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## Efento Logger user manual (v 3.5.2 or newer)

### Application installation

Download and install Efento Logger from Google Play. The application is free and available for devices equipped with Bluetooth 4.0 and Android 4.4 or newer.

### Supported sensors

The Efento Logger application works with all types of Efento sensors, like:

- temperatures (including recorders with an external probe and low temperature recorders),
- temperature and humidity,
- temperature, humidity and atmospheric pressure,
- differential pressure
- opening / closing,
- flooding.

### Searching for sensors and displaying data

Remove tape from sensor's battery. Open the application, after a few seconds the application will automatically detect all sensors within range of your phone / tablet. The list shows the names of sensors, their serial numbers and current values of their measurements.

The padlock icon next to the serial number of the recorder means that it is encrypted, but the phone / tablet has access to it, because the correct encryption key was provided in the application. The padlock icon at the measurement location means the encrypted device and no access to the recorder measurements.

### Warnings

The application notifies you of:

- Low battery - a red battery icon next to the name of the sensor that has a low battery. After the icon appears, you have approximately 30 days to replace it. In the event of battery discharge, data that has already been saved in the sensor memory will not be lost. After replacing the battery you will be able to read them from the sensor memory
- Problem with measurements - exclamation mark icon next to the name of the recorder that cannot take the measurement. This applies only to recorders with a probe. If you see this warning on the list, check if the probe is properly connected to the sensor
- not resetting the sensor - after commissioning, we recommend you to reset the sensor to set the measurement period and time - then when the battery is discharged, the measurements will be saved and can be read after replacing the

battery. If the sensor has not been reset, all data will be lost after removing the battery.

- Availability of sensor software update - if a new version of the software is available, information about it will appear under the sensor name and serial number. To update the software, simply click on the respective recorder and enter its PIN code.

## Application configuration

To configure the application settings, click on the menu in the upper left corner of the application. Open the settings where you will be able to:

- **The Activation Energy** settings are a constant used when calculating the average kinetic temperature. Its default value is 83.14472 kJ / mol.
- **The default encryption key** settings are used to automatically decrypt the sensors when it is encrypted with the same key (e.g. user key "qwerty123" as the default encryption key in the application. From now on, each recorder encrypted with the key "qwerty123" will be decrypted by the application automatically). It can add up to five default encryption keys in the application.
- **Enable / disable adding address to PDF reports** - if this option is selected, the address of the place where the report was generated will be added to the footer of PDF reports generated by the application. The address is downloaded based on the GPS signal from Google Maps
- **Sensor forgetting** - the application removes the encryption keys and reset codes of the selected recorder from its memory

## Sensor configuration

From the list of detected sensors, select the one you want to configure and click it to connect to it. If you selected an encrypted sensor, enter the correct encryption key to gain access. The phone will connect to the sensor (in the case of full sensor memory it may take several seconds) and you will be able to start configuring the sensor and using the application functions. Enter the settings menu (three dots icon in the upper right corner of the screen) to:

- Change the name of the sensor - after selecting this option, enter the new name of the selected sensor, and then enter the PIN code. The PIN code is a four-digit number 4 assigned to each sensor. You will find it on a sticker on the side of the device housing. If you have entered the correct code, you will be able to change the device name. The new name will be visible on every phone / tablet that connects to the sensor.
- Clear the sensor memory and / or change the measurement frequency - press the Change period and reset button, select a new measurement period using the sliders and enter the PIN code (you will not be asked to do this if you have already entered it before). By selecting a new measurement frequency, the application will automatically calculate how long the sensor memory will last - this information is visible at the bottom of the screen. Save changes, sensor memory will be cleared

and new measurement period set. By default, the measurement period is set to 3 minutes. It is recommended to reset the device the first time you use it.

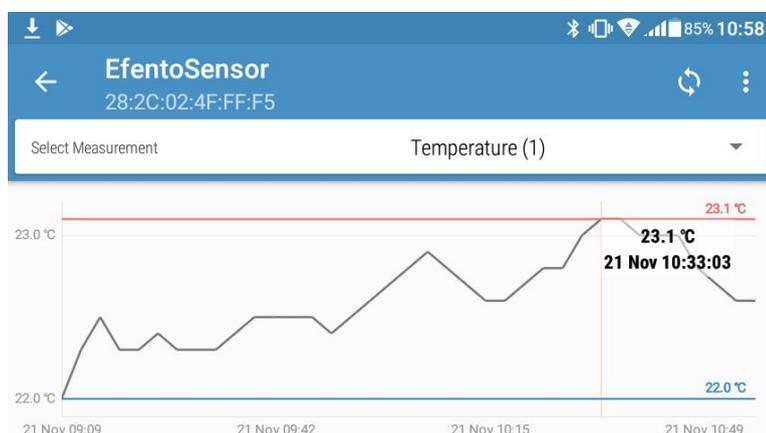
- Encrypt the sensor - select the option Enable encryption, enter your own encryption key and (if you have not done it before) enter the PIN code. Data from the encrypted sensor can only be read using a smartphone that has the correct encryption key. Eavesdropping on data transmission from an encrypted sensor is not possible.
- In the case of NB-IoT sensors from the menu level, it is also possible to configure the server address to which data are to be sent, APN, network selection, change of transmission period and change of the thresholds forcing data sending.

### Reading data from the sensor memory



After connecting with the sensor and downloading the data, on the application screen you will see a summary of the measurement data downloaded from the sensor memory: date and time of the first and last measurement; minimum and maximum values in the measurement series for each of the measured parameters together with the date and time of their occurrence; graph of measurement values over time; set measurement frequency along with information about available free memory in the device and the number of days it is enough for it; sensor software version.

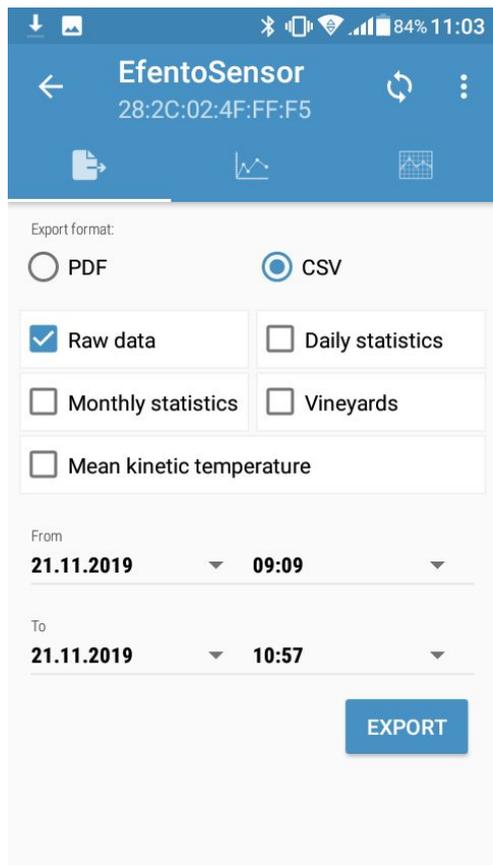
### Diagrams



Clicking on the graph in the general view enables detailed examination of the graph. Data on the chart can be enlarged by spreading the screen with two fingers. To reduce the graph, slide the screen down with two fingers. The chart also indicates the minimum and maximum

values in the measurement series. If the sensor measures various parameters, select the one you want to display on the chart from the list at the top of the screen.

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To export data from the menu at the top of the screen, select the export icon (first icon on the left) or slide the screen to the right. Then select the type of data you want to export (measurements, daily statistics, monthly statistics as well as SAT and GDDC values) and the range from which the data you want to export and press "Export". Data can be exported using any application installed on your phone - you can send it by e-mail, save it to Google Drive / Dropbox, send it to an FTP server or print it using a printer connected via Bluetooth or WiFi. Data is exported in csv format, which is supported by many popular data processing programs (Excel, Matlab, etc.).

## Statistics

The application calculates statistical values from the downloaded data series. Impressions are possible the following statistics:

- Average values - average value of the measurement on a daily or monthly basis;
- Minimum and maximum values - the minimum and maximum measurement value on a daily or monthly basis;
- SAT and GDDC - important parameters for viticulture. On the basis of the calculated SAT and GDDC values for a given region, an optimal selection of the vine strain that can be grown there is possible;
- The length of the growing season (LGS) determines the number of days with average daily temperatures above 10 degrees Celsius. Depending on the variety, the region is widely considered suitable for viticulture if the LGS value is higher than 182 days.
- The Huglin index is the sum of active temperatures from the beginning of April to the end of September. HI includes day length as well as average and maximum daily temperatures. It is divided into 6 climate classes, from very cold ( $HI \leq 1500$ ) to very warm ( $HI > 3000$ ). The heliothermal index using sums of air temperatures and latitudes is one of the most common methods used to identify relevant wine growing

areas. The Efento Logger application using the GPS signal determines the user's position and takes it into account when calculating the Huglin Index. Thanks to this, the index values are precisely calculated for the specific place where it is planned for setting up the vine

- The Cool nights index (CNI) defines a relative measure of ripening potential equal to the average minimum temperature during the month before harvest. In the northern hemisphere: CI = average minimum temperature in September, in the southern hemisphere: CI = average minimum temperature in March
- Average kinetic temperature - allows you to assess the effect of temperature changes on maintaining the quality of the drug. If the permissible storage temperatures are exceeded temporarily, it may be part of the assessment of the medicine's usability.

To display statistics on the screen, select the statistics icon from the menu at the top of the screen (first icon on the right), or move the screen to the left, and then select the statistics you are interested in from the list.

## Cooperation with Efento Cloud

The application allows you to log in to your account in Efento Cloud and access to measurement data from recorders sending data to the platform. In addition, the application displays alarms and allows you to acknowledge them.

To log in to your account in the Efento Cloud platform, go to the menu by clicking on its symbol in the upper left corner and select "Cloud". Enter the login and password for your account in the platform. After logging in to the platform, you'll see a list of your organizations along with their assigned sensors. By clicking on the sensor you can display its historical data in the form of charts.

In addition, it is possible to display current and historical alarms. If the alarm is no longer active, you can acknowledge it by clicking the "Confirm" button

## Efento Gateway configuration

The Efento Logger application can be used to configure the Efento Gateway. To configure Efento Gateway, switch it to configuration mode by quickly pressing the button twice on the back of its reconstruction. After pressing the button, the Gateway's diode will start flashing quickly and the device will appear on the list of recorders in Efento Logger.

Click on the selected Gateway and then enter the password to enter its settings. You can configure:

- network settings (DHCP, IP, gateway address, subnet mask, DNS, NTP),
- address and port of the server to which the data is sent and the token of the organization to which the data is sent by Gateway
- encryption keys enabling Gateway to send data from encrypted sensors