

NB-IoT

Wireless soil moisture and temperature sensor

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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 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

- **Long battery life**
Loggers have been designed to work for up to 10 years on batteries. You do not have to remember about changing the batteries frequently or troublesome batteries 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.
- **Any cloud platform**
Standard communication protocols allow integration with any cloud platform or mobile application. Logger works with Efento Cloud out of the box.
- **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.
- **Remote configuration and updates**
All logger settings can be configured remotely from the cloud platform. Moreover, logger's software can be updated remotely.

TECHNICAL DATA

Moisture and temperature sensor

- Soil moisture range: 0 – 200 cb (kPa)
- Measurement interval: 1 minute to 10 days
- Temperature range: -55 to +125°C
- Accuracy: up to 0.5°C in the range from -10°C to +85°C and up to 2°C in the range -55 to -125°C
- Memory size: 40 000 measurements

NB-IoT

- NB-IoT band:
B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B26/B28/B66
- 3GPP: Release 13
- Power: 23 dBm ±2 dB

Bluetooth Low Energy

- Communication: Bluetooth Low Energy
- Radio module frequency: 2,4 GHz
- Power: 2,5 mW (4 dBm)
- Range: up to 100 m (LOS)
- Transmission period: 1 s

Communication

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

Mechanical

- The sensor is equipped with a waterproof probes with a length of 3m
- Enclosure 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

Power supply

- Replaceable 3 x AA, 6300 mAh. Battery operating time: up to 10 years
- USB 5V with 1000 mAh rechargeable battery

Environmental

- Operating
 - ◆ Temperature: -35° to 70°C
 - ◆ Humidity: 0 to 99% non-condensing
- Storage and transportation
 - ◆ Temperature: -40° to 70°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 increases, 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.

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. There are several types of analyses that can be performed by the sensor: from a simple comparison of the measured value to the threshold to more complex mathematical operations.

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.