TECHNICAL BROCHURE

Environment Monitoring Solutions

2025

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Environmental Monitoring Solutions (EMS) deliver end-to-end monitoring of essential parameters, supporting proactive problem-solving across diverse workplace environments.

#1 Safety First
Detect and respond to environmental risks before they become hazards.

#2 Protect Health
Maintain clean air, and a healthy work environment.

#3 Streamlined Audits
Generates audit trails & Part 11 compliant reports

#4 Gain Real-time Insights
Get continuous monitoring 24/7 to maintain optimal work conditions.

#5 Improve Profits
Use data to improve Operational Equipment Efficiency (OEE).

What we **Control & Change** starts with measurement.

Environment Monitoring Solution (EMS)

A smart, one stop solution for the enterprise to achieve sustainability initiatives. Remotely monitor and maintain environmental parameters as per regulations, across all locations and facilities from a single dashboard.

The system can be customised with any parameters through cloud-connected sensors (portable / fixed) to generate audit-ready incident reports. Furthermore, one can share zone-specific reports defined by the location hierarchy. With a highly user friendly and accessible interface, smoothly transition into data-driven improvements and automated systems.

Architecture

BMS Interface

EMS application with remote config

Responsive dashboard

Cloud / On-premise server

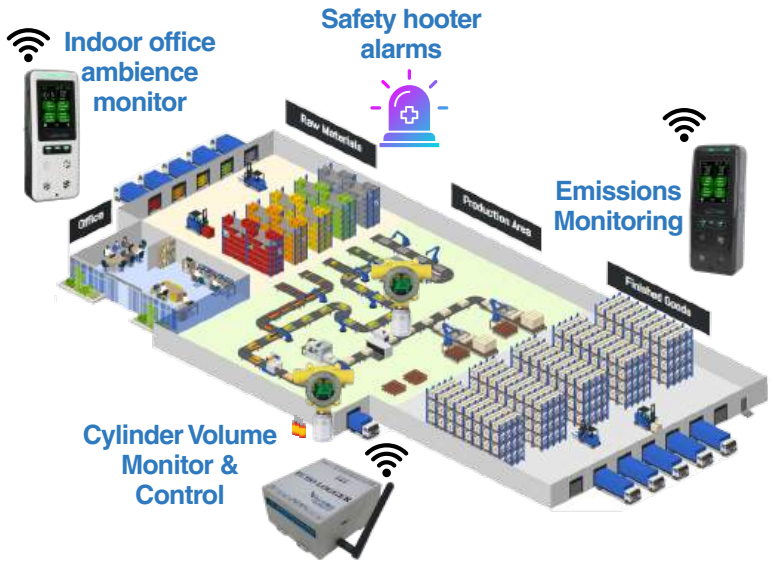
Indoor Air Quality Monitor

Smart Environment Monitor

Echologger with Fixed sensor

Environment Monitoring Solution (EMS)

Unified Interface



Key Features

- Real-time data at configurable intervals
- Real time trends & analytics
- Air Quality Index (AQI) as per CPCB
- Set safety limits as per preferred standards
- OTA Firmware Upgrade
- Email notification for alarms & reminders
- Download & email diverse set of reports
- Data Integration with BMS
- Scheduled maintenance reminders
- Real-Time Remote Diagnostics

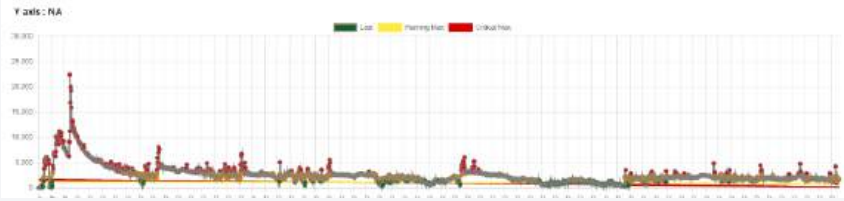
Privacy

- Encrypted server ensures data privacy
- Data security with custom access control

Live deployments and practical applications | Pharma

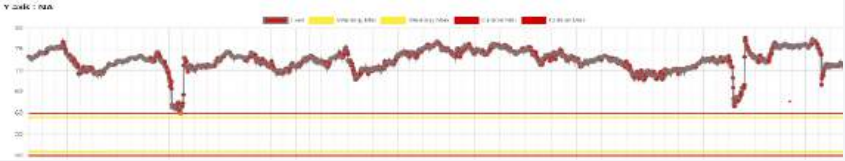
Case #1: Mitigating TVOC Exposure to Ensure Employee Safety

Concern: Persistent pungent odour in the research lab created an uncomfortable work environment for scientists.
Instantaneous alarms: Consistent exceedance of safe limits for TVOC were detected.
Correction: Supplemental exhausts and ventilation in chemical storage areas adopted to protect employee health.



Case #2: Preventing Infrastructure Damage Through Humidity Control

Concern: Metal infrastructure in the labs was repeatedly damaged due to uncontrolled rusting.
Data: Humidity was observed to be far higher than the acceptable limits leading to condensation inside the lab after the office hours.
Correction: Dehumidifier integrated with the HVAC system thus reducing condensation and preventing equipment rust.



Case #3: Optimising Exhaust Infrastructure Through Data-Driven Analysis

Concern: Expansion of the laboratory required additional infrastructure and thus exhaust to be added on the terrace. A challenge arose due to space and weight constraints.
Historical Trends Analysis: Bleeder position and energy consumption monitored to determine exhausts that were under utilized.
Energy Savings: Multivariate analysis (MVA) done to establish correlation and determine efficiency of the exhaust duct and use the under utilized systems.

PM - Particulate matter, TVOC - Total Volatile Organic Compounds, HVAC - Heating, Ventilation, and Air-Conditioning

Proprietary products
designed to deliver
Custom solutions.

SMART ENVIRONMENT MONITOR (SEM)

The Smart Environment Monitor is capable of detecting invisible threats of diffused toxic & flammable gases and possible machine malfunctions.

A versatile device with Configurable sensors and continuous remote monitoring that triggers alerts & notification (for immediate and long-term exposure) helping to pin-point the root cause.

As an edge device (with an interactive touchscreen) connecting to the server wirelessly, it makes portable or fixed real-time monitoring effortless.

IAQ Variant

We also provide specific devices to assess the overall quality of the indoor environment with: PM10, PM2.5, CO2, TVOC, Oxygen, Temperature & Humidity

Features

- SOS Button for Emergencies
- 10+ hours battery &/ AC Power
- Visual & Audible Alarms when unsafe
- Preventive Maintenance
- 3 months of event log data
- Remote cloud monitoring

SMART ENVIRONMENT MONITOR (SEM)

Technical Specifications

Specification	Value
Operating Temperature	0 - 45 °C
Operating Humidity	15 - 90 %RH
Display	2.4” resistive touch display
Alerts	Critical (High, Low), STEL (Short Term Exposure Limit), Warning (High, Low), TWA (Time Weighted Average) & Sensor Fault
Keys	Power, Mute, SOS
Memory	2 years of event log data
Connectivity	2.4 GHz Wi-Fi (802.11 b/g/n)
Power	5V 2A, Type C power adapter
Battery	4000mAh, 10+ hours
Audible Alarm	94 dB
Storage Conditions	Temperature: 10 to +40 °C ; Humidity: 15 - 90 %RH

Fixed Parameters

Parameter	Range	Resolution	Units	Working Principle
Equivalent Carbon Dioxide	400 - 65000	1	ppm	Solid state semiconductor sensing
Total Volatile Organic Compounds	0 - 65000	1	ppb	
Oxygen	0 - 25	0.1	%vol	Electrochemical

SMART ENVIRONMENT MONITOR (SEM)

Parameters List

Parameter	Range	Resolution	Units	Working Principle
Sulphur Dioxide	0 - 20	0.1	ppm	Electrochemical
Nitrogen Dioxide	0 - 20	0.1	ppm	Electrochemical
Hydrogen Sulphide	0 - 100	1	ppm	Electrochemical
Carbon Dioxide (1)	0 - 40000	1	ppm	Non-dispersive Infrared
Carbon Dioxide (2)	0 - 10	0.1	%	
Carbon Monoxide	0 - 1000	1	ppm	Electrochemical
Hydrogen (1)	0 - 1000	1	ppm	Electrochemical
Hydrogen (2)	0 - 30000	50	ppm	Electrochemical
Ammonia	0 - 100	1	ppm	Electrochemical
Hydrogen Chloride	0 - 10	0.1	ppm	Electrochemical
Phosphine	0 - 1000	0.1	ppm	Electrochemical
Ozone	0 - 20	0.1	ppm	Electrochemical
Chlorine	0 - 10	0.1	ppm	Electrochemical
Hydrogen Fluoride	0 - 10	0.1	ppm	Electrochemical
Methane	0 - 10	0.1	%vol	Electrochemical
Ethylene Oxide	0 - 100	0.1	ppm	Electrochemical
Ethylene	0 - 100	0.1	ppm	Electrochemical
Particulate Matter 10	0 - 1000	1	µg/m3	Laser particle counter
Particulate Matter 2.5	0 - 1000	1	µg/m3	

INDOOR AIR QUALITY MONITOR (IAQ)

IAQ Variant Parameters

Parameter	Range	Resolution	Units	Working Principle
Temperature	0 to +45	0.01	°C	Solid state semiconductor sensing
Humidity	15 - 90	0.008	%RH	
Carbon Dioxide	0 - 40000	1	ppm	Non-dispersive Infrared
Total Volatile Organic Compounds	0 - 65000	1	ppb	Solid state semiconductor sensing
Oxygen (optional)	0 - 25	0.1	%vol	Electrochemical
Particulate Matter 10	0 - 1000	1	µg/m3	Laser particle counter
Particulate Matter 2.5	0 - 1000	1	µg/m3	

Technical Specifications

Specification	Value
Operating Temperature*	0 - 45 °C
Operating Humidity*	5 - 95 %RH
Display	2.4” resistive touch display
Alerts	Critical (High, Low), STEL, Warning (High, Low), TWA & Out of Range
Keys	Power, Mute, SOS
Memory	2 years of event log data
Connectivity	2.4 GHz Wi-Fi (802.11 b/g/n)
Power	5V 2A, Type C power adapter
Battery	4000mAh, 10+ hours
Audible Alarm	94 dB
Storage Conditions	Temperature: 10 to +40 °C ; Humidity: 15 - 90 %RH

ECHO LOGGER

Introducing our state-of-the-art data logger: the ultimate solution for all your data monitoring needs. With seamless wireless connectivity to servers, and variety of inputs, IoT enable your legacy machines or systems and monitor remotely.

Engineered for reliability and precision, our data logger ensures you capture and analyze critical information easily, providing you with unparalleled insights and control. Upgrade your data management with our powerful and user-friendly data logger today.

Technical Specifications

Specification	Value
LED	Power, Signal strength, Server Connected, Alarms
Analog Voltage / Current	8 channels
SERIAL	RS485 , RS232
Digital input	3 inputs
Relay	2 SPST and I optional DPST
Drain	1 open drain output
Add-on	DAC module - 0-10V / 0-24V output
Connectivity	Wi-Fi, GSM or Ethernet
Power	24V, 2A
Storage Conditions	Temperature: 10 to +40 °C ; Humidity: 15 - 90 %RH non- condensing

Connect to diverse sensor types

Control any equipment remotely

IoT enable legacy machines

Live deployments and practical applications | Other Industries

Case #1: Connecting fixed sensors in Aquaculture

Problem Statement: Measure Dissolved Oxygen (DO) and pH in a aquaculture plant
Use Case: Dissolved Oxygen (DO) and pH levels were continuously monitored in real time. Beyond just monitoring, the system automatically activated the oxygen pump whenever DO levels dropped below a defined threshold. Additionally, the device was integrated with the feeding system, enabling automated control of feed delivery based on water quality conditions.

Case #2: Gas detection and safety alarm in a manufacturing set-up

Concern: Monitoring and managing indoor air pollution in the welding zone of a manufacturing facility.
Use Case: The welding zone in the manufacturing setup is prone to high levels of smoke and airborne pollutants. Sensors connected to the EchoLogger continuously monitor air quality and trigger an alert when pollution levels exceed a defined threshold. In addition to raising alarms, the system automatically activates the auxiliary exhaust system to remove smoke and maintain a safe working environment.

AI-DEA LABS

“ Measurement improves visibility,

Visibility leads to insights,

Insights help to stay differentiated

and win, Continuously.”

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