

ASUSTeK Computer Inc.

**[Chromebox 5 / CN67]  
RMA Shim Flow for Self-Repair**

ASUS Confidential Proprietary Information

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# RMA Shim Flow for Self-Repair

## Introduction

After replacing the **motherboard, memory** or **Wi-Fi module**, the RMA shim flow must be performed to reinstall the firmware, software, and device information of the Chromebox.

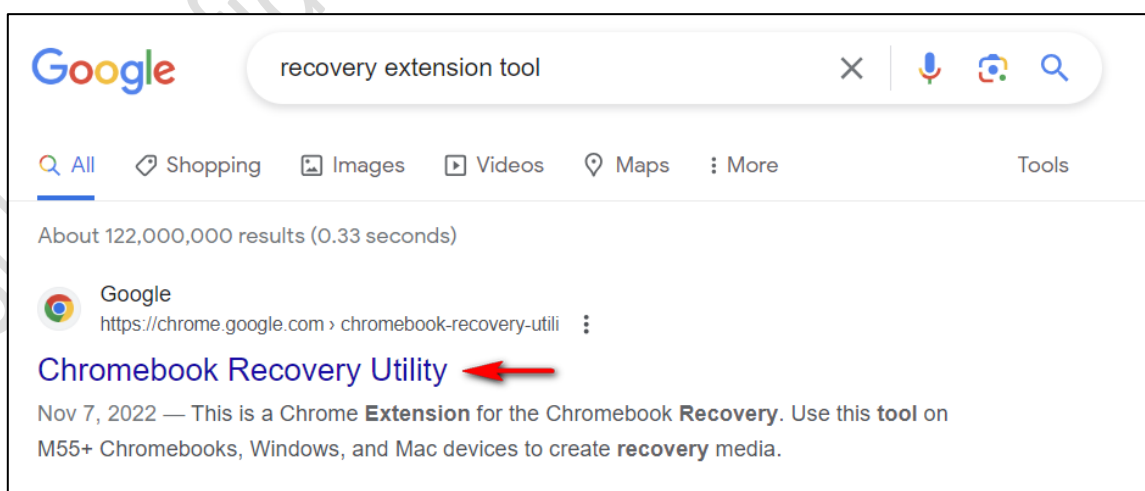
Please make sure the device is deprovisioned before you start. Please visit [here](#) for more information about deprovision a device.

## Preparation

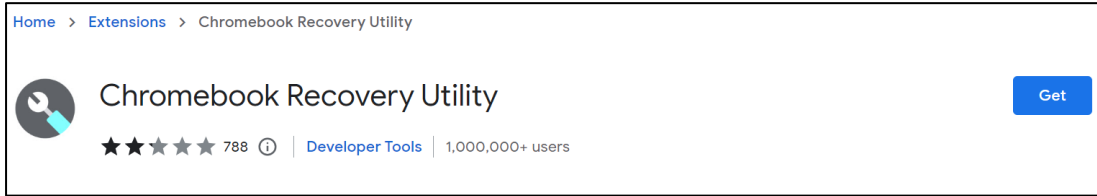
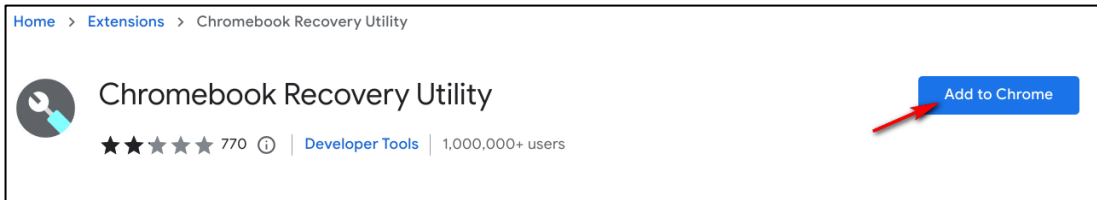
- 1) A computer with Internet connection
- 2) An USB flash drive with at least 8GB capacity

## Create RMA Shim Bootable USB Drive

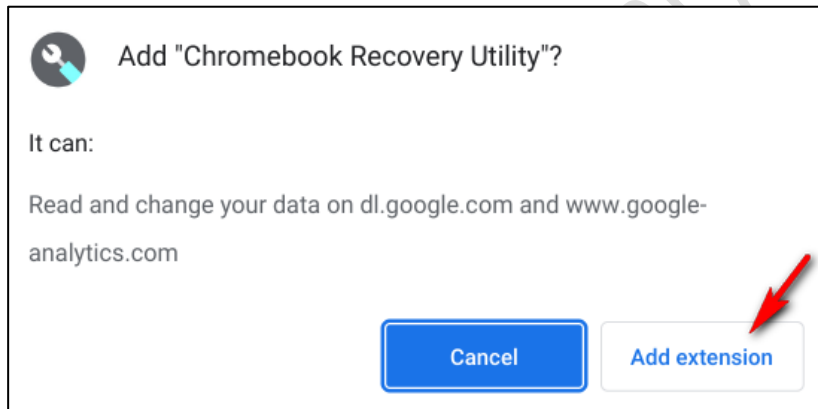
- 1) Access [here](#) to download the corresponding RMA shim image. Extract the file after the download is complete, there will be a .bin file.
- 2) Please download **Chromebook Recovery Utility** [here](#) or open a web browser and search for **recovery extension tool**.





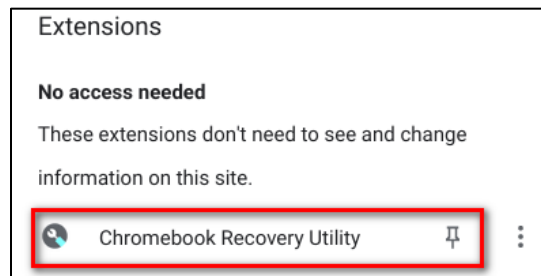
- 3) Click **Add to Chrome** or **Get** if you're using Edge.



4) Click **Add extension**.

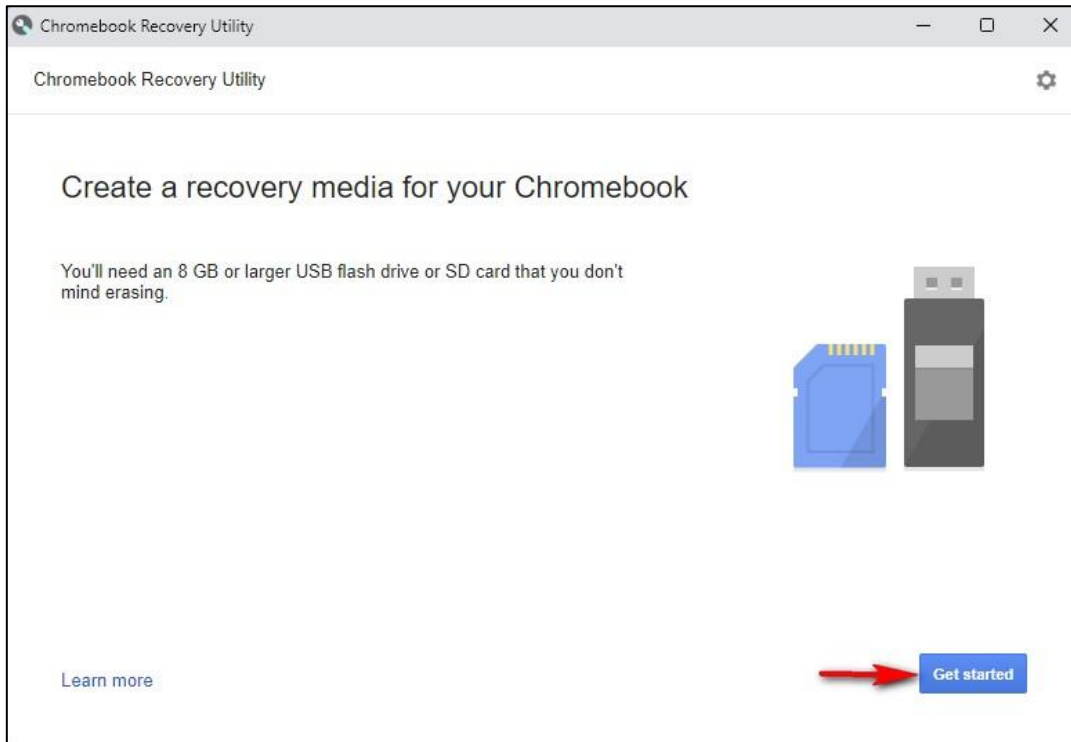


5) Click extension icon  or  on the browser, find and click **Chromebook Recovery Utility**.

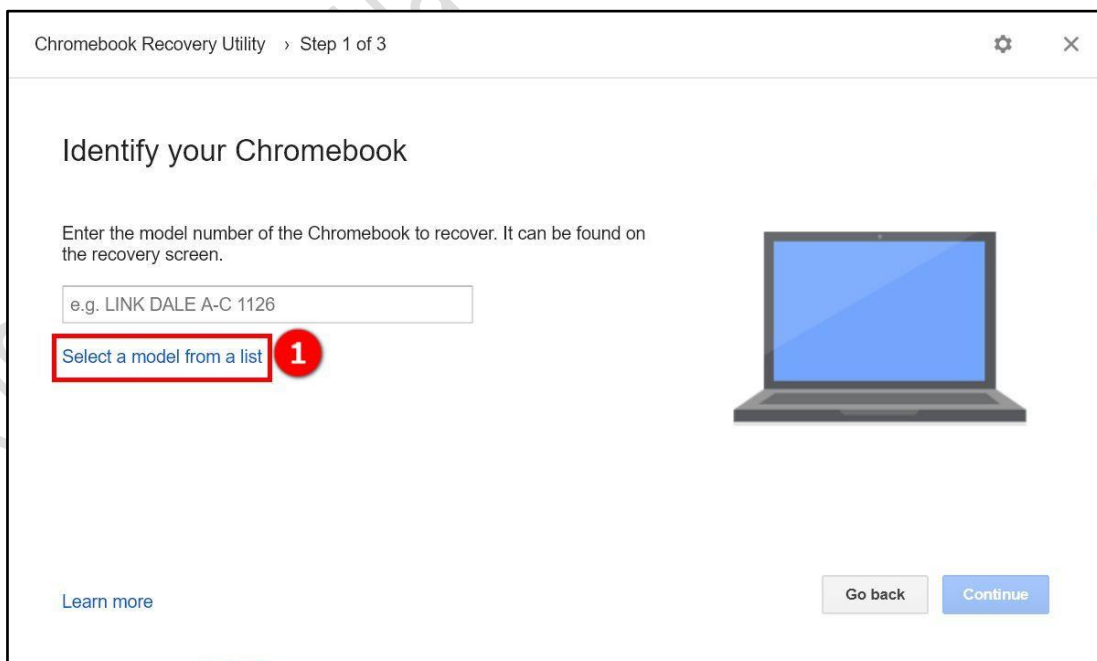


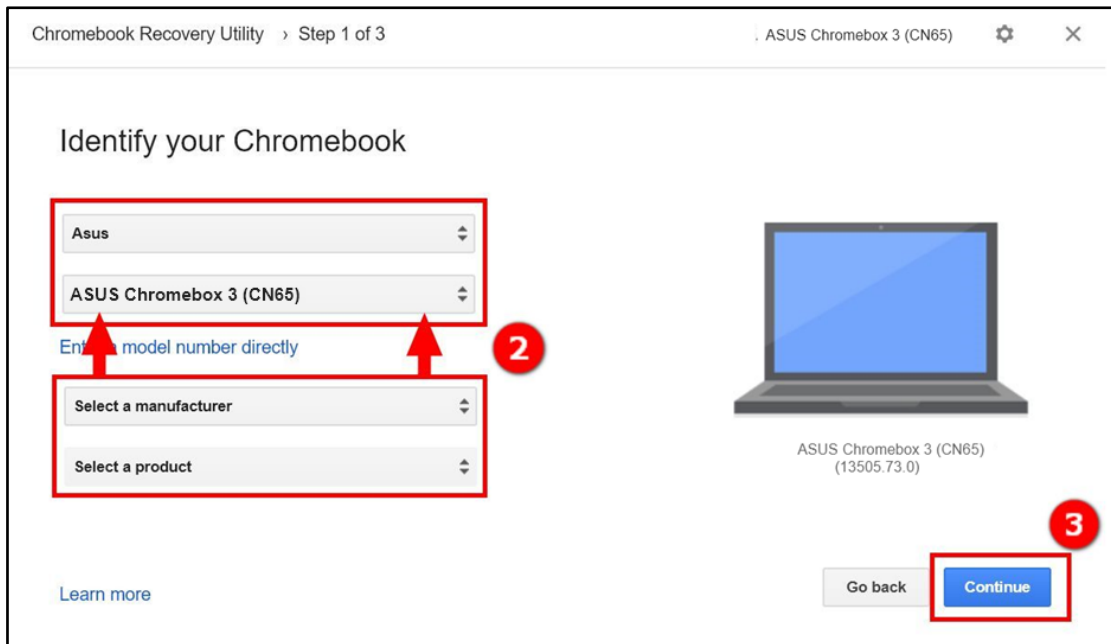
6) Insert the USB drive and then click **Get started**.





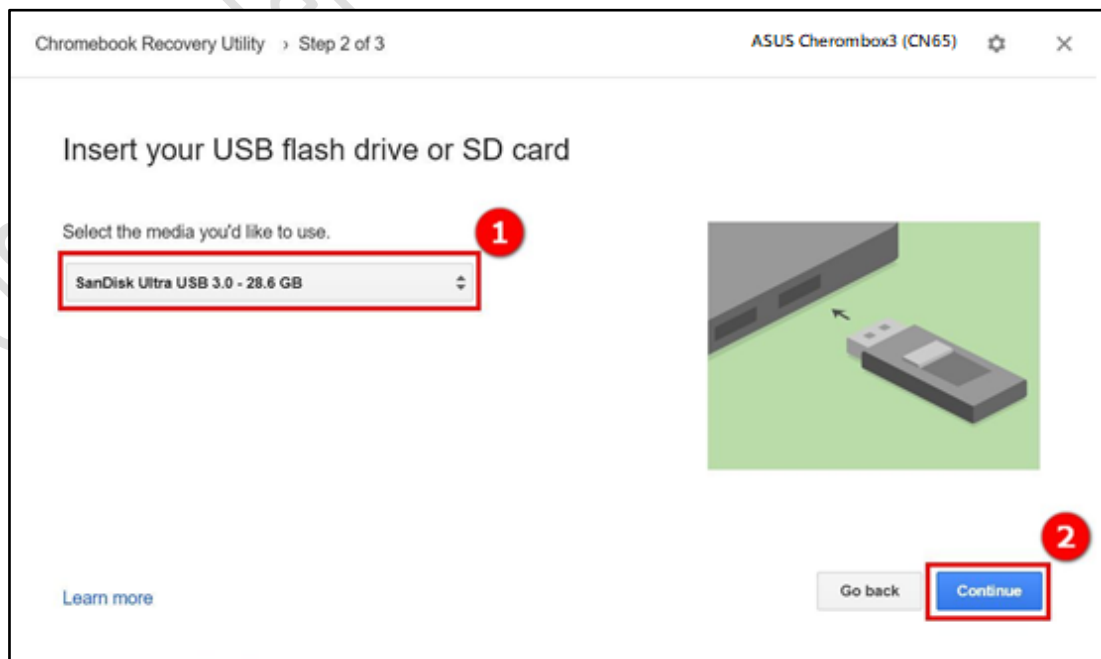
- 7) Click ① **Select a model from a list**, find ② **The name of the Chromebook model** you want to restore, and click ③ **Continue**.

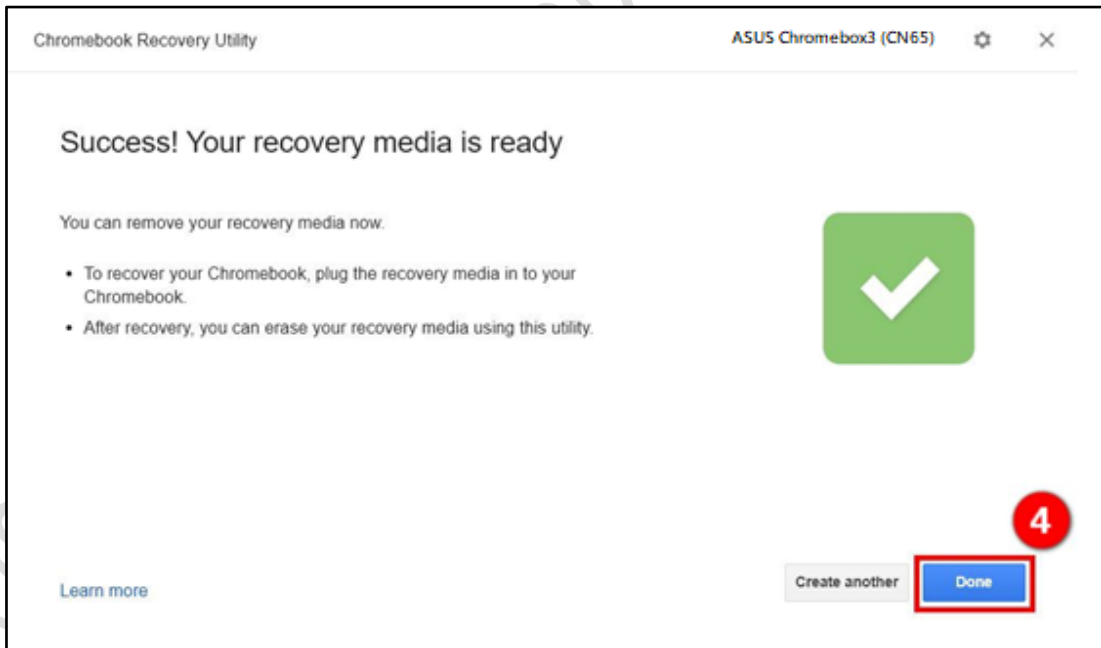
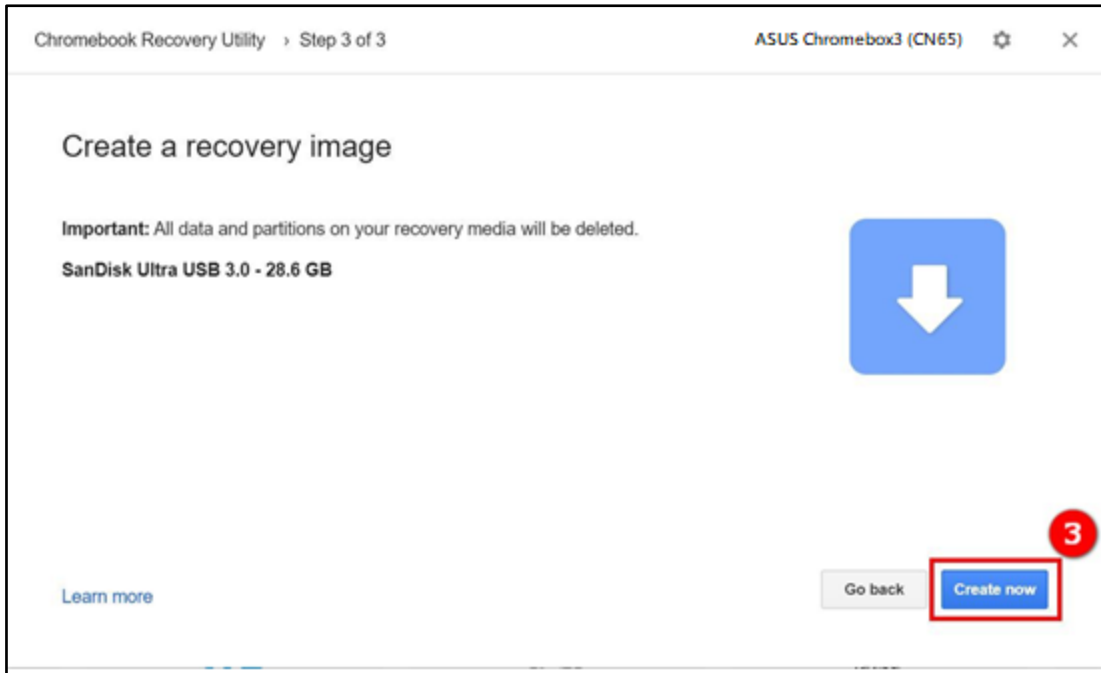




- 1) Click ① **USB Flash inserted**, and click ② **Continue**. Click ③ **Create now\***. Click ④ **Done** to finish the creation.

\*The process takes a while and please don't shutdown the system or **all the data and partitions on this USB drive will be deleted**.

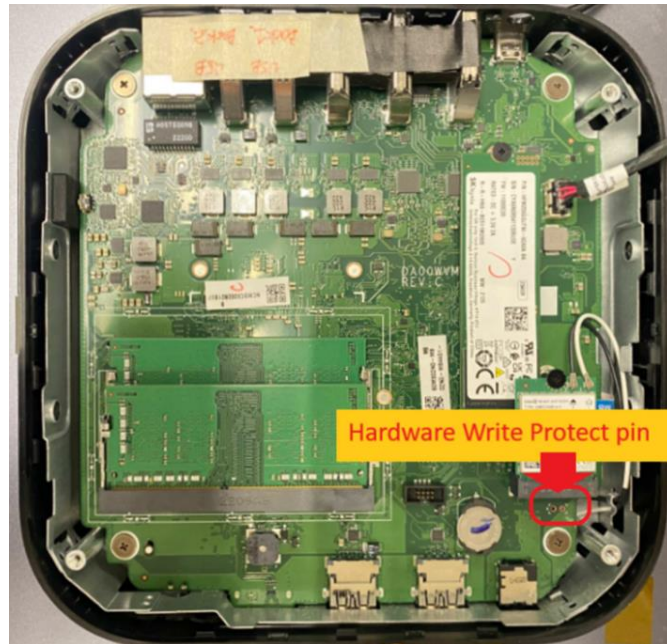




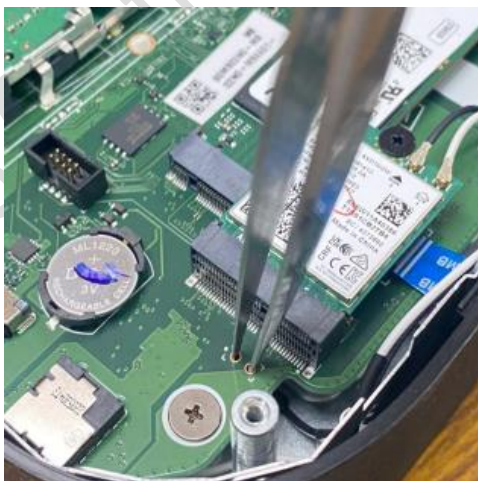
## Disable Hardware Write Protection

Hardware Write Protection needs to be disabled before installing the RMA shim on a Chromebox. Please ensure that the device is powered off and that the AC power cord is unplugged before proceeding with the following steps.

- 1) Remove the bottom cover and locate the **Write Protection Pin**.

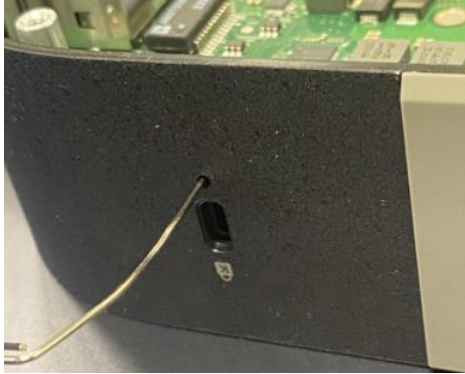


- 2) Short the pin to disable hardware write protection. You can use **tweezers**, a **jumper** or a **paper clip**.

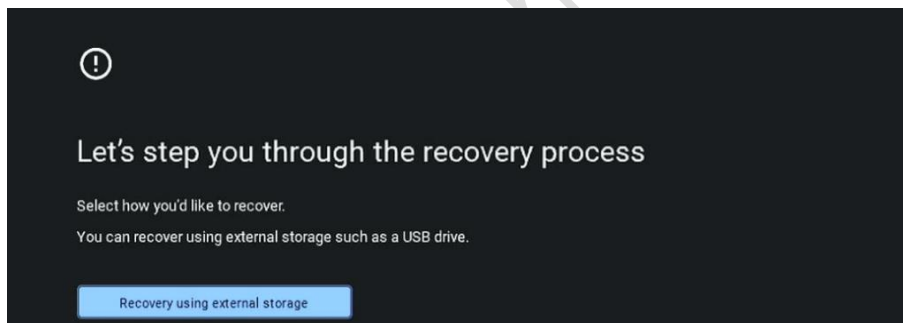


## Enter Developer Mode (DEV Mode)

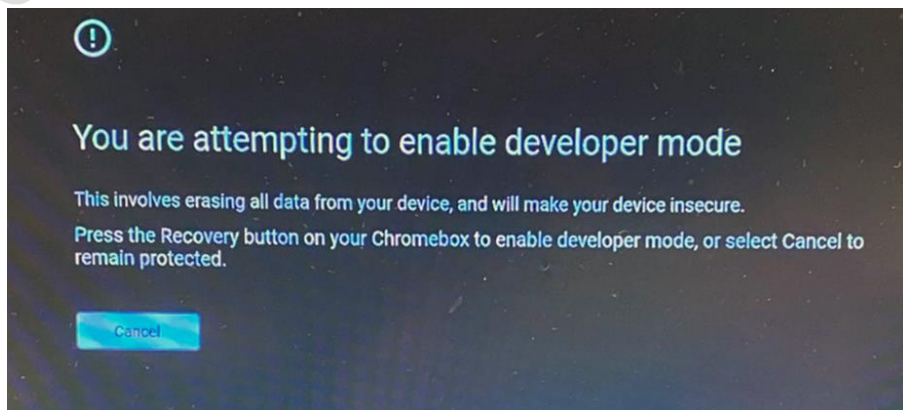
- 1) Connect to AC power, press and hold **Recovery Button** with a paper clip, and then press **Power Button** to power on the device.



- 2) Press **Ctrl + D** when the following message appears.

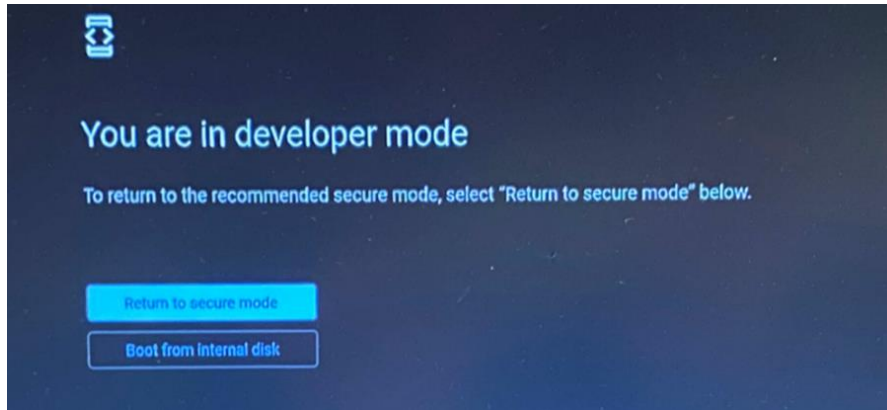


- 3) Press **Recovery Button** with a paper clip when the following message appears. The system will reboot automatically.

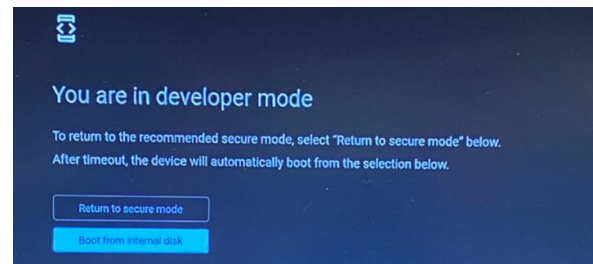
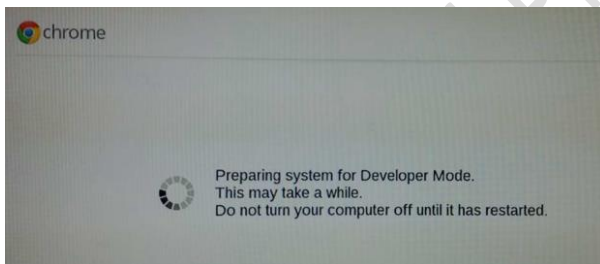
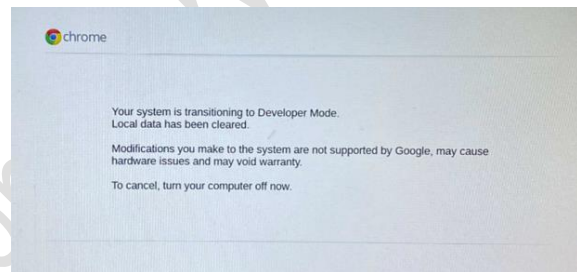
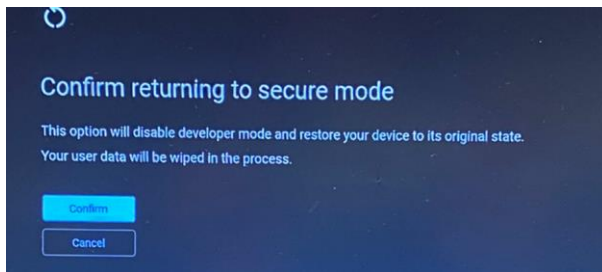




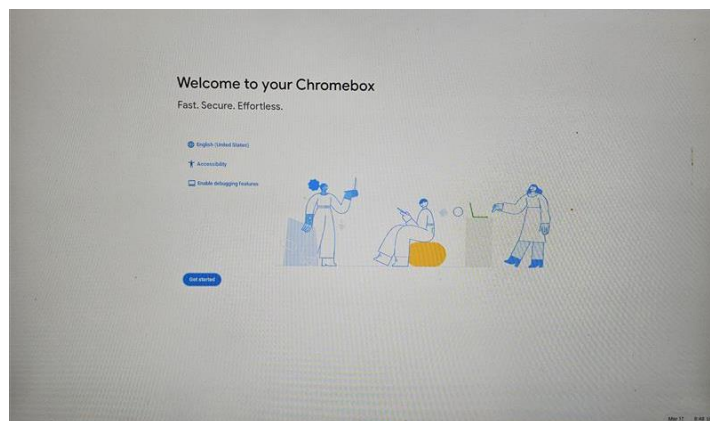
4) Press **Ctrl + D** when the following message appears. The system will reboot again.



5) Following messages will appear during the process.

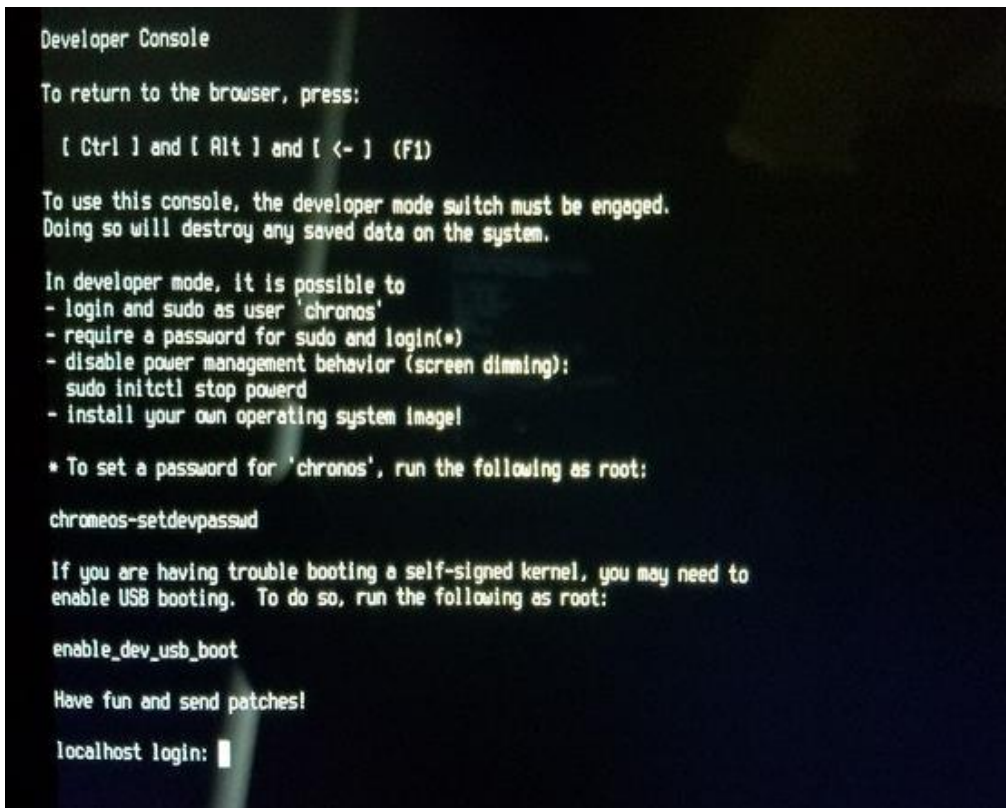


6) Please press **Ctrl + Alt + F2** to enter VT2 (Developer Console) when OOBЕ shows up.



## Enable USB Boot & Install RMA Shim

- 1) Enter Username & Password: **root / test0000**



```

Developer Console

To return to the browser, press:

  [ Ctrl ] and [ Alt ] and [ <- ] (F1)

To use this console, the developer mode switch must be engaged.
Doing so will destroy any saved data on the system.

In developer mode, it is possible to
- login and sudo as user 'chronos'
- require a password for sudo and login(*)
- disable power management behavior (screen dimming):
  sudo initctl stop powerd
- install your own operating system image!

* To set a password for 'chronos', run the following as root:

chromeos-setdevpasswd

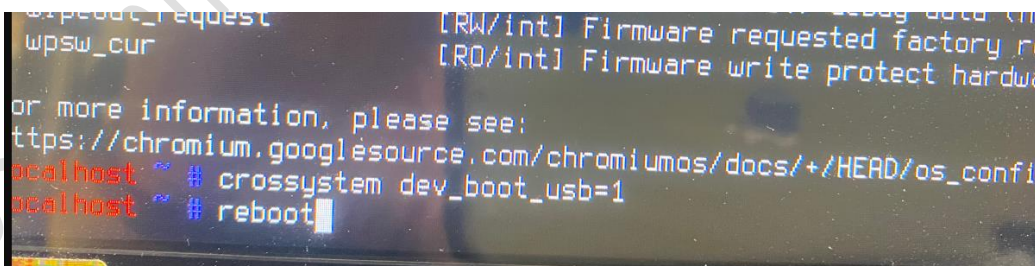
If you are having trouble booting a self-signed kernel, you may need to
enable USB booting. To do so, run the following as root:

enable_dev_usb_boot

Have fun and send patches!

localhost login: █
  
```

- 2) Enter command: **crossystem dev\_boot\_usb=1**, then plug in the USB drive, and then enter command: **reboot**



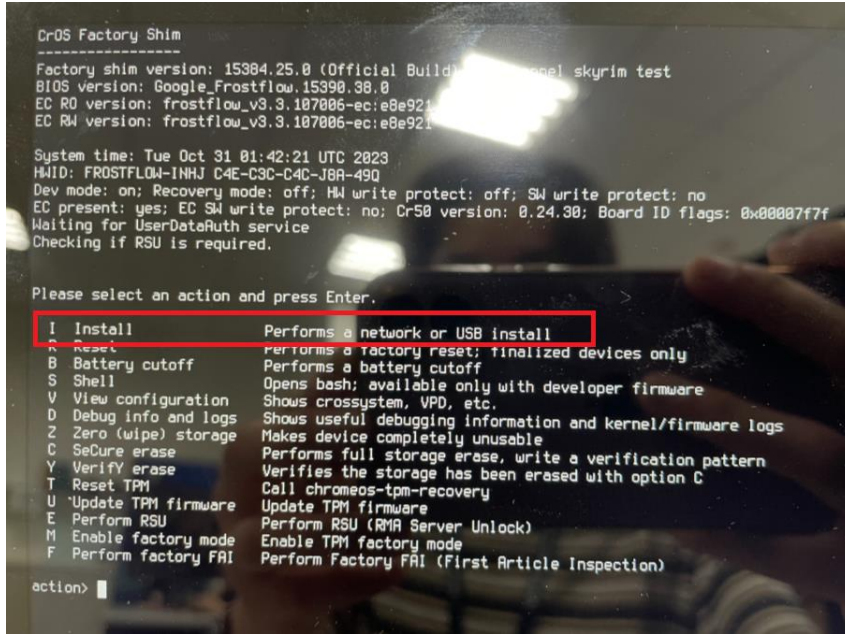
```

...boot_request ... debug data (m
wpsw_cur [RW/int] Firmware requested factory re
[RO/int] Firmware write protect hardwa

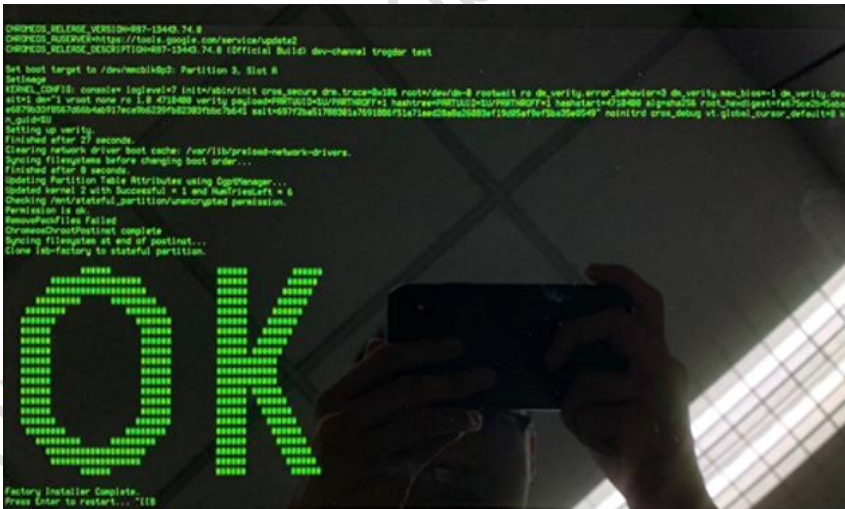
or more information, please see:
https://chromium.googlesource.com/chromiumos/docs/+HEAD/os_conf
localhost: ~ # crossystem dev_boot_usb=1
localhost: ~ # reboot █
  
```

- 3) During system reboot, continuously tap **Ctrl + U** (long press Ctrl, then tap U) to initiate the installation process.

- 4) Press **any key**, then select “**I**” and press **Enter** when the following screen appears. The RMA shim will be installed automatically.



- 5) Press **Enter** when “OK” shows up, the device will reboot to Factory Test Mode automatically.



- 6) Remove the USB drive and shutdown the system by long pressing power button or remove AC power adapter.
- 7) Remove the tweezers (or the jumper, or the paper clip) on Hardware Write Protection pin, then close the bottom cover.
- 8) When key part is replaced, the correct hardware ID (HWID) must be re-generated. Please Refer to “**RMA Shim Testing Procedure**” for final testing.



## Recovery process for new WIFI module, RAM, Mainboard

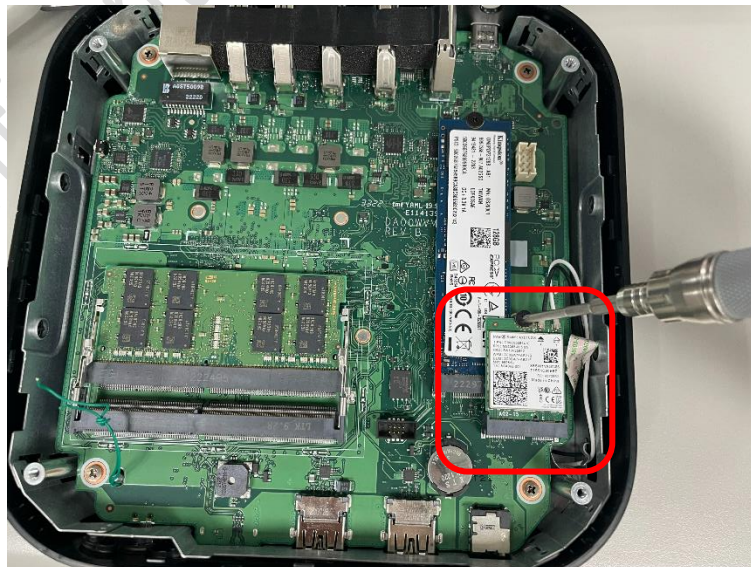
### 1. Preparation

Replace the WIFI module, RAM and Mainboard.

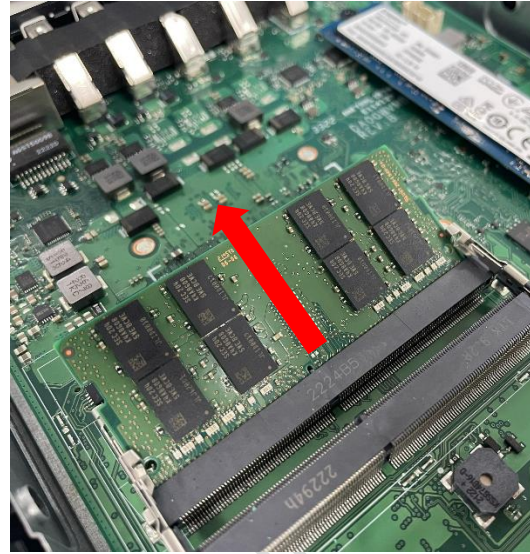
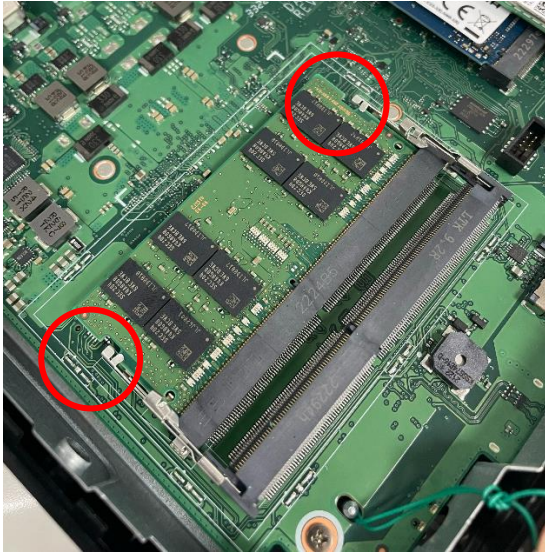
- 1) Remove the bottom cover and locate the **Wireless Card**.



- 2) Remove the **Wireless Card** as shown.



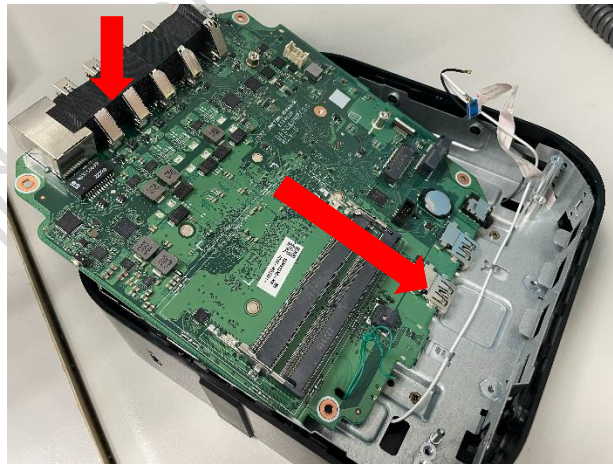
3) Remove the **RAM**.



4) Remove the following other component(s):

- M.2 SSD (if one is installed)
- Fan module
- Heatsink

5) Replace the **mainboard**. Align and place the motherboard in the chassis as shown.



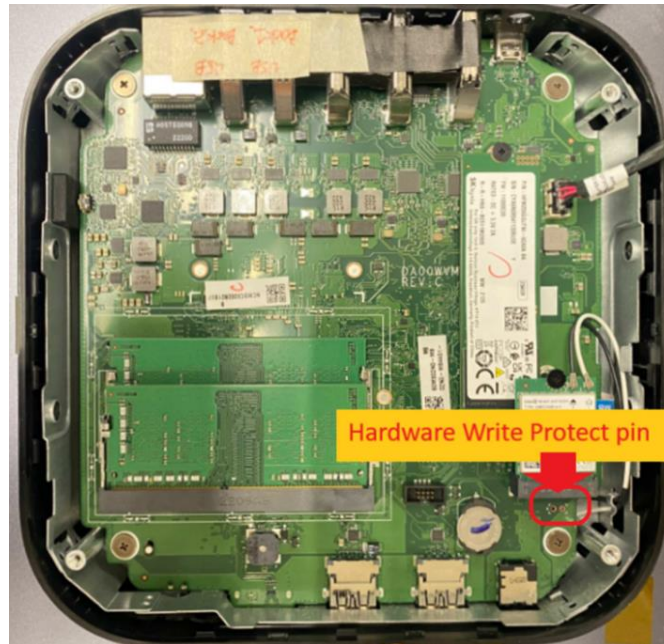
6) Install the rest of the component(s) including new **WIFI module** and new **RAM**



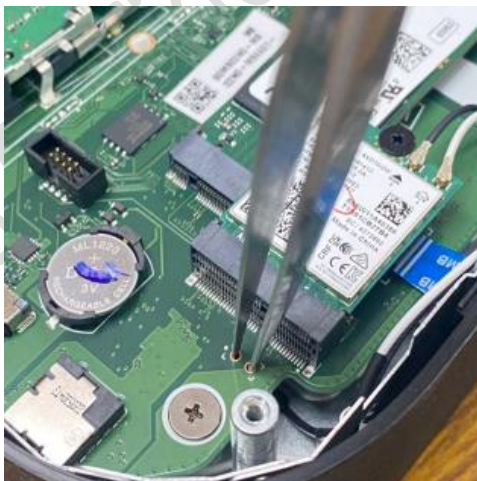
## 2. Disable Hardware Write Protection

Hardware Write Protection needs to be disabled before installing the RMA shim on a Chromebox. Please ensure that the device is powered off and that the AC power cord is unplugged before proceeding with the following steps.

- 1) Locate the **Write Protection Pin**.

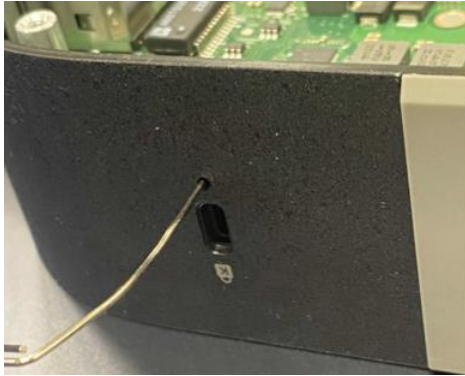


- 2) Short the pin to disable hardware write protection. You can use **tweezers**, a **jumper** or a **paper clip**.

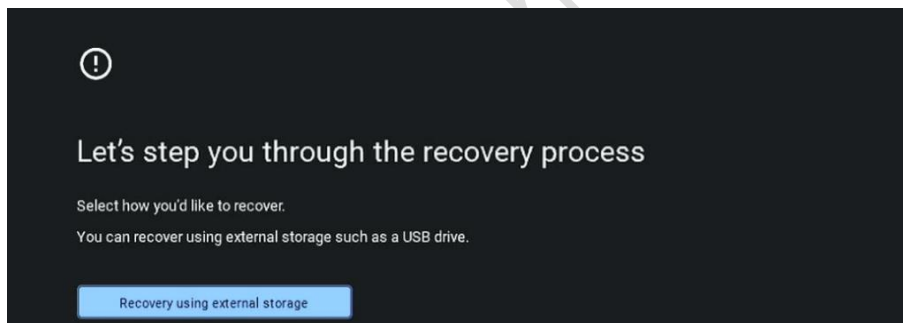


### 3. Enter Developer Mode (DEV Mode)

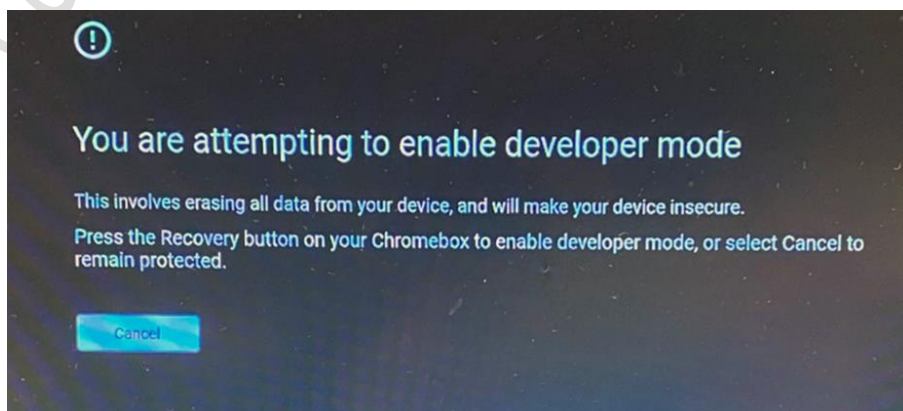
- 1) Connect to AC power, press and hold **Recovery Button** with a paper clip, and then press **Power Button** to power on the device.



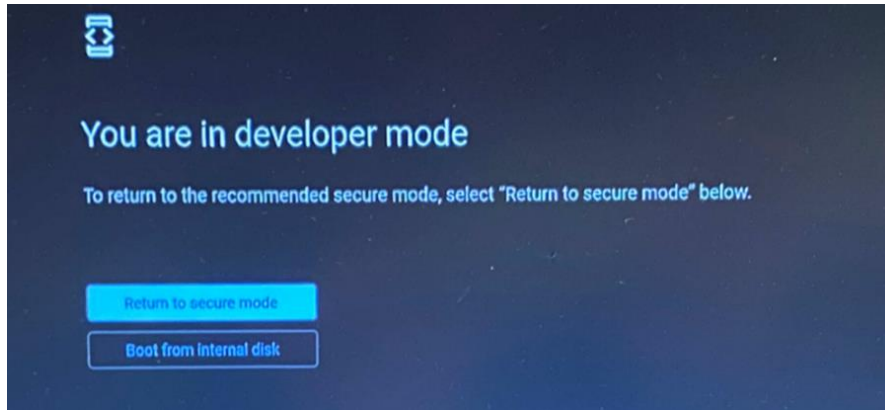
- 2) Press **Ctrl + D** when the following message appears.



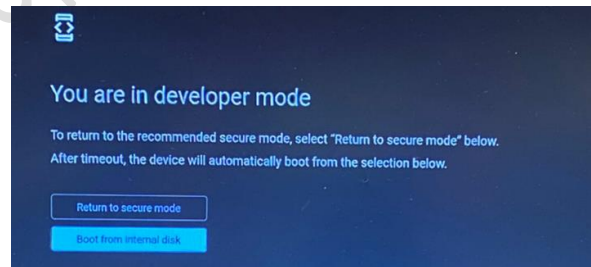
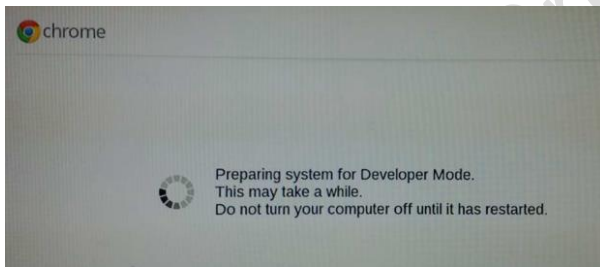
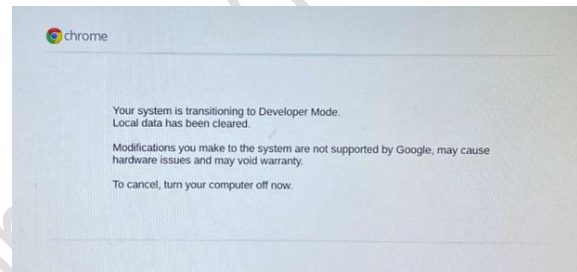
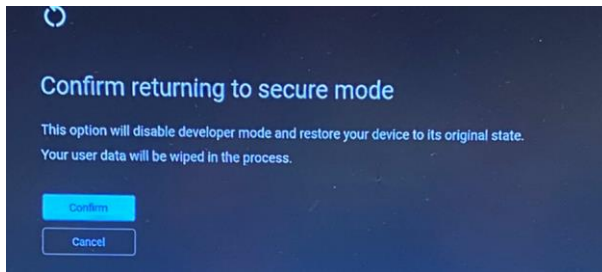
- 3) Press **Recovery Button** with a paper clip when the following message appears. The system will reboot automatically.



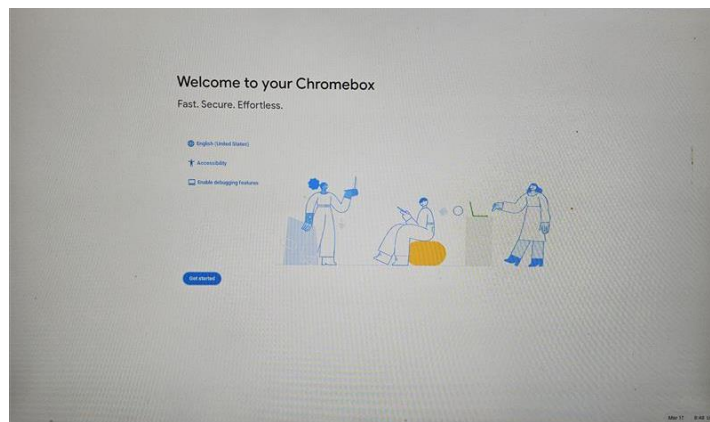
4) Press **Ctrl + D** when the following message appears. The system will reboot again.



5) Following messages will appear during the process.



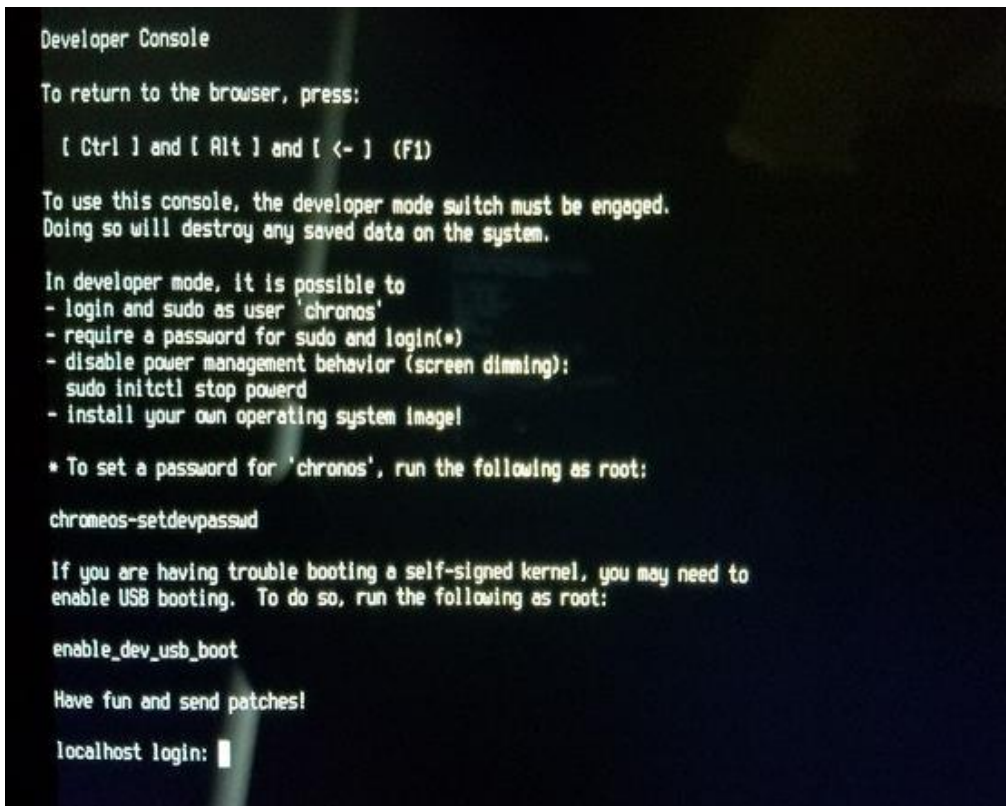
6) Please press **Ctrl + Alt + F2** to enter VT2 (Developer Console) when OOBЕ shows up.





## 4. Enable USB Boot & Install RMA Shim

- 1) Enter Username & Password: **root / test0000**



```

Developer Console

To return to the browser, press:

  [ Ctrl ] and [ Alt ] and [ <- ] (F1)

To use this console, the developer mode switch must be engaged.
Doing so will destroy any saved data on the system.

In developer mode, it is possible to
- login and sudo as user 'chronos'
- require a password for sudo and login(*)
- disable power management behavior (screen dimming):
  sudo initctl stop powerd
- install your own operating system image!

* To set a password for 'chronos', run the following as root:

chromeos-setdevpasswd

If you are having trouble booting a self-signed kernel, you may need to
enable USB booting. To do so, run the following as root:

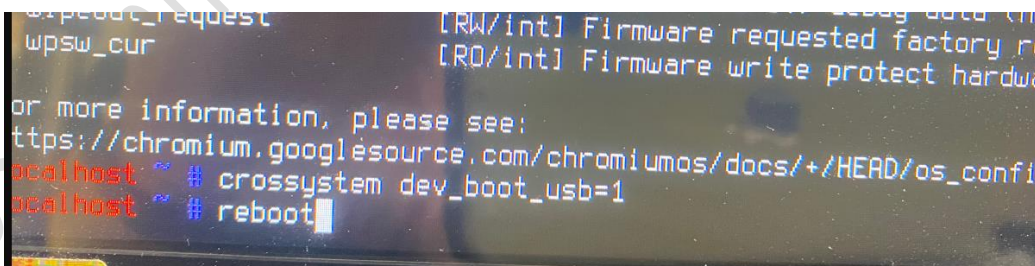
enable_dev_usb_boot

Have fun and send patches!

localhost login: █

```

- 2) Enter command: **crossystem dev\_boot\_usb=1**, then plug in the USB drive, and then enter command: **reboot**



```

...
wpsw_cur [RW/int] Firmware requested factory re
[RO/int] Firmware write protect hardwa
or more information, please see:
https://chromium.googlesource.com/chromiumos/docs/+HEAD/os_conf
localhost: ~ # crossystem dev_boot_usb=1
localhost: ~ # reboot █

```

- 3) During system reboot, continuously tap **Ctrl + U** (long press Ctrl, then tap U) to initiate the installation process.



## Recovery process for replacing new SSD only / new SSD and new mainboard

If you are replacing a **new SSD** on the original mainboard, please follow below steps to install recovery OS and enable USB boot-up for running RMA shim flow.

If you purchased both **new SSD** and **new mainboard**, please **replace the SSD first** and install recovery OS, then proceed to run RMA shim flow. After completion, if the defect still exists, replace mainboard and run RMA shim directly.

### 1. Preparation

- 1) Get another Chromebox / Chromebook, or a Windows / Mac computer with Chrome installed to create RMA shim USB drive.
- 2) A USB flash drive with a capacity of at least 8 GB and make sure it can be emptied. If your Chromebox has a SD card slot, you can also use a SD card instead.
- 3) Remove all external devices on the Chromebox which needs to be restored but you can keep the power connected.
- 4) Recovery will permanently erase everything on your Chromebox 's hard drive, including files you've downloaded. If possible, back up your files before restoring your Chromebook.

### 2. Download device Recovery image

- 1) Search device name and download the latest version of Recovery image from Google [Chromium Dash](#).

Serving Builds ChromeOS

Newer than most versions
  Most common version
  Older minor version
  Older major version

View by Codename View by Brand Name

Last updated 21:26 PT, 2024-02-01

Keep enterprise pin columns expanded
  Show Automatic Update Eligible
  Show Automatic Update Ineligible

Search multiple devices or board names, comma separated

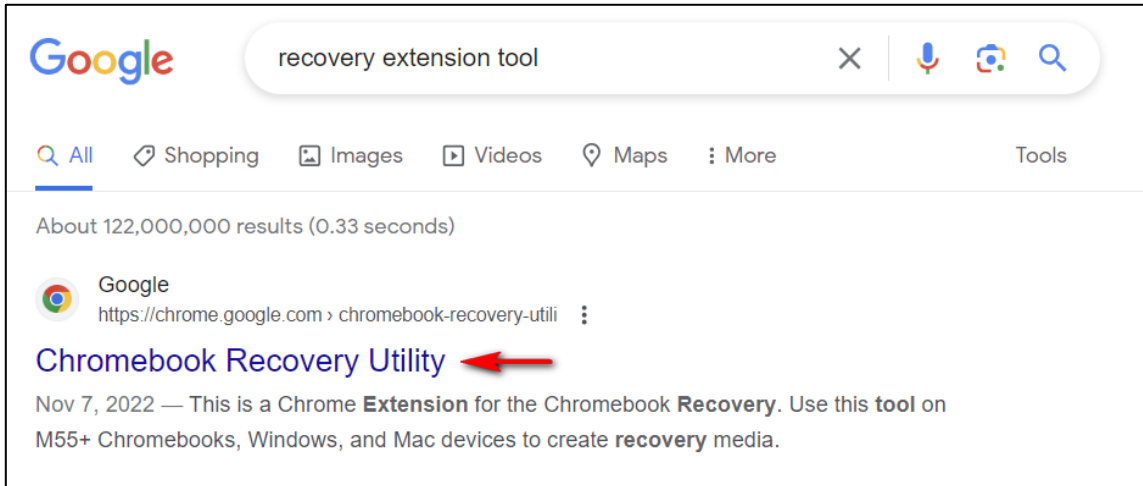
ASUS Chromebox 5 (CN67)

Codename	Stable	Beta	Dev	Canary	Brand Names	First Release	Automatic Updates Until	Recovery Images
<b>brask</b>								
kuldax	120.0.6099.272 15662.88.0	121.0.6167.131 15699.45.0	122.0.6261.13 15753.10.0	123.0.6268.0 15763.0.0	<a href="#">View</a>	M111	2032-06	<a href="#">120</a> <a href="#">119</a> <a href="#">118</a> <a href="#">117</a> <a href="#">116</a> <a href="#">115</a> <a href="#">114</a> <a href="#">113</a>

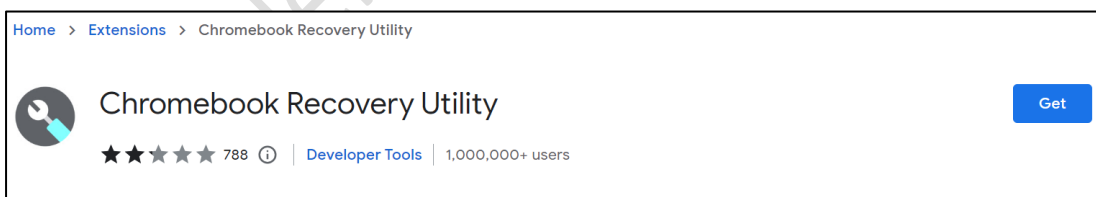
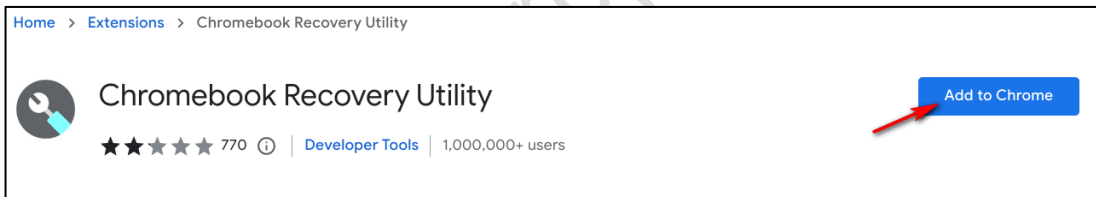


### 3. Create Recovery USB drive

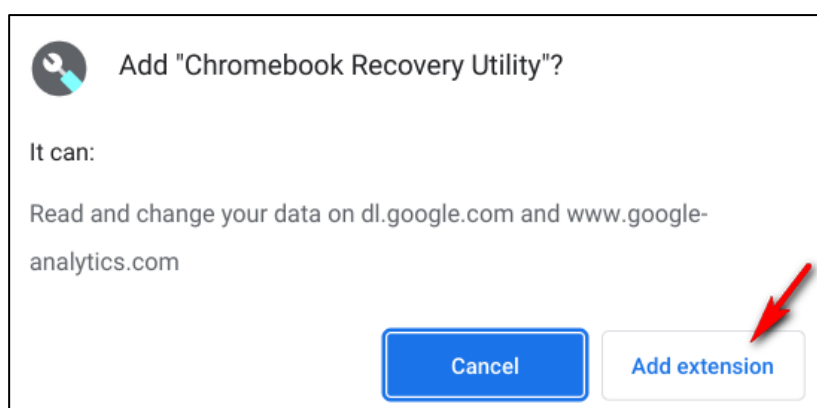
- 1) Please download **Chromebook Recovery Utility** [here](#) or open a web browser and search for **recovery extension tool**.





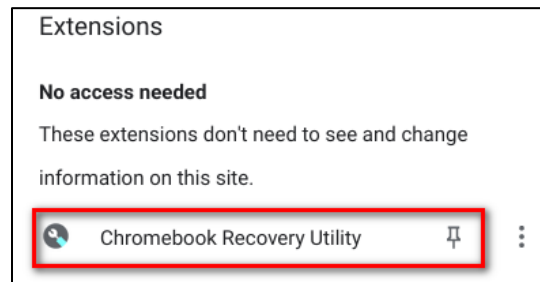
- 2) Click **Add to Chrome** or **Get** if you're using Edge.



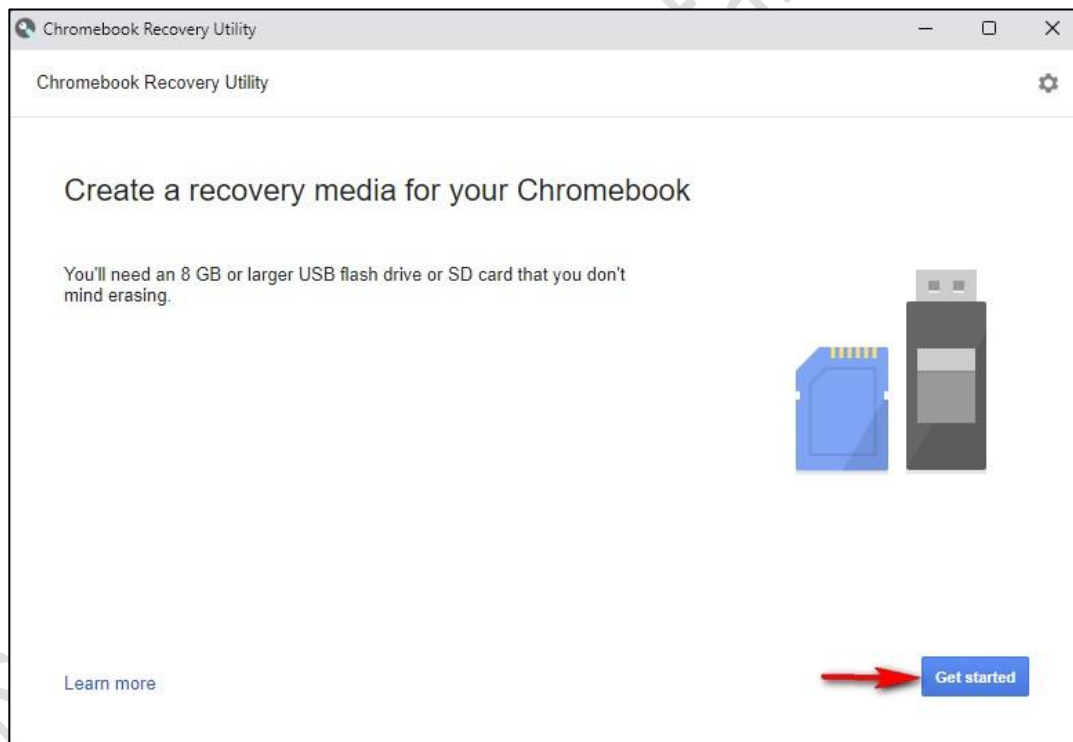
- 3) Click **Add extension**.



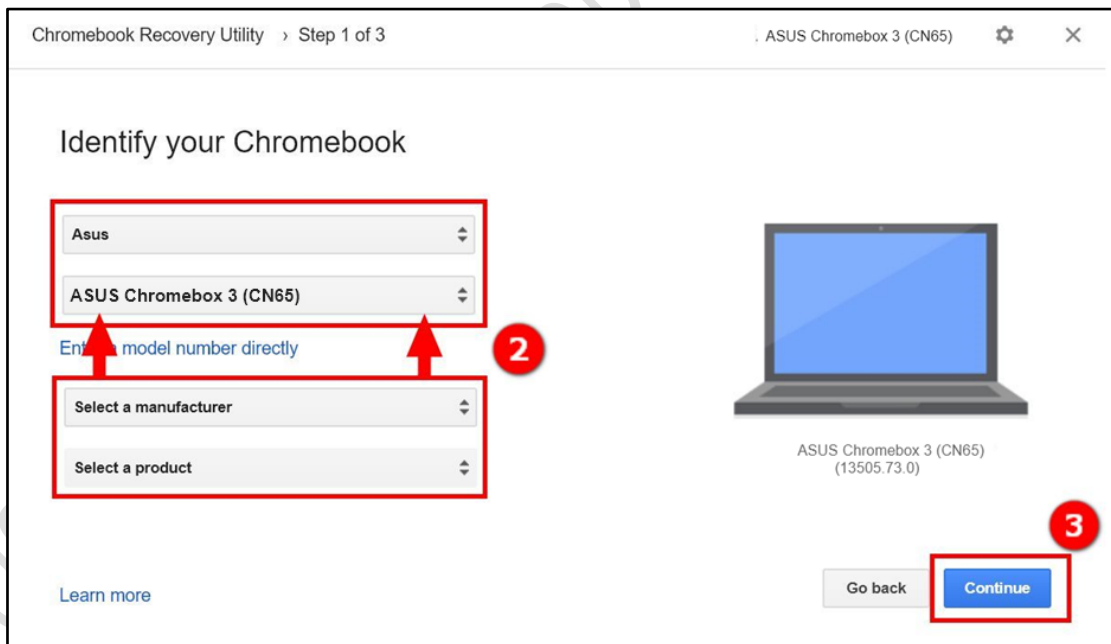
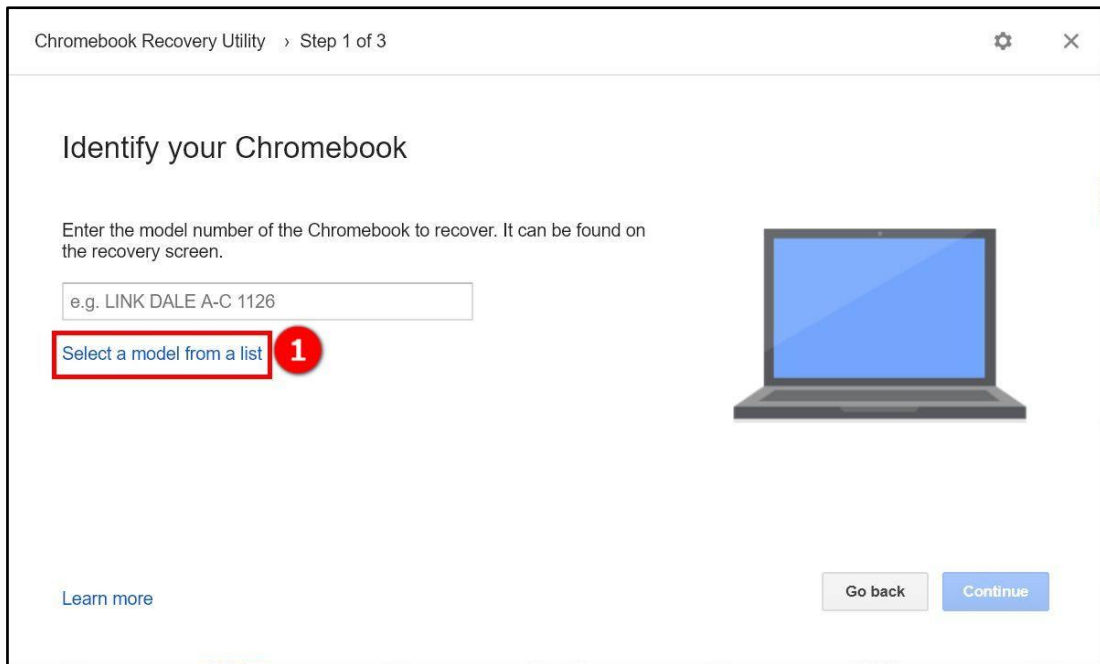
- 4) Click extension icon  or  on the browser, find and click **Chromebook Recovery Utility**.



- 5) Insert the USB drive and then click **Get started**.

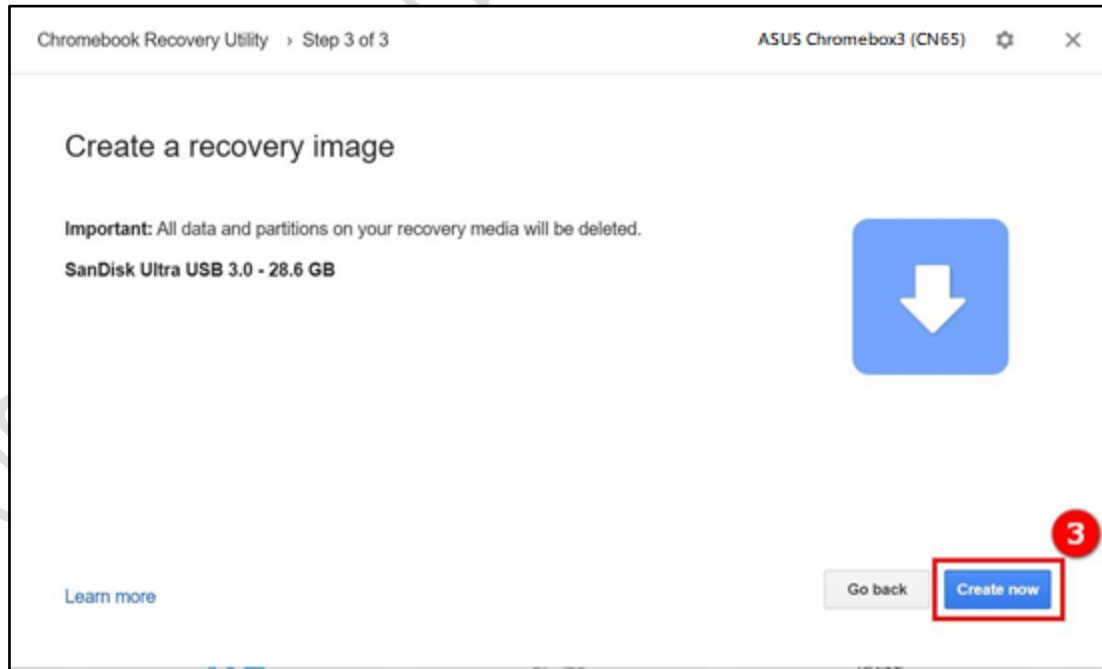
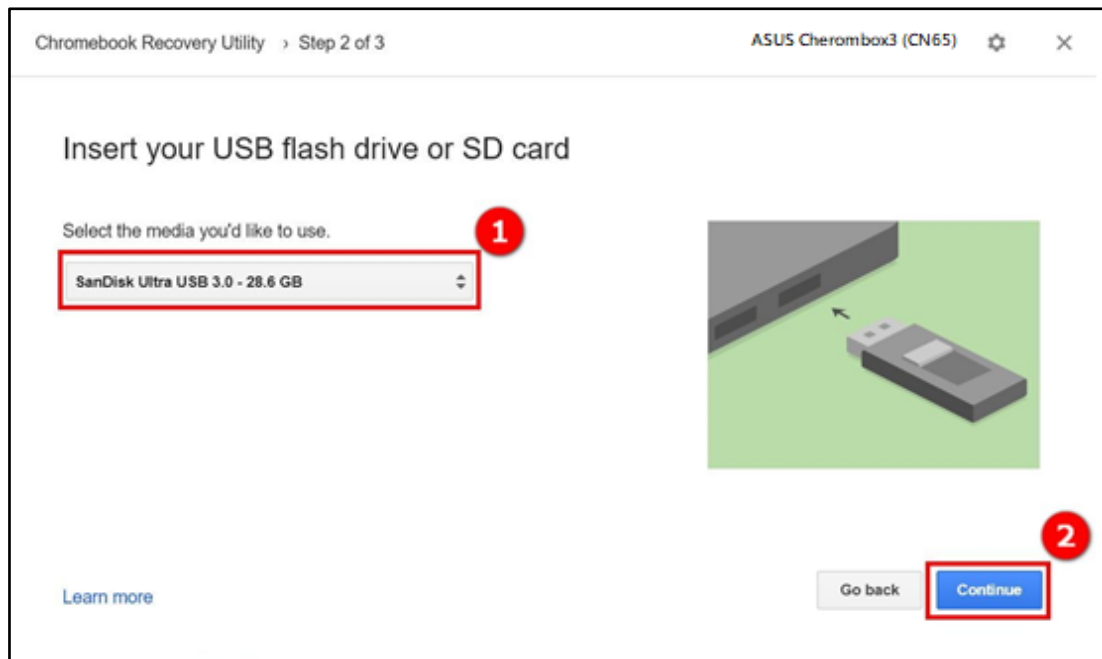


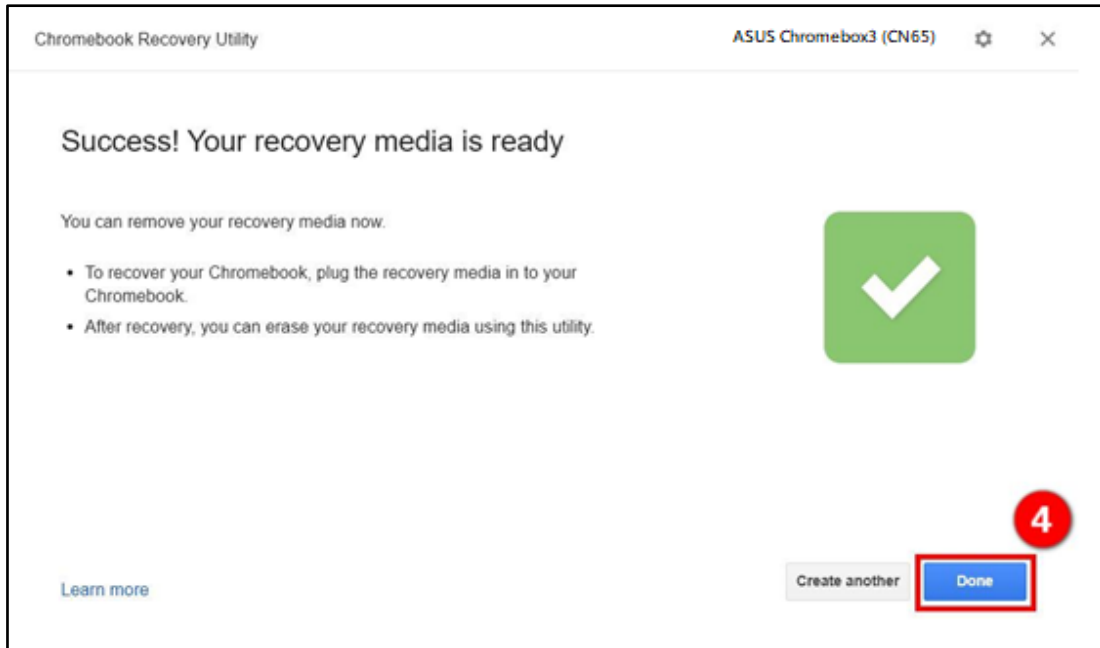
- 6) Click ① **Select a model from a list**, find ② **The name of the Chromebook model** you want to restore, and click ③ **Continue**.



- 7) Click ① **USB Flash inserted**, and click ② **Continue**. Click ③ **Create now\***. Click ④ **Done** to finish the creation.

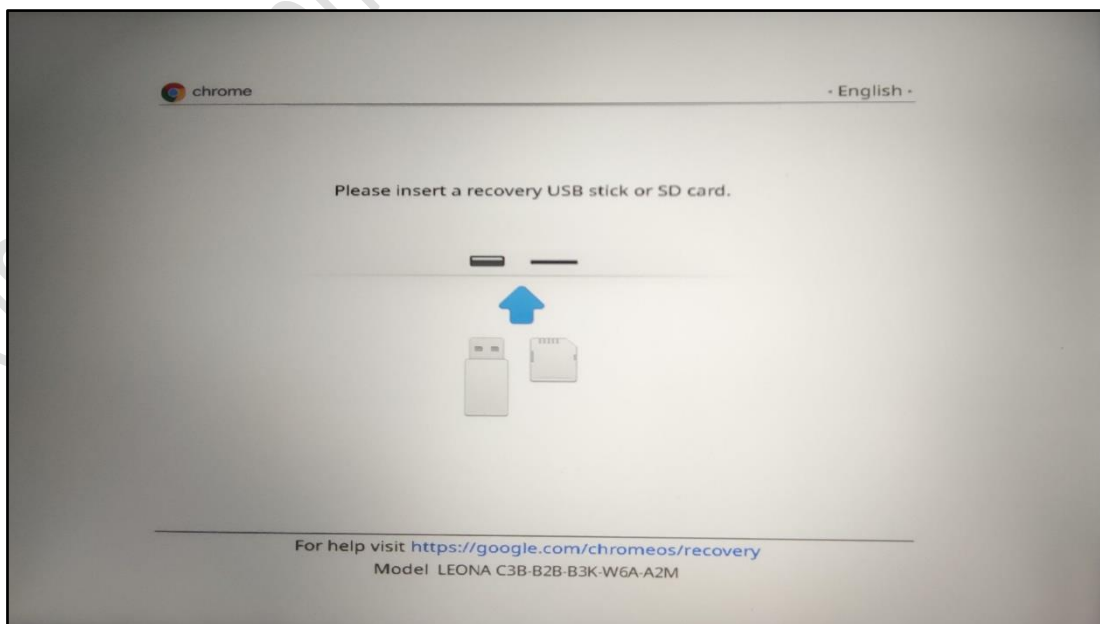
\*The process takes a while and please don't shutdown the system or **all the data and partitions on this USB drive will be deleted**.





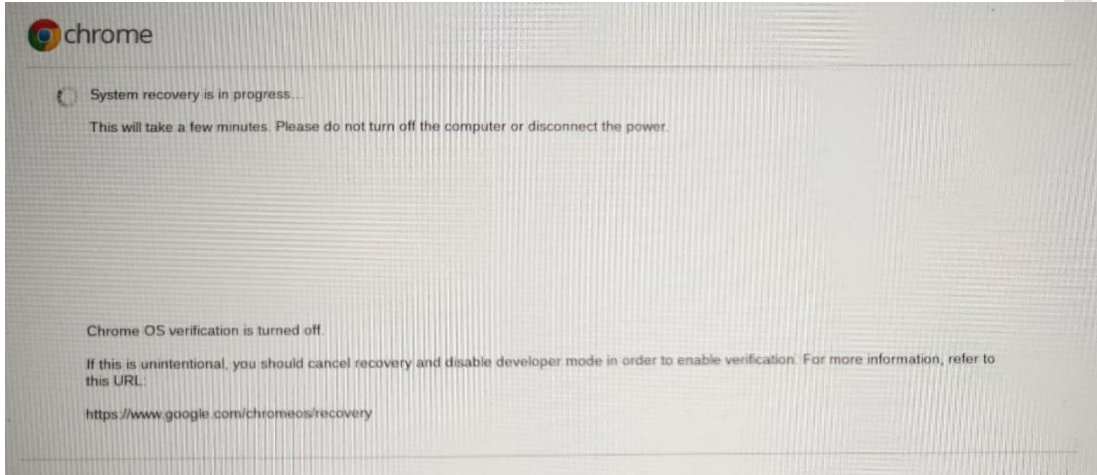
## 4. Enter recovery mode

Turn off Chromebox. Using a paper clip or similar object, press and hold the recovery button. Press the Power button to turn the Chromebox back on. When you see a message on screen, release the recovery button.

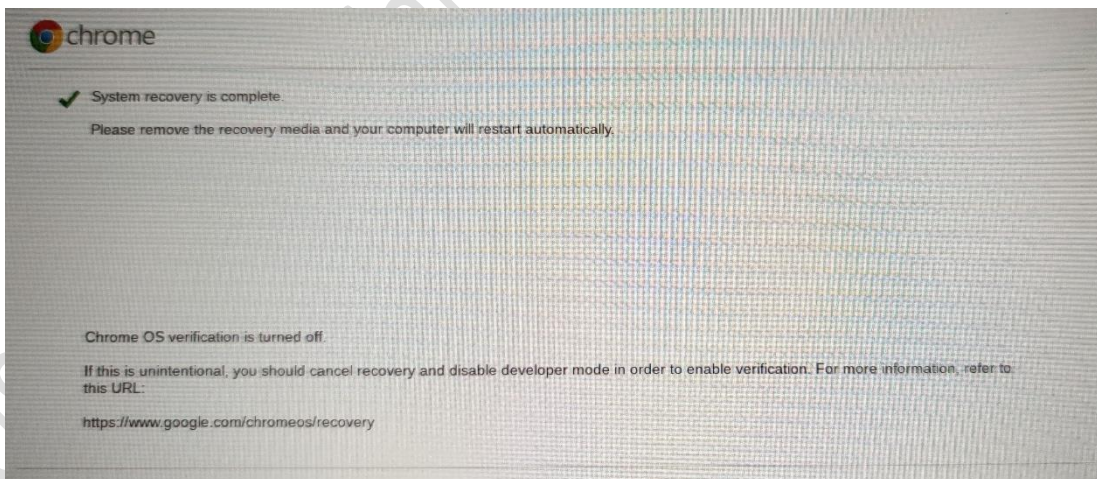


## 5. Flash image

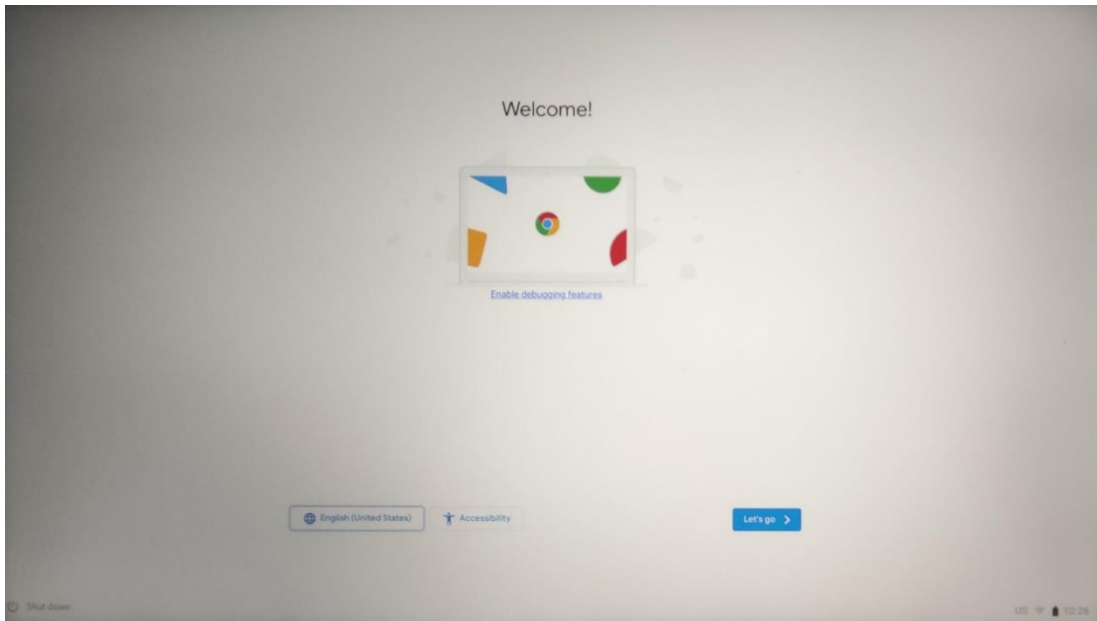
- 1) Insert the USB Flash into the ASUS Chromebox.
- 2) After the USB Flash is inserted, the restoration process will start automatically. Please wait patiently.



- 3) Restore is complete. Please unplug the USB Flash, and ASUS Chromebox will restart automatically.



4) The system has been restored.



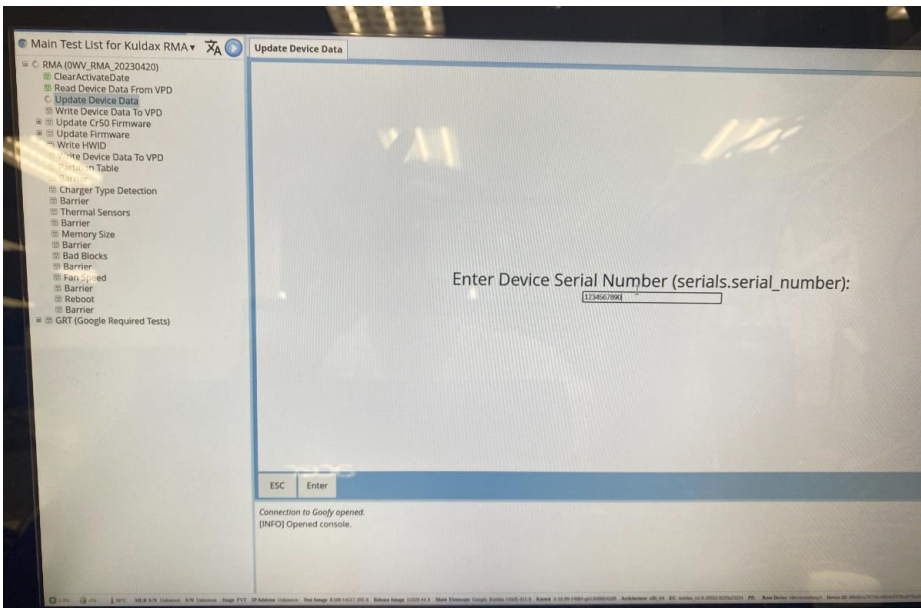
5) Power-off the device, then start to run [RMA shim flow](#)



# RMA Shim Testing Procedure

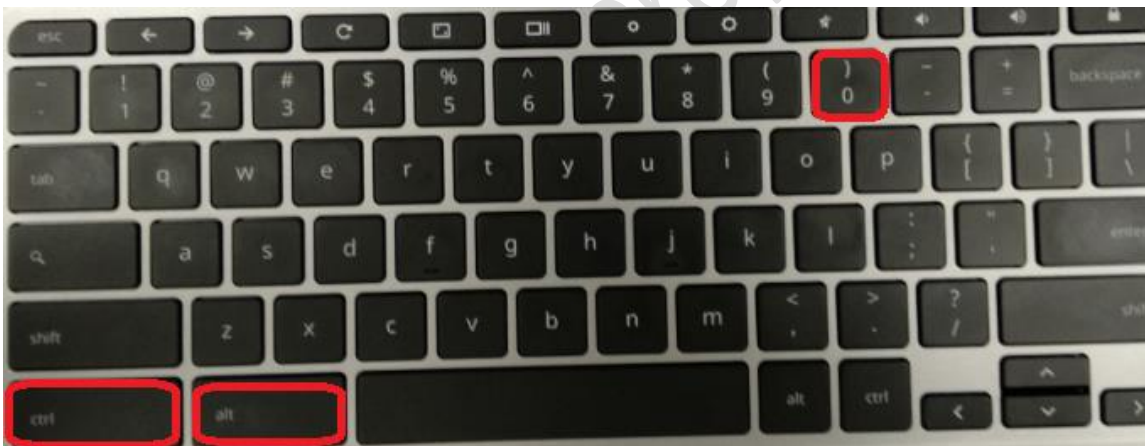
## 1) RMA FFT test:

Press power button to Start the Factory test mode:

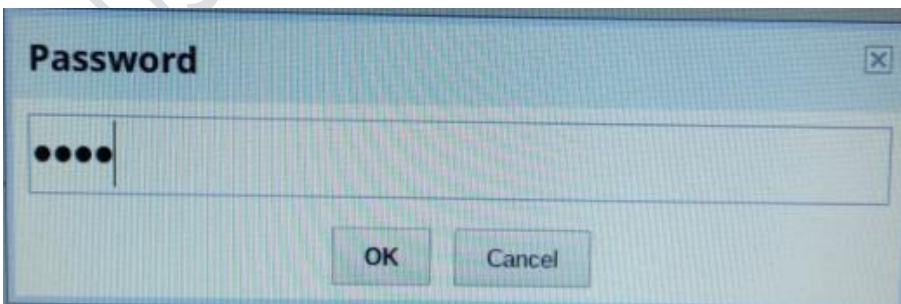


## 2) Start the Factory test

1. After press "ALT + CTRL + 0"

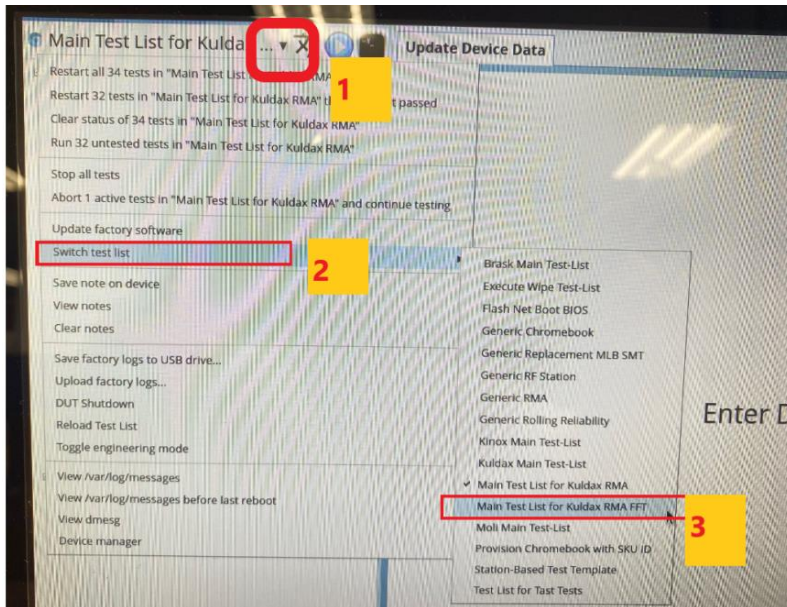


2. Password Enter: **cross**

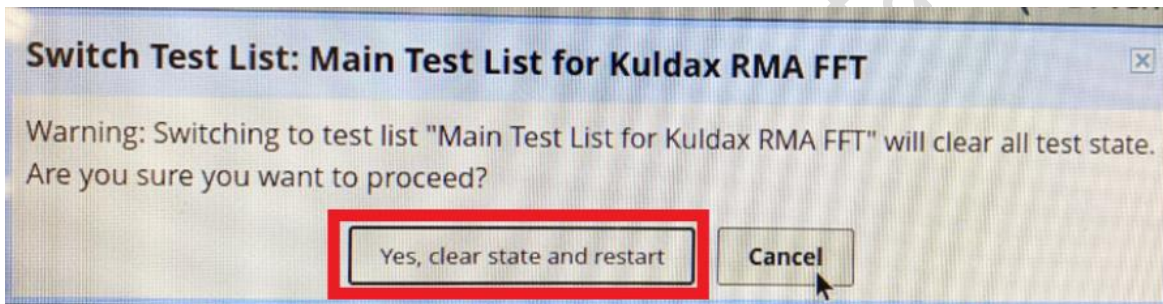


3. Switch test list "Main Test LIST for Kuldax RMA FFT".

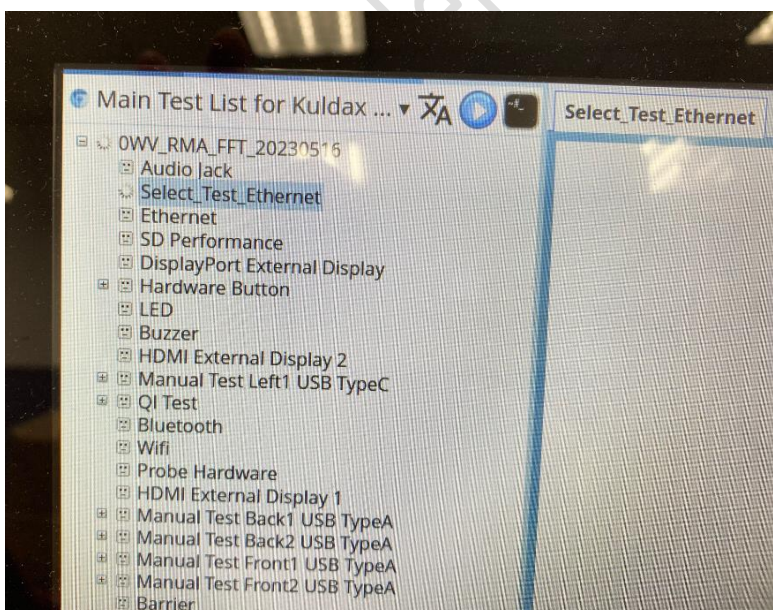




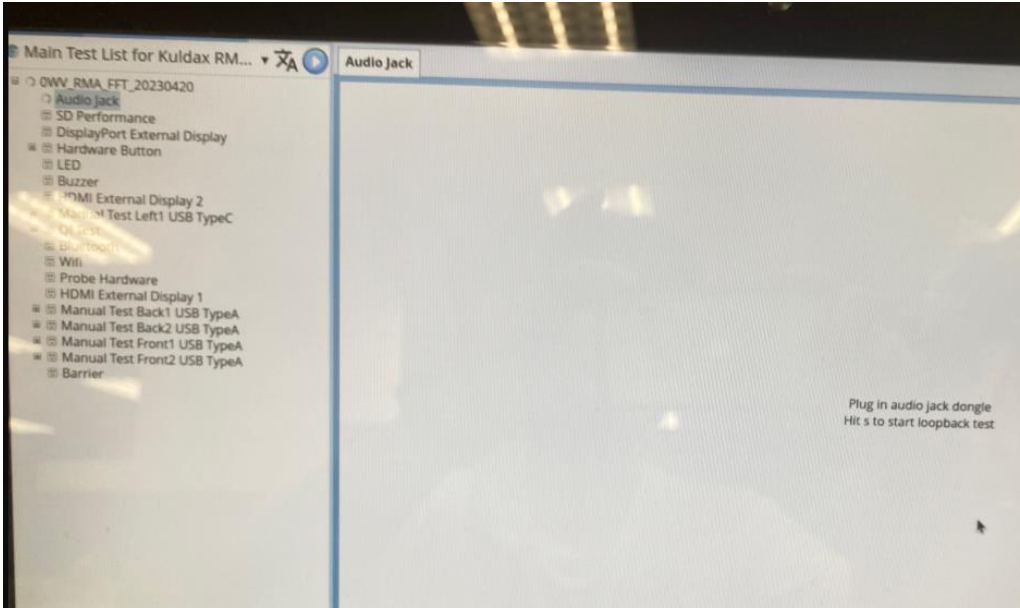
4. Select "Yes, clear state and restart" to switch to diagnostic tool.  
System changes test mode (Main Test LIST for Kuldax RMA FFT).



5. Main Test LIST for Kuldax RMA FFT:



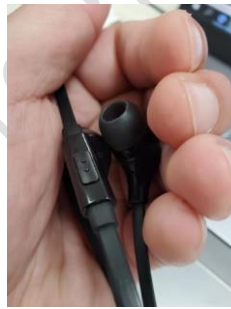
3) Audio jack test: plug Headphone test, press “S” to start.  
Use Headphone to test.



4) Plug Headphone to device and grip mic and speaker together before testing

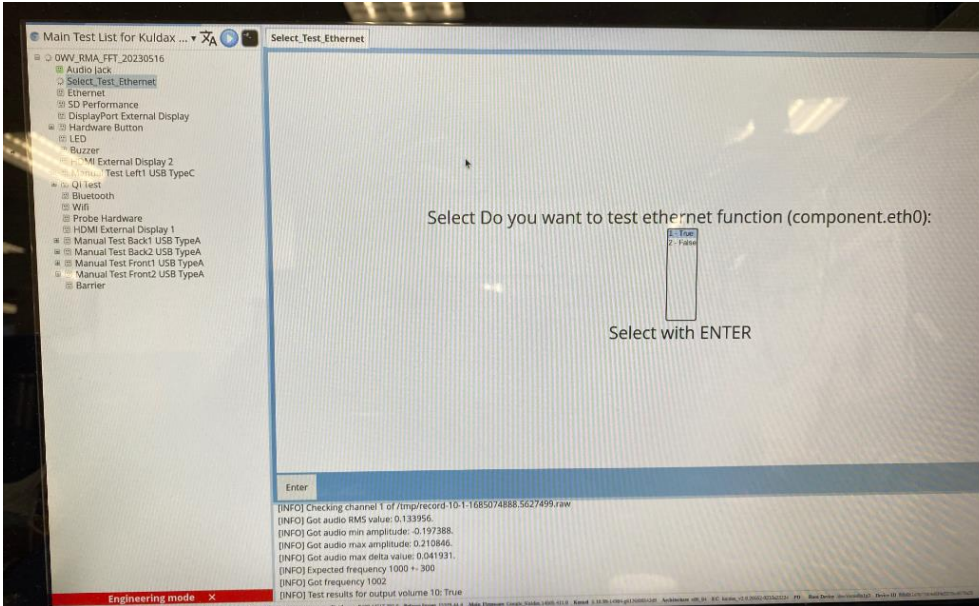


to

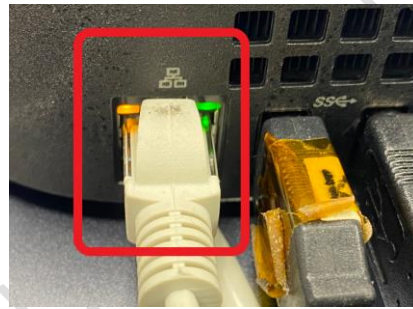
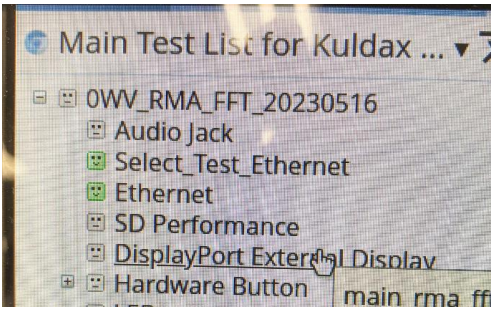


5) Ethernet test: use 100M/ADSL Ethernet.

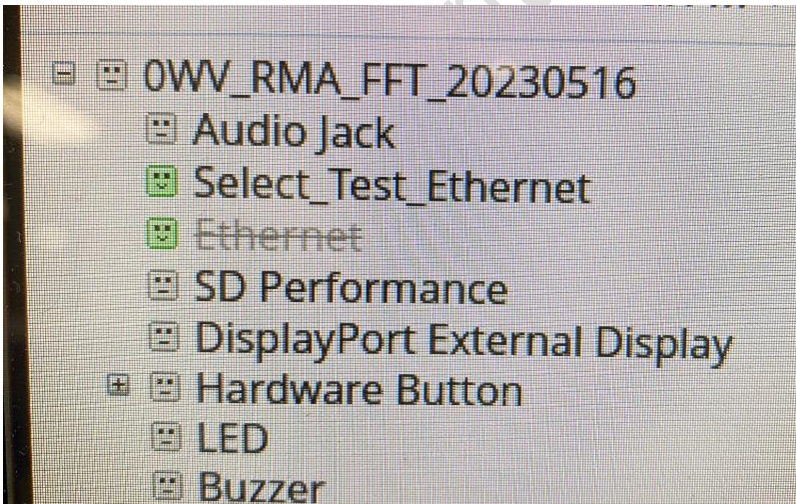




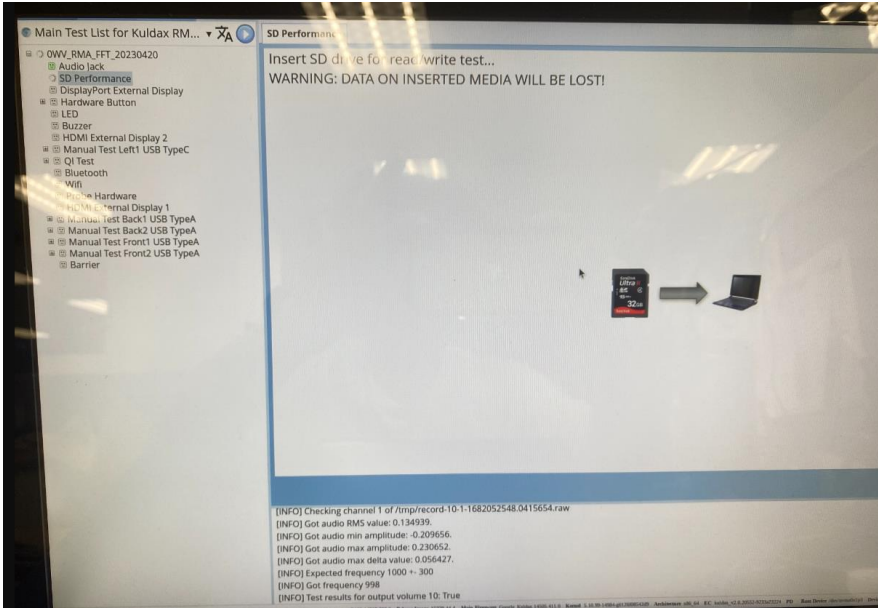
\*Select **True** to test, plug Ethernet LAN cable (100M ADSL) to test.



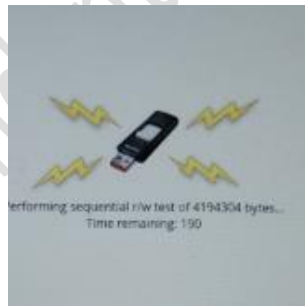
\*Select **False**: cancel Test.



6) SD Card Performance test.  
Use SD card to test.

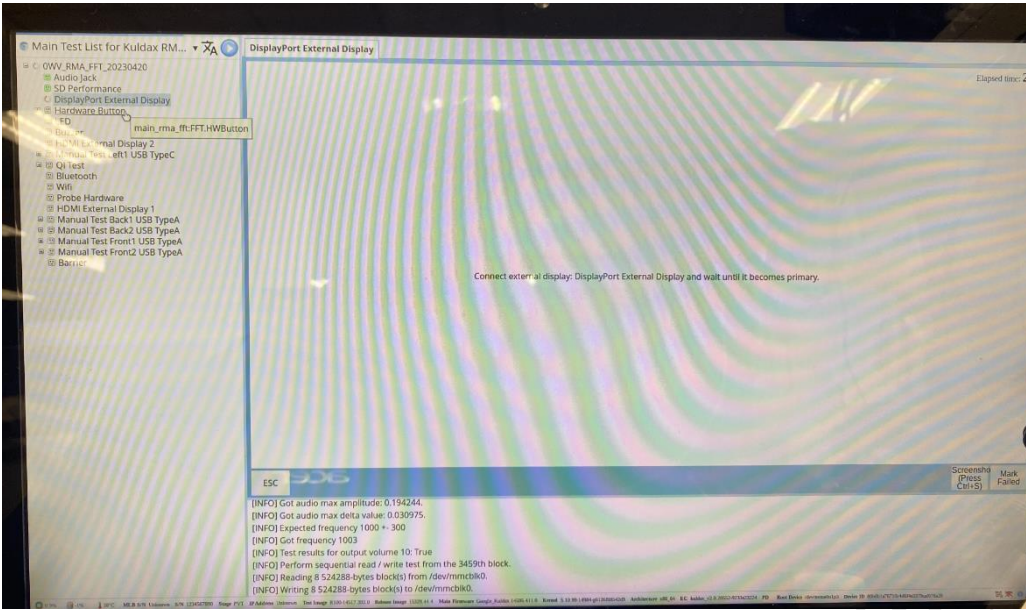


Performance Test:





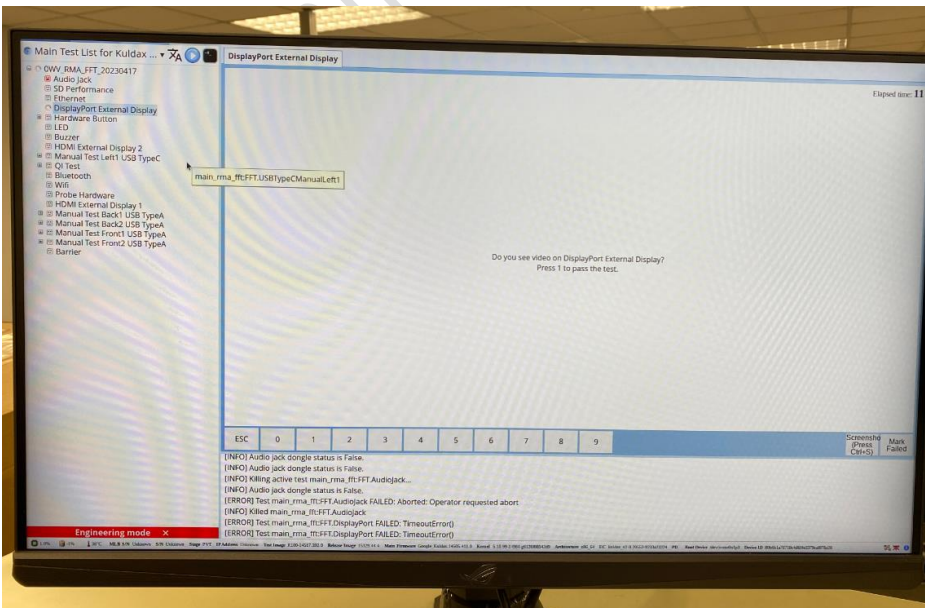
7) External Display Port (DP) to monitor.  
 Press the number(monitor) to pass the test item.



Use DP change HDMI cable.

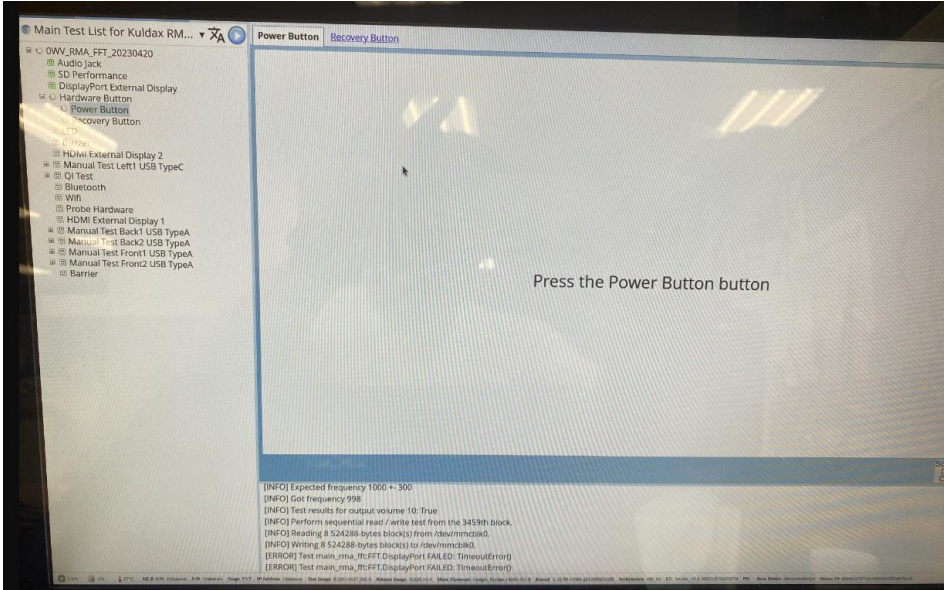


Press the number to pass the test item (monitor number ).

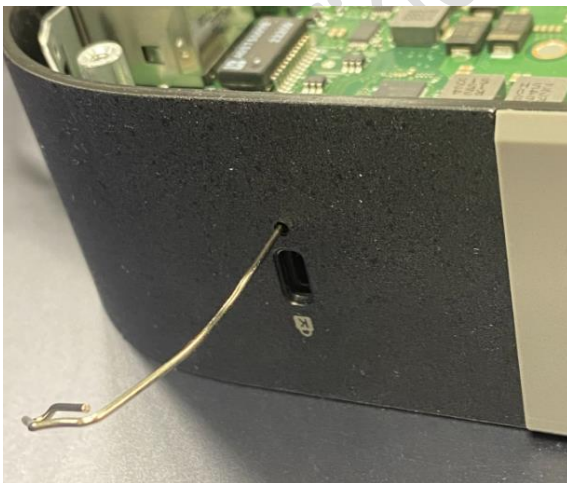
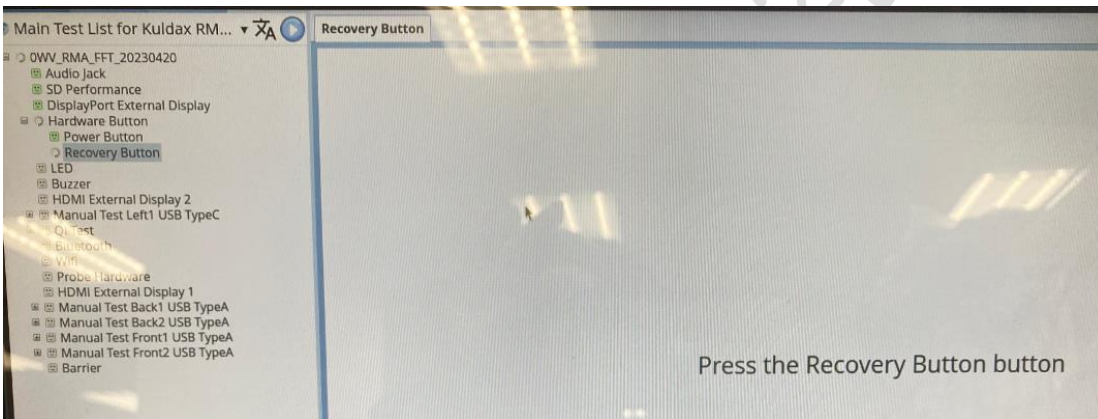


## 8) Hardware Test:

Press power button to test.

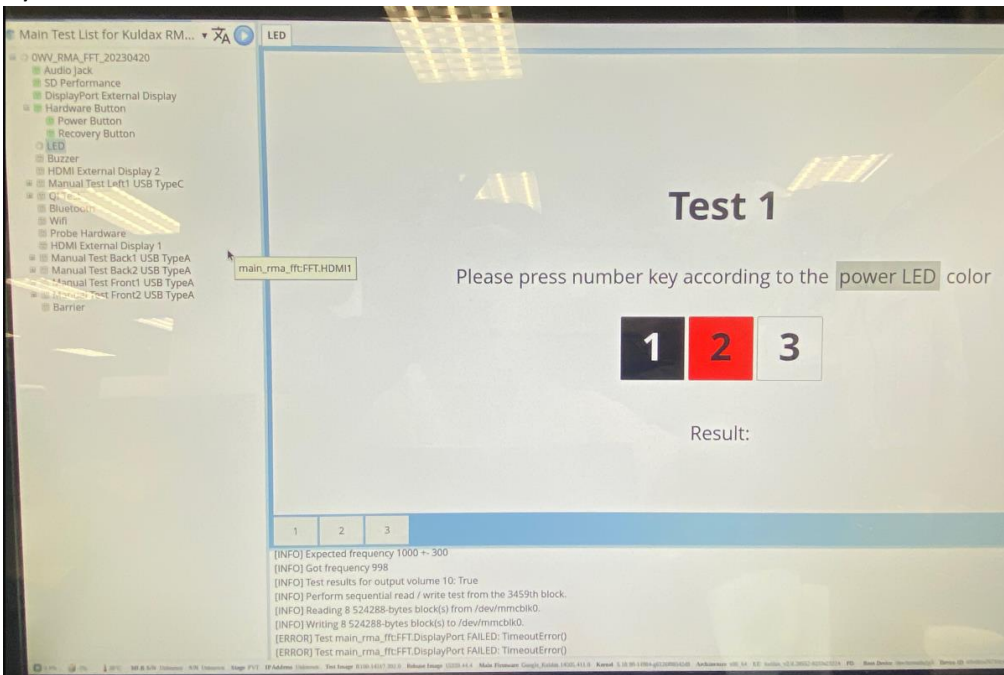


Press Recover button to test.





### 9) LED Test:

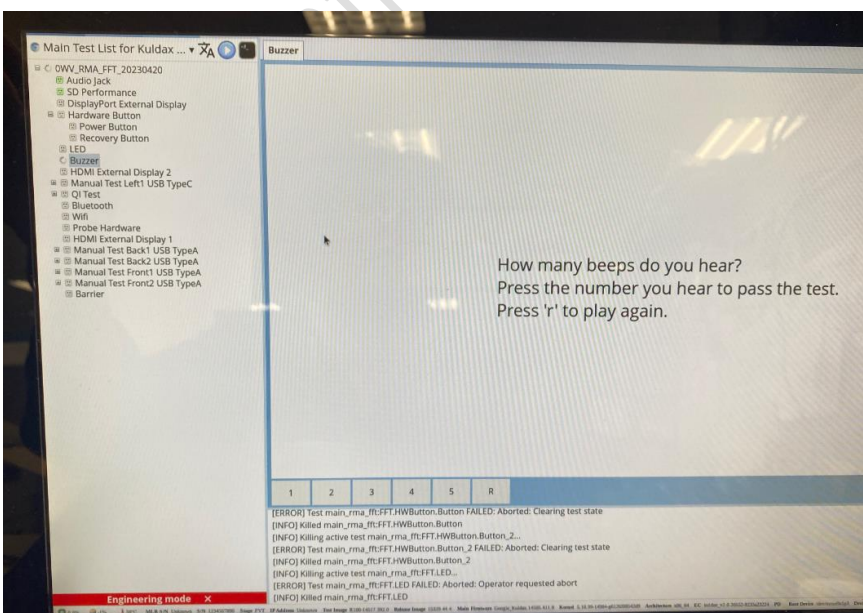


Check Power button LED Color.

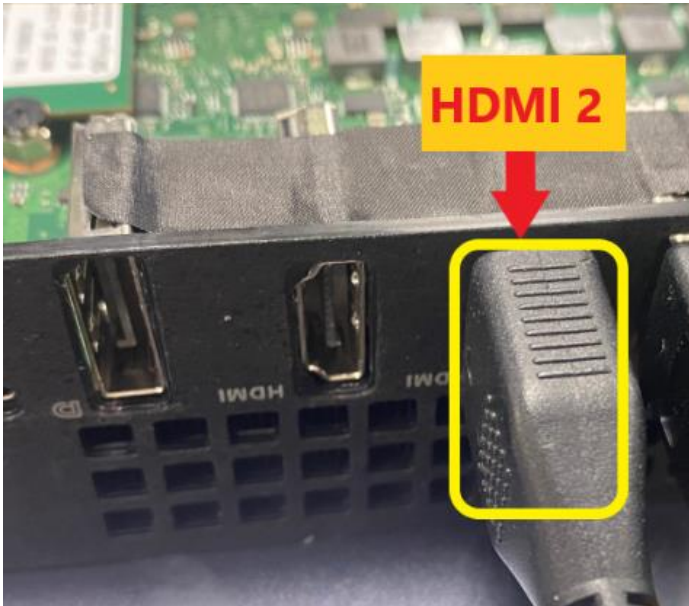
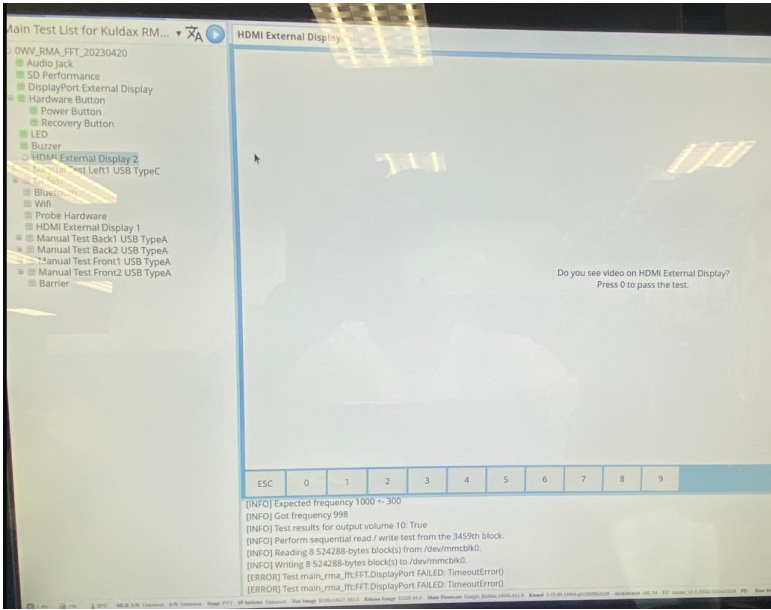


### 10) Buzzer test:

Press the K/B Space to test (press the number).

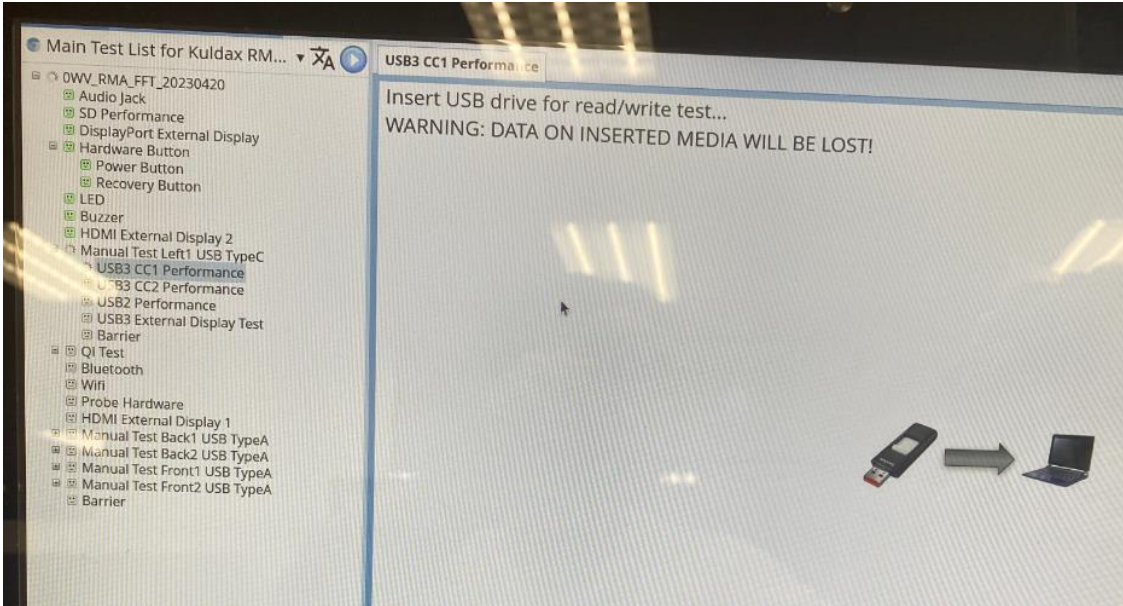


11) External Display test 1\_HDMI:  
Press the number to pass the test



12) Manual Test Back Type C Performance Test:



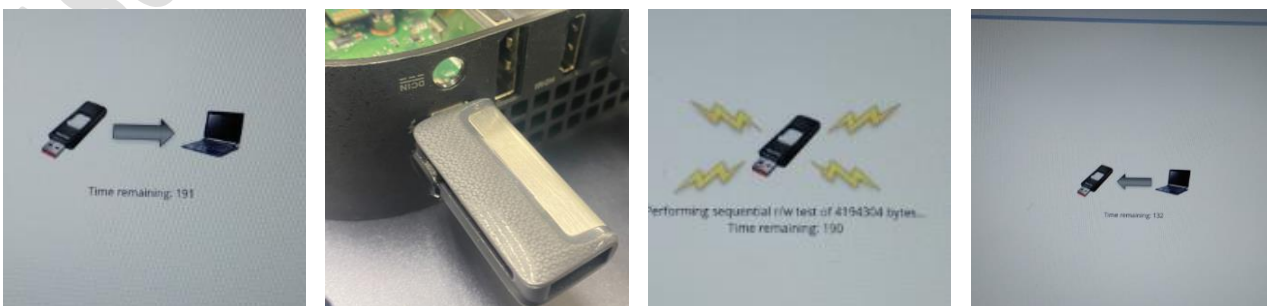


13) Manual Test Back Type C:

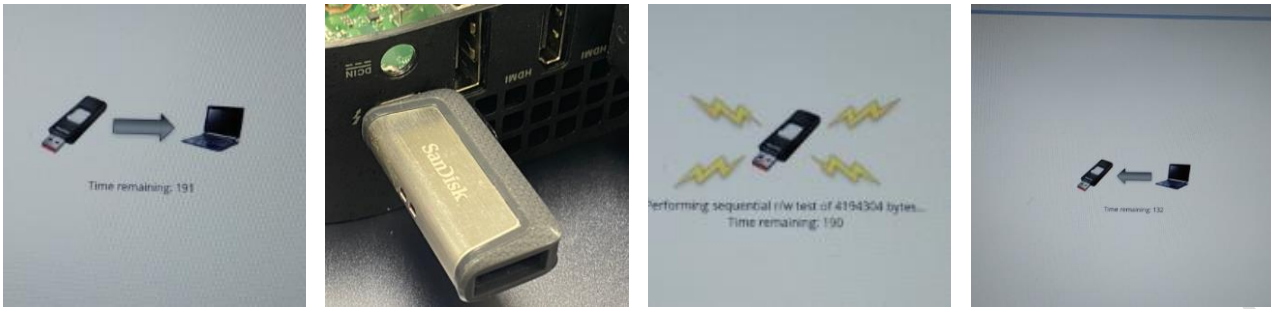
Use Type C device to test. (Type C USB Device, Type C to HDMI Cable, Type C to USB cable)



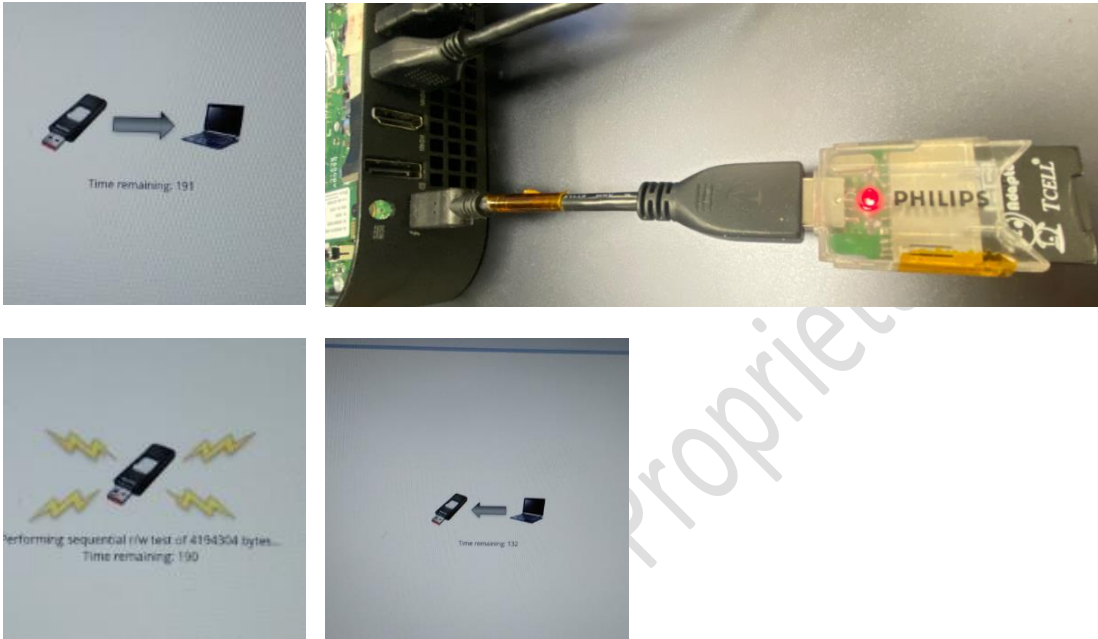
Insert Type C USB 3.0 device to Type C test.



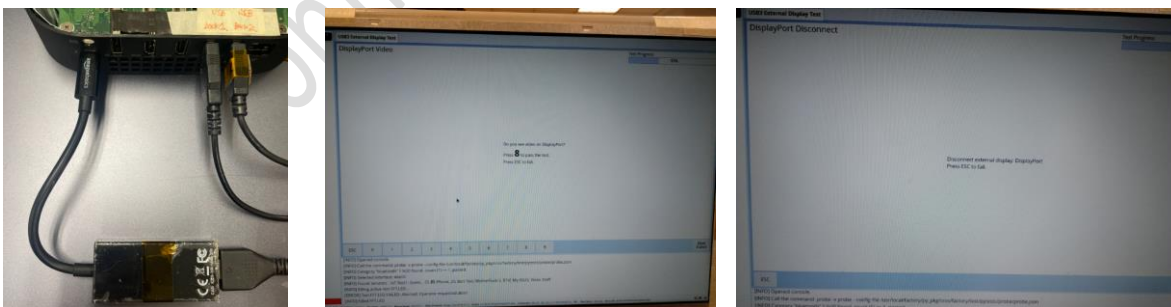
Insert USB 3.0 Type C disk to the machine device test. (Change Type C direction)



Insert USB 2.0 Type C disk device test.



External HDMI Type C disk to the machine device test.  
Press the number to pass the test



The single function test item can be bypassed if no test fixture. The install process also can be finished by switching back to FFT to finish "Finalize".

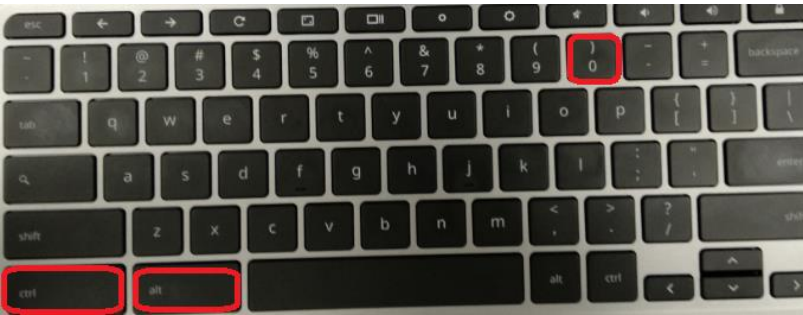
Abandon testing: If device is missing (Type C to HDMI device output monitor)



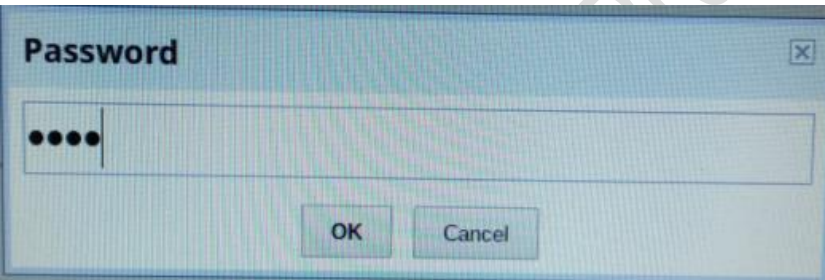


Type C to HDMI device

1. Press "ALT + CTRL + 0"

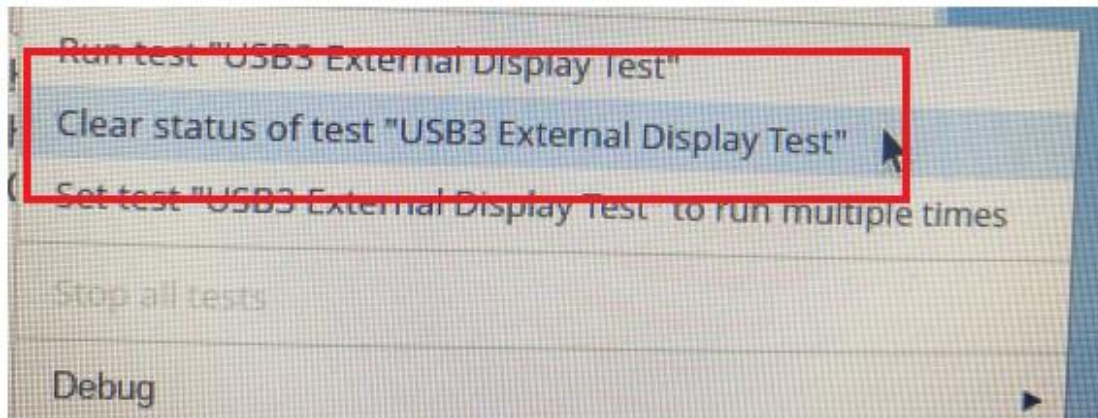


2. Enter password "cros" then click ok.



3. use mouse select test item "USB3 External Display"

4. Press mouse "Right" click Select "Clear status of test "usb3 external display test"

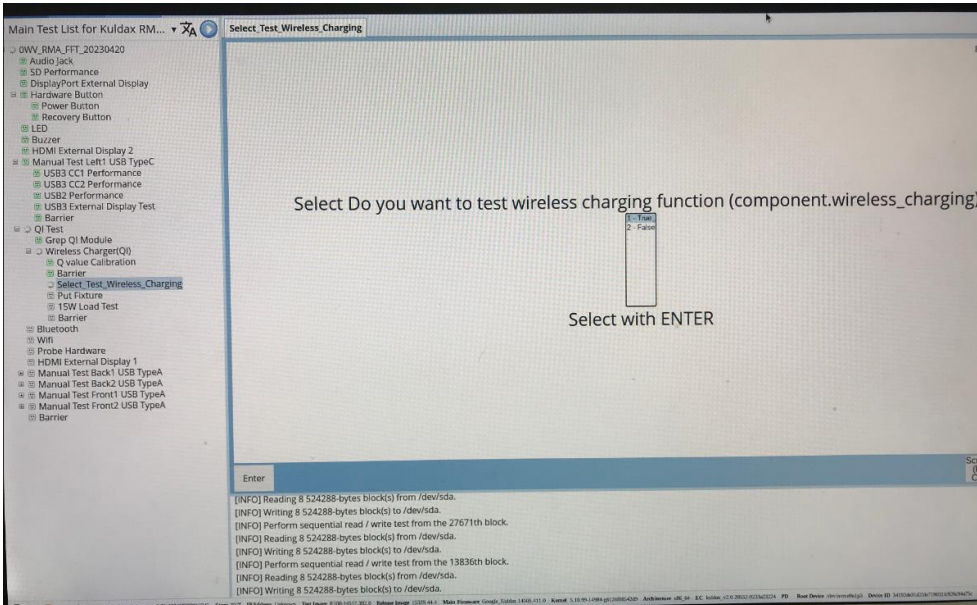


## 5. Abandon Type C to monitor testing

### 14) QI TEST: Wireless charging Test:

\* Select **True**: use special tools Test.

\* Select **False**: cancel test. (Machine is placed on the front to calibration QI data)



### 15) Select "True":

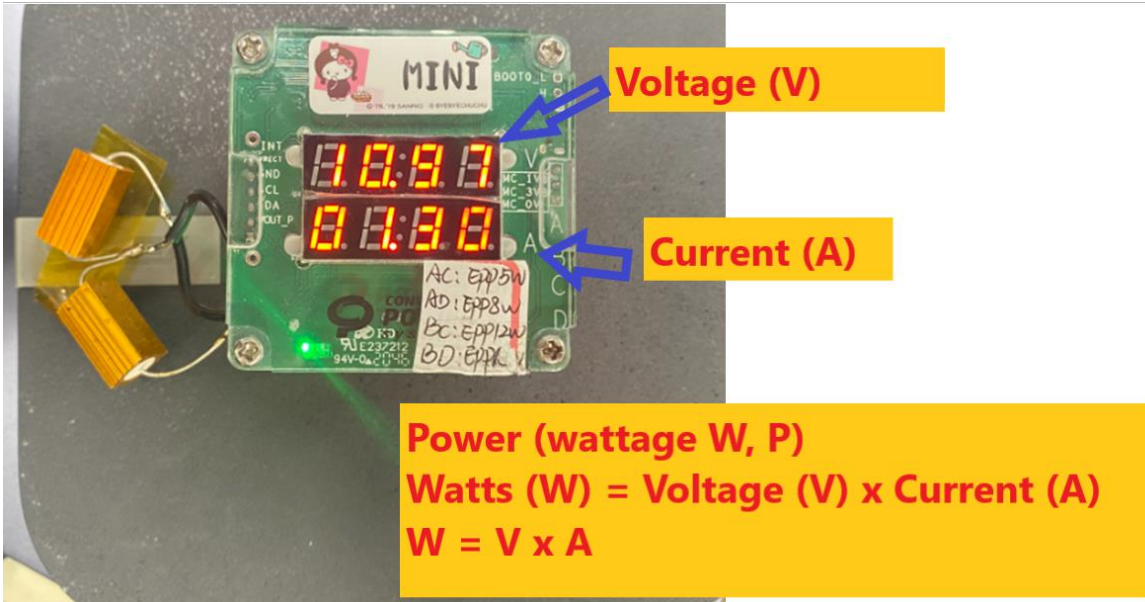
The machine is placed on the front to calibration QI data.



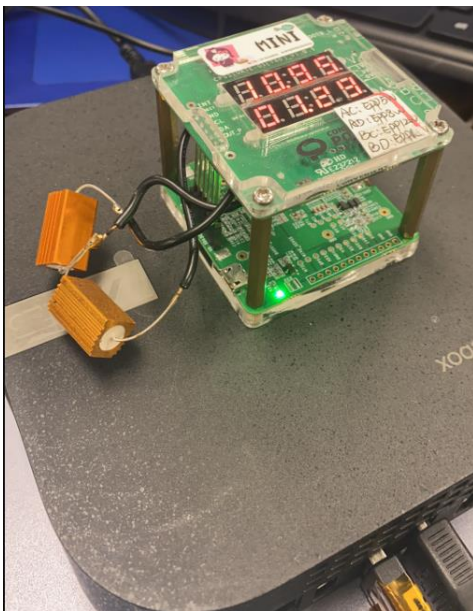
Put fixture to test Wireless charging 15W output.

Wait for the tool to be Voltage (V) x Current (A) ready.

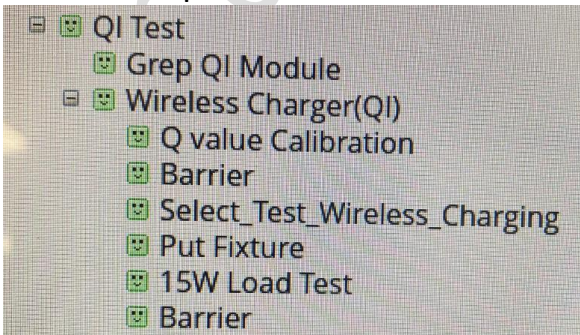




placed test equipment as follows:

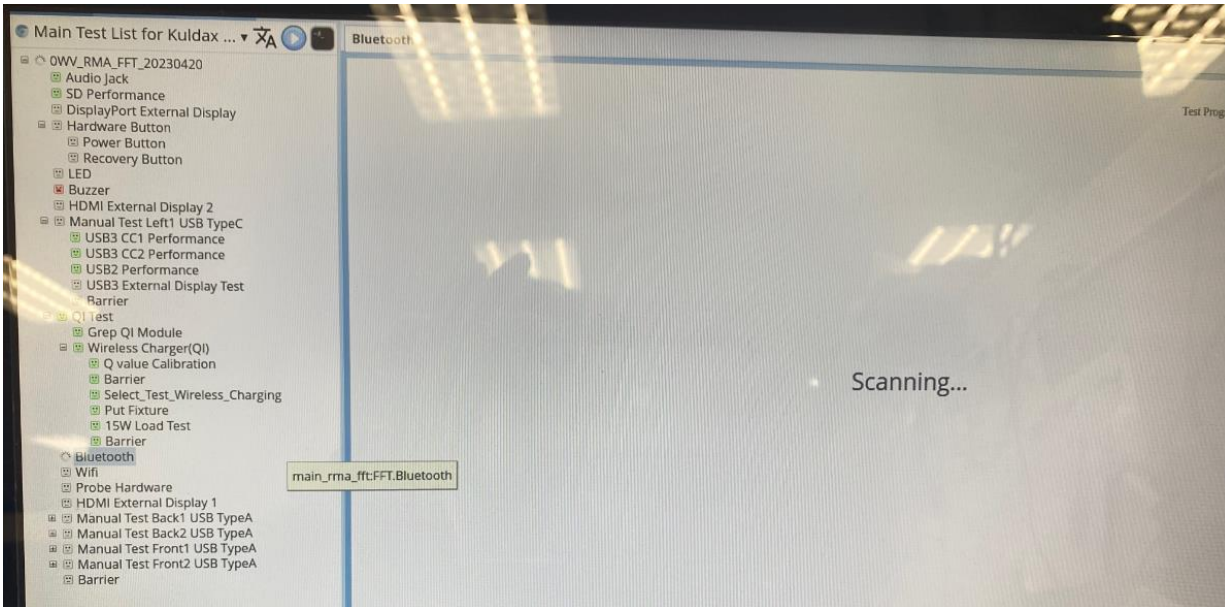


QI Test pass:



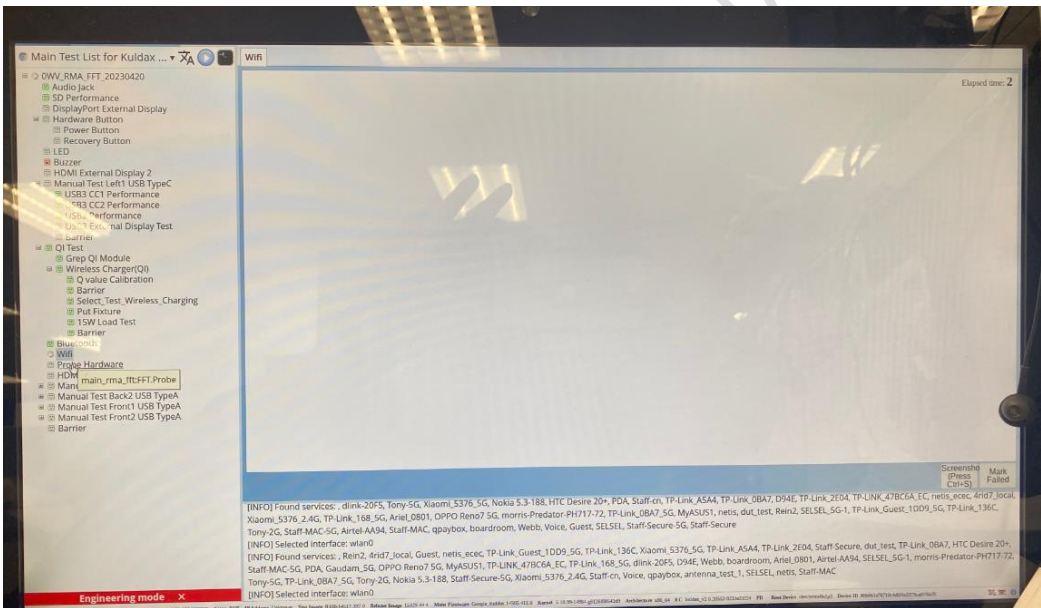
### 16) Bluetooth test: Scan BT signal

Turn on the Bluetooth device (cellphone BT , BT device) and Place it near the machine.



### 17) WIFI test: Scan WIFI signal station

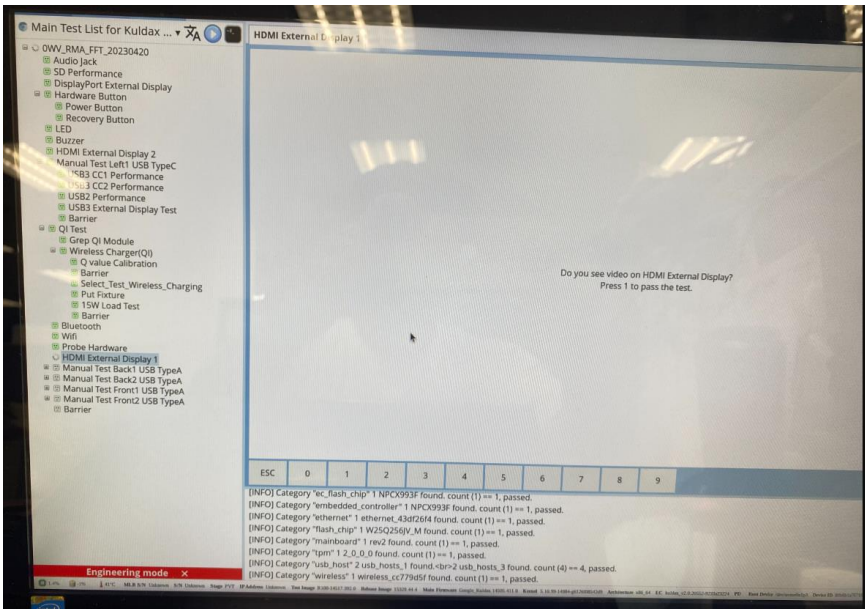
Turn on Wifi Router (cellphone AP, Wifi router ) and Place it near the machine.



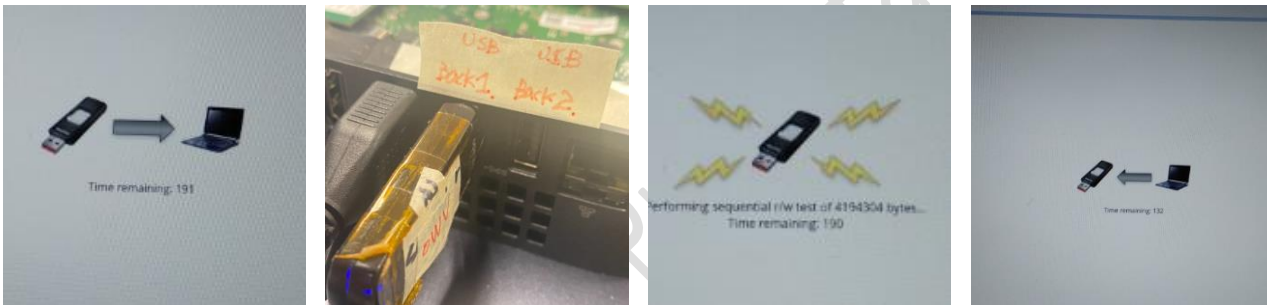
### 18) HDMI External Display 1: use HDMI monitor to test.

Press 0 ~ 9 number to pass the test.

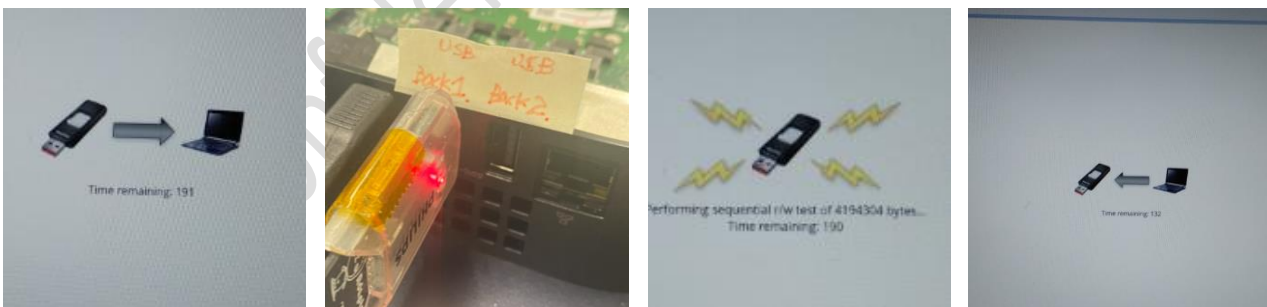




19) Manual Test Back1 USB Type A:  
 Insert USB 3.0 device to Back1 port test.



Insert USB 2.0 disk to Back1 port test.



20) Manual Test Back2 USB Type A:  
 Insert USB 3.0 device to Back2 port test.

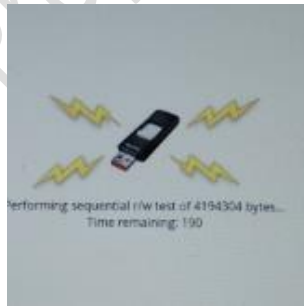
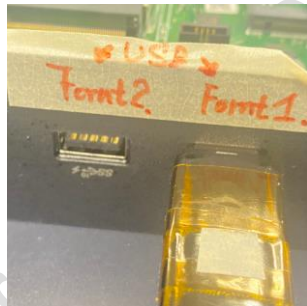


Insert USB 2.0 disk to Back2 port test.



21) Manual Test front1 USB Type A:

Insert USB 3.0 device to Back3 port test.



Insert USB 2.0 disk to Back3 port test.

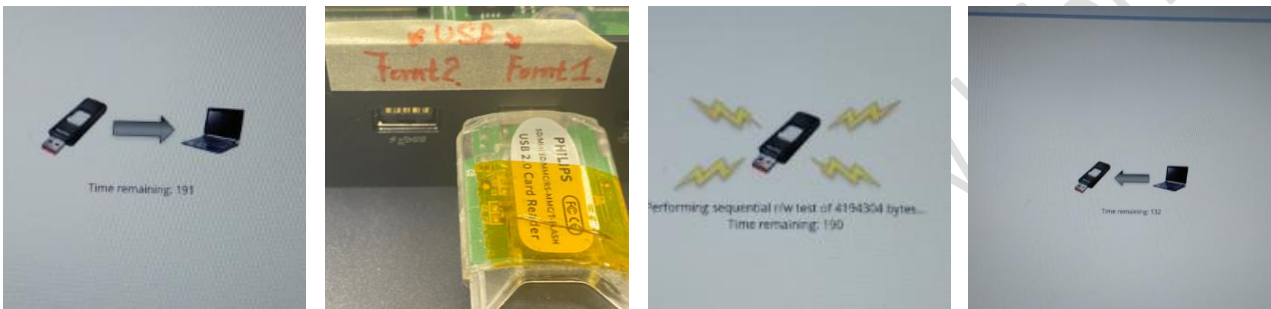




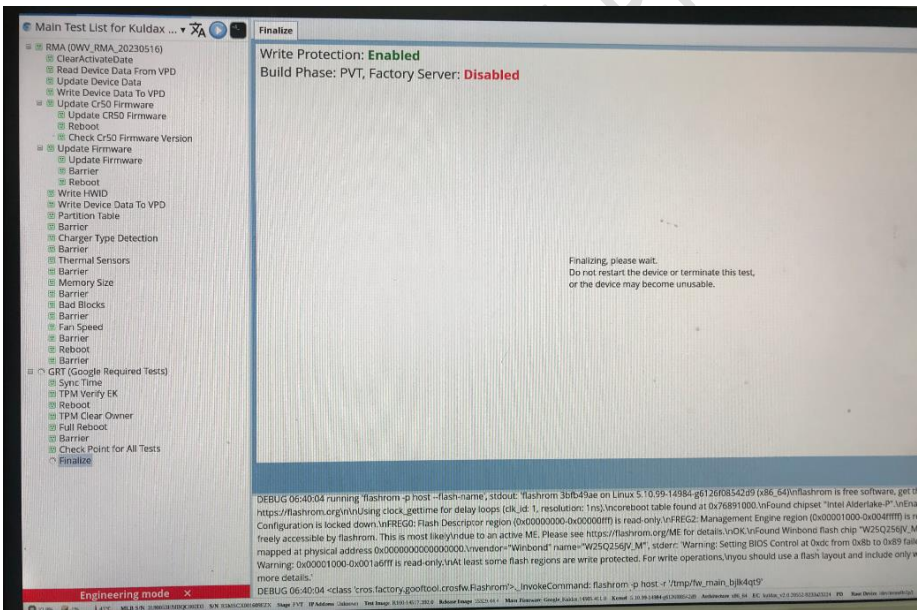
22) Manual Test front2 USB Type A:  
 Insert USB 3.0 device to Back4 port test.



Insert USB 2.0 disk to front2 port test.



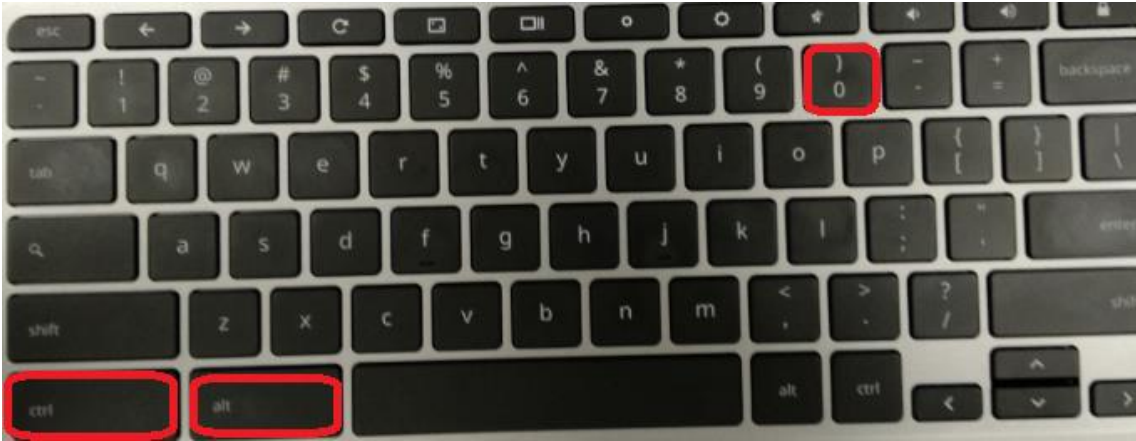
Finished test:



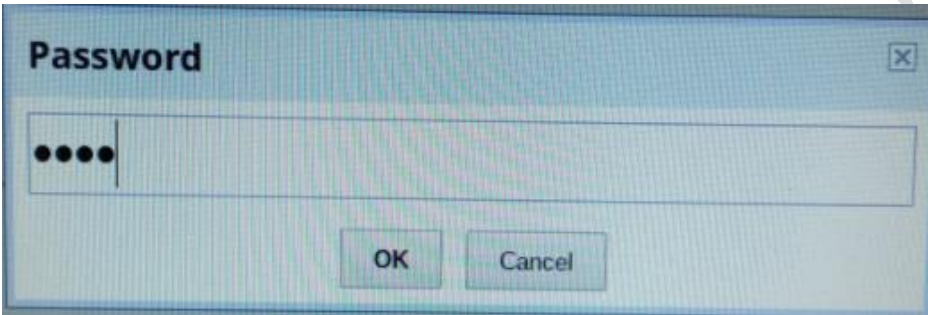
ALL Test PASS.

23) Change to Duffy RMA mode.

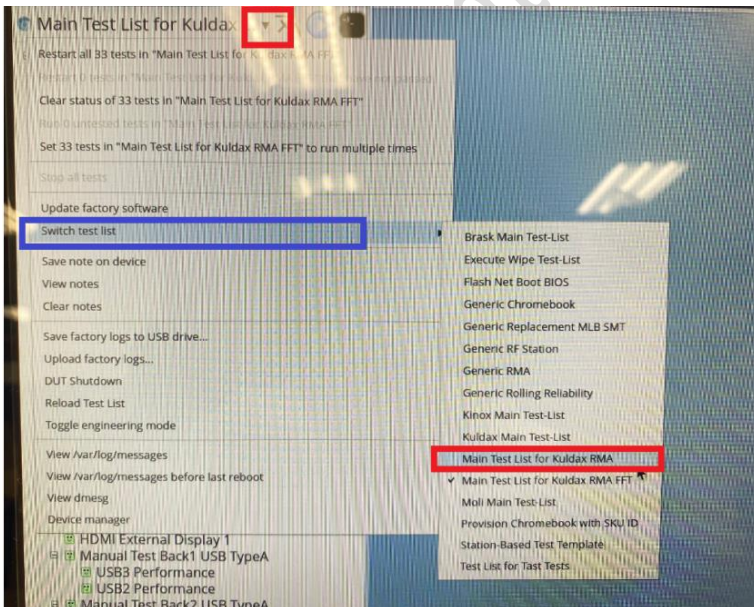
After press “ALT + CTRL + 0”



Password Enter: **cross**

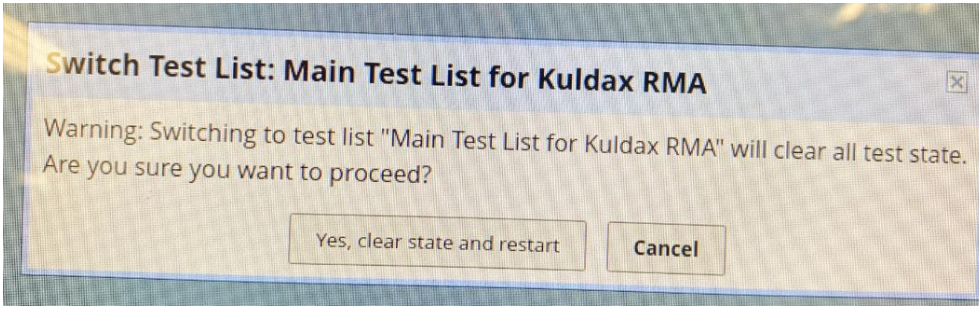


Switch test list to “Main Test List Kuldax RMA “

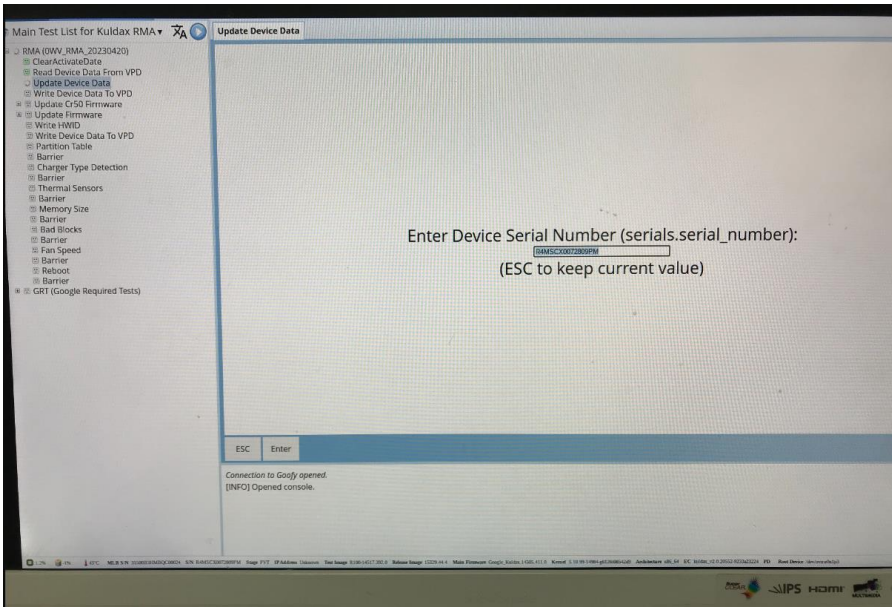


Select “Yes, clear state and restart”.

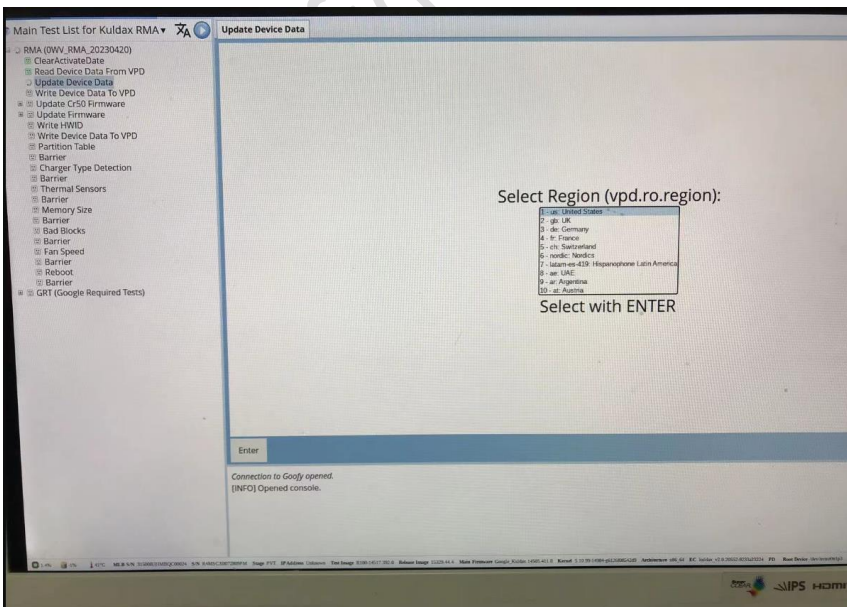




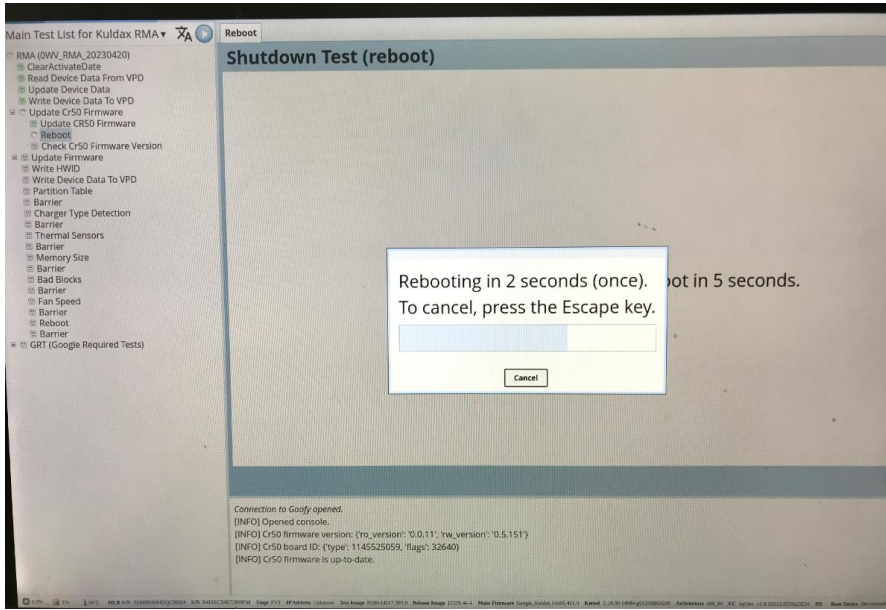
24) Update Device Data: Please enter Serial Number, and then press ENTER key to next step.



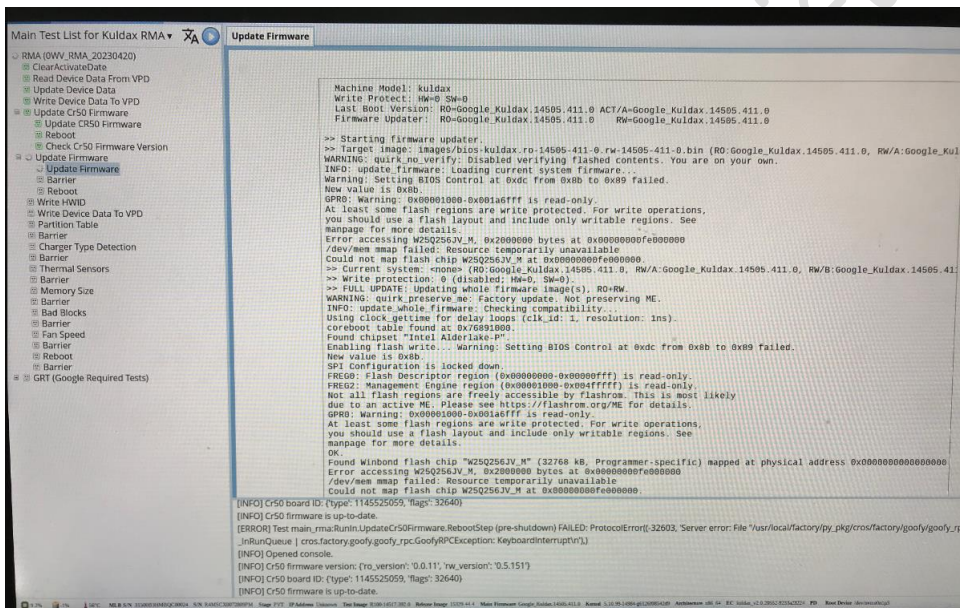
25) ShopFloor-VPD: Please select region, and then press ENTER key to next step.



## 26) System auto Reboot

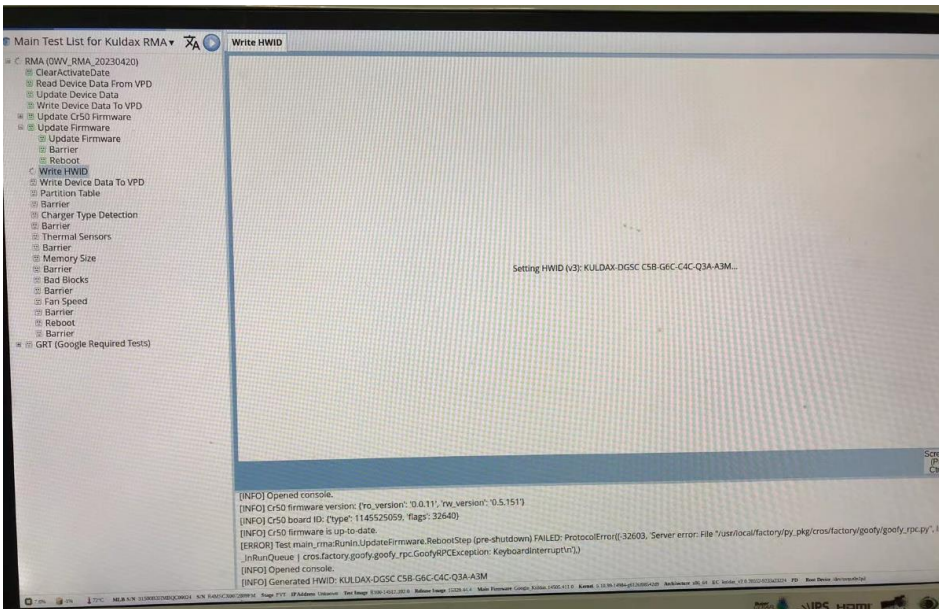


## 27) Auto update the firmwary

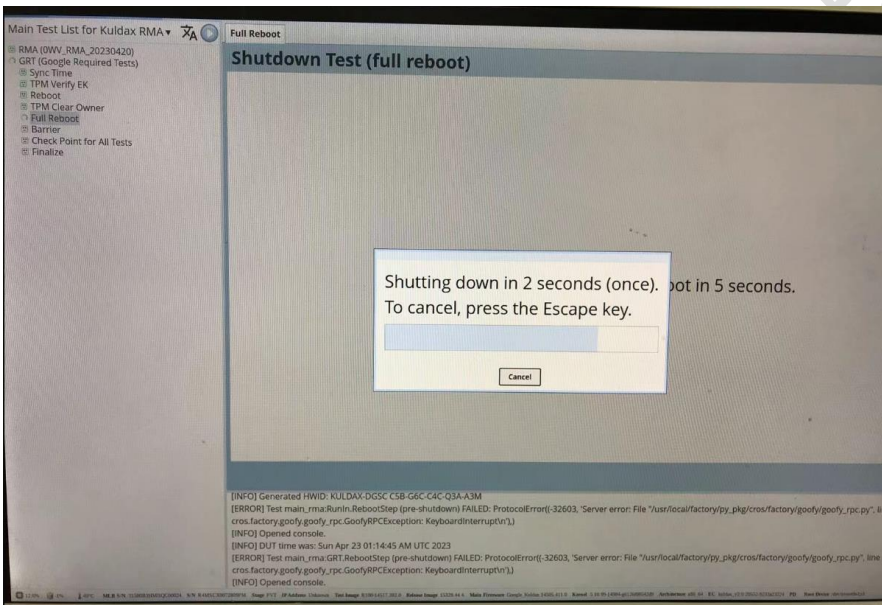


## 28)HWID Check: RAM ID, SSD ID/Size, Wifi card, FW and Vendor checking.

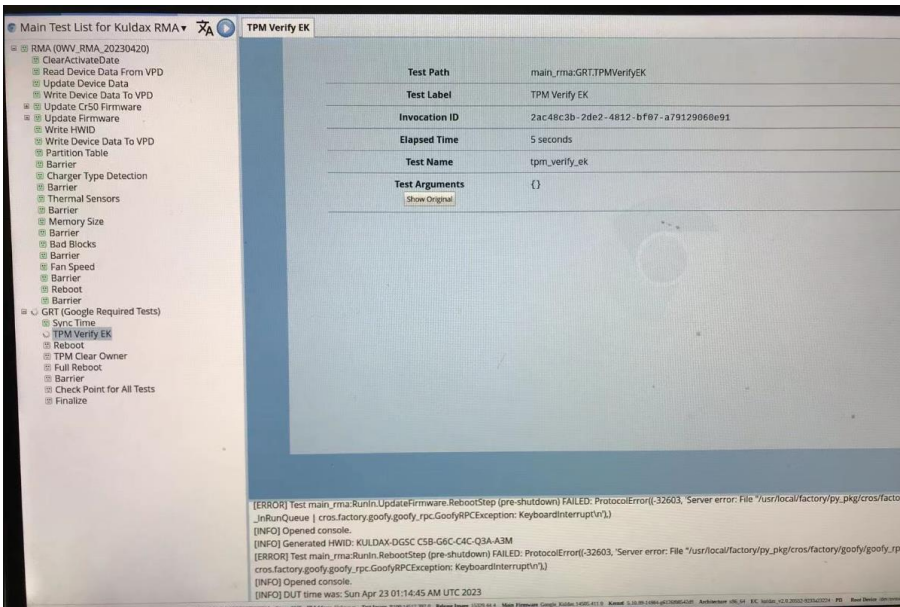




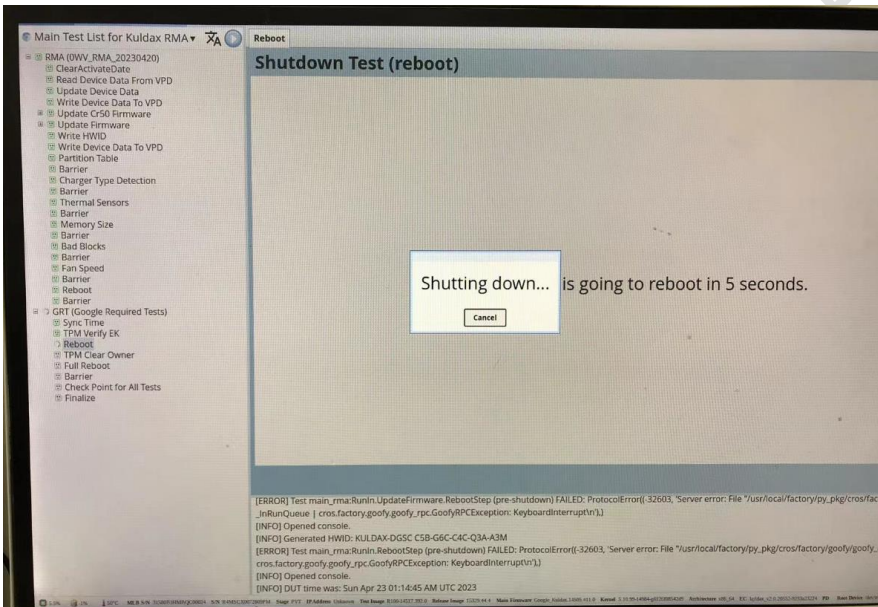
## 29) System auto Reboot:



## 30) GRT (Google Required Test): TPM Check.

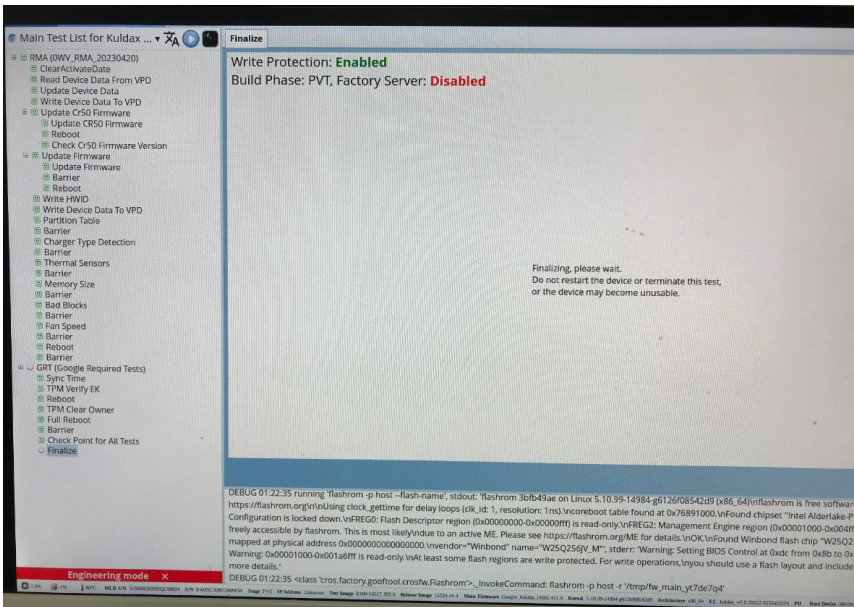


### 31) GRT (Google Required Test): system reboot for Data to write.

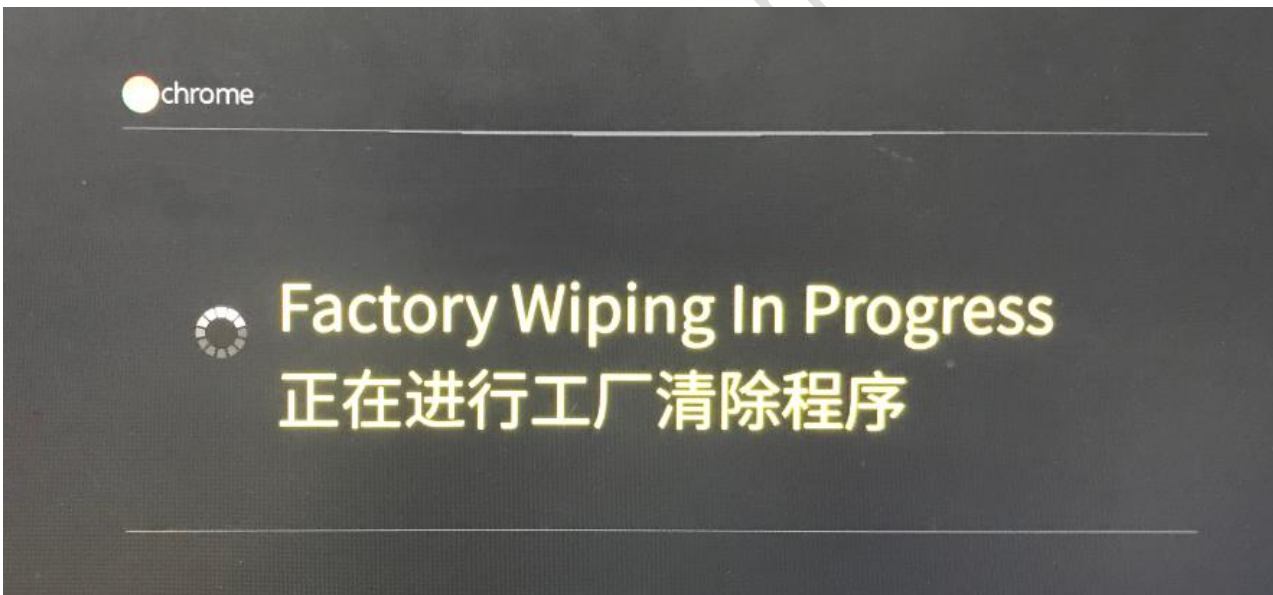


### 32) System Finalize.





- 33) After restart, system will auto start to wiping image from factory test to shipping image.  
 Wait for 2 minutes.  
 When done, system will auto restart.





34) Press power button, system turn on Chrome OS.

