



AQ GUARD SMART

AIR QUALITY MEASUREMENT

High-resolution real-time monitoring

Made in Germany

Precise determination of air quality with **AQ GUARD SMART**

How can air pollution be reduced in the future? In order to answer this question, reliable, continuous and flexible measurements of particulate matter concentrations and distributions are required, which allow conclusions to be drawn on the cause and predictions to be made.

The lightweight and easy-to-use measuring device **AQ GUARD SMART** is suitable as a supplement to regulatory measurements, for monitoring and controlling safe working conditions and for temporary or permanent air quality monitoring at roadside locations, construction sites or industrial plants.

Like all Palas® fine dust devices, **AQ GUARD SMART** works according to the proven principle of optical measurement and classification of single particles, which has been considerably improved by us. If required, the device can be equipped with additional sensors, like weather or gas measurement technology. Also it can provide information about the origin of the pollution.

AQ GUARD SMART is the perfect addition to the Palas® portfolio for mobile or stationary outdoor air quality measurement tasks.

Application examples



NETWORK WITH ROADS, RAILS & PORTS



SMART CITY



OPEN PIT MINING & LANDFILLS



CONSTRUCTION SITES



INDUSTRY



NATURAL RISK AREAS

Principle of operation

AQ GUARD SMART is a robust aerosol spectrometer for ambient air. It uses the measurement principle of optical scattered light measurement on single particles based on the technology of the EN 16450 certified FIDAS® 200, can be upgraded with a gas sensor package (SO₂, CO, NO₂, O₃) and thus offers optimum options for evaluating air quality.

For a better understanding and interpretation of immissions and their origin, the device can be equipped with a weather station. Sensors for recording temperature, humidity and pressure are integrated as standard.

AQ GUARD SMART can be operated over longer periods without recalibration. Deviations in the particle size determination and thus drifts of the PM values are determined by a specific analysis of the particle size distribution and displayed and reported when a tolerance threshold is exceeded as part of the self-monitoring.

The transmission of the measurement data takes place via the Palas® Cloud **MYATMOSPHERE**. For stand-alone operation, the system can be operated by an external battery with or without solar support.



Special advantages and benefits

LATEST TECHNOLOGY

- High accuracy and reproducibility of the fine dust values due to the technology based on the certified FIDAS[®] 200 series; known for its proven quick and easy on-site calibration
- Short-term commissioning and immediate recording of measured values via the cloud **MYATMOSPHERE**
- Situation-specific configuration via Wi-Fi hotspot, remote access and external touchpad
- Communication over GPRS/3G/4G/Ethernet/Wi-Fi, optional: LoRaWAN
- Expandable with weather station and gas sensors for better assessment and evaluation of particulate matter data

DIFFERENT MEASUREMENTS

- Measurement of C_n , PM_{10} , $PM_{2.5}$, PM_{4} , PM_{10} with high temporal resolution (optional: SO_2 , CO , NO_2 , O_3)
- Particle measurement range from 0.175 - 20,000 nm up to 100 mg/m³ mass concentration or 20,000 particle/cm³ (single particle analysis)
- Continuous, simultaneous real-time measurement in second-by-second resolution

EXTENSIVE OUTPUT OPTIONS

- Visualization and real-time transmission of the measured data and their cause without post-processing or applying corrections

Technical features

Measuring principle	Optical light scattering of single particles
Reported data	PM ₁ , PM _{2.5} , PM ₄ , PM ₁₀ , TSP, C _N , particle size distribution, pressure, temperature, relative humidity, optional: SO ₂ , CO, NO ₂ , O ₃
Measurement range (number C _N)	0 – 20,000 particles/cm ³
Measurement range (size)	0.175 – 20 µm
Measurement range (mass)	0 – 100 mg/m ³ (depending on aerosol composition)
Measurement uncertainty	< 15 % for PM _{2.5} , < 20 % for PM ₁₀ (expanded measurement uncertainty according to EN 16450, corrected – MCERTS)
Size channels	64 (32/decade)
Time resolution	1 min, moving average 1 min
Installation conditions	-20 – +50 °C
Interfaces	USB, Ethernet (LAN), Wi-Fi, 3G/4G via modem, optional: LoRaWAN
Power supply	12 V, supplied power supply
Power consumption	1.2 A in standard operation, 1.7 A with additional heating
Data management	Cloud connection to MyAtmosphere*
Dimensions (H • W • D)	530 • 270 • 208 mm
Special features	Accessories: mast/tripod mount optional: weather station, sunshade, LoRa modem

*separate registration required; cloud license fees may apply and/or SIM card required

Subject to technical changes

Latest gas sensor technology

AQ Guard Smart uses state-of-the-art polymer electrolyte sensors to determine gas concentrations of SO₂, NO₂, O₃ and CO. Compared to liquid electrolyte technology, these sensors are characterized by durability and long-term stability.

All sensors are factory calibrated. If required, they can also be calibrated by the customer. Corresponding calibration factors can be saved independently in the firmware.

Moisture and temperature influences are reliably detected and directly compensated with their built-in technology. In addition, sensors are designed to be dust and corrosion resistant. All sensors have internal status monitoring.

Replacing the boards including the sensors can be carried out by the customer independently.

Settings and registrations in the firmware are not necessary.

Repeatability	< 2%
Linearity	Linear
Long-term drift	< 1% / month
Range	0 – 5 ppm
Resolution	0.01 ppm
Response time	< 3 s

Palas® is a leading developer and manufacturer of high precision instruments for the generation, measurement and characterization of particles in air.

With more than 30 active patents, Palas® develops technologically leading and certified fine dust and nanoparticle analyzers, aerosol spectrometers, generators and sensors as well as related systems and software solutions. Palas® was founded in 1983 and employs more than 100 people.

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