



Air Quality Monitor

Evaluates air conditions by monitoring the main environmental parameters to improve the well-being of citizens.

DESCRIPTION

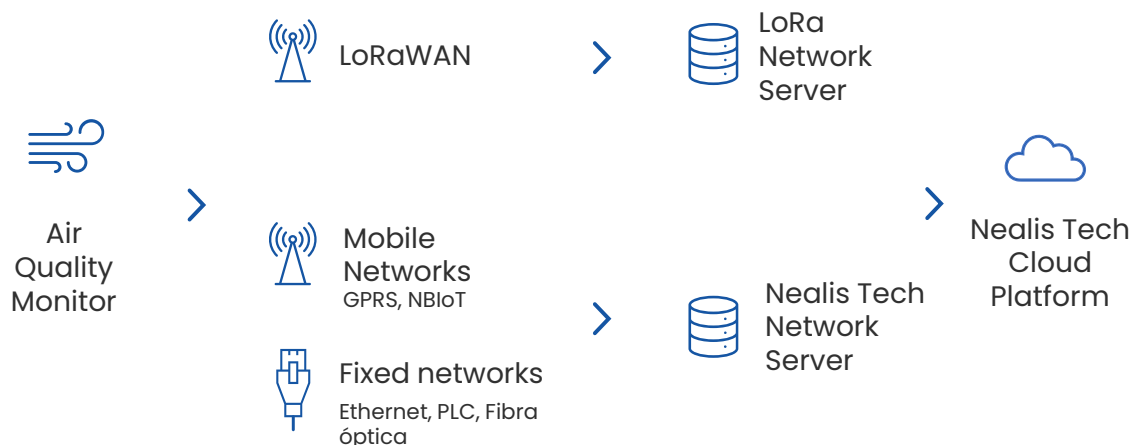
The Nealis Tech Air Quality monitor consists of a set of environmental sensors capable of collecting different variables to evaluate the conditions of the air that surrounds it. This device measures the concentration of CO, SO₂, NO₂, O₃, NO, H₂S, CO₂, the particles suspended in the air (PM₁, PM_{2.5} and PM₁₀) and TVOC. In addition, it also records environmental conditions such as temperature and humidity. The use of this device is recommended for the evaluation of air conditions, being able to monitor the levels of contamination to make the appropriate decisions.

The device has been developed based on the guidelines set forth in the framework Directive 96/62/EC of the council and all its Daughter Directives. The purpose of this decree is to regulate air quality 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.

BENEFITS

- Information and evaluation of air pollution levels.
- Improvement of public health and well-being of citizens.
- Essential information for taking preventive and corrective actions in areas of special interest such as green areas or school zones.
- Operation on variables collected to provide hourly and daily data to comply with the levels established in the regulation. E.g., pollution levels from road traffic.

CONNECTIVITY



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 ₂ S)	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.
Volatile Organic Compounds (VOC)	Description: MOx gas sensor for air quality Range: 0–500 VOC Index points They are produced by incomplete combustion of hydrocarbon fuels, and by their evaporation. Because there are many hundreds of different compounds, VOCs display a wide range of properties. Some, like benzene, are carcinogenic; some are toxic and others harmless to health.
Particulate Matter (PM1, PM2.5 y PM10)	Description: air suspended particles Measure range: de 0 a 1000 µg/m³ 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.
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
Barometric Pressure	Description: MEMS pressure sensor Measure range: 300mbar – 1200mbar Accuracy: ±1,5mbar (0°C–50°C) ±3mbar (-20°C–70°C)

OPTIONS

	Humidity and Temperature	TVOC	Particles	NO2+O3	CO+SO2	NO+H2S
Basic	✓	✓	✓			
Standard	✓	✓	✓	✓		
Advanced	✓	✓	✓	✓	✓	
Full	✓	✓	✓	✓	✓	✓

Optional CO2 in all devices*

PRODUCT

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/US915/AU915/AS923/US915 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

NEALIS TECH PLATFORM

By integrating this sensor into the Nealis Tech 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.

