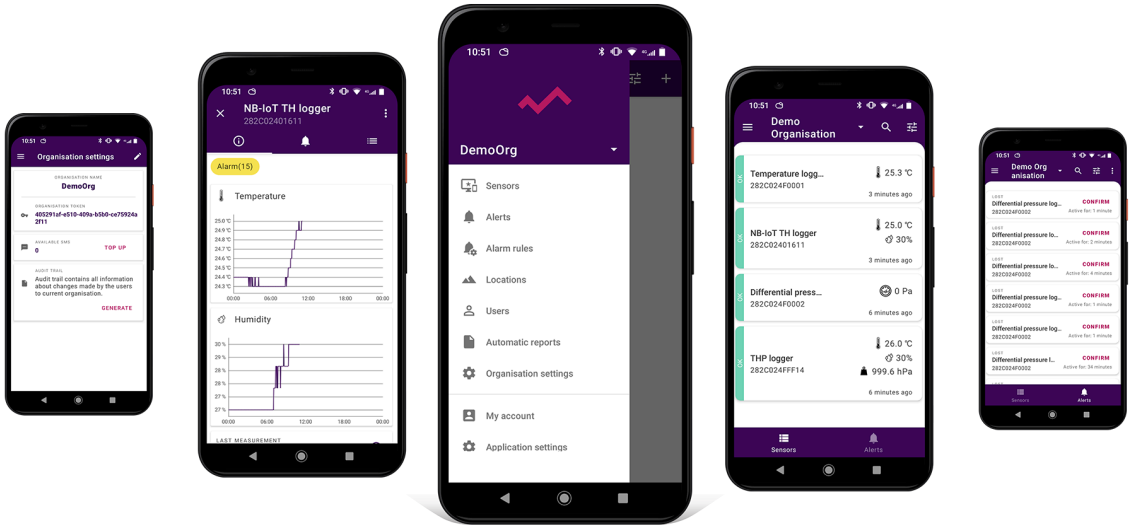
Efento
Mobile Application
User Manual



Ver. 1.5.13

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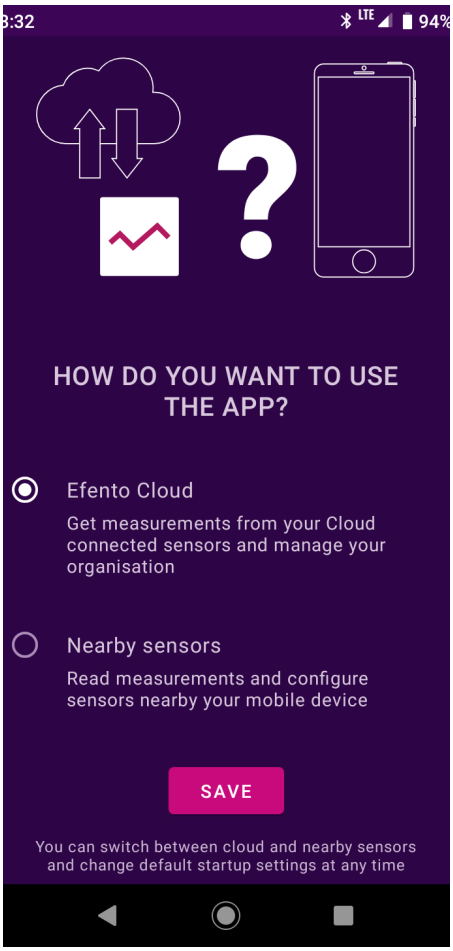
1. Overview

Efento mobile application allows users to interact with all Efento sensors (configuration, reading the measurements) and Efento Cloud platform (access to the sensors measurements and all cloud functions through a mobile device). Application is available free of charge in Google Play. Users can switch between the application modes (nearby devices and cloud) at any time. Application works with mobile devices equipped with Android 5.0 or newer.

2. First launch



During the first launch, user will be asked to choose the default application mode:

Efento Cloud - access your Efento Cloud added sensors through a mobile device. You can check current sensors measurements, alerts, generate reports, etc. This requires an Efento Cloud account.

Nearby sensors - connect to the sensors nearby you (Bluetooth Low Energy sensors, NB-IoT, Efento Gateways) and get the measurements data from their memory and configure the devices.

You can switch between the application modes at any time in the application main menu.

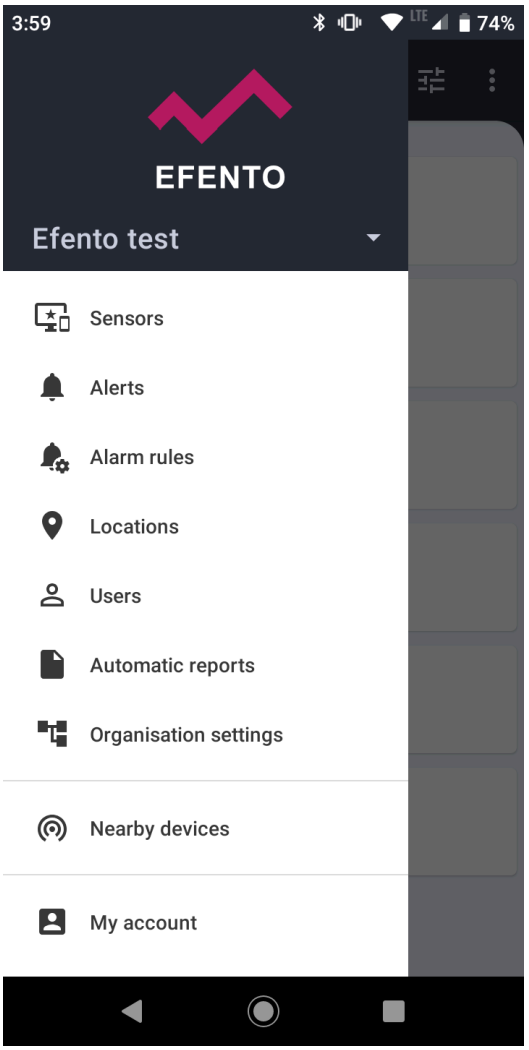
3. Efento Cloud

3.1 Registration and logging in to Efento Cloud

If you do not have an active Efento Cloud account, you need to register. During the registration you will be directed to the Efento Cloud website to set up an account. After registering your account, you will receive an email with an activation link.Open the email and follow the instructions to complete the registration process.
Users who already have an active Efento Cloud account can skip the above steps and log in by entering their email address and password in the application.

3.2 Creating a new Organisation

The organisation allows sharing measurement data from loggers with other users. Additionally, as part of the Organization, you can create a location structure to organise sensors. Users with access to your Organisation can be given access to view or modify individual locations.



If you have registered with Efento Cloud and are not yet a member of any Organisation, you will be asked to create a new Organisation and select its name. After entering this data, you will receive full access to manage your Organisation, invite other users to it, and configure sensors. If a new user has been invited to an existing Organisation, they will be automatically assigned to it after completing the registration

Configuration of organisation settings is done through the menu in the upper left corner of the screen. The menu has the following elements: *Sensors, Alerts, Alarm Rules, Locations, Users, Automatic Reports, Organization Settings and Profile*. The use of these functions will be described later in this manual.

Selecting *Nearby devices* will switch the application in the nearby mode and allow the user to interact with Efento's devices nearby the user's phone.

3.3 Adding sensors and gateways

All Efento devices (both wireless loggers and Efento Gateway) can be configured to work with Efento Cloud using a mobile application. You only need a smartphone with the mobile application installed on it to configure the devices and add them to your cloud account.

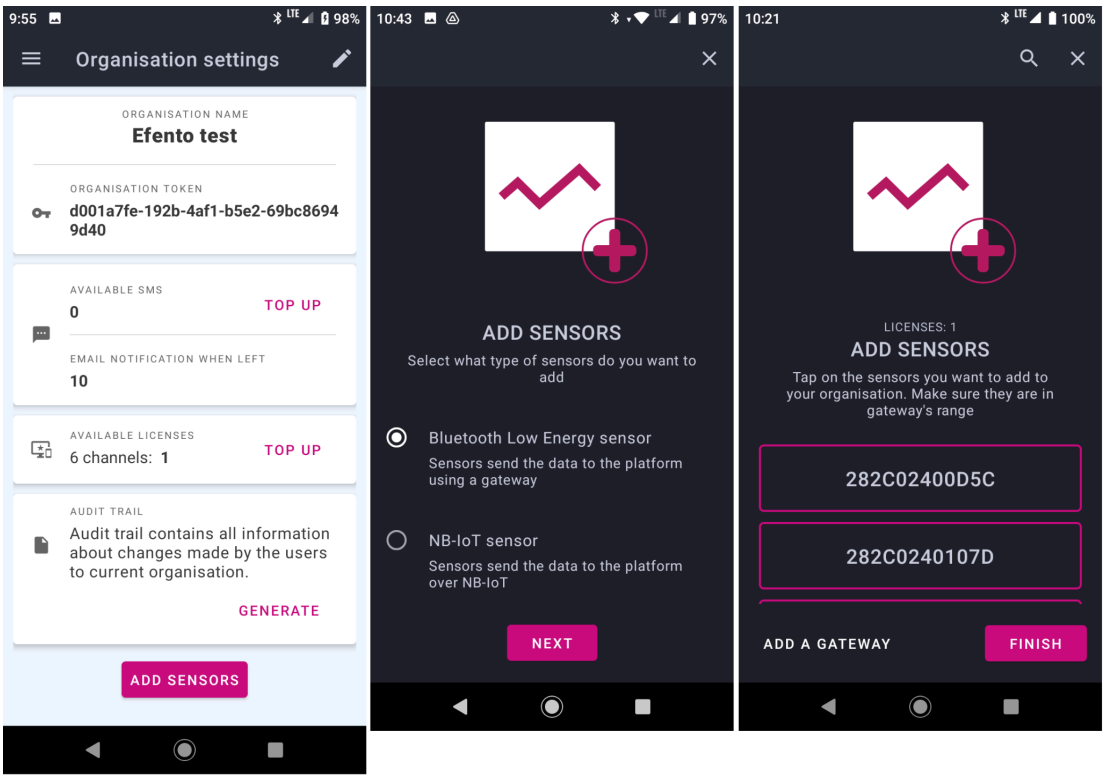
If there are no loggers added to your Efento Cloud organisation, tap anywhere on the screen to add a logger. From the organisation settings screen select *Add sensors*. In order to add loggers to your organisation, you need a licence code. The licence code is a 36-character key sent by email when purchasing access to the Efento Cloud platform. To add the licence code either copy and paste the code from the email or scan the QR code using the phone's camera.

If you have already added sensors to your Efento Cloud organisation, you can add new sensors by selecting the *Organisation settings* tab in the main menu.

3.4 Adding and configuring Efento Gateway

Efento Gateway is a network device that sends measurement data from Efento loggers to the Efento Cloud platform. The device can be powered from a mini USB (5V, 1A) by connecting the USB power adapter included in the kit.

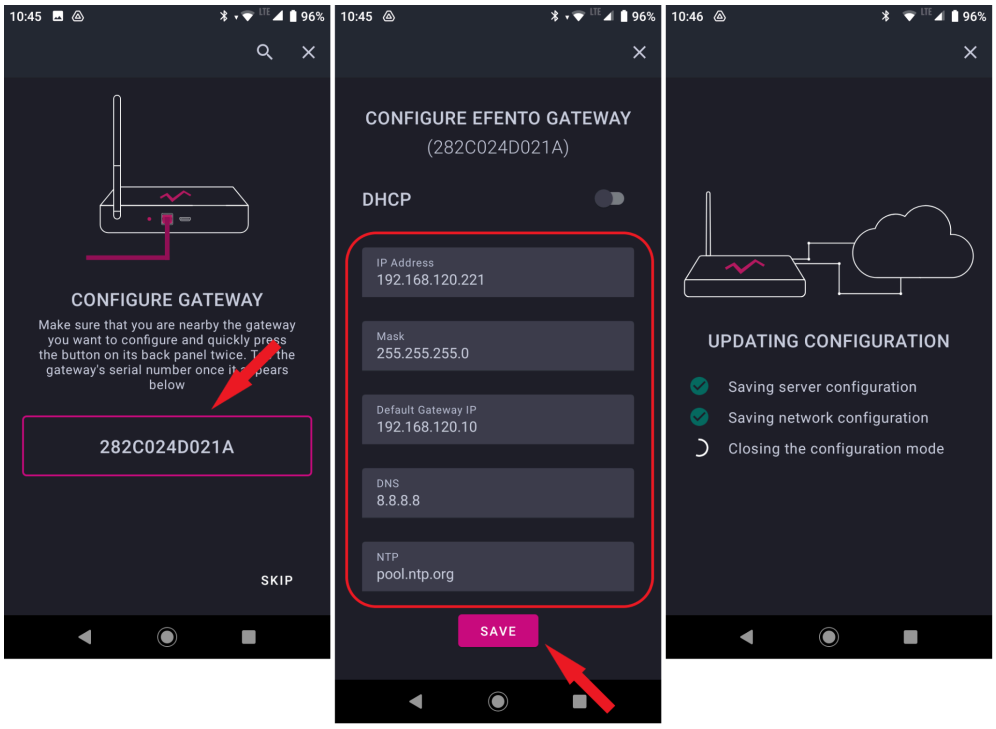
To configure Efento Gateway from the main menu, select *Organisation settings* and then *Add sensors*. Then select the option *Bluetooth Low Energy Sensor* and *Add Gateway*.



Press the button on the back of the device twice (the button should be pressed with a pin) to switch the gateway into configuration mode. Configuration mode is indicated by a fast flashing blue LED on the front gateway panel.

Press the button on the back of the gateway twice to enter the configuration mode

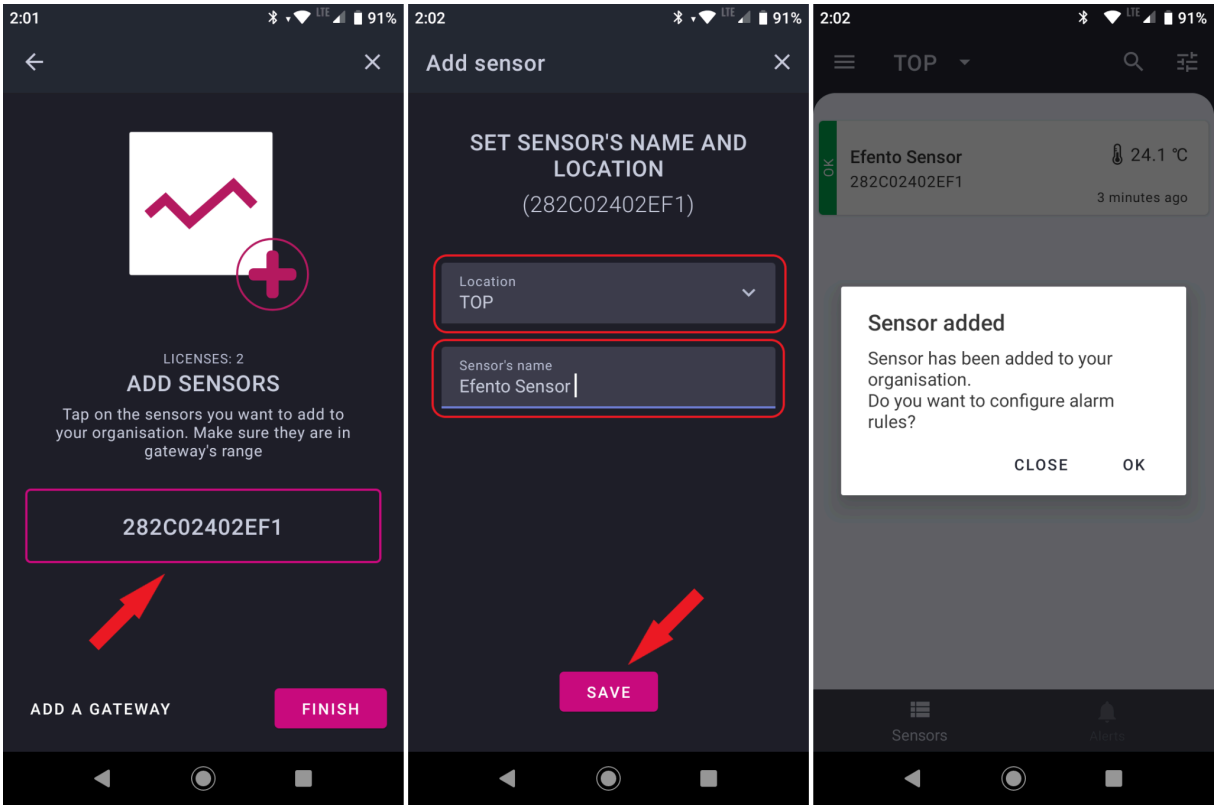
The gateway serial number will appear in the list of available devices, and after choosing it you will go to the configuration screen. Efento Gateway must be configured to have Internet access. Efento Gateway supports DHCP. If you enable DHCP, all Efento Gateway network configuration will be downloaded from the router (don't forget to enable DHCP on the router!). The second option is manual network configuration settings - enter the Efento Gateway IP address, router IP address, subnet mask, and DNS address and save all changes by clicking "Save". The Gateway will try to connect to Efento Cloud. After successful connection, the configuration mode will close and you will be taken to the adding loggers screen.



3.5 Adding Bluetooth Low Energy loggers

From the main application menu, select *Organization Settings* and then *Add Sensors -> Bluetooth Low Energy Sensor*.

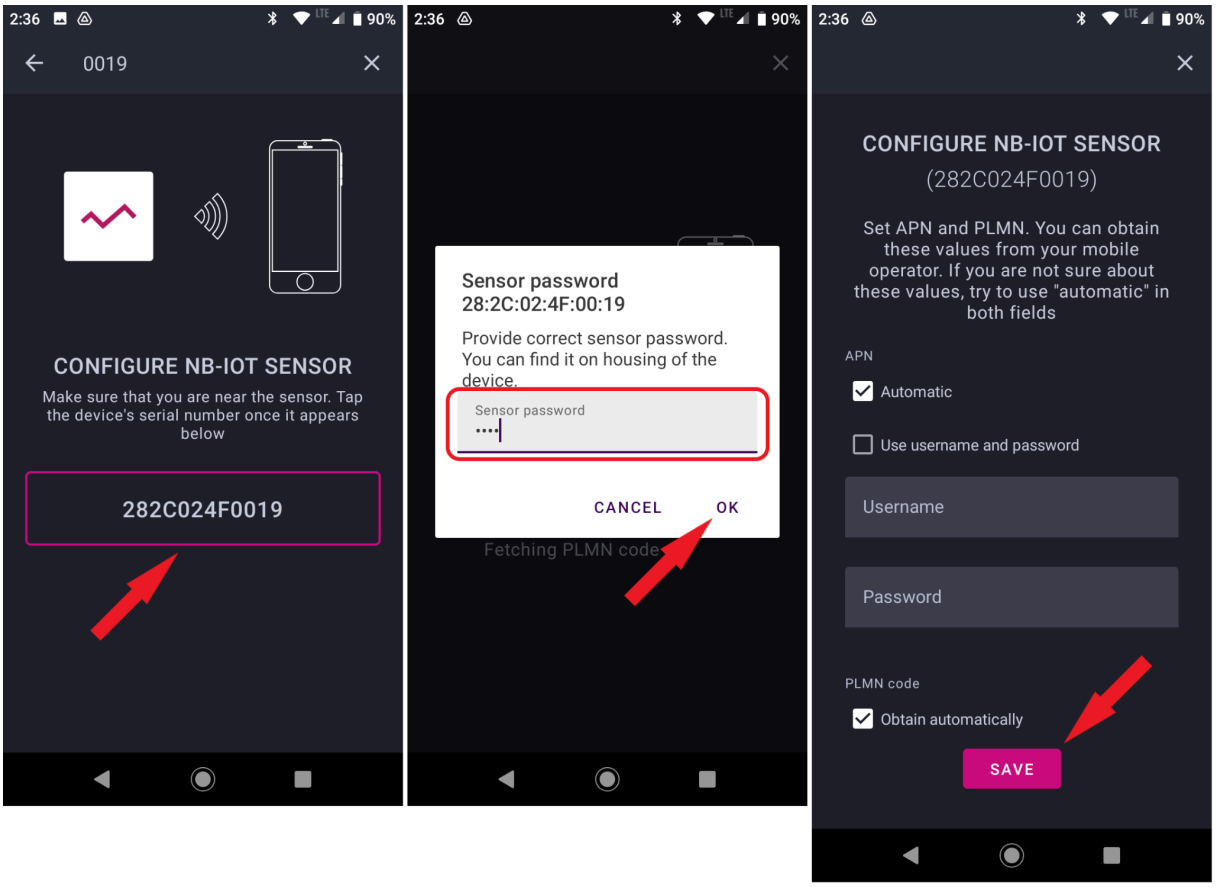
Click on the sensor you want to add, give it a name (by default, all are called *New Sensor*) and choose to which location the logger should be assigned. If you want to change its name or move it to another location, you can do it at any time.



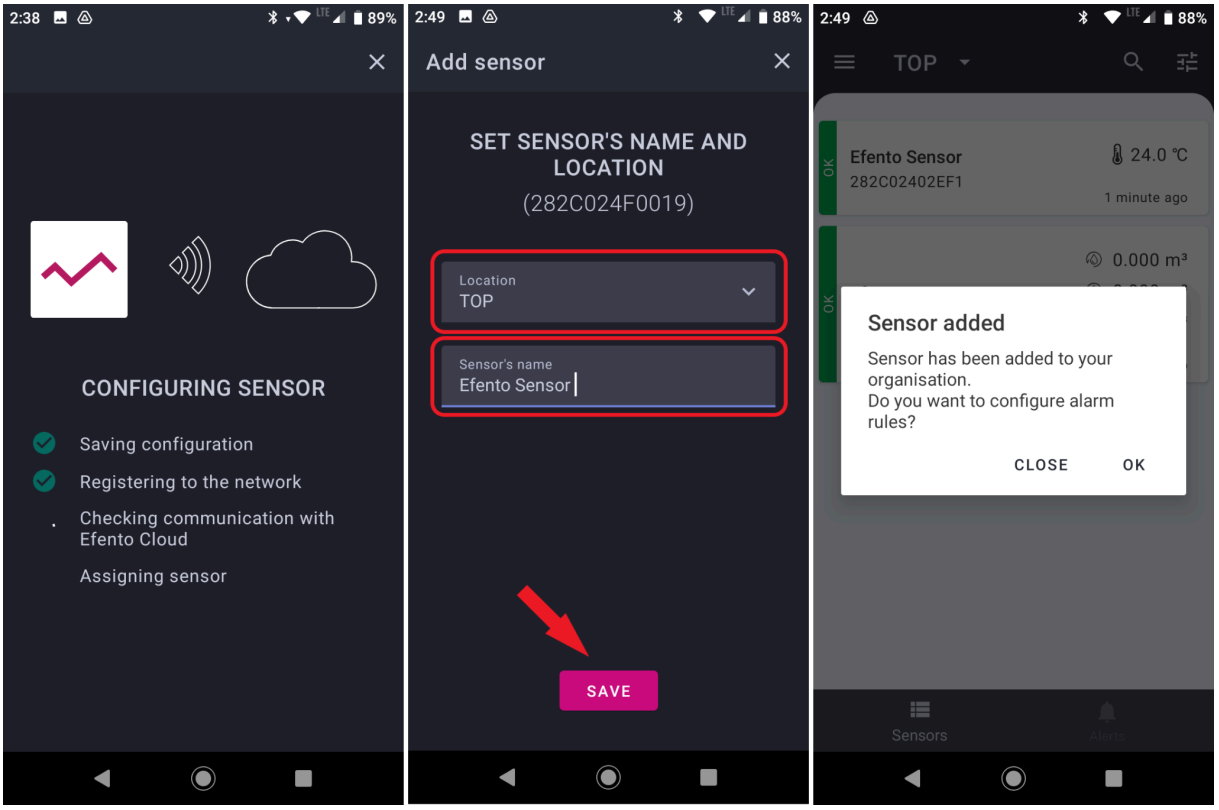
3.6 Adding NB-IoT loggers

From the main application menu, select *Organisation settings* and then *Add sensors -> NB-IoT sensor*.

Place the NB-IoT sensor near the smartphone with the application, and then from the list of available loggers select the one you want to configure and add to the Efento Cloud platform. Enter a reset pin that you can find on the enclosure label. Configure APN and PLMN settings - you can get this information from the mobile operator that you use. If you have not received such information, check the "Automatic" / “Obtain automatically" boxes. After configuring APN and PLMN, the logger will try to connect to the network and send data to the Efento Cloud platform. In addition, during the connection attempt the logger will check the signal strength and in case of poor connection quality inform you about it. The process of registering to the network and first communication with the platform may take a few minutes.



The application will keep you updated on progress. After successful communication with the platform, name the logger and assign it to the selected location.



3.7 Creating and managing locations

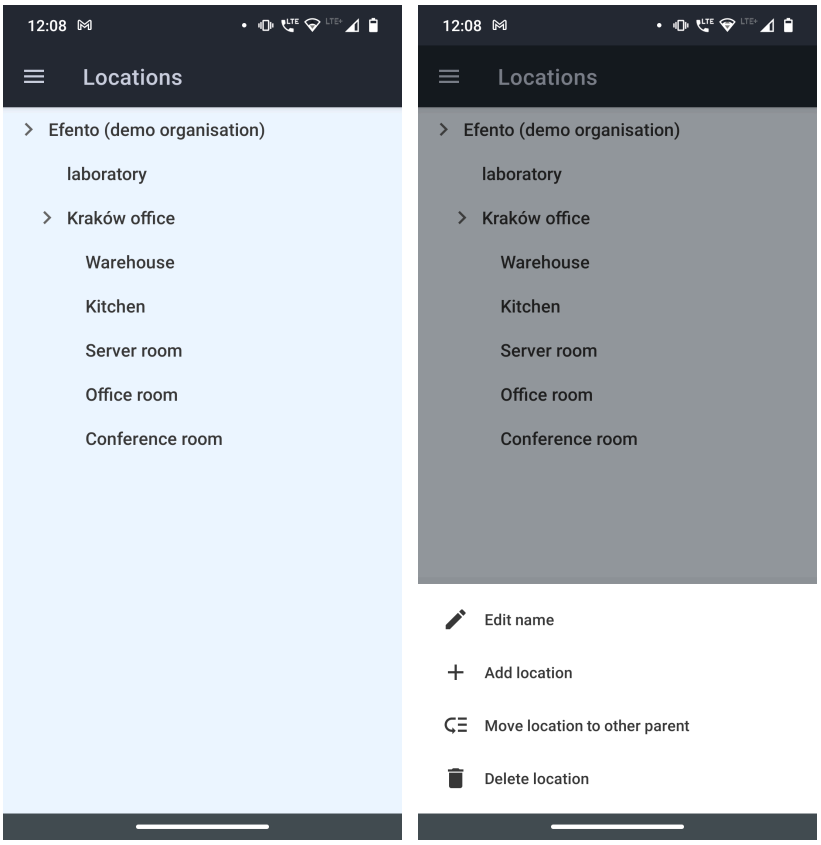
The Efento mobile application allows easy management of locations and their associated loggers. Thanks to this, you can create the structure of your Organization in the form of a tree and assign sensors to it. The grouping of sensors is unlimited, you can use geographical distribution (e.g. Country -> Cities -> Districts -> Facilities), function distribution (e.g. Object type -> City -> Exact location) or any other, depending on your needs. In addition, users assigned to your organisation may be given specific permissions in different locations. Locations significantly simplify system administration and give full control over user access.

Location configuration is done in the *Locations* menu, which only users with the Administrator or Manager roles can access. There you will find a tree of already created locations.

Press and hold the location name you wish to edit for 3 seconds, a menu will appear with the following options:

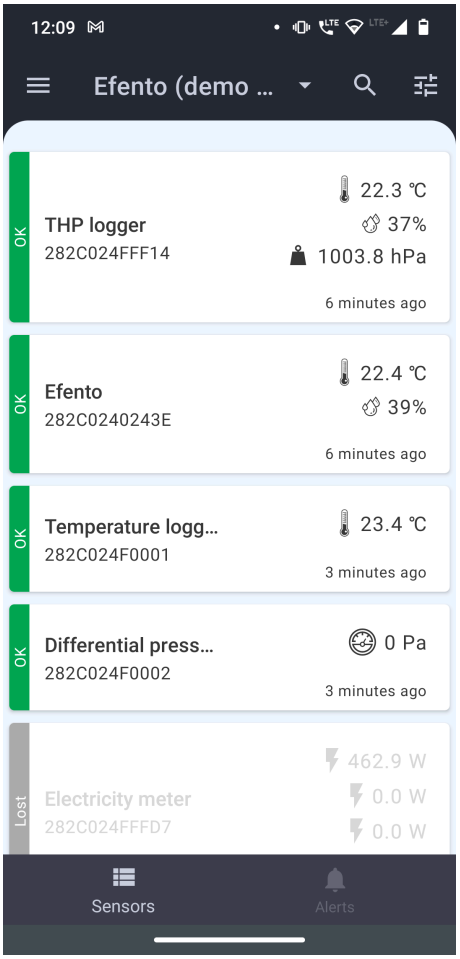
- Rename - change the name of the selected location

- Add location - add a location to the tree, enter the name of the new location and confirm with OK. The location will be automatically added to the list as a subordinate location to the one you selected
- Change parent - move the location to another location in the organisation tree
- Delete location - Deleting a location also deletes its child locations. It is impossible to delete a location with loggers assigned. In this case, it is necessary to remove the loggers or change their location first, and then delete the selected location.



4. Dashboard - preview of sensors added to Efento Cloud platform

4.1 Dashboard



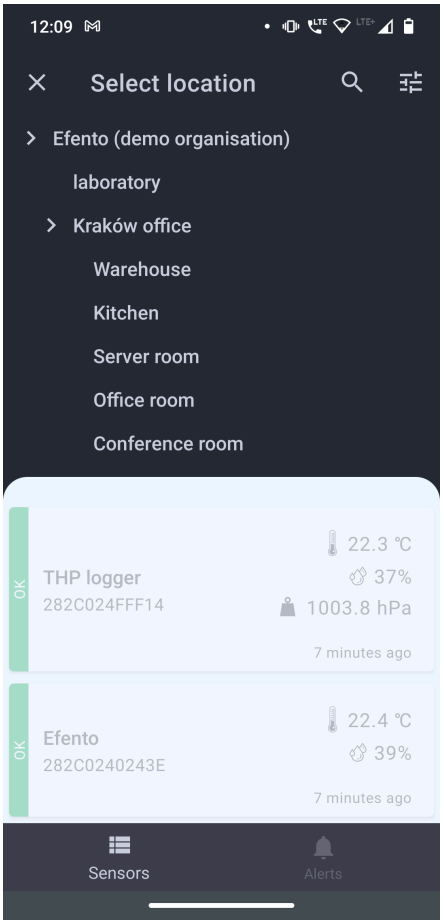
- The dashboard presents all available sensors in a given organisation and information about them. Each logger visible on the list has its name and serial number. On the right hand side of the screen you can see the measurements taken by the logger along with the time of the last measurement.
- On the left, next to the sensor name, its current status is visible:
    - OK - a green label with the word OK means that the logger working properly and is sending data to the platform
    - Lost - a grey label with the word LOST means that the platform does not receive data from the logger
    - No licence - a grey label with words NO LICENSE means that the licence is expired.
    - Alarm - a red label with the word ALARM means that the alarm threshold set for this logger has been exceeded
    - Battery - a yellow label with the word BATTERY means that the logger battery is getting low and should be replaced
    - Archived - a grey label with the word ARCHIVED means that it's only possible to browse historical measurements from this measurement point. The sensor is removed from all reports and rules. Archived devices are not shown on the sensor list by default, to display them filter the list by Archived status.

Access to the dashboard is available to every user added to the organisation, regardless of their permission level (Analyst / Manager / Administrator).

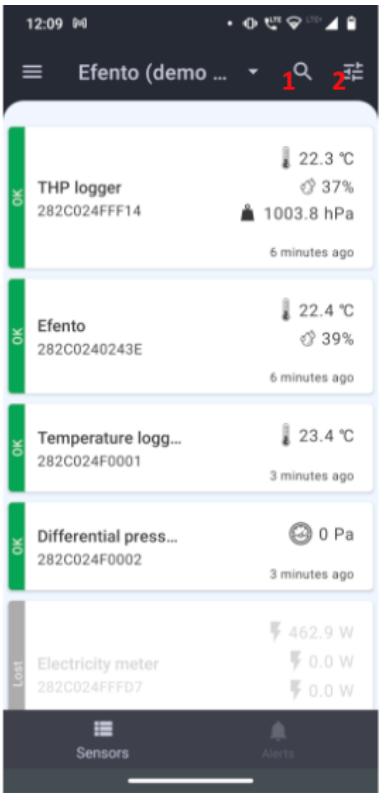
At the bottom of the screen are navigation icons that allow you to quickly switch between the dashboard and the alarm list.

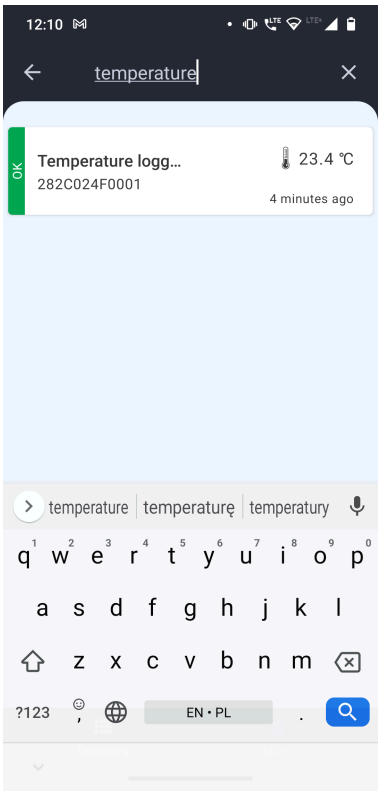
4.2 Filters, search, locations

The data displayed on the desktop can be filtered out to easily find the information you need. The first filtration method is based on location. By clicking the location name above the list of loggers, you can select the location to display and filter only the loggers assigned to it. Further methods described in the manual operate within the selected location.

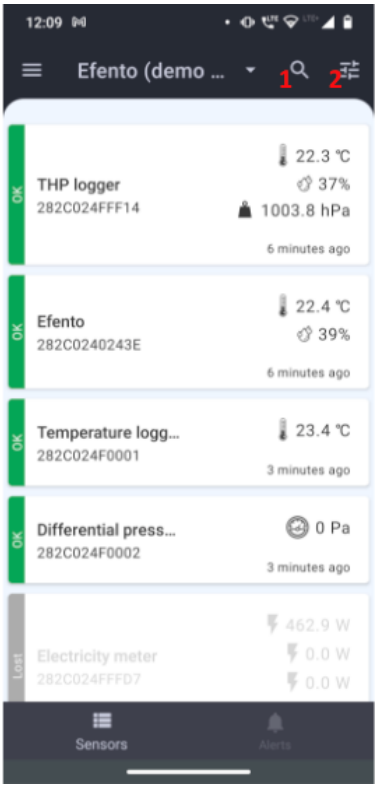


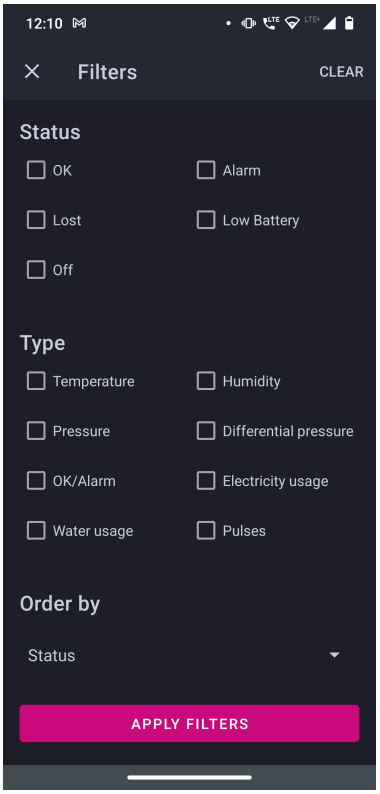
The second method of filtration is searching the sensor by name or by its serial number. Tap on the magnifying glass icon (1) and key in a serial number or name of a sensor that you wish to find and the list will only show the sensors you are interested in.





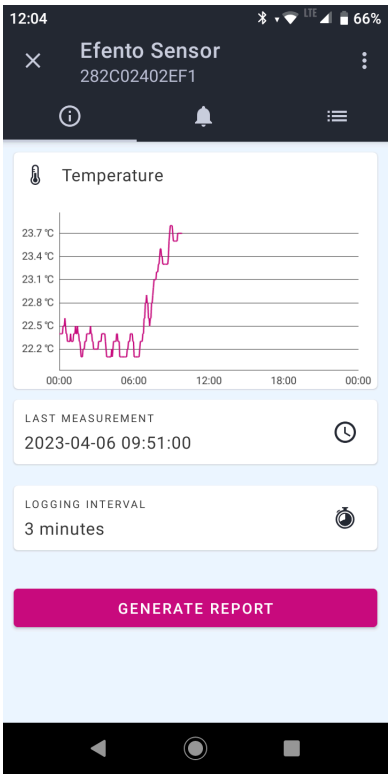
You can also filter out sensors by their type or status. Tap on the filter icon (2) and select the sensor types or statuses by which you want to filter the sensors and tap *Apply filters*. After selecting a specific type(s) only the sensors that meet the filter criteria will be shown.





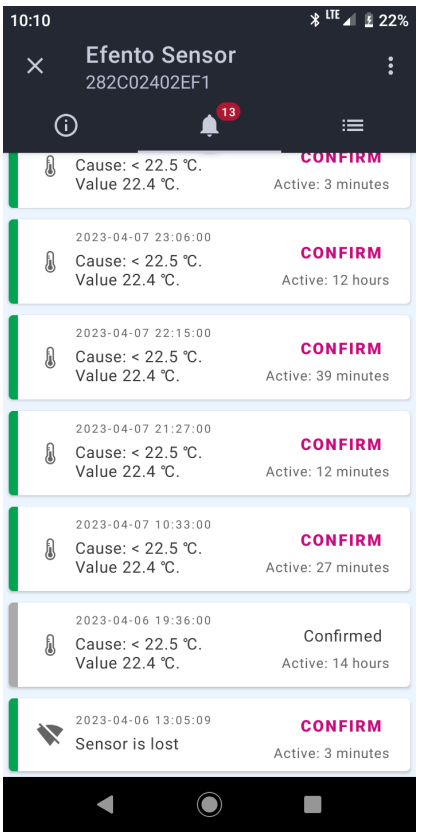
4.3 Preview of detailed sensor's data

After tapping the sensor on the list you will be able to browse detailed information about the selected sensor such as alarm occurrences, measurement data in the form of a chart or table and alert rules to which the sensor is assigned. You will also be able to export the sensor's measurements from any time period in the form of PDF or CSV report.

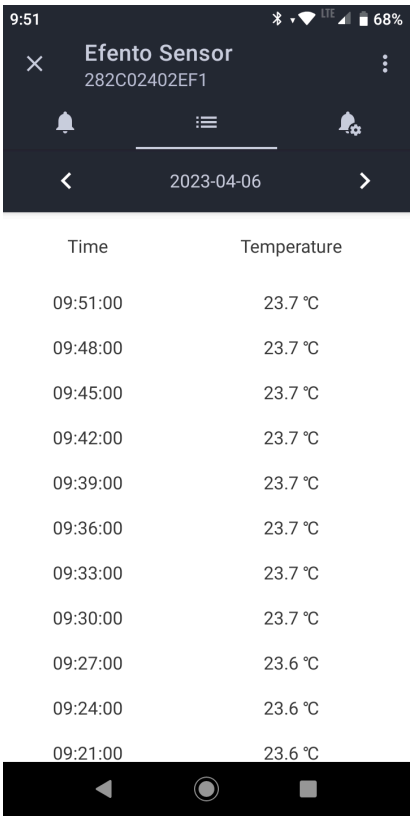


The *Preview* tab shows the current data of the sensor. The graph shows the measurements of a given value from the current day (click the graph to open the full-screen mode and change the range of presented data). You can also find information on the time of the last measurement and the measurement period. The *Generate report* button enables generating reports with measurements from any period. Detailed instructions on generating reports are described in the *Generating report on demand* chapter.

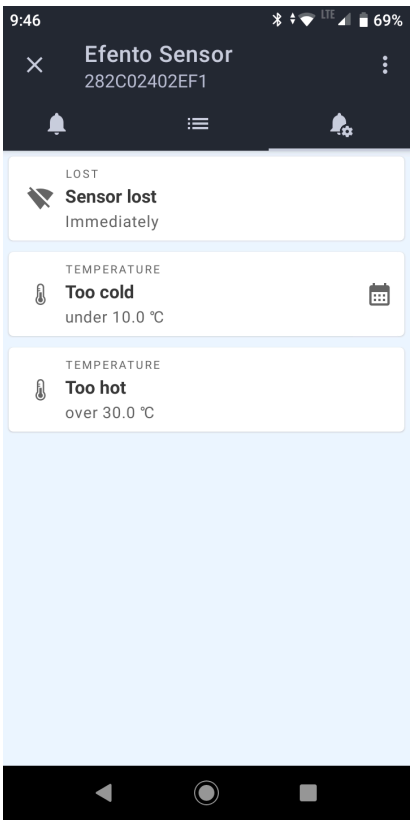
The *Alarms* tab contains a list of alarms related to the selected sensor (details in the *Alarms* chapter). Here you can find information about the date and time of the alarm and the reason for the alarm, including the name of the alarm rule. Click on the selected alarm to view its details. If the measurement has returned to a safe range, the user can confirm the occurrence of an alarm. After confirming the alarm, notifications about it will not be displayed again on the platform.



The *Table* tab contains a table with all measurements sent by the selected sensor including the date and time of those measurements. Tap on the data over the table to select the date from which you want to browse the measurements.

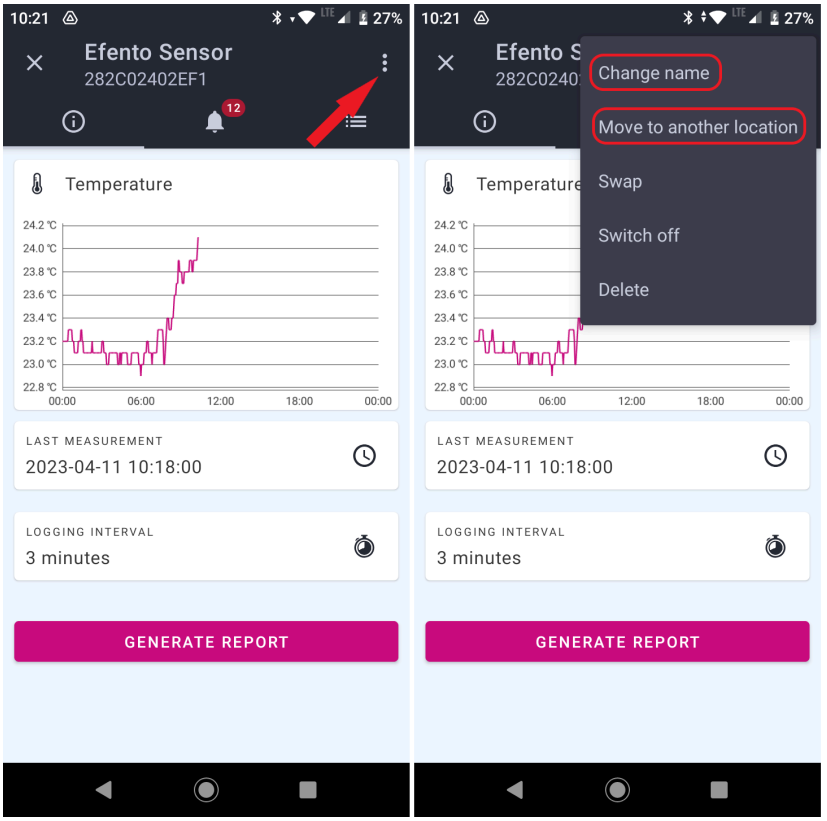


The *Alarm rules* tab shows the alarm rules assigned to a given logger. If the calendar icon is displayed on the right, it means that the alarm rule is active in a certain period of time. Click on the selected rule to view the details. A detailed description of the alarm rules can be found in the chapter *Alarm rules*.



4.4 Editing the sensor's name and changing its location

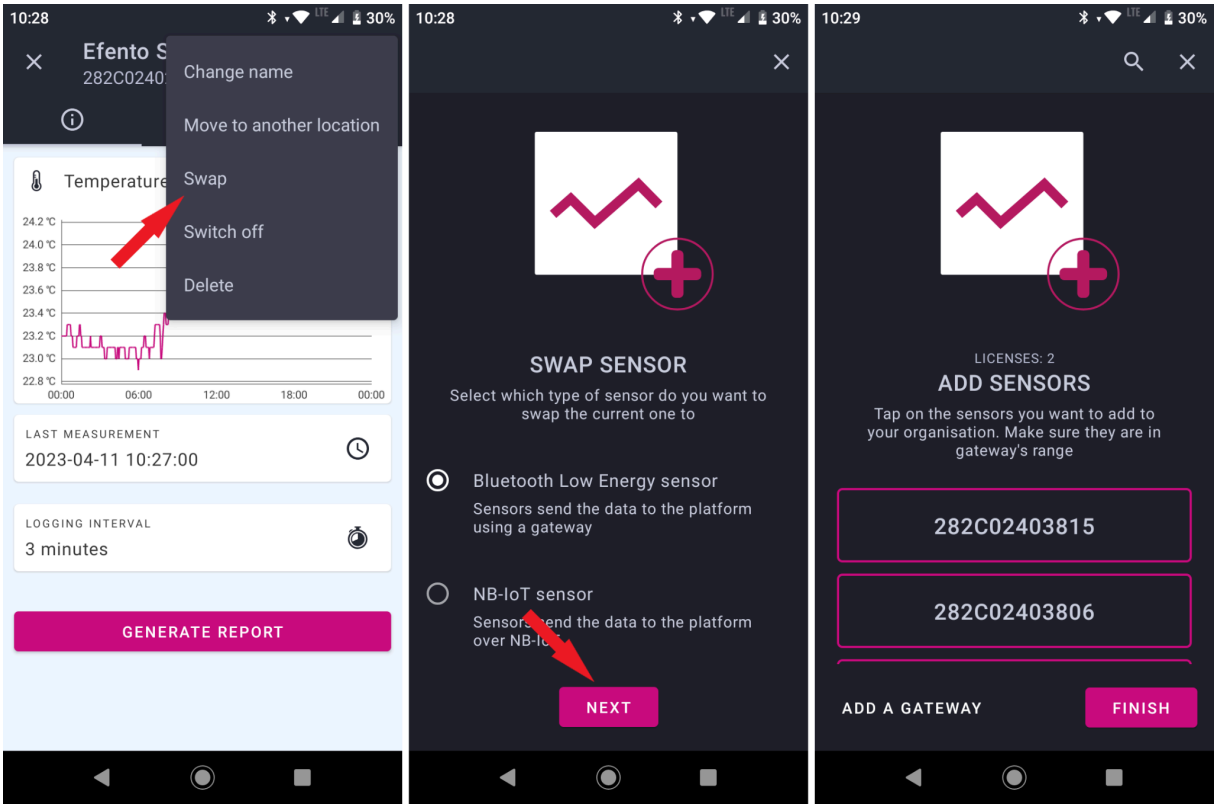
Tap on the three dots in the upper right corner of the sensor details screen to open the sensor settings menu. Choose option *Change name*, type in a new name and approve it by clicking OK. In the same way you can move the sensor to another location.



4.5 Swapping sensors

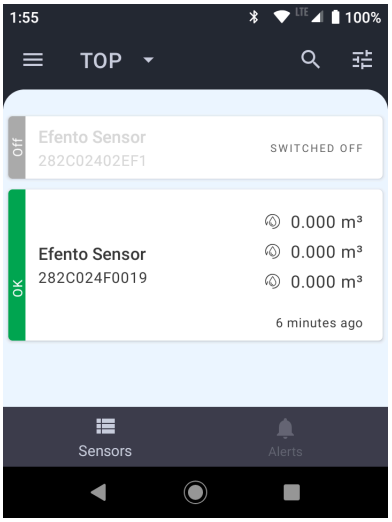
Thanks to the sensor swapping function, the user can freely replace the sensors without losing data and maintaining the continuity of existing measurements, e.g. in the case of periodic calibration of the sensor. Select the sensor you want to replace and then click the three dots at the upper corner of the screen and tap *Swap*. Choose the type of the sensor (BLE / NB-IoT) and click next. From the list that appears, select the sensor that will be used to replace it. Measurement data and configuration (alarm rules, automatic reports) of the swapped sensor are preserved and the measurements sent by the new sensor are being saved in the platform. Information on sensor swapping is saved in the system logs.

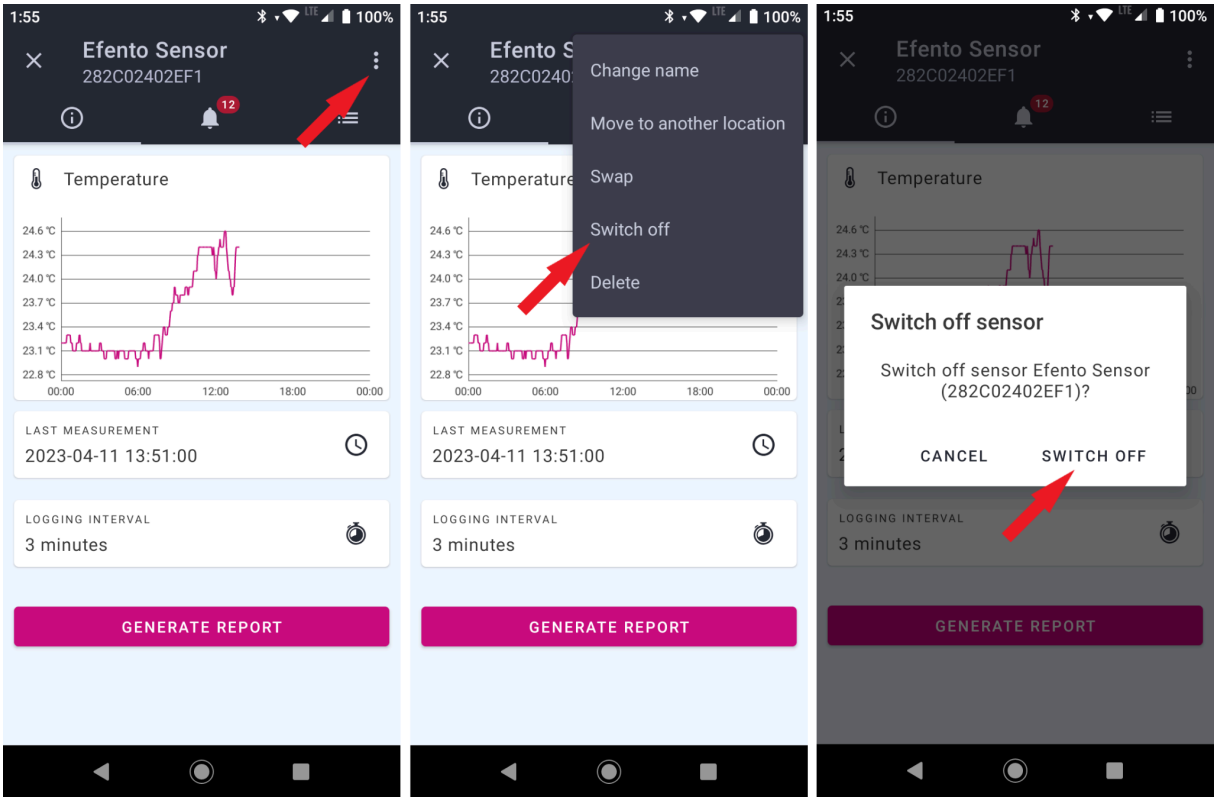
Replacement of the sensors does not require the purchase of an additional licence.



4.6 Switch sensor on/off

If you switch off a sensor, its measurements will not be saved in the platform and in case of alarm rules violation the notifications about that sensor will not be displayed. If a sensor is disabled, it will be greyed out on the dashboard. In order to switch off a sensor tap the three dots in the upper right corner of the sensor details screen and choose *Switch off*. To enable the disabled sensor click *Switch on*, which is located on the same menu.





4.7 Archiving / Deleting the sensor

Efento Cloud allows users to archive and / or remove measurement points.

- Archiving measurement points removes them from the dashboard, rules, reports, etc. but the measurements taken by them can still be accessed by the users. Archived sensors do not require license - a license used by them is free and can be used to add another measurement point to Efento Cloud
- Deleting measurement points removes them completely from the platform. The measurements assigned to them can't be restored. In order to delete a measurement point, it first needs to be archived

To archive a measurement point tap the three dots in the upper right corner of the sensor details screen and choose *Archive*. To display all the archived measurement points, on the dashboard go to *Filters* and select devices with *Archived* status.
Archived measurement points can be deleted (tap the three dots in the upper right corner of the sensor details screen and choose *Delete*) and restored (tap the three dots in the upper right corner of the sensor details screen, choose *Add sensor* and select the sensor that will be assigned to the measurement point).

5. Reports

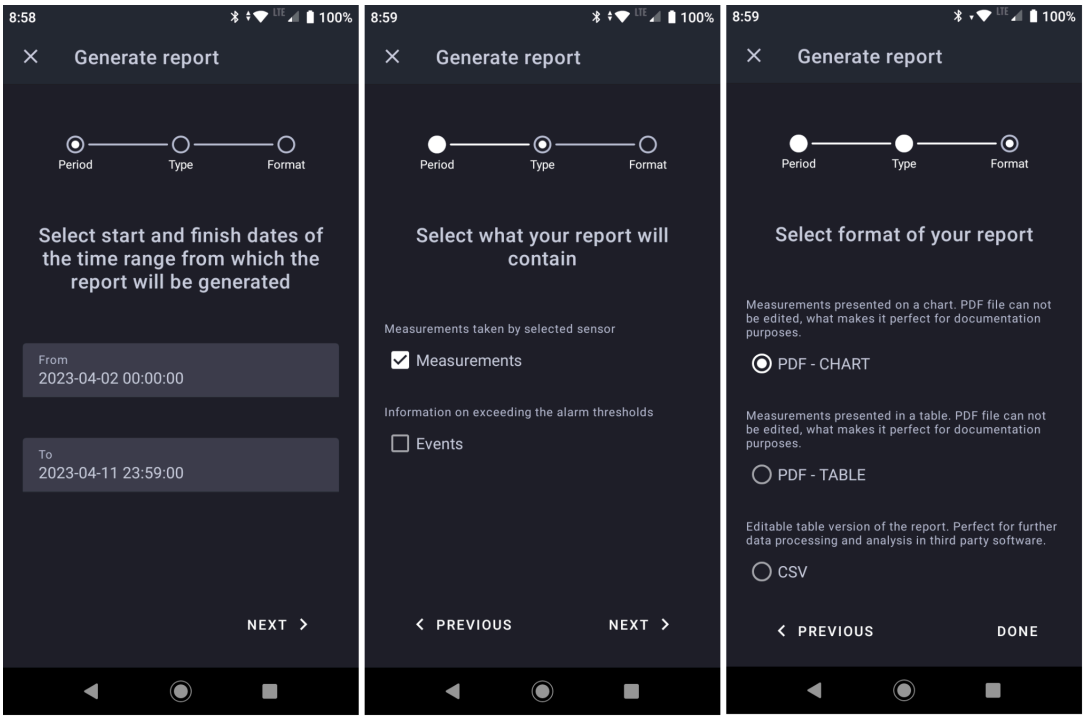
Measurements from the selected period can be exported as a PDF or CSV report anytime you wish. Additionally, Efento Cloud allows you to configure automatic reports, which will be sent with selected frequency (e.g. daily, once a week or once a month) to any e-mail address you type in.

The reports include measurements made by sensors. Additionally they can include information about events such as violation of alarm rules, connection lost or low battery level. The measurements can be saved in reports with a density of 3 / 15 / 30/ 60 minutes.

Reports can be generated on user's demand or periodically (automatic reports) with selected frequency (daily, once a week, once a month) and sent to any email address. Reports on demand can be generated by each user (Analyst, Manager and Administrator), whereas automatic reports can be configured by users with permissions of Manager or Administrator.

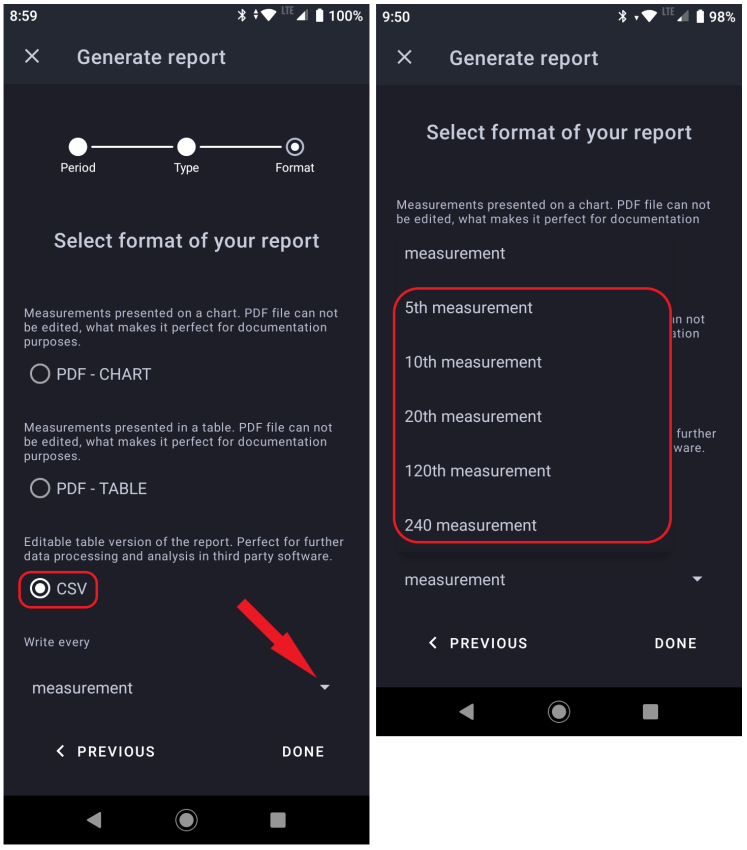
5.1 Generating a report on demand

Generating a report on demand allows you to export measurements from one or more sensors from any period of time in a PDF or CSV file.
To generate a report from a given sensor, select it from the list and tap the *Generate report* button. Select the time range from which the report will be generated. Choose what information should be included in the report and select the report type (PDF - CHART, PDF - TABLE or CSV). Confirm the report settings by clicking DONE.

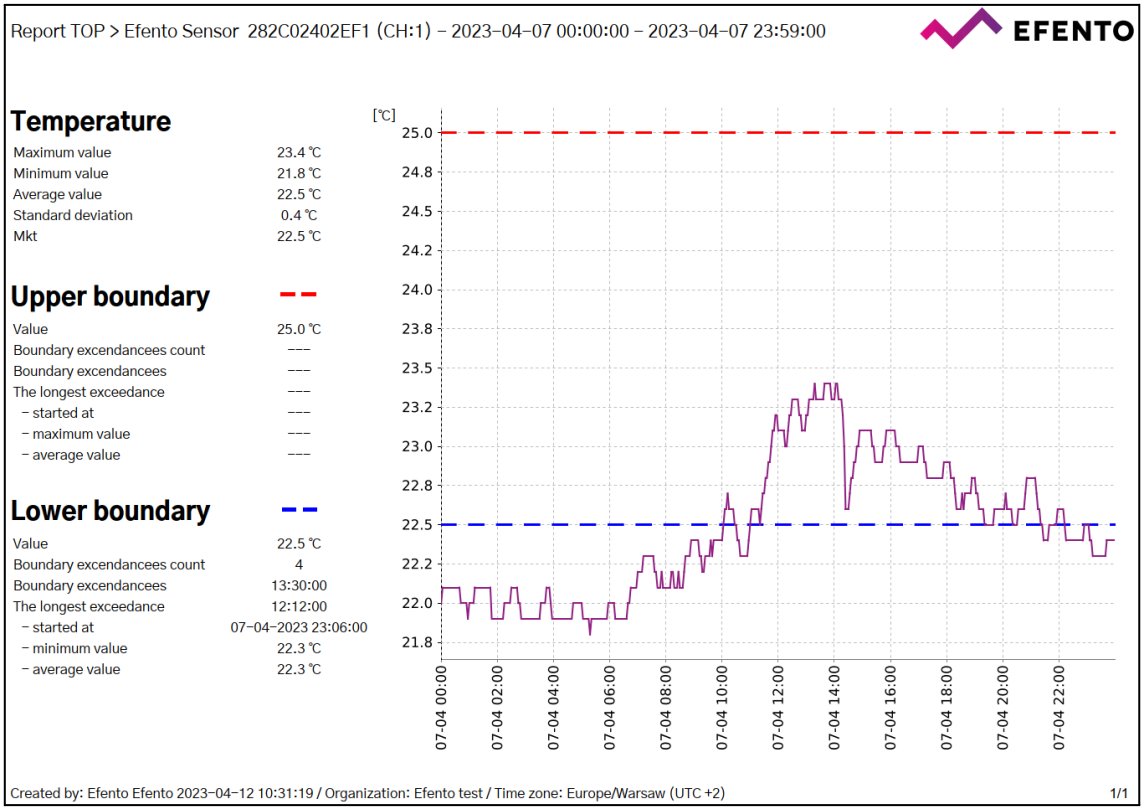


CSV type allows you to change the number of measurements included in the report. Depending on how many measurements should be included, you can choose "write every":

- measurement
- 5th measurement
- 10th measurement
- 20th measurement
- 120th measurement
- 240th measurement

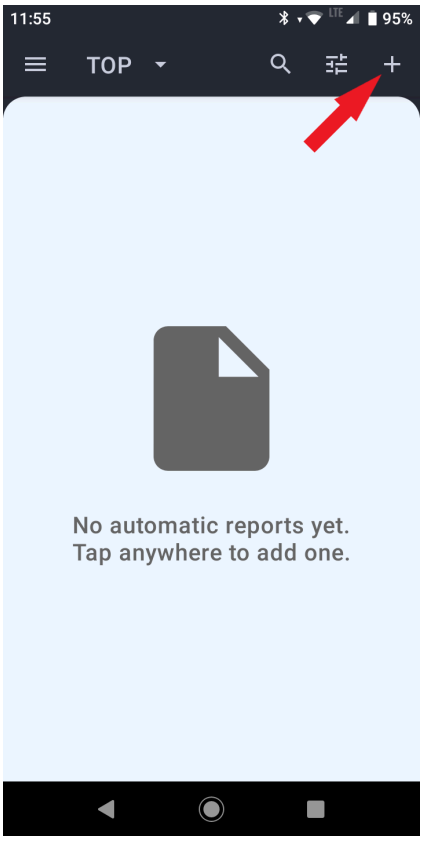


The report will be sent to the email address you have entered while creating an account in Efento Cloud. The report will be delivered within a few minutes.

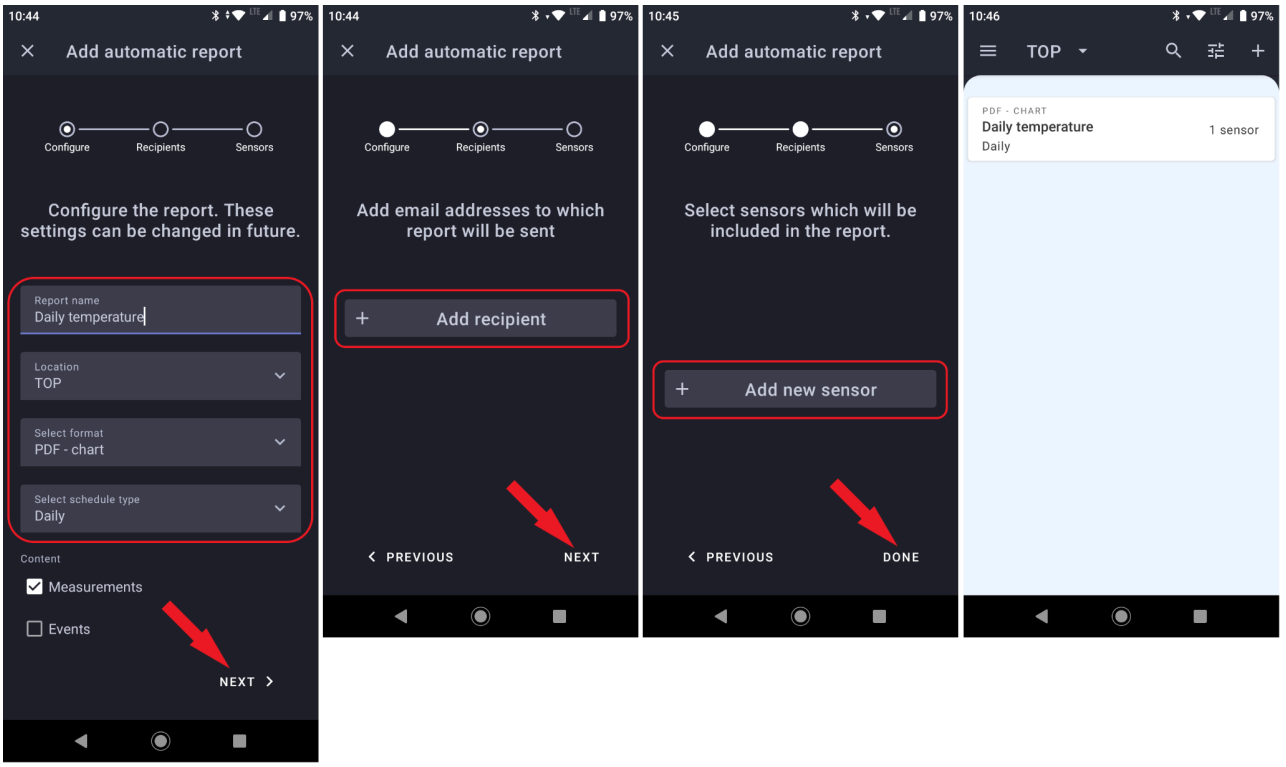


5.2 Configuration of automatic reports

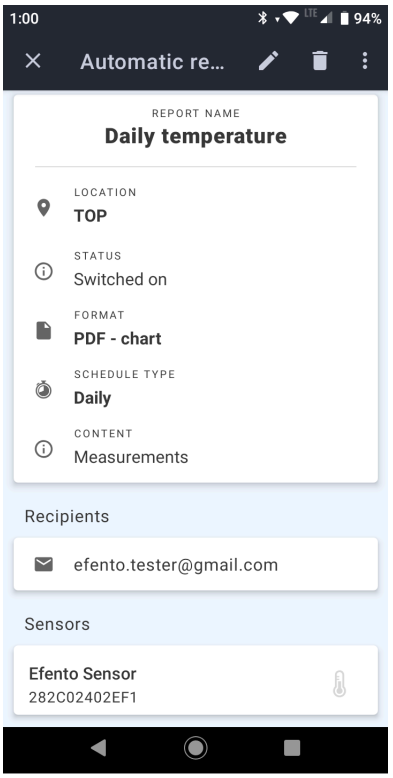
Automatic reports allow you to automate sending reports to selected email addresses. The reports will be generated and sent periodically, depending on the configuration. To configure automatic reports you need to have Administrator or Manager access permission. From the Main menu select *Automatic reports*.



Tap the '+' icon in the upper right corner of the screen and add settings for the automatic report. Add a name to your report, choose *PDF or CSV* format, report sending frequency: *daily, weekly or monthly* and add what should be included in it: *Measurements / Events*. CSV format allows you to set the number of measurements included in the report, the same as when generating a report on demand. Click the next button and add the email addresses to which the report should be sent. Finally add sensors for which the report is to be generated and confirm with the *Done* button. The added report will appear in the list of automatic reports.



Automatic reports are generated and sent to recipients a few minutes after midnight (depending on the selected frequency - every day, every Monday or every 1st day of the Month).



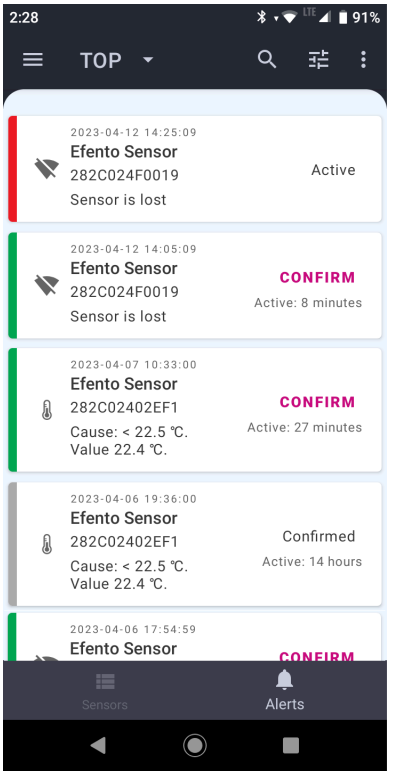
All configured automatic reports including information about their status, report content, sending frequency, and report recipients are visible in the *Automatic reports* tab. To delete an automatic report click the 'trash' icon on the upper right. You can also edit an already existing report by clicking on the pencil icon. In order to disable an automatic report click the three dots icon and switch the report off.

6. Alerts

6.1 Alert preview

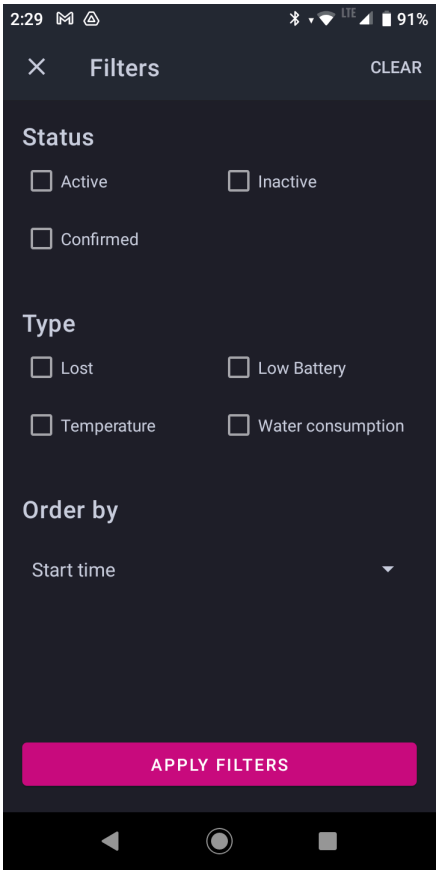
The user can display all alarms by selecting *Alerts* from the navigation menu. Alerts are listed along with the following information:

- Name and serial number of a sensor which triggered the alert
- Date and time when the alert occurred
- Cause of the alert (value of the threshold that has been exceeded) and value measured by the device at the moment when the alert occurred
- Duration of the alert
- Alert status (Active, Inactive, Confirmed). If the alert's status is Inactive, a *CONFIRM* button is visible in the right part of the list. After checking the alarm, the user can tap the button to confirm that the alert was noticed and actions have been taken. While confirming the alert, users may leave a comment which will be visible to all the users who have access to the location.



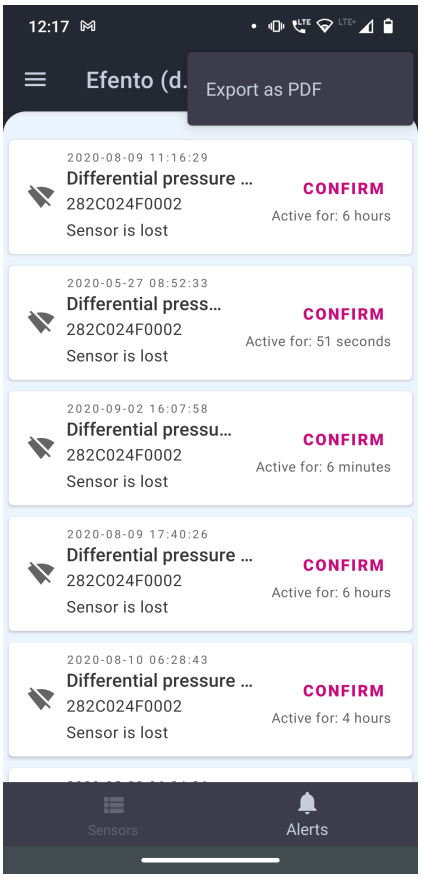
The alerts can be sorted depending on the date of their occurrence, alert type, alert cause, current sensor measurement, alert rule name or recipients assigned to the alert.

In the upper right corner there are search and filter icons that allow you to find a selected sensor's alerts by entering its name, serial number or filter out the result by sensor type.



6.2 Exporting the alert list

In order to export the alerts list, go to the *Alerts* tab, tap the three dots in the upper right corner of the screen and select *Export as PDF.* A list of alerts in the PDF file will be generated and sent to your email address.



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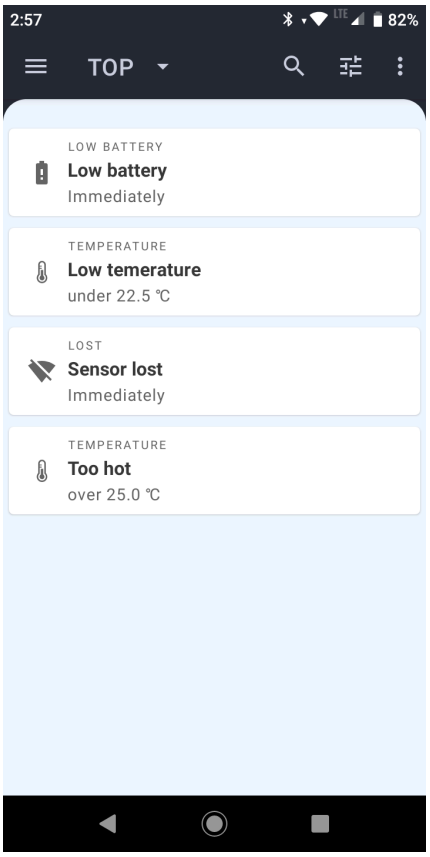
Alarm listing

#	Created	Sensors	Value	Type	Measurement	Rule name	Recipients	Status	Confirmed by	Comment
1	2023-04-06 13:05:09	Efento Sensor	Lost	Occurred		Sensor lost	efento.tester@gmail.com	not confirmed		
2	2023-04-06 17:54:59	Efento Sensor	Lost	Occurred		Sensor lost	efento.tester@gmail.com	not confirmed		
3	2023-04-06 19:36:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	confirmed	Efento Efento	
4	2023-04-07 10:33:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
5	2023-04-07 14:55:09	Efento Sensor	Lost	Occurred		Sensor lost	efento.tester@gmail.com	not confirmed		
6	2023-04-07 21:27:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
7	2023-04-07 22:15:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
8	2023-04-07 23:06:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
9	2023-04-08 11:48:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
10	2023-04-08 12:24:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
11	2023-04-08 13:57:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
12	2023-04-08 14:48:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
13	2023-04-08 17:30:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
14	2023-04-08 21:27:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
15	2023-04-09 08:57:00	Efento Sensor	Temperature	Less than (channel 1)	22.4	Low temerature	efento.tester@gmail.com	not confirmed		
16	2023-04-11 07:50:09	Efento Sensor	Lost	Occurred		Sensor lost	efento.tester@gmail.com	not confirmed		
17	2023-04-11 08:20:09	Efento Sensor	Lost	Occurred		Sensor lost	efento.tester@gmail.com	not confirmed		
18	2023-04-11 09:55:09	Efento Sensor	Lost	Occurred		Sensor lost	efento.tester@gmail.com	not confirmed		

Created by: Efento Efento 2023-04-14 14:35:27 / Organization: Efento test 1/4

An example list of alerts in PDF format

7. Alarm rules



Alarm rule is a formula that defines what events in Efento Cloud should initiate the alarm. The rule consists of impulse, condition and action, e.g.: if the temperature (impulse) increases above 10 degrees (condition) then the platform will send text message notification to selected recipients (action). The rules can be configured as you wish - e.g. sending notifications to different recipients depending on temperature level; violation of thresholds will be only registered in the platform (without sending a notification).. You can define any number of alarm rules and assign sensors to each of them.
Alarm rules can be configured in the *Alarm rules* menu by users with permissions of Administrator or Manager.

7.1 Types of alarm rules

In the Efento Cloud platform you can configure a few different types of rules depending on the impulse that initiated the alarm. These are:

- Violation of threshold (depending on the physical value measured by the sensor e.g. temperature, humidity and pressure);
- Low battery level - if the sensor's battery is low then the platform will inform you about it. After initiation of low battery alarm the sensor will work for about 21 days;
- Connection lost - a situation in which the senor does not send new measurements to the platform.

7.2 Configuration of the alarm rules

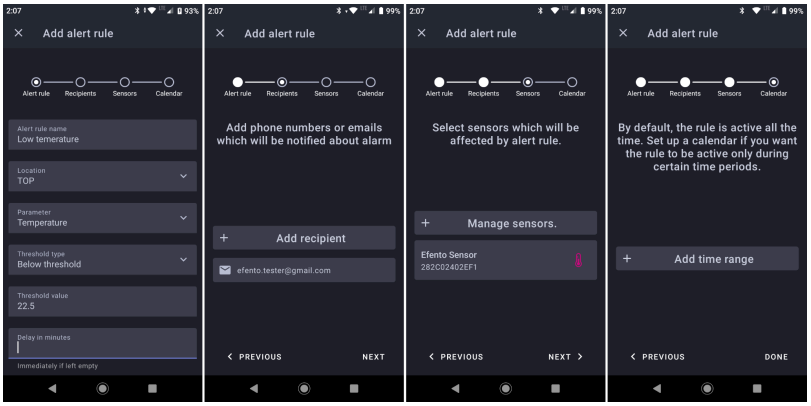
In order to add a new alarm rule go to the Main menu -> *Alarm rules* menu, tap the three dots icon in the upper right corner and then *Add alarm rule*. The parameters that need to be completed depend on the type of alarm rule. Creating an alarm rule consists of several steps:

- Alert rule
  - enter the alert rule name,
  - choose the location to which the alarm rule should be assigned,

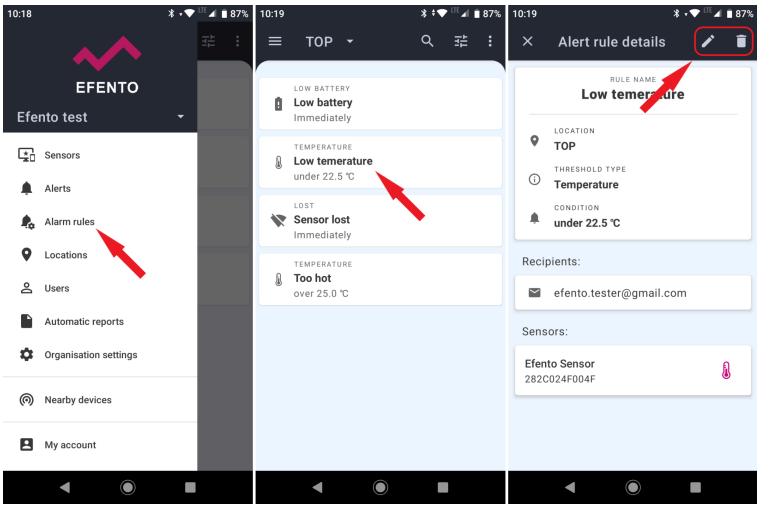
- choose the alarm rule parameter (temperature, humidity, pressure, etc.),
- choose threshold type (*above threshold* - if the alarm should be triggered after the value increases above the set threshold, or *below threshold* - if the alarm should be triggered after the value decreases below the set threshold),
- enter the threshold value,
- enter the delay in minutes (time counted from the moment of exceeding the alarm threshold, after which the alarm will be triggered - provided that the threshold is still exceeded. If you want the alarm to be triggered immediately after crossing a threshold, leave the *Delay* field empty),
- choose if the notification should be sent only once or should it be repeated, if the values measured by the sensor exceed the threshold for a longer time. Enter the number of minutes how often the notification should be repeated.

- Recipients
  - Select the type of the notification (email, SMS, phone call or PUSH - a message to the mobile application) and add the recipients. The e-mail and PUSH notifications are free of charge. If you want to use PUSH notifications, the recipient must belong to the same Efento Cloud organisation, have the Efento application installed on their mobile device and be logged in to the account set in the alarm rule notification. In the event of an alarm, the user will be informed about it by a notification on their smartphone. If you would like to receive text message notifications or phone calls, then it is necessary to have the Efento platform SMS / phone calls balance topped up (the description of topping up the balance is in chapter *10 Text message / phone calls notification*).
- Sensors
  - Select the sensors that will be covered by this alarm rule (choose which slots should be considered. Click the icon shown on the right side of the sensor. If you want to set an alarm for the temperature measuring slot, select the thermometer icon, it will light up in pink).
- Calendar
  - Add a time range to set up a calendar if you want the rule to be active only during certain time periods (by default, the rule is active all the time).

If the alarm rule is configured correctly, press *Done* to save it.

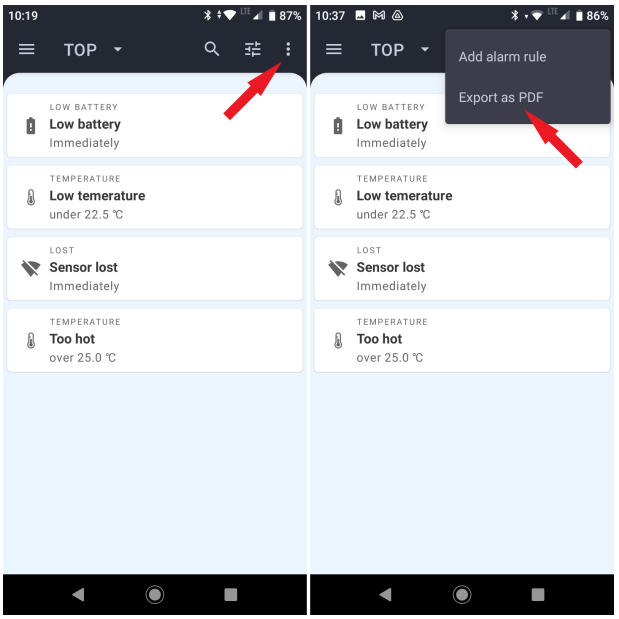


The alarm rule can be edited or deleted anytime in the *Alarm rules* section by clicking the rule on the rules list. To do this, click on the rule and then select appropriate icon in the upper right corner



7.3 Exporting the alarm rules list

To export alarm rules, go to the Main menu -> *Alarm rules* from the menu and tap the three dots in the upper right corner of the screen, then *Export as PDF*. The list of rules will be automatically generated and sent to your email address within a few minutes.



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Alarm rules listing

#	Rule name	Sensors	Location	Value	Type	Threshold	Alarm delay [s]	Mobile recipients	Email recipients
1	Too hot	Efento Sensor	TOP	More than	Temperature	25.0	0		efento.test.quickstart@gmail.com
2	Sensor lost	Efento Sensor , Efento Sensor	TOP	Occurred	Lost		0		efento.tester@gmail.com
3	Low temerature	Efento Sensor	TOP	Less than	Temperature	22.5	0		efento.tester@gmail.com
4	Low battery	Efento Sensor , Efento Sensor	TOP	Occurred	Low battery		0		efento.tester@gmail.com

Created by: Efento Efento 2023-04-21 10:37:25 / Organization: Efento test 1/1

List of alarm rules exported from the Efento Cloud platform

8. Users management

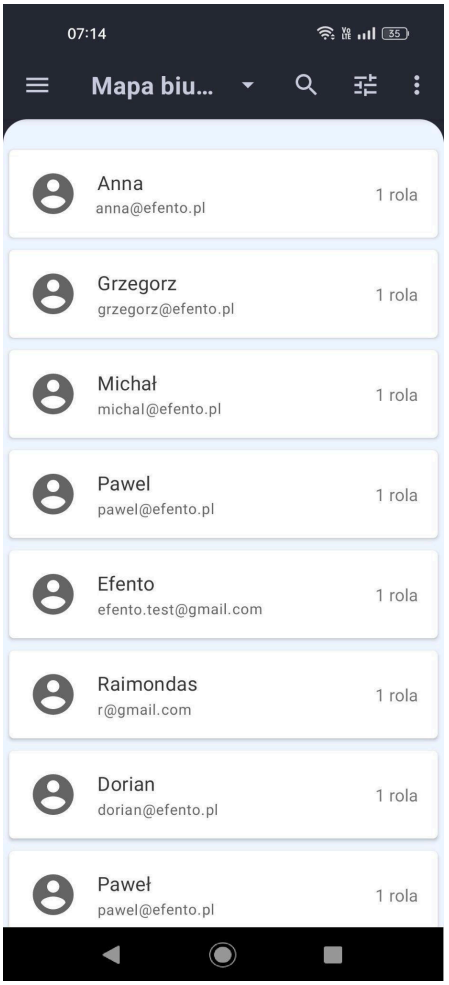
Each user that is assigned to your Organisation, can be granted one of three different levels of permissions: Administrator, Manager or Analyst. Additionally the permissions are granted for specific locations. In Efento Cloud platform permission levels are called roles.
By creating a new Organisation you automatically get the role of Administrator to all its locations. When you invite new users to your Organisation you can grant them any level of permissions to the selected locations.

Each group of permissions has access to different platform functions, as presented in the table below:

	Administrator	Manager	Analyst
Dashboard preview	✔	✔	✔
Report generation	✔	✔	✔
Alarm preview	✔	✔	✔
Configuring automatic reports	✔	✔	✘
Configuring alarm rules	✔	✔	✘
Configuring sensors, structures and location maps	✔	✔	✘
Formulas	✔	✔	✘

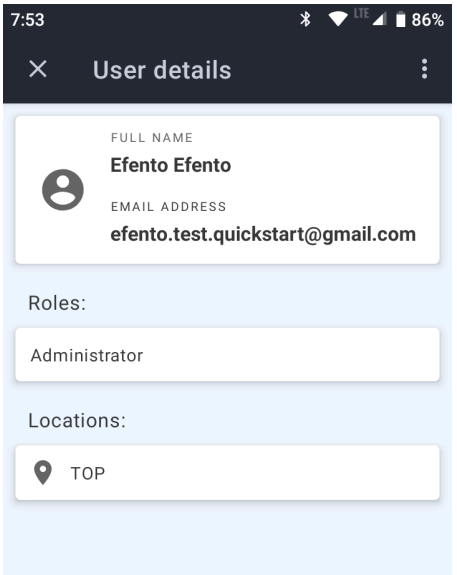
Permissions editing, adding and deleting users	✔	✘	✘
System logs preview	✔	✘	✘
Managing the Organisation's account	✔	✘	✘

8.1 Adding new users to your Organisation



Adding new users is done by invitations, which can be issued only by users with Administrator rights. From the Main menu choose *Users* and tap three dots in the upper right corner of the screen. You will see a dialog that allows you to send invitations to your organisation. Type in the email address of a person you want to invite to join your organisation,choose a role, which will be given to them after accepting the invitation and select the location to which the new user will have access. After saving the changes, the new user will receive an email with an invitation to your Organisation. If a user does not already have an account in the platform, before joining your Organisation they will have to create one.
You can invite any number of users to your Organisation and give them any permissions. Remember that Administrator permission allows the user to access configuration of sensors, users, alarm rules and to edit your Organisation's account, therefore you should not give them to every user you invite.

8.2 Editing user's permissions and deleting users



Editing users can be done in the *Users* menu by users with the Administrator role.
To edit the user's role select the user, click the three dots in the upper right corner and add / change the role of the selected user.

You can also delete users added to your Organisation. Select the user which you want to remove, hold the location it is assigned to and tap *Revoke access*. The user's account will not be deleted entirely, they will only lose access to your Organisation. Only a user can completely delete his account from the platform (see *10.1 Changing username, language and password / deleting the account)*

8.3 Exporting the users list

You can export the list of users in a PDF file. Tap the three dots in the upper right corner of the *Users* menu and select *Export as PDF*. The list will be sent to your email address within a few minutes.

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Users listing

#	User	E-mail	Roles
1	Piotr	piotr@efento.pl	admin: Mapa biura test
2	K R	karol@efento.pl	admin: Mapa biura test
3	Anna	anna@efento.pl	admin: Mapa biura test
4	Mateusz	@efento.pl	admin: Mapa biura test
5	Artur	artur@efento.pl	admin: Mapa biura test
6	Dominik	dominik@efento.pl	admin: Mapa biura test
7	Mateusz	@efento.pl	admin: Mapa biura test
8	Rai	@elj.lt	manager: Mapa biura test
9	Dorian	dorian@efento.pl	admin: Mapa biura test
10	karol	karol@efento.pl	admin: Mapa biura test
11	Paweł	pawel@efento.pl	admin: Mapa biura test
12	Grzegorz	grzegorz@efento.pl	admin: Mapa biura test
13	Michał	michal@efento.pl	admin: Mapa biura test
14	Paweł	pawel@efento.pl	admin: Mapa biura test
15	Efento Efento	efento.test.quickstart@gmail.com	admin: Mapa biura test

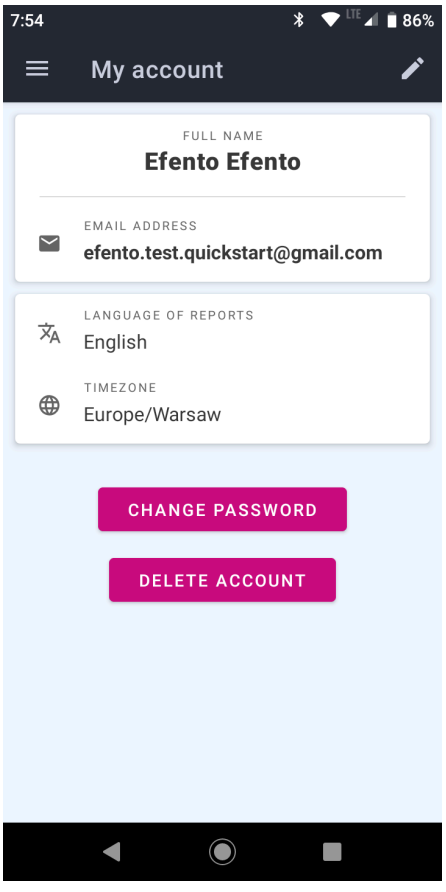
Created by: Efento Efento 2023-05-09 07:58:29 / Organization: Mapa biura 1/1

9. User profile

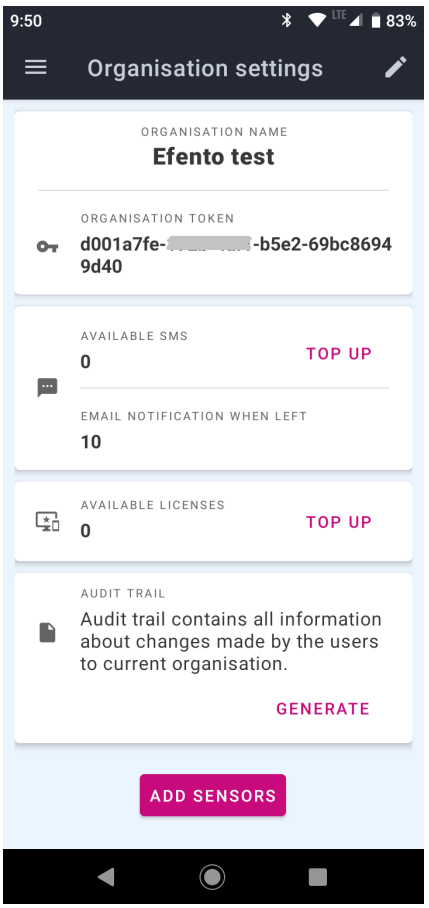
9.1 Changing username, language and password / deleting the account

Select *My account* from the main menu to edit your data such as name, surname, e-mail address and Efento Cloud password. You can also change the language and the time zone. Tap the pencil icon in the upper right corner, make the changes and save them with the *Save changes* button. If you wish to delete your account including all your data in the platform, tap the *Delete account* button.

Warning! This action is irreversible.



10. Text message (SMS) / phone calls notifications

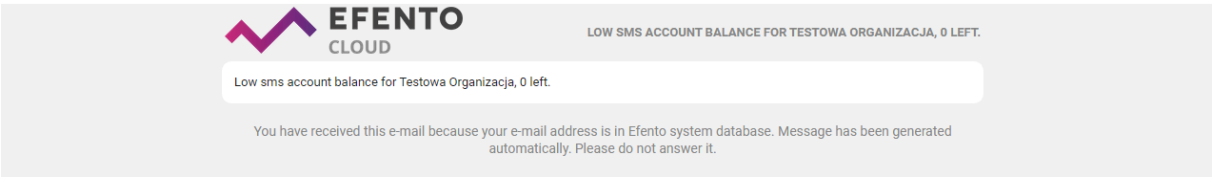


10.1 Topping up the text message / phone calls balance

Efento Cloud allows you to configure text message (SMS) and phone calls notifications about rules violations. If you have configured the text message notifications or phone call, then in order to receive them it is necessary to top-up the balance. To do it, go to the Main Menu -> *Organisation settings* and select *Top up* in the *Available SMS / phone calls* section. Key in the top-up code. If the code is valid, the balance will increase by a specified amount (100 / 500 / 1000 SMS or phone calls).

10.2 Low message balance notification

When the number of available SMS / phone calls drops below 10, an email notification will be automatically sent to users defined in the organisation (you can edit the recipients via the web version of Efento Cloud). If you want to change the low text message / phone calls balance notification, tap on the pencil icon in the upper right corner and enter the appropriate number of text messages left for triggering the notification.



11. Audit trail

11.1 Audit trail export

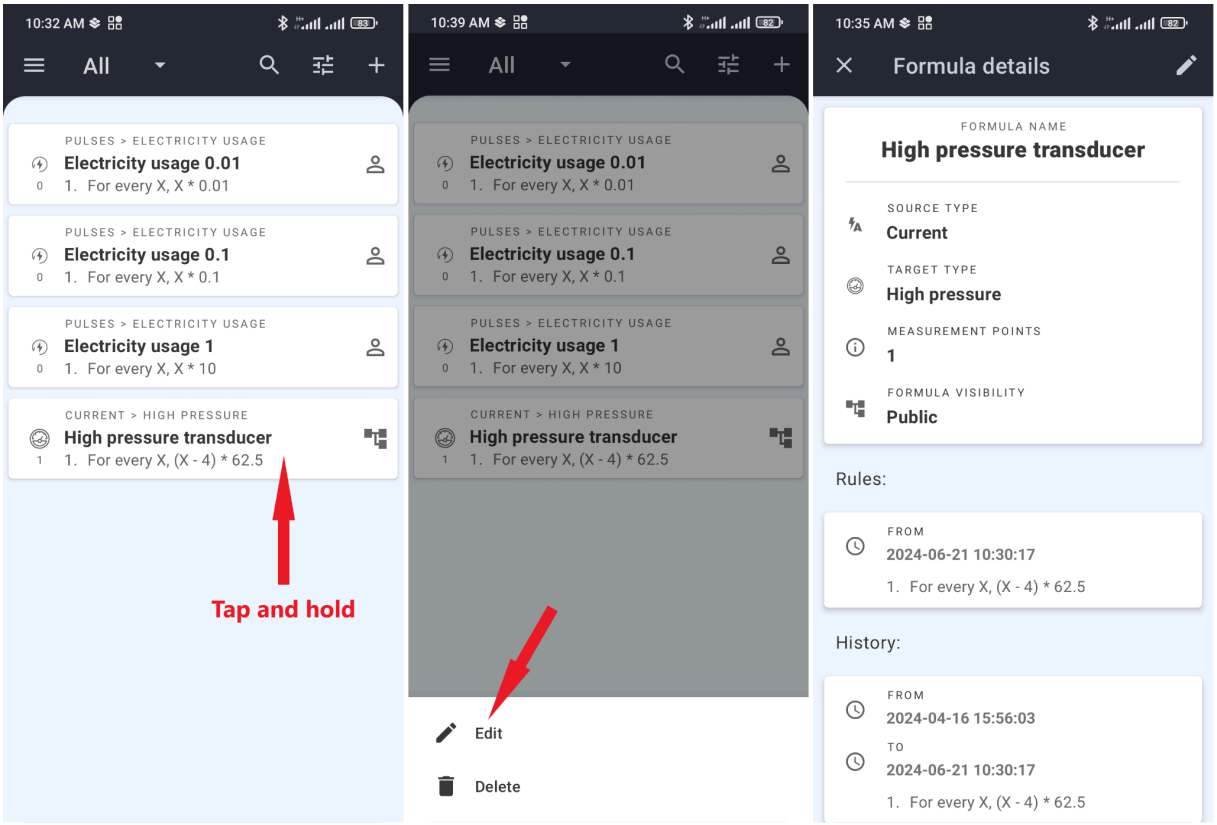
System logs, which are the list of all changes made in Efento Cloud platform, can be browsed by users with permissions of an Administrator. To export the logs list, go to the Main Menu -> *Organisation settings* and select *Generate* in the *Audit trail* section. A PDF report with a list of all changes in your Organization will be generated and sent to your email address.

12. Formulas

The platform allows converting the measurements from pulse counters, current (4-20mA) and voltage (0-10 V) sensors into appropriate physical values, making them user readable / interpretable.

12.1 Channel formulas manager

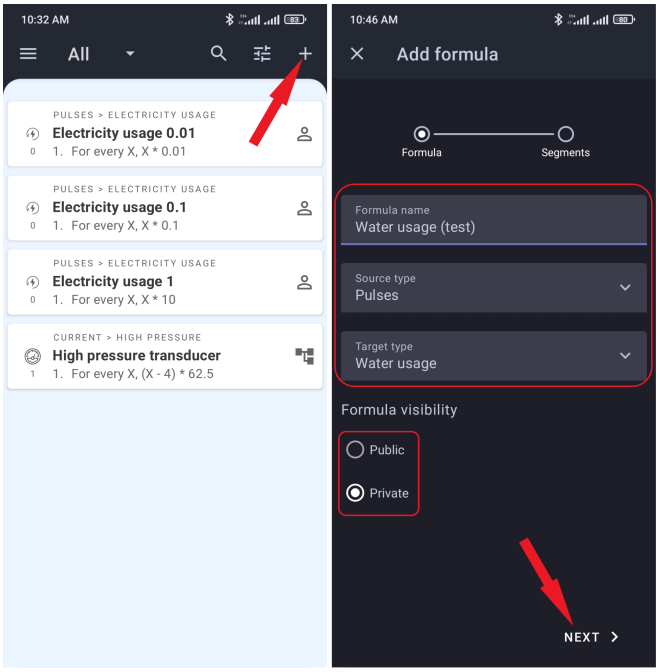
The Channel Formula Manager allows users to configure formulas. To access the Channel formulas manager open the app's menu (three lines in the upper left corner) and select ‘Formulas’. The list shows all currently defined channel formulas. To create a new formula, press the '+' button located in the upper right corner of the screen. To check the details and the history of a formula, select it from the list. Editing and deleting a formula is possible by tapping and holding the selected one in the formula list.



Important! Before removing a formula, you must detach all the sensors from it. Detaching a sensor from a is done by switching its channels to another formula or deleting a measurement point from Efento Cloud.

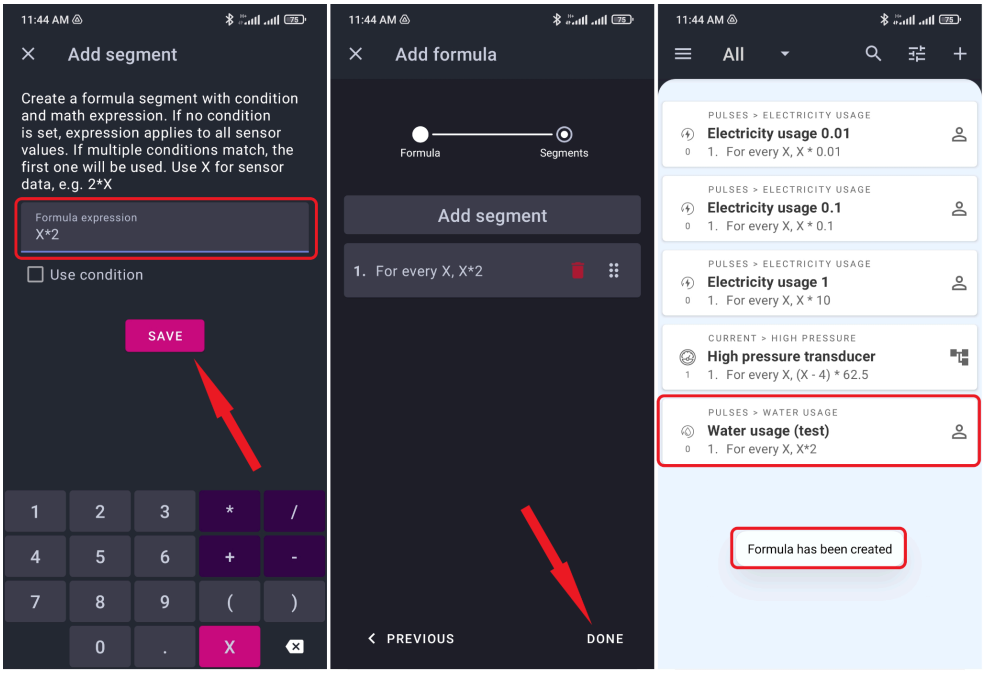
12.2 Adding a formula

In the first step of creating a new formula, give it a name, check whether the redefinition of the channel type is consistent with the assumptions and set the access permission to the channel formula (*Private* - channel formula can only be edited by its owner, *Public* - channel formula can be edited by any user having access to the formula manager).



In the second step, define the logical conditions along with formulas used to convert the measurements sent by sensors. The conversion formula must be mathematically correct and no longer than 32 characters. To refer to the value sent by a sensor, use 'X' character. For example, doubling the value sent by the sensor will be achieved by the formula: X * 2. It is possible to use the following operators in the formulas:

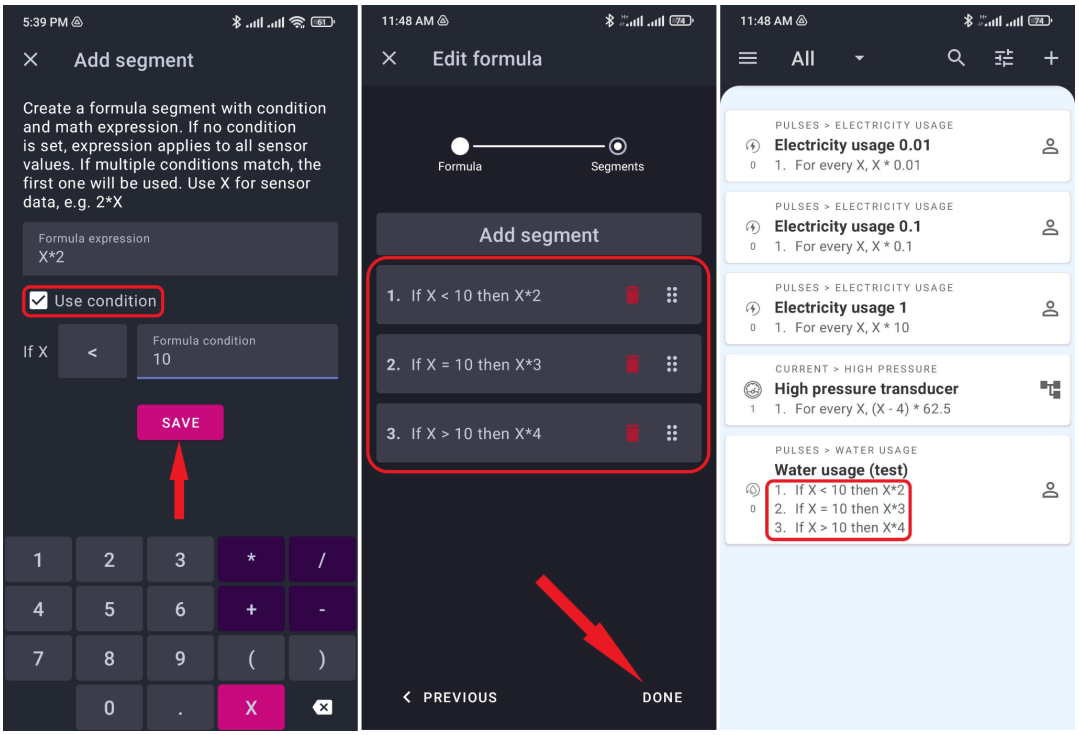
- “+” sum,
- "-" difference,
- “*” multiplication,
- “/” division,
- “()” grouping of expressions.



It is possible to define a few formulas for different measurement ranges and apply a formula depending on the measurement value. For example, if a measurement taken by a sensor is:

- smaller than 10, multiply it by 2
- equal to 10, multiply it by 3
- larger than 10, multiply it by 4

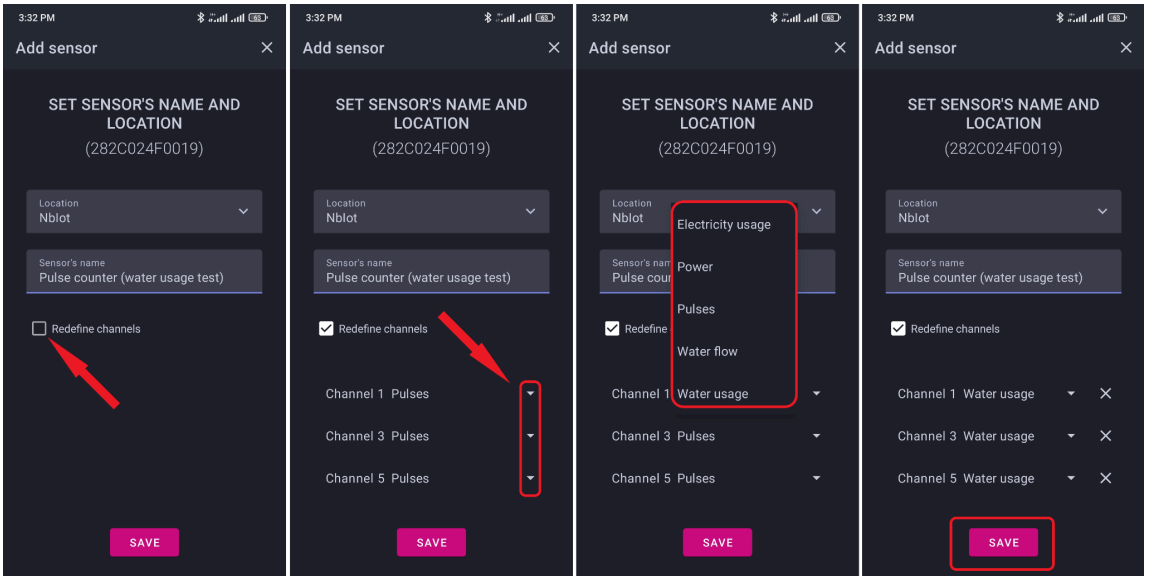
To enable this option, check the *'Use condition'* checkbox. After saving the condition, press the '*Add segment'* button again to add another condition.



12.3 Adding formulas to sensors' channels

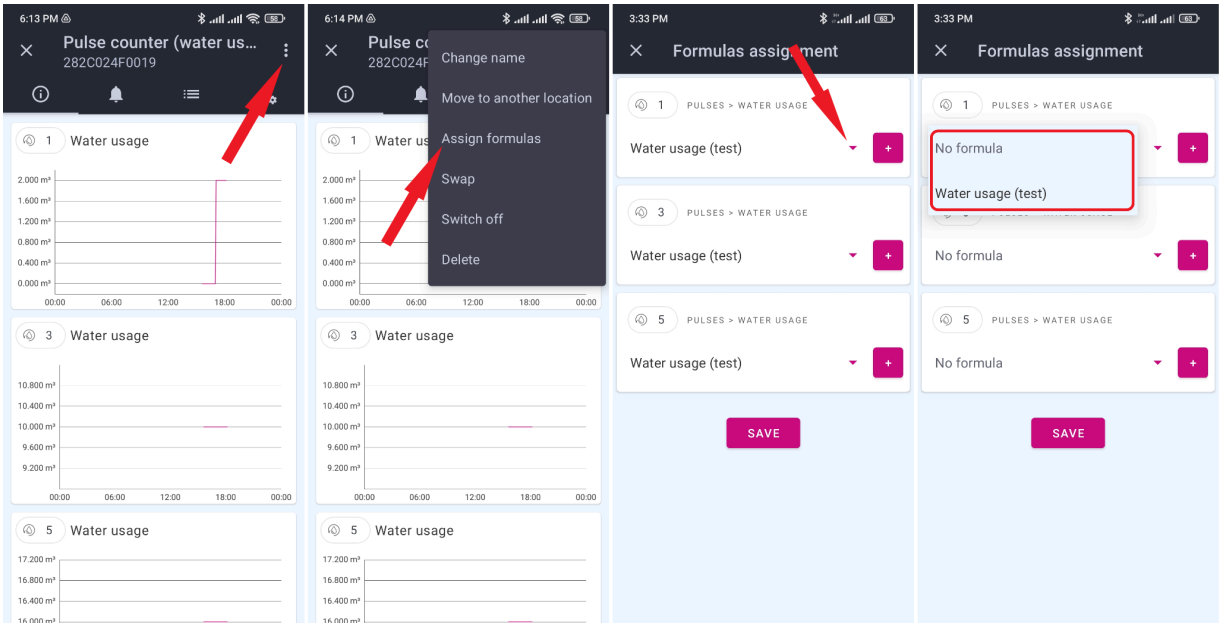
The formulas can be applied to 4-20mA / 0-10V sensors and pulse counters. This is only possible when adding the sensor to the Efento Cloud organisation. Once the target type is defined, it can't be changed to another without removing the sensor from Efento Cloud. It is however possible to apply a different formula with the same target type to the already added sensor.

In order to apply a formula to the sensor's channel check the *'Redefie channels'* checkbox when adding a sensor. Select a formula for each of the channels and save the changes by clicking *'Save'*.



12.4 Editing and disabling sensor formula

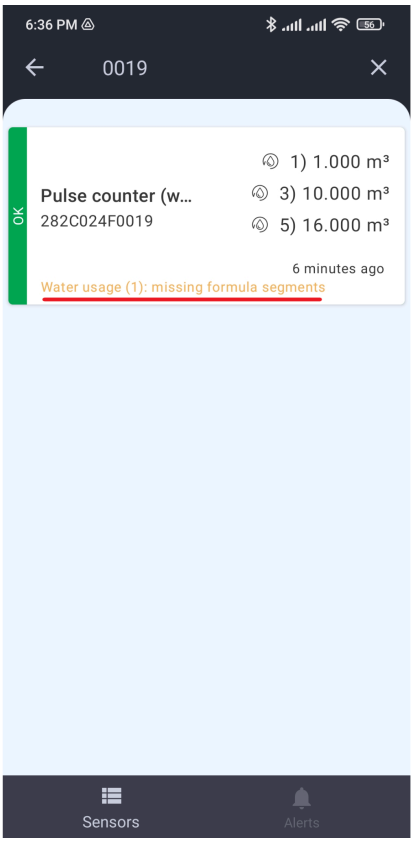
It is possible to change the formulas assigned to sensor channels anytime. After selecting the sensor on the dashboard, tap on the three dots in the upper right corner and select *'Assign formulas'* from the menu. Select a formula you want to assign to the channel from the drop-down or select *'No formula'* to disable the formula for a given channel. To add a new formula, press the '+' button. After making changes, accept them by clicking the '*Save*' button.



12.5 Formulas errors

If Efento Cloud encounters a problem while re-calculating the received measurement, the user will be informed by the channel error message on the dashboard. The reason for the error may be:

- division by 0,
- the calculated value is out of the allowed range,
- received measurement does not meet any defined segment criteria.



13. Nearby devices

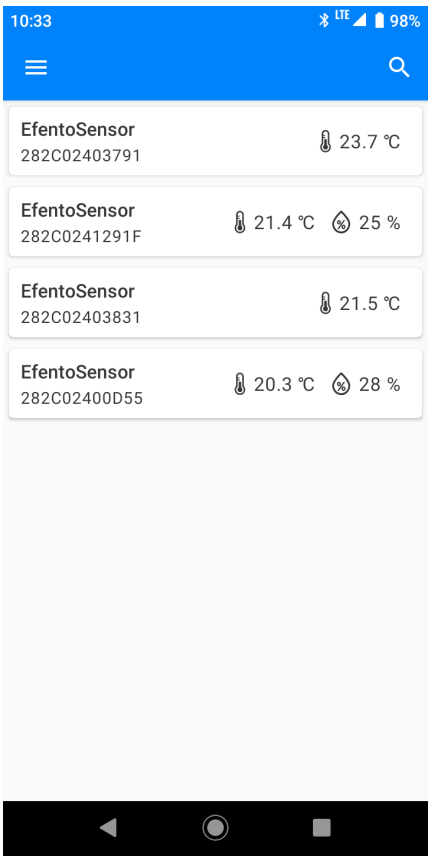
The *Nearby mode* of the application allows users to read the current measurements directly from loggers' memory, configure all Efento devices (Bluetooth loggers, NB-IoT loggers, gateways). In the nearby mode the application communicates with the devices over Bluetooth Low Energy, therefore it requires Android's Location permission (application will ask the user to grant it the first time the user enters the Nearby mode).

13.1 Supported sensors

Application supports all types of Efento sensors, including:

- temperature (including sensors with an external probe and low or high temperature sensors),
- humidity,
- atmospheric pressure,
- high pressure,
- differential pressure,
- pulse counters,
- open / close,
- gases and air quality,
- distance
- flooding
- soil moisture
- voltage and current
- motion
- light intensity
- PM1.0 / PM2.5 / PM10
- current (4-20mA)
- voltage (0-10V)

13.2 Nearby devices list



The application automatically detects all sensors within range of your phone / tablet. The list shows the names of the sensors, their serial numbers and their current measurement values.

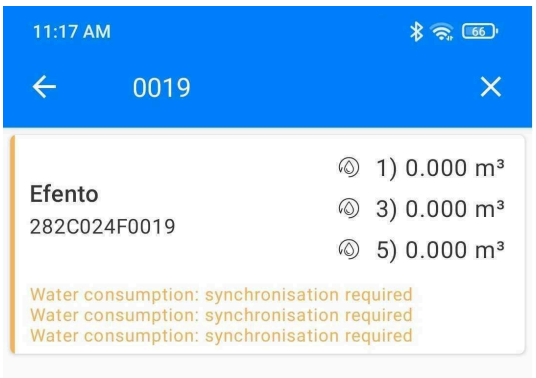
The padlock icon on the left side of the sensor's serial number means that communication between sensor and mobile devices is encrypted. The padlock icon displayed instead of the measurement value means the sensor communication is encrypted and the mobile device is not able to decrypt the data (sensor communication

encryption is described in further parts of this user manual).

13.3 Warnings

The application notifies user of:

- **Low battery level** - a red battery icon next to the sensor's name. After the icon appears, you have approximately 30 days to replace the battery. 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
- **Measurement issue** - exclamation mark icon next to the sensor's name. Sensor is damaged and can't take proper measurements (measurements are out of scale, or the device is not able to take measurements at all). Measurement is not available or out of range. If you see this warning, contact Efento's support team at help.efento.io.
- **Sensor has not been restarted** - during the first startup, we recommend resetting the sensor to set the measurement period and time. If the sensor has not been reset, all measurements data will be lost after removing the battery.
- **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 sensor's software, simply click on it and enter the sensor's PIN code (you can find it on the sticker on the enclosure).
- **Sensor should be calibrated** - for the device to work properly, calibration during start-up is required. There are three calibration notifications:
    - XYZ sensor is still calibrating - the device is in the first stage of automatic calibration
    - XYZ sensor is still not fully calibrated - the device is in the second stage of automatic calibration
    - XYZ sensor synchronisation required - notification displayed in cumulative pulse counters where it is necessary to manually set the starting point for each channel



13.4 Sensor configuration

From the list of the sensors in range, select the one you want to configure and tap on it. If you selected an encrypted sensor, enter the correct encryption key to allow the

application to communicate with it. The application will connect to the sensor and you will be able to configure the sensor. Enter the settings menu by tapping three dots icon in the upper right corner of the screen to:

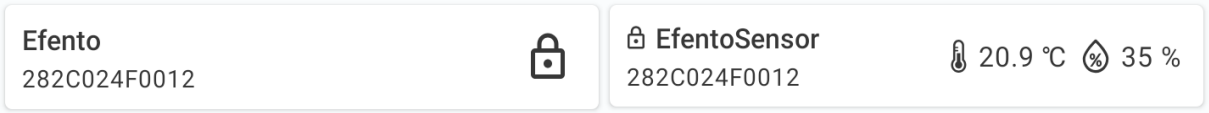
- **Change measurement period and / or clear sensor's memory** - select a new measurement period using the sliders and enter the PIN code (you will not be asked to enter the PIN code, if you have already entered the PIN code for this sensor before). The application automatically calculates how many measurements will be stored in the sensor's memory with the selected measurement period - this information is visible at the bottom of the screen. Save changes, sensor memory will be cleared and a new measurement period will be set. By default, the measurement period is set to 3 minutes. For sensors, which measure physical / chemical values (e.g. temperature, humidity), the measurement will be taken with the set period. For pulse counters, the sensor will count the number of pulses in that particular period of time (e.g. if the measurement period is set to 60 minutes, the sensor will count the number of pulses in each 60 minutes window). It is recommended to reset the device during the first configuration.
- **Encrypt sensor communication** - communication between Efento sensors and mobile devices / Efento gateways can be encrypted (AES128 encryption). If the encryption is on, only the devices with the proper encryption key will be able to decrypt the data sent by the sensor. Using encryption has been described in the next part of this document.
- **Battery status** - information on the current state of the battery and its lowest level measured.
- **Pulse counter conversion ratio** (water and electricity pulse counters only) - user can define how many Wh / litres represents a single pulse. This allows users to set the proper conversion ratio based on the meter type and a value represented by a single pulse. In order to change the conversion ratio connect to the sensor -> three dots in the upper right corner -> Advanced -> Calibration -> Calibration parameters

In case of Efento NB-IoT sensors full device configuration is accessible from this menu. The configuration has been described in the Efento NB-IoT sensors user manual

13.5 Encryption

Enabling the encryption will result in encrypting the data sent by the sensor over Bluetooth Low Energy interface. The encrypted data sent by the sensor can only be decrypted by a device with the encryption key. This feature is useful, if you need to be sure that only the authorised personnel can read the data over Bluetooth

interface. Users who do not know the encryption key, will not be able to read the data.



If the sensor communication is encrypted, only devices with a proper encryption key can read its measurements (right). Devices without the encryption key are not able to read the data (left)

In order to set the encryption key:

1. Connect to the sensor with the Efento Android app, tap on the three dots in the upper right corner -> “Advanced” -> “Turn encryption on”.
2. Key in the encryption key. Make sure you write it down as you will need to add it in mobile devices that will access the sensor data.
3. From now on, the communication is encrypted. You will need to add the encryption key in Efento Logger in order to see the data sent by the sensor.

In order to switch the encryption off:

1. Connect to the sensor with Efento Logger, tap on the three dots in the upper right corner -> “Advanced” -> “Turn encryption off”.

If the encryption has been turned on, once you try to connect to the sensor with Efento Logger, you will be asked to key in the encryption key. Once you add it, the application will store the encryption key and you will be able to access the sensor without adding it again. *Efento* Android app allows you to add up to five default encryption keys. If a sensor communication is encrypted with any of the added keys, Efento Logger will automatically decrypt the data. This is useful for managing a fleet of sensors. In order to add a default encryption key in Efento Logger:

1. Enter the application settings (menu icon in the upper left corner -> “Configuration”),
2. Select “Default keys”,
3. Press “Add encryption key” button,
4. Add the encryption key and its label

If you want to delete an encryption key:

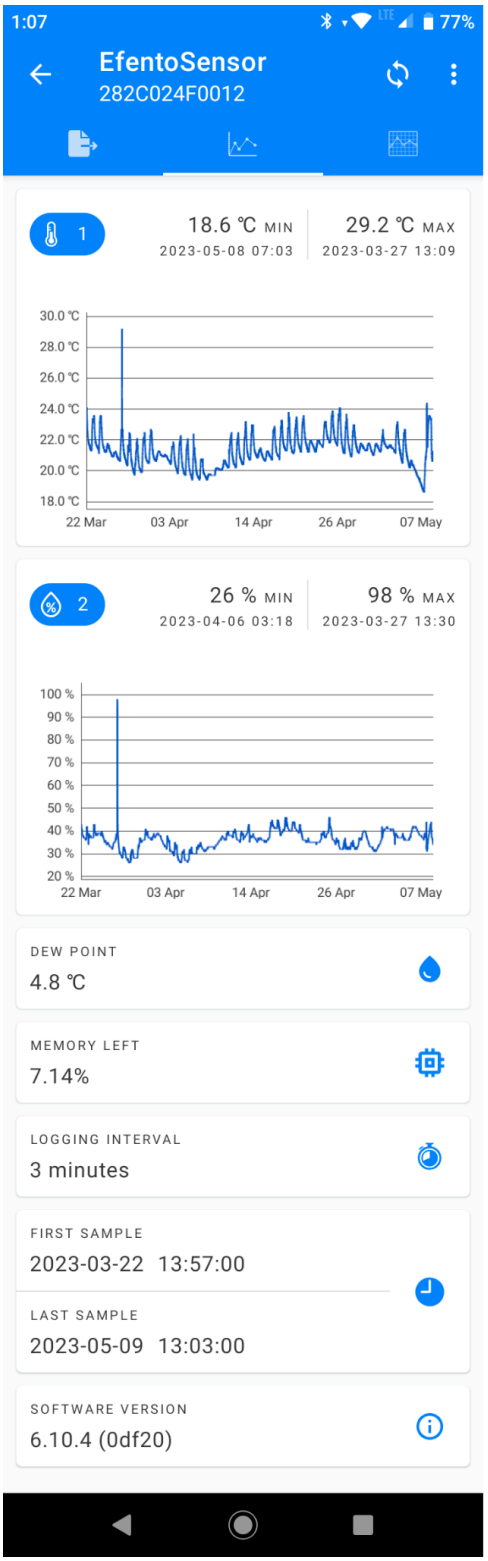
1. Enter the application settings (menu icon in the upper left corner -> “Configuration”),
2. Select “Default keys”,
3. Tap and hold the encryption key you want to remove,
4. Confirm action by *OK* button.

13.6 Reading data from the sensor memory

After connecting to the sensor and downloading the data you will see a screen with a summary of the measurements downloaded from the sensor's memory.

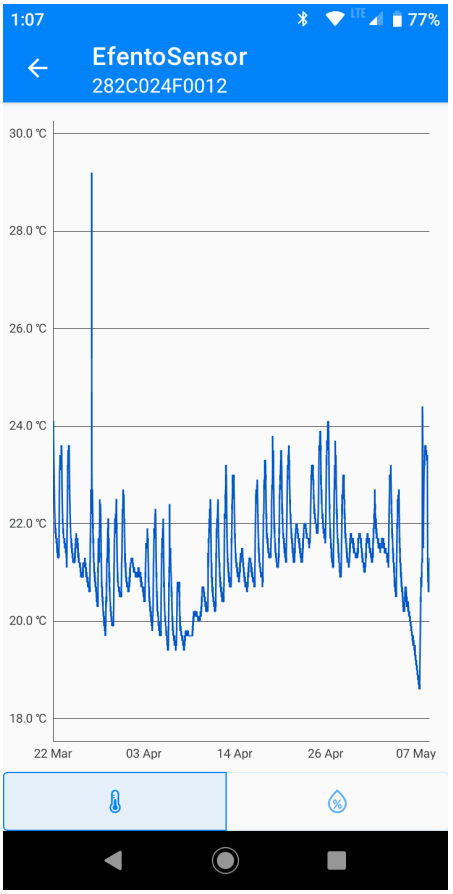
The summary includes:

- date and time of the first and the last measurements,
- minimum and maximum values in the series for each of the measured physical values together with the date and time of their occurrence,
- graph showing the measurement values over time,
- measurement period along with information about available device's memory and the number of days it is enough for it,
- sensor software version.



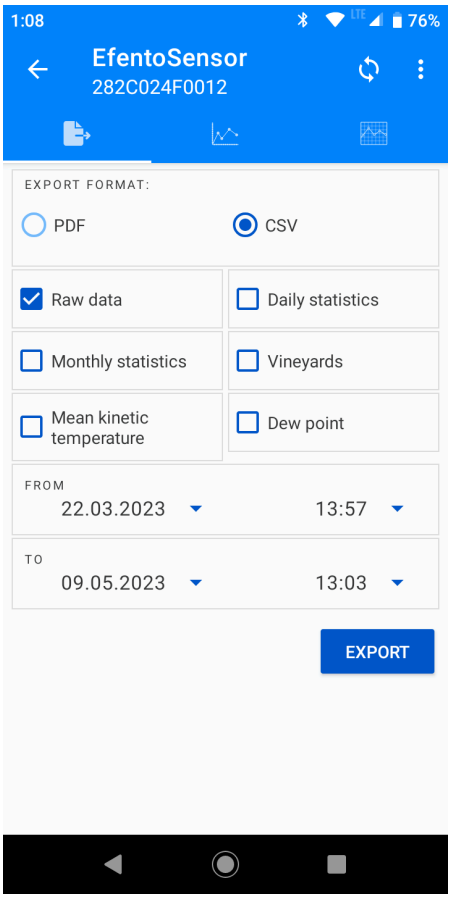
13.7 Charts

Click on the chart in the general view to zoom it in. Use your fingers to zoom in / out the chart and scroll it. Red and blue lines on the chart indicate the minimum and maximum values in the measurement series. If the sensor measures more than one physical value, select the one you want to display on the chart using the dropdown at the top of the screen.



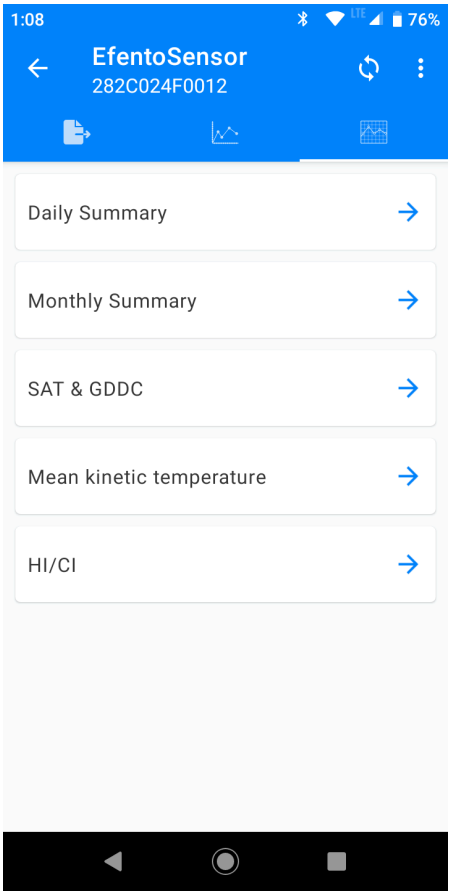
13.8 Exporting the data

To export the data, from the top menu select the export icon (first icon on the left). Select the type of data you want to export (measurements, daily statistics, monthly statistics, SAT and GDDC values and mean kinetic temperature) and the range from which the data should be exported and press "Export". Data can be shared using any application installed on your phone - you can send it by email, save it to Google Drive / Dropbox, send it to an FTP server or print it using a printer connected via Bluetooth or WiFi. The data can be exported in CSV format, which is supported by many popular data processing programs (Excel, Matlab, etc.) or PDF - not editable file, good for documentation. CSV report contains data only, PDF report contains a chart.



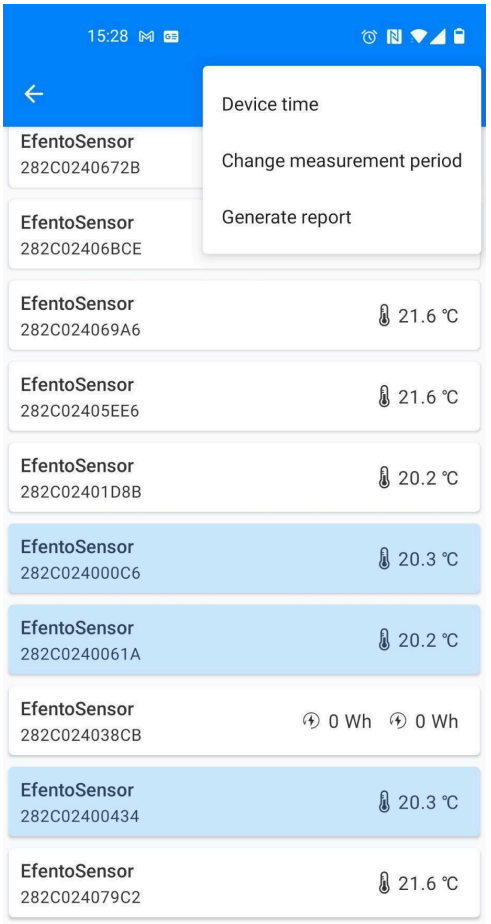
13.9 Statistics

The application calculates statistical values from the downloaded data series. To display statistics, select the statistics icon from the top menu (first icon on the right). Currently supported statistics include:



- **Average values** - average value of the measurements 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** - parameters used in grapes cultivation;
- **The length of the growing season (LGS)** - determines the number of days, in which the average daily temperatures were above 10 Celsius degrees. The region is widely considered as suitable for viticulture, if the LGS value is higher than 182.
- **Mean kinetic temperature** - allows users 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.
- **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 ≤ 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 uses GPS to determine 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 the measurements have been taken
- **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

13.10 Batch actions



Some of the actions can be performed on multiple sensors. In order to access the batch action menu tap and hold one of the sensors. Tap on other sensors you want to select. Selected sensors will be highlighted in blue. Tap on the menu icon (three dots in the upper right corner) and select the batch action you want to perform. Make sure all the devices are nearby your mobile phone. Batch actions are available for sensors with software version 06.01 or newer. Available batch actions:

- **Set time** - sets time on all selected devices
- **Change measurement period** - changes measurement period on the selected devices. If you want to synchronise the timers of the selected sensors check the box “synchronise”. checking this box will result in synchronising the time of the measurements on all the sensors (e.g if the measurement period is set to 5 minutes and the synchronisation was selected, all the devices will take measurements at 12:00, 12:05, etc.)
- **Generate report** - downloads the data and generates the report from the selected sensors. You can select the report type (PDD, CSV) and content of the report (data, statistics, etc.)

13.11 Application configuration

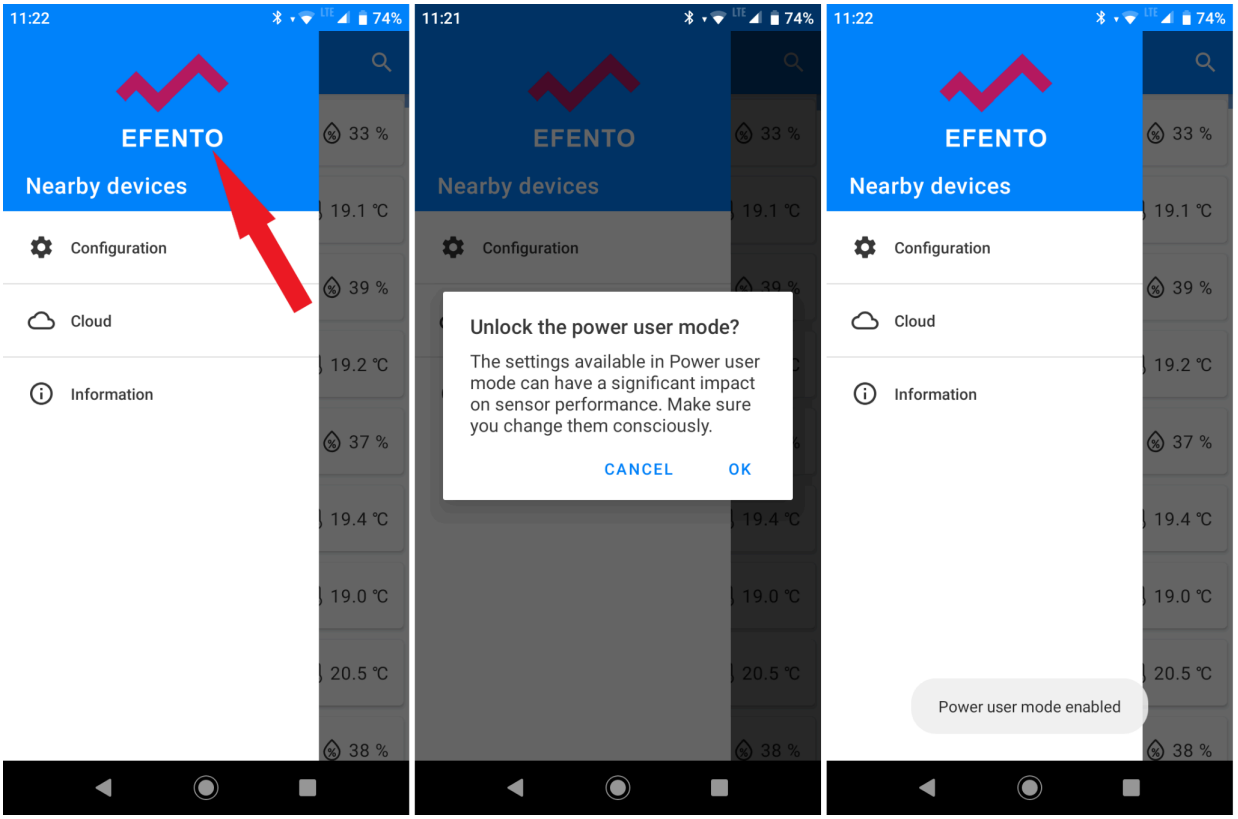
To configure the Nearby mode application settings, click on the menu in the upper left corner of the application. Open the settings where you will be able to:

- **Activation Energy** settings are a constant used when calculating the average kinetic temperature. Its default value is 83.14472 kJ / mol.
- **Default encryption keys** settings are used to automatically decrypt the sensor communication when it is encrypted with the same key (e.g. key "qwerty123" has been added as the default encryption key in the application. From now on, each sensor encrypted with the key "qwerty123" will be decrypted by the application automatically). It can add up to five default encryption keys.
- **Location in 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

- **Forget sensor -** the application removes the encryption keys and reset codes of the selected sensor

13.12 Sensors' software updates

The Efento app can be used to update the software on the sensor. For this purpose, it is necessary to enable the *Power user mode* by pressing the Efento logo five times in the application settings. Additional configuration options offered by the Power user mode are described in the Efento NB-IoT sensors user manual.



In order to update the software:

1. Download the .zip file with the new software version to your mobile phone
2. Connect to the sensor -> three dots in the upper right corner -> Power user -> Update firmware from file
3. Select the .zip file you want to update
4. Perform the update