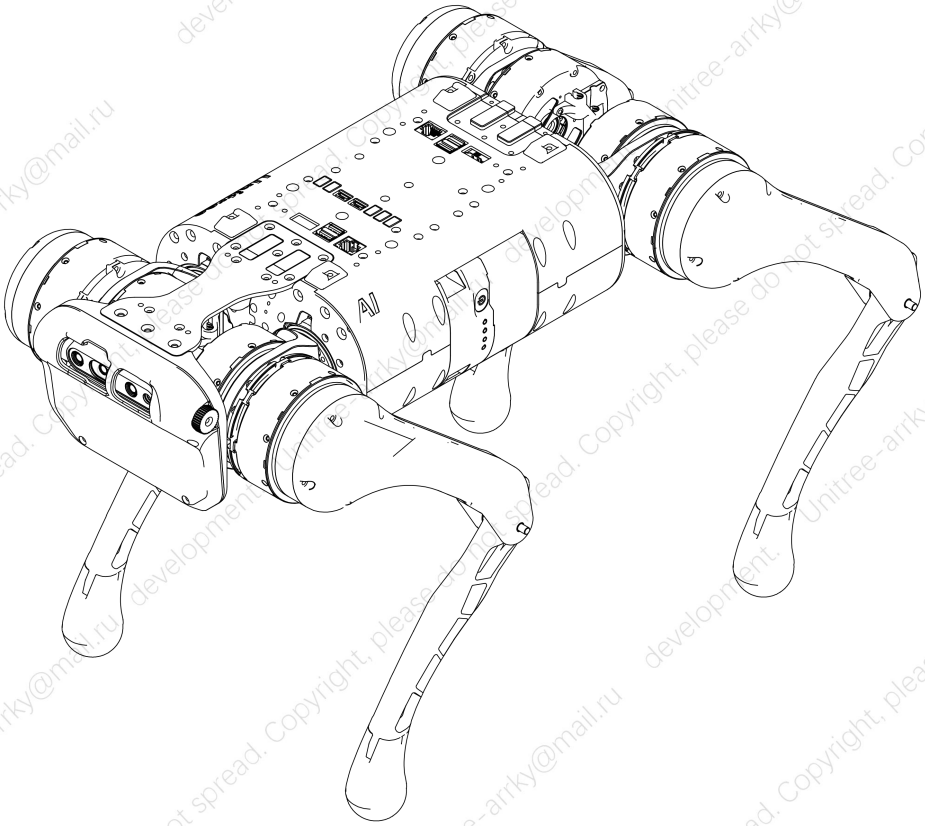
# A1

## Quick Start Guide

V1.0

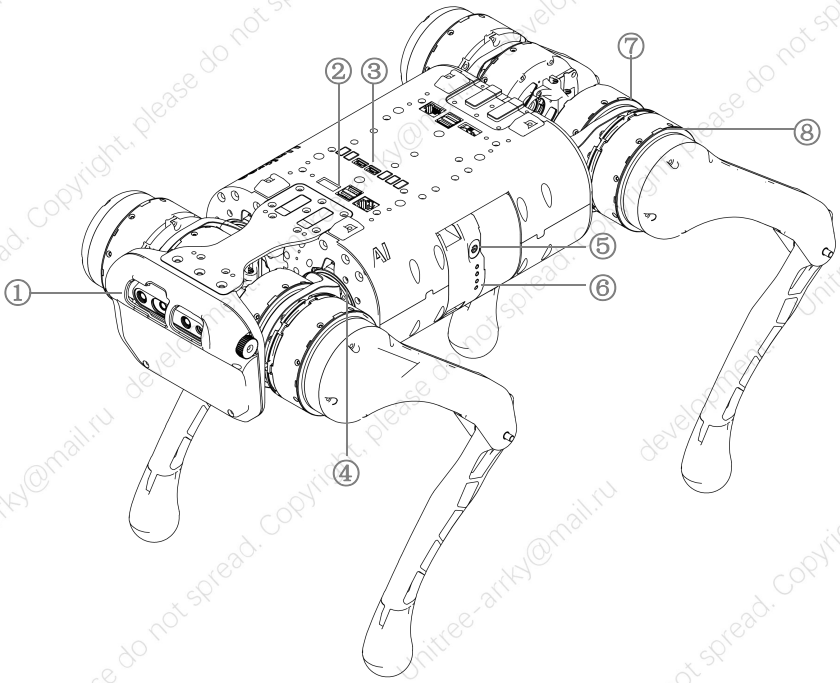





**Unitree**

# A1

The optimal design of joint parts makes the quadruped robot not only reduce the cost, but also greatly improve the motion performance and service life. In Sport mode, the maximum joint speed of 21rad/s allows A1 to speed up to 3.3m/s in an instant, possess excellent balance ability; and the torque of 33.5NM allows A1 to easily achieve backflip; the joints can be quickly disassembled and easy to maintain. The addition of a multi-eye depth camera allows the quadruped robot platform to have intelligent applications such as real-time image transmission (image transmission quality 720P / 30fps) and character following; and supports secondary development. With optional lidar, extended functions such as dynamic obstacle avoidance, navigation planning, autonomous positioning, and map construction can be completed; optional NVIDIA TX2 can be used for visual SLAM and gesture recognition. At the same time, A1 supports APP control for Android and IOS.

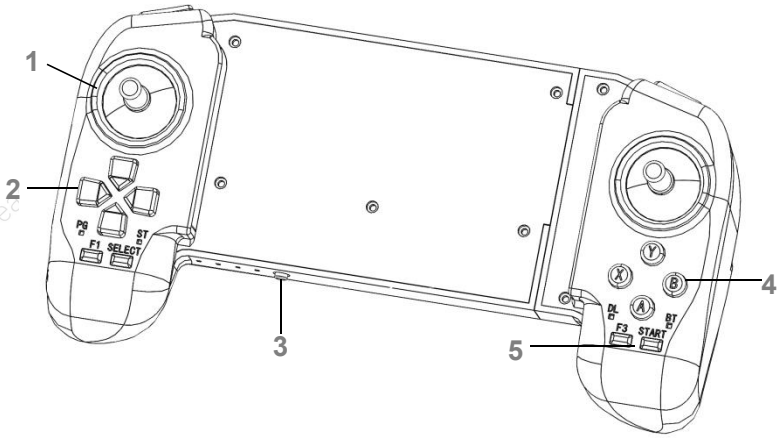


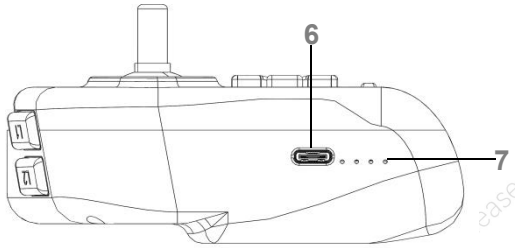

1. Multi-Eye depth camera
2. Developing reserved communication interfaces
3. Developing reserved power interfaces
4. Body motor& Reducer
5. Power switch
6. Battery Indicator
7. Thigh motor& Reducer
8. Calf motor& Reducer

# Remote Controller

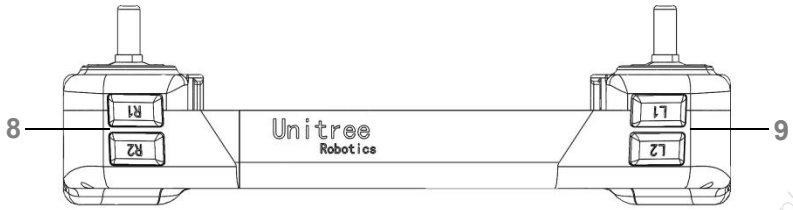
The joystick can control the robot to realize the 3-axis attitude and the 3-axis position control when standing. It can also control the robot to realize the forward and backward, the left and right side shift, the in-situ turn and the certain rule walking on the leveling ground. (straight line, circle, arc, rectangle), crawl forward, up and down slope / step, etc. The joystick through bluetooth connection to mobile phones, the signal transmission is more convenient and stable; Ergonomic structure for a more comfortable feel.

1. Stick
2. Left Button
3. Power Button
4. Right Button
5. START Button and Calibration Button




6. Charging Interface Type c
7. WIFI Signal Indicator




8. R1,R2 Button
9. L1,L2 Button

# Specifications

## A1

| | |
|---|---|
| Machine Weight(with battery) | 12 kg |
| Dimensions(Stand) | 500×300×400 mm (L×W×H) |
| Dimensions(Folded) | 450×300×150 mm (L×W×H) |
| Maximum Walking Speed | 3.3 m/s |
| Operating Time | 1-2.5 h |
| Real-time HD Video Transmission | 0.1-0.2 s delay |
| Payload | 5kg |
| DOFS | 12 |
| Joint Torque | 33.5 NM |
| Joint Maximum Speed | 21 rad/s |
| Foot Force Sensors | 4 |
| Protection Mode | Emergency stop, Fall protection, Overheat |
| Warning System | Low voltage, High temperature<br>Short circuit, Overcharge |
| RTOS | Motion control: Ubuntu<br>Environmental awareness: Ubuntu-ROS |
| Abundant External Interface | HDMI×1<br>FE×1<br>USB 3.0×2 |
| Optional Lidar | Dynamic obstacle avoidance,<br>Navigation planning, Map construction<br>Autonomous positioning |
| Optional NVIDIA TX2 etc. | Gesture recognition, Visual SLAM<br>Professional secondary development |

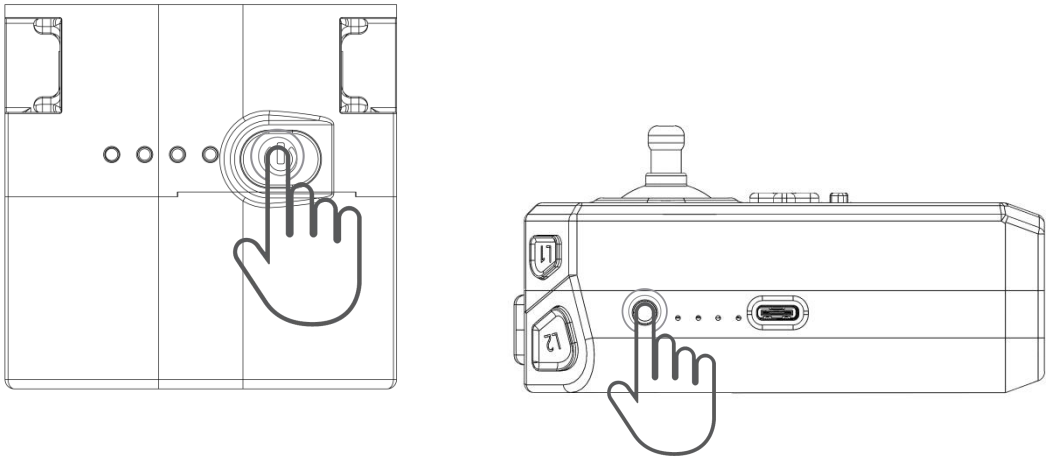
## Remote Controller

| | |
|---|---|
| Operating Time | 2.5 h |
| Max Transmission Distance | 1 km |

## Battery

| | |
|---|---|
| Capacity | 4200 mAh |
| Voltage | 21.6 V |
| Battery Type | Lithium-ion 6S |

# 1. Check the Battery Levels



Press once to check the battery level. Press once, then again and hold to turn on/off.

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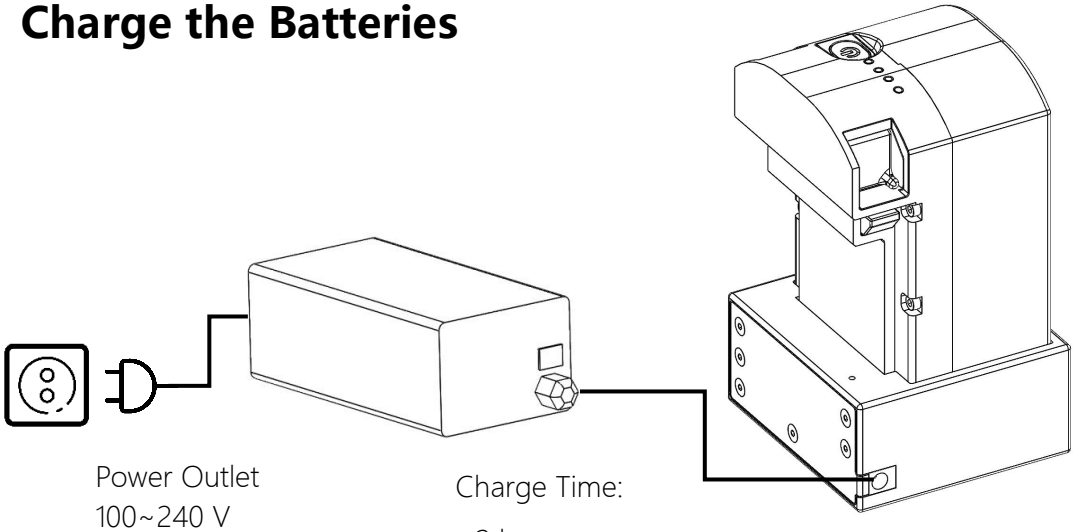
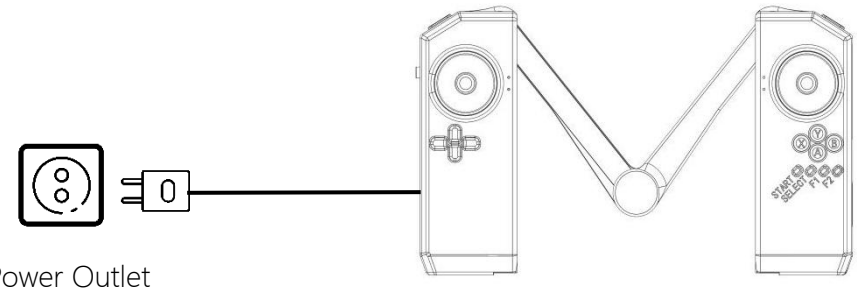
# 2. Charge the Batteries



Power Outlet
100~240 V

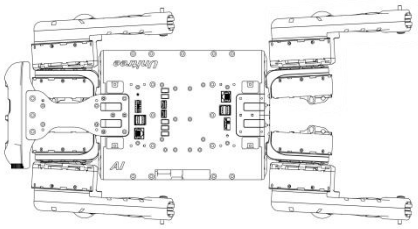
Charge Time:
~2 hours



Power Outlet
100~240 V

Charge Time:
~1.5 hours

# 3. Prepare the Robot



Please make sure that the robot is placed on the leveling ground before starting the machine. The robot's abdominal support pad should be flat on the ground. The body level is not tilted on the ground. The robot calf is fully stowed（As shown below）, make sure that the robot's thighs and calves are not pressed by the body, otherwise the robot may fail to boot.

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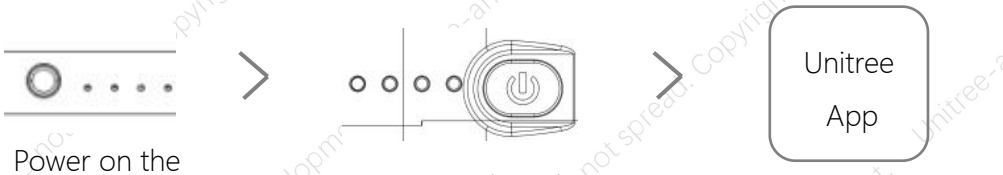
# 4. Prepare for Operating




Power on the remote controller

Power on the robot

Launch the Unitree App

A1 supports remote control and Wi-Fi control of mobile devices, the robot control mode can be switched through the App.

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# 5. Control the Robot

1. Joystick control method for basic operation in Sport mode.
2. Joystick control method for combined action and special action in Sport mode.
3. Joystick control method for basic action in Sport mode (walking).
4. Joystick control method for combined action and special action in Sport mode(walking).
5. Joystick control method for basic operation in Sport mode(fast-running).
6. Joystick control method for basic action in SLAM mode .

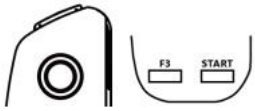
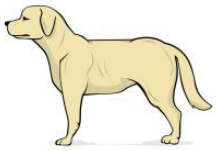
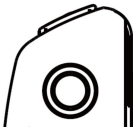
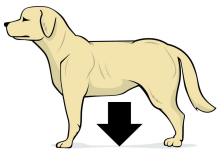
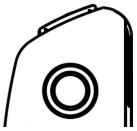
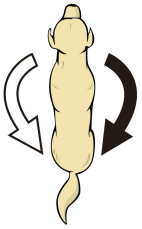
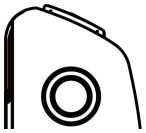
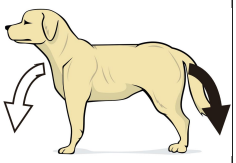
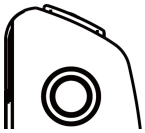
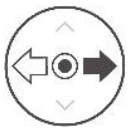
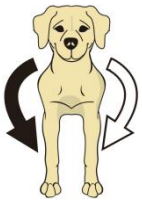
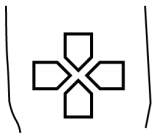
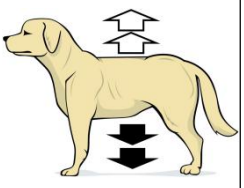
7. Actions not recommended in Sport and SLAM mode.

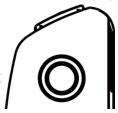
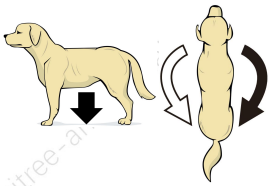
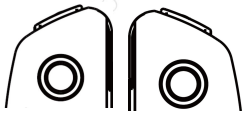
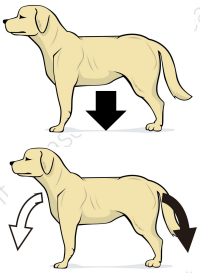
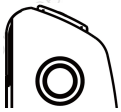
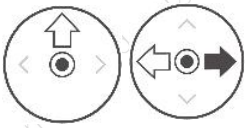
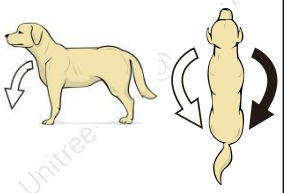
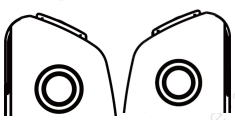
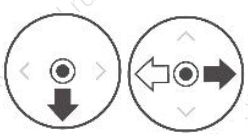
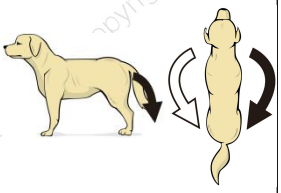
Parts 1 to 6 are actions that allow the operator to use them, which are sufficient to express the superior athletic performance of the robot. When using the actions involved in sections 1 through 6, be sure to follow the instructions in the "Disclaimer and Safe Use Guidelines"section.

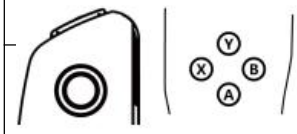
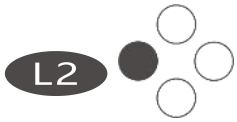
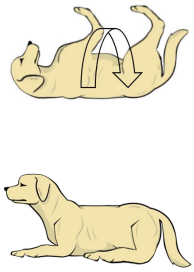
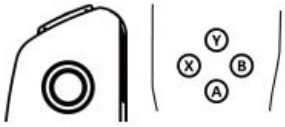
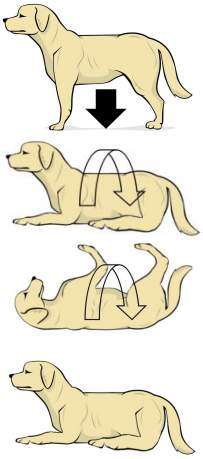
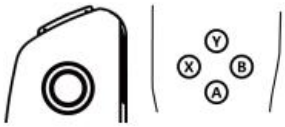
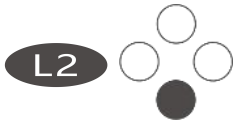
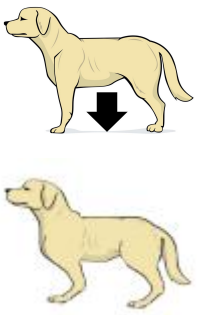
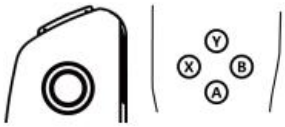
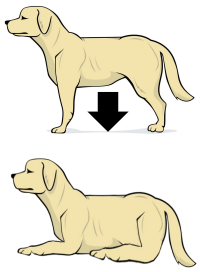
Part 7 is an action that is not recommended, it is very likely that the robot will fall and the robot's battery life may be greatly reduced.

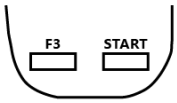
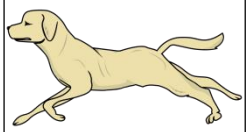
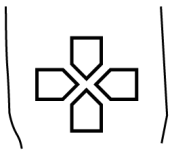
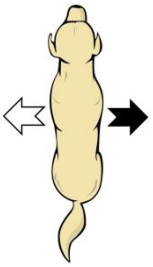
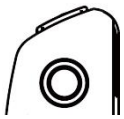
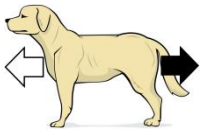
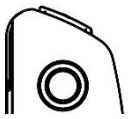
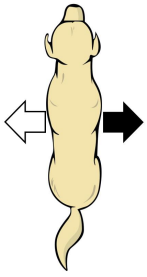
⚠ ꕥSince the robot does not have a visual perception system at present, and the actual control personnel have different levels of control proficiency, in order to be reliable and stable, please use it in an open and flat environment. When operating the robot, be careful to avoid steps above 5cm, slopes greater than 25°, and obstacles that may cause the robot to fall. When the robot is walking on a terrain with a certain undulation or slope, the controller should reduce the walking speed of the robot and carefully control it so that the robot is tripped by obstacles.

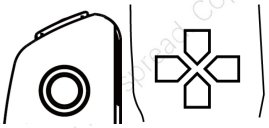
ꕥFoot robots have certain requirements for the ground to walk. Do not use robots on the ground with insufficient friction, such as ice. Do not use robots on soft ground, such as thicker sponge/turf floors. For use on smoother floors, such as glass, tiles, etc., carefully and compliantly control the robot to exercise, avoid strenuous exercise, and reduce the walking speed of the robot to prevent the robot's foot from slipping and falling.

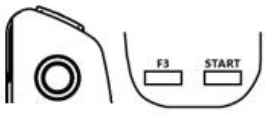
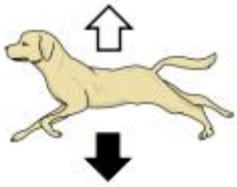
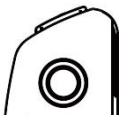
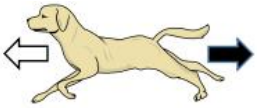
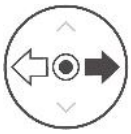
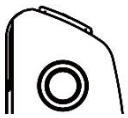
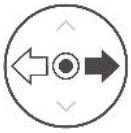
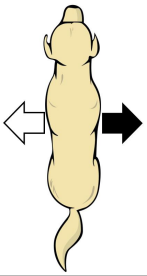
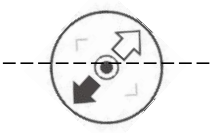
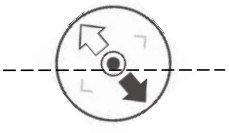
| 1.Basic Action under “Sport Mode” (3-Axis Attitude and 3-Axis Position Control when Standing) | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 1 | L1 Button START Button   | L1 Button START Button   |  | **When the robot dog is turned on and standing** , after holding down the L2 button, single-click the B button, the robot dog squats and lies on the ground, enters the damping mode; then hold down the L1 button, single-click the START button, this time will When there is obvious current sound, the robot dog stands again; release the L1 key and click the START key once to enter the sport mode. |
| 2 | Left Stick  | Left Stick  |  | **When the robot dog is standing in Sport mode,** the left stick is used to control the robot body to lift or squat.<br>Push the stick up, robot body lifts up. Push the stick down, the robot squats. When the stick is in the middle position, the robot is in a static standing state (the body position is in the initial state after power on). |
| 3 | Left Stick  | Left Stick  |  | **When the robot dog is standing in Sport mode,** the left Stick is used to control the yaw of the robot.<br>Push the stick to the left, the robot is twisted to the left. Push the stick to the right, the robot is twisted to the right. In the middle position, the yaw angular of body is zero.<br>The more the stick is pushed away from the center position, the greater the yaw angular. |
| 4 | Right Stick  | Right Stick  |  | **When the robot dog is standing in Sport mode,** the right Stick is used to control the pitch of robot. (lean forward and backward)<br>Push the stick up, robot body leans forward. Push the stick down, robot body leans backward. When the stick is in the middle position, robot body is in a horizontal position.<br>The more the stick is pushed away from the center position, the greater the yaw angle. |
| 5 | Right Stick  | Right Stick  |  | **When the robot dog is standing in Sport mode, t**he right Stick is used to control the robot body roll.<br>**(When the robot faces the operator)** Push the stick to the left , robot body rolls to the right. Push the stick to the right, robot body rolls to the left. The robot body does not roll when the Stick is in the middle position.<br>The more the stick is pushed away from the center position, the larger the roll angle. |
| 6 | Left Button  | Left Button  |  | **When the robot dog is standing in Sport mode,** the left button is used to control the robotic body's jog lift and jog squat.<br>Press the up button and the robot body is lifted up. Press the down button and the robot body will be clicked.<br>**Note: Please keep in mind the number of key presses. After the end of the action, please adjust back to the static standing state of the robot, otherwise the robot's battery life may be greatly reduced.** |

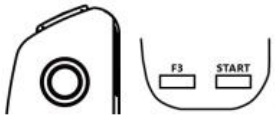
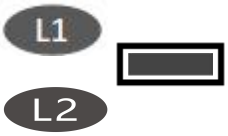
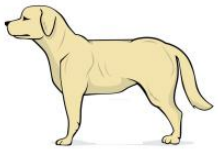
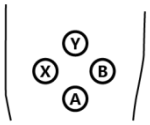
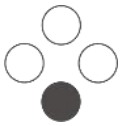
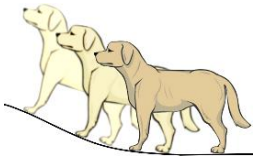
| 2.Combined Action and Special Action under “Sport Mode” | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 7 | Left Stick  | Left Stick  |  | **When the robot dog is standing in Sport mode,** the left Stick is used to control the robot's jaw and the body is twisted.<br>Push stick down and to left, the robot squats while twisting to left. Push stick down and to right, the robot squats while twisting to left. The robot is in a static standing state when it is in the middle position.<br>The more the stick is pushed away from the center position, the larger the amplitude. |
| 8 | Left Stick Right Stick  | Left Stick Right  |  | **When the robot dog is standing in Sport mode,** the linkage of the left and right Sticks is used to control the lower jaw of the robot and the front and back of the body.<br>Push left stick down and push right stick up, the robot squats and the body leans forward. Push left stick down and push right stick down, the robot squats and the body leans backward. The robot is in a static standing state when it is in the middle position.<br>The more the stick is pushed away from the center position, the larger the amplitude. |
| 9 | Right Stick  | Right Stick  |  | **When the robot dog is standing in Sport mode,** the right Stick is used to control the robot body to make a clockwise rotation.<br>Shake the right Stick clockwise to rotate the robot body clockwise. When in the middle position, the robot is in a stationary standing state.<br>The more the stick is pushed away from the center position, the larger the amplitude. |
| 10 | Right Stick  | Right Stick  |  | **When the robot dog is standing in Sport mode,** the right stick is used to control the robot body to rotate counterclockwise.<br>Shake the right Stick counter-clockwise to rotate the robot body counter-clockwise. When in the middle position, the robot is in a stationary standing state.<br>The more the stick is pushed away from the center position, the larger the amplitude. |
| 11 | Right Stick Left Stick  | Right Stick Left Stick  |  | **When the robot dog is standing in Sport mode,** the combination of the left and right Sticks can control the robot to lean forward and the body to twist.<br>Push right stick up and push left stick to left, the robot leans forward and the body twists to the left. Push right stick up and push left stick to right, the robot leans forward and the body twists to the right. The robot is in a stationary standing position in the middle position.<br>The more the stick is pushed away from the center position, the larger the amplitude. |
| 12 | Right Stick Left Stick  | Right Stick Left Stick  |  | **When the robot dog is standing in Sport mode,** the combination of the left and right Sticks can control the robot to lean backward and the body to twist.<br>Push right stick down and push to left stick left, the robot leans backward and the body twists to the left. Push right stick down and push stick to right, the robot leans backward and the body twists to the right. The robot is in a stationary standing position in the middle position.<br>The more the stick is pushed away from the center position, the larger the amplitude. |

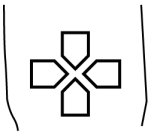
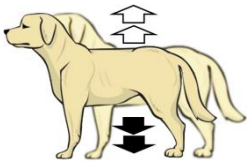
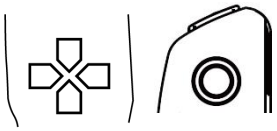
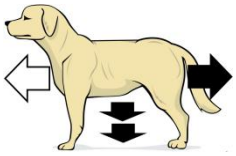
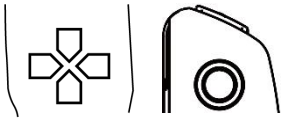
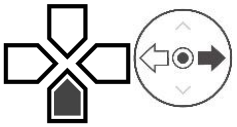
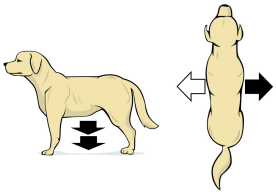
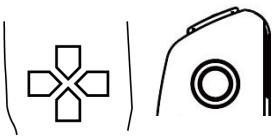
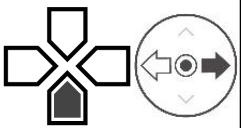
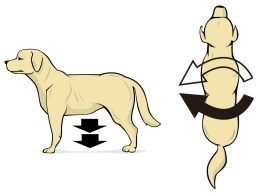
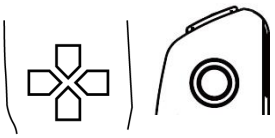
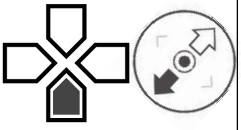
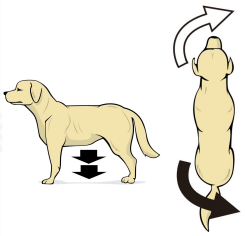
| 2.Combined Action and Special Action under “A Mode” | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 13 | L2 Button<br>  | L2 Button<br>Right Button-“X”Button<br>  |  | When the robot dog is standing in Sport mode, when the robot is lying on its back, hold down the L2 key and press the X key to roll the robot 180° to the right. After rolling, the robot is in the supine state and the joints are in the high-damping state. Hold down the L2 key and press the single right button-a button to perform semi-squat and standing movements successively. Press START to release the joint locking state and enter the normal operation mode.<br>Note:Do not use this function after configuring lidar, otherwise the lidar or robot will be damaged. |
| 14 | L2 Button<br>Right Button-“Y”Button<br>  | L2 Button<br>Right Button-“Y”Button<br>  |  | When the robot dog is standing in Sport mode, press L2 and then Y and the robot rolls 360° to the right.After rolling, the robot is in the supine state and the joints are in the high-damping state. Hold down the L2 key and press the single right button-a button to perform semi-squat and standing movements successively. Press START to release the joint locking state and enter the normal operation mode.<br>Note:Do not use this function after configuring lidar, otherwise the lidar or robot will be damaged. |
| 15 | L2 Button<br>Right Button-“A”Button<br>  | L2 Button<br>Right Button-“A”Button<br>  |  | When the robot dog is standing in Sport mode, after holding down the L2 key and repeatedly clicking the right button-A button, the robot joint will be locked . When the robot in half squatting state, the joint will be locked, and robot can manually raised from one place to another place.<br>Note: Press the L2+A button only when the robot is in a static standing position. Do not press the L2+A button while walking, otherwise the robot will fall and be damaged. |
| 16 | L2 Button<br>  | L2 Button<br>  |  | After holding down the L2 key and single-clicking the B key, the robot will enter the zero torque mode (in this mode, the remote control can be used to calibrate the joint zero point; in this mode, the remote control L1+B can be used to calibrate the IMU installation error) |

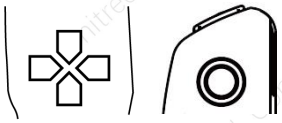
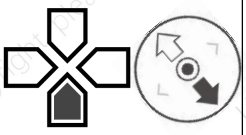
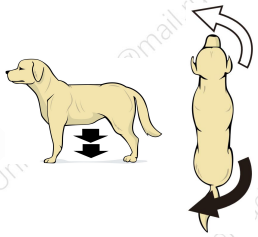
| 3.Basic Action under “Sport mode” (walking) | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 17 | START Key<br>  | START Key<br>  |  | **When the robot dog is in Sport mode,** the START button is used to switch between the two states of the robot in step and stationary.<br>Press the START button to turn on the step function and the robot enters the W mode. Press the START button again and the robot switches to the static standing state. |
| 18 | Left Button<br>  | Left Button<br>  |  | The left button is used to correct the phenomenon that the robot IMU drifts heavily.<br>**In the Sport mode (turning on the local step function), there is no joystick operation, and if there is a left or right drift when the robot is stepping on the ground, the IMU needs to be corrected**. If the robot drifts to the right (left), press the left (right) button once, and observe the IMU correction after 3 seconds. If it is still drifting, continue to repeat until the drift is not obvious (the reaction time of the button takes 3 seconds) |
| 19 | Left Stick<br>  | Left Stick<br>  |  | The left Stick is used to control the forward and backward movement of the robot.<br>**In Sport mode**, Push stick up, the robot moves forward. Push stick down, the robot moves backward. When in the middle position, the robot walks at zero speed and steps on the ground.<br>The more the stick is pushed away from the center position, the faster the robot will move. **(please push the Stick slowly to prevent the robot from suddenly moving forward or backward)**. |
| 20 | Left Stick<br>  | Left Stick<br>  |  | The left Stick is used to control the robot to circle in the in-situ state.<br>**In Sport mode**, push stick to left, the robot steps back and turns counterclockwise. Push stick to right and the robot steps back and turns clockwise. When in the middle position, the rotational angular velocity of the robot is zero and the robot is stepping on the ground.<br>The more the stick is pushed away from the center position, the faster the robot will rotate.. |
| 21 | Right Stick<br>  | Right Stick<br>  |  | The right Stick is used to control the robot's lateral movement.<br>**In Sport mode**, push stick to left, the robot moves to the left. push stick to the right, the robot moves to the right. When in the middle position, the speed is zero and the robot is in place.<br>The more the stick is pushed away from the center position, the faster the robot will move. |

| 4.Combined Action and Special Action under “Sport Mode” (walking) | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 21 | Left Stick  | Left Stick  |  | The left Stick is used to control the arc (circle) of the robot.<br>In Sport mode, push stick in the upper right direction, the robot will go to the right front arc. If you hold on the direction of stick, the robot will go forward and circle clockwise. Push stick to the lower left, the robot will take the arc to the right. If hold on, the robot will retreat and move counterclockwise. The angle between the Stick and the horizontal line corresponds to the walking radius of the robot. The larger the angle, the larger the radius. |
| 22 | Left Stick  | Left Stick  |  | The left Stick is used to control the arc (circle) of the robot.<br>In Sport mode, push stick to the upper left direction, robot will take the arc to the left front. If hold on, the robot will go forward and rotate counterclockwise. Push Stick to the lower right, the robot will take the arc to the left. If hold on, the robot will retreat and move clockwise. The angle between the Stick and the horizontal line corresponds to the walking radius of the robot. The larger the angle, the larger the radius. |
| 24 | L1 Key Left Button  | L1 Key Left Button   |  | The L1 button is used in conjunction with the left button to change the height of the robot's leg.<br>In the Sport mode, after pressing the L1 button, the up button of the left button is clicked, and the robot raises the leg height. After holding down the L key, jog the left button down button, the height of the robot lift leg is lowered. Each change in height changes by 1 cm. The robot's initial leg height is 5cm, and the leg height can be changed to 4-8cm.<br>Note: Increasing the height of the leg raises the landing speed of the foot end, the contact force between the foot end and the ground increases, and the step sound becomes larger, increasing the impact on the reducer and reducing the life of the reducer. No special circumstances, please set the height of the leg to 4-5cm. |

| 5.Basic Action Under “Sport Mode”(fast-running) | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 25 | L1 Button START Button   | L1 Button START Button   |  | In the sport mode (When the robot steps), after holding down the L2 key, click the START key once, the robot enters the fast running state. |
| 26 | Left Stick  | Left Stick  |  | The left stick is used to control the robot to move forward and backward. In the fast-running state, push the rod upward, and the robot runs forward. Pulling the lever down, the robot runs backward. In the neutral position, the robot jumps quickly in place. The amount of the joystick corresponds to the running speed. The greater the amount of the stick, the greater the running speed (please push and pull the lever slowly to prevent the robot from moving forward and backward suddenly). |
| 27 | Left Stick  | Left Stick  |  | The left Stick is used to control the robot to circle in the in-situ state. In the fast-running state, push stick to left, the robot steps back and turns counterclockwise. Push stick to right and the robot steps back and turns clockwise. When in the middle position, the rotational angular velocity of the robot is zero and the robot is trotting on the ground. The more the stick is pushed away from the center position, the faster the robot will rotate. |
| 28 | Right Stick  | Right Stick  |  | The right Stick is used to control the robot's lateral movement. In the fast-running state, push stick to left, the robot moves to the left. push stick to the right, the robot moves to the right. When in the middle position, the speed is zero and the robot is trotting on the ground. The more the stick is pushed away from the center position, the faster the robot will move. |
| 29 | Left Stick  | Left Stick  |  | The left Stick is used to control the arc (circle) of the robot. In the fast-running state, push stick in the upper right direction, the robot will go to the right front arc. If you hold on the direction of stick, the robot will go forward and circle clockwise. Push stick to the lower left, the robot will take the arc to the right. If hold on, the robot will retreat and move counterclockwise. The angle between the Stick and the horizontal line corresponds to the walking radius of the robot. The larger the angle, the larger the radius. |
| 30 | Left Stick  | Left Stick  |  | The left Stick is used to control the arc (circle) of the robot. In the fast-running state, push stick to the upper left direction, robot will take the arc to the left front. If hold on, the robot will go forward and rotate counterclockwise. Push Stick to the lower right, the robot will take the arc to the left. If hold on, the robot will retreat and move clockwise. The angle between the Stick and the horizontal line corresponds to the walking radius of the robot. The larger the angle, the larger the radius. |

| 6.Basic Action Under “SLAM Mode” | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 31 | L1 Button+L2 Button<br>START Button<br>  | L1 Button+L2 Button<br>START Button<br>  |  | **In the Sport mode,** after holding down the L2 key, single-click the B key to enter the noiseless damping mode; hold down the L1 and L2 keys at the same time, single-click the START key; then press the L2 key, single-point B key twice, single-point A key twice enter SLAM mode.<br>For operations in SLAM mode, refer to the APP section. |
| 32 | Right Button – “A” Button<br>  | Right Button-“A”Button<br>  |  | **In the SLAM mode**, A button is used to turn on/off the climbing mode (terrain following mode)<br>Press the A button to turn on the climbing mode. In the W mode, you can manipulate the robot to climb.<br>**Note: rated forward climbing angle is less than or equal to 22°.** |

| 7.Actions that are not recommended under “Sport” and “SLAM” mode | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 33 | Left Button  | Left Button  |  | The left button is used to control the body lift and squat when stepping. In Sport and SLAM mode, press the up button, the robot body will lift up. Press the down button, the robot body will squat. Note 1: This action is not recommended. Note 2: Please refer to Table 6 for other precautions. |
| 34 | Left Button Left Stick  | Left Button Left Stick  |  | Left button and left Stick linkage is used to control the robot crept forward and backward. In Sport and SLAM mode, press the down button, the robot body will squat. Push stick up, the robot crept forward. Push stick down, the robot crept backrward. Note 1: This action is not recommended. Note 2: Please refer to Table 6 for other precautions. |
| 35 | Left button Right Stick  | Left Button Right Stick  |  | Left button and right Stick linkage is used to control the robot crept to the left and right. In Sport and SLAM mode,, press the down button, the robot will squat. Psuh stick to left, the robot crept and moves to the left. Psuh stick to right, the robot crept and moves to the right. Note 1: This action is not recommended. Note 2: Please refer to Table 6 for other precautions. |
| 36 | Left Button Left Stick  | Left Button Left Stick  |  | Left button and Left Stick linkage is used to control the robot crept to turn counterclockwise and clockwise. In Sport and SLAM mode,, press the down button, the robot will squat. Push stick to left, the robot crept and turns counterclockwise. Push stick to right, the robot crept and turns clockwise. Note 1: This action is not recommended. Note 2: Please refer to Table 6 for other precautions. |
| 37 | Left Button Left Stick  | Left Button Left Stick  |  | Left button and left Stick linkage is used to control the robot crept to walk arc (circle) In Sport and SLAM mode, press the down button, the robot will squat. Push stick in the upper right direction, and the robot will squat down to the right front. If the Stick is kept, the robot will kneel forward and circle clockwise. Push stick in the lower left direction, and the robot will squat down to the right rear. If the Stick is kept, the robot will squat back and move counterclockwise. Note 1: This action is not recommended. Note 2: Please refer to Table 6 for other precautions. |

| 7.Actions that are not recommended under “W” and “Sport ” mode | | | | |
|---|---|---|---|---|
| NO | The Position of Stick or Button on Joystick | Operation Diagram | Robot Schematic | Remarks |
| 38 | Left Button Left Stick  | Left Button Left Stick  |  | Left button and left Stick linkage is used to control the robot crept to walk arc (circle)<br>In W and Sport mode, press the down button, robot will squat. Push stick in the upper left direction, and the robot will squat down the arc in front of the left front. If the Stick is kept, the robot will kneel forward and move counterclockwise. Push stick in the lower right direction, and the robot will squat down the right rear. If the Stick is kept, the robot will squat back and move clockwise.<br>Note 1: This action is not recommended. Note 2: Please refer to Table 6 for other precautions. |

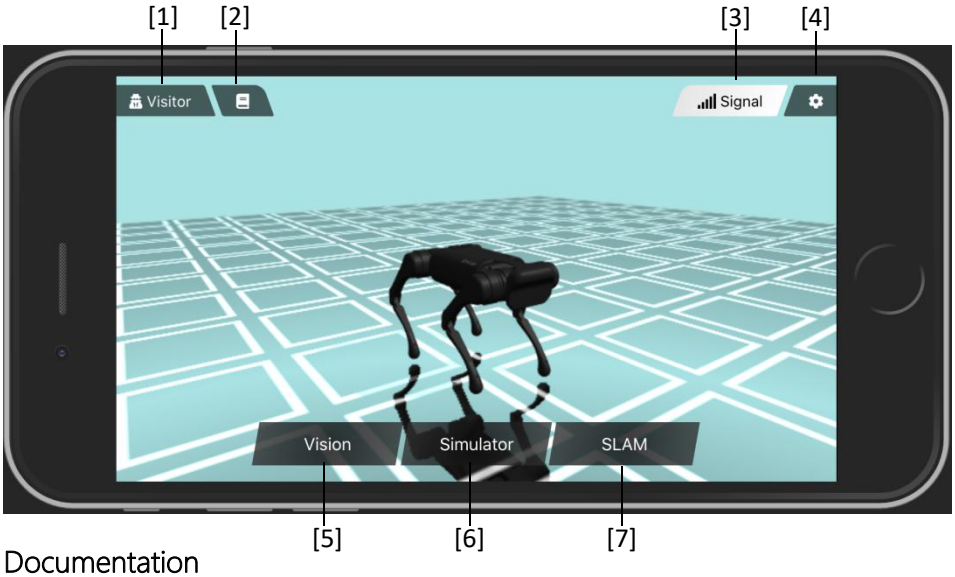
# 6. APP

## APP Interface Introduction

UnitreeRobotics is an application tailored for quadruped robots of Unitree. Use of Android and IOS system platforms; It supports touch screen and special joysticks, this section takes UnitreeRobotics APP as an example to explain, the specific interface is subject to the corresponding platform display.

APP download link: http://www.unitree.cc/e/action/ShowInfo.php?classid=6&id=370

UnitreeRobotics APP home page




[1] Visitor

[2] Documentation

[3] Connection

[4] Select

[5] Vision

[6] Simulator

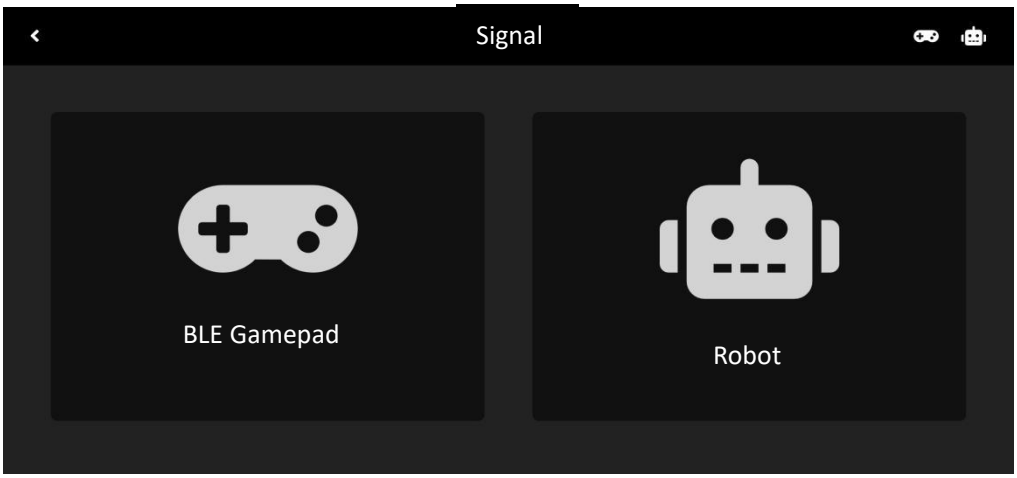
[7] SLAM

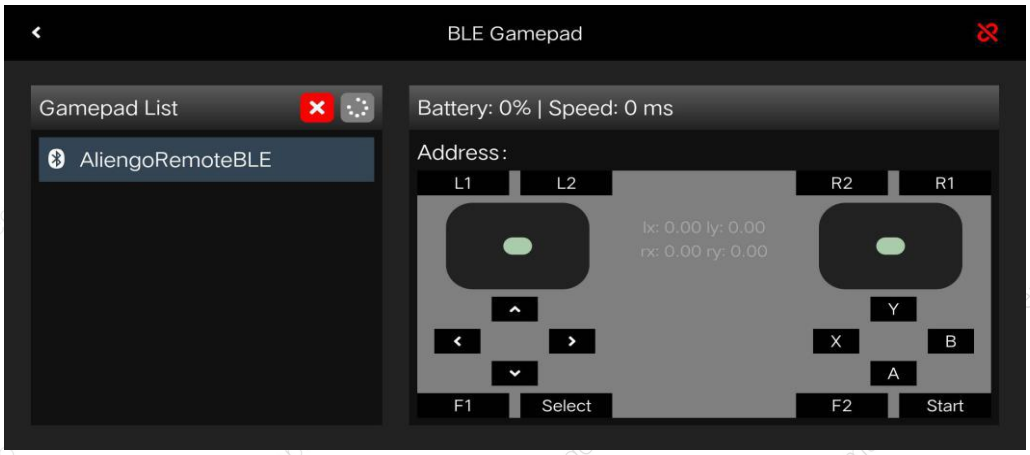
### Documentation

Click to view the robot user manual and other documents.

### Connect

Check the connection status of the phone with the Bluetooth controller or robot. Operate the joystick when the connection is successful, The keys and joystick on the Bluetooth controller interface will be synchronized.

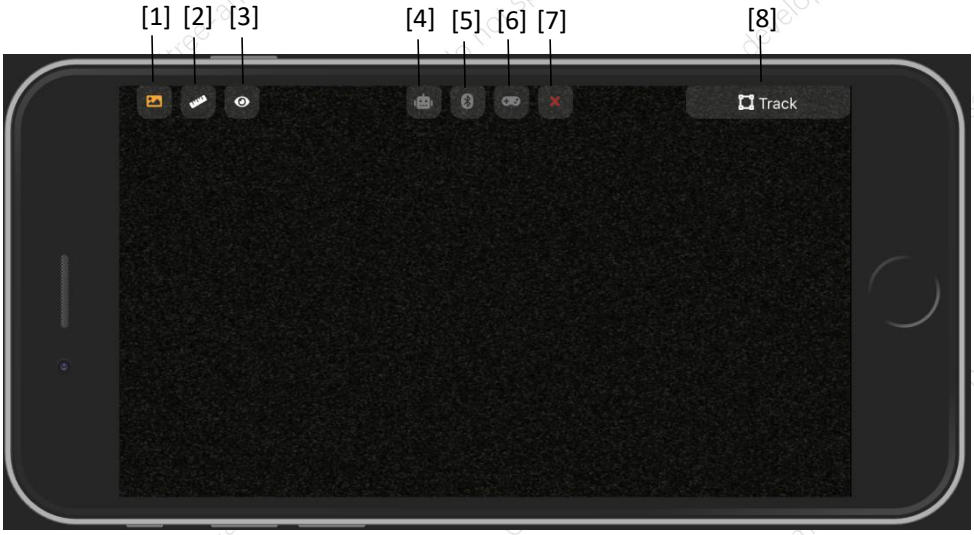





## Vision

Click the machine vision button to enter the following operation interface:

Image mode shows the robot perspective; depth mode shows the distance between the object and the robot, the closer the distance, the darker the color.




[1] Image mode

[2] Depth mode

[3] Body recognition

[4] Robot

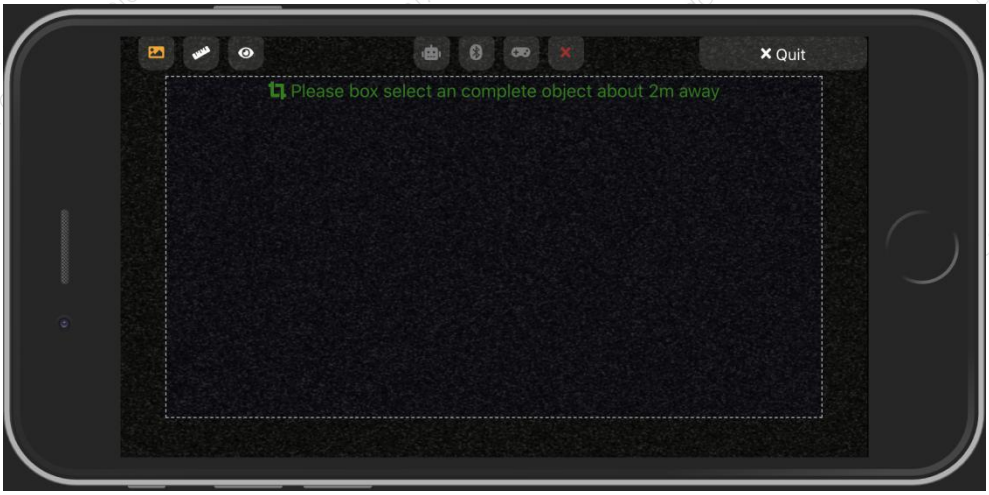
[5] Bluetooth

[6] Handle operation

[7] Exit

[8] Track

When the robot is in motion mode, click on the open tracking button to enter the character tracking interface, select the person to be tracked in the image, and the robot will follow automatically. Do not track missions in scenes with complex terrain or many obstacles.

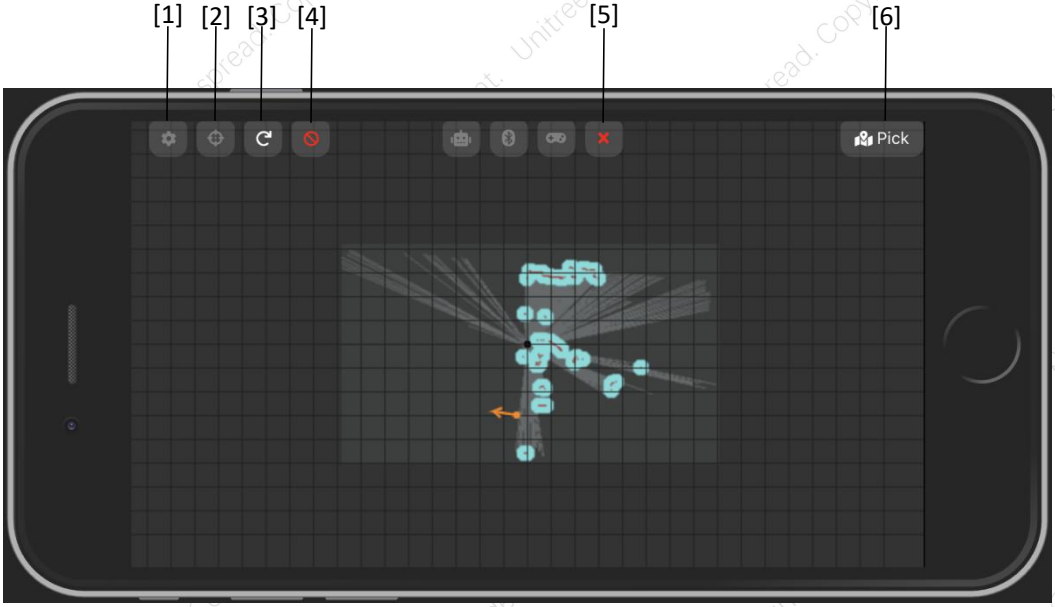


## Simulator

Click to enter the simulation operation interface. When the robot is not connected, you can learn the handle keys and functions through simulation control. For operation, refer to "Remote Control Module-Handle Operation". The simulator only supports basic actions, and combined actions are still being improved.


## SLAM

When the robot is in W mode, click to enter SLAM.




[1] Select

[2] Update the map centered on the robot

[3] Refresh the live map

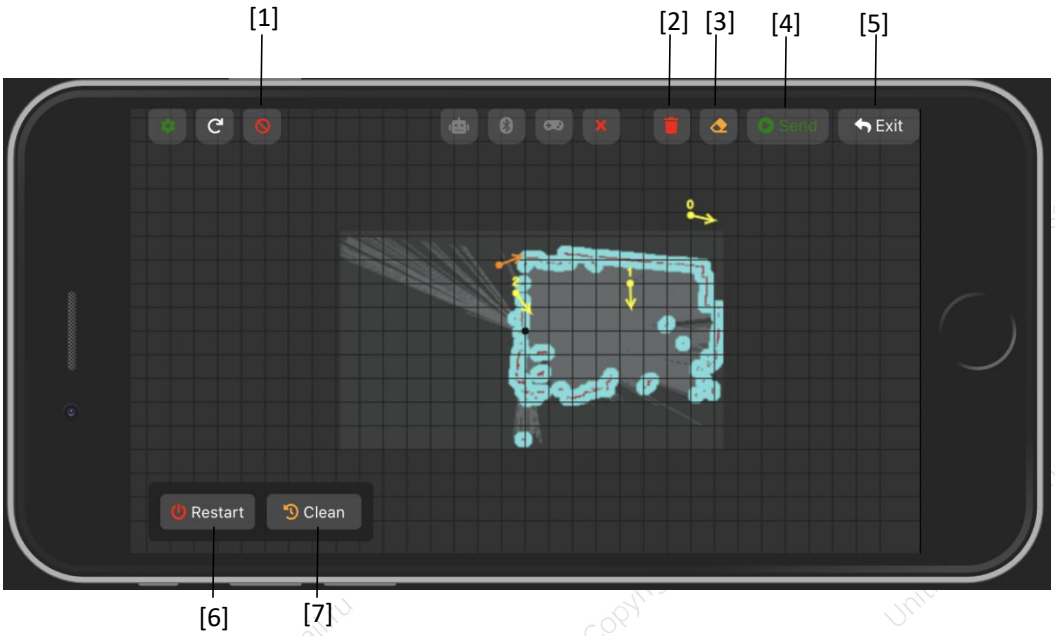
[4] Stop robot

[5] Exit

[6] Pick

Click to select the point and enter the following interface:

The map is updated in real time according to the radar data of the robot. You can select any point on the map and send the information to the robot after confirmation. The robot will autonomously navigate to the destination, avoid obstacles autonomously, and select the optimal path.




[1] Stop robot

[2] Clear all points

[3] Clear a single point

[4] Send selected information to the robot

[5] Exit

[6] Restart SLAM

[7] Clear all points

note:

1. When there are obstacles around the robot, please clear the obstacles before setting the target point, otherwise you cannot navigate;

2. Wait for the robot posture to appear on the screen of the mobile phone and then set the target point after starting up, otherwise the robot cannot receive the command;

3. When operating in a place with many people (dynamic obstacles), please ensure that the set target point is a passable area.

4. If you encounter other unexpected situations, you can press the stop button to stop the robot. To resume operation, click the restart button on the phone screen.

# A1