AIM-Android13-ARM_64-TPC1XX
User Manual
V1.2

ADVANTECH

Enabling an Intelligent Planet

Revision History

Date	Version	Description
2024/07/24	1.2	1.update the information about display setting in uboot.
2024/07/18	1.1	1. Add the information about the Network port priority Settings. 2.Add the information about CanTestTool App.
2024/06/27	1.0	First version

Contents

1 About Manual

Thank you for using Advantech product and AIM-Android 13. This manual is a user manual of AIM-Android 13. This manual may be copied and distributed in any medium, either commercially or non-commercially.

2 Introduction

AIM-Android 13 is developed for Advantech devices based on formal Android 13. It is customized to satisfy users' requirements and to add new functions and features.

2.1 New features

2.1.1 Automatic Installation

In the process of installation, device recognizing can make phase more automatically. It will ensure that the users use Advantech android in Advantech device more comfortably.

2.1.2 Debugging Support

In the Advantech device you can also use adb over NET. It will ensure that the users use debugging in Advantech device more comfortably.

2.1.3 Serial Port Support

We have developed a demo serial port JNI, JAR and utility for users. It can test serial port functions with UI utility.

2.1.4 Pre-installed Third Party Applications

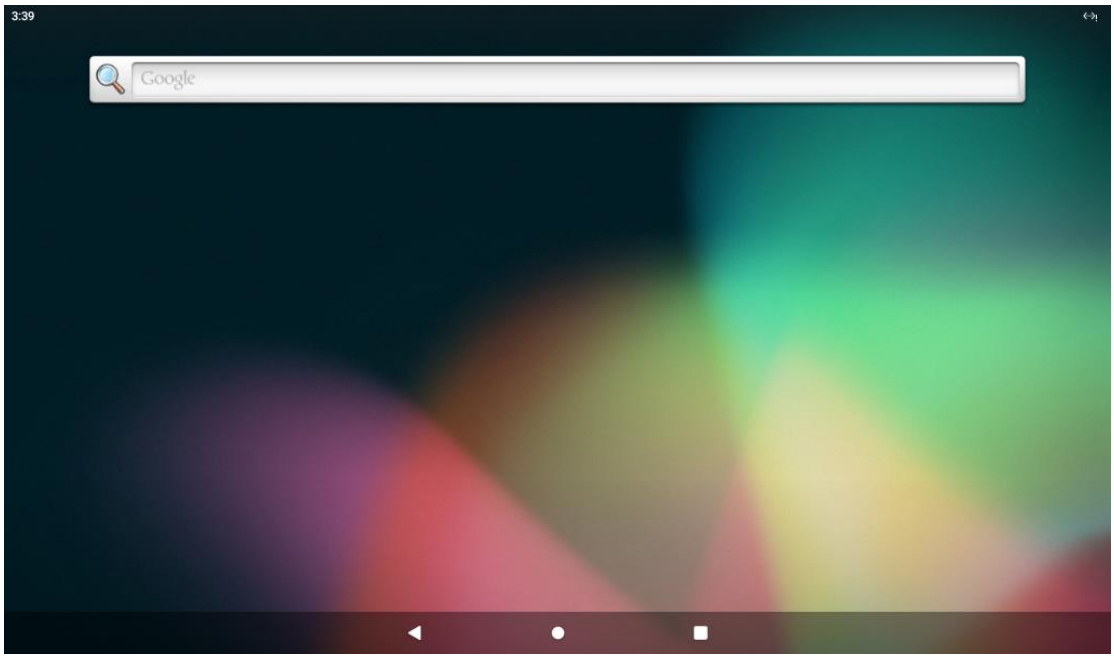
Third party applications are installed as default: KioskSetting, ComPort, Chromium, power manager. It is more convenient for the user.

2.2 Device support list

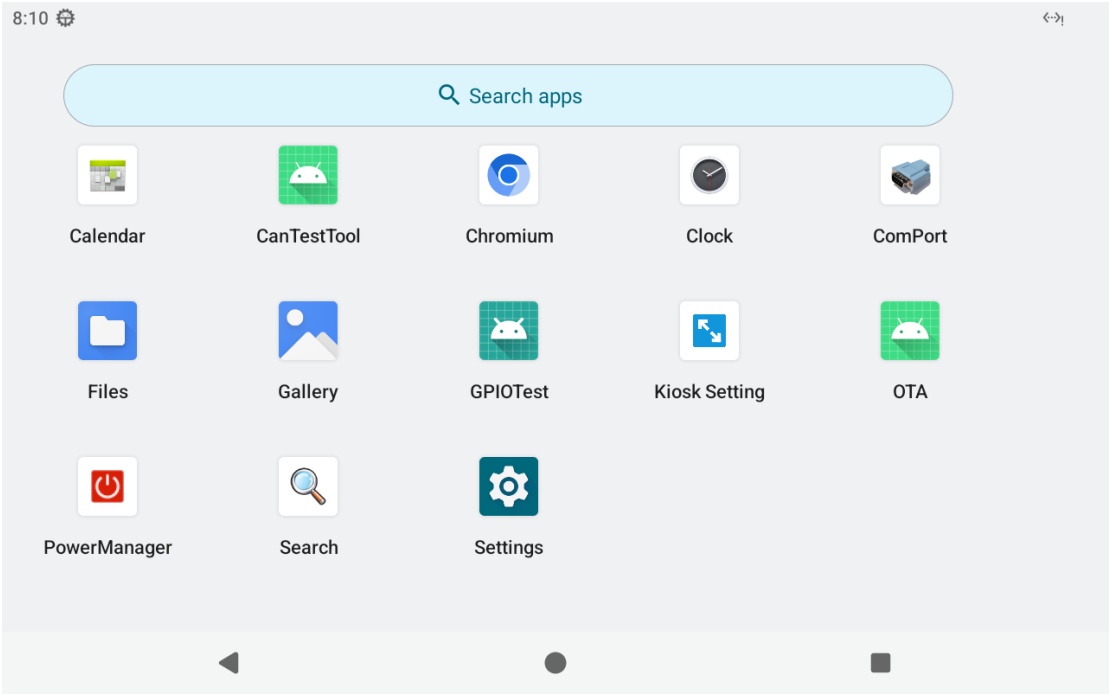
We currently support the following products:
TPC-1XX

2.3 Preview

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



HOME



App List

3 Boot up from SD card or eMMC

TPC-1XX supports boot from SD card or onboard flash. This section will guide you how to build an image for TPC-1XX Android system boot media.

The storages devices name as following

Device	Node
sdcard	/dev/mmcblk1
eMMc	/dev/mmcblk2

3.1 Create a bootable SD card

You are able to find the pre-built image from Advantech website. Please follow the steps below to create an SD card(not less than 16G) for boot up. (Note: The PC's free partion need 10G or more)

Ubuntu:

Copy “AIM-Android-13-ARM_64-TPC-1XX_yyyy_mm_dd.zip” package to your PC /root/.

Open "Terminal" on Ubuntu LTS.

$sudo su (Change to “root” authority)

Input your password.

cd /root/

unzip AIM-Android-13-ARM_64-TPC-1XX_yyyy_mm_dd.zip (Unzipfiles)

Insert one SD card into your PC.

Check the SD card location, like /dev/sdb

#dd if=/root/AIM-Android-13-ARM_64-TPC-1XX_yyyy_mm_dd

/eamb9918-sdcard_20211222.img of=/dev/sdb bs=4096

#sync

#eject /dev/sdb

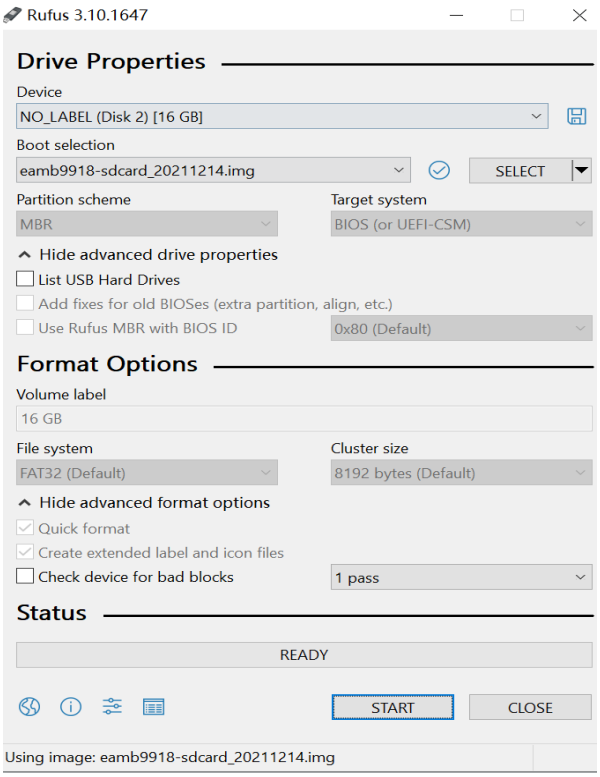
Then insert the SD card to TPC-1XX and power up.

Now, it should boot up with an Ubuntu environment.

Windows 10:

Unzip the AIM-Android-13-ARM_64-TPC-1XX_yyyy_mm_dd.zip.(Note: The PC's free partion need 10G or more)

Use the rufus to burn the image.



Then insert the SD card to TPC-1XX and power up.

Now, it should boot up with an Ubuntu environment.

Note:

1.The DIP switch(SW2) needs to be adjusted to “1-off 2-on 3-on 4-off 5-off 6-off”.

2.If you switch the operating system from android to linux, you need to re-input the uboot env.

The resolution’s parameters:

TPC-107W (1024x600, tdm07040ws) --> lvds_panel_mode 0

TPC-110W, TPC-110WX (1280x800, g101ice) --> lvds_panel_mode 1

TPC-115W HD (1366x768, g156bge) --> lvds_panel_mode 2

TPC-115W FHD (1920x1080, g156hce) --> lvds_panel_mode 3

TPC-121W (1920x1080, g215han) --> lvds _panel_mode 5

TPC-107WX (800x480, g070ace-lh1) --> lvds _panel_mode 6

For example:

#env default -a

#setenv lvds_panel_mode 1

#saveenv

#reset

3.2 Boot from eMMC

Please follow the section 3.1 to create a bootable SD card that is TPC-1XX Ubuntu SD card. The TPC-1XX Android Image is in the SD card(/root/AndroidImg).

In the TPC-1XX Ubuntu.

Perform the following command:
$sudo su
#cd /root/AndroidImg
#./burnEmmc.sh /dev/mmcblk2

And then, please power off and remove the SD card.

Now, the TPC-1XX can boot up from the Android.

Note:

1.The DIP switch(SW2) needs to be adjusted to “1-on 2-off 3-off 4-off 5-off 6-off”.
2.Wait for the LCD interface to have a screen output (for the first time, the eMMC needs about 65s). Do not shut down during the waiting process / Unplug the SD card / Unplug the monitor / Run the system command through the console, otherwise the system may crash.
3. If you switch the operating system from linux to android, you need to re-input the uboot env.
The resolution’s parameters:

TPC-107W (1024x600, tdm07040ws) --> lvds_panel_mode 0
TPC-110W, TPC-110WX (1280x800, g101ice) --> lvds_panel_mode 1
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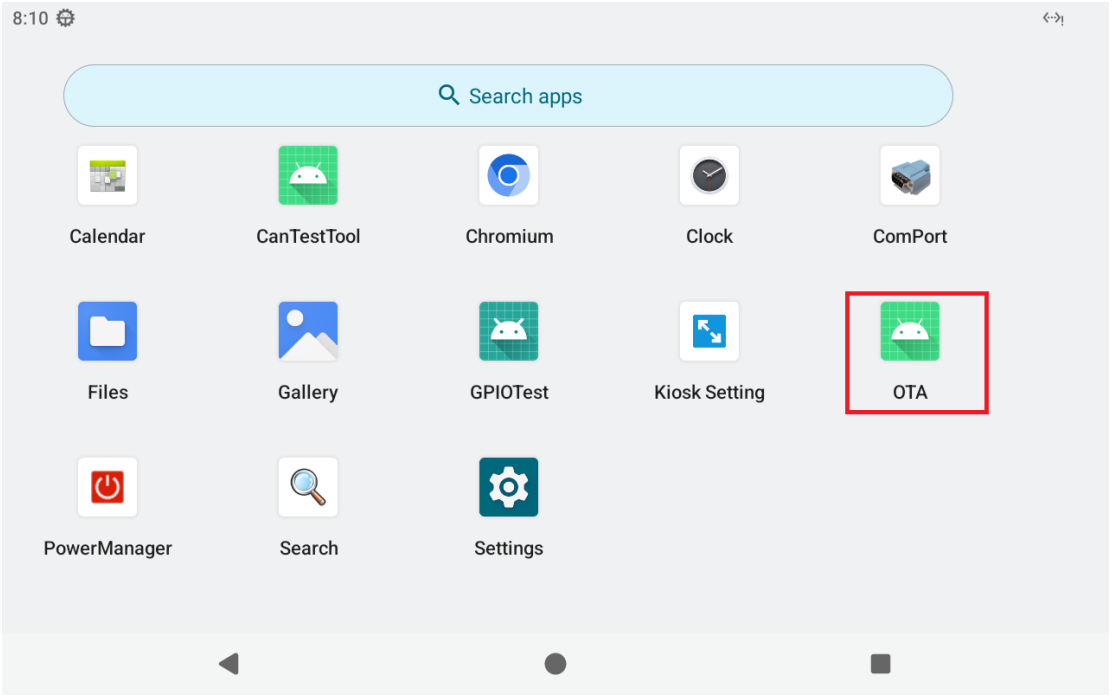
TPC-115W FHD (1920x1080, g156hce) --> lvds_panel_mode 3
TPC-121W (1920x1080, g215han) --> lvds _panel_mode 5
TPC-107WX (800x480, g070ace-lh1) --> lvds _panel_mode 6

For example:
#env default -a
#setenv lvds_panel_mode 1
#saveenv
#reset

4 OS Upgrade

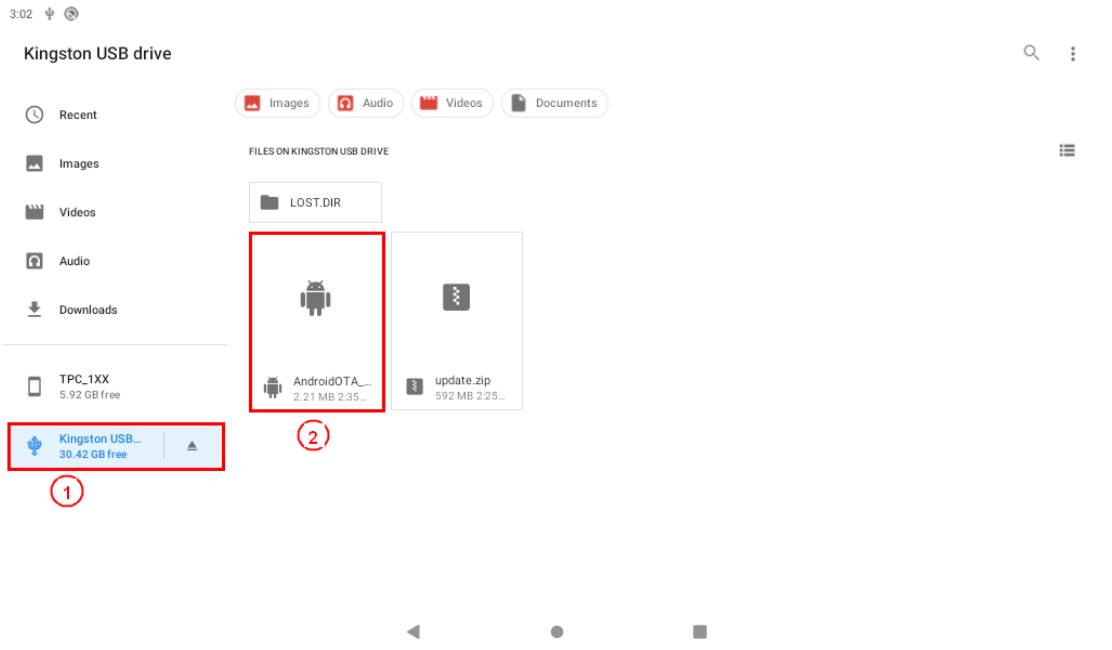
TPC-1XX supports the system upgrade function. The system update function requires OTA app. If your current system is not installed, please refer to Chapter 4.1 for installation first. If it is already installed, please skip Chapter 4.1.

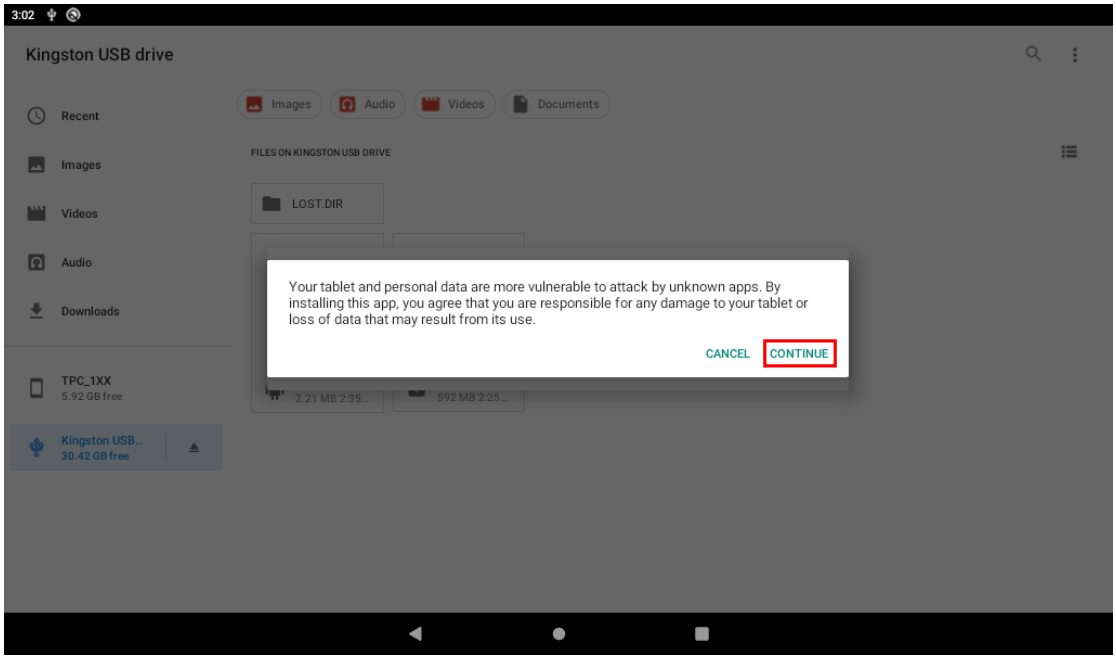


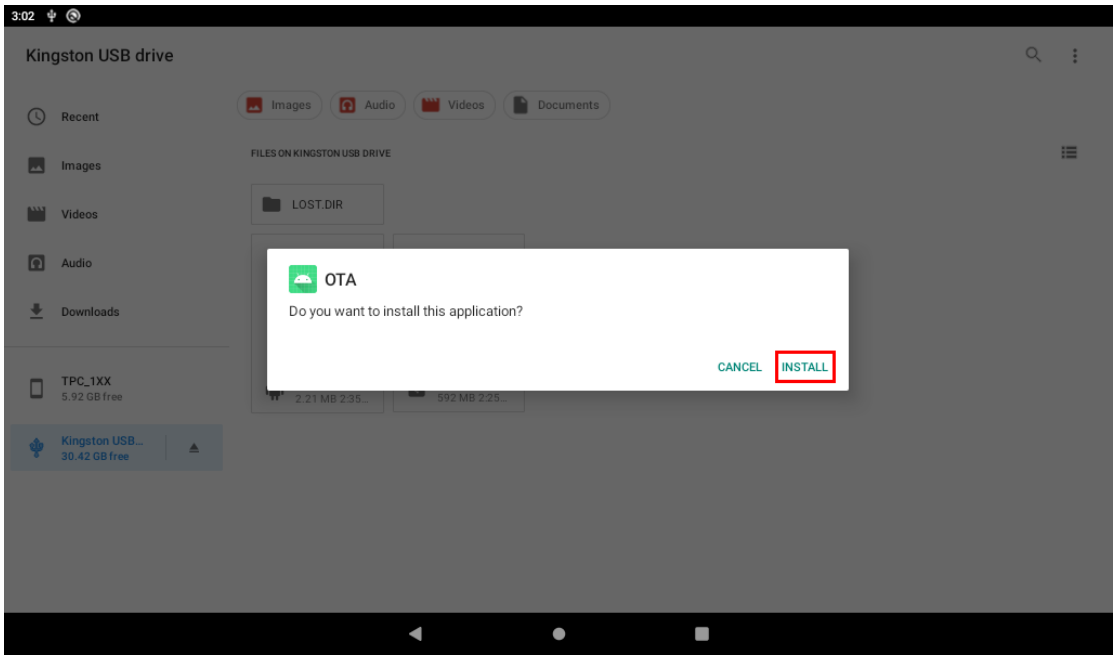
4.1 Install Android OTA app

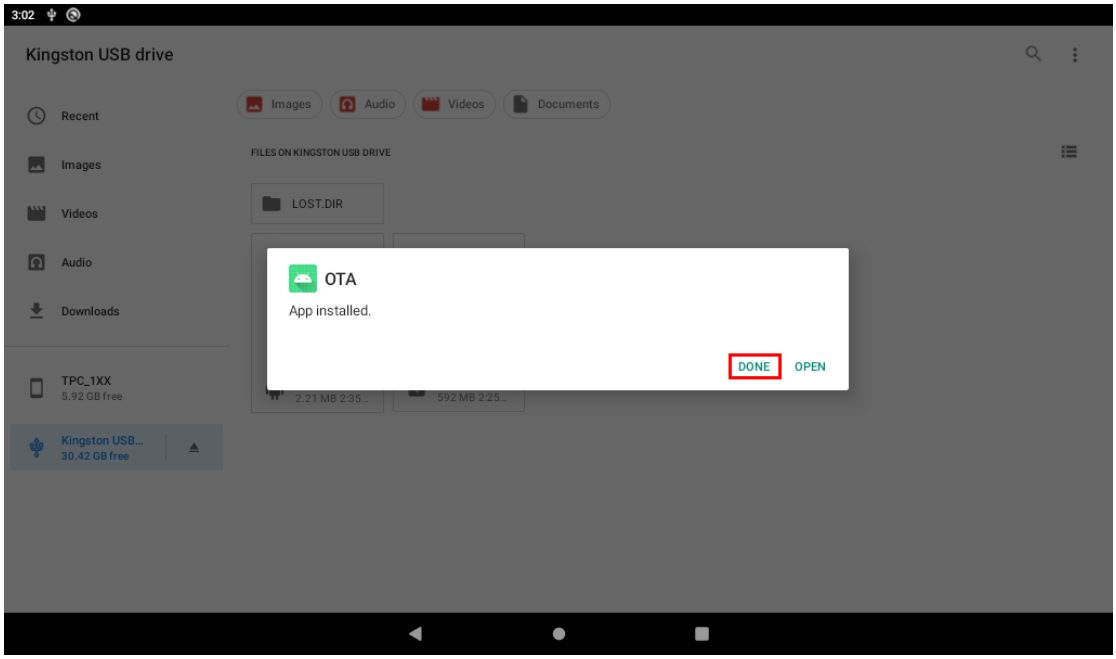
1. Put the AndroidOTA_v1.0.apk package into the USB stick and connect the USB stick to the device

2. Follow the picture steps below



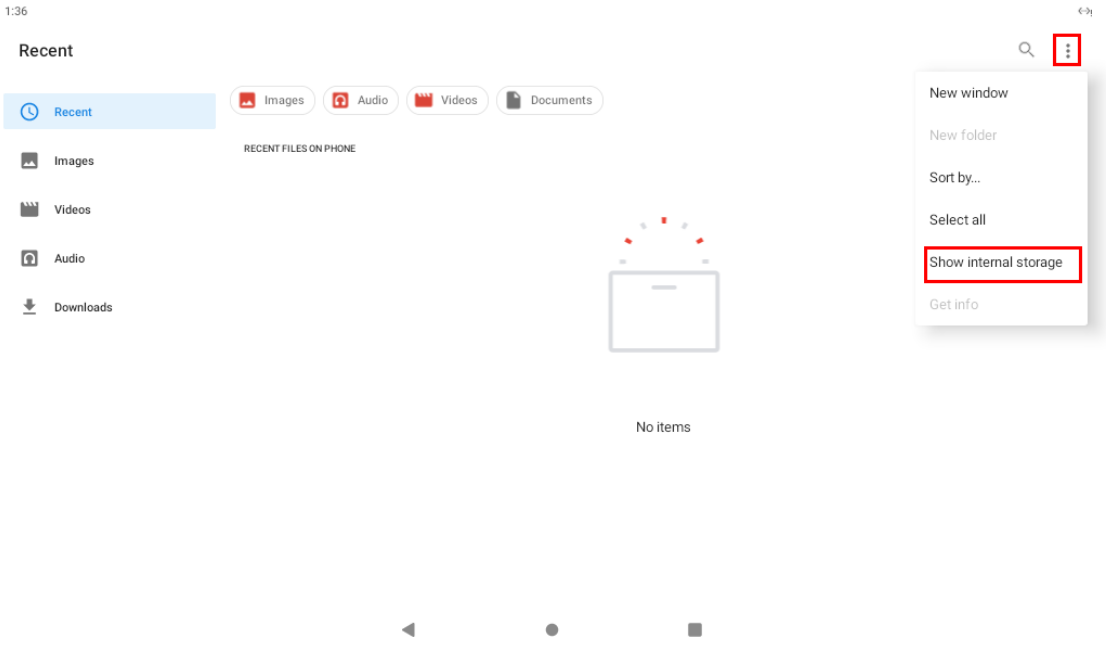

3:02
Kingston USB drive
Recent
Images
Videos
Audio
Downloads
TPC_1XX
5.92 GB free
Kingston USB...
30.42 GB free
Images
Audio
Videos
Documents
FILES ON KINGSTON USB DRIVE
LOST.DIR
Your tablet and personal data are more vulnerable to attack by unknown apps. By installing this app, you agree that you are responsible for any damage to your tablet or loss of data that may result from its use.
CANCEL
CONTINUE

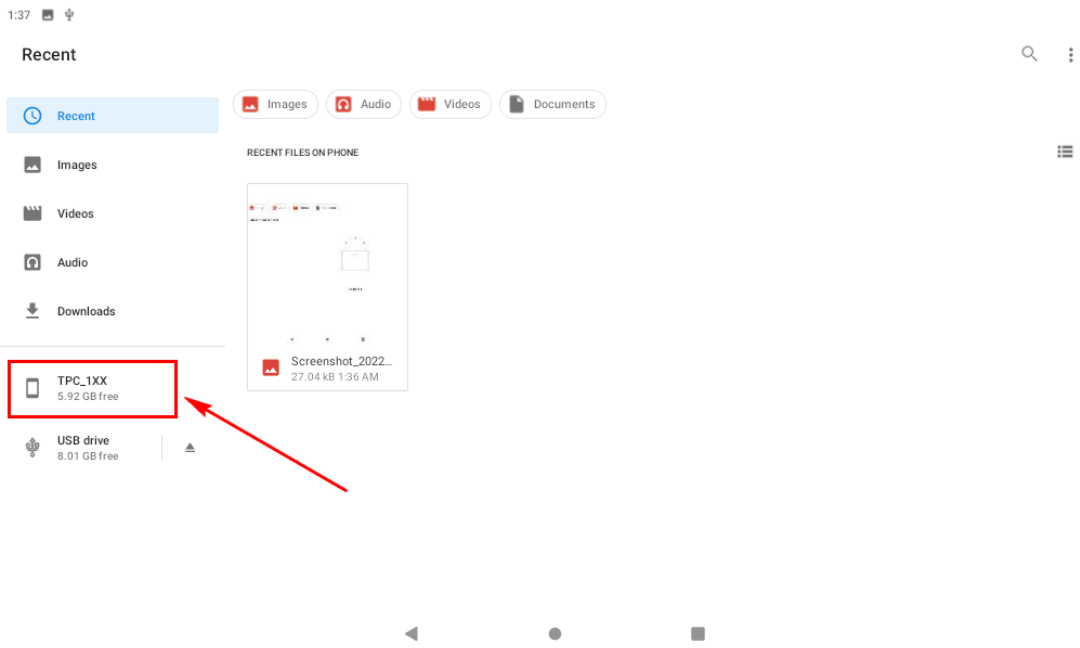

3:02
Kingston USB drive
Recent
Images
Videos
Audio
Downloads
TPC_1XX
5.92 GB free
Kingston USB...
30.42 GB free
Images
Audio
Videos
Documents
FILES ON KINGSTON USB DRIVE
LOST.DIR
OTA
Do you want to install this application?
CANCEL
INSTALL



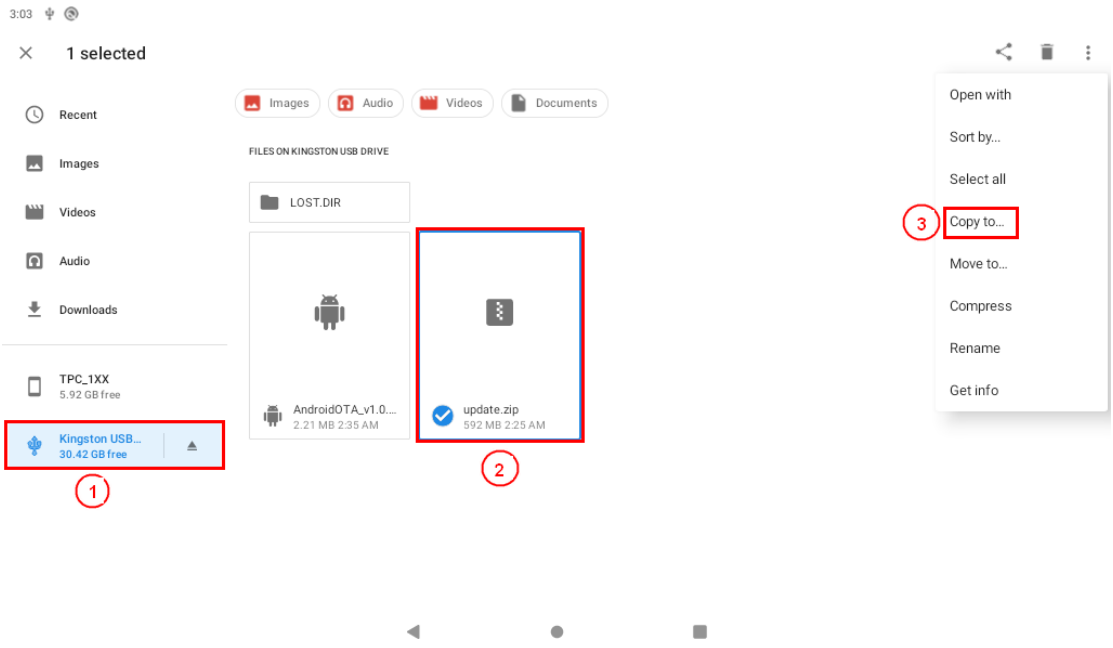
4.2 Copy the update package to the internal storage

1. If you cannot see the internal storage (TPC_1XX) in the File browser, please follow the steps below

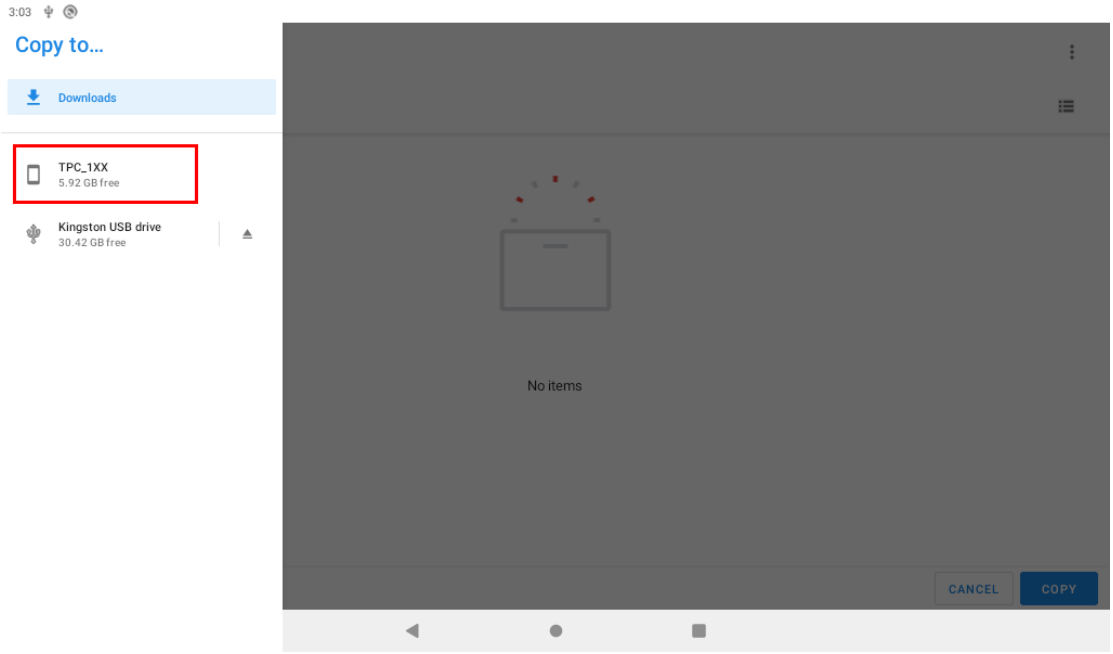




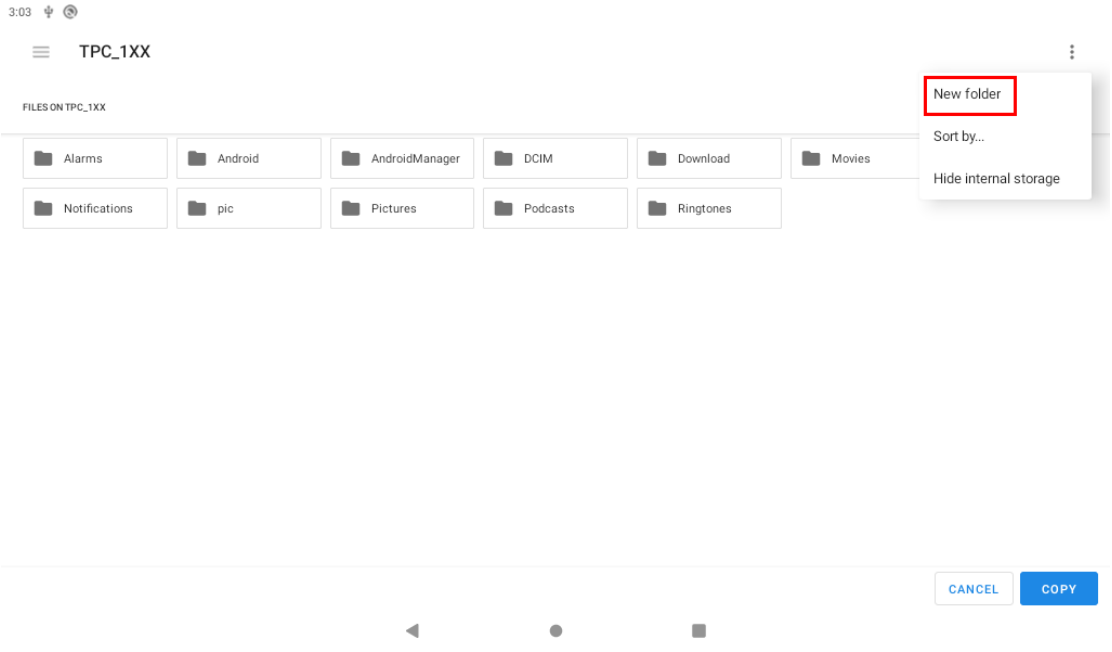
2. Put the update.zip ota package into the USB stick and connect the USB stick to the device
3. Copy the system update package update.zip file in the USB flash drive

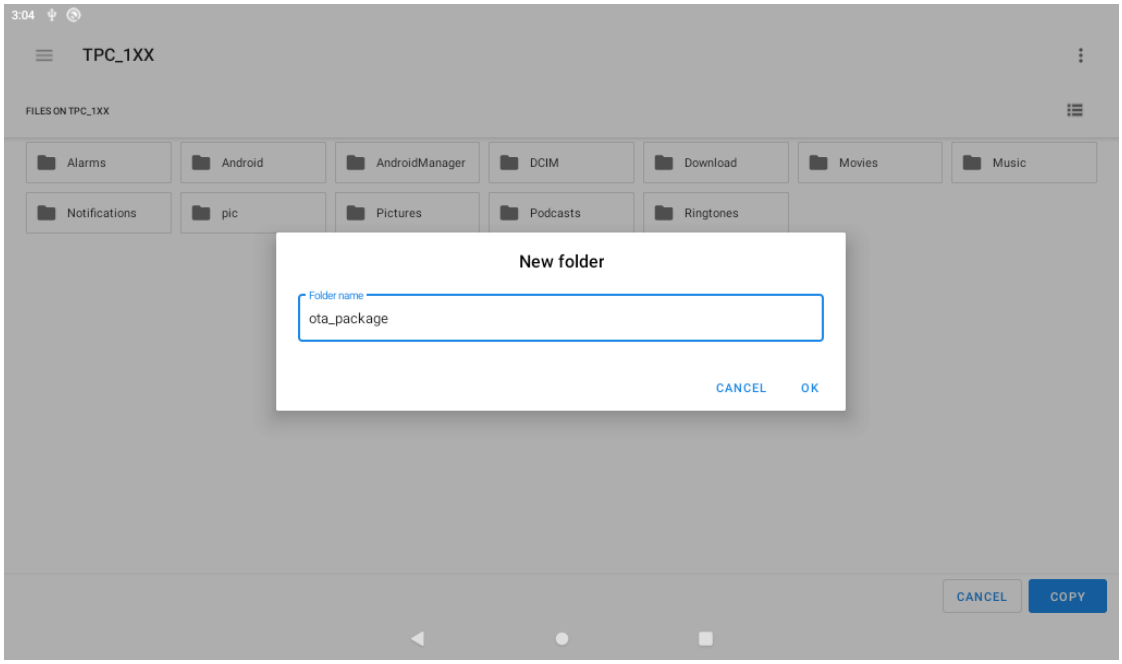


4. Select internal storage (TPC_1XX).

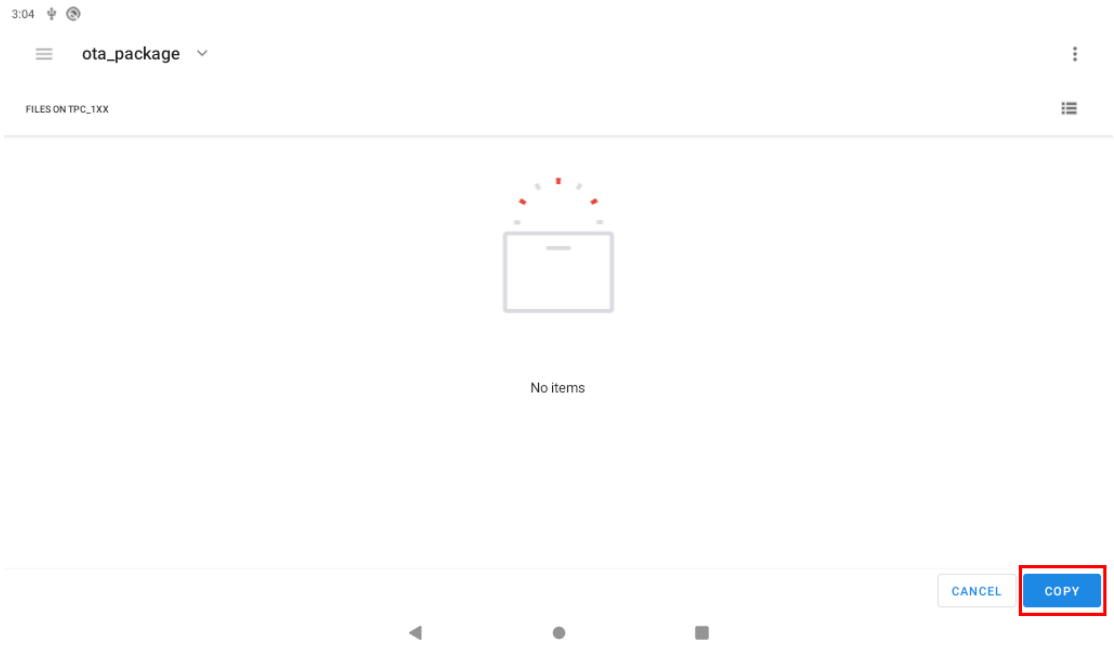


5. Create a new folder named ota_package.



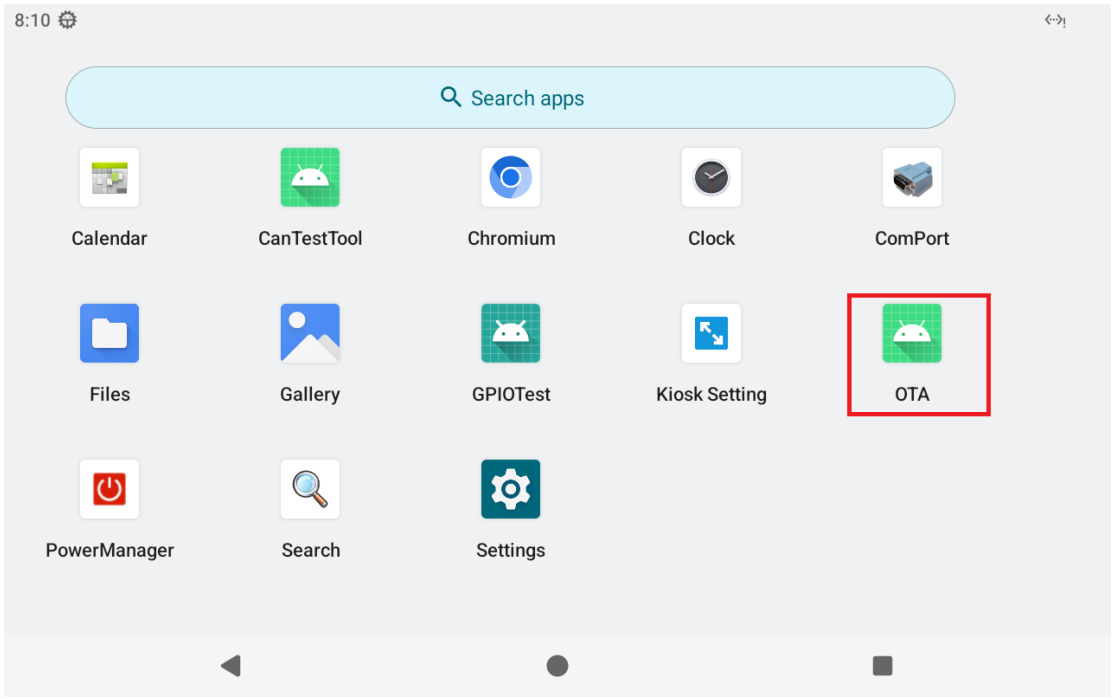


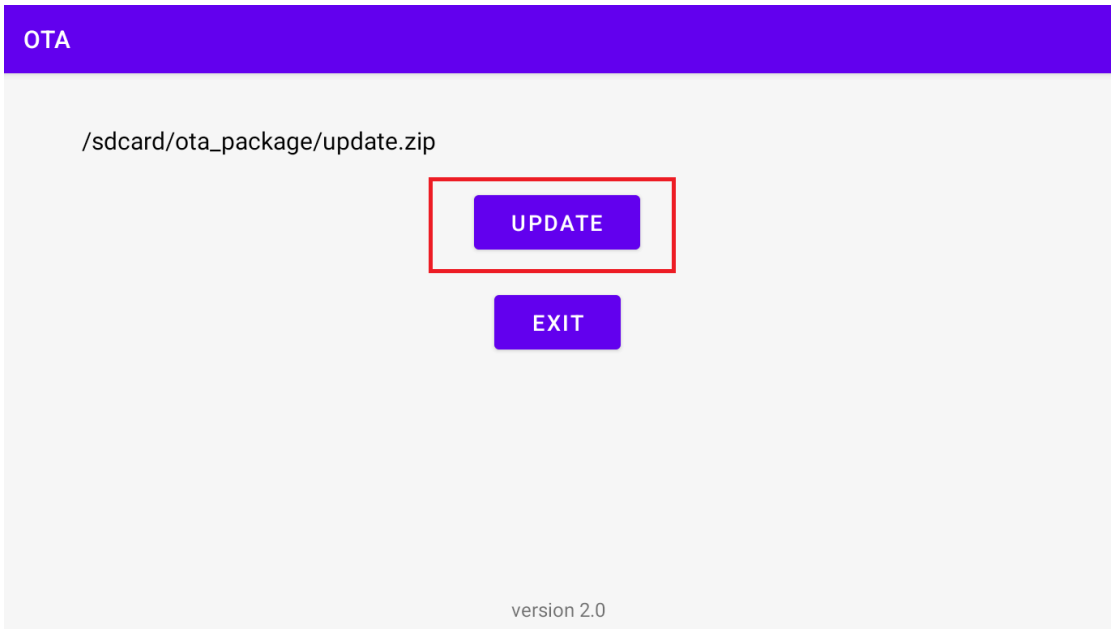
6. Select Copy.

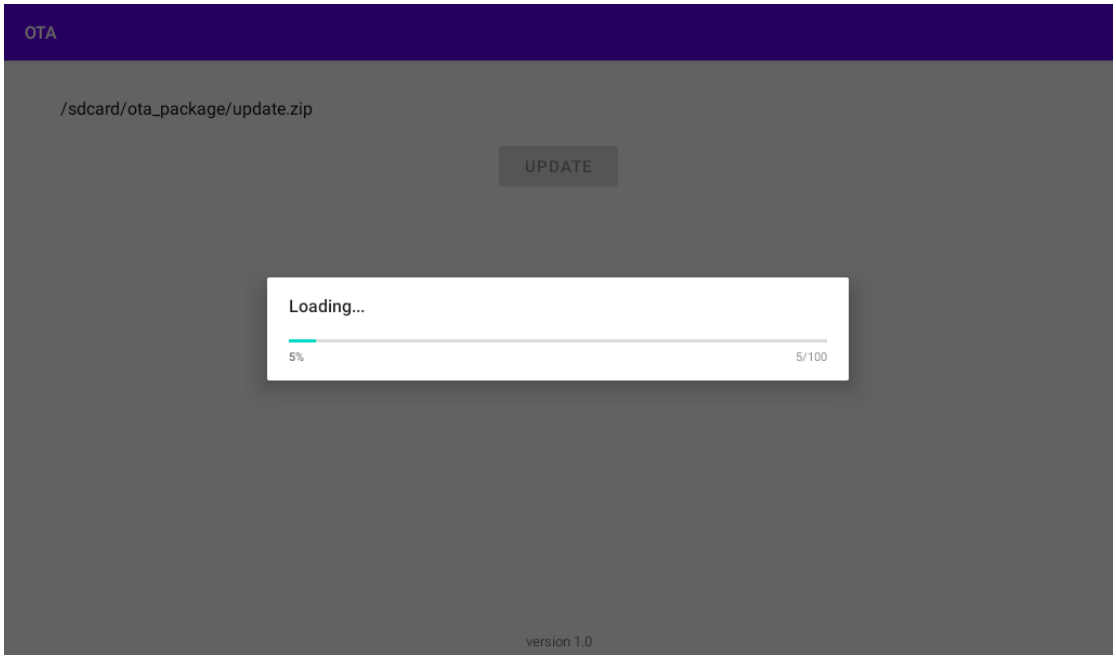


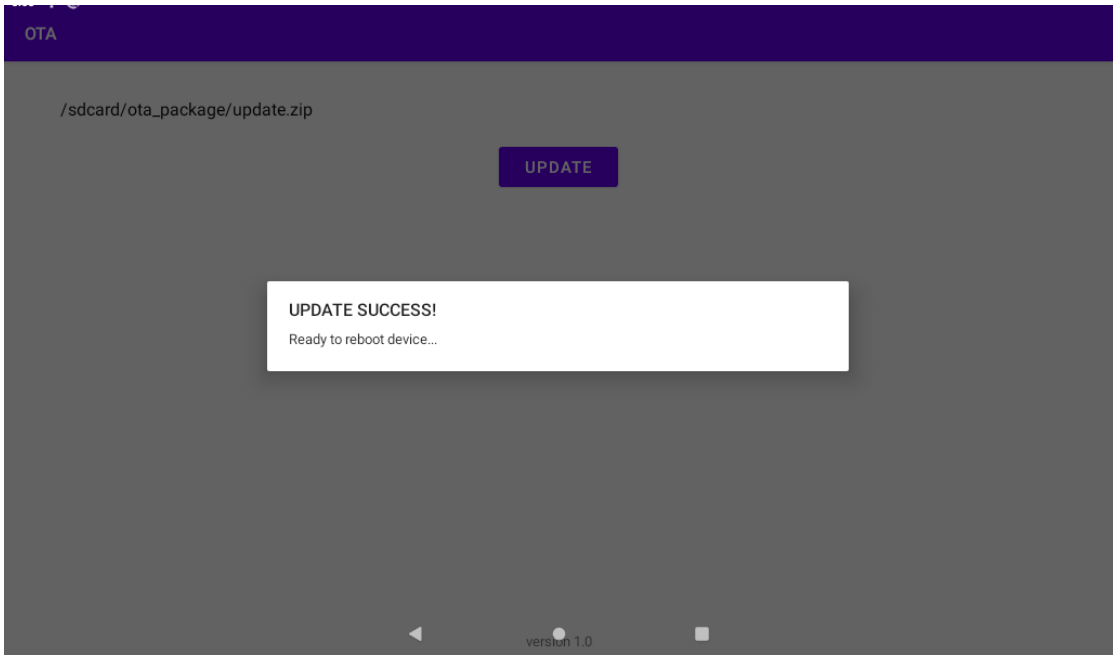
4.3 Start Update

Run ota app to update . Follow the picture steps below


8:10
Search apps
Calendar
CanTestTool
Chromium
Clock
ComPort
Files
Gallery
GPIOTest
Kiosk Setting
OTA
PowerManager
Search
Settings


OTA
/sdcard/ota_package/update.zip
UPDATE
EXIT
version 2.0


OTA
/sdcard/ota_package/update.zip
UPDATE
Loading...
5%
5/100
version 1.0


OTA
/sdcard/ota_package/update.zip
UPDATE
UPDATE SUCCESS!
Ready to reboot device...
version 1.0

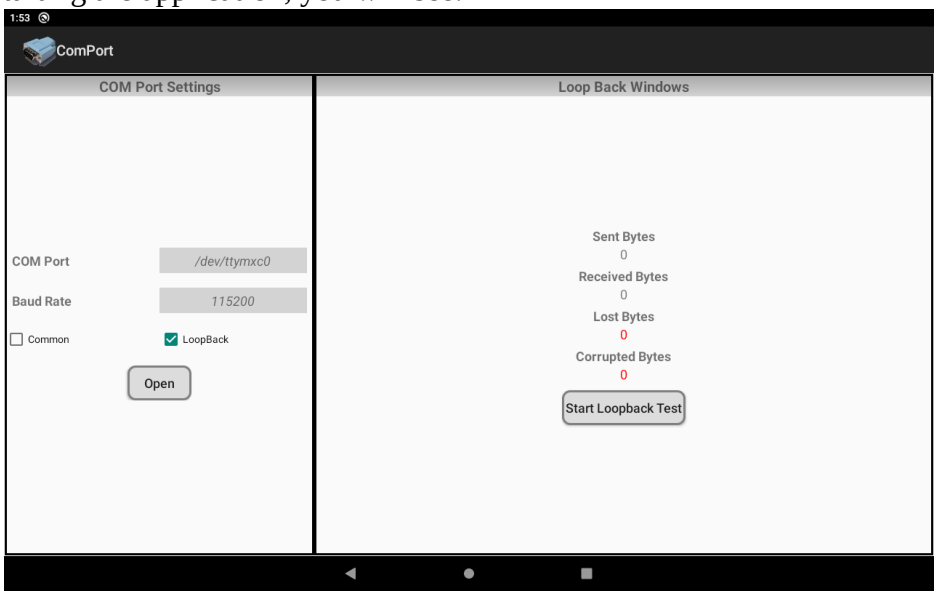
5 Usage

5.1 About SerialPort sample

After installing AIM-Android, you will see a Serial application in App list. Users can test serial port with it.

Note:
1.Choose the SerialPort mode.
Settings->Network & internet->
Select serial mode(com1)(232mode,422mode,485mode)
2.The COM1(/dev/ttymxc0) support three modes: 232mode,422mode,485mode.
The COM2(/dev/ttymxc2) only support 485 mode.

After starting the application, you will see:



Serial port options

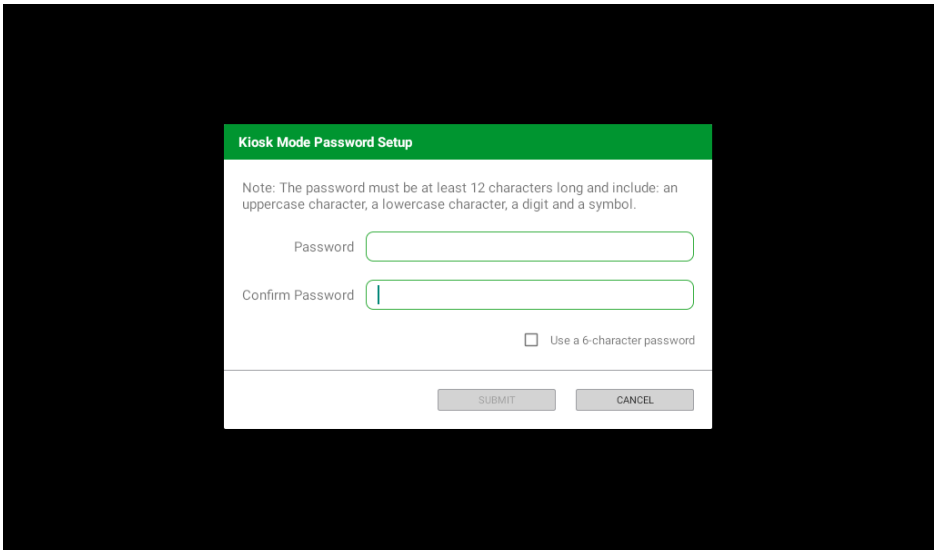
Usage: choose the port, baudrate.(e.g., ttymxc0, 115200)

5.2 About KioskSetting

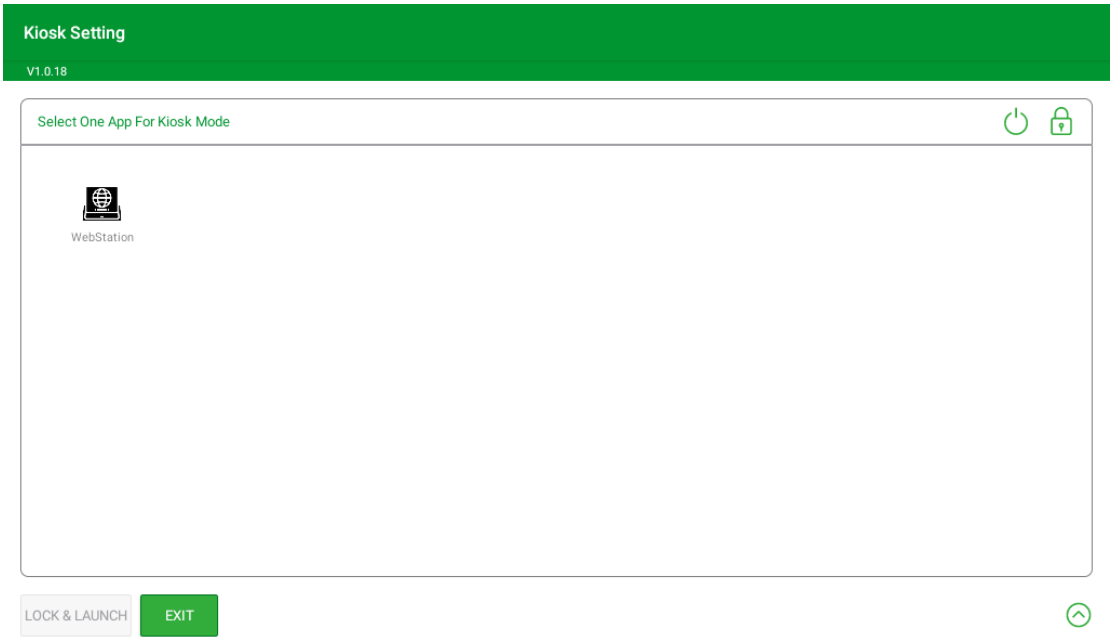
For Android Kiosk solution, Advantech provide a kiosk setting launch App, user can use this App to set any other android App as kiosk App, kiosk App means it will run in full screen when boot up, navigate bar and status bar of android will hide.

5.2.1 Set the Kiosk Setting app as the default launcher

Just launch the kiosksetting app, the app can be the android default home app.
When KioskSetting app starts for the first time, you can see the following screen. Please set the password of kiosk mode according to the prompt information in the dialog box.

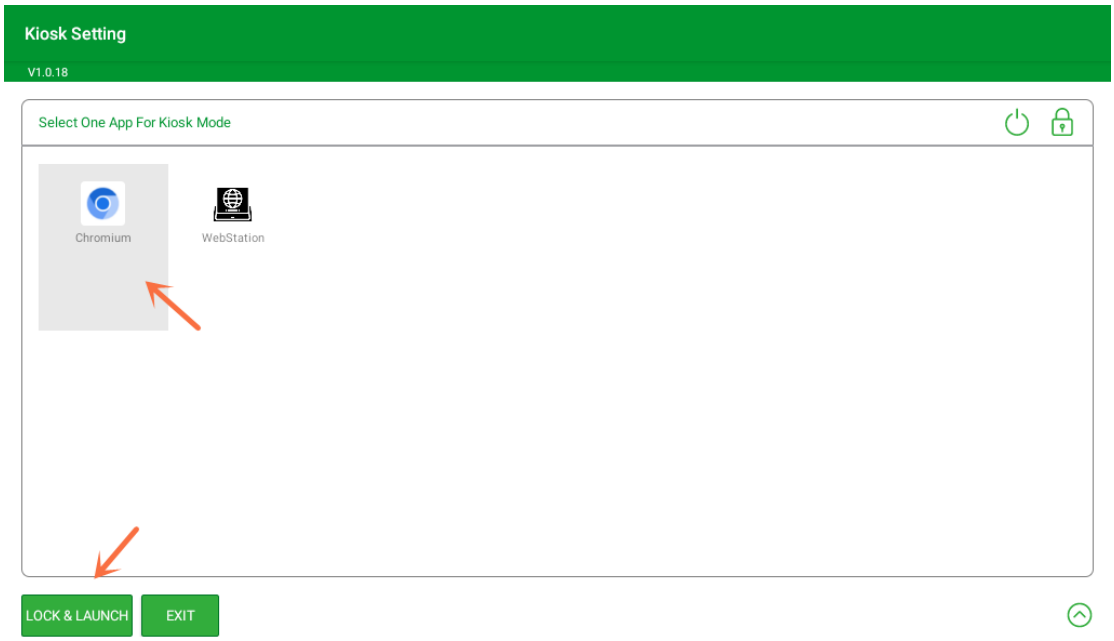


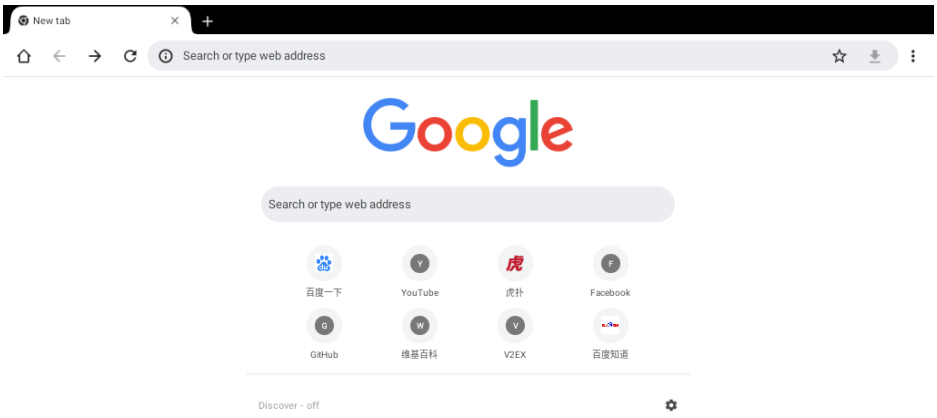
After input, click "SUBMIT" button to enter the app main interface.



5.2.2 Set third app as kiosk app

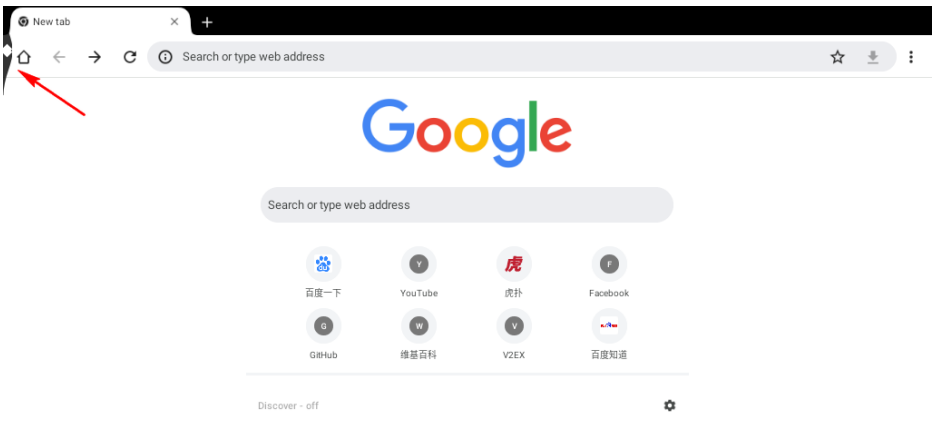
First, click the "Chromium" icon in the main interface, and then click the "LOCK & LAUNCH" button to set the Chromium app as kiosk app.

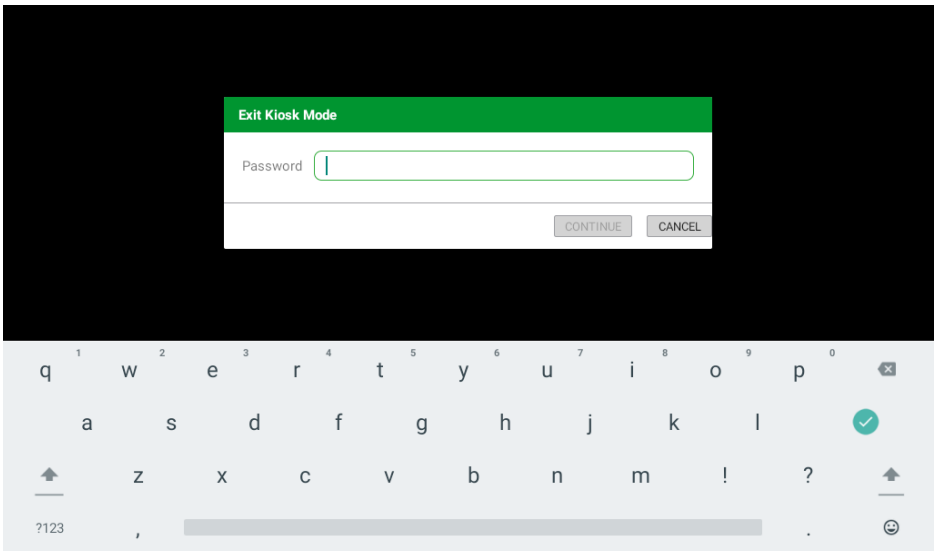




5.2.3 Exit kiosk app

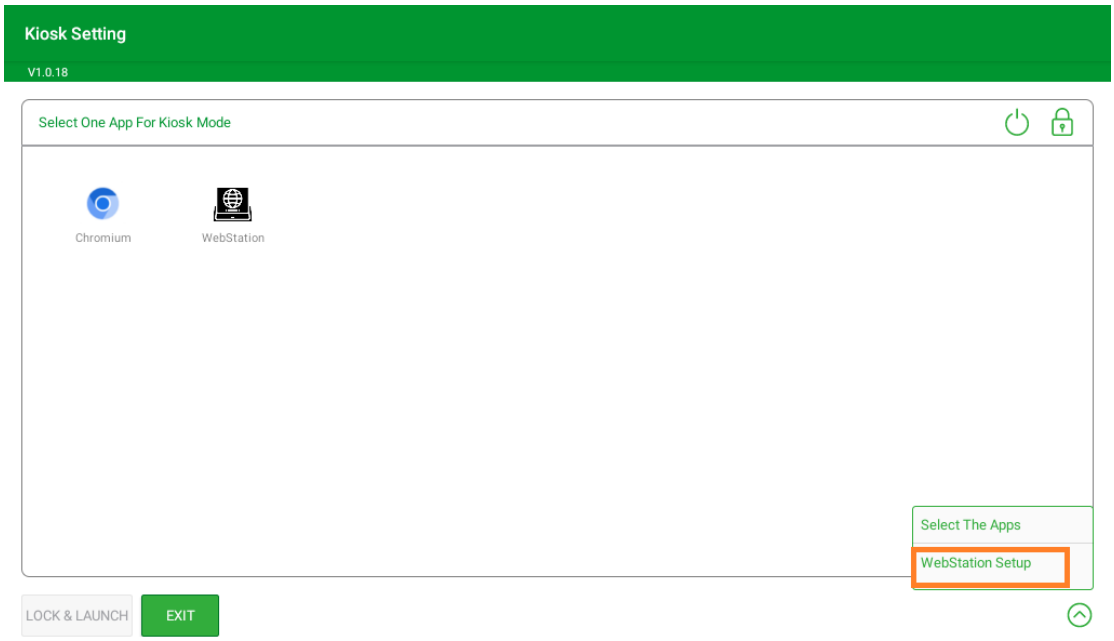
If you want to exit the kiosk app, you need to touch the screen in the upper left corner and pull it inward for 3 seconds and enter the password for setting the kiosk mode before.



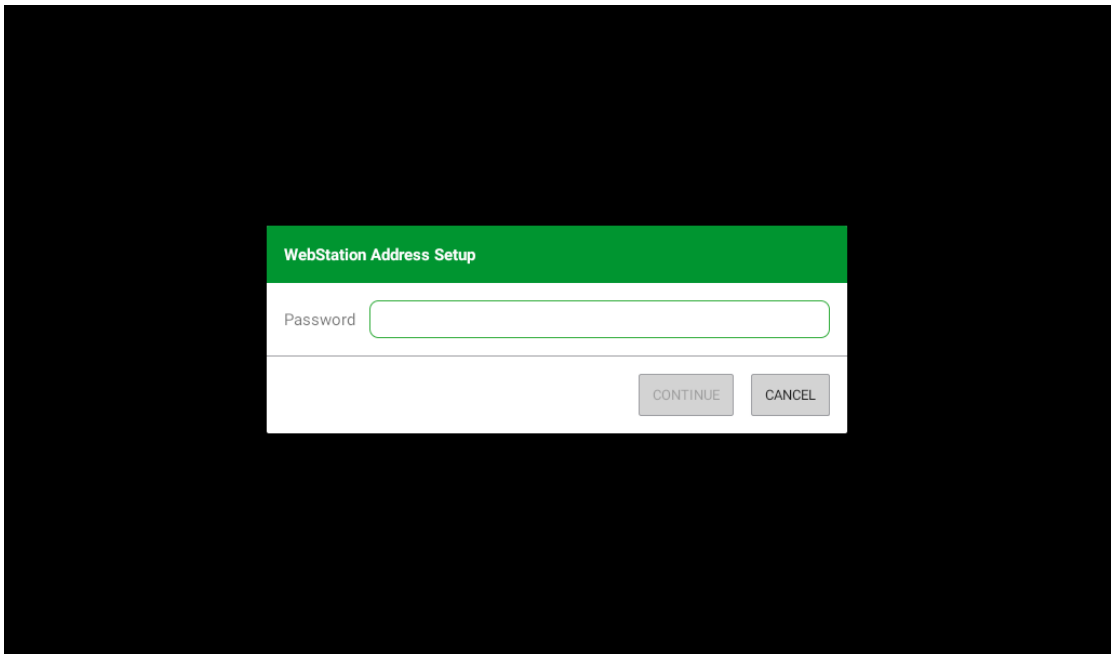


5.2.4 Set WebView as kiosk app

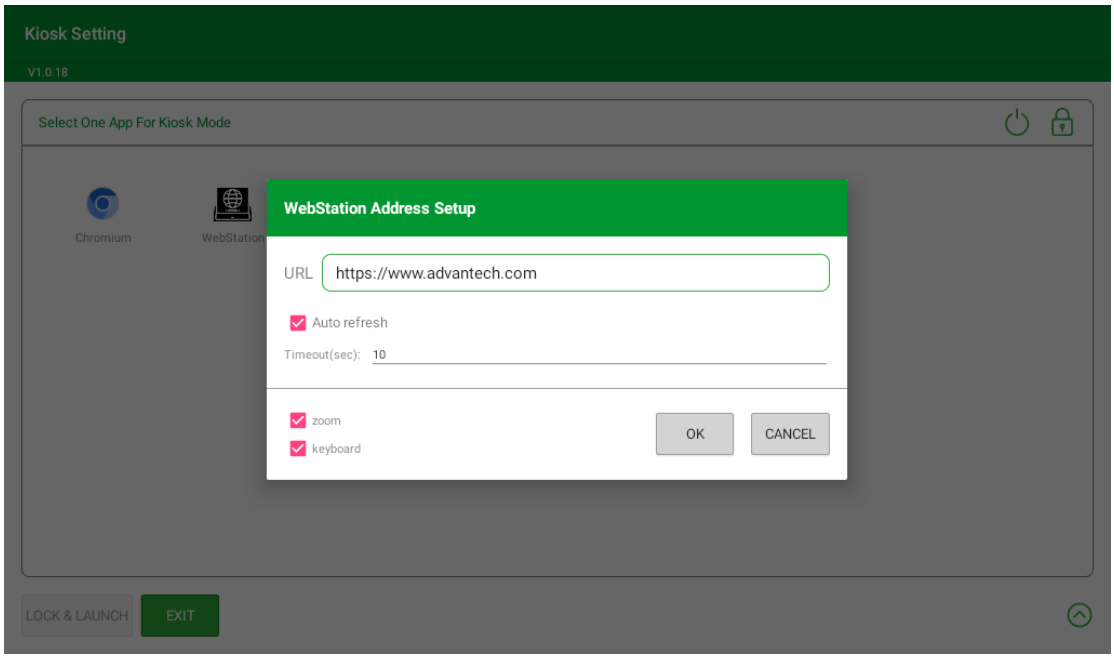
Click the "WEBSTATION SETUP" and input the URL.



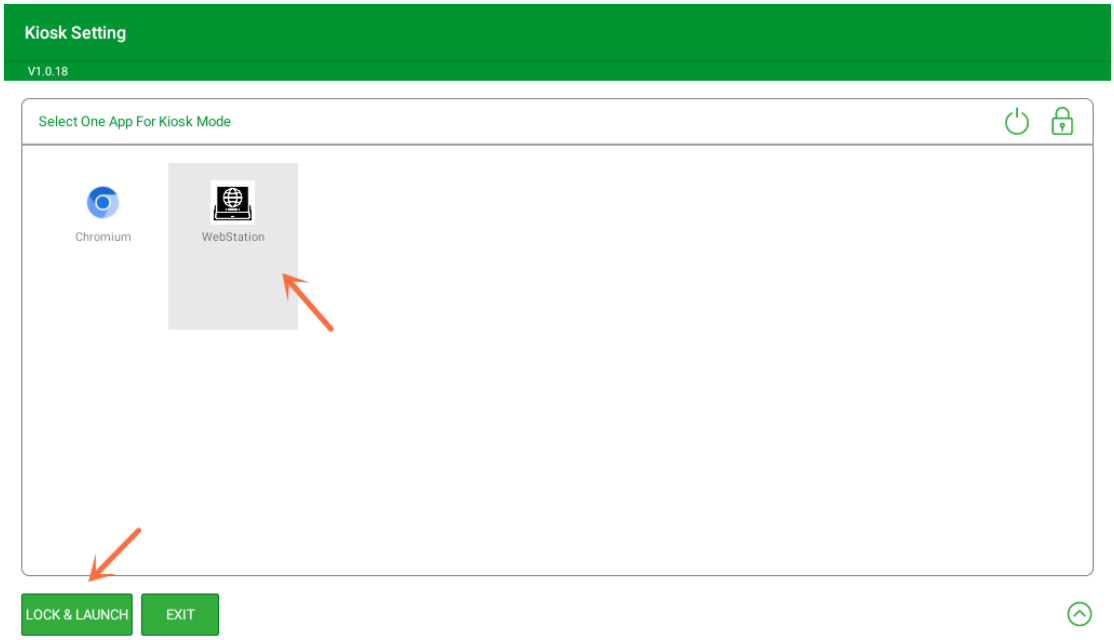
Input password:



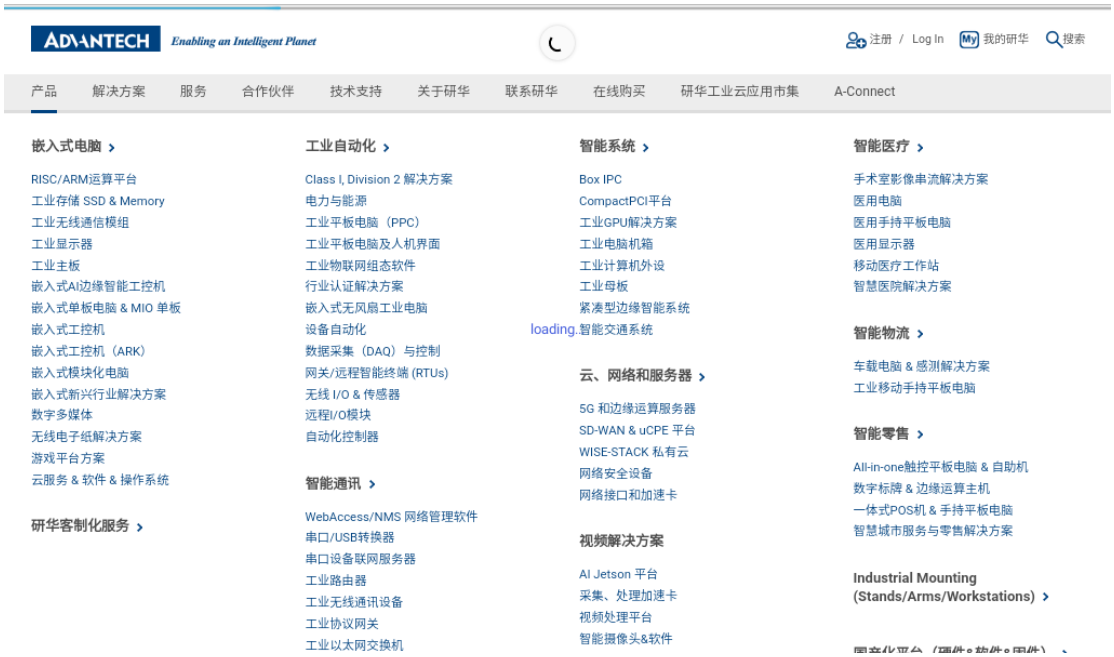
Input URL:



Click the "WebStation" icon in the main interface, and then click the "LOCK & LAUNCH" button to set the WebStation app as kiosk app.



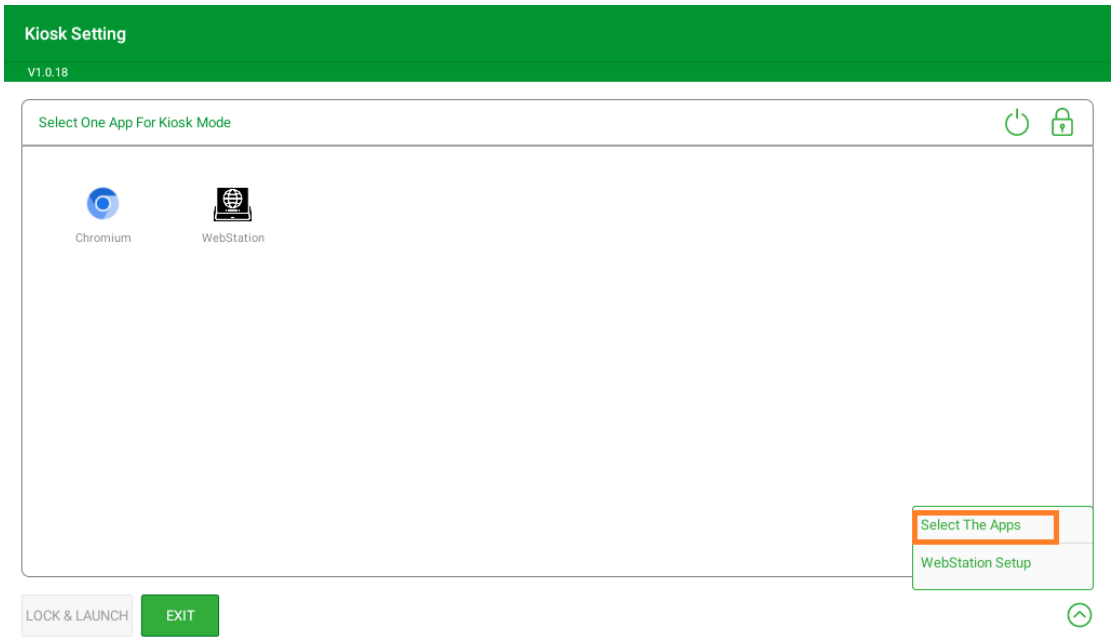
Users can swipe down the screen to refresh the webpage.



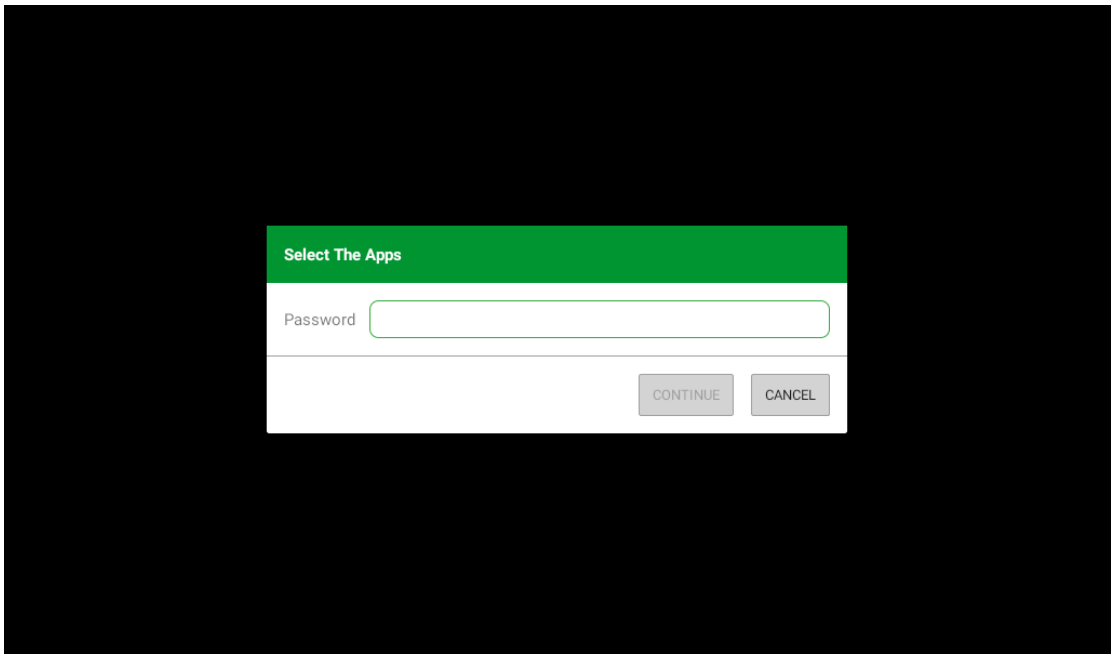
If you want to exit the kiosk app, you need to touch the screen in the upper left corner and pull it inward for 3 seconds and enter the password for setting the kiosk mode before.

5.2.5 Select the app to display

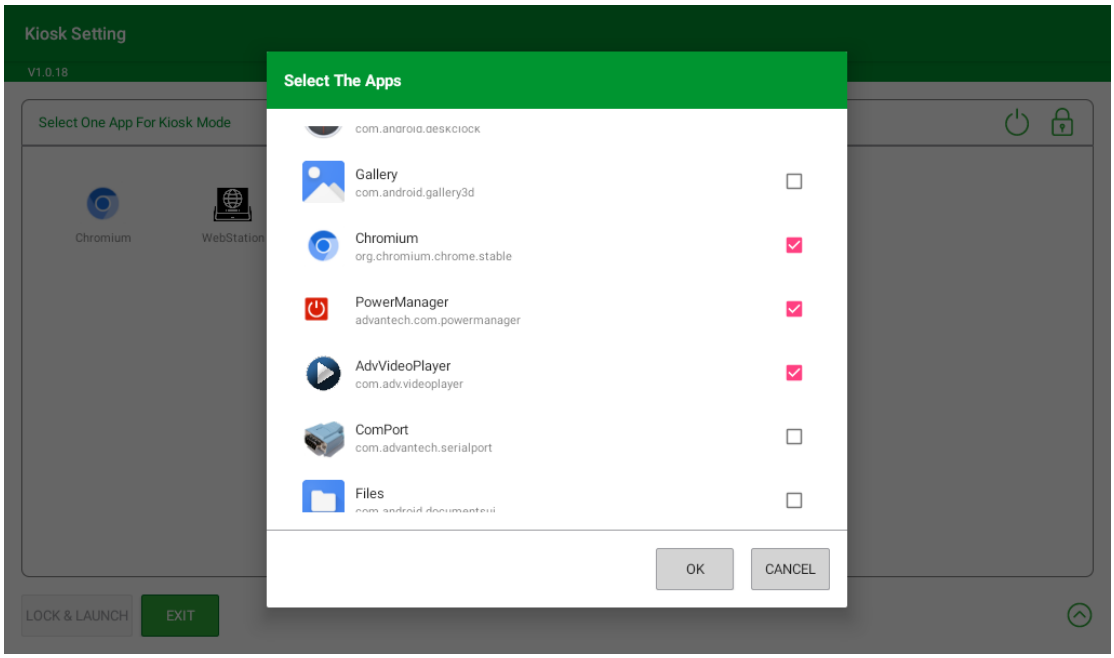
Click the "SELECT THE APPS" icon in the main interface

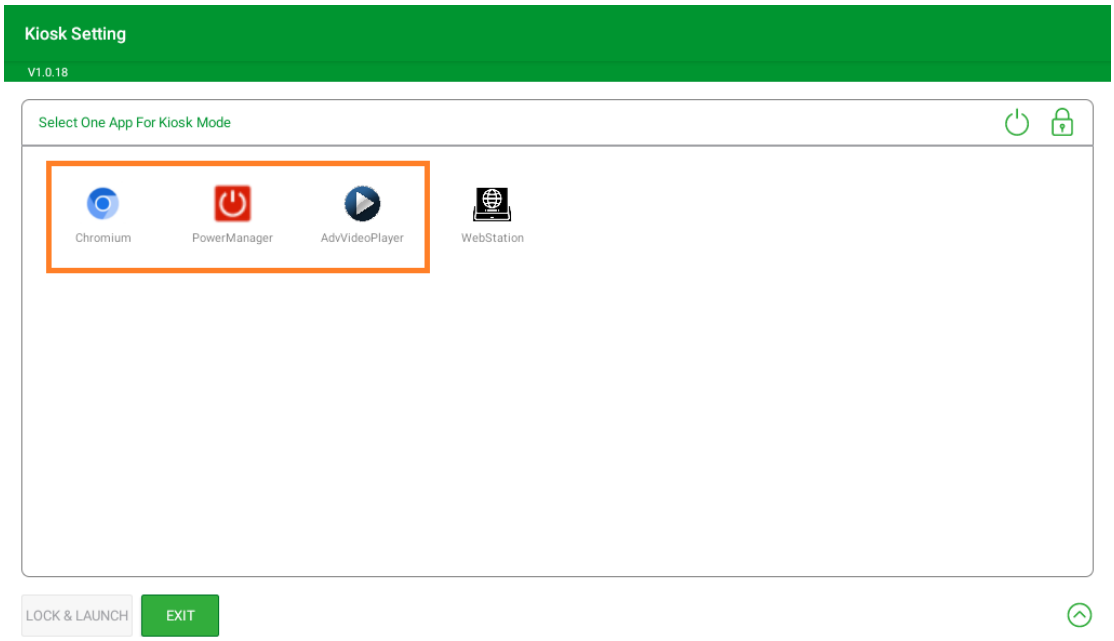


Input password:



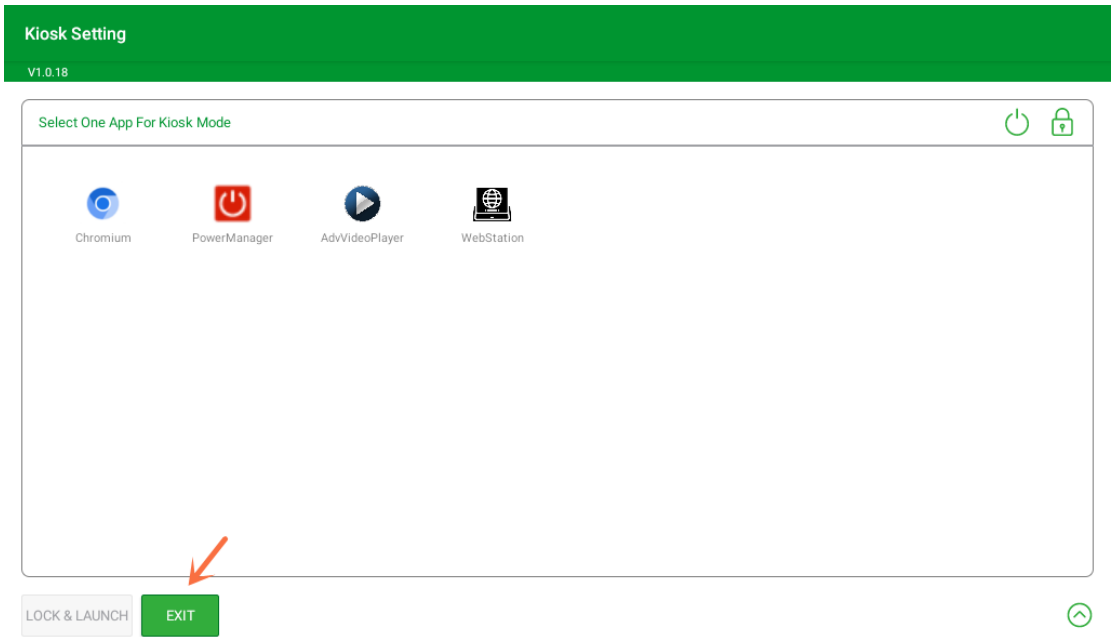
Select apps:

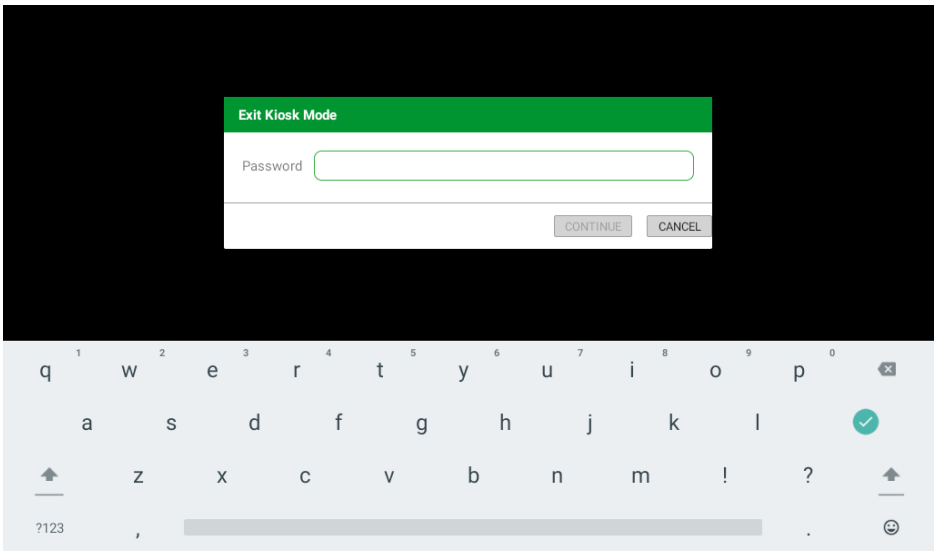




5.2.6 Exit kioskSetting

Click the "EXIT" in the main interface and input the password.
If you exit the application successfully, the launche3 will be the default home app.



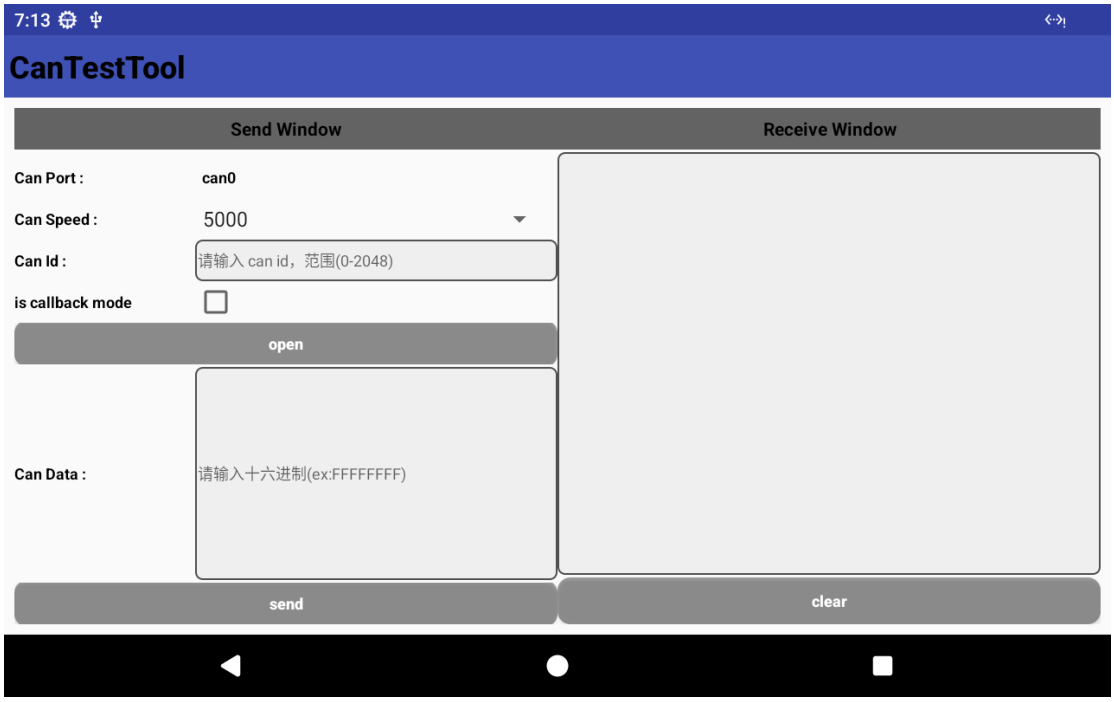


5.3 About CanTestTool

After installing AIM-Android, you will see CanTestTool application in App list. Users can test can port with it. User can write your own demo using the provided SDK.

Note:
1.Choose the can speed.
2.Input the CAN ID .then open the can.
3.Input the can data and then send the data.

After starting the application, you will see:



If you want to learn more about CAN sample and sdk, please refer to https://github.com/AIM-Android/SocketCanSample

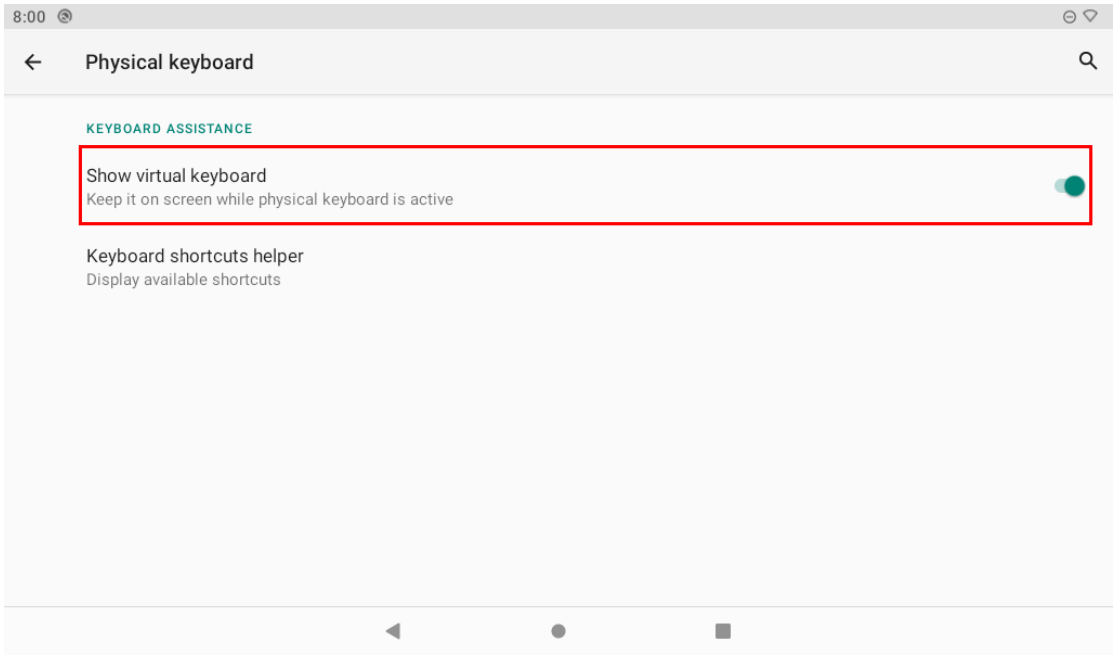
5.4 Other Applications

Many other applications for arm supported by Android or other resource web sites. You can search and download them from internet by yourself.

5.5 Virtual keyboard

5.5.1 How to keep the virtual keyboard display while the physical keyboard is active

Open the “Show virtual keyboard” option on the “System->Languages & Input->Physical keyboard” page of the setting app.

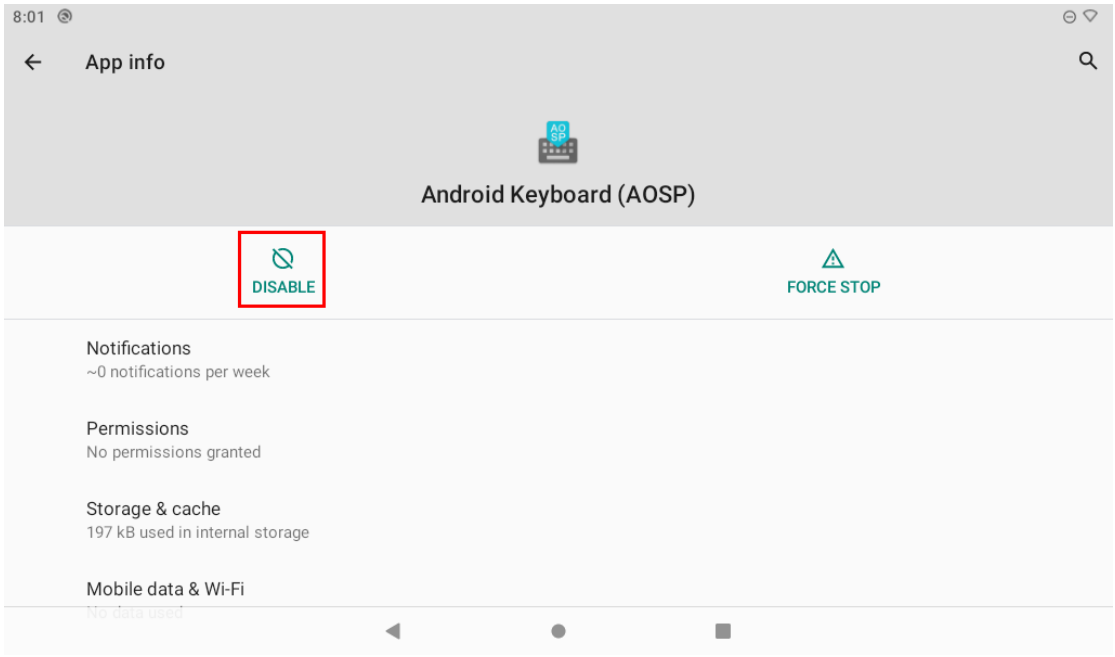


NOTE: If you do not want to pop up the virtual keyboard when using the physical keyboard, please turn off this option.

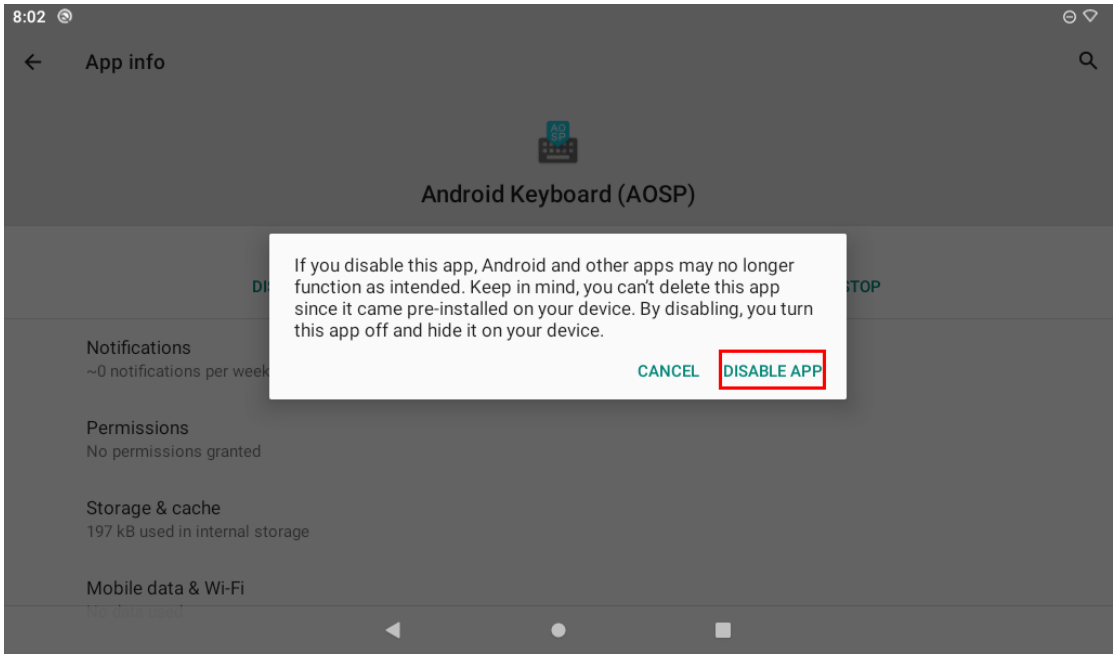
5.5.2 How to disable virtual keyboard

Open the “Apps & notifications” page in the setting app and find the “Android keyboard(AOSP)” app, then click to go to the app details page

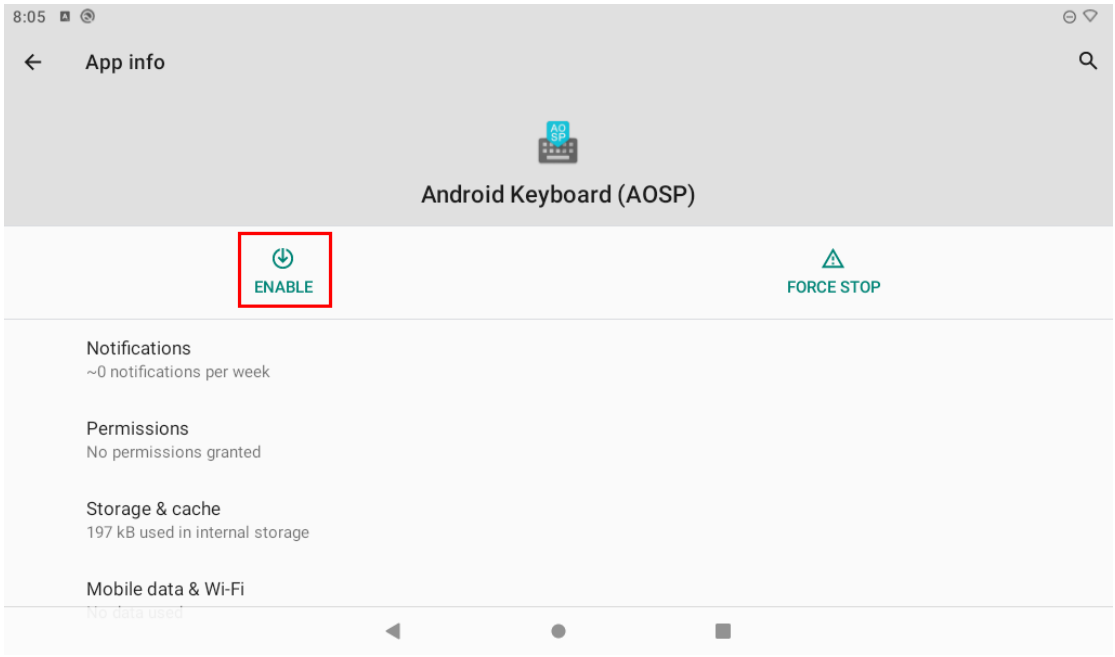
Then click the "DISABLE" option



Then click the "DISABLE APP" button



NOTE: If you want to enable the virtual keyboard again, please click the button below



5.6 Network port priority Settings

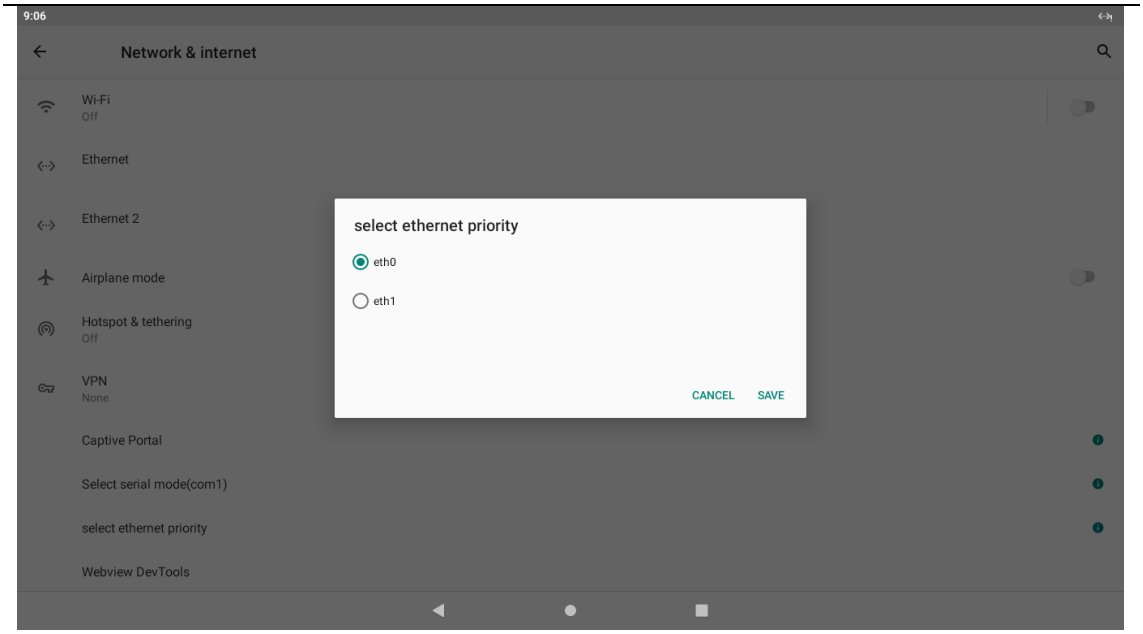
The meaning of network priority is to determine which network port has a higher priority when starting the system when two network ports are connected to the network cable at the same time.

◆ **How to set network port priority**

If both network ports on the device are plugged in with Ethernet cables, the priority of the network port can be set as follows:

Open Settins-> Network & Internet. Click Advanced, as follows:

Click “select ethernet priority”, and then You can choose the network port with higher priority.



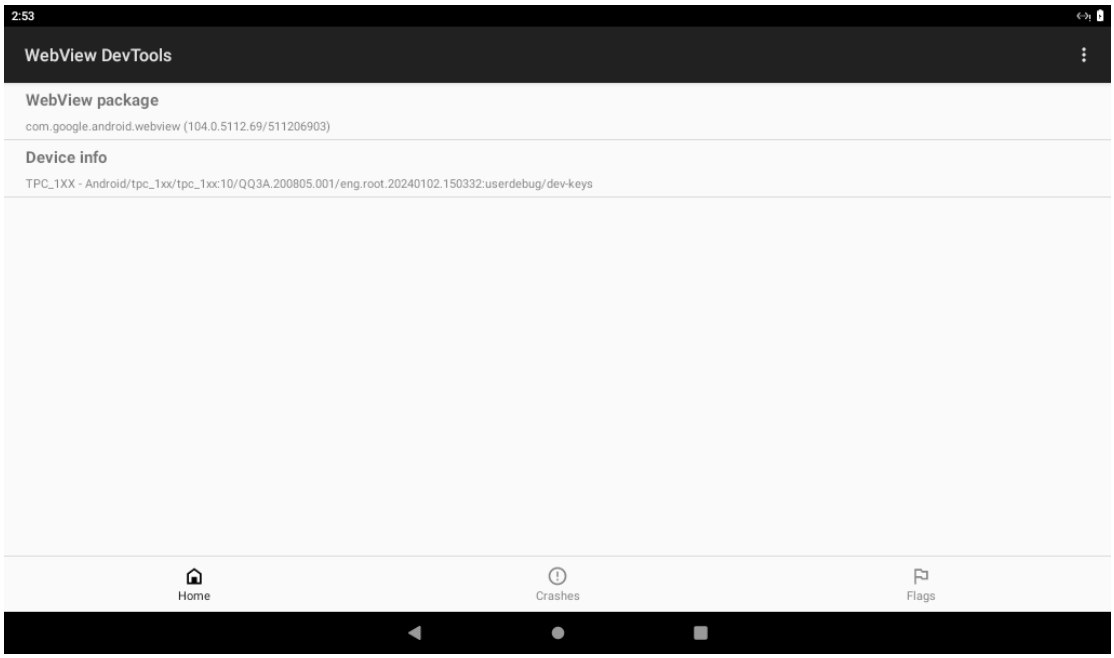
Note:

1. After selecting the network port priority, the system must be restarted to take effect.

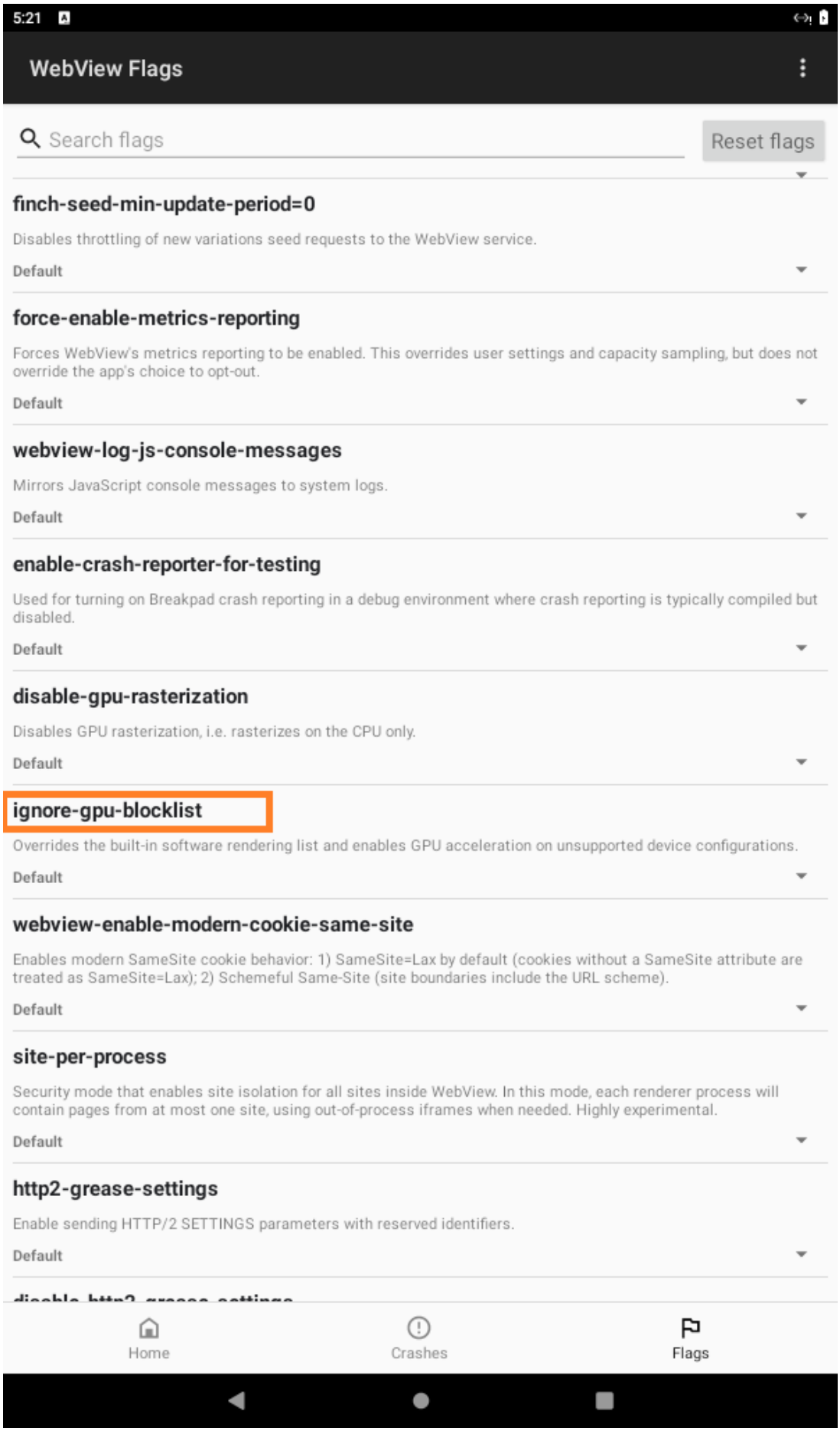
5.7 How to enable Webgl in settings.

User can enable “webgl” as follows:

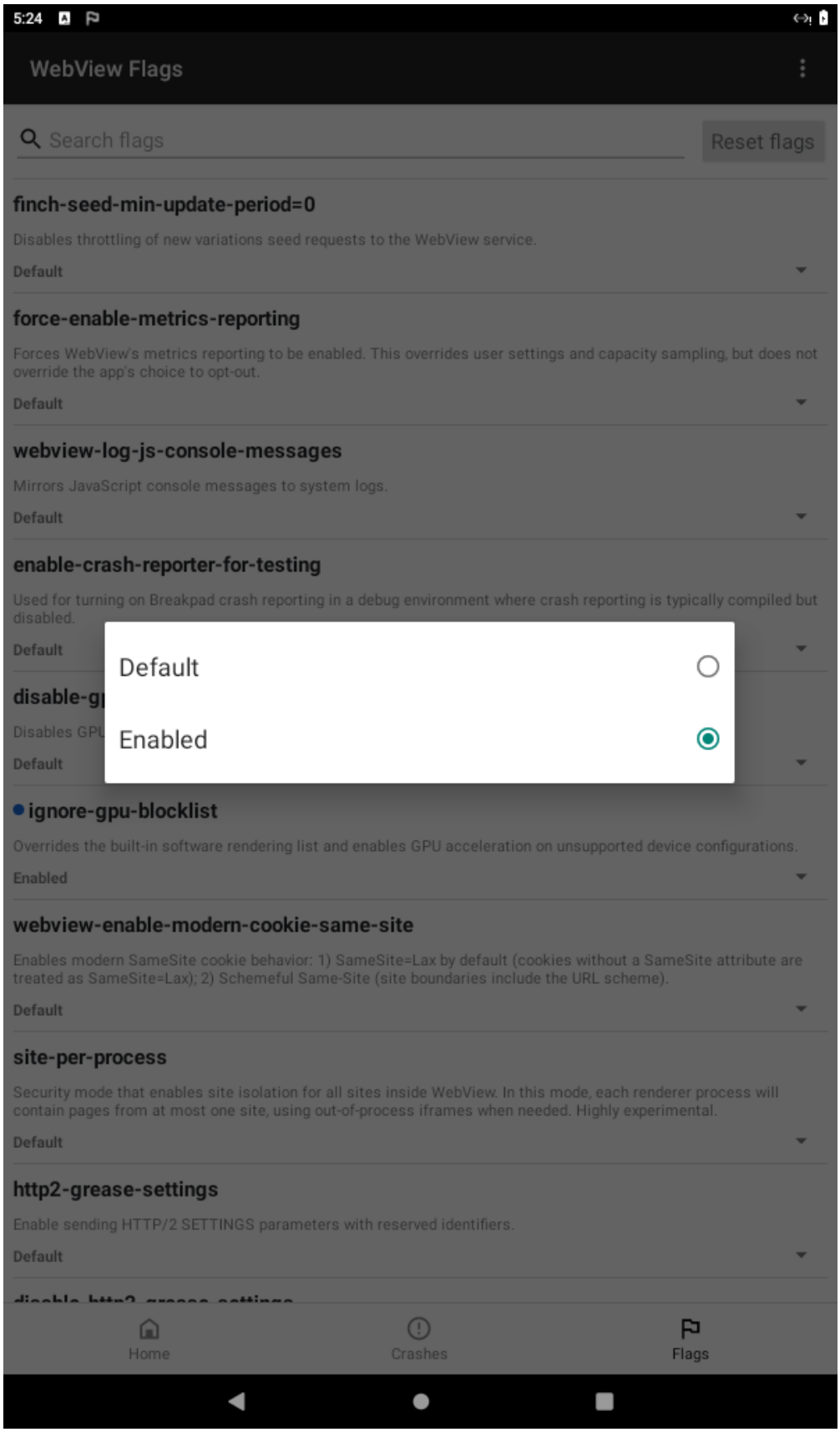
First open the Settings app, and then click Network & Internet. and then click “webview DevTools”.



Choose Flags, and then Pull down and find “Ignoral gpu blocklis”.


5:21
WebView Flags
Search flags
Reset flags
finch-seed-min-update-period=0
Disables throttling of new variations seed requests to the WebView service.
Default
force-enable-metrics-reporting
Forces WebView's metrics reporting to be enabled. This overrides user settings and capacity sampling, but does not override the app's choice to opt-out.
Default
webview-log-js-console-messages
Mirrors JavaScript console messages to system logs.
Default
enable-crash-reporter-for-testing
Used for turning on Breakpad crash reporting in a debug environment where crash reporting is typically compiled but disabled.
Default
disable-gpu-rasterization
Disables GPU rasterization, i.e. rasterizes on the CPU only.
Default
ignore-gpu-blocklist
Overrides the built-in software rendering list and enables GPU acceleration on unsupported device configurations.
Default
webview-enable-modern-cookie-same-site
Enables modern SameSite cookie behavior: 1) SameSite=Lax by default (cookies without a SameSite attribute are treated as SameSite=Lax); 2) Schemeful Same-Site (site boundaries include the URL scheme).
Default
site-per-process
Security mode that enables site isolation for all sites inside WebView. In this mode, each renderer process will contain pages from at most one site, using out-of-process iframes when needed. Highly experimental.
Default
http2-grease-settings
Enable sending HTTP/2 SETTINGS parameters with reserved identifiers.
Default
Home
Crashes
Flags

Click this option, and then choose Enable.



Now “webgl’ has been already opened。And user can choose Default to close it.

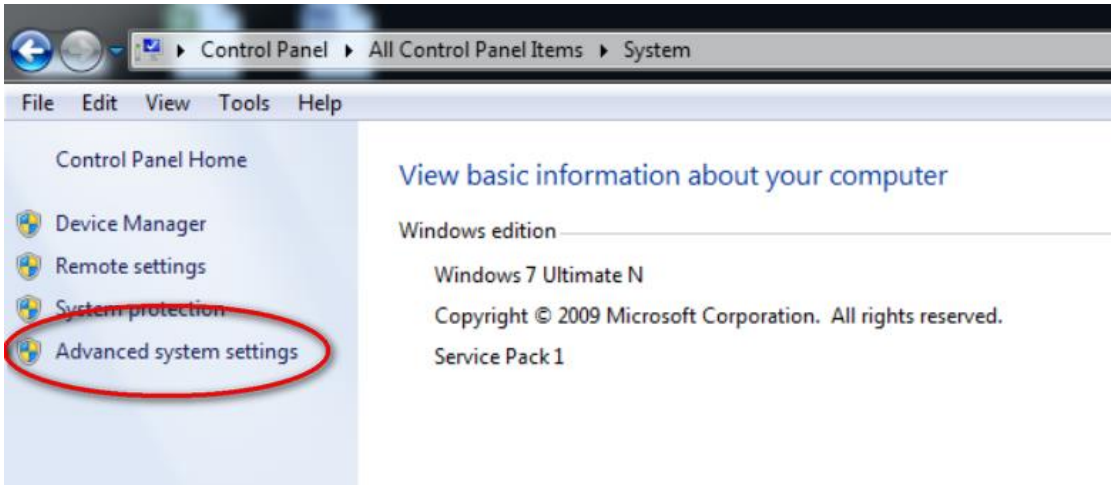
5.8 How to use adb tool in windows

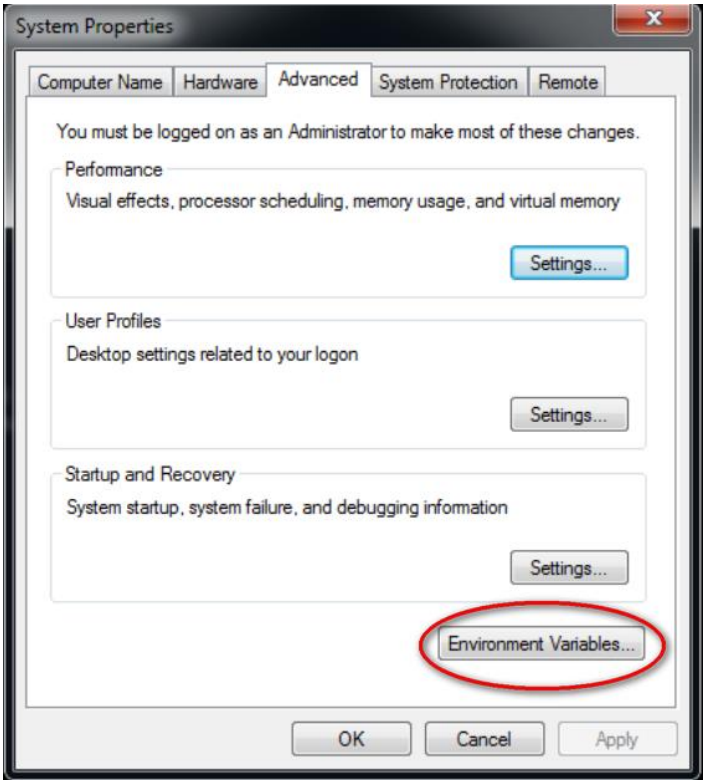
5.8.1 Install ADB

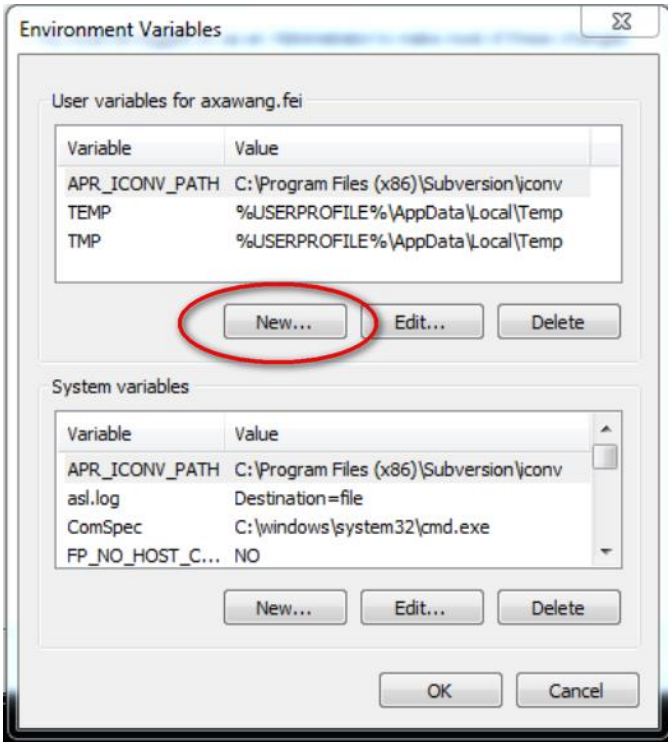
After the connection is built, download & execute “ADBDriverInstaller.exe” to install adb driver.

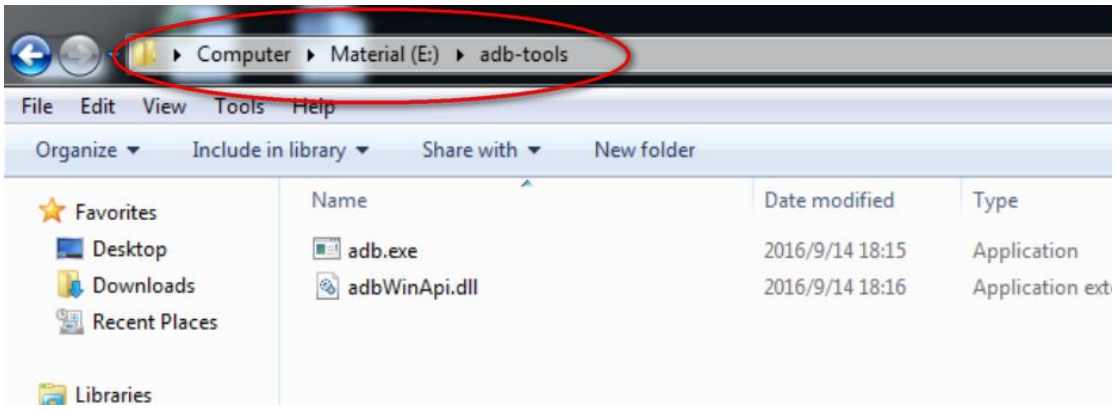
5.8.2 Create PATH

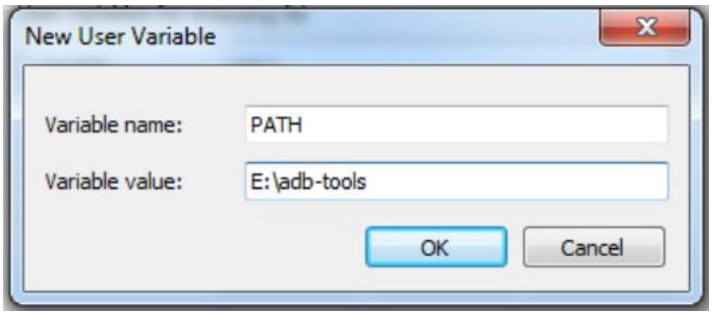
Add adb-tool and create path in windows.




System Properties
Computer Name
Hardware
Advanced
System Protection
Remote
You must be logged on as an Administrator to make most of these changes.
Performance
Visual effects, processor scheduling, memory usage, and virtual memory
Settings...
User Profiles
Desktop settings related to your logon
Settings...
Startup and Recovery
System startup, system failure, and debugging information
Settings...
Environment Variables...
OK
Cancel
Apply


Environment Variables
User variables for axawang.fei
Variable
Value
APR_ICONV_PATH
C:\Program Files (x86)\Subversion\iconv
TEMP
%USERPROFILE%\AppData\Local\Temp
TMP
%USERPROFILE%\AppData\Local\Temp
New...
Edit...
Delete
System variables
Variable
Value
APR_ICONV_PATH
C:\Program Files (x86)\Subversion\iconv
asl.log
Destination=file
ComSpec
C:\windows\system32\cmd.exe
FP_NO_HOST_C...
NO
New...
Edit...
Delete
OK
Cancel





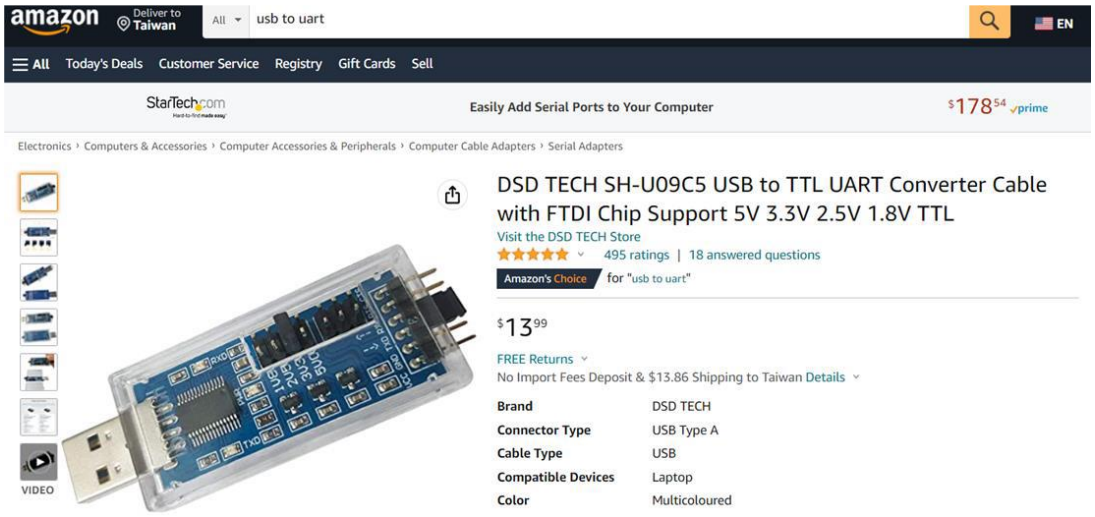
5.9 How to connect to debug port?

5.9.1 Description

In some cases, we may need to use the debug port for system checking or uboot modification. For the location of the TPC-100 deport port, please check with your Advantech contact window.

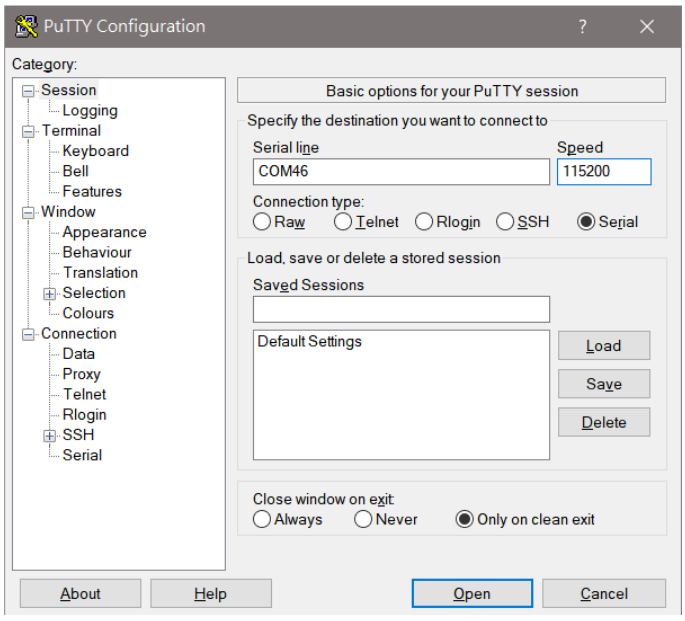
5.9.2 Tool

As the debug port is a UART interface, you need a USB-to-UART converter.
Note: UART is different from RS-232.

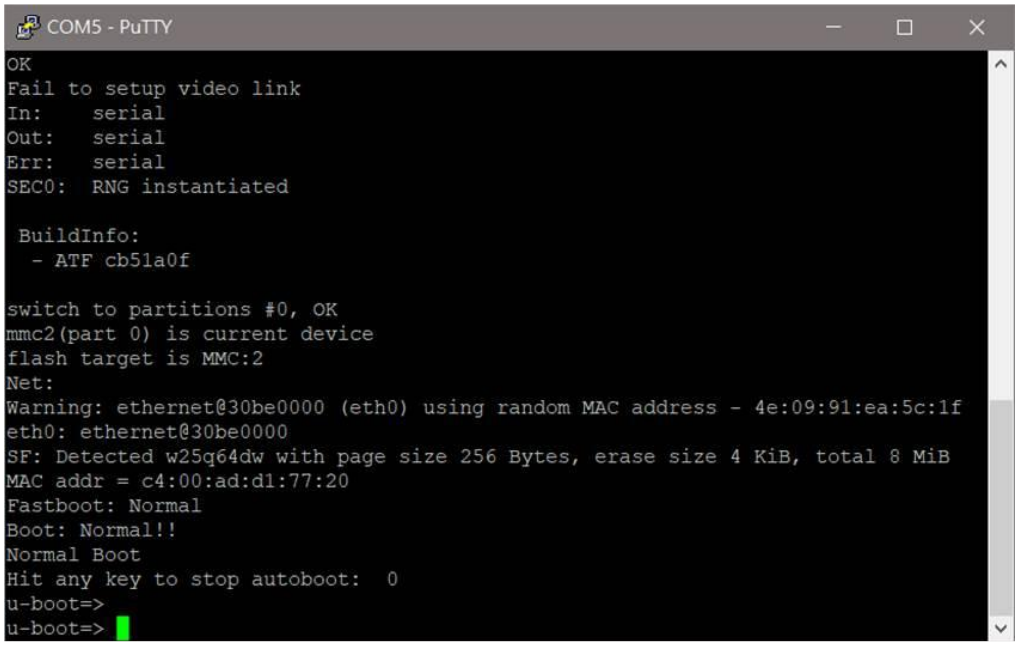


5.9.3 Demo

1. Connect debug port to laptop via a USB-to-UART converter. Download putty, and open COM port on my computer, set the speed as 115200.
https://www.putty.org/



2. Power on TPC-100 and press the Enter key several times at the same time, otherwise you will not be able to enter the uboot environment in time.


COM5 - PuTTY
OK
Fail to setup video link
In: serial
Out: serial
Err: serial
SEC0: RNG instantiated
BuildInfo:
- ATF cb51a0f
switch to partitions #0, OK
mmc2(part 0) is current device
flash target is MMC:2
Net:
Warning: ethernet@30be0000 (eth0) using random MAC address - 4e:09:91:ea:5c:1f
eth0: ethernet@30be0000
SF: Detected w25q64dw with page size 256 Bytes, erase size 4 KiB, total 8 MiB
MAC addr = c4:00:ad:d1:77:20
Fastboot: Normal
Boot: Normal!!
Normal Boot
Hit any key to stop autoboot: 0
u-boot=>
u-boot=>

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.