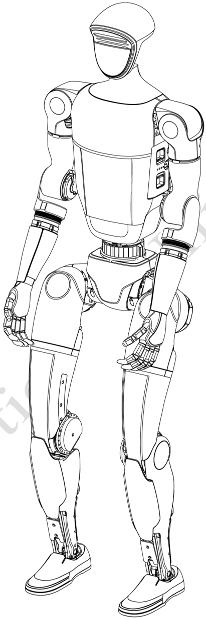
G1

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
Unitree Robotics
Unitree Robotics
Unitree Robotics

Catalogue

Disclaimer 2

Safety Instructions 3

Product Overview 4

  - Introduction 4
  - Parts Name 4
  - Specification Comparison 6

How to charge 9

  - Charge the battery 9
  - Remote Control Charging 10

Instructions for use 11

  - Requiring Environment 11
  - Unpacking 11
  - Check before Power on 11
  - Sitting upright and turning on the device 12
  - Hanging and turning on 14
  - Connecting to the Unitree Explore App 18
  - Operate your G1 20
  - Debugging instructions (Applicable to EDU series models) 21
  - Switching off G1 22
  - Packing 23

Abnormal Condition Description 24

Precautions 25

Dalily Care and Maintenance 26

  - Whole Machine Clean 26
  - Inspection and Maintenance 26

Revision History 27

Unitree Robotics Unitree Robotics Unitree Robotics Unitree Robotics

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) To the fullest extent permitted by law, in no event does Unitree provide any express or implied commercial or technical warranties not covered herein, that the products/services provided are completely defect-free, that they are fully compliant with customer requirements, that there will be no problems or interruptions in the use of the products/services, and that Unitree will be able to completely repair these defects. In any case, Unitree shall not be liable for direct or indirect economic losses of the customer because of this service manual, and the maximum compensation of Unitree for the losses of the customer caused by its own product liability shall not be higher than the amount paid by the customer for the purchase of the product/service.

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

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

Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics

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

G1 is an integrated humanoid intelligent entity featuring advanced motion control algorithms, AI learning capabilities, and a high cost-performance ratio. With exceptional athletic performance, it enables the execution of complex actions, catering to the research, education, and entertainment sectors. It pioneers the popularization and innovation of humanoid robot 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) 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.

Unitree Robotics

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!

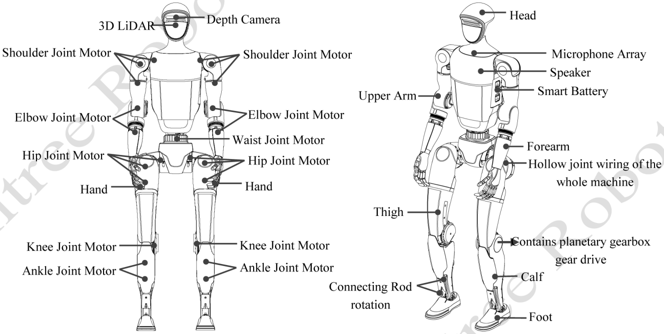
Product Overview

Introduction

The Unitree G1 is a fusion of agility and intelligence in a humanoid robot, designed with an all-joint hollow internal wiring system. It features dual-encoder equipped joint encoders and a localized forced air-cooling system, significantly enhancing operational precision and runtime stability. The main body structure adopts high-strength, lightweight materials such as aerospace-grade aluminum alloy and carbon fiber, weighing in at 35kg. All connecting material structures are made of high-strength aluminum alloy, which can withstand the impact of falling. G1 has 23 joint degrees of freedom, each leg possesses 6 while each arm has 5 degrees of freedom, endowing it with remarkable athletic dexterity. Equipped with an octa-core high-performance CPU, depth camera, and 3D LiDAR, it supports Wi-Fi 6 and Bluetooth 5.2 wireless communication, facilitating efficient data exchange. G1-EDU enhances its extended attributes on the regular version, with an optional range of 23-43 degrees of freedom.

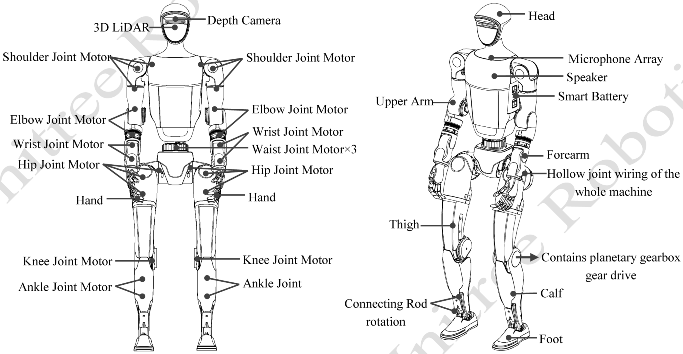
Parts Name

The G1_23-degree-of-freedom humanoid robot body is as shown in the figure below, with the actual product serving as the standard!



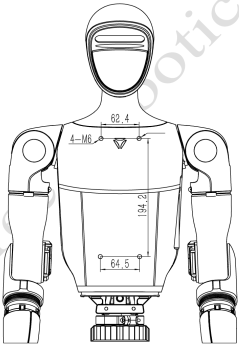
Unitree Robotics

The G1-EDU 29-degree-of-freedom humanoid robot body is illustrated below, kindly refer to the physical product for precise details!

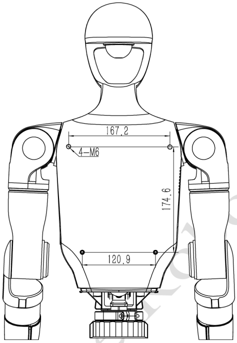


Note: The radar used here is based on lidar technology, which uses infrared emission, not radio wave emission.

G1 installation hole size diagram: unit: mm. If you need to use the G1 mounting hole, please remove the label on the hole first.



Positive



Back

Unitree Robotics

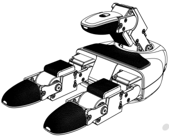
Specification Comparison

MODEL	G1	G1-EDU
Height, Width and Thickness (Stand)	1320x450x200mm	1320x450x200mm
Height, Width and Thickness (Fold)	690x450x300mm	690x450x300mm
Weight (With Battery)	About 35kg	About 35kg+
Total Degrees of Freedom (Joint Freedom)	23	23-43
Single Leg Degrees of Freedom	6	6
Waist Degrees of Freedom	1	1+ (Optional 2 additional waist degrees of freedom)
Single Arm Degrees of Freedom	5	5
Single Hand Degrees of Freedom	/	7(Optional Force outrolled three-fingered dexterous hand Dex3-1) +2(Optional 2 additional wrist degrees of freedom)
Full Joint Hollow Electrical Routing	YES	YES
Joint Encoder	Dual encoder	Dual encoder
Cooling System	Local air cooling	Local air cooling
Power Supply	13 string lithium battery	13 string lithium battery
Basic Computing Power	8-core high-performance CPU	8-core high-performance CPU
Sensing Sensor	Depth Camera+3D LiDAR	Depth Camera+3D LiDAR
Microphone Array	Noice Cancellation, Echo Cancellation	Noice Cancellation, Echo Cancellation
Speaker	Stereo, 5W Power	Stereo, 5W Power
WiFi 6 、Bluetooth 5.2	YES	YES
Intelligent OTA Upgrade	YES	YES
Secondary Development	○	YES
High Computing Power Module	○	NVIDIA Jetson Orin

Unitree Robotics

© 2024 All rights reserved, Unitree Robotics

Three-fingered dexterous hand Dex3-1 Electrical Parameter



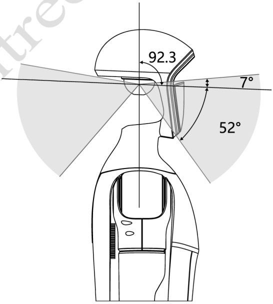
Operating Voltage	12-58V
Range of Perception	10g-2500g
Degrees of Freedom	Total degrees of freedom: 7 1.Thumb with 3 Degrees of Freedom, 2.Index and Middle Finger with 2 Degrees of Freedom.
Angle of Joint	Thumb: 0°~+100°, -35°~+60°, -60°~+60°; Index Finger and Middle Finger: 0°~+90°, 0°~+100°.
Number of Array Sensors	9

- Please visit the Unitree documentation center to obtain the G1-EDU secondary development guide.
- If you need to obtain more parameters of the three-fingered dexterous hand, please contact with relevant personnel of Unitree!

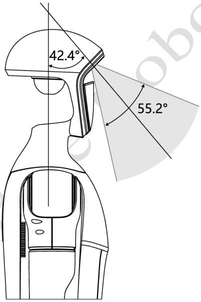
Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics

Field of view of G1 radar and camera:

The G1 head is equipped with LIVOX-MID360 laser radar, which provides excellent environmental perception capabilities for robots.Lidar adopts omnidirectional and full-angle scanning technology, with a FOV level of up to 360° and a maximum vertical angle of 59°, enabling real-time acquisition of accurate environmental data.It can quickly identify and measure surrounding objects, providing high-resolution point cloud data.

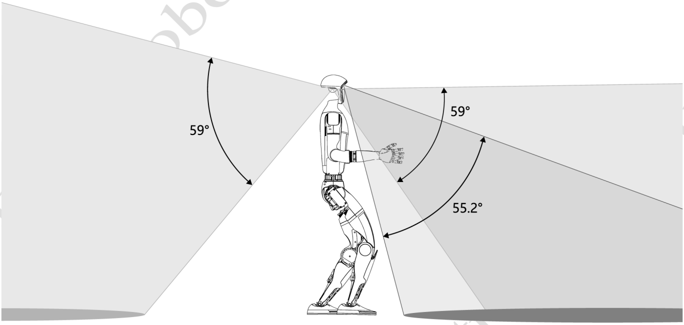


MID360 Laser Radar FOV



D435i Depth Camera FOV

The G1 head is equipped with a D435i depth camera, which provides the robot with excellent visual perception capabilities, enabling it to more accurately perceive and understand its surroundings, achieve precise spatial perception and obstacle detection, and enable the robot to interact with the environment and respond to various scenarios more intelligently and flexibly.



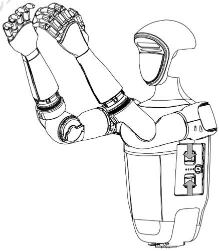
MID360+D435i Merged FOV

Unitree Robotics

How to charge

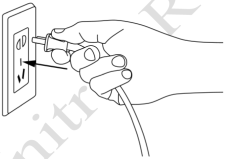
Due to factors such as battery self-discharge during transportation and storage, it is normal for the battery to have low or no power when first used. You can charge it as follows.

Charge the battery



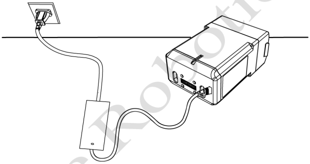
1) Remove the battery from the G1 body

(Pull out the battery pack strap)

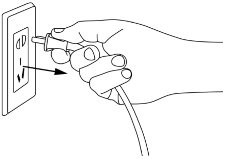


2) Charger input AC power

(100-240V, 50/60Hz)



3) Connect the G1 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.

Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics

© 2024 All rights reserved, Unitree Robotics

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.

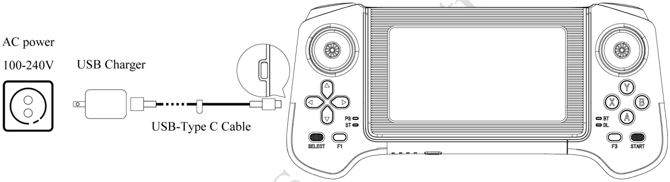
6) If the battery indicator is off, the battery pack is fully charged. Please remove the battery pack and charger to finish charging.

7) The temperature of the battery pack may be high after running, 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 G1 batteries. Please use official chargers for charging!

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 off 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

Unitree Robotics

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.

Unitree Robotics

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.

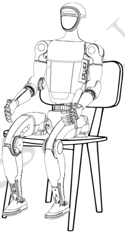
6) Ensure that the remote control module and battery pack are fully charged.

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

Sitting upright and turning on the device

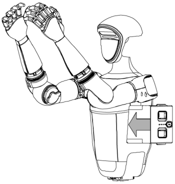
1) Preparation before startup

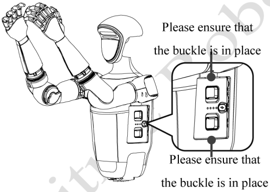
If conditions permit, G1 also supports booting while sitting in a chair.First, ensure that the G1 is sitting on a chair with arms and legs placed naturally, as shown in the following image.



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 back 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!

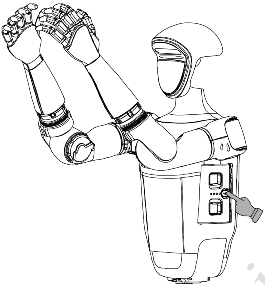




Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics

3) Start up

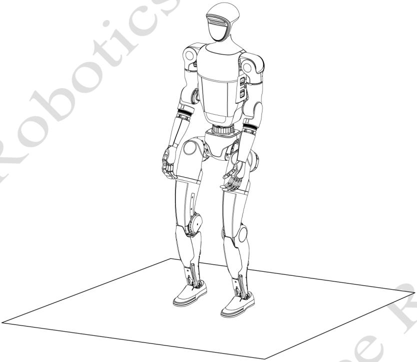
After completing the pre-startup check and preparation of the robot, power it on by following these steps:Short-press the power button of the battery once, and then press and hold the power button for more than 2 seconds to power on the battery.



Short press and long press the battery for more than 2 seconds

4) Successfully boot

After short pressing and long pressing the power button to turn on the machine, wait for about 1 minute until G1 enters the zero torque state. Press L1+A to enter the damping state. At this point, hold the G1 shoulder and press the L1+UP button to help G1 enter the ready state, as shown in the following figure.After G1 is straightened and standing, you can press R1+X to enter the operation control state.



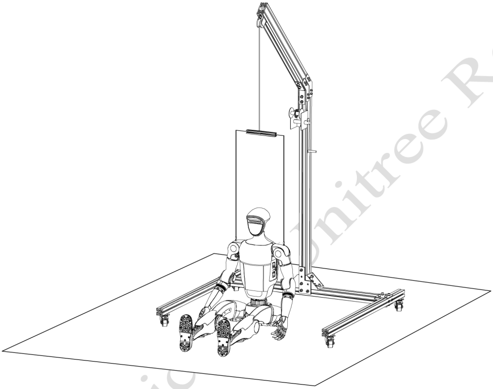
⚠ ● Emergency Stop: When G1 appears in an unexpected state, press L1+A, G1 will enter damping mode and will slowly fall to the ground.

Unitree Robotics

Hanging and turning on

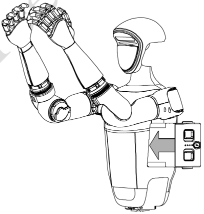
1) Preparation before startup

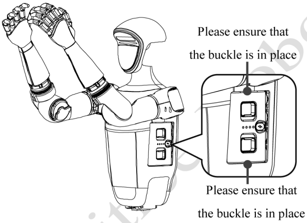
Please place G1 steadily on the ground, thread the rope through the special suspension buckles on both shoulders, and securely tie it to the dead knot. Hang the rope onto the suspension buckle of the protective frame, gradually raise G1 by adjusting the support, ensuring that the robot's body is completely 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 back 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!

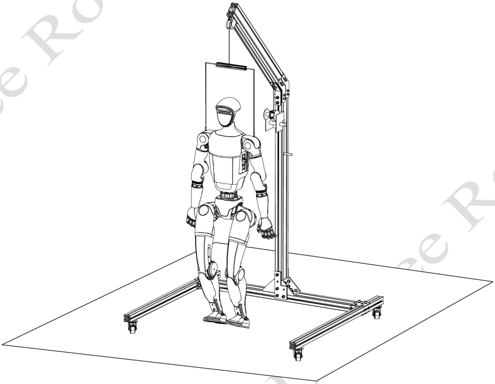



Please ensure that the buckle is in place
Please ensure that the buckle is in place

Unitree Robotics
Unitree Robotics
Unitree Robotics
Unitree Robotics

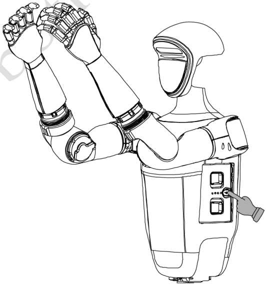
3) Body Placement

Hanging and starting up: Place the arms and legs naturally, ensuring that the joints are not entangled



4) 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 battery once, and then press and hold the power button for more than 2 seconds to power on the battery.

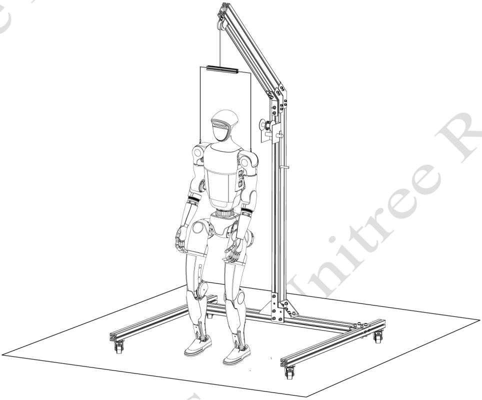


Short press and long press the battery for more than 2 seconds

Unitree Robotics

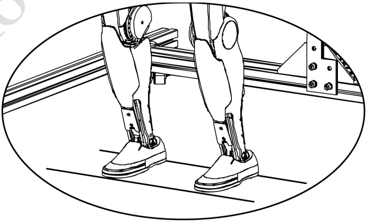
5) Successfully boot

The entire boot process lasts approximately 1 minute. Please be patient after the battery starts up.When all joints are in a zero torque state, it indicates successful initialization.Press the L1+A key on the remote control to enter damping to unlock the control, and then press L1+UP to enter the ready state.The G1 posture is shown in the following figure.



6) Descend the suspension rope

After lowering the suspension rope, make G1's feet touch the ground. Press R1+X on the remote control again. At this time, the control program starts, G1 enters the motion state from the ready state, and G1 starts to move in place.

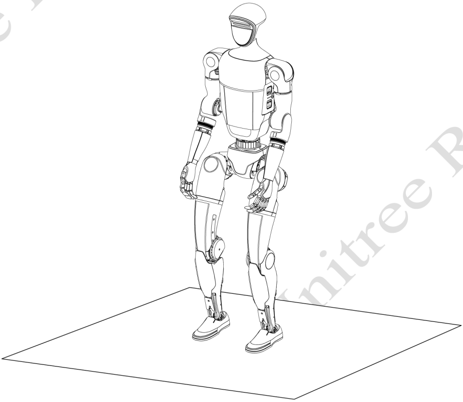


Unitree Robotics

7) Unlock the hanging rope

After the G1 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 G1.

Press **START** on the remote control to control G1 to switch between standing and walking states.



⚠ ● Emergency Stop: When G1 appears in an unexpected state, press L1+A, G1 will enter damping mode and will slowly fall to the ground.

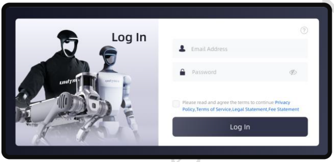
Unitree Robotics

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 G1 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.

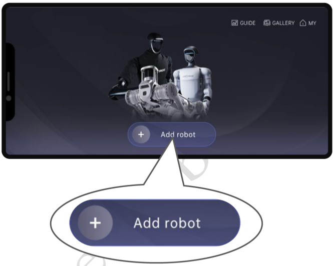
Unitree Explore App Download

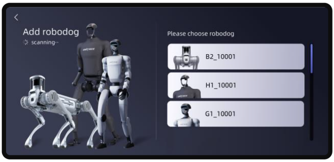


Please read and agree the terms to continue Privacy Policy,Terms of Service,Legal Statement,Fee Statement

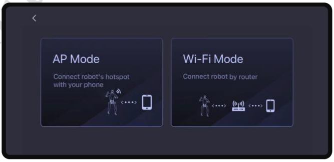
- If you don't have a business account, please contact Unitree Robotics's sales service personnel to open an account! The Unitree Explore App is tailored for B2, H1, and G1 series robots, providing excellent control experience and functional support!

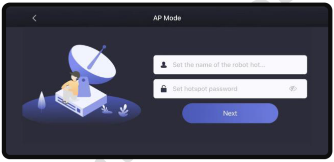
2) After starting the G1 power, **add the robot in the Unitree Explore App:** Turn on the Bluetooth in the phone system -> Click "Add Robot" on the homepage -> Select the device you want to add.



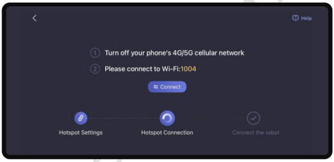


3) **Binding G1:** You can choose to connect in AP direct connection mode or Wi-Fi connection mode. After successful connection, you can learn from the built-in tutorials to quickly master the control techniques.

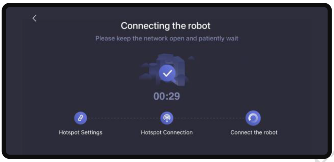




Unitree Robotics

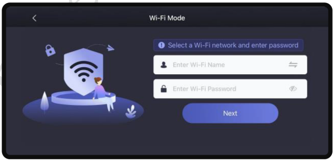


1. Turn off your phone's 4G/5G cellular network
2. Please connect to Wi-Fi:1004

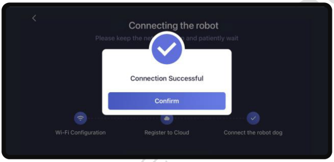


Connecting the robot

Please keep the network open and patiently wait



Select a Wi-Fi network and enter password

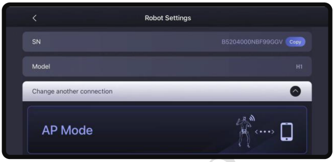


Connecting the robot

Connection Successful

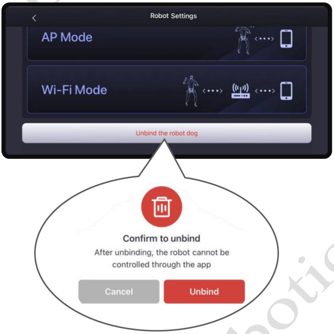
4) How to change the account binding?

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.



SN: B5204000NBF99GGV

Model: H1



Confirm to unbind

After unbinding, the robot cannot be controlled through the app

- 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!

Unitree Robotics

Operate your G1

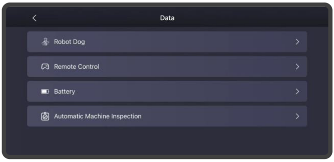
1) Use the Unitree Explore App to inspect

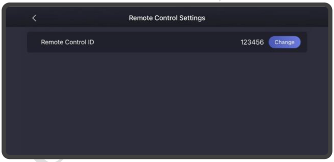
After completing the built-in tutorial in the Unitree Explore App, you can use the app to connect the robot to confirm the relevant status, such as motor information.

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.

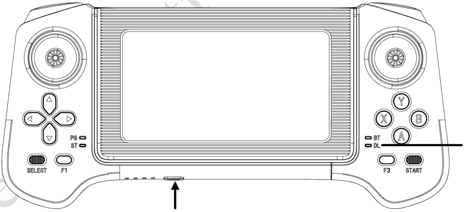
To use the remote control for the first time, you need to bind it in the Unitree Explore App. Go to **[Settings]** -> **[Remote Control Settings]**, enter the corresponding remote control code to bind it with the data transmission module on the robot. Click **[Modify]** to change the remote control for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





Remote Control ID 123456

Once the remote control is powered on and successfully connected to G1, the right DL indicator light is on, indicating that the remote control is connected to the G1'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.



DL indicator light is on

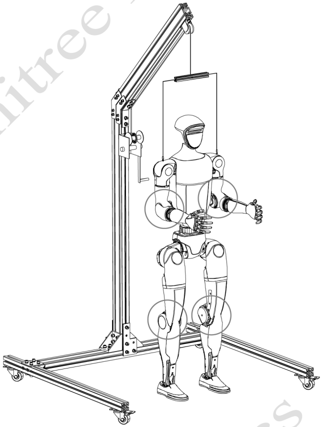
Short press and long press for more than 2 seconds

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

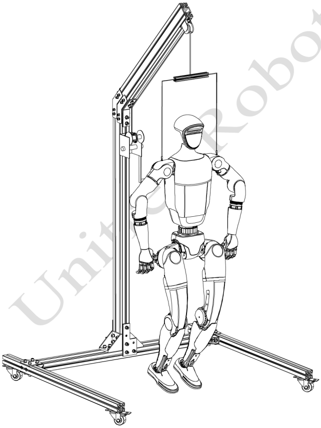
Unitree Robotics

Debugging instructions (Applicable to EDU series models)

When G1 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 G1 enters the Develop mode. At this time, press L2+A, G1 will enter the position mode and assume a specific diagnostic posture.



Position Mode



Damping State

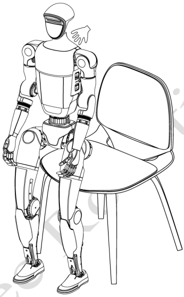
Press L2+B again, G1 enters damping state. This process can be used to confirm whether G1 successfully enters Develop mode, or for hardware troubleshooting. At this point you can start using the SDK for development and debugging.

- Under the current system version, once G1 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 G1 to jitter.
- Therefore, when you need to use the SDK for development and debugging, please make sure that G1 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.

Unitree Robotics

Switching off G1

1) Sitting and turning off



Before turning off the robot, please stand in front of the chair with the G1 facing away from you, ensuring that the robot is in a stationary state. Hold the back of the shoulders with your hands and press L1+LEFT to help G1 sit down.

a) Press L1+A, G1 enters damping mode again;

b) After the robot enters damping mode, first press and hold the battery power switch key, 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 G1 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.

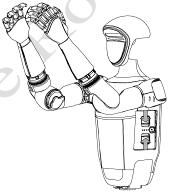
2) Hanging shutdown

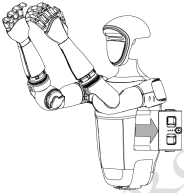
Before shutting down, please make sure to resuspend G1 on the protective frame to ensure that the robot is in a stationary state (the robot position is in the initial state after successful startup, the handle is not operated, and it is in a static standing state), and the rope has tension on G1.

a) Press L1+A, G1 enters damping mode again;

b) After the robot enters damping mode, first press and hold the battery power switch key, 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 G1 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 a protective frame and in a suspended or sitting on a chair, and shut down in a damped state. Otherwise, if the robot shuts down and loses power, it will fall heavily to the ground, which may cause damage to the body and pose a certain safety hazard! 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!

Unitree Robotics

Unitree Robotics

Packing

Packing steps:

1) Hang the G1 robot vertically and prepare the matching transport box..

2) Lift the big and small legs of the G1 robot, fold them back until the waist is level, please pay attention to the direction.

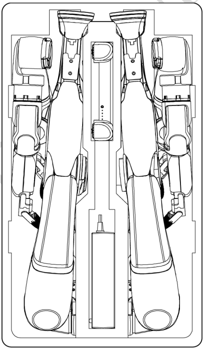
3) Slowly lower the suspension rope so that the G1 robot's rear end enters the transport box first and moves to the corresponding side of the transport box..

4) Place G1 with its head and chest facing down, lying flat in the box, paying attention to the direction.

5) Place the robot arms on both sides of the body, and rotate the wrists vertically to ensure they can fit into the box.

6) Fold your legs back towards your body and place them inside the box, ensuring that the soles of your feet and calves fit snugly against the lining.

7) Make sure to buffer the collision of each contact surface of the robot, put in relevant accessories such as remote control, charger, etc., complete the packing, and be careful not to miss the square lining placed in the middle of G1.



Robot placement effect

Unitree Robotics

Unitree Robotics

Abnormal Condition Description

When using the G1 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) Robot fall self-protection

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 G1. 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 the battery, 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

Robots are prone to falling during walking, and if restarting the robot does not solve the problem, it is necessary to recalibrate the robot joints according to the relevant steps on the Unitree Explore App.

Note: G1 has been calibrated by default after leaving the factory. Do not recalibrate the joints for normal use! If any abnormal situation occurs with the G1, 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].

Unitree Robotics

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 L1+A 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 2m/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 2m/s, realized in special configurations, in practice there is a speed limit for security purposes

Unitree Robotics

Dalily Care and Maintenance

Whole Machine Clean

1) Cleaning: After using G1, 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: G1 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.

Unitree Robotics Unitree Robotics Unitree Robotics

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

Edition	Date	Modify Content
1.1	2024/10/28	Parts Name - Add G1 Installation Hole Position
1.0	2024/9/3	Initial Version

Unitree Robotics