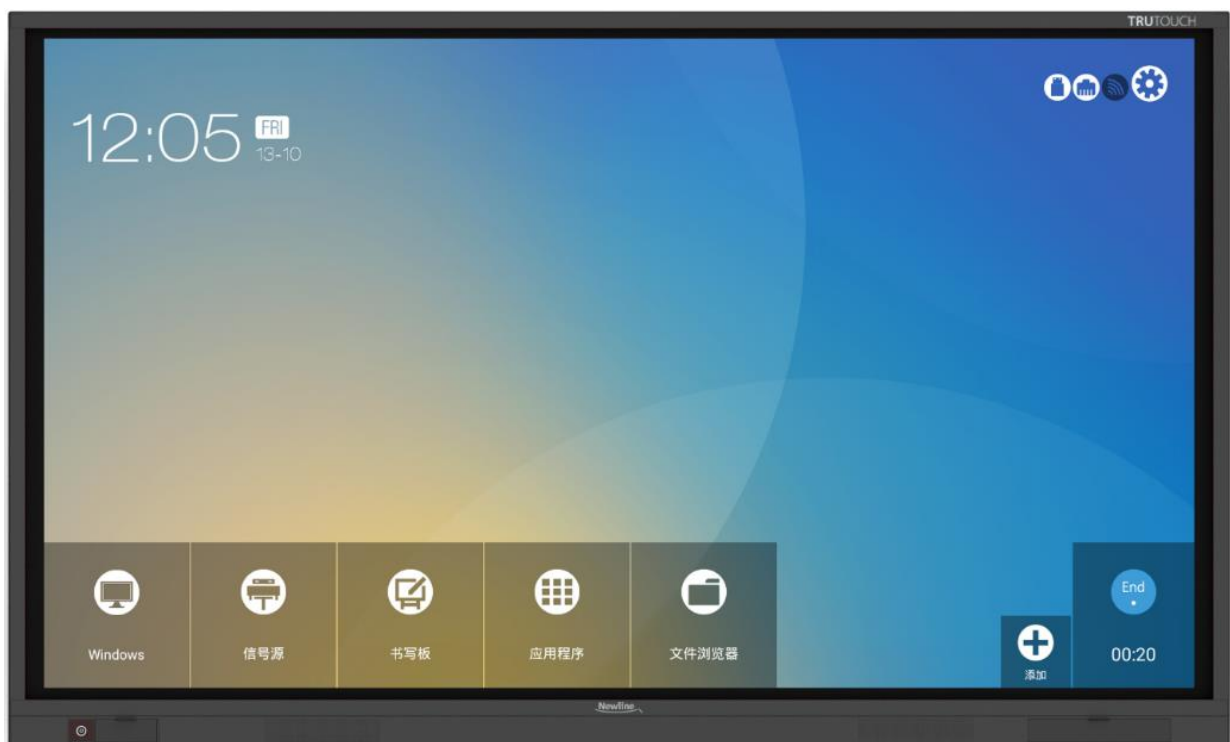


VN Series

Service Manual

Version: V1.0, 26/3/2018



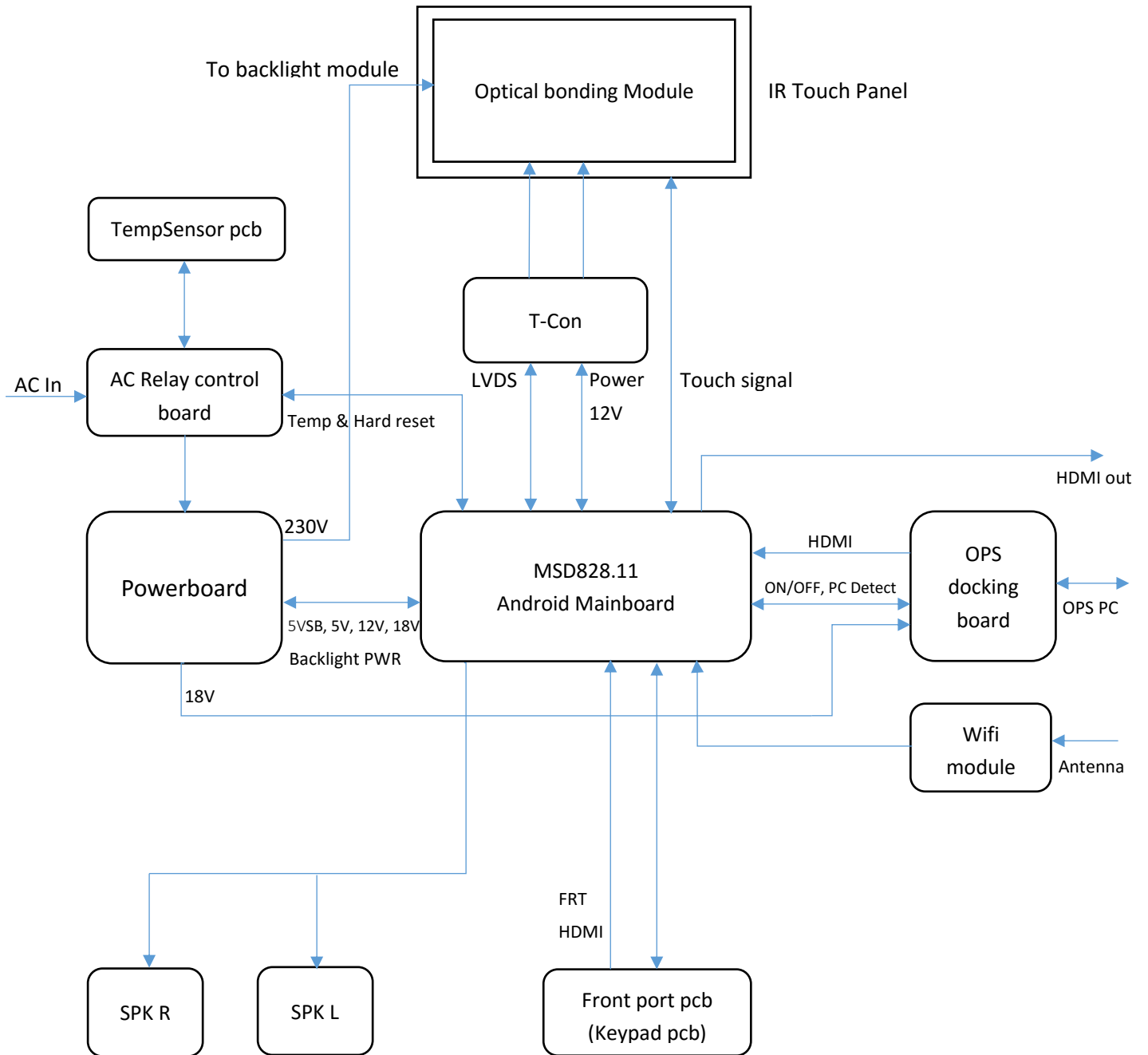
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Safety Notice

1. There are many electrical and mechanical parts in the VN series touchscreen, which the technician need pay attention to the safety precaution before repairing.
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 disassembling the machine, please make sure unplug the machine from any power source and properly grounded.

Part A. System Diagram



Part B. Recommended Spare Parts List

VN65 RSPL:

Part No.	Part Description	Usage
Standard Spare Parts		
10503T6A8000002	Powerboard, AY450D-5SF111/MP600S-H-65T	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
30100ZZZZ001629	TempSensor pcb, HHT_TempSensor_15_901.3v02	1
30100T6G8004010	Front port pcb, FRONTBOARD KEY-VN-17	1
10503T7A7000001	Wifi module, 5G WIFI WC0DR2611	1
10503T6A8000001	VN65 ITW065LU1004 (16pcs PCBA, 3pcs cable)	1
Non-standard Spare Parts		
10505V14D001080	VN remote controller	1
10500T5C4002020	X5 writing pen	1
10403ZZZZ001654	Inner cable, between Powerboard and Mainboard, 450mm	1
10403ZZZZ001656	Inner cable, LVDS cable, between Mainboard to T-CON board, 51pin, 800mm	1
10403ZZZZ001657	Inner cable, between Mainboard and speaker, 2 ports cable, longer side 1000mm shorter side 800mm	1
10403ZZZZ001652	Inner cable, between Powerboard and OPS docking board, with Magnetic ring, 360mm	1
10403ZZZZ001487	Inner HDMI cable, HDMI2.0, between Mainboard and Front port board, 900mm	1
10403ZZZZ001555	Inner cable, between Mainboard and WIFI module, 150mm	1
10403ZZZZ000905	Inner cable, between AC relay control board and Powerboard	1
10403ZZZZ000936	Inner cable, between TempSensor board and AC relay control board	1
10403ZZZZ001650	Inner cable, between Mainboard and IR Touch mainboard, 1250mm	1
10403ZZZZ001651	Inner cable, between Mainboard and Front port board, 910mm	1
10403ZZZZ001542	Inner cable, between Mainboard and 4K OPS board, 500mm	1
10403ZZZZ001679	Inner HDMI cable, HDMI2.0, between Mainboard and OPS docking board, with screw, 630mm	1
10403ZZZZ001649	Inner cable, between Mainboard and AC relay control board, 190mm	1

VN75 RSPL:

Part No.	Part Description	Usage
Standard Spare Parts		
10503T6GP000002	Powerboard, AY668D-4MF102 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
30100T6G8004010	Front port pcb, FRONTBOARD KEY-VN-17	1
10503T7A7000001	Wifi module, 5G WIFI WC0DR2611	1
30100ZZZZ001629	Temp sensor pcb, HHT_TempSensor_15_901.3v02	1
10503T6G8000001	VN75 ITW075LU1004 (18pcs PCBA, 3pcs FFC cable)	1
Non-standard Spare Parts		
10505V14D001080	VN remote controller	1
10500T5C4002020	X5 writing pen	1
10403ZZZZ001234	Inner cable, between Powerboard and Mainboard, 1050mm	1
10403ZZZZ001655	Inner cable, LVDS cable, between Mainboard to T-CON board, 51pin, 785mm	1
10403ZZZZ001488	Inner cable, between Mainboard and speaker, 2 ports cable, longer side 1200mm shorter side 520mm	1
10403ZZZZ001386	Inner cable, between Powerboard and OPS docking board, with Magnetic ring, 1550mm	1
10403ZZZZ001479	Inner HDMI cable, HDMI2.0, between Mainboard and Front port board, 350mm	1
10403ZZZZ001555	Inner cable, between Mainboard and WIFI module, 150mm	1
10403ZZZZ001546	Inner cable, between AC relay control board and Powerboard, 100mm	1
10403ZZZZ000936	Inner cable, between TempSensor board and AC relay control board	1
10403ZZZZ001547	Inner cable, between Mainboard and IR Touch mainboard, 700mm	1
10403ZZZZ001539	Inner cable, between Mainboard and Front port board, 600mm	1
10403ZZZZ001542	Inner cable, between Mainboard and 4K OPS board, 500mm	1
10403ZZZZ001679	Inner HDMI cable, HDMI2.0, between Mainboard and OPS docking board, with screw, 630mm	1
10403ZZZZ001545	Inner cable, between Mainboard and AC relay control board, 1300mm	1

VN86 RSPL:

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
30100T6G8004010	Front port pcb, FRONTBOARD KEY-VN-17	1
10503T7A7000001	Wifi module, 5G WIFI WC0DR2611	1
30100ZZZZ001629	Temp sensor pcb, HHT_TempSensor_15_901.3v02	1
10503T5J5000020	VN86 ITW086RU1003 (20pcs PCBA, 3pcs FFC cable)	1
Non-standard Spare Parts		
10505V14D001080	VN remote controller	1
10500T5C4002020	X5 writing pen	1
10403ZZZZ001234	Inner cable, between Powerboard and Mainboard, 1050mm	1
10403ZZZZ001504	Inner cable, LVDS cable, between Mainboard to T-CON board, 51pin, 880mm	1
10403ZZZZ001235	Inner cable, power cable, between Mainboard to T-CON board, 900mm	
10403ZZZZ001488	Inner cable, between Mainboard and speaker, 2 ports cable, longer side 1200mm shorter side 520mm	1
10403ZZZZ001386	Inner cable, between Powerboard and OPS docking board, with Magnetic ring, 1550mm	1
10403ZZZZ001479	Inner HDMI cable, HDMI2.0, between Mainboard and Front port board, 350mm	1
10403ZZZZ001555	Inner cable, between Mainboard and WIFI module, 150mm	1
10403ZZZZ001546	Inner cable, between AC relay control board and Powerboard, 100mm	1
10403ZZZZ000936	Inner cable, between TempSensor board and AC relay control board	1
10403ZZZZ001547	Inner cable, between Mainboard and IR Touch mainboard, 700mm	1
10403ZZZZ001539	Inner cable, between Mainboard and Front port board, 600mm	1
10403ZZZZ001542	Inner cable, between Mainboard and 4K OPS board, 500mm	1
10403ZZZZ001679	Inner HDMI cable, HDMI2.0, between Mainboard and OPS docking board, with screw, 630mm	1
10403ZZZZ001545	Inner cable, between Mainboard and AC relay control board, 1300mm	1

Part C. Structure Exploded Diagram

Basically there are 4 layers for VN series structure, they are Outer frame (IR touch panel inside), Optical bonding module, Backlight module and PCBAs.

Structure exploded diagram (Zoom in to see details):

<https://www.dropbox.com/s/ik4c99kz4gtmerm/VN%20series%20exploded%20drawing.pdf?dl=0>

Part D. Overall Process of Disassembly & Reassembly

A. Operation video of replacing OC backlight module & OC optical bonding module:

https://www.dropbox.com/s/z1ceo6qw9l4kuq2/VN_OC%20module_Disassembly%20%26%20Reassembly.mp4?dl=0

Operations involved in the above video:

1. Take off rear covers, remove all PCBAs.
2. Take off OC backlight module.
3. Take off OC optical bonding module.
4. Install OC optical bonding module.
5. Install OC backlight module.
6. Install all PCBAs, fix cables and install rear covers.

Note:

1. The above operation 2-5 MUST be done in a dust-free plant to avoid the dust stick onto the glass or backlight module surface.
2. Must use a suction cups tooling (see it in the above video clip) to fix the glass to uplift it, don't uplift OC optical bonding module by hand directly which will destroy it.

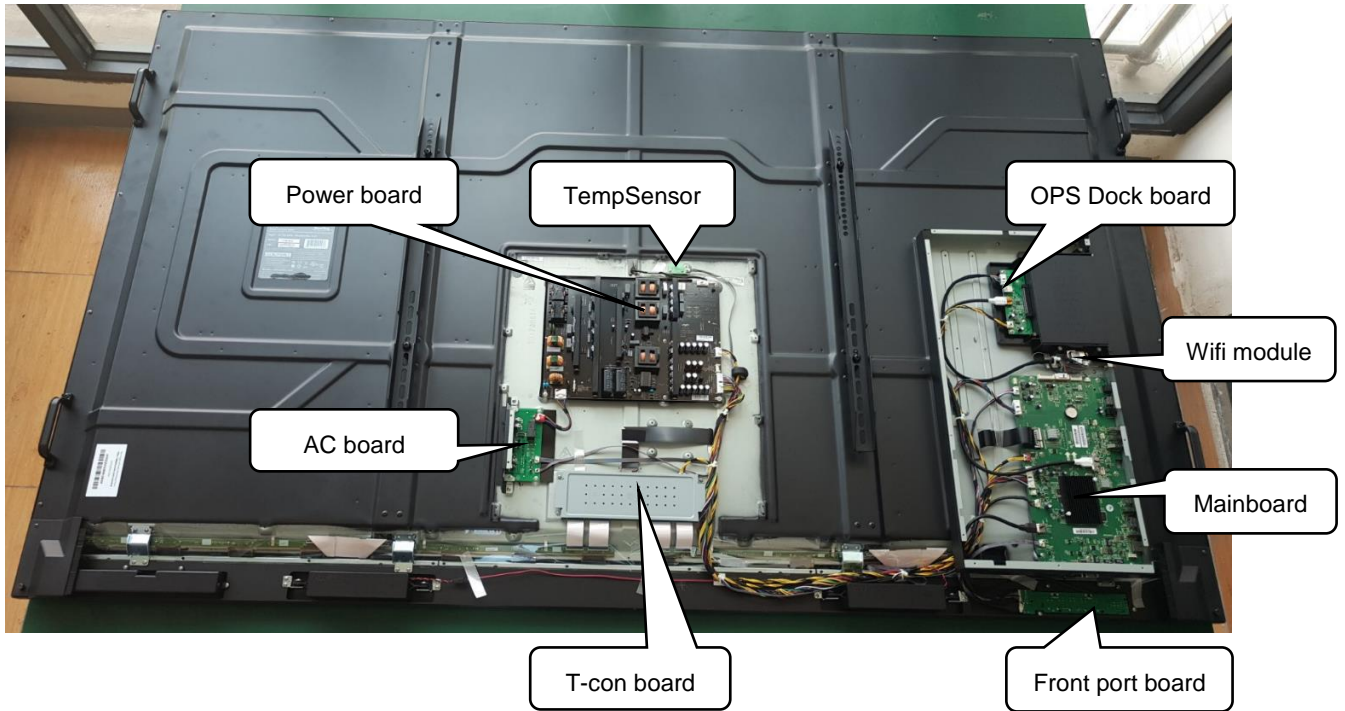
B. Operation video of replacing IR touch PCBAs:

https://www.dropbox.com/s/ymhpyblklmjswe9/VN_IR%20PCB%20SET_Disassembly%20%26%20Reassembly.mp4?dl=0

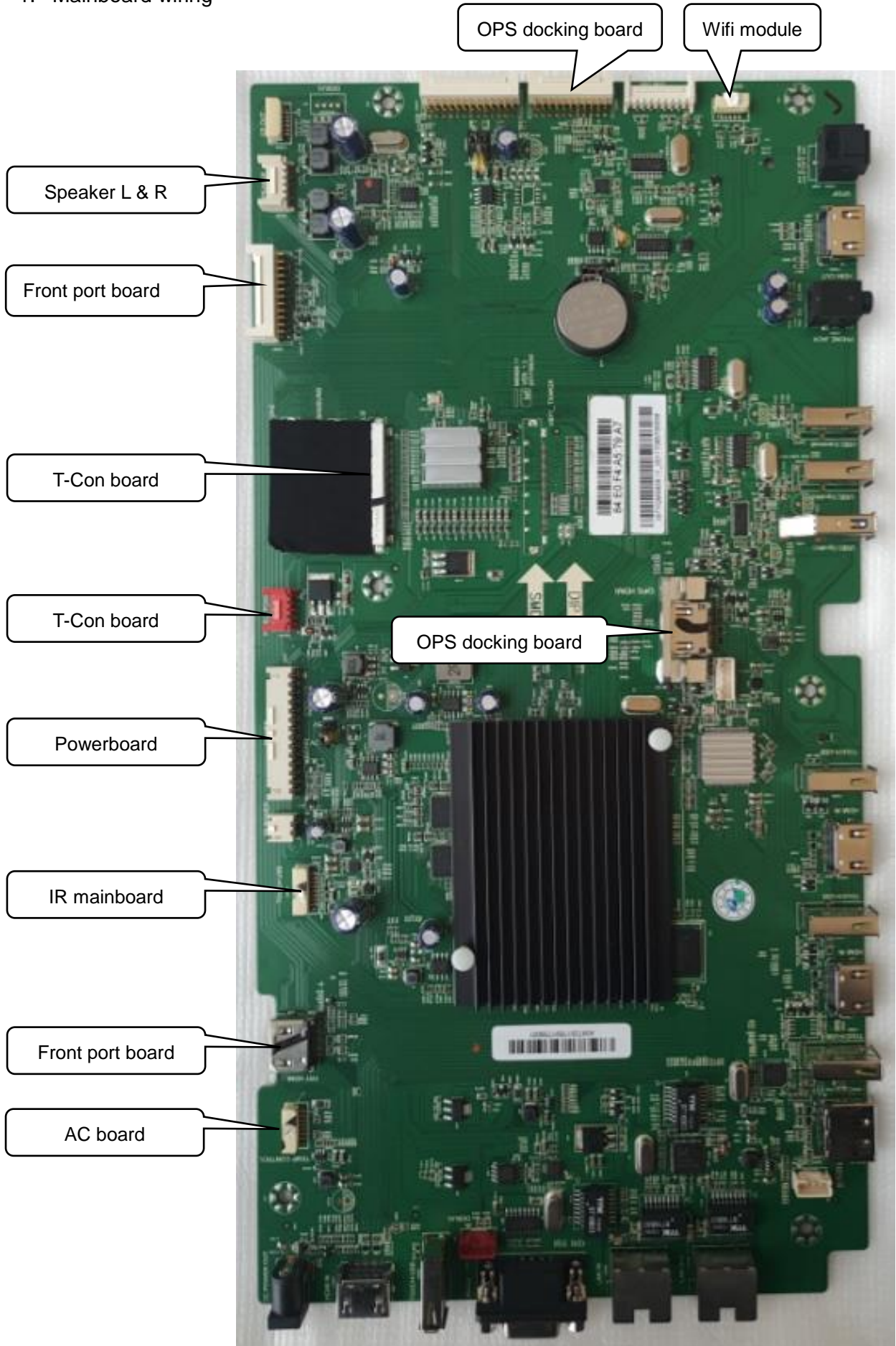
Operations involved in the above video:

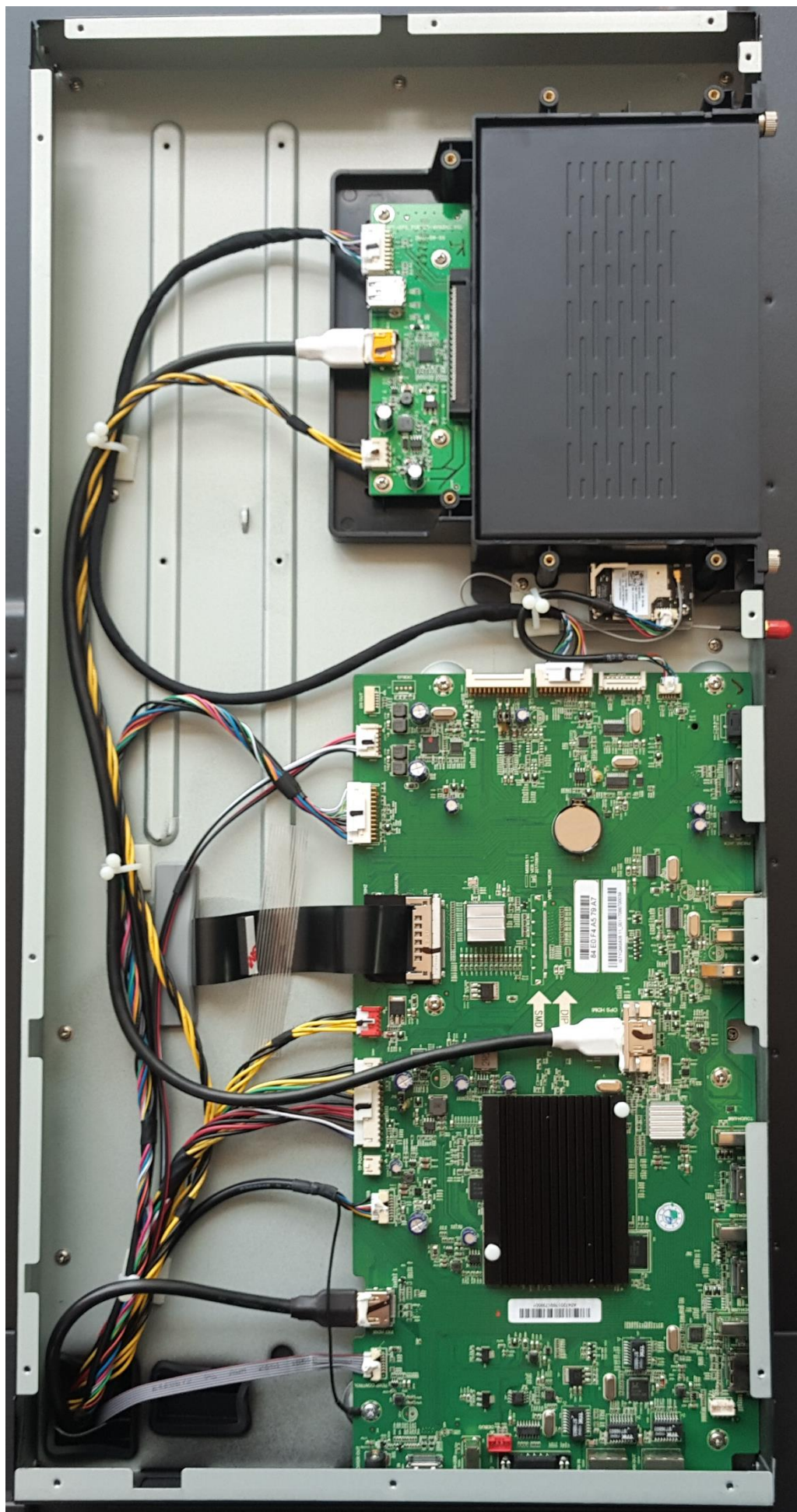
1. Take off 4 corner covers, there is no connection in the upper-right corner in front view, from right to left to remove upper IR PCBAs, from bottom to up to remove the left and right side IR PCBAs, from right to left to remove the bottom side IR PCBAs.
2. According to IR PCBA layout and refer to above opposite order to insert the 4 frames IR PCBAs.
3. Connect the bottom-left, bottom-right and upper-left corner PCBA, pay attention not to bend the contact pins, assemble the 4 corner covers.

Part E. PCBA Overviews

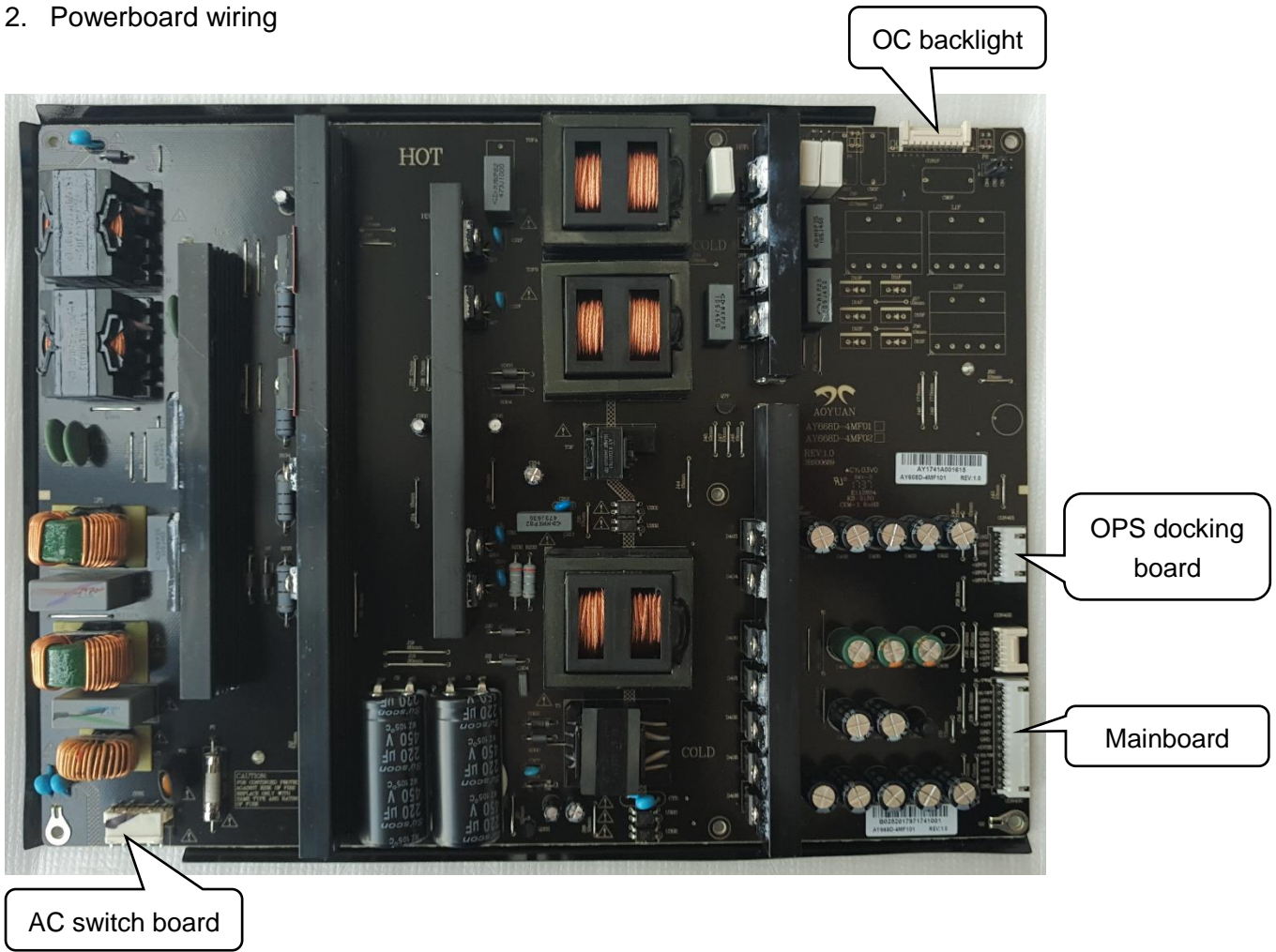


1. Mainboard wiring

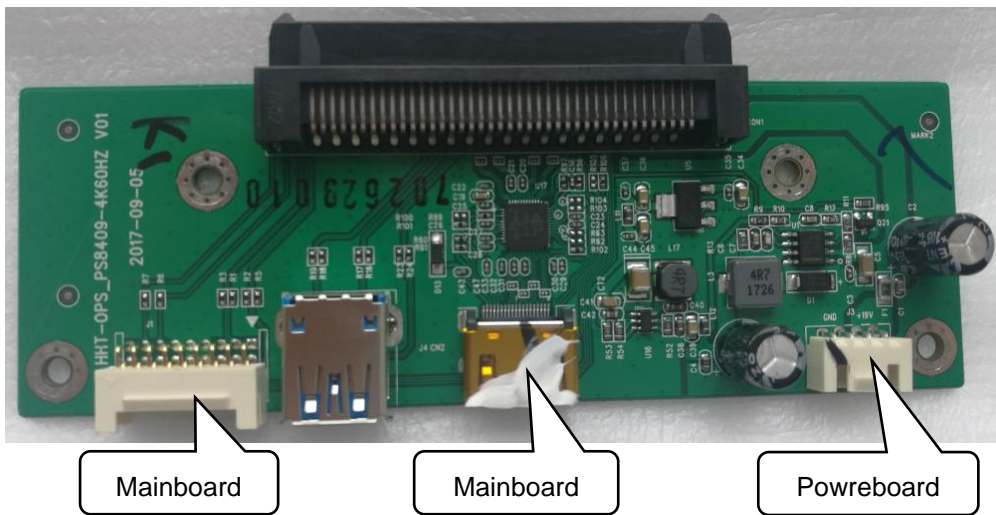




2. Powerboard wiring



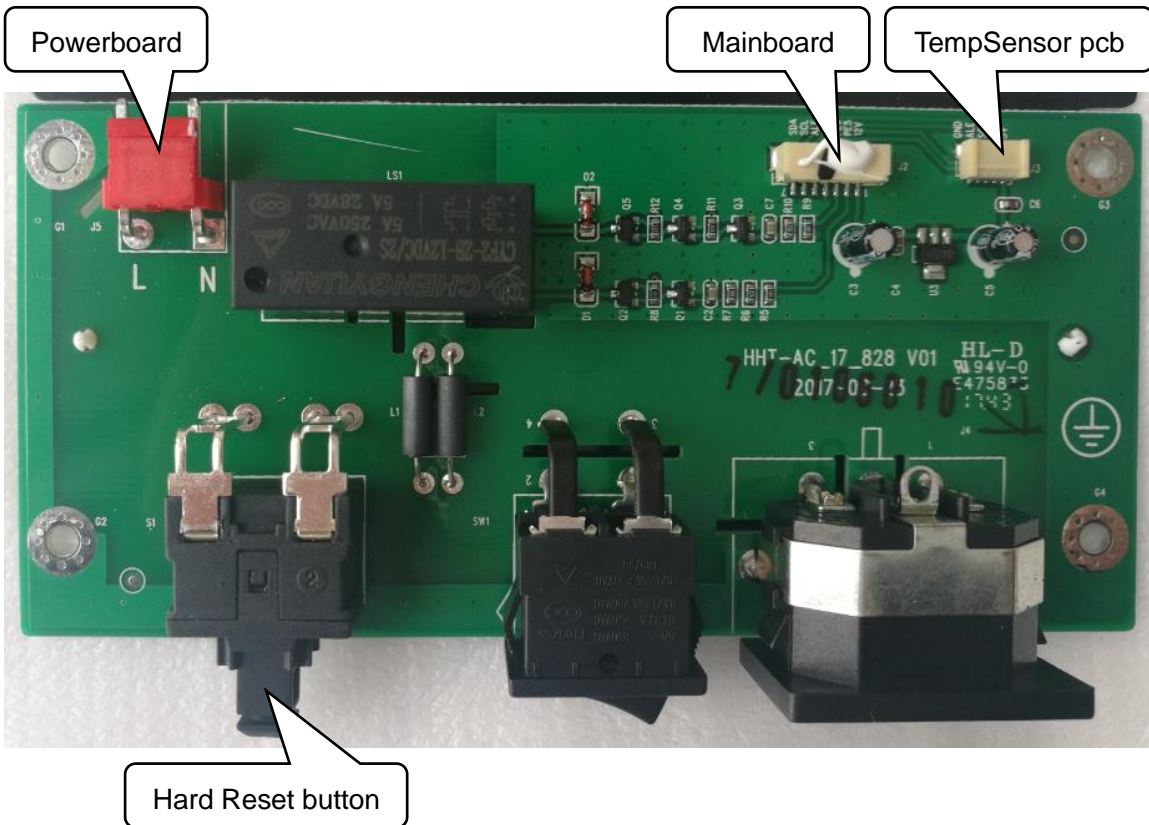
3. OPS docking board wiring



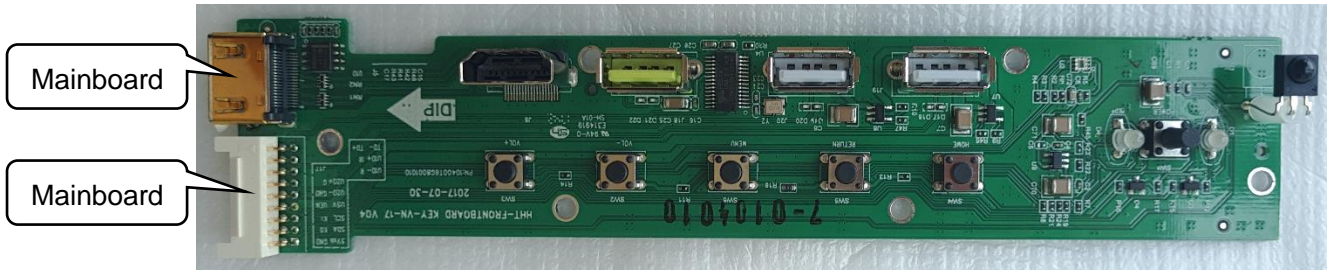
4. Wifi module wiring



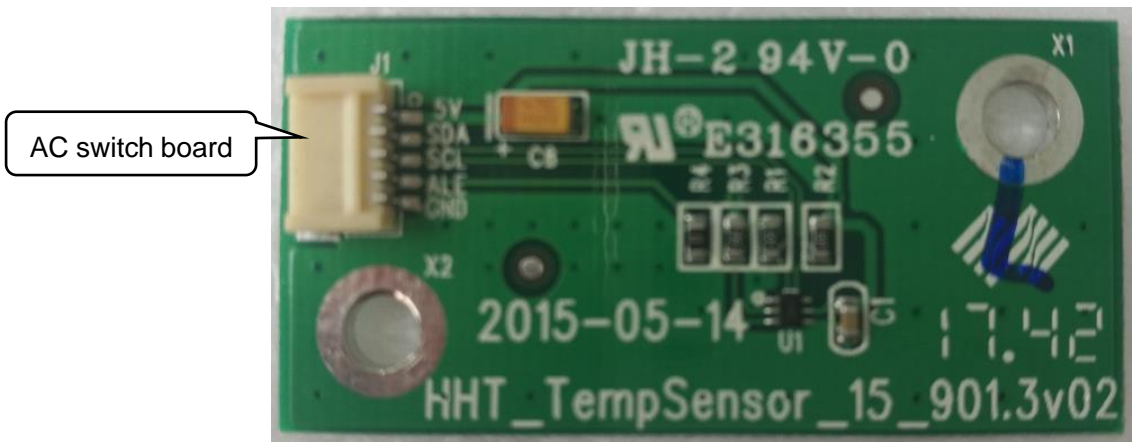
5. AC Switch board wiring



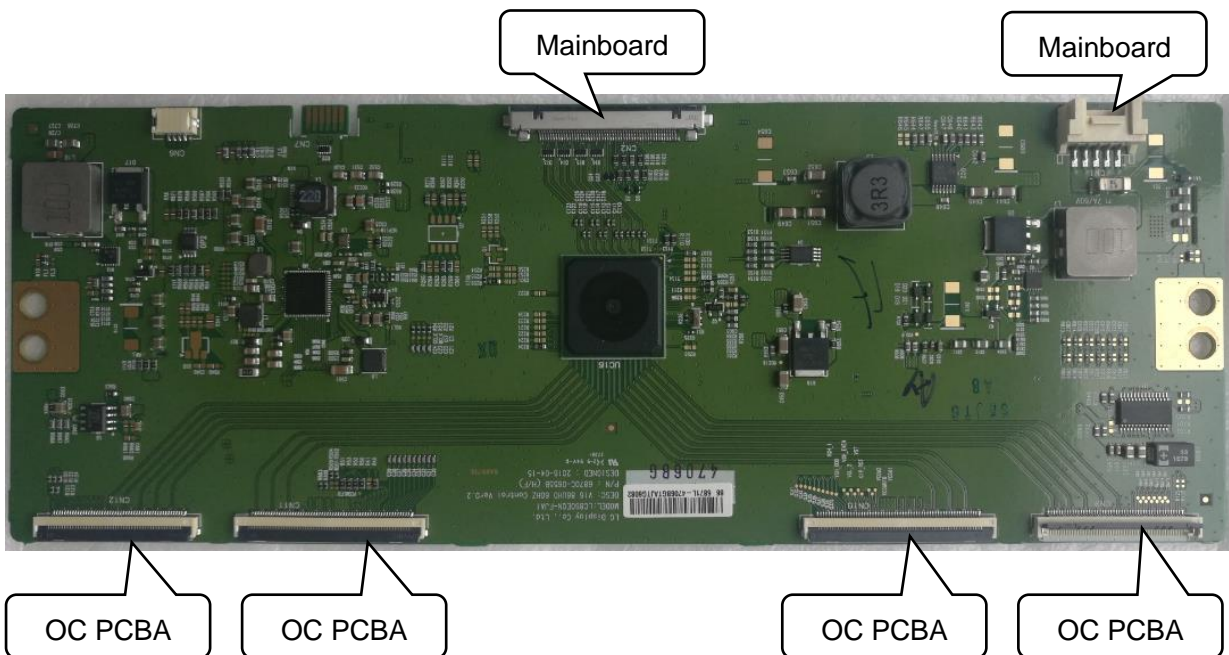
6. Front port board wiring

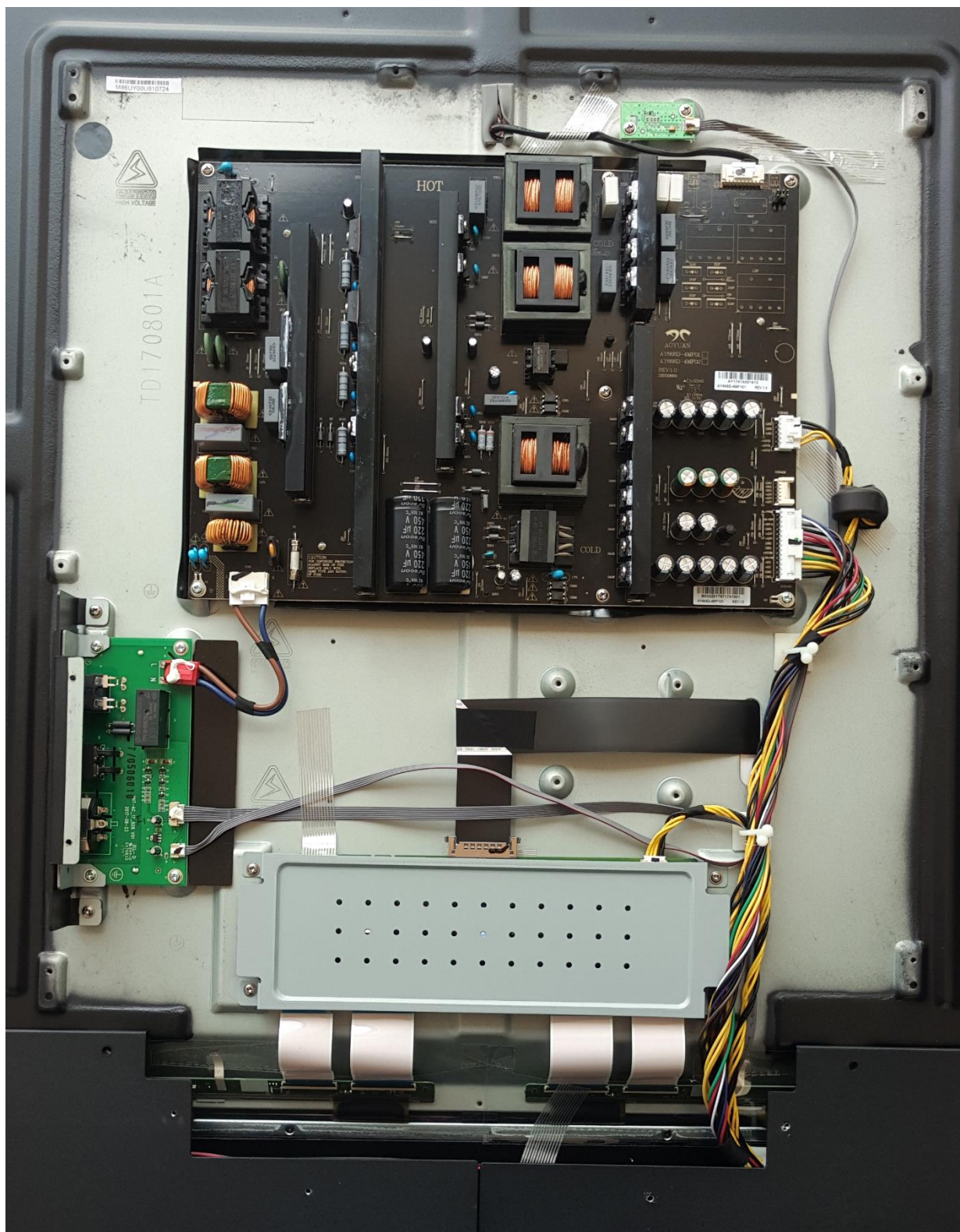


7. TempSensor PCBA wiring



8. T-CON board wiring





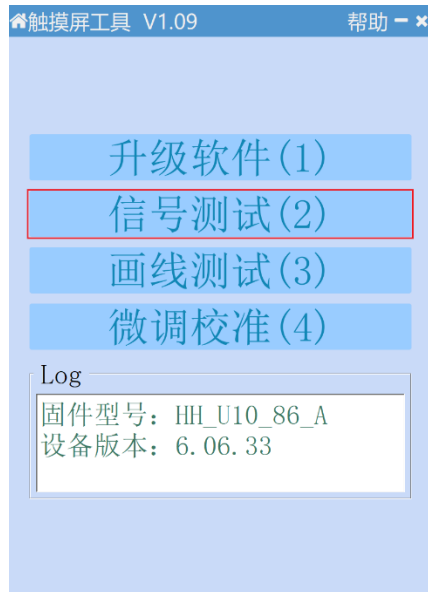
Part F. IR Touch Panel Signal Test

Step 1: Switch to Windows source.

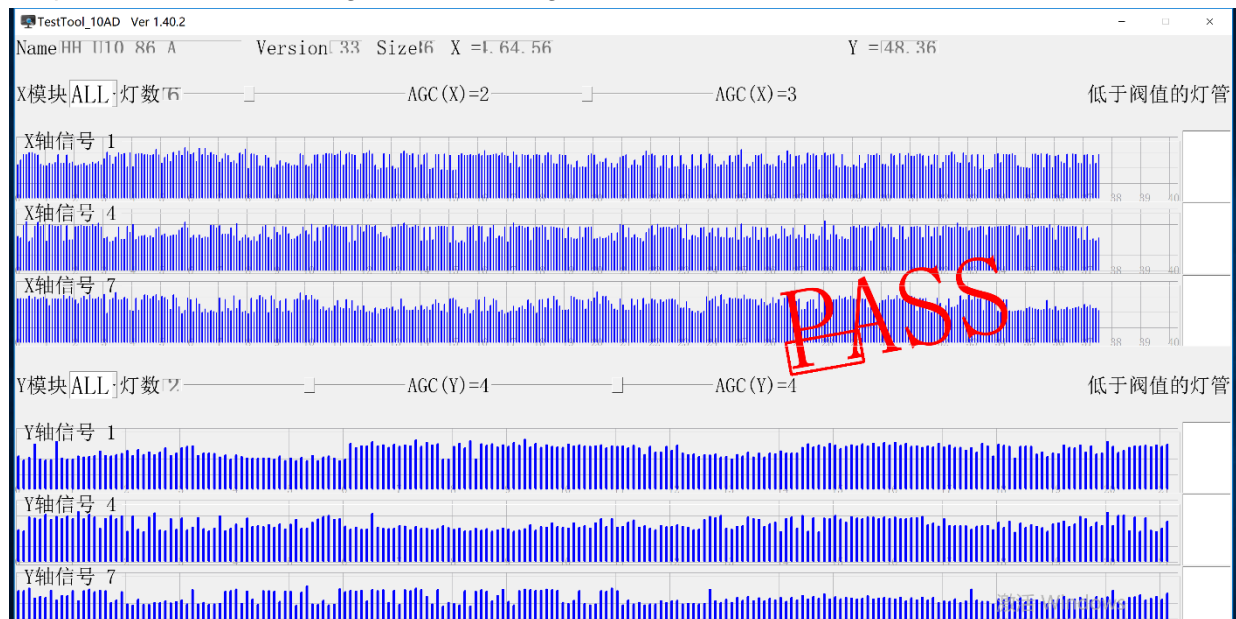
Step 2: Double click “VN series IR signal touchtest tool_v1.09.exe” to run it.

https://www.dropbox.com/s/bltbpzds4judt22/VN%20series%20IR%20signal%20touchtest%20ool_v1.09.exe?dl=0

Step 3: Click the second option to start the signal testing.

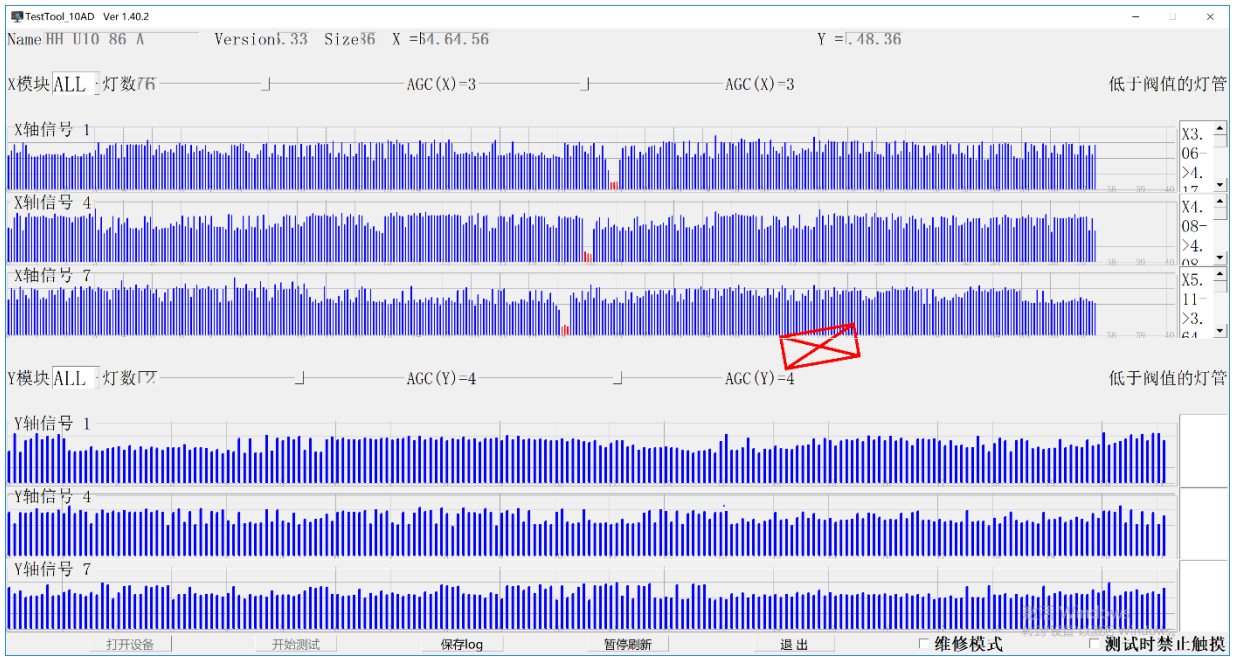


Step 4: If the hardware is good, the testing tool will show “PASS” result as below.



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

VN Service Manual



*It may will not affect the writing performance, 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 OC Backlight module

Refer to chapter A of Part D.

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

Refer to chapter A of Part D.

Note: Clean the dust on the led glass surface with a dustless cloth in a dust-free plant under a strong light source.

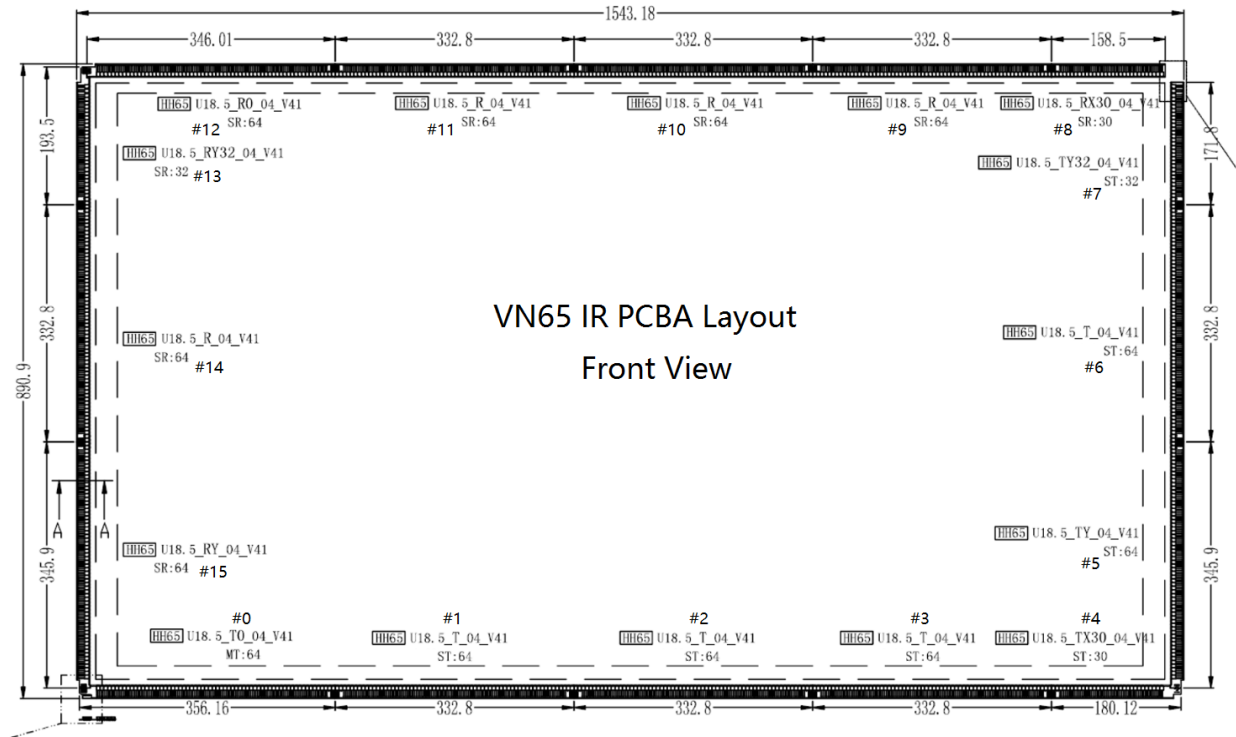
Part I. Replace Outer Frame

Refer to chapter A of Part D, after take out the OC optical bonding module then you can replace the outer frame.

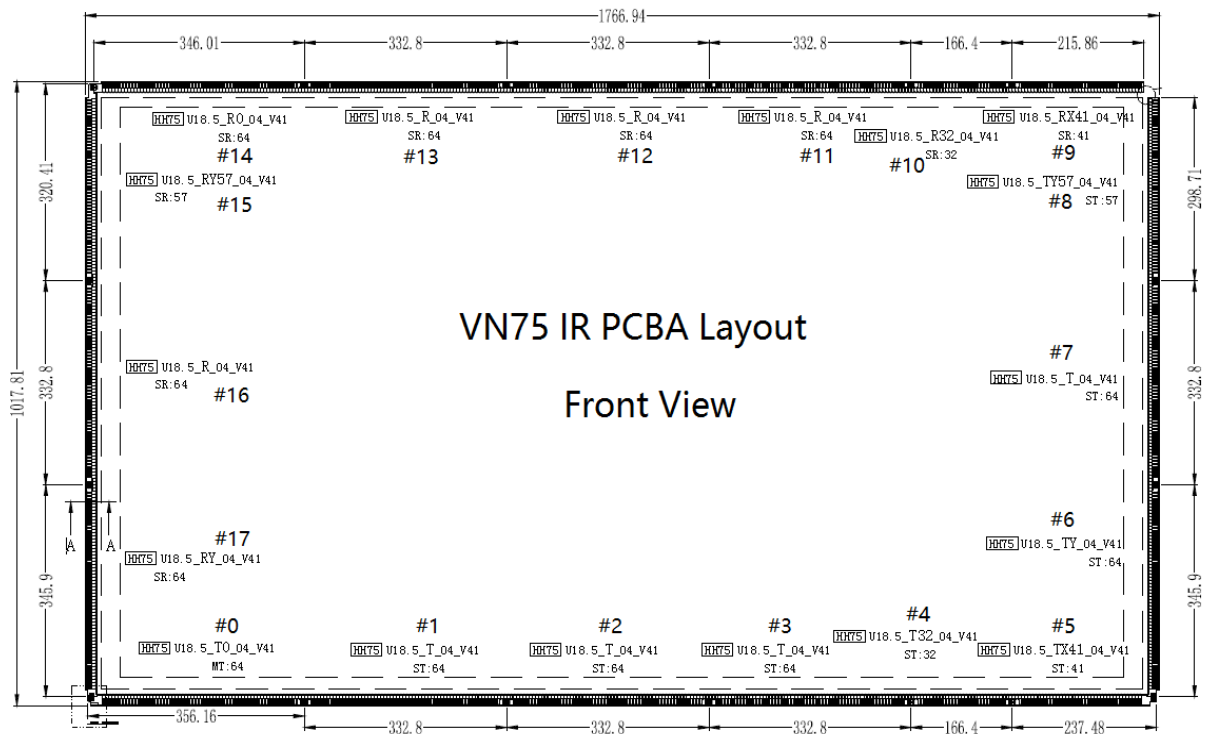
Part J. Replace IR Touch Panel Sensor PCBAs

Please see the chapter B of Part D before operation.

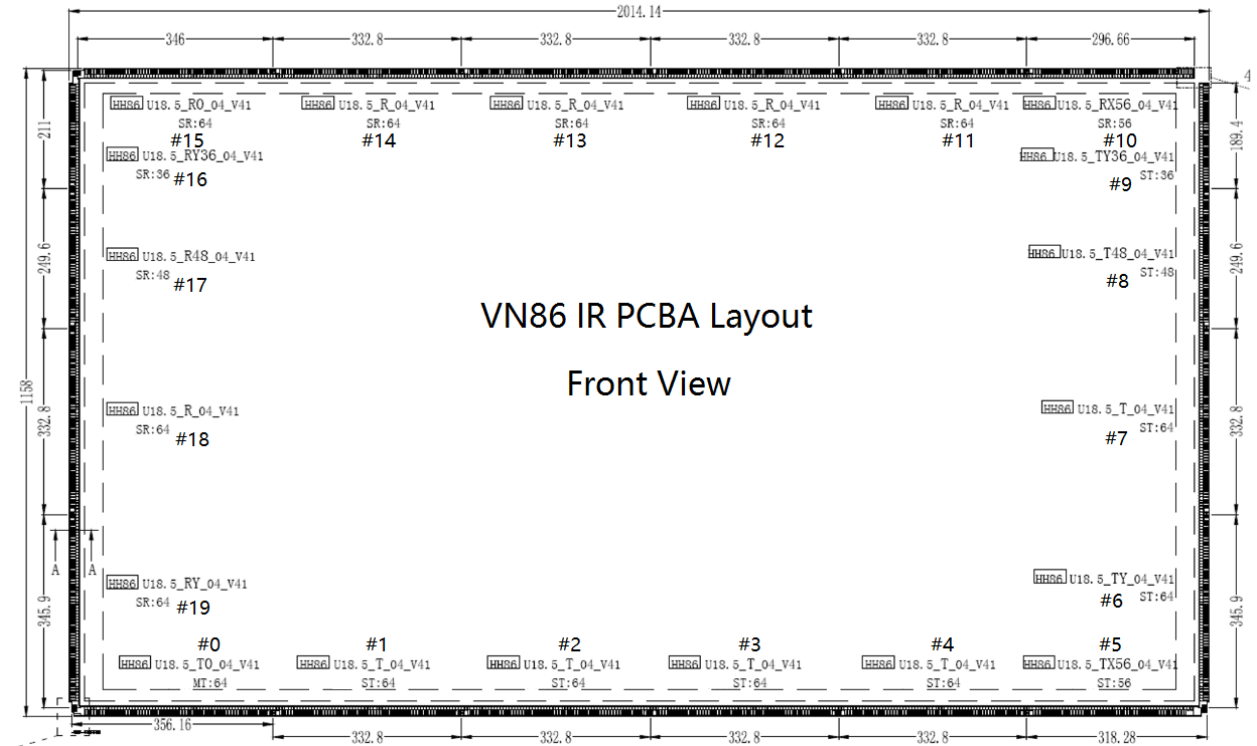
VN65:



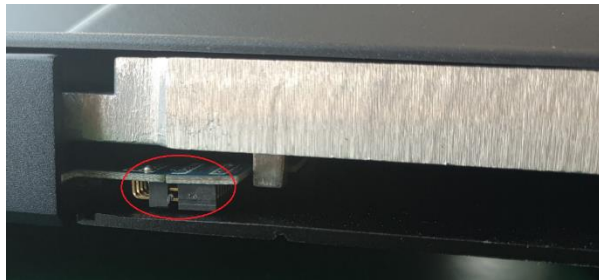
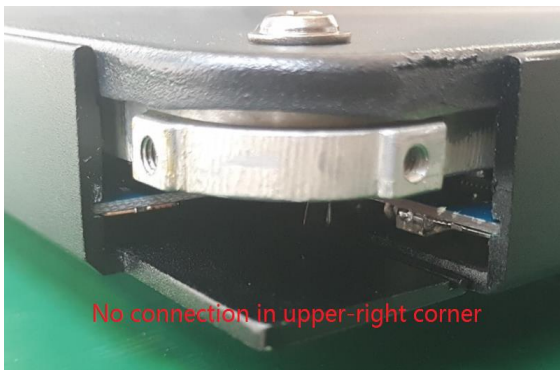
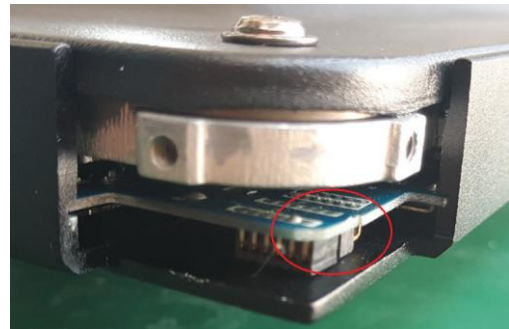
VN75:



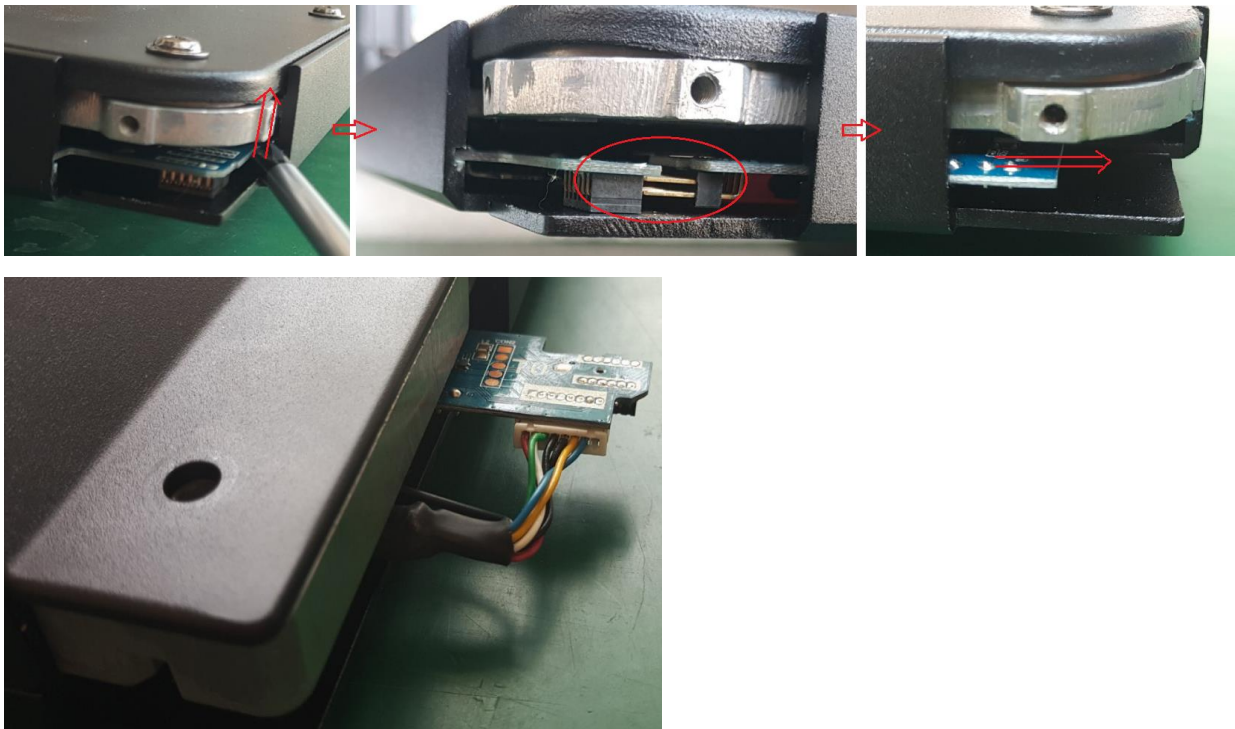
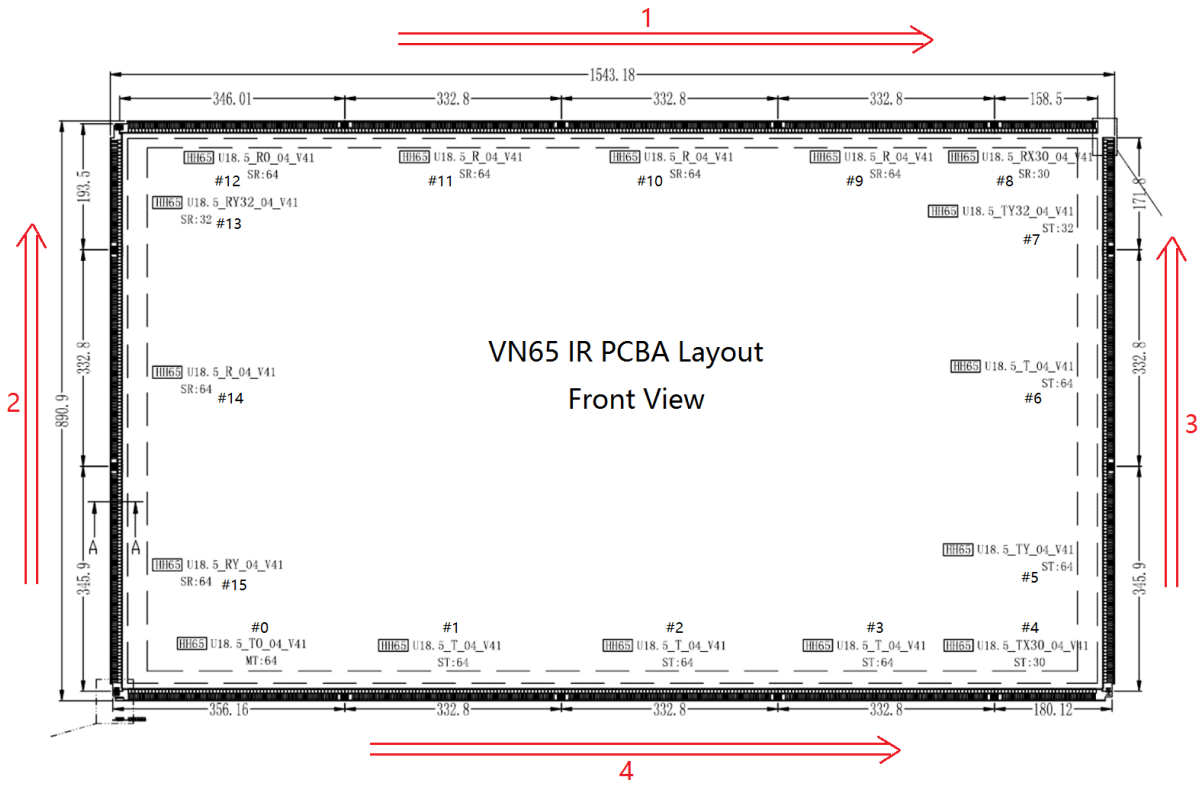
VN86:



Step 1: Place it on a flat table, open 4 corner covers.

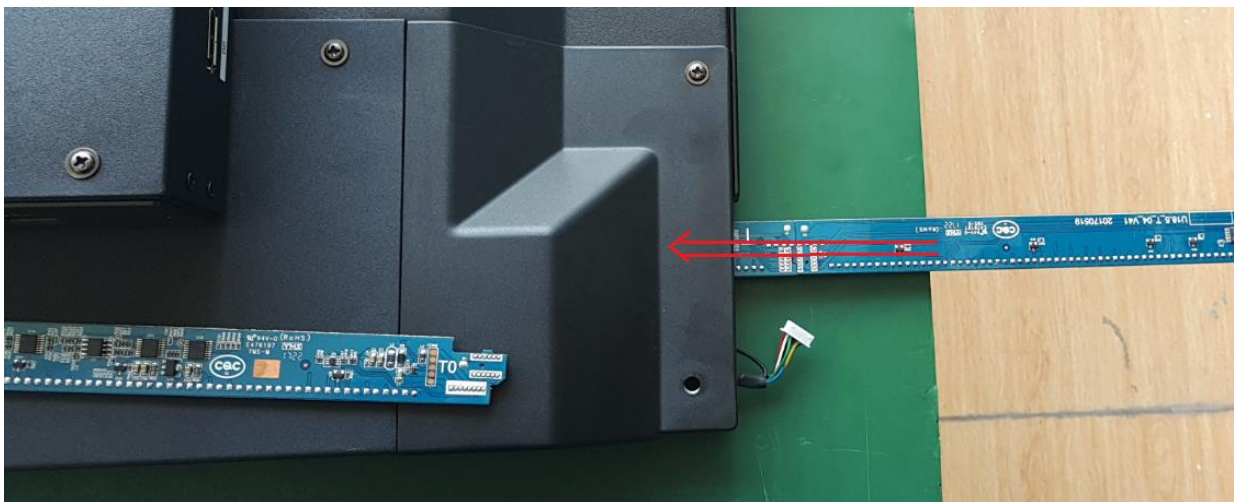
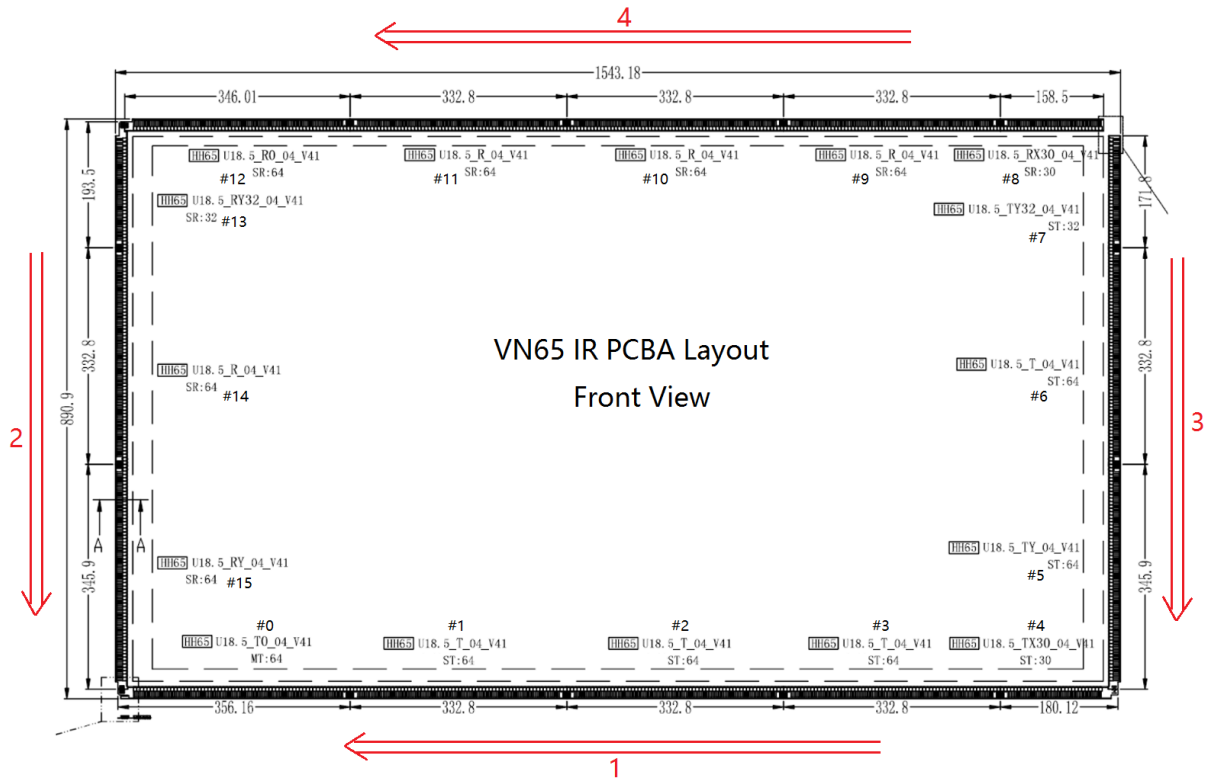
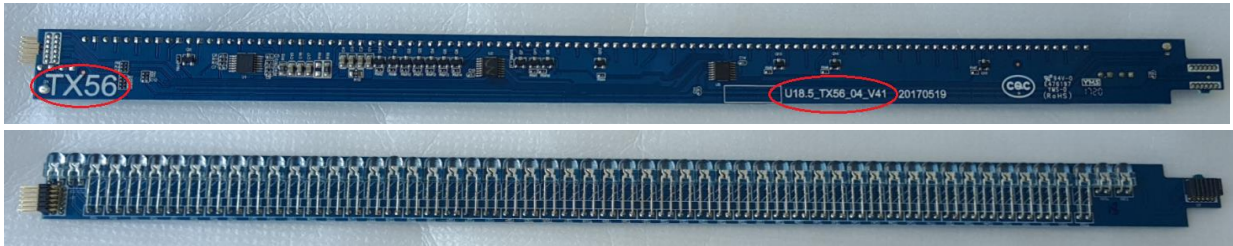


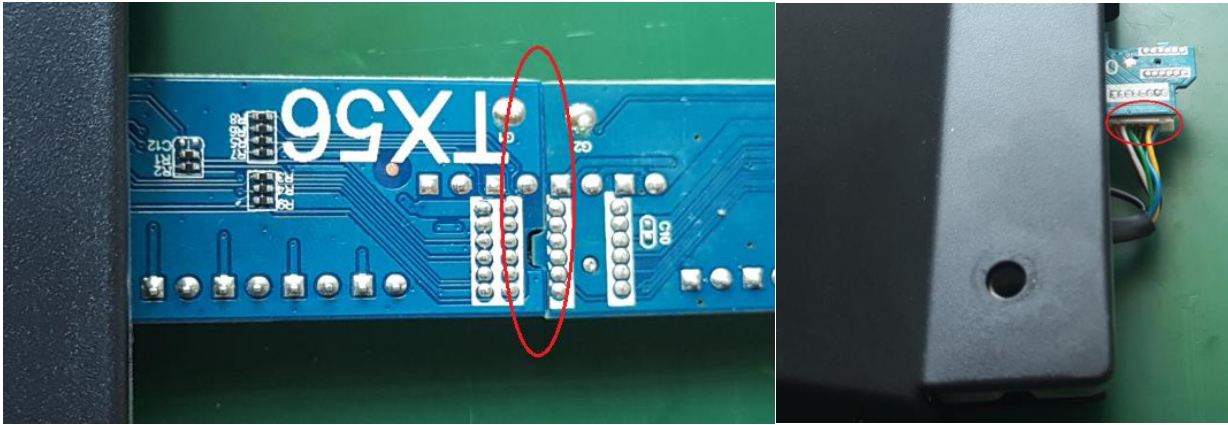
Step 2. Use a thin screwdriver or ball-pen to push and disconnect the PCBAs in the corner then take out the disconnected PCBA according to below red mark direction.



Step 3. Take new IR PCBA SET and according to the IR PCBA Layout to confirm the position in the 4 frames for every pieces PCBA, according to below red mark direction to insert the PCBAs.

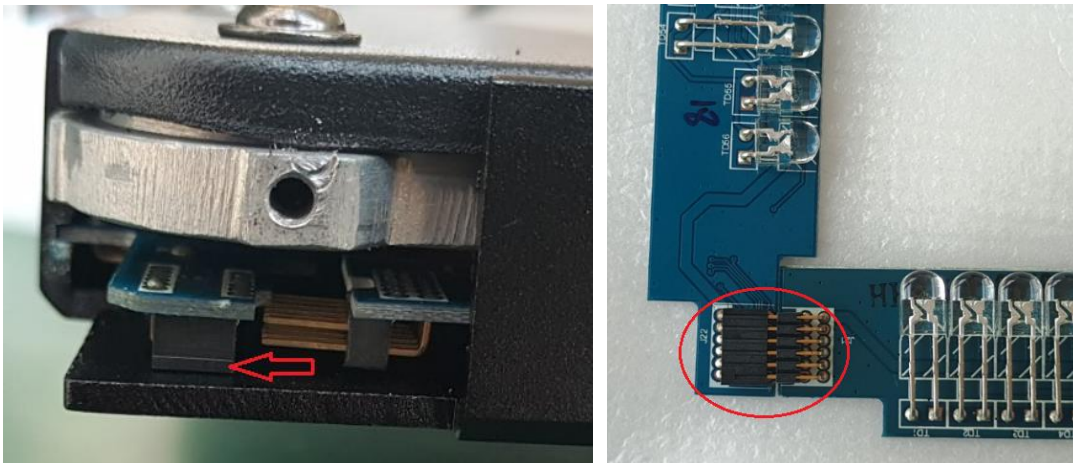
PCBA identification:



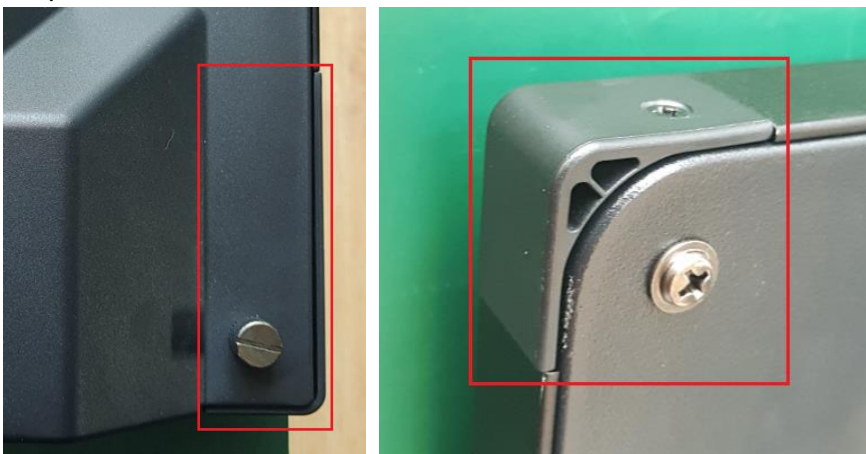


Take care to make sure every piece PCBA must be connected solidly, no loose connection.

Step 4. Connect the corner PCBAs pins, usually need 2 person co-work to connect it, one person to take air the contact pins and pin slot, one person push the PCBA in another side to make the contact pins get in pin slot.

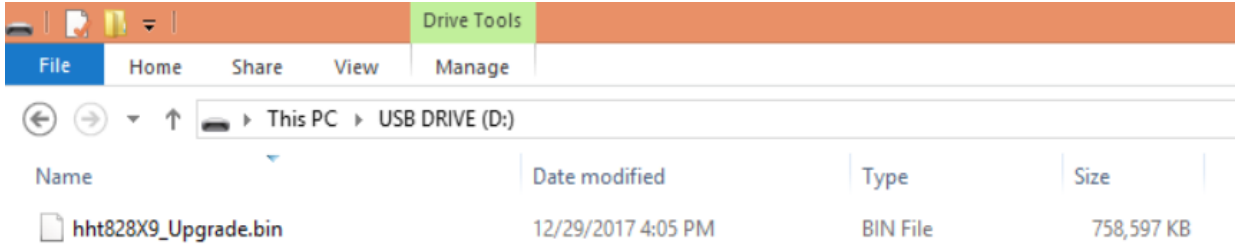


Step 5. Assemble back the 4 corner covers with screws.



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 screen to standby status, connect the USB drive to below USB port.

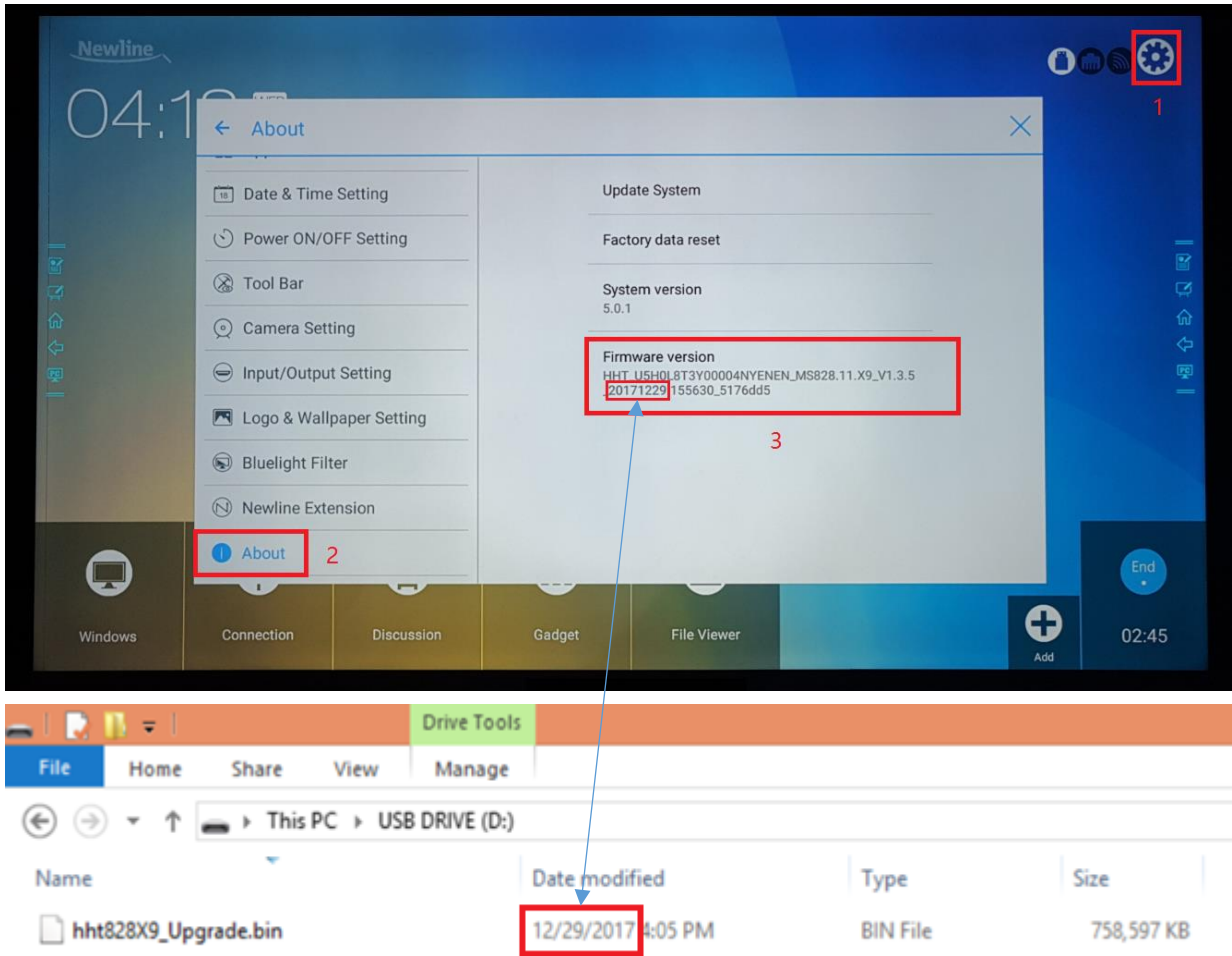


Step 3: Turn on screen, the firmware upgrade will start automatically.



Step 4: When firmware upgrade finished, the screen will restart automatically.

Step 5: 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.

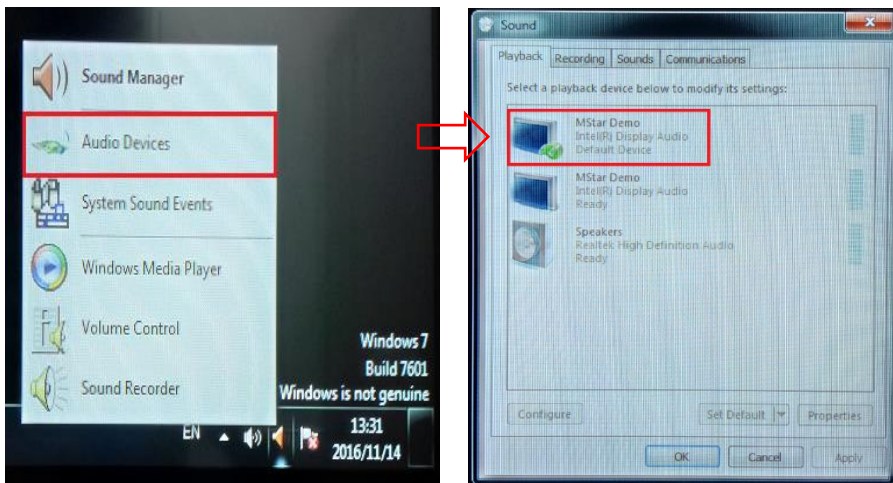
Problem #15: Broken sound or sound popping

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.