

SleepAnalyser – Documentation

(for version 2.1)

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About SleepAnalyser

SleepAnalyser records your movement during your sleep.

It is able to visualise it on a graph to show how much you move during your sleep. This can help to indicate how you sleep. It also has an alarm function and other features. You can set the alarm and a time window (ex. 30 minutes). The Alarm will then go off sometimes during the time window (as soon as you move more), but latest at the set alarm. This should help you to wake up while you are in the light sleep phase. Old records can be loaded and visualised and the graphs can be exported as bitmaps.

Some of the other features are lucid dream music, wake up music and alternative alarms.

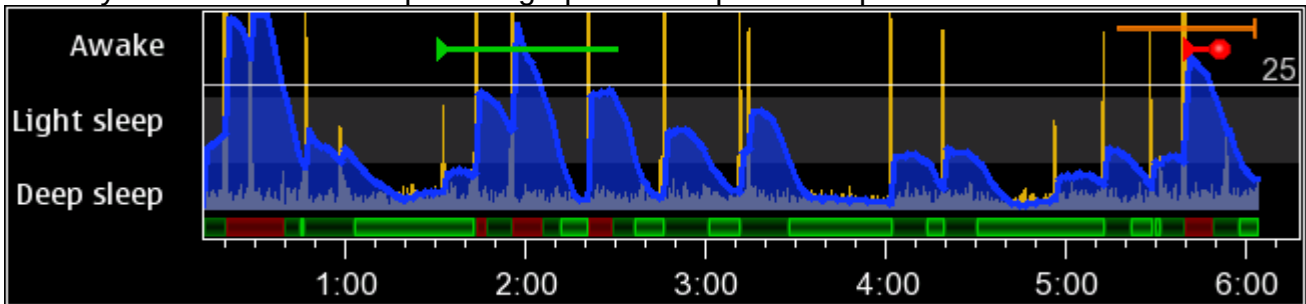
Quick start

To give it a test run, push on the application title and select **Test recording**. It will then run in a test mode which is much faster than the normal mode. Now put the phone beside or under your pillow onto the mattress and lay down. Every time you move more, you will see bigger yellow bars. If you move enough, the blue sleep pattern graph will also go higher. When it goes over the white trigger line, it will make a beep.

After you are happy with the quick test, you will have to do a normal recording and calibrate it. But first of all, let's have a look on the graph details.

Graph

Below you can see an example of a graph with all possible options enabled:



On the left side you can see the three sleep stages **awake**, **light sleep** and **deep sleep**. Those sleep stages divide the graph into three areas. The background of the **light sleep** phase is slightly gray marked.

Your **Movements** are shown **yellow**. If the movements are stronger, the bars go higher. The yellow bars indicate the data which got recorded during the sleep.

The **blue sleep pattern graph** is an interpretation of all the movements. (Basically it is a multiplication of all movements with a defined sleep window). If the graph is always in the lower part, you have a smooth (deep) sleep. If the graph is often and for a longer time in the upper part, it means you move a lot and are most likely in a light sleep phase or even awake.

To make it easier to see in which sleep phase you have been at which time, a **time line** is drawn at the bottom of the graph. If it is **green** ■, you have been in the **Deep sleep** phase. **Orange** ■ means **light sleep** and **red** ■ means **awake**.

Note: There is also a separate graph with 3 bars in the same colors, representing the summary of your time in each sleep phase. You can find it underneath the graph when you open a record in the view window.

The white horizontal line in the graph shows the currently **trigger level**. There is also a white number on the right side indicating the trigger level value. Both are only shown and used if an alarm is set.

If you have set an alarm, you will see an orange line in the top part of the graph with the set **alarm time window** for the alarm. If the **alarm** goes off, it will be marked with a red point.

If you used the **lucid dream music option**, a green line at the top indicates when and how long the lucid dream music got played.

Also when you use the **wake up music option**, a red line shows its start and duration.

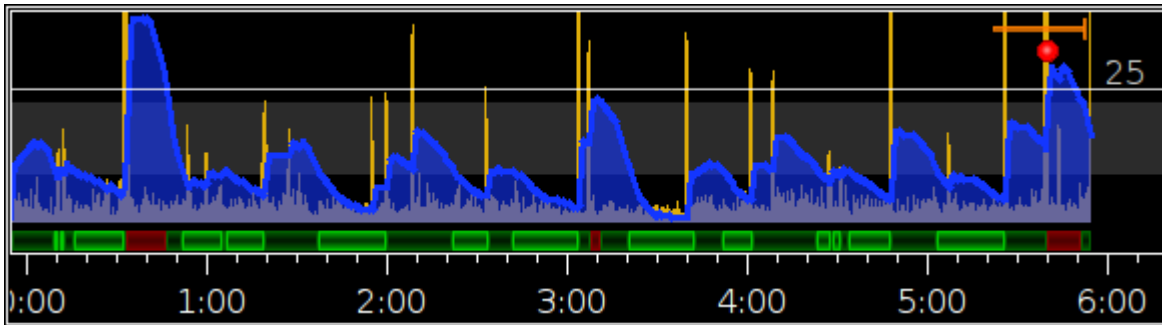
Now you know how an optimal graph should look like. If it looks different, some parameters might have to be adjusted. The next section explains how the parameters can be adjusted, so you can get an optimal result.

Calibration

The parameters are already pre-set with good values and SleepAnalyser should work out of the box. However depending on how soft your mattress is and how far away you put the phone, it might be that some of the parameters have to be adjusted.

First of all, do a normal recording over a night or open an existing record. After that you will see if the parameters need adjustment.

A normal record could look like this:

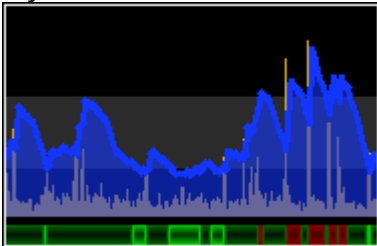


You can see that the person had been most of the time in deep sleep (almost 50% of the time). The rest of the time he was in light sleep and for a short while he was even awake.

If your graph looks more or less like in the example, nothing has to be adjusted. Else you can adjust them in the [settings](#) menu.

If your yellow bars are very small or very big, you **can** adjust them, how ever it only changes how big they are drawn in the graph! **It does not have any impact on the blue sleep pattern graph!** If your blue sleep pattern graph is too much in the awake phase or deep sleep phase, you can adjust its **Y scaling**. This usually has to be done once, unless you change your mattress or the position of the phone.

Note: If you increase the **Y scaling** for the blue sleep pattern graph a lot, it can look like as if you would be almost never in the deep sleep phase:



To correct that, you can adjust the **Y offset**. This basically will cut off the bottom part of the blue sleep pattern graph.

Those are the only parameters which really matter! The other parameters are explained in the section [settings](#).

After you have done those adjustments, you are almost ready for recording. The only thing you will have to do is to set the trigger level. This will have to be done after you started the [recording](#).

Recording

Setup

There are several options for recording. You can choose between the usage of **lucid dream music**, **wake up music** and/or **alarm**, or just **simple recording**.

In the main window, when you push on the **Start recording** button, a new window will open. Here you can set up all the available options.



Lucid dream option: You can set up a song to be played after you stayed for a certain time in light or deep sleep. Don't set the volume too loud, so you do not get waken up put rather guided into a nice dream.



Alarm option: Set an **alarm** and an **alarm time window** for a certain time. The Alarm will go off sometimes during the set alarm time window (as soon as your sleep pattern graph is over the trigger level), but latest at the set alarm time. Normally

SleepAnalyser uses the MAEMO alarm functions. However you can use another installed application like **evilalarm** as an alarm. The alternative alarm command has to be set in the [settings](#).

Note: Even in the case that SleepAnalyser would crash, the alarm will go off at the set time.



Wake up option: Set a song to be played before the alarm gets set off. If the wake up option is activated, the alarm will be delayed until the end of the song, but not later than the set alarm time. In the beginning, the volume will be 0 and increase over time up to the set volume.

Start

After you have chosen the desired options, press **start** to continue. Now the **recording window** will open. In the upper half of the screen you can see some status information. Below is the graph which will be filled over time. At the bottom you have a turning clock for run indication and some buttons for fine adjustments.



Note button: During or after the recording you can add a note for this record. It is useful to add a note of how your sleep really was. In that way it is later on easier to understand the graph.



Zoom buttons: Use them to zoom in and out in X axis.



Trigger level buttons: Use them to set the trigger level. If the trigger level is set higher, it needs more or stronger movements before the alarm gets activated. **It is suggested to set the trigger level in the upper part or slightly above the light sleep phase.**

View Record

In the main window, when you push on **View records**, the View window opens and shows the latest created record. Like in the recording window there are buttons in the lower part of the window.



Folder button: Use it to open any SleepAnalyser record stored on your phone.



Date button: Use it to open a record recorded on a specific date.



Note button: Same functionality as in recording window.



Left and right arrow buttons: Go to the last/next record stored in `~/MyDocs/SleepAnalyser/`.



Trash button: Used to delete a record.



Clip board button: This button opens a new window with additional information about the record.



Zoom buttons: Same functionality as in recording window.

Beside the **Note** button are 3 colored bars. They summarize how long you have been in which sleep phase. This gives you a quick overview about each sleep phase

Settings

To get into the **settings window**, push on the application title and select **settings**. Below are all available parameters listed.

1. tab

User name: Set or change your user name. This name will be saved in the record file.

2. tab

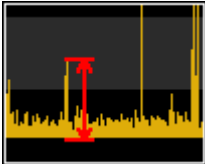
Offline Mode: When this is activated, the phone will switch to Offline Mode while recording.

Silent Profile: When this is activated, the phone will switch to the silent profile while recording.

Stop after alarm occurred: When this is activated, the recording will automatically stop after the alarm occurred.

3. tab

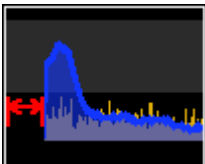
Y scaling movement (yellow):



This defines how much the yellow movement bars get stretched in Y axis. Increase this value if the yellow movement bars are too small.

Changing this value will not have any impact on the blue sleep pattern graph, trigger level or alarm!

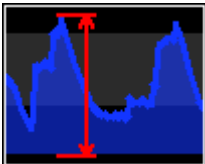
Start delay:



Set a delay for the start of the recording, so you have enough time to put your phone beside your pillow.

4. tab

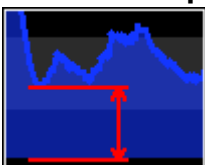
Y scaling sleep pattern graph (blue):



This is the most important setting!

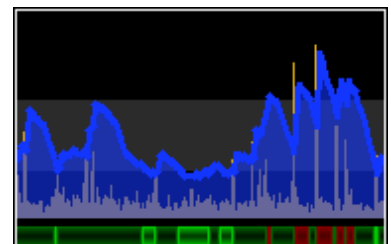
This defines how much the blue graph gets stretched in Y axis. The blue graph tries to interpret your sleep pattern. Try to adjust it so you are most of the time (in a normal night) in **deep sleep**, sometimes in **light sleep** and only rarely **awake**. It might need some time to find the right settings.

Y offset sleep pattern graph (blue):



If you have to increase the Y scaling for the blue sleep pattern graph a lot, it can look like as if you would be almost never in the deep sleep phase (see example image on the right). To correct that, you can adjust the Y offset. This

basically will cut off the bottom part of the blue sleep pattern graph.



5. tab

Alternative alarm: Here you can set any program to be used as an alarm.

More settings

More parameters can be set in the file `~/SleepAnalyser/SleepAnalyser.conf`. However you should only touch them if you know what you do! Normally they don't have to be adjusted.

Record files

During recording, the data is written to a record file. Every time you start recording, a new file is created. The files are saved in the folder `~/MyDocs/SleepAnalyser/`. They are plain text and you can share them easily with somebody else who has the same application.

Good to know

The application will drain the battery around 10..20% per night. It is suggested to have the phone charged or to charge it while using SleepAnalyser for a longer time.

Make sure the phone is not fully covered with your pillow, so it will not overheat!

If you don't feel confident to have a phone close beside your head for the whole night, activate the option "Offline Mode" in the settings window. It then will automatically change into Offline Mode while it records.

How it works

SleepAnalyser uses the built in acceleration sensor to detect your movements. The recorded data then gets smoothed and filtered in several steps until it is ready to be used in a graph.

Disclaimer

This application is distributed for free under the GPL. You may redistribute and modify it freely, as long as you follow the rules of the GPL. I will not give any warranty for any harm on people, environment or the phone.

Copyright

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For more information, please visit <http://www.ruinelli.ch/sleepanalyser/>.

The icons are from KDE Nuvola theme (© by David Vignoni) and KDE Oxygen theme (© by Oxygen Team)

Special thank goes to the MAEMO community. Without their help, suggestions and feedback SleepAnalyser wouldn't be what it is now.

Donation

SleepAnalyser is available free of charge. However if you like it, I would appreciate a donation. You can donate either via PayPal to george@ruinelli.ch or by using my IBAN (CH92 0070 0113 3000 3973 8).