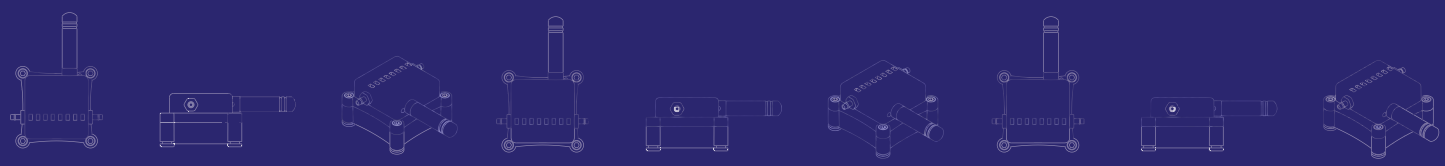
Delta Pressure Sensor

UIO-G4AM-DPS



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Ruggedised IoT Delta Pressure Sensor

The Urban.io Delta Pressure Sensor measures the microthermal change as a gas flows across two points in an internal chamber which is digitally translated into the difference in gas pressure on either side of a barrier such as a filter.

Used in conjunction with an Urban.io Gateway the Delta Pressure Sensor will read and transmit pressure levels to the Urban.io Cloud Platform on a near real-time basis.

Measured data is securely displayed within the Urban.io Cloud Platform for reporting purposes. Through the use of dynamic profiles, thresholds can be set for each sensor which can trigger alarms that can be sent via email or SMS.

All recorded sensor data, historical summaries and alarms are made available for use within external software platforms via the IoT Data API.

Sensor Operation

The Urban.io Delta Pressure sensor averages multiple samples of gas flow fed by two hoses to provide readings to 0.1 Pa accuracy between a pressure range of -500 to +500 Pa.

Cloud Reporting Platform

IoT API

Email/SMS Alerts

Can be retrofit into any location in less than 10 minutes, with no special equipment required.

Features

Delta Pressure Sensor / UIO-G4AM-DPS

Core Features

Primary Sensing Element:

- Two port mass flow thermal measurement integrated circuit

Secondary Sensing Elements:

- Fault detection (loss of sensing element)
- IoT network connectivity (Signal to Noise levels “SNR”)
- IoT device battery Level (% of remaining battery level)

General Sensor Features:

- Gateway to sensor network range:
  - 500m non-line-of-sight
  - 5km line-of-sight
- Operating Temperature: -40° to 85°C
- Power Supply: 3.0 V CR2477 coin cell battery (replaceable)
- Battery life: 2 years under normal operation
- Reading frequency: 1 Sample each 10 minute interval
- Data transmission frequency: 10 minute interval

Variants

Each sensor is packaged with three screw-in antennas for use depending on the region you are deploying them into.

915 Band (915–925 MHz)

Suitable for South East Asia, Australia, North/South America

868 Band (863–870 MHz)

Suitable for Africa, Middle East, Europe

780 Band (779–787 MHz)

Suitable for China

Example Applications

Pressure drops across air filters (HVAC)

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Specifications

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Technical Specification

Maximum resolution over measured electrical range	**65,535 detectable points**
Measurement range	**-500 Pa – +500 Pa**
Maximum continual pressure	**1 bar**
Maximum burst pressure	**3 bar**
Calibration / Drift	**0.01 Pa / year**
Accuracy	**NA**
Temperature range (limited by battery)	**-20°C to 85°C**

Data Sampling and Reporting Frequency Specification

Standard measurement reporting heartbeat	**10 minutes**
Standard measurement interval	**10 minutes**
Priority event reporting	**No**
Priority events reported per heartbeat	**NA**

Power Specification

Supply Voltage	**2.0 – 3.4 V DC** replaceable CR2477 1AH lithium metal battery
Current consumption — sleep mode	**7 uA**
Current consumption — sensor active sampling mode	**5.5 uA**
Current consumption — radio RX mode	**25 mA for 0.5 seconds**
Current consumption — radio TX mode (max)	**100 mA for 0.5 seconds**

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Specifications

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Environment Specification

Enclosure rating	**IP67**
Operating temperature electronic circuit board	**-40°C to +85°C**
Operating temperature CR2477 coin cell battery	**-40°C to +85°C**

Network Specification

Radio modulation	**LoRa**
Radio protocol	**Urban.io IoT Generation 4.x**
Frequency bands	**780 MHz, 868 MHz, 915 MHz, 4th configurable**
Frequency accuracy	**±30kHz** (±30ppm max)

915 MHz Band

Maximum output power	**+17 dBm**
Default channel low, channel high	**923.3 MHz, 925.1 MHz**
Default bandwith	**500 kHz**

868 MHz Band

Maximum output power	**+17 dBm @ 869.5, +12 dBm others**
Default channel low, channel high	**868.1 MHz, 869.5 MHz**
Default bandwith	**125 kHz**

780 MHz Band

Maximum output power	**+17 dBm**
Default channel low, channel high	**779.9 MHz, 783.0 MHz**
Default bandwidth	**250 kHz**

Security Specification

Sensor data encryption	**AES 128-Bit**

Certifications

CE	**EN 301 489-x** (EMC), **EN60950** (safety)
FCC	**CFR47, Part 15 for 915 MHz**

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Dimensions and Mounting

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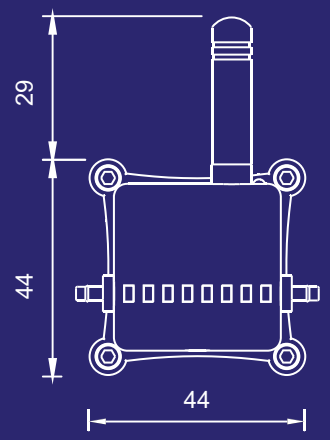
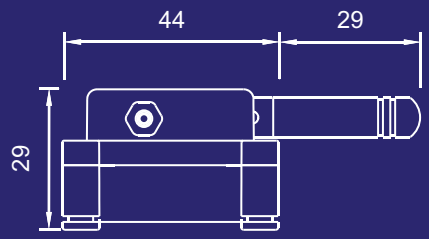
Top View



Side View



Dimensions

Length:
73 mm (with antenna)

Height:
29 mm

Width:
44 mm

Weight:
85 g

Mounting

Option: A

Magnetic Attachment

Option: B

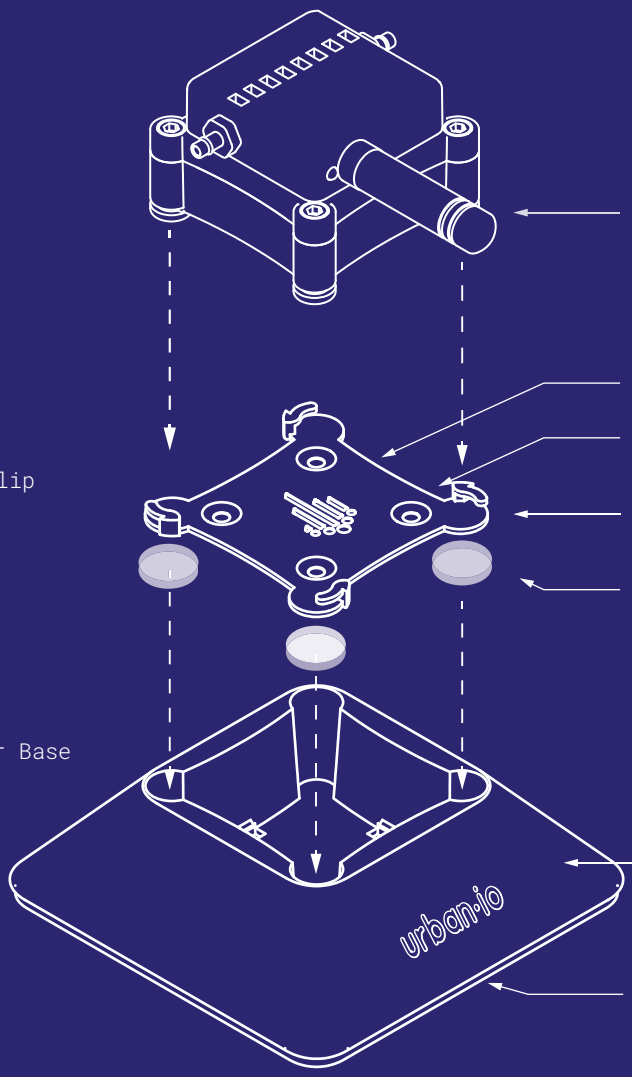
Industrial Sensor Clip

SKU: UIO-G4RL-INC

Option: C

Architectural Sensor Base

SKU: UIO-G4RL-BAS



Magnetic feet snap to any metal surface

Option to 3M VHB stick Industrial Clip onto surface

Option to Tek Screw Clip into surface

Magnetic feet snap and twist click into Industrial Clip mount

Option to 3M VHB feet pads to stick Industrial Clip onto curved surface

Snug fit into recess magnetic feet snap onto metal base of Architectural Mount

3M VHB stick Architectural Mount onto any flat surface

Can be retrofit into any location in less thatn 10 minutes, with no special equipment required.

Positioning & Usage

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Correct Positioning

This product is designed for usage with an Urban.io IoT Gateway. In ideal conditions with correct orientation of sensors and gateway antennas the following ranges can be achieved.

Up to 5km line-of-sight where there are no obstructions between the gateway and the sensor and they are placed on the same horizontal plane.

500m non-line-of-sight in an enclosed space where there are one or more obstructions (objects, walls, buildings) between the gateway and the sensor and it is placed on the same horizontal plane.

Where the sensors and gateways are placed in an enclosed space, the range can vary significantly. In addition incorrect antenna orientation, placement on different vertical planes, interruptions by walls, doors, boxes, ducts, pipes, machinery or any other large dense physical objects can affect the range even further. It is advised to avoid installation inside metal containers or behind metal objects.

Correct Usage

This product is designed for application in normal indoor and certain outdoor environments. The gateway housing is IP65 rated and as such is designed to be water and dust resistant as well as generally resistant to direct sunlight. However the 240v Power Adapter is not rated for outdoor usage.

Please avoid the following:

- Environments where there is extreme heat (above +60°C) or cold (below -20°C)
- Environments where there is corrosive gas or fluids
- Environments which cause intermittent connectivity between gateway and sensors; this increases the frequency that sensors will scan for available networks and cause batteries to drain prematurely

Certifications

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Connecting IoT Data to External Software Platforms

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Urban.io proactively supports the interfacing of IoT sensor data with all industry leading Asset Management, Field Force and Work Management, Data Analytics and Machine Learning Platforms.

We provide the following Public APIs as well as pre-built API Adapters for the following Enterprise IoT Systems:

Public APIs

Rest Web Services

MQTT

API Adapters

AWS IoT Core

IBM Watson IoT

Azure IoT Hub

If you wish to interface our IoT device data with a platform not on this list please contact enquiries@urban.io

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