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Chapter I Overview

M10 using Rockchip RK3188 quad-core chip and Android 4.4.4 system. RK3188 equip-ed with ARM quad-core A9 core chip and GPU Mali-400 series. It supports mainstream audio, video formats and picture decoding. Dual LVDS interfaces, support 1080P output, HDMI interface 1080P output, and 2K video playback. Also supports infrared remote control, Wi-Fi, RJ45 and other rich interfaces, making the product more versatile, and it's widely used in advertising, interactive all-in-one, security, medical, transportation, finance, industrial control and other intelligent control areas. Because of its hardware platform and Android's intelligent features, it can be used on the smart terminal motherboard when human-machine interaction and network device interaction are required.

FEATURES:

High performance; RK3188 chip adopts quad-core ARM Cortex A9 architecture, and adopts the chip's RK3188 motherboard. Compared with the single-core, dual-core, and quad-core solutions common in the market, it has a qualitative leap in performance and can play various formats, High-definition video, capable of handling complex interactive operations;

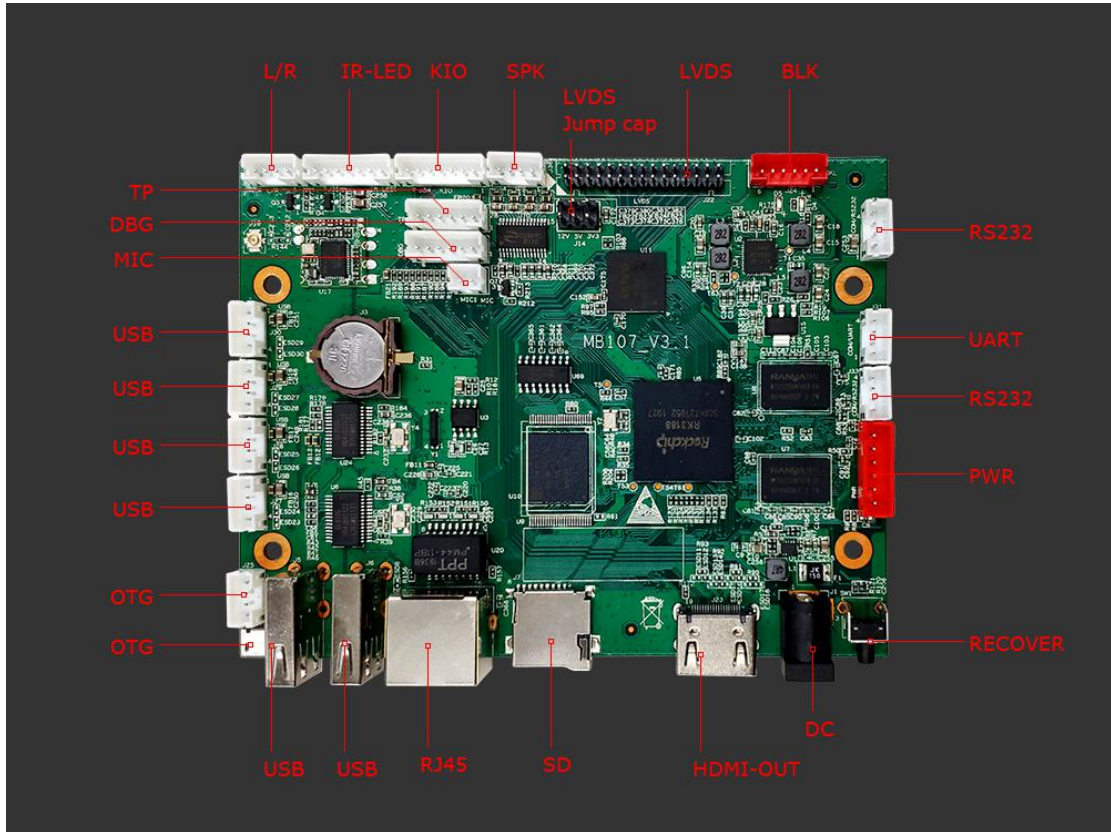
High stability; M10 adds its own unique technology in hardware and software to ensure the stability, which can make the final product unattended for 7 * 24 hours;

High integration; M10 integrates Ethernet, Wi-Fi, power amplifier, TF expansion card, USB expansion port, IR remote control function, HDMI, LVDS, backlight control, microphone and other functions, which greatly simplifies the overall design;

High scalability, four extended USB ports, three serial ports and one expandable debug string, one I2C interface, five IO expansion ports can expand more peripheral devices.

Chapter II Hardware interface introduction

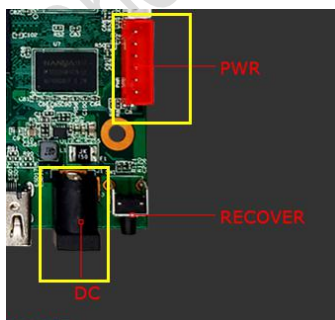
1. Appearance and interface



2. Interface definition

1) PWR / DC (power input) interface

It adopts 12V DC power supply, and only allows the board subsystem to be powered from the DC socket and power socket.



| No. | Definition | Property | Description |
|-----|------------|----------|-------------|
| 6 | 12V | Input | 12V Input |
| 5 | 12V | Input | 12V Input |

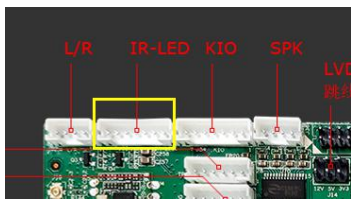
| | | | |
|---|-----|--------|-----------------------|
| 4 | GND | Ground | Ground |
| 3 | GND | Ground | Ground |
| 2 | 5VS | Input | Standby 5V input |
| 1 | STB | output | Standby signal output |

2) MIC (microphone) interface



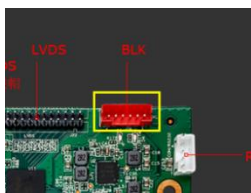
| No. | Definition | Property | Description |
|-----|------------|----------|-------------|
| 1 | MIC | Input | MIC Input |
| 2 | GND | Ground | Ground |

3) IR-LED (remote control) interface



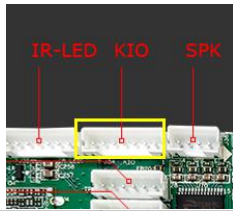
| No. | Definition | Property | Description |
|-----|------------|--------------|----------------------|
| 1 | RED | Output | Red light |
| 2 | 5V | Power supply | 5V output |
| 3 | GRN | Output | Green light |
| 4 | IO | Output | Remote signal output |
| 5 | IR | Input | Remote signal input |
| 6 | GND | Ground | Ground |
| 7 | 5V | power supply | 5V output |

4) BLK (backlight) interface



| No. | Definition | Property | Description |
|-----|------------|--------------|------------------------------|
| 1 | GND | Ground | Ground |
| 2 | GND | Ground | Ground |
| 3 | ADJ | Output | Backlight brightness control |
| 4 | EN | Output | Backlight enable control |
| 5 | 12V | Power supply | 12V output |
| 6 | 12V | Power supply | 12V output |

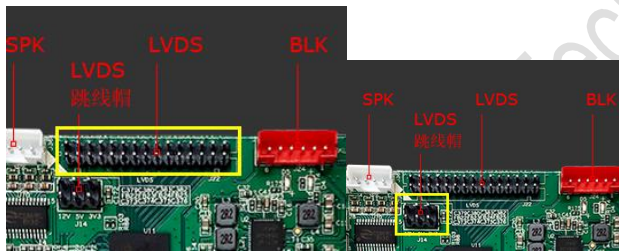
5) KIO interface (spare)



| No. | Definition | Property | Description |
|-----|------------|--------------|-------------|
| 1 | GND | Ground | Ground |
| 2 | K5 | K5 | K5 |
| 3 | K4 | K4 | K4 |
| 4 | K3 | K3 | K3 |
| 5 | K2 | K2 | K2 |
| 6 | K1 | K1 | K1 |
| 7 | 3V3 | Power supply | 3.3V output |

6) LVDS interface

General LVDS interface definition, support single / dual, 6/8 / 10-bit 1080P LVDS screen. The screen voltage can be selected through a jumper cap, and it can be selected to support 3.3V / 5V / 12V (from left to right) screen power supply.



| No. | Definition | Property | Description |
|-----|------------|--------------|-----------------------------|
| 1 | VCC | Power supply | 3.3V/5V/12V optional output |
| 2 | VCC | | |
| 3 | VCC | | |
| 4 | GND | Ground | Ground |
| 5 | GND | Ground | Ground |
| 6 | GND | Ground | Ground |
| 7 | RXO0- | Output | Odd 0- |
| 8 | RXO0+ | Output | Odd 0+ |
| 9 | RXO1- | Output | Odd 1- |
| 10 | RXO1+ | Output | Odd 1+ |
| 11 | RXO2- | Output | Odd 2- |
| 12 | RXO2+ | Output | Odd 2+ |
| 13 | GND | Ground | Ground |
| 14 | GND | Ground | Ground |
| 15 | RXOC- | Output | OddClock- |
| 16 | RXOC+ | Output | OddClock+ |

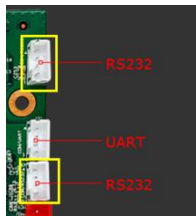
| | | | |
|----|-------|--------|------------|
| 17 | RXO3- | Output | Odd 3- |
| 18 | RXO3+ | Output | Odd 3+ |
| 19 | RXE0- | Output | Even 0- |
| 20 | RXE0+ | Output | Even 0+ |
| 21 | RXE1- | Output | Even 1- |
| 22 | RXE1+ | Output | Even 1+ |
| 23 | RXE2- | Output | Even 2- |
| 24 | RXE2+ | Output | Even 2+ |
| 25 | GND | Ground | Ground |
| 26 | GND | Ground | Ground |
| 27 | RXEC- | Output | EvenClock- |
| 28 | RXEC+ | Output | EvenClock+ |
| 29 | RXE3- | Output | Even 3- |
| 30 | RXE3+ | Output | Even 3+ |

In order to avoid burning the board and screen, please note the following:

- a. Please confirm whether the screen specification power supply voltage of the screen is correct and whether the corresponding power supply of the board can meet the maximum current of the screen;
- b. Please use a multimeter to confirm whether the power supply selected by the jumper cap is correct;
- c. When connecting the 6 / 8-bit LVDS screen cable, install it near the pin1 end.

7) RS232 (serial port) interface

The board introduces two sets of ordinary 232 serial ports, which can support common 232 serial port devices on the market.



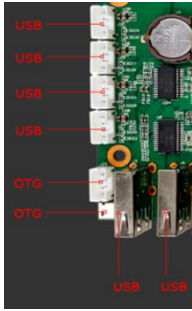
| No. | Definition | Property | Description |
|-----|------------|--------------|-------------|
| 4 | GND | Ground | Ground |
| 3 | RX | Input | 232-RX |
| 2 | TX | Input | 232-TX |
| 1 | 5V | Power supply | 5V output |

Precaution:

- a. Whether the serial port voltage matches. Can not directly access TTL, 485 serial devices.
- b. TX, RX Whether the connection is correct.

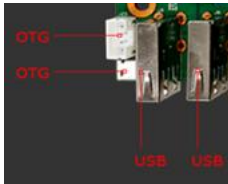
8) USB interface

M10 has 2 USB standard interfaces, 1 OTG standard interface, and 5 built-in USB sockets (of which the OTG socket is shared with OTG), which is used for peripheral USB expansion.



| No. | Definition | Property | Description |
|-----|------------|----------------|-------------|
| 1 | 5V | Power supply | 5V output |
| 2 | DM | Input / output | DM |
| 3 | DP | Input / output | DP |
| 4 | GND | Ground | Ground |

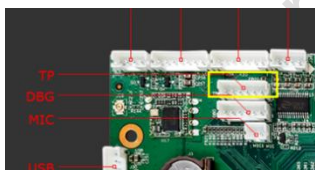
9) OTG interface



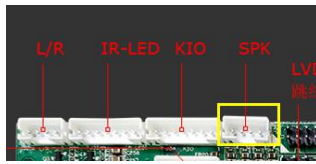
| No. | Definition | Property | Description |
|-----|------------|----------------|-------------|
| 1 | 5VS | Power supply | 5V output |
| 2 | DM | Input / output | DM |
| 3 | DP | Input / output | DP |
| 4 | GND | Ground | Ground |

10) TP (touch) interface (**spare**)

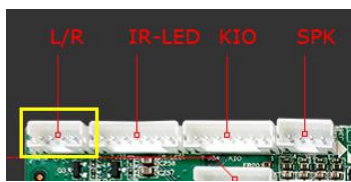
It is recommended to use touch via USB interface



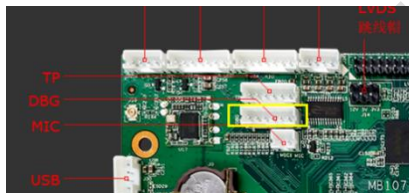
| No. | Definition | Property | Description |
|-----|------------|----------------|-------------|
| 1 | 3V3 | Power supply | 3.3V output |
| 2 | SCL | Input / output | I2C clock |
| 3 | SDA | Input / output | I2C data |
| 4 | INT | Input / output | Break |
| 5 | RST | Input / output | Reset |
| 6 | GND | Ground | Ground |

11) SPK (power amplifier) interface


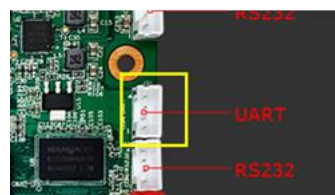
| No. | Definition | Property | Description |
|-----|------------|----------|----------------|
| 1 | OUTP-L | Output | Left channel+ |
| 2 | OUTN-L | Output | Left channel- |
| 3 | OUTN-R | Output | Right channel- |
| 4 | OUTP-R | Output | Right channel+ |

12) L/R (audio)interface


| No. | Definition | Property | Description |
|-----|------------|----------|---------------|
| 1 | LO-L | Output | Left channel |
| 2 | LO-R | Output | Right channel |
| 3 | GND | Ground | Ground |
| 4 | NC | NC | No definition |

13) DBG (DEBUG) interface (spare)


| No. | Definition | Property | Description |
|-----|------------|--------------|-------------|
| 1 | 3V3 | Power supply | 3.3V Output |
| 2 | TX | Output | TX |
| 3 | RX | Input | RX |
| 4 | GND | Ground | Ground |
| 5 | IO | Output | IO |
| 6 | IO | Output | IO |

14) UART(serial port)interface (spare)


| No. | Definition | Property | Description |
|-----|------------|----------|-------------|
|-----|------------|----------|-------------|

| | | | |
|---|-----|--------------|-------------|
| 4 | GND | Ground | Ground |
| 3 | RX | Input | RX |
| 2 | TX | Output | TX |
| 1 | 3V3 | Power supply | 3.3V output |

15) other interface

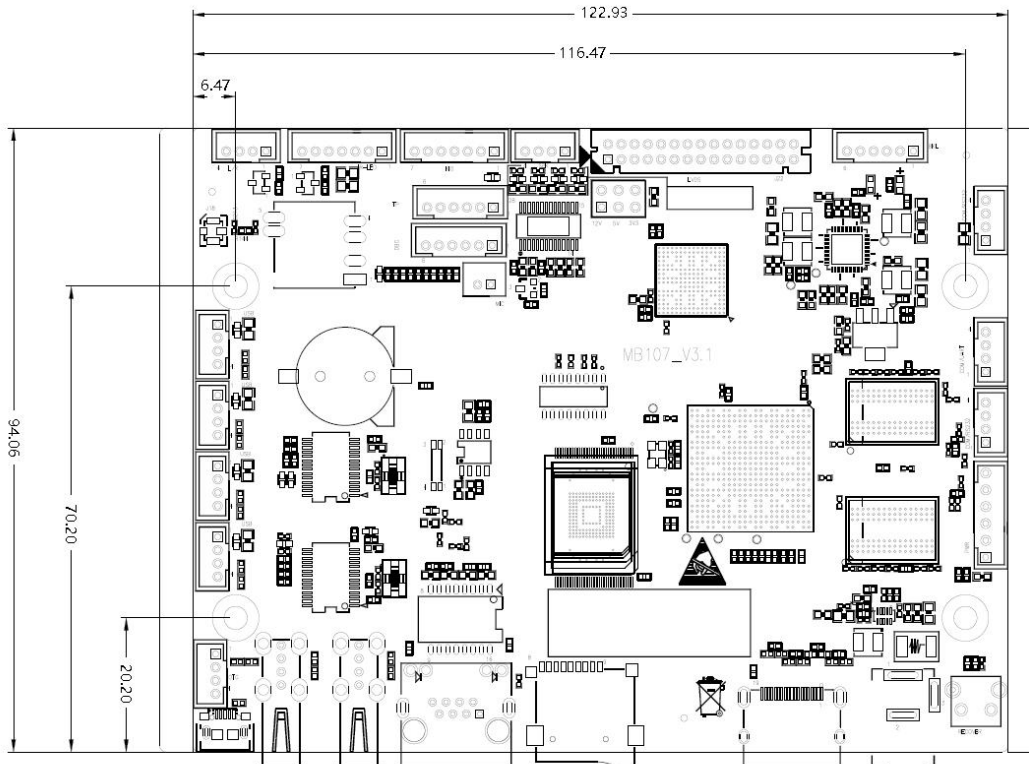
| | | |
|--------------------|--------------------|---|
| Storage interface | SD card | Data storage, up to 32G |
| | USB | HOST interface, support data storage, data import, USB mouse keyboard, camera, touch screen, etc. |
| Ethernet interface | RJ45 interface | Support 100M wired network |
| HDMI interface | Standard interface | Support HDMI output, up to 1080P |

3.Hole size chart

Unit: millimeter (mm)

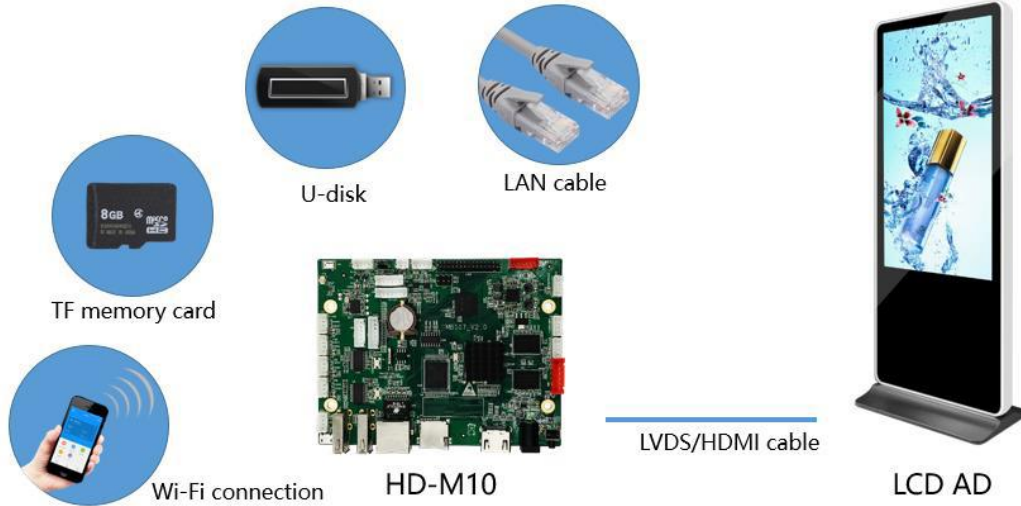
Screw hole specifications: $\phi 3.5\text{mm} \times 4$

PCB board thickness: $1.6\text{mm} \pm 10\%$



Chapter III Program Editing and Updating

M10 can update the program in 4 ways through Wi-Fi connection, TF card, U disk and network cable connection.



1. TF/U disk editing and updating programs

1) One area full screen playback

a. The video / picture is stored in the root directory of the TF / U disk, and the video / picture will automatically play in a loop. As shown below,

This PC > USB Drive (H:)

| Name | Date modified | Type | Size |
|-------------------|------------------|----------|-----------|
| 002.mp4 | 2011/11/15 22:05 | MP4 File | 4,524 KB |
| Touch_The_Sky.mp4 | 2015/12/4 18:20 | MP4 File | 42,506 KB |
| 41.jpg | 2019/2/28 15:51 | JPG File | 1,539 KB |
| 42.jpg | 2019/2/28 16:06 | JPG File | 1,238 KB |
| 43.jpg | 2019/2/28 16:07 | JPG File | 1,063 KB |
| 1111.png | 2018/8/11 18:04 | PNG File | 66 KB |

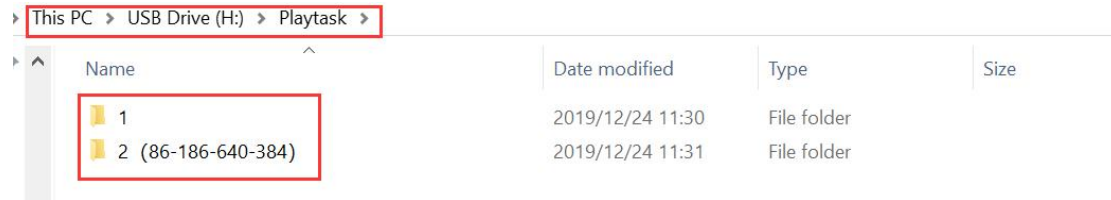
b. Create a "Playtask" folder in the root directory of the TF / U disk → create a "1" folder → put videos / pictures, and the videos / pictures will automatically play in a loop. As shown below

This PC > USB Drive (H:) > Playtask > 1

| Name | Date modified | Type | Size |
|-------------------|------------------|----------|-----------|
| 002.mp4 | 2011/11/15 22:05 | MP4 File | 4,524 KB |
| 41.jpg | 2019/2/28 15:51 | JPG File | 1,539 KB |
| 42.jpg | 2019/2/28 16:06 | JPG File | 1,238 KB |
| 43.jpg | 2019/2/28 16:07 | JPG File | 1,063 KB |
| 1111.png | 2018/8/11 18:04 | PNG File | 66 KB |
| Touch_The_Sky.mp4 | 2015/12/4 18:20 | MP4 File | 42,506 KB |

2) Partition playback

Create a "Playtask" folder under the root directory of the TF / U disk → create a folder of "1 (XYWH)" and "2 (XYWH)", corresponding to areas 1 and 2 superimposed playback, where X represents the abscissa and Y represents On the ordinate, W represents the width of the area, and H represents the height of the area. If there is no (X-Y-W-H), it means full screen playback by default. As shown below



It is divided into two areas "1" and "2", and the area "1" is played in full screen; the area 2 is superimposed and played on the area "1", X coordinate 86, Y coordinate 186, width 640, height 384.

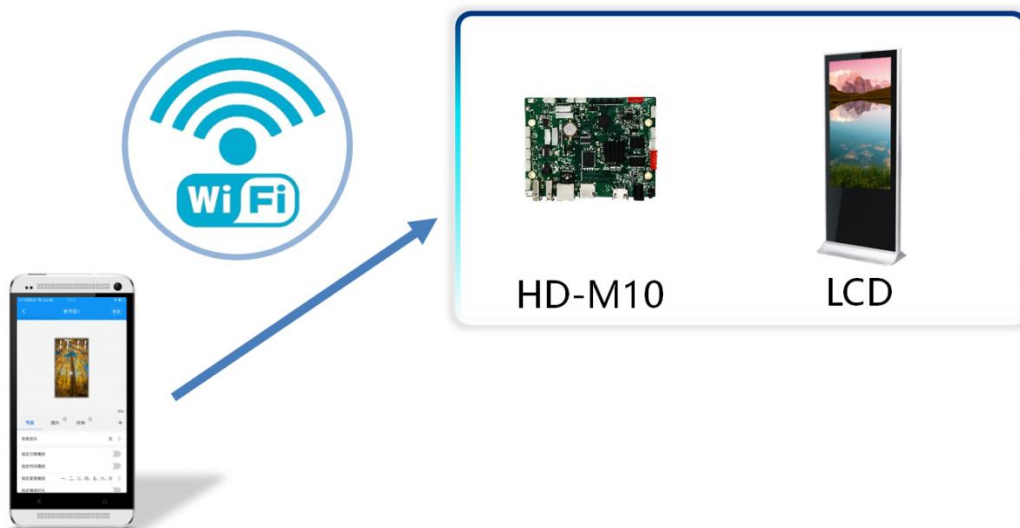
At last, the video / picture can be placed in the files "1" and "2" respectively.

Note: 1) Support video formats (encoding methods)-H.264, VP8, MAV, WMV, AVS, H.263, MPEG4, etc., and videos within 1080P;

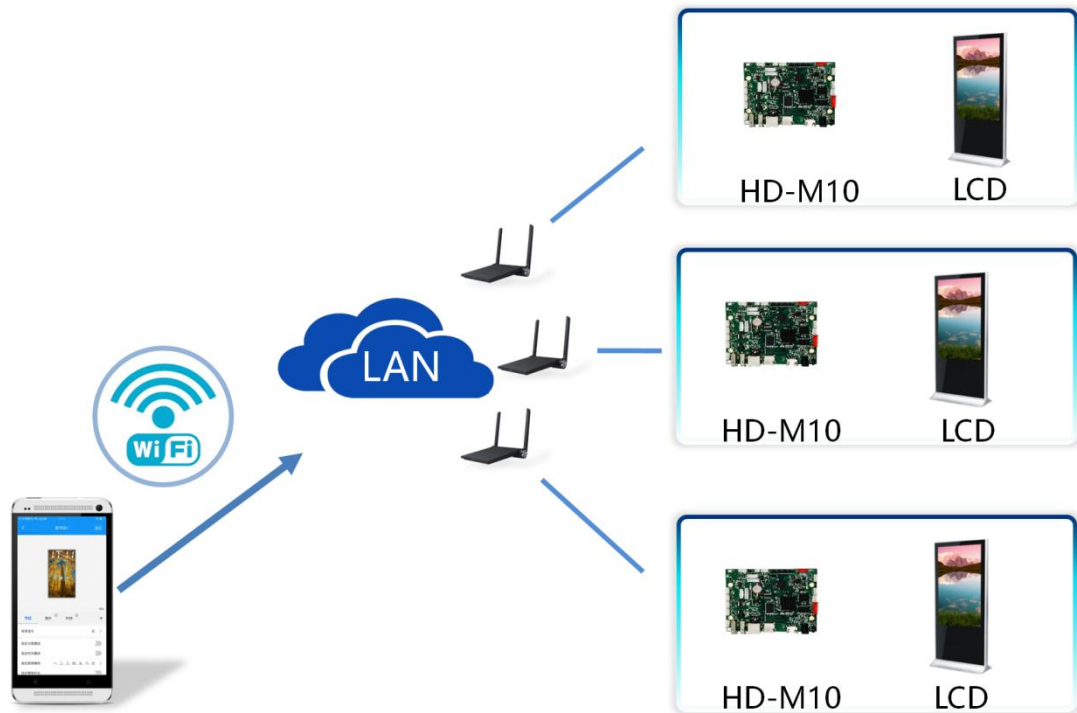
2) Support picture formats: JPG, BMP, PNG, etc.

2.Mobile APP editing and sending programs

1) Wi-Fi Connect



2) Network cable access to router




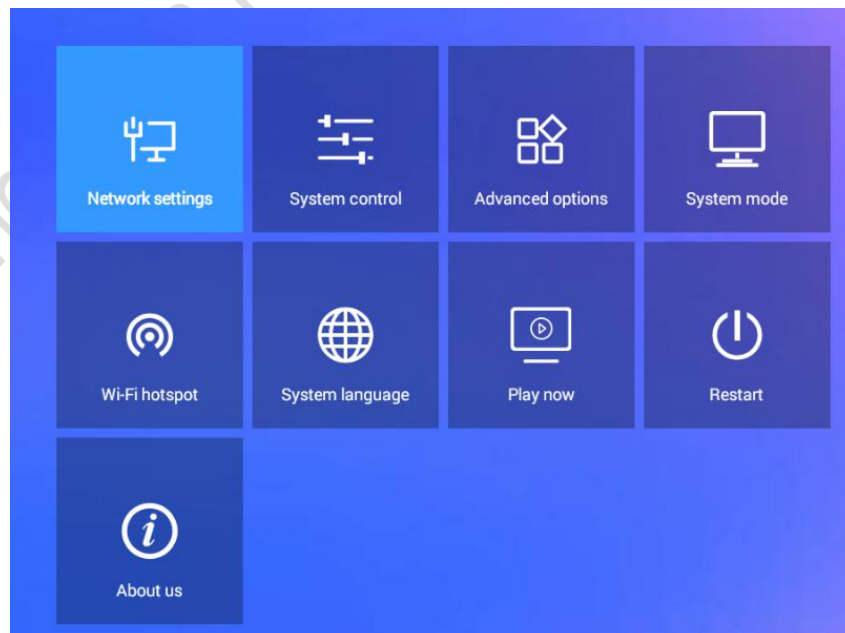
Note: Please refer to "LedArt Manual-M10 Version" for how to edit and send programs on the mobile APP "Screen Control", which will not be introduced here.

Chapter 4 System Settings

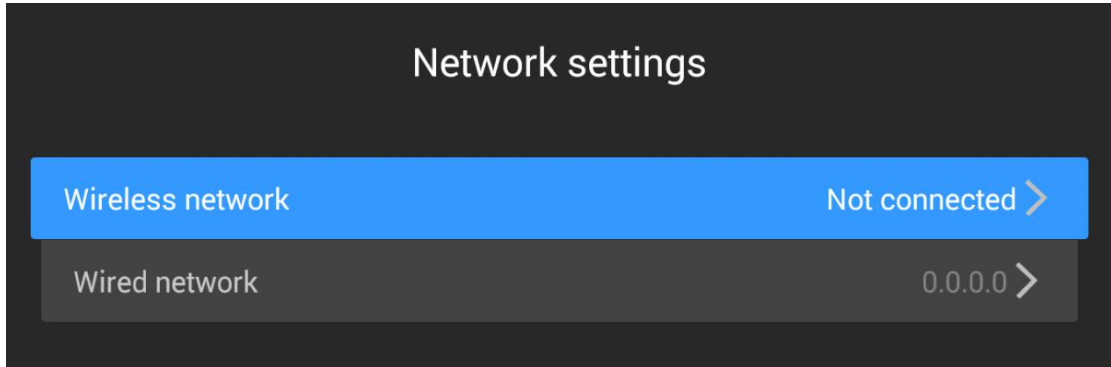
Entering the system settings by using a remoter. The function of the remote control buttons is as follows:



Press  Key to enter the system settings, the interface is as follows:



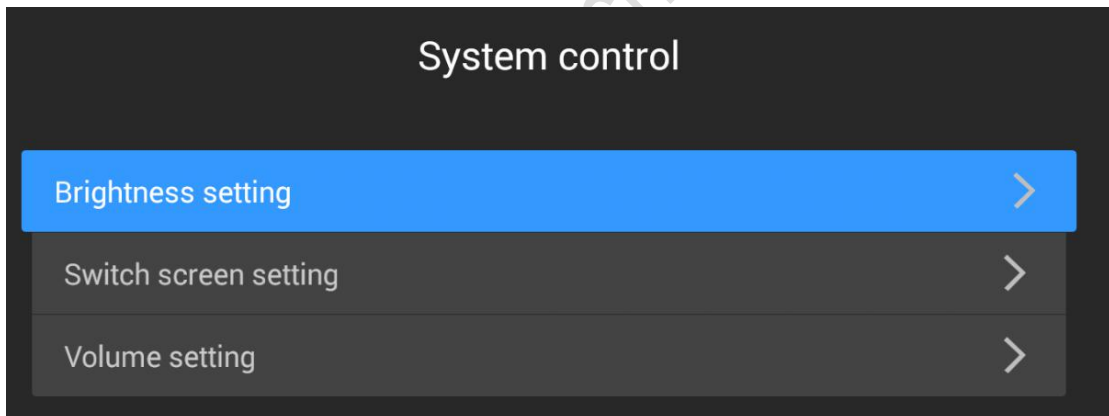
1. Network settings



Wireless network: The controller is bridged to other routers via Wi-Fi signals, and the IP address is automatically obtained from the router. It cannot be set to a fixed IP;

Wired network: The controller is connected to other routers through a network cable. The IP address can be obtained automatically from the router or it can be set to a fixed IP.

2. system control

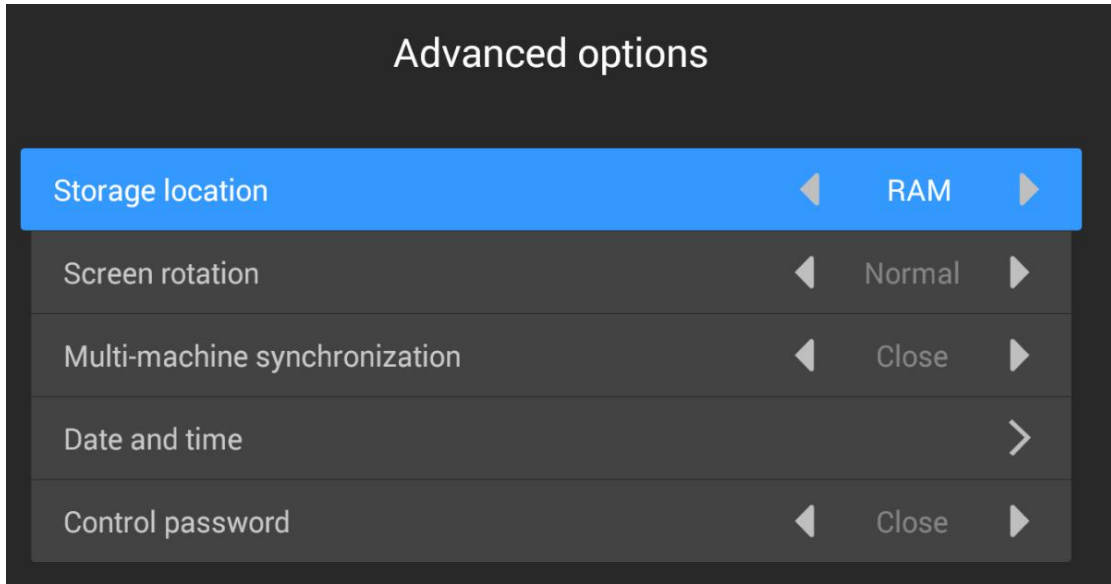


Brightness setting: adjust LCD screen brightness; (requires LCD panel support)

Switch screen setting: set the switch time of the LCD screen;

Volume setting: Adjust the volume of the LCD screen.

3.advanced options



Storage location: where the program is stored; (sending programs by APP)

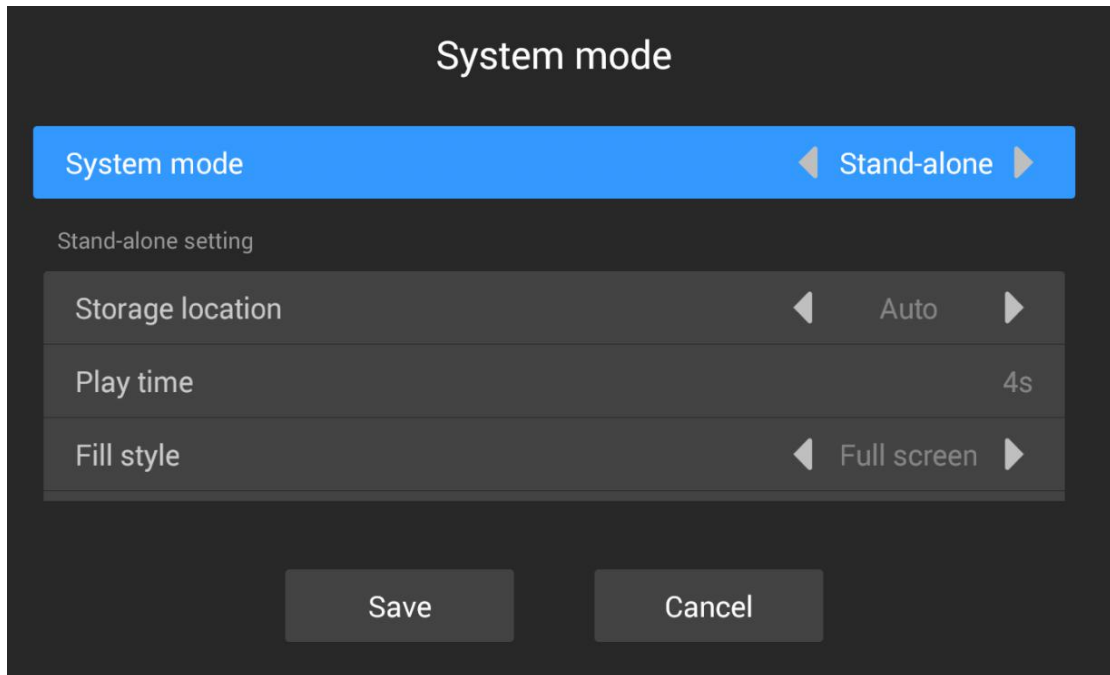
Screen rotation: support LCD screen rotation of 0 °, 90 °, 180 ° and 270 °;

Multi-machine synchronization: multiple LCD screens play the same content and play the same progress;

Date and time: Set the date and time of the player. When the automatic adjustment is turned on, the Internet time is automatically synchronized (requires Internet access);

Control password: Turn on password control, means when entering the system setting interface from play mode, it need to enter the password.

4.system mode

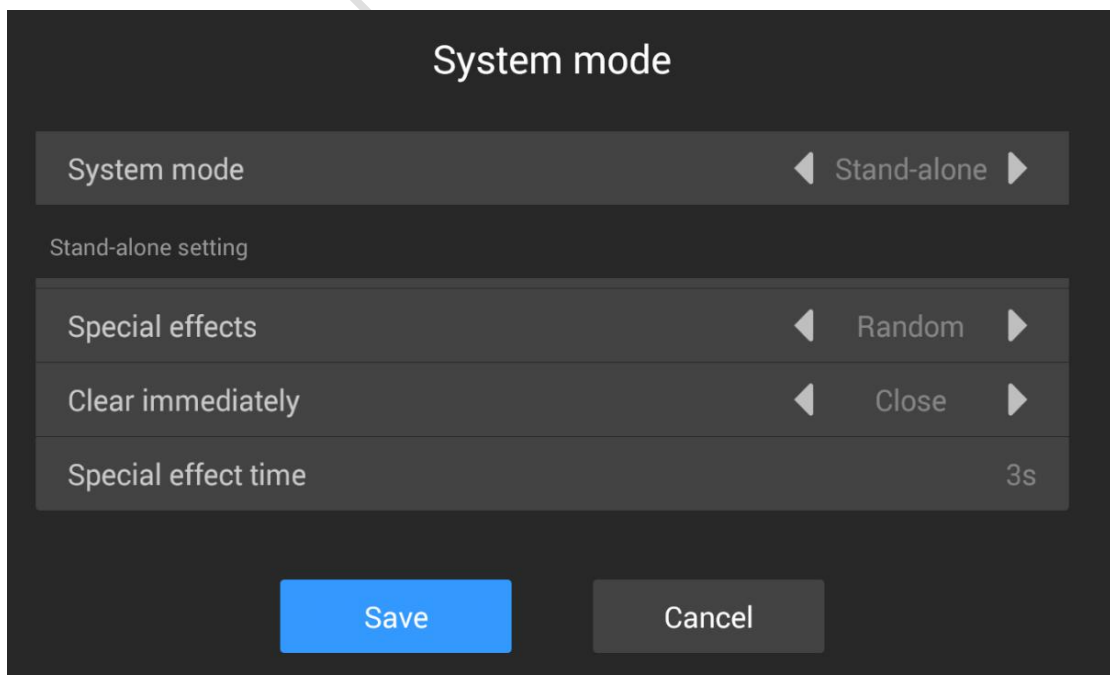


System mode: stand-alone mode and Internet mode; (Internet mode is still under development and testing ...)

Storage location: where the program is stored;

Playing time: the time of playing pictures in TF / U disk, 5S means playing each picture for 5 seconds; (if sent by APP, the playing time can be set on APP)

Filling style: Video / picture playback in TF / U disk is displayed in full screen or scaled in equal proportion;

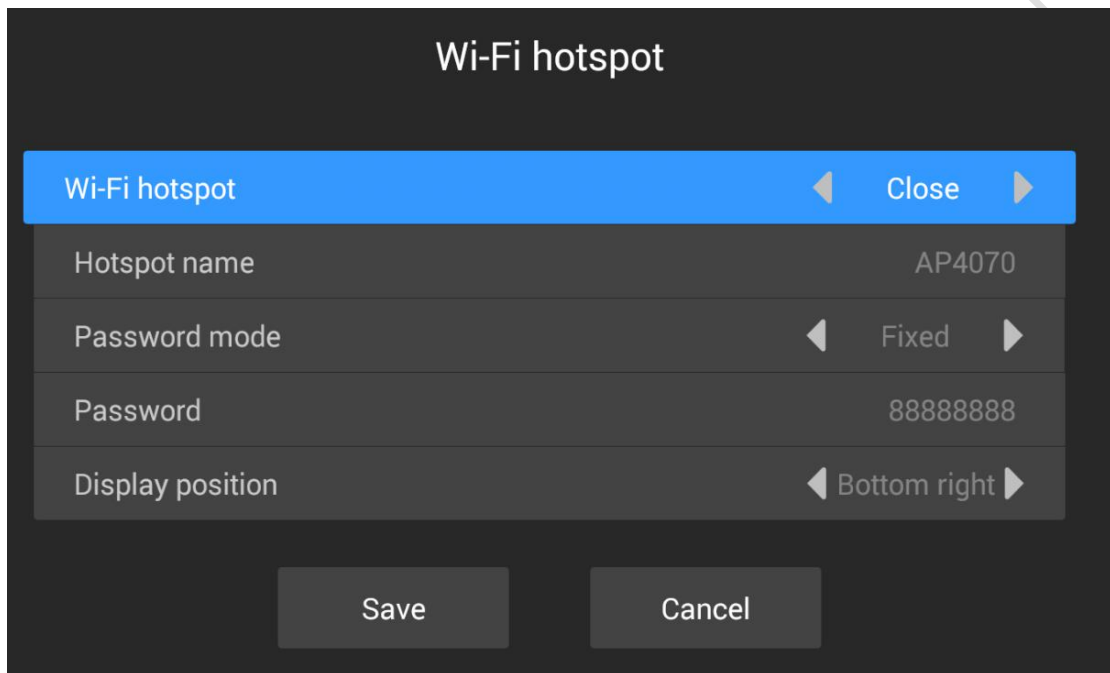


Special effects: special effects for picture in TF / U disk, it has random, still display, pan left, pan right, etc .;

Clear screen immediately: if On, the previous picture will be cleared, and then the next picture will appear; If Off, the next picture will gradually cover the previous picture;

Special Effect Duration: The time for the picture to appear in the special effect, 3S means it takes 3 seconds for the picture to appear from the beginning to the entire screen.

5. Wi-Fi Hot spot



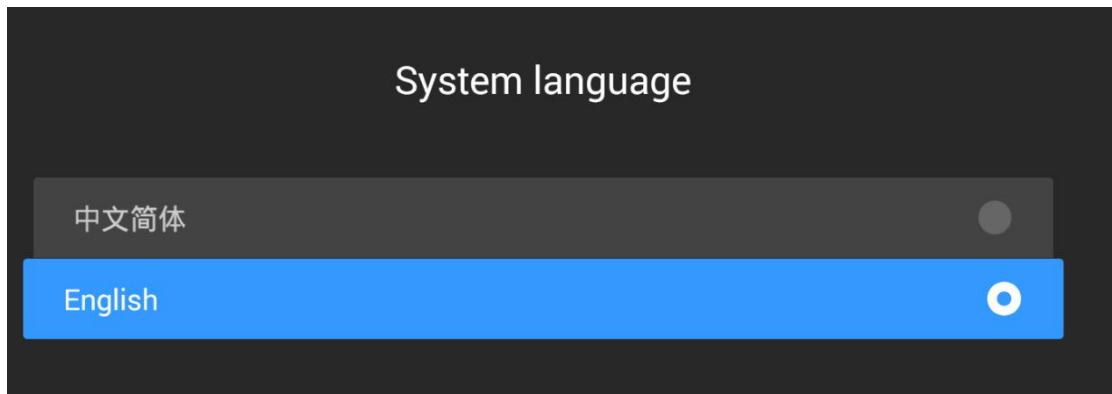
Wi-Fi hot spot: Turn on this item, the phone can connect to the player's Wi-Fi for control;

Hot spot name: Wi-Fi name, which can be modified;

Password mode: fixed, means a fixed password; random, means the password 30 minutes / 1 hour (can be set) will change once;

Display position: The position where Wi-Fi is displayed on the LCD screen. (If the controller cable is connected to the Internet and the phone is connected to Wi-Fi, the phone can access the Internet)

6.system language



Now it only has two language: Chinese and English;

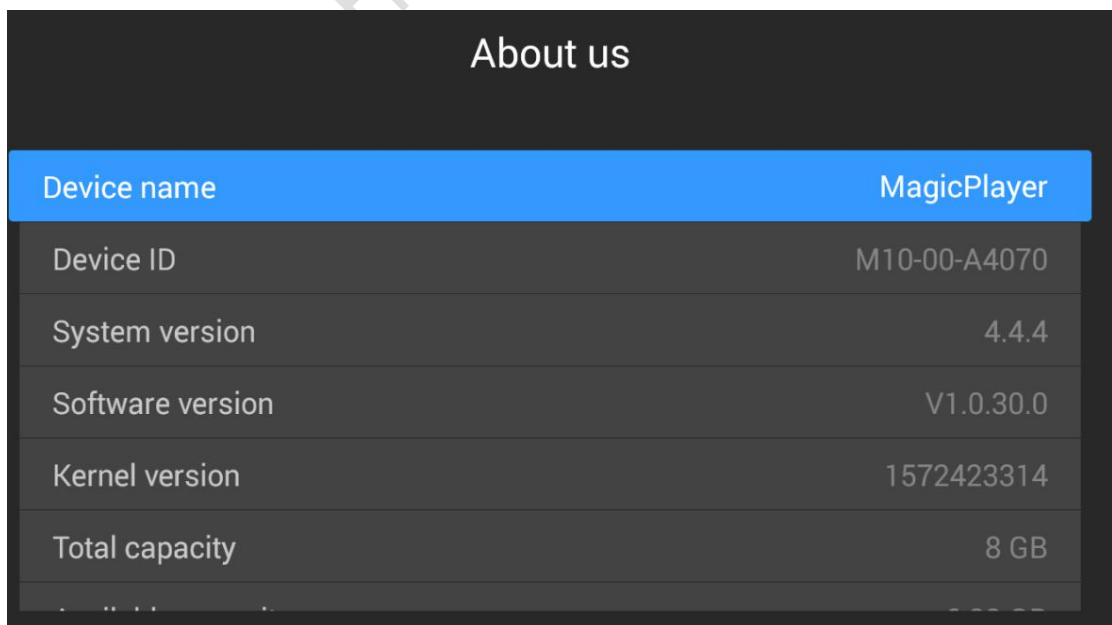
7.play now

Click once to exit the system settings and play the program immediately.

8.restart

Press it twice to restart the controller.

9.about



Controller name, ID, version, capacity, and more.

Chapter 5 Precautions for assembly and use

During assembly and use, please pay attention to the following (but not limited to) problem points.

1. Short circuit between bare board and peripherals;
2. In the process of installation and fixing, avoid deformation of the bare board due to fixing;
3. When installing the eDP / LVDS screen, pay attention to whether the screen voltage and current meet the requirements. Pay attention to the orientation of the first leg of the screen holder;
4. When installing the eDP / LVDS screen, pay attention to whether the screen backlight voltage and current meet the requirements. If the power of the screen backlight is above 20W, whether to use other power supply boards for power supply;
5. When installing peripherals (USB, IO.etc), pay attention to the external IO level and current output issues;
6. When installing the serial port, pay attention to whether the 232,485 devices are directly connected. Whether the TX and RX connections are correct;
7. Whether the input power is connected to the power input interface. According to the overall peripheral evaluation, whether the input power voltage, current, etc. meet the requirements. Eliminate the need to access the power input power source from the backlight socket for easy operation.