

MT-AIR QUALITY

Datasheet

Rev. 2



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1. MAIN POINTS

The MT-Air Quality is a wireless device that adds air quality parameters plus CO2 measuring capabilities to the set of data collected by the MeteoTracker platform.

The module comes with BT and WiFi connectivity and 3 modes of operation:

- associated with the [MeteoTracker+ App \(Android\)](#), together with a MeteoTracker device (weather and air quality data together) or alone (only air quality data).
- associated with a 4G/cellular modem for a complete automation of data collection, together with a MeteoTracker device (weather and air quality data together) or alone (only air quality data)
- Associated with a WiFi network, together with a MeteoTracker device (weather and air quality data together) or alone (only air quality data)

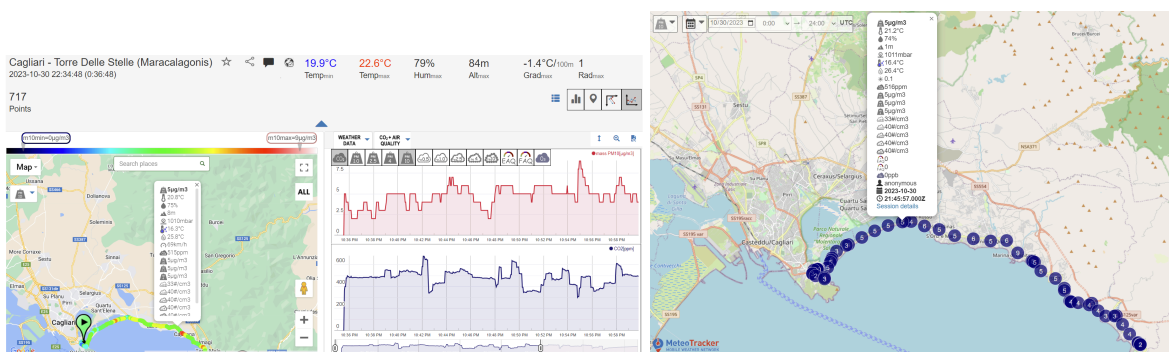
The operating mode depends on the firmware installed on the device and can be changed directly by the user through a FOTA (Firmware Over-The-Air) procedure via app.meteotracker.com.

For further information, please contact us at info@meteotracker.com.

The MT-Air Quality device measures particulate matter concentrations (PM0.5, PM1, PM2.5, PM4 and PM10, expressed both in $\mu\text{g}/\text{m}^3$ and particles/cm³), the European Air Quality Index (EAQI), and CO₂ levels.

O₃ and NO₂ measurements are also available when the device is operated in continuous mode (long-duration measurements), due to the operating characteristics of the O₃ and NO₂ sensors.

Data are transmitted to the server in real time and can be visualized, both in real time and from the archive, through the MeteoTracker+ App, the MeteoTracker interactive map, and the MeteoTracker dashboard.



2. INSTALLATION

The MT-Air Quality device is very easy to install. Thanks to its strong magnetic base (four N52 magnets), it can simply be placed on a vehicle roof, provided the surface is made of a ferromagnetic material, as is the case for most cars on the market.

If safe installation cannot be guaranteed by the magnetic base alone (for example, due to weak magnetic properties of the surface, ice on the roof, or other adverse conditions), two mounting holes are provided in the housing, allowing the device to be secured with a safety cable attached to a suitable anchoring point.

For bicycle applications, a dedicated custom bike mount is also supplied.

3. MAIN TECHNICAL DATA

Air quality data

- Particulate matter | PM 0.5, 1.0, 2.5, 4, 10 ([SPS30 Sensirion](#))
- O3 (with continuous operation only)
- NO2 (with continuous operation only)
- AQI EPA standard based on O3 and NO2 levels ([ZMOD4510 Renesas](#))
- CO2 ([SCD4x Sensirion](#))

Connectivity

- Bluetooth Low Energy
- WiFi

Power supply and autonomy

- Embedded solar panel
- Embedded battery (3000 mAh, rechargeable)
- 8 hours of continuous operation without solar power

Installation

- By magnetic base
- Bike holder

Dimensions and weight

- 10 cm x 11.8 cm x 2.5 cm
- 233 grams

4. PRECISION/ACCURACY

4.1. PMX (Sensirion SPS30)

1.1 Specification Overview

Parameter	Conditions	Value	Units	
Mass concentration range	-	0 to 1'000	µg/m ³	
Mass concentration size range	PM1.0	0.3 to 1.0	µm	
	PM2.5	0.3 to 2.5	µm	
	PM4	0.3 to 4.0	µm	
	PM10	0.3 to 10.0	µm	
Mass concentration precision ^{1,2} for PM1 and PM2.5 ³	0 to 100 µg/m ³	±10	µg/m ³	
	100 to 1000 µg/m ³	±10	% m.v.	
Mass concentration precision ^{1,2} for PM4, PM10 ⁴	0 to 100 µg/m ³	±25	µg/m ³	
	100 to 1000 µg/m ³	±25	% m.v.	
Maximum long-term mass concentration precision limit drift	0 to 100 µg/m ³	±1.25	µg/m ³ / year	
	100 to 1000 µg/m ³	±1.25	% m.v. / year	
Number concentration range	-	0 to 3'000	#/cm ³	
Number concentration size range	PM0.5	0.3 to 0.5	µm	
	PM1.0	0.3 to 1.0	µm	
	PM2.5	0.3 to 2.5	µm	
	PM4	0.3 to 4.0	µm	
	PM10	0.3 to 10.0	µm	
Number concentration precision ^{1,2} for PM0.5, PM1 and PM2.5 ³	0 to 1000 #/cm ³	±100	#/cm ³	
	1000 to 3000 #/cm ³	±10	% m.v.	
Number concentration precision ^{1,2} for PM4, PM10 ⁴	0 to 1000 #/cm ³	±250	#/cm ³	
	1000 to 3000 #/cm ³	±25	% m.v.	
Maximum long-term number concentration precision limit drift ²	0 to 1000 #/cm ³	±12.5	#/cm ³ / year	
	1000 to 3000 #/cm ³	±1.25	% m.v. / year	
Sampling interval	-	1±0.04	s	
Typical start-up time ⁵	number concentration	200 – 3000 #/cm ³	8	s
		100 – 200 #/cm ³	16	s
		50 – 100 #/cm ³	30	s
Sensor output characteristics	PM2.5 mass concentration	Calibrated to TSI DustTrak™ DRX 8533 Ambient Mode		
	PM2.5 number concentration	Calibrated to TSI OPS 3330		
Lifetime ⁶	24 h/day operation	> 10	years	
Acoustic emission level	0.2 m	max.	25	dB(A)
Long term acoustic emission level drift	0.2 m	max.	+0.5	dB(A) / year
Additional T-dependent mass and number concentration precision limit drift ²	temperature difference to 25°C	typ.	±0.5	% m.v. / °C
Weight	-	26.3 ±0.3	g	

4.2. CO₂ (Sensirion SCD4X)

1.1 CO₂ Sensing Performance

Default conditions of 25 °C, 50 % RH, ambient pressure 1013 mbar, default periodic measurement and 3.3 V supply voltage apply to values in the table below, unless otherwise stated.

Parameter	Conditions	Value
CO ₂ output range ¹	-	0 – 40'000 ppm
SCD40 CO ₂ measurement accuracy ²	400 ppm – 2'000 ppm	± (50 ppm + 5% of reading)
SCD41 CO ₂ measurement accuracy ²	400 ppm – 5'000 ppm	± (40 ppm + 5% of reading)
Repeatability	Typical	± 10 ppm
Response time ³	τ _{63%} , typical	60 s
Accuracy drift per year with automatic self-calibration algorithm enabled ⁴	Typical	± (5 ppm + 0.5 % of reading)

Table 1: SCD40 and SCD41 CO₂ sensor specifications

4.3. O₃ and NO₂ (ZMOD4510 Renesas)

See [ZMOD4510 datasheet](#) for detailed information

Table 7. Gas Sensor Module Characteristics

Symbol	Parameter	Conditions	Minimum	Typical	Maximum	Unit ^[1]
AQI	Air Quality Index	Rating according to EPA for nitrogen dioxide and ozone	0	-	500	-
-	Measurement Range	Nitrogen dioxide (NO ₂ O ₃ operation)	20	-	500	ppb
-		Ozone	20	-	500	ppb
-	Cross sensitivity	NO ₂ O ₃ operation, 200ppb ozone	-	15	-	AQI level
-		NO ₂ O ₃ operation, 200ppb nitrogen dioxide	-	10	-	AQI level
-		ULP O ₃ operation, Ozone reporting at 200ppb nitrogen dioxide	-	25	-	AQI level

Table 8. Typical ZMOD4510 Sensor Module Performances

Parameter	Conditions	Gas	Typical	Unit
Accuracy	uncalibrated, 0 to 500 ppb	Nitrogen dioxide (only NO ₂ O ₃ operation) and Ozone (all modes)	±50	AQI
Consistency ^[1]			±50	
Accuracy	NO ₂ O ₃ operation, calibrated, 23°C and 30% RH, 0 to 100 ppb	Nitrogen dioxide	±20	ppb
Consistency ^[1]		Ozone	±10	
		Nitrogen dioxide	±10	
		Ozone	±5	

1. Part-to-Part variation.

5. REFERENCES

- [MeteoTracker documentation](#)
- www.meteotracker.com
- info@meteotracker.com
- <https://www.linkedin.com/showcase/meteotracker/>