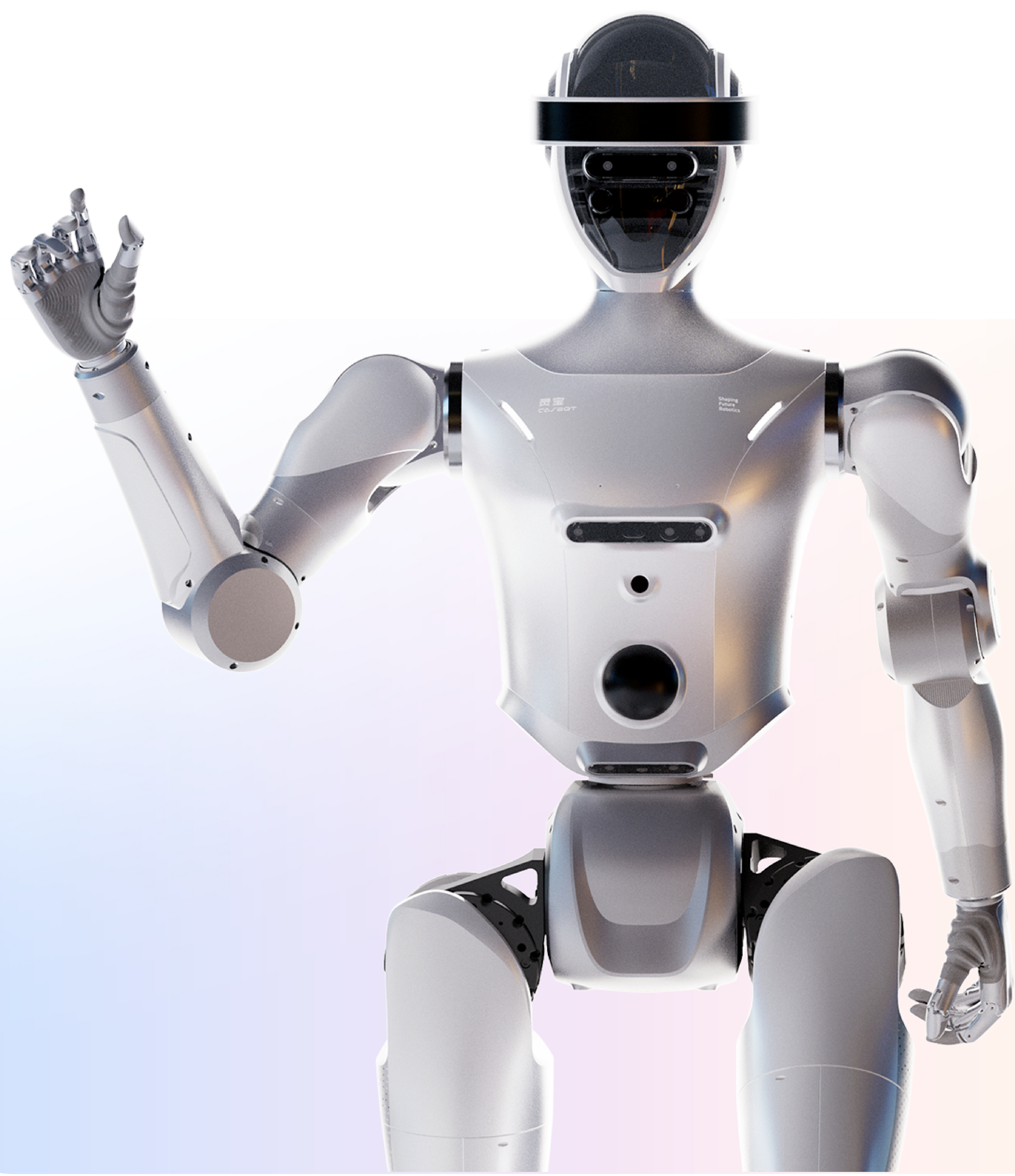
CASBOT 02

Product Manual



Beijing Zhongke Huiling Robot Technology Co., LTD

Room B103, F/1, Building B-2, Zhongguancun Dongsheng Technology Park Northern Territory, No.66 Xixiaokou Road, Haidian District, Beijing, China

TABLE OF CONTENTS

Beijing Zhongke Huiling Robot Technology Co., LTD
Room B103, F/1, Building B-2, Zhongguancun Dongsheng Technology Park Northern Territory, No.66 Xixiaokou Road, Haidian District, Beijing, China

1. Disclaimer

Prerequisites and Consent Statement:

Before using this product, please read and follow the user manual. Use of this product constitutes your acknowledgment that you have read and agreed to this statement and its related terms.

Liability for Improper Use:

The company shall not be liable for any property damage, personal injury, or safety hazards resulting from failure to use the product in accordance with the manual. Users shall bear all related consequences.

Legal Use and Warranty Invalidation Agreement:

The user pledges to use the product solely for lawful purposes, strictly adhering to local laws, regulations, and our company's relevant policies and guidelines. The product must not be used to harm or intimidate others or animals, nor as a weapon or in conjunction with weapons. **Any violation of the above provisions will automatically invalidate the product warranty, and the user will no longer be entitled to repair, upgrade, or replacement services.**

Scope of Product Warranty:

To the extent permitted by law, the Company makes no express or implied warranties regarding the product, including but not limited to fitness for a particular purpose or non-infringement. **The Company does not guarantee that the provided product/service is entirely defect-free, fully meets customer requirements, or that existing defects can be completely repaired.**

Limitation of Liability and Damages:

The Company shall not be liable for any damages arising from failure to use the product in accordance with the manual, nor shall it be liable for indirect, consequential, punitive, or other special damages. The Company's total liability for all damages, losses, and legal claims against the user shall not exceed the amount paid by the user for the purchased product.

Disclaimer Regarding Manual vs. Product Differences:

Manual content, colors, and appearance may differ from the actual product; the actual product shall prevail. The manual may be updated periodically without prior notice.

Interpretation and Modification Rights:

The Company reserves the final right to interpret the terms of this statement and shall comply with applicable laws and regulations. The Company also reserves the right to update, modify, or terminate the terms of this statement without prior notice.

2. Safety Precautions

Reading Instructions:

Before using this product, please carefully read the product manual to fully understand its functions, operating methods, and safety precautions.

Environmental Requirements:

Use this product in a suitable environment, avoiding operation in excessively high or low temperatures or humid conditions.

Usage Specifications

- After powering on the robot, keep it within your line of sight and maintain a safe distance of 1 meter from people. Do not touch the robot with your hands. During operation, someone must hold the emergency stop remote control to enable emergency braking and restarting in case of equipment failure.
- When the robot is moving, keep the surrounding area clear or use a safety tether to prevent accidental tripping that could cause the robot to fall and damage objects or injure people.
- After powering on, if the robot will be idle for an extended period, promptly hang it on the protective frame.
- When moving the robot, use the protective frame. Do not carry it directly by hand, especially near the joints, as they may pinch fingers.

Power Safety

When the battery indicates low power, promptly shut down the device and replace the battery. In case of short circuits, overheating, or other abnormalities, immediately disconnect the power supply.

Regular Maintenance:

Conduct periodic maintenance and inspections to ensure motors, power supplies, and other components operate normally, preventing safety hazards caused by aging or damaged parts.

Proper Usage:

Strictly prohibit using this product in improper, hazardous, or legally prohibited scenarios.

Special Note:

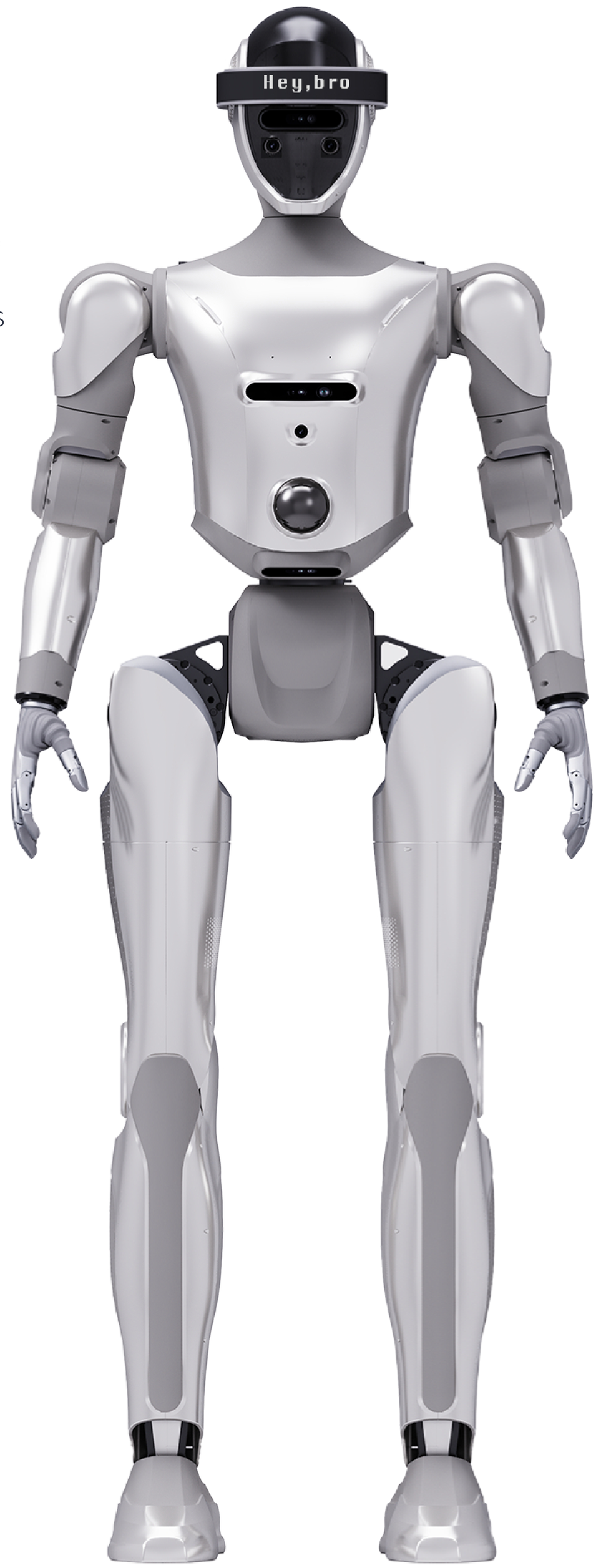
When battery level drops below 20%, continued operation carries a risk of loss of control. Switch the robot to standby mode and lift it using the safety frame.

3. Product Introduction

3.1 Product Overview

3.1.1 Product Introduction

CASBOT02 is a compact and agile humanoid robot offering exceptional value for its price. Standing approximately 163cm tall and weighing about 50kg, it possesses seamless locomotion capabilities, including walking, and can adapt flexibly to varying ground conditions.



3.1.2 Product Features

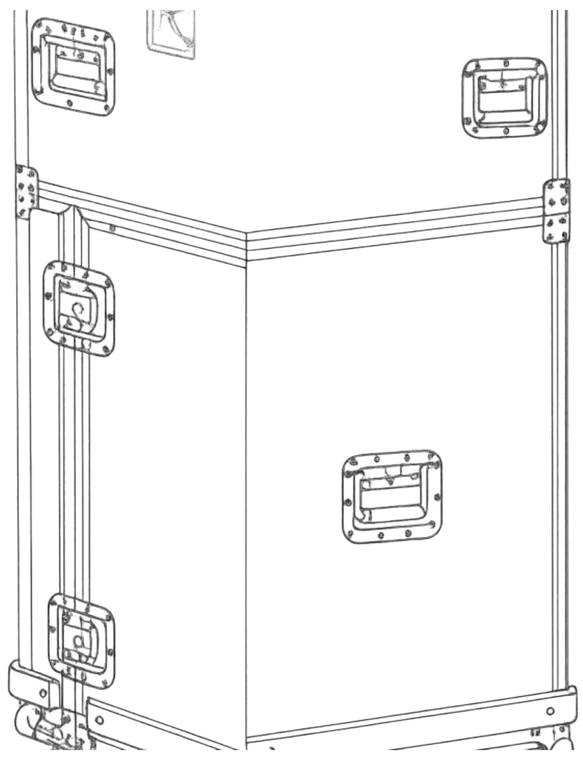
Motion Control Capabilities

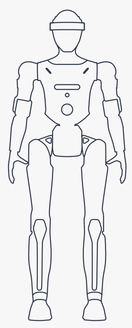
Achieves stable self-balancing, walking, and turning abilities across various terrain conditions.

Human-Machine Interaction Capabilities

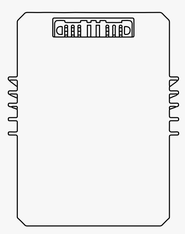
Supports multi-modal interaction functions including voice and gestures, enabling natural and fluid human-machine interaction.

3.2 Packing List

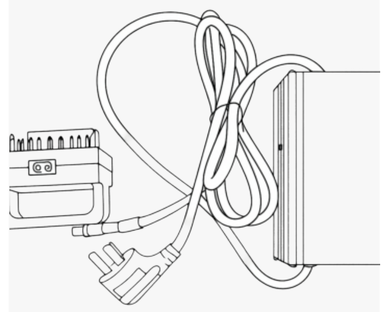




Entity x1

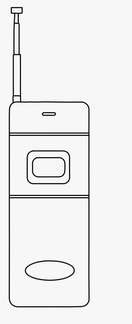


Battery x1
Optional X2

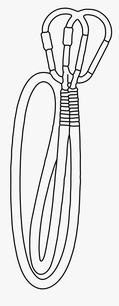


Charger x1

Remote control x1
Logitech F710



Wireless Emergency Stop x1



Safety rope x1

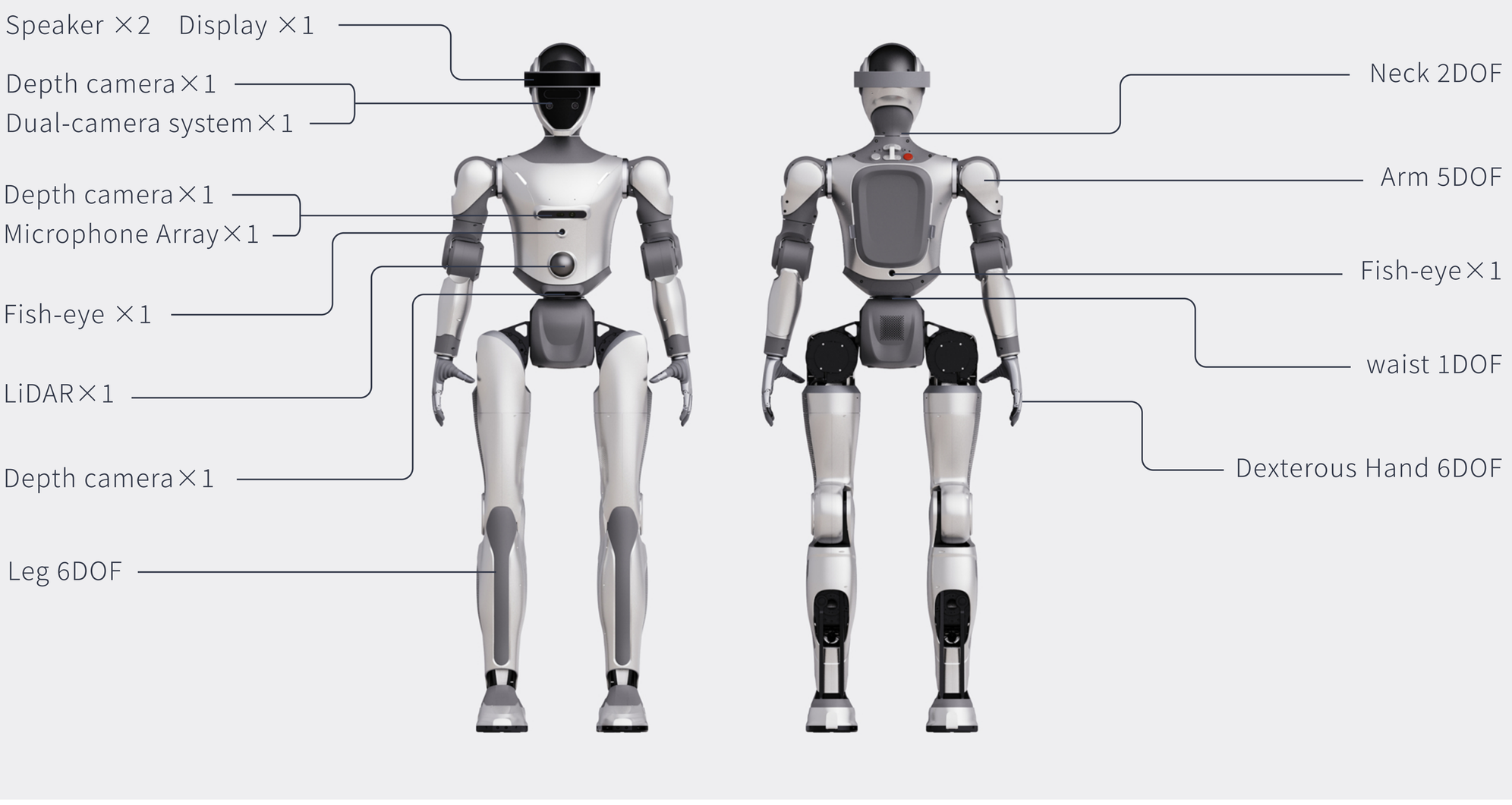
Packing List

Packing List x1

Warranty Card

Warranty Card x1

3.3 Component Description



4. Product Specifications

Category	Item	Standard Edition	EDU Edition
Basic Parameters	Height, width, depth (standing)	1630*510*280mm	1630*510*280mm
	Total weight (with battery)	≈ 50kg	≈ 52 kg
	Full-body degrees of freedom (excluding dexterous hands)	25DoF	25DoF
	Head Degrees of Freedom	2DoF	2DoF
	Single Arm Degrees of Freedom	5DoF	5DoF
	Waist Degrees of Freedom	1DoF	1DoF
	Single Leg Degrees of Freedom	6DoF	6DoF
	Dexterous Hand	11DoF (6 degrees of active freedom)	11DoF (6 degrees of active freedom)
	Single-arm load	1.5kg	1.5kg
	Maximum joint torque	150N.m	150N.m
	pace	1m/s	1m/s
Electrical Parameters	Battery Specifications	48V 10Ah	48V 10Ah
	Combined Range	约1.5h	约1.5h
	Computing Power	275TOPS	275TOPS
	RCU	Orin AGX	Orin AGX
	HRU	Rk3588	Rk3588
	Communications	WiFi 6/4G/Bluetooth 5.2	WiFi 6/4G/Bluetooth 5.2
	Heat Dissipation System	Air-cooled heat dissipation	Air-cooled heat dissipation
	Work Environment	Temperature: 5–40°C Humidity: 25%–85% (non-condensing)	Temperature: 5–40°C Humidity: 25%–85% (non-condensing)
Configuration Parameters	Microphone Array and Speaker	1	1
	LiDAR	/	1
	IMU Sensor	1	1
	RGBD Camera	1	3
	Stereo Camera	1	1
	Fisheye Lens	2	2
	Navigation ADU	/	Support
	Wireless Charging	/	Support
	Teleoperation Kit (Includes VR Equipment)	Optional	Optional
	Control Methods	Handle/Remote Control/App	Handle/Remote Control/App
Accessory Specifications	Battery	Ternary Lithium Battery (1 included as standard equipment; available for separate purchase)	Ternary Lithium Battery (1 included as standard equipment; available for separate purchase)
	Charger	1	1
	Remote control	1 controller (Optional for tablet)	1 controller + 1 tablet
	Wireless Emergency Stop	1	1
	Safety rope	1	1
	Rings	2	2
	Electronic Products Manual	1	1
	Packing List	1	1
Others	OTA	Support	Support
	Secondary Development	/	Support
	Appearance Customization	/	Support
	Standard Features	Pre-set basic action library, operated via controller	Universal Secondary Development and Teaching Suite
	Warranty Period	6 months	6 months

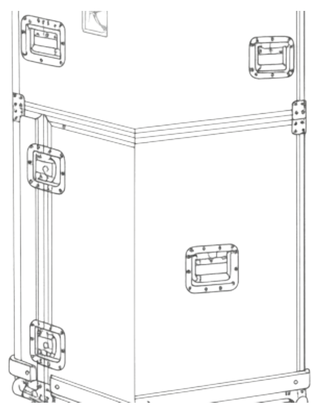
5. Key Features Overview

Category	Item	Description
Motion Control	Full-body movement	Stand still	Capable of maintaining stable, independent standing with a certain degree of resistance to external disturbances.
		Walking on level ground	Maximum speed: 2 m/s Gait support: Straight-knee Direction support: Forward/backward, left/right turns
	Upper body movements	Like	Raise both hands and forearms, thumbs pointing upward
		Wave	Raise right arm and forearm, swing forearm side to side while rotating waist in sync
		Heart	Form a heart shape with both hands in front of chest
		Congrats	Left hand above, right hand below, clasp fists in front of chest
		Peace sign/Yay	Raise both arms, bring hands to face, make scissors hand gesture
Human-computer interaction	Perception Capabilities	Voice pickup	Microphone array with voice control support
		ASR	ASR support in quiet environments
	Execution Capabilities	Audio Playback	Dual full-range speakers
		Audio Synthesis	TTS support with multiple voice options
		Lighting Effects Control	Equipped with 2 LED light strips
		Screen Display	LED display capable of showing simple characters and emojis
		Multimodal Interaction	Capable of simultaneously utilizing voice, emojis, and actions for multimodal expression
	Interactive Services	Voice Dialogue	Supports wake-up without a keyword, enables continuous conversation with a default limit of 20 rounds
		Self-Introduction	Performs self-introductions with synchronized gestures and facial expressions during voice playback
		Handshake	Supports voice and remote control activation of handshake function, featuring visual recognition of handshake motions
		Rock-Paper-Scissors Game	Capable of playing rock-paper-scissors with humans and visually determining the outcome
Operational capability		Teleoperation	Movement of the head, arm, and hand based on the remote control device
Others		Remote control	The robot can be controlled via remote control for actions such as initialization.

6. User Manual

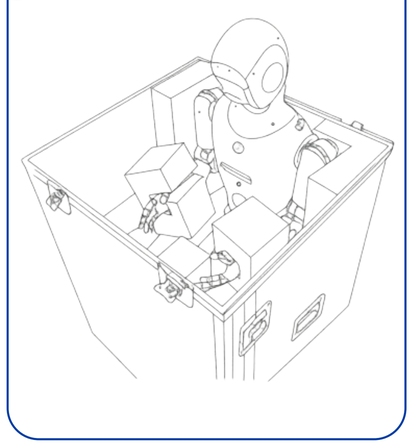
6.1 Unboxing and Initialization

1



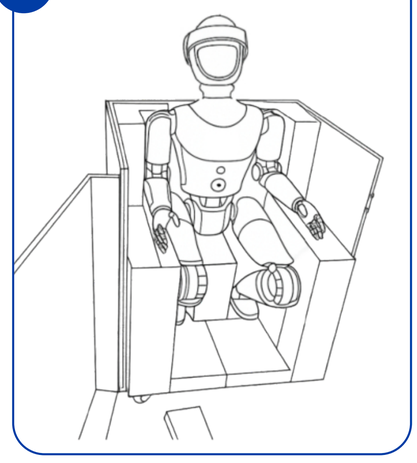
Remove the top cover of the packaging box

2



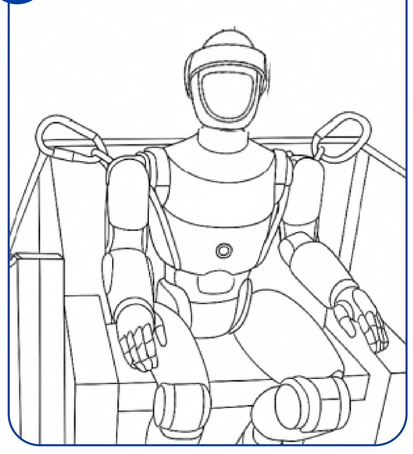
Open the front door of the packaging box

3



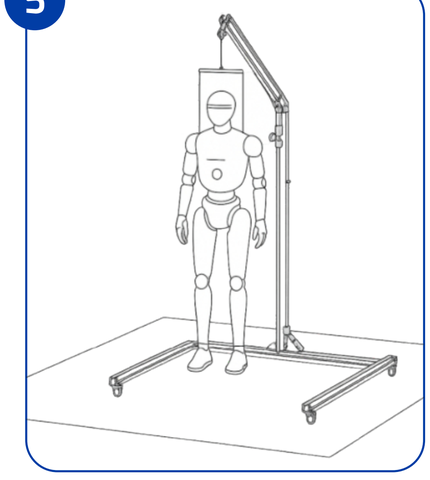
Remove the protective device

4



Install the lifting ring

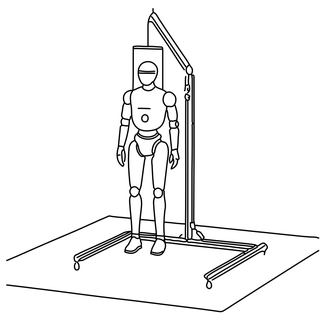
5



Use the lifting frame to suspend the robot, keeping its feet 5-10 cm off the ground

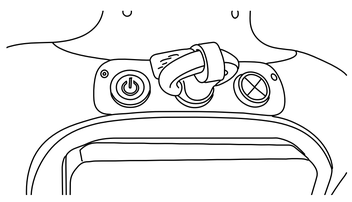
6.2 Power-On and Power-Off Procedures

Power-on Procedure



1. Startup Requirements:
Place the robot on the stand
(with feet 5-10 cm off the ground).
Power on the robot
(battery must be installed).

2. Press the power button to turn on the device.
There are two switches on the back.
The left switch is the power button.
Press and hold the power button for
3 seconds to turn on the device.
After powering on, the power indicator
will glow red, and the robot's headset
and light strip will illuminate.
Wait approximately 1 minute.
Once powered on, the robot will
enter zero-position mode.



3. Activate the remote controller (press and hold LB + RB)

4. Enter preparation mode via remote controller (press and hold LB + click B)

5. Robot lands and stands upright (lowering the gantry)

6. Enter motion mode via remote controller (press and hold LB + click X)

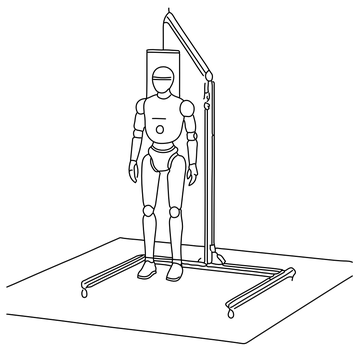
7. Control the robot's movement or actions according to the remote controller operation manual

Power-off Procedure

1. In motion mode, hang the robot on the gantry and raise it until the cable is slightly taut.

2. Use the remote control to enter preparation mode (long press LB + single press B).

3. Raise the gantry until the robot's feet are 5-10 cm off the ground.



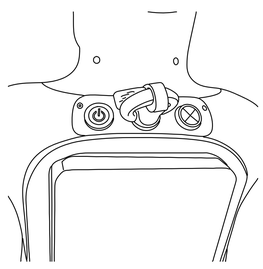
4. Remote control operation to enter damping mode (Long press LB + Single click A)

5. Power button shutdown:
Short press while powered on: System shuts down,
joints power off.Long press for 5 seconds:
Battery output is disabled, power indicator light turns off.

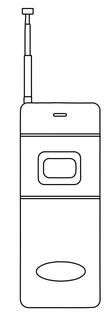
Note: Ensure the robot is in the ready state before lifting.
Lifting it while it is not in the ready state may injure nearby personnel

Emergency Stop Instructions

1. The right switch on the robot's back is the emergency stop switch, which controls the power supply to the joints. When pressed, it disconnects the power; when released, it reconnects it.



2. The wireless emergency stop remote functions identically to the emergency stop switch on the robot's back, enabling operators to activate the emergency stop when the robot malfunctions and they cannot reach the back switch in time.



6.3 Model Description

Mode Name	Mode Description	Control Method and Features
Zero Position Mode	Position all lower limb joints to zero, while setting specific initial postures for upper limb joints to prevent upper-lower limb interference.	Employing PD control ensures smooth transitions of joints to target positions
Preparation Mode	Maintain standard standing posture for lower limb joints as the robot's initial state upon landing, providing a stable starting point for reinforcement learning.	Achieved through PD control to guarantee stable posture
Motion Mode	Enter reinforcement learning-based control mode to execute motion strategies.	Implementing motion control based on reinforcement learning algorithms
Damping Mode	Set KP to zero, retaining only KD control for abnormal scenarios or slow force release to reduce joint damage risk.	Realizing safe force unloading via damping control

6.4 Lighting and Headset Instructions

The chest light on the CASBOT device can indicate the robot's different operational states.

Indicator Light Status	Meaning and Description
Blue light breathing display	The machine is in the startup process
White light breathing display, with CASBOT02 (white) displayed in the center of the headset	Robot status is normal, battery remaining charge (>20%)
Orange light breathing display	Battery remaining charge 0%-20%
Red light flashes once per second	Device malfunction

6.5 Remote Control Button Layout

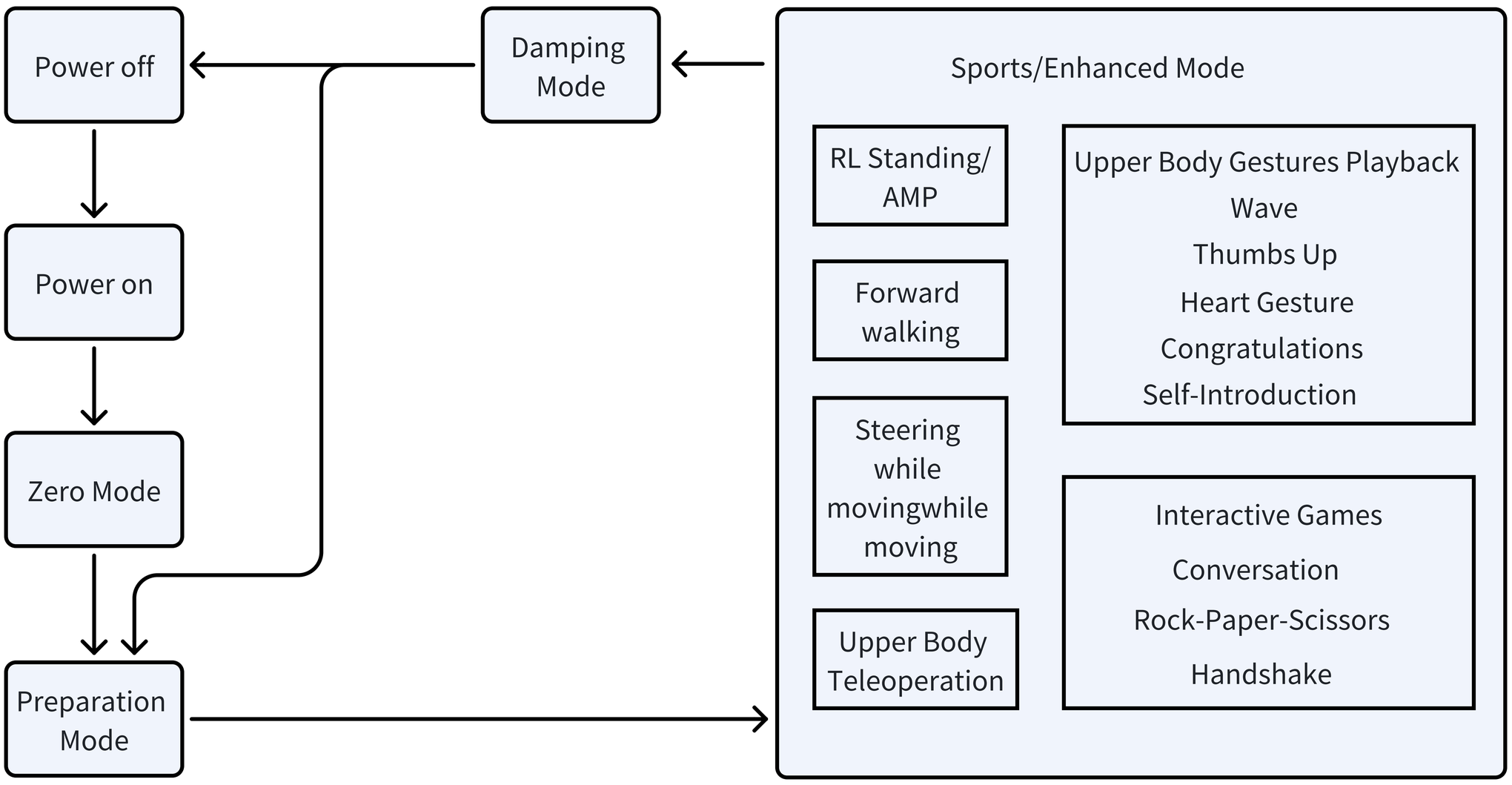
category	Mode/Function/Action	Key	Remarks
Mode Switching	Zero Position Mode	Default at startup	
	Preparation Mode	Long press LB + Click B	
	Motion Mode	Long press LB + Click X	
	Damping Mode	Long press LB + Click A	
Interactive Features	Start voice chat	Long press LT + Click A	
	Stop voice chat	Long press LT + Click Y	
	Self-introduction	Long press → + Double-click B	
	Rock-paper-scissors game	Long press LT + Click B	
	Handshake	Long press LT + Click X	
	Pause action playback	Long press LT + Double-click A	
Motor function	Stand still	Long press LB + Click X	After entering exercise mode, the default position stands still.
	Walk forward	Left stick forward	
	Turn left (counterclockwise)	Right stick left	
	Turn right (clockwise)	Right stick right	
Basic Movements	Wave	Long press ← + Double-click A	
	Like	Long press ← + Double-click B	
	Heart	Long press ← + Double-click X	
	Peace sign	Long press ← + Double-click Y	
	Congratulations	Long press → + Double-click A	
Remote control operation	Turn on the remote control	Long press LB + RB	
	Turn off the remote control	Long pressLT + RT	

The remote control requires a 3-step setup process; otherwise, the robot's buttons will not respond:

1. Mode Adjustment: Locate the remote's mode switch button and set the mode to “X”;
2. Indicator Light Handling: Observe whether the remote indicator light is off. If it remains lit, press and hold the【MODE】button until the light completely turns off;
3. Device Restart: Power off the robot and restart it. The remote control will now pair correctly with the robot, and all buttons will function normally.

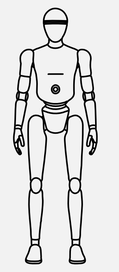
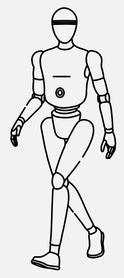
6.6 Key Features

6.6.1 Functional State Topology



6.6.2 Full-Body Movements

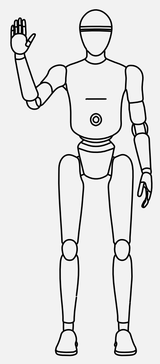
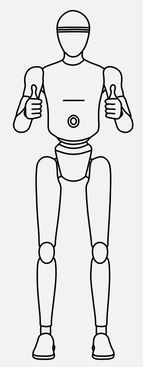
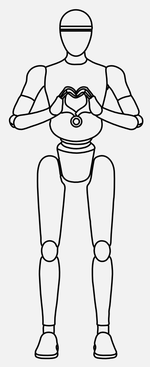
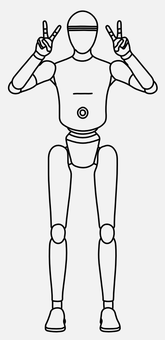
Before operating the robot into full-body motion, ensure the robot is in standby mode.

Action Name	Remote Control	Action Diagram
Stand still	1. Preparation Mode (Long press LB + Click B), requires operation while mounted on the bracket 2. Movement Mode (Long press LB + Click X), allows detachment from the bracket after entering Movement Mode (Detach from bracket)	
Walking on level ground	1. Preparation Mode (Long press LB + Click B) 2. Movement Mode (Long press LB + Click X) 3. Forward + Steering (Control with left/right joystick)	

6.6.3 Upper Body Movements/Gestures

Voice/Remote Control Triggers Upper Body Preset Actions: Wave, Thumbs Up, Heart Sign, Peace Sign, Congratulations

Prerequisites: Before initiating full-body actions, ensure the robot is in stationary mode within motion mode. For voice triggering, ensure voice interaction is enabled during operation.

Action Name	Example Trigger Command	Remote Control Button	Schematic Diagram	Remarks
Wave	"Wave your hand" "Wave to me" "Wave your hand" "Wave once"	Long press ← + Double-click A		Commands containing keywords like "wave," "shake hand," or "greet" will trigger the robot to raise its right hand and wave it left and right 2-3 times.
Like	"Give me a thumbs up "Give me a like" "Awesome, give me a thumbs up" "Do the thumbs-up gesture"	Long press ← + Double-click B		When the command explicitly mentions "thumbs up," the robot will raise its right thumb, hold it for 2 seconds, then retract it.
Heart	"Make a heart sign" "Give me a heart sign" "Do the heart sign gesture" "Give me a heart gesture"	Long press ← + Double-click X		Includes expressions like "heart gesture" or "love sign" to trigger the action. The robot will form a heart shape with the thumbs and index fingers of both hands, holding the pose for 3 seconds.
Peace sign	"Give me a peace sign" "Make a peace sign" "Give me a thumbs-up" "Peace sign"	Long press ← + Double-click Y		Includes phrases like "V sign" or "victory gesture" to trigger the action. The robot will raise its right hand to make a "V" sign, holding the pose for 2 seconds.
Congratulations	"Congratulations!" "Give me a congratulatory gesture." "Make a congratulatory hand sign." "Congratulate me."	Long press → + Double-click A		Includes the keyword "congratulations" to trigger the action. The robot will clasp its hands together at chest level and shake them up and down twice, mimicking a congratulatory gesture.

6.6.4 Human-Computer Interaction

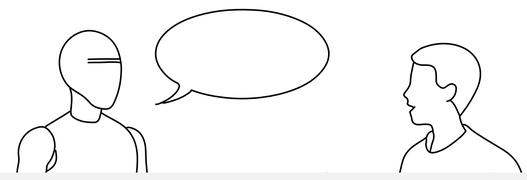
6.6.4.1 Voice Dialogue

Open multi-turn voice dialogue based on cloud/edge-side large language models.

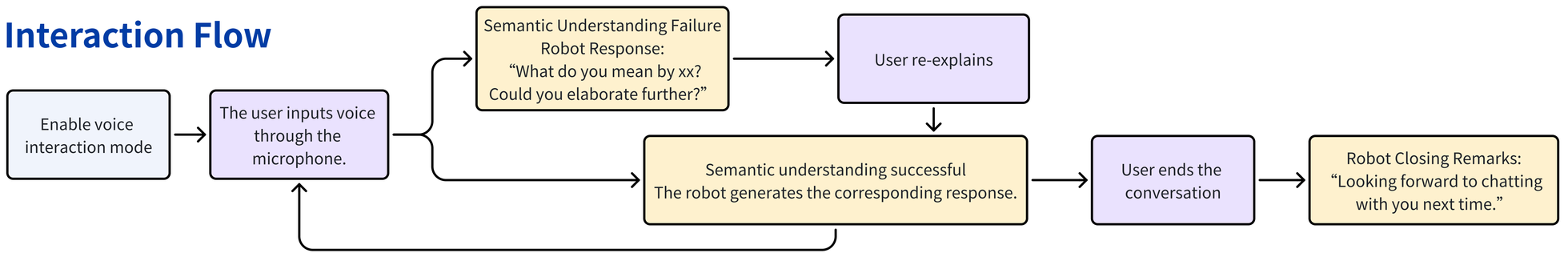
Access Method

Prerequisite: /
Remote control combination key: Long press LT + Click A

Function Overview



Interaction Flow



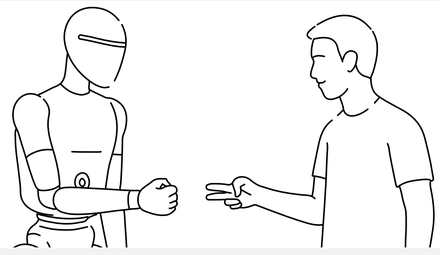
6.6.4.2 Rock-Paper-Scissors Game

Voice interaction triggers a rock-paper-scissors game. After both the robot and user make their moves, the robot uses visual recognition to determine the outcome and announces it via voice.

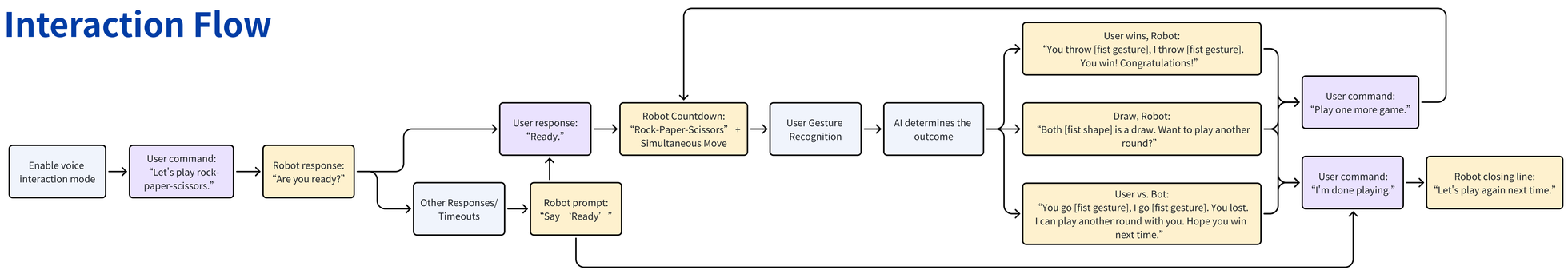
Access Method

Prerequisite: Robot is in conversation mode
Voice commands: “Let's play rock-paper-scissors,” “Let's play rock-paper-scissors”

Function Overview



Interaction Flow



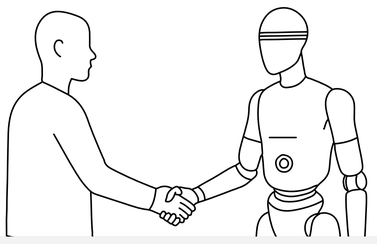
6.6.4.3 Handshake

When voice activation triggers the handshake action, the robot extends its right hand and waits for the user to shake hands. The robot then actively shakes its arm up and down three times before pausing. It waits for the user to release their hand and step back before retracting its arm.

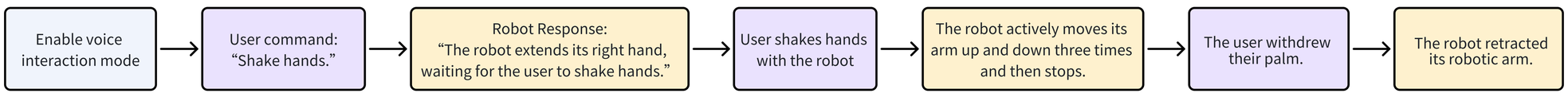
Access Method

Prerequisite: Robot is in dialogue mode
Voice commands: “Shake hands,” “Handshake”

Function Overview



Interaction Flow

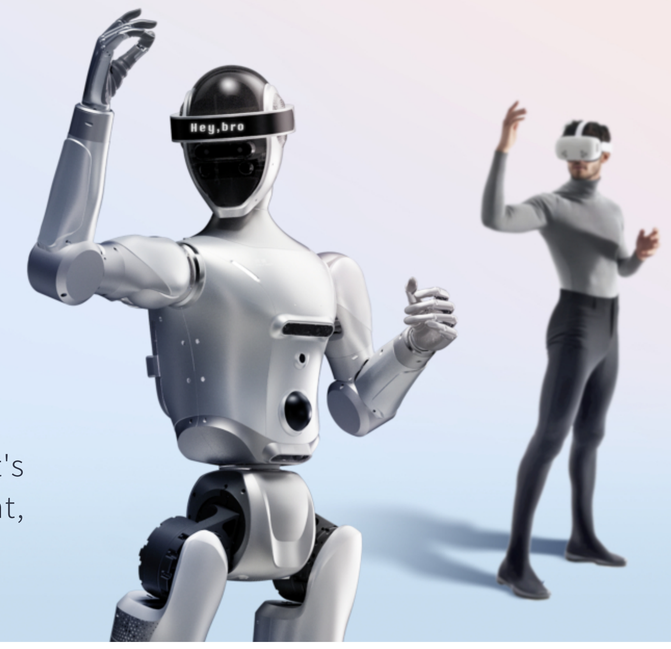


6.7 Remote Operation Instructions

Operation:

In motion mode, press the remote control button to enter upper body remote operation mode. Use VR to remotely control upper body movements (head/hands/arms).

Note: When entering and exiting VR, ensure the robot and remote operator are in their initial pose state. Upon entry, the operator's arm pose must match the robot's current pose. Significant pose discrepancies may cause excessive robot movement, potentially resulting in injury or equipment damage.



6.7.1 Remote Control Equipment List

Server

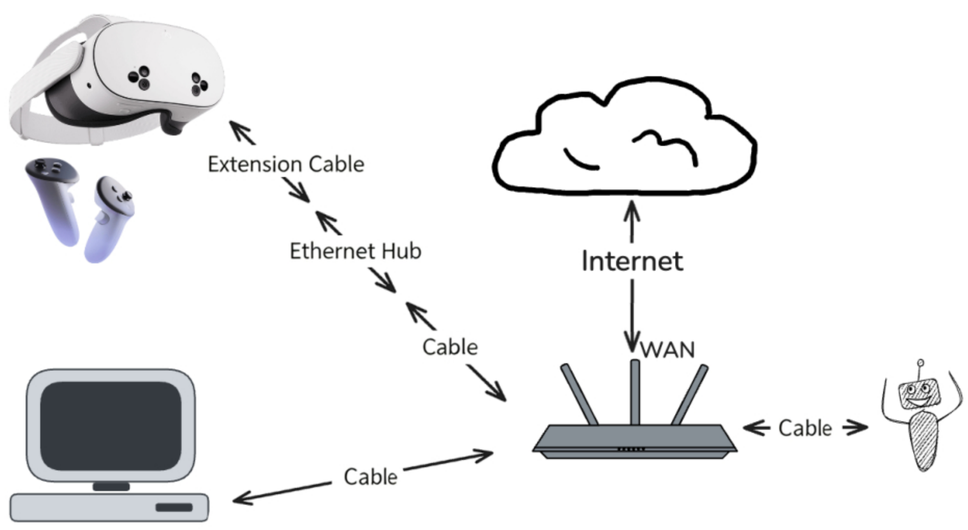
Quest 3S Headset

Quest 3S Controller

6.7.2 Equipment Connection Instructions

Wired solutions

- Disable the Wi-Fi connection on the Quest 3S and connect it directly to the router using an Ethernet cable via the docking station.
- The server connects to the same router via Ethernet cable.
- The robot connects to the same router via Ethernet cable.
- The router's WAN port (automatically identified as WAN) connects to your internet service.



6.7.3 Server Specifications

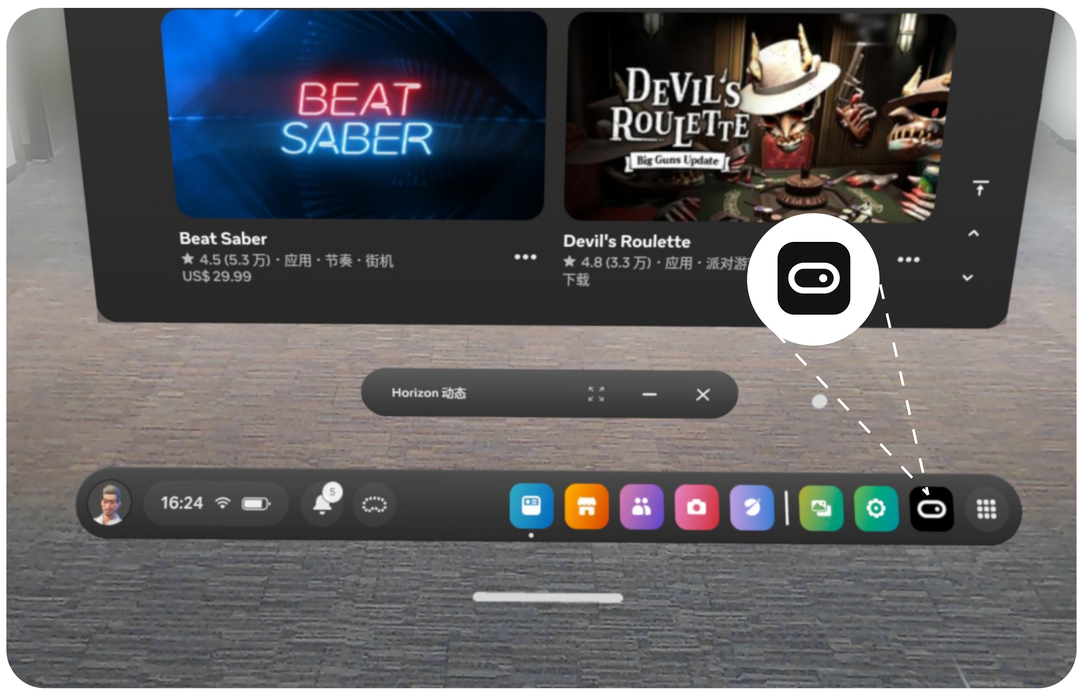
- **Navigate to the program directory and launch the server application. It will automatically broadcast the server address and await client connections to create the simulation environment.**

  cd ~/Documents/dist/

- **Run the startup program**

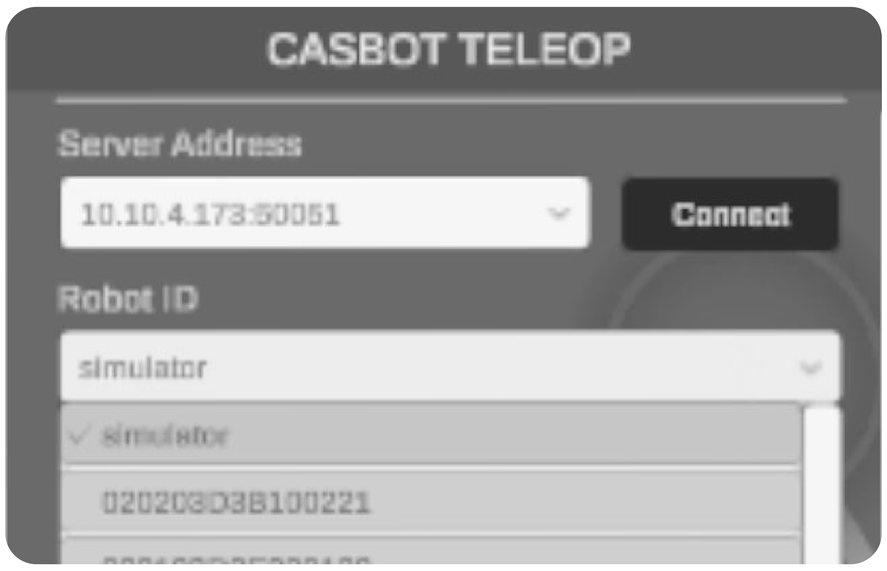
  ./run.sh

6.7.4 Client Specifications



Wear the Quest 3S, select the Lingbao icon program from the Dock bar, and enter the XR Teleop application. The icon and Quest 3S main page are shown in the figure below.

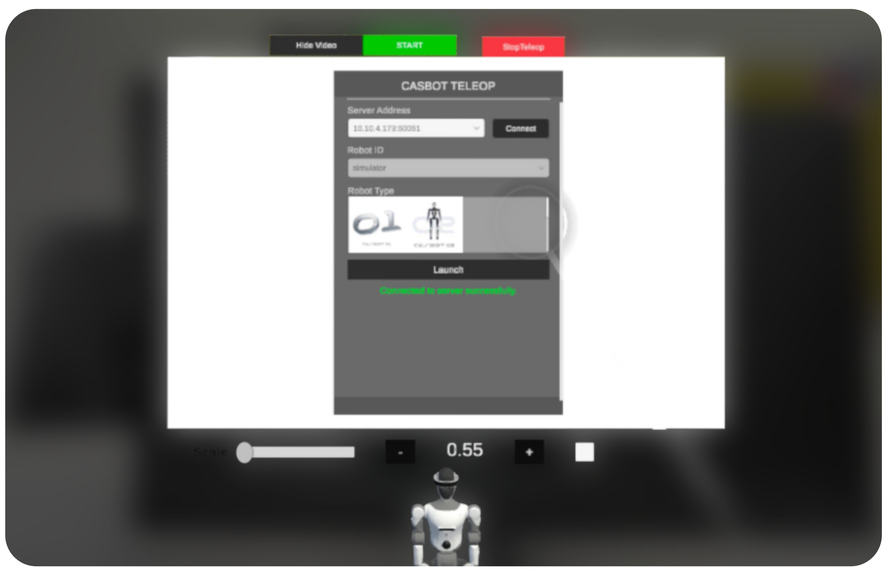
Upon entering the app, the following interface appears



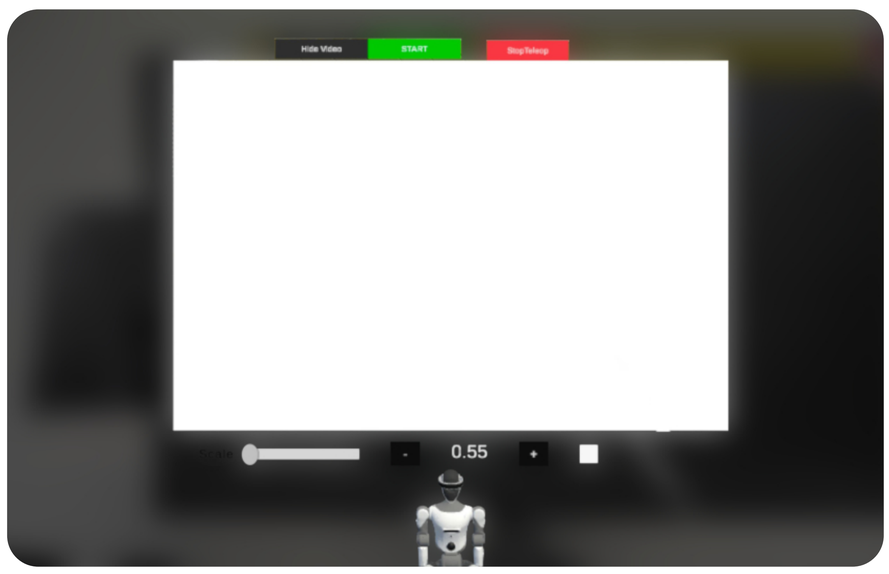
It contains the following controls:

- **Server Address:** Available server addresses dropdown list. The Connect button is used to connect to the server.

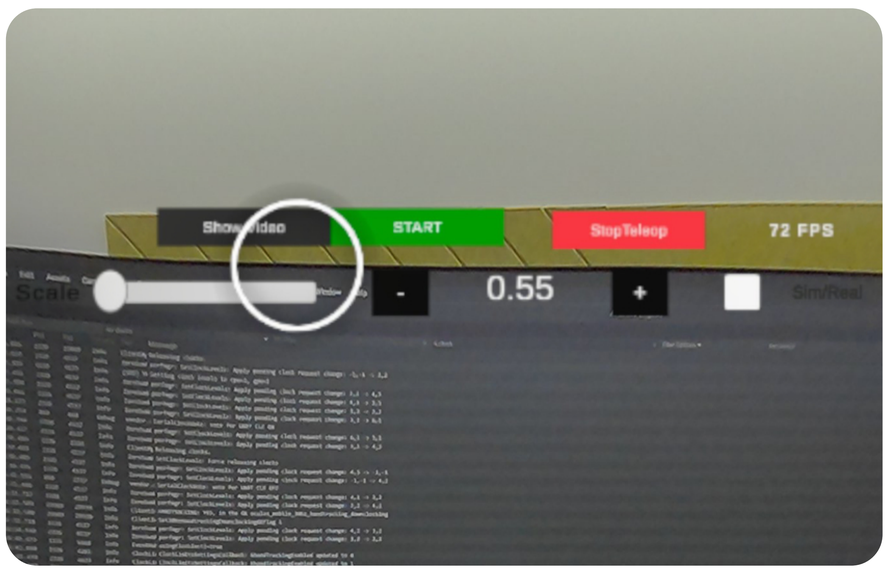
- **Robot ID:** The dropdown menu defaults to “simulator” for remote operation of simulation robots. Expanding it displays the physical robot ID (each real robot corresponds to a unique ID). Selecting a real ID indicates remote operation of the actual machine.



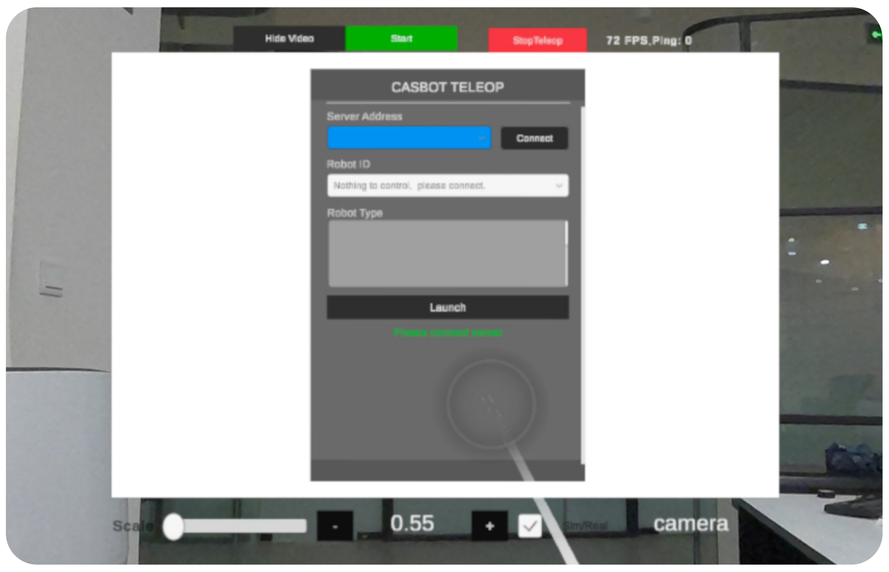
- **Robot Type:** If the Robot ID is set to simulator, the Robot Type will display all robot types currently supported by the simulator. If the Robot ID is set to real ID, the Robot Type will display a unique type. Clicking the icon in the Robot Type list will generate a corresponding 3D robot model in the scene, used to synchronize the robot's pose with the real device or simulation.



- **Launch：** Click the Launch button to initiate remote operation. The server will load the corresponding robot's simulation environment and automatically hide this login interface. The white video window will display the first-person view video stream from either the simulated or real robot.

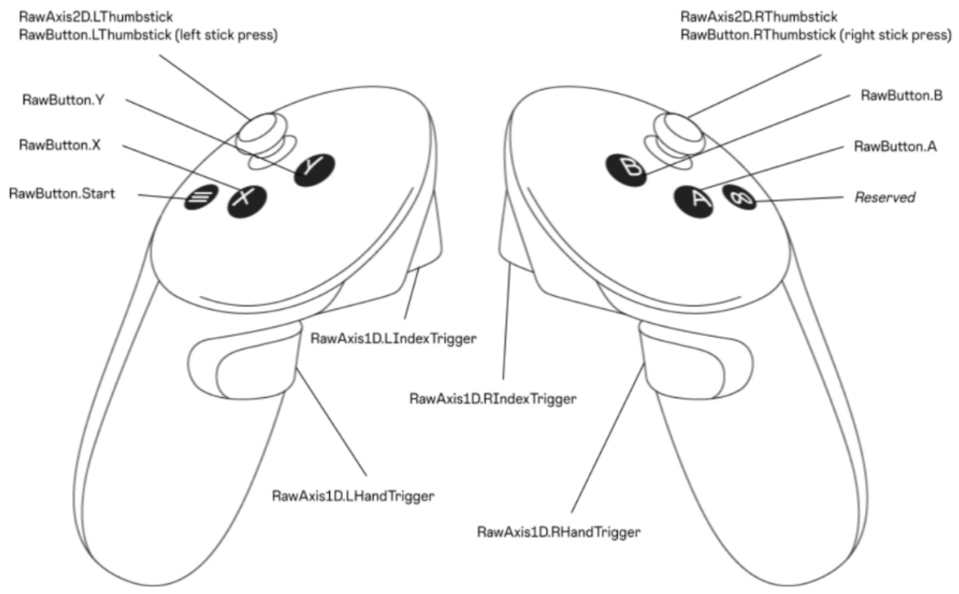


- **Hide Video / Show Video：**This button controls whether the video window is displayed.
- **Start / Stop ：**This button initiates or terminates data recording for real robots or simulations. (Right joystick “A” button),Before pressing the Start button (right joystick), ensure the robot model's arms are naturally lowered to zero position in the scene to maintain safety.
- **Stop Teleop：**This button halts teleoperation. Upon pressing, it resets all scenes and returns to the login interface. (Right joystick “B” button)



- **Sim / Real ：**This toggle switch switches between first-person view video streams for simulation and real-world environments.
- **Scale ：**This slider controls the size of the video window.
- **-**+ ：**This component adjusts and displays the operator's arm length (estimated value) to accommodate different arm lengths.

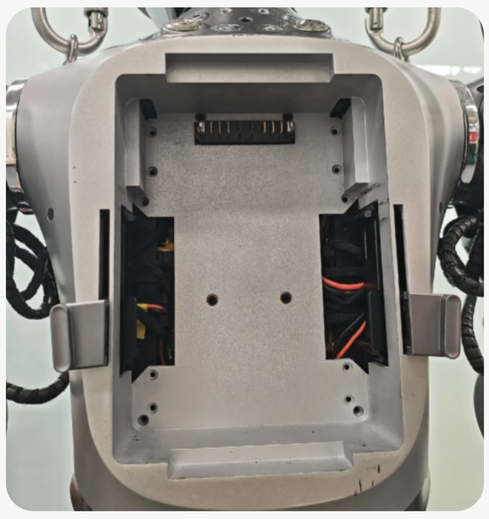
6.7.5 Handle Instructions



- The HandTrigger on the left and right handles controls the opening and closing of the hands, representing a linear value where the depth of press determines the dexterity of the gripping hand.
- The IndexTrigger on the left and right handles is used for UI interaction selection, analogous to mouse click events.
- The A button on the right handle activates/pauses remote operation control. Pressing it once sends action data to the virtual machine, pressing it again stops data transmission. Simultaneously, the Start/Stop button on the interface changes color and state accordingly.
- The B button on the right handle ends remote operation and returns to the launch interface.

6.8 Charging Instructions

After sliding the tabs on both sides of the robot's back all the way down, install the battery and secure it. Slide the tabs back up to lock the battery in place, and the robot is ready for use.



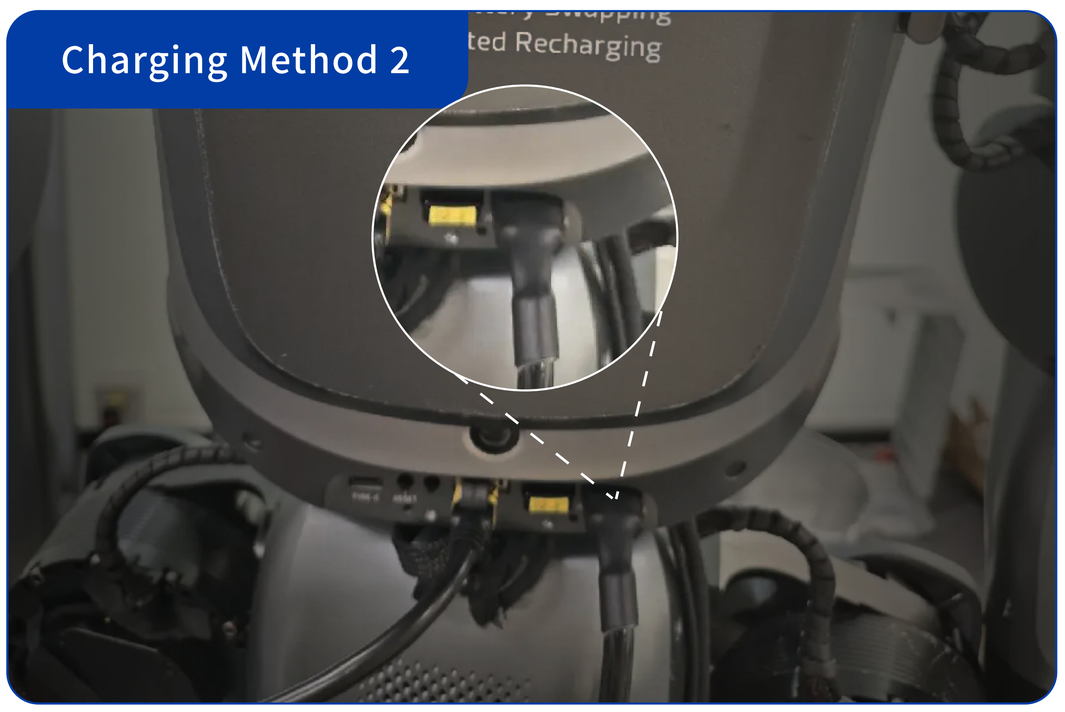

A designated person must be present during battery charging. If unattended, charging should be stopped and the charger disconnected from the power source.


Note: If the robot detects abnormal battery communication (especially when inserting the battery for the first time), suspend the robot and reinsert the battery.

Charging Method 1

Plug the 220V power plug into the power strip, then connect the charger to the power source. The red indicator light will illuminate to indicate charging is in progress. Once the battery is fully charged, the indicator light will turn green. Unplug the power plug when charging is complete.

Charging Method 2



For users with only one battery available, you can plug the charger directly into the charging port on the robot's back. The battery supports charging while in use, but only interactive functions can be used during this charging method.

6.9 Distribution Network Process

6.9.1 Computer Connection to HRU

1. Ethernet cable connection

Connect the robot's Ethernet port to the computer using an Ethernet cable. Configure the computer's IP address to 172.16.0.50. Run the following command in the terminal. The password is 123456.

```
code block
1        ssh casbot@172.16.0.1
```

2. Wireless AP Connection

Connect your computer's Wi-Fi to the robot's AP hotspot (hotspot name: devcasbot-XX, where XX corresponds to ROBOT_ID; password: hello@casbot). Run the following command on your computer terminal:

```
code block
1        ssh casbot@192.168.188.1
```

6.9.2 HRU Wi-Fi Configuration

Username casbot Password 123456
After connecting the computer to the HRU, configure the HRU terminal's Wi-Fi settings.

```
code block
1        Turn on WiFi
2        sudo nmcli r wifi on
3        Scan nearby Wi-Fi networks
4        sudo nmcli dev wifi
5        Connect to Wi-Fi
6        sudo nmcli dev wifi connect "WiFi name" password "WiFi password" ifname wlan0
```

6.10 Routine Maintenance and Care

Cleaning and Storage

- Clean surfaces regularly or after use in dusty environments with a clean microfiber cloth
- Use the dedicated transport case designed for the robot to store and transport it, preventing impacts and vibrations

Inspection and Maintenance

- **Exterior Maintenance:**
  Clean dust from joints and check for loose screws
- **Software Updates:**
  Promptly upgrade official firmware to address potential system vulnerabilities and optimize motion algorithms
- **Battery Pack:**
  Charge 50%-60% before storage (avoid fully charged or depleted states); recharge to the same range every 3 months
- **Remote Controller:**
  Keep ports clean; ensure joysticks are free from external pressure during storage; periodically check for interference resistance

7. After-Sales Service Information

7.1 After-Sales Service

We provide complimentary user training, operational guidance, online technical support, and after-sales service.

7.2 Warranty Policy

The warranty period for the major components you purchased is as shown in the table below:

Component Name	Warranty Period
Joint Module, Replaceable Battery, Dexterous Hand	6 months
Depth Camera, Fisheye Camera, Lidar, Computing Board, Other Electronic Components	12 months

Note: Consumable parts such as the outer casing and accessories like shipping containers are not covered under warranty. For inquiries, please contact after-sales support.

The warranty period for this product commences on the date of delivery receipt. Please retain your warranty documentation securely.

Products or components meeting warranty eligibility criteria will receive complimentary after-sales service.

Should your product exceed the warranty period, you may still obtain assistance by purchasing extended service coverage.

7.3 Exclusions from Warrant Coverage

Depending on the specific circumstances, we will provide corresponding repairs or component replacements for the products you have purchased. However, the following situations are not covered under the free warranty, though you may still opt for paid after-sales service. For details, please consult our after-sales support:

- Damage occurring after the warranty period has expired.
- Damage resulting from failure to install, use, or operate the product correctly as specified in the manual.
- Damage caused by unauthorized modifications, disassembly, or opening of the casing.
- Damage resulting from use beyond the safe weight capacity.
- Any damage caused by human factors unrelated to the product's inherent quality.
- Malfunctions or damage caused by force majeure events such as typhoons, earthquakes, fires, lightning strikes, or abnormal voltage fluctuations.