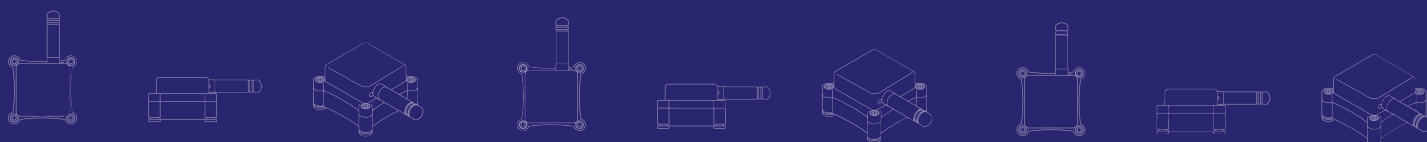
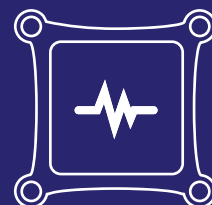




Vibration Sensor

UIO-G4RL-VIS





Vibration Sensor

UIO-G4RL-VIS

Ruggedised IoT Vibration Sensor

The Urban.io Vibration Sensor measures relative movement (acceleration) in three (XYZ) axis, giving the user the maximum amplitude of movement in each dimension. In addition the sensor will process the time wave form of each sample, to identify the frequencies at which peak values occur.

Used in conjunction with an Urban.io Gateway the Vibration Sensor will read and transmit XYZ movement amplitude and frequency peak values 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.

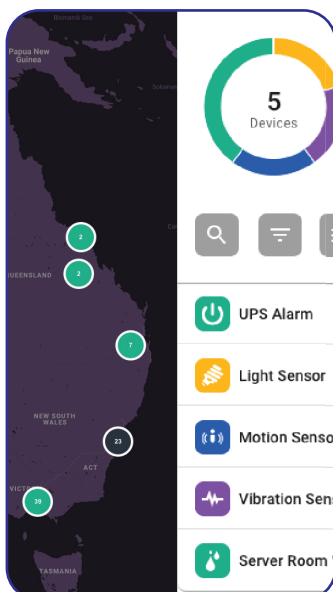
All recorded sensor data, historical summaries and alarms are made available for use within external software platforms via the IoT Data API



Sensor Operation

The Urban.io Vibration Sensor samples acceleration every 10 minutes. Time domain samples are converted to speed, then converted to frequency domain. The sensor reports the frequency and amplitude values for the top ten points in each of the X, Y and Z dimensions. Additionally the total amplitude for each dimension is also reported.

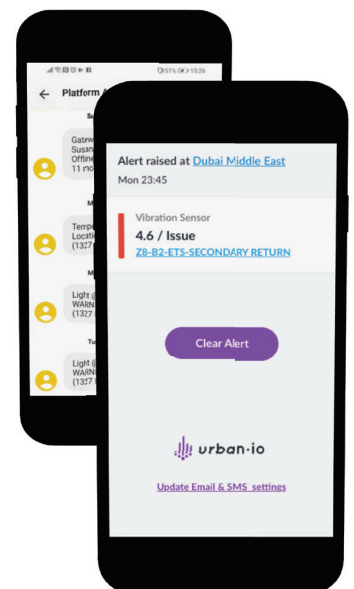
Cloud Reporting Platform



IoT API

```
ices": [
{
  "id": 11,
  "position": "Office",
  "display_type": "temperature",
  "operator_id": 41,
  "order_by_status": false,
  "hardware_device_id": "device
  "logical_datastreams": [
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      "id": 44,
      "display_type": "SENSOR_BA
      "sensor_network": true,
      "measure": {
        "id": 1,
        "name": "Sensor Battery"
        "requires_multiplier": n
        "series_type": "continuo
```

Email/SMS Alerts



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



Features

Vibration Sensor / UIO-G4RL-VIS

Core Features

Primary Sensing Element:

- Accelerometer + intelligent signal processing engine to detect frequency peaks

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 1 minute interval
- Data transmission frequency: 10 minute interval

Variants

Each sensor is packaged with three pluggable/snap-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)

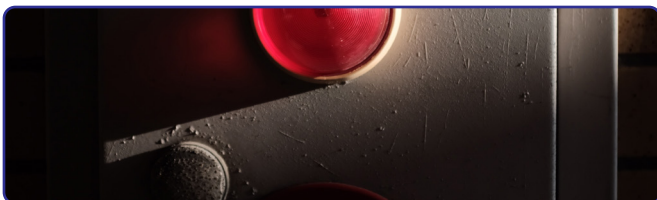
Suitable for Africa, Middle East, Europe

780 Band (779–787 MHz)

Suitable for China

Example Applications

Pump monitoring



Machinery monitoring



Gearbox fault / failure detection



Conveyor pulley fault / failure detection



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



Specifications

Vibration Sensor / UI0-G4RL-VIS

Technical Specification

Maximum resolution over measured electrical range	1Hz, 1mm/s
Vibration frequency detection range	0 to 1 kHz
Signal processing resolution	2,048 point
Digital threshold voltage	10 point (15 Hz*)
Calibration / Drift	None
Accuracy	±1mm/s, ±2Hz
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 seconds
High resolution measurement interval (magnet mode)	10 seconds
Priority event reporting	No
Priority events reported per heartbeat	NA

Power Specification

Supply Voltage	2.0 – 3.4 DVC replaceable CR2477 1AH lithium metal battery
Current consumption – sleep mode	6 uA
Current consumption – sensor active sampling mode	10 mA for 5 seconds
Current consumption – radio RX mode	25 mA for 0.5 seconds
Current consumption – radio TX mode (max)	100 mA for 0.5 seconds



Specifications

Humidity Sensor / UI0-G4RL-HUS

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 bandwidth	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 bandwidth	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
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Certifications

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

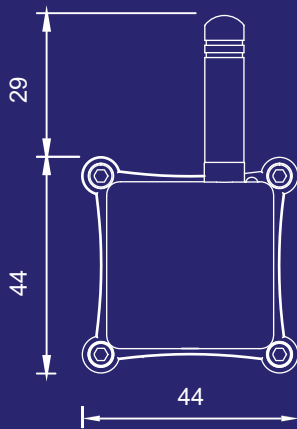
 Can be retrofit into any location in less than 10 minutes, with no special equipment required.



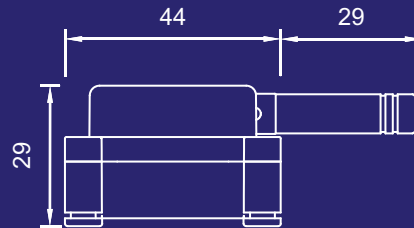
Dimensions and Mounting

Vibration Sensor / UIO-G4RL-VIS

Top View



Side View



Dimensions

Length:
73 mm (with antenna)

Height:
29 mm

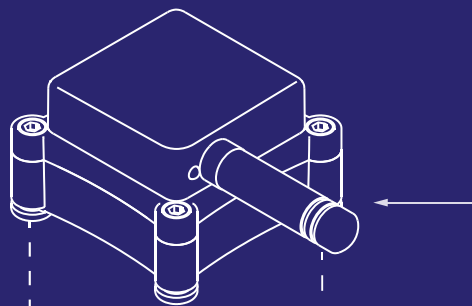
Width:
44 mm

Weight:
85 g

Mounting

Option: A

Magnetic Attachment



Magnetic feet snap to any metal surface

Option: B

Industrial Sensor Clip
SKU: UIO-G4RL-INC

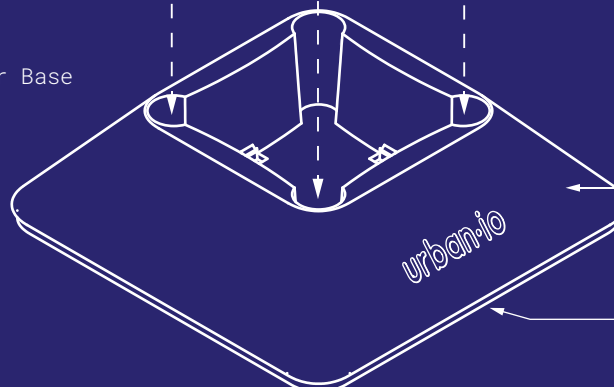


Option to 3M VHB stick Industrial Clip onto surface
Option to Tek Screw Clip into surface

Magnetic feet snap and twist click into Industrial Clip mount

Option: C

Architectural Sensor Base
SKU: UIO-G4RL-BAS



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 than 10 minutes, with no special equipment required.



Positioning & Usage

Vibration Sensor / UIO-G4RL-VIS

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





Connecting IoT Data to External Software Platforms

Vibration Sensor / UIO-G4RL-VIS

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