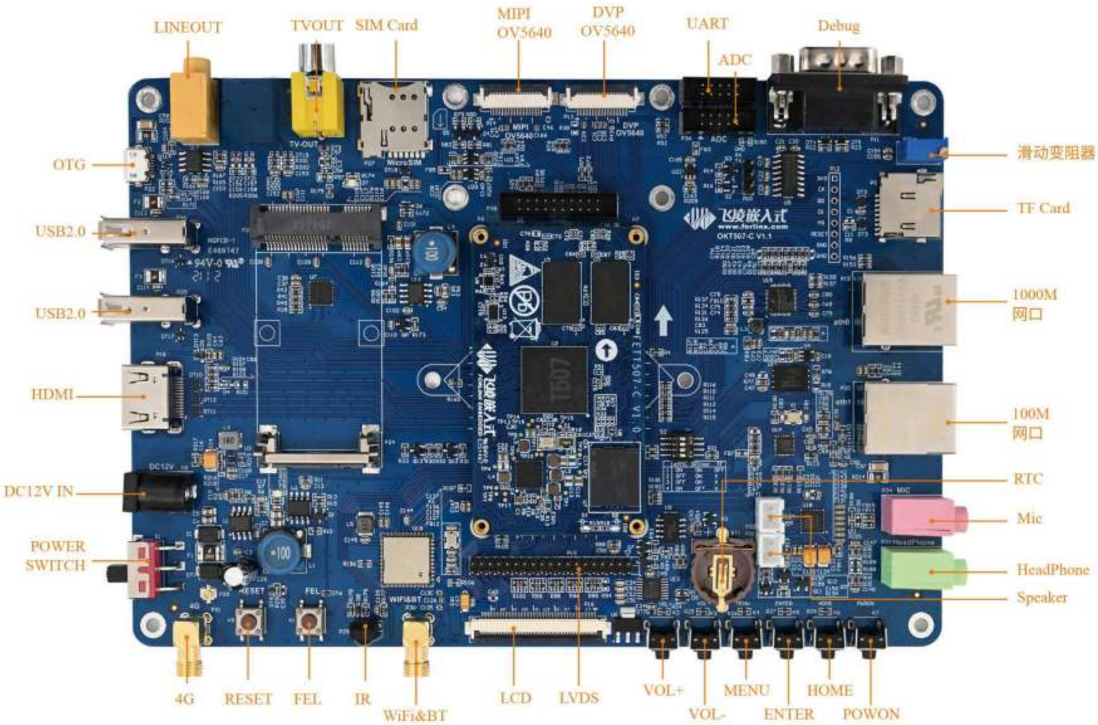
# BSP Dev for OKT507

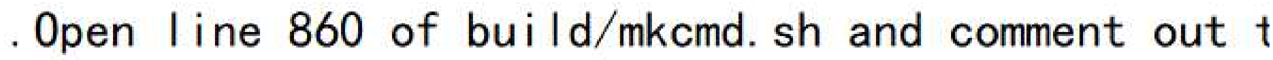


## Contents:

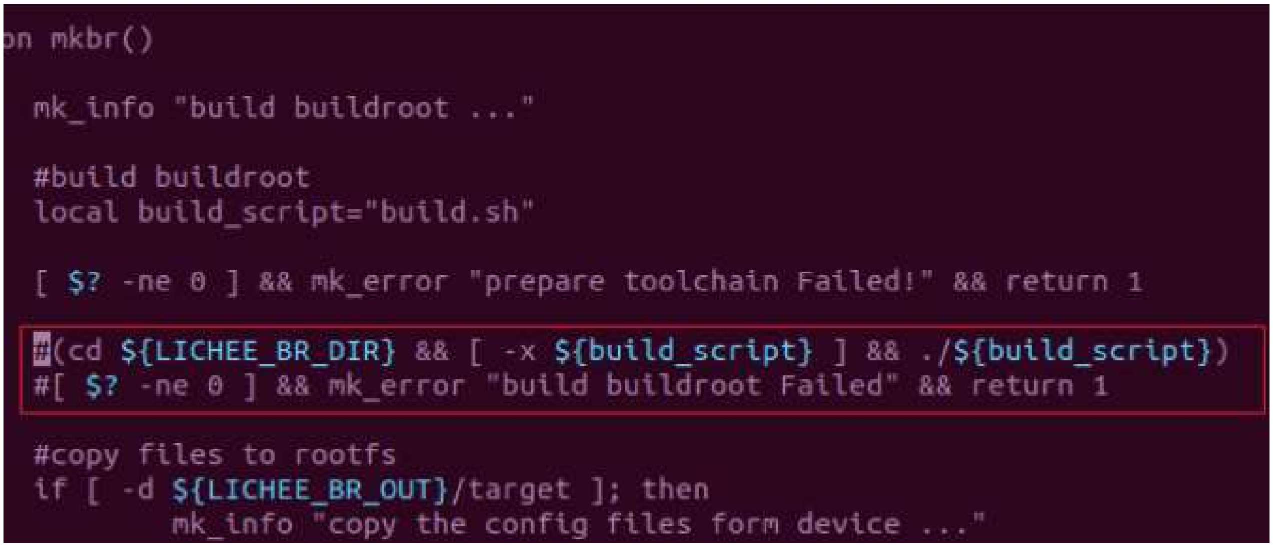
## 1. Generate a image using OKT-507 SDK:

Refer a OKT507-C_Linux4.9.170+Qt5.12.2_User's Compilation Manual (SDK2.0)_V1.0.pdf to generata a image.

Executed the pack command (./build.sh pack) to generate the OKT507 image file (out/t507_linux_okt507_uart0.img).
In case of image generation failures due to default SDK build issues, the problem was resolved by modifying the SDK build configuration.
Specifically, the required changes were applied in the build/mkcmd.sh script located at **/home/forlinx/okt_507_linux_sdk20/build by commenting out the identified lines.**



. Open line 860 of build/mkcmd.sh and comment out t



```
on mkbr()

  mk_info "build buildroot ..."

  #build buildroot
  local build_script="build.sh"

  [ $? -ne 0 ] && mk_error "prepare toolchain Failed!" && return 1

  #(cd ${LICHEE_BR_DIR} && [ -x ${build_script} ] && ./${build_script})
  #[ $? -ne 0 ] && mk_error "build buildroot Failed" && return 1

  #copy files to rootfs
  if [ -d ${LICHEE_BR_OUT}/target ]; then
          mk_info "copy the config files form device ..."
```

Finally it will generate a Image file: out/t507_linux_okt507_uart0.img

## OKT507 board bring-up procedure:
## FEL SWITCH (USB Interface) and Boot Process

### 1. Trigger the FEL Switch:

When the **FEL switch** is pressed during power-on, the **ROM Bootloader** in the SoC (System on Chip) starts executing.

It performs the following steps:

1 **Checks External Memory Sources**

- The ROM bootloader looks for a bootable image from available external memories such as:
  - **Serial EEPROM**
  - **SD Card (TF Card)**
  - **eMMC (embedded MultiMediaCard)**

2 **Loads Bootloader into External RAM (DDR)**

- Once a valid bootloader (binary file) is found, it is **loaded into the DDRAM** (Dynamic RAM).
- Then the bootloader execution begins.

### 2. Software Block Architecture:

After the bootloader is loaded into DDRAM, the software execution follows this block sequence:

ROM Bootloader

↓

UBOOT (Binary Image)

↓

Linux Kernel (ZImage)

↓

Root File System

**Explanation:**

- **U-Boot (Bootloader):** Initializes hardware and loads the Linux kernel.
- **Linux Kernel (ZImage):** Starts the operating system.
- **Root File System:** Contains user space programs, libraries, and system files.

## Flashing Methods

### A. Flashing via OTG USB Cable:

**Required setup:**

- Connect **OKT507 board** to **laptop/PC** using an **OTG USB cable**.
- Install all the necessary drivers and tools.

**Steps:**

- **Download all required packages** (from SDK/OneDrive).
- **Install USB Driver (64-bit)** using SDK.

- Windows don’t install unauthorized drivers automatically.
- Follow the driver installation link provided in SDK documentation.
- For updating the firmware, we get an error prompting the USB driver as unauthorized. To resolve this issue, **check for the USB driver update.**

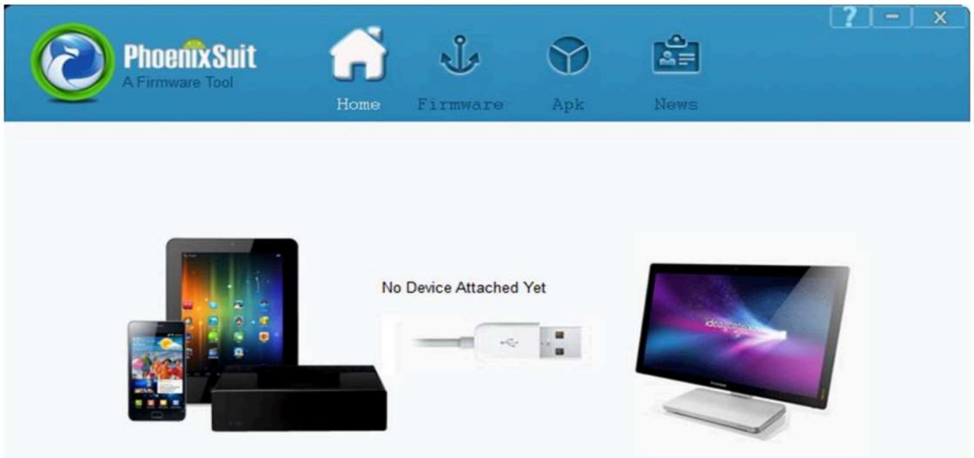
## USB Driver Updation:

- The USB driver which was provided in the okt507-c package was not supported in windows OS ,Since it was an unauthorized driver
- Windows 11: Disable Driver Signature Enforcement to install unsigned drivers
- **Process:**
  - ➢ Open Settings → Update & Security →Recovery
  - ➢ Under Advanced startup →Restart now
  - ➢ When windows reboot:
    - ➢ Go to Troubleshoot →Advanced options → Startup Settings →Restart
  - ➢ After restart, when menu appears press F7 / 7 →Disable driver signature enforcement
  - ➢ Windows will boot signature enforcement disable mode
  - ➢ Now install the USB/serial driver(via installer/device manager )
  - ➢ The driver will now install successfully.
  - ➢ After rebooting, Windows will re-enable signature enforcement .

**Procedure:**

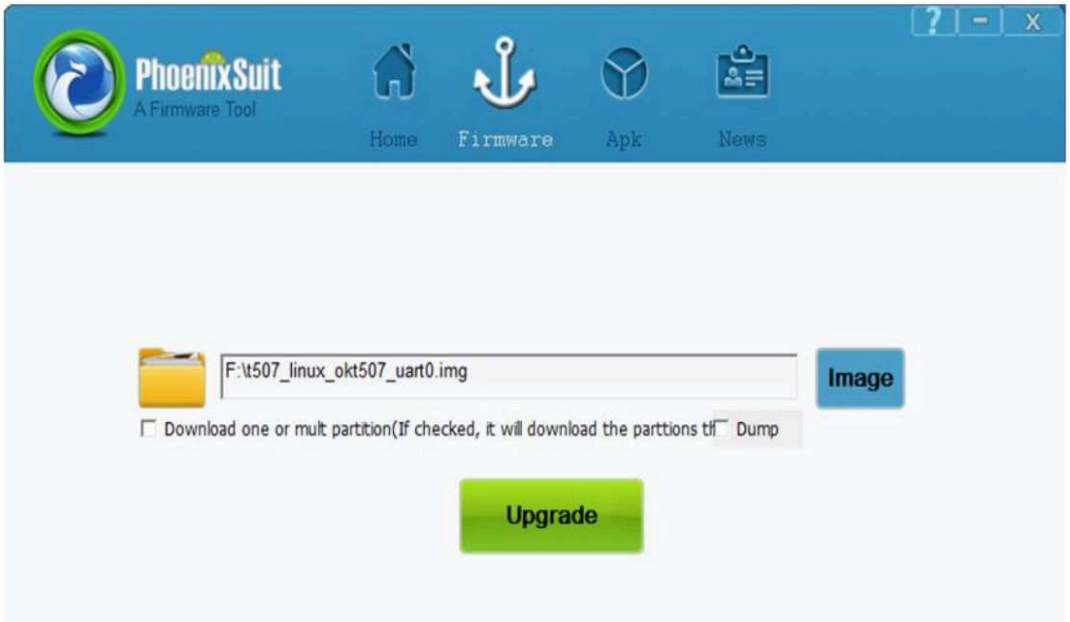
- **Download and extract PhoenixSuit** (from SDK/OneDrive).
  path:okt507&fett507-c/okt507_cLinux4.9.170+Qt5.12_SDK/phoinexsuit_v1.13.zip
- In phoinexsuit_v1.13 →open phoinexsuit.exe

- **Open PhoenixSuit Application**



No Device Attached Yet

- **Load the OS image file (.img)**

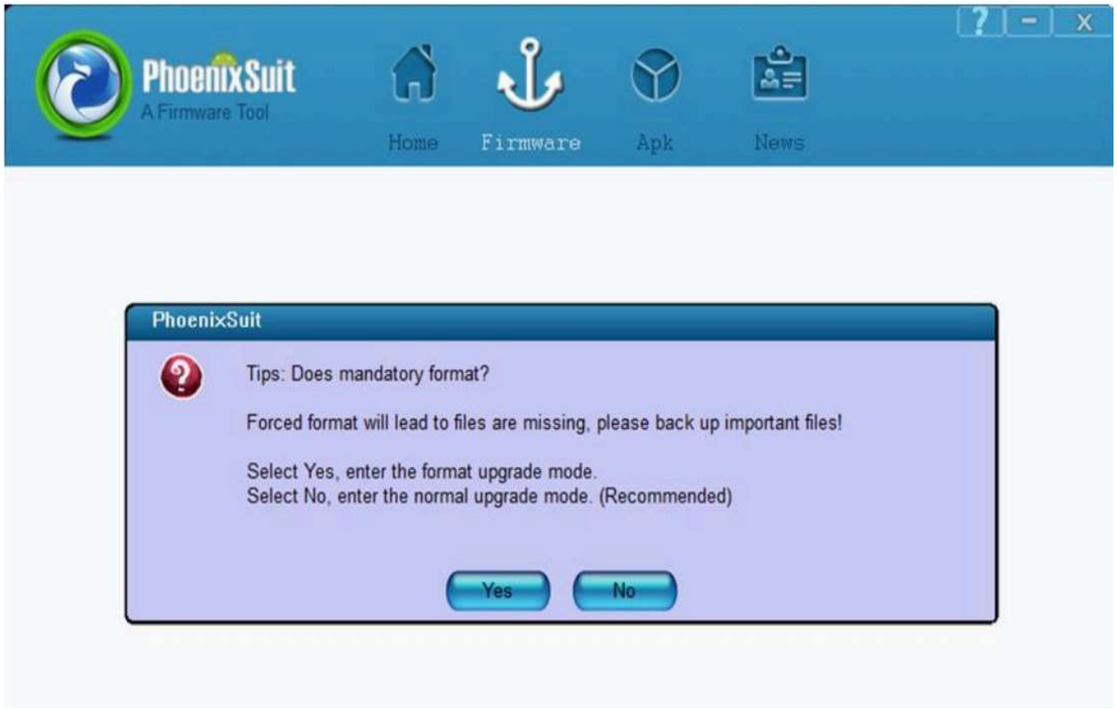


F:\t507_linux_okt507_uart0.img

□ Download one or mult partition(If checked, it will download the parttions tl □ Dump

Path:okt507&fett507-c/okt507_cLinux4.9.170+Qt5.12_SDK/Linux/os image/t507_linux_okt507_uart.img

- If it shows the device is not connected then press RESET+FEL Switch it will show upgrade then it will upgrade the Image in the board.
- click "Yes" to enter the formatting upgrade mode.



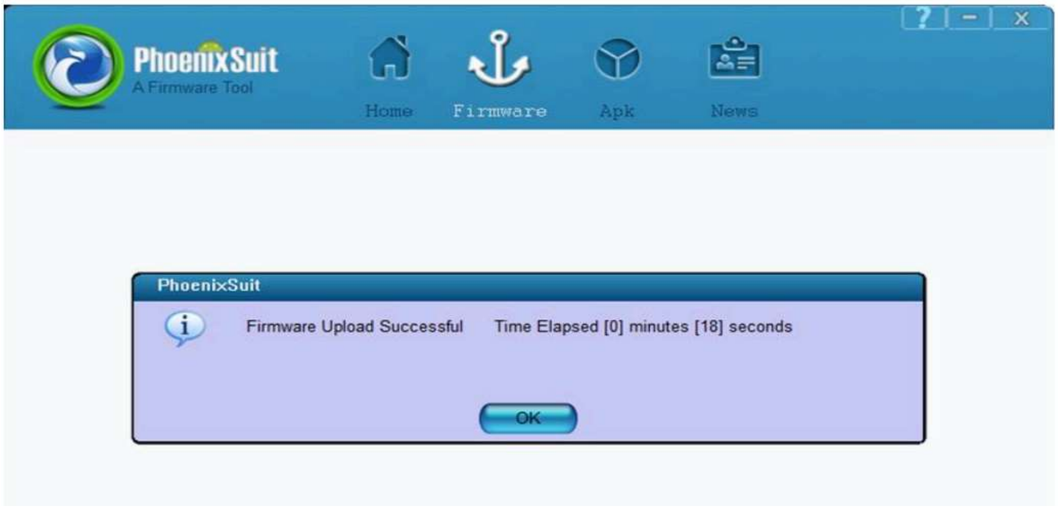
PhoenixSuit

Tips: Does mandatory format?

Forced format will lead to files are missing, please back up important files!

Select Yes, enter the format upgrade mode.
Select No, enter the normal upgrade mode. (Recommended)

- The OS image will be flashed to the device through the **OTG interface**.



PhoenixSuit

Firmware Upload Successful Time Elapsed [0] minutes [18] seconds

## B. Flashing via TF Card (SD Card)

**Required Tool:** *PhoenixCard v4.1.9*

**Steps:**

**TF Card Flashing Steps – OKT507-C (Android)**

- Insert **8GB / 16GB / 32GB TF card** into the **PC** using a **card reader**.
- Copy **PhoenixCard_V4.1.9.zip** from the path:
- OKT507-C (Android) User Profile\Android\Tool\PhoenixCard_V4.1.9.zip
- Extract the ZIP file to any folder on your Windows PC.
- Open the extracted folder and double-click PhoenixCard.exe.
- If multiple partitions exist on the TF card, click "Restore Card" first.
- Click "Firmware" and select the image file from the path:
- OKT507-C (Android) User Profile\Android\Mirror\t507_android10_okt507_uart0.img
- Select **"Mass Production Card"** mode.
- Click **"Flash Card"** to start burning the image.
- Wait until the process completes and the success message appears.
- Remove the TF card from the PC.
- Insert the TF card into the **OKT507-C development board**.
- Set the **BOOT DIP switch** to **0000**.
- Power on the board — flashing will start automatically.
- Wait until the screen or serial console shows the message:
    - ➢ CARD OK
    - ➢ [129.829] sprite success
    - ➢ Sprite_next_work=3
    - ➢ SUNXI_UPDATE_NEXT_ACTION_SHUTDOWN
    - ➢ [132.837][mmc]: mmc exit start
    - ➢ [132.856][mmc]: mmc 2 exit ok
- Power off the board and remove the TF card.
- Set the **BOOT DIP switch** to **1001**.
- Power on the board — the system will boot normally.
- **SoM Green LED Indications:**
- **Constant ON:** Flashing preparation stage
- **OFF:** Flashing completed

**To restore TF card:**

- Insert the TF card into the Windows PC
- Run **PhoenixCard.exe** as administrator
- Click **"Restore Card"** to return it to normal use.

## Procedure to access the Linux OS in OKT507:

There are two ways to access the Linux OS:

**1.Through Network Access.**
**2.Using ADB Tool.**

## 1.Network Access using ADB tool - OKT507-C

**Procedure to get the ADB platform-tool:**

- Download the ADB tool from the path and extract it:
  **OKT507-C (Android) User Profile \ Tools \platform-tools_v3db08f2c6889_20190708.7z**
- Copy the extracted ADB tool.
  - In Windows 32-bit, the extracted tool will be downloaded in the path - **C:\Windows\System32.**
  - In Windows 64-bit, the extracted tool will be downloaded in the path - **C:\Windows\SysWOW64.**
- Alternative method : Extract the ADB tool and add that folder to your PATH
- Verify the ADB tool path.
- Open the Command Prompt and run: adb
- Connect OKT507-C to your network
  - Ensure the OKT507-C is online on the same network as your PC (Wi-Fi or ETH0). \
  - (Follow device's "3.11 WIFI Network Test" or "3.10 Ethernet Test" if necessary.)
- Enable Developer Options on OKT507-C
- Go to Settings → About Tablet → Tap Version/build number repeatedly until "You are in developer mode" prompt appears.
- Open →Developer Options
- Now go to Settings → System → Advanced → Developer Options →Enable Network ADB debugging
- In Developer Options →Enable Network ADB / ADB over network / ADB debugging network.
- Note the device IP address (e.g. 192.168.1.101) shown in the device's network info.
- Disconnect USB
  - Unplug any Micro-USB cable from the device (ADB network requires unplugged USB).
- Connect from PC via adb network.
- Turn On your PC and open command prompt and run:
  - **adb connect Ip Address**( Device IP address).

eg **: adb connect 192.168.1.101:5555**

- To Confirm the connection in ADB shell:

Run : adb devices

Result: 192.168.1.101:5555 device.

- Open Command prompt on your PC:
  - **adb shell**

The way to mount system as an read/write property :

```
adb root
adb remount
```

The mount property of the system has been successfully changed to rw property.
To Verify whether the system is mounted rw

**Mount | grep system**

Finish and safety

After making changes, remount system back to read-only for safety

**adb shell mount -o ro,remount /system**

Now Reboot the device.

**adb reboot**.

## 2nd Method:Using USB Cable

**Procedure to get the ADB platform-tool:**

- Download the ADB tool from the path and extract it:
  **OKT507-C (Android) User Profile \ Tools \platform-tools_v3db08f2c6889_20190708.7z**
- Copy the extracted ADB tool.
  - In Windows 32-bit, the extracted tool will be downloaded in the path - **C:\Windows\System32.**
  - In Windows 64-bit, the extracted tool will be downloaded in the path - **C:\Windows\SysWOW64.**
- Alternative method : Extract the ADB tool and add that folder to your PATH
- Verify the ADB tool path.
- Open the Command Prompt and run: adb
- For Connecting to OKT507:
  - **adb devices**
- It will show all devices connected to PC
- For Root Access:
  - **adb shell**
- For Super User Access:
  - **su**
- Command to verify the Device Drivers:
  - **ls/dev**
- To verify the Display devices:
  - fb0,fb1,fb2
- Command for the Blank screen Display :
  - **Dd if=/dev/1 or 0 of=/dev/fbo=/dev/fb1**

- push the binary file into the OKT Board

**e.g: adb push (filename) root**

To check the Differenent Frame buffer virtual size

-
  ```
  sh-4.4# cat /sys/class/graphics/fb1/virtual_size
  1280,1440
  ```

-
  ```
  sh-4.4# cat /sys/class/graphics/fb0/virtual_size
  024,1200
  ```

-
  ```
  sh-4.4# cat /sys/class/graphics/fb2/virtual_size
  1024,1200
  ```

-
  ```
  sh-4.4# cat /sys/class/graphics/fb3/virtual_size
  ```

**NOTE:**

1. FBO is supprorting for LCD.
2. FB1 is supporting for HDMI.

- These 5 commands are used to set the parameters before going to execute the binary in the OKT-507 board..

```
export QT_QPA_PLATFORM=linuxfb

export QT_QPA_FB_DEVICE=/dev/fb0

export QT_QPA_PLATFORM_PLUGIN_PATH=/usr/lib/qt/plugins

export QT_QPA_FONTDIR=/usr/lib/fonts

export XDG_RUNTIME_DIR=/tmp/runtime-root
```

Execute the Binary file

e.g: ./filename