

# SENSECOM-OMN

## NB-IoT communication device with optical head for meter reading

### Purpose



The **SENSECOM-OMN** acquires **data from the power meter** (or other meters) by means of an optical readout head that is simply attached to the meter by a built-in magnet. It then sends the readings wirelessly over the **NB-IoT** network, normally **at hourly** intervals (depending on the settings).

#### Typical use:

Remote continuous or daily readings of electricity consumption and production from electricity meters at consumption points of the distribution network.

### Description of equipment:

The **SENSECOM-OMN** series of devices is in the form of an optical readout head, defined by **IEC(CSN) 62056-21** standard with a communication protocol type "C". The device is designed to be easily deployable by the end user, i.e. without the need for specific knowledge or competence.

**SENSECOM-OMN-E** models (i.e. in preset energy mode) are designed to send 4 selected basic data related to consumption (two tariffs), energy production (supply) and meter number. These data are identical to the data visible on the meter display and label. Some distribution companies require reporting or approval of the placement of this model of device on the selected meter.



The **SENSECOM-OMN** has rechargeable (LiPOL) batteries with recharging via USB-C (using common mobile phone adapter). The mode with more frequent readings and messages, e.g. hourly intervals, requires recharging at approximately 6-month intervals. With one day of sending all readings during the day, the battery life is several years on a single charge. The device can be configured to power saving modes, e.g. sending all readings in aggregate once a day, or it is possible to use filtering, where only data from registers where differences between current and previous values have been detected are sent (the whole data set is sent at least once every 28 days in this case).

### Data processing and security

Data transmission can be secured by E2E encryption with an individual key for each device. The data is made available in the **SENSEPARAM** information system portal (with content decryption). From this system, the data can be sent via callback to the customer database via a secure SSL connection or downloaded to a csv file. In the case of a large number of devices, decryption can be performed in the customer database. The message transmission is secured against spoofing by the NB-IoT operator's network, or the customer can use their own APN for connection. The device with encryption fulfils comparable technical and security requirements for communication as those imposed on AMM meters (type C1-C3). The mode of sending messages and their period can be remotely configured on the device. The device sends once a day a keep-alive system message with information about the battery voltage status. Once a day, the device can be remotely reconfigured or FW upgraded.

For electricity meters installed in places that are difficult to reach by radio, such as in full-floor switchboards, in the basement, in the shaft, etc., the related **SENSECOM-OMD** model can be used in combination with a repeater (or gateway) for a larger number of devices) of the **SENSECOM-WNH** type and sent to the **NB-IoT network** via this model. The repeater (gateway) is placed at the NB-IoT network availability point and at a distance of up to approx. 20m from the **SENSECOM-OMD**.

### Device design

The **SENSECOM-OMN** is manufactured as a compact device with built-in antenna, with IP20 protection. It includes a USB-C connector and a two-colour indicative LED. It is delivered in sleep mode. By disconnecting the device from the charger (after previous charging), the device automatically switches on to the operational state and takes the first reading within 1-2 min.

# Technical parameters

SENSECOM	OMN	OMN-E										
Readout interface	Optical head interface with serial data transmission according to IEC (CSN) 62056-21											
Communication protocol	IEC 620561-21 Protocol "C" (OBIS codes with C.D.E structure)											
Number of readout registers	Up to 13 configurable registers (OBIS codes) for readings (downlink configurable)	Fixed preset 4 registers of readings from billing meters: <table border="1" data-bbox="863 353 1465 595"> <thead> <tr> <th>Value</th> <th>OBIS</th> </tr> </thead> <tbody> <tr> <td>Positive active energy (A+) in tariff T1 [kWh] (consumption)</td> <td>1.8.1 (1.8.0, 1.8.2)*</td> </tr> <tr> <td>Positive active energy (A+) in tariff T2 [kWh] (consumption)</td> <td>1.8.2 (1.8.3)*</td> </tr> <tr> <td>Negative active energy (A-) total [kWh] (supply)</td> <td>2.8.0</td> </tr> <tr> <td>Gauge serial number</td> <td>C.1.0 (or 0.0.0)</td> </tr> </tbody> </table> <p>* Configurable options (OBIS meter settings may vary for different energy distributors)</p>	Value	OBIS	Positive active energy (A+) in tariff T1 [kWh] (consumption)	1.8.1 (1.8.0, 1.8.2)*	Positive active energy (A+) in tariff T2 [kWh] (consumption)	1.8.2 (1.8.3)*	Negative active energy (A-) total [kWh] (supply)	2.8.0	Gauge serial number	C.1.0 (or 0.0.0)
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Transmission network	<b>NB-IoT</b> (LTE sub-band)											
Data transfer and datagram	The message is transmitted using a UDP packet within an APN (public or private), 20-1280 Bytes/packet. One packet contains a set of values from one reading, or an aggregation of readings for 24 hours.											
Time synchronisation	Daily correction, accuracy 10s, readings synchronized to the beginning of 15min intervals, or synchronization of reading time with meter time											
Types of messages	<ul style="list-style-type: none"> <li>▪ Interval (periodic)</li> <li>▪ Initial with setting status</li> <li>▪ Alarm - reading error, missing OBIS code, battery voltage drop, or tampering with the device</li> <li>▪ Keep-Alive (24h)</li> </ul>											
Setting the readout interval and messages	Adjustable in 15min multiples, default 1h											
Jam interval	<b>10 min</b> interval between alarm messages of the same origin, the first alarm is immediate (no delay)											
Connectible to the repeater	No (OMD models only)											
Access to data	UDP packets (raw data) or <b>SENSEPARAM</b> portal (with normalized values) with the possibility of data transfer: <ul style="list-style-type: none"> <li>▪ Call-back (push)</li> <li>▪ Email alarm notifications</li> <li>▪ SMS alarm notifications (SENSEPARAM only)</li> <li>▪ CSV download</li> </ul>											
Data encryption	OMN-A models with <b>E2E</b> encryption using <b>AES-256</b> with individual keys for each device. Decryption on the SENSEPARAM portal side, or in the customer database (with delivery >100pcs of devices).											
Internet transmission security	<b>UDP with SSL</b> operator -> SENSEPARAM (SSL) -> customer database											
Auxiliary sensors	Thermometer (processor temperature) or accelerometer (on request for deliveries >100pcs)											
Power	Built-in rechargeable battery (accumulator), occasional charging via <b>USB-C</b> connector, or permanent power supply via USB-C											
Estimated battery life per charge	<b>approx. 6-9 months</b> with 1hr readings of 4 registers. Battery life can be extended by connecting an external power supply. The power bank can also be used to charge the internal battery without interrupting operation (readings & data transfer). The device can be operated permanently with a standard mobile phone charger; thus the internal battery provides uninterrupted power backup.											
Antenna	Built-in antenna											
Coverage	IP20											
Weight	200g											
Dimensions	45x78x36mm											

