



Muto Hexapod Robot

说明书/Manual



基础版 (Basic Version)



视觉版 (Vision Version)

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
[YahboomRobot]



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

基础版 <https://www.yahboom.com/study/Muto-S1>
视觉版 <https://www.yahboom.com/study/Muto-S2>

提取码: kutn
提取码: ormk
<http://www.yahboom.net/study/Muto-S1>
<http://www.yahboom.net/study/Muto-S2>

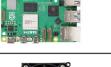
在产品使用过程中，如对以下说明有疑问的，请根据说明书首页的网址查阅最新的网页资料或者联系我们技术支持。
! Any questions about the instructions on manual, please enter the tutorial link on the homepage, check the latest information on our website or contact our technical support.

物品清单(基础版)

底盘			PS2手柄
		PS2手柄 接收器	
		PS2转接板	
电源电池组			充电器
螺丝刀			三包+说明书
7号电池			Muto—S1接收器配件包⑦
PS2连接线			魔术贴
Micro USB 数据线 (右弯)			

	USB3.0公头转 USB3.0公头		XH2.54排线
	OLED屏 连接线		USB无线手柄 +7号电池
	螺丝刀		Micro USB 数据线 (右弯)
	魔术贴		三包+说明书

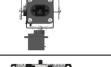
树莓派配件(选配)

	树莓派5 (另购)		TF卡
	主动散热器		读卡器
	Muto—树莓派 配件包②		树莓派5稳压 电源扩展板包

Jetson NANO 4GB配件(选配)

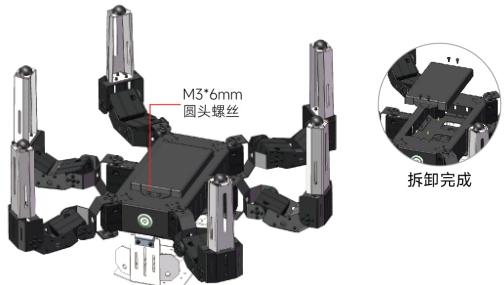
	Jetson NANO 4GB开发板 (另购)		U盘
	Muto—Nano 4GB配件包①		4010风扇
	M.2天线		DC电源线

物品清单(视觉版)

底盘			摄像头云台 精巧版
			USB HUB 扩展板
			OLED屏幕 扩展板
Muto—OLED 屏幕安装板			OLED屏幕扩 展板配件包⑥
USB HUB扩展 板配件包③			OLED屏幕 亚克力保护板
电源电池组			充电器

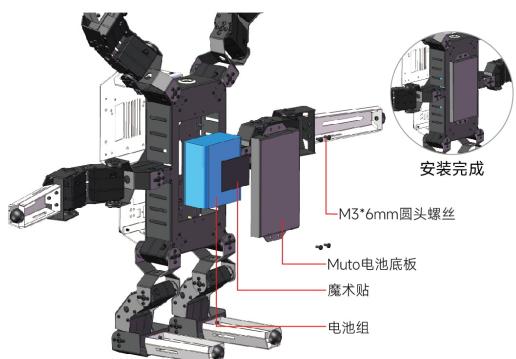
基础版安装步骤

1. Muto电池底板拆卸

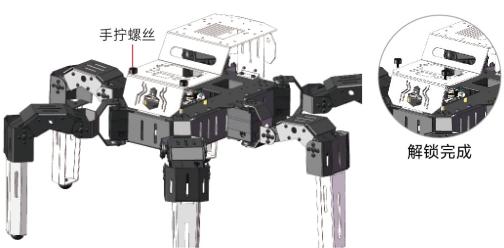


2. 电池组安装(安装前确保电源按钮是未按下状态)

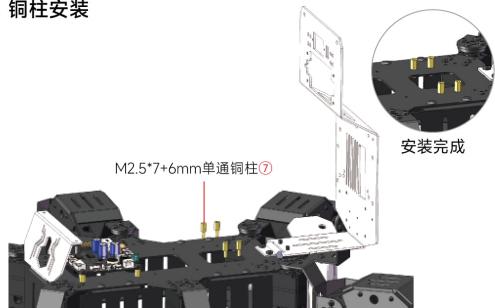
注：电池组优先接好线材，再放入安装，安装电源时，请将六足竖立头部朝下。



3. Muto顶板解锁

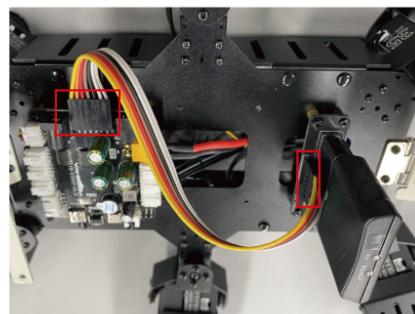
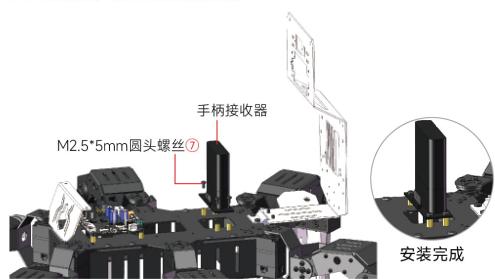


4. 铜柱安装

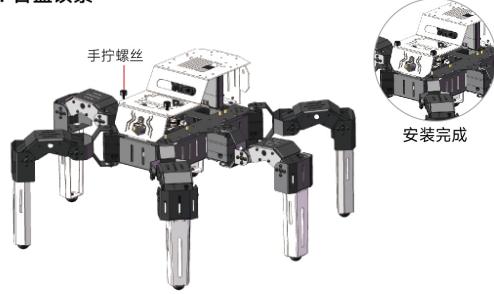


5. 手柄接收器安装

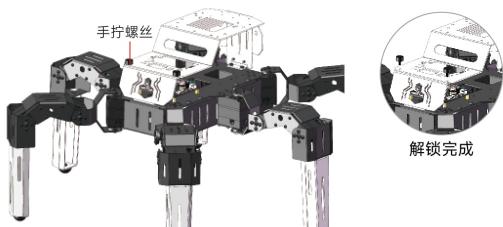
注：安装完后，将手柄接收器线材接好



6. 合盖锁紧



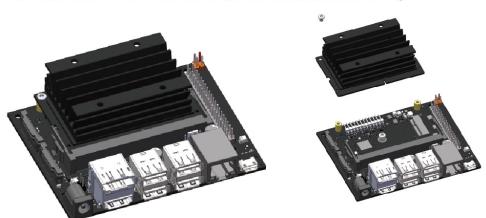
3. Muto顶板解锁



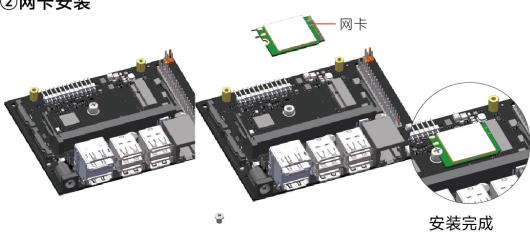
4. JETSON NANO主控安装 (树莓派版本请跳过)

①拆卸核心板

注：拆卸核心板请小心，两侧夹片易断，核心板需要倾斜拔出。



②网卡安装



安装完成

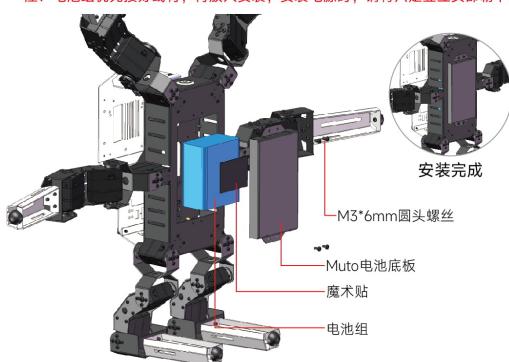
视觉版安装步骤

1. Muto电池底板拆卸



2. 电池组安装(安装前确保电源按钮是未按下状态)

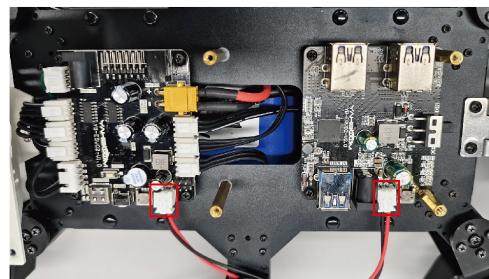
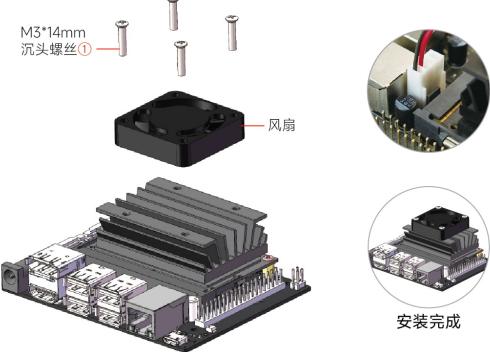
注：电池组优先接好线材，再放入安装，安装电源时，请将六足竖立头部朝下。



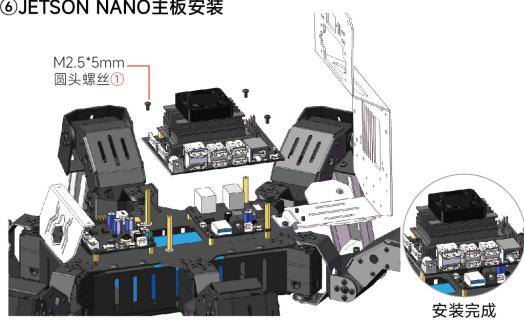
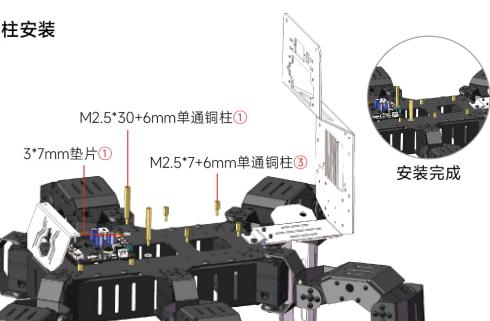
03

③风扇安装

注：风扇装好后，将线接好。

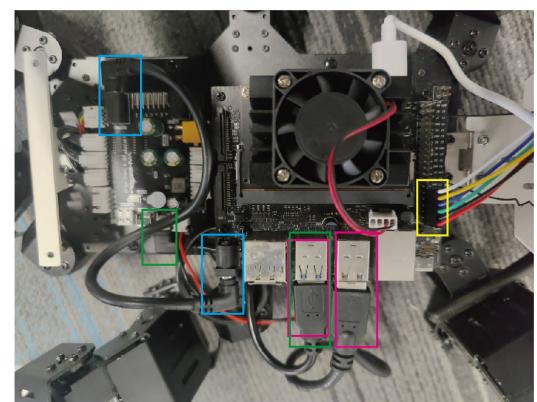
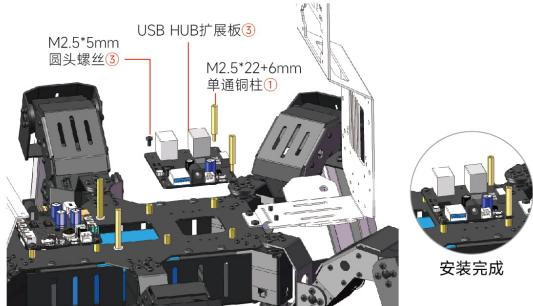


④铜柱安装

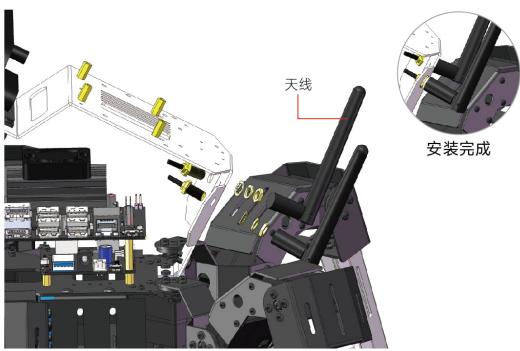


黄框部分为OLED屏幕连接线，优先将一端连接在主板上；接线详情请见P9、10、11。

⑤USB HUB扩展板安装



⑦JETSON NANO天线安装

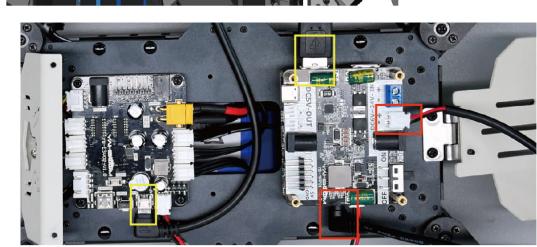
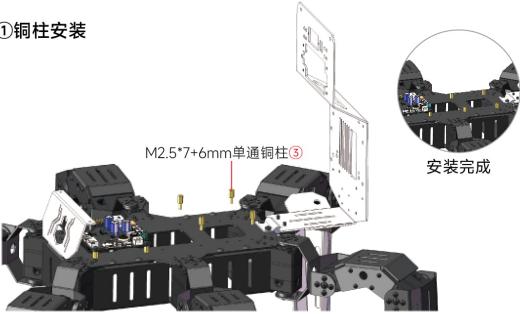


③稳压电源扩展板安装

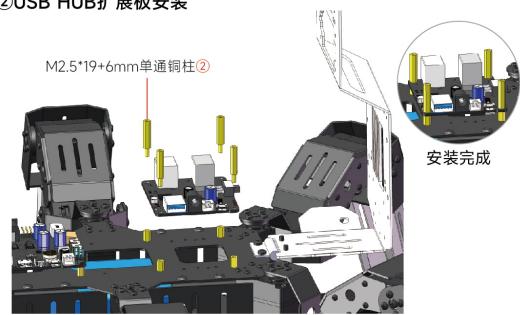


5. 树莓派主控安装 (JETSON NANO版本请跳过)

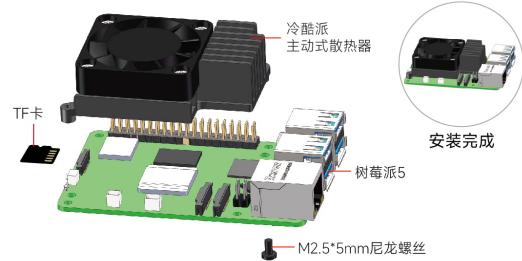
①铜柱安装



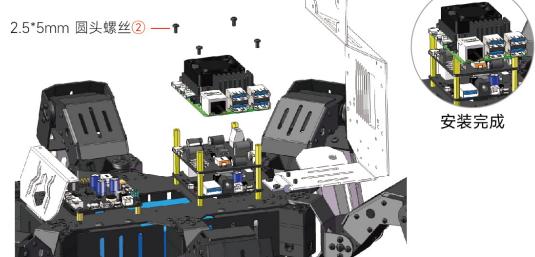
②USB HUB扩展板安装



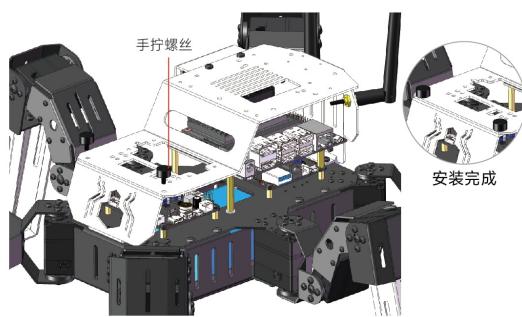
④主动式散热器安装



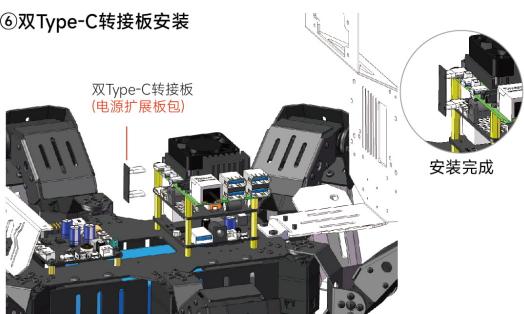
⑤树莓派主板安装



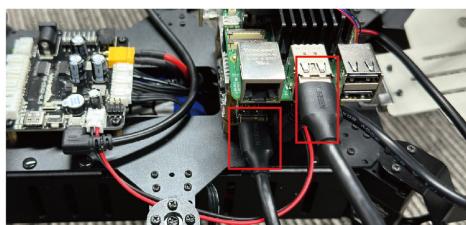
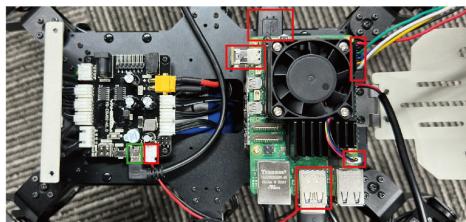
6. 合盖锁紧 (后面步骤以Nano主板为例)



⑥双Type-C转接板安装



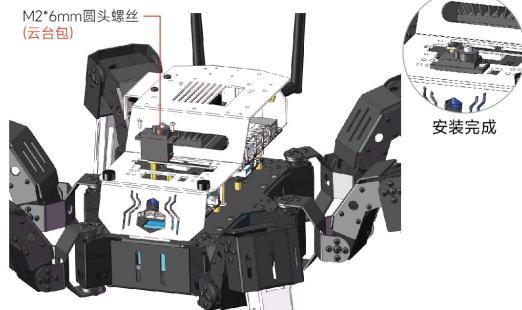
接线详情请见P9、10、11。



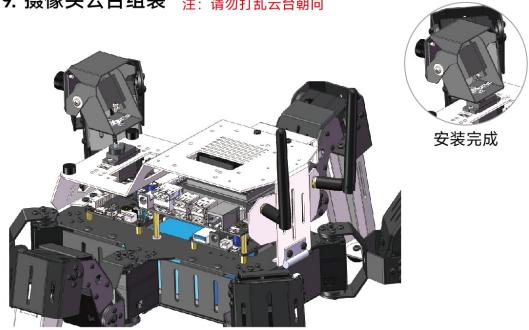
7. 摄像头云台精巧版拆卸：将舵盘中心螺丝拧出，将云台分离
注：拆卸请勿打乱云台朝向



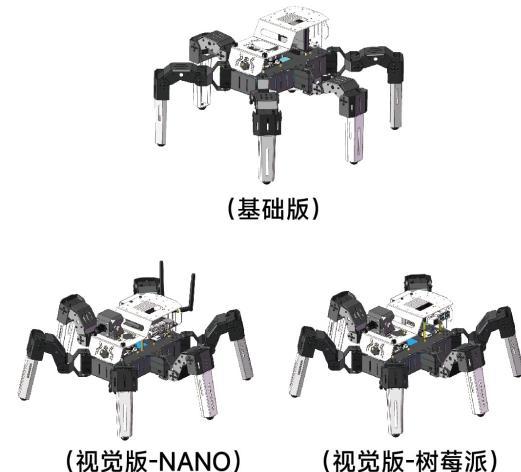
8. 摄像头云台舵机安装



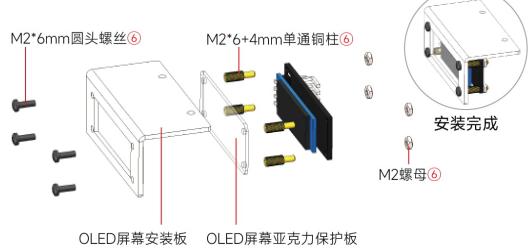
9. 摄像头云台组装 注：请勿打乱云台朝向



安装完成效果展示

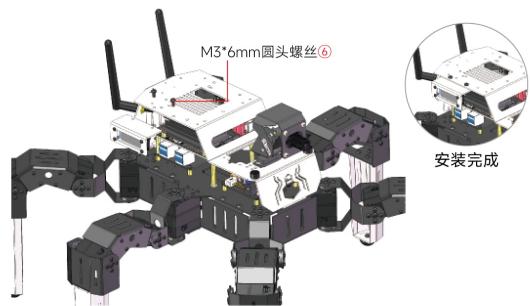


10. OLED屏幕装配

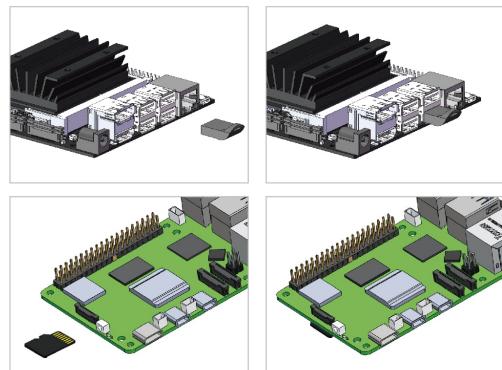


11. OLED屏幕装配到机器人

注：将OLED屏幕线材接好后安装。

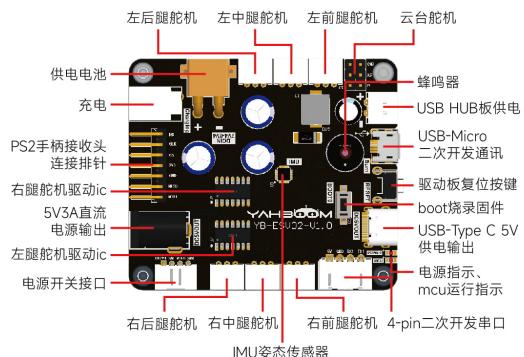


U盘/SD卡安装(视觉版)

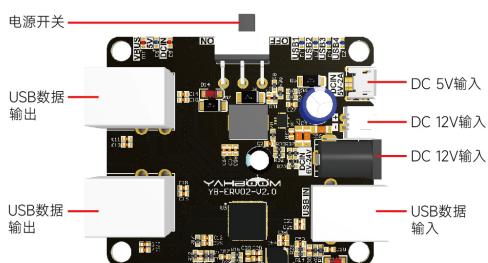


扩展板接口说明

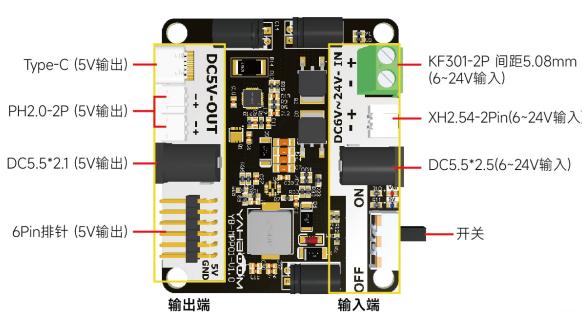
①六足扩展板 (S1&S2通用配件)



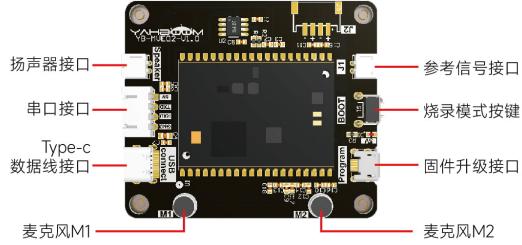
②USB HUB扩展板 (S2配件)



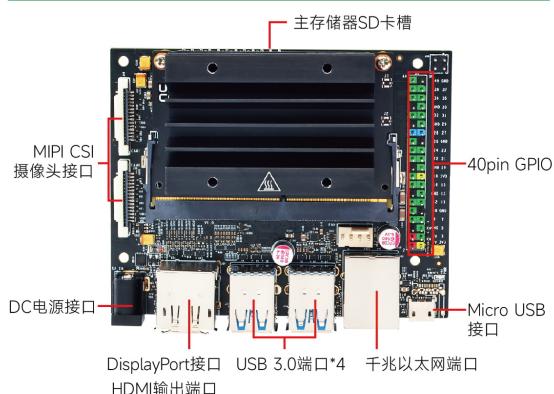
③稳压电源扩展板 (S2树莓派配件)



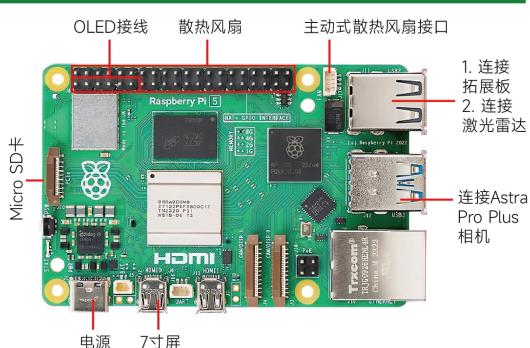
④语音交互模块 (S2配件)



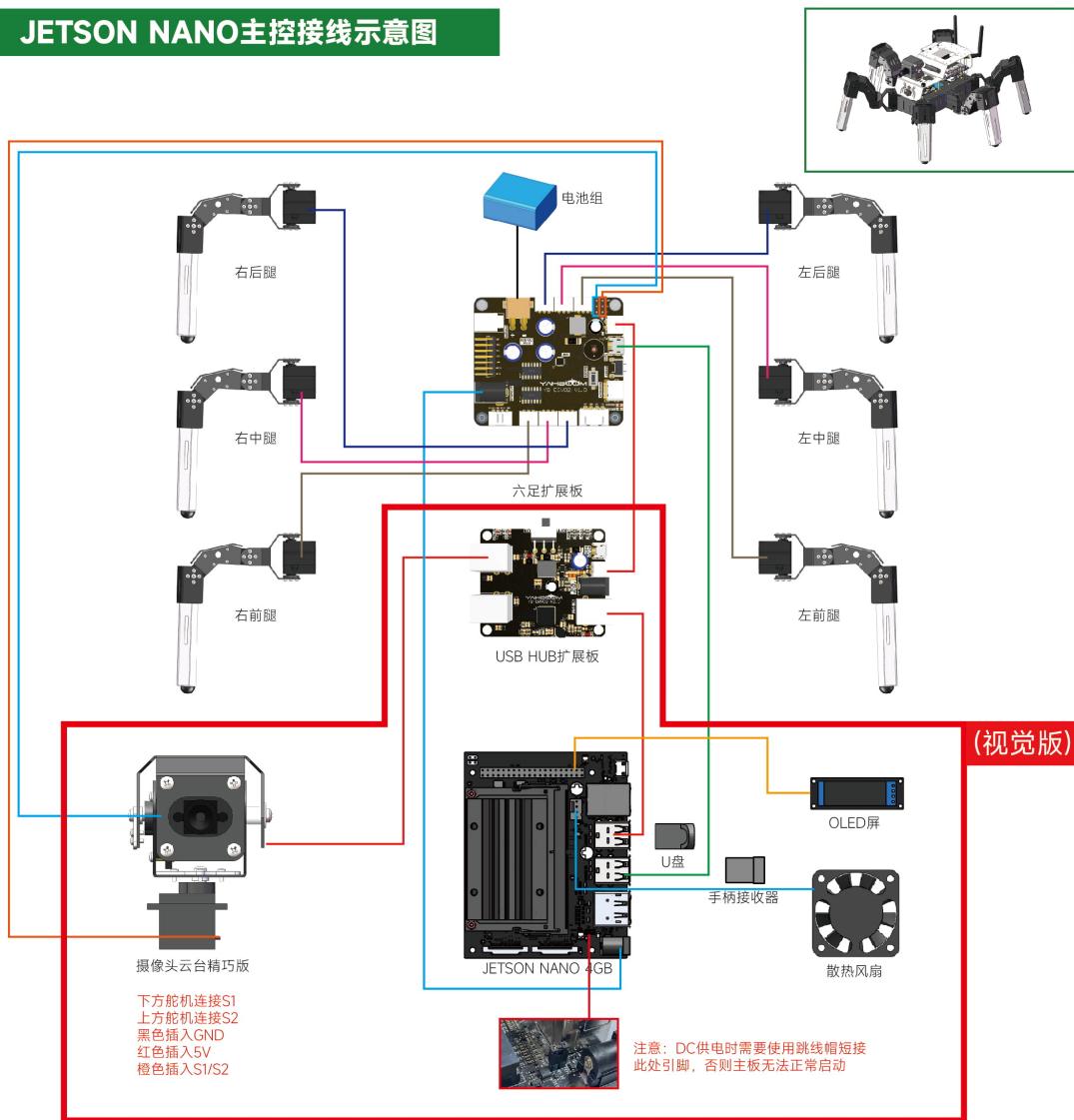
JETSON NANO 4GB主板接口说明(视觉版)



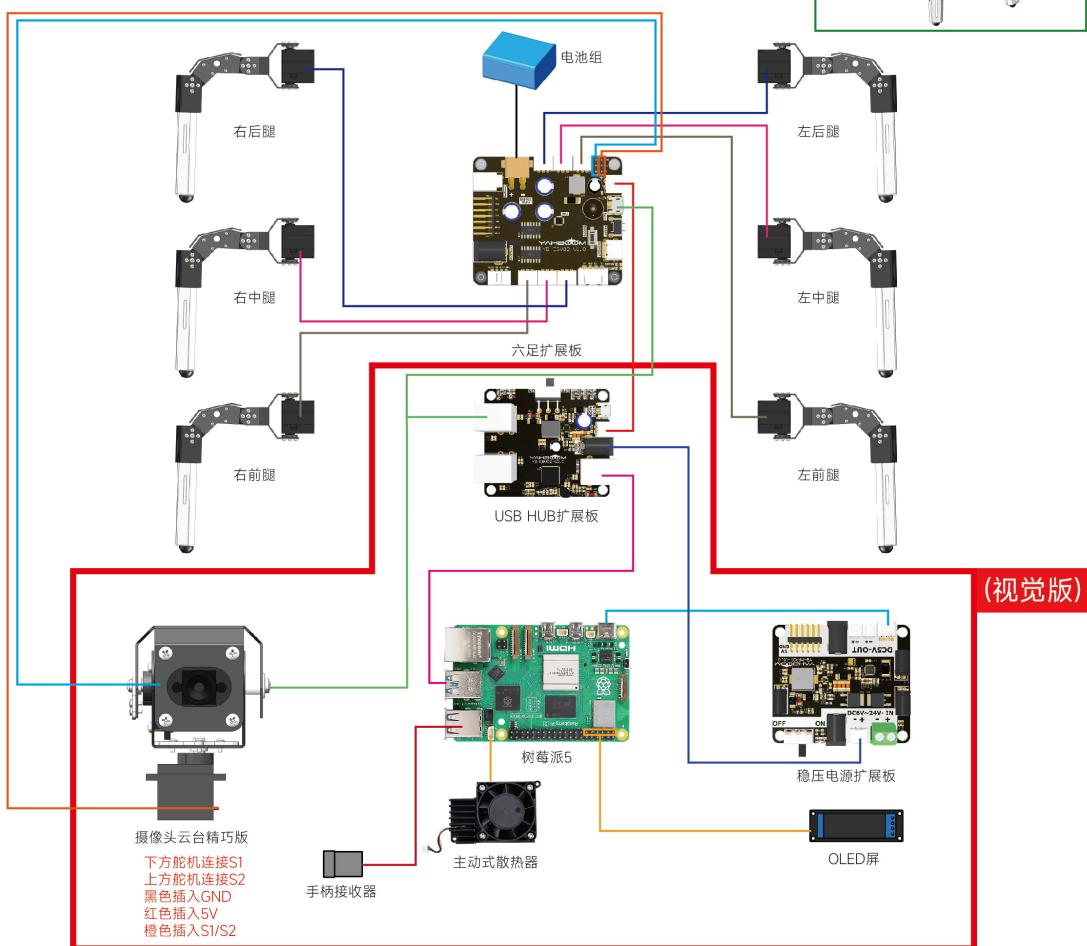
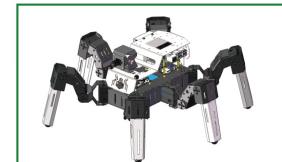
树莓派主板接口说明(视觉版)



JETSON NANO主控接线示意图



树莓派主控接线示意图

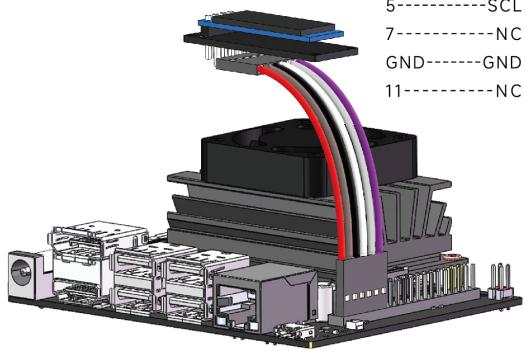


注意：六足扩展板的USB线请连接至USB-HUB板，请勿连接到树莓派5主板USB端口。

OLED模块接线示意图(视觉版)

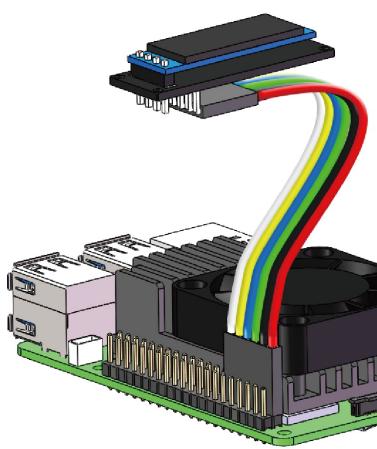
1. Jetson主控接线示意图 (请根据接头的朝向插入排针)

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

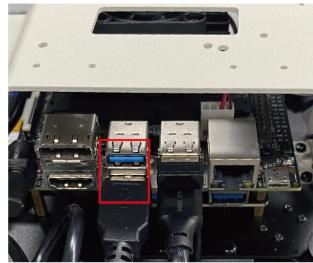


2. 树莓派主控接线示意图 (请根据接头的朝向插入排针)

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



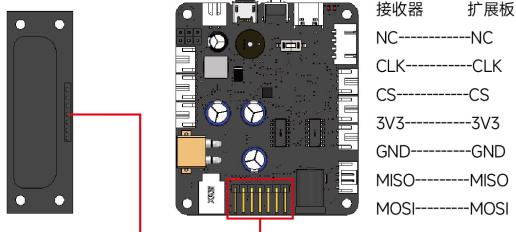
USB手柄接收器连接说明(视觉版)



无线手柄

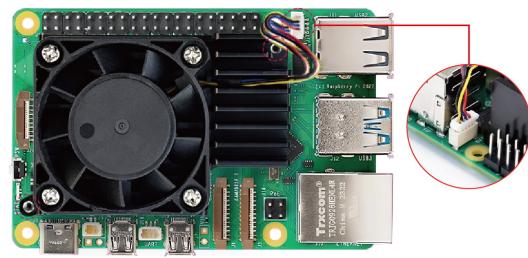
注意：当使用 USB 手柄接收器时，建议将其连接到主板的 USB 口上。

PS2手柄接收器接线示意图



注意：扩展板与接收板插针丝印 mosi 对齐接插

树莓派5 主动式散热器风扇接线

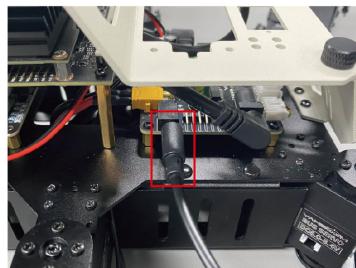


机器人充电

将产品自带的充电器插入排插，此时充电器指示灯亮绿色。



关闭机器人的总电源开关。在机器人扩展板找到充电接口，将充电器的充电接头插入扩展板的充电接口。



充电器正在给机器人充电时，充电器指示灯亮红色。



等待电池充满后指示灯变为亮绿色。拔下充电器接头和充电器，并将充电器放置在安全区域。

安装手机APP(视觉版)

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

如果手机里已经安装了最新版的【YahboomRobot】APP 则不需要再次安装。



(APP下载二维码)

启动Muto六足机器人(视觉版)

产品中提供的 TF 卡 /U 盘默认包含镜像系统，将 TF 卡 /U 盘插入主板 TF 卡槽 /USB 接口，组装好 Muto 机器人即可正常开机，无需重新配置镜像。

按下 Muto 机器人尾部的开关按钮，开关为自锁类型，即按下后不回弹且机器人处于持续通电状态，开关绿灯常亮。Muto 机器人站立起来，等待约 1.5 分钟，系统启动完成后蜂鸣器鸣笛三声‘滴’，此时可以看到 OLED 显示的信息。

Jetson nano 系统用户名：jetson 密码：yahboom
树莓派系统用户名：pi 密码：yahboom

连接Muto六足机器人(视觉版)

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

首次打开【YahboomRobot】APP，根据所购买的机器人型号，需要选择【ROS 机器人】中的【MUTO】设备。



在 IP 栏填写机器人的 OLED 显示的 IP 地址，Port 栏填 6000，Video 栏填 6500，点击【连接】，连接成功之后将会自动跳转到主控制界面。



注意：连接设备前，请确认手机连接了机器人的热点信号，或者手机与机器人连接到相同的路由器上。而且已经启动了 App 控制程序（出厂系统默认开机启动 App 控制程序）。

【机体遥控】界面功能示意如下。



- Part 1. 速度：控制机器人的运动速度，可选择低速、中速或高速。
- Part 2. 高度：控制机器人的身体高度，可选择低、中或高。
- Part 3. 步宽：控制机器人行走一步的宽度。
- Part 4. 控制方式：左边选择按键控制，向上为前进，向下为后退，向左为左平移，向右为右平移，中间按钮为停止。右边选择摇杆控制，向上为前进，向下为后退，向左为左旋，向右为右旋，中间为停止。
- Part 5. 抬头 / 低头：控制机器人抬头 / 低头。
- Part 6. 左旋 / 右旋：控制机器人原地左旋 / 原地右旋。

2. 表演模式



【表演模式】界面功能示意如下。



- Part 1. 预设的八个动作，每次点击运行一次。
- Part 2. 复位按钮：机器人恢复为默认姿态。

3.全屏控制



【全屏控制】界面功能示意如下。

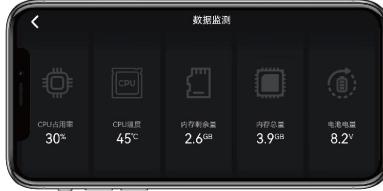


- Part 1. 隐藏 隐藏控件，保留全屏摄像头画面，再次点击显示控件。
Part 2. 摆杆：控制机器人移动位置。
Part 3. X/Y 轴舵机：控制摄像头舵机云台转动。

4.数据监测



【数据监测】界面功能示意如下。



Part 1. CPU 占用率：显示主板 CPU 的占用率。

Part 2. CPU 温度：显示主板 CPU 的温度。

Part 3. 内存剩余量：显示主板系统内存剩余多少 G 空间。

Part 4. 内存总量：显示主板内存总共多少 G 空间。

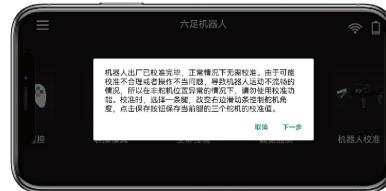
Part 5. 电池电量：显示机器人电池电压多少伏。

5.机器人校准

注：机器人出厂已标准完毕，正常情况下不需要校准。由于机器人校准功能比较特殊，操作不当可能会引起机器人运动不流畅等问题。



进入机器人校准界面前，APP 会提示以下内容，请点击下一步。



【机器人校准】界面功能示意图如下。



如上图所示，左边图片表示机器人选择的腿，图标亮则表示选中，底部保存按钮用于保存数据到机器人底板。右边三个滑动条分别控制选中腿的三个舵机。

请将 Muto 机器人平放在地面上，并面向自己，查看某一条腿悬空不着地，则选择对应的腿图标（图标亮则表示选中，此时右边三个滑动条数值都为 0），点击保存按钮，清空以前保存的数据。再调节右边三个滑动条，调节到有问题的腿着地。然后再次点击保存按钮，将数据保存到机器人舵机。

常见问题分析

1. Muto 机器人 S1 版本和 S2 版本有什么区别？

答：S1 版本使用的是 PS2 手柄控制方式，安装成功后即可使用 PS2 手柄控制，无需编程。S2 版本使用的是 jetson nano 或者树莓派主控，支持 Python 编程控制。

2. 驱动深度相机或雷达时出现设备报错问题，为什么？

答：确认硬件连接没有问题，请退出程序并重新插拔设备 USB 线。

3. 机器人如何供电？

答：小车出厂配有电池组，将电池组 T 型接口通过转接线连接扩展板的电池接口上，打开总电源开关，扩展板集成电压转化芯片，提供给各设备使用。

4. 扩展板上哪些功能是由单片机管理？

答：扩展板上的单片机管理的部分包括：有源蜂鸣器、姿态传感器、RESET 键、PWM 舵机接口、串口舵机接口等。

5. 为什么要关闭 APP 控制程序？对程序开发有什么影响？

答：为了体验控制程序方便，机器人开机自动运行了 APP 控制程序，但是会占用摄像头和串口等资源。在实际开发例程前，需要先关闭 APP 控制程序，避免例程调用摄像头和串口等资源而报错。如果长期不使用 APP 控制，可以根据教程永久关闭 APP 控制程序。

6. 机器人复位静止时，有一个腿不着地怎么办？

答：请打开 APP 控制界面，找到机器人校准，按照校准步骤重新校准机器人腿部的舵机。

锂电池组和充电器使用规范

1. 严禁接入超过产品使用负载的设备。
2. 严禁使用非亚博官方提供的电池或充电器。
3. 电池电压在 6.5V 以下时，扩展板蜂鸣器发出报警声，此时需要关闭电源，然后给电池充电。
4. 电池充电时请关闭扩展板上的总电源开关，请勿对电池边充电边使用，防止出现充电器或电池爆炸。
5. 充电时充电器指示灯亮红色，表示正在充电，充电器指示灯亮绿色，表示电池已充满。电池充电时应有人看护，充电完毕后应尽快拔下充电器，避免电池过冲。
6. 使用完毕后应关闭电源总开关，长时间不使用设备时，保持电池电压在 7.0V-7.8V 之间，拆下底部电池仓，把电池接线拔下来，取出锂电池组并放到电池安全区域，不要与金属物体混放，包在外面的绝缘膜不可以撕掉。
7. 远离热源、火源、任何液体，切勿在潮湿或雨中使用。潮湿环境可能导致产品短路损坏。
8. 锂电池组或电池充电器冒烟、发烫（严重时外包装会裂开），应迅速断开排插电源或者断开总闸，然后迅速拔出充电器，并取出电池放置空旷地带。
9. 当锂电池组或电池充电器起火、冒烟，请使用沙或者干粉灭火器灭火，然后迅速撤离至安全区域。
10. 若锂电池组或电池充电器出现破损、漏液、严重发热、变形、变色、有异味或其他任何异常现象时不得使用，并及时联系亚博或者其他代理商处理。
11. 请在温度 0°C 至 45°C 环境下使用，其他温度下锂电池组或电池充电器稳定性可能会出现下降。
12. 严禁故意刺破、短路、反接、私自焊接、撞击、碾压、抛掷电池组或电池充电器。

13. 禁止在强静电和强磁场环境中使用产品，否则会导致产品损坏。

14. 严禁私自改装或修改硬件电路板。

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

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

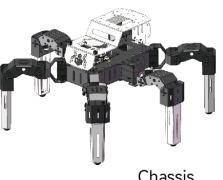
使用人群 18 岁以上；

产品名称 / 型号：Muto Hexapod Robot

技术支持邮箱：support@yahboom.com

制造商：深圳市亚博智能科技有限公司

Packing List (Basic Version)

Chassis			PS2 handle
			PS2 handle receiver
			PS2 adapter board
Battery pack			Charger
Screwdriver			Manual
AAA battery			Muto-S1 receiver accessory pack⑦
PS2 connection cable			Velcro
Micro USB cable (right-bend)			

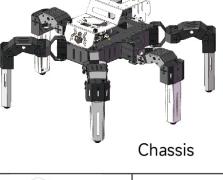
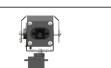
	USB3.0 male-male		XH2.54 cable
	OLED connection cable		PS2 handle+AAA battery
	Screwdriver		Micro USB cable (right-bend)
	Velcro		Manual

Raspberry Pi Accessories(optional)

	Raspberry Pi 5 (optional)		TF card
	Cool cooler Pi 50		Card reader
	Muto Raspberry Pi accessory pack②		RPI 5 power supply expansion board pack

Jetson NANO 4GB Accessories(optional)

	Jetson NANO 4GB (optional)		U disk
	Muto NANO 4GB accessory pack①		4010 fan
	M.2 antennas		DC power cable

Chassis			Camera PTZ Basic Version
			USB HUB board
			OLED board
OLED fixed plate			OLED board accessory pack⑥
USB HUB board accessory pack③			OLED board acrylic board
Battery pack			Charger

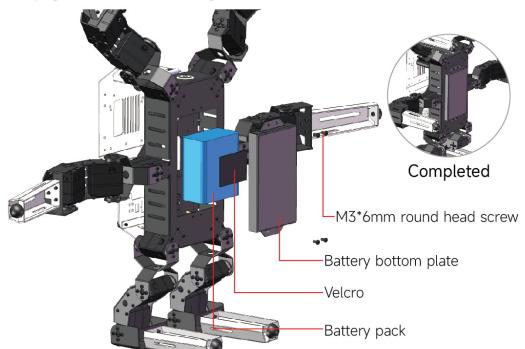
Muto Basic Version Assembly Steps

1. Unload battery bottom plate

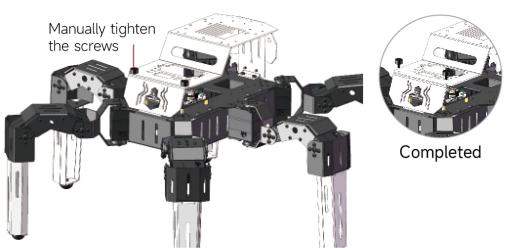


2. Install battery (Ensure power button is not pressed before installation)

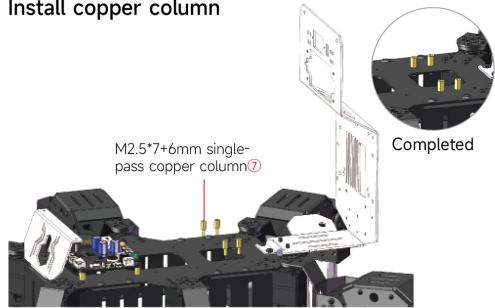
Note: Connect the wiring of the battery pack first, and then put it into the position of the battery. When installing the battery, please stand the hexapod upright with the head facing down.



3. Open Muto top plate

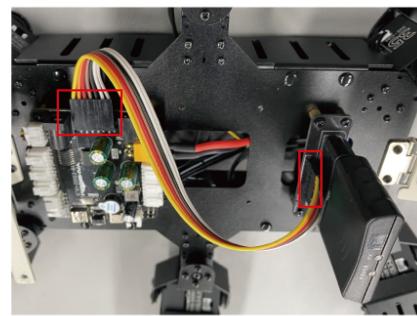
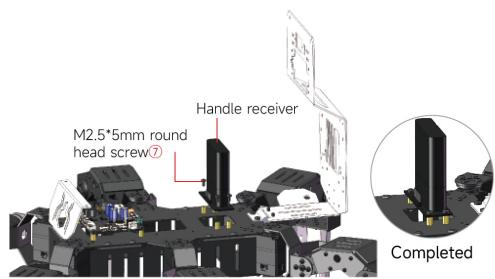


4. Install copper column

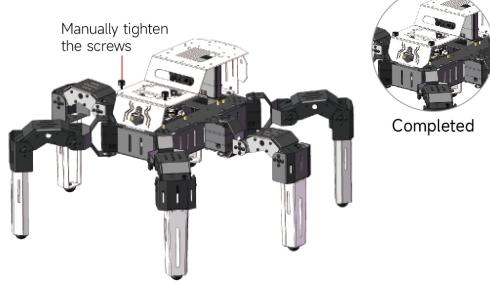


5. Install handle receiver

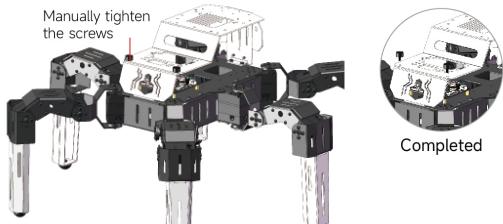
Note: After installation, connect the handle receiver wire.



6. Close Muto top plate



3. Open Muto top plate



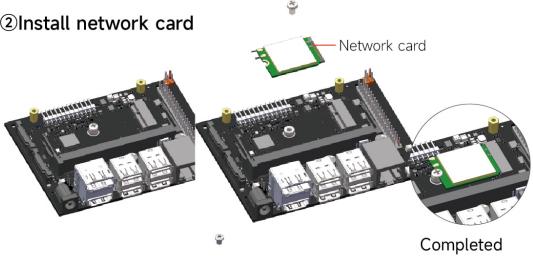
4. Install Jetson NANO board (Just for Jetson NANO version)

① Remove the core board

Note: Please remove the core board carefully. The clips on both sides are easy to broken.

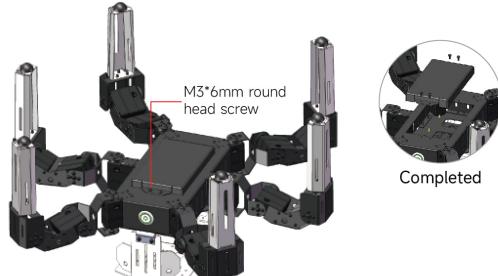


② Install network card



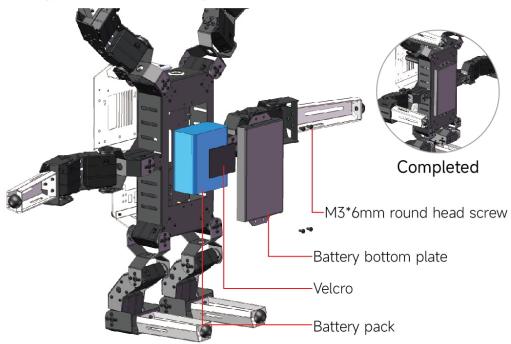
Muto Vision Version Assembly Steps

1. Unload battery bottom plate



2. Install battery (Ensure power button is not pressed before installation)

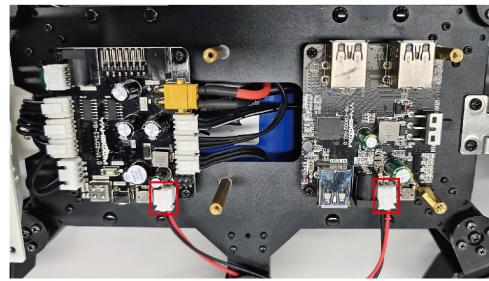
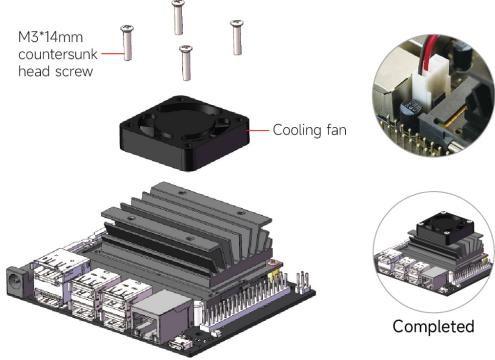
Note: Connect the wiring of the battery pack first, and then put it into the position of the battery. When installing the battery, please stand the hexapod upright with the head facing down.



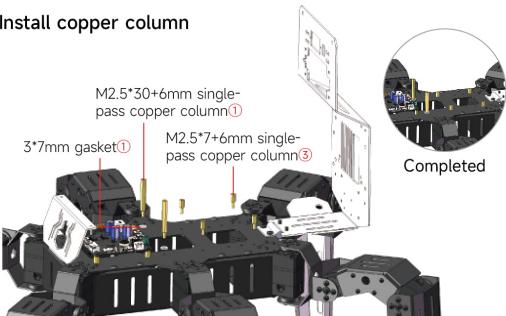
19

③Install cooling fan

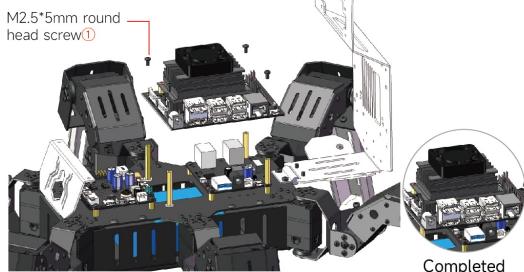
Note: After the fan is installed, connect the wires.



④Install copper column

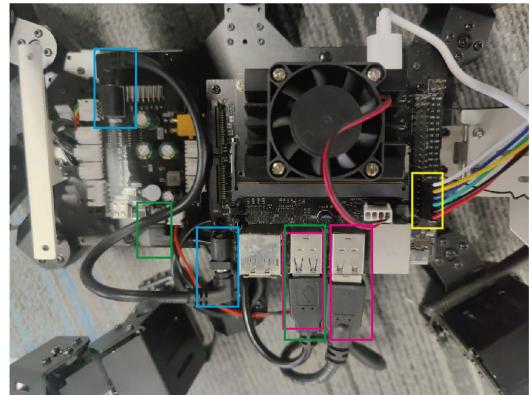
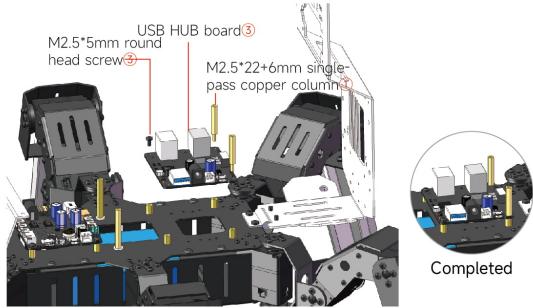


⑥Install Jetson NANO board

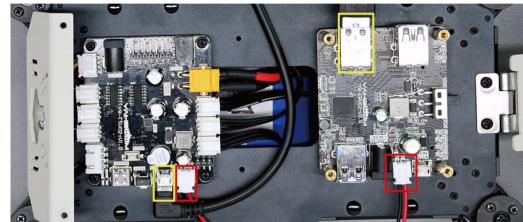
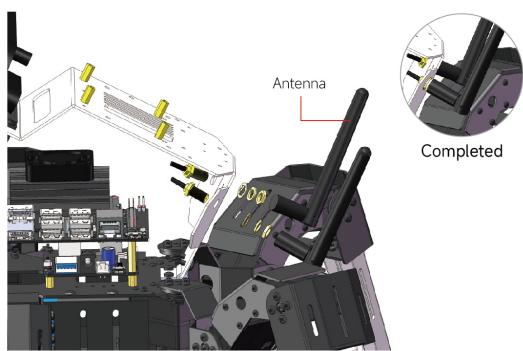


The part in the yellow frame is the connection line of the OLED screen, and one end should be connected to the main board firstly; please refer to P25, 26, and 27 for wiring details.

⑤Install USB HUB board

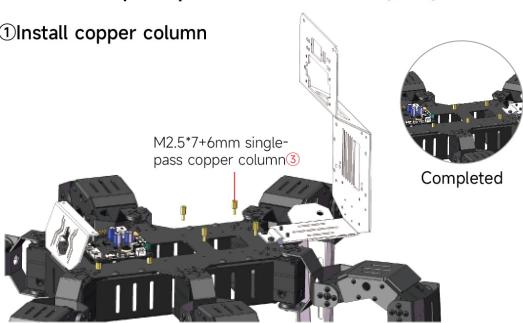


⑦Install Jetson NANO antenna

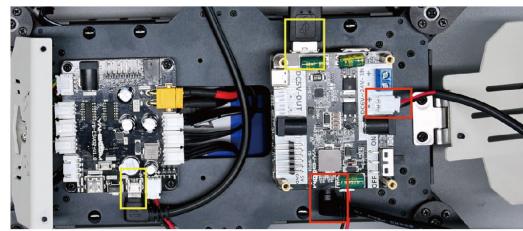
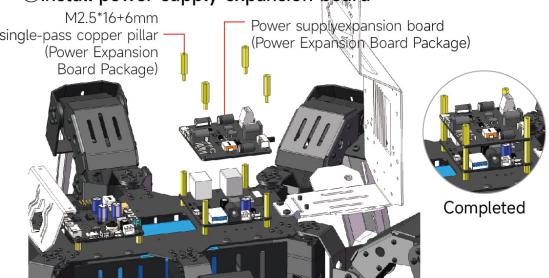


5. Install Raspberry Pi board (Just for Raspberry Pi version)

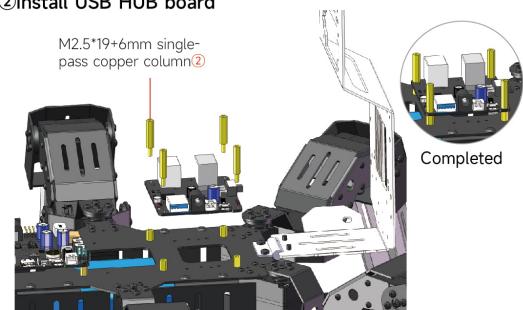
①Install copper column



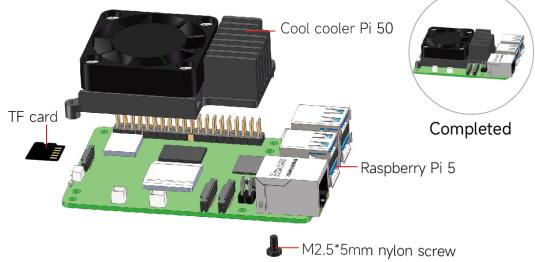
③Install power supply expansion board



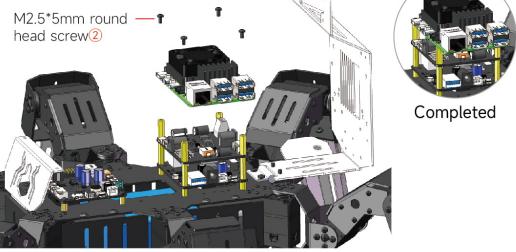
②Install USB HUB board



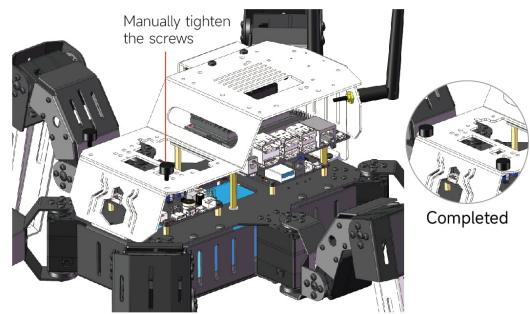
④Install Cool cooler Pi 50



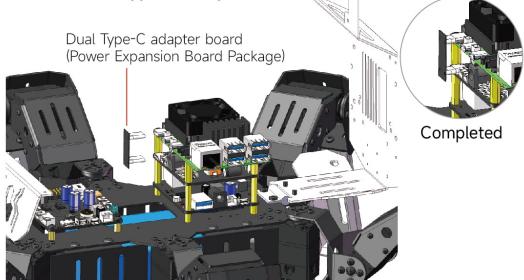
⑤ Install Raspberry Pi board



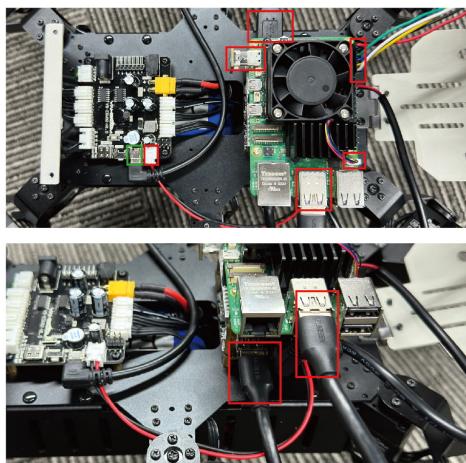
6. Close Muto top plate (Nano version as an example)



⑥ Install dual Type-c adapter board



Please view pages 25, 26, 27 for wiring details.

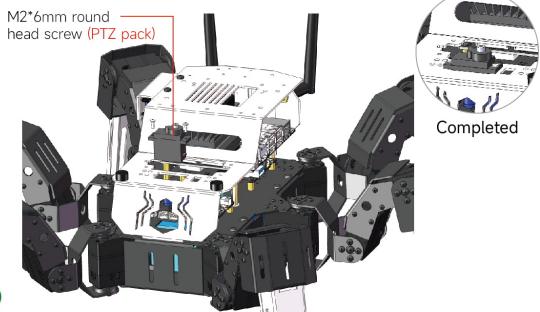


7. Unload camera PTZ basic version: Unscrew the center screw of the steering wheel and separate the PTZ

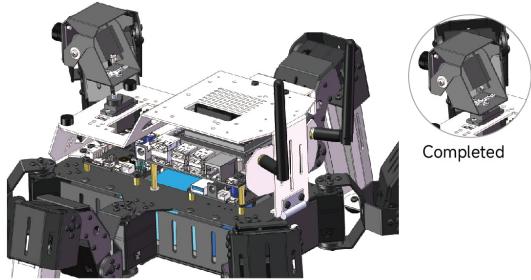
Note: Do not change the direction of the PTZ



8. Install camera PTZ



9. Install camera PTZ Note: Do not change the direction of the PTZ

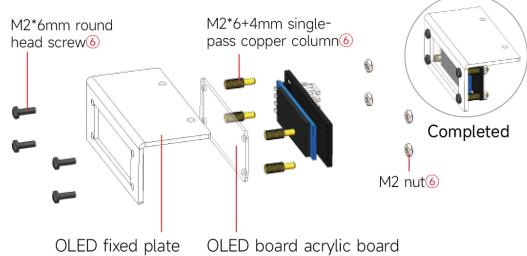


The installation is complete



(Basic version)

10. Install OLED screen

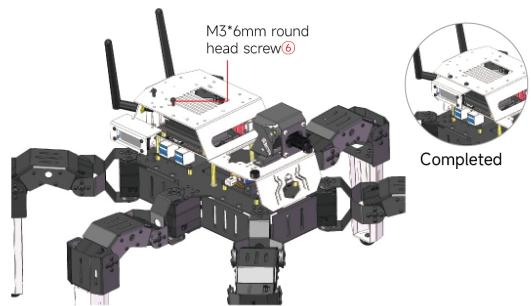


(Vision version-NANO)

(Vision version -RaspberryPi)

11. Install OLED screen to robot

Note: Connect the OLED screen wires before installation



U disk/SD card Installation (Vision Version)

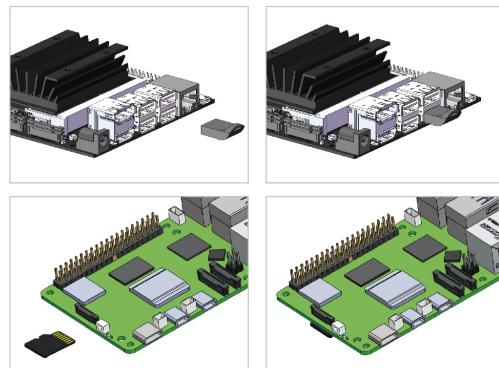
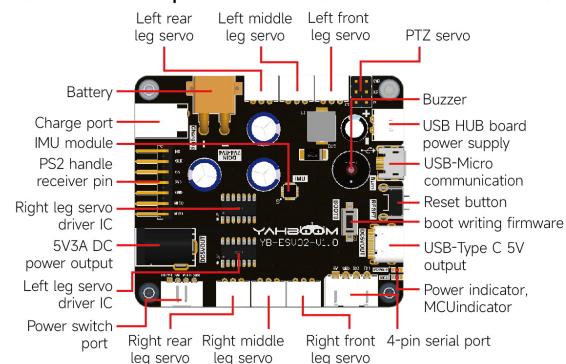


Figure 1-2 Insert USB disk into Jetson Nano board.

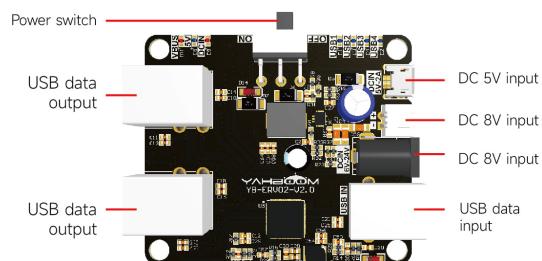
Figure 3-4 Insert TF card into Raspberry Pi board.

Expansion Board Interface Description

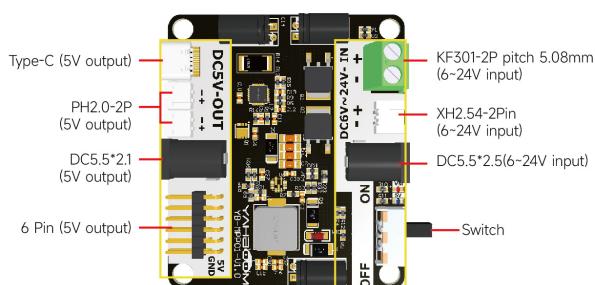
①Muto robot expansion board (S1&S2 universal accessories)



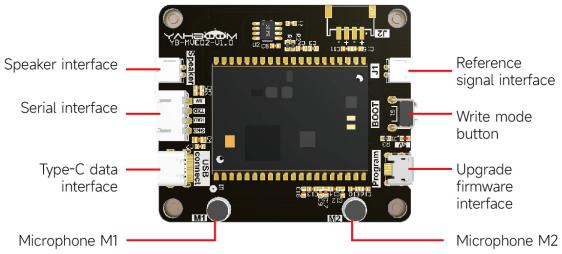
②USB HUB expansion board (S2 accessory)



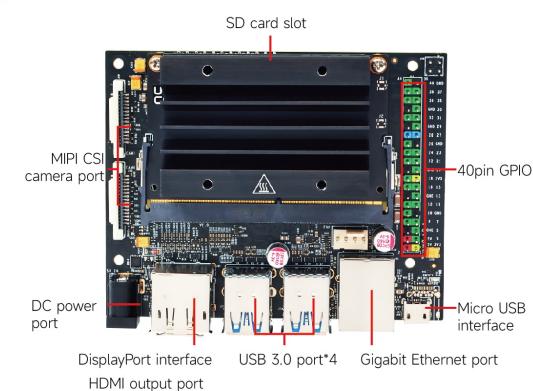
③Power supply expansion board (S2 RPi accessories)



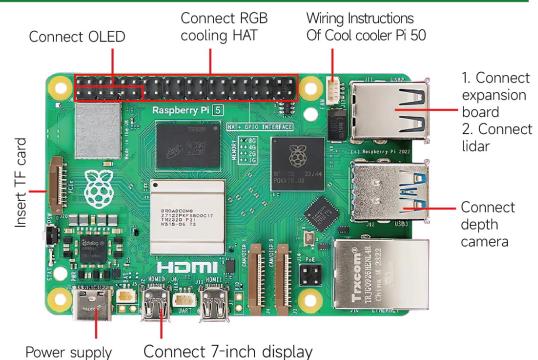
④Voice interaction module (S2 accessory)



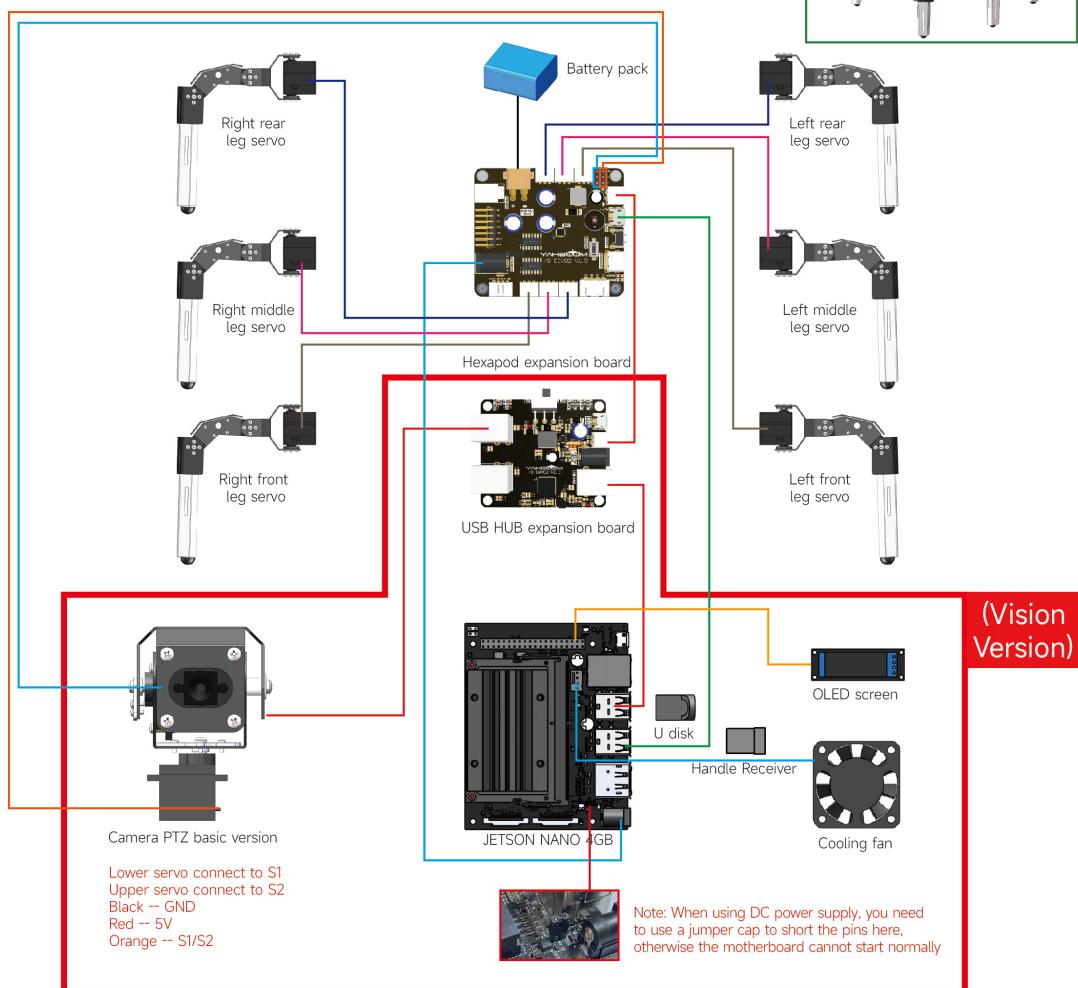
JETSON NANO 4GB Board Interface (Vision Version)



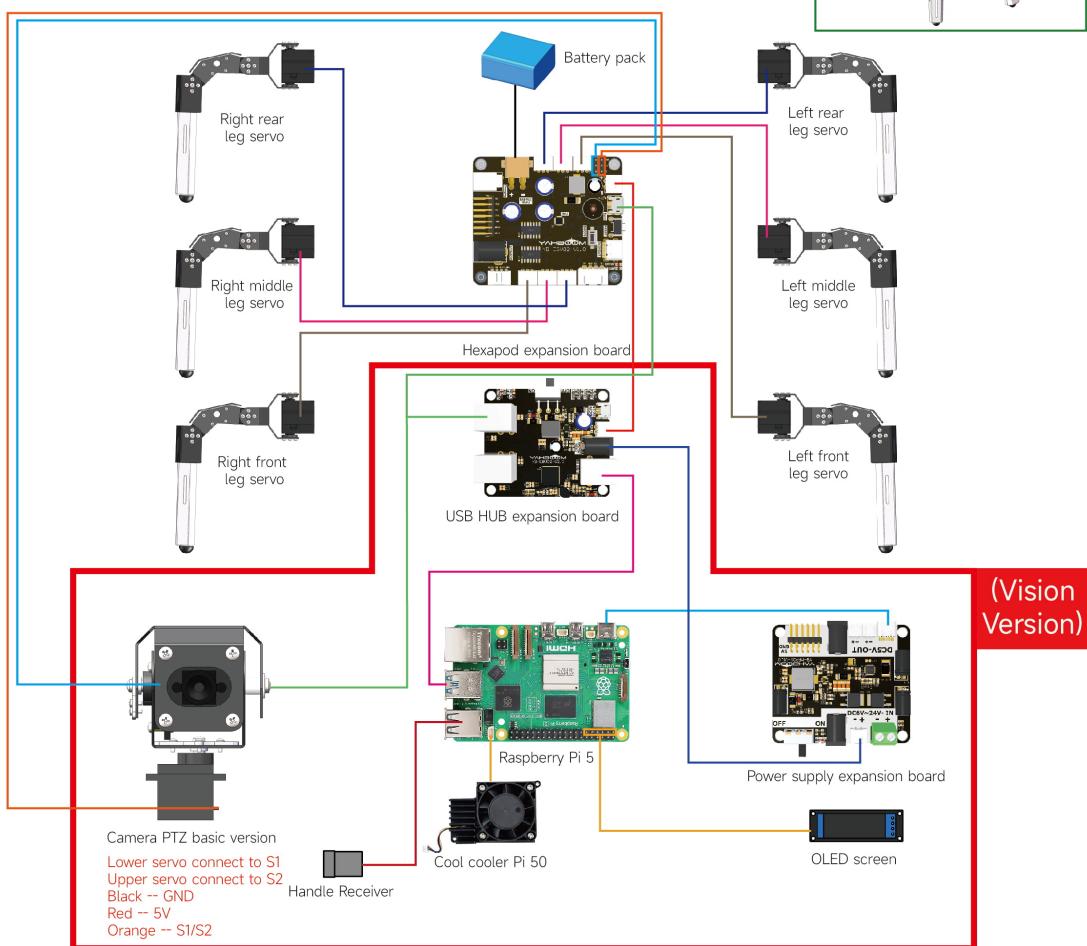
Raspberry Pi Board Interface (Vision Version)



JETSON NANO Version Wiring Diagram



Raspberry Pi Version Wiring Diagram

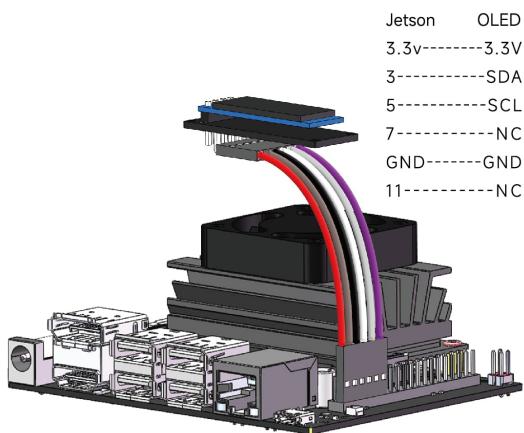


Note: Please connect the USB cable of the Muto robot expansion board to the USB-HUB board, not connect it to the USB port of the Raspberry Pi 5 board.

OLED module wiring diagram (Vision Version)

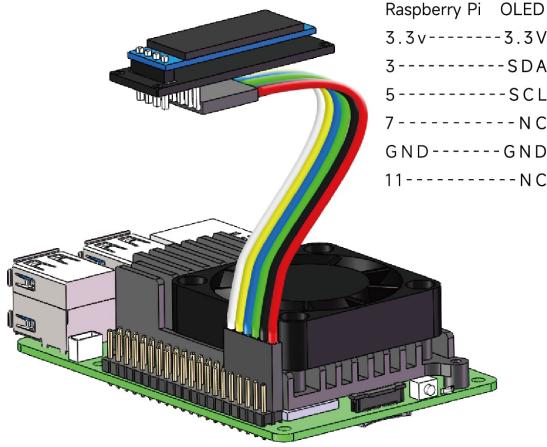
1. For Jetson version

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



2. For Raspberry Pi version

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

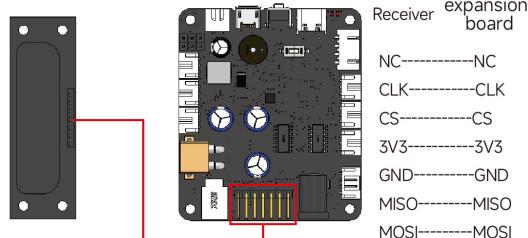


Handle Receiver Connection Instructions (Vision Version)



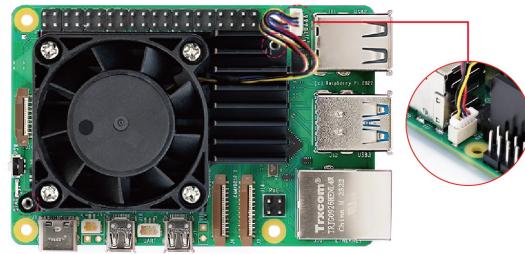
Note: Please insert
USB handle receiver to
the USB on the board.

PS2 Handle Receiver Wiring Diagram



Note: The expansion board is aligned with the receiving board
pin silk screen mosi and inserted

Wiring Instructions Of Cool cooler Pi 50

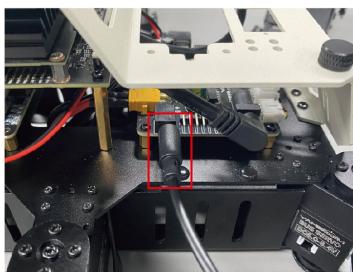


Charging

Plug the charger into the power outlet at home, and the indicator light of the charger will be green. As shown below.



Turn off the power switch of the robot. Then, insert the charger into the charging port on expansion board. As shown below.



When charging, the charger indicator light is red.



When fully charged, the charger light will become green.
Unplug the charger, and place the it in a safe area.

Download and install APP (Vision Version)

- Android users search "YahboomRobot" in Play Store or scan the QR code with browser to download APP.
- iOS users search "YahboomRobot" in App Store or scan the QR code with camera to download APP.



Start up robot (Vision Version)

The U disk or TF card 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 you can see green light on switch. Muto robot will stand up, wait patiently for 2 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 system: user name: jetson password: yahboom

Connect Muto robot (Vision Version)

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

1. Select device

Open the [YahboomRobot] APP, and select the [ROS Robot]--[MUTO].



2. Fill in the IP address displayed by the OLED on the robot, as shown below. Port:6000, and Video:6500.

Click [Connect], after the connection is successful, it will automatically jump to the main control interface.



Note: Before connecting the device, please confirm that the phone is connected to the hotspot signal of the robot, or that the phone and the robot are connected to the same router. And the APP control program has already been started.

APP function introduction (Vision Version)

1. Remote control



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



Part 1. Speed: Control the motion speed of the robot.

Part 2. Height: Controls the height of the robot body.

Part 3. Step width: Control the width of the robot walking step.

Part 4. Control method: Left side: Button control, up for forward, down for backward, left for translate left, right for translate right, middle button for stop. Right side: Rocker control, up for forward, down for backward, left for left rotation, right for right rotation, middle button for stop.

Part 5. Head Up I Down: Control the robot to head up I Down.

Part 6. Left/Right Rotation: Control the robot to rotate left/right in place.

2. Performance



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



Part 1. The eight preset actions are run once per click.

Part 2. Reset button: The robot returns to its default posture.

3.FPV Control



Click the [FPV Control] icon, you can see the following interface.



Part 1. Hide: Hidden button, keep the full screen camera image.

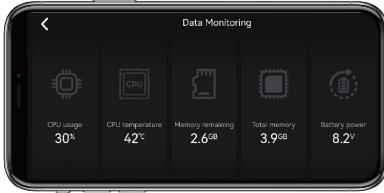
Part 2. Rocker: Control robot movement position.

Part 3. X/Y axis servo: Control camera PTZ.

4.Data Monitoring



Click the [Data Monitoring] icon, you can see the following interface.



Part 1. CPU usage: Display the CPU usage of the motherboard.

Part 2. CPU temperature: Display the temperature of the motherboard CPU.

Part 3. Memory remaining: Display the remaining memory space on the motherboard.

Part 4. Total memory: Display the total amount of memory on the motherboard.

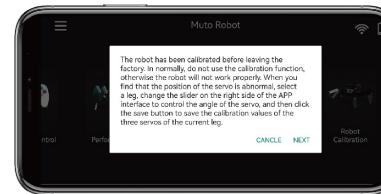
Part 5. Battery power: Display the voltage of the robot battery.

5. Robot Calibration

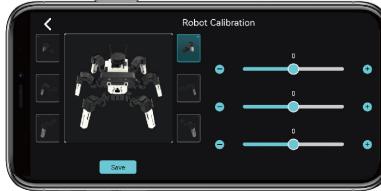
Note: The robot has been calibrated at the factory. In generally, does not require calibration. Improper calibration operation will cause the robot to not work properly.



Before entering the robot calibration interface, the APP will prompt the following content, please click [Next].



Click the [Robot Calibration] icon, you can see the following interface.



As shown in the above figure, the six buttons on the left correspond to the six legs of the robot. If the icon is lit, it indicates that the leg is selected. Click [save] button is used to save the current servo data. The three sliding bars on the right can control the three servo motors of the selected leg.

Robot calibration steps:

- ① Put the Muto robot on a flat ground, facing yourself, and check whether all six legs are on the ground.
- If one of the legs does not touch the ground, we need to calibrate the servo on this leg.
- ② Select the corresponding leg icon and click the [save] button to clear the previously saved data.
- ③ Adjust the three sliders on the right until the leg touches the ground.
- ④ Click [save] button again to save the current servo data.

FAQ

1. What is the difference between Muto robot S1 and S2?

A: The S1 version uses the PS2 handle control method. After the installation is successful, it can be controlled by the PS2 handle without programming. The S2 version uses jetson nano or Raspberry Pi as a main controller, supports Python programming.

2. When use depth camera or lidar , there is a device error problem.

A: Ensure the wiring of the device is correct, then exit the process and re-plug the wiring.

3. How to power supply the robot?

A: The battery pack is included in the robot kit, connect the battery to the battery interface of the expansion board. Turn on the power switch, and the expansion board integrates a voltage conversion chip to provide power to all devices.

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

A: Active buzzer, attitude sensor, RESET key, PWM servo interface, serial port servo interface, etc.

5. When running a single routine, why do we need to close the APP control process?

A: After the robot starts, it will automatically run the APP control program, but it will occupy resources such as the camera and serial port.

Before running a single routine, we need to close the APP control process first to avoid calling resources such as cameras and serial ports and reporting errors.

If you do not use APP control for a long time, you can permanently close the APP control process according to the tutorial.

6. What should I do if the legs does not touch the ground when the robot is stationary?

A: Open the APP control interface, click [robot calibration], complete the calibration of the servo according to the calibration steps.

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 provided by Yahboom.

3. When the battery level is less than 6.5v, the buzzer will sound the alarm. At this time, we need turn off power switch and charge the robot.

4. Please turn off the power switch before charging. For safety reasons, the robot cannot be used during charging.

5. When charging, the indicator light of the charger is red,

when the indicator light become green, indicating that the battery is fully charged. When charging the battery, some one should take care of it. After charging, unplug the charger in time to avoid over-charging.

6.After use, the power switch should be turned off. When the device is not used for a long time, we should be kept battery voltage is between 7.0V-7.8V. Remove the bottom battery box and unplug the battery cable, take out the lithium battery pack and place it in a battery safe area. Do not mix with metal objects, and the insulating film wrapped outside cannot be torn off.

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

8.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.

9.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.

10.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.

11.Please use the battery at 0°C~45°C environment. The battery will be damaged or the discharge performance will be extremely reduced at other temperatures.

12.Deliberate piercing, short circuit, reverse connection, unauthorized welding, impact, extrusion and throwing of batteries are strictly prohibited.

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

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

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

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

<http://www.yahboom.net/study/Muto-S2>

Technical Support

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Website: www.yahboom.net

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