

# MClimate CO2 Sensor and Notifier LoRaWAN®

User manual

## Scan the QR Code to access MClimate CO2 Sensor and Notifier LoRaWAN® extended documentation



[mclimate.eu/lorawan-resources](https://mclimate.eu/lorawan-resources)

### **Need some help?**

For more product information  
and issues related to it, visit:  
[mclimate.eu/lorawan-resources](https://mclimate.eu/lorawan-resources)  
or write us to:  
[lorawan-support@mclimate.eu](mailto:lorawan-support@mclimate.eu)

 **00359 800 3 1010**  
Monday-Friday 09:00 - 18:00

 **Sofia, Bulgaria**  
Sofia Tech Park,  
labs building, floor 1

### Bulgarian

За да разберете как се  
инсталира MClimate CO2  
Sensor and Notifier  
LoRaWAN®, сканирайте  
QR кода или посетете  
линка до него.

### Italian

Per installare MClimate  
CO2 Sensor and Notifier  
LoRaWAN® scannerizzare  
il codice QR oppure aprire  
il link al suo lato.

### Swedish

För att ta reda på hur du  
installerar MClimate CO2  
Sensor and Notifier  
LoRaWAN®, skanna  
QR-koden eller besök  
länken bredvid den.

### German

Um herauszufinden, wie  
man MClimate CO2 Sensor  
and Notifier LoRaWAN®  
installiert, scannen Sie den  
QR-Code oder besuchen  
Sie den Link daneben.

### Dutch

Om te weten te komen hoe  
u MClimate CO2 Sensor and  
Notifier LoRaWAN®  
installeert, scan de QR-code  
of bezoek de link ernaast.

### Czech

Chcete-li zjistit, jak  
nainstalovat MClimate CO2  
Sensor and Notifier  
LoRaWAN®, prohlédněte si  
kód QR nebo navštivte  
odkaz vedle něj.

### Polish

Aby dowiedzieć się, jak  
zainstalować MClimate CO2  
Sensor and Notifier  
LoRaWAN®, zeskanuj kod QR  
lub odwiedź link obok niego.

### Finnish

Tutustu MClimate CO2  
Sensor and Notifier  
LoRaWAN®-laitteen  
asentamiseen, skanna  
QR-koodi tai vierailla sen  
vieressä olevassa linkissä.

### French

Pour savoir comment  
installer MClimate CO2  
Sensor and Notifier  
LoRaWAN®, scannez le code  
QR ou visitez le lien à côté  
de celui-ci.

### Spanish

Para saber cómo instalar  
MClimate CO2 Sensor and  
Notifier LoRaWAN®, escanee  
el código QR o visite el  
enlace al lado.

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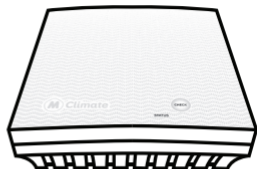
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### 08

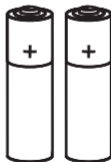
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## What's inside the box?



MClimate CO<sub>2</sub> Sensor and  
Notifier LoRaWAN®



2xAA Batteries  
Energizer Lithium Ultimate L91

## Technical specifications

**Description:** MClimate CO2 Sensor and Notifier

**Model:** MC-LW-CO2-01

**Dimensions:** 80 x 80 x 19mm

**Weight:** 69gr

**Frequency range:** 863÷870MHz

**LoRaWAN® Device type:** Class A End-device

**Power supply:** 2xAA batteries 1,5VDC

**Sensors:** NDIR CO2 sensor, temperature & humidity sensor

**Work temperature:** 0°C to +50°C

**Material:** ABS

**Environmental conditions, in which the device is intended to operate:**

- Indoor using;
- for altitude up to 2000m;
- for an ambient temperature: 0°C to +60°C;
- for maximum relative humidity of 80% for temperature up to 31°C, decreasing linearly to 25% relative humidity at temperature 50°C;
- for environment with a degree of contamination 2 (PD2).

**Storage and transportation conditions:**

- for an ambient temperature: -40°C to +85°C;
- for relative humidity 5% to 90% without condensation

**Manufacturer**

MClimate Jsc, 1784 Sofia, Sofia Tech Park, Labs Building, 111J Tzarigradsko Shose

**Compliance with the WEEE Directive**

The appliance marked with this symbol should not be disposed of with other household waste. It must be handed over to the relevant collection point for the recycling of electrical and electronic equipment.

## ▲ Safety Instructions

Please read the safety instructions before installing the device! Failure to follow the recommended instructions in this manual may be dangerous or in violation of the law. The manufacturer MClimate Jsc., is not responsible for any loss or damage caused by failure to follow the instructions in the operating manual.

### Legal Notices

All information, including but not limited to, features, functionality, and / or other product specifications are subject to change without notice. MClimate retains all rights to review or update its products, software or documentation without being required to notify any natural or legal person.

The MClimate and MClimate logo are trademarks of MClimate Jsc. All other brands and product names mentioned herein are trademarks of their respective owners.

### EU Declaration of Conformity

This device complies with the essential requirements and other applicable provisions of the following EU directives:

2014/53/EC, EN 50491-3:2009

EEU 300 220-1 V3.1.1:2017

EN 60950-1:2006+A11:2009 +A1:2010+A12:2011+

A2:2013 + AC:2015

EEU 300 220-2 V3.1.1:2017, EN 301 489-1

### Compatibility

**In order to operate MClimate CO2 Sensor and Notifier LoRaWAN®, you will need:**

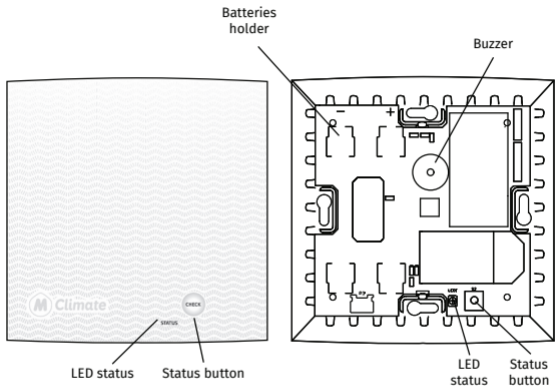
LoRaWAN® network

Battery (2xAA battery 1,5VDC)

Device operating voltage: 2.7 - 3.6VDC



## Device parts



Assembled MClimate CO2 Sensor and Notifier LoRaWAN®, top view

Disassembled MClimate CO2 Sensor and Notifier LoRaWAN®, top view

## Calibration

The device comes pre-calibrated with ABC algorithm enabled. By default, the ABC algorithm is based on a 8-day period. It keeps a log of the minimum measured CO2 in ppm and at the end of the period considers the minimum value as if it was 400 for the next period. Meaning - if during the previous period the minimum measured CO2 was 430ppm, in the next period this value will be measured as 400ppm.

The ABC auto-calibration is a standard practice in the industry and is applicable for places with non-constant occupation. If a place is constantly occupied (e.g. manufacturing plant), you have to disable the ABC algorithm.

Apart from the ABC algorithm, if the device measures a value below 400ppm, it will run the ABC algorithm immediately, as CO2 values below 400ppm (background level) are considered impossible for smart building applications.

## LED, Buttons and behaviour

When you press the button, the device indicates the current:

### 1. CO2 Level

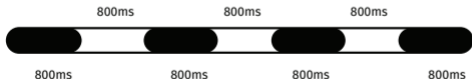
- Green: Good CO2 levels (less than 900ppm by default)
- Yellow: Medium CO2 levels (>900ppm and <1500ppm)
- Red: Bad CO2 levels (>1500ppm)

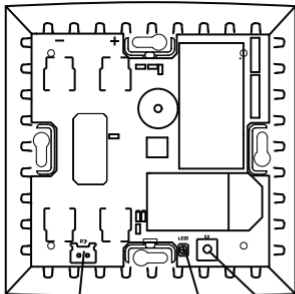
### 2. Connection status

- Constant indication: The device is connected to a LoRaWAN® network



Device is NOT connected to a network





LED status      Status button

Connector for optional external  
10K NTC temperature sensor.

#### Acoustic alarm:

The acoustic alarm activates when the CO2 reading is in medium or bad level. By default, the acoustic alarm is disabled.



**Warning:** CO2 levels thresholds as well as the color of the indication can be changed through a downlink command.



**Warning:** Acoustic notification behavior can be changed with a downlink command!



# Commissioning


- 1 Open your LoRaWAN® Network provider access panel and add the device using the supplied Serial Number, DevEUI, AppEUI (JoinEUI) and AppKey.

Device ID: 9X742795

DevEUI: 70B3D25D10000001

AppEUI: 70B3D25100000000

AppKey: A0658DFAE721315A7F20A8B211

 The data is example.  
Do not use.

Register

- 2 Continue the Installation with the instructions of your LoRaWAN® Network provider.

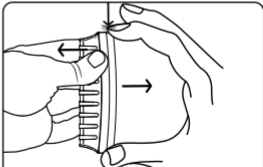
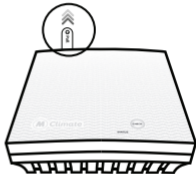
MClimate\_LoRaWAN\_51177

Serial Number	DevEui	AppEui	AppKey
01000000000000000000000000000000	70B3D25D10000001	70B3D25100000000	5fc3115a7f20a8b211



You can get DevEUI, AppEUI (JoinEUI) & AppKey information from the LoRaWAN® credentials .csv file we sent you with the fulfillment confirmation.

- 3 After pulling away the protective film from the batteries, the device will automatically connect to the network. In order to see whether the device has connected to the network, please check **LED, Buttons and behaviour**.

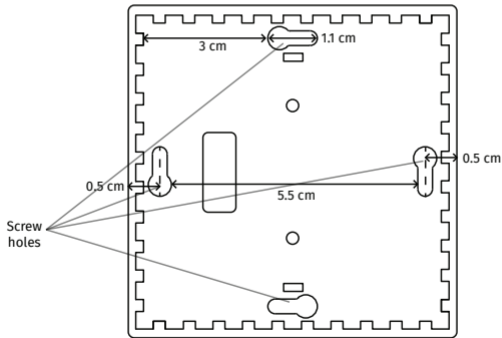


In order to remove the frontal plastic cover, apply pressure on the top and bottom of the front plate with one hand and hold the bottom plate with the other, gently lift one of the sides.

## Installation

We recommend installing the device in an open environment (e.g. not in a recess) at 1.5m height. Do not install the device near air vents as it will negatively impact the CO2 measurements. Avoid large metal parts as it will worsen the RF performance. Use double-sided tape to attach it or remove the frontal plastic cover and use screws to attach it in a more permanent manner.

We recommend installing the device so that the QR code with the serial number stays on the bottom-right side of the device in order to ensure good measurements.

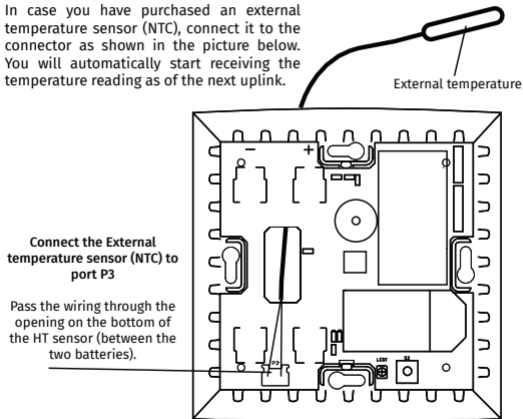


Disassembled MClimate CO2 Sensor and Notifier  
LoRaWAN®, back view

## Installation of external temperature sensor (NTC)

MClimate CO2 Sensor measures ambient temperature and relative humidity using a digital temperature sensor. The device also supports installing an additional temperature sensor (NTC) in cases where you want to monitor e.g. pipe surface temperature.

In case you have purchased an external temperature sensor (NTC), connect it to the connector as shown in the picture below. You will automatically start receiving the temperature reading as of the next uplink.



Disassembled CO2 Sensor, top view



We  
make any  
building  
**smart.**

[www.mclimate.eu](http://www.mclimate.eu)

Designed & Manufactured by MClimate in Europe.

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