Efento
Mobile Application
User Manual
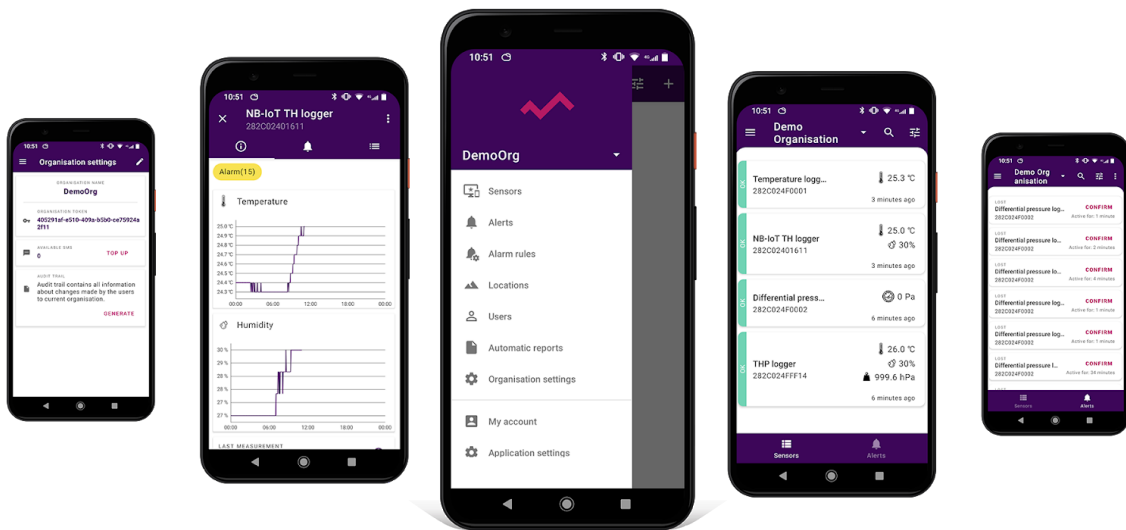
Ver. 1.2.0

2020-11-20

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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 and cloud) at any time. Application works with mobile devices equipped with Android 5.0 or newer and Bluetooth Low Energy interface.

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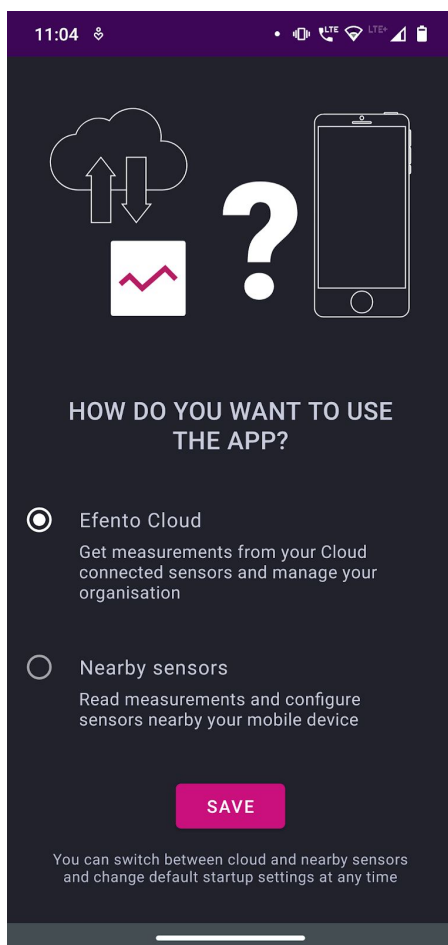
During the first launch, user will be asked to choose the default application mode:

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

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

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

Efento Cloud

Registration and logging in to Efento Cloud

If you do not have an active Efento Cloud account, you will have to register. During 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 that you must open to complete the registration process.
Users who already have an active account can skip the above steps and log in by entering their email address and password in the application.

Creating a new Organization

The organization allows sharing measurement data from loggers to many users. Additionally, as part of the Organization, you can create a location structure to organize sensors. Users with access to your Organization 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 Organization, you will be asked to create a new Organization and select its name. After entering this data, you will receive full access to manage your Organization, invite other users to it, and configure sensors. If a new user has been invited to an existing Organization, then he will be automatically assigned to it after registration

Configuration of organization settings is done through the menu in the upper left corner of the screen. The menu has the following elements: *Sensors, Alarms, 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 user's phone.
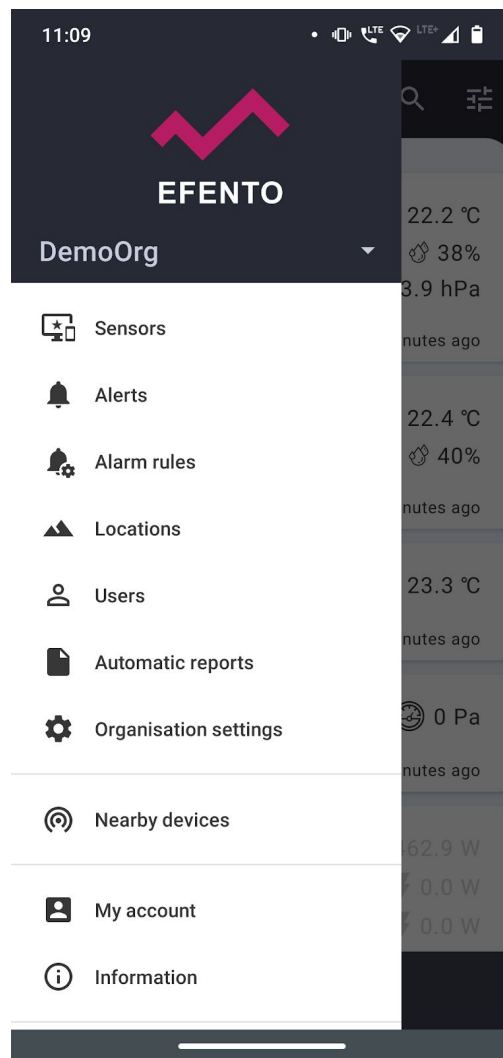
Adding sensors and gateways

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 license code. The license code is a 36-character key sent by email when purchasing access to the Efento Cloud platform. To add the license 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.

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 USB (5V, 1A) or PoE (802.3af) power supply. If you have a switch / router that supports PoE (802.3af), you can only connect an Ethernet cable to the gateway that will provide connection to the network and power. Otherwise, you must also connect the USB power adapter included in the kit.

To configure Efento Gateway from the main menu, select *Organization 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. 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.
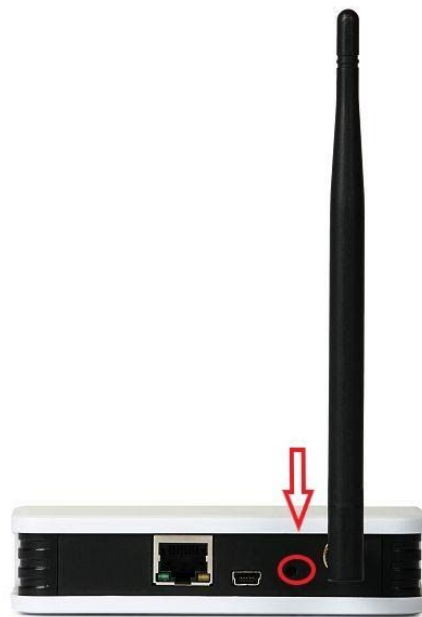
Press the button on the back of the gateway twice to enter the configuration mode
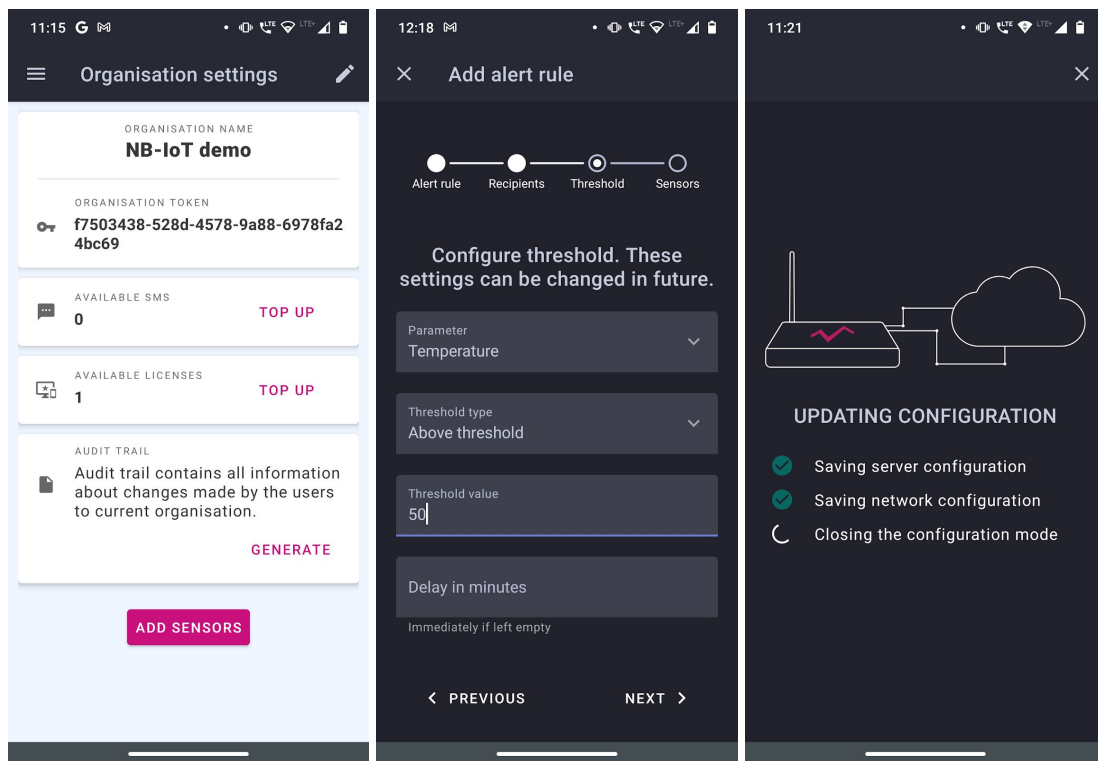
Adding Bluetooth Low Energy loggers

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 Efento) 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.
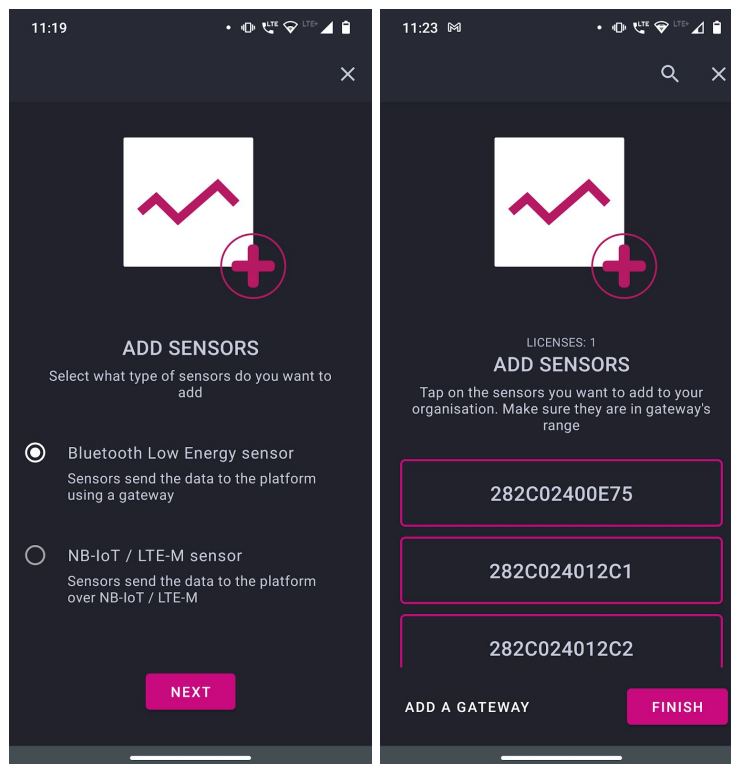
Adding NB-IoT / LTE-M loggers

From the main application menu, select *Organization settings* and then *Add sensors -> Sensor NB-IoT / LTE-M*.

Place the NB-IoT / LTE-M 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. 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" / "Automatically download" 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.

ADD SENSORS

Select what type of sensors do you want to add

○ Bluetooth Low Energy sensor

Sensors send the data to the platform using a gateway

◉ NB-IoT / LTE-M sensor

Sensors send the data to the platform over NB-IoT / LTE-M

NEXT

CONFIGURE NB-IOT / LTE-M SENSOR

Make sure that you are near the sensor. Tap the device's serial number once it appears below

282C02403053

282C024FFF66

282C024FFF72

CONFIGURE NB-IOT / LTE-M SENSOR

(282C024FFF71)

Set APN and PLMN. You can obtain these values from your mobile operator. If you are not sure about these values, try to use "automatic" in both fields

APN

☑ Automatic

PLMN code

☑ Obtain automatically

SAVE

CONFIGURING SENSOR

✓ Saving configuration

↻ Registering to the network

Checking communication with Efento Cloud

Assigning sensor

Demo Organi...

Efento
282C024FFFE1
🌡 25.0 ℃
💧 39%
1 minute ago

26.9 ℃

Sensor assigned

Configuration finished successfully and sensor has been assigned to your organisation.

OK

2 minutes ago

Pulse Counter Ele...
282C024FFFD7
⚡ 0.0 W
⚡ 102.9 W
⚡ 0.0 W
5 minutes ago

Sensors   Alerts

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 organization 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 your organization's name 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 organization tree

Delete location - Deleting a location also deletes its child locations. All loggers from the deleted location will be moved to the New loggers section. The loggers measurements will not be deleted, but all rules and automatic reports assigned to the deleted location will be deleted.
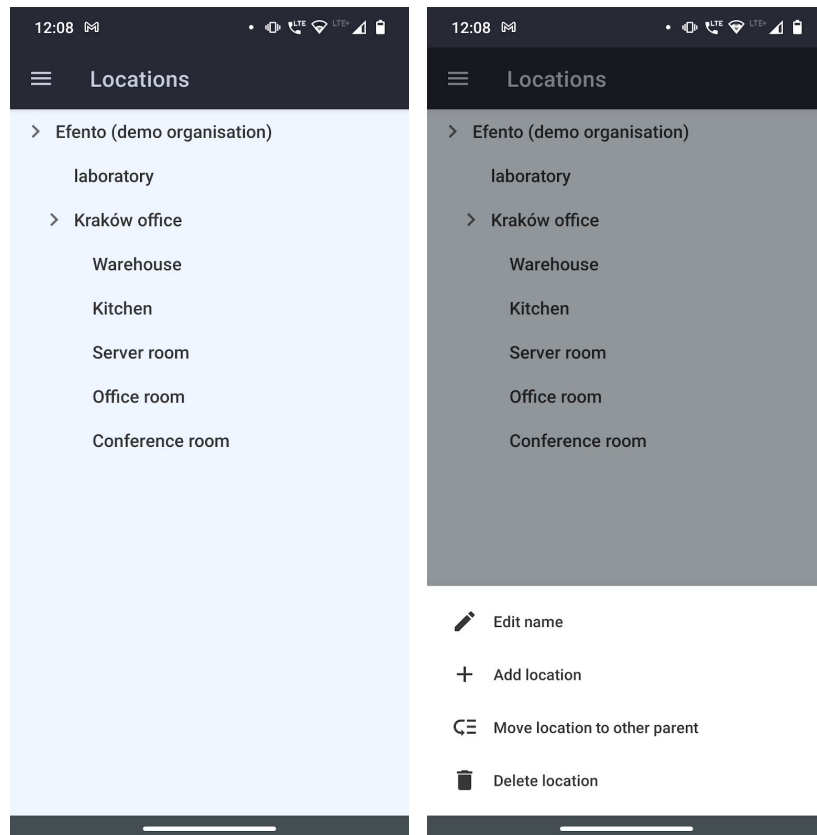
Dashboard - preview of sensors added to Efento Cloud platform

Dashboard

- The desktop presents all available sensors in a given organization and information about them. Each logger visible on the list has its name and serial number. On the right side of the screen you can see the measurements made 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 gray label with the word LOST means that the platform does not receive data from the logger
- Alarm - red with the word ALARM means that the alarm threshold set for this logger has been exceeded
- Battery - means that the logger battery is getting low and should be replaced
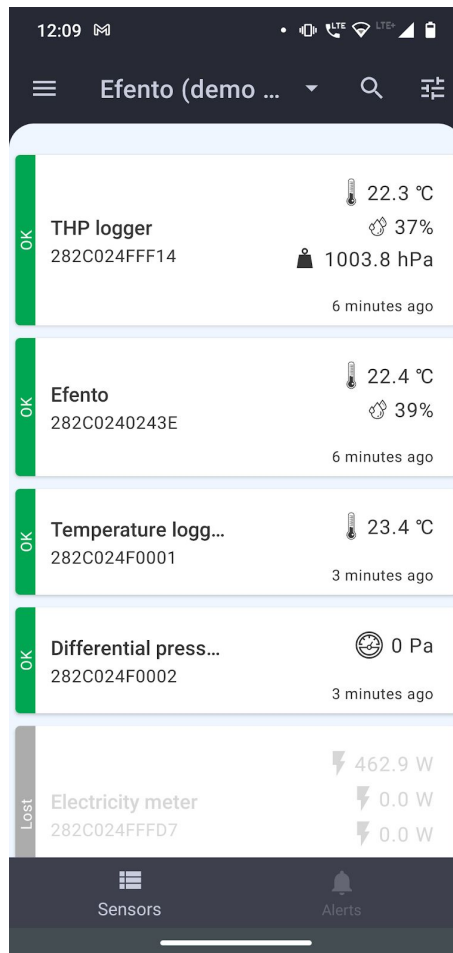
Access to the dashboard is available to every user added to the organization, regardless of their permission level (Analyst / Manager / Administrator).

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

Filters, search, locations

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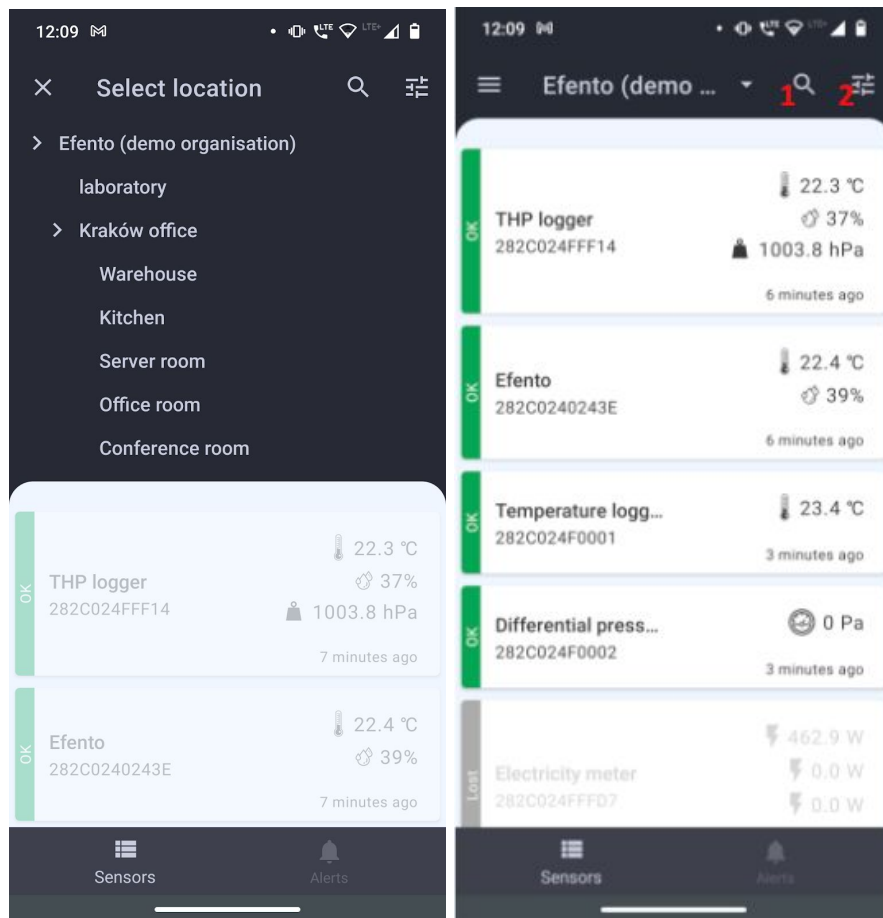
The second method of filtration is searching the sensor by name or by its serial number. Tap on the magnifying glass icon (1) and key in a serial number or name of a sensor that you wish to find and the list will only show the sensors you are interested in.

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 value(s) only the sensors that meet the filter criteria will be shown.
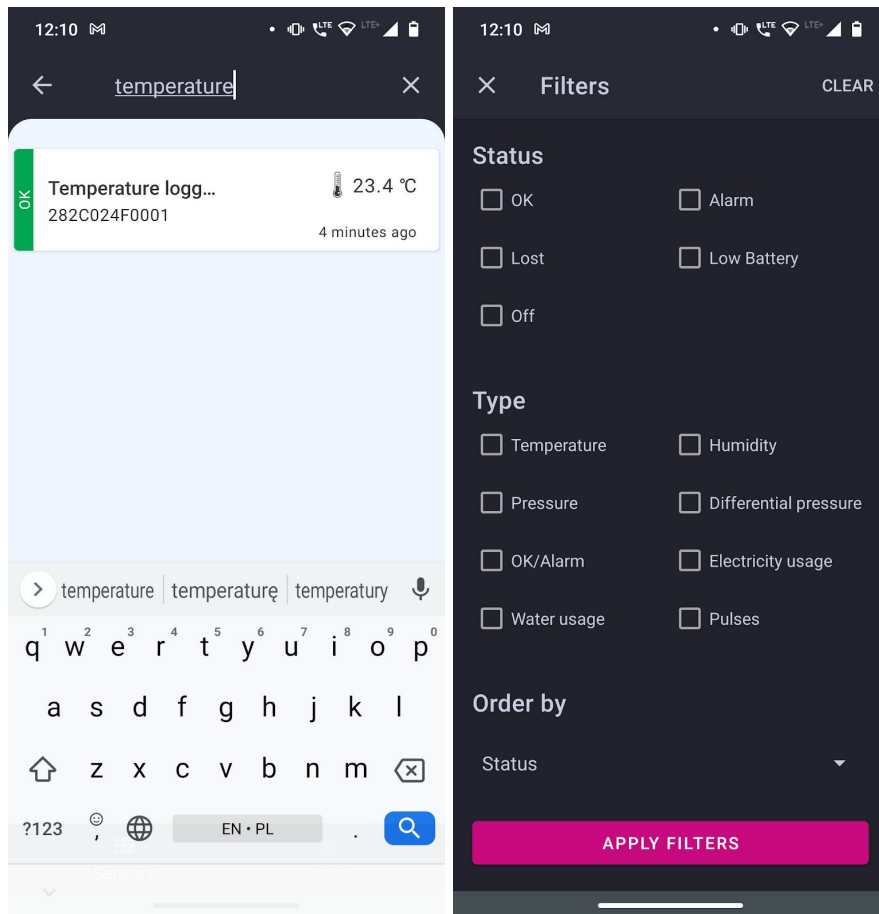
Preview of detailed sensor's data

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 a 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.
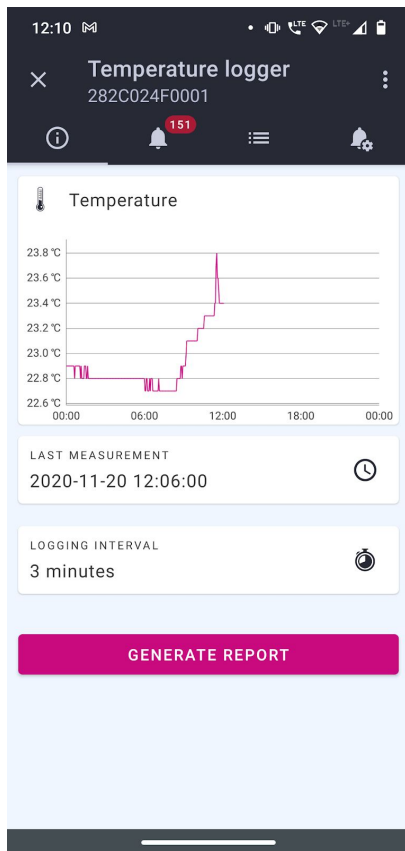
The *Preview* tab shows the current data of the sensor. The graph shows the measurements of a given value from the current day (click the graph to open the full-screen mode and change the range of presented data). You can also find information on the time of the last measurement and the measurement period. The *Generate report* button enables generating reports with measurements from any period. Detailed instructions on generating reports are described in the *Reports* chapter.
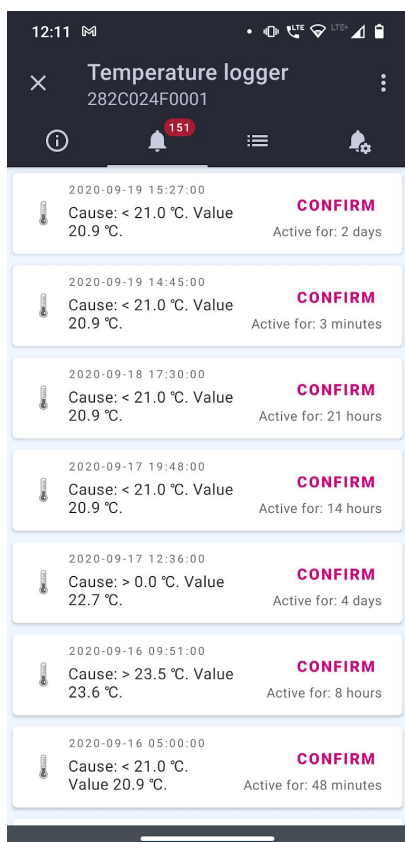
The *Alarms* tab contains a list of alarms related to the selected sensor (details in the *Alarms* chapter). Here you can find information about the date and time of the alarm and the reason for the alarm, including the name of the alarm rule. Click on the selected alarm to view its details. If the measurement 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.
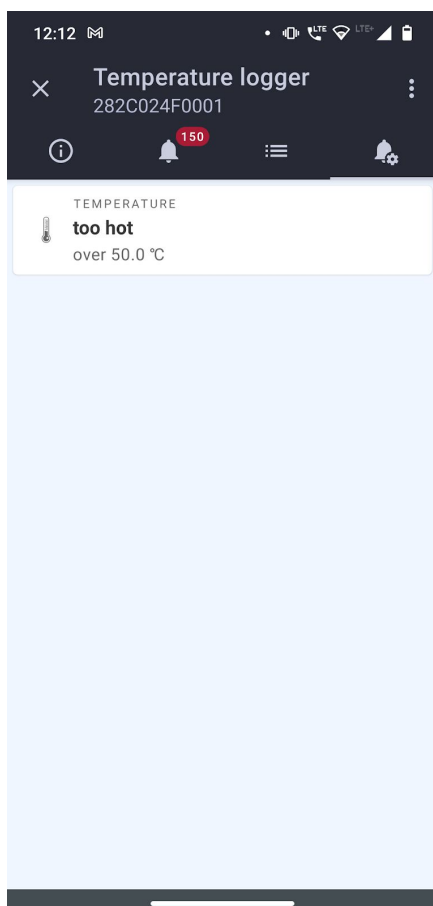
The *Alarm rules* tab shows the alarm rules assigned to a given logger. Click on the selected rule to view the details. A detailed description of the alarm rules can be found in the chapter *Alarm rules*.

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.
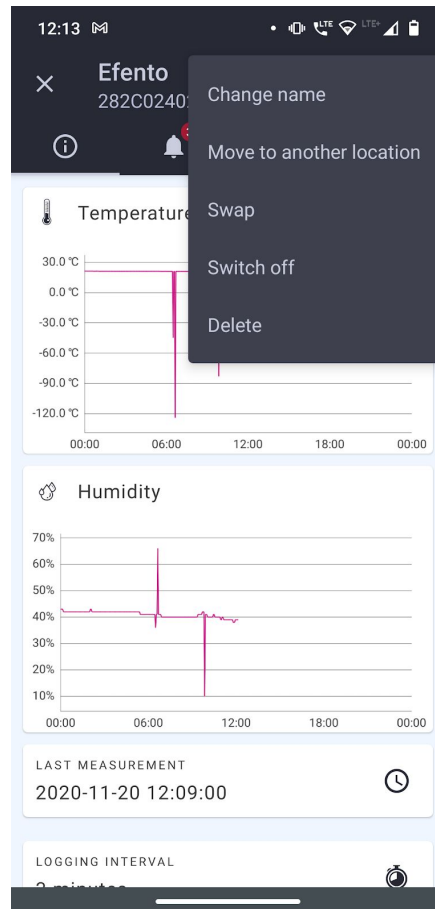
Swapping sensors

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 choose *Swap*. From the list that appears, select the sensor that will be used to replace it. Accept the changes by tapping OK. 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 sensors swapping is saved in the system logs.

Replacement of the sensors does not require the purchase of an additional license.
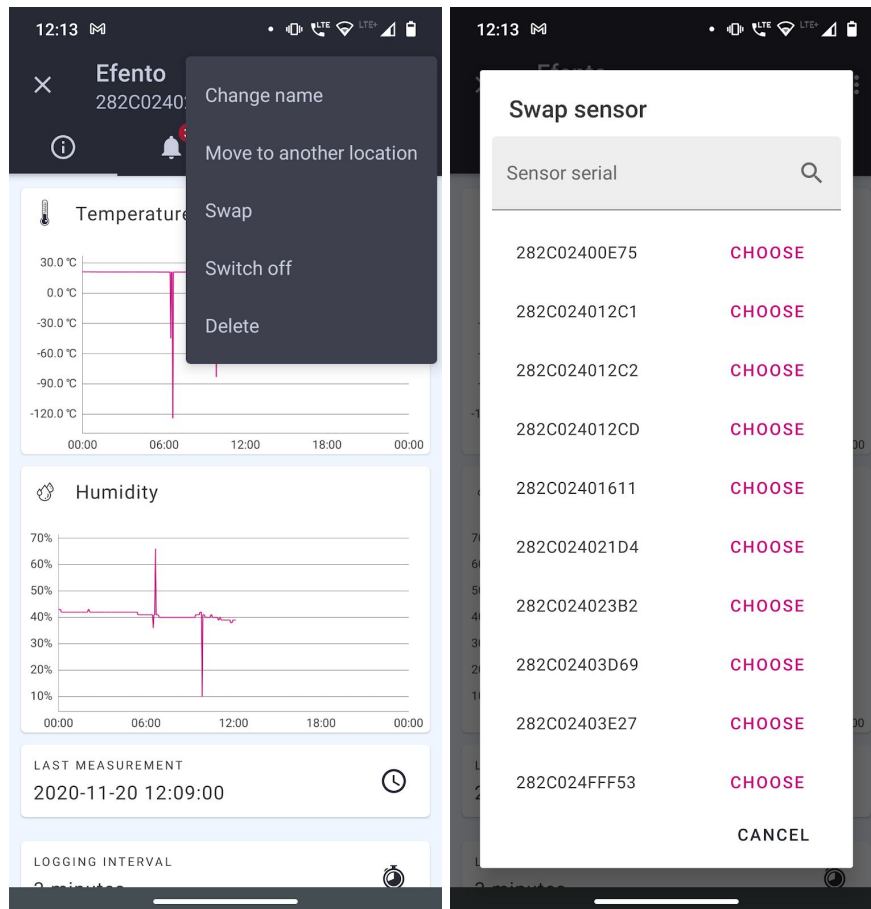
Switch sensor on/off

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. 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.

Removing the sensor

Removing the sensor causes the complete removal from Efento Cloud platform. All measurements sent by this sensor will also be deleted. To remove the sensor, tap the three dots in the upper right corner of the sensor details screen and choose delete and confirm the action by tapping OK. The sensor will be removed.

It is impossible to restore the sensor's measurements, but you can add the sensor to the platform again in the same way you add a new sensor.

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.

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 or CSV). Confirm the report settings by clicking DONE.
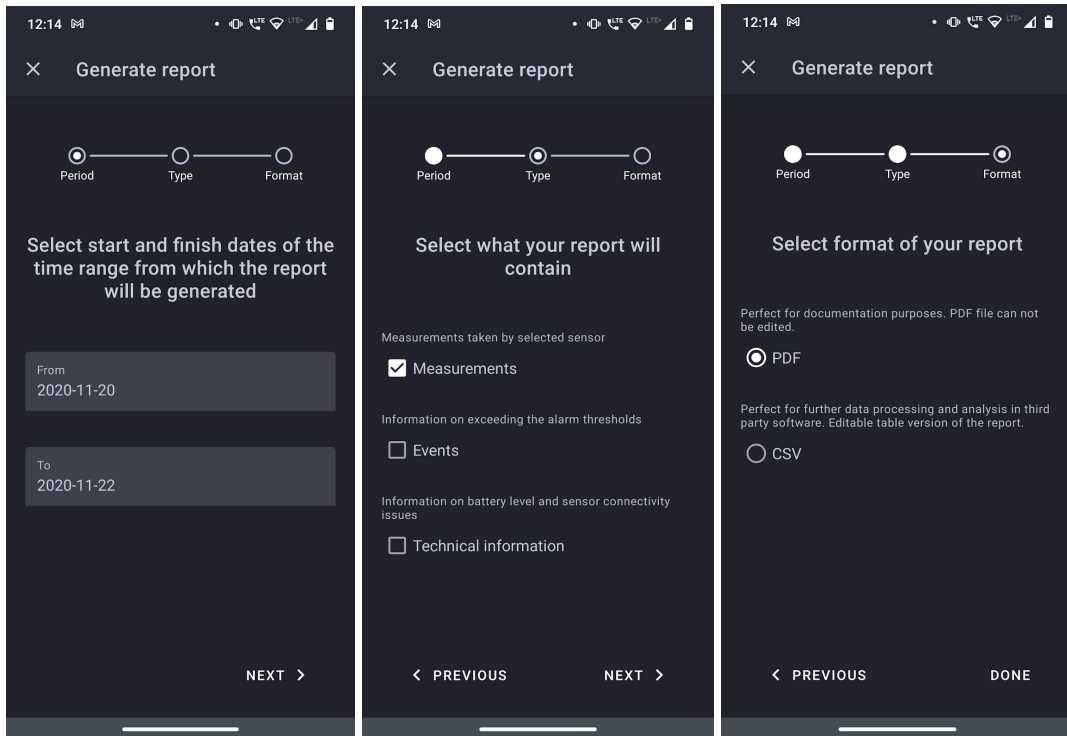
The report will be sent to the email address you have entered while creating an account in Efento Cloud. The report will be delivered within a few minutes.

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*.
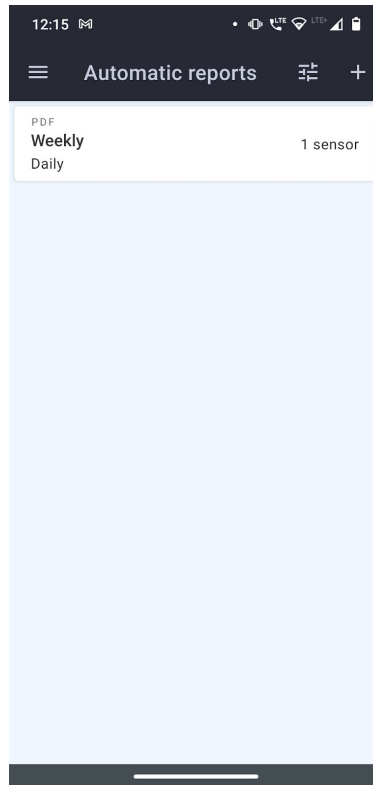
Tap the '+' icon in the upper right corner of the screen and add settings for the automatic report. Add a name to your report, choose *PDF or CSV* format, report sending frequency: *daily, monthly* or *sent every 1st day of the month* and add what should be included in it: *Measurements, Events* and *Technical information*. 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.
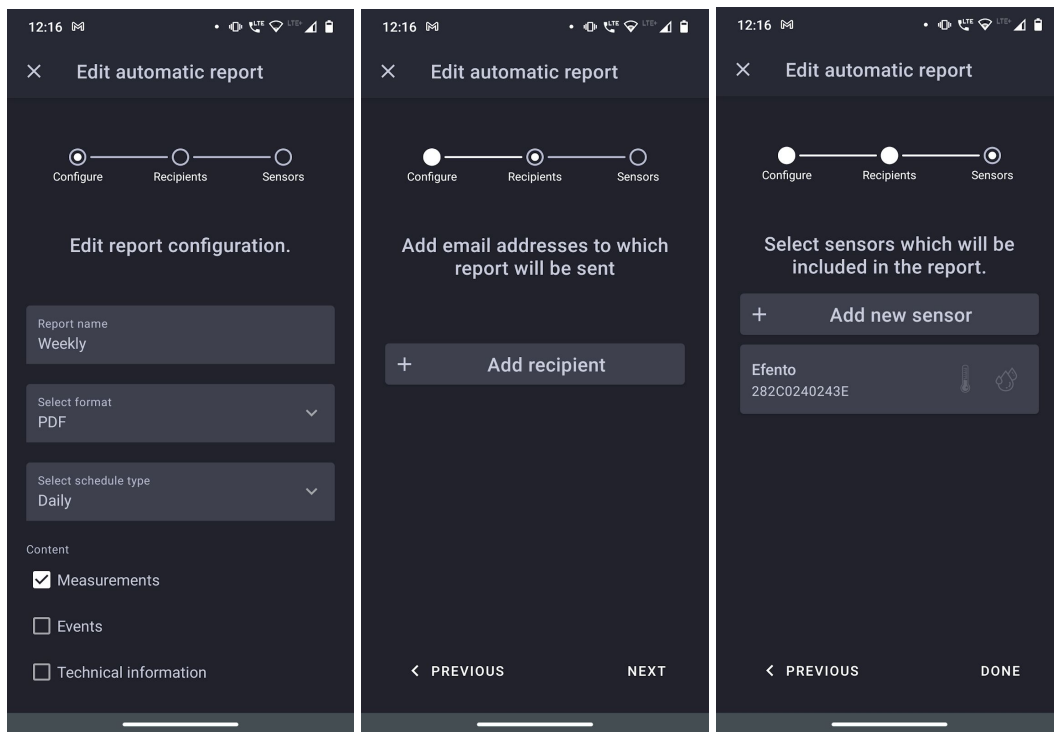
Automatic reports are generated and sent to recipients a few minutes after midnight.
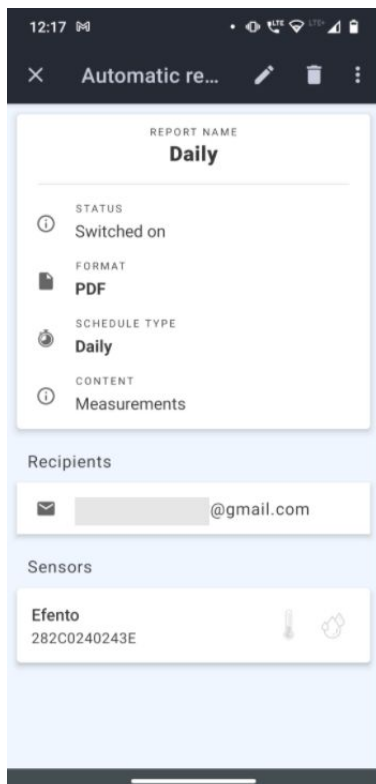
All configured automatic reports including information about report creator, sending frequency, report content and report recipients are visible in the *Automatic reports* tab. To delete an automatic report click the 'trash' icon on the upper right. You can also edit an already existing report by clicking on the pencil icon. In order to disable an automatic report click the three dots icon and switch the report off.

Alarms

Alarm preview

The user can display all alarms by selecting *Alerts* from the navigation menu at the bottom of the screen. Alarms 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 alarms can be sorted depending on the date of their occurrence, alarm type, alarm cause, current sensor measurement, alarm rule name or recipients assigned to the alarm.

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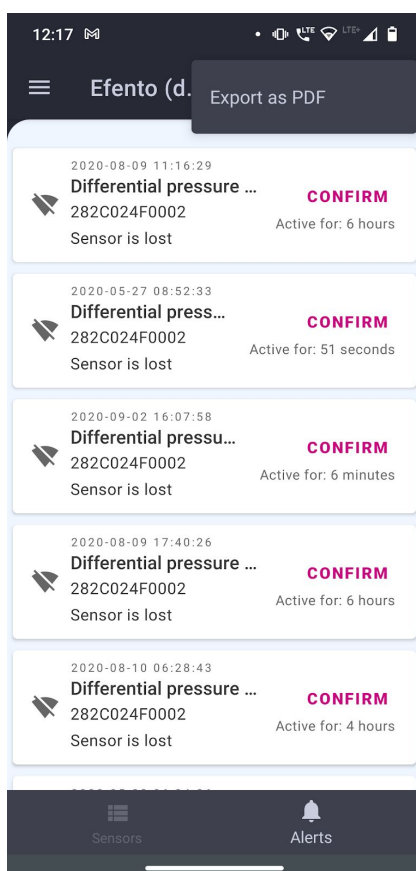
Export list of alarms

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

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#	Created	Sensor	Value	Type	Measurement	Rule name	Recipients	Status	Confirmed by	Comment
										Alarms listing for DemoOrg
1	2020-04-07 18:22:29	THP logger	Lost	---		lost		Unconfirmed		
2	2020-03-28 20:34:10	THP logger	Lost	---		lost		Unconfirmed		
3	2020-03-28 20:34:10	NB-IoT TH logger	Lost	---		lost		Unconfirmed		
4	2020-03-28 20:34:10	Differential pressure logger	Lost	---		lost		Unconfirmed		
5	2020-03-25 08:06:00	THP logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
6	2020-03-24 11:42:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Confirmed		Test
7	2020-03-24 11:12:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
8	2020-03-23 17:18:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
9	2020-03-23 17:09:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
10	2020-03-23 16:57:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
11	2020-03-23 16:42:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
12	2020-03-23 15:57:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
13	2020-03-23 03:45:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
14	2020-03-23 00:24:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
15	2020-03-22 21:51:00	NB-IoT TH logger	Temperature	Lower	19.9°C	Too cold		Unconfirmed		
16	2020-03-15 17:22:20	Efento NB-IoT TH	Lost	---		lost		Unconfirmed		
17	2020-03-15 17:22:20	Efento differential pressure	Lost	---		lost		Unconfirmed		
18	2020-03-15 17:19:08	Efento THP	Lost	---		lost		Unconfirmed		
19	2020-03-15 16:55:19	Efento NB-IoT TH	Lost	---		lost		Unconfirmed		
20	2020-03-15 16:55:19	Efento differential pressure	Lost	---		lost		Unconfirmed		
21	2020-03-15 16:52:09	Efento THP	Lost	---		lost		Unconfirmed		
22	2020-03-15 01:52:24	Efento NB-IoT TH	Lost	---		lost		Unconfirmed		
23	2020-03-15 01:52:24	Efento differential pressure	Lost	---		lost		Unconfirmed		

An example list of alarms in PDF format

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) etc.. You can define any number of alarm rules and assign sensors to each of them.

Alarm rules can be configured in *Alarm rules* menu by users with permissions of Administrator or Manager.

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.

Configuration of the alarm rules

In order to add a new alarm rule go to the Main menu -> *Alarm rules* menu and tap *'+'* button in the upper right corner. The first field you need to fill in is the rule's name and choose the location. Next add phone numbers or emails which will be notified about the alarm. After keying in the email address/telephone number apply the changes with the *Ok* button. You can type in any number of recipients. The e-mail notifications are free of charge, but if you would like to receive text message notifications, then it is necessary to have the Efento platform text message balance topped up (the description of topping up the balance is in chapter *10 Text message notification)*.
Next configure a threshold, choose what type of event should initiate the alarm. If you have chosen a "continuous" sensor (temperature, humidity, pressure, etc.), you also have to choose whether the alarm should be initiated after exceeding the upper threshold (the value increases above the selected threshold) - option *above* or after exceeding the lower threshold (the value decreases below the selected threshold) - option *below* and key in the threshold value in the selected field.

When creating an alarm rule, the user can enter in the *Delay in minutes* field the time in minutes after the alert will be on. For example: If the temperature exceeds the defined range and will stay out of this range for a number of minutes defined in the field *Delay in minutes* the alarm will be triggered. If the temperature returns to the safe range before time defined in the *Delay in minutes* field has passed, the alarm will not be triggered. If the user wants the alarm to be triggered immediately, the *Delay in minutes* should be left empty

At the end select sensors which will be affected by the alert rule. Tap the *Manage sensors* button and choose which slots should be activated. 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, tap the *Save changes*.

To save the alert rule, click *Done*. All assigned rules will appear in the list of alarm rules. From this moment the rule is active until its removal. The alarm rule can be edited anytime by clicking it on the rules list.

An alarm rule can be deleted at any time from the list of rules. To do this, click the rule you want to delete, select the *trash icon* in the upper right corner and confirm its removal by clicking *delete*.
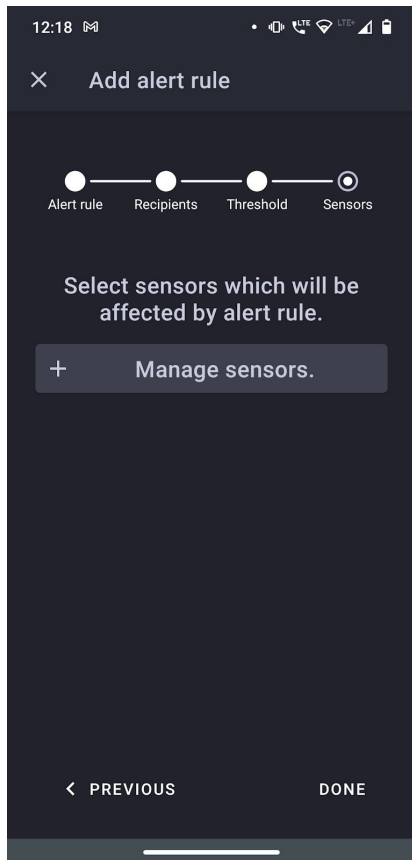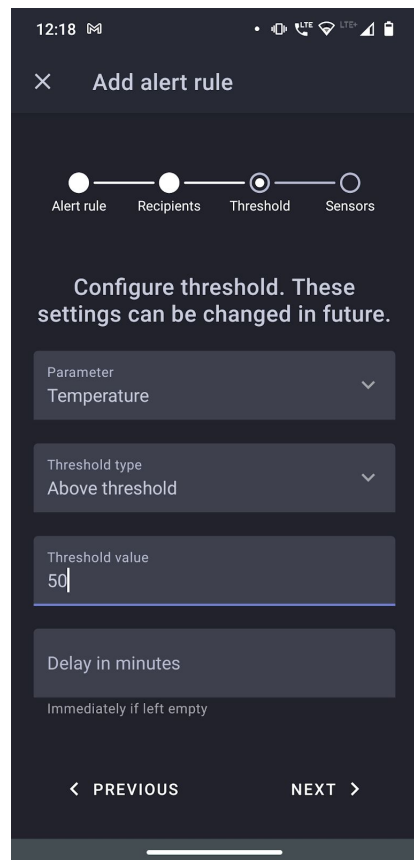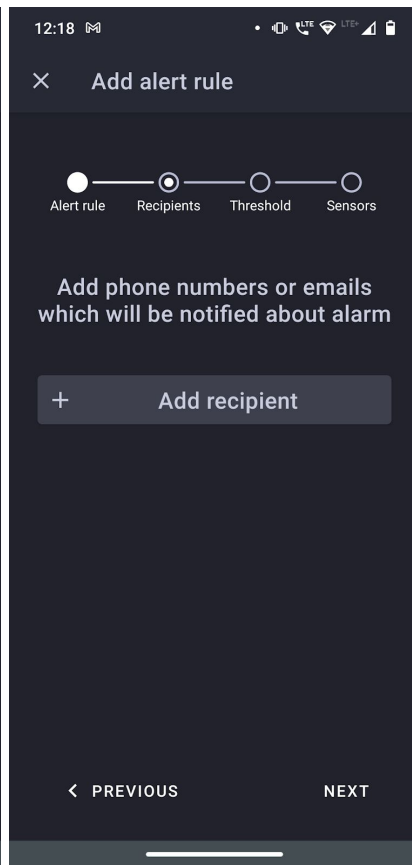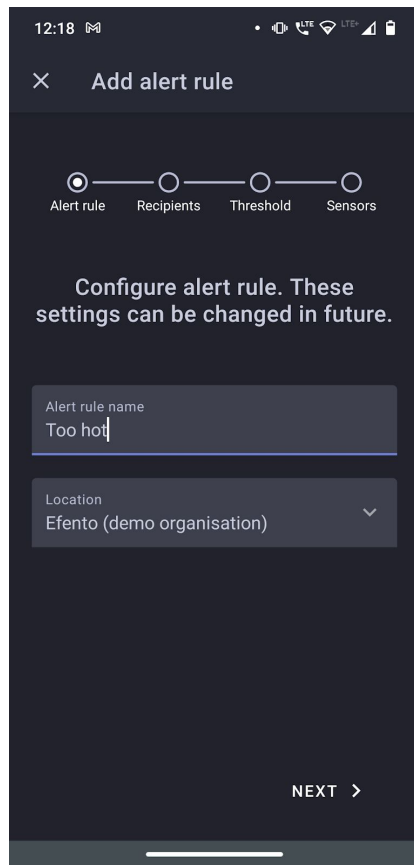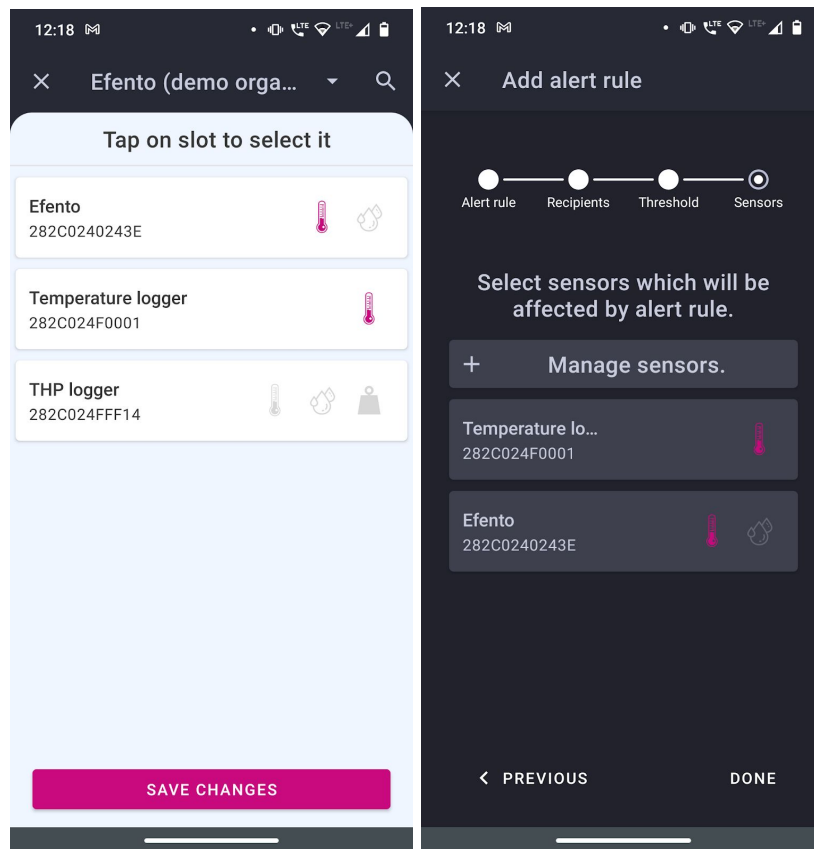
Export list of alarm rules

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.

Alarm rules listing for DemoOrg

#	Rule name	Sensors	Value	Type	Threshold	Mobile recipients	E-mail recipients
1	lost	THP logger, Differential pressure logger, NB-IoT TH logger	Lost	---			
2	Too cold	THP logger, NB-IoT TH logger	Temperature	Lower	20.0 °C		
3	Too hot	NB-IoT TH logger	Temperature	Upper	27.6 °C		

List of alarm rules exported from the Efento Cloud platform

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. For example the user can be an Administrator in one location and an Analyst in the other one, which allows you to divide permissions and duties between different users for different 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 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	✔	✔	✘
Permissions editing, adding and deleting users	✔	✘	✘
System logs preview	✔	✘	✘
Managing the Organisation's account	✔	✘	✘

Adding new users to your Organisation

Adding new users is done by invitations, which can be sent 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 window that allows you to send invitations to your organization. Type in the email address of a person you want to invite to join your organization and choose role(s), which will be given to him after accepting the invitation. Roles can be different for different locations. 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 he will have to create one. If the new user has not accepted your invitation yet, you can dismiss it by tapping the *Cancel* icon next to the invitation.

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 want to invite.
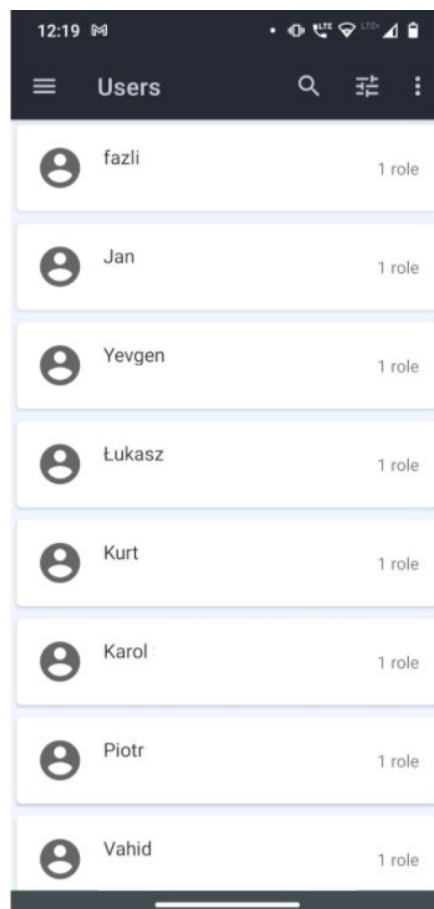
Editing user's permissions and deleting users

Editing users can be done in *Users* menu by users with the role of an Administrator. To edit the user's roles select the user, whose roles you want to edit, click the '+' in the upper right corner and add a new role for the user. Tap and hold already existing roles of the user to edit it.

You can also delete users added to your Organisation. Select the user which you want to remove and tap the trash icon in the upper right corner of the screen, Confirm the sanction by tapping the Delete button. The user's account will not be deleted entirely, he 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)*
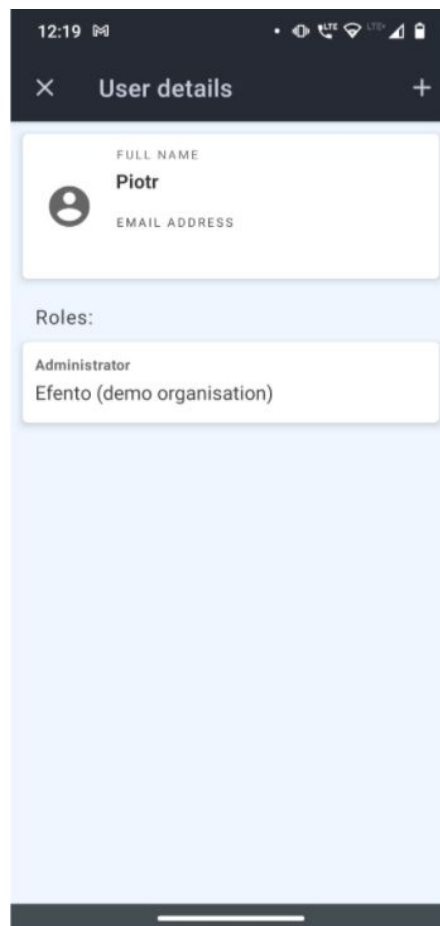
Export list of users

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

Users listing for DemoOrg

#	User	Username	E-mail	Roles
1	alfakom	alfakomdemo	@positrex.gr	Menager Demo Organisation
2	Anna	ania	@efento.pl	Admin Demo Organisation
3	Dorian	dozjon_k	@efento.pl	Admin Demo Organisation
4	Piotr	piotr	@efento.pl	Admin Demo Organisation
5	Aleksandra		@efento.pl	Admin Demo Organisation

User profile
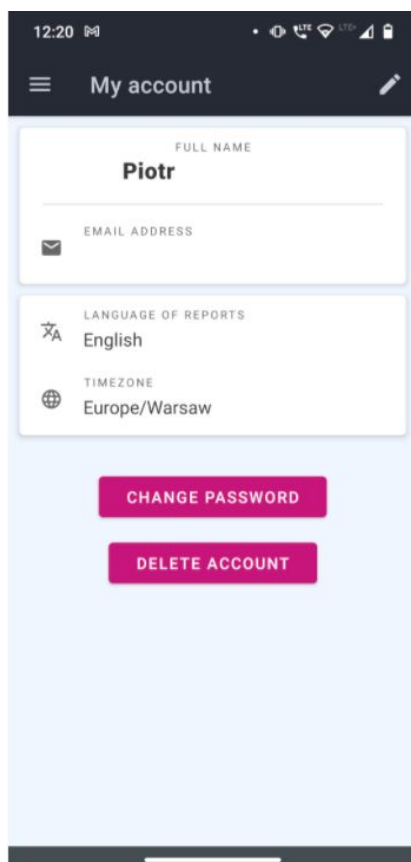
Changing username, language and password / deleting the account

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

Text message notification

Topping up the text message balance

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

Low text message balance notification

When the number of available SMS drops below 15, an email notification will be automatically sent to all administrators of the organization. Notifications are turned on automatically and cannot be turned off.
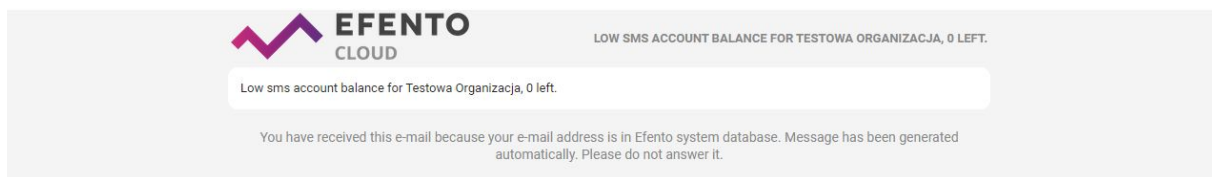
Audit trail

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.

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/ LTE-M loggers, gateways). In the nearby mode 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).

Supported sensors

Application supports all types of Efento sensors, including:
- temperatures (including sensors with an external probe and low temperature sensors),
- temperature and humidity,
- temperature, humidity and atmospheric pressure,
- differential pressure,
- pulse counters (including electricity and water usage counters)
- opening / closing,
- flooding

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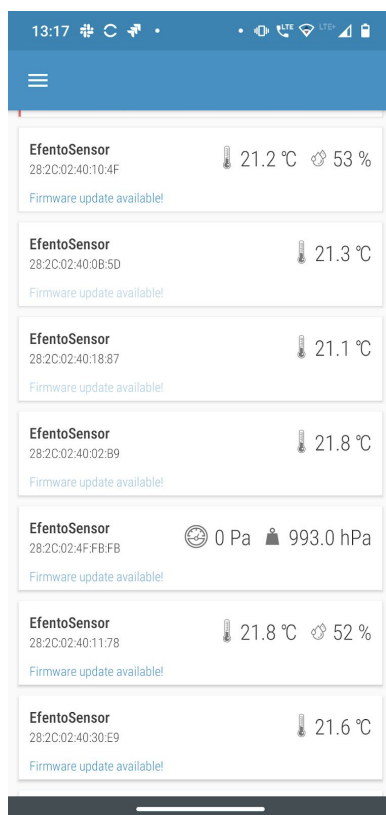
The application automatically detects all sensors within range of your phone / tablet. The list shows the names of the sensors, their serial numbers and their current measurement values.

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).

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 problem** - 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). 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 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 sensor's name** - 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 can find it on a sticker on the sensor's enclosure). If you have entered the correct PIN, 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 sensor's memory and / or change the measurement period** - 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, 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.
● **Pulse counter conversion ratio** (water and electricity pulse counters only) - user can define how many Wh / liters 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 the case of NB-IoT sensors, full device configuration is accessible from this menu. The configuration has been described in the [Efento NB-IoT sensors user manual](#)

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 authorized 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 Efento Logger, tap on the three dots in the upper right corner -> "Settings" -> "Device settings" -> "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 -> "Settings" -> "Device settings" -> "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 Logger 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 -> "Settings")
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 -> "Settings")
2. Select "Default keys"
3. Tap and hold the encryption key you want to remove
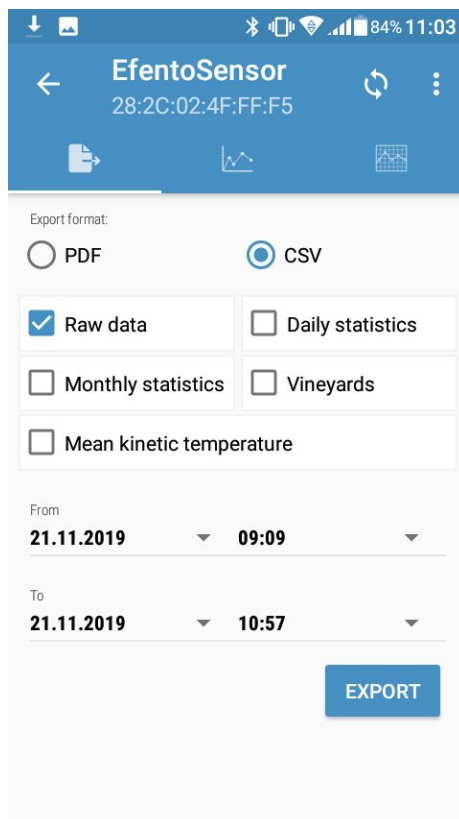
Reading data from the sensor memory

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.

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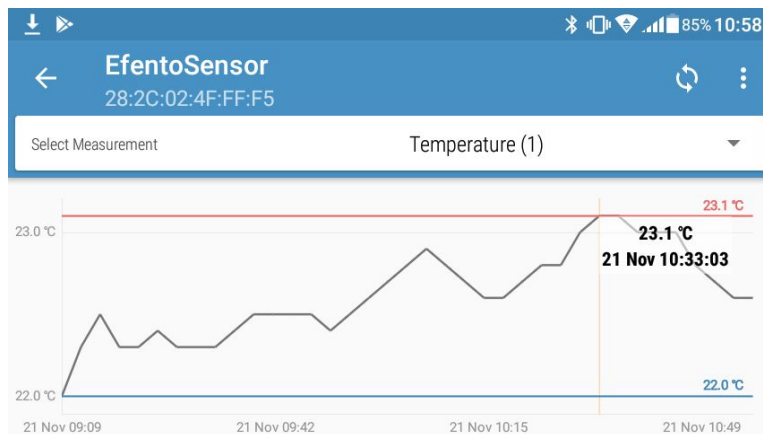
Click on the chart in the general view to zoom it in. Use your fingers to zoom in / out the chart and scroll it. Red and blue lines on the chart indicate the minimum and maximum values in the measurement series. If the sensor measures more than one physical value, select the one you want to display on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

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.

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.
- **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
- **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.

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