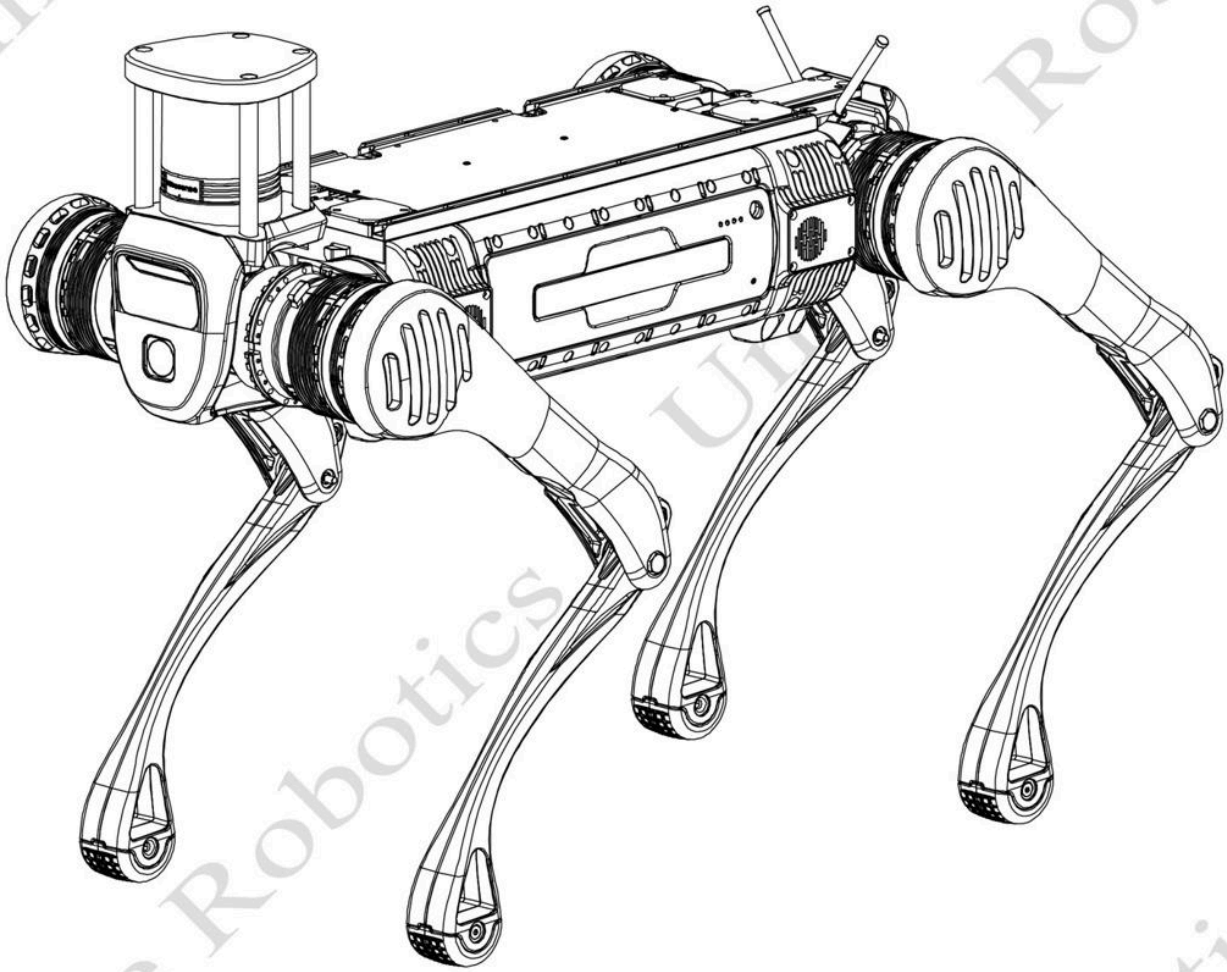
B2

User Manual V1.0



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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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 untaken to be responsible for their actions and all consequences therefrom. 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

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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

B2 is a four-legged robot designed for industrial applications, featuring all-weather operation, strong load and expansion space, multi-dimensional perception, full-scene coverage, powerful computing power, and precise insight. It can provide you with a more efficient and intelligent solution.

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 B2 is turned on, it defaults to AI control mode and automatically stands up. Please keep a safe distance from the quadruped robot!

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7) When using complex remote control commands, such as forward jumping, please make sure that there are no obstacles (especially people) within a half-circle with a diameter of 2 meters in front of the robot dog. If any casualties or property damage occur due to non-standard operations, Yushu Technology will not be responsible for any resulting losses and consequences!

8) Switching standard instructions: When switching control modes, please ensure that the robot dog is in a prone or damping mode and that there are no people within a 1-meter diameter range. After successfully switching control modes, the robot dog will automatically stand up. If any casualties or property damage occur due to non-standard operations, Unitree Robotics will not be responsible for any resulting losses and consequences!

9) Safety reminder for restoring standing position: Restoring standing position requires space for the robot dog to flip over. Please ensure that there are no people or objects within a 2-meter diameter circle around the robot dog to avoid unnecessary casualties and property damage. Otherwise, Unitree Robotics will not be responsible for any resulting losses and consequences.

10) When the battery power is only one block left, please stop and turn off the robot dog in time, take out the battery to charge to avoid the damage of falling when the battery is low.

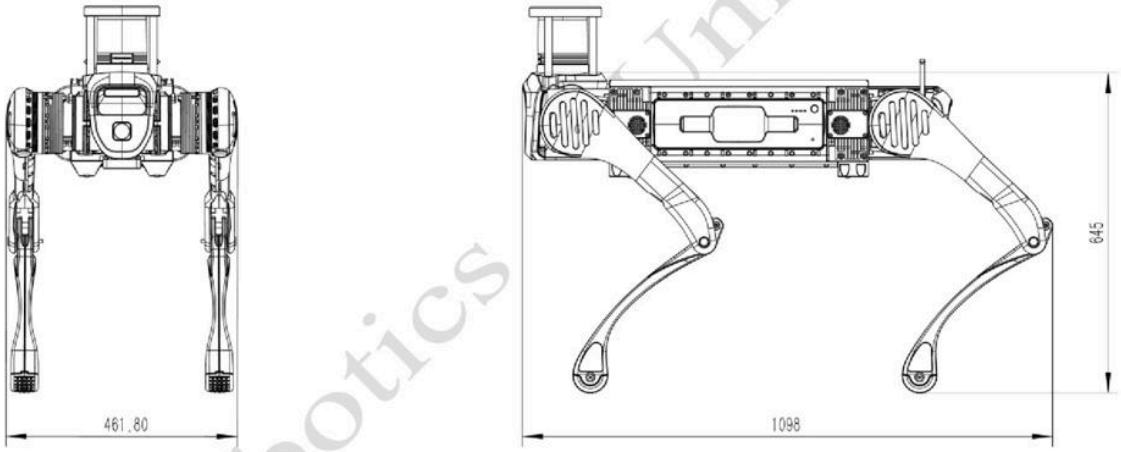
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Product Overview

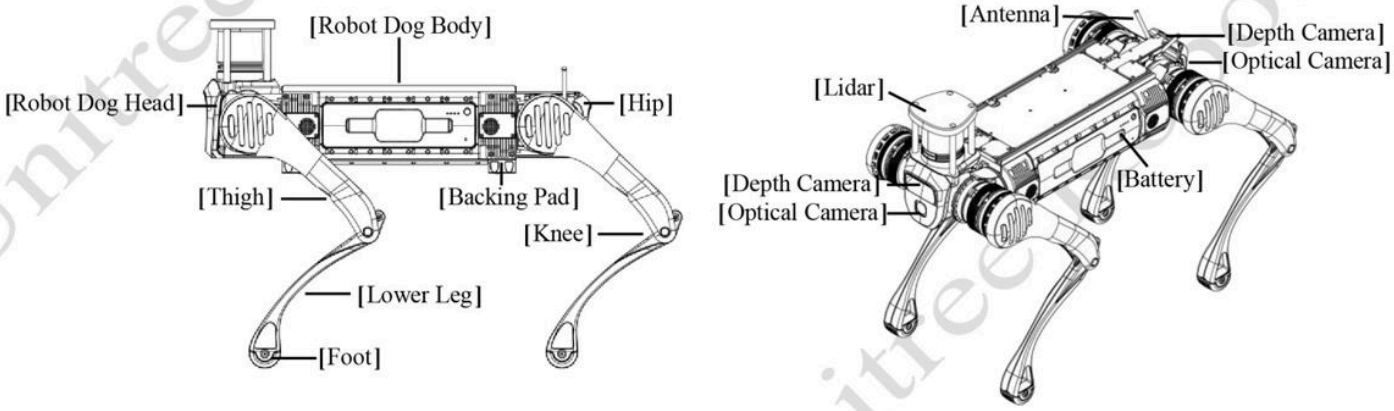
Introduction

The B2 industrial-grade quadruped robot has exceptional mobility, with a maximum running speed exceeding 6m/s. Its main body structure is made of high-strength, lightweight materials such as aerospace aluminum alloy and carbon fiber. The entire unit weighs 60kg and has a maximum thrust-to-weight ratio of 6.25. It is capable of jumping distances ranging from 0.5m to 1.2m and can adapt to various complex terrains. All connecting material structures are made of 6061-T6 aluminum alloy, with some key components utilizing 7075-T6, capable of withstanding impacts from falls. Equipped with a wide-angle omnidirectional LiDAR as standard, it is equipped with a depth camera and optical camera in the front and rear, providing the B2 with powerful obstacle avoidance and terrain adaptation capabilities. When combined with deep learning algorithms, it can achieve flexible and dynamic obstacle avoidance. B2 comes standard with Intel Core i5 (platform features) and Intel Core i7 (user developed), with optional Intel Core i7 and Nvidia Jetson Orin NX (up to 3), providing super strong AI computing power.

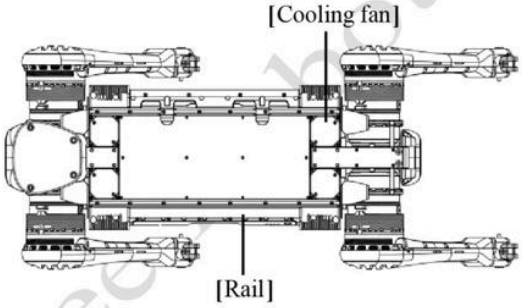


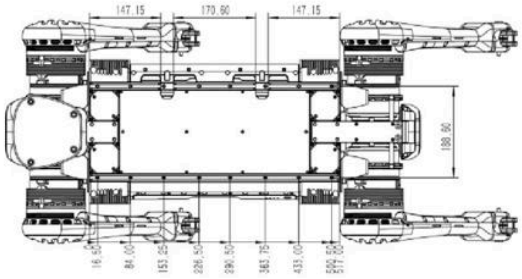
Parts Name

The main body of the B2 quadruped robot is as shown in the following diagram. Please refer to the actual product for accuracy.



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Unit: mm

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

Function Highlights

1) Super large load capacity, universal helper

The B2 has a very large load capacity, with a maximum standing load of 120kg and a continuous walking load of 40kg. It can meet various load demands in special and complex operations and become a universal and powerful helper for operators in emergencies.

2) Long-lasting endurance for continuous operation

The B2 robot features a high-capacity 45000mAh battery, equipped with high-performance battery cells and an advanced Battery Management System (BMS) developed independently by Unitree Technology. The robot can operate continuously for over 5 hours without a load, and for over 4 hours with a 20kg load, providing strong power support for the B2 quadruped robot. Additionally, it can be optionally equipped with a contact charging pad for autonomous recharging, greatly improving operational time and efficiency, and providing reliable support for all-weather operations!

3) Ultimate Power, Superb Athletic Performance

The B2 boasts outstanding mobility, with a maximum running speed of over 6m/s, allowing for swift execution of various tasks and greatly improving work efficiency. It also possesses exceptional obstacle-surmounting capabilities, with a maximum jumping distance of 1.2 meters, enabling it to easily traverse high obstacles or ditches and adapt to a variety of complex terrains.

4) Multi-surface Adaptability, Great Obstacle-Crossing Capability

The B2 is equipped with a wide-angle omnidirectional lidar, as well as a depth camera and optical camera at the front and rear, providing long-range perception and strong anti-interference capabilities. The fusion of these sensors, combined with independently developed and continuously optimized motion control algorithms, enables high-resolution recognition of terrain features for flexible and dynamic obstacle avoidance. This enables the robot to effortlessly climb stairs and traverse rugged terrain, adapt to various complex terrains and weather conditions such as ruins and railway tracks, and possess high mobility and flexibility. It can replace humans in completing tasks in many special or high-risk environments.

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5) IP67 Dust and Waterproof Rating, Strong Protective Function

The B2's body structure is made of high-strength sealing materials, effectively preventing water from infiltrating the interior. Special treatment is also applied to critical parts and connections, ensuring normal operation when submerged in water. With an IP67 protection rating (certified), it can withstand outdoor rain and various harsh environments during operations.

6) Equipped with Additional Peripherals to Enhance Operational Precision

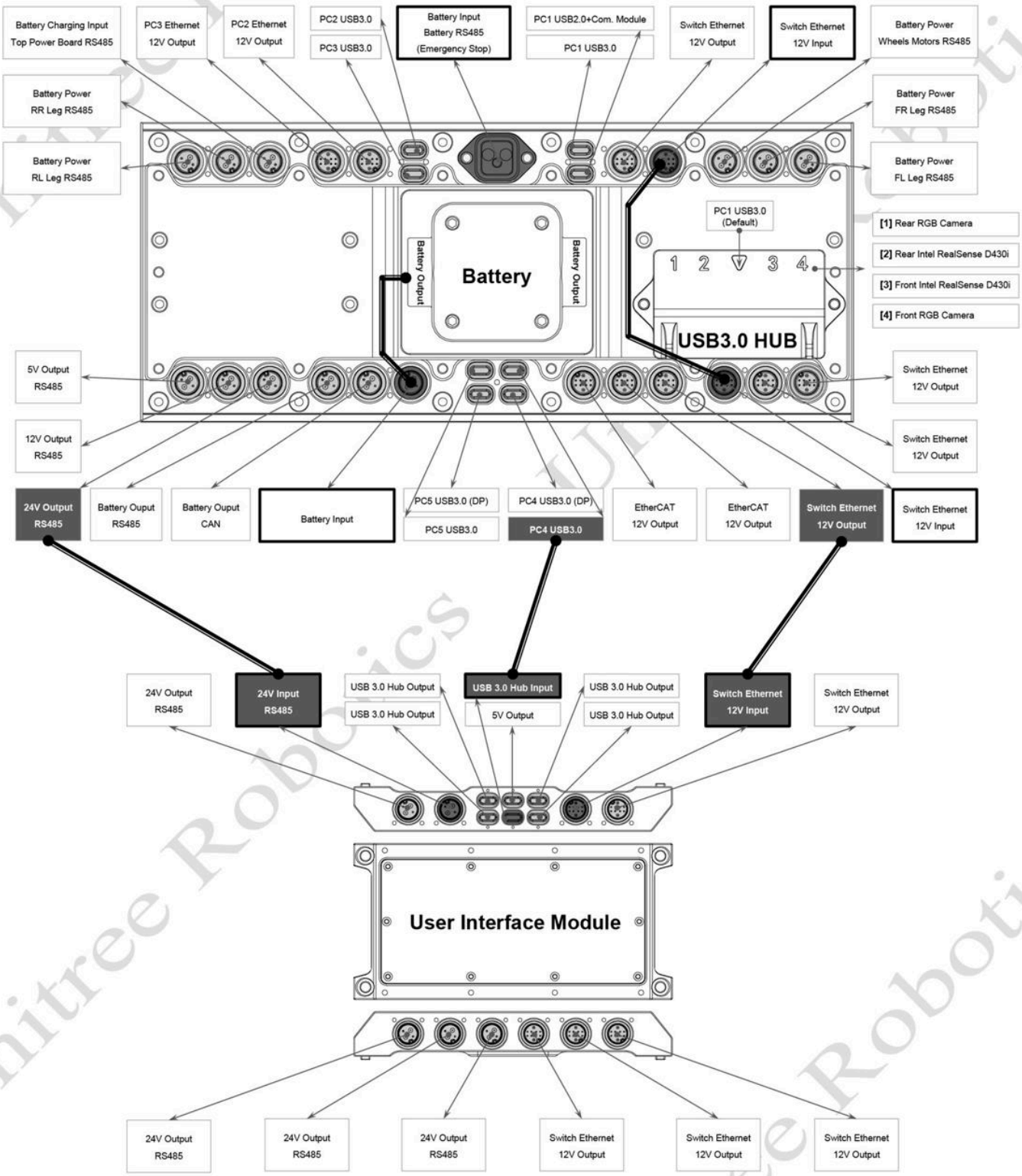
The B2 provides multiple expansion interfaces, including 1000M-Base-Ethernet×4, USB3.0×4, 12V×4, 5V×1, 24V×4, and BAT×1, enabling it to accommodate various peripherals. It can seamlessly collaborate with Unitree's self-developed product, the Z1 robotic arm, to complete complex tasks. Users can also adapt various peripherals such as gas sensors, temperature sensors, 5G networking, IR gimbals, industrial cameras, etc., for various application scenarios including power line inspection, fire rescue, and industrial logistics. This capability enhances traditional operations, making them safer, more effective, and improving operational precision.

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Interface Description

The B2 fuselage provides an SDK extension port on the side, so that developers can continue to develop more extension functions, as shown in the following figure.

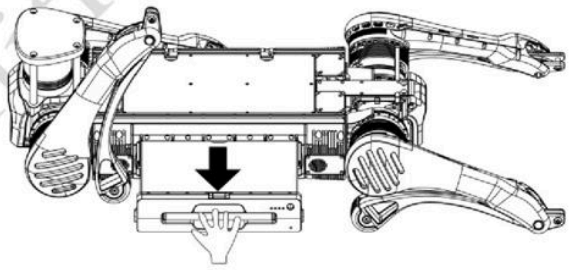


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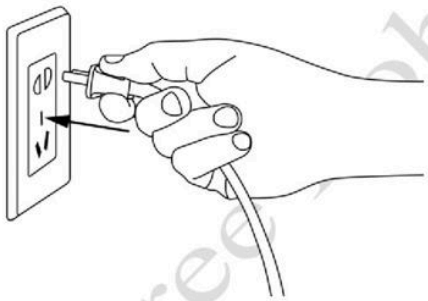
How to charge

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.

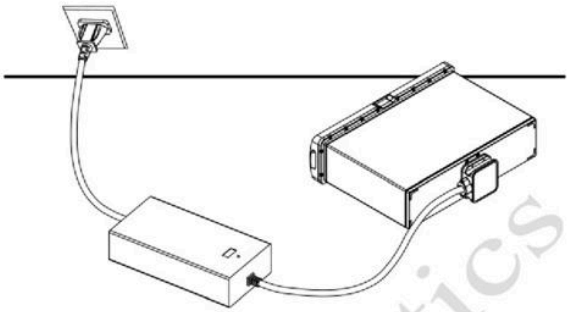
Charge the battery



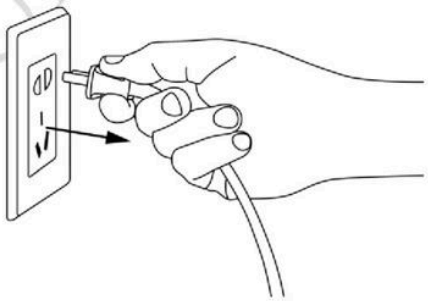
1) Remove the battery from the B2 body
(Pull out the battery pack strap)



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



3) Connect the B2 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.

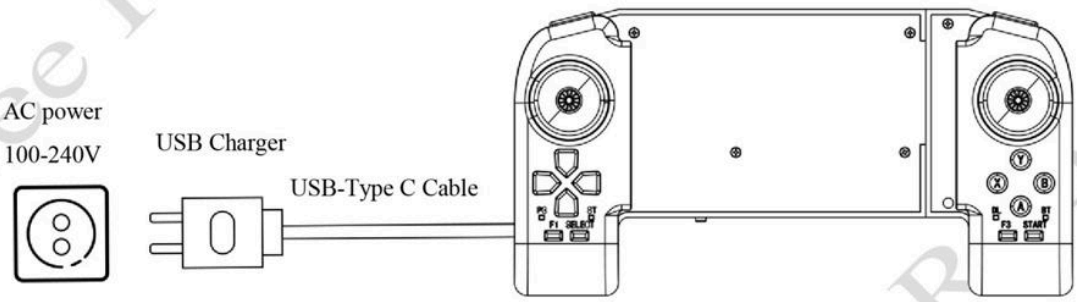
6) If the battery indicator is off, the battery pack is fully charged. Please remove the battery pack and charger to finish charging.

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

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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/1A 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

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Instructions for use

Operation Environment Requirement

1) Run the robot in -20℃ -55 ℃ with good weather condition. Do not operate in bad weather, such as lightning and tornado weather. When operating in water, the users need to be sure to comply with the requirements described in the IP67 Protection level instructions.

2) Please keep it under control in the users' view when using the robot and keep the robot maintain a safe distance of at least 2 meters from obstacles, complex ground, crowds, water, and other objects.

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

4) Due to the varying proficiency levels of actual operators, for the sake of reliability and safety, please use in an open and unobstructed flat ground environment. When operating robots, it should be noted that in AI operation mode, the step should be less than 25cm, the slope should be less than 45 ° in low gear, and less than 30 ° in high gear; In conventional operation and control mode, the step should be below 20cm and the slope should be less than 20 °. Failure to meet these conditions may cause the robot to fall. 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 over obstacles.

5) The legged 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 quadruped robot, the remote control, the charger, etc. from the box separately, place the quadruped 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.

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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.

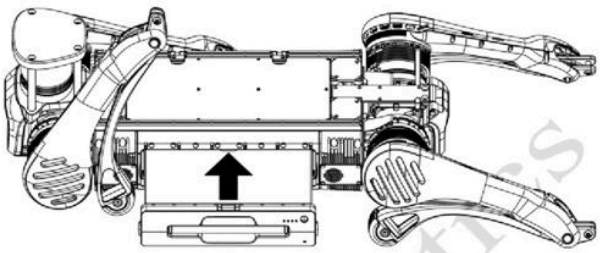
6) Ensure that the remote control module and battery pack are fully charged.

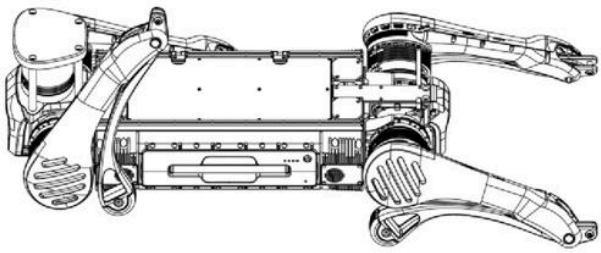
7) If the expansion interface is used, check whether the cable connection is correct.

Preparation before Power on

1) Installing Battery Packs

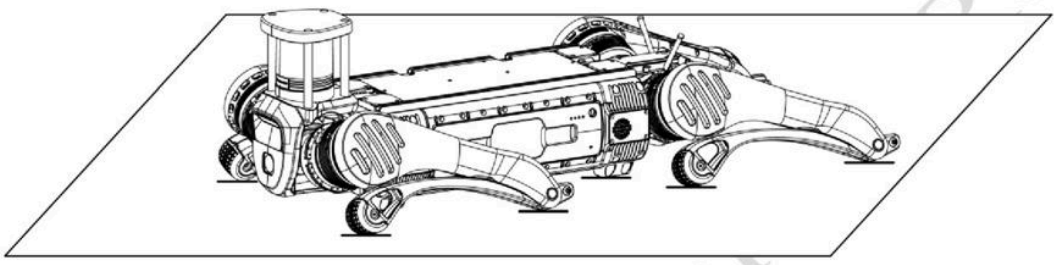
Place the B2 on a flat surface, insert the battery pack into the battery slot on the side of the robot, paying attention to the installation direction with the anti-reverse interface facing upward. If the battery pack cannot be fully inserted, please adjust the orientation of the battery pack. Do not force it to avoid damaging the battery interface and buckles. When you hear a "click" sound, the battery pack is installed. Please ensure that the buckle is in place!





2) Body Placement (Important Steps !!!)

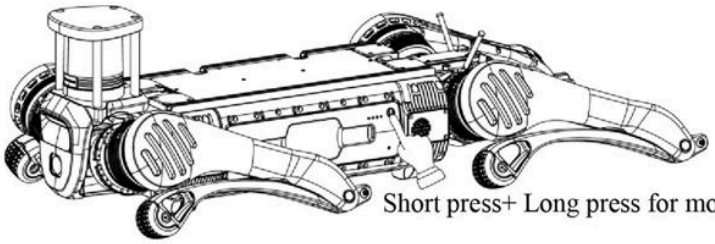
Horizontal type startup: please make sure that the robot dog is placed on a flat ground before startup and operation. The belly support pad of the robot dog should be flat against the ground. The machine body should lie on the ground horizontally without tilting. The legs of the robot dog should be fully retracted (as shown in the figure below). The four knee joints and foot ends should be flat on the ground to ensure that neither the thighs nor the legs of the robot dog are pressed by the machine body.



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Start up B2

After completing the pre-startup check and preparation of the robot, power it on by following these steps: first, briefly press the power button, then press and hold the power button for more than 3 seconds to activate the battery (when the battery is activated, the indicator light will be a solid green, indicating the current battery level). After the battery is activated, wait for 2 minutes, and the robot will automatically stand up with the body parallel to the ground, indicating a successful startup.



Short press+ Long press for more than 3 seconds

- If the starting up fails, please check the placement of the body!
- protruding outward or the lower legs being pressed inward may cause the robot dog to fail to start up!
- Be careful with your hands at the movement joints, be careful!
- After B2 starts up, it will stand up automatically. Please maintain a safe distance.

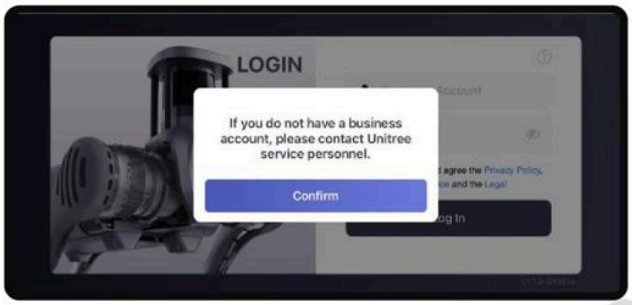
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Connecting to the Unitree Explore App

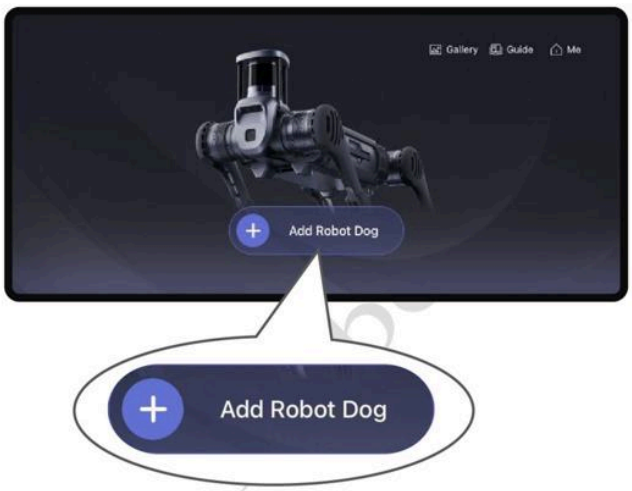
To use it for the first time, you need to bind the device. During the binding process, please turn on the Bluetooth on your mobile phone and keep it close to B2 to ensure real-time Bluetooth communication.

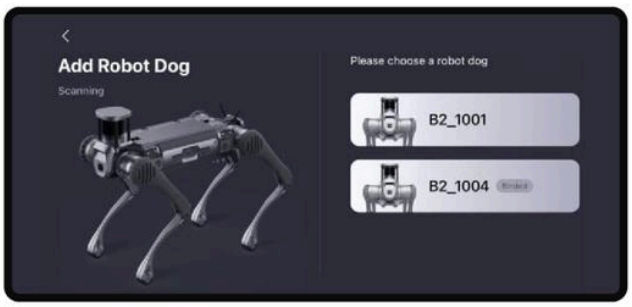
1) **Download and install the Unitree Explore App**, and log in with the enterprise account and password provided by Unitree.



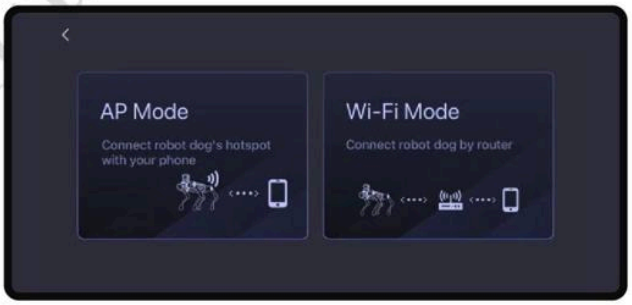
● If you don't have a business account, please contact Unitree Robotics's sales service personnel to open an account!

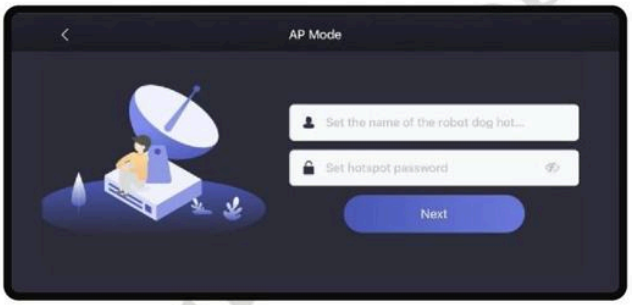
2) After starting the B2 power, **add the robot in the Unitree Explore App**: Turn on the Bluetooth in the phone system -> Click "Add Robot" on the homepage -> Select the device you want to add.





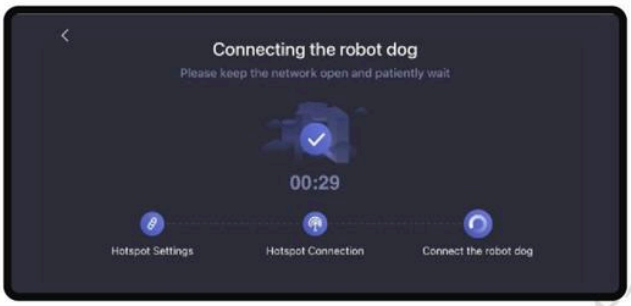
3) **Binding B2**: You can choose to connect in AP direct connection mode or Wi-Fi connection mode. After successful connection, you can learn from the built-in tutorials to quickly master the control techniques.

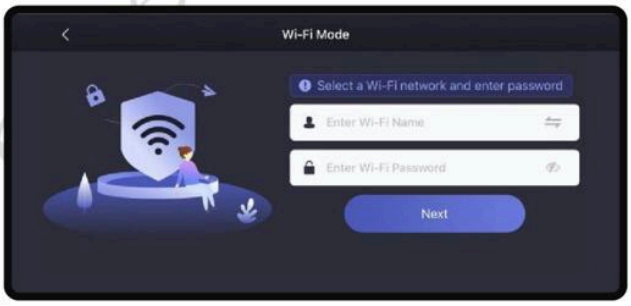


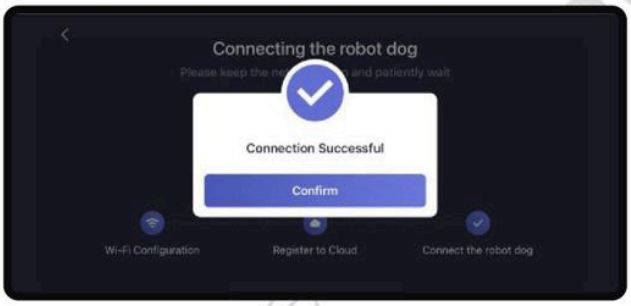


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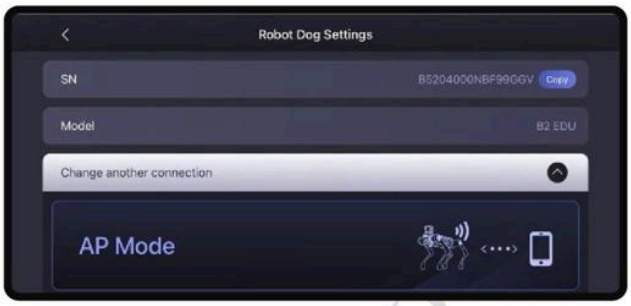


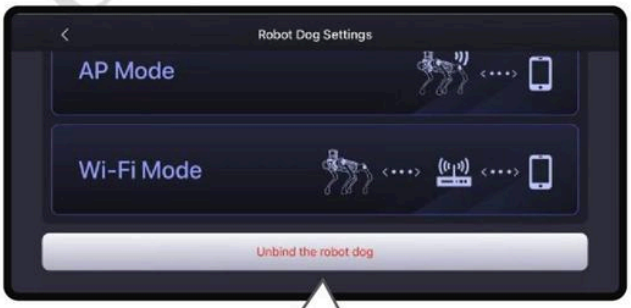




4) How to change the account binding?

Click on the homepage to go to **[**Settings**]** -> **[**Robot Settings**]**, then select Unbind to release the binding of the robot dog from the current account. After the robot dog 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.

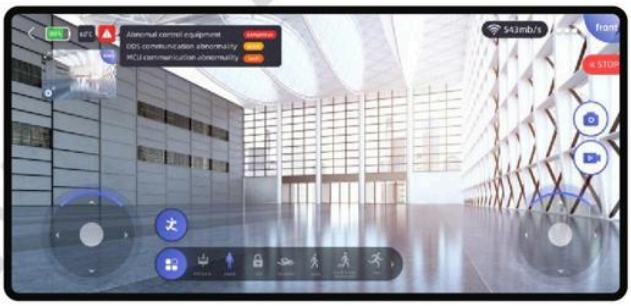
● If you forget to bind your account or lose your account, please contact relevant personnel at Unitree!

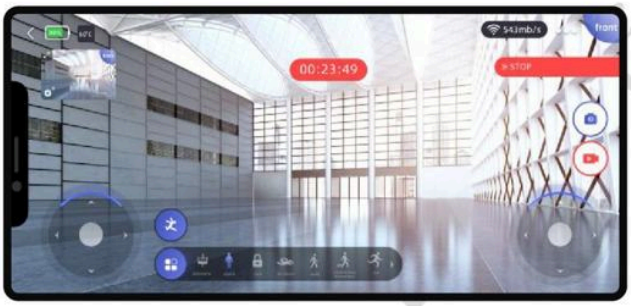
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Operate your B2

1) Use the Unitree Explore App to control

After completing the built-in tutorial in the Unitree Explore App, you can use the app to control your B2 as you want.



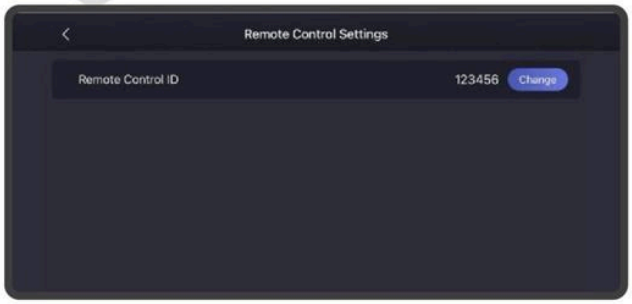


2) Use remote control to control

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 dog. Click **[**Modify**]** to change the remote control for operation.

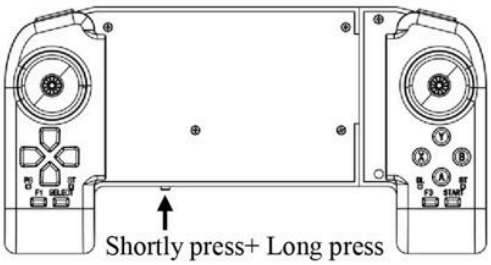


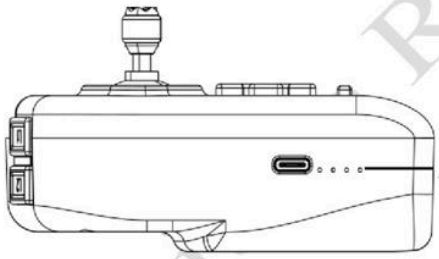


Once the remote control is powered on and successfully connected to B2, the data transmission light on the left side will be fully lit, indicating that the remote control is connected to the B2's data transmission module. At this point, you can choose to use either regular remote control commands or AI remote control commands to control the robot dog to perform corresponding actions. There are differences between the two:

Regular remote control mode: relies on manual intervention and decision-making, providing good stability and reliability.

AI remote control mode: it will autonomously adapt to the environment and make decisions, providing better adaptability for scenarios such as climbing stairs and walking on complex terrain.





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

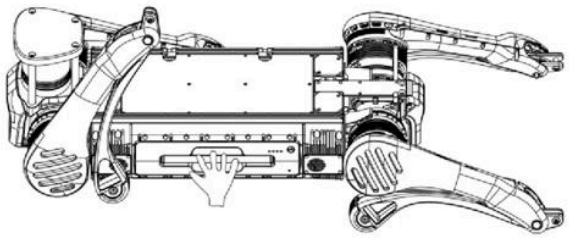
Switching off B2

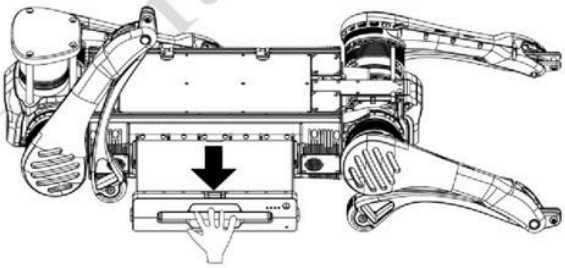
Please make sure that the robot dog stands on a flat ground and the robot is in a static standing state before turning it down, (the position of the robot body is in the initial state after startup and standing, the body is horizontal, the handle is not operated, and the robot is in a static standing state).

1) Press the buttons L2+A twice, and the robot completes the joint locking and lying down actions in turn.

2) After the robot enters the lying state, press the power button briefly and then press the power button for 3 seconds to shut down.

After turning off the power, please place the robot in the required position, and arrange the legs and hip joints properly to prepare for the next power on. If B2 is not used for a long time, please remove the battery pack in time: pull out the battery pack handle, and the battery pack will pop out and can be removed.

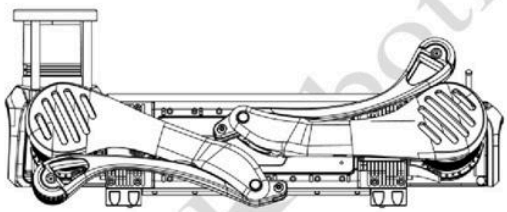




- Please make sure that the robot turned off in a damping state, otherwise the robot will fall heavily on the ground after it is turn down and powered off, which may cause damage to the robot body and certain potential hidden dangers!
- Be careful to pinch your hands at the movement joints, please be careful!

Packing

Preparation for packing: Rotate the legs of the quadruped robot to the position shown in the picture (rear leg retracted step: rotate the rear leg hip motors so that the rear thighs are placed in the position as the picture shows, and at the same time retract the rear lower legs to the position shown in the picture.



After completing the pre-packing preparations, first place the quadruped robot into the lower part of the transportation case. After the quadruped robot is placed in the lower part of the case, put the accompanying remote control, charger, etc. into their respective positions inside the transportation case to ensure that none of the above items will fall out when the upper part of the case is closed.

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Abnormal Condition Description

When using the B2 quadruped 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

If the robot fails to stand up after lying on the ground for 2 minutes during startup, it indicates a failed self-check. In this case, the robot needs to be rechecked following the "Check before Power on" and "Preparation before Power on" steps 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 B2. 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 failure of the remote control module (such as the handle battery exhaustion, etc.), the remote control buttons cannot be used to make the robot lie on the ground and standby. The only way to forced shutdown is to press the battery supply button.

Forced shutdown: Keep the robot at least 2 meters away from obstacles, complex ground, crowd, water, and other objects. Hold the head and tail of the robot, short press the power switch once, and then long press the power switch for more than 3 seconds to turn off. Move it to the ground slowly after powering off.

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: B2 has been calibrated by default after leaving the factory. Do not recalibrate the joints for normal use! If any abnormal situation occurs with the B2, 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 Dog] -> [Calibration].

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6) How to stand by for a long time

If you need to stand by for a long time, please control the robot to the lying position and press (press L2 + B keys to enter the damping mode) to avoid the robot from falling down and falling when the power is low!

⚠ ● 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 motion control switching

Please ensure that the control of the robot dog is in the lying down or damping mode before switching motion control. There should be no one within a 1-meter diameter range to avoid any casualties or property damage caused by non-standard operations. Unitree Robotics will not be liable for any losses or consequences resulting from such incidents.

2) Regarding safe recovery of standing

Please ensure that there is space for the robot to stand up, and there should be no people or objects within a 2-meter diameter circle around the robot. To avoid unnecessary casualties and property damage, Unitree Robotics will not be liable for any losses or consequences resulting from such incidents.

3) Regarding complex command safety instructions

When triggering the front jump command, the front jump function is considered a dangerous action. Please ensure that there are no obstacles within a half-circle with a diameter of 2 meters in front of the robot (especially no people). Unitree Robotics will not be liable for any losses or consequences resulting from casualties or property damage caused by non-standard operations.

4) Regarding battery life

The robot's comprehensive running endurance is approximately 4-6 hours, with a load of 20kg, the running time is approximately 4 hours, and the range is over 15km. When walking without a load, the continuous walking time is approximately 5 hours, and the range is over 20km. 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.

5) Regarding steps and uneven surfaces

When using regular motion control, it is recommended that customers avoid steps exceeding 20cm, and with AI motion control, steps exceeding 25cm should be avoided to prevent tripping. When encountering uneven terrain, operators should be cautious and reduce the robot's speed.

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6) Regarding climbing slopes

In regular motion control mode, the rated uphill angle is less than 20°, and in AI motion control mode, the rated uphill angle in low gear is less than 45°, and in high gear is less than 30°. When using a larger climbing angle (approximately equal to or greater than 45°), the robot is likely to drift sideways, and when turning directly on steep slopes, the robot is likely to become unstable. Operators must control the robot properly.

7) Regarding obstacle crossing

In regular motion control mode, the obstacle crossing distance is less than or equal to 20cm, and in AI motion control mode, the obstacle crossing distance is less than or equal to 25cm. Operators should be cautious and reduce the walking speed when crossing obstacles.

8) Regarding speed

When running on smooth terrain, please stay away from crowds.

9) Regarding foot components

The robot's foot components are consumable items, and spare foot components will be provided with the product. Wear and tear will be more significant when running on rough terrain. If significant wear or damage to the foot pads is observed, or if there is a noticeable increase in impact noise while walking, the foot components should be replaced promptly to prevent abnormal movement or damage to the robot.

10) Regarding IP67 protection

Before operation, ensure that the battery interface, battery compartment interface, battery surface, and battery compartment surface are dry and free of water. After operating in water or rainy weather, wipe the surface of the robot clean.

11) **Do not touch the robot while it is in motion!** Be careful of getting fingers caught at the joints, such as the knee joint.



● Maximum running speed of 6m/s, realized in special configurations, in practice there is a speed limit for security purposes

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Daily Maintenance

Whole Machine Clean

1) Clean

When the B2 is used in harsh environments (rainy, dusty, wet), please clean the surface of the robot body in time.

Before cleaning the robot body, please turn off the power, use a clean, soft cloth to wipe the body, especially pay attention to whether the multi-view depth camera is wiped clean. It is strictly forbidden to use metal brushes, sandpaper, etc. to clean to avoid scratching the surface of the parts. After cleaning, dry the body with a soft cloth. After drying, use a fan or air gun to dry the accumulated water on the surface of the robot and the joint gap to avoid leaving water marks.

⚠ ● Be careful! The whole B2 robot (including battery pack) has IP67 waterproof. Do not remove the battery pack when cleaning!

2) Storage

The B2 should be stored in a dry and cool room and away from the sun and rain to avoid the corrosion of parts and shorten the service life span. Take out the battery pack when storing for a long time.

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.

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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.

Uncharged 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!

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