H1

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.

Catalogue

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.

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4) 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.

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

6) 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.

7) In any case, Unitree Robotics shall not bear legal liability for direct or indirect economic losses to the customers due to this service specification, and the maximum compensation amount of Unitree Robotics for losses to the customers caused by its own product liability shall not be higher than the amount paid by the customers for the products/services.

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

9) 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 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.

Safety Instructions

H1 is a highly energy-efficient innovative product that integrates multi-dimensional perception, powerful computing power, and self-developed high-performance motors. It is a universal humanoid robot designed for industry level applications, specifically for complex environments, showcasing excellent athletic performance and broad application potential.

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) When using, please control the robot within sight, keep a certain safe distance from the robot, and do not touch the robot with your hands after the robot is powered on.

6) After the robot is turned on, if it needs to stand for a long time, please promptly hang it on a protective frame; when the robot is moving, please keep the area around the robot clear or use a protective rope to prevent it from accidentally tripping and hitting objects or people.

7) When the handling robot or machine is in motion, it is forbidden to touch the robot, and be careful not to pinch your hands at joints such as the knee joints!

8) When the last battery cell of the battery flashes, please stop and turn off the robot in time, remove the battery for charging, and avoid the robot falling down and damaging due to low battery power!

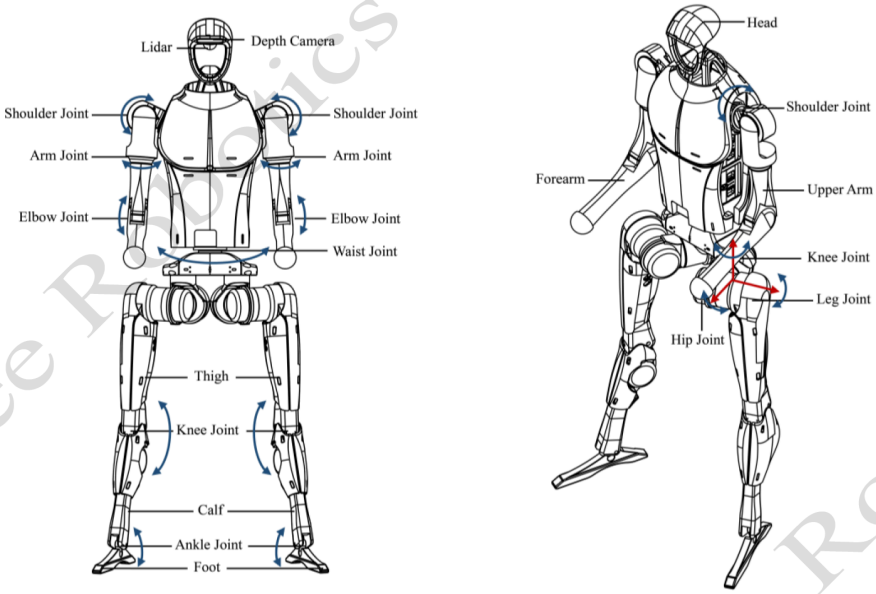
Product Overview

Introduction

The H1 general humanoid robot has super strong movement ability, with a maximum running speed of 3.3m/s (world record). The main body structure of the robot uses high-strength and lightweight materials such as aviation aluminum alloy and carbon fiber. The overall weight of the robot is 47kg, and all connecting materials are made of 6061-T6 aluminum alloy, with individual key components made of 7075-T6, which can withstand falling impact. The H1 robot has a total of 19 degrees of freedom, consisting of 19 joint motors, enabling the robot to achieve precise motion and posture control. The head is equipped with a MID-360 laser radar and a D435i depth camera, providing excellent visual perception capabilities for the robot. Standard configuration includes Intel Core i5 (platform function), Intel Core i7 (user development), and optional Intel Core i7 and Nvidia Jetson Orin NX (up to 3 pieces), providing super AI computing power.

Parts Name

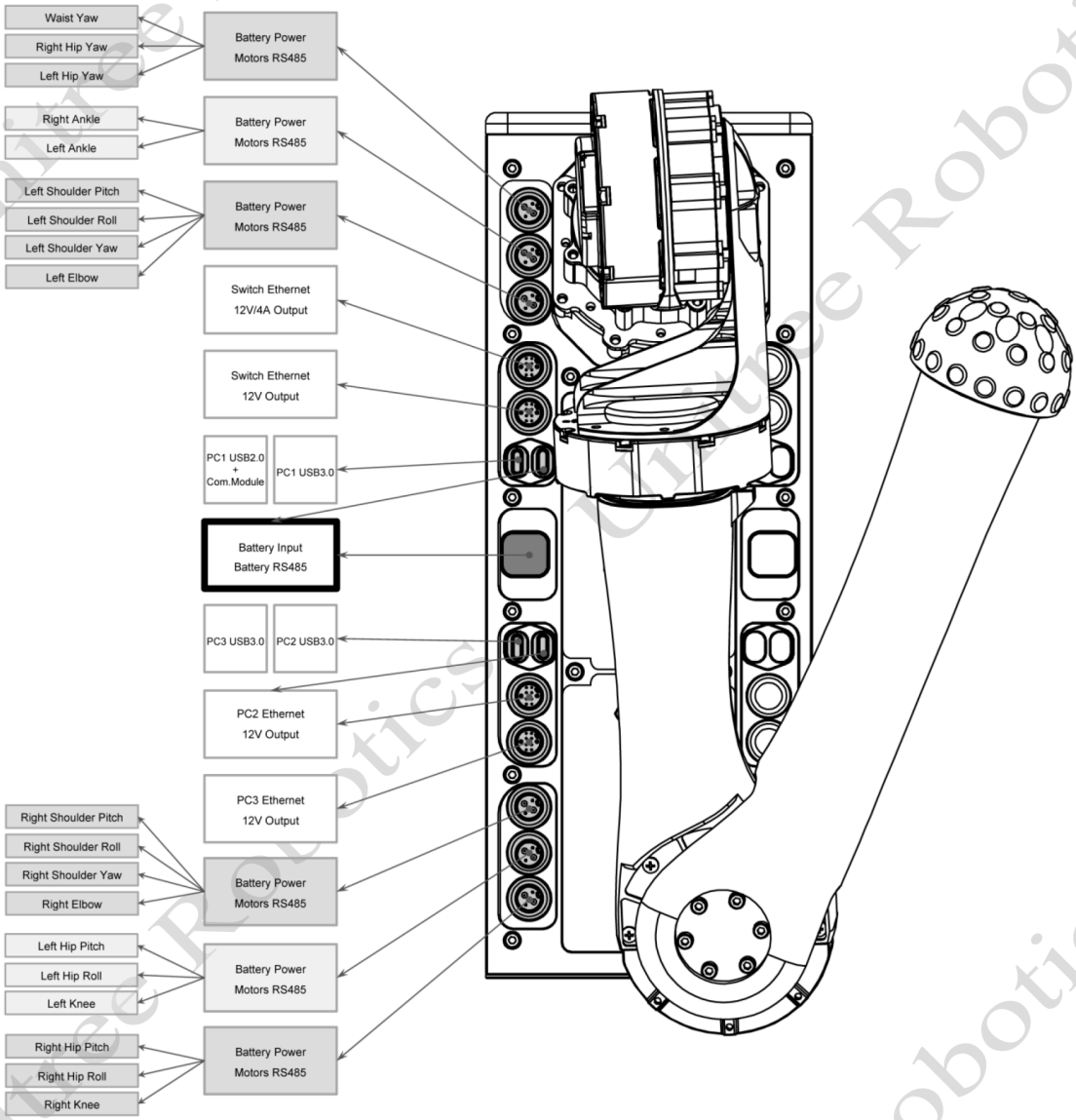
The main body of the H1 robot is as shown in the following diagram. Please refer to the actual product for accuracy.



Note: The radar used here is based on lidar technology, which uses infrared emission, not radio wave emission.

Interface Description

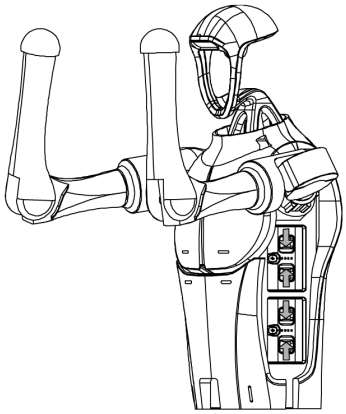
The H1 robot is equipped with electrical interfaces on its right side, which are used to connect various body joint motors, sensor peripherals, Ethernet ports, etc. This design allows for convenient debugging, issue troubleshooting, and secondary development.



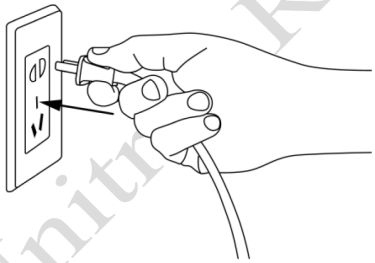
How to charge

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.

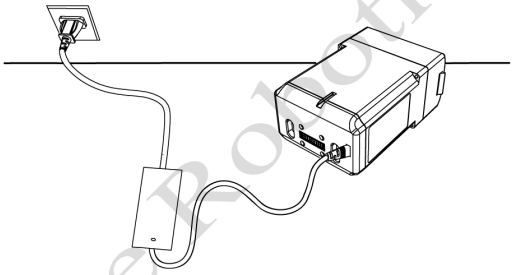
Charge the battery



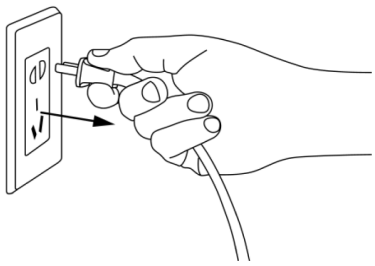
1) Remove the battery from the H1 body
(Pull out the battery pack strap)



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



3) Connect the H1 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.

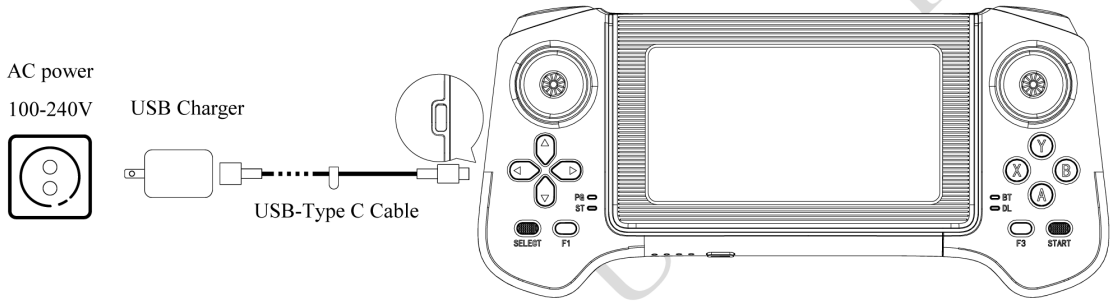
5) In the charging state, the battery indicator of battery pack will flash at a frequency of 1Hz (1 second/time) and indicate the current battery.

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, and the battery pack must be charged after the temperature of the battery pack has dropped to room temperature.

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

Instructions for use

Requiring Environment

1) Run the robot in 0°C -40°C with good weather condition. Do not run in inclement weather, such as fog, snow, rain, lightning, sandstorms, windstorms, tornado weather, etc.The robot is not waterproof, so do not run it with water on the ground, in rain, snow, or wet conditions! The robot is not dustproof, please do not run it on gravel floors, 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 some or all Wi-Fi signal sources of other wireless devices before using the remote control to operate the robot.

5) Due to the varying levels of proficiency among actual operators, for reliability and safety, please use the robot in an open, flat, and unobstructed environment. If the robot needs to travel on complex terrain or terrain with certain ups and downs and slopes, the operator should reduce the robot's walking speed and carefully control it to avoid tripping over obstacles.

6) The robot has certain requirements for the ground on which it walks. Do not use the robot on very low friction ground, such as ice. Do not use the robot on soft ground, such as thick spongy ground. If the robot is used on smooth ground, such as glass and ceramic tile, the users need to control the robot for movement carefully and smoothly, avoid violent movement, and reduce the walking speed of the robot to prevent the robot foot from slipping and falling.

Unpacking

Place the box on a flat surface according to the placement requirements (with the front side up), then open the top of the box and lift the robot out in its entirety. Remove the robot, the remote control, the charger, etc. from the box separately, place the robot flat on the flat surface, and then prepare to power it on.

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 ensures that he or she is not operating the robot while 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 matters (such as water, oil, sand, soil, etc.) inside the robot and its components.

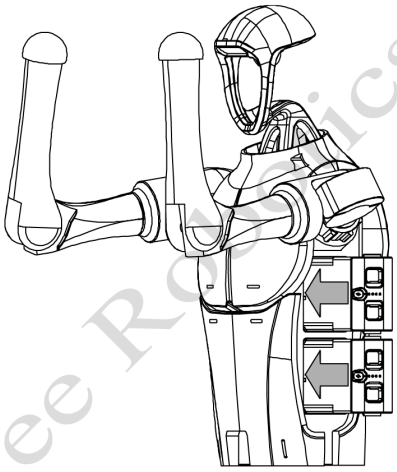
6) Ensure that the remote control module and battery pack are fully charged.

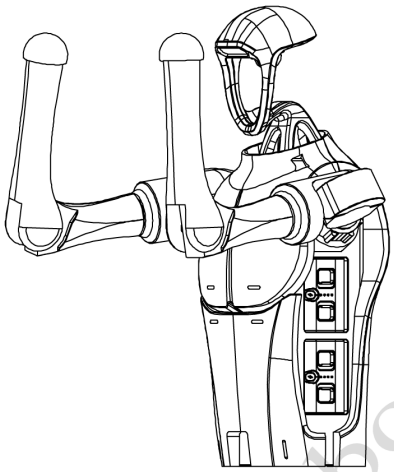
7) Check whether the protective bracket is installed correctly and whether the bottom universal wheel is locked.

Power On In Sitting Posture

1) Install the Battery Pack

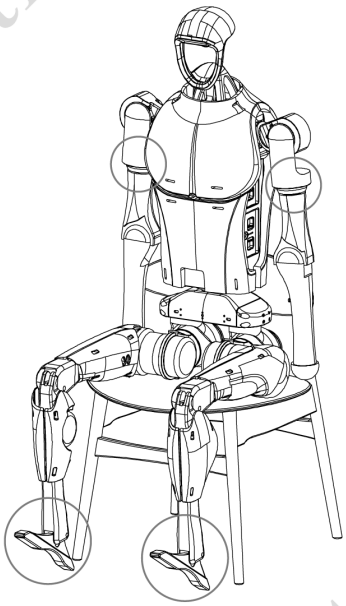
When conditions permit, the H1 supports powering on while sitting on a chair. First, ensure that the H1 is seated upright on the chair, and then install the battery pack: Insert the two batteries into the battery slots from the side of the robot. Pay attention to the installation direction, with the power switch facing the front of the robot. If the battery pack cannot be fully inserted, adjust the direction of the battery pack. Do not press it forcefully to avoid damaging the battery interface and the buckle. When you hear a "click", the installation of the battery pack is complete. Please make sure that the buckle is properly fastened!





2) Placement of the Robot Body (Important Step!!!)

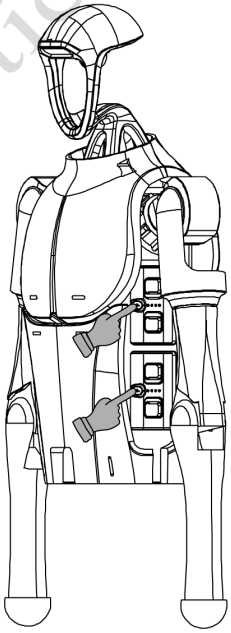
Powering on in a Sitting Posture: Retract the arms of the H1 to the limiting position, and then lower the arms vertically. Meanwhile, make sure to raise the front part of the foot until it reaches the limiting position, as illustrated in the following picture:



● The hip joints of the H1 are relatively wide. Please pay attention to the width of the seat before the H1 sits down.

3) Start up

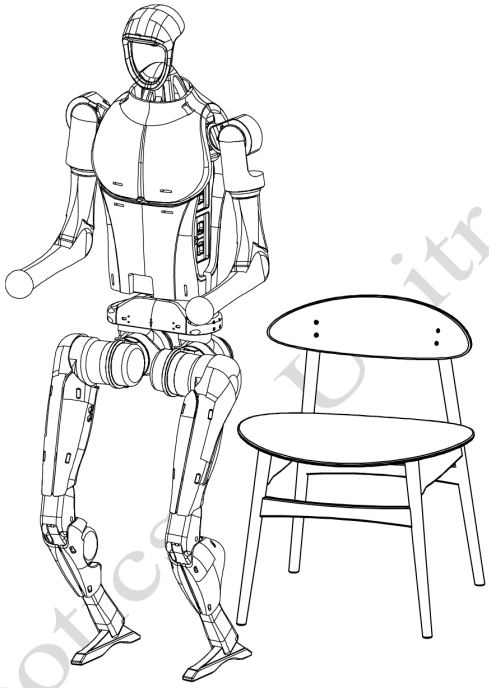
After completing the pre-startup check and preparation of the robot, power it on by following these steps:Short-press the power button of the two batteries once at the same time, and then press and hold the power button for more than 2 seconds to power on both batteries at the same time.



Short press and long press for more than 2 seconds on both batteries simultaneously

4) Assist in Standing Up

The entire boot-up process takes approximately 120 seconds. Please be patient after the battery is activated. When you hear the sound of the ankles hitting the limit position, it indicates that the initialization is successful. Please wait for about another 30 seconds, then press L2 + B on the remote control to let the robot enter the damping mode. Press L2 + UP, and the H1 will stand up. During the standing-up process, the robot has a tendency to fall backward. When operating for the first time, it is recommended to provide low-level support from behind the robot. After standing up, press R2 + X to start the walking control. Once the robot is stable, you can release it.

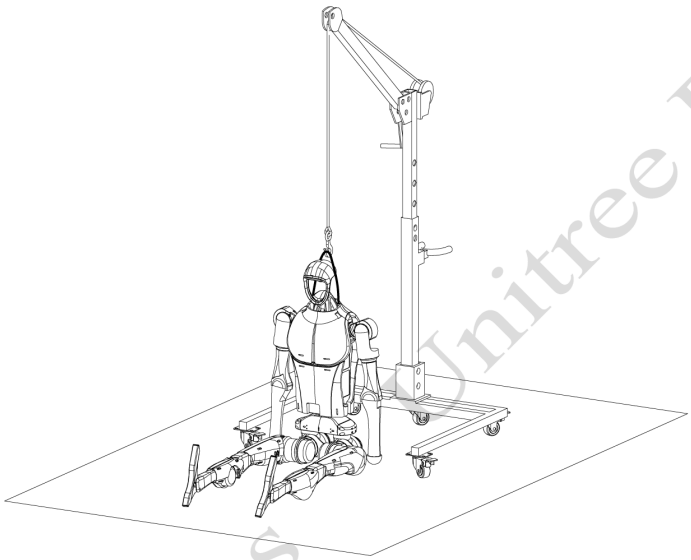


⚠ ● Emergency Stop: When H1 appears in an unexpected state, press L2+B, H1 will enter damping mode and will slowly fall to the ground.

Preparation before Power on

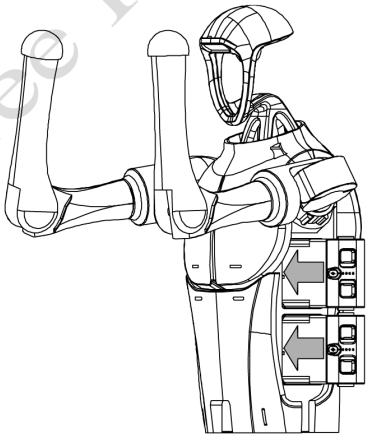
1) Suspension H1

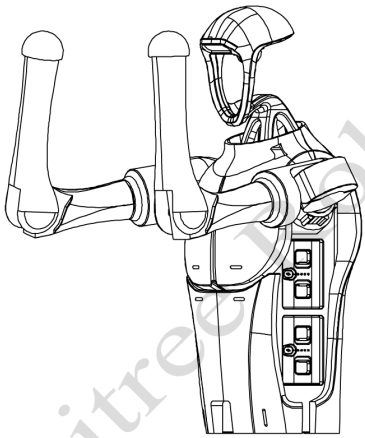
Please place H1 steadily on the ground, thread the rope through the special suspension buckles on both shoulders, and securely tie it to the dead knot. Hang the rope onto the suspension buckle of the protective frame, gradually raise H1 by adjusting the support, ensuring that the robot's body is completely suspended and its feet do not touch the ground.



2) Installing Battery Packs

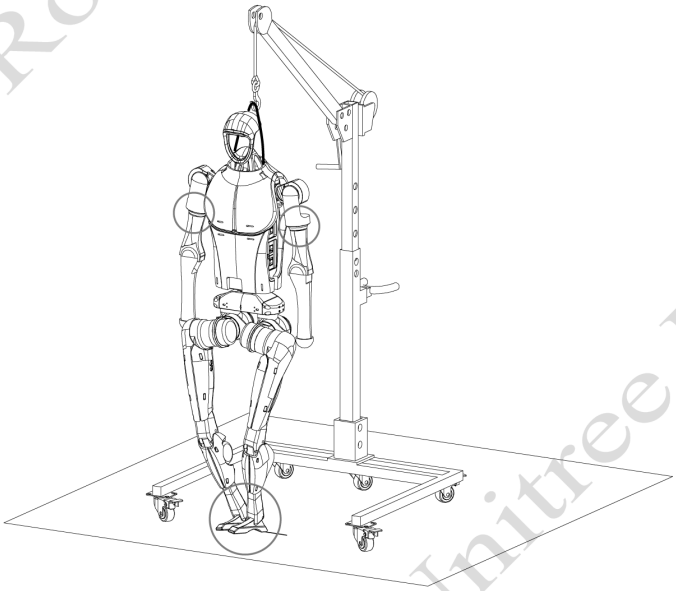
Insert two batteries into the battery compartment from the side of the robot, paying attention to the installation direction. The power switch should face the front of the robot. If it is not possible to fully insert the battery pack, please adjust the direction of the battery pack and do not forcefully press it to avoid damaging the battery interface and buckle. When you hear a "click~" sound, the battery pack installation is completed. Please ensure that the buckle is in place!





3) Body Placement (Important Steps !!!)

Adduct H1's arms to the limit position, and then lower the arms vertically. At the same time, pay attention to the forefoot lifting and reaching the limit position.

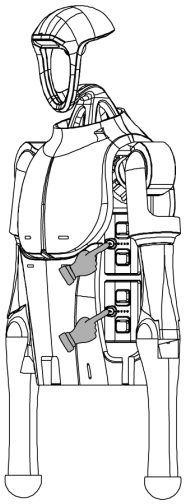


⚠ ● H1 The upper limb and ankle joints set the zero position based on the power-on position. If the positions are incorrect, these joints will deviate from the zero position. Causes abnormal movement after startup

Start up H1

1) Start up

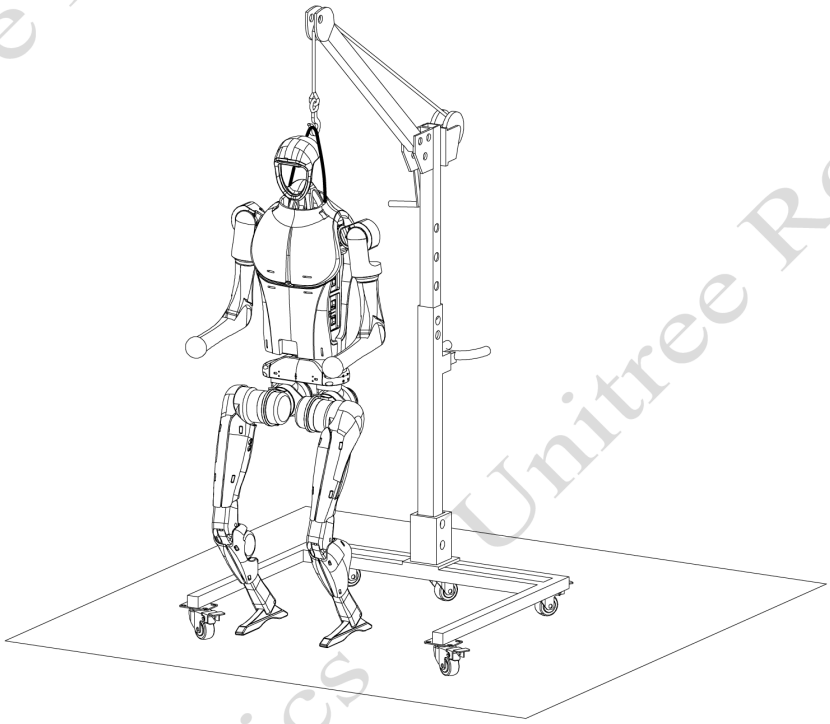
After completing the pre-startup check and preparation of the robot, power it on by following these steps:Short-press the power button of the two batteries once at the same time, and then press and hold the power button for more than 2 seconds to power on both batteries at the same time.



Short press and long press for more than 2 seconds on both batteries simultaneously

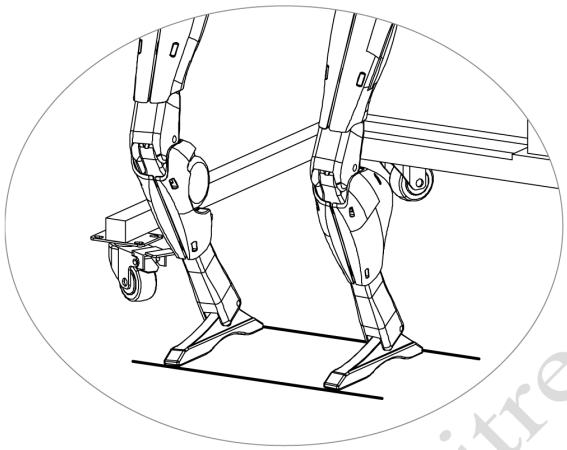
2) Successfully boot

The entire boot process lasts about 120 seconds, please wait patiently. When you hear the sound of the ankle hitting the limit, it means the initialization is successful. Please wait for about 30 seconds, press the remote control L2+B to enter the damping to unlock the control, and then press L2+UP to enter the ready state. At this time, the H1 posture is as shown in the figure below.



3) Descend the suspension rope

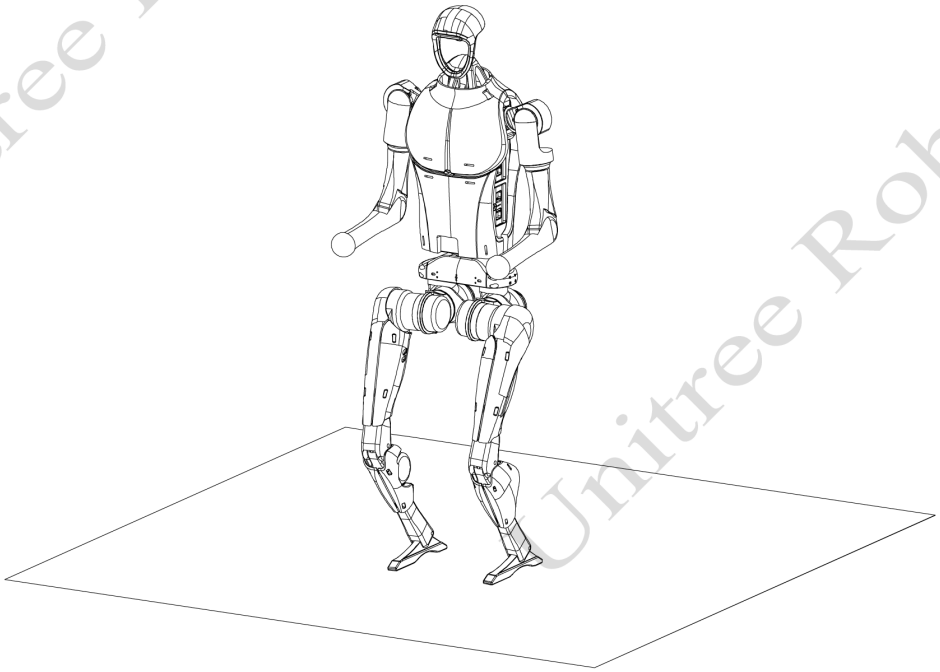
After lowering the suspension rope, make H1's feet touch the ground. Press R2+X on the remote control again. At this time, the control program starts, H1 enters the motion state from the ready state, and H1 starts to move in place.



4) Unlock the hanging rope

After the H1 movement stabilizes, the hook can be fully released. At this time, you can operate the left and right joysticks of the remote control to control the movement of H1.

Press **START** on the remote control to control H1 to switch between standing and walking states.



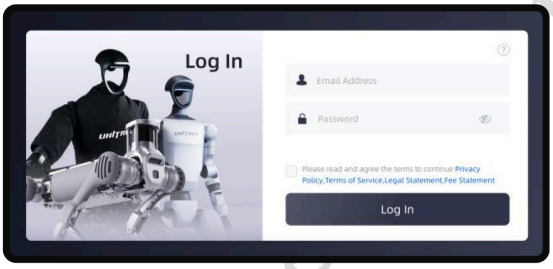
⚠ ● Emergency Stop: When H1 appears in an unexpected state, press L2+B, H1 will enter damping mode and will slowly fall to the ground.

Connecting to the Unitree Explore App

To use it for the first time, you need to bind the device. During the binding process, please turn on the Bluetooth on your mobile phone and keep it close to H1 to ensure real-time Bluetooth communication.

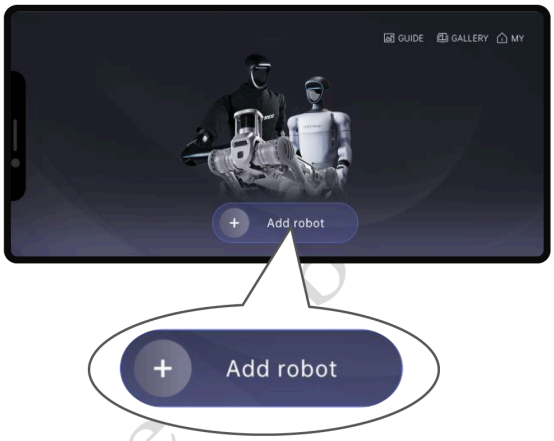
1) **Download and install the Unitree Explore App**, and log in with the enterprise account and password provided by Unitree.

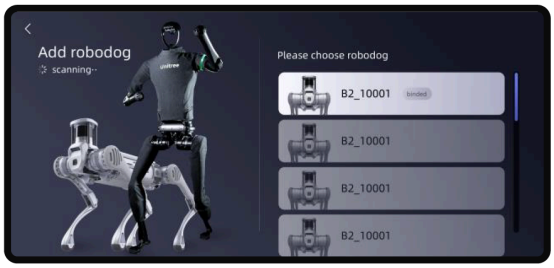
Unitree Explore App Download



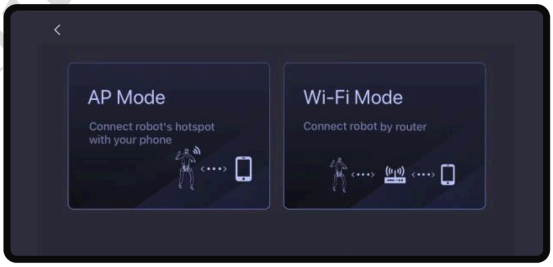
● If you don't have a business account, please contact Unitree Robotics's sales service personnel to open an account!

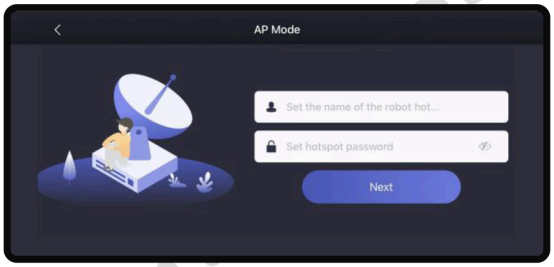
2) After starting the H1 power, **add the robot in the Unitree Explore App:** Turn on the Bluetooth in the phone system -> Click "Add Robot" on the homepage -> Select the device you want to add.

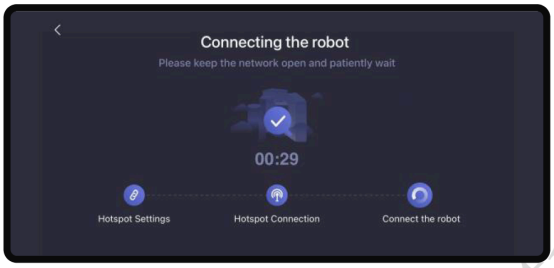


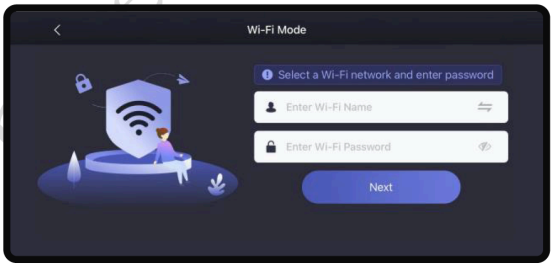


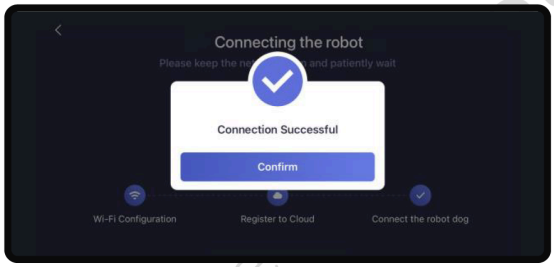
3) **Binding H1:** You can choose to connect in AP direct connection mode or Wi-Fi connection mode. After successful connection, you can learn from the built-in tutorials to quickly master the control techniques.





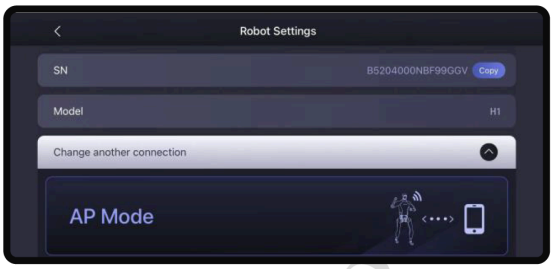


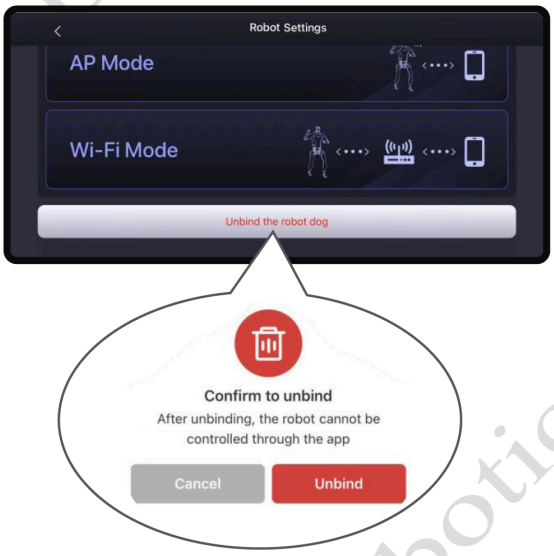




4) How to change the account binding?

Click on the homepage to go to **[**Settings**]** -> **[**Robot Settings**]**, then select Unbind to release the binding of the robot from the current account. After the robot is unbound, it can be bound to another account.





⚠
- Please keep your mobile phone's bluetooth on during connection!
- Bluetooth connection error: Unitree Explore App needs to access Bluetooth permissions. Please open the Bluetooth permission for Unitree Explore in your phone's App settings.
- If you forget to bind your account or lose your account, please contact relevant personnel at Unitree!

Operate your H1

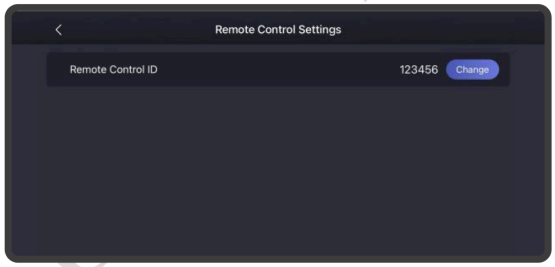
1) Use the Unitree Go App to inspect

After completing the built-in tutorial in the Unitree Explore App, you can use the app to connect the robot to confirm the relevant status, such as motor information.

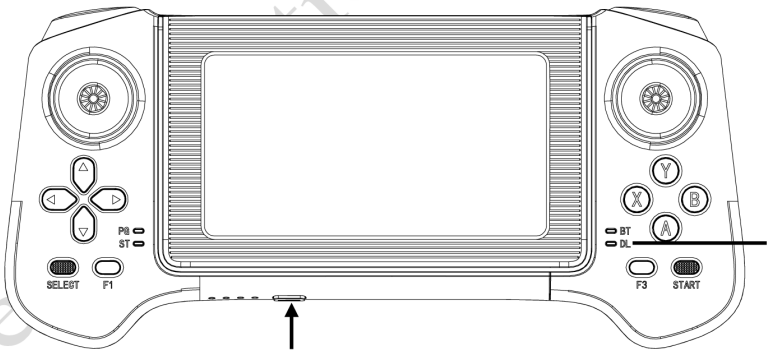
2) Use remote control to control

First, short press the power button on the remote control, then press and hold the power button for more than 2 seconds. When you hear a "beep" sound, the remote control will be turned on.

To use the remote control for the first time, you need to bind it in the Unitree Explore App. Go to **[**Settings**]** -> **[**Remote Control Settings**]**, enter the corresponding remote control code to bind it with the data transmission module on the robot. Click **[**Modify**]** to change the remote control for operation.



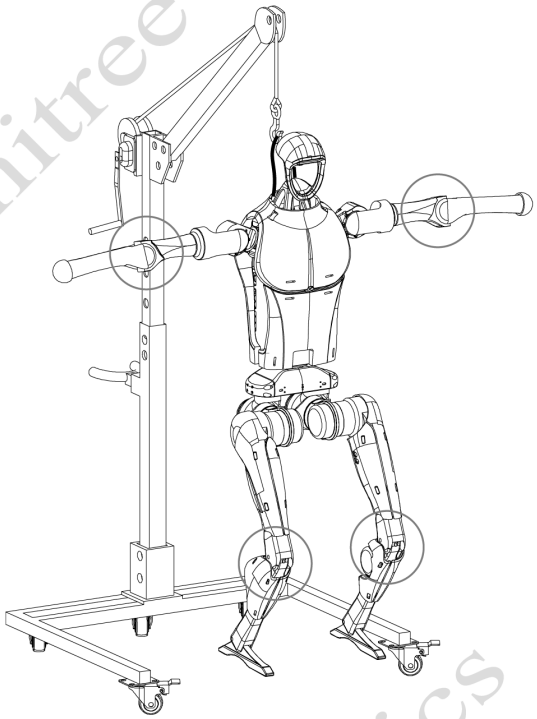
Once the remote control is powered on and successfully connected to H1, the right DL indicator light is on, indicating that the remote control is connected to the H1's data transmission module. At this point, you can use the instructions on the remote control to control the robot to complete the corresponding actions.



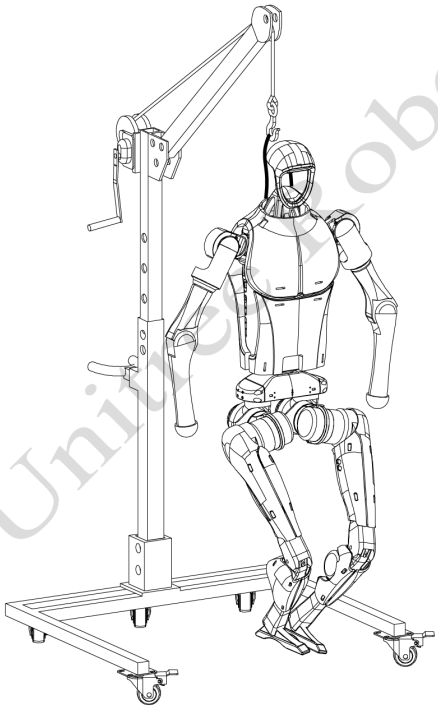
● Please use the remote control commands affixed to the remote control or visit the Unitree Explore App to access the remote control user manual.

Debugging instructions

When H1 is in the suspension state and in the damping state, press the L2+R2 key combination on the remote control at the same time, and H1 enters the Develop mode. At this time, press L2+A, H1 will enter the position mode and assume a specific diagnostic posture.



Position Mode



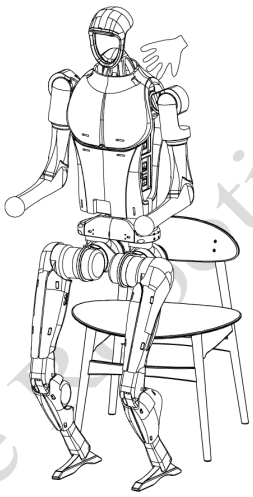
Damping State

Press L2+B again, H1 enters damping state. This process can be used to confirm whether H1 successfully enters Develop mode, or for hardware troubleshooting. At this point you can start using the SDK for development and debugging.

- Under the current system version, once H1 is turned on, the built-in motion control program will automatically start, even if you do not operate the remote control. The program periodically sends instructions with a speed of 0 . However, if you use the SDK for underlying development in this state, it may cause instruction conflicts, causing H1 to jitter.
- Therefore, when you need to use the SDK for development and debugging, please make sure that H1 has entered Develop mode to stop the motion control program from sending instructions, so as to avoid potential instruction conflicts. You can press L2+A to confirm whether you have entered Develop mode.
- If the behavior after pressing L2+A does not match the instructional video, press L2+R2 multiple times to ensure that it enters Develop mode.

Switching off H1

1) Sitting and turning off



Before powering off, first control the H1 to stand with its back facing forward in front of the chair, ensuring that the robot is in a stationary state. Hold the shoulders with your hand, press L2 + LEFT, and assist the H1 to sit down along the way. Please lift the robot upward for assistance.

1) Press L2 + B, and the H1 will enter the damping mode again;

2) After the robot enters the damping mode, briefly press the power switches of the two batteries simultaneously first, and then press and hold for more than 2 seconds to power off.

After sitting down, please place the robot according to the requirements for the placement of the robot body to prepare for the next power-on. If the H1 is not to be used for an extended period, please remove the battery pack in a timely manner: Press the buckle of the battery pack with both hands, and then you can remove the battery.

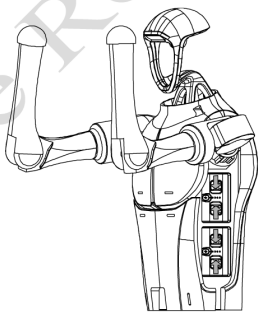
2) Hanging shutdown

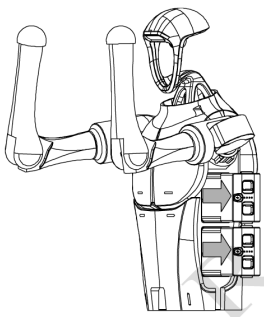
Before shutting down, please make sure to resuspend H1 on the protective frame to ensure that the robot is in a stationary state (the robot position is in the initial state after successful startup, the handle is not operated, and it is in a static standing state), and the rope has tension on H1.

1) Press L2+B, H1 enters damping mode again;

2) After the robot enters damping mode, first press and hold the two battery power switch keys simultaneously, and then press and hold for more than 2 seconds to shut down.

After shutting down, please arrange the robot arm joint limit and foot joint limit according to the requirements of the body placement, in preparation for the next startup. If H1 is not used for a long time, please take out the battery pack in a timely manner: hold down the battery pack clip with both hands to remove the battery.





⚠ ● Please ensure that the robot is suspended on the protective frame and in a suspended, damped state before shutting down. Otherwise, the robot may fall heavily to the ground after power failure, which may cause damage to the body and pose certain safety hazards! If the startup fails, please check if the robot body is placed correctly.

● Be careful to pinch your hands at the movement joints, please be careful!

Packing

Packing steps:

1) Hang the H1 robot vertically and prepare the matching aviation box.

2) Lift the H1 robot's big and small legs to level with the waist.

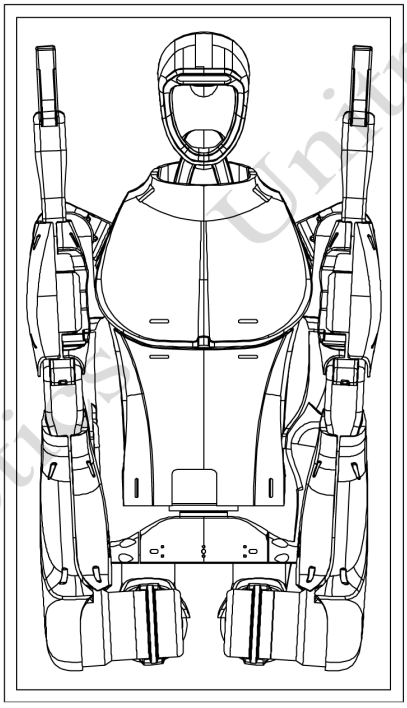
3) Slowly lower the suspension rope so that the H1 robot's butt enters the aviation box first.

4) Move the buttocks of the H1 robot to the edge of one side of the aviation box, ensuring that the robot's upper body can lie flat inside the box.

5) Place the robot arm on both sides of the body.

6) Flip your legs towards your body and place them inside the box.

7) Ensure collision avoidance and buffering for each contact surface of the robot, place relevant accessories such as remote control, charger, etc., and complete the packing.



Robot placement effect

Abnormal Condition Description

When using the H1 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) Self-testing fails after startup

When the robot is suspended and turned on, if no sound is heard from the ankle hitting the limit after waiting for 2 minutes, it indicates initialization failure. The robot has failed to start up, and the body should be rechecked according to the two steps of "Check before Power on" and "Preparation before Power on" before attempting again.

2) Self-testing fails after startup

In the use of Unitree Robotics official movement control program (control the robot move by using the remote control), the robot will switch to self-protection status as a result of falling down caused by the external environment reasons (lack of friction, etc.) on the surface or improper operation, the motor of the robot will automatically switch to the braking state to protect the various parts.

3) App connection abnormality

If using the AP direct connection mode, check if the phone is connected to the AP hotspot emitted by the H1. If the hotspot configuration fails, ensure that the hotspot name does not contain special symbols and spaces. Also, ensure that the robot and the phone are close to each other, then restart the robot and the App to attempt the connection again.

4) How to turn off the robot when the remote control module fails

When encountering the inability to use the remote control module due to the failure of the remote control module (such as running out of battery on the remote control or mobile phone), the robot is suspended and standby. It can only be forced to shut down by pressing the battery power button.

Forced shutdown: Hang the robot on a protective frame, with both feet suspended in the air, and maintain a safe distance of at least 2 meters from obstacles, complex terrain, crowds, water surfaces, and other objects. First, short press the power switch of two batteries at the same time, and then long press for more than 2 seconds to turn off the power.

5) The robot is easy to fall down and cannot stand when powered on

If the robot fails to stand up after startup due to incorrect startup posture leading to incorrect motor angles, restart the robot with the correct startup posture. If restarting the robot does not resolve the issue, it is necessary to recalibrate the robot joints according to the relevant steps in the Unitree Explore App.

Note: H1 has been calibrated by default after leaving the factory. Do not recalibrate the joints for normal use! If any abnormal situation occurs with the H1, please consult Unitree's official technical support before determining whether joint recalibration is necessary.

The entrance for joint calibration in the App is [Settings] -> [Data] -> [Robot] -> [Calibration].

6) How to stand by for a long time

If you need a long standby time, please hang the robot and control it to a damping state (press L2+B key) to avoid the robot from automatically shutting down and falling down due to low battery!

⚠ ● Attention! When lifting the robot, do not place your hands on the joints, such as the hip joint, to avoid pinching. If the robot is forced to shut down while standing without protection, it will fall flat on the ground after losing power.

Precautions

1) Regarding battery life

The robot's comprehensive running endurance is approximately 2 hours. The actual battery life will depend on various factors such as walking at high speeds for long periods, intense adjustment of the robot's posture while standing, walking with bent legs, carrying a load, walking at a low body height, and walking on terrain with appropriate undulations and slopes.

2) Regarding undulating road surfaces

When a robot walks on complex terrain or terrain with certain undulations and slopes, the operator should reduce the robot's walking speed and handle it carefully to avoid tripping the robot.

3) Regarding speed

Running speed can reach 3.3m/s under stable control on flat terrain. Please stay away from crowds when operating!

4) When the robot is moving, please keep the surrounding area open and try to use traction ropes or protective frames to protect it from tripping and causing damage to the machine or surrounding personnel and objects. Do not touch the robot during movement or transportation! Be careful to pinch your hands at the joints, such as the knee joint.

⚠ ● Maximum running speed of 3.3m/s, realized in special configurations, in practice there is a speed limit for security purposes

Dalily Care and Maintenance

Whole Machine Clean

1) Cleaning: After using H1, 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 and radar whether to wipe clean.

2) Storage: H1 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.

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. 3) Check if there are any obstructions around the head-mounted LiDAR.
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.
Foot end parts	Check whether there is obvious foot pad damage. If there is damage, please replace it in time.
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.

- It is recommended to do the above inspection before each use!
- If any parts are damaged and need to be replaced, please contact Unitree Robotics after-sales service in time!

Revision History

Version	Date	Modification Content
2.0	April 18, 2025	Update Of Operation Buttons: 1. Damping mode: L2+B 2. Lock standing mode: L2+UP Add Seating Mode: L2+LEF
1.0	May 20, 2024	Initial Version

