# Contents

Chapter I   Overview

M20 using the Rockchip RK3288 quad-core chip solution, equipped with Android 5.1.1 system, the main frequency is up to 1.8GHz, with super performance. Adopts Mali-T764 GPU, supports AFBC (Frame Slow Slave Compression), 4K \ H.265 hard decoding, 1080P video decoding, HDMI interface 1080P output, 4K video playback. Supports infrared remote control, Wi-Fi, RJ45 and other rich interfaces to make the product more versatile. It is widely used in advertising, interactive all-in-one, security, medical, transportation, finance, industrial control and other intelligent control fields, which can accelerate Product development cycle. Due to its hardware platform and Android's intelligent characteristics, when it is necessary to perform human-computer interaction and network device interaction, it can be used on the smart terminal motherboard, which can become your best choice.

FEATURES:

➢ High performance. The RK3288 chip uses a quad-core ARM Cortex-A17 architecture, and uses the chip's RK3288 motherboard solution. The main frequency can be as high as 1.8GHz, compared with the single-core, dual-core, and quad-core solutions common in the market. It has a qualitative leap in performance, can play high-definition video in various formats, and can handle complex interactive operations.

➢ High stability. RK3288 Android integrated board, in hardware and software, add your own unique technology to ensure the stability of the product, can make the final product 7 * 24 hours unattended.

➢ High integration. RK3288 Android integrated board integrates Ethernet, eDP, Wi-Fi, power amplifier, TF expansion card, USB expansion port, IR remote control function, HDMI, LVDS, backlight control, microphone and other functions, greatly simplifying the overall design.

➢ High scalability. Two expansion USB ports, 2 serial ports + 1 expandable debug serial port, five IO expansion ports can expand more peripheral device.

➢ High definition. Supporting various LVDS / eDP / HDMI interfaces and cropping screens of various sizes and resolutions.

➢ Perfectly support multiple mainstream touch screen functions such as multi-point infrared touch, multi-point capacitive touch, multi-point nano film touch, multi-point acoustic wave touch, multi-point optical touch, etc.
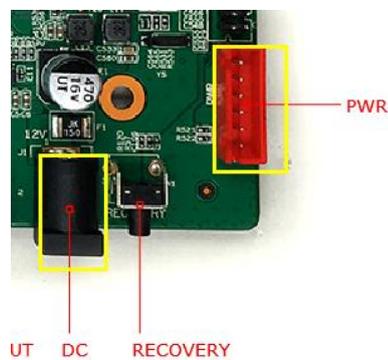
Chapter II   Hardware interface introduction

1.Appearance and interface
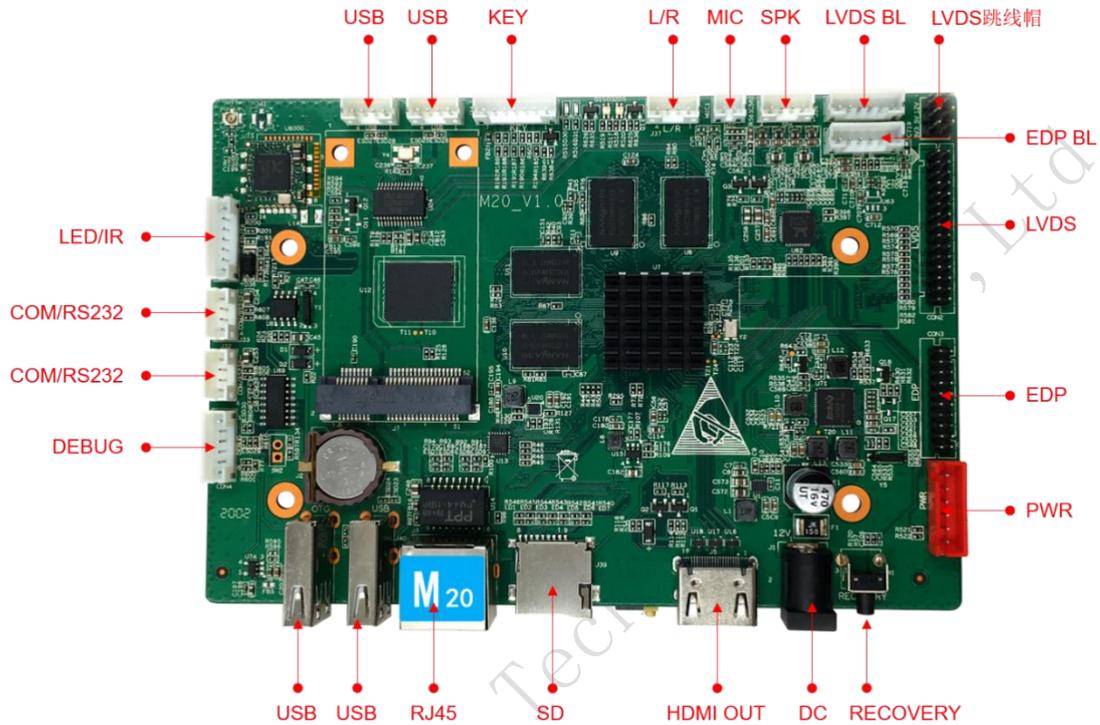
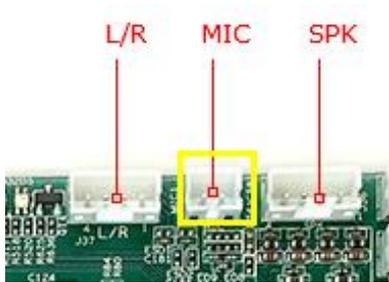## 2.Interface definition

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.
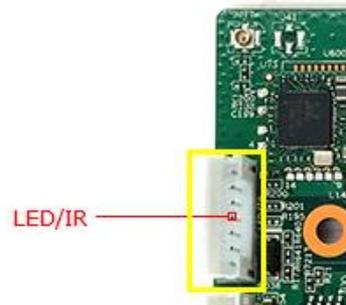
NO.	definition	Attributes	description
6	12V	Input	12V Input
5	12V	Input	12V Input
4	GND	Ground	Ground
3	GND	Ground	Ground
2	5VS	Input	Standby 5V input
1	STB	Output	Standby signal output

2) MIC(Microphone) interface and definition

No.	definition	Attributes	description
1	MIC-P	Input	MIC+Input
2	MIC-N	Input	MIC-Input

3) LED/IR(Remote control) interface and definition

No.	definition	Attributes	description
1	RED	Output	Red light
2	5V	Power	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	5V Output

4) LVDS BL(LVDS backlight) interface
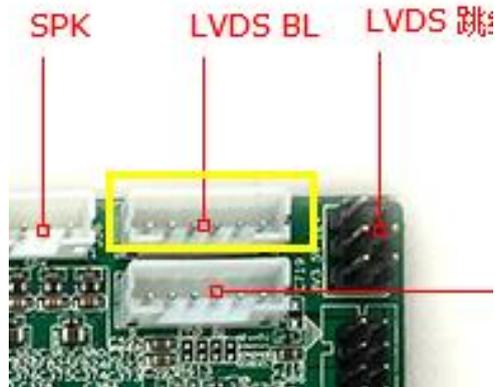
No.	definition	Attributes	description
1	GND	Ground	Ground
2	GND	Ground	Ground
3	ADJ	Output	Backlight brightness control
4	EN	Output	Backlight enable control
5	12V	Power	12V output
6	12V	Power	12V output

5) EDP BL（EDP backlight) interface and definition
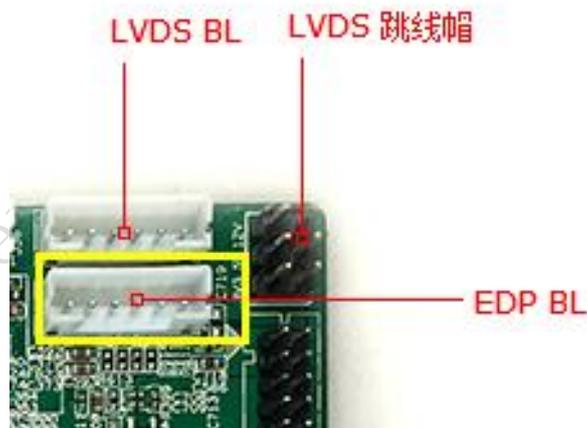
No.	definition	Attributes	description
1	GND	Ground	Ground
2	GND	Ground	Ground
3	ADJ	Output	Backlight brightness control
4	EN	Output	Backlight enable control
5	12V	Power	12V output
6	12V	Power	12V output

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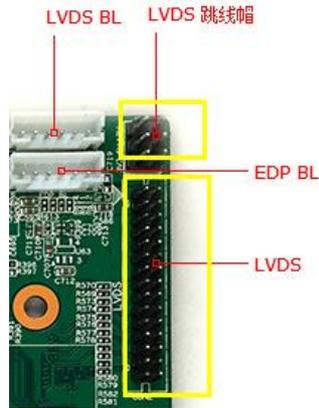
General LVDS interface definition, support single / dual, 6/8 / 10-bit 1080P LVDS screen. The screen voltage can be selected through a jumper cap, and it can be selected to support 3.3V / 5V / 12V screen power supply.

In order to avoid burning boards and screens, please note the following:

1. Please confirm whether the screen specification book screen supply voltage is correct, whether the board's corresponding power supply can meet the maximum working current of the screen.

2. Please use a multimeter to confirm that the power supply selected by the jumper cap is correct.

3. When connecting the 6 / 8-bit LVDS screen cable, install it near pin1.

No.	definition	Attributes	description
1	VCC	Power	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	Odd Clock-
16	RXOC+	Output	Odd Clock+

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	Even Clock-
28	RXEC+	Output	Even Clock+
29	RXE3-	Output	Even 3-
30	RXE3+	Output	Even 3+

7) EDP Interface and definition

This interface is a common EDP screen interface, in the form of 10 * 2 double row pins, 3.3V screen power supply。

In order to avoid burning boards and screens, please note the following:

Confirm that the screen specification book screen supply voltage is correct and whether the board's corresponding power supply can meet the screen's maximum working current.
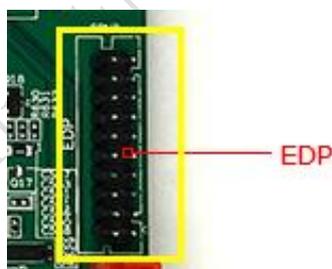
No.	definition	Attributes	description
1	VCC	Power	output
2	VCC	Power	output
3	GND	Ground	Ground
4	GND	Ground	Ground
5	T0P	Output	True Signal Link Lane 0
6	T0N	Output	Complement Signal Link Lane 0
7	T1P	Output	True Signal Link Lane 1
8	T1N	Output	Complement Signal Link Lane 1
9	T2P	Output	True Signal Link Lane 2
10	T2N	Output	Complement Signal Link Lane 2
11	T3P	Output	True Signal Link Lane 3

12	T3N	Output	Complement Signal Link Lane 3
13	GND	Ground	Ground
14	GND	Ground	Ground
15	AUP	Output	True Auxiliary Channel
16	AUN	Output	Complement Signal Link Lane 0
17	GND	Ground	Ground
18	GND	Ground	Ground
19	GND	Ground	Ground
20	GND	Ground	Ground

8) USB Interface and definition
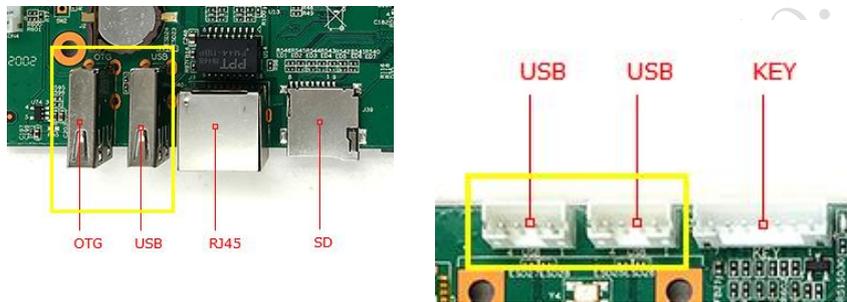
The board has 2 USB standard interfaces (the left one is device mode), 2 built-in USB sockets for peripheral expansion.

USB Interface

No.	definition	Attributes	description
1	5VS	Power	5V Output
2	DM	Input / output	DM
3	DP	Input / output	DP
4	GND	Ground	Ground

9) SPK (Power amplifier) interface
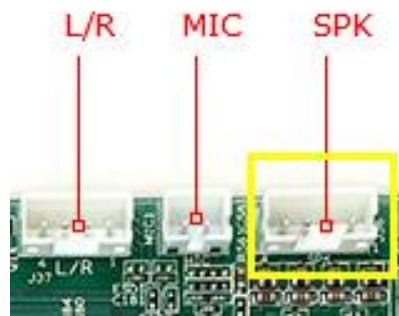
No.	definition	Attributes	description
1	OUTP-R	Output	Right channel +
2	OUTN-R	Output	Right channel-

3	OUTN-L	Output	Left channel-
4	OUTP-L	Output	Left channel+

10)   L/R (Audio interface and definition)
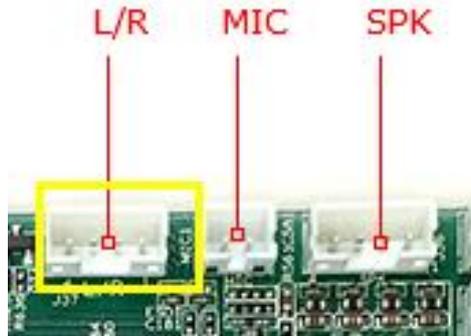
No.	definition	Attributes	description
1	LO-L	Output	Left channel
2	LO-R	Output	Right channel
3	GND	Ground	Ground
4	NC	NC	No definition

11)   KEY Interface (extension) and definition
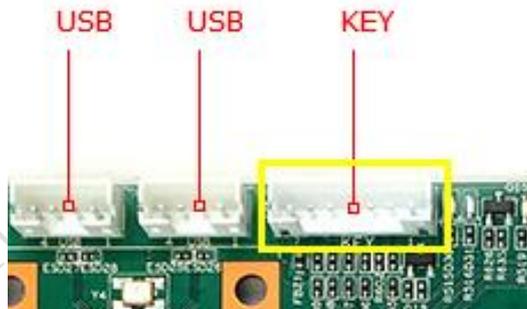
No.	definition	Attributes	description
1	GND	Ground	Ground
2	K5	K5	K5
3	K4	K4	K4
4	K3	K3	K3
5	K2	K2	K2
6	K1	K1	K1
7	3V3	Power	3.3V output

12)   Other interfaces

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, maximum support 1080P
3G/4G	PCI-E standard interface	Support various
SIM card interface	Standard interface	Support various standards (depending on 3G / 4G module)

3.Hole size chart

Unit: millimeter (mm)

Screw hole specifications: φ3.5mm x 4

PCB board thickness: 1.6mm ± 10%
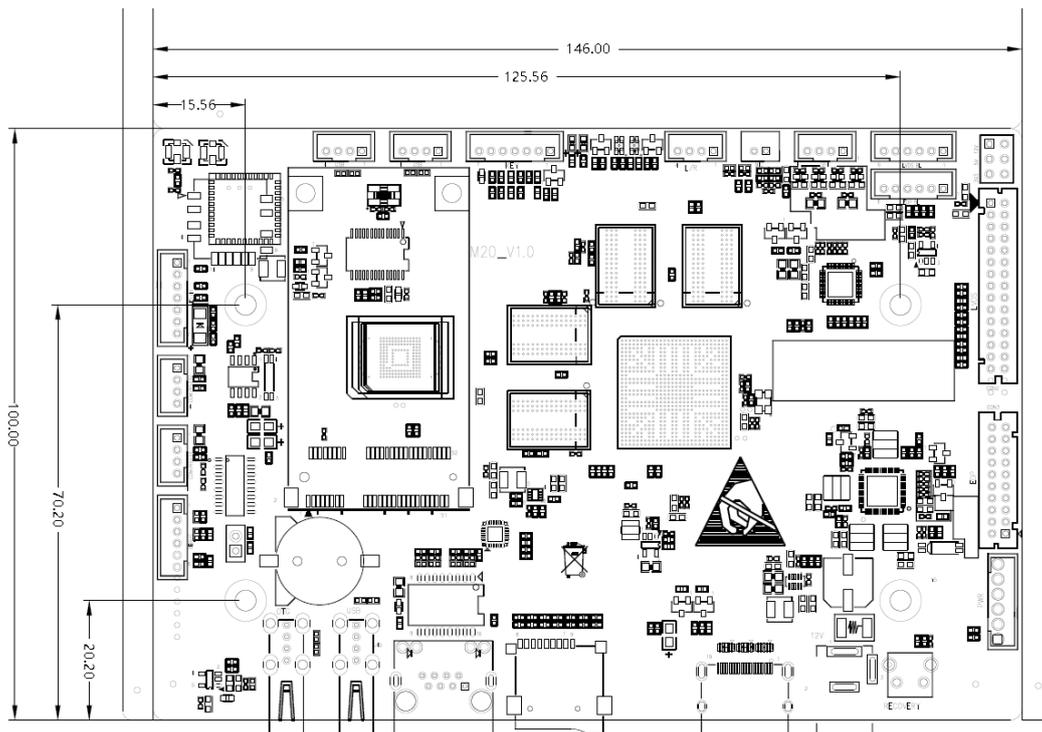
Chapter III Program Editing and Updating

M20 can update the program in 4 ways through Wi-Fi connection, TF card, U disk and network cable connection.
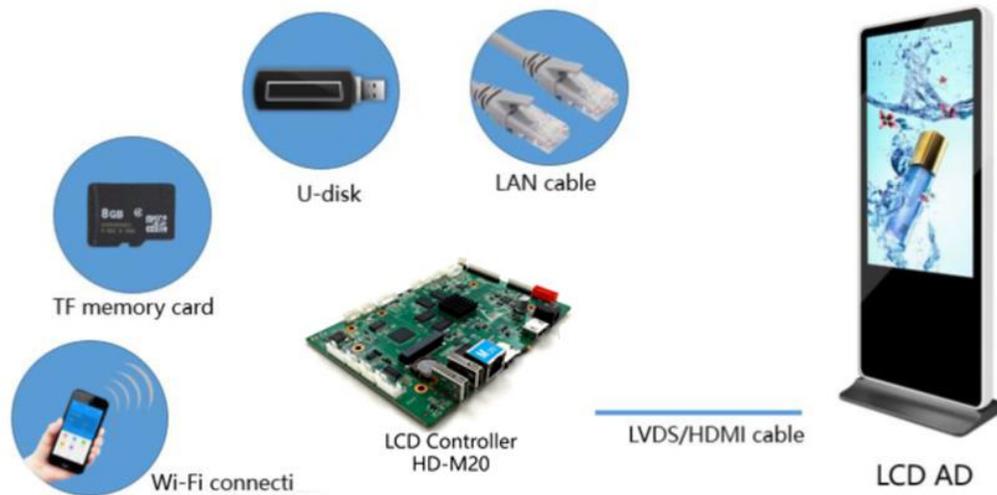
1. TF/U disk editing and updating programs

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,

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

2）Partition playback

Create a "Playtask" folder under the root directory of the TF / U disk → create a folder of "1"→ 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.
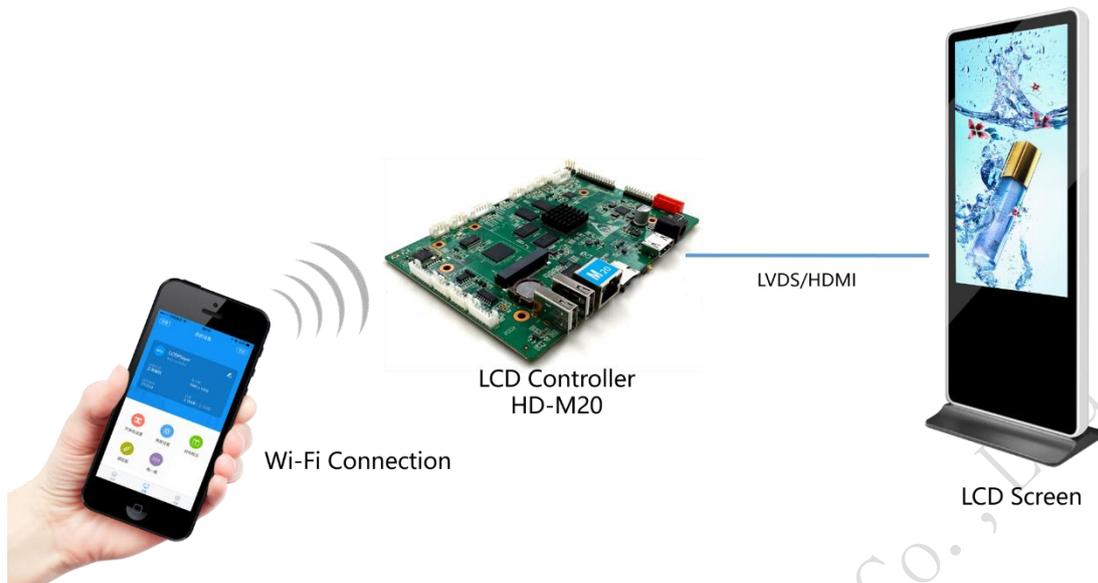
At last, the video / picture can be placed in the files "1" and "2" respectively.

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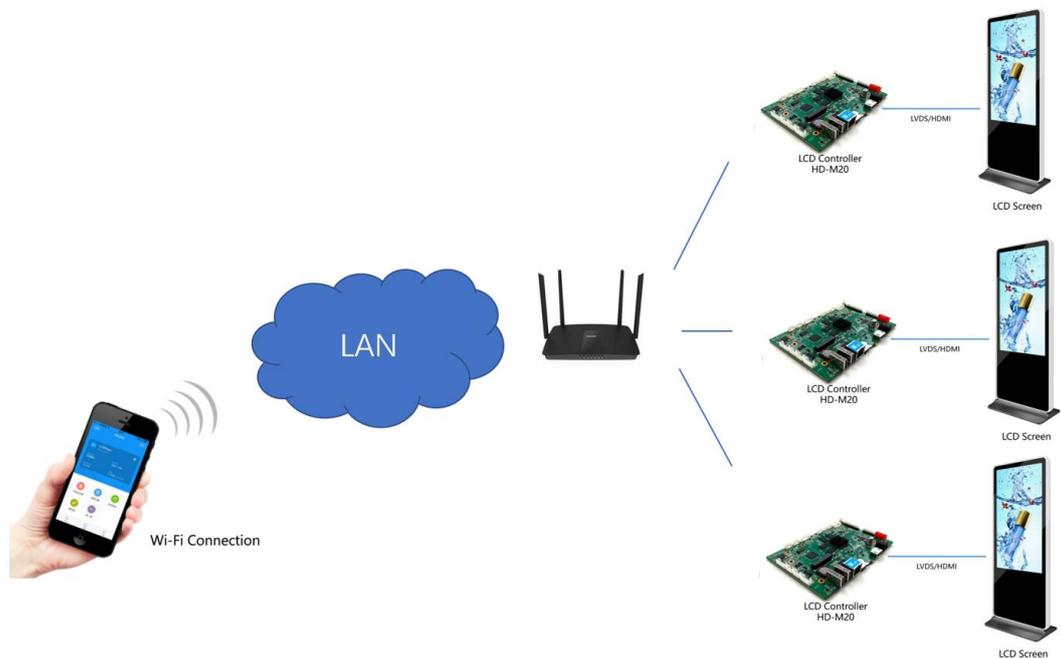2) Support picture formats: JPG, BMP, PNG, etc.

2.Mobile APP editing and sending programs

1）Wi-Fi Connect

2) Network cable access to router

Note: Please refer to "LedArt Manual-LCD Version" for how to edit and send programs on the mobile APP "Screen Control", which will not be introduced here.
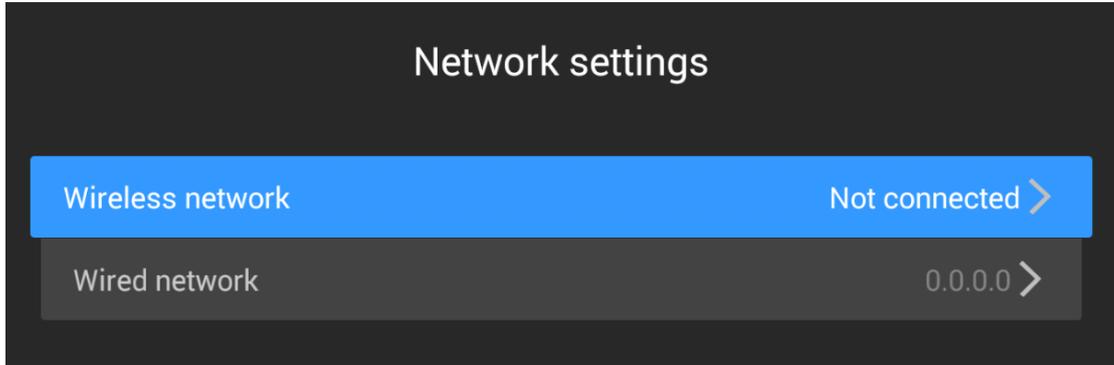
Chapter 4   System Settings

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:
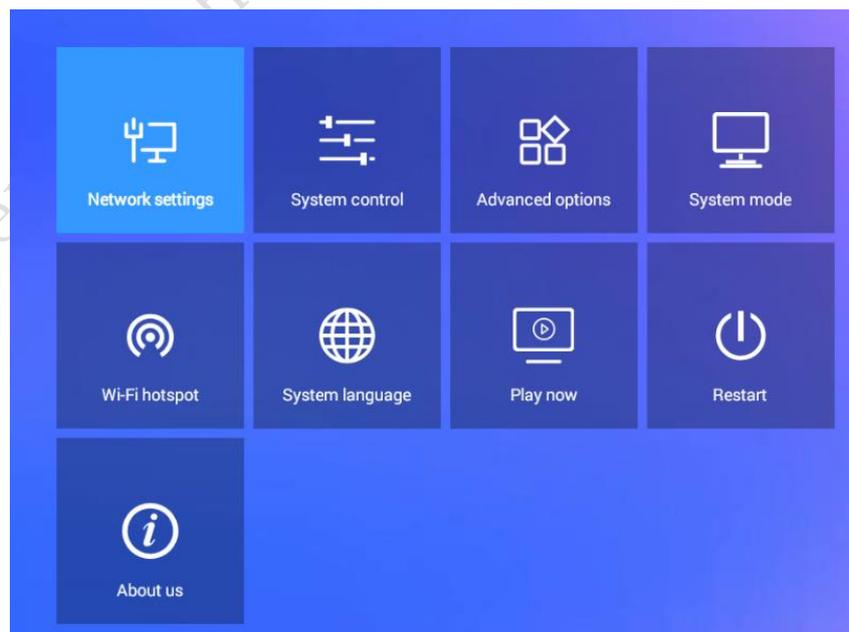
1.Network settings

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.
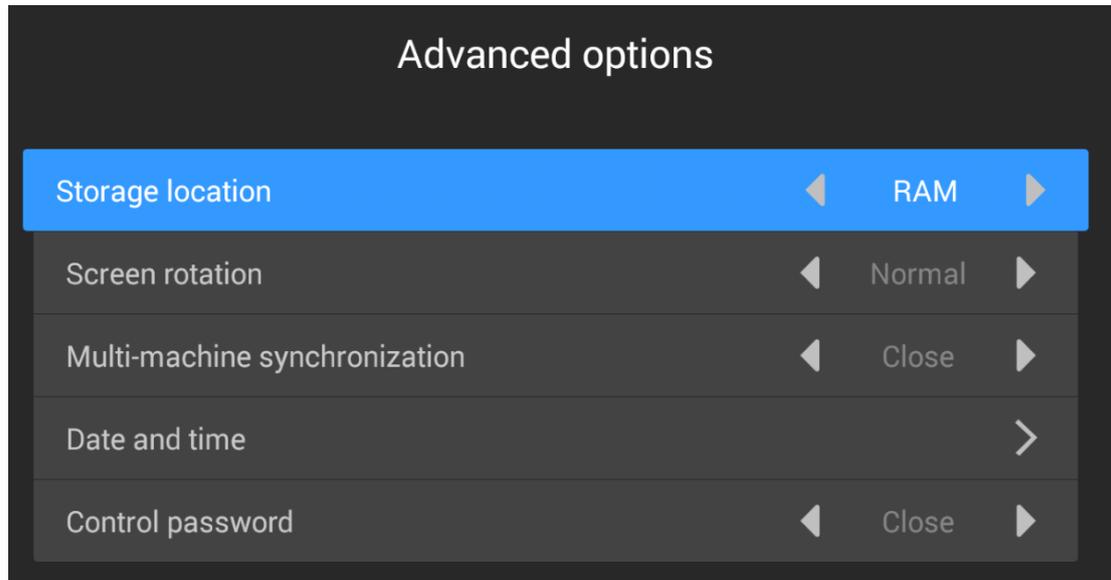
2.system control
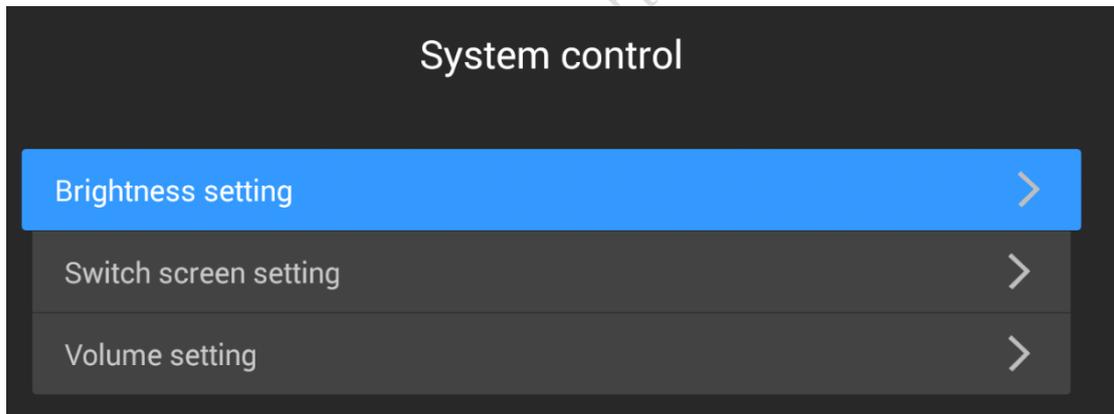
Brightness setting: adjust LCD screen brightness; (requires LCD panel support)

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

Volume setting: Adjust the volume of the LCD screen.

3.advanced options

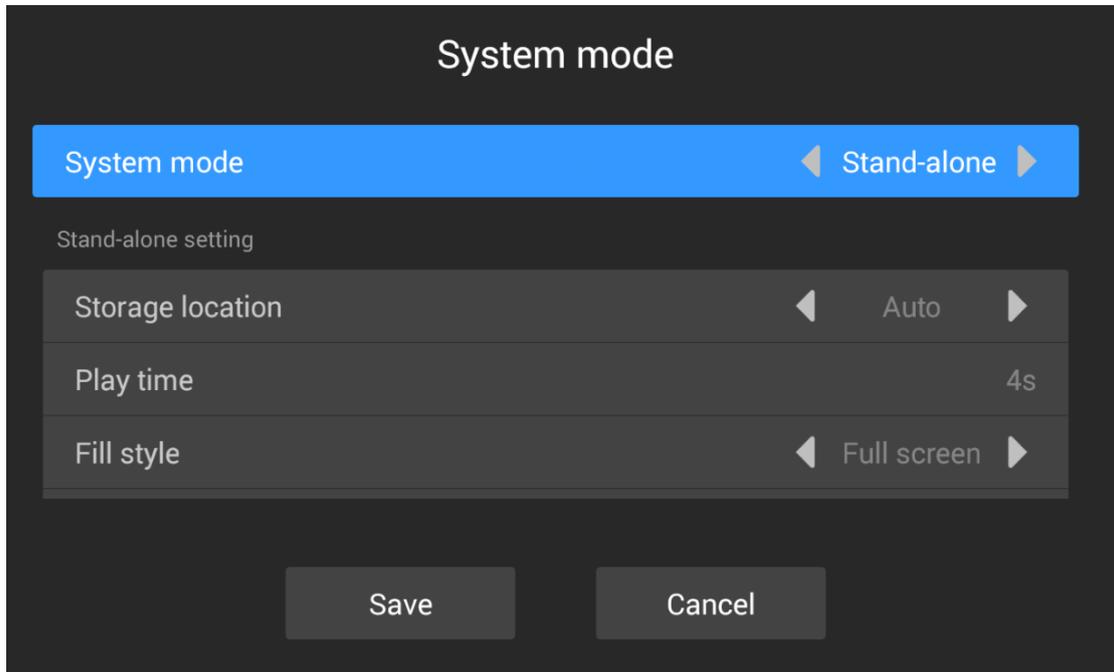Storage location: where the program is stored; (sending programs by APP)

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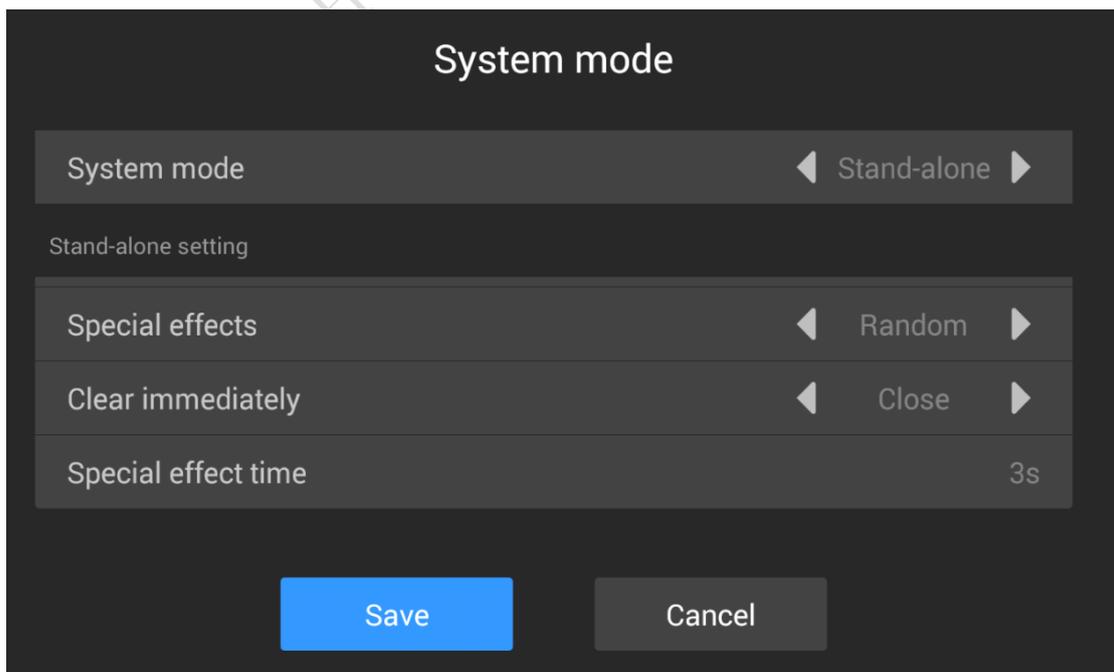
Special effects: special effects for picture in TF / U disk, it has random, still display, pan left, pan right, etc .;

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, 3Smeans it takes 3 seconds for the picture to appear from the beginning to the entire screen.

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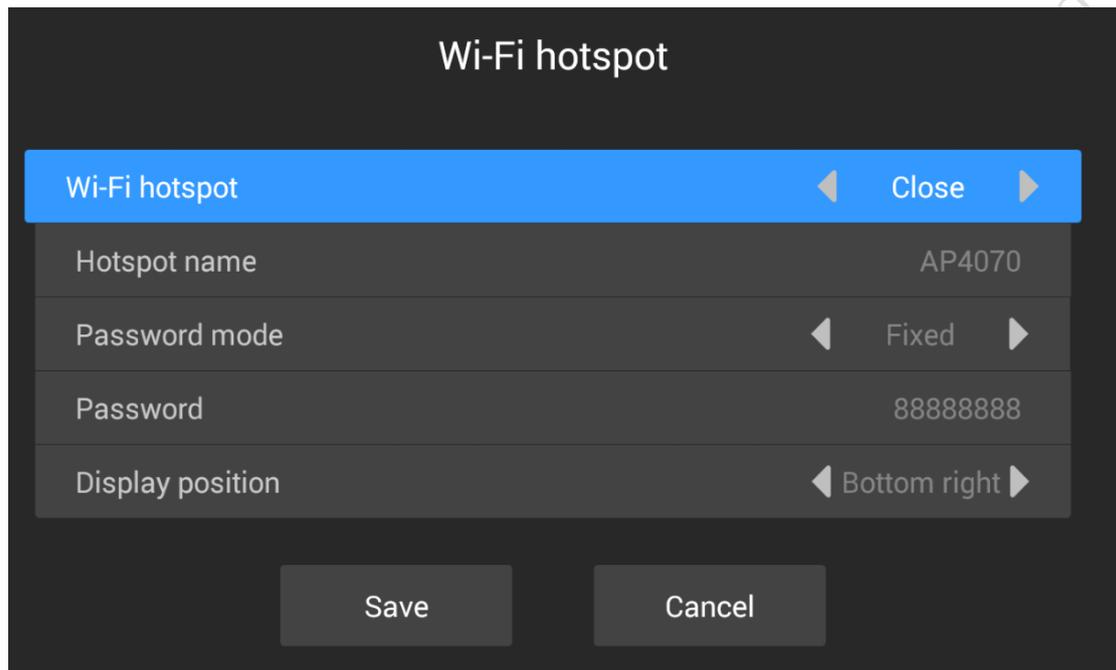
Wi-Fi hot spot: Turn on this item, the phone can connect to the player's Wi-Fi for control;

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
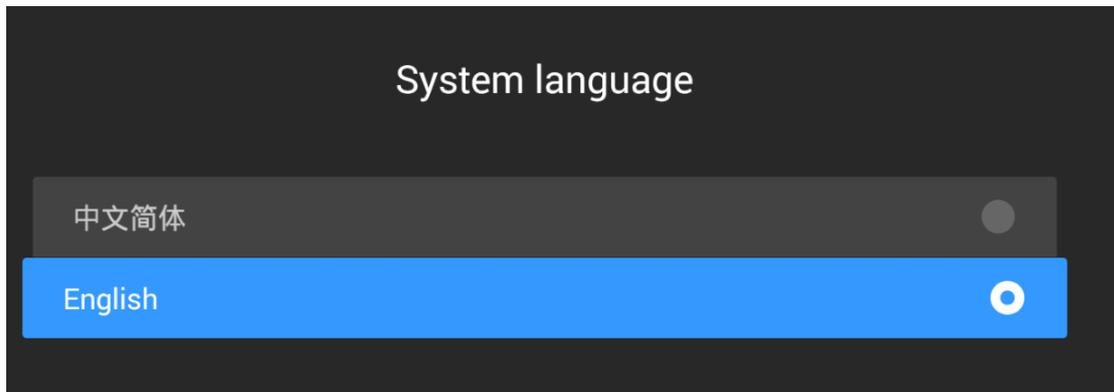
Now it only has two language: Chinese and English;

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.