

Autonomous networks of sensor-based mini-stations

AIR QUALITY MONITORING SYSTEMS

“40 years of experience in the field of environmental monitoring to the benefit of our micro-sensors”

A Cairnet® device is a real-time standalone and networkable air-monitoring station containing up to four Cairsens® micro-sensors and cellular communication within a waterproof enclosure.

Compact, easily deployable and autonomous thanks to its solar panels, Cairnet® enables you to cost-effectively monitor dust and gas and gives a complete picture of the environmental impact of your operations.

It offers unprecedented flexibility in producing accurate and dynamic air quality measurements across a broad swathe of industries and applications.

MAIN BENEFITS:

- Real-time monitoring and alerts of the most common types of pollutants: H₂S/CH₄S, NH₃, nmVOC, O₃/NO₂, NO₂, CO, SO₂, PM10 & PM2.5
- Very high sensitivity to capture low level gas concentrations (down to ppb)
- Provides reliable measurement data at a fraction of the cost of reference method analyzers
- Evolutive, easy to use, easy to move: no cables or complicated installation, just set up and move to different locations on your site as needed
- Cairnet® requires only annual maintenance, when sensors should be replaced with new ones
- Ability to change the set of pollutants being monitored at any time (excepting dust)
- Embedded measurement of temperature, relative humidity and pressure
- Possibility to realize hybrid AQMS networks (reference stations & mini-stations)
- Measurements meet European directive 2008/50/EC

MAIN APPLICATIONS:

- > Leak detection and monitoring of fugitive emissions: quarries, storage facilities, mines, manufacturing plants
- > Odor monitoring: WWTP, recycling, pulp and paper manufacturing, sewerage treatment facilities, refineries
- > Forecasting of industrial fence line emissions
- > Indoor and outdoor air quality monitoring: smart cities, road-side & tunnels, schools, airports, ship terminals...
- > Health and safety: mines, industrial sites, construction
- > Providing data for air dispersion modelling



SUPERVISION

ALARMS

PROCESSING



STORAGE

ACQUISITION



Cairnet® provides optimal coverage and measurement of air pollution over a vast area with centralized data management in the cloud.



Independent reviewers, including the **European JRC** (Joint Research Council) and the **US-EPA**, have determined the accuracy, linearity, limits of detection and precision of Cairsens® as very good when compared with reference devices. Further studies with **NASA** have shown very good agreement with reference measurements.

MEASURABLE PARAMETERS

Pollutant	Range (ppb)	Certified detection limit (ppb)*	Resolution (ppb)	Product code
H ₂ S / CH ₄ S	0-1,000	10	1	A40-0001
	0-20,000	30		A40-0005
	0-200,000	200		A40-0007
NH ₃	0-25,000	500	1	A40-0060
nmVOC	0-16,000	500	1	A40-0040
	0-2,000	200		A40-0043
O ₃ / NO ₂	0-250	20	1	A40-0070
NO ₂	0-250	20	1	A40-0020
CO	0-20,000	50	1	A40-0010
SO ₂	0-1,000	50	1	A40-0050
PM10 & PM2.5		0-1,000 µg/m ³		A40-0215



The Cairsens® are manufactured in France and are calibrated in our metrological laboratory using Standard Reference AQMS monitors. No need for re-calibration (1 year lifetime)

*They are delivered with a calibration certificate.

CAIRNET® TECHNICAL SPECIFICATIONS

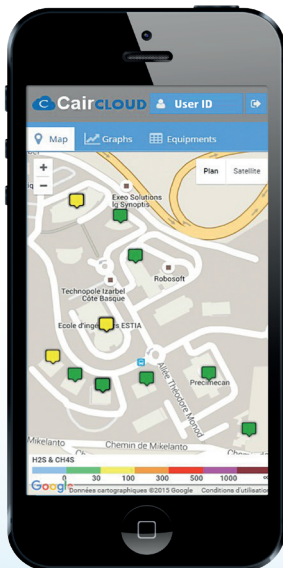
Power supply	12VDC / 1.5A plug pack and internal battery
Solar Panels Kit (option)	26 Watts (with 2 panels). Mounting bracket included
Mounting	Mounting bracket included for pole, tripod, mast etc. (ø40 mm max)
Dimensions (LxHxW)	Cairnet® enclosure: 230x370x200 mm Solar Panels kit: 800x410x100 mm (for 2 pcs)
Weight	Cairnet® enclosure: 5,1 Kg Solar Panels kit: 4,9 Kg (for 2 pcs)
Environmental conditions	-20°C to +50°C / HR 10% to 90%

CELLULAR COMMUNICATION CHARACTERISTICS:

- **Technology and frequency bands:** 2G/3G/LTE advanced Quad-band GSM/2G/ EDGE (850 MHz, 900 MHz, 1800 MHz, 1900 MHz)
- **Regulatory compliance:** R&TTE directive 1999/5/EC Japan JRF/JPA - FCC - IC

SITE CONFIGURATION AND COMMUNICATION MODE:

- **2,5G/3G** cellular: suitable for large surface network deployments; area must be covered by the 2G to 3G network (data access contract required)
- **Radio Xbee:** suitable for small sites. The distances between Cairnet stations and the central antenna (Modem / Coordinator) must not exceed 200 meters in free field.



CAIRCLOUD®

Access your data When and Where you want

- Data acquisition and processing secured web-based interface
- Real-time air quality data with dynamic view: tables, graphs, filters...
- Programmable threshold alerts
- Geo-location of measuring points on interactive map
- Data storage up to 3 years
- Automatic and / or manual data export (xlsx, csv, pdf, jpeg...)
- Auto data export via FTP, SFTP, API REST
- Status tracking of the battery charge, power supply, Cairsens™ sensors' lifetime
- Optional acquisition of weather parameters

XR Provided data is compatible with Air Quality Data Acquisition systems and databases such as the XR® software from ENVEA



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