

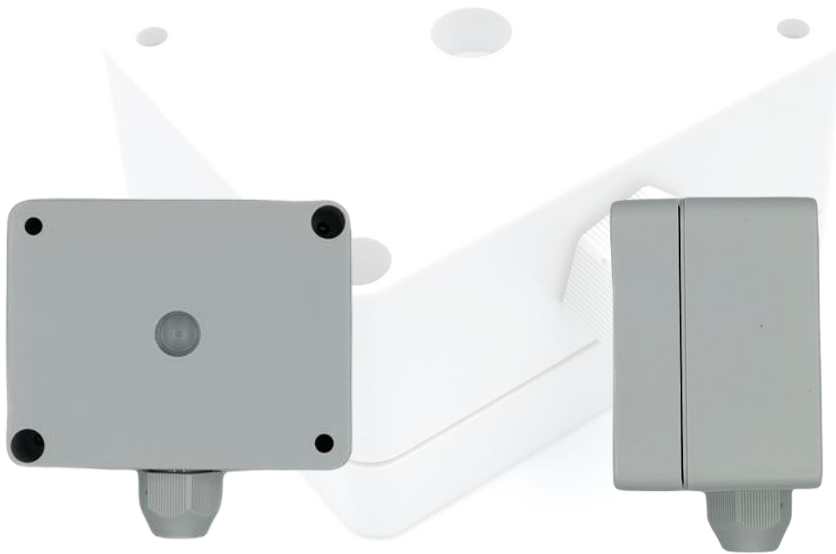


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LoRaWAN G-FORCE SENSOR

OVERVIEW

NetOP G-Force Sensor measure acceleration on the X, Y, and Z axes to determine G-force. This digital, low-power sensor's applications include tracking machine inclination or tilt, detecting asset orientation, or testing for vibrations. This sensor is fully compatible with technology by using LoRaWAN.

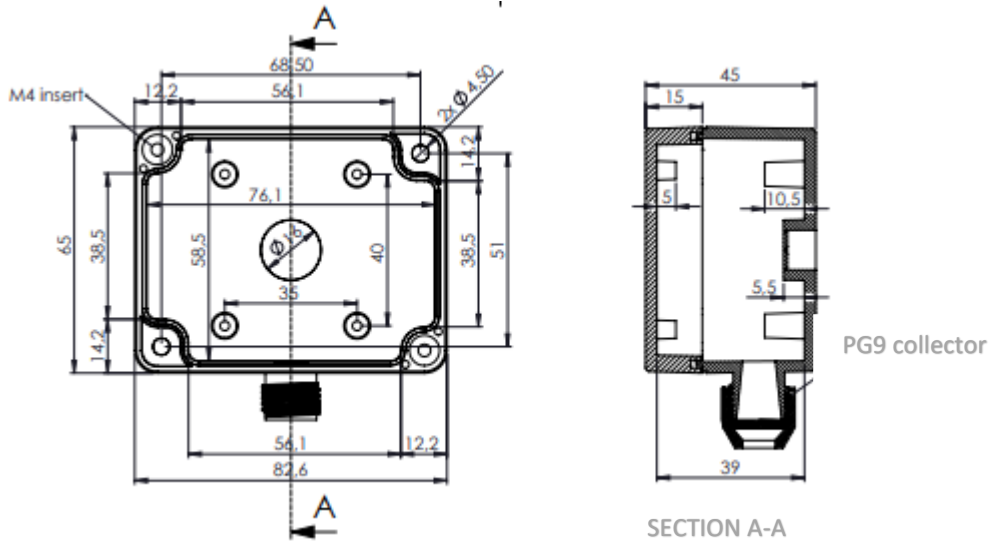




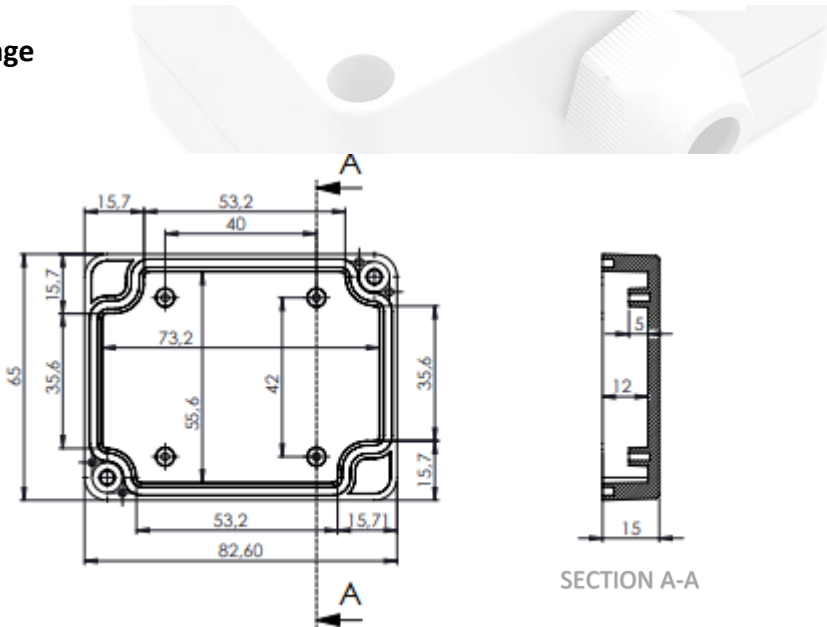
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TECHNICAL DRAWING

Box With Terminal Seal



Cover Page





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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: 0°C to 40°C

POWER SUPPLY

AA Battery 3.6 V Li-SOCl₂-Saft LS 14500

INDICATORS

Status LED (on board)

G-FORCE SENSOR SPECIFICATIONS

Sensitivity range selections: +/-2 G, +/-4 G, +/-8 G

Measurement accuracy: ±2.5 % (force: X, Y)

Bandwidth for data measurement: 50 Hz

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 G-FORCE SENSOR PROTOCOL

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

01: Selected Slot (1 byte)

1E: G-Force Snapshot Sensor Board ID (1 byte)

0059: 0x0059H -> 89D -> (2 bytes) -> 0.089G

FFE8: 0xFFE8H -> 65512D -> (2 bytes)

i. FFE8 – FFFF -> -0x0017H -> -23D -> -0.023G

0409: 0x0409H -> 1033D -> (2 bytes) -> 1.033G

YY-YY: Empty Data (9 bytes)

012C: Sleeping Period 0x012CH -> 300D Seconds (2 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)

ii. Main Version 1

iii. Sub Version 2

0DEF: 0x3567H -> 3567D -> 3567mV -> 3.567V (2 bytes)



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INFORMATION

01: Selected slot.

1E: This slot determines the sensor type.

0059: Indicates the 0.089G 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 G for the X-Axis.)

FFE8: Indicates the -0.023G on the Y-axis.

(The value FFE8H is converted to decimal. The result -23D. The resulting decimal value is divided by 1000. This value returns the result in G for the Y-Axis.)

0409: Indicates the 1.033G 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 G for the Z-Axis.)

YYYY: Dummy data (12 bytes)

012C: Sleep interval along 300S.

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

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

12: Sensor firmware version 1.2

0DEF: Outputs the measurement in Volt (3.567V).