



PRODUCT SPECIFICATION

LCD Mainboard
HD-528M

Version: V1.0

Update History

Version	Release time	Description
V1.0	Dec.4.2024	First official release.

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Chapter I Product Description

I. Overview

HD-528M is a LCD digital sign motherboard, using Allwinner R528 Dual-core chip solution, The CPU Dominant frequency is up to 1.0GHz, equipped with Linux 5.4 system, compatible with most Video format and decoding capabilities.

It supports Ethernet, Wi-Fi, USB, LVDS, IR control and other rich interfaces, making the product more versatile, and is widely used in advertising machines, traffic, price tag and other intelligent control fields.

Due to its hardware platform and Android intelligent features, it can be used on the smart terminal motherboard when human-computer interaction or network device interaction is required, which can be your best choice.

II. Features

- Minimalist design, reserved common interfaces, Mini size, can be used in ultra-thin application scenarios;
- High stability. The 528M LCD digital sign board adds its own unique technology to the hardware and software to ensure the stability of the product, which can make the final product reach 7*24 hours unattended.
- High integration. The 528M LCD digital sign board integrates Ethernet, Wi-Fi, LVDS, USB, IR remote control function and other functions, which greatly simplifies the design of the whole machine.
- High scalability. 3 USB (1 pin, 2 standards) and 2 serial ports (1 UART, 1 DEBUG).
- High definition. It supports various LVDS interface LCD displays, and supports various sizes and resolutions of screens.

Chapter II Product Specifications

I . Basic Parameters

1. Hardware Parameters

Hardware Specifications	
CPU	R528, Dual-core, Dominant Frequency up to 1.0GHz, Linux 5.4
RAM	256MB
Storage	8GB
Network	RJ45 100M Ethernet; Support PoE power supply, 2.4GHz Wi-Fi and Wi-Fi 802.11b/g/n protocol
Image rotation	Support 0 degree, 90 degree, 180 degree, 270 degree manual rotation
Display interface	1 * LVDS interface (single/ dual, 6-bit/8-bit), support 3.3V/5V/12V power supply
Power amplifier	2 outputs (8 ohms, 5 watts dual audio amplifier output)
RTC	Built-in real-time clock function
USB	1 * USB-2.0 HOST, 1 * USB2.0 OTG, 1 * USB-4G
IR	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 * UART, 1 * DEBUG, 1 * MCU, Optional RS485
Storage Humid	10% ~ 90%, RH
Storage Temp	-40°C~70°C
Work Temp	-10°C~60°C

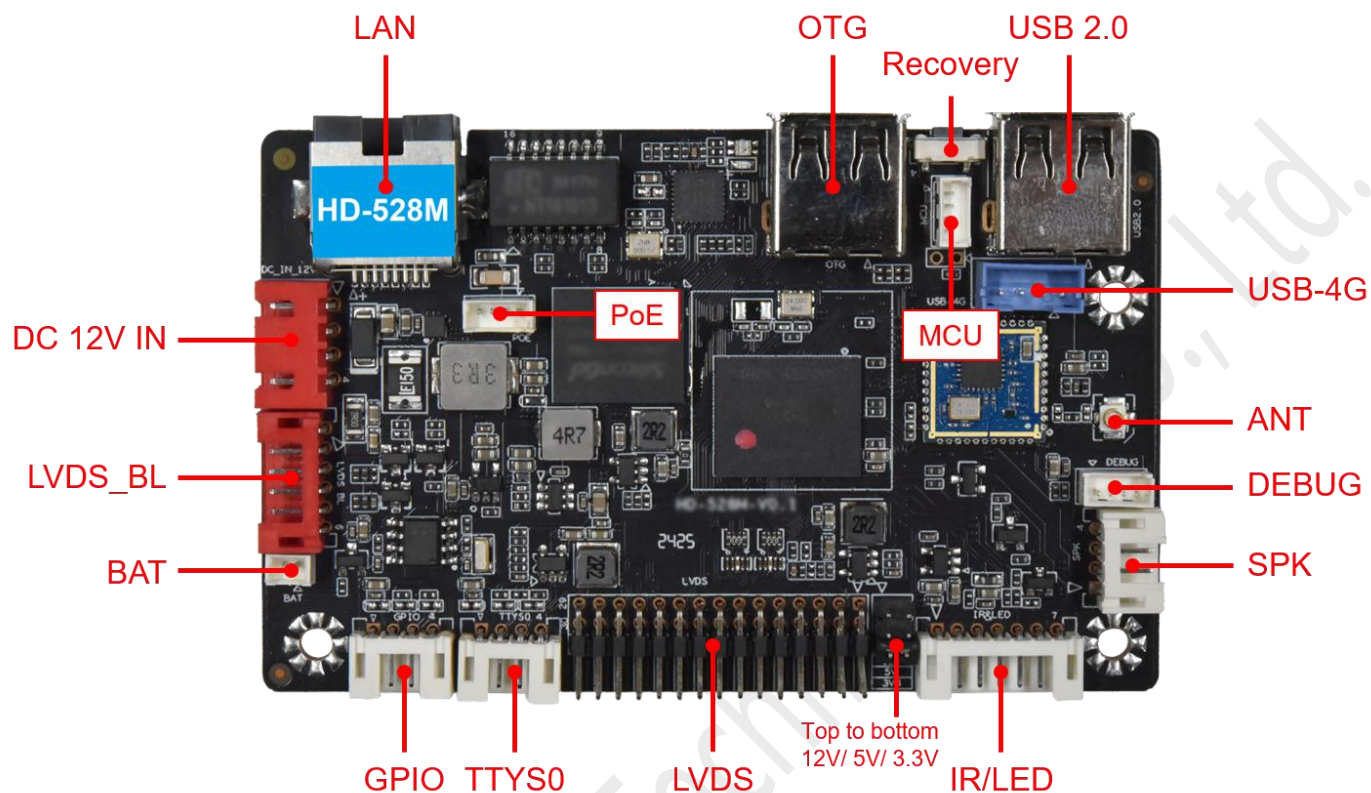
2. Software Parameters

Software Specifications	
Operation system	Linux 5.4
Audio	MP3, WMA, WAV, APE, FLAC, AAC, OGG, M4A, 3GPP and other formats
Video	H.265/ H.264/ H.253/ MPEG-4/ MPEG-2/ MPEG-1/ JPEG/ Xvid/ Sorenson Spark encoding format, Maximum resolution 1080P60fps, The maximum bit rate is 60Mbit/s Support MJPEG encoding format, Maximum resolution 1080P30fps, The maximum bit rate 60Mbit/s Support more than 30 encapsulation formats such as AVI, MKV, WMV, MOV, MP4, DAT, MPEG, MPG, FLV, TS and 3GP.
Image	Support JPG, BMP, PNG, GIF and various images formats
Language	Support Chinese / English / Japanese
System Management	Real-time remote monitoring, system crash self-recovery, unattended 7 * 24 hours
	Support server / stand-alone mode switching
	Support Wi-Fi hotspot
System watchdog	Support software watchdog, hardware watchdog

Unit: millimeter (mm); screw hole specification: $\phi 3.5\text{mm} \times 4$; PCB layer number: 4 layers; PCB thickness: 1.6mm $\pm 10\%$



III. Product Diagram



IV. Interface Parameter Description

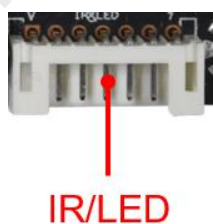
1. PWR/DC (Power input) Interface and Definition (4pin*2.54mm)

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



No.	Definition	Attribute	Description
4	12V	Input	12V Input
3	12V	Input	12V Input
2	GND	GND	GND
1	GND	GND	GND

2. LED/IR Interface (Remote control) (7pin*2.00mm)



No.	Definition	Attribute	Description
1	RED	Output	Red indicator lamp
2	3V3	Power	3V3 Output
3	GRN	Output	Green indicator lamp
4	IO	Output	Remote control signal Output

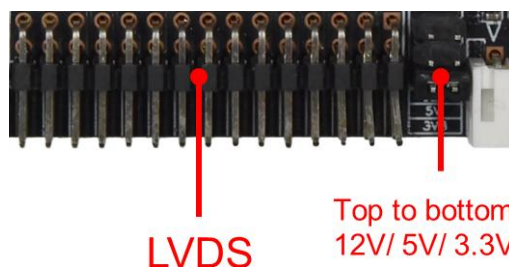
5	IR	Input	Remote control signal input
6	GND	GND	GND
7	3V3	电源	3V3 Output

3. LVDS BL (LVDS backlight) Interface (6pin*2.00mm,Red)



No.	Definition	Attribute	Description
1	GND	GND	GND
2	GND	GND	GND
3	ADJ	Output	Backlight Brightness control
4	EN	Output	Backlight enable control
5	12V	Power	12V Output
6	12V	Power	12V Output

4. LVDS Interface (Double row pin, 2*15pin*2.0mm, pin header)



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

In order to avoid burning the motherboards and screens, please pay attention to the following matters:

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 pin 1.

No.	Definition	Attributes	Describe
1	VCC	Power	3.3V/5V/12V optional output
2	VCC		
3	VCC		
4	GND	GND	GND
5	GND	GND	GND
6	GND	GND	GND
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	GND	GND
14	GND	GND	GND
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	GND	GND
26	GND	GND	GND
27	RX1C-	Output	Even Clock-
28	RX1C+	Output	Even Clock+
29	RX13-	Output	Even 3-
30	RX13+	Output	Even 3+

Note: Do not operate with power on, Do not hot swap.

5. USB Interface and Definition



The motherboard has 2 USB standard interfaces (Custom OTG), 1 built - in (4 - pin * 2.0mm) USB pin header is used for peripheral devices to expand USB interfaces.

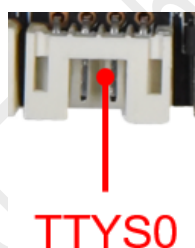
No.	Definition	Attribute	Description
1	5V	Power	5V Output
2	DM	Input/ Output	DM
3	DP	Input/ Output	DP
4	GND	GND	GND

6. SPK (Audio) Interface (4pin*2.0mm)



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

7. UART Interface (4pin*2.0mm)



The motherboard leads to one set of common UART serial ports, which can support common UART serial devices on the market.

Matters need attention:

1. Whether the TTL serial port voltage matches. Cannot directly connect to RS232, RS485 devices.
2. Whether the TX and RX connections are correct.

No.	Definition	Attribute	Description
1	3V3	Power	3V3 Output
2	TX	Output	TX
3	RX	Input	RX
4	GND	GND	GND

TTYs0 can be adjusted by hardware RS485.

8. POE Interface (4pin*1.25mm)



No.	Definition	Attribute	Description
1	V1	CT1	center tap Transformer Center 1
2	V2	CT2	center tap Transformer Center 2
3	B1	CT3	center tap Transformer Center 3
4	B2	CT4	center tap Transformer Center 4

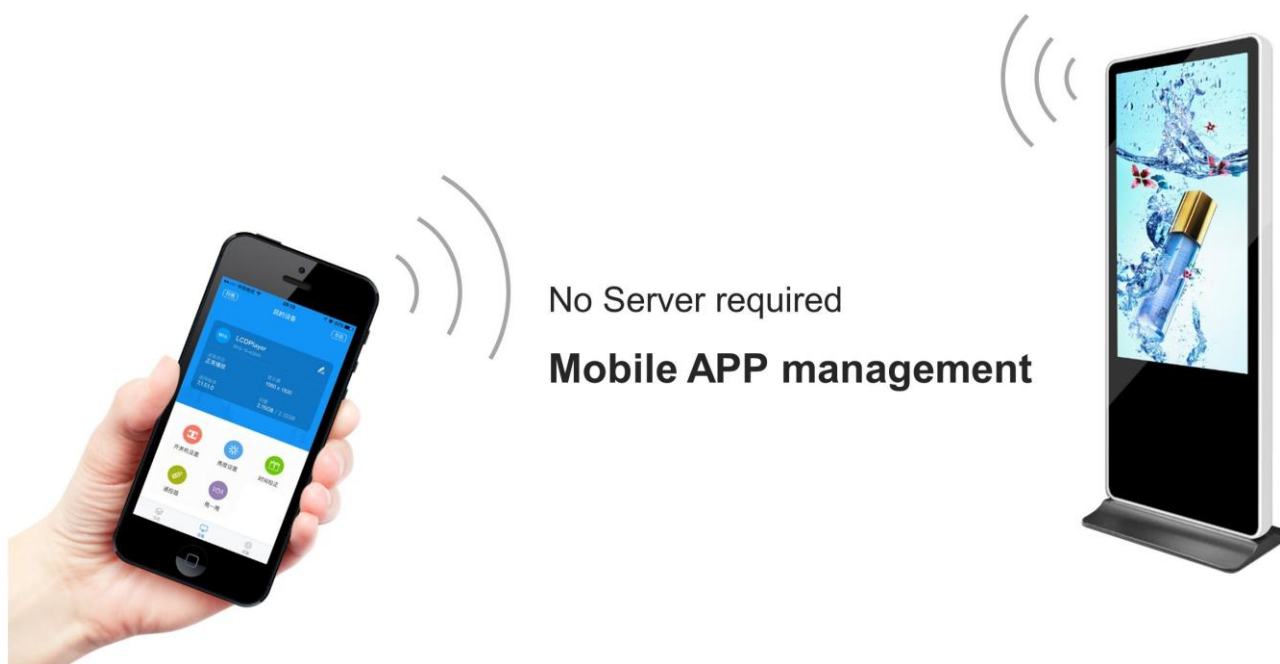
9. DEBUG Interface (4pin*1.25mm)



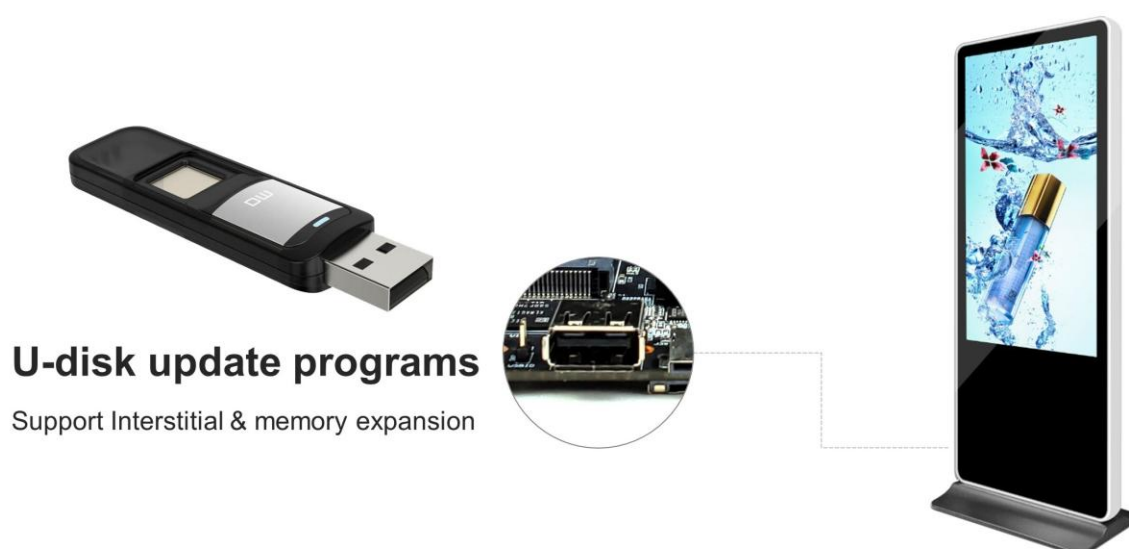
No.	Definition	Attribute	Description
1	3V3	Power	3.3V Output
2	TX	Output	TX
3	RX	Input	RX
4	GND	GND	GND

Chapter III Communication Methods

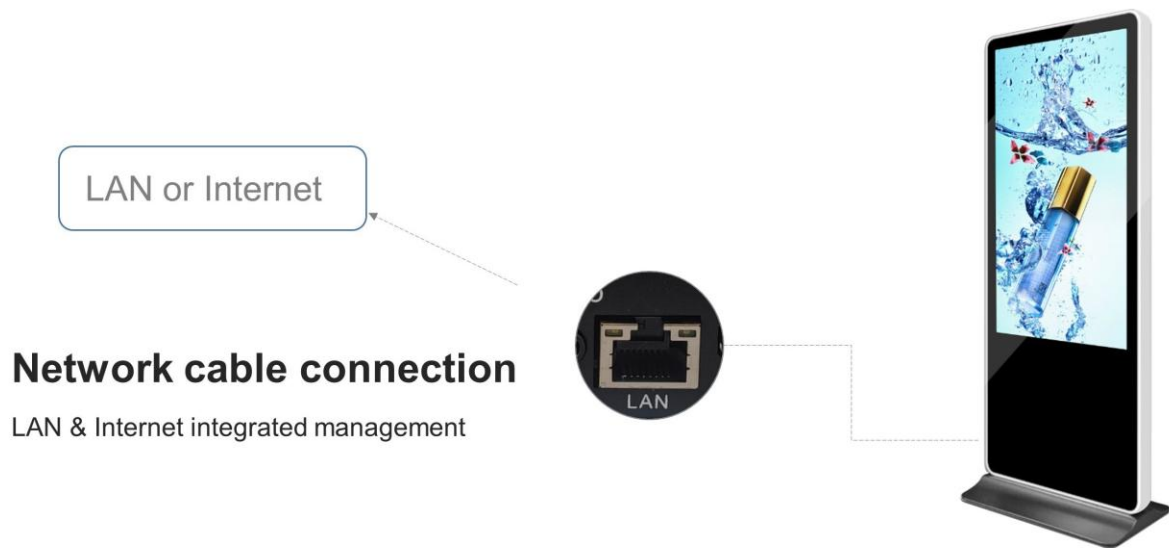
I . Wi-Fi Update Program



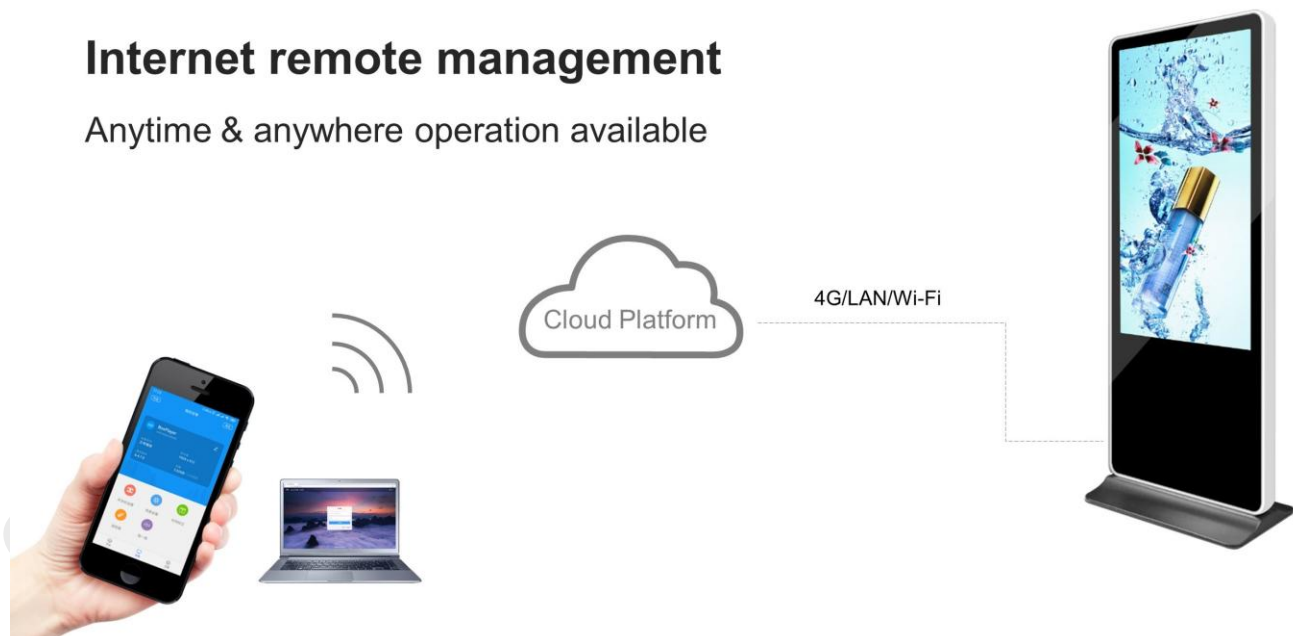
II. U-disk Update Program



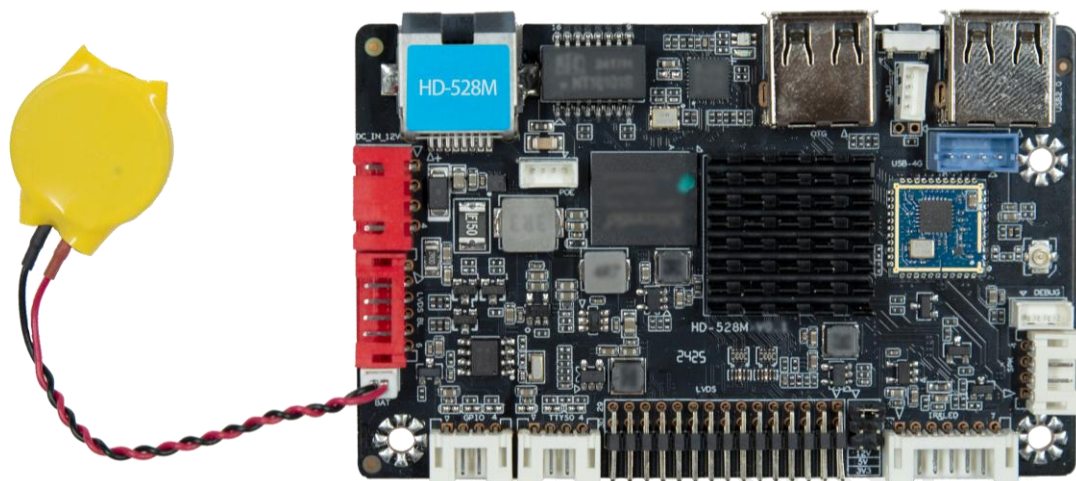
III. Ethernet cable to Update



IV. Internet Update



Chapter IV Appendix: Product Appearance



Note:

1. Paste the corresponding model label on the sales product. Some difference between the product picture in the specification and the actual product, not a fake or inferior product. If you have any questions, please contact HUIDU Technology for confirmation.
2. **Do not operate with power on, Do not hot swap.**