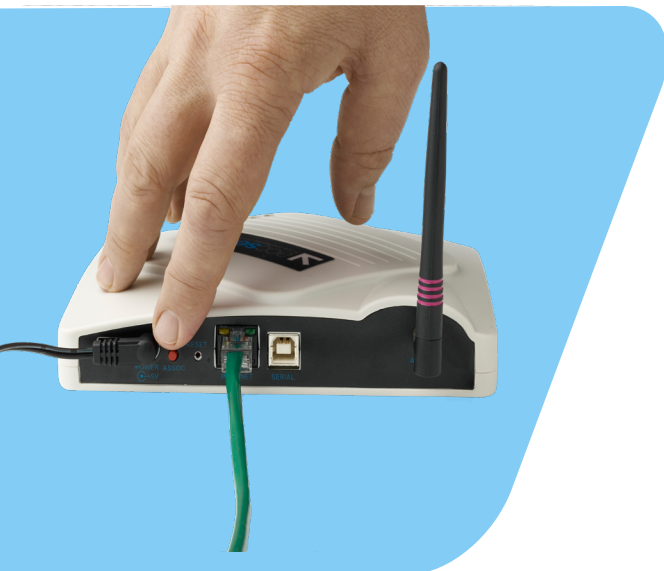


MULTI-PARAMETER ENVIRONMENT MONITORING IN HEALTHCARE CENTERS

JOINT COMMISSION COMPLIANT SYSTEMS FOR HOSPITALS & CLINICS



For comprehensive environmental monitoring in hospital operating rooms and cleanrooms, the Accsense Wireless Monitoring System collects critical parameters including temperature, humidity, and air pressure. Fully compliant with Joint Commission guidelines, Accsense is the choice of many of the best healthcare centers in the US including Stanford Hospital and Clinics, Boston Children's Hospital, and the Cleveland Clinic, among many others. In this app note, CAS DataLoggers shows how an Accsense system can handle continual monitoring, alarming, and data storage.

MONITOR MULTIPLE PARAMETERS:

An [Accsense wireless system](#) can continually monitor healthcare environments including medical storage units, refrigerators, freezers, liquid nitrogen chambers, cleanrooms, patient care areas, operating rooms, and more. Users can record many parameters including:

- The temperature in either Celsius and Fahrenheit
- Relative Humidity (RH%)
- Ambient Air Pressure and Differential Air Pressure

- Door Opening and Closing
- Light Level, Vibration, or Sound

Accsense monitoring systems can also monitor analog voltage or current outputs from other sensors or equipment, allowing you to capture practically any value you need. The wireless measurement pods can operate on either AC power for fixed installations or a battery for use on carts or other mobile equipment.

ACCSENSE FEATURES OVERVIEW:

Accsense systems provide comprehensive monitoring and alarming capabilities including:

- Accsense alarm systems automatically send Email, SMS text message, or Phone alerts
- Accsense also sends Power or Internet Communication outage notifications
- Continually monitor and record your data and view real-time data
- Remotely access your data with online graphing, reporting, and configuration features
- View data with a standard web browser on a PC or Mobile device
- Complies with FDA, JCAHO, AABB, and other industry standards

SYSTEM ARCHITECTURE:

The Accsense Wireless Monitoring System utilizes 2 components. The [B1-06 Wireless Gateway](#) connects to your existing Ethernet network using its built-in 10/100BaseT connection. Its wireless interface is used to communicate with the sensor pods using a standard Zigbee 802.15 mesh network. The wireless pods automatically send data to the gateway, which in turn packages up the data and immediately sends it out securely to the Accsense cloud servers. The gateway supports as many as 16 sensor pods, as well as DHCP and static IP addressing for easy integration into the local network.

The second part of the system is the [A1 Series Wireless Sensor Pods](#). They come in a variety of models with built-in sensors for temperature and humidity or connections for a variety of external sensors including air pressure, CO2, 0-5VDC, and 4-20 mA. The wireless communication provides a point-to-point range between the pod and gateway of up to 250' line of sight or 90' indoors. Since it is a mesh network, the pods can also act as repeaters allowing deployment across longer distances or between floors in a building.



CLEANROOM SYSTEMS:

For effective cleanroom monitoring, there are several models of Accsense pods that can connect to a standard differential pressure sensor to continually monitor the pressure inside an environment like a clean room, operating room, or isolation area. For example, the [Accsense A1-01a wireless pod](#) provides both a 0-5volt and 4-20 mA input for connection to the differential pressure sensor plus an ambient temperature and humidity sensor. In the event of an equipment failure, Accsense will immediately send out alarms so that staff can be notified in time to take corrective actions.

Continual monitoring of pressure is an effective form of air leak detection. By using an A1-01a pod connected to a differential pressure sensor with one port located inside the room and the other port located outside the room, you can quickly determine whether the room has a positive or negative pressure with respect to atmospheric pressure. This setup archives your compliance data and also alerts you whenever there's a risk of microbes and other contaminants entering or exiting the room.

Many cleanrooms also require monitoring of ambient temperature and humidity for patient safety and to avoid microbial growth. If there is a failure in the HVAC system, Accsense can notify staff whenever the temperature and humidity go outside preset limits.

INCUBATOR MONITORING:

If you need to monitor the temperature in medical incubators to meet regulatory needs, our [Accsense A1-08 wireless temperature data logger](#) has 6 thermistor inputs to provide highly accurate temperature measurements. To go along with the A1-08, we offer our [E1-20 Thermistor Probes](#) made of stainless steel with 10' cabling and a temperature range of -20°C to 150°C, each of which can monitor an incubator.

For example, a common incubator setup in IVF clinics is a room containing rows of 2 incubators stacked atop each other. With an Accsense installation, each of these incubators has a thermistor probe monitoring its interior leading out to the A1-08 wireless pods which communicate with an Accsense B1-06 wireless gateway mounted on the wall. The A1-08 wireless datalogger also has two digital inputs which can be connected to door switches to enable you to alarm the open/close state of the incubators or other types of storage units.

Additionally, if you need to monitor other parameters such as carbon dioxide and oxygen levels, we have Accsense wireless pods that can attach to an analog voltage or current output allowing you to measure any value you need—if you have a sensor for it, just plug it in and Accsense can log it!

SURGERY ROOMS:

The current ASHRAE specification is for the humidity in operating rooms to be maintained between 20% and 60% and both the Joint Commission and CMS require continuous monitoring to ensure compliance. If humidity gets below 20% it can affect the shelf life of some medical supplies and increase the potential for static discharge.



If the humidity gets too high it can lead to the potential for mold and mildew growth and may increase the potential for infection in wounds. Staff also find it difficult to work in a humid environment since the temperature feels warmer.

In this setup, an [Accsense A1-05](#) wireless temperature humidity data logger can monitor ambient air temperature and humidity values. It's easy to mount an Accsense datalogger to the wall using the supplied bracket. The data logger can operate on either AC power or internal AA batteries.

Users can setup alarm limits - high, low, outside a range, or inside a range – on any of the measured values and receive alarms via email, cell phone, or landline. Accsense can even send the same alarm to multiple recipients either all at once or sequentially! Another feature is the ability to define filters such as the requirement for 3 readings in a row outside of the limits before the alarm is generated to reduce nuisance alarms caused by things like door openings when a refrigerator is being restocked. In case of a power or internet outage causing a loss of connectivity to the servers, Accsense will alarm the staff while it keeps logging into its local internal data buffer.

With Accsense, all your data is automatically uploaded to the Accsense Cloud servers. Users can log in to access real-time reports and graphs and download measurement data for offline analysis and archiving. Administrators can modify the system configuration online from any Internet-enabled location. The customizable interface and measurement dashboard shows the most recent data from the datalogger, and users can display historical data, active and historical alarms, and corrective action data.



LAN TEMPERATURE MONITORING SYSTEMS:

If your hospital or clinic needs temperature monitoring for vaccines, Accsense makes it easy to monitor one or more medical refrigerators and/or freezers. The [A2-06 Ethernet Temperature Monitor](#) is designed for temperature measurement and alarm in medical refrigerators, freezers, cryogenic storage, and incubators. This temperature recorder has connections for 2 external RTD probes and thermocouple sensors.

If you need an all-in-one solution, the [A2-06 Vaccine Temperature Monitoring Kit](#) bundles the A2-06 datalogger, an AC Power adapter, an RTD probe, a Glycol Buffer Vial to stabilize temperature readings, and a 1-Year Accsense Monitoring Plan—all for less than \$1,000.

THE ACCSENSE ADVANTAGE:

Accsense wireless environmental monitoring systems are the choice of many health-care facilities holding the Joint Commission's Gold Seal of Approval including Stanford Hospital and Clinics, Boston Children's Hospital, and the Cleveland Clinic Foundation, among many others.

Read more about Accsense customers achieving Joint Commission Gold Seal accreditation [here](#).

For more information on our [Accsense Monitoring Systems](#), or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.