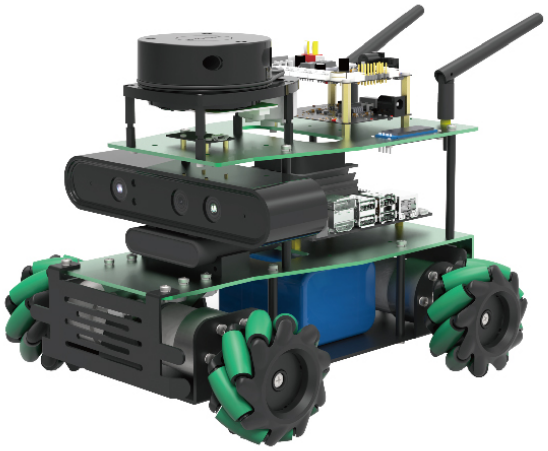
Installation instruction

YAHBOOM

ROSMASTER

说明书/Manual

ROSMASTER X1



ROSMASTER X3

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-X1 提取码：jikm Tutorial link: https://www.yahboom.net/study/ROSMASTER-X1
官网在线学习: https://www.yahboom.com/study/ROSMASTER-X3 提取码：zsdf Tutorial link: https://www.yahboom.net/study/ROSMASTER-X3

Packing List (standard)

	Pendular suspension bracket-1		Anti-collision beam
	Motor base plate		Main controller fixed plate
	Pendulum suspension bracket-2		RGB strip fixed bracket
	Lidar fixed plate		Robot expansion board
	USB HUB expansion board		Motor*4
	OLED		Coupling*4
	LED strip		Several cables
	Data line		Screwdriver
	Handle+ AAA battery		Battery
	USB 3.0		Charger
	Parts kit		Handle mobile phone holder
	Plastic tire*4 (X1 version)		Mecanum wheel*4 (X3 version)

Astra Pro Depth camera (optional)

	Astra Pro d epth camera		Fixed bracket
	No.5 Screw pack		

SLAM A1 Lidar (optional)

	SLAM A1 Lidar		Micro USB data cable (right bend)
	No.6 screw pack		

SLAM S2 Lidar (optional)

	SLAM S2 Lidar		No.7 screw pack

YDLIDAR X3 Lidar (Optional)

	X3 Lidar		Expansion plate
	Type-c data cable		No.1 screw pack

7-inch screen package (optional)

	7-inch screen		7-inch screen fixed bracket 7 inch screen support
	HDMI Adapter		No.8 screw pack
	Micro USB data cable (right bend)		HDMI+DP

Jetson Orin NX Accessories (optional)

	Jetson Orin NX developer kit (optional)		128G SSD
	Orin NX parts package		DC to 2Pin power cable
	Network card antenna		

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		

Raspberry Pi Accessories (optional)

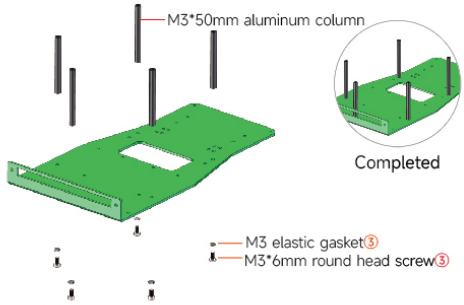
	Raspberry Pi 4B (optional)		TF card
	RGB cooling HAT		Type-c male-to-male data cable
	(Pi) parts package		

Jetson NANO 4GB Accessories(optional)

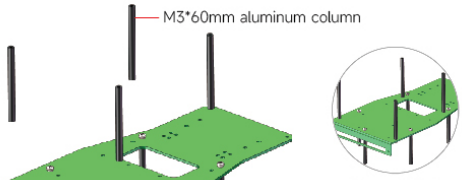
Assemble Steps

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

1. Install M3*50 aluminum column



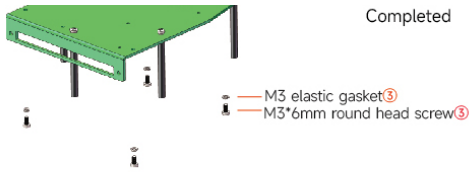
2. Install M3*60 aluminum column



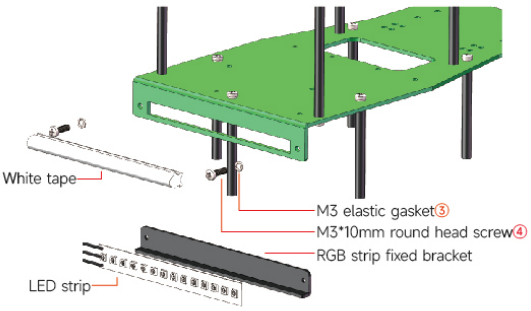
	Jetson NANO 4GB (optional)		U Disk
	(NANO 4GB) parts package		4010 cooling fan
	M.2 Antenna		DC Power cable

Voice interaction package (optional)

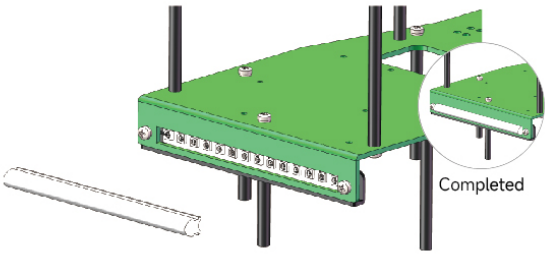
	Voice interaction module		Type-c data cable
	Voice Screw Pack		Speaker

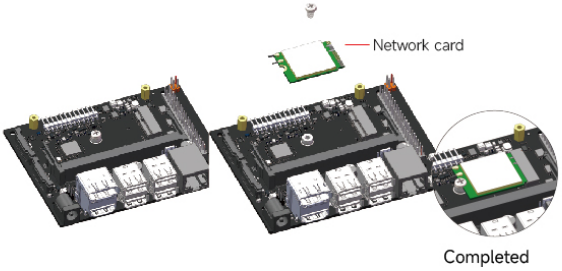


3. Install LED strip



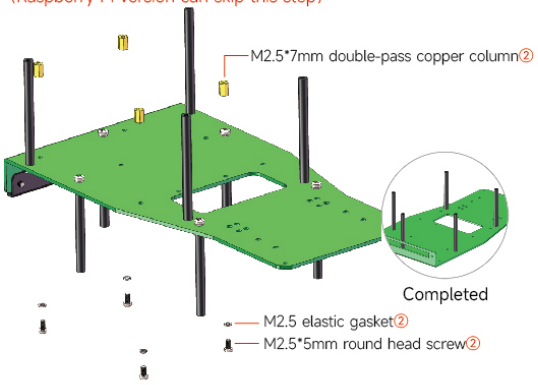
② Install network card

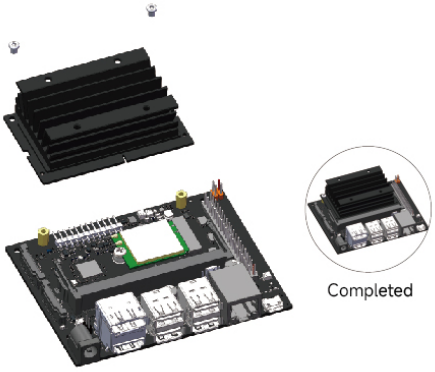




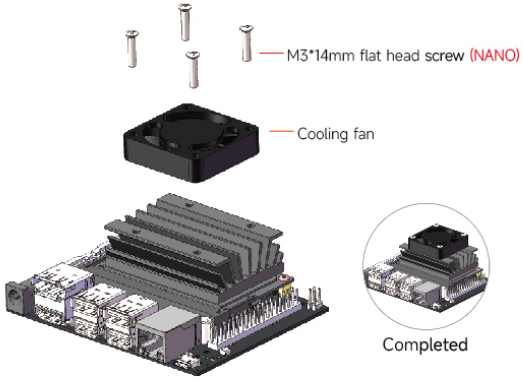
4. Install supporting copper pillars

(Raspberry Pi version can skip this step)





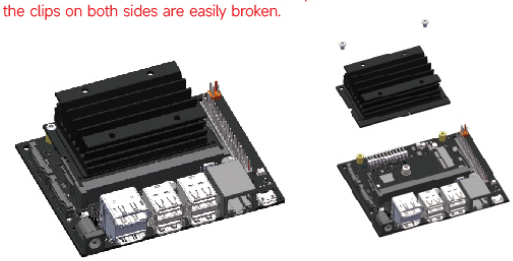
③ Install cooling fan



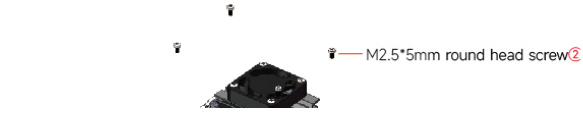
5. Install Jetson NANO board

① Remove the core board

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

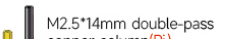


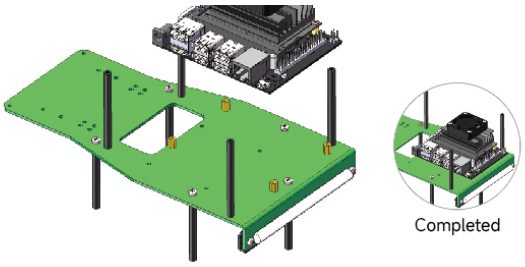
④ Install Jeston NANO board

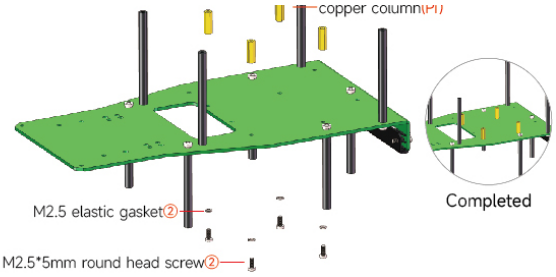


7. Install Raspberry Pi board

① Install supporting copper pillars

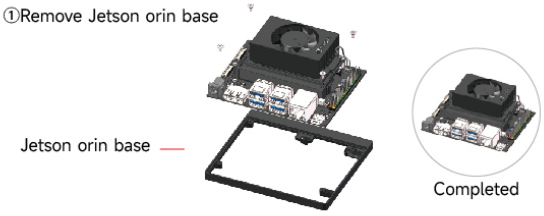




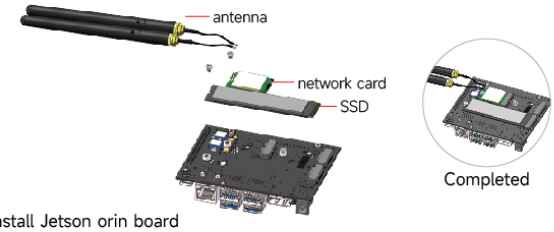


6. Install Jetson Orin Nano/Jetson Orin NX

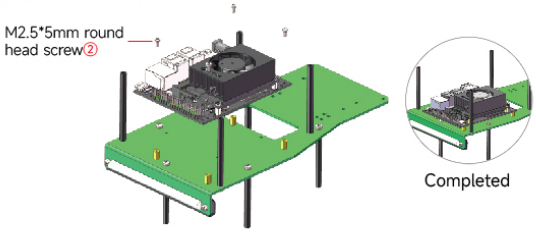
①Remove Jetson orin base



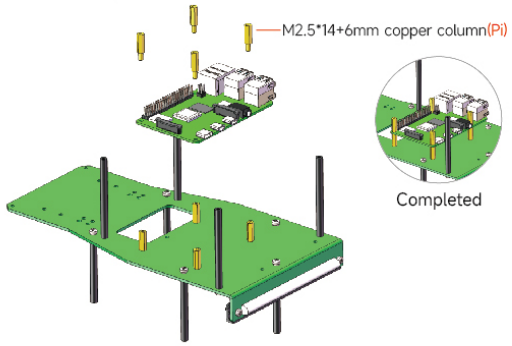
②Install network card、SSD、antenna



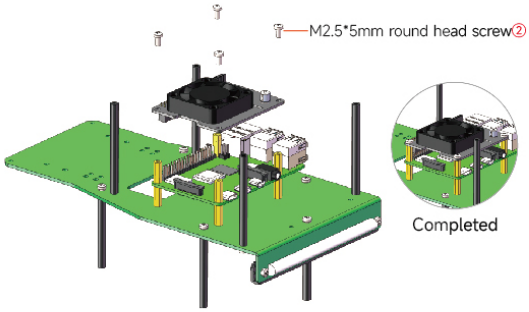
③Install Jetson orin board



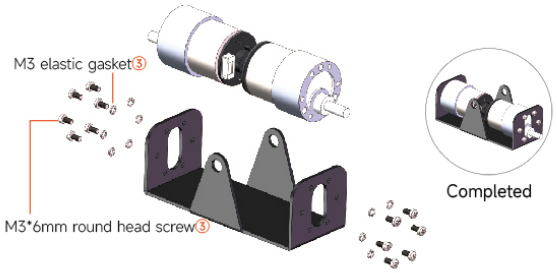
② Install Raspberry Pi board



③ Install RGB cooling HAT

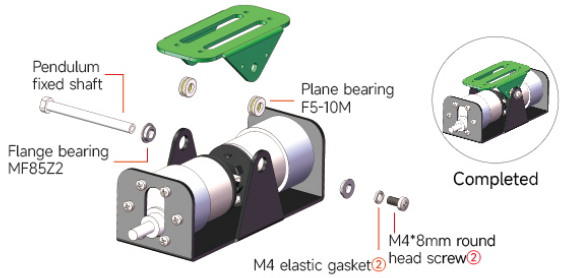


8. Install pendulum suspension bracket-1 and motor

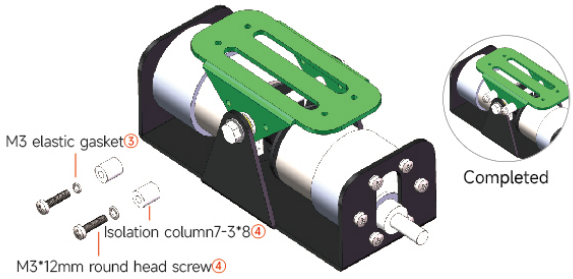


9. Install pendulum suspension bracket-2

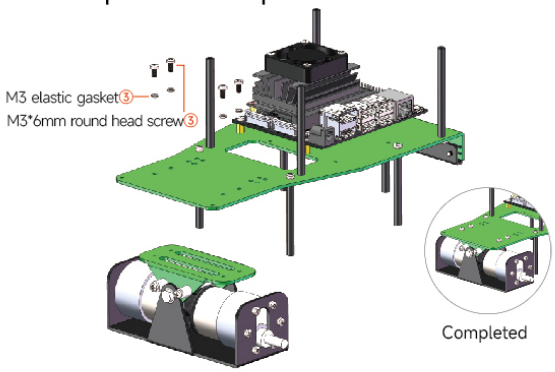
(Please check installation video)



10. Install suspension limit post



11. Install pendulum suspension

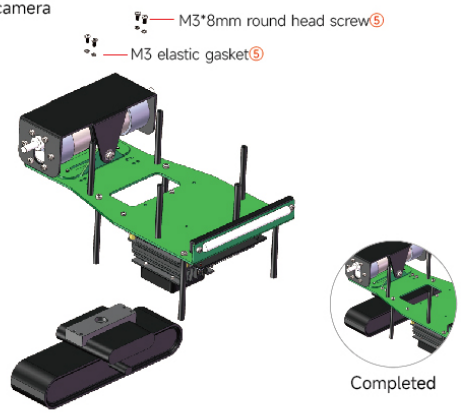


12. Install Depth camera

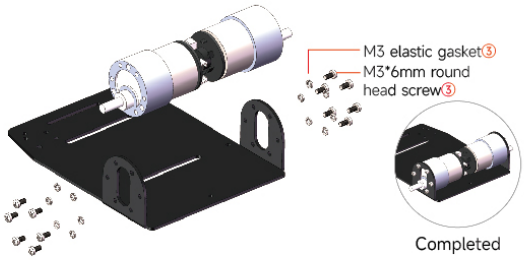
(You can skip this step if you have not purchased this accessory)

① Install fixed bracket

② Install camera

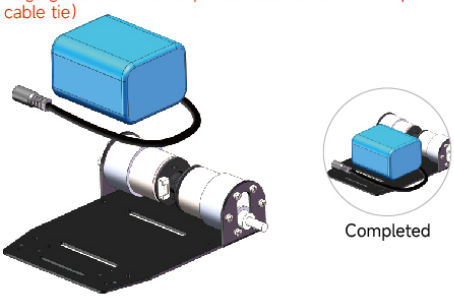


13. Install motor fixed bracket

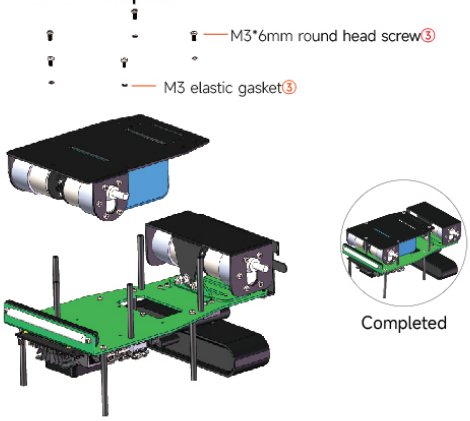


14. Install battery

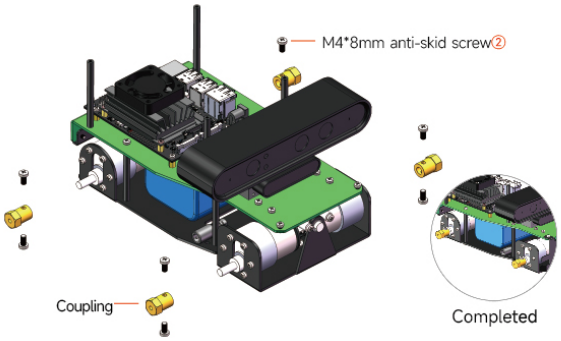
(The charging cable and battery can be fixed to the base plate with a cable tie)



15. Install bottom plate

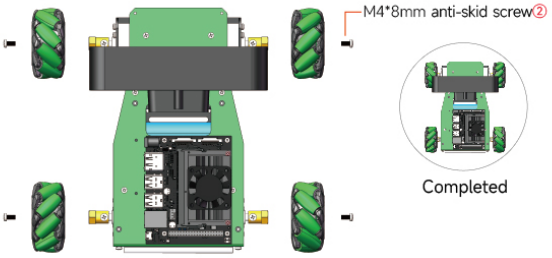


16. Install motor plate

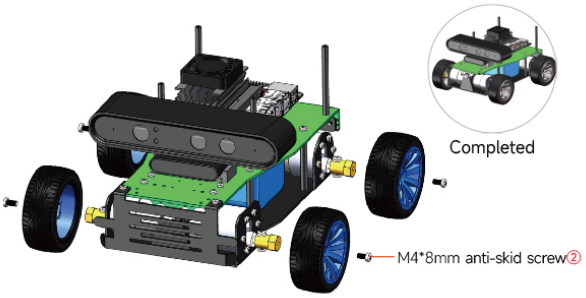


17. Mecanum wheel installation (just for X3 version)

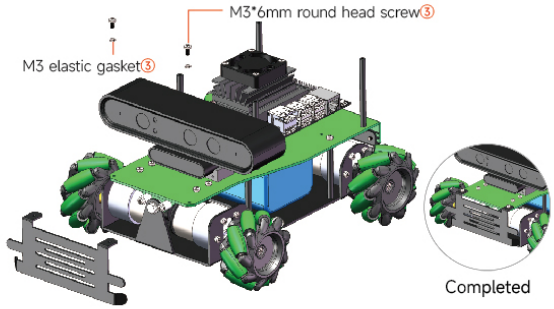
Note: Please install the Mecanum wheel in the direction shown in the picture



18.Metal high friction tire installation (just for X1 version)

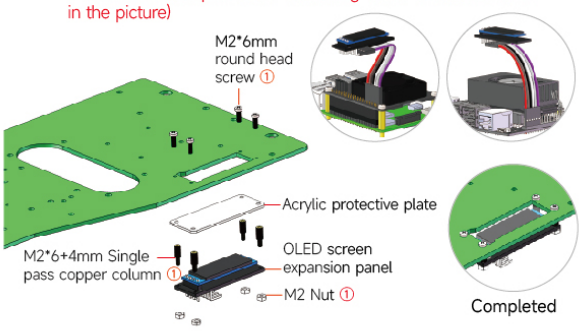


19. Install anti-collision beam

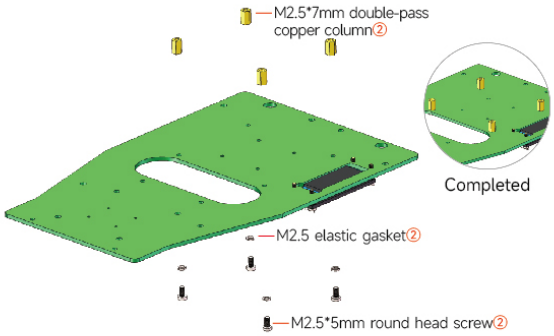


20. Install OLED

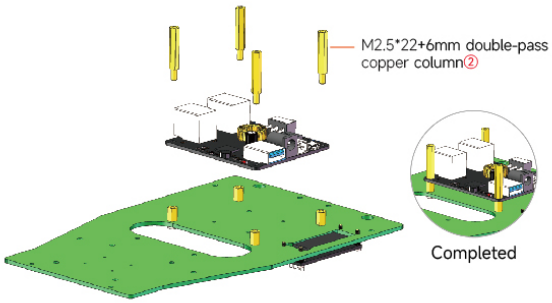
(Please insert the pin header according to the direction shown in the picture)



21.Install supporting copper pillars

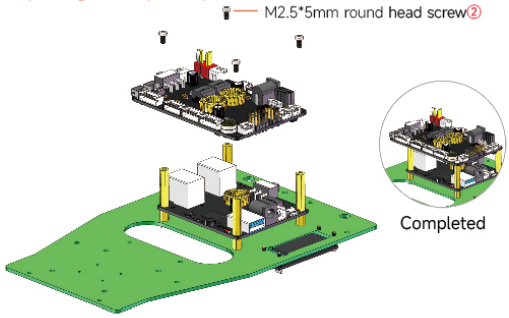


22. Install USB HUB expansion board



23. Install robot expansion board

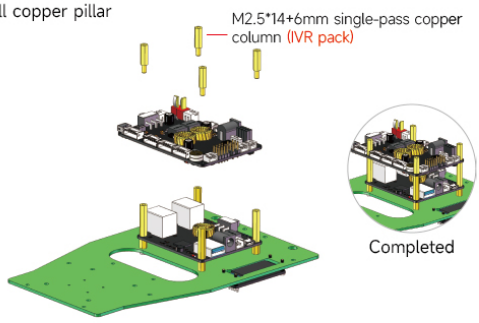
(If you purchased the voice interaction module, please ignore this step and go directly to step 24)



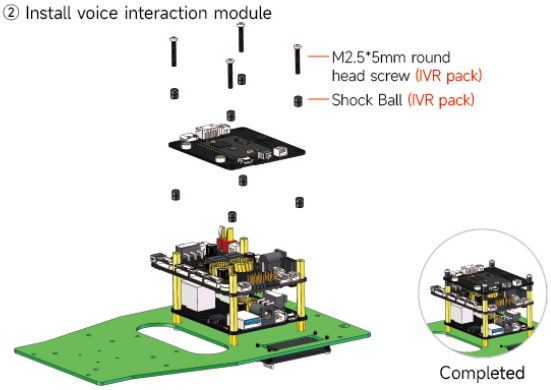
24. Voice interaction module installation

(You can skip this step if you have not purchased this accessory)

① Install copper pillar



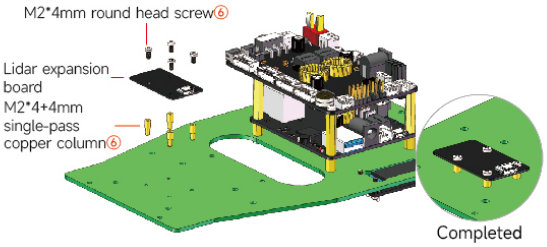
② Install voice interaction module



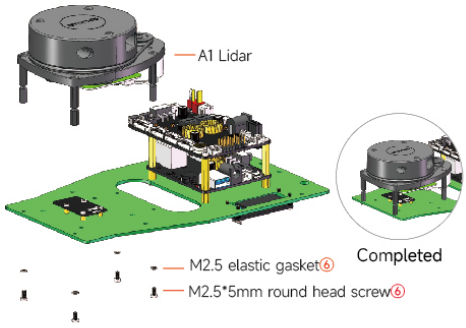
25. Install A1 lidar

(You can skip this step if you have not purchased this accessory)

① Install lidar expansion board

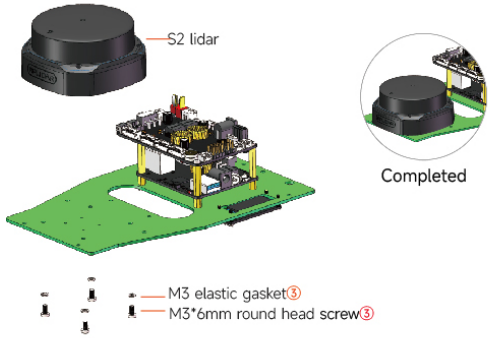


② Install lidar



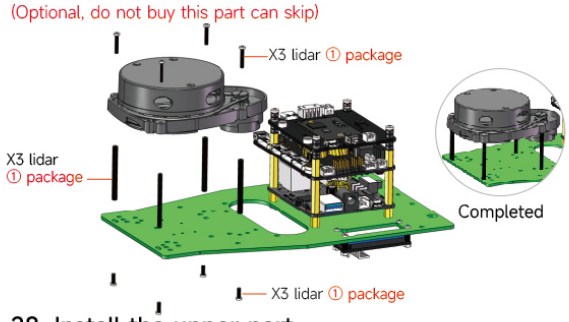
26. Install S2 lidar

(You can skip this step if you have not purchased this accessory)

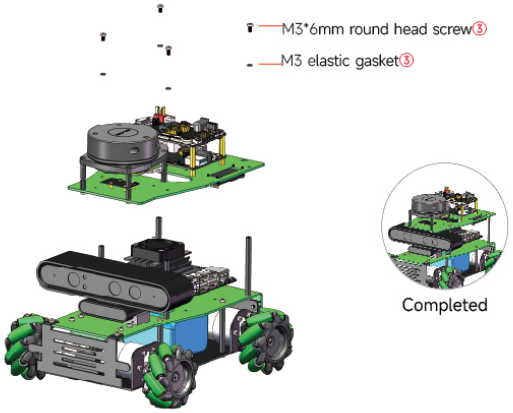


27. Installation of X3 Lidar

(Optional, do not buy this part can skip)

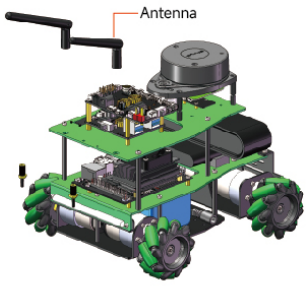


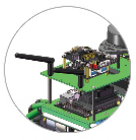
28. Install the upper part



29. Install antenna

(Raspberry PI master please skip)

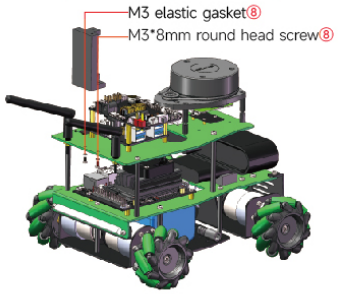


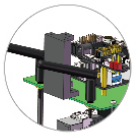


Completed

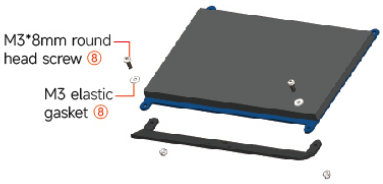
30. Install 7-inch screen

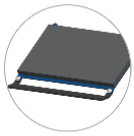
(You can skip this step if you have not purchased this accessory)



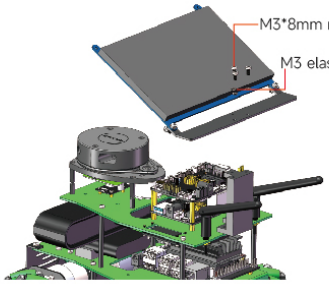


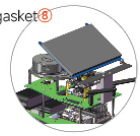
Completed





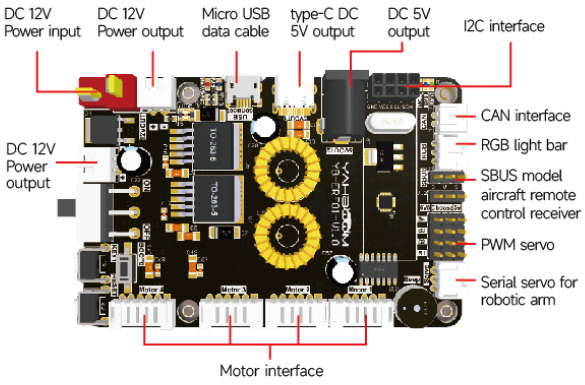
Completed

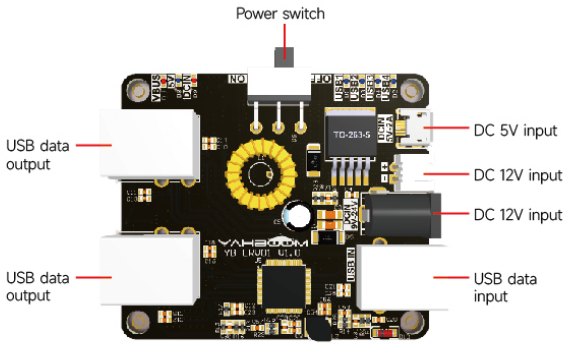


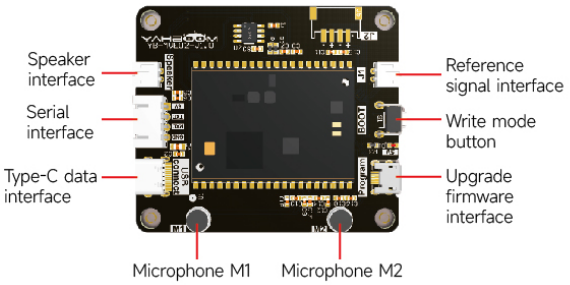


Completed

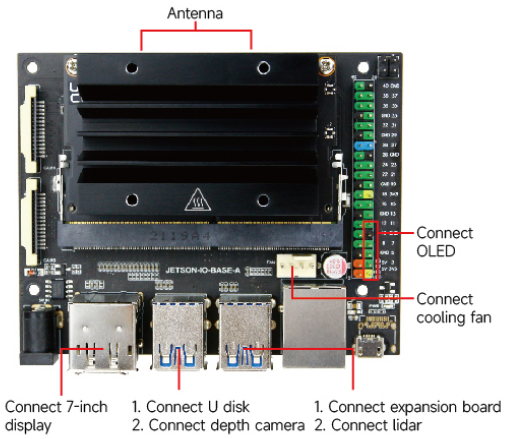
Expansion board interface description



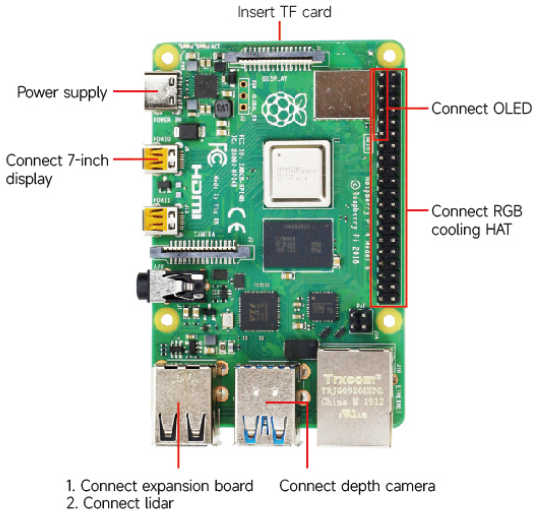




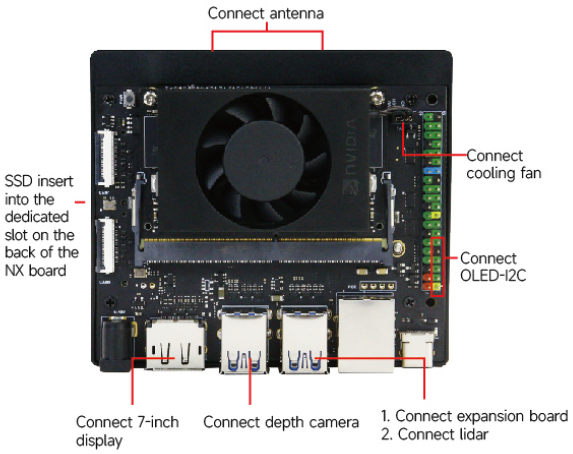
JETSON NANO 4GB board interface description



Raspberry Pi board interface description



Jetson Orin Nano/Orin NX board interface description



Install U disk and TF card

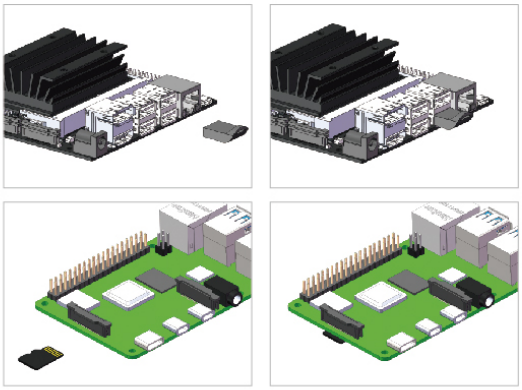
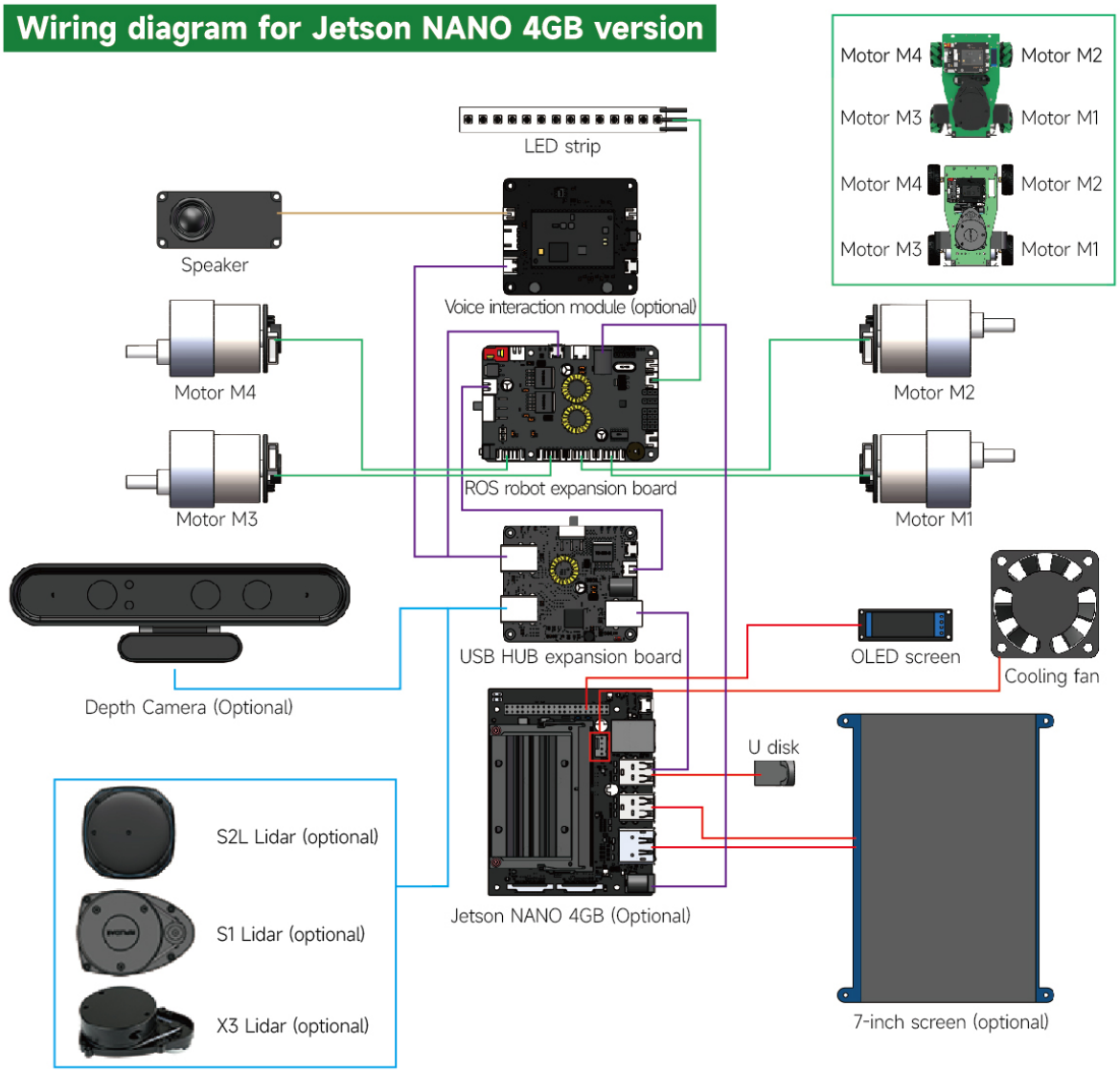


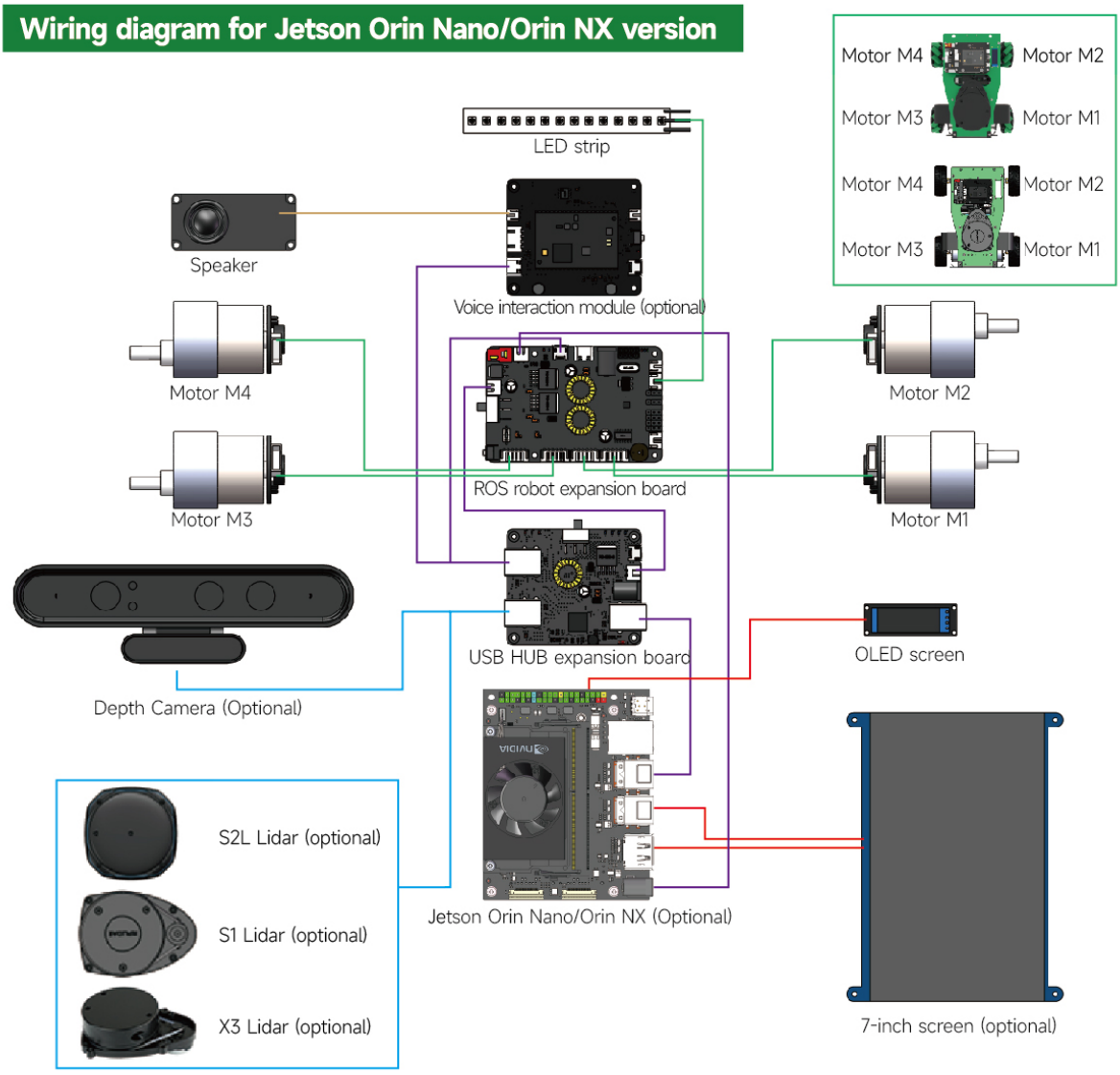
Figure 1-2 Insert U disk into Jetson NANO.

Figure 3-4 Insert TF card into Raspberry Pi.

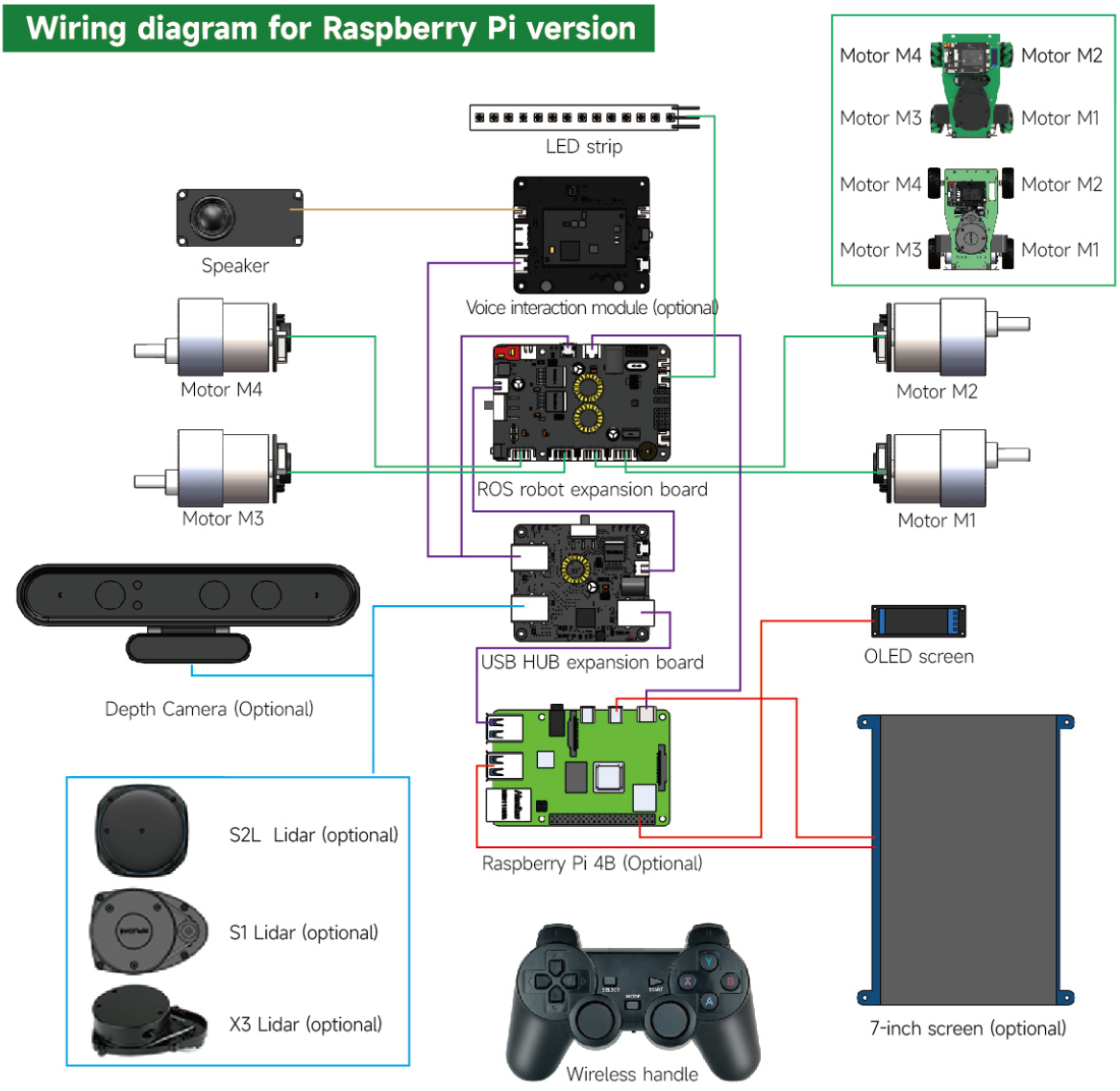
Wiring diagram for Jetson NANO 4GB version



Wiring diagram for Jetson Orin Nano/Orin NX version



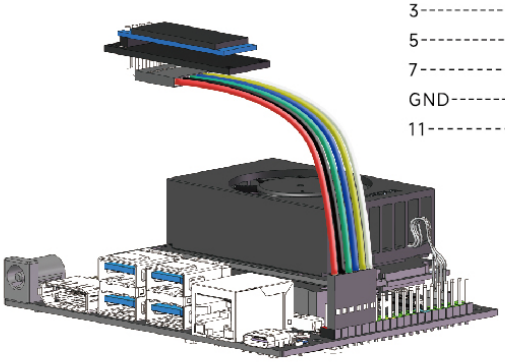
Wiring diagram for Raspberry Pi version



OLED module wiring diagram

1. For Jetson version

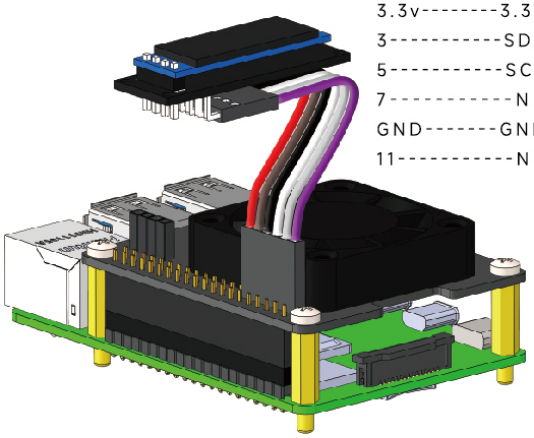
(Please connect the OLED and Jetson board correctly, as shown below.)



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

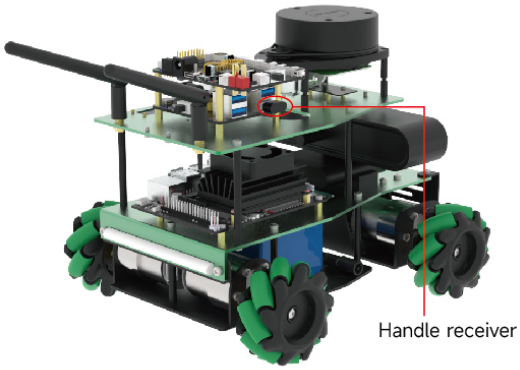
2. For Raspberry Pi version

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



Raspberry Pi OLED
3.3v--------3.3V
3----------SDA
5----------SCL
7----------NC
GND-------GND
11----------NC

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.

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 (forJetson Orin Nano/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 X3

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 X3] device in the [ROS Robot] according to your order.

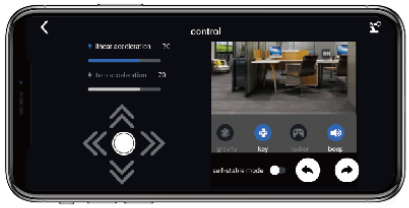
2. Fill in the IP address displayed by the OLED on the robot, as shown below. Port and Video use default parameters. Click [Connect], after the connection is successful, it will automatically jump to the main control interface.

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. Left area: The scroll bar can adjust the straight-line speed and turn speed of the robot. The button can control the robot to move forward, back, move left, move right and stop.

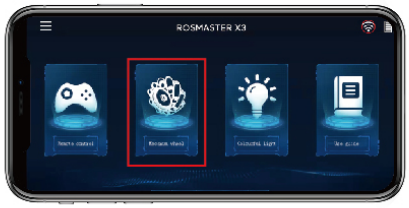
Part 2. Right area: Camera display screen, you can see the front screen of ROSMASTER. The screen supports zoom in/out. The frame rate of the current camera will displayed on left corner.

Part 3. Bottom right area: users can choose three control methods: gravity sensing control, button control, joystick control.
The last button is pressed to control the buzzer to whistle, release to turn off the buzzer.

Part 4. Self-stabilizing mode: When the self-stable mode is turned on, the car will brake to stop immediately after receiving the stop command.
When the self-stable mode is turned off, the car will stop after coasting for a while after receiving the stop command.

Part 5. Bottom right area: Two buttons control the robot to rotate left and right.

2. Mecanum wheel



Click the [Mecanum wheel] icon, you can see the following interface.

The four scroll bars represent the four wheels of the robot, and when it is in the middle, the wheels stop. When you swipe it to the left, the wheel reverses. When you swipe it to the right, the wheel forward.
After moving the scroll bar, select [update speed], the wheel of the robot will turn.
Open the [drag the update switch], when we move the scroll bar, the wheel of the robot will rotate in real time and change the speed. Click [all clean], the robot stop.
Tip: Before testing this function, we can keep the wheels of the robot away from the ground or desktop to prevent the robot from breaking. Bottom left and bottom right buttons be used to control the robot movements directly.

Middle dial (from top to bottom):
1. X: Speed in X-axis direction; 2. Y: Speed in Y-axis direction; 3. Z: Speed in Z-axis direction.

3. 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.

4. Use guide

This function is not enabled on this product.

CONNECT ROSMASTER X1

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 X1] device in the [ROS Robot] according to your order.

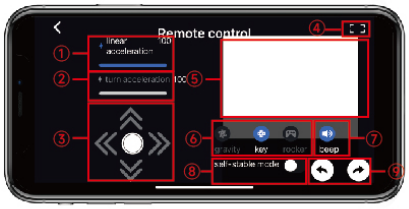
2. Fill in the IP address displayed by the OLED on the robot, as shown below. Port and Video use default parameters. Click [Connect], after the connection is successful, it will automatically jump to the main control interface.

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. Straight speed: Control the straight speed of the car.

Part 2. Turning acceleration: control the turning speed of the car.

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

Part 4. Switch the full-screen mode: The display screen displays the full-screen picture of the camera, which can be used with the USB wireless controller and bracket.

Part 5. The camera displays the picture.

Part 6. Switching control mode: gravity sensing, key control, rocker control.

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

Part 8. Self stabilization mode Start the self stabilizing mode, the robot car will stop immediately after receiving the stop command. Close the self stabilizing mode, the robot car will slide freely and stop after receiving the stop command.

Part 9. Control left and right rotation: control the car to complete left and right rotation.

2. Colorful light

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

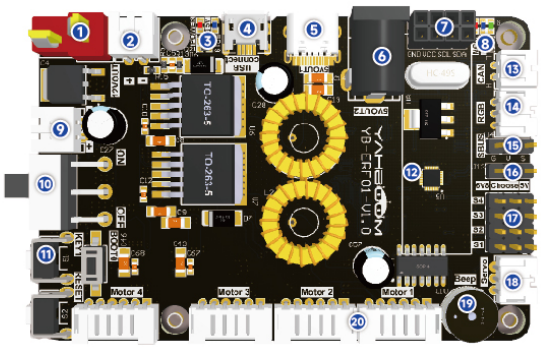
The colorful light are divided into three parts.

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.

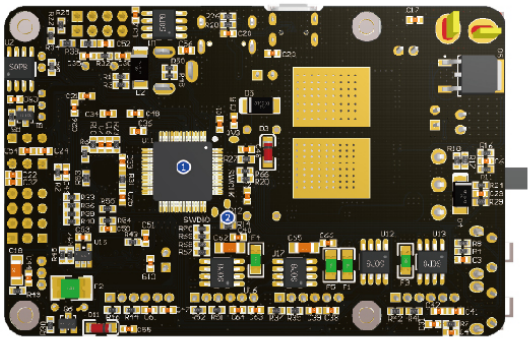
Part 2. Lower left area: This function can make the RGB light bar display red, green, blue, yellow, purple, cyan, white and off. Users can also adjust the color of the breathing light.

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.

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.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.

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-X1
Tutorial link: https://www.yahboom.net/study/ROSMASTER-X3

Technical Support

WhatsApp: +86 18682378128
Email: support@yahboom.com
Website: www.yahboom.net