



## User Guide




essentim sphere



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## Notes

	<p>Warning: This symbol represents a warning. It describes a dangerous situation or indicates safety risks.</p>
	<p>Note: This symbol indicates important information.</p>
	<p>The symbol of a crossed-out dustbin indicates that this device contains electronic components and must not be disposed of with household waste in accordance with Directive 2002/96/EC (WEEE).</p>

### Legal notice

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### Warranty and liability

The device complies with the basic safety and health requirements of the relevant EU regulations and has been tested for proper functioning at the factory. When claiming warranty, the device number must be indicated (see product label on the device). Failure to comply with the manufacturer's specifications or legal requirements or unauthorized modifications to the equipment or unauthorized replacement of individual parts or accessories may significantly impair the electrical safety of this product and void the warranty. Any liability, property damage or personal injury resulting from the device being used contrary to the instructions in this manual is excluded. We reserve the right to make technical design and execution changes at any time without prior notice as a result of continuous further development and product improvement. No liability is accepted for damage resulting from improper use. Warranty claims are then also void. Liability for any damage to property or personal injury that occurs is then transferred to the operator.

## Safety Instructions

Read these instructions carefully before commissioning and using the device and always keep the instructions within easy reach!



### Warning

Always observe all safety instructions in this document! Non-observance may result in personal injury or damage to property! Always keep the safety instructions and the user manual permanently always keep the safety instructions and the user manual in an accessible and permanent place.

- Observe all technical limits as well as storage conditions for the device.
- If there is obvious damage to the device, it must be taken out of service and stored safely.
- Do not attempt to repair or modify the device. For maintenance and repair, the device must be sent to the manufacturer or an agency designated by the manufacturer.
- Before operation, the safety instructions and the user manual must have been read and understood by the user. The device may only be operated by persons to whom this applies.
- In addition to the instructions and safety notes in this manual, the basic regulations for occupational safety must be observed.
- The system is safe and reliable and complies with the relevant EU directives. Improper use may result in damage to the user, third parties or material objects.
- The user is responsible for safety risks arising from biological material or samples used and monitored with the sphere.
- Maintenance or repairs may only be carried out by the manufacturer or by persons or companies authorized by the manufacturer.
- Do not operate the device in potentially explosive atmospheres, aggressive atmospheres or explosion protection zones.
- The device is not a toy. Keep the device away from children and animals.
- Avoid contact with liquids or high humidity.
- Avoid liquid penetration into the device.
- Protect the device from permanent direct sunlight.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in a legible condition.
- Do not open the device with a tool.
- The product should not be sterilized.

## Intended Use and User

The essentim sphere is a wireless, rechargeable multi-sensor unit for stationary device and room monitoring. For this purpose, the sphere is placed at the desired location or alternatively attached to a surface using the enclosed mounting system (for example Velcro system) on the back of the sphere.

The sphere measures temperature, humidity, movement, brightness and air pressure.



### Warning

Always observe the safe operating conditions specified here!  
Failure to do so may result in personal injury and/or damage to property.

- Operating conditions are from -10°C to +58°C, non-condensing humidity up to 100%, 0.3 to 1.1 bar ambient pressure.
- The sphere should not be used in rooms where explosive substances are processed.
- The sphere should be used as a stationary measuring unit.
- The sphere may only be charged at room temperature (range 0°C - 40°C).
- Only cables and extensions approved by essentim may be used with the sphere.
- Avoid mechanical stress on the sphere, damage to the housing can cause damage to the lithium-ion polymer battery. This can lead to leakage of liquids from the battery or short circuits and temperature development.
- During transport, the transport regulations of the respective transport service provider with regard to batteries containing lithium-ion must be taken into account. For further information contact your transport service provider or essentim GmbH.

The user is, for example, a trained laboratory employee / assistant / technician / student. Each user must have read and understood the safety instructions and the user manual.

## Device Description

### General Information

The essentim sphere is a wireless sensor with recording function (data logging function). The data is transmitted wirelessly and stored in parallel in the internal memory.

The sphere measures temperature, humidity, motion, brightness and barometric pressure. Additional sensors can be connected via two interfaces. The sphere has a push button for switching on and off and for interaction during operation.

The measurement data of the sphere can be read out with the essentim wireless sensor network. This requires an essentim gateway.

### sphere



## Technical Data

<b>Manufacturer</b>	essentim GmbH
<b>Model</b>	sphere
<b>Type</b>	Wireless Multi-Sensor-Unit
<b>Power supply for charging</b>	5V DC (max. 500 mA)
<b>Battery Type</b>	Lithium-ion Polymer Battery, 1900mAh, rechargeable, built-in
<b>Operating condition (EN / IEC 61010-1)</b>	<ul style="list-style-type: none"> <li>● Operating location</li> <li>● Ambient temperature</li> <li>● Humidity</li> <li>● Altitude</li> <li>● Other</li> </ul> <p>Indoor, no use or storage in explosive atmospheres.</p> <p>-10 to +58 °C</p> <p>Maximum 100 % relative humidity, non-condensing</p> <p>5000 m</p> <p>Do not expose to chemicals or mechanical stress. The product should not be sterilized! Observe the cleaning instructions in the user manual to prevent damage.</p>
<b>Storage and loading conditions</b>	
<ul style="list-style-type: none"> <li>● Temperature</li> <li>● Humidity</li> <li>● Other</li> </ul>	<p>0 to 40°C</p> <p>10 to 50%</p> <p>Protected from frost and heat, not in contact with hazardous substances in a place protected from dust and sunlight.</p>
<b>EMC/radio</b>	EN 61000-6-2:2005, EN 61326-1:2013 ETSI EN 301 489-1 V2.2.3:2019-11 ETSI EN 301 489-17 V3.1.1:2017-02 ETSI EN 300 328 V2.2.2:2019-07
<b>Other conformities</b>	RoHS, FCC, IC, CE
<b>IP protection class (EN 60529)</b>	IP20
<b>Sensor specification / measuring range</b>	<ul style="list-style-type: none"> <li>- Temperature</li> <li>- Humidity</li> <li>- Barometric pressure</li> <li>- Brightness</li> <li>- Motion</li> </ul> <p>-10 bis +58°C (typ. +/-0,3°C)</p> <p>0 to 100% (typ. +/- 2%)</p> <p>300 to 1100 hPa (typ. +/- 1hPa)</p> <p>0 to 100% (dark/bright)</p> <p>Standstill detection, motion detection</p>
<b>Interfaces</b>	Radio interface 2.4 GHz, two USB type C interfaces for connecting sensor expansions
<b>Dimensions</b>	66 x 66 x 23 mm (length x width x height)
<b>Weight</b>	80 g



## Transport and Storage



### Warning

Improper transport can lead to personal injury and damage to property. Observe all instructions for safe transport.

The essentim sphere must be secured during transport to prevent possible mechanical impact. As far as possible, the sphere must be positioned so that the button is not pressed by mistake.

Always consider the transport guidelines of your transport service provider when transporting batteries containing lithium-ion. Information can be obtained directly from the transport service provider or contact essentim GmbH.

Unused spheres should be stored with a charge level of about 30%, protected from dust, sunlight and moisture.



### Note

Long-term storage may shorten the maximum battery life.

Storage and loading conditions	
● Temperature	0 to 40°C
● Humidity	10 to 50%
● Others	Protected from frost and heat, not in contact with hazardous substances in a place protected from dust and sunlight.

## Initial Setup

The following steps must be performed when using the sphere for the first time:

1. Fully charge the sphere before using it for the first time. A charged sphere signals the completion of the charging process with a continuously green status LED.
2. Press the button briefly to start the sphere. The status LED flashes green.
3. The sphere is immediately ready for operation after being switched on. The measured values can be read out immediately via essentim's wireless sensor network (essentim gateway).

The serial number of the sphere corresponds to the device name in the software.



### Note

To protect the battery, the sphere should always be fully discharged and then fully charged.



### Note

The battery of the sphere can heat up during the charging process. This heating affects the temperature readings of the sphere.



### Warning

Only use the power supply unit included in the scope of delivery for charging the sphere.

## Device Functions

The essentim sphere has several measurement and interaction options.

### Button

The button has two functions: Switch on and off and Reset function:

#### Switching on and off

To switch on, it is sufficient to press the button briefly.

To switch off, the button must be pressed for 6 to 7 seconds.

The sphere switches itself off when the battery level is low to prevent deep discharge.



#### Note

After switching off due to a low battery level, the sphere can no longer be switched on via the button, but only by recharging.

#### Reset

By pressing the button for at least 12.5 seconds, a reset is performed - the sphere is restarted.



#### Note

Measurement data from the memory will not be lost during a reset, however settings may be lost.

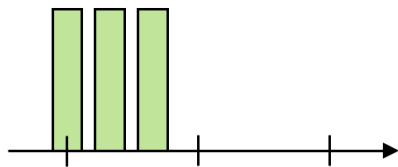
## LED Functions

The status LED of the sphere can light up in three different colors:

#### Colors of the status LED and their meaning

Green LED	everything is ok
Blue LED	sphere memory is read out or smartphone is connected to sphere
Red LED	there is a problem - connect to the essentim cloud to fix the problem

## Blink codes of the status LED



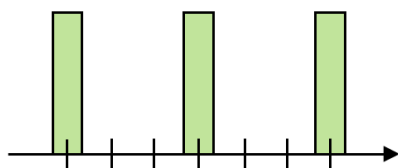
Switch on

The sphere flashes green 3 times quickly. This blink code also occurs when a sensor extension is plugged in via the USB interface.



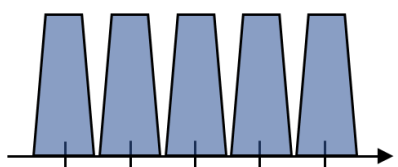
Switch off

The sphere flashes red 3 times quickly. This blink code also occurs when a sensor extension is plugged out or not detected via the USB interface.



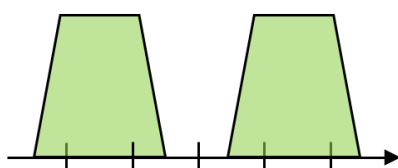
Battery operation

In battery mode the sphere status LED flashes every 3 seconds. The status is indicated by the color.



Connected

As long as the sphere is connected to the readout unit, the status LED pulses blue. Data is being transferred.



Charging

During the charging process, the status LED pulses. The status is indicated by the color.



Fully Charged

When the sphere is fully charged, the status LED lights up green continuously.

## Cleaning, Maintenance and Repair

### Cleaning

The essentim sphere can be cleaned with demineralized water or isopropanol (70%). The cleaning fluid should be applied with a lint-free cloth.



#### Warning

Incorrect cleaning agents or cleaning agents not specified in the operating instructions or sharp objects may damage the device! Observe the information on chemical resistance!

essentim GmbH recommends the following procedure for cleaning:

1. Switch off the sphere.
2. Moisten a cloth with isopropanol (70%) and wipe over the surface.
3. Let the liquid soak for one minute.
4. Wipe the sphere dry, preferably with a microfiber cloth.
5. Wait a further five minutes to ensure that all residues of the isopropanol have evaporated.
6. The procedure can be repeated if necessary
7. The sphere can be used again.



#### Warning

The sphere should not be sterilized! essentim GmbH does not give approval for sterilization processes of any kind, as both thermal and chemical processes can destroy the sphere and lead to property damage and personal injury!

### Maintenance and Repair

Checking the measuring accuracy

To determine the measuring accuracy, we recommend performing an annual metrological traceability.

Defect

In case of a defect, please contact essentim GmbH.

[support@essentim.com](mailto:support@essentim.com)

[www.essentim.com](http://www.essentim.com)

## Disposal

The sphere is marked according to the EU Directive on Waste Electrical and Electronic Equipment (WEEE).



WEEE registration number of essentim GmbH: DE 22316070.

This product must not be disposed of with household waste.

Before disposal, the sphere must be completely discharged so that it cannot be switched on again by pressing a button.

The sphere can be taken to a designated primary treatment facility for the disposal of electrical and electronic equipment at your own expense for environmentally sound disposal. As a designated B2B product, you can alternatively return the sphere (sufficiently stamped) to essentim GmbH. We will dispose of the device at our expense in a proper and environmentally friendly manner.

## Changelog

18.01.2018	Creation of the User Manual	V1.0
14.02.2020	Adaption Maintenance	
14.07.2020	Adaptation of the specified data after certification Adaptation of current LED blink codes	V.1.1
15.09.2021	Adaptation membrane and version derivation operating instructions without mobile app	V1.2
21.02.2022	Address adaptation	
14.04.2022	Creation of an English version	
22.04.2022	Removal of the EC Conformity Declaration	
24.01.2024	Links to essentim lab app removed Minor adjustments and new versioning	V1.3

