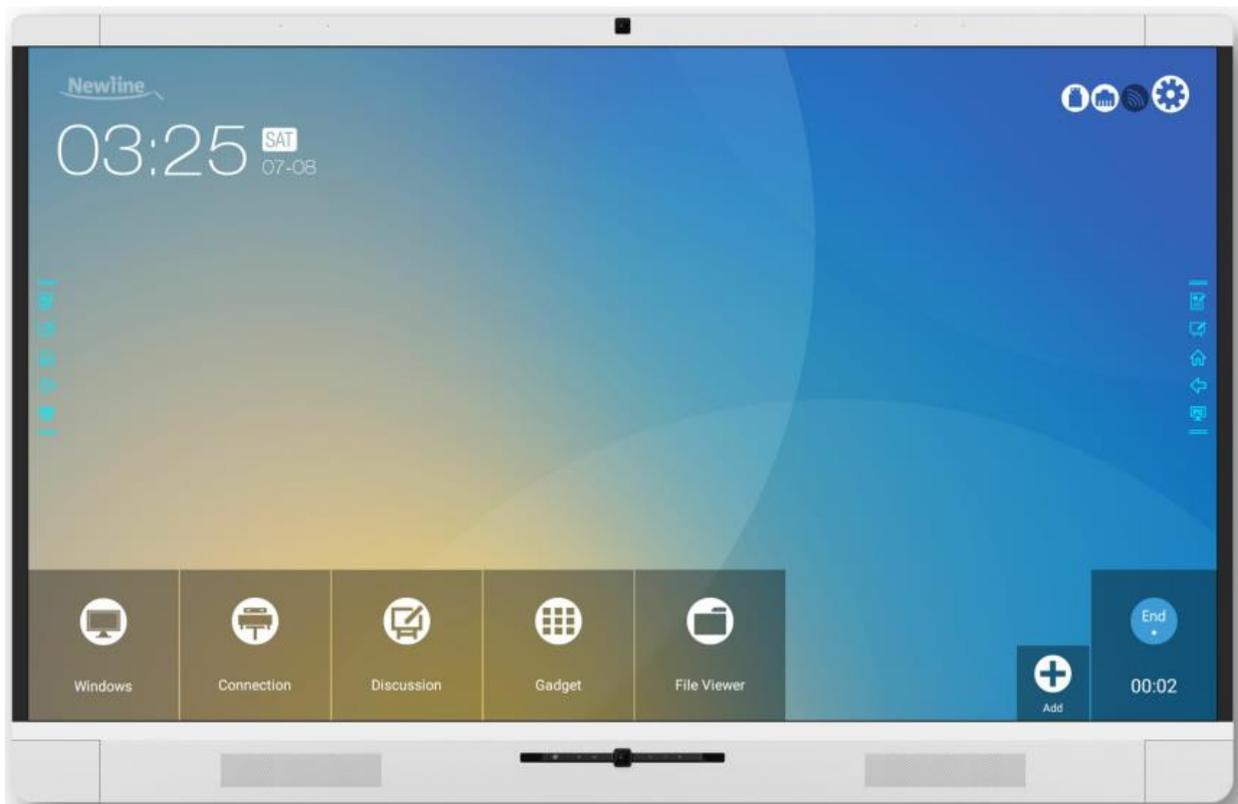


# X9

## Service Manual

Version: V1.0, 12/3/2018



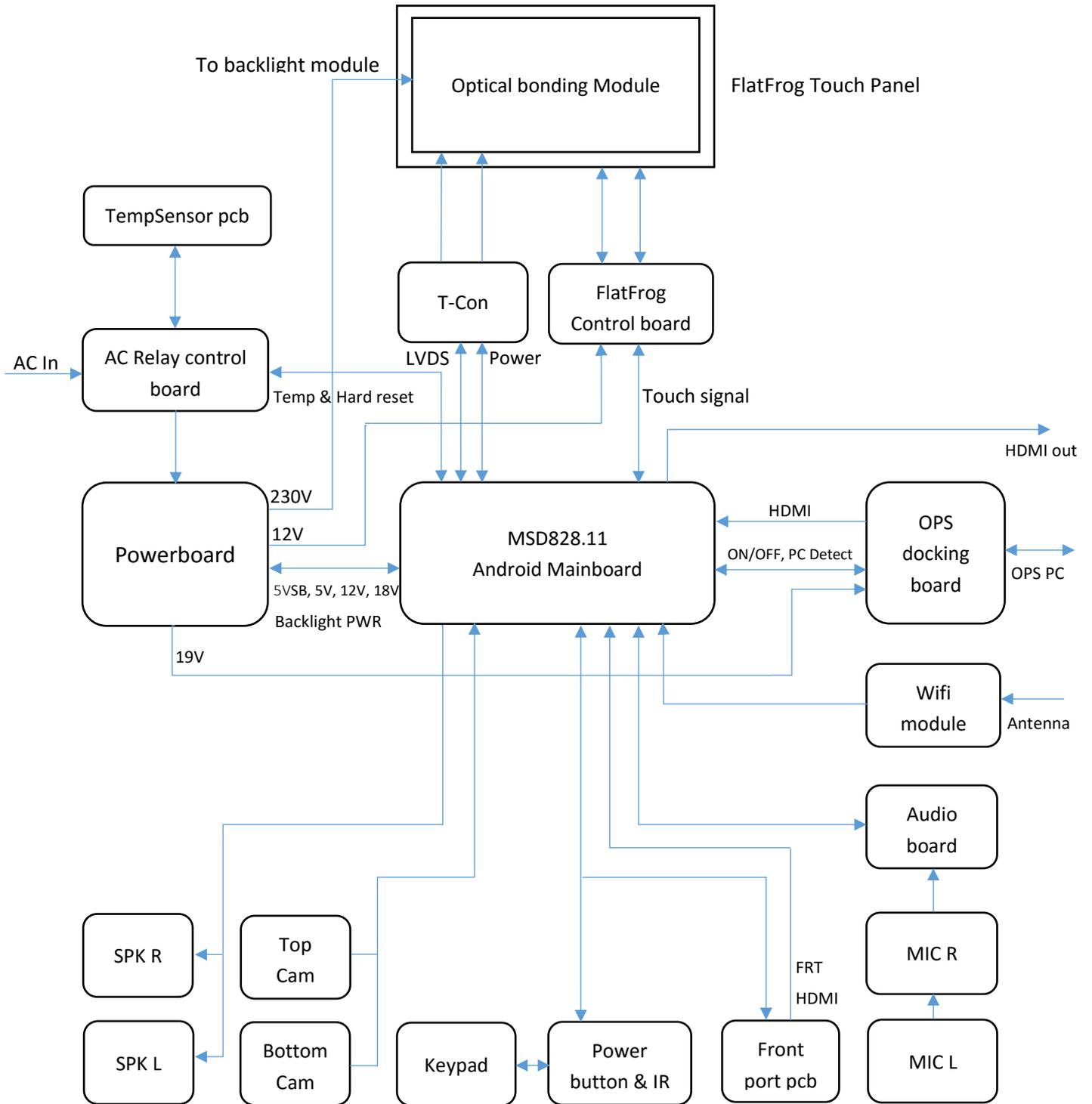
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## Safety Notice

1. There are many electrical and mechanical parts in the X9, which the technician need pay attention to the safety precaution before doing the repairment.
2. It is essential that all the components should be replaced with the same or authorized components as recommended in this manual to prevent Shock, Fire, or any other Hazards.
3. Please do not modify the original mechanical or electrical design without previous verification from the manufacturer or authorized agent.
4. Before start repairing or disassembly the machine, please make sure unplug the machine from any power source and properly grounded.

Part A. System Diagram



Notes:

1. For some earlier trials production X9, its T-CON board is driven by Powerboard, and the FlatFrog control board is driven by Mainboard, these 2 points are different from the current mass production product.

## Part B. Recommended Spare Parts List

Part No.	Part Description	Usage
Standard Spare Parts		
10503T6JP000002	Powerboard, AY668D-4MF101 A PMI	1
30500T6G7001010	Mainboard, MSD828.11UHD 2.0/8GB HDMI-OUT	1
30100T5J5029010	OPS docking board, HHT-OPS_PS8409-4K60HZ V01	1
30100T6G8006010	AC Relay control board, HHT-AC_Relay control_17_828	1
30100T6J4001010	Keypad, HHT-UC-CAP TOUCH-17	1
30100ZZZZ001629	TempSensor pcb, HHT_TempSensor_15_901.3v02	1
30100T5C4003010	Front port board, HHT-UC-FRONTPORT	1
30100T6G7004010	Power_IR board, HHT-POWER-IR-LED-17	1
30100T5C4001010	Left Micphone PCB, UC55-MEMSMIC2X2-L-A1	1
30100T5C4002010	Right Micphone PCB, UC55-MEMSMIC2X2-R-A1	1
10503T6J4000007	Audio board, UCX600 EMI	1
10503T7A7000001	Wifi module, 5G WIFI WC0DR2611	1
30200ZZZZ0000003	Camera module	2
Non-standard Spare Parts		
10503T6J4000004	X9 FF TP control board	1
30703T6J4200020	X9 FF whole set touch sensor PCBAs (Includes 10503T6J4000004)	1
10505V14D001070	X9 remote controller	1
10500T5C4002020	X5 writing pen	1
10500T6C6003010	T5 writing pen, thin	1
10403ZZZZ001674	Inner cable, between Mainboard and T-Con board, with magnetic ring, 900mm	1
10403ZZZZ001234	Inner cable, between Powerboard and Mainboard, 1050mm	1
10403ZZZZ001494	Inner cable, between Mainboard and speaker, 2 ports cable, longer side 1670mm shorter side 500mm	1
10403ZZZZ001386	Inner cable, between Powerboard and OPS docking board, with Magnetic ring, 1550mm	1
10403ZZZZ001496	Inner HDMI cable, HDMI2.0, between Mainboard and Front port board, 630mm	1
10403ZZZZ001577	Inner cable, between Mainboard and WIFI module, 370mm	1
10403ZZZZ001546	Inner cable, between AC relay control board and Powerboard, 100mm	1
10403ZZZZ000934	Inner cable, between Power_IR board and Keypad board	1
10403ZZZZ000936	Inner cable, between TempSensor board and AC relay control board	1
10403ZZZZ001641	Inner cable, between Mainboard and FlatFrog TP control board, 320mm	1
10403ZZZZ001578	Inner cable, between Camera module and Mainboard, longer side 3250mm, shorter side 1200mm	1
10403ZZZZ001581	Inner cable, between Mainboard and FlatFrog TP control board, 970mm	1
10403ZZZZ001545	Inner cable, between Mainboard and AC relay control board, 1300mm	1
10403ZZZZ001582	Inner cable, between Audio board and Mic R board, 1100mm	1
10403ZZZZ001669	Inner cable, between Mic R and Mic L board, with magnetic ring, 2600mm	1
10403ZZZZ001576	Inner cable, 2 ports cable, between Mainboard and Front port board and Keypad board, longer side 1000mm, shorter side 850mm	1

10403ZZZZ001542	Inner cable, between Mainboard and 4K OPS board, 500mm	1
10403ZZZZ001668	Inner cable, between Mainboard and Audio board, 370mm	1
10403ZZZZ001679	Inner HDMI cable, HDMI2.0, between Mainboard and OPS docking board, with screw, 630mm	1

### Part C. Structure Exploded Diagram

Basically there are 5 layers for X9 structure, they are Outer frame, Inner frame & Touch panel, Optical bonding module, Backlight module and PCBAs.

Structure exploded diagram (Zoom in to 800% to see details):

<https://www.dropbox.com/s/otj9t2g1fxdojks/X9%20exploded%20diagram.PDF?dl=0>

### Part D. Overall Process of Disassembly & Reassembly

Video of overall process:

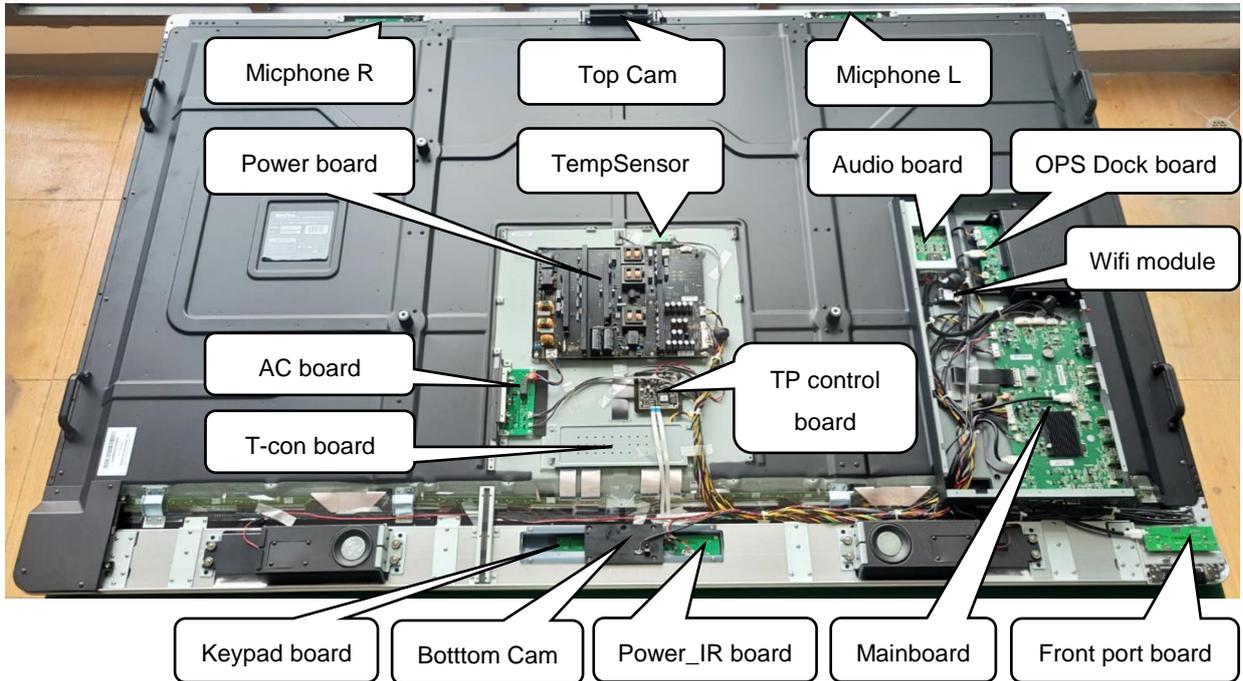
[https://www.dropbox.com/s/2ftd0h8rcr363en/X9%20Disassembly%20%26%20Reassembly%20overall%20process\\_2018.3.11.mp4?dl=0](https://www.dropbox.com/s/2ftd0h8rcr363en/X9%20Disassembly%20%26%20Reassembly%20overall%20process_2018.3.11.mp4?dl=0)

Operations involved in the above video:

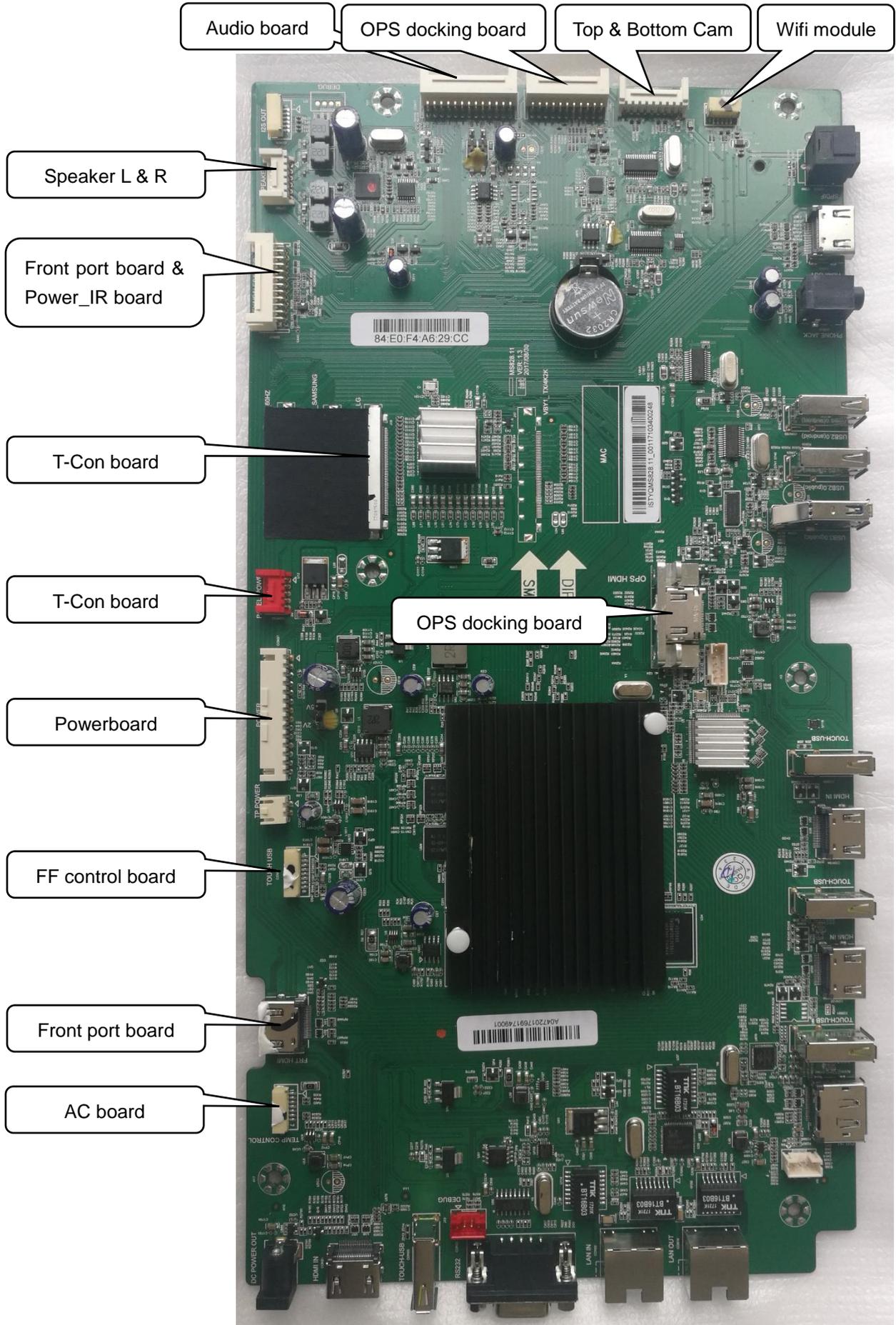
1. Take off rear covers, remove all PCBAs, top camera and L & R micphone.
2. Take off backlight module.
3. Take off optical bonding module.
4. Take off inner frame & touch panel.
5. Disassemble & reassemble FlatFrog touch sensor pcbas.
6. Install inner frame & touch panel on the outer frame.
7. Install optical bonding module.
8. Install backlight module.
9. Install all PCBAs, top camera and L & R micphone.
10. Fix cables and install rear covers.

Note: The above operation 2-8 must be done in a dust-free plant to avoid the dust stick onto the glass or backlight module surface.

Part E. PCBA Overviews

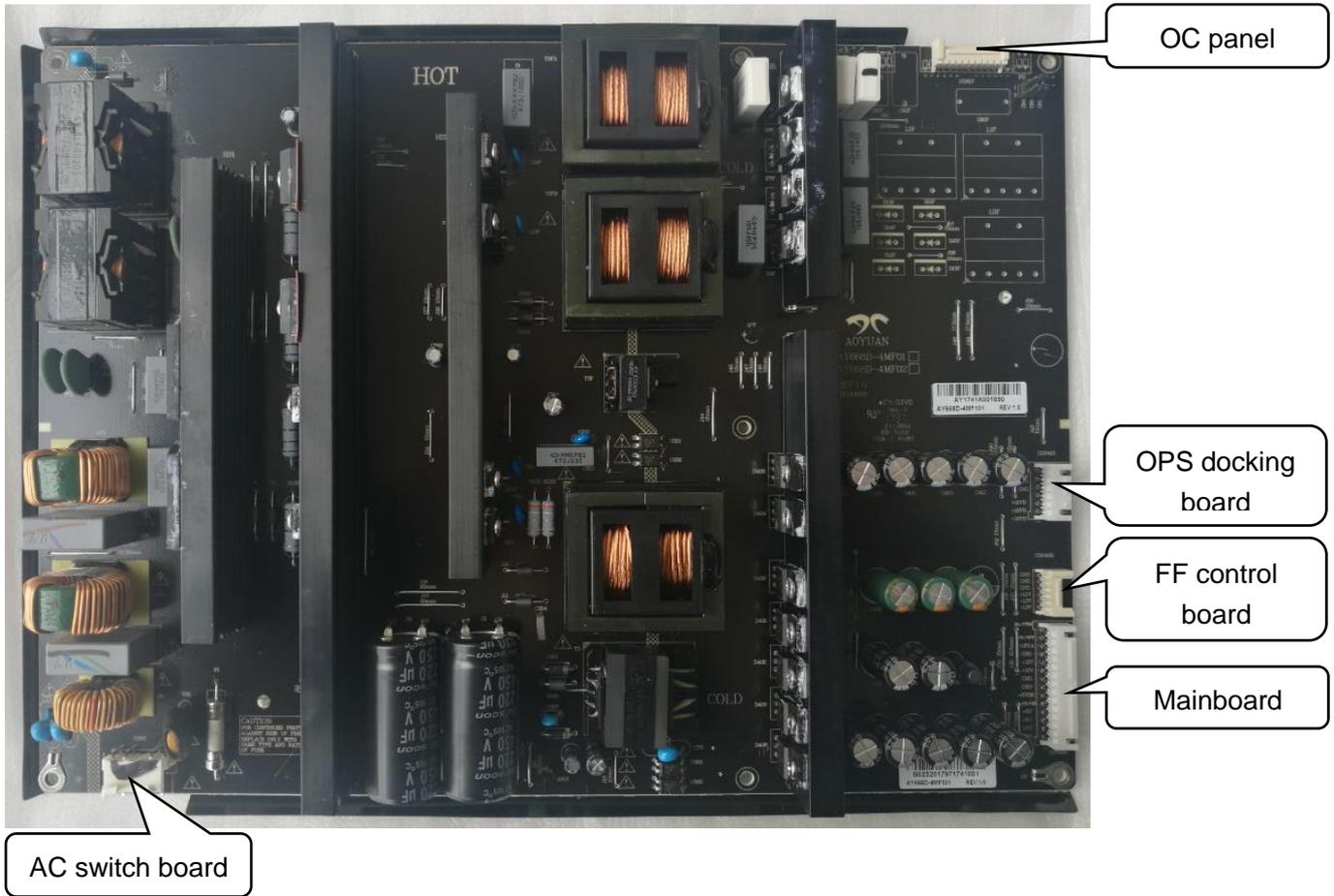


1. Mainboard wiring

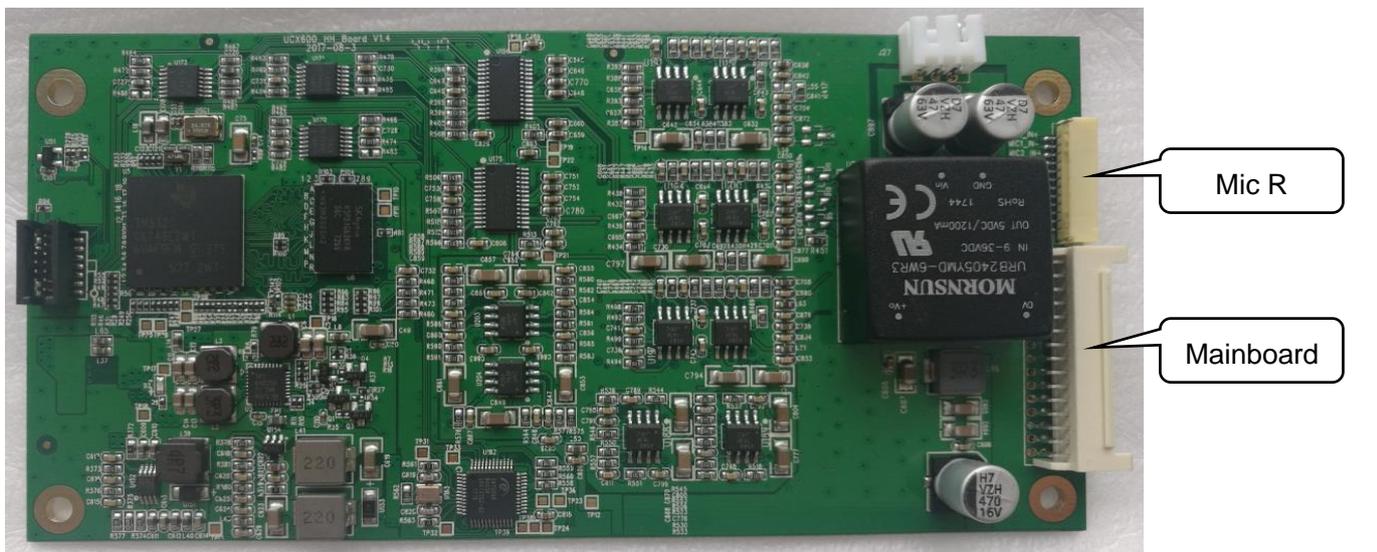




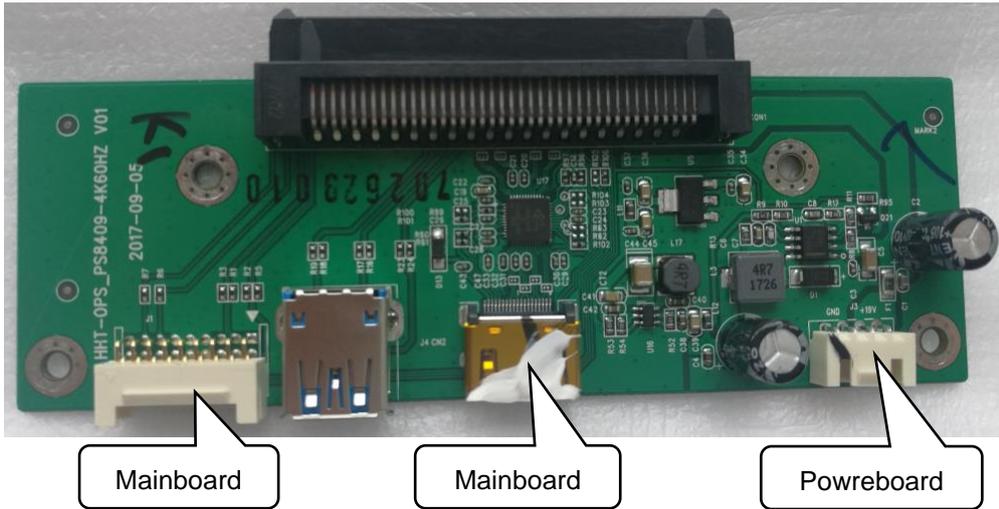
2. Powerboard wiring



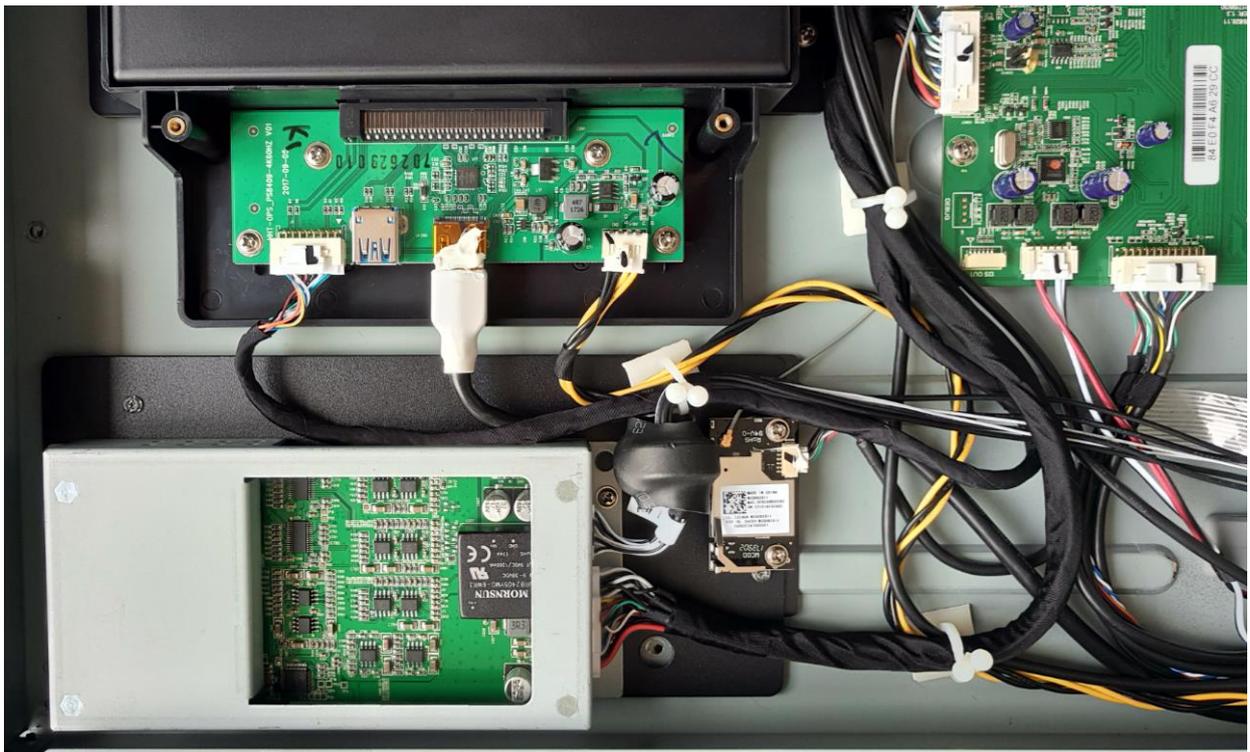
3. Audio board wiring



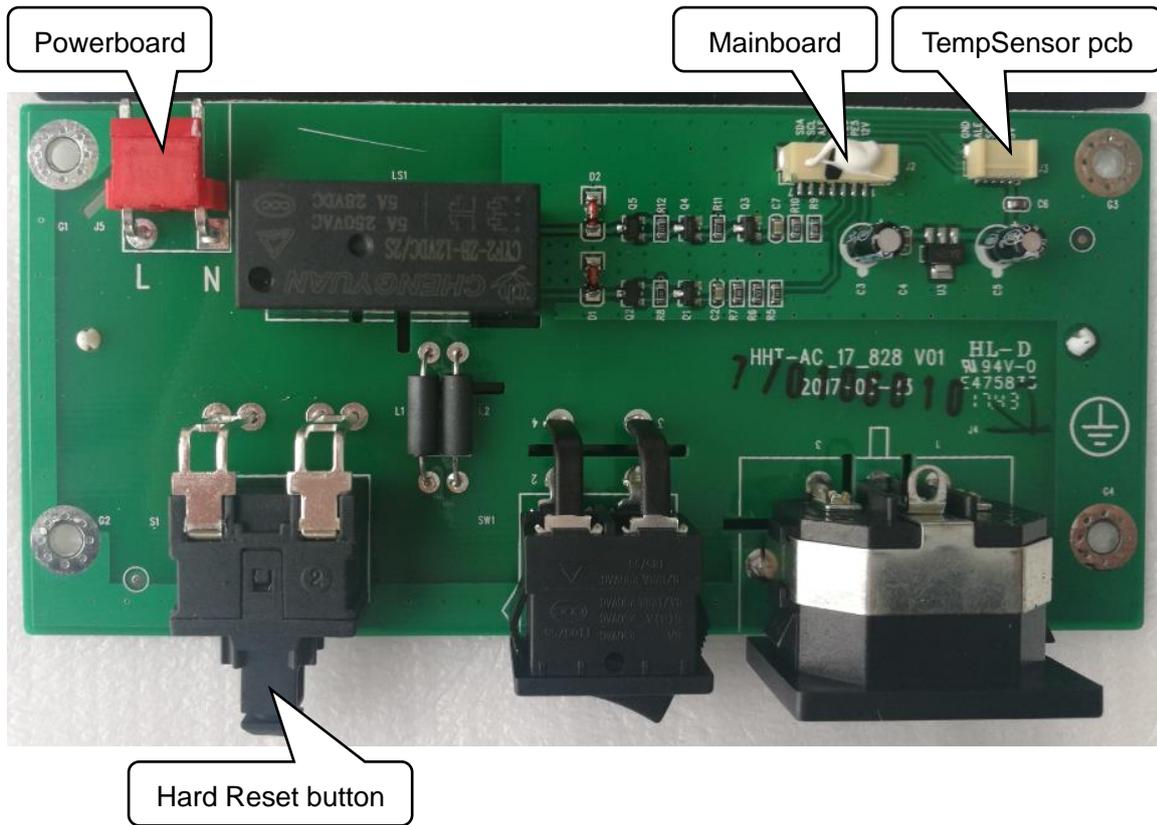
4. OPS docking board wiring



5. Wifi module wiring



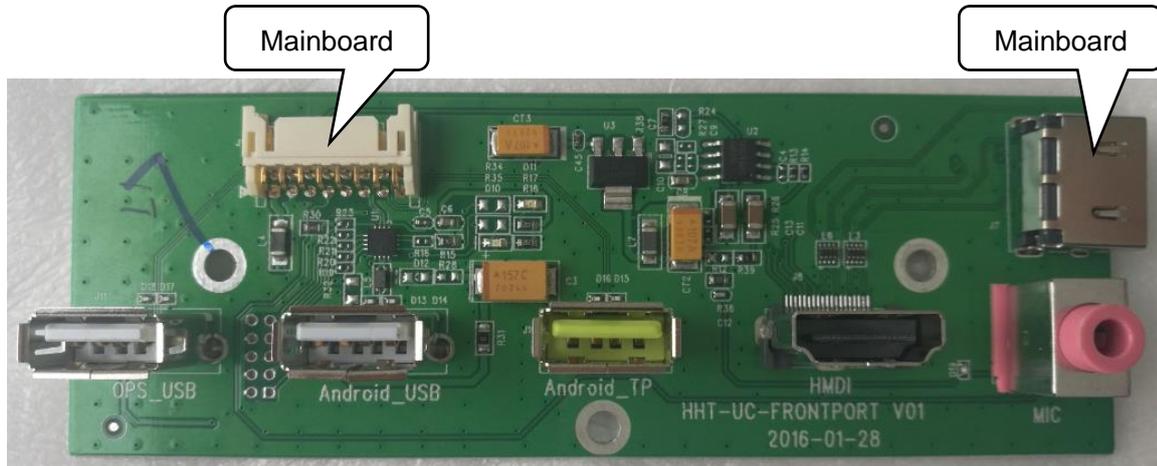
6. AC Switch board wiring



Tips:

1. From March,2018, there is no Hard Reset button in the AC switch board.

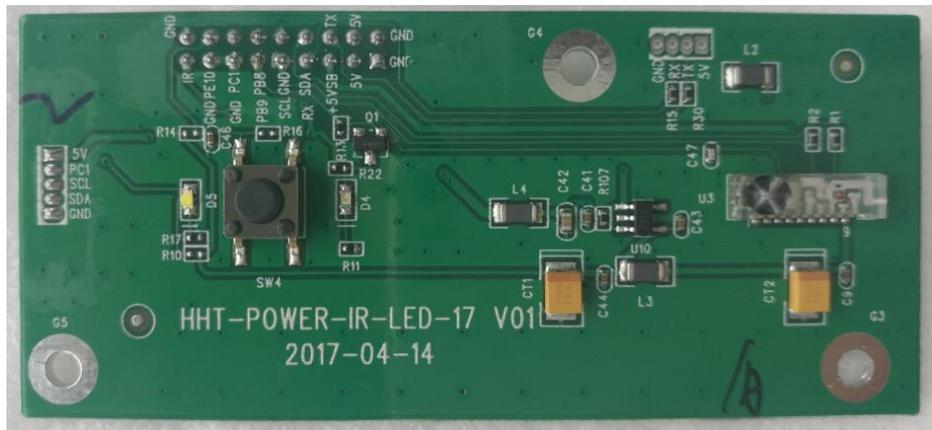
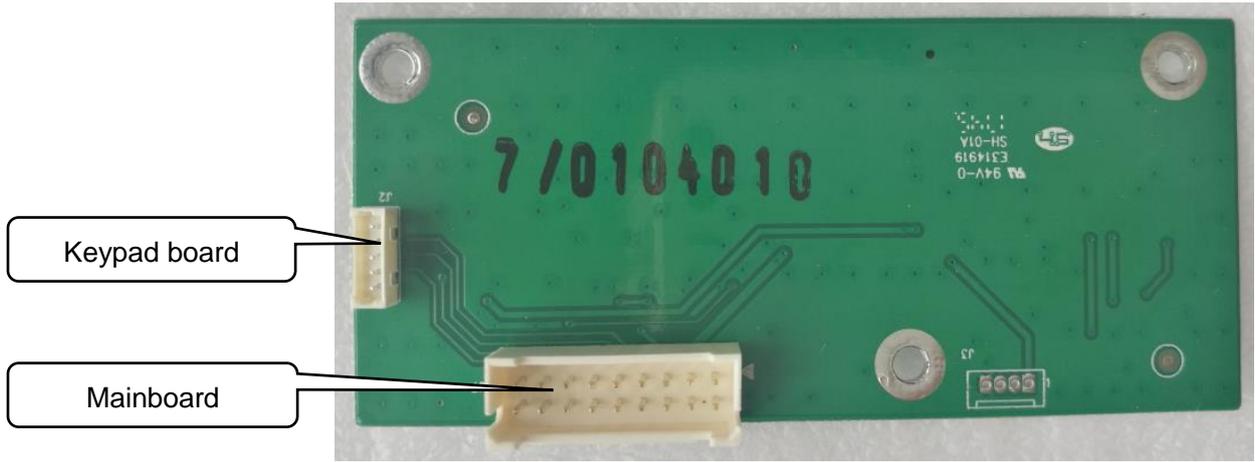
7. Front port board wiring



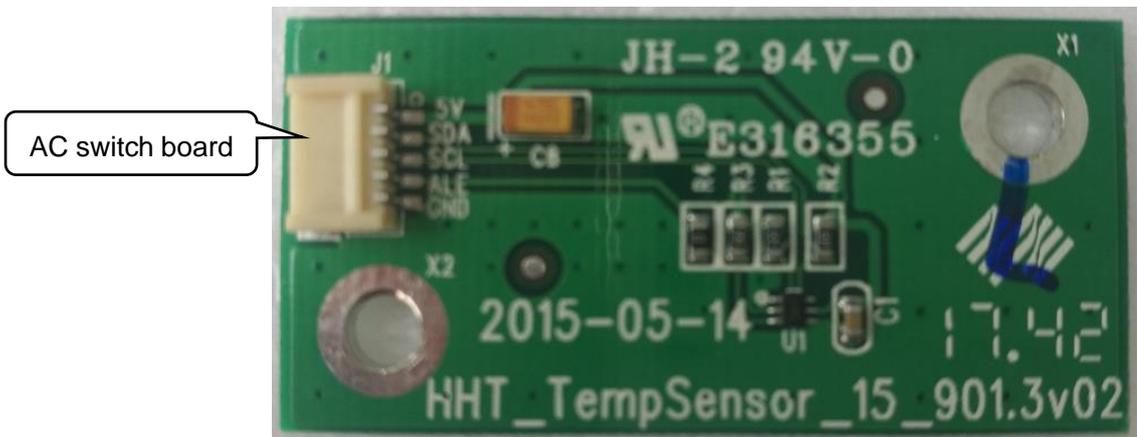
8. Keypad PCBA connections



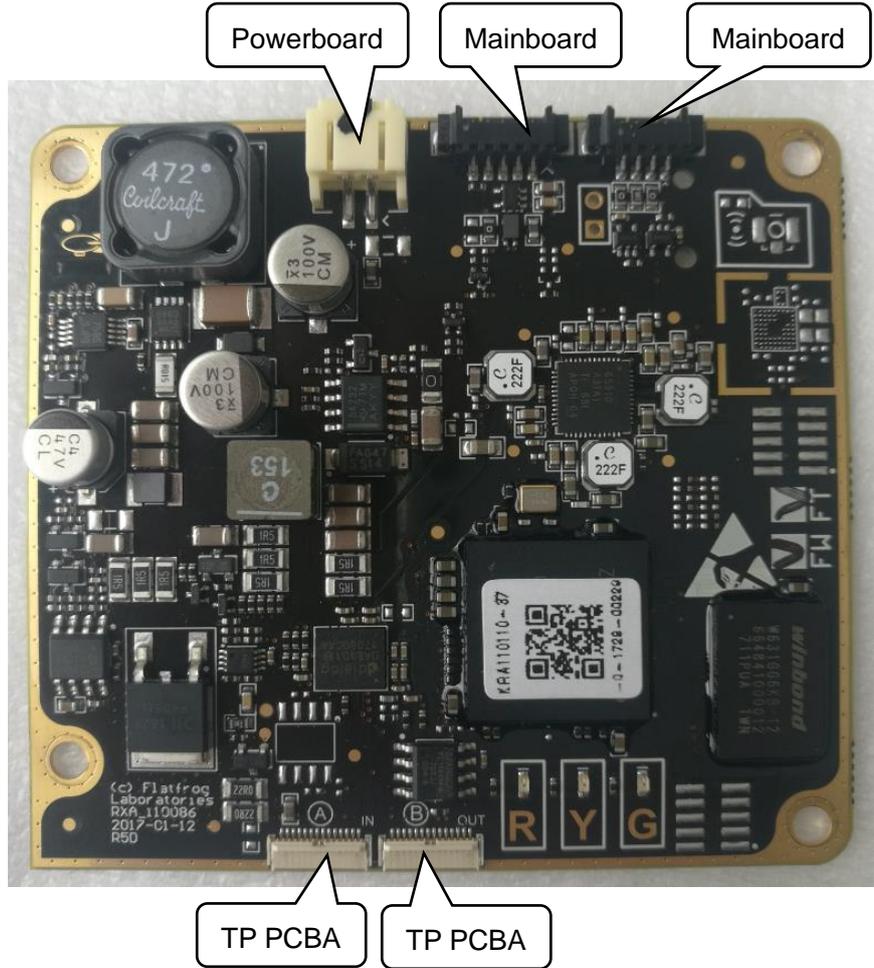
9. Power\_IR board wiring



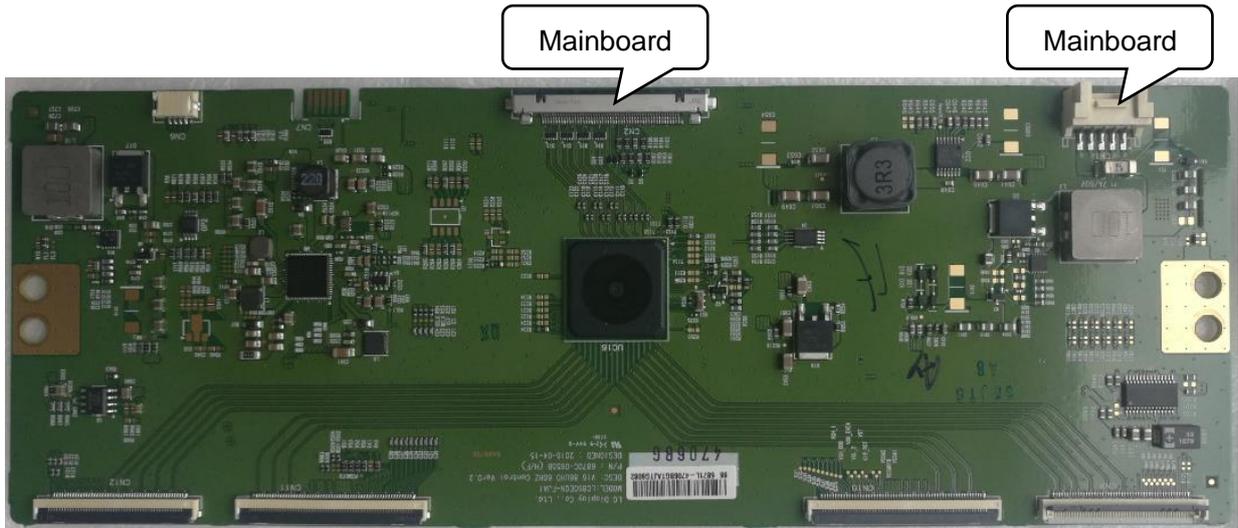
10. TempSensor PCBA wiring

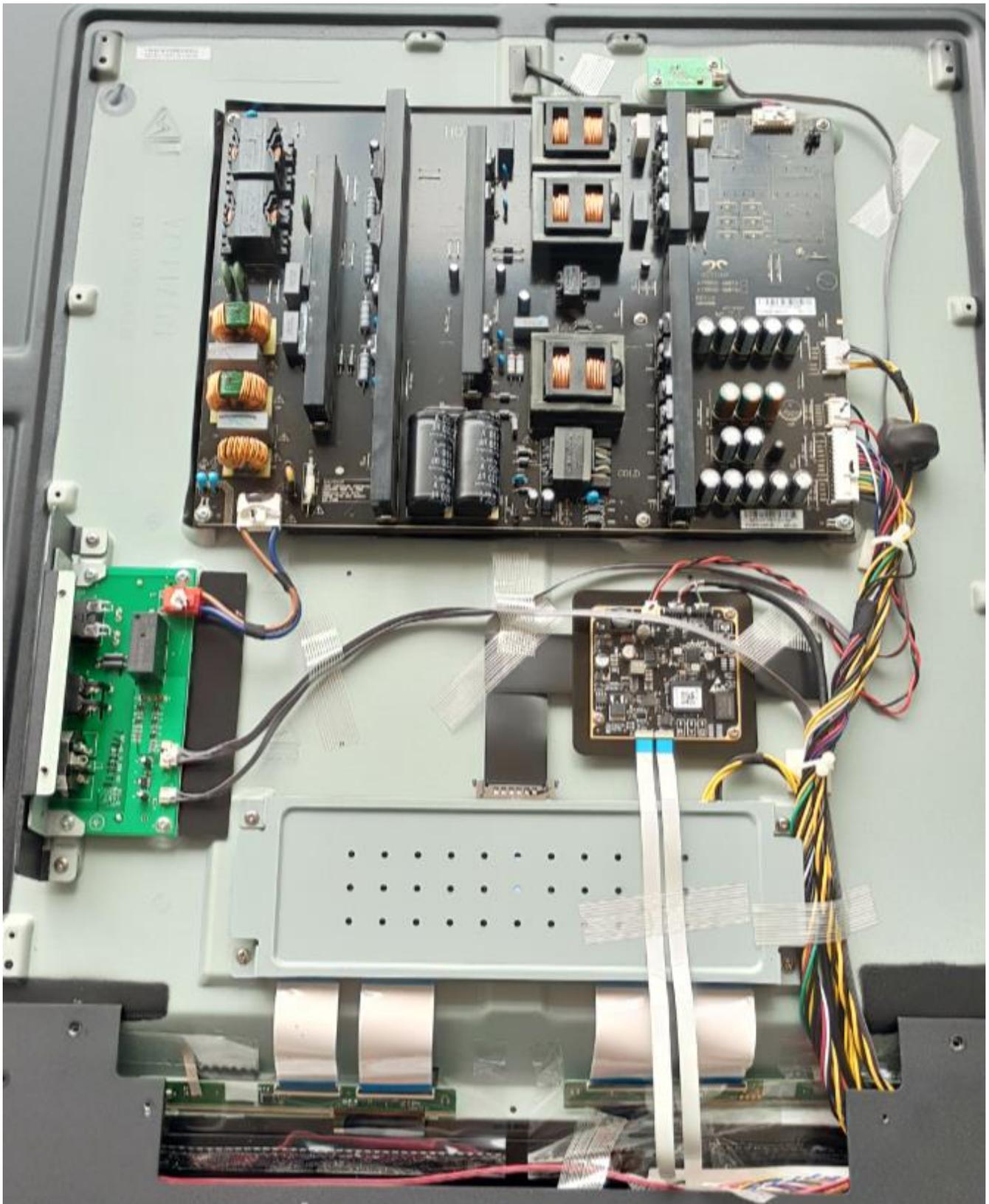


11. FlatFrog Touch Panel Control board wiring



12. T-CON board wiring

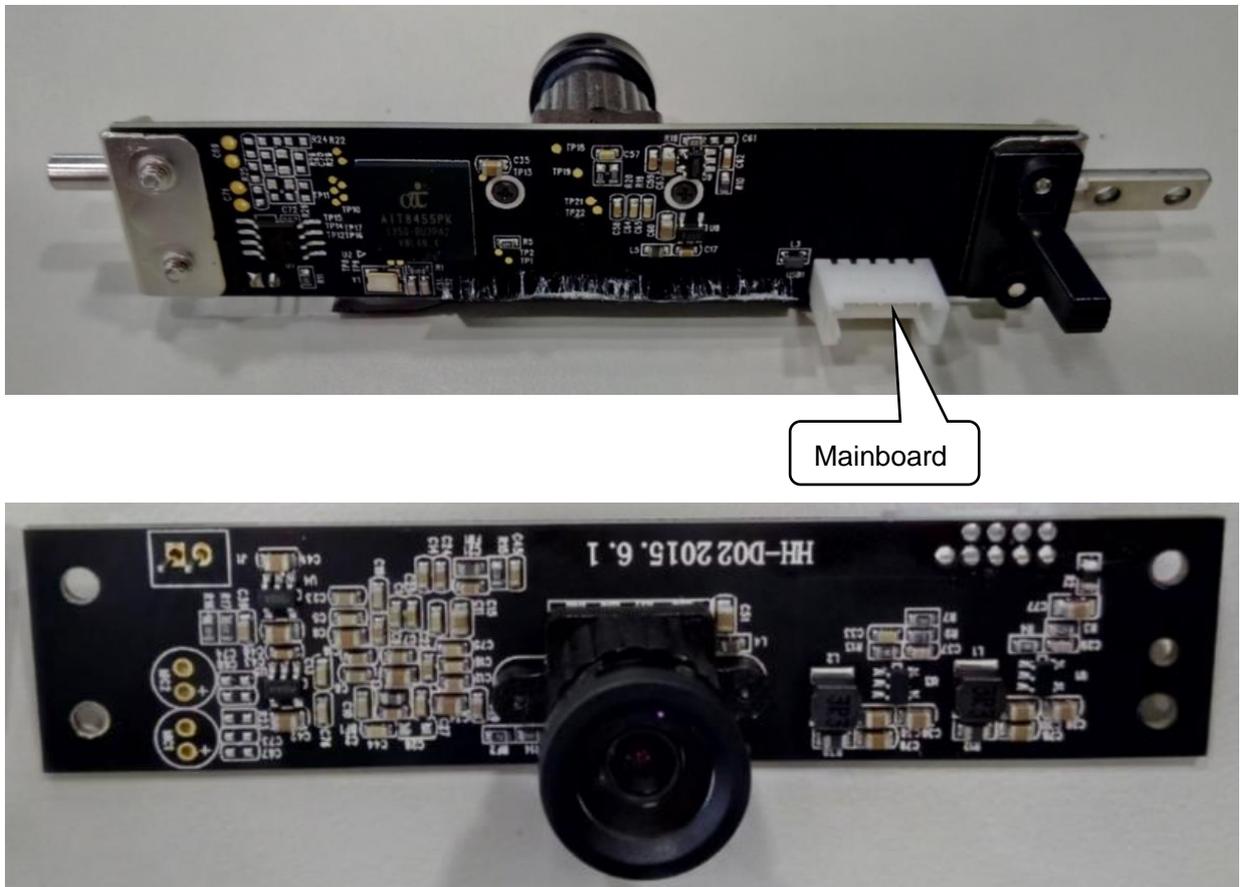


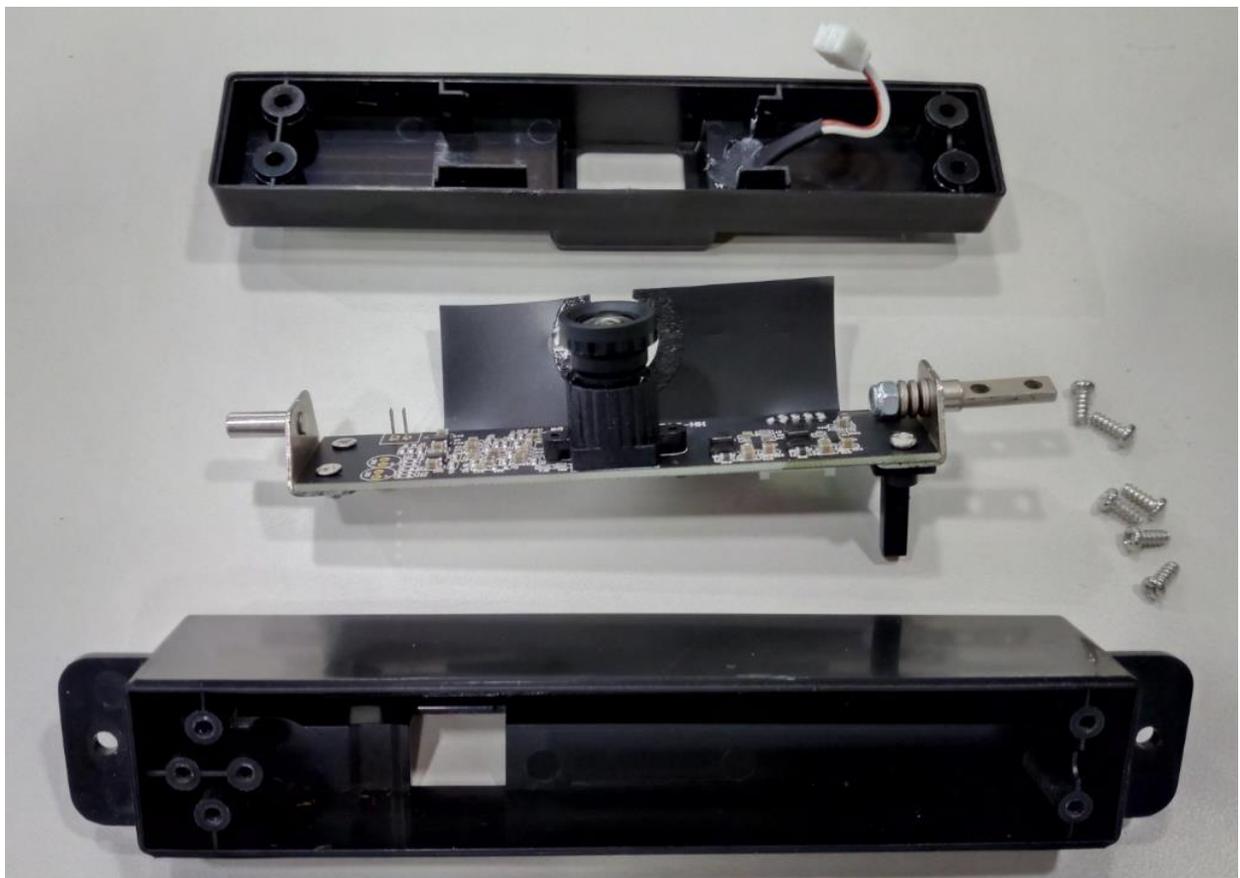


13. Micphone pcba L & R wiring



14. Camera module wiring





## Part F. FlatFrog Touch Panel Signal Test

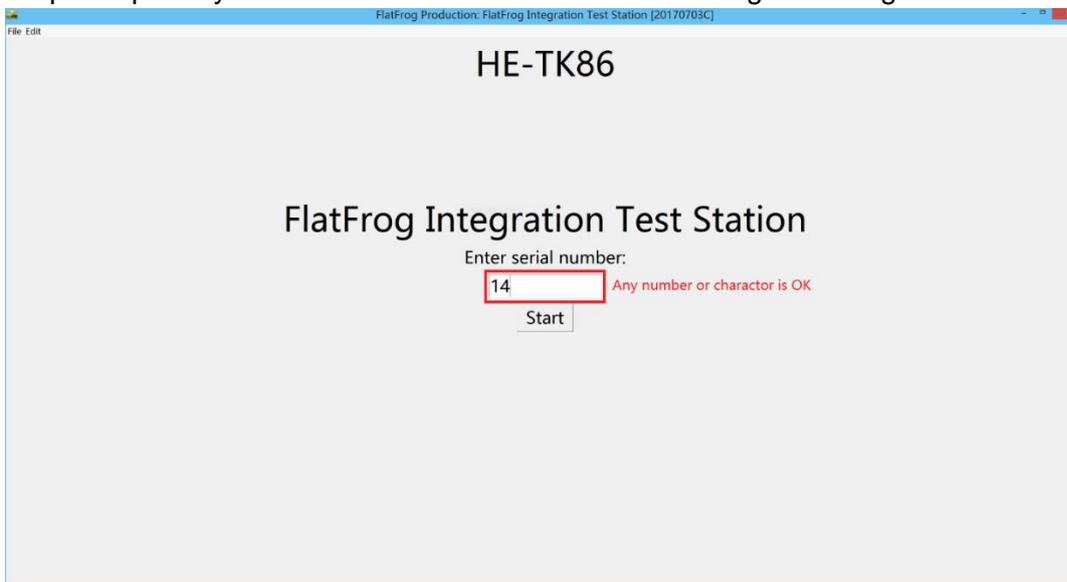
Step 1: Switch to Windows source.

Step 2: Install the FlatFrog signal testing tools “HE-TK86-005a-v3522-IntegrationTestStation-20170703C.exe”, it will create a “FlatFrog” folder on the Windows Desktop, there is a shortcut

 IntegrationTestStation in the folder, please double click it to run it.

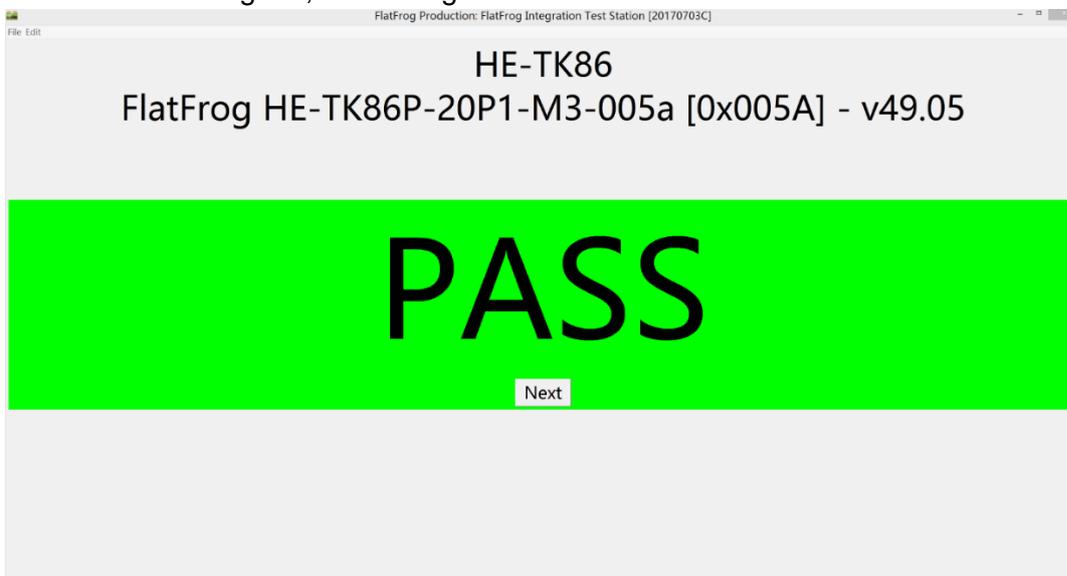
<https://www.dropbox.com/s/7s7ygnptgfftuns/HE-TK86-005a-v3522-IntegrationTestStation-20170703C.exe?dl=0>

Step 3: Input any number or character here to start the signal testing.

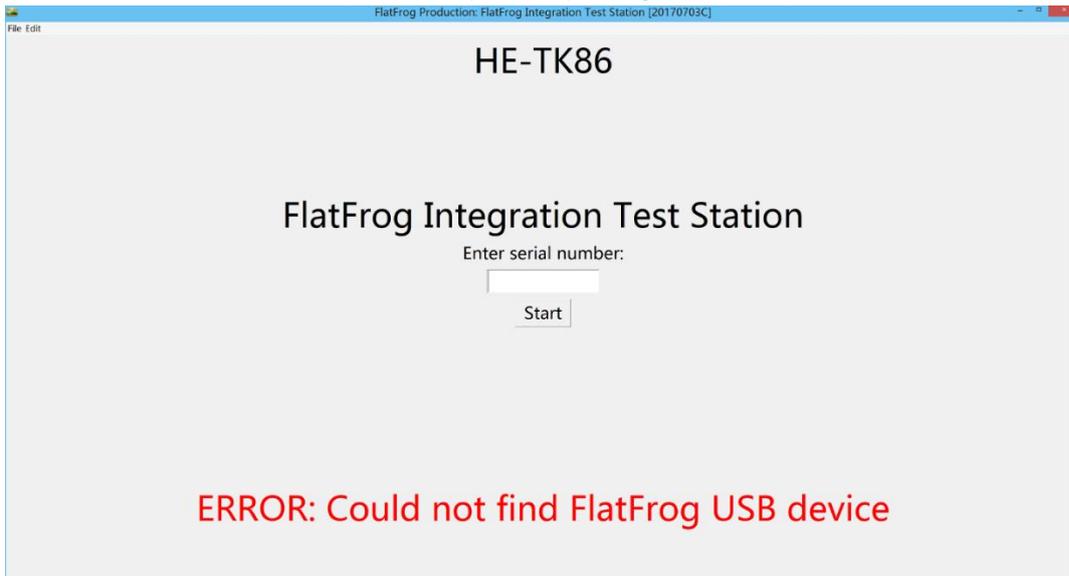


Step 4: It will perform a series of testing continuously, at the final testing step, please according to the prompt to do testing, you can place your finger on the green point and press Enter key in the computer keyboard to finish the testing.

If the hardware is good, the testing tool will show “PASS” result as below.

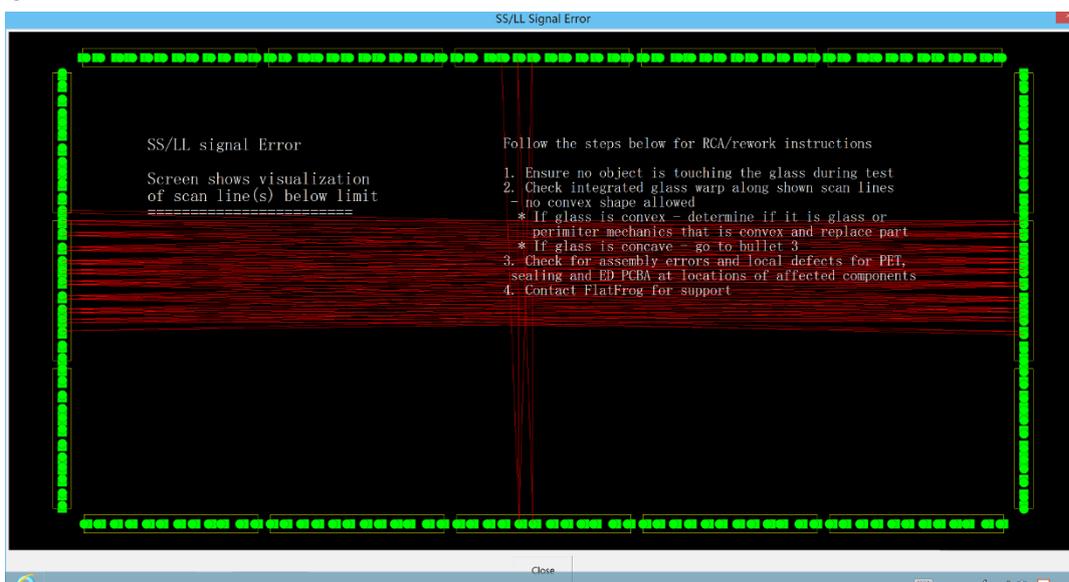


If the hardware has some problem, you may will get error report such as below:



\*Please re-connect TP cable between mainboard, TP control board to test again.

Or



\*It may will not affect the writing perforce, if yes, it don't need be repaired.

Note: If problem still present, please take picture or screen shoot the testing result to us for analysis.

## Part G. Replace Backlight module

Refer to Part D operation #1 and #2.

## Part H. Replace Optical bonding module / Clean dirt inside the glass

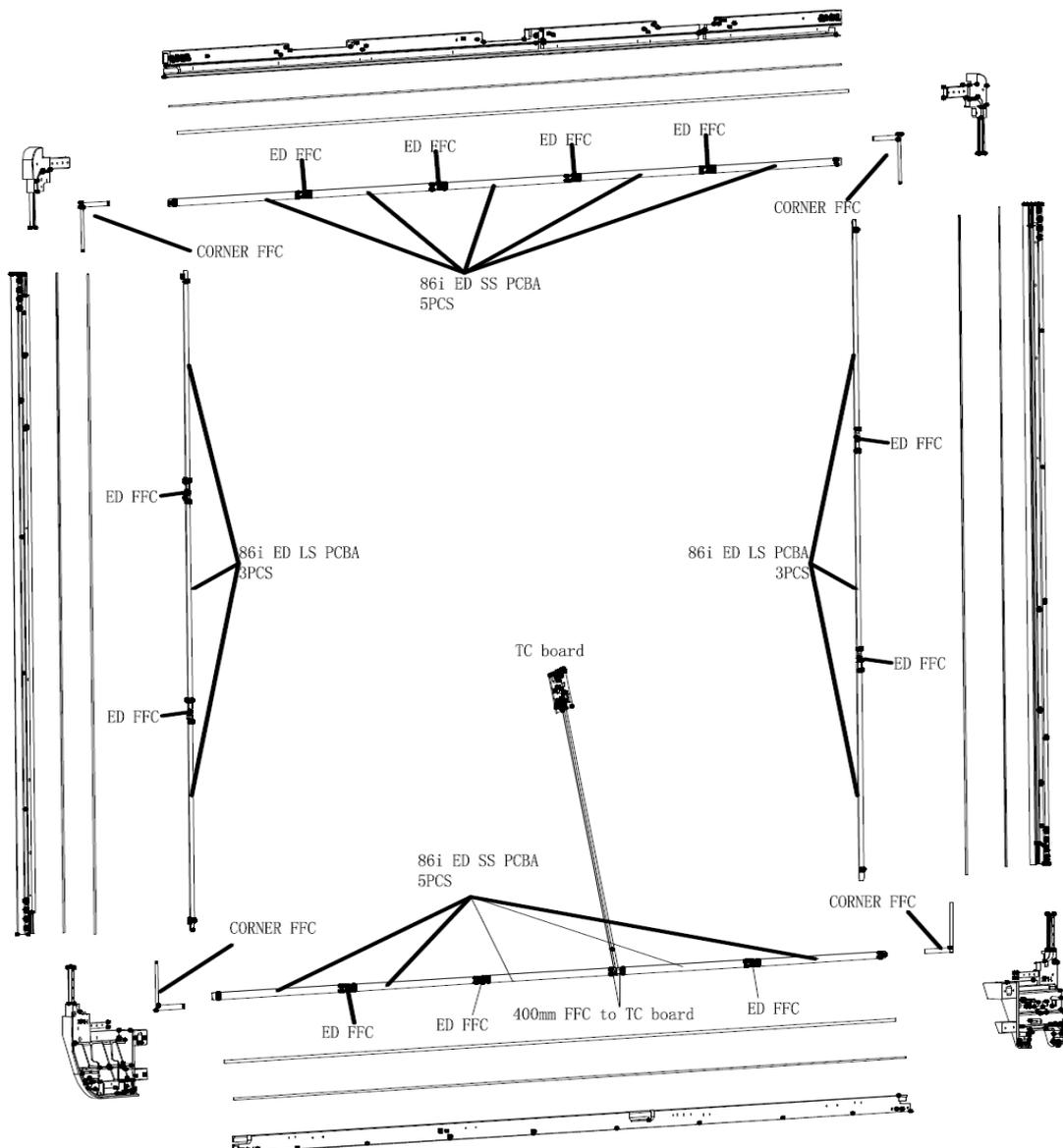
Refer to Part D operation #1, #2 and #3.

Note: Clean the dust on the led glass surface need under a strong light source.

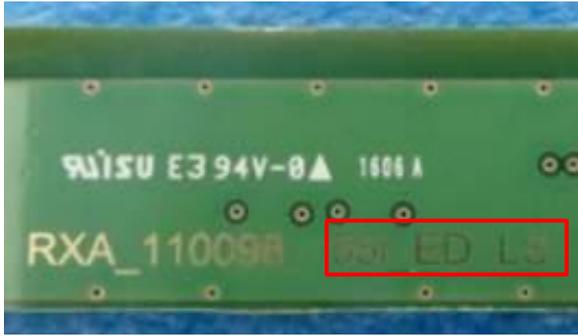
## Part I. Replace FlatFrog Touch Panel Sensor PCBAs

Step 1: Refer to Part D operation #1, #2, #3 and #4 to take off the Inner frame & Touch panel.

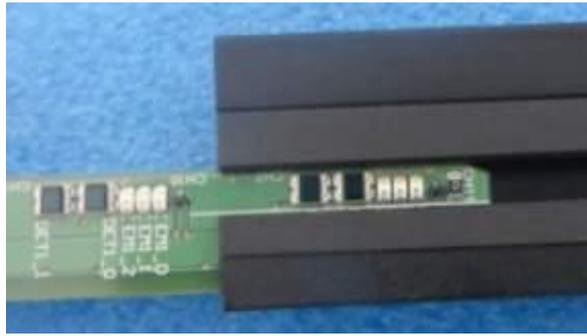
Step 2: Place it on a flat table, refer to below structure diagram to disassemble & reassemble it.



PCBA identification:



PCBA inserting direction:

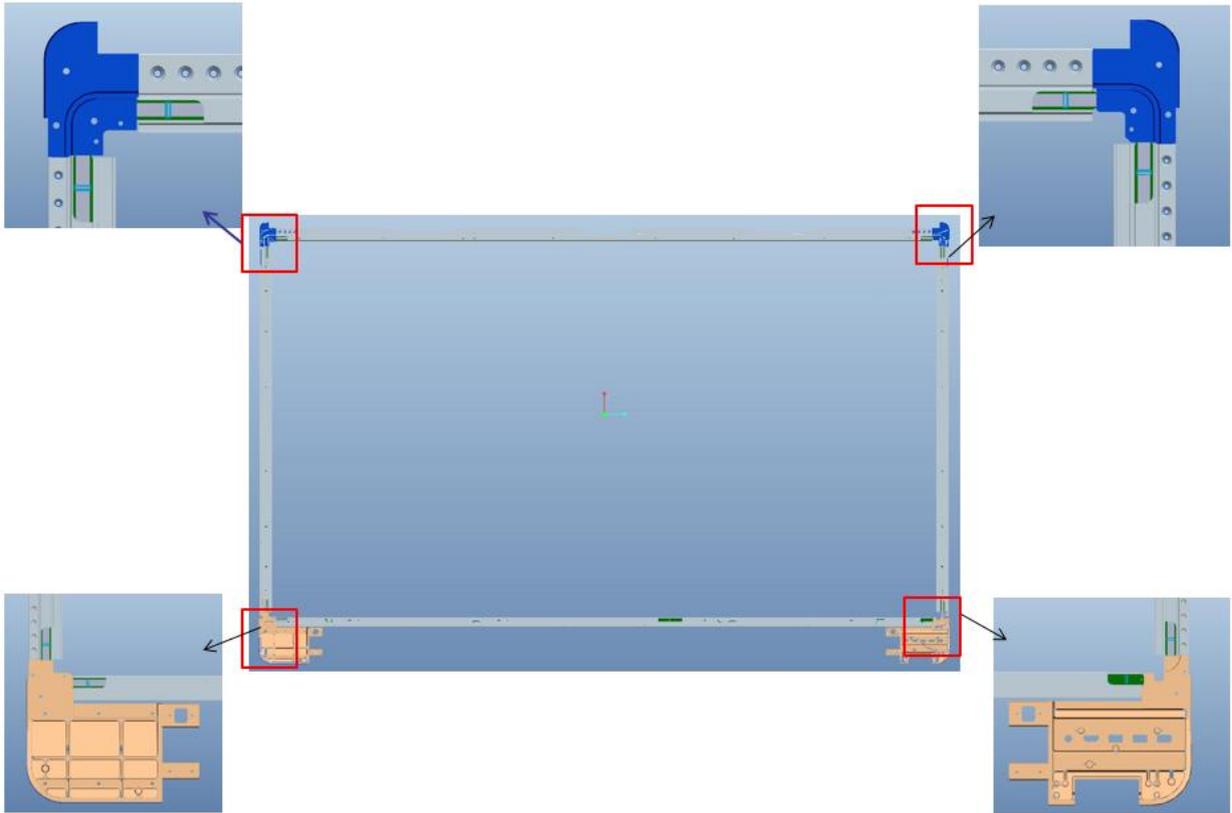


FFC cable installation:



Corner FFC installation:





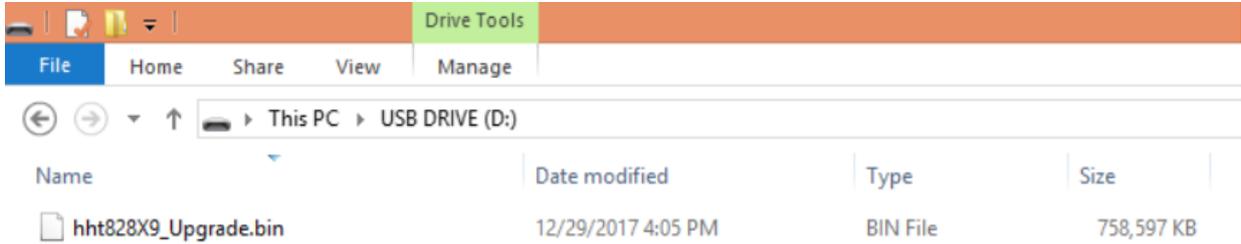
## Part J. Replace Outer Frame

Step 1: Refer to Part D operation #1, #2, #3 and #4 to take off the inner frame & touch panel, then you can replace the outer frame.

Step 2: Refer to Part D operation #6, #7, #8, #9 and #10 to reassemble the whole unit.

## Part K. Firmware Upgrade

Step 1: Prepare a USB drive and formatted it with FAT32 format, copy the firmware files to the root folder of the USB drive, show as following:



Step 2: Turn off the X9 to standby status, connect the USB drive to below USB port.



Step 3: Turn on X9, the firmware upgrade will start automatically.

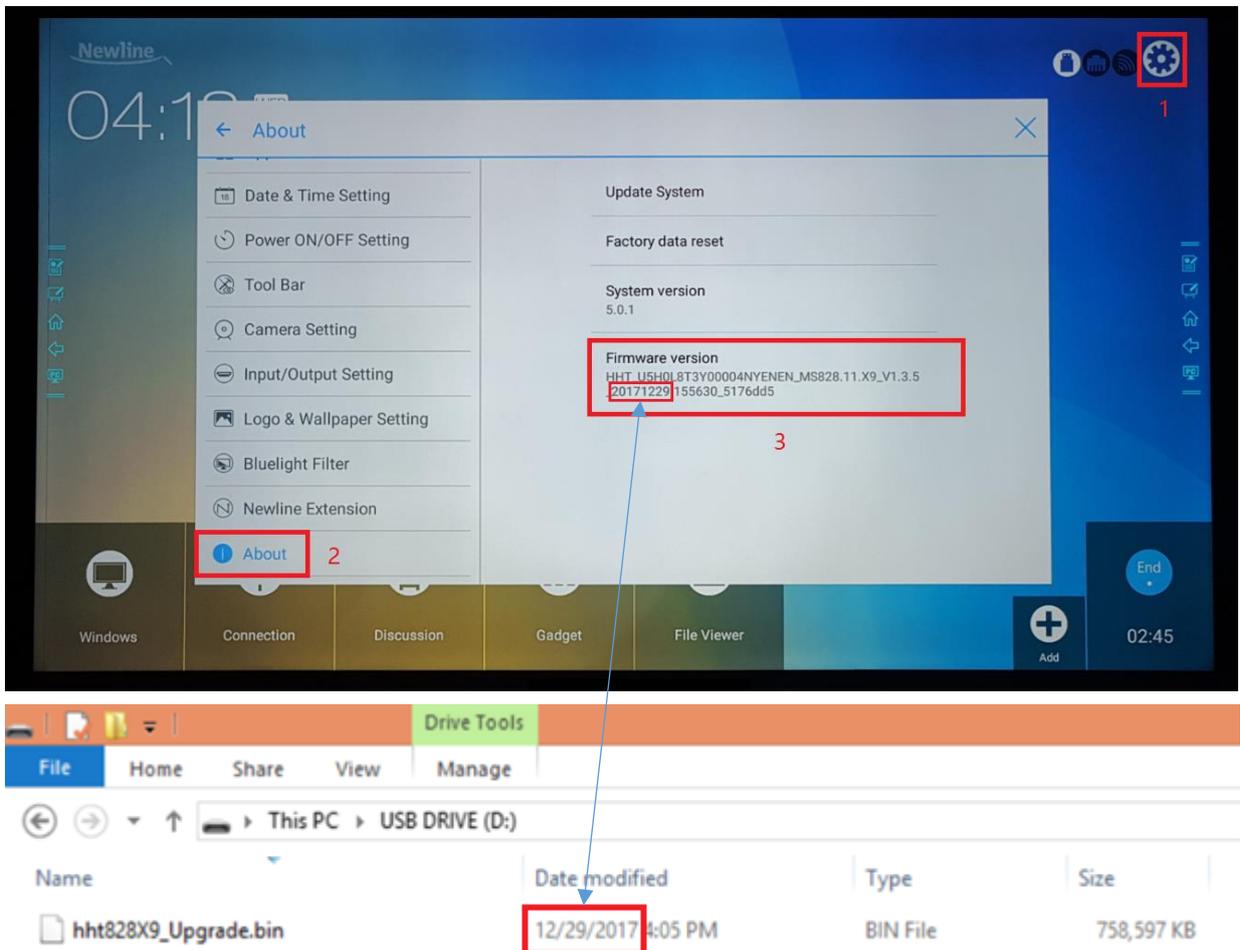


Step 4: When firmware upgrade finished, the X9 will return to standby status.

Step 5: Turn on X9 manually, in the first time boot-up after firmware upgrade, it will stay on the X9 splash logo as below for about 3 minutes.



Step 6: Go to setting menu to check the firmware version.



## Part L. Trouble shooting

- Problem #1: Can't turn on machine (Power indicator always stay on red)
- Problem #2: Dim screen (After turn on, the display get image but is very faint hard to see)
- Problem #3: Android can't pick up the OPS signal
- Problem #4: No power (Power indicator is blank even no red colour)
- Problem #5: Partial touch or dead touch area
- Problem #6: No touch
- Problem #7: Ghost touch or the calibration is inaccurate
- Problem #8: No image (Black screen) even no faint display
- Problem #9: Black spot or Partial screen is dark
- Problem #10: Vertical line or Horizontal line
- Problem #11: Noise image or colour distortion
- Problem #12: Flicker screen
- Problem #13: Stuck on splash logo, can't enter into homepage
- Problem #14: Always show different colour lines in screen after start.
- Problem #15: Broken sound or sound popping
- Problem #16: No audio output from OPS
- Problem #17: The splash logo appear and disappear quickly, then black screen.
- Problem #18: No signal from all HDMI input
- Problem #19: Wifi module not working, can't detect wifi signal
- Problem #20: Front HDMI not working

**Problem #1: Can't turn on machine (Power indicator always stay on red)**

Step 1: Replace the mainboard firstly.

Step 2: Replace the powerboard.

**Problem #2: Dim screen (After turn on, the display get image but is very faint hard to see)**

Step 1: If backlight is ON, replace the optical bonding module.

Step 2: If backlight is OFF, replace the backlight module.

**Problem #3: Android can't pick up the OPS signal**

Step 1: Check if the OPS is powered on, if not, press POWER button on the OPS front panel to check if the OPS can be powered on or not.

Step 2: Check if the OPS can work with another known-working touchscreen, if not work, replace the OPS.

Step 3: If there is no others touchscreen, connect the OPS pc via external HDMI cable to touchscreen's rear HDMI IN port, if yes, check the OPS windows has installed the graphic card driver properly or not, if not, install the graphic card driver.

Step 4: Replace the mainboard.

Step 5: Replace the OPS dock board.

**Problem #4: No power (Power indicator is blank even no red colour)**

Step 1: Replace the Powerboard

Step 2: Replace the AC relay control board.

Step 3: Replace the Mainboard.

**Problem #5: Partial touch or dead touch area**

Step 1: Refer to Part F to test the FlatFrog touch panel signal.

Step 2: According to testing result to replace some one sensor pcba or whole set sensor pcbas.

**Problem #6: No touch**

Step 1: Check if only Windows has no touch or both Windows and Android all have no touch.

Step 2: If only Windows has no touch, replace mainboard and OPS docking board one by one.

Step 3: If both Windows and Android all have no touch, please refer to Part F to test the FlatFrog touch panel signal, according to testing result to do next replacement, basically need replace the TP control board at first, if not working, send back testing result for analysis.

**Problem #7: Ghost touch or the calibration is inaccurate**

Step 1: Refer to Part F to test the FlatFrog touch panel signal.

Step 2: According to testing result to replace some one sensor pcba or whole set sensor pcbas.

**Problem #8: No image (Black screen) even no faint display**

Step 1: Pull off the power cord for 30s then pull on the power cord to check again, if it become to start with image normally, please replace the Powerboard.

Step 2: If still no image, replace Mainboard, T-CON board, FFC cable of T-CON board, LVDS cable and Powerboard one by one.

Step 3: Replace the backlight module.

Step 4: Replace the optical bonding module.

**Problem #9: Black spot or Partial screen is dark**

Step 1: Replace optical bonding module.

**Problem #10: Vertical line or Horizontal line**

Step 1: Replace optical bonding module.

**Problem #11: Noise image or colour distortion**

Step 1: If only OPS source has this issue, replace the OPS docking board or HDMI cable that between OPS docking board and Mainboard.

Step 2: If all source included the Android all has this issue, replace the Mainboard, T-CON board and LVDS cable one by one.

Step 3: Replace optical bonding module.

**Problem #12: Flicker screen**

Step 1: Replace Mainboard at first.

Step 2: Replace T-CON board and clean the FFC cable of T-CON.

Step 3: Replace optical bonding module.

**Problem #13: Stuck on splash logo, can't enter into homepage**

Step 1: Reload FW for mainboard.

Step 2: If it not work, replace Mainboard.

**Problem #14: Always show different colour lines in screen after start.**

Step 1: Replace T-Con board, clean FFC cable of T-CON, Mainboard, LVDS cable one by one.

Step 2: Replace optical bonding module.

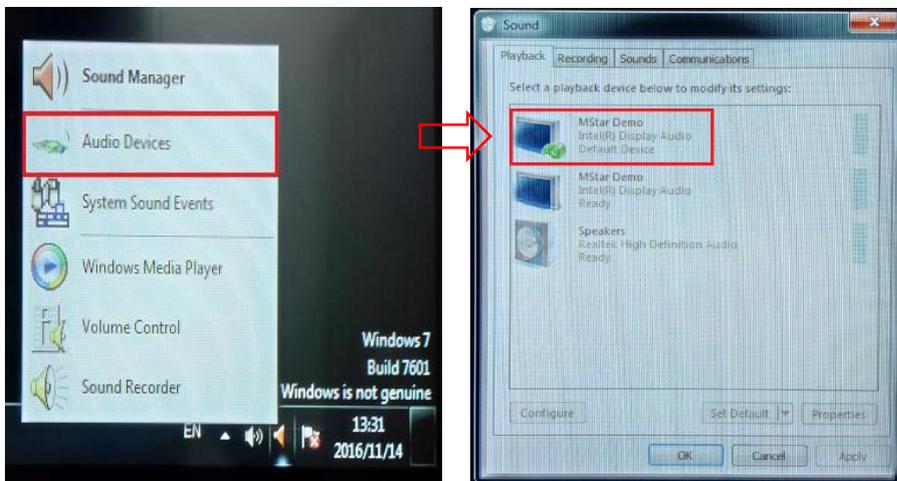
**Problem #15: Broken sound or sound popping**

Step 1: It should be a speaker issue, replace the speaker.

**Problem #16: No audio output from OPS**

Step 1: Install audio card driver for OPS windows.

Step 2: Right click Speaker icon in the right side of Windows toolbar, select the "Audio device" item, set "MStar Demo" speaker as default speaker device.



Step 3: Install all OPS driver.

**Problem #17: The splash logo appear and disappear quickly, then black screen.**

Step 1: Replace LVDS cable and Mainboard one by one.

Step 2: Replace T-CON board, clear FFC cable of T-Con board.

Step 3: Replace optical bonding module.

**Problem #18: No signal from all HDMI input**

Step 1: Replace Mainboard.

**Problem #19: Wifi module not working, can't detect wifi signal**

Step 1: Replace wifi module pcbas.

**Problem #20: Front HDMI not working**

Step 1: Replace Front port board.

Step 2: Replace HDMI cable between Front port board and Mainboard.

# Thank you for reading!

For more info, please contact the manufacturer or authorized agent.