User Manual

V1.3 03/24

MICA Mini / MICA / MICA Plus / MICA WELL

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1.General Description

MICA is an smart monitor that continuously measures indoor air quality. This device is capable of measuring up to 12 parameters: temperature, humidity, carbon dioxide (CO_2), volatile organic compounds (TVOC), suspended particles (PM10, PM4.0, PM2.5, and PM1.0), formaldehyde, ozone (O_3), nitrogen dioxide (NO_2), and carbon monoxide (CO).

The device communicates wirelessly with the My inBiot web platform where the user can see the indoor air quality of the room over a certain period of time, check the historical values, and obtain relevant information for each of the measured parameters.

Depending on the chosen version of the device, MICA can be placed on a desktop or installed on the wall.

Furthermore, with our MICA device, you can view real-time updates of air quality through our control panel, receive weekly reports, alerts, advice, and insights on managing indoor air quality when issues arise.

There are currently four “models” of the device: MICA WELL, which measures all parameters, MICA Plus, which only measures temperature, humidity, CO_2, TVOC, suspended particles, and formaldehyde, MICA, which only measures temperature, humidity, CO_2, PM2.5, PM10, and TVOC, and MICA Mini, which only measures temperature and humidity with aditional option of measuring CO_2.

Each of these models is available in two versions: Desktop, which is designed to be placed on a desk or flat surface and connects via USB-C, and the wall version, which is designed to be installed either in an electrical flush-mounted box or directly screwed to the wall with AC power.

2.Technical Specifications

Features

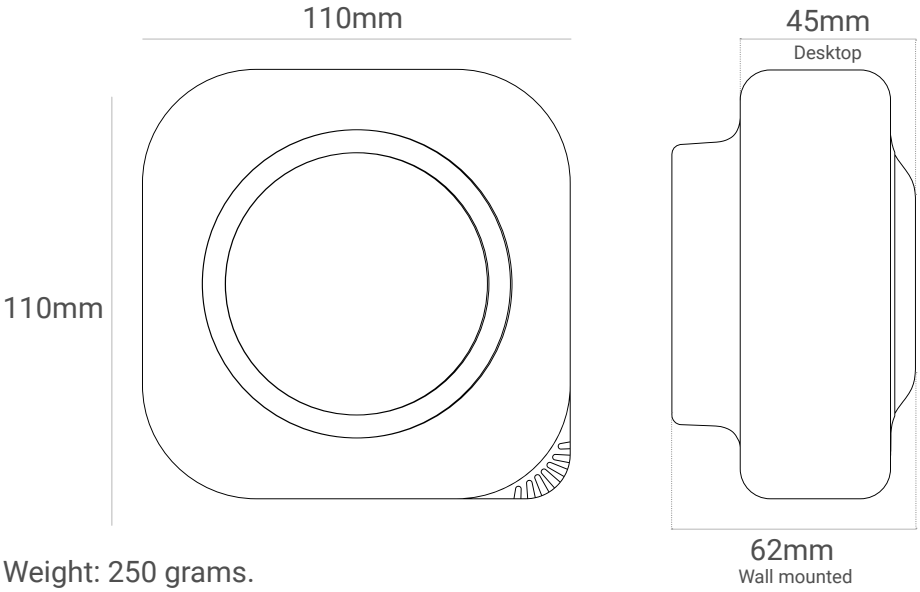
Multifunction touch button.

Status LED light ring.

USB type C connector.

Wi-Fi connection.*

Dimensions and weight



Weight: 250 grams.

Power Supply Options

USB type C cable + 5V USB power adapter (desktop only).

Fast 110 - 240V AC 50-60 Hz 0.2A connector.

Fast 8 - 36V DC 2A 10W connector.

Connectivity Options

LoRaWAN.

Sigfox.

NB-IoT / LTE-M.

Local Communication Options

Modbus RTU (RS-485).

Modbus TCP/IP (wireless) .

API.

MQTT.

*The device can only connect to 2.4 GHz WiFi networks. 5GHz WiFi networks are not supported.
Supported authentication and security protocols: WPA2 (Personal), WPA2 Enterprise, WPA3 (Personal), and WPA3 Enterprise.

3.Sensors

MICA Mini

Temperature

Sensor: Silicon bandgap / Unit: ºC
Range: -40 - 145 ºC / Resolution: 0,1 ºC
Accuracy: ± 0,5 ºC
Lifespan[1]: >10 years

Relative Humidity

Sensor: Capacitive / Unit: %RH
Range: 0 - 100 %RH / Resolution: 1 %RH
Accuracy: ± 2 %RH
Lifespan: >10 years

Optional sensor: CO_2

Sensor: NDIR / Unit: ppm
Range: 400 - 10.000 ppm / Resolution: 1ppm
Accuracy: ±(30 + 3% m.v.) ppm
Lifespan: >10 years

[1] Lifespan is based on the average lifetime of the sensor, at which the specified accuracy is guaranteed. After the indicated years, it is recommended to replace the sensor to guarantee the accuracy of the measurement.

MICA

Temperature

Sensor: Silicon bandgap / Unit: ºC
Range: -40 - 145 ºC / Resolution: 0,1 ºC
Accuracy: ± 0,5 ºC
Lifespan[1]: >10 years

Relative Humidity

Sensor: Capacitive / Unit: %RH
Range: 0 - 100 %RH / Resolution: 1 %RH
Accuracy: ± 2 %RH
Lifespan: >10 years

CO_2

Sensor: NDIR / Unit: ppm
Range: 400 - 10.000 ppm / Resolution: 1ppm
Accuracy: ±(30 + 3% m.v.) ppm
Lifespan: >10 years

TVOC

Sensor: NDIR / Unit: ppb
Range: 0 - 2383 ppb / Resolution: 1ppb
Accuracy: ± 15% v.m.
Lifespan: >10 years

$PM_{2,5}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ± (5 µg/m^3 + 5% m.v.) (0 -100 µg/m^3), ±10% m.v. (101-1000 µg/m^3)
Lifespan: >10 years

PM_{10}

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ±25 µg/m^3 (0 -100 µg/m^3), ±25% m.v. (101 - 1000 µg/m^3)
Lifespan: >10 years

[1] Lifespan is based on the average lifetime of the sensor, at which the specified accuracy is guaranteed. After the indicated years, it is recommended to replace the sensor to guarantee the accuracy of the measurement.

MICA Plus

Temperature

Sensor: Silicon bandgap / Unit: ºC
Range: -40 - 145 ºC / Resolution: 0,1 ºC
Accuracy: ± 0,5 ºC
Lifespan[1]: >10 years

Relative Humidity

Sensor: Capacitive / Unit: %RH
Range: 0 - 100 %RH / Resolution: 1 %RH
Accuracy: ± 2 %RH
Lifespan: >10 years

CO_2

Sensor: NDIR / Unit: ppm
Range: 400 - 10.000 ppm / Resolution: 1ppm
Accuracy: ±(30 + 3% m.v.) ppm
Lifespan: >10 years

TVOC

Sensor: NDIR / Unit: ppb
Range: 0 - 2383 ppb / Resolution: 1ppb
Accuracy: ± 15% v.m.
Lifespan: >10 years

$PM_{2,5}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ± (5 µg/m^3 + 5% m.v.) (0 -100 µg/m^3), ±10% m.v. (101-1000 µg/m^3)
Lifespan: >10 years

PM_{10}

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ±25 µg/m^3 (0 -100 µg/m^3), ±25% m.v. (101 - 1000 µg/m^3)
Lifespan: >10 years

[1] Lifespan is based on the average lifetime of the sensor, at which the specified accuracy is guaranteed. After the indicated years, it is recommended to replace the sensor to guarantee the accuracy of the measurement.

$PM_{4,0}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ±25 µg/m^3 (0 -100 µg/m^3), ±25% m.v. (101 - 1000 µg/m^3)
Lifespan: >10 years

$PM_{1,0}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ± (5 µg/m^3 + 5% m.v.) (0 -100 µg/m^3), ±10% m.v. (101-1000 µg/m^3)
Lifespan: >10 years

Formaldehyde

Sensor: Electrochemical / Unit: ppb
Range: 0 - 1000 ppb / Resolution: 1 ppb
Accuracy: ±20 µg/m^3 or ±20% m.v., whichever is larger
Lifespan: >6 years

[1] Lifespan is based on the average lifetime of the sensor, at which the specified accuracy is guaranteed. After the indicated years, it is recommended to replace the sensor to guarantee the accuracy of the measurement.

MICA WELL

Temperature

Sensor: Silicon bandgap / Unit: ºC
Range: -40 - 145 ºC / Resolution: 0,1 ºC
Accuracy: ± 0,5 ºC
Lifespan[1]: >10 years

Relative Humidity

Sensor: Capacitive / Unit: %RH
Range: 0 - 100 %RH / Resolution: 1 %RH
Accuracy: ± 2 %RH
Lifespan: >10 years

CO_2

Sensor: NDIR / Unit: ppm
Range: 400 - 10.000 ppm / Resolution: 1ppm
Accuracy: ±(30 + 3% m.v.) ppm
Lifespan: >10 years

TVOC

Sensor: NDIR / Unit: ppb
Range: 0 - 2383 ppb / Resolution: 1ppb
Accuracy: ± 15% v.m.
Lifespan: >10 years

$PM_{2,5}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ± (5 µg/m^3 + 5% m.v.) (0 -100 µg/m^3), ±10% m.v. (101-1000 µg/m^3)
Lifespan: >10 years

PM_{10}

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ±25 µg/m^3 (0 -100 µg/m^3), ±25% m.v. (101 - 1000 µg/m^3)
Lifespan: >10 years

[1] Lifespan is based on the average lifetime of the sensor, at which the specified accuracy is guaranteed. After the indicated years, it is recommended to replace the sensor to guarantee the accuracy of the measurement.

$PM_{4,0}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ±25 µg/m^3 (0 -100 µg/m^3), ±25% m.v. (101 - 1000 µg/m^3)
Lifespan: >10 years

$PM_{1,0}$

Sensor: Particle laser / Unit: µg/m^3
Range: 0 - 1.000 µg/m^3 / Resolution: 1 µg/m^3
Accuracy: ± (5 µg/m^3 + 5% m.v.) (0 -100 µg/m^3), ±10% m.v. (101-1000 µg/m^3)
Lifespan: >10 years

Formaldehyde

Sensor: Electrochemical / Unit: ppb
Range: 0 - 1000 ppb / Resolution: 1 ppb
Accuracy: ±20 µg/m^3 or ±20% m.v., whichever is larger
Lifespan: >6 years

O_3

Sensor: Electrochemical / Unit: ppb
Range: 0 - 5.000 ppb / Resolution: 1 ppb
Accuracy: ±10 ppb (0 - 500 ppb), ±2% m.v. (500 - 5000 ppb)
Lifespan[1]: >10 years

NO_2

Sensor: Electroquímico / Unit: ppb
Range: 0 - 2500 ppb / Resolution: 1 ppb
Accuracy: ±20 ppb (0 - 500 ppb), ±(3% m.v. AND 5 ppb) (500 - 2500 ppb)
Lifespan[1]: >10 years

CO

Sensor: Electrochemical / Unit: ppm
Range: 0 - 1000 ppm / Resolution: 0,1 ppm
Accuracy: ±1 ppm (0 - 100 ppm), ±1% m.v. (100 - 1000 ppm)
Lifespan[1]: >10 years

[1] Lifespan is based on the average lifetime of the sensor, at which the specified accuracy is guaranteed. After the indicated years, it is recommended to replace the sensor to guarantee the accuracy of the measurement.

4. Indicators

My inBiot Indicators

IAQ

The Indoor Air Quality (IAQ) Indicator is based on the RESET AIR INDEX and allows for simple communication, on a scale of 0-100, of the indoor air quality of a space. It enables real-time and straightforward checking of the overall air quality in a specific area. The IAQ indicator also includes improvement recommendations and allows for tracking the evolution of air quality over the selected period.

It is calculated from continuous monitoring data of the most relevant parameters for defining indoor air quality, such as CO2, TVOC, and PM2.5, and their combined impact.

It takes into account the cumulative effect of exposure over time, evaluating the sum of concentrations of different pollutants and considering the objectives of the RESET AIR Standard, as well as the know-how developed by inBiot regarding the behavior of specific CO2, TVOC, and PM2.5 sensors in a monitoring device, and the impact on health of different parameters combined under certain conditions of indoor space use.

The indicator defines 6 impact categories on indoor air quality: poor (0-16%), inadequate (17-32%), fair (33-48%), moderate (49-65%), good (66-83%), and excellent (84-100%), according to the calculation made by an algorithm based on CO2, TVOC, and PM2.5 concentrations.

- Poor: Continuously low levels of indoor air quality can endanger the health and well-being of occupants.
- Inadequate: Prolonged inadequate indoor air quality is a health and well-being alarm situation.
- Fair: Indoor air quality with a low trend implies the possibility of experiencing adverse health effects.
- Moderate: Indoor air quality is moderate, and although the general public is unlikely to be affected in this range of the indicator, hypersensitive individuals may experience mild to moderate conditions.
- Good: Air quality is good, although levels of pollutants may be detected, decreasing the desired indoor air quality and potentially causing specific long-term problems.
- Excellent: Indoor air quality is excellent, and there is no risk to health.

Ventilation Eficiency

The Ventilation Effectiveness Indicator measures in real-time the effectiveness of ventilation in an indoor space, represented on a scale of 0-100 and based on continuous monitoring of CO2 and TVOC.

The "Ventilation Effectiveness Indicator" in indoor spaces is a tool developed by inBiot to evaluate and control the effectiveness of ventilation and the degree of air renewal. CO2 and TVOC are two important parameters to determine if ventilation is adequate and sufficient to maintain a healthy and comfortable indoor environment.

1. Continuous monitoring of CO2: Carbon dioxide is a gas exhaled in breathing and, therefore, a good indicator of the degree of air renewal in an occupied space. Elevated CO2 levels can be an indication of inadequate ventilation.

2. Continuous monitoring of TVOC: Total volatile organic compounds (TVOC) are the set of chemical substances released into indoor air from products and building materials, equipment, or cleaning products, such as paints, furniture, or hygiene products. Exposure to high levels of TVOC can cause discomfort and health problems.

The Ventilation Effectiveness Indicator based on continuous monitoring of CO2 and TVOC allows for evaluating indoor air quality in real-time and provides valuable information on whether the ventilation degree of the space is sufficient to maintain a healthy indoor environment. When CO2 and TVOC levels exceed certain limits established by regulations or standards, the indicator is negatively affected. This indicator is calculated through an algorithm developed by inBiot, through which the person responsible for the air quality of the space is proactively informed so that corrective measures can be taken, such as adjusting, regulating, and controlling the space's air renewal systems.

The indicator defines 6 impact categories on ventilation effectiveness: poor (0-16%), inadequate (17-32%), fair (33-48%), moderate (49-65%), good (66-83%), and excellent (84-100%), according to the calculation made by the algorithm based on the concentration of CO2 and TVOC.

Resistance to Virus Spread

The transmission of viruses in indoor spaces is so complex and diverse that it can significantly change depending on the type of virus. There are several key parameters relevant in indoor spaces, such as temperature, relative humidity, ventilation effectiveness calculated from CO2 concentration, or suspended particles present in indoor air.

The new Virus Propagation Resistance Indicator from My inBiot indicates the probability of airborne virus propagation in an indoor space. Based on the RESET VIRAL INDEX, it shows on a scale of 0-100 the resistance that the air in a space offers to virus propagation.
The indicator calculates the infection potential based on scientifically validated indoor air quality metrics, such as temperature, relative humidity, PM2.5 concentration, and CO2, evaluated through

inBiot monitoring technology.

Although it is currently impossible to measure airborne virus transmission in real-time, continuous monitoring of a building's capacity to minimize the potential for airborne transmission infection is possible through a series of parameters. To do this, it is necessary to combine scientific research with real-time results in a standardized and meaningful way. This has shown the direct impact of humidity, temperature, and suspended particles in the air on the rate of viral infections.

Therefore, to understand the infection risk, it is necessary to know the virus's survival, the impact of different indoor air quality parameters on the immune system, and the dose of such exposure:

[Virus Survival] + [Immune System Impact] + [Dose] = [Infection Risk]

From this information, the resulting algorithm from the research work conducted by RESET for obtaining the virus indicator is applied, calculated in real-time in My inBiot from MICA monitoring data:

- VS: Virus Survival
- ISPM: Impact of PM2.5 on the immune system
- ISRH: Impact of relative humidity on the immune system
- PVDr: Potential Viral Dose Risk
- AIP: Airborne Infection Potential
- RVI: RESET Virus Indicator

Impact of different virus indicator parameters:

Temperature

The virus infection rate is significantly reduced at room temperature (20ºC) compared to colder temperatures, where viruses have greater persistence. On the other hand, at high temperatures, viruses destabilize and generally reduce their contagion capacity. High temperatures can reduce virus activity, and in some cases, can even inactivate it. Additionally, at low temperatures, the efficiency of our innate respiratory defenses is reduced.

Relative Humidity

A relative humidity between 40% and 60% is ideal from the thermohygrometric comfort standpoint, although in terms of virus inactivation, 50% is the optimal level as viruses show less activity.

With significantly low relative humidity (below 40%), the mucous membranes of the respiratory tract dry out, reducing their protective capacity against the entry of pathogens into the body. With high relative humidity (above 60%), the proportion of pathogenic germs in the air increases, and there is a higher probability of mold proliferation.

CO2

Ventilation is the key strategy to reduce the concentration of contaminants in indoor air, whether chemical compounds or biological agents such as viruses. High CO2 levels indicate a space with deficient ventilation and, therefore, a higher risk of virus concentration in the air.

PM2.5

Virus transmission and virulence also depend on the size and concentration of inhaled aerosols. With typical nasal breathing, aerosols can continuously deposit in the respiratory system. And in particular, small aerosols (those smaller than 2.5 µm - PM2.5) penetrate deeply into the respiratory tract and have

the ability to remain suspended longer than larger particles (PM10), which deposit on surfaces more easily due to gravity.

Thermohygrometric Comfort

The Comfort Indicator allows for the easy identification of the temperature and relative humidity range that represents thermal well-being. It helps to objectify the temperature and humidity conditions of an indoor space.

Thermohygrometric comfort can be defined as “the mood state that expresses satisfaction with the thermal environment and is assessed through subjective evaluation”. It greatly influences our experiences in the places where we live and work and is one of the factors that most impact people’s overall satisfaction in buildings since it affects individual levels of motivation, alertness, concentration, and mood. Its influence on the integumentary, endocrine, and respiratory systems also makes thermohygrometric comfort play an important role in our health, well-being, and productivity.

Beyond individual impact, indoor thermohygrometric comfort also influences the energy consumption of buildings. This is due to the impact of heating and cooling systems necessary to maintain the required comfort conditions, which represent approximately half of a building’s energy consumption.

The calculation of comfort conditions is defined in the UNE-EN ISO 7730. However, it is an analytical and interpretive determination of thermal well-being through the calculation of the PMV and PPD indices and local thermal comfort criteria individually, and does not allow for real-time monitoring.

InBiot offers the “Thermohygrometric Comfort Indicator” as an intelligent tool designed to measure and evaluate the level of thermohygrometric comfort in an indoor space. The aim of this indicator is to provide a quantitative measure of people’s satisfaction in terms of temperature and relative humidity, and its impact on well-being conditions.

The indicator defines 6 impact categories on comfort: poor (0-16%), inadequate (17-32%), fair (33-48%), moderate (49-65%), good (66-83%), excellent (84-100%). These categories are determined by the calculation made by an algorithm, based on the real-time measured indoor temperature and relative humidity.

MICA LED Indicator

MICA devices feature an LED indicator in the form of a ring, located on the front part of the device, which indicates the actions to be taken based on the ventilation needs of the space it is in.

No need to ventilate

Ventilation is recommended

Ventilation is needed

5. Levels and Recommendations

Temperature

The comfort temperature range is typically between 21°C and 25°C, according to the RITE (Regulation of Thermal Installations), with 21-23°C recommended in winter and 23-25°C in summer. However, these values may vary based on other factors influencing comfort.

My inBiot Ranges:

MICA only establishes a risk range for indoor temperature in indoor air quality assessment projects, as they must be evaluated in conjunction with other parameters such as relative humidity, primarily due to the variability of factors determining comfort. These comfort values range from 19°C to 27°C.

Humidity

The ideal relative humidity for a normal indoor temperature ranges between 45% and 50%, with recommended values between 40% and 60%.

My inBiot Ranges:

- GREEN: 35% - 60%
- YELLOW: 25% - 35% / 60% - 70%
- RED: < 25% or > 70%

Carbon Dioxide (CO_2)

In outdoor environments, the CO2 concentration level is approximately 350-400 ppm (parts per million). It is considered "stuffy" above 800-1,000 ppm, and severe symptoms can occur above 5,000 ppm.

My inBiot Ranges:

- GREEN: 800 ppm
- YELLOW: 800 - 1,500 ppm
- RED: > 1,500 ppm

Formaldehyde

The limits established in Spain for short-term occupational exposures (VLA-EC) are 0.3 ppm or 370 µg/m³. However, there is no reference value for residential indoor environments.

The technical measurement standard in Bioconstruction SBM2015 provides the following indicative values of formaldehyde concentration in indoor air for rest areas:

- Not significant: <20 µg/m³.
- Weakly significant: 20 - 50 µg/m³.
- Strongly significant: 50 - 100 µg/m³.
- Extremely significant: > 100 µg/m³.

The ranges of values used in the MICA device as indicators are collected taking into account the SBM values for rest areas, as well as the values from which allergic and sensitizing reactions occur:

My inBiot Ranges:

- GREEN: < 70 µg/m³
- YELLOW: 70 - 120 µg/m³
- RED: > 120 µg/m³

Volatile Organic Compounds (TVOC)

The AGÖEF (German Association for Ecological Research) has been working since 1993 to develop reference values for chemical compounds, both in air and dust samples.

The recommended limits are:

-50th Percentile (normal value): Not considered sufficient evidence for urgent action - TVOC < 360 µg/m³.
-90th Percentile (attention value): Emission source present - TVOC < 1,572 µg/m³.
-Guidance values: Reference value equivalent to values derived from toxicological risk - TVOC = 1,000 µg/m³.

The indicative values collected in the SBM2015 measurement standard refer to total volatile organic compounds, recommended as precautionary values for rest areas:

- Not significant: <1µg/m³.
- Weakly significant: 100 - 300µg/m³.
- Strongly significant: 300 - 1000 µg/m³.
- Extremely significant: >1000µg/m³.

The ranges of values used in the MICA device as indicators are collected taking into account the values of the German Federal Environmental Agency, from which, depending on the exposure time, allergic and sensitizing reactions, hypersensitivities, or diseases of various pathologies can result.

My inBiot Ranges:

- GREEN: < 204 ppb.
- YELLOW: 204 - 621 ppb.
- RED: > 621 ppb.

Particulate Mattter (PM1.0, PM2.5 & PM4.0)

PM2.5 particles (with a diameter ≤ 2.5 µm) can remain in the air for weeks and are more likely to travel through ventilation systems. The current standards of the EPA (Environmental Protection Agency of the United States) recommend maximum values for PM2.5 of 35 µg/m³, although it reduces the annual total values to 12 – 15 µg/m³. The EU also sets maximum levels of 20 µg/m³ for PM2.5, albeit with a perspective of increasing the restriction.

My inBiot Ranges:

- GREEN: < 15 µg/m³.
- YELLOW: < 35 µg/m³.
- RED: PM2.5 >= 35 µg/m³.

Particulate Mattter (PM10)

Particles larger than 10 µm quickly settle in dust; PM10 particles (with a diameter ≤ 10 µm) can remain suspended for hours.

My inBiot Ranges:

- GREEN: < 50 µg/m³.
- YELLOW: < 100 µg/m³.
- RED: >= 100 µg/m³.

6. Instalation

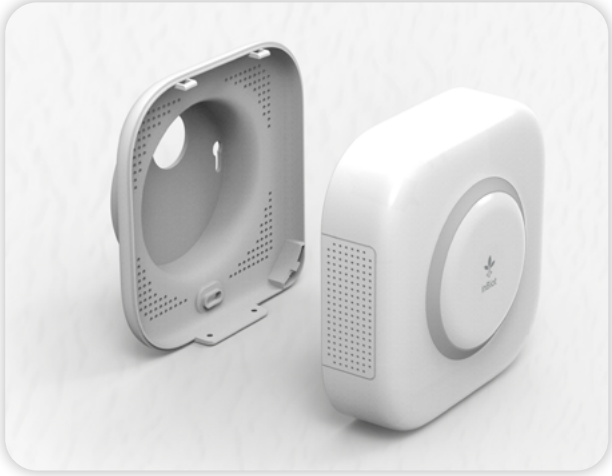
To install the MICA on a wall, follow the steps found in the Installation Manual. This manual can be found at inbiot.es/soporte in the “Documentation” tab.

Before starting the installation, remember to follow these steps:

1. Identify what type of installation you are going to do: on the wall or in an electrical box.
2. Check what communication and connectivity options has your MICA at the bottom of the box.

3. Check that the box contents are correct.
4. Remove the MICA from the box and remove the back cover from the case.

Remove bottom screws (2)



Detach the back cover of the MICA

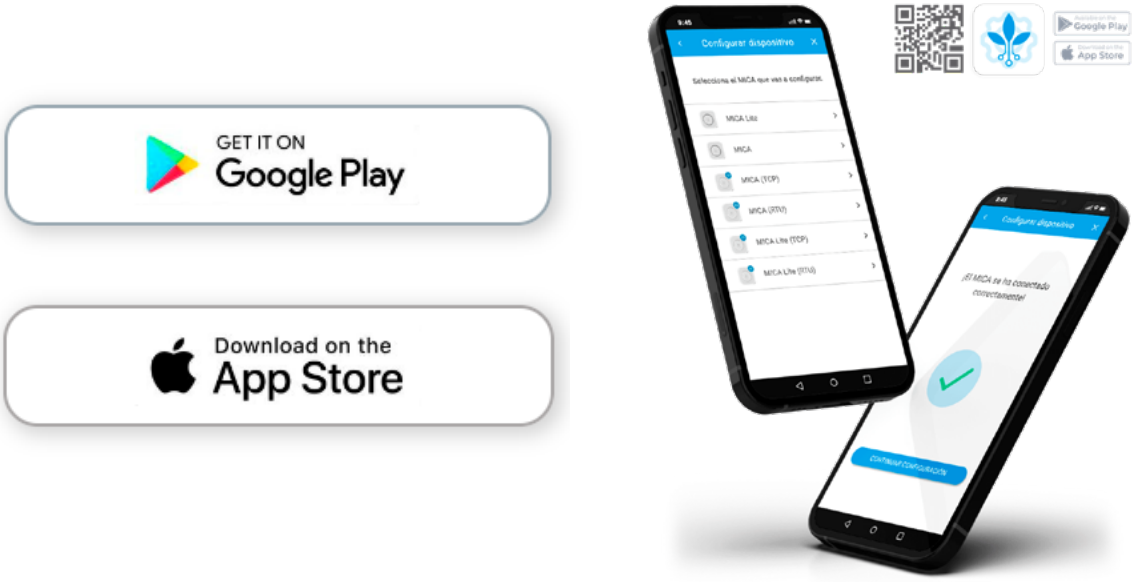
Nota: The recommended height to install the electrical boxes or attach the MICA to the wall is between 120cm and 180cm.

Download Installation Manual

7.Configuration

Configuring MICA

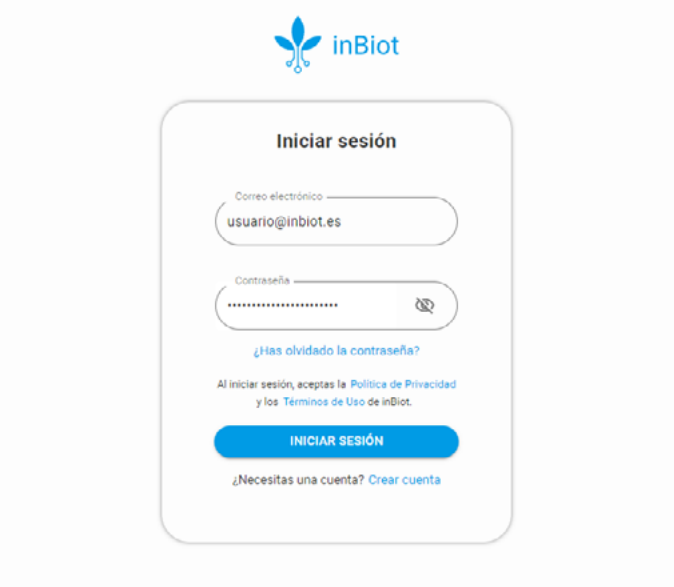
To configure MICA, you must download the configuration app and follow the steps indicated. If you need help you can watch the video tutorial available at inbiot.es/support in the “Configuration” tab.



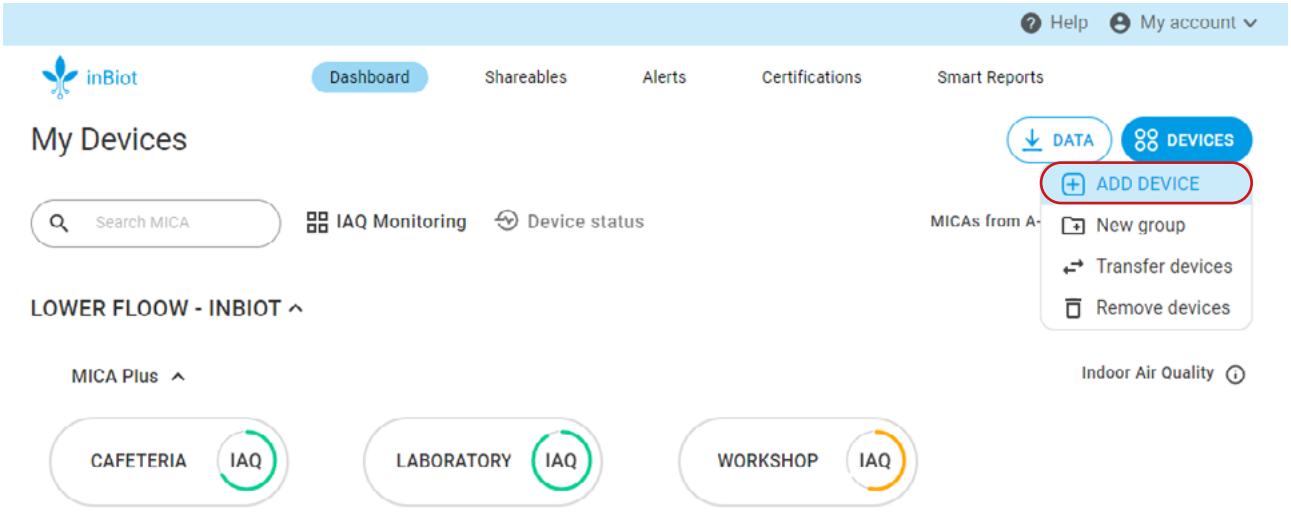
Adding MICA to My inBiot

Once the MICA is configurated, it can be added to the My inBiot web platform as follows:

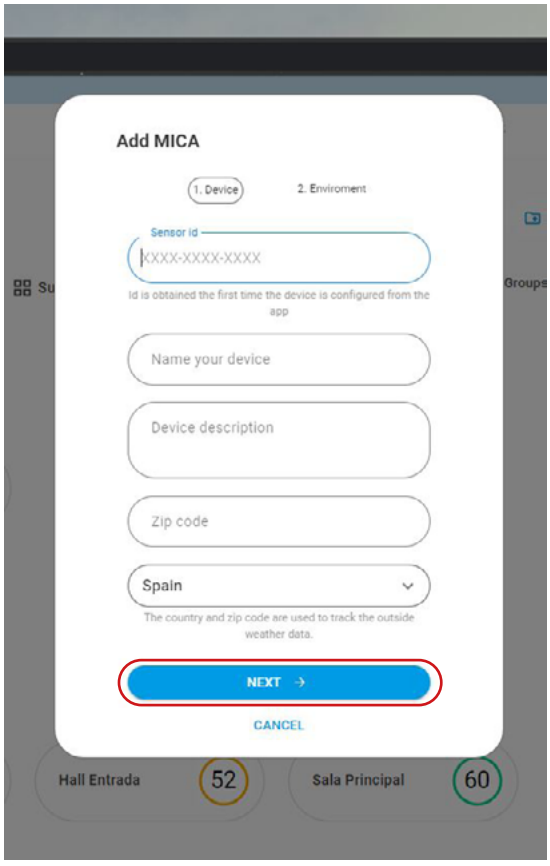
1. Go to myinbiot.com and log in or create an account if you do not have one.

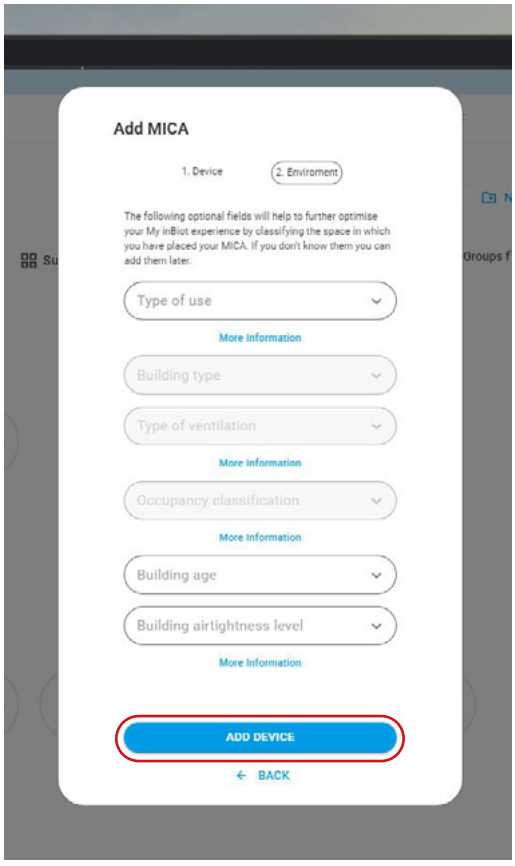


2. On the My inBiot home page, click on the DEVICES button and then click on “ADD DEVICE”.



3. Fill in the requested information and click on “ADD DEVICE”.
Note: The sensor ID was obtained earlier when finalizing the MICA configuration in the app.





8.Device Operation

Powering MICA

The first time you plug in the device, the white LED ring will light up and start flashing until the following happens:

1. A) If the MICA has been previously configured:

    - If the connection to the Wi-Fi network fails: It goes into access point mode with the LED ring turning blue.

    - If the connection to the Wi-Fi network is successful: It flashes green 3 times and then turns white (reading data) until it turns into another color depending on the indoor air quality (green, yellow or red).

    B) If it has never been configured before: It switches to the access point with the LED ring turning blue for 5 minutes.

2. Access point: Lasts for 5 minutes and is indicated by the LED ring turning blue: 

    - If the user's connection to the device through the app fails: flashes red 3 times and then returns to the access point.
    - If 5 minutes pass and no action is taken: flashes blue 3 times, then the LED ring turns off for X seconds and turns on again depending on indoor air quality (green, yellow, red) without being connected to the platform (no data sent or received).
    - If the user's connection to the device through the app is successful: It will stay steady blue until the configuration is finished.

4. If everything went well when the configuration is finished the LED ring will turn white until the device reads the indoor air quality.

5. Once the device reads the indoor air quality, the LED ring will turn to the corresponding color: green, yellow, or red.

Connection status

To check if the device is connected to the Wi-Fi network, press twice in succession the touch button located on the MICA logo.

- If connected: The LED ring flashes green 3 times (and returns to the previous state).
- If not connected: The LED ring flashes red 3 times (and returns to the previous status).

Note: This indicates if the device is connected to Wi-Fi, not to My inBiot.

Sending data

To send data to My inBiot manually, press once the touch button located on the MICA logo.

Upon pressing the button, the LED ring will turn white and then return to the previous state.

Updates

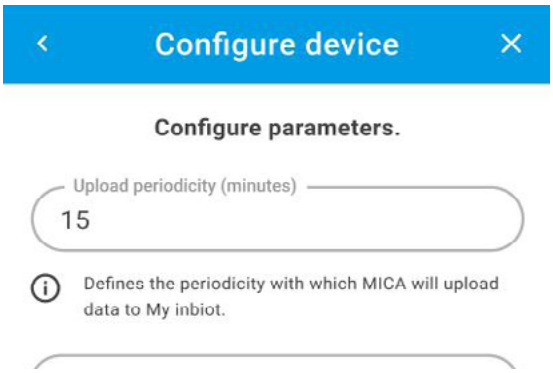
When the device is updating, the LED ring will turn pink.

Taking measurements

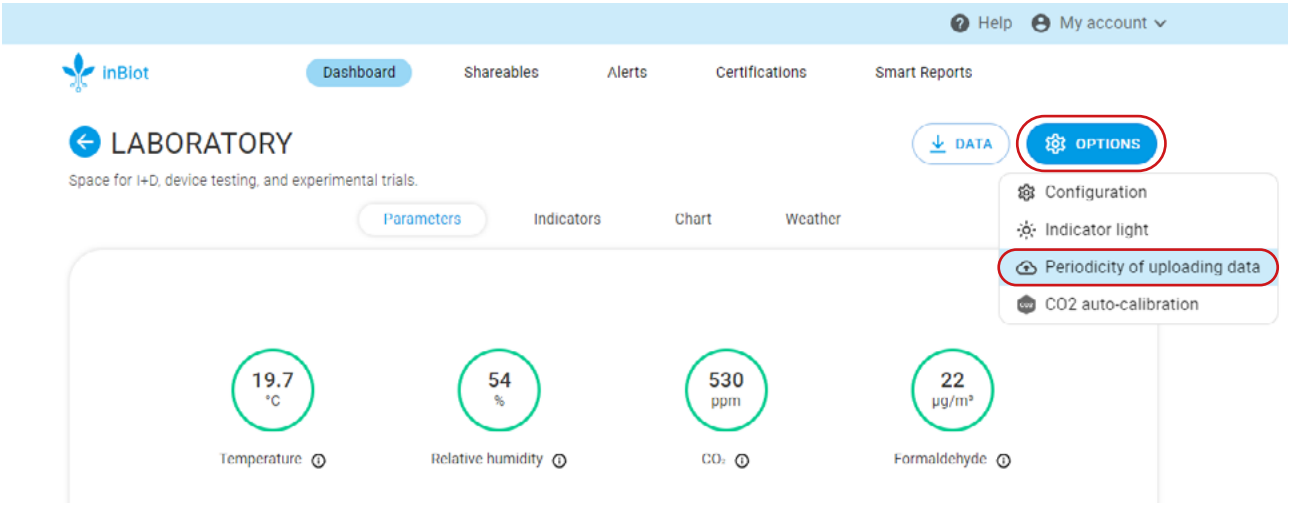
The MICA device will record the measured parameters in the web platform with the selected time interval. Depending on the type of account you have, you can choose a longer or shorter time interval. The Basic account allows settings between 10 and 15 minutes, whereas the Business account allows settings between 1 and 15 minutes for WiFi connectivity and between 3 and 15 minutes for GSM connectivity.

The process of configuring the upload periodicity can be done from two places.

1. When the device is configured for the first time, there is a section that says "Upload periodicity (minutes)". Here, you can select the upload time interval you want for your data to be uploaded to My inBiot.

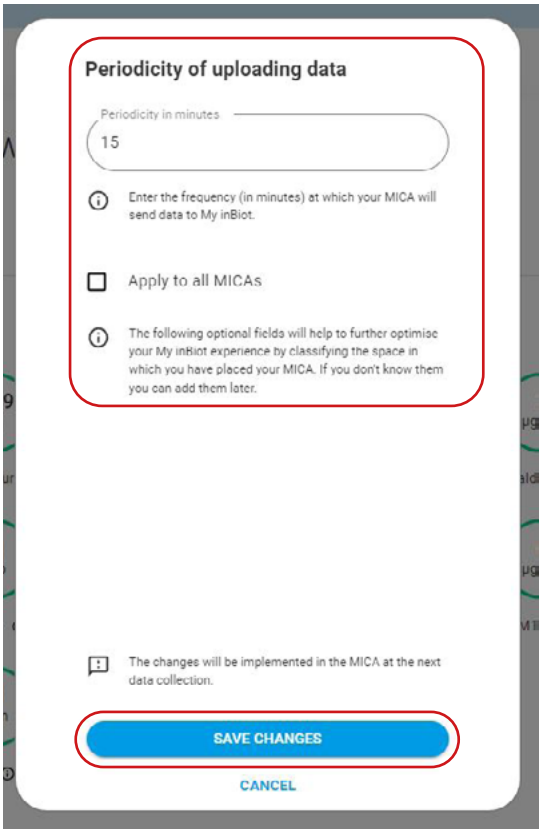


2. Within the My inBiot platform: Go to the device you want to change the upload periodicity and select "OPTIONS" in the upper right margin. Then, select the "Periodicity of uploading data" option.



A new window will appear where you can define the time between data uploads and select this setting for all devices or only the current one.

Finally, select 'SAVE CHANGES'.



9.My inBiot Platform

You can access My inBiot Web Platform through the following link: www.myinbiot.com/login.

The first time you access the platform, you will need to create an account and password, which you will use to log in each time you access the platform. Within an account, you can have as many devices as you wish.

In the My inBiot web platform you will be able to:

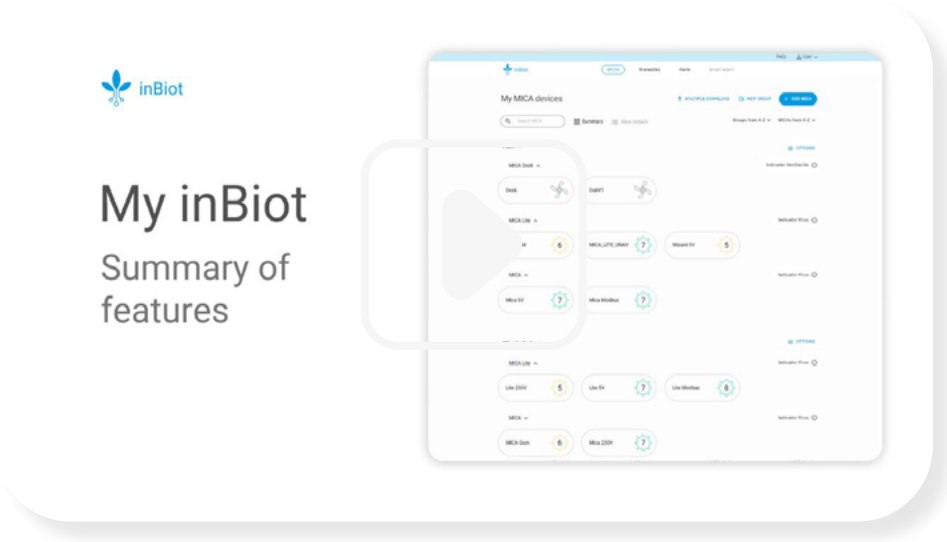
- Consult the parameters in real time.
- View the evolution of the parameters over time: hours, days, and weeks.
- Consult the information on each parameter to know its effects on health, the possible sources of contamination, and recommended ranges.
- Download data for analysis in another application.
- Give access to several clients through a shareable link, which you can also use to display the data on screens for events or offices.

Additionally, the My inBiot Business account gives access to more functionalities. This option has an annual subscription fee and includes:

- The ability to configure data collection from 1 minute onwards.
- The ability to download historical data without time limitations.
- The ability to perform multiple downloads of several devices in weekly groups of up to one week.
- To be able to create groups of devices to organize them.
- To be able to create customized alerts when exceeding a certain value previously configured.
- To be able to download statistics.

Using My inBiot

To learn about the basic functionalities of the platform and the pages that compose it, access the video Summary of features.



10.Calibration

The calibration process of MICA devices has several phases, from the manufacturer's warranty of the sensors, remote correction of some sensors, and modular design for sensor replacement based on the life span of eachspecific sensor.

This process allows for:

- Regular maintenance according to the specific requirements of each user.
- The reduction of measurement variations between different devices, both in the short and long term.
- Long-term stability of measurements.

Manufacturer's warranty

The design of MICA devices includes a curated selection of specific sensors. All sensors are calibrated by the sensor manufacturer itself, with a corresponding warranty.

Self-calibration of sensors

Additionally, some sensors, such as CO_2 or VOC, have an automatic self-calibration process by software.

- Carbon dioxide

  MICA's carbon dioxide sensor is an NDIR (non-dispersive infrared) sensor, which uses gas spectrometry to measure CO_2 concentrations. NDIR sensors are not susceptible to the physical degradation of the sensor, as they do not produce chemical reactions on their surface.

  Like any sensor, NDIR sensors will begin to drift over time. However, it is possible to use the 400-ppm outdoor air reference for self-calibration or remote correction. Depending on the type of ventilation selected in the MICA device configuration, an automatic self-calibration period of between 24 and 48 hours will be set, correcting the lowest average value during this period in relation to the outdoor reference.

  The CO_2 sensor also requires at least one complete cycle of 24-48 hours of continuous use to activate this automatic self-calibration. Once this period has elapsed, the device saves the setting and does not need to be recalibrated in the event of a power failure.

  During the initial period of calibration activation, the readings will fluctuate, and once completed, the data measured by the MICA will be automatically adjusted.

- Volatile Organic Compounds

  The VOC sensor requires an initial 12 h calibration and has a bi-weekly automatic calibration with exposure to outside air for 30 minutes. Unlike the CO_2 sensor, calibration data is not saved in case of power failure. Therefore, it is necessary to respect the 12 hours of calibration in order to have reliable reading values.

11.Safety Instructions

Cleaning and storage

- To clean the device, you should use a damp cloth and mild detergent. Do not use solvents or abrasives.
- The device is intended for indoor use only and is not suitable for outdoor use.
- Store it in an area with moderate temperature and humidity: -5 °C to 50 °C (23 °F to 122 °F) and less than 90% relative humidity.
- Do not put the device in water.

Important safety notes

- The MICA device is developed for general-purpose air quality monitoring only and has not been certified for use in accordance with local or state carbon monoxide monitoring or alarm requirements.
- The MICA device has not been tested by an independent laboratory for compliance with UL 2034 or IAS 6-96. CO15-en-EN_v1.0 7/17 3.
- It is the customer's responsibility to obtain and apply current local, state, and national regulations regarding CO alarms, monitoring, and testing.

Indications - Warranty

The device comes with a 3-year warranty for products sold in Spain, 2 years for products sold within the EU/UK, and 1 year for those sold in the US/CAN and other countries.

If, after purchasing the device, you find any defect that is the responsibility of inBiot and not due to misuse, please contact our Customer Service team at support@inbiot.es and indicating the device ID, proof of purchase, date of purchase, and description of the fault. As soon as possible we will contact you to proceed with the repair or replacement of the device.

For devices that are out of warranty, we will be happy to repair or replace them according to inBiot's repair rates. Please contact our Customer Service team for more information.

In the event of damage caused by non-compliance with this manual, the warranty claim will be extinguished provided that:

- Has been modified by any party other than inBiot.
- Has been subject to accident or misuse.
- Hs been damaged during the installation of the product.
- Has been damaged by the system with which the product is used.
- Has been damaged by liquids.
- Has been damaged during transport to our facilities.
- Has been damaged in the interface or charging connections.
- Has been counterfeited: The warranty will only apply to products with an inBiot brand, serial number, and logo identifying it as such. The warranty does not apply to any product that was not manufactured by or with the permission of inBiot.

End of life

In the European Union, electronic equipment may not end up in household waste: it must be disposed of properly in accordance with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE). At the end of its useful life, please dispose of this device in accordance with the legal regulations in force.

inBiot

Sense your building

www.inbiot.es

support@inbiot.es