

## AX-EU-MULTI (LoRaSENS Axino)

### Technical Specification

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### Features

- LoRa modulation technology, 868 MHz frequency band
- Temperature sensor
- Acceleration sensor
- Air quality / humidity / temperature sensor <sup>(1)</sup>
- 4 Mbit Flash memory for data acquisition
- 2 AA-cell batteries operation. Supply voltage range from 1.8 to 3.6 V
- Operating temperature range -40 °C to +85 °C

<sup>(1)</sup> optional

### Description

The AX-EU-MULTI (LoRaSENS Axino) is a sensor device for measuring temperature, humidity and air quality in food safety and smart buildings applications.

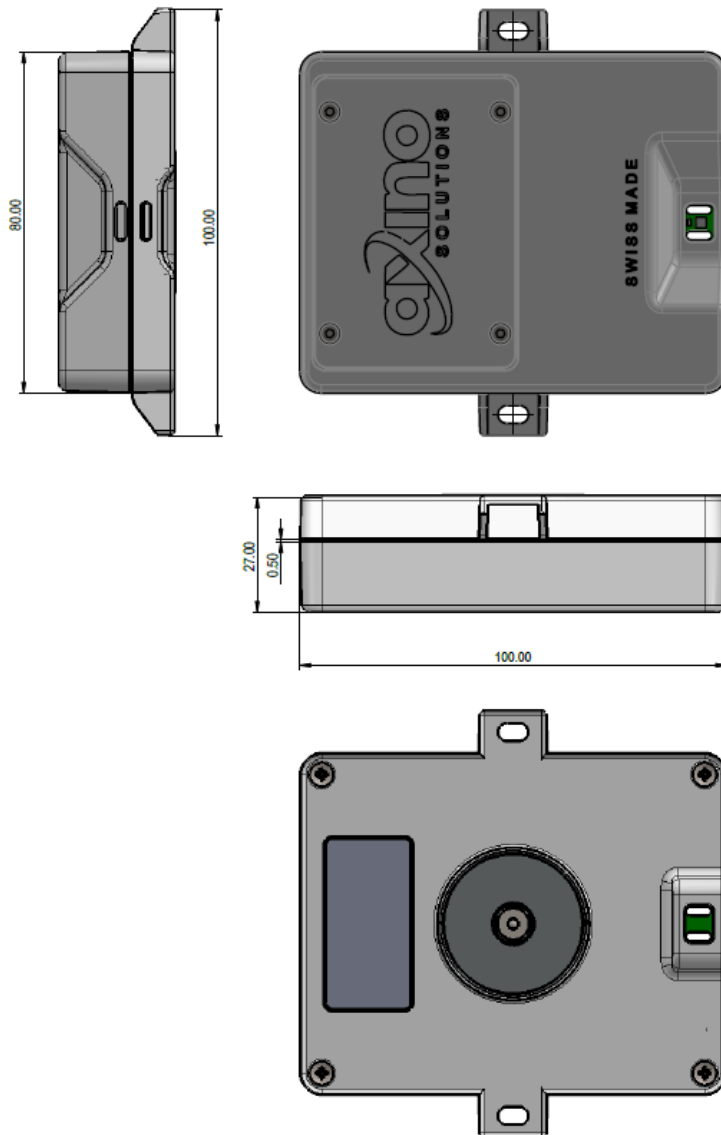
Measured data is transmitted over an encrypted LoRaWAN communication to the application server. Measurement rate and transmission rate can be adjusted over a LoRaWAN downlink communication.

The device is continuously recording measured data to a non-volatile memory. In case of a

communication outage the device is able to replay previously recorded data over the LoRaWAN Network.

The device is powered by two of-the-shelf AA batteries (Mignon, R6) that can be replaced in the field by the end-user.

## Mechanical Dimensions



All dimensions in mm

Weight approx. 150g (excluding batteries)

## Material Specification

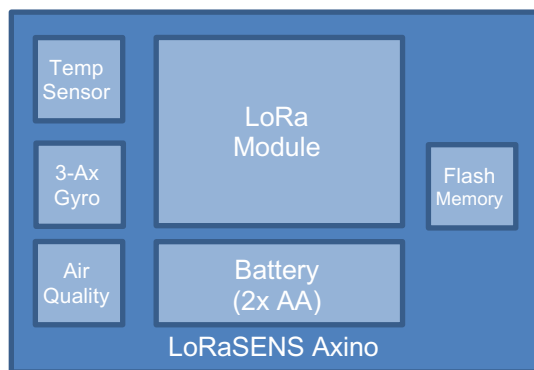
Housing: PC/ABS Cycloy HC1204 (8H5D150 signalweiss),  
For medical devices and pharmaceutical applications. Biocompatible (ISO10993 or USP Class VI).  
Magnet: NdFeB, Holding Force approx. 98N  
Screws: Inox (Stainless steel) A2

## Device Label



The QR-Barcode represents the device's LoRaWAN DevEUI (unique EUI-64 device identifier)

## Block Diagramm



## Service / Maintenance

This device contains no user-serviceable parts. Batteries may be replaced with the same type.

## Technical Data

### Temperature Sensor TSYS02D:

| Parameter         | min. | typ. | max. | Unit | Comment           |
|-------------------|------|------|------|------|-------------------|
| Temperature range | -40  |      | +85  | °C   |                   |
| Resolution        |      | 0.1  |      | °C   |                   |
| Accuracy 1        |      | ±0.2 |      | °C   | -5° C to +50° C   |
| Accuracy 2        |      | ±0.5 |      | °C   | -20° C to +100° C |

### Acceleration Sensor LIS2HH12:

| Parameter          | min. | typ. | max. | Unit | Comment |
|--------------------|------|------|------|------|---------|
| Temperature range  | -40  |      | +85  | °C   |         |
| Acceleration range |      | ±8   |      | g    |         |

### Air Quality Sensor BME680:

| Parameter                | min. | typ. | max. | Unit    | Comment              |
|--------------------------|------|------|------|---------|----------------------|
| Temperature range        | -40  |      | +85  | °C      | operating range      |
| Humidity range           | 10%  |      | 95%  | rel. H. |                      |
| Humidity accuracy        |      | ±3%  |      | rel. H. |                      |
| Pressure range           | 300  |      | 1100 | hPa     |                      |
| Pressure accuracy        |      | ±0.6 |      | hPa     |                      |
| Gas sensor specification |      |      |      |         | see BME680 Datasheet |

### Memory AT45DB041E:

| Parameter         | min. | typ.   | max. | Unit    | Comment |
|-------------------|------|--------|------|---------|---------|
| Flash memory size |      | 4      |      | Mbit    |         |
| Data points       |      | 262144 |      | Samples |         |

### Electrical Characteristics:

| Parameter         | min. | typ.   | max. | Unit  | Comment                                       |
|-------------------|------|--------|------|-------|-----------------------------------------------|
| Battery operation |      | 2 x AA |      |       | Energizer L91 recommended                     |
| Battery life      |      | 3      | 5    | years | depending on battery and operating conditions |

### RF Characteristics:

| Parameter                         | min. | typ. | max.              | Unit | Comment                                                     |
|-----------------------------------|------|------|-------------------|------|-------------------------------------------------------------|
| RF Frequency range <sup>(2)</sup> | 863  |      | 870               | MHz  | 868MHz SRD Range                                            |
| RF output power <sup>(2)</sup>    |      |      | 14 <sup>(3)</sup> | dBm  | 868MHz SRD Range                                            |
| RF frequency stability            |      | 2.5  |                   | ppm  | -40 to +85°C                                                |
| RF receiver sensitivity           |      | -140 |                   | dBm  | @ BW125kHz, SF12 depending on modulation mode and bandwidth |

<sup>(2)</sup> RF frequencies, power levels and duty cycles are subject to legal regulations <sup>(3)</sup> Software-configurable

### Thermal Characteristics:

| Parameter                   | min. | typ. | max. | Unit | Comment |
|-----------------------------|------|------|------|------|---------|
| Storage temperature range   | -45  |      | +85  | °C   |         |
| Operation temperature range | -40  |      | +85  | °C   |         |