

EdaMove 3

EDA and Physical Activity Sensor

User Manual



movisens 

Imprint

EdaMove 3 User Manual

Version: 13.03.2018

The newest version of the User Manual can be found here:

https://www.movisens.com/wp-content/downloads/EdaMove3_User_Manual.pdf

Frequently asked questions:

<https://www.movisens.com/en/faq/>

movisens GmbH
Augartenstraße 1
76137 Karlsruhe
Germany

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

Internet: www.movisens.com

E-Mail: support@movisens.com

© Copyright: movisens GmbH

Contents

1	Welcome!	1
2	Scope of Application	3
3	Instructions of Use	7
4	Scope of Delivery and Accessories	9
4.1	Scope of Delivery	9
4.2	Accessories	10
4.3	Complementary Products	11
4.4	Complete Measurement System	12
5	Description of the Sensor	14
6	Software Installation	17
6.1	System Requirements	17
6.2	Installing the Software	18
6.3	Updating the Software	20
6.4	Updating the Sensor Firmware	20
6.5	Uninstalling the Software	21
7	Handling	23
7.1	Charging the Sensor	26
7.2	Preparing a Measurement	29
7.3	Starting a Measurement	30
7.4	Attaching the Sensor to the Test Person	32
7.5	Stopping a Measurement	35
7.6	Storing Measurement Data	36
7.7	Viewing Measurement Data	41
7.8	Analyzing Data	44

8	Maintenance and Proper Disposal.....	47
8.1	Maintenance.....	47
8.2	Cleaning Instructions	47
8.3	Cleaning the electrodes	47
8.4	Cleaning of Wrist Bands	47
8.5	Proper Disposal	48
8.6	Troubleshooting	48
9	Technical Data	50
10	Legal Notes	53
10.1	Copyright	53
10.2	Disclaimer	53
10.3	Trademarks	53

1 Welcome!

Dear customer,

Thank you for choosing the EDA (electrodermal activity) and physical activity sensor **EdaMove 3** from movisens. This sensor provides researchers the latest technology for the mobile monitoring of psycho-physiological parameters in everyday life.

Please read this manual completely and thoroughly before bringing the measurement system into service! In this manual you will find the relevant information about using and maintaining the measurement system as well as for solutions for common 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

E-Mail: support@movisens.com

2 Scope of Application

The **EdaMove 3** detects and records the EDA (electrodermal activity) and physical activity of a person. Other secondary parameters are also calculated from this raw data. The **EdaMove 3** comes optimized for researchers.

The EDA and physical activity sensor EdaMove 3 is not a medical device!

The sensor acquires a single channel EDA signal using two Ag/AgCl electrodes. The **EdaMove 3** uses the exosomatic measurement method, applying a DC voltage of 0.5V to the skin to acquire skin conductance.

To measure the physical activity of a person the sensor acquires the 3D-acceleration and the atmospheric air pressure. The sensor also records the ambient temperature.

The sensor can be configured via a PC by utilizing the **Sensor Manager** software included in this package.

When used with the **DataAnalyzer** software, the **EdaMove 3** allows the offline generation of reports, and the analysis of the following parameters:

- Skin Conductance
- Skin Conductance Level
- Acceleration in three dimensions
- Atmospheric Air Pressure
- Temperature

- Movement Acceleration
- Acceleration along the body axis
- Inclination of body axes
- Steps
- Activity Classes
- Body Position
- Altitude
- Activity Energy Expenditure
- Total energy expenditure
- Metabolic Equivalent of Task (MET)
- Energy expenditure summary
- Physical activity report
- Physical activity and energy expenditure report

In addition to long term data recording and offline processing; the **EdaMove 3** can transmit a live analysis of EDA data and physical activity parameters via Bluetooth Smart. When connected to the **Sensor Trigger** application, changes in these parameters can trigger questionnaires on the experience sampling platform **movisensXS**.

Algorithms can be implemented to identify specific physiological changes, allowing researchers to accurately capture answers and to track very specific variables via interactive ambulatory assessment studies.

The following parameters are measured and calculated on the sensor in 1 minute epochs, and then transmitted via a Bluetooth Smart interface:

- EDA SCL mean 1/30 Hz
- Temp mean 1/30 Hz
- Movement Acceleration 1/30 Hz
- Step Count
- Step count 1/30 Hz
- charging 1/10 Hz (whether the device is being charged)
- State of charge 1/60 Hz (the current battery level)

These values are transmitted with 1 value per minute. Additional live parameters will be available soon.



Tip:

movisens can calculate other parameters from raw data upon request.

3 Instructions of Use

- ! **EdaMove 3 is not a medical device.**
- ! Only use **EdaMove 3** for the designated applications.
- ! Never connect the sensor to the charging cradle when the electrodes are attached to the test person.
- ! Never open the **EdaMove 3**.
- ! The battery of the **EdaMove 3** may only be changed by the manufacturer.
- ! The **EdaMove 3** is not waterproof. Don't use the sensor in wet environments.
- ! Only use the **EdaMove 3** under the specified conditions.
- ! Only use USB standard compatible devices to charge the battery of the **EdaMove 3**.
- ! The wrist band for the **EdaMove 3** should be cleaned regularly.
- ! If any physical problems develop from using the electrodes or wrist band (e.g. pressure marks, skin irritations, itching, redness of skin, hypersensitivity or other discomfort) cease using the product.

4 Scope of Delivery and Accessories

In this chapter, you'll learn which parts come with the **EdaMove 3**, and what accessories are available. All of these parts can be reordered as required. Please note the order numbers in the following table to ensure the appropriate product is shipped.

Note: A PC is also required to perform measurements in addition to the scope of delivery.

4.1 Scope of Delivery

The following component is included in delivery:

Article	Order No.
EdaMove 3 EDA and Activity Sensor Raw data acquisition: EDA 32 Hz, 3D acceleration 64 Hz, Barometric Altitude 8 Hz Measurement duration: 5 days (up to 4 weeks with re-charging) Live analysis of data Bluetooth Smart interface Fixation port for use with wristband Includes cradle, Micro USB cable and SensorManager software to read out and configure the sensor	10151

4.2 Accessories

The following accessories can be ordered optionally:

Article	Order No.
Wrist Band Move 3 (S) Size: S Wrist Measurement: 13 to 16 cm	10129
Wrist Band Move 3 (M) Size: M Wrist Measurement: 15 to 18 cm	10130
Wrist Band Move 3 (L) Size: L Wrist Measurement: 17 to 23 cm	10131
Wrist Band Move 3 (XL) Size: XL Wrist Measurement: 20 to 28 cm	10132
USB Charger USB Charger for 110-240V	30100
USB Hub USB Hub 2.0, 7 Ports	30101
Micro USB Cable	30102
Cradle Cradle with Micro USB interface	30110
EDA Gel for Electrodes	40101
Adhesive Rings for EDA Electrodes	40102



4.3 Complementary Products

The following products can be used together with **EdaMove 3**:

Article	Order No.
DataAnalyzer Base Single User Licence Basic Software with Algorithms for Physical Activity	20100
DataAnalyzer Module EnergyExpenditure Single User Licence, in combination with DataAnalyzer Base Algorithms for Energy Expenditure	20101
DataAnalyzer Module EDA Single User Licence, in combination with DataAnalyzer Base Algorithms for Electro Dermal Activity	20102

movisensXS Basic Experience Sampling for Android Bundle license for 10.000 item results usable with unlimited number of smartphones	20110
movisensXS Gold Experience Sampling for Android Bundle license for 100.000 item results usable with unlimited number of smartphones	20111
movisensXS Platinum Experience Sampling for Android Bundle license for 1.000.000 item results usable with unlimited number of smartphones	20112
Sensor Trigger Solution for Interactive Ambulatory Assessment to retrieve the sensor data on your android device and trigger forms in movisensXS.	20120

4.4 Complete Measurement System

Through a combination of the following components you can measure and analyze EDA and physical activity data:

- An **EdaMove 3** sensor for the objective assessment and recording of the electrodermal and physical activity

- The movisens **SensorManager** software to configure and transfer data from the sensor
- The **UnisensViewer** for the visualization and preprocessing of the sensor data and calculated results
- The movisens **DataAnalyzer** software to analyze and calculate outcome parameters, create reports, and process the captured data
- The experience sampling platform **movisensXS** (for interactive ambulatory assessment)
- The **SensorTrigger** application allows the **EdaMove 3** to transmit various parameters to an Android smartphone. The application evaluates these parameters with predefined and configurable algorithms and triggers forms in **movisensXS**.

A detailed description of these components can be found in the following documents:

- [Online help for **UnisensViewer**](#)
- [DataAnalyzer User Manual](#)
- [Online help **movisensXS**](#)
- [Sensor Trigger User Manual](#)

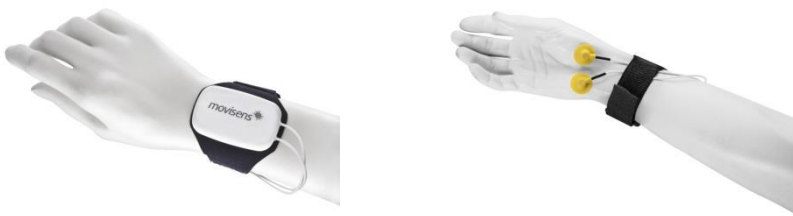
5 Description of the Sensor

The **EdaMove 3** is a mobile sensor that measures electrodermal (EDA) and physical activity. The EDA signal is assessed by an exosomatic measurement with DC (direct current), using a constant voltage system supplying 0.5 Vdc.

The measurable bandwidth for EDA signals in the literature is from 0 to 5Hz when a DC voltage is applied to the skin. The **EdaMove 3** uses a sample rate of 32 Hz, to achieve an ideal tradeoff between exact determination of skin conductance reaction timing and preserving memory and battery.

The **EdaMove 3** comes equipped with reusable, non-polarizing sintered Ag/AgCl electrodes recessed in cylindrical plastic cases for high quality recordings. The electrode disc diameter of 10 mm, results in an effective electrode area of 78.5 mm². The electrode size should be noted in publications.

There are two attachment points for the sensor electrodes – either the palm or the ankle. The attachment process for the hand is detailed in chapter 7.4. The same principles apply when the sensor needs to be attached to the ankle.



The **EdaMove 3** utilizes a Bluetooth Smart interface to allow the sensor to connect with a gateway or a mobile phone for live applications. The Bluetooth Smart interface comes activated in the default configuration of the sensor. If this feature is not required, it can be deactivated by installing a different firmware. (See 6.4)

A cradle with a micro USB interface comes included in the delivery. To connect the sensor to a PC, you have to remove the sensor **and** the electrodes from the test person and connect it to the cradle.

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



EdaMove 3 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 charging.
Flashing magenta	The sensor is active and records data. It is connected to a charger and charging
Flashing yellow	The sensor is active, records data. It is connected to a charger. The battery is fully charged.
Flashing blue fast (three times per second)	The battery level is low, the sensor will turn off soon.
Flashing red fast (three times per second)	An error occurred. Reset sensor (see 8.6). If the sensor doesn't stop flashing, please contact the manufacturer.
No LED active	The sensor is inactive.

Combinations of red and green blinking as well as red and blue blinking are possible with the appropriate combination of the above descriptions.

EdaMove 3 will vibrate upon Bluetooth disconnection.

6 Software Installation

6.1 System Requirements

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

- PC with one of the following Versions of Microsoft Windows: Windows 7, Windows 8, Windows 8.1, Windows 10
- USB 2.0 or USB 3.0 interface
- Administrator rights during installation
- A minimum of 300 MB free space on hard disc

The included software consists of two programs:

- **SensorManager:** A program that allows you to configure the sensor, to start a measurement and to extract the data from the sensor.
- **UnisensViewer:** A program to view and edit the recorded data.

Option:

The sensor trigger app and cloud based experience sampling program **movisensXS** can also be utilized in addition to the analysis software. This can provide further complementary research data (see 0):

- **DataAnalyzer:** A program that can generate detailed reports and analyze the data collected by the sensor.

- **movisensXS:** Experience sampling /Ecological Momentary Assessment platform.
- **Sensor Trigger:** android sensor trigger app that can evaluate the analyzed data transmitted via a Bluetooth smart interface.

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.exe "

- ✓ The Installation runs automatically in the background. After a successful installation, shortcuts are created in the Windows Start Menu under the entry "movisens SensorManager".



The following chapters detail how to use the software.

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

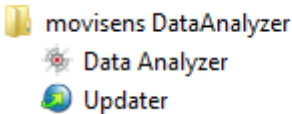
- ✓ The Installation runs automatically in the background. After a successful installation a shortcut "UnisensViewer" is created in the Windows Start Menu.

Option:

If you ordered a licence for the **DataAnalyzer** software package, please follow the next step. The **DataAnalyzer** User Manual explains how to use the application in detail.

Step 4: Double click the file "DataAnalyzer_Setup_Full.exe"

- ✓ The Installation runs automatically in the background. After a successful installation a shortcut "movisens DataAnalyzer" is created in the Windows Start Menu.



The use of the different programs is explained in the **DataAnalyzer** User Manual.

6.3 Updating the Software

You need an internet connection to update the software. Select Windows Start Menu → movisens SensorManager → Updater

If a new version is available, it will be downloaded and installed automatically after starting the updater software.

6.4 Updating the Sensor Firmware

If the **SensorManager** contains a sensor firmware version that is newer than the firmware on the sensor, an option to "Update sensor" is displayed.

Step 1: Check that the sensor is charged.

Step 2: Start the update by clicking the "Update sensor" button.

- ❗ Never unplug the sensor during firmware update or interrupt the firmware update process.

Special firmware versions can be installed to change the default configuration of the sensor, allowing customized applications or to deactivate the Bluetooth interface in order to extend battery life. These firmware versions are available upon request from movisens.

To install the new firmware, please start
Windows Start Menu → movisens SensorManager → Firmware Updater

You can now select the new firmware and start the update.

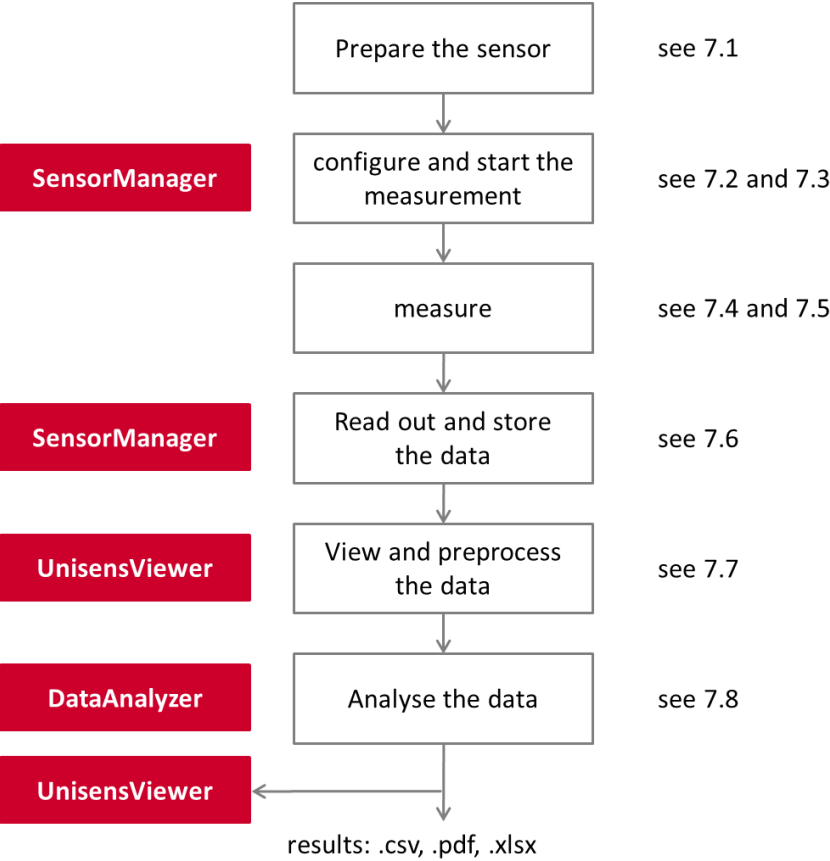
6.5 Uninstalling the Software

The software can be uninstalled using the Windows Control Panel.

7 Handling

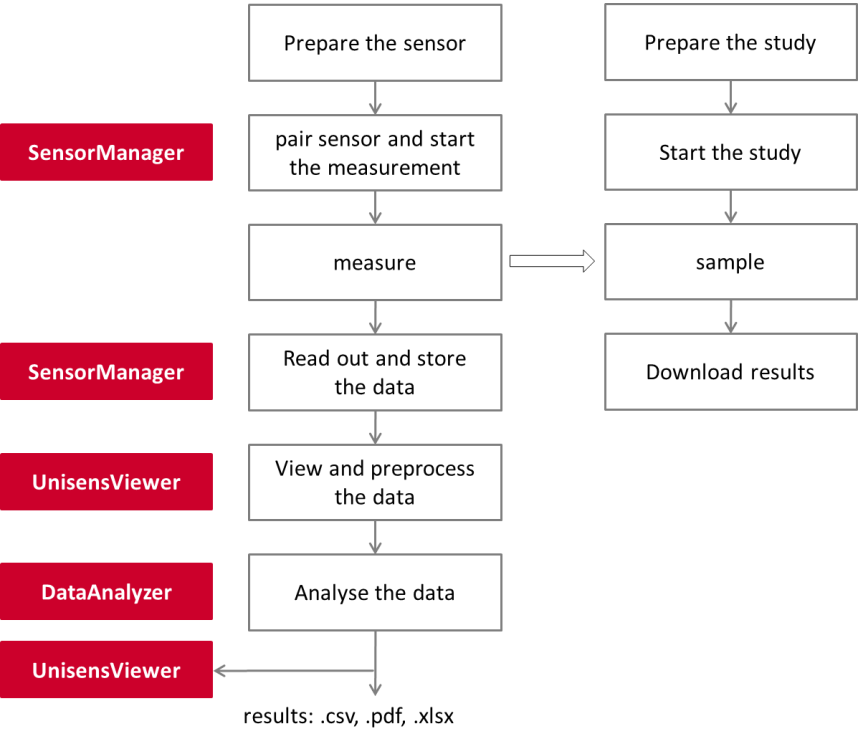
This chapter describes how to prepare a measurement and how to attach the sensor to a test person. Furthermore you get information on how to save, delete and analyze data from the sensor.

A typical usage scenario for the assessment of data and offline analysis is shown in the following diagram. The relevant software for each step is indicated on the left side of the diagram.



The different steps are described in further detail in the chapters indicated on the right of the diagram.

If you want to use the sensor in combination with the experience sampling platform **movisensXS**, the different steps to use the sensor are shown in the following figure. Unlike the offline measurement, the measurement is initiated on your mobile device.

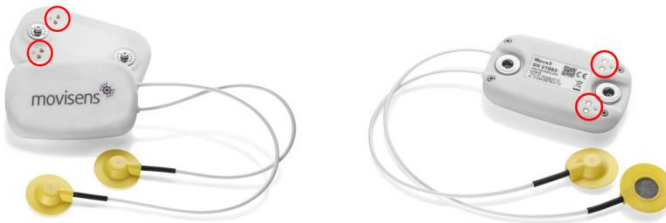


The right side of the diagram illustrates the process to prepare and run a study on **movisensXS**.

To retrieve the data from the **EdaMove 3**, you have to read out the sensor after the measurement. The results of **movisensXS** only contain the sensor information that causes a trigger.

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 a USB hub or USB charger). Attach the sensor with the help of the push buttons on the cradle. Please make sure that the 4 contacts are connected (marked red in the picture). To charge multiple sensors at the same time, we suggest using a USB hub (see 4.2).



- ✓ After connecting the sensor to a USB port, the charging process starts immediately. During charging, the status LED is blinking blue. If the battery is fully charged, the LED is blinking green. The charging process of the sensor can take up to two hours, depending on the battery status of your sensor.
- ✓ If the sensor is fully charged, the battery run time during recording is 5 days.

Step 2: To extend the measurement duration you can recharge the sensor during a measurement.

- ! If you want to recharge the sensor, you first have to remove the electrodes from the test person.
- ! If recharging while taking a measurement **DO NOT** to plug it into your PC as that will stop the measurement. Instead use a USB charger.

When recharging the sensor you have to ensure that the battery is fully charged (until the sensor is blinking yellow).



Tip:

If the sensor should be recharged by the test person, you can define a regular time (e.g. during the night or during taking a shower in the morning) when they can plug the sensor to a USB charger.

- ! To be sure that the sensor is not running out of battery, you must advise the test persons to recharge the sensor every day until it is blinking yellow. The recommended duration for **daily recharging** is **15 minutes**.

If you recharge the sensor regularly you can make a measurement up to the 1 month recording capacity of the sensor.

If the sensor runs out of battery during a long measurement, the recording will be stopped. The recording will not continue, even if you connect it to a charger.

If the sensor is discharged completely (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.

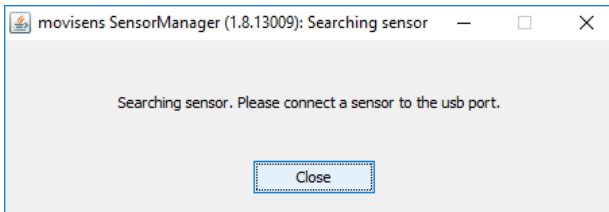
You can check the battery status before the measurement with the sensor manager, see the following section.

7.2 Preparing a Measurement

Before conducting a measurement please make sure you installed the software as described in chapter 6.2.

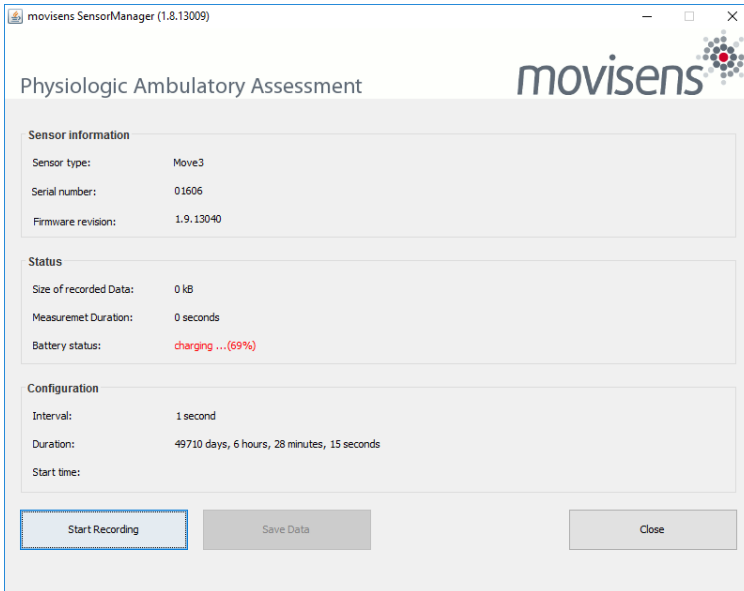
Step 1: Start the **SensorManager** by selecting Windows Startmenu → movisens SensorManager → SensorManager

✓ **SensorManager** is now searching for available sensors.



Step 2: Connect **EdaMove 3** 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.

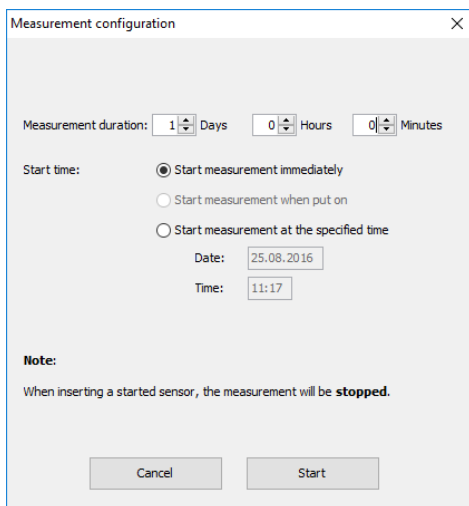
- ❗ When connecting for the first time allow up to 30 seconds for the device to be detected as it installs the driver.

7.3 Starting a Measurement

To start a measurement, please perform the following steps:

Step 1: In the **SensorManager** software click on the “Start Recording” button in the lower left of the window.

✓ You can see the following window:



The image shows a 'Measurement configuration' dialog box with a close button (X) in the top right corner. It contains the following elements:

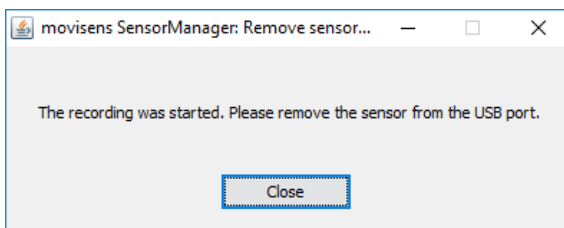
- Measurement duration:** Three spinners for 'Days' (set to 1), 'Hours' (set to 0), and 'Minutes' (set to 0).
- Start time:** Three radio buttons:
 - ☒ Start measurement immediately
 - ☐ Start measurement when put on
 - ☐ Start measurement at the specified time
- Date:** A text field containing '25.08.2016'.
- Time:** A text field containing '11:17'.
- Note:** A text label 'Note:' followed by the text 'When inserting a started sensor, the measurement will be **stopped**.'
- Buttons:** 'Cancel' and 'Start' buttons at the bottom.

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

- **Measurement duration:** The maximum measurement duration of the **EdaMove 3** is about 5 days without recharging the sensor. (see 0)
- **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 as the maximum measurement duration can be influenced.

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 PC.

- ✓ 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.
- ✓ At the end of the measurement the LED stops flashing.
 - ! 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 a USB charger, the measurement won't be stopped. That means you can extend the measurement duration by intermittently charging the sensor during a measurement (see 0).

7.4 Attaching the Sensor to the Test Person

- ! Make sure that the sensor is **NOT** connected to the cradle when the electrodes are attached to the test person!

Step 1: Clean the electrodes, making sure that there are no traces of old electrode gel and that the surfaces are free from grease.

Step2: Connect the sensor to the wrist strap and lay the sensor on a flat surface in front of the test subject. Make sure that the electrode cables are lying towards the subjects elbow, not the fingers and ensure that they are separated on either side of the arm.

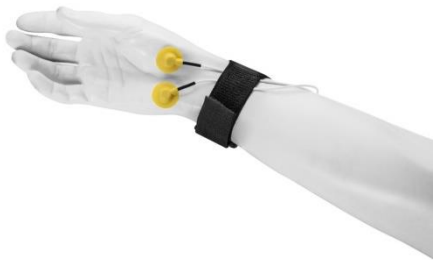


Step 3: Bring the electrode cables up and place them in the hand of the test person. As the test person holds the electrodes in place, secure the wrist strap **over** the cables. The strap should be firm, but not too tight. This helps to keep the cables secure and prevents them from being caught on any protruding object.

Step 4: Now attach the adhesive rings to the electrodes. Make sure that the skin of the test person is clean and free from grease.

Step 5: Fill the electrode with electrode gel, and then use a plain object to scrape away any excess gel. Now you can remove the protective foil from the adhesive ring, and place the electrode on to the skin. Adjust the electrode cables to remove excess slack

around the hand. The slack of the cable should remain on the elbow side of the wrist strap against the forearm to minimize any discomfort for the test person.

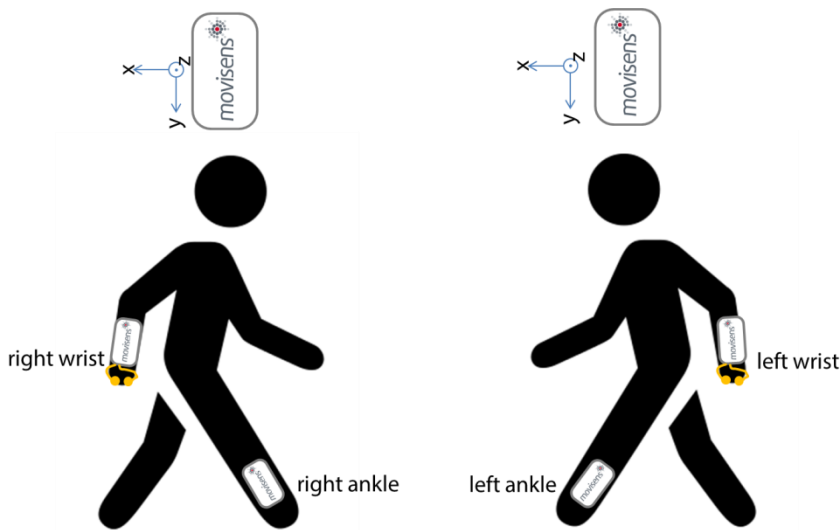


Tip:


We recommend to use an electrode gel containing chloride salt (concentration $\leq 0.5\%$) in a neutral

Note that with the sensor attached to the non-dominant wrist, only simple physiological activity parameters like Movement Acceleration and activity class can be reliably detected and used for calculation.

The following figure and table lists the possible sensor locations supported by the **DataAnalyzer** software and the parameters that can be calculated. For more details refer to the user manual of the **DataAnalyzer**.



Sensor positions for **EdaMove 3**

 EDA electrodes

Sensor location	Movement acceleration	Activity class	Body position	Energy expenditure
right, left wrist	✓	✓	-	(✓)
right, left ankle	✓	-	-	-

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

If the battery is low, this is indicated by fast blue flashing (three times per second). The sensor will then turn off soon.

7.6 Storing Measurement Data

The measurement data of the sensor is stored as raw data (e.g. the acceleration data as it is measured). The data is not processed or aggregated neither in the sensor nor in the **SensorManager** software. That allows you to have a sustainable database with all the raw data of your study that can be used with future studies and with future algorithms.

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 **EdaMove 3** and the electrodes from the test person and connect it to the PC using the cradle.

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

movisens SensorManager (1.8.13009)

Physiologic Ambulatory Assessment

Sensor information

Sensor type:	Move3
Serial number:	01606
Firmware revision:	1.9.13040

Status

Size of recorded Data:	14 kB
Measurement Duration:	1 minute, 36 seconds
Battery status:	charging ... (77%)

Configuration

Interval:	1 second
Duration:	1 day
Start time:	25.08.2016 at 11:22:19

Buttons: Start Recording, Save Data, Close

Step 3: Click on „Save Data“.

✓ You will see the following window:

Save data of sensor 01606

Base folder: C:\Measurements

Measurement id: 2016-08-25 11.22.19

Name or subject id: ID01

Age: 28 Years

Weight: 70 kg

Height: 175 cm

Gender: M

Sensor location: right side hip

Comment:

☐ Store data as csv

Buttons: Cancel, Save data

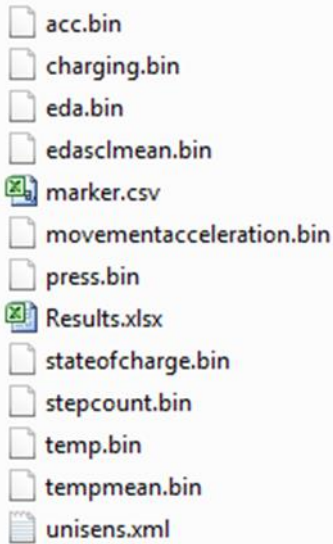
Step 4: Please type in the following information:

- 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.
- If the measurement data shall be further processed with the movisens **DataAnalyzer** the additional information about the person and the sensor location is mandatory.

Step 5: Finally click on „Save data“

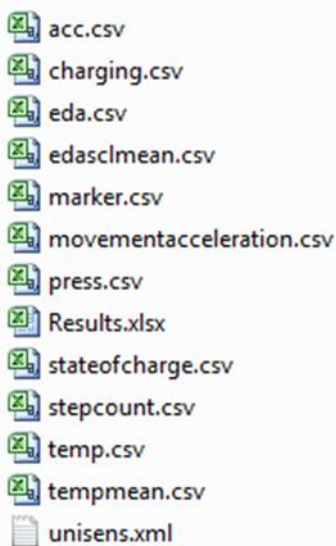
The measurement data will be stored either in the unisens format or as a .csv file. Unisens is an open data format for multi sensor data. You can find further information about unisens here: www.unisens.org

A unisens data set consists of a meta file (unisens.xml) and different data files for each measurement signal. If you select to store data in unisens format, the following files will be generated:



movementacceleration.bin is the result of the live analysis on the sensor, the other .bin files are the raw data of the other measurement parameters.

If you select to store data in .csv format, the following files will be generated:

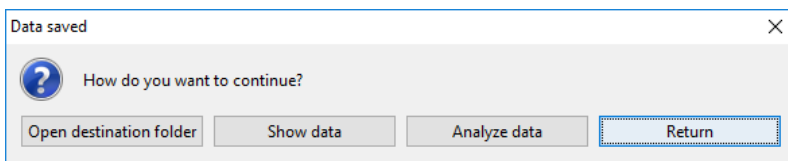


Tip:



When storing data as .csv file, you have to take into account that the size of the data file doesn't exceed the maximum size of the program you want to use (e.g. Microsoft Excel)

- ✓ 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 opened in the **UnisensViewer**. If you have installed the **DataAnalyzer** you can directly start data analysis and generate reports by clicking on "Analyze data". You can find more information in the **DataAnalyzer** User Manual.

7.7 Viewing Measurement Data

To view recorded measurements click on "Show data" directly after storing the data.



Tip:

Directly after storing the data you should check if the measurement is complete and correct. You can check visually if all signals are recorded for the full measurement duration and if the signals are of high quality

To view previously stored measurements use 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**:



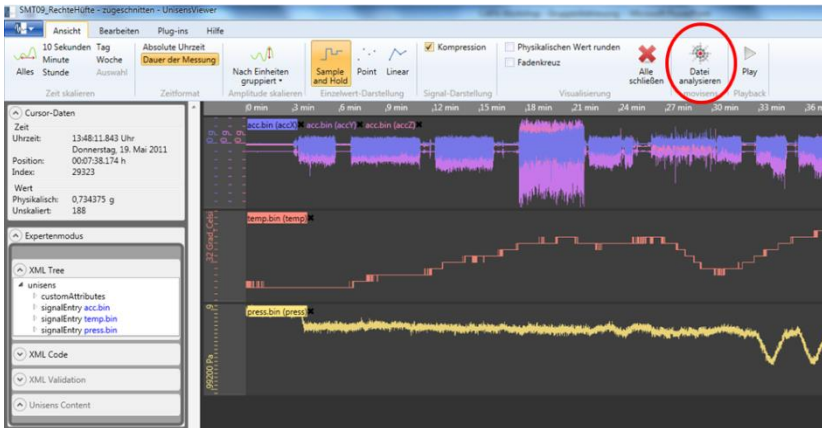
A first preprocessing of the data can be done with **UnisensViewer**. You can crop your signal to the desired time, set markers and annotate artefacts. Details can be found in the online help of **UnisensViewer**.



Tip:

Before changing the data of your study, be sure to have a copy of your raw data.

You directly start the analysis of the data with **DataAnalyzer** by clicking the “Analyze Data” button.



7.8 Analyzing Data

Option:

To analyze the data, movisens offers the modular analyzing software **DataAnalyzer**. This scientific software package allows the analysis of physiologic measurement data. Optimized for movisens sensors, the software can also utilise raw data acquired from sensors that also record raw data in the unisens format.

DataAnalyzer calculates secondary parameters from your physiologic measurement data, creating summaries and reports in just a few clicks. It is also possible to select an entire database for batch-processing.

DataAnalyzer (1.8.13023) - movisens GmbH

Physiologic Ambulatory Assessment

☐ Process all measurements in source folder (batch mode)

Source: C:\Measurements\2016-08-25 11.35.40

Destination: C:\Measurements\2016-08-25 11.35.40_result_2016-08-25 11.52.22

Please select the parameter to be calculated (multiple selection with ctrl key).

Report: Summary of daily energy expenditure, METs, steps and activity classes (Excel)

- ReportActivityMediumPdf (beta)
- Activity report, medium, PDF
- ReportActivityPdf
- Activity Report PDF
- ReportActivitySummaryPdf (beta)
- Activity Summary Report Type A PDF (step, MET)
- ReportActivitySummaryShortPdf (beta)
- Activity Summary Report PDF in one page
- StepCount [steps]
- Count of steps per output interval
- TempMean
- Mean temperature in output interval
- TotalEnergyExpenditure [kcal/d]
- Total energy expenditure (TEE = BMR + AEE)
- VerticalSpeed [m/s]
- Vertical speed, calculated from barometer
- WearTimeAcc (beta)
- Wear time detection based on acceleration (1=worn, 0=not worn)

Alter in Jahren: 28

Körpergröße in cm: 175

Sensor Typ: Move3

Körpergewicht in kg: 70

Geschlecht: M

Trageort des Sensors: right_side_hip

Output interval in s: 60

Calculate


Upon selecting a measurement, all possible analysis outputs (secondary parameters and reports) are shown. The list of analysis outputs depends on your licensed modules and the

data contained in your measurement. You can now select the desired analysis output. If you want to select more than one analysis output keep the Ctrl-key pressed while selecting.

The results of the analysis are stored as a unisens data set. A unisens data set consists of a meta file (unisens.xml) and additional data files for each measurement signal and secondary parameter. Secondary parameters are stored as a .csv file within the unisens data set and are available for further processing e.g. with Microsoft Excel or SPSS



Tip:

movisens  can also analyze your raw data and generate reports according to your needs. 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, **EdaMove 3** 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 **EdaMove 3**, please note the following:

- Disconnect the sensor from USB cable and wrist band.
- 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 Cleaning of Wrist Bands

To clean the wrist bands please consider the following:

- Wash the bands by hand and not in the washing machine.
- Use a mild liquid detergent.
- Directly after washing, air -dry the bands before storing or using it for new measurements.

8.5 Proper Disposal

EdaMove 3 is subject to the EU directive WEEE (Waste Electrical and Electronic Equipment). Please consider your local regulations for waste disposal.



8.6 Troubleshooting

You can find answers to the most common questions here:

<https://www.movisens.com/en/faq/>

Error	Solutions
Sensor is not blinking when connected	If battery is empty it can take 30 seconds or more for the LED to start blinking.
Sensor is not found by sensor manager	Reset sensor. This is found in the start menu under the movisens Sensor Manager folder. The LED will flash all colours (blue, red, green)

	when it is reset.
Flashing Red (3 times per second)	An error occurred. Reset sensor. If the sensor doesn't stop flashing, please contact the manufacturer.

9 Technical Data

Power supply	Lithium-Polymer-Battery
Battery voltage	3,0 – 4,2 V
Number of charging cycles	300 (with 1 C / 1 C > 80%)
Internal Memory	4 GB
Maximum recording capacity	4 weeks
Battery run time (recording)	~ 5 days
Recharging time	1 hour
Size of sensor (W x H x D)	62,3mm x 38,6mm x 11,5mm
Weight of sensor	31 g
Internal sensors	<p>EDA sensor: Exosomatic method, constant voltage, DC, 0,5V Resolution: 14 bit, Input range 2 µS up to 100 µS Bandwith: DC to 8 Hz Output rate: 32 Hz</p> <p>3D acceleration sensor: Measurement range: +/- 8 g Noise: 4 mg Output rate: 64 Hz</p> <p>Pressure sensor: Measurement range: 300 - 1000 hPa Noise: 0,03 hPa Output rate: 1 Hz</p> <p>Temperature sensor:</p>

	Output rate: 1 Hz
Live analysis	EDA SCL mean Temp mean Movement Acceleration Step count charging State of charge
Indicators	LED, 3-color Vibration alarm Marker
Interfaces	Micro-USB, Bluetooth Smart (4.0)
API	Java API for USB (Windows) Example for Bluetooth Smart (Android)
Wear locations	Wrist, Ankle
Environmental conditions	Temperature: -20 °C - 60 °C 0 °C - 45 °C during charging Humidity: 0 - 75 % Relative Humidity Atmospheric pressure: 300 - 1100 hPa absolute
Warranty	1 year

10 Legal Notes

10.1 Copyright

The software that comes with **EdaMove 3** 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 **EdaMove 3** is not a 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

Augartenstraße 1
76137 Karlsruhe
Germany

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

