Upper Limb Intelligent Exoskeleton Training Device ORE-3000/ORE-2000

User Manual

Please read the manual carefully before using the product and keep it properly.

www.oymotion.com

Upper Limb Intelligent Exoskeleton Training Device

Model:

ORE-3000-L-M

ORE-3000-R-M

ORE-3000-L-L

ORE-3000-R-L

ORE-2000-L-M

ORE-2000-R-M

ORE-2000-L-L

ORE-2000-R-L

User Manual

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Chapter I Introduction

Thank you very much for purchasing the ORE-3000 Upper limb intelligent exoskeleton training device produced by OYMotion Technologies Co., Ltd..

Before starting to use, please read the manual carefully to understand the use of the device. After reading, keep the manual near the device for reference at any time.

Please contact OYMotion Technologies Co., Ltd. if the user manual is lost or damaged.

This manuals contain the general information of this product, which is the first condition for the operator to use ORE-3000 Upper limb intelligent exoskeleton training device for the first time. These general information includes the manufacturer's responsibility, guarantee, product introduction, applicable product model and size, product structure composition, technical specifications, equipment operation, equipment list, common faults and troubleshooting methods, maintenance and repair and after-sales service, etc. Before installing, operating or maintaining the equipment, please read the manuals carefully to ensure the equipment work normally and ensure the safety of the operators and patients.

The Upper limb intelligent exoskeleton training device must be used in strict accordance with the methods specified in the manuals. The company will not be liable for the consequences caused by not using this product in accordance with the manual (such as not achieving the expected effect or even causing personal safety and property loss).

The company makes no guarantees of any kind, including (but not limited to) the implied warranties of merchantability and fitness for a particular purpose. The Company shall not be liable for accidental or indirect damage caused by the errors contained in the manuals or by the provision of this manuals.

The manuals contains proprietary information protected by the patent law. All rights reserved, no photographic reproduction, photocopying or translation of any part of the instructions for use without the written consent of the Company.

The contents contained in the manuals for use can be changed without notification to the user.

1.1 Manufacturer's responsibility

(1) The products produced by the Company shall meet the technical requirements of the products. If there is any failure, the Company shall be responsible for replacement and return;

(2) The Company shall only be responsible for the safety, reliability and performance of the products under the following circumstances, namely: the assembly operation, improvement and maintenance shall be carried out by the personnel approved by the Company, and the relevant

electrical equipment shall meet the national standards and shall be used in accordance with this manuals;

(3) For personal or property loss caused by product manufacturing defects, the Company shall assume corresponding liabilities, but the Company shall not be liable for any of the following circumstances:

a. Buyers and operators do not use according to the instructions, or use according to safety precautions and warning instructions;

b. Violating the regulations on transportation, installation, use, maintenance, storage, resulting in damage to products, personal or property;

c. **Still use beyond the service life of the product**;

d. Damage to the equipment, operators or patients caused by the purchasers or operators who do not use the accessories of the company;

(4) For the equipment parts designated by OYMotion Technologies Co., Ltd. that can be repaired by the qualified technical personnel of the user unit, the company can provide the circuit diagram, component list, drawing notes and calibration rules as required.

1.2 Guarantee

Manufacturing process and raw materials: The Company guarantees that the products (except accessories) are used and repaired under the condition according to this manuals from the date of shipment. No inspection by the Company is perfect.

Chapter Ⅱ Overview

2.1 Product introduction

Upper limb intelligent exoskeleton training device function mode includes passive mode and active mode. Passive mode includes automatic mode and remote control mode, through the motor drive elbow to do passive movement. active mode using EMG control mode, through the EMG signal acquisition and intelligent algorithm to realize the interaction between exoskeleton and muscle, and convert it into exoskeleton movement control, help users to do the upper limb movement.

2.2 Applicable product model and size

Model	Size
ORE3000-L-M、ORE3000-R-M	484mm*166mm*115mm
ORE3000-L-L、ORE3000-R-L	524mm*166mm*115mm

2.3 Product structure and composition

The upper limb intelligent exoskeleton training device is composed of host, control panel, EMG sensors, brackets and straps etc.

Part labeling description:

① Upper arm bracket ⑨ Forearm strap 1

② Charging port ⑩ Forearm strap 2

③ Emergency button
④ Host
⑤ Forearm bracket
⑥ Upper arm strap
⑦ EMG sensor
⑧ Control panel
⑪ Wrist bracket
⑫ Palm strap
⑬ Palm bracket
⑭ Forearm telescopic button
⑮ Shoulder strap

2.3.1 Battery and the charger

The battery uses a lithium-ion battery with a nominal capacity of 2600mAh,7.4V, and is equipped with a matching power adapter.

2.4 Technical specifications

2.4.1 Load and speed

Parameter	Description
Speed	Fast: 51°/s, Slow: 38°/s
Maximum lifting weight	2.5kg
Timing	15m/30m/1h

2.4.2 Weight

Parameter	Description
Weight	M: 1260g
	L: 1282g

2.4.3 Power supply

The power supply is powered by a rechargeable lithium battery.

Parameter	Description
Input voltage	DC 7.4V
Battery capacity	2600mAh

2.4.4 Charging

Charge the battery through the power adapter.

Parameter	Description
Charging port	USB typeC
Import	100~240V 50~60Hz AC
Output	5V 2A DC

2.4.5 Communication interface

Operation Method	Communication Interface
Remote control	433 MHz radio
Mobile phone	Bluetooth Low Energy BLE 4.2

Chapter III Device Operation

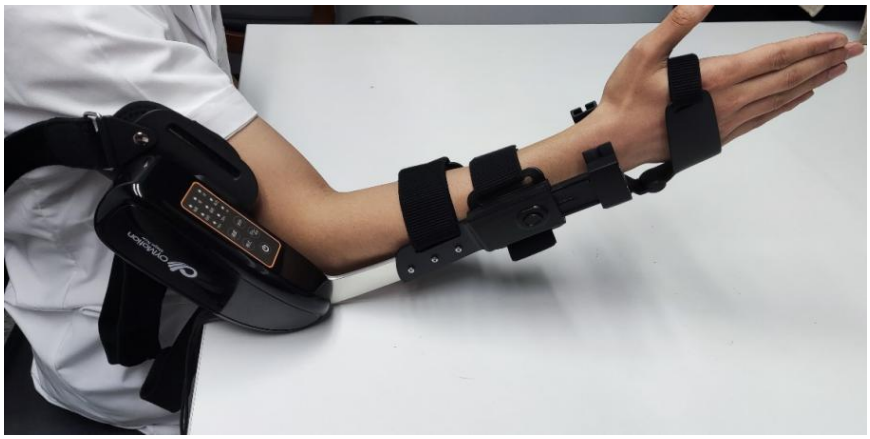
3.1 User wear

1) Position matching

First confirm that the left and right models of the exoskeleton you are wearing are correct, and then place the arm in the exoskeleton, making sure that the position of the elbow olecranon corresponds to the position of the exoskeleton axis. Then adjust the exoskeleton to the appropriate length through the forearm telescopic button in the wrist rest position, and place the palm on the palm bracket.

2) Forearm fixed

After placing the arm in the proper position of the exoskeleton, start to fix the exoskeleton and the arm. First fix the position of the forearm, thread 1/2 of the forearm strap at the forearm bracket through the strap hole and fix it, then thread the palm strap through the strap hole and fix it. After fixing the 3 straps, the exoskeleton of the forearm has been fixed, and then fine-tuned the position of the exoskeleton to ensure wearing comfort.



3) Sensor fixed

After the forearm fixing is completed, the position of the EMG sensor is fixed. First, each of the four sensors is assigned to a group of 2 sensors, and the 2 sensors in each group are 1cm apart.

Then, the position between the two groups of sensors is adjusted according to the upper arm circumference of the wearer. One group is placed in the position of the biceps muscles, and the other group is placed in the position of the triceps muscles, After adjusting the position, the sensor band is tied and fixed.

4) Upper arm fixed

After the sensor position is fixed, the upper arm is bound to the exoskeleton, the upper arm strap is fixed through the strap hole, the entire exoskeleton is worn after the upper arm is fixed, and the position of the entire exoskeleton is adjusted after fixation to ensure the comfort after wearing.

5) Shoulder strap fixed

The shoulder strap is mainly used to bear the weight of the exoskeleton and reduce the burden of the exoskeleton on the arm during use.

First, the main part of the shoulder strap corresponds to the position of the acromion, pay attention to the shoulder strap hair face up during wearing, and then thread the shoulder strap through the wearer's armpit, adjust the shoulder strap tightness, too loose shoulder strap will lead to a decrease in load-bearing capacity.

After wearing the shoulder strap, connect the exoskeleton to the shoulder strap through three straps.

Two of the three straps are located above the exoskeleton, pulled vertically to connect to the exoskeleton, and one is located below the host and connected upward to the shoulder strap after crossing the armpit.

6） Position adjustment

After wearing the shoulder strap, all the positions of the exoskeleton have been worn. At this time, the position, length and tightness of the strap can be adjusted to ensure the comfort in the use process. After wearing, the user needs to stand in the open area to start training.

⚠ Cautions

- If there is obvious damage, it is strictly prohibited to use. The product mark and service life shall be confirmed before use;
- Before training, you need to do simple and relaxing activities on the upper limbs to avoid fracture or injury;

3.2 Operation instructions

3.2.1 Overview

ORE-3000 upper limb intelligent Exoskeleton training device includes two control modes: Control panel and APP.

3.2.2 Control Panel

Device indicator light:

Status	Power indicator light	Speed indicator light	Time indicator light
Startup	Flashing	Always-on	Always-on
Running	Flashing	Always-on	Slow flash
Stop	Flashing	Always-on	Fast flash

3.2.2.1 Startup

Press and hold the “ ⏻ ” button on the control panel for more than 2 seconds, and the power indicator light will display green. Release the “ ⏻ ” button, and the device will emit a **“beep”** sound. The power indicator light will flash, indicating that the device is turned on.

3.2.2.2 Setting Speed

The device speed is divided into two gears: slow and fast, and the default gear is slow when the

device is used at first time. Click the "**Speed**" button on the control panel once, the device speed changes from slow to fast, and at the same time, the device emits a "beep" sound; Click the "**Speed**" button on the control panel again to change the device speed from fast to slow. Each time the "**Speed**" button is clicked, it switches between the slow/fast gears cyclically.

3.2.2.3 Setting Time

The duration is divided into three periods: 15m, 30m, and 1h. The default time for turning on the device is 30m. To make adjustments, click the **"Time"** button on the control panel. Click the **"Time"** button on the control panel once, and the device duration will change from 30m to 1h, while the device emits a "beep" sound. Clicking on the device again changes the duration to 15m, and the device emits a "beep" sound. The duration switches one gear every time when **"Time"** button is clicked, and cycles through three gears of 15m/30mh/1h in sequence.

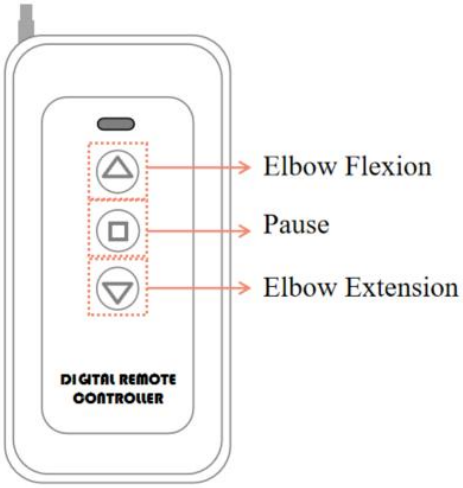
3.2.2.4 Setting Mode

The device supports three modes: automatic mode, remote control mode, and EMG mode. The default mode for powering on the device is remote control mode. Click the **"Mode"** button once, the device mode changes from remote control to EMG, and the device emits a **"beep"** sound. Click the **"Mode"** button again to change the mode from EMG to automatic. The **"Mode"** button switches to one mode every time it is clicked, and cycles through three modes: automatic, remote, and EMG.

3.2.2.4.1 Automatic Mode

In automatic mode, the motor continuously performs elbow flexion and extension movements at the specified speed within the set range of activity (which can be set on the mobile app) and the set duration.

3.2.2.4.2 Remote control Mode



In remote control mode, the trainer moves according to the signal from the remote control.

Press the "△" key on the remote control to perform elbow flexion, press the "▽" key on the

remote control to perform elbow extension, and press the "□" key to pause.

3.2.2.4.3 EMG Mode

In EMG mode, the device recognizes gestures according to the EMG signals (gesture training should be conducted on the mobile phone app) and maps the gestures into action signals.

Note: If the used device has been activated, the device will remember the speed, duration, and mode selected during the last time using. The gear selected during the previous use of the instrument shall prevail every time it is restarted.

3.2.2.5 Start

After selecting the speed and duration, click the control **"Start/Stop"** button to start the device running. The device will perform elbow flexion and extension movements in cycles according to the settings of speed and duration. During operation, the power indicator and duration indicator on the panel will both flash, while the speed indicator will remain on. After the device reaches the set duration, the beeper will emit a "beep" prompt, and the device will stop running.

3.2.2.6 Stop

If there is a need to suspend the use of the device during its use, you can press the **"Start/Stop"** button on the control panel, and the device will emit a **"beep"** sound, causing it to pause operation. If the device needs to continue running, click the **"Start/Stop"** button on the control panel to continue running.

⚠Cautions

After about 14 minutes of device pause, the device will emit a **"beep"** sound to remind to shut down due to being in standby mode for a long time. If the user does not turn off the device, the device will automatically shut down after one minute.

3.2.2.7 Emergency Button

In case of emergency, if the device needs to be stopped, the red **"STOP"** button near the charging port on the side of the device can be pressed. The device will cut off power and all indicator lights on the device will be turned off.

3.2.2.8 Power Off

Press and hold the " ⏻ " button on the control panel for more than 2 seconds before releasing it. The device emits a **“beep”** sound and the indicator light goes out, indicating that the device has been turned off.

⚠ Cautions

If the beeper of the upper limb intelligent exoskeleton training device emits a **“one long, two short”** sound, the voltage is too low and the battery is insufficient. Please use the matching charger to charge the device in a timely manner.

3.3 Software operation

3.3.1 Overview

3.3.1.1 Purpose

The software can mainly achieve the following functions:

NeuCir App is an application software that can adjust the parameters of the ORE-3000 upper limb intelligent exoskeleton training device for better training for users.

3.3.1.2 Operating environment

This software is available in Android and IOS versions, supporting versions of Android 10 and IOS 10 and above, respectively.

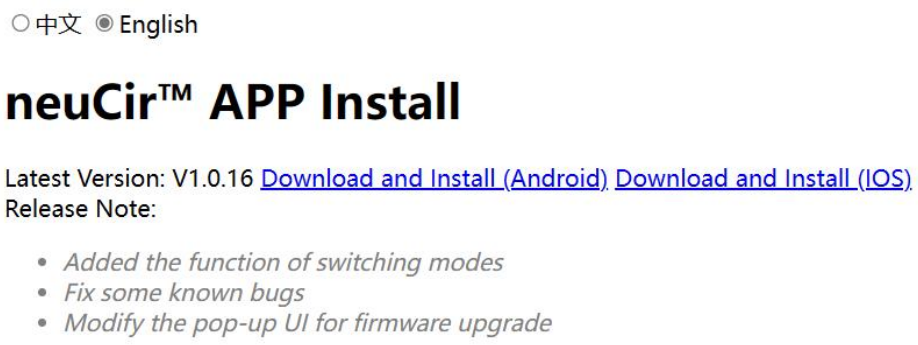
3.3.2 Software Window Interface

This chapter mainly introduces and explains the various functional interfaces of **NeuCir App**.

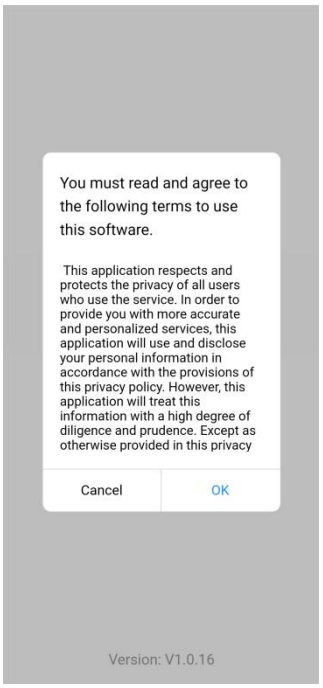
3.3.2.1 Download and Installation

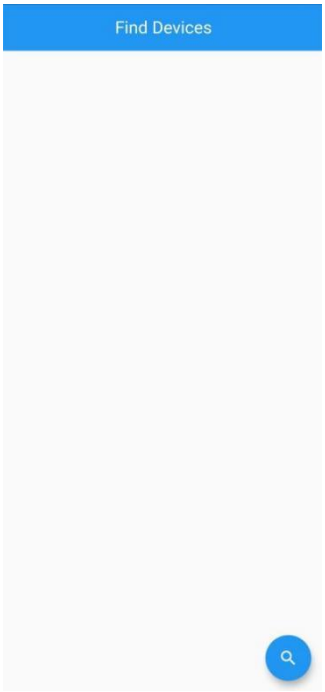
(1) Turn on the phone and ensure that the Bluetooth and location information are turned on, and the network is connected.

(2) Open web page https://neucir-portal.oymotion.com, click **“Download and Install (Android)”** on Android phones, and click **“Download and Install (IOS)”** on Apple phones to download the APP, as shown in the following figure:



(3) And install the APP, run the APP, enter the startup page, display the APP version number, wait for 2-3 seconds, and then pop up the privacy terms window. After reading, click **"OK"** to enter the APP **"Find Devices"** page.

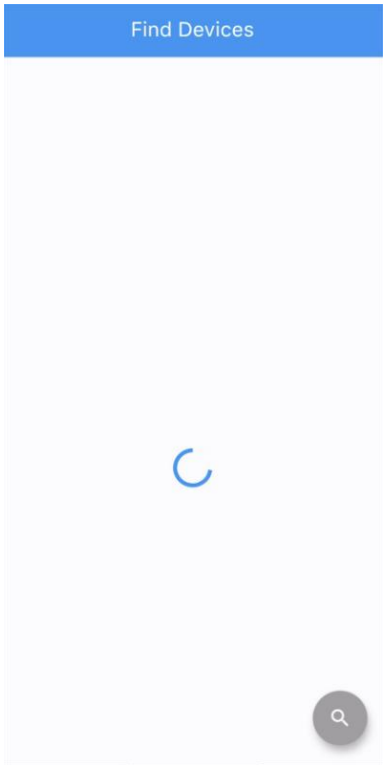


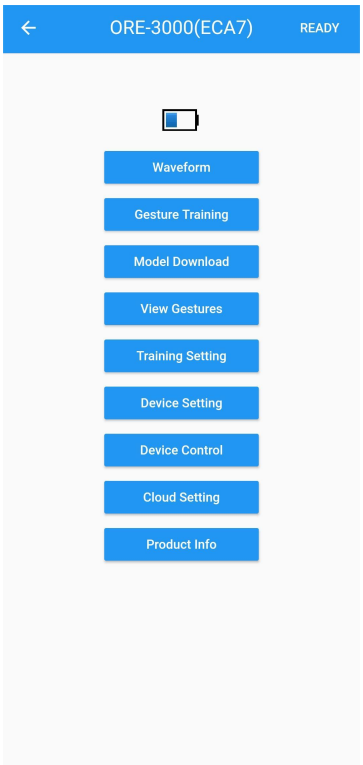


3.3.2.2 Connecting Devices

(1) Press and hold the " ⏻ " button of the upper limb intelligent exoskeleton training device for 2 seconds, and then release it to turn on the device.

(2) Click on the search icon in the bottom right corner of the **"Find Devices"** page of the APP, find the relevant device in the device list, and click the **"CONNECT"** button on the right to connect. Registered devices will be displayed on the main page of the **NeuCir APP**, while unregistered devices will need to input an activation code to activate.





⚠ Cautions

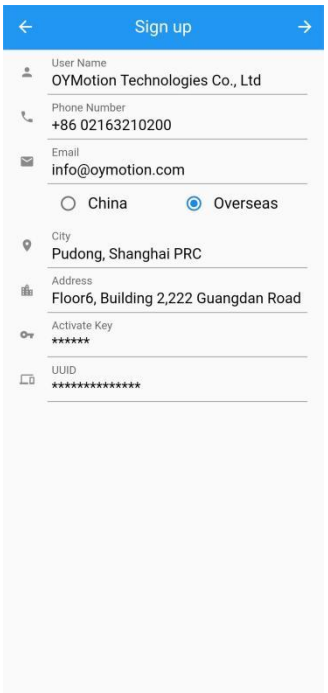
The activation code is distributed along with the ORE-3000 upper limb intelligent exoskeleton training device or obtained through email.

3.3.2.3 Registering Products

If your phone or tablet is connected to the ORE-3000 upper limb intelligent exoskeleton training device for the first time, you need to register first. The activation steps are as follows:

（1）Enter the activation code and click the **"OK"** button.

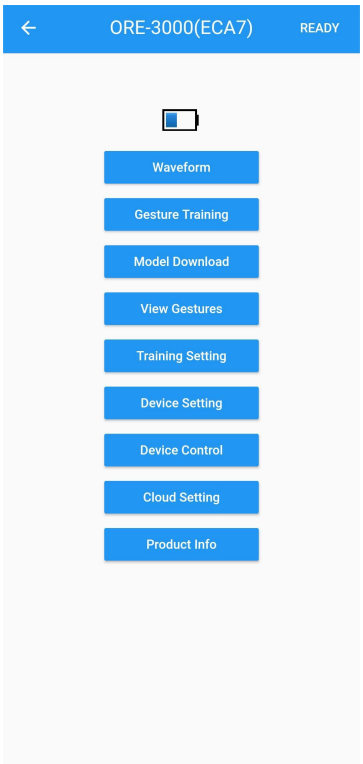
（2）Enter your correct information on the registration page, and then click the arrow in the upper right corner to register.



⚠Cautions

Please ensure the accurate of the registration information in order to get better technical support in the future.

（3）After successful registration, the APP will redirect to the **NeuCir App** homepage, as shown in the following figure:



3.3.2.4 Firmware Upgrade (Normal Mode)

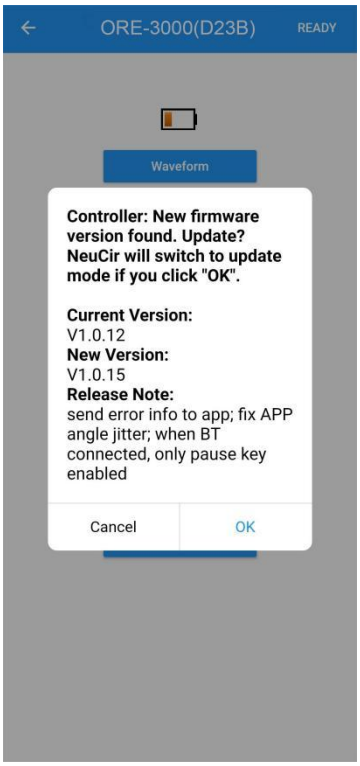
The ORE-3000 Upper Limb Intelligent Exoskeleton Training Device includes a control board. If a new version is detected to be available, there will be corresponding upgrade prompts. Please carefully review the prompts.

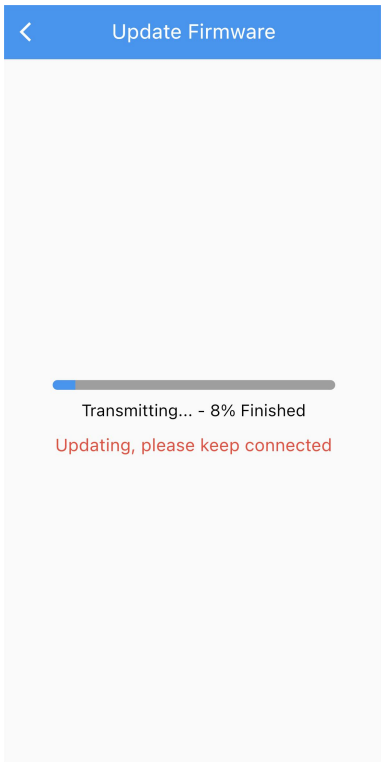
If the ORE-3000 upper limb intelligent exoskeleton training device displays a prompt box for upgrading the control board when entering the device homepage, indicating that a new version of firmware is available for upgrade. Users can click **"OK"** to upgrade, and click **"Cancel"** to remind again the next time they connect to the device.

⚠Cautions

Please ensure upper limb intelligent exoskeleton training device and phone or tablet have sufficient power, and then click **"OK"** to upgrade.

（1） Click **"OK"** to start the upgrade, and the APP prompt message is shown in the following figure:

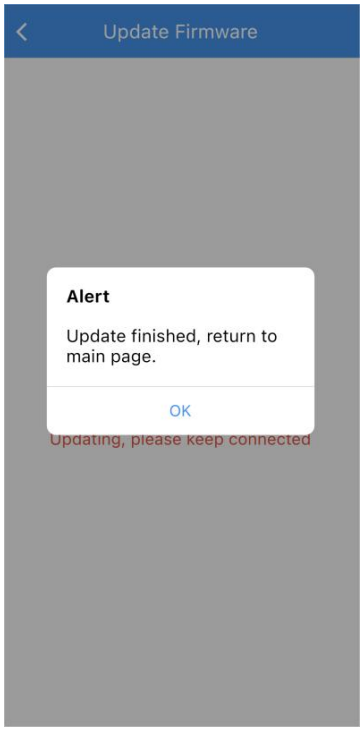




⚠Cautions

After clicking **"OK"**, the upgrade cannot be cancelled.

The device will restart and enter upgrade mode. After the device is connected, the APP will enter the upgrade page. After the upgrade is completed, the APP will return to the homepage. Please search and connect the device again.



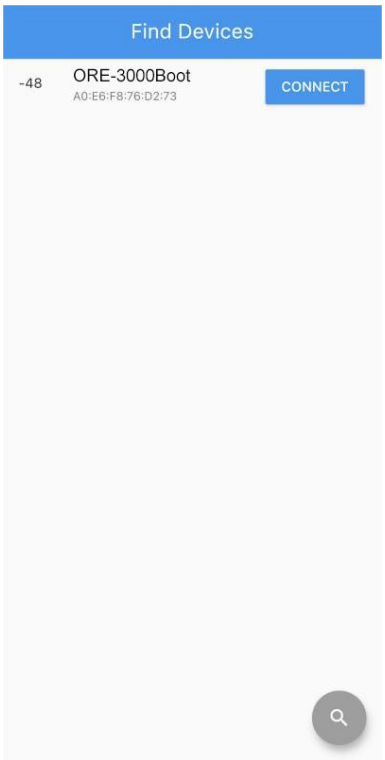
⚠ Cautions

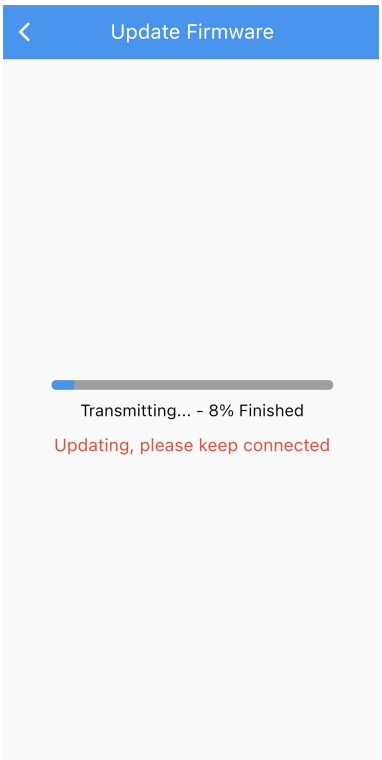
Before upgrading, please ensure that the ORE-3000 upper limb intelligent exoskeleton training device and mobile phone have sufficient power. During the upgrade process, there should be no abnormal situations such as automatic phone power off or Bluetooth power off. If there are abnormal situations such as the ORE-3000 exoskeleton being unable to connect, please manually restart the ORE-3000 upper limb intelligent exoskeleton training device.

3.3.2.5 Firmware Upgrade (BOOT Mode)

If the firmware upgrade of the upper limb intelligent exoskeleton training device fails unexpectedly, the device will automatically enter BOOT mode, and a new upgrade is required at this time.

Click on the search icon in the bottom right corner, find the device named **"ORE-3000Boot"** in the device list, and click the **"CONNECT"** button on the right to upgrade again. As shown in the following figure:



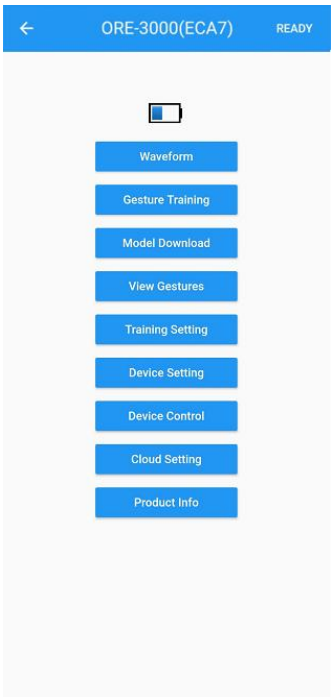


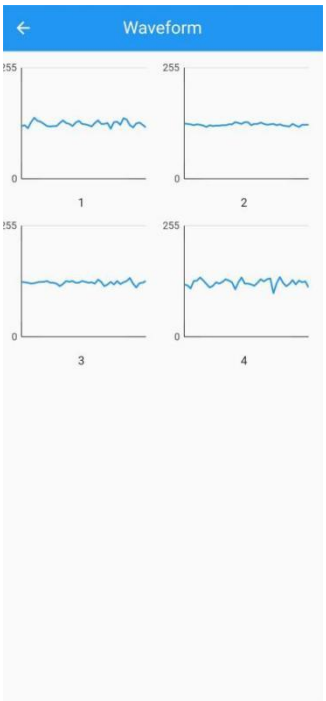
⚠ Cautions

Before upgrading, please ensure that the ORE-3000 upper limb intelligent exoskeleton training device and mobile phone have sufficient power. During the upgrade process, there should be no abnormal situations such as automatic phone power off or Bluetooth power off.

3.3.2.6 Waveform

Click the **"Waveform"** button on the homepage to enter the Waveform page. As shown in the following figure:





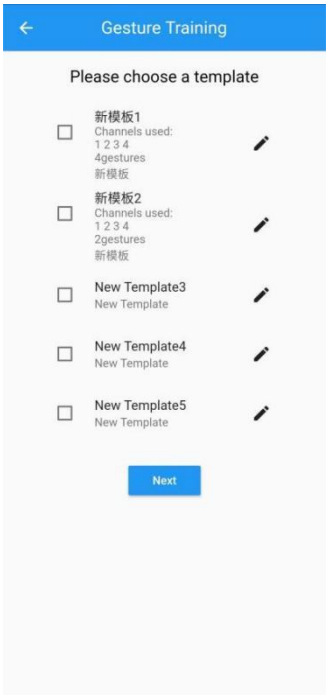
(1) This function displays real-time waveforms of various EMG signals, making it easy for users to check data transmission, check sensor connection quality, detect signal interference, etc.

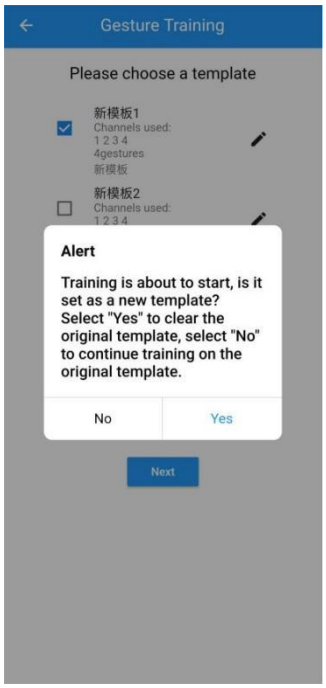
(2) When wearing, users should pay attention to checking whether the sensor has fallen off: when the sensor falls off, the waveform shows a large amplitude of full grid oscillation up and down.

(3) After wearing, the user drives the muscles and makes different gesture movements to check if there are any visible differences in the waveform.

3.3.2.7 Gesture Training

Click on the **"Gesture Training"** button on the homepage to enter the Gesture Training page.





（1）The **NeuCir App** allows each ORE-3000 upper limb intelligent exoskeleton training device to set up to 5 templates. Users can adjust the number of sensor channels, the type and sequence of trained gesture actions, and the number of trained gesture actions on different templates according to their own needs.

（2）If there are training data on the selected template already, a prompt window will pop up to remind the user whether to clear the training data in the template. If **"No"** is selected, gesture training and model generation will be performed based on the previously saved data overlaid with the current saved data. If you select **"Yes"**, a secondary confirmation prompt window will pop up to let the user confirm the deletion of the previous training data again, and if the user confirms the deletion again, the user needs to set the number of channels and the number of gesture training again.

⚠ Cautions

The device wearing method of each template and the user's training gesture action type must be strictly consistent, otherwise it may lead to training failure or incorrect recognition of gestures.

（3）Click **"Next"**, select the channel to be trained and the number and time of training gestures. At least two gestures need to be trained.

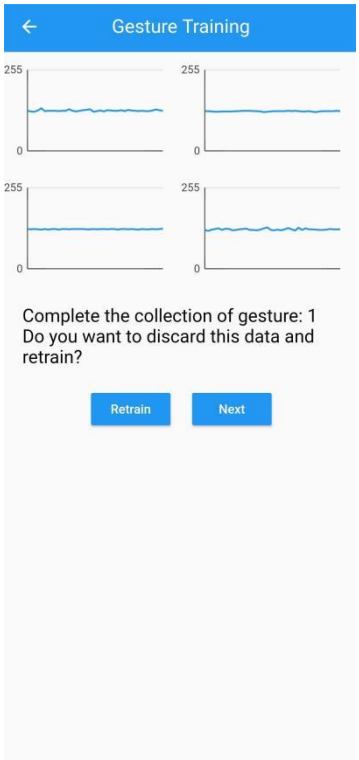
（4）After completing the selection, click **"Next"** to enter the training preparation page. When there are no abnormalities in the waveform, click **"Start"** to collect sensor data for the first gesture action. Train in the order of **"Relax—Make Gesture—Relax—Make Gesture"**. Please ensure the consistency of the actions. After keeping each action for about 2 seconds, relax for another 2 seconds. After 30 seconds, finish the data collection for that action. If you need to abandon the current data collection, You can click the **"Stop"** button to resume data collection for this action according to the prompts. When relaxing, the user should naturally relax and should not exert any force, otherwise it will affect the quality of the data.

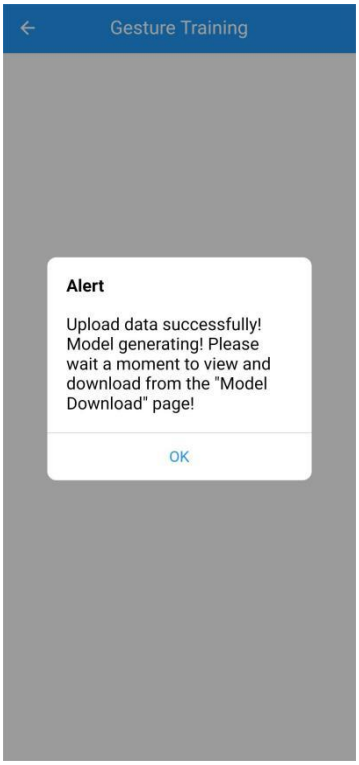
（5）After the current action collection is completed, click **“Next”** to proceed with the data collection of the next action. If you want to abandon the data collected this time, you can click **“Retrain”**. After completing the setting number of gesture action data collection in sequence, click **“Next”** and the APP will upload the training data to the cloud server for gesture AI model training generation. After successful upload, the APP will display a **“Upload Data Successfully”** prompt window. After the user clicks **“OK”**, they will return to the homepage and click **“Model Download”** to view the model generation status.

（6）When generating a model, the template cannot be retrained. If the user needs to retrain, they need to wait for the previous round of data generation to complete.

⚠ Cautions

There is very little data input for 30s for single gesture action training, and the accuracy of the generated gesture model is poor. Users need to conduct multiple overlapping training under the same template to increase the amount of data and improve the accuracy.

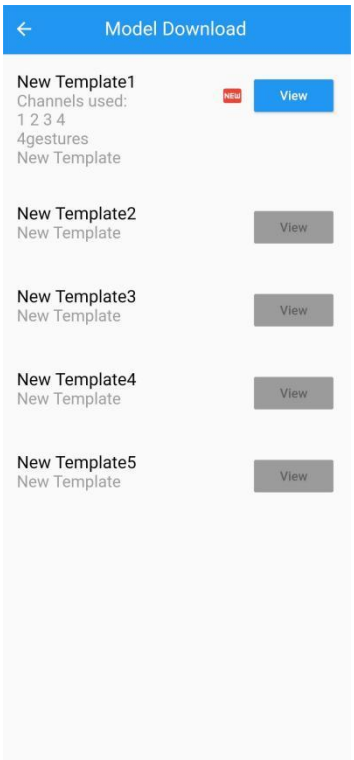


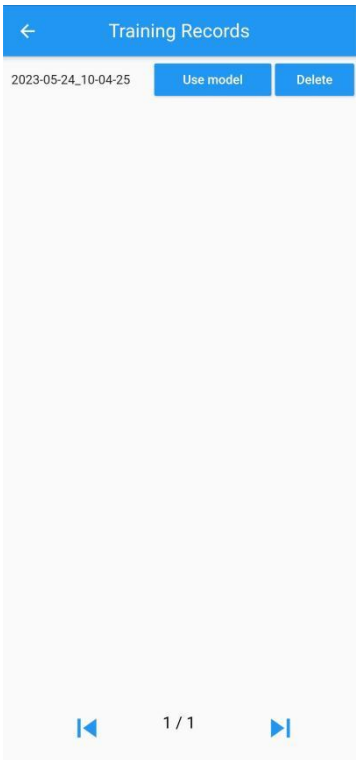


3.3.2.8 Model Download

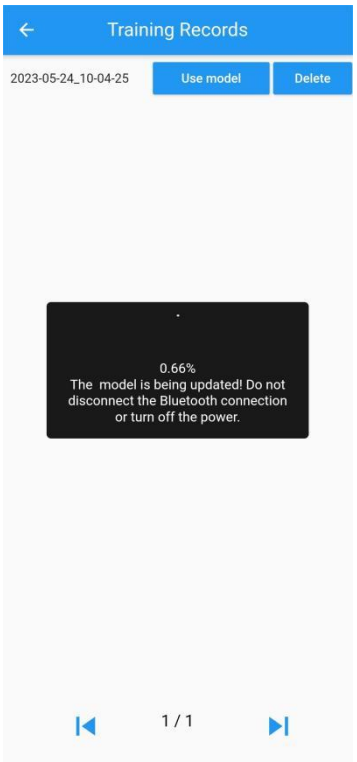
（1）Click on the **“Model Download”** button on the main page to enter the **“Model Download”** page.

（2）The new model takes about 2 minutes to complete generation, during which a prompt **“Training”** will be displayed. After the new model is successfully trained, a red **“NEW”** will appear on the right side of the corresponding template. Click **“View”** to view the training records.





（3）Click on the **"Use model"** button to apply the training results. During the model download process, please ensure that the device has sufficient power and stable Bluetooth connection. Click **"OK"** to download the model to the device, wait for the model to load to 100%, and it will be completed. The device will automatically restart and disconnect the Bluetooth connection from the APP and return to the search page.

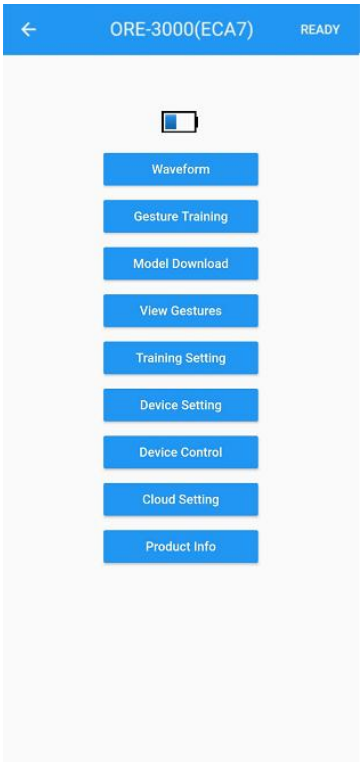


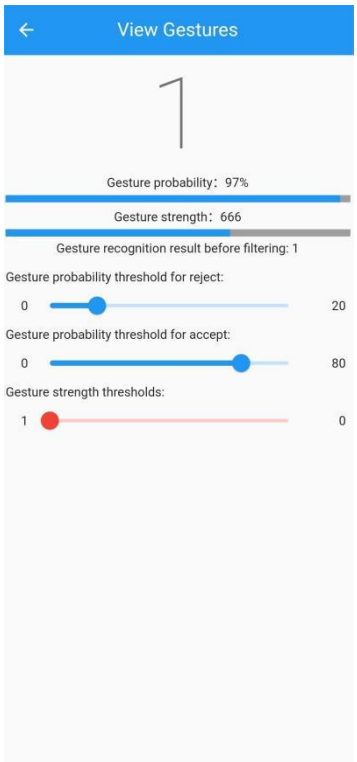
3.3.2.9 View Gestures

（1）After the model is downloaded, click the **"View Gestures"** button on the homepage to enter the view gestures page for gesture recognition check and threshold adjustment.

（2）The user performs trained gesture actions, and the corresponding gesture number will be displayed at the top of the page, indicating that the training was successful. The APP provides two thresholds for adjustment, **"Gesture probability threshold for reject"** and **"Gesture probality threshold for accept"** respectively.

（3）When the strength of the EMG signal is too small, it is generally judged as an interference signal. When making gesture movements, you can check their **"strength"** value and choose to adjust the corresponding number of **"Gesture strength thresholds"** to about 1/2-2/3 of the **"Gesture strength"** value. If the EMG signal strength exceeds this threshold, the action signal is considered valid. Multiple gestures can be made for adjustment and verification to achieve the best experience effect.

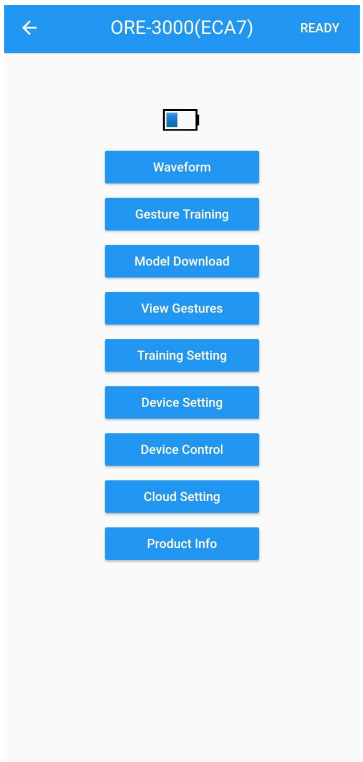


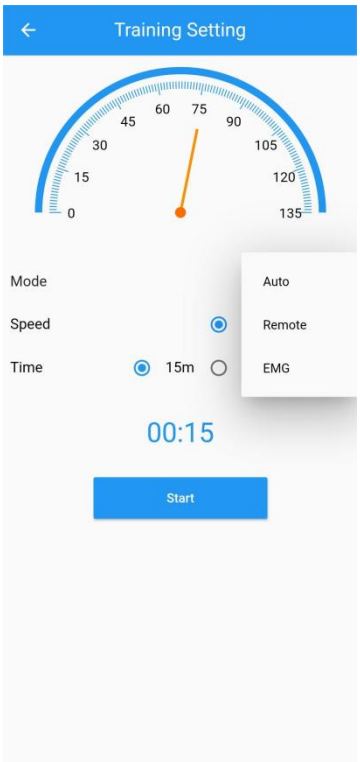


3.3.2.10 Training Setting

（1）Click the **"Training Setting"** button on the homepage to enter the Training Setting page.

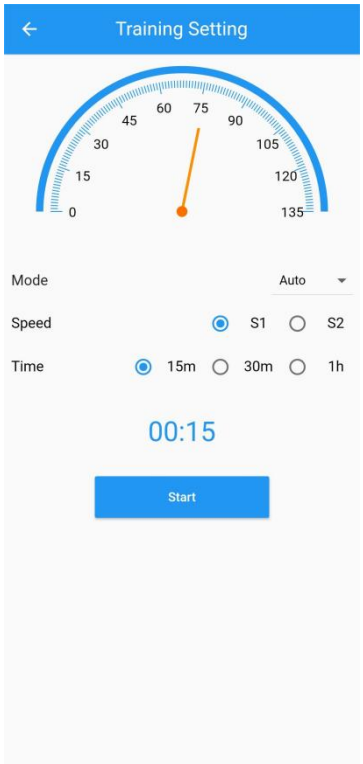
（2）The scale indicated by the pointer on the dial is the current angle of the device, the blue part represents the range of angles that the device operates during the training process, and the gray part represents the angles that the device cannot reach.

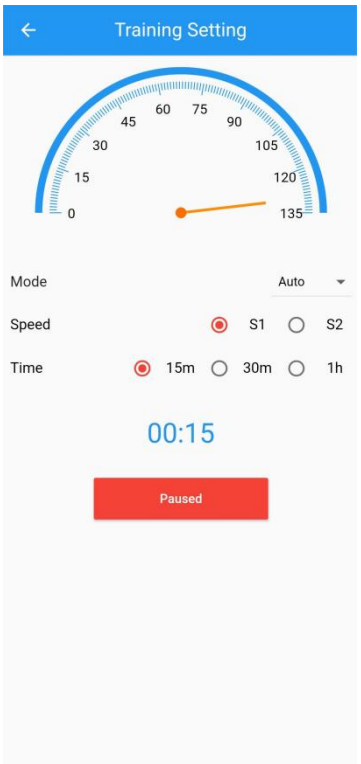




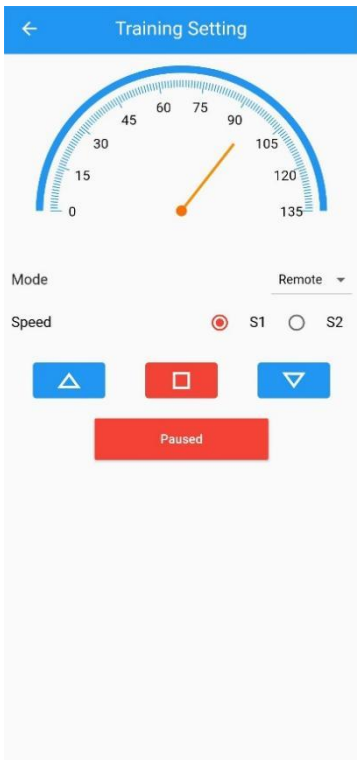
（3）There are three modes for the device, namely automatic mode, remote control mode, and EMG mode. Users can click on the dropdown box and select corresponding mode according to their own needs.

（4）In automatic mode, the user can adjust the speed and time of device movement. After clicking **“Start”**, the pointer on the page will rotate according to the user's selected speed and enter the countdown based on the selected duration. After pausing, the countdown will not reset. The user can practice again based on the previous settings. Only when the user reselects the speed or time will the countdown be reset according to the user's selected duration.

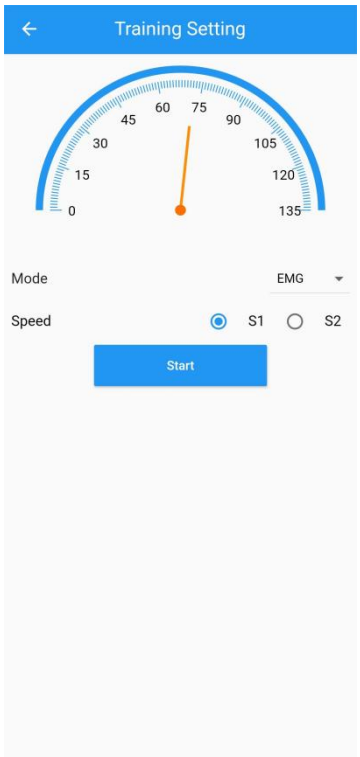


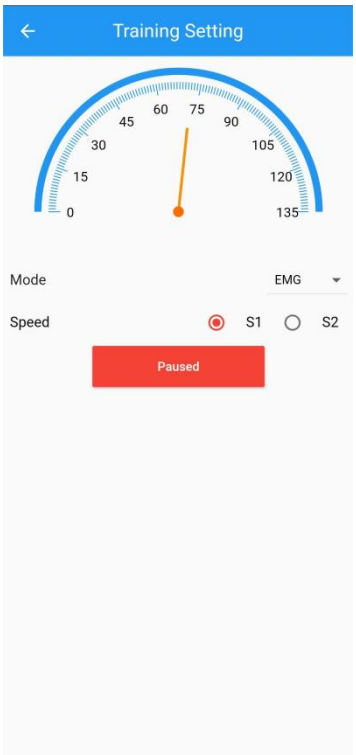


（5）In remote control mode, the user can only adjust the speed of the device's movement. When the action start, the “△” 、 “▽” and “□” buttons will appear on the page. If press “△”, the device will engage in elbow bending motion. Similarly, if you continue to press “▽”, the device will engage in elbow stretching motion. If press “□”, the device will pause.



（6）In EMG mode, users can adjust the speed of device movement, make training gestures, and control the device to perform elbow extension or bending movements.





⚠ Cautions

The device cannot modify its mode and parameters while it is in startup status. If modifications are needed, please pause the device.

3.3.2.11 Device Setting

（1）Click the **“Device Setting”** button on the homepage to enter the Device Setting page, and then click **“Control Setting”** to enter the control setting page.

（2）Gesture hold time refers to the time that a certain gesture needs to be maintained. If the duration is lower than this set time, it is not considered that the gesture has been made. Users can click on the minimum duration of the gesture and enter a value of 0-5000 to modify it. The recommended minimum duration for initial use is 200 milliseconds (ms). If users feel that the device delay is too long, they can modify a smaller number, such as 50 milliseconds (ms).

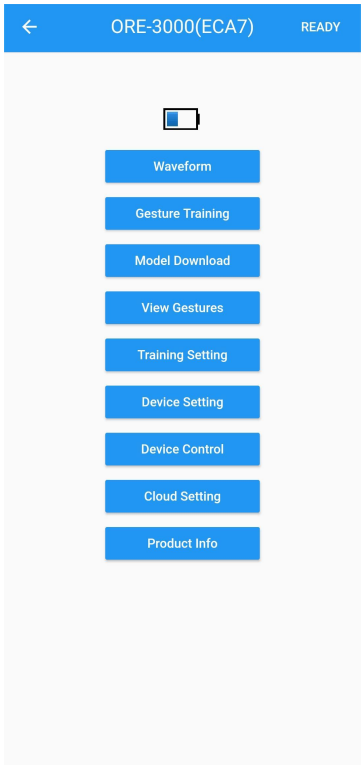
（3）Minimum angle: The user clicks on the minimum angle and enters values ranging from 0 to 120 to modify it.

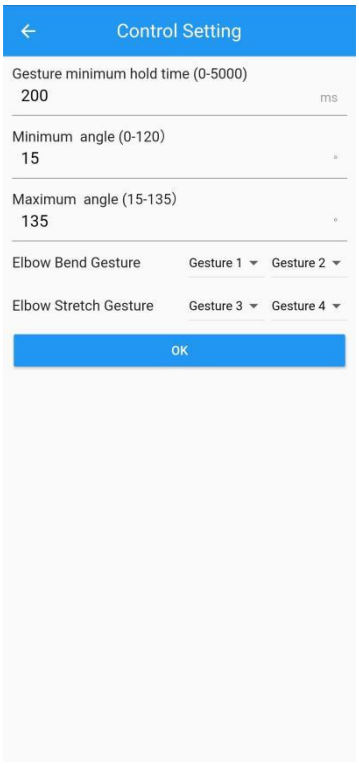
（4）Maximum angle: The user clicks on the maximum angle and enters values ranging from 15 to 135 to modify it.

（5）Elbow bend Gesture: Users can click on the two drop-down boxes on the right and select the two gestures as elbow bend gestures. The default value is none.

（6）Elbow Stretch Gesture: Users can click on the two drop-down boxes on the right and select the two gestures as the elbow stretch gesture. The default value is none.

（7）After the modifications are completed, click the **“OK”** button to save.





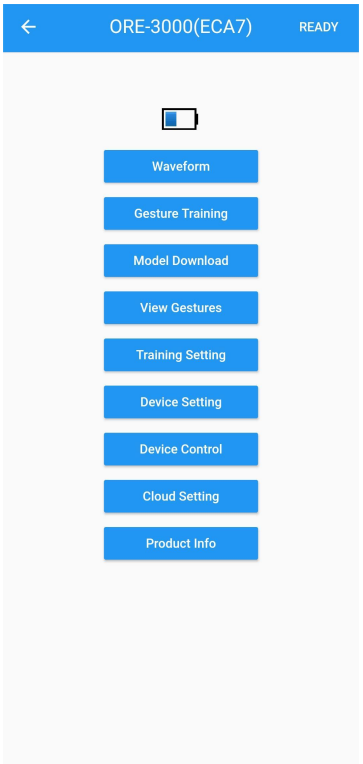
⚠ Cautions

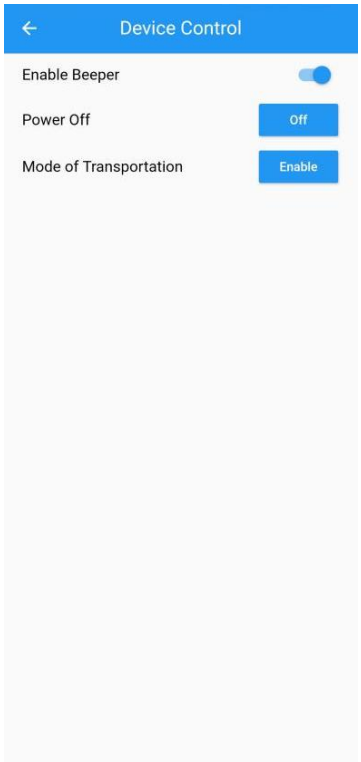
After the model download is completed, the mapping gesture needs to be set in advance before switching to EMG mode to control the device.

3.3.2.12 Device Control

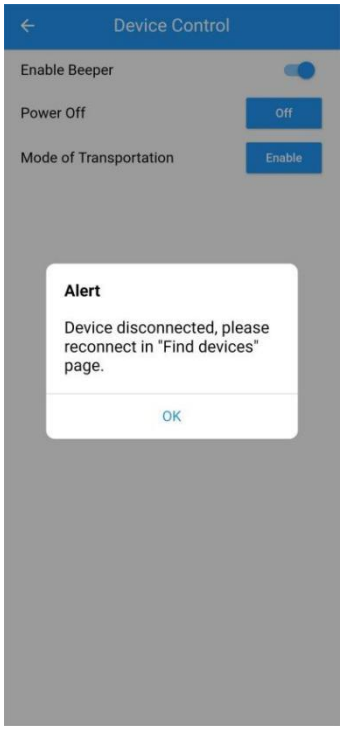
（1）Click on the **“Device Control”** button to enter the **“Device Control”** page.

（2）Click on the **“Enable Beeper”** indicates that the device's beeper is turned on when it is blue, and off when it is gray.

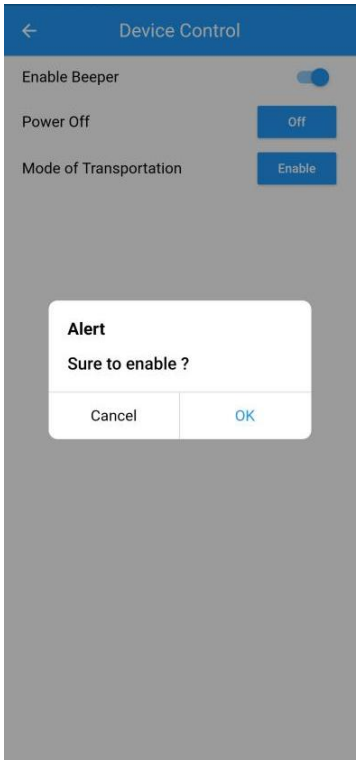


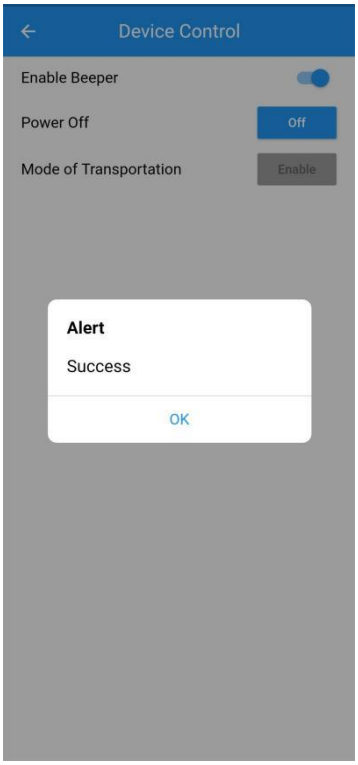


（3）Click the **“Power Off”** button, a confirmation prompt window will pop up. If the user clicks **“OK”**, the device will automatically power off. The APP will prompt **“Device disconnected, please reconnect in ‘Find devices’ page”**.



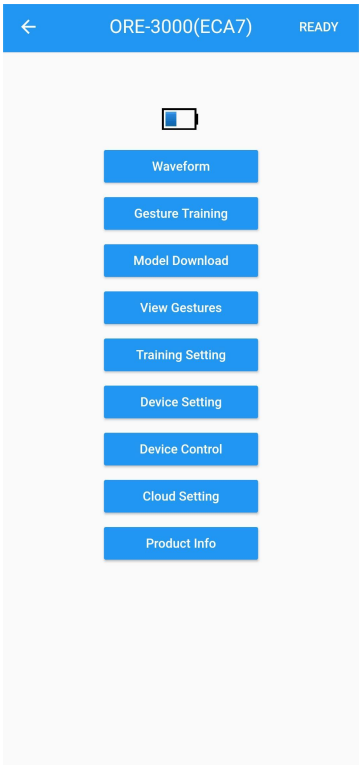
（4）Click the **"Enable"** button and the APP will pop up a confirmation prompt window. If the user clicks **"OK"**, the device will automatically rotate to 90 degrees. When the device rotates to 90 degrees, the APP will pop up a successful prompt window, which can be loaded into the packaging box.

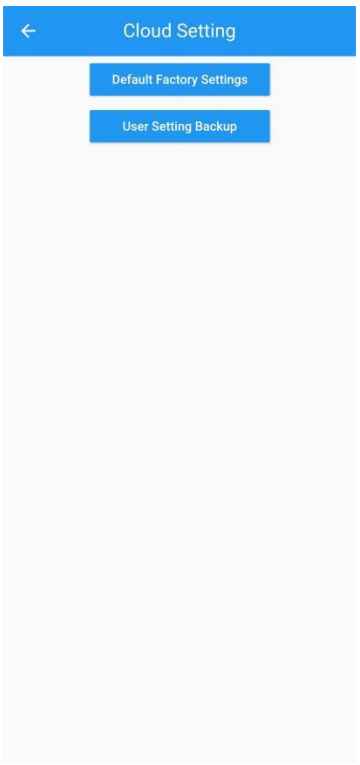




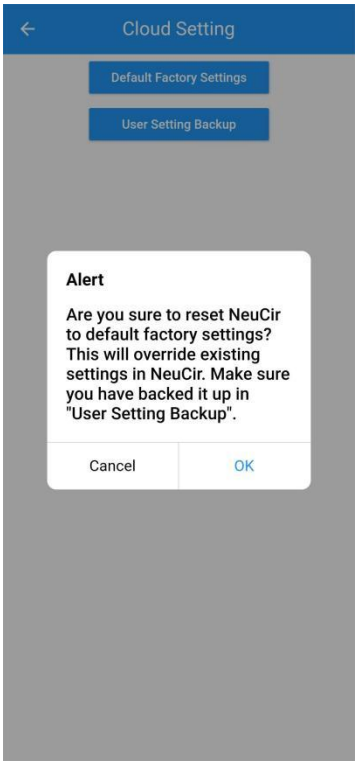
3.3.2.13 Cloud Setting

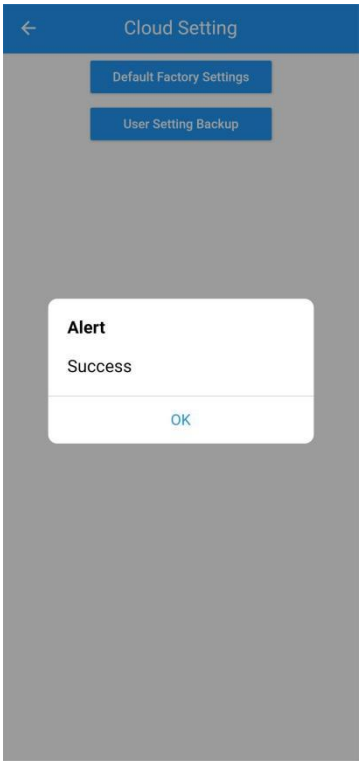
（1）Click on the **"Cloud Setting"** button to enter the cloud setting page.



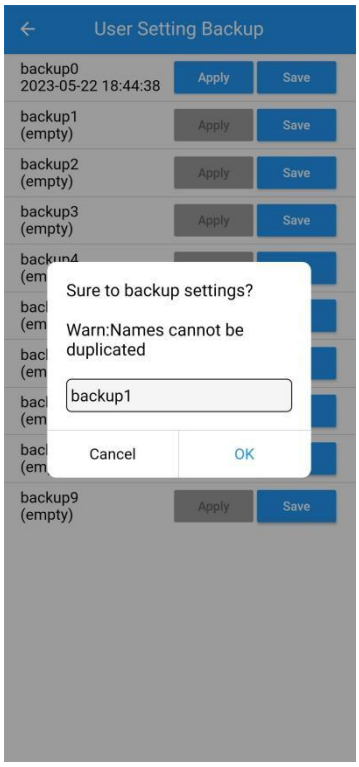


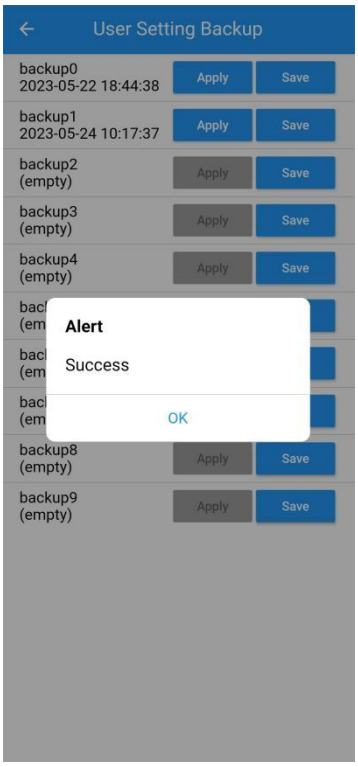
（2）Click **"Default Factory Settings"** to pop up a confirmation prompt window. Click **"OK"** to successfully set the settings and a success prompt window will pop up.



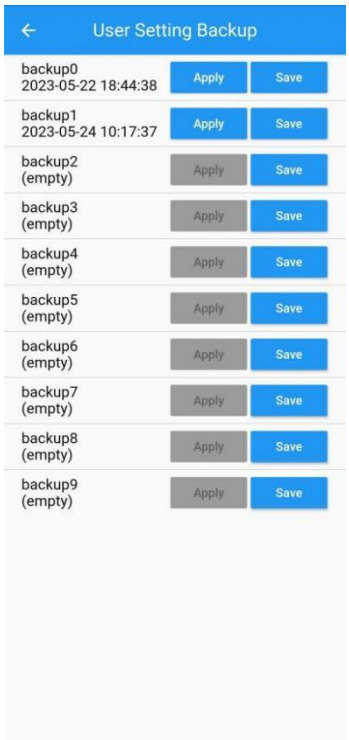


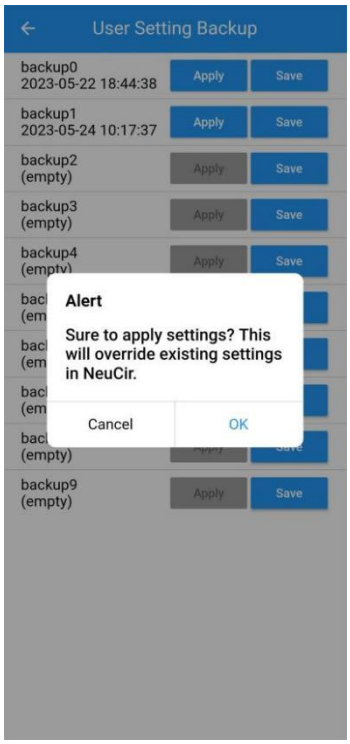
（3）Click the **"User Setting backup"** button to enter the user setting backup page. The APP allows users to save a total of 10 sets of device control parameter settings records. Click the **"Save"** button on the right to save the currently set parameters to the cloud. Users can modify the name in the pop-up window for future differentiation. After editing the name, click **"OK"** to save it.





(4) For the saved parameter setting records, click the **"Apply"** button on the right, and the APP will prompt **"Sure to apply the settings? This will override existing settings in NeuCir.".** Click **"OK"**, and the APP will download this set of data from the cloud and write it to the device. This operation will override the existing parameter settings and restart the device. Please use it with caution.

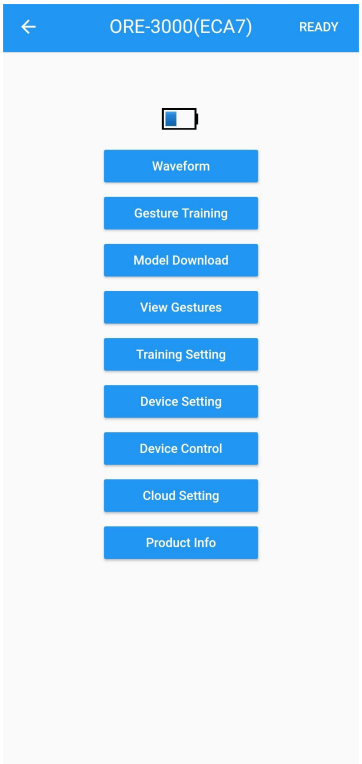


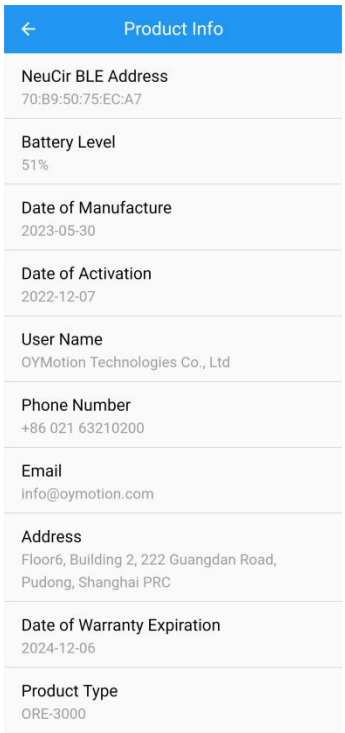


3.3.2.14 Product Info

(1) Click the **"Product Info"** button on the homepage to enter the product info page.

(2) This page displays the relevant information and user information of the ORE-3000 upper limb intelligent exoskeleton training device, as shown in the following figure:





Chapter IV Device List

Number	Name	Model / Specification	Quantity	Unit
1	Device	ORE -3000-L-M ORE -3000-R-M ORE-3000-L-L ORE-3000-R-L	1	set
2	Power adapter	/	1	pcs
3	USB cable	Length: 1m	1	pcs
4	Shoulder strap	/	1	bale
5	User manual	/	1	pcs
6	Certificate	/	1	pcs
7	Warranty card	/	1	pcs

Chapter Ⅴ Common faults and troubleshooting methods

The following lists the common faults, cause analysis and treatment methods of the upper limb intelligent exoskeleton training device. If users still cannot follow this method, or need more technical support, please call OYMotion Technologies Co., Ltd..

⚠ Cautions

When the upper limb intelligent exoskeleton training device is abnormal, it should be stopped immediately. If there is smoke, coke smell, etc., continue to use may have the risk of fire, electric shock.

Except for the maintenance personnel of the company and the maintenance personnel authorized by the company, no other personnel can dismantle, unload, modify or repair the upper limb intelligent exoskeleton training device. If there is any violation, the company will make the company unable to carry out normal warranty for the upper limb intelligent exoskeleton training device.The Company will not be liable for personnel injury, fire and electric shock.

Number	Common fault	Analysis of causes	Processing method
1	Cannot startup normally	Long press “ ⏻ ” for less than 2 seconds	Release the “ ⏻ ” button when the power indicator light is on
		Battery power is insufficient	Charge the device in time
2	Wrong Angle range	The angle range is pre-set.	Use the APP to adjust the minimum and maximum angle of the device
3	The APP cannot connect to the device.	The device has been connected by an NeuCir App on any other phone or tablet	Connect again after starting the device
4	The power indicator light flashes in a 2-second cycle	The device has been started, usually for the Bluetooth part of the software error	Connect again after starting the device
5	The charging indicator light is not on	Fast charging is not supported	Please use the company-supplied power adapter
		The power adapter is not being properly used	Check the power adapter for proper use
		The power supply adapter is damaged	Replace the power supply adapter
		Battery exceeds its service life	Please replace the battery
6	The charging	Battery exceeds its service	Please replace the battery

	indicator light flashes	life	
7	Only the control panel power indicator light flashes	Press and hold the “ ⏻ ” button after 10s	Press the “ ⏻ ” button above 3s or press the red “STOP” button to power off
		Firmware upgrade failed	Press the “ ⏻ ” button for 3s or press the red “STOP” button to power off, restart, upgrade through the APP

⚠ Cautions

If the above operation instructions still cannot solve the fault, please stop the operation and contact OYMotion Technologies Co., Ltd..

Chapter VI Maintenance and Repair

6.1 Maintenance

Device operators or managers must perform regular maintenance of the components of the upper limb intelligent exoskeleton training device.

6.1.1 Regular maintenance

(1) Wipe the dust from the device with a clean, soft, slightly damp cloth regularly (weekly or if necessary).

(2) When the battery power is too low, please use the power adapter to charge the device in time.

6.1.2 Regular inspection

Regularly check that the device is not stained, damage or corrosion, and the label is not damaged;

⚠ Cautions

- The maintenance of this device must be performed by the experienced professionals.
- Before cleaning and maintenance, confirm that the device is disconnected.
- All parts and accessories of the device must be maintained and repaired regularly (at least once half a year).
- The components of this equipment do not need to be replaced regularly during the service life.

6.1.3 Clean and disinfect

If there is pollution, it should be cleaned in time and after disinfection. To avoid long-term damage to the product, we recommend disinfection only if necessary. The specific cleaning and disinfection methods are described as follows:

Cleaning method is as follows:

Clean device surfaces, especially when contaminated with corrosive chemicals. After soaking the soft cloth in water mixed with neutral detergent, clean the shell and surface of the device, especially the parts in contact with the patient. Finally, use a soft cloth soaked in clean water to remove the surface attached detergent.

Disinfection method is as follows:

It is recommended to soak a clean dry gauze with 70% (volume ratio) isoprol alcohol disinfectant, and then wipe the disinfected surface with the gauze for 3 minutes. Then dry the residual disinfectant with a clean, dry cloth.

⚠ Cautions

- Always power off the device before cleaning, otherwise it may cause electric shock hazard or abnormal system function.
- Do not use volatile liquids, such as diluents or gasoline, which can melt or crack the device.
- Avoid washing. The power charging interface is in contact with water and disinfectant.
- Improper disinfection or too frequent disinfection can shorten the service life of the equipment.
- After cleaning, place the equipment in a cool and dry place to avoid direct sunlight and fully dry the equipment parts.

6.2 Repair

After purchasing the upper limb intelligent exoskeleton training device, please fill in the warranty card and send it to OYMotion Technologies Co., Ltd..

⚠ Cautions

Warranty with the purchase of the upper limb intelligent exoskeleton training device invoice and warranty card.

⚠ Cautions

Warranty period: 1 year.

⚠ Cautions

Warranty scale:

(1) Quality problems of the company's products;

(2) Limited to the equipment host, excluding accessories and other consumables that need to be replaced regularly;

(3) During the warranty period, if the damage caused by human factors cannot be damaged according to the warranty regulations, the maintenance fee shall be charged; After the warranty period, please contact OYMotion Technologies Co., Ltd directly to provide service guarantee;

(4) Maintenance of upper limb intelligent exoskeleton training device needs to contact with OYMotion Technologies Co., Ltd., do not repair without authorization, where the disassembly, the company can not repair in accordance with the warranty regulations.

(5) The replacement of components may lead to the upper limb intelligent exoskeleton training device does not meet the basic safety and performance requirements. Do not replace components without authorization. The replacement of components should be carried out by professionals of OYMotion Technologies Co., Ltd..

Chapter VII Product after-sales Service

7.1 Free service

The warranty period of the hardware products of the ORE-3000 upper limb intelligent exoskeleton training device is 1 year. If any quality problem occurs within 1 year from the date of sale, the company will be responsible for solving the maintenance of accessories and equipment performance. The obligations under this commitment do not include other expenses such as freight. No free service for direct, indirect or eventual damage and delay caused by:

⚠ Cautions

This commitment does not apply to the following situations:

- Damage caused by improper use of human reasons, such as wrong connection, change, private maintenance;
- Damage caused by accidents, such as object extrusion, liquid immersion, etc.;
- Damage caused by earthquake, flood, fire, lightning strike, and chemical corrosion;
- Damage caused by unauthorized upgrade, addition, and deletion operations;
- Other damage resulting from the unintended use.

7.2 Parts replacement instructions

When there is any problem with the accessories of the upper limb intelligent exoskeleton training device and the consumables that need to be replaced regularly, please contact OYMotion Technologies Co., Ltd. for paid replacement.

7.3 Waste disposal

This product shall not be treated together with the conventional waste. The user has the responsibility to deliver the waste equipment to the designated waste electrical and electronic equipment recycling point.

Separate collection and recycling of waste equipment at disposal will help protect natural resources and ensure recycling in a manner that protects human health and the environment.

Equipment exceeding the service period or scrapped equipment shall be treated in accordance with local laws and regulations and other relevant provisions.

Chapter Ⅷ FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC. Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. such modifications could void the user's authority to operate the equipment.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

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