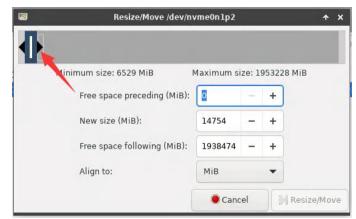


 f) Then select the /dev/nvme0n1p2 partition, click the right button again, and then select Resize/Move

| | | | vme0n1 - GPar | ted | | | 1 | - ¤ × |
|----------------------|--------|--------------|------------------|----------|-------------|----------|------------|----------|
| GParted Edit View | Device | Partition He | elp | | | | | |
| 🕑 🔕 🔊 | P. | | 2 | | | /dev/nvr | me0n1 (1.8 | 6 ТіВ) 🔻 |
| | | | unallo 1.85 T | | | | | |
| Partition | Name | File System | Mount Point | Label | Size | Used | Unused | Flags |
| unallocated | | unallocated | | | 30.00 MiB | | | |
| /dev/nvme0n1p1🛕 | bootfs | fat16 | /boot | opi_boot | 256.00 MiB | | | bls_boot |
| /dev/nvme0n1p2 | | ext4 | | opi_root | New | con cin | Insert | |
| unallocated | | unallocated | | | 🛞 Delete | | Delete | |
| | | | | | 🔊 Resize/M | ove | | |
| | | | | | 탄 Copy | 111 | Ctrl+C | |
| | | | | | 💼 Paste | | Ctrl+V | |
| | | | | | Format to |) | • | |
| | | | | | Open Enc | ryption | | |
| | | | | | Mount | | | |
| | | | | | Name Pa | rtition | | |
| 0 operations pending | | | | | Manage F | lags | | |
| o operacions penang | | | | | Check | | | |
| | | | | | Label File | System | | |
| | | | | | New UUI | С | | |
| | | | | | 💡 Informati | on | | |

g) Then drag the capacity to the maximum at the position shown in the figure below



h) Then click **Resize/Move**

| Resize/Move /dev/n | vme0n1p2 | | | |
|-----------------------------|------------|--------|-----------|------|
| | | | | |
| Minimum size: 6529 MiB | Maximum si | ze: 19 | 953228 Mi | В |
| Free space preceding (MiB): | ٥ | - | + | |
| New size (MiB): | 1953228 | - | + | |
| Free space following (MiB): | 0 | - | + | |
| Align to: | Мів | | - | |
| | Canc | el | ≫∥ Re | size |

i) Then click the green \checkmark in the position below

| | | /dev/n | vme0n1 - GPar | ted | | | * | - 🗆 × |
|-------------------|--------|----------------|----------------------|----------|------------|----------|-------------|----------|
| GParted Edit View | Device | e Partition He | elp | | | | | |
| · 😣 🔊 | | 6 9 | 1 | | 6 | /dev/nvr | ne0n1 (1.80 | 5 TiB) 🔻 |
| | | | /dev/nvm 1.86 TiB | e0n1p2 | | | | |
| Partition | Name | File System | Mount Point | Label | Size | Used | Unused | Flags |
| unallocated | | unallocated | | | 30.00 MiB | | | |
| /dev/nvme0n1p1 🛕 | bootfs | fat16 | /boot | opi_boot | 256.00 MiB | | | bls_boot |

j) Then click Apply

| | /dev/nvme0n1-G | iParted | ↑ - □ × |
|-------------------------------|--|---|-------------------------|
| GParted Edit View [| Device Partition Help | | |
| ▶ ⊗ ≥ | H 🛍 🥱 🖌 | Jd | ev/nvme0n1 (1.86 TiB) 🔻 |
| | /dev/n 1.86 T | vme0n1p2 ïB | |
| Partition | Apply operati | ons to device | Unused Flags |
| unallocated /dev/nvme0n1p1 | | want to apply the | bls boot |
| /dev/nvme0n1p1 | pending operation | | 3 1.86 TiB |
| | Editing partitions has the pot You are advised to backup yo | ential to cause LOSS of DATA. ur data before proceeding. | |
| | Cancel | Apply | |
| | | | |
| lorow /dev/nvme0n1p2 | ? from 14.41 GiB to 1.86 TiB | | |
| | | | |
| | | | |
| 1 operation pending | | | |

k) Then click **Close** to close

| ۵ | /dev/nvme0n1 - GParted | | ↑ - □ × |
|--------------------------------|------------------------------|---------------------|---------------------|
| GParted Edit View Device Pa | tition Help | | |
| 🕑 😣 🕅 🖳 💼 | (m) 🗸 | /dev/nv | vme0n1 (1.86 TiB) 🔻 |
| | /dev/nvme0n] 1.86 TiB | Lp2 | |
| Part | Applying pending operat | ions | + • × |
| un Depending on the number and | type of operations this migh | t take a long time. | 19.5 |
| /de Completed Operations: | | | poot |
| /di | All operations successfully | completed | |
| ▶ Details | | | |
| | | | |
| | | | |
| | | | |
| ≫l Gi | | Save Details | X Close |

m. At this point, you can use the **sudo poweroff** command to shut down. Then please pull out the TF card, and then short press the power button to turn on, then the Linux system in SPIFlash+NVMe SSD will be started.

10) Step **9** is to clone the system in the TF card to the NMVe SSD. We can also directly burn the Linux image file to the NVMe SSD. Here are the steps:

- a. Upload the Linux image file to the Linux system of the development board
- b. Then use balenaEtcher to burn

| (| | balenaEtcher | + - × |
|----------|------------------------------|---|-------|
| | | 😭 balena Etcher | ¢ 0 |
| | € — | | |
| | Orangepi50.110.img Remove | ▲ Fanxiangopi_root) Change | Flash |
| | | | |
| | | | |
| | | ecting your system drive is dangerous and wil | |

c. After using this method to burn the image, there is no need to manually expand the capacity, and it will automatically expand the capacity at the first startup.

2.7. How to burn Android image to TF card

2. 7. 1. Method of burning Android image to TF card through USB2.0 burning port

1) First prepare a TF card with 8GB or larger capacity. The transmission speed of the TF card must be class10 or above. It is recommended to use a TF card of SanDisk and other brands

2) You also need to prepare a good quality USB2.0 male-to-male data cable



3) Then download Rockchip driver **DriverAssitant_v5.12.zip** and burning tool **RKDevTool_Release_v3.15.zip** from **Orange Pi's data download page**

- 4) Then download the Android image from **Orange Pi's download page**.
 - After opening the download link of the Android image, you can see the following two types of Android images, please select the image in the TF card and eMMC startup image folder to download



- b. After entering the **TF card and eMMC startup image** folder, you can see the following two images, the difference between them is:
 - a) The first image is dedicated to HDMI display and supports 4K display. If you don't use LCD screen, please download the image without lcd
 - b) If you want to use lcd screen, please choose image with lcd

- OrangePi3B_RK3566_Android11_v1.0.0.tar.gz
- OrangePi3B_RK3566_Android11_lcd_v1.0.0.tar.gz

5) Then use the decompression software to decompress the compressed package of the downloaded Android image. Among the decompressed files, the file ending with ".img" is the Android image file, and the size is more than 1GB

6) Then use the decompression software to decompress **DriverAssitant_v5.12.zip**, and then find the **DriverInstall.exe** executable file in the decompressed folder and open it

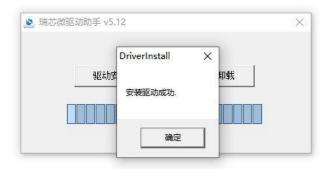
| 名称 | 修改日期 | 类型 | 大小 |
|------------------|-----------------|------|--------|
| ADBDriver | 2022/12/1 15:07 | 文件夹 | |
| - bin | 2022/12/1 15:07 | 文件夹 | |
| Driver | 2022/12/1 15:07 | 文件夹 | |
| Config | 2014/6/3 15:38 | 配置设置 | 1 KB |
| le DriverInstall | 2022/2/28 14:11 | 应用程序 | 491 KB |
| Readme | 2018/1/31 17:44 | 文本文档 | 1 KB |
| revison | 2022/2/28 14:14 | 文本文档 | 1 KB |
| | | | |

7) After opening **DriverInstall.exe**, the steps to install the Rockchip driver are as follows

a. Click the "Driver Installation" button

| | 1 | |
|------|------|--|
| 驱动安装 | 驱动卸载 | |
| | | |

b. After waiting for a period of time, a pop-up window will prompt "The driver is installed successfully", and then click the "OK" button.



8) Then decompress **RKDevTool_Release_v3.15.zip**, this software does not need to be installed, just find **RKDevTool** in the decompressed folder and open it

| 名称 | 修改日期 | 类型 | 大小 |
|-----------------|------------------|-----------------|----------|
| 📙 bin | 2022/12/1 15:07 | 文件夹 | |
| 📙 Language | 2022/12/1 15:07 | 文件夹 | |
| 🗋 config.cfg | 2022/3/23 9:11 | CFG 文件 | 7 KB |
| 📄 config | 2021/11/30 11:04 | 配置设置 | 2 KB |
| revision | 2022/5/27 9:09 | 文本文档 | 3 KB |
| KKDevTool | 2022/5/27 9:06 | 应用程序 | 1,212 KB |
| ☑ 开发工具使用文档_v1.0 | 2021/8/27 10:28 | Foxit PDF Reade | 450 KB |

9) After opening the **RKDevTool** burning tool, because the computer has not connected to the development board through the USB2.0 male-to-male data cable at this time, the lower left corner will prompt "**No device found**"

| | | 注工具 v3.15 | | | | |
|-----|-----|-----------|------------|-----------|----------|---|
| 城镜 | 像 | 升级固件; | 高級功能 | | | |
| 6 | | 存储 | 地址 | 名字 | 路径 | |
| | Г | 11 PH | 0x00000000 | Loader | DH LL | |
| | Г | 1.00 | 0x00000000 | Parameter | | |
| | | | 0x00000000 | Vboot | | |
| | | | 0x00000000 | trust | | |
| | | | 0x00000000 | Misc | | |
| | | | 0x00000000 | Resource | | |
| | Г | | 0x00000000 | Kernel | | |
| | Г | | 0x00000000 | Boot | | |
| | Г | | 0x00000000 | Recovery | | |
| 0 | Г | | 0x00000000 | System | | |
| 1 | Г | | 0x00000000 | Backup | | |
| | | | | | | |
| bad | er: | | 执行 | 切换 | 设备分区表 清空 | |
| | | | □强制按地址写 | | | |
| | | - | 有发现设备 | _ | | * |

- 10) Then start burning the Android image to the TF card
 - a. First, connect the development board to the Windows computer through the USB2.0 male-to-male data cable. The position of the USB2.0 programming interface of the development board is shown in the figure below



- b. Then make sure that the development board is not inserted into the TF card and not connected to the power supply
- c. Then press and hold the MaskROM button on the development board, the position of the MaskROM button on the development board is shown in the figure below:



d. Then connect the power supply of the Type-C interface to the development board, and power on



e. If the previous steps are successful, the development board will enter the **MASKROM** mode at this time, and the interface of the burning tool will prompt "found a **MASKROM device**"

| # | | 存储 | 地址 | 名字 | 路径 | |
|------|-----|----|------------|-----------|----------|--|
| 1 | Г | | 0x00000000 | Loader | | |
| 2 | | | 0x00000000 | Parameter | | |
| 3 | | | 0x00000000 | Uboot | | |
| 4 | | | 0x00000000 | trust | | |
| 5 | | | 0x00000000 | Misc | | |
| 6 | | | 0x00000000 | Resource | | |
| 7 | Г | | 0x00000000 | Kernel | | |
| 8 | Г | | 0x00000000 | Boot | | |
| 9 | Г | | 0x00000000 | Recovery | | |
| 10 | Г | | 0x00000000 | System | | |
| 11 | Г | | 0x00000000 | Backup | | |
| .oad | er: | | 执行 | 切换 | 设备分回来 清空 | |

- f. Then insert the TF card into the development board
- g. Then please select advanced features

| 芯秋 | 如开发工具 v3.1 | 5 | | | | - |
|----|------------|------------|-----------|----|---|---|
| 载镜 | 像升级固件 | 高级功能 | | | 1 | |
| # | 口存储 | 1 tit | 名字 | 路径 | | |
| 1 | | 050000000 | Loader | | | |
| 2 | | 0x00000000 | Parameter | | | |
| 3 | | 0x00000000 | Uboot | | | |
| 4 | | 0x00000000 | trust | | | |
| 5 | | 0x00000000 | Misc | | | |
| 6 | | 0x00000000 | Resource | | | |
| 7 | | 0x00000000 | Kernel | | | |
| 8 | | 0x00000000 | Boot | | | |
| 9 | | 0x00000000 | Recovery | | | |
| 10 | | 0x00000000 | System | | | |
| 11 | Г | 0x00000000 | Backup | | | |

h. Then click the position shown in the figure below

| 續像 升级固件 | - 両30(か)時間 | | | | |
|-----------|------------|-----------|--------------|---|--|
| loot: | | | | 下载 | |
| 5件: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FlASH 2. EMMC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM 8. USB | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | |
| 起始扇区: | | | | | |
| 扇区数: | | | | | |

i. Then select MiniLoaderAll.bin in the MiniLoader folder downloaded earlier, and click to open

| ← → ∽ ↑ こ、 桌面 > | orangepi > N | finiLoader-烧录Linux镜像才需要用到的东 | 西 ~ C 在 | MiniLoader-烧录Linux | Q |
|-----------------|--------------|-----------------------------|-----------------|--------------------|------|
| 组织 ▼ 新建文件夹 | | | | ≣ • □ | 0 |
| > 🖕 WPS云盘 | 1 | 名称 ^ | 修改日期 | 类型 | 大小 |
| ☆ 主文件夹 | | 😏 MiniLoaderAll.bin | 2023/8/18 11:17 | BIN 文件 | 45 |
| > 🔷 OneDrive | | rk356x_linux_emmc.cfg | 2023/8/18 11:17 | txtfile | 1 |
| | | rk356x_linux_pcie.cfg | 2023/8/18 11:17 | txtfile | 1 |
| 重 桌面 | * | rk356x_linux_spiflash.cfg | 2023/8/18 11:17 | txtfile | |
| 业 下载 | * | rk356x_linux_tfcard.cfg | 2023/8/18 11:17 | txtfile | |
| ■ 文档 | * | rkspi_loader.img | 2023/8/18 11:17 | DAEMON.Tools | 4,09 |
| 🗾 圏片 | * | | | | |
| 🕜 音乐 | | | | | - |

j. Then click download

| ot: C:\ | Users\hh177\Deskt | op\orangepi\Mini | Loader-烧 | 下载 | |
|-----------|-------------------|------------------|--------------|--|--|
| l#: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EMOC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | | 5. SPINOR 6. SPINAND 7. RAM | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | |
| 导出镜像 | 擁除扇区 | 擦除所有 | | | |
| 验扇区: | | | | | |
| 間区数: | | | | | |

k. The display after downloading MiniLoaderAll.bin is shown in the figure below

| | ‡ 高级功能 Vsers\csy\Desktop | \orangepi\MiniLo | ader-烧录 | 下载 | 下载Boot开始 下载Boot成功 | |
|---------------|-----------------------------|------------------|--------------|---|----------------------|--|
| 固件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EMMC 3. SD | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | X | |
| 起始扇区: 扇区数: | | | | | | |
| 发现 | 一个MASKRO | M设备 | 2-3 :MASKROM | ι | ~ | |

1. Then select the storage device as SD, and then click Switch Storage

| Boot: C:\ | Users\csy\Desktop | \orangepi\MiniLo | ader-烧录 | 下载 | 1 | 下载Boot成功 | | |
|-----------|-------------------|------------------|---------------------------------------|-----------------------------------|---|----------|--|--|
| 固件: | | | | 解包 |] | | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC 3. SD | | | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 4. SD1 5. SPINOR 5. SPINAND | | | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | ————————————————————————————————————— | 8. USB 9. SATA 10. PCIE | | | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | L | | | | | |
| 起始扇区: | | | | | | | | |

m. The display of successful switching is shown in the figure below

| Boot: C:\1 | Users\csy\Desktop' | \orangepi\MiniLo | ader-烧录 | 下载 | | 下载Boot成功 | | |
|------------|--------------------|------------------|---------------|--|-----------|----------|--|--|
| 固件: | | | | 解包 | | | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC | RKDevTool | × | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 3. SD 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | 存储成功. | | |
| 导出镜像 | 擦除扇区 | 擦涂所有 | | | | 确定 | | |
| 起始扇区: | | | | | | | | |
| 扇区数: | | | | | | | | |

n. Then click the "Upgrade Firmware" column of the burning tool

| 芯微开发工具 v3.15 | | | - 0 |
|-----------------|----------------|---|-----|
| 議像 开级固件 高级功能 | | | |
| 固件 升级 切换 | | | |
| 固件版本: Loader版本: | 芯片信息: | | |
| 固件: | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 发现一个MASKROM设备 | 1-2-3 :MASKROM | ~ | |
| 发现一个MASKROM设备 | 1-2-3 IMASERUM | | |

o. Then click the "**Firmware**" button to select the path of the Android image that needs to be burned

| 端芯微开发工具 v3.15 | | <u>_</u> | |
|-----------------|------------------|----------|--|
| 載鏡像「升级固件」高级功能 | | | |
| 固件 升级 切换 | | | |
| 固件版本: Loader版本: | 芯片信息: | | |
| 固件: | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 发现一个MASKROM设备 | 1-2-3 :NASKRON V | | |

p. Finally, click the "**Upgrade**" button to start burning, and the log during the burning process is shown in the figure below. After burning is completed, the Android system will start automatically.

| 、瑞芯微开发工具 v3.15 | - |
|---|---|
| 下鉄鎮像 升級固件 高級功能 <u>固件 升級</u> 切換 <u>固件</u> 升級 切換 <u>固件</u> 新泰: 11.0.00 Loader版本: 1.01 芯片信息: RE568 <u>固件</u> : C:\Users\cay\Desktop\OrangeFi38_EE3566_Android11_v1.0.0\Orange <u>没有发現设格</u> | 测试设备开始 测试设备成功 时线运行开始 转起芯片成功 转现11 allafo成为 准备100成功 下载10开始 下载100开始 下载100开始 正在有载团件(100%) 下载10件成功 |

2. 7. 2. How to use SDDiskTool to burn Android image to TF card

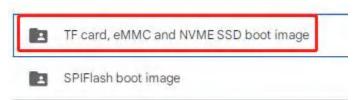
1) First prepare a TF card with 8GB or larger capacity. The transmission speed of the TF card must be class10 or above. It is recommended to use a TF card of SanDisk and other brands

2) Then use the card reader to insert the TF card into the computer

3) Then download the SDDiskTool programming tool from the **Orange Pi data download page**, **please make sure that the version of the SDDiskTool tool is the latest v1.72**.

4) Then download the Android11 image from the Orange Pi download page

a. After opening the download link of the Android image, you can see the following two types of Android images, please select the image in the TF card and eMMC startup image folder to download



- b. After entering the **TF card and eMMC boot image** folder, you can see the following two images, the difference between them is:
 - a) The image without lcd is specially used for HDMI display and supports 4K display. If you do not use the LCD screen, please download the image without lcd
 - b) If you want to use LCD screen, please choose image with lcd

- OrangePi3B_RK3566_Android11_v1.0.0.tar.gz
- OrangePi3B_RK3566_Android11_lcd_v1.0.0.tar.gz

5) Then use decompression software to decompress the compressed package of the downloaded Android image. Among the decompressed files, the file ending with ".img" is the Android image file, and the size is more than 1GB

6) Then use decompression software to decompress **SDDiskTool_v1.72.zip**, this software does not need to be installed, just find **SD_Firmware_Tool.exe** in the decompressed folder and open it

| 🍶 Language | 2022/9/5 15:04 | 文件夹 | |
|------------------------|-----------------|-----------|--------|
| config | 2020/3/18 17:27 | 配置设置 | 2 KB |
| revision | 2021/4/21 18:01 | 文本文档 | 1 KB |
| sd_boot_config.config_ | 2014/9/3 9:52 | CONFIG 文件 | 1 KB |
| B SD_Firmware_Tool | 2021/4/21 17:57 | 应用程序 | 698 KB |
| SDBoot.bin | 2015/9/29 17:13 | BIN 文件 | 149 KB |
| | | | |

7) After opening **SDDiskTool**, if the TF card is recognized normally, the inserted disk device will be displayed in the "**Select Removable Disk Device**" column. Please make sure that the displayed disk device is consistent with the drive letter of the TF card you want to burn, if there is no display, you can try to unplug the TF card

| | 选择可称动能争语备 Generic MassStorageClass USB Device 29.7 | SDBoot:2.12 |
|-----|---|-------------|
| 育二步 | 选择功能模式 | _ |
| | □ 固件升级 □ PCBA测试 | ☑SD启动 |
| 第三步 | 选择升级固件 | □修复 |
| | | 选择固件 |
| 第四步 | 选择Demo数据(可选) | |
| | | 选择Demo |
| | | |
| | | 开始创建 |

8) After confirming the drive letter, you can format the TF card first, click the restore disk button in SDDiskTool, or use the SD Card Formatter mentioned above to format the TF card

| | rageClass USB [| Device 29.7G | · ~ | |
|--------------|-----------------|------------------|---|---|
| | | | | |
| 驿功能模式 | | | | |
| 国件升级 | | PCBA测试式 | | SD启动 |
| 释升级固件 | SD_Firmwar | e_Tool | ×□ | 修复 |
| | | | | 选择固件 |
| 爭Demo数据(i | | 灰复磁盘成功. | | |
| | | | _ D | 选择Bemo |
| | | 确定 | | |
| | 爭升級固件 | 释升级固件 SD_Firmwar | ¥升级固件 SD_Firmware_Tool () 恢复磁盘成功. | 計級固件 SD_Firmware_Tool X peno数据(同 な复磁豊成功. |

- 9) Then start to write the Android image to the TF card
 - a. First check "SD Boot" in "Select Function Mode"
 - b. Then select the path of the Android image in the "Select to upgrade firmware" column
 - c. Finally click the "Start Create" button to start burning the Android image to the TF card

| 第一步:选择可移动磁盘设备 | Class USB Device 29.7G | SDBoot:2.1 |
|-----------------|------------------------|------------|
| 第二步:选择功能模式 | | |
| □固件升级 | рсващія, | ☑ SD 启动 |
| 第三步:选择升级固件 | | □修复 |
| | | 选择固件 |
| 第四步:选择Demo数据(可选 |) | |
| | | 选择Demo |
| | | |
| | | 开始创建 |

10) After burning, you can exit the SDDiskTool software, and then you can pull out the TF card from the computer and insert it into the development board to start



2.8. How to burn Android image to eMMC

Note, after burning the image into eMMC, if the test finds that it cannot be started, please clear the SPIFlash and try again. For the method of clearing SPIFlash, please refer to the method of using RKDevTool to clear SPIFlash.

2. 8. 1. Method of burning Android image into eMMC through USB2.0 burning port

Note that all the following operations are performed on a Windows computer.

1) The development board reserves an eMMC expansion interface. Before programming the system to eMMC, you first need to purchase an eMMC module that matches the eMMC interface of the development board. Then install the eMMC module to the development board.

The eMMC module and the method of plugging into the development board are as follows:





2) You also need to prepare a good quality USB2.0 male-to-male data cable



3) Then download Rockchip driver **DriverAssitant_v5.12.zip** and burning tool **RKDevTool Release v3.15.zip** from **Orange Pi's data download page**

- 4) Then download the Android image from **Orange Pi's download page**.
 - a. After opening the download link of the Android image, you can see the following two types of Android images, please select the image in the TF card and eMMC startup image folder to download



- b. After entering the **TF card and eMMC startup image folder**, you can see the following two images, the difference between them is
 - a) The first image is dedicated to HDMI display and supports 4K display. If you don't use LCD screen, please download the image without lcd
 - b) If you want to use lcd screen, please choose image with lcd

OrangePi3B_RK3566_Android11_v1.0.0.tar.gz
OrangePi3B_RK3566_Android11_lcd_v1.0.0.tar.gz

5) Then use decompression software to decompress the compressed package of the downloaded Android image. Among the decompressed files, the file ending with ".img" is the Android image file, and the size is more than 1GB

6) Then use decompression software to decompress **DriverAssitant_v5.12.zip**, and then find the **DriverInstall.exe** executable file in the decompressed folder and open it

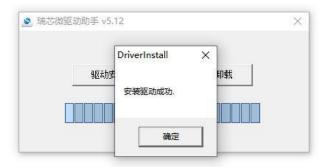
| 名称 | 修改日期 | 类型 | 大小 |
|------------------|-----------------|------|--------|
| ADBDriver | 2022/12/1 15:07 | 文件夹 | |
| 📑 bin | 2022/12/1 15:07 | 文件夹 | |
| Driver | 2022/12/1 15:07 | 文件夹 | |
| onfig | 2014/6/3 15:38 | 配置设置 | 1 KB |
| le DriverInstall | 2022/2/28 14:11 | 应用程序 | 491 KB |
| Readme | 2018/1/31 17:44 | 文本文档 | 1 KB |
| revison | 2022/2/28 14:14 | 文本文档 | 1 KB |
| | | | |

7) After opening **DriverInstall.exe**, the steps to install the Rockchip driver are as follows

a. Click the "Driver Installation" button

| 驱动安装 | 驱动卸载 | |
|------|------|--|
| 驱动安装 | 驱动卸载 | |

b. After waiting for a period of time, a pop-up window will prompt "driver installed successfully", and then click the "OK" button.



8) Then decompress **RKDevTool_Release_v3.15.zip**, this software does not need to be installed, just find **RKDevTool** in the decompressed folder and open it

| range Pi User Manual | Copyright reserved | by Shenzhen Xu | nlong Software Co., Lte |
|----------------------|--------------------|-----------------|-------------------------|
| 名称 ^ | 修改日期 | 类型 | 大小 |
| bin | 2022/12/1 15:07 | 文件夹 | |
| Language | 2022/12/1 15:07 | 文件夹 | |
| 📄 config.cfg | 2022/3/23 9:11 | CFG 文件 | 7 KB |
| Config | 2021/11/30 11:04 | 配置设置 | 2 KB |
| revision | 2022/5/27 9:09 | 文本文档 | 3 KB |
| KKDevTool | 2022/5/27 9:06 | 应用程序 | 1,212 KB |
| ◎ 开发工具使用文档_v1.0 | 2021/8/27 10:28 | Foxit PDF Reade | 450 KB |

9) After opening the **RKDevTool** burning tool, because the computer is not connected to the development board through the USB2.0 male-to-male data cable at this time, the lower left corner will prompt "**No device found**"

| 5-0-0 | NOT Z | 注工具 v3.15 | | | | | - 0 |
|-------|-------|-----------|------------|-----------|----------|---|-----|
| 载豄 | 像 | 升级固件; | 高级功能 | | | | |
| | | 存储 | 地址 | 名字 | 路径 | | |
| 1 | Г | | 0x00000000 | Loader | | | |
| 2 | Г | - | 0x00000000 | Parameter | | | |
| 3 | Г | | 0x000000x0 | Vboot | | | |
| 4 | | | 0x00000000 | trust | | | |
| 5 | | | 0x00000000 | Misc | | | |
| 6 | | | 0x00000000 | Resource | | | |
| 7 | Г | | 0x00000000 | Kernel | | | |
| 8 | Г | | 0x00000000 | Boot | | | |
| 9 | Г | | 0x00000000 | Recovery | | | |
| 10 | Г | | 0x00000000 | System | | | |
| 11 | Г | | 0x00000000 | Backup | | | |
| | | | | | | | |
| | | | | | | | |
| .oad | er: | | 执行 | 切换 | 设备分区表 清空 | | |
| | | | □强制按地址写 | | | | |
| | | | | - | | 1 | |
| | | - Y- | 有发现设备 | | | ~ | |

10) Then start burning the Android image into eMMC

a. First, connect the development board to the Windows computer through the USB2.0 male-to-male data cable. The position of the USB2.0 programming interface of the development board is shown in the figure below



- b. Then make sure that the development board is not inserted into the TF card and not connected to the power supply
- c. Then press and hold the MaskROM button on the development board, the position of the MaskROM button on the development board is shown in the figure below:



d. Then connect the power supply of the Type-C interface to the development board



e. If the previous steps are successful, the development board will enter the **MASKROM** mode at this time, and the interface of the burning tool will prompt "found a MASKROM

| # | | 存储 | 地址 | 名字 | 路径 | |
|-----|------|----|--------------------------|------------------|----------|--|
| 1 | Г | | 0x00000000 | Loader | | |
| 2 | Г | | 0x00000000 | Parameter | | |
| 3 | Г | | 0x00000000 | Uboot | | |
| 4 | | | 0x00000000 | trust | | |
| 5 | | | 0x00000000 | Misc | | |
| 6 | | | 0x00000000 | Resource | | |
| 7 | Г | | 0x00000000 | Kernel | | |
| 8 | Г | | 0x00000000 | Boot | | |
| 9 | Г | | 0x00000000 | Recovery | | |
| 10 | Г | | 0x00000000 | System | | |
| 11 | | | 0x00000000 | Backup | | |
| 10 | | | 0x00000000 0x00000000 | System Backup | | |
| | | | 11.7= | 切换 | 设备分区表 清空 | |
| Loa | ler: | | 执行 | 切拱 | 以面 有土 有土 | |

f. Then please select Advanced Features

| 动 | 的开发 | 工具 v3.15 | | | | |
|----|-----|----------|------------|-----------|----|--|
| 截镇 | 像 | 升级固件 | 高级功能 | | | |
| # | | 存储 | 址 | 名字 | 路径 | |
| 1 | Г | | 0.0000000 | Loader | | |
| 2 | Г | | 0x00000000 | Parameter | | |
| 3 | | | 0x00000000 | Uboot | | |
| 4 | Г | | 0x00000000 | trust | | |
| 5 | | | 0x00000000 | Misc | | |
| 5 | Г | | 0x00000000 | Resource | | |
| 7 | Г | | 0x00000000 | Kernel | | |
| в | Г | | 0x00000000 | Boot | | |
| 3 | Г | | 0x00000000 | Recovery | | |
| 10 | Г | | 0x00000000 | System | | |
| 11 | Г | | 0x00000000 | Backup | | |

g. Then click the position shown in the figure below

| | : 高级功能 | | | | |
|-----------|-----------|-----------|--------------|---|--|
| Boot: | | | | 下载 | |
| 5件: | | | | 解包 | |
| 读取FlashID | 读职Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMUNC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM 8. USB | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | |
| 起始扇区: | | | | | |
| 扇区数: | | | | | |

h. Select MiniLoaderAll.bin in the MiniLoader folder downloaded earlier, and

click to open.

| | orangepi > N | AiniLoader-烧录Linux镜像才需要用到的东西 | 1 ~ C 在 | MiniLoader-烧录Linux | 9 |
|--------------|--------------|------------------------------|-----------------|--------------------|------|
| 组织 ▼ 新建文件夹 | | | | ≣ • □ | 0 |
| > 🔷 WPS云盘 | 1 | 名称 | 修改日期 | 美型 | 大小 |
| ↑ 主文件夹 | | ઇ MiniLoaderAll.bin | 2023/8/18 11:17 | BIN 文件 | 45 |
| > 🔷 OneDrive | | rk356x_linux_emmc.cfg | 2023/8/18 11:17 | txtfile | |
| | | rk356x_linux_pcie.cfg | 2023/8/18 11:17 | txtfile | |
| 三 貞面 | * | 🗋 rk356x_linux_spiflash.cfg | 2023/8/18 11:17 | txtfile | |
| 业 下载 | * | rk356x_linux_tfcard.cfg | 2023/8/18 11:17 | txtfile | |
| □ 文档 | * | 🗋 rkspi_loader.img | 2023/8/18 11:17 | DAEMON.Tools | 4,09 |
| ▶ 團片 | * | | | | |
| 🕢 音乐 | * | | | | |

i. Then click **Download**

| T軟線像 升级回件 高级功能 Boot: C:\Users\lhh177\Desktop\orangepi\WiniLoader-皮 面件: 读取FlashID 读取Flash信息 演取FlashID 读取Chip信息 测试设备 重启设备 进入Maskron 切脑存储 9:25序列号 检测安全模式 导出课像 摄影原区 3:00 | | | | | | |
|---|-----------|-----------|--------------|-----------------------------------|--|--|
| 固件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 2. ENDIC 3. SD | | |
| 测试设备 | 重启设备 | 进入Naskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM | | |
| 清空序列号 | 检测安全模式 | 式导出串口日志 | 获取当前存储 | 9. SATA | | |
| 导出镜像 | 擦除扇区 | 攔除所有 | | | | |
| 起始扇区: | | | | | | |

j. The display after downloading MiniLoaderAll.bin is shown in the figure below

| < 瑞芯微开发工具 v3 | .15 | | | | | - 🗆 X |
|--------------|-------------------|-------------------|--------------|---|----------------------|-------|
| 下載镜像 升级固件 | 高级功能 | | | | 下載Boot开始 下載Boot成功 | |
| Boot: C:\U | Jsers\hh177\Deskt | op\orangepi\Minil | Loader-烧 | 下载 | | |
| 固件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC 3. SD 4. SD1 | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM 8. USB | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | |
| 起始扇区: | | | | | | |
| 扇区数: | | | | | L. | |
| 发现一 | 一个MASKRO | M设备 | 1-2-3 :MASKF | ROM | ~ | |

k. Then select the storage device as EMMC, and then click Switch Storage

| 《現際 并级回答 | ‡ 高级功能 | | | | | 下载Boot开始 下载Boot成功 | | |
|-----------|-------------------|------------------|---------------|---|---|----------------------|--|--|
| Boot: C:\ | Users\csy\Desktop | \orangepi\MiniLo | ader-烧录 | 下载 | J | | | |
| 固件: | | | | 解包 | | | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC 3. SD | | | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 茲即当前存储 | 8. USB 9. SATA 10. PCIE | | | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | | | |
| 起始扇区: | | | | | | | | |
| 扇区数: | | | | | | | | |

1. The display of successful switching is shown in the figure below

| 找 <mark>镜</mark> 像 升级固作 | ‡ 高级功能 | | | | 下載Boot开始 下載Boot成功 |
|-------------------------|-------------------|------------------|--------------|--|----------------------|
| Boot: C:\ | Users\csy\Desktop | \orangepi\MiniLo | ader一烧录 | 下载 | |
| 固件: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EMMC 3. SD | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 3. SD 4. SD1 5. SPINOR 6. SPINAND 7. RAM | RKDevTool X |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | 切换存储成功. |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | SubsetFileRevol. |
| 起始扇区: | | | | | 确定 |
| 扇区数: | | | | | |

m. Then click the "Upgrade Firmware" column of the burning tool

| 芯微开发工具 v3.15 | | - 0 | |
|------------------------------|----------------|-----|--|
| 战镜像 <mark>「升级固件」</mark> 高级功能 | | | |
| 固件 升级 切换 | | | |
| 固件版本: Loader版本: | 芯片信息: | | |
| 固件: | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 发现一个MASKROM设备 | 1-2-3 :MASKROM | | |

n. Then click the "**Firmware**" button to select the path of the Android image that needs to be burned

| 、瑞芯微开发工具 v3.15 | | - 🗆 X |
|-----------------|------------------|-------|
| 下載鏡像「升级固件」高级功能 | | |
| 国件 升级 切换 | | |
| 固件版本: Loader版本: | 芯片信息: | |
| 固件: | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 发现一个MASKROM设备 | 1-2-3 :naskron ~ | |

o. Finally, click the "**Upgrade**" button to start burning, and the log during the burning process is shown in the figure below. After burning is completed, the Android system will start automatically.

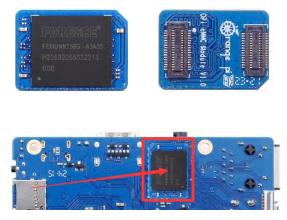
Android system will start automatically.

| 🔀 瑞芯微开发工具 | ↓ v3.15 | | | | _ | × |
|-------------------------------|---|---|--------------------|--|---|---|
| 下數貨幣 升级 固件 固件版本: 固件: | 固件 高級功能 升級 切換 11.0.00 Loader版本: | 1.01 芯片信息: RK ngePi38_RKS566_Android11_v1.0. | 3568 0 \0r angs | 期试设备开始 期试设备开始 税验芯片环动 获取14本LnG-开始 获取14本LnG-所始 准备110所开始 准数110开开始 下数110开开始 正在下数10件开始 正在下数10件出台 | | |
| | 没有发现设备 | | ~ | | | |

2. 8. 2. How to burn Android11 image into eMMC via TF card

Note that all the following operations are performed on a Windows computer.

1) The development board reserves an eMMC expansion interface. Before programming the system to eMMC, you first need to purchase an eMMC module that matches the eMMC interface of the development board. Then install the eMMC module to the development board. The eMMC module and the method of plugging into the development board are as follows:



2) You also need to prepare a TF card with 8GB or larger capacity. The transmission speed of the TF card must be class10 or above. It is recommended to use a TF card of SanDisk and other brands

3) Then use the card reader to insert the TF card into the computer

4) Then download the SDDiskTool programming tool from the Orange Pi data download page, please make sure that the version of the SDDiskTool tool is the latest v1.72

- 5) Then download the Android image from Orange Pi's download page
 - a. After opening the download link of the Android image, you can see the following two types of Android images, please select the image in the TF card and eMMC startup image folder to download



b. After entering **the TF card and eMMC boot image folder**, you can see the following tow images, the difference between them is:

- a) The first image is dedicated to HDMI display and supports 4K display. If you don't use LCD screen, please download the image without lcd
- b) If you want to use lcd screen, please choose image with lcd

| 0 0 | OrangePi3B_RK3566_Android11_v1.0.0.tar.gz |
|-----|---|
| 0 8 | OrangePi3B_RK3566_Android11_lcd_v1.0.0.tar.gz |

6) Then use the decompression software to decompress the compressed package of the downloaded Android image. Among the decompressed files, the file ending with ".img" is the Android image file, and the size is more than 1GB

7) Then use decompression software to decompress **SDDiskTool_v1.72.zip**, this software does not need to be installed, just find **SD_Firmware_Tool.exe** in the decompressed folder and open it

| 🕌 Language | 2022/9/5 15:04 | 文件夹 | |
|-----------------------|-----------------|-----------|--------|
| config | 2020/3/18 17:27 | 配置设置 | 2 KB |
| revision | 2021/4/21 18:01 | 文本文档 | 1 KB |
| sd_boot_config.config | 2014/9/3 9:52 | CONFIG 文件 | 1 KB |
| 🚜 SD_Firmware_Tool | 2021/4/21 17:57 | 应用程序 | 698 KB |
| SDBoot.bin | 2015/9/29 17:13 | BIN 文件 | 149 KB |
| | | | |

8) After opening **SDDiskTool**, if the TF card is recognized normally, the inserted disk device will be displayed in the "**Select Removable Disk Device**" column. **Please make sure that the displayed disk device is consistent with the drive letter of the TF card you want to burn**, if there is no display, you can try to unplug the TF card.

| 第一步 | 讲择可称和联邦的 | SDBoot:2.1 |
|------|--|------------|
| | Generic MassStorageClass USB Device 29 | .7G ~ |
| 第二步: | 选择功能模式 | |
| | □ 固件升级 □ PCBA测试 | ☑SD启动 |
| 第三步 | 选择升级固件 | □修复 |
| | | 选择固件 |
| 第四步 | 选择Demo数据(可选) | |
| | | 选择Demo |
| | | |
| | | 开始创建 |
| | | |
| | | 恢复磁盘 |

9) After confirming the drive letter, you can format the TF card first, click the restore

disk button in SDDiskTool, or use the SD Card Formatter mentioned above to format

the TF card

| | Generic MassStor | ageClass USB Device 29.7G | SDBoot:2.1 |
|-----|------------------|---------------------------|------------|
| 第二步 | :选择功能模式 | | |
| | 固件升级 | PCBATHIT | |
| 第三步 | :选择升级固件 | SD_Firmware_Tool > | < □修复 |
| | | 6 恢复磁盘成功。 | 选择固件 |
| 第四步 | :选择Demo数据(ī | | |
| | | 确定 | 选择Demo |
| | | | 开始创建 |

- 10) Then start to write the Android image into the TF card
 - a. First confirm that the displayed drive letter is the drive letter corresponding to the TF card under "Select Removable Disk Device"
 - b. Then select "Firmware Upgrade" in "Select Function Mode"
 - c. Then select the path of the Android firmware in the "Select Upgrade Firmware" column
 - d. Finally click the "Start Create" button to start burning

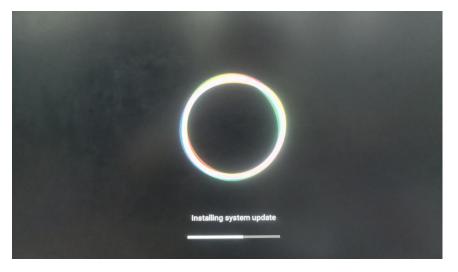
| 第一步:选择可移 | 动磁盘设备 | | SDB | oot:2.12 |
|------------|-------------|------------------|-----|----------|
| NORELSY | S 1081CS0 U | ISB Device 14.8G | ~ | |
| 第二步:选择功能 | 模式 | | | |
| ☑固件升 | 級 | 🗌 рсваллія | | J |
| 第三步:选择升级 | 固件 | | 修复 | |
| | | | 选 | 译固件 |
| 第四步:选择Demo | 数据(可选) | | | |
| | _ | | 选 | 译Demo |
| | | | | 治创建 |
| | | | | 夏磁盘 |

11) After the burning is completed, the display is as shown in the figure below, and then you can exit SDDiskTool

| NORELSYS 10010 | 设备 Set 155 D 14 05 | SDBoot:2.12 |
|-------------------|-----------------------|-------------|
| SD_F 第二步:选择功能模 | irmware_Tool X | |
| 一固件升级 | 创建升级磁盘成功. | □SD启动 |
| 第三步:选择升级固 | | ■修复 |
| i\orangepi\¢ | | .img 选择固件 |
| 第四步:选择Demo数 | 确定 | |
| | | 选择Demo |
| | | TT 4/ 0/24 |
| | | 开始创建 |

12) Then pull out the TF card from the computer and insert it into the development board. After the development board is powered on, it will automatically start burning the Android image in the TF card to the eMMC of the development board.

13) If the development board is connected to an HDMI display, you can also see the progress bar of burning the Android image to eMMC from the HDMI display



14) When the HDMI monitor displays the following information, it means that the burning of the Android image into the eMMC has been completed. At this time, the TF card can be pulled out, and then the Android system in the eMMC will start.

| <pre>vbmeta writing RKA_File_Download entry.name=vbmeta RKA_File_Download entry.name=vbmeta DONE! boot writing RKA_File_Download entry.name=boot RKA_File_Download entry.name=boot DONE! recovery writing RKA_File_Download entry.name=recovery DONE! baseparameter writing RKA_File_Download entry.name=baseparameter RKA_File_Download entry.name=baseparameter RKA_File_Download entry.name=baseparameter RKA_File_Download entry.name=baseparameter RKA_File_Download entry.name=baseparameter RKA_File_Download entry.name=baseparameter RKA_File_Download entry.name=super INFO:ErasePartition super.offset=0x1da000,size=3263168512 INFO:ErasePartition super.offset=0x1da000,size=3263168512, part_size=0x614000 INFO:RKA_SparseFile_Download entry.name=super DONE! parameter checking RKA_File_Check entry.name=uboot RKA_File_Check entry.name=uboot</pre> | |
|---|--|
| <pre>RKA_File_Check entry.name=uboot RKA_File_Check entry.name=uboot DONE! misc checking RKA_File_Check entry.name=misc DONE! dtbo checking RKA_File_Check entry.name=dtbo DONE! vbmeta checking RKA_File_Check entry.name=vbmeta RKA_File_Check entry.name=vbmeta RKA_File_Check entry.name=vbmeta RKA_File_Check entry.name=boot RKA_File_Check entry.name=boot RKA_File_Check entry.name=boot RKA_File_Check entry.name=boot RKA_File_Check entry.name=boot RKA_File_Check entry.name=boot RKA_File_Check entry.name=boot RKA_File_Check entry.name=recovery RKA_File_Check entry.name=recovery RKA_FILE_RCA_FILE_CHECK</pre> | |
| nKA_file_Check entry.name=baseparameter DONE! super checking RKA_Sparsefile_Check entry.name=super INFO:Start to check super.offset=0x1da000.size=IG4u RKA_SparseFile_Check entry.name=super Done! Finish to upgrade firmware. SD upgrade ok. prksdboot->do_rk_mode_update Successful! Doing Actions succeeded.please remove the sdcard | |

2.9. How to burn Android image to SPIFlash+NVMe SSD

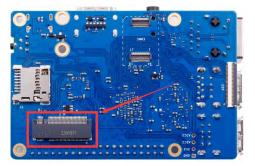
Note that all the following operations are performed on a Windows computer.

1) First, you need to prepare an NVMe SSD solid-state drive

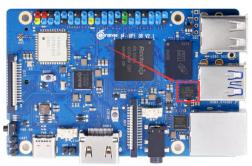
2) Then insert the NVMe SSD into the M.2 PCIe interface of the development board and secure it. The Orange Pi 3B has two hardware versions, and the M.2 PCIe interface position for version 2.1 is shown in the following figure:



The position of the M.2 PCIe interface in v1.1.1 version is shown in the following figure:



3) The position of SPI Flash on the development board is shown in the following figure, and no other settings are required before starting the burning process

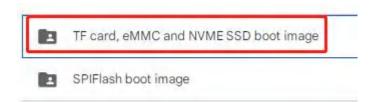


4) We also need to prepare a high-quality USB 2.0 male to male data cable



5) Then download Rockchip driver **DriverAssitant_v5.12.zip** and burning tool **RKDevTool_Release_v3.15.zip** from **Orange Pi's data download page**

- 6) Then download the image of Android11
 - a. After opening the download link of the Android image, you can see the following two types of Android images, please select the image in the SPIFlash-NVME SSD boot image folder to download



- b. After entering the **SPIFlash-NVME SSD boot image folder**, you can see the following two images. Their differences are:
 - a) The image without lcd is specially used for HDMI display and supports 4K display. If you do not use the LCD screen, please download the image without lcd
 - b) If you want to use LCD screen, please choose image with lcd



7) Then use the decompression software to decompress **DriverAssitant_v5.12.zip**, and then find the **DriverInstall.exe** executable file in the decompressed folder and open it

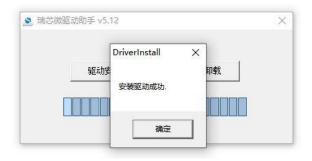
| 名称 | 修改日期 | 类型 | 大小 |
|-----------------|-----------------|------|--------|
| ADBDriver | 2022/12/1 15:07 | 文件夹 | |
| 🔄 bin | 2022/12/1 15:07 | 文件夹 | |
| Driver | 2022/12/1 15:07 | 文件夹 | |
| config | 2014/6/3 15:38 | 配置设置 | 1 KB |
| S DriverInstall | 2022/2/28 14:11 | 应用程序 | 491 KB |
| Readme | 2018/1/31 17:44 | 文本文档 | 1 KB |
| i revison | 2022/2/28 14:14 | 文本文档 | 1 KB |
| | | | |

8) After opening **DriverInstall.exe**, the steps to install the Rockchip driver are as follows

a. Click the "Driver Installation" button

| | 驱动安装 | 驱动卸载 |
|--|------|------|
|--|------|------|

b. After waiting for a period of time, a pop-up window will prompt "driver installed successfully", and then click the "OK" button.



9) Then decompress **RKDevTool_Release_v3.15.zip**, this software does not need to be installed, just find **RKDevTool** in the decompressed folder and open it

| 名称 | 修改日期 | 类型 | 大小 |
|-----------------|------------------|-----------------|----------|
| 📙 bin | 2022/12/1 15:07 | 文件夹 | |
| 📙 Language | 2022/12/1 15:07 | 文件夹 | |
| 🗋 config.cfg | 2022/3/23 9:11 | CFG 文件 | 7 KB |
| 🔄 config | 2021/11/30 11:04 | 配置设置 | 2 KB |
| revision | 2022/5/27 9:09 | 文本文档 | 3 KB |
| 🔆 RKDevTool | 2022/5/27 9:06 | 应用程序 | 1,212 KB |
| ◎ 开发工具使用文档_v1.0 | 2021/8/27 10:28 | Foxit PDF Reade | 450 KB |

10) After opening the **RKDevTool** burning tool, because the computer is not connected to the development board through the USB2.0 male-to-male data cable at this time, the lower left corner will prompt "**No device found**"

| 专芯符 | 8开发 | 工具 v3.15 | | | | | | | - 0 | |
|------|-----|----------|-------------------|-----------|-------|----|---|--|-----|--|
| 就镜 | 12 | 升级固件; | 高級功能 | | | | | | | |
| : | | 存储 | 地址 | 名字 | 路径 | | | | | |
| 1 | Г | | 0x00000000 | Loader | | | | | | |
| 2 | | | 0x00000000 | Parameter | | | | | | |
| 3 | | | 0x00000000 | Vboot | | | | | | |
| 4 | | | 0x00000000 | trust | | | | | | |
| 5 | | | 0x000000000 | Misc | | | | | | |
| 6 | | | 0x0000000x0 | Resource | | | | | | |
| 7 | | | 0x00000000 | Kernel | | | | | | |
| 8 | Г | | 0x0000000x0 | Boot | | | | | | |
| 9 | Г | | 0x0000000x0 | Recovery | | | | | | |
| 10 | Г | | 0x000000000 | System | | | 1 | | | |
| 11 | Г | | 0x00000000 | Backup | | | | | | |
| Load | er: | | 执行 □强制按地址写 | 切换 | 设备分区表 | 清空 | | | | |
| | | | □ 强制按地址写 有发现设备 | - | _ | | ~ | | | |

- 11) Then start burning the Android image to SPIFlash+NVMe SSD
 - a. First, connect the development board to the Windows computer through the USB2.0 male-to-male data cable. The position of the USB2.0 programming port of the development board is shown in the figure below



- b. Make sure that the development board is not inserted into the TF card and not connected to the power supply
- c. Then press and hold the MaskROM button on the development board, the position of the MaskROM button on the development board is shown in the figure below:



d. Then connect the power supply of the Type-C interface to the development board, and power on, and then release the MaskROM button



e. If the previous steps are successful, the development board will enter the **MASKROM** mode at this time, and the interface of the burning tool will prompt "found a MASKROM device"

| : | 口存 | 緒 地址 | 名字 | 路径 | |
|--------|-----|------------|-----------|----------|--|
| 1 | Г | 0x00000000 | Loader | | |
| 2 | | 0x000000x0 | Parameter | | |
| 3 | | 0x00000000 | Vboot | | |
| 4 | | 0x00000000 | trust | | |
| 5 | | 0x00000000 | Misc | | |
| 6 | | 0x000000x0 | Resource | | |
| 7 | Г | 0x00000000 | Kernel | | |
| 8 | Г | 0x00000000 | Boot | | |
| 9 | | 0x00000000 | Recovery | | |
| 10 | Г | 0x00000000 | System | | |
| 11 | | 0x00000000 | Backup | | |
| .0 8 0 | er: | 执行 | 切换 | 设备分词表 清空 | |

f. Then click the "Upgrade Firmware" column of the burning tool

| 瑞芯微开发工具 v3.15 | 高级功能 | |
|-----------------|----------------|--|
| 载镜像 开级固件 高级功能 | | |
| 固件 升级 切换 | | |
| 固件版本: Loader版本: | 芯片信息: | |
| 固件: | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 发现一个MASKROM设备 | 1-2-3 :MASKROM | |

g. Then click the "Firmware" button to select the Android image to be burned

| 瑞芯微开发工具 v3.15 | | - 0 × |
|-----------------|----------------|-------|
| 下載镜像「升级固件」高级功能 | | |
| 固件 升级 切换 | | |
| 固件版本: Loader版本: | 芯片信息: | |
| 固件: | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 发现一个MASKROM设备 | 1-2-3 :MASEROM | |

 Finally, click the "Upgrade" button to start burning. The burning process is shown in the figure below. You can see that the firmware will be burned to SPIFlash first, and then burned to PCIE. After burning is completed, the Android system will start automatically.

| 遺像 升级团 | 101-04 7 91 | | | | | | lashInfo成功 | |
|-----------|-------------|----------------|----------------|--------------|---------------|---|--|--|
| 固件 | 升级 | 切换 | | | | | DB开始 DB成功 | |
| | | | | | | 下载工 | DB开始 | |
| 固件版本: | 11.0.00 | Loader版本: | 1.01 | 芯片信息: | RK3568 | | DB成功 | |
| HI I MATT | [] | | | AND THE ASY. | | | 3件开始 「载固件(100%) | |
| 固件: | U:\RK3566\ | RK356X_Android | 11\OrangePi3B_ | RK3566_Andr | oid11_lod_spi | | 国件成功 | |
| 回十 | | - | | | | | oader开始 | |
| | | | | | | | oader成功 | |
| | | | | | | | | |
| | | | | | | 正在下 | 「载PCIE固件 | |
| | | | | | | 正在下现试试 | | |
| | | | | | | 正在下 测试时 测试时 校验起 | S載PCIE固件 ≷备开始 ≷备成功 5片开始 | |
| | | | | | | 正在下 测试试 规试试 校验范 校验范 | ★ PCIE/固件 設备开始 設备成功 な片开始 な片成功 | |
| | | | | | | 正在 - - - - - - - - - - - - - | 「 載PCIE 固件 設备开始 設备成功 な片开始 ち片成功 1 askInfo开始 | |
| | | | | | | 正在下 测试式 校验范 校验范 获取F | ★ PCIE/固件 設备开始 設备成功 な片开始 な片成功 | |
| | | | | | | 正在式 別 加 式 絵 花 変 沢 新 推 絵 花 変 沢 新 本 絵 花 空 式 絵 絵 花 空 で 式 絵 絵 花 い た 絵 た で た い た 絵 た で た い た い た や た 絵 た で た い た い た た た で た い た い た た で た い た た で た い た た で た い た た で た た で い た た で た で た い た で た た で た た で た で た た で た た で た で た た で た た で た た で た た で た た で た た で た た で た で た た で た で た た で た で た で た た で た で た で た た で た た で た で た で た で た で た で た で た で た で た で た で た で た で た で た で た で た た で た で た た で た で た で た で た で た た で た で た た で た た で た で た で た た た た た で た た た た た た た た た た た た た | 新ETEE固件 新开始 公告成功 公片开始 た片水站 1ashInfo所始 1ashInfo成功 DB开始 DB成功 | |
| | | | | | | 正在下设设 测试验验。 一次通过的 一次的 一次的 一次的 一次的 一次的 一次的 一次的 一次的 一次的 一次 | 新PCIEI国件 会 新开始 会 会 な が 方 方 方 | |

2. 10. How to burn Orange Pi OS (OH) image to TF card

Note that all operations below are performed on a Windows computer.

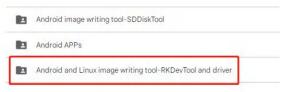
1) First prepare a TF card with 8GB or larger capacity. The transmission speed of the TF card must be class10 or above. It is recommended to use TF cards from SanDisk and other brands.

2) You also need to prepare a good quality USB2.0 male-to-male data cable

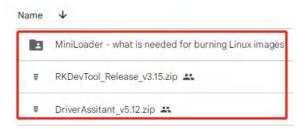


3) Then download Rockchip microdriver **DriverAssitant_v5.12.zip** and burning tool **RKDevTool_Release_v3.15.zip** from the **Orange Pi data download page**

a. On the **Orange Pi data download page**, first select the **official tool**, and then enter the folder below



b. Then download all the files below



- 4) Then download the image of OPi OS (OH) from the Orange Pi data download page
- 5) Then use decompression software to decompress the compressed package of the

downloaded OPi OS (OH) image

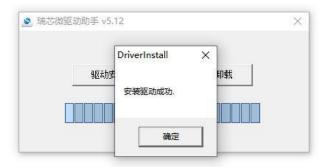
6) Then use decompression software to decompress **DriverAssitant_v5.12.zip**, then find the **DriverInstall.exe** executable file in the decompressed folder and open it.

| 名称 | 修改日期 | 类型 | 大小 |
|------------------|-----------------|------|--------|
| ADBDriver | 2022/12/1 15:07 | 文件夹 | |
| 📙 bin | 2022/12/1 15:07 | 文件夹 | |
| Driver | 2022/12/1 15:07 | 文件夹 | |
| config | 2014/6/3 15:38 | 配置设置 | 1 KB |
| le DriverInstall | 2022/2/28 14:11 | 应用程序 | 491 KB |
| Readme | 2018/1/31 17:44 | 文本文档 | 1 KB |
| revison | 2022/2/28 14:14 | 文本文档 | 1 KB |

- 7) Open **DriverInstall.exe** and install the Rockchip microdriver as follows:
 - a. Click the "**Driver Installation**" button

| | 驱动安装 | 驱动卸载 | |
|--|------|------|--|
|--|------|------|--|

b. After waiting for a period of time, a window will pop up prompting "Driver installation successful", then click the "OK" button.



8) Then unzip **RKDevTool_Release_v3.15.zip**. This software does not need to be installed. Just find **RKDevTool** in the unzipped folder and open it.

| nge Pi User Manual | Copyright reserved | by Shenzhen Xu | nlong Software Co |
|--------------------|--------------------|-----------------|-------------------|
| 名称 | 修改日期 | 类型 | 大小 |
| bin | 2022/12/1 15:07 | 文件夹 | |
| 📙 Language | 2022/12/1 15:07 | 文件夹 | |
| Config.cfg | 2022/3/23 9:11 | CFG 文件 | 7 KB |
| config | 2021/11/30 11:04 | 配置设置 | 2 KB |
| revision | 2022/5/27 9:09 | 文本文档 | 3 KB |
| 🔀 RKDevTool | 2022/5/27 9:06 | 应用程序 | 1,212 KB |
| ◎ 开发工具使用文档_v1.0 | 2021/8/27 10:28 | Foxit PDF Reade | 450 KB |

9) After opening the **RKDevTool** burning tool, because the computer has not yet connected to the development board through the USB2.0 male-to-male data cable, a message "**No device found**" will appear in the lower left corner.

| 戦績 | 像 | 升级固件 7 | 高级功能 | | | | |
|-----|-----|--------|------------|-----------|----------|--|--|
| _ | | | | No. | | | |
| 6 | | 存储 | 地址 | 名字 | 路径 | | |
| 1 | Г | | 0x00000000 | Loader | | | |
| 2 | Г | | 0x00000000 | Parameter | | | |
| 3 | | | 0x00000000 | Uboot | | | |
| 1 | | | 0x00000000 | trust | | | |
| 5 | | | 0x00000000 | Misc | | | |
| 6 | | | 0x00000000 | Resource | | | |
| 7 | Г | | 0x00000000 | Kernel | | | |
| 3 | Г | | 0x00000000 | Boot | | | |
| 3 | Г | | 0x00000000 | Recovery | | | |
| 10 | Г | | 0x00000000 | System | | | |
| 11 | Г | | 0x00000000 | Backup | | | |
| | | | | | | | |
| | | | | | | | |
| oad | er: | | 执行 | 切换 | 设备分区表 清空 | | |
| | | | □ 强制按地址写 | | | | |

- 10) Then start burning the OPi OS (OH) image to the TF card
 - a. First, connect the development board to the Windows computer through a USB2.0 male-to-male data cable. The location of the development board's USB2.0 burning interface is as shown in the figure below.



- b. Then make sure that the TF card is not inserted into the development board and the power supply is not connected.
- c. Then press and hold the MaskROM button on the development board. The position of the MaskROM button on the development board is as shown in the figure below:



d. Then connect the development board to the power supply of the Type-C interface and power on



e. If the previous steps go well, the development board will enter **MASKROM** mode at this time, and the interface of the burning tool will prompt "A

MASKROM device was found"

| # | | 存储 | 地址 | 名字 | 路径 | | | |
|------|-----|----|----------------|-----------|----------|--|--|--|
| 1 | Г | | 0x00000000 | Loader | | | | |
| 2 | Г | | 0x00000000 | Parameter | | | | |
| 3 | Г | | 0x00000000 | Uboot | | | | |
| 4 | | | 0x00000000 | trust | | | | |
| 5 | | | 0x00000000 | Misc | | | | |
| 6 | | | 0x00000000 | Resource | | | | |
| 7 | Г | | 0x00000000 | Kernel | | | | |
| 8 | Г | | 0x00000000 | Boot | | | | |
| 9 | Г | | 0x00000000 | Recovery | | | | |
| 10 | Г | | 0x00000000 | System | 1 | | | |
| 11 | | | 0x00000000 | Backup | | | | |
| Loud | er: | | 执行 □ 强制按地址写 | 切换 | 设备分回表 清空 | | | |

- f. Then insert the TF card into the development board
- g. Then please select **advanced functions**

| | 改开发工具 v3.1 | | | | |
|-----|------------|------------|-----------|----|--|
| πij | 讀 升级固件 | 高级功能 | | | |
| ŧ | 口存储 | 1 tut | 名字 | 路径 | |
| 1 | | 0.0000000 | Loader | | |
| 2 | | 0x00000000 | Parameter | | |
| 3 | | 0x0000000 | Vboot | | |
| 1 | Г | 0x00000000 | trust | | |
| 5 | | 0x00000000 | Misc | | |
| 5 | | 0x00000000 | Resource | | |
| 7 | | 0x00000000 | Kernel | | |
| в | | 0x00000000 | Boot | | |
| 3 | | 0x00000000 | Recovery | | |
| 10 | | 0x00000000 | System | | |
| 11 | Г | 0x00000000 | Backup | | |

h. Then click the location shown in the picture below

| 镜像 升级固体 | 干 局级切脑 | | | | |
|-----------|-----------|-----------|--------------|---|--|
| oot: | | | | 下载 | |
| 件: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读职Capability | 1. FlASH 2. EMMC 3. 5D 4. 5D1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAN 8. USB | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | |
| 已始扇区: | | | | | |
| 弱区数: | | | | | |

i. Then select MiniLoaderAll.bin in the MiniLoader folder downloaded earlier, and then click Open

| ← → ∽ ↑ 🚞 > 桌面 | > orangepi > I | MiniLoader-烧录Linux镜像才需要用到的东西 | i ~ C 在 | MiniLoader-烧录Linux | ٩ |
|----------------|----------------|------------------------------|-----------------|--------------------|------|
| 组织 ▼ 新建文件夹 | | | | ≣ • □ | 0 |
| > 🔷 WPS云盘 | 1 | 名称 | 修改日期 | 类型 | 大小 |
| ↑ 主文件夹 | | 🔮 MiniLoaderAll.bin | 2023/8/18 11:17 | BIN 文件 | 45 |
| > 🔷 OneDrive | | rk356x_linux_emmc.cfg | 2023/8/18 11:17 | txtfile | |
| | | rk356x_linux_pcie.cfg | 2023/8/18 11:17 | txtfile | |
| 重重 | * | rk356x_linux_spiflash.cfg | 2023/8/18 11:17 | txtfile | |
| 业 下载 | * | rk356x_linux_tfcard.cfg | 2023/8/18 11:17 | txtfile | |
| ■ 文档 | * | rkspi_loader.img | 2023/8/18 11:17 | DAEMON.Tools | 4,09 |
| 🔀 图片 | * | | | | |
| 🚹 音乐 | * | | | | |

j. Then click download

| Boot: C:\U | | | | | |
|---------------|------------------|-------------------|---------------|---|--|
| | sers\hh177\Deskt | op\orangepi\Minil | Loader-媫 | 下载 | |
| 固件: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM 8. USB | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 攔除所有 | L | | |
| 起始扇区: 扇区数: | | | | | |
| | 一个MASKRO | | 1-2-3 :MASKRO | | |

k. After downloading MiniLoaderAll.bin, the display is as shown below

| | : 高级功能 Jsers\csy\Desktop) | orangepi WiniLo | ader-烧录 | 下載 | 下载Boot开始 下载Boot成功 | |
|---------------|------------------------------|-----------------|--------------|--|----------------------|--|
| 国件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EMMC 3. SD | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 3. SD 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | |
| 起始扇区: 扇区数: | | | | | | |
| - 告祖- | 一个MASKRO | W 冶女 | 2-3 :MASKROM | t | * | |

1. Then select the storage device as **SD**, and then click to switch storage

| Boot: C:\1 | Users\csy\Desktop' | \orangepi\MiniLo | ader-烧录 | 下载 |] | 下载Boot成功 | | |
|------------|--------------------|------------------|---------------|--|---|----------|--|--|
| 固件: | | | | 解包 |] | | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC | | | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 3. SD 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | | | |
| 起始扇区: | | | | | | | | |
| 扇区数: | | | | | | | | |

m. The successful switching is displayed as shown below

| 戦績像 升级固件 Boot: C:\ | Users\csy\Desktop | \orengeni\MiniLo | adar-他寻 | 下载 | | 下载Boot成功 | | |
|-----------------------|-------------------|-------------------|--------------|--|-----------|----------|---|--|
| 固件: [| | ior angept parame | | 解包 | | | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. Flash 2. EMMC 3. SD | RKDevTool | × | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 3. SD 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | D换存储成功. | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | 确定 | | |
| 起始扇区: | | | | | | | / | |
| 扇区数 | | | | | | | | |

n. Then click the "Upgrade Firmware" column of the burning tool

| 芯微开发工具 v3.15 | | - 0 |
|------------------|-------|-----|
| 續像「升级固件」 高级功能 | | |
| 固件 升级 切换 | | |
| 固件版本: Loader版本: | 芯片信息: | |
| 固件: | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

o. Then click the "**Firmware**" button to select the path of the OPi OS (OH) image that needs to be burned.

| 芯微开发工具 v3.15 | | - 0 |
|--|----------------|-----|
| 續像「升级固件」高级功能 | | |
| 固件 升级 切换 | | |
| 固件版本: Loader版本: | 芯片信息: | |
| 固件: | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| 发现一个MASKROM设备 | 1-2-3 :MASKROM | |
| 反现———————————————————————————————————— | | |

p. Finally, click the "**Upgrade**" button to start burning. The log during the burning process is as shown below. After the burning is completed, the OPi OS (OH) system will automatically start.

| 固件 | 升级 切换 | 测试设备成功 校验芯片开始 校验芯片成功 |
|--------------|---|---|
| 固件飯本: 固件: | 11.0.00 Loader版本: 1.01 芯片信息: RK3568 C:\Vsers\xumlong\Desktop\Opios-oh-4.0-betal-aarch64-opi3b-23.1 | 2、2007年3月1日 3、2007年3月1日 3、20 |
| | | |

2.11. Method to burn Orange Pi OS (OH) image into eMMC

Note that after burning the image into eMMC, if you test and find that it cannot be started, please clear SPIFlash and try to start again. For the method of clearing SPIFlash, please refer to the section "How to clear SPIFlash using RKDevTool".

Note that all operations below are performed on a Windows computer.

1) The development board has reserved eMMC expansion interface. Before burning the system to eMMC, you first need to purchase an eMMC module that matches the eMMC interface of the development board. Then install the eMMC module to the development board.

The eMMC module and the method of inserting the development board are as follows:





2) You also need to prepare a good quality USB2.0 male-to-male data cable



3) Then download Rockchip microdriver **DriverAssitant_v5.12.zip** and burning tool **RKDevTool_Release_v3.15.zip** from the **Orange Pi data download page**

a. On the Orange Pi data download page, first select the official tool, and then

enter the folder below

| Android image writing tool-SDDiskTool | |
|---|--|
| Android APPs | |
| Android and Linux image writing tool-RKDevTool and driver | |

b. Then download all the files below

| Name | ¥ |
|------|--|
| 12 | MiniLoader - what is needed for burning Linux images |
| Ŧ | RKDevTool_Release_v3.15.zip |
| Ŧ | DriverAssitant_v5.12.zip 🚢 |

4) Then download the image of OPi OS (OH) from the Orange Pi data download page

5) Then use decompression software to decompress the compressed package of the downloaded OPi OS (OH) image

6) Then use decompression software to decompress **DriverAssitant_v5.12.zip**, then find the **DriverInstall.exe** executable file in the decompressed folder and open it.

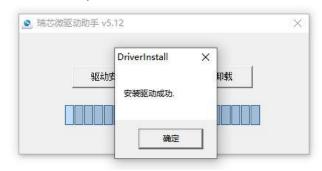


7) Open **DriverInstall.exe** and install the Rockchip microdriver as follows: 开 **DriverInstall.exe**

a. Click the "Driver Installation" button



b. After waiting for a period of time, a window will pop up prompting "Driver installation successful", then click the "OK" button.



8) Then unzip **RKDevTool_Release_v3.15.zip**. This software does not need to be installed. Just find **RKDevTool** in the unzipped folder and open it.

| 名称 | 修改日期 | 类型 | 大小 |
|-----------------|------------------|-----------------|----------|
| 📙 bin | 2022/12/1 15:07 | 文件夹 | |
| 📙 Language | 2022/12/1 15:07 | 文件夹 | |
| 🗋 config.cfg | 2022/3/23 9:11 | CFG 文件 | 7 KB |
| 🔄 config | 2021/11/30 11:04 | 配置设置 | 2 KB |
| revision | 2022/5/27 9:09 | 文本文档 | 3 KB |
| 🔆 RKDevTool | 2022/5/27 9:06 | 应用程序 | 1,212 KB |
| 🤬 开发工具使用文档_v1.0 | 2021/8/27 10:28 | Foxit PDF Reade | 450 KB |

9) After opening the **RKDevTool** burning tool, because the computer has not yet connected to the development board through the USB2.0 male-to-male data cable, a message "**No device found**" will appear in the lower left corner.

| • | | 存储 | 地址 | 名字 | 路径 | | | | |
|-----|------|----|-------------|-----------|-------|----|---|--|--|
| 1 | Г | | 0x00000000 | Loader | | | | | |
| 2 | Г | | 0x00000000 | Parameter | | | | | |
| 3 | | | 0x0000000x0 | Uboot | | | | | |
| 1 | | | 0x00000000 | trust | | | | | |
| 5 | | | 0x00000000 | Misc | | | | | |
| ŝ | | | 0x00000000 | Resource | | | | | |
| 7 | Г | | 0x00000000 | Kernel | | | | | |
| 3 | Г | | 0x00000000 | Boot | | | - | | |
| 3 | Г | | 0x00000000 | Recovery | | | | | |
| 10 | Г | | 0x00000000 | System | | | | | |
| 11 | Г | | 0x00000000 | Backup | | | | | |
| oad | .er: | | 执行 □强制按地址写 | 切换 | 设备分区表 | 清空 | | | |

- 10) Then start burning the OPi OS (OH) image into eMMC
 - a. First, connect the development board to the Windows computer through a USB2.0 male-to-male data cable. The location of the development board's USB2.0 burning interface is as shown in the figure below.



- b. Then make sure that the TF card is not inserted into the development board and the power supply is not connected.
- c. Then press and hold the MaskROM button on the development board. The position of the MaskROM button on the development board is as shown in the figure below:



d. Then connect the development board to the power supply of the Type-C interface and power on



e. If the previous steps go well, the development board will enter **MASKROM** mode at this time, and the interface of the burning tool will prompt "**A**

MASKROM device was found"

| | 0x00000000 | | | | | | |
|---|------------|---|---------------------------------------|--|---|--|--|
| | | Loader | | | | | |
| | 0x00000000 | Parameter | | | | | |
| | | | | | | | |
| | | | - | | | | |
| | | | | | | | |
| _ | | | | | | | |
| | 0x00000000 | Boot | | | | | |
| | 0x00000000 | Recovery | | | | | |
| Г | 0x00000000 | System | | | | | |
| | 0x00000000 | Backup | | | | | |
| | | Ox000000 Ox0000000 Ox0000000 Ox0000000 Ox0000000 Ox0000000 Ox0000000 Ox0000000 Ox0000000 Ox00000000 | 0.00000000000000000000000000000000000 | 0x00000000 trust 0x00000000 Miso 0x00000000 Miso 0x00000000 Resource 0x00000000 Kernel 0x00000000 Boot 0x00000000 Recovery 0x00000000 System | 0x0000000 00000 0x00000000 Hise 0x00000000 Reserve 0x00000000 Reserve 0x00000000 Boot 0x00000000 Boot 0x00000000 Becovery 0x00000000 System | 0x0000000 trust 0x00000000 Miso 0x00000000 Risorce 0x00000000 Resurce 0x00000000 Resurce 0x00000000 Boot 0x00000000 Recovery 0x00000000 System | 0x0000000 Urvst 0x0000000 Mise 0x0000000 Resource 0x0000000 Resource 0x0000000 Boot 0x0000000 Boot 0x00000000 Boot 0x00000000 System |

f. Then please select advanced functions

| | | 工具 v3.15 | | | | |
|----|---|----------|------------|-----------|---------------|--|
| + | | 存储 | | 名字 | 路径 | |
| 1 | Г | 17.17.8 | 050000000 | Loader | Provide State | |
| 2 | Г | | 0x0000000 | Parameter | | |
| 3 | | | 0x00000000 | Uboot | | |
| 4 | Г | | 0x00000000 | trust | | |
| 5 | | | 0x00000000 | Misc | | |
| 6 | Г | | 0x00000000 | Resource | | |
| 7 | | | 0x00000000 | Kernel | | |
| 3 | Г | | 0x00000000 | Boot | | |
| 9 | | | 0x00000000 | Recovery | | |
| 10 | | | 0x00000000 | System | | |
| 11 | Г | | 0x00000000 | Backup | | |

g. Then click the location shown in the picture below

| 續像 升级固件 | - 南级功能 | | | | |
|-----------|-----------|-----------|--------------|--|--|
| oot: | | | | 下载 | |
| 圆件: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EMMC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | |
| 起始扇区: | | | | | |
| 扇区数: | | | | | |

h. Then select **MiniLoaderAll.bin** in the **MiniLoader** folder downloaded earlier, and then click to open

| $\leftrightarrow \rightarrow \checkmark \uparrow $ $\stackrel{\bullet}{=}$, \downarrow \downarrow \downarrow | orangepi > M | liniLoader-烧录Linux镜像才需要用到的东 | 西 ~ C 在 | MiniLoader-烧录Linux | Q |
|---|--------------|-----------------------------|-----------------|--------------------|-------|
| 组织 ▼ 新建文件夹 | | | | ≣ • □ | 0 |
| > 🖕 WPS云盘 | 1 | 名称 个 | 修改日期 | 类型 | 大小 |
| ↑ 主文件夹 | | 🔮 MiniLoaderAll.bin | 2023/8/18 11:17 | BIN 文件 | 45 |
| > 🔷 OneDrive | | rk356x_linux_emmc.cfg | 2023/8/18 11:17 | txtfile | i |
| | | rk356x_linux_pcie.cfg | 2023/8/18 11:17 | txtfile | ŝ |
| (二) 桌面 | * | 🗋 rk356x_linux_spiflash.cfg | 2023/8/18 11:17 | txtfile | i |
| 业 下载 | * | rk356x_linux_tfcard.cfg | 2023/8/18 11:17 | txtfile | 2 |
| ■ 文档 | * | rkspi_loader.img | 2023/8/18 11:17 | DAEMON.Tools | 4,090 |
| ▶ 團片 | * | | | | |
| 🚯 音乐 | * | á | | | |

i. Then click **Download**

| 芯微开发工具 v3 镜像 升级固件 | | | | | - 0 |
|------------------------|-------------------|-------------------|----------------|---|-----|
| oot: | Users\hh177\Deskt | op\orangepi\Ninil | | 下載 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 1×4xCapability | 1. Flash 2. EMMC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAH 8. USB | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | |
| 导出镜像 起始扇区: | 擦除扇区 | 擲除所有 | l | | |
| 前区数: | | | | | |
| 发现 | 一个MASKRO | M设备 | 1-2-3 :MASKRO | м ~ | |

j. After downloading MiniLoaderAll.bin, the display is as shown below

| 遺像 升级固件 | | | | | | 下载Boot成功 | |
|-----------|-------------------|-------------------|----------|-----|---|----------|--|
| C:\ | Users\hh177\Deskt | op\orangepi\MiniI | .oader-烧 | | 下载 | T | |
| 件: | | | | | 解包 | | |
| 读取FlashID | 读职Flash信息 | 读取Chip信息 | 读取Capa | | 1. Flash 2. EMMC 3. SD 4. SD1 | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换和 | 宇储 | 5. SPINOR 6. SPINAND 7. RAM 8. USB | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前 | 前存储 | 9. SATA 10. PCIE | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | | |
| 2始扇区: | | | | | | | |
| 詞区数: | | | | | | L | |

k. Then select the storage device as EMMC, and then click to switch storage

| Boot: C:\1 | Users\csy\Desktop' | \orangepi\MiniLo | ader燒录 | 下载 | 下载Boot成功 | |
|------------|--------------------|------------------|--------------|---|----------|--|
| 固件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EMMC 3. SD | | |
| 测试设备 | 重启设备 | 进入Maskrom | 扣協友妹 | 4. SD1 5. SPINOR 6. SPINAND 7. RAM | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | |
| 起始扇区: | | | | | | |
| 扇区数: | | | | | | |

1. The successful switching is displayed as shown below.

| 找 镜像 升级固 体 | # 高级功能 | | | | 下载Boot开始 下载Boot成功 | |
|-------------------|-------------------|-------------------|--------------|---|----------------------|--|
| Boot: C:\ | Users\csy\Desktop | \orangepi\MiniLo: | ader烧录 | 下载 | | |
| 固件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EAMAC 3. SD 4. SD1 | | |
| 测试设备 | 重启设备 | 进入Maskrom | 切换存储 | 4. SD1 5. SPINOR 6. SPINAND 7. RAM | RKDevTool X | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | 1 初换存储成功. | |
| 导出镜像 | 撞除扇区 | 擦除所有 | | | 1.00+1+100-02. | |
| | | | | | | |
| 起始扇区: | | | | | 确定 | |

m. Then click the "Upgrade Firmware" column of the burning tool

| 芯微开发工具 v3.15 | | - 0 | |
|-----------------|-------|-----|--|
| a鏡像 开级固件 高级功能 | | | |
| 固件 升级 切换 | | | |
| 固件版本: Loader版本: | 芯片信息: | | |
| 固件: | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

n. Then click the "**Firmware**" button to select the path of the OPi OS (OH) image that needs to be burned.

| | | - 0 |
|-----------------|-------|-----|
| 战镜像「升级固件」高级功能 | | |
| 固件 升级 切换 | | |
| 固件版本: Loader版本: | 芯片信息: | |
| 固件: | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

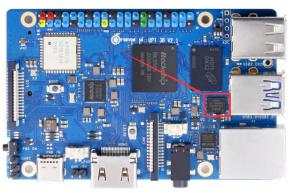
Finally, click the "Upgrade" button to start burning. The log during the burning 0. process is as shown below. After the burning is completed, the OPi OS (OH)

system will automatically start.

| 見訳 713X14 | 固件 高级功能 | 6 | | | 测试设备开始 测试设备成功 | |
|---------------|------------|-----------------|----------------------|---------------------|--------------------------------|--|
| 固件 | 升级 | 切换 | | | 校验芯片开始 校验芯片成功 | |
| 固件版本: | 11.0.00 | Loader版本: | 1.01 芯片 | 信息: RK3568 | 获取FlashInfo开始 获取FlashInfo成功 | |
| <u>到什</u> 殿争。 | | | | | 准备IDB开始 准备IDB成功 | |
| 固件: | C:\Users\x | unlong\Desktop\ | \Opios-oh-4.0-beta1- | -aarch64-opi3b-23.1 | 下载IDB开始 下载IDB成功 | |
| | | | | | 下载固件开始 正在下载固件(100%) | |
| | | | | | 下载固件成功 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

2.12. Using RKDevTool to clear SPIFlash

1) The position of SPI Flash on the development board is shown in the figure below



2) First, you need to prepare a good quality USB2.0 male-to-male data cable

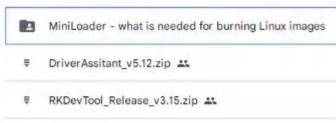


3) Then download the Rockchip driver **DriverAssitant_v5.12.zip** and MiniLoader and the burning tool **RKDevTool_Release_v3.15.zip** from the **Orange** Pi data download page

a. On the download page of Orange Pi, first select the official tool, and then enter the following folder



b. Then download all the files below



Note that the "MiniLoader-things needed to burn the Linux image" folder is hereinafter referred to as the MiniLoader folder.

4) Then use decompression software to decompress **DriverAssitant_v5.12.zip**, and then find the **DriverInstall.exe** executable file in the decompressed folder and open it

| 名称 | 修改日期 | 类型 | 大小 |
|-----------------|-----------------|------|--------|
| ADBDriver | 2022/12/1 15:07 | 文件夹 | |
| 📙 bin | 2022/12/1 15:07 | 文件夹 | |
| Driver | 2022/12/1 15:07 | 文件夹 | |
| Config | 2014/6/3 15:38 | 配置设置 | 1 KB |
| 🥞 DriverInstall | 2022/2/28 14:11 | 应用程序 | 491 KB |
| Readme | 2018/1/31 17:44 | 文本文档 | 1 KB |
| i revison | 2022/2/28 14:14 | 文本文档 | 1 KB |
| | | | |

- 5) After opening DriverInstall.exe, the steps to install the Rockchip driver are as follows
 - a. Click the "Driver Installation" button

| | 驱动安装 | 驱动卸载 |
|--|------|------|
|--|------|------|

b. After waiting for a period of time, a pop-up window will prompt "driver installed successfully", and then click the "OK" button.

| | DriverInstall | × |
|-----|---------------|----|
| 驱动学 | | 印载 |
| | 安装驱动成功. | |
| | | |
| | - | |
| | 确定 | |

6) Then decompress **RKDevTool_Release_v3.15.zip**, this software does not need to be installed, just find **RKDevTool** in the decompressed folder and open it

| 名称 | 修改日期 | 类型 | 大小 |
|-----------------|------------------|-----------------|----------|
| 🔒 bin | 2022/12/1 15:07 | 文件夹 | |
| Language | 2022/12/1 15:07 | 文件夹 | |
| Config.cfg | 2022/3/23 9:11 | CFG 文件 | 7 KB |
| 🔄 config | 2021/11/30 11:04 | 配置设置 | 2 KB |
| revision | 2022/5/27 9:09 | 文本文档 | 3 KB |
| 🔆 RKDevTool | 2022/5/27 9:06 | 应用程序 | 1,212 KB |
| ◎ 开发工具使用文档_v1.0 | 2021/8/27 10:28 | Foxit PDF Reade | 450 KB |

7) After opening the **RKDevTool** burning tool, because the computer has not connected to the development board through the USB2.0 male-to-male data cable at this time, the lower left corner will prompt "**No device found**"

| | | 存储 | 地址 | 名字 | 路径 | | | | |
|------|-------|----|------------|-----------|-------|----|---|--|--|
| 1 | Г | | 0x00000000 | Loader | | | | | |
| 2 | Г | | 0x00000000 | Parameter | | | - | | |
| 3 | | | 0x00000000 | Uboot | | | | | |
| 4 | | | 0x00000000 | trust | | | | | |
| 5 | | | 0x00000000 | Misc | | | | | |
| 6 | | | 0x00000000 | Resource | | | | | |
| 7 | | | 0x00000000 | Kernel | | | | | |
| 8 | Г | | 0x00000000 | Boot | | | | | |
| 9 | Г | | 0x00000000 | Recovery | | | | | |
| 10 | Г | | 0x00000000 | System | | | | | |
| 11 | Г | | 0x00000000 | Backup | | | | | |
| Loud | ler : | [| 执行 | 切换 | 设备分区表 | 清空 | | | |

- 8) Then you can start to clear the content in SPI FLASH
 - a. First, connect the development board to the Windows computer through the USB2.0 male-to-male data cable. The position of the USB2.0 programming port of the development board is shown in the figure below



- b. Make sure that the development board is not inserted into the TF card and not connected to the power supply
- c. Then press and hold the MaskROM button on the development board, the position of the MaskROM button on the development board is shown in the figure below:



d. Then connect the power supply of the Type-C interface to the development board, and power on, and then release the MaskROM button



e. If the previous steps are successful, the development board will enter the **MASKROM** mode at this time, and the interface of the burning tool will prompt "found a **MASKROM device**"

| 载镜 | 像 | 升级固件 副 | 高级功能 | | | |
|----|------|--------|-------------|-----------|----------|--|
| # | | 存储 | 地址 | 名字 | 路径 | |
| 1 | Г | | 0x00000000 | Loader | | |
| 2 | Г | | 0x00000000 | Parameter | | |
| 3 | Г | | 0x00000000 | Uboot | | |
| 4 | | | 0x00000000 | trust | | |
| 5 | | | 0x00000000 | Misc | | |
| 6 | | | 0x00000000 | Resource | | |
| 7 | Г | | 0x00000000 | Kernel | | |
| 8 | Г | | 0x00000000 | Boot | | |
| 9 | Г | | 0x00000000 | Recovery | | |
| 10 | Г | | 0x000000000 | System | | |
| 11 | | | 0x000000000 | Backup | | |
| | er : | | | | 读音分回来 清空 | |
| | | | □ 强制按地址写 | | | |

f. Then please select Advanced Features

| | | 工具 v3.15 | | | | |
|----|-----|----------|---------------|--------------|----|--|
| | | 存储 | anty solution | 名字 | 路径 | |
| # | H | 1子14角 | 0.00000000 | 右子 Loader | 開出 | |
| 2 | Ē | | 0x0000000 | Parameter | | |
| 3 | i E | | 0x00000000 | Uboot | | |
| 4 | í É | | 0x00000000 | trust | | |
| 5 | Ē | | 0x00000000 | Misc | | |
| 6 | | | 0x00000000 | Resource | | |
| 7 | | | 0x00000000 | Kernel | | |
| 8 | Г | | 0x00000000 | Boot | | |
| 9 | | | 0x00000000 | Recovery | | |
| 10 | | | 0x00000000 | System | | |
| 11 | | | 0x00000000 | Backup | | |

g. Then click the position shown in the figure below

| 镜像 升级固件 | (国364)月6 | | | | |
|-----------|-----------|-----------|--------------|--|--|
| oot: | | | | 下载 | |
| 四件: | | | | 解包 | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FlASH 2. EMMC 3. SD 4. SD1 | |
| 测试设备 | 重启设备 | 进入Maskron | 切换存储 | 5. SPINOR 6. SPINAND 7. RAM | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | |
| 3始扇区: | | | | | |
| 弱区数: | | | | | |

h. Select MiniLoaderAll.bin in the MiniLoader folder you downloaded earlier, and click Open

| ← → ∽ ↑ 🚞 > 桌面 > | orangepi > MiniLoader-烧录Linux镜像才需要用到的: | 东西 > 〇 在 | MiniLoader-烧灵Linux | Q |
|----------------------|--|-----------------|--------------------|-------|
| | | | _ | |
| 组织 ▼ 新建文件夹 > ● WPS云盘 | | 修改日期 | ≡ ▼ □ | 大小 |
| > ● WPS云蓋 合 主文件夹 | G MiniLoaderAll.bin | 2023/8/18 11:17 | 大型 BIN 文件 | 455 |
| > OneDrive | rk356x linux emmc.cfg | 2023/8/18 11:17 | txtfile | 45. |
| | rk356x_linux_pcie.cfg | 2023/8/18 11:17 | txtfile | 2 |
| · 桌面 | rk356x_linux_spiflash.cfg | 2023/8/18 11:17 | txtfile | 2 |
| 业 下载 | | 2023/8/18 11:17 | txtfile | â |
| ■ 文档 | * rkspi_loader.img | 2023/8/18 11:17 | DAEMON.Tools | 4,096 |
| 🚬 图片 | * | | | |
| 🕖 音乐 | * | | | |
| 文件名(N): MiniLo | aderAll.bin | ~ A | File(*.*) | ~ |

i. Then click **Download**

| ot: C:\1 | Jsers\hh177\Deskto | op\orangepi\Minil | Loader-'烧 [| 下载 | |
|-----------|--------------------|-------------------|--------------|---|--|
| 件: | | | | 解包 | |
| 读职FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FLASH 2. EDUC 3. SD 4. SD1 | |
| 则试设备 | 重启设备 | 进入Maskron | 切换存储 | 4. SDINOR 6. SPINAND 7. RAM 8. USB | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 9. SATA 10. PCIE | |
| 导出镜像 | 擦除扇区 | 擲除所有 | | | |
| 始扇区: | | | | | |
| ⊪⊠数: | | | | | |

j. The display after downloading MiniLoaderAll.bin is shown in the figure below

| 載鏡像 升级固件 7 | 高级功能 | | | | 下载Boot开始 下载Boot成功 | |
|--------------|------------------|-------------------|--------------|--|----------------------|--|
| Boot: C:\Use | ers\hh177\Deskto | op\orangepi\MiniI | .oader-烧 | 下载 | | |
| 固件: | | | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capability | 1. FlASH 2. EMMC 3. SD 4. SD1 | | |
| 测试设备 | 重启设备 | 进入Maskrom | 0/J#(14) | 5. SPINOR 6. SPINAND 7. RAM | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前存储 | 8. USB 9. SATA 10. PCIE | | |
| 导出镜像 | 擦除扇区 | 擦除所有 | | | | |
| 起始扇区: | | | | | | |
| 扇区数: | | | | | 1 | |

k. Then select the storage device as **SPINOR**

| 战镜像 升级固件 Boot: C:\[| 高级功能 Jsers\hh177\Deskto | op\orangepi\MiniI | .oader-饶 | ••• | 下载 | 下载Boot开始 下载Boot成功 | | |
|------------------------|----------------------------|-------------------|----------|-----------|---|----------------------|--|--|
| 固件: | | | | | 解包 | | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capa | bility | 1. FlASH 2. ENONC 3. SD | | | |
| 测试设备 | 重启设备 | 进入Maskron | 切换有 | + Int _ C | 4. SD1 5. SPINOR 3. SPINAND 7. RAM | | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前 | 前存储 | B. USB 9. SATA 10. PCIE | | | |
| 导出镜像 | 擲除扇区 | 擦除所有 | | L | | | | |
| 起始扇区: 扇区数: | | | | | | | | |
| 发现- | 一个MASKRO | M设备 | 1-2-3 | 3 :MASKRO | M | ~ | | |

1. Then click Switch Storage



m. Then click Erase All to start erasing SPIFlash

| 裁鏡像 升级固件 | - 高级功能 | | | | | 下载Boot开始 下载Boot成功 | |
|-----------|-------------------|--------------------|---------|--------|---|----------------------|--|
| Boot: C:\ | Users\hh177\Deskt | op\orangepi\MiniLo | oader一烧 | ••• | 下载 | | |
| 固件: | | | j | | 解包 | | |
| 读取FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capa | bility | . Flash . EMMC . SD | | |
| 测试设备 | 重启设备 | 进入Maskron | 切换在 | 了储 🧧 | . SD . SD1 . SPINOR . SPINAND . RAM | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当前 | 存储 | I USB SATA O. PCIE | - | |
| 导出镜像 | 擦除扇区 | 擦除所有 | _ | | | | |
| 起始扇区: | | | | | | | |
| 扇区数: | | | | | | | |

n. The display log after erasing SPIFlash is shown in the figure below

| 竟像 升级固件 | | | | | | 正在擦除(100%) 擦除扇区成功 | |
|------------------|-------------------|-------------------|----------|--------|---|---|--|
| ot: C:\1 | Users\hh177\Deskt | op\orangepi\Minil | .oader-烷 | | 下载 | 100000000000000000000000000000000000000 | |
| 件: | | | | | 解包 | | |
| 卖职FlashID | 读取Flash信息 | 读取Chip信息 | 读取Capa | bility | 1. FlASH 2. EMMC 3. SD 4. SD1 | | |
| 则试设备 | 重启设备 | 进入Maskron | 切换有 | 储 | 4. SDI 5. SPINOR 6. SPINAND 7. RAH 8. USB | | |
| 清空序列号 | 检测安全模式 | 导出串口日志 | 获取当有 | 存储 | 9. SATA 10. PCIE | | |
| 导出镜像 | 擲除扇区 | 擦除所有 | | l | | | |
| 始扇区: | | | | | | | |
| 区数: | | | | | | | |

2.13. Start the Orange Pi development board

1) Insert the TF card with the burned image into the TF card slot of the Orange Pi development board. If the image of SPIFlash+NVMe SSD has been burnt, then there is no need to insert a TF card, just make sure that the NVMe SSD is inserted into the development board normally.

2) The development board has an HDMI interface, and the development board can be connected to a TV or HDMI display through an HDMI-to-HDMI cable. If you have purchased an LCD screen, you can also use the LCD screen to display the system interface of the development board.

3) Connect a USB mouse and keyboard to control the Orange Pi development board.

4) The development board has an Ethernet port, which can be plugged into a network cable for Internet access.

5) Connect a high-quality power adapter with a 5V/3A USB Type-C interface.

Remember not to plug in a power adapter with a voltage output greater than 5V, as this will burn out the development board.

Many unstable phenomena during the power-on and start-up process of the system are basically caused by power supply problems, so a reliable power adapter is very important. If you find that there is a phenomenon of continuous restart during the startup process, please replace the power supply or the Type-C data cable and try again. The Type-C power port does not support PD negotiation.

In addition, please do not connect the USB interface of the computer to power the development board.

6) Then turn on the switch of the power adapter. If everything is normal, you can see the startup screen of the system on the HDMI monitor or LCD screen.

7) If you want to view the output information of the system through the debugging serial port, please use the serial cable to connect the development board to the computer. For the connection method of the serial port, please refer to **the section on how to use the debugging serial port.**

2.14. How to use the debugging serial port

2. 14. 1. Connection instruction of debugging serial port

1) First, you need to prepare a 3.3V USB-to-TTL module, and then insert the USB interface end of the USB-to-TTL module into the USB interface of the computer.

For better compatibility, it is recommended to use CH340 USB to TTL module, please do not use CP2102, PL2303 USB to TTL module.

Before purchasing a USB to TTL module, please confirm that the module supports a baud rate of 1500000.



2) The corresponding relationship between GND, RXD and TXD pins of the debugging serial port of the development board is shown in the figure below



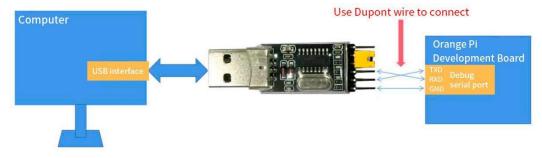
3) The GND, TXD and RXD pins of the USB to TTL module need to be connected to the debugging serial port of the development board through a DuPont line

a. Connect the GND of the USB to TTL module to the GND of the development board

b. The **RX of the USB to TTL module is connected to the TX** of the development board

c. The **TX of the USB to TTL module is connected to the TX** of the development board

4) The schematic diagram of connecting the USB to TTL module to the computer and the Orange Pi development board is as follows



Schematic diagram of connecting the USB to TTL module to the computer and the Orange Pi development board

The TX and RX of the serial port need to be cross-connected. If you don't want to carefully distinguish the order of TX and RX, you can connect the TX and RX of the serial port casually first. If there is no output in the test, then exchange the order of TX and RX, so there is always a the order is right

2. 14. 2. How to use the debugging serial port on the Ubuntu platform

There are many serial port debugging software that can be used under Linux, such as putty, minicom, etc. The following demonstrates how to use putty.

1) First, insert the USB-to-TTL module into the USB interface of the Ubuntu computer. If the connection and recognition of the USB-to-TTL module is normal, you can see the corresponding device node name under /dev on the Ubuntu PC. Remember this node name, and then set the serial port software will be used

test@test:~**\$ ls /dev/ttyUSB*** /dev/ttyUSB0 2) Then use the following command to install putty on Ubuntu PC

test@test:~\$ sudo apt-get update

test@test:~\$ sudo apt-get install -y putty

3) Then run putty, remember to add sudo permission test@test:~\$ sudo putty

4) After executing the putty command, the following interface will pop up

| | PuTTY Configuration | 6 |
|---|--|------------------|
| Category: - Session | Basic options for your Put Specify the destination you want to connec | t to |
| Logging | Host <u>N</u> ame (or IP address) | Port |
| ▼ Terminal | | 22 |
| Keyboard Bell | Connection type: Raw <u>T</u> elnet Rlogin | SSH OSerial |
| Features • Window Appearance | Load, save or delete a stored session Saved Sessions | |
| Behaviour Translation | Default Settings | Load |
| Selection Colours | | Sa <u>v</u> e |
| Fonts | | Delete |
| Connection Data Proxy Telnet | Close window on e <u>x</u> it: | |
| Rlogin | Always ONever Only | on clean exit |
| ▶ SSH | | |
| About | Ope | n <u>C</u> ancel |

5) First select the setting interface of the serial port

| cite in the second s | PuTTY Configuration | - Land Street Income | | | | | | |
|--|--|----------------------|--|--|--|--|--|--|
| Category: Logging | Options controlling local serial lines Select a serial line | | | | | | | |
| Terminal Keyboard | Serial line to connect to | /dev/ttyUSB0 | | | | | | |
| Bell | Configure the serial line | | | | | | | |
| Features • Window | <u>S</u> peed (baud) | 1500000 | | | | | | |
| Appearance Behaviour | Data <u>b</u> its | 8 | | | | | | |
| Translation | S <u>t</u> op bits | 1 | | | | | | |
| Selection Colours | <u>P</u> arity | None 👻 | | | | | | |
| Fonts | <u>F</u> low control | None 🔻 | | | | | | |
| Connection Data Proxy Telnet Rlogin SSH Serial | | | | | | | | |

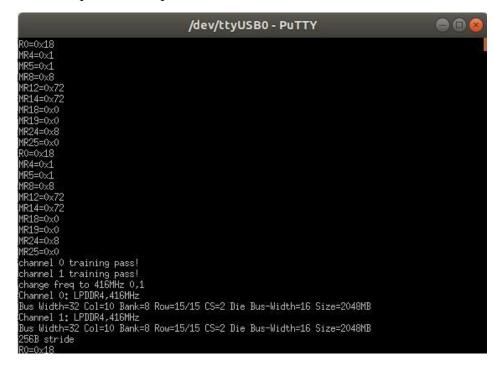
- 6) Then set the parameters of the serial port
 - a. Set Serial line to connect toas /dev/ttyUSB0 ((Modified to the corresponding node name, generally /dev/ttyUSB0)
 - b. Set Speed(baud) as **1500000** (Serial port baud rate)
 - c. Set Flow control as None

| | PuTTY Configuration | 🖨 🗎 😣 |
|--|---|-------------------------|
| Category: Logging ▼ Terminal Keyboard Bell 2. Enter th | Options controllin Select a serial line Serial line to connect to the device node name of the seria Configure the serial line | /dev/ttyUSB0 |
| Features | speed842000 | 1500000 |
| Appearance Behaviour | Data <u>b</u> its | 8 |
| Translation | Stop bits | 1 |
| Selection Colours | Parity | None • |
| Fonts | <u>F</u> low control | None - |
| Proxy Telnet Rlogin | Set Flow control to None Select the setting inter | face of the serial port |
| SSH Serial | | Open <u>C</u> ancel |

- 7) After setting the setting interface of the serial port, return to the Session interface
 - a. First select the Connection type as Serial
 - b. Then click the Open button to connect to the serial port

| | PuTTY Configuration | 00 | | | |
|--|---|-------------------|--|--|--|
| Category: 🖌 1. | Go back to the Session interface Basic options for your PuTTY ses | sion | | | |
| Session Logging | Specify the destination you want to connect Serial line | | | | |
| ▼ Terminal | /dev/ttyUSB0 | 1500000 | | | |
| Keyboard Bell | Connection type: 2. Select Serial Connection type: Rlogin Select Serial Select Serial | • Se <u>r</u> ial | | | |
| Features Window Appearance | Load, save or delete a stored session Sav <u>e</u> d Sessions | | | | |
| Behaviour | | | | | |
| Translation | Default Settings | Load | | | |
| Selection Colours | | Sa <u>v</u> e | | | |
| Fonts | | Delete | | | |
| Connection | | | | | |
| Data | | | | | |
| Proxy Telnet Rlogin | Close window on e <u>x</u> it: O Always O Never O Only on cle | an exit | | | |
| ь ссн | 3. Finally click the Open button | | | | |
| | 5. Thiany click the Open button | | | | |
| About | Open | <u>C</u> ancel | | | |

8) After starting the development board, you can see the Log information output by the system from the opened serial port terminal



2. 14. 3. How to use the debugging serial port on Windows platform

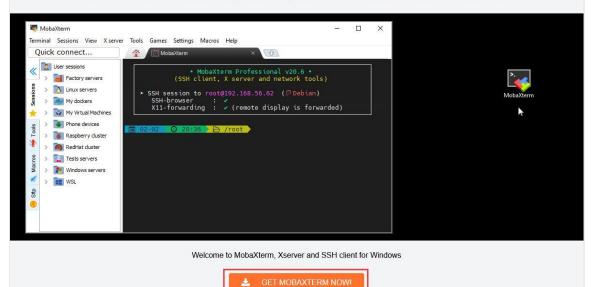
There are many serial port debugging software that can be used under Windows, such as SecureCRT, MobaXterm, etc. The following demonstrates how to use MobaXterm. This software has a free version and can be used without buying a serial number.

- 1) Download MobaXterm
 - a. Download MobaXterm website as follows

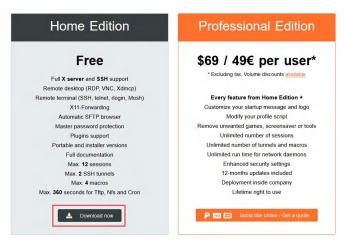
https://mobaxterm.mobatek.net

b. After entering the MobaXterm download page, click GET XOBATERM NOW! MobaXterm

Enhanced terminal for Windows with X11 server, tabbed SSH client, network tools and much more



c. Then choose to download the Home version



d. Then select the Portable version. After downloading, you don't need to install it, just open it and use it

| Download | MobaXterr | m Home Ec | ition (currer | nt version): | | | | | | |
|---------------------------|------------|--------------|-----------------------------|---------------------|------------|---------------|-----------------|--------------|---|------|
| | * | | erm Horne E table editio | Edition v22.2 n) | | | | | MobaXterm Home Edition v22 (Installer edition) | .2 |
| Dow <mark>nlo</mark> ad | previous s | table versio | n: <u>Moba</u> x | (term Portabl | le v22.1 | MobaXter | n Installer | <u>v22.1</u> | | |
| B <mark>y down</mark> lo | ading Mob | aXterm sof | ware, you a | accept <u>Mobal</u> | Xterm terr | ns and cor | <u>iditions</u> | | | |
| Y <mark>ou can d</mark> o | ownload th | e third part | r pl <mark>ugins a</mark> n | d componen | ts sources | s <u>here</u> | | | | |
| A | | | - | | | | | | fessional Edition: your subscription | will |
| | give you a | | | | | | your welco | | allow you to generate personalized | |

2) After downloading, use decompression software to decompress the downloaded compressed package, you can get the executable software of MobaXterm, and then double-click to open

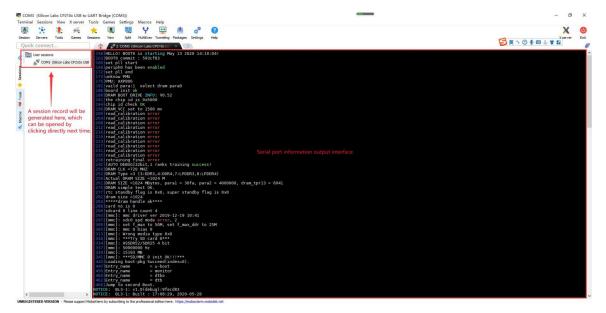
| 名称 | 修改日期 | 类型 | 大小 |
|-------------------------|------------------|-----------|-----------|
| CygUtils.plugin | 2022/9/24 20:16 | PLUGIN 文件 | 17,484 KB |
| MobaXterm_Personal_22.2 | 2022/10/22 16:53 | 应用程序 | 16,461 KB |

- 3) After opening the software, the steps to set up the serial port connection are as follows
 - a. Open the session settings interface
 - b. Select the serial port type
 - c. Select the port number of the serial port (select the corresponding port number according to the actual situation)
 - d. Select the baud rate of the serial port as 1500000
 - e. Finally click the "**OK**" button to complete the setting

| range | Pi U | lser I | Manual |
|-------|------|--------|--------|

| on S | Servers | Nools | Games S | 🚖 Sessions | View | Split M | Y AultiExec | Tunneling | Packages | settings | (?) Help | | | | |
|-------|------------|------------|---------------------|---------------|---------|-------------------------|-----------------|-----------|-------------|------------|-------------|------------|------|--------|-----|
| | connect | | | | (¢) | | | - | | | | | | | |
| Se Se | ession set | ttings | | | | | | | | | | | | | |
| | SSH | Telnet | Rsh | Xdmcp | RDP | VNC | S FTP | SFTF | Seria | a shirt - | ≥ Shell | Browser | Mosh | Aws S3 | WSL |
| | se Ba | asic Seria | al settings | | | | | | | | 2. Select | the serial | port | | |
| | | Serial p | _ | ose at sess | | | | ~ | | Speed (| bps) * 150 | 00000 ~ | | | |
| | 🔊 A | dvanced S | CON Serial setti | 13 (Silicon | | P210x US al settings | | X.1 | rk settings | 6 | 1 | | | | |
| | | | 3. Sel | ect the po | ort num | per of the | serial p | ort | 4. Se | lect the b | aud rate | as 150000 | 0 | | |
| | | | | | | Serial (| COM) s | ession | | | | | | Ń | ſ. |
| | | | | | 5. F | inally clic | k OK | | | | | | | | |
| | | | | | | | | | | | | | | | |

4) After clicking the "**OK**" button, you will enter the following interface. At this time, start the development board and you can see the output information of the serial port



2.15. Instructions for using the 5v pin in the 40pin interface of the development board to supply power

The power supply method we recommend for the development board is to use the 5V/3A Type C interface power cord to plug into the Type-C power interface of the development board for power supply. If you need to use the 5V pin in the 40pin interface to power the development board, please make sure that the power cord and power adapter used can meet the power supply requirements of the development board. If the use is unstable, please switch back to the Type-C power supply.

1) First, you need to prepare a power cord as shown in the figure below



Please purchase the power cord shown in the picture above by yourself

2) Use the 5V pin in the 40pin interface to supply power to the development board. The connection method of the power line is as follows

- a. The USB A port of the power cord shown in the above picture needs to be plugged into the 5V/3A power adapter connector (please do not plug into the computer's USB port for power supply)
- b. The red DuPont line needs to be plugged into the 5V pin of the development board 40pin
- c. The black Dupont wire needs to be inserted into the GND pin of the 40pin interface
- d. The position of the 5V pin and GND pin of the 40pin interface on the development board is shown in the figure below, **remember not to reverse the connection**



3. Instructions for use of Ubuntu/Debian Server and

Xfce desktop system

The content of this chapter is written based on the images of the Linux server version and the xfce desktop version.

3.1. Supported Linux image types and kernel versions

| Linux image type | kernel version | server version | desktop version |
|----------------------|----------------|----------------|-----------------|
| Debian 11 - Bullseye | Linux5.10 | support | support |
| Ubuntu 20.04 - Focal | Linux5.10 | support | support |
| Ubuntu 22.04 - Jammy | Linux5.10 | support | support |
| Debian 11 - Bullseye | Linux6.6 | support | support |
| Debian12 - Bookworm | Linux6.6 | support | support |
| Ubuntu 22.04 - Jammy | Linux6.6 | support | support |

3.2. Linux System adaptation

3. 2. 1. Linux5.10 system adaptation situation

| Function | Debian11 | Ubuntu20.04 | Ubuntu22.04 |
|--------------------|----------|-------------|-------------|
| USB2.0x3 | OK | ОК | ОК |
| USB3.0x1 | OK | ОК | ОК |
| M.2 NVMe SSD Start | OK | ОК | ОК |
| WIFI | OK | ОК | ОК |
| Bluetooth | OK | ОК | ОК |
| GPIO (40pin) | OK | ОК | ОК |
| UART (40pin) | OK | ОК | ОК |
| SPI (40pin) | OK | ОК | ОК |
| I2C (40pin) | OK | ОК | ОК |
| PWM (40pin) | OK | ОК | ОК |
| PWM fan interface | ОК | ОК | ОК |

| 3pin Debug serial port | OK | ОК | ОК |
|-------------------------------|------------|--------------------|----------------|
| ЕММС | OK | ОК | ОК |
| TF card start | ОК | ОК | ОК |
| HDMI Video | ОК | ОК | ОК |
| HDMI Audio | ОК | ОК | ОК |
| OV5647 Camera | The kernel | driver is OK, 3A i | s not adjusted |
| LCD | ОК | ОК | ОК |
| Edp Display | ОК | ОК | ОК |
| Gigabit Ethernet port | ОК | ОК | ОК |
| Network port status light | ОК | ОК | ОК |
| headphone playback | ОК | ОК | ОК |
| headphone recording | ОК | ОК | ОК |
| LED Light | ОК | ОК | ОК |
| RTC | ОК | ОК | ОК |
| GPU | ОК | ОК | ОК |
| NPU | ОК | ОК | ОК |
| VPU | ОК | ОК | ОК |
| watchdog test | ОК | ОК | ОК |
| Chromium Hard solution | ОК | ОК | ОК |
| video | | | |
| | | | |

3. 2. 2. Linux6.6 system adaptation situation

| Function | Debian11 | Debian12 | Ubuntu22.04 |
|-------------------------------|----------|----------|-------------|
| USB2.0x3 | ОК | OK | ОК |
| USB3.0x1 | ОК | OK | ОК |
| M.2 NVMe SSD Start | ОК | OK | ОК |
| WIFI | ОК | ОК | ОК |
| Bluetooth | ОК | OK | ОК |
| GPIO (40pin) | ОК | OK | ОК |
| UART (40pin) | ОК | OK | ОК |
| SPI (40pin) | ОК | OK | ОК |
| I2C (40pin) | ОК | OK | ОК |
| PWM (40pin) | ОК | OK | ОК |
| PWM fan interface | ОК | OK | ОК |
| 3pin Debug serial port | ОК | OK | ОК |

| ЕММС | OK | OK | ОК |
|---------------------------|----|----|----|
| TF card start | ОК | ОК | ОК |
| HDMI Video | ОК | ОК | ОК |
| HDMI Audio | ОК | ОК | ОК |
| OV5647 Camera | NO | NO | NO |
| LCD | NO | NO | NO |
| eDP Display | NO | NO | NO |
| Gigabit Ethernet port | ОК | ОК | ОК |
| Network port status light | ОК | ОК | ОК |
| headphone playback | NO | NO | NO |
| headphone recording | NO | NO | NO |
| LED Light | ОК | ОК | ОК |
| RTC | ОК | ОК | ОК |
| GPU | ОК | ОК | ОК |
| NPU | NO | NO | NO |
| VPU | NO | NO | NO |
| watchdog test | NO | NO | NO |

3. 3. The format of Linux commands in this manual

1) In this manual, all commands that need to be entered in the Linux system will be marked with the following box

As shown below, the content in the yellow box indicates the content that needs special attention, except for the commands in it.

2) Description of the prompt type in front of the command

a. The prompt in front of the command refers to the content of the red part in the box below, which is not part of the Linux command, so when entering the command in the Linux system, please do not enter the content of the red font part

orangepi@orangepi:~\$ sudo apt update root@orangepi:~# vim /boot/boot.cmd test@test:~\$ ssh root@192.168.1.xxx root@test:~# ls

- b. root@orangepi:~\$ The prompt indicates that this command is entered in the Linux system of the development board. The \$ at the end of the prompt indicates that the current user of the system is a normal user. When executing a privileged command, you need to add sudo
- c. **root@orangepi:~#** The prompt indicates that this command is entered in the Linux system of the development board, and the # at the end of the prompt indicates that the current user of the system is the root user, who can execute any desired command
- d. test@test:~\$ The prompt indicates that this command is entered in the Ubuntu PC or Ubuntu virtual machine, not in the Linux system of the development board. The \$ at the end of the prompt indicates that the current user of the system is an ordinary user. When executing privileged commands, sudo needs to be added sudo
- e. root@test:~# The prompt indicates that this command is entered in the Ubuntu PC or Ubuntu virtual machine, not in the Linux system of the development board. The # at the end of the prompt indicates that the current user of the system is the root user and can execute any command you want
- 3) What are the commands that need to be entered?
 - a. As shown below, **the black bold part** is the command that needs to be input, and the content below the command is the output content (some commands have output, some may not), and this part of the content does not need to be input

```
root@orangepi:~# cat /boot/orangepiEnv.txt
verbosity=7
bootlogo=false
console=serial
```

b. As shown below, some commands cannot be written in one line and will be placed on the next line. As long as the black and bold parts are all commands that need to be input. When these commands are entered into one line, the last "\" of each line needs to be removed, this is not part of the command. In addition, there are spaces in different parts of the command, please don't miss it

orangepi@orangepi:~\$ echo \

"deb [arch=\$(dpkg --print-architecture) \ signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] \ https://download.docker.com/Linux/debian \ \$(lsb release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

3. 4. Linux system login instructions

3. 4. 1. Linux system default login account and password

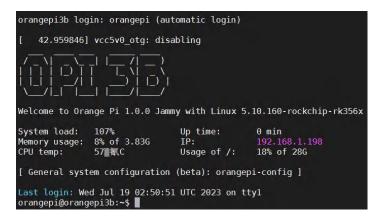
| Account | Passport |
|----------|----------|
| root | orangepi |
| orangepi | orangepi |

Note that when entering the password, the specific content of the entered password will not be displayed on the screen, please do not think that there is any fault, just press Enter after inputting.

When the wrong password is prompted, or there is a problem with the ssh connection, please note that as long as you are using the Linux image provided by Orange Pi, please do not suspect that the above password is wrong, but look for other reasons.

3. 4. 2. How to set automatic terminal login in Linux system

1) The Linux system automatically logs in to the terminal by default, and the default login user name is **orangepi**



2) Use the following command to set the root user to automatically log in to the terminal orangepi@orangepi:~\$ sudo auto_login_cli.sh root

3) Use the following command to disable automatic login terminal

orangepi@orangepi:~\$ sudo auto_login_cli.sh -d

4) Use the following command to set the orangepi user to automatically log in to the terminal again

orangepi@orangepi:~\$ sudo auto_login_cli.sh orangepi

3. 4. 3. Instructions for automatic login of Linux desktop version system

1) After the desktop system starts, it will automatically log in to the desktop without entering a password



2) Run the following command to prohibit the desktop system from automatically logging into the desktop

orangepi@orangepi:~\$ sudo disable_desktop_autologin.sh

3) Then restart the system and a login dialog box will appear, at which point a **password** is required to enter the system



3. 4. 4. The setting method of root user automatic login in Linux desktop version system

1) Execute the following command to set the desktop system to automatically log in as the root user

orangepi@orangepi:~\$ sudo desktop login.sh root

2) Then restart the system, and the root user will automatically log in to the desktop



Note that if you log in to the desktop system as the root user, you cannot use pulseaudio in the upper right corner to manage audio devices.

Also note that this is not a bug, since pulseaudio is not allowed to run as root.

3) Execute the following command to set the desktop system to log in automatically with the orangepi user again

orangepi@orangepi:~\$ sudo desktop_login.sh orangepi

3. 4. 5. The method of disabling the desktop in the Linux desktop version system

1) First enter the following command on the command line, Please remember to add sudo permission

orangepi@orangepi:~\$ sudo systemctl disable lightdm.service

2) Then restart the Linux system and you will find that the desktop will not be displayed orangepi@orangepi:~\$ sudo reboot

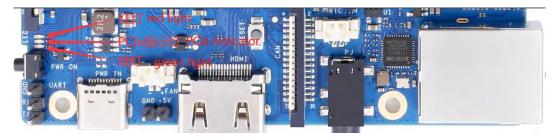
- 3) The steps to reopen the desktop are as follows:
 - a. First enter the following command on the command line, **Please remember to** add sudo permission

orangepi@orangepi:~\$ sudo systemctl start lightdm.service

b. After the command is executed, the desktop will be displayed

3.5. **Onboard LED Light Test Instructions**

1) There are three LED lights on the development board, one green light, one red light, and one PCIe light. The location is shown in the figure below:



2) As long as the development board is powered on, the red LED light will always be on, which is controlled by the hardware and cannot be turned off by the software

3) The green LED light will keep blinking after the kernel is started, which is controlled by software.

4) The PCIe indicator will flash when there is data transmission on the PCIe interface.

5) The method of setting the green light on and off and flashing is as follows

Note that the following operations should be performed under the root user.

a. First enter the setting directory of the green light

root@orangepi:~# cd /sys/class/leds/status_led

b. The command to set the green light to stop flashing is as follows

root@orangepi:/sys/class/leds/status_led# echo none > trigger

c. The command to set the green light to be on is as follows

root@orangepi:/sys/class/leds/status_led# echo default-on > trigger

d. The command to set the green light to flash is as follows

root@orangepi:/sys/class/leds/status_led# echo default-on > trigger

3. 6. Network connection test

3. 6. 1. Ethernet port test

1) First, insert one end of the network cable into the Ethernet interface of the development board, and connect the other end of the network cable to the router, and ensure that the network is unblocked

2) After the system starts, it will automatically assign an IP address to the Ethernet card through DHCP, **No other configuration is required**

3) The command to view the IP address in the Linux system of the development board is as follows:

Note that in the following command, Debian12 of linux5.10 needs to modify eth0 to end1, and Debian12 of linux6.6 needs to modify eth0 to end0.

orangepi@orangepi:~\$ ip addr show eth0

2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000

link/ether 4a:fe:2b:3d:17:1c brd ff:ff:ff:ff:ff:ff

inet **192.168.1.150**/24 brd 192.168.1.255 scope global dynamic noprefixroute eth0 valid_lft 43150sec preferred_lft 43150sec

inet6 fe80::9a04:3703:faed:23be/64 scope link noprefixroute

valid_lft forever preferred_lft forever

When using ifconfig to view the IP address, if the following information is displayed, it is because sudo is not added. The correct command is: sudo ifconfig

orangepi@orangepi:~\$ ifconfig

Command 'ifconfig' is available in the following places

* /sbin/ifconfig

* /usr/sbin/ifconfig

The command could not be located because '/sbin:/usr/sbin' is not included in the PATH environment variable.

This is most likely caused by the lack of administrative privileges associated with your user account.

ifconfig: command not found

There are three ways to check the IP address after the development board starts:

1. Connect the HDMI display, then log in to the system and use the ip addr show eth0 command to view the IP address

2. Enter the ip addr show eth0 command in the debugging serial terminal to view the IP address

3. If there is no debugging serial port and no HDMI display, you can also check the IP address of the development board's network port through the router's management interface. However, in this method, some people often cannot see the IP address of the development board normally. If you can't see it, the debug method looks like this:

A) First check whether the Linux system has started normally. If the green light of the development board is blinking, it is generally started normally. If only the red light is on, it means that the system has not started normally;

B) Check whether the network cable is plugged in tightly, or try another network cable;

C) Try another router (I have encountered many problems with the router, such as the router cannot assign the IP address normally, or the IP address has been assigned normally but cannot be seen in the router);

D) If there is no router to replace, you can only connect to an HDMI display or use

the debugging serial port to view the IP address

In addition, it should be noted that the development board DHCP automatically assigns an IP address without any settings.

4) The command to test the network connectivity is as follows, the **ping** command can be interrupted through the shortcut key of **Ctrl+C** (Here is an uppercase I, not a lowercase L)

orangepi@orangepi:~\$ **ping www.baidu.com -I eth0** PING www.a.shifen.com (14.215.177.38) from 192.168.1.12 eth0: 56(84) bytes of data. 64 bytes from 14.215.177.38 (14.215.177.38): icmp_seq=1 ttl=56 time=6.74 ms 64 bytes from 14.215.177.38 (14.215.177.38): icmp_seq=2 ttl=56 time=6.80 ms 64 bytes from 14.215.177.38 (14.215.177.38): icmp_seq=3 ttl=56 time=6.26 ms 64 bytes from 14.215.177.38 (14.215.177.38): icmp_seq=4 ttl=56 time=7.27 ms ^C

--- www.a.shifen.com ping statistics ---

4 packets transmitted, 4 received, 0% packet loss, time 3002ms

rtt min/avg/max/mdev = 6.260/6.770/7.275/0.373 ms

3. 6. 2. WIFI connection test

Please do not connect to WIFI by modifying the /etc/network/interfaces configuration file. There will be problems connecting to the WIFI network in this way.

3. 6. 2. 1. The server image connects to WIFI through commands

When the development board is not connected to Ethernet, not connected to HDMI display, but only connected to the serial port, it is recommended to use the commands demonstrated in this section to connect to the WIFI network. Because nmtui can only display characters in some serial port software (such as minicom), and cannot display the graphical interface normally. Of course, if the development board is connected to an Ethernet or HDMI display, you can also use the commands demonstrated in this section to connect to the WIFI network.

- 1) First log in to the Linux system, there are the following three ways
 - a. If the development board is connected with a network cable, you can remotely

log in to the Linux system through ssh

- b. If the development board is connected to the debugging serial port, you can use the serial port terminal to log in to the Linux system
- c. If the development board is connected to the HDMI display, you can log in to the Linux system through the terminal displayed on the HDMI

2) First use the nmcli dev wifi command to scan the surrounding WIFI hotspots

| orangepi(a |)orangepi:~\$ | nmcli | dev | wifi |
|------------|---------------|-------|-----|------|
| Bepre | Jermesepri 🗘 | | | |

| IN-USE | BSSID | SSID | MODE | CHAN | RATE | SIGNAL | BARS | SECURITY |
|--------|-------------------|----------------|-------|------|------------|--------|------|-----------|
| | 28:6C:07:6E:87:2E | orangepi | Infra | | 260 Mbit/s | 97 | | WPA1 WPA2 |
| | D8:D8:66:A5:BD:D1 | | Infra | 10 | 270 Mbit/s | 90 | | WPA1 WPA2 |
| | A0:40:A0:A1:72:20 | | Infra | | 405 Mbit/s | 82 | | WPA2 |
| | 28:6C:07:6E:87:2F | orangepi 5G | Infra | 149 | 540 Mbit/s | 80 | | WPA1 WPA2 |
| | CA:50:E9:89:E2:44 | Chinatist TC15 | Infra | 1 | 130 Mbit/s | 79 | | WPA1 WPA2 |
| | A0:40:A0:A1:72:31 | NET CEAREA | Infra | 100 | 405 Mbit/s | 67 | | WPA2 |
| | D4:EE:07:08:A9:E0 | | Infra | | 130 Mbit/s | 55 | - | WPA1 WPA2 |
| | 88:C3:97:49:25:13 | | Infra | | 130 Mbit/s | 52 | | WPA1 WPA2 |
| | 00:BD:82:51:53:C2 | | Infra | 12 | 130 Mbit/s | | _ | WPA1 WPA2 |
| | C0:61:18:FA:49:37 | | Infra | 149 | 270 Mbit/s | 47 | - | WPA1 WPA2 |
| | 04:79:70:8D:0C:B8 | | Infra | 153 | 270 Mbit/s | 47 | - | WPA2 |
| | 04:79:70:FD:0C:B8 | | Infra | 153 | 270 Mbit/s | 47 | - | WPA2 |
| | 9C:A6:15:DD:E6:0C | | Infra | | 270 Mbit/s | 45 | - | WPA1 WPA2 |
| | B4:0F:3B:45:D1:F5 | | Infra | 48 | 270 Mbit/s | 45 | | WPA1 WPA2 |
| | E8:CC:18:4F:7B:44 | | Infra | 157 | 135 Mbit/s | 45 | | WPA1 WPA2 |
| | B0:95:8E:D8:2F:ED | | Infra | 11 | 405 Mbit/s | | | WPA1 WPA2 |
| | C0:61:18:FA:49:36 | | Infra | 11 | 270 Mbit/s | 24 | 100 | WPA1 WPA2 |

3) Then use the nmcli command to connect to the scanned WIFI hotspot, where:

a. **wifi_name** needs to be replaced with the name of the WIFI hotspot you want to connect to

b. **wifi_passwd** needs to be replaced with the password of the WIFI hotspot you want to connect to

orangepi@orangepi:~\$ nmcli dev wifi connect wifi_name password wifi_passwd Device 'wlan0' successfully activated with 'cf937f88-ca1e-4411-bb50-61f402eef293'.

4) You can view the IP address of wifi through the **ip addr show wlan0** command

orangepi@orangepi:~\$ ip addr show wlan0

11: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000

link/ether 23:8c:d6:ae:76:bb brd ff:ff:ff:ff:ff:ff

inet **192.168.1.11**/24 brd 192.168.1.255 scope global dynamic noprefixroute wlan0 valid lft 259192sec preferred lft 259192sec

inet6 240e:3b7:3240:c3a0:c401:a445:5002:ccdd/64 scope global dynamic noprefixroute

valid_lft 259192sec preferred_lft 172792sec

inet6 fe80::42f1:6019:a80e:4c31/64 scope link noprefixroute

valid_lft forever preferred_lft forever

5) Use the **ping** command to test the connectivity of the wifi network, and the **ping** command can be interrupted through the shortcut key **Ctrl+C**

orangepi@orangepi:~\$ ping www.orangepi.org -I wlan0

PING www.orangepi.org (182.92.236.130) from 192.168.1.49 wlan0: 56(84) bytes of data.

64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=1 ttl=52 time=43.5 ms 64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=2 ttl=52 time=41.3 ms 64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=3 ttl=52 time=44.9 ms 64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=4 ttl=52 time=45.6 ms 64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=5 ttl=52 time=48.8 ms ^C

--- www.orangepi.org ping statistics ----

5 packets transmitted, 5 received, 0% packet loss, time 4006ms

rtt min/avg/max/mdev = 41.321/44.864/48.834/2.484 ms

3. 6. 2. 2. The server image connects to WIFI in a graphical way

1) First log in to the Linux system, there are the following three ways

- a. If the development board is connected with a network cable, you can remotely log in to the Linux system through ssh
- b. If the development board is connected to the debugging serial port, you can use the serial port terminal to log in to the Linux system (please use MobaXterm for the serial port software, and the minicom cannot display the graphical interface)
- c. If the development board is connected to the HDMI display, you can log in to the Linux system through the HDMI display terminal

2) Then enter the nmtui command in the command line to open the wifi connection interface

orangepi@orangepi:~\$ nmtui

3) Enter the nmtui command to open the interface as shown below

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4) Select Activate a connect and press Enter



5) Then you can see all the searched WIFI hotspots

| Wired * Wired connection 1 | t | <deactivate></deactivate> | |
|-------------------------------|-----------------------------------|---------------------------|---------------|
| orangepi | *** **** **** *** *** | WIFI s | gnal received |
| | *** *** ** ** ** | <back></back> | |

6) Select the WIFI hotspot you want to connect to, then use the Tab key to position the cursor on **Activate** and press Enter

| Wired | t | <activate></activate> | |
|--|-----------------|-----------------------|----------|
| * Wired connection 1 | . 🕌 | ACCIVALE> | |
| | L | | |
| Wi-Fi | G *** 🛛 🕷 | | |
| orangepi | 5G *** **** | | |
| Jrangepi | **** | | |
| Ct als i | **** | | |
| C i c ve | *** | | |
| s 5 1. C | | iFi you want to co | nnect to |
| N T AR 10 | *** | | |
| | *** ** ** | | |
| EVE T | ** 🞆 | | |
| (all all all all all all all all all al | ** 🞆 | | |
| in the second second | ** 1 | <back></back> | |

7) Then a dialog box for entering a password will pop up, enter the corresponding password in **Password** and press Enter to start connecting to WIFI

| ſ | Suicon Labs CP210x US X Wired t t <activate> * Wired connection 1 Wi-Fi Authentication required by wireless network Passwords or encryption keys are required to access the wireless network 'orangepi'. 1. Enter the WiFi password Password Cancel> <ok> 2. Press Enter</ok></activate> |
|---|--|
| | ETWIFI ** J <back></back> |

8) After the WIFI connection is successful, a "*" will be displayed in front of the connected WIFI name

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| [| | | | |
|--|---|--|---------------------------|--|
| Wired * Wired connection | 1 | Ť | <deactivate></deactivate> | |
| Wi-Fi * orangepi 00 77 73 f1 * 15 7 55 | * will be displa connection na 56 | ived in from | nt after the WIFI | |
| A P AR AR KTOP | actical msGG | *** *** ** ** ** ** ** ** | <back></back> | |

9) You can view the IP address of wifi through the ip addr show wlan0 command

orangepi@orangepi:~\$ ip addr show wlan0

11: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000

link/ether 24:8c:d3:aa:76:bb brd ff:ff:ff:ff:ff:ff

inet **192.168.1.11**/24 brd 192.168.1.255 scope global dynamic noprefixroute wlan0 valid_lft 259069sec preferred_lft 259069sec

inet6 240e:3b7:3240:c4a0:c401:a445:5002:ccdd/64 scope global dynamic noprefixroute

valid_lft 259071sec preferred_lft 172671sec

inet6 fe80::42f1:6019:a80e:4c31/64 scope link noprefixroute

valid_lft forever preferred_lft forever

10) Use the **ping** command to test the connectivity of the wifi network, and the **ping** command can be interrupted through the shortcut key **Ctrl+C**

orangepi@orangepi:~\$ ping www.orangepi.org -I wlan0 PING www.orangepi.org (182.92.236.130) from 192.168.1.49 wlan0: 56(84) bytes of data.

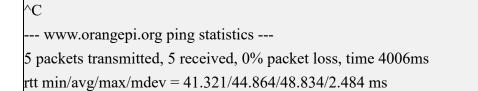
64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=1 ttl=52 time=43.5 ms

64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=2 ttl=52 time=41.3 ms

64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=3 ttl=52 time=44.9 ms

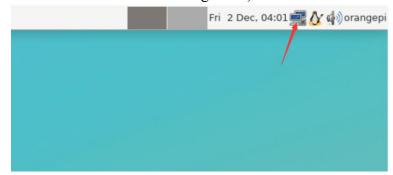
64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=4 ttl=52 time=45.6 ms

64 bytes from 182.92.236.130 (182.92.236.130): icmp_seq=5 ttl=52 time=48.8 ms

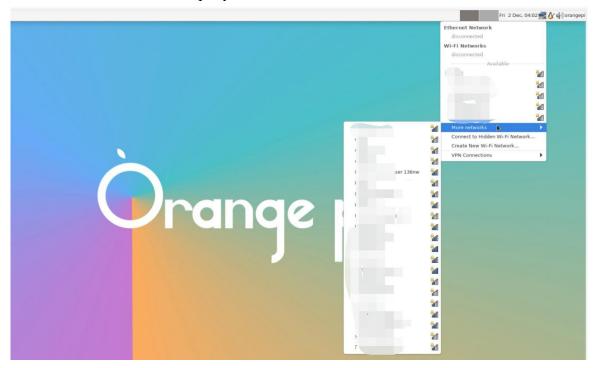


3. 6. 2. 3. Test method of desktop image

1) Click the network configuration icon in the upper right corner of the desktop (please do not connect the network cable when testing WIFI)



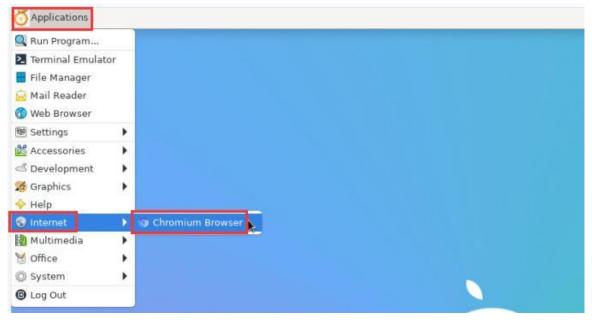
2) Click **More networks** in the pop-up drop-down box to see all scanned WIFI hotspots, and then select the WIFI hotspot you want to connect to.



3) Then enter the password of the WIFI hotspot, and then click **Connect** to start connecting to WIFI



4) After connecting to WIFI, you can open the browser to check whether you can access the Internet. The entrance of the browser is shown in the figure below



5) If you can open other web pages after opening the browser, it means that the WIFI connection is normal



3. 6. 3. How to set a static IP address

Please do not set a static IP address by modifying the /etc/network/interfaces configuration file.

3. 6. 3. 1. Use the nmtui command to set a static IP address

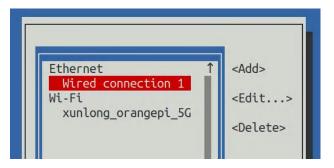
1) First run the **nmtui** command

orangepi@orangepi:~\$ nmtui

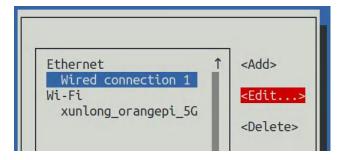
2) Then select Edit a connection and press Enter

| Net | workManager TUI 🔶 |
|--------|------------------------------------|
| Please | e select an option |
| Edit a | a connection |
| | ate a connection ystem hostname |
| Quit | |
| | <0K> |

3) Then select the network interface that needs to set a static IP address, for example, to set the static IP address of the **Ethernet** interface, select **Wired connection 1**.



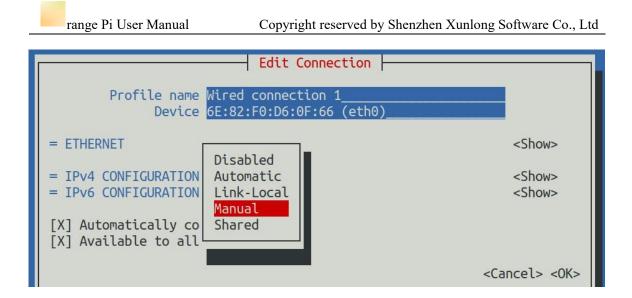
4) Then select **Edit** with the **Tab** key and press the Enter key



5) Then use the Tab key to move the cursor to the **<Automatic>** position shown in the figure below to configure IPv4

| Edit Connection |] |
|--|---------------------------------|
| Profile name Wired connection 1 Device 6E:82:F0:D6:0F:66 (eth0) | |
| = ETHERNET | <show></show> |
| <pre>= IPv4 CONFIGURATION <automatic> = IPv6 CONFIGURATION <automatic></automatic></automatic></pre> | <show> <show></show></show> |
| [X] Automatically connect [X] Available to all users | |
| | <cancel> <ok></ok></cancel> |

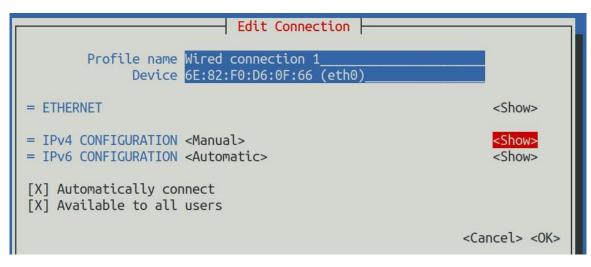
6) Then press Enter, select **Manual** with the up and down arrow keys, and press Enter to confirm



7) The display after selection is shown in the figure below

| Edit Connection | |
|---|---------------------------------|
| Profile name Wired connection 1 Device 6E:82:F0:D6:0F:66 (eth0) | |
| = ETHERNET | <show></show> |
| <pre>= IPv4 CONFIGURATION < Manual> = IPv6 CONFIGURATION < Automatic></pre> | <show> <show></show></show> |
| [X] Automatically connect [X] Available to all users | |
| | <cancel> <ok></ok></cancel> |

8) Then move the cursor to the **<Show>**



9) Then press Enter, the following setting interface will pop up after entering

| Edit Connection | |
|--|-----------------------------|
| Profile name Wired connection 1 Device 6E:82:F0:D6:0F:66 (eth0) | |
| = ETHERNET | <show></show> |
| <pre>= IPv4 CONFIGURATION <manual> Addresses <add> Gateway DNS servers <add> Search domains <add> Deutipe (Ne sustem coutes) </add></add></add></manual></pre> | <hide></hide> |
| Routing (No custom routes) <edit> [] Never use this network for default route [] Ignore automatically obtained routes [] Ignore automatically obtained DNS parameters</edit> | |
| [] Require IPv4 addressing for this connection | |
| = IPv6 CONFIGURATION <automatic></automatic> | <show></show> |
| <pre>[X] Automatically connect [X] Available to all users</pre> | |
| | <cancel> <ok></ok></cancel> |

10) Then you can set the IP address (Addresses), gateway (Gateway) and DNS server address in the position shown in the figure below (there are many other setting options in it, please explore by yourself), Please set it according to your specific needs, the value set in the figure below is just an example

| Edit Connection | |
|--|---------------|
| Profile name Wired connection 1 Device eth0 (86:F2:85:2C:81:CE) | |
| = ETHERNET | <show></show> |
| = IPv4 CONEIGURATION < Manual> | <hide></hide> |
| Addresses 192.168.1.177/24 <remove></remove> | |
| Gateway 192.168.1.1 DNS servers 8.8.8.8 <remove></remove> | |
| <add> Search domains <add></add></add> | |

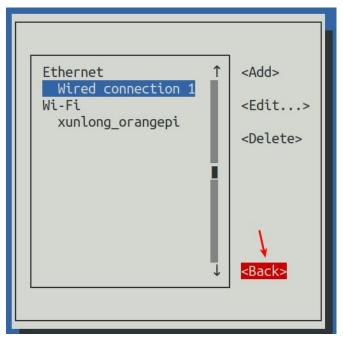
11) After setting, move the cursor to **<OK>** in the lower right corner, and press Enter to



confirm

| = IPv6 CONFIGURATION <automatic></automatic> | <show></show> |
|---|--|
| <pre>[X] Automatically connect [X] Available to all users</pre> | |
| | <cancel> <mark><ok></ok></mark></cancel> |

12) Then click**<Back>** to return to the previous selection interface



13) Then select **Activate a connection**, then move the cursor to **<OK>**, and finally click Enter

| NetworkManager TUI |
|-------------------------|
| Please select an option |
| Edit a connection |
| Set system hostname |
| Quit |
| <0K> |
| |

14) Then select the network interface that needs to be set, such as **Wired connection 1**, then move the cursor to**<Deactivate>**, and press Enter to disable **Wired connection 1**

| Wired 1 * Wired connection 1 | <deactivate></deactivate> |
|---------------------------------|---------------------------|
| Wi-Fi * xunlong_orangepi | |

15) Then please do not move the cursor, and then press the Enter key to re-enable **Wired connection 1**, so that the static IP address set earlier will take effect

| Wired Wired connection 1 | ↑ <mark><activate></activate></mark> |
|-----------------------------|--------------------------------------|
| Wi-Fi * xunlong_orangepi | |

16) Then you can exit nmtui through the **Back** and **Quit** buttons

```
range Pi User Manual Copyright reserved by Shenzhen Xunlong Software Co., Ltd
```

17) Then through **ip addr show eth0**, you can see that the IP address of the network port has changed to the static IP address set earlier

orangepi@orangepi:~\$ ip addr show eth0

3: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000

link/ether 5e:ac:14:a5:92:b3 brd ff:ff:ff:ff:ff:ff

inet 192.168.1.177/24 brd 192.168.1.255 scope global noprefixroute eth0

valid_lft forever preferred_lft forever

inet6 241e:3b8:3240:c3a0:e269:8305:dc08:135e/64 scope global dynamic noprefixroute

valid_lft 259149sec preferred_lft 172749sec

inet6 fe80::957d:bbbe:4928:3604/64 scope link noprefixroute

valid_lft forever preferred_lft forever

18) Then you can test the connectivity of the network to check whether the IP address is configured OK, and the **ping** command can be interrupted through the shortcut key **Ctrl+C**

```
orangepi@orangepi:~$ ping 192.168.1.47 -I eth0
PING 192.168.1.47 (192.168.1.47) from 192.168.1.188 eth0: 56(84) bytes of data.
64 bytes from 192.168.1.47: icmp_seq=1 ttl=64 time=0.233 ms
64 bytes from 192.168.1.47: icmp_seq=2 ttl=64 time=0.263 ms
64 bytes from 192.168.1.47: icmp_seq=3 ttl=64 time=0.273 ms
64 bytes from 192.168.1.47: icmp_seq=4 ttl=64 time=0.269 ms
64 bytes from 192.168.1.47: icmp_seq=5 ttl=64 time=0.275 ms
```

 C

--- 192.168.1.47 ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 4042ms rtt min/avg/max/mdev = 0.233/0.262/0.275/0.015 ms

3. 6. 3. 2. Use the nmcli command to set a static IP address

1) If you want to set the static IP address of the network port, please insert the network cable into the development board first. If you need to set the static IP address of WIFI, please connect the WIFI first, and then start to set the static IP address

2) Then use the **nmcli con show** command to view the name of the network device, as shown below

- a. **orangepi** is the name of the WIFI network interface (the names are not necessarily the same)
- b. Wired connection 1 is the name of the Ethernet interface

| orangepi@orangepi:~\$ nmcli con show | | | | |
|--------------------------------------|--------------------------------------|----------|--------|--|
| NAME | UUID | TYPE | DEVICE | |
| orangepi | cfc4f922-ae48-46f1-84e1-2f19e9ec5e2a | wifi | wlan0 | |
| Wired connection 1 | 9db058b7-7701-37b8-9411-efc2ae8bfa30 | ethernet | eth0 | |

3) Then enter the following command, where

a. "Wired connection 1" means to set the static IP address of the Ethernet port. If you need to set the static IP address of the WIFI, please change it to the corresponding name of the WIFI network interface (you can get it through the **nmcli** con show command)

b. After **ipv4.addresse** is the static IP address to be set, which can be modified to the value you want to set

c. **ipv4.gateway** indicates the address of the gateway

orangepi@orangepi:~\$ nmcli con mod "Wired connection 1" \ ipv4.addresses "192.168.1.110" \ ipv4.gateway "192.168.1.1" \ ipv4.dns "8.8.8.8" \ ipv4.method "manual"

4) Then restart the Linux system

orangepi@orangepi:~\$ sudo reboot

5) Then re-enter the Linux system and use the **ip addr show eth0** command to see that the IP address has been set to the desired value

orangepi@orangepi:~\$ ip addr show eth0

3: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000

link/ether 5e:ae:14:a5:91:b3 brd ff:ff:ff:ff:ff:ff

inet 192.168.1.110/32 brd 192.168.1.110 scope global noprefixroute eth0

valid_lft forever preferred_lft forever

inet6 240e:3b7:3240:c3a0:97de:1d01:b290:fe3a/64 scope global dynamic noprefixroute

1:1.16.250102

valid_lft 259183sec preferred_lft 172783sec

inet6 fe80::3312:861a:a589:d3c/64 scope link noprefixroute

valid_lft forever preferred_lft forever

3. 6. 4. Method to create WIFI hotspot through create_ap

create_ap is a script that helps quickly create WIFI hotspots on Linux, and supports bridge and NAT modes. It can automatically combine hostapd, dnsmasq and iptables to complete the setting of WIFI hotspots, avoiding users from making complicated configurations. The github address is as follows:

https://github.com/oblique/create_ap

If you are using the latest image, the create_ap script has been pre-installed. You can create a WIFI hotspot through the create_ap command. The basic command format of create_ap is as follows:

create_ap [options] <wifi-interface> [<interface-with-internet>] [<access-point-name> [<passphrase>]]

* options: You can use this parameter to specify the encryption method, frequency band of WIFI hotspot, bandwidth mode, network sharing method, etc. You can get the options through create_ap -h.

* wifi-interface: The name of the wireless network card

* interface-with-internet: The name of the network card that can connect to the

Internet, usually eth0

* access-point-name: Hotspot name

* passphrase: hotspot password

3. 6. 4. 1. create_ap method to create WIFI hotspot in NAT mode

1) Enter the following command to create a WIFI hotspot with the name **orangepi** and password **orangepi** in NAT mode

Note that in the following command, Debian12 needs to modify eth0 to end1.

orangepi@orangepi:~\$ sudo create_ap --no-virt -m nat wlan0 eth0 orangepi orangepi

2) If the following information is output, it means that the WIFI hotspot is successfully created.

orangepi@orangepi:~\$ sudo create_ap --no-virt -m nat wlan0 eth0 orangepi orangepi Config dir: /tmp/create_ap.wlan0.conf.Ji9Coeqo PID: 5526 Network Manager found, set wlan0 as unmanaged device... DONE Sharing Internet using method: nat hostapd command-line interface: hostapd_cli -p /tmp/create_ap.wlan0.conf.Ji9Coeqo/hostapd_ctrl wlan0: interface state UNINITIALIZED->ENABLED wlan0: AP-ENABLED

3) At this time, take out your mobile phone and find the WIFI hotspot named **orangepi** created by the development board in the searched WIFI list. Then you can click **orangepi** to connect to the hotspot. The password is **orangepi** set above



4) The display after successful connection is as shown below



5) In NAT mode, the wireless device connected to the development board's hotspot requests an IP address from the development board's DHCP service, so there will be two different network segments. For example, the development board's IP here is 192.168.1.X

```
orangepi@orangepi:~$ ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.1.150 netmask 255.255.255.0 broadcast 192.168.1.255
inet6 fe80::938f:8776:5783:afa2 prefixlen 64 scopeid 0x20<link>
ether 4a:a0:c8:25:42:82 txqueuelen 1000 (Ethernet)
RX packets 25370 bytes 2709590 (2.7 MB)
RX errors 0 dropped 50 overruns 0 frame 0
TX packets 3798 bytes 1519493 (1.5 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
device interrupt 83
```

The DHCP service of the development board will assign the IP address of **192.168.12.0/24** to the device connected to the hotspot by default. At this time, click on the connected WIFI hotspot **orangepi**, and then you can see that the IP address of the mobile phone is **192.168.12.X**



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| IPV4 地址 | |
|---------|----------------|
| 配置IP | 自动 > |
| IP地址 | 192.168.12.249 |
| 子网掩码 | 255.255.255.0 |
| 路由器 | 192.168.12.1 |

6) If you want to specify a different network segment for the connected device, you can specify it through the -g parameter. For example, use the -g parameter to specify the network segment of the access point AP as 192.168.2.1.

| Note that in the following command, Debian12 needs to modify eth0 to end1. |
|--|
| orangepi@orangepi:~\$ sudo create_apno-virt -m nat wlan0 eth0 orangepi orangepi -g 192.168.2.1 |

At this time, after connecting to the hotspot through the mobile phone, click on the connected WIFI hotspot **orangepi**, and then you can see that the IP address of the mobile phone is **192.168.2.X**



7) Without specifying the --freq-band parameter, the hotspot created by default is in the
2.4G frequency band. If you want to create a hotspot in the 5G frequency band, you can specify it through the --freq-band 5 parameter. The specific command is as follows

Note that in the following command, Debian12 needs to modify eth0 to end1.

orangepi@orangepi:~\$ sudo create_ap --no-virt -m nat wlan0 eth0 orangepi orangepi --freq-band 5

8) If you need to hide the SSID, you can specify the **--hidden** parameter. The specific command is as follows

| Note that in the following comman | d, Debian12 needs to modify eth0 to end1. |
|--|---|
| orangepi@orangepi:~\$ sudo create_apno-v | irt -m nat wlan0 eth0 orangepi orangepihidden |

At this time, the mobile phone cannot search for WIFI hotspots. You need to manually specify the WIFI hotspot name and enter the password to connect to the WIFI hotspot.

| | 输入网络信息 | |
|-----|----------|-------|
| 取消 | 其他网络 | 加入 |
| 名称 | orangepi | |
| 安全性 | ŧ | WPA > |
| 密码 | | |

3. 6. 4. 2. create_ap method to create WIFI hotspot in bridge mode

1) Enter the following command to create a WIFI hotspot with the name **orangepi** and password **orangepi** in bridge mode

Note that in the following command, Debian12 needs to modify eth0 to end1. orangepi@orangepi:~\$ sudo create_ap --no-virt -m bridge wlan0 eth0 orangepi orangepi

2) If the following information is output, it means that the WIFI hotspot is successfully created.

orangepi@orangepi:~\$ sudo create_ap --no-virt -m bridge wlan0 eth0 orangepi orangepi [sudo] password for orangepi:

Config dir: /tmp/create_ap.wlan0.conf.hXrfLdof

| PID: 8372 |
|---|
| Network Manager found, set wlan0 as unmanaged device DONE |
| Sharing Internet using method: bridge |
| Create a bridge interface br0 created. |
| hostapd command-line interface: hostapd_cli -p |
| /tmp/create_ap.wlan0.conf.hXrfLdof/hostapd_ctrl |
| wlan0: interface state UNINITIALIZED->ENABLED |

3) At this time, take out your mobile phone and find the WIFI hotspot named **orangepi** created by the development board in the searched WIFI list. Then you can click **orangepi** to connect to the hotspot. The password is **orangepi** set above.



4) The display after successful connection is as shown below



5) In bridge mode, the wireless device connected to the hotspot of the development board also requests an IP address from the DHCP service of the main router (the router to which the development board is connected). For example, the IP of the development board here is **192.168.1.X**

| orangepi@orangepi:~\$ ifconfig eth0 | | | | |
|---|-----------------------|-----------|---------------|--|
| eth0: flags=4163 <up,broad< td=""><td>CAST,RUNNING,MULT</td><td>TICAST></td><td>mtu 1500</td><td></td></up,broad<> | CAST,RUNNING,MULT | TICAST> | mtu 1500 | |
| inet 192.168.1.150 | netmask 255.255.255.0 | broadcast | 192.168.1.255 | |

inet6 fe80::938f:8776:5783:afa2 prefixlen 64 scopeid 0x20<link>
ether 4a:a0:c8:25:42:82 txqueuelen 1000 (Ethernet)
RX packets 25370 bytes 2709590 (2.7 MB)
RX errors 0 dropped 50 overruns 0 frame 0
TX packets 3798 bytes 1519493 (1.5 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
device interrupt 83

The IP of the device connected to the WIFI hotspot is also assigned by the main router, so the mobile phone connected to the WIFI hotspot and the development board are in the same network segment. At this time, click on the connected WIFI hotspot **orangepi**, and then you can see the IP address of the mobile phone. Also **192.168.1.X**.

| く设置 | 无线局域 | 网编辑 |
|----------|------|---------------|
| 无线局 | j域网 | |
| 🗸 orange | epi | ê 🗢 🚺 |
| IPV4地址 | | |
| 配置IP | | 自动 > |
| IP地址 | | 192.168.1.161 |
| 子网掩码 | | 255.255.255.0 |
| 路由器 | | 192.168.1.1 |

6) Without specifying the --freq-band parameter, the hotspot created by default is in the 2.4G frequency band. If you want to create a hotspot in the 5G frequency band, you can specify it through the --freq-band 5 parameter. The specific command is as follows

Note that in the following command, Debian12 needs to modify eth0 to end1.

orangepi@orangepi:~\$ sudo create_ap --no-virt -m bridge wlan0 eth0 orangepi orangepi --freq-band 5

7) If you need to hide the SSID, you can specify the **--hidden** parameter. The specific command is as follows

Note that in the following command, Debian12 needs to modify eth0 to end1.

| range | Pi | User | Manual | |
|-------|----|------|--------|--|
|-------|----|------|--------|--|

orangepi@orangepi:~\$ sudo create_ap --no-virt -m bridge wlan0 eth0 orangepi orangepi --hidden

At this time, the mobile phone cannot search for WIFI hotspots. You need to manually specify the WIFI hotspot name and enter the password to connect to the WIFI hotspot.

| | 输入网络信息 | |
|-------|----------|-------|
| 取消 | 其他网络 | 加入 |
| 名称 | orangepi | |
| | | |
| 安全的密码 | Æ | WPA > |
| | | |

3.7. SSH remote login development board;

Linux systems enable ssh remote login by default and allow the root user to log in to the system. Before logging in with ssh, you first need to ensure that the Ethernet or wifi network is connected, and then use the ip addr command or check the router to obtain the IP address of the development board.

3. 7. 1. SSH remote login development board under Ubuntu

1) Obtain the IP address of the development board

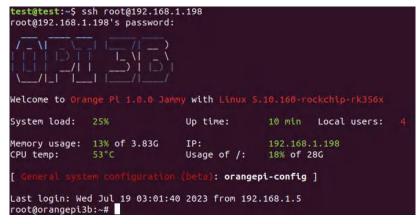
2) Then you can remotely log in to the Linux system through the ssh command

| test@test:~\$ ssh root@192.168.1.xxx | (Need to be replaced with the IP address |
|--------------------------------------|---|
| of the development board) | |
| root@192.168.1.xx's password: | (Enter the password here, the default password is |
| orangepi) | |

Note that when entering the password, the specific content of the entered password will not be displayed on the screen, please do not think that there is any fault, just press Enter after inputting.

If you are prompted to refuse the connection, as long as you are using the image provided by Orange Pi, please do not suspect that the password orangepi is wrong, but look for other reasons.

3) After successfully logging in to the system, the display is as shown in the figure below



If ssh cannot log in to the Linux system normally, please first check whether the IP address of the development board can be pinged. If the ping is ok, you can log in to the Linux system through the serial port or HDMI display and then enter the following command on the development board and try again. Is it possible to connect:

root@orangepi:~# reset_ssh.sh

If it still doesn't work, try to reset the system.

3. 7. 2. SSH remote login development board under Windows

1) First obtain the IP address of the development board

2) Under Windows, you can use MobaXterm to remotely log in to the development board, first create a new ssh session

- a. Open Session
- b. Then select SSH in Session Setting
- c. Then enter the IP address of the development board in the Remote host

d. Then enter the user name root or orangepi of the Linux system in Specify username

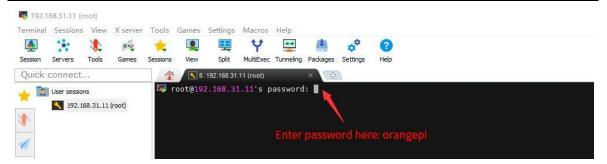
e. Finally click OK

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| C Mobalterm | - 0 | × |
|--|----------|------|
| Terminal Sessions View X server Tools Games Settings Macros Help | 0.55 | |
| 🖲 決 🐮 🕫 💺 明 🦉 Y 🚍 👛 🔗 🕢 | X | O |
| Sensor Tradis Games Sessions View Spit HuldExec Turneling Rodages Settings Hills | X server | Exit |
| Quick convert | | |
| Select serial port SSH | | \$ |
| 1. Choose Session X | | |
| | | |
| SSH Tahet Roh Xdmcp RCP VIC FTP SFTP Serial File Shell Browser Moth Avs S3 WSL | | |
| | | |
| SSH Teffer Ruh Zöncp RDP V/hC FTP SFTP Serial File Stell Broker Moth Avs S3 WSL | | |
| | | |
| Remote host * 192 164 1.36 🛛 😰 Specify username (*default) 🖉 Put 122 🛊 | | |
| | | |
| 🖾 Advanced SSH settings 👘 Network settings 🔶 Bellemark settings | | |
| | | |
| 3. Enter the IP address of the development board 4. Enter the username of the Linux system, Orangepi or root | | |
| | | |
| | | |
| Secure Shell (SSH) session | | |
| | | |
| 5. Finally click OK | | |
| | | |
| | | |
| O OK O Cancel | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

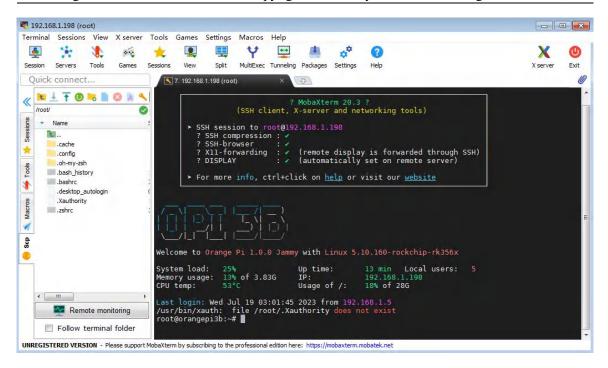
3) Then you will be prompted to enter a password. The default passwords for root and orangepi users are orangepi

Note that when entering the password, the specific content of the entered password will not be displayed on the screen, please do not think that there is any fault, just press Enter after inputting.



4) After successfully logging in to the system, the display is as shown in the figure below

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3.8. The method of uploading files to the Linux system of the development board

3. 8. 1. How to upload files to the development board Linux system in Ubuntu PC

3. 8. 1. 1. How to upload files using the scp command

1) Use the scp command to upload files from the Ubuntu PC to the Linux system of the development board. The specific commands are as follows

a. file_path: need to be replaced with the path of the file to be uploaded

b. **orangepi**: It is the user name of the Linux system of the development board, and it can also be replaced with other ones, such as root

c. **192.168.xx.xx**: It is the IP address of the development board, please modify it according to the actual situation

d. /home/orangepi: The path in the Linux system of the development board, which can also be modified to other paths

test@test:~\$ scp file_path orangepi@192.168.xx.xx:/home/orangepi/

2) If you want to upload a folder, you need to add the -r parameter

| range Pi User Manual | range | Pi | User | Manual | |
|----------------------|-------|----|------|--------|--|
|----------------------|-------|----|------|--------|--|

test@test:~\$ scp -r dir_path orangepi@192.168.xx.xx:/home/orangepi/

3) There are more usages of scp, please use the following command to view the man manual

test@test:~\$ man scp

3. 8. 1. 2. How to upload files using filezilla

1) First install filezilla in Ubuntu PC

test@test:~\$ sudo apt install -y filezilla

2) Then use the following command to open filezilla

test@test:~\$ filezilla

3) The interface after filezilla is opened is as follows, and the display under the remote site on the right is empty

| | | | File | Zilla | | | - • × |
|--------------------------|--------------------|-------------|------|-------|-----------|---------|------------|
| 文件(F) 编辑(E) 查 | ፻看(∨) 传输(T) 服务器(S) | 书签(B) 帮助(H) | | | | | |
| # • RT | |) 🕵 🦆 🎩 🎗 🧕 | * | | | | |
| 主机(H): | 用户名(U): | 密码(w): | 端 | ⊐(P): | 快速连接(Q) ▼ | | |
| | | | | | | | |
| 本地站点: / | | | ~ | 远程站点: | | | ~ |
| > bin > boot cdrom | | | | | | | |
| 文件名 ^ | 文件大小 文件类型 | 最近修改 | | | | | |
| 📒 lib32 | 目录 | 2022年11月06… | | 1 | | | |
| 📒 lib64 | 目录 | 2022年08月09… | | | | | |
| 📒 libx32 | 目录 | 2022年11月06… | | 245 | | | cc + + 1/2 |
| lost+found | 目录 | 2022年11月05… | | 文件名 ^ | 文件大小 文件类型 | 最近修改 权限 | 所有者/组 |
| 📒 media | 目录 | 2022年12月03… | | | | | |
| 📒 mnt | 目录 | 2022年08月09… | | | 没有连接到任 | 何服务器 | |
| <mark>e</mark> opt | 目录 | 2022年11月06… | | | | | |
| proc | 目录 | 2022年12月03… | | | | | |
| i root | 目录 | 2022年12月03… | | | | | |
| in run | 目录 | 2022年12月03… | | | | | |
| 1个文件和26个日录 | | | | 未连接。 | | | |
| 服务器/本地文件 | 方向 远程文件 | 大小 优先级 | 状态 | X | | | |
| 列队的文件 传输失 | 败 成功的传输 | | | | | | |
| | | | | | | 이 지하· 호 | • • //. |

4) The method of connecting the development board is shown in the figure below

| | Password: orangepi 5, Click Quick Connect | - 🗆 X |
|--|---|-------|
| 文件(F) 编辑(E) 查看(V) 传输(T) 服务器(S) 书签(B) 帮助(H) | J. J. GICK GUICK CONNECT | |
| # · • • • • • • • • • • • • • • • • | . A ≥ & | |
| 主机(H): 192.168.1.100 用户名(U): root 密码(W): | 端口(P): 22 快速连接(Q) 🔻 | |
| | | |
| 1.IP address 2.Username | 4.Port number 22 | |

5) Then choose to save the password, and then click OK

| 记住的 | 密码? | × |
|----------------------------|----------------|---------|
| 您想让 FileZilla 记住密码吗? | | |
| 如果允许 FileZilla 记住密码,重启 Fil | eZilla 后重新连接无需 | 再次输入密码。 |
| ●保存密码(E) | | |
| ○ 不要保存密码(O) | | |
| ○保存主密码保护的密码(V) | | |
| 主密码(M): | | |
| 再次输入密码(R): | | |
| 主密码一旦丢失无法恢复!请牢证 | 您的密码。 | |
| | 取消 | 确定(O) |

6) Then choose to always trust this host, and then click OK



7) After the connection is successful, you can see the directory structure of the development board Linux file system on the right side of the filezilla software

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| | | | | | sftp:// | root@ | 192.168. | .31.11 - Fi | leZilla | а | | | | | - | |
|---|-----------|---|--|--|--|-------|----------|---|---------|-----|---------------|----------------------------------|---|--|---|----------------------|
| 文件(F) 编辑(E) 查看 | (V) 传输(T) | 服务器(S) | 书签(B) | 帮助(H |) | | | | | | | | | | | |
| | | | 0 Jx | 2 | EQ | • | 8 | | | | | | | | | |
| 主机(H): tp://192.168.3 | 31.11 用户名 | (U): root | | 密码(W) | : | | 端口(P | P): | | 快速连 | 接(Q) | • | | | | |
| 态: Connected to 19 法: 读取目录列表 法: Listing directory 法: 列出"/root"的目 | /root | | | | | | | | | | | | | | | |
| 本地站点: / | | | | | | | ~ iž | 元程站点: | /1001 | t | | | | | | - |
| 2 -1 | | | | | | | | ✓ 2 / > □ r | oot | | | | | | | |
| 文件名 へ | | 文件类型 1录 | 202 | 近修改 22年11月0 22年08月0 | | | | | oot | | | | | | | |
| C件名 へ Lib32 Lib64 Libx32 | E | 录 录 录 | 202 202 202 | 22年11月0 22年08月0 22年11月0 |)9)6 | | | > <mark>=</mark> r | oot | | 文件★小 | ☆ 仕**刑 | 易沂修改 | 权限 | 所右去 | /28 |
| 件名 へ lib32 lib64 libx32 lost+found | | 录 录 录 录 | 202 202 202 202 | 22年11月0 22年08月0 22年11月0 22年11月0 |)9)6)5 | | | > ■ r | oot | : | 文件大小 | 文件类型 | 最近修改 | 权限 | 所有者 | /组 |
| 件名 へ lib32 lib64 libx32 lost+found media | E | 录 1录 1录 1录 1录 | 202 202 202 202 202 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 |)9)6)5)3 | | | > ■ r | oot | | 文件大小 | | | | | |
| r件名 へ lib32 lib64 libx32 lost+found media mnt | | 录 录 录 录 录 录 录 | 202 202 202 202 202 202 202 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 22年12月0 22年08月0 |)9)6)5)3 | | 3 | > ■ r 文件名 ▲ | oot | : | 文件大小 | 目录 | 2022年12月… | drwx | root ro | ot |
| (件名 へ Lib32 Lib64 Lib532 Lost+found media mnt opt | | 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 | 200 200 200 200 200 200 200 200 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 22年12月0 22年08月0 22年11月0 |)9)6)5)3)9 | | 3 | > ■ r 文件名 ▲ .cache .config | | | 文件大小 | 目录 目录 | 2022年12月… 2022年12月… | drwx drwxr-xr-x | root ro root ro | ot ot |
| 次件名 へ Lib32 Lib54 Lib54 Libx32 Lost+found media mnt opt proc | | 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 录 | 200 200 200 200 200 200 200 200 200 200 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 22年08月0 22年11月0 22年12月0 22年12月0 |)9)5)3)9)6)3 | | | > ■ r 文件名 ▲ .cache .config .oh-my-z | | : | 文件大小 | 目录 目录 目录 | 2022年12月… 2022年12月… 2022年12月… | drwx drwxr-xr-x drwxr-xr-x | root ro root ro root ro | ot ot ot |
| 2件名 へ lib32 lib64 libx32 lost+found media mnt opt proc root | | 录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录录 | 200 200 200 200 200 200 200 200 200 200 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 22年12月0 22年11月0 22年12月0 22年12月0 22年12月0 |)9)5)3)9)6)3 | | | > ■ r 文件名 ▲ .cache .config .oh-my-z .pip | zsh | | | 目录 目录 目录 目录 | 2022年12月··· 2022年12月··· 2022年12月··· 2022年12月··· | drwx drwxr-xr-x drwxr-xr-x drwxr-xr-x | root ro root ro root ro root ro | ot ot ot |
| 文件名 へ Lib32 Lib64 Lib532 Lost+found media mnt opt proc root run | | 큧큧큧큧큟큟큟큟큟큟큟 | 200 200 200 200 200 200 200 200 200 200 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 22年12月0 22年12月0 22年12月0 22年12月0 22年12月0 |)9)5)3)9)9)6)3)3)3 | | | 文件名 ▲ .cache .config .oh-my-z .pip .Xautho | rity | | 55 B | 目录 目录 目录 目录 文件 | 2022年12月··· 2022年12月··· 2022年12月··· 2022年12月··· 2022年12月··· | drwx drwxr-xr-x drwxr-xr-x drwxr-xr-x | root ro root ro root ro root ro root ro | ot ot ot ot |
| libx32 lost+found media mnt | | 录录录录录录录录录录录录 录录录录录录录录录录录 | 200 200 200 200 200 200 200 200 200 200 | 22年11月0 22年08月0 22年11月0 22年11月0 22年12月0 22年12月0 22年11月0 22年12月0 22年12月0 22年12月0 |)9)5)3)9)9)6)3)3)3 | | | > ■ r 文件名 ▲ .cache .config .oh-my-z .pip | rity | | 55 B 793 B | 目录 目录 目录 目录 文件 文件 | 2022年12月··· 2022年12月··· 2022年12月··· 2022年12月··· | drwx drwxr-xr-x drwxr-xr-x drwxr-xr-x | root ro root ro root ro root ro | ot ot ot ot |

8) Then select the path to be uploaded to the development board on the right side of the filezilla software, and then select the file to be uploaded on the Ubuntu PC on the left side of the filezilla software, then click the right mouse button, and then click the upload option to start uploading the file to the development board.

| 文件(F) 编辑(E) 查看(V) 传输 | | sicp.//100 | t@192.1 | 68.31.11 - Fi | eZilla | | | | - 0 |
|---|---|----------------|---------|--|------------------------------------|---|----------------|---|----------------------------------|
| | 俞(T) 服务器(S) 书签(B) 表 | 帮助(H) | | | | | | | |
| H - E T T # | : O 🕸 O 🗽 | I E Q I | * * | | | | | | |
| 主机(H): tp://192.168.31.11 月 | 用户名(U): root 密 | 码(w): •••••• | 端口 |](P): | 快速进 | 连接(Q) ▼ | | | |
| 状态: 列出"/home"的目录成功 状态: 读取"/home/orangepi"的 状态: Listing directory /home/o 状态: 列出"/home/orangepi"的 | orangepi | | | | | | | | |
| 本地站点: /home/test/Downloa | ds/test/ | | - | 远程站点: | /home/ora | ngepi | | | |
| Music > Pictures Public Templates Videos > VirtualBox VMs bin 文件名 へ 文件大 | 大小 文件类型 最近所 | ⁸ 改 | | 文件名 ^ | orangepi ? .cache ? .cinnamo | 文件大小 文 | | 最近修改权限 | 所有者/组 |
| | | ≡12月03… | | .bashrc .profile | | 3.6 KB 文 807 B 文 | 件 | 2022年12月··· -rw-rr 2022年12月··· -rw-rr | orangepi orangepi |
| | 上传(U) | - 12/J 03 | | viminfo | | SEVD T | - 41+ | 2022年12日 5世 | orangoni |
| | 上传(U) | -12/-]03 | | .viminfo | | 3.5 KB 文 20 B 文 | | 2022年12月··· -rw 2022年12月··· -rw-rw-r | orangepi orangepi |
| | 上传(U) 添加文件到队列(A) | - 12/3 03*** | | .xscreen | saver n-errors | 20 B 文 7.6 KB 文 | :件 :件 | 2022年12月··· -rw-rw-r 2022年12月··· -rw | orangepi orangepi |
| | 上传(U) 添加文件到队列(A) 打开(Q) | - 12/303*** | | .xscreen | saver n-errors | 20 B 文 7.6 KB 文 7.7 KB ol | 件 件 d-文件 | 2022年12月···· -rw-rw-r 2022年12月···· -rw 2022年12月···· -rw | orangepi orangepi orangepi |
| nomachine_8.2.3_3 | 上传(U) 添加文件到队列(A) 打开(Q) 编辑(E) | -12/3 03** | | .xscreen .xsessio .xsessio .zshrc | saver n-errors n-errors | 20 B 文 7.6 KB 文 | 件 件 d-文件 | 2022年12月··· -rw-rw-r 2022年12月··· -rw | orangepi orangepi |
| nomachine_8.2.3_3 洗怪了 1 个文件。大小总井: 0 B | 上传(U) 添加文件到队列(A) 打开(Q) 编辑(E) 创建目录(<u>C</u>) | 大小 优先线 | 及 状态 | .xscreen .xsessio .xsessio .zshrc | saver n-errors n-errors | 20 B 文 7.6 KB 文 7.7 KB ol 4.0 KB 文 | 件 件 d-文件 | 2022年12月···· -rw-rw-r 2022年12月···· -rw 2022年12月···· -rw | orangepi orangepi orangepi |
| nomachine_8.2.3_3 洗怪了 1 个文件。大小总井: 0 B | 上传(U) 添加文件到队列(A) 打开(Q) 编辑(E) | | 及 状态 | .xscreen .xsessio .xsessio .zshrc | saver n-errors n-errors | 20 B 文 7.6 KB 文 7.7 KB ol 4.0 KB 文 | 件 件 d-文件 | 2022年12月···· -rw-rw-r 2022年12月···· -rw 2022年12月···· -rw | orangepi orangepi orangepi |
| nomachine_8.2.3_3 洗怪了 1 个文件。大小总井: 0 B | 上传(U) 添加文件到队列(A) 打开(Q) 编辑(E) 创建目录(C) 创建目录并进入(Y) | | 發 状态 | .xscreen .xsessio .xsessio .zshrc | saver n-errors n-errors | 20 B 文 7.6 KB 文 7.7 KB ol 4.0 KB 文 | 件 件 d-文件 | 2022年12月···· -rw-rw-r 2022年12月···· -rw 2022年12月···· -rw | orangepi orangepi orangepi |

9) After the upload is complete, you can go to the corresponding path in the Linux system

of the development board to view the uploaded file

10) The method of uploading a folder is the same as that of uploading a file, so I won't go into details here

3. 8. 2. The method of uploading files from Windows PC to the Linux system of the development board

3. 8. 2. 1. How to upload files using filezilla

1) First download the installation file of the Windows version of the filezilla software, the download link is as follows

https://filezilla-project.org/download.php?type=client



| | FileZilla | FileZilla with manual | FileZilla Pro | FileZilla Pro + CLI |
|-------------------------------------|-----------|--------------------------|---------------|------------------------|
| Standard FTP | Yes | Yes | Yes | Yes |
| FTP over TLS | Yes | Yes | Yes | Yes |
| SFTP | Yes | Yes | Yes | Yes |
| Comprehensive PDF manual | - | Yes | Yes | Yes |
| Amazon S3 | - | - | Yes | Yes |
| Backblaze B2 | - | - | Yes | Yes |
| Dropbox | - | - | Yes | Yes |
| Microsoft OneDrive | - | - | Yes | Yes |
| Google Drive | - | - | Yes | Yes |
| Google Cloud Storage | - | - | Yes | Yes |
| Microsoft Azure Blob + File Storage | - | - | Yes | Yes |
| WebDAV | - | - | Yes | Yes |
| OpenStack Swift | - | - | Yes | Yes |
| Box | - | - | Yes | Yes |
| Site Manager synchronization | - | - | Yes | Yes |
| Command-line interface | - | - | - | Yes |
| Batch transfers | - | - | - | Yes |
| | Download | Select | Select | Select |

2) The downloaded installation package is as follows, and then double-click to install directly

FileZilla_Server_1.5.1_win64-setup.exe

During the installation process, please select **Decline** on the following installation interface, and then select **Next>**



3) The interface after filezilla is opened is as follows, and the display under the remote site on the right is empty

| | | | | - | | | | | | |
|--|--------------------|---------|--------------|--------|---------|---|------|----|-------|---|
| E切(H): | 用户名(U): | 密码(W): | | 発□(P): | 快速连接(Q) | * | | | | |
| | | | | | | | | | | |
| 本地站点: C:\Users\tes | t | | | ~ | 运程站点 | | | | | |
| ▲ 重 ▲面 ○ 文档 ○ 型 比电脑 ○ 型 C: | - | | | ~ | | | | | | |
| 2(# R | 文件大小 文件 | 类型 最近惊 | 20 | ^ | 文件名 ^ | 文件大小 文件美型 | 最近修改 | 权限 | 所有者/组 | - |
| | 文件 | | 12/3 20:06: | | | All | | | | |
| | 文件 | | 11/6 0:23:28 | | | | | | | |
| | 文件 | 夹 2022/ | 11/19 1:30: | | | 没有连接到任 | 可服务器 | | | |
| | 文件 | 夹 2022/ | 12/3 15:40: | | | | | | | |
| | 文件 | 夹 2022/ | 12/3 19:41: | | | | | | | |
| and the second second | 文件 | 夹 2022/ | 12/3 20:05: | | | | | | | |
| 1 | 文件 | 夹 2022/ | 11/6 0:23:28 | | | | | | | |
| | 文件 | 夹 2022/ | 11/6 0:23:28 | | | | | | | |
| and the second second | 文件 | 夹 2022/ | 12/3 20:06: | | | | | | | |
| | 文件 | 夹 2022/ | 11/6 0:23:28 | | | | | | | |
| | 文件 | 夹 2022/ | 12/3 19:41: | | | | | | | |
| | 文件 | 夹 2019/ | 12/7 17:14: | | | | | | | |
| and the second | 文件 | | 11/6 0:25:57 | | | | | | | |
| | | | | | 未连接. | | | | | |
| | 大小总计: 8,003,604 字节 | | | | | | | | | |
| | | | 大小 优先级 | 2 状态 | | | | | | |

4) The method of connecting the development board is shown in the figure below:

| | | FileZilla 3.Password: orangepi | | _ D × |
|----------------------|--------------------|-----------------------------------|-----------------------|-------|
| 文件(F) 编辑(E) 查看(V) | 传输(T) 服务器(S) 书签(B) | 51 | 5.Click Quick Connect | |
| | 🗮 🖸 🎼 🔕 🛼 | 🏂 🎟 🖉 🤗 🙈 | | |
| 主机(H): 192.168.1.100 | 用户名(U): root | 密码(W): 端口(P): 22 | 2 快速连接(Q) 🔻 | |

5) Then choose to save the password, and then click OK

| | × |
|---------------|----------|
| | |
| eZilla 后重新连接无 | 需再次输入密码。 |
| | |
| | |
| | |
| | |
| | |
| 您的密码。 | |
| 确定(O) | 取消 |
| | 燃的密码。 |

6) Then choose to always trust this host, and then click OK

| 14.服务者的 | 主机密匙是未知的。不能保证该服务 | 酸机是心时认知的 | 皆计异 |
|---------|---|------------------|------------|
| 主机: | 192.168.31.11:22 算法: ssh-ed25519 255 | etFlAyEfdRQcewhW | /pgodyPsII |
| | 并继续连接? | | |
| ☑ 息是信任 | E该主机,并将该密钥加入缓存(A) | | |

7) After the connection is successful, you can see the directory structure of the development board Linux file system on the right side of the filezilla software

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| (J(H): sftp://192.168.31. 用户名(U): root 密码(W): ••••••• | 3月口(P): | 快速连接(Q) * | | | | | | |
|---|---------|---|---|---|--|--|---|------|
| © Connected to 192.168.31.11 | | h | | | | | | |
| 5. 读取目录列表 | | | | | | | | |
| 5: Listing directory /root | | | | | | | | |
| 5: 列出"/root"的目录成功 | | | | | | | | |
| 8站点: C:\ | ~ | 远程站点: /root | | | | | | |
| el C | ^ | ₽ ? / | | | | | | |
| Birthe data | | 🗈 🔚 root | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 1 | | | | | | | | |
| | ~ | The directory stru | cture of 1 | the Linux | file system o | of the deve | elopment be | oard |
| 4名 文件大小 文件类型 最近修改 | ^ | | | | | | | |
| 2022/12/3 18:57: | | 文件名 | 文件大小 | 文件类型 | 最近惨改 | 权限 | 所有者/祖 | |
| 2022/12/3 18:57: | | B . | | | | | | |
| 2022/12/3 18:57: | | cache | | 文件夹 | 2022/12/3 16 | drwx | root root | |
| 文件夹 2022/11/11 1:48: | | .config | | 文件夾 | 2022/12/3 4 | | root root | |
| | | | | 文件夹 | 2022/12/3 5: | | root root | |
| 文件中 2022/12/3 18:55 | | .oh-my-zsh | | | | | | |
| 文件夹 2022/12/3 18:55: 文件夹 2022/12/3 0:17:04 | | .oh-my-zsh | | | | | root root | |
| 文件夹 2022/12/3 0:17:04 | _ | .pip | 793 | 文件夹 | 2022/12/3 16 | drwxr-xr-x | root root | |
| 文件夹 2022/12/3 0:17:04 文件夹 2022/11/13 0:14: | _ | .pip .bash_history | | 文件夹 BASH_HIS | 2022/12/3 16 2022/12/3 18 | drwxr-xr-x -rw | root root root root | |
| 文件类 2022/12/3 0.17:04 文件类 2022/11/13 0.14: 文件类 2022/11/13 0:14: | | .pip .bash_history .bashrc | 3,523 | 文件夹 BASH_HIS BASHRC | 2022/12/3 16 2022/12/3 18 2022/12/3 4: | drwxr-xr-x -rw | root root | |
| 交件类 2022/12/3 0.17:04 文件类 2022/11/3 0.14 文件类 2022/12/8 19:57 文件类 2022/12/8 19:57 | | .pip .bash_history .bashrc .desktop_autologin | 3,523 0 | 文件夹 BASH_HIS BASHRC DESKTOP | 2022/12/3 16 2022/12/3 18 2022/12/3 4: 2022/12/3 4: | drwxr-xr-x -rw -rw-r -rw-rw-r | root root root root root root root root | |
| 文年奏 2022/12/ 01704 文件奏 2022/11/3 014- 文件奏 2022/12/3 1657 文件奏 2022/12/3 1657 文件奏 2022/12/3 0066 | | .pip bash_history bashrc desktop_autologin viminfo | 3,523 0 1,375 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO | 2022/12/3 16 2022/12/3 18 2022/12/3 4: 2022/12/3 4: 2022/12/3 17 | drwxr-xr-x -rw -rw-r | root root root root root root | |
| 文件类 2022/12/8 01704 文件类 2022/11/13 014- 文件类 2022/12/1957 文件类 2022/12/1957 文件类 2022/12/8 1957 文件类 2022/12/8 2006 文件类 2019/12/7 1714 | | .pip Jash history Jashrc Jesktop_autologin Jviminfo Jwget-hsts | 3,523 0 1,375 169 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO WGET-HS | 2022/12/3 16 2022/12/3 18 2022/12/3 4 2022/12/3 4 2022/12/3 17 2022/12/3 16 | drwxr-xr-x -rw -rw-rw-r -rw-rw-r -rw-r | root root root root root root root root root root root root | |
| 文年終 2022/12/0 1704 文年終 2022/11/3 0144. 文年終 2022/12/3 1957 文年終 2022/12/3 1957 文年終 2022/12/3 1956 文年終 2019/12/17144 文年終 2019/12/17144 | | .pip .bash_history .bashrc .desktop_autologin .viminfo .wget-hsts .Xauthority | 3,523 0 1,375 169 55 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO WGET-HS XAUTHOR | 2022/12/3 16 2022/12/3 18 2022/12/3 4: 2022/12/3 4: 2022/12/3 17 2022/12/3 16 2022/12/3 18 | drwxr-xr-x -rw -rw-r-r -rw-rw-r -rw-r -rw | root root root root root root root root root root root root root root | |
| 文件典 2022/12/3 01704 文件典 2022/11/3 0144 文件典 2022/11/3 0145 文件典 2022/12/3 1957. 文件典 2022/12/3 0056 文件典 2019/12/7 1746 文件典 2019/12/7 1746 文件典 2022/12/3 1855 | | .pip Jash history Jashrc Jesktop_autologin Jviminfo Jwget-hsts | 3,523 0 1,375 169 55 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO WGET-HS XAUTHOR | 2022/12/3 16 2022/12/3 18 2022/12/3 4 2022/12/3 4 2022/12/3 17 2022/12/3 16 | drwxr-xr-x -rw -rw-r-r -rw-rw-r -rw-r -rw | root root root root root root root root root root root root | |
| 文年候 2022/12/2 01704 文年候 2022/11/3 1014- 文年候 2022/11/3 1014- 文年候 2022/12/3 1957. 文年候 2022/12/3 1957. 文年候 2022/12/3 1957. 文年候 2022/12/3 1955. 文年候 2022/11/0 103. 文年候 2022/11/0 103. | v | .pip bash history desktop autologin viminfo wet-hsts Xauthority asthrc | 3,523 0 1,375 169 55 3,979 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO WGET-HS XAUTHOR ZSHRC 文件 | 2022/12/3 16 2022/12/3 18 2022/12/3 4: 2022/12/3 4: 2022/12/3 17 2022/12/3 16 2022/12/3 18 | drwxr-xr-x -rw -rw-r-r -rw-rw-r -rw-r -rw | root root root root root root root root root root root root root root | |
| 文件典 2022/12/3 01704 文件典 2022/11/3 0144 文件典 2022/11/3 0145 文件典 2022/12/3 1957. 文件典 2022/12/3 0056 文件典 2019/12/7 1746 文件典 2019/12/7 1746 文件典 2022/12/3 1855 | v | .pip .bash_history .bashrc .desktop_autologin .viminfo .wget-hsts .Xauthority | 3,523 0 1,375 169 55 3,979 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO WGET-HS XAUTHOR ZSHRC 文件 | 2022/12/3 16 2022/12/3 18 2022/12/3 4: 2022/12/3 4: 2022/12/3 17 2022/12/3 16 2022/12/3 18 | drwxr-xr-x -rw -rw-r-r -rw-rw-r -rw-r -rw | root root root root root root root root root root root root root root | |
| 文年候 2022/12/2 01704 文年候 2022/11/3 1014- 文年候 2022/11/3 1014- 文年候 2022/12/3 1957. 文年候 2022/12/3 1957. 文年候 2022/12/3 1957. 文年候 2022/12/3 1955. 文年候 2022/11/0 103. 文年候 2022/11/0 103. | ▼ | .pip bash history desktop autologin viminfo wet-hsts Xauthority asthrc | 3,523 0 1,375 169 55 3,979 | 文件夹 BASH_HIS BASHRC DESKTOP VIMINFO WGET-HS XAUTHOR ZSHRC 文件 | 2022/12/3 16 2022/12/3 18 2022/12/3 4: 2022/12/3 4: 2022/12/3 17 2022/12/3 16 2022/12/3 18 | drwxr-xr-x -rw -rw-r-r -rw-rw-r -rw-r -rw | root root root root root root root root root root root root root root | |

8) Then select the path to be uploaded to the development board on the right side of the filezilla software, and then select the file to be uploaded on the Ubuntu PC on the left side of the filezilla software, then click the right mouse button, and then click the upload option to start uploading the file to the development board.

| (H4): ftp://192.168.31. 用户名(U): root 衛码(W): ●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●● | | 夫速连接(Q) ▼ | | | | | | |
|--|------------|-------------------|-------------|----------|--------------|--------|-----------|---|
| 5: 读取目录列表 5: Listing directory /root 5: 列出 /root*的目录成功 的起命, C1 | | | | | | | | |
| 5: Listing directory /root 5: 列出"/root"的目录成功 B&&感, Cc\ | | | | | | | | |
| 5: 列出'/root'的目录成功 884点 C1 | | | | | | | | |
| 他を伝示: C:\ | | | | | | | | |
| | | | | | | | | _ |
| | 100 | 醒站点: /root | | | | | | |
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| 1 | | | | | | | | |
| | | | | | | | | |
| | - | 2件名 ^ | 文件大小 | ☆伊姆田 | 最近修改 | 权限 | 所有者/组 | _ |
| in- | × [| | XHAD | XITXE | ARCE IN MA | LAFR | //mm//2E | |
| 4名 文件大小 文件美型 最近修改 | ^ | .cache | | 文件夹 | 2022/12/3 16 | 4 | root root | |
| | | .cache .config | | 文件夹 | 2022/12/3 16 | | root root | |
| E18(0) | | .oh-my-zsh | | 文件夹 | 2022/12/3 4: | | root root | |
| ★ RAULX_1+±10A91(A) ★/#± 2022/12/2 0.17-04 | | .pip | | 文件夹 | 2022/12/3 5 | | root root | |
| 进入目录(N) 文件夹 2022/11/13 0:11:04 | | .bash history | 702 | | 2022/12/3 10 | | root root | |
| 打开(0) 文件夹 2022/12/3 19:57: | | bashrc | | BASHRC | 2022/12/3 18 | | root root | |
| 编辑(E) 文件夹 2022/11/26 19:2 | | desktop autologin | | | 2022/12/3 4: | | root root | |
| 创建目录(C) 文件夹 2022/12/3 20:06 | | .viminfo | | | 2022/12/3 4: | | root root | |
| | | .wget-hsts | | | 2022/12/3 17 | | | |
| 10月1日東井道(1) | | | | | | | root root | |
| 刷新(F) 文件夹 2022/12/3 10:55: 文件夹 2022/11/10 10:3 | | .Xauthority | | | 2022/12/3 18 | | root root | |
| 删除(D) 文件夹 2022/11/10 10:3 | |].zshrc | 3,979 | ZSHKC 文件 | 2022/12/3 5: | -rw-rr | root root | |
| 重命名(R) 2022/11/6 16:20: | × | | | | | | | |
| | 7 | 个文件和4个目录。大小组 | 总计: 9,894 号 | TT . | | | | |
| 务器/本地文件 方向 远程文件 大小 优先级 状 | * | 1 | | | | | | |
| Star/44021+ 70 L91221+ 7/1 10/08 14 | 222 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

9) After the upload is complete, you can go to the corresponding path in the Linux system of the development board to view the uploaded file

10) The method of uploading a folder is the same as that of uploading a file

3.9. HDMI test

3. 9. 1. HDMI display test

1) Use HDMI to HDMI cable to connect Orange Pi development board and HDMI monitor



2) After starting the Linux system, if the HDMI monitor has image output, it means that the HDMI interface is in normal use

Note that although many notebook computers have an HDMI interface, the HDMI interface of the notebook generally only has the output function, and does not have the function of HDMI in, that is to say, the HDMI output of other devices cannot be displayed on the notebook screen.

When you want to connect the HDMI of the development board to the HDMI port of the laptop, please make sure that your laptop supports the HDMI in function.

When the HDMI is not displayed, please check whether the HDMI cable is plugged in tightly. After confirming that there is no problem with the connection, you can change a different screen and try to see if it is displayed.

3. 9. 2. HDMI to VGA display test

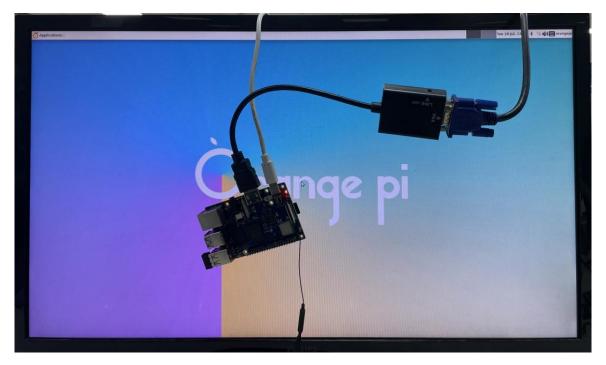
- 1) First, you need to prepare the following accessories
 - a. HDMI to VGA converter



b. A VGA cable



- c. A monitor or TV that supports VGA interface
- 2) HDMI to VGA display test as shown below

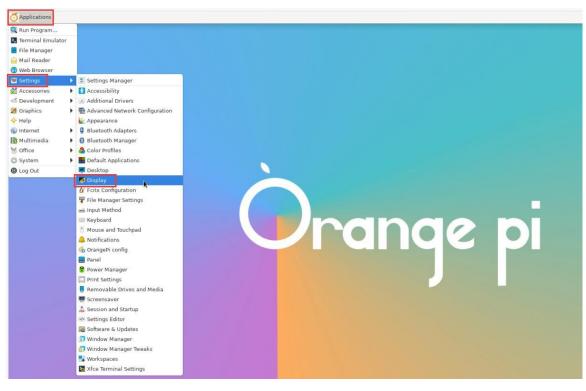


When using HDMI to VGA display, the development board and the Linux system of the development board do not need to make any settings, only the HDMI interface of the development board can display normally. So if there is a problem with the test, please check whether there is a problem with the HDMI to VGA

converter, VGA cable and monitor.

3. 9. 3. HDMI resolution setting method

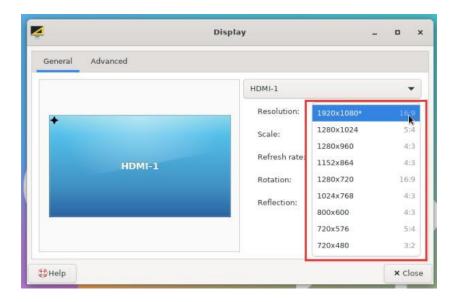
1) First open **Display** in **Settings**



2) Then you can see the current resolution of the system

| | Display | | _ = × | ¢ |
|------------------|---------------|------------|---------|---|
| General Advanced | | | | |
| | HDMI-1 | | • | |
| • | Resolution: | 1920x1080* | 16:9 🔻 | 1 |
| | Scale: | lx | • | |
| HDMI-1 | Refresh rate: | 60.0 Hz | • | |
| | Rotation: | None | • | |
| | Reflection: | None | • | |
| | | | ✓ Apply | |
| | | | | |
| (1) Help | | k | × Close | e |

3) Click the drop-down box of Resolution to see all resolutions currently supported by the monitor



4) Then select the resolution you want to set, and click Apply

| 2 | | Display | , | × |
|----------|----------|---------------|-----------|---------|
| General | Advanced | | | |
| + | | HDMI-1 | | • |
| | | Resolution: | 1280x1024 | 5:4 🕶 |
| | HDMI-1 | Scale: | lx | • |
| | | Refresh rate: | 60.0 Hz | • |
| | | Rotation: | None | • |
| | | Reflection: | None | • |
| | | | | ✓ Apply |
| | | | • | |
| 🔀 Help | | | - | × Close |

5) After the new resolution is set, select Keep the configuration

| 🚫 Applications 🗾 🖉 Display | Confirmation | | | 2 Dec, 01:13 | ∆ r di⊚orangepi |
|----------------------------|-------------------------|--|---------------|--------------|------------------------|
| 17 MB | | | | | |
| 403 M | | | | | |
| | | Display | | | _ 0 × |
| | | General Advanced | | | |
| | | | HDMI-1 | | Ψ. |
| | | • | Resolution: | 1280×1024 | 5.4 💌 |
| | | | Scale: | 1x | * |
| | • | Confirmation + - | Refresh rate: | 60.0 Hz | Ψ. |
| | Would you like to | keep this configuration? | lotation: | None | * |
| | The previous configurat | ion will be restored in 1 seconds if you do not reply to this question | , teflection: | None | * |
| | Kee | p this configuration Restore the previous configuration | | | ✓ Apply |
| | | ₩Help | | | × Close |

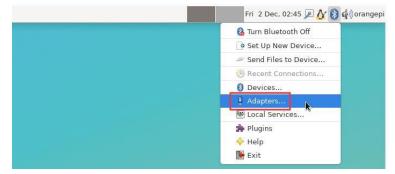
3.10. How to use Bluetooth

3. 10. 1. Test method of desktop image

1) Click the Bluetooth icon in the upper right corner of the desktop.



2) Then select the adapter



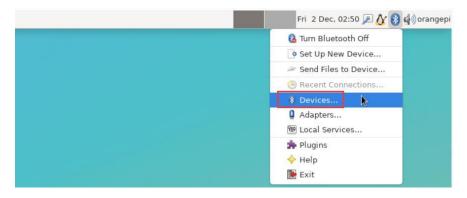
3) If there is a prompt on the following interface, please select Yes



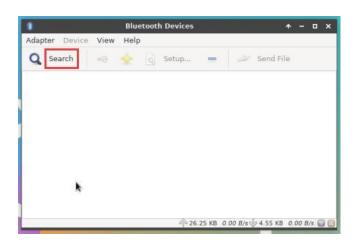
4) Then set **Visibility Setting** as **Always visible** in the Bluetooth adapter settings interface, and then close it



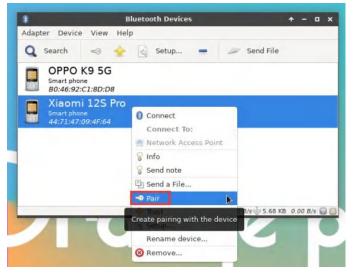
5) Then open the configuration interface of the Bluetooth device



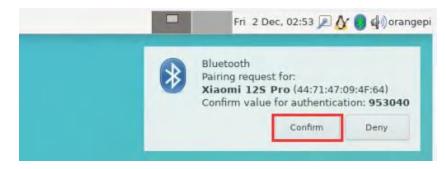
6) Click Search to start scanning the surrounding Bluetooth device



7) Then select the Bluetooth device you want to connect to, and then click the right button of the mouse to pop up the operation interface for this Bluetooth device, select **Pair** to start pairing, and the demonstration here is to pair with an Android phone



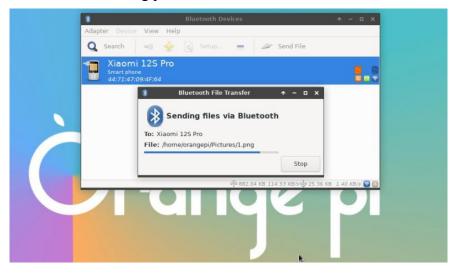
8) When pairing, the pairing confirmation box will pop up in the upper right corner of the desktop. Select **Confirm** to confirm. At this time, the mobile phone also needs to be confirmed



9) After pairing with the mobile phone, you can choose the paired Bluetooth device, then right-click and select **Send a File** to start sending a picture to the phone

| Q search |
|--|
| Aleomi 125 Pro Smart phone 44:71:47:09:4F:64 |

10) The interface of the sending picture is shown below



3.11. USB interface test

The USB interface can be connected to a USB hub to expand the number of USB interfaces.

3. 11. 1. Connect the USB mouse or keyboard to test

1) Insert the USB interface keyboard into the USB interface of the Orange Pi development board

2) Connect Orange PI development board to HDMI display

3) If the mouse or keyboard can operate normally, it means that the USB interface is working normally (the mouse can only be used in the desktop version of the system)

3. 11. 2. Connect the USB storage device test

1) First insert the U disk or USB mobile hard disk into the USB interface of the Orange Pi development board

2) Execute the following command, if you can see the output of sdX, it means that the U disk is recognized successfully

| orangepi@orangepi:~\$ cat /proc/partitions grep "sd*" | | | | |
|---|------|---------------|--|--|
| major minor | #blo | ocks name | | |
| 8 | 0 | 30044160 sda | | |
| 8 | 1 | 30043119 sda1 | | |

3) Use the mount command to mount the U disk into /mnt, and then you can view the file in the U disk

orangepi@orangepi:~\$ sudo mount /dev/sda1 /mnt/ orangepi@orangepi:~\$ ls /mnt/ test.txt

4) After mounting, you can view the capacity usage and mount point of the U disk through the **df -h** command

| orangepi@orang | epi:~\$ d | f -h gre | ep "sd" | | |
|----------------|------------------|------------|---------|---------|--|
| /dev/sda1 | 29G | 208K | 29G | 1% /mnt | |

3. 11. 3. USB wireless network card test

The currently **tested** USB wireless network cards are shown below. Please test it by yourself for other models of USB wireless network cards. If you cannot use it, you need to transplant the corresponding USB wireless network card driver

| No. | Model | |
|-----|-------------------------|------------------|
| 1 | RTL8723BU | |
| | Support 2.4G WIFI+BT4.0 | With Restorted A |

| _ | range Pi User Manual | Copyright reserved by Shenzhe | n Xunlong Software Co., Ltd |
|---|----------------------|--|-----------------------------|
| | 2 | RTL8811 Support 2.4G +5G WIFI | GRIS- |
| | 3 | RTL8821CU Support 2.4G +5G WIFI Support BT 4.2 | Office area |

3. 11. 3. 1. **RTL8723BU test**

1) First insert the RTL8723BU wireless network card module into the USB interface of the development board

2) Then the Linux system will automatically load the RTL8723BU bluetooth and WIFI-related kernel modules, through the lsmod command, you can see that the following kernel modules have been automatically loaded

| orangepi@orangepi:~\$ lsmod | | | |
|-----------------------------|--------|---------|--|
| Module | Size | Used by | |
| rfcomm | 57344 | 4 16 | |
| rtl8xxxu | 106496 | 0 | |
| rtk_btusb | 61440 | 0 | |

3) Through the dmesg command, you can see the loading information of the RTL8723BU module

orangepi@orangepi:~\$ dmesg

•••••

83.438901] usb 2-1: new high-speed USB device number 2 using ehci-platform

[83.588375] usb 2-1: New USB device found, idVendor=0bda, idProduct=b720, bcdDevice= 2.00

83.588403] usb 2-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3

83.588422] usb 2-1: Product: 802.11n WLAN Adapter

83.588443] usb 2-1: Manufacturer: Realtek

83.588460] usb 2-1: SerialNumber: 00e04c000001

83.601974] Bluetooth: hci0: RTL: examining hci_ver=06 hci_rev=000b lmp_ver=06

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lmp subver=8723 83.603894] Bluetooth: hci0: RTL: rom version status=0 version=1 83.603920] Bluetooth: hci0: RTL: loading rtl bt/rtl8723b fw.bin 83.610108] Bluetooth: hci0: RTL: loading rtl bt/rtl8723b config.bin 83.611274] Bluetooth: hci0: RTL: cfg sz 68, total sz 22564 rtk btusb: 83.658494] Realtek Bluetooth USB driver ver 3.1.6d45ddf.20220519-142432 83.658651] usbcore: registered new interface driver rtk btusb 83.667124] usb 2-1: This Realtek USB WiFi dongle (0x0bda:0xb720) is untested! 83.667137] usb 2-1: Please report results to Jes.Sorensen@gmail.com 83.890140] usb 2-1: Vendor: Realtek 83.890153] usb 2-1: Product: 802.11n WLAN Adapter 83.890159] usb 2-1: rtl8723bu parse efuse: dumping efuse (0x200 bytes): 83.890412] usb 2-1: RTL8723BU rev E (SMIC) 1T1R, TX queues 3, WiFi=1, BT=1, GPS=0, HI PA=0 83.890417] usb 2-1: RTL8723BU MAC: 00:13:ef:f4:58:ae 83.890421] usb 2-1: rtl8xxxu: Loading firmware rtlwifi/rtl8723bu nic.bin 83.895289] usb 2-1: Firmware revision 35.0 (signature 0x5301) 84.050893] Bluetooth: hci0: RTL: fw version 0x0e2f9f73 84.266905] Bluetooth: RFCOMM TTY layer initialized 84.266949] Bluetooth: RFCOMM socket layer initialized 84.266999] Bluetooth: RFCOMM ver 1.11 84.884270] usbcore: registered new interface driver rtl8xxxu 84.912046] rtl8xxxu 2-1:1.2 wlx0013eff458ae: renamed from wlan0

4) Then you can see the RTL8723BU WIFI device node through the **sudo ifconfig** command. Please refer to **the WIFI connection test** chapter for WIFI connection and testing methods

```
orangepi@orangepi:~$ sudo ifconfig wlx0013eff458ae
wlx0013eff458ae: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
ether 00:13:ef:f4:58:ae txqueuelen 1000 (Ethernet)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
```

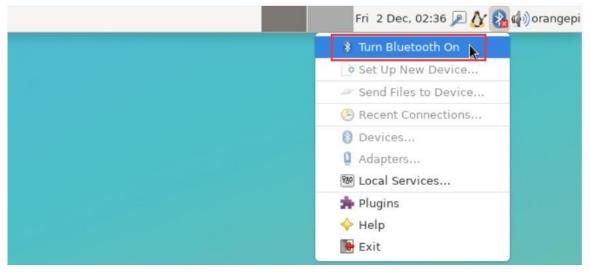
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

5) Then you can see the USB Bluetooth device through the hciconfig command orangepi@orangepi:~\$ sudo apt update && sudo apt install bluez orangepi@orangepi:~\$ hciconfig hci0: Type: Primary Bus: USB BD Address: 00:13:EF:F4:58:AE ACL MTU: 820:8 SCO MTU: 255:16 DOWN RX bytes:1252 acl:0 sco:0 events:125 errors:0 TX bytes:23307 acl:0 sco:0 commands:125 errors:0

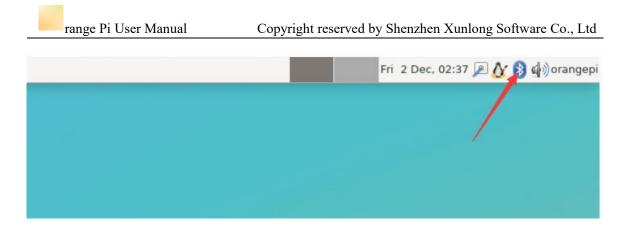
6) You can also see the Bluetooth icon on the desktop. At this time, Bluetooth has not been opened, so a red \mathbf{x} will be displayed



7) Click Turn Bluetooth On to turn on Bluetooth



8) The display after turning on Bluetooth is as follows



9) Please refer to the **Bluetooth use method** for Bluetooth test method, so I won't go into details here.

3. 11. 3. 2. **RTL8811 test**

1) First insert the RTL8811 wireless network card module into the USB interface of the development board.

2) Then the Linux system will automatically load the kernel modules related to RTL8811 WIFI, and you can see that the following kernel modules have been automatically loaded through the lsmod command

| orangepi@orangepi:~\$ lsmod | | | |
|-----------------------------|---------|---------|--|
| Module | Size | Used by | |
| 8821cu | 1839104 | 0 | |

3) Through the dmesg command, you can see the loading information of the RTL8811 module

orangepi@orangepi:~\$ dmesg

118.618194] usb 2-1: new high-speed USB device number 2 using ehci-platform

[118.767152] usb 2-1: New USB device found, idVendor=0bda, idProduct=c811, bcdDevice= 2.00

[118.767181] usb 2-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3

118.767199] usb 2-1: Product: 802.11ac NIC

118.767219] usb 2-1: Manufacturer: Realtek

118.767235] usb 2-1: SerialNumber: 123456

119.500530] usbcore: registered new interface driver rtl8821cu

119.525498] rtl8821cu 2-1:1.0 wlx1cbfced9d260: renamed from wlan0

4) Then you can see the WiFi device node through the **sudo ifconfig** command. Please refer to the **WiFi connection test chapter** for WIFI connection and testing methods. I won't go into details here

| orangepi@orangepi:~\$ sudo ifconfig wlx1cbfced9d260 | | |
|--|--|--|
| wlx1cbfced9d260: flags=4099 <up,broadcast,multicast> mtu 1500</up,broadcast,multicast> | | |
| ether 1c:bf:ce:d9:d2:60 txqueuelen 1000 (Ethernet) | | |
| RX packets 0 bytes 0 (0.0 B) | | |
| RX errors 0 dropped 0 overruns 0 frame 0 | | |
| TX packets 0 bytes 0 (0.0 B) | | |
| TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 | | |

3. 11. 4. USB Camera Test

1) First, you need to prepare a USB camera that supports UVC protocol as shown in the figure below or similar, and then insert the USB camera into the USB port of the Orange Pi development board



2) You can see that the USB camera's device node information is /dev/video0 through the v4l2-ctl command

orangepi@orangepi:~\$ v4l2-ctl --list-devices

Q8 HD Webcam: Q8 HD Webcam (**usb**-fc880000.usb-1):

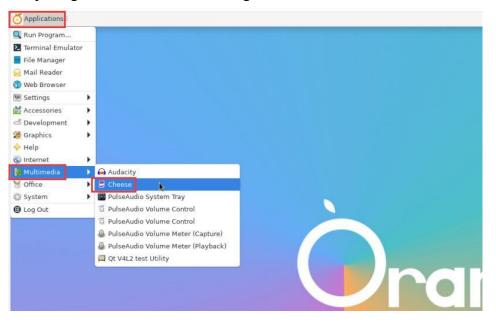
/dev/video0

/dev/video1

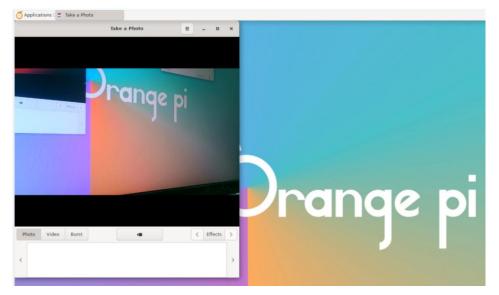
/dev/media0

Note that the l in v4l2 is a lowercase letter l, not the number 1.

In addition, the serial number of the video is not necessarily video0, please refer to what you actually see. 3) In the desktop system, Cheese can be used to directly open the USB camera. The method of opening Cheese is shown in the figure below:



The interface after Cheese turns on the USB camera is shown in the figure below:



- 4) How to test the USB camera using fswebcam
 - a. Install fswebcam

orangepi@orangepi:~\$ sudo apt update orangepi@orangepi:~\$ sudo apt-get install -y fswebcam

b. After installing fswebcam, you can use the following command to take pictures

- a) -d The option is used to specify the device node of the USB camera
- b) --no-banner Used to remove the watermark of photos
- c) -r The option is used to specify the resolution of the photo
- d) -S The option is used to set the number of previous frames to skip
- e) ./image.jpg The name and path for setting the generated photos

orangepi@orangepi:~\$ sudo fswebcam -d /dev/video0 \

--no-banner -r 1280x720 -S 5 ./image.jpg

c. In the server version of the Linux system, you can use the scp command to transfer the taken pictures to the Ubuntu PC for mirror viewing after taking pictures

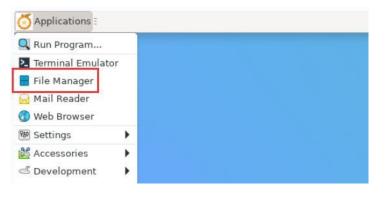
orangepi@orangepi:~\$ scp image.jpg test@192.168.1.55:/home/test (Modify the IP address and path according to the actual situation)

d. In the desktop version of the Linux system, you can directly view the captured pictures through the HDMI display

3.12. Audio Test

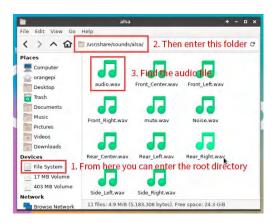
3. 12. 1. Test audio methods in the desktop system

1) First open the file manager



2) Then find the following file (if there is no audio file in the system, you can upload a audio file to the system by yourself)

range Pi User Manual

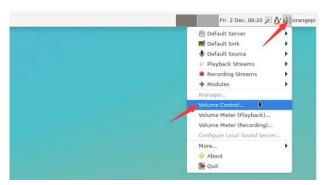


3) Then select the audio.wav file, right click and select open with vlc to start playing

| 1 | alsa | + - □ × |
|---|--|--------------|
| File Edit View Go | Help | |
| < > ^ 企 | 🗂 /usr/share/sounds/alsa/ | G |
| Places Computer orangepi Desktop | audio. | player* twav |
| Trash Documents Music | Open With Send To | wav |
| Pictures Videos Downloads | Copy Paste Move to Trash Rear_Cent Reproperties | 3 |
| Devices File System 17 MB Volume 403 MB Volume | Rear_Cent Properties | ht.wav |
| Network Browse Network | Use "VLC media player" to open the s | elected file |

4) Methods to switch different audio equipment such as HDMI playback and headset playback

a. First open the volume control interface



b. When playing audio, the audio equipment options that play software can be used will be displayed in **Playback**. As shown in the figure below, which audio equipment you need to play here can be set. <complex-block>

3. 12. 2. How to play audio with commands

3. 12. 2. 1. Headphone interface play audio test

Note that linux6.6 is not supported yet.

1) First insert the headset into the headphone jack of the development board



- Then you can use the aplay -l command to check the sound card devices supported by the Linux system
 - a. The output of a.linux5.10 system is as follows. Card 0 is the sound card device of rk809, which is the sound card device of the headset.

orangepi@orangepi:~\$ aplay -l

**** List of PLAYBACK Hardware Devices ****

card 0: rockchiprk809 [rockchip-rk809], device 0: dailink-multicodecs rk817-hifi-0 [dailink-multicodecs rk817-hifi-0]

Subdevices: 0/1

Subdevice #0: subdevice #0 card 1: rockchiphdmi [rockchip,hdmi], device 0: fe400000.i2s-i2s-hifi i2s-hifi-0 [fe400000.i2s-i2s-hifi i2s-hifi-0] Subdevices: 0/1 Subdevice #0: subdevice #0 Subdevice #0: subdevice #0

- 3) Then use the **aplay** command to play the audio file that comes with the system. If the headset can hear the sound, it means that the hardware can be used normally.
 - a. Playback command for linux5.10 system:

orangepi@orangepi:~\$ aplay -D hw:0,0 /usr/share/sounds/alsa/audio.wav Playing WAVE 'audio.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo

3. 12. 2. 2. HDMI Audio Play Test

1) First use the HDMI to HDMI cable to connect the Orange PI development board to the TV (other HDMI displays need to ensure that the audio can be played)

2) Then check the HDMI sound card serial number. From the output below, you can know that the HDMI sound card is **card 1**.

a. The output of the linux5.10 system is as follows, card 1 is the HDMI sound card device

orangepi@orangepi:~\$ aplay -l

**** List of PLAYBACK Hardware Devices ****

card 0: rockchiprk809 [rockchip-rk809], device 0: dailink-multicodecs rk817-hifi-0 [dailink-multicodecs rk817-hifi-0]

Subdevices: 0/1

Subdevice #0: subdevice #0

card 1: rockchiphdmi [rockchip,hdmi], device 0: fe400000.i2s-i2s-hifi i2s-hifi-0 [fe400000.i2s-i2s-hifi i2s-hifi-0]

Subdevices: 0/1

Subdevice #0: subdevice #0

Subdevice #0: subdevice #0

b. The output of the b.linux6.6 system is as follows. Card 0 is the HDMI sound card device

orangepi@orangepi:~\$ aplay -l **** List of PLAYBACK Hardware Devices **** card 0: HDMI [HDMI], device 0: fe400000.i2s-i2s-hifi i2s-hifi-0 [fe400000.i2s-i2s-hifi i2s-hifi-0] Subdevices: 1/1 Subdevice #0: subdevice #0 card 2: RK809 [Analog RK809], device 0: fe410000.i2s-rk817-hifi rk817-hifi-0 [fe410000.i2s-rk817-hifi rk817-hifi-0] Subdevices: 1/1 Subdevice #0: subdevice #0

3) Then use the **aplay** command to play the audio file that comes with the system. If the sound can be heard on the HDMI display or TV, it means that the hardware can be used normally.

a. Playback command for linux5.10 system:

orangepi@orangepi:~\$ aplay -D hw:1,0 /usr/share/sounds/alsa/audio.wav

b. Playback command for linux6.6 system

orangepi@orangepi:~\$ aplay -D hw:0,0 /usr/share/sounds/alsa/audio.wav

3. 12. 3. Use the command to test the recording method

Note that linux6.6 is not supported yet.

1) The Orange Pi 3B development board does not have an onboard MIC, and audio can only be recorded through headphones with a MIC function. After inserting the headset with MIC function into the development board, run the following command to record an audio period through the headset.

a. Commands for linux5.10 system:

orangepi@orangepi:~\$ amixer -c 0 cset name='Capture MIC Path' 'Main Mic' orangepi@orangepi:~\$ arecord -D hw:0,0 -d 5 -f cd -t wav /tmp/test.wav

3.13. Temperature Sensor

1) The command to view the system temperature sensor is:

orangepi@orangepi:~\$ sensors soc_thermal-virtual-0 Adapter: Virtual device range Pi User Manual

temp1: +41.9°C (crit = +115.0°C) gpu_thermal-virtual-0 Adapter: Virtual device

temp1: +43.8°C

2) The command to view the current temperature of the nvme ssd solid state drive is:
orangepi@orangepi:~\$ sudo smartctl -a /dev/nvme0 | grep "Temperature:"
Temperature: 40 Celsius

3. 14. 40 Pin interface pin explanation

2) Orange Pi 3B Development board 40 Pin interface pins, please refer to the figure below



3) The function of the Orange Pi 3B development board 40 PIN interface pins is shown in the table below.

| 复用功能 | 复用功能 | GPIO | GPI0序号 | 引脚序号 | 引脚序号 | GPIO序号 | GPIO | 复用功能 | 复用功能 |
|----------------------------|-----------------------|----------|---------------|------|------|---------------|----------|-----------------------|----------------|
| Presente Contra | | 3.3₹ | | 1 | 2 | | 5V | | |
| | I2C2_SDA_M1 | GPIO4_B4 | 140 | 3 | 4 | | 5V | | |
| | I2C2_SCL_M1 | GPIO4_B5 | 141 | 5 | 6 | 1 | GND | | |
| | PWM15_IR_M1(fe700030) | GPIO4_C3 | 147 | 7 | 8 | 25 | GP100_D1 | UART2_TX_HO | |
| | | GND | | 9 | 10 | 24 | GPIO0_D0 | UART2_RX_MO | |
| | | GP103_C6 | 118 | 11 | 12 | 119 | GP103_C7 | | |
| | | GPIO4_A0 | 128 | 13 | 14 | | GND | | |
| | UART7_TX_M2 | GPIO4_A2 | 130 | 15 | 16 | 131 | GPI04_A3 | UART7_RX_H2 | |
| a subserve a second second | | 3.3¥ | | 17 | 18 | 129 | GPI04_A1 | | |
| I2C4_SDA_HO | SPI3_MOSI_MO | GPIO4_B2 | 138 | 19 | 20 | | GND | | |
| | SPI3_MISO_MO | GPIO4_B0 | 136 | 21 | 22 | 132 | GPIO4_A4 | UART9_TX_M2 | |
| I2C4_SCL_MO | SPI3_CLK_MO | GPIO4_B3 | 139 | 23 | 24 | 134 | GPIO4_A6 | SPI3_CS0_MO | |
| | | GND | | 25 | 26 | 126 | GP103_D6 | | and the second |
| UART3_RX_MO | I2C3_SDA_MO | GPIO1_A0 | 32 | 27 | 28 | 33 | GPI01_A1 | 12C3_SCL_10 | UART3_TX_M |
| | UART9_RX_M2 | GPIO4_A5 | 133 | 29 | 30 | | GND | | |
| | | GPIO3_D4 | 124 | 31 | 32 | 144 | GPI04_C0 | PWM11_IR_M1(fe6f0030) | |
| | | GPIO3_D7 | 127 | 33 | 34 | | GND | | |
| | | GPIO3_DO | 120 | 35 | 36 | 125 | GPIO3_D5 | | |
| | | GPIO3_D3 | 123 | 37 | 38 | 122 | GPI03_D2 | | |
| | | GND | | 39 | 40 | 121 | GPIO3 D1 | | |

a. Below is a complete pins of 40pin

b. The following form is a picture on the left half of the full table above, which can

| be seen o | clearly | |
|-----------|---------|--|
|-----------|---------|--|

| 复用功能 | 复用功能 | GPIO | GPIO 序号 | 引脚序号 |
|-------------|-----------------------|----------|----------------|------|
| | | 3. 3V | | 1 |
| | I2C2_SDA_M1 | GPIO4_B4 | 140 | 3 |
| | 12C2_SCL_M1 | GPI04_B5 | 141 | 5 |
| | PWM15_IR_M1(fe700030) | GPI04_C3 | 147 | 7 |
| | | GND | | 9 |
| | | GP103_C6 | 118 | 11 |
| | | GPI04_A0 | 128 | 13 |
| | UART7_TX_M2 | GPI04_A2 | 130 | 15 |
| | | 3. 3V | | 17 |
| I2C4_SDA_MO | SPI3_MOSI_MO | GPIO4_B2 | 138 | 19 |
| | SPI3_MISO_MO | GPIO4_B0 | 136 | 21 |
| I2C4_SCL_MO | SPI3_CLK_MO | GPI04_B3 | 139 | 23 |
| | | GND | | 25 |
| UART3_RX_MO | I2C3_SDA_MO | GPI01_A0 | 32 | 27 |
| | UART9_RX_M2 | GPI04_A5 | 133 | 29 |
| | | GPI03_D4 | 124 | 31 |
| | | GP103_D7 | 127 | 33 |
| | | GPI03_D0 | 120 | 35 |
| | | GPI03_D3 | 123 | 37 |
| | | GND | | 39 |

c. The following form is a picture on the right half of the top table above, which can be seen clearly

| 引脚序号 | GPIO序号 | GPIO | 复用功能 | 复用功能 |
|------|---------------|----------|-----------------------|-------------|
| 2 | | 57 | | a constant |
| 4 | | 57 | | |
| 6 | | GND | | |
| 8 | 25 | GP100_D1 | UART2_TX_MO | |
| 10 | 24 | GPIO0_D0 | UART2_RX_MO | |
| 12 | 119 | GP103_C7 | | |
| 14 | | GND | | |
| 16 | 131 | GPIO4_A3 | UART7_RX_M2 | |
| 18 | 129 | GPIO4_A1 | | |
| 20 | | GND | | |
| 22 | 132 | GPIO4_A4 | UART9_TX_M2 | |
| 24 | 134 | GPIO4_A6 | SPI3_CSO_MO | |
| 26 | 126 | GP103_D6 | | |
| 28 | 33 | GPIO1_A1 | I2C3_SCL_MO | UART3_TX_MO |
| 30 | | GND | | |
| 32 | 144 | GPIO4_CO | PWM11_IR_M1(fe6f0030) | |
| 34 | | GND | | |
| 36 | 125 | GPIO3_D5 | | |
| 38 | 122 | GPIO3_D2 | | |
| 40 | 121 | GPIO3_D1 | | |

4) There are a total of **28** GPIO ports in the 40pin interface. The voltage of all GPIO ports is **3.3v**

3.15. How to install wiringOP

Note that wiringOP has been pre-installed in the Linux image released by Orange Pi. Unless the code of wiringOP is updated, there is no need to re-download, compile and install, and use it directly.

The storage path of the compiled wiringOP deb package in orangepi-build is: orangepi-build/external/cache/debs/arm64/wiringpi_x.xx.deb

After entering the system, you can run the gpio readall command. If you can see the following output, it means that wiringOP has been pre-installed and can be used normally.

| root@orangepi3b:~# gpio readall ++-PI3B +++++++++ | | | | | | | | | | | |
|--|-----|----------|------|---|-----|------|---|------|----------|-----|------|
| GPI0 | wPi | Name | Mode | V | | | V | Mode | Name | wPi | GPI0 |
| | | 3.3V | | | 11 | 2 | | | 5V | | |
| 140 | 0 | SDA.2 | IN | 1 | 3 | 4 | | | 5V | | |
| 141 | 1 | SCL.2 | IN | 1 | 5 | 6 | | | GND | | |
| 147 | 2 | PWM15 | IN | 0 | 7 | 8 | 1 | ALT1 | RXD.2 | 3 | 25 |
| | | GND | | | 9 | 10 | 1 | ALT1 | TXD.2 | 4 | 24 |
| 118 | 5 | GPI03 C6 | IN | 0 | 11 | 12 | 0 | IN | GPIO3 C7 | 6 | 119 |
| 128 | 7 | GPI04_A0 | IN | 0 | 13 | 14 | | | GND | | |
| 130 | 8 | TXD.7 | IN | 0 | 15 | 16 | 0 | IN | RXD.7 | 9 | 131 |
| | | 3.3V | | | 17 | 18 | 0 | IN | GPI04_A1 | 10 | 129 |
| 138 | 11 | SPI3_TXD | IN | 0 | 19 | 20 | | | GND | | |
| 136 | 12 | SPI3_RXD | IN | 0 | 21 | 22 | 0 | IN | TXD.9 | 13 | 132 |
| 139 | 14 | SPI3_CLK | IN | 0 | 23 | 24 | 0 | IN | SPI3_CS1 | 15 | 134 |
| | | GND | | | 25 | 26 | 0 | IN | GPI03_D6 | 16 | 126 |
| 32 | 17 | SDA.3 | IN | 1 | 27 | 28 | 1 | IN | SCL.3 | 18 | 33 |
| 133 | 19 | RXD.9 | IN | 0 | 29 | 30 | | | GND | | |
| 124 | 20 | GPI03_D4 | IN | 0 | 31 | 32 | 0 | IN | PWM11 | 21 | 144 |
| 127 | 22 | GPI03_D7 | IN | 0 | 33 | 34 | | | GND | | |
| 120 | 23 | GPI03_D0 | IN | 0 | 35 | 36 | 0 | IN | GPI03_D5 | 24 | 125 |
| 123 | 25 | GPI03_D3 | IN | 0 | 37 | 38 | 0 | IN | GPI03_D2 | 26 | 122 |
| | | GND | | | 39 | 40 | 0 | IN | GPI03_D1 | 27 | 121 |
| GPIO | wPi | Name | Mode | V | 1 2 | ical | V | Mode | Name | wPi | GPIO |
| ++++++++++ | | | | | | | | | | | |

1) Download the code of wiringOP

orangepi@orangepi:~\$ sudo apt update

orangepi@orangepi:~\$ sudo apt install -y git

orangepi@orangepi:~\$ git clone https://github.com/orangepi-xunlong/wiringOP.git -b next

Note that Orange Pi 3B needs to download the code of the wiringOP next branch, please don't miss the parameter of -b next.

If there is a problem with the download code from GitHub, you can use the wiringOP source code that comes with the Linux image directly, and the storage

location is:/usr/src/wiringOP

2) Compile and install wiringOP

orangepi@orangepi:~\$ cd wiringOP orangepi@orangepi:~/wiringOP\$ sudo ./build clean

orangepi@orangepi:~/wiringOP\$ sudo ./build

3) Test the output of the gpio readall command as follows

| root@orangepi3b:~# gpio readall | | | | | | | | | | | |
|---------------------------------|-------------------|----------|------|---|----|------|---|------|----------|-----|------|
| +++++++ PI3B ++++++++ | | | | | | | | | | | |
| GPI0 | wPi | Name | Mode | V | | ical | V | Mode | Name | wPi | GPI0 |
| +++++++++++++ | | | | | | | | | | | |
| | | 3.3V | | | 1 | 2 | | | 5V | | |
| 140 | 0 | SDA.2 | IN | 1 | 3 | 4 | | | 5V | | |
| 141 | 1 | SCL.2 | IN | 1 | 5 | 6 | | | GND | | |
| 147 | 2 | PWM15 | IN | 0 | 7 | 8 | 1 | ALT1 | RXD.2 | 3 | 25 |
| | | GND | | | 9 | 10 | 1 | ALT1 | TXD.2 | 4 | 24 |
| 118 | 5 | GPI03_C6 | IN | 0 | 11 | 12 | 0 | IN | GPI03_C7 | 6 | 119 |
| 128 | 7 | GPI04_A0 | IN | 0 | 13 | 14 | | | GND | | |
| 130 | 8 | TXD.7 | IN | 0 | 15 | 16 | 0 | IN | RXD.7 | 9 | 131 |
| | | 3.3V | | | 17 | 18 | 0 | IN | GPI04_A1 | 10 | 129 |
| 138 | 11 | SPI3_TXD | IN | 0 | 19 | 20 | | | GND | | |
| 136 | 12 | SPI3_RXD | IN | 0 | 21 | 22 | 0 | IN | TXD.9 | 13 | 132 |
| 139 | 14 | SPI3_CLK | IN | 0 | 23 | 24 | 0 | IN | SPI3_CS1 | 15 | 134 |
| | | GND | | | 25 | 26 | 0 | IN | GPI03_D6 | 16 | 126 |
| 32 | 17 | SDA.3 | IN | 1 | 27 | 28 | 1 | IN | SCL.3 | 18 | 33 |
| 133 | 19 | RXD.9 | IN | 0 | 29 | 30 | | | GND | | |
| 124 | 20 | GPI03_D4 | IN | 0 | 31 | 32 | 0 | IN | PWM11 | 21 | 144 |
| 127 | 22 | GPI03_D7 | IN | 0 | 33 | 34 | | | GND | | |
| 120 | 23 | GPI03_D0 | IN | 0 | 35 | 36 | 0 | IN | GPI03_D5 | 24 | 125 |
| 123 | 25 | GPI03_D3 | IN | 0 | 37 | 38 | 0 | IN | GPI03_D2 | 26 | 122 |
| | | GND | | | 39 | 40 | 0 | IN | GPI03_D1 | 27 | 121 |
| ++ | + | ++ | | + | ++ | + | + | + | + | + | ++ |
| GPI0 | wPi | Name | Mode | V | | ical | V | Mode | Name | wPi | GPIO |
| ++ | ++ PI3B +++++++++ | | | | | | | | | | |

3. 16. 40Pin interface GPIO, I2C, UART, SPI, and PWM test

Note that if you need to set overlays to open multiple configurations at the same time, please use a space to write in one line like the following space.

orangepi@orangepi:~\$ sudo vim /boot/orangepiEnv.txt

overlays=spi3-m0-cs0-spidev i2c2-m1 i2c3-m0 uart7-m2 uart9-m2 pwm11-m1

3. 16. 1. **40pin GPIO port test**

The Linux system released by Orange Pi has a pre-installed blink_all_gpio program, which will set all 28 GPIO ports in the 40pin to switch between high and low levels continuously.