# AQI Sensor & Notifier

by MClimate

LoRaWAN®



8 cm

8 cm

## Description

MClimate AQI Sensor and Notifier LoRaWAN is an indoor Air Quality Index Sensor and Notifier with 10+ years of battery life, configurable settings and beautiful and discreet design. It is a 4-in-1 sensor with gas, humidity, pressure and temperature measurement based on proven sensing principles by Bosch. It measures AQI, VOCs (ppm), temperature, humidity and barometric pressure. It also has a configurable buzzer and LED to notify tenants if the air quality Index is below a configurable threshold.

## Product features

- VOCs
- Temperature
- Humidity
- Barometric pressure sensor
- RGB LED
- Buzzer
- 2xAA Power supply

## Applications

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

## Device specifications

### Mechanical specifications

| | |
|---|---|
| WEIGHT | 68gr |
| DIMENSIONS | 80x80x19mm |
| ENCLOSURE | ABS |
| BUZZER SOUND PRESURE LEVEL | 8dB at 10cm |

### Operating conditions

| | |
|---|---|
| TEMPERATURE | -20+60°C |
| HUMIDITY | 0-80% RH (non-condensing) |

### Power supply

| | |
|---|---|
| BATTERY TYPE | 2xAA (1,5VDC) |
| OPERATING VOLTAGE | 3VDC |
| EXPECTED BATTERY LIFE | < 10 years (depending on configuration and environment) |

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## Radio/Wireless

| | |
|---|---|
| WIRELESS TECHNOLOGY | LoRaWAN® 1.0.3 |
| WIRELESS SECURITY | LoRaWAN® End-to-End encryption (AES-CTR) |
| LORAWAN DEVICE TYPE | Class A End-device |
| SUPPORTED LORAWAN FEATURES | OTAA, ADR, Adaptive Channels setup |
| SUPPORTED LORAWAN REGIONS | EU863 – 870; Other LoRaWAN regional settings available upon request |
| LINK BUDGET | 130dB |
| RF TRANSMIT POWER | 14dB |

## Data types

| KEEPALIVE | TYPE VALUE | VALUE NAME | DATA SIZE | NOTES |
|---|---|---|---|---|
| | 0x00 | Reason to send message + status | 1 | Possible reasons: Keepalive; Device test switches; |
| | 0x01 | Battery voltage | 1 | |
| | 0x02-0x12 | AQI, VOC, Temperature, Humidity, Pressure | 10 | |

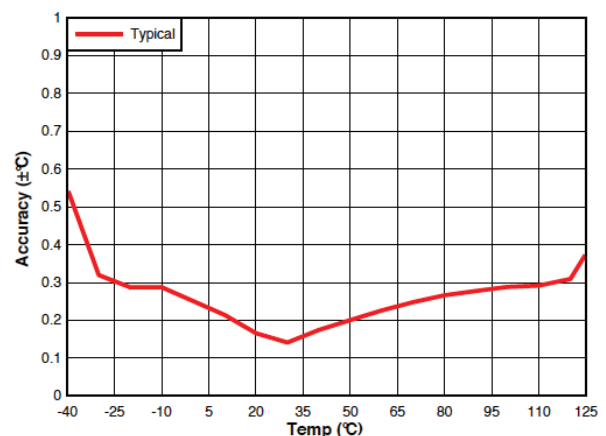| | |
|---|---|
| LIST OF FUNCTIONS FROM THE PROTOCOL DOCUMENTATION | Read AQI, VOC, Temperature, humidity, pressure<br>Activate RGB LED (different modes available)<br>Write keepalive period<br>Write AQI threshold buzzer notification (or disable)<br>Write buzzer sound configuration<br>and others |

# Sensors

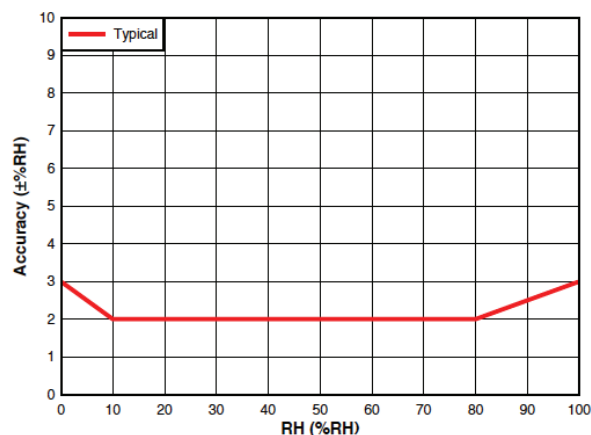Certified accuracy delivered **by Bosch**

## Temperature

| | |
|---|---|
| RESOLUTION | 0,18°C |
| ACCURACY | ±0,2°C |

## Humidity

| | |
|---|---|
| RESOLUTION | 0.39%RH |
| ACCURACY | 2%RH |



## VOC equiv. (ppm)

| | |
|---|---|
| DESCRIPTION | Conversion into breath VOC-equivalents in ppm concentration. The scaling is derived from lab tests with the VOC gas mixture described below. |

| MOLAR FRACTION | COMPOUND | PRODUCTION TOLERANCE | CERTIFIED ACCURACY |
|---|---|---|---|
| 5 ppm | Ethane | 20% | 5% |
| 10 ppm | Isoprene/2-methyl-1,3 Butadiene | 20% | 5% |
| 10 ppm | Ethanol | 20% | 5% |
| 50 ppm | Acetone | 20% | 5% |
| 15 ppm | Carbon Monoxide | 10% | 2% |

## Presure

| | |
|---|---|
| RMS NOISE | 0.12 Pa, equiv to 1.7cm |
| OFFSET TEMPERATURE COEFFICIENT | ±1.3 Pa/K, equiv. to ±10.9cm at 1 °C temperature change |

## AQI

| | |
|---|---|
| RANGE | 0-500 |

Index of Air Quality (IAQ) classification and color-coding

| IAQ Index | Air Quality | Impact (long-term exposure) | Suggested action |
|---|---|---|---|
| 0 – 50 | Excellent | Pure air; best for well-being | No measures needed |
| 51 – 100 | Good | No irritation or impact on well-being | No measures needed |
| 101 – 150 | Lightly polluted | Reduction of well-being possible | Ventilation suggested |
| 151 – 200 | Moderately polluted | More significant irritation possible | Increase ventilation with clean air |
| 201 – 250[9] | Heavily polluted | Exposition might lead to effects like headache depending on type of VOCs | optimize ventilation |
| 251 – 350 | Severely polluted | More severe health issue possible if harmful VOC present | Contamination should be identified if level is reached even w/o presence of people; maximize ventilation & reduce attendance |
| > 351 | Extremely polluted | Headaches, additional neurotoxic effects possible | Contamination needs to be identified; avoid presence in room and maximize ventilation |