

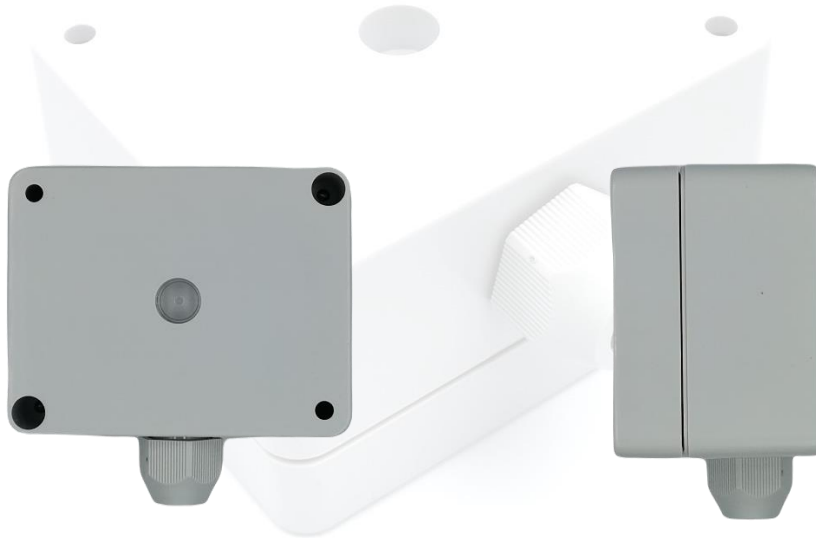


## PRODUCT DATASHEET

## LoRaWAN VIBRATION SENSOR

### OVERVIEW

NetOP Vibration Sensor is a long-range wireless sensor. It gives an acceleration of X, Y, Z-axis output periodically (maximum values and average values) (Maximum 5 seconds of measurement is made in each wake - up state) The max values within these measurements and the average values of the measurements are used as output.) so it can be monitored whether something or somebody is stable/moving or not. This sensor is fully compatible with LoRaWAN technology.

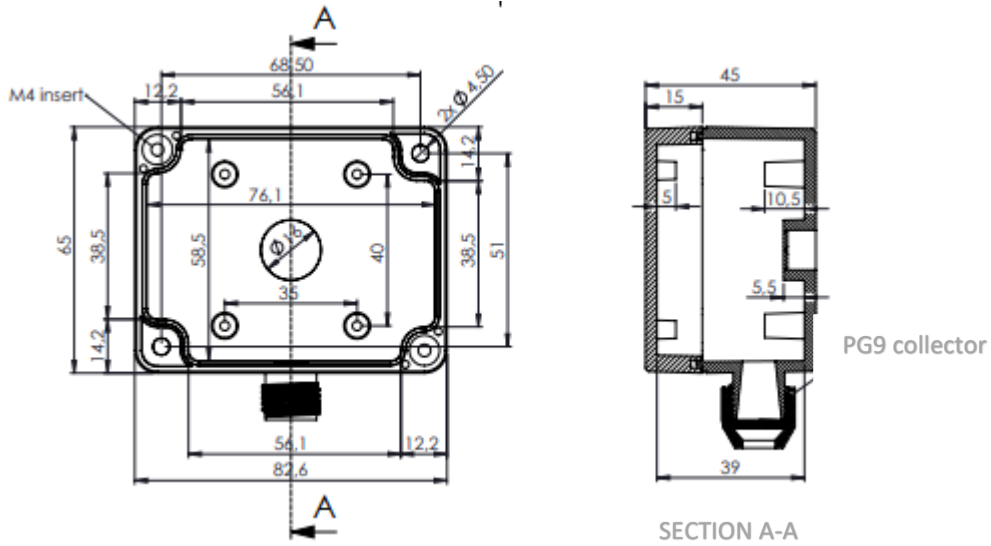




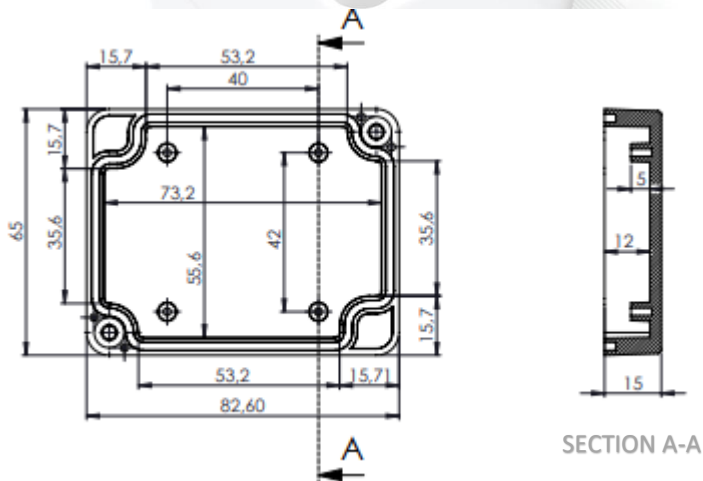
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TECHNICAL DRAWING

Box With Terminal Seal



Cover Page





## PRODUCT DATASHEET

### KEY FEATURES

Real Plug & Play

Easy to mount & install

Compatible with LoRaWAN™ specification

Maintenance free

Secure communication (AES-128)

Ultra -Low Power Consumption

Certificate: LoRaWAN™

### COMMUNICATION SPECS

Compatible with LoRaWAN Specification 1.0.3

The sensor uses Low Power Wide Area Network-LPWAN technology (LoRa) for connectivity

Compliant with Low and High Frequencies (AS923, AU915, CN470, CN779, EU433, EU868, IN865, KR920, RU864, US915 MHz ISM bands)

Supports High power and Low power LoRa RF applications: - Up to +22 dBm at US915 and AU915, - Up to +14 dBm elsewhere

Ultra -low power consumption. Excellent long-term stability.

170 dB maximum link budget

Radio Performance: High RX sensitivity down to -148 dBm

Full ADR, OTAA and ABP support

Long range wireless data transmission



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### MECHANICS

Housing: ABS (IP65 or higher)

Dimensions: 82.5 x 65 x 45 mm

Operating Temperature: -40°C to 85°C

### POWER SUPPLY

AA Battery 3.6 V Li-SOCI2-Saft LS 14500

### INDICATORS

Status LED (on board)

### VIBRATION SENSOR SPECIFICATIONS

Measurement Range:  $\pm 2.0$  g

Linear acceleration sensitivity: 0.061 mg

Output: For X, Y, Z axes  $m/s^2$

### CERTIFICATIONS & RELIABILITY

EN 60950-1;2006/A2:2013

ETSI EN 301 489-17 V3.1.1(2017-02)

EN 55032:2015



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## LoRaWAN FRAME FORMAT

Standard packet size: 24 Bytes

00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15-16-17-18-19-20-21-22-23

1 byte: Connection Type(1->LoRaWAN)

## INFORMATION

012345678: Device ID

|1|: Indicates the type of connection the device uses.





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## LoRaWAN VIBRATION SENSOR PROTOCOL

01-1F-00-59-00-E8-04-09-1E-00-59-FF-E8-04-09-YY-YY-YY-01-2C-25-01-12-0D-EF

01: Selected Slot (1 byte)

1F: Vibration Sensor Board ID (1 byte)

0059: 0x0059H -> 89D -> (2 bytes) -> 0.089 m/s<sup>2</sup> MAX

00E8: 0xFFE8H -> 232D -> (2 bytes) -> -0.232 m/s<sup>2</sup> MAX

0409: 0x0409H -> 1033D -> (2 bytes) -> 1.033 m/s<sup>2</sup> MAX

0059: 0x0059H -> 89D -> (2 bytes) -> 0.089 m/s<sup>2</sup> AVG

00E8: 0xFFE8H -> 232D -> (2 bytes) -> -0.232 m/s<sup>2</sup> AVG

0409: 0x0409H -> 1033D -> (2 bytes) -> 1.033 m/s<sup>2</sup> AVG

YY-YY: Empty Data (9 bytes)

25: Payload Counter 0x25H -> 37D (1 byte)

01: Sensor Message Type Periodic (02->Sensor Message Type Interrupt) (1 byte)

12: Sensor FW Version (1 byte)

- i. Main Version 1
- ii. Sub Version 2

0DEF: 0x0DEFH -> 3567D -> 3567 mV -> 3.567 V (2 bytes)



## PRODUCT DATASHEET

### INFORMATION

01: Selected slot.

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1F: This slot determines the sensor type.

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0059: Indicates the max value of 0.089 m/s<sup>2</sup> on the X-axis.

(The value 0059H is converted to decimal. The result 89D. The resulting decimal value is divided by 1000. This value returns the result in m/s<sup>2</sup> for the X-Axis.)

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00E8: Indicates the max value of -0.232 m/s<sup>2</sup> on the Y-axis.

(The value 00E8H is converted to decimal. The result -232D. The resulting decimal value is divided by 1000. This value returns the result in m/s<sup>2</sup> for the Y-Axis.)

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0409: Indicates the max value of 1.033 m/s<sup>2</sup> on the Z-axis.

(The value 0409H is converted to decimal. The result 1033D. The resulting decimal value is divided by 1000. This value returns the result in m/s<sup>2</sup> for the Z-Axis.)

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0059: Indicates the average value of 0.089 m/s<sup>2</sup> on the X-axis.

(The value 0059H is converted to decimal. The result 89D. The resulting decimal value is divided by 1000. This value returns the result in m/s<sup>2</sup> for the X-Axis.)

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00E8: Indicates the average value -0.232 m/s<sup>2</sup> on the Y-axis.

(The value 00E8H is converted to decimal. The result -232D. The resulting decimal value is divided by 1000. This value returns the result in m/s<sup>2</sup> for the Y-Axis.)

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0409: Indicates the average value of 1.033 m/s<sup>2</sup> on the Z-axis.

(The value 0409H is converted to decimal. The result 1033D. The resulting decimal value is divided by 1000. This value returns the result in m/s<sup>2</sup> for the Z-Axis.)

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YY-YY: Empty Data (9 bytes)

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25: Data is live or not. Each measurement is incremented by degree

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01: When the sensor message 02 comes, it enters the interrupt.

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12: Sensor firmware version 1.2

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3567: Outputs the measurement in Volt (3.567V).

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