



**USER GUIDE**

# mBox Guardian

Indoor monitor

*MMG – 175 - Wellness*

## Contents of the kit:

-  Air quality monitoring: CO2, PM, LVOC, temperature, relative humidity, pressure, light, noise.
-  12V power supply from a 220V socket
- A foundation

## Station positioning:

Be sure to position the mBox Guardian correctly:

- At a height between 1 and 2 m corresponding as much as possible to the height, of the respiratory tract of the people occupying the premises (children, adults, seated most often)
- Away from draught areas (air inlet or outlet, door, window)
- Away from punctual and localized sources of pollution (kitchen, garbage can, changing rooms, perfume diffuser...)
- Away from heat sources (radiator, direct sun)
- More than 1 meter from the corners of the room

## Product:

### [Introduction](#)

The **mBox Guardian MMG-175 - Wellness** is an intelligent sensor of the global air index. It can monitor fine particulate matter (PM), volatile organic compounds (VOCs), relative humidity, carbon dioxide (CO2), temperature, light and noise – which essentially covers various indicators reflecting air quality.

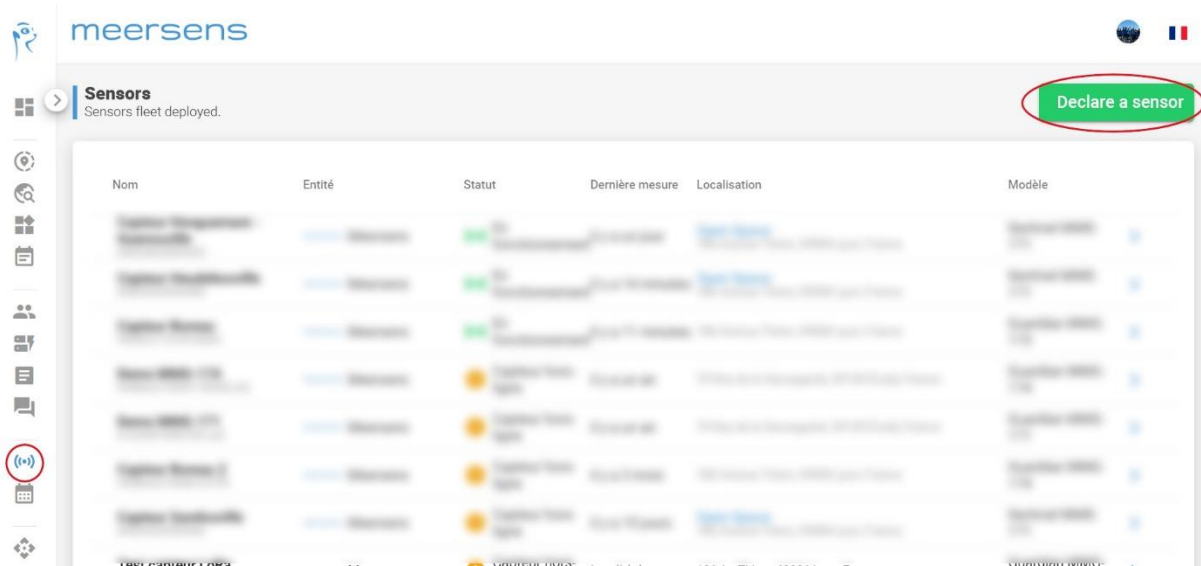


# Sensor Pairing :

After receiving an email with your login information, you can begin the pairing of your sensors using one of these methods.

- **Through the Meersens SaaS Platform:**

1. Visit the Meersens platform using the following link: <https://eaas.meersens.com/home>.
2. Go to the "Sensors" tab on your left.
3. Click the "Declare a sensor" button to start the pairing process.



4. Enter all required sensor information.
5. Once completed, click on the « Create » button. Your sensor is now connected.

### Declare a sensor

MAIN INFORMATION

Name \*

Model \*

Context \* Connectivity  
**Indoor** **LoRa**

Serial number \*

Location

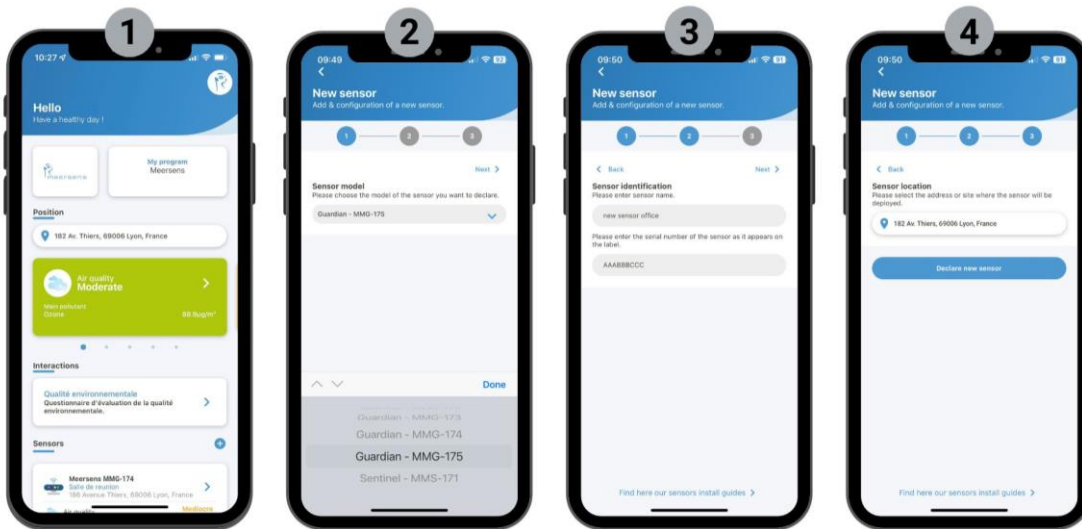
Associate to a site Search for an address

Room

\* Required fields Cancel



- **Through the Meersens Pro app** (if available in your contract): After downloading the Meersens Pro app from the Apple or Android app stores, you can initiate the pairing process:







1. In your phone's Meersens Pro app, go to the home page and scroll down to the "Sensors" section. Add a sensor by clicking on the "+" icon on the right.
2. Select the "MMG-175" model from the dropdown list.
3. Choose a name for the sensor to easily identify it later (e.g., meeting room) and enter the serial number.
4. Add the sensor's location and press the "Declare the new sensor" button.

**If you have received gateways with your sensors, please refer to the appendix titled "Sensor Deployment with Gateways" located at the end of this document.**



# Sensor Information :

## Indication of LEDs

Status of LEDs	Description
 <p>5s cycle</p>	<p>The air quality is <b>ideal</b>. The probe works perfectly. <math>CO_2 &lt; \text{Threshold} + 2.5\%</math> of the Threshold            Or  <math>VOC &lt; \text{Threshold} + 2.5\%</math> of the Threshold or  <math>PM_{2.5} &lt; \text{Threshold} + 2.5\%</math> of Threshold or  <math>HR &lt; \text{Threshold} + 2.5\%</math> RH</p>
 <p>Cycle of 2s</p>	<p>Air quality is <b>acceptable</b>. The probe works perfectly. <math>CO_2 &gt; \text{Threshold} + 2.5\%</math> of the Threshold            Or  <math>VOC &gt; \text{Threshold} + 2.5\%</math> of Threshold or  <math>PM_{2.5} &gt; \text{Threshold} + 2.5\%</math> of Threshold or  <math>HR &gt; \text{Threshold} + 2.5\%</math> RH</p>
 <p>5s cycle</p>	<p>Air quality is <b>poor</b>. The probe works perfectly. <math>CO_2 &gt; \text{Threshold} + 5\%</math> of the Threshold            Or  <math>VOC &gt; \text{Threshold} + 5\%</math> of Threshold or  <math>PM_{2.5} &gt; \text{Threshold} + 5\%</math> of Threshold or  <math>HR &gt; \text{Threshold} + 5\%</math> RH</p>
 <p>Cycle of 2s</p>	<p>Air quality is <b>poor</b>. The probe works perfectly. <math>CO_2 &gt; \text{Threshold} + 7.5\%</math> of the Threshold            Or  <math>VOC &gt; \text{Threshold} + 7.5\%</math> of Threshold or  <math>PM_{2.5} &gt; \text{Threshold} + 7.5\%</math> of the Threshold or  <math>HR &gt; \text{Threshold} + 7.5\%</math> RH</p>

## Indication of peripheral LEDs



Registration required (POE version only)



Junction OK (LoRa WAN version)  
 Peering (EnOcean)  
 ZigBee recording



## [Indication of LEDs in case of defect](#)

The LEDs indicate defects as follows:



LED code on front panel	Identification #	FRU in default
No active LED	NA	Suspicion of power default or failure of the sensor power board.
<b>Red LED active 5 seconds</b>		
<b>Followed by a yellow flash</b>	1	Front panel.
<b>Followed by 2 yellow flashes</b>	2	Single band CO2 sensor
<b>Followed by 3 yellow flashes</b>	3	Dual-band CO2 sensor
<b>Followed by 4 yellow flashes</b>	4	VOC sensor module
<b>Followed by 5 yellow flashes</b>	5	Motherboard
<b>Followed by 6 yellow flashes</b>	6	Interconnect card
<b>Followed by 7 yellow flashes</b>	7	Particle Sensor
<b>Followed by 8 yellow flashes</b>	8	Power card
<b>Flashing red LED</b>	9	Multiple failures
<b>Alternation Red Blue</b>	10	Perishable end-of-life sensors.
<b>All flashing LEDs</b>	11	No communication between the probe and the front (after 30 seconds).

## [Indications in case of LED failure](#)

In case one of the LEDs is detected in default at startup, the other LEDs will remain lit indefinitely. This makes it possible to visually identify the defective LED(s).

The probe will continue to measure and communicate normally. This failure will therefore be transmitted in the integrated test.

This test is not performed during operation, only at start-up so if an LED fails during operation, this failure will not be detected.



## [Default settings](#)

The set points have a great influence on the LED display, it is important to know the default values.

The default values can be considered as a reference because they will be lost after a setting and there is no magic button to go back to the default values.

### **In Measurement Thresholds mode (default)**

Cloakroom	Comfort (defect)	Eco	Night
Temperature	18.5°C	17°C	17°C
CO2	1000ppm	1500ppm	1300ppm
tVOCs	300 µg/m3	800 µg/m3	1300 µg/m3
Nox	300 µg/m3	800 µg/m3	1300 µg/m3
O3	300 µg/m3	800 µg/m3	1300 µg/m3
PM2.5	20 µg/m3	40 µg/m3	40 µg/m3
High humidity	75%	95%	95%
Low humidity	40%	30%	25%

Note that the Night Mode is not by default controlled by the integrated light sensor of the probe





## Sensor Deployment with Gateway



A gateway is a device that acts as a bridge between different networks. It enables data to be transferred from a local network to a wider network, such as the Internet. Gateways are often used in situations where a specific building or location has difficulty establishing a direct connection due to physical obstacles or range limitations. In such cases, a LoRa gateway is positioned at a strategic location that can receive signals from LoRaWAN devices inside the building or hard-to-reach area, and then relay these signals to the 3G/4G cellular network.

### Box content:

-  LoRa gateway and antenna
-  12V power supply from 220V socket



N°	Components	N°	Components
1	Wimnet™ iFemtoCell-evolution	9	SMA connector for LoRa antenna
2	Silkscreened KERLINK marking	10	Reset push button
3	Jack connector (for power supply 12Vdc 0,5A)	11	Silkscreened Reset marking
4	USB-A connector for configuration	12	USIM connector
5	RJ45 connector (Ethernet)	13	USB-C connector for debug probe and for configuration
6	3 bicolor LEDs	14	LoRa antenna (862-873MHz, 902-928MHZ, 3dBi, 50Ω; vertical polarization)
7	Wall mounting oblong holes	15	AC/DC power supply (not provided)
8	Sticker with markings	16	Quick Start Guide (this document)



### 3G/4G network connection

Connecting to a 3G/4G network makes the LoRa gateway mobile and autonomous. Here are the steps to follow:

- **Step 1:** Connect the gateway(s)
- **Step 2:** Check that the MMG-175 sensor(s) are registered in the Meersens platform and plugged in.
- **Step 3:** Make sure a SIM card is already available in your gateway (n°12).
- **Step 4:** Add the antenna to the gateway (n°14)
- **Step 5:** Plug in your gateway.

A red LED flashes during gateway initialization. Wait until the first two LEDs are green to continue the process.

- **Step 6:** After 15 minutes, check that your sensor data has been uploaded to the Meersens platform.
- **Step 7:** Once both LEDs are steady green, your gateway is operational.





meersens

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