



A Facility Manager's Guide

Multi-Parameter Environmental Monitoring in Critical Environments

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premium sensing solutions





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Rethinking Environmental Monitoring as an Operational System

Traditional monitoring methods (manual logs, standalone sensors, or limited building automation systems) are not designed for today's level of scrutiny. They introduce delays between measurement and response, create fragmented data silos, and make it difficult to maintain consistent, audit-ready records.

Modern facilities are shifting toward multi-parameter environmental monitoring systems to use data to gain real-time cross-parameter visibility and centralized access.

As a facility manager, you are ultimately accountable for maintaining conditions that directly impact safety, compliance, and operational continuity. This guide is designed to help you evaluate whether that transition is necessary for your facility, and how to approach it strategically.

Setra CEMS™ Environmental Monitoring

Setra CEMS™ can monitor differential pressure, relative humidity, particle counts, air change rates, door status, temperature, and more.

The software is compatible with Setra or third-party hardware and can be commissioned with existing hardware or as a complete package. Sensor hardware communicates through Setra EDGE™ to the Setra CLOUD via LAN, Wi-Fi, or cellular network. Setra CEMS also generates reports on-demand or automatically, ensuring compliance with regulatory bodies.



Common Applications

Multi-parameter monitoring is most valuable in environments where conditions directly affect outcomes. In each of these environments, the goal of monitoring is maintaining control and proving it.



Cleanrooms

Pressure, particle count, and environmental control for compliance



Compounding Pharmacies

Sterile conditions and audit readiness



Vaccine Storage

Temperature stability and real-time alerts



Blood & Tissue Banks

Strict environmental control and traceability



Biopharma & Medical Device Manufacturing

Product integrity and regulatory compliance

What This Means for Your Facility

Multi-parameter environmental monitoring is the continuous measurement and centralized analysis of multiple environmental variables (e.g. differential pressure, relative humidity, temperature, particle count) within a single system.

While this may seem overcomplicated at first, from a facility management perspective, multiparameter monitoring simplifies problem solving by providing key context.

Environmental issues rarely occur in isolation. A pressure imbalance may result from a door opening or insufficient air changes. Humidity may affect both equipment reliability and HVAC performance. Temperature fluctuations may be tied to storage asset performance rather than room conditions.

By monitoring these parameters together, you move from reactive troubleshooting to proactive operational awareness.

The Challenges You're Likely Facing

If your facility relies on traditional monitoring approaches, you are likely to encounter one or more of the following challenges:

- Delayed detection of environmental changes due to manual or periodic checks
- Limited visibility across rooms or systems, especially when data is siloed
- Fragmented monitoring tools that make it difficult to see the full picture
- Compliance pressure requires accurate, traceable, and audit-ready records
- Restricted data access, especially for teams outside the BAS
- Inconsistent response times, particularly outside of normal working hours

These challenges are operational risks which can lead to contamination, product loss, or compliance failures.

Follow this step-b-step guide to understand how multi-environmental monitoring can benefit your facility.





Step 1: Determine If Your Environment Requires Advanced Monitoring

Before evaluating solutions, the first step is to assess whether your facility truly requires a multi-parameter monitoring system.

Key Questions for Facility Managers

Ask yourself the following:

- ☐ Would an environmental shift cause immediate harm, contamination, or product loss?
- ☐ Are you required to maintain regulatory compliance (e.g., FDA 21 CFR Part 11, ISO 14644)?
- ☐ Do you need to respond to issues outside of staffed hours?
- ☐ Do you currently rely on environmental data for efficiency, energy, or operational decisions?
- ☐ Would relying on environmental data for efficiency, energy, or operational decisions in the future add substantial benefits to your business?
- ☐ Are you monitoring multiple parameters across different systems?
- ☐ Do you manage multiple zones, rooms, or facilities?
- ☐ Do teams need access to environmental data without relying on the BAS?

How to Interpret Your Answers

4 or more “Yes” responses

Strong indication your facility would benefit from a multi-parameter monitoring system

2 to 3 “Yes” responses

You may benefit from a targeted or phased approach

0 to 1 “Yes” responses

Your current monitoring approach may still be sufficient

As a facility manager, this step is critical. It ensures that any investment in monitoring is driven by operational need.

Step 2: Identify Parameters That Matter Most

Once you've established the need for monitoring, the next step is determining what to monitor. This should always be based on risk level and application.

Differential Pressure Managing Contamination Risk

Differential pressure monitoring is essential when there is a risk of contamination between adjacent spaces. This includes environments such as:

- Cleanrooms and anterooms
- Operating rooms and adjacent corridors
- Manufacturing areas and employee spaces

The key is to think in terms of boundaries, where contamination could move from one space to another. Monitoring should be placed across these boundaries in addition to within rooms.

It is also important to consider door activity and air change rates, as both can influence pressure stability and lead to unexpected deviations. Monitoring both in conjunction with air pressure can provide more insight in the event of unstable conditions.

Differential Pressure Monitoring with Setra FLEX™ and Setra Lite™

Setra FLEX™ and Setra Lite™ room pressure monitors maintain and verify pressure relationships across critical boundaries.

Why Integrate with Setra CEMS Connect

Setra FLEX and Setra Lite enable consistent monitoring across multiple zones, providing the visibility and reliability required for compliance and operational control.



Relative Humidity Protecting Equipment and Stability

Humidity is often underestimated, but it plays a critical role in:

- Preventing corrosion or electrical failures in sensitive equipment
- Maintaining HVAC efficiency (higher humidity increases cooling load)
- Supporting pressure stability, as humidity can influence air density

In some environments, such as electronics or battery manufacturing, humidity may need to be monitored at the equipment level with wall-mounted sensors. In environments where humidity is a concern with respect to how it affects temperature or air pressure, duct-level monitoring may be more appropriate.

Humidity Monitoring Using the SRH Series

The SRH Series humidity transmitters provide accurate, stable measurement of relative humidity.

Why Integrate with Setra CEMS Connect

SRH Series transmitters support real-time awareness, alarm-based response, and consistent environmental control across critical spaces.





Particle Count

Ensuring Environmental Cleanliness

Particle monitoring becomes critical when airborne contamination can affect:

- Patient or staff safety (bacteria, mold spores, dust)
- Pharmaceutical product purity (airborne pollutants)
- Equipment performance or material integrity (dust, metal)

As a facility manager, you should determine:

- Known locations contaminants enter from, or highly sensitive areas → These areas require continuous monitoring.
- Locations that are not likely to be exposed to contamination sources → Periodic spot check may be sufficient for these spaces.

This distinction helps optimize both cost and system design.

Environmental Cleanliness with Setra's Particle Counters

Setra's particle counters provide continuous, high-accuracy measurement of airborne particulate level. There are also hand-held options.

Why Integrate with Setra CEMS Connect

Setra's particle counters deliver real-time visibility, alarm-based alerts, and comprehensive data logging to ensure environmental conditions remain controlled and audit-ready.



Temperature

Safeguarding Critical Assets

Temperature monitoring is essential in environments where materials or products are sensitive to temperature variation, including:

- Blood banks
- Vaccine storage
- Refrigerated or frozen storage units

Unlike room-level monitoring, temperature strategies are often asset-driven. Each refrigerator or freezer may require its own monitoring point. Installed directly at the refrigerators, freezers, or storage units, these devices ensure that critical materials remain within required thresholds.

Critical Asset Protection from SRF Temperature Monitors

The SRF600 Series provides continuous, high-accuracy measurement of temperature across a variety of temperature ranges.

Why Integrate with Setra CEMS Connect

SRF600 temperature monitors deliver real-time visibility, automated alerts, and comprehensive data logging to support audit readiness and consistent environmental control.





Step 3: Move from Sensors to Systems

Installing sensors alone does not solve the operational challenge. The real value comes from how data is collected, connected, and used.



Real-Time Monitoring

Continuous data collection allows you to detect environmental changes immediately, rather than waiting for scheduled checks. Facility teams can identify deviations the moment they happen, preventing small issues from escalating into compliance failures or operational disruptions.



Alarm Notifications

Alerts delivered via dashboard, email, or SMS ensure that issues are addressed quickly (including outside of working hours). Configurable alarm thresholds and escalation paths allow teams to prioritize critical events, ensuring the right personnel are notified based on severity and location.



Automated Compliance Reporting

Automated data logging and reporting simplify compliance with standards such as FDA 21 CFR Part 11 and ISO 14644. By eliminating manual recordkeeping, facilities can maintain audit-ready documentation while reducing administrative burden and minimizing the risk of human error.



Historical Data Trending

Trend analysis illuminates long-term environmental patterns, enabling teams to identify recurring issues, seasonal variations, or gradual system degradation. This supports proactive maintenance, improved system optimization, and informed operational and capital planning decisions.



Sensor Compatibility & Integration

The ability to integrate both Setra and third-party sensors allows facilities to unify data from previously disconnected systems into a single platform. This consolidation improves visibility across all monitored parameters and reduces reliance on siloed tools or limited BAS access.



Scalability

Whether monitoring a single room, multiple zones, or an entire network of facilities, the system can match operational needs. This flexibility allows organizations to start with high-risk areas and expand monitoring coverage over time without requiring a complete system overhaul.



Ensure Access & Integration Across Teams

In many facilities, environmental data is locked within the BAS, limiting visibility to a small group of users. Setra CEMS allows multiple authorized users to access a system dashboard, which means fewer silos and more coordinated responses across your organization.



Step 4: Practical Recommendations for Facility Managers

A system like Setra CEMS Connect is designed to support facility operations, but it can still be a difficult process to make the shift from traditional monitoring methods to full environmental monitoring systems. To implement an effective monitoring strategy, consider the following:

Map Out Your Facility

- Identify where environmental failure would have the greatest impact on safety, compliance, or product integrity.
- Use the considerations above to determine what environmental factors are most relevant to your use case and where they might be needed.

Check out the Setra CEMs Solution Builder

Building out a full environmental monitoring solution is a nuanced process. The solution builder delivers a starting point for which parameters and products can benefit your application based on your answers to its questions. At the end of the builder, you'll receive sample solution, a price estimate of the given solution, and an opportunity to speak with a product expert to further refine your solution based on your application needs.

Chat with Product Experts

For many facilities, the most effective monitoring strategy requires collaboration between facility managers, quality teams, engineering teams, IT stakeholders, and product specialists. Speaking with a product expert can help clarify which parameters should be monitored, where devices should be placed, and how the system should be configured to support compliance and operational goals.



[SPEAK WITH A PRODUCT EXPERT](#)

Consider an Installation Partner

An installation partner can help streamline the process by supporting deployment planning and on-site implementation. This can be particularly valuable for facilities with multiple rooms, multiple parameters, or limited internal resources for installation and commissioning.

For facilities looking for additional support, Setra's partnership with SCI can help bridge the gap between solution design and implementation. An installation-focused partner can help ensure that the monitoring system is properly deployed, configured, and ready to support daily operations.

From Monitoring to Operational Control

The shift to multi-parameter monitoring represents a move from reactive oversight to proactive control. By centralizing data, enabling real-time response, and supporting compliance, systems like Setra CEMS Connect help ensure that critical environments remain stable, efficient, and audit-ready. The key is to approach monitoring strategically. Starting with your facility's risks, select the right parameters, and implement a system that supports both your current operations and future growth.



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