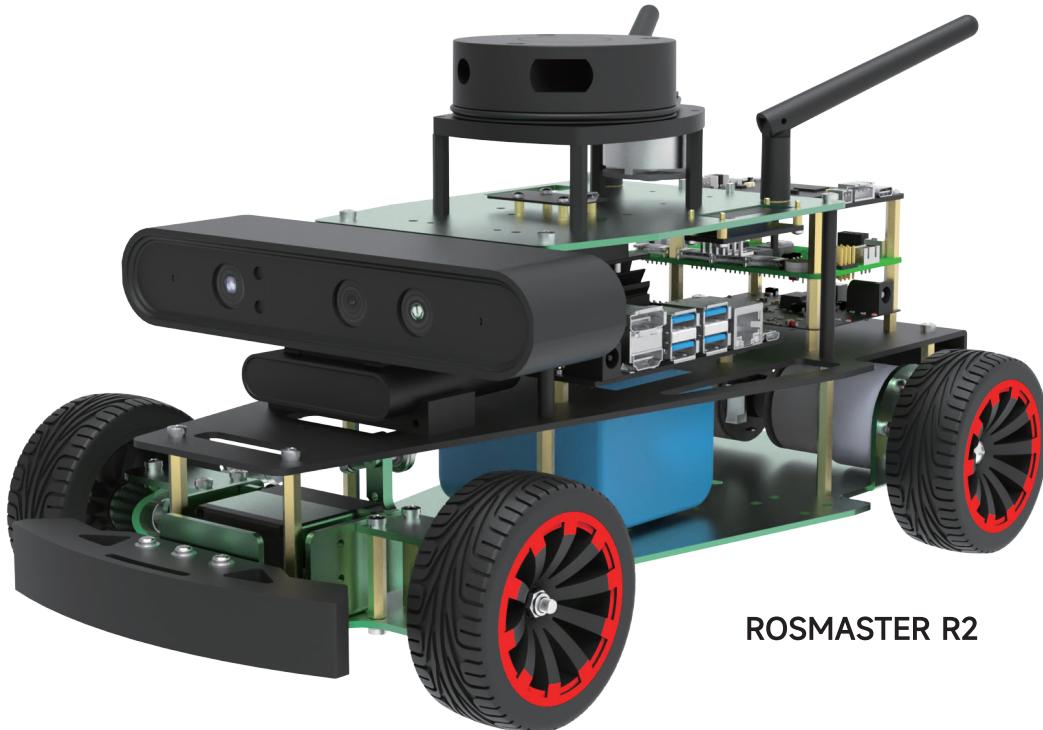


ROSMASTER R2

说明书/Manual



①使用前请仔细阅读本说明书
①Please read this manual carefully before use

②本公司保留说明书解释权
②Our company reserves the right of interpretation for this manual

③产品外观请以实物为准
③Product appearance, please prevail in kind

④阅后请妥善保留
④Please keep the manual properly after reading



Android/iOS 手机用户请扫描二维码下载遥控软件。
iOS 用户也可在 App store 苹果应用商城搜索并下载
【MakerControl】



Android users search "MakerControl" in
Play Store to download APP.
iOS users search "MakerControl" in App
Store to download APP.

物品清单

	车体		Astra Pro 深度相机
	说明书+ 三包凭证		深度摄像头 固定支架
	USB HUB 扩展板		ROS小车 扩展板
	游戏手柄+ 7号电池		手柄手机支架
	电池充电器		螺丝刀
	USB3.0公头 转USB3.0公头		Micro USB 数据线 (右弯)
	零件包		电池组
	雷达固定板 组件		摄像头固定板
	Micro USB 数据线		OLED屏 扩展板
	OLED屏 连接线		XH2.54排线

语言交互包(选配)

	语音交互模块		Type-C数据线
	语音螺丝包		喇叭

树莓派配件(选配)

	树莓派4B (另购)		TF卡
	温控扩展板		双弯头Type-C 公对公数据线
	Pi配件包		

Jetson NANO 4GB配件(选配)

	Jetson NANO 4GB开发板 (另购)		U盘
	Nano 4GB 配件包		4010风扇
	M.2天线		DC电源线

7寸屏扩展包(选配)

	7寸屏		7寸屏固定
	7寸屏支撑		⑧号螺丝包
	Micro USB 数据线 (右弯)		HDMI线

Jetson TX2 NX配件(选配)

	Jetson TX2 NX开发板 (另购)		128GB 固态硬盘
	TX2-NX配件包		DC转2Pin 电源线
	网卡天线		

Jetson Xavier NX配件(选配)

	Jetson Xavier NX开发板 (另购)		128GB 固态硬盘
	NX配件包		DC转2Pin 电源线
	网卡天线		

思岚A1激光雷达(选配)

	思岚A1 激光雷达		Micro USB 数据线 (右弯)
	⑥号螺丝包		

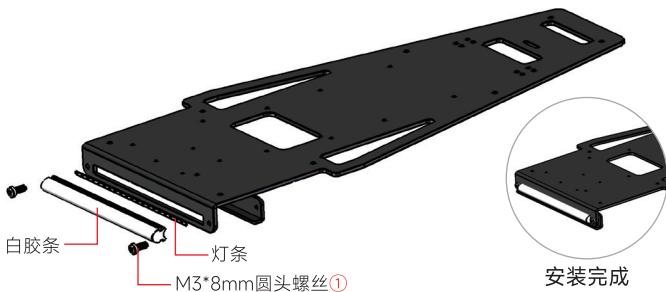
YDLIDAR 4ROS 激光雷达(选配)

	4ROS 激光雷达		雷达接线 扩展板
	Type-c数据线		④号螺丝包

安装步骤

(说明书螺丝后面的序号代表所在零件包号)

1. 灯条安装

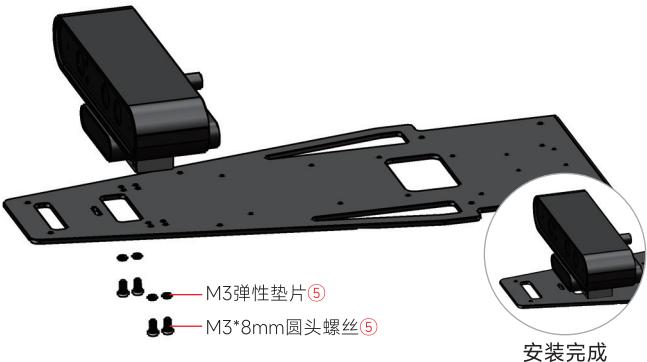


2. 深度摄像头安装

①深度摄像头固定安装

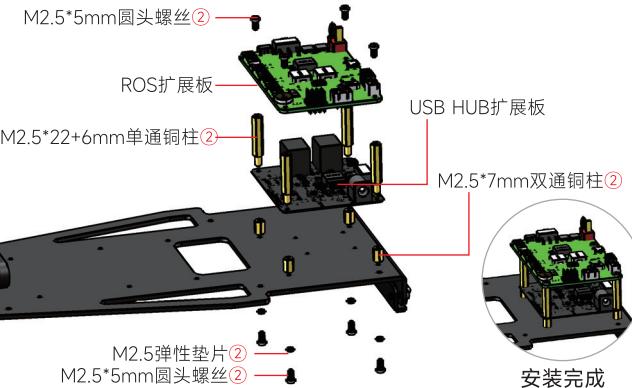
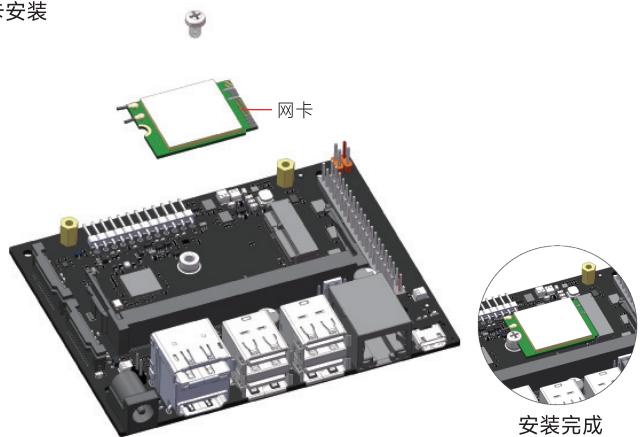


②深度摄像头安装

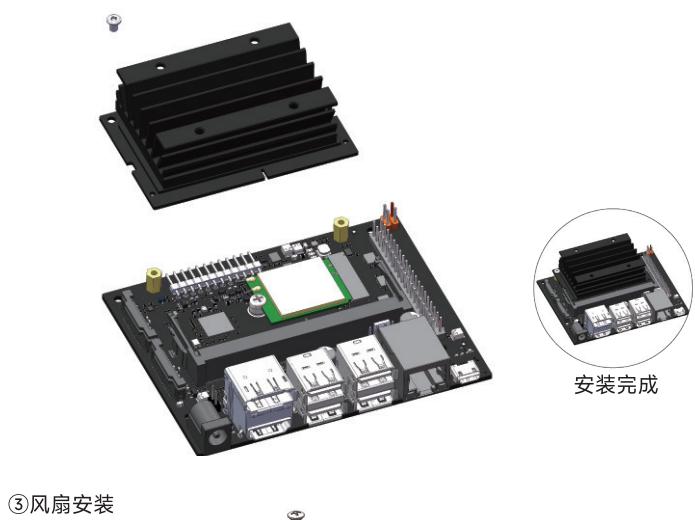


3. 扩展板安装

②网卡安装



4. 语音交互模块安装 (选配, 未购买此配件的可以跳过)

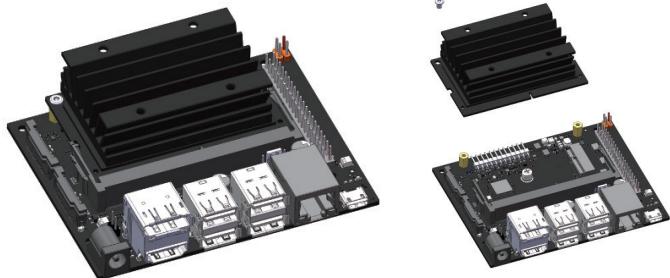
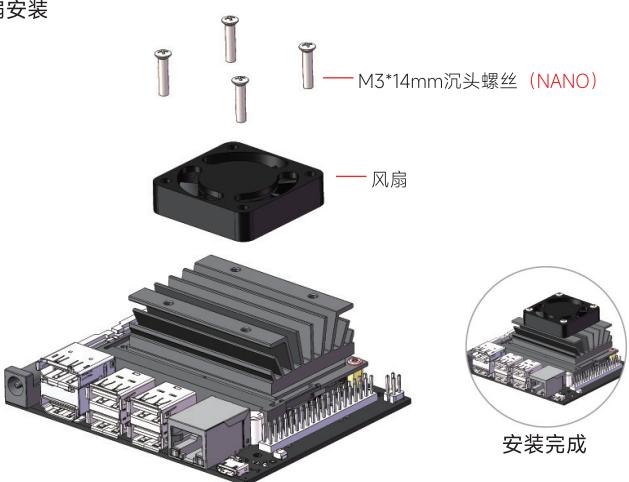


5. Jetson NANO主控安装 (其他主控请跳过)

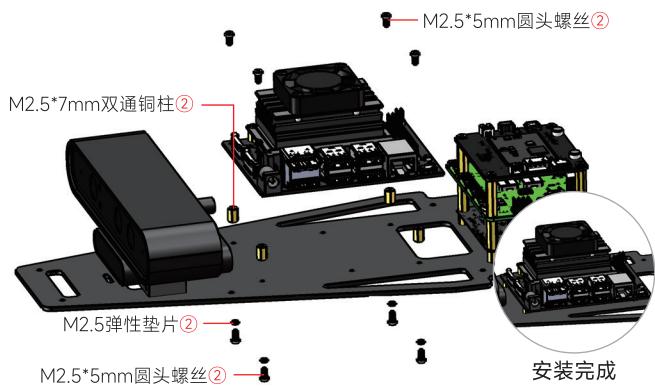
①拆卸核心板

注：拆卸核心板请小心，两侧夹片易断，核心板需要倾斜拔出。

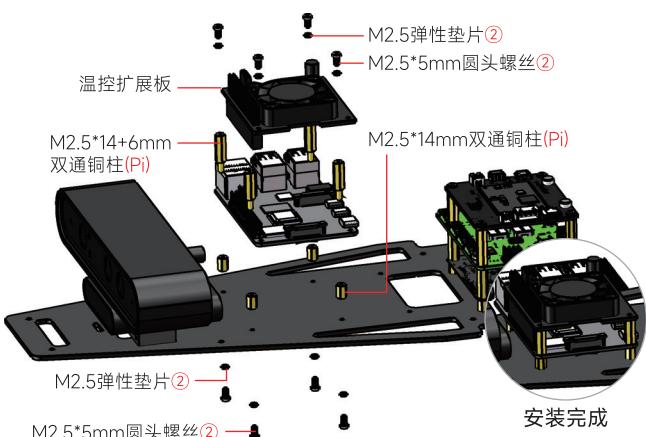
③风扇安装



④主控安装



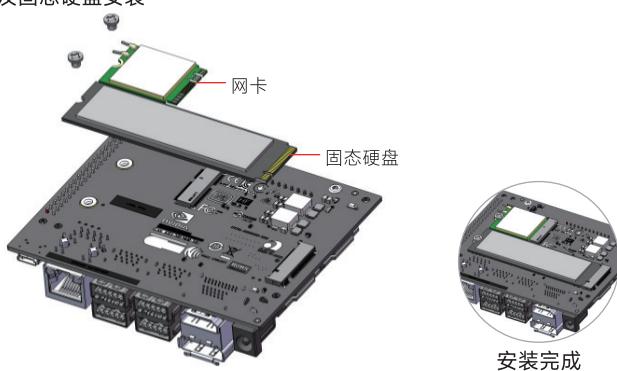
7. 树莓派主控及温控扩展板安装 (其他主控请跳过)



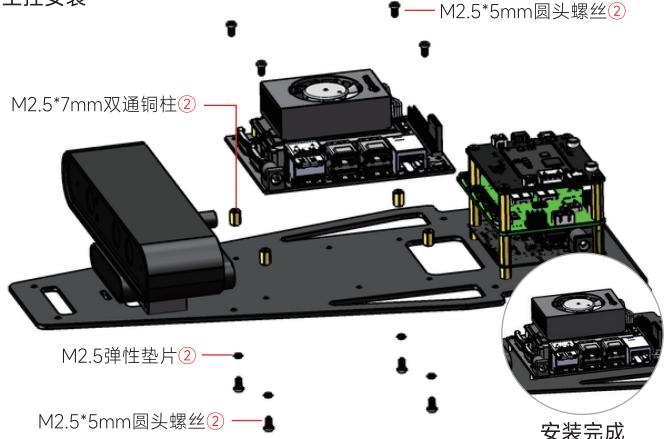
6. Jetson Xavier NX/Jetson TX2NX 主控安装

(其他主控请跳过)

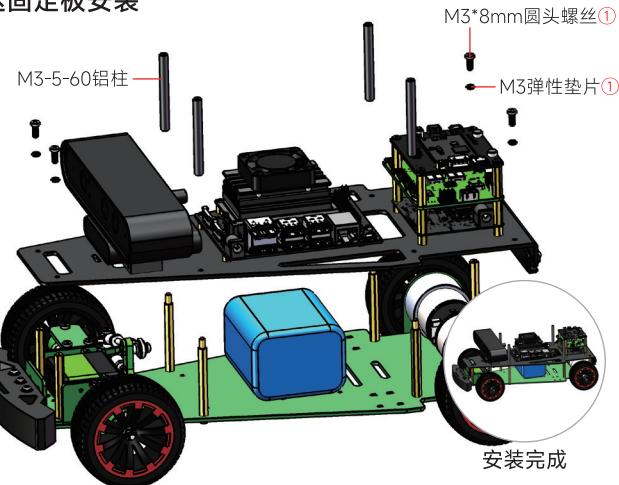
①网卡及固态硬盘安装



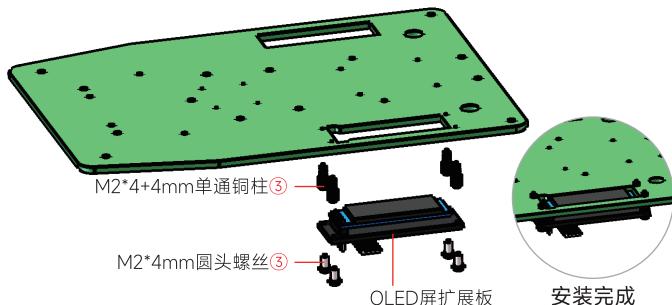
②主控安装



8. 雷达固定板安装

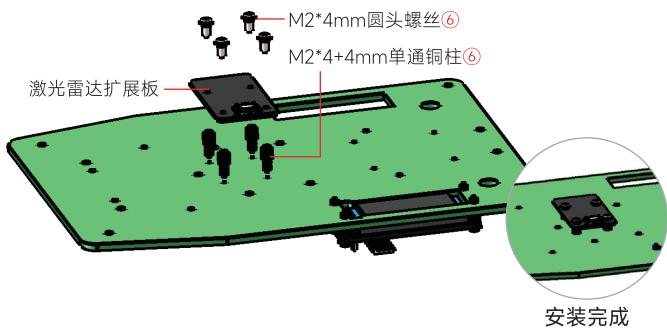


9. OLED屏扩展板安装

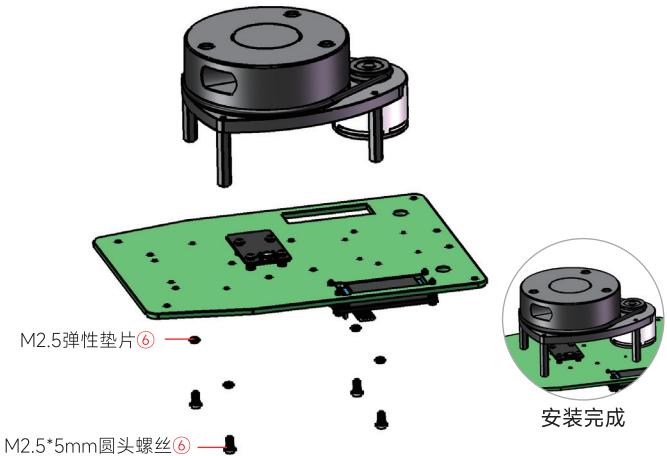


10. 思岚A1激光雷达安装 (选配, 未购买此配件的可以跳过)

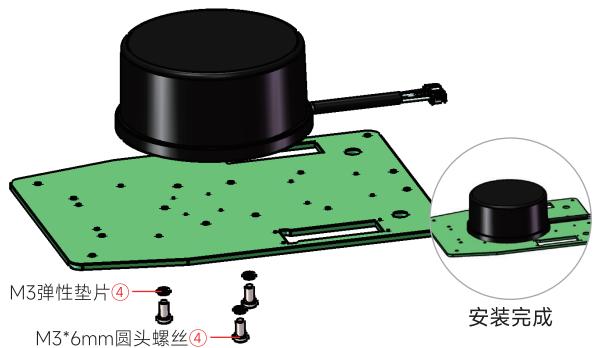
① 激光雷达扩展板安装



② 激光雷达安装



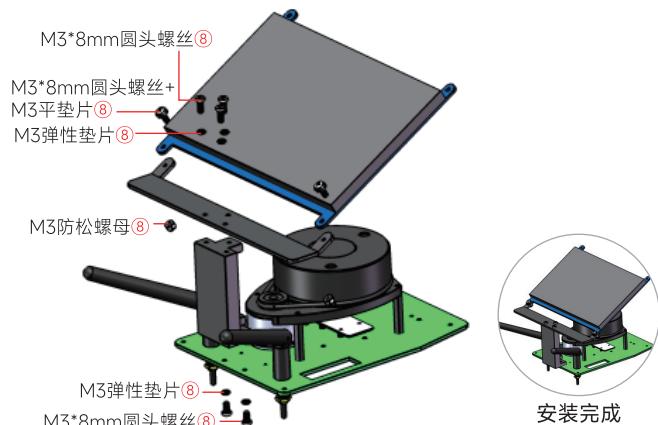
11. YDLIDAR 4ROS激光雷达安装 (选配, 未购买此配件的可以跳过)



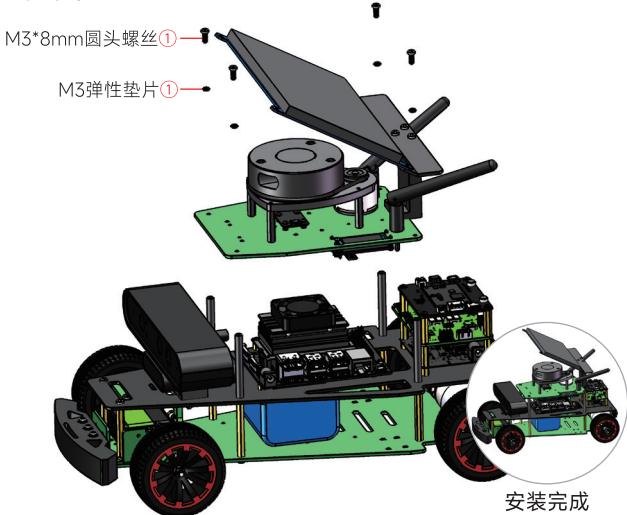
12. 天线安装 (树莓派主控请跳过)



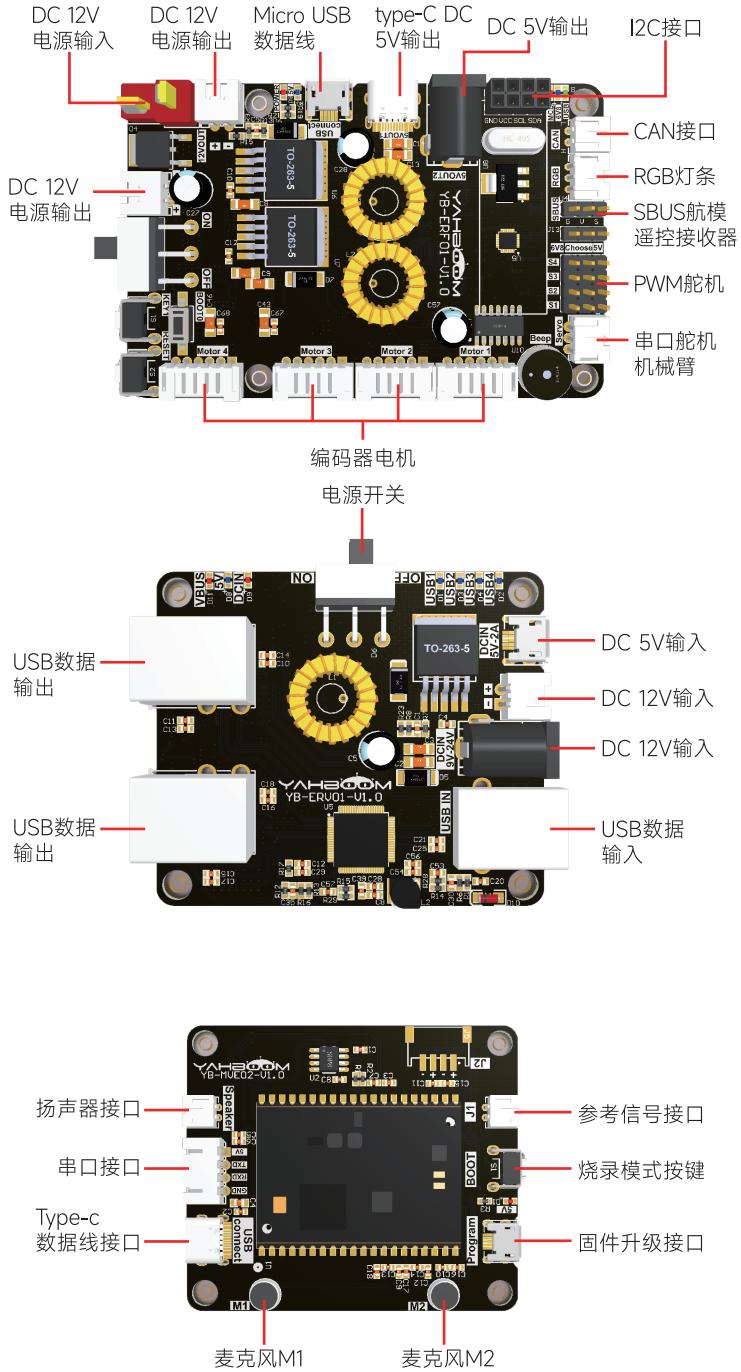
13. 7寸屏安装 (选配, 未购买此配件的可以跳过)



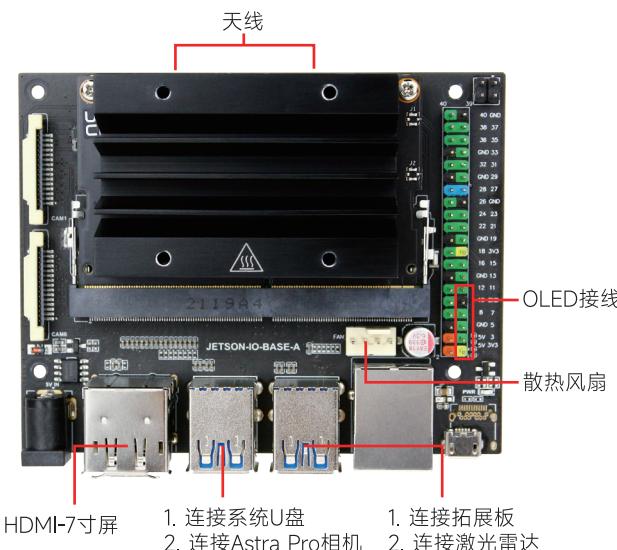
14. 顶板装配



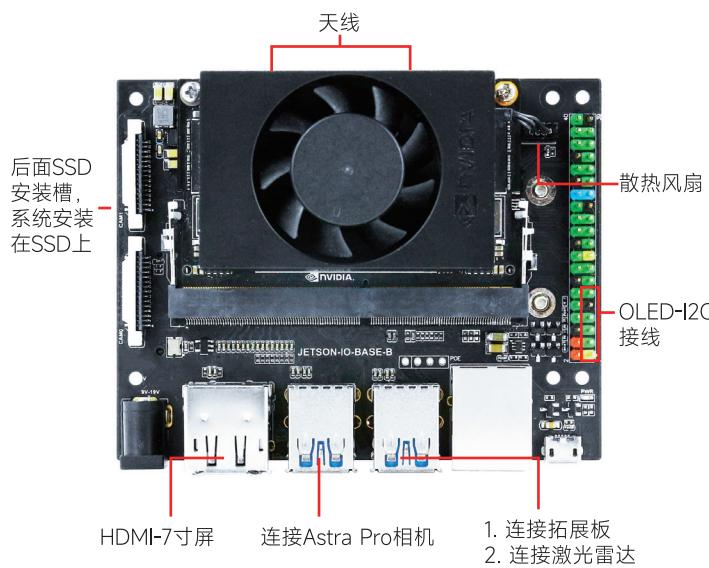
扩展板接口说明



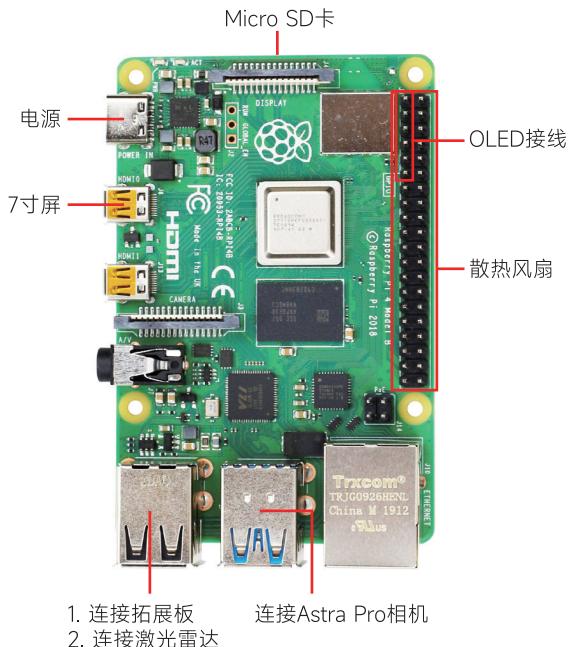
JETSON NANO 4GB 主板接口说明



JETSON XAVIER NX/TX2 NX 主板接口说明



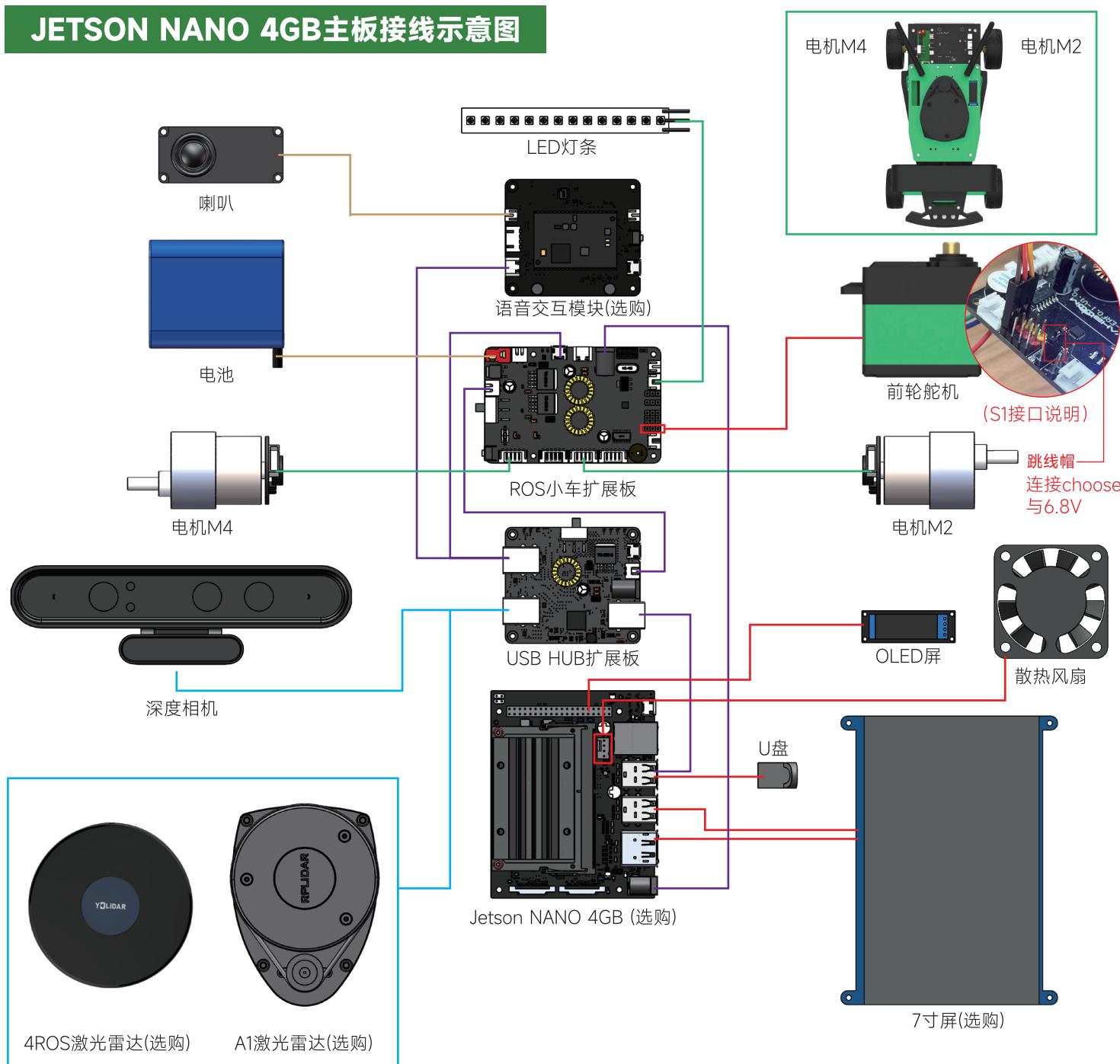
树莓派主板接口说明



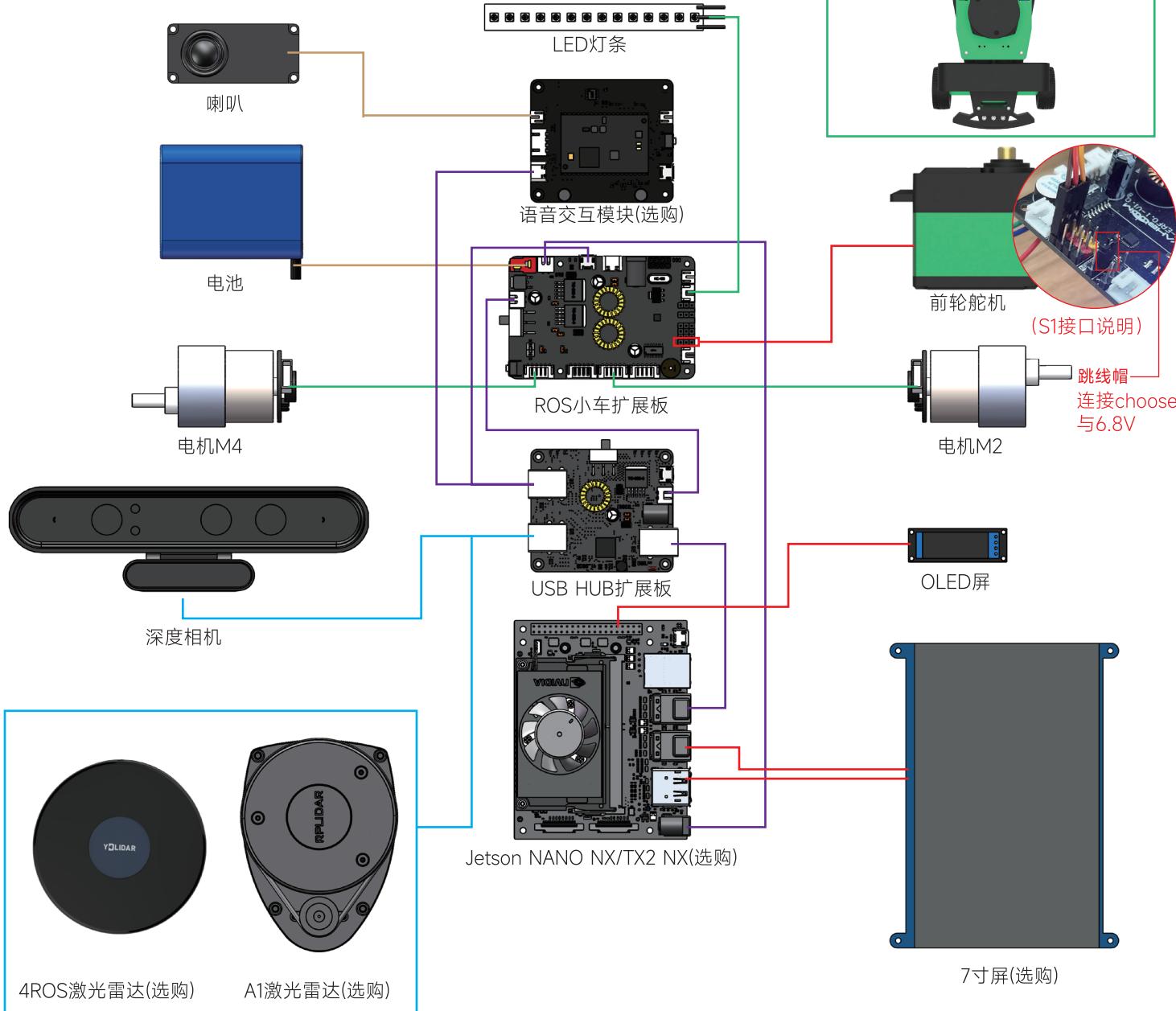
OLED模块接线示意图

1. Jetson主控接线示意图 (请根据接头的朝向插入排针)

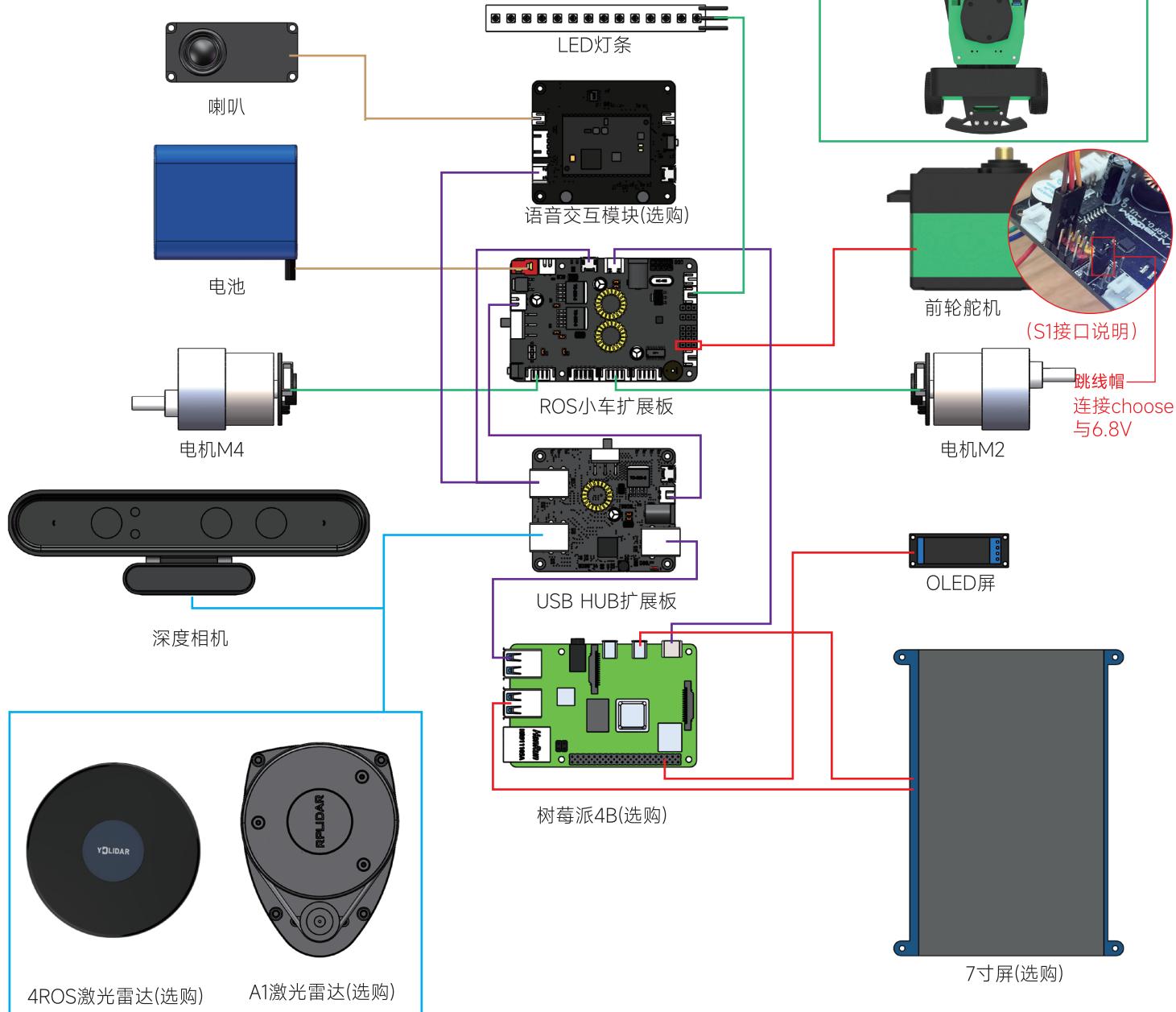
JETSON NANO 4GB主板接线示意图



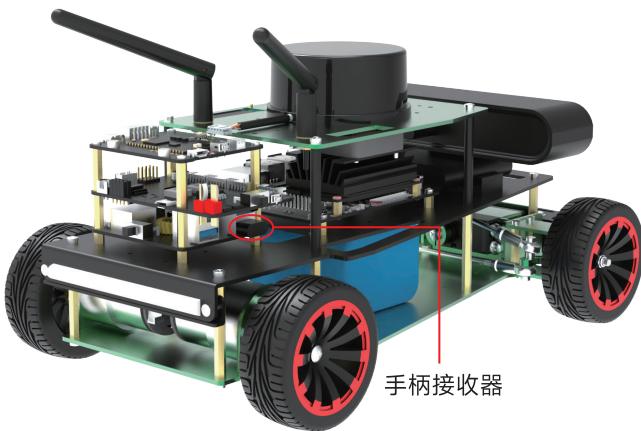
JETSON XAVIER NX/TX2 NX主板接线示意图



树莓派主板接线示意图



USB手柄接收器连接说明



无线手柄

注意：当使用 USB 手柄接收器时，建议将其连接到的 USB-HUB 扩展板上，而不是直接连接到主板。如果直接连接到主板，由于主板上下有铝合金格挡，将严重干扰手柄信号接收。

安装手机APP

- Android 系统用户请打开 Google Play 应用商店搜索【MakerControl】，或者打开手机浏览器，扫描下方二维码，下载并安装【MakerControl】APP。
- IOS 系统用户请打开 App store 应用平台搜索【MakerControl】，或者打开扫码器，扫描下方二维码，下载并安装【MakerControl】APP。



(APP下载二维码)

启动ROSMASTER

产品中提供的 U 盘 (Jetson nano 4GB 版本)/TF 卡 (树莓派版本) /SSD (Jetson Xavier NX 或 TX2 NX 版本) 中已经默认包含镜像系统，将 U 盘 /TF 卡 /SSD 安装至 ROSMASTER 中即可正常开机，无需重新配置镜像。

打开 ROSMASTER 机器人电源开关，2-3 分钟左右可以听到蜂鸣器滴滴三声，表示系统正常启动，此时可以看到 OLED 显示的信息。

树莓派版本系统用户名 : **pi**

密码 : **yahboom**

Jetson nano 4GB 版本系统用户名 : **jetson**

密码 : **yahboom**

Jetson TX2 NX 版本系统用户名 : **jetson**

密码 : **yahboom**

Jetson Xavier NX 版本系统用户名 : **jetson**

密码 : **yahboom**

连接ROSMASTER R2

ROSMASTER 出厂系统自带发射热点信号【ROSMASTER】，可以先使用手机连接 ROSMASTER 的热点信号组成局域网，热点密码 12345678。或者将 ROSMASTER 与手机都连接到同一个路由器组成局域网。

1、选择设备

打开【MakerControl】APP，根据所购买的机器人型号，选择【ROS 机器人】中的【ROSMASTER R2】设备：



2、在 IP 栏填写 ROSMASTER 机器人中 OLED 显示的 IP 地址，Port 和 Video 栏使用默认参数即可，点击【连接】，连接成功之后将会自动跳转到主控制界面。



APP功能介绍

ROSMASTER 的 APP 主界面总共分为三个模块，每个模块都对应不同的功能。

1、遥控



在主界面点击【遥控】图标，会出现以下界面。



Part 1. 调节速度：控制小车的运行速度。

Part 2. 调节前轮舵机角度：控制前轮舵机转动的角度，调节后可按前进或者后退让小车运动。

Part 3. 控制小车前进后退，左转右转和停止。

Part 4. 切换全屏模式：显示屏显示摄像头全屏画面，可配合 USB 无线手柄和支架来使用。

Part 5. 摄像头显示画面。

Part 6. 切换控制方式：重力感应、按键控制、摇杆控制。

Part 7. 鸣笛：控制蜂鸣器开关，按下蜂鸣器打开，松开蜂鸣器关闭。

Part 8. 自稳模式：开启自稳模式，小车接收到停车指令，会立刻刹车停止，关闭自稳模式，小车接收到停车指令，会自由滑行后停止。

Part 9. 控制左右旋转：控制小车前轮舵机最大角度左旋和右旋。

2、炫彩车灯



在主界面点击【炫彩车灯】图标，会出现以下界面。



炫彩车灯总共分为三部分。

Part 1. 左上部分【颜色切换】：此功能可以实时修改灯条的RGB颜色，直接拖动【R】【G】【B】的拖动条，就可以看到ROS-MASTER尾部的RGB灯条实时变化炫酷灯效。

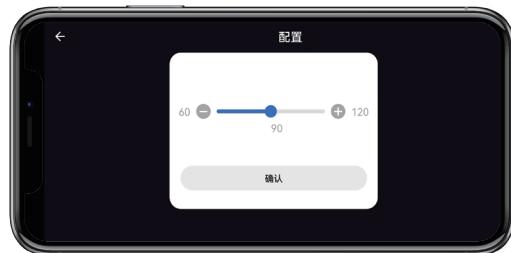
Part 2. 左下部分【固定颜色切换】：此功能可以让RGB灯条显示红色、绿色、蓝色、黄色、紫色、青色、白色、关闭。同时还可以调节单色呼吸灯的颜色。

Part 3. 右边【炫酷特效】：每次点击一个按钮都会展示特定的特效，分别有流水灯、跑马灯、星光点点、单色呼吸灯、渐变灯功能，再次点击按钮退出特效；底下的拖动条可以改变灯光特效的速度，默认为5，最快为1，最慢为10。

3、配置



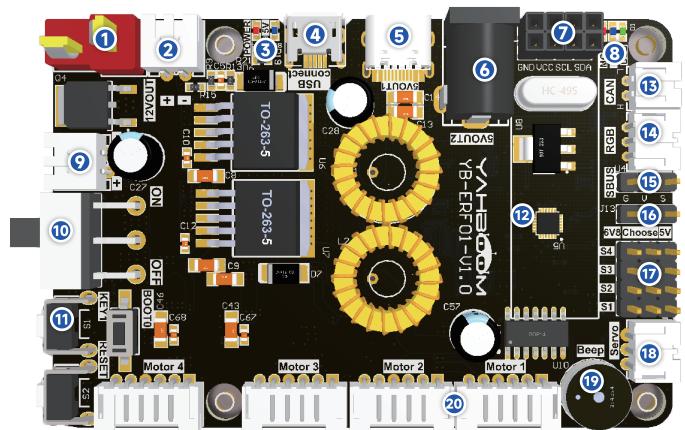
在主界面点击【配置】图标，会出现以下界面。



在此界面调节前轮舵机的相对零值（默认角度值）。

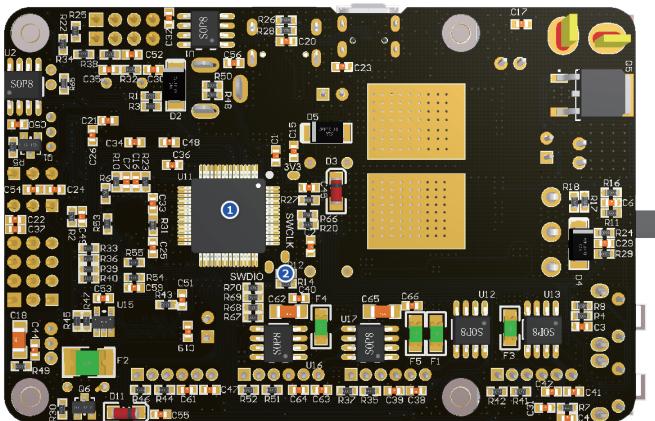
操作步骤：请先将小车前轮架空，然后调节滑动条，观察小车两个前轮，最佳效果为两个前轮与小车正前方保持平行。然后点击确定保存数据。

功能布局



- ① T型 DC 12V 电源输入接口：作为扩展板的主电源输入，连接到 DC 12V 电源或者 12V 电池。
- ② DC 12V 电源输出：向外提供 DC 12V 电源。
- ③ 电源指示灯：指示电源供电是否正常。
- ④ micro USB 数据接口：连接主机通讯。
- ⑤ type-C 接口：向外提供 DC 5V，仅供电不能通讯。
- ⑥ DC 5V 输出接口：可给 Jetson Nano 供电。
- ⑦ I2C 接口：可连接外部 I2C 设备，例如 OLED 屏幕。
- ⑧ 指示灯：数据指示灯和 6.8V 电压指示灯。
- ⑨ DC 12V 电源输出：向外提供 DC 12V 电源。
- ⑩ DC 12V 电源开关：电源总开关。

- ⑪ 按键：按键 KEY1：用户功能按键，可通过编程实现自定义功能。按键 RESET：板载单片机复位按键。按键 BOOT0：板载单片机 BOOT0 键，用于单片机进入烧录模式。
- ⑫ 九轴姿态传感器：提供扩展板当前姿态。
- ⑬ CAN 接口：连接 CAN 设备。
- ⑭ RGB 炫彩灯条接口：连接 RGB 炫彩灯条。
- ⑮ SBUS 接口：连接航模遥控接收器。
- ⑯ PWM 舵机电压切换：改变跳线帽的位置可选择 6.8V 或者 5V 电压为 PWM 舵机供电。
- ⑰ PWM 舵机接口：可连接 6.8V 或者 5V 电压 PWM 舵机，需根据舵机电压在⑯选择对应的电压。
- ⑱ 串口舵机接口：连接到串口舵机机械臂。
- ⑲ 蜂鸣器：用于鸣笛报警。
- ⑳ 四路电机连接口：连接四个电机，根据不同车型连接方式请参考对应课程文档。



- ① 板载单片机：主要负责控制扩展板上的外设，例如蜂鸣器、电机驱动等。
- ② 调试接口：连接到 ST-Link 或者 J-Link 上 SW 接口，用于调试单片机或者下载单片机固件。

常见问题分析

1. 连续驱动 astrapro.launch 容易出现报错，为什么？

答：需重新插拔相机 USB 线并关闭终端才可继续使用。

2. 在运行单例代码时，机器人模型不对或现象不一致。

答：请核对 .bashrc 文件中的车型与雷达是否与购买的型号一致。

3. Jetson Nano 怎么控制扩展板？如何与扩展板通讯？

答：Jetson Nano 发送串口数据，通过 USB 口传输到扩展板，扩展板上集成了单片机，接收并解析串口数据，再处理具体要执行的命令。

4. 机器人如何供电？Jetson Nano 需要另外供电吗？

答：小车出厂配有电池组，将电池组插入扩展板的 DC 12V 电源 T 型接口上，打开总电源开关，扩展板集成电压转化芯片，提供 DC 5V 电源，通过 DC 5V 电源线传输给 Jetson Nano 供电。

5. 扩展板上哪些功能是由单片机管理？

答：扩展板上的单片机管理的部分包括：机械臂、有源蜂鸣器、姿态传感器、PWM 舵机、电机、RGB 炫彩灯条、按键 KEY1、RESET 键、SBUS 接口、CAN 接口等。

6. 扩展板如何更新单片机固件？为什么要更新单片机固件？

答：扩展板集成的单片机出厂时已经烧录好固件，非必要情况下请无需更新固件。如果烧录过基础课程中的固件或者其他固件，则需要重新烧录出厂的固件才可以正常使用。如果需要更新固件，请参考更新固件的教程来烧录更新单片机的固件。

7. 打开小车扩展板电源，蜂鸣器一直在响？

答：小车拓展板带有电池电压检测功能，当电池电压不足以维持小车工作电压，蜂鸣器会一直发出响声，以提示小车电池电量不足，需要为电池充电。

8. 接上语音控制模块之后小车无法控制？

答：因为 HUB 板和语音控制模块的 ID 设备号都是一样，直接插上语音控制模块会与出厂提前绑定的 HUB 板设备端口号冲突。使用语音控制模块，需按照教程“14.2 语音控制模块端口绑定”重新绑定设备端口号。

锂电池组和电池充电器安全使用规范

1. 严禁接入超过产品使用负载的设备。

2. 严禁使用非亚博官方提供的电池或充电器。

3. 电池电压在 9.6V 以下时，扩展板蜂鸣器发出‘滴滴滴’的报警声，并且 MCU 指示灯快闪，此时需要关闭电源，然后给电池充电。

4. 电池充电时请关闭扩展板上的总电源开关，请勿对电池边充电边使用，防止出现充电器或电池爆炸。

5. 充电时充电器指示灯亮红灯，表示正在充电中，充电器亮绿灯，表示电池已充满。电池充电时应有人看护，充电完毕后应尽快拔掉充电器插头，避免电池过冲。

6. 使用完毕后应关闭扩展板上的电源总开关，长时间不使用设备时，应把电池接线拔下来，并保持电池电压在 11.1V-11.7V，用螺丝刀拆下电池仓，取出锂电池组并放到电池安全区域，不要与金属物体混放，包在外面的绝缘膜不可以撕掉。

7. 远离热源、火源、任何液体，切勿在潮湿或雨中使用。潮湿环境可能导致产品短路损坏。

8. 当锂电池组或电池充电器起火、冒烟，请使用沙或者干粉灭火器灭火，然后迅速撤离至安全区域。

9. 若锂电池组或电池充电器出现破损、严重发热、变形、变色、有异味或其他任何异常现象时不得使用，并及时联系亚博或者其他代理商处理。

10. 请在温度 0°C 至 35°C 环境下使用，其他温度下锂电池组或电池充电器稳定性可能会出现下降。

11. 严禁故意刺破、短路、反接、私自焊接、撞击、碾压、抛掷电池组或电池充电器。

12. 禁止在强静电和强磁场环境中使用产品，否则会导致产品损坏。

13. 严禁私自改装或修改硬件电路板。

14. 无成人监护时，请不要让儿童使用锂电池组或电池充电器，存放电池时应放在儿童不能拿到的地方。

15. 锂电池组或电池充电器冒烟、发烫（严重时外包装会裂开），应迅速断开排插电源或者断开总闸，然后迅速拔出充电器，并取出电池放置空旷地带。

郑重声明：请客户仔细阅读本规格书，特别是参数指标、注意事项等，了解产品的使用方法及应用范围。若出现产品使用方法错误、电路连接不对或采用的输入电源、负载功能参数与产品规格书所标性能参数不符合等现象均属使用不当，由于使用不当造成产品、负载及周边连接的损坏，本公司均不承担相关责任。

使用人群 18 岁以上；

产品名称 / 型号：ROSMASTER R2

制造商：深圳市亚博智能科技有限公司

服务电话：0755-86965197

亚博智能交流群：534441487 验证码：9H02

技术支持邮箱：support@yahboom.com

地址：广东省深圳市南山区桃源街道留仙大道 1189 号润利达工业大厦 B 栋二楼东亚博智能

Packing List

	Robot body		Astra Pro depth camera
	Manual		Depth camera mounting bracket
	USB HUB expansion board		ROS robot expansion board
	Gamepad + AAA battery		Handle phone holder
	Charger		Screwdriver
	USB3.0 male to USB3.0 male		Micro USB cable (bend right)
	Parts kit		Battery
	Lidar fixing plate parts		Camera fixing plate
	Micro USB data cable		OLED
	OLED screen connecting line		XH2.54 cable

7-inch screen package (optional)

	7-inch screen		7-inch screen fixed bracket
	7 inch screen support		⑧ screw pack
	Micro USB data cable (right bend)		HDMI

Voice interaction package (optional)

	Voice interaction module		Type-c data cable
	Voice Screw Pack		Speaker

Raspberry Pi Accessories (optional)

	Raspberry Pi 4B (optional)		TF card
	RGB cooling HAT		Type-c male-to-male data cable
	Pi screw pack		

Jetson NANO 4GB Accessories(optional)

	Jetson NANO 4GB (optional)		U Disk
	Nano 4GB screw pack		4010 cooling fan
	M.2 Antenna		DC Power cable

Jetson TX2 NX Accessories (Optional)

	Jetson TX2NX development board (Optional)		128G SSD
	TX2-NX parts package		DC to 2Pin power cable
	Network card antenna		

Jetson Xavier NX Accessories (optional)

	Jetson Xavier NX development board (Optional)		128G SSD
	NX parts package		DC to 2Pin power cable
	Network card antenna		

SLAM A1 Lidar (optional)

	SLAM A1 Lidar		Micro USB data cable (right bend)
	⑥ screw pack		

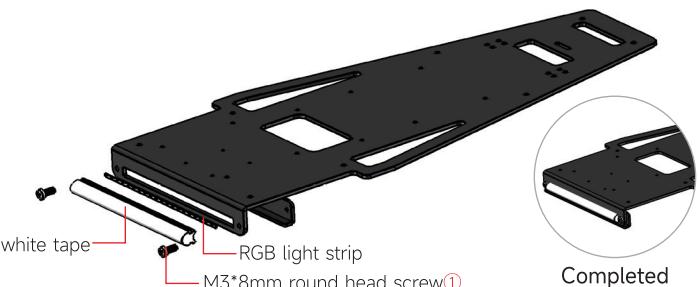
YDLIDAR 4ROS Lidar (Optional)

	4ROS Lidar		Lidar adapter board
	Type-c data cable		④ screw pack

Assemble Steps

(The red serial number that appears in the installation step correspond to screw pack number)

1. Install RGB light strip

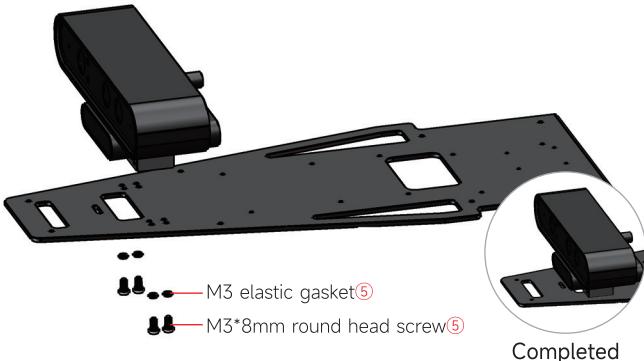


2. Install depth camera

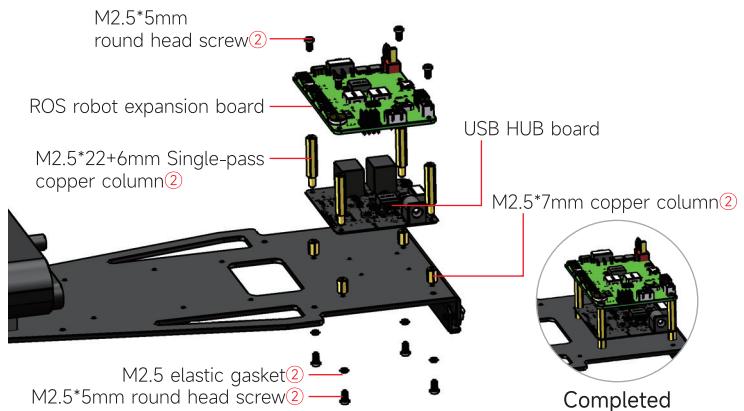
①Install depth camera mounting bracket



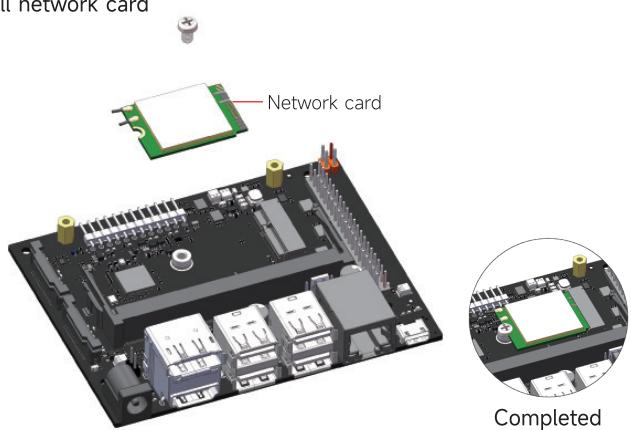
②Install depth camera



3. Install expansion board

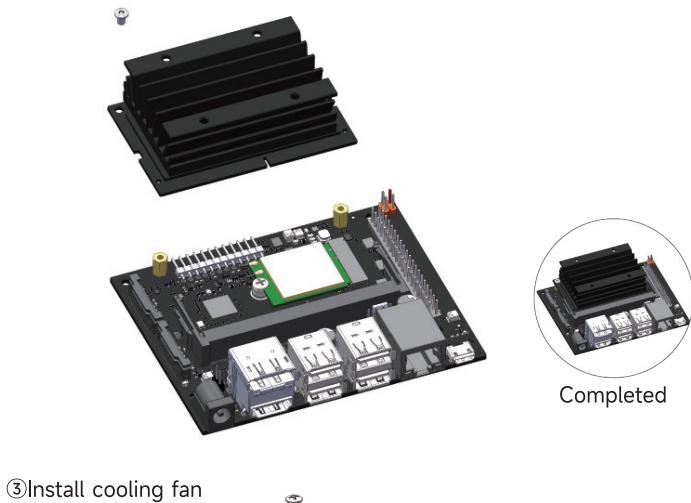
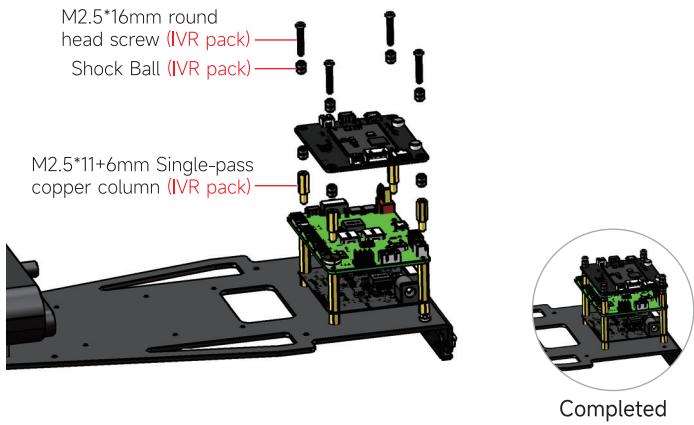


②Install network card



4. Install Voice interaction module

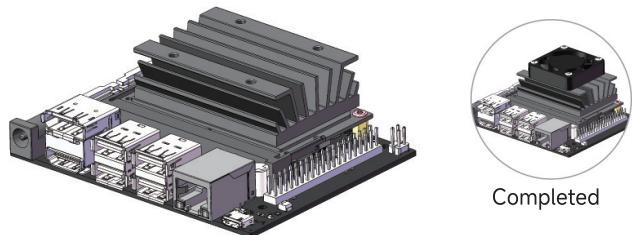
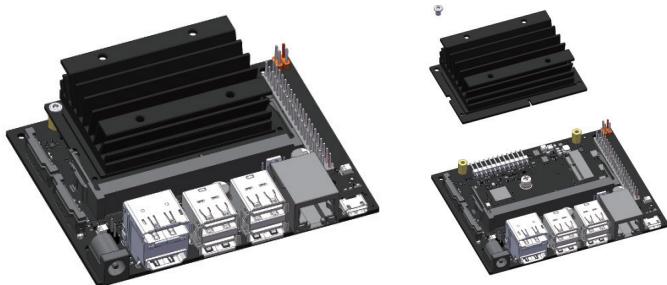
(Just for Voice interaction module version)



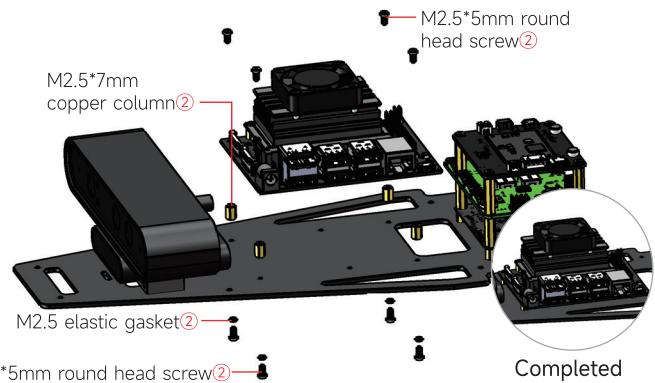
5. Install Jetson NANO board (Just for Jetson NANO version)

①Remove the core board

Note:Please remove the core board carefully.the clips on both sides are easily broken.



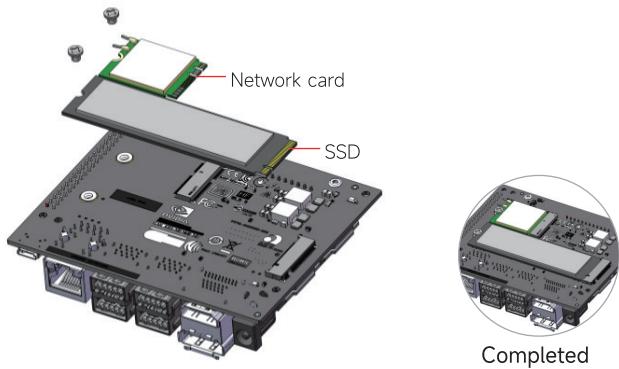
④Install Jetson NANO board



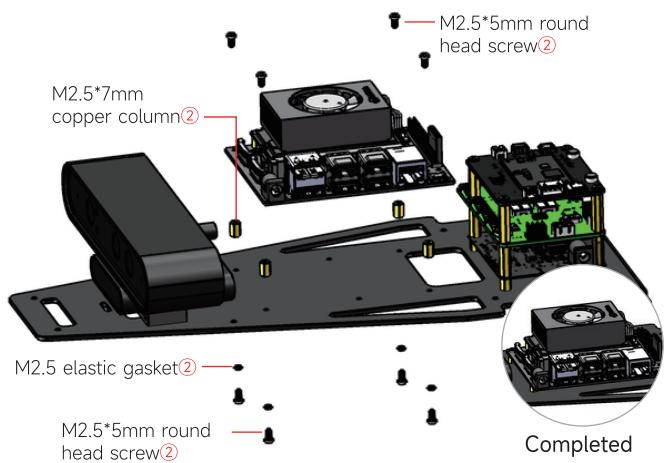
6. Install Jetson Xavier NX/Jetson TX2NX

(Just for Jetson Xavier NX/Jetson TX2NX version)

①Install network card and SSD

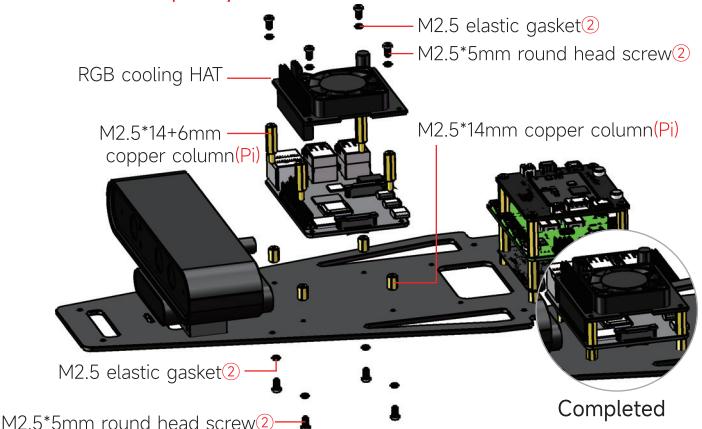


②Install Jetson Xavier NX/Jetson TX2NX board

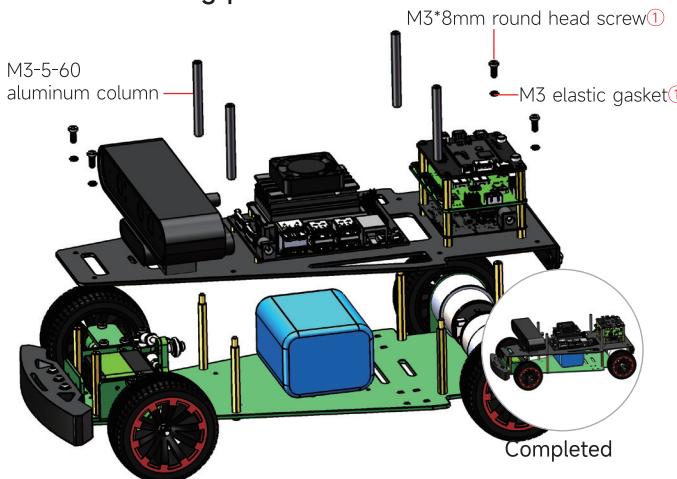


7. Install RaspberryPi board and RGB cooling HAT

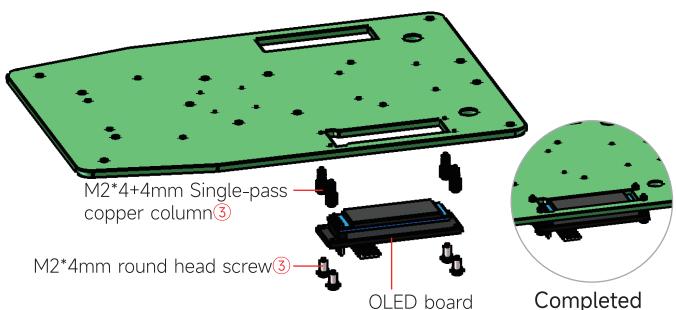
(Just for RaspberryPi version)



8. Install lidar fixing plate

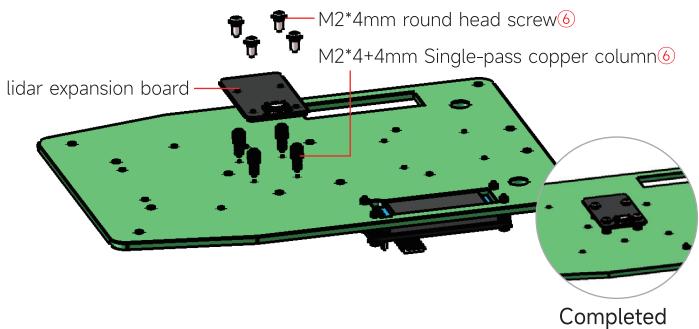


9. Install OLED board

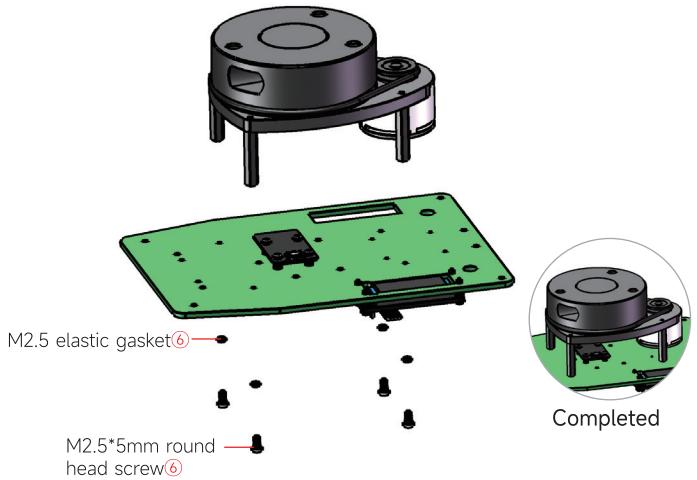


10. Install SLAM AI lidar (Just for A1 lidar version)

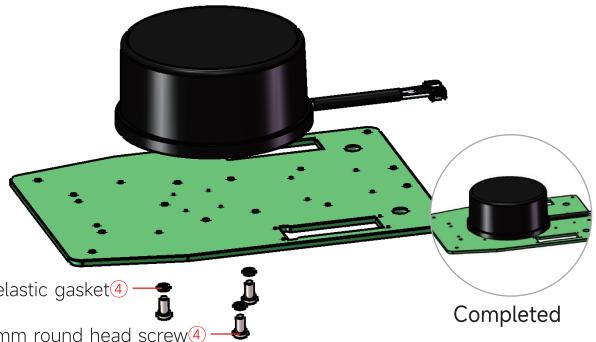
①Install lidar expansion board



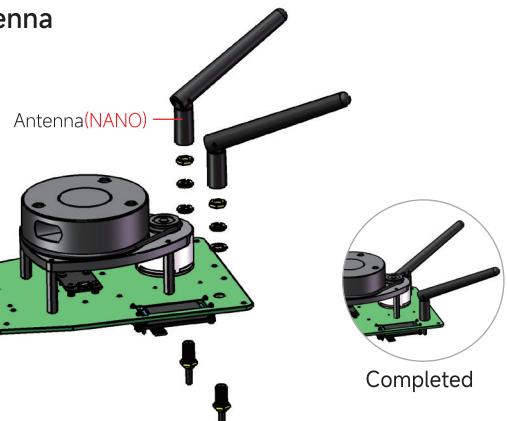
②Install lidar



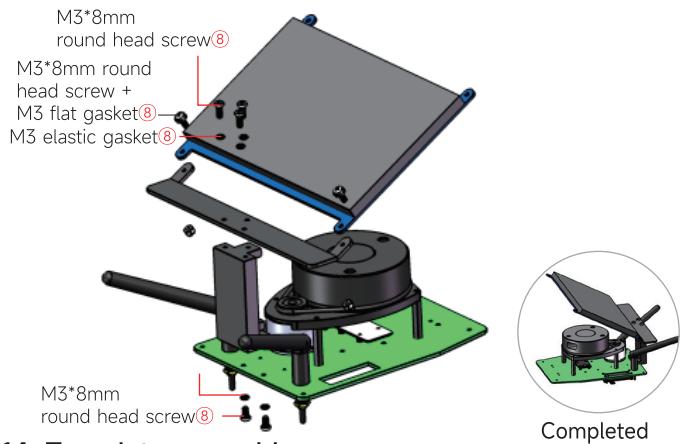
11. Install YDLIDAR 4ROS lidar (Just for 4ROS lidar version)



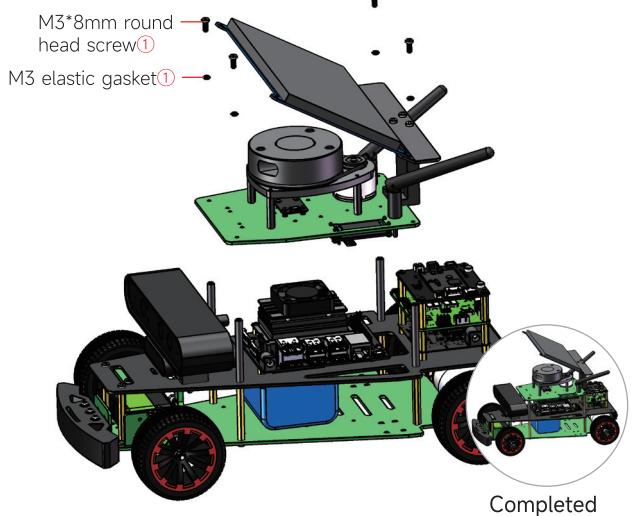
12. Install antenna



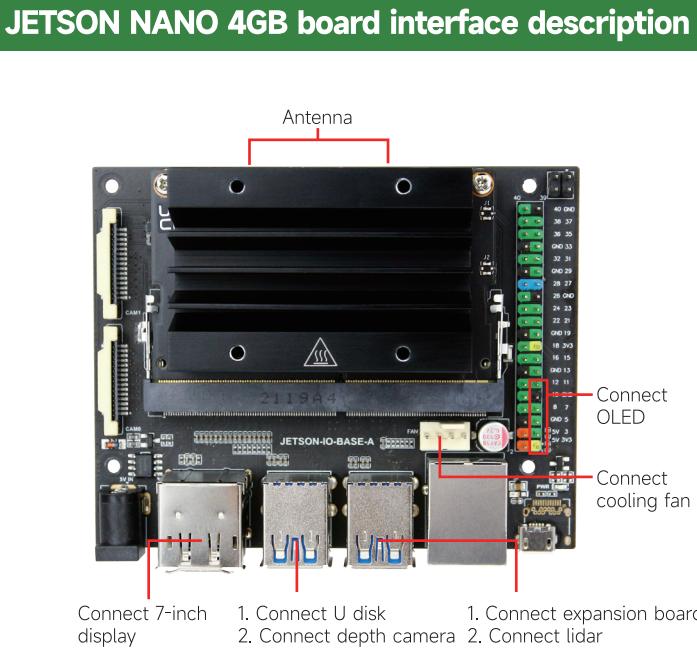
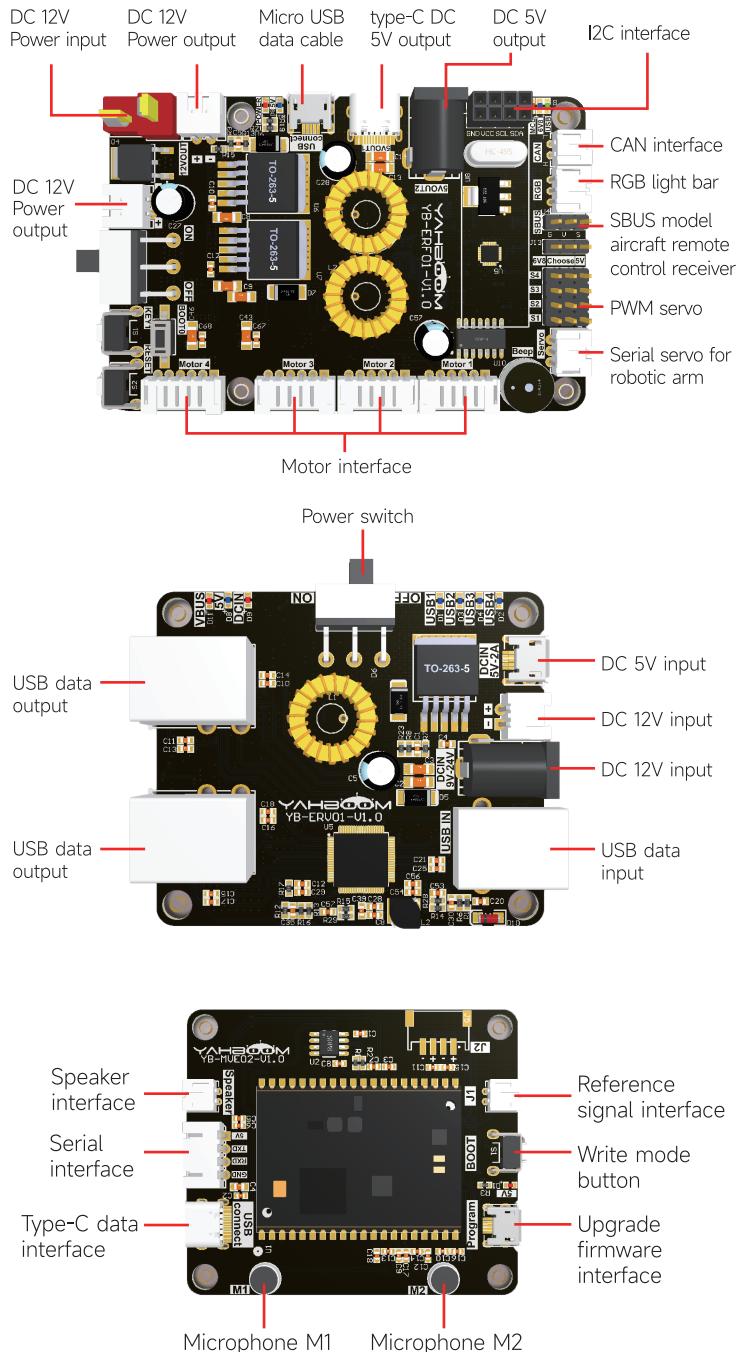
13. Install 7 inch screen (Just for 7 inch screen version)



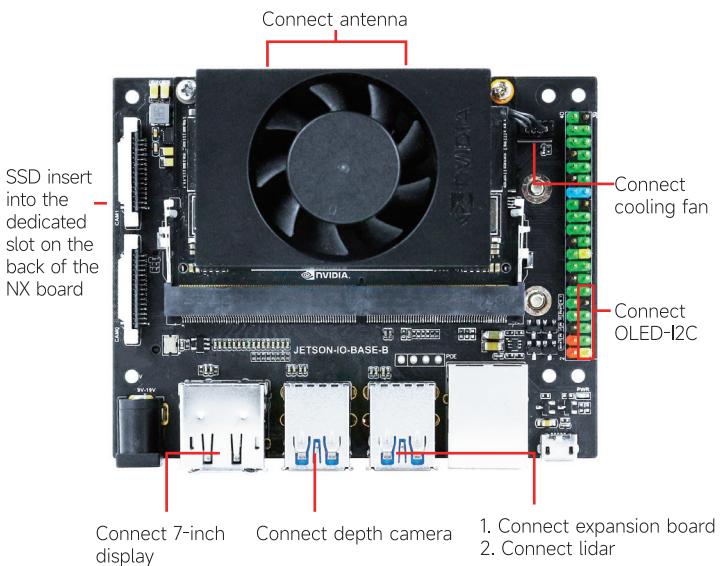
14. Top plate assembly



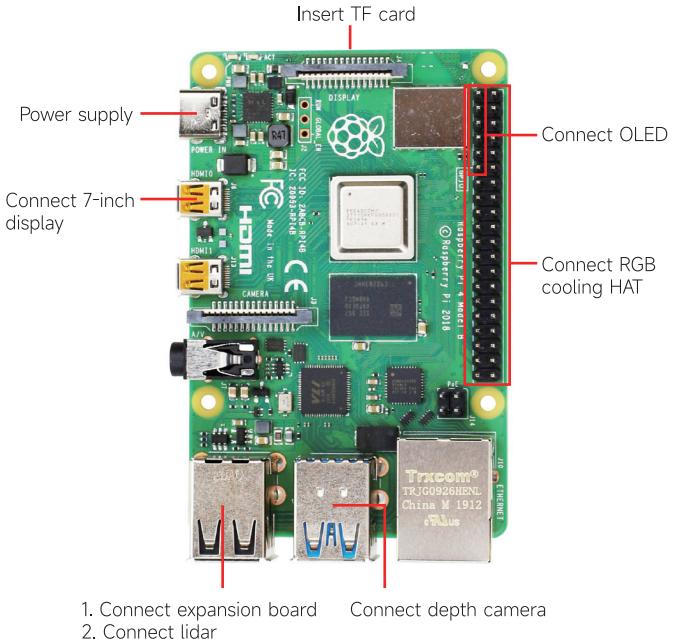
Expansion board interface description



JETSON XAVIER NX/TX2 NX board interface description



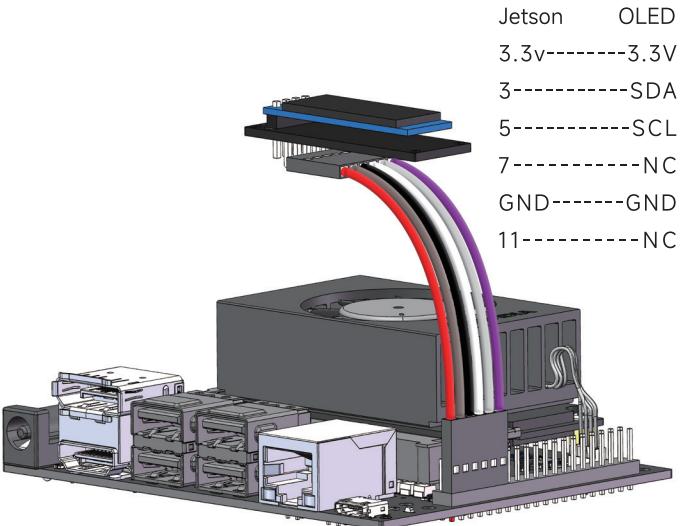
Raspberry Pi board interface description



OLED module wiring diagram

1. For Jetson version

(Please connect the OLED and Jetson board correctly, as shown below.)



Install U disk and TF card

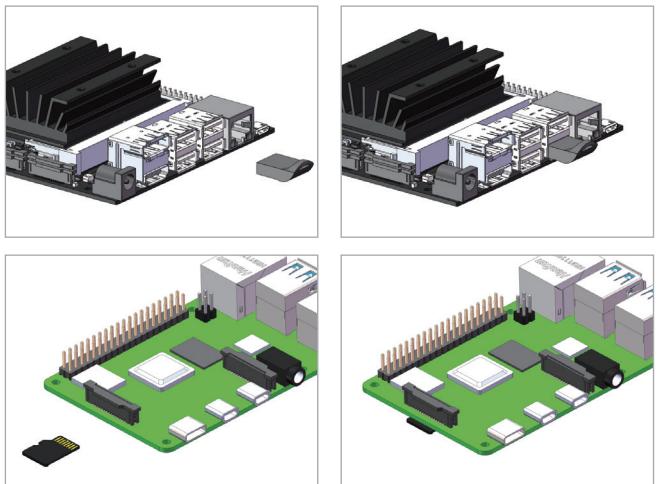
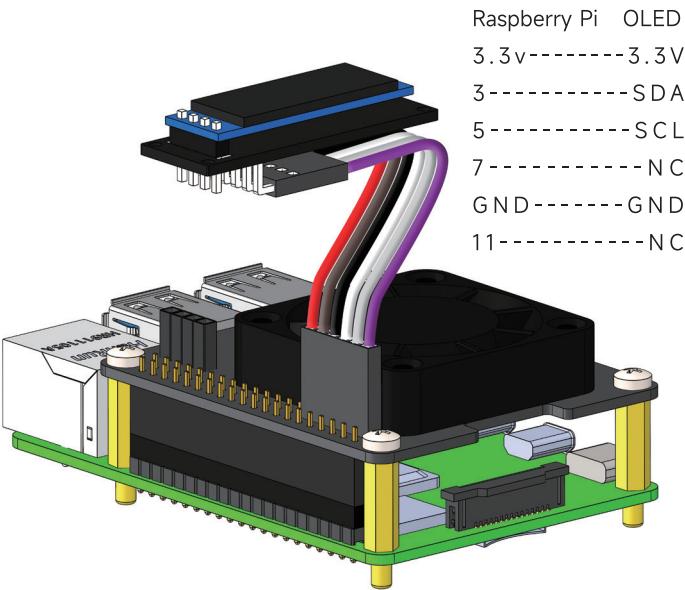


Figure 1-2 Insert U disk into Jetson NANO.

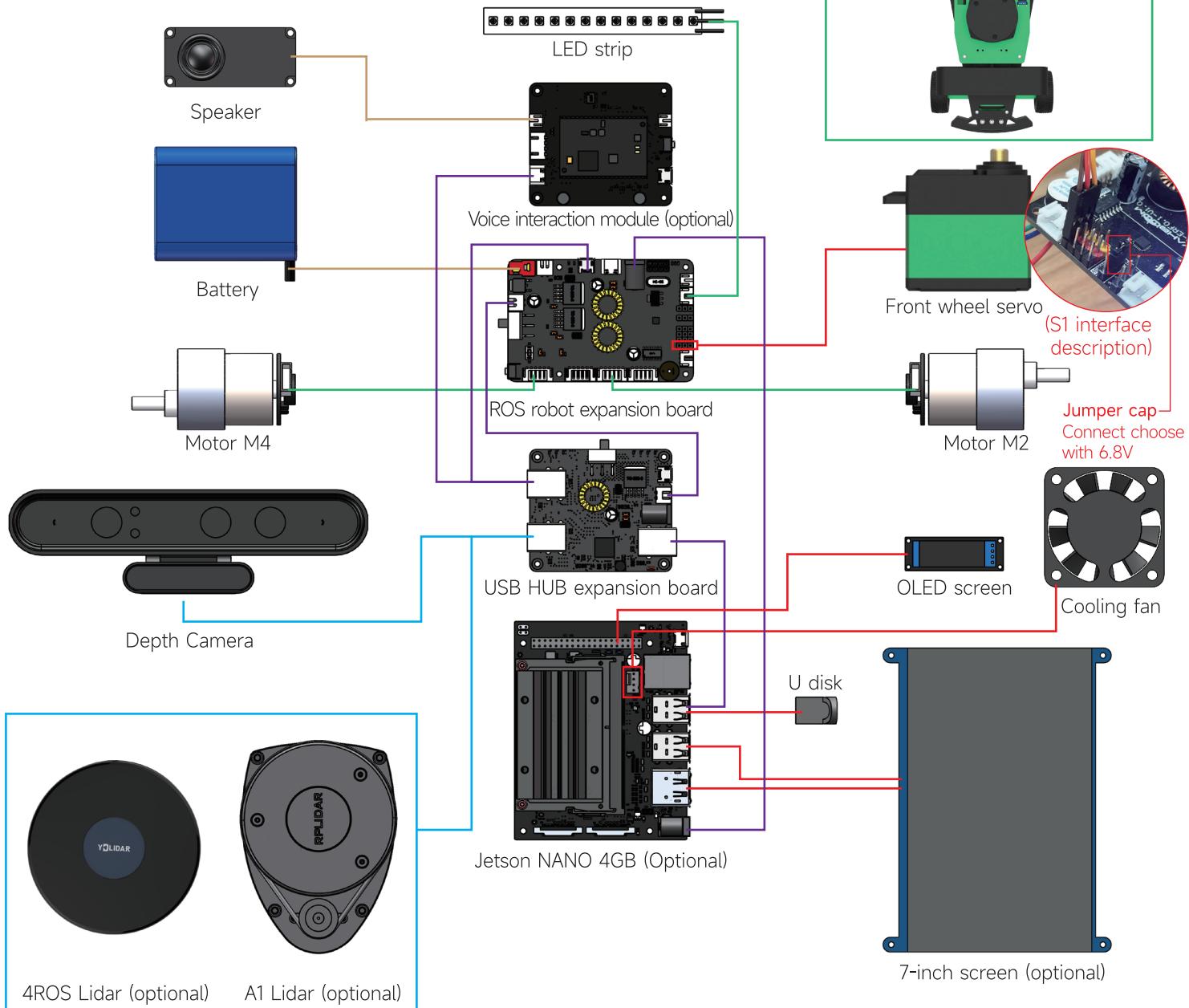
Figure 3-4 Insert TF card into Raspberry Pi.

2. For Raspberry Pi version

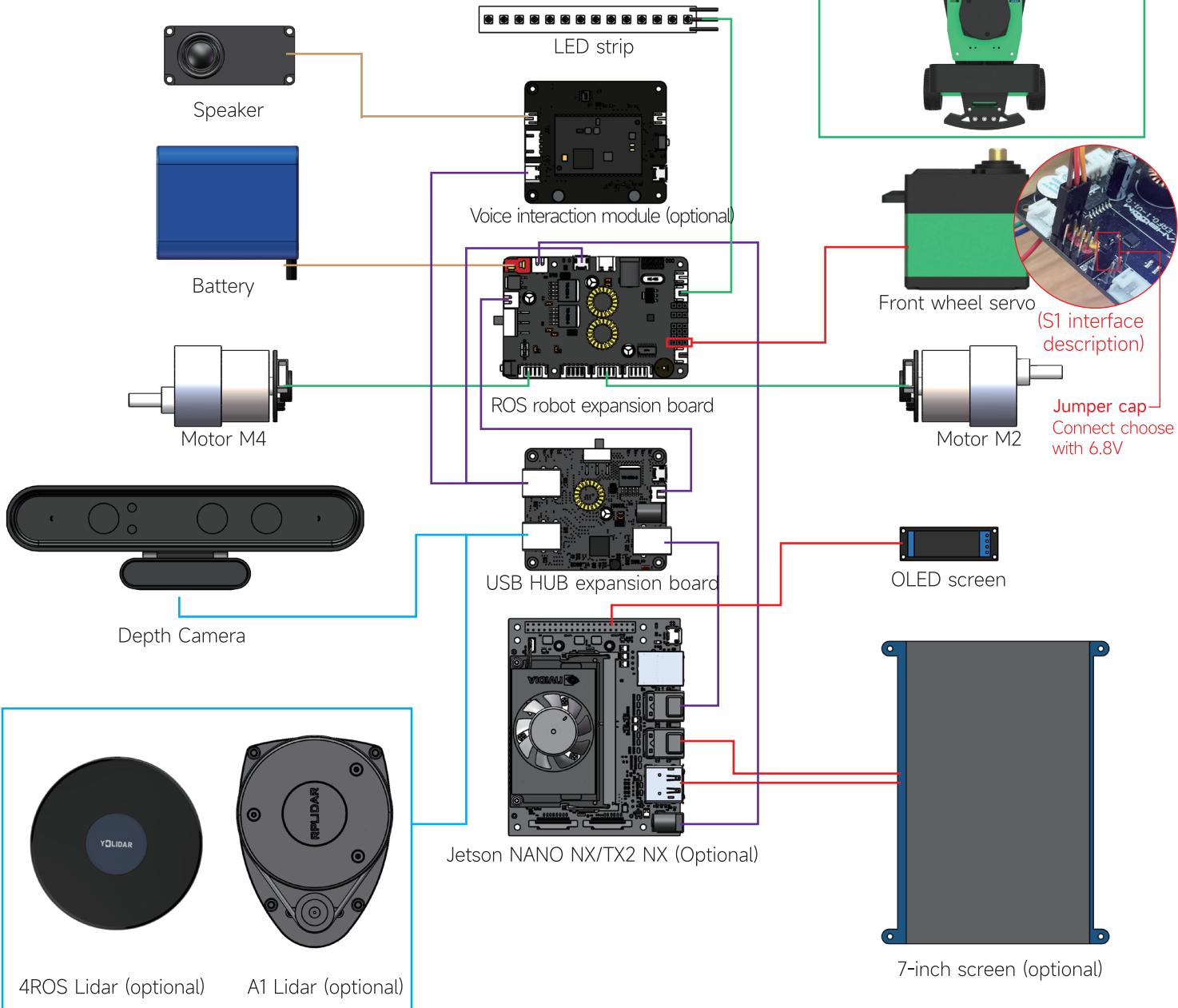
(Please connect the OLED and Raspberry Pi board correctly, as shown below.)



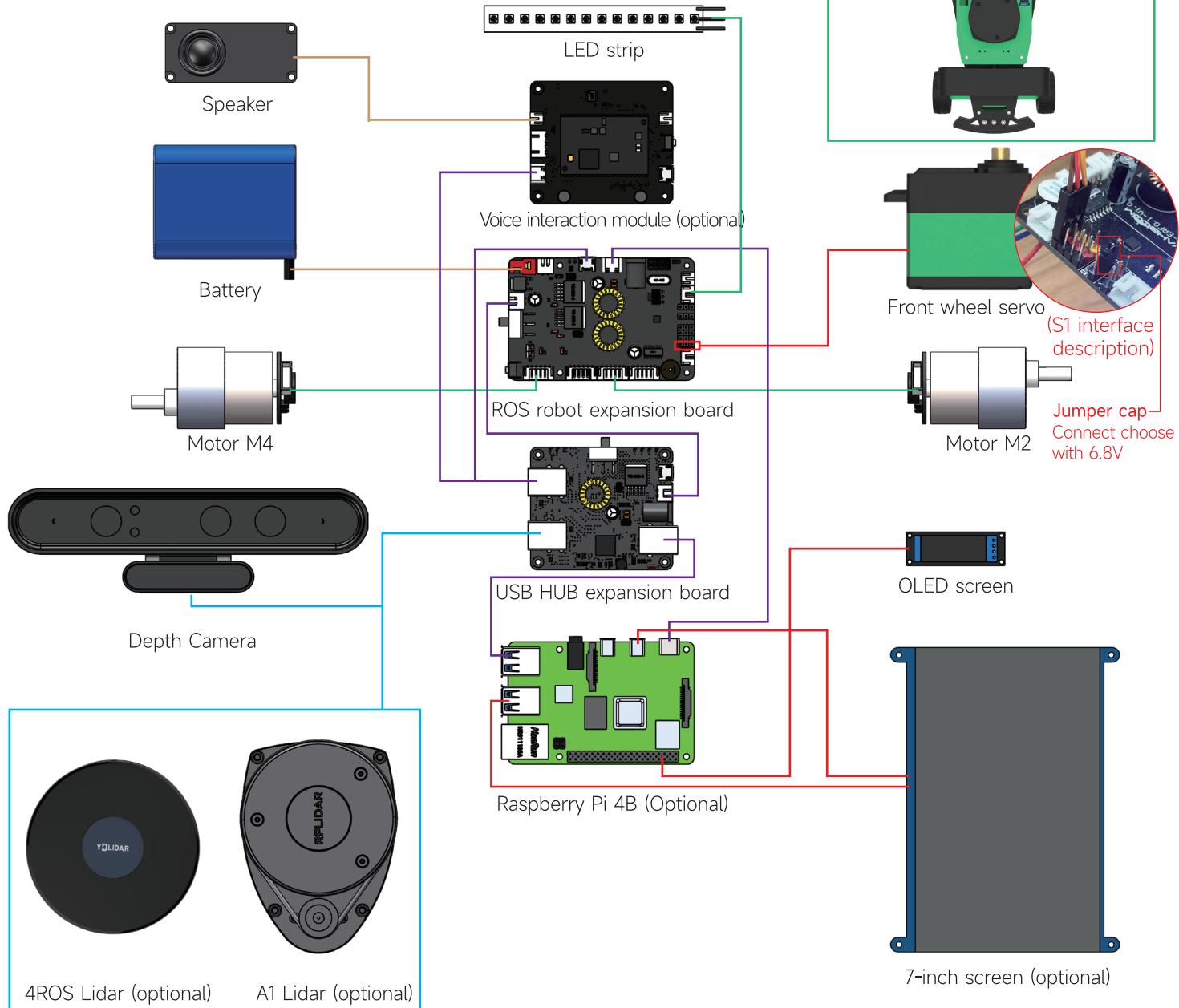
Wiring diagram for Jetson NANO 4GB version



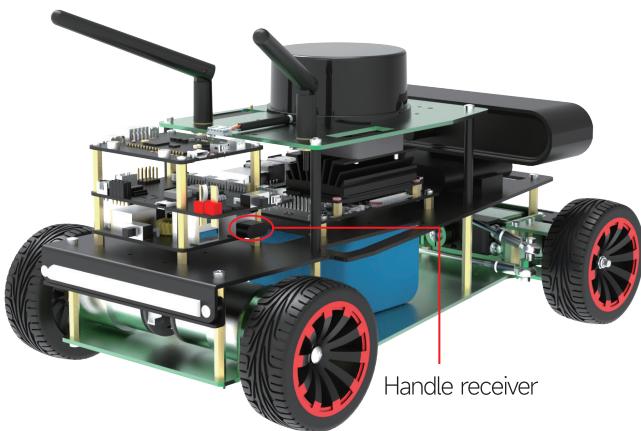
Wiring diagram for Jetson XAVIER NX/TX2 NX version



Wiring diagram for Raspberry Pi version



USB Handle Receiver Connection Instructions



Note: When using a USB handle receiver, it is recommended to connect it to USB-HUB expansion board instead of directly connecting it to the main control board. If directly connected to the main control board, the aluminum alloy plate on the main control board, which will affect the signal reception of the handle.

Download and install APP

- Android users search "MakerControl" in Play Store or scan the QR code on the homepage of the manual with browser to download APP.
- iOS users search "MakerControl" in App Store or scan the QR code on the homepage of the manual with camera to download APP.

Start up robot

The U disk (for Jetson NANO 4GB version), SSD (for Jetson Xavier NX/TX2-NXversion), TF card (for Raspberry Pi version) provided by Yahboom has been written into the Robot specific system image file. You can use them directly.

After completing all wiring according to the wiring diagram. Open the power switch and wait patiently for 2~3 minutes. When you hear the buzzer whistle three times, which means the system has been successfully started. At the same time, you can see some information is displayed on the OLED.

Raspberry Pi system, user name: pi

password: yahboom

Jetson NANO 4GB system, user name: jetson

password: yahboom

Jetson TX2-NX system, user name: jetson

password: yahboom

Jetson Xavier NX system, user name: jetson

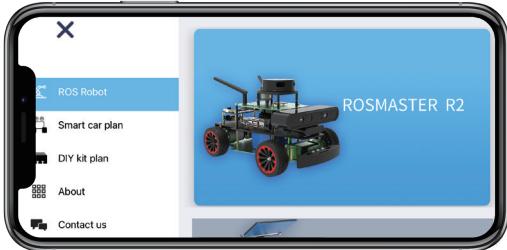
password: yahboom

Connect ROSMASTER R2

If you are using the system image file provided by Yahboom, after the robot starts normally, it will emit a WiFi hotspot signal [ROSMASTER], the password is 12345678. You can make your phone connect [ROSMASTER] WiFi to form a local area network between them. Or make robot and phone connect the same network.

1. Select device

Open the [MakerControl] APP, and select the [ROSMASTER R2].



2. Fill in the IP address displayed by the OLED on the robot, as shown below. Port and Video use default parameters. Click [Connect], after the connection is successful, it will automatically jump to the main control interface.



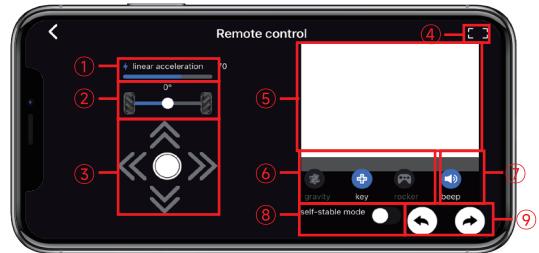
APP function introduction

The main interface of ROSMASTER APP is divided into three parts.

1. Remote control



Click the [Remote control] icon, you can see the following interface.



Part 1. Adjust the speed: control the running speed of robot.

Part 2. Adjust the angle of the front wheel servo: control the rotation angle of the front wheel servo.

Part 3. Control the car to move forward and backward, turn left, turn right and stop.

Part 4. Switching the full screen mode: Displays the full screen of the camera, which can be matched with USB wireless handle and stand to use.

Part 5. Camera display screen.

Part 6. Switch control mode: gravity induction, button control, rokcer control.

Part 7. Whistle: Control the buzzer, press the buzzer to turn on, release the buzzer to turn off.

Part 8. Auto-stabilization mode: When auto-stabilization mode is turned on, the car will immediately receive a stop command; When the car receives a stop command, it will coast for a period of time and stop.

Part 9. Control spin left and right: control the maximum angle of the front wheel servo of robot to rotate left and right.

2、Colorful light



Click the [Colorful light] icon, you can see the following interface.



The colorful light are divided into three parts.

Part 1. Upper left area: When we directly drag the [R] [G] [B] scroll bar, we can see that the RGB light bar at the rear of the robot will be changed in real time.

Part 2. Lower left area: This function can make the RGB light bar display red, green, blue, yellow, purple, cyan, white and off. Users can also adjust the color of the breathing light.

Part 3. Right area: After pressing a button, the RGB lights will show the corresponding special effects, click the button again to exit the special effect. The scroll bar below can change the speed of the lighting effects, the default is 5, the fastest is 1, and the slowest is 10.

3、Configuration



Click the [Configuration] icon on the main interface, and the following interface will appear.

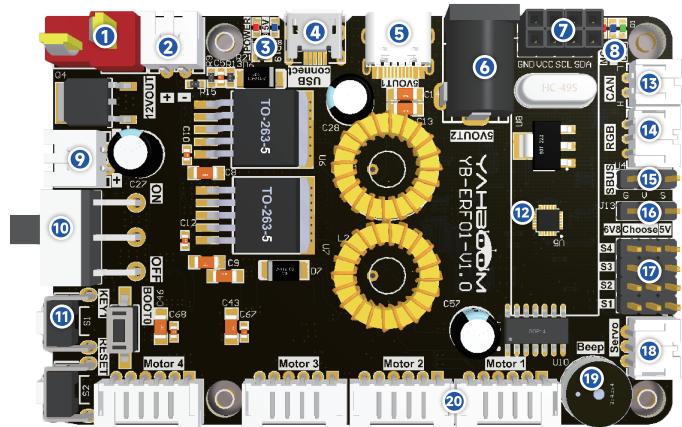


Adjust the relative zero value (default angle value) of the front wheel servo on this interface.

Steps:

- 1) Lift the front wheel of robot away from the ground.
- 2) Then adjust the sliding bar and observe the two front wheels of robot. The best effect is that keep the two front wheels parallel to the front of the robot car.
- 3) Click "comfirm" to save the data.

Expansion board functional layout



- ① T-type DC 12V power input interface: Connect to the DC 12V power supply or 12V battery.
- ② DC 12V power output: Provide DC 12V power to an external device.
- ③ Power indicator: Indicates whether the power supply is normal.

- ④ Micro USB data interface: Connect to main control board.
- ⑤ Type-C interface: Provide DC 5V to an external device, only power supply can't communicate.
- ⑥ DC 5V output interface: Can supply power to main control board
- ⑦ I2C interface: Can connect external I2C devices, such as OLED screen.
- ⑧ Indicator: Data indicator and 6.8V voltage indicator.
- ⑨ DC 12V power output: Provide DC 12V power to the outside.
- ⑩ DC 12V power switch: Power switch.
- ⑪ Button:

Button KEY1: User function button, which can realize custom functions through programming.

Button RESET: Reset button of the onboard microcontroller.

Button BOOT0: BOOT0 button of the on-board MCU is used for the MCU to enter the flashing mode.

⑫ 9-axis attitude sensor: Check the current attitude of the expansion board.

⑬ CAN interface: Connect CAN devices.

⑭ RGB light bar interface: Connect to RGB colorful light bar.

⑮ SBUS interface: Connect to the model aircraft remote control receiver.

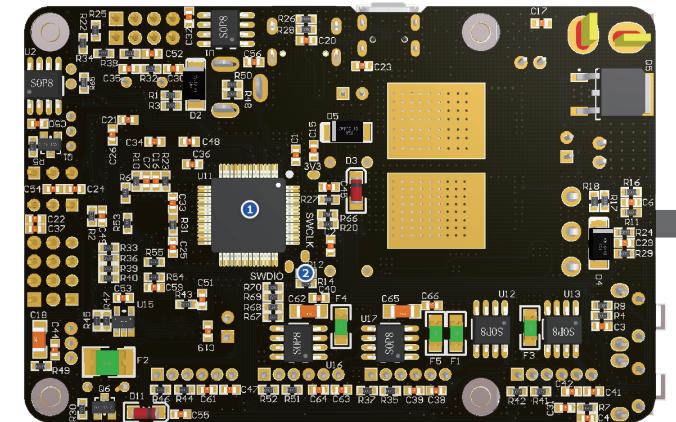
⑯ PWM servo voltage switch: Change the position of the jumper cap to select 6.8V or 5V to supply power to the PWM servo.

⑰ PWM servo interface: It can be connected to 6.8V or 5V voltage PWM servo, and the corresponding voltage should be selected in ⑯ according to the servo voltage.

⑱ Serial Servo Interface: Connect to the serial servo of robotic arm.

⑲ Buzzer: Whistle.

⑳ 4-channel motor port: Connect four motors. Please refer to the corresponding tutorials according to different robots.



- ① On-board MCU: It is mainly used to control external devices on the expansion board, such as buzzer, motor drive, etc.
- ② Debugging interface: Connect to the SW interface on ST-Link or J-Link to debug the MCU or download the MCU firmware.

FAQ

1. When we continuously drive astrapro.launch, the system will prompt an error.
A: You need to re-plug the camera USB cable and close the terminal, then use it continuously.
2. When running the single code, the robot model is incorrect or the phenomenon is inconsistent.
A: Please check whether the model and lidar in the .bashrc file are consistent with the model you purchased.
3. How does the main control communicate with the expansion board?
A: The main control board sends serial data, and then transmits the data to the expansion board through the USB port. The expansion board integrates a MCU, which can receive and parse the serial port data, and then process the specific commands to be executed.

4. How is the robot powered? Does the main control board need an additional power supply?

A: The battery pack is included in the robot kit, plug the battery pack into the DC 12V power T-type of the expansion board. Open the power switch, the expansion board integrated voltage conversion chip provides DC 5V power supply, and transmits power to the main control board through the DC 5V power cable.

5. Which functions on the expansion board are managed by MCU?

A: The part managed by MCU on the expansion board includes: robotic arm, active buzzer, attitude sensor, PWM servo, motor, RGB light bar, key KEY1, RESET key, SBUS interface, CAN interface, etc.

6. How does the expansion board update the MCU firmware? Why update microcontroller firmware?

A: The MCU integrated in the expansion board has already programmed the firmware when it leaves the factory. If it is not necessary, please do not need to update the firmware. If you need to update the firmware, please refer to Yahboom tutorials.

7. When I turn on the power of robot car, the buzzer keeps sounding

A: The robot expansion board has a battery voltage detection function. When the battery voltage is not enough to maintain the car's working voltage, the buzzer will keep sounding to indicate that the car battery is low and needs to be charged.

8. After the voice control module is connected, the robot car cannot be controlled?

A: Because the ID device numbers of the USB HUB board and the voice interaction module are the same.

If the user directly plugs the voice interaction module, it will conflict with the port number of the USB HUB board device. If you need to use the voice interaction module, please re-bind the device port number according to the tutorial **【14.2 Voice control module port binding】**.

Lithium-ion battery safety specification

1. It is strictly forbidden to connect to equipment that exceeds the load used by the product.

2. Please use the official battery, power adapter and battery box provided by Yahboom.

3. When the battery voltage is less than 9.6V, the expansion board buzzer will emit a “di di di” alarm sound and the MCU indicator will flash quickly. At this time, you need to turn off the power and then charge the battery.

4. When charging the battery, please turn off the power switch on the expansion board. Do not use the battery while charging to prevent the charger or the battery from exploding.

5. When charging, the indicator light of the charger is red, indicator light on the charger will become green, when battery is fully charged. When charging the battery, someone should take care of it. After charging, unplug the charger as soon as possible to avoid overcharging of the battery.

6. After using, turn off the power switch on the expansion board. When not in use for a long time, please keep the voltage of the lithium battery pack 11.1V~11.7V, use a screwdriver to remove the battery box, take out the lithium battery pack and put it in the battery safe area. Do not mix with metal objects, and the insulating film wrapped on the outside cannot be torn off.

7. Keep away from heat, fire, any liquid. Don't use it in wet or rain. Humid environment may cause the battery to ignite or even explode.

8. When the lithium battery pack or battery charger catches fire or smoke, please use sand or dry powder fire extinguisher to extinguish the fire, and then quickly evacuate to a safe area.

9. Don't use the battery when it is leaking, damaged,

heated, deformed, discolored, smelly or any other abnormal phenomenon, and contact Yahboom or other agents in time.

10. Please use the battery at 0° C~35°C environment.The battery will be damaged or the discharge performance will be extremely reduced at other temperatures.

11. Intentional puncture, short circuit, reverse connection, unauthorized welding, impact, crushing, and throwing of batteries are strictly prohibited.

12. Do not use the battery in a strong static and magnetic field environment, otherwise the battery may leak fluid, catch fire or even explode.

13. It is strictly forbidden to modify the hardware circuit board without permission.

14. Do not allow children to replace batteries without adult supervision. Keep batteries out of the reach of children.

15. If the charger or battery pack smokes or hot (the outer packaging will crack in severe cases) or the battery leaks, please disconnect the power strip or the main gate, then quickly pull out the charger, remove the battery and put it in an open area.

Solemnly declare: Users must read this manual carefully, especially the parameter indicators, precautions, etc., understand the use method and application range of the product. Any economic loss and safety accident caused by failure to comply with the above-mentioned lithium ion battery use specifications or operating errors shall be borne by the user.

Tutorial link

Tutorial link: <https://www.yahboom.net/study/ROSMASTER-R2>

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