

Planning Guide

EnviroAlert® Monitoring Systems

Planning Your Remote Monitoring Environment

This planning guide discusses the factors that will help you design a successful environmental monitoring system. Your monitoring requirements will lead you to local or Web-based monitoring, or a mix of both. Understanding your environments and the conditions you will be monitoring is critical to avoiding needless alerts and alarms. At the end of this planning guide, you will find a facility survey, equipment list, and facility map with which to begin to put your plans into action.

Local Monitoring

The purpose of any environmental monitoring system is to give you access to current conditions and to notify you when something is wrong. Local monitoring, which is available on all EnviroAlert consoles, describes interaction with the system exclusively at the console. You manage the system and monitor sensors at the console. You control access to the console through physical security and the keypad locking feature. The EA200 and EA400 consoles unlock with a key combination; the EA800-ip console unlocks with a password.



The simplest notification method is the visual alarm (flashing screen) that is built in to the EnviroAlert console. You can extend this local alarm by connecting auxiliary or zone-specific relays on the console to an alarm indicators such as a light or buzzer, or to a security system panel.

Web-Based Monitoring

In addition to local monitoring, the EA800-ip system offers Web-based monitoring. Web-based monitoring describes the use of the INSIGHT platform to interact with the system from any location where you have access to the Internet. INSIGHT requires a paid subscription and an Ethernet connection to the EA800-ip console.



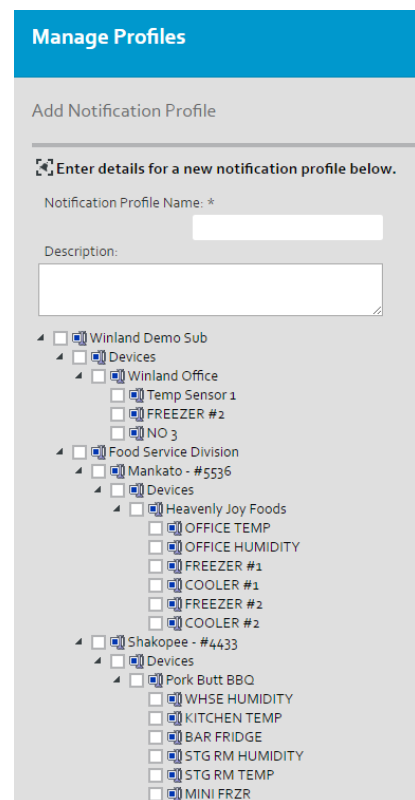
Consider the following capabilities that INSIGHT provides to help you determine whether you need Web-based monitoring:

- Remote monitoring—Observe, acknowledge, and respond to environment conditions over the Internet.
- Remote control—Configure EA800-ip devices, sensors, User IDs, alert notifications, and alert response profiles over the Internet.
- Alert notification: Alert notification by E-mail and text messaging
- Automated reporting—Schedule and distribute system, sensor, and alert log reports by E-mail to selected users.

If you choose Web-based monitoring, there will be planning considerations for alert notification profiles, user administration, and alert response profiles. A notification profile is a named set of devices and sensors for which a user can receive an E-mail or text message about an alert condition. User administration is the task of providing members of your staff with access to the INSIGHT platform. Before creating User IDs in INSIGHT, consider the responsibilities of your staff:

- Will this person need to make changes to the EnviroAlert EA800-ip device and sensor configuration, or just monitor conditions and create reports? There are two user permission levels: *Admin* for management control and *User* for simple monitoring and reporting.
- Will this person have an active role in maintaining environments and sensors? Create a list of sensors for each staff member to receive notification of alert conditions. This list of sensors is called a notification profile and is included in the User ID configuration.
- Will this person need access to all devices and sensors in your environments or a subset? You can isolate selected users and devices in an INSIGHT entity called a *location*, while at the same time, giving other users access to all devices and sensors in your INSIGHT customer account.

A response profile is a sequence of actions to perform in response to an alert condition. Typically, these actions can be found in your standard operating procedures (SOPs). Consider each of your sensors and develop a response profile that you can include in your EnviroAlert EA800-ip device and sensor configurations.



Environment Characteristics




Understanding the nature of your environments and the ranges of sensor readings you can expect will help you choose effective monitoring thresholds. Effective thresholds mean fewer false alarms and less time spent fixing problems that do not exist. Consider the following characteristics of your environment:

- [Number of Environments and Conditions](#)
- [Monitored Conditions](#)
- [Environment Stability](#)

Number of Environments and Conditions

How many environments and conditions do you want to monitor? Is it a single-room walk-in refrigerator where you are monitoring temperature and humidity; or a grocery store with numerous refrigerator cases, freezer cases, walk-in freezers, a humidior, and a lobster tank. The number of environments will guide your choice of EnviroAlert console models supporting two, four, and twelve sensors ([Table 1](#)).

Table 1. Number of Monitored Zones

EnviroAlert Product	Number of Monitored Zones
<p>EA200</p> 	<p>Dual zone.</p> <ul style="list-style-type: none"> ■ One built-in temperature sensor ■ One wired sensor capable of monitoring temperature, humidity, or water presence
<p>EA400</p> 	<p>Four zones using wired sensors capable of monitoring temperature, humidity, or water presence.</p>
<p>EA800-ip</p> 	<p>Twelve zones.</p> <ul style="list-style-type: none"> ■ Four wired sensors and eight wireless sensors capable of monitoring temperature, humidity, water presence, and dry contact. ■ Four wired terminals support 4–20mA current loop sensors, which can monitor a variety of other conditions. ■ Web-based monitoring is available with an Ethernet connection and a subscription to INSIGHT.

Monitored Conditions



What conditions are you monitoring? Temperature and humidity are common conditions that require monitoring. Sometimes two or more conditions need to be monitored in the same environment, as in the case of a vegetable or fruit cooler, where temperature and humidity are both important to preserve quality.

There are several other conditions that can be monitored—there is a

way to measure just about anything, including temperature and water presence to protect a seasonal cabin from freezing pipes and flooding. The EA800-ip console supports the monitoring of vibration, air pressure, toxic gases, and other conditions using specialized 4–20mA wired sensors.



Environment Stability

There a number of factors that can affect the stability of conditions in your environment, such as size of the environment, presence of doors or openings, traffic, air/water exchange, energy sources/sinks, and maintenance. By understanding the transient effects in your environments, you can better predict the range of values and how long to delay issuing an alert after a condition exceeds a sensor threshold.

What is the size of each environment? It may be as small as a fish tank or as large as a commercial walk-in freezer. Conditions across a large room may vary more than a smaller enclosure. Some experimentation and testing may be needed to learn how much variation exists, which will determine how many sensors you need and where to place them.

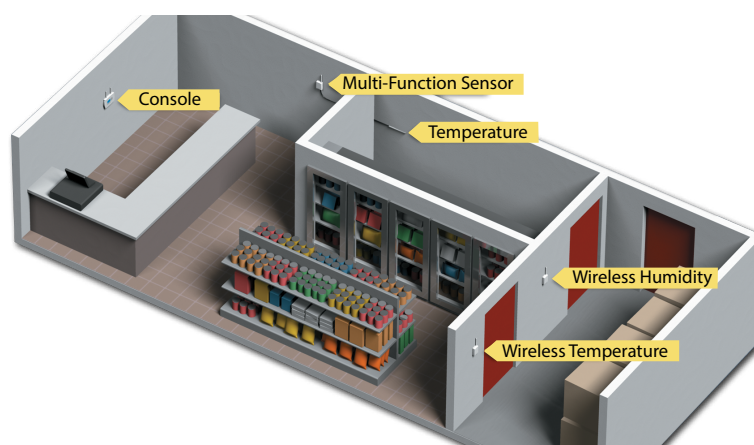
Access to the environment can affect the stability of conditions. For example, a walk-in cooler may see significant temperature changes while the door is open for stocking. New stock could also affect sensor readings until the stock reaches equilibrium with the environment. An open-case freezer case will have more variations in temperature than a closed freezer case. Similarly, a walk-in humidifier could experience humidity changes as people enter and exit.

Proximity to an energy source/sink can also affect sensor readings. For example, a temperature sensor could be affected by nearby refrigeration coils, an exterior wall, or a vent. Other transient effects, such as the compressor cycle or scheduled maintenance will create regular fluctuations in conditions.



EnviroAlert Consoles and Sensors

Based on the type of monitoring you want (local or Web-based) and the characteristics of your environment, choose the number and types of EnviroAlert consoles that you need. Choose a location for each EnviroAlert console in a non-condensing environment that is centrally located with respect to the sensors, auxiliary alarms, and alarm panels. Wired sensors, auxiliary alarms, and alarm panels can be connected with 18–22AWG twisted-pair wire as far away as 1,000 feet. Wireless sensors are available for monitoring temperature, non-condensing humidity, and water presence. For sensor and probe specifications, see the list of EnviroAlert sensors, probes, and accessories in the Winland Electronics product catalog.



Sensor Selection and Placement

Choose sensors that correspond to the condition, value range, and accuracy that are needed. Choose sensor accessories and locations that are suited to the environment and near the commodity that you want to protect:

- Wet or condensing environments require water-resistant or waterproof sensors and probes.
- Tube stands and glycerin bottles may be needed to simulate the internal temperatures of stored products, such as vaccines.
- When a refrigerator or a freezer does not have a sensor access port, and drilling a hole through the casing is not acceptable, a flat-cable splice kit may be needed to pass a cable under the door seal to connect to a probe.

Depending on the commodity and the industry, regulatory standards for accuracy may apply. Some regulatory agencies require accuracy certification to a National Institute of Standards and Technology (NIST) traceable standard or known standard, such as a freezing point. NIST certification may be required for the entire monitoring system. Consider the time and cost of certification. If certification requirements are unknown, consult the appropriate regulatory agency or inspecting authority.

Wired and Wireless Sensors

Wired sensors offer the widest selection, including all 4–20mA sensors. Other sensors, including temperature, humidity, and water presence are available in wired and wireless models. Consider wire routing and costs—it may be less expensive to install another EnviroAlert console than to run wire over long distances through steel girders and thick concrete walls.



If there is good signal strength, wireless sensors are an alternative when wiring costs are prohibitive. Wireless sensors are supported only by the EA800-ip console and have the best signal strength when there is direct path to the console. As much as possible, choose console and wireless sensor locations that are above most objects and below the door tops—typically 4.5–6.5ft (1.37–1.98m) off the floor. [Table 2](#) shows typical signal ranges. Actual ranges depend on the construction of walls and floors, and other environmental factors.



Table 2. EA800-ip: Wireless Sensor Signal Range

Environment	Obstruction	Typical Range (ft)
Indoor, open factory	No walls	100
Indoor, convenience store	One wall	75
Indoor, home	Two walls	45

When using wireless sensors, minimize the number of walls and floors between the console and its sensors. For example, for a three-floor facility in which there are wireless sensors on all three levels, choose an EA800-ip console location on the second floor. Test your setup to ensure that you have good signal strength.

What's Next

Having acquired a basic understanding of the factors involved in preparing a monitored environment, the following pages lead you through a facility survey to help you identify important details, followed by an equipment list, and finally, a grid upon which to map the monitoring system components.

Facility Survey

1. **Sensors:** How many wired and wireless sensors will you need?
2. **EnviroAlert Consoles:** How many EnviroAlert EA200, EA400, EA800-ip consoles will you need to support the sensors?
 - The EA200 console supports one built-in temperature sensor and one wired sensor.
 - The EA400 console supports four wired sensors.
 - The EA800-ip console supports four wired sensors and eight wireless sensors.
3. **Alarms:** How many visual/audible alarms will you need?
4. **Security System Panels:** How many security system panels are you integrating into the system?
5. **Wiring:** What is distance between each EnviroAlert console and its wired sensors, visual/audible alarms, and security system panels?
6. **Web-based Monitoring:** Do you require remote monitoring, remote control, data logging, Email/text message alert notification, or automated reports? If the answer is Yes to any of these, you will need an EA800-ip console, an Ethernet connection, and a subscription to INSIGHT.
7. **Accessories:** What accessories will you need, such as glycerin tubes, sensor stands, and flat-cable splice kits?
8. **Certification:** Will your system require NIST or some other certification?

Equipment List

EnviroAlert Consoles

EA200 Consoles; built-in temperature sensor, one wired sensor input	
EA400 Consoles; four wired sensor inputs	
EA800-ip Consoles; four wired sensor inputs; 8 wireless sensor inputs	

Temperature Sensors

TEMP-L-S low temperature, stainless steel; -58 to 158 °F (50 to 70 °C)	
TEMP-L-W low temperature, waterproof; -58 to 158 °F (50 to 70 °C)	
TEMP- H-S high temperature, stainless steel; 32 to 302 °F (0 to 150 °C)	
TEMP-H-W high temperature, waterproof; 32 to 221 °F (0 to 105 °C)	
TEMP-UL-S ultra-low temperature, stainless steel; -148 to 32 °F (-100 to 0 °C)	
EA-WTS temperature, wireless; 32 to 122 °F (0 to 50 °C)	

Humidity Sensors

EA-WHS humidity, wireless; 5 to 95% RH; ±5% at 10–90% RH, 77 °F (25 °C)	
HA-III+ Humid-Alert® electronic humidity; 5 to 95% RH; ±5% at 10–90% RH, 77 °F (25 °C)	

Multifunction Sensors

EA-WMFS multifunction, wireless	
4–20mA sensors	

Water Sensors

W-S-S WaterBug® water presence, supervised	
W-UC-S WaterBug under carpet water presence, supervised	

Accessories

18–22 AWG Wire (ft)		Flat-Cable Splice Kits	
Glycerin Bottle		Visual Alarms	
Tube and Z-Stand		Audible Alarms	

Facility Map

Plot the locations of EnviroAlert consoles, sensors, alarms, and security sytem panels.

