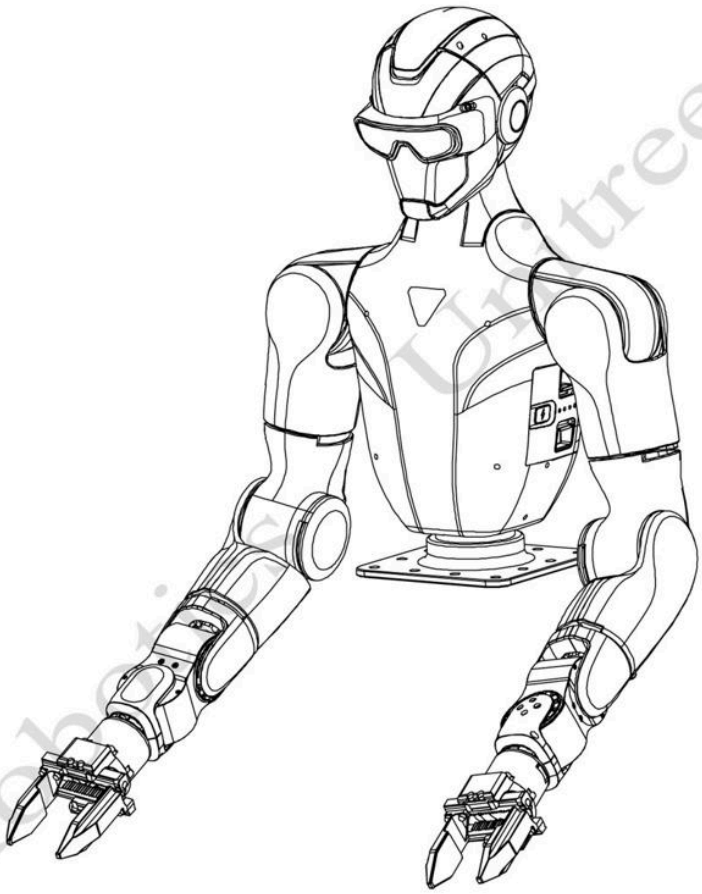
R1-A5/A7

User Manual V1.1



Unitree

This product is a civilian robot. We kindly request that all users refrain from making any dangerous modifications or using the robot in a hazardous manner.

Please visit Unitree Robotics Website for more related terms and policies, and comply with local laws and regulations.

Unitree Robotics

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Unitree Robotics

1.Disclaimer

To avoid illegal behavior, potential harm, and loss, it is essential to adhere to the following regulations:

1) Please be sure to read this article carefully before using the product, understand how to use the product correctly and your legitimate rights, responsibilities, and safety instructions. Otherwise, it may bring property damage, safety accidents and personal safety hazards. Once used this product, you are deemed to have carefully read, understood, recognized, and accepted all the terms and contents of this article. Users are responsible for their own actions and the consequences thereof. Users undertake to use this product only for legitimate purposes and agree with these terms and any relevant policies or guidelines that Unitree may establish.

2) The laws of some countries may prohibit the exemption of guarantee clauses, so your relevant rights may vary in different countries.

3) Subject to legal compliance, Unitree reserves the right of final interpretation of the above terms. Unitree has the right to update, amend or terminate this term without prior notice.

4) Unitree Robotics does not provide any explicit or implied commercial and technical guarantees not involved in this article.

5) Unitree Robotics does not guarantee that the products / services provided are completely free from defects and fully meet the customer's requirements. It also does not guarantee that Unitree Robotics can completely repair these defects.

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7) The purchased parts are not within the scope of services included in this service specification.

8) No on-site services are provided for terminal products and accessories. The maintenance service provided by Unitree Robotics for more than one year is an optional service. The customers can choose whether to purchase related services and choose when to terminate them. If the customers choose to purchase related services, it means that the customer allows Unitree Robotics to access, collect and process information related to faults, detection, positioning and debugging when providing services. Unitree Robotics will access and process relevant information in accordance with the customers' request under the premise of the customers' consent, and the information will only be used to provide maintenance services. Since the users are the controller of such information, Unitree Robotics cannot confirm whether such information contains customers' confidential information or personal data, and the customers shall guarantee that it will obtain or retain all necessary consents, licenses, authorizations ("Agree") is used to allow Unitree Robotics to provide this service, so that Unitree Robotics will not violate applicable legal requirements, the customers' privacy policy, or the

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agreement between the customer and the user when providing related services. Unitree will take reasonable measures to ensure the security of such users information, but Unitree Robotics is not responsible for direct or indirect responsibility for the act of obtaining and processing such information in the process of providing services.

2.Safety Instructions

The Unitree R1-A5/A7 is an extremely lightweight, freely customizable dual-arm humanoid robot, featuring 13-31 degrees of freedom and advanced multimodal AI interaction capabilities. With advantages in ultra-fast deployment and fully open-stack secondary development, it targets research, education, and multi-scenario implementation, promoting the popularization and innovation of embodied intelligence technology.

1) This product is not a toy and is not intended for use by persons under the age of 18. Keep out of reach of children and be careful when operating in the presence of children.

2) You are obliged to be aware of the laws in your area and to comply with relevant laws and regulations.

3) This chapter is an introductory chapter for new users to manipulate robots. New users can quickly master how to use the Remote Control to control the robot to show excellent movement performance by reading this section. This chapter is also a chapter that old users often need to refer to. Old users can read this chapter repeatedly to grasp the essentials of operating the robot, and then they can draw inferences from case, and know what kind of movements are not recommended.

4) When the users run the program developed by themselves in the developer mode: The remote control commands are still valid when the high-level (application layer) is developed. At this time, if the high-level API commands and the remote control commands are sent to the robot, both commands will be executed by the robot. It may cause the robot to become unstable. Please be sure to judge whether the users need to use the remote control according to the running state of the robot. Remote control commands fail during low-level development.

5) During use, maintain visual contact with the robot while controlling it, keep a safe distance from the humanoid robot, and do not touch the robot with your hands after it is powered on!

6) When the robot is in motion, ensure the surrounding area is clear or use a safety tether to prevent tripping accidents that could cause it to fall onto objects or people.

7) When moving the robot or when the robot is in motion, do not touch the joint areas of the robot to prevent pinching.

8) When the last battery indicator is flashing, promptly stop and shut down the robot, remove the battery for charging, to prevent the robot from losing power and falling due to low battery, which could cause damage!

9) This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.

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3.Product Overview

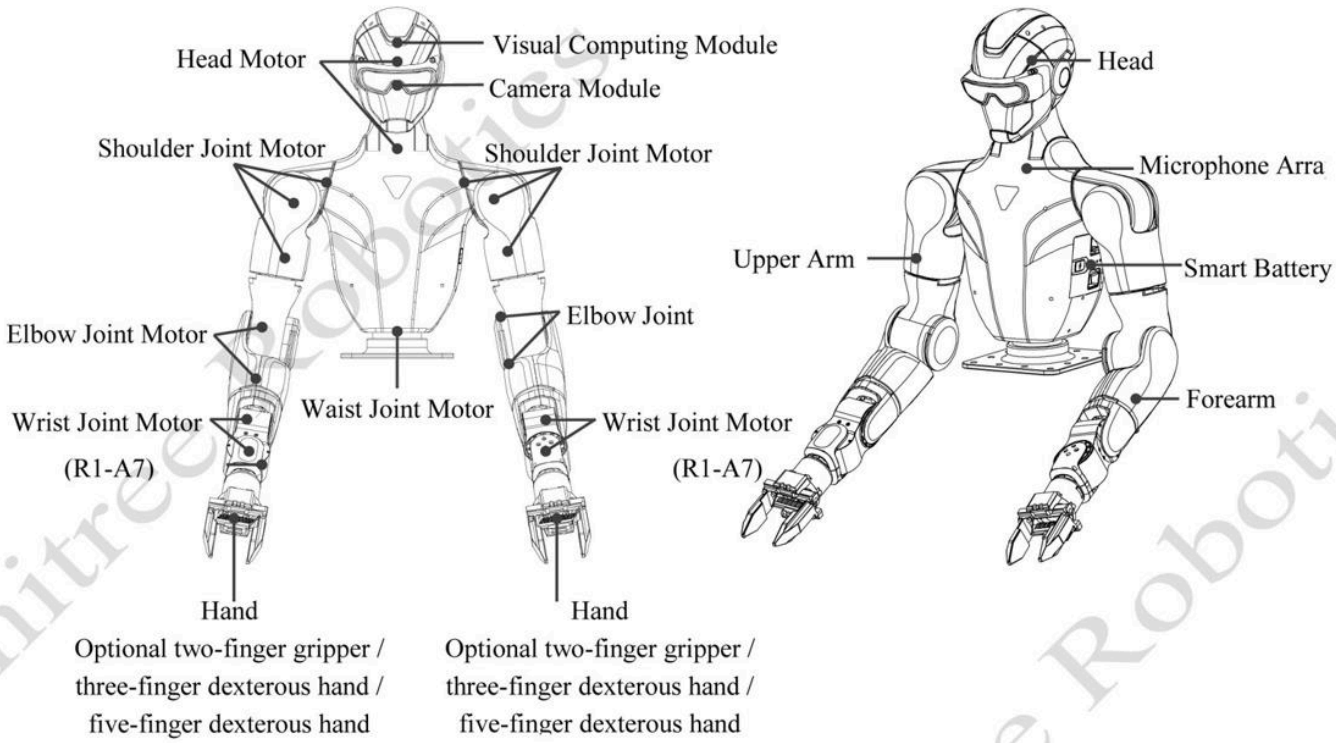
3.1 Introduction

The Unitree R1-A5/A7 is a high-performance, rapidly deployable dual-arm robot, featuring 13–31 selectable degrees of freedom (DoF) and advanced multimodal AI interaction capabilities. It integrates a stereo vision computing module (10 TOPS) and a voice interaction system (4-array microphone + dual speakers), paired with an 8-core high-performance CPU, enabling real-time data processing and AI-driven interaction. The robot adopts a fully open-stack secondary development framework, supporting end-to-end low-level customization, and offers two deployment options: fixed base and mobile chassis. With an arm payload capacity of 2–4 kg, an end-effector repeatability of ±0.1 mm, and flexible 5/7-DoF single-arm configurations, it is designed to meet diverse application needs in research, education, industry, and service sectors—promoting the widespread adoption and innovative application of high-performance dual-arm robots.

3.2 Parts Name

R1-A7 Single-Arm 7-DoF Dual-Arm Robot Unit is shown in the figure below. Please refer to the actual product for specifics.

R1-A5, compared to R1-A7, has reduced the number of wrist joint motors.

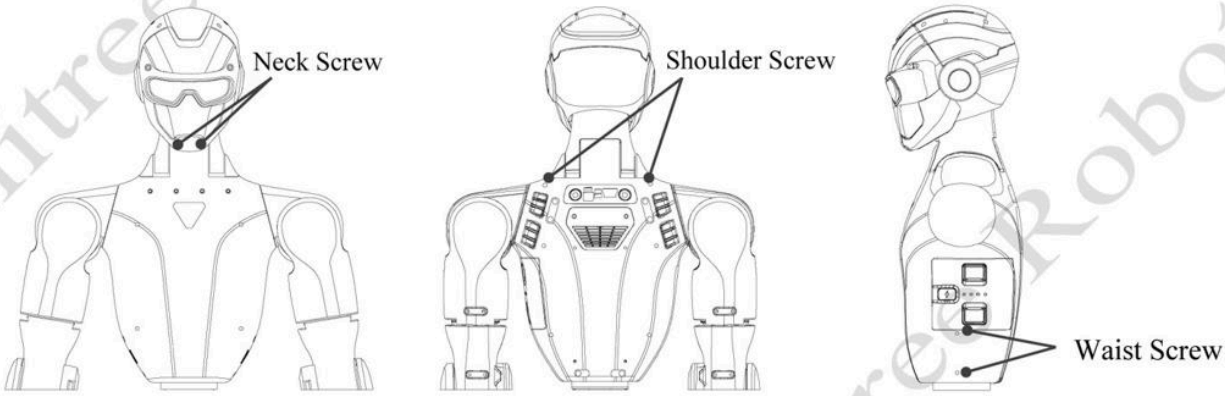


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If you need to use the R1-A5/A7 front chest mounting holes:

> ● Please scan the QR code to visit the Unitree Documentation Center for **Installation Hole Instructions and Usage** videos.

1) First, remove the two neck fixing screws from the front, the two shoulder fixing screws from the back, and the four waist fixing screws from the sides, as shown in the figure.

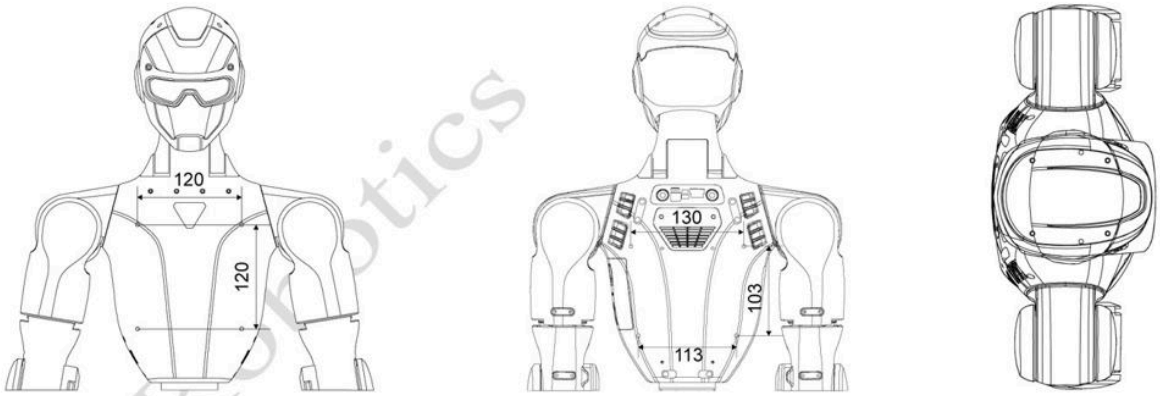


Positive Back Side

2) Then, from inside the front panel, use a 3.3mm drill bit to drill through the front panel screw holes.

3) Finally, from inside the front panel, use an M4 tap to thread through the front panel along the existing M4 threads (be careful not to damage the threads).

R1-A5/A7 Mounting Hole Dimension Diagram: M4 threaded hole, unit mm.



Positive Back Head

3.3 Specification Comparison

Model	R1-A5	R1-A7
Dimensions	700x357x190mm	835x357x190mm
Weight	Approx. 11kg (with external power supply)	Approx. 13kg (with external power supply)
Degrees of Freedom (with Gripper)	15	19

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DOF per Arm	5	7
Waist DOF	1	1
Head DOF	2	2
Joint Output Bearing	Crossed Roller + Deep Groove Ball	Crossed Roller + Deep Groove Ball
Joint Motor	Low-Inertia High-Speed Inner Rotor PMSM (Superior Responsiveness & Heat Dissipation)	Low-Inertia High-Speed Inner Rotor PMSM (Superior Responsiveness & Heat Dissipation)
Maximum torque of the shoulder	60Nm	60Nm
End Effector	Optional two-finger gripper / three-finger dexterous hand / five-finger dexterous hand	Optional two-finger gripper / three-finger dexterous hand / five-finger dexterous hand
Forearm + Upper Arm Length	420mm	555mm
Joint Motion Range	Waist: Yaw±150° Head: Yaw±115° Pitch±36°	Waist: Yaw±150° Head: Yaw±115° Pitch±36°
Wiring	Hollow + Internal Wiring	Hollow + Internal Wiring
Joint Encoder	Dual encoder (arm)	Dual encoder (arm)
Cooling System	Local Air Cooling	Local Air Cooling
Power Supply	External Power or Li-ion Battery	External Power or Li-ion Battery
Base Computing Power	Body: 8-core high-performance CPU Head: 8-core high-performance CPU + 10 TOPS	Body: 8-core high-performance CPU Head: 8-core high-performance CPU + 10 TOPS
Microphone	4-Array	4-Array
Speaker	Dual Speakers (3W×2)	Dual Speakers (3W×2)
WiFi 6 & Bluetooth 5.2	Yes	Yes
Camera Module	Binocular Camera + Optional Wrist Camera	Binocular Camera + Optional Wrist Camera
High-Computing Module	Optional NVIDIA Jetson Orin (40-100 TOPS)	Optional NVIDIA Jetson Orin (40-100 TOPS)
Power Input	Yes	Yes
Charger	Yes	Yes

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Battery Life(Battery-powered)	Approx. 1.5h	Approx. 1.5h
Smart OTA Update	Yes	Yes
Secondary Development	Yes	Yes

● Please visit the Unitree documentation center to obtain the R1-A5/A7-EDU secondary development guide.

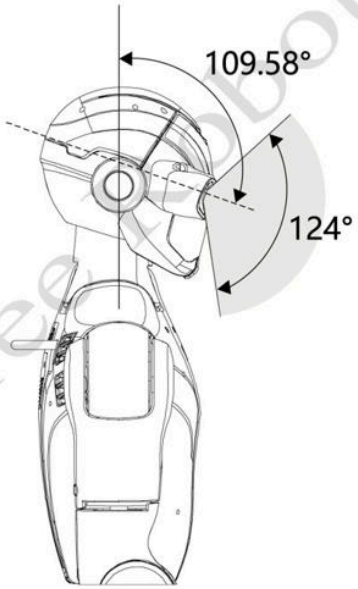
R1-A5/A7 Camera Parameters:

RGB Full Resolution	1270*720
Depth Resolution	544*448
Depth Map Frame Rate	10Hz
RGB Frame Rate	30Hz
Resolution	13 million
Features	● Global Shutter ● High Photosensitivity ● Supports High Dynamic Range Output ● High Signal-to-Noise Ratio ● 850nm/940nm Near-Infrared Enhancement ● Supports External Exposure Control and Multi-Sensor Synchronization ● Automatic Exposure/Gain Control, Supports Exposure Less Than One Line ● Supports LED STROBE ● Horizontal/Vertical Window Adjustment ● 15.5x Analog Gain, 16x Digital Gain ● 1PC Interface Register Programming
Dynamic Range	● Normal mode: 66dB ● HDR mode: >100dB

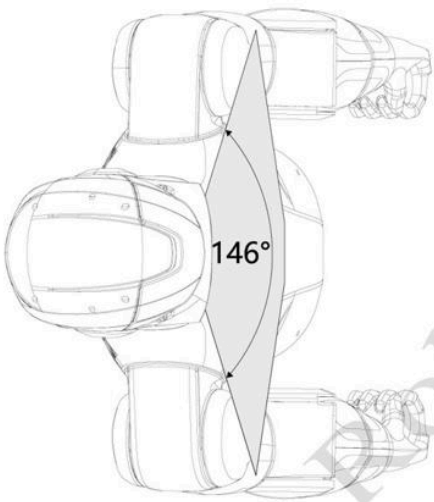
R1-A5/A7 Camera Field of View:

The R1-A5/A7 basic version is equipped with a depth camera in the head, with a horizontal FOV of up to 146° and a maximum vertical FOV of 124°.

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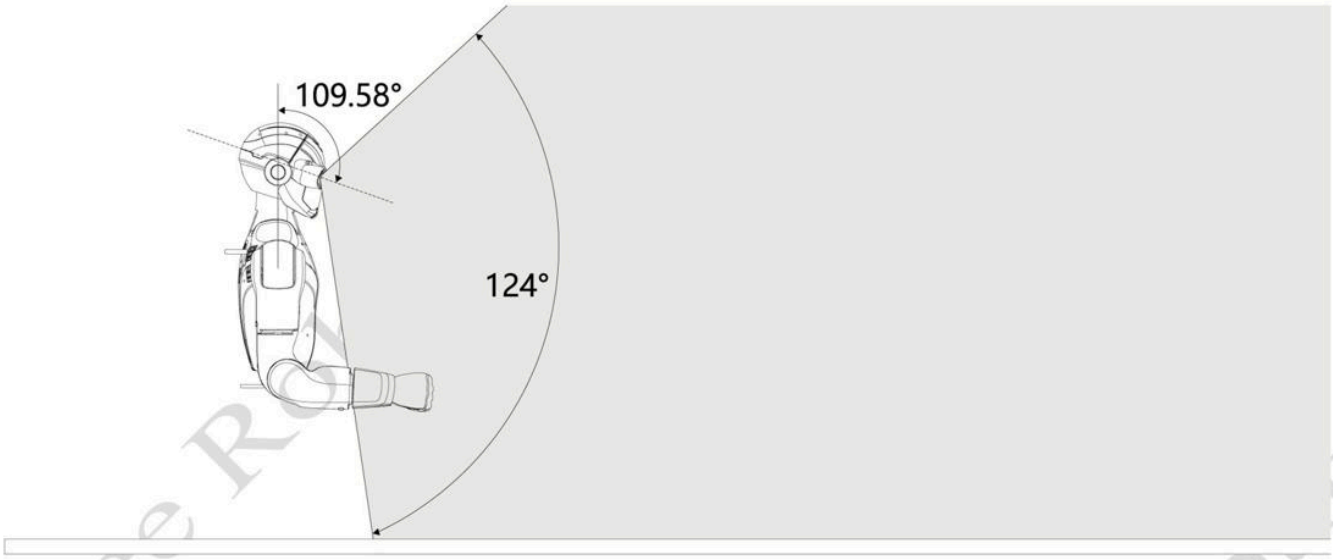


Vertical



Horizontal

The wide field of view provides the robot with exceptional visual perception, enabling it to accurately understand its surroundings, achieve high-precision spatial awareness and obstacle detection, and thus interact and respond more intelligently and flexibly in diverse scenarios.

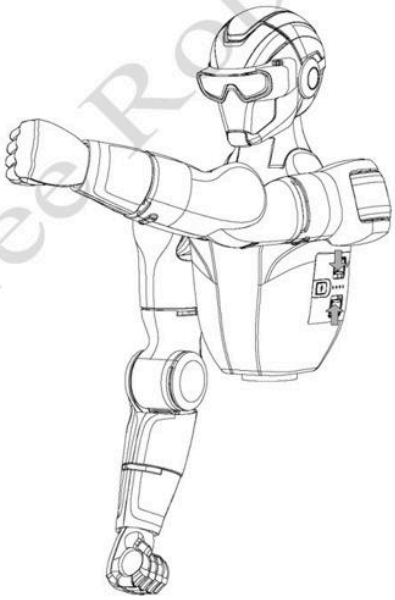


4.How to charge

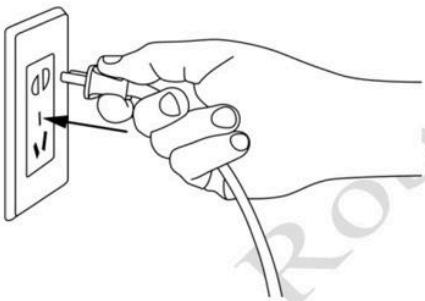
Due to factors such as battery self-discharge during transportation and storage, it is normal for the battery to have low or no power when first used. You can charge it as follows.

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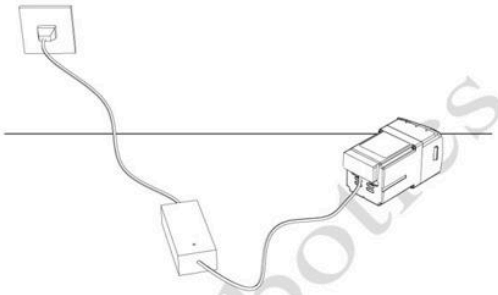
4.1 Charge the Battery



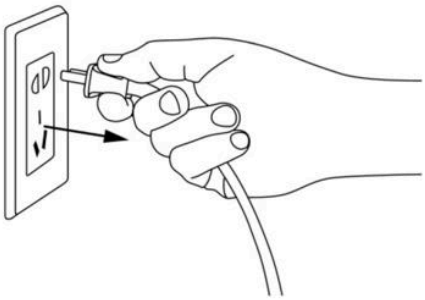
1) Remove the battery from the R1-A5/A7 body (press the two latches on the battery pack with both hands)



2) Charger input AC power (100-240V, 50/60Hz)



3) Connect the R1-A5/A7 battery



4) Manually disconnect the power when fully charged

1) Connect the charger to an AC power source (100-240V, 50/60Hz). It must be ensured that the external power supply voltage matches the rated input voltage of the charger before connecting. Otherwise, the charger will be damaged (the rated input voltage of the charger is marked on the nameplate of the charger).

2) Plug in the input AC power first before charging the battery, then connect the charger to the battery.

3) Before charging the battery, ensure that the battery pack is switched off. Otherwise, the battery and charger may be damaged.

4) The users need to remove the battery pack from the robot itself when charging the battery pack.

5) In the charging state, the battery indicator of battery pack will flash at a frequency of 1Hz (1 second/time) and indicate the current battery.

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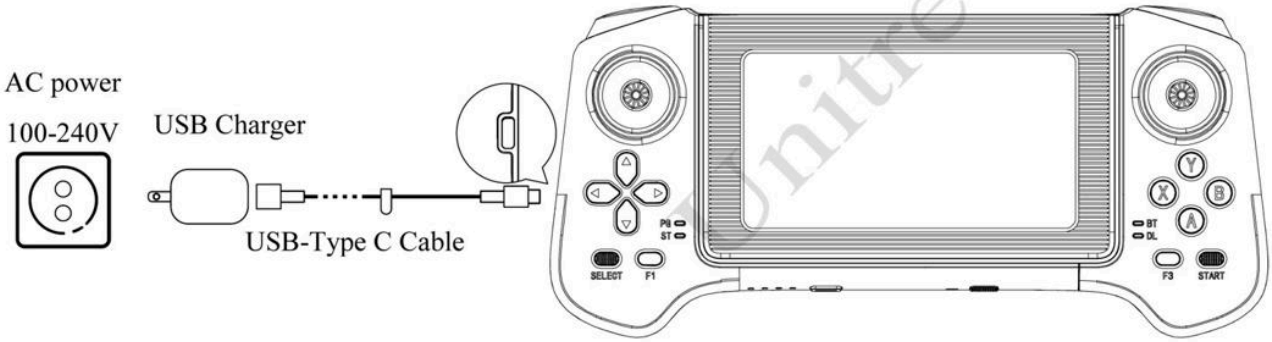
6) If the battery indicator is off, the battery pack is fully charged. Please remove the battery pack and charger to finish charging.

7) The temperature of the battery pack may be high after running, t, and the battery pack must be charged after the temperature of the battery pack has dropped to room temperature.

⚠ ● It is strictly prohibited to use unofficial chargers to charge R1-A5/A7 batteries. Please use official chargers for charging!

4.2 Remote Control Charging

When the battery indicator light of the companion remote control shows that the battery is low, you should connect the companion remote control to the charger as shown in the figure below:



1) We recommend you to use a 5V/2A USB charger which meets FCC/CE standard.

2) Ensure that handheld remote control is switched off before charging it.

3) The power indicator light will flash at 1Hz (1 second/time) in charging status and indicate the current power level.

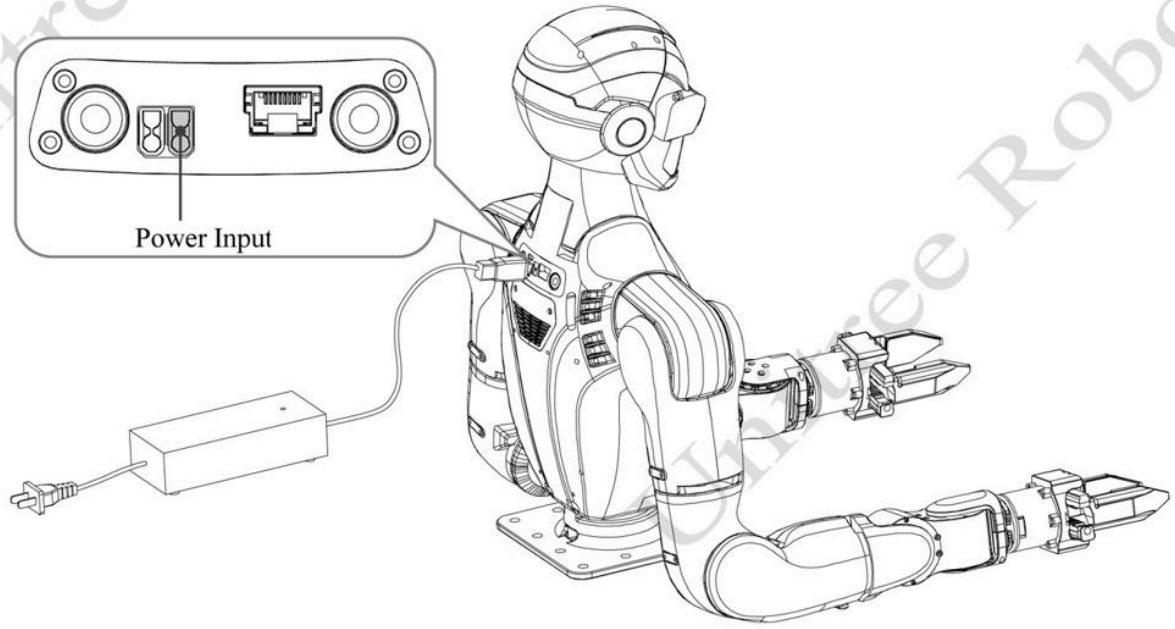
4) When the power indicator light is all on it means the battery pack is full, please remove the charger to finish charging.

Charging Indicator Light				
LED1	**LED2**	**LED3**	**LED4**	**Current Battery**
☀	○	○	○	0%-25%
☀	☀	○	○	25%-50%
☀	☀	☀	○	50%-75%
☀	☀	☀	☀	75%-100%
☀	☀	☀	☀	Full Charged

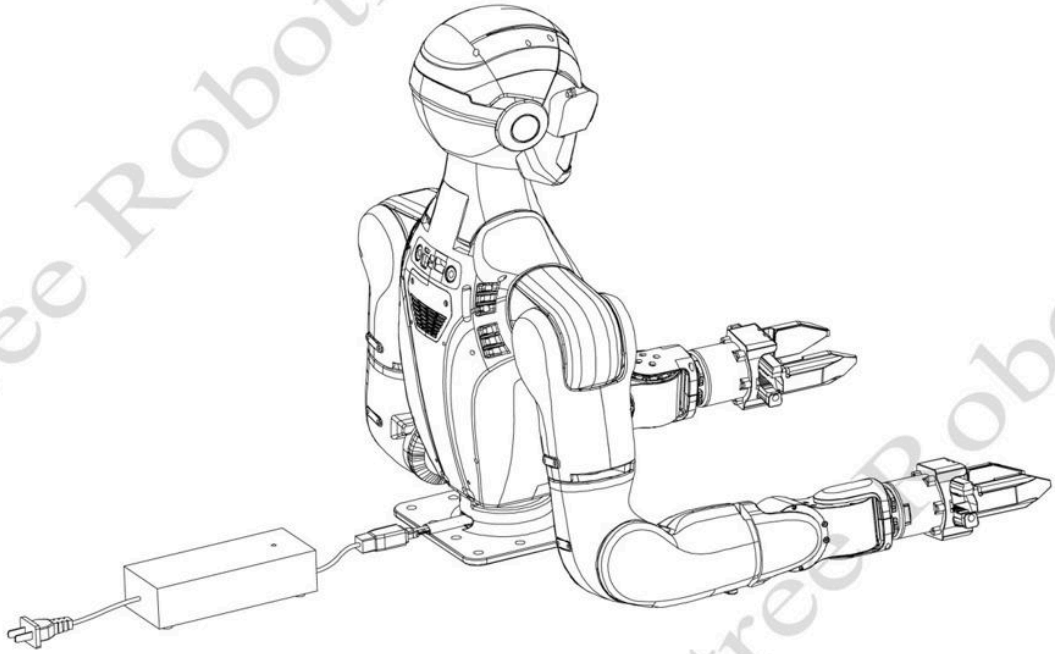
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4.3 External Power Supply

The R1-A5/A7 can be powered via the rear power input port or the base power input port. The recommended power supply voltage is 36V/6A. When no battery is inserted, the rear power input will directly power the R1-A5/A7. When a battery is inserted and its voltage is below the operating voltage, the rear power input will charge the battery.



Rear power supply



Base power supply

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5.Instructions for use

5.1 Operating Environment Requirements

1) Operate in good weather conditions at temperatures ranging from 0°C to 40°C. Do not operate in adverse weather conditions, such as fog, snow, rain, thunderstorms, sandstorms, storms, tornadoes, etc. The robot is NOT waterproof. Do not operate on wet ground, in rain, snow, or humid environments! The robot is not dustproof. Do not operate on gravel ground or in dusty environments!

2) When using the robot, keep it within your field of vision and a safe distance of at least 2 meters from obstacles, complex terrain, crowds, water and other objects.

3) Please do not run the robot in an electromagnetic interference environment. Sources of electromagnetic interference include but are not limited to: high-voltage power lines, high-voltage transmission stations, mobile phone base stations, and television broadcast towers.

4) Please do not run the robot in the Wi-Fi signal interference environment. Wi-Fi signal interference is usually caused by co-channel interference. In case of interference, be sure to turn off the Wi-Fi signals on some or all other wireless devices before using the remote control to operate the robot.

5.2 Check before Power on

1) Only Use Unitree Robotics authentic parts and ensure that all parts are in good working condition.

2) Ensure that the firmware has been updated to the latest version.

3) The users must make sure that he or she is not operating the robot under conditions such as, intoxicated, under the influence of drugs, and unable to concentrate.

4) Be familiar with the characteristics of each gait mode. Be familiar with the emergency braking method of the robot in case of instability / loss of control.

5) Ensure that there are no foreign objects (such as water, oil, sand, soil, etc.) inside the robot and its components.

6) Ensure normal power supply.

5.3 Power on Procedures

⚠ ● Paint wear on the exterior caused during the power-on/off process is a normal occurrence.

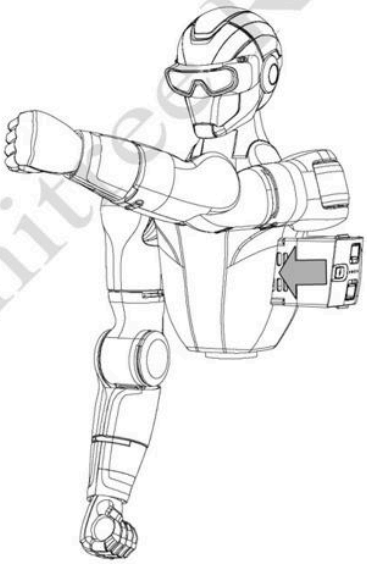
1) Power On

a) Lift the left arm and insert the battery. A "click" sound indicates it is properly installed. Ensure the latch is securely engaged!

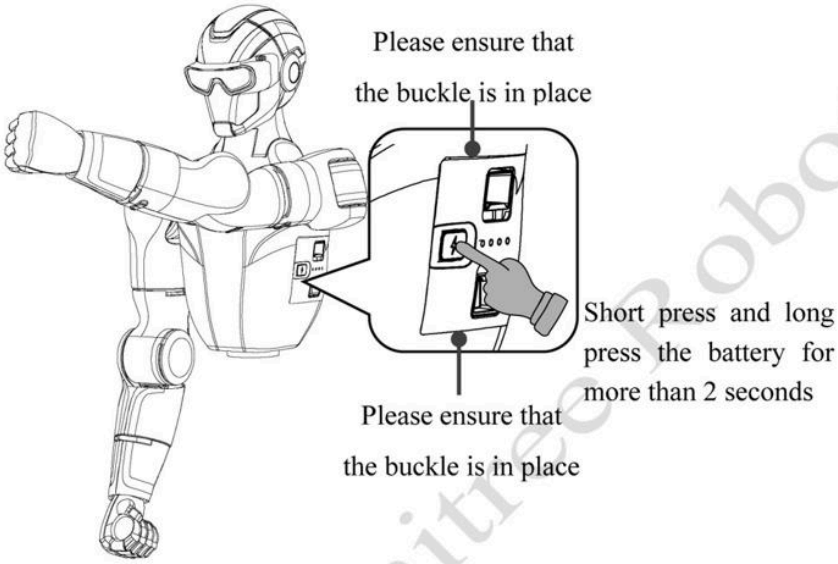
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b) Briefly press the battery power button for 1 second, then press and hold it for more than 2 seconds to power on.

c) The chest lights up with a purple light, and the voice prompt " Startup Complete " indicates the startup is complete.



Step1 Insert the Battery



Step2 Power On and Start

2) Start the Robot

a) Power on via remote control: Briefly press the power button on the remote control once, then press and hold it for more than 2 seconds to power on.

b) The remote control's DL indicator will stay steadily on, indicating a successful connection.

c) Press **[L2 + B]** on the remote controller to switch the robot into Damping Mode / Zero Moment Mode.

3) External Power Supply

a) Connect the adapter to the rear power input port or the base power input port, and plug the adapter into a power source.

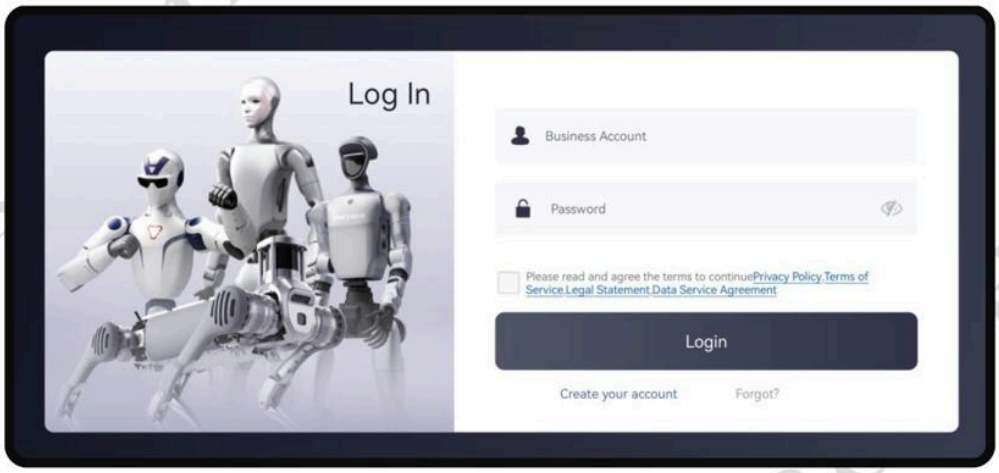
b) After power is supplied, the robot will automatically power on. The chest will illuminate with a purple light, and the message "Startup complete" will be announced, indicating a successful boot.

5.4 Connecting to the Unitree Explore App

1) Scan the QR code to download and install the Unitree Explore App, register an account, and complete the login.

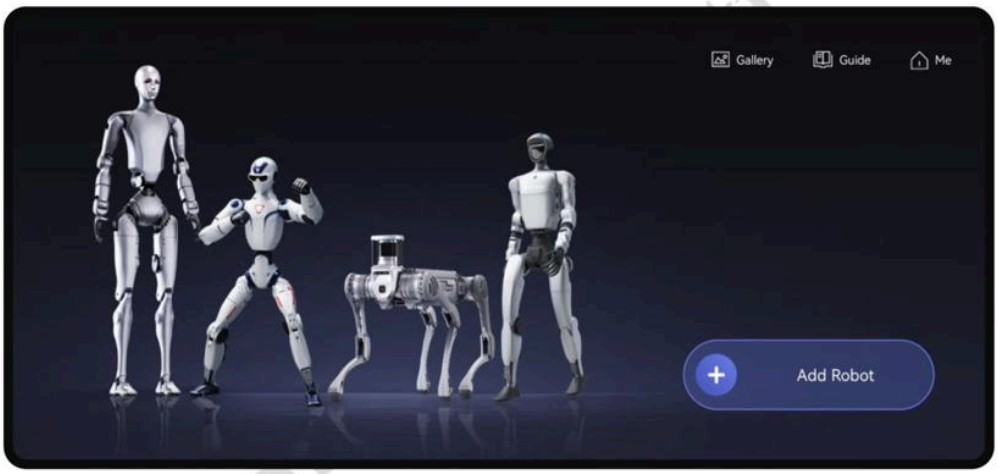
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Unitree Explore App Download Link

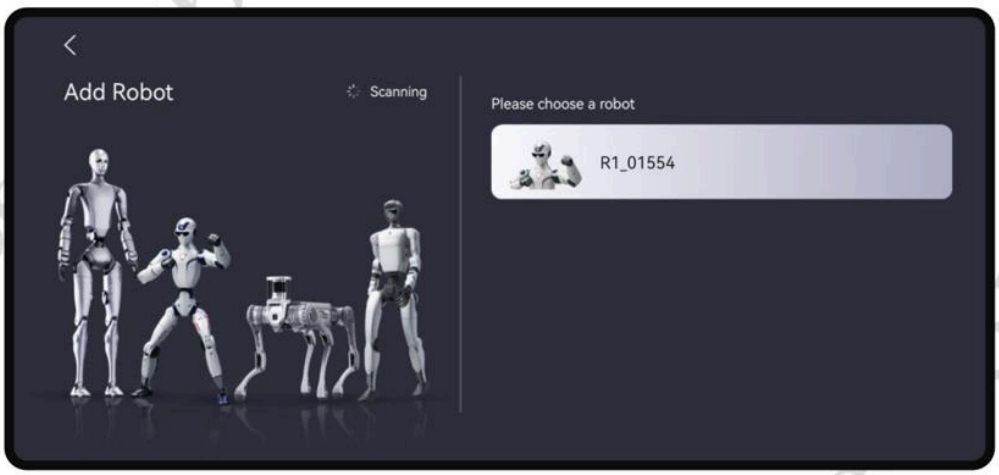


● The Unitree Explore App is specifically designed for the B2, H1, G1, and R1-A5/A7 series robots, providing an excellent control experience and feature support!

2) After the R1-A5/A7 is powered on, click "Add Robot."



3) Click on the device you want to add.



● Please keep your phone's Bluetooth turned on during the connection process!

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● Bluetooth connection error: The Unitree Explore App requires Bluetooth permissions. Please enable Bluetooth permissions for Unitree Explore in your phone's app settings.

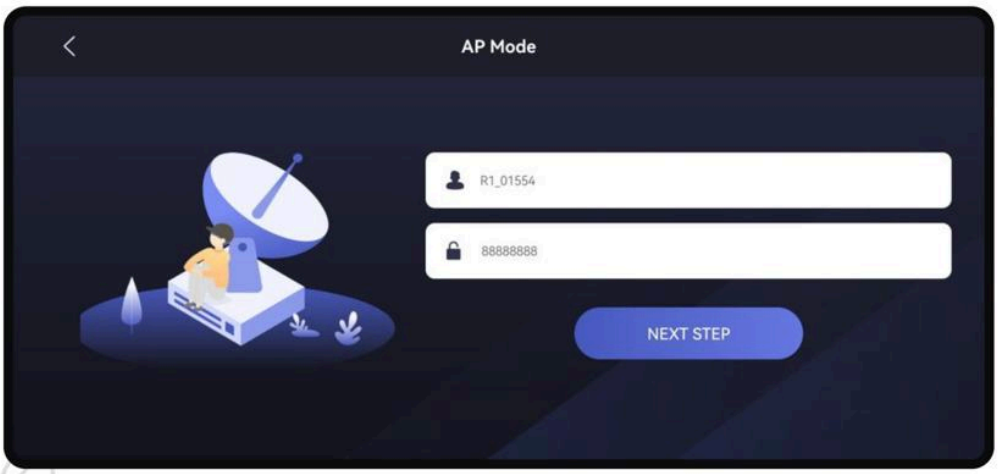
● If you forget the bound account or lose the account, please contact Unitree personnel!

4) AP Direct Connection Mode

● Please scan the QR code to visit the Unitree Documentation Center to obtain the **AP direct connection robot** instruction video.

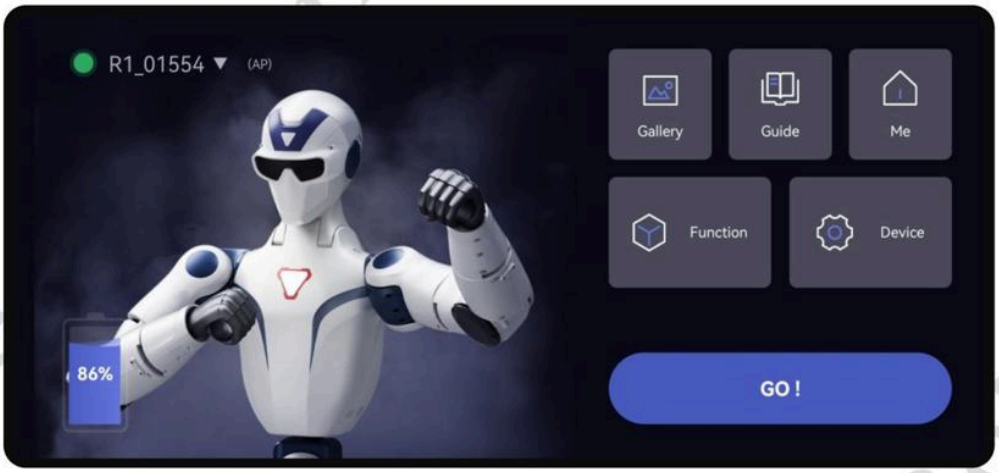


Step1: Click on "AP Direct Connection"



Step2: The robot account will be read

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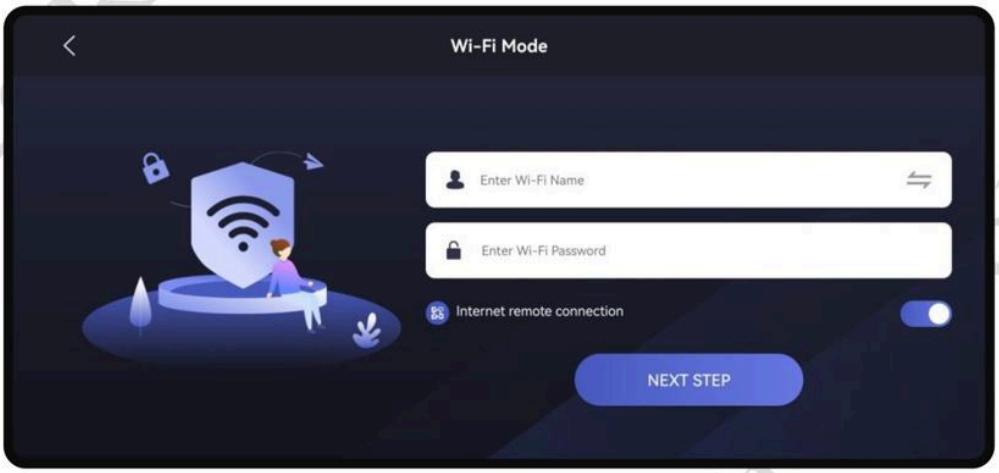
Step3: Connection successful

5) Wi-Fi Connection Mode

● Please scan the QR code to visit the Unitree Documentation Center to obtain the **Wi-Fi connection robot** instruction video.



Step1: Click on "Wi-Fi Connection Mode"



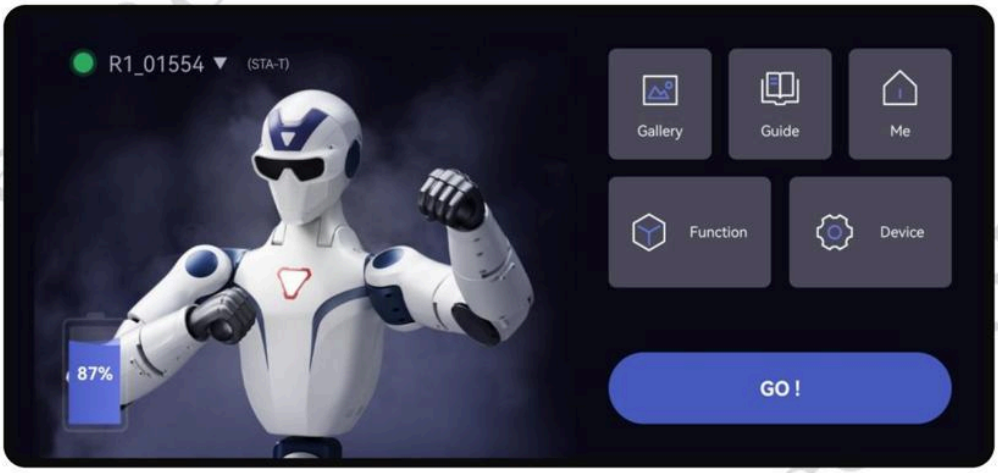
Step2: Select the Wi-Fi network, enter the password, and click "Next"

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(The phone needs to be connected to the target Wi-Fi first; the App can recognize it automatically)

(After enabling public network remote connection,

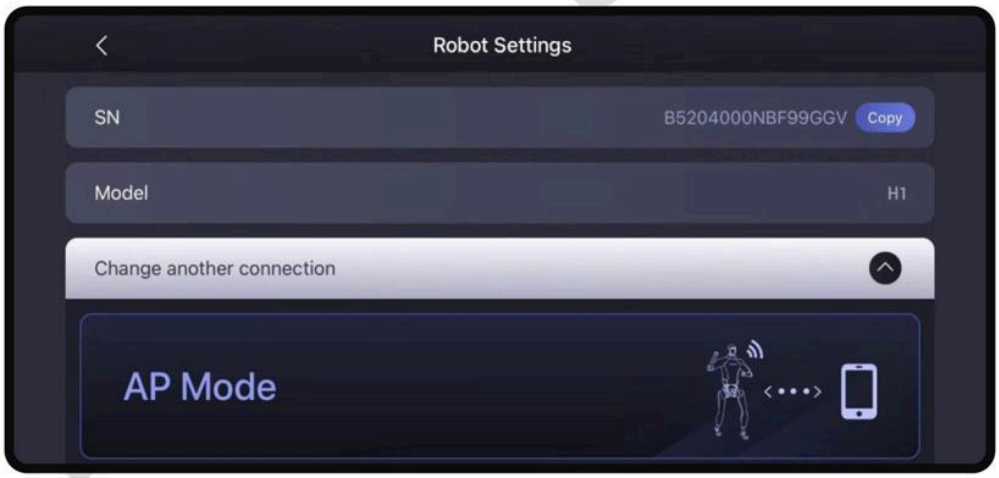
you can connect to the public network, which can be used to upgrade the robot's software)

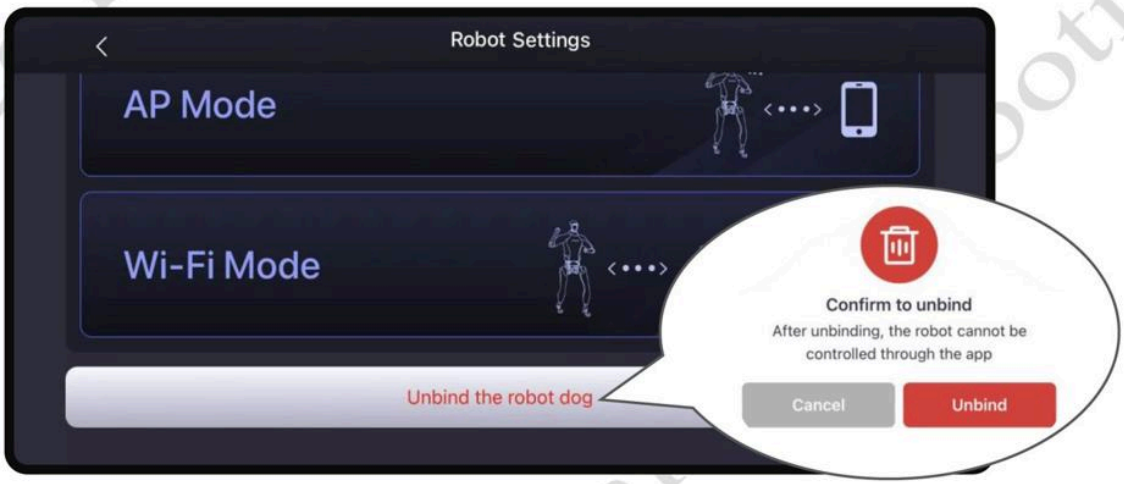


Step3: Connection successful

6) How to Change Account Binding

On the home page, click [Settings] - [Robot Settings], select and click "Unbind" to unbind a robot that is already bound. After the robot is unbound, it can be bound by another account.



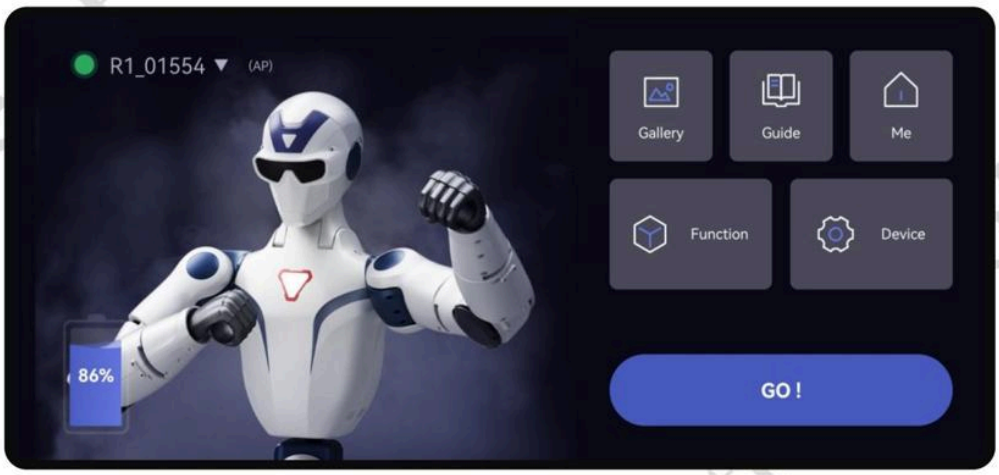


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5.5 Operate your R1-A5/A7

5.5.1 Using the Unitree Explore App to Operate the Robot

Click [GO] to enter the first-person perspective operation interface.

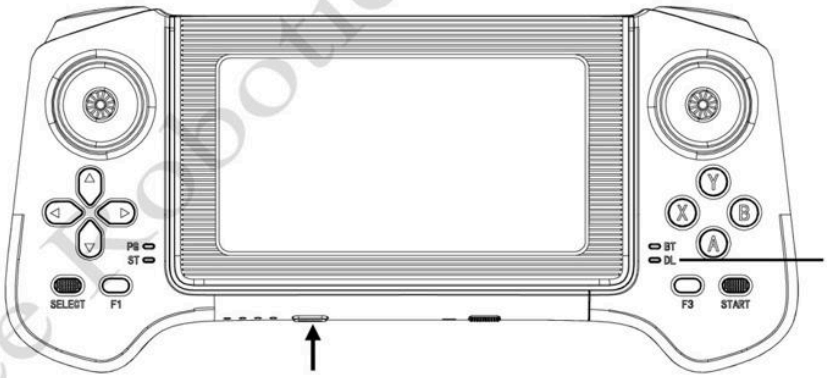


5.5.2 Using the Remote Controller to Operate the Robot

(Note: Old and new versions of the remote controller will be shipped randomly; please refer to the physical product received! Thank you for your support.)

1) First, briefly press the power switch for 1 second, then press and hold it for more than 2 seconds. Upon hearing a 'beep~' sound, the remote controller is powered on.

2) After the remote control successfully connects to the R1-A5/A7, the DL indicator on the right will stay steadily lit, indicating a successful connection.



5.6 Emergency Stop

1) Soft Emergency Stop

Short press **[L2 + B]:** R1-A5/A7 enter the damping state, and both arms will slowly lower.

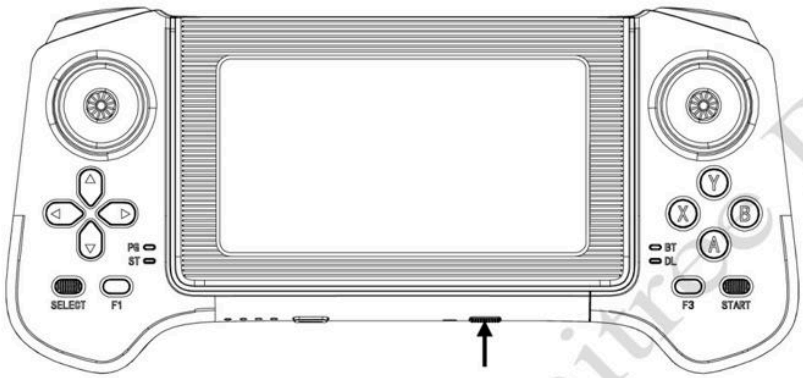
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After activating the soft emergency stop, you can enter the diagnostic state by pressing **[L2 + A]** -> Once the robot returns to its initial position, it can be used normally.

2) Hard Emergency Stop

Press the **[Emergency Stop Button]** on the remote controller. The R1-A5/A7 will enter emergency stop mode, and the robot's joints will lose power.

After activating the hard emergency stop, you need to restart the robot's power before you can use the robot again.



Emergency Stop Button (New version remote control)

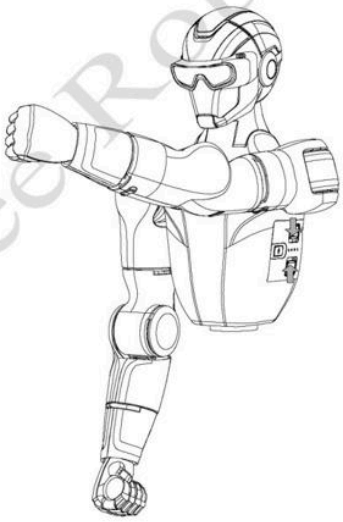
> ● After pressing the **[Emergency Stop Button]**, you must wait for 3 seconds or more before restarting the robot.

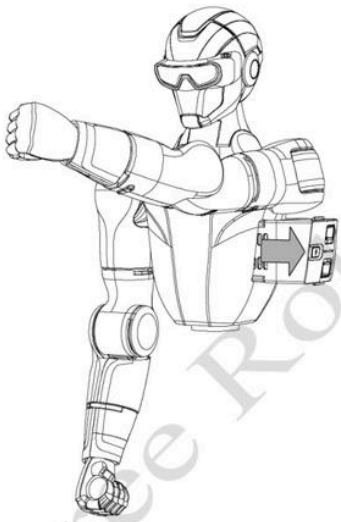
5.7 Switching off R1-A5/A7

1) Press **[L2+B]** on the remote control to make the R1-A5/A7 enter damping mode.

2) Briefly press, then press and hold the battery power switch for more than 2 seconds to power off.

3) First lift the left arm, then remove the battery as shown in the figure below.

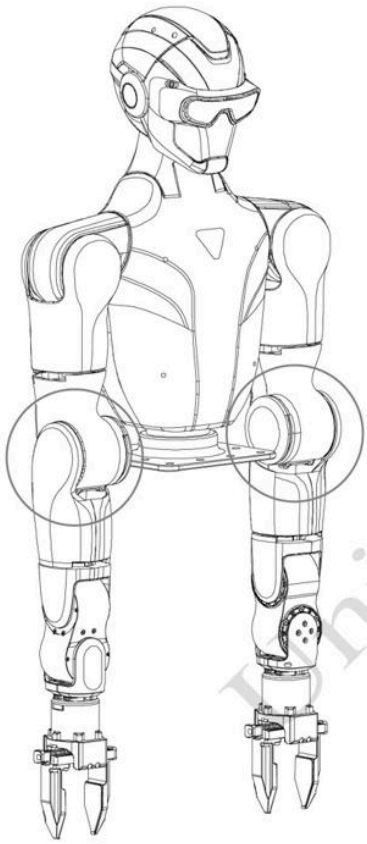




> ● Be careful to not get your hands pinched by the moving joints, please be careful!

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4) When the battery is not inserted and external power is being used:First, press **[L2+B]** on the remote control. The R1-A5/A7 will enter damping mode. After all joints have automatically lowered and come to a complete stop, you may then cut off the external power supply.



5.8 Packing

Packing Procedure:

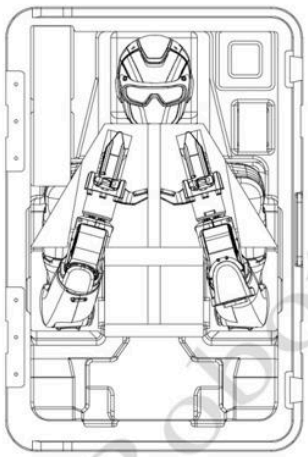
Lay the R1-A5/A7 robot flat on the ground and prepare the accompanying transport case.

1) Hold the R1-A5/A7 robot by its waist.

2) Gently place it into the transport case, positioning the robot as shown in the right-side diagram.

3) Position the robot's arms at its sides, with the wrists rotated to an upright position to ensure they fit inside the case.

4) Place the cushion liner in front of the R1-A5/A7 robot's chest, securing the arms in place.



Robot placement Illustration

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5.9 Remote Controller Binding

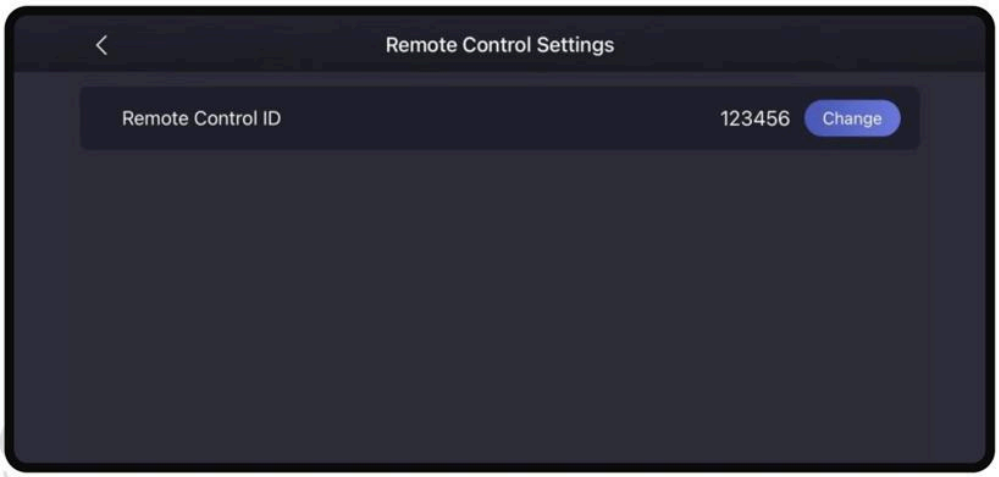
● Please scan the QR code to visit the Unitree Documentation Center for the **Remote Control Binding** instruction video.

When using a new remote controller, it needs to be bound via the App.

1) Click on [Settings] -> [Robot Settings] -> [Remote Controller Settings].



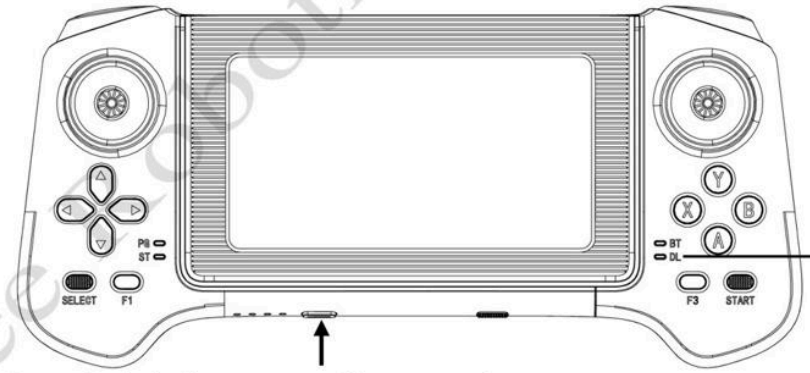
2) Click on [Enter the corresponding remote controller code] -> [Click Modify]. The remote controller ID is located on the white sticker on the back of the remote controller and is case-insensitive.



3) Bring the remote controller close to the robot's chest. Press and hold **[ELECT]** until you hear six consecutive beeps to enter binding mode.

The DL indicator stays on, indicating successful binding.

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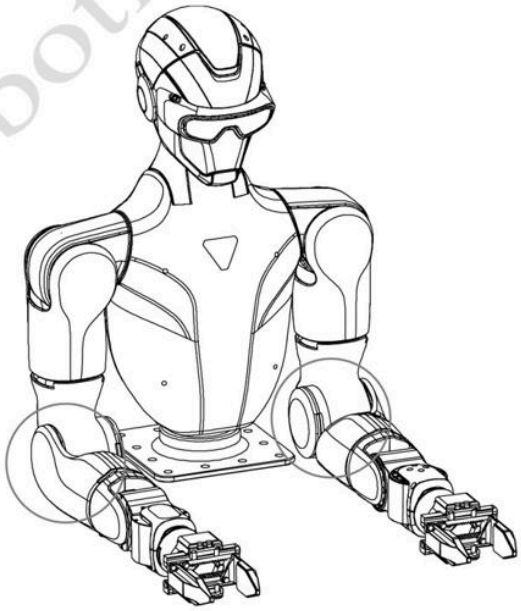
5.10 R1-A5/A7 Chest Light Indicator Meaning

Color	Semantic Description
Cyan Breathing Light	Booting Up
Purple Steady Light	Zero Torque Mode
Orange Steady Light	Damping Mode
Dark Blue Steady Light	Standby Mode
Red Steady Light	**Device Fault**
Blue Breathing Light	Recording
Green Breathing Light	Voice Command Received After Wake-Up

5.11 Debugging Instructions

When R1-A5/A7 is in a fixed state and already in the [L2+B] damping mode, pressing [L2+A] will switch R1-A5/A7 to position mode and move into a specific diagnostic pose.

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When the R1-A5/A7 is in a suspended state and in the **[L2+B]** damping mode, simultaneously press and hold the **[L2+R2]** combination keys on the remote control. The R1-A5/A7 will then enter debug mode. In this state, pressing **[L2+A]** will switch the R1-A5/A7 to position mode, causing it to assume a specific diagnostic posture.

5.12 R1-A5/A7 EDU Backpack Installation

● Please scan the QR code to visit the Unitree Documentation Center to obtain the **R1-A5/A7 EDU Backpack** installation video.

5.13 R1-A5/A7 EDU Dexterous Hand Installation

● Please scan the QR code to visit the Unitree Documentation Center to obtain the **R1-A5/A7 EDU Dexterous Hand** installation video.

5.14 R1-A5/A7 EDU Radar Installation

● Please scan the QR code to visit the Unitree Documentation Center to obtain the **R1-A5/A7 EDU Radar** installation video.

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6.Abnormal Condition Description

When using the R1-A5/A7 robot, the robot may be abnormal. Most abnormal situations are controllable (there are solutions). The users should not panic when encountering these problems. Read the following contents in detail and solve the problems step by step.

If you have any questions, please contact Unitree Robotics official technical **support:support@unitree.cc.**

1) Power-On Self-Test Unsuccessful

If the robot fails to power on, recheck the body according to the "Pre-Power-On Inspection" steps and try again.

2) Robot Fall Self-Protection

When using the official Unitree motion control program (controlling the robot's movement with the remote controller), if the robot loses balance and falls due to external environmental factors (e.g., insufficient ground friction) or improper user operation, the robot will automatically switch to self-protection mode. The robot's motors will automatically enter a braking state to protect all components.

3) App Connection Exception

If using AP direct connection mode, check if the phone is connected to the AP hotspot broadcast by the R1-A5/A7. If hotspot configuration fails, ensure the set hotspot name contains no special characters or spaces. Ensure the robot and phone are close to each other, then restart both the robot and the App before attempting to connect again.

If using Wi-Fi connection mode, check if the connected Wi-Fi network is functioning normally and can access the external network.

4) How to Power Off the Robot When the Remote Module Fails

If unable to use the remote module (e.g., due to remote controller or phone battery depletion) to put the robot in standby, you can only force a shutdown by pressing the battery power button.

Force Shutdown: Place the robot lying flat on the ground, maintaining a safe distance of at least 2 meters from obstacles, uneven terrain, crowds, water surfaces, etc. Briefly press the battery power button, then press and hold it for more than 2 seconds to power off.

5) How to Maintain Standby for Extended Periods

If the robot needs to remain in standby for a long time, suspend the robot and control it to enter the damped state (by pressing the **[L2+B]** keys) to prevent the robot from automatically powering off due to low battery and falling, which could cause damage!

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⚠ ● Caution! When lifting the robot, avoid placing your hands on joint areas, such as the shoulder joint, to prevent pinching. If the robot is forced to shut down without protective measures, it will fall flat on the ground after power loss.

7.Precautions

When the robot is in motion, keep the surrounding area clear and do not touch the robot! Be cautious around the neck and joint areas to prevent pinching.

8.Daily Care and Maintenance

8.1 Whole Machine Clean

1) Cleaning: After using R1-A5/A7, if there are stains on the surface, please clean the surface of the body in time. Before wiping the body, please switch off the power, use a dry and clean soft cloth to wipe the body, pay special attention to the camera whether to wipe clean.

2) Storage: R1-A5/A7 is not dustproof or waterproof, it should be stored in a dry and cool room, avoiding sunlight and rain, so as not to shorten the service life of the parts due to water ingress and rust corrosion.

8.2 Inspection and Maintenance

Carrying out routine inspection before and after operation can greatly improve the reliable performance of products, reduce potential safety hazards and extend the service life span.

Uncharged checklist

Type	Main points
Appearance of the whole robot	1) Whether the appearance of the body is clean and free of damage or deformation marks. 2) Whether the lens on the camera surface has foreign matters.

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Structure	1) Visually and touch to check whether the body, joints, connections, and foot end parts are in good condition. If there are cracks or damages, replace them in time and contact Unitree Robotics after-sales service. 2) Ensure that the screws of all connecting parts are locked, especially the screws of joint connectors and battery locking knobs. 3) Check for any obstructions in the intake and exhaust of the cooling fan.
Battery packs	1) Check the battery pack interface of the body for foreign matters and deformation. 2) Whether the battery pack is installed reliably to ensure that it will not loosen during operation. 3) Check whether the battery pack shell is obviously damaged. The battery pack with obvious damage is forbidden to be used.
Remote Control	1) Whether the remote control rocker is in the middle position and whether the rocker enters sand and other foreign matters. 2) Check whether each key of the remote control is lagged.

Charged checklist

Type	Main points
Remote control	1) Confirm whether the basic operation function of the rocker is normal. 2) Confirm whether the current power is sufficient
Battery	Confirm whether the current power is sufficient.
Cooling fan	Listen carefully with ears to confirm that the cooling fan works normally and there is no sound such as scratching.

Battery pack maintenance

1) Never charge the battery pack in an environment where the temperature is too high or too low

2) Never store the battery pack at room temperatures above 40°C.

3) Do not overcharge the battery pack as this will cause damage to the cells.

4) If you do not use the battery for a longer period of time, please check the remaining battery power regularly, if the power is less than 30%, please charge the battery to 70% before continuing to store. So as not to over-discharge the battery and damage the battery.

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9.Product Warranty

9.1 Warranty Description

1) Unitree is introducing a warranty of up to 12 months for all of our products from the date of purchase (the period varies from models, please refer to commodity detail page). Unitree charges repair costs for the products out of warranty period.

2) Please ensure that the product is properly packed before its delivery. We are not responsible for any damage or loss during delivery.

3) Unitree reserves the right to refuse service or charge for repair and service fees if any of the following occurs, even if the product is within the warranty period:

a) Damage cause d by usage deviating from the product manual.

b) Damage caused by usage under abnormal conditions, such as heat, freezes, corrosion, fire, soak and sands.

c) Damage caused by equipment removal, repair, customization, or other operations undertaken by personnel or service providers without the authorization of Unitree.

d) Damage caused by operator error or negligence, natural disasters or theft.

e) Damage caused by defective equipment with damaged product label or natural wear.

9.2 Free Appearance Modification - Special Warranty Terms

1) If the user modifies the robot's exterior shell through painting or aesthetic alterations without disassembling the unit or damaging the original structure, the entire machine will continue to be eligible for the official warranty service. However, the original painted appearance is not guaranteed to be restored during repair or part replacement.

2) If self-applied painting, sticker application, or other exterior modifications cause blockage of microphone holes, leading to abnormal voice recognition or sound pickup failure, the corresponding acoustic components will not be covered under warranty.

3) If self-applied painting, sticker application, or other exterior modifications cause contamination of the binocular lenses/camera lenses, reduced light transmittance, or abnormal field of view, the corresponding vision system components will not be covered under warranty.

4) If self-applied painting, sticker application, or other exterior modifications cause blockage of the speaker sound output holes, resulting in abnormal volume, sound distortion, or no sound, the corresponding audio components will not be covered under warranty.

5) If self-applied painting, sticker application, or other exterior modifications cause blockage of ventilation holes, reduced heat dissipation efficiency, or overheating of the body, subsequently leading

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to failures of the mainboard, motors, battery, etc., the corresponding damaged components will not be covered under warranty.

6) If self-applied painting, sticker application, or other exterior modifications seep into limb joints, reducers, or transmission structures, causing joint stiffness, abnormal noise, abnormal torque, or increased wear, the corresponding joint and transmission components will not be covered under warranty.

7) If any signs of disassembly, unauthorized disassembly, internal modification, flying wires (unauthorized wiring), or replacement with non-original parts are found on any part of the robot body, the entire machine will lose its eligibility for the official warranty.

8) Exterior issues such as scratches, color differences, paint peeling, or corrosion caused by self-applied painting, sticker application, or other exterior modifications are not covered under warranty.

9) Failures of circuits or motors caused by loss of sealing, water ingress, or dust ingress resulting from the user's modification process are not covered under warranty.

10) If official inspection confirms that a malfunction was directly or indirectly caused by user modifications, the official party reserves the right to deny warranty coverage and handle the case as a paid repair.

11) This supplementary terms document forms an integral part of the product warranty policy. In case of any conflict with the main warranty terms, these supplementary terms shall prevail.

9.3 Warranty Coverage

	Warranty Coverage	Warranty Period
R1-A5	Full insurance	12 months
R1-A7	Full insurance	12 months

Interface_Sensors Description

R1-A5/A7 exposed network interfaces and services via network interfaces in factory default state.

Network interface	**Network service**	**Description**
WLAN interface	Http web service on port 9991.	Serve as signal server for webrtc connection.
BLE interface	BLE one to one link between a mobile and our robot	Enable mobile app connection for wlan network configuration.
LoRaWAN interface	One to one LoRaWan between our remote controller and our robot	Enable remote controller connection for controlling the robot

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Environment Sensors:

Sensor Name	Function description	Sensing capabilities
Microphone	The function of microphone is to record the voice command of users to realize the functionality of voice control.	5 meters in circle.
Camera	**The camera is mounted on the head of our robot to transfer the video signal to multiple mobile applications**.	1270*720

YuShuTechnologyCo.,Ltd.

306 Room, Building 1, 88 Dongliu Rd, Xixing Street, Binjiang District, Hangzhou, 310000 Zhejiang P.R. China

Industry Canada

Operation is subject to the following Two conditions:(1) this device may notcause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

RESTRICTIONS IN THE 5 GHZ BAND

Within the 5.15 to 5.25 GHz band, UNII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel Mobile Satellite System (MSS) operations.

RESTRICTIONS DANS LA BANDE DE 5 GHZ

Dans la bande de 5,15 à 5,25 GHz, les appareils UNII seront restreints aux opérations intérieures pour réduire toute possibilité d'interférence pouvant nuire aux opérations du Système satellite mobile dans le même canal(MSS).

RF exposure

RF Radiation Exposure Statement Caution: This Transmitter must beinstalled to provide a separation distance of at least 20 cm from all persons.

Déclaration d'exposition Attention: Cet émetteur doit être installé pour fournir une distance de séparation d'au moins 20 cm de toute personne.

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FCC Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to this equipment not expressly approved by the Party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Privacy of communications may not be ensured when using this device.

50 General Information

RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.

Industry Canada

Radio Frequency Specifications

Specifications

2.4GHz Wi-Fi (2412-2472MHz): 20dBm (EIRP)

Bluetooth(2402-2480MHz): 20dBm (EIRP)

2.4GHz SRD (2400.8-2480MHz) : 14dBm (EIRP)

Sub 1GHz Bands (865-868, 868-868.6, 869.4-869.65, 869.7- 870MHz): 14dBm (ERP)

5GHz Wi-Fi:

5150-5250MHz: 23dBm (EIRP)

5250-5350MHz, 5470-5725MHz: 20dBm (EIRP)

5725-5850MHz: 14dBm (EIRP)

Wi-Fi 5150-5350MHz frequency range is limited to indoor use in all EU/EFTA member states and

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Turkey.



BE	BG	CZ	DK	DE	EE
IE	EL	ES	FR	HR	IT
CY	LV	LT	LU	HU	MT
NL	AT	PL	PT	RO	SI
SK	FI	SE	UK (NI)	TR	NO
CH	IS	LI			

RF exposure

The equipment complies with radiation exposure limits set for an uncontrolled environment. To avoid the possibility of exceeding radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm during normal operation. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

Revision History

Edition	Date	Modify Content
1.1	July 1, 2026	Updated button/key logic
1.0	June 9, 2026	Initial Version

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