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1. SafetyInformation

1.1 Warnings and precautions

Symbol	Meaning
	A WARNING statement provides important information about a potentially hazardous situation that, if not avoided, could result in serious injury or death
	A CAUTION statement provides important information about a potentially hazardous situation that, if not avoided, may result in minor or moderate injury to the user or damage to any equipment connected
	Manufacturer name and address
	Manufacturing date
	CE Mark
	Swiss Made Software
	Consulting instruction for use
	Follow the instructions for use
	Unique Device Identification
	Device article number
	Serial number
	WEEE Compliance Logo: the electronic device will not be disposed of through common waste means, and follow local regulations regarding electronic devices recycling
	Pressure: accepted pressure transport range within which the transport package shall be stored and handled

	Temperature: accepted transport temperature range within which the transport package shall be stored and handled
	Humidity: accepted humidity transport range within which the transport package shall be stored and handled
	Lithium battery handling label
IPXX	IP classification: the device is protected from ingress by particles greater than 12 milimeters and protected from water spray less than 15 degrees from vertical
	Non-ionizing radiation/RF
	Electrical safety Class I, during recharge Class II, during use, internal
	Not made with natural latex rubber
FCC	Certification mark: Certifies that the radio equipment device is compliant with the Federal Communications Commission's (FCC) standards and regulations
IC	Industry Canada Certification mark: certifies that the radio equipment device is compliant with Innovation, Science, and Economic Development (ISED) Canada technical regulations and standards

Warnings	
	USAGE WITH CHILDREN Do not leave children unattended with the device (risk of chewing the device).
	KEEP OUT OF REACH OF PETS Keep Physilog out of the reach of pets and most particularly dogs. A dog crushing Physilog can generate battery fire or explosion

ENVIRONMENTAL WARNINGS

- Physilog is not designed for use in areas where an explosion hazard may occur. An explosion hazard may result from the use of flammable anesthetics, oxygen-rich environments, skin cleansing agents and disinfectants
- Do not overheat Physilog. Do not place it close to a fireplace or a radiant heater
- Do not expose Physilog to moisture coming for example from nebuliser or steam kettle
- Do not use the device in combination or in close proximity to high risk medical devices or life supporting medical devices.
- Do not use the device in combination with active implantable devices.
- **Do not immerse the device in water or other liquid. Physilog is IP22.**
- Before use, allow Physilog to reach room temperature. If the unit has been transported or stored at temperatures below 0°C (32°F), leave it to reach at room temperature for about 2 hours, until any condensation has disappeared. If the unit has been transported or stored at temperatures above 40°C (104°F), leave it to reach at room temperature for about 2 hours
- Liquids and foreign material (such as dust, metal, etc.) must not be allowed to enter Physilog. If such material has entered into the unit, it must be immediately checked by a service technician, before it can be reused



PROPER USE

- Do not modify the device. Modifications can destroy the device and generate electrical hazards or fire
- Do not open Physilog or any of its accessories
- Use only accessories provided and recommended by MindMaze. Use of inappropriate accessories can increase electromagnetic emissions or decrease electromagnetic immunity of the device and result in improper operation, generate electrical hazards or fire
- Strangulation: do not wrap the adapter cable around your neck
- Do not apply a force of more than 80 kg on Physilog, as this could damage the device and generate fire or explosion of the battery
- Inspect Physilog and its accessories before using it. Never use Physilog or any of its accessories if it is damaged, as there is a risk of electrical shock. Contact Customer Support if a part is defective.
- In case of a change of performance of Physilog or its accessories, outside of battery life reduction, stop using the device and contact MindMaze customer support



END-OF-LIFE DISPOSAL

Follow instructions to dispose the device. Refer [Section 9](#).



Precautions

ENVIRONMENTAL PRECAUTIONS

- Respect the environmental conditions specified in the Technical Specification section regarding use, storage and transport.
Not respecting these limits can deteriorate the equipment or create an electrical dysfunction.
- Under extreme use conditions and especially during the charge, the Physilog sensor can reach a maximum temperature of 42 °C (107.5 °F).
- Do not charge the device while it is worn by a user. If you feel that Physilog sensor is too hot, release the device.
- Do not expose Physilog to direct sunlight for an extended period of time, because some of the components may reach unacceptably high temperatures.
- Respect the cleaning instructions specified in the [Cleaning Instructions](#) section. Inappropriate cleaning can damage the device or generate operator contamination. Do not use incompatible cleaning agents.
- Portable Radio Frequency communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30cm to any part of Physilog including cables specified by MindMaze. Otherwise, degradation of the performance of this equipment could result.
- Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.



2. Product description

The Physilog P6 and P6 Plus are two variants of the 6th generation of Physilog sensors. The wearable IMU (Inertial Measurement Unit) is designed for use by Academic and Clinical Researchers for sport and health applications.

2.1 Main features

Designed in Switzerland, the Physilog is packed with powerful electronic components and features that enable in-clinic and real-world collection of high-precision digital motion measures.

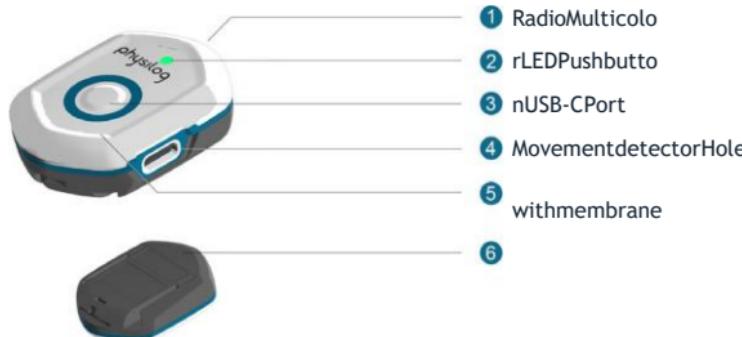
The Physilog device built-in 512MBytes memory allows up-to 24h of continuous measures (10h at full-speed). With sampling frequency up to 1024Hz, it provides flexibility and adaptability to a wider range of use cases, connectivity is provided either through standard BLE or a proprietary RF synchronization protocol.

Whether used in Monitoring or Assessing conditions, its elegant form factor with multiple color options to distinguish body locations, small size, and light-weight sets a new standard in usability, data accuracy and convenience.

Differences in sensing capabilities are listed in the table below. More information are available in the [Technical specifications](#) section

Sensing modality	P6	P6 Plus
3D Accelerometer (Low-G)	YES	YES
3D Gyroscope	YES	YES (extended range)
3D Accelerometer (High-G)	NO	YES
3D Magnetometer	NO	YES
Barometer	NO	YES
Thermometer	NO	YES

2.2 User interfaces of Physilog sensor



ID	Interface	Functionalities
1.	Radio	<p>BluetoothMode Configure the data acquisition parameter Drive the motion data acquisition mode Stream and transfer data recording Synchronize in time Manage the on-board memory</p> <p>StandaloneMode Synchronize in time</p>
2.	MulticolorLED	Display the Physilog sensor status
3.	Pushbutton	Wake-up the Physilog sensor Reset the Physilog sensor
4.	USB-CPort	Transfer data recording Configure the Physilog sensor Charge the sensor
5.	Movementdetector	Wake-up the Physilog sensor
6.	Hole with membrane (P6 Plus model only)	Allow to measure atmospheric pressure variation. Do not put any pointy object in it. This is not a set button.

2.3 Radiocommunication

2.3.1 Bluetooth

The Physilog sensor supports the connection to a Bluetooth master device such as a computer, mobile phone or a tablet using a Bluetooth Low-Energy (BLE) interface. Ensure to keep the device within a 10 meters range (without interferences) from the Bluetooth master device. The following features can be supported by the Bluetooth master device:

- Configuration of the data acquisition parameters
- Driving the motion data acquisition mode
- Streaming and transfer data recording
- Synchronization in time
- Management of the on-board memory
- Update the Physilog sensor firmware
- Resetting the Physilog sensor

A Bluetooth master device may support the connection to multiple Physilog sensors. Timesynchronization across Physilog sensors can be carried out by the Bluetooth master device.

Note: Access to specific features depends on the Bluetooth master device and therefore all features may not be available.

2.3.2 Standalone

The Physilog sensor supports Standalone communication dedicated for time synchronization across a network of Physilog sensors without requiring an external device. Motion data can be recorded using the central push button and are available in the Physilog sensor internal memory.

A network of Physilog sensors is composed of a single Standalone Physilog Master and Standalone Physilog Slave(s):

- **StandalonePhysilog Master :** Physilog sensor sends network time information
- **StandalonePhysilogSlave:** Physilog sensor receives and records time information

To ensure co-existence of several Physilog networks, the network of Physilog sensors is defined by its radio channel. All Physilog sensors within the same network must be configured with the same radio channel.

Note: The standalone mode is deactivated by default. To enable the Standalone, refer to section [4.5.2.2 Standalone Mode](#)

3. Setup

If you encounter any difficulties during installation, contact MindMaze customer support at customersupport@mindmaze.com

3.1 Unpacking



Description of the kit content

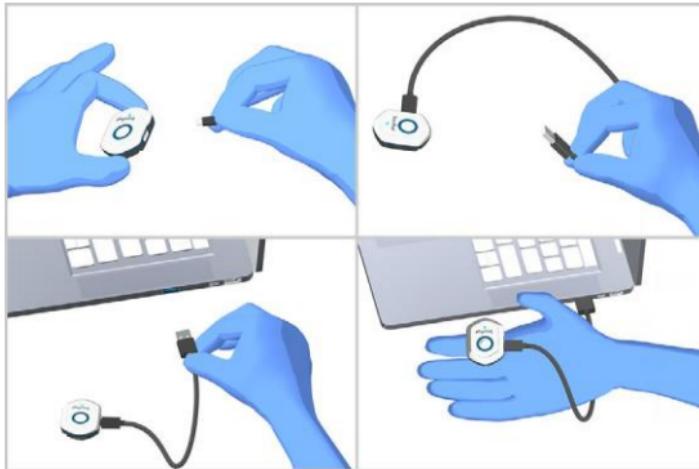
- Physilog (P6 or P6 Plus)
- USB Cable (optional)
- Attachment (optional)

3.2 Firstuse

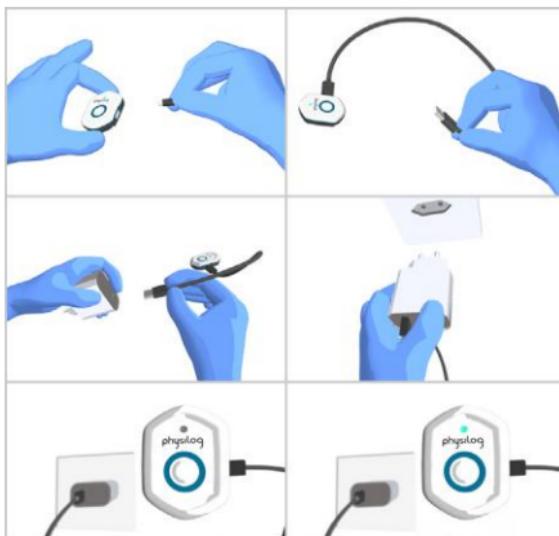
3.2.1 Charge the Physilog

Charge the Physilog using the provided charger cable to the Physilog USB-C Port. Plug the cable into a power source and make sure the Physilog is blinking green after booting. LED indications are described in the section "[LED indications](#)". Wait until the Physilog is fully charged (up to 3 hours). The device's LED should turn to a continuous green indication. Remove it from the charge.

USB charging (on computer or USB charging hub)



USB charging from the main (USB power adapter not provided)



4. Howto use

4.1 Powering the Physilog sensor

4.1.1 Turning on the Physilog sensor

The Physilog sensor switches on from the Standby mode and at first use when the user presses on the push button. From the Standby mode, the Physilog also switches on automatically when it is moved.

4.1.2 Shutting down the Physilog sensor

When not recording, the device automatically enters the Standby mode after 10 minutes without movement. The device LED is completely turned off.

4.2 Operation and acquisition modes

4.2.1 Acquisition modes

The Physilog sensor supports different acquisition modes to collect data:

- **Standalone**: recording the motion and synchronization data in the on-board memory. Start and stop recording signal is done from the device itself
- **Real-timestreaming**: wireless transfer of the raw motion data to a Bluetooth master device
- **Live file transfer**: recording the motion and synchronization data in the on-board memory while transfer data to the Bluetooth master device
- **Remote control**: recording the motion and synchronization data in the on-board memory. Start and stop recording signal is provided by the Bluetooth master device
- **Utility**: provides device information to the Bluetooth master device

Acquisition mode	Record data into on-board memory	Stream data over Bluetooth
Standalone	YES	NO
Real-timestreaming	NO	YES
Live file transfer	YES	YES
Remote control	YES	NO
Utility	NO	NO

4.2.2 Operation modes

4.2.2.1 Standby mode

The standby mode is automatically activated after 10 minutes without movement to save energy and extend battery life. The Physilog sensor wakes up by moving the device or pushing on the push button.

4.2.2.2 Activemodes

The Physilog offers two active modes. The default mode is Bluetooth only active mode. The Physilog configuration software is required to change the active mode.

Bluetooth only

Physilog sensor communicates only to the Bluetooth master device to support the data collection. Only the Bluetooth acquisition modes ([see section 4.2.1](#)), i.e. Real-timestamping, Live file transfer, Remote control and Utility are enabled. The standalone acquisition mode is disabled. The Bluetooth only active mode is recommended for users who do not need to record data without a Bluetooth master device.

Bluetooth and Standalone

In addition to the Bluetooth only mode, access to the standalone data acquisition mode is enabled. This mode allows recording data synchronously across multiple Physilog sensors, by pressing on the push button, without the need of a Bluetooth master device. More information can be found in section [4.5.1](#) and section [4.5.2](#)

Note: During a standalone recording, all Bluetooth communications are turned off and the Physilog can no longer be connected to the Bluetooth master device. Closing a recording turns back on the Bluetooth functionalities.

4.3 LED Indications

Description of LED behaviors

Type and color	Timing	Behavior
	-	LED off
	Blinking green every 1 sec	Battery charging
	Blink yellow every 1 sec	Very low battery
	Continuous green light	When charging: Battery charged
	Continuous green light for 5 seconds	After device reset: Device ready to use
	Fast pink blink	Error
	Fast white blink	Reset in progress
	Continuous white light	Button pushed

	Fastyellowblink	Buttonreleaserequired
	Fastblueblink	Closing recording andtransferringfile(exceptfor resetwherethetransferisstop ped)
	Veryslowblueblinkevery5sec	Bluetoothadvertisingandready to connect
	Continuousbluelight	ConnectedviaBLE
	Doubleblueblinkevery10sec	Remotecontrolrecordingin progress
	Doubleblueblinkevery2s	FiletransferorStreamrecording in progress
	Doubleyellowblinkevery10sec	Standalone or Remotecontrol recording inprogresswithlowbattery
	Doubleyellowblinkevery2sec	File transfer or Streamrecordinginprogress withlowbattery

AdditionalLEDindicationswhenStandalonemodeisactivated

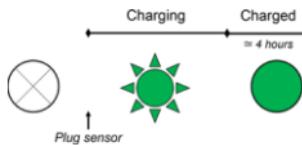
	Doubleblueblinkevery1sec	Recording in Progress.For Slave : Waiting for synchronization from the Master
	Doubleblueblinkevery10sec	Recording in Progress.For Slave only: Synchronized with Master

4.4 ChargingthePhysilogsensor

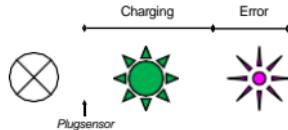
The Physilog sensor is charged via the USB-C port. Plug the USB-C connector of the USB cable to the Physilog sensor on one hand and to a USB-compliant computer, mobile device, or charger (see voltage specifications in Technical Description section). A full charging cycle may take up to 3 hours. When the Physilog sensor is discharged, plug in for charging for at least 30 minutes before use. If motion data are being recorded, please stop any data acquisition before replacing the Physilog

sensor into charge. Data may be permanently lost otherwise.

It is recommended to avoid complete discharging of the Physilog. After a long period without using the Physilog, plug it in for charging for at least 30 minutes before use. If the device is not used for a time period longer than 3 months, please make sure it is partially charged once every three months.



During charging, if the sensor encounters an error, a pink LED will be displayed:



Note: It is mandatory to keep Physilog sensor within the charging temperature range during charge (5°C to 30°C).

4.5 Recording motion

4.5.1 Recording preparation

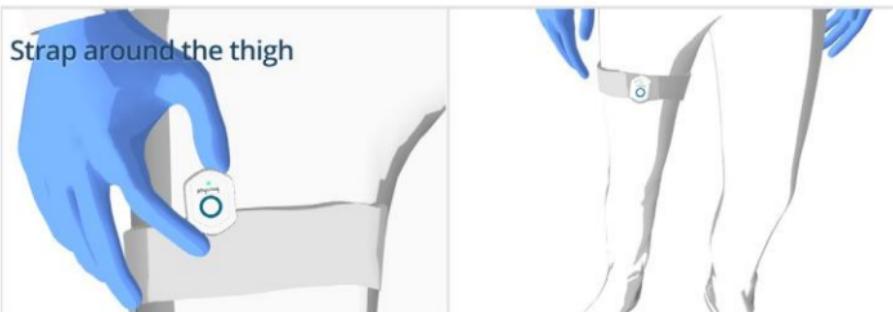
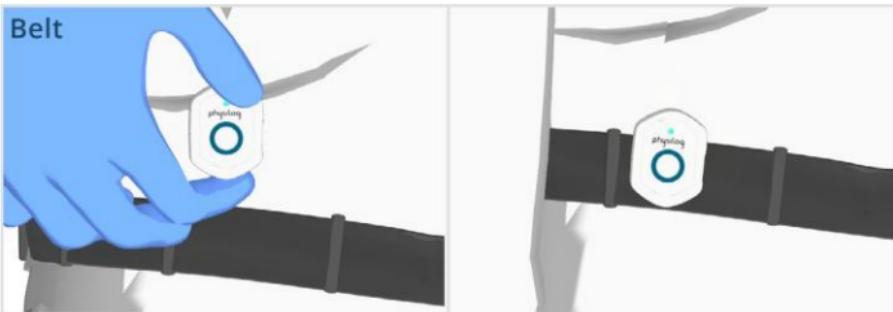
4.5.1.1 Attaching the Physilog sensor

Before recording motion, attach the Physilog sensor to the body part of interest using the attachment system (optional). Ensure that the sensor is correctly attached and comfortable for the participant.

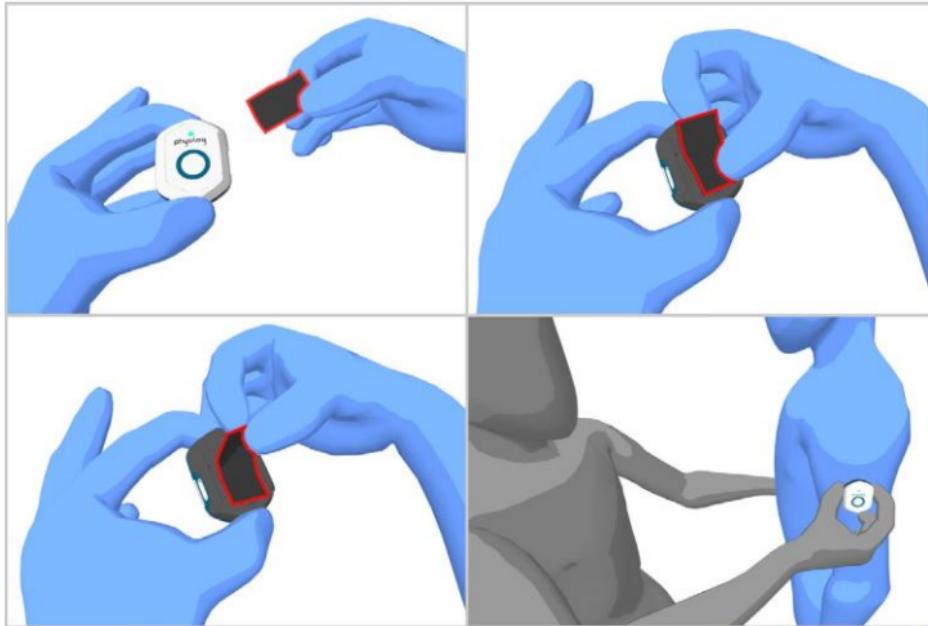
How to clip the sensor



Sensorattachmentexamplesonbelt,shoe,thigh



Sensorattachmentwithpatch



4.5.1.2 Data acquisition configuration

The data acquisition properties, i.e. range and sampling frequency of each sensing modality can be configured separately depending on the application requirements.

In many of the Bluetooth acquisition modes, the data acquisition properties are directly provided by the Bluetooth master device before starting a measurement.

In Standalone acquisition mode, the data acquisition properties are read from the Physilog internal memory and can be configured using the Physilog configuration utility software. [Data acquisition parameters: default values for standalone acquisition mode](#)

Sensor	Property	P6M	P6MPlus
3DAccelerometer	RangeFrequency	$\pm 16g$ 12 8Hz	$\pm 16g$ 12 8Hz
3DGyroscope	RangeFrequency	$\pm 2000^\circ$ /s12 8Hz	$\pm 4000^\circ$ /s 128Hz
3DMagnetometer	RangeFrequency	-	± 16 Gauss 128 Hz
3DHigh-G Accelerometer	RangeFrequency	-	$\pm 75g$ 1024Hz z

Barometer	Frequency	-	64Hz
Temperature	Frequency	-	64Hz

4.5.1.3 Radionetworkconfiguration(onlystandaloneacquisitionmode)

Instandaloneacquisitionmode, thePhysilogsensorbelongstoanetwork. Thenetworkcanbe configured using the Physilog configuration utility software.

Radionetworkconfiguration:Defaultvaluesforstandaloneacquisitionmode

Parameter	P6M	P6MPlus
Devicetype(MasterorSlave)	Master	Master
Radiochannel	21	21

4.5.2 Startandstopdataacquisition

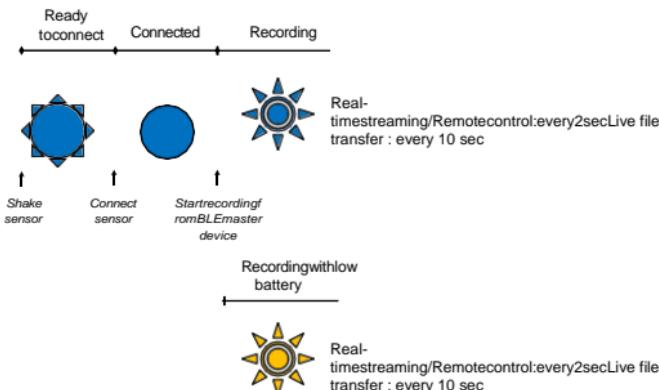
RemovethePhysilogsensorfromcharge. Make sure the device is waiting for BluetoothconnectionortobestartedorconnectedtoaBluetoothmasterdevice. Thesensorisnowreadytostartrecordinginallthendifferentavailablemodes.

4.5.2.1 Bluetoothmodes(Real-timestreaming,LiveFiletransfer,Remotecontrol)

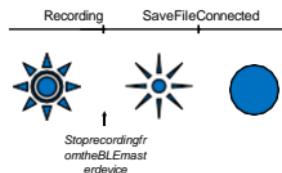
ThePhysilogsensorcanbecontrolledviaaBluetoothmasterdevicewhenconnected. Prior to connecting the Physilog sensor to a Bluetooth master device, make sure the sensor is ready to connect (Refer to [section 4.3](#)for LED indicator).

InallmodesusingBluetoothconnectivity,managethesensordataacquisitionremotelyusing Bluetoothmasterdevice. LEDindicationsaredescribedinthe“[LEDindications](#)”section.

TostartaBluetoothrecording(Real-timestreaming,LiveFiletransfer,Remotecontrol)LED scenario is described in the following picture:



TostopanyBluetoothrecording(Real-timestreaming,LiveFiletransfer,Remotecontrol):

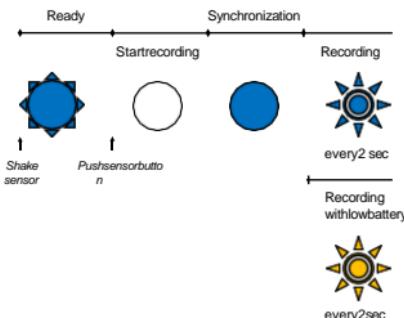


Note(a): To power on the Physilog sensors, move the sensor. There is no need to start your Physilog sensor with the push button prior to connecting to the Bluetooth master device. Refer to [section 4.1](#) for more information

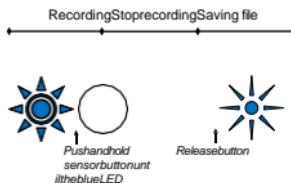
Note(b): When the recording is stopped in Bluetooth mode, the sensor goes back to a connected state. However if the sensor is disconnected from the Bluetooth master device at the end of the recording, the LED will switch to a Bluetooth advertising state and do not display a green continuous light

4.5.2.2 Standalone mode

To start recording in standalone mode, press for 2 seconds on the Physilog sensor button, the LED turns blue and blinks every 10 seconds. For multiple sensors start, push the button of each sensor one by one. Synchronization is automatically done regularly during the recording if at least one sensor is set up as "Master" and if the sensors are restarted within a range of one minute. After starting the slave sensor is waiting for a master device and displays a continuous blue LED until the synchronization completion. A network could include one single master sensor and several slave sensors (from one to as many as wished). Multiple sensor networks can be created by selecting a different radio channel. The network configuration is done using the Physilog configuration utility software. When the synchronization is done correctly, all the sensors are blinking simultaneously.



To stop a recording in standalone mode, hold the main button and release after 2 seconds. The LED then blinks blue showing the recording is being closed. For multiple sensors, it is possible to stop in any order.



4.6 Datatransfer

The Physilog sensor saves raw data on its internal memory, except when streaming the raw data via Bluetooth using the “Streaming mode” functionality of an external compatible device. Users have access to the raw data through additional external software. Please refer to the external software user manual for more details.

4.6.1 USBdatatransfer

For Standalone, Live file transfer and Remote control acquisition modes, data is saved on the internal memory of the Physilog sensor and can be accessed using a compatible USB cable (see [Technical Specifications](#)). Connect the Physilog sensor to the computer with the USB cable. The Physilog sensor connects to the computer as a USB key and files can be accessed. One file for each measurement has been created. Recording files are stored in folders depending on creation date (YY_MM_DD). The file name is composed of a file number (increasing from 01 to 99), the body location (as defined in the configuration) or by the Bluetooth master device, e.g. ‘LF’) and the unique sensor serial number (4 digits or characters). Copy-paste the files to the computer for analysis. Files and folders can also be renamed or deleted from the sensor’s memory.

It is recommended to copy-paste the files from the internal memory to a computer and delete the files from the sensor memory to avoid encountering memory capacity problems and to simplify file identification when performing multiple recordings. Files may also be deleted by the Bluetooth master device if the device supports this feature.

4.6.2 Bluetoothdatatransfer

For file transfer mode, data collected can be also accessed on the Bluetooth master device. All the files collected can be accessed from the internal memory by the Bluetooth master device.

Note: In the file transfer mode, the data are also saved in the Physilog sensor memory

4.7 Setting the time of Physilog sensor and timer recovery

In any Bluetooth acquisition mode, the internal time of the Physilog sensor is provided by the Bluetooth master device. In stand-alone mode, the sensor time needs to be provided by either the Bluetooth master device or the Physilog configuration utility software.

Note: The behavior of the Physilog P6 and P6 Plus differs after reset. Only the P6 Plus has a timer recovery feature that enables the P6 Plus to keep the internal time after reset. Therefore, after reset, the P6 internal time is reset while the P6 Plus keeps it.

4.8 Cleaning

Physilog sensor and accessories shall be cleaned after each measurement session if the next user is not the same. To clean a Physilog sensor, first disconnect the device if plugged via USB. Then use a wipe and a disinfecting cleaning solution containing 70% isopropyl alcohol. Do not use a solvent. Do not use an abrasive material. Do not immerse the Physilog sensor or any of its accessories as this could damage the device. If the device or an accessory was exposed to liquid, make sure it is completely dry and inspect it before using it. Never connect the Physilog sensor to the USB cable if the sensor is wet or humid.

4.9 Maintenance

There is no other maintenance besides Firmware Updates.

5. Troubleshooting

5.1 Resetting the Physilog sensor

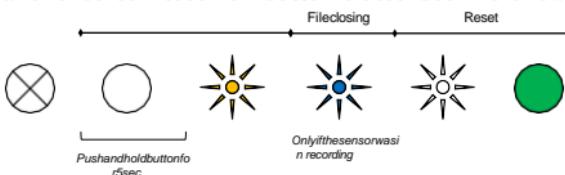
Resetting the Physilog sensor can be performed via Bluetooth master device or directly with the sensor button. The Physilog sensor button can be pressed for soft and hard reset. A Bluetooth master device can be used for soft, recovery and factory reset.

	Softreset	Hardreset	Recoveryreset	Factoryreset
Trigger	Pushbutton held for more than 5 seconds Bluetooth application	Pushbutton held for more than 10 seconds	Bluetooth application	Bluetooth application
Recordings stored in memory	Keep recordings	Keep recordings	Keep recordings	Delete recordings
On-going recording	Try to close	Maybe deleted	Maybe deleted	Deleted
First-use action	None	None	Press button	Press button

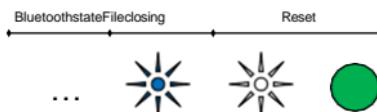
Standalonesensorconfiguration	Keep	Keep	Keep	Resettofactorysettings
Activemodeselection	Keep	Keep	Keep	ResettoBluetoothonly
Internaltime	P6:Reset P6Plus:Keep			

5.1.1 Softreset

The softreset is the first action to perform if the Physilog sensor is not working properly. The softreset can be done during a recording or in standbymode. To perform a softreset using the pushbutton, hold the main button for 5 seconds until the yellow LED blinks on, then the LED blinks blue (only if the sensor is recording). The sensor LED blinks white indicating that the reset is in progress. A softreset can also be activated by the Bluetooth master device. LED scenario for sensor reset from button is described in the following picture:



LED scenario for sensor reset from Bluetooth is described in the following picture



Note: A data recording may be affected by a softreset. If the softreset is done during a recording the file is stopped, the Physilog sensor will try to close the file. If closing the file is not successful then recording data may be lost.

5.1.2 Recoveryreset

The recovery reset can be done when the Physilog is not working properly and if the softreset could not resolve a previous issue. A recoveryreset can only be performed using the Bluetooth master device. The following actions are performed during a recovery reset:

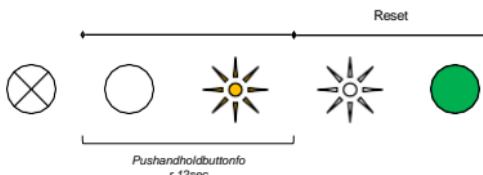
- Delete recordings from the memory
- Keep the standaloneradio configuration
- Keep the selected activemode

- Reboot the Physilog sensor

Note: After a Recovery reset, the Physilog sensor shall be powered on using the pushbutton

5.1.3 Hard reset

The hard reset can be done when the Physilog is not working properly and if the soft reset could not resolve a previous issue. The hard reset can be done during a recording or stand by mode. To perform a hard reset, hold the main button for 12 seconds.



Note: If the hard reset is performed during a recording, the files will be lost.

5.1.4 Factory reset

A factory reset can only be performed using the Bluetooth master device. The following actions are performed during a factory reset:

- Delete recordings from the memory
- Reset the stand alone radio configuration
- Reset the selected active mode
- Reboot the Physilog sensor

Note: After a Factory reset, the Physilog sensor shall be powered on using the pushbutton

Problem	Possible solutions
The Physilog sensor does not start for unknown reason	<ul style="list-style-type: none"> • Ensure the sensor is properly charged • If the device is charged, perform a soft reset • If the soft reset does not help, perform a hard reset • Check if the sensor is blinking blue • Verify that the device is not damaged if the previous steps do not resolve the problem • Contact technical support

<p>The Physilog sensor blinks pink</p>	<ul style="list-style-type: none"> • Make sure the sensor memory is not full by connecting it to a computer • Backup the files saved in a secure place and delete all the files in the sensor memory <p>If the previous steps do not resolve the problem</p> <ul style="list-style-type: none"> • Make sure the sensor is correctly charged <p>If the previous steps do not resolve the problem</p> <ul style="list-style-type: none"> • Perform a soft reset • Perform a recovery reset • Perform a hard reset <p>If the previous steps do not resolve the problem</p> <ul style="list-style-type: none"> • Contact technical support
<p>The Physilog sensor cannot be connected to a compatible external Bluetooth device</p>	<ul style="list-style-type: none"> • Make sure to activate the Bluetooth on the Bluetooth master device • Make sure the sensor is not connected to another external device • Check if the sensor is currently ready to be connected for Bluetooth recording. The sensor's LED should blink blue every 5 seconds. 10 seconds blinks indicate that the sensor is recording in standby mode and cannot be detected for Bluetooth modes. <p>If the previous steps do not resolve the problem</p> <ul style="list-style-type: none"> • Perform a soft reset • Perform a hard reset <p>If the previous steps do not resolve the problem</p> <ul style="list-style-type: none"> • Contact technical support
<p>The time of the data recorded is not correct on my Physilog sensor</p>	<p>Refer to section 4.7</p>

The Physilog sensor does not blink green while being on charge

It may happen that the LED doesn't blink green at the beginning of charging after a long period of low battery. To see the charging ongoing shortly push the main button or disconnect and reconnect after some charging time.

If a problem persists, write an email to: customersupport@mindmaze.com

6. Technical specifications

6.1 Sensors specifications

	PhysilogP6	PhysilogP6Plus
PartNumber	Red:P6-C11 Blue:P6-C12 Green:P6-C13	Red:P6-C21 Blue:P6-C22 Green:P6-C23
Sensings specifications		
3DAccelerometer	Range (max): up to ±16g Range: ±2g, ±4g, ±8g, ±16g Frequency: up to 1024Hz	
3DGyroscope	Frequency: up to 1024Hz	Range(max): up to ±4000°/s Range(selectable): ±250, ±500, ±1000, ±2000, ±4000°/s
3DMagnetometer		Range: up to ±16 Gauss Range(selectable): ±4, ±8, ±12, ±16 Gauss Frequency: max 128Hz
3DHigh-G Accelerometer		Range: ±75g Frequency: up to 1024Hz

Temperature		Accuracy: $\pm 1.5^\circ\text{C}$ (temperature measured inside the casing) Frequency: max 64 Hz
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Supported data acquisition modes		
Bluetooth	<ul style="list-style-type: none"> Real-time streaming Live file transfer Remote control Utility 	
Standalone	YES	YES (incl. Time Recovery)
Electrical specifications		
Battery	Lithium Polymer (Li-Po) rechargeable battery (3.7V 240mAh)	
Battery life	<p>Data Acquisition:</p> <ul style="list-style-type: none"> Up to 24 hours 10 hours at Full Speed Stand-by : 3 months <p>Note: Battery life can decrease with the use of the device</p>	
On-board memory	512 MBytes	
Radio communication	Bluetooth Low Energy v5.1 2.4GHz proprietary synchronization protocol	
RF Frequency Band	2,400-2,480 GHz (TX & RX)	
Effective radiated power	10 dBm	
Power adapter	<ul style="list-style-type: none"> Output: 5VDC, minimum 200mA CE-marked USB-C connection on Physilog sensor side 	
USB communication	<ul style="list-style-type: none"> USB mass storage device. Use exclusively a cable certified for USB 2.0 and above. Maximum cable length: 150 cm (60") 	
Mechanical specifications		
IP Rating	IP64	
Casing material	<ul style="list-style-type: none"> Hard part: ABS-Class II Soft part: Silicon rubber 	
Weight	17 grams	
Dimensions	47.4 x 35.8 x 13.2 mm	

6.2 Storage and transport conditions

- Storage temperature:
 - -20°C to 45°C (-4°F to 113°F) for a duration ≤ 3 months
 - 0°C to 30°C (32°F to 86°F) for a duration > 3 months
- Storage humidity: 5% to 90%, noncondensing
- Storage and transport pressure: 500 hPa to 1060 hPa
- Transport temperature: -20°C to 60°C (-4°F to 140°F)
- Transport humidity: 5% to 90%

6.3 Operating conditions

- Operating temperature (except charging): 0°C to 40°C (41°F to 104°F)
- Charging temperature: 5°C to 30°C (41°F to 86°F)
- Operating humidity: 15% to 90%, noncondensing but not requiring a water vapor partial pressure greater than 50 hPa
- Operating pressure: 700 hPa to 1060 hPa

6.4 Lifetime of the product

Lifetime of Physilog will depend on the usage of the product, under which environmental conditions it is used and the care of the product. Under normal conditions of use, the expected lifetime of Physilog and its accessories is 3 years. Beyond this timeframe, using Physilog is possible as long as it is working correctly and it does not present a default. Do not store Physilog for an extended period of time (over 6 months) without recharging it regularly (every 3 months), as this could damage the battery. Ideal charge level for storage is around 30%.

6.5 Spare parts/Repairs

The following parts can be ordered separately to replace defective, worn out or lost parts of the Physilog system:

Part Number	Description
	USB Cable - 0.5 meter
	USB Cable - 1 meter
	Physilog Universalclip

Do not try to repair or replace any part of the device as this could result in a risk of fire or explosion. Contact MindMaze customer support for more information.

6.6 EMI Emissions

System characteristic	Description
Frequency(MHz)	2,400-2,480MHz
Maximum declared output power(dBm)	6.14dB
Maximum declared antenna gain(dBi)	3.5dBi
MaxEIRP(dBm)	9.8dBm
MaxEIRP(mW)	9.55mW

6.7 Guidance and manufacturer's declaration – electromagnetic compatibility

Physilog sensor is intended for use in the electromagnetic environments specified in this document. Physilog has been tested and found to be in compliance as shown. You should take care to use the device as described.

6.7.1 Electromagnetic Emissions

Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR11	Group1	Physilog sensor uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment
RF emissions CISPR11	ClassB	Physilog sensor is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC61000-3-2	ClassA	
Voltage fluctuations IEC61000-3-3	Complies	

6.7.2 Electromagnetic Immunity

Immunity test	IEC60601 test level	Compliance level	Guidance
Electrostatic discharge(ESD)	±8kV contact ±2, ±4, ±8, ±15kV air	±8kV contact ±2, ±4, ±8, ±15kV air	Floors should be wood, concrete or ceramic tile. If floors are recovered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines ±1kV for input/output lines	± 2kV for power supply lines ±1kV for input/output lines	Mains power quality should be at a typical commercial or hospital environment
Surge IEC61000-4-5	± 1kV power supply line to line ± 2kV power supply line to ground ± 2kV input/output lines to ground	± 1kV power supply line to line ± 2kV power supply line to ground ±2kV input/output lines to ground	Mains power quality should be at a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	0%UT (100% dip in UT) for 0,5 cycle 0%UT (100% dip in UT) for 1 cycle 70%UT (30% dip in UT) for 25/30 cycles 0%UT	0%UT (100% dip in UT) for 0,5 cycle 0%UT (100% dip in UT) for 1 cycle 70%UT (30% dip in UT) for 25 cycles 0%UT	Mains power quality should be at a typical commercial or hospital environment

(Cont.)			
Voltagedips,short interruptionsand voltagevariationson power supplyinputlines IEC61000-4-11	0%UT (100%dipinUT) for250/300cycles	0%UT (100%dipinUT) for250cycles	Mainspowerqualityshouldbethatofatypicalcommercialorhospitalenvironment
Powerfrequency(50/60Hz) magneticfieldIEC61000-4-8	30A/m	30A/m	Powerfrequencymagneticfields should be at levelscharacteristic of a typicalallocation in a typicalcommercial or hospitalenvironment
ConductedRF IEC61000-4-6 RadiatedRFIEC61000-4-3	3Vrms 150kHzto80 MHz 6VrmsISM Bands	3Vrms 150kHzto80 MHz 6VrmsISM Bands	If the measured field strength in the location in which the Physilog sensor is used exceeds the applicable RF compliance level, the Physilog system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Physilog system
RadiatedRF immunity IEC61000-4-3	10 V/m 80MHzto2,7 GHz	10 V/m 80MHzto2,7 GHz	Portable and mobile RF communication equipments should be used no closer to any part of the Physilog system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: E is the immunity test level in [V/m] d is the minimum separation in [m] P is the maximum power in [W]

Proximity fields emitted by RF wireless communication devices IEC61000-4-3	385MHz 27V/m 50%PM18Hz	385MHz 27V/m 50%PM18Hz	RF wireless equipment maximum output power and separation distance tested (at 30 cm): TETRA 400: max 1.8W GMRS460,FRS460: max 2W LTE Band 13 and 17: max 0.2W
	450MHz 28V/m 50%PM18Hz	450MHz 28V/m 50%PM18Hz	
	710MHz 9V/m 50%PM217Hz	710MHz 9V/m 50%PM217Hz	
	745MHz 9V/m 50%PM217Hz	745MHz 9V/m 50%PM217Hz	
	780MHz 9V/m 50%PM217Hz	780MHz 9V/m 50%PM217Hz	
	810MHz 28V/m 50%PM18Hz	810MHz 28V/m 50%PM18Hz	
	870MHz 28V/m 50%PM18Hz	870MHz 28V/m 50%PM18Hz	
	930MHz 28V/m 50%PM18Hz	930MHz 28V/m 50%PM18Hz	
	1720 MHz 28V/m 50%PM217Hz	1720 MHz 28V/m 50%PM217Hz	
	1845MHz 28V/m 50%PM217Hz	1845MHz 28V/m 50%PM217Hz	

(Cont.)	(Cont.)	(Cont.)	GSM800/900:max2W
Proximity fieldsemited by RF wireless communication devices IEC61000-4-3	1970MHz 28V/m 50%PM217Hz 2450MHz 28V/m 50%PM217Hz 5240MHz 9V/m 50%PM217Hz 5500MHz 9V/m 50%PM217Hz 5785MHz 9V/m 50%PM217Hz	1970MHz 28V/m 50%PM217Hz 2450MHz 28V/m 50%PM217Hz 5240MHz 9V/m 50%PM217Hz 5500MHz 9V/m 50%PM217Hz 5785MHz 9V/m 50%PM217Hz	TETRA 800: max 2 W iDEN820:max2W CDMA850:max2W LTE Band 5: max 2 W GSM 1800/1900:max2WCDMA 1900: max 2 W DECT: max 2W LTEBand1,3,4and25: max2W UMTS: max 2 W Bluetooth: max2WWLAN802.11b/g/n: max2W RFID 2450:max2W LTEBand7:max2W WLAN802.11a/n: max0.2W

Note(a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To access the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the Physilog sensor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocation of the Physilog device.

Note (b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.

6.7.3 Guidance

Portable and mobile RF communication equipment should be used no closer to any part of the devices, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.

$$\text{Recommended separation distance (d): } d = \frac{6}{E} \sqrt{P}$$

where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey.

Note (a) should be less than the compliance level in each frequency range.

Note (b) To prevent electromagnetic interference, maintain a minimum distance between the portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communication equipment.

Rated maximum output power of transmitter	80KHz to 1000MHz outside ISM bands	1GHz to 2.7GHz outside ISM bands	2.7GHz to 6GHz outside ISM bands
	$d = 0.6\sqrt{P}$	$d = 0.6\sqrt{P}$	$d = 0.6\sqrt{P}$
0.0	0.06	0.06	0.06
0.1W	0.19	0.19	0.19
1W	0.6	0.6	0.6
10W	1.9	1.9	1.9
100W	6.0	6.0	6.0

For transmitters rated at a maximum output power not listed above, the recommended separation distance in metres [m] can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts [W]

$$\text{According to the transmitter manufacturer } E = \frac{6}{d} \sqrt{P}$$

The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765-6.795 MHz, 13.553-13.567 MHz, 26.957-27.283 MHz and 40.66-40.7 MHz

Formulas coming from the IEC60601-1-2

Interference may occur in the vicinity of equipment marked with the following symbol:



7. Compliance information

7.1 FCC Compliance information

7.1.1 Information to the user

This document, which describes the instructions for use for an intentional radiator, cautions the user that changes or modifications not expressly approved by the Manufacturer could void the user's authority to operate the equipment.

[54FR17714, Apr. 25, 1989, as amended at 68FR68545, Dec. 9, 2003]

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 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

7.1.2 FCC human exposure limits

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the EUT transmitting at the specified power

level in different channels.

The FCC has granted Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of www.fcc.gov/eot/ea/fccid after searching on FCC ID: 2AYHHMMP6S1

This device has been evaluated for and shown compliant with the FCC/ IC Specific Absorption Rate ("SAR") limits when operated in portable exposure conditions.

To ensure that RF exposure levels remain at or below the tested levels, use a belt-clip, holster, or similar accessory designated for this product or when used with an accessory that Contains no metal that maintains a minimum separation distance of 0mm between your body and the device.

Note:For body-worn operation, the device has been tested and meets the FCC RF exposure, the maximum SAR value is 0.347W/Kg at 0mm.

7.2 IC compliance information

7.2.1 IC statement

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be chosen so that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. This device complies with Industry Canada 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 contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- This device may not cause interference
- This device must accept any interference, including interference that may cause undesired operation of the device

7.2.2 IC human exposure limits

This device complies with IC exposure limits set forth for the general population. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: For body-worn operation, the device has been tested and meets the IC RF exposure, the maximum SAR value is 0.347W/Kg at 0mm.

Pour une utilisation corporelle, l'appareil a été testé et répond à l'exposition RF IC, la valeur maximale du das est de 0.347W/Kg à 0mm.

7.3 RF exposure compliance—Europe

Maximum RF Output power (9.55 mW peak EIRP) of the equipment is under 20mW, and thus, the test result is compliant without additional measurement. Therefore, EN62311(2008) "low power / inherent compliance decision" is applied.

8. Warranty

Please refer to section [Safety information](#).

Warranty for defects. The Seller warrants to the Customer that the Products manufactured by the Seller that are sold to the Customer will be free from defects in material and workmanship as may be required for normal use for a warranty period of two (2) years following delivery of a Product. Notice of a defective Product under warranty must be given to the

eSeller in writing within ten (10) days following the discovery of such defect. Any oral or written statement concerning the Products inconsistent with the limited warranty set forth herein will be of no force or effect. The Seller's sole liability under the warranty will

be, at the Seller's option, to either replace or repair the defective Product(s) or refund or credit the purchase price to the Customer. This will be the Customer's exclusive remedy for a covered defect. Limited warranty. The warranty, provided under the section above, does not cover and the Seller will have no warranty obligation whatsoever with respect to any damage to a Product caused by or associated with: (i) usage not in accordance with Product instructions or usage for a purpose not indicated on the labelling;

(ii) abuse, misuse, neglect, improper maintenance or storage, accident, vandalism, or the negligence of any party other than the Seller; (iii) external causes, including natural disasters, acts of God, power failure, cosmetic damage or melting; (iv) use of unauthorised third party consumables and accessories with the Product; or (v) modifications or alterations to a Product not expressly authorised in writing by the Seller (e.g., any modifications to any software programs that are embedded in a Product). The Seller's obligations under its limited warranty are also contingent on the Customer's payment in full of the Product purchase price. THE SELLER EXPRESSLY DISCLAIMS ALLOTHERRWARRANTIESANDCONDITIONS, EXPRESSOR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AS WELL AS

WARRANTIES ARISING FROM COURSE OF DEALING AND USAGE OF TRADE, AND THE SELLER DOES NOT REPRESENT OR WARRANT THAT ANY PRODUCT WILL MEET THE CUSTOMER'S REQUIREMENTS.

9. Disposal

At the end of their lifetime, Physilog and its accessories shall be disposed of in conformity with the regulation of your country regarding electronic equipment. Particular attention shall be paid to Physilog as it contains a lithium battery. Do not dispose of Physilog and its accessories with regular waste.

For assistance, please contact

your customer service team

US: +18335380101

Other: +80044154415

customersupport@mindmaze.com

Or visit our website for additional contact information:<https://www.mindmaze.com/contact/>



Manufacturer:

MindMaze SA

Chemin de Roseneck 5

CH-1006 Lausanne, Switzerland

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Device Model: P6 / P6 Plus

FCC ID: 2AYHHMMP6S1

IC ID: 26802-MMP6S1



LBL-0155 Rev AAA