

# Installation instruction



## ROSMASTER

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.

官网在线学习: <https://www.yahboom.com/study/ROSMASTER-X3-PLUS> 提取码: jakd Tutorial link: <https://www.yahboom.net/study/ROSMASTER-X3-PLUS>

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 (standard)

<b>Car frame (Installed)</b>	A green and black 4WD robot car frame with various sensors and components attached.	A black Astra Pro depth camera mounted on a flexible arm.	Astra Pro Depth camera kit
		A black 7-inch LCD screen panel.	7-inch screen kit
A black 4ROS lidar sensor.	4ROS Lidar (Installed)	A black ROS robot expansion board.	ROS robot expansion board
A blue USB HUB expansion board.	USB HUB expansion board	A blue battery pack.	Battery pack (Installed)
A blue OLED screen expansion board.	OLED screen expansion board (Installed)	A roll of LED strip.	LED strip (Installed)
A white data line cable.	Data line	A red and black screwdriver.	Screwdriver
A black handle and three AAA batteries.	Handle+ AAA battery	A black power adapter.	Charger
A black MicroUSB cable and a black HDMI cable.	MicroUSB cable (bend right) HDMI cable	A black HDMI Adapter DP.	HDMI Adapter DP
A black handle/phone holder.	Handle/phone holder	Four small white plastic bags labeled 1, 2, 3, 4.	Parts package

## Jetson Orin Nano Accessories (optional)

A black Jetson Orin Nano development board.	Jetson Orin Nano development board (Optional)	A black 128G SSD.	128G SSD
A white bag labeled "Orin Nano".	Orin Nano parts package	A black DC to 2Pin power cable.	DC to 2Pin power cable
A black network card antenna.	Network card antenna		

## Raspberry Pi Accessories (optional)

A white Raspberry Pi 5 model.	Raspberry Pi 5 (Optional)	A red TF card.	TF card
A black "Cool cooler Pi 50" cooler.	Cool cooler Pi 50	A black double-headed Type-C power supply line.	Double-headed Type-C power supply line
A white bag labeled "Pi".	Pi parts package		

## Jetson NANO 4GB Accessories (optional)

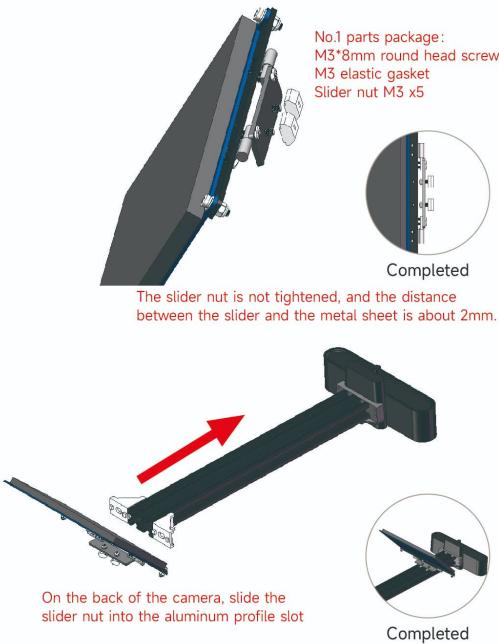
A black Jetson NANO 4GB development board.	Jetson NANO 4GB (optional)	A black U Disk.	U Disk
A white bag labeled "(NANO 4GB) parts package".	(NANO 4GB) parts package	A black 4010 cooling fan.	4010 cooling fan
A black M.2 Antenna.	M.2 Antenna	A black DC Power cable.	DC Power cable

## Jetson Orin NX Accessories (optional)

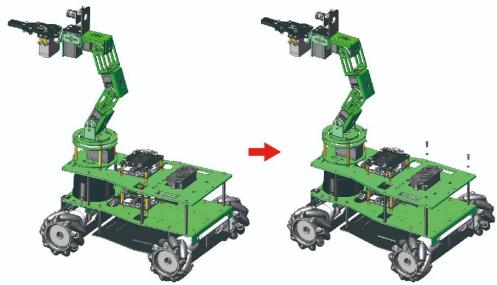
A black Jetson Orin NX developer kit.	Jetson Orin NX developer kit (optional)	A black 128G SSD.	128G SSD
A white bag labeled "Orin NX".	Orin NX parts package	A black DC to 2Pin power cable.	DC to 2Pin power cable
A black network card antenna.	Network card antenna		

## Installation steps

### 1. Install 7-inch screen



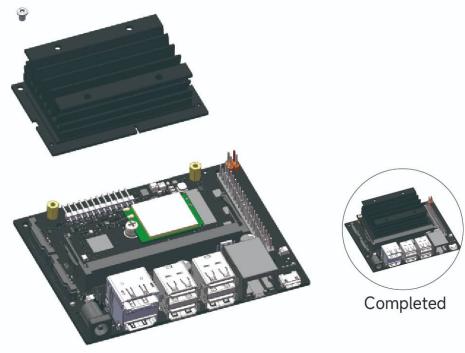
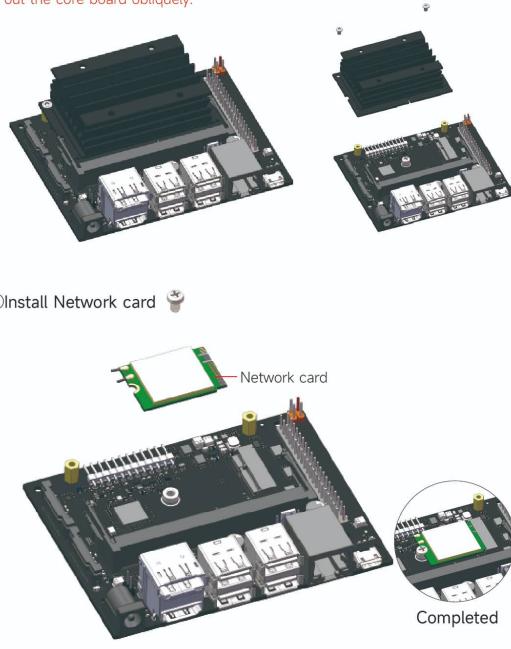
### 2. Remove top plate



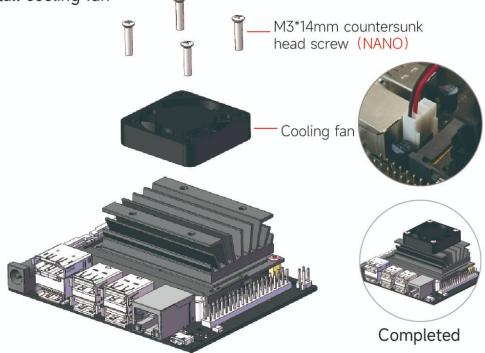
### 3. Install Jetson NANO board (For Jetson NANO version)

#### ① Remove the core board

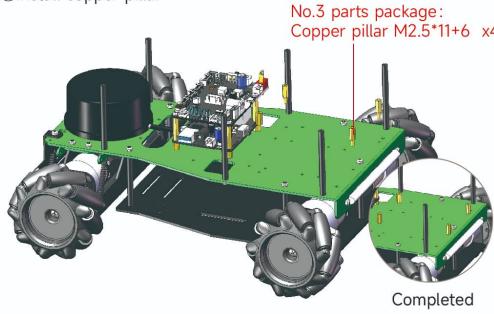
Note: The clips on both sides of the core board are easy to break, please pull out the core board obliquely.



③Install cooling fan

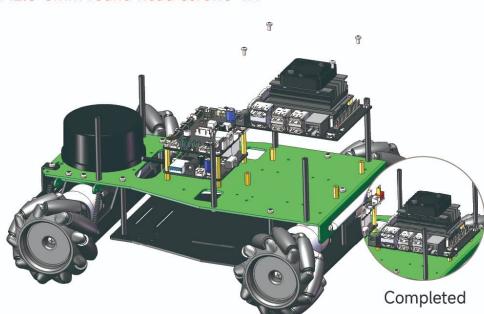


④Install copper pillar



⑤Install Jetson board on car

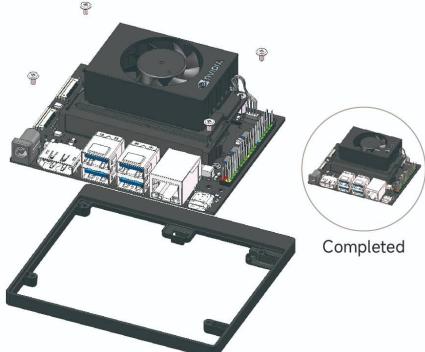
No.3 parts package:  
M2.5\*5mm round head screws x4



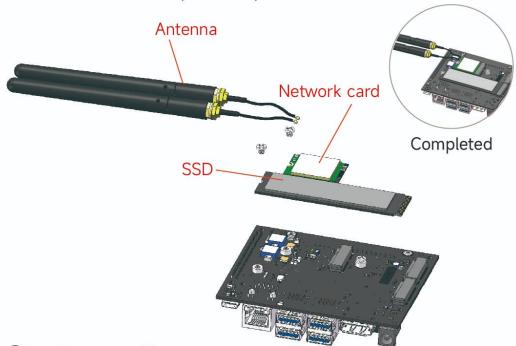
4. Install Jetson Orin Nano/Jetson Orin NX board

(For Jetson Orin Nano/Jetson Orin NX version)

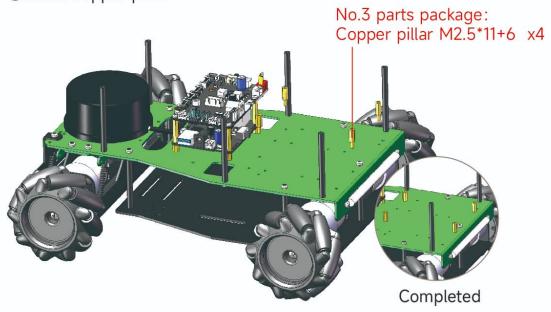
①Remove Jetson board base



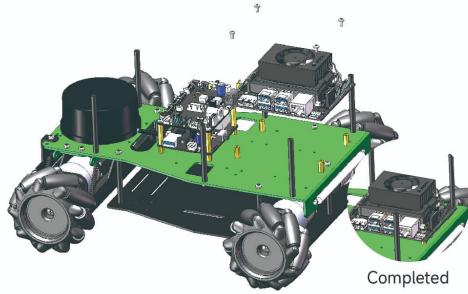
②Install network card, antenna, SSD



③Install copper pillar



④Install Jetson board on car  
No.3 parts package:  
M2.5\*5mm round head screws x4



#### 6. Install camera bracket



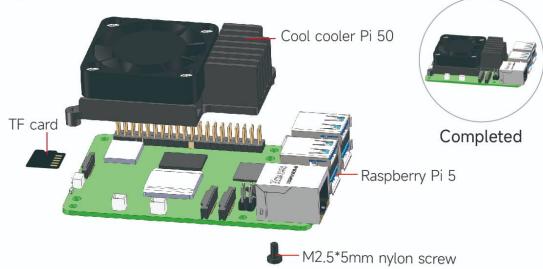
No.1 parts package:  
M5\*8mm round head hexagon  
socket screws x2  
M5 elastic gaskets x2



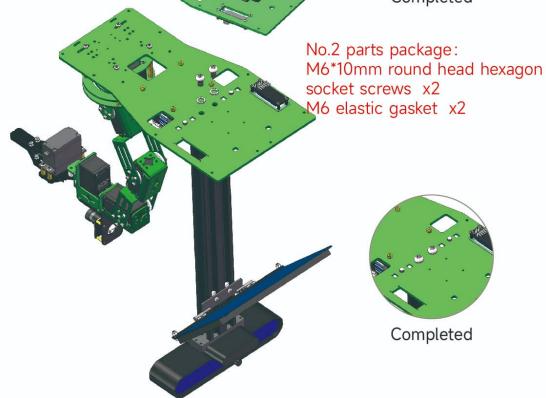
Completed

#### 5. Install Raspberry Pi (Just for RPi version)

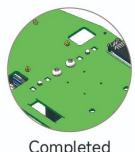
①Install Cool cooler Pi 50



Completed



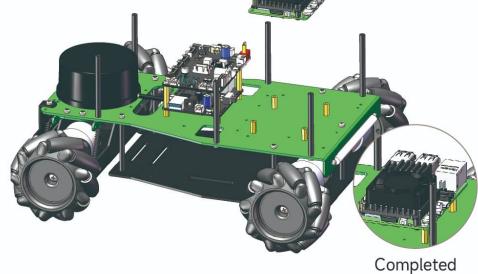
No.2 parts package:  
M6\*10mm round head hexagon  
socket screws x2  
M6 elastic gasket x2



Completed

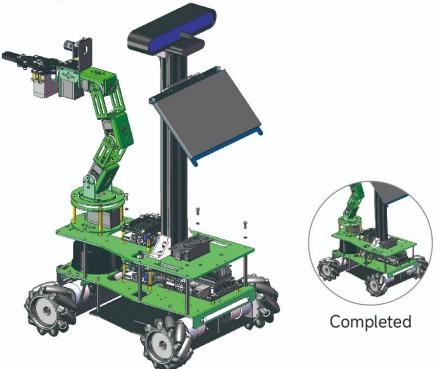
②Install Raspberry Pi board

No.3 parts package:  
Copper pillar M2.5\*11+6 x4  
M2.5\*5mm round head screws x4



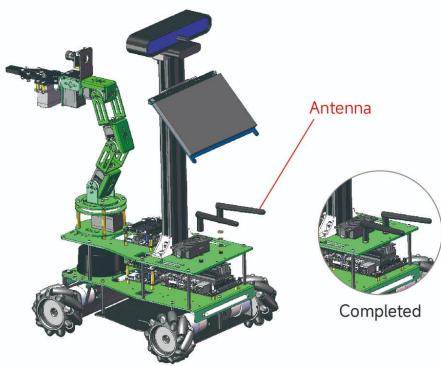
Completed

#### 7. Install top plate

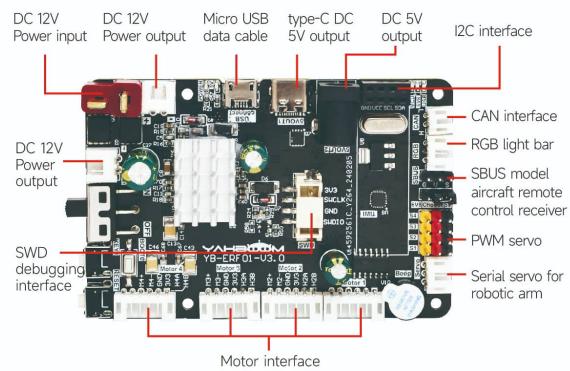


Completed

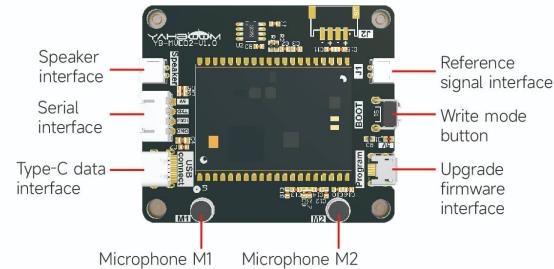
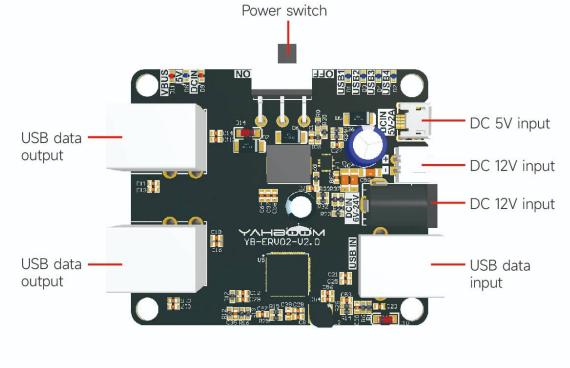
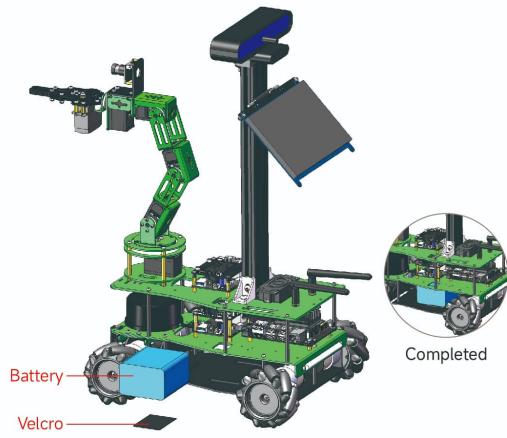
8. Fix antenna (RPi version, can skip this step)



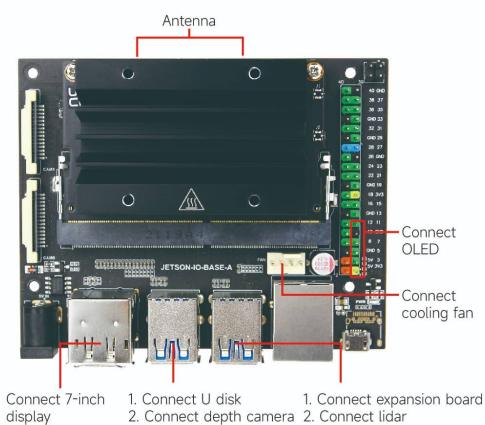
**Expansion board interface description**



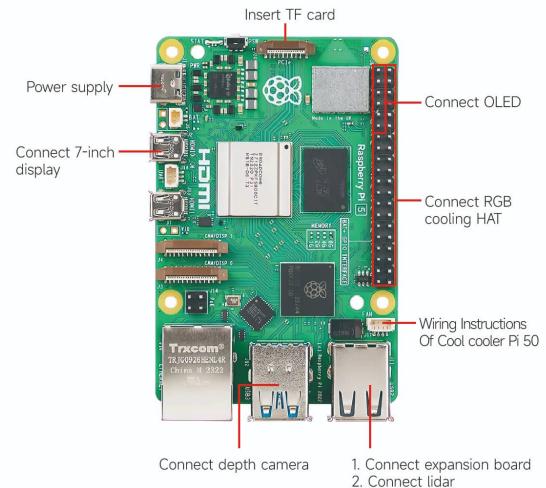
9. Install battery



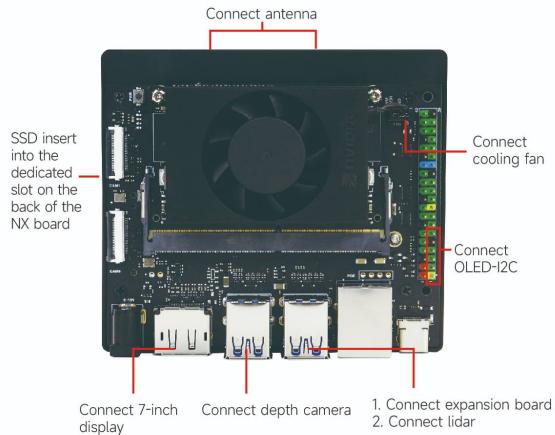
## JETSON NANO 4GB board interface description



## Raspberry Pi board interface description



## Jetson Orin Nano/Orin NX board interface description



## Install U disk and TF card

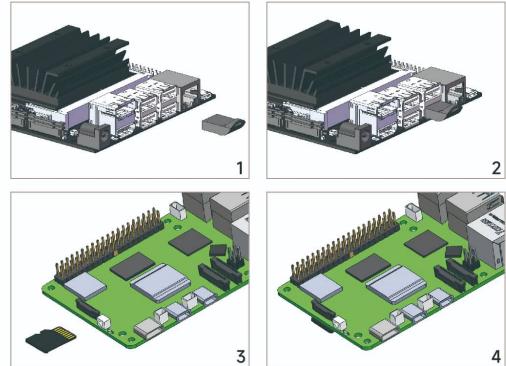
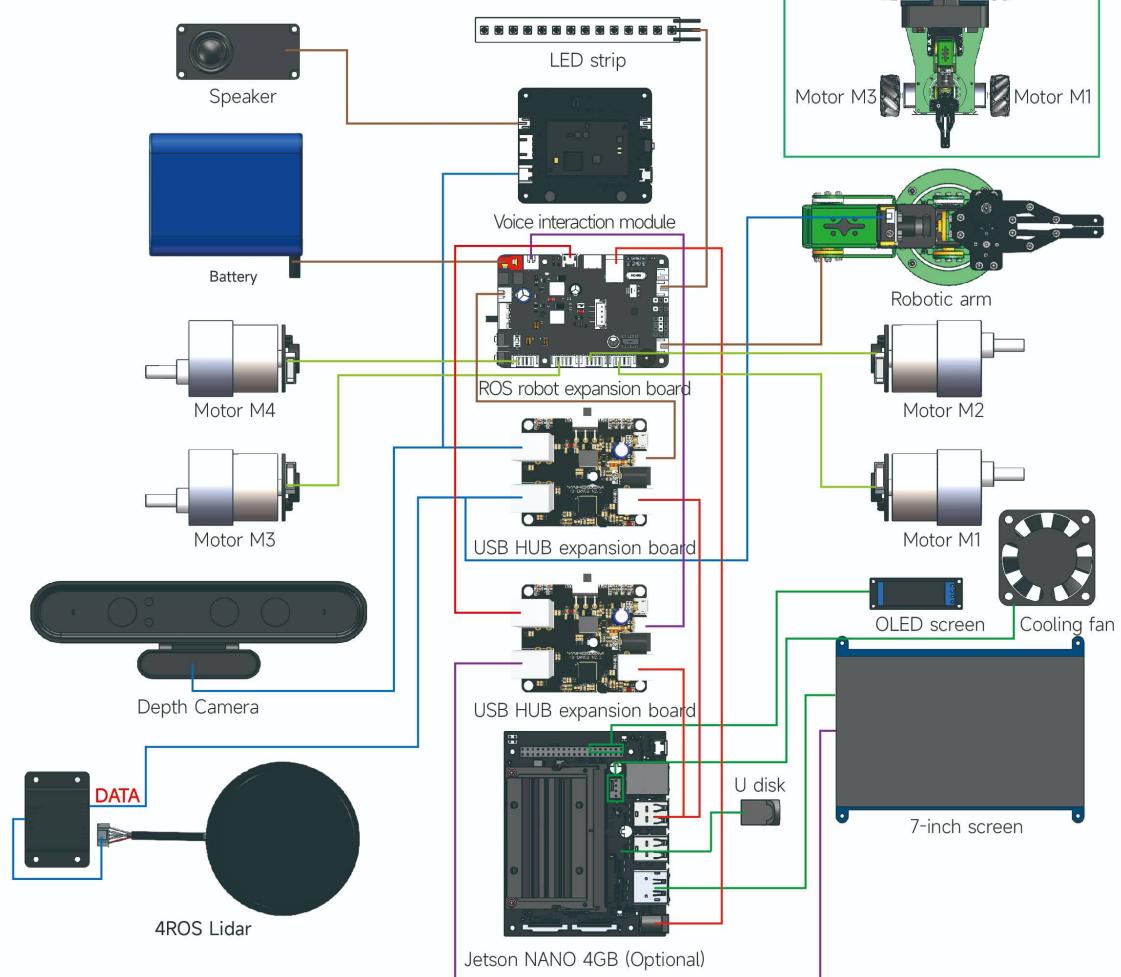


Figure 1-2 Insert U disk into Jetson NANO.

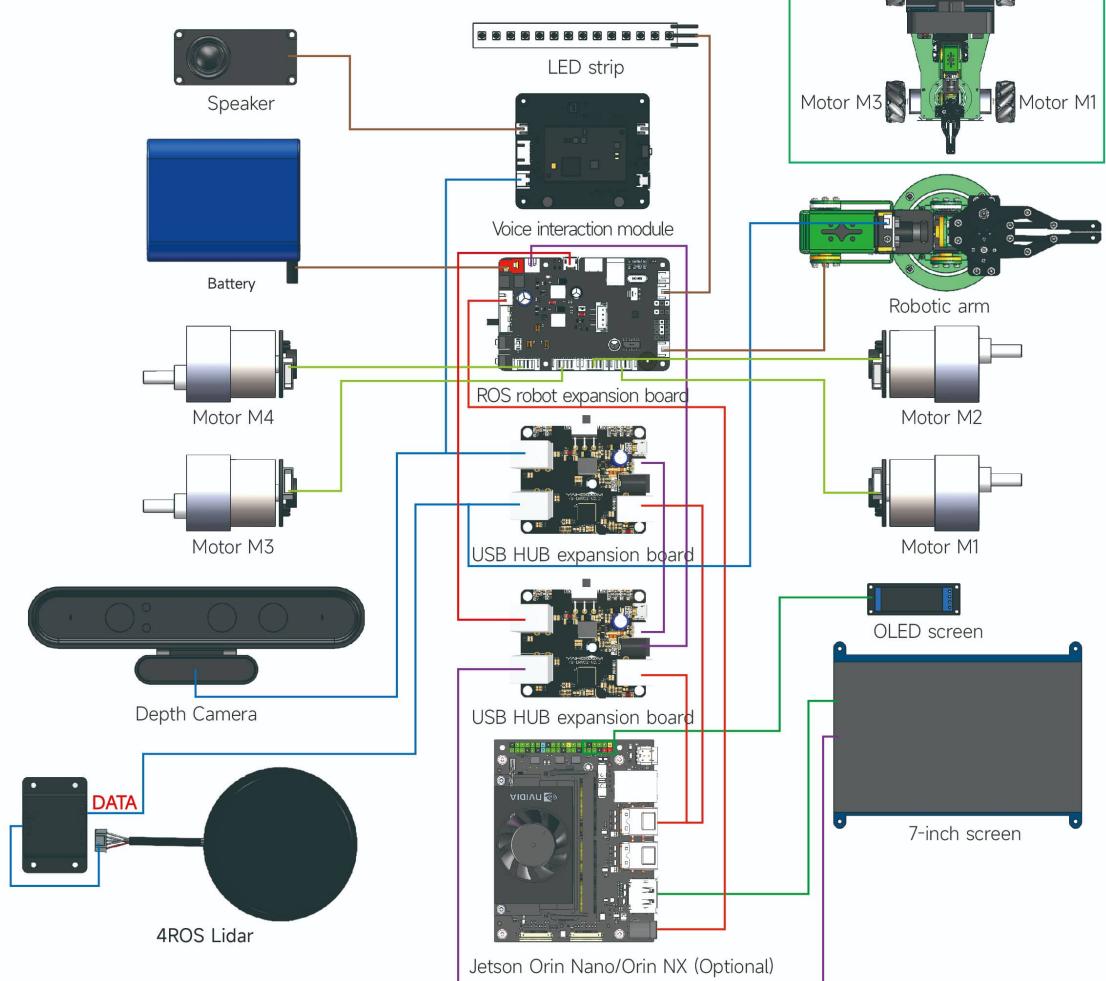
Figure 3-4 Insert TF card into Raspberry Pi.

## Wiring diagram for Jetson NANO 4GB version



\* The voice interaction module can only be used normally after binding the port according to the tutorial [Voice control courses -->Voice control module port binding].  
If only the voice module is connected but the port is not bound, the APP control program will not be able to start normally.

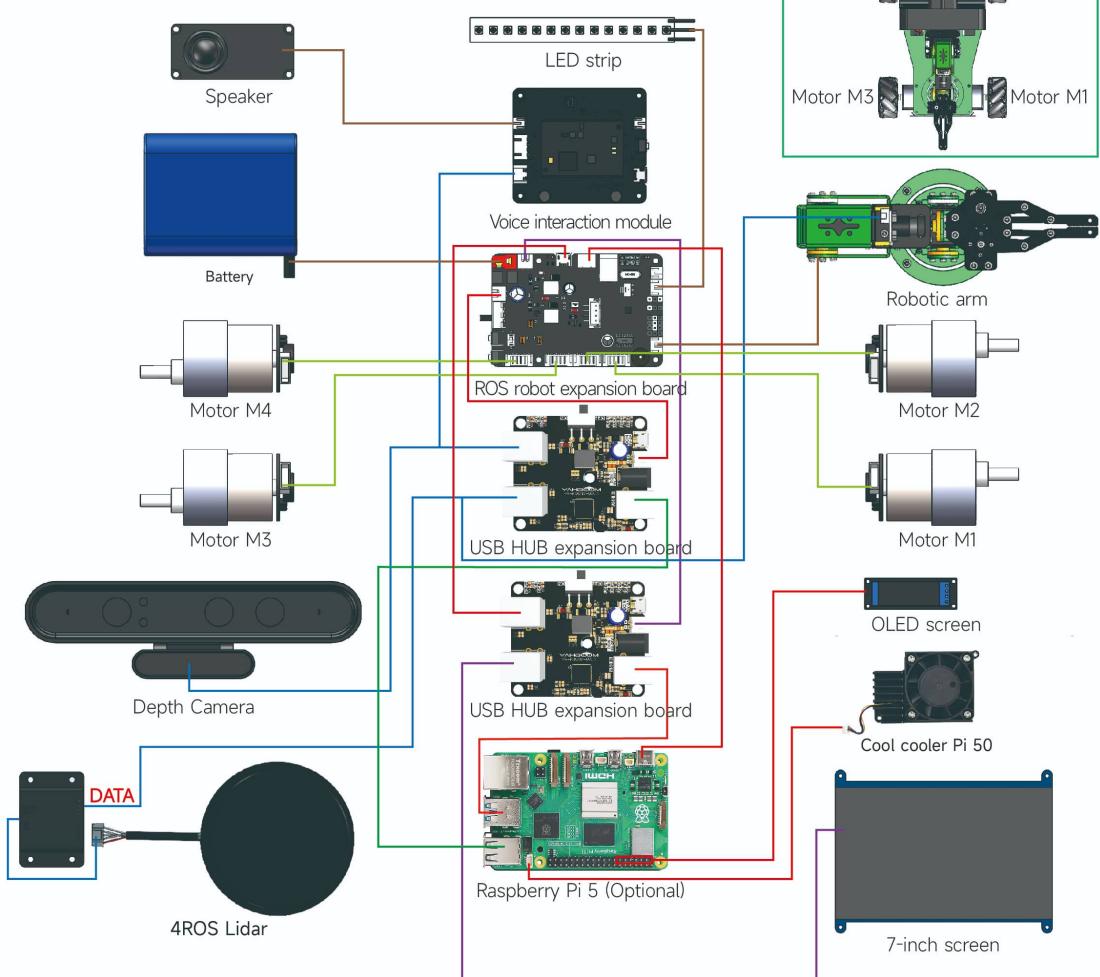
## Wiring diagram for Jetson Orin Nano/Orin NX version



\* The voice interaction module can only be used normally after binding the port according to the tutorial [Voice control courses -->Voice control module port binding].

If only the voice module is connected but the port is not bound, the APP control program will not be able to start normally.

## Wiring diagram for Raspberry Pi version

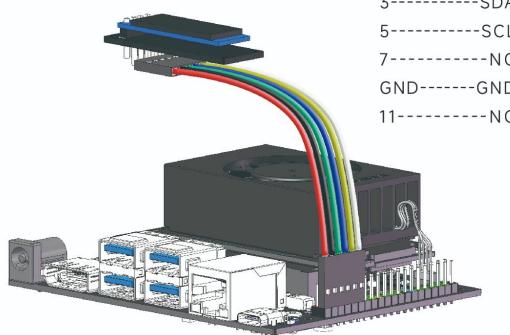


\* The voice interaction module can only be used normally after binding the port according to the tutorial [Voice control courses --->Voice control module port binding].  
If only the voice module is connected but the port is not bound, the APP control program will not be able to start normally.

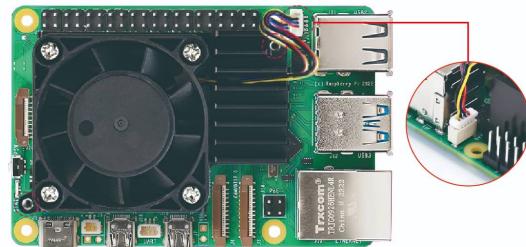
## OLED module wiring diagram

### 1. For Jetson version

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



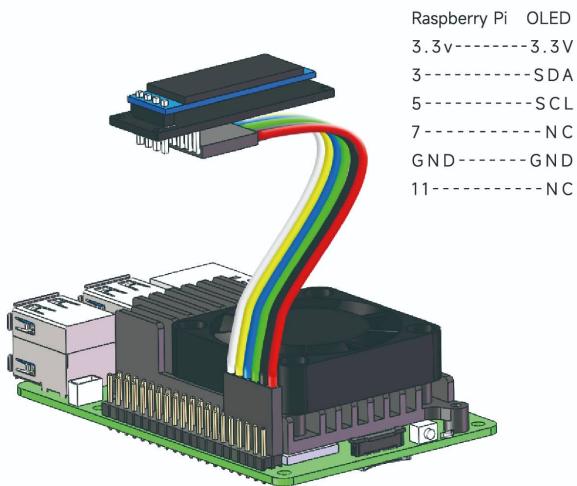
## Wiring Instructions Of Cool cooler Pi 50



## USB Handle Receiver Connection Instructions

### 2. For Raspberry Pi version

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





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 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 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 PLUS

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 X3 PLUS] 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 four 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. Top right area: The first option can switch the front camera, the second option can switch the rear camera, and the third option is to switch the full screen display.

Part 3. Middle right area: This is the camera display screen, users can see the camera screen of ROSMASTER, the screen supports zoom in/out, and the upper left corner of the screen displays the frame rate of the current camera.

Part 4. 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 5. Self-stabilizing mode: When the self-stable mode is turned on, the car will brake to stop immediately after receiving the stop command.

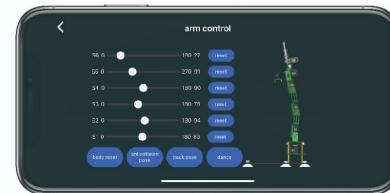
When the self-stable mode is turned off, the car will stop after coasting for a while after receiving the stop command.

Part 6. Bottom right area: Two buttons control the robot to rotate left and right.

### 2. Control robotic arm



Select the icon of the robotic arm on the remote control interface, we can enter robotic arm control interface



Users can individually control the six servos of the robotic arm through the sliding rod and the center button, and there are different states of the robotic arm posture for choice.

### 3. 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.

### 4. 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.

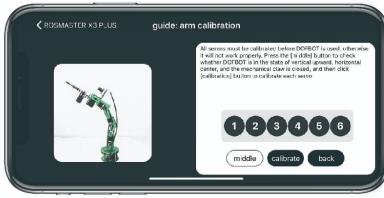
Part 3. Right area: After pressing a button, the RGB lights will show the corresponding special effects, click the button again to exit the special effect. The scroll bar below can change the speed of the lighting effects, the default is 5, the fastest is 1, and the slowest is 10.

## 5. Use guide



In order to prevent some functions from not working properly due to the deviation of the center position of the robot arm. Before using it, we need to calibrate the robotic arm.

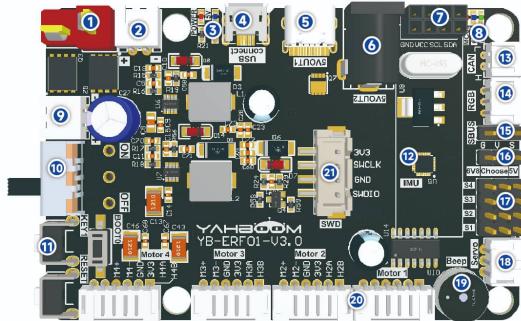
Press the [middle] button to judge whether the mechanical arm is vertically upward, left and right return to the center, and the mechanical claw is in a gripping state.



After clicking [calibrate], it will enter the state of calibrating the robotic arm, please check whether the robotic arm is upright, and whether the left and right centering is normal. The indicator ring changes from black to green, indicating that the setting is successful, click [back].



## 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.

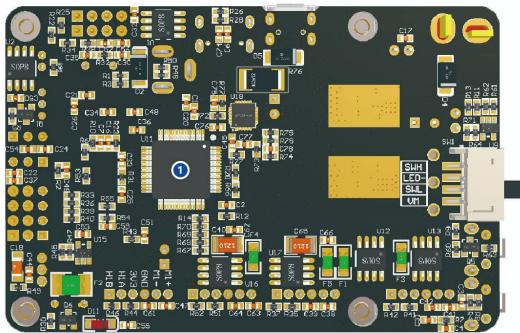
⑪ Button:

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.



- ① 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.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.

## 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

<https://www.yahboom.net/study/ROSMASTER-X3-PLUS>

### Technical Support

WhatsApp: +86 18682378128

Email: support@yahboom.com

Company: Shenzhen Yahboom Technology Co.,Ltd.

Website: [www.yahboom.net](http://www.yahboom.net)