gForce EMG Armband

User Manual

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Contents

1. Trademarks & Patents

gForce^{TM} is a registered trademark of OYmotion Technology Co., Ltd. (hereinafter referred to as OYmotion). gForce^{TM} EMG Armband is registered and produced by OYmotion Technology Co., Ltd. with the patent owned by the company. Without the written permission of OYmotion Technology Co., Ltd., no other group or individual,may reproduce and disseminate any part of this document in any form or by any means (including electronic, physical, etc.) for any purpose.

2. About gForce^{TM} EMG Armband

gForce^{TM} EMG Armband has built-in 8-Channel high sensitive EMG sensors, 9-axis motion sensor, Buetooth BLE4.2 and other modules. It allows users to directly access the original data of EMG and motion sensors, and supports otrain gesture training platform, and can add 8 kinds of user-defined gesture movement analysis.

3. Applicable product model

OYM-GF-P001 , OYM-GF-B001 , OYM-GF-R001 ; OYM-GFD-001

4. Product model description

Model	Name	Description
OYM-GF-P001	gForce Rehab Training Armband	Green shell, professional version, can transmit original EMG data
OYM-GF-B001	gForce Rehab Training Armband	Black shell, basic version, unable to transmit original EMG data
OYM-GF-R001	gForce Rehab Training Armband	Orange shell, encrypted version, can transmit encrypted EMG data
OYM-GFD-001	gForce Dongle	Bluetooth data transceiver, used with gforce EMG Armband

5. Product structure and dimensions

5.1. gForce EMG Armband's hardware composition
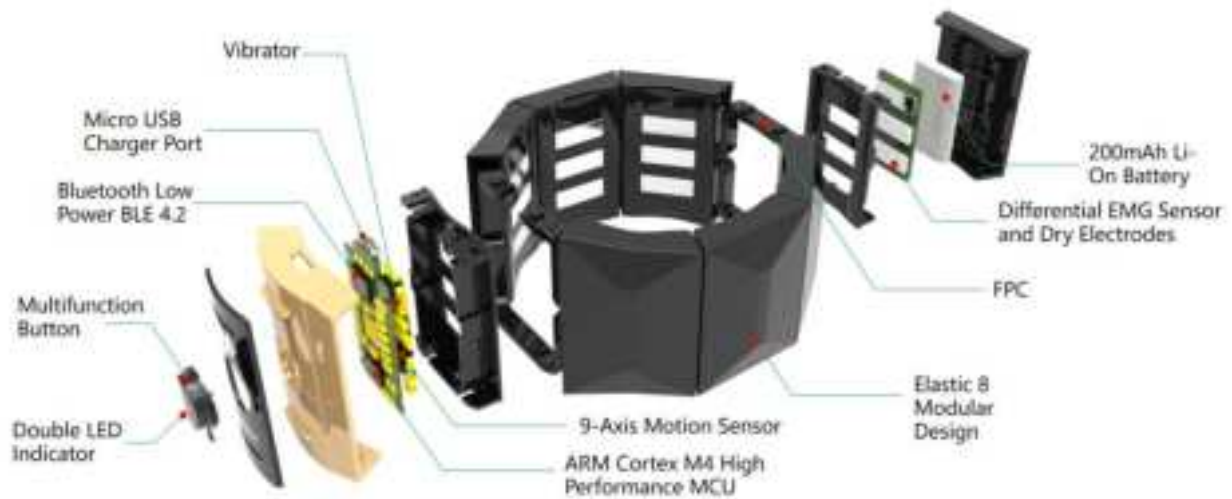
5.2. gForce EMG Armband's size and weight

Measurement Index	Measurement Value
Internal diameter	65-90 mm
Height	40 mm
Thickness	10 mm
Weight	about 80 g

5.3. gForce Dongle

Gforce Dongle is a USB Bluetooth data transceiver used with gforce EMG Armband.

Measurement Index	Measurement Value
Length	35 mm
Width	20 mm
Thickness	8 mm
Weight	About 3.5 g

6. System description and instructions

6.1. gForce support platform

Support Platform	Notes
 Win 7/ win8 / win10	● SDK for Windows ● Unity3D SDK ● Need to be used with USB2BLE gForce Dongle
 Android	● With original Bluetooth BLE 4.0 and above ● Android Unity3D SDK
 MCU	● SDK for Arduino/STM32 ● Arduino、STM32 ● Need to be used with UART2BLE gForce-Joint (Contact the manufacturer for purchase additionally)

6.2. gForce OTrain gesture training platform

6.2.1. Otrain gesture training platform is based on hybrid development concept and adopts C / S architecture. The internal tools of the platform include web server, data collection service, machine learning engine and interface display service.

6.2.2. The personal gesture training, modeling and uploading of gforce EMG Armband can be completed through the guidance of OTrain platform to achieve personalized gesture customization. gForce can work offline after gesture training.

gForce | gForce Dongle (USB2BLE) | OTrain

6.3. gForce and Arduino development board (additional purchase required)

gForce Joint acts as a Bluetooth Center and can automatically establish a connection with gForce Pro Armband through Bluetooth BLE for data transmission. gForce Pro sends the recognized gesture index and quaternion values to gForce Joint. gForce Joint forwards the received gesture index and quaternion values to the next level through its COM port (TX). Arduino receives gesture index and quaternion values from gForce Joint through its COM port (Rx) .

gForce   gForce Joint   Arduino
                  (UART2BLE Adapter)

6.4. Key points of using gForce Pro Armband

6.4.1. When using gForce Armband, it should be close to the skin and worn in the middle of forearm.

6.4.2. In the power OFF state, press the switch button gently, the armband starts, the green indicator light is on, and it flashes slowly; in the power ON state, press the switch button lightly, and set the gyroscope as the current direction.

6.4.3. In the power ON state, long press the switch button for five seconds to release, the armband is closed, and the green indicator light is off.

6.4.4. When charging the armband, the red charging indicator light is on; when charging is completed, the indicator light is off.

6.4.5. When connecting the armband to OTrain, try to be as close to Dongle as possible. When the green indicator light flashes, it indicates that the connection is successful.

6.4.6. In the process of training gestures in OTrain platform, when switching from one gesture to another, the green light is always on, indicating that the new gesture training mode has been entered, and the training can be started.

6.4.7. When making gestures, gestures need to be performed when the user's arm muscles are relaxed.

7. gForce technical parameters

Main indicators	Specific parameters
Communication mode	Low power Bluetooth BLE4.2 standard
Communication distance	10m

Power waste	0.1W
Battery	200mAh
Power input	USB 5V
Gesture classification	8 kinds
Gesture definition	Support customization
Original EMG data	• Support real-time output of original EMG data • Sampling rate: 1000Hz（max） • ADC：8bit • Channel: 8 channels • Gain: 1000 times • Filtering: 20 ~ 500Hz hardware band-pass filtering circuit
Quaternion / Euler angle / Rotation matrix	• Support quaternion / Euler angle / rotation matrix output • Sampling rate: 50Hz
Software support	• SDK For Windows • SDK For Android • SDK For Arduinio/STM32 • Unity3D /C# SDK for Windows • OTrain EMG gesture training App • Open source oym8chwave EMG waveform display and data acquisition app + source • gForce App for Android

8. Packing list

8.1. gForce Pro EMG armband：1pcs

8.2. gForce Dongle：1pcs

8.3. User manual：1pcs

9. Contact information

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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.

RF warning for Portable device:

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