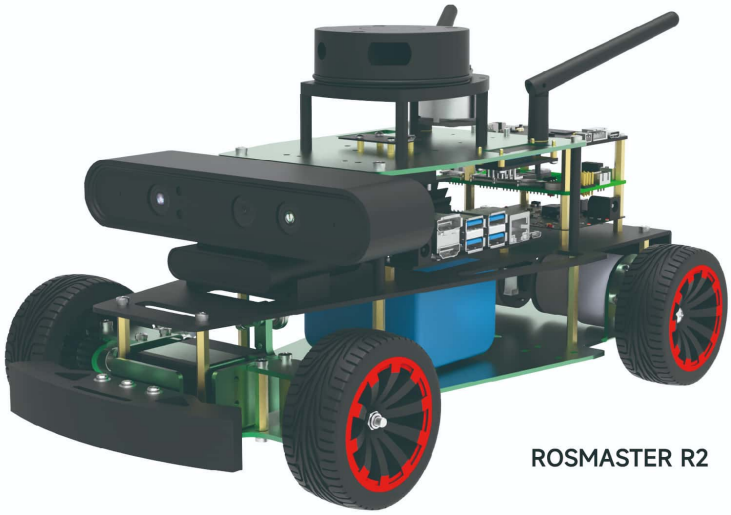
Accessories introduction

YAHBOOM

ROSMASTER R2

说明书/Manual



ROSMASTER R2

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】

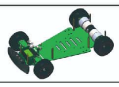
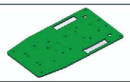
Android users search "MakerControl" in Play Store to download APP.
iOS users search "MakerControl" in App Store to download APP.

官网在线学习：https://www.yahboom.com/study/ROSMASTER-R2 提取码：afes

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

在产品使用过程中，如对以下说明有疑问的，请根据说明书首页的网址查阅最新的网页资料或者联系我们技术支持。
! Any questions about the instructions on manual, please enter the tutorial link on the homepage, check the latest information on our website or contact our technical support.

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

Voice interaction package (optional)

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

Raspberry Pi Accessories (optional)

	Raspberry Pi 5 (Optional)		TF card
	Cool cooler Pi 50		Double-headed Type-C power supply line
	(Pi) parts package		

Jetson NANO 4GB Accessories(optional)

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

7-inch screen package (optional)

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

Jetson Orin Nano Accessories (Optional)

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

Jetson Orin NX Accessories (optional)

	Jetson Orin NX development board (Optional)		128G SSD
	Orin 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		

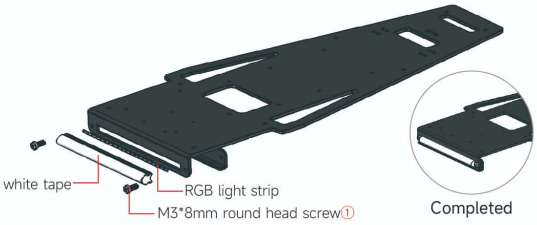
YDLIDAR 4ROS Lidar (Optional)

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

Assemble Steps

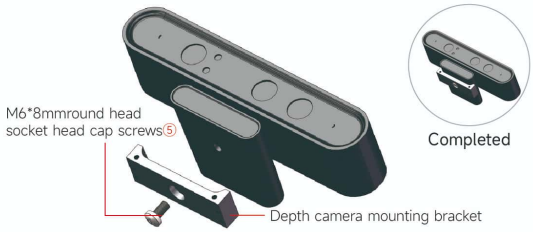
(The red serial number that appears in the installation step correspond to screw pack number)

1. Install RGB light strip

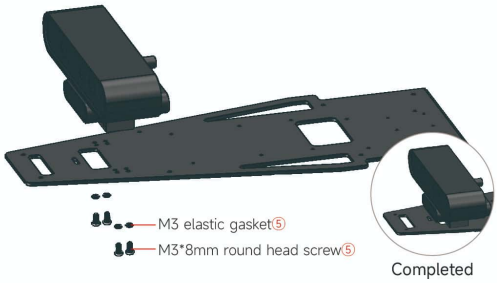


2. Install depth camera

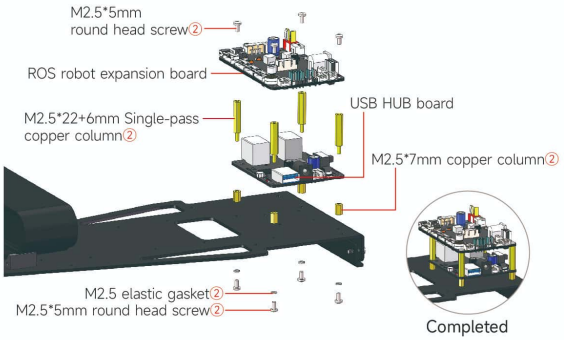
①Install depth camera mounting bracket



②Install depth camera

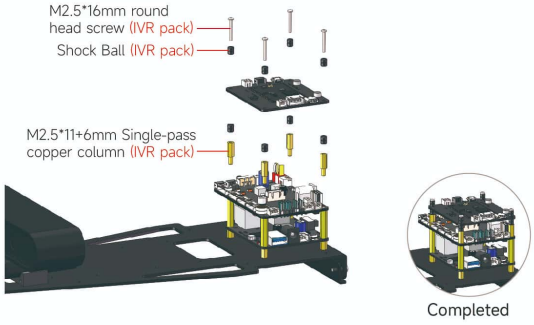


3. Install expansion board



4. Install Voice interaction module

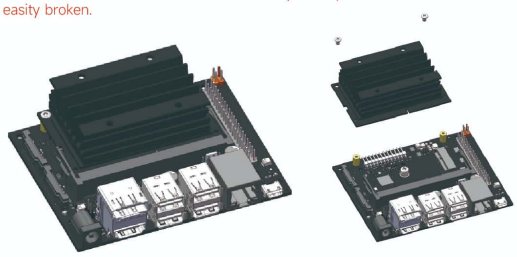
(Just for Voice interaction module version)



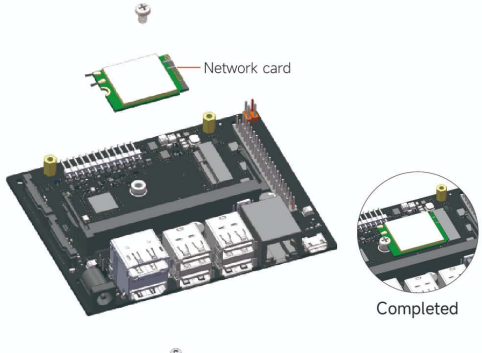
5. Install Jetson NANO board (Just for Jetson NANO version)

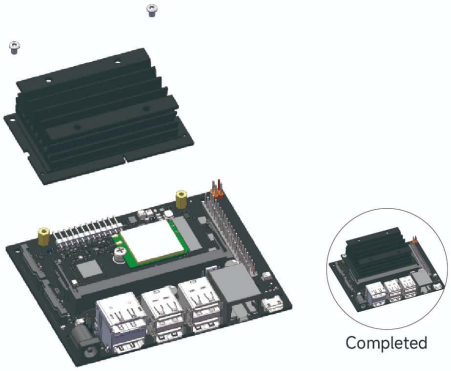
①Remove the core board

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

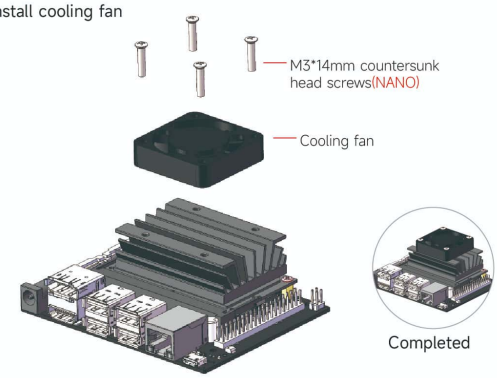


②Install network card

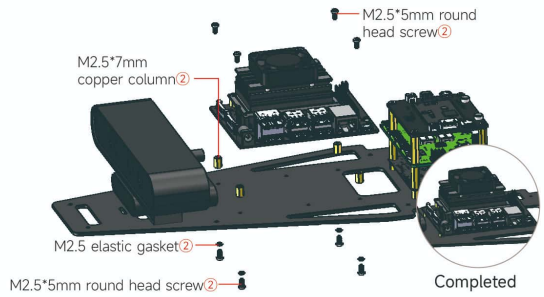




③Install cooling fan

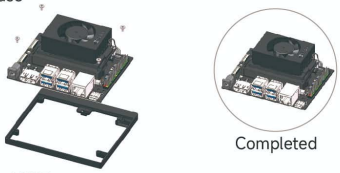


④Install Jetson NANO board

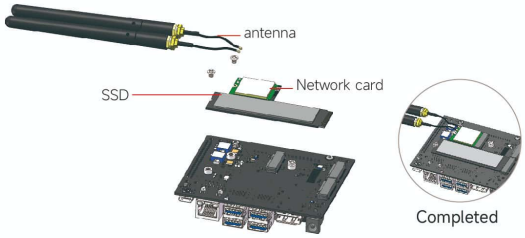


6. Install Jetson Orin Nano/Jetson Orin NX
(Just for Jetson Orin Nano/Jetson Orin NX version)

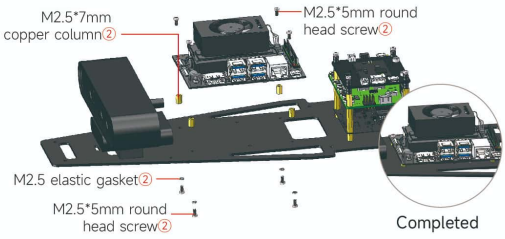
①Remove Jetson orin base



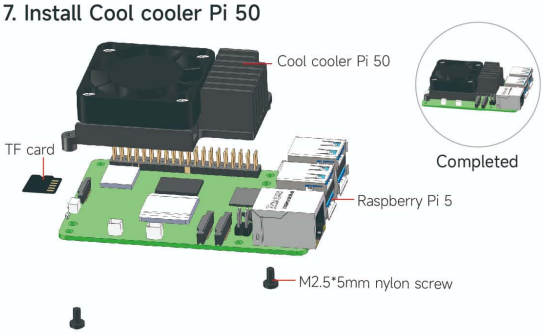
①Install network card and SSD



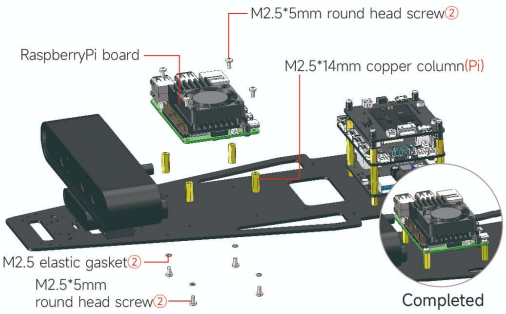
②Install Jetson Orin Nano/Jetson Orin NX board



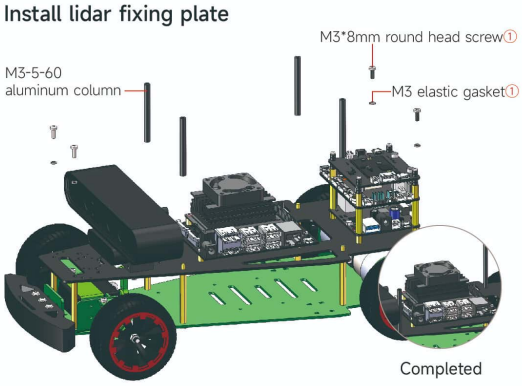
7. Install Cool cooler Pi 50



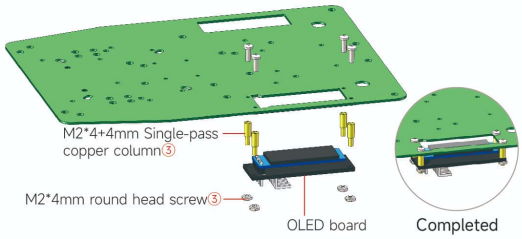
8. Install RaspberryPi board
(Just for RaspberryPi version)



9. Install lidar fixing plate

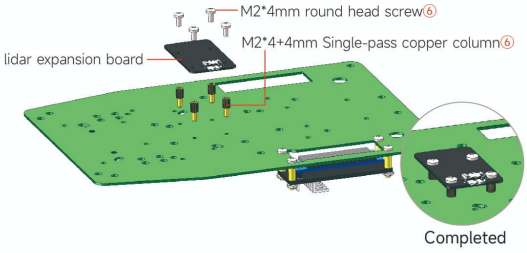


10. Install OLED board

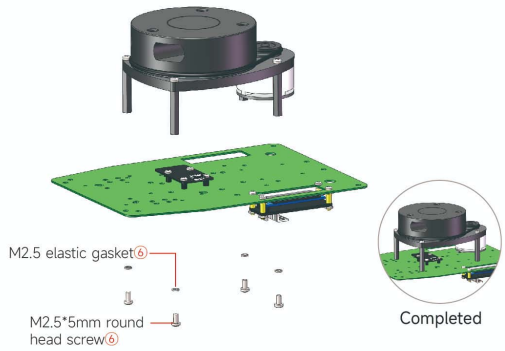


11. Install SLAM AI lidar (Just for A1 lidar version)

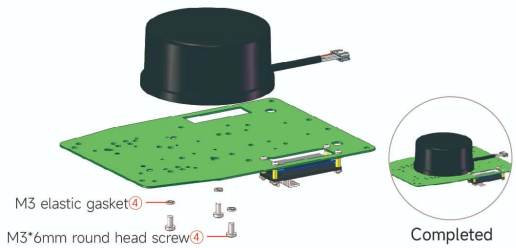
①Install lidar expansion board



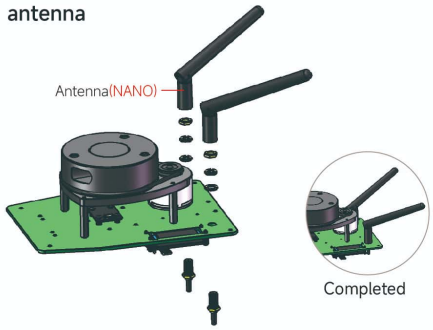
②Install lidar



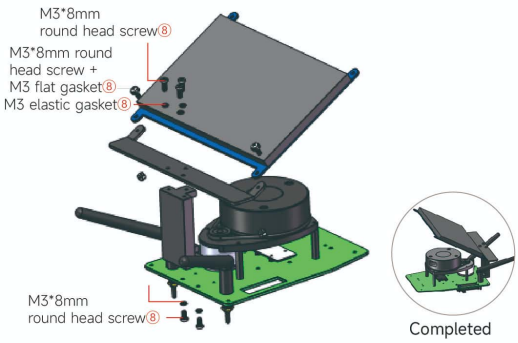
12. Install YDLIDAR 4ROS lidar (Just for 4ROS lidar version)



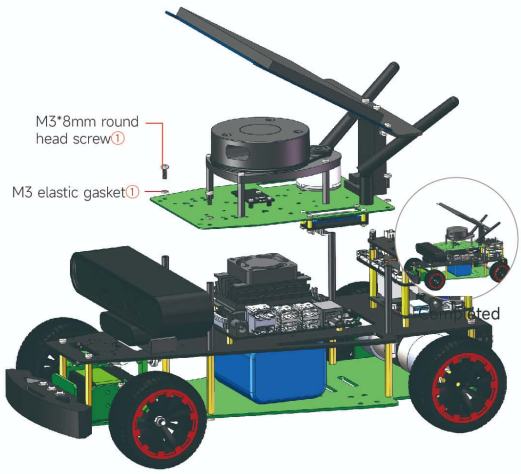
13. Install antenna

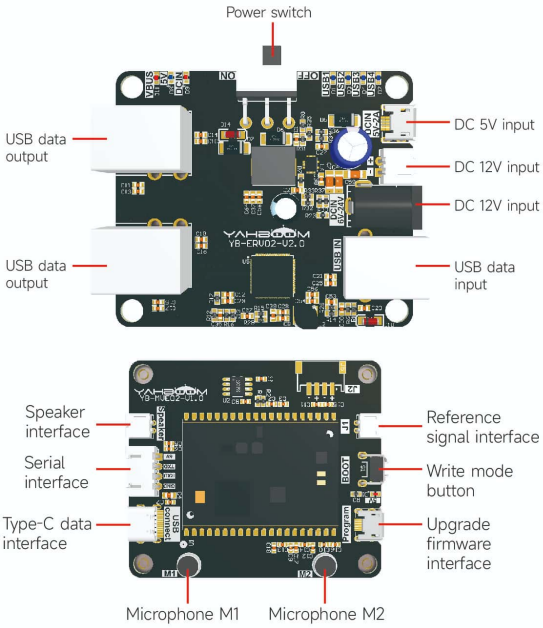


14. Install 7 inch screen (Just for 7 inch screen version)

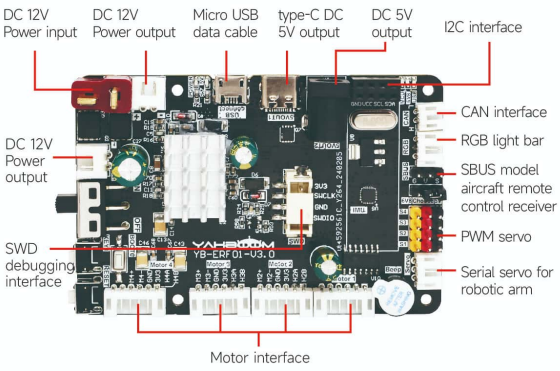


15. Top plate assembly

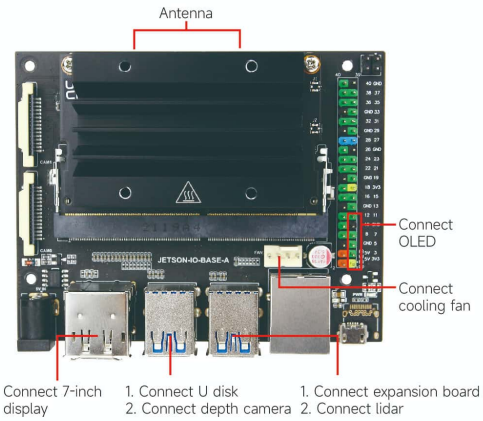




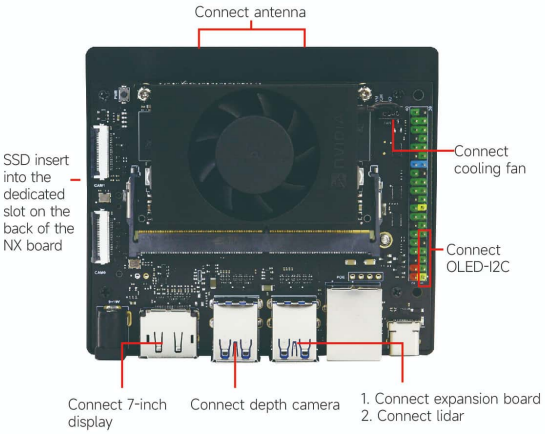
Expansion board interface description



JETSON NANO 4GB board interface description



Jetson Orin Nano/Orin NX board interface description



Install U disk and TF card

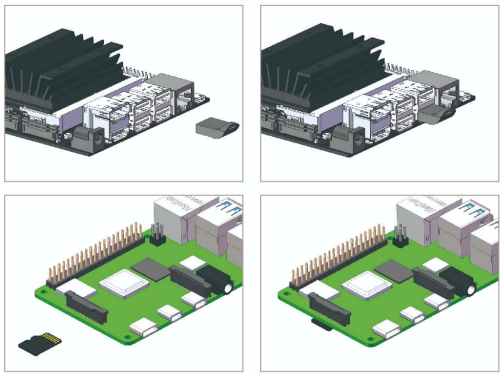
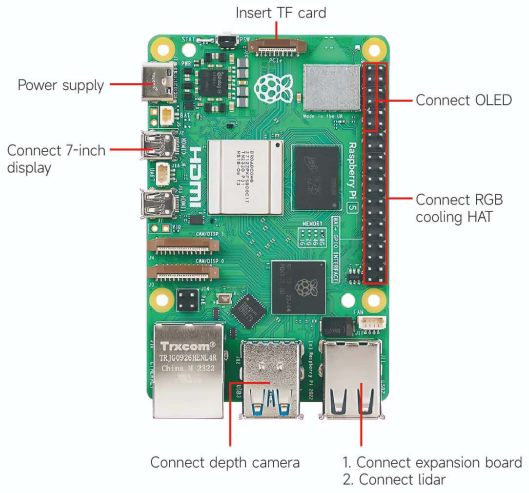


Figure 1-2 Insert U disk into Jetson NANO.
Figure 3-4 Insert TF card into Raspberry Pi.

Raspberry Pi board interface description

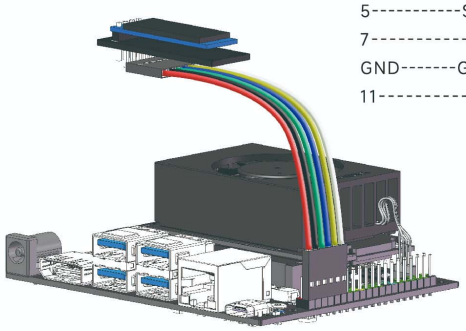


OLED module wiring diagram

1. For Jetson version

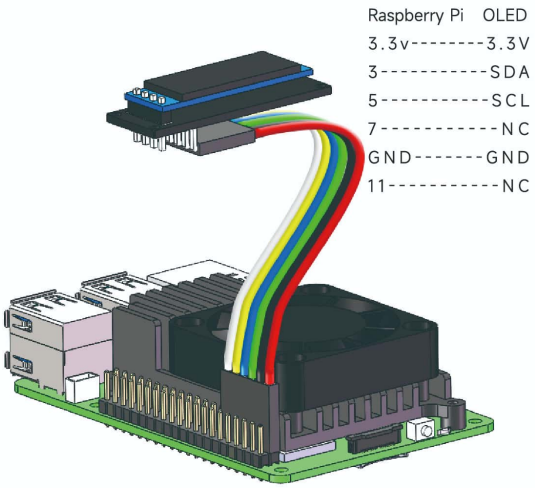
(Please connect the OLED and Jetson board correctly, as shown below.)

Jetson	OLED
3.3v	3.3V
3	SDA
5	SCL
7	NC
GND	GND
11	NC

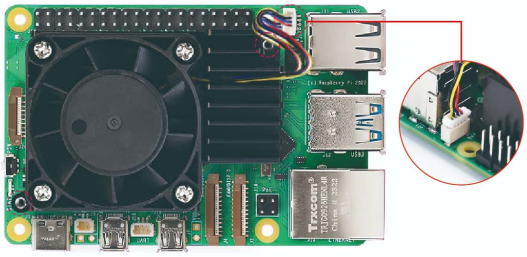


2. For Raspberry Pi version

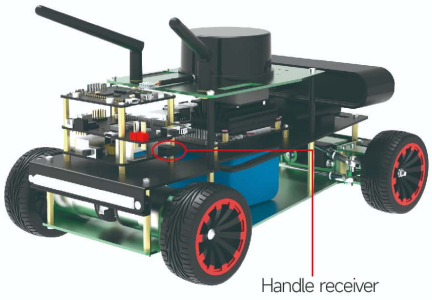
(Please connect the OLED and Raspberry Pi board correctly, as shown below.)



Wiring Instructions Of Cool cooler Pi 50



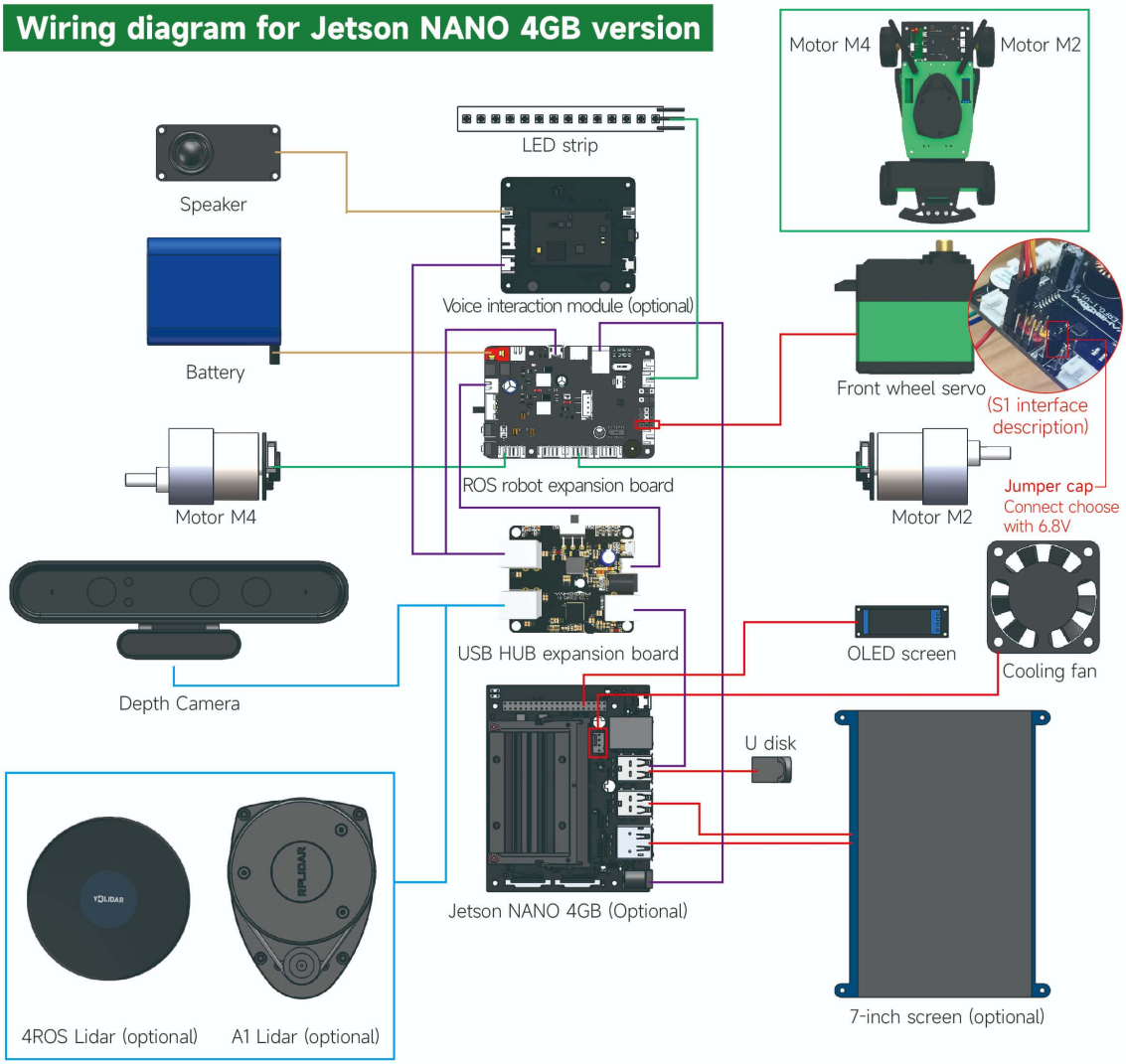
USB Handle Receiver Connection Instructions



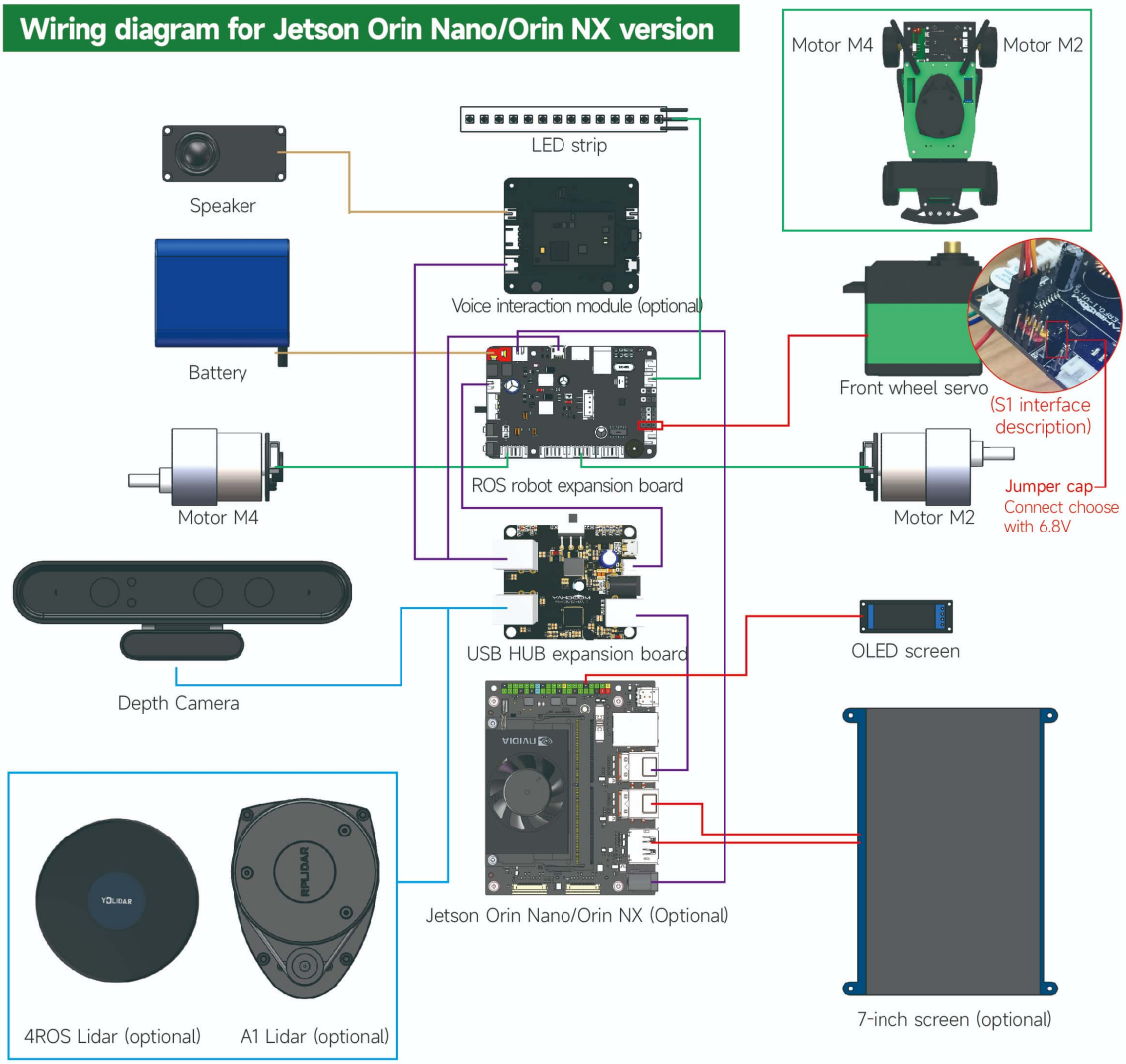
Wireless handle

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 mian control board. If directly connected to the main control board, the aluminum alloy plate on the mian control board, which will affect the signal reception of the handle.

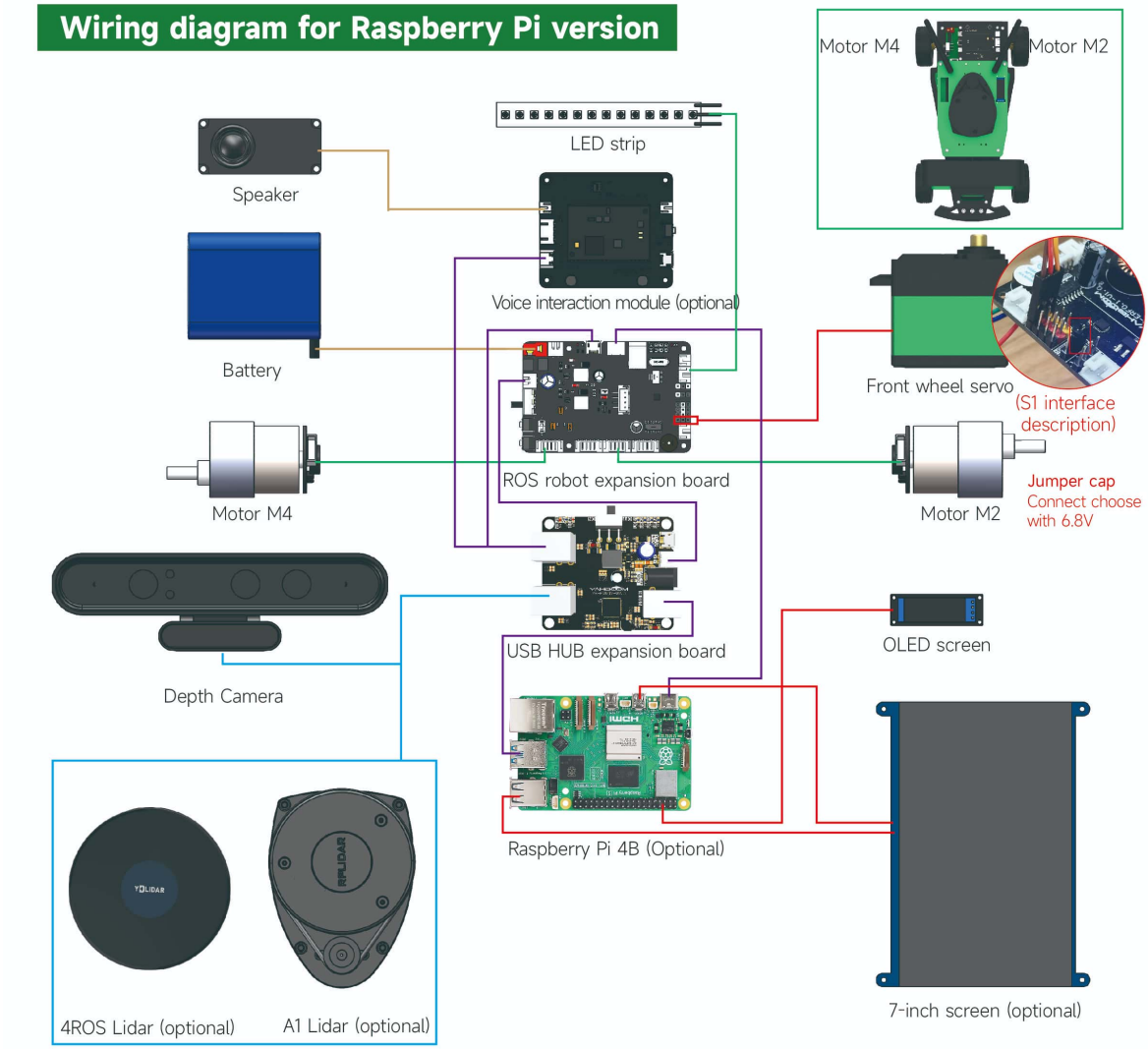
Wiring diagram for Jetson NANO 4GB version



Wiring diagram for Jetson Orin Nano/Orin NX version



Wiring diagram for Raspberry Pi version



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 Orin Nano/Jetson Orin NX version)， TF card (for Raspberry Pi version)provided by Yahboom has been written into the Robot specific system image file. You can be 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 Orin Nano system, user name: jetson password: yahboom
Jetson Orin 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 WIF 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].

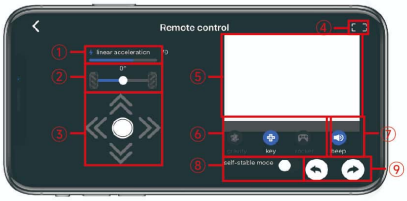
2. Fill in the IP address displayed by the OLED on the robot, as shown below. Port and Video use default parameters. Click [Connect], after the connection is successful, it will automatically jump to the main control interface.

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 t 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.

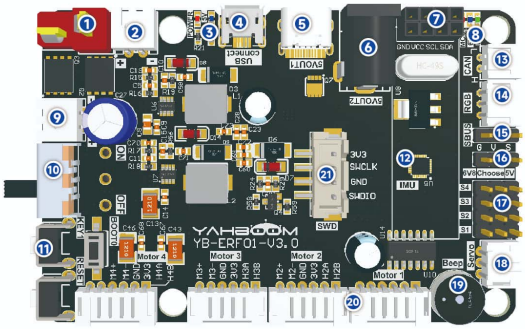
3、Configuration

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

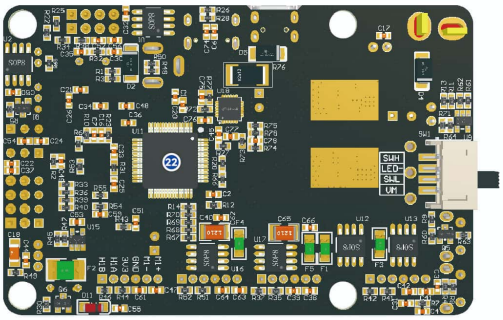
Adjust the relative zero value (default angle value) of the front wheel servo on this interface.

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.
㉑ SWD debugging interface: Can connect J-Link and ST Link for simulation debugging and download.



㉒ On-board MCU: It is mainly used to control external devices on the expansion board, such as buzzer, motor drive, etc.

FAQ

1. When we continuously drive astrapro.lauch, 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 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

Technical Support

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