

# Idea3399 Android7.1 User Manual

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V1.1



**Boardcon Embedded Design**

[www.boardcon.com](http://www.boardcon.com)

## **1. Introduction**

### **1.1. About this Manual**

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

### **1.2. Feedback and Update to this Manual**

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website ([www.boardcon.com](http://www.boardcon.com) , [www.armdesigner.com](http://www.armdesigner.com)). These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments, or concerns about your product or project, please no hesitate to contact us at [support@armdesigner.com](mailto:support@armdesigner.com).

### **1.3. Limited Warranty**

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lightning or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs make after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.



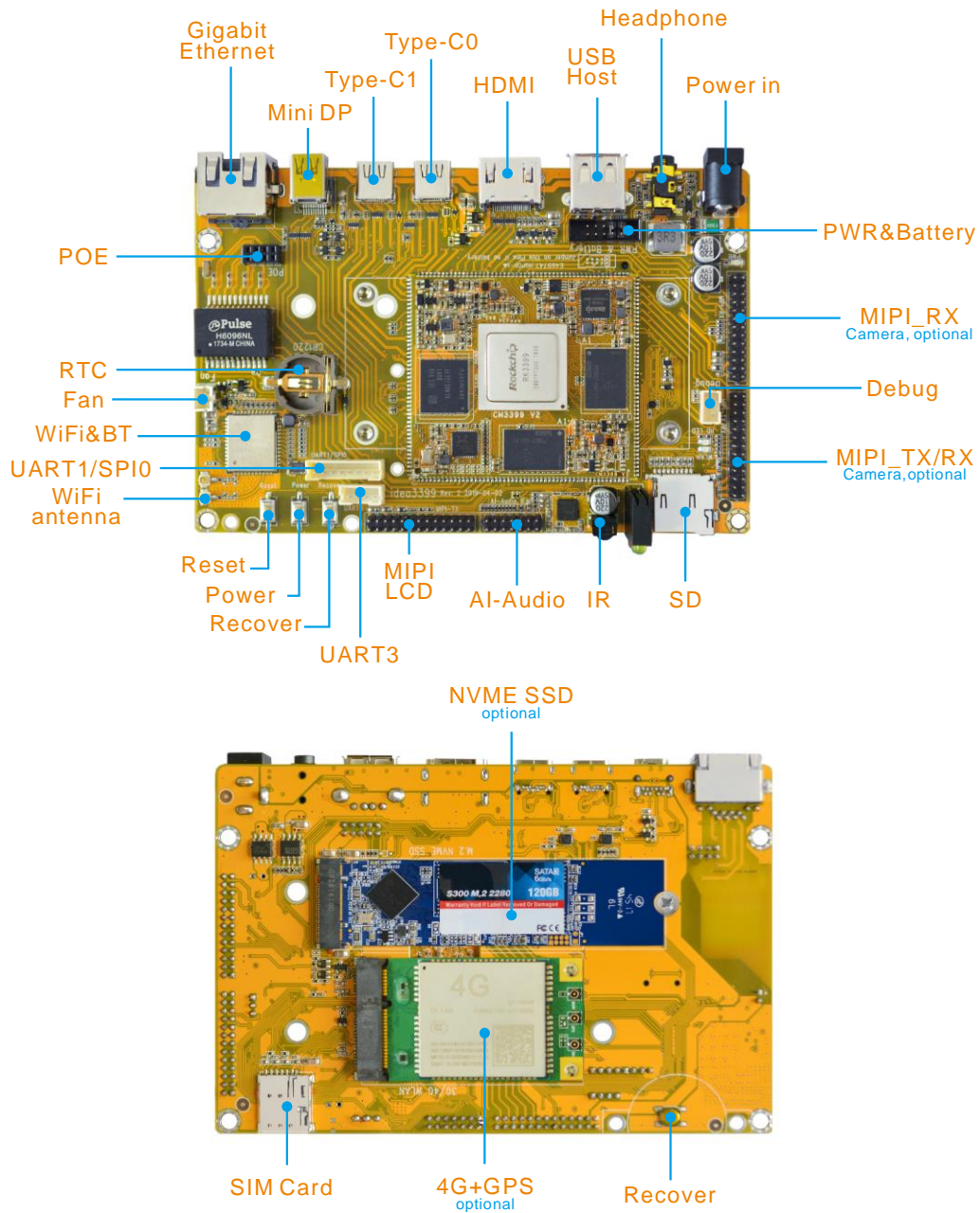
## Revision History

Ver	Description	Author	Date
V1.0	Initial version android7.1.2 industry	Qin Xueqin	2019-05-05
V1.1	Description update	Zhou Lijun	2019-11-22

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# 1 Idea3399 Introduction



Feature	Specifications
CPU	<ul style="list-style-type: none"> <li>· Rockchip RK3399. Big.Little architecture: Dual Cortex-A72 + Quad Cortex-A53, 64-bit CPU. Frequency is over 1.8GHz (Big cluster)</li> <li>· 28nm HKMG process</li> <li>· 1MB unified L2 Cache for Big cluster, 512KB unified L2 Cache for Little cluster</li> </ul>
GPU	<ul style="list-style-type: none"> <li>· Mali-T864 GPU, OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11</li> <li>· Supports AFBC (ARM Frame Buffer Compression)</li> </ul>
Memory	4GB LPDDR4
Flash	8GB eMMC Flash

Power	DC 5V/3A or 3.7V Li-Battery
USB	1x USB2.0 Host, 2x USB3.0 Type C
UART	1x 3pin connector. For debug.
LCD	MIPI TX for MIPI LCD via 26-pin header interface
Ethernet	1000M High performance Ethernet (RTL8211E), RJ45 interface
HDMI OUT	HDMI 1.4 /2.0 support 4K, 1080P, 720P, 480P resolution
MIPI Camera	MIPI RX for camera1, 13 Megapixels OV13850 model; MIPI RX/TX for camera2, 13 Megapixels; Support 3-D video capture
Audio codec	Adopt ALC5651 Audio chip, 3.5mm Audio I / O interface, 14-pin header for MIC Array.
PWR&Battery	2x5pin connector. 3.7V Li-Battery
RTC	Real Time Clock, powered by external lithium battery
SD card	1x T-Flash card slot
SIM card	1x SIM card slot
Buttons	3x User Buttons, for Recover, Power, Reset
IR	Support IR in
WIFI&BT	AP6356S, Wireless-2.4GHz/5GHz 802.11 a/b/g/n/ac. Bluetooth 4.1
3G/4G(optional)	52pins MINI PCI-E Socket. Support 3G/4G module
SSD(optional )	NVME SSD PCI.E X2
Dimension	135mm x 90mm

## 2 Compiler Environment

### 2.1 Vmware7.0+ubuntu14.04

Install Vmware7.0 in windows OS, and then install ubuntu14.04 in VMware to compile. Please refer to the official website <http://www.ubuntu.com/> to download and install Ubuntu system.

**Note:** Android7.1 should be compiled on ubuntu 64bit OS, Ubuntu 14.04 is recommended.

### 2.2 Install JDK

**JDK:** openjdk-8-jdk

**PC OS:** ubuntu system

**Network:** online

**Permission:** root

Execute the follow command in ubuntu system to download jdk and install.

```
# sudo apt-get update
# sudo apt-get install openjdk-8-jdk
```

For example, the installation path is `/usr/lib/jvm/java-8-openjdk-amd64`.

Configure the environment variable at the terminal by executing commands

```
# export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
# export PATH=$JAVA_HOME/bin:$PATH
# export CLASSPATH=.:$JAVA_HOME/lib:$JAVA_HOME/lib/tools.jar
```

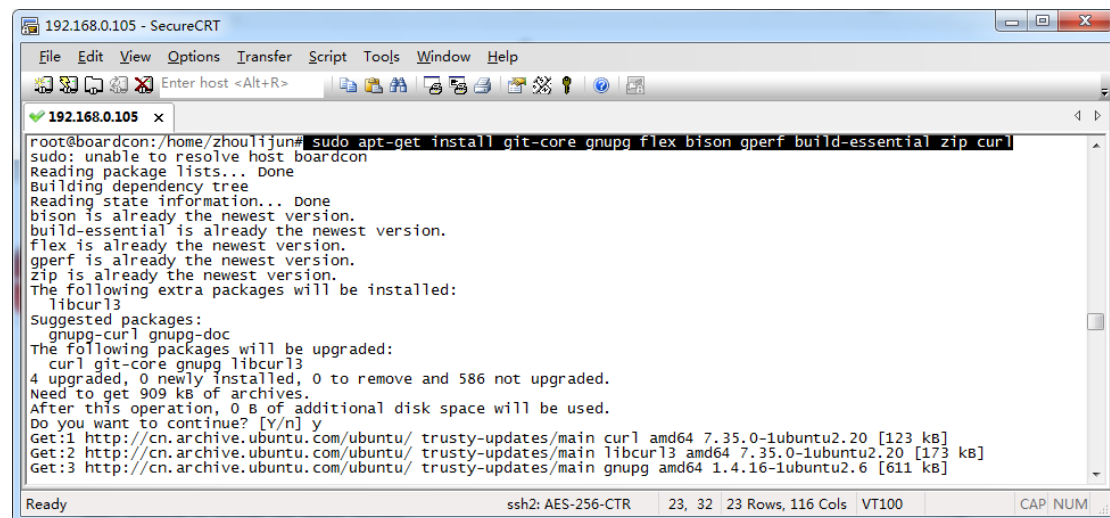
Execute the command to check if the **jdk** has been installed successfully and view the revised version

```
# java -version
openjdk version "1.8.0_121"
OpenJDK Runtime Environment (build 1.8.0_121-8u121-b13-0ubuntu1.16.04.2-b13)
OpenJDK 64-Bit Server VM (build 25.121-b13, mixed mode)
```

## 2.3 Install Tools

Root user execute the follow commands to install necessary tools.

```
# sudo apt-get install git-core gnupg flex bison gperf build-essential zip curl
```



```
192.168.0.105 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.105 x
root@boardcon:/home/zhoulujun# sudo apt-get install git-core gnupg flex bison gperf build-essential zip curl
sudo: unable to resolve host boardcon
Reading package lists... Done
Building dependency tree
Reading state information... Done
bison is already the newest version.
build-essential is already the newest version.
flex is already the newest version.
gperf is already the newest version.
zip is already the newest version.
The following extra packages will be installed:
  libcurl3
Suggested packages:
  gnupg-curl gnupg-doc
The following packages will be upgraded:
  curl git-core gnupg libcurl3
4 upgraded, 0 newly installed, 0 to remove and 586 not upgraded.
Need to get 909 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main curl amd64 7.35.0-1ubuntu2.20 [123 kB]
Get:2 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libcurl3 amd64 7.35.0-1ubuntu2.20 [173 kB]
Get:3 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main gnupg amd64 1.4.16-1ubuntu2.6 [611 kB]
Ready                                ssh2: AES-256-CTR    23, 32  23 Rows, 116 Cols  VT100    CAP NUM
```

```
# sudo apt-get install zlib1g-dev gcc-multilib g++-multilib libc6-dev-i386
```



```
192.168.0.105 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.105 x
root@boardcon:/home/zhoulifun# sudo apt-get install zlib1g-dev gcc-multilib g++-multilib libc6-dev-i386
sudo: unable to resolve host boardcon
Reading package lists... Done
Building dependency tree
Reading state information... Done
g++-multilib is already the newest version.
gcc-multilib is already the newest version.
zlib1g-dev is already the newest version.
The following extra packages will be installed:
  libc-dev-bin libc6 libc6:i386 libc6-dbg libc6-dev libc6-dev-x32 libc6-i386
  libc6-x32
Suggested packages:
  glibc-doc glibc-doc:i386 locales:i386
The following packages will be upgraded:
  libc-dev-bin libc6 libc6:i386 libc6-dbg libc6-dev libc6-dev-i386
  libc6-dev-x32 libc6-i386 libc6-x32
9 upgraded, 0 newly installed, 0 to remove and 577 not upgraded.
Need to get 21.4 MB of archives.
After this operation, 2,048 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libc6-i386 amd64 2.19-0ubuntu6.15 [2,208 kB]
Get:2 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libc-dev-bin amd64 2.19-0ubuntu6.15 [68.9 kB]
Get:3 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libc6-dev amd64 2.19-0ubuntu6.15 [1,913 kB]
Ready ssh2: AES-256-CTR 23, 32 23 Rows, 116 Cols VT100 CAP_NUM
```

# sudo apt-get install lib32ncurses5-dev x11proto-core-dev libx11-dev

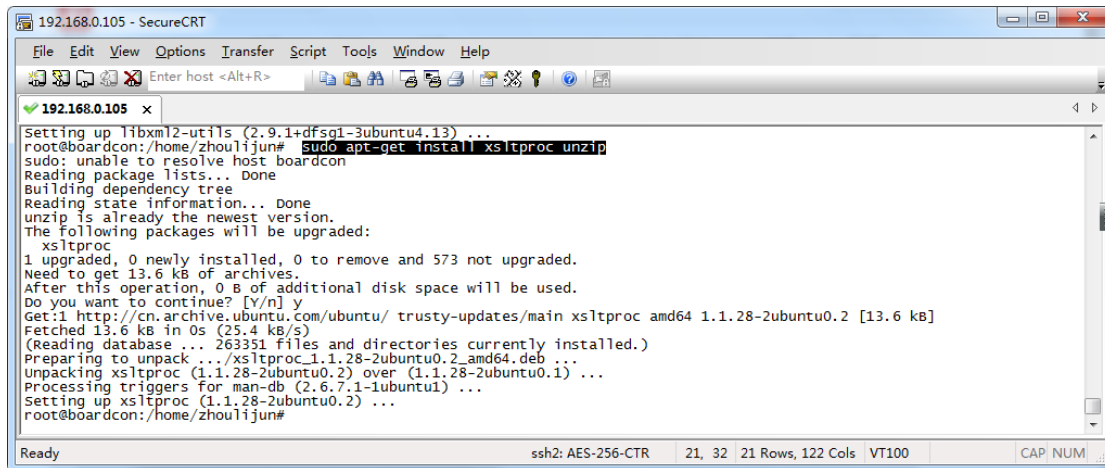
```
192.168.0.105 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.105 x
root@boardcon:/home/zhoulifun# sudo apt-get install lib32ncurses5-dev x11proto-core-dev libx11-dev
sudo: unable to resolve host boardcon
Reading package lists... Done
Building dependency tree
Reading state information... Done
lib32ncurses5-dev is already the newest version.
x11proto-core-dev is already the newest version.
x11proto-core-dev set to manually installed.
The following extra packages will be installed:
  libx11-6
The following packages will be upgraded:
  libx11-6 libx11-dev
2 upgraded, 0 newly installed, 0 to remove and 575 not upgraded.
Need to get 1,194 kB of archives.
After this operation, 2,048 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libx11-dev amd64 2:1.6.2-1ubuntu2.1 [632 kB]
Get:2 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libx11-6 amd64 2:1.6.2-1ubuntu2.1 [561 kB]
Fetched 1,194 kB in 6s (178 kB/s)
(Reading database ... 263336 files and directories currently installed.)
Preparing to unpack .../libx11-dev_2%3a1.6.2-1ubuntu2.1_amd64.deb ...
Unpacking libx11-dev:amd64 (2:1.6.2-1ubuntu2.1) over (2:1.6.2-1ubuntu2) ...
Preparing to unpack .../libx11-6_2%3a1.6.2-1ubuntu2.1_amd64.deb ...
Ready ssh2: AES-256-CTR 23, 32 23 Rows, 116 Cols VT100 CAP_NUM
```

# sudo apt-get install lib32z-dev ccache libgl1-mesa-dev libxml2-utils

```
192.168.0.105 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.105 x
root@boardcon:/home/zhoulifun# sudo apt-get install lib32z-dev ccache libgl1-mesa-dev libxml2-utils
sudo: unable to resolve host boardcon
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'lib32z1-dev' instead of 'lib32z-dev'
lib32z1-dev is already the newest version.
libgl1-mesa-dev is already the newest version.
Suggested packages:
  distcc
The following NEW packages will be installed:
  ccache
The following packages will be upgraded:
  libxml2-utils
1 upgraded, 1 newly installed, 0 to remove and 574 not upgraded.
Need to get 113 kB of archives.
After this operation, 262 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://cn.archive.ubuntu.com/ubuntu/ trusty/main ccache amd64 3.1.9-1 [77.8 kB]
Get:2 http://cn.archive.ubuntu.com/ubuntu/ trusty-updates/main libxml2-utils amd64 2.9.1-1dfsg1-3ubuntu4.13 [34.8 kB]
Fetched 113 kB in 3s (34.8 kB/s)
Selecting previously unselected package ccache.
(Reading database ... 263336 files and directories currently installed.)
Ready ssh2: AES-256-CTR 23, 32 23 Rows, 116 Cols VT100 CAP_NUM
```

# sudo apt-get install xsltproc unzip





```

192.168.0.105 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.105 x
Setting up libxml2-utils (2.9.1+dfsg1-3ubuntu4.13) ...
root@boardcon:/home/zhoulifun# sudo apt-get install xsltproc unzip
sudo: unable to resolve host boardcon
Reading package lists... Done
Building dependency tree
Reading state information... Done
unzip is already the newest version.
The following packages will be upgraded:
  xsltproc
1 upgraded, 0 newly installed, 0 to remove and 573 not upgraded.
Need to get 13.6 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://cn.archive.ubuntu.com/ubuntu/trusty-updates/main xsltproc amd64 1.1.28-2ubuntu0.2 [13.6 kB]
Fetched 13.6 kB in 0s (25.4 kB/s)
(Reading database ... 263951 files and directories currently installed.)
Preparing to unpack .../xsltproc_1.1.28-2ubuntu0.2_amd64.deb ...
Unpacking xsltproc (1.1.28-2ubuntu0.2) over (1.1.28-2ubuntu0.1) ...
Processing triggers for man-db (2.6.7.1-1ubuntu1) ...
Setting up xsltproc (1.1.28-2ubuntu0.2) ...
root@boardcon:/home/zhoulifun#
Ready ssh2: AES-256-CTR 21, 32 21 Rows, 122 Cols VT100 CAP NUM
  
```

## 3 Compile Source

Unzip the source.

```
# tar zxvf ideal3399-android7.1-industry.tar.gz
```

### 3.1 Compile Kernel

```
# cd ideal3399-android7.1-industry/kernel/
# make ARCH=arm64 boardcon_defconfig -j8
# make ARCH=arm64 ideal3399-boardcon.img -j12
```

**kernel.img** and **resource.img** are generated in current directory.

### 3.2 Compile Android

```
# cd ideal3399-android7.1-industry /
# source build/envsetup.sh
# lunch ideal3399-userdebug
# make -j12
# ./mkimages.sh
```



```
qinxueqin@boardcon:~/3399/android/ideal3399-android7.1-industry$ source build/envsetup.sh
including device/rockchip/rk3399/vendorsetup.sh
including sdk/bash_completion/adb.bash
qinxueqin@boardcon:~/3399/android/ideal3399-android7.1-industry$ lunch ideal3399-userdebug

=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.1.2
TARGET_PRODUCT=ideal3399
TARGET_BUILD_VARIANT=userdebug
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
TARGET_2ND_ARCH_VARIANT=armv7-a-neon
TARGET_2ND_CPU_VARIANT=cortex-a53.a57
HOST_ARCH=x86_64
HOST_2ND_ARCH=x86
HOST_OS=linux
HOST_OS_EXTRA=Linux-4.2.0-42-generic-x86_64-with-Ubuntu-14.04-trusty
HOST_CROSS_OS=windows
HOST_CROSS_ARCH=x86
HOST_CROSS_2ND_ARCH=x86_64
HOST_BUILD_TYPE=release
BUILD_ID=NHG47K
OUT_DIR=out
=====
qinxueqin@boardcon:~/3399/android/ideal3399-android7.1-industry$ make -j12
=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.1.2
TARGET_PRODUCT=ideal3399
TARGET_BUILD_VARIANT=userdebug
TARGET_BUILD_TYPE=release
```

Generated image file

```
# cd rockdev/Image-ideal3399
# ls
```

Images are generated in current directory.

## 4 Images Operation

### 4.1 Pack Image

Step 1, unzip **AndroidTool.rar** in windows.

Step 2, copy all the files in the Android root directory **rockdev/Image-ideal3399** to the development tools **rockdev/Image** directory.

Step 3, enter the directory **AndroidTool/rockdev/Image**, and then double-click to run **mkupdate.bat**.



```
Android Firmware Package Tool v1.62

C:\Users\Administrator\Desktop\3399\AndroidTool-android\rockdev>afptool -pack .\
backupimage backupimage\backup.img
Android Firmware Package Tool v1.62
----- PACKAGE -----
Add file: .\backupimage\package-file
Add file: .\backupimage\package-file done,offset=0x800,size=0x2cd,userspace=0x1
Add file: .\backupimage\...\Image\MiniLoaderAll.bin
Add file: .\backupimage\...\Image\MiniLoaderAll.bin done,offset=0x1000,size=0x4
394e,userspace=0x88
Add file: .\backupimage\...\Image\parameter.txt
Add file: .\backupimage\...\Image\parameter.txt.tmp done,offset=0x45000,size=0x
399,userspace=0x1
Add file: .\backupimage\...\Image\trust.img
Add file: .\backupimage\...\Image\trust.img done,offset=0x45800,size=0x400000,u
serspace=0x801
Add file: .\backupimage\...\Image\uboot.img
Add file: .\backupimage\...\Image\uboot.img done,offset=0x446000,size=0x400000,
userspace=0x801
Add file: .\backupimage\...\Image/misc.img
Add file: .\backupimage\...\Image/misc.img done,offset=0x846800,size=0xc000,use
rspace=0x19
Add file: .\backupimage\...\Image/kernel.img
Add file: .\backupimage\...\Image/kernel.img done,offset=0x853000,size=0x12a281
4,userspace=0x2546
Add file: .\backupimage\...\Image/boot.img
Add file: .\backupimage\...\Image/boot.img done,offset=0x1af6000,size=0x1e6b9c,
userspace=0x3ce
Add file: .\backupimage\...\Image/recovery.img
Add file: .\backupimage\...\Image/recovery.img done,offset=0x1cdd000,size=0x754
560,userspace=0xea9
Add CRC...
Make firmware OK!
----- OK -----
```

```
Android Firmware Package Tool v1.62

6
Add file: .\Image\boot.img
Add file: .\Image\boot.img done,offset=0x1b38800,size=0x1e6b9c,userspace=0x3ce
Add file: .\Image\recovery.img
Add file: .\Image\recovery.img done,offset=0x1d1f800,size=0x754560,userspace=0xe
a9
Add file: .\Image\system.img
Add file: .\Image\system.img done,offset=0x2474000,size=0x458058b8,userspace=0x8
b00c
Add file: .\backupimage\backup.img
Add file: .\backupimage\backup.img done,offset=0x47c7a000,size=0x2431804,userspa
ce=0x4864
Add file: .\update-script
Add file: .\update-script done,offset=0x4a0ac000,size=0x3a5,userspace=0x1
Add file: .\recover-script
Add file: .\recover-script done,offset=0x4a0ac800,size=0x10a,userspace=0x1
Add CRC...
Make firmware OK!
----- OK -----

C:\Users\Administrator\Desktop\3399\AndroidTool-android\rockdev>RKImageMaker.exe
-RK330C Image\MiniLoaderAll.bin Image\update.img update.img -os_type:androidos

*****RKImageMaker ver 1.62 *****
Generating new image, please wait...
Error:Create new image file failed!

C:\Users\Administrator\Desktop\3399\AndroidTool-android\rockdev>ren update.img i
s new format, Image\update.img is old format, so delete older format

C:\Users\Administrator\Desktop\3399\AndroidTool-android\rockdev>del Image\updat
e.img

C:\Users\Administrator\Desktop\3399\AndroidTool-android\rockdev>pause
请按任意键继续. . .
```

Step 4, **update.img** will be generated in **rockdev** directory.

Note: If an error occurs, it may be in the script is not the same bootloader version, follow the prompts to modify the file **mkupdate.bat** and **package-file** the same version of the current directory.

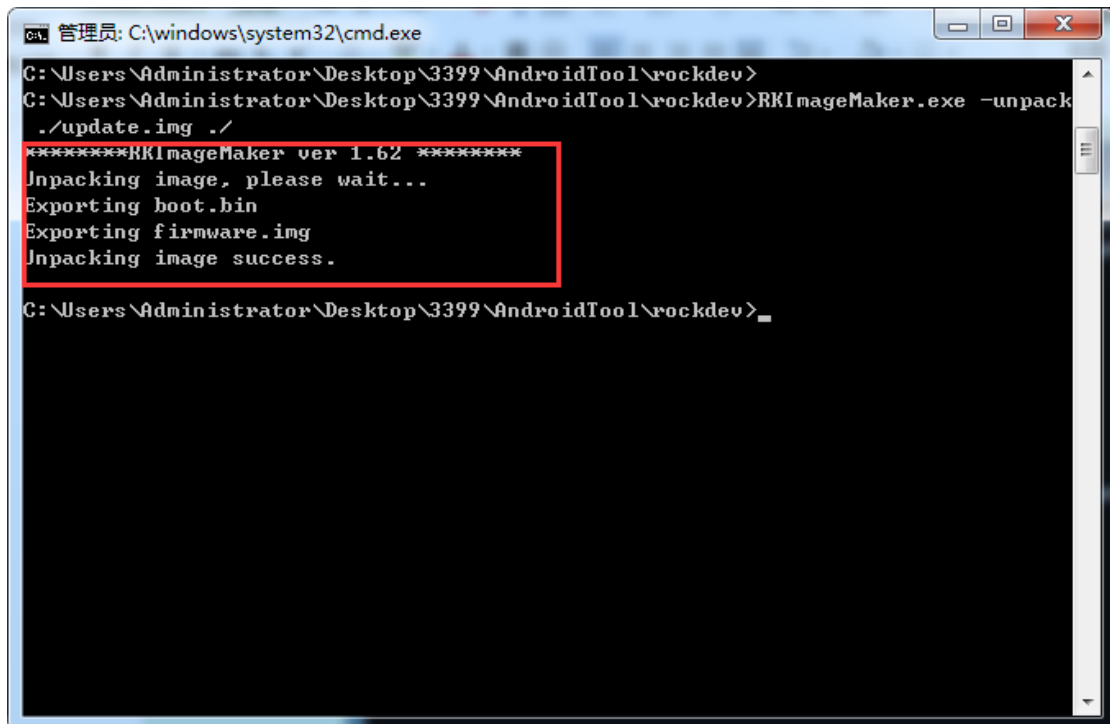
## 4.2 Unzip Firmware

Step 1, enter the directory **AndroidTool rockdev** in CMD, unzip **update.img**.

Enter the following command

```
RKImageMaker.exe -unpack ./update.img ./
```

Then unzip the file to get the files **boot.bin** and **firmware.img**.

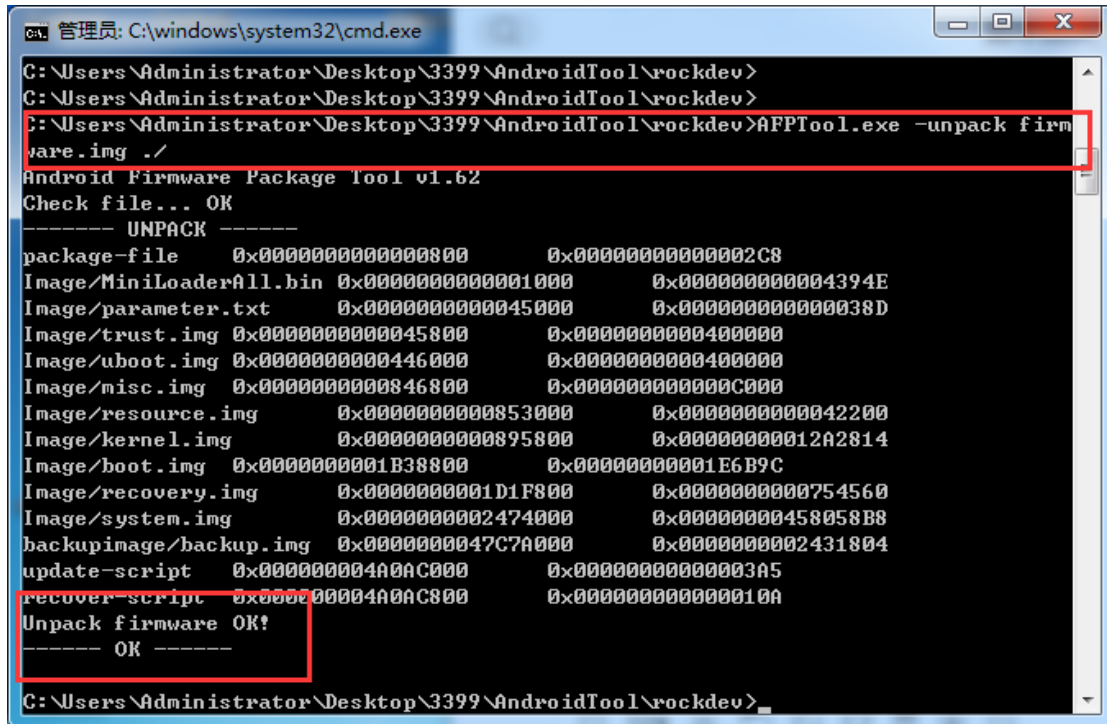


```
ca. 管理员: C:\windows\system32\cmd.exe
C:\Users\Administrator\Desktop\3399\AndroidTool\rockdev>
C:\Users\Administrator\Desktop\3399\AndroidTool\rockdev>RKImageMaker.exe -unpack
./update.img ./
*****RKImageMaker ver 1.62 *****
Inpacking image, please wait...
Exporting boot.bin
Exporting firmware.img
Inpacking image success.
C:\Users\Administrator\Desktop\3399\AndroidTool\rockdev>_
```

Step 2, unzip **firmware.img**.

Execute the command

```
AFPTool.exe -unpack firmware.img ./
```

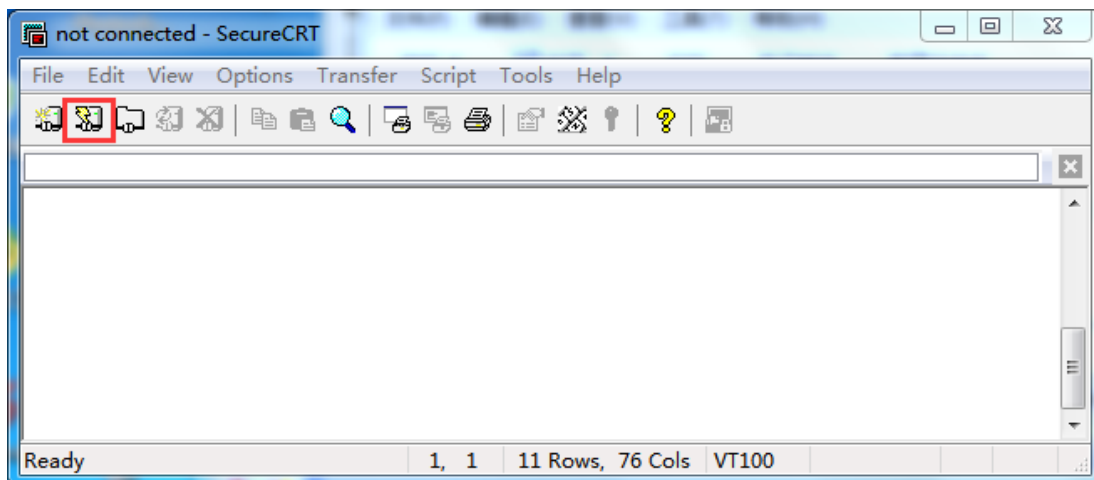


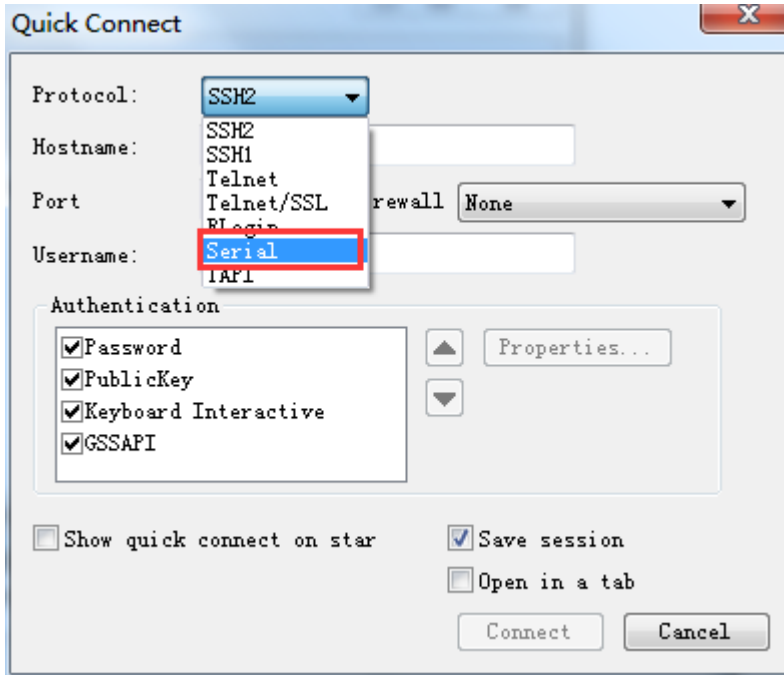
The unzip files will be generated in the directory **AndroidTool\rockdev\Image**.

## 5 Install Serial Terminal Tool

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

Open SecureCRT.exe after copy to PC (path: tools\windows\SecureCRT.exe), then click the icon **Quick Connect** to config.





Set the parameters as follow:

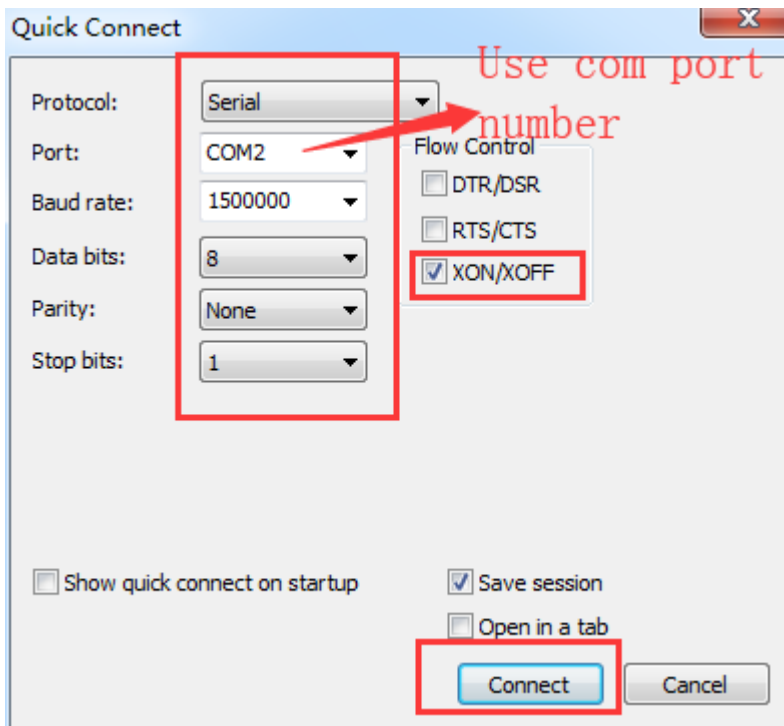
**Protocol:** Serial

**Port:** To be specified by user PC

**Baud rate:** 1500000

Please check XON/XOFF but not RTS/CTS

Check Save session



After all, click **connect**

**Illusion:** If open more than one serial terminal tools, and they use the same serial port, there will be

reported **the port is busy**.

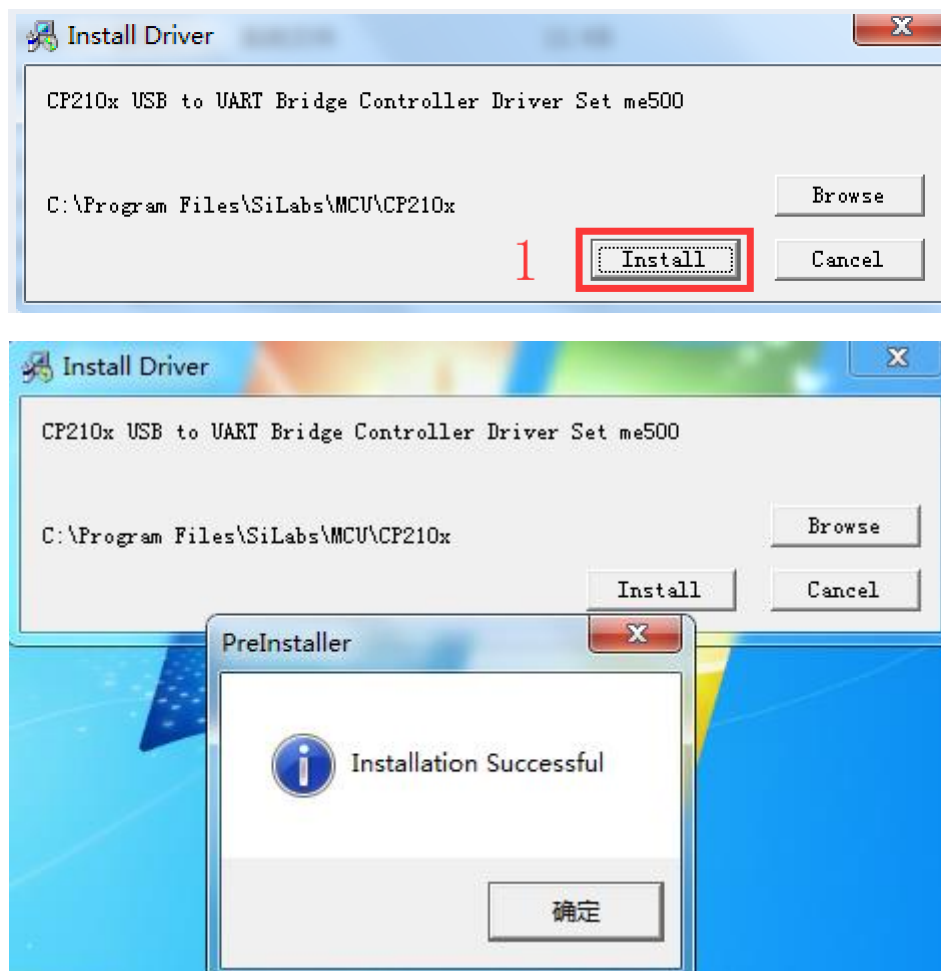
**Solution:** Turn off the serial tool that unnecessary.

## 6 Burn Images


### 6.1 Install Driver

Step 1, Install **CP2102 driver**.

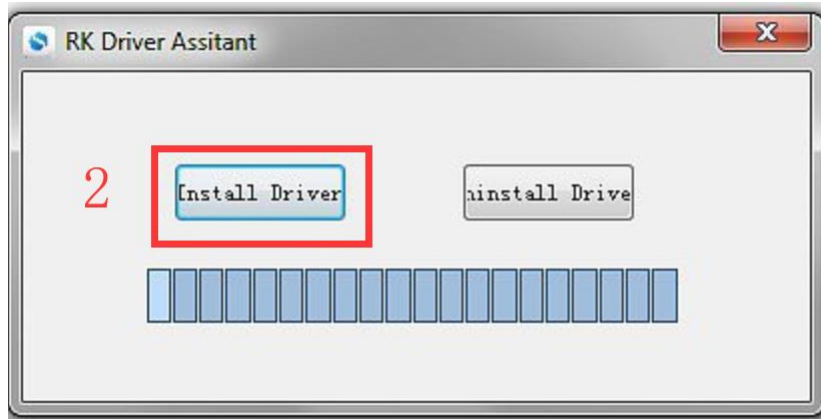
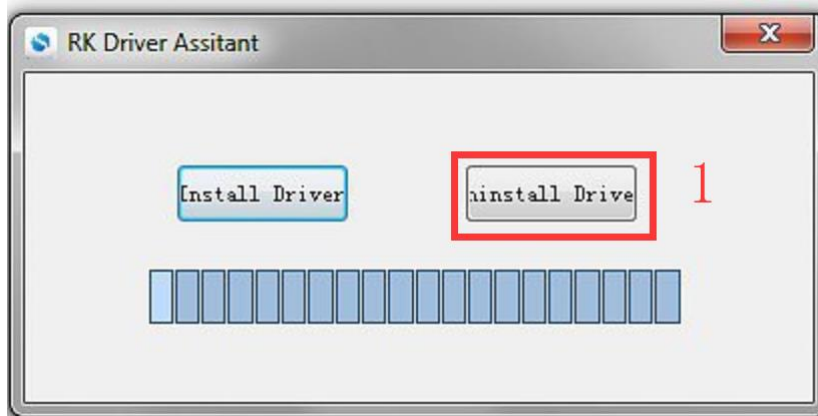
Plug the **USB-to-UART cable CP2102** to the PC, unzip **CP2102WIN7.rar** on Windows, then click **preInstaller.exe** to install



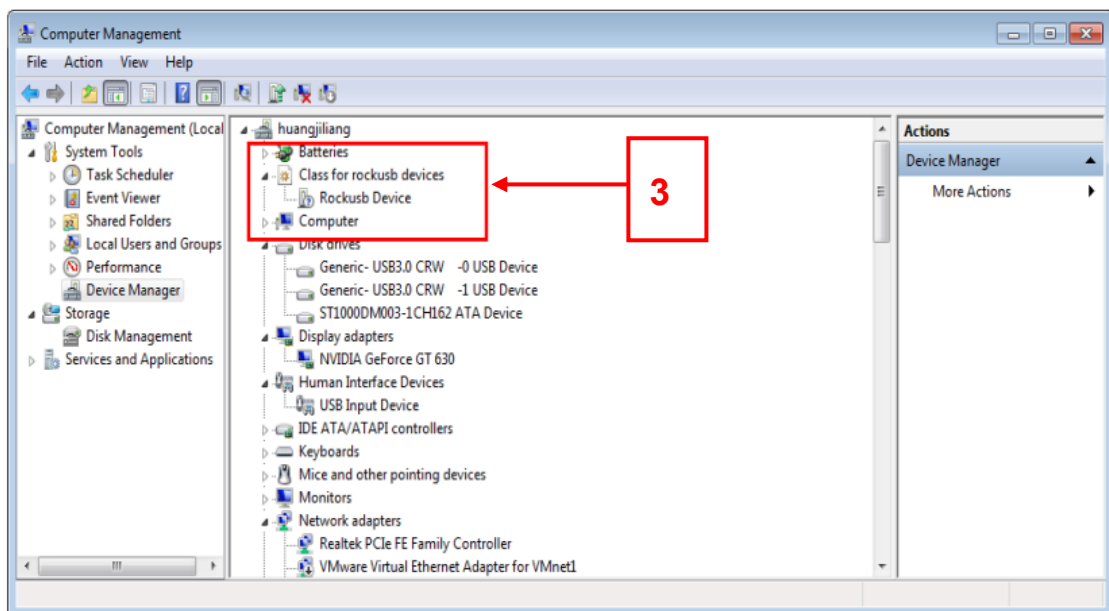
Now the device will be listed under **Device Manager -> PORTS** with unique serial port assigned

 CP210x USB to UART Bridge Controller (COM5)

Step 2, Install Rockchip Driver Assistant (Path: Release\_DriverAssistant/DriverInstall.exe)



Step 3, After the installation is complete, connect the board and PC with USB Type-C cable, then power on, in *Computer Management* can see the following information:

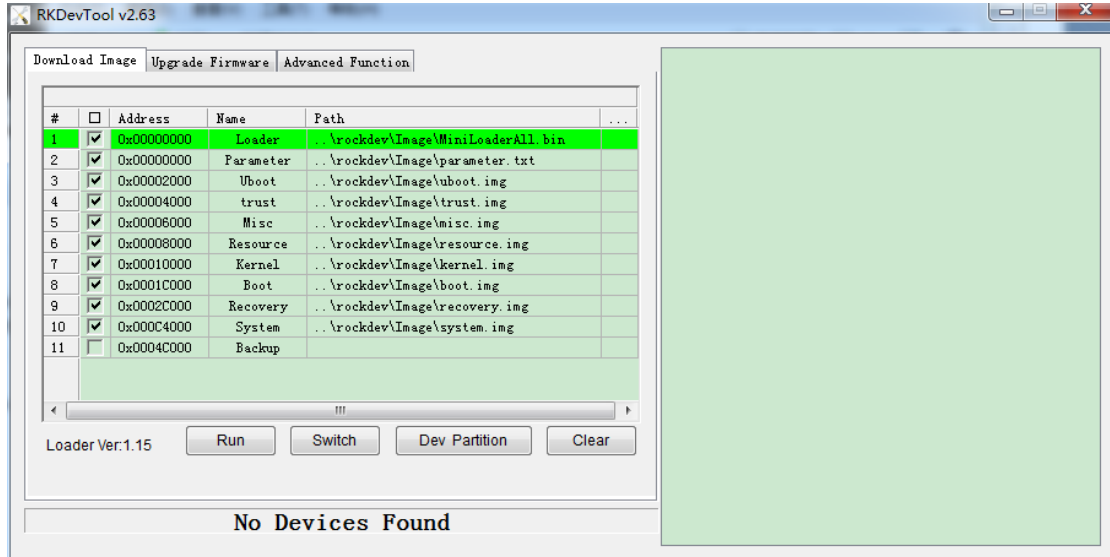




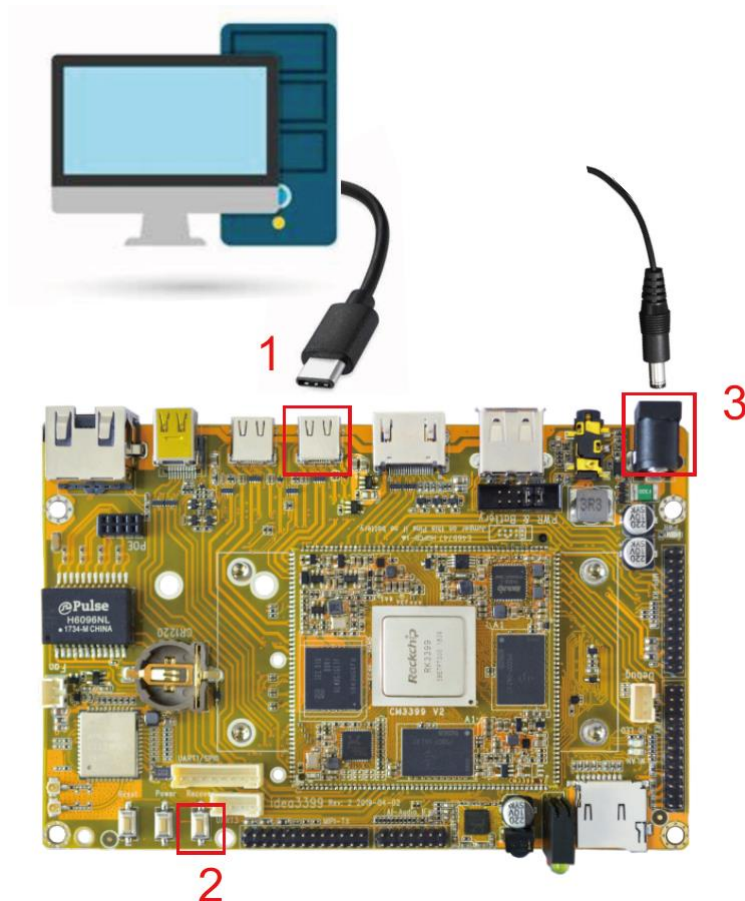
## 6.2 Upgrade Uniform Firmware

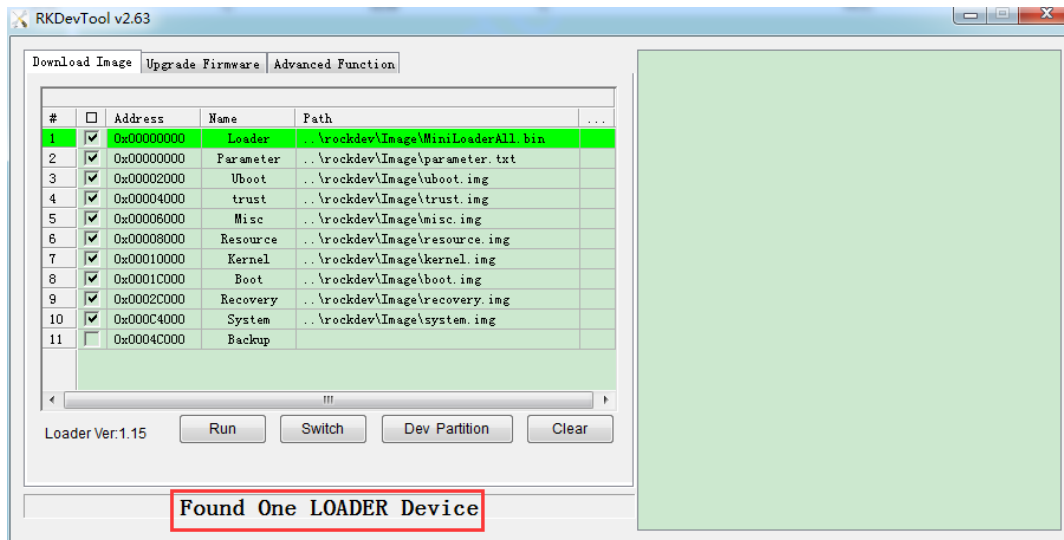
Step 1, unzip **AndroidTool\_Release\_v2.63** on Windows.

Step 2, open **AndroidTool.exe** (Path: *AndroidTool\AndroidTool\_Release\_v2.63\AndroidTool.exe*)

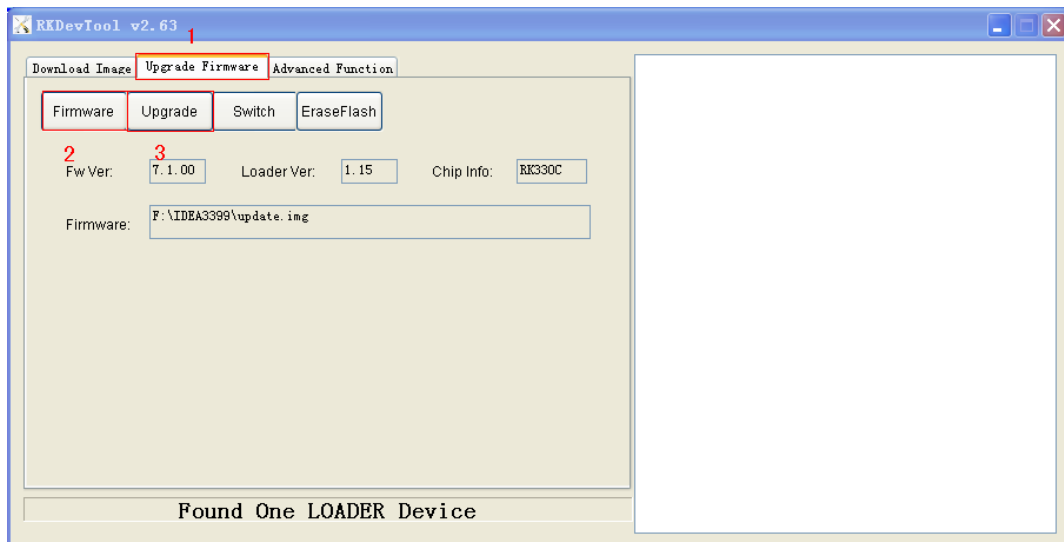


Step 3, connect PC and development board with USB Type-C cable, keep pressing the **Recover Key** and power on, until the windows PC shows **Found one LOADER Device**.

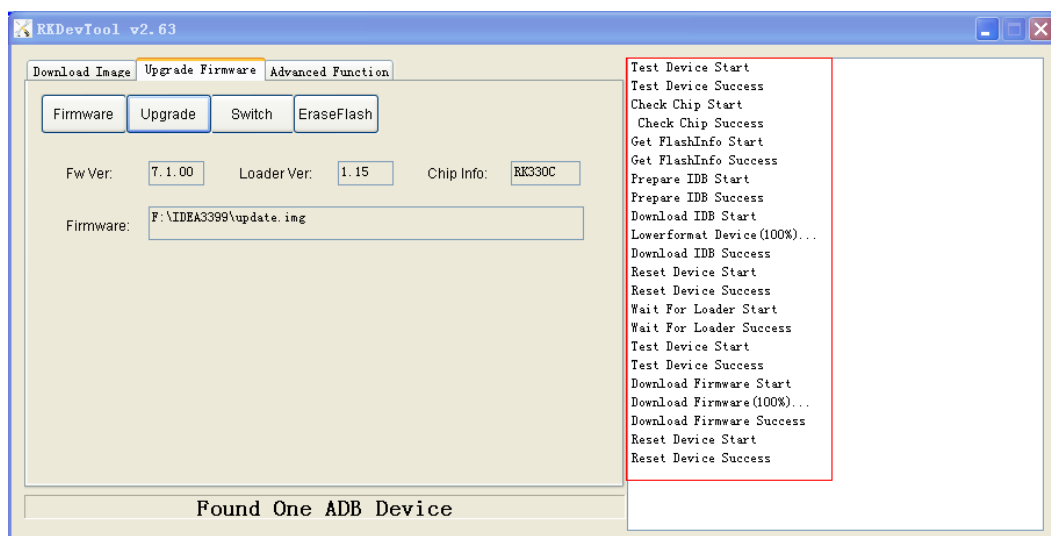




Step 4, click **Upgrade Firmware** -> **Firmware**, select **update.img**. Click **Upgrade** to flash.



Download completed.

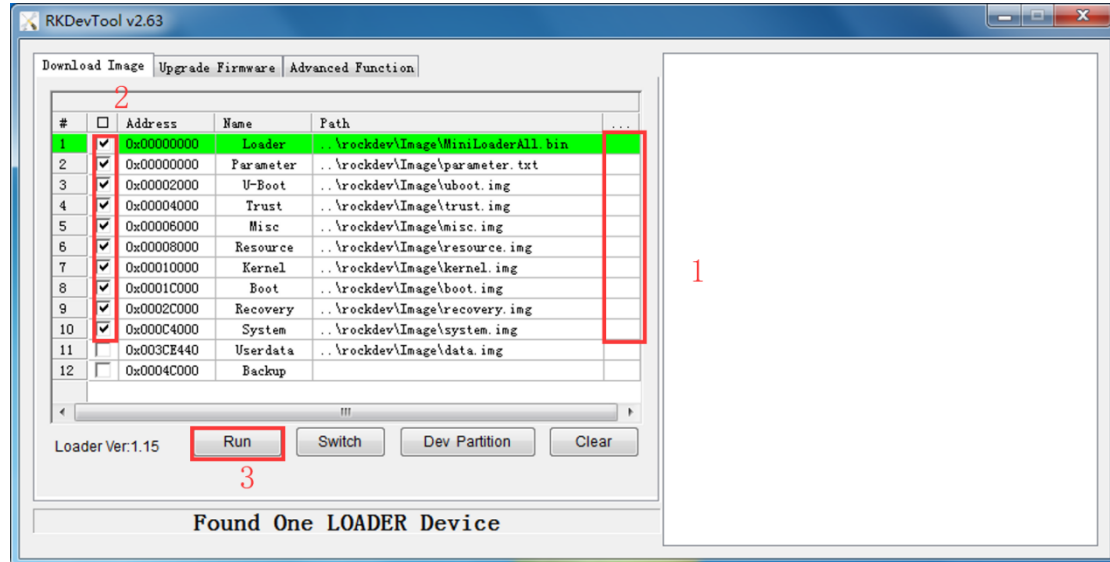


If necessary, user can choose to update the firmware separating.

Step 1, Click the column on the right side for the path of the file want to flash.

Step 2, Select the checkbox on the left.

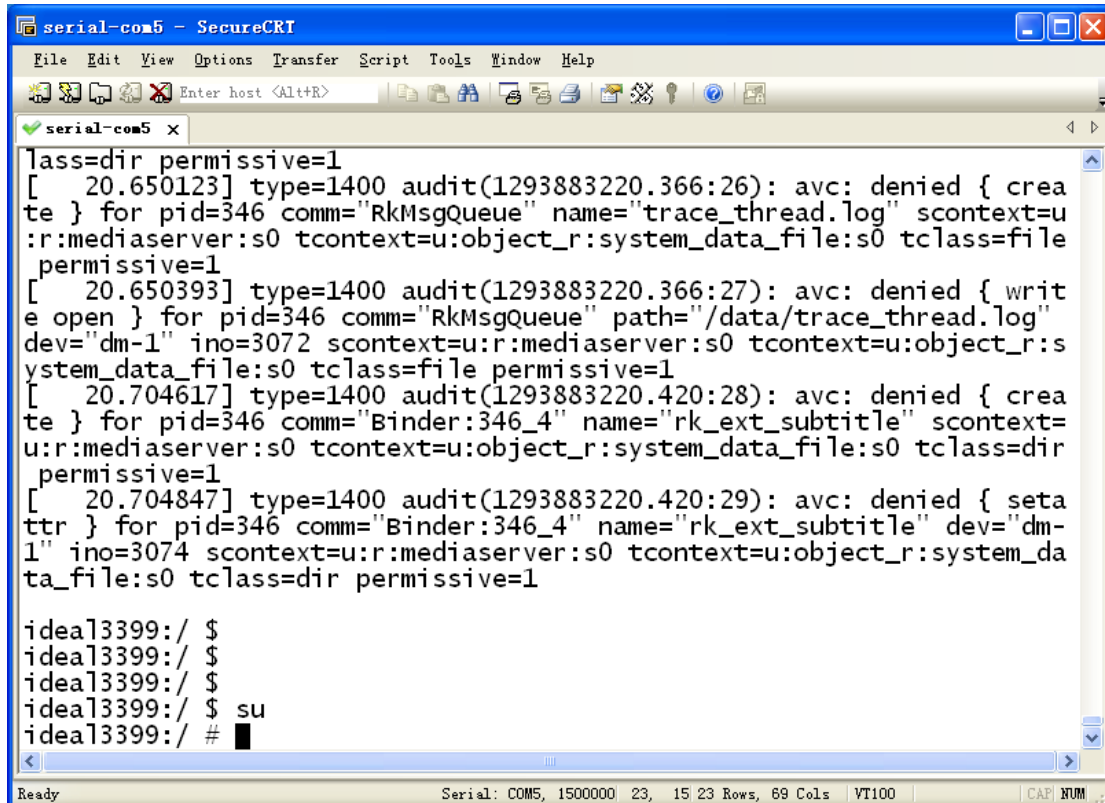
Step 3, Click “run” to flash the image.



# 7 Android Application

## 7.1 Serial Terminal

Connect the board and PC with USB Serial cable, then power on, the terminal will output startup information.



```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
[ 20.650123] type=1400 audit(1293883220.366:26): avc: denied { create } for pid=346 comm="RkMsgQueue" name="trace_thread.log" scontext=u:r:mediaserver:s0 tcontext=u:object_r:system_data_file:s0 tclass=file permissive=1
[ 20.650393] type=1400 audit(1293883220.366:27): avc: denied { write open } for pid=346 comm="RkMsgQueue" path="/data/trace_thread.log" dev="dm-1" ino=3072 scontext=u:r:mediaserver:s0 tcontext=u:object_r:system_data_file:s0 tclass=file permissive=1
[ 20.704617] type=1400 audit(1293883220.420:28): avc: denied { create } for pid=346 comm="Binder:346_4" name="rk_ext_subtitle" scontext=u:r:mediaserver:s0 tcontext=u:object_r:system_data_file:s0 tclass=dir permissive=1
[ 20.704847] type=1400 audit(1293883220.420:29): avc: denied { setattr } for pid=346 comm="Binder:346_4" name="rk_ext_subtitle" dev="dm-1" ino=3074 scontext=u:r:mediaserver:s0 tcontext=u:object_r:system_data_file:s0 tclass=dir permissive=1
ideal3399:/ $
ideal3399:/ $
ideal3399:/ $
ideal3399:/ $ su
ideal3399:/ # █
  
```

## 7.2 ADB

Execute the follow commands to turn off verity of system partition before enable ADB.

- # adb root
- # adb disable-verity
- # adb reboot (reboot the board)
- # adb root (after boot system)
- # adb remount

Now you can use adb to push file to the board.

```
ca. 管理员: C:\windows\system32\cmd.exe - adb shell
C:\Users\Administrator>adb root
C:\Users\Administrator>adb disable-verity
Verity disabled on /system
Now reboot your device for settings to take effect
C:\Users\Administrator>adb reboot
C:\Users\Administrator>adb root
C:\Users\Administrator>adb remount
remount succeeded
C:\Users\Administrator>adb shell
ideal3399:/ # adb push com /system/bin
/system/bin/sh: adb: not found
127!ideal3399:/ #
130!ideal3399:/ # exit
C:\Users\Administrator>adb push com /system/bin
com: 1 file pushed. 6.2 MB/s (654374 bytes in 0.100s)
C:\Users\Administrator>adb shell
ideal3399:/ #
ideal3399:/ # cd /system/bin
ideal3399:/system/bin # ls
abc                hostapd            pre install_cleanup.sh
acpi               hostapd_cli       printenv
akmd              hostname          printf
am                hwclock           prlimit
app_process       id                profman
```

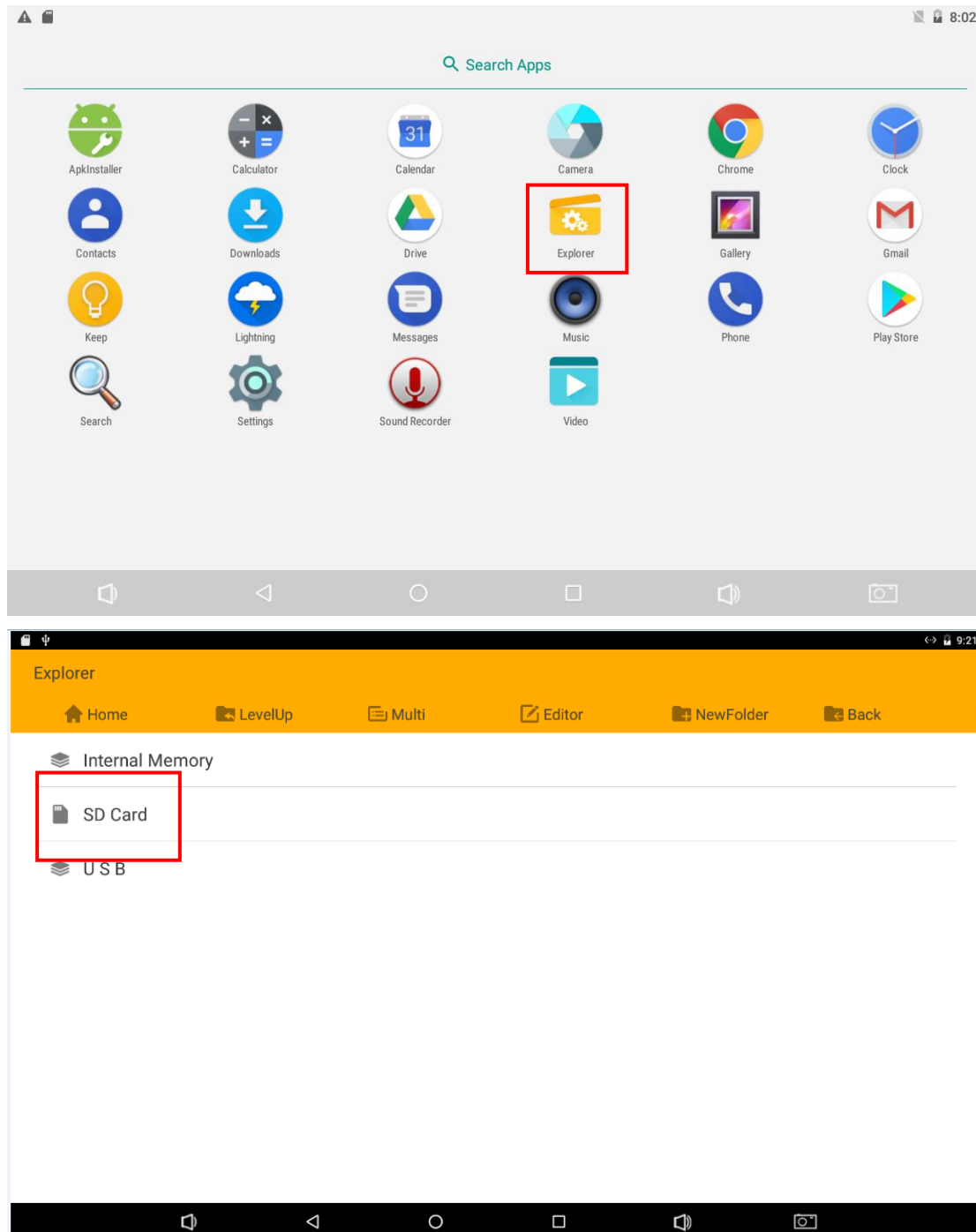
## 7.3 Display

Idea3399 supports display HDMI + MIPI LCD at the same time.



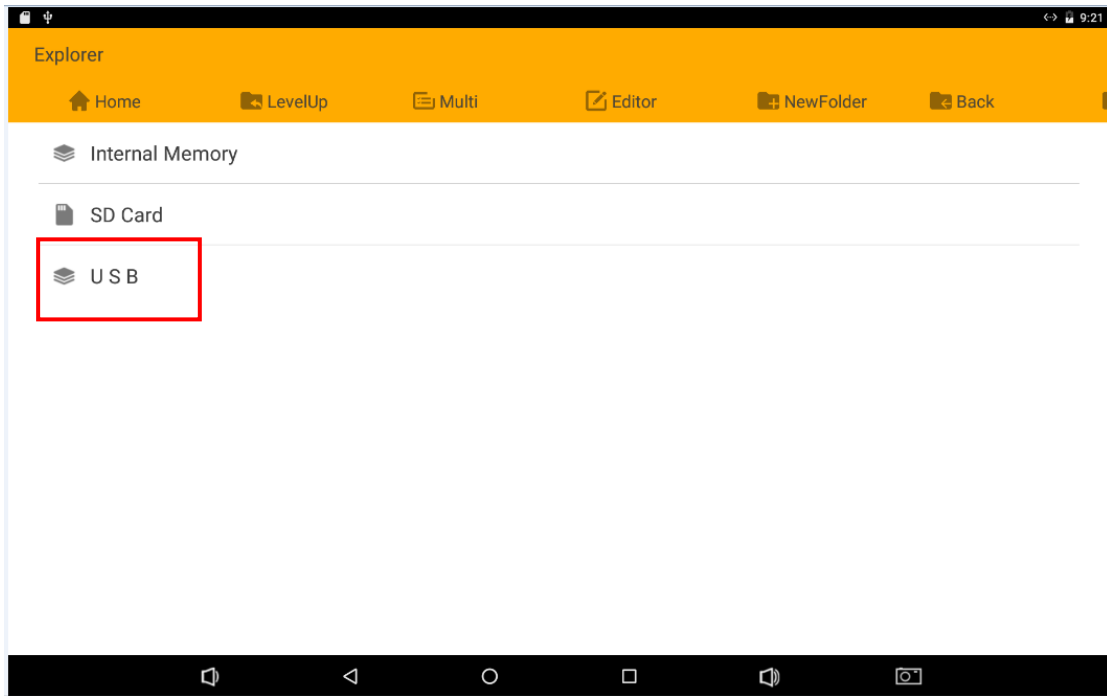
## 7.4 SD Card

Idea3399 supports SD Hot-plug.



## 7.5 USB Host

The USB Host can be used to connect USB mouse, USB keyboard, U-Disk or other USB devices.

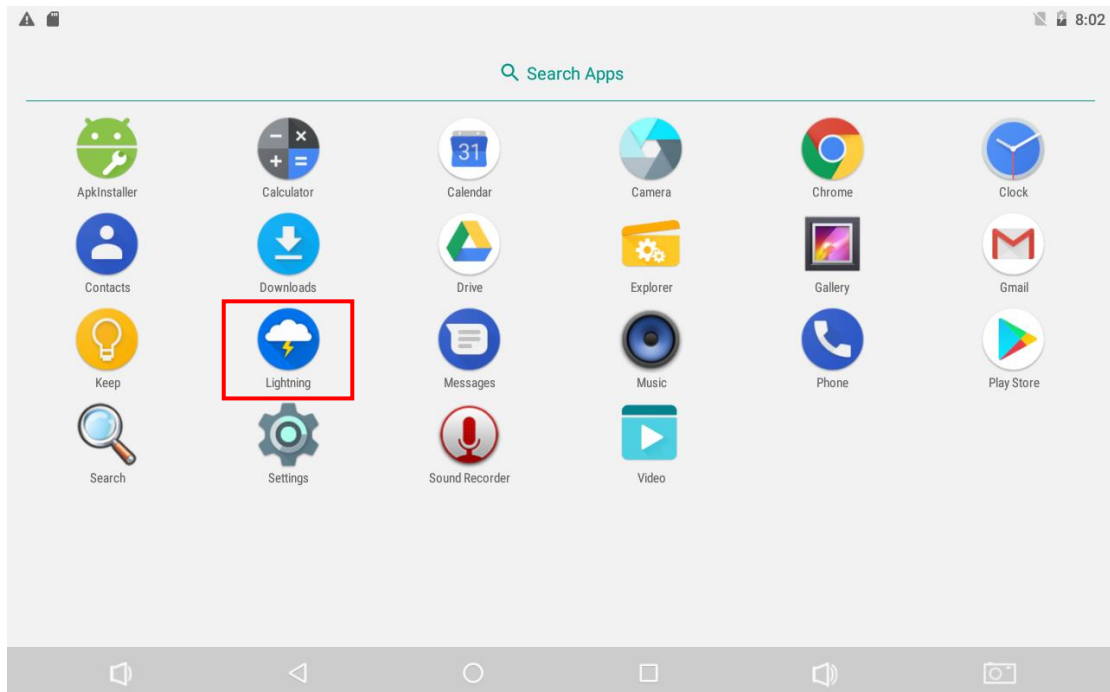


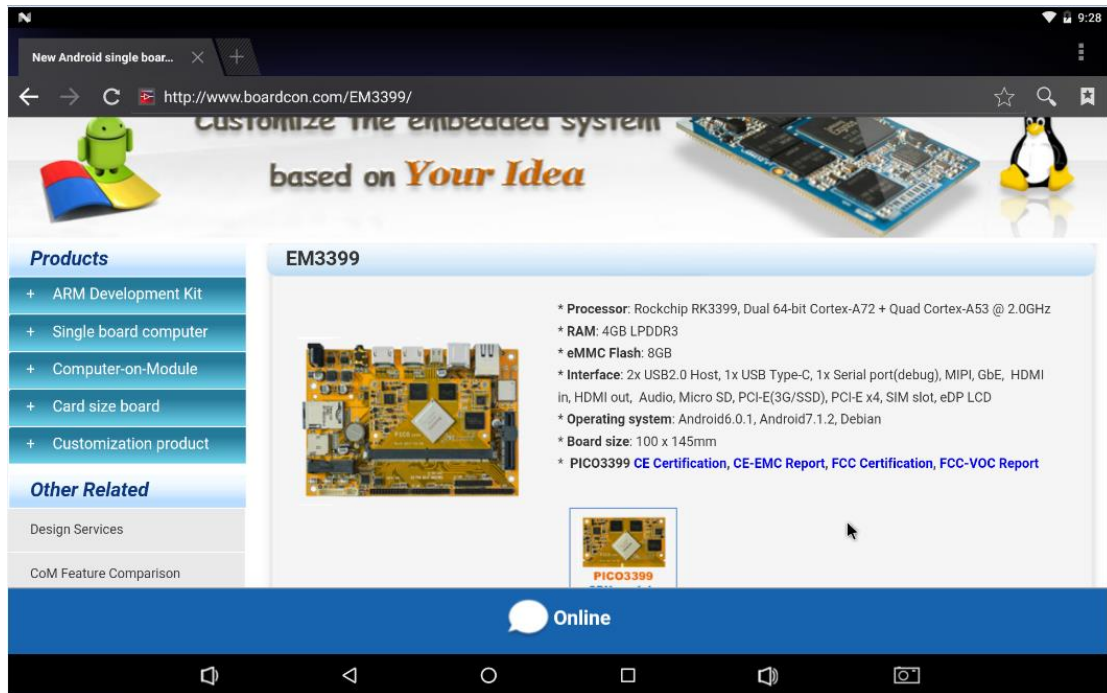
## 7.6 Ethernet

Connect the Board and router with an Ethernet cable (default DHCP=Yes). User can ping URL/IP at terminal, or open the browser to test Network.

# su

# ping www.boardcon.com

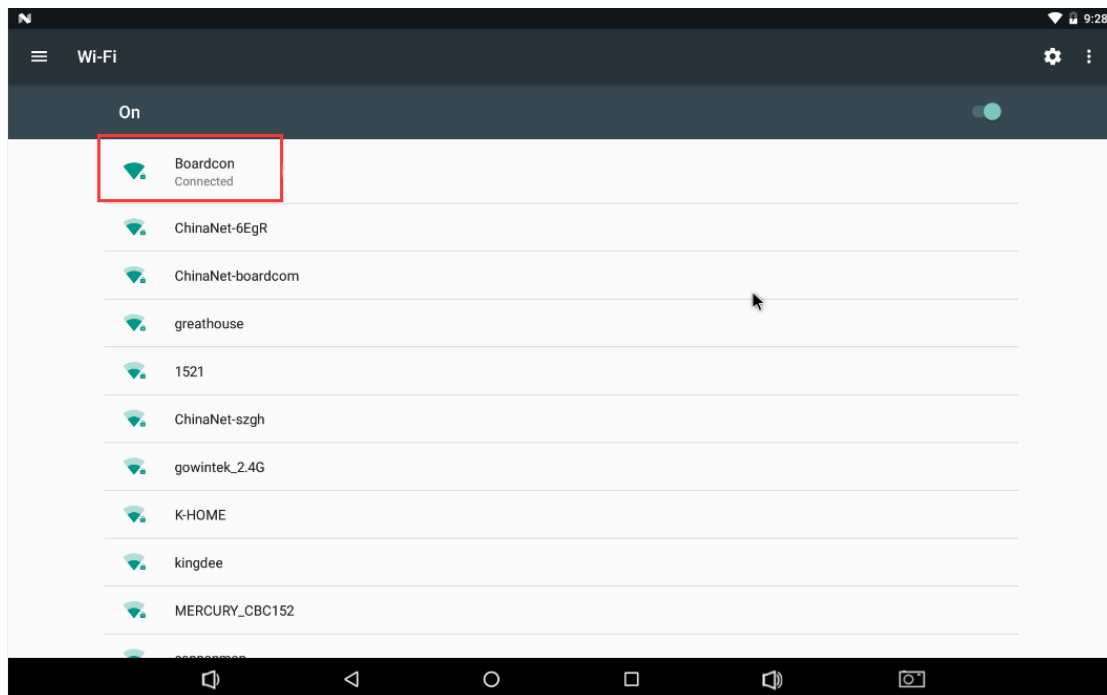




## 7.7 WiFi

Connect the WiFi antenna, then click **Settings -> WiFi -> turn on**, select the SSID from the list of available networks and enter the password.

After connected, user can open the browser to browse the web.

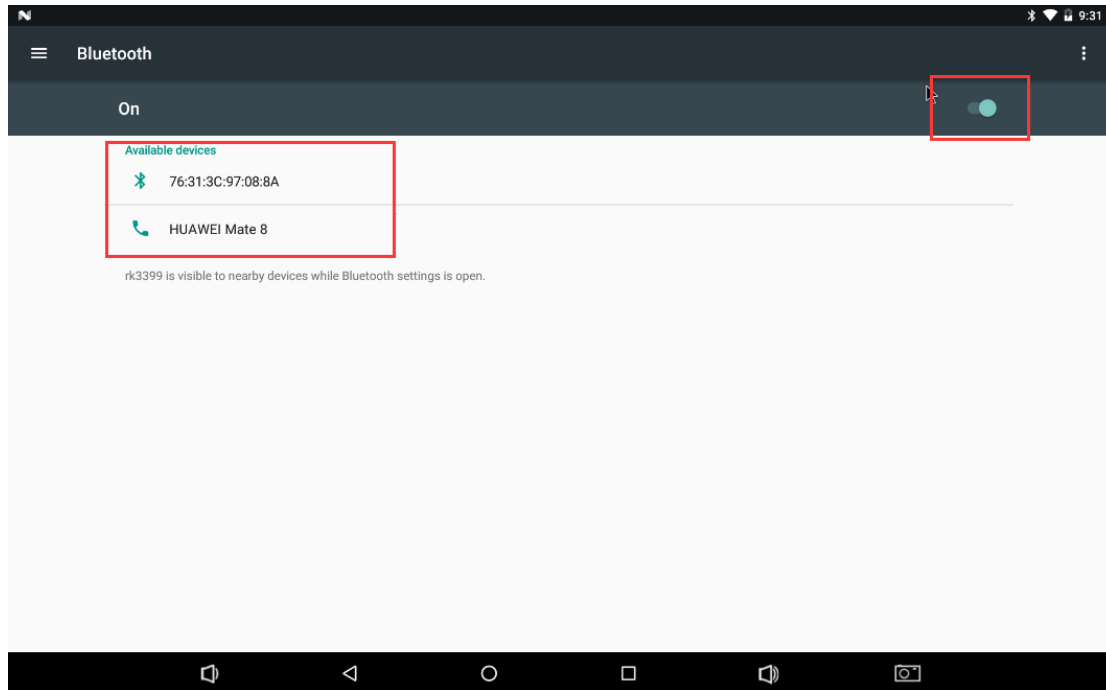




## 7.8 Bluetooth

Click **Settings -> Bluetooth -> turn on**

Select the available device in the list to pair.



After pairing, devices can connect with each other automatically

## 7.9 4G Network

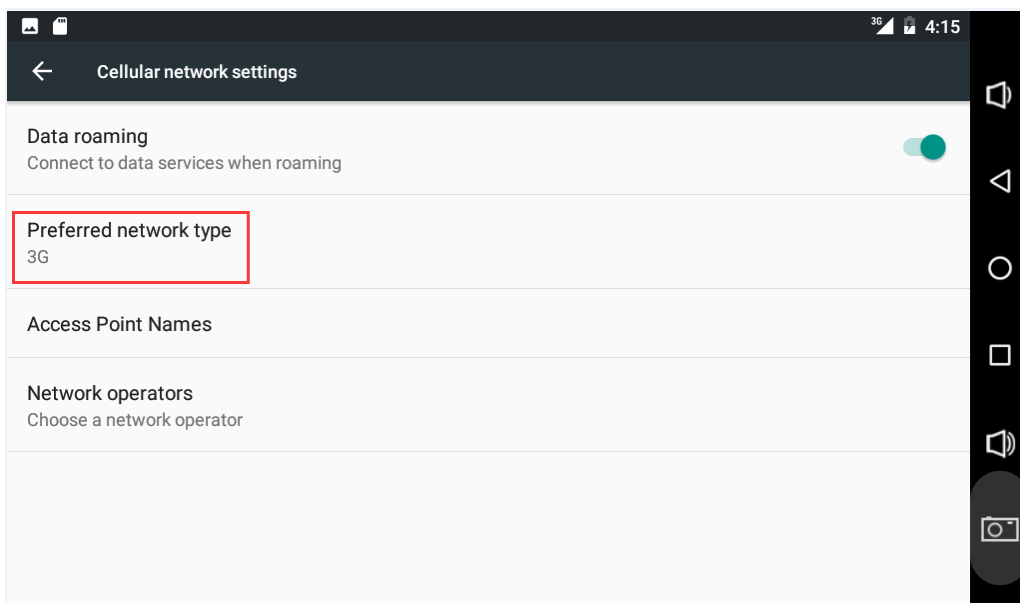
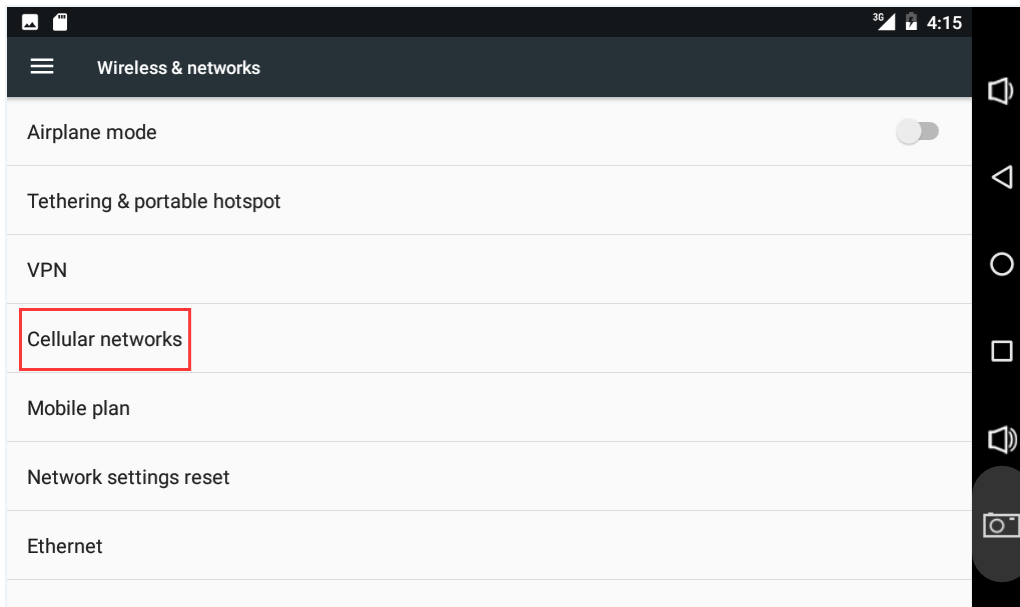
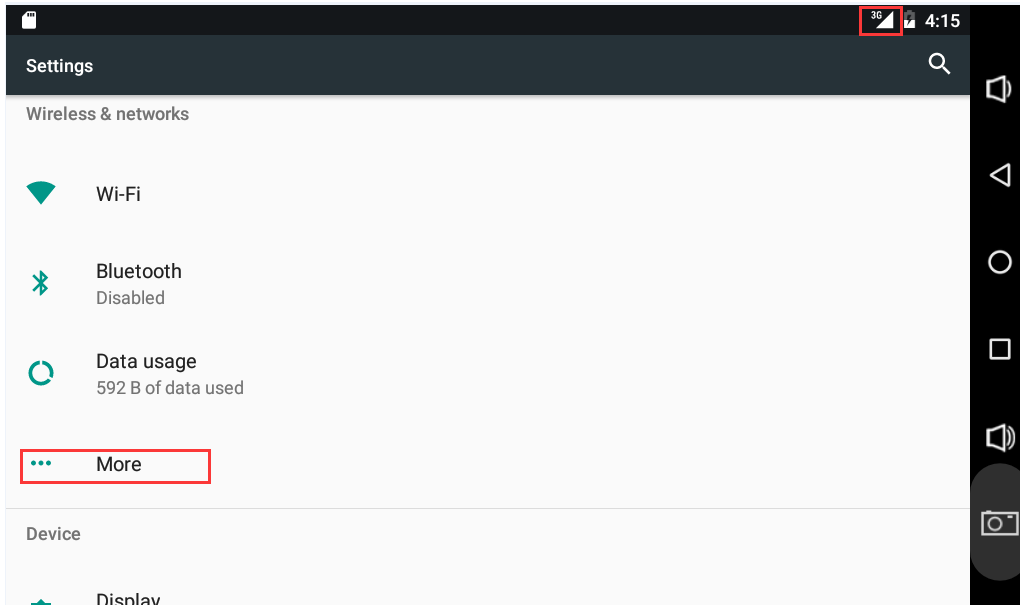
**Step 1**, Insert 4G module to PCI-E slot (4G model:EC20).

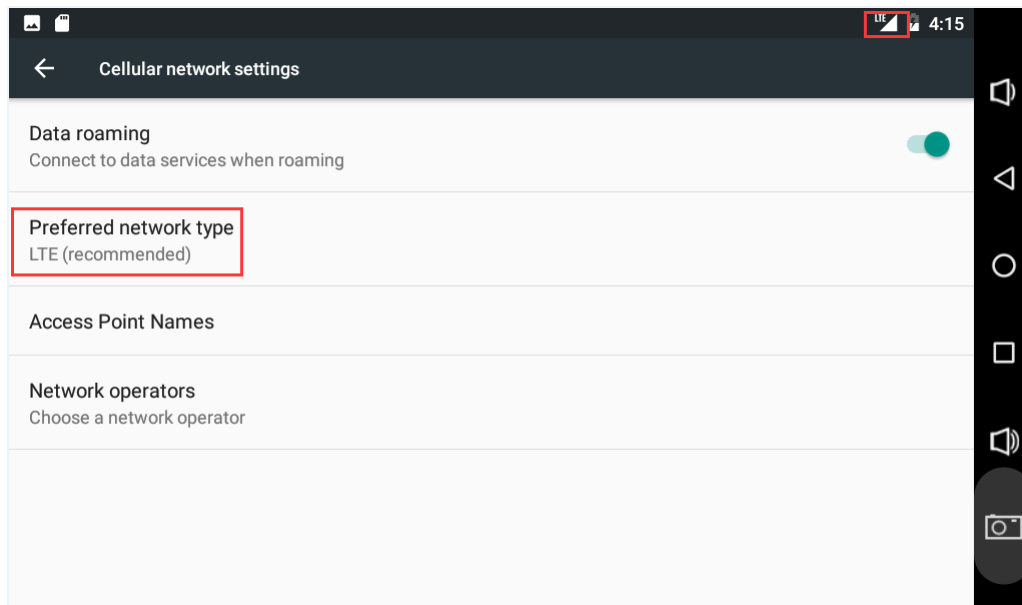
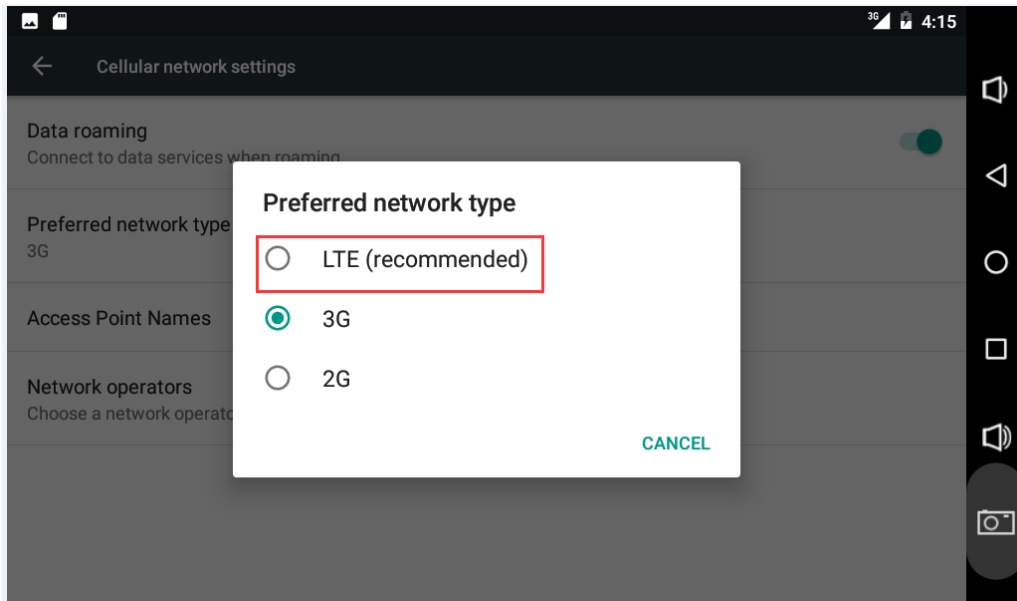
**Step 2**, Connect antenna and insert SIM card.

**Step 3**, The default connection is 3G network after power on.

4G network settings:

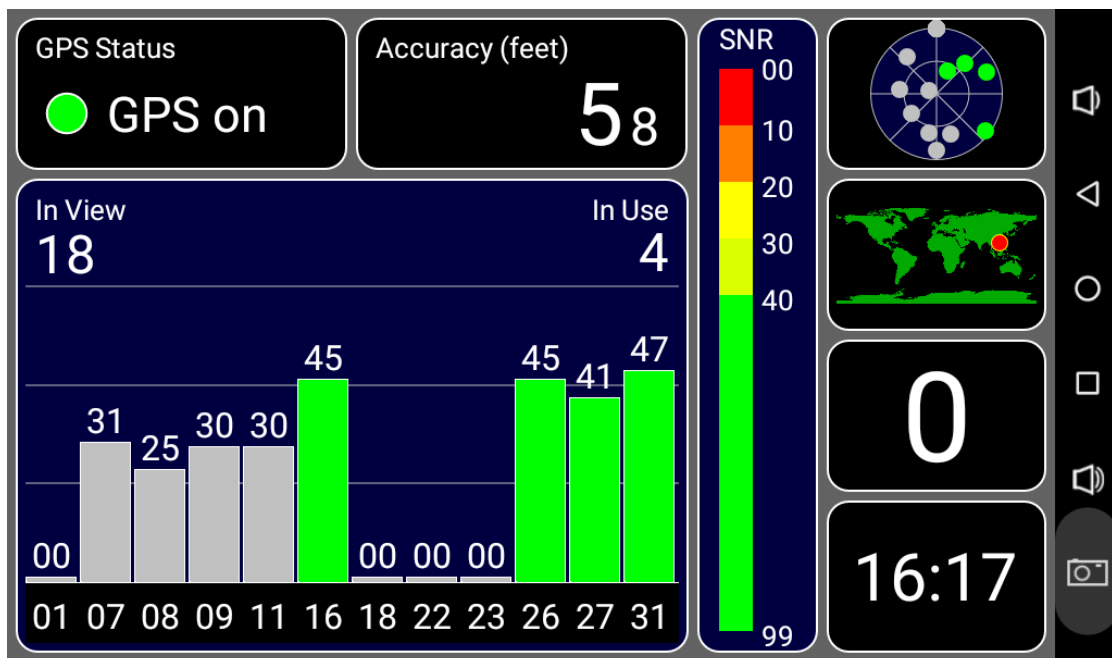
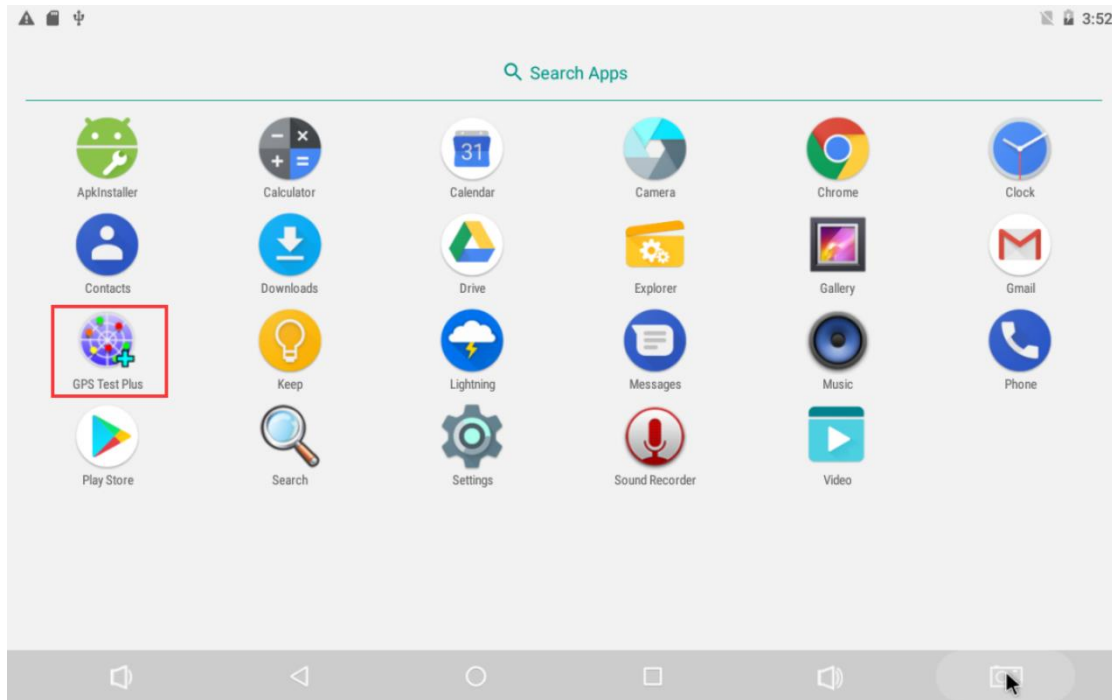
**Settings -> Wireless&networks -> More -> Cellular networks -> Preferred network type -> LTE**





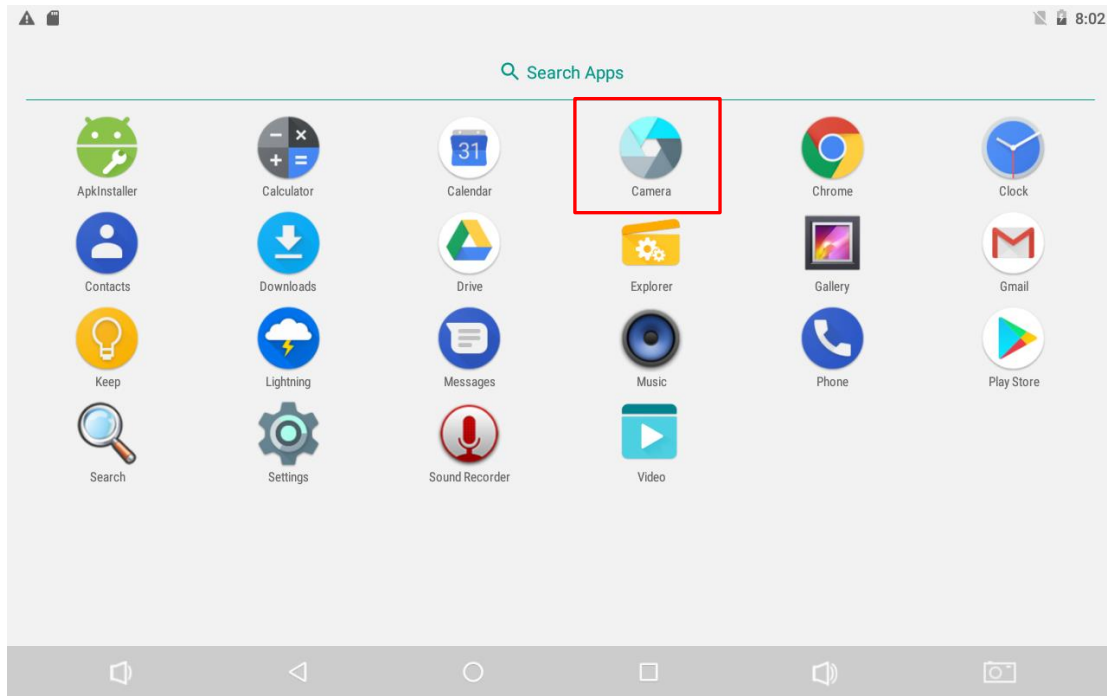
## 7.10 GPS

Plug the EC20 module and connect GPS antenna, then power on and install the APP **GPS\_test1.2.4.apk** (path: *CD/Tools/*)

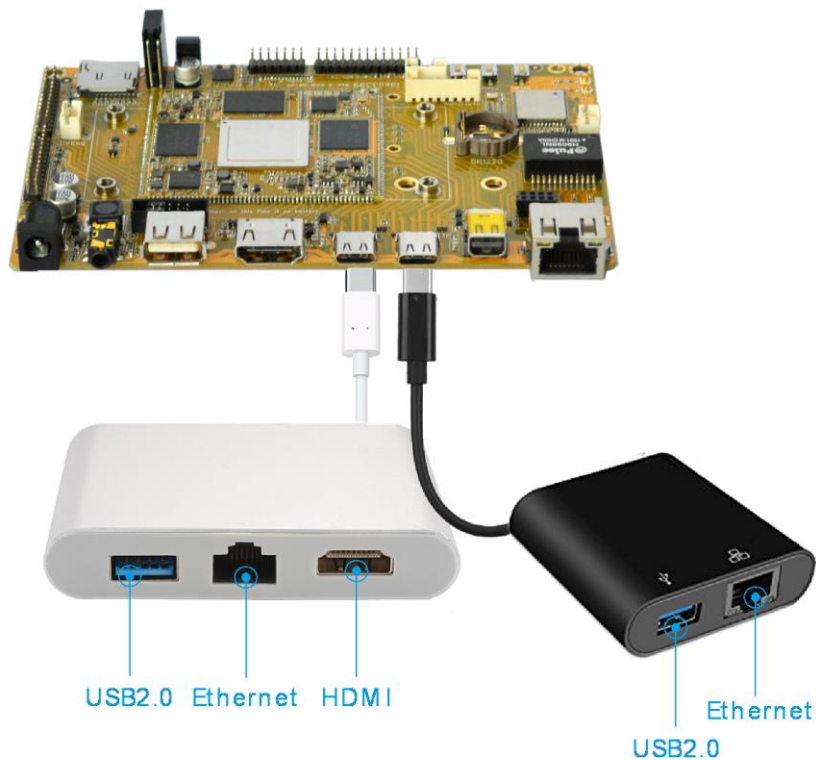


## 7.11 Camera

Connect the camera module (OV13850) to the development board **before power on**, then click the camera app to test.



## 7.12 Type-C to HDMI/USB/Ethernet



Idea3399 supports Type-C to HDMI /USB /Ethernet. The device can use directly without install any driver.

**USB Type-C0** can be converted to **HDMI /USB /Ethernet**.

**USB Type-C1** can be converted to **USB /Ethernet**.

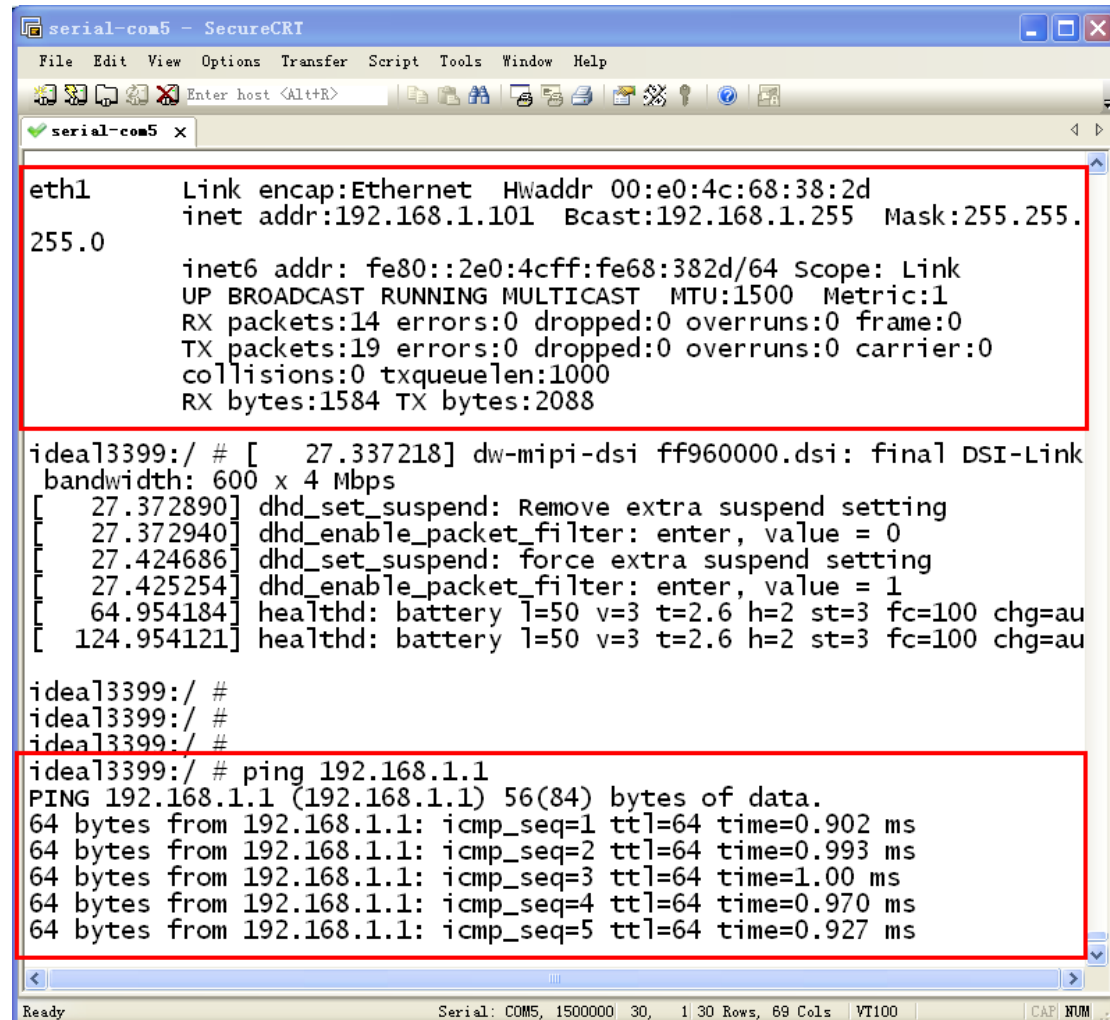
### HDMI display for example.

Connect a cable from HDMI monitor to the HDMI Port on the docking station.

Plug the docking station to Idea3399 Type-C port and power on (Hot-plug is supported).

#### NOTE

*For Type-C to Ethernet, Boardcon Android BSP only supports Ping command, browse web is not supported.*



```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
eth1    Link encap:Ethernet  Hwaddr 00:e0:4c:68:38:2d
        inet addr:192.168.1.101  Bcast:192.168.1.255  Mask:255.255.
255.0
        inet6 addr: fe80::2e0:4cff:fe68:382d/64 Scope: Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:14 errors:0 dropped:0 overruns:0 frame:0
        TX packets:19 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:1584 TX bytes:2088

ideal3399:/ # [ 27.337218] dw-mipi-dsi ff960000.dsi: final DSI-Link
bandwidth: 600 x 4 Mbps
[ 27.372890] dhd_set_suspend: Remove extra suspend setting
[ 27.372940] dhd_enable_packet_filter: enter, value = 0
[ 27.424686] dhd_set_suspend: force extra suspend setting
[ 27.425254] dhd_enable_packet_filter: enter, value = 1
[ 64.954184] healthd: battery l=50 v=3 t=2.6 h=2 st=3 fc=100 chg=au
[ 124.954121] healthd: battery l=50 v=3 t=2.6 h=2 st=3 fc=100 chg=au

ideal3399:/ #
ideal3399:/ #
ideal3399:/ #
ideal3399:/ # ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data.
64 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=0.902 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=0.993 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=64 time=1.00 ms
64 bytes from 192.168.1.1: icmp_seq=4 ttl=64 time=0.970 ms
64 bytes from 192.168.1.1: icmp_seq=5 ttl=64 time=0.927 ms

Ready Serial: COM5, 1500000 30, 1 30 Rows, 69 Cols VT100 CAP NUM
  
```

## 7.13 RTC

Execute the command to view RTC.

```
# hwclock
```

The RTC use network-provided time.

```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
1|idea13399:/ #
1|idea13399:/ #
1|idea13399:/ # hwclock
Mon Nov 25 23:35:48 2019 0.000000 seconds
idea13399:/ # hwclock
Mon Nov 25 23:35:50 2019 0.000000 seconds
idea13399:/ # hwclock
Mon Nov 25 23:35:51 2019 0.000000 seconds
idea13399:/ # hwclock
Mon Nov 25 23:35:52 2019 0.000000 seconds
idea13399:/ #
Ready Serial: COM5, 1500000 11, 15 11 Rows, 46 Cols VT100

```

## 7.14 M.2 NVME SSD

Idea3399 SSD only supports **ext4** format.

Connect the SSD to the development board **before power on**. Then execute follow command to erase SSD and mount.

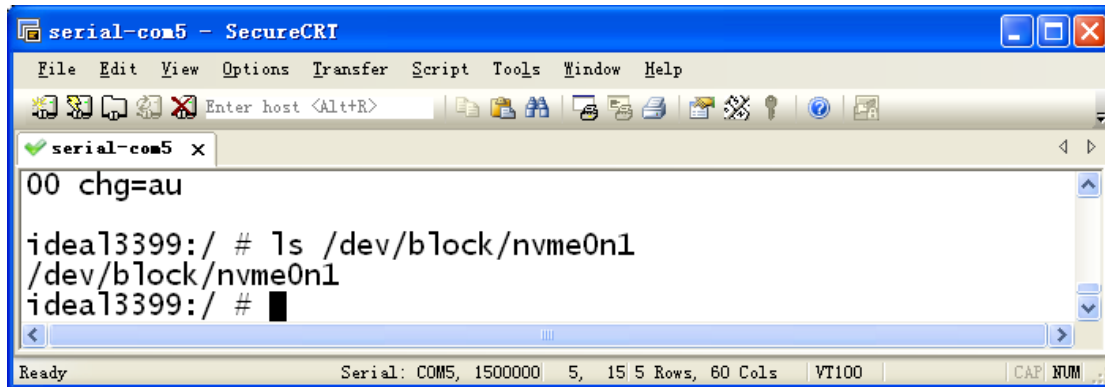
# **busybox lspci** (check device)

```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
idea13399:/ #
idea13399:/ # busybox lspci
00:00.0 class 0604: 1d87:0100
01:00.0 class 0108: 1b4b:1160
idea13399:/ # █
Ready Serial: COM5, 1500000 5, 15 5 Rows, 60 Cols VT100

```

# **ls /dev/block/nvme0n1** (view the SSD path)



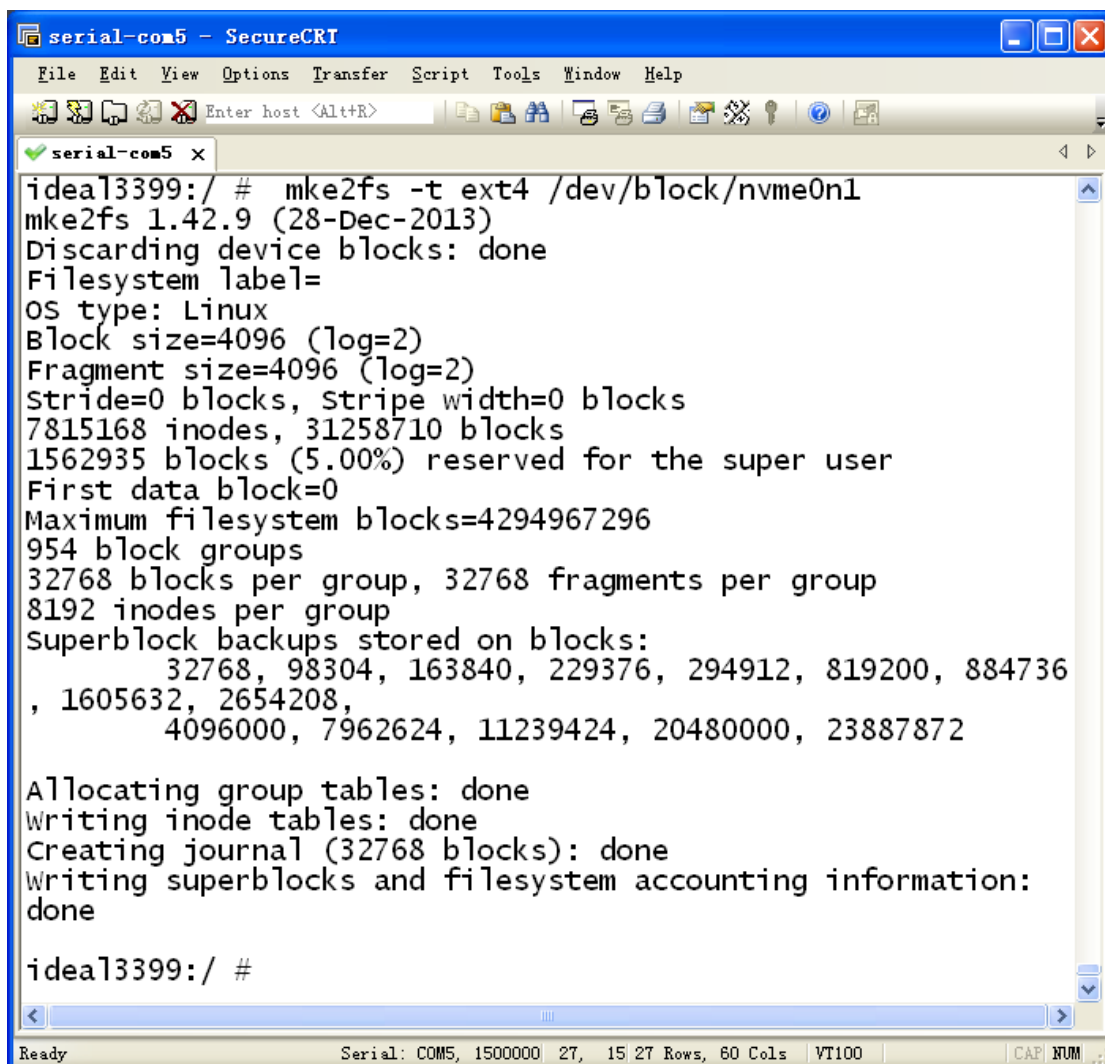
```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
00 chg=au

idearl3399:/ # ls /dev/block/nvme0n1
/dev/block/nvme0n1
idearl3399:/ # █
Ready Serial: COM5, 1500000 5, 15 5 Rows, 60 Cols VT100 CAP NUM

```

# mke2fs -t ext4 /dev/block/nvme0n1 (format to ext4 file system)



```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
idearl3399:/ # mke2fs -t ext4 /dev/block/nvme0n1
mke2fs 1.42.9 (28-Dec-2013)
Discarding device blocks: done
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, stripe width=0 blocks
7815168 inodes, 31258710 blocks
1562935 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=4294967296
954 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736
, 1605632, 2654208,
    4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information:
done

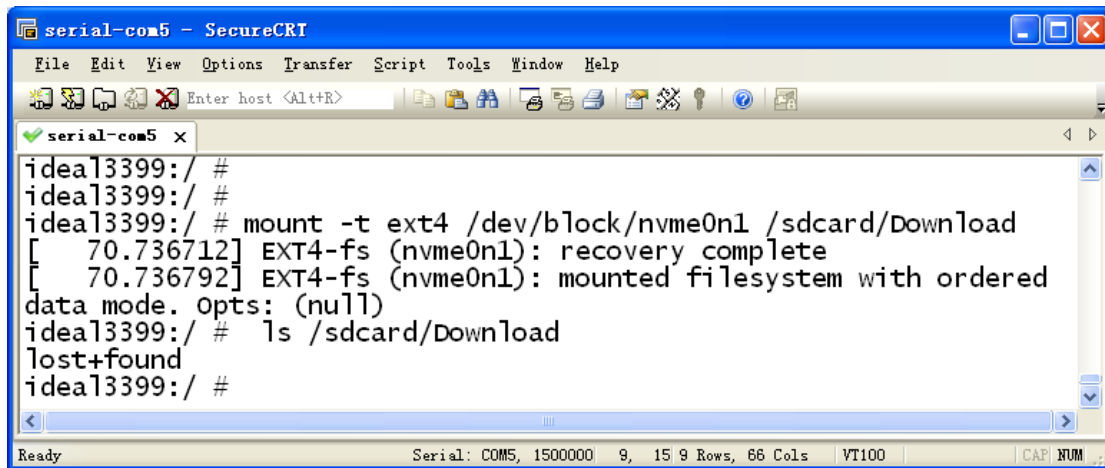
idearl3399:/ #
Ready Serial: COM5, 1500000 27, 15 27 Rows, 60 Cols VT100 CAP NUM

```

# mount -t ext4 /dev/block/nvme0n1 /sdcard/Download

# ls /sdcard/Download





```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
idea13399:/ #
idea13399:/ #
idea13399:/ # mount -t ext4 /dev/block/nvme0n1 /sdcard/Download
[ 70.736712] EXT4-fs (nvme0n1): recovery complete
[ 70.736792] EXT4-fs (nvme0n1): mounted filesystem with ordered
data mode. Opts: (null)
idea13399:/ # ls /sdcard/Download
lost+found
idea13399:/ #
  
```

Copy file to SSD and modify the file property

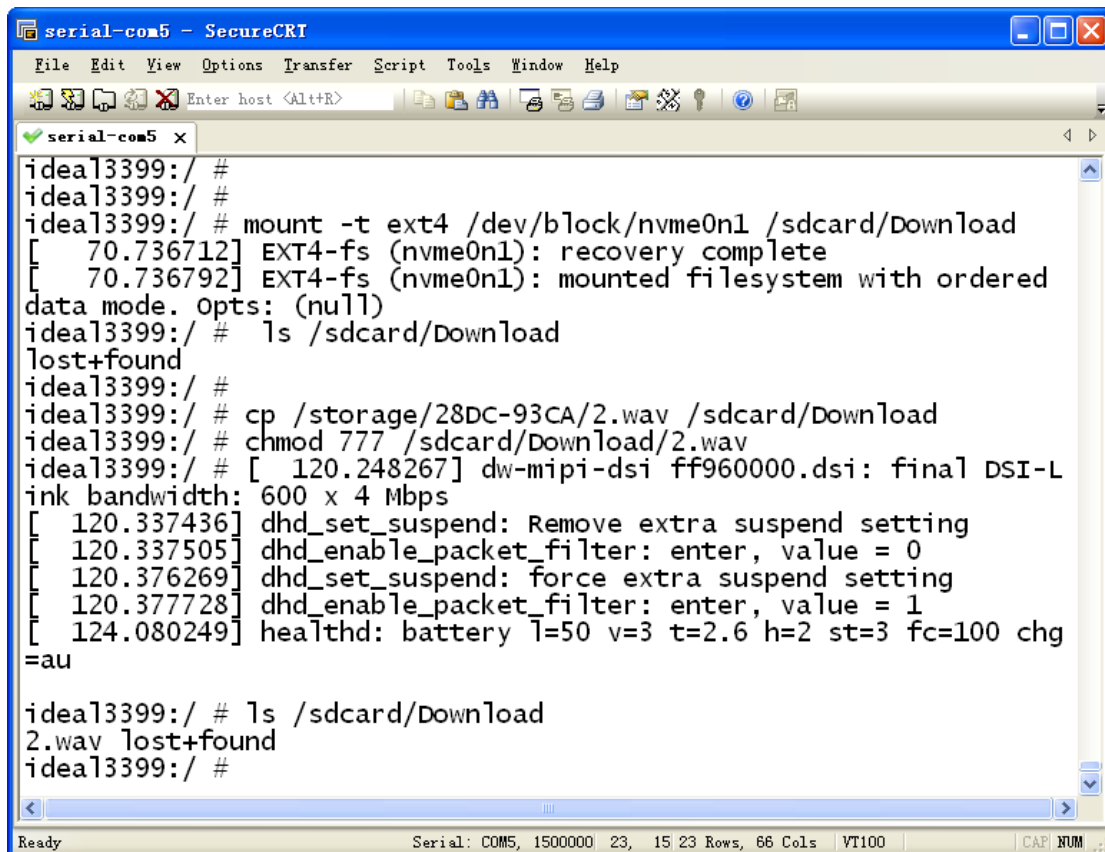
**NOTE**

if not modify the permissions, the application layer cannot read the file.

# cp /storage/28DC-93CA/2.wav /sdcard/Download

# chmod 777 /sdcard/Download/2.wav

# ls /sdcard/Download



```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
idea13399:/ #
idea13399:/ #
idea13399:/ # mount -t ext4 /dev/block/nvme0n1 /sdcard/Download
[ 70.736712] EXT4-fs (nvme0n1): recovery complete
[ 70.736792] EXT4-fs (nvme0n1): mounted filesystem with ordered
data mode. Opts: (null)
idea13399:/ # ls /sdcard/Download
lost+found
idea13399:/ #
idea13399:/ # cp /storage/28DC-93CA/2.wav /sdcard/Download
idea13399:/ # chmod 777 /sdcard/Download/2.wav
idea13399:/ # [ 120.248267] dw-mipi-dsi ff960000.dsi: final DSI-L
ink bandwidth: 600 x 4 Mbps
[ 120.337436] dhd_set_suspend: Remove extra suspend setting
[ 120.337505] dhd_enable_packet_filter: enter, value = 0
[ 120.376269] dhd_set_suspend: force extra suspend setting
[ 120.377728] dhd_enable_packet_filter: enter, value = 1
[ 124.080249] healthd: battery l=50 v=3 t=2.6 h=2 st=3 fc=100 chg
=au
idea13399:/ # ls /sdcard/Download
2.wav lost+found
idea13399:/ #
  
```

