gForceDual™ Neuro Rehab System

User Guide

OYMotion Technologies Co., Ltd

www.oymotion.com

Contents

1. Preface

Dear users, thank you for purchasing gForceDual™ Neuro Rehab System from OYMotion Technologies Co., Ltd. To further understand this product, please read this user guide carefully.

2. Product Introduction

OYMotion gForceDual™ Neuro Rehab System is a wearable device designed to carry out specialized muscle active rehabilitation training. The gForceDual™ comes equipped with two highly sensitive sEMG sensors, a nine-axis motion sensor, a vibrator, a rechargeable lithium battery, and Bluetooth BLE4.2 wireless communication. The gForceDual™ uses disposable electrodes to monitor user's muscle activity in real time. Through BLE communication, user interacts with rehabilitation games running on Android mobile, tablet or smart TV. These rehabilitation games give user guidance, feedback, and evaluation to better help user.

3. Models

OYM-REH-D001A；OYM-REH-D001B

4. Model Description

Model	Product Name	Description
OYM-REH-D001A	gForceDual™ Neuro Rehab System	Electrode Cable Length: 200mm
OYM-REH-D001B	gForceDual™ Neuro Rehab System	Electrode Cable Length: 350mm

5. Scope of Application

The gForceDual™ system is designed for users with upper limb dysfunction caused by cerebrovascular accident, brain trauma or nerve system diseases. This system can be used for users who are recovering from upper limb surgery too.

With the virtual interactive rehabilitation games, user can complete repetitive and task-oriented rehabilitation training. It helps booster the body's rate of recovery, increase muscle fiber recovery, muscle endurance, range motion in the joints, and coordination and

flexibility of upper limbs. Moreover, the training will promote the remodeling of the central and peripheral nerve functions and correct the pathological movement pattern caused by hemiplegia.

6. Product and Packaging

The gForceDual™ Neuro Rehab System is composed of the gForceDual™ 2-channel wireless electromyograph wrist band, disposable electrodes, USB Type-A charging cable, and the downloadable Rehabilitation Game App.

Wrist Band

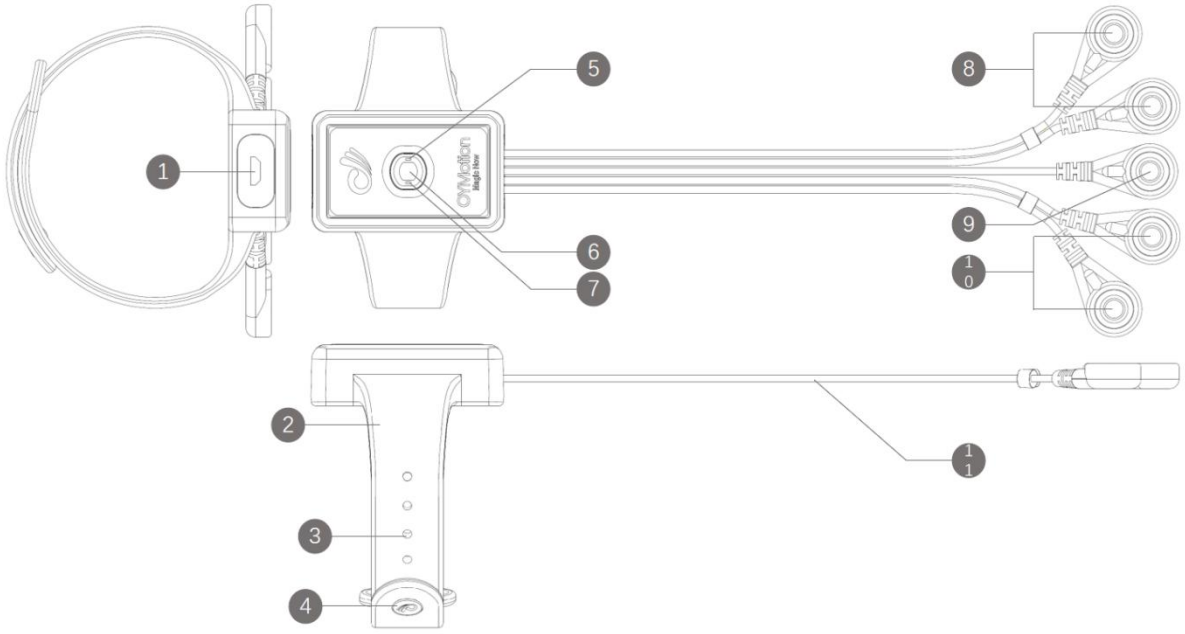
Disposable Electrodes

Charging Cable

7. Product Component Introduction

7.1. gForceDual™ 2-Channel Wireless Electromyograph Wrist Band

7.1.1. Product Diagram



1- USB Charging Port
2- Silicone Band
3- Buckle Holes
4- Buckle
5- Red LED Charging Indicator
6- Multifunction Button
7- Green LED Status Indicator
8- Channel-1 EMG Differential Electrode Snap Button
9 – Reference Level Electrode Snap Button
10- Channel-2 EMG Differential Electrode Snap Button
11- Snap Button Electrode Cable

7.1.2. Size and Weight

Parameter	Value
Maximum inner diameter of Wrist Band	72 mm
Length of main module	51 mm
Width of main module	32 mm
Thickness of main module	16 mm
Length of Electrode Cable	200 mm / 350 mm
Weight	59 g / 65 g

7.2. Disposable Electrode

The disposable electrode is composed of metal snap, Ag/AgCl low impedance conductive gel, PE foam tape or cloth tape with medical hypoallergenic adhesive, PET anti-sticking film.

Users can adopt disposable ECG electrode with metal snap diameter of 3.7-3.8mm.

Front (adhesive side)

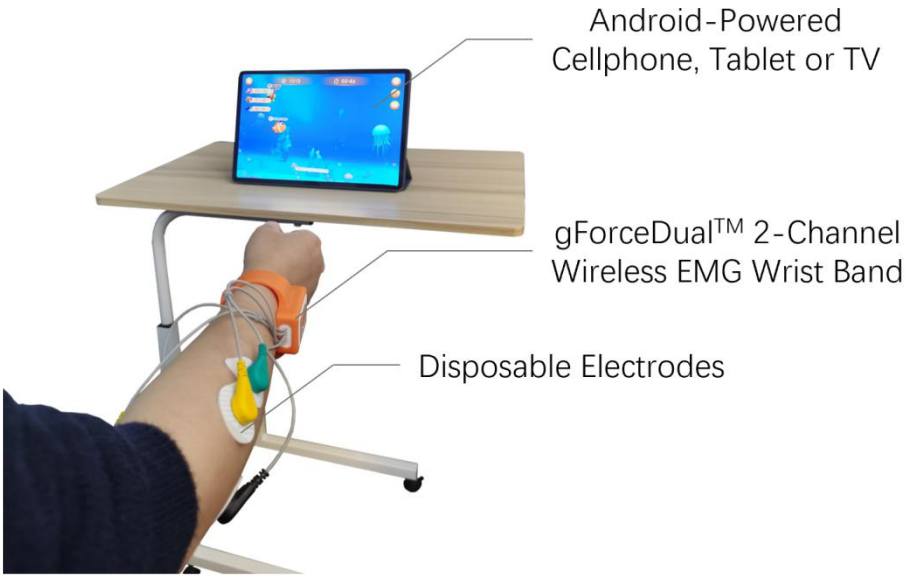
Back (metal snap side)

7.3. Rehabilitation Game App

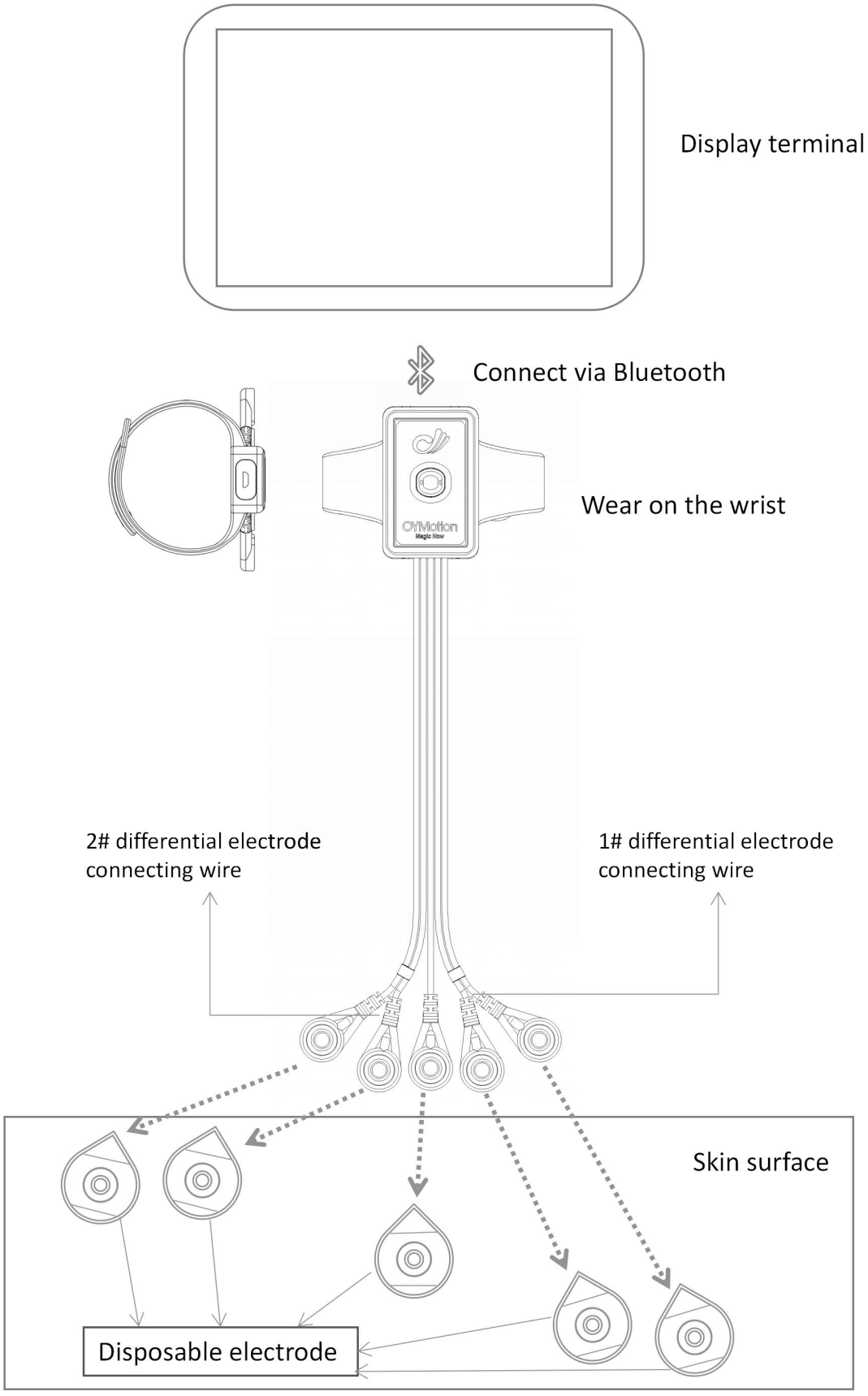
The Rehabilitation Game App is developed by OYMotion Technologies Co., Ltd to work with gForceDual™ wrist band. The app can be installed on Android-powered mobile, tablet or smart TV with BLE support. The gForceDual™ wrist band communicates with the games through BLE. Multiple rehabilitation games are provided to help users to recover with repetitive, fun, and task.

Please refer to the corresponding user guide for detailed introductions of the Rehabilitation Game App.

8. System Connection



gForceDual™ worn on right arm for flexor / extensor training



gForceDual™ Rehab System Connection Diagram

9. Operation Instructions

9.1. Use of disposable electrodes: The gForceDual™ has 5 connecting wires: 2 pairs (adjacent green and yellow snaps makes one pair) of EMG differential wires and a single reference level output wire (black snap and in middle). Connect the disposable electrodes to the wires through the snaps. Each pair of electrodes need to stick on the skin of the interested muscle, be close to each other and along the direction of muscle contraction. The reference level output electrode with the black snap should stick on a bony area where muscle activity is relatively low.

9.2. EMG raw data: The gForceDual™ is mainly used to monitor contractions of two muscles of the arm through the two differential pairs of EMG sensor. It is usually used to monitor two opposite muscles, such as flexor and extensor muscles in the forearm, or bicep and tricep muscles in the upper arm.

9.3. Powering on: When the gForceDual™ wrist band device is turned off, press the switch button for 1 second to turn the device on, after, a green LED below the button flashes at a frequency of 1Hz. There's a short vibration as well to indicate successful powering on. The devices will then wait for a BLE connection. Once the device establishes a BLE connection with the Rehab Game App the green LED stays on. Once data or commands start to transmit the green LED flashes faster at a frequency of 2Hz.

9.4. Entering firmware upgrade mode: To enter firmware upgrade mode press the button for 15 seconds or until the green indicator light flashes 5 times rapidly first then flashes slowly. This indicates that the gForceDual™ wrist band switches to firmware upgrade mode, the BLE device name changes to gForceDual-BOOT. Entering this mode is only recommended if the device's firmware is damaged or the device is not working as expected. Upon entering this mode, the user can force a firmware upgrade on the device through the "gForce App". When upgrade finishes, power off the device and on the next power on cycle the device returns to normal work mode.

9.5. Powering off: When the gForceDual™ wrist band is turned on, press the button for 5 seconds and release to turn the device off. The green LED will flash 3 times if the internal IMU sensor is automatically calibrated successfully during use or otherwise the device will just turn off.

9.6. Charging: To charge the gForceDual™ wrist band connect the device via the USB interface. When charging, the red LED turns on. Once charging finishes the red LED turns off.

10. Specifications

Main index	Parameters
Communication mode	● Low Power Bluetooth BLE4.2
Communication Distance	● 10 meters
Power Consumption	● 0.1W
Battery	● 160mAh/3.7V Li-ion
Power Input	● Micro-USB 5V
Vibrator	● Built-in
Wrist Band	● Material: Silicone Rubber ● Length: 243 mm ● Maximum Diameter: 72 mm
Device Main Module	● Material: Plastic ● Color: White ● Button Color: Orange ● Dimension: 51 x 32 x 16 mm ● Electrode Cable Length: 20 cm / 35 cm ● Snap Color: Yellow/Green/Black/Yellow/Green
EMG sensor	● Sensor Channels: 2 ● Electrode: Disposable Electrode ● Amplifier Gain: 13000 times
Motion Sensor	● 9-Axis IMU Sensor

11. Precautions

11.1. Users should properly do some warm-up before and after the training, to avoid muscle injury.

11.2. At any time during training if user feels an increase in muscle tension, STOP training immediately and begin stretching to reduce tension. Once user feels better training can be resumed.

11.3. The duration and intensity of training should be specific to the user's situation. In general, training can be performed several times a day and it is recommended to train three times, in the morning, at noon, and at night. The duration of each session should be determined according to the user's needs. The user should not feel tired after each session.

11.4. The system needs to be used with the supporting Rehab Games App which runs on Android-powered devices.

11.5. The system can be used indoor and outdoor in normal environments. It should not be used in humid, wet, and electrostatic environments as the device can be damaged.

11.6. The electrodes are disposable and should only be used according to its instructions. Users can purchase disposable ECG electrode with metal snap diameter of 3.7-3.8mm to use.

11.7. Use with caution if user is allergic to the disposable electrodes. It is recommended to avoid skins with scar or wound.

11.8. The electrodes should be used as soon as possible after unsealed to guarantee a good connection. DO NOT USE electrodes if the conductive adhesive has dried up or can't tightly stick to skin.

11.9. Follow local regulations on disposing the electrodes.

12. Packing List

gForceDual™ 2-Channel Wireless Electromyograph Wrist Band	×1
Disposable Electrode	×10
Charging Cable	x 1
Instruction Booklet	×1

Warranty Card	×1

13. Contact US

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REV. V1.0.1

FCC Statement：

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

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.

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

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.