APPLICATION NOTE

CAS DATALOGGERS

Incubator Monitoring for an In Vitro Clinic

Accsense Wireless Automated Temperature Monitoring

CAS DataLoggers provided an automated incubator monitoring and alarm system for an in vitro fertilization clinic. They were looking for a wireless system to monitor and provide alarms for several triple stack injection incubators. These medical incubators were used for the embryonic implantation stage of the in-vitro process staff need to maintain the incubators at a constant temperature of 37°C (99°F) and relative humidity of 99%. Also, these incubators provided a controlled CO2 environment using an external tank of gas and a control valve to regulate the flow. Sensors are used to determine the CO2 levels inside the incubators to keep them at acceptable limits (about 5% concentration). However, the environment inside is vulnerable to temperature and humidity fluctuations caused by the opening of the door so tracking door open and close events were also needed. Therefore this complex setup required an automatic system to monitor and alarm temperature, humidity, CO2, and door activity in real-time to alert staff of unsafe levels and prevent any losses.

Installation

After taking their call, CAS visited the clinic to install an Accsense system consisting of four Accsense Wireless Data Loggers attached to the side of each triple stack unit. All the data loggers communicated with an Accsense B1-06 Wireless Data Logger Gateway which was mounted on a nearby wall.

One of the wireless dataloggers was the Accsense A1-10 model which features six 4-20mA inputs which were connected to analog outputs from the incubator for temperature, humidity, and CO2 providing enough channels to cover two of the 3 incubators. Then, three Accsense A1-01a pods were set up with magnetic door switches, one for each incubator. The pods offer digital inputs with a unique feature of tracking door open/close events and door open times. The A1-01 also has analog inputs to cover the remaining signals from the incubators. Using these 4 pods, all the necessary parameters for 3 incubators were covered. Each data logger's wireless range extends up to 90' indoors without obstructions and can also act as a repeater for other logger signals.

All of the data is sent wirelessly to the Accsense B1-06 gateway. The wireless gateway uses built-in 10/100BaseT Ethernet to communicate to the Accsense cloud server. The cloud server eliminates any heavy IT burden often found with local server installations. Diagnostic LEDs provide clear status indications. In the event, the gateway can't be reached, individual pods store up to 255 data points until a connection is restored, while the gateway's 1900-point data buffer further ensures continual data integrity.

Each of the A1-01 pod's digital inputs enables monitoring of the door opening closings including counting of open/close cycles which have been identified as critically important for incubator monitoring plus the duration of the door open time. User configured alarms on the Accsense server also monitor for unsafe temperatures, humidity, and CO2 levels and will send email, pager, or phone warnings to multiple designees whenever an alarm triggers. The server also features a communication loss alarm to notify users of a power loss or network problem affecting connectivity.

Cloud-based data storage and reporting enable effective monitoring as each pod monitors and logs data, giving staff the ability to view and remotely access data in real-time. The wireless gateway sends all this data to the secure Accsense cloud server. This data can also be downloaded as a CSV file for use with many database applications or for custom reports. Additionally, the clinic's online Accsense account gives instant access to charts showing all measurement history with ranges as narrow as 5 minutes or as wide as 90 days. The account also features an interface with a dashboard showing the most recent measurements from all sensor pods. Clinic personnel now retrieve all readings for offline analysis, log in to access reports and graphs, and can modify the system setup from anywhere they're connected to the Internet.

Benefits

Now the clinic relies on Accsense to notify employees when any of the incubator environments are compromised. Whenever this happens, the system makes voice synthesized alert phone calls until staff designees respond and take safety measures.
Likewise, the system sends all readings to the cloud so that regulators have proof that best practices were followed. Accsense was particularly cost-effective for these unique incubator monitoring application, covering 12 parameters – 3 incubators x 4 points each - with just 4 pods and a gateway. Accsense can be used for reliable incubator temperature monitoring solutions or as part of an incubator validation protocol in clinical or research environments.

For more information on our Accsense systems for clinics, hospitals and cleanrooms for cost effective Medical Monitoring, or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or request more information.