



EFENTO NB-IoT / LTE-M SENSORS

Quick start

V 2.0

12.02.2020

Setup

Follow this few simple steps to quickly get started with Efento NB-IoT / LTE-M sensors and Efento Cloud platform.

Step 1 - set up an account

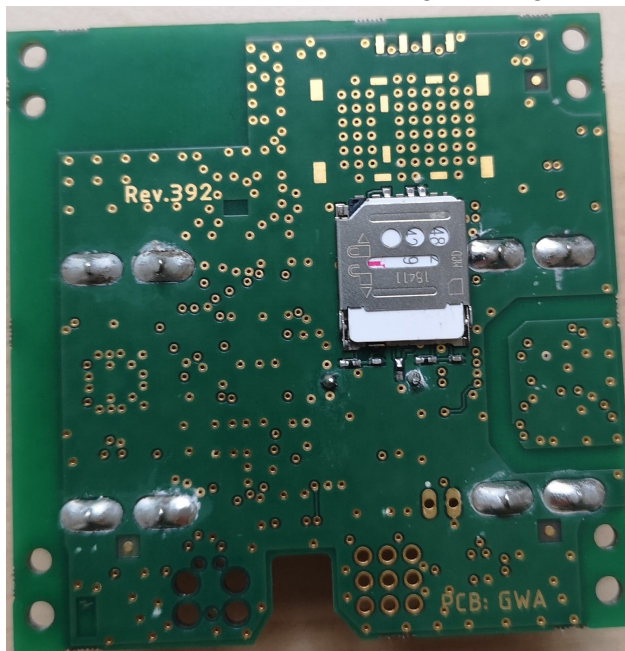
Set up a new account on cloud.efento.io platform by clicking on the “Register” button. If you already have an account skip this step.

Step 2 - attach sensor to the network

Insert the proper SIM card, as well as batteries into the sensor. Red and green LEDs should blink five times, after that green LED should quickly blink for 3 seconds - this means that the sensor is working and from now on will make measurements. During the normal sensor's operation, green LED blinks every 15 seconds, which means that the sensor is connected to the NB-IoT network. If the sensor cannot log in to the NB-IoT network, red LED will blink instead. Sometimes logging into the network could be a matter of a few minutes. Please note that some networks require manual APN settings. In that case please set an APN address as described in Step 4. Without APN settings the sensor will not be able to connect to the network. If the sensor doesn't connect after that amount of time, please refer to the troubleshooting section of this document.

If the sensor is performing measurement, green LED will blink five times, by default the logging interval is set to 3 minutes. When the sensor is sending the data to a platform, green LED will blink fast dozens of times. By default transmission interval is set to 3 hours.

Both logging interval and transmission interval can be changed using Efento Logger mobile application.



Step 3 - configure the sensor

Sensor configuration can be done over Bluetooth Low Energy and Efento Logger mobile application. Efento Logger is a free app for Android that can be downloaded from Google [Play](#). With this app, you will be able to see the sensor's measurements locally and configure the sensor to meet your needs.

After downloading and launching the app, you will see all the sensors that are in your mobile device's range. Tap on the sensor you're interested in, the app will connect to it and show the sensor's information and current configuration. To open up the settings menu, tap on the „three dots” icon in the upper right corner. First thing you want to do, is to set the APN you have received from your operator with a SIM card.



Using Efento Logger mobile application you can change the following settings:

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- **Change period and reset** – change logging interval and erase all the data from the sensor's memory
 - **Change name** – change the name of the sensor
 - **Turn encryption on** – switches on communication encryption. All the data is encrypted with a user-generated key. Mobile devices have to decrypt the data from the sensor in order to display it.
 - **Trigger transmission** – sends data to Efento Cloud immediately
 - **NB-IoT status** – shows the current status of NB-IoT module and NB-IoT network
 - **Installation mode** – forces the device to attach to network every few seconds and updates information about network connectivity. After exit, device erases data.
 - **Set APN** – choose between automatic or manual APN configuration. APN address depends on the mobile network you use. Please contact your operator to get the proper APN address.
 - **Change PLMN code** – choose between automatic or manual PLMN configuration. PLMN address depends on the mobile network you use. Please contact your operator to get the proper PLMN address.
 - **Set server configuration** – Efento sensors can send the data to any server. If you want to change the server address to which the data should be sent, you can do it here. By default, they send the data to Efento Cloud.
 - **Transfer limit** – every transmission we add 1 to counter, and every 25 minutes we subtract 1 from the counter, if the counter will reach "Transfer limit" value the next transmission will be aborted
 - **Change sending interval** – you can configure how often the sensor sends the data to the platform. Transmission interval can be larger than logging interval - in that case, data will be sent in packets (e.g. 5 measurements in one data packet)
 - **Set thresholds** – Efento sensors send the data to the Cloud platform in set transmission interval. You can set the thresholds and if the measured value exceeds it, the transmission will be triggered immediately, no matter what transmission interval is set. You can set one upper and one lower threshold. This can also be remotely configured via Efento Cloud.
 - **BLE turnoff time** – you can choose the time after which sensor will be no longer visible in Efento Logger, this allows the device to save more battery. To enable bluetooth you need to take out the batteries and restart the sensor
 - **Change device time** – you can set the time of a sensor manually in case if your operator doesn't provide time with network

Step 4 - manage your Efento Cloud account

Efento Cloud is a platform that receives and stores all the data collected by sensors. On Efento Cloud you can preview all the measurements, export them in PDF or CSV and set up notifications.

- **Displaying the data** – measurements from sensors can be visualized in form of a chart or table, just click on one of the devices in "Dashboard". The chart range can be modified by dragging the cursor vertically and horizontally.

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- **Generating reports** – To generate a report you can either click on one of the sensors, then “Reports”, select the time interval and entry, then choose to export it as a PDF or CSV, or go to section “Reports” section and do the same thing. In this section, you can also configure automatic reports, which will be sent to specified email addresses at the scheduled time (e.g. every month, every day).
 - **Rules / notifications** – Efento Cloud can send SMS / email notification if measured values are out of the safe range. Rules can be created in “Rules” section. To create a rule, you need to choose one of the physical values, add recipients by typing their emails or phone numbers, and select for which sensors this rule will be active. There is also a possibility to delay the alarm
 - **Alarms** – if any of the rules are violated, the alarm will be triggered and saved in the platform. All the historical alarms are visible in “Alarms” section.
 - **User management** – In “Users” section you can invite users to your organization, remove them or change their roles and permissions.

This is only a short list of key functions of Efento Cloud platform. For more information about the platform and full configuration manual feel free to refer to Efento Cloud [User Manual](#).

Troubleshooting

Sensor doesn't switch on

If red and green diodes keep blinking, it means that the sensor is in reset loop due to the low voltage of the batteries. To solve this problem replace the batteries with new ones (3.6 V, ER14505M).

Sensor doesn't send the data

If the sensor is taking measurements, and they are visible in Efento Logger, but it doesn't send the data to Efento Cloud please check:

- SIM card – make sure that SIM card is active and dedicated for NB-IoT devices
- Range – make sure that there is NB-IoT coverage in the place where you want to use the sensor
- APN settings – some networks require manual APN set up. Please contact your operator and obtain APN configuration. Set APN with Efento Logger as described in Step 4.
- If the device is able to fetch time from the network - Efento sensors need to fetch the time from the NB-IoT network in order to synchronize internal time with the network time. If this feature is not available, you can set the time manually using “Change device time” option.
- Temperature in which sensor operates – If the temperature is below the range declared in the datasheet, sensor will not be able to send the data over NB-IoT. This is due to the voltage required by NB-IoT module. If you need to measure low temperatures, please use the sensor with an external temperature probe

Cellular status

Current device's cellular status can be checked in the "Cellular status" tab (connect to the sensor -> three dots in the upper right corner -> "Cellular status"). To speed up the troubleshooting, please provide Efento's team with this information. In the tab, you can see the following information:

- Supported technologies - what cellular technologies are supported by the device. There are two options: NB-IoT or NB-IoT & LTE-M
- Current technology - what technology is currently in use. For NB-IoT only sensors it will always be NB-IoT, For NB-IoT & LTE-M sensor, current technology depends on the technology which is currently in use. Devices automatically switch between technologies, depending on the inserted SIM card
- Registration status - indicates current network communication status:
 - REGISTERED - registered to the network - this is typical status of the device;
 - NOT REGISTERED, SEARCHING - not registered to the network, searching for it - this status may be seen during device power up, when it did not manage to attach to the network yet;
 - NOR REGISTERED_NOT_SEARCHING - not registered to the network, not searching for it - this status is seen mainly, if there is no network coverage;
 - REGISTRATION DENIED - network did not allow device to register
 - REGISTERED ROAMING - if the device is registered in roaming
 - REGISTERED EMERGENCY ONLY
 - UNKNOWN - all the other states
- Registration reject cause - if the device is not able to register to the network, the cause is displayed in this field. Reject causes are described in 3GPP TS 24.301 Annex A
- Signal strength - strength of the signal
- Communication status - describing current status of communication with the server. Possible statuses: OK, server error, encoding error, socket error, timeout, mismatch, unauthorized, unexpected error, not registered, not supported
- IMEI - IMEI number of the cellular module
- ICCID
- IP address - current IP address of the device
- ECL - ECL level. This parameter is a good indicator of the signal quality. The lower, the better. ECL 1 or 2 may significantly reduce the battery life
- Cell ID - ID of the cell in to which the device is connected
- Last communication timestamp - timestamp of the last successful communication. All the information on this card is refreshed during the communication / self check.
- Last status check timestamp - timestamp of the last self check. Self checks are performed on the startup or may be performed on server's demand. All the information on this card is refreshed during the communication / self check.

