

PHYWE Systeme GmbH & Co. KG  
Robert-Bosch-Breite 10  
D-37079 Göttingen

Telefon +49 (0) 551 604-0  
Fax +49 (0) 551 604-107  
E-mail info@phywe.de  
Internet www.phywe.com

## Operating instructions

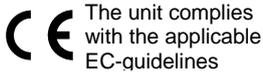


Fig. 1: 12935-01 Cobra SMARTsense Heart rate

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## 1 SAFETY PRECAUTIONS



Caution!

- Do not use the Cobra SMARTsense Heart rate if a device connected to it is also connected to the mains power supply!
- Carefully read these operating instructions completely before operating this instrument. This is necessary to avoid damage to it, as well as for user-safety.
- Only use the instrument for the purpose for which it was designed.
- Only use the instrument in dry rooms in which there is no risk of explosion.
- Protect the instrument from dust, moisture and vapours. Use a slightly moist lint-free cloth to clean the instrument. Do not use aggressive cleaning agents or solvents.
- Take care that no liquid penetrates in through the housing openings, as such penetration would result in damage to Sensor.
- Do not open the unit.

## 2 PURPOSE AND CHARACTERISTICS

The sensor is used for measuring the heart rate and for transferring the values to a terminal device, e.g. a tablet computer, smartphone, etc., via Bluetooth or USB.

The sensor is neither suitable nor approved for medical purposes. It is intended solely for didactic purposes. This device must not be used for defined measurements on humans in order to diagnose an illness or disease, i.e. it is not intended for monitoring, treating or alleviating illnesses or diseases. As a consequence, it is not subject to the strict constraints of the Medical Devices Act.

### 3 FUNCTIONAL AND OPERATING ELEMENTS

#### 3.1 Operating elements

The sensor has an on-button and two LEDs for indicating the Bluetooth and battery charge status.

##### On-button

To switch the sensor on and off in Bluetooth mode, the power button must be pressed for longer than 3s. If the sensor is to be connected via USB, it is not necessary to press the power button.

##### Bluetooth-LED

Flashing red every 2 seconds	Not connected
Flashing green every 2 seconds	Connected to the terminal device
Flashing green every 4 seconds	Running measurement

##### Battery charge LED

Flashing red every 2 seconds	Low battery
Illuminated red	Active charging process
Illuminated red	Charging process completed

#### 3.2 USB port

The battery, which is permanently installed in the sensor, is charged via the type C USB port. Furthermore, communication with a computer takes place via this interface.

### 4 NOTES ON OPERATION

For safety reasons, the Cobra SMARTsense sensor may only be used when the sensor is not connected to mains voltage!

To do this, make sure that either

- The Cobra SMARTsense sensor is not connected to a charger via USB.
- If a USB connection to a laptop is established, it is used in battery mode with the power supply disconnected, or
- If there is a USB connection to a standard PC or laptop with a power supply unit, these are connected to the mains voltage via a floating isolating transformer.

This device fulfils all of the technical requirements that are compiled in current EC guidelines. The characteristics of this product qualify it for the CE mark.

This instrument is only to be put into operation under specialist supervision in a controlled electromagnetic environment in research, educational and training facilities (schools, universities, institutes and laboratories).

The individual connecting leads are each not to be longer than 2 m.

The instrument can be so influenced by electrostatic charges and other electromagnetic phenomena (HF, bursts, indirect lightning discharges) that it no longer works within the given specifications. Carry out the following measures to reduce or eliminate the effect of such disturbance: Ensure potential

equalization at the PC (especially with Laptops). Use screening. When a total failure of the instrument occurs, unplug it and plug it back in again for a reset.

### 5 HANDLING

This section describes the start-up of the sensor and the recording of measurement data. Please read this section thoroughly in order to avoid failures or operating errors.

#### 5.1 Charging process

Use a USB-C cable to connect the sensor to a computer or USB charger (not included).

During the charging process, the battery charge LED lights up red. When the charging process is complete, the battery charge LED lights up green. The charging time for a completely discharged battery is 3 hours maximum.



Disconnect the charger at the latest four hours after the completion of the charging process. Otherwise, the service life of the battery may be negatively affected.

#### 5.2 Start-up

Switch on the sensor by pressing the power button for more than 3s. Now the Bluetooth LED flashes red. Start the software and select the sensor.

If the sensor is to be used via the USB interface, it does not need to be switched on. The sensor is connected directly to the end device using the supplied USB cable.

There is a 9-digit code on the back of the sensor (Fig.2). The last 4 digits of the code are displayed as the sensor name in the software (Fig.3). This enables the precise assignment of the sensors within the software.

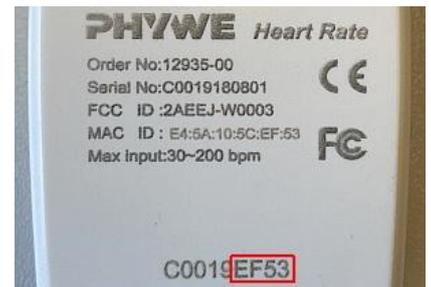


Fig. 2

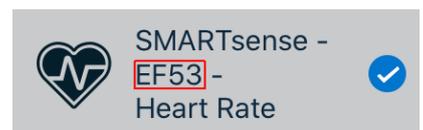


Fig. 3

#### Selection of the sensor via the Bluetooth interface

Make sure that the Bluetooth interface is activated on the terminal device (PC/Tablet/Smartphone) and that the software is allowed to access the interface.

After the sensor has been selected in the software, the LED flashes green to indicate that the connection has been established correctly. After the sensor has been coupled with the software, the sensor is no longer visible to other users in the software, and therefore can no longer be selected.

If the sensor is switched on and not connected, it switches off automatically after 5 minutes.

#### Selection of the sensor via the USB interface

For this purpose the sensor must be plugged into the USB port of the end device. It is not necessary to switch on the

sensor. The sensor is automatically recognized and displayed. It can be selected and connected directly.

### 5.3 Recording of measurement data

With every heartbeat, the heart pumps blood into the blood vessels. As a result, the concentration of blood cells in the peripheral blood vessels of the fingertips or earlobe increases briefly with every heartbeat. Since the blood cells absorb the infrared light of the ear clip depending on their concentration level, the signal of the ear clip varies accordingly. The controller in the sensor measures the period and uses it to calculate the pulse frequency.

Due to the measuring principle, it is important that the infrared signal is not completely absorbed in a permanent manner. On the other hand, the absorption by the blood in the vessels must be sufficiently high. The fingertips (no bones) or the earlobes are suitable measuring points. Fasten the sensor, ensure that it cannot slip off and then wait a few seconds until the measurement values have settled. Correct the position of the ear clip, if necessary.

## 6 TECHNICAL DATA

Operating temperature range: 5 - 40°C

Rel. humidity < 80%

Measuring range 20...200 bpm  
Resolution 1 bpm

Max. data rate 10 Hz  
Battery capacity 250 mAh  
Max. wireless range (open field) 30 m  
Dimensions (length x width x height) 80 x 40 x 32 mm  
Weight 38 g

## 7 SCOPE OF DELIVERY

The extent of delivery is as follows

- Cobra SMARTsense Heart rate 12935-01
- Ear clip
- USB connecting cable type C 07935-00
- Operating instructions

## 8 ACCESSORIES

The following accessories are available:

- Cobra SMARTlink 12999-99
- USB connecting cable type C 07935-00
- USB-charger 07934-99
- USB-Bluetooth-Adapter 07936-00
- Software measureLAB 14580-61
- Free measureApp available from supplier portals

iOS



Android



Windows



## 9 CONFORMITY



PHYWE Systeme GmbH & Co.KG hereby declares that the radio system type 12935-01 complies with the 2014/53/EU directive. The complete text of the EC Declaration of Conformity is available at the following Internet address:

[www.phywe.com/en/ec-declaration](http://www.phywe.com/en/ec-declaration)

## 10 DISPOSAL

The packaging mainly consists of environmentally-friendly materials that should be returned to the local recycling stations.



Do not dispose of this product with normal household waste. If this unit needs to be disposed of, please return it to the address that is stated below for proper disposal

PHYWE Systeme GmbH & Co. KG  
Abteilung Kundendienst  
Robert-Bosch-Breite 10  
D-37079 Göttingen

Telefon +49 (0) 551 604-274  
Fax +49 (0) 551 604-246

## 11 EXPLANATION OF THE SYMBOLS



Attention!  
Potentially damaging situation (damage to property)  
General danger area  
Observe operating instructions



Note  
Important information about the device  
Observe operating instructions