RG2i
Spécialiste IoT & M2M

Sound Level and Air Quality Monitor

Evaluates external conditions through the monitoring of the main environmental parameters to improve the well-being of citizens.

IOTSENS
Gimeno IoT division

DESCRIPTION

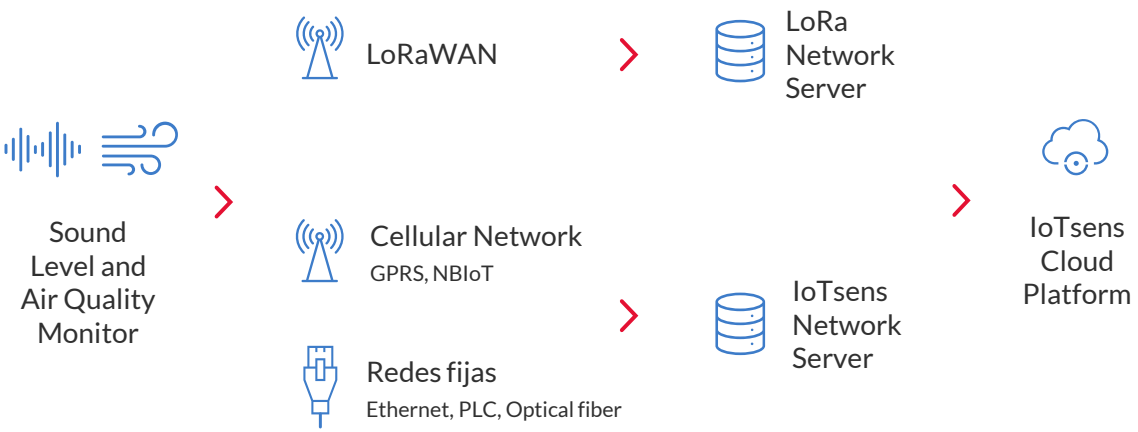
The IoTsens Sound Level and Air Quality monitoring device consists of a set of environmental sensors capable of collecting different variables to evaluate the surrounding air conditions. This device measures the concentration of CO, SO2, NO2, O3, NO, H2S, CO2, airborne particles (PM1, PM2.5 and PM10) and barometric pressure. In addition, it also records environmental conditions such as temperature and humidity. Thanks to its integrated microphone it can monitor noise levels, displaying the collected data in dBA, this information is essential in areas with noise level restrictions. It obtains as recorded variables LAeq, LAmax, LAmin, LAp (01-10-50-90-99).

The device has been developed based on the guidelines set out in the Council Framework Directive 96/62/EC and all its secondary Directives. This decree aims to regulate air quality in order to avoid, prevent and reduce the harmful effects of the substances mentioned in the regulation on human health, the environment as a whole and other goods of any nature. Also based on the guidelines contained in Directive 2002/49 / EC of the European Parliament and Council of 25 June 2002 and Law 37/2003 of 17 November published in the BOE of Spain. This law aims to regulate noise pollution to prevent and, where appropriate, reduce the damage it may cause to human health, property or the environment.

BENEFITS

- Essential for taking preventive and corrective actions in areas of special interest such as green spaces, school zones or Low Emission Zones.
- Improvement of public health and well-being of citizens.

CONECTIVITY



PRODUCT

Product	Sound Level and Air Quality Monitor
Dimensions	200 x 120 x 60 mm
Weight	610 g
Temperature Range	-40 °C to +65 °C
Housing	IP protection 53 (UV resistant ABS)
Internal Storage	16 MB
Available Power Supply	Passive power over Ethernet: 12/24 VDC Power supply with 12/24 VDC

AVAILABLE COMMUNICATIONS

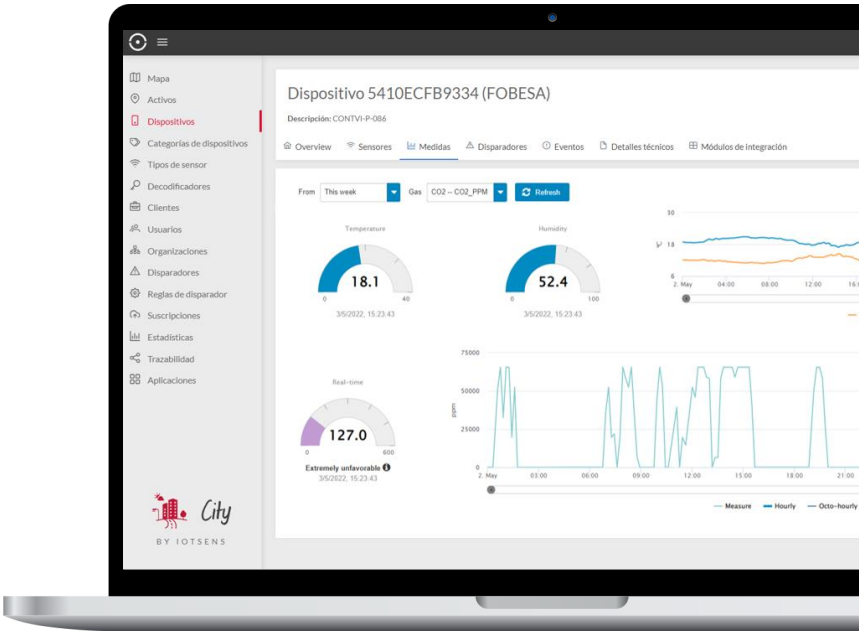
Ethernet	Standard: IEEE 802.3 100Base-TX Cable: 4 twisted pairs (category 5 UTP) PoE: Passive mode (4-5 positive, 7-8 negative) 12/24 VDC
WiFi	Standard: IEEE 802.11 b/g/n Bands: 2.4Ghz Power transmission: +16dBm Sensitivity: -98 dbM (802.11b, 1Mbps)
LoRaWAN	EU868 region Specification Version 1.0.2 Regional Parameters 1.0.2rB
NarrowBand IOT	Bands: Global (B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B26/B28/ B66/B70/B71) Bandwidth: Uplink: 150Kbps Downlink: 126Kbps Power consumption: PSM / eDRX

VARIABLES

Nitrogen Dioxide (NO_2)	Range: 0 to 8500ppb Accuracy: ± 5ppb Operational life: 24 months up to 50% deviation from measurement It is formed in high temperature combustion processes (motor vehicles, power plants). It is a frequent pollutant in urban areas. It is a toxic gas, irritant and a precursor to the formation of nitrate particles that lead to the production of acid and high levels of PM2.5
Ozone (O_3)	Range: 0 to 4000ppb Accuracy: ±15ppb Operational life: 24 months up to 50% deviation from measurement Ozone at ground level, unlike other pollutants, is not emitted directly into the atmosphere, but is a secondary pollutant produced by the reaction between nitrogen oxides and carbon monoxide together with other derivatives of the burning of fuel and the sunlight. Ozone levels are not as high in urban areas as in rural areas. The whole of the ozone, forms a visible mist in highly polluted areas, called photochemical smog. It is one of the gases that produce the greenhouse effect in the atmosphere. Breathing in large amounts may cause eye or throat irritation
Carbon Monoxide (CO)	Range: 0 to 5800ppb Accuracy: ± 20ppb Operational life: 36 months up to 50% deviation from measurement It is an odorless, tasteless, and colorless gas produced by the incomplete combustion of carbon-containing materials, including most transportation fuels. Even in busy urban centers, CO concentrations rarely exceed health-related standards. CO is toxic, acts by reaction with hemoglobin and reduces its oxygen transport capacity in the blood.
Sulfur Dioxide (SO_2)	Range: 0 to 5800ppb Accuracy: ± 15ppb Operational life: 36 months up to 50% deviation from measurement When fossil fuels, or any other material that contains sulfur, burns in the presence of oxygen, sulfur dioxide is produced. Sulfuric acid generated from atmospheric reactions is the main component of acid rain, and ammonium sulfate particles are the most abundant secondary particles found in the air.
Nitrogen Oxide (NO)	Range: 0 to 4000ppb Accuracy: ± 80ppb Operational life: 24 months up to 50% deviation from measurement It is produced in much greater quantities than NO2. It is a highly unstable molecule in air, and it oxidizes rapidly in the presence of oxygen to nitrogen dioxide

Hydrogen Sulfide (H_2S)	Range: 0-1000ppb Accuracy: ± 5ppb Operational life: 24 months up to 50% deviation from measurement It is a toxic gas with a high danger to health. This depends on both the duration of the exposure and the concentration. It is an irritating gas for the lungs that in low concentrations irritates the eyes and the respiratory tract. The toxicity of hydrogen sulfide is high, and it can cause death in man at very low concentrations in the environment.
Carbon Dioxide (CO_2)	Range: 400-2000ppm Accuracy: ± 40ppm It has no direct adverse health effects, but it is the most abundant anthropogenic greenhouse gas in the atmosphere.
Particulate Matter (PM1, PM2.5 y PM10)	Description: air suspended particles Measure range: de 0 a 1000 µg/m^3 Accuracy: PM1 ±10%; PM2.5 ±15%; PM10 ±25% Airborne particulates vary widely in their physical, chemical composition, origin, and particle size. PM10 particles (the fraction of very small sized particles in air (<10 µm)), PM2.5 particles (<2.5 µm) and PM1 particles (<1 µm) are of great concern today as they are small enough to penetrate deep into the lungs and therefore suppose significant health risks. Meanwhile, larger particles are not easily inhaled and are removed from the air relatively efficiently by sedimentation. The main source of PM10, PM 2.5 and PM1 matter in the air in cities are road traffic emissions, especially diesel vehicles.
Barometric Pressure	Description: MEMS pressure sensor Measure range: 300mbar – 1200mbar Accuracy: ±1,5mbar (0°C-50°C) ±3mbar (-20°C-70°C)
Humidity	Description: CMOS Humidity sensor Measure range: de 0 to 100% Accuracy: ±2%
Temperature	Description: CMOS Temperature Sensor Measure range: -40°C to +125°C Accuracy: ±0.2°C
LAeq	Essentially, an average noise level. More specifically, it shows the equivalent amount of energy in each period for a fluctuating source as if it were a steady continuous noise level.
LAmax	Shows the highest noise level reached in each period.
LAmin	Shows the lowest noise level reached in each period.
LAp##	Where p may be anything from 1 to 99, is that noise level exceeded for n% of the measurement time.

IOTSENS PLATFORM

By integrating this sensor into the IoTsens Cloud platform, we are able to offer hourly and daily data on these variables, as well as the corresponding calculations to know if the levels comply or not with current regulations.

Open	We use components based on free software and communication mechanisms based on open protocols.
Integrable	We provide the necessary tools for bidirectional integration with third-party platforms.
Scalable	Horizontal and transversal platform capable of evolving and being scalable thanks to the organization of each of its layers.
Secure	We offer fine granularity regarding permissions and assigned resources, which allows you to control which resources are accessible at any time.
Modular	It is composed of different work modules, which makes it easy to evolve and customize.
Big Data & Business Intelligence capabilities	Real-time analysis, heavy calculations and machine learning processes that support the determination of KPIs.
Customizable	With the client's corporate identity. It can be configured for integration with proprietary systems such as ERP or MES, guaranteeing privacy and security in data processing.