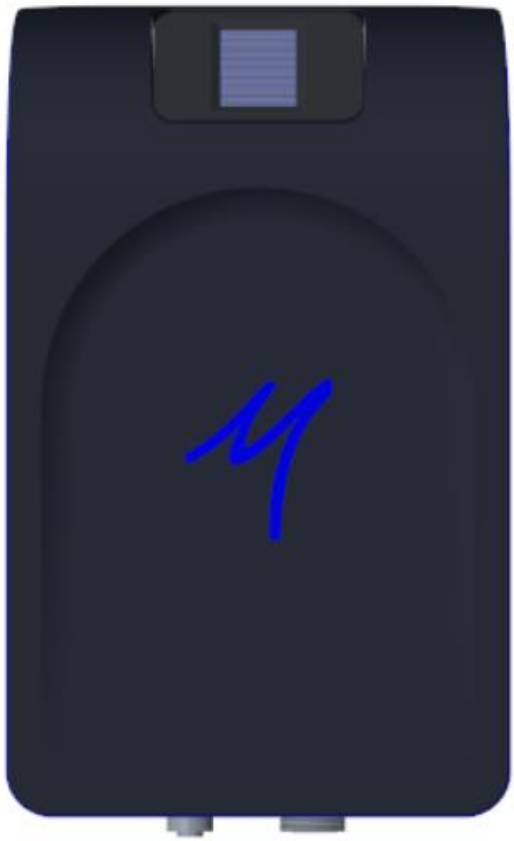
QSense-Air

Environmental Quality Sensor

Our highly reliable air quality, rain and noise sensor enables you to better understand your environment



Poor air quality and noise are the most serious environmental health issues globally and the primary driving force for environmental quality monitoring.

Macq provides with its sensor eQs the latest technology for environmental quality monitoring. It measures accurately the most important gaseous pollutants (**NO_2, O_3, VOC, CO, CO_2, SO_2, H_2S, NH_3**), particulate matter ($PM_{1\ /\ 2.5\ /\ 10}$), weather parameters relevant to monitor, estimate, and forecast air quality (air pressure, temperature, humidity, rain), as well as the surrounding noise. Showing the real-time exposure thanks to all collected data enables you to better understand your environment, identify pollution and/or noise hotspots and trends at a localized level, such as busy road junctions, and thus improve your environmental decision making.

The data is available locally via Ethernet or is sent wirelessly to a web-based database. The dual GPRS & 4G LTE connection ensures an increased data reliability and guarantees a reliable analysis of your situation.

The measurement performance of our eQs is based on advanced algorithms that enable parts per billion (ppb) measurements by using electrochemical sensor (only for CO), semiconductors, optics and analog sensors. The algorithms compensate the impact of ambient conditions and aging on the sensor elements and remove the need for costly gas sampling and maintenance equipment.

Our compact and lightweight eQs is specifically designed for environmental quality monitoring networks in urban areas, road networks, or around industrial sites and transportation hubs. Thanks to its simple wall/pole fixing system, it is ideally suited for deployment even in large environmental quality networks. It fits discreetly into your environment and ensures you a constant control of your environmental quality.

MAIN TECHNICAL CHARACTERISTICS

- High sensitivity sensors measuring: NO_2, O_3, VOC, CO, CO_2, SO_2, H_2S, NH_3, $PM_{1\ /\ 2.5\ /\ 10}$, noise, air pressure, humidity, temperature & rain
- Connectivity: Ethernet, optical fiber (optional), GPRS, 4G LTE, 5G (pre-orderable)
- Main GNSS used worldwide included
- Low power consumption (typically 2.75W), optional with solar panel & battery
- Compact design & easy to deploy in the field
- Easy integration & open API
- No need for costly gas sampling and maintenance equipment
- Weight: 1kg

✓ Ready to use with MACQ MOBILITY MANAGER

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TECHNICAL DATA

Gas Measurement Performance

Gas	Range	Resolution	Accuracy
NO_2	0 to 500 ppb	2 ppb	± 15 ppb
O_3	0 to 500 ppb	2 ppb	± 15 ppb
VOC	0 to 1,000 ppb	5 ppb	± 30 ppb
CO	0.25 to 10 mg/m³	0.01 µg/m³	± 0.2 µg/m³
CO_2	0 to 5,000 ppm	1 ppm	± 50 ppm
SO_2			
H_2S			
NH_3			

Particulate Matter Measurement Performance

Particulates counter channel	PM_1, $PM_{2.5}$, PM_{10}
Particulates diameter range	0.3 to 10 µm
Measurement range	0 to 1,000 µg/m³
Sampling time	1000 ms ±5%
Resolution	0.5 µg/m³
Accuracy	± 10 µg/m³

Environmental Measurement Performance

Noise	Ratio	64dB signal-to-noise ratio (low distortion digital microphone)
	Sensitivity	Omnidirectional -26dBFS ±3dB
	Temperature range	-40 to +85 °C
Rain	Sensor dimensions	30.48mm * 35.56mm
	Sensitivity	100% Dry: 100pF capacitance 100% Wet: >550pF capacitance

Weather Measurement Performance

Weather Parameter	Range	Resolution	Accuracy
Humidity	0 to 100%	0.1%	20 to 80% RH: ±3.5% RH 0 to 100% RH: ±5% RH
Temperature	-40 to +125 °C	0.1 °C	15 to 40 °C: ±0.5 °C 0 to 60 °C: ±1 °C
Air Pressure	260 to 1,260 hPa	0.1 hPa	20 to 60 °C: ±0.2 hPa 0 to 80 °C: ±1 hPa

RF Performance

P_{RF} max GPRS/LTE	LTE category M1 / NB1		Class 3 (23dBm)	
	2G GMSK		Class 4 (33 dBm) for GSM/E-GSM bands Class 1 (30 dBm) for DCS/PCS bands	
	2G 8-PSK		Class E2 (27 dBm) for GSM/E-GSM bands Class E2 (26 dBm)	
Data Rate GPRS/LTE	LTE category M1		Up to 375 kb/s UL, up to 300 kb/s DL	
	LTE category NB1		Up to 62.5 kb/s UL, up to 27.2 kb/s DL	
	GPRS multi-slot class 336		Up to 85.6 kb/s UL, up to 107 kb/s DL	
	EGPRS multi-slot class 336		Up to 236.8 kb/s UL, up to 296.0 kb/s DL	
Receiver sensitivity GPRS/LTE	LTE category M1		-105 dBm to -107.5 dBm	
	LTE category NB1		112 dBm to -114 dBm	
	2G RF		-109 dBm for GSM/E-GSM/ DCS/PCS bands	
Maximum GNSS Sensibility	GPS:	-166 dBm	BEIDOU:	-160 dBm
	GLONASS:	-166 dBm	GALILEO:	-159 dBm

Mechanical & Operating Specifications

Operating temperature	No CO and no CO_2: - 20 to +50 °C With CO and CO_2: 0 to 50 °C
Operating humidity	No CO and no CO_2: 5 to 85 % RH With CO and CO_2: 10 to 85 % RH
Installation height	Up to 10m
IP/IK rating	IP65, IK8
CE conformity	Yes
Data transmission	Ethernet, 2G (GPRS), 4G (LTE category M1), 5G (pre-orderable), optical fiber connection (optional)
RAM	8 GB
Operating voltage	DC Input: 5 to 16V (typical: 12V) PoE RJ45: 48V Solar panel & battery (optional)
Power consumption	2.75W, 10W max (GPRS peak)