



inBiot
Sense your building



MICA Lite

User Manual

V 1.3.(20/06/2022)

1. Product overview

MICA Lite is a smart device that will allow you to monitor the indoor air quality. This device is able to measure up to 4 different parameters: temperature, humidity, carbon dioxide and suspended particles (PM2.5).

Using WiFi, the device communicates with the My inBiot web platform, where you can check the air quality status, obtain track records and download your information.

Depending on the type of the version chosen, the MICA Lite will be located and installed:

- At the wall.
- On the desk.

Make sure it stays away from windows, vents or direct sunlight.

The LED Light (green, yellow, red) provides an intuitive information about the ventilation needs. Should the LED turn red, a ventilation of the room is clearly needed.

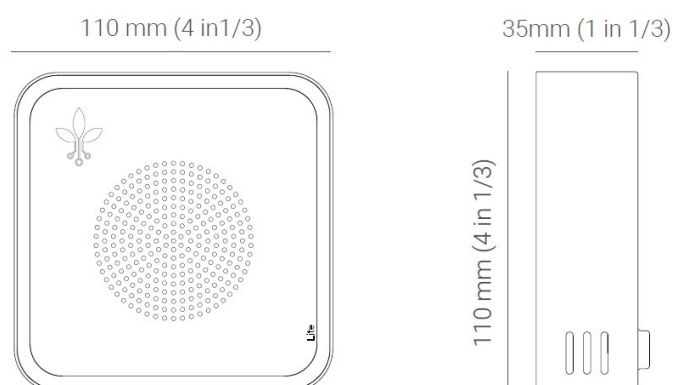
2. Main technical characteristics

Connections:

- Wall installation: Fast connector 230VAC 50 Hz.
- Desk installation: Magnetic connector (5V 1A).

Size and Weight:

Weight: 325 grams (11.46 oz)



Connectivity:

- IoT "My inBiot" Platform.
- WiFi 802.11 b/g/n/e/i (802.11n @ 2.4 GHz up to 150 Mbit/s).
- Modbus.
- GSM/GPRS connectivity (Optional).
- Touchpad.

Sensors:

- Temperature.
- Humidity.
- Carbon dioxide (CO₂).
- Suspension particles (PM2.5).

Technical specifications:

Temperature

Measurement unit: °C (°F) / Range: 0 - 90 °C (32 °F - 194 °F).

Precision: ±0,5°C (± 0.89 °F).

Humidity

Measurement unit: %RH / Range: 0 - 100%.

Precision: ±2 %.

Carbon Dioxide (CO₂)

Sensor: NDIR.

Measurement unit: ppm / Range: 0 - 5,000 ppm.

Precision: ± (50 + 5%) ppm.

Calibration lifespan: 10 years.

PM2.5

Sensor: Particle laser.

Measurement unit: µg/m³ / Range: 0 - 1,000 µg/m³.

Precision: < 35 µg/m³: ±5 µg/m³; >35 µg/m³: ±15% of measurement value.

Calibration lifespan: 4 years.

Indicators:

MICA Lite provides two indicators:

- **Ventilation indicator:** The LED light shows when ventilation is needed depending on the dioxide carbon (CO₂) concentration levels.

There are three different colors:

Red: Bad air quality. Ventilation is strongly needed.

Yellow: Ventilation is suggested.

Green: Good air quality. No need for ventilation.

- **Virus Indicator:** Shows the probability for a virus transmission according to carbon dioxide (CO₂), PM2.5, temperature and humidity. Value range goes from 0 to 10:

0 - 3 High probability of virus transmission.

4 - 6 Medium probability of virus transmission.

7 - 10 Low probability of virus transmission.

3. Value levels and recommendations

Temperature:

According to RITE (Thermal Installations Regulation) comfort levels for temperature should be between 21 - 25 °C (70 - 77 °F), being 21 - 23 °C in winter (70 - 73.4 °F) and 23 - 25 °C for summer (73.4 - 77 °F), although these values could be slightly higher or lower depending on the rest of parameters that determine comfort.

My inBiot Values:

GREEN: 20 - 23°C (68 - 73.4 °F)

YELLOW: 24 - 26°C (75.2 - 78.8 °F) / 18 - 20°C (64.4 - 68 °F)

RED: > 26°C (78.8 °F) or < 18°C (64.4 °F)

Humidity:

The ideal relative humidity for a normal temperature inside an inhabited space is between 45 and 50%, with a range of recommended values between 40 and 60%.

My inBiot Values:

GREEN: 40 - 60 %

YELLOW: 30 - 40% / 60 - 70%

RED: < 30 % or > 70%

Carbon dioxide (CO₂)

In outdoor environments the concentration level of CO₂ is approximately 350 - 400 ppm (parts per million).

The environment is considered "stuffy" at values above 800 - 1,000 ppm.

From 2,000 ppm it is considered very stuffy and symptoms related to headache, tiredness and general apathy occur.

The most serious effects occur from 5,000 ppm, when fading can occur.

My inBiot Values:

GREEN: < 800 ppm

YELLOW: 800 - 1,500 ppm

RED: > 1,500 ppm

PM2.5

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 total annual values to 12-15 µg/m³. The EU establishes maximum limits of 25 µg/m³ also for PM2.5, although with the prospect of increasing the restriction.

The value ranges used for PM2.5 are as follows:

GREEN: < 15 µg/m³

YELLOW: 15 µg/m³ - 35 µg/m³

RED: > 35 µg/m³

4. Installation and set up

To install and set up the device, follow the steps indicated in the following video tutorials:

1. Installing MICA Lite on a wall: [How to install MICA Lite on a wall](#)

NOTE: Before starting the installation, disconnect the fuses and make sure that the wires are placed in the correct position to avoid a short circuit.

2. MICA Lite Set up: [MICA Lite Set up](#)
3. MICA Lite Modbus: [MICA Lite Modbus Set up](#)
4. Adding a new MICA Lite to My inBiot: [How to add a MICA Lite to My inBiot](#)
5. Firewall and WiFi security measures: [Firewall and WiFi protocols](#)

5. Operation

Right after plugging in, the device will enter Access Point mode. A dim blue light will appear, changing to white and after a few seconds finally blinking in a dark blue color. This indicates that it is ready to proceed with the WiFi setup configuration following the videos shown on the Tutorials section.

There are two possible outcomes after setting up the WiFi:

- **Not connected:** A red light is shown for 10 seconds and then turns off. Repeat the process and make sure the password is correct and there are not any Firewalls or safety protocols blocking the connection.
- **Successfully connected:** A green light is shown for 10 seconds and then turns off. You may proceed to My inBiot and add your new device to your account following the video on the Tutorials section.

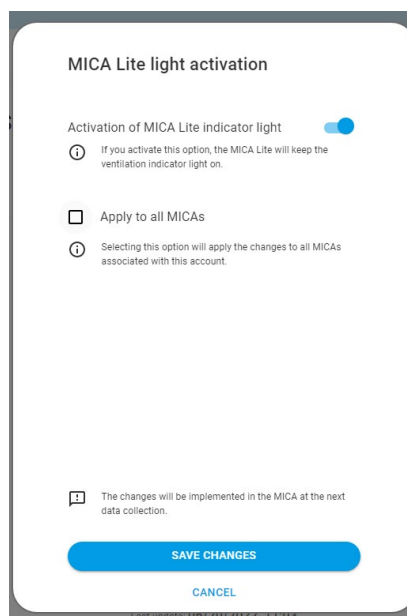
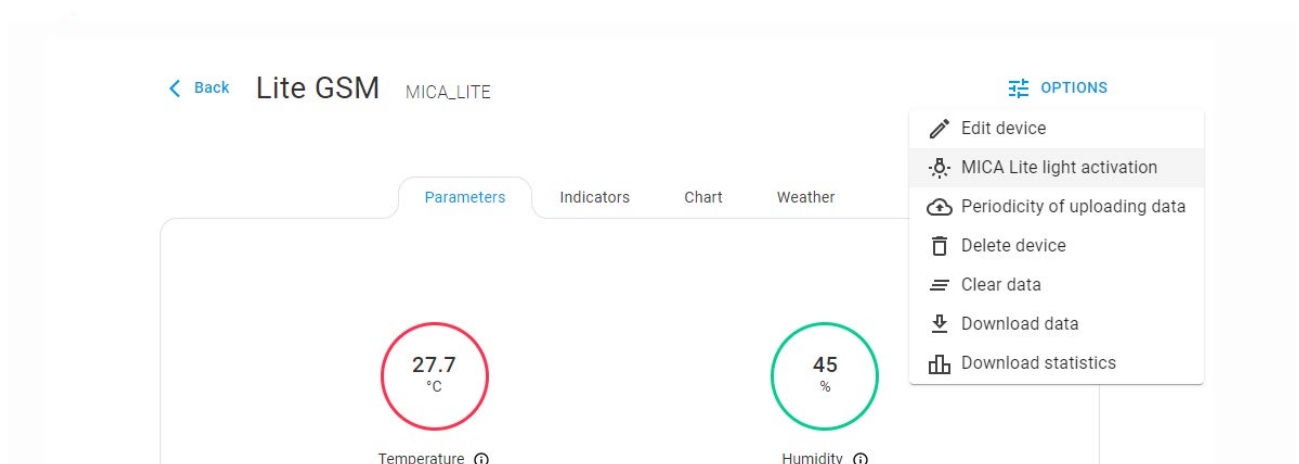
Regardless of the outcome, after 1 minute the device will show the CO₂ level with its LED light (green, yellow or red). The status of this light is updated every minute.

You may select if you want the LED light to be on or off from two different places.

- At the initial setup: There is a checkbox to switch.

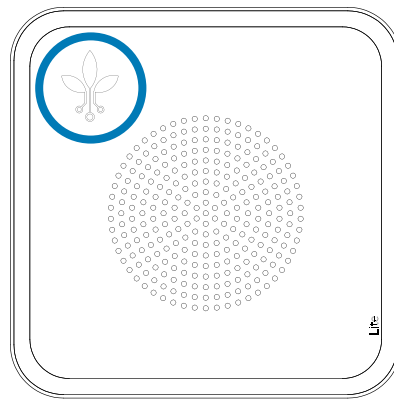
☒ Activar LEDs

- At My inBiot, select the desired device and click on the 3 vertical dots at the upper right corner. Select "MICA Lite light activation". A new screen will pop up and you can select the status for the light indicator. You may also apply this change to all the devices in your account selecting the Apply to all MICAs option. Save the changes to confirm your selection.



In addition, the equipment has a touch button on the logo on its front face. Depending on the duration of the press, the device will perform two different operations:

- A short press will force a measurement, uploading the different parameters to the web platform. In addition, it shows the CO₂ status by means of the LED light for 5 seconds even if this functionality is deactivated.
- A long press will set the device into Access Point mode. A dim blue light will appear, changing to white and after a few seconds finally blinking in a dark blue color. This indicates that is ready to proceed with the WiFi setup configuration.



Time intervals

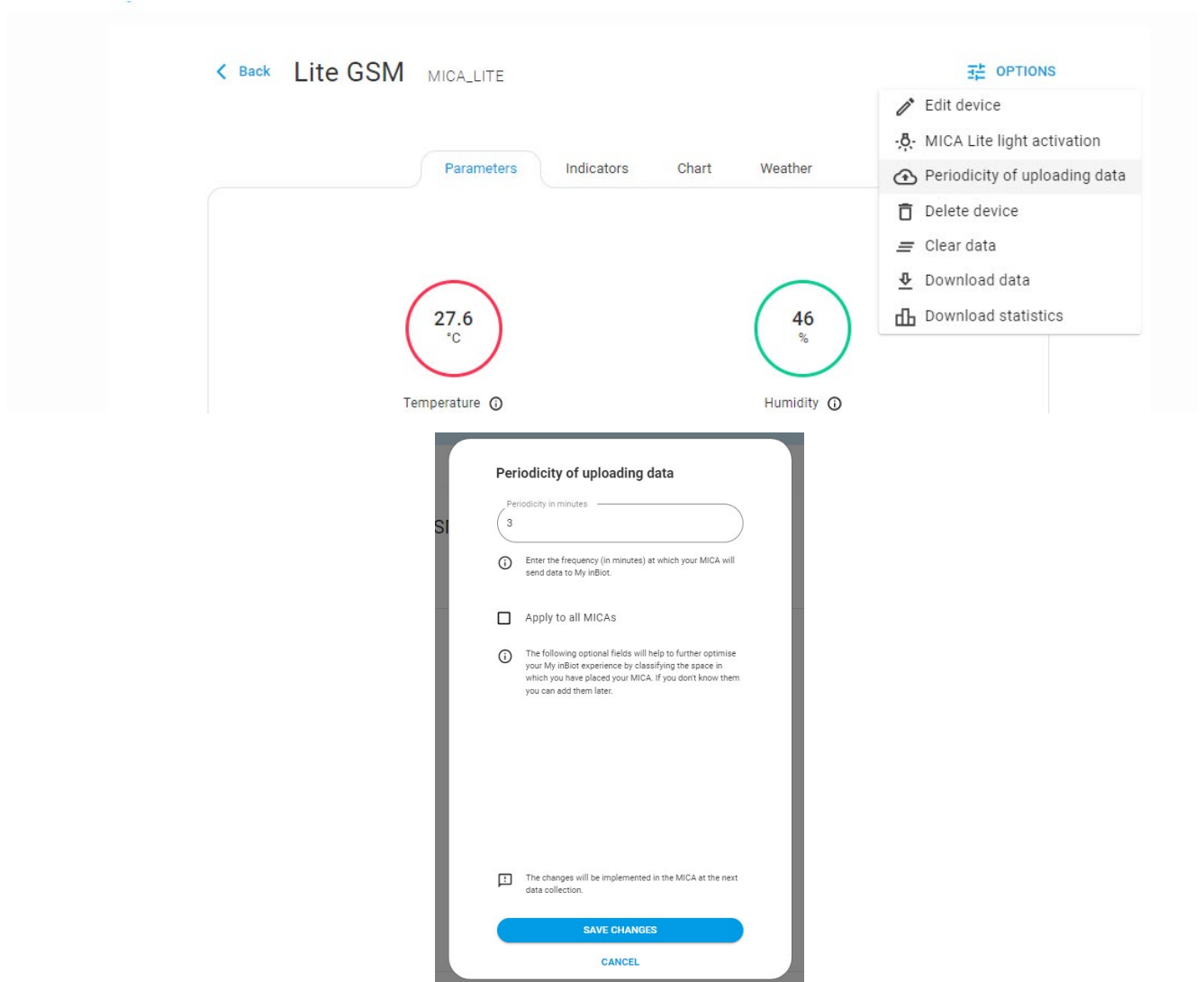
The LED status will be updated every minute. However, the parameters measurements will be uploaded according to the selected interval. The Basic account allows adjustments between 10 and 15 minutes, while the Business account allows adjustments between 1 and 15 minutes.

You may select the uploading time interval from two different places.

- At the initial setup, where you can select the periodicity of uploading data.

Tiempo entre datos [min]: ?

- At My inBiot, select the desired device and click on the 3 vertical dots at the upper right corner. Select "Periodicity of uploading data". A new screen will pop up where you can select the time interval between measurements. You may also apply this change to all the devices in your account selecting the Apply to all MICAs option. Save the changes to confirm your selection.



6. Web Platform

Access your account using: <https://www.myinbiot.com/login>.

The first time you access, you will need to create an account and a valid password.

Within an account, you may have as many devices as you like.

Using My inBiot web platform you may:

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

Web platform

You will find a clear explanation of the possibilities of our software in the following link

[My inBiot web platform.](#)

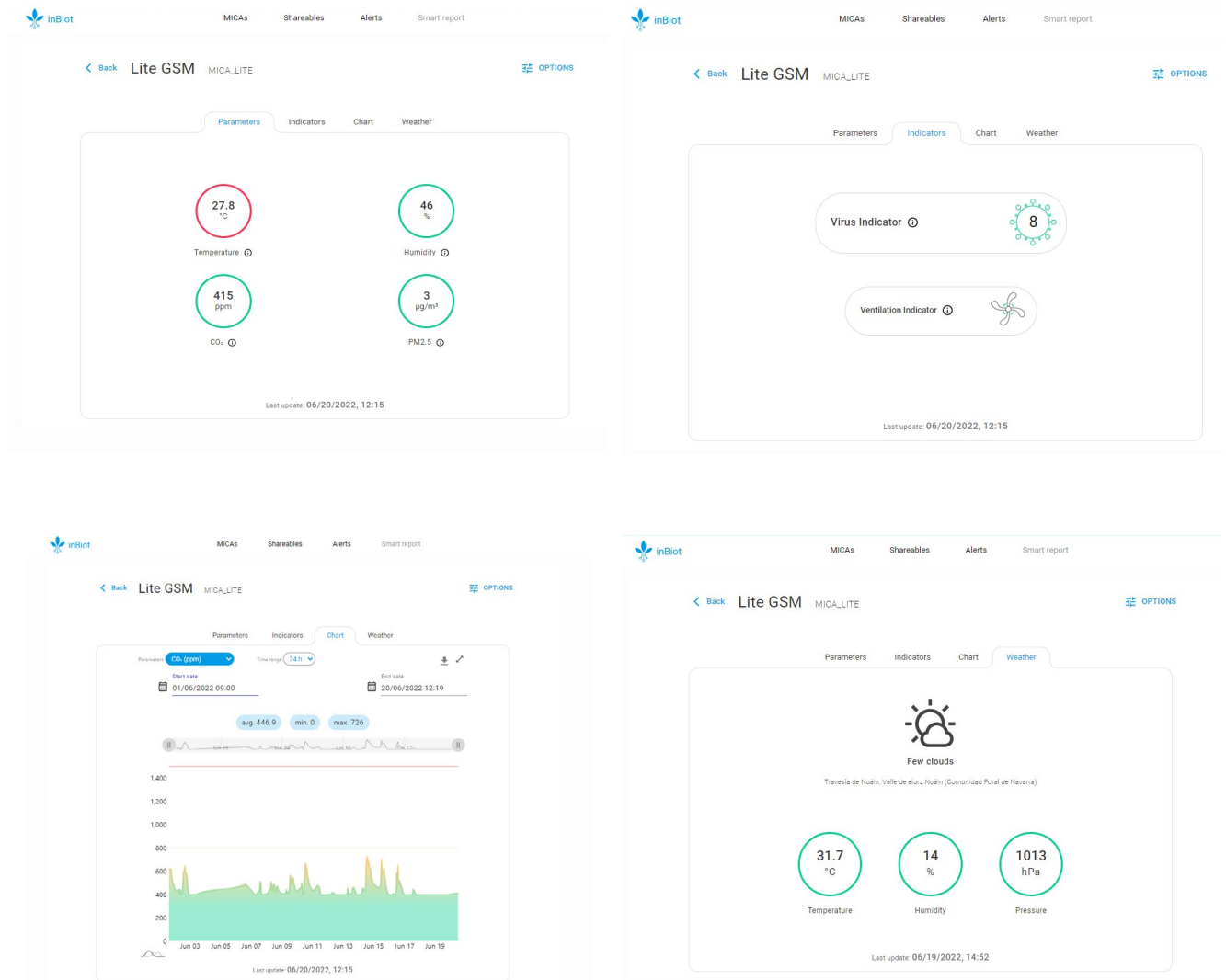
START

The screenshot shows the 'My MICA devices' page in the inBiot web platform. The top navigation bar includes 'Help' and 'User'. Below the navigation bar, there are tabs for 'MICAs', 'Shareables', 'Alerts', and 'Smart report'. The main section is titled 'My MICA devices' and includes a search bar, a 'Summary' button, and a 'View details' button. There are also buttons for 'MULTIPLE DOWNLOAD', 'NEW GROUP', and 'ADD MICA'. The devices are listed under the 'MICA Lite' category. Each device has a circular status indicator with a number (8, 8, 7 respectively). To the right, there are indicators for Ventilation, Virus, and IAQ.

The screenshot shows the 'My MICA devices' page in the inBiot web platform, displaying a detailed table of device parameters. The table includes columns for Name, Virus indicator, Temperature, Humidity, CO2, PM2.5, and Radiant Temperature. The data is as follows:

Name	Virus indicator	Temperature (°C)	Humidity (%)	CO2 (ppm)	PM2.5 (ug/m³)	Radiant Temp (°C)
Lite GSM	8	27.8	46	415	3	30.1
MICA_LITE_UNAV	8	25.6	53	425	2	30.1
Wizard 5V	7	29.4	37	513	3	30.1

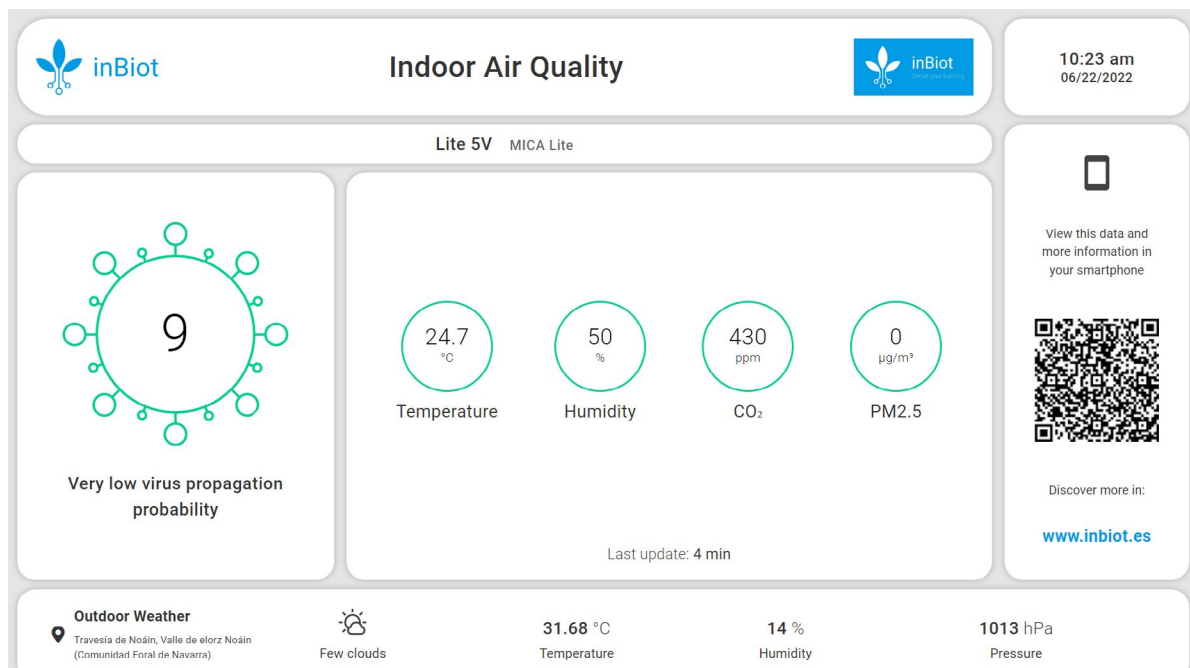
DEVICE



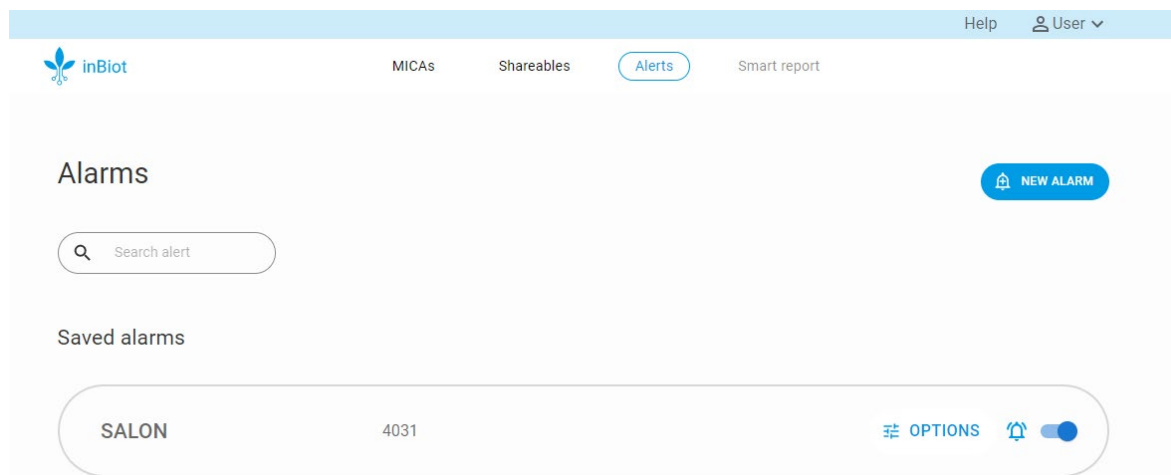
SHAREABLES

The screenshot shows the inBiot Shareables interface. At the top, there is a search bar labeled 'Search shareable'. Below it, the 'Saved views' section lists two items:

- Lite 5V:** Includes options for 'OPTIONS', 'DOWNLOAD QR', 'SHARE', and a QR code icon.
- Lite GSM:** Includes options for 'OPTIONS', 'DOWNLOAD QR', 'SHARE', and a QR code icon.



ALERTS



Additionally, the My inBiot Business account gives access to several more features. This modality has an annual fee and will give you access to:

- Select up to 1 minute of periodicity of uploading data.
- Download historical data without any time limitation.
- Download multiple devices in one file up to one week.
- Organize your devices in Groups for an easier management.
- Set personalized alerts when a parameter reaches a certain level.
- Download statistics.

7. Calibration

The calibration process of the MICA Lite devices has several phases, from the manufacturer's guarantee of the sensors, the remote correction of some sensors and the modular design for the replacement of sensors according to the life span of each specific sensor. This process allows:

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

Manufacturer's warranty

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

Sensor self-calibration

Additionally, some sensors, such as CO₂, have an automatic self-calibration process by software.

Carbon dioxide (CO₂)

The MICA Lite carbon dioxide sensor is an NDIR sensor (non-dispersive infrared sensor), which uses gas spectrometry to measure CO₂ concentrations. NDIR sensors are not susceptible to physical sensor degradation, as they do not produce chemical reactions on their surface.

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

The CO₂ sensor also requires at least one full cycle of 24-48 hours of continuous use to trigger this automatic self-calibration. Once the initial calibration has been successfully completed, the values are stored in the device and thus there is no need for a new calibration after a disconnection.

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

8. Safety instructions

Cleaning and storage

- Use a damp cloth and mild detergent for cleaning purposes. Do not use solvents or abrasives.
- MICA Lite is designed exclusively for indoor use only and is not suitable for outdoor use.
- Store the equipment 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 submerge the device in water.

Important safety notes

- MICA Lite has been developed solely for general purpose air quality monitoring and thus has not been certified for use in accordance with state or local carbon monoxide monitoring or alarm requirements.
- MICA Lite has not been tested by an independent laboratory to comply with UL 2034 or IAS 6-96. CO15-en-ES_v1.0 7/17 3.
- It is the customer's responsibility to obtain and apply applicable local, state, and national regulations regarding CO alarms, monitoring, and testing.

Notes – Warranty

The device includes 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.

Should you find any defect that is the responsibility of inBiot and not due to misuse of the device, please contact our Customer Service team through support@inbiot.es and communicate the ID of the equipment, proof of purchase, date of purchase and a detailed fault description. We will contact you as soon as possible to proceed with its repair or replacement.

For devices that have expired their warranty already, we will be happy to repair or replace them according to inBiot's repair prices. Contact our Customer Service team for more information.

In case of damage caused by non-compliance with this manual, the right to guarantee will be extinguished provided that:

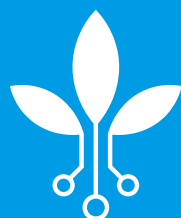
- Has been modified by any other but inBiot.
- Has suffered an accident or misuse.
- Has been damaged during the installation of the product.

- Has been damaged by the system with which the product is used.
- Has liquid damage.
- Has been damaged during transport to or from our facilities.
- Has damage to the interface or charging connections.
- Has been falsified. The guarantee will only apply to products with the inBiot brand, serial number and logo that identifies it as such. inBiot will not apply the warranty on any product that was not manufactured by or with the permission of inBiot.

End of life cycle

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





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