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? To answer this question, reliable, continuous, and flexible measurements of particulate matter concentrations and distributions are required, allowing conclusions to be drawn on the cause and predictions.

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 roadside 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 ultra-fine particles in the air.

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

The AQ Guard Smart System is MyAtmosphere-ready. The measurement data can be transmitted via the Palas Cloud MyAtmosphere.

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 principle of optical scattered light measurement on single particles based on the EN 16450 certified Fidas® 200 technology. The model **AQ Guard Smart 2000** for ultra-fine particles works on the principle of diffusion charging.

AQ Guard Smart 1X00 is MCERTS Indicative certified for $PM_{2.5}$ and PM_{10}.

MCERTS
Sira MC 220412/00

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.

The device can be equipped with a weather station to understand better and interpret immissions and their origin. Sensors for recording temperature, humidity, and pressure are integrated as standard.

AQ Guard Smart System can be operated over more extended 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, CO_2 (NDIR sensor)

AQ Guard Smart 2000 for measurement of ultra-fine 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 a weather station for better assessment and evaluation of particulate matter data and other parameters
- Compact size and easy installation

Different measurements

- Measurement of particle mass concentrations with high temporal resolution and optional gas sensor technology as well as concentration of ultra-fine particles down to 10 nm 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 Polymer Electrolyte (AQ Guard Smart 1100 | 1200)	Diffusion charging
Reported data	PM_1, $PM_{2.5}$, PM_4, PM_{10}, TSP, C_N, particle size distribution, pressu-re, temperature, relative humidi-ty, SO_2, CO, NO_2, O_3, 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	1,000–10^7 particles/cm^3
Measurement range (size)	0.175–20 µm	0.01–1 µm
Measurement range (mass)	0–100 mg/m^3 (depending on aerosol composition)	
Interfaces	USB, Ethernet (LAN), Wi-Fi, 3G/4G via modem, optional: LoRaWAN GPS (AQ Guard Smart 1200)	
Protocols	UDP, ASCII, Modbus	
Data management	Prepared for connection to the Palas Cloud MyAtmosphere („MyAtmosphere-ready“)*	
Installation conditions	-20–+50 °C	
Dimensions (H • W • D)	530 • 270 • 208 mm	
Special features	Heated inlet, mast / tripod mount	

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

Subject to technical changes

As an aerosol technology expert, Palas® Germany is committed to providing users with solutions for the generation, conditioning, measurement and analysis of aerosol particles. Based on the unique advantages of its own technology, Palas® developed a variety of application cases in ambient air quality monitoring, particle filtration performance testing and various scientific research fields. Palas Instruments (Shanghai) Co., Ltd. is a wholly owned subsidiary of Hong Kong Palas (Asia) Limited. As one of the global branches of Palas GmbH, it has legally obtained the Palas trademark authorized by Palas GmbH in Exclusive use rights in China and Asia.

As a company that has passed the ISO 9001:2015 quality management system certification, Palas®'s test rig solutions can execute particle filtration performance tests for filter media and filter elements according to applicable international, national and regional standards. In terms of environmental protection, Palas®'s equipment meets the requirements of multiple environmental monitoring standards (EN 15267, EN 16450, HJ653, GBZ/T 192.6, etc.) for indoor and ambient PM2.5, PM10, particle number size distribution monitoring and analysis.

Palas (Asia) Limited, Hong Kong
Operational Office Address:
Palas Instruments (Shanghai) Co., Ltd.
5th Floor, Building 6C, No. 650 Shunqing Rd, Song Jiang District, 201612 Shanghai
Hotline: +86 400 784 6669
Email: info@palas.com.hk
Website: www.palas.com.hk