深圳市智莱科技股份有限公司

智莱科技 ZL-Android 系列产品使用说明书

User's Manual

for A9 ZL-Android series products

Shenzhen Zhilai Sci and Tech Co., Ltd.

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认可声明 Accreditation statement

Android 为 Google 的商标

所有其他产品名或者商标均为各自所属方的财产

本手册使用与下列机型:

ZL-Android-IMX6D-1G8G-WIFI-04

ZL-Android-IMX6D-2G8G-WIFI-04

ZL-Android-IMX6Q-2G8G-WIFI-04

Android is the trademark of Google

All other product names or trademarks are the property of their respective owners.

This manual applies to the following models:

ZL-Android-IMX6D-1G8G-WIFI-04

ZL-Android-IMX6D-2G8G-WIFI-04

ZL-Android-IMX6Q-2G8G-WIFI-04

产品质量保证 product quality assurance

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在使用过程中，如果您认为您购买的产品出现了故障，请按照下述步骤进行操作：

1 收集您所遇到的故障问题（例如，智莱科技产品出现死机或不可控现象，控制出错现象以及其他软件、硬件等问题）。

2 反馈问题给您的供应商，描述故障问题。

3 如果您的产品被诊断发生故障，请从您的供应商那里获得RMA(Return Material Authorization)序列号。智莱科技会尽快进行故障产品回收。

4 请仔细包装故障产品，并且在故障产品包装中附上售后服务卡片和购买日期证明。如您无法提供购买日期证明，智莱科技不提供质量保证服务。

5 把相关的RMA序列号填写在包装内，并且发送给供应商。

From the date of purchase, Zhilai provides one year of product quality assurance for the original purchaser. During the warranty period, Zhilai Technology products are faulty, we will provide free repair or replacement reset during the warranty period. For the insurance products, Zhilai will charge the relevant fees according to materials and labor service fees, but for those who are not authorized The products repaired by the maintenance personnel are not guaranteed.

If you think that the product you purchased has failed during use, please follow the steps below:

1. Collect the problem you are experiencing (for example, the system is dead or uncontrollable, control error, and other software, hardware, etc.).

2. Give feedback to your supplier and describe the problem.

3. If your product is diagnosed as having failed, please obtain the RMA (Return Material Authorization) serial number from your supplier. Zhilai will recycle faulty products as soon as possible.

4. Please carefully package the faulty product and attach the after-sales service card and proof of purchase date to the faulty product package. If you are unable to provide proof of purchase date, Zhilai does not provide quality assurance services.

5. Fill in the relevant RMA serial number in the package and send it to the supplier.

符合性声明 Declaration of conformity

CE

本设备已通过 CE 测试认证，符合以屏蔽电缆进行外部接线的环境规格标准。建议用户使用屏蔽电缆，此种电缆可以从智莱科技购买。

This equipment has passed the CE certification and complies with the environmental specifications for external wiring with shielded cables. It is recommended that users use shielded cables, which can be purchased from Zhilai.

FCC A 级

注意：根据 FCC 规则第 15 款，本设备产品已经过检测并且被判定符合 FCC A 级数字设备标准。FCC 规则限制是为产品设备在使用环境下的系统操作提供可靠的保护，免受外界其他因素的有害干扰。本设备在使用过程中会产生、耗费和对外发射无线电频率能量，如果用户没有按照手册的说明进行正确的安装和

使用，此设备可能会对其他无线电通信设备造成有害干扰。

根据 FCC 规则第 15 条，本设备需满足以下两个条件：

6 设备不能造成有害干扰；

7 设备必须接受接收到的干扰，包括可能导致意外操作的干扰。

未经负责方明确批准的更改或修改可能会使用户无权操作该设备。

For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

8 This device may not cause harmful interference;

9 This device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC 辐射暴露声明

本设备经评估已经满足一般辐射暴露要求，发射器的天线安装范围必须确保距离人至少 20cm 并且不能与其他天线发射器一起使用,屏蔽电缆必须与设备一起使用以确保符合 FCC A 级限制。

FCC Radiation Exposure Statement

The device has been evaluated to meet general Radiation exposure requirement. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located f or operating in conjunction with any other antenna or trans mitter. Shielded cables must be used with this unit to ens ure compliance with the Class A FCC limits.

技术支持与服务 Technical support and service

10 对于本产品的最新的产品信息,请咨询深圳市智莱科技股份有限公司，或者访问深圳市智莱科技股份有限公司的网站进行查阅：http://www.szzhilai.com/

For the latest product information of this product, please contact Shenzhen Zhilai Technology Co., Ltd., or visit the website: http://www.szzhilai.com/

11 用户如果需要技术支持,请联系智莱科技销售代表或者客户中心联系。在进行技术咨询前，用户需要收集下面各项的完整信息：

-产品名称及序列号

-产品的外围附加设备描述

-用户所使用的操作系统及其应用软件

-产品故障的完整描述及其完整错误内容

If you need technical support, please contact your Zhilai Technology sales representative or customer center. Before conducting a technical

consultation, the user needs to collect complete information on the following items:

- product name and serial number
- peripheral additional device description of the product
- The operating system and application software used by the user
- A complete description of the product failure and its complete error content

安全指示

12 请仔细阅读此安全操作说明。

13 请参照此说明文档进行安全操作。

14 在使用此产品前，确定产品的外观，以及端口是否存在损坏现象。

15 请不要将此产品放置在潮湿环境中，或者在潮湿环境中使用。

16 在使用时，请将此产品安装在可靠的平面上，放置意外跌落可能会导致设备损坏。

17 当您给产品设备提供电源前，请确认好电源插座的电压是否符合要求。

18 请将产品设备的所有连接线整理规范，以免造成连接错误。

19 请注意产品设备上的警告标语。

20 如果长时间的不使用本设备，请将其电源插座断开，避免影响设备的使用生命周期。

21 请不要让设备接触任何液体，以免液体流入通信接口，造成设备的短路损坏。

22　　请不要自行打开设备。为了确保您的安全，请经过相应工程师来打开设备。

23　　请不要将设备放置在超出建议环境温度范围，不低于-20℃或者高于 60℃，否则设备可以会被损坏。

24　　产品设备中的实时时钟电路的电源由电池供电，不可使用其他类型的纽扣电池进行更换，需要使用智莱科技推荐的同一种或者同等型号电池进行替换。

25　　如果遇到下列情况，请由专业人员来维修：

26　设备出现不可正常运行的故障；

27　设备出现部分功能故障；

28　电源线接头出现损坏；

29　设备内部存在液体流入；

30　设备曾暴露过潮湿的环境中使用；

31　设备出现跌落或者损坏；

32　设备有明显的外观损坏。

免责声明：该安全指示符合 IEC 704-1 的要求。深圳市智莱科技股份有限公司对其内容的准确性不承担任何法律责任。

安全措施-静电保护

为了保证您和您的设备不受到伤害或者损害，请遵守以下安全措施：

32.1.1操作设备前，请不要带电触摸设备中的器件，以免发生触电；

32.1.2不可直接用手触摸 CPU 以及其他关键器件，以免静电对关键器件的损害；

32.1.3　安装设备前，请安装者确保接地以清除身上附带的静电，为了安全起见，请使用接地静电手腕环。

Safety instruction

1. Please read this safety instructions carefully.

2. Please refer to this documentation for safe operation.

3. Before using this product, determine the appearance of the product and whether the port is damaged.

4. Please do not place this product in a humid environment or in a humid environment.

5. When using, please install this product on a reliable surface, and accidental dropping may cause equipment damage.

6. Before you supply power to the product equipment, please confirm that the voltage of the power outlet meets the requirements.

7. Please arrange all the connecting lines of the product equipment to avoid connection errors.

8. Please pay attention to the warning slogan on the product equipment.

9. If the device is not used for a long time, disconnect its power socket to avoid affecting the life cycle of the device.

10. Please do not let the device touch any liquid to prevent liquid from flowing into the communication interface, causing short circuit damage.

11. Please do not open the device yourself. To ensure your safety, please turn on the device with the appropriate engineer.

12. Please do not place the device outside the recommended ambient temperature range, not lower than -20℃ or higher than 60℃, otherwise the device may be damaged.

13. The power supply of the real-time clock circuit in the product equipment is battery-powered. It cannot be replaced with other types of button batteries. It needs to be replaced by the same or equivalent

battery recommended by Zhilai Technology.

14. If you encounter any of the following conditions, please have it repaired by a professional:

The device has a fault that cannot be operated normally;

Some functional failures occurred in the device;

The power cable connector is damaged.

There is liquid inflow inside the device;

The equipment has been exposed to humid environments;

The device is dropped or damaged;

The device has obvious appearance damage.

Disclaimer: This safety directive complies with the requirements of IEC 704-1. Shenzhen Zhilai Sci and Tech Co., Ltd. does not assume any legal responsibility for the accuracy of its contents.

Safety measures - electrostatic protection

To ensure that you and your equipment are not harmed or damaged, please observe the following safety precautions:

Do not touch the device in the device before operating the device to avoid electric shock.

Do not touch the CPU and other key components directly with your hands to avoid damage to critical components caused by static electricity;

Before installing the device, please ensure that the installer ensures that the static electricity is attached to the body. For safety reasons, use a grounded static wrist ring.

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33 概述 Overview

本章介绍系列产品规格概述。

内容包括：

34 产品简介

35 硬件规格

36 安全措施

37 产品尺寸

This chapter provides an overview of the product specifications.

content include:

Product introduction

Hardware specifications

Security measures

Product size

1.1、 产品简介 Product introduction

智莱 A9 安卓主机是一款无风扇便携嵌入式工控主机，采用 Freescale i.MX6D 系列 CPU， 低功耗的同时，提供极佳的运算与图形性能，尤其适合条件严苛或要求较高的工业场合及公共空间应用。智莱 A9 安卓主机系列提供多种温度等级产品以支持宽温工作，并扩展出丰富的外围功能接口。

智莱 A9 嵌入式工控主机适用于以下应用场合，公共商业空间 HMI（人机界面交互）应用，轨道交通智能控制应用，便携设备，车队管理/导航/物流，工业现场数据采集，医疗设备智能终端，无人值守环境下的智能终端。

Freescale iMX6 处理器的主要特性：

（1）ARM Cortex™-A9 高性能处理器，双核/四核 1.2GHz 主频。

（2）支持 OpenGL ES2.0 和 OpenVG™1.1 硬件加速器，全高清 1080p 视频

编解码器。

（3）Freescale 卓越的支持低功耗 Smart Speed™技术。

（4）优异的 I/O 扩展能力：UART， LVDS，音频，USB，OTG，千兆以太网，TF 卡，SATA 硬盘。

（5）GPIO，I2C，SPI，I2S，CAN 总线，PCIe，并行 RGB，HDMI，MIPI，CSI。

（6）扩展商业级，工业级以及汽车级温度范围可选。

The Zhilai A9 Android host is a fanless portable embedded industrial host with Freescale i.MX6D series CPU. It provides excellent computing and graphics performance with low power consumption, especially for industries with strict conditions or high requirements. Occasion and public space applications. The Zhilai A9 Android host series offers a wide range of temperature grades to support wide temperature operation and expands the rich peripheral function interface.

Zhilai A9 embedded industrial control host is suitable for the following applications, public commercial space HMI (Human Machine Interface Interaction) application, rail transit intelligent control application, portable equipment, fleet management / navigation / logistics, industrial field data acquisition, medical equipment intelligent terminal , intelligent terminals in an unattended environment.

Key features of the Freescale iMX6 processor:

(1) ARM CortexTM-A9 high-performance processor, dual-core / quad-core 1.2GHz frequency.

(2) Support OpenGL ES2.0 and OpenVGTM1.1 hardware accelerators, full HD 1080p video codec.

(3) Freescale's superior support for low power Smart SpeedTM technology.

(4) Excellent I/O expansion capability: UART, LVDS, audio, USB, OTG,

Gigabit Ethernet, TF card, SATA hard disk.

(5) GPIO, I2C, SPI, I2S, CAN bus, PCIe, parallel RGB, HDMI, MIPI, CSI.

(6) Extended commercial, industrial and automotive temperature ranges are available.

1.2 、硬件规格 Hardware specification

1.2.1 一般描述 General description

认证	CE,FCC
尺寸（D x W x H）	211x145.5x51.1mm
外壳材质	镀锌板
安装方式	壁挂式安装、台式安装、面板安装
功耗	18W（接显示屏后典型值）
电源要求	12V±10%
重量	660g
OS 支持	Android4.4.2/6.0
系统设计	无风扇设计，无内部布线
Certification	CE, FCC
Size (D x W x H)	211x145.5x51.1mm
Shell material	galvanized sheet
Installation method	Wall mounting, desktop mounting, panel mounting
Power consumption	18W (typical value connected to display)
Power requirements	12V ± 10%
Weight	660g
OS support	Android4.4.2/6.0
System design	Fanless design, no internal wiring

1.2.2 系统硬件 System hardware

CPU ZL-Android-IMX6D-1G8G-WIFI-04:

Freescale i.MX6D-MCIMX6D5EYM10AD（dual core/1GHz）

ZL-Android-IMX6D-2G8G-WIFI-04:

Freescale i.MX6D-MCIMX6D5EYM10AD（dual core/2GHz）

ZL-Android-IMX6Q-2G8G-WIFI-04:

Freescale i.MX6D-MCIMX6Q5EYM10AD（quad core/1GHz）

内存

Memory ZL-Android-IMX6D-1G8G-WIFI-04:

内置 1G DDR3 SDRAM

ZL-Android-IMX6D-2G8G-WIFI-04:

内置 2G DDR3 SDRAM

ZL-Android-IMX6Q-2G8G-WIFI-04:

内置 2G DDR3 SDRAM

存储

Storage eMMC 8G, TF card 2GB~32GB

显示

Display 1xLVDS、1xHDMI、1xVGA

指示灯 LED 灯，分别指示电源状态，运行状态

Indicator LED indicator, indicating power status, operating status

1.2.3 接口 interface

串口 4xRS232（包含 2 路流控 RS232），2xRS485

LAN 1x10/100/1000 base-T RJ45 接口

USB 接口 6xUSB2.0 接口、1 USB OTG

音频 1x 音频输入、1x 音频输出、1x5W 双声道立体声输出

WIFI 1x802.11b/g/n(2.4～2.4835GHz)

Serial port 4xRS232 (including 2 flow control RS232), 2xRS485

LAN 1x10/100/1000 base-T RJ45 interface

USB interface 6xUSB2.0 interface, 1 USB OTG

Audio 1x audio input, 1x audio output, 1x5W stereo stereo output

WIFI 1x802.11b/g/n (2.4~2.4835GHz)

1.2.4 环境规格 Environmental specifications

相对湿度 0%～90%的相对湿度，非冷凝

工作温度 -20～60℃（14～140℉）@5～85%RH

Relative humidity 90% @40 degrees Celsius (non-condensing)

Temperature -20 - 60℃ (14 - 140℉) @ 5-85% RH

1.3 、安全措施 Safety measures

为避免对您和您的设备造成不必要的损坏，请阅读下面注意事项。您再使用本设备的时候，只需一个标准的电源适配器和电源线即可正常的使用本产品。

注意！ 无论任何时候对设备进行操作，请完全断开设备供电电源。不可在电源接通时进行连接设备，以避免瞬间电浪涌损坏敏感器件。

注意！ 设备遇到故障时，不可自行拆开进行查看，需要专业人员才可以进行拆卸查看。如果您的设备在质量保证期之内，自行拆开，造成损坏，智莱科技有权不对其进行相关质保期内的服务。

注意！ 在进行安装或者接触设备前，请确保您接地移除身上附带的静电。为安全起见，请使用接地腕环

注意！ 设备的 DC 电源供应需要安全可靠，不可随意使用其他型号适配器或者电源进行供电，应当使用智莱科技推荐同一种或者同类型的电源适配器对设备进行供电

To avoid unnecessary damage to you and your equipment, please read the notes below. When you use this device, you only need a standard power adapter and power cord to use this product.

NOTES:

Whenever you operate the device, completely disconnect the device from the power supply. Do not connect the device while the power is on to avoid transient electrical surges damaging sensitive devices.

When the device encounters a fault, it cannot be disassembled for viewing. Professionals are required to disassemble and view it. If your equipment is disassembled and damaged within the warranty period, Zhilai Technology reserves the right to not provide services during the relevant warranty period.

Before installing or touching the device, make sure that you ground to remove any static electricity from your body. For your safety, use a grounded wrist strap.

The DC power supply of the equipment needs to be safe and reliable. It is not allowed to use other types of adapters or power supplies for power supply. It should use the same or the same type of power adapter to supply power to the equipment.

1.4、产品尺寸 Product Size

1.4.1 产品三维外观图 Product appearance

图 1.1：A9 工控机一侧三维外观图

图 1.2：A9 工控机另一侧三维外观图

注意：本三维外观图为全功能 A9 工控机图，智莱科技 ZL-Android 系列 A9 工控机由于不同类型的配比参数，其三维外观图可能存在少许差异，但其外接接口的位置不会发生改变。

Note: This 3D external view is a full-featured A9 industrial computer. The ZL-Android series A9 industrial computer has a slight difference in its three-dimensional appearance due to different types of matching parameters, but the position of its external interface will not change.

1.4.2 产品尺寸图 Product Size

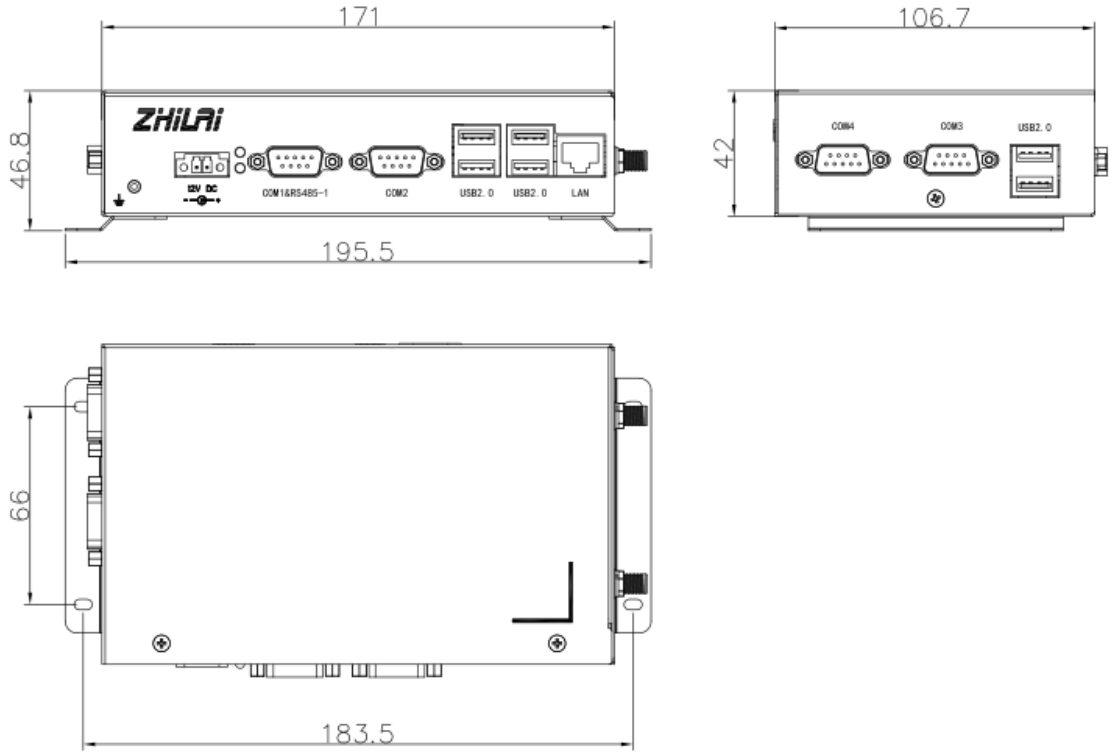


图 1.3：A9 工控机产品尺寸图

38 接口说明 Interface Description

本章介绍系列产品的接口功能及其细节。

内容包括：

39 产品接口定义说明

40 产品接口资源说明

This chapter describes the interface functions and details of the series.

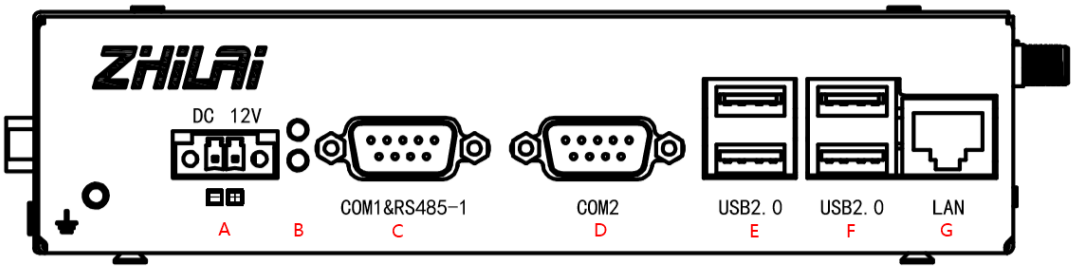
Including:

Product interface definition description

Product Interface Resource Description

2.1、产品接口说明 Product interface description

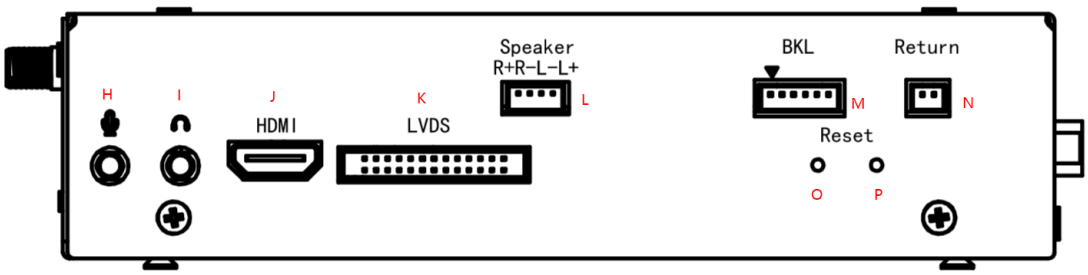
2.1.1 前面板接口说明 Front panel interface description



编号 NO.	描述 Description
A	12V 电源输入插座 12V power input socket
B	红、绿 LED 指示灯，红色表示 12V 输入电源正常，绿色为系统工作正常指示 Red and green LED indicators, red indicates that the 12V input power is normal, and green is the normal operation of the system.
C	RS232 &RS485 DB9 公座 Male
D	RS232-DB9 公座 Male
E	双层 USB-A 母座 Double layer USB-A female
F	双层 USB-A 母座 Double layer USB-A female
G	千兆以太网插座 Gigabit Ethernet socket

表 1.1 前面板接口说明表

2.1.2、后面板接口说明 Rear panel interface description



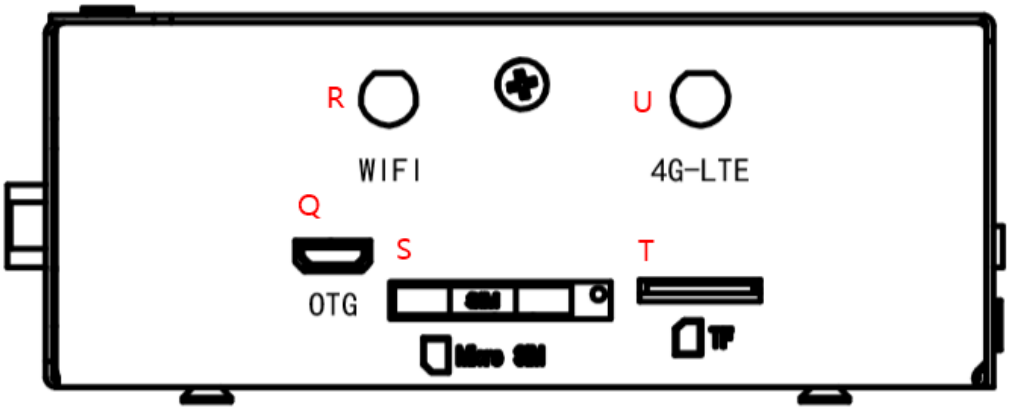
编号 NO.	描述 Description
H	MIC 输入插座

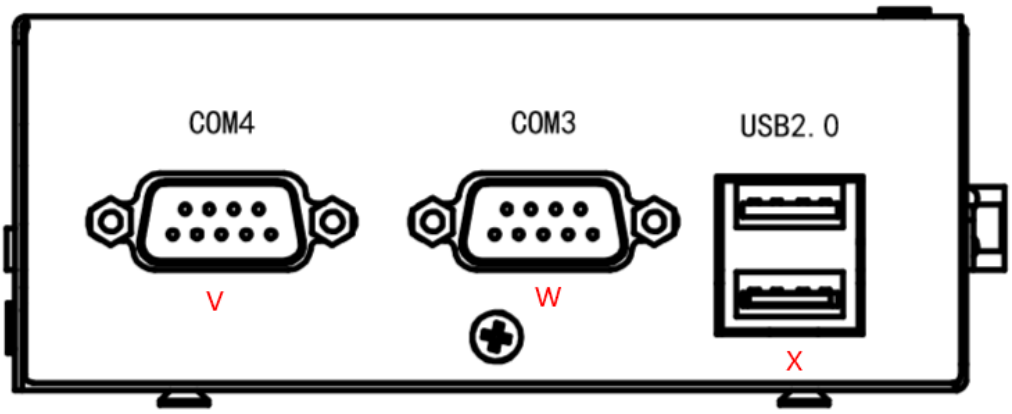
	MIC input socket
I	耳机输出插座 Headphone output socket
J	HDMI 输出插座 HDMI output socket
K	双 LVSD 输出插座 Dual LVSD output socket
L	双通道立体声喇叭输出插座 Dual channel stereo speaker output socket
M	背光驱动输出插座 Backlight drive output socket
N	按键返回信号输入插座 Return button signal input socket
O	RESET
P	ON/OFF 开关机按键

表 1.2 后面板接口说明表

2.1.3、侧面板接口说明

Side panel interface description





编号 NO.	描述 description
Q	USB OTG 插座
R	Wifi 天线座
T	TF 卡插座
S	SIM 卡插座（美国市场不使用） Not use in US market
U	4G 天线座 antenna（美国市场不使用） Not use in US market
V	RS232 DB9 公座 male
W	RS232 DB9 公座 male
X	双层 USB-A 母座 Double layer USB-A female

表 1.3 测面板接口说明表

2.2、产品接口资源说明

Product Interface Resource Description

2.2.1、电源输入端口 （12V DC）Power input port (12V DC)

供电电压为+12V 输入，DC，物理接口形式为插拔式凤凰接线端子座（2Pin），引脚定义如表所示。

The power supply voltage is +12V input, DC, and the physical interface is plug-in Phoenix terminal block (2Pin). The pin definition is shown in the table.

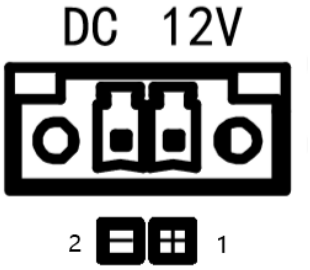


图 2.1 电源端口图

引脚 pin	名称 name	说明 description
1	12V	供电正极 positive electrode
2	GND	地 Ground

表 2.1 电源引脚定义

2.2.2、RS232 & RS485-1 接口(COM1&RS485-1)

其物理接口形式为 DB9 插座(公头，如图 1 所示)，引脚定义如图表所示。The physical interface is in the form of a DB9 socket (male, as shown in Figure 2), and the pin definitions are shown in the diagram.

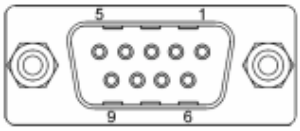


图 1.2 RS-232/485 复用接口

引脚 pin	名称 name	说明 description
1	NC	空 none
2	RXD	串行数据接收 Serial data reception
3	TXD	串行数据发送 Serial data transmission
4	NC	空 none
5	GND	地 Ground
6	NC	空 none
7	485A	RS-485 A
8	485B	RS-485 B
9	NC	空 none

表 2.2 RS232/RS485 引脚定义

2.2.3、RS-232 接口 （COM2、COM3、COM4）

其物理接口形式为 DB9 插座(公头)，引脚定义如图表所示。The physical interface is in the form of a DB9 socket (male) and the pin definitions are shown in the diagram.

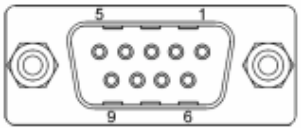


图 2.3 RS232 端口图

引脚 pin	名称 name	说明 description
1	NC	空 none
2	RXD	串行数据接收 Serial data reception
3	TXD	串行数据发送 Serial data transmission
4	NC	空 none
5	GND	地 Ground
6	NC	空 none
7	NC	空 none
8	NC	空 none
9	NC	空 none

表 2.3 串口引脚定义

2.2.4、LVDS 接口(LVDS)

其物理接口形式为 2.0mm 间距 2*15 连接器 Its physical interface form is 2.0mm pitch 2*15 connector

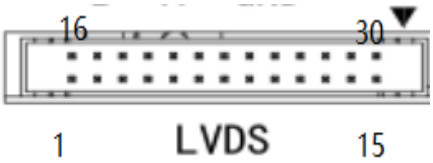


图 2.4 LVDS 端口图

引脚	名称	说明
1	LVDS1_TX3_DP	第二组 LVDS 差分信号对

2	LVDS1_TX3_DN	The second set of LVDS differential signal pairs
3	LVDS1_CLK_DP	第一组 LVDS 差分时钟对 The first set of LVDS differential clock pairs
4	LVDS1_CLK_DN	
5	GND	参考地 Ground
6	GND	参考地 Ground
7	LVDS1_TX2_DP	第二组 LVDS 差分信号对 The second set of LVDS differential signal pairs
8	LVDS1_TX2_DN	
9	LVDS1_TX1_DP	
10	LVDS1_TX1_DN	
11	LVDS1_TX0_DP	
12	LVDS1_TX0_DN	
13	LVDS0_TX3_DP	第一组 LVDS 差分信号对 The first set of LVDS differential signal pairs
14	LVDS0_TX3_DN	
15	LVDS0_CLK_DP	第一组 LVDS 差分时钟对 The first set of LVDS differential clock pairs
16	LVDS0_CLK_DN	
17	GND	参考地 Ground
18	GND	
19	LVDS0_TX2_DP	第一组 LVDS 差分信号对 The first set of LVDS differential signal pairs
20	LVDS0_TX2_DN	
21	LVDS0_TX1_DP	
22	LVDS0_TX1_DN	
23	LVDS0_TX0_DP	
24	LVDS0_TX0_DN	
25	GND	参考地 Ground
26	GND	
27	GND	
28	5V	+5V 电源 power
29	5V	
30	5V	

表 2.4 LVDS 引脚定义

2.2.5、音频功放接口(Speaker)

其物理接口形式为对插端子连接器 XH2.0-4P 插座，引脚定义如下：The physical interface is in the form of a plug-in terminal connector XH2.0-4P socket. The

pins are defined as follows:

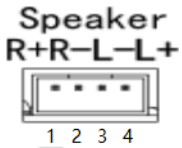


图 2.5 Speaker 端口图

引脚	名称	说明
1	R+	右声道正输出 Right channel positive output
2	R-	右声道负输出 Right channel negative output
3	L-	左声道负输出 Left channel negative output
4	L+	左声道正输出 Left channel positive output

表 2.5 Speaker 引脚定义

2.2.6、返回按键(Return)

其物理接口形式为对插端子连接器 XH2.0-2P 插座，引脚定义如下：The physical interface is in the form of a plug-in terminal connector XH2.0-2P socket, and the pin is defined as follows

图 2.6 Return 端口图

引脚	名称	说明
1	KEY_RET	返回信号输入 Return signal input
2	GND	参考地 Ground

表 2.6 Return 引脚定义

2.2.7、LCD 背光接口（BKL）

其物理接口形式为对插端子连接器 XH2.0-2P 插座，引脚定义如下：

The physical interface is in the form of a plug-in terminal connector XH2.0-2P socket. The pins are defined as follows:

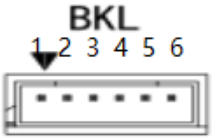


图 2.7 BKL 端口图

引脚	名称	说明
1	12V	背光电源 Backlight power
2	12V	背光电源 Backlight power
3	BLK_EN	背光使能信号 Backlight enabling signal
4	LCD_DAC/PWM	背光亮度调节信号 Backlight brightness adjustment signal
5	GND	参考地 Ground
6	GND	参考地 Ground

表 2.7 LCD 引脚定义

2.2.8、USB Host 接口（USB2.0）

设备外部含有 2x3 个 USB2.0 的接口，接口类型为 USB-TYPE-A。引脚定义如下：The device has 6 USB2.0 interfaces on the outside, and the interface type is USB-TYPE-A. The pins are defined as follows:

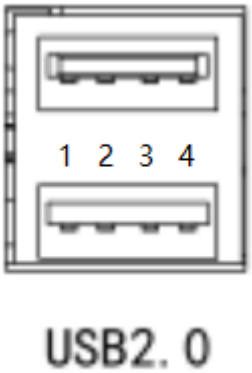


图 2.8 USB2.0 端口图

引脚	名称	说明
1	VBUS	5V 电源输出 5V power output
2	D-	USB 负 USB negative
3	D+	USB 正 USB positive
4	GND	地 Ground

表 2.8 USB2.0 引脚定义

2.2.9、USB OTG(OTG)

其物理形式为 MicroUSB 接口座，引脚定义如下:Its physical form is MicroUSB interface socket, the pin definition is as follows

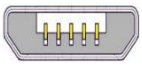


图 2.9 USB OTG 端口图（左边为 1 脚）

* The leftmost is counted as 1.

引脚	名称	说明
1	VBUS	电源 power
2	D-	USB 负 -
3	D+	USB 正 +
4	ID	USB ID
5	GND	地 Ground

表 2.9 MicroUSB 引脚定义

——全文完 END——