Idea3576 Android14 User Manual

V2.0

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	Android14
LGA3576 V1 Idea3576-V2	Y

Revision History

Version	Date	Author	Revision History
V2.0	2026-07-15	Wugk	PCB revised to Rev.2
V1.0	2025-07-24	Boarcon Team	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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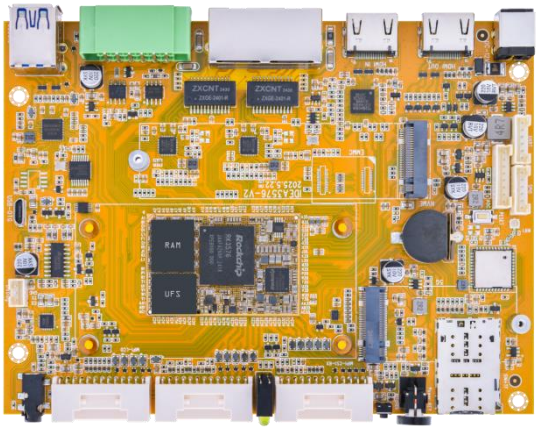
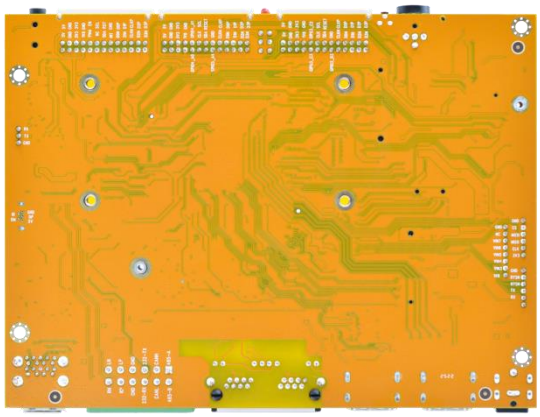
1. Introduction

1.1 Overview

The Idea3576 development board, powered by the RK3576 processor (quad Cortex-A72@2.2GHz and quad A53@1.8GHz), delivers 6 TOPS INT8 AI inference and supports high-resolution displays. It is configurable with up to 8GB LPDDR5 RAM and 512GB UFS storage. The LGA packaging ensures reliability and better heat dissipation, while industrial-grade I/O enables flexible expansion for diverse applications.





1.2 Product Parameters

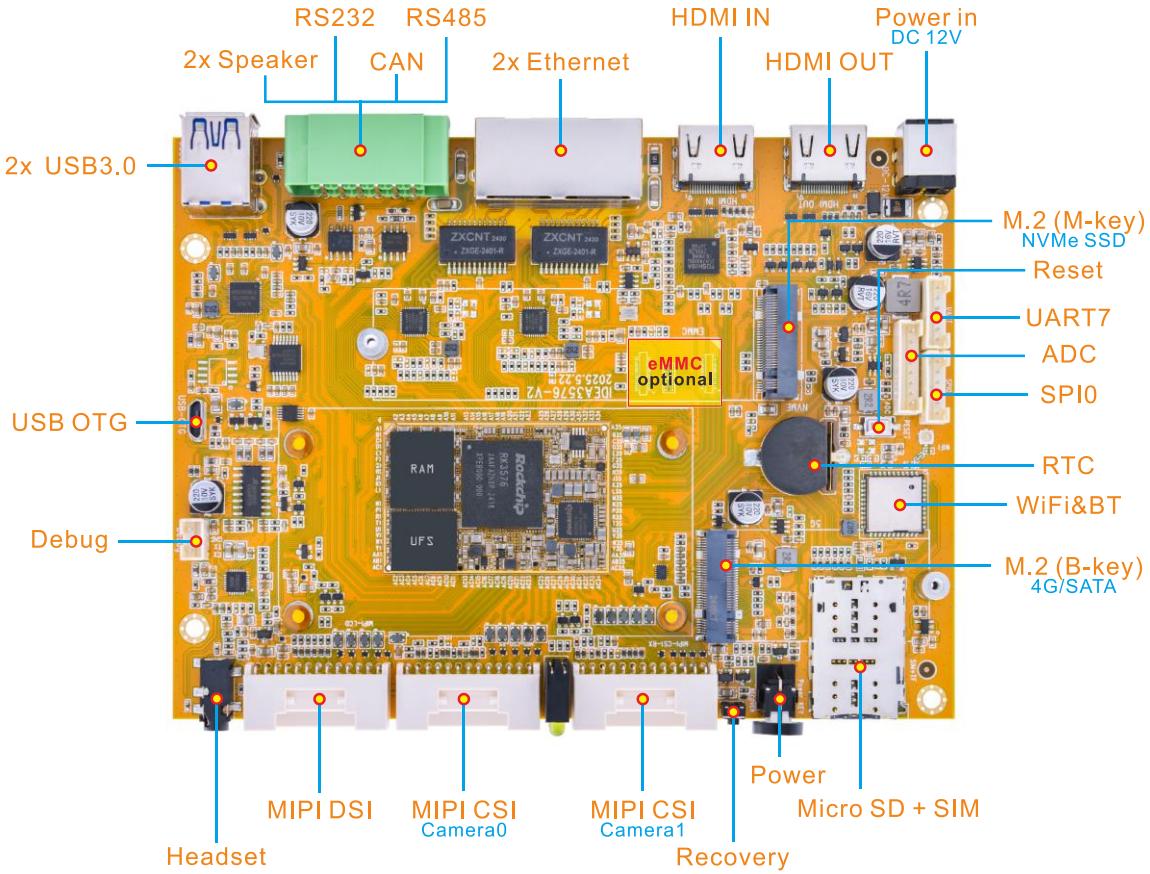
Basic Parameters	
SOC	RK3576
CPU	• Octa-core 64-bit architecture (Quad-core Cortex-A72 + Quad-core Cortex-A53)

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 LPDDR5(up to 8GB)
ROM		128GB UFS(up to 512GB)
Support system		Android, Debian, Buildroot
Hardware Parameters		
Extended Storage		• Support 1x M.2 (M-key) socket for NVMe SSD • Support 1x M.2 (B-key) socket for SATA (optional. multiplexed with 4G module) • Support 1x MicroSD Card

Display	• Support 1x HDMI2.1 output, up to 4K@120fps • Support 1x MIPI output, up to 2560x1600@60fps
Audio	• Support 1x HDMI TX audio output • Support 1x Headphone output/input • Support 1x HDMI IN audio input • Support 2x Speaker audio output
USB	• Support 1x USB2.0 OTG(USB2.0 OTG is multiplexed with USB3.0 Host) • Support 2x USB3.0
Network	• Support 2x Gigabit Ethernet • Support 1x WIFI/BT module • Support 1x 4G module(optional. multiplexed with M.2(B-key) SATA
Camera	• Support 2x IMX415 Camera
Peripheral communication	• Support 1x CAN • Support 1x RS485 • Support 1x UART(TTL) and 1x RS232
Other parameters	Support 1x Debug, 1x RTC, 5x ADC, 1x SPI
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	40.0mm x 30.0mm
Motherboard dimensions	155.0mm x 115.0mm

1.3 Hardware Interface Introduction



Interface parameters	
Power in DC 12V	12V/3A DC power input interface
2x Camera	2-channel camera input interface
HDMI	HDMI2.1 TX interface
HDMI IN	HDMI in interface
2x Ethernet	Gigabit Ethernet RJ45 interface
2x USB3.0 Host	USB3.0(multiplexed with USB2.0 OTG)
1x USB2.0 OTG	USB2.0 OTG(multiplexed with USB3.0 Host)
2x Speaker	12-pin pluggable terminal block for speaker
Headset	Audio in/out interface
RS485	12-pin pluggable terminal block
CAN	12-pin pluggable terminal block
SIM card + Micro SD	Nano_SIM + TF card slot
M.2	M.2(B-key) interface for connecting SATA/4G M.2(M-key) interface for connecting NVMe SSD
MIPI DSI	MIPI DSI interface
Debug	debug the serial port
UART	• UART7, TTL level serial interface • UART1, RS232 level serial interface

SPI	8-pin connector
ADC	5x ADC, 6-pin connector
WIFI&BT	WIFI&Bluetooth module
RTC	RTC coin cell connector
Recovery	Recovery key
Reset	Reset key
Power	Power key

2. Install Drivers and Tool

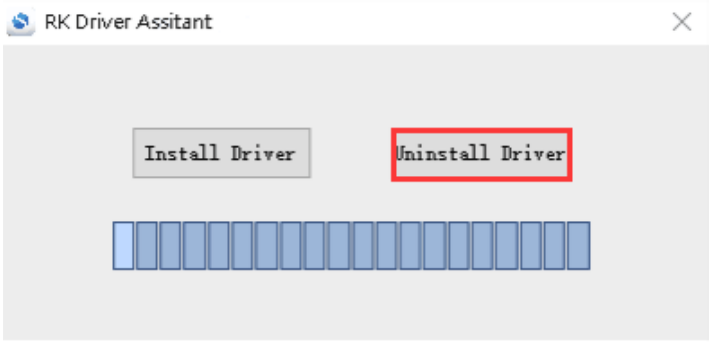
To download firmware and debug in the terminal, the following drivers and software need to be installed (for Windows computers):

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 Assitant

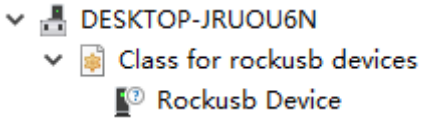
Step 1: Open *DriverAssitant_v5.1.3/DriverInstall.exe*.

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

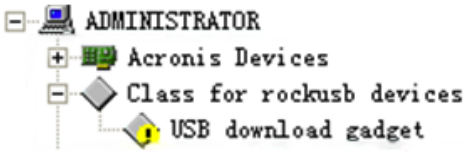


Step 3: Click button **"Install Driver"** to install.

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.

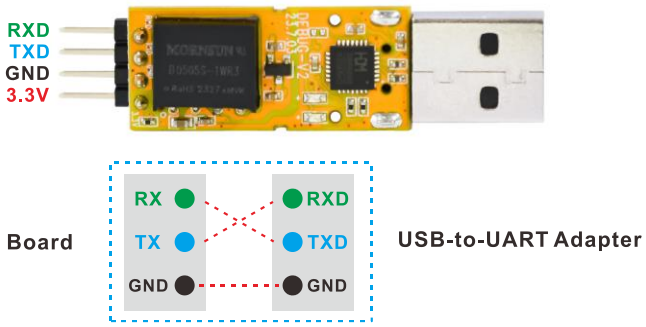


Step 6: The WINDOW will pop up found New Hardware Wizard dialog box, choose to install from the specified location, and then select: *DriverAssitant_v5.1.1/ADBDriver.*

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



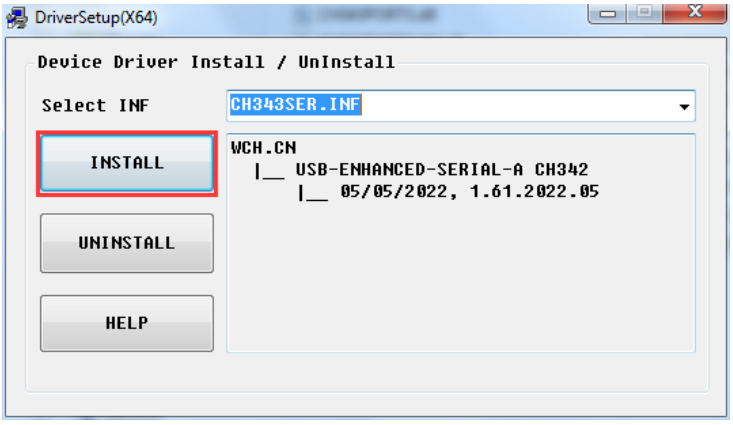
Pin	Connection Description
RXD	Receive, connect to TX pin of the board.
TXD	Transmit, connect to RX pin of the board.
GND	Ground, connect to GND pin of the board.
3V3	No need to connect.

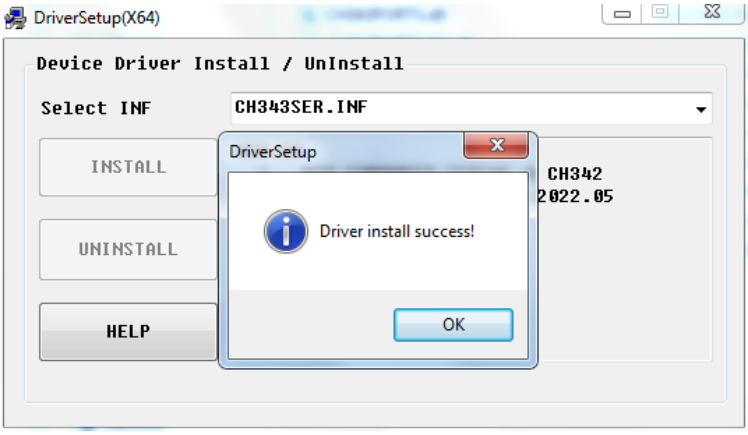
2.2.2 Install Driver

Step 1: Plug the CH9102X Module to the PC

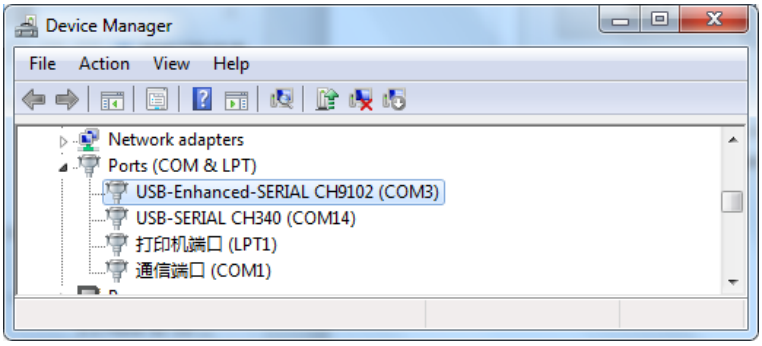
Step 2: Unzip *CH343SER.ZIP* on Windows.

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.



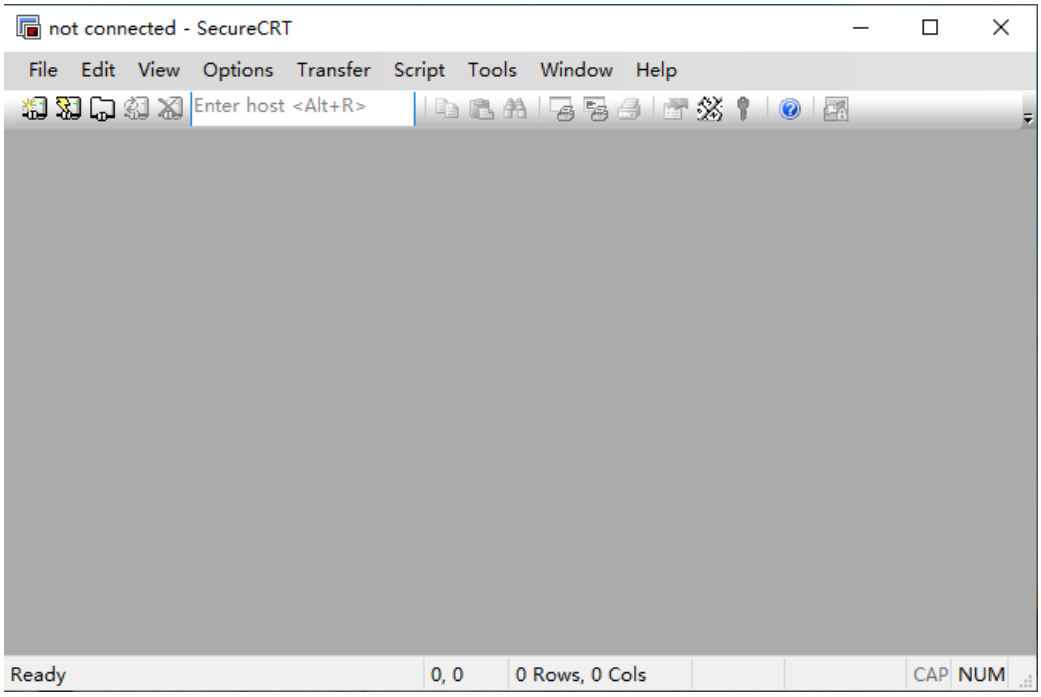
2.3 Install Serial Terminal Tool

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

directly after decompression.

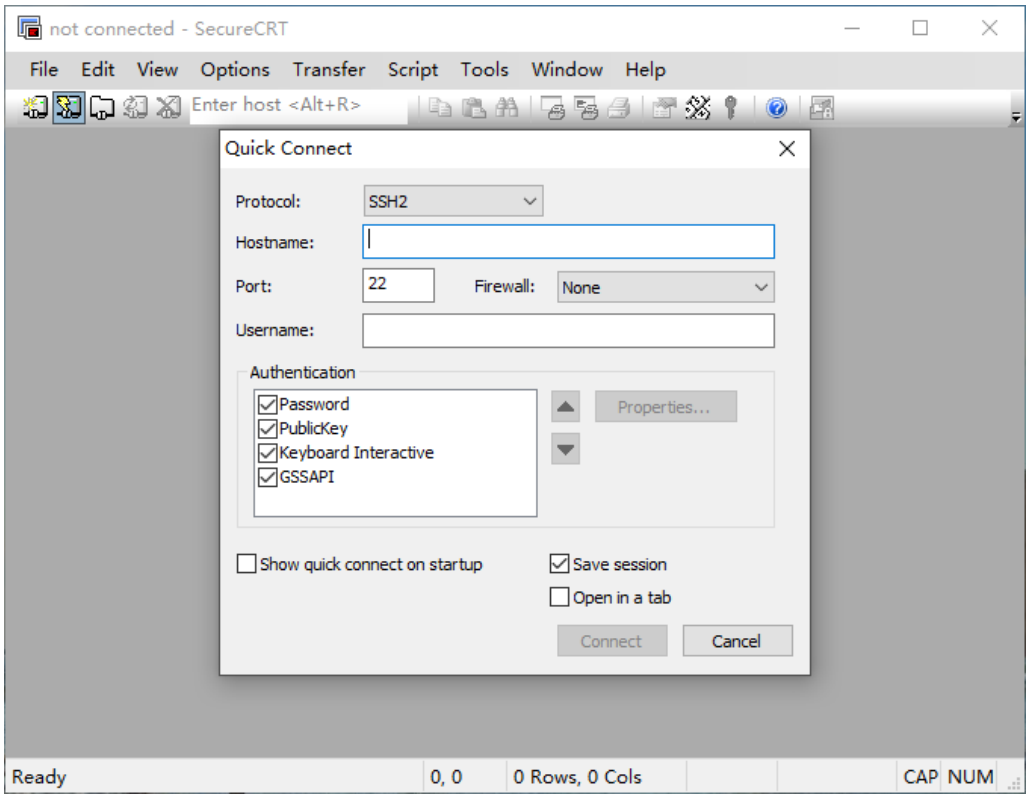
Step 1: Unzip *Platform/SecureCRT.rar* on PC.

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

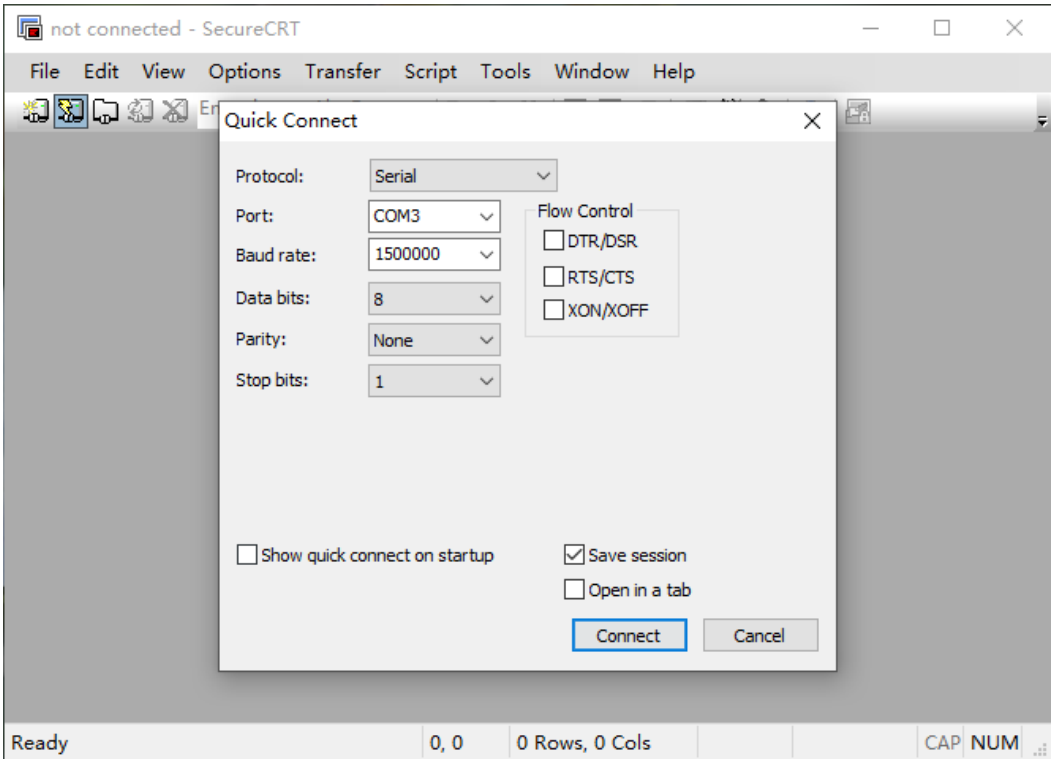


Step 3: Confirm that the CH9102X driver has been installed and the CH9102X module is connecting to the PC.

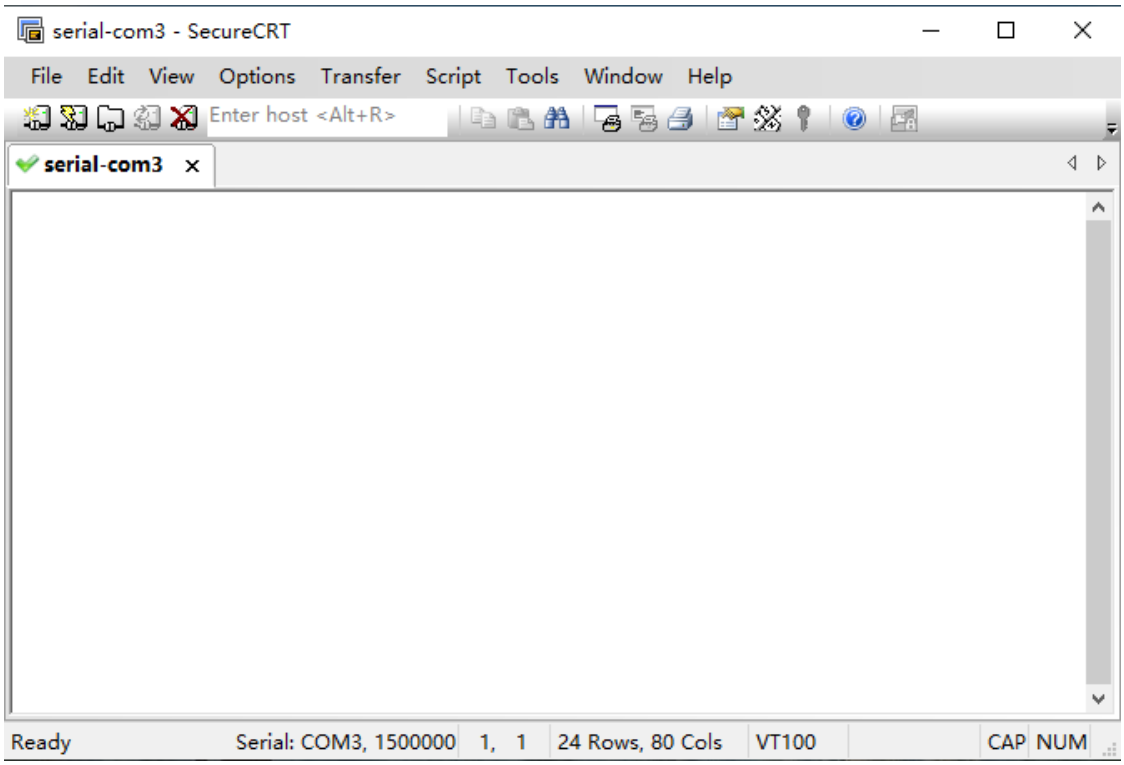
Step 4: Click the **"Quick Connect"** button to go to the Quick Connect configuration screen.



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:

Loader Mode:

The standard mode used for firmware upgrades.

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

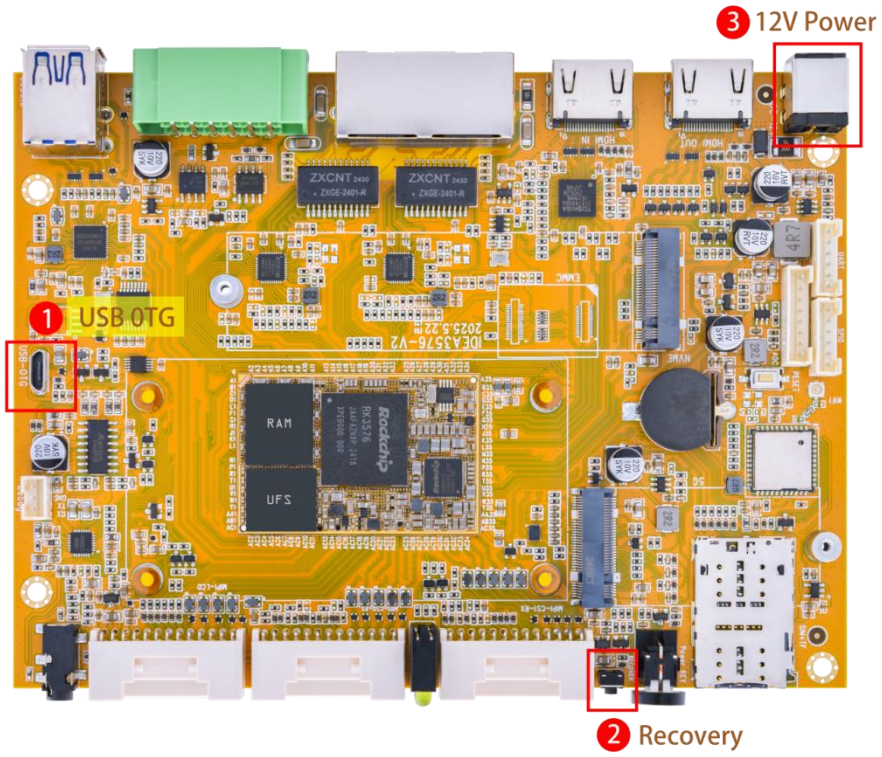
3.1.1.1 Hardware

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.

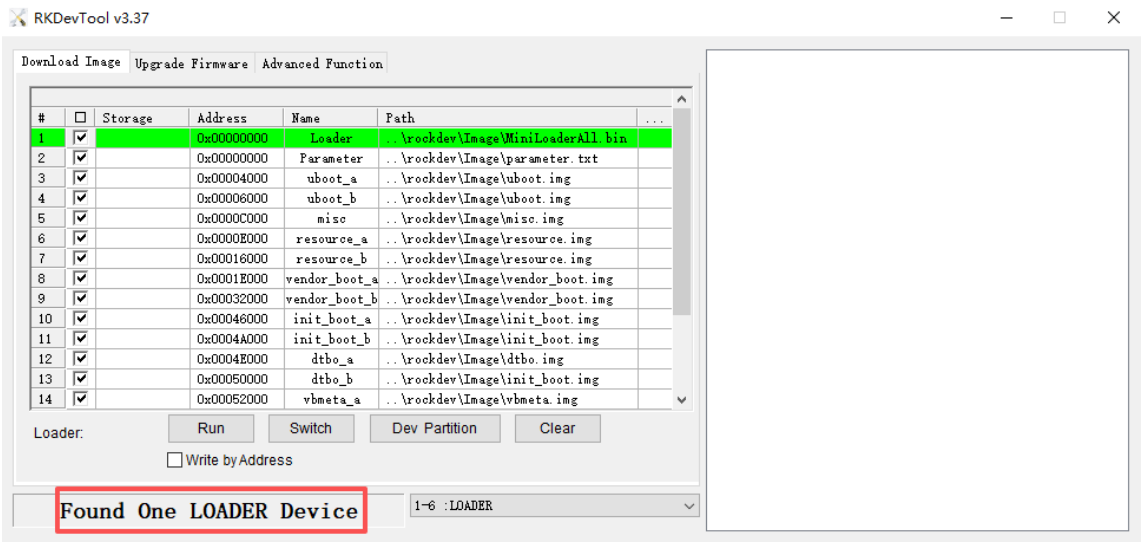
Step 3: Press and hold the **Recovery** button on the board

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.

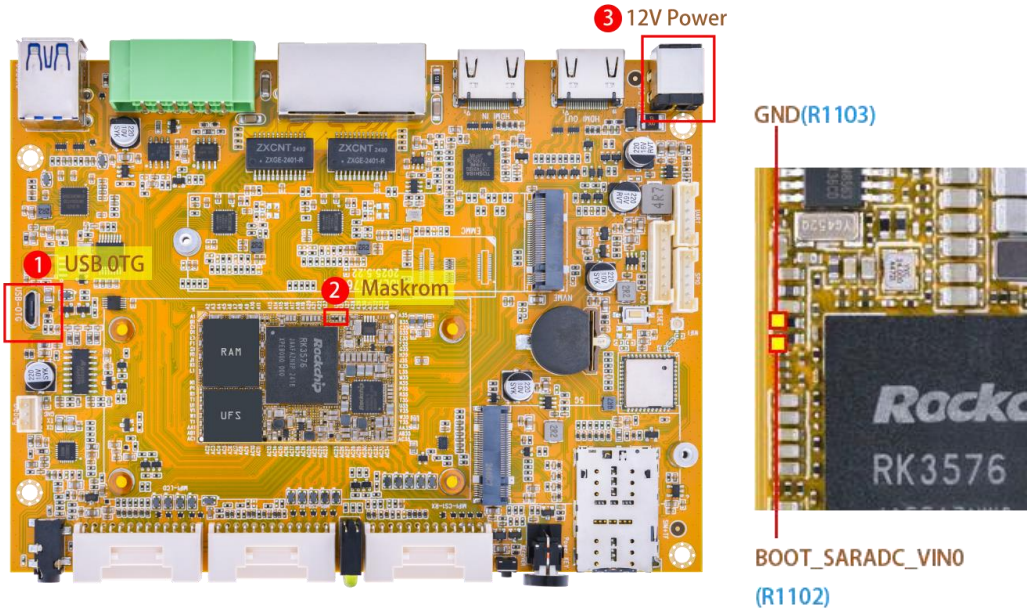
```
# reboot loader
```

3.1.2 How to Enter MaskRom Mode

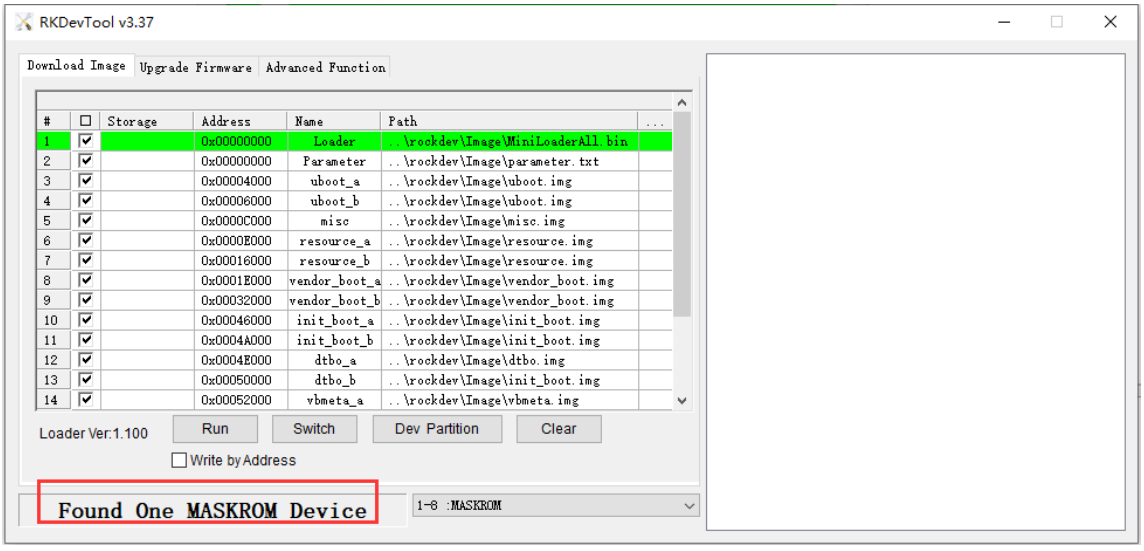
Step 1: Disconnect the power adapter.

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

Step 3: Use tweezers to short the two test points on the LGA3576.



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



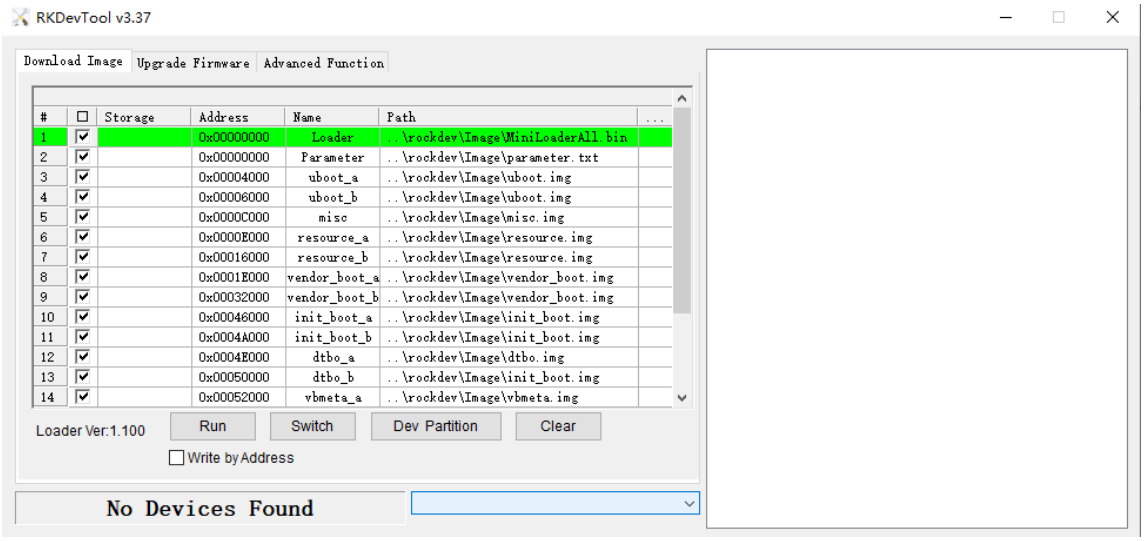
3.2 Burn Firmware

Environment: Windows OS (Operating System).

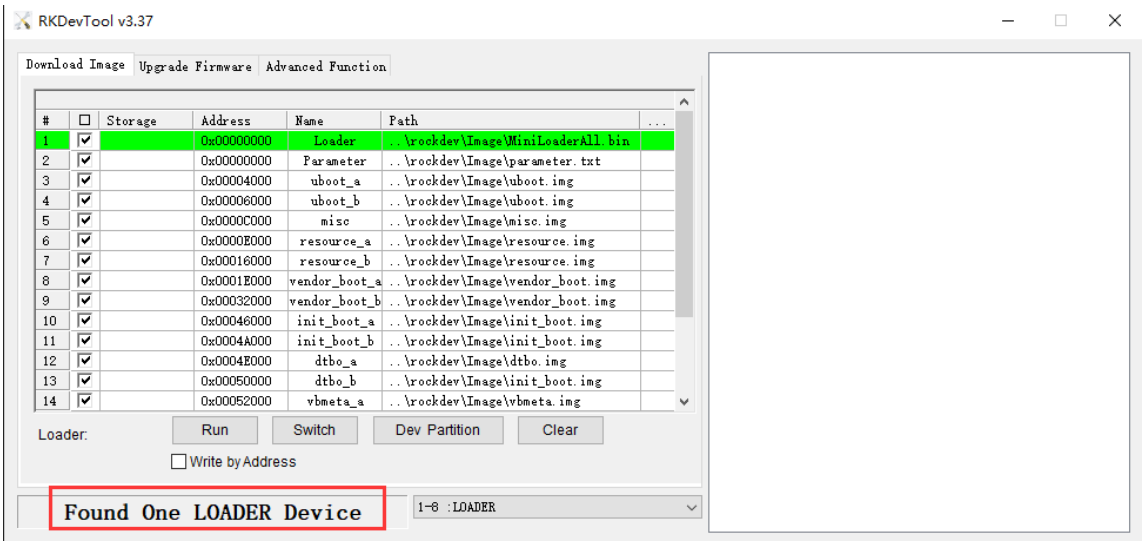
3.2.1 Burn Update.img Firmware

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

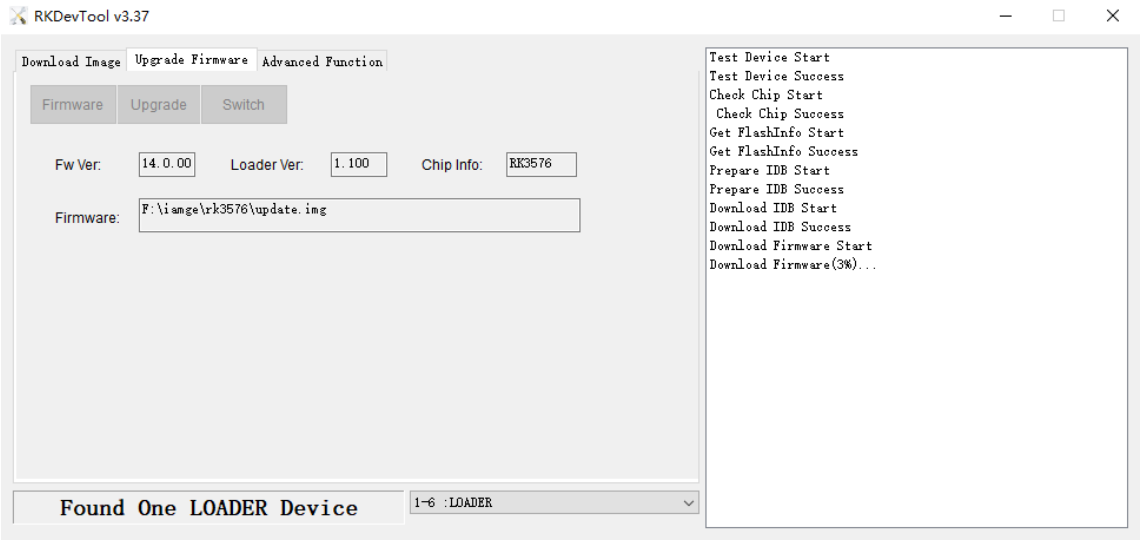
Step 2: Open *RKDevTool\RKDevTool_Release\RKDevTool.exe.*



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.

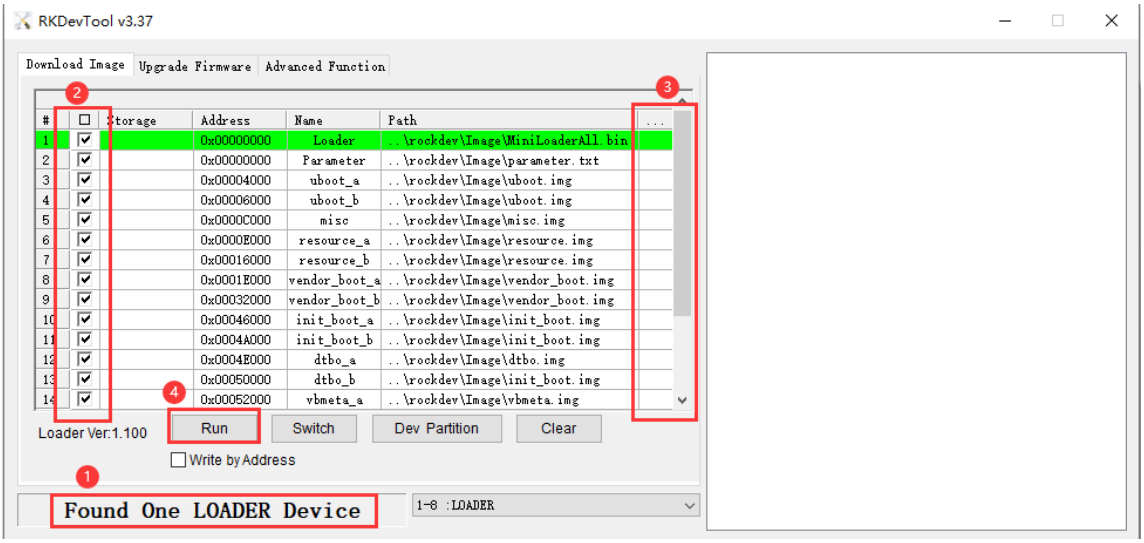
3.2.2 Burn Split Firmware

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.



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

①Note

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 200G. 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
```

5. Compile Source

Step 1: Unzip the Source

Execute the following commands to extract the source files:

```
$ tar xvf RK3576_Android14_SDK_RKR8.1_260715.tar.gz
```

Step 2: Configure the Compiled Board

Execute the following commands to configure the board:

```
$ source build/envsetup.sh

$ lunch boardcon_idea3576-userdebug
```

Step 3: compile

Method 1: One key compiling

```
$ ./build.sh -AUCKu
```

Images and **update.img** are generated in *rockdev/Image-boardcon_idea3576/* directory.

Method 2: Step-by-step compilation

Step A: Compile U-Boot

Execute the following command to compile uboot:

```
$ ./build.sh -U  //The configuration file used: u-boot\configs\rk3576_defconfig
```

Step B: Compile Kernel

Execute the following command to compile kernel:

```
$ ./build.sh -K
```

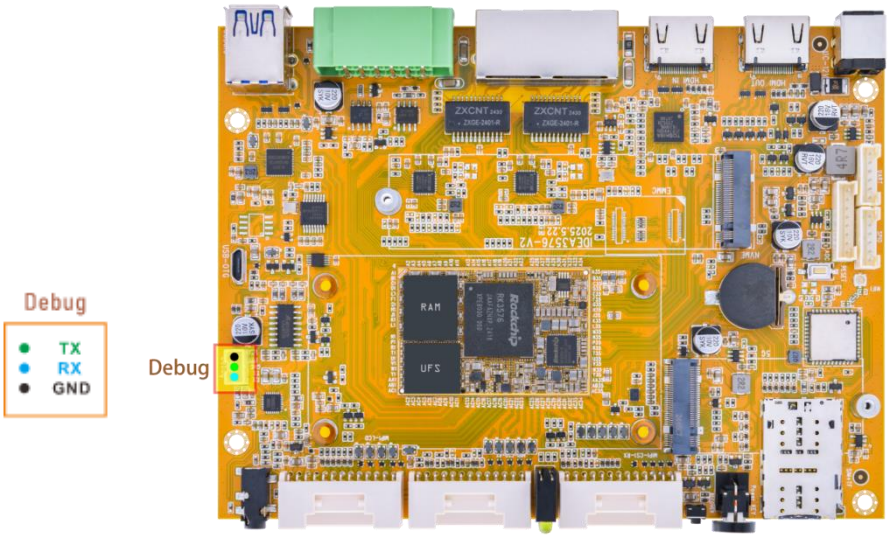
Step C: Compile Android

Execute the following command to compile kernel:

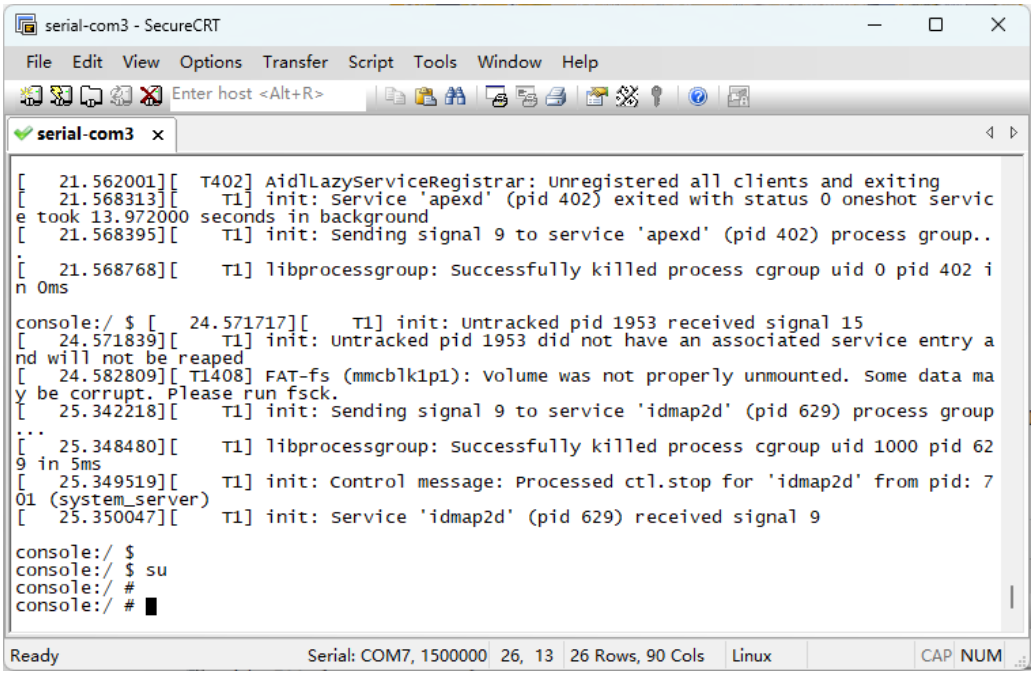
```
$ ./build.sh -A
```

6. Android14 Test

6.1 Serial Terminal



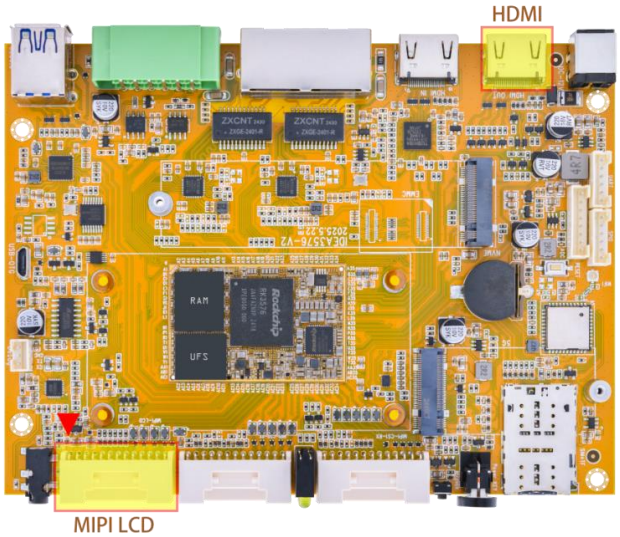
Connect the board and PC with USB Serial cable, then power on, the terminal will output boot information. The default baudrate is 1500000.



Enter "**su**" into the root user interface.

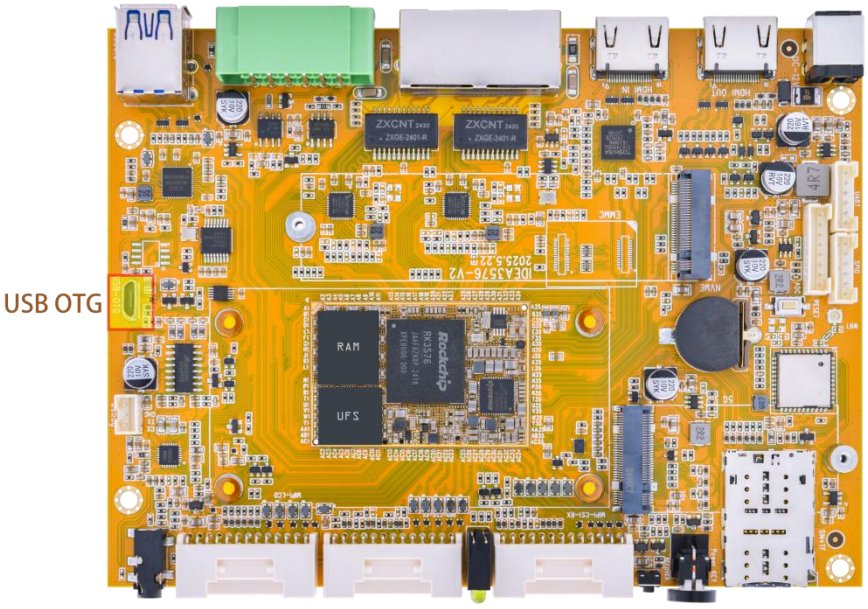
6.2 Display

The Idea3576 supports dual displays showing the same content via MIPI DSI and HDMI interfaces.



The display effect diagram is as follows:

6.3 USB OTG(Loader/ADB)



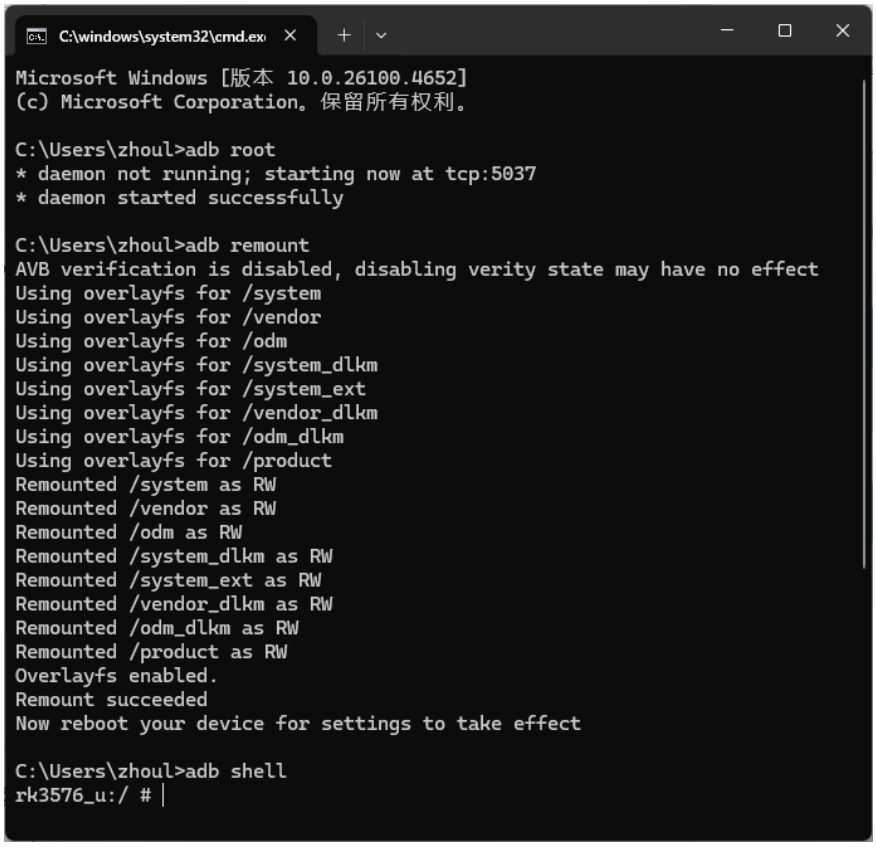
Step 1: Connect the board and PC host with USB OTG cable.

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
```



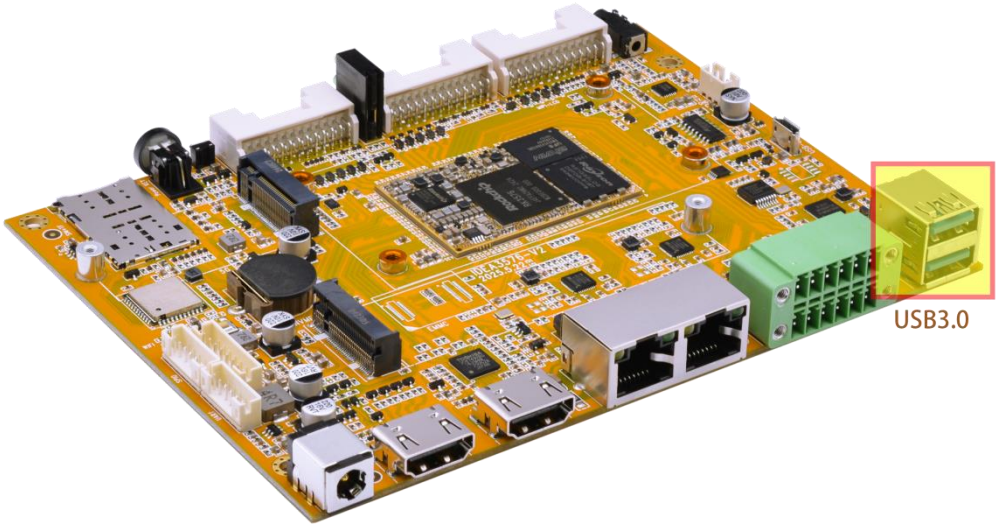
①Note

When USB OTG is used, USB 3.0 cannot be used ! ! !

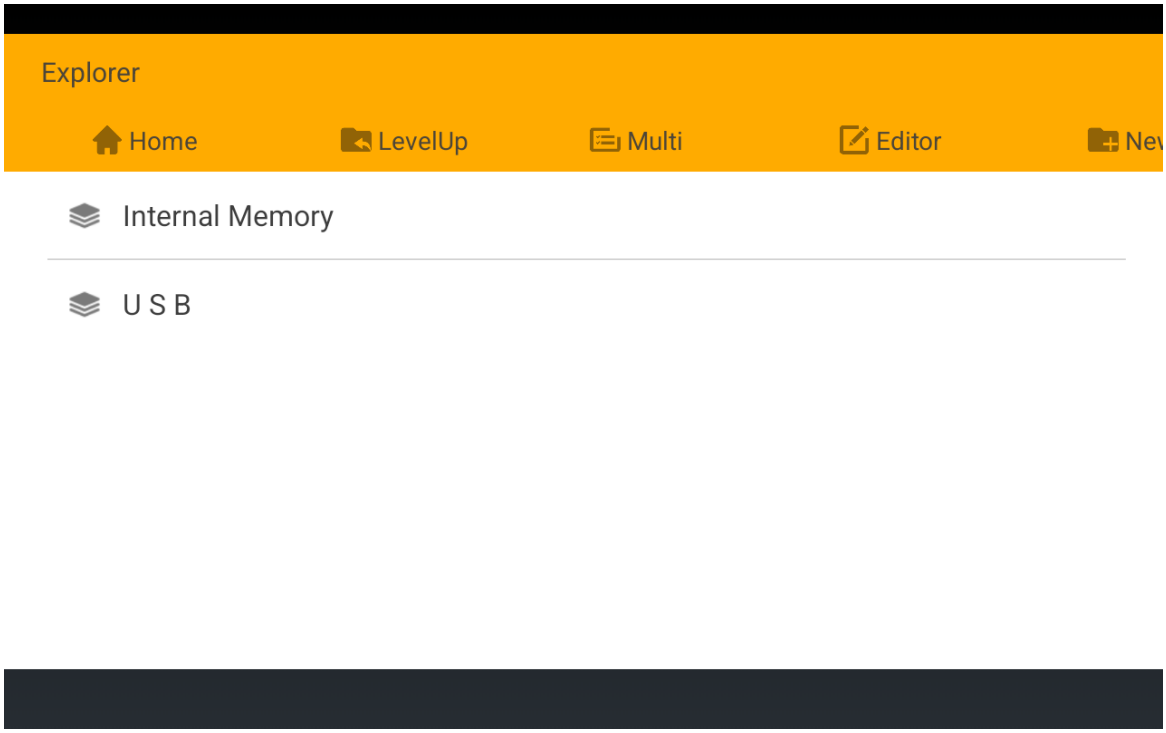
6.4 USB 3.0

After the Idea3576 is powered on, when the system is running normally, USB3.0 can only be used when the USB OTG cable is not connected.

The USB host can be used to connect devices such as USB mouse, USB keyboards, USB flash drives, and other USB peripherals.



Once the USB flash drive is connected and successfully recognized, you can browse its files using “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.

```
console:/ # [  223.142248][  T164] usb 3-1.3: new high-speed USB device number 4 using xhci-hcd
[  223.244548][  T164] usb 3-1.3: New USB device found, idVendor=0951, idProduct=1643, bcdDevice= 1.00
[  223.244611][  T164] usb 3-1.3: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[  223.244625][  T164] usb 3-1.3: Product: DataTraveler G3
[  223.244637][  T164] usb 3-1.3: Manufacturer: Kingston
[  223.244649][  T164] usb 3-1.3: SerialNumber: 6C626D606E88FC40196F239E
[  223.248059][  T164] usb-storage 3-1.3:1.0: USB Mass Storage device detected
[  223.249633][  T164] scsi host1: usb-storage 3-1.3:1.0
[  224.518612][  T174] scsi 1:0:0:0: Direct-Access     Kingston DataTraveler G3  1.00 PQ: 0 ANSI: 0 CCS
```

• USB3.0 print information in SuperSpeed mode.

```
[  113.499383][    T6] usb 2-1.3: new SuperSpeed USB device number 18 using xhci-hcd
[  113.526445][    T6] usb 2-1.3: New USB device found, idVendor=0951, idProduct=1666, bcdDevice= 1.10
[  113.526478][    T6] usb 2-1.3: New USB device strings: Mfr=2, Product=3, SerialNumber=4
[  113.526488][    T6] usb 2-1.3: Product: DataTraveler 3.0
[  113.526496][    T6] usb 2-1.3: Manufacturer: Kingston
[  113.526504][    T6] usb 2-1.3: SerialNumber: E0D55E6290781731D88604A2
[  113.528149][    T6] usb-storage 2-1.3:1.0: USB Mass Storage device detected
[  113.529306][    T6] scsi host2: usb-storage 2-1.3:1.0
[  114.554580][   T84] scsi 2:0:0:0: Direct-Access     Kingston DataTraveler 3.0 0000 PQ: 0 ANSI: 6
```

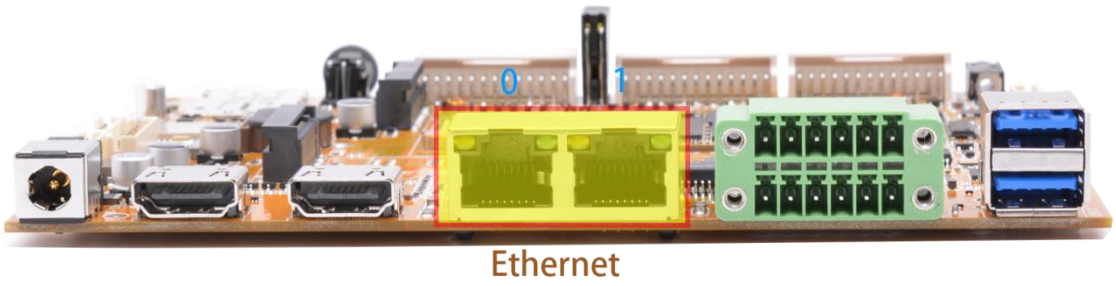
Execute the following commands to view the USB flash disk node, it is mounted to the /mnt/media_rw path.

```
# 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/sda11           28M 152K   28M   1% /metadata
/dev/block/dm-0           1.1G 1.1G  3.6M 100% /
/dev/block/dm-3           288M 287M  908K 100% /vendor
/dev/block/dm-5           772K 768K  4.0K 100% /odm
/dev/block/dm-1           232K  56K  176K  25% /system_dlkm
/dev/block/dm-2           175M 175M  540K 100% /system_ext
/dev/block/dm-4            25M  25M   80K 100% /vendor_dlkm
/dev/block/dm-6           232K  56K  176K  25% /odm_dlkm
/dev/block/dm-7           268M 267M  824K 100% /product
tmpfs                    1.9G  16K  1.9G   1% /apex
```

6.5 Ethernet

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



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

```
console:/ # [   65.593223][   T87] rk_gmac-dwmac 2a220000.ethernet eth0: Link is Up - 1Gbps/Full - flow
control rx/tx

[   65.593354][   T87] IPv6: ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
```

Step 2: View network interface information.

```
# ifconfig
```

```
130|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 3e:49:8e:ef:11:15

          inet6 addr: fe80::3c49:8eff:feef:1115/64 Scope: Link

          UP BROADCAST RUNNING NOARP  MTU:1500  Metric:1

          RX packets:0 errors:0 dropped:0 overruns:0 frame:0

          TX packets:3 errors:0 dropped:0 overruns:0 carrier:0

          collisions:0 txqueuelen:1000

          RX bytes:0 TX bytes:210


eth0      Link encap:Ethernet  HWaddr 3a:f5:f8:2b:03:d8  Driver rk_gmac-dwmac

          inet addr:192.168.0.24  Bcast:192.168.0.255  Mask:255.255.255.0
```

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

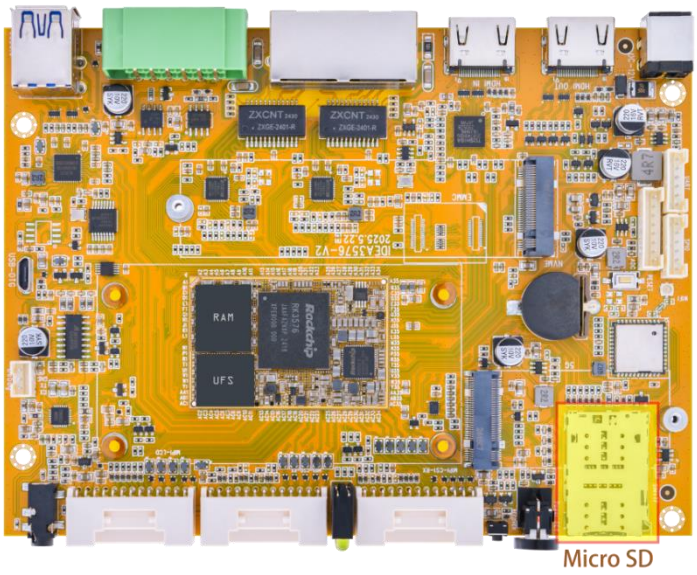
Step 3: Users can test network connectivity using the UI app "**Chromium**" or verify it through the following command.

```
# ping -I eth0 192.168.0.1

# ping -I eth1 www.boardcon.com
```

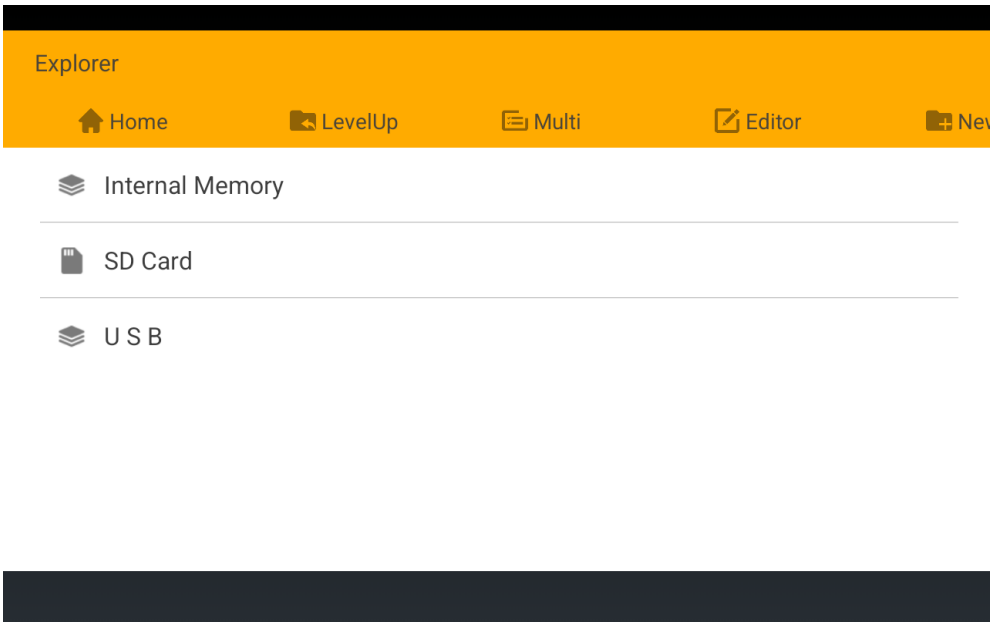
```
1|console:/ # ping -I eth0 192.168.0.1
ping: Warning: source address might be selected on device other than eth0.
PING 192.168.0.1 (192.168.0.1) from 192.168.0.241 eth0: 56(84) bytes of data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=255 time=2.41 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=255 time=0.433 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=255 time=0.461 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=255 time=0.458 ms
^C
--- 192.168.0.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3052ms
rtt min/avg/max/mdev = 0.433/0.941/2.413/0.850 ms
console:/ #
console:/ # ping -I eth1 www.boardcon.com
```

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**". Idea3576 supports SD Hot-plug.



6.7 M.2

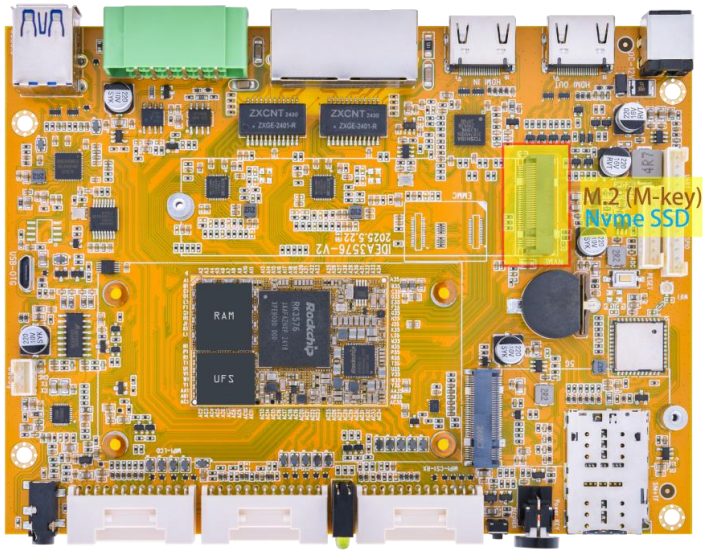
M.2(B-key) interface for connecting SATA/4G

M.2(M-key) interface for connecting NVMe SSD

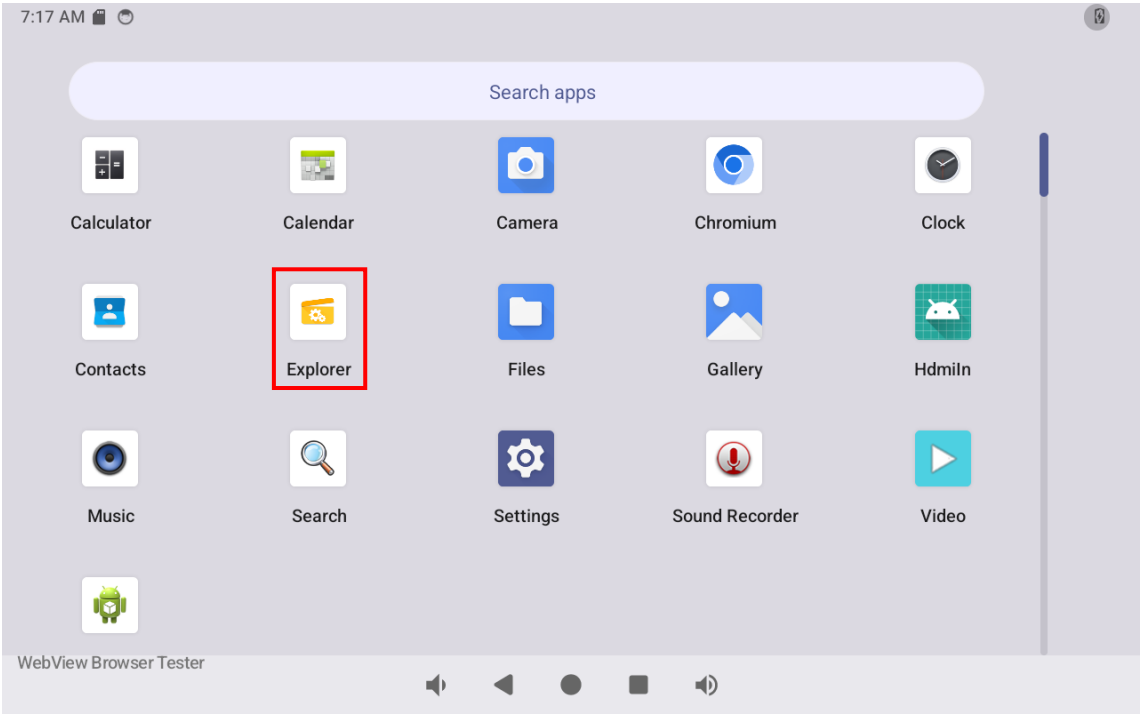
6.7.1 SSD (M-key)

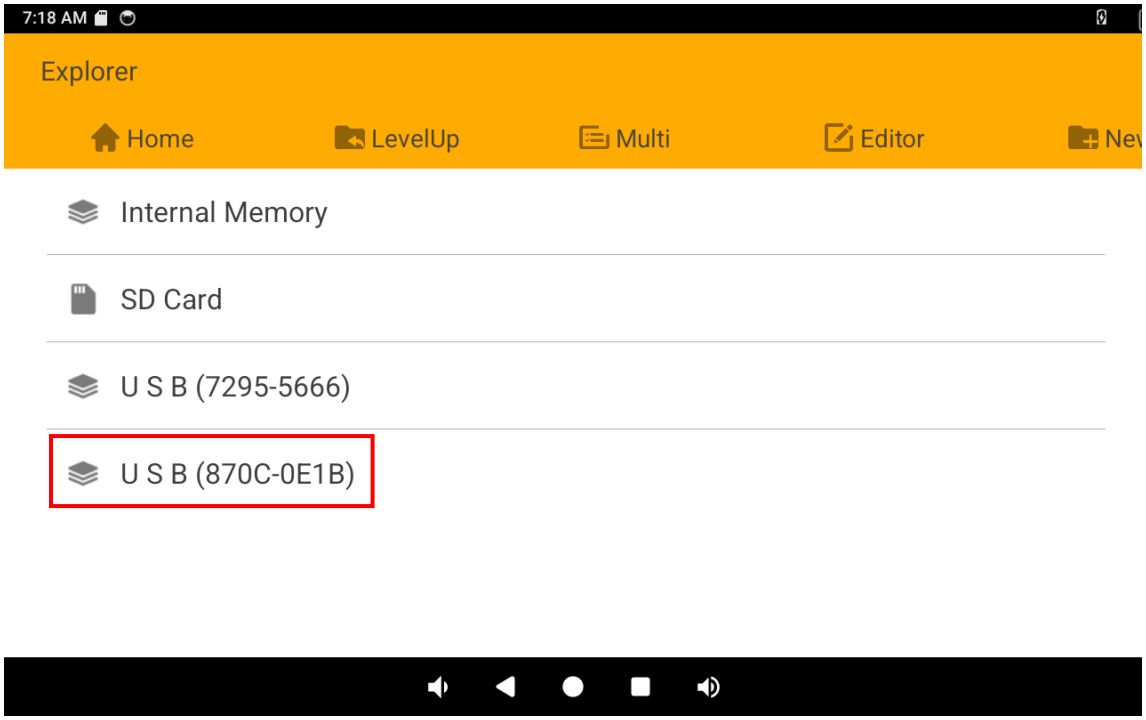
The SSD on Android14 only supports the ext4 format.

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**". Idea3576 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/sda11           28M 152K   28M   1% /metadata
/dev/block/dm-0           1.1G 1.1G  3.6M 100% /
/dev/block/dm-3           288M 287M  908K 100% /vendor
/dev/block/dm-5           772K 768K  4.0K 100% /odm
/dev/block/dm-1           232K  56K  176K  25% /system_dlkm
/dev/block/dm-2           175M 175M  540K 100% /system_ext
/dev/block/dm-4            25M  25M   80K 100% /vendor_dlkm
/dev/block/dm-6           232K  56K  176K  25% /odm_dlkm
/dev/block/dm-7           268M 267M  824K 100% /product
tmpfs                    1.9G  16K  1.9G   1% /apex
tmpfs                    1.9G 804K  1.9G   1% /linkerconfig
```

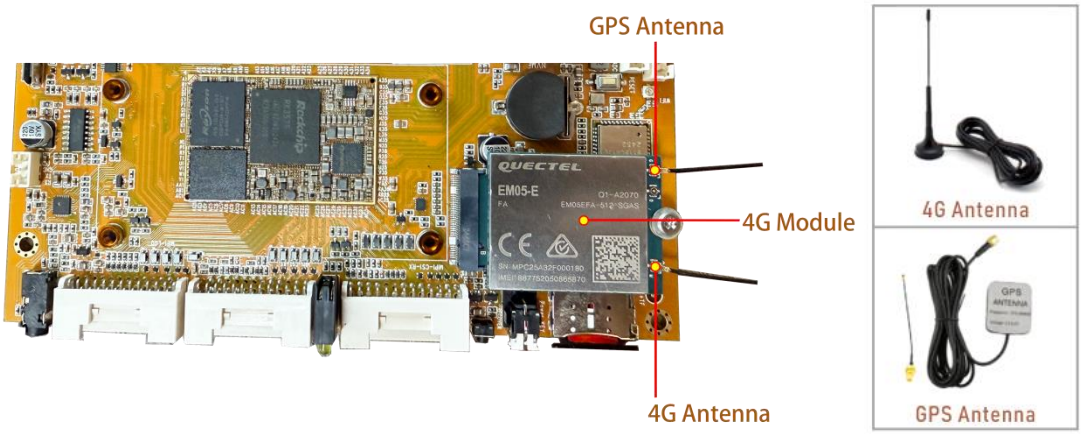
Note: If devices that are not in ext4 format, the user can choose to format them in the board. After formatting, the files on the device will be permanently lost, so please proceed with caution.

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

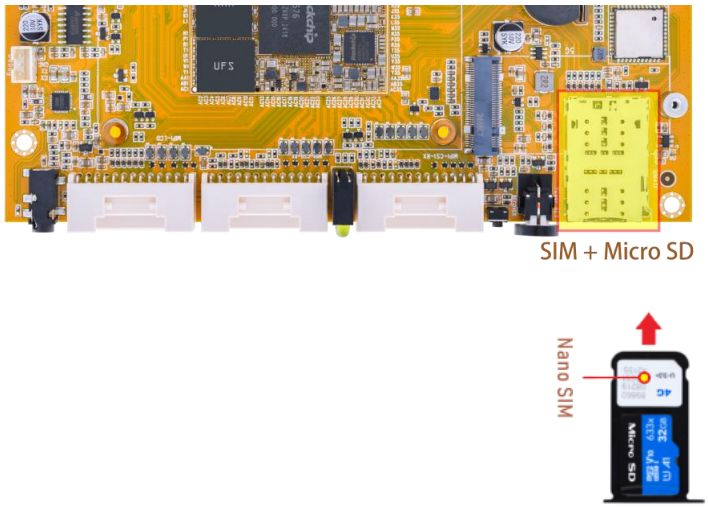
6.7.2 4G (B-key)

The update.img on Android14 default supports 4G.

Step 1: Insert 4G module to PCIe socket (4G model: EM05-E), and connect antenna.



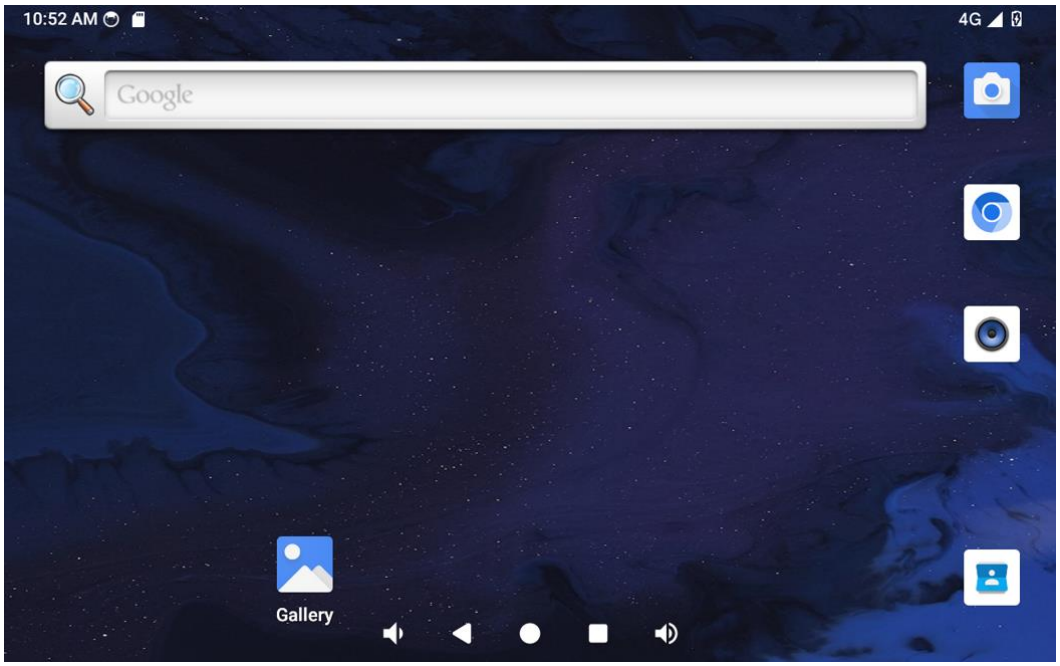
Step 2: Insert SIM card then power on.



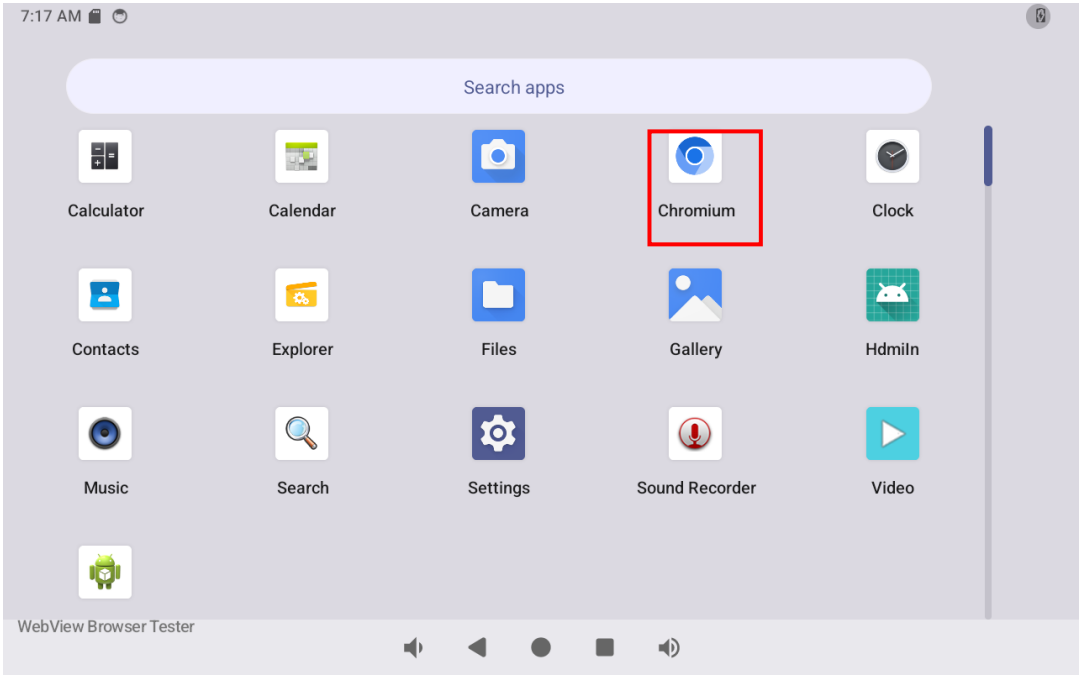
Step 3: Power on.

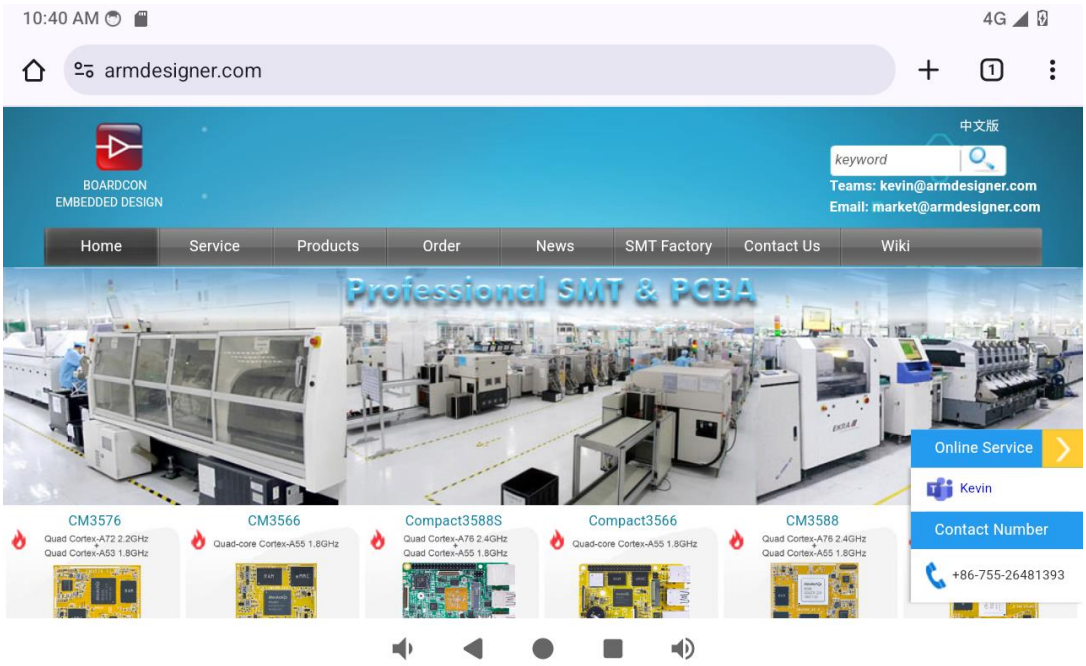
6.7.2.1 4G

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
```

(2) Network connection test.

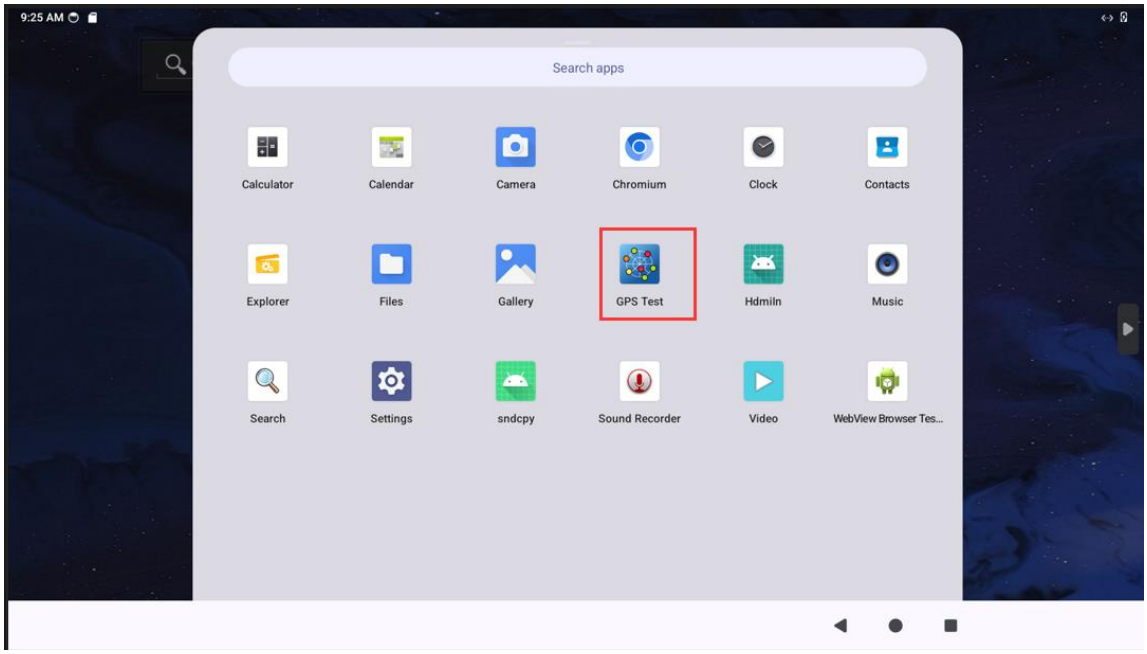
```
# ping -I wwan0 www.armdesigner.com
```

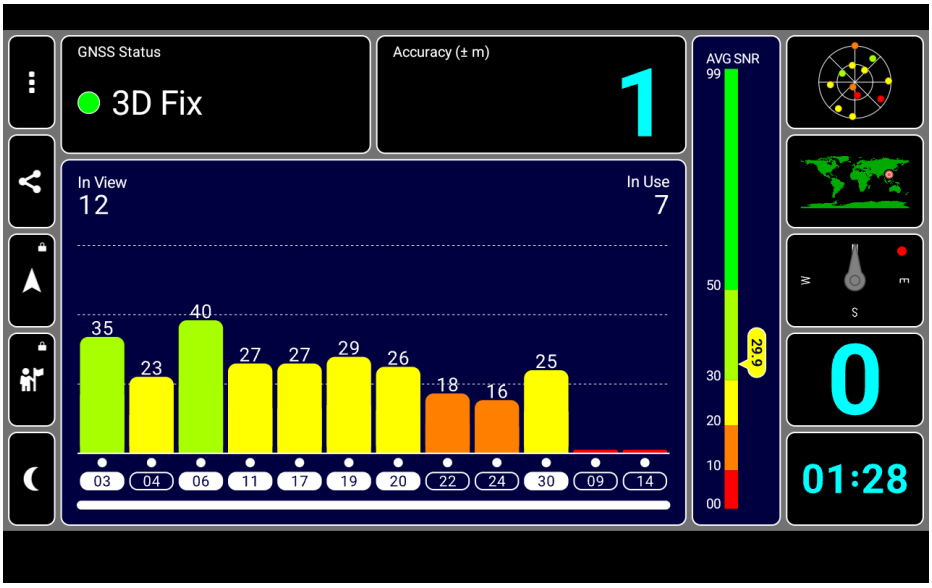
```
console:/ # ping -I wwan0 www.armdesigner.com
PING www.armdesigner.com (67.222.54.196) from 10.96.137.126 wwan0: 56(84) bytes of data.
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=1 ttl=47 time=220 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 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
```

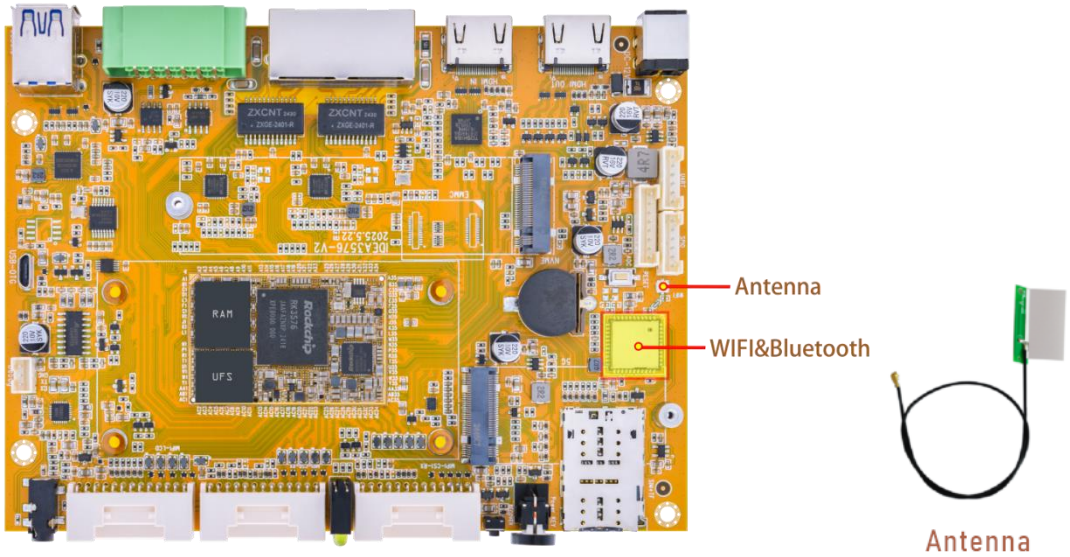
6.7.2.2 GPS Test

Step 1: Place the GPS antenna in an open outdoor area.

Step 1: By opening the GPS Test app, you can view the GPS signal strength.



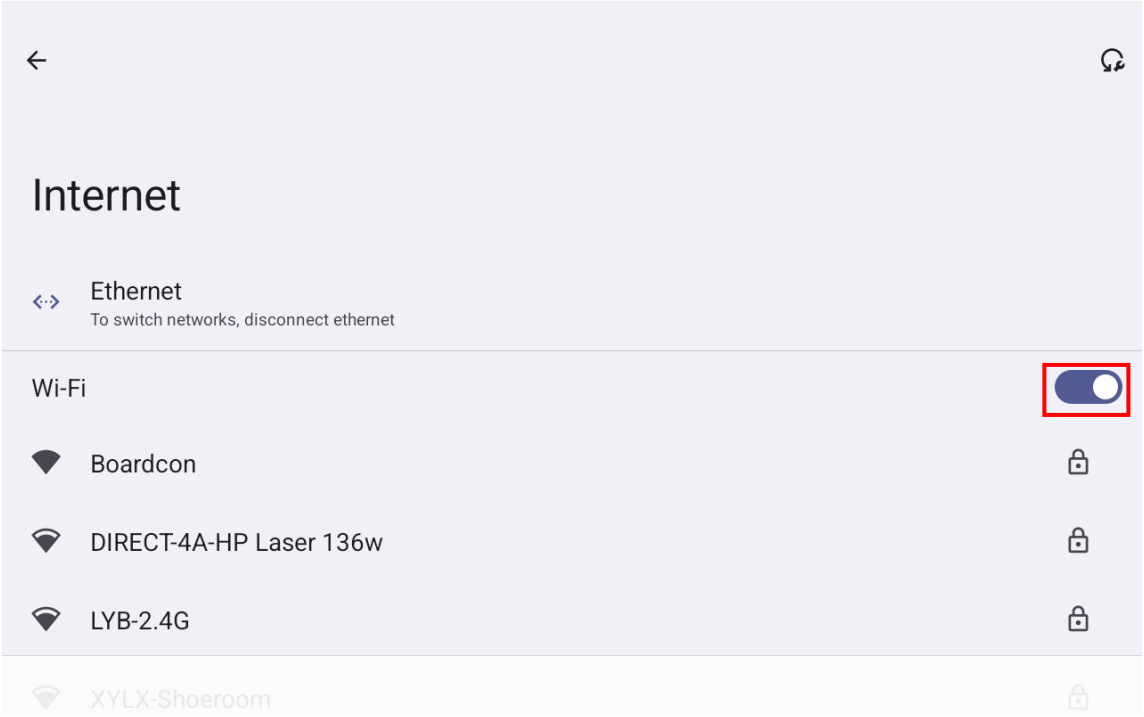




6.8.1 WiFi

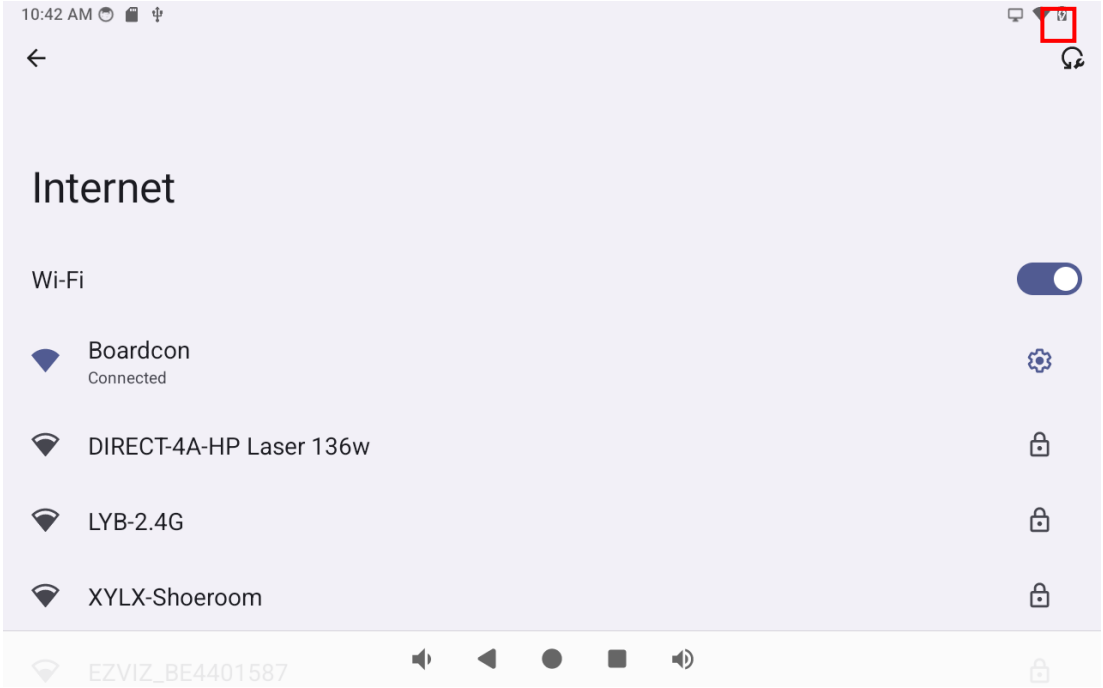
To use Wi-Fi and Bluetooth functions properly, the antenna needs to be connected.

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.



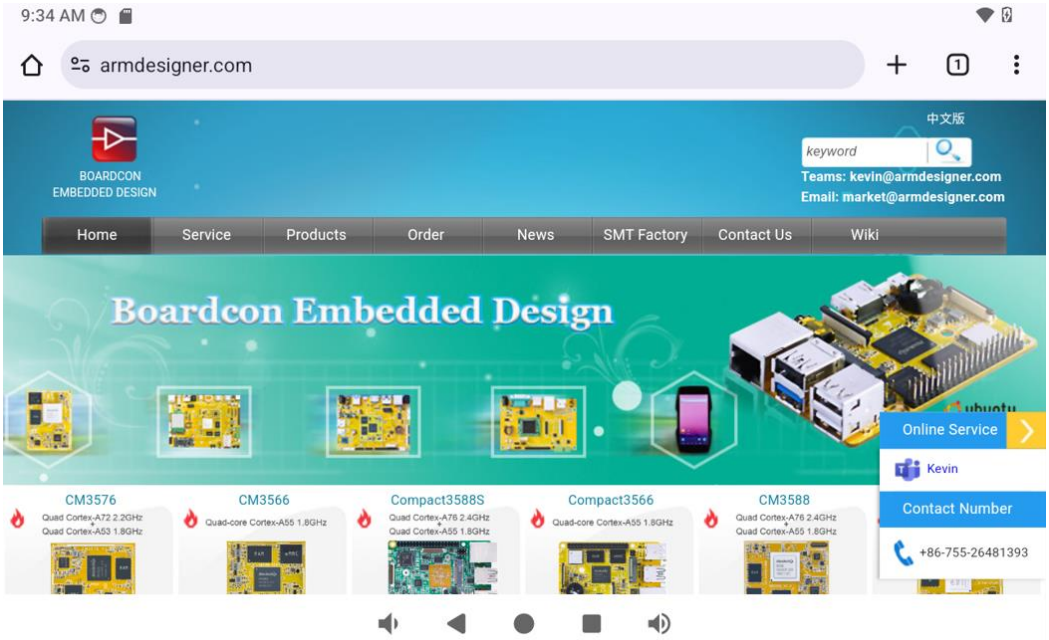
Step 4: Users can test network connectivity using the UI browser or verify it through the following command.

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
```

Network connection test.

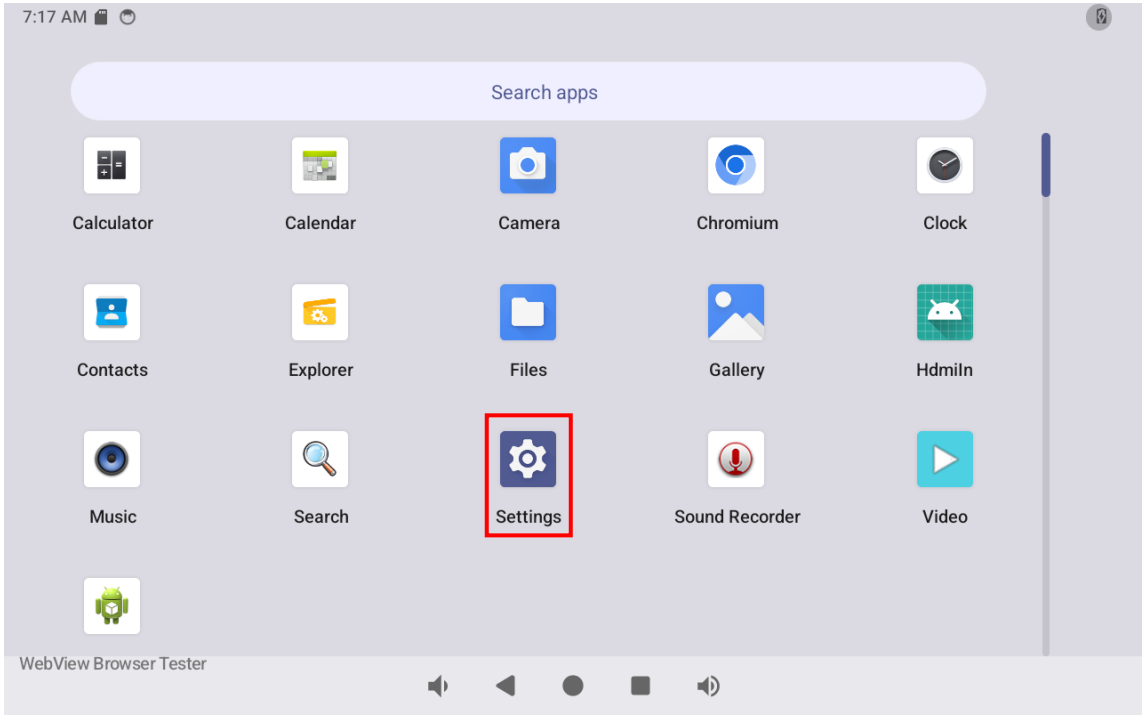



```
# ping -I wlan0 www.armdesigner.com
```

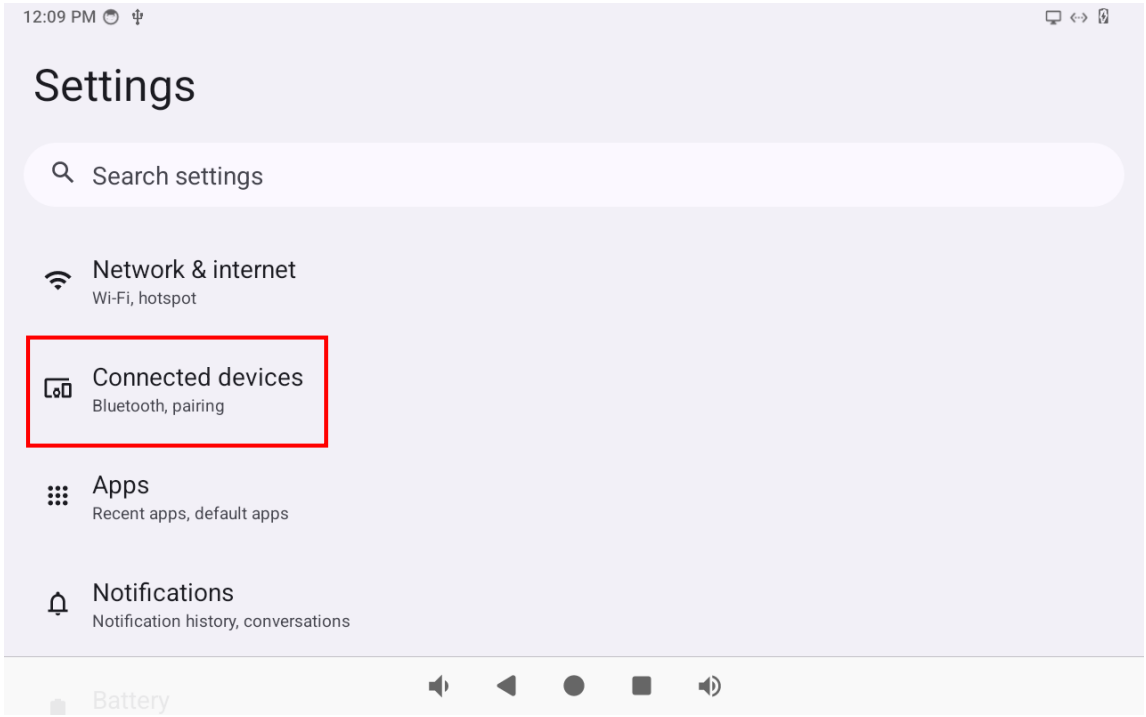
```
console:/ # ping -I wlan0 www.armdesigner.com
PING www.armdesigner.com (67.222.54.196) from 192.168.0.144 wlan0: 56(84) bytes of data.
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=1 ttl=48 time=196 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 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
```

6.8.2 Bluetooth

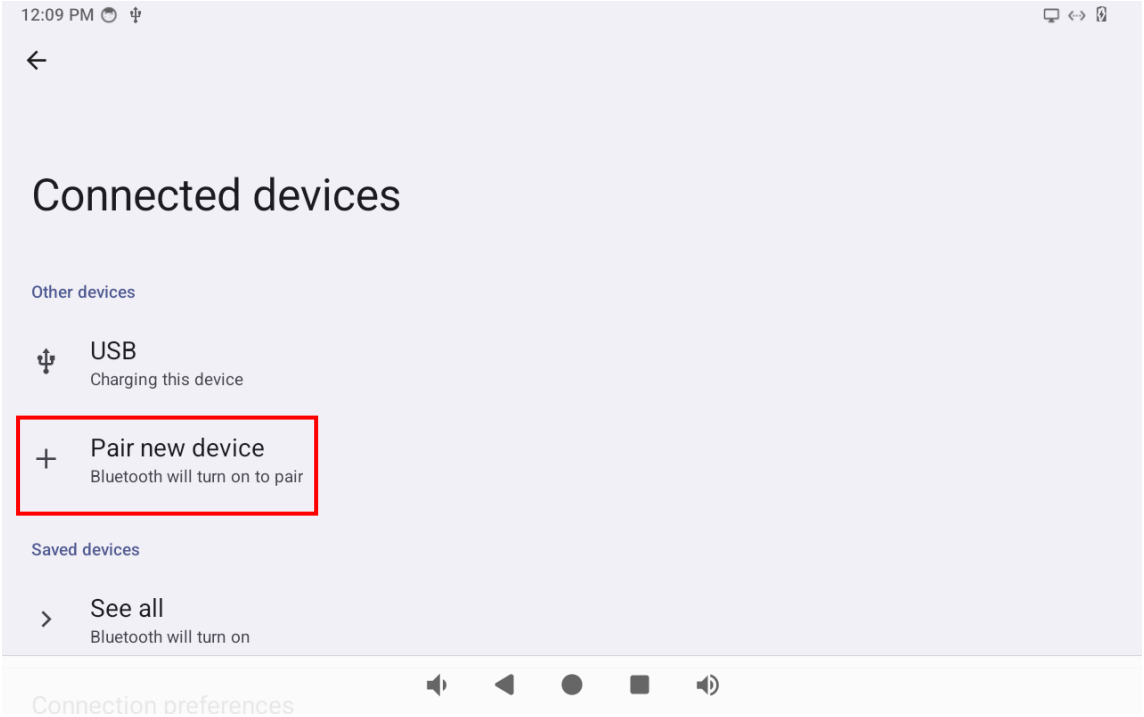
Step 1: Open the **Settings** app.



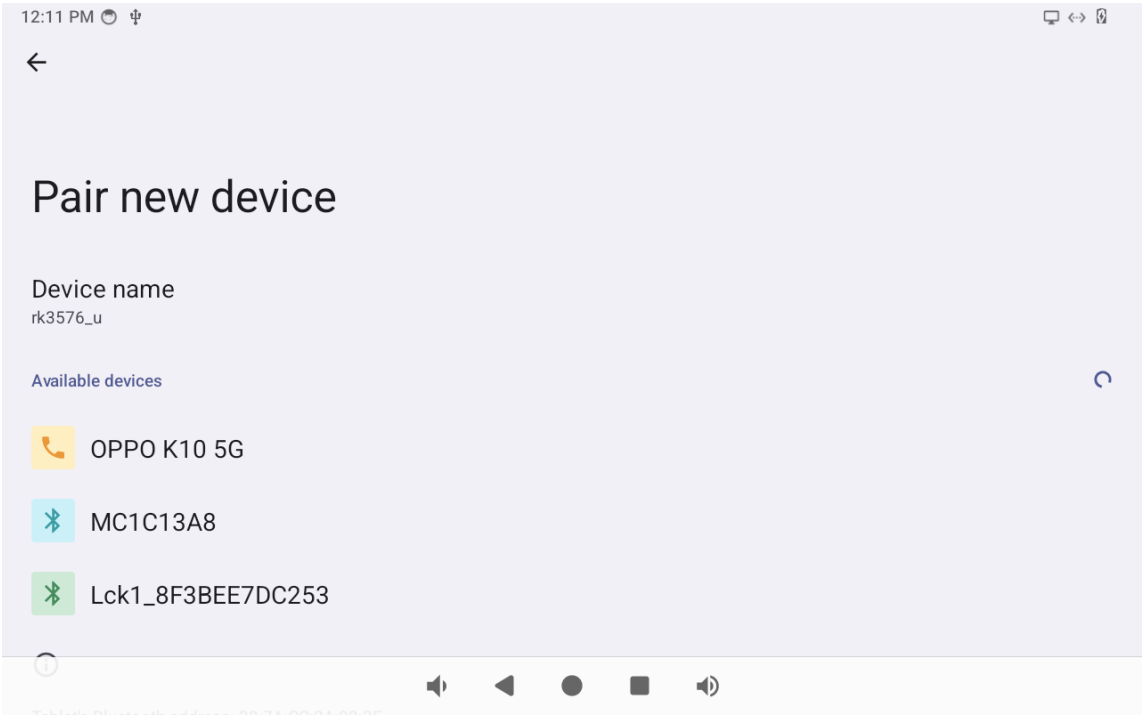
Step 2: Open the **"Connected devices"** option.



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



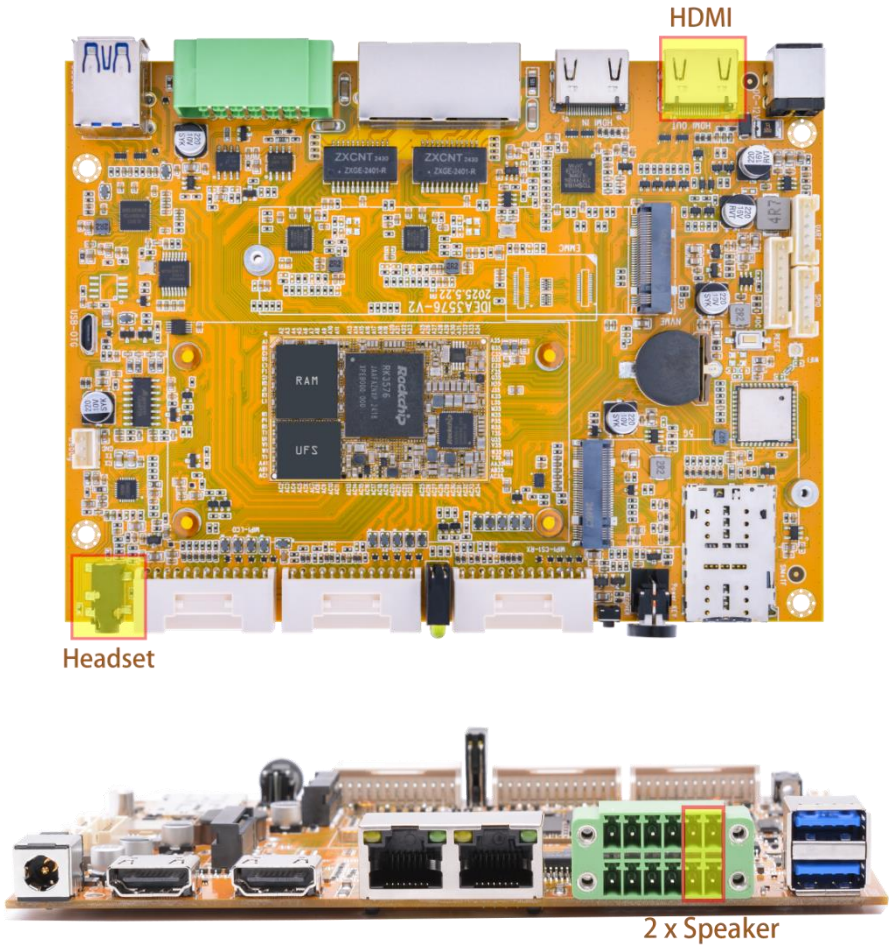
Step 4: User can pair themselves in the Bluetooth device list.



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

6.9 Audio

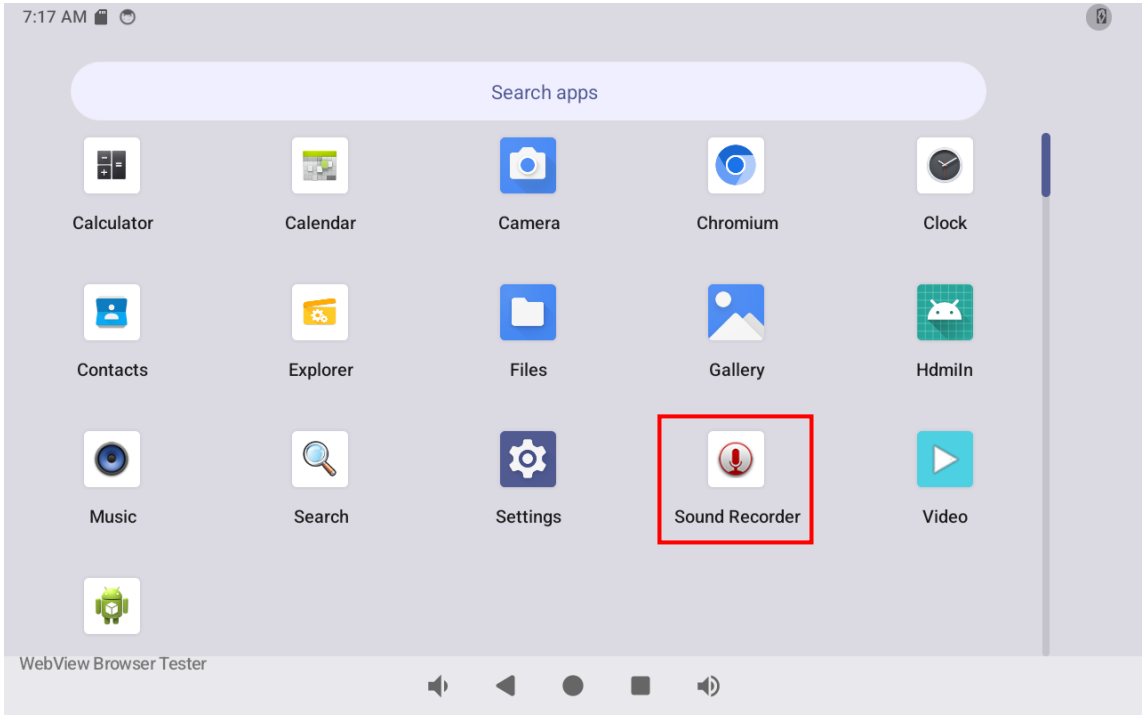
The audio input supports one channels: headset. And audio output supports four channels: headset, 2 x speaker and HDMI OUT.



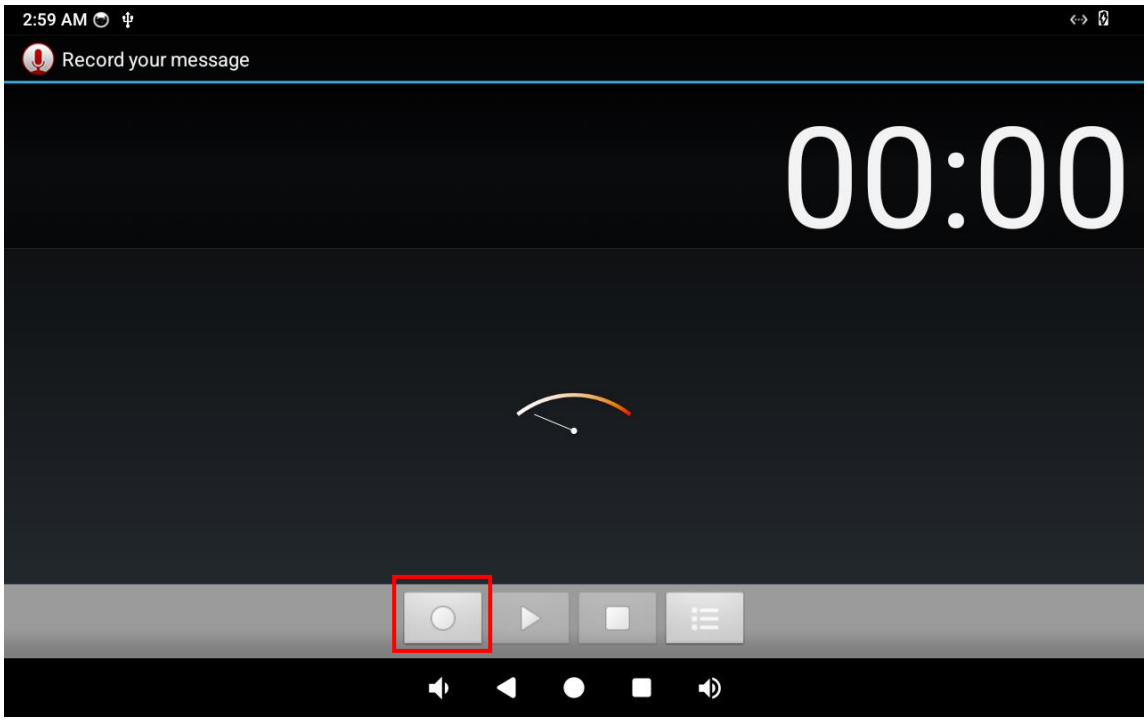
6.9.1 Audio input

Step 1: Plug the headset into the headset jack.

Step 2: open the **Sound Recorder** app for a recording test

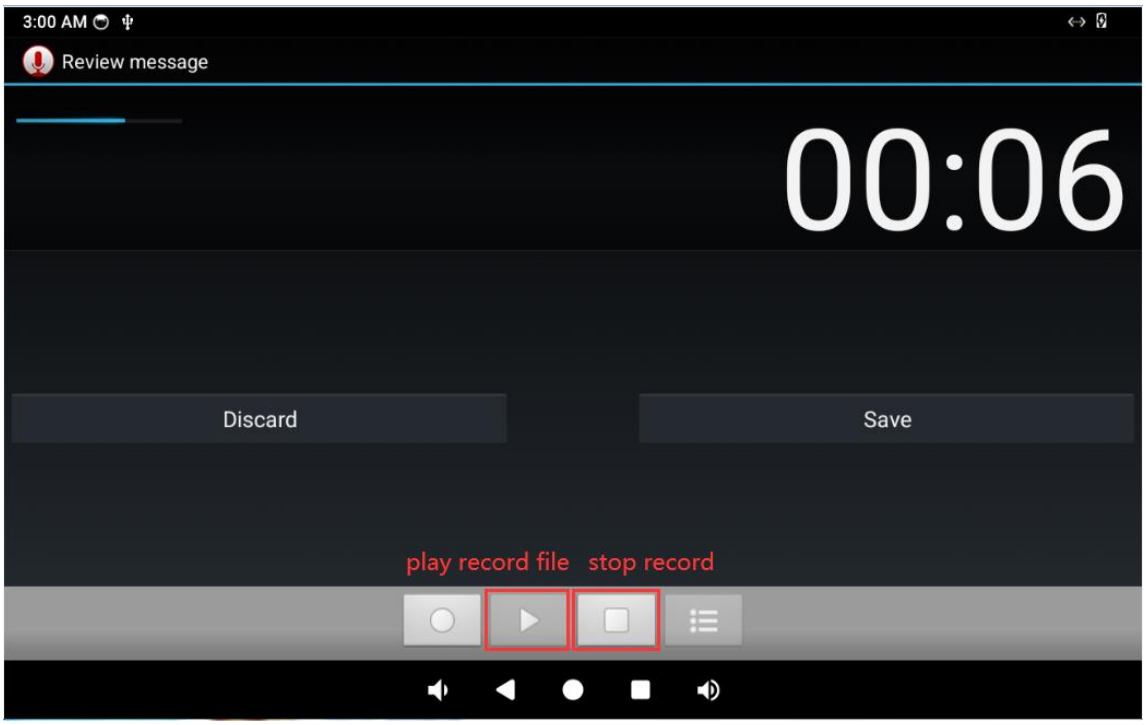


Step 3, Click the button as shown below to start recording.



Then speak in the MIC can record.

Step 4, click the button as shown below to stop recording and play.



6.9.2 Audio output

• Test by command

Step 1: put the audio file from sdcard or U-disk then execute the following command to view sound card.

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

```
console:/ # cat /proc/asound/cards
 0 [rockchiphdmi   ]: rockchip-hdmi - rockchip-hdmi
                      rockchip-hdmi
 1 [rkhdmiintc35874]: simple-card - rk,hdmiin-tc358749x-codec
                      rk,hdmiin-tc358749x-codec
```

Step 2: Execute the following command to play audio by Headset out.

```
# tinyplay test.wav -D 2 -d 0 -p 1024 -n 3
```

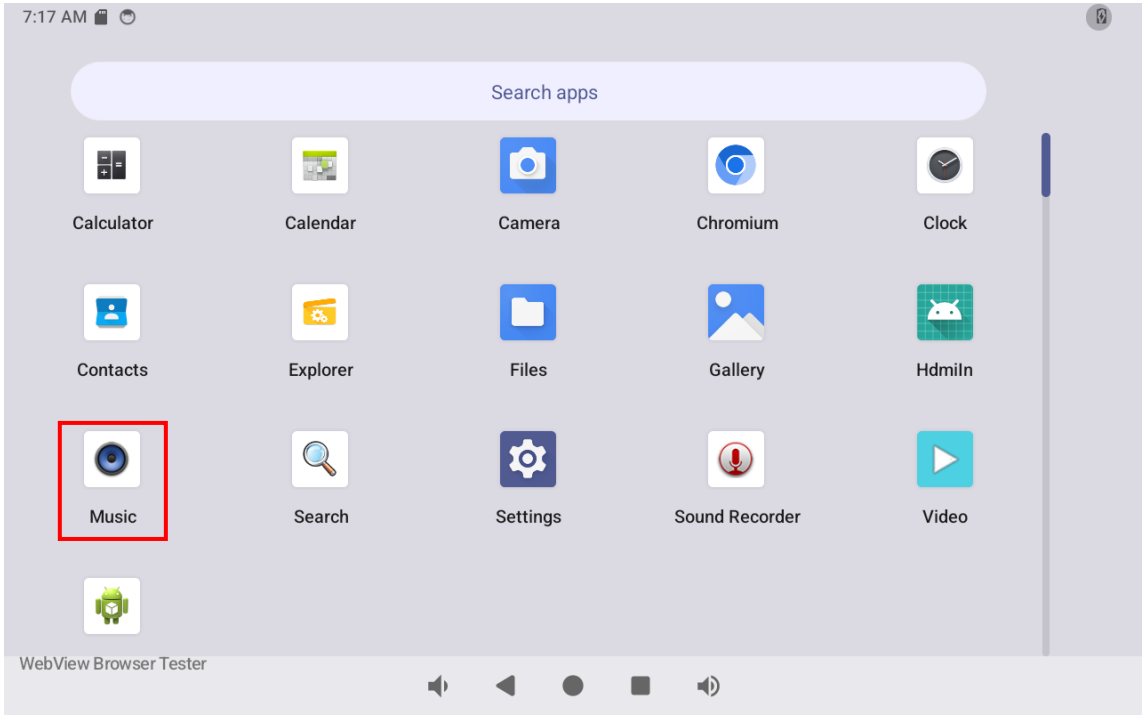
```
console:/mnt/media_rw/88E7-4C8E # tinyplay test.wav -D 2 -d 0 -p 1024 -n 3
Playing sample: 2 ch, 44100 hz, 16 bit 14590568 bytes
```

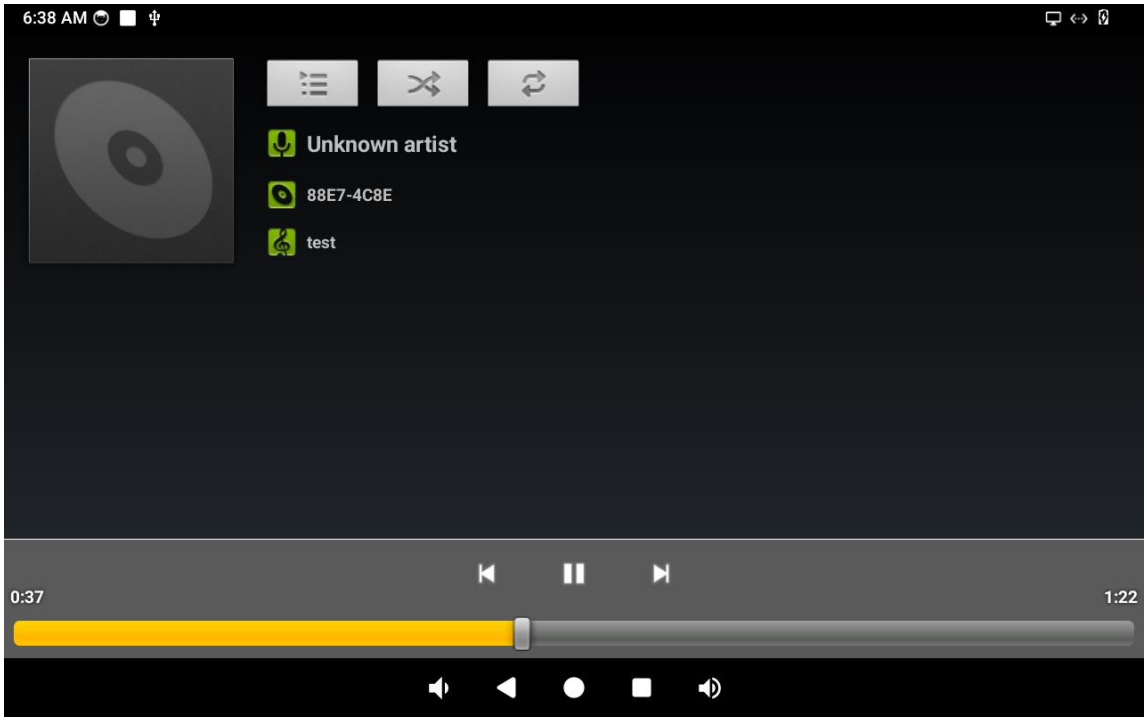
Supplementary instructions on audio output:

```
# tinyplay test.wav -D 0 -d 0 -p 1024 -n 3 // headset/speaker audio output
（Priority: Headset > speaker)

# tinyplay test.wav -D 0 -d 0 -p 1024 -n 3 // HDMI TX audio output
```

- **Test by APP**

Open the **Music** app for a audio test.

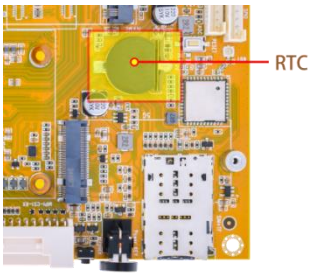




audio output priority: Headset audio output > HDMI audio output > Speaker audio output.

6.10 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
```

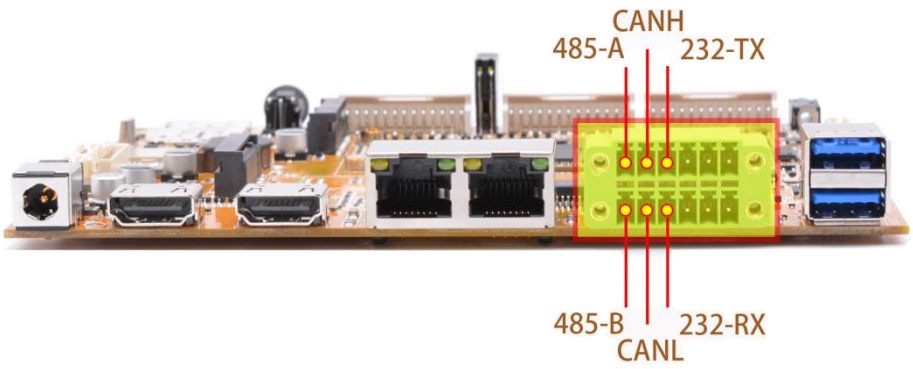
```
console:/ # date -s "2026-05-28 16:56:00"
Thu May 28 16:56:00 GMT 2026
console:/ # hwclock -w
console:/ # hwclock
2026-05-28 16:56:42+0000
console:/ # hwclock
2026-05-28 16:56:43+0000
```

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
```

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

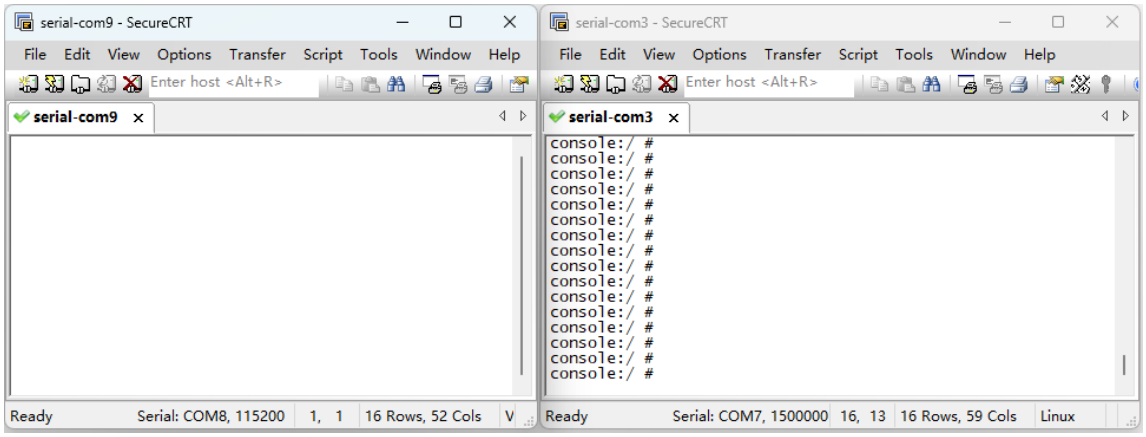
6.11 U27(RS485/CAN/RS232)



6.11.1 RS485

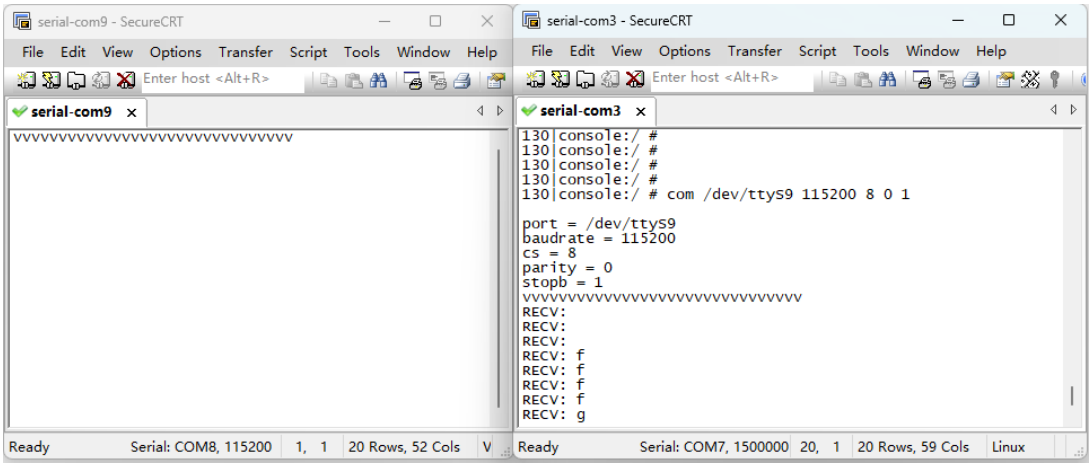
Step 1: As shown in the diagram, connect the RS485 test tool to the development board.

Step 2: Open the corresponding serial terminal, set the baud rate of the board to 1500000, and set the baud rate of the RS485 test tool to 115200.



Step 3: Execute the following command on the board to test the RS485 transmission and reception functionality.

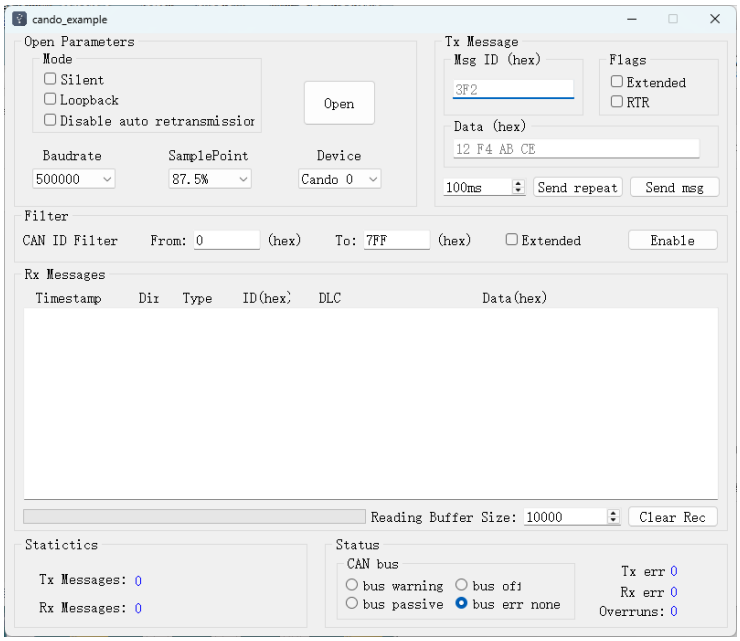
```
# com /dev/ttyS9 115200 8 0 1
```

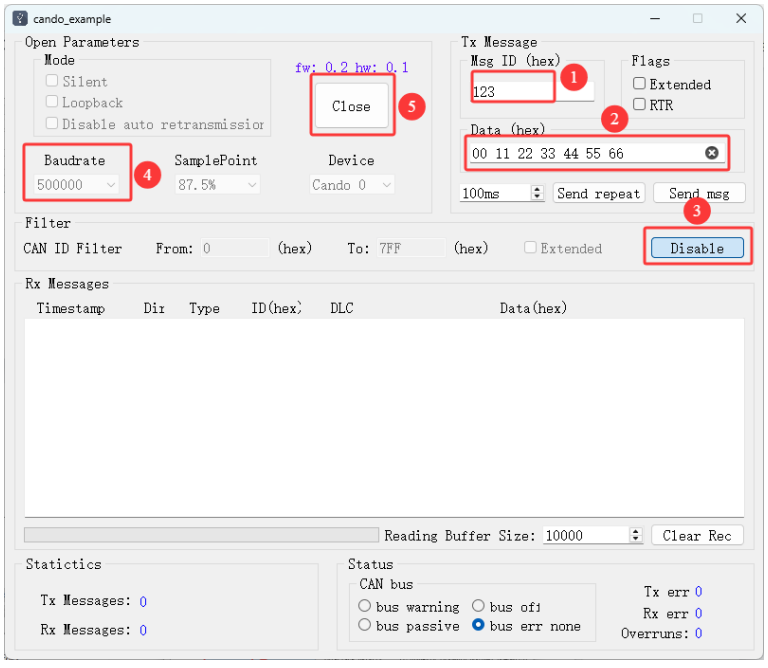


6.11.2 CAN

Step 1: Connect the CAN test tool to the board as shown in the diagram below.

Step 2: Open the CAN test software and set the baud rate to 500000.

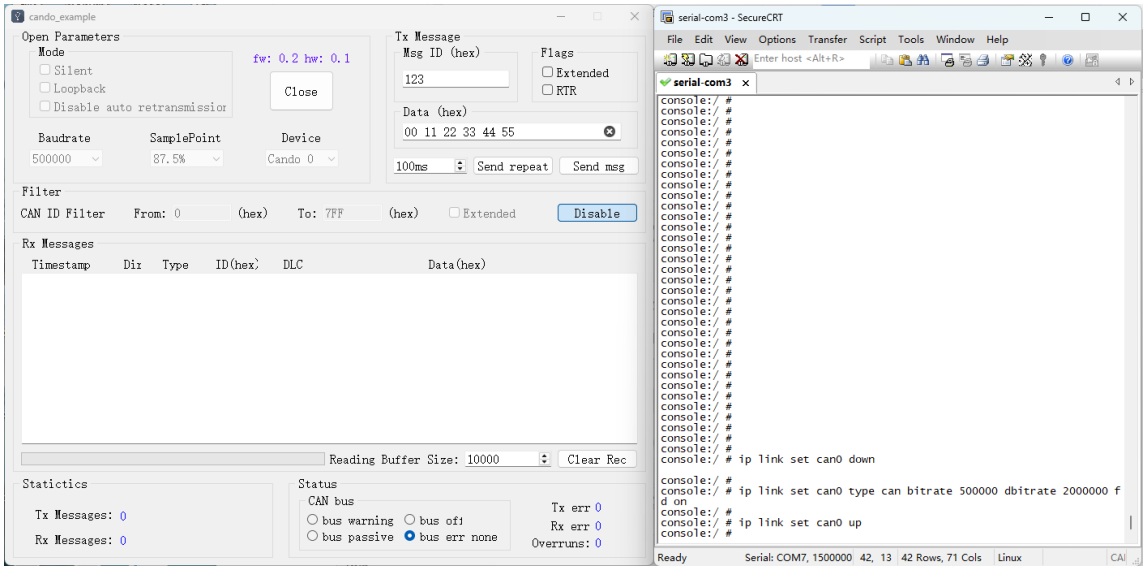




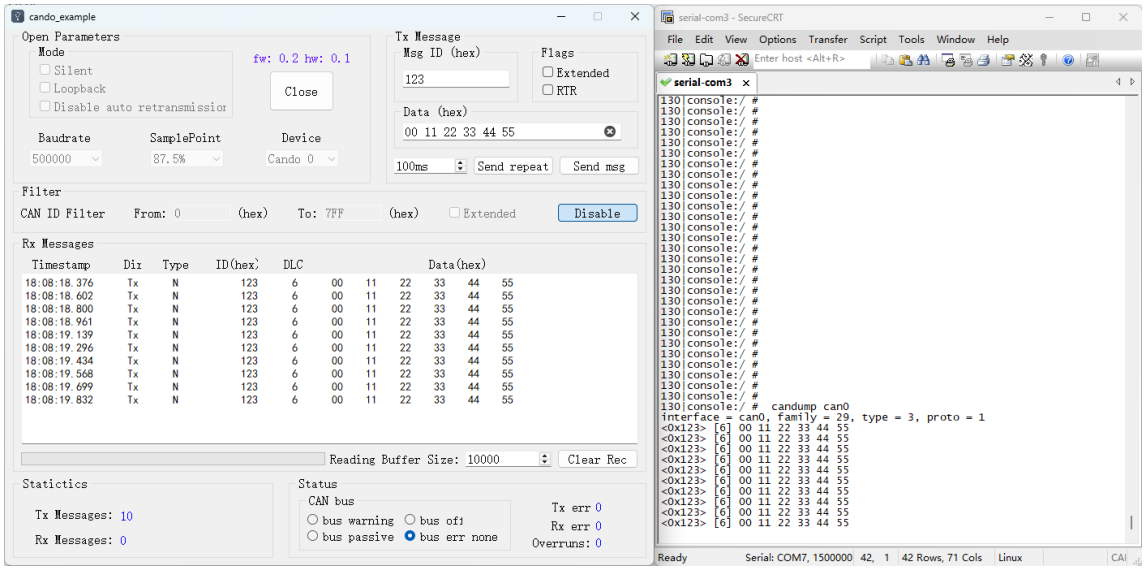
Step 3: Set up and activate the CAN network in CAN FD mode, with a nominal bitrate of 500000 and a data bitrate of 2000000.

```
# ip link set can0 down

# ip link set can0 type can bitrate 500000 dbitrate 2000000 fd on
```

Step 4: Configure CAN as the receiver.

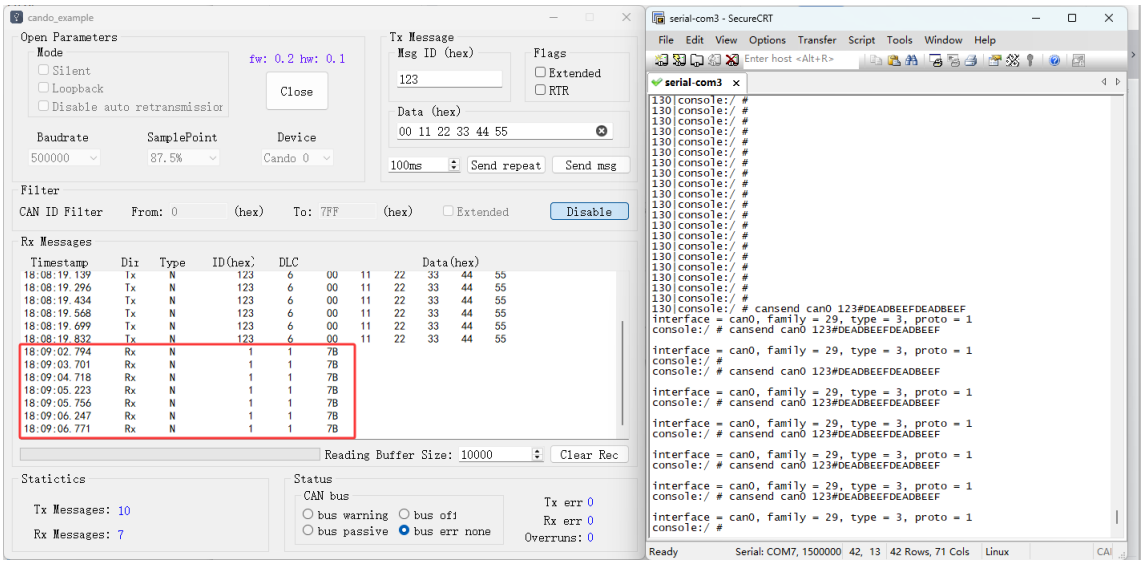



```
# candump can0
```



Step 5: Configure CAN as the sender.

```
# cansend can0 123#DEADBEEFDEADBEEF
```



6.11.3 RS232

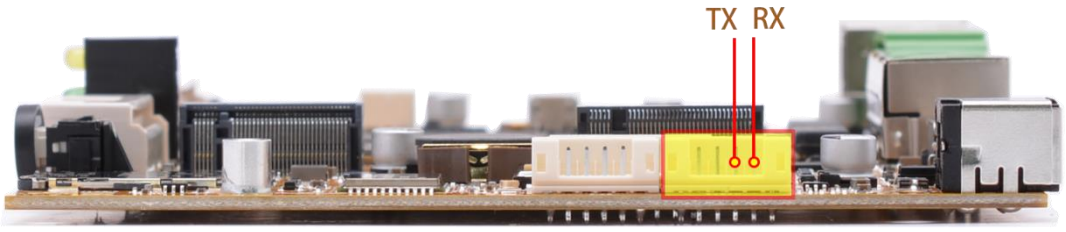
Step 1: Short circuit RX and TX pins of RS232.

Step 2: RS232 test.

```
# com /dev/ttyS1 115200 8 0 1
```

```
 130|console:/ # com /dev/ttyS1 115200 8 0 1
port = /dev/ttyS1
baudrate = 115200
cs = 8
parity = 0
```

6.12 UART



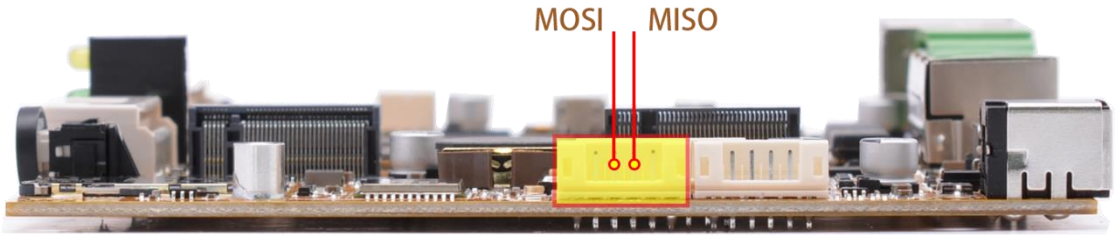
Step 1: Short circuit RX and TX pins of UART.

Step 2: UART test.

```
# com /dev/ttyS7 115200 8 0 1
```

```
130|console:/ # com /dev/ttyS7 115200 8 0 1
port = /dev/ttyS7
baudrate = 115200
cs = 8
parity = 0
stopb = 1
```

6.13 SPI



Step 1: Execute follow command to check SPI value.

```
# spidev_test -D /dev/spidev0.0
```

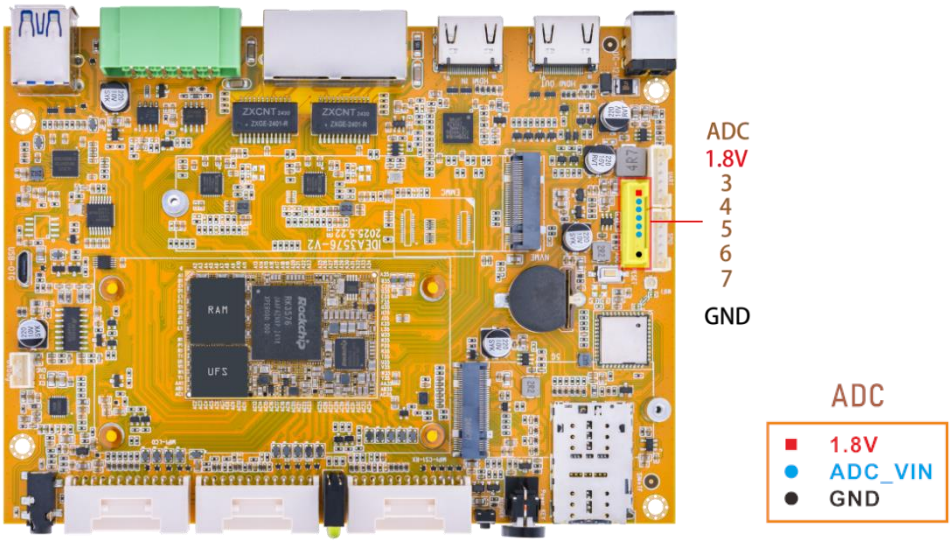
```
console:/ # spidev_test -D /dev/spidev0.0
spi mode: 0
bits per word: 8
max speed: 500000 Hz (500 KHz)

00 00 00 00 00 00
00 00 00 00 00 00
```

Step 2: Short circuit MOSI and MISO pins of SPI. Then execute follow command to check SPI value again.

```
# spidev_test -D /dev/spidev0.0
```

```
console:/ # spidev_test -D /dev/spidev0.0

spi mode: 0

bits per word: 8

max speed: 500000 Hz (500 KHz)


FF FF FF FF FF FF

40 00 00 00 00 95
```

6.14 ADC



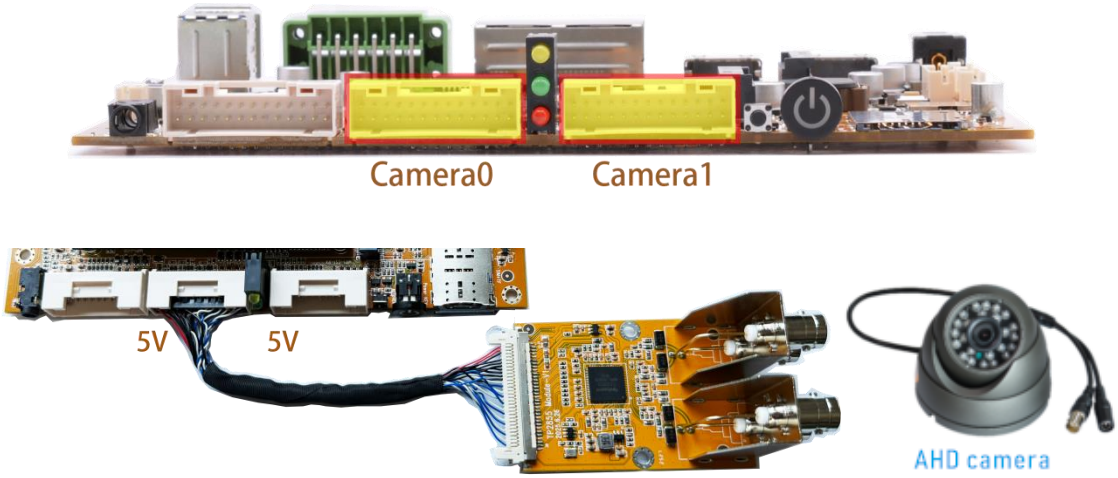
Connect the ADC_VIN pin to 1.8V or GND voltage, then execute the following command to observe the data changes.

```
# cat /sys/bus/iio/devices/iio\:device0/in_voltage*_raw
```

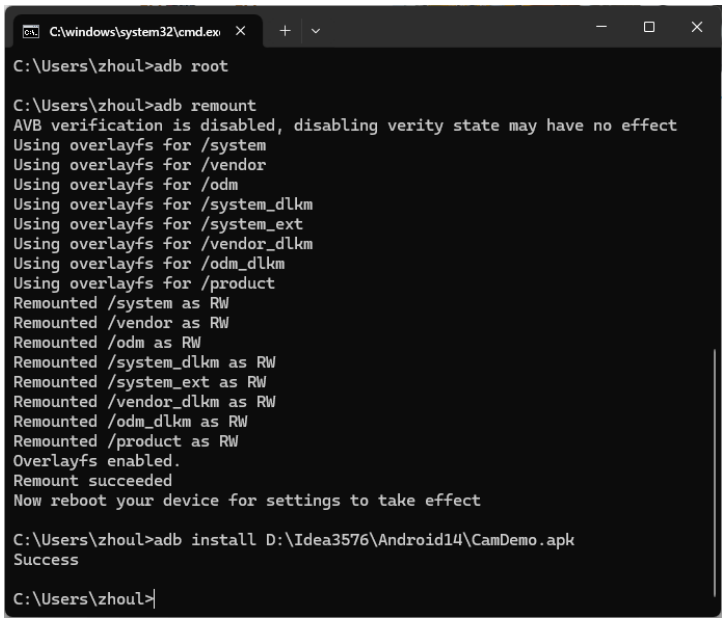
```
console:/ # cat /sys/bus/iio/devices/iio\:device0/in_voltage*_raw
2862
4092
3725
3429
3212
3168
3000
3302
console:/ # cat /sys/bus/iio/devices/iio\:device0/in_voltage*_raw
2862
4092
3725
4095
```

6.15 Camera

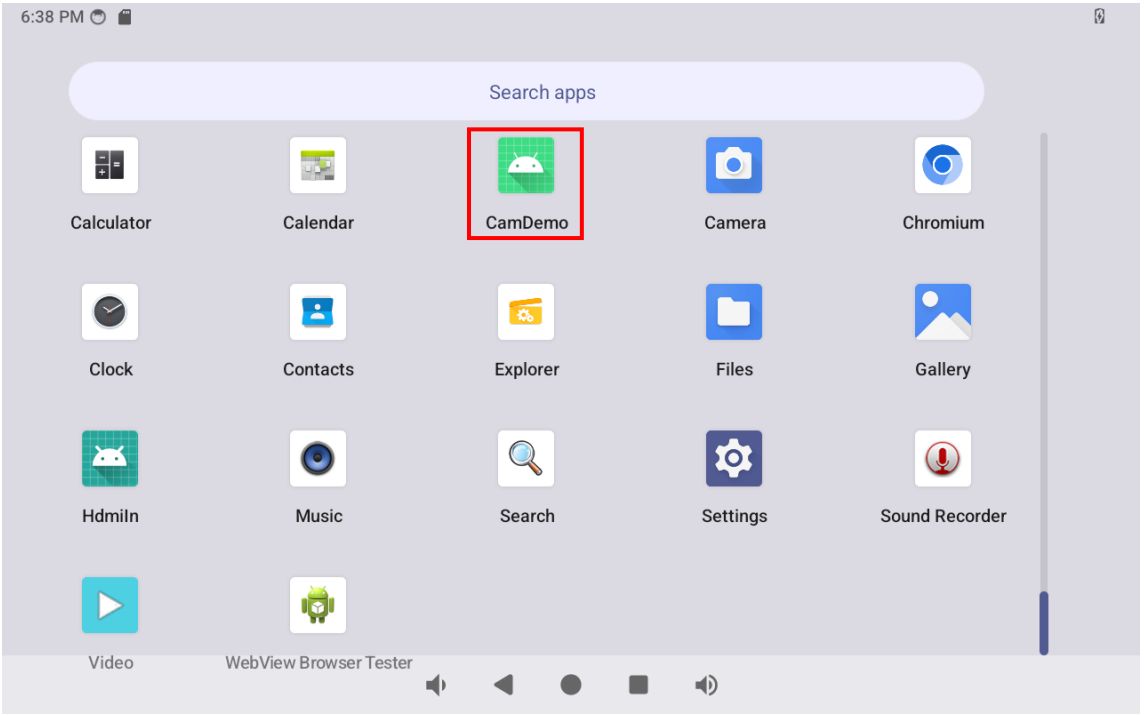
Step 1: Connect the camera to the board as shown in the diagram below.

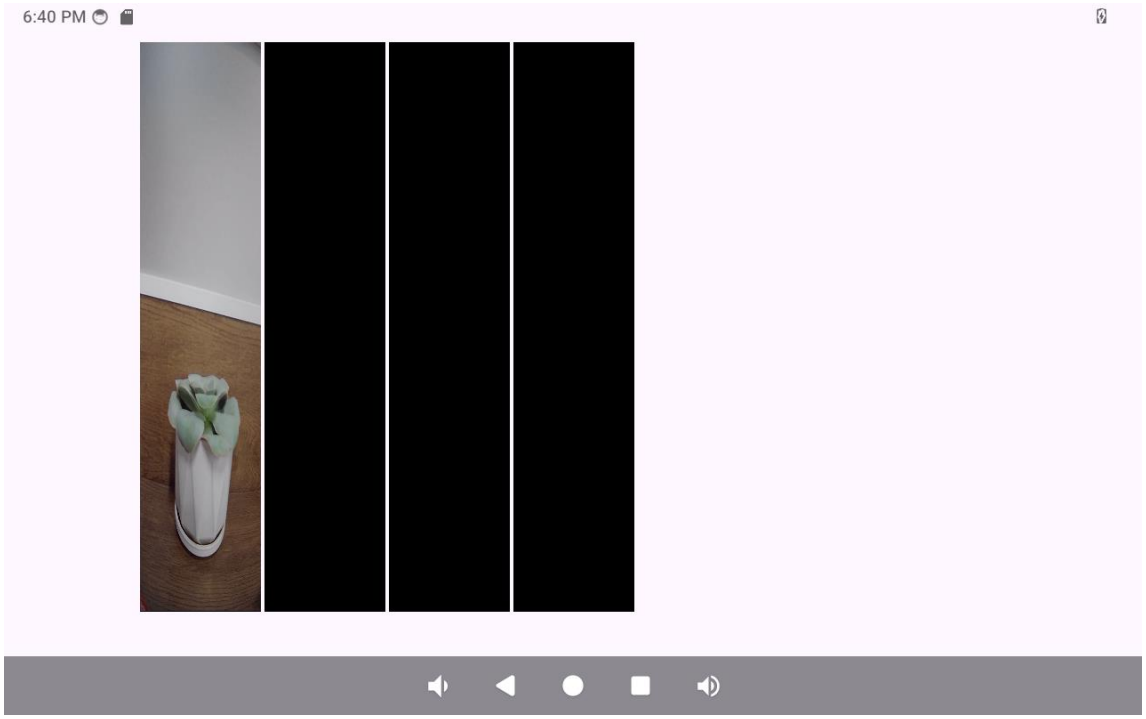


Step 2: Install CamDemo.apk via adb.



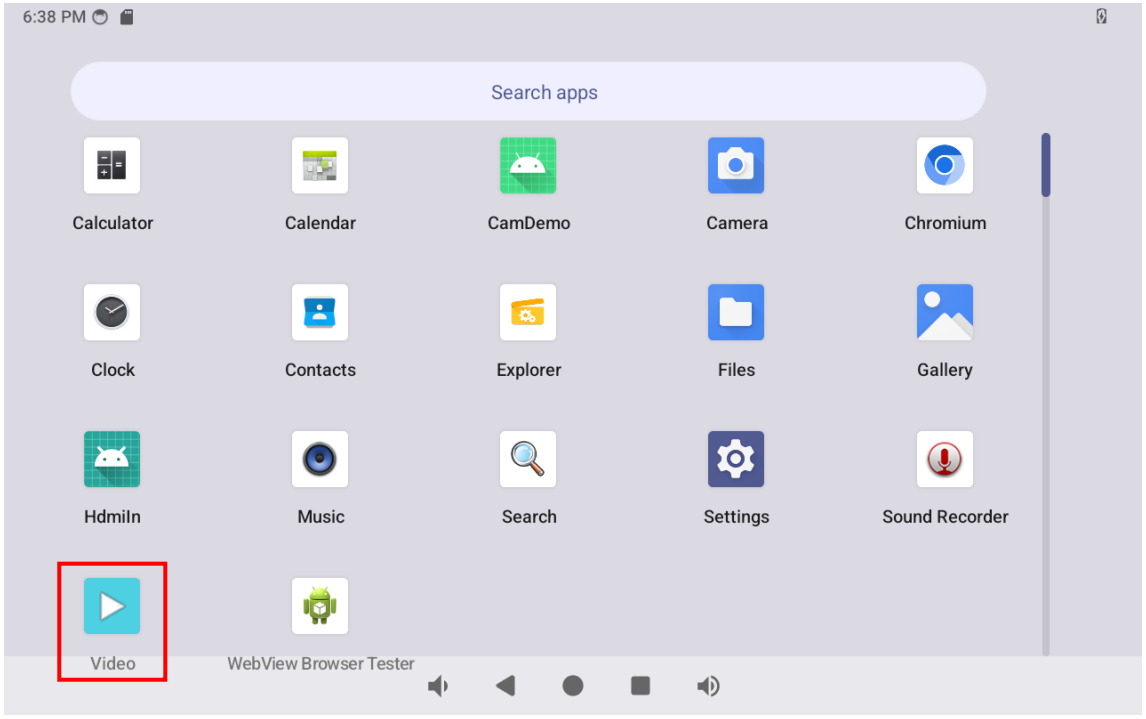
Step 3: Open the CamDemo app for a camera test.



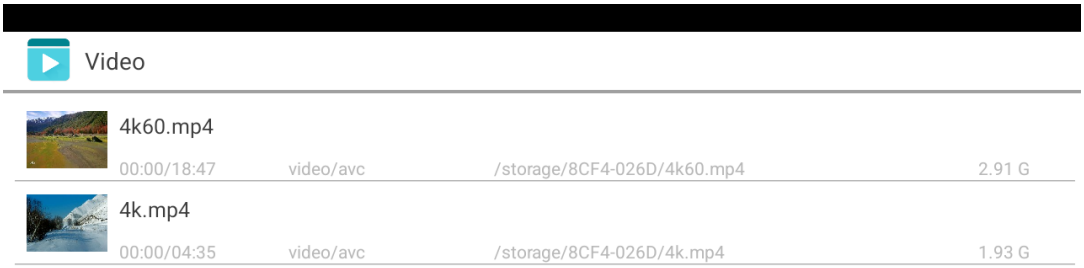


6.16 Video Playback

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



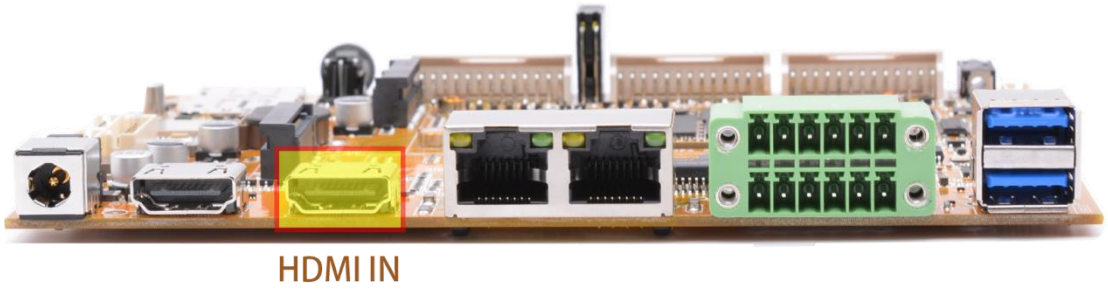
Step 2, Select video file to play.



• The IDA3576 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.

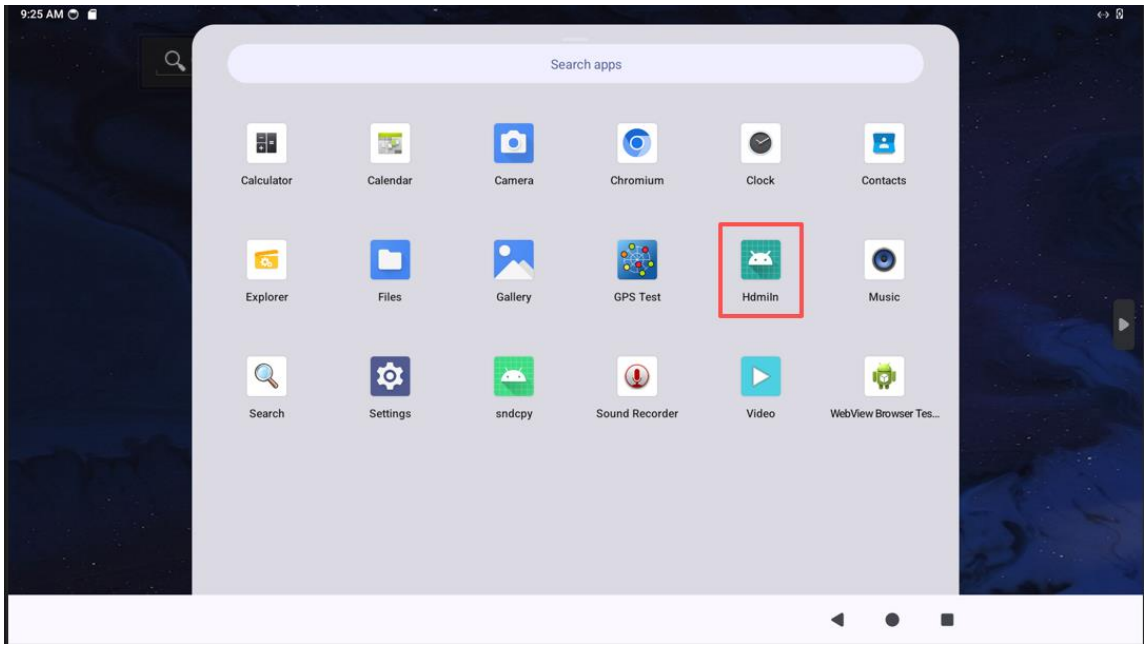
6.17 HDMI IN

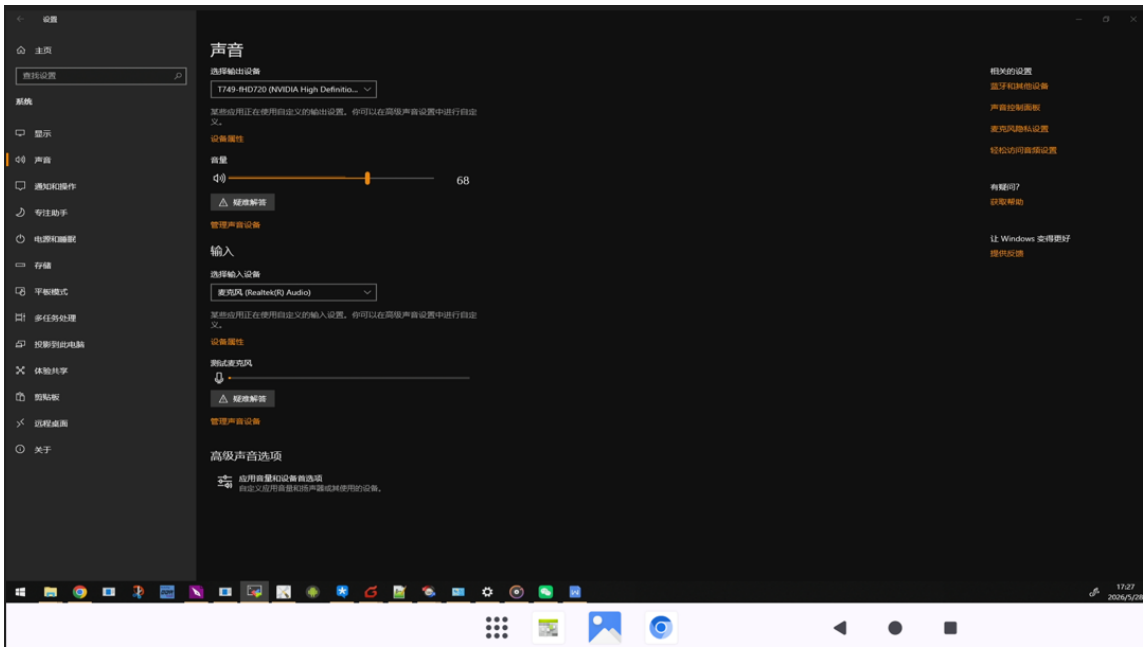


After connecting the HDMI OUT port of the source device to the HDMI IN port of the Idea3576. The log will show:

```
[    192.920894][    T146]  m03_b_tc35874x  4-000f:  tc35874x_format_change:  New  format:  1920x1080p60.00
```

Open the Hdmiin app and we can preview the image.




设置
主页
查找设置
系统
显示
声音
通知和操作
专注助手
电源和睡眠
存储
平板模式
多任务处理
投影到此电脑
体验共享
剪贴板
远程桌面
关于
声音
选择输出设备
T749-8HD720 (NVIDIA High Definitio...
某些应用正在使用自定义的输出设置。你可以在高级声音设置中进行自定义。
设备属性
音量
68
疑难解答
管理声音设备
输入
选择输入设备
麦克风 (Realtek(R) Audio)
某些应用正在使用自定义的输入设置。你可以在高级声音设置中进行自定义。
设备属性
测试麦克风
疑难解答
管理声音设备
高级声音选项
应用音量和设备首选项
自定义应用音量和扬声器或其使用的设备。
相关的设置
蓝牙和其他设备
声音控制面板
麦克风隐私设置
轻松访问音频设置
有疑问?
获取帮助
让 Windows 变得更好
提供反馈