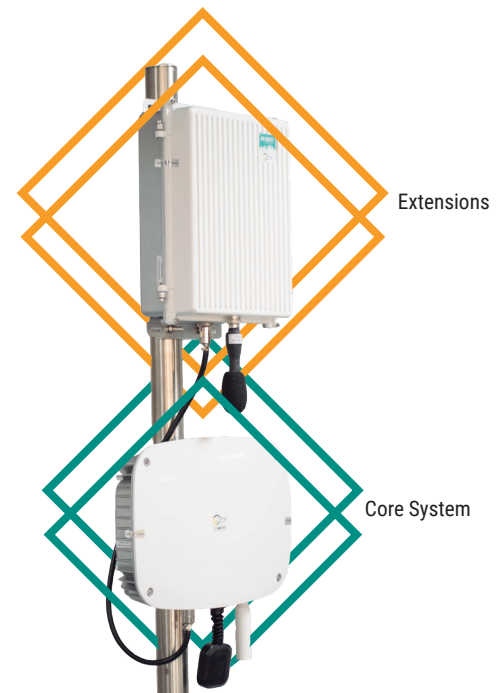


Smart Spot Extensions

Smart Spots are configurable IoT devices that allow monitor different environmental factors, such as air quality (gases and suspended particles), temperature, humidity and noise, as well as integrating weather stations.

The inclusion of all these sensors and capacities in a single device provides savings in the installation, maintenance and management as well as in communications.

As for the connection possibilities of this device, it is offered in multiple versions, including Wi-Fi, LoRa, GSM/GPRS and NB-IoT



CORE SYSTEM

Characteristics

Operating system	Watchdogs anti-blocking system
	Industrial operating system in real time (FreeRTOS)
	Valid for industrial environments
CPU	Dual Core 240 MHz
Antennas	Multi-antenna IP68 anti-vandalism (GPS/M2M/WiFi)
Device health monitoring	Temperature
	Humidity
Vandalism detection	Accelerometer
	Gyroscope

Enclosure

Protection	Protection IP65
	UV
Size	300x220x36,7 cm
Material	Aluminium
Anchorage system	Anti-vandalism security
Weight	1,8 kg

Communications

Network	WiFi
	LoRa
	GPRS
	NB-IoT
Protocols	MQTT
	OMA LwM2M
	ETSI NGSI (FIWARE)
	HTTP
Remote management	Sentilo
	Own platform (Homard)
	Third party platform
Data sending	Configurable between 1 seg - 24 hr.

Power supply

Energy consumption	180-300 mA Active
Voltage (nominal)	5V
Battery (optional)	20.000 mA
Solar panel (optional)	6.5V

Extensions

Harmful & greenhouses gases*	NO ₂ , H ₂ S, CO, NO, SO ₂ , O ₃ , NH ₃ & CO ₂
Particles Matters (PM)	PM1, PM2.5 & PM10
People Flow	WiFi & BLE
Sound level meter**	Class II - 40 dB - 115 dB
Weather parameters	Temperature y humidity

*To 6 gases

**Possibility of incorporating a sound level meter CESVA Class I

Extensions enclosures

Protection	Aluminium IP65
Weight	2,2 Kg
Anchorage system	Anti-vandalism system
Size	100x220x280 mm

Harmful & greenhouses gases

Core system	Optimal air flow pump
	Connector with coarse filter
	Air quality plate control system
	Dual-gas plate (2, 4 or 6 gases)

Sensors technology

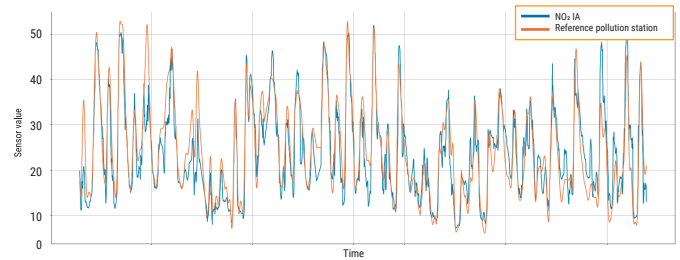
Type of sensor	Electrochemical
Humidity range	[15, 85] % hr
Temperature range	[-20, 40] °C
Lifetime	24 Months

Calibration and data quality service

Calibration equipments	Certified own laboratory and reference equipment
	External certification of Composition and stability
	UNE-EN ISO/IEC 17025, Agency EPA
Artificial Intelligence models	Drift compensation
	Removal of outliers
	Model for the improvement of data accuracy for each sensor

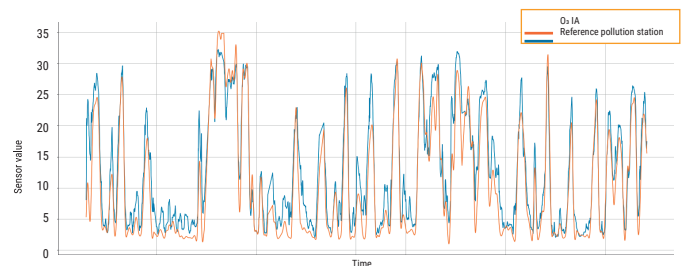
NO₂ (correlation coef. 0,90)

Range	0-5 ppm
Accuracy	±2 ppb
Resolution	1 ppb
Maximum stable value	50 ppm
Cross sensitivity	Cl ₂ > H ₂ S> NO> SO ₂ , CO



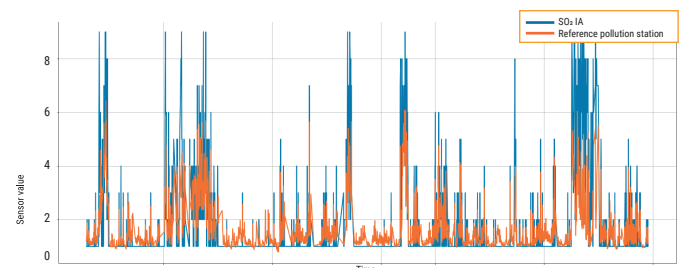
O₃ (correlation coef. 0,95)

Range	0-5 ppm
Accuracy	±3 ppb
Resolution	1 ppb
Maximum stable value	50 ppm
Cross sensitivity	Cl ₂ > H ₂ S> NO> SO ₂ , CO



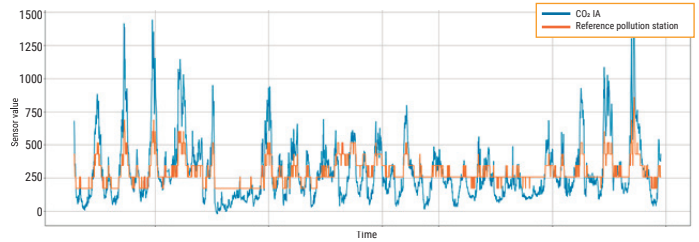
SO₂ (correlation coef. 0,95)

Range	0-5 ppm
Accuracy	±3 ppb
Resolution	1 ppb
Maximum stable value	100 ppm
Cross sensitivity	O ₃ , NO ₂ > Cl ₂ > H ₂ S, NO, CO



CO (correlation coef. 0,84)

Range	0-10 ppm
Accuracy	±5 ppb
Resolution	1 ppb
Maximum stable value	2.000 ppm
Cross sensitivity	H ₂ S> NO ₂ , NO



NO

Range	0-5 ppm
Accuracy	±10 ppb
Resolution	1 ppb
Maximum stable value	50 ppm
Cross sensitivity	H ₂ S>NO ₂ >SO ₂ , Cl ₂

H₂S

Range	0-1 ppm
Accuracy	±2 ppb
Resolution	1 ppb
Maximum stable value	50 ppm
Cross sensitivity	NO ₂ >SO ₂ > CL ₂ > NO

NH₃

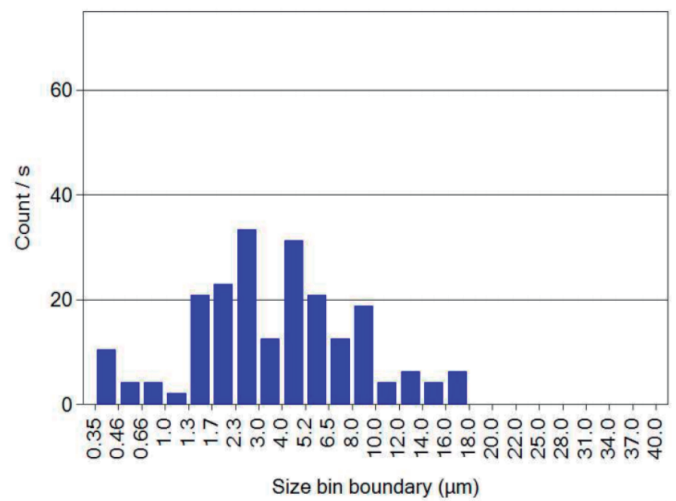
Range	0-20 ppm
Accuracy	±20 ppb
Resolution	1 ppb
Maximum stable value	200 ppm
Cross sensitivity	CL ₂ , NO, SO ₂ > H ₂ S; NO ₂ > CO> H ₂

CO₂

Tecnology	Optical
	Specific plate & hood
Range	0-5.000 ppm
Accuracy	±1 ppm
Resolution	1 ppm
Lifetime	24 Months

Particles Matter (PM)

Core system	Air quality control system
	Anti-humidity filter
	Forced air flow pump
Measurement range	0,35 - 40 µm
Particles/second	10,000
Size of measured particles	PM1, PM2.5 y PM10
Max. Mass flow rate	2,000 µg/m ³



Crowd monitoring

Configuration	Independent for each technology (WiFi & BLE)
Time range	Simultaneous aggregation in 3 time ranges
	Aggregation time configurable from 1 m 1 h. (3 ranges)

Hash algorithms	Obfuscated WiFi/BLE identifiers SHA1 and MDS since detection
	Configurable Hash algorithm for obfuscation (MDS and SHA1)
	Key for configurable Hash obfuscation algorithm
	Individual report of detected devices in Hash format (SHA1 and MDS)
	Collective report of devices detected in Hash format (SHA1 and MDS)

Sound level meter (Class 2)

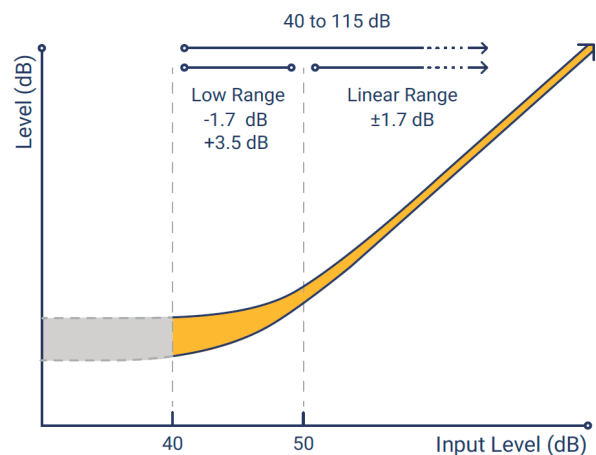
Characteristics

Working range SPL	40 - 115 dB
Weighting frequency	Filter IEC 61672-1 A
Weighting time	IEC 61672-1 Slow (S) & Fast (F)
Certification	ROHS2/CE
Additional features	Continuous exposure monitor
	Threshold detection

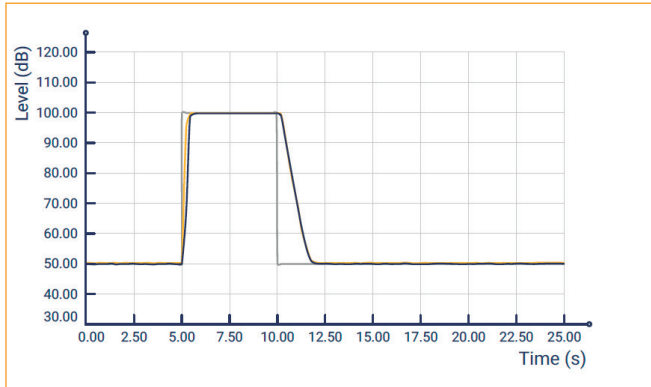
Functions

Available functions	LASFast	LASlow min	LA1
	LAFast max	LAeq	LA10
	LAFast min	LA	LA50
	LASlow	LAmix	LA90
	LASlow max	LAMin	LA99

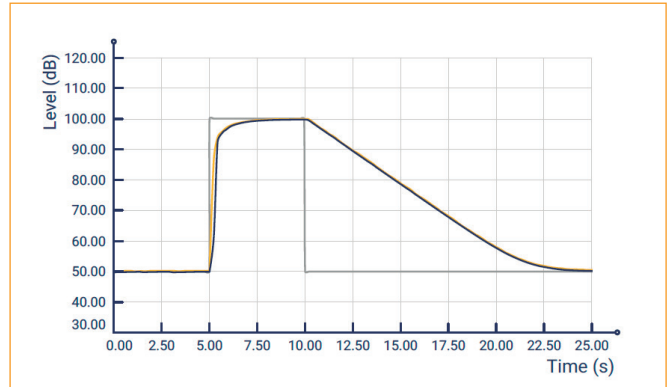
Range of action (40-115 dB)



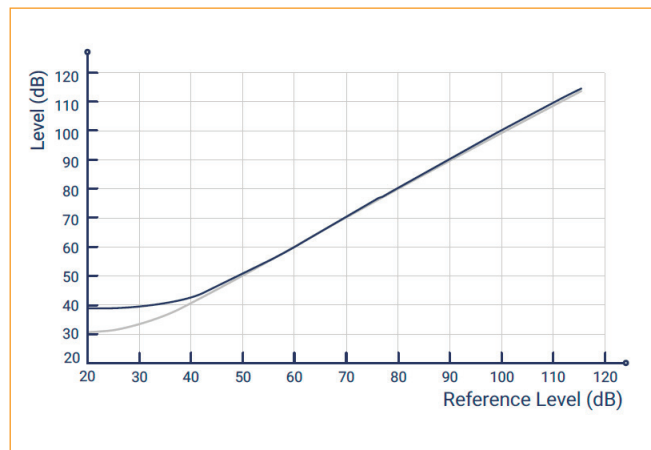
Weighting time - FAST (F)



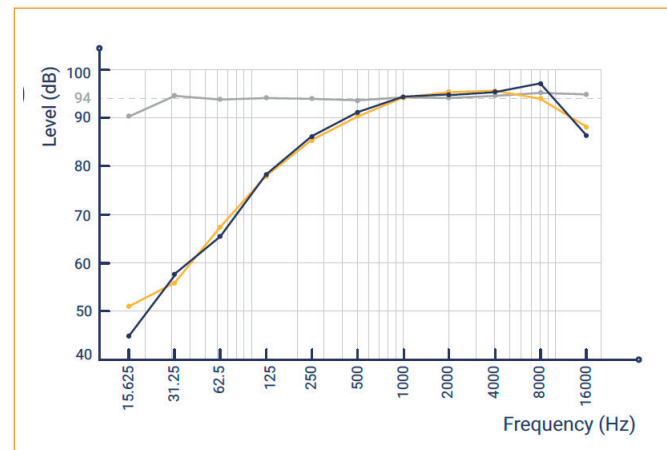
Weighting time - SLOW (S)



Extensive response (1kHz)



Response frequency weighting A



— SPL Meter — Entry level
— Reference*

*The device used as reference is a class 2 sound level meter according to IEC 61672 and ANSI S1.4

Temperature & humidity

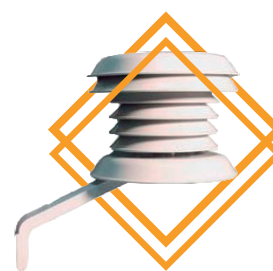
Temperature

Resolution	0.01°C
Accuracy	±0.1°C
Range	-40°C a +125°C

Humidity

Resolution	0.01 %HR
Accuracy	±1.5 %HR
Range	0 %HR a 100 %HR

Probe	Solar radiation protection RS3-B
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Solar radiation protection probe RS3-B