MAGNASCI

uRADMonitor INDUSTRIAL
Environmental Monitoring

Particulate matter PM2.5, PM10, Ozone O_3, Carbon Monoxide CO, Nitrogen Dioxide NO_2, Sulphur Dioxide SO_2

Features

- Compliant to US, EU, UK requirements on air quality index determination
- Four slots for electrochemical sensors, allowing custom gas detection (9 gases supported)
- 2 connectivity options including Wifi and LoraWAN
- Direct and Cloud data access via API
- Rugged design with aluminum enclosure
- Low power consumption
- Built in high efficiency boost converter
- Designed for solar operation with solar panels
- Compact size 150x60x30 mm
- Wall mounting support

Applications

- City monitoring
- Office and production space monitoring
- CBRN Monitoring
- Smart cities
- Internet of things

Description

uRADMonitor INDUSTRIAL is an automated, fixed monitoring station that tracks a total of 6 important air quality parameters. It is compliant to international requirements on determining the Air Quality Index. It comes in a rugged aluminum enclosure with wall mounting support. The data is exported to the uRADMonitor network and can be accessed in real time using the cloud API interface or directly via the local network.

Automated monitoring provides more options over using handheld units occasionally. Mapping data trends becomes possible thanks to continuous surveillance and a permanent data flux. We have a higher detection capability for small variations and can trigger automated alarms if predefined thresholds are reached, improving reaction time while lowering costs.

The uRADMonitor network is a global array of interconnected monitoring stations, focused on continuous Environmental Surveillance. Its purpose is to generate fully transparent open data, used to assert the quality of our environment.

Using the available connectivity options and the low power consumption this device can be deployed for a large variety of field applications. Its versatility is combined with a convenient cloud based data access with an API interface to access the measurements directly from the uRADMonitor cloud.

Sensors

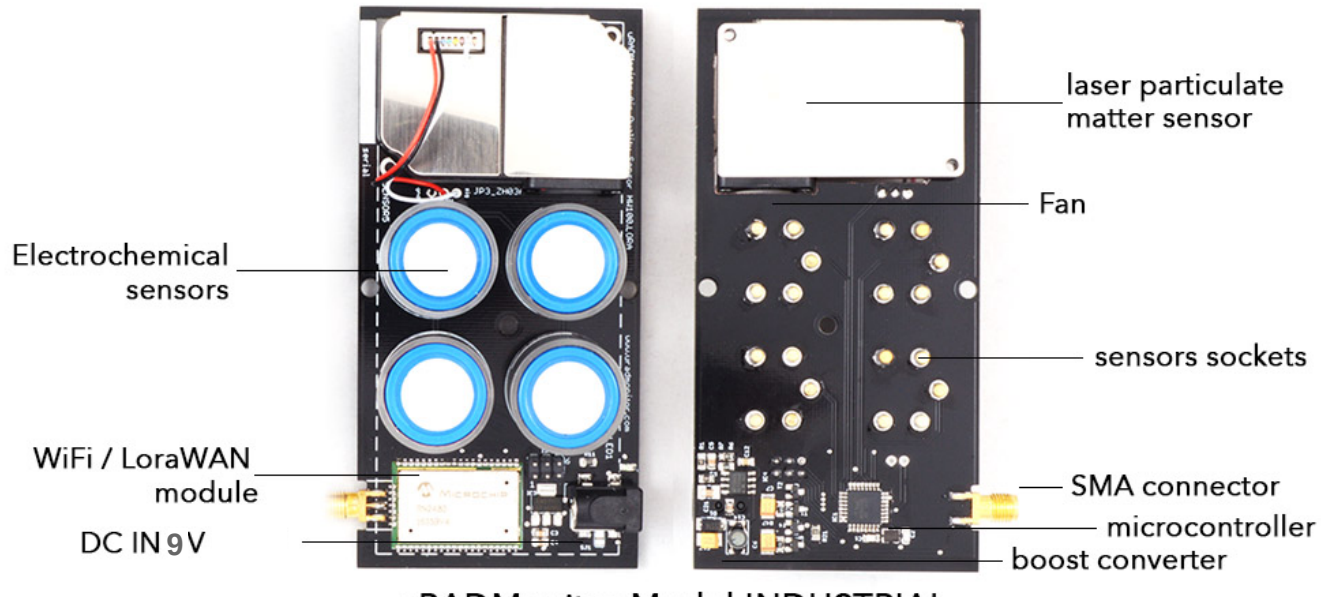
The device uses a high quality laser scattering sensor to measure the Particulate Matter PM2.5 and PM10 concentration in air. There are four additional electrochemical sensors to measure Carbon Monoxide, Sulphur Dioxide, Nitrogen Dioxide and Ozone. A built in fan assures an active air flow stream across the sensing elements.

Sensor	Parameter	Minimum value	Maximum value	Operating temperature
Internal sensor	Temperature	-40 °C	+85 °C	-40 °C .. +100 °C
Winsen ZH03A	Particulate matter PM2.5 Particulate matter PM10	0 µg/m³	1000 µg/m³	-40 °C .. +100 °C
Winsen ZE03-O_3	Ozone	0 ppm	20 ppm	-20 °C .. +50 °C
Winsen ZE03-CO	Carbon Monoxide	0 ppm	1000 ppm	-20 °C .. +50 °C
Winsen ZE03-SO_2	Sulphur Dioxide	0 ppm	20 ppm	-20 °C .. +50 °C
Winsen ZE03-NO_2	Nitrogen Dioxide	0 ppm	20 ppm	-20 °C .. +50 °C

* All sensors are individually tested and calibrated.

Specification

Parameter	uRADMonitor INDUSTRIAL.Wifi	uRADMonitor INDUSTRIAL.LoraWAN
Internet connection	Wifi 2.4GHz	LoraWAN compliant with EU, US and the Israeli MoC spec
Standards	IEEE 802.11b/g/n	IEEE 802.15.4g(FSK/GFSK)
Wireless frequencies	2400-2483.5MHz	915-917MHz
TX Power	100mW	100mW
Modem Chip	Espressif ESP8266	Microchip RN2903
Modem certifications	CE, FCC	CE, FCC, IC
Antenna connector	SMA male	SMA male
Enclosure Protection	IP30	IP30
Supply Voltage	9V / Solar	9V / Solar
Dimensions	110x65x25 mm (excl. sup)	110x65x25 mm (excl. sup)
Weight	210g	210g
Mounting	mounting support provided	mounting support provided

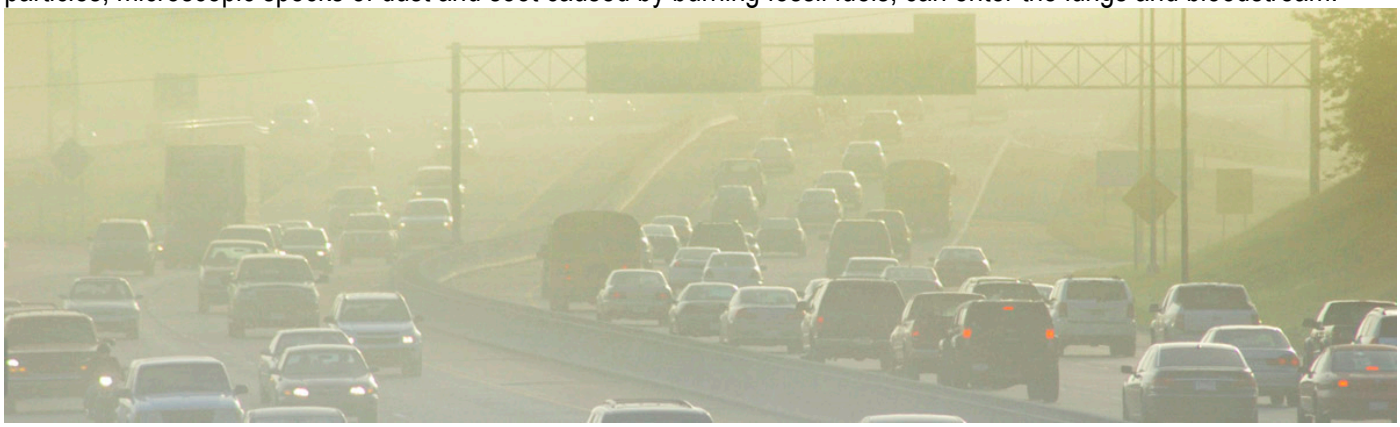


uRADMonitor Model INDUSTRIAL

uRADMonitor INDUSTRIAL LoraWAN variant - motherboard front and bottom view

Impact

Air pollution is the single largest environmental cause of premature death in urban Europe and transport is the main source. The 2008 Air Quality Directive, now under review, obliges member states to cut exposure to fine particulate matter by an average of 20% by 2020, based on 2010 levels.
The National Emissions Ceiling Directive caps some emissions including particulate matter (PM) and nitrogen dioxide (NOx) at national level. A revised version of the directive is as of 2016 under scrutiny by the Council of Ministers and European Parliament.
Across the EU in 2013, nitrogen dioxide (NO_2), which is mostly produced by traffic, caused 68,000 premature deaths. The Dieselgate scandal exposed how Volkswagen had gamed NO_2 emissions tests.
Ozone (O_3) killed 16,000 and small particulate matter ($PM_{2.5}$) caused 436,000 deaths in the same year. $PM_{2.5}$ particles, microscopic specks of dust and soot caused by burning fossil fuels, can enter the lungs and bloodstream.



Air pollution has different particulate matter (PM) components – smoke, dirt and dust form coarse particles known as PM_{10} and metals and toxic exhaust from smelting, vehicle exhaust, power plants and refuse burning forming fine particles called $PM_{2.5}$.

uRADMonitor INDUSTRIAL is equipped with all sensors required to compute the Air Quality Index as defined by several international standards on air quality and give a direct assessment on the pollution problem and possible infringements.