

User Manual



Android-x86 6.0.1

(PPC-31X0)

ADVANTECH

Enabling an Intelligent Planet

Version History

Version	Date	Author	Status/Changes
v1.00	20190417	Fengchao.dai	Init version;
v1.01	20190524	Fengchao.dai	1. Add BacklightControl APP instructions 2. Modify the Dual Display chapter;

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1. About Manual

Thank you for using Advantech product and Advantech android x86. This manual is a user manual of Advantech android x86 6.0.1. This manual may be copied and distributed in any medium, either commercially or non-commercially.

2. Introduction

Advantech android x86 6.0.1 is developed for Advantech devices based on formal android x86. It is customized to satisfy users' requirements and to add new functions and features.

2.1. New features

2.1.1 Automatic Installation

Just unzip the system we released to the U disk, and plug the U disk into the device and boot it up. Then select "UEFI: Built-in EFI Shell" in the BIOS. The device will automatically burn the system.

2.1.2 Touch Screen and Calibration

We provide the touch screen driver. Users can calibrate it in UI.

2.1.3 Rotating screen Support

We have supported the rotating screen function. Users can open the function using Rotation Control applications and then rotate the screen in any direction.

2.1.4 Ethernet Support

We provide "Ethernet configuration" in settings. Users can set ethernet devices and connection type (DHCP or Static IP) in UI.

2.1.5 Screen Off

By default our system does not go to sleep, but we provide a screen off application that allows users to turn off the screen.

2.1.6 Pre-installed Third Party Applications

Third party applications are installed as default. It is more convenient for the user.

2.2. Device support list

We currently support the following products:

PPC-3150,

PPC-3170,

PPC-3190

2.3. Language support

Language support list as shown in the figure below:

Afrikaans	Deutsch (Schweiz)	Español (España)	Italiano (Svizzera)
Azərbaycan	Eesti	Español (Estados Unidos)	Kiswahili
Bahasa Indonesia	English (Australia)	Filipino	Latviešu
Bahasa Melayu	English (Canada)	Français (Belgique)	Lietuvių
Català	English (India)	Français (Canada)	Magyar
Čeština	English (New Zealand)	Français (France)	Nederlands (België)
Dansk	English (Singapore)	Français (Suisse)	Nederlands (Nederland)
Deutsch (Deutschland)	English (United Kingdom)	Hrvatski	Norsk bokmål
Deutsch (Liechtenstein)	English (United States)	IsiZulu	Polski
Deutsch (Österreich)	English (XA)	Italiano (Italia)	Português (Brasil)

Figure 2.1 Language support list1

Português (Portugal)	Български	नेपाली
Română	Монгол	हिन्दी
Rumantsch	Русский	ไทย
Slovenčina	Српски	ລາວ
Slovenščina	Українська	မြန်မာ
Suomi	ქართული	한국어
Svenska	Հայերեն	中文 (简体)
Tiếng Việt	עברית	中文 (繁體)
Türkçe	العربية	中文 (香港)
Ελληνικά	(XB) العربية	日本語

Figure 2.2 Language support list2

2.4. Preview

After installation, you can see the HOME and application list:

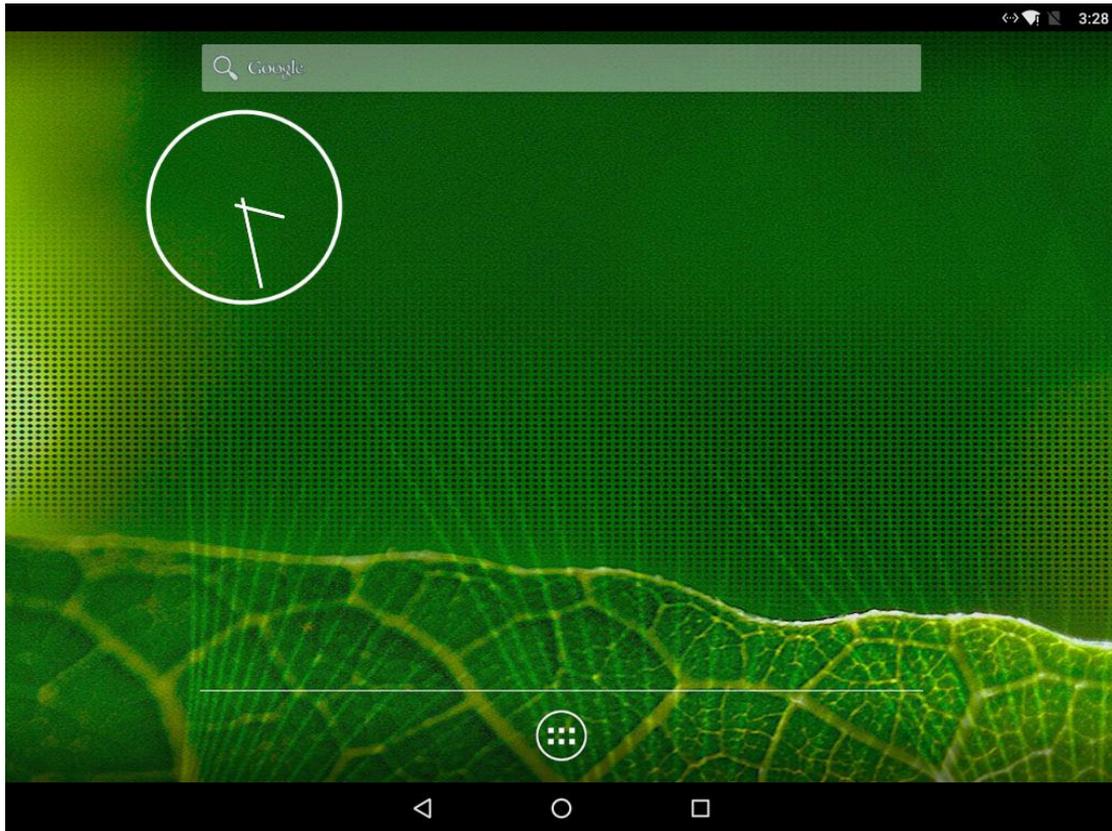


Figure 2.3 Home

And you can see application list after pressing the list button in the top of HOME:

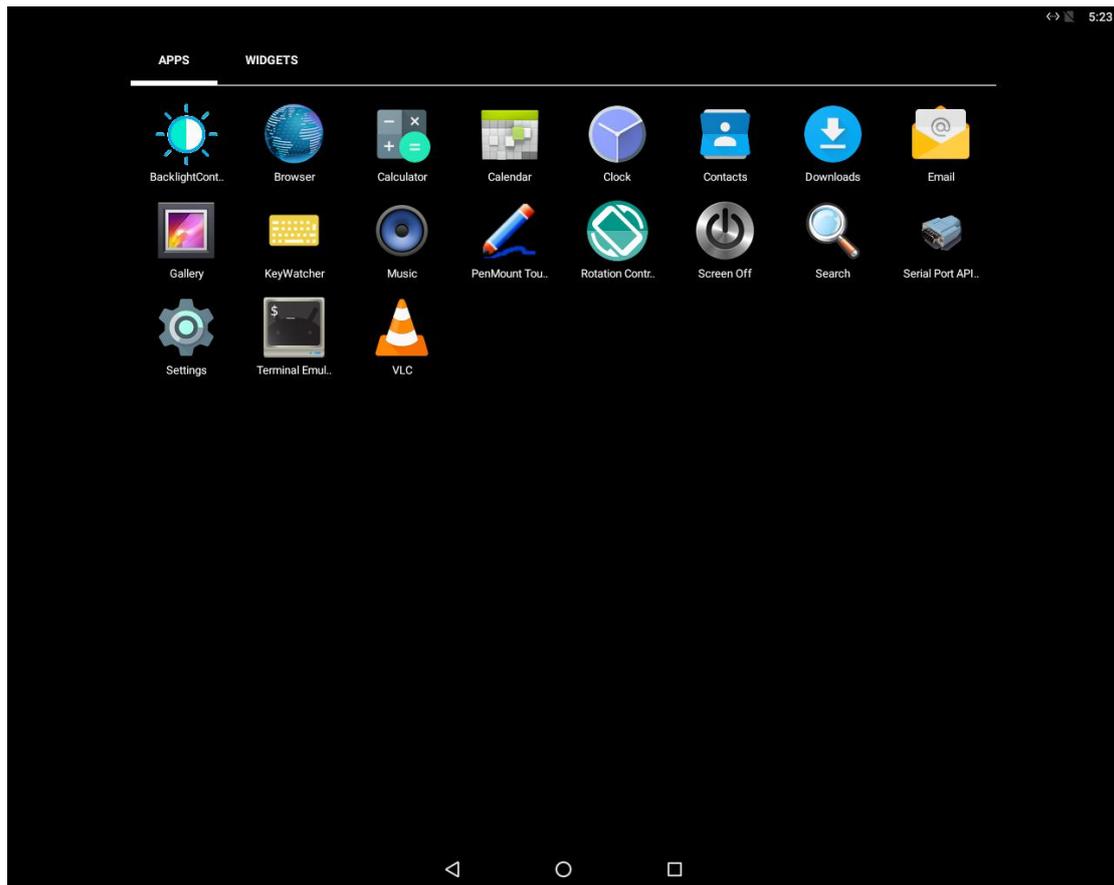


Figure 2.4 Application list

3. Installation

3.1. Installation preparation

First you need to find a U disk with a space greater than 1G. Then format the U disk into FAT32 format, and then extract the "upos-flashfiles-eng.root.zip" image file to the U disk. This process can be easily done on ubuntu and windows operating systems.

可移动磁盘 (G:)

名称	修改日期	类型	大小
system.img	2009/1/1 星期四 ...	好压 IMG 压缩文件	938,899 KB
upos-flashfiles-eng.root.zip	2019/3/20 星期...	好压 ZIP 压缩文件	431,367 KB
bootloader_U211	2009/1/1 星期四 ...	文件	61,440 KB
fastboot.img	2009/1/1 星期四 ...	好压 IMG 压缩文件	13,154 KB
recovery.img	2009/1/1 星期四 ...	好压 IMG 压缩文件	13,002 KB
boot.img	2009/1/1 星期四 ...	好压 IMG 压缩文件	9,932 KB
oem_U211.img	2009/1/1 星期四 ...	好压 IMG 压缩文件	8,365 KB
cache.img	2009/1/1 星期四 ...	好压 IMG 压缩文件	5,753 KB
installer.efi	2009/1/1 星期四 ...	EFI 文件	4,091 KB
loader.efi	2009/1/1 星期四 ...	EFI 文件	4,042 KB
flash.json	2009/1/1 星期四 ...	JSON 文件	11 KB
gpt_U211.bin	2009/1/1 星期四 ...	BIN 文件	2 KB
btsdata_U211.ini	2009/1/1 星期四 ...	配置设置	1 KB
installer_U211.cmd	2009/1/1 星期四 ...	Windows 命令脚本	1 KB
startup.nsh	2009/1/1 星期四 ...	NSH 文件	1 KB

Figure 3.1 Content in the U disk

3.2. Setting the BIOS configuration

When you see the following screen during the boot process, press the "delete" button to enter the BIOS setup interface.



Figure 3.2 BIOS logo

Select Advanced->CSM Configuration

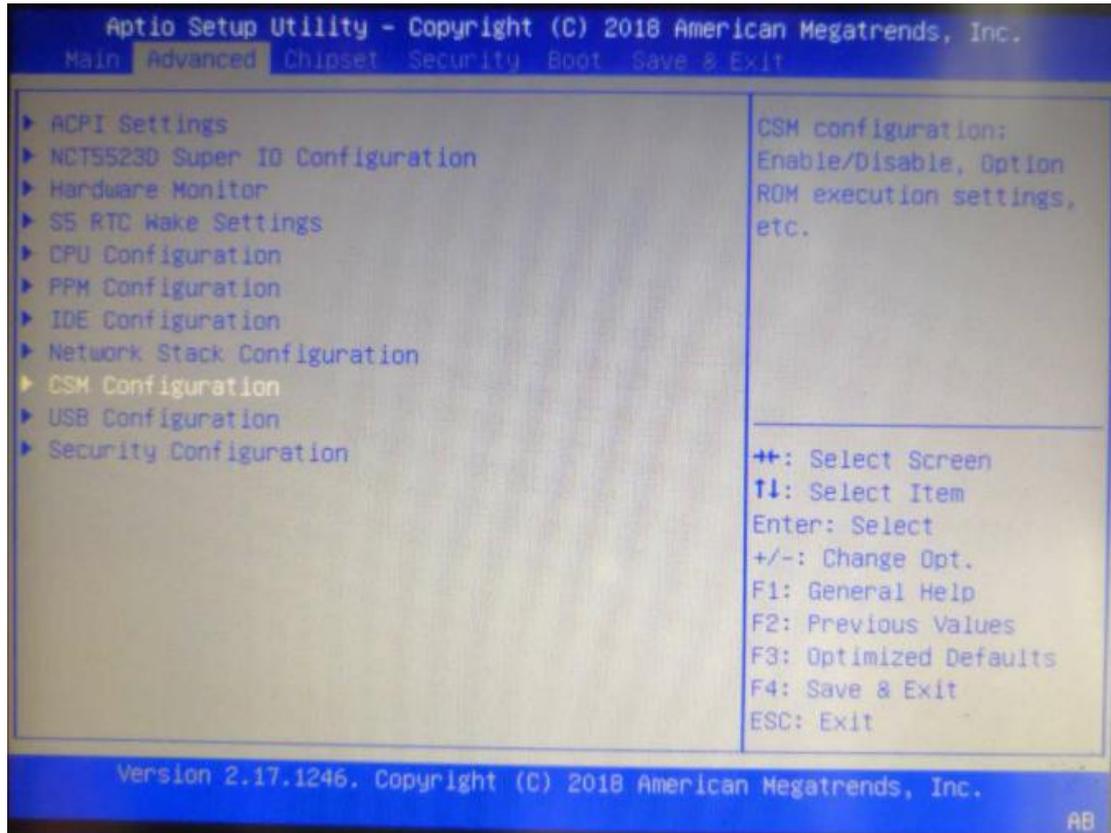


Figure 3.3 BIOS Advanced table

Set the "Boot option filter " option to "UEFI only" .

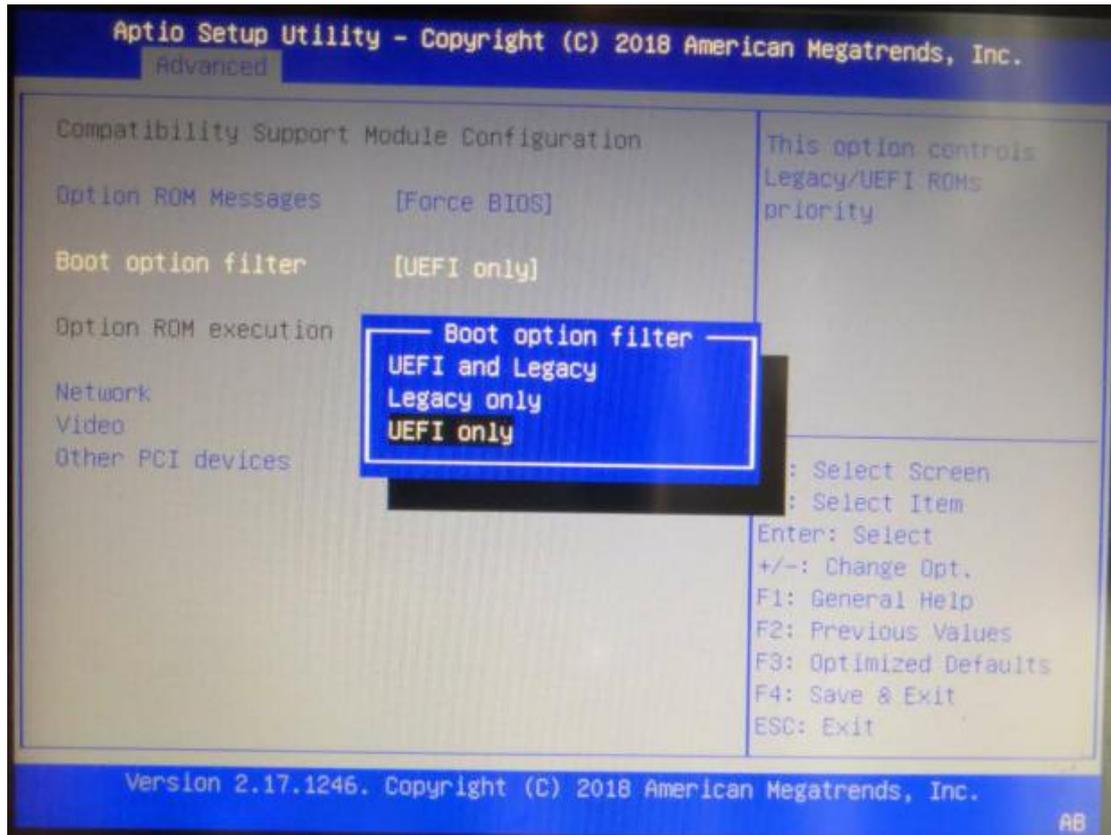


Figure 3.4 Choose "UEFI only"

Select Chipset->South Bridge

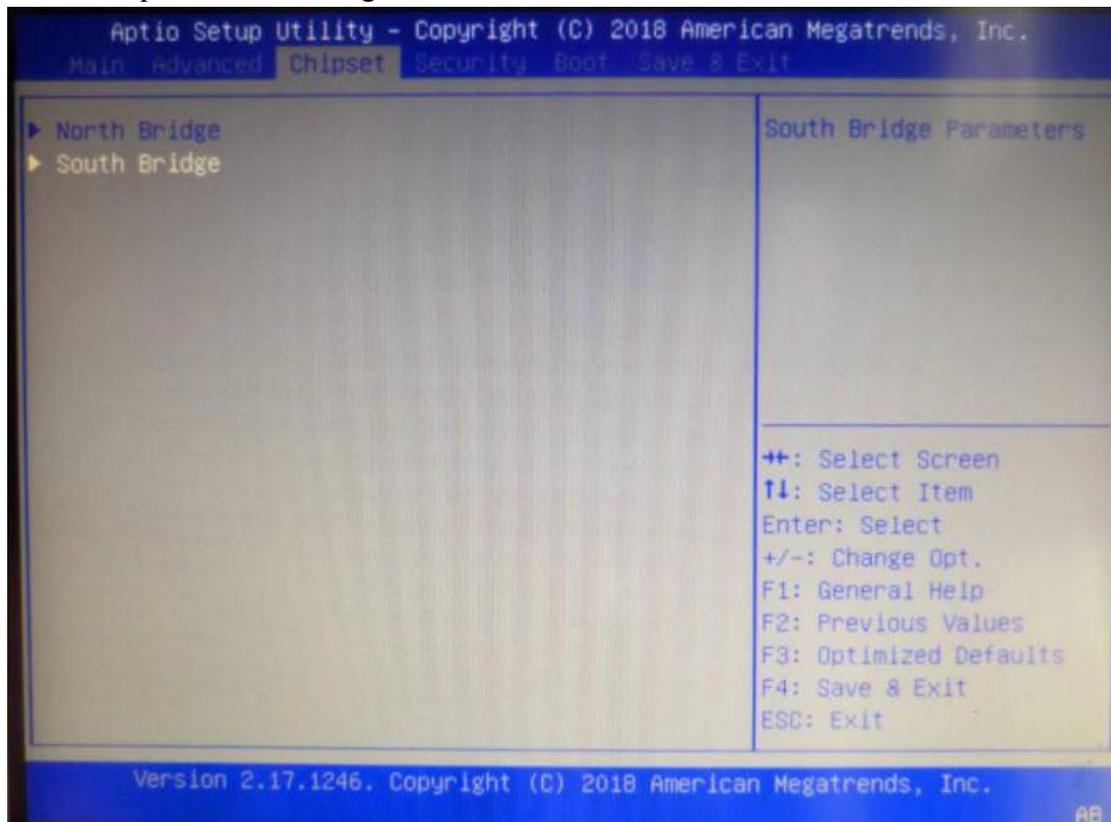


Figure 3.5 BIOS Chipset table

Set the "OS Selection" option to "Android" .

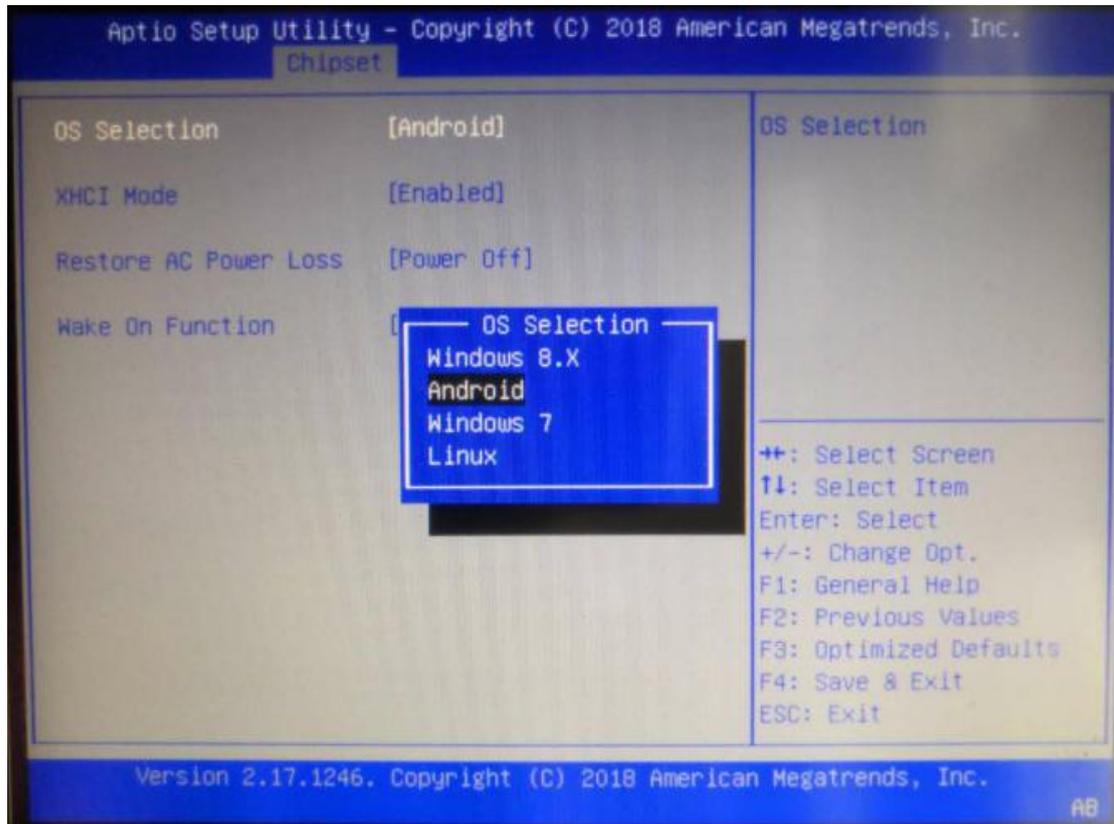


Figure 3.6 Choose "Android"

Select Save & Exit -> Save Changes and Reset
 Select "Yes" to Save configuration and restart.

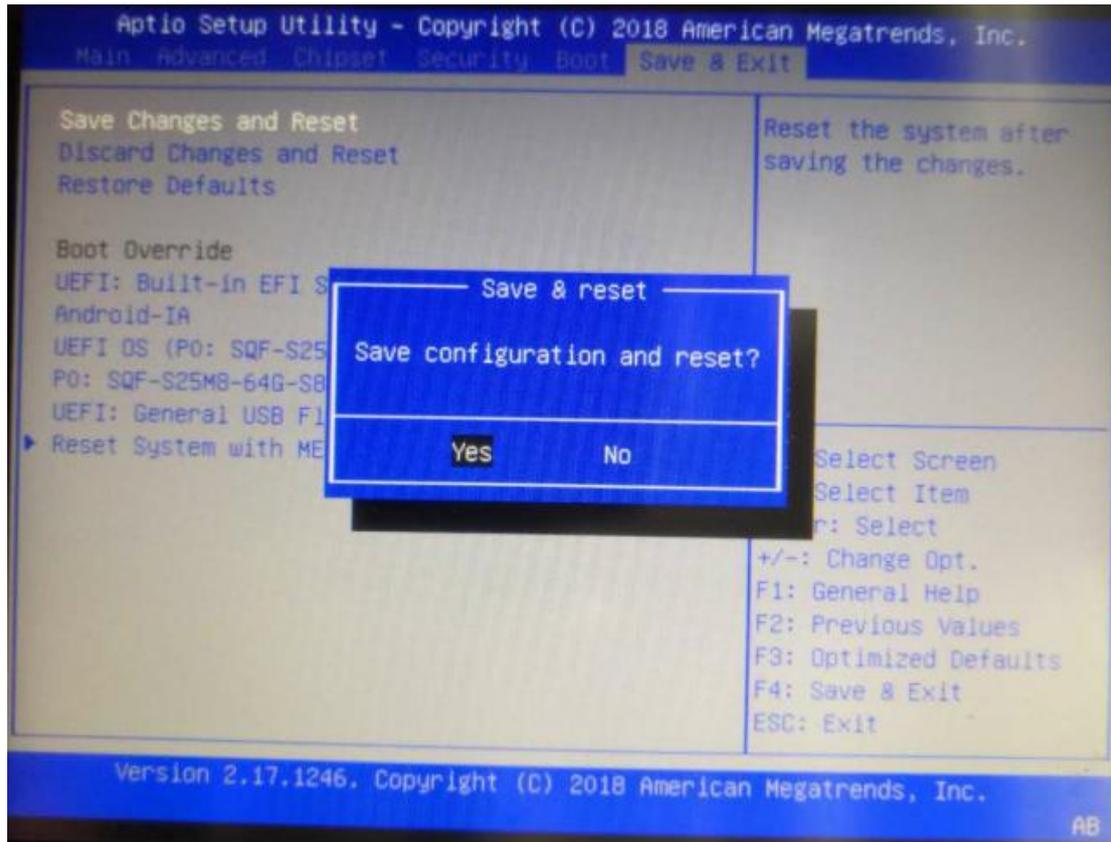


Figure 3.7 Choose "Yes" to save changes and restart

3.3. To install

When you see the following screen during the boot process, press the "F7" button to select boot device.



Figure 3.8 BIOS logo

Select "UEFI: Built-in EFI Shell" to automatically burn the system through the script.

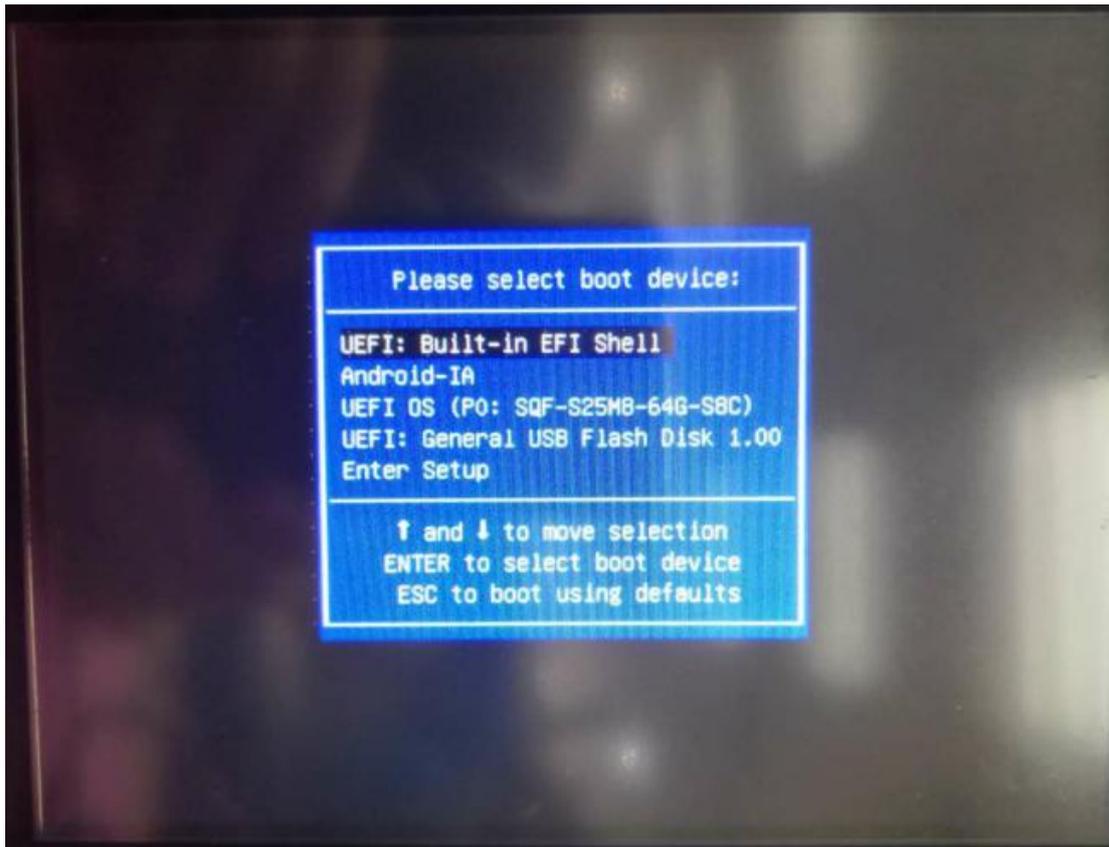


Figure 3.9 Choose "UEFI: Built-in EFI Shell"

Select "UEFI: Built-in EFI Shell" to automatically burn the system through the script.

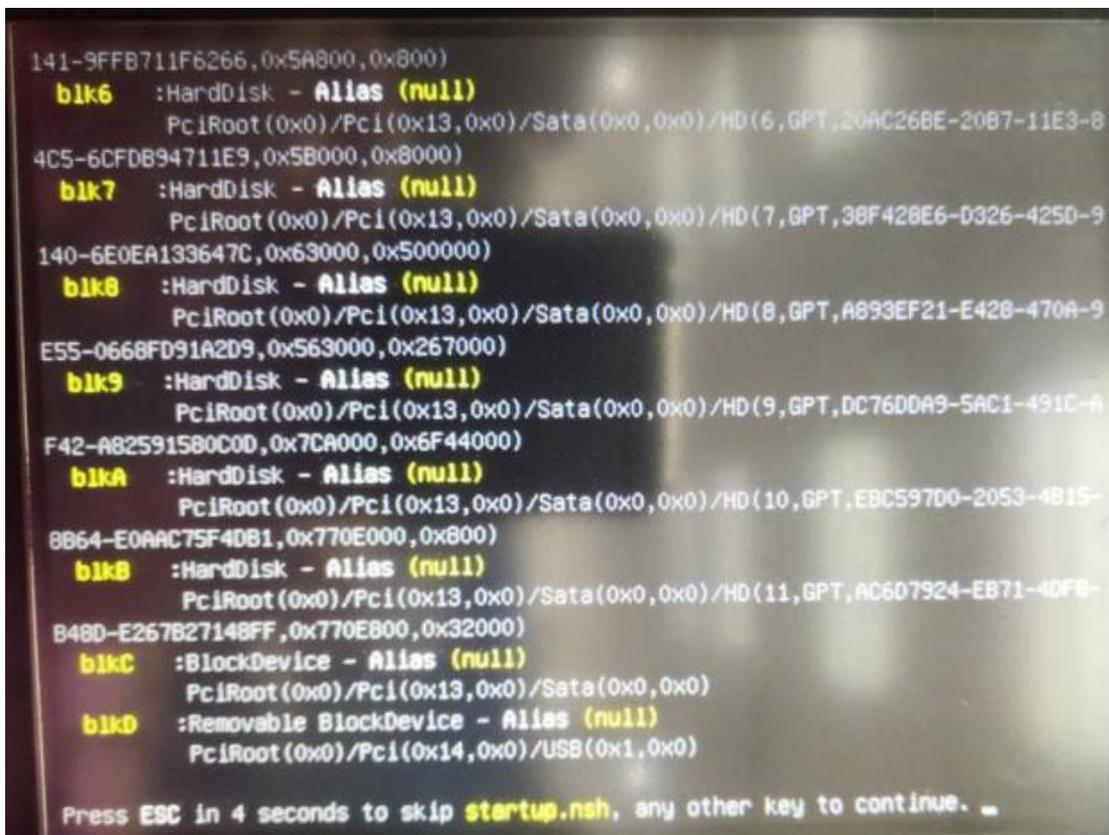


Figure 3.10 Auto skip startup.nsh

```
Fallbacking to filling with zeros
Erase done.
(bootloader) userdata.img is missing, cannot format data
(bootloader) Android fs_mgr will manage this
Command successfully executed
Starting command: 'flash boot boot.img'
Flashing boot ...
Flash done.
Command successfully executed
Starting command: 'flash recovery recovery.img'
Flashing recovery ...
Flash done.
Command successfully executed
Starting command: 'flash system system.img'
Flashing system ...
Flash done.
Command successfully executed
Starting command: 'flash bootloader bootloader_U211'
```

Figure 3.11 Execute startup.nsh script

After the burning is completed, it will automatically restart into the system.

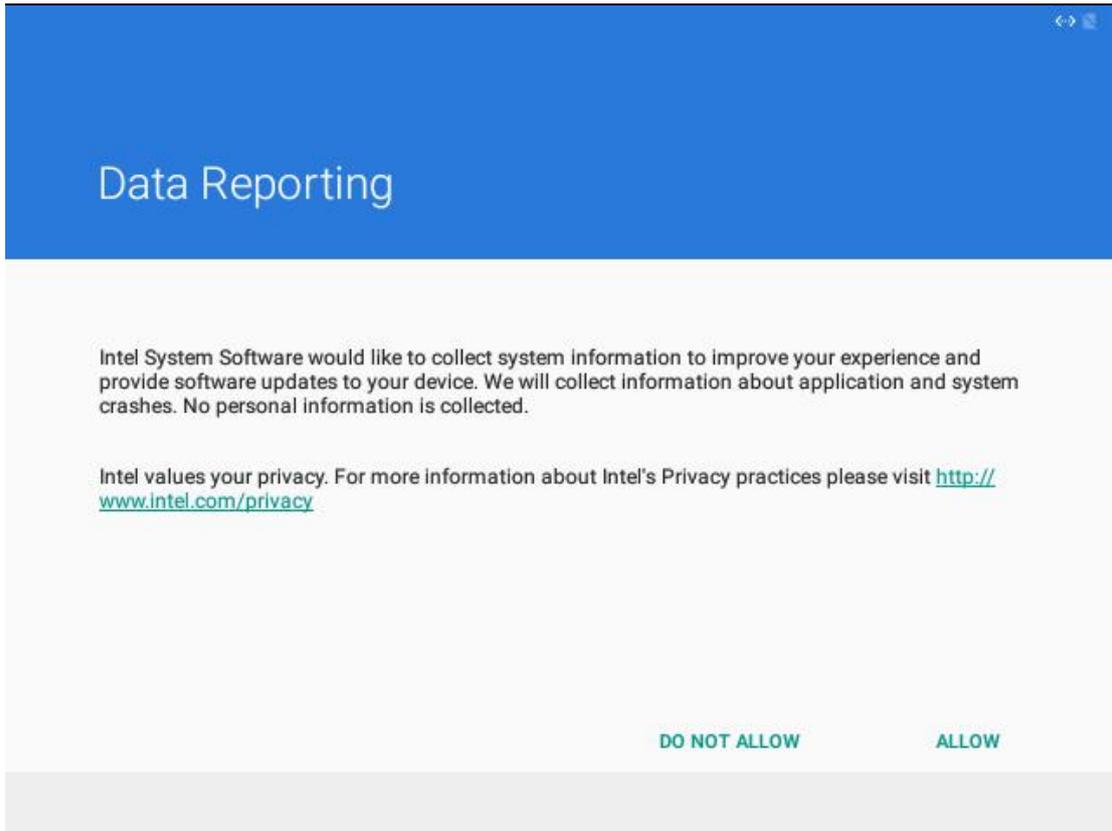


Figure 3.12 Choose "Do NOT ALLOW"

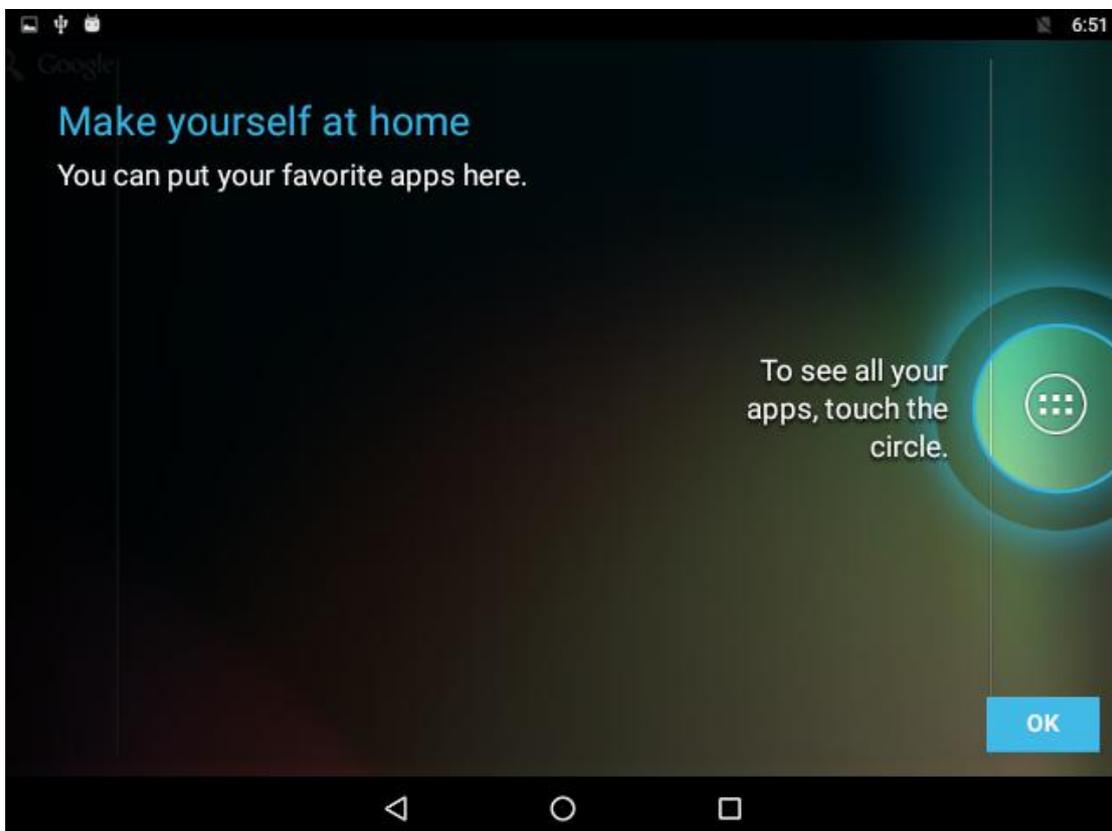


Figure 3.13 Choose "OK"

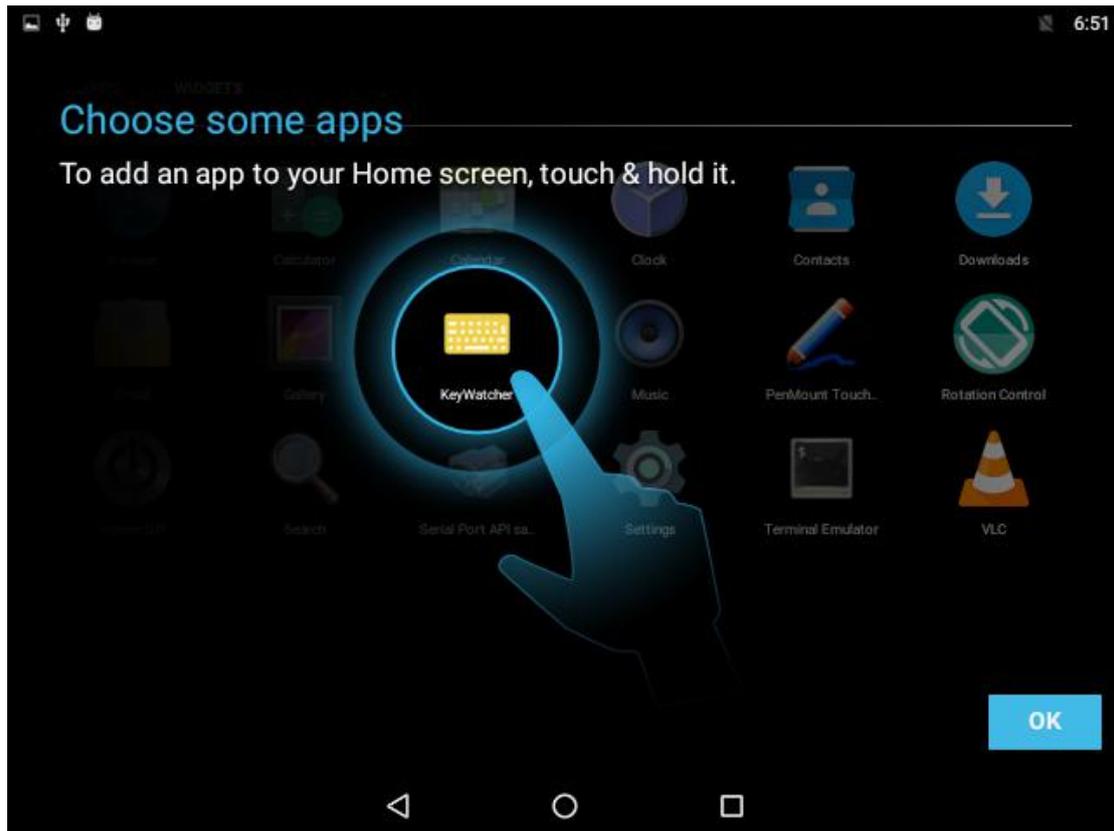


Figure 3.14 Choose "OK"

4. Applications Usage

4.1. About SerialPort sample

After installing Advantech android, you will see a Serial application in App list. Users can test serial port with it. This program is the sample application provided with project android-serialport-api, please refer to help for more information.

After starting the application, you will see:

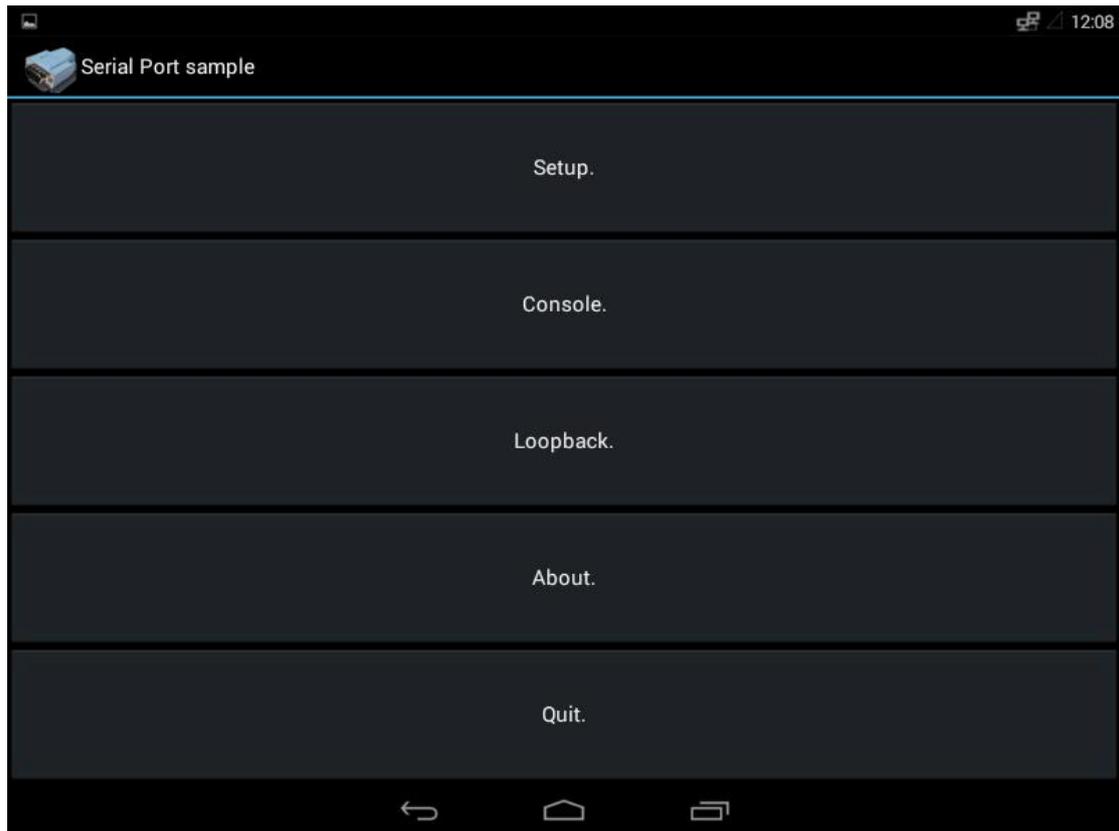


Figure 4.1 Serial port options

Users can set port and baud rate in "Setup", test loopback with "Loopback" and send and receive data in "Console". Pressing "About" will show information like version number. You can quit the application by pressing "Quit".

4.1.1 Setup

Press the "Setup" button and you will see:

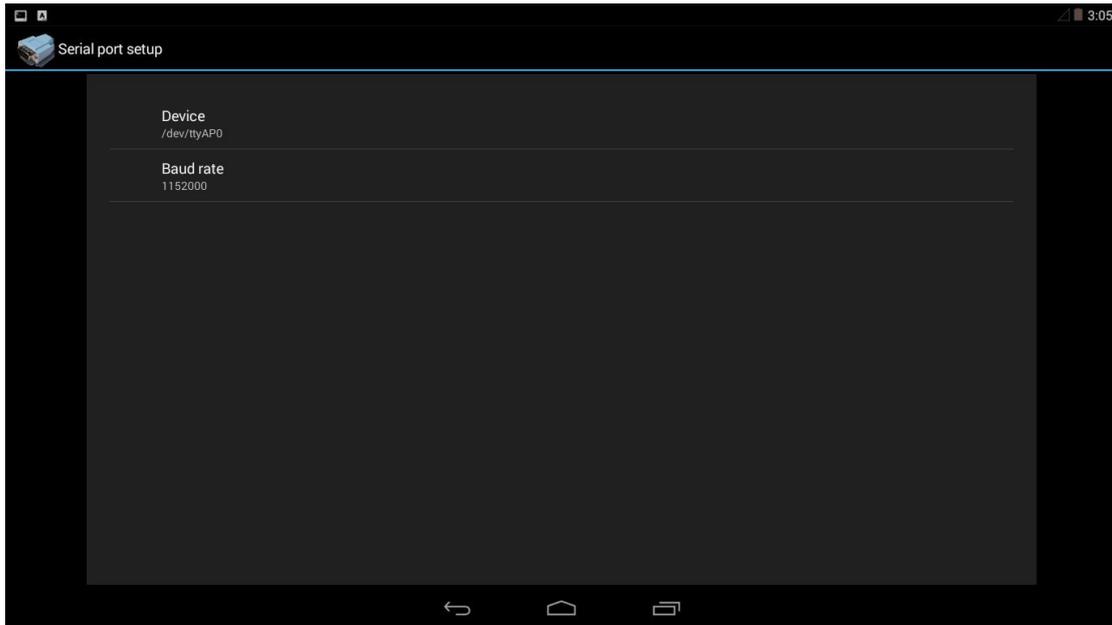


Figure 4.2 Serial port setup

Users can set port in "Device" as below:

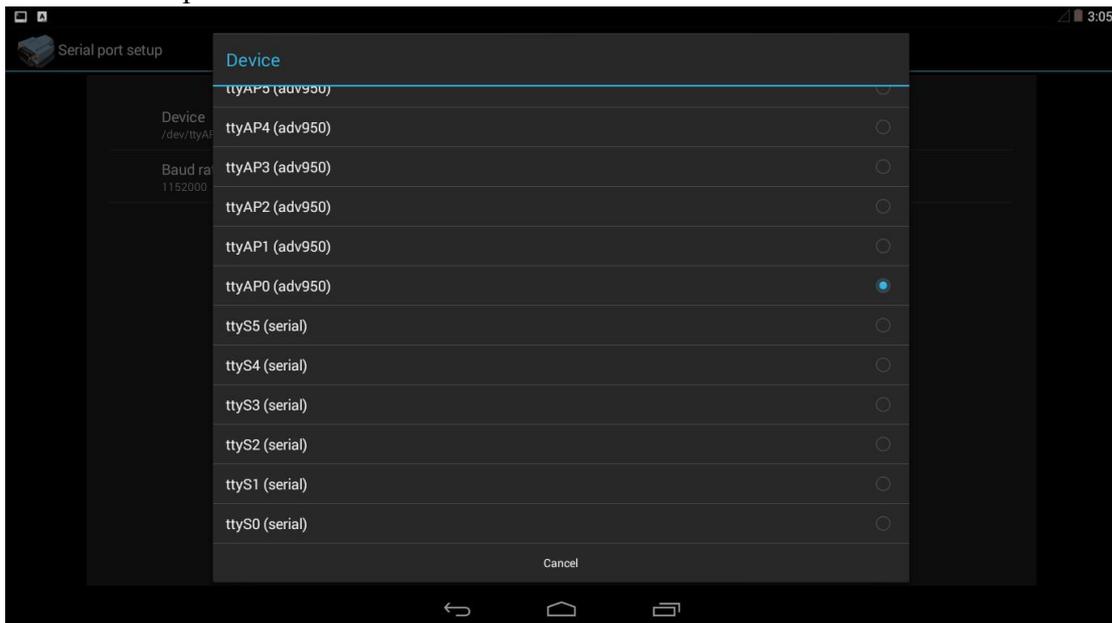


Figure 4.3 Select device

And can set baud rate in "Baud rate" as below:

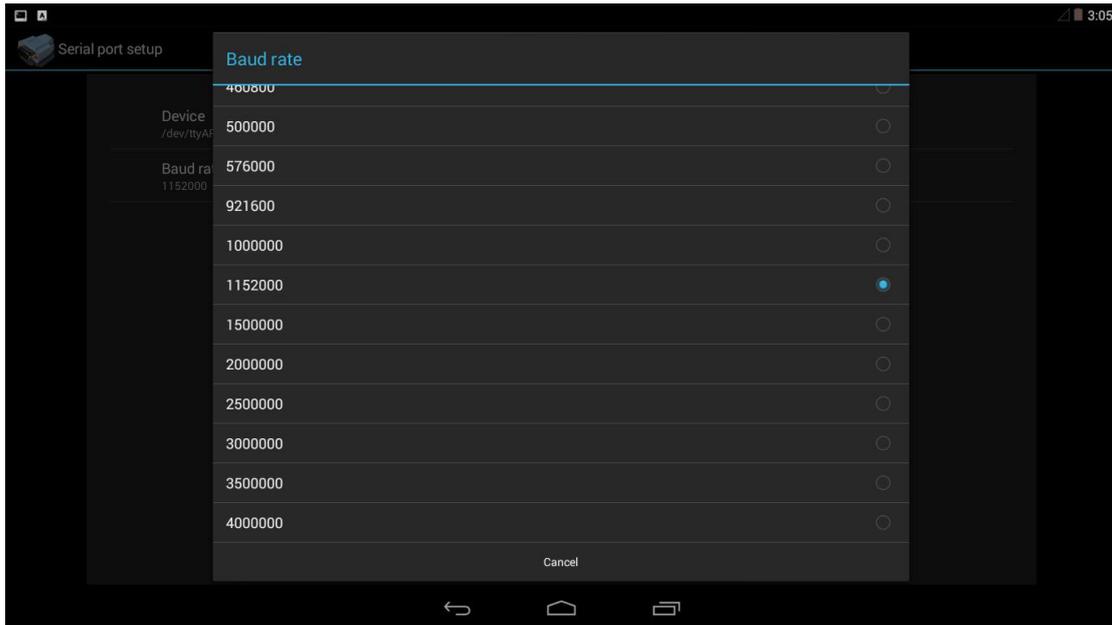


Figure 4.4 Set baud rate

4.1.2 Console and Loopback

After setting port number and baud rate, you can use "Loopback" to test loop back function.

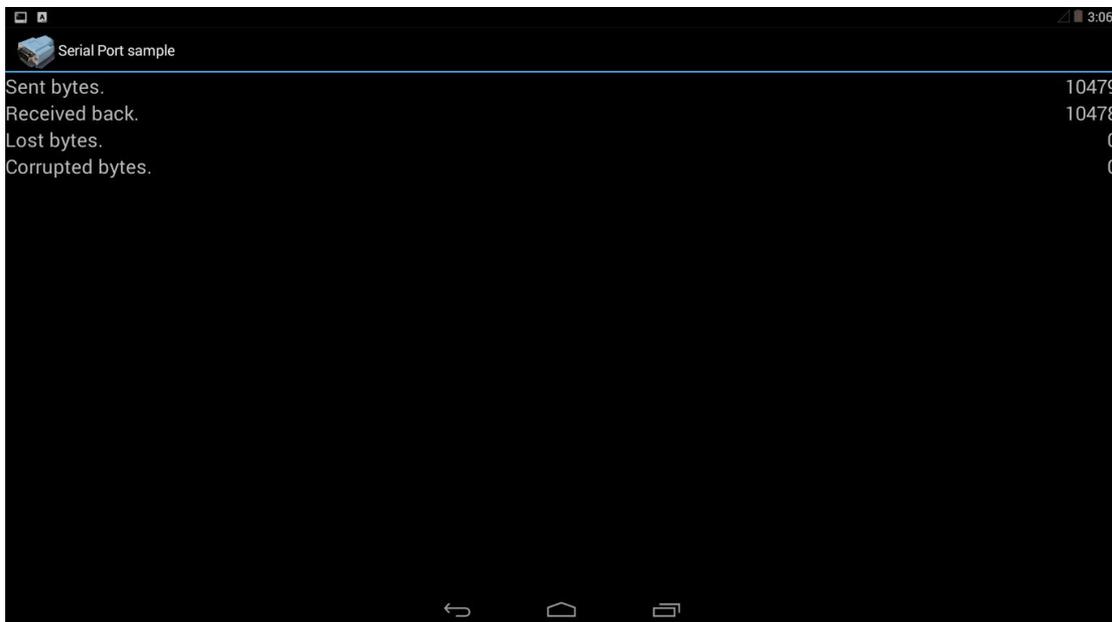


Figure 4.5 Loopback

And use "Console" to test sending and receiving functions manually .

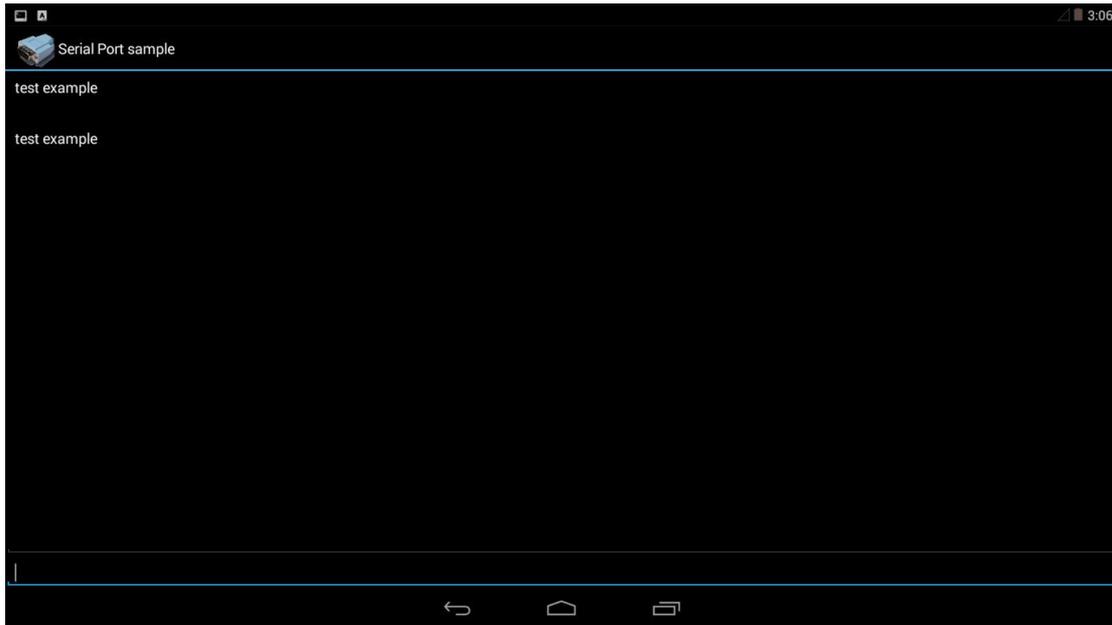


Figure 4.6 Console

4.1.3 About

Press the "About" button, and you can see application information.

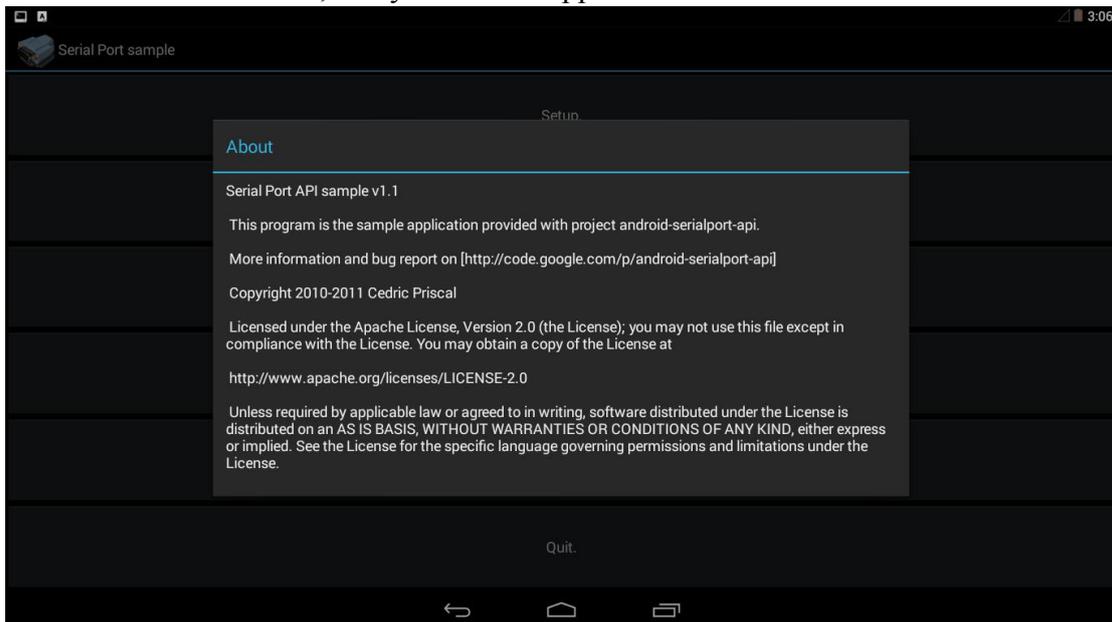


Figure 4.7 About

4.1.4 Quit

Press the Quit button to exit application.

4.2. About Touch Screen Calibration

You can find an application named "PenMount TouchScreen Calibration" in App list.

After starting, you will see the screen below:

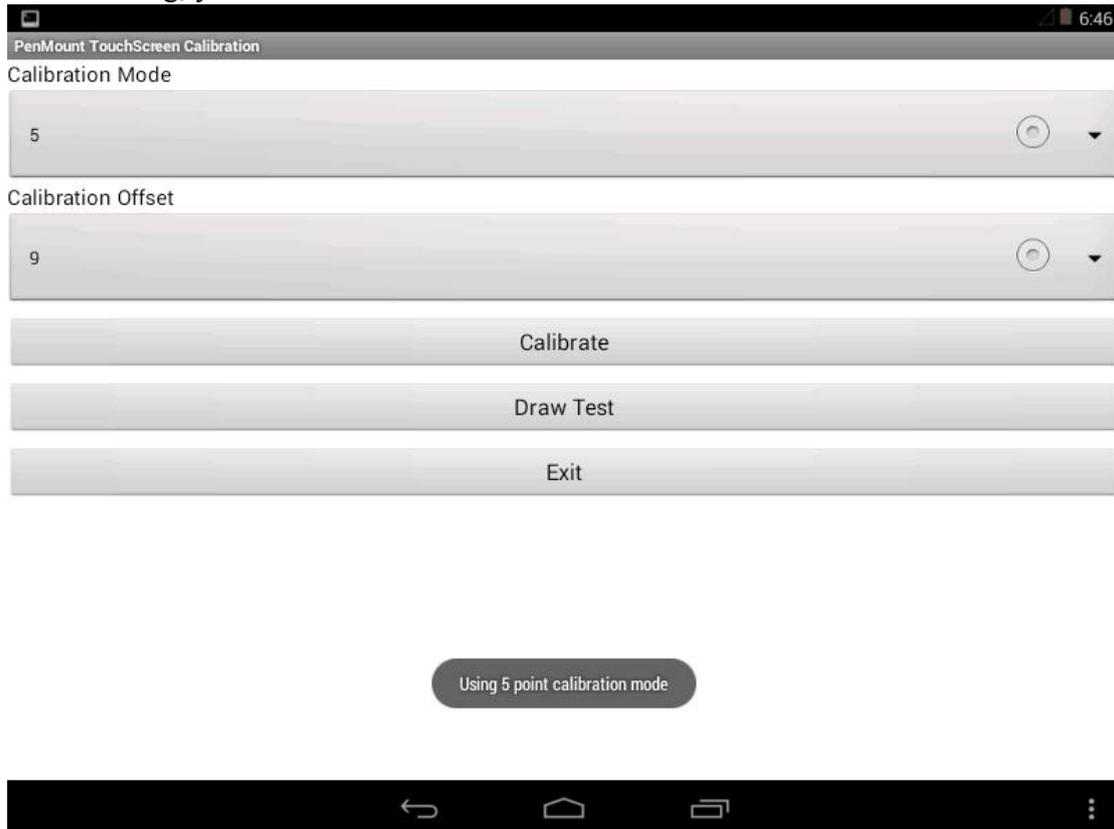


Figure 4.8 Start calibration

After touching the screen, you will see:



Figure 4.9 Touch Point

After touching five points in panel, please touching screen to quit, the touch screen will be calibrated.

4.3. About Screen off

You can find an application named “Screen off” in App list. After starting, you will see the screen below:

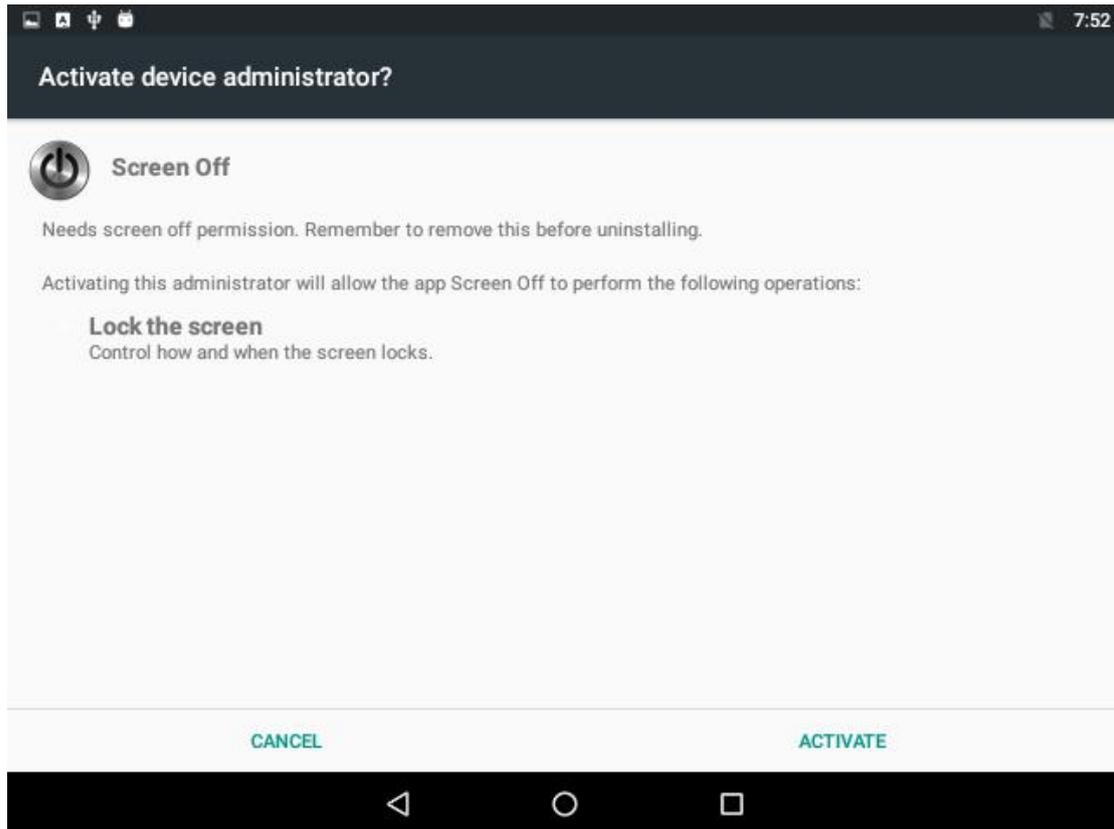


Figure 4.10 Screen Off

If you choose ACTIVATE, the "Screen off" function will be turned on, Then when you next run the "Screen off" application, the system will go to sleep. After the system enters the sleep state, the system can only be woken up by the power button or the mouse and keyboard.

4.4. About BacklightControl

You can find an application named “BacklightControl” in App list. After starting, you will see the screen below:

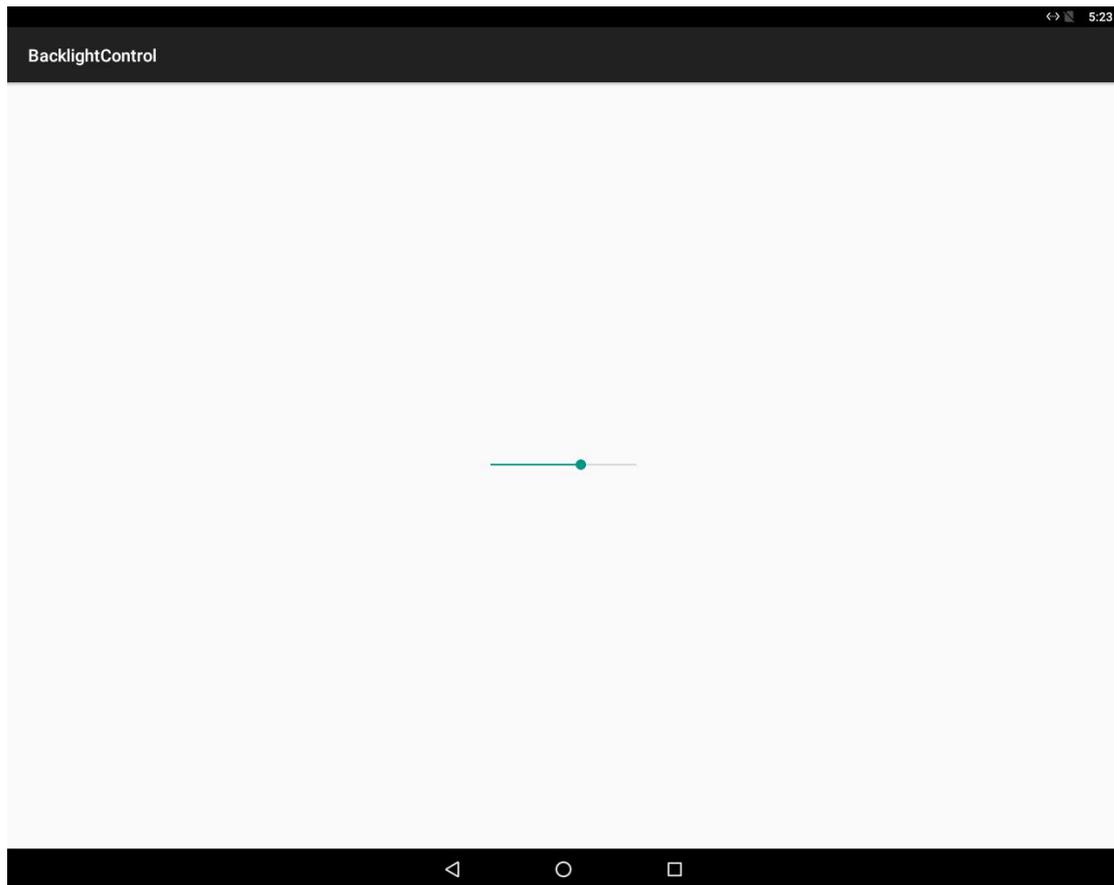


Figure 4.11 Backlight Control

You can control the system backlight through the seek bar on the view. The system backlight value ranges from 0-100. You can control the range from 10-100.

4.5. About KeyWatcher

You can find an application named "KeyWatcher" in App list. After starting, you will see the screen below:

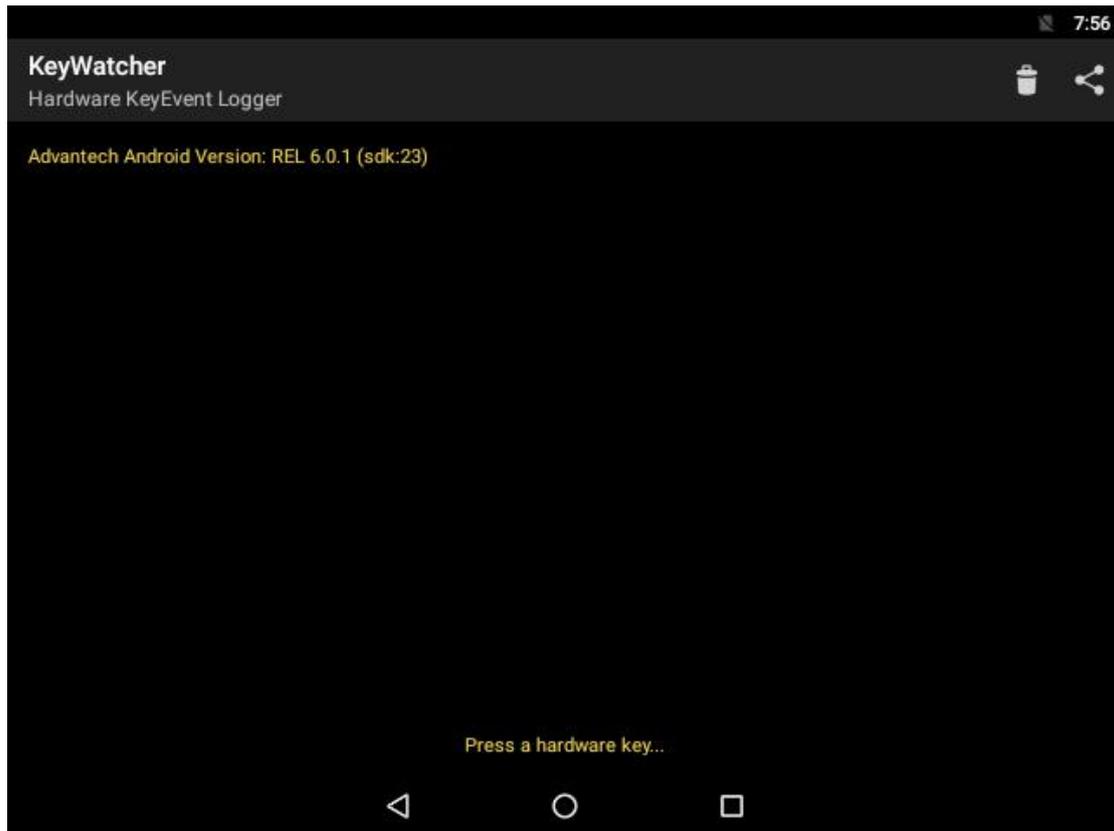


Figure 4.12 KeyWatcher

Then when you press the keyboard, you can see the response in the APP interface.

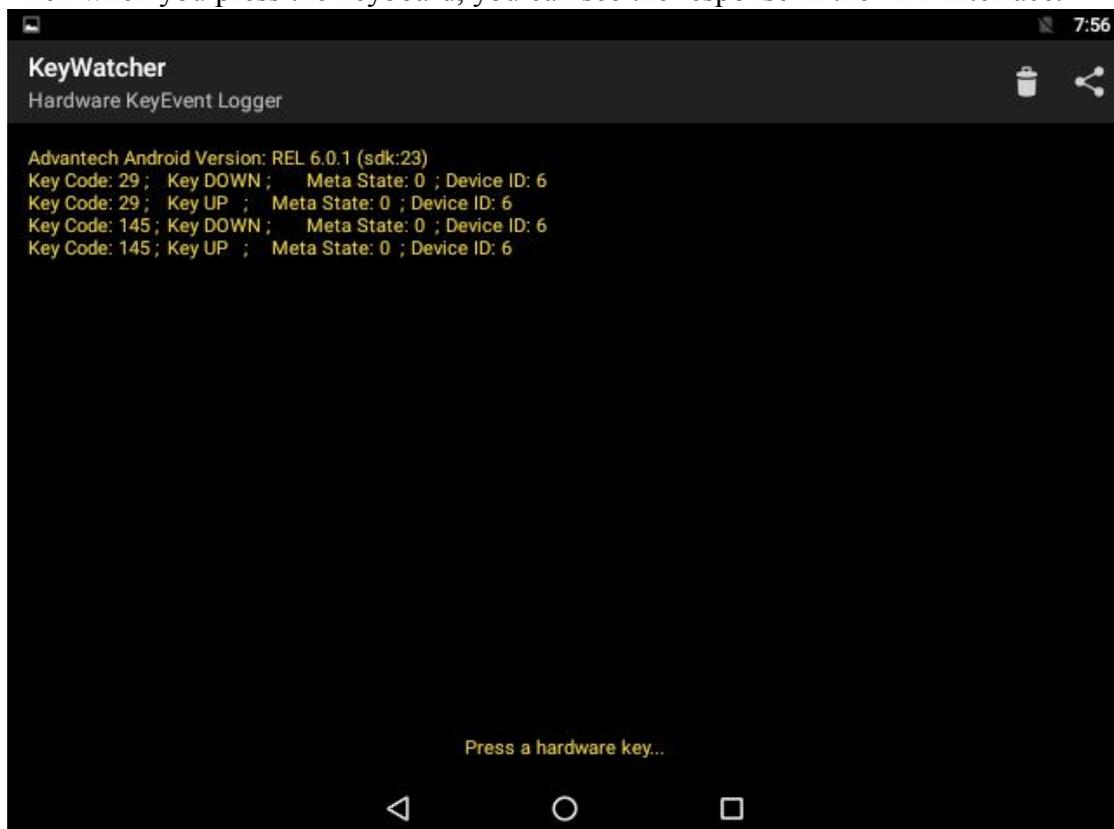


Figure 4.13 KeyWatcher Test

4.6. About Rotation Control

You can find an application named "Rotation Control" in App list. After starting, you will see the screen below:

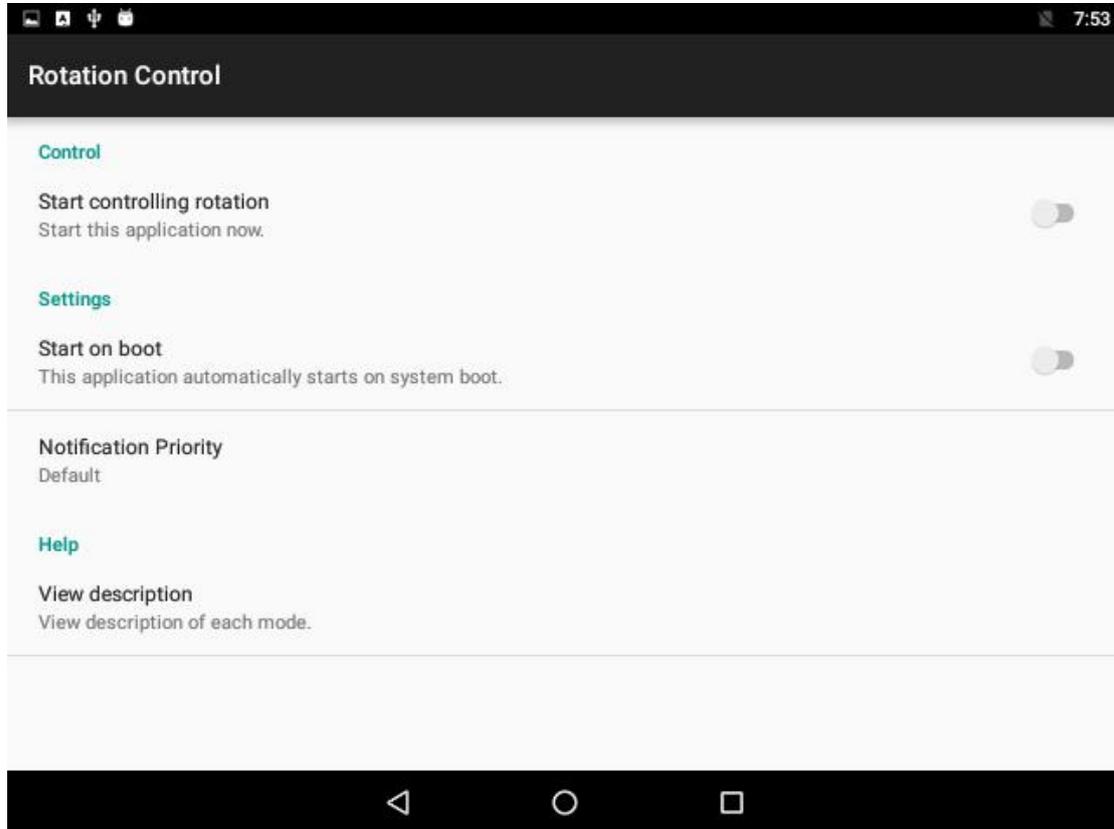


Figure 4.14 Rotation Control

If you selecting "Start controlling rotation" option, the "control rotation" function will be turned on.

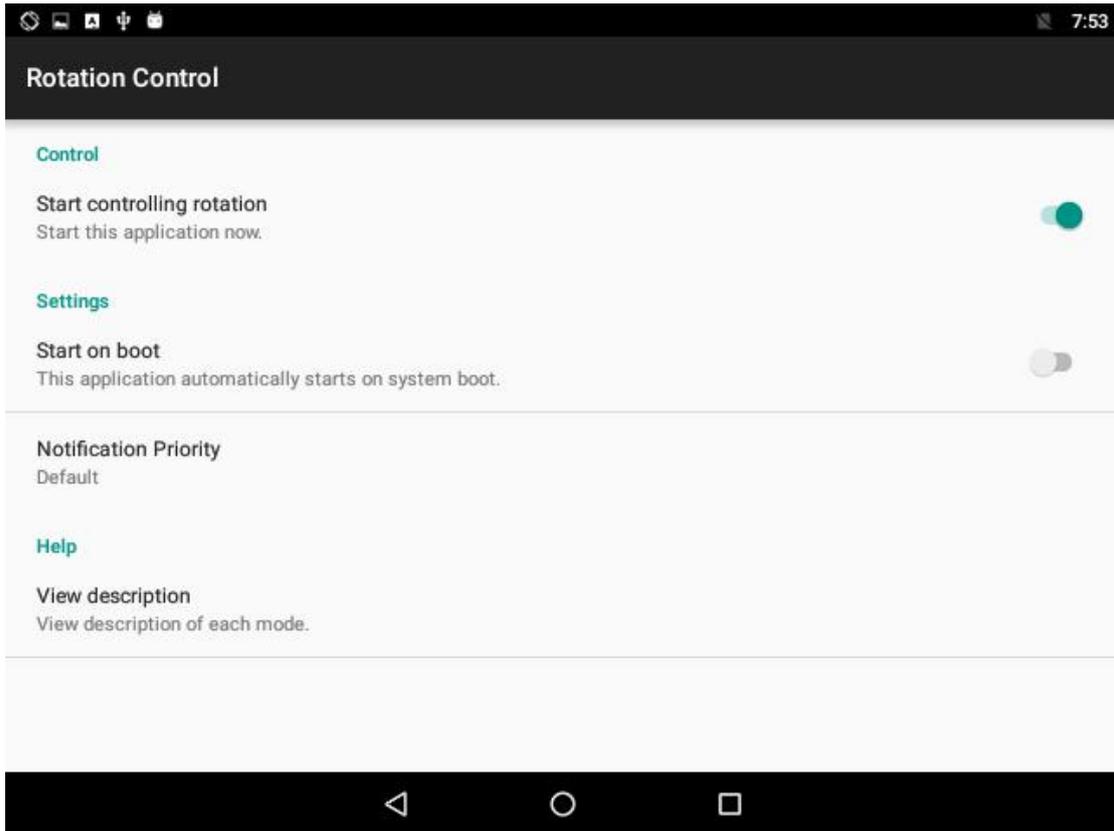


Figure 4.15 Start controlling rotation

Then you can see the relevant control options under the Quick Setting Menu.

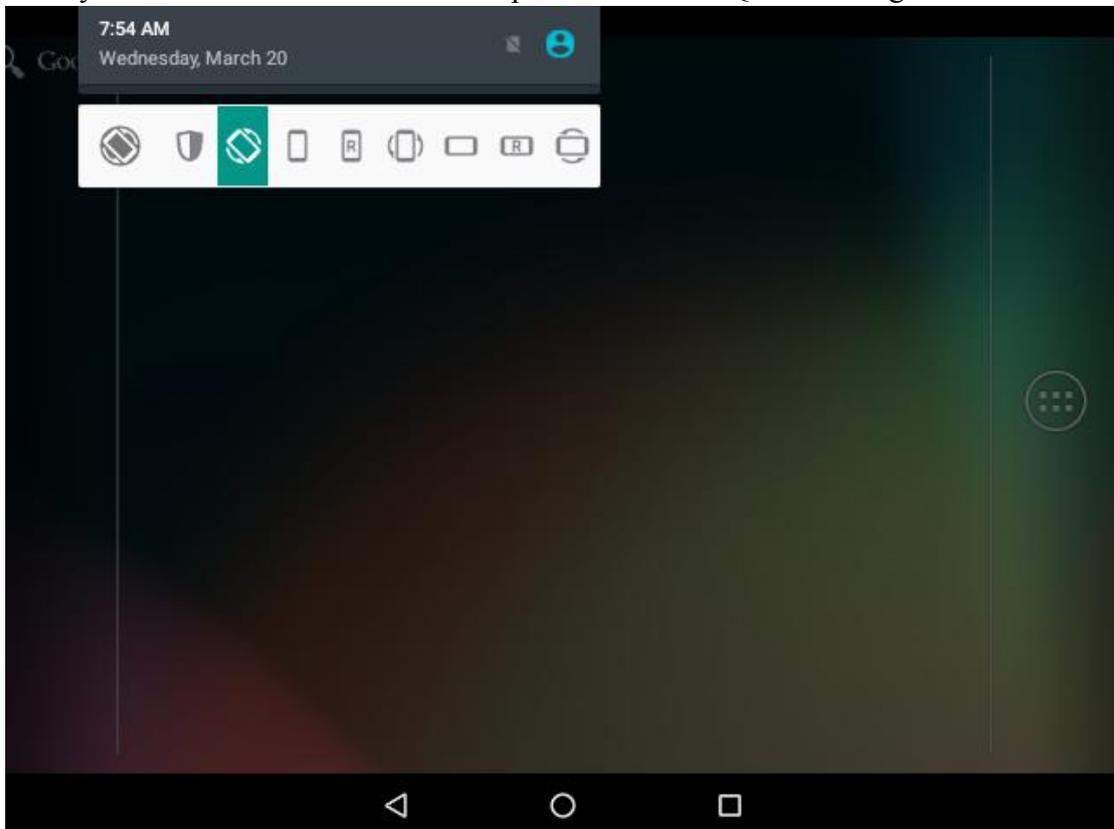


Figure 4.16 Rotation control menu

Then with these control options we can control the screen orientation

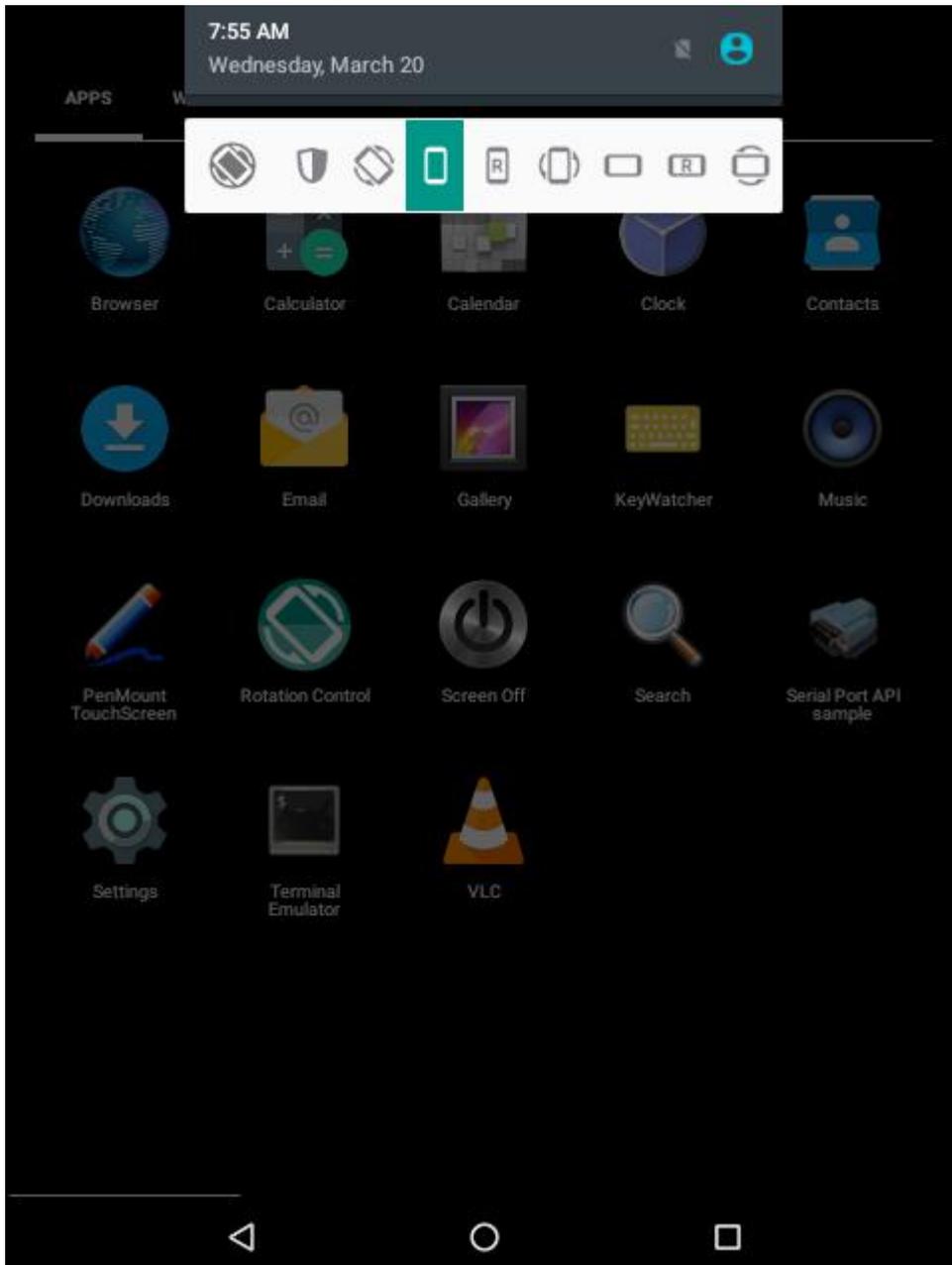


Figure 4.17 Set vertical screen

4.7. About Ethernet

You can find "Ethernet configuration" in Settings:

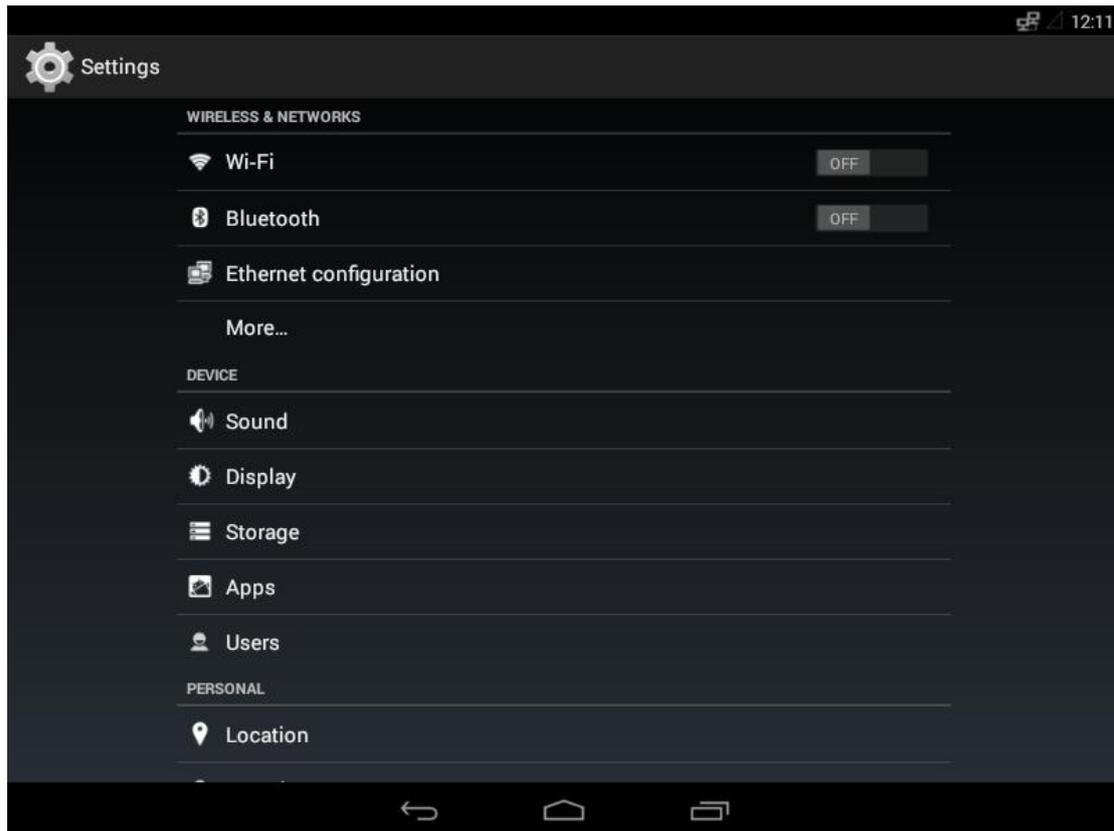


Figure 4.18 Ethernet configuration

Click "Settings" -> "Ethernet configuration", you will see the screen below. You can turn on/off Ethernet by press the checkbox.

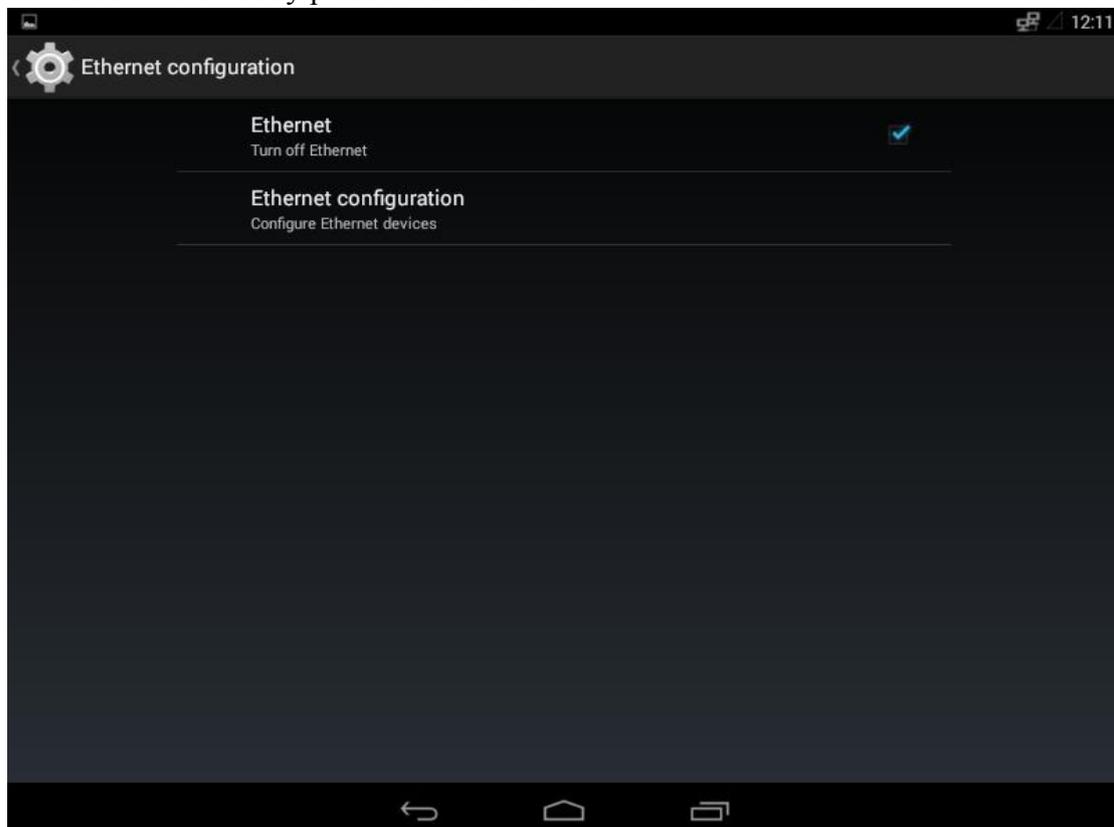


Figure 4.19 Ethernet configuration

Click "Ethernet configuration", you will see the screen below. You can choose Ethernet devices and connection type (DHCP or Static IP). If you choose "Static IP", you can configure the IP address, Netmask, DNS address and Gateway address, then save.

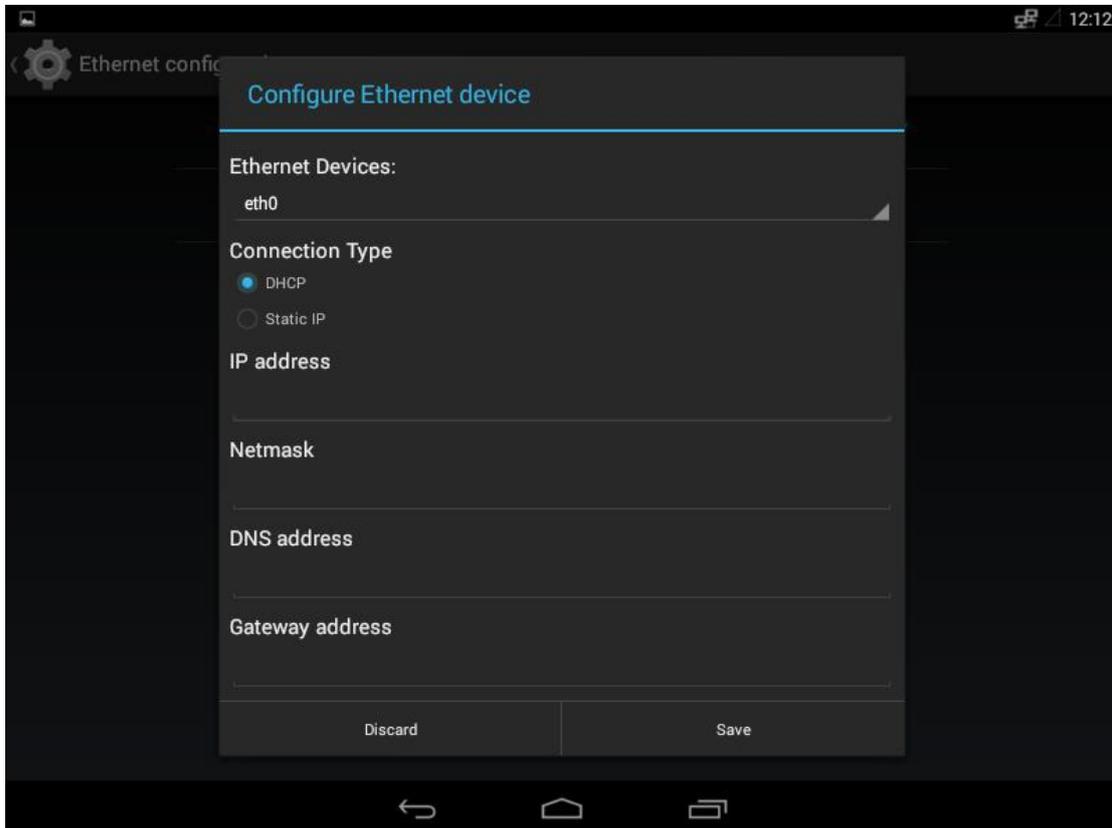


Figure 4.20 Ethernet configuration

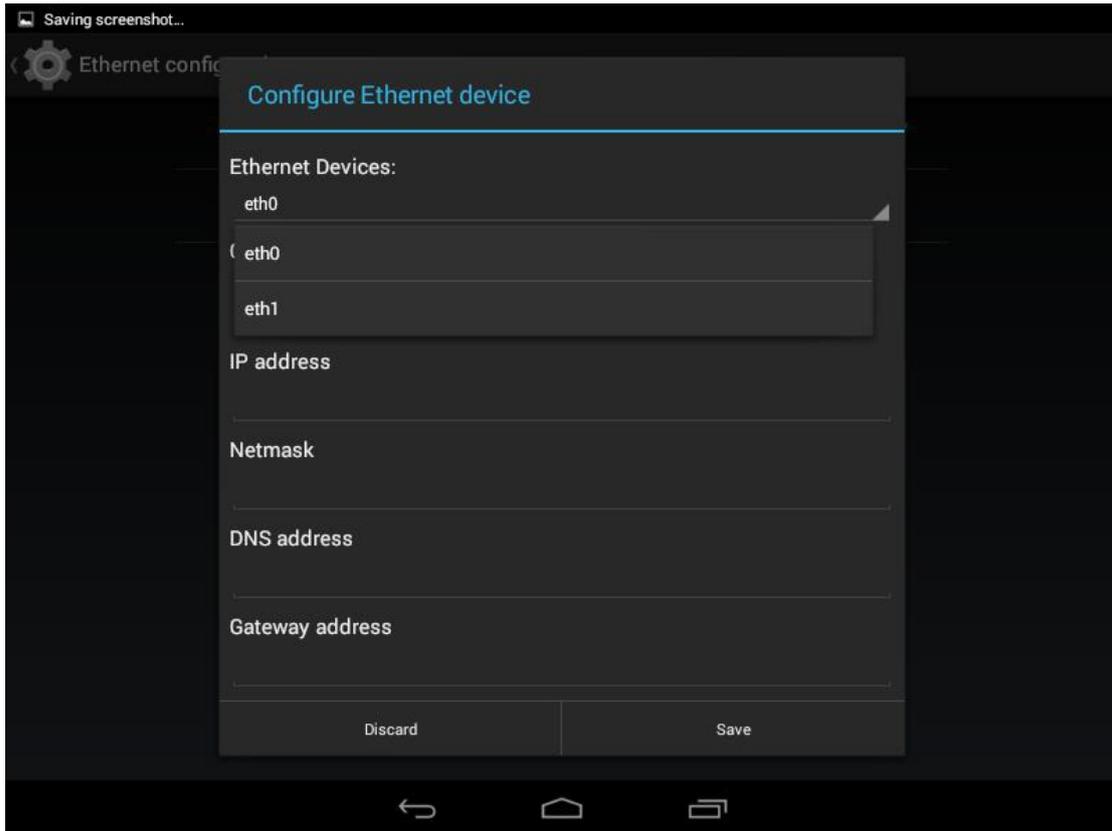


Figure 4.21 Ethernet configuration

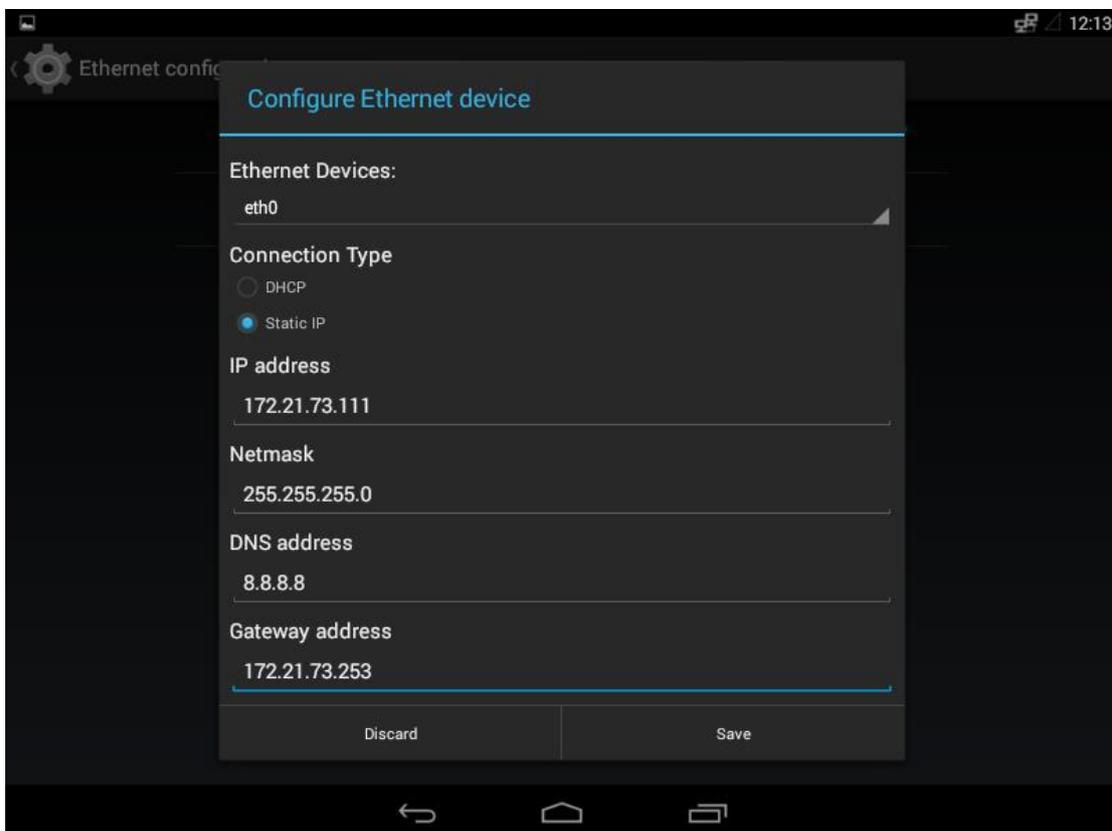


Figure 4.22 Ethernet configuration

If there is a normal ethernet connection, the ethernet status icon on the top right corner of the desktop will turn blue, otherwise it will be white.

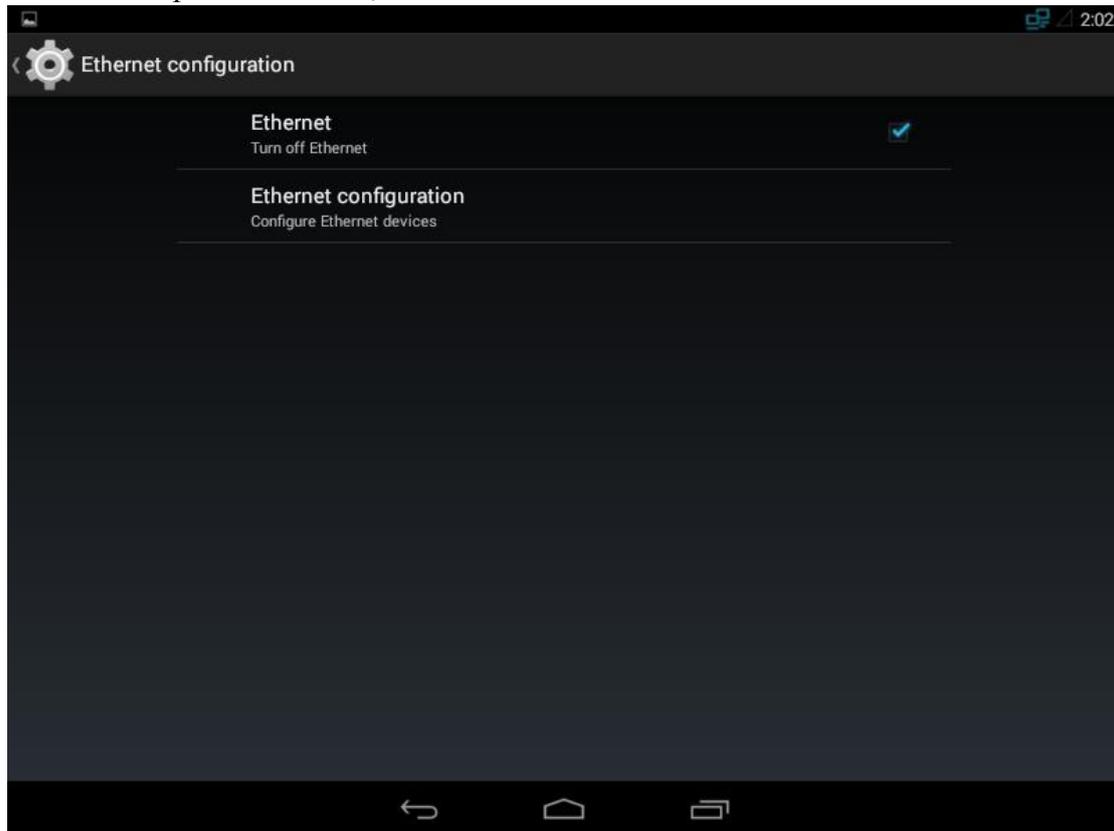


Figure 4.23 Ethernet Status

4.8. Other Applications

Many other applications for x86 supported by Android or other resource web sites. You can search and download them from internet by yourself. But the applications for ARM can not execute because native library (JNI) isn't executable by x86 device.

5. Dual Display

5.1. Behavior

Devices such as PPC-3150/PPC-3170/PPC-3190 support VGA/LVDS dual display functions. We are currently aware of the following caveats/restrictions with Dual Display:

1. The hardware does not appear to support VGA hot-plug detection. The external display will only work when plugged in at boot.
2. The external display will show the launcher whenever there is no application running on it.
3. A USB mouse is required to provide input to the external application.

5.2. Setting Application to Display on External

External display defaults to display in clone mode.

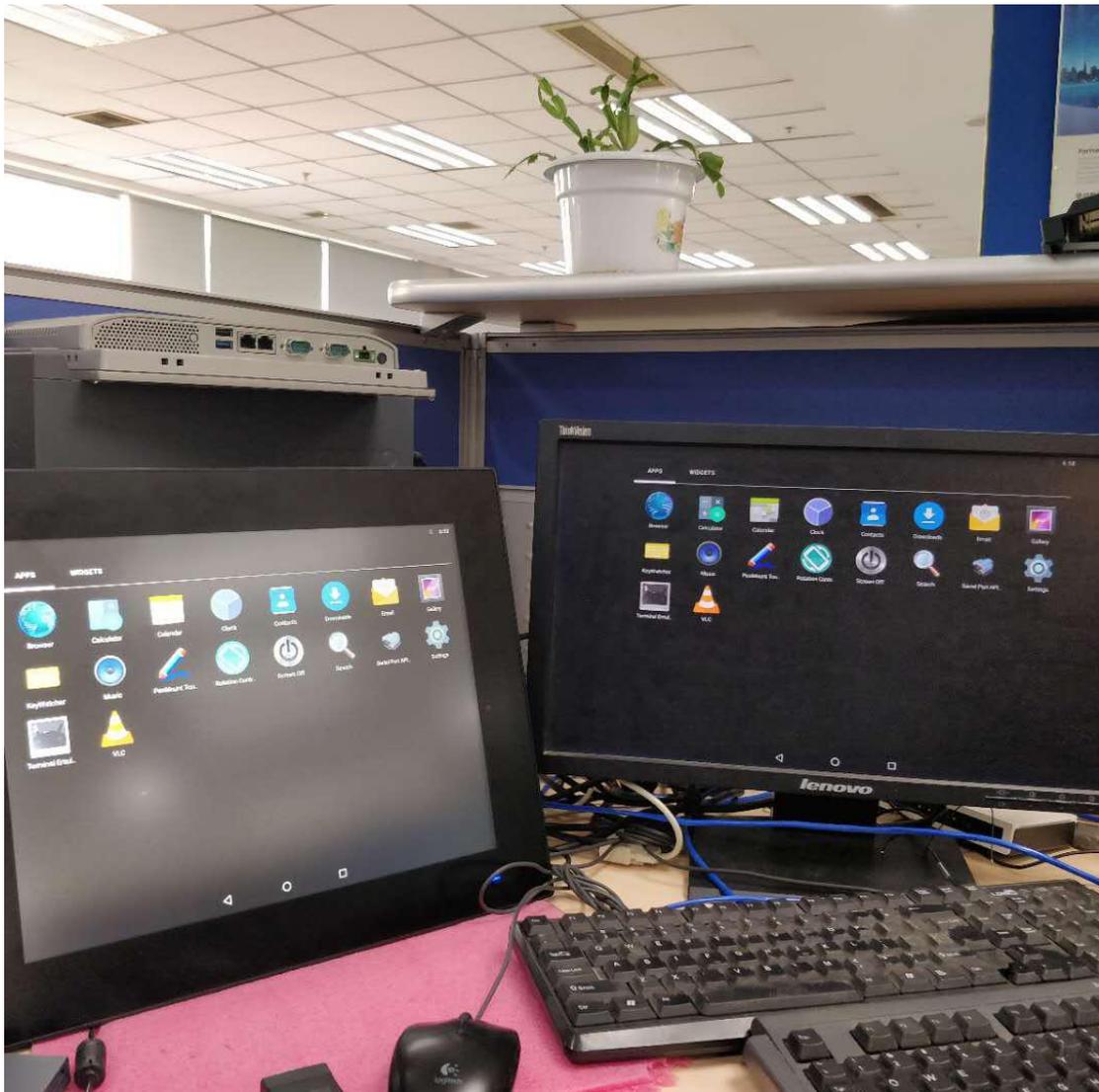


Figure 5.1 Clone Mode

Follow the below steps to setting application to display on External (Take the Browser APP as an example) :

Open the Settings APP. You will see:

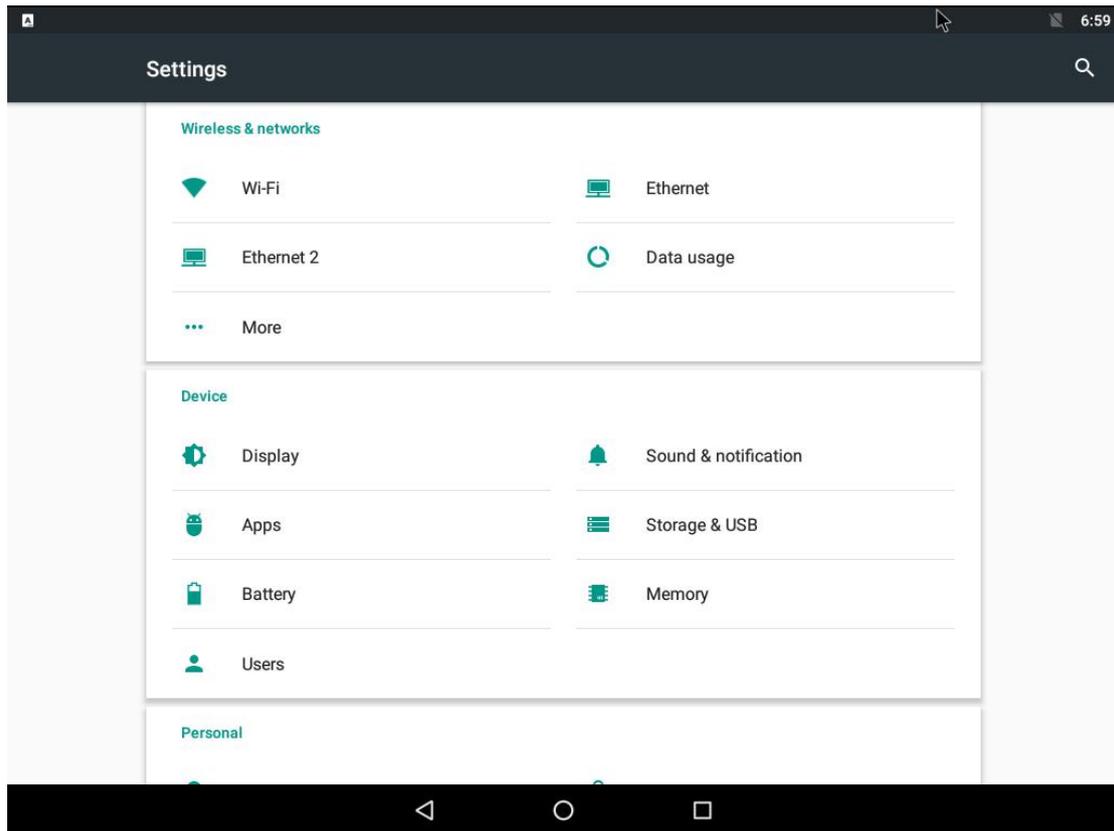


Figure 5.2 Settings APP

Click on the "Apps" option under Device. You will then get a list of applications. Such as:

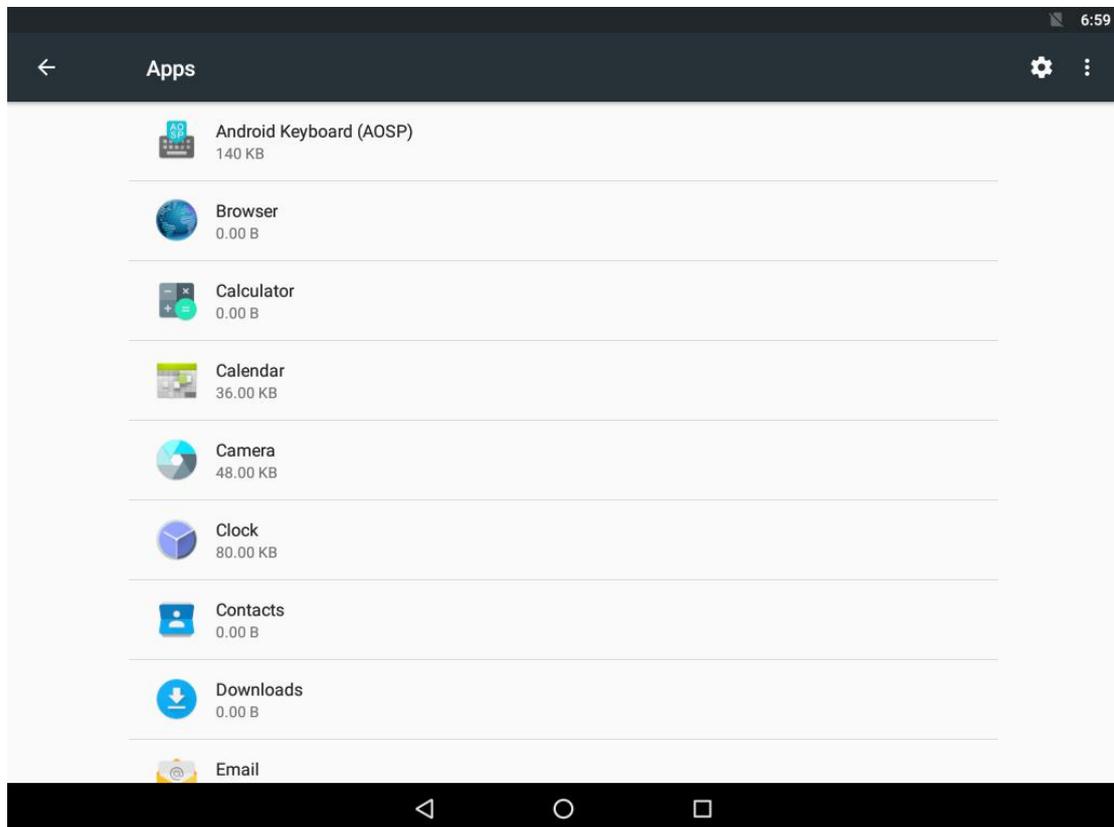


Figure 5.3 APPS

Click on the desired Application. For the Browser App, Click on Browser and you get:

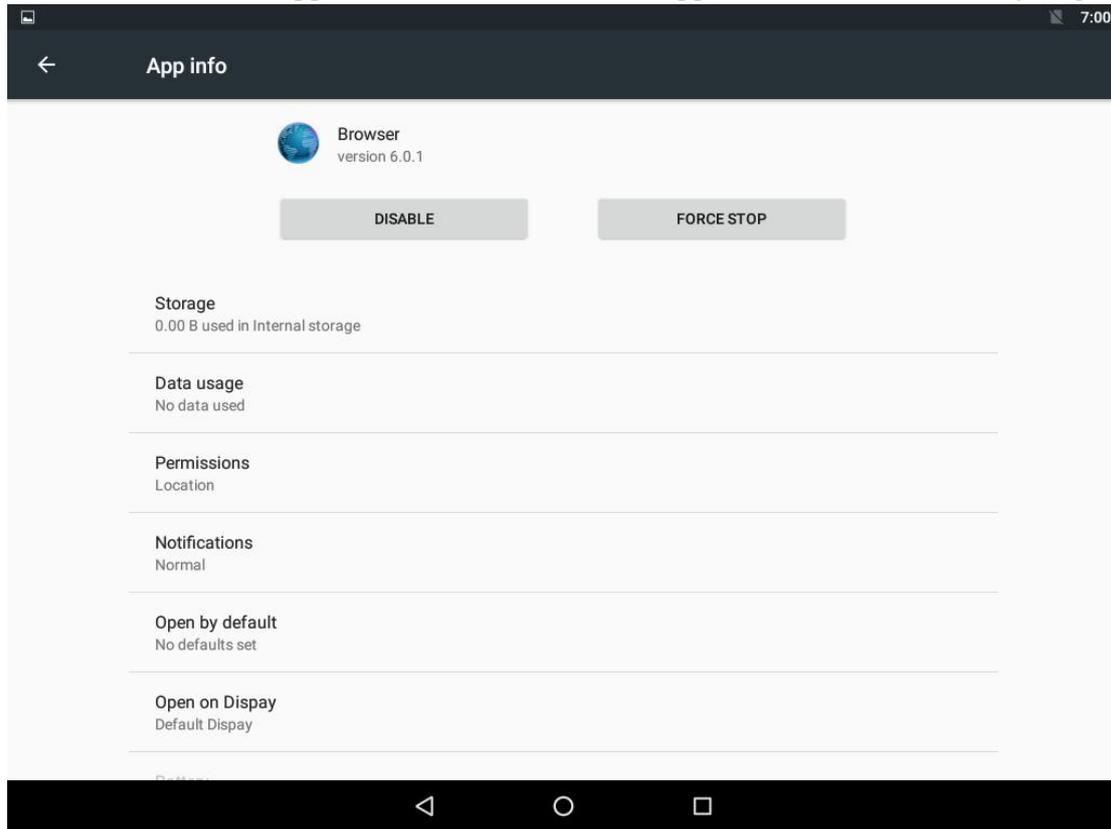


Figure 5.4 Browser

This shows what the application is currently set to display onto. Normally, this is "Default Display"

Click on the item "Open on Display". It will provide the ability to change which is the preferred display to open the application onto. You will see:

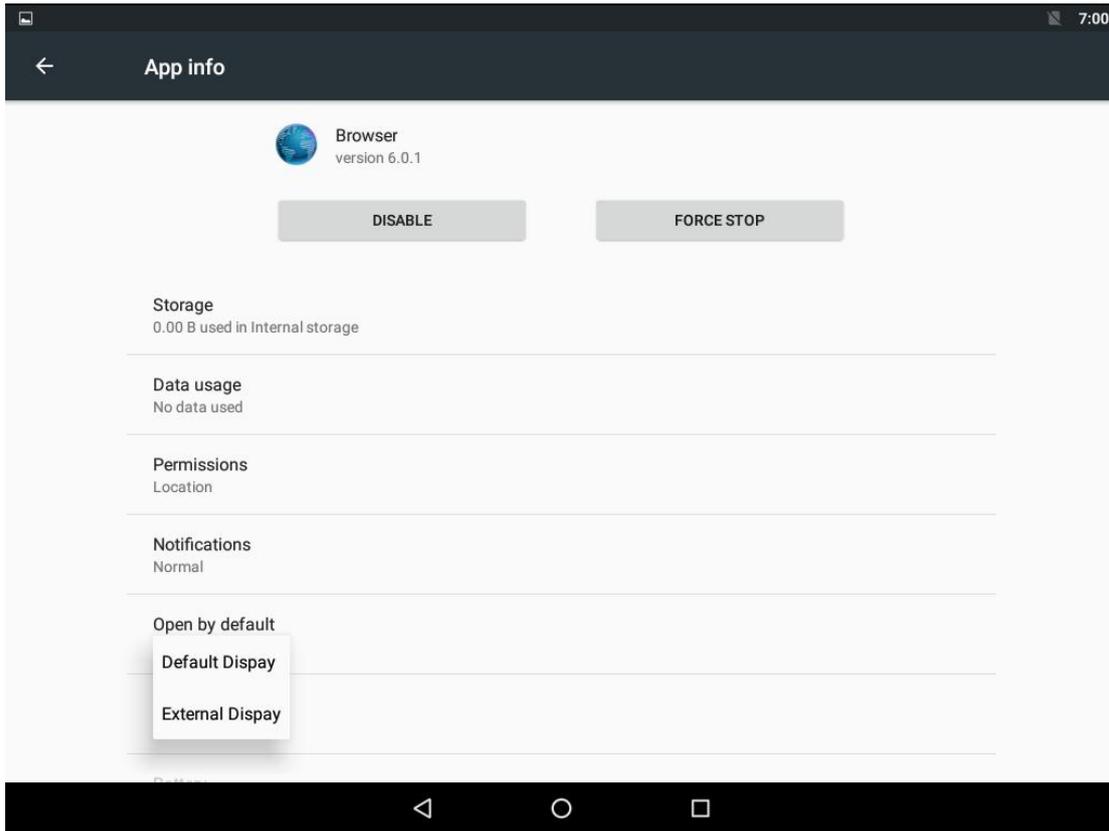


Figure 5.5 "Open on Display" Option

Select "External Display"

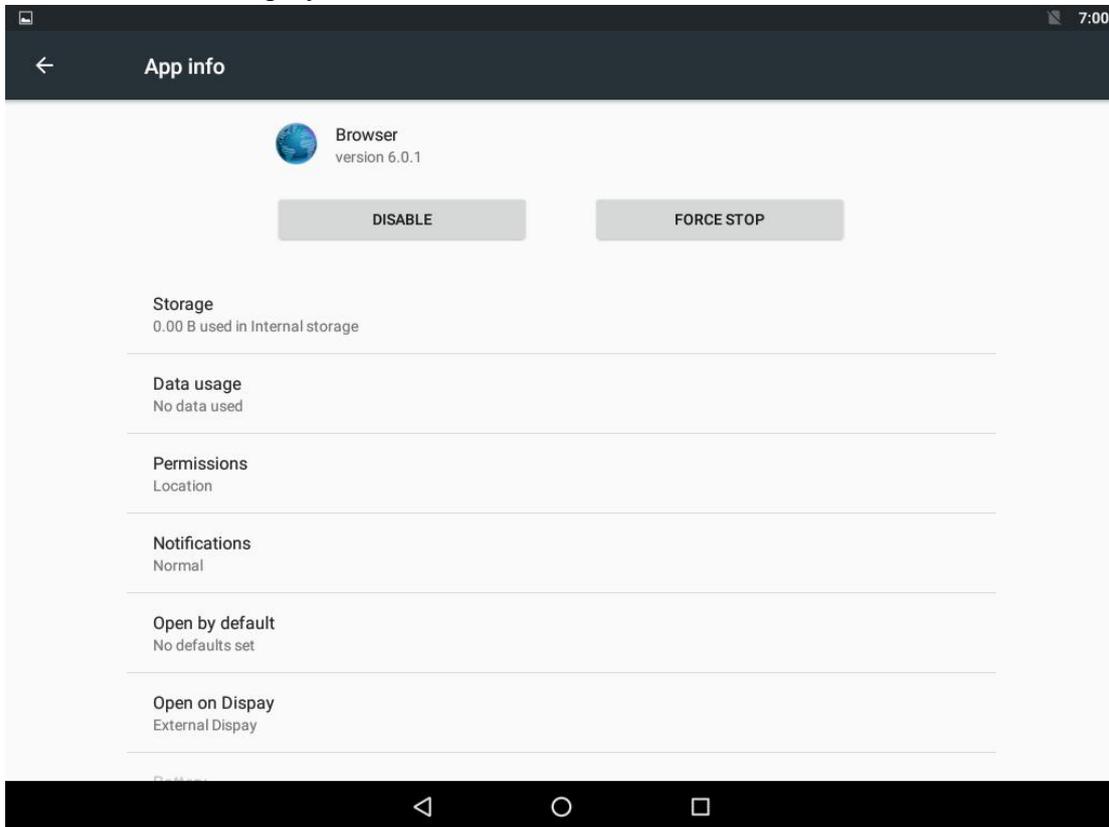


Figure 5.6 Browser

Go back to the launcher and open the Browser app, you will see

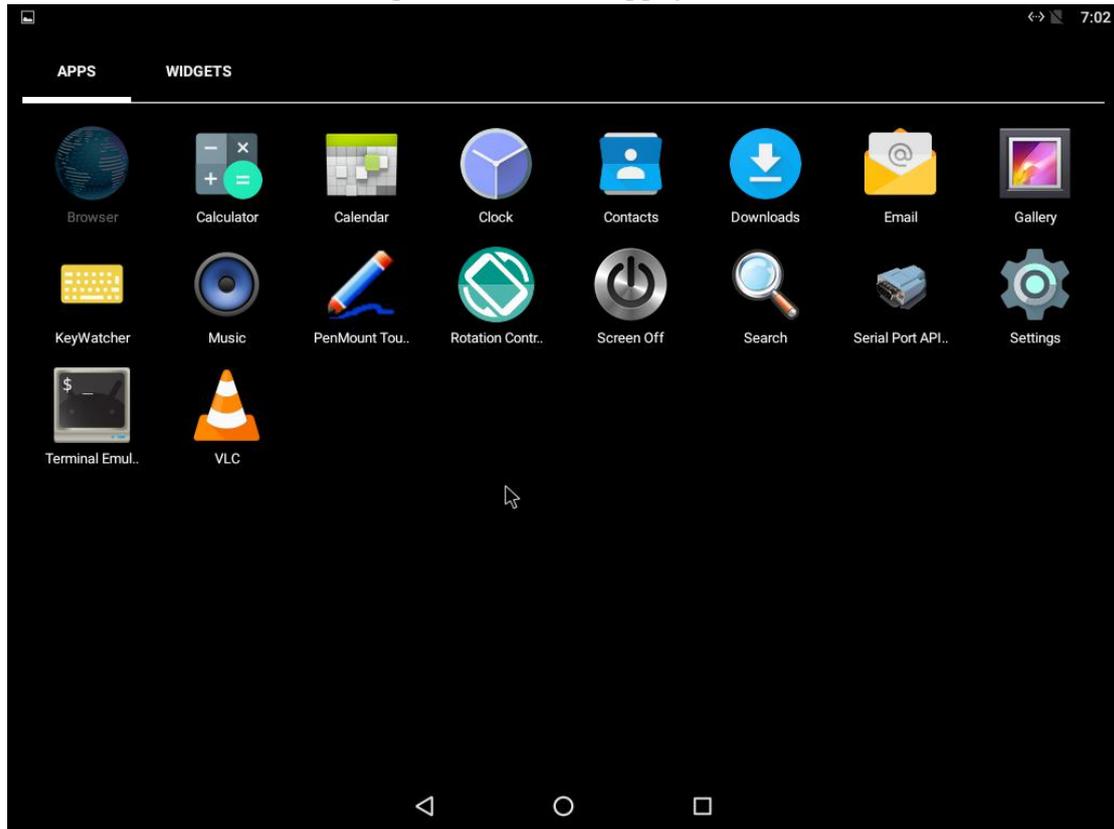


Figure 5.7 Open the Browser app

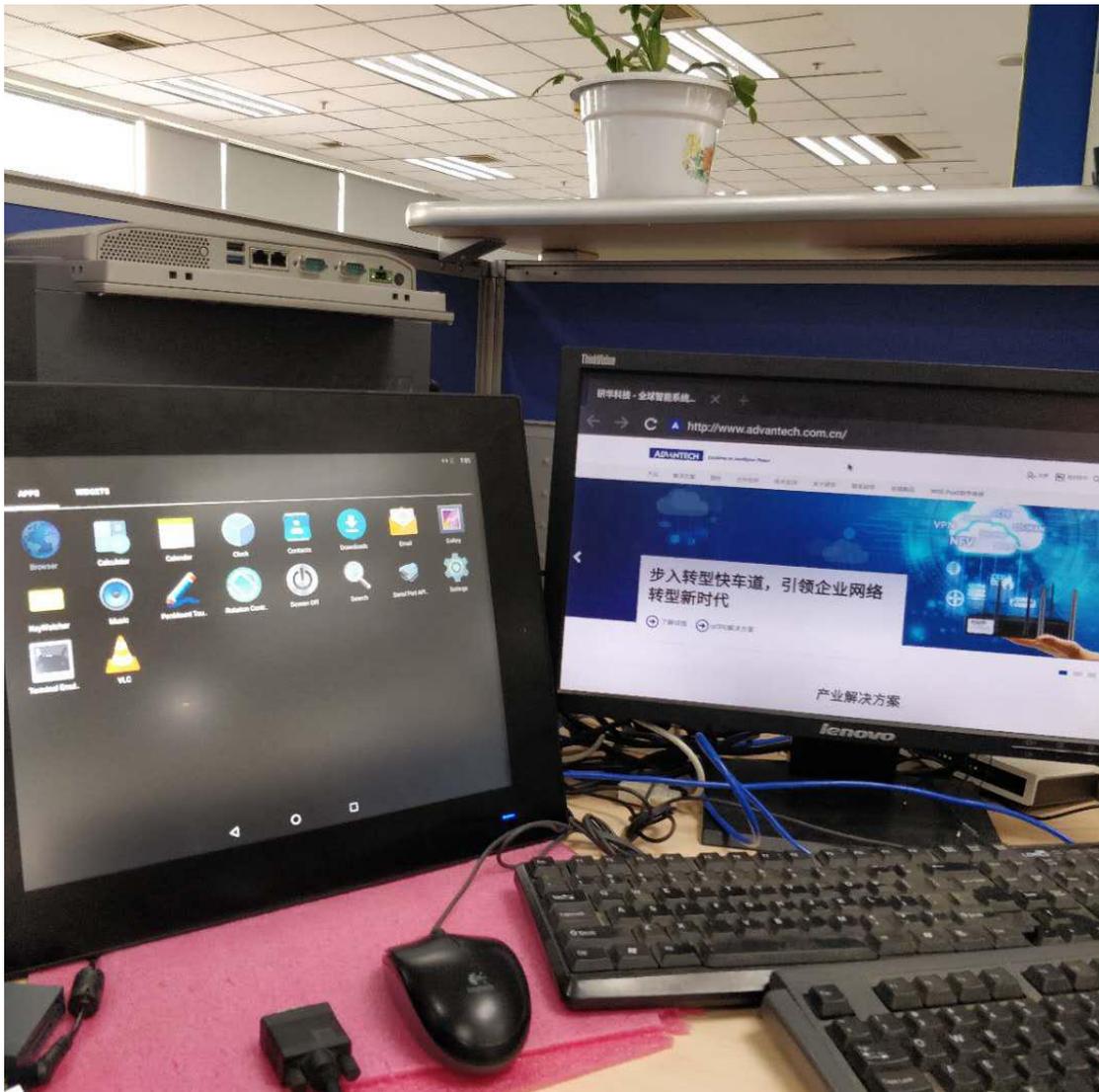


Figure 5.8 External Display

5.3. Controlling the External Application

The main screen can be controlled with touch or mouse. The external display is spanning to the right of the built-in display. To use the mouse as input to the external application, simply move the mouse pointer to the right until the cursor is on the external display.

5.4. Closing the External Application

There are three (3) basic means for closing an application.

1. Click on the task list button (square) on the bottom of the screen, then swipe left/right or hit X on upper right corner to close.
2. From the Settings->Apps->Application menu where the application was chosen to go on the external display, there is a "FORCE STOP" button to close the app.

5.5. Changing the ordering of External Application

The ordering of the external apps can be changed by clicking on the application you want on top from within the task list.

1. Click on the Task List button (square) at the bottom of the screen.
2. Scroll up/down the task list until the desired application is seen.
3. Click on the application. This will cause it to be the top application on the screen.

6. Development

6.1. How to Develop Android Application

If you want to develop android application, you should:

1. Install JDK 6 or JDK 7 first.
2. Then install android studio development tools.
3. Install android sdk you can visit:
<http://developer.android.com/sdk/installing.html>
4. After configuring the environment, you can start to develop. For details, please refer to: <http://developer.android.com/index.html>

Take 'Hello World' project for example. Users can refer to <http://developer.android.com/resources/tutorials/hello-world.html>

6.2. How to install Android Application

Follow the below steps to install android application (apk file) :

Copy your apk file to android system. We take USB device for example. You can copy apk file to an USB device which must be formatted as FAT32, and plug it to device which has installed Advantech android 6.0.1 system.

Access your U disk with the "Storage & USB" option of the Setting APP.

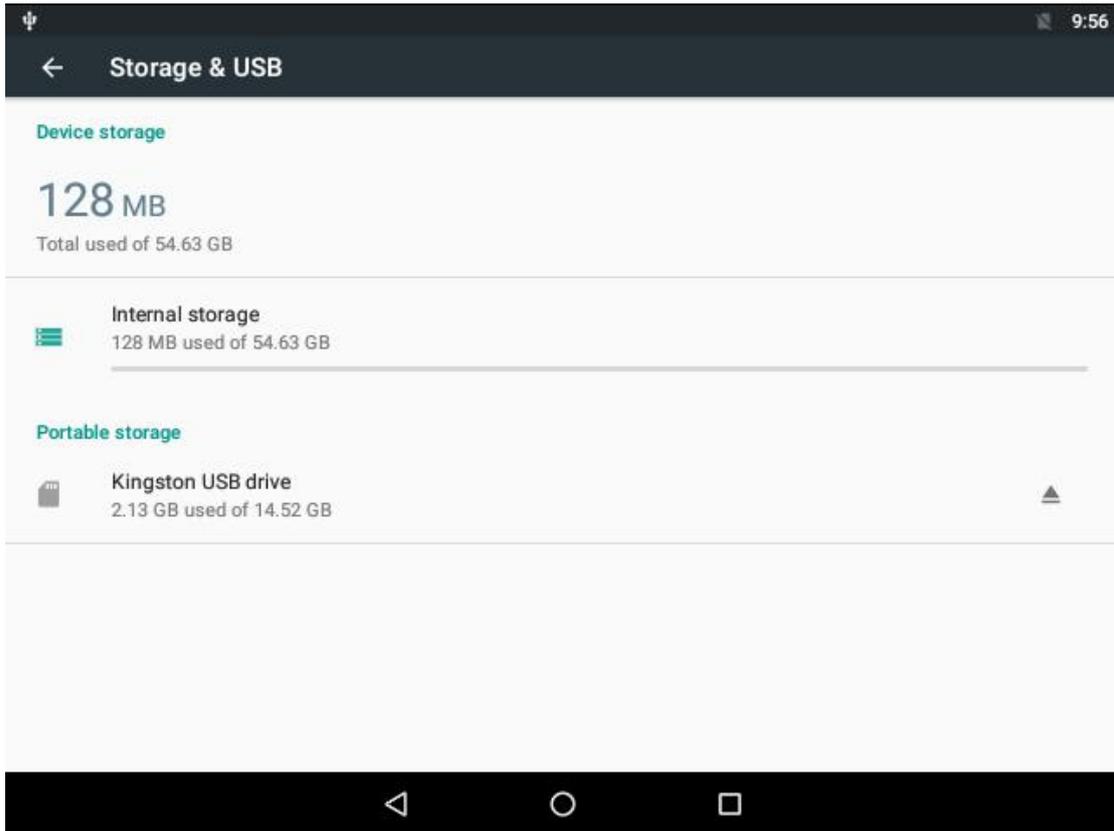


Figure 6.1 Storage & USB

Copy the app you need to install.

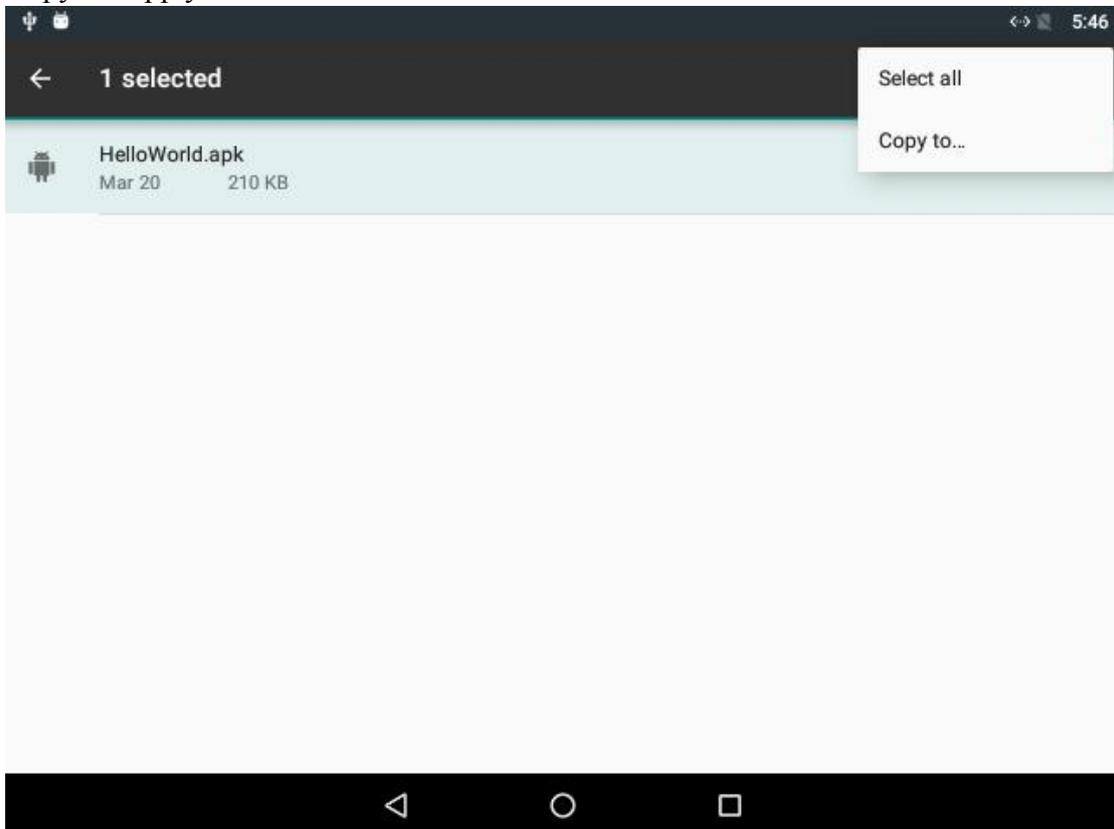


Figure 6.2 Copy helloworld.apk

Place your copied app to downloads.

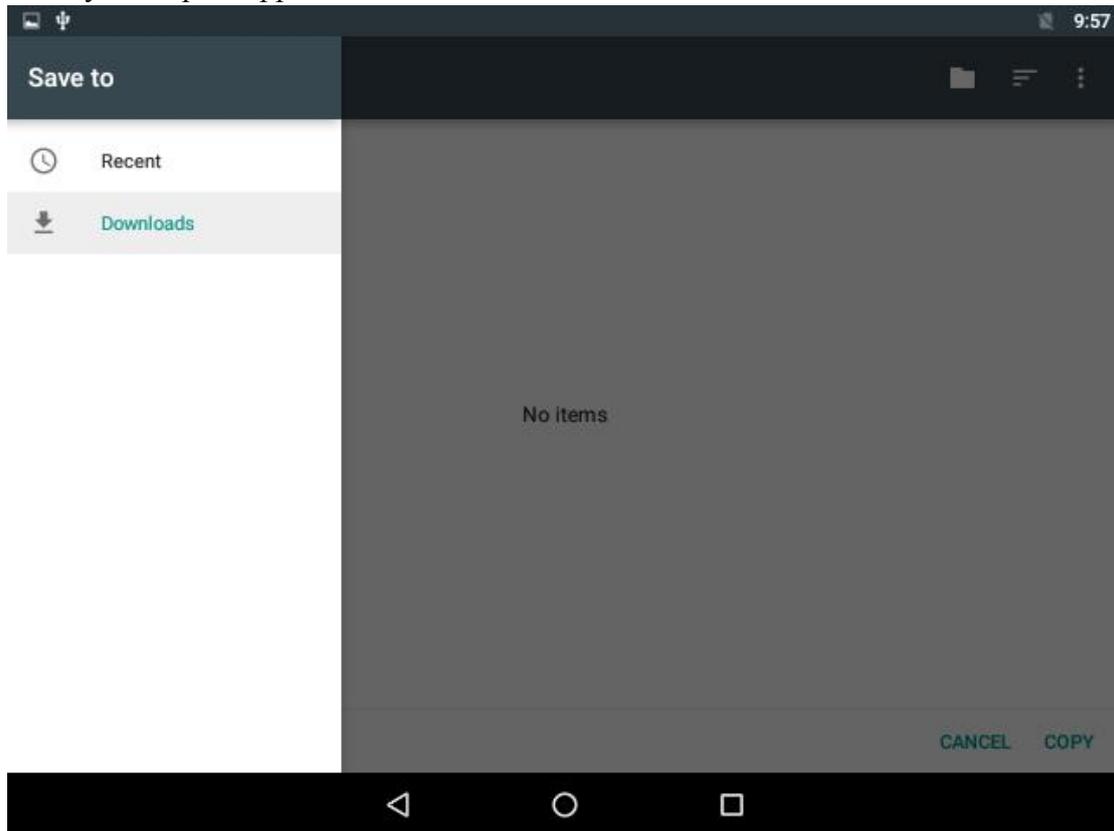


Figure 6.3 Place helloworld.apk

Open the "Unknown source" option in the Setting APP "Security" option.

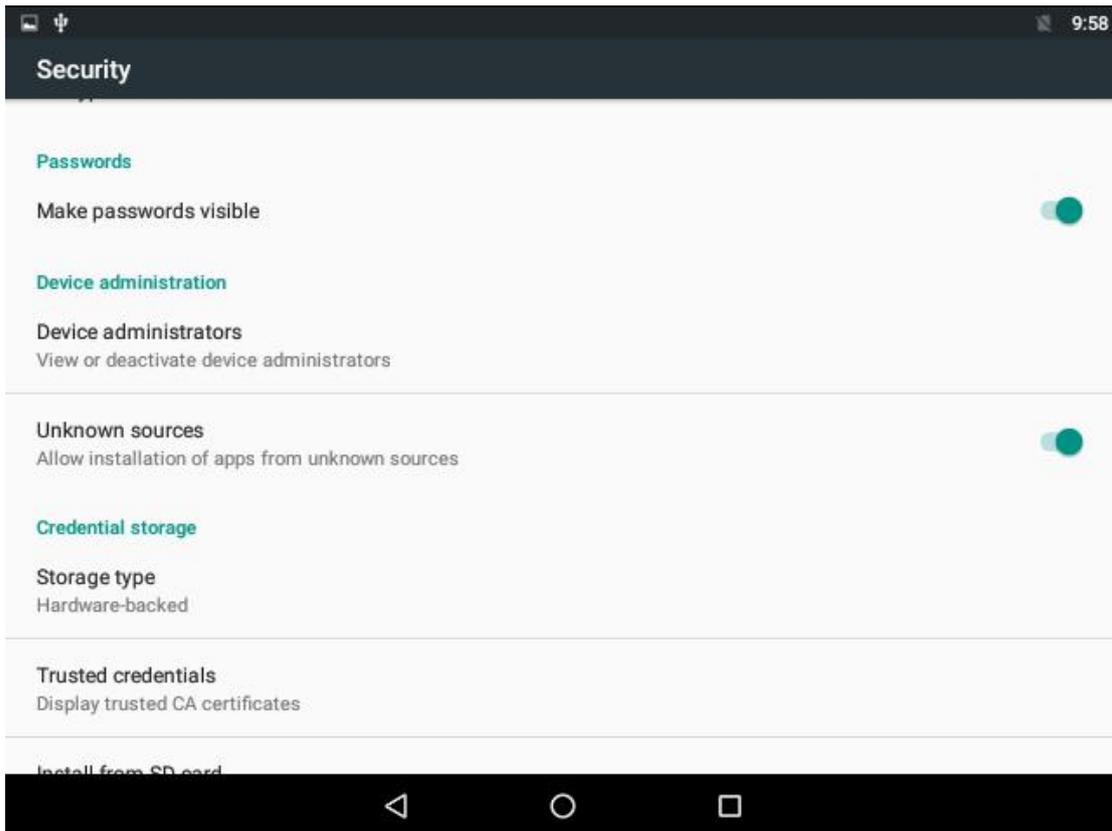


Figure 6.4 Choose "Unknown sources"

Open application named "Downloads" in Application list and Choose the app you copied

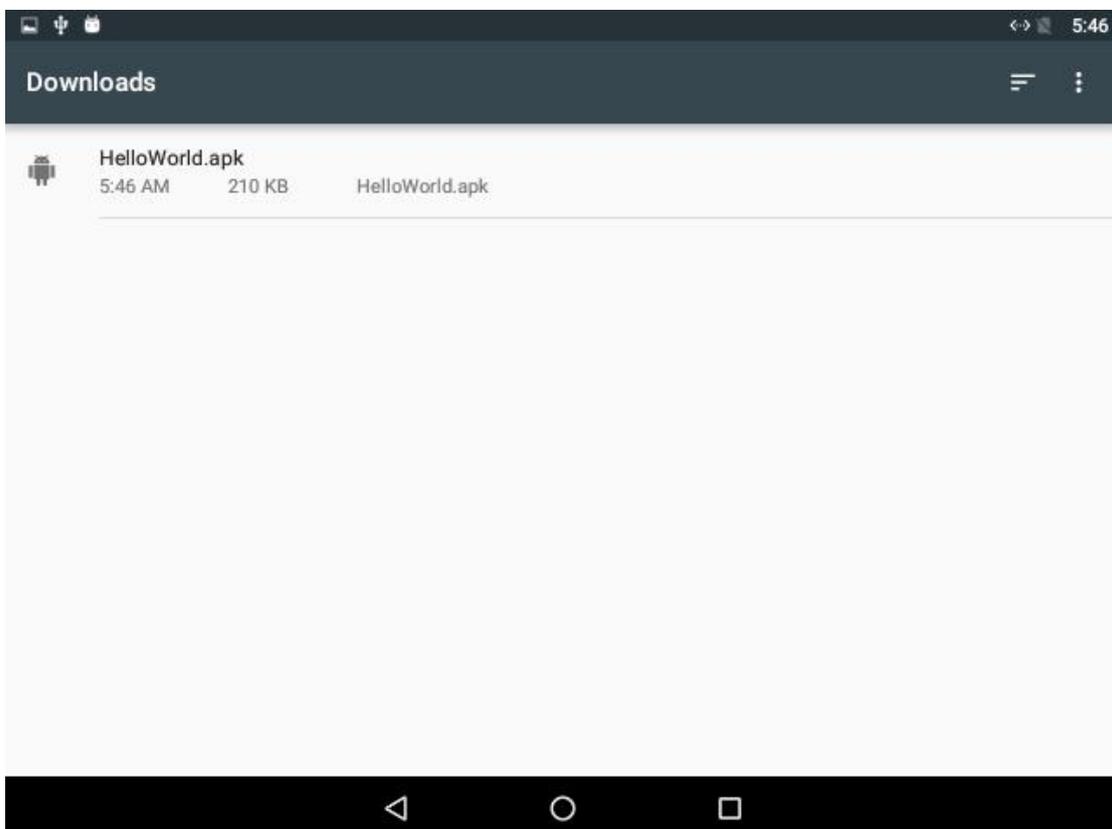


Figure 6.5 Downloads

Choose INSTALL

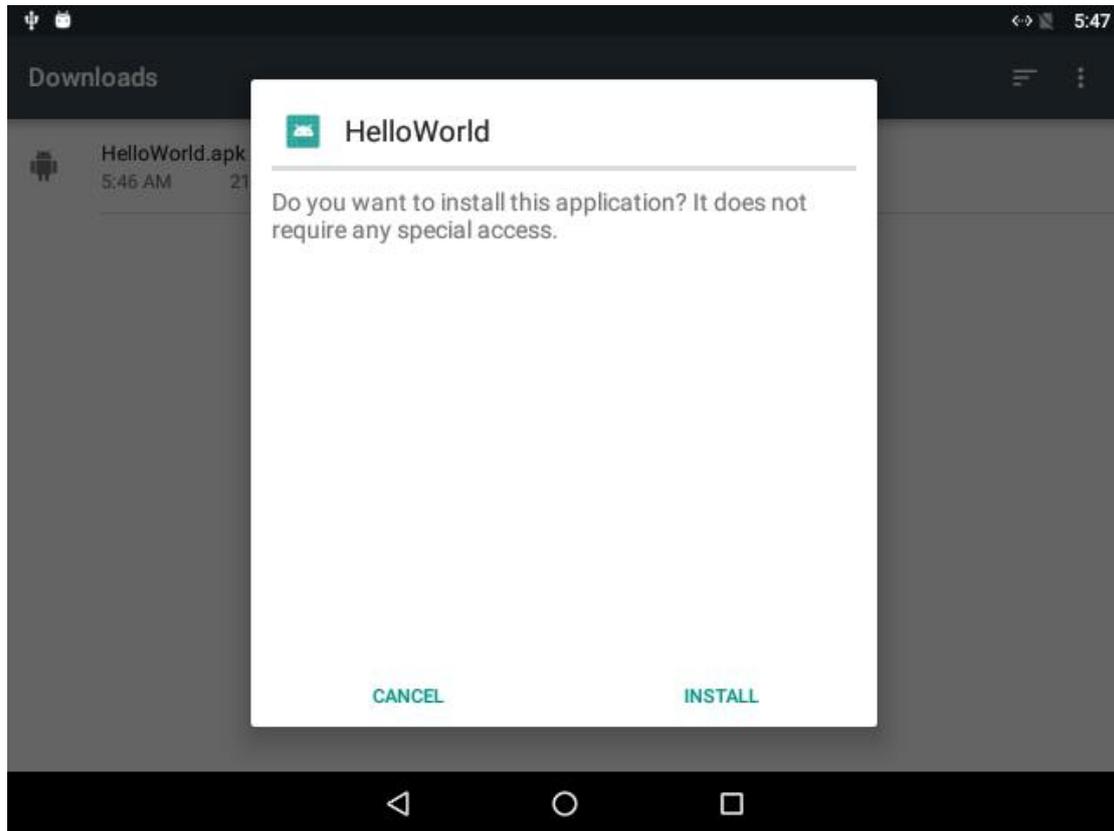


Figure 6.6 Chose "INSTALL"

Choose OPEN

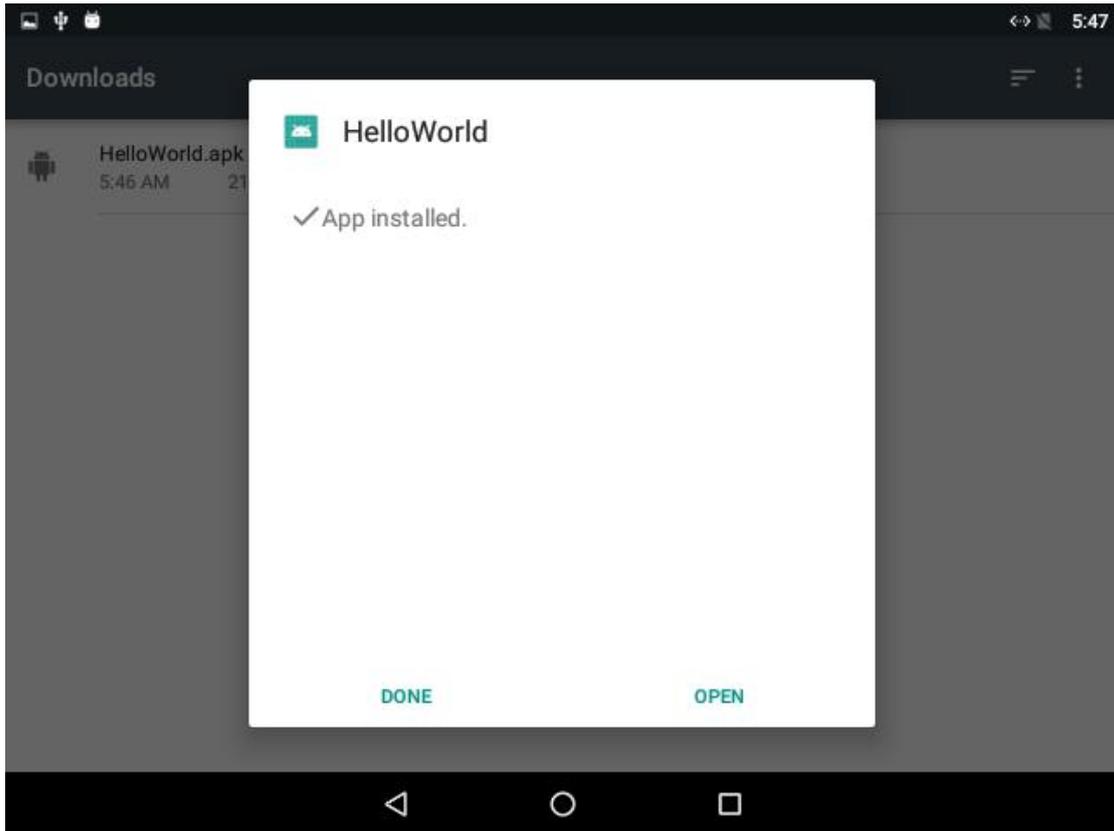


Figure 6.7 Chose "OPEN"

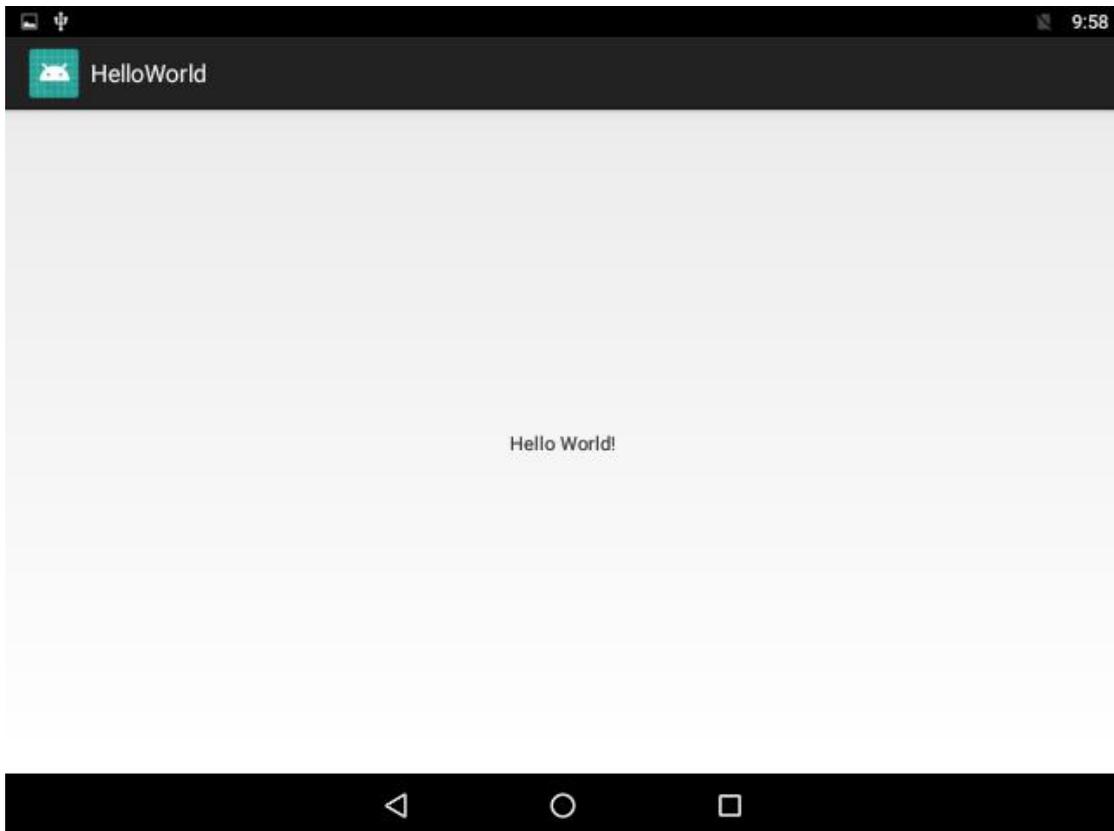


Figure 6.8 Helloworld.apk

6.3. How to use ADB function to debug

6.3.1 Get current IP address for android

Open the Terminal Emulator and switch to ROOT permissions

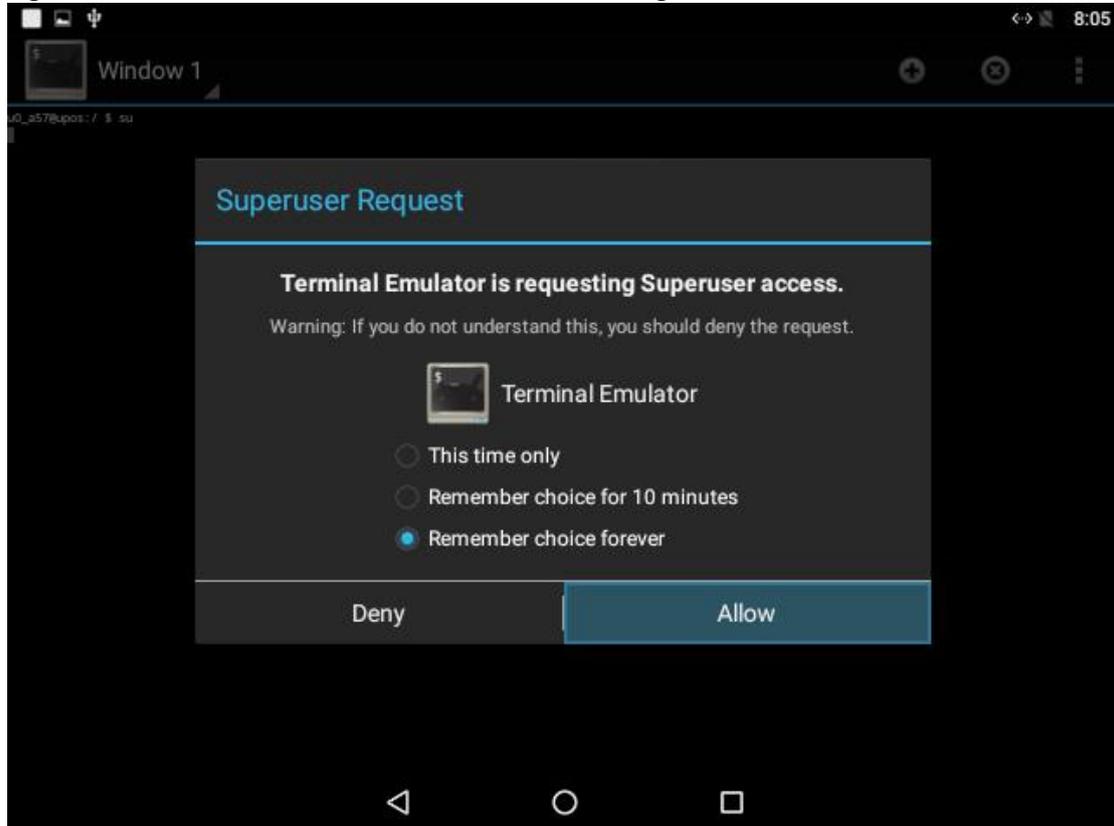


Figure 6.9 "su" Command

Execute the "ifconfig" command to query the device IP address.

Figure 6.11 Enable adb

6.3.3 Connect the device

Execute the following command on the PC to connect the device.

```
advantech@chao:~$  
advantech@chao:~$  
advantech@chao:~$  
advantech@chao:~$  
advantech@chao:~$  
advantech@chao:~$ adb connect 172.21.73.148  
connected to 172.21.73.148:5555  
advantech@chao:~$  
advantech@chao:~$  
advantech@chao:~$
```

Figure 6.12 Connect device

6.3.4 Debug the device.

Execute the adb command to debug the device on the PC.

```
advantech@chao:~$ adb devices  
List of devices attached  
172.21.73.148:5555    device  
  
advantech@chao:~$  
advantech@chao:~$ adb shell  
root@upos:/ # ls  
acct  
cache  
charger  
config  
d  
data  
default.prop  
dev  
etc  
file_contexts  
fstab.upos  
init  
init.environ.rc  
init.kernel.rc  
init.rc
```

Figure 6.13 Debug device

Appendix

1. How to start application after booting android system?

After android system is started, it will broadcast an action message named 'android.intent.action.BOOT_COMPLETED'. You can receive this message and start your application.

2. How to accelerate debugging?

When developing application with the eclipse, it is very slow to debug in emulator. So you can debug application with android-x86 in device connected with LAN. This method must use adb tool to connect your PC to android-x86 at beginning. Then the eclipse will deploy application automatically.

3. How to configure authority in application?

You can configure item "users-permission" of android manifest.xml to declare authority.

4. How to switch the ethernet cable in Terminal Emulator ?

Insert the ethernet cable, run the following command in Terminal Emulator.

```
# su
# dhcpcd eth*
```

5. How to mount USB storage devices in Terminal Emulator ?

run the following command in Terminal Emulator.

```
# su
// get USB storage device node
# ls /dev/block/ |grep sd
// Provides four mount directory(usb0 ~ usb3) by default
# busybox mount /dev/block/<device node> /storage/usb0
// umount
# busybox umount /storage/usb0
```