KyberAir Max

A Comprehensive Air Quality Monitoring Solution by ExpandoWorks

About KyberAir

KyberAir is a Continuous Ambient Air Quality Monitoring System (CAAQMS) capable of tracking a wide range of environmental parameters - air quality, noise, odour, weather, and radiation. It provides real-time measurements of particulate matter and gaseous concentrations in ambient air. With external probes, it can also extend to auxiliary monitoring.

With KyberAir, we can monitor exactly everything listed above in **one place, one sensor, one unit.**

KyberAir is an ideal choice for smart cities and urban-infrastructure applications such as roads and highways, tunnels, smart campuses, and airport environments. It integrates easily with a Smart or Intelligent Poles.

Product Key Features & Benefits

Designed & Built in SA
100% End-to-end South African build: design, firmware, and assembly.

Retrofit Design
Simple installation, plug and play, easy start-up included.

Compact
Lightweight, low-profile unit; typical install height 4–5 m (12–15 ft).

Real-Time Data & Dashboard View
Continuous monitoring with data stored on our servers.

Weather-Resistant
IP65 enclosure for harsh outdoor environments.

KyberPortal Dashboard
Visualise and analyse data in the cloud with live dashboards, alerts and reports. Easy integration via APIs (REST/MQTT).

Tamper Proof Unit
Unit is fully lockable and mounted at height/in secure locations to deter tampering.

OTA Updates
Remote firmware/config updates; no site visit needed.

Multi-Network Connectivity
4G LTE Cat-1, Wi-Fi, LoRa, Ethernet, RS-485/Modbus.

On-Device Calibration
On-site calibration using built-in software tools.

Solar-Powered with Battery Backup
Runs on solar with integrated backup battery.

Accurate Data
Real-time, precise measurements for detecting ambient-air concentrations.

KyberAir **Use cases**

Smart City

Pollution monitoring at strategic locations in a smart-city empowers city authorities to obtain actionable insights for pollution control.

Roads and Highways

Pollution monitoring at roads and tunnels can help create pollution mitigation action plan to control vehicular emissions

Smart Campus

Pollution monitoring at key locations on campus allows stakeholders to spread awareness about environmental conditions of the premises.

Airports

Pollution and noise monitoring at taxiways and terminal surroundings facilitate airport authorities to analyse its impact on travellers and surrounding neighbourhoods.

KyberAir Variants

Variants	Applications	Parameters
KyberAir Standard	General Purpose	PMs (1.0, 2.5, 10, 100), CO2, CO, SO2, NO, NO2, O3, Wind Engine, Temp, Hum, Pres, Light, Rain, Noise
KyberAir Dust	Industrial & Mining	PMs (1.0, 2.5, 10, 100), Wind Engine, Temp, Hum, Pres, Light, Rain, Noise
KyberAir Smell	Odor Tracking	TVOC, H2S, NH3, SO2, CH4S, CH2O, NO2, Cl2, Wind Engine, Temp, Hum, Pres, Light, Rain, Noise
KyberAir Waste	Landfills & Waste	SO2, H2S, NH3, CH4S, TVOC, Wind Engine, Temp, Hum, Pres, Light, Rain, Noise
KyberAir Max	Comprehensive	PMs, CO2, CO, SO2, NO, NO2, O3, H2S, TVOC, Wind Engine, Temp, Hum, Pres, Light, Rain, Noise
KyberAir Met	Meteorology Only	Wind Direction & Speed, Temperature, Humidity, Pressure, Light, Rain, Noise

Unit Sensor Parameters

ID	Parameter	Range	Resolution	Working Principle	Measurement	Rate	Sensor Life
ENV-PM1	PM1.0	0-1000 µg/m³	1 µg/m³	Laser Scattering	Optical	1s	>2 Years
ENV-PM2	PM2.5	0-1000 µg/m³	1 µg/m³	Laser Scattering	Optical	1s	>2 Years
ENV-PM10	PM10	0-1000 µg/m³	1 µg/m³	Laser Scattering	Optical	1s	>2 Years
ENV-PM100	PM100 (TSP)	0-2000 µg/m³	1 µg/m³	Laser Scattering	Optical	1s	>2 Years
GAS-CO2	CO2	400-5000 ppm	1 ppm	NDIR	Infrared	1s	>5 Years
GAS-CO	Carbon Monoxide	0-1000 ppm	0.1 ppm	Electrochemical	Amperometric	1s	>18 Months
GAS-SO2	Sulfur Dioxide	0-20 ppm	0.01 ppm	Electrochemical	Amperometric	1s	>18 Months
GAS-NO	Nitrogen Monoxide	0-50 ppm	0.1 ppm	Electrochemical	Amperometric	1s	>18 Months
GAS-NO2	Nitrogen Dioxide	0-10 ppm	0.01 ppm	Electrochemical	Amperometric	1s	>18 Months
GAS-O3	Ozone	0-10 ppm	0.01 ppm	Electrochemical	Amperometric	1s	>18 Months
MET-WD	Wind Direction	0-360°	1°	Ultrasonic	Time-of-flight	1s	>2 Years
MET-WS	Wind Speed	0-60 m/s	0.1 m/s	Ultrasonic	Time-of-flight	1s	>2 Years
MET-TP	Temperature	-40 to 85 °C	0.1 °C	Digital	Semiconductor	1s	>2 Years
MET-HM	Humidity	0-100 %RH	0.1 %	Digital	Capacitive	1s	>2 Years
MET-PR	Pressure	300-1100 hPa	0.1 hPa	Piezo	Piezoresistive	1s	>2 Years
MET-LX	Light LUX	0-200,000 lux	1 lux	Silicon Photo	Photodiode	1s	>2 Years
MET-RG	Rain Gauge	0-4 mm/min	0.1 mm	Tipping Bucket	Magnetic Pulse	1s	>2 Years
MET-NS	Noise	30-130 dB	0.1 dB	Decibel	Condenser Mic	1s	>2 Years

Unit Specifications

Power

Avg. Power Consumption	≈ 6 W (typical, all sensors connected)
Power Input Options	External 110–240 VAC 50–60 Hz; 40 W solar panel; onboard solar power manager & battery manager
DIN-Rail SMPS	24 V, 2.5 A output, 60 W; input 85–264 VAC; CE certified; protections: Short-circuit, Over-current, Over-load; display shows input/output voltage; 35 mm DIN-rail mount (52.5×90×54.5 mm)
Battery Backup Time	Up to 14 hours (typical load)
Battery Specs	$LiFePO_4$ (LFP12-7): 12.8 V nominal, 7 Ah typical (6.22 Ah rated), 89.6 Wh; >2000 cycles @ 0.2C 80% DOD; operating −20-60 °C (discharge); IP56; ~1.1 kg

Communications

Telemetry Interval	Configurable: every 60 s up to 15 min
Protocols	HTTP / HTTPS; MQTT / MQTTS; TCP/IP
Connectivity	LTE Cat-1; LoRa 433 / 868 / 915 MHz; Ethernet with DHCP
Industrial Interfaces	RS-485 Modbus; up to 8 relay outputs
OTA	Over-the-air firmware updates supported
Approvals	ICASA approved for LTE communications

General Specs

Enclosure	Mild Steel (powder-coated) – 300 × 300 × 200 mm; options: Aluminium alloy or FRP (fiberglass)
Ingress Protection	IP65 (per EN 60529 test report)
Weight	≈ 6.7 kg (assembled unit)
Certifications (Enclosure/Compliance)	EN 60529 (IP code). Power supply CE-certified, ICASA Type Approved Communications

Technical Specs

Processor	Quad-core Atmel-based
Device Interface	KyberPortal dashboard
Operating Temperature	
Operating Humidity	0–95% RH
Recommended Humidity	5–90% RH

Type	Connectivity options	Specifications
Wireless	GSM LoRa LTE NB-Iot	Global 2G / 3G / 4G, 868, 915 MHz, CAT-M1, CAT-NB-IoT, LTE, FDD
Wired	Ethernet Modbus Relay Output	RS485 RTU / TCP 2 Channel

Functional Specifications

Proper location selection is critical for optimized data collection. It varies as per the purpose of the project, the selection of locations should be based on monitoring purposes

Preferred Mounting	Pole / Wall (preferably 270° open surrounding)
Installation Height	12-15 feet (4-5 meters)
Direction	As per maximum direct sunlight exposure
Power Availability	Constant AC / DC supply within a 2-meter range from the unit or solar panel
Network Availability	Uninterrupted network connection

Data and Calibration

1 Laboratory Calibration

All air quality monitoring systems are calibrated at laboratory using standard traceable calibration gas standards as per the international guidelines.

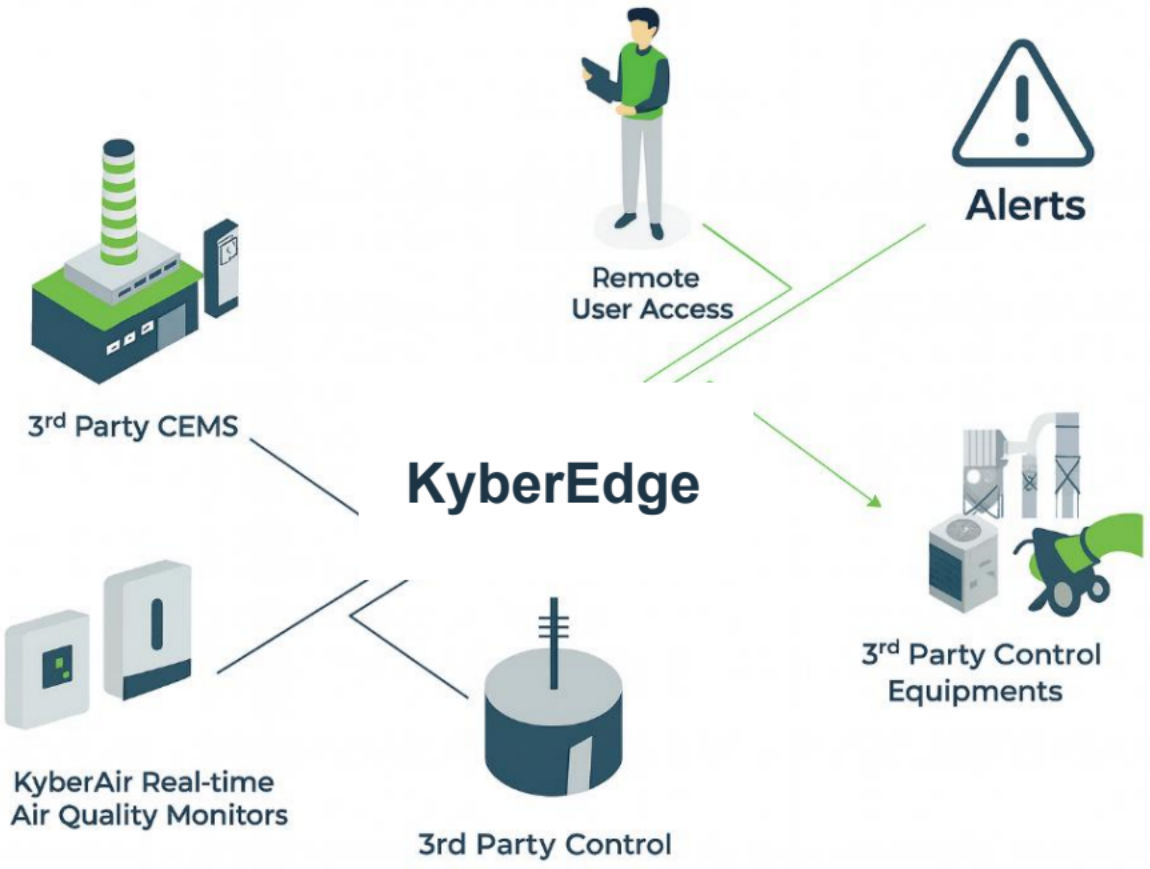
2 Collocation Calibration

The monitors are operated adjacent to a custom-built reference station housing designated FEM for collocation calibration to ensure optimum data quality.

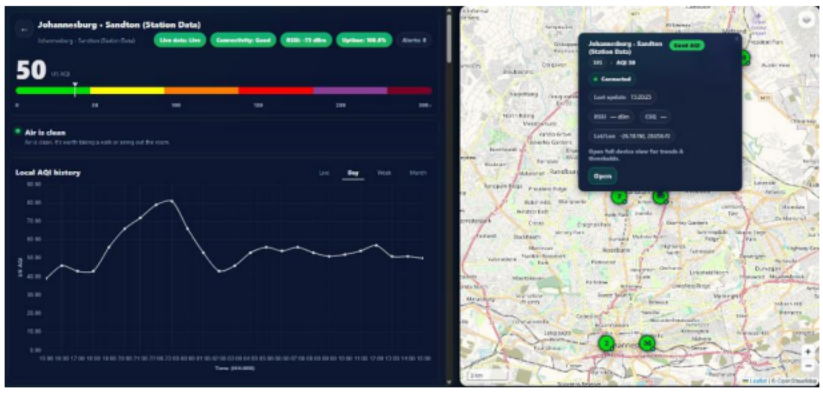
3 On-site Calibration

On-site calibration of KyberAir devices can be performed using standard calibration gas cylinders of known concentration or by co-locating with a reference standard.

Solution **Architecture**

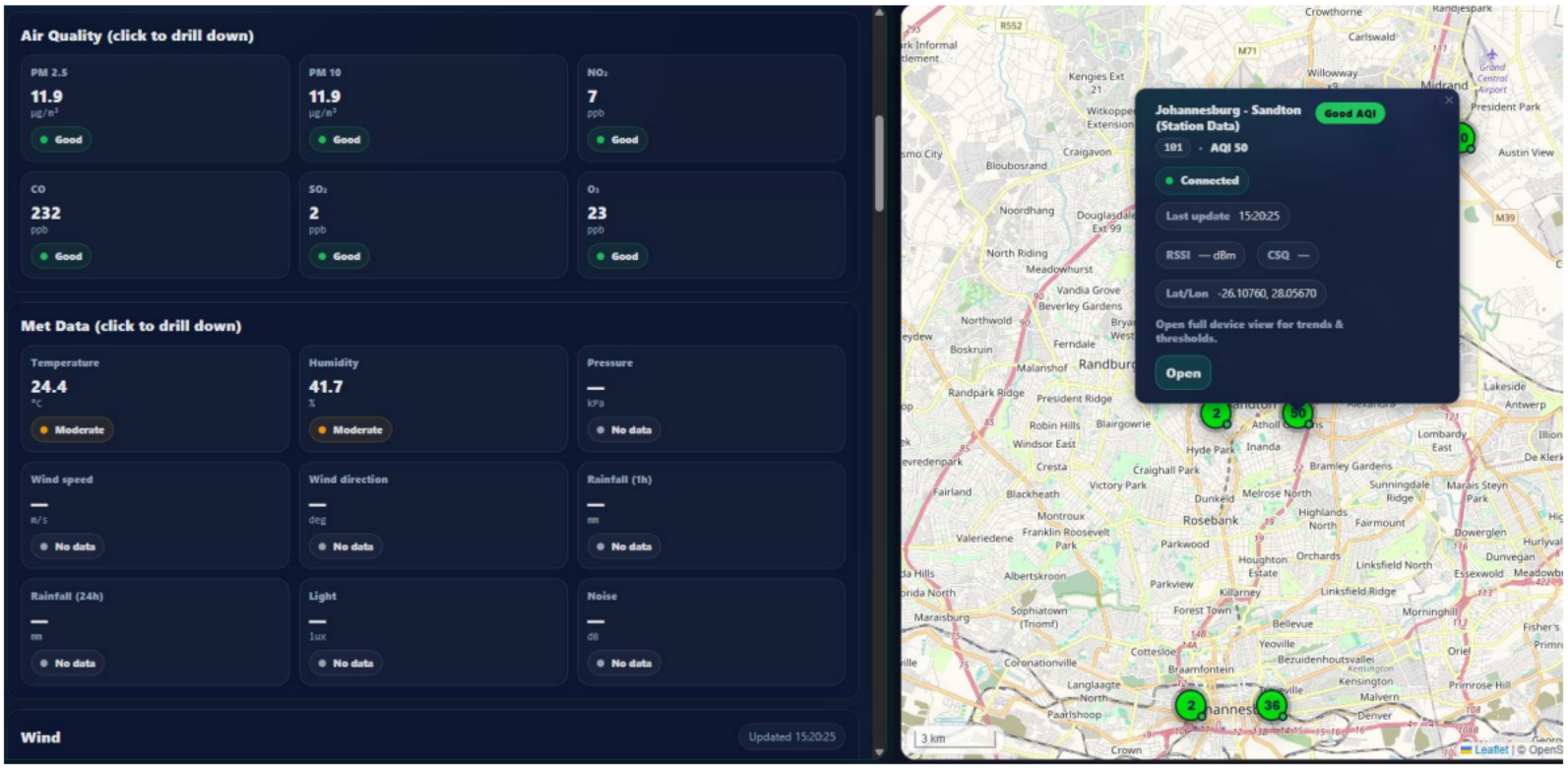


KyberPortal **RMS**



An on-device and cloud-enabled KyberAir software allows users to remotely access their data, configure each sensor, adjust how the sensors operate, and manage settings such as data upload frequency and reporting. Users can also define who receives automated reports via email. In addition, KyberAir enables seamless integration with other Kyber products through the dashboarding tool, allowing users to connect and manage multiple devices. The system also supports linking external devices into KyberAir's air quality monitoring solution (KyberPortal), making it possible to collect and unify environmental data from a wide range of sources.

KyberPortal Features



- **Real-time data**
- **Easy to Set Up**
- **Smart alerts**
- **One click share / report**
- **User friendly interface**
- **Data accessibility**

Privacy First Platform

Data Privacy

KyberPortal also uses AES encryption for client connection that adds to data safety through HTTPS Secure Socket layers. OMLY also uses AES encryption for connection that adds to data safety. **Data does not leave South Africa.**

Data Ownership

KyberPortal creates a secured and **encrypted password** combination for the user login. KyberAir ensures **100% privacy** of the data and doesn't share without relevant permissions.

Data Transparency

Data collected from KyberAir equipment runs through the **Environment Data Interpretation Engine**. It processes various algorithms and eliminates environmental impact interferences on the sensors.

About ExpandoWorks

Leaders in sensor based air quality monitoring

Plug and play monitors for hassle free setup

Low powered solutions for multiple applications

ExpandoWorks is a powerful IoT company that delivers data-driven monitoring solutions to enable better, faster decision-making. We design and deploy sensor-based hardware that measures key environmental conditions - such as air quality, noise, odour, radiation, and weather - transforming real-world signals into reliable, usable data. We also connect a wide range of sensors and integrate with machines to collect operational and performance data across sites and assets.

Our analytics platform converts this information into clear, actionable insights for government authorities, communities, and industry - helping clients track trends, detect issues early, respond faster, and plan with confidence. With years of experience building innovative monitoring technologies, ExpandoWorks combines IoT engineering and data science to deliver practical solutions that support a more efficient, sustainable future.