Indoor Solutions

Scalable and easy-to-deploy solutions for indoor tracking of CO2 levels and control of sanitary and air quality conditions

RUBIX
Senses & Instrumentation

MONITOR CO2 LEVELS

The air you breathe right now has most probably been breathed out with particles that may end up in your body. Monitoring CO2 content in the air can tell you how well ventilated a room is and drastically lower the chance of transmitting airborne diseases. Last but not least, monitoring CO2 content can help you manage heating/cooling more effectively so you can ultimately cut on your energy usage

CO2

Accurately monitoring CO2 has many upsides for commercial, residential and public buildings (e.g. schools). It can tell you whether a room is well ventilated and if occupants are breathing fresh air

Humidity

This is a very important parameter to track the perception of comfort that is frequently overlooked. Monitoring humidity will allow you to offer a healthy environment

Notifications

With active occupant notifications, people can make sure they breathe fresh air, which has been proven vital during pandemics with airborne viruses

Temperature

Track temperature in indoor spaces accurately and gain data to optimize comfort and energy usage

Powerful battery

It can work flawlessly for up to 10 years without having to change batteries

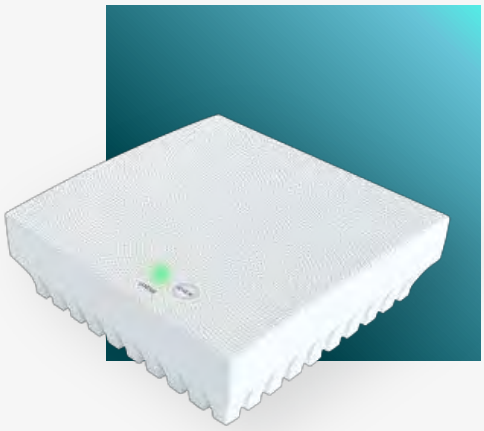
LED & Buzzer

If the CO2 present in the air becomes unhealthy, our device is able to alert the occupants with a visual and acoustic signal for the corresponding level of CO2

EMPOWER OCCUPANTS TO KNOW WHAT AIR QUALITY IS

The CO2 Lora Detector is not a simple sensor. It also visually and audibly notifies occupants whether the CO2 content in the air is healthy or not, so they can take the right actions to ensure they breathe fresh air

CO2 levels depend on occupancy, ventilation rate and outdoor CO2. Levels above 1000ppm can lead to drowsiness, headache and cognitive disfunction



BREATHE FRESH AIR

Good indoor air quality is overlooked too often. However, it can be a driver for a healthier, more productive lifestyle

Advanced systems to monitor CO2 content indoors act an important role in ensuring occupants' safety

Several countries in Europe have implemented regulatory measures to ensure workers are protected from airborne virus transmission

10 years of battery life

Thanks to LoRaWAN, the AQUI Sensor and Notifier can operate flawlessly for up to 10 years using off-the-shelf AA batteries

MONITOR AIR QUALITY & VIRUS PROPAGATION CONDITIONS

CO2 is one amongst several parameters that contributes to favor virus propagation, though it is not sufficient. Levels of humidity, temperature and particulate matters are, all together with CO2, required to be monitored to compile a virus propagation index

CO2

Accurately monitoring CO2 has many upsides for commercial, residential and public buildings (e.g. schools). It can tell you whether a room is well ventilated and if occupants are breathing fresh air

Humidity/Temperature

Viruses' stability varies depending on the environment conditions, high values of these parameters tend to reduce viruses' transmissions while low values would on the contrary increase circulation

Particulate Matters

High levels of PM have shown to decrease biological defenses, and particularly respiratory ones, which would increase the transmission of influenza-like viruses. It also reflects the poor ventilation of a room

TVOCs

They affect your sense off wellbeing and if you feel comfortable inside a building. Some are more harmful than others and depends of exposure and length of time being exposed.

Other Gases & Odors

Ability to measure various gases and fingerprint odors helps controlling other kind of nuisances as well as detecting meaningful events (ex: cleaning process)

Noise, Light & Vibration

General wellbeing can highly be affected by these parameters and should be kept under control.

LED, QR Code & Communication

POD2 Color indicator alerts occupants, QR Code allows to capture subjective people feedback, several communications options available (PoE, LoRaWan, 4G)

EMPOWER OCCUPANTS TO GO BEYOND CO2 MONITORING

The POD2 Advanced is an Environmental Intelligence Monitoring system to precisely understand air quality conditions and trigger meaningful alerts when critical nuisance thresholds are crossed. It also helps remediate through automatic triggers for remediation and mitigation and collect subjective human feedback.

Indoor air environment is complex and requires to monitor various gases and parameters to propose accurate and meaningful representation of the conditions (CO2, PM, Temp, Hum, etc.)

SECURE PLACES

Advanced and diverse information collected help in having a deep understanding of indoor environments and keep them under control both from an air quality and sanitary standpoints.

It plays a key role in insuring trust with occupants sharing relevant information, collecting subjective feedback as well as being connected to remediation actions: cleaning process, air purifying,…

All-in-One Environmental Monitoring

Mimicking human senses, POD2 deployed in networks act as humans sensing their environments everywhere, anytime

CLEANING PROCESS IMPROVEMENT

The POD2 allows to follow the information relative to the detection of detergent and thus to follow and optimize the operations of cleaning or disinfection, in a way adapted with the frequentation of the places

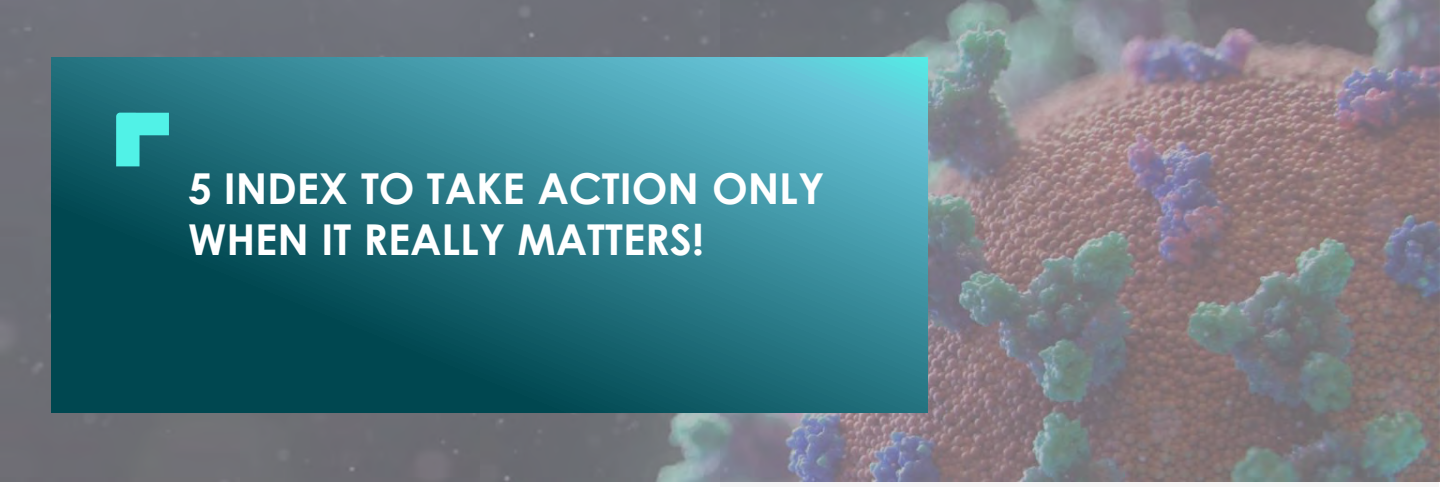
By measuring parameters such as Formaldehydes (CH2O) and Ethylene Oxide (C2H4O), which are found in most of the disinfectants, the POD2 allows you to optimize your cleaning processes and to offer high quality services

- Offer clean, healthy, disinfected and odor-free places to use with confidence

- Optimize cleaning actions by dealing with exceptional events and ensure compliance with disinfection procedures

- Have a well-calibrated, tailor-made cleaning service adapted to the frequency of use of the premises

- Budget optimization:
  - Targeted interventions according to needs
  - Optimal use of disinfectants and resources



5 INDEX TO TAKE ACTION ONLY WHEN IT REALLY MATTERS!

Instantaneous measurement and display of values can lead to anxiety-inducing situations for occupants and potentially trigger false alarms. Relying on leading indicators is essential to thoroughly understand conditions and take appropriate action

Containment index

Based on a continuous measurement of the CO2 concentration, it characterizes the adequacy of air renewal in a room according to its occupation. It allows to express on a unique scale from 0 to 5 the frequency and the intensity of the confinement situations undergone by the occupants. A high confinement index indicates that the air renewal was insufficient in the room

- Benefit from a healthy and sufficiently renewed air
- Positive impact on cognitive performance
- Avoid relying solely on instantaneous values that do not necessarily indicate a problematic situation

Comfort index

It is composed of objective parameters affecting the well-being of occupants such as temperature, noise and humidity. It ensures optimal conditions of comfort and use for the occupants. Moreover, it prevents the anticipated degradation of the building's infrastructure

- Functional and comfortable environment to be able to enjoy the spaces in all tranquillity
- Complete and regular control of the comfort of the spaces, adapted to the frequentation of the people
- Reduced absenteeism due to better conditions
- Cost optimization (use of energy, insurance contract, extension of equipment life...)

5 INDEX TO TAKE ACTION

Viral transmission index

Based on a scale of 0 to 10 and divided into 4 sub-levels, it allows to know in real time the risk of transmission incurred if a virus is present in a closed space
It provides accurate information on air quality and whether your environments are conducive to virus transmission
Particularly useful in the fight against Covid-19, promoting the recovery of economic and social life
For more information, see our fact sheet on viral transmission

- Understanding of the environment and making decisions based on accurate, actionable data in real time
- Reduction of the risk of virus propagation by triggering corrective actions
- Facilitating the return to shared spaces

Air Quality Index

It characterizes in an advanced way the global pollution level of the environment. It allows to ensure the good quality of the air and its renewal to guarantee a healthy air

- Control air quality in a detailed manner (all particles)
- Remedy in real time and according to specific needs and environment
- Cost optimization through intelligent energy use

Odor Index

It characterizes the number, intensity and persistence of persistent olfactory events, objectifying the olfactory nuisances felt in a space

- Well-calibrated, tailor-made cleaning services adapted to the frequency of use of the premises
- To offer clean, healthy, disinfected and odor-free premises
- Cost optimization

RUBIXSOFT ENVIRONMENTAL INTELLIGENCE PLATFORM

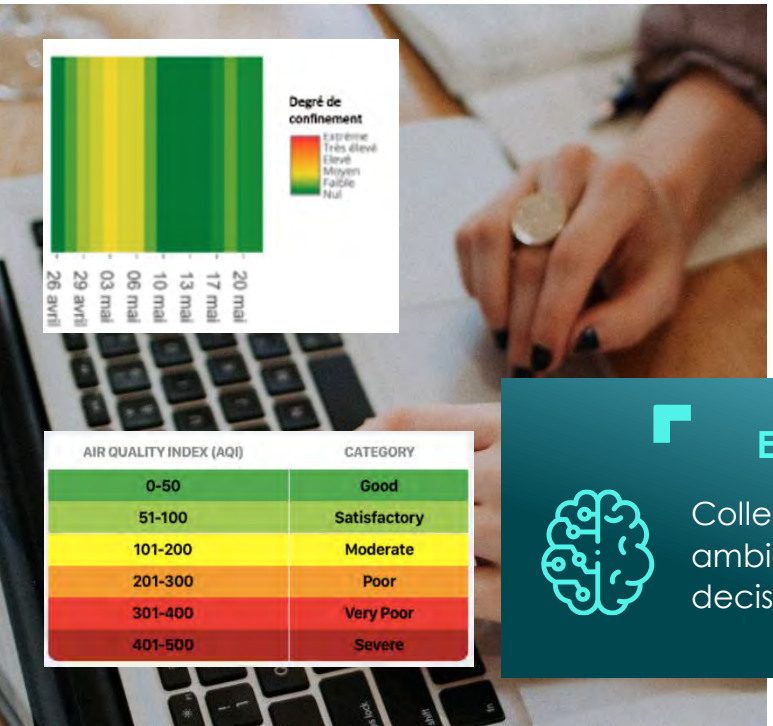
A connected solution: The devices (CO2 detector and POD2) permanently record the data of each indicator and index and can save up to 2 years of history in case of loss of connection (POD2 only). They download the measurements in real time via a connection to the RUBIXSOFT

Thanks to RUBIXSOFT's API system, the PODs can interface and communicate with other connected objects in order to automatically readjust identified anomalies; for example, an air purifier

MONITOR & ACT

RUBIXSOFT allows you to consult data and indices but also to define and manage alerts. These alerts are triggered and notify you in real time by sms or email. This allows you to immediately remedy the incident in a precise and informed manner.

Our complete solution generates "intelligent reports" for managers, allowing a simple visualization of the main parameters that have an impact on the air quality of your environment



Environmental Intelligence

Collection and enrichment of data on ambient environmental conditions for decision making

A CONNECTED SOLUTION IS A SMARTER SOLUTION

A "smart" solution that offers the following advantages, unlike non-connected sensors

- **Real-time alerts: no matter where** you are, you will be informed in real time of the conditions of your spaces, without having to look at the device all the time
- **Intelligent alerts:** creation of indices allowing to alert in a more relevant and representative way of the real conditions of the environment (exposure to pollutants) and to avoid « false positives »
- **Historical data:** access to historical information collected for better analysis of the environment and prediction of long-term conditions. In addition, availability of data in the form of reports for easy communication to stakeholders
- **Scalable solution:** network of devices that work in a coordinated manner, allowing for global quality control of different environments at the same time

A TRUE MEASURE OF CO2

There are 2 ways to measure CO2 and, unlike most CO2 sensors on the market, the POD2 offers a true measurement and control of CO2:

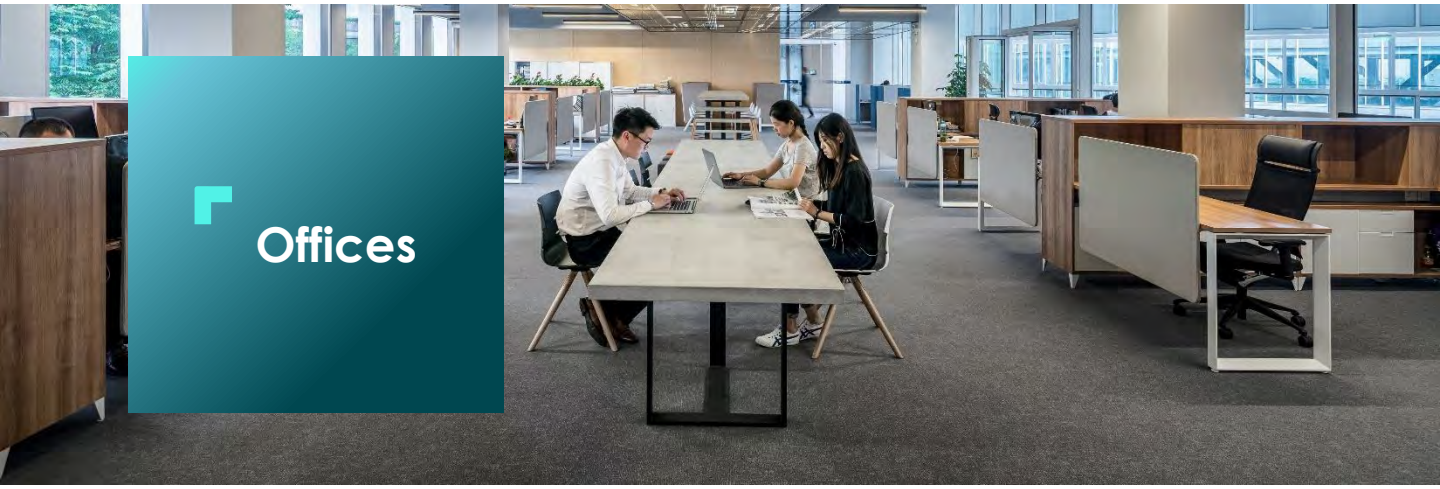
An indirect and unreliable method	Direct measurement
Through a measurement of VOCs and in a qualitative way, this measurement offers just a trend of the variation of the CO2 rate, but in no case a true measurement. **This is why it is called "CO2 equivalent" (CO2eq)**	Through a specialized optical technology sensor (NDIR), which provides an accurate measurement of the CO2 level in ppm in indoor air **This measurement is used by the POD2**

However, **the measurement of CO2 is only a starting point**. In order to have a real control of the environment**, it is necessary to characterize the environment in a holistic way**; taking into account other parameters such as temperature and humidity but also fine particles, gases, noise, light or odors.

USE CASES

Schools

- Be confident your staff and students are in a healthy and safe environment with fresh air
- Keep track of indoor temperature and humidity, access historical data
- Receive and review comprehensive reports for your entire school
- Spot patterns and improve indoor air ventilation
- A practical approach to teaching students why good air quality matter
- Understand the possibility of mold growth and spread in your building



Offices

- Promote employee wellbeing and productivity
- Understand the indoor air quality, learn and receive tips on how to improve it
- Incentivize return to the office
- Understand mold growth possibility and act before the damages occur
- Involve your employees - allow them to be aware of the air quality and receive feedback
- Spot temperature inconsistencies in the office and solve them

USE CASES

Hospital

- Ensure your patients are breathing fresh and healthy
- Track CO2 levels and air quality inside and ensure well-ventilated and fresh air
- Receive comprehensive reports and understand how to improve it in the long-term
- Understand when and where something influences the indoor air quality
- Track disinfection activities throughout your facilities
- Understand when and where mold could form in your facilities

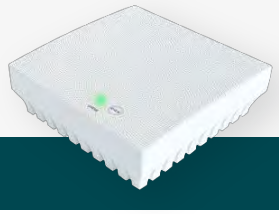
Municipality

- Promote employee wellbeing and productivity
- Promote a safe environment for citizens to visit, reduce virus infection anxiety
- Discover facility-related issues before they appear
- Understand, learn and receive tips on how to improve the air quality in your estates
- Manage multiple rooms and buildings from the same platform
- Save energy by better balancing the temperature in your building - reduce overheating and overcooling.

INDOOR SOLUTIONS

	SOLUTIONS					
	PEOPLE PRESENCE	BASIC E.Q.	WELL BEING & COVID	CLEANING	TOILETS	OZONOLYSYS
MEASUREMENTS						
Temperature	X	X	X	X	X	X
Humidity	X	X	X	X	X	X
CO2	X	X	X	X	X	X
Particulate Matters (PM1, PM2.5, PM4, PM10)			X	X	X	X
Total Volatile Organic Compounds (TVOC)		X	X	X	X	X
Atmospheric Pressure		X	X	X	X	X
Lighting Level		X	X	X	X	X
Noise Level		X	X	X	X	X
Vibration Level		X	X	X	X	X
Ethylen-Oxyde & Ozone						X
CLEANING & DISINFECTION PROCESS MONITORING						
Cleaning Passages Monitoring				X	X	X
Cleaning Product Identification				X	X	X
Toilets Usage Monitoring					X	X
Ozonolysis Process Monitoring						X
INDEXES						
Containement Index	X	X	X	X	X	X
Viral Transmission Index			X	X	X	X
Comfort Index			X	X	X	X
Air Quality Index			X	X	X	X
Odor Index				X	X	X
PLATFORM / APPLICATION						
Multi-users Access	X	X	X	X	X	X
SMS & Email Alerts	X	X	X	X	X	X
Automatic Periodic Reports	X	X	X	X	X	X
QR Code: Subjective Feedback		X	X	X	X	X

SENSOR FUNCTIONS

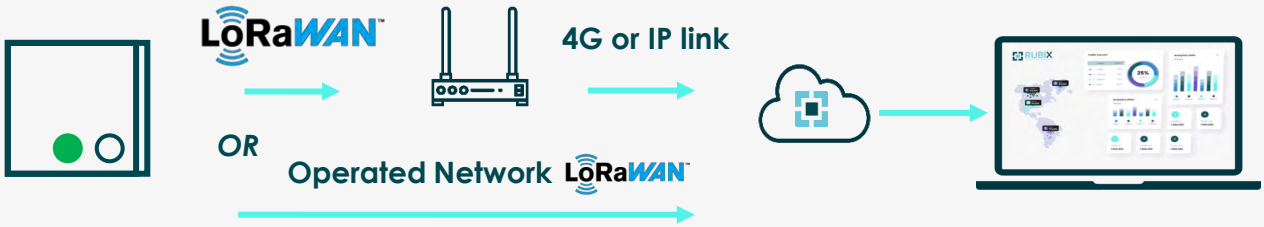


PARAMETERS		
Temperature	✓	✓
Humidity	✓	✓
CO2 concentration	✓	✓
Mass concentration of particles (PM1, PM2.5, PM4, PM10)		✓
Number of PM (PM0.5, PM1, PM2.5, PM4, PM10)		✓
Total Volatile Organic Compounds		✓
Atmospheric Pressure		✓
Light level		✓
Equivalent noise level		✓
Vibration level		✓
OPTION: Electrochemical sensor card (4 gases max)		✓

INDEX		
Containement index	✓	✓
Viral transmission index		✓
Comfort index		✓
Air Quality Index		✓
Odor Index		✓

CO2 LoRa DETECTOR – HOW DOES IT WORKS?

LoRaWAN® devices work with special radio waves that can penetrate through multiple walls and obstacles. They offer a long range of connectivity as well as long battery life (up to 10 years). All LoRaWAN devices connect to a LoRaWAN® gateway in the vicinity and vicinity and transmit collected data to it. The Gateway then sends the data to a LoRaWAN® Network server. Data can then be visualized in Rubix Soft platform



Data collection

LoRa CO2 detector

Transfer data

Via a gateway or directly to the cloud

Organize and display data

Rubix software platform

PRODUCT DESCRIPTION

The CO2 LoRa Detector is a device that uses NDIR technology to measure the actual CO2 and has built-in temperature and humidity sensors. The device also has acoustic and visual notification abilities to indicate occupants whether a room should be ventilated

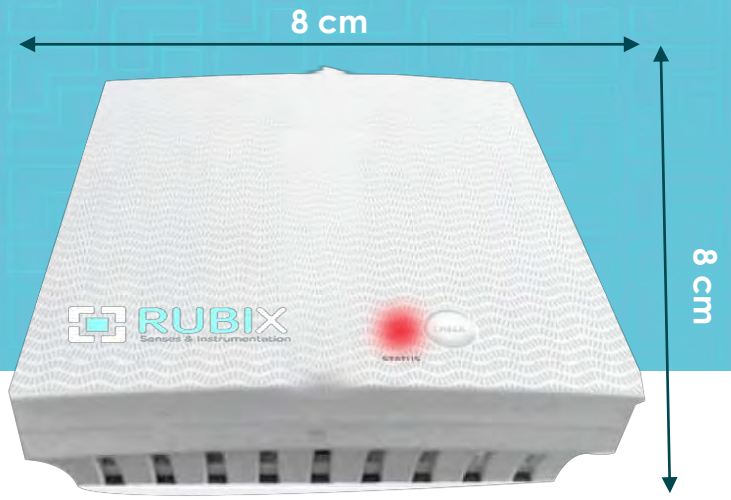
Product features

- CO2 Sensor (NDIR)
- Temperature sensor
- Humidity sensor
- RGB LED
- Acoustic buzzer
- 2xAA power supply
- 5 mn measurements

Applications

- Smart Buildings
- Smart Home
- Residential buildings
- Commercial buildings
- Environment monitoring

CO2 LoRa DETECTOR SPECIFICATIONS

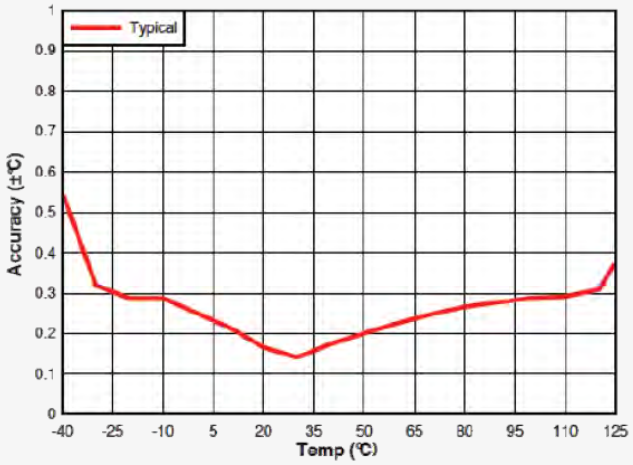


Mechanical specifications	
Weight	68 gr
Dimensions	80 x 80 x 19 mm
Housing	ABS
Ringing sound pressure level	80 dB at 10 cm
Operating conditions	
Temperature	0 - +50°C
Humidity	0-80% RH (non-condensing)
Power supply	
Type of battery	2xAA (1,5VDC)
Operating voltage	3VDC
Communication	
Wireless technology	LoRaWAN® 1.0.3 - Class A End Device

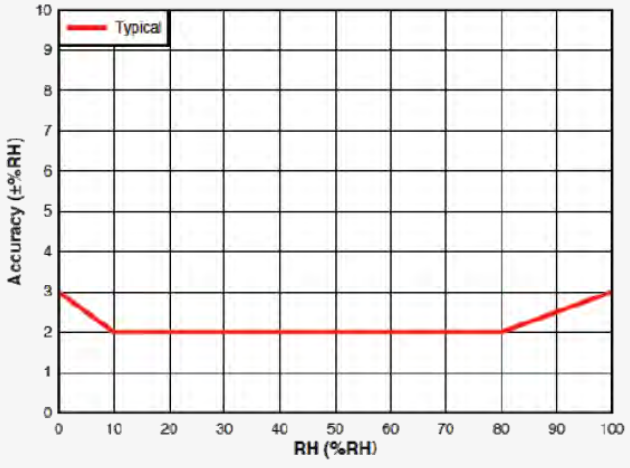
CO2 LoRa DETECTOR SENSORS

CO2	
Accuracy	±3% or 30 ppm at 25°C
Range	0-5000ppm
Technology	NDIR
Peak consumption	15mA

Temperature	
Resolution	0,18 °C
Accuracy	± 0,2 °C

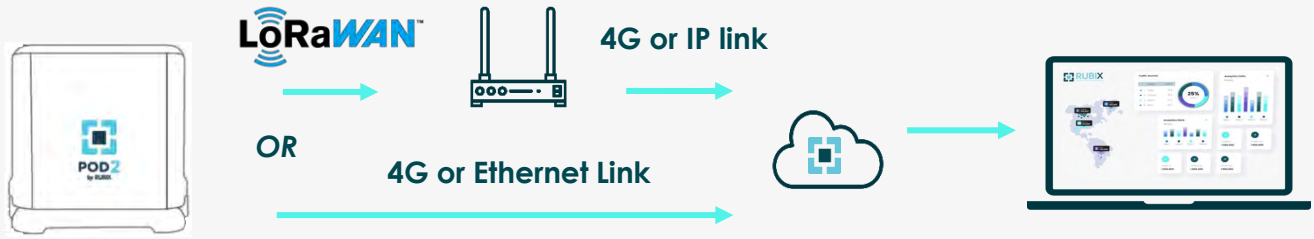


Relative Humidity	
Resolution	0,39 %
Accuracy	2 %



POD2 – HOW DOES IT WORKS?

Cellular communication (4G) or Ethernet are the preferred options to connect the POD2 in order to take full advantage of its capabilities LoRaWAN® option is available for specific cases allowing lower performance. Once transmitted and processes, data can then be visualized in RubixSoft platform.



Collect Data

POD2 analyzer

Transfer Data

Through a gateway or directly to the cloud

Organize & Display Data

RubixSoft Platform

PRODUCT DESCRIPTION

The POD2 is a device that uses NDIR technology to measure the actual CO2, has built-in temperature, humidity, pressure sound and light sensors. The device also has visual notification abilities to indicate occupants whether a room should be ventilated. In addition, it uses Particulate Matters sensor as well as electrochemical sensors to measure gases (more than 15 possible gases)

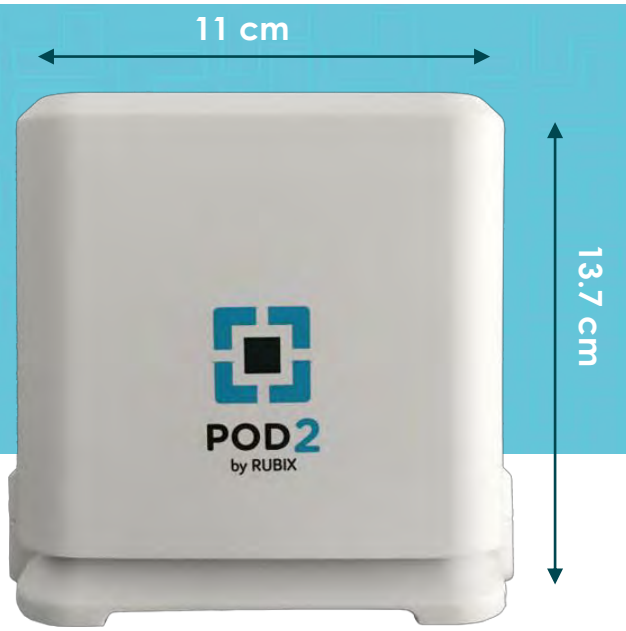
Product features

- CO2 Sensor (NDIR)
- Temp./Hum./Pression/Light/Noise sensors
- TVOC sensor
- Particulate Matter sensor
- Electrochemical sensors (option)
- Colored LED
- QR Code for subjective feedback
- 5V power supply
- 10s measurements (4G or IP)

Applications

- Smart Buildings
- Smart Home
- Residential buildings
- Commercial buildings
- Environment monitoring

POD2 ADVANCED SPECIFICATIONS



Mechanical specifications	
Weight	360 gr
Dimensions	11 x 11 x 13,7 cm
Enclosure	ABS
Buzzer sound pressure level	80 dB at 10 cm
Operating conditions	
Temperature	-10 - +40°C
Humidity	0-100% RH (non-condensing)
Power supply	
Operating voltage	5V DC
Communication	
Wireless technology	4G, Wifi, LoRaWAN®
Wired technology	Ethernet (PoE)

POD2 SENSORS

Type of Sensor	Measuring Range	Accuracy	Resolution
Temperature	-40°c to +85°c	0.5°C to 2°C	±1
Atmospheric pressure	300 to 1100 hPa	0.25%	1 hPa
Humidity	0 to 100% Rh	3%	1%
CO2 concentration	400 to 10 000 ppm	400 to 10 000 ppm	1 ppm
Mass concentration of particles (PM1, PM2.5, PM4, PM10)	0 to 1000 µg/m3	10 µg/m3	0.1 µg/m3
PM count (PM0.5, PM1, PM2.5, PM4, PM10)	0 to 1 000 1/cm3	10% (25% for PM4, PM10)	0.1 1/cm3
Total VOC concentration equivalent	0 to 1000 ppm	-	0.1 ppm
Illumination level	0 to 10 000 Lux	10%	1 Lux
Equivalent noise level	30 dBA to 120 dBA	-	0.1 dBA
Vibration level	0 to 40m/s2	-	0.01m/s2
Electrochemical sensor board (4 gases max)	Option * (ask for details)	Option * (ask for details)	Option * (ask for details)

**Available gases: NH3, H2S, NO2, O3, SO2, NO, CO, O2, CI2, HCI (HBr), CH2O (formaldehyde), H2O2, EtO, Alcohols, PH3, HCN, H2*

RUBIX

Senses & Instrumentation

Leader in environmental intelligence for a healthier world, through environmental monitoring and source identification IoT technologies

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