edaMove

Mobile EDA and Physical Activity Sensor

User Manual

movisens

Imprint

User manual edaMove

Version: 02.04.2014

movisens GmbH
Fritz-Erler-Straße 1-3
76133 Karlsruhe
Germany

Phone: +49 721 381344-0
Fax: +49 721 381344-90

Internet: www.movisens.com
E-Mail: support@movisens.com

Contents

1 Welcome!

Dear customer,

Thank you for choosing the EDA (electrodermal activity) and physical activity Sensor **edaMove** from movisens. With this sensor, you get the newest technology for mobile monitoring of psycho physiological parameters in everyday life.

Please read this manual completely and thoroughly before bringing the measurement system into service! In his manual you will find all Information relevant to the use and maintenance of the measurement system as well as for solving problems.

If you have any further questions, don't hesitate to call us. It is our pleasure to help you:

Phone: +49 721 381344-0

2 Scope of application

edaMove is a scientific research instrument, to capture the EDA (electrodermal activity) and the physical activity of a person and other secondary parameters derivable from these measurement signals. edaMove is designed and tailored for the use in research applications.

The EDA and activity sensor edaMove is not a medical device!

The sensor acquires a single channel EDA signal using two Ag/AgCl electrodes. In addition to this, the sensor is measuring acceleration in three dimensions, air pressure and ambient temperature.

The edaMove uses the exosomatic measurement method, where an external DC voltage of 0.5V is applied to the skin to acquire skin conductance.

The configuration of the sensor is done from PC by means of the software included in this package.

edaMove allows the measurement and in conjunction with movisens DataAnalyzer the analysis of the following parameters:

- Skin conductance
- Skin conductance level
- Many features of skin conductance responses
- Acceleration in three dimensions
- Air pressure and temperature
- Movement Acceleration and Step Count
- Activity Classes and Body Position
- Energy Expenditure

Tip:

On demand, other parameters could be calculated from raw data by movisens.

3 Instructions of Use

- edaMove is not a medical device.
- Only use ekgMove for the designated applications.
- Never connected the sensor to the cradle as long as the electrodes are attached to the test person.
- Never open edaMove.
- The battery of the ekgMove may only be changed by manufacturer.
- edaMove is not waterproof. Don't use edaMove in wet environment.
- Only use the edaMove under the specified conditions.
- To charge the battery of the sensor, only use USB standard compatible devices.
- If there are any problems by using the electrodes or the wrist band or any other physical problems (e.g. pressure marks, skin irritations, itching, redness of skin, hypersensitivity or other discomfort), please stop using the product immediately.

4 Scope of delivery and accessories

In this chapter, you come to know which parts are within the scope of delivery and what is available as accessories.

All of these parts could be reordered. Please consider the order number in the following paragraph.

To use the sensor a computer is needed in addition to the scope of delivery.

4.1 Scope of delivery

The following components are included in delivery:

Article	Order No.
EDA- and Activity Sensor edaMove Cradle with Micro USB Interface, Wrist band, Mirco USB Cable, SensorManager Software	10102

4.2 Accessories

The following accessories can be ordered optionally:

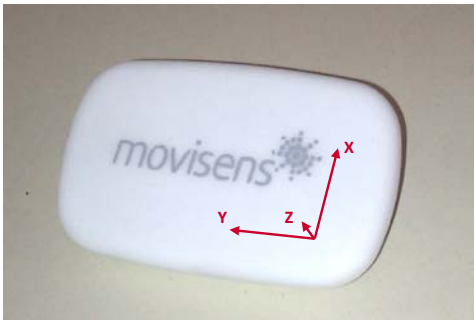
Article	Order No.
Wrist band	TBD
Cradle with Micro USB Interface	30105
Micro USB Cable	30102
Bluetooth-Dongle	30103
Micro USB Charger for 110-240V	30100
USB Hub, 7 Ports	30101

5 Description of the sensor

edaMove is equipped with Ag/AgCl electrodes for high quality recordings of electrodermal activity. The sensor can be attached to the wrist and the electrodes can be placed on the palm of a hand.

Included in the delivery you also get a cradle with micro a USB interface. To connect the sensor to a PC, you have to remove the sensor and the electrodes from the test person and plug it into the cradle.

The axes of the integrated acceleration sensor are defined as described in the following figure:



The edaMove sensor is equipped with a multi-colored LED to show the status of the sensor:

Status-LED	Meaning
Flashing red (once per second)	The sensor is active and records data
Flashing red slowly (every two seconds)	Delayed recording active
Flashing green	The sensor is connected to a PC or a charger. The battery is fully charged.
Flashing blue	The sensor is connected to a PC or a charger. The battery is actually being charged.
Flashing blue fast (three times per second)	The battery is flat, sensor will turn off soon.
Flashing Red fast (three times per second)	An error occurred. Please contact the manufacturer.
No LED active	The sensor is inactive.

Combination of red blinking and green blinking as well as red blinking and blue blinking are possible whit the appropriate combination of the above described meanings.

The edaMove sensor features a vibration alarm to signal the beginning and the end of a measurement.

6 Software Installation

This chapter describes how to install and uninstall the software and how to update it. Beside this, the system requirements are defined.

6.1 System Requirements

Before installing the software, please check if the following system requirements are fulfilled.

- PC with Windows XP or higher
- Administrator rights during installation
- A minimum of 300 MB free space on hard disc

The delivered software consists of two programs:

- SensorManager: Program to configure the sensor, to start a measurement and to download the data from the sensor.
- UnisensViewer: Program to view the stored data.

6.2 Installing the software

Please ensure that your PC fulfills the requirements described above.

Step 1: Plug the USB drive into the USB port of your PC. The content of the medium will be shown.

> ! If the window does not open automatically, select the appropriate drive from the window “My computer”

Step 2: Double click the file “movisens_SensorManager_Setup_Full.exe“

✓ The Installation runs automatically in the background. After successfull installation, shortcuts are created in the Windows Start Menu under the entry “movisens SensorManager”

Step 3: Double click the file “UnisensViewer_Setup_Full.exe“

✓ The Installation runs automatically in the background. After successfull installation, a shortcut “UnisensViewer” is created in the Windows Start Menu.

6.3 Updating the software

You need an internet connection to make an update. Select Windows Start Menu → movisens SensorManager → Updater and respectively Windows Start Menu → UnisensViewer → Updater. If a new version is available, it will be downloaded and installed automatically.

6.4 Uninstalling the Software

The software can be uninstalled with the Windows Control Panel.

7 Handling

This chapter describes how to prepare a measurement and how to attach the sensor to a test person. Furthermore you get information to save, delete and analyze data from the sensor.

7.1 Charging the Sensor

Step 1: Connect the cradle with the USB cable to a USB port (USB port of your computer or another port that conforms to USB standard like USB hub or USB charger). Attach the sensor with the help of the push buttons at the cradle. Please make sure that the 4 contacts are connected (marked red in the picture).

✓ After connecting the sensor to a USB port, the charging process starts immediately. During charging, the status LED is blinking blue. If the sensor is fully charged, the LED is blinking green.

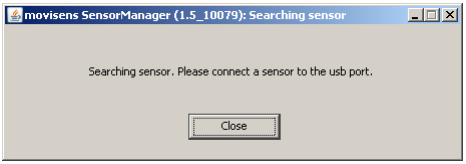
If the sensor is deeply discharged (e.g. after a long period where it was not used), it can take up to several minutes until the sensor reacts and can be identified by the computer.

7.2 Preparing a measurement

Before conducting a measurement please make sure you installed the software as described in chapter 6.1.

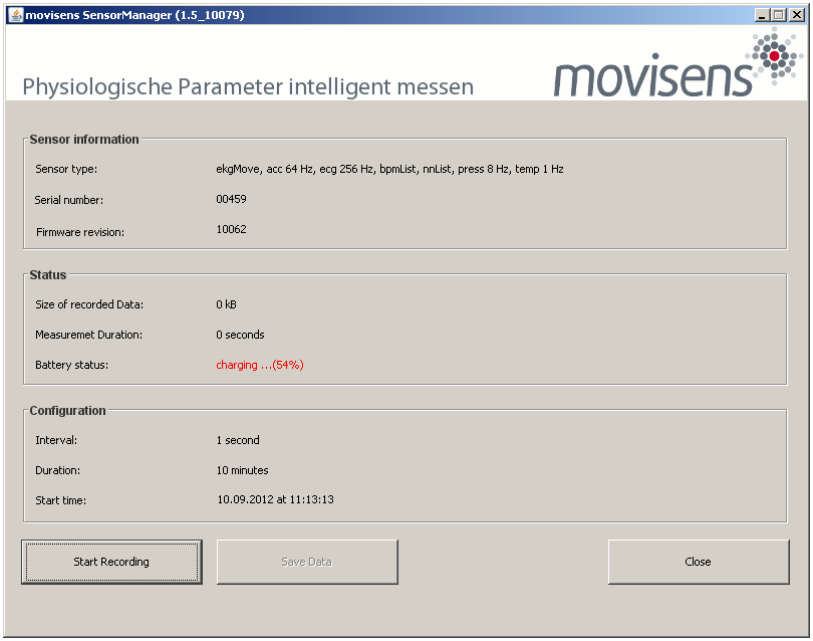
Step 1: Start the movisens SensorManager by selecting Windows Startmenu → movisens SensorManager → SensorManager

✓ SensorManager is now searching for available sensors.



Step 2: Connect the edaMove sensor with your PC using the cradle.

✓ The software will automatically detect the device and open the following window:



This application shows information about sensor hardware, sensor state and sensor configuration.

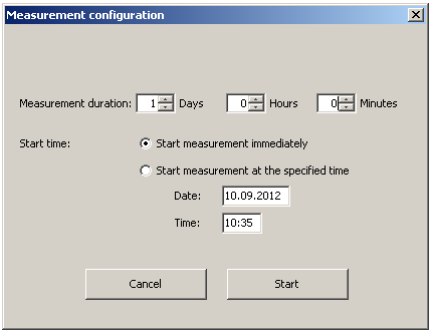
Before you start a measurement please check the charging status of the battery. The maximum measurement duration can only be reached when the battery is fully charged.

7.3 Starting a measurement

To start a measurement do the following steps:

Step 1: In the sensor manager software click on the „Start Recording“ button in the lower left of the window.

✓ You can see the following window:

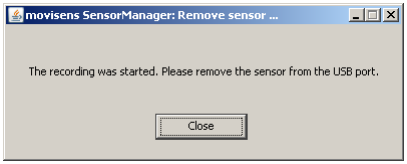


Step 2: Please supply the following information into the text fields:

- Measurement duration. The maximum measurement duration depends on the manufacturer configuration of your sensor.
- Start time. You can start the measurement immediately or delayed at a specific time. If you want to start your measurement delayed please specify date and time. The given time should not be more than 2 days from now.

Step 3: Start the measurement by clicking the „Start“ button.

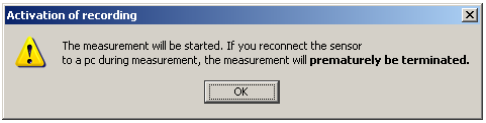
✓ You will see the following window:



Step 4: Please follow the instructions and remove the sensor from the cradle.

✓ The status LED will flash red once per second as soon as the measurement has started and data will be recorded. If a delayed start was configured the LED flashes red every two seconds until the measurement starts.

❗ If you reconnect the sensor after starting a measurement again with a PC, the measurement will be stopped prematurely.



❗ If you connect the sensor to an USB charger, the measurement won't be stopped. That means you can extend the measurement duration by intermediately charging the sensor during a measurement.

7.4 Attaching the Sensor to the test person

Step 1: Make sure that the electrodes are clean und free from old electrode gel. Make also sure that the edges of the electrodes are free from grease.

Step2: Attach the adhesive rings to the electrode. Degrease the skin of the test person. Fill electrode gel into the electrode and remove

excess gel with a plain object. Remove the protective foil from the adhesive ring and place the electrodes onto the clean skin area.

Step 3: Attach the sensor with the wristband.

> **Make sure that the sensor is never connected to the cradle as long as the electrodes are attached to the test person!**

7.5 Stopping a measurement

The measurement will automatically be stopped, if the configured measurement duration has passed.

A running measurement will also be stopped when:

- The sensor is connect to a PC
- The end of the battery run time has been reached

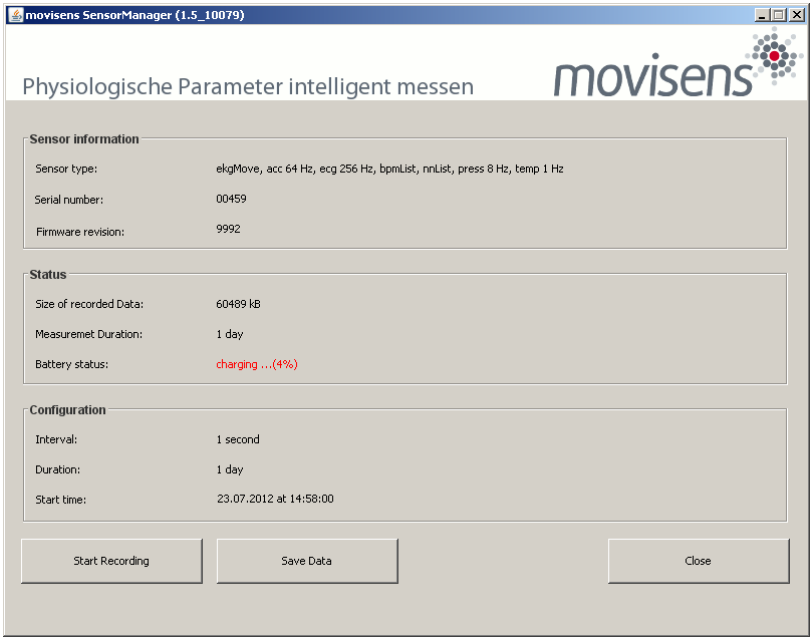
7.6 Storing measurement data

To store recorded measurement data on the PC do the following steps:

Step 1: Start the SensorManager by selecting Windows Start menu → movisens SensorManager → SensorManager

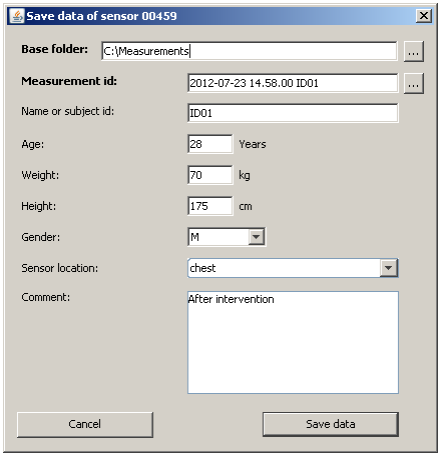
Step 2: Remove the edaMove sensor and the electrodes from the test person and connect the sensor to the PC using the cradle.

✓ After the SensorManager has detected the connected sensor, the following windows will be shown:



Step 3: Click on „Save Data“.

✓ You will see the following window:



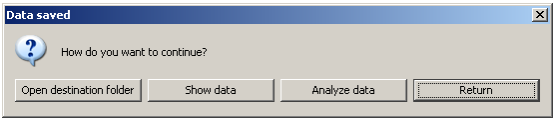
Step 4: Please type in the following information:

- Select the base folder, where your measurements should be stored. To do this, click the button after the text field.
- Type in the ID of the measurement. If you want to use date and time in the ID click the button after the text input field.
- All other information is optional. If the measurement data shall be further processed with the movisens DataAnalyzer the additional information is mandatory.

Step 5: Finally click on „Save data“

The measurement data will be stored in the Unisens format. Unisens is an open data format for multi sensor data. You can find further information about Unisens here: www.unisens.org

✓ The software confirms the end of data storing process. The following window is shown:

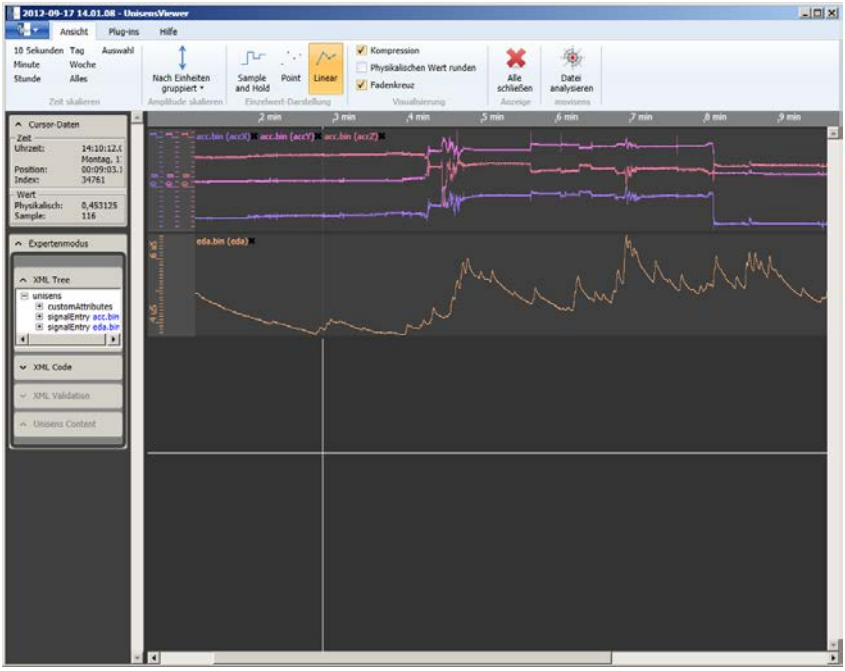


You can now directly show the stored data. The measurement will be shown in the UnisensViewer. If you have installed the movisens DataAnalyzer you can directly start data analysis and generate reports be clicking on “Analyze data”. You can find more information in the DataAnalyzer manual.

7.7 Viewing measurement data

To view recorded measurements click on „Show data“ directly after the string process.

To view previously stored measurements use the Windows Explorer to navigate to your measurements folder and then open the folder with the desired ID. Then double click on the “unisens.xml”-file. The measurement will then be shown in the UnisensViewer:



movisens also offers analyzing your data and generating reports according to your needs as a service. If you have any further questions, please do not hesitate to contact us.

8 Maintenance and proper disposal

8.1 Maintenance

Besides charging the batteries, the ecgMove sensor does not need any further maintenance. The battery capacity will decrease slowly with charging cycles and age. The battery can only be changed by movisens. Please contact us in the case when a replacement is necessary

8.2 Cleaning instructions

If you want to clean the ekgMove sensor, please note the following:

- Disconnect the sensor from chest belt, electrode patch adapter or cradle
- Use a soft slightly moistened cloth
- Take care that no humidity enters the sensor housing

8.3 Cleaning the electrodes

To clean the electrodes please consider the following:

- Don’t touch the electrode area with sharp objects
- Use cotton swabs to clean the electrode area and to remove old electrode gel.

8.4 Proper disposal

The Move II is subject to the EU directive WEEE (Waste Electrical and Electronic Equipment). Please consider your local regulations for waste disposal.

9 Technical Data

Power supply	Lithium-Ion battery
Supply voltage	3 V
Accumulator voltage	2.7 – 4.2 V
Number of charging cycles	300 with 1C/1C > 80%
Maximum recording capacity	~ 2 weeks, depending on manufacturer configuration
Battery run time (recording, Bluetooth off)	~ 1,5 days
Size of sensor (W x H x D)	62.3mm x 38.6mm x 10.5mm
Internal sensor	EDA-Amplifier: Exosomatic method, DC, 0.5V Resolution 14bit, Input range 2µS up to100µS Bandwith: DC to 8Hz Output rate: 32Hz 3D acceleration sensor: Measurement range: +/- 8 g Noise: 4 mg Output rate: 64 Hz Pressure sensor: Measurement range: 300 - 1100 hPa Noise: 0.03 hPa Output rate: 1 Hz
Indicators	LED, 3-color (operation and charging status) Vibrating alert (start and end of measurement)

Interfaces	Micro-USB, Bluetooth
Environmental conditions	Temperature: -20 °C to 60 °C 0 °C to 45 °C during charging Humidity: 0 to 75% RH relative humidity Atmospheric pressure: 300 to 1100 hPa absolute

10 Legal Notes

10.1 Copyright

The software that comes with the Move 3 sensor is protected by copyright. Renting, exchanging, broadcasting, duplication or copies are not permitted.

10.2 Disclaimer

The material in this manual is for informational purposes only. The products it describes are subject to change without prior notice. movisens makes no representations or warranties with respect to this manual or with respect to the products described herein.

movisens shall not be liable for any damages, losses, costs or expenses, direct, indirect or incidental, consequential or special, arising out of, or related to the use of this material or the products described herein.

The activity sensor Move II is no medical device and is not intended to be used for medical purposes.

10.3 Trademarks

Windows and Windows XP are registered trademarks of Microsoft Corporation.

movisens GmbH

Fritz-Erler-Str. 1-3
76133 Karlsruhe
Germany

Tel.: +49 721 381344-0
Fax: +49 721 381344-90
info@movisens.com
http://www.movisens.com