NB-IoT

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Wireless soil moisture logger in an IP67 cover

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Soil moisture sensors are used to monitor the amount of water stored in the soil, which acts as a reservoir retaining water available to plants. The soil moisture logger consists of 2 components: a wireless sensor and an external probes (temperature and soil moisture) which are placed in the soil.

Efento NB-IoT sensors transmit the data over cellular network (Narrowband IoT) and do not require any additional devices (router, gateway, etc.). Sensors are also equipped with Bluetooth Low Energy interface, which allows quick and easy configuration with a smartphone. Efento NB-IoT sensors can be integrated with any cloud platform.

Key features

- ➔ **Works with Efento Cloud**
  Together with Efento Cloud, the sensors enable constant monitoring, alerting about exceeding safe limits, generating reports and analyzes.

- ➔ **Long battery life**
  Loggers have been designed to work for up to 5 years on battery. You can forget about changing the battery frequently or troublesome battery charging.

- ➔ **Lower costs**
  Choosing wireless sensors and a cloud platform reduces the installation and maintenance costs.

- ➔ **Wide range of sensors**
  Efento sensors can measure various physical and chemical values. If you decide on one sensor today, you can expand your sensors fleet to another types anytime you want.

- ➔ **Integration**
  Efento NB-IoT sensors can be integrated with any cloud platform.

- ➔ **Easy set up**
  All you need to set up a logger is a smartphone with a free mobile application. The whole configuration takes no more than 15 minutes.

Technical data

Moisture sensor
- Measurement range: 0 – 200 cb (kPa)
- Measurement period: configurable from 1 minute to 10 days
- Memory: ~40,000 measurements

NB-IoT
- NB-IoT band: 8, 20
- 3GPP: Release 13
- Power: 20 dBm

Communication
- Protocol: CoAP;
- Transmission interval: 5 minutes – 10 days, configurable

Software updates
- Over the air (with delta mechanism); Over Bluetooth Low Energy

Mechanical
- The sensor is equipped with a waterproof probes with a length of 3m
- Dimensions: 130 x 80 x 35 mm + 21 mm cable gland
- Weight: 360 g (including batteries)
- Enclosure: plastic PC, colour gray
- Enclosure IP rating: IP67

Battery
- Battery: 3,6 V, size AA, capacity 6 600 mAh (replaceable)
- Battery operating time: at least 10 years

Environmental
- Operating
  - Temperature: -125° to 125°C
  - Humidity: 0 to 99% non-condensing
- Storage and transportation
  - Temperature: -40° to 80°C

Additional information

How does the soil moisture sensor work?
The external probe which is placed in the soil, is a resistance device that reacts to changes in soil moisture. Inside the probe there is an electrode placed in the granulate, which swells when water is taken from the soil. The granulate is enclosed in a hydrophilic material that provides good conductivity. As the soil dries, the water is removed from the sensor and the resistance measurement increases, and vice versa when the soil moisture increases, the resistance decreases. Reading the measurements allows you to accurately know the soil moisture in the area of the plant root system during irrigation periods and between them. At any time, the user can check the measurements on the chart that create soil moisture curves, showing how the moisture level changes.

Edge analytics
Devices analyse the data and send it to cloud platform when needed. This allows to decrease the number of cellular transmissions and increase the battery lifetime.

Software over the air update (SOTA)
The sensors are equipped with over the air software update mechanism, thanks to which, your fleet of sensors will always have the latest version of software. Moreover, SOTA is based on delta mechanism and only the difference between the current and the new version of the software is sent to the device. This saves both the battery and data transfer.

Full remote configuration
All the settings of the NB-IoT sensors can be changed remotely in a secure way. This allows you to easily reconfigure thousands of the deployed devices, no matter how far they are located.

Integration
We believe that the Internet of Things is about integrating data sources, analysing the data and drawing conclusions based on it. If you want to integrate Efento loggers with your software, cloud platform or mobile application, we will provide you with the necessary documentation, libraries, SDKs and we will gladly assist you.

Sensor's passport
Sensor's passport documents the entire lifecycle of a device. By accessing the data on Efento Cloud platform, the user can check all information about the sensor: date of sale, warranty status, date of calibration, information on all service activities. In addition, the user can download all documents regarding the device – a duplicate of calibration certificate or service protocols.