

Compact3576 Android16 User Manual

V1.0



Boardcon Embedded Design

Overview

The content of this document is intended solely for the Idea3576 development board, aiming to help users quickly understand, apply, and test the Idea3576 development board.

System Support

Development Board	Android	Debian	Builroot
CM3576 V1 Compact3576 V1	Yes	Yes	Yes

Revision History

Version	Date	Author	Revision History
V1.0	2026-06-02	Wugk	Initial version

Disclaimer

The information in this manual is for reference only. While Boardcon strives to ensure its accuracy, no guarantees are made regarding its completeness or correctness. All content is subject to change without prior notice. Boardcon reserves the right to revise the content of this manual without prior notification.

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1.Introduction

1.1 Overview

The Compact3576 modular SBC (Rockchip RK3576, octa-core CPU, Mali-G52 GPU, 6-TOPS NPU) features a SOM/baseboard split for easy upgrades and cost savings. Rich I/O includes triple USB 3.0, dual displays, HDMI in, GbE, M.2, Wi-Fi/BT, and optional 4G. Targets edge AI, machine vision, digital signage, video processing, IoT gateways, and medical/POS systems.



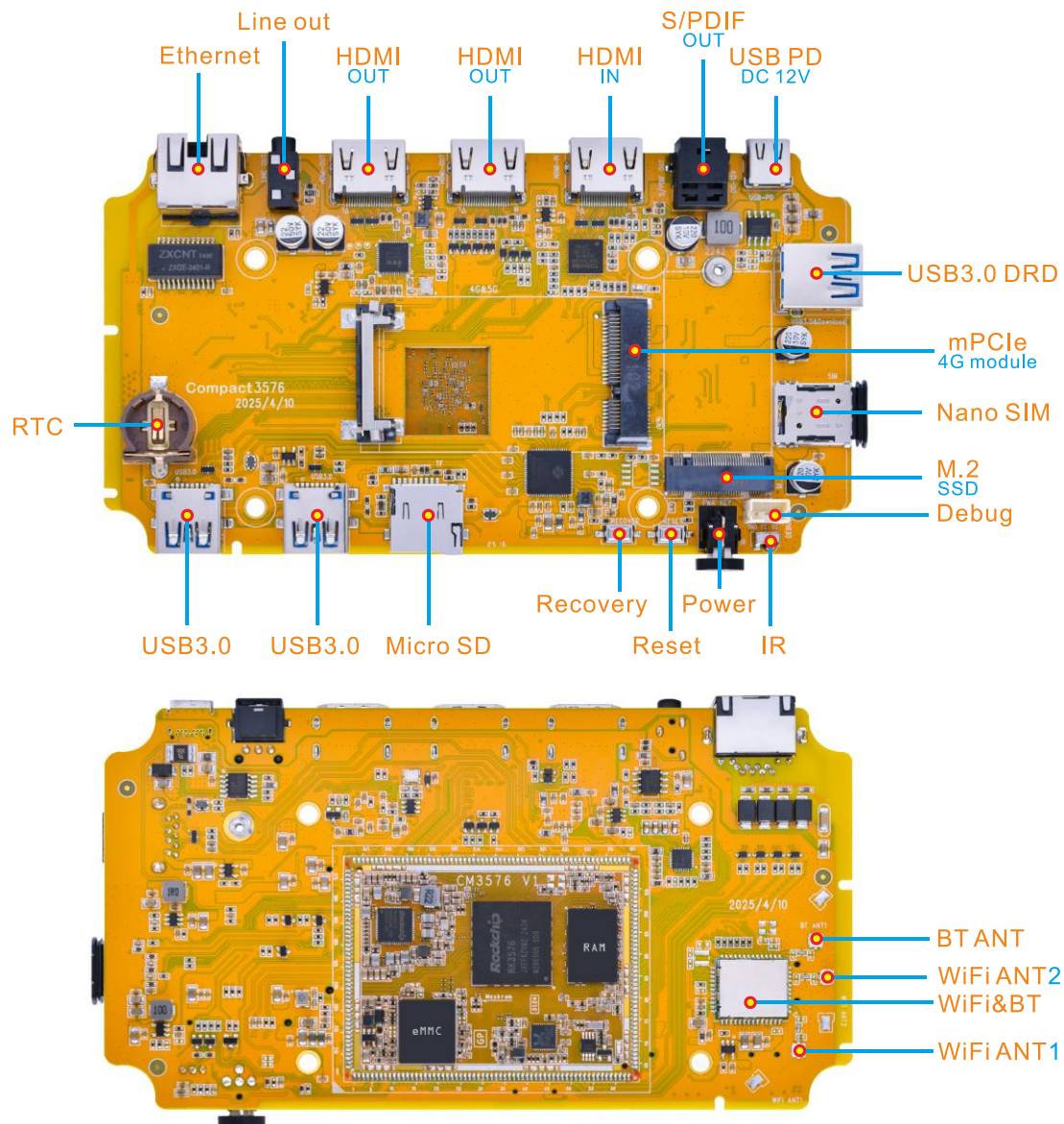
1.2 Product Parameters

Basic Parameters	
SOC	RK3576
CPU	• Octa-core 64-bit architecture (Quad-core Cortex-A72 + Quad-core Cortex-A53)
GPU	• ARM Mali-G52 MC3 • Support OpenGL ES 1.1/2.0/3.2

		• Support Vulkan 1.1 • Support OpenCL 2.0 and AFBC
NPU		• 6 TOPS for INT8 operations. • Supports int4, int8, int16, FP16, BF16, TF32 operation
Video	Decoder	• Supports up to 8K@30fps for H.265/HEVC, VP9, AVS2, and AV1 video decoding • Supports up to 4K@120fps for H.265/HEVC, VP9, AVS2, and AV1 video decoding • Supports up to 4K@60fps for H.264/AVC and MVC video decoding
	Encoder	• Supports H.264/H.265 video encoding up to 4K@60fps
RAM		4GB (up to 8GB) LPDDR4X
Storage		32GB(up to 256GB) eMMC
Support system		Android, Debian, Buildroot
Hardware Parameters		
Extended Storage		• Support 1x M.2 PCIe3.0 SSD • Support 1x MicroSD Card
Display		• Support 1x HDMI2.1 output, up to 4K@120fps • DP to HDMI2.0

Audio	• Support 1x HDMI TX audio output • Support 1x Line out • Support 1x HDMI IN audio input • S/PDIF out
USB	• Support 2x USB3.0 Host, Type-A • Support 1x USB3.0 DRD (Type-A, USB 3.0)
Network	• Support 1x Gigabit Ethernet • Support 1x WIFI/BT module
Other parameters	Support 1x Debug, 1x RTC
Electrical Parameters	
Power supply input voltage	12V/3A
RTC input voltage	3V/0.6uA
Operating temperature	0~70°
Storage temperature	-40~85°
Structural Parameters	
Core board dimensions	57.5 x 44.0 mm
Motherboard dimensions	152.5 x 83 mm

1.3 Hardware Interface Introduction



Interface parameters

Power in DC12V	12V/3A DC power input interface
HDMI	HDMI2.1 TX interface
HDMI IN	HDMI in interface

1x Ethernet	Gigabit Ethernet RJ45 interface
2x USB3.0 Host	USB3.0
1x USB3.0 DRD	USB3.0 device/Host
Headphone	Audio out interface
Micro SD	TF card slot
M.2	M.2(M-key) interface for connecting NVMe SSD
Debug	debug the serial port
WIFI&BT	WIFI&Bluetooth module
RTC	RTC coin cell connector
Recovery	Recovery key
Reset	Reset key
Power	Power key

2.Install Drivers and Tool

To download firmware and debug in the terminal, the following drivers and software need to be installed (for Windows computers):

Number	Driver name	Driver	Use
1	RK Driver Assitant	DriverInstall.exe	OTG USB driver installation assitant
2	CH9102x	SETUP.EXE	Serial port debugging driver
3	Serial Terminal Tool	SecureCRT.exe	Debugging tool

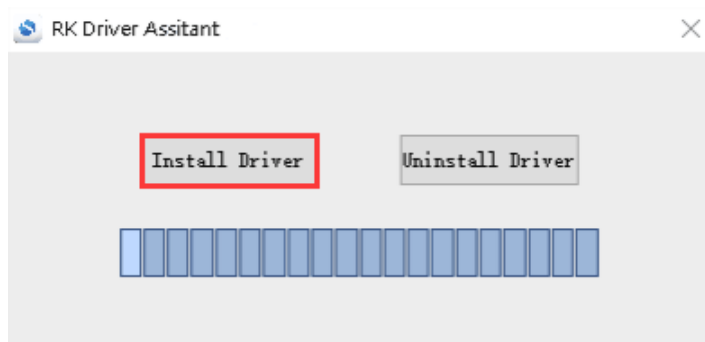
2.1 Install RK Driver Assistant

Step 1: Open *DriverAssistant_v5.1.3/DriverInstall.exe*.

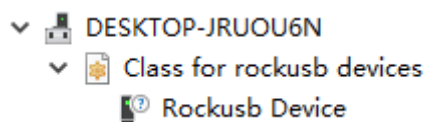
Step 2: To avoid driver conflicts, click “**Uninstall Driver**” to uninstall the driver.



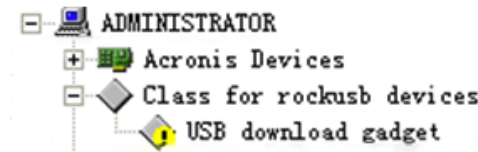
Step 3: Click button “**Install Driver**” to install.



Step 4: After the installation is complete, connect the board and PC with Type_C USB cable and press the **Recovery** key and hold then power the board, the following information is displayed in the Computer **Device Manager**, indicating that the USB driver was successfully installed.

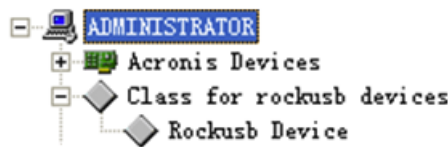


Step 5: If the following device information appears in the **Device Manager** after the operation in Step 4, user need to proceed to the next step.



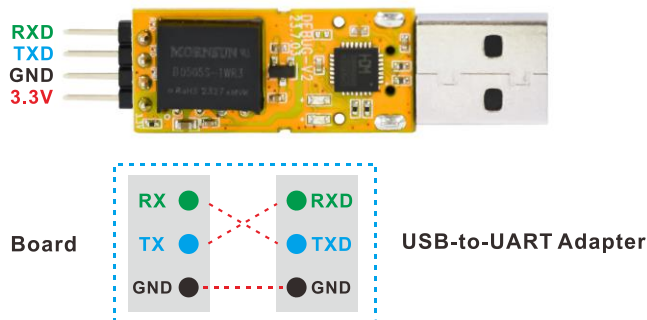
Step 6: The WINDOW will pop up found New Hardware Wizard dialog box, choose to install from the specified location, and then select: *DriverAssitant_v5.1.1/ADBDriver*.

Step 7: After the installation is completed, the following device information can be seen in the Computer **Device Manager**.



2.2 Install CH9102X Driver

2.2.1 How to Connect the Serial Port Tool



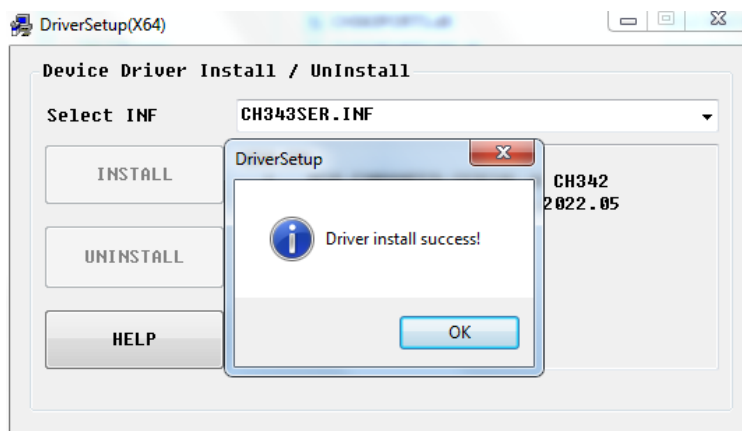
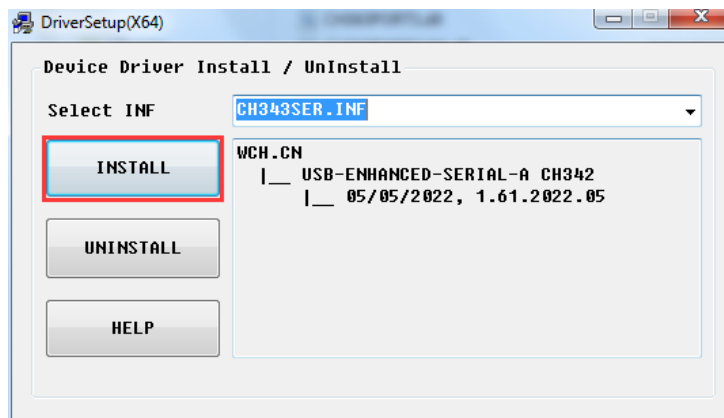
Pin	Connection Description
RXD	Receive, connect to TX pin of the board.
TXD	Transmit, connect to RX pin of the board.
GND	Ground, connect to GND pin of the board.
3V3	No need to connect.

2.2.2 Install Driver

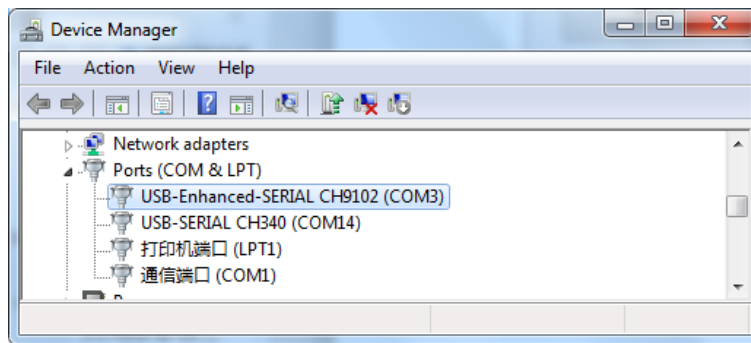
Step 1: Plug the CH9102X Module to the PC

Step 2: Unzip *CH343SER.ZIP* on Windows.

Step 3: Select and install the corresponding *SETUP.EXE* according to the computer properties.



Step 4: After the installation is completed, the device will be listed under **Device Manager** ports with unique serial port assigned.

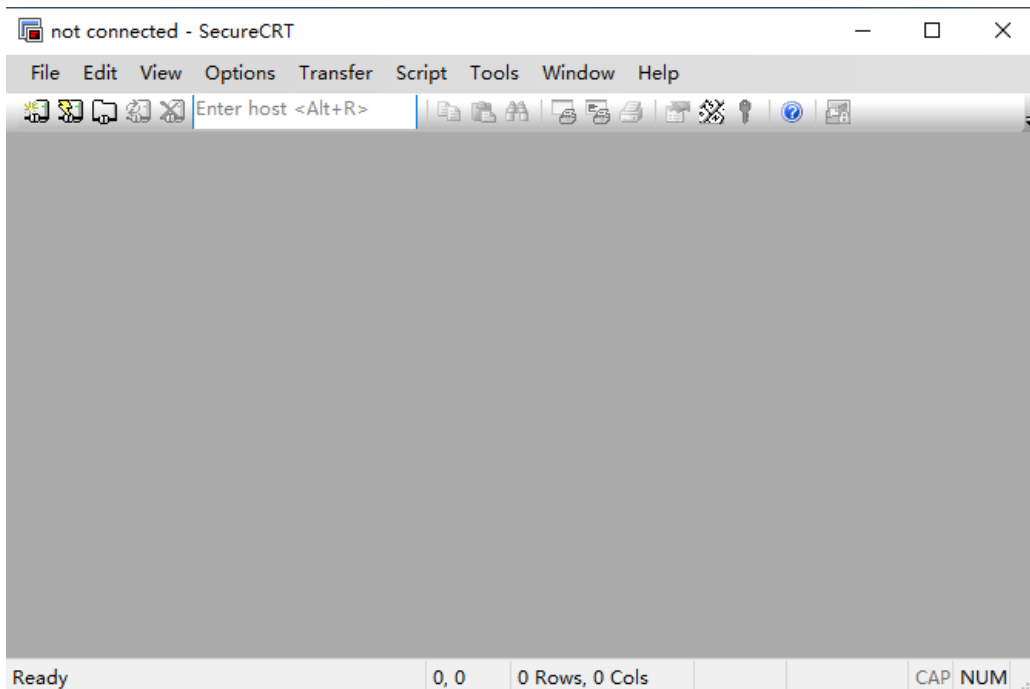


2.3 Install Serial Terminal Tool

The serial terminal SecureCRT is used for debugging in Windows. It can be used directly after decompression.

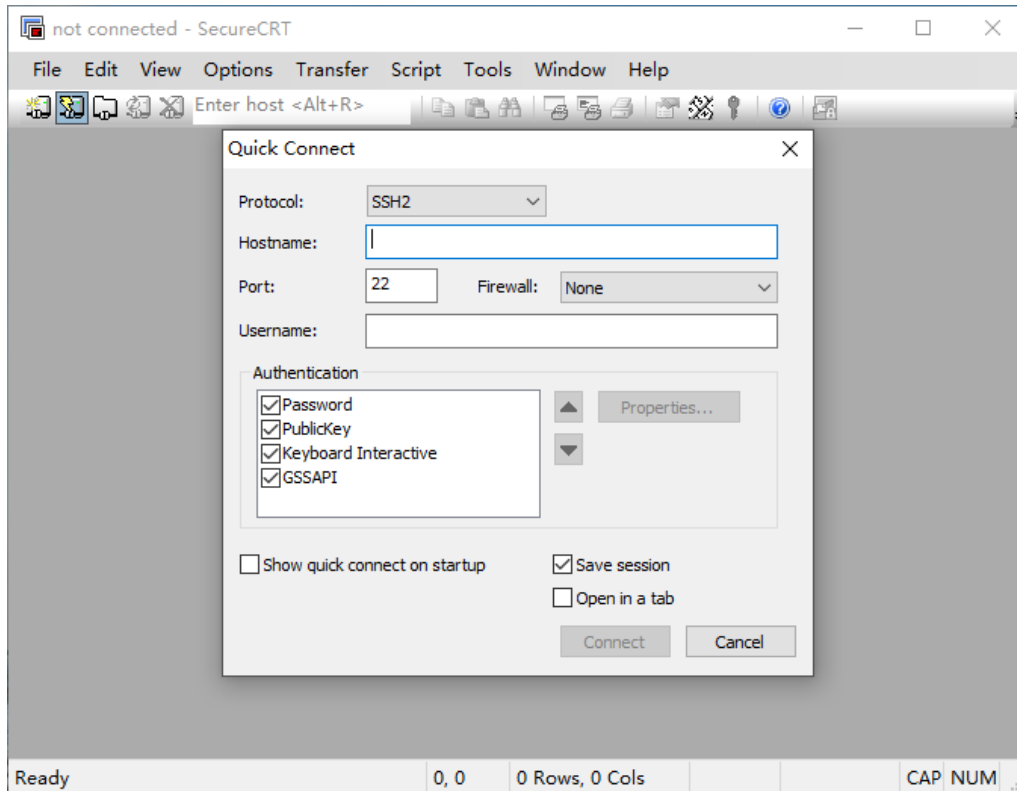
Step 1: Unzip *Platform/SecureCRT.rar* on PC.

Step 2: Click *SecureCRT/SecureCRT.exe* open the SecureCRT.

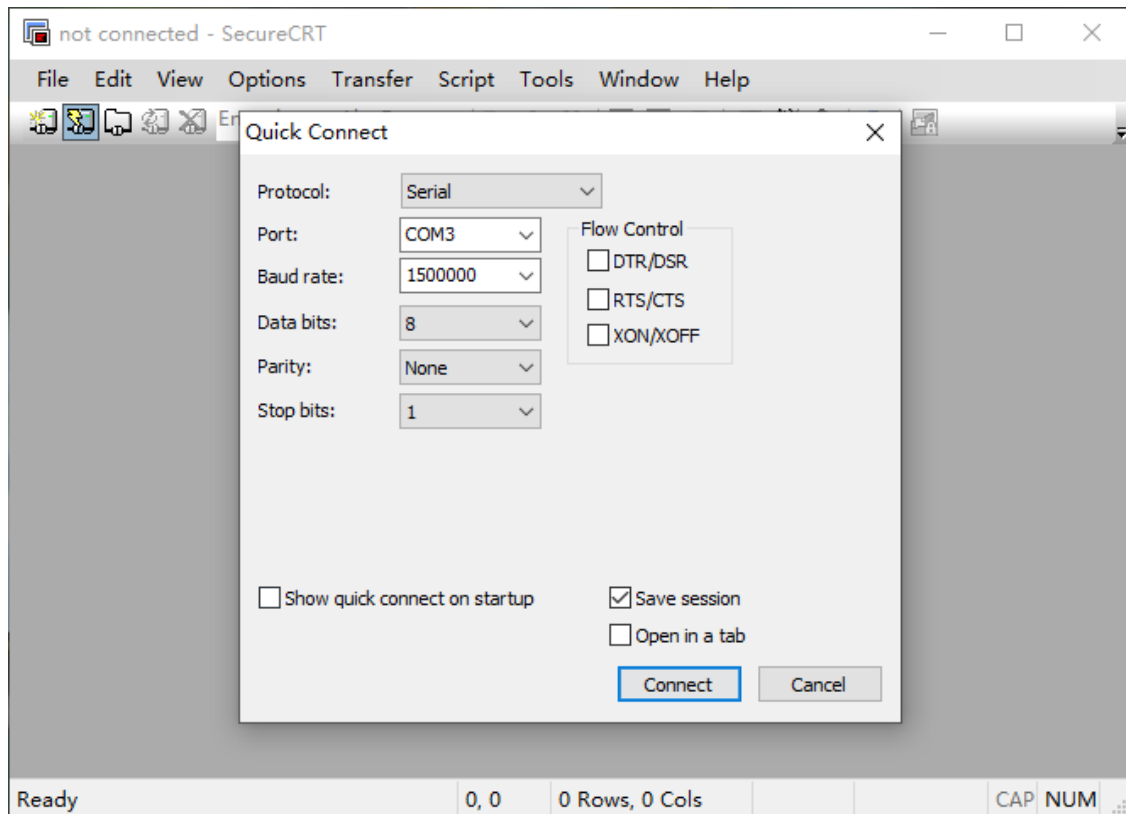


Step 3: Confirm that the CH9102X driver has been installed and the CH9102X module is connecting to the PC.

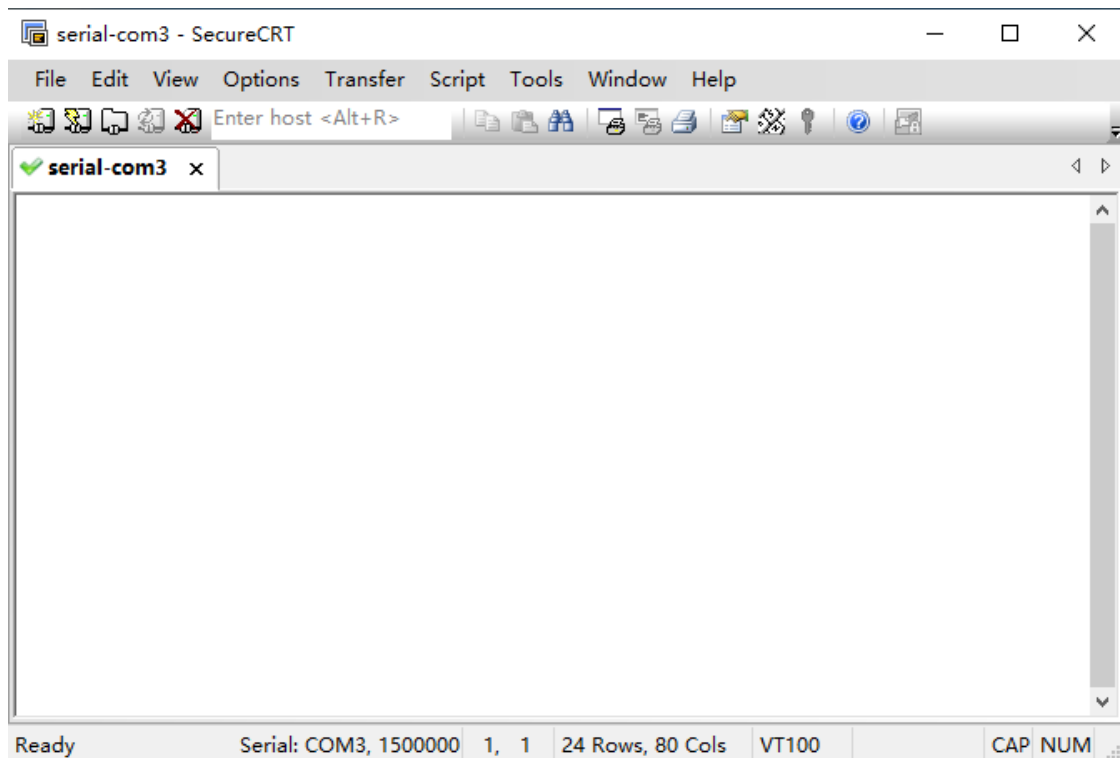
Step 4: Click the “Quick Connect” button to go to the Quick Connect configuration screen.



Step 5: Configure as shown in the following figure.



Step 6: After clicking “**Connect**” button, the terminal serial interface will be successfully accessed.



3. Upgrade Introduction

3.1 Upgrade Mode

The firmware can be upgraded via USB cable in two modes:

1. Loader Mode:

The standard mode used for firmware upgrades.

2. MaskRom Mode:

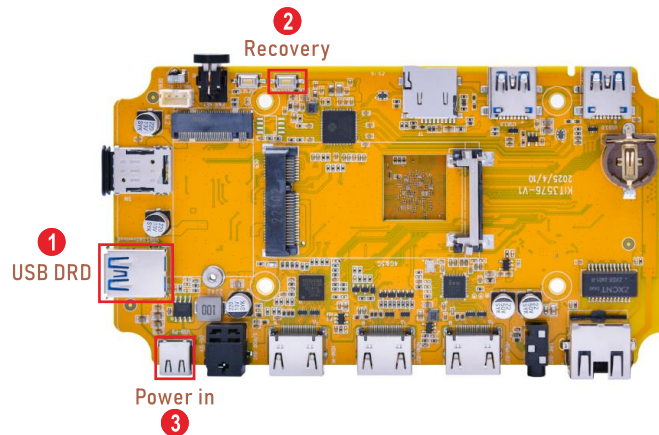
A last-resort mode used when the device is bricked. Entering MaskRom mode requires hardware manipulation, which involves certain risks. It should only be attempted if Loader mode is unavailable.

- **Prerequisite**

Before upgrading the firmware via USB cable, ensure that the necessary drivers are installed. For installation instructions, refer to the section [Install RK Driver Assistant](#).

3.1.1 How to Enter Loader Mode

3.1.1.1 Hardware



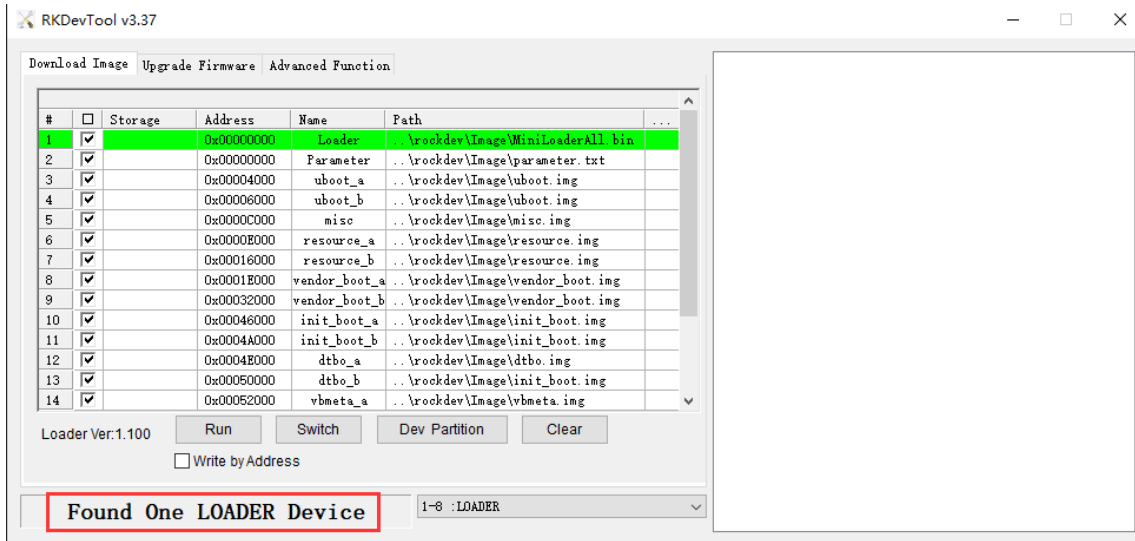
Step 1: Disconnect the power adapter.

Step 2: Connect one end of the USB cable to the host and the other end to the development board.

Step 3: Press and hold the **Recovery** button on the board

Step 4: Connect the power supply.

Step 5: After a few seconds, release the **Recovery** button when the flashing tool shows “Found one LOADER Device”.

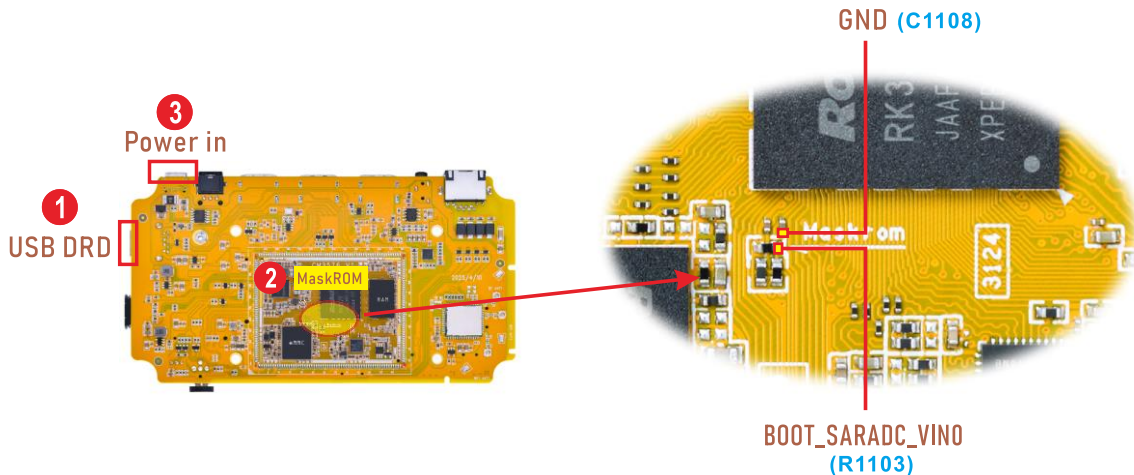


3.1.1.2 Software

After connecting the USB cable, execute the following command in the serial debug terminal or adb shell.

```
# reboot loader
```

3.1.2 How to Enter MaskRom Mode

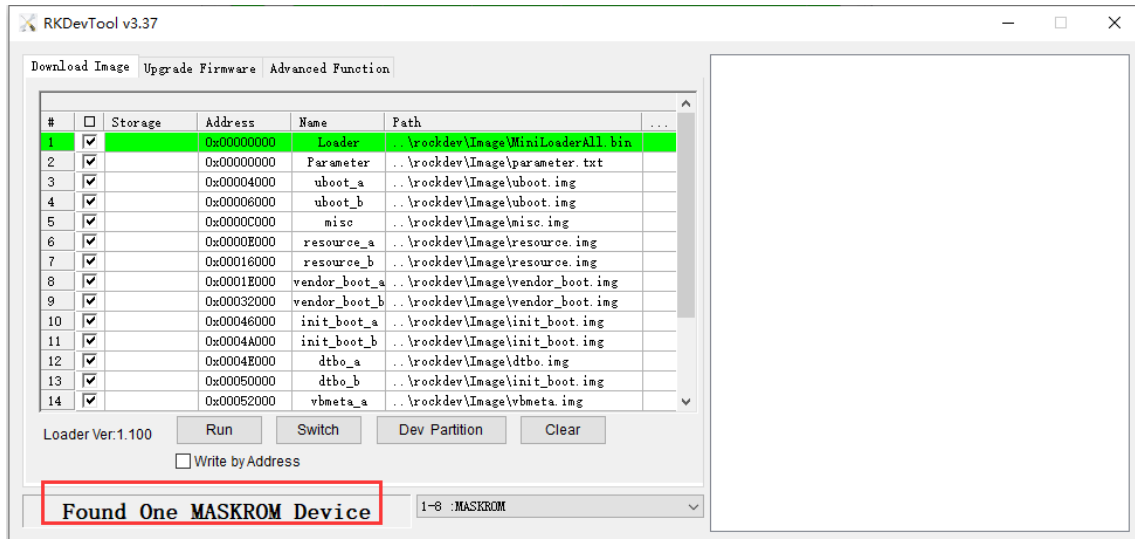


Step 1: Disconnect the power adapter.

Step 2: Connect one end of the Type_A cable to the host and the other end to the development board.

Step 3: Use tweezers to short the two test points on the CM3576.

Step 4: After connecting the power cable, the device will enter MaskRom mode.



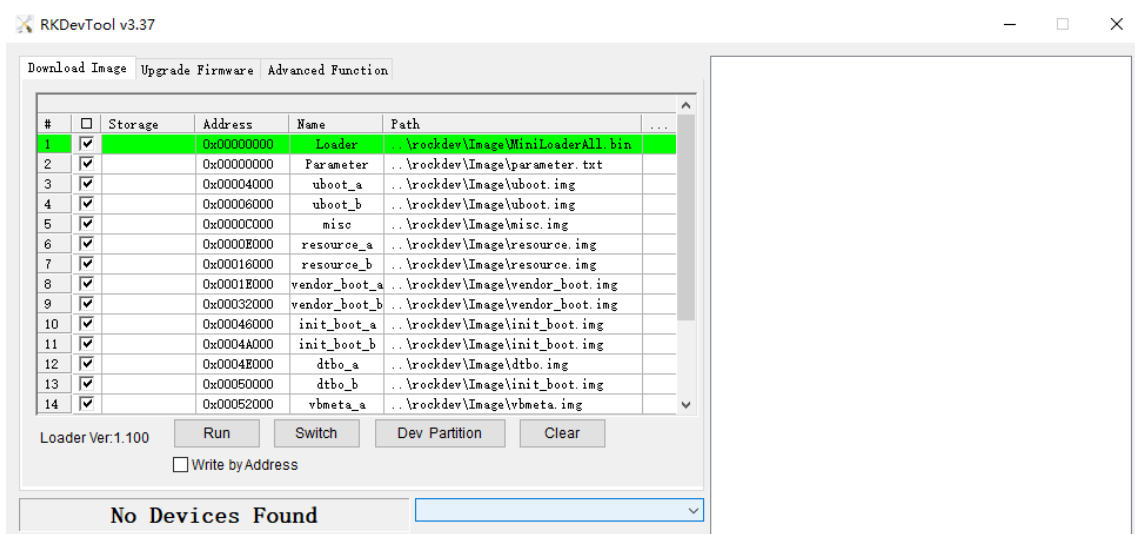
3.2 Burn Firmware

Environment: Windows OS (Operating System).

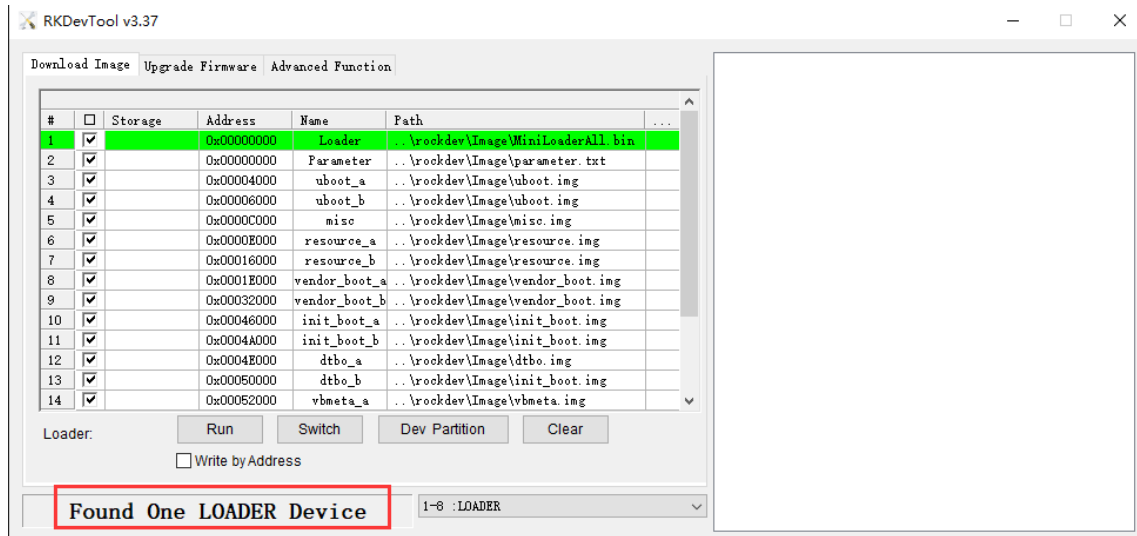
3.2.1 Burn Update.img Firmware

Step 1: Unzip *RKDevTool.rar* on Windows.

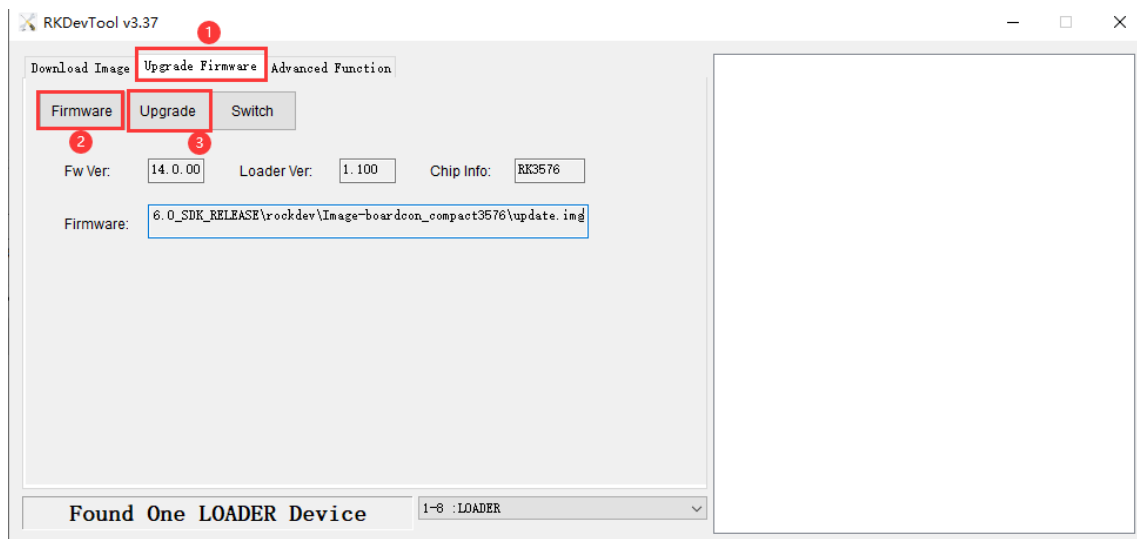
Step 2: Open *RKDevTool\RKDevTool_Release\RKDevTool.exe*.

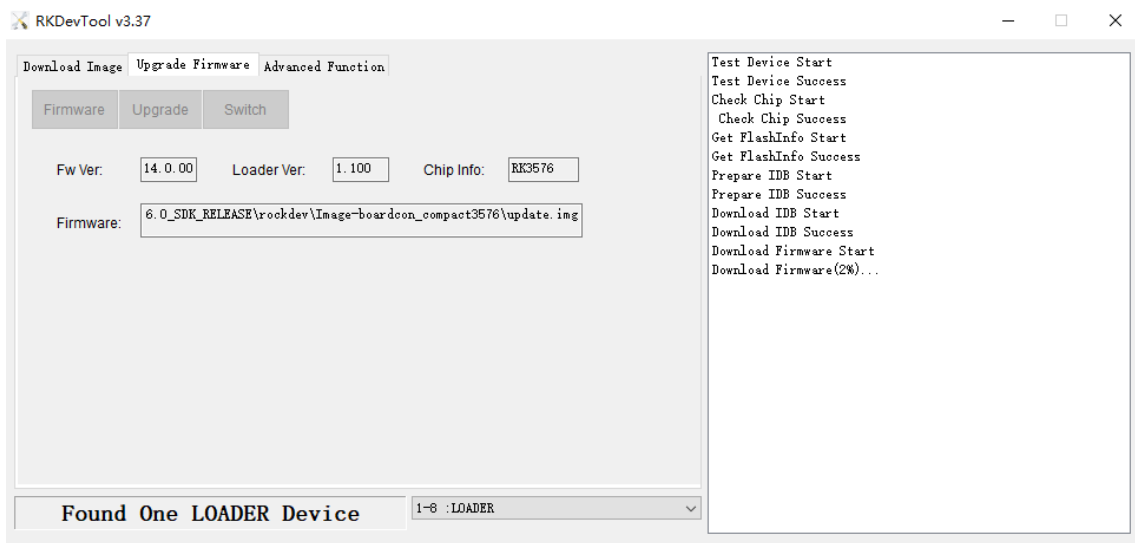


Step 3: Switch to loader mode. ([How to Enter Loader Mode](#))



Step 4: Click Upgrade Firmware -> Firmware, select **update.img**, then click Upgrade to flash.





After the flashing is complete, the board will automatically reboot.

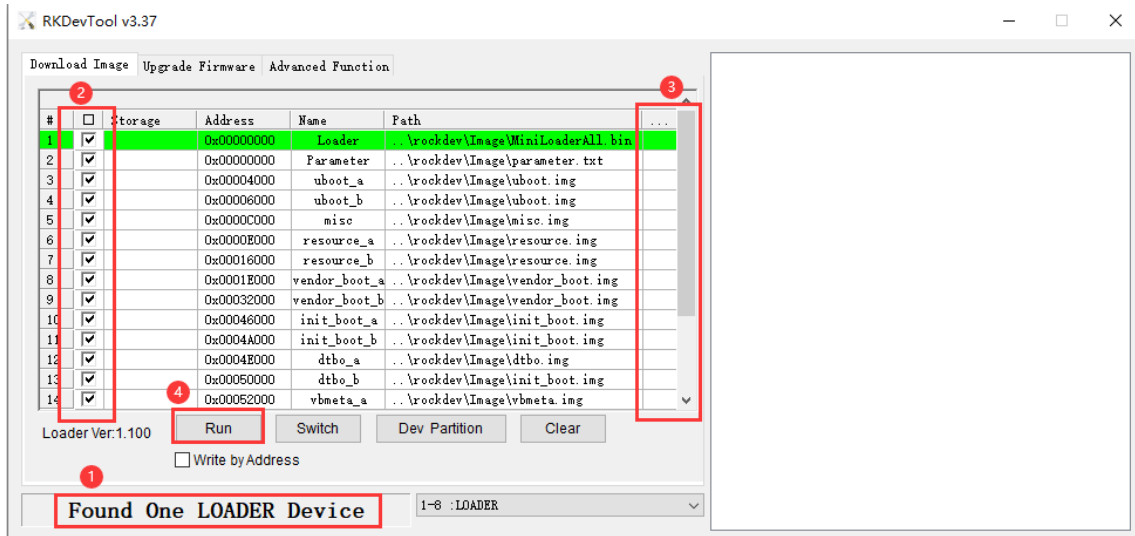
3.2.2 Burn Split Firmware

Step 1: Switch to **Loader mode**.

Step 2: Check the partitions to be flashed, multiple partitions can be selected.

Step 3: Ensure the image file path is correct. If necessary, click the blank cell next to the path to reselect it.

Step 4: Click the **Run** button to flash the image.



Note

① Without burning the [parameter.txt](#) file, please check the "Write by Address" checkbox, otherwise the flashing may fail with the "Image is larger than partition size" error.

4. Development Environment

4.1 Preparing the Development Environment

It is recommended to use Ubuntu 22.04 or higher version for compilation. If you encounter an error during compilation, user can check the error message and install the corresponding software packages accordingly. Other Linux versions may need to adjust the software package accordingly. In addition to the system requirements, there are other hardware and software requirements.

Hardware requirements	Software requirements
64-bit system, hard disk space should be greater than 500G. If you do multiple builds, you will need more hard drive space.	Ubuntu 22.04

4.2 Installing Libraries and Toolkits

The contents of this directory only provide the software package installation commands that are needed to build the compiled SDK environment. Please install other tools such as samba and ssh by yourself.

PC OS	Network	Permission
Ubuntu 22.04	online	root

Execute the following commands to install the required tools:

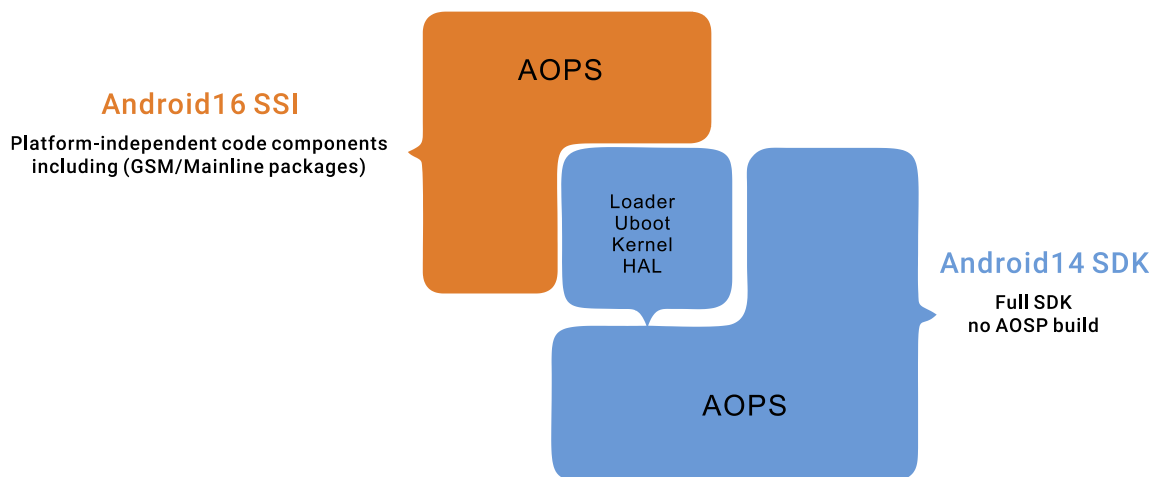
```
$ sudo apt-get install u-boot-tools
$ sudo apt-get install git gnupg flex bison gperf build-essential zip curl libc6-
dev libncurses5-dev:i386 x11proto-core-dev libx11-dev:i386 libreadline6-dev:i386
libgl1-mesa-dri:i386 libgl1-mesa-dev g++-multilib tofrodos libxml2-utils xsltproc
zlib1g-dev:i386 dpkg-dev
$ sudo apt-get install libncurses5-dev
$ sudo apt-get install libsdl1.2-dev
$ sudo apt-get install lib32z-dev ccache
$ sudo apt-get install python3-pyelftools
$ sudo apt-get install libssl-dev libmpc-dev
$ sudo apt-get install liblz4-tool
$ sudo apt-get install expect g++ patchelf chrpath gawk texinfo chrpath diffstat
$ sudo apt-get install binfmt-support live-build bison flex fakeroot libgmp-dev
$ sudo apt-get install cmake gcc-multilib g++-multilib unzip device-tree-compiler
$ sudo apt-get install ncurses-dev libgucharmap-2-90-dev bzip2 expat gpgv2
$ sudo apt-get install cpp-aarch64-linux-gnu g++-aarch64-linux-gnu
$ sudo apt install python2 python-is-python3
$ sudo ln -s /usr/bin/python3 /usr/bin/python
$ sudo apt-get install device-tree-compiler
$ sudo apt install apt-file
$ sudo apt-file update
$ sudo apt install libncurses5
$ sudo apt-file find libncurses.so.5
$ sudo apt-get install binfmt-support qemu-user-static live-build
```

5. Compile Source

Rockchip Android 16.0 SSI SDK only releases aosp code, and after compilation it only generates system-related images such as system.img, system_ext.img, product.img, which are identical to Google's GSI

firmware. Other parts of the code need to be compiled using the Android 14 SDK, so Rockchip Android16.0 SSI SDK needs to be used in conjunction with the Android 14 SDK.

-- The architecture diagram of the complete SDK composed of Rockchip Android 16.0 SSI SDK and Android14 SDK is as follows:



Step 1: Unzip the Source

Execute the following commands to extract the source files:

```
$ mkdir RK3676_Android16.0
$ tar xvf rk3576_android14_sdk-20260528.tar.gz -C RK3676_Android16.0
$ tar xvf Rockchip_Android16.0_SDK_RELEASE.tar.gz -C RK3676_Android16.0
$ cd RK3676_Android16.0/Rockchip_Android16.0_SDK_RELEASE/
```

Step 2: Configure the Compiled Board

Execute the following commands to configure the board:

```
$ source build/envsetup.sh
$ lunch ssi_16_arm64-bp2a-userdebug
```

Step 3: Link Android 14 SDK and configure compilation parameters

```
$ rkbuild_setup
```

```
wuguankang@boardcon:~/opt/RK3576/RK3576_Android16.0/Rockchip_Android16.0_SDK_RELEASE$ rkbuild_setup
[WARN] rkbuild_setup -d <kernel_dts> -l <vendor_lunch> -f <build_number> -p <vendor_sdk_path> -j <build_thread>
Enter parameters in format or press Enter to input interactively:
/home/wuguankang/opt/RK3576/RK3576_Android16.0/RK3576_Android14_SDK_RKR8.1/wuguankang/opt/RK3576/RK3576_Android16.0/RK3576_Android14_SDK_RKR8.1
# Please enter the path of the Android 14 SDK here
[WARN] Android_VENDOR_SDK available lunch options:
You're building on Linux
Lunch menu .. Here are the common combinations:
  1. aosp_arm-eng
  2. aosp_arm64-eng
  3. aosp_x86-eng
  4. aosp_x86_64-eng
  5. boardcon_compact3576-user
  6. boardcon_compact3576-userdebug
  7. boardcon_RK3676-user
  8. boardcon_RK3676-userdebug
  9. boardcon_idea3576-user
 10. boardcon_idea3576-userdebug
 11. rk3576_ebook-user
 12. rk3576_ebook-userdebug
 13. rk3576_ebookcolor-user
 14. rk3576_ebookcolor-userdebug
 15. rk3576_u-user
 16. rk3576_u-userdebug
 17. rk3576s_u-user
 18. rk3576s_u-userdebug

boardcon_compact3576-userdebugfor Android_VENDOR_SDK (e.g., rk3588_u-user): boardcon_compact3576-userdebug #Select
boardcon_compact3576-userdebug
Specify build number? (Press Enter to auto-generate, or input a specific build number): # Enter the build number
here. You can simply press Enter without filling it in.
```

Step 4: Compilation

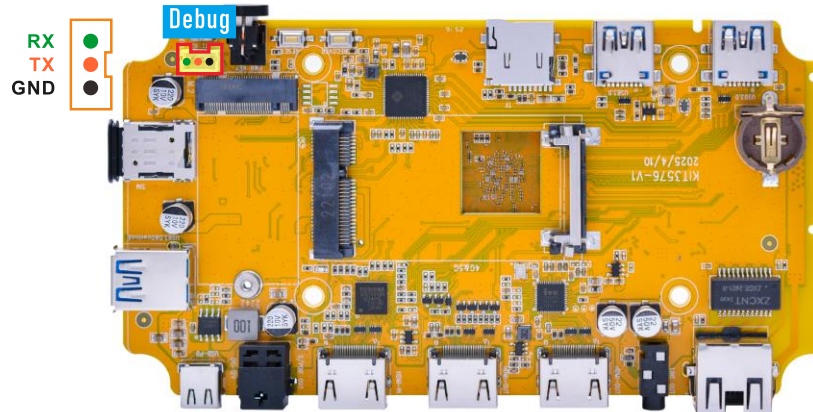
```
$ rkbuild_build all
```

Images and **update.img** are generated in

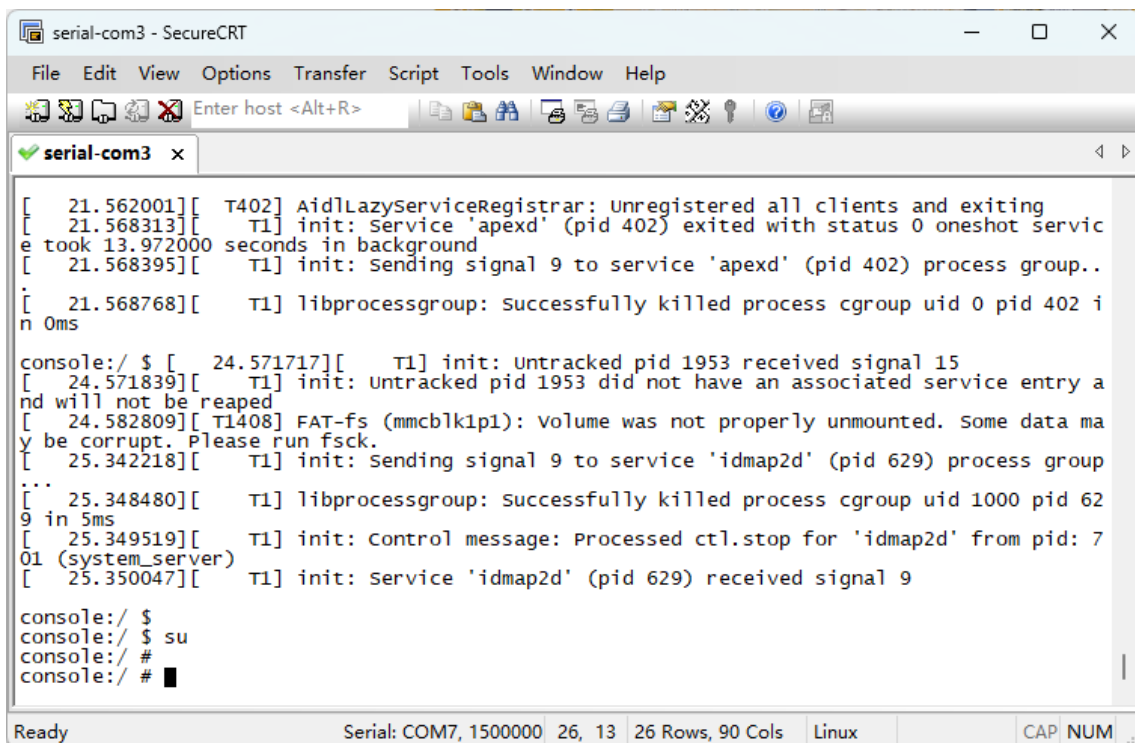
Rockchip_Android16.0_SDK_RELEASE/rockdev/Image-boardcon_compact3576/
directory.

6. Android16 Test

6.1 Serial Terminal



Connect the board and PC with USB Serial cable, then power on, the terminal will output boot information. The default baudrate is 1500000.



```

serial-com3 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com3 x
[ 21.562001][ T402] AidLazyServiceRegistrar: unregistered all clients and exiting
[ 21.568313][ T1] init: Service 'apexd' (pid 402) exited with status 0 oneshot service took 13.972000 seconds in background
[ 21.568395][ T1] init: Sending signal 9 to service 'apexd' (pid 402) process group..
[ 21.568768][ T1] libprocessgroup: successfully killed process cgroup uid 0 pid 402 in 0ms
console:/ $ [ 24.571717][ T1] init: untracked pid 1953 received signal 15
[ 24.571839][ T1] init: untracked pid 1953 did not have an associated service entry and will not be reaped
[ 24.582809][ T1408] FAT-fs (mmcblk1p1): volume was not properly unmounted. Some data may be corrupt. Please run fsck.
[ 25.342218][ T1] init: Sending signal 9 to service 'idmap2d' (pid 629) process group
...
[ 25.348480][ T1] libprocessgroup: successfully killed process cgroup uid 1000 pid 629 in 5ms
[ 25.349519][ T1] init: Control message: Processed ctl.stop for 'idmap2d' from pid: 701 (system_server)
[ 25.350047][ T1] init: service 'idmap2d' (pid 629) received signal 9
console:/ $
console:/ $ su
console:/ #
console:/ #
  
```

Enter “su” into the root user interface.

6.2 Display



Compact3576 supports dual HDMI output for display.

6.3 USB OTG(Loader/ADB/HOST)

6.3.1 ADB

Step 1: Connect the board and PC host with USB OTG cable.

Step 2: Install ADB driver on Windows system.

Step 3: Press **Windows + R** to open the Run program. Type “cmd” and press Enter.

Step 4: Execute the following command to enable ADB.

```
# adb root
# adb remount
# adb shell
```

6.3.2 HOST

Step 1, Use the command to switch the USB OTG to the host mode.

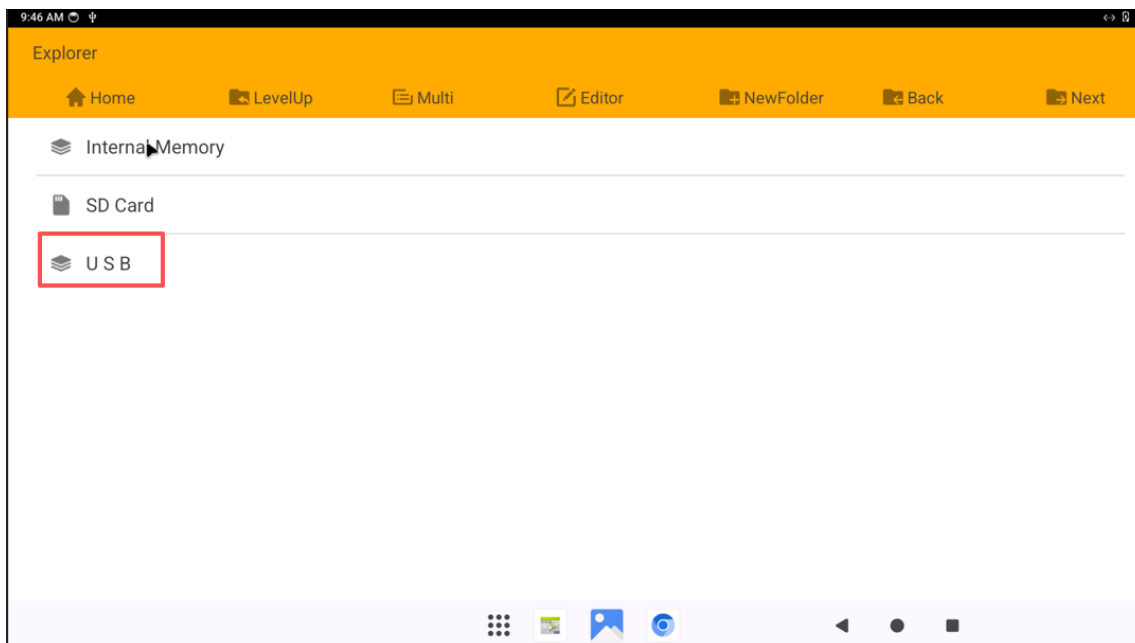
```
# echo host > /sys/kernel/debug/usb/23000000.usb/mode
```

```
console:/ # echo host > /sys/kernel/debug/usb/23000000.usb/mode
console:/ # [ 898.270108][ T129] dwc3 23000000.usb: request 0000000000000000 was not queued to ep0out
[ 898.274149][ T2395] android_work: did not send uevent (0 0 0000000000000000)
[ 898.315761][ T865] read descriptors
[ 898.315843][ T865] read strings
[ 898.385803][ T129] phy phy-2602e000.syscon:usb2-phy@0.6: illegal mode
[ 898.385950][ T129] xhci-hcd xhci-hcd.10.auto: xHCI Host Controller
[ 898.386063][ T129] xhci-hcd xhci-hcd.10.auto: new USB bus registered, assigned bus number 3
[ 898.386425][ T129] xhci-hcd xhci-hcd.10.auto: hcc params 0x0220fe64 hci version 0x110 quirks 0x0000008002010010
[ 898.386548][ T129] xhci-hcd xhci-hcd.10.auto: irq 89, io mem 0x23000000
[ 898.387864][ T129] xhci-hcd xhci-hcd.10.auto: xHCI Host Controller
[ 898.387973][ T129] xhci-hcd xhci-hcd.10.auto: new USB bus registered, assigned bus number 4
[ 898.388051][ T129] xhci-hcd xhci-hcd.10.auto: Host supports USB 3.0 SuperSpeed
[ 898.388651][ T129] usb usb3: New USB device found, idVendor=1d6b, idProduct=0002, bcdDevice= 6.01
[ 898.388708][ T129] usb usb3: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 898.388756][ T129] usb usb3: Product: xHCI Host Controller
[ 898.388797][ T129] usb usb3: Manufacturer: Linux 6.1.145-android14-11-g4f184da362d5-ab14200214 xhci-hcd
[ 898.388840][ T129] usb usb3: SerialNumber: xhci-hcd.10.auto
[ 898.394280][ T129] hub 3-0:1.0: USB hub found
[ 898.394601][ T129] hub 3-0:1.0: 1 port detected
[ 898.399518][ T129] usb usb4: We don't know the algorithms for LPM for this host, disabling LPM.
[ 898.399924][ T129] usb usb4: New USB device found, idVendor=1d6b, idProduct=0003, bcdDevice= 6.01
[ 898.399962][ T129] usb usb4: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 898.399995][ T129] usb usb4: Product: xHCI Host Controller
[ 898.400024][ T129] usb usb4: Manufacturer: Linux 6.1.145-android14-11-g4f184da362d5-ab14200214 xhci-hcd
[ 898.400053][ T129] usb usb4: SerialNumber: xhci-hcd.10.auto
[ 898.404855][ T129] hub 4-0:1.0: USB hub found
[ 898.405080][ T129] hub 4-0:1.0: 1 port detected
```

Step 2, Inserting a USB 3.0 flash drive for testing.

```
[ 250.563571][ T128] usb 4-1: new SuperSpeed USB device number 2 using xhci-hcd
[ 250.593964][ T128] usb 4-1: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 250.594101][ T128] usb 4-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 250.594151][ T128] usb 4-1: Product: OnlyDisk
[ 250.594194][ T128] usb 4-1: Manufacturer: Netac
[ 250.594235][ T128] usb 4-1: SerialNumber: C0E8BFA3EC38F796
[ 250.597369][ T128] usb-storage 4-1:1.0: USB Mass Storage device detected
[ 250.598792][ T128] scsi host0: usb-storage 4-1:1.0
[ 251.136493][ T865] read descriptors
[ 251.136654][ T865] read strings
[ 251.917493][ T128] scsi 0:0:0:0: Direct-Access    Netac    OnlyDisk        8.01 PQ: 0 ANSI: 6
[ 251.920682][ T128] sd 0:0:0:0: Attached scsi generic sg0 type 0
[ 251.922370][ T10] sd 0:0:0:0: [sda] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 251.922654][ T10] sd 0:0:0:0: [sda] Write Protect is off
[ 251.922927][ T10] sd 0:0:0:0: [sda] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[ 251.927819][ T10] sda: sda1
[ 251.929314][ T10] sd 0:0:0:0: [sda] Attached SCSI removable disk
[ 252.195629][ T865] read descriptors
[ 252.195715][ T865] read strings
[ 252.438751][ T1] init: Untracked pid 2443 received signal 15
[ 252.438871][ T1] init: Untracked pid 2443 did not have an associated service entry and will not be reaped
[ 252.452689][ T2446] FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please run fsck.
```

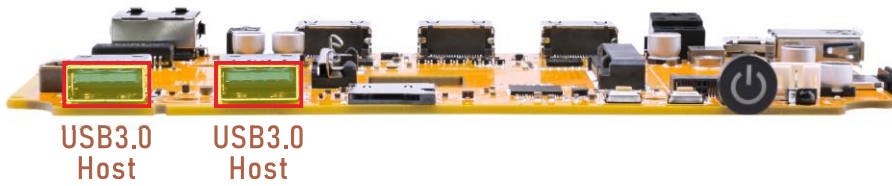
After connecting the USB flash drive, if the device is successfully recognized, user can browse USB flash drive files through the file browser "**Explorer**".



If the USB OTG is switched to the device mode, the following command needs to be executed.

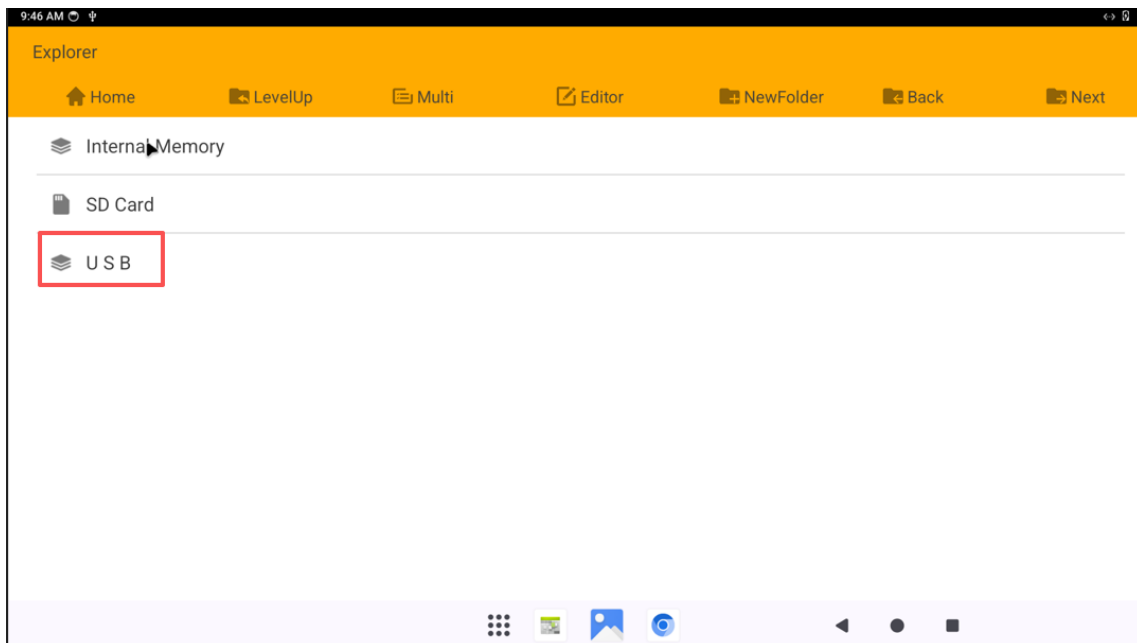
```
# echo device> /sys/kernel/debug/usb/23000000.usb/mode
```

6.4 USB 3.0



Compact3576 supports two USB 3.0 hosts.

After connecting the USB flash drive, if the device is successfully recognized, user can browse USB flash drive files through the file browser "**Explorer**".



The user can identify whether the mounted flash drive is USB 2.0 or USB 3.0 from the debug log.

- USB2.0 print information in **high-speed** mode.

```
[ 1043.769493][ T263] usb 1-1.3: new high-speed USB device number 4 using xhci-hcd
[ 1043.871983][ T263] usb 1-1.3: New USB device found, idVendor=346d, idProduct=5678, bcdDevice= 2.00
[ 1043.872139][ T263] usb 1-1.3: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 1043.872191][ T263] usb 1-1.3: Product: Disk 2.0
[ 1043.872234][ T263] usb 1-1.3: Manufacturer: HIKSEMI
[ 1043.872276][ T263] usb 1-1.3: SerialNumber: 7896431044660721636
[ 1043.880158][ T263] usb-storage 1-1.3:1.0: USB Mass Storage device detected
[ 1043.882498][ T263] usb-storage 1-1.3:1.0: Quirks match for vid 346d pid 5678: 420
[ 1043.882958][ T263] scsi host0: usb-storage 1-1.3:1.0
[ 1044.903851][ T263] scsi 0:0:0:0: Direct-Access    HIKSEMI   ProductCode    2.00 PQ: 0 ANSI: 4
[ 1044.908836][ T91] sd 0:0:0:0: [sda] 122880000 512-byte logical blocks: (62.9 GB/58.6 GiB)
[ 1044.909239][ T91] sd 0:0:0:0: [sda] Write Protect is off
[ 1044.909633][ T263] sd 0:0:0:0: Attached scsi generic sg0 type 0
[ 1044.910066][ T91] sd 0:0:0:0: [sda] No Caching mode page found
[ 1044.910090][ T91] sd 0:0:0:0: [sda] Assuming drive cache: write through
[ 1044.917718][ T91] sda: sda1
[ 1044.921043][ T91] sd 0:0:0:0: [sda] Attached SCSI removable disk
```

- USB3.0 print information in **SuperSpeed** mode.

```
[ 1220.197960][ T2345] usb 2-1.4: new SuperSpeed USB device number 4 using xhci-hcd
[ 1220.228960][ T2345] usb 2-1.4: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 1220.229096][ T2345] usb 2-1.4: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 1220.229147][ T2345] usb 2-1.4: Product: OnlyDisk
[ 1220.229189][ T2345] usb 2-1.4: Manufacturer: Netac
[ 1220.229231][ T2345] usb 2-1.4: SerialNumber: C0E8BFA3EC38F796
[ 1220.235838][ T2345] usb-storage 2-1.4:1.0: USB Mass Storage device detected
[ 1220.238224][ T2345] scsi host0: usb-storage 2-1.4:1.0
[ 1221.968607][ T2345] scsi 0:0:0:0: Direct-Access    Netac    OnlyDisk      8.01 PQ: 0 ANSI: 6
[ 1221.973527][ T2345] sd 0:0:0:0: Attached scsi generic sg0 type 0
[ 1221.974364][ T2323] sd 0:0:0:0: [sda] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 1221.974684][ T2323] sd 0:0:0:0: [sda] Write Protect is off
[ 1221.981829][ T2323] sd 0:0:0:0: [sda] Write cache: disabled, read cache: enabled, doesn't support DPO
or FUA
[ 1221.987101][ T2323] sda: sda1
[ 1221.988675][ T2323] sd 0:0:0:0: [sda] Attached SCSI removable disk
[ 1225.656778][ T1599] FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please
run fsck.
```

Execute the following commands to view the USB flash disk node, it is mounted to the /mnt/media_rw path.

```
# df -h
```

```

console:/ # df -h
Filesystem                Size  Used Avail Use% Mounted on
tmpfs                     1.9G  1.4M   1.9G   1% /dev
tmpfs                     1.9G   0    1.9G   0% /mnt
/dev/block/mmcblk0p21      62M   34M   28M  56% /metadata
/dev/block/dm-0           1.0G  1.0G   3.1M 100% /
/dev/block/dm-3          236M  236M  756K 100% /vendor
/dev/block/dm-5           3.5M  3.5M   12K 100% /odm
/dev/block/dm-1           11M   11M   36K 100% /system_dlm
/dev/block/dm-2          175M  175M  540K 100% /system_ext
/dev/block/dm-4           19M   19M   60K 100% /vendor_dlm
/dev/block/dm-6          232K   56K  176K  25% /odm_dlm
/dev/block/dm-7          268M  267M  824K 100% /product
tmpfs                     1.9G  16K   1.9G   1% /apex
tmpfs                     1.9G  788K   1.9G   1% /linkerconfig
/dev/block/loop0          764K  736K   28K  97% /apex/com.android.tzdata@34009000
/dev/block/loop1          24M   24M   48K 100% /apex/com.android.vndk.v34@1
/dev/block/loop3          6.7M  6.6M   40K 100% /apex/com.android.runtime@1
/dev/block/loop2          35M   35M   32K 100% /apex/com.android.i18n@1
/dev/block/mmcblk0p20     320M  164K  320M   1% /cache
/dev/block/dm-40         25G  652M   24G   3% /data
tmpfs                     1.9G   0    1.9G   0% /data_mirror
/dev/fuse                 25G  652M   24G   3% /mnt/user/0/emulated
/dev/block/vold/public:179,1 29G  1.1M   29G   1% /mnt/media_rw/7908-0EEA
/dev/fuse                 29G  1.1M   29G   1% /mnt/user/0/7908-0EEA
/dev/block/vold/public:259,19 119G 864K  119G   1% /mnt/media_rw/D8FD-1107
/dev/fuse                 119G 864K  119G   1% /mnt/user/0/D8FD-1107
/dev/block/vold/public:8,1  58G  56G   1.5G  98% /mnt/media_rw/F3AB-0FF3
/dev/fuse                 58G  56G   1.5G  98% /mnt/user/0/F3AB-0FF3
  
```

6.5 Ethernet



Step 1: Connect the network cable to the Ethernet port.

According to the log, the Gigabit Ethernet was recognized successfully.

```

[ 2137.452777][ T3335] rk_gmac-dwmac 2a230000.ethernet eth0: Link is Up - 1Gbps/Full - flow control rx/tx
[ 2137.452980][ T3284] IPv6: ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
  
```

Step 2: View network interface information.

```
# ifconfig
```

```
console:/ # ifconfig
lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope: Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:0 errors:0 dropped:0 overruns:0 frame:0
        TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:0 TX bytes:0

dummy0  Link encap:Ethernet  HWaddr ce:15:08:2e:d0:81
        inet6 addr: fe80::cc15:8ff:fe2e:d081/64 Scope: Link
        UP BROADCAST RUNNING NOARP  MTU:1500  Metric:1
        RX packets:0 errors:0 dropped:0 overruns:0 frame:0
        TX packets:10 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:0 TX bytes:700

eth0    Link encap:Ethernet  HWaddr be:c3:37:8b:f1:c4  Driver rk_gmac-dwmac
        inet addr:192.168.0.224  Bcast:192.168.0.255  Mask:255.255.255.0
        inet6 addr: fe80::e5c7:2a06:b4df:2afd/64 Scope: Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:473 errors:0 dropped:0 overruns:0 frame:0
        TX packets:70 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:50096 TX bytes:8775
        Interrupt:83

console:/ #
```

Note: When eth0 and eth1 are enabled simultaneously, eth0 is dedicated to internal network communication, while eth1 is dedicated to external network communication.

Step 3: Users can test network connectivity using the UI app “**Chromium**” or verify it through the following command.

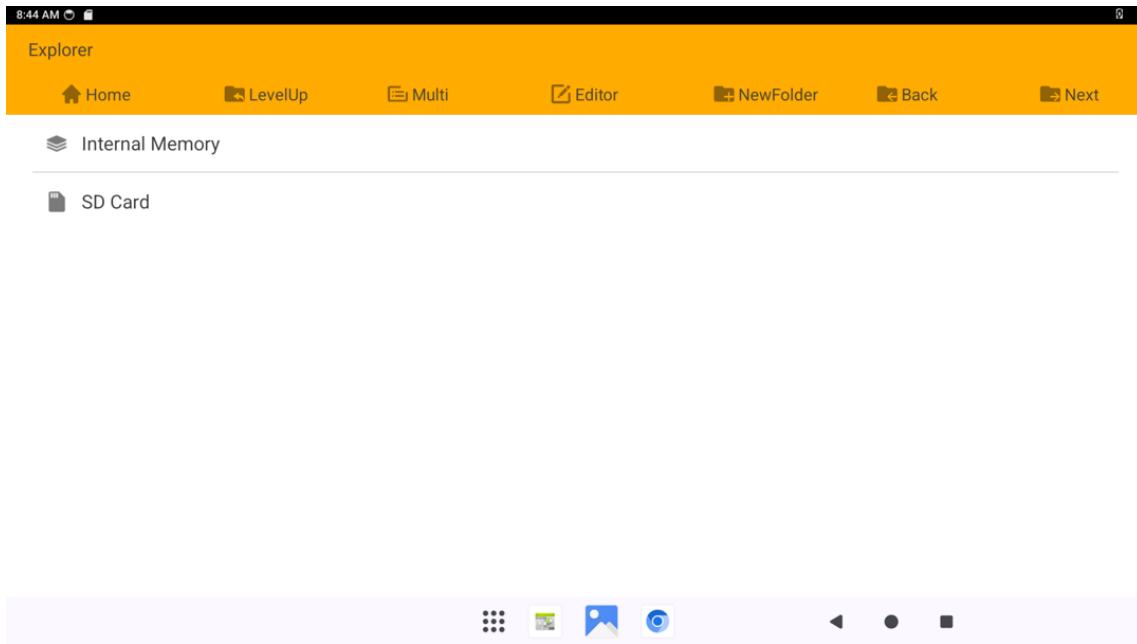
```
ping -I eth0 www.armdesigner.com
```

```
PING d3dsoj86mhwkk6.cloudfront.net (13.249.126.73) from 192.168.0.224 eth0: 56(84) bytes of data.
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=1 ttl=246 time=169 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=2 ttl=246 time=170 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=3 ttl=246 time=169 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=4 ttl=246 time=169 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=5 ttl=246 time=169 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=6 ttl=246 time=171 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=7 ttl=246 time=168 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=8 ttl=246 time=171 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=9 ttl=246 time=169 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=10 ttl=246 time=177 ms
64 bytes from www.armdesigner.com (13.249.126.73): icmp_seq=11 ttl=246 time=169 ms
```

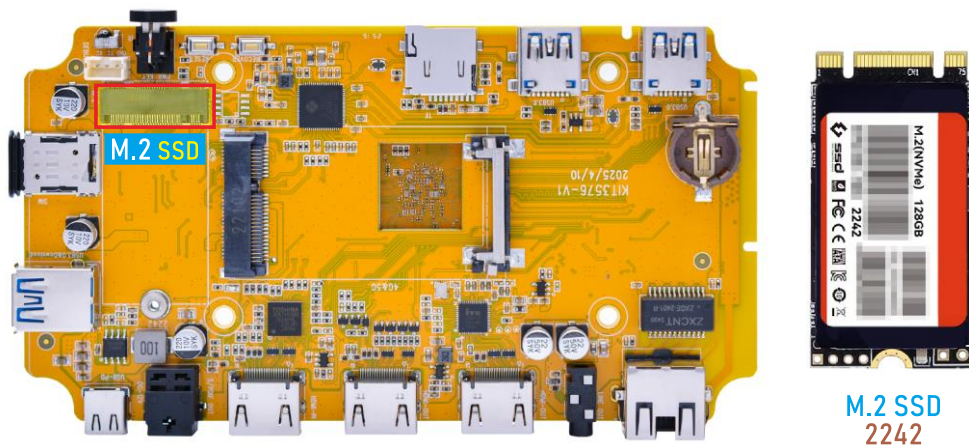
6.6 SD Card

Step 1: Insert the microSD card into the card slot.

Step 2: After inserting the SD card, if it is recognized successfully, User can Browse SATA device files through the file browser “**Explorer**”. Compact3576 supports SD Hot-plug.



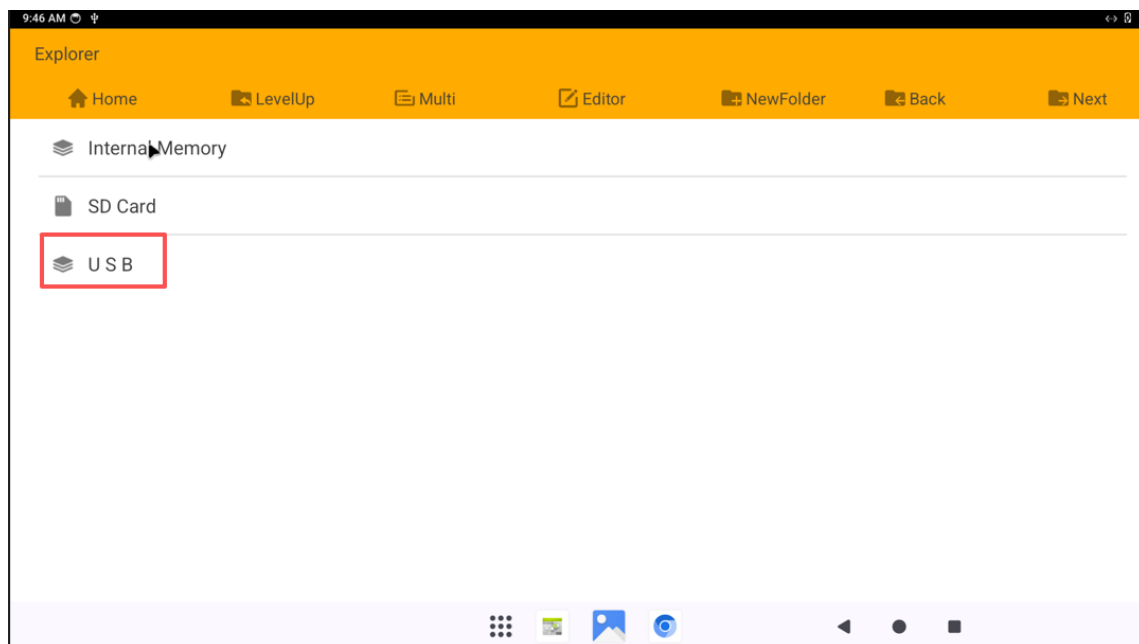
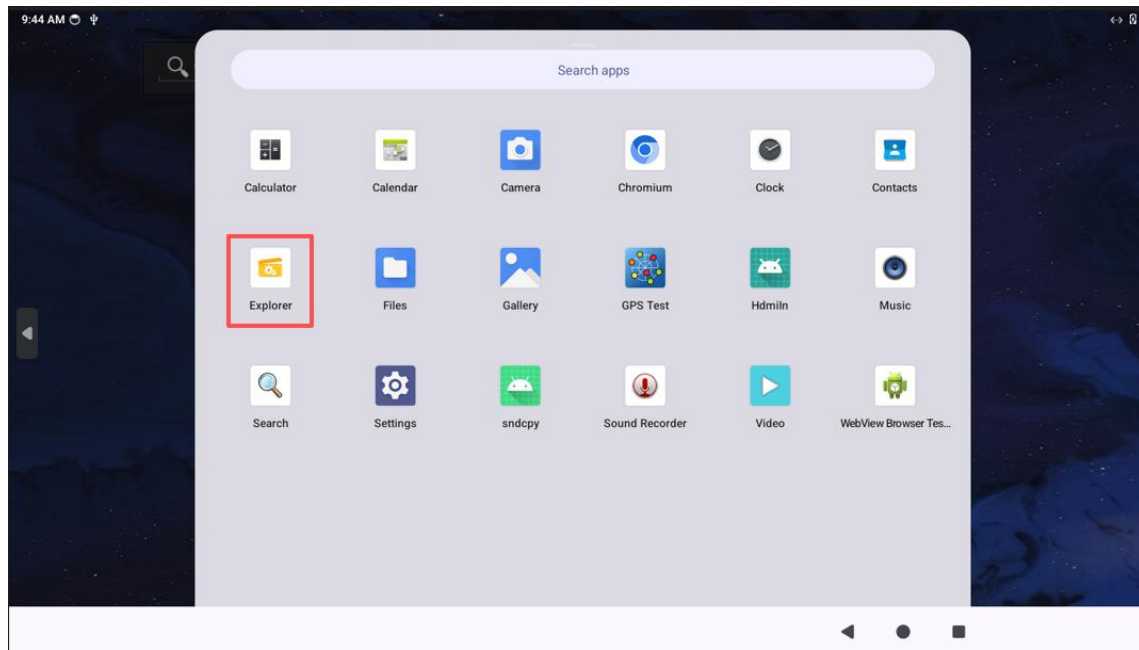
6.7 M.2(M-Key)



The SSD on Android16 only supports the ext4 format.

Step 1: Connect the SSD, then power on.

Step 2: If the SSD device is successfully recognized, User can Browse SSD device files through the file browser “**Explorer**”. Compact576 not support SSD Hot-plug.



Execute the following commands to view the SSD node, it is mounted to the /mnt/media_rw path.

```
# df -h
```

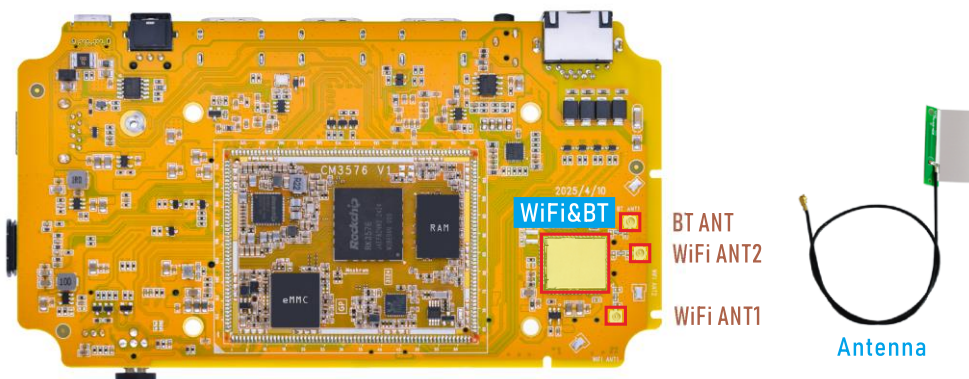
```

console:/ # df -h
Filesystem                Size      Used Avail Use% Mounted on
tmpfs                     1.9G  1.4M    1.9G   1% /dev
tmpfs                     1.9G   0    1.9G   0% /mnt
/dev/block/mmcblk0p21      62M   34M   28M  56% /metadata
/dev/block/dm-0           1.0G  1.0G   3.1M 100% /
/dev/block/dm-3          236M  236M  756K 100% /vendor
/dev/block/dm-5           3.5M   3.5M   12K 100% /odm
/dev/block/dm-1           11M   11M   36K 100% /system_dlk
/dev/block/dm-2          175M  175M  540K 100% /system_ext
/dev/block/dm-4           19M   19M   60K 100% /vendor_dlk
/dev/block/dm-6          232K   56K   176K  25% /odm_dlk
/dev/block/dm-7          268M  267M  824K 100% /product
tmpfs                     1.9G  16K    1.9G   1% /apex
tmpfs                     1.9G 788K    1.9G   1% /linkerconfig
/dev/block/loop0          764K  736K   28K  97% /apex/com.android.tzdata@340090000
/dev/block/loop1          24M   24M   48K 100% /apex/com.android.vndk.v34@1
/dev/block/loop3          6.7M   6.6M   40K 100% /apex/com.android.runtime@1
/dev/block/loop2          35M   35M   32K 100% /apex/com.android.i18n@1
/dev/block/mmcblk0p20     320M  164K  320M   1% /cache
/dev/block/dm-40          25G  645M   24G   3% /data
tmpfs                     1.9G   0    1.9G   0% /data_mirror
/dev/fuse                 25G  645M   24G   3% /mnt/user/0/emulated
/dev/block/vold/public:179,1 29G  1.1M  29G   1% /mnt/media_rw/7908-0EEA
/dev/fuse                 29G  1.1M  29G   1% /mnt/user/0/7908-0EEA
/dev/block/vold/public:259,19 119G  864K  119G   1% /mnt/media_rw/D8FD-1107
/dev/fuse                 119G  864K  119G   1% /mnt/user/0/D8FD-1107
  
```

Note: If devices that are not in ext4 format, the user can choose to format them in the board. After formatting, **the files on the device will be permanently lost**, so please proceed with caution.

```
# mke2fs -t ext4 /dev/block/nvme0n1p1
```

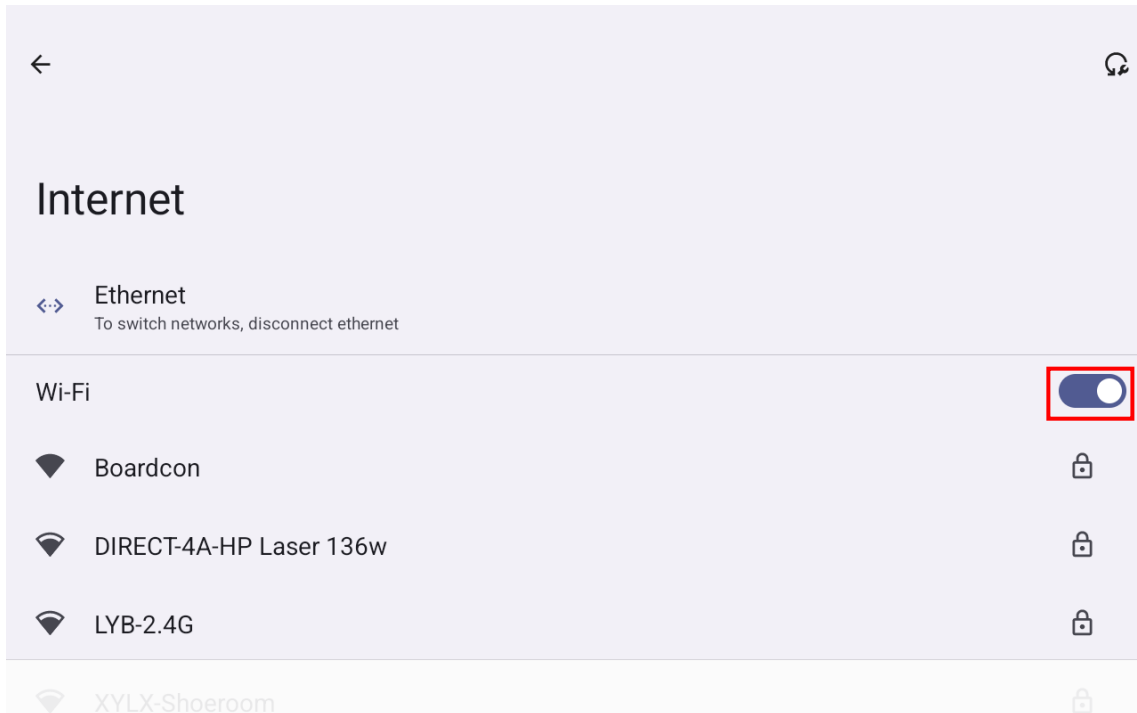
6.8 WiFi & Bluetooth



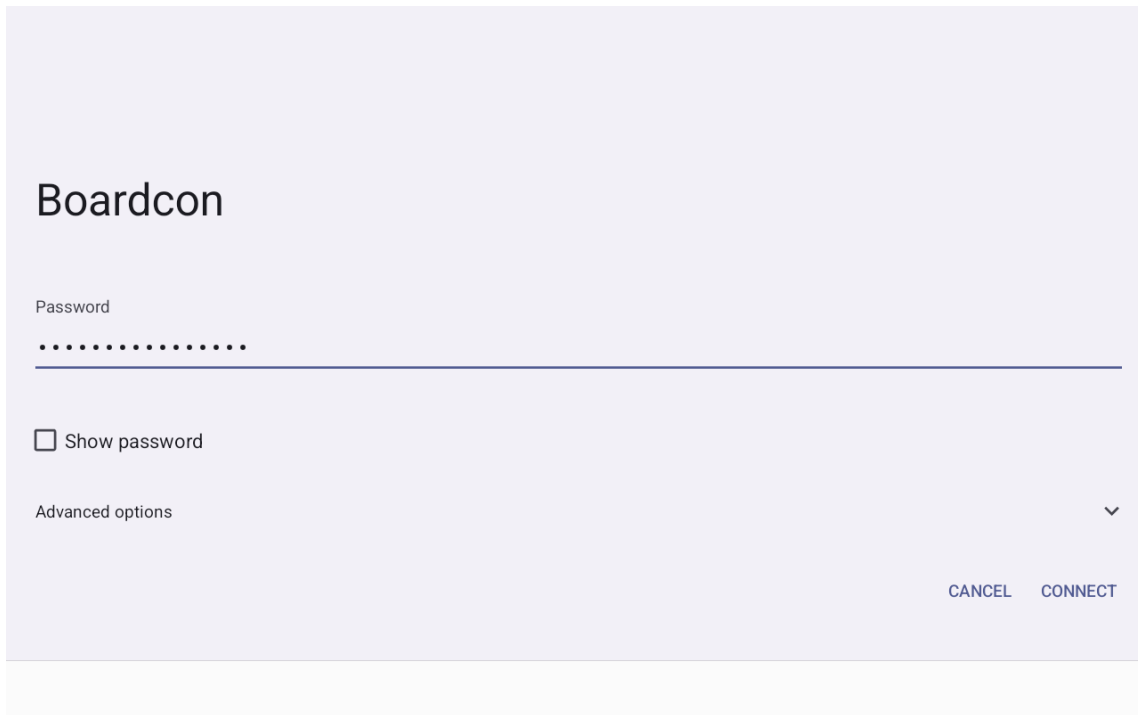
To use Wi-Fi and Bluetooth functions properly, the antenna needs to be connected.

6.8.1 WiFi

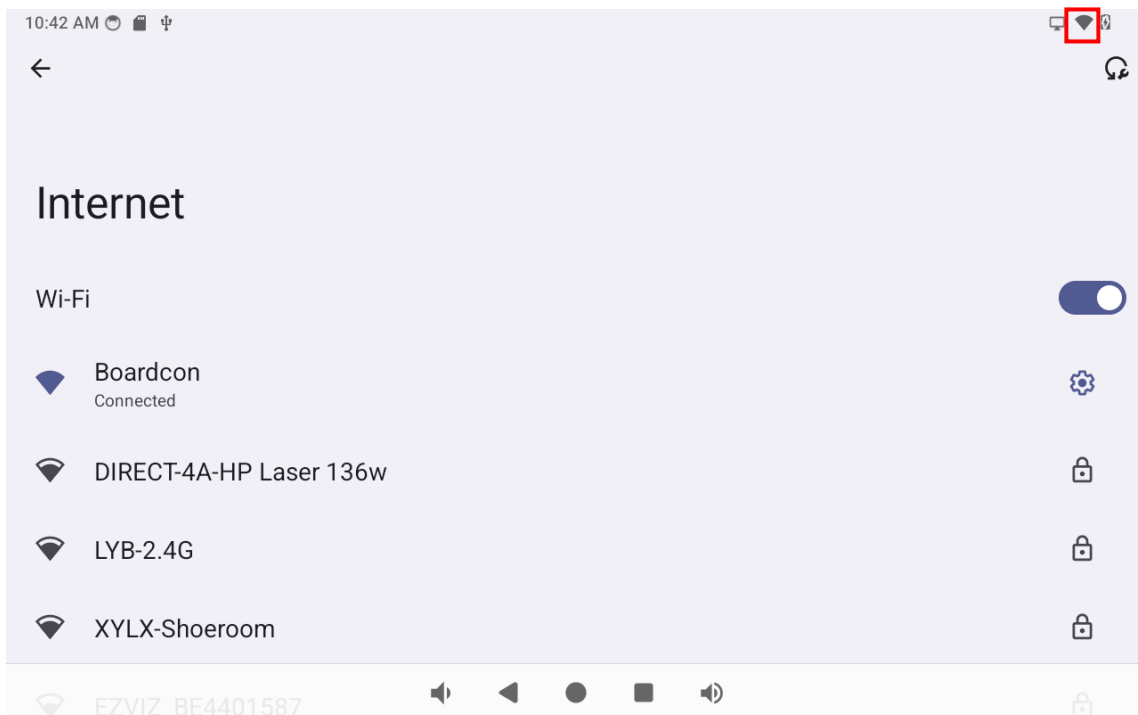
Step 1: Open “**Settings > Network & internet > Internet > Wi-Fi**” turn on and connect WIFI.



Step 2: Select the SSID from the list of available networks and enter the password.



Step 3: After the WiFi successfully connects to the SSID, the system will display the corresponding connection status icon in the top right corner.



Step 4: Users can test network connectivity using the UI browser or verify it through the

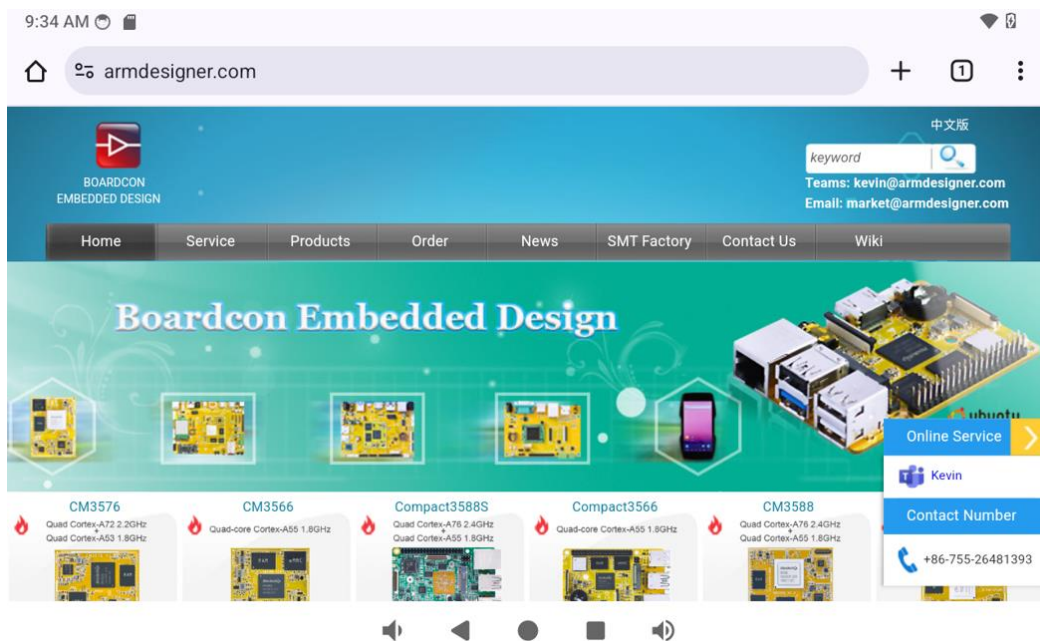
following command.

(1) View network interface information.

```
# ifconfig
```

```
console:/ # ifconfig
wlan0    Link encap:Ethernet  HWaddr 38:7a:cc:2a:09:33  Driver rtl88x2cs
         inet addr:192.168.0.144  Bcast:192.168.0.255  Mask:255.255.255.0
         inet6 addr: fe80::4b77:5637:e9c3:7d69/64  Scope: Link
         UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
         RX packets:322 errors:0 dropped:1 overruns:0 frame:0
         TX packets:111 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:61593 TX bytes:15157
console:/ #
```

(2) Network connection test.

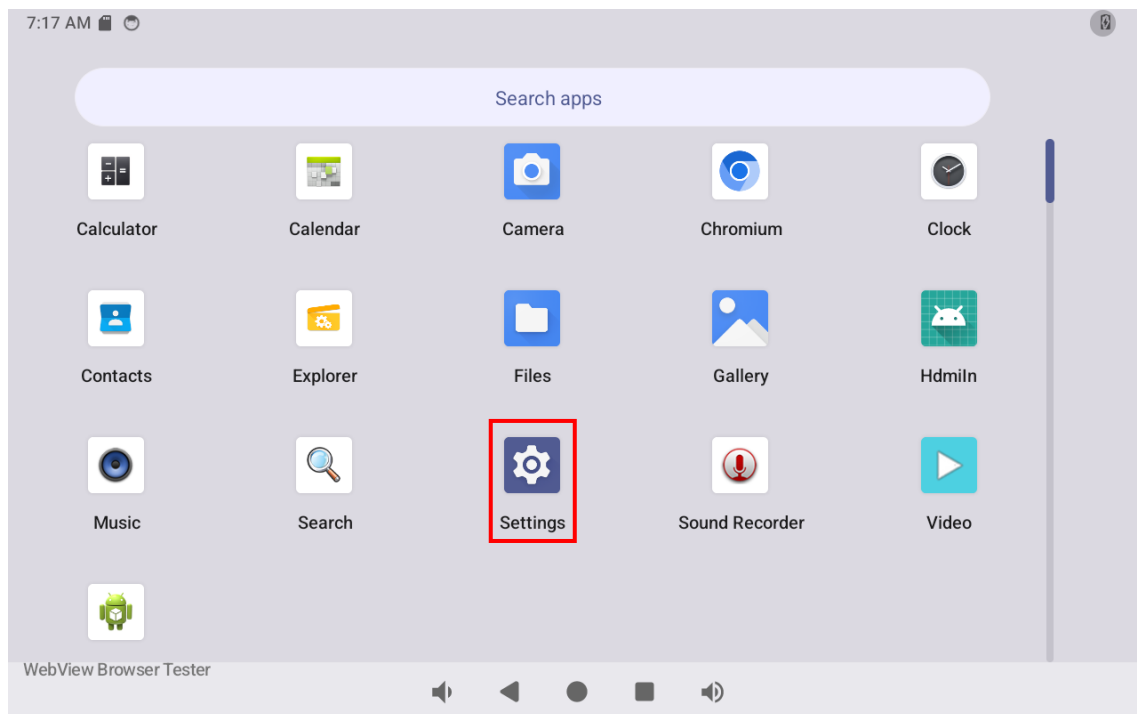


```
# ping -I wlan0 www.armdesigner.com
```

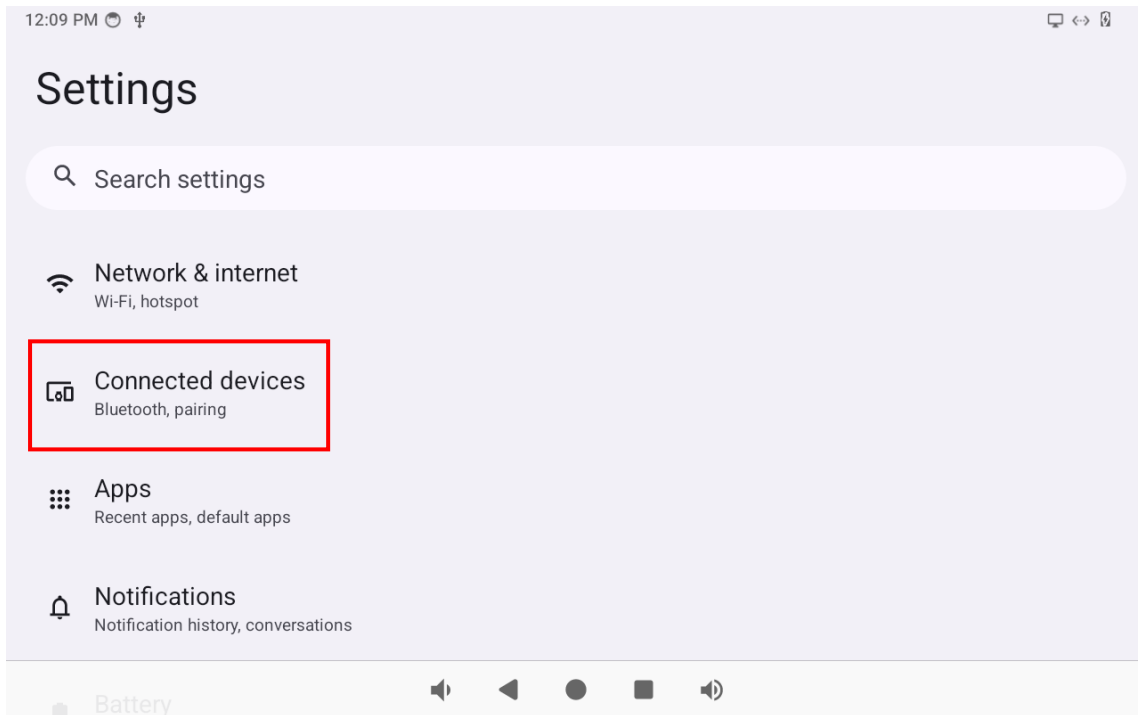
```
console:/ # ping -I wlan0 www.armdesigner.com
PING www.armdesigner.com (67.222.54.196) from 192.168.0.144 wlan0: 56(84) bytes of data.
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=1 ttl=48 time=196 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 ttl=48 time=189 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=3 ttl=48 time=189 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=4 ttl=48 time=225 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=5 ttl=48 time=248 ms
^C
--- www.armdesigner.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4464ms
rtt min/avg/max/mdev = 189.233/209.876/248.002/23.195 ms
console:/ #
```

6.8.2 Bluetooth

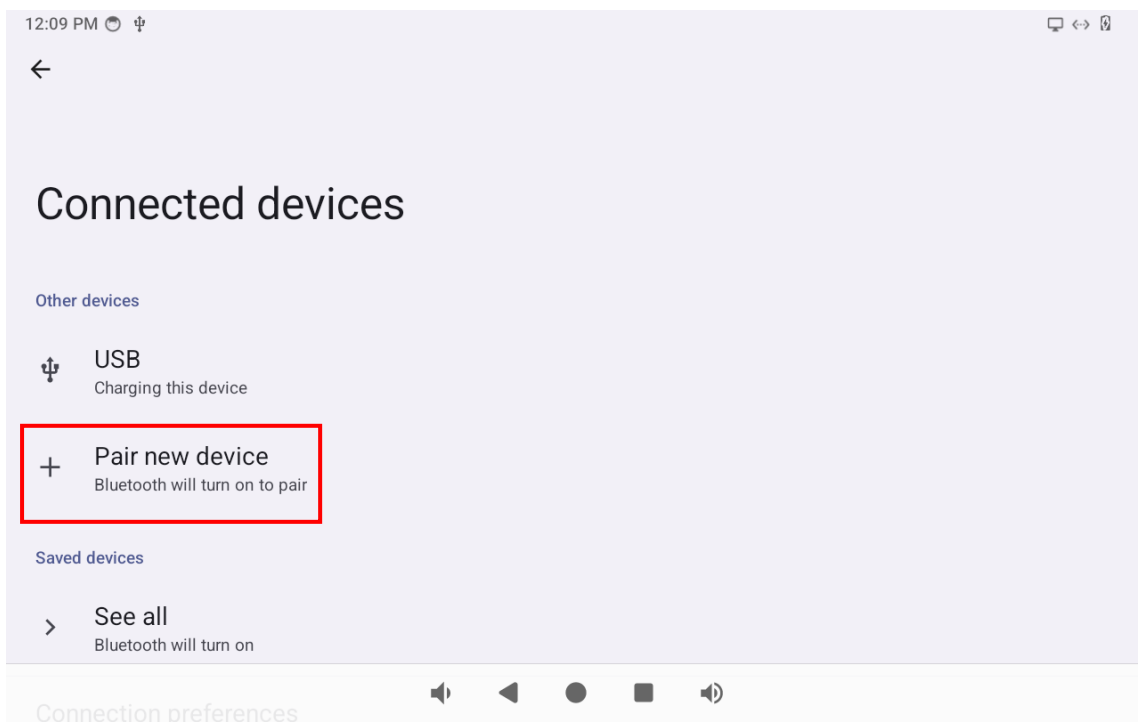
Step 1: Open the **Settings** app.



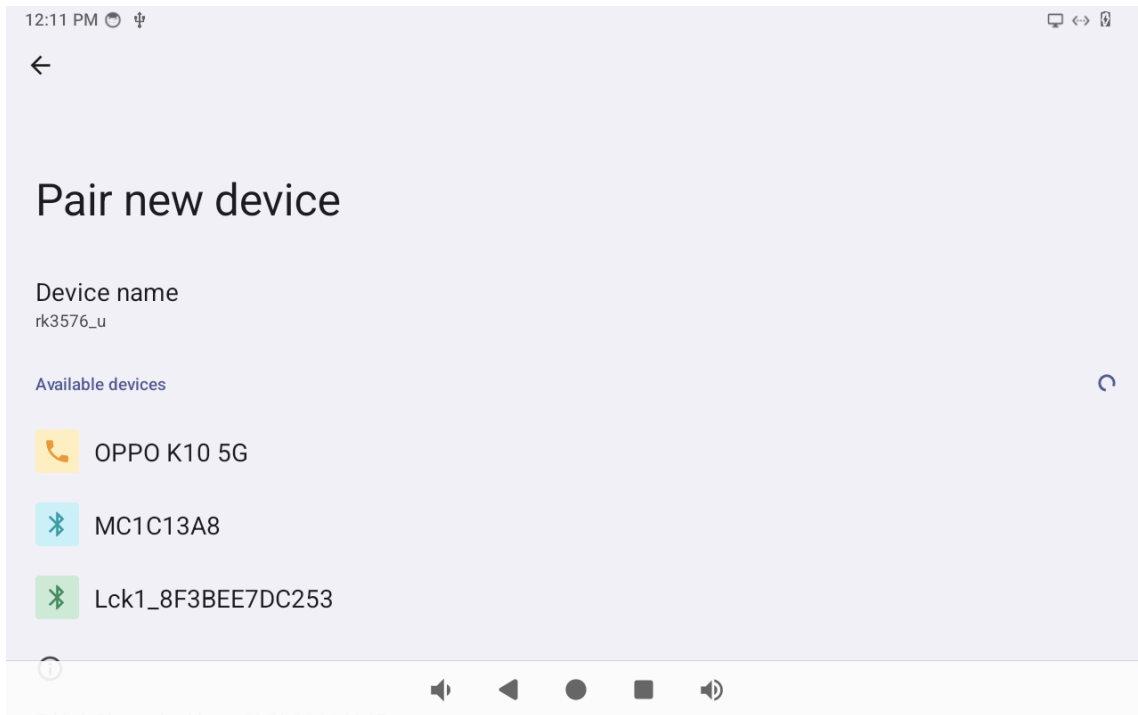
Step 2: Open the **"Connected devices"** option.



Step 3: Open the **"Pair new device"** option, and start scanning for devices.



Step 4: User can pair themselves in the Bluetooth device list.

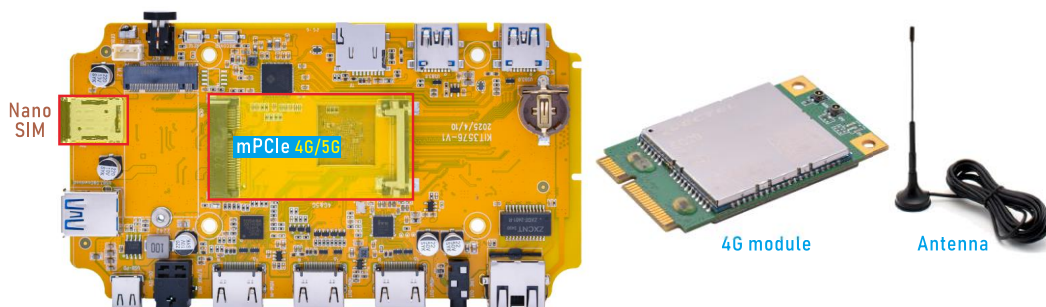


After successful configuration, Bluetooth devices can communicate with each other directly.

6.9 4G & GPS

The update.img on Android14 default supports 4G.

Step 1, Install the EC20 or EC25 module into the mPCIe socket and connect the 4G antenna.

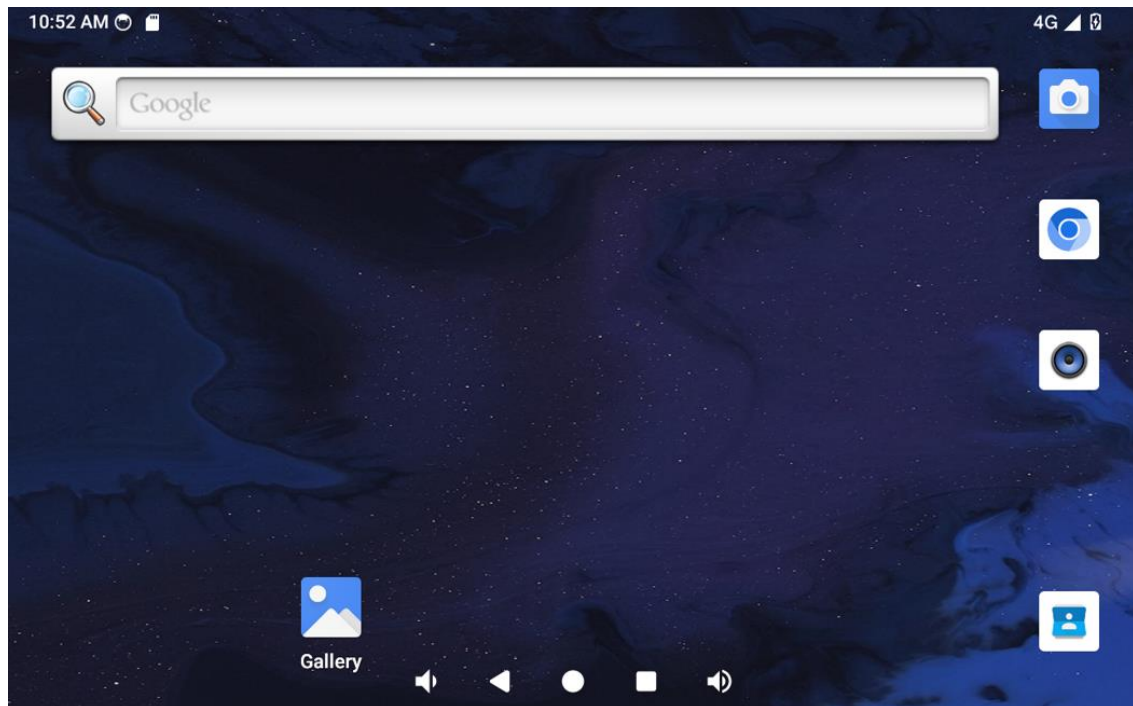


Step 2, Insert SIM card then power on.

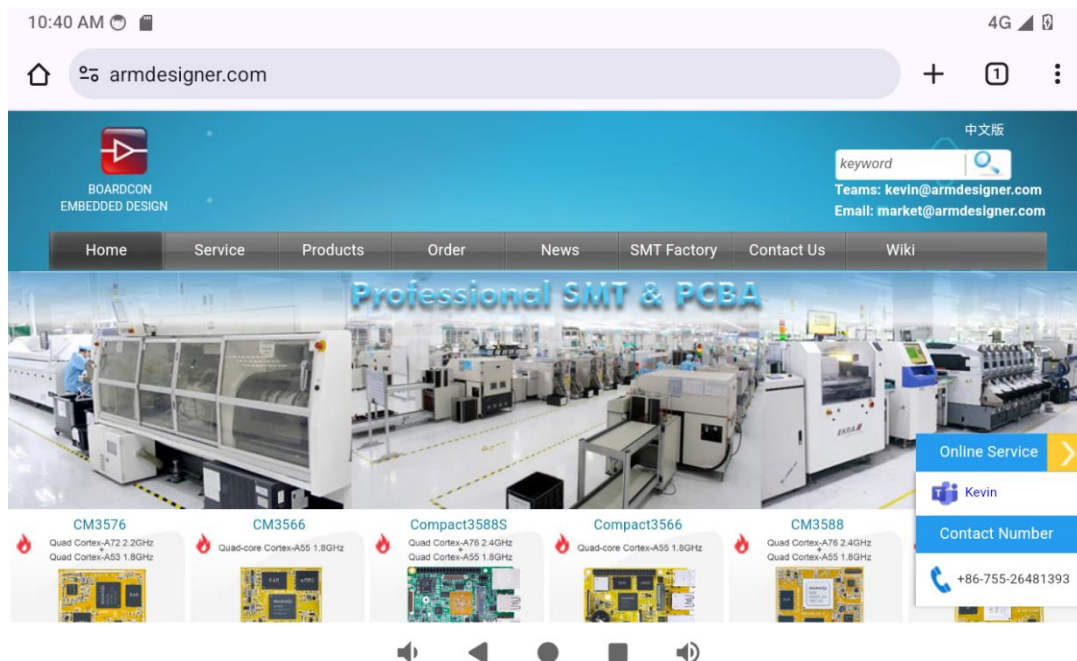
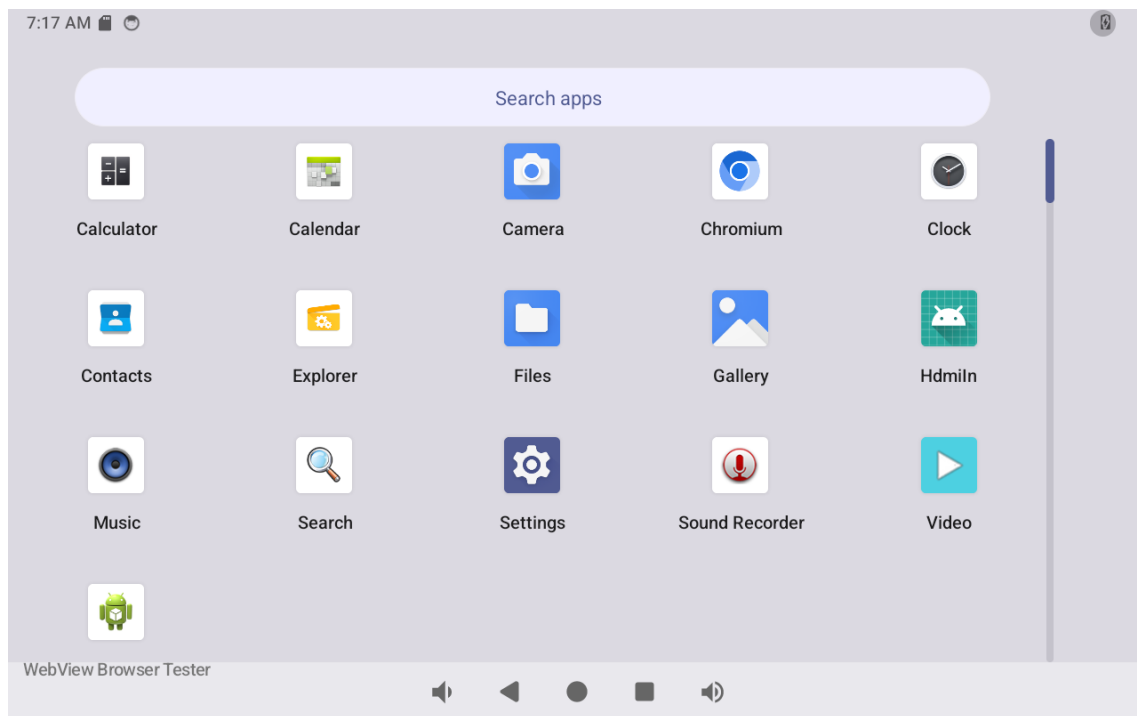
Step 3, Power on.

6.9.1 4G

After boot, the device defaults to 4G mode, and the corresponding icon will appear in the upper right corner of the desktop.



Test the 4G connection:



Users can also choose to use the ping command to test the connectivity of the 4G, as shown below:

(1) View network interface information.

```
# ifconfig
```

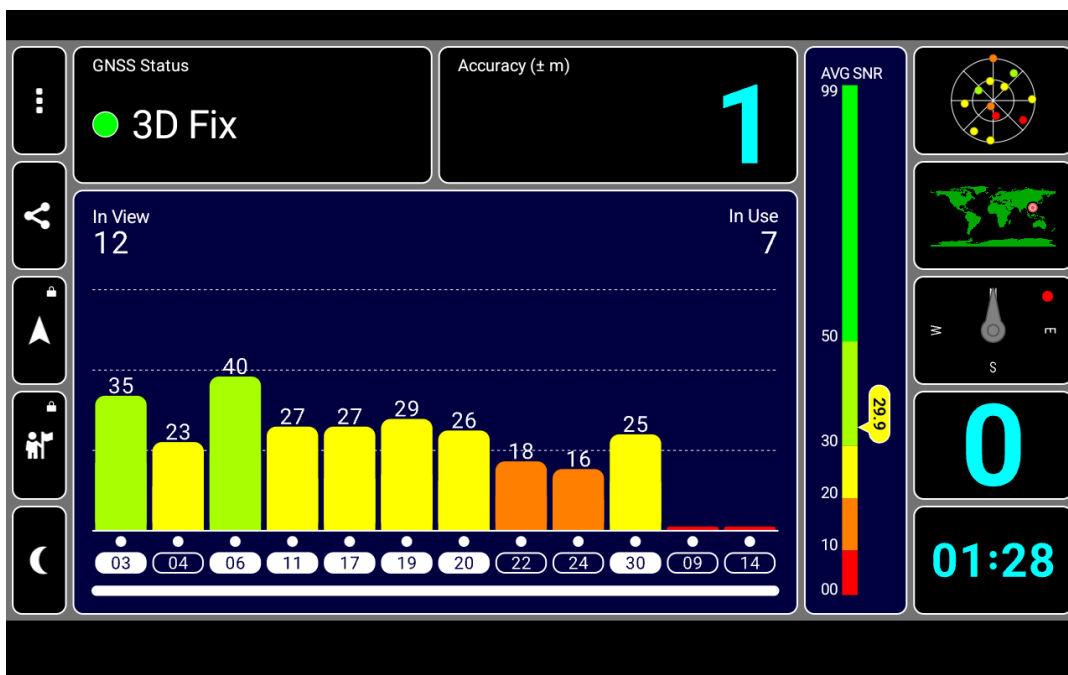
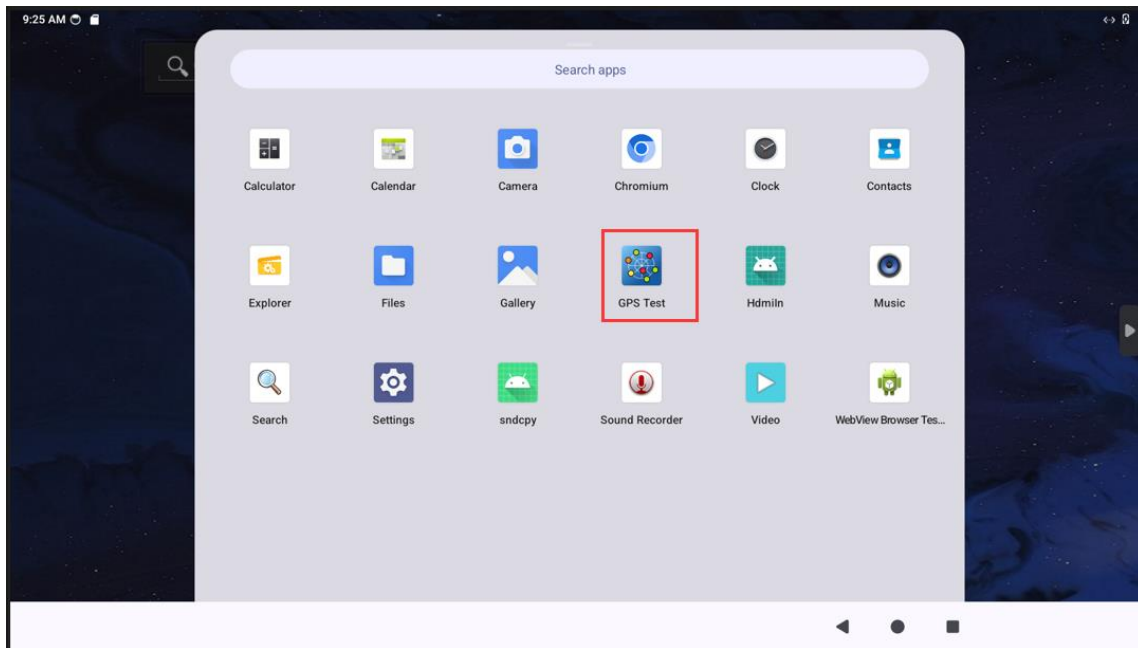
```
console:/ # ifconfig
wwan0    Link encap:Ethernet  HWaddr 2e:0a:be:d3:db:86  Driver qmi_wwan_q
          inet addr:10.79.15.253  Mask:255.255.255.252
          inet6 addr: fe80::2c0a:beff:fed3:db86/64 Scope: Link
          UP RUNNING NOARP  MTU:1500  Metric:1
          RX packets:19 errors:0 dropped:0 overruns:0 frame:0
          TX packets:20 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2108 TX bytes:2213
```

(2) Network connection test.

```
# ping -I wwan0 www.armdesigner.com
```

```
console:/ # ping -I wwan0 www.armdesigner.com
PING www.armdesigner.com (67.222.54.196) from 10.96.137.126 wwan0: 56(84) bytes of data.
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=1 ttl=47 time=220 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 ttl=47 time=209 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=3 ttl=47 time=213 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=4 ttl=47 time=208 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=5 ttl=47 time=208 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=6 ttl=47 time=208 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=7 ttl=47 time=207 ms
^C
--- www.armdesigner.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6002ms
rtt min/avg/max/mdev = 207.607/210.826/220.234/4.316 ms
```

6.9.2 GPS Test



6.10 Audio

Step 1, Insert the AUX audio cable into the line out jack.



Step 2, Check the sound card information.

Execute the following command:

```
# cat /proc/asound/cards
```

```
root@rk3576-buildroot:/# cat /proc/asound/cards
0 [rockchip-es8390 ]: rockchip-es8390 - rockchip-es8390
rockchip-es8390
1 [rkhdmiintc35874]: simple-card - rk,hdmiin-tc358749x-codec
rk,hdmiin-tc358749x-codec
2 [rockchipspdiftx]: simple-card - rockchip,spdif-tx0
rockchip,spdif-tx0
3 [rockchipdp0 ]: rockchip-dp0 - rockchip-dp0
rockchip-dp0
4 [rockchiphdmi ]: rockchip-hdmi - rockchip-hdmi
rockchip-hdmi
```

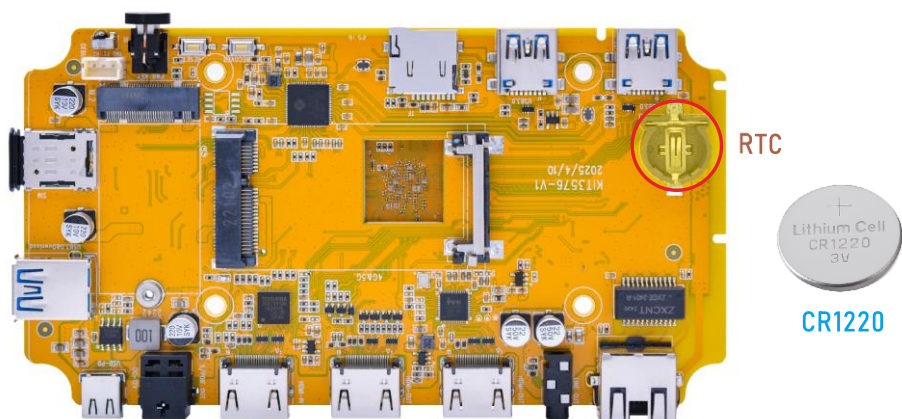
Step 3, Play audio test

```
# aplay -Dhw:0,0 test.wav
```

```
rk3576-buildroot:/# aplay -Dhw:0,0 test.wav
Playing WAVE 'test.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

```
# aplay -Dhw:2,0 test.wav // S/PDIF out audio output
# aplay -Dhw:3,0 test.wav // DP AIT mode audio output
# aplay -Dhw:4,0 test.wav // HDMI TX audio output
```

6.11 RTC



Step 1: Install the coin cell battery.

Step 2: Set the system time.

```
# date -s "2026-05-28 16:56:00"
```

Step 3: Write the system time to the hardware clock.

```
# hwclock -w
```

Step 4: Display the current hardware clock time.

```
# hwclock
```

```
console:/ # date -s "2026-05-28 16:56:00"
Thu May 28 16:56:00 GMT 2026
console:/ # hwclock -w
console:/ # hwclock
2026-05-28 16:56:42+0000
console:/ # hwclock
2026-05-28 16:56:43+0000
console:/ # hwclock
2026-05-28 16:56:44+0000
console:/ # hwclock
2026-05-28 16:56:44+0000
console:/ # hwclock
2026-05-28 16:56:45+0000
```

Step 5: Power off, after a while to turn on the power again, check whether the time is saved.

```
console:/ # hwclock
2026-05-28 17:04:54+0000
console:/ # hwclock
2026-05-28 17:04:55+0000
console:/ # hwclock
2026-05-28 17:04:59+0000
console:/ # hwclock
2026-05-28 17:05:01+0000
console:/ # hwclock
2026-05-28 17:05:03+0000
```

If the network is connected, the RTC can synchronize with the network time.

6.12 IR



Step 1: Open IR debugging print.

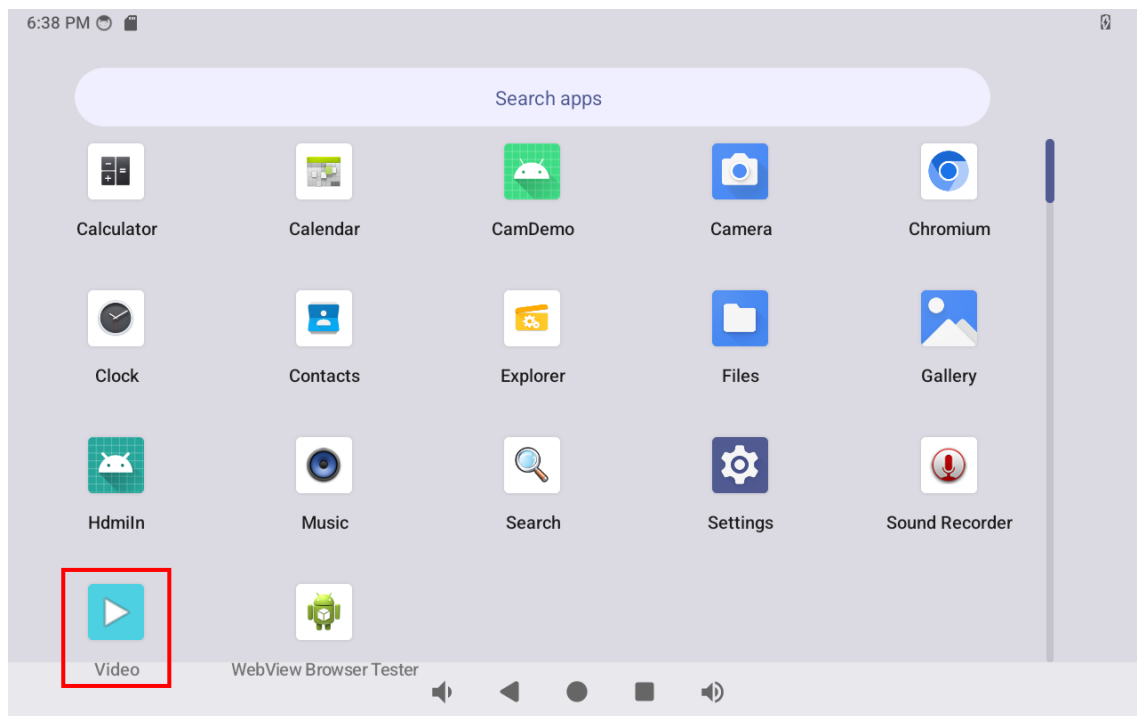
```
# echo 1 > /sys/module/rockchip_pwm_remotectl/parameters/code_print
```

Step 2: When pressing a button on the remote control towards the IR receiver, the key value will be printed to the log.

```
[ 3455.141358] [ C1] USERCODE=0xb24d
[ 3455.167518] [ C1] RMC_GETDATA=2
[ 3456.206876] [ C1] USERCODE=0xb24d
[ 3456.233033] [ C1] RMC_GETDATA=2
[ 3456.300413] [ C1] USERCODE=0xb24d
[ 3456.326573] [ C1] RMC_GETDATA=2
[ 3457.927422] [ C1] USERCODE=0xb24d
[ 3457.953580] [ C1] RMC_GETDATA=2
[ 3458.020950] [ C1] USERCODE=0xb24d
[ 3458.047108] [ C1] RMC_GETDATA=2
[ 3459.012683] [ C1] USERCODE=0xb24d
[ 3459.038839] [ C1] RMC_GETDATA=2
[ 3459.106130] [ C1] USERCODE=0xb24d
[ 3459.132361] [ C1] RMC_GETDATA=2
```

6.13 Video PLAY

Step 1, open the **Video** app for video playback test.



Step 2, Select video file to play.





- The Compact3576 supports video playback up to 4K at 60Hz, with support for the following decoding formats: VP8, H.264, H.265, VP9, and AV1.
- However, it is only compatible with certain H.265 video files.

6.14 HDMI IN

After connecting the HDMI OUT port of the source device to the HDMI IN port of the Compact3576. The log will show:

```
[ 36.800368][ T165] m03_b_tc35874x 4-000f: tc35874x_format_change: New format: 1920x1080p60.00 (2200x1125)
```

Open the HdmiIn app and we can preview the image.

