

Hip Assistive Exoskeleton AlpWalk S1

Product Manual



Contents

Important Safety Instructions	2
Related information	5
List of Included Items	7
Overview	8
Exterior Introduction	8
Product Parameter	9
Operational principle	11
Key Features	11
Wearing Guide	13
Wearing Instructions	13
Removal Instructions	17
Usage Tutorial	19
Device Interaction	19
APP Interaction	23
Daily Maintenance	33
Regular Cleaning	33
Battery Maintenance	34

Important Safety Instructions

Important Notice

1. This product is a walking assistance device, not a medical device, and cannot replace professional medical equipment or physician recommendations. The following functions are not included in the product design: weight support, restoration of independent walking ability, maintenance of walking balance, fall prevention, or treatment/relief of disease symptoms.

Patients should use the relevant medical device registered products under the guidance of a physician.

2. Before using this product, users must undergo evaluation by a professional (the term "professional" as defined in this user manual specifically refers to individuals holding valid practicing qualifications, including but not limited to: licensed physicians, rehabilitation therapists, licensed nurses, health management specialists, sports rehabilitation specialists, licensed traditional Chinese medicine practitioners, specialized traditional Chinese medicine physicians, and traditional Chinese medicine rehabilitation technicians, provided that their services align with the registered scope of practice) to confirm the absence of contraindications such as severe osteoporosis, joint deformities, acute inflammation, uncontrolled

cardiovascular or cerebrovascular diseases, or epilepsy. If any of the aforementioned contraindications are diagnosed during use, users shall immediately cease using this product.

3. For users with mild motor dysfunction (e.g., those with arthritis or early-stage Parkinson's disease), the product must be used under the full guidance of a healthcare professional.

4. The following individuals are prohibited from using this product:

- Individuals with cognitive impairments or severe loss of balance ability;
- Patients with contraindications listed in the product instructions, cardiovascular or cerebrovascular diseases, or other conditions that may worsen with use;
- Individuals who have not undergone professional evaluation to confirm suitability for using this product;
- Users experiencing moderate to severe muscle spasms;
- Individuals experiencing physical discomfort or impaired consciousness;
- Users with severe visual or cognitive impairments that affect safe operation;
- Patients requiring absolute bed rest as diagnosed by a healthcare professional;

- Pregnant women and minors;
- Users with severe limitations in lower limb mobility due to muscle, ligament, or joint disorders;
- Patients with non-healed fractures, abnormal bone joint structures, or severe osteoporosis;
- Patients with pressure ulcers, bedsores, or open wounds on the body surface that may come into contact with or rub against medical devices;
- Other individuals who are not suitable for using this product due to medical conditions.

Note :

For your safety, the AlpWalk S1 features multiple safety protection mechanisms for reliable use in normal conditions. To prevent accidents, please follow these guidelines:

1. Do not use this device in environments with water immersion, proximity to fire sources, strong magnetic fields, high electric currents, or extreme temperatures.
2. In case of an emergency during operation, long-press the right-side button to power off the device immediately.
3. After removing the equipment, you need to adapt to the change in body sensation without assistance. Stand for a brief period to acclimate, and only proceed walking after confirming stability.

4. Turn off the device during charging and charge the battery separately (by unplugging it from the device). Do not exceed 24 hours of continuous charging.
5. Do not insert or remove the power plug with wet hands while charging to avoid electric shock.
6. Do not expose the battery to direct sunlight, place it in a fire, or immerse it in water.
7. Do not use metal objects to simultaneously contact the positive and negative terminals of the battery, as this may cause a short circuit.
8. Do not disassemble or deform the battery.
9. Do not use a faulty charger to charge the battery.
10. Heat generation during motor operation is normal; the device is equipped with a thermal protection system: the motor will automatically activate downshift protection if overheating persists, and shut down once the temperature exceeds the protection threshold.
11. Please turn off the device before removing it. Before turning it on, follow the wearing instructions to ensure the device is properly worn.

Related information

Serial Number

The serial number of this device is printed on the base of the battery pack.

Manufacturer Information

Full company name: Alpwalk Technology (Hangzhou) Co., Ltd.;

Company Address: No.188 Yunzhan Road, Xihu District, Hangzhou City, Zhejiang Province;

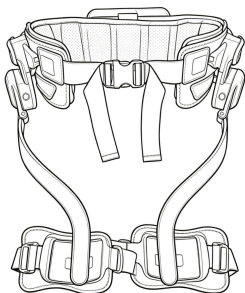
Official website: www.alpwalk.com.

Certification Information

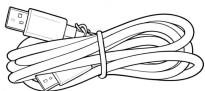
This product has obtained FCC and CE certifications.



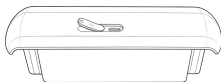
List of Included Items



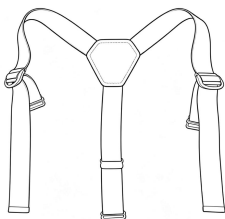
Main Structure of the
Exoskeleton



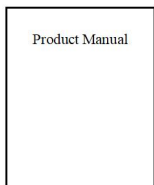
Charger



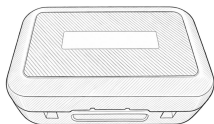
Battery



Shoulder Strap



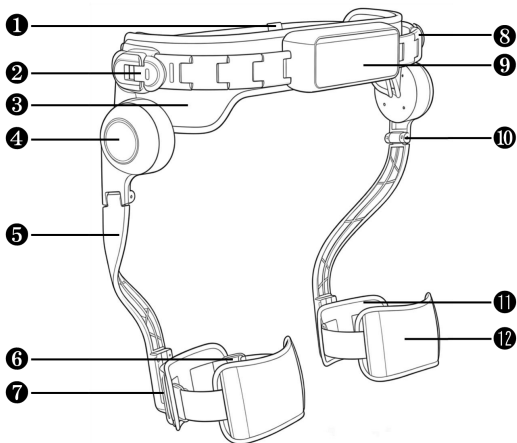
Product Manual



Storage Box

Overview

Exterior Introduction



① Shoulder

Strap Fixing Loop

② Waist Buckle

③ Waist Pad

④ Motor

⑤ Leg Rod

⑥ Leg Buckle

⑦ Leg Rod

Adjustment

Button

⑧ Waist Belt

⑨ Battery

⑩ Leg Rod

Hinge

⑪ Anterior

Leg Strap

⑫ Posterior Leg

Strap

Product Parameter

Product model	AlpWalk S1
Main Weight	2.4Kg
Maximum Motor Torque	18Nm
Ingress Protection Rating	IP54
Battery Life	≥4h*
Battery Capacity	4600mAh
Charging Power	65W
Charging Port	USB-C port
Operating Temperature	-20°C~50°C
Storage Temperature	-40°C~60°C
Maximum Motion Speed	18km/h
Bluetooth	BLE: 2.4G
Terrain Adaptability	Flat ground, uphill and downhill areas, staircases, slopes
Supported Mode	Smart Mode, Elderly Assistance Mode,

	Follow-up Mode
Intelligent Control	Support App Control

The battery life results were measured under laboratory conditions (25°C) with smart mode enabling 30% assistance at a speed of 4 km/h.

Operational principle

The AlpWalk S1 features a built-in processor and multiple sensors that monitor human movement in real time. By integrating sensor data, the processor analyzes movement intentions and activates the motor modules on both sides to generate power, thereby driving leg motion.

During human movement, the hip joints of both legs alternately generate hip flexion torque and hip extension torque. These torques work in concert to maintain stable gait: hip flexion torque assists in lifting the thighs and facilitating stepping motions, while hip extension torque helps extend the hips and knees upon foot contact with the ground, enabling backward ground propulsion to generate forward momentum.

The AlpWalk S1 simulates natural human gait by alternately applying hip flexion and extension torque to the lower limbs via bilateral motor modules, mimicking the forces generated during natural walking. This enhances the mobility of the lower limbs while reducing the physical strain associated with walking.

Key Features

- Ergonomic design with lightweight construction for snug and comfortable fit against the body;

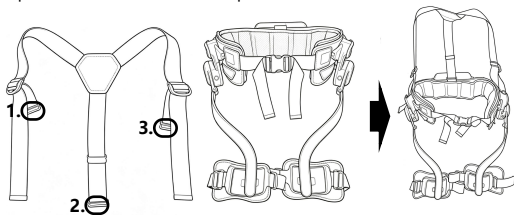
- Intelligent motion detection for automatic start/stop upon movement;
- Swappable battery pack for extended endurance.;
- High power output, smooth and quiet operation, with bidirectional assistance for leg lifting and pushing off;
- The APP adjusts the assist mode for scenarios such as walking assistance and long-distance travel;
- Easy to wear with adjustable binding sizes for waist and legs;
- Suitable for outdoor use with IP54 protection.

Wearing Guide

Wearing Instructions

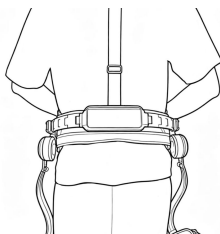
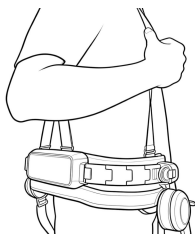
Wearing Preparation

- ① Place the shoulder strap with its front side facing upward;
- ② Secure the hook fasteners at the ends of the shoulder straps in sequence onto the lateral and posterior fixation holes.



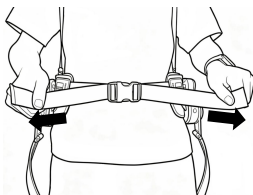
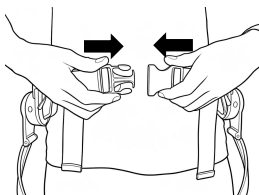
Put on the device

- ① Hang the shoulder straps over your shoulders and adjust the length of the back strap so that the AlpWalk S1 fits around your waist (using the narrowest point of the lumbar region as the reference).
- ② Move the device up and down manually to ensure proper height adjustment. (Standard for appropriate height: The centers of the joint motors on both sides of the AlpWalk S1 should align with the rotational center of the wearer's hip joint.)



Fasten the waist buckle

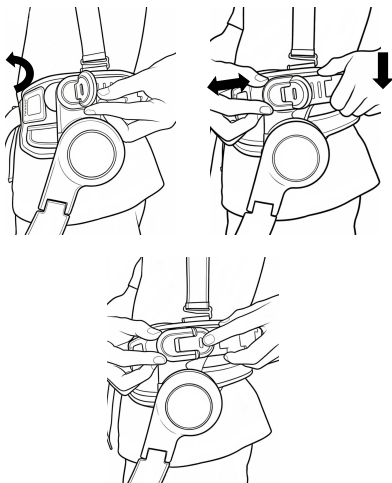
- ① Insert and fasten the left and right plug-in buckles together;
- ② Secure the waist fasteners tightly on both sides, ensuring they fit snugly and are slightly tight.



Adjust the motor position

- ① Flip open the buckle at the end of the waist belt;
- ② Slide forward and backward to position it laterally or anterolaterally relative to the hip joint;
- ③ Press the buckle down to lock.

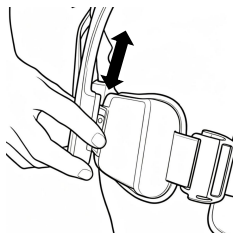
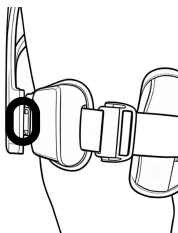
(Same operation on both sides)



Adjust the protective gear position

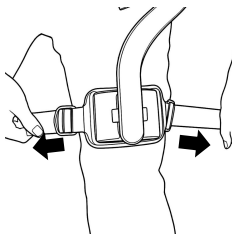
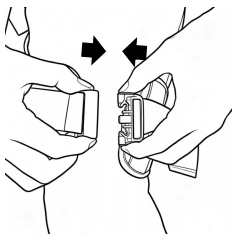
Press and hold the button on the circle to adjust the thigh protector in steps, moving it up or down to a comfortable position (above the knee); release the button to set the desired setting.

(Both legs should be adjusted to a symmetrical position)



Tighten the leg straps.

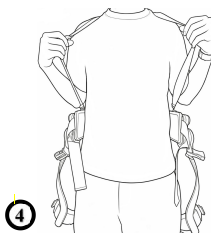
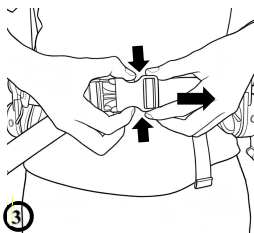
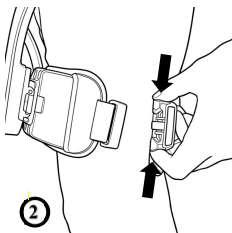
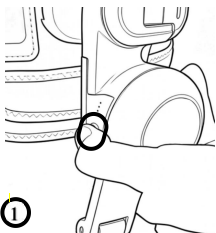
- ① Place the leg strap on the anterior side of the thigh, wrap it around the thigh, and insert it into the medial buckle;
- ② Grab both leg straps and pull them backward, adjusting their length until they fit snugly without loosening.



Note: The leg strap must be securely fastened. Loosening may cause the leg rod to rebound, potentially leading to injury.

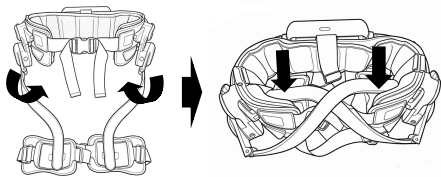
Removal Instructions

- ① Press and hold the power button to shut down the device;
- ② Open the buckle on the outer side of the leg and unfasten the leg strap;
- ③ Unfasten the waist buckle and release the belt;
- ④ Remove the shoulder strap and then take off the device.

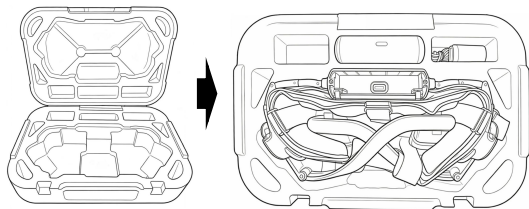


Storage Guidelines

- ① First rotate the machine lever upward, then fold and press it into the waist restraint as shown in the figure.



- ② Remove the battery and place the battery, charger, and device into the designated compartment of the storage box.



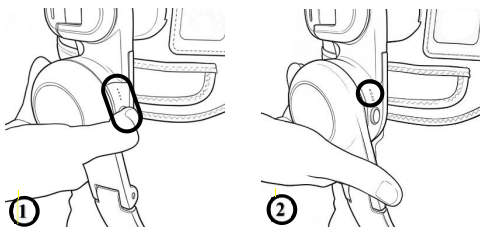
Usage Tutorial

Device Interaction

Powering on

Long-press the right button for more than 3 seconds; the running light display (lights illuminate sequentially and cycle) will activate, entering the calibration state as shown in Figure ①.

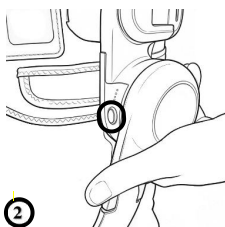
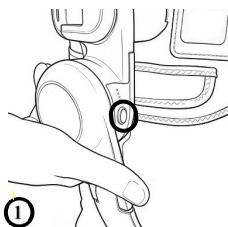
Once the machine is calibrated, the four lights on the right display battery levels, as shown in Figure ②.



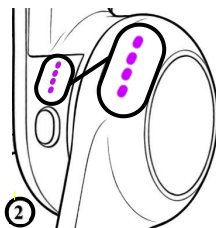
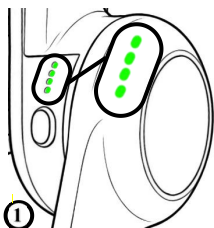
Buttons & Indicators

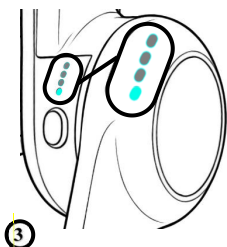
The right button is the power-on/off button, as shown in Figure ①.

The left button is the mode/gear selection button, as shown in Figure ②.



Long-press the left button (for over 1 second) to switch modes; a short press changes the assistance level. The buttons enable three modes: Smart Mode, Senior Assistance Mode, and Follow-up Mode. Long-pressing the left button switches modes: the default is Smart Mode with a green indicator light (see Figure ①); Senior Assistance Mode uses a purple indicator light (Figure ②); Follow-up Mode displays a blue indicator light (Figure ③).





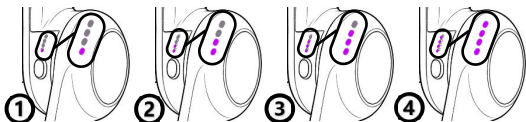
Short-press the left button to switch adjust assistance level; the number of lights corresponds to the assistance level. For example, in Senior Assistance Mode:

When one light is illuminated, it indicates a support level of 25%, as shown in Figure ① below.

Two lights are illuminated, indicating a support level of 50%, as shown in Figure ② below;

Three lights illuminated indicate a support level of 75%, as shown in Figure ③ below.

Four lights are lit, indicating 100% power support, as shown in Figure ④ below.



The right indicator light remains on to show the battery level range,

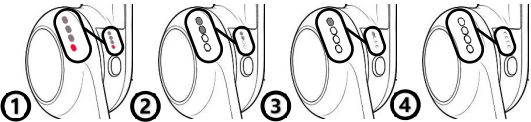
as follows:

A red light indicates that the battery level is between 0% and 25%, as shown in Figure ① below.

Two white lights indicate that the battery level is between 25% and 50%, as shown in Figure ② below.

Three white lights indicate that the battery level is between 50% and 75%, as shown in Figure ③ below.

Four white lights indicate that the battery level is between 75% and 100%, as shown in Figure ④ below.



If a machine fails, corresponding interaction states will occur. The types and symptoms of failures are listed in the table below:

order number	Fault Status	Interaction Guidance
1	Leg rod detachment during operation	4 red lights; alternating on and off for 1 second
2	Low battery (device battery level below	The end red light (one red light) remains constantly illuminated

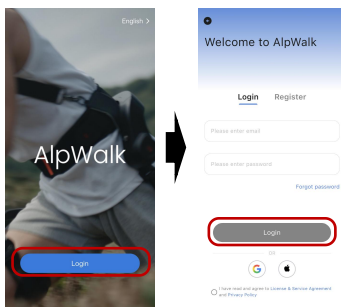
	10%)	
3	Motor Communication Error	4 red lights; alternating on and off for 1 second

APP Interaction

First Time Login

First-time login/registration: Open the app and tap Login/Registration;

Register and log in to your account using your email address and verification code, or sign in with third-party accounts such as Google or Apple.(For elderly users, please ask a family member to assist with first-time registration.)

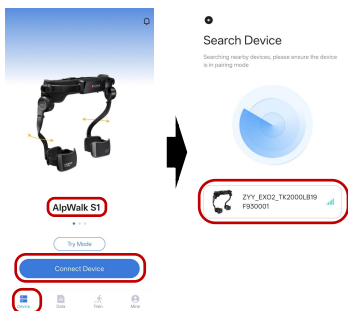


Device Connection

① Follow the steps to properly wear the exoskeleton device, turn on its power supply, and ensure Bluetooth is enabled on your smartphone.

Open the app, tap the "Device" button at the bottom left to enter the device page, and select your S1 exoskeleton model.

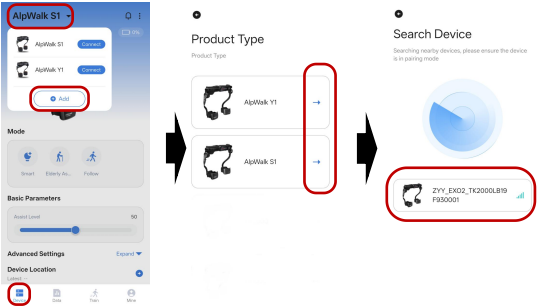
Click "Connect Device"; in the Device Search interface, select your exoskeleton product and connect.



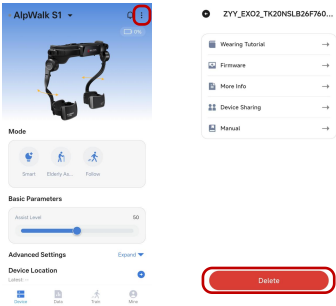
② If the connection fails: Check that the device has sufficient power, that Bluetooth is enabled on your phone, or restart both the device and your phone's Bluetooth before trying again.

③ Adding new devices: Tap the device name area in the top-left corner of the "Device" page, tap "Add", and select the product model (you can search for and select it in the search interface). The device

will be bound to the logged-in account; if you wish to use a different account, you must first remove the device using the original account.

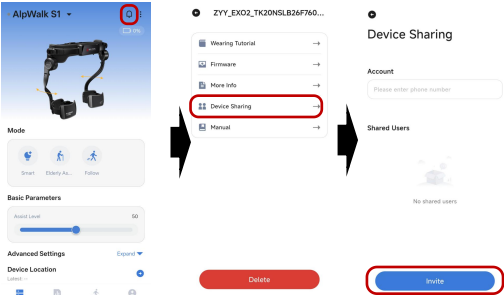


④ Delete Device: To remove a bound device, tap the top-right corner of the "Device" page and select "Delete Device" to unbind it.

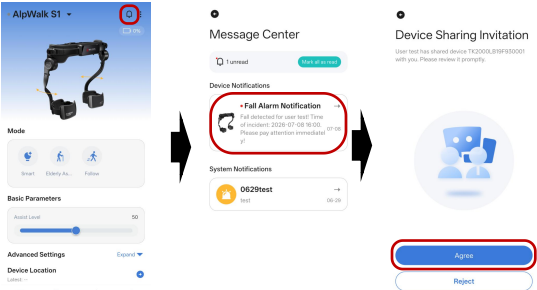


⑤ Sharing Devices: To enable remote monitoring for seniors, tap

"Device" in the top-right corner of the app, select "Device Sharing", enter the recipient's phone number, and click "Invite."



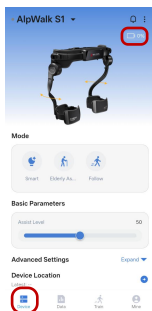
⑥ Sharing Confirmation: Tap the Message Center in the top-right corner of the Devices page to view the device sharing invitation under System Notifications, then tap "Agree".



Device Status and Parameter Adjustment

① After the device connects successfully, click "Device" in the bottom-left corner.

You can view device signal status and remaining battery level in the top-right corner.



② The device features a fall alert function: If a fall is detected, the app can send an alert to the caregiver's device for remote notification. (To enable this feature, navigate to "My" → "Additional Settings" → "Sensitive Information Collection" → "Motion/Gait, Body Parameters, and Fall Alert Records").

③ Core Adjustable Parameters:

Assistance Mode:

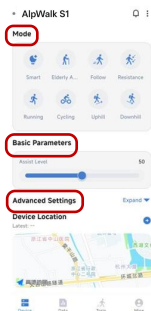
It features three modes: Smart Mode, Senior Assistance Mode, and

Follow-up Mode. Select the appropriate mode based on your usage scenario.

Basic Parameters: Adjust the exoskeleton assistance level, with a maximum assistance of 100% and a minimum adjustment range of 5%. Drag the slider to adjust the assistance torque.

Professional Parameters: Adjust the device's response speed to movements, flexion-extension symmetry, and left-right symmetry. (Do not modify these parameters arbitrarily; use the default settings.)

Note: After adjustment, click “ Restore ” to revert to default professional settings.

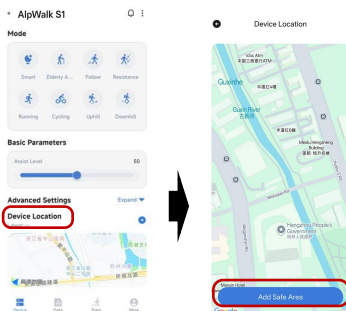


Location

① On the Devices page, locate the “Device Location” section and click to access it. The page displays the exoskeleton device's current

location on a map view, visible to both you and your caregiver. (To use this feature, go to My Settings> Additional Settings> Sensitivity Collection> Precise Location Information.)

② Security fence setup (optional): Click "Add Fence" at the bottom of the page to define a secure activity area (e.g., residential community or a park).



Tip :

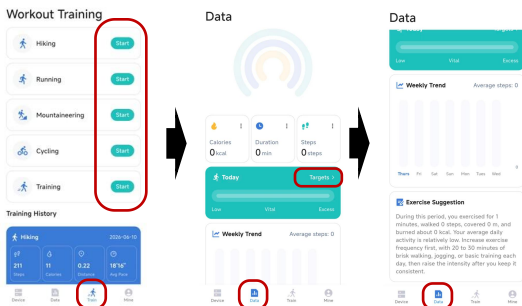
For best location accuracy, keep your phone outdoors with network connectivity. If location is unclear, check your network or move to an open outdoor area. If you need help, ask a family member. Always review the wear instructions before use to ensure safety.

If you have any questions about the procedures, feel free to contact your family for assistance. Before use, please review the wearing

instructions to ensure proper device placement and safety.

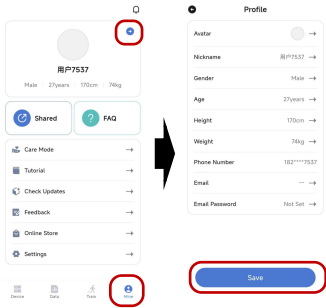
Training Mode and Data Viewing

- ① On the Training page in the bottom-right corner, select the desired training mode and click "Start". The device will record the distance, duration, and location information.
- ② Training Data View: Tap the "Data" at the bottom to view information such as calories burned, duration, and step count during exercise. Through "Target Settings," you can check your daily exercise progress. Below "Weekly Trends," you'll find exercise recommendations provided by the device (to use this feature, enable "My" → "More Settings" → "Sensitive Information Collection" → "Exercise Gait, Body Parameters, and Fall Injury Alert Records").

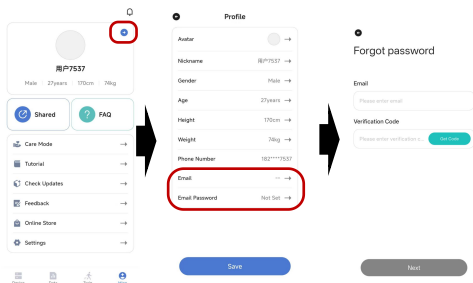


Personal Information and Other Features

① View and modify personal information: Click the "My" button at the bottom right to enter your personal center. The page displays information such as nickname, age, height, and weight. Click the arrow next to your avatar to edit information or change your avatar. After making changes, click "Save".



② Bind Email and Change Password: Click the arrow next to your profile picture to enter the Personal Information page. Select "Email" to view your linked email address. Click "Email Password" to change your login password.



③ Quick Access Features (click the corresponding text to access):

Device Sharing: View device usage permission shares to help family members manage devices and view usage data.

FAQs: For minor problems encountered during use (e.g., connection issues), find solutions here.

Care Mode: You can enable Care Mode for elderly users, where app fonts and icons will be enlarged.

Wearing Tutorial: Watch the exoskeleton wearing video to follow the steps correctly.

Feedback: If you encounter an unresolved issue, submit feedback here and our staff will address it promptly.

User Data Export: Access personal data and understand how it is processed.

More Settings: Adjust language, clear cache, log out, and more.

Daily Maintenance

Regular Cleaning

Clean the exoskeleton structure: Please follow the instructions below to clean the surface structure.

- Gently wipe the device surface with a soft, damp cloth (Do not wipe the internal battery connectors).
- Ensure the exoskeleton is completely dry before storage or use.

Important:

- Do not use corrosive or volatile chemical solvents (such as alcohol, gasoline, diesel, acetone) or any abrasive materials to avoid damaging the equipment's surface and internal components.
- Do not use a high-pressure cleaner or high-pressure water gun to clean the main unit's structure, and avoid exposing the equipment to pressurized or high-speed water streams.

Clean soft fabrics: Please follow the instructions below when cleaning exoskeleton soft fabrics.

- Wipe soft fabric surfaces with a soft damp cloth using a mild cleaner.
- Ensure the soft fabric is completely dry before storing or using it.

Important:

- Do not use detergents containing bleaching agents or strong alkaline substances to avoid damaging soft fabrics.
- Do not machine wash to avoid vigorous agitation that may deform or damage the soft fabric.
- Do not dry, and avoid exposing soft fabrics to direct sunlight or high temperatures, as this may cause fading or deformation.

Battery Maintenance

Before each use, check the battery for damage, bulging, or leakage.

- Charge the battery when its level drops to 20%–30%, and avoid overcharging.
- The recommended charging temperature range is 0°C to 40°C. The device will pause charging when the battery is overheated or too cold to protect it.
- Do not charge immediately after use; allow the battery to cool down first.
- If the battery has not been used for more than 10 days, check the charge level every two weeks; if it drops below 40%, recharge it to approximately 60%.