

# Gait<sup>up</sup>

Movement analysis and measurement



User Manual and Specifications

Patent WO2012/007855 A1

## Introduction

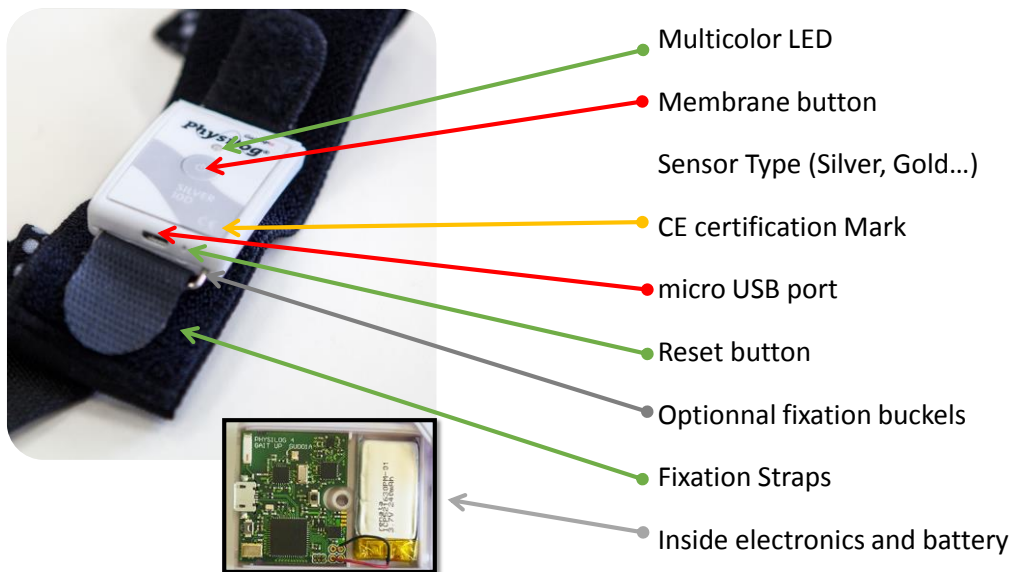
Thank you for purchasing our Physilog® system, the world's thinnest 10D wearable sensor.

Gait Up's goal is to provide you with a user-friendly setup to measure movement accurately in sports and clinics. We hope you will enjoy working with your Physilog® sensors, and we welcome your suggestions for future improvement.

# Table of contents

1. Physilog® 4
2. Recording with Physilog®
3. Charging and Data Transfer
4. Important Remarks
5. Handling & Warnings
6. Troubleshoot
7. Product Specifications
8. FCC Notifications
9. Limited Warranty & Support Policy
10. Contact Information

**Physilog® 4**



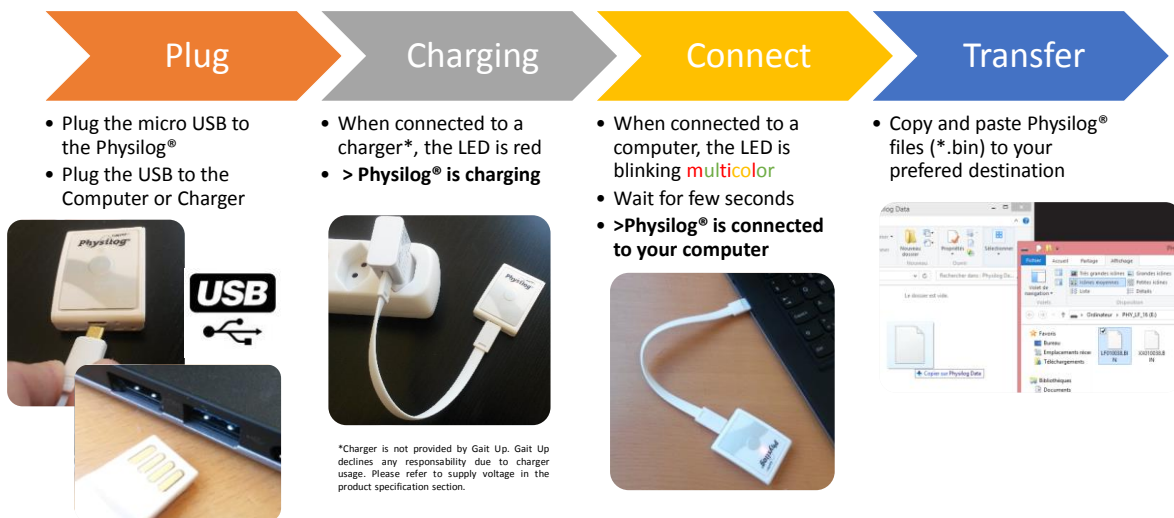
www.gaitup.com © 2014

# Recording with **Physilog®**



© 2013, Gait Up Sàrl. [www.gaitup.com](http://www.gaitup.com)

## Charging and Data Transfer



© 2013, Gait Up Sàrl. [www.gaitup.com](http://www.gaitup.com)

## Important Remarks

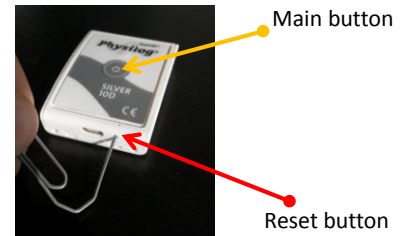
- Sensors can be placed in any orientation, it will not influence measurements
- Make sure Physilog® are fully charged (LED off while plugged) before doing measurements.
- Make sure to know which «.bin» file corresponds to which trial for your analysis – Last digits of file name are automatically incremented. Note that date of file generation (recorded between one start and stop of the Physilog®) is visible in the XLS file.
- Make sure to plug the USB cable in the right way: contact pins should be centered

## Handling & Warnings

- Sensors do not need yearly recalibration.
- Cleaning: Sensors can be cleaned gently using alcohol wipes. Caution: Do not put any liquid nearby the micro USB port. Excess of liquid may damage the sensor. Straps can be washed in a washing-machine.
- Storage: Store in a cool (0°C – 30°C) and dry place. The provided wallet is the perfect place for your sensor.
- Physilog®4 should be handled carefully. In particular, they should not receive shocks, such as fall, crushing, being hit, ...
- !! Warning: Physilog® includes a lithium battery. This battery may only be charged over a limited temperature range. Never attempt to dock or charge your Physilog® when the temperature is outside the range of 0 to 45°C.
- !! Warning: the sensor is not waterproof.

# Troubleshoot

1. First, Visit FAQ on the website:  
<http://www.gaitup.com/2013/12/support/>
2. If Physilog® is not working properly, please do a simple reset:  
Press the hole button once. LED blinks **ORANGE**, then **RED**
3. If Physilog® is really not working, please do a master reset:  
Maintain the hole button, then maintain main button, release hole button, and once LED has stopped blinking, release main button. LED blinks **ORANGE 3 times**  
*Warning: this operation formats the device and data stored on the Physilog® will be lost*
4. If you still have a problem, email it to: [contact@gaitup.com](mailto:contact@gaitup.com),  
Please indicate Physilog®'s number and attach problematic .bin files if any



# Product Specifications

Hardware Characteristics	
Dimensions	50 x 38 x 9.2 mm with anatomical curved shape
Weight	19 grams (with battery)
Fixation	Double side Velcro or optional buckles with elastic straps
Material	ABS plastic (same as LEGO®)
Internal Storage	Removable Micro SD Card. Typically 4Gb
Battery	Renata Rechargeable Lithium Ion Polymer, battery life ~21 hours (with 10D sensors at 200Hz)
Button	Start/stop membrane switch with dual-color LED
Operating temperature	-20°C to +60°C
Supply voltage	4.2 V – min: 125mA max:250mA
Port	Micro-USB for charging and data transfer

# Product Specifications

Sensor Characteristics	
3D Accelerometers	3D Accelerometers: Invensense MPU 6000, triple-axis MEMS accelerometer with a programmable full-scale range of $\pm 2g$ , $\pm 4g$ , $\pm 8g$ and $\pm 16g$ , 16-bit ADCs
3D Gyroscopes	Invensense MPU 6000, triple-axis MEMS angular rate sensors (gyroscopes) with a programmable full-scale range of $\pm 250$ , $\pm 500$ , $\pm 1000$ , and $\pm 2000^\circ/\text{sec}$ , 16-bit ADCs
3D Magnetometer	Freescall MAG3110 3-axis magnetometer. Full-scale range $\pm 1000 \mu\text{T}$ , Sensitivity of $0.10 \mu\text{T}$ , Noise down to $0.25 \mu\text{T rms}$
1D Barometer	Measurement Specialties MS5611-01BA03 Barometric Pressure Sensor, altitude accuracy of $\sim 10 \text{ cm}$
Sampling rate	Programmable from 100 to 2000 Hz
Calibration	Performed at Gait Up prior to delivery

# Product Specifications

Wireless Characteristics	
Wireless Synchronisation:	Nordic Semiconductor nRF24L01+ Single Chip 2.4GHz Transceiver, up to 16 Physilogs.
Real-time data transfer*	ST Bluetooth® technology SPBT2632C2A class-2 module

\* optionnal

Certifications	
Certifications	CE – FCC
RoHS	Compliant

Format and Softwares	
File Format	.Bin XLS or CSV format after processing through Gait Up software
Software	Gait Up Software, MATLAB, Octave
Gait Up Software	Available both for Mac & PC

## FCC Notifications

- *This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.*
- *This device complies with FCC radiation exposure limits set forth for general population. This device must not be co-located or operating in conjunction with any other antenna or transmitter.*
- *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 Notifications

*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 instruction, 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 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 circuit different from that to which the receiver is connected*
- *Consult the dealer or an experienced radio/TV technician for help*

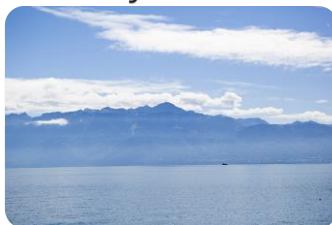
# Limited Warranty & Support Policy

## Warranty:

- Gait Up offers 12 months parts and labor on Physilog® starting from the date of shipping. If within one year from the date of delivery to the customer the equipment does not comply with the foregoing Limited warranty, Gait Up will at Gait Up's option, repair, replace or refund the purchase price of the defective equipment free of charge to the customer. Customers requesting repair, replacement or refund are required to ship the Physilog® to Gait Up. As a condition of this warranty, customers must contact Gait Up's customer service for instructions on and approval of shipment prior to returning any defective Physilog®. The warranty shall not apply to any product or component thereof which has been repaired or altered by anyone other than Gait Up in any manner so as, in Gait Up's judgment, to affect its service ability, or any product been subject to alteration, accident, misuse, abuse, neglect or abnormal wear. Gait up warrants solely to the original purchaser (customer). Only the terms expressed in this warranty shall apply and no distributor, corporation or individual is authorized to amend, modify or extend this warranty in any way.
- Gait Up shall have no liability for any consequential, incidental or special damages by reason of any act or omission or arising out of or in connection with the equipment or its rental, delivery, installation, maintenance, operation, performance or use, including without limitation any loss of use, lost revenue, lost profits or a cost associated with downtime. The obligation contained in this paragraph continue beyond the term of this limited warranty.
- Physilog® and Gait Analysis Software are not considered as proper Medical Devices, since they do not support directly diagnosis, but they provide data which have to be analysed and approved by medical doctors for them to make their diagnosis. Reclamations regarding medical devices will not be considered.

## Support Policy:

- Support does not include:
  - support for 3rd party hardware, software, mailing lists or web content
  - writing or debugging customer applications and deployments
  - detailed explanations of the engineering principles behind our software and hardware
  - support for systemic problems beyond the scope of the actual Physilog® and existing systems software (IT issues, computer operation)
  - support for customers whose conduct fails to meet professional standards
- Occasionally we engage in more interactive support or consulting. Interactive support is a customer courtesy and provided at our discretion. It does not invalidate the support policy described above. There is no guarantee of performance, timeliness, or establishment of a continuous support relationship. Consulting is subject to acceptance of a formal statement of work.



At Gait Up, we welcome your feedback and questions.

Please contact us at: Avenue d'Ouchy, 17  
CH-1006 Lausanne  
Switzerland

tel: +41 79 101 1990  
mail: [contact@gaitup.com](mailto:contact@gaitup.com)