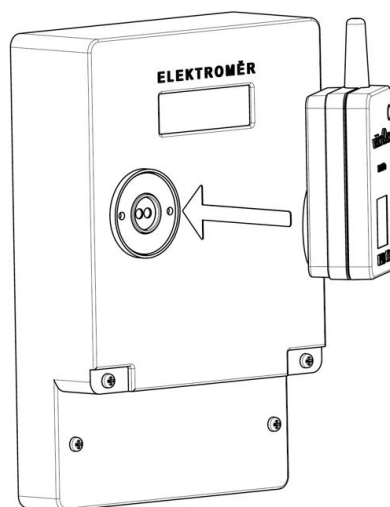


Sensor for measuring electricity consumption “Eliot”



This datasheet describes wireless battery operated optical sensor for measurement of electric power consumption from electricity meters, equipped with infrared optical interface according to the IEC 62056-21 (former IEC 1107) specification. Data measured are transmitted via low-power long-range network (LPWAN) LoRaWAN (Class A – battery powered device) or NB-IoT.

Mechanically the sensor is connected to the electricity meter using magnetic ring, located on its back side – the design strictly follows IEC 62056-21 norm. After connecting, the sensor is immediately ready to operate.

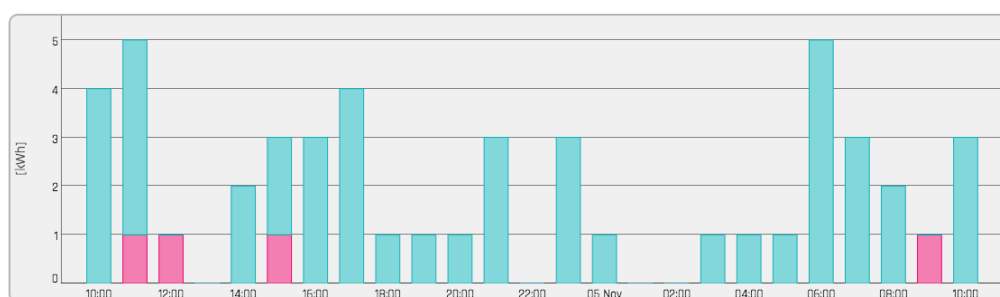


Firmware of the sensor ELoT receives messages from electricity meters via communication protocol IEC 62056 (DLMS/COSEM). For getting information about electric power consumption, OBIS (Object Identification System) identifiers (or as often called registers) are used. Sensor ELoT is compatible with all electricity meters which conforms the DLMS specification and IEC 62056-21 specification.

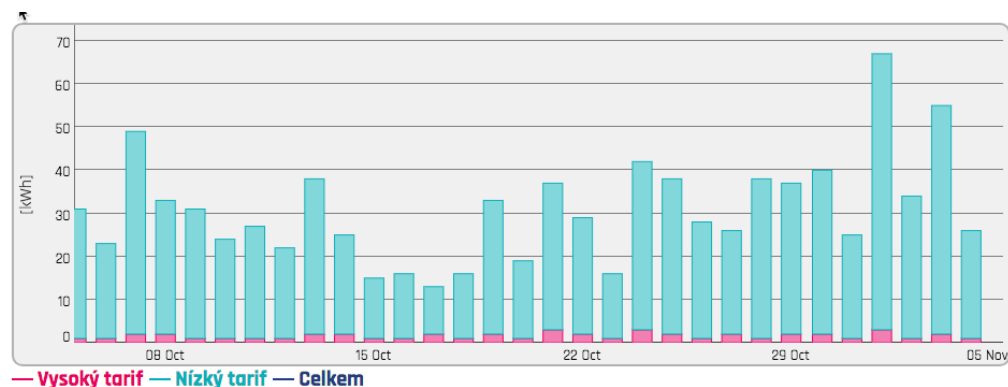
Based on complexity of the specific electricity meter, there is a number of additional information available for transmission. ELoT can be parametrized to gather all those data required and transmit it over LoRaWAN network to application for further processing.

Examples of visualization of electricity consumption:

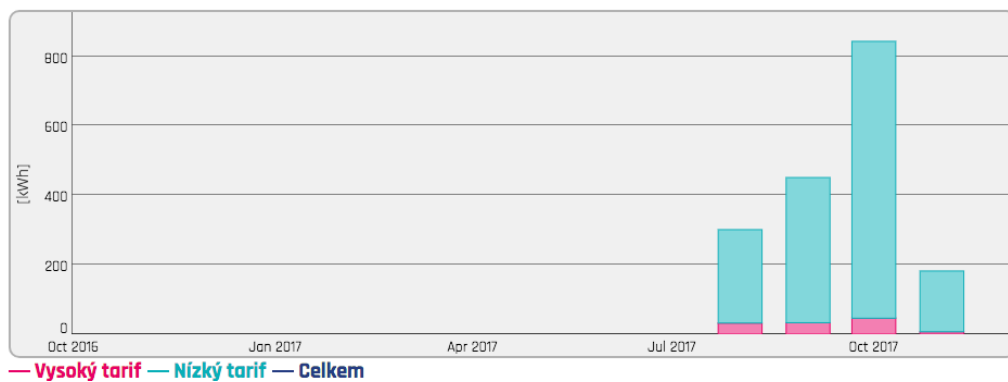
<https://app.visionq.cz/index.php?language=en>



Daily chart (last 24 hours)



Monthly chart (last 30 days)



Yearly chart (last 12 months)

Technical specification

Power supply

- Battery: Lithium, 3.6V/2700mAh, size AA, type CT-Energy ER14305
- Battery life: min 2 years, typically 4 years (when transmitted messages each 60 minutes)
- Consumption: in average 25 μ A (when transmitted message each 60 minutes)

Housing

- Protection: IP20
- Size: 74 x 46 x 27 mm
- Weight: 68 g
- Operational temperatures: od -20°C do +50°C

Signalization

Signalization of Elliot status is solved using a red LED on the front of the sensor.

- After power-on (or reset), LED is blinking 20 seconds with the frequency 1 second and is waiting for communication with a special settings tool
- If it does not happen, network registration procedure is started (LED five times flashes after registration is finished)
- Factory reset (= initial setup) is:
 - Period of communication with electricity meter: 60 minutes
 - Transmitting data each 60 minutes, but only in case of change from the last transmission
 - In case of no change of consumption during last 60 minutes, “keep-alive” message is transmitted
- Error status: fast LED flashing with the period of 200 milliseconds. Should not occur in normal circumstances.

Putting into operation

Sensor is switched on from manufacturing, which means that when connected to the electricity meter, it is immediately ready to operate. In ProLoRa network, there is a badge on the front side of the sensor with QR code. Reading this code via smartphone for example navigates the user to the application for creating an account in the ProLoRa system and automatically adds the particular sensor identified with its unique ID (DevEUI or IMSI) to this account. Third party providers can have different way of sensor activation.

Radio network specification

- Technology: LoRaWAN 1.0 compliance, ISM EU863-870, NB-IoT
- Antenna 2,0 dBi

LPWAN registration and payload

- From manufacturing, the sensor is set for working in ČRa network (Czech countrywide LoRaWAN operator) or Vodafone NB-IoT network.
- Upon request, settings into other networks can be done or just providing necessary keys for customers is also available
- From manufacturing, the standard payload is set (consumption in low tariff, high tariff and sum of them in time of transmission)
- Upon request, other structure of payload can be provided (based on which data particular electricity meter provides)

Details of registration and payload description can be find in relevant documentation: ELIoT – registration and payload, available on the web www.visionq.cz in pdf format.