深圳市灰度科技有限公司

Product Specifications

LCD controller

HD-M30

V2.0

Contents

Chapter I Product description

I. Overview

M30 is a well-built all- in-one motherboard, using Rockchip RK3399 (dual core cortex-A72 big core plus four quad-core Cortex-A53 little core) six core, 64-bit CPU, equipped with Android 7.1.2 solution. Frequency is up to 1.8GHz. Use Mail- T864 GPU, support 4K H.265 hard decode. Support IR remote, 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.

II. Features

- High performance. The RK3399 chip use CPU equipped with Android 7.1 system, which is faster and more powerful. The main frequency can be as high as 1.8GHz. Compared with the common single-core, dual-core and quad-core solutions in the market, the performance have qualitative leap, capable of playing various formats of high-definition video screens, and capable of handling complex interactive operations.

- High stability. RK3399 Android integrated board, in hardware and software, add it own unique technology to ensure the stability of the product can make the final product 7 * 24 hours unattended.

- High integration. RK3399 Android integrated board integrates Ethernet, EDP, Wi-Fi, power amplifier, USB expansion port, IR remote control function, HDMI, LVDS, backlight control, microphone and other functions, greatly simplifying the overall design.

- High scalability. Six USB ports (Two USB 3.0, Four USB 2.0), 3 serial ports + 1 expandable debug serial port, five IO expansion ports can expand more peripheral device.

- High definition. Largest support 3840*2160 4K decode; support various LVDS / EDP / HDMI OUT/HDMI IN interfaces (optional TF expansion port) LCD screen 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 Specifications

I. Basic parameters

1. Hardware parameters

| Hardware specifications	
CPU	RK3399 highest 64 bit high performance CPU，Frequency up to 1.8 GHz； 1.Dual Cortex-A72 big-core + Quad Cortex-A53 little-core 64-bit CPU 2.Build in low energy consumption MCU Cortex-M0
GPU	Quad Cortex ARM Mali-T864 high performance GPU
Memory	Default 4G
Build-in ROM	32KB EEPROM
Build-in storage capacity	Default 16G（64G optional）
Network	Adaptive 100M / 1000M Ethernet; Support 2.4G/5G Wi-Fi, support Wi-Fi 802.11b/g/n protocol; Built-in WCDMA, EVDO, 4G full Netcom, support voice calls.
Image rotation	Support manual rotation of 0 degrees, 90 degrees, 180 degrees, 270 degrees
Display interface	1 * LVDS interface (single / dual, 6-bit / 8-bit) ,support 7"-108" display screen 1080P 60HZ output, support 3.3V / 5V / 12V power supply 1 HDMI2.0 interface; Support 1080P 60HZ/120 HZ, 4K*2K 60HZ output. Support dual screen simultaneous display function, can directly drive interface EDP interface screen with multiple resolutions. Onboard backlight control supports 12V backlight power supply.
HDMI in or TF	1 HDMI IN or 1 TF card
Audio	Support standard left and right channel line output
Power amplifier	2 outputs (8 ohms, 5 watts dual audio amplifier output)
Microphone	Differential MIC input
Touch screen	Support USB multi-point infrared touch, multi-point capacitive touch, multi-point Nano film touch, multi-point acoustic wave Touch, multi-point optical touch and more.。
RTC	Built-in real-time clock function
USB	2 USB 3.0，4 extended USB 2.0口
Infrared	Infrared receiver, support infrared remote control function
LED	1*power status LED(green),1*system LED(green blinking in default)

Button	1*upgrade key
Serial port	1 RS232，1R S485，1 UART/TTL
IO port	4 KIO ports, support 5 IO input and output control，can be used as key scanning control
Mipi Camera	30pin FPC interface，Largest support 1300w Camera
Power Adapter	Input: AC100-240V.50-60HZ, Output: DC12V 1.5A (Requires surge voltage less than 18V and ripple voltage less than 100mV)
Storage Humid	10%~90% RH
Storage Temp	-40℃~70℃
Work Temp	-20℃~70℃

2. Software parameters

Software specifications	
Operating system	Android 7.1.2
Audio	MP3,WMA,WAV, APE, FLAC, AAC, OGG,M4A,3GPP and other formats
Video	Support AVI（H.264、DIVX、DIVX、XVID），rm，rmvb， MKV（H.264、DIVX、DIVX、XVID），WMV，MOV，MP4（.H.264、MPEG、DIVX、XVID），DAT（VCD format），VOB（DVD format），PMP,MPEG，.MPG,， FLV（H.263，H.264），ASF ，TS， TP，3GP，MPG etc. and other 30 kinds of formats
Image	Support various image formats such as JPG、BMP、PNG
System comes with application software	APK Installer, Email, Calculator, Browser, Recorder, Calendar, Settings, Clock, Video Player, Search, Contacts, Gallery, Download, Camera, Music, Explorer, etc.
Language	Support multi-language
Input	Standard Android keyboard with optional third-party input method
System Management	Original ecological Android system, open root permissions, and can customize product development
	Real-time remote monitoring, system crash self-recovery, unattended 7 * 24 hours
	Support OTA remote upgrade; support U disk upgrade
	Support boot animation definition
	Support server / stand-alone mode switching
	Support Wi-Fi hotspot
System watchdog	Support software watchdog

II. Product size specifications

1. Bare board size specification, unit: mm（mm）
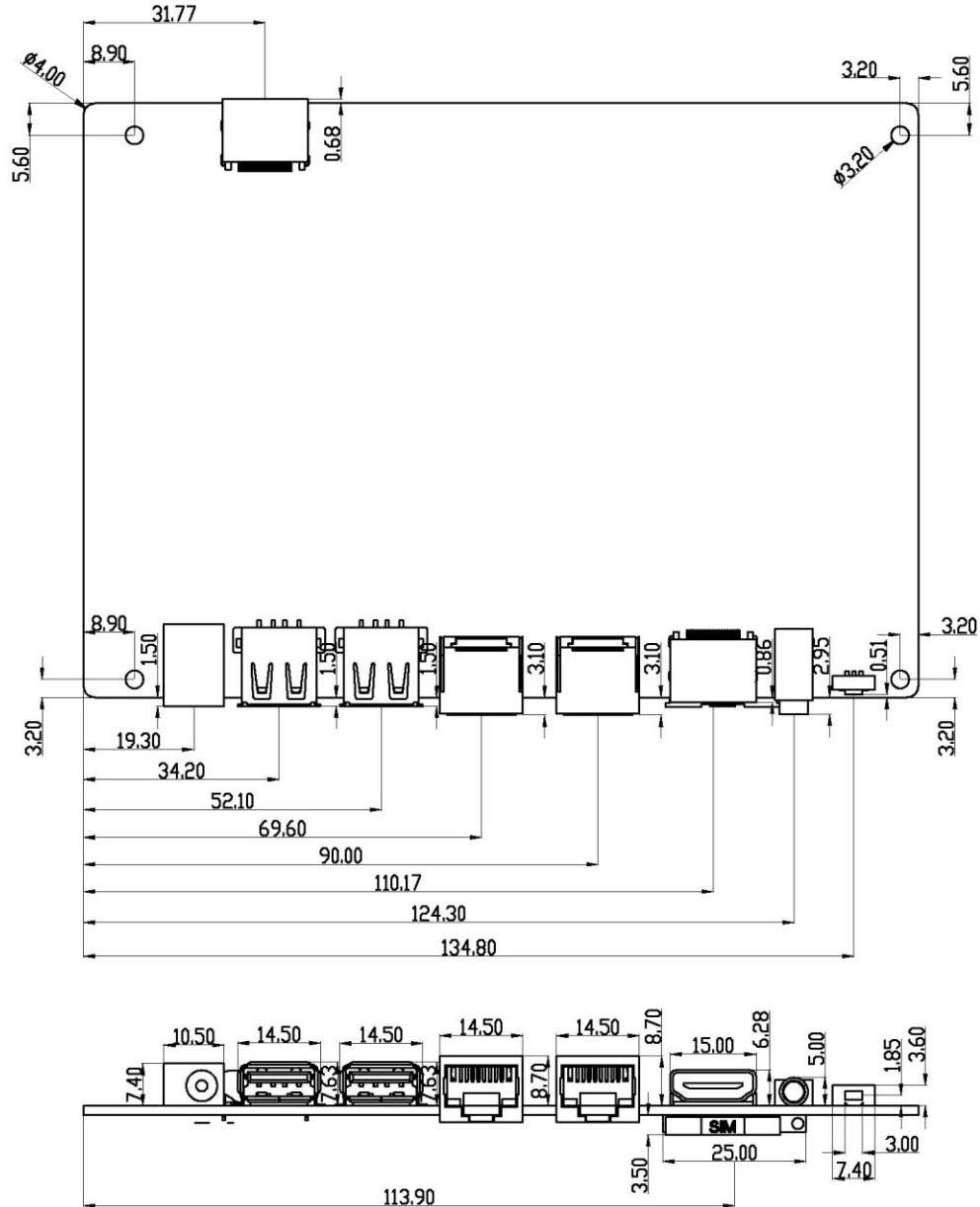
Screw hole specifications：φ3.5mm x 4

PCB board thickness：1.6mm ±10%

III. Product interface diagram
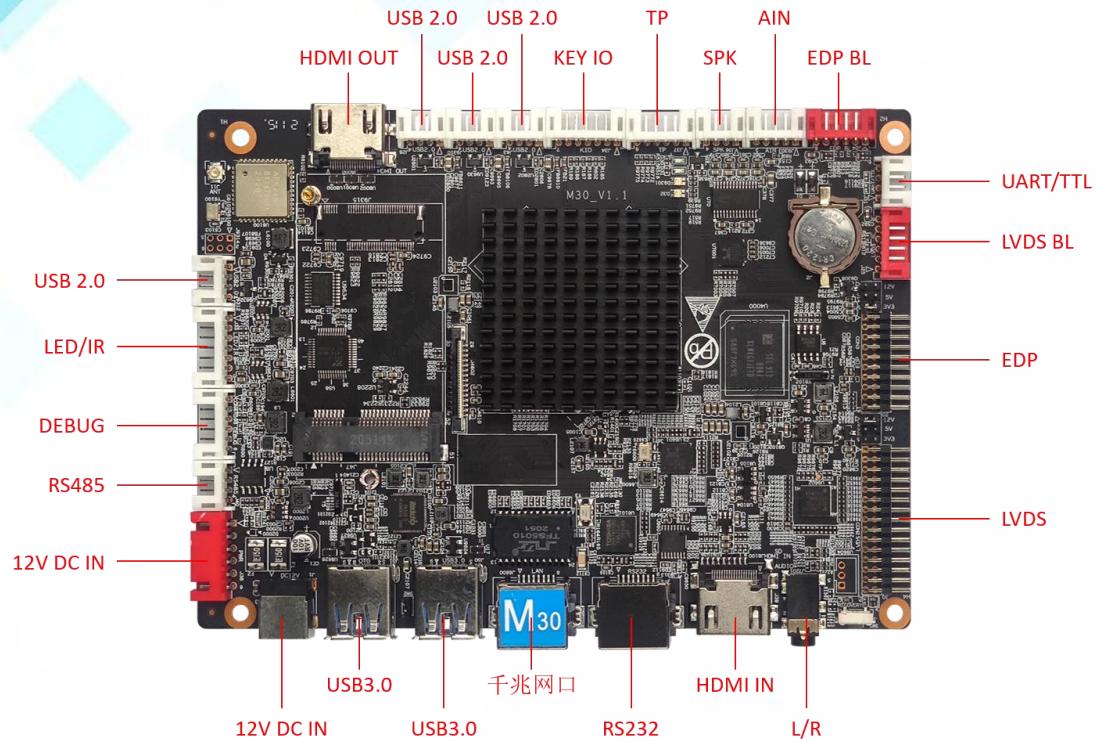

IV. Interface parameter description

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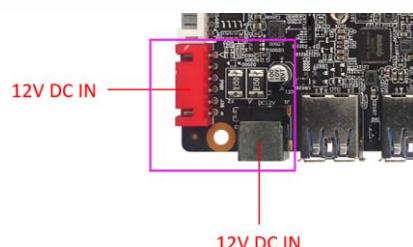
| No.	definition	Attributes	description
6	12V	Input	12V Input
5	12V	Input	12V Input
4	GND	Ground	Ground
3	GND	Ground	Ground
2	5VS	Input	Standby 5V Input
1	STB	Output	Standby signal output

2. AIN（MIC）interface and definition
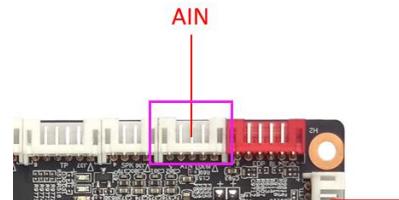
No.	definition	Attributes	description
1	GND	Ground	Ground
2	MIC	Input	MIC input
3	RIN	Input	Right channel input
4	GND	Ground	Ground
5	LIN	Input	Left channel input

3. LED/IR（Remote control）interface and definition
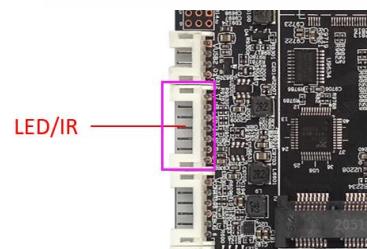
No.	definition	Attributes	description
1	RED	Output	Red light
2	3V3	Power	3V3 Output
3	GRN	Output	Green light
4	IO	Output	Remote signal output
5	IR	Input	Remote signal Input
6	GND	Ground	Ground
7	3V3	Power	3V3 Output

4. LVDS BL（LVDS backlight）interface
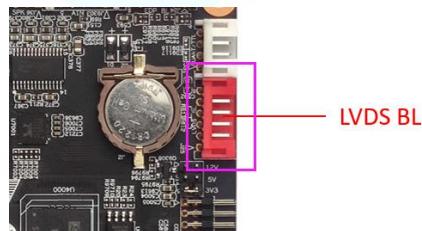
LVDS BL

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
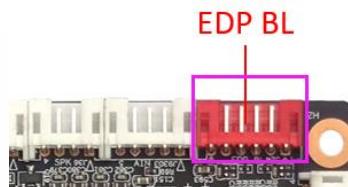
EDP BL

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. KEY interface（Spare）
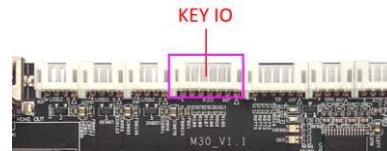
No.	definition	Attributes	description
1	GND	Ground	Ground
2	K5	K5	K5
3	K4	K4	K4
4	K3	K3	K3
5	K2	K2	K2
6	K1	K1	K1
7	3V	Power	3V output

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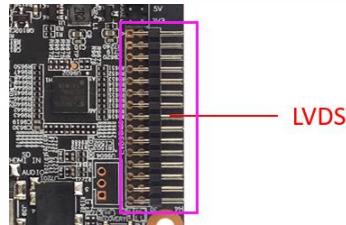
General LVDS interface definition, support single / dual, 6/8 / 10-bit 1080P LVDS screen. The screen voltage can be selected through a jumper cap, and it can be selected to support 3.3V / 5V / 12V screen power supply.

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	RX00-	Output	Odd 0-
8	RX00+	Output	Odd 0+
9	RX01-	Output	Odd 1-
10	RX01+	Output	Odd 1+
11	RX02-	Output	Odd 2-
12	RX02+	Output	Odd 2+
13	GND	Ground	Ground
14	GND	Ground	Ground
15	RX0C-	Output	Odd Clock-
16	RX0C+	Output	Odd Clock+
17	RX03-	Output	Odd 3-
18	RX03+	Output	Odd 3+
19	RX10-	Output	Even 0-
20	RX10+	Output	Even 0+
21	RX11-	Output	Even 1-
22	RX11+	Output	Even 1+
23	RX12-	Output	Even 2-
24	RX12+	Output	Even 2+
25	GND	Ground	Ground
26	GND	Ground	Ground
27	RX1C-	Output	Even Clock-
28	RX1C+	Output	Even Clock+
29	RX13-	Output	Even 3-
30	RX13+	Output	Even 3+

8. EDP Interface and definition

This interface is a common EDP screen interface, in the form of 10 * 2 double row pins, can optional 3.3V/5V/12V 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.

EDP
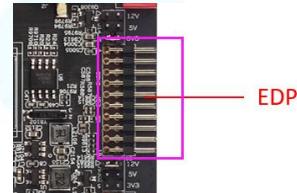
No.	definition	Attributes	description
1	PVCC	Power	output
2	PVCC	Power	output
3	GND	Ground	Ground
4	GND	Ground	Ground
5	D0-	output	True Signal Link Lane 0
6	D0+	output	Complement Signal Link Lane 0
7	D1-	output	True Signal Link Lane 1
8	D1+	output	Complement Signal Link Lane 1
9	D2-	output	True Signal Link Lane 2
10	D2+	output	Complement Signal Link Lane 2
11	D3-	output	True Signal Link Lane 3
12	D3+	output	Complement Signal Link Lane 3
13	GND	Ground	Ground
14	GND	Ground	Ground
15	AUX-	output	True Auxiliary Channel
16	AUX+	output	Complement Signal Link Lane 0
17	GND	Ground	Ground
18	GND	Ground	Ground
19	GND	Ground	Ground
20	GND	Ground	Ground

9. RJ45 RS232（Serial port）

RS232
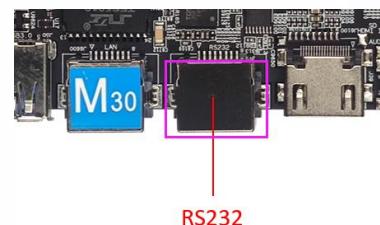
NO.	definition	Attributes	description
1	TXA	output	TX

| 2	RXA	input	RX
3	TXB	output	TX
4	NC	NC	NC
5	GND	Ground	Ground
6	RXB	input	RX
7	NC	NC	NC
8	NC	NC	NC

10. USB Interface and definition
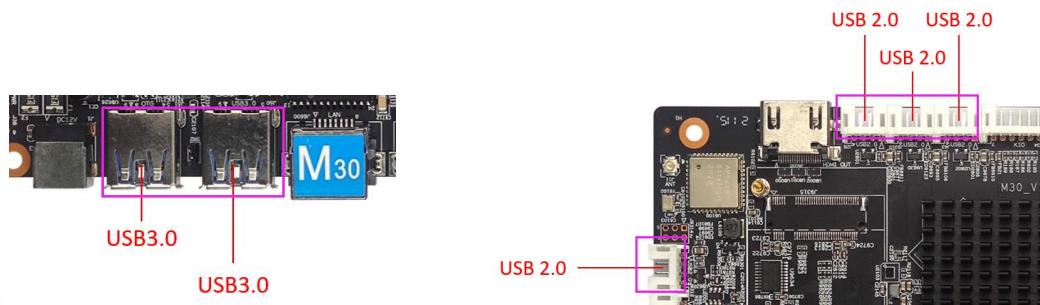
The board has 2 USB 3.0 standard interfaces, 4 build-in USB2.0 sockets for peripheral expansion.

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

11. SPK（Power amplifier）interface
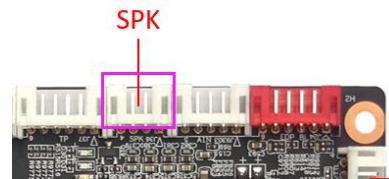
NO.	definition	Attributes	description
1	P-L	Output	Left channel+
2	N-L	Output	Left channel-
3	N-R	Output	Right channel-
4	P-R	Output	Right channel +

12.L/R （Audio）3.5 interface and definition

L/R
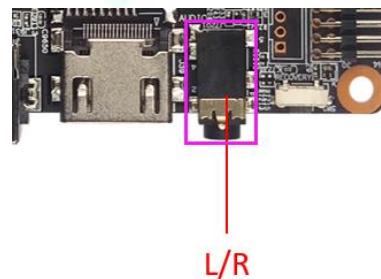
13.DEBUG interface（Spare）

DEBUG
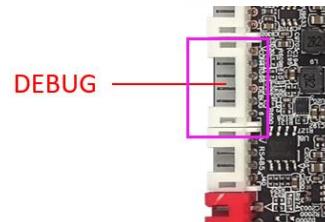
| NO.	definition	Attributes	description
1	3V3	Power	3.3V output
2	TX	Output	TX
3	RX	Input	RX
4	GND	Ground	Ground
5	IO	Output	IO
6	IO	Output	IO

14.RS485 interface and definition

RS485
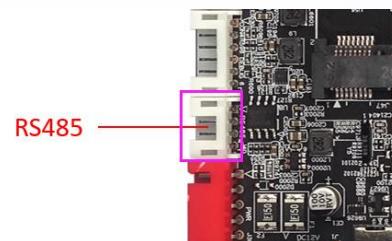
1 group of 485 communication interface, which can support common 485 interface equipment on the market. The level of the interface is 5V. If the level of the connected interface is higher than 5V, there must be an isolation circuit or a level conversion circuit, otherwise the main control and equipment will be burned out.

1. Whether the voltage of the 485 interface matches.

2. Whether the connection of 485A and 485B wires is correct.

NO.	definition	Attributes	description
1	5V	Power	5V Output
2	A	Output	TX
3	B	Input	RX
4	GND	Ground	Ground

# 15. UART/TTL interface and definition
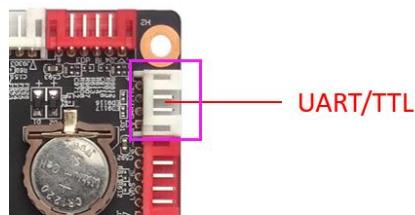
1 set of ordinary two-wire serial ports, which can support common serial devices on the market. The level of the serial ports is 0V to 3.3V. If the level of the connected serial port is higher than 3.3V, there must be an isolation circuit or a level conversion circuit, otherwise the main control and equipment will be burned out.

Precautions:

1. Whether the TTL serial port voltage matches. Can not directly connect to MAX232,485 devices.

2. Whether the TX and RX connections are correct.

NO.	definition	Attributes	description
1	3V3	Power	3V3 Output
2	TX	Output	TX
3	RX	Input	RX
4	GND	Ground	Ground

16. TP（Touch screen interface）and definition
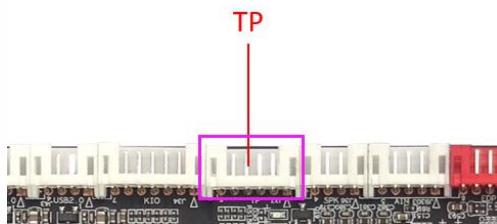
| NO.	definition	Attributes	description

1	3V3	Power	3V3 Output
2	SCL	Input / output	I2C Clock
3	SCA	Input / output	I2C Data
4	INT	Input / output	Interrupt
5	RST	Input / output	Reset
6	GND	Ground	Ground

17. Other interfaces

Ethernet interface	RJ45 interface	Support 100M/1000M adaptive wired network
TF	TF card holder	Standard TF card interface definition
HDMI IN	Standard interface	Support HDMI input，Larges support 1080P
HDMI OUT interface	Standard interface	Support HDMI output，largest support 4K*2K
3G/4G	PCI-E Standard interface	Support multiple Mini PCI-E 3G/4G modules
SIM card port	Standard interface	Support various formats (depending on 3G/4G module)

Chapter III Communication Methods

I. Wi-Fi Update Program

No Server required

Mobile APP management

II. U-disk update program

U-disk update programs

Support Interstitial & memory expansion

III. TF Card Update Program

8GB microSDHC
1204008641ΩFH
IN MADE IN CHINA

TF card update programs

Support Interstitial & memory expansion
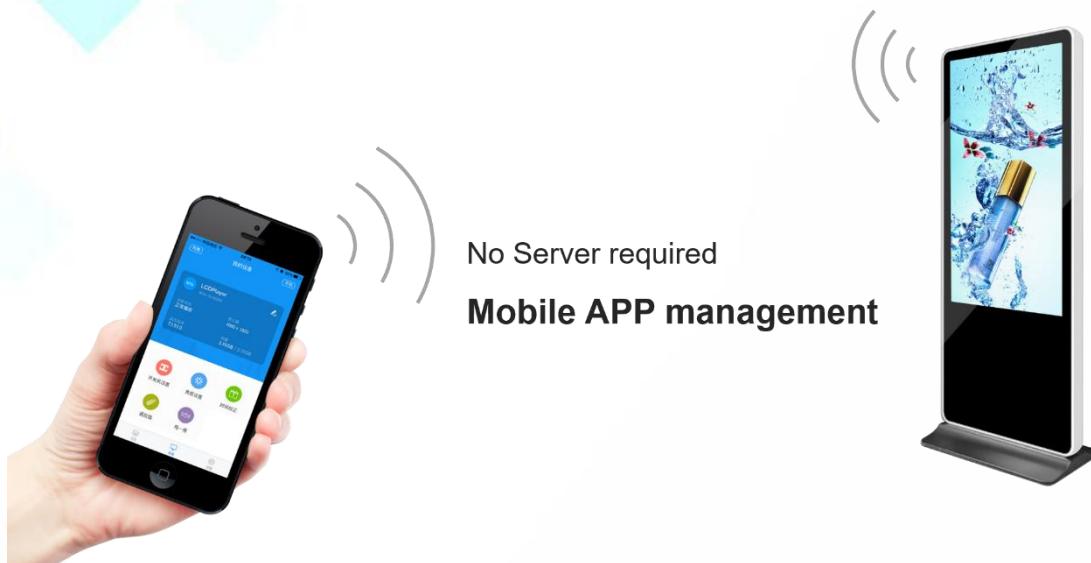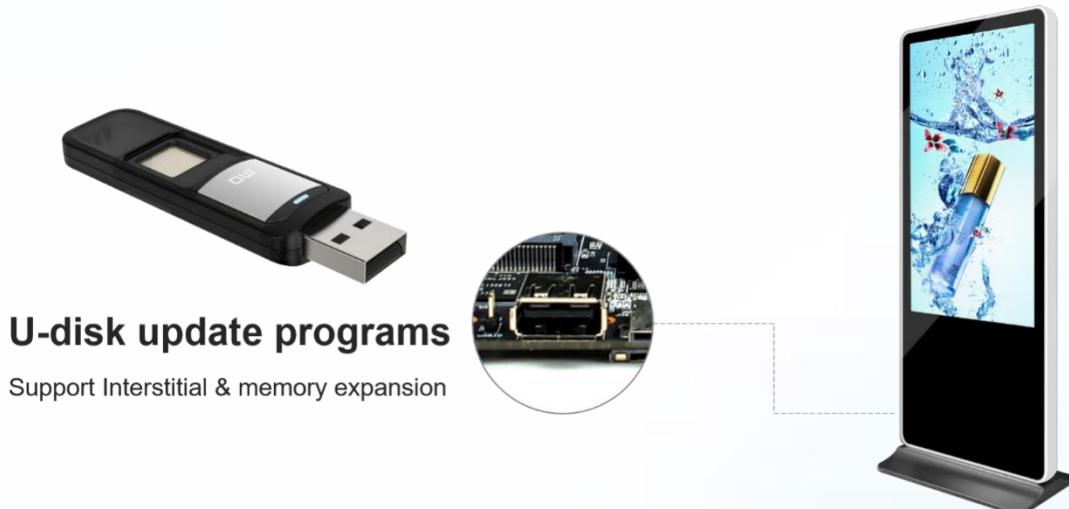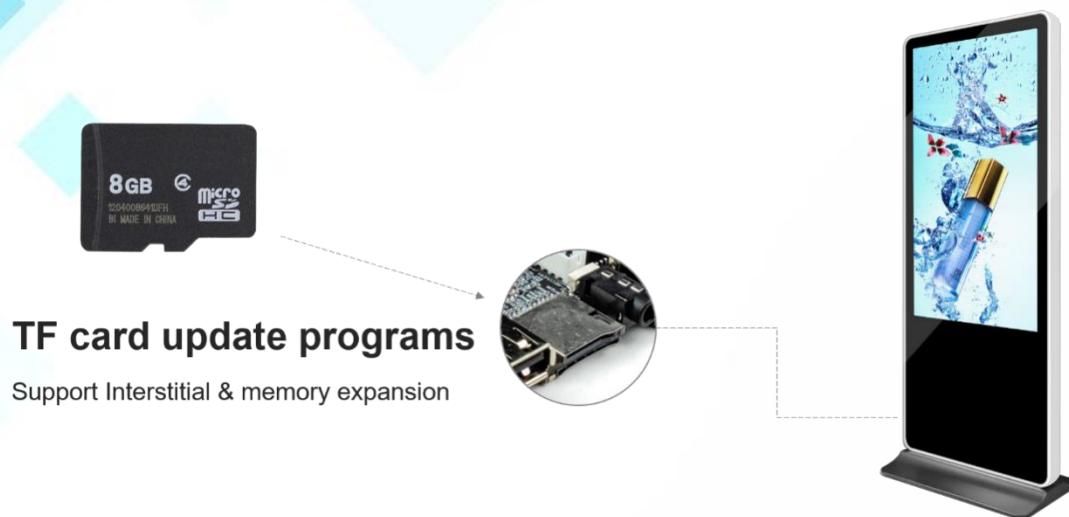
IV. Ethernet cable to Update

LAN or Internet

## Network cable connection

LAN & Internet integrated management
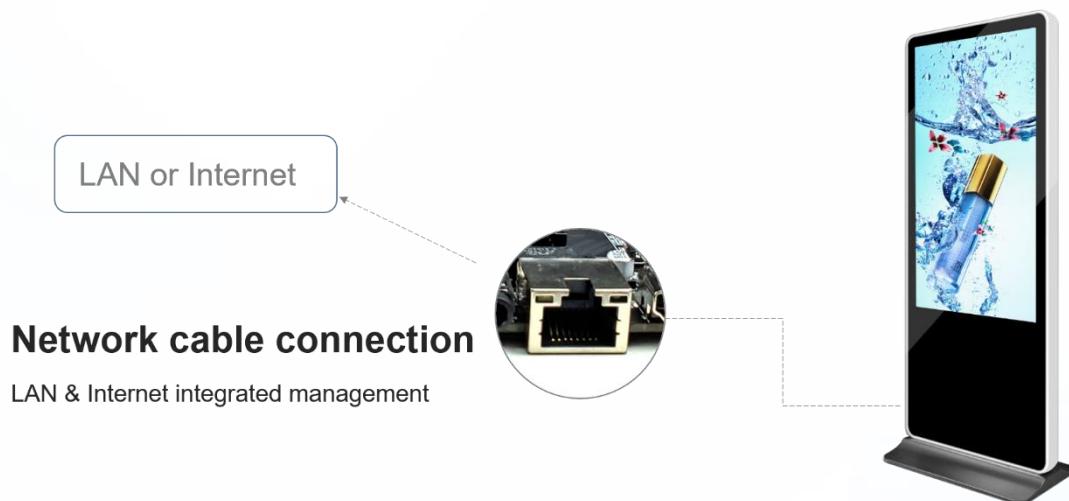
V. Internet Update

Internet remote management

Anytime & anywhere operation available

Cloud Platform

4G/LAN/Wi-Fi

Chapter IV Appendix: Product Appearance
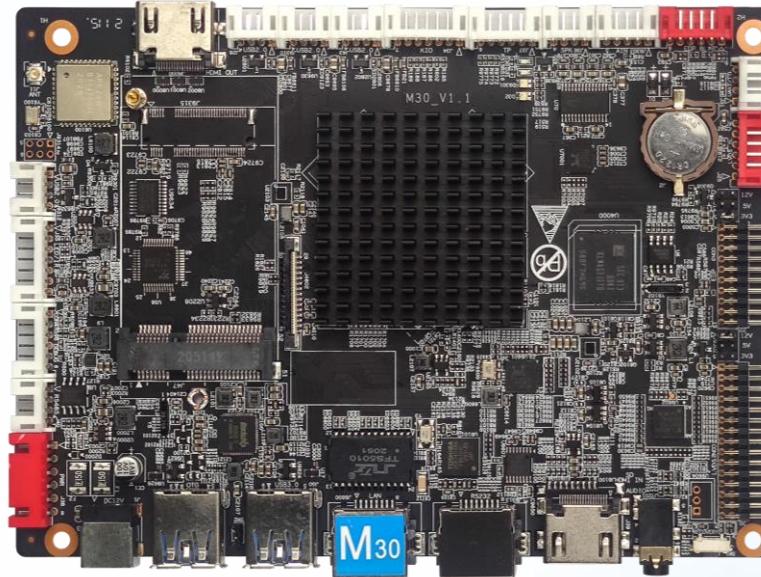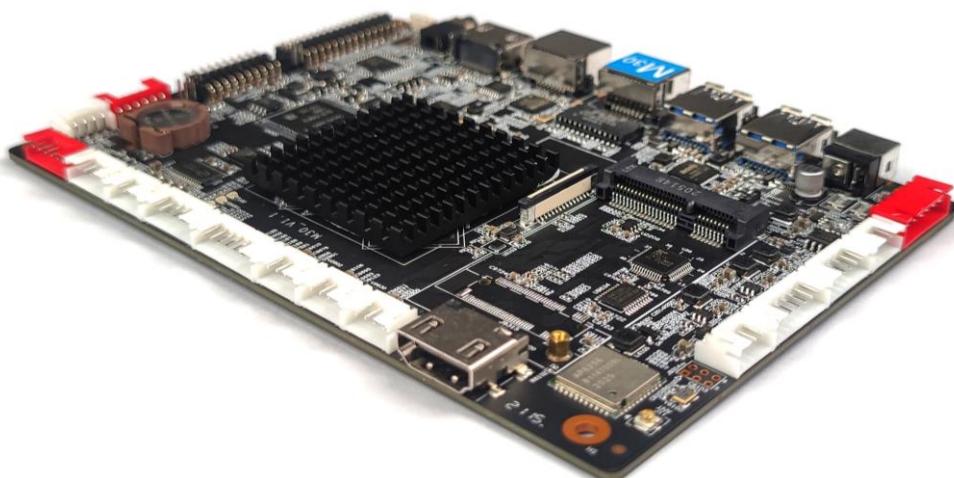
Note:

1. The model label is attached to the sales product. The product picture in the specification is different from the actual product. It is not a fake or inferior product. If you have any questions, please contact us for confirmation.