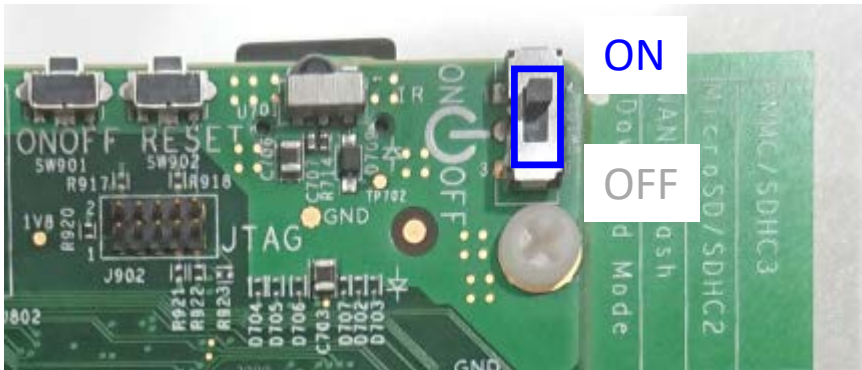


Hardware setting is completed.



## 1.4 Login to Linux on i.MX 8M Mini EVK (1/3)

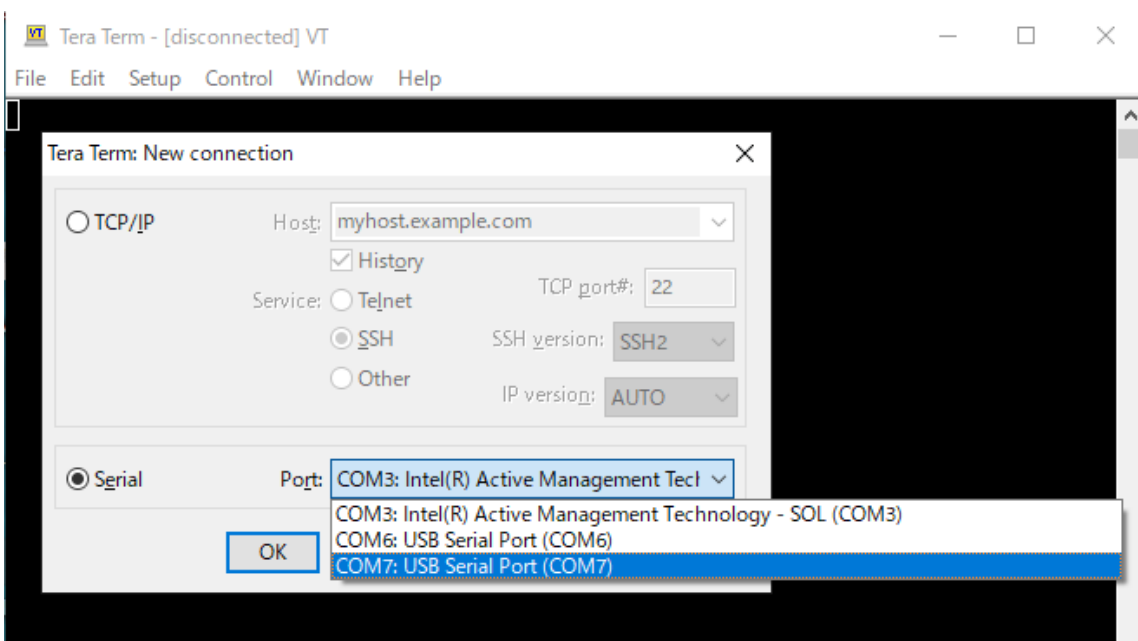
### Step 1: Power on i.MX 8M Mini EVK



### Step 2: Launch “Tera term” on your Windows PC

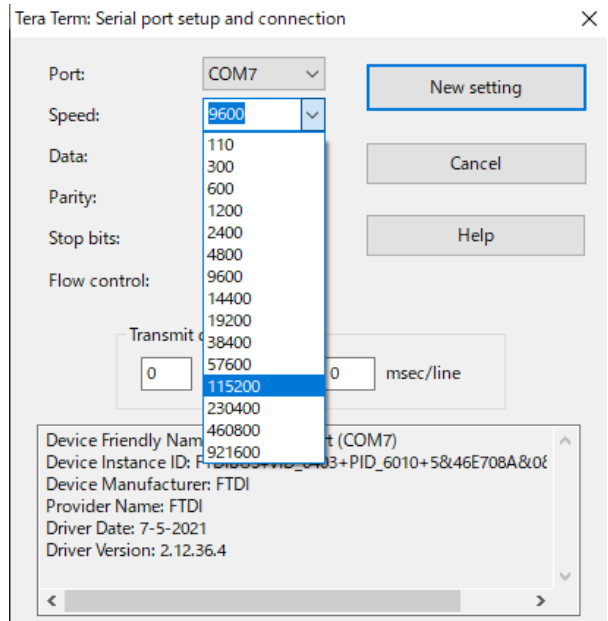
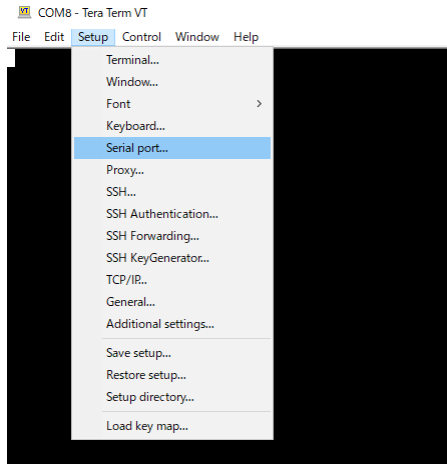
- You may need to install VCP driver.
  - <http://www.ftdichip.com/Drivers/VCP.htm>

**Step 3:** Select the serial option. Choose the highest numbered COM port. For example, choose “COM7” in the case that there are “COM6” and “COM7” as serial ports.



## 1.4 Login to Linux on i.MX 8M Mini EVK (2/3)

**Step 4:** Setup → Serial Port... to open port setup window, then select the Speed as 115200. Then click "New setting".



**Step 5:** Press enter key, then Tera Term displays following message.





## 1.4 Login to Linux on i.MX 8M Mini EVK (3/3)

### **Step 6:** Login as "root"

- Enter "root", then press enter key.

```
imx8mmevk login: root
root@imx8mmevk:~#
```

## 1.5 THSCM101 firmware update (optional) (1/2)

### Step 1: Check THSCM101 firmware version.

1-1) Identify the firmware version in the hardware.

You can identify the THP7312-P firmware version in the THSCM101 hardware by the following command.

- `v4l2-ctl --get-ctrl=thp7312_firmware_version`

thp7312\_firmware\_version: 'THSCM101:THP7312 firmware version = xx.xx(\*)'

(\*) xx.xx is the firmware version

1-2) Identify the firmware version in the latest release pack

You can identify the THP7312-P firmware version of THSCM101 in the latest THSCM101 SD Card Image release pack by confirming the README.txt in the pack.

1-3) Compare the firmware version

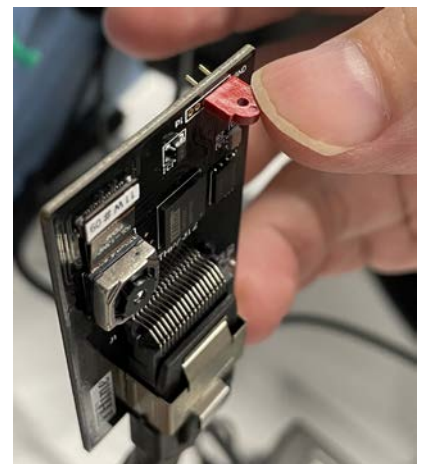
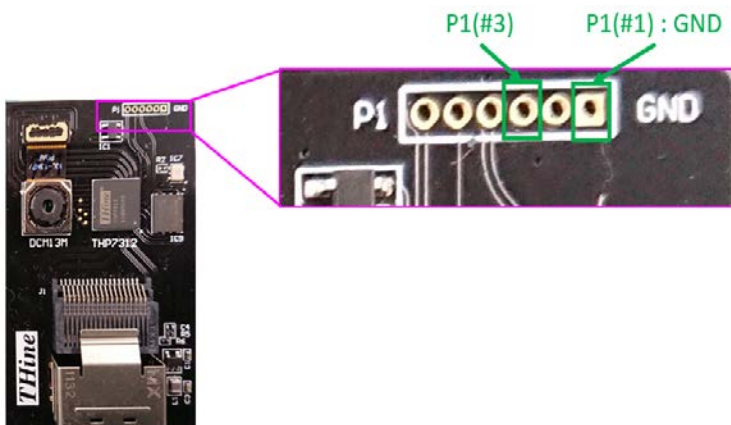
You can go to section 2.6 if the firmware version in the hardware is the latest.

### Step 2: Shutdown and power off i.MX 8M Mini EVK.

### Step 3: Connect P1(#3) to P1(#1):GND of THSCM101.

- Hold the jumper pin until firmware update completed

e.g. Set 2.54mm pitch,  $\phi 0.5\text{mm}$  jumper to connect into the P1 #1 and P1 #3 thru holes and hold.



### Step 4: Power on i.MX 8M Mini EVK and login as root.

## 1.5 THSCM101 firmware update (optional) (2/2)

### Step 5: Update THSCM101 firmware

- `v4l2-ctl --set-ctrl=thp7312_firmware_update=1`

Please confirm the completion of firmware update in the log.

```
root@imx8mmevk:~# v4l2-ctl --set-ctrl=thp7312_firmware_update=1
[ 75.544406] thp7312_mipi 2-0061: firmware file= thine/thscm101_thp7312.bin
[ 75.551753] thp7312_mipi 2-0061: Flash Memory:THP7312 firmware size is 132268
root@imx8mmevk:~# [ 75.564025] thp7312_mipi 2-0061: Flash Memory: Manufacturer ID =0xef Device ID (ID7-ID0)=0x14
[ 75.576136] thp7312_mipi 2-0061: Flash Memory: JEDEC ID =0xef 0x60 0x15
[ 75.584032] thp7312_mipi 2-0061: Flash Memory: Erase Block Start
[ 75.702316] thp7312_mipi 2-0061: Flash Memory: Waiting Erase
[ 75.812579] thp7312_mipi 2-0061: Flash Memory: Erase Block 0 Complete
[ 75.933056] thp7312_mipi 2-0061: Flash Memory: Waiting Erase
[ 76.046926] thp7312_mipi 2-0061: Flash Memory: Erase Block 1 Complete
[ 76.166814] thp7312_mipi 2-0061: Flash Memory: Waiting Erase
[ 76.277461] thp7312_mipi 2-0061: Flash Memory: Erase Block 2 Complete
[ 76.288011] thp7312_mipi 2-0061: Flash Memory:Flash Memory is erased.
[ 76.294470] thp7312_mipi 2-0061: Flash Memory: firmware download 131072 bytes start
[ 80.074029] thp7312_mipi 2-0061: Flash Memory: firmware data downloading
[ 83.808750] thp7312_mipi 2-0061: Flash Memory: firmware data downloading
[ 87.599039] thp7312_mipi 2-0061: Flash Memory: firmware data downloading
[ 91.391681] thp7312_mipi 2-0061: Flash Memory: firmware data downloading
[ 91.398494] thp7312_mipi 2-0061: Flash Memory: firmware download 131072 bytes complete
[ 99.511660] thp7312_mipi 2-0061: Flash Memory: Program 131072 bytes is completed.
[ 99.519174] thp7312_mipi 2-0061: Flash Memory: firmware download 1196 bytes start
[ 99.667332] thp7312_mipi 2-0061: Flash Memory: firmware download 1196 bytes complete
[ 107.780184] thp7312_mipi 2-0061: Flash Memory: Program 1196 bytes is completed.
[ 109.895089] thp7312_mipi 2-0061: Flash Memory: CRC of firmware in Source File = 0xc5be9de6
[ 109.903472] thp7312_mipi 2-0061: Flash Memory: CRC of firmware in Flash Memory = 0xc5be9de6
[ 109.911845] thp7312_mipi 2-0061: Flash Memory: THP7312 Firmware update is completed
```

### Step 6: Shutdown and power off i.MX 8M Mini EVK

### Step 7: Disconnect P1(#3) from P1(#1) : GND of THSCM101

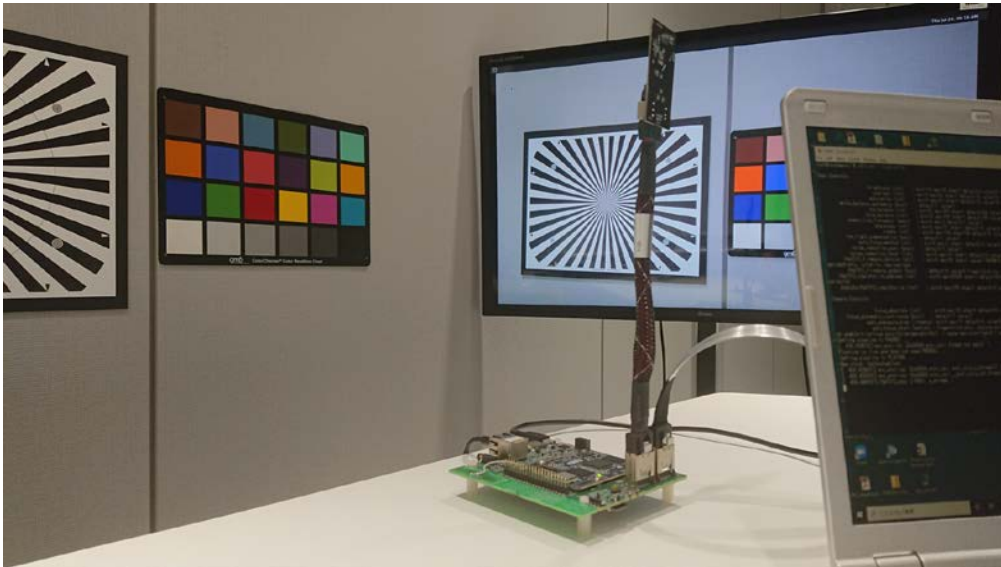
### Step 8: Power on i.MX 8M Mini EVK and login as root.

## 1.6 Stream camera images with i.MX 8M Mini EVK

**Step 1:** Enter the following command to stream 4K 30fps image.

```
gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=YUY2,width=3840,height=2160,framerate=30/1 ! queue max-size-time=0 ! waylandsink enable-tile=true sync=false
```

You can see the streaming images on the display.



## 1.7 Capture a camera image with i.MX 8M Mini EVK

**Step 1:** Enter the following command to save a 4K JPEG image.

```
gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=YUY2,width=3840,height=2160,framerate=30/1 ! queue max-size-time=0 ! jpegenc snapshot=true quality=95 ! filesink location=4k.jpeg
```

4K JPEG image is saved.



## 2.1 What you need for i.MX 8M Plus EVK

- i.MX 8M Plus EVK
  - 8MPLUSLPD4-EVK
    - CPU board
    - Power supply
    - USB micro-B cable
- Micro SD card
  - 32GByte
- i.MX 8M Plus SD card image for THSCM101
  - Request the latest SD card image to THine Solutions.  
<https://www.thinesolutions.com/support-request>
- THSCM101
  - Camera board
  - Mini SAS cable
- Display and HDMI cable
  - Display with HDMI port
  - HDMI cable
- PC
  - Windows10
  - SD card interface

## 2.2 i.MX 8M Plus EVK SD card preparation

**Step 1** : Get .bz2 file of SD card image for i.MX 8M Plus EVK.

- Request the latest SD card image to THine Solutions.  
<https://www.thinesolutions.com/support-request>

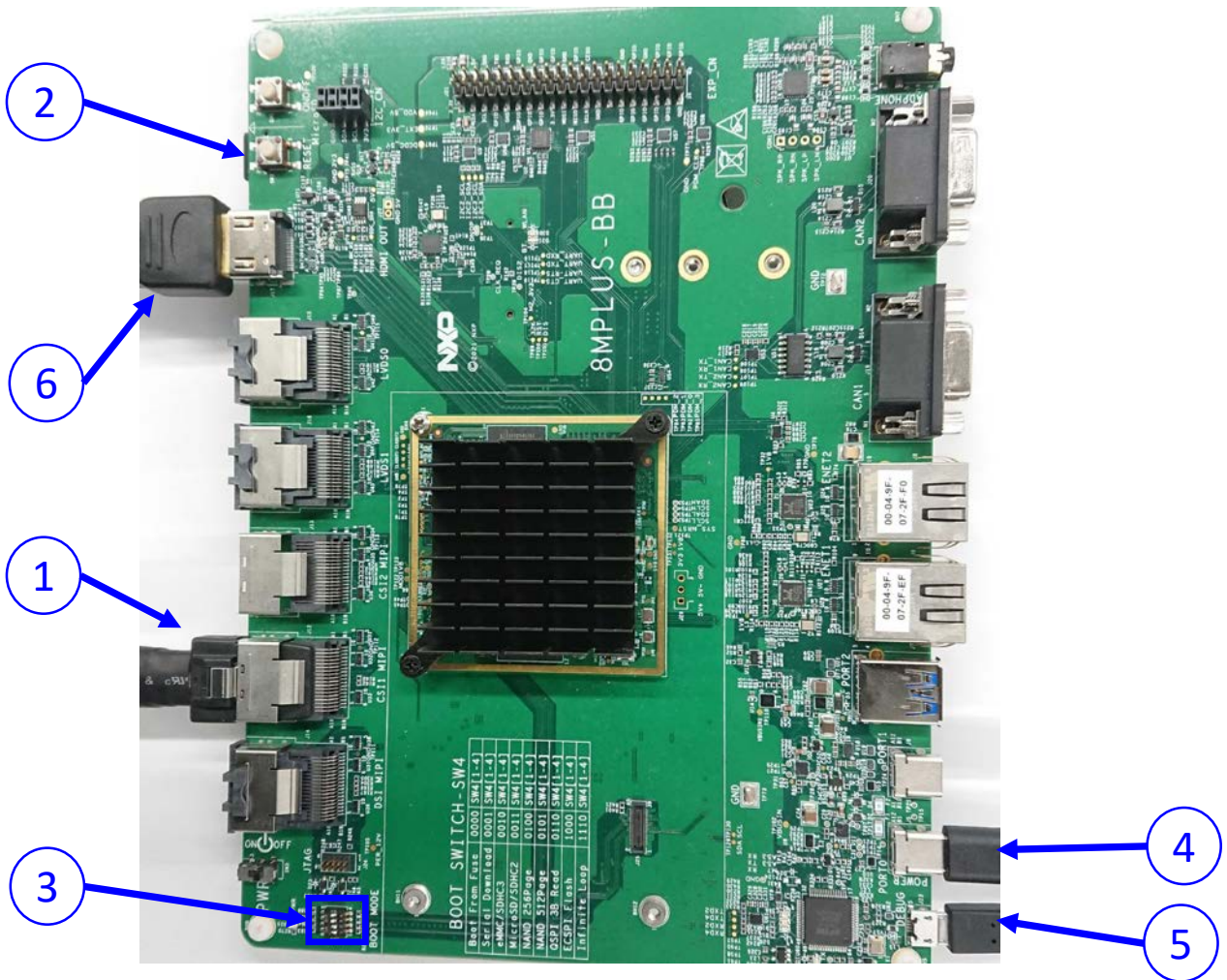
**Step 2** : Decompress

- Decompress the .wic file from .bz2 file.

**Step 3** : Write

- Write the SD card image file, .wic to the micro SD card by using disk image writer application software such like “Win32 Disk Imager”.

## 2.3 i.MX Plus EVK hardware setup (1/2)

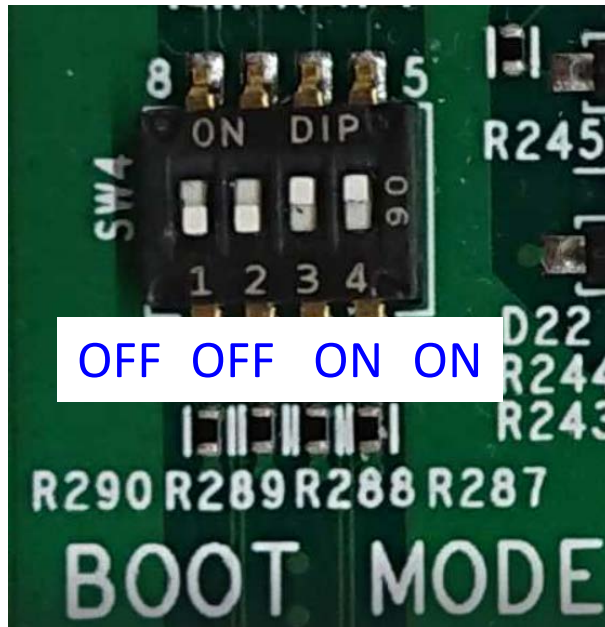


- ① Connect THSCM101 to i.MX 8M Plus EVK via Mini SAS cable
- ② Insert the micro SD card
- ③ Set BOOT switches (SW4). See next page.
- ④ Connect AC adaptor to the power
- ⑤ Connect the PC to i.MX 8M Plus EVK via USB2 cable
- ⑥ Connect the monitor to HDMI port of i.MX 8M Plus EVK

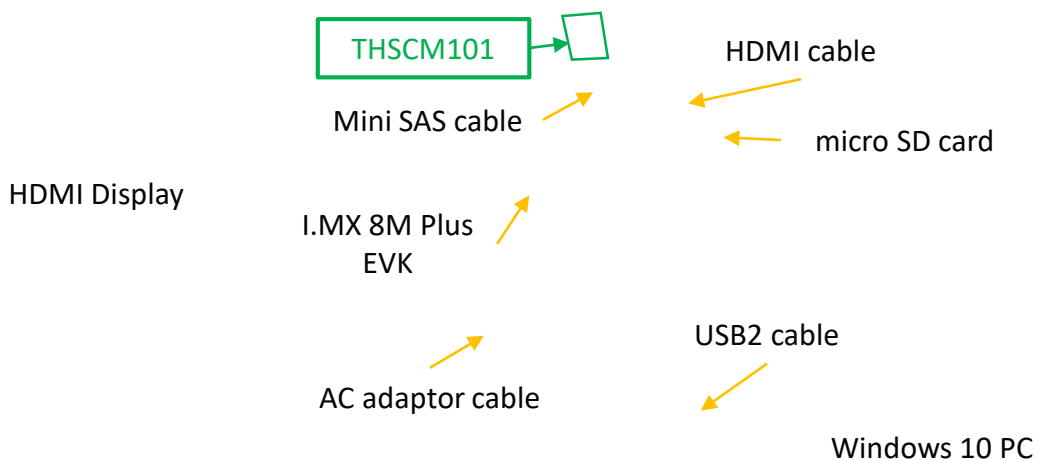


## 2.3 i.MX 8M Plus EVK hardware Setup (2/2)

Set BOOT Device Switch (SW4) to OFF, OFF, ON, ON (from 1-4 bit)

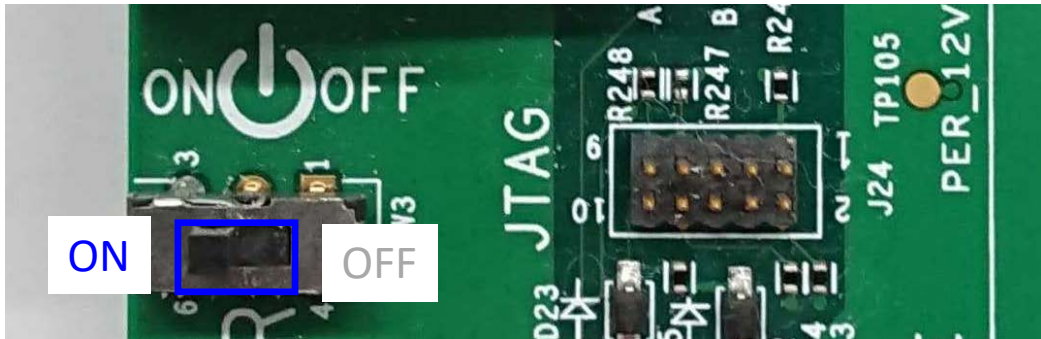


Hardware setting is completed.



## 2.4 Login to Linux on i.MX 8M Plus EVK (1/3)

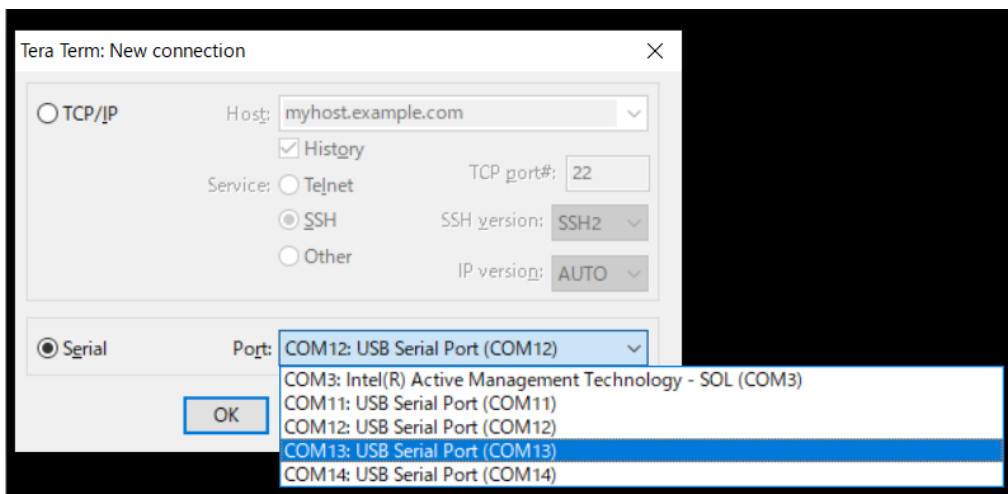
### Step 1: Power on i.MX 8M Plus EVK



### Step 2: Launch “Tera term” on your Windows PC

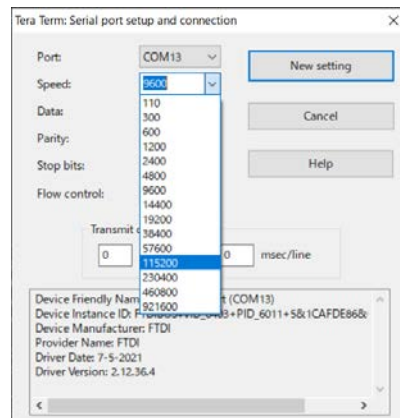
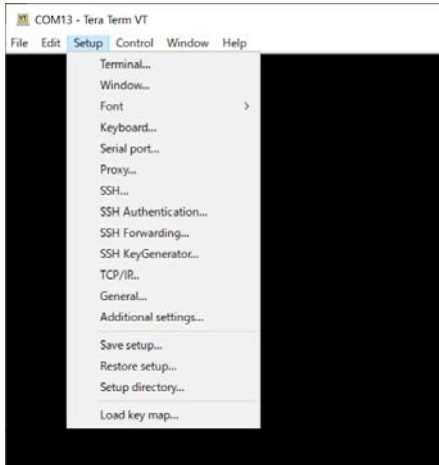
- You may need to install VCP driver.
  - <http://www.ftdichip.com/Drivers/VCP.htm>

**Step 3:** Select the serial option. Choose the third COM port. For example, choose “COM13” in the case that there are “COM11” to “COM14” as serial ports.

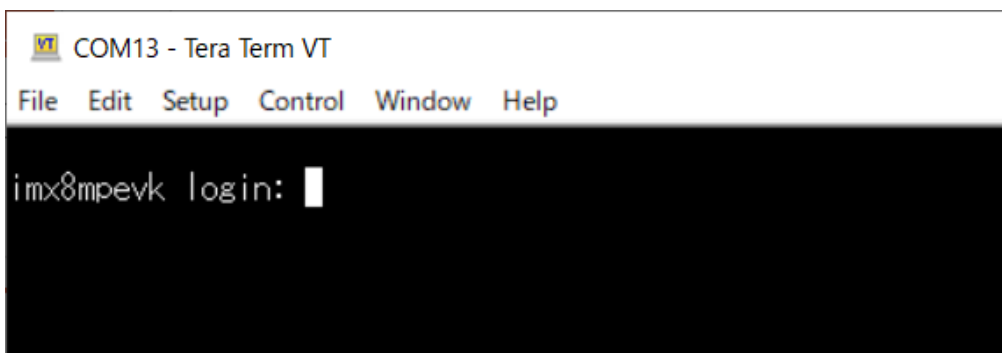


## 2.4 Login to Linux on i.MX 8M Plus EVK (2/3)

**Step 4:** Setup → Serial Port... to open port setup window, then select the Speed as 115200. Then click "New setting".



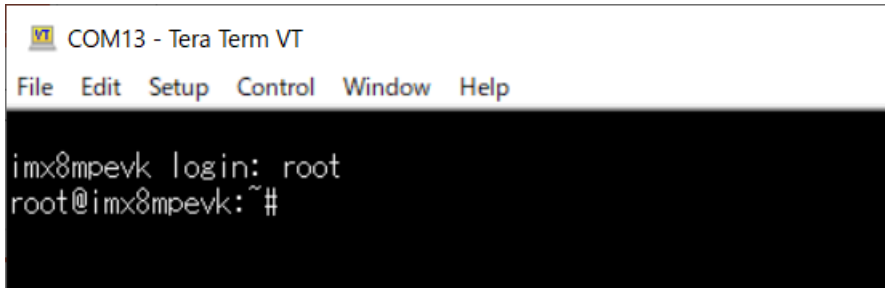
**Step 5:** Press enter key, then Tera Term displays following message.



## 2.4 Login to Linux on i.MX 8M Plus EVK (3/3)

### Step 6: Login as "root"

- Enter "root", then press enter key.



```
COM13 - Tera Term VT
File Edit Setup Control Window Help
imx8mpevk login: root
root@imx8mpevk:~#
```

## 2.5 THSCM101 firmware update (optional) (1/2)

### Step 1: Confirm if THSCM101 firmware version is latest.

1-1) Identify the firmware version in the hardware.

You can identify the THP7312-P firmware version in the THSCM101 hardware by the following command.

- `v4l2-ctl -d /dev/video3 --get-ctrl=thp7312_firmware_version`  
`thp7312_firmware_version: 'THSCM101:THP7312 firmware version = xx.xx(*)'`

(\*) xx.xx is the firmware version

1-2) Identify the firmware version in the latest release pack

You can identify the THP7312-P firmware version of THSCM101 in the latest THSCM101 SD Card Image release pack by confirming the README.txt in the pack.

1-3) Compare the firmware version

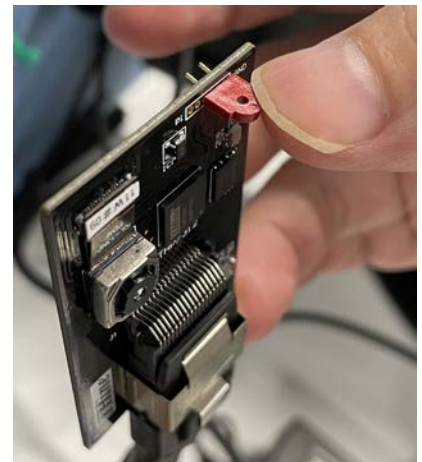
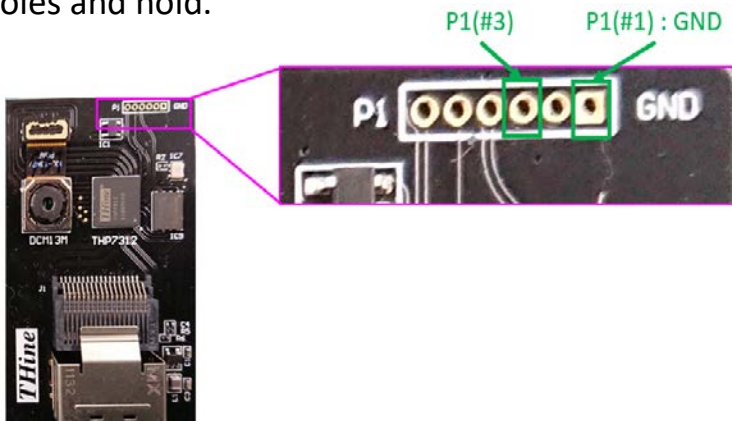
You can go to section 2.6 if the firmware version in the hardware is the latest.

### Step 2: Shutdown and power off i.MX 8M Plus EVK.

### Step 3: Connect P1(#3) to P1(#1):GND of THSCM101.

- Hold the jumper pin until firmware update completed

e.g. Set 2.54mm pitch,  $\phi 0.5\text{mm}$  jumper to connect into the P1 #1 and P1 #3 thru holes and hold.



### Step 4: Power on i.MX 8M Plus EVK and login as root.

## 2.5 THSCM101 firmware update (optional) (2/2)

### Step 5: Update THSCM101 firmware

- `v4l2-ctl -d /dev/video3 --set-ctrl=thp7312_firmware_update=1`  
Please confirm the completion of firmware update in the log.

```
root@imx8mpevk:~# v4l2-ctl -d /dev/video3 --set-ctrl=thp7312_firmware_update=1
[ 91.891962] thp7312 1-0061: firmware file= thine/thscm101_thp7312.bin
[ 91.904011] thp7312 1-0061: Flash Memory:THP7312 firmware size is 132268
[ 91.915765] thp7312 1-0061: Flash Memory: Manufacturer ID =0xef Device ID (ID7-ID0)=0x14
root@imx8mpevk:~# [ 91.927545] thp7312 1-0061: Flash Memory: JEDEC ID =0xef 0x60 0x15
[ 91.934353] thp7312 1-0061: Flash Memory: Erase Block Start
[ 92.053822] thp7312 1-0061: Flash Memory: Waiting Erase
[ 92.163965] thp7312 1-0061: Flash Memory: Erase Block 0 Complete
[ 92.282443] thp7312 1-0061: Flash Memory: Waiting Erase
[ 92.397354] thp7312 1-0061: Flash Memory: Erase Block 1 Complete
[ 92.515529] thp7312 1-0061: Flash Memory: Waiting Erase
[ 92.627154] thp7312 1-0061: Flash Memory: Erase Block 2 Complete
[ 92.637775] thp7312 1-0061: Flash Memory:Flash Memory is erased.
[ 92.643799] thp7312 1-0061: Flash Memory: firmware download 131072 bytes start
[ 96.311658] thp7312 1-0061: Flash Memory: firmware data downloading
[ 99.978738] thp7312 1-0061: Flash Memory: firmware data downloading
[ 103.688586] thp7312 1-0061: Flash Memory: firmware data downloading
[ 107.351197] thp7312 1-0061: Flash Memory: firmware data downloading
[ 107.357574] thp7312 1-0061: Flash Memory: firmware download 131072 bytes complete
[ 115.469017] thp7312 1-0061: Flash Memory: Program 131072 bytes is completed.
[ 115.476091] thp7312 1-0061: Flash Memory: firmware download 1196 bytes start
[ 115.622546] thp7312 1-0061: Flash Memory: firmware download 1196 bytes complete
[ 123.734389] thp7312 1-0061: Flash Memory: Program 1196 bytes is completed.
[ 125.846809] thp7312 1-0061: Flash Memory: CRC of firmware in Source File = 0xc5be9de6
[ 125.854554] thp7312 1-0061: Flash Memory: CRC of firmware in Flash Memory = 0xc5be9de6
[ 125.862489] thp7312 1-0061: Flash Memory: THP7312 Firmware update is completed
```

### Step 6: Shutdown and power off i.MX 8M Plus EVK

### Step 7: Disconnect P1(#3) from P1(#1) : GND of THSCM101

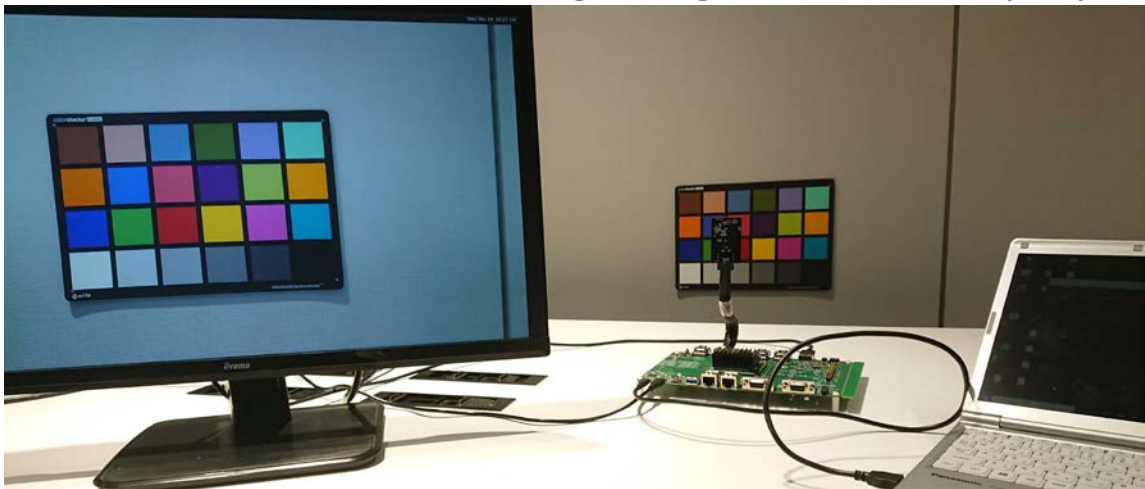
### Step 8: Power on i.MX 8M Plus EVK and login as root.

## 2.6 Stream camera images with i.MX 8M Plus EVK

**Step 1:** Enter the following command to stream the 4K 30fps image.

```
gst-launch-1.0 v4l2src device=/dev/video3 ! video/x-raw,format=YUY2, width=3840,height=2160,framerate=30/1 ! queue max-size-time=0 ! waylandsink enable-tile=true sync=false
```

You can see the streaming images on the display.



## 2.7 Capture camera image with i.MX 8M Plus EVK

**Step 1:** Enter the following command to save 4K JPEG image.

```
gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=YUY2,width=3840,height=2160,framerate=30/1 ! queue max-size-time=0 ! jpegenc snapshot=true quality=95 ! filesink location=4k.jpeg
```

4K JPEG image is saved.





## 3.1 What you need for i.MX 8M EVK

- i.MX 8M EVK
  - MCIMX8M-EVKB
    - CPU board
      - Please contact to THine Solutions if the EVK is EVK Revision B3 Board or older revision.
    - Power supply
    - USB micro-B cable
  - Micro SD card
    - 32GByte
  - i.MX 8M SD card image for THSCM101
    - Request the latest SD card image to THine Solutions.  
<https://www.thinesolutions.com/support-request>
- THSCM101
  - Camera board
  - Mini SAS cable
- Display and HDMI cable
  - Display with HDMI port
  - HDMI cable
- PC
  - Windows10
  - SD card interface

## 3.2 i.MX 8M EVK SD card preparation

### **Step 1** : Get .bz2 file of SD card image for i.MX 8M EVK.

- Request the latest SD card image to THine Solutions.  
<https://www.thinesolutions.com/support-request>

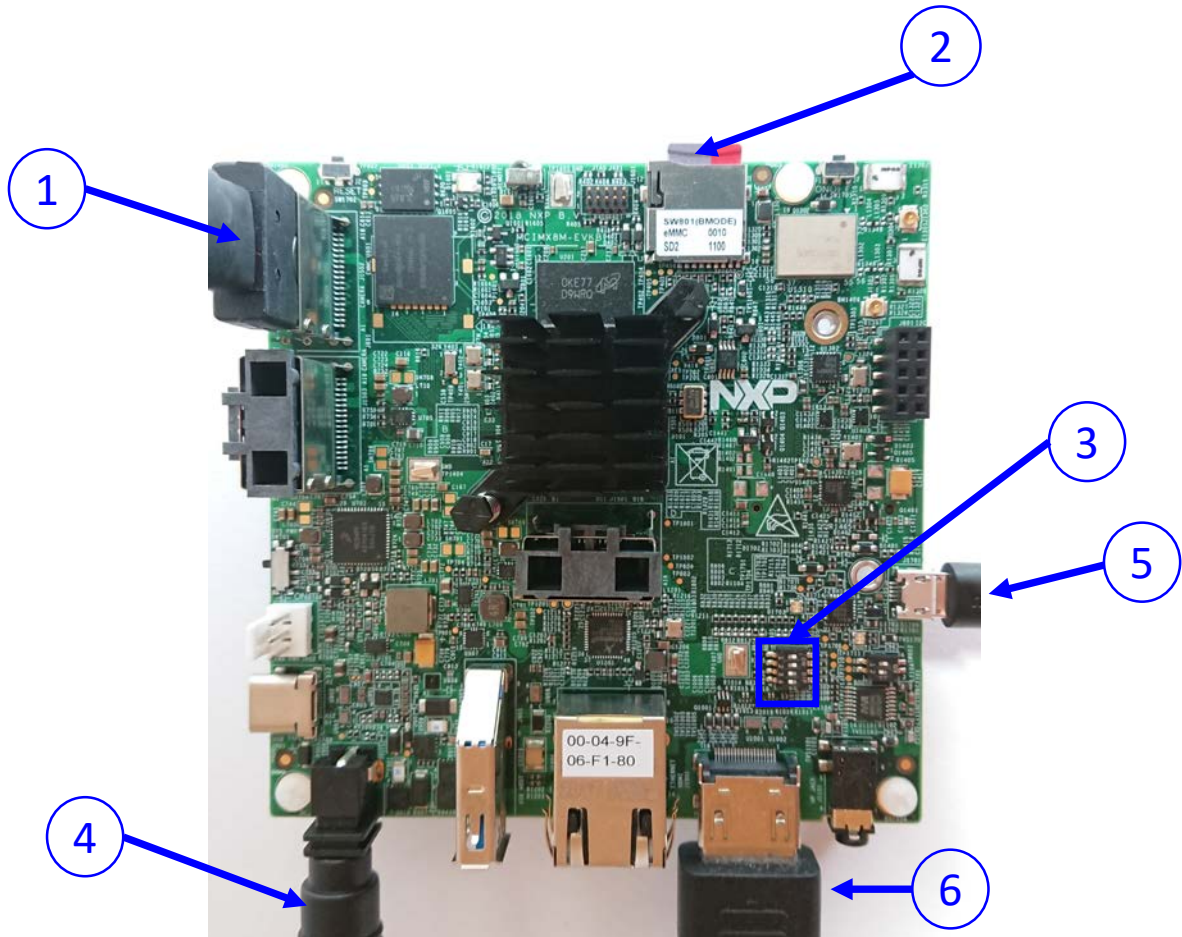
### **Step 2** : Decompress

- Decompress the .wic file from .bz2 file.

### **Step 3** : Write

- Write the SD card image file, .wic to the micro SD card by using disk image writer application software such like “Win32 Disk Imager”.

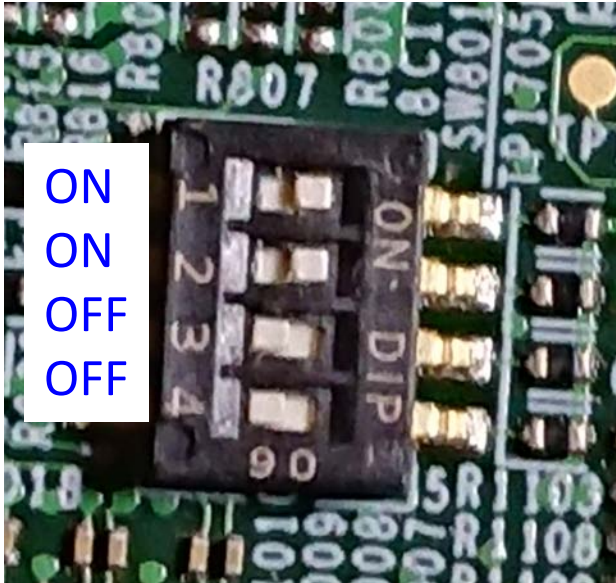
## 3.3 i.MX 8M EVK hardware Setup (1/2)



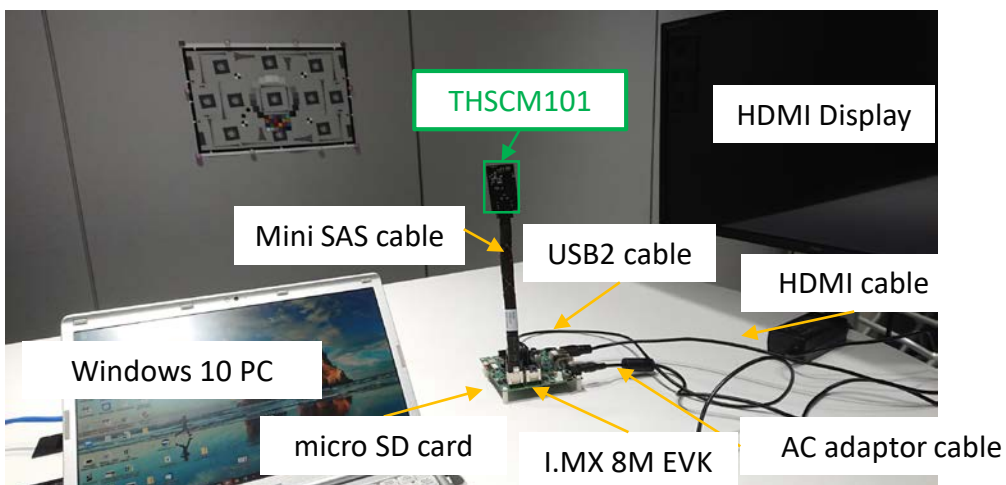
- ① Connect THSCM101 to i.8M EVK via Mini SAS cable
- ② Insert the micro SD card
- ③ Set BOOT Device Switch(SW801). See next page.
- ④ Connect AC adaptor to the power
- ⑤ Connect the PC to i.MX 8M EVK via USB2 cable
- ⑥ Connect the monitor to HDMI port of i.MX 8M EVK

## 3.3 i.MX 8M EVK hardware Setup (2/2)

Set BOOT Device Switch (SW801) to ON, ON, OFF, OFF (from 1-4 bit)

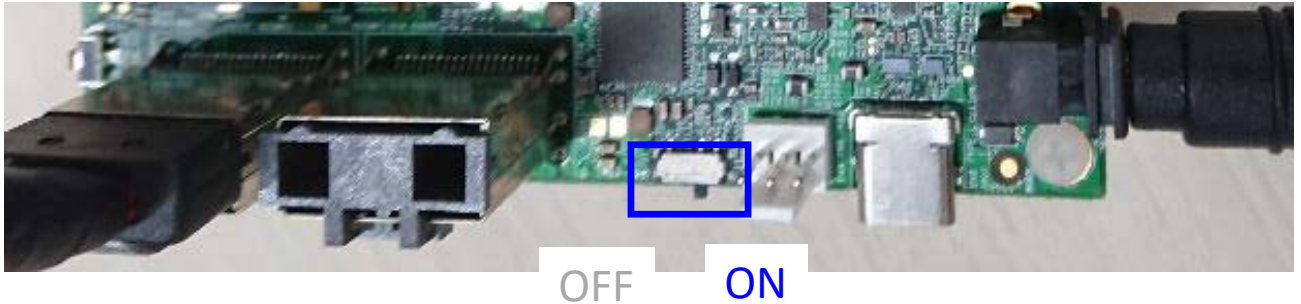


Hardware setting is completed.



## 3.4 Login to Linux on i.MX 8M EVK (1/3)

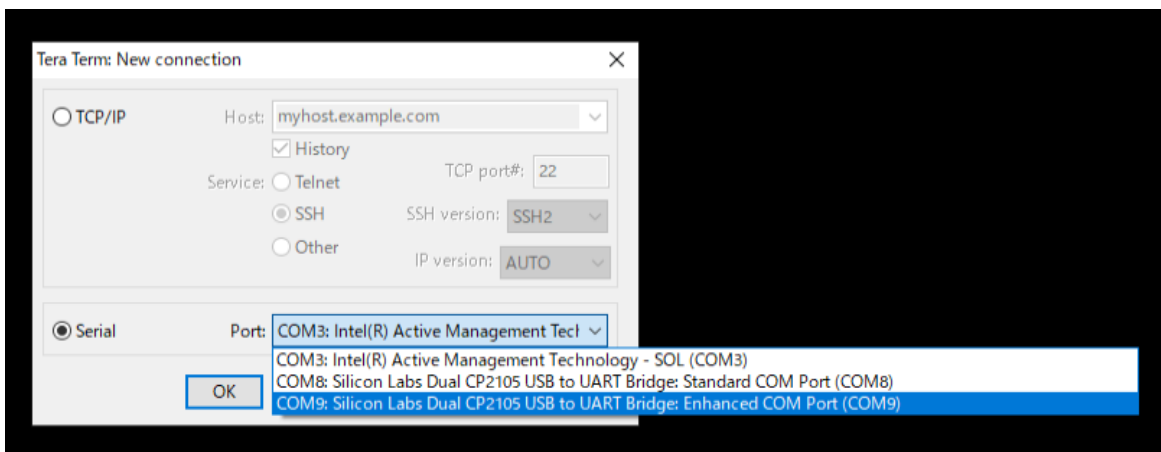
### Step 1: Power on i.MX 8M EVK



### Step 2: Launch “Tera term” on your Windows PC

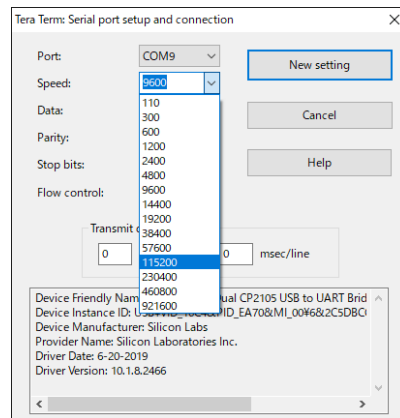
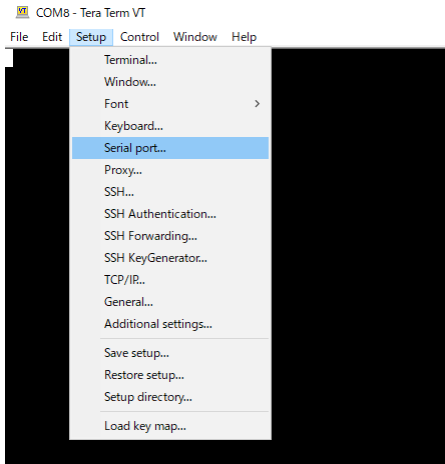
- You may need to install VCP driver.
  - <http://www.ftdichip.com/Drivers/VCP.htm>

### Step 3: Select the serial option. Choose “COM<n>:Silicon Labs Dual CP2105 USB to UART Bridge: Enhanced COM Port (COM<n>)”



## 3.4 Login to Linux on i.MX 8M EVK (2/3)

**Step 4:** Setup → Serial Port... to open port setup window, then select the Speed as 115200. Then click "New setting".



**Step 5:** Press enter key, then Tera Term displays following message.



## 3.4 Login to Linux on i.MX 8M EVK (3/3)

### **Step 6:** Login as "root"

- Enter "root", then press enter key.

```
imx8mqevk login: root
root@imx8mqevk:~#
```

## 3.5 THSCM101 firmware update (optional) (1/2)

### Step 1: Check THSCM101 firmware version.

1-1) Identify the firmware version in the hardware.

You can identify the THP7312-P firmware version in the THSCM101 hardware by the following command.

- `v4l2-ctl --get-ctrl=thp7312_firmware_version`  
`thp7312_firmware_version: 'THSCM101:THP7312 firmware version = xx.xx(*)'`  
 (\*) xx.xx is the firmware version

1-2) Identify the firmware version in the latest release pack

You can identify the THP7312-P firmware version of THSCM101 in the latest THSCM101 SD Card Image release pack by confirming the README.txt in the pack.

1-3) Compare the firmware version

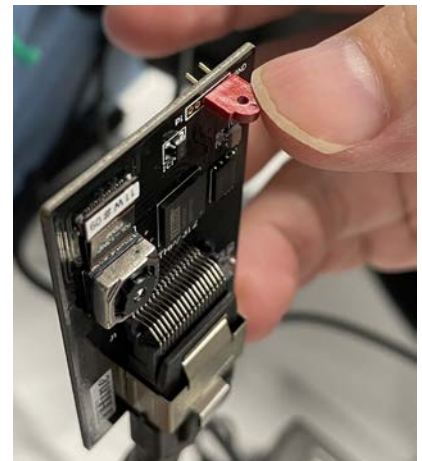
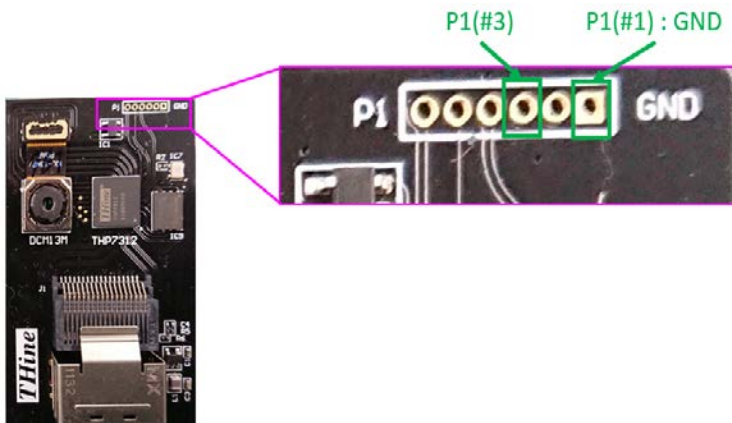
You can go to section 2.6 if the firmware version in the hardware is the latest.

### Step 2: Shutdown and power off i.MX 8M EVK.

### Step 3: Connect P1(#3) to P1(#1):GND of THSCM101.

- Hold the jumper pin until firmware update completed

e.g. Set 2.54mm pitch,  $\phi 0.5\text{mm}$  jumper to connect into the P1 #1 and P1 #3 thru holes and hold.



### Step 4: Power on i.MX 8M EVK and login as root.



## 3.5 THSCM101 firmware update (optional) (2/2)

### Step 5: Update THSCM101 firmware

- `v412-ctl --set-ctrl=thp7312_firmware_update=1`

Please confirm the completion of firmware update in the log.

```
root@imx8mqevk:~# v412-ctl --set-ctrl=thp7312_firmware_update=1
[ 90.429741] thp7312_mipi 1-0061: firmware file= thine/thscm101_thp7312.bin
[ 90.437157] thp7312_mipi 1-0061: Flash Memory:THP7312 firmware size is 132268
root@imx8mqevk:~# [ 90.449319] thp7312_mipi 1-0061: Flash Memory: Manufacturer ID =0xef Device ID (ID7-ID0)=0x14
[ 90.461416] thp7312_mipi 1-0061: Flash Memory: JEDEC ID =0xef 0x60 0x15
[ 90.468657] thp7312_mipi 1-0061: Flash Memory: Erase Block Start
[ 90.607131] thp7312_mipi 1-0061: Flash Memory: Waiting Erase
[ 90.740697] thp7312_mipi 1-0061: Flash Memory: Erase Block 0 Complete
[ 90.881443] thp7312_mipi 1-0061: Flash Memory: Waiting Erase
[ 91.011564] thp7312_mipi 1-0061: Flash Memory: Erase Block 1 Complete
[ 91.163564] thp7312_mipi 1-0061: Flash Memory: Waiting Erase
[ 91.285707] thp7312_mipi 1-0061: Flash Memory: Erase Block 2 Complete
[ 91.309882] thp7312_mipi 1-0061: Flash Memory:Flash Memory is erased.
[ 91.316339] thp7312_mipi 1-0061: Flash Memory: firmware download 131072 bytes start
[ 98.084105] thp7312_mipi 1-0061: Flash Memory: firmware data downloading
[104.542170] thp7312_mipi 1-0061: Flash Memory: firmware data downloading
[111.311999] thp7312_mipi 1-0061: Flash Memory: firmware data downloading
[117.738528] thp7312_mipi 1-0061: Flash Memory: firmware data downloading
[117.745345] thp7312_mipi 1-0061: Flash Memory: firmware download 131072 bytes complete
[125.862440] thp7312_mipi 1-0061: Flash Memory: Program 131072 bytes is completed.
[125.869962] thp7312_mipi 1-0061: Flash Memory: firmware download 1196 bytes start
[126.110482] thp7312_mipi 1-0061: Flash Memory: firmware download 1196 bytes complete
[134.229901] thp7312_mipi 1-0061: Flash Memory: Program 1196 bytes is completed.
[136.355739] thp7312_mipi 1-0061: Flash Memory: CRC of firmware in Source File = 0xc5be9de6
[136.364126] thp7312_mipi 1-0061: Flash Memory: CRC of firmware in Flash Memory = 0xc5be9de6
[136.372510] thp7312_mipi 1-0061: Flash Memory: THP7312 Firmware update is completed
```

### Step 6: Shutdown and power off i.MX 8M EVK

### Step 7: Disconnect P1(#3) from P1(#1) : GND of THSCM101

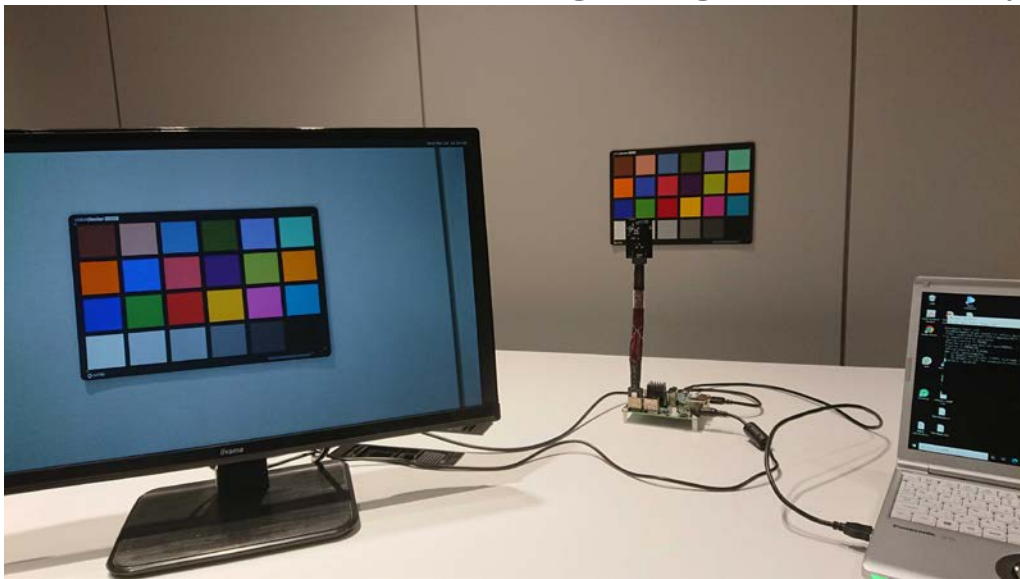
### Step 8: Power on i.MX 8M EVK and login as root.

## 3.6 Stream camera images with i.MX 8M EVK

**Step 1:** Enter the following command to stream the 4K 30fps image.

```
gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=YUY2, width=3840,height=2160,framerate=30/1 ! queue max-size-time=0 ! waylandsink enable-tile=true sync=false
```

You can see the streaming images on the display.



## 3.7 Capture camera image with i.MX 8M EVK

**Step 1:** Enter the following command to save 4K JPEG image.

```
gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=YUY2,width=3840,height=2160,framerate=30/1 ! queue max-size-time=0 ! jpegenc snapshot=true quality=95 ! filesink location=4k.jpeg
```

4K JPEG image is saved.

