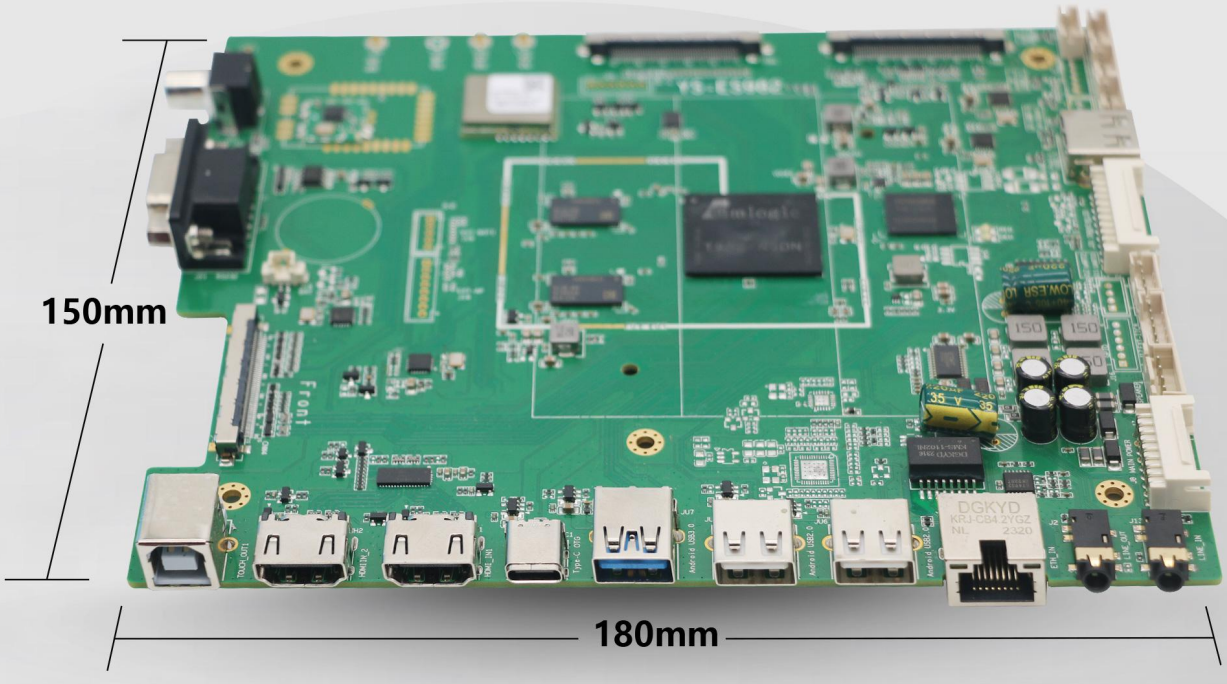
YISHENG ELECTRONICS

# Specification

# YS-ES982

Conference screen, smart blackboard




Shenzhen Yisheng Technology Co., Ltd

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# Declaration

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# Revision History

| Version | Date | Author | Approver | Description |
|---|---|---|---|---|
| V3.0 | 2023.12.18 | Zhang Wenjuan | Qin Yongling | Initial version |
| | | | | |

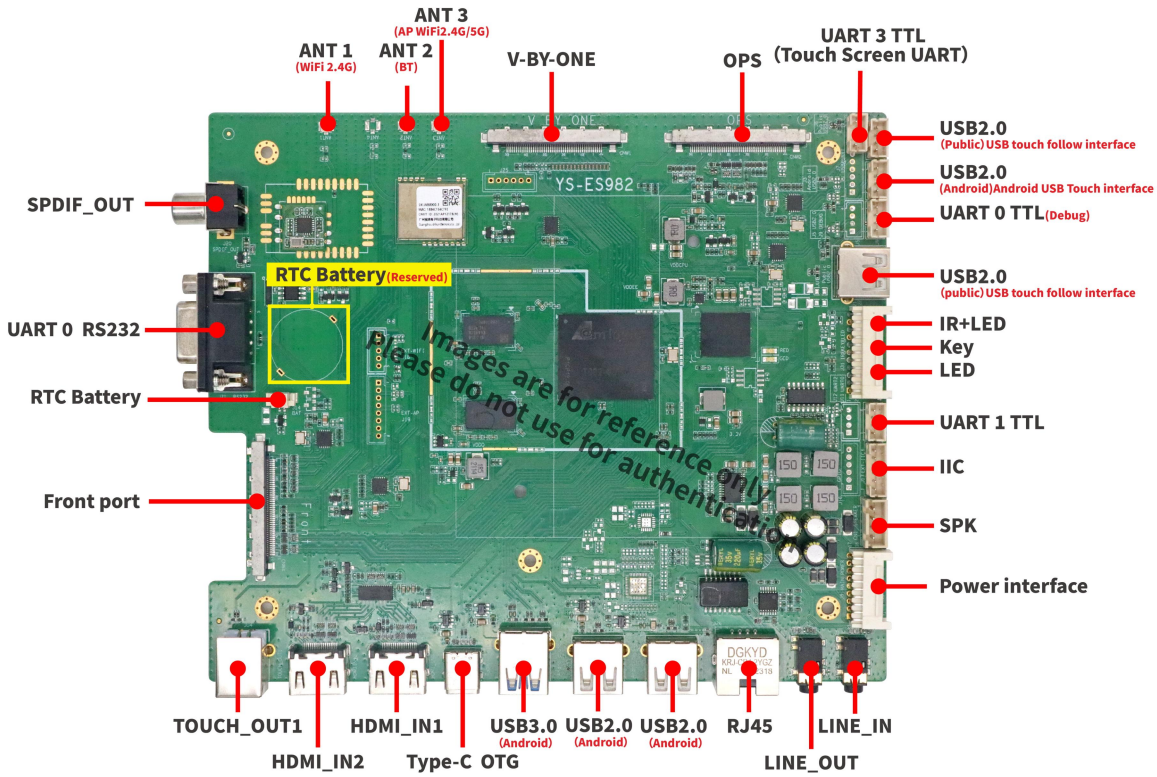
# Chapter 1 Product Introduction

## 1.1 Overview

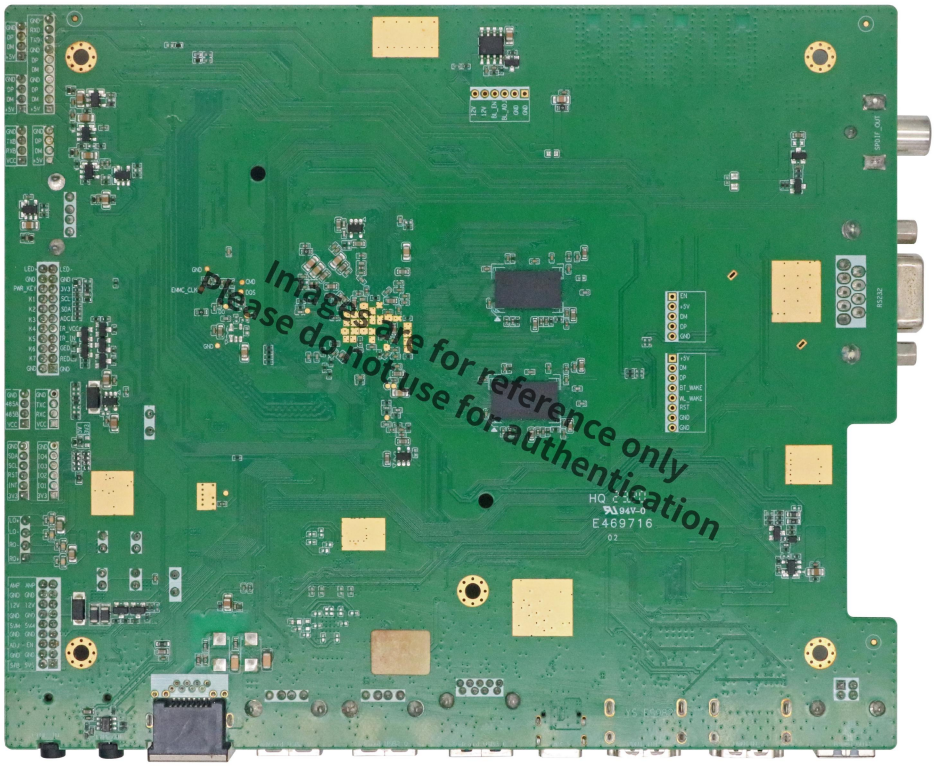
YS-ES982 adopts a quad core Cortex-A55 Amlogic T982 high-performance processor, up to 1.92GHz, supporting the Android 11.0/13.0 system, with rich peripheral interfaces that perfectly match the interface of educational conference equipment, industry compatible touch screens, MIC arrays, and other peripherals; Equipped with whiteboard writing, wireless screen projection, video conferencing and other software.

## 1.2 Pictures and dimensions

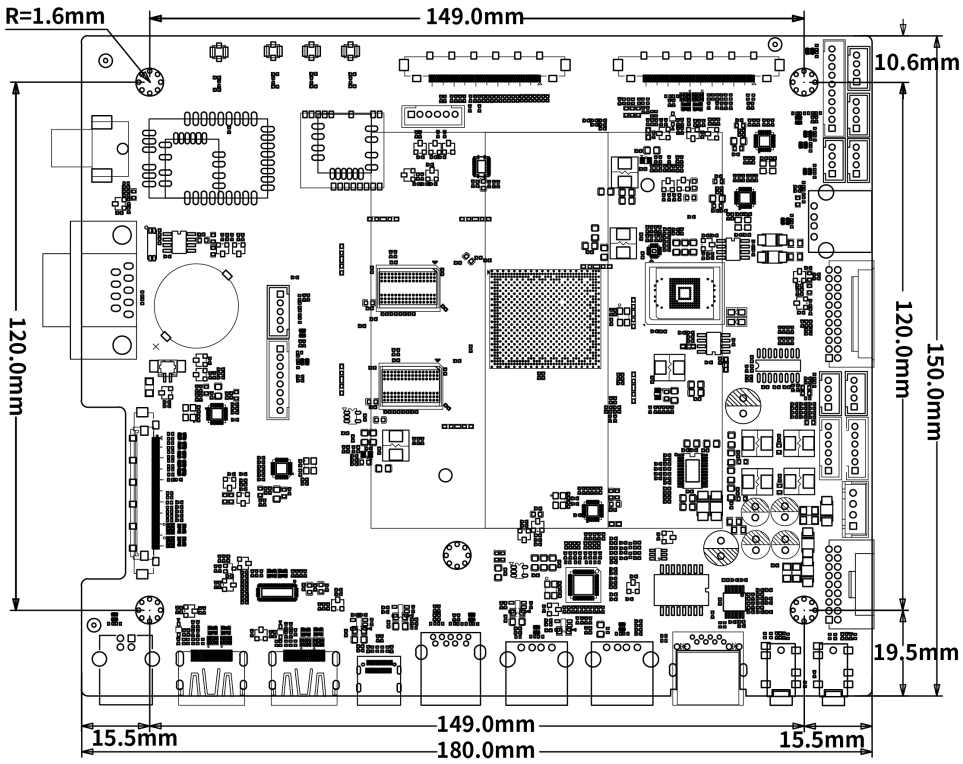
**Top View**



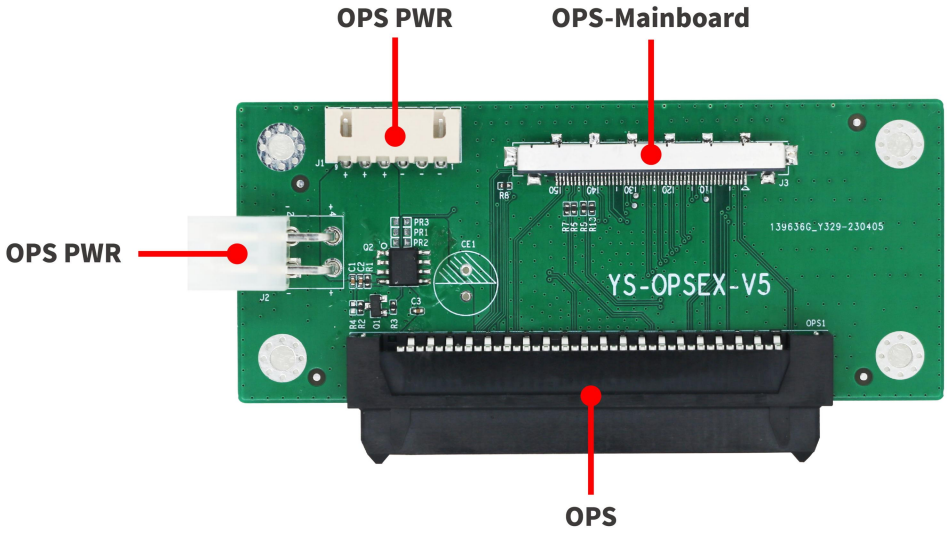
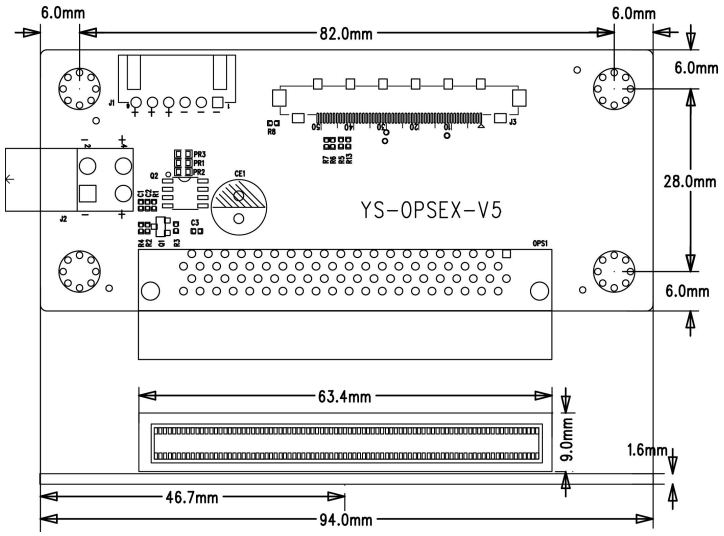
## Bottom View

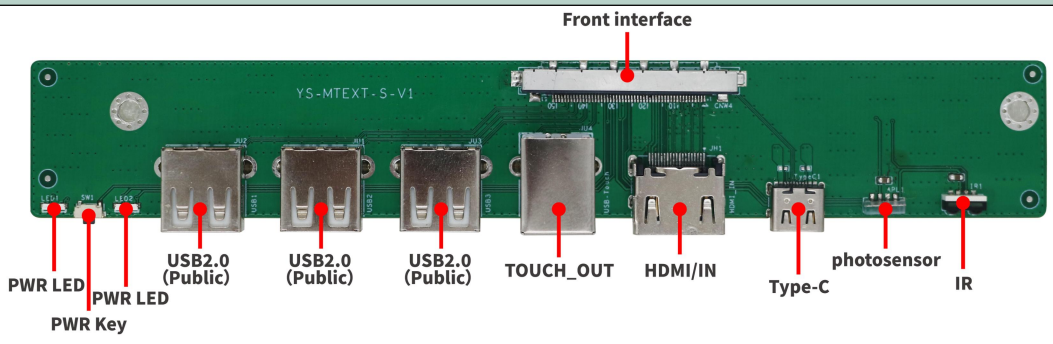


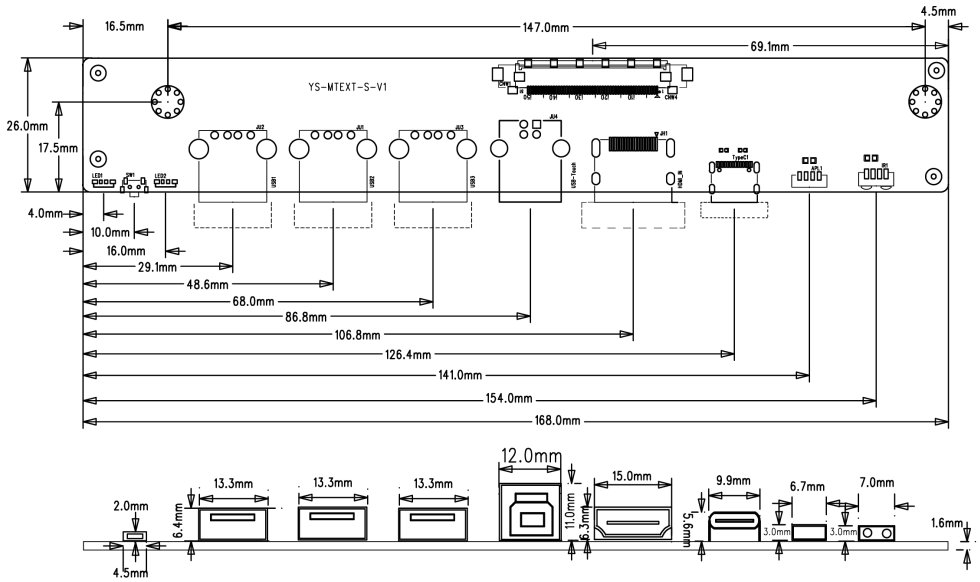

## Dimensions




*PCBA L：180mm *PCBA W：150mm *PCBA H：18mm *PCBA Location Hole：Φ3.2mm x4

| YS-OPSEX-V5 OPS Breakout Board | |
|---|---|
| Product Image |  |
| Dimension Drawing |  |

| YS-MTEXT-S-V Front Interface Board | |
|---|---|
| Product Image |  |

| | |
|---|---|
| **Dimension Drawing** |  |



## 1.3 Product detailed parameters


Amlogic T982

Android 11.0/13.0

5*USB2.0
1*USB3.0、1*USB-OTG

RJ45 100M、WIFI2.4G、
Dual-band WIFI hotspot

V-BY-ONE 4K Display output
HDMI、OPS Display input

| Detail specification | |
|---|---|
| CPU | Quad-core Cortex-A55<br>Max CPU frequency: 1.92GHz |
| GPU | Mali-G52-MP2, supports AFBC (ARM Frame Buffer Compression) |
| NPU | Supports 2.6 Tops |
| OS | **Android:** Android 11.0,Android 13.0 |
| ROM | 4GB, up to 8GB |
| Storage | 32GB, up to 128GB |
| Video CODEC | **Video decoder**<br>Supports 4K 10bits H265/H264<br>1080P VC-1, MPEG-1/2/4, VP8<br>**Video encoder**<br>1080P video encoder for H.264 and VP8<br>**Video post processor** |

| | |
|---|---|
| | Se-interlace, de-noise, enhancement for edge/detail/color |
| **Display Output** | 1*V-by-One (4K@60Hz) |
| **Display Input** | 2 *HDMI IN(4K@60Hz)<br>1*OPS, after connecting OPS sub-board, can be connected to standard OPS PC |
| **Audio** | Supports SPK, up to 2* 8Ω 15W, dual-channel speaker output<br>Support 1*LINE_IN, 1*LINE_OUT (support ASIO)<br>1*SPDIF_OUT |
| **Network** | Ethernet：Support 10/100/1000M GMAC<br>WIFI STA：2.4G WiFi + BT4.0<br>WIFI AP：2.4G/5G WiFi6 |
| **USB** | 1*USB 3.0<br>5*USB 2.0<br>1*Type-C OTG<br>1*USB 2.0<br>（The number of USB doesn't include the front port and the USB port on the OPS) |
| **UART** | 3* UART(1 *TTL Debug(optional DB9 RS232 )）<br>2*TTL |
| **Others** | 8*ADC keys<br>1*Remote control<br>1*IIC<br>1*LED |

# 1.4 Precautions for assembly and operation

**During assembly and operation, please pay attention to the following (and not limited to) problem.**

1.Relative Humidity ≤85％

2.Storage Temperature:-30℃ to +70℃

3.Operating temperature(（-5℃ ～ +60℃）

4.Pay attention to anti-static treatment during the assembly and transportation of the whole machine.

5.When the whole machine is assembled, it can be mounted under or on the side, but do not make the board deformed or distorted, do not exit heavy pressure.

6.The wiring position of each terminal retains a suitable distance to avoid extrusion of the terminal during installation.

7.The connecting line between this board and the matching module board should not be too long, otherwise the image quality may be affected.

8.The internal wiring of the whole machine should be reasonable, and the connecting lines should not cross directly from the PCB board as far as possible.

9.During the whole process of machine assembly, please attention to the installation of the motherboard combined with the direction of the whole machine cooling, to avoid poor heat dissipation caused by abnormal system

operation.

10.When using I2C or port interface for external communication, please confirm the pull-up resistor, serial resistor and power domain matching with our hardware engineers.

11.Do not turn on the power before properly connecting the drive cable.

12.Do not plug or unplug cables when the motherboard is working.

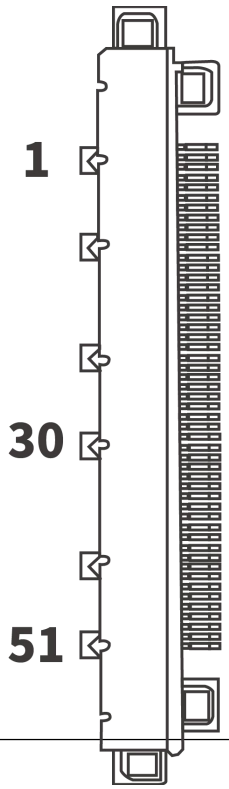
13.Switching the whole machine total power to turn on-and-off the motherboard power, please do not directly plug or unplug the power interface line at the motherboard.

14.In order to achieve better EMC effect of the whole machine, it is recommended that the screen line between the motherboard and the screen adopt a shielded wire.

15.The whole machine certification performance will be affected by the whole machine matching, which must be tested with the whole machine to confirm.

# Chapter 2 Interface Definition

## CNW4 Front port(51 PIN/0.5mm)

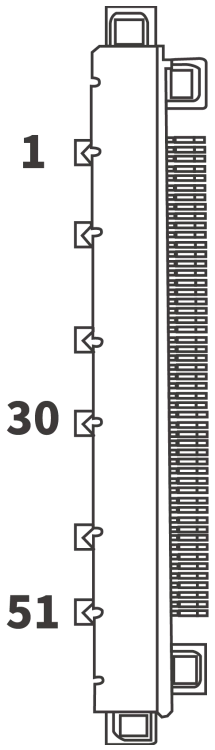
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | GND | Ground |
| | 2 | USB_DP | USB positive |
| | 3 | USB_DN | USB negative |
| | 4 | GND | Ground |
| | 5 | USB_DP | USB positive |
| | 6 | USB_DN | USB negative |
| | 7 | GND | Ground |
| | 8 | USB_DP | USB positive |
| | 9 | USB_DN | USB negative |
| | 10 | GND | Ground |
| | 11 | USB_DP | USB positive |
| | 12 | USB_DN | USB negative |
| | 13 | GND | Ground |
| | 14 | Front_TUSB_DP | TOUCH_OUT USB positive |
| | 15 | Front_TUSB_DN | TOUCH_OUT USB negative |
| | 16 | GND | Ground |
| | 17 | ADC | ADC reserved |
| | 18 | PWR_KEY | PWR key |
| | 19 | IR_IN | IRC receive |

| | | | |
|---|---|---|---|
| | 20 | GED_LED | Green LED indicator |
| | 21 | RED_LED | Red LED indicator |
| | 22 | IR_VCC | Remote control 3.3V PWR |
| | 23 | VCC_EXT | 3.3V PWR |
| | 24 | GND | Ground |
| | 25 | IIC_SCL | I2C data signal |
| | 26 | IIC_SDA | I2C clock signal |
| | 27 | GND | Ground |
| | 28 | 5V_USBPWR | 5V PWR |
| | 29 | 5V_USBPWR | 5V PWR |
| | 30 | 5V_USBPWR | 5V PWR |
| | 31 | 5V_USBPWR | 5V PWR |
| | 32 | 5V_USBPWR | 5V PWR |
| | 33 | 5V_USBPWR | 5V PWR |
| | 34 | HDMI_HPD | HDMI detection |
| | 35 | HDMIRX_5V_B | HDMI 5V input detection |
| | 36 | F_H_SDA1 | HDMI I2C data |
| | 37 | F_H_SCL1 | HDMI I2C clock |
| | 38 | F_H_CEC | HDMI signal |
| | 39 | GND | Ground |
| | 40 | F_H-RXCN | HDMI audio-video data signal |
| | 41 | F_H-RXCP | HDMI audio-video data signal |
| | 42 | GND | Ground |
| | 43 | F_H-RX0N | HDMI audio-video data signal |
| | 44 | F_H-RX0P | HDMI audio-video data signal |
| | 45 | GND | Ground |
| | 46 | F_H-RX1N | HDMI audio-video data signal |
| | 47 | F_H-RX1P | HDMI audio-video data signal |
| | 48 | GND | Ground |
| | 49 | F_H-RX2N | HDMI audio-video data signal |
| | 50 | F_H-RX2P | HDMI audio-video data signal |
| | 51 | GND | Ground |

## J14（2PIN/1.25）Battery interface (Direct plug-in)

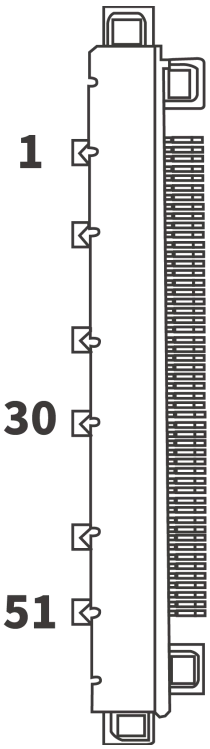
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | BAT- | BAT negative |
| | 2 | BAT+ | BAT positive |

## CNW1 V-by-One interface (51 PIN/0.5mm)

| Exterior | Pin | Definition | Description |
|---|---|---|---|
|   | 1 | GND | Ground |
| | 2 | VBX1_7P | V-by-One signal |
| | 3 | VBX1_7N | V-by-One signal |
| | 4 | GND | Ground |
| | 5 | VBX1_6P | V-by-One signal |
| | 6 | VBX1_6N | V-by-One signal |
| | 7 | GND | Ground |
| | 8 | VBX1_5P | V-by-One signal |
| | 9 | VBX1_5N | V-by-One signal |
| | 10 | GND | Ground |
| | 11 | VBX1_4P | V-by-One signal |
| | 12 | VBX1_4N | V-by-One signal |
| | 13 | GND | Ground |
| | 14 | VBX1_3P | V-by-One signal |
| | 15 | VBX1_3N | V-by-One signal |
| | 16 | GND | Ground |
| | 17 | VBX1_2P | V-by-One signal |
| | 18 | VBX1_2N | V-by-One signal |
| | 19 | GND | Ground |
| | 20 | VBX1_1P | V-by-One signal |
| | 21 | VBX1_1N | V-by-One signal |
| | 22 | GND | Ground |
| | 23 | VBX1_0P | V-by-One signal |
| | 24 | VBX1_0N | V-by-One signal |
| | 25 | GND | Ground |
| | 26 | LOCKN-OUT | Control signal |
| | 27 | HTPDN | Control signal |
| | 28 | SEL-LVDS | Control signal |
| | 29 | AGP | Control signal |
| | 30 | SCN-EN | Control signal |
| | 31 | Bit-SEL1 | Control signal |
| | 32 | LD-EN2 | Control signal |
| | 33 | BOE-SCL | IIC signal |
| | 34 | BOE-SDA | IIC signal |
| | 35 | 2D/3D | Control signal |
| | 36 | L/R-IN | Control signal |
| | 37 | L/R-OUT | Control signal |
| | 38 | NC | Null |
| | 39 | GND | Ground |
| | 40 | GND | Ground |

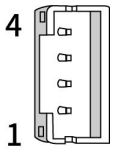
| | | | |
|---|---|---|---|
| | 41 | GND | Ground |
| | 42 | GND | Ground |
| | 43 | NC | Null |
| | 44 | VCC | 12V PWR |
| | 45 | VCC | 12V PWR |
| | 46 | VCC | 12V PWR |
| | 47 | VCC | 12V PWR |
| | 48 | VCC | 12V PWR |
| | 49 | VCC | 12V PWR |
| | 50 | VCC | 12V PWR |
| | 51 | VCC-VX1 | 12V PWR |

## CNW2 OPS interface (51 PIN/0.5mm)

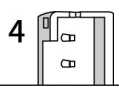
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | GND | Ground |
| | 2 | USB_D+ | USB positive |
| | 3 | USB_D- | USB negative |
| | 4 | GND | Ground |
| | 5 | USB3_TX+ | USB send positive 3 |
| | 6 | USB3_TX- | USB send negative 3 |
| | 7 | GND | Ground |
| | 8 | USB3_RX+ | USB send positive3 |
| | 9 | USB3_RX- | USB send negative3 |
| | 10 | GND | Ground |
| | 11 | USB_DP | USB positive |
| | 12 | USB_DN | USB negative |
| | 13 | GND | Ground |
| | 14-17 | NC | Null |
| | 15 | NC | Null |
| | 16 | NC | Null |
| | 17 | NC | Null |
| | 18 | OPS_PS_ON | OPS signal |
| | 19 | OPS_DEVICE_RST | OPS signal |
| | 20 | OPS_PWR_STATUS | OPS signal |
| | 21 | OPS_DET_PB | OPS signal |
| | 22 | SDA | IIC signal |
| | 23 | SCL | IIC signal |
| | 24 | GND | Ground |
| | 25 | HDMI_PC_RXCKN | HDMI signal |

| | | | |
|---|---|---|---|
| | 26 | HDMI_PC_RXCKP | HDMI signal |
| | 27 | GND | Ground |
| | 28 | HDMI_PC_RX0N | HDMI signal |
| | 29 | HDMI_PC_RX0P | HDMI signal |
| | 30 | GND | Ground |
| | 31 | HDMI_PC_RX1N | HDMI signal |
| | 32 | HDMI_PC_RX1P | HDMI signal |
| | 33 | GND | Ground |
| | 34 | HDMI_PC_RX2N | HDMI signal |
| | 35 | HDMI_PC_RX2P | HDMI signal |
| | 36 | GND | Ground |
| | 37 | HDMI_PC_SCL | HDMI signal |
| | 38 | HDMI_PC_SDA | HDMI signal |
| | 39 | GND | Ground |
| | 40 | HDMI_PC_5V | HDMI signal |
| | 41 | HDMI_PC_HPD | HDMI signal |
| | 42 | PC_TX | PC send |
| | 43 | PC_RX | PC receive |
| | 44 | VCC_5V | 5V PWR |
| | 45 | OPS_45 | OPS signal |
| | 46 | PC-SO | OPS signal |
| | 47 | OPS_EN_PWR | OPS signal |
| | 48 | GND | Ground |
| | 49 | NC | Null |
| | 50 | NC | Null |
| | 51 | GND | Ground |

## J7（4 PIN/2.0） UART3 TTL (Direct plug-in)

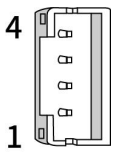
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | GND | Ground |
| | 2 | TX3 | UART3 send data |
| | 3 | RX3 | UART3 receive data |
| | 4 | GND | Ground |

## J6（4 PIN/2.0） USB 2.0（Public）Supports USB touch input (Direct plug-in)

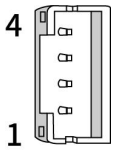
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | +5V | PWR |
| | 2 | DM | Data negative |

| | | | |
|---|---|---|---|
| | 3 | DP | Data positive |
| | 4 | GND | Ground |

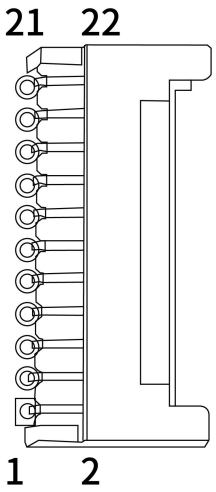
## J3（4 PIN/2.0)USB 2.0 (Android) Supports Android USB touch input (Direct plug-in)

| Exterior | Pin | Definition | Description |
|---|---|---|---|
|   | 1 | +5V | PWR |
| | 2 | DM | Data negative |
| | 3 | DP | Data positive |
| | 4 | GND | Ground |

## J9（4 PIN/2.0） UART0 interface (Direct plug-in)（Debug-TTL）

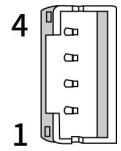
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|   | 1 | 3V3 | 3.3V PWR |
| | 2 | RX0 | Receive data |
| | 3 | TX0 | Send data |
| | 4 | GND | Ground |

## J31 (22 PIN/2.0) Remote contro/Key/LED indicator

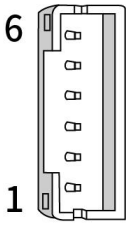
| Exterior | Pin | Definition | Description |
|---|---|---|---|
|   | 1-2 | GND | Ground |
| | 3 | RED | RED LED indicator |
| | 4 | K7 | Reserved key 7 |
| | 5 | GED | Green LED indicator |
| | 6 | K6 | 6Reserved key 6 |
| | 7 | IR_IN | Remote control input |
| | 8 | K5 | Reserved key 5 |
| | 9 | IR_VCC | Remote control PWR |
| | 10 | K4 | Reserved key 4 |
| | 11 | ADC1 | ADC reserved |
| | 12 | K3 | Reserved key 3 |
| | 13 | SDA | I2C data signal |
| | 14 | K2 | Reserved key 2 |
| | 15 | SCL | I2C clock signal |
| | 16 | K1 | Reserved key 1 |
| | 17 | 3V3 | 3.3V PWR |
| | 18 | PWR_KEY | PWR key |
| | 19-20 | GND | Ground |
| | 21 | LED- | LED negative |

| | | | |
|---|---|---|---|
| | 22 | LED+ | LED positive |

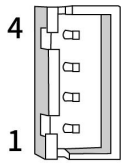
## J11（4 PIN/2.0） UART1 TTL (Direct plug-in)

| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | VCC | PWR |
| | 2 | TX1 | Receive data |
| | 3 | RX1 | Send |
| | 4 | GND | Ground |

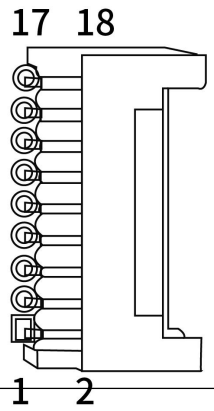
## J17（6 PIN/2.0）IIC (Direct plug-in)(Power domain voltage 3.3V)

| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | 3.3VV | 3.3V PWR |
| | 2 | INT | Interrupt data |
| | 3 | RST | Reset data |
| | 4 | SCL | I2C clock |
| | 5 | SDA | I2C clock |
| | 6 | GND | Ground |

## CN1（4 PIN/2.54） SPK interface (Direct plug-in)

| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | ROUT+ | Right channel + |
| | 2 | ROUT- | Right channel |
| | 3 | LOUT- | Left channel - |
| | 4 | LOUT+ | Left channel + |

## J8 (18 PIN/2.0) Integrated power supply interface

| Exterior | Pin | Definition | Description |
|---|---|---|---|
|  | 1 | 5VS | Standby power,supports 5VS |
| | 2 | STB | PWR enable, supports PSON |
| | 3 | GND | Ground |
| | 4 | GND | Ground |
| | 5 | EN | Backlight enable signal |
| | 6 | ADJ | Adjust PWM backlight brightness |
| | 7 | GND | Ground |
| | 8 | GND | Ground |
| | 9 | 5VM | 5V PWR IN |
| | 10 | 5VM | 5V PWR IN |
| | 11 | GND | Ground |

| | | | |
|---|---|---|---|
| | 12 | GND | Ground |
| | 13 | 12V | 12V PWR |
| | 14 | 12V | 12V PWR |
| | 15 | GND | Ground |
| | 16 | GND | Ground |
| | 17 | AMP | Audio PWR 18-24V |
| | 18 | AMP | PWR 18-24V |

# Chapter 3 Electrical Properties

## ◆ Power supply

| PWR Interface | Voltage | Typical Current | Max Current |
|---|---|---|---|
| 5V PWR Interface | 5V | 3000mA | - |
| 5VS PWR Interface | 5V | 2000mA | |
| 12V PWR | 12V | 2000mA | |
| 18V PWR | 18-24V | 2000mA | - |

## ◆ Single board power consumption

| Normal operating power consumption | Sleep mode power consumption | Standby power consumption (Power off status) |
|---|---|---|
| 11.33W | 10.30W | 1.58W |

Note: Test power consumption connected to 5V, 12V, 5VS power, turn on WIFI, Bluetooth, Hotspot, Ethernet, and do not connect any peripherals.

## ◆ USB PWR

| USB Interface Type | Voltage | Typical Current | Max Current |
|---|---|---|---|
| USB-Type-A | 5V | 500mA | 1400mA |
| USB-Type-B | 5V | 500mA | 1400mA |
| USB-Type-C | 5V | 500mA | 1400mA |

Note: USB overcurrent protection is normal within the maximum current ± 0.3mA error value.

◆ **Others**

| Interface Type | Rated Current | Max Current | |
|---|---|---|---|
| External 5V | / | 3000mA | |
| External 3.3V | / | 3000mA | |

# Chapter 4 System Instruction

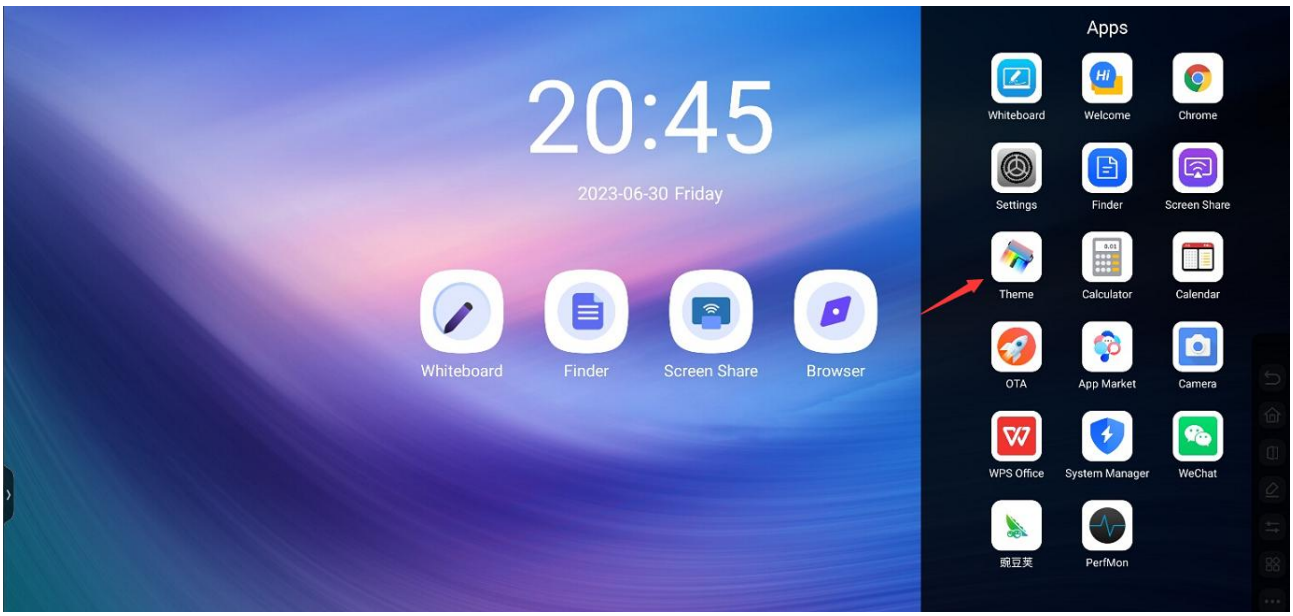
## 4.1 System interface description

As shown in the picture, it is the standard version of the main interface, which mainly includes four main function application: smart whiteboard, document presentation, wireless screen projection and browser. At the same time, you can also enter the application page through "application", click "settings" to enter the settings page, with sidebars on the left and right sides, and a "signal source" switching selection bar on the lower right. Click on the upper right corner to connect to the network and server.


Main interface

**（1）APP Menu**

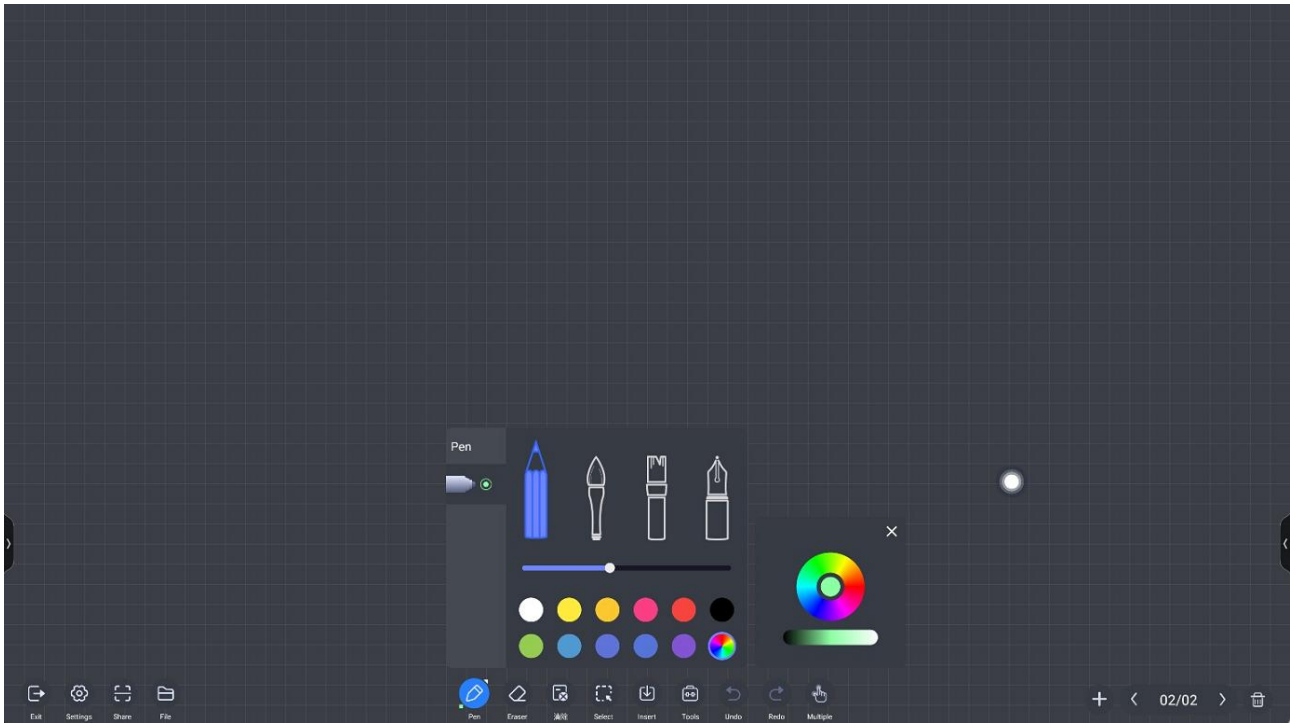
The application interface includes: smart whiteboard, document presentation, Pad manager, settings, wireless screen projection, Chrome, WPS Office, calculator, calendar, high-definition camera, theme, application store, welcome template and other applications.




Application interface

## （2） Smart Whiteboard Interface

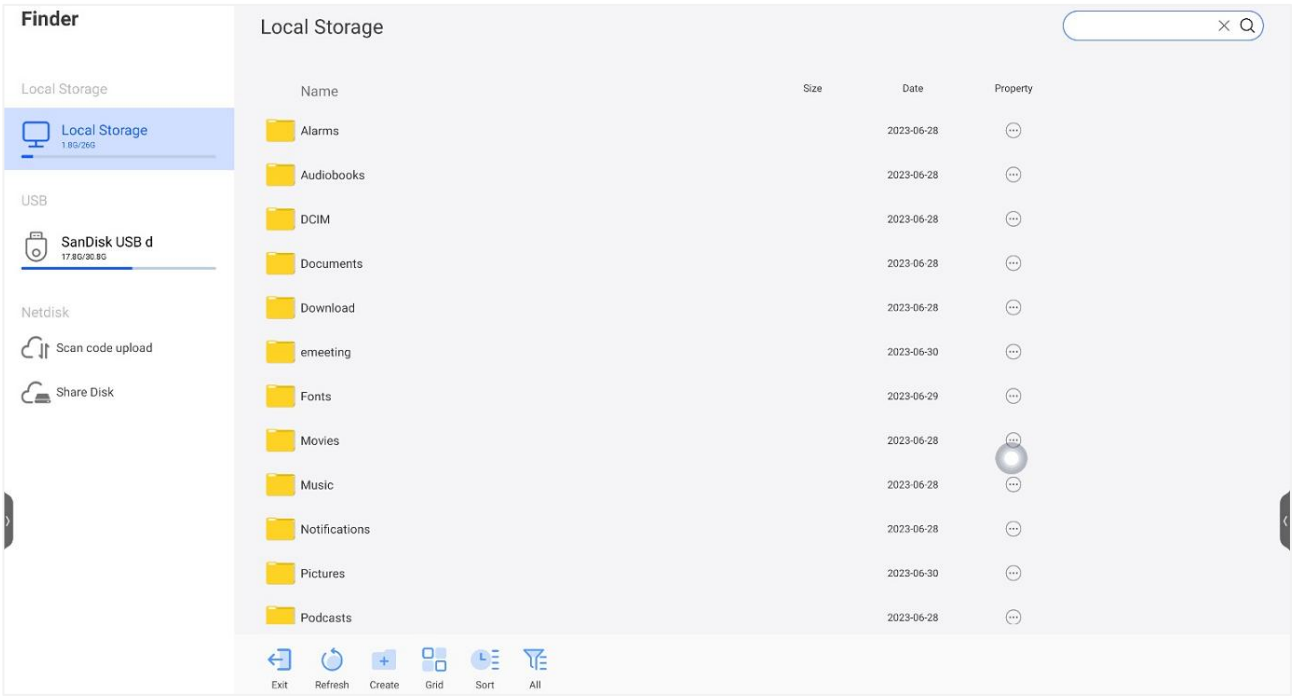
Smart whiteboard is mainly set for meetings. In smart whiteboard, you can use brush/eraser tools and other functions to scribble/modify.




Smart whiteboard interface

## （3）Document Presentation Interface

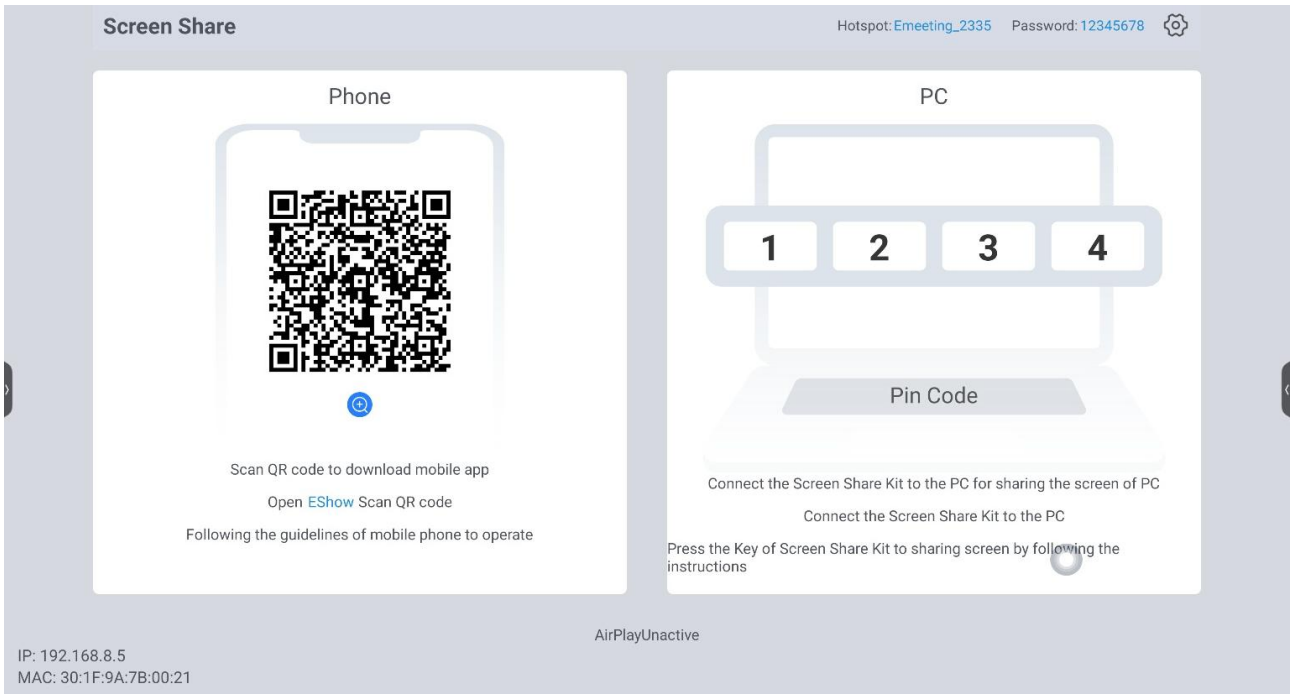
In the document presentation, you can operate and view the contents of local storage, U disk storage and cloud disk.




Document presentation interface

## （4）Wireless Display Interface

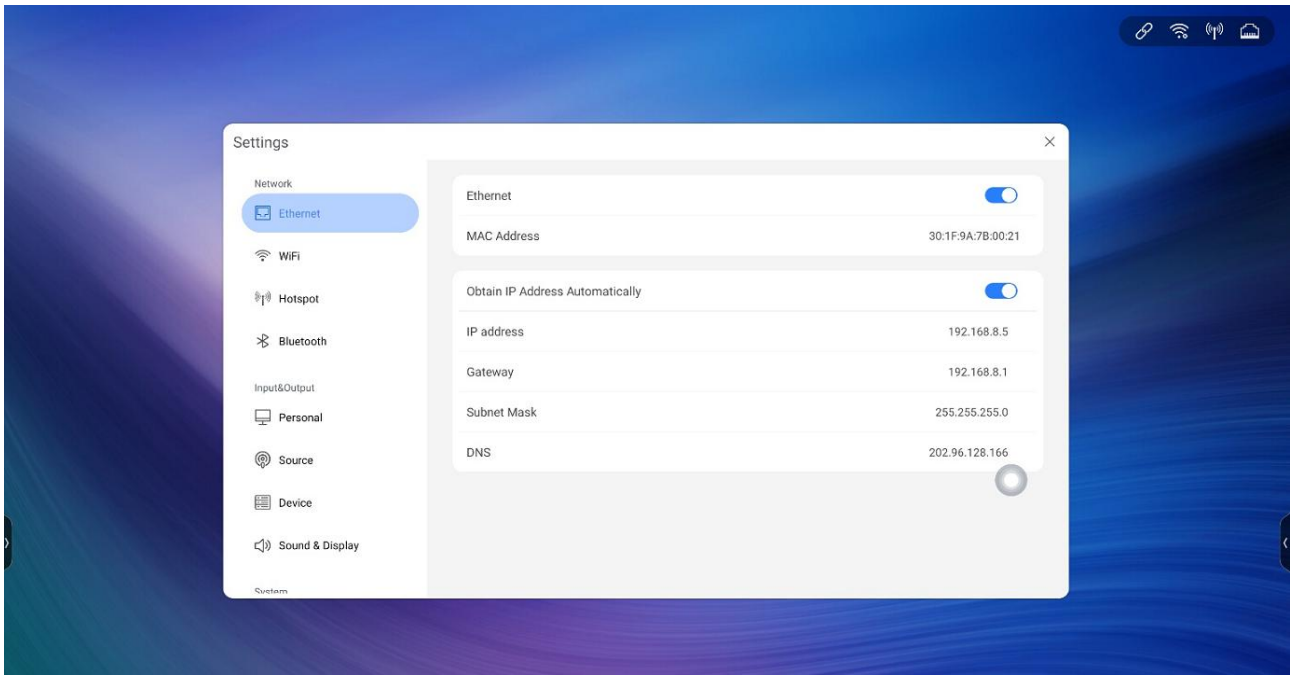
As shown in the following picture, the main page of the receiver will display the hotspot name, hotspot password, screen code and other information. On the left is the operation steps of Android the hand screen projection. After downloading the app, scan the code or use the screen transmission code to connect the receiving end of the device.




Wireless screen projection interface

## （5）Settings Interface

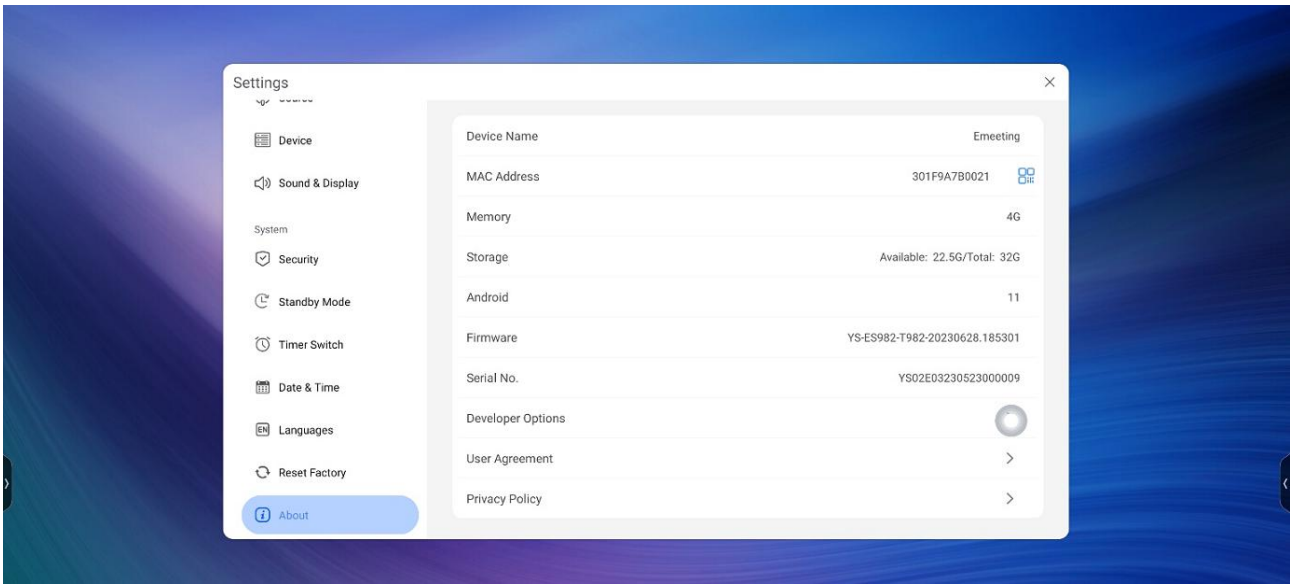
It mainly includes network settings, general settings and system settings, such as network connection, sound/brightness adjustment, time settings, language settings, boot animation, boot logo, board card information, etc. can be set here.




Settings interface（设置界面）

## （6）About

Enter the settings, drop-down to About , enter the following interface, you can see the specific board configuration and system information

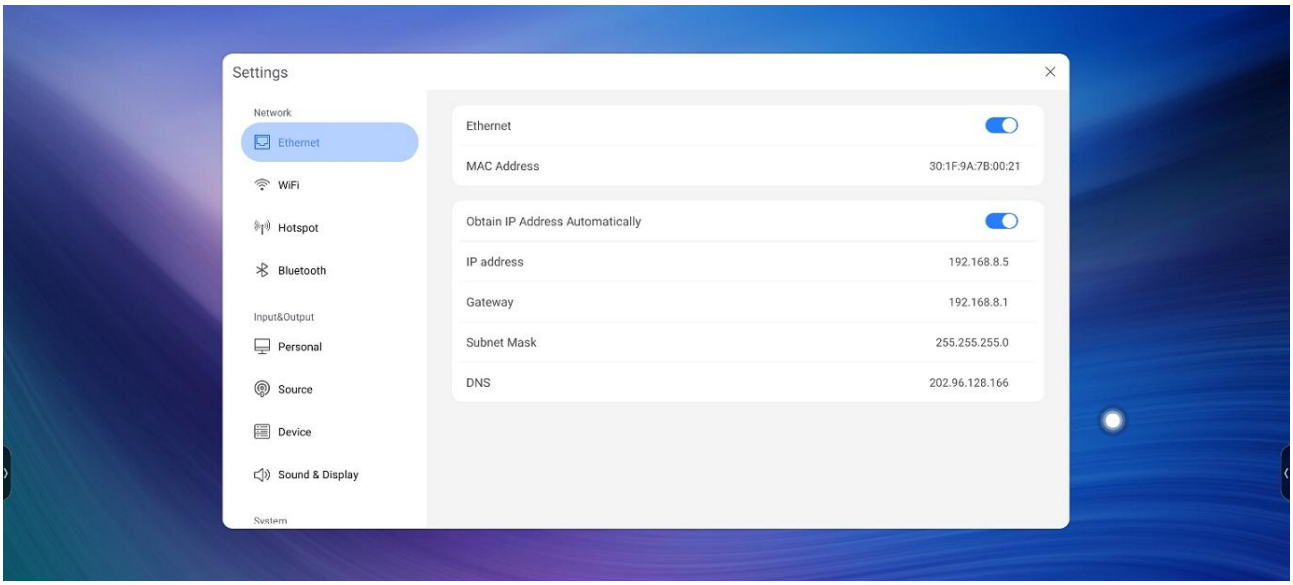



About the native interface（关于本机界面）

# 4.2 Network interface description

## （1）Wired network connection

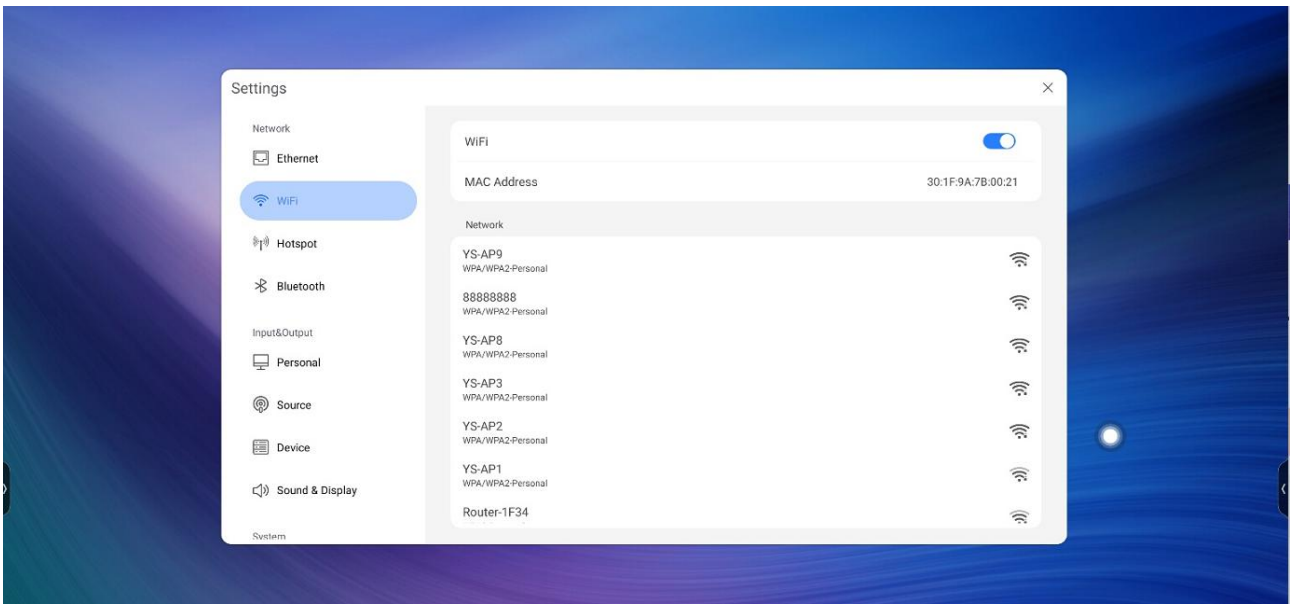
Enter Settings-Network-Wired Network, enter the page as shown in the following picture, turn on the wired network switch, and automatically connect to Ethernet after inserting the network cable. You can view the IP Address, Ethernet MAC address and other information on the interface as shown in the picture




Wired network setup interface

## （2）Wireless network connection

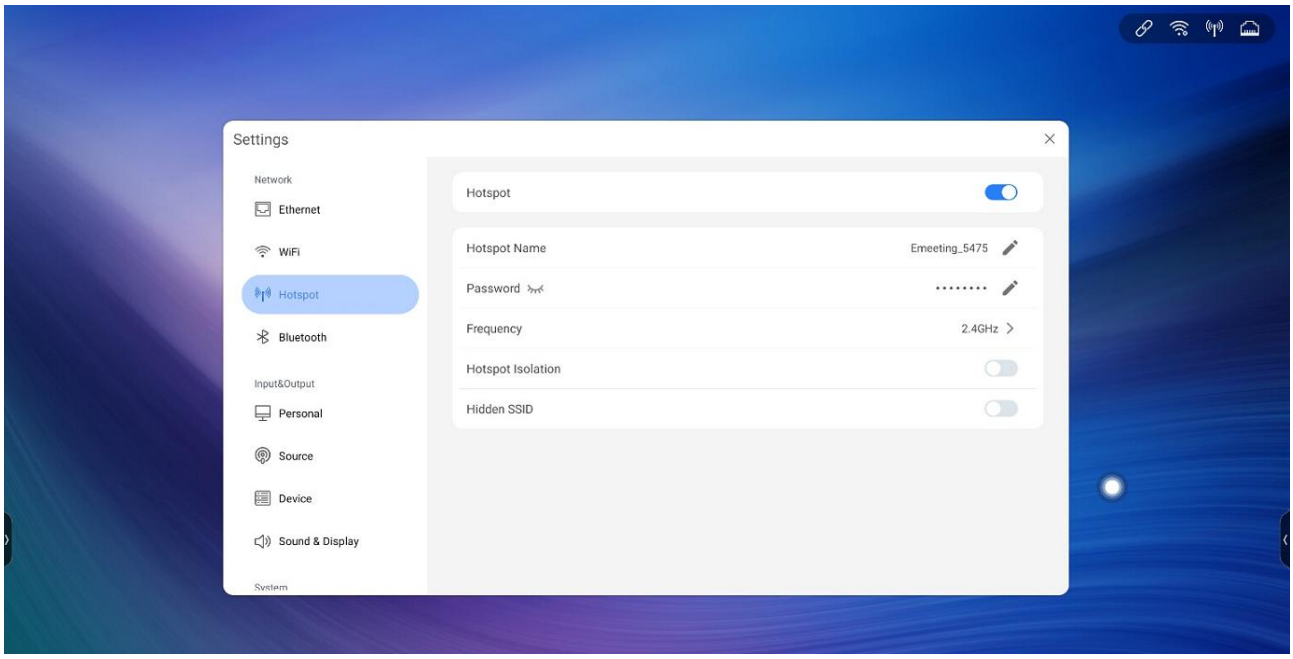
In the Settings-Network-Wired Network interface, turn on the wireless network switch, as shown in the following picture; Select the WIFI signal to be connected and enter the corresponding password to successfully connect




Wireless network setup interface

### （3）Wireless Hotspot Connection

As shown in the following picture, in Settings-Network-Hotspot, turn on the hotspot switch to send out WIFI hotspot signal. The device can successfully connect to the hotspot by entering the password. when using the screen transmitter for wireless screen transmission, the hotspot must be turned on.




Wireless hotspot setup interface

**NOTE:**

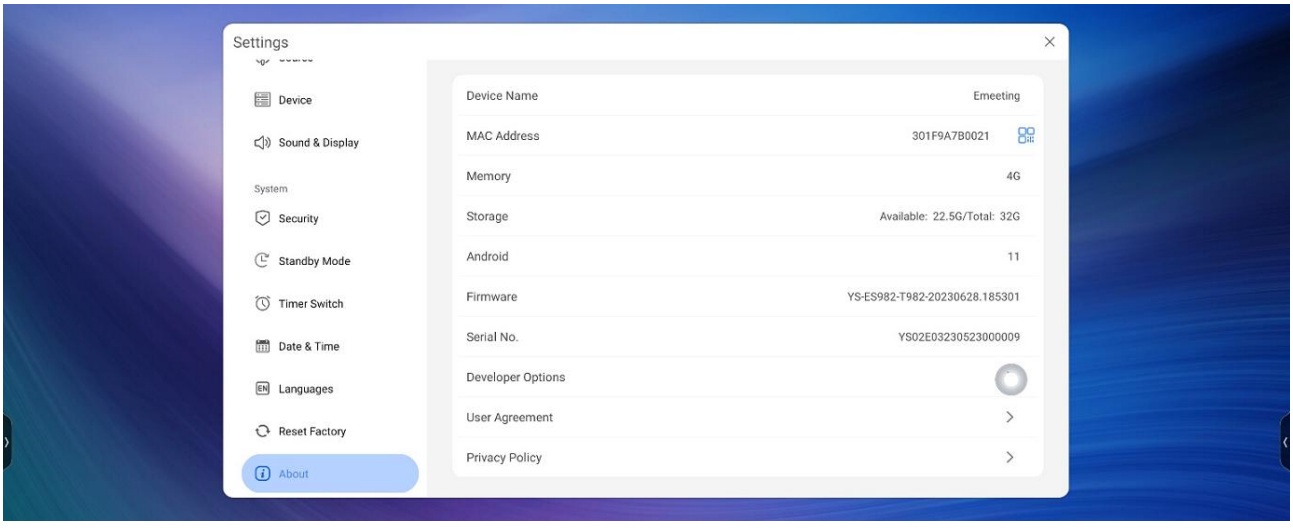
THE USE OF WIRELESS NETWORKS MUST BE CONNECTED TO THE WIFI ANTENNA AT THE WIFI ANTENNA PEDESTAL

WIFI SIGNAL AVAILABILITY AND COVERAGE IS DETERMINED BY THE NUMBER OF SIGNALS, ANTENNA PERFORMANCE AND EXTERNAL ENVIRONMENT

THE ETHERNET MAC ADDRESS IS THE ONLY PERMANENTLY VALID DEVICE ID FOR THIS SYSTEM.Network priority order is:ETH>WIFI

# 4.3 About

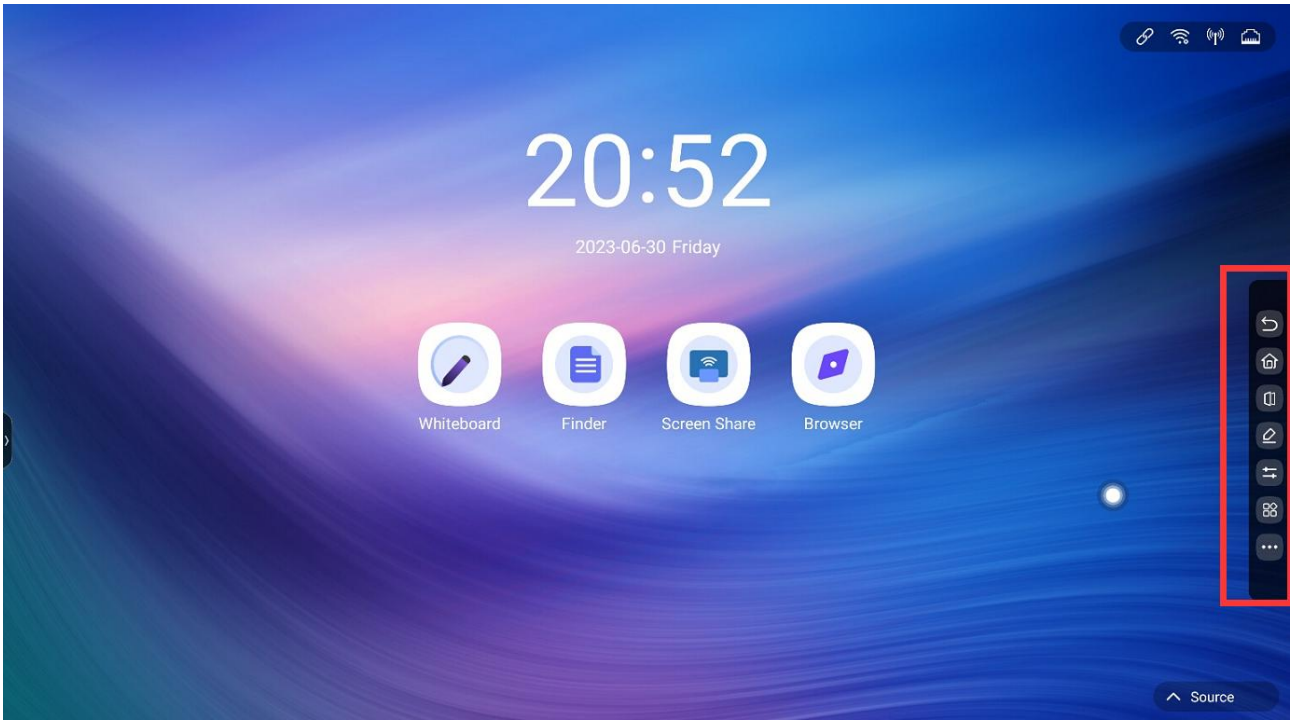
Enter the settings, drop down to About, and enter the following interface to see the specific board configuration and system information.




About the native interface

# 4.4 Sidebar settings

As shown in the figure below, the sidebar adopts a floating design. The sidebars on both sides of the interface are symmetrical. Both sides can be clicked on. When stowed away, they are on the right, and clicked on as shown on the left. The sidebar can be used on every page of the system. The sidebar mainly includes the return button, one-click return to the main page, tasks, applications, comments, shortcuts, and more gadgets to display functions




Sidebar interface

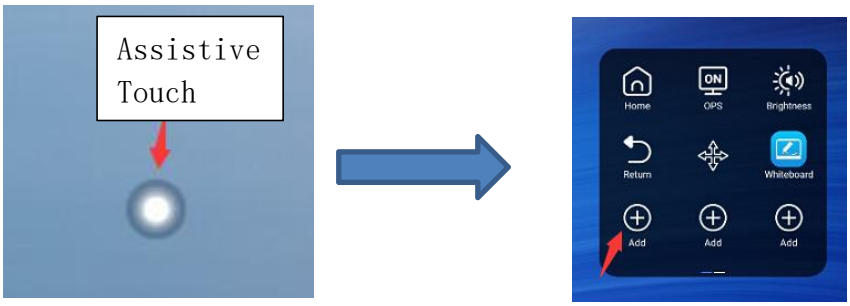
- Back: Return to the previous interface
- Home:Go directly to home page
- Tasks: Display background tasks, which is convenient for clearing programs running in the background; click the close button to close a single task; click the one-click clean button to close all tasks
- Annotation: annotate under any interface, click on the annotation, open the annotation mode, and pop up the annotation toolbar in the lower left corner. They are used to exit the annotation mode, scan the code to share the annotation screen, save the annotation file, eraser to clear the annotation trace, and select the brush size and color for annotation.
- Fast: Quickly adjust the sound and brightness of the signal source input, the ratio of screen display, display effect, and sound effect
- Applications: Displays the applications already installed on the current device, and can directly jump to and click on the application
- Tools: Convenient gadgets can be used on any interface

# 4.5 Assistive touch

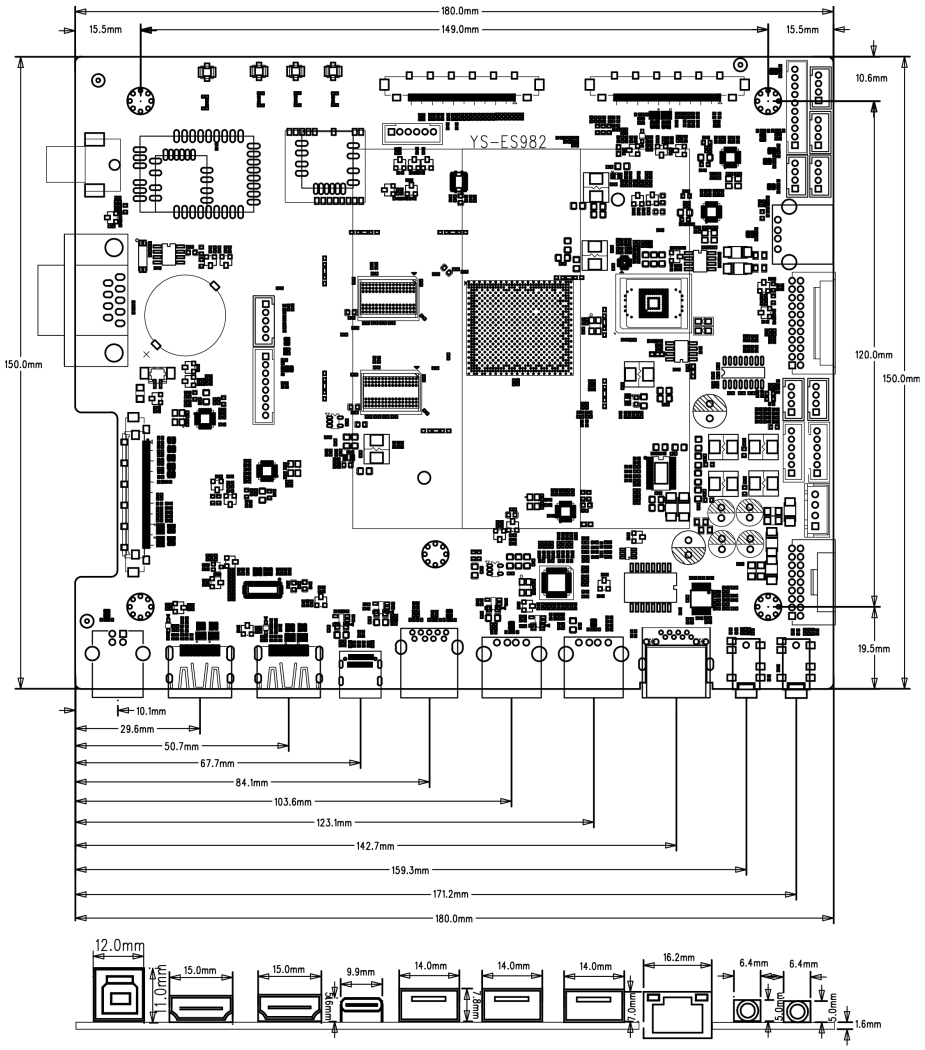
The system displays the assistive touch by default. If you don't need it, you can set-display-turn off the assistive touch. If you have a display assistive touch, press any position on the interface for 2s with two fingers, and you can drag

the assistive touch to the current position of the finger.

Click the button to turn on the assistive touch, you can see that there are mainly: home page, open PC, Back, adjustment, smart whiteboard, eleven custom reserved, custom can choose the application tool in the system as a shortcut




# Chapter 5 Motherboard Dimensions




Note: The soldering tolerance for each component is approximately ±0.5mm

*PCBA L：180 *PCBA W：150mm *PCBA H：18mm *PCBA Location Hole：3.2mm x4

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***Looking forward to working with you, thank you***