

PALAS®

AQ GUARD SMART SYSTEM

AIR QUALITY MEASUREMENT

High-resolution real-time monitoring

Made in Germany

Precise determination of air quality with AQ Guard Smart System

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 devices of the AQ Guard Smart system are suitable as a supplement to regulatory measurements, for monitoring and controlling safe working conditions and for temporary or permanent air quality monitoring at road-side locations, construction sites or industrial plants.

With the introduction of the AQ Guard Smart system, the proven Palas® technology of optical particle measurement is now supplemented in one family by innovative gas sensor technology and technology for measuring ultrafine particles in the air.

If required, the devices can be equipped with further accessories: for example, climate sensors or signal technology for alarming.

The measurement data is transmitted via the Palas® Cloud MyAtmosphere.

MY ATMOSPHERE

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 system is a robust aerosol spectrometer for ambient air. The model **AQ Guard Smart 1X00** uses the measurement principle of optical scattered light measurement on single particles based on the technology of the EN 16450 certified Fidas® 200. The model **AQ Guard Smart 2000** works on the principle of diffusion charging.

AQ Guard Smart system uses state-of-the-art polymer electrolyte sensors to determine gas concentrations of SO_2, NO_2, O_3 and CO. Compared to liquid electrolyte technology, these sensors are characterized by durability and long-term stability.

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 system 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.

AQ Guard Smart System

AQ Guard Smart 1000 for particle measurement of ambient air

- PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, pressure, temperature, relative humidity

AQ Guard Smart 1100 for particle measurement of ambient air with gas sensors

- PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, pressure, temperature, relative humidity, as well as: SO_2, CO, NO_2, O_3

AQ Guard Smart 1200 for particle measurement of ambient air with extended gas sensors and GPS

- PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, pressure, temperature, relative humidity, SO_2, CO, NO_2, O_3, TVOC (metal oxide sensor), CO_2 (NDIR sensor)

AQ Guard Smart 2000 for measurement of ultrafine particles in ambient air

- C_N: 1,000 – 10^6 particles/cm^3, D < 0.01 - 1 µm, pressure, temperature, relative humidity, average diameter X50, LDSA (Lung Deposited Surface Area)

Special advantages and benefits

Latest Technology

- High accuracy and reproducibility of the fine dust values
- 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
- Extensive communication capabilities
- Expandable with weather station for better assessment and evaluation of particulate matter data and other parameters

Different Measurements

- Measurement of particle mass concentrations with high temporal resolution and optional gas sensor technology and ultra fine particle concentrations down to 10nm in size
- 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

	AQ Guard Smart 1X00	AQ Guard Smart 2000
Measuring principle	Optical light scattering of single particles Solid Polymere Elektolyt (AQ Guard Smart 1100 | 1200)	Diffusion charging
Reported data	PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, pressure, temperature, relative humidity, SO_2, CO, NO_2, O_3, TVOC, CO_2	C_N, average diameter X50, LDSA (Lung Deposited Surface Area), pressure, temperature, relative humidity
Measurement range (number C_N)	0 – 20,000 particles/cm^3	1,000 – 10^6 particles/cm^3
Measurement range (size)	0.175 – 20 µm (particle)	0.01 – 1 µm
Measurement range (mass)	0 – 100 mg/m^3 (depending on aerosol composition)	
Installation conditions	-20 – +50 °C	
Interfaces	USB, Ethernet (LAN), Wi-Fi, 3G/4G via modem, optional: LoRaWAN GPS (AQ Guard Smart 1200)	
Protocols	UDP, ASCII, Modbus	
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

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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Version: October 2022