

Industry: Biotechnology

Products Used: FieldPoint™ • LabVIEW™ Datalogging and Supervisory Control Module

Using FieldPoint and LabVIEW to Create a Temperature and Humidity Monitoring System

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The Challenge: Monitoring and logging the temperature and humidity at approximately 50 warehouse and repackaging facilities of the U.S. Department of Health and Human Services, to meet FDA requirements.

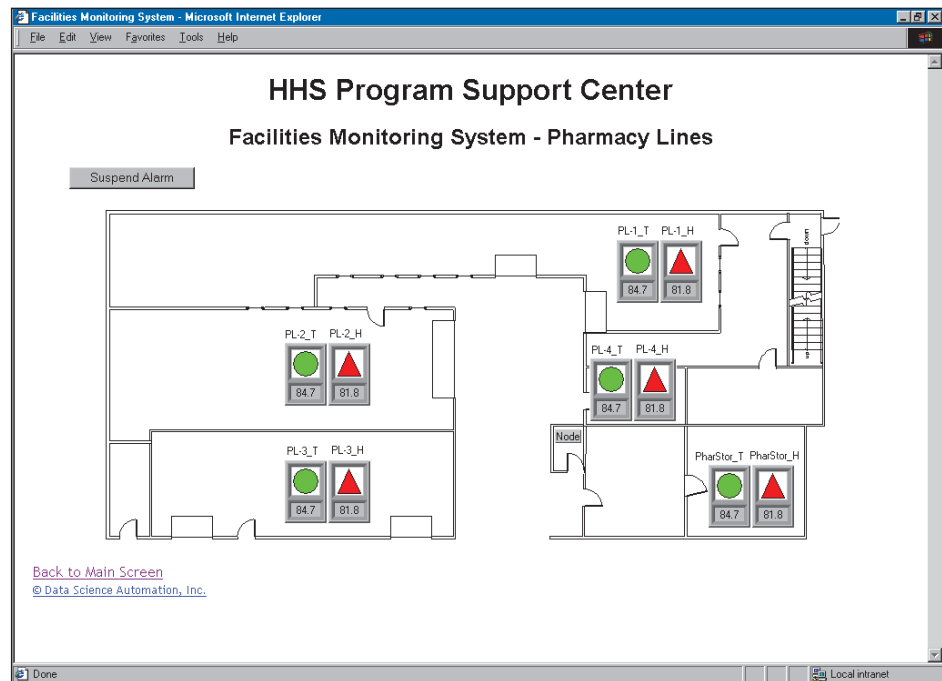
The Solution: Using National Instruments FieldPoint to connect 3,000 feet of four-conductor wire to omega temperature and humidity transducers in 4-20 mA circuits throughout the warehouse and repackaging buildings. Also, using LabVIEW Datalogging and Supervisory Control Module to log and monitor the sensors and produce Web pages to easily access the system via remote.

24-Hour Monitoring of Temperature and Humidity

We needed to create a system that could meet FDA requirements of monitoring our warehouse and repackaging facilities. The system we created, the Facilities Monitoring System for Health and Human Services,

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monitors and logs 50 temperatures and levels of humidity of sensors distributed throughout a building complex. The application uses FieldPoint Ethernet modules for distributed I/O and the built-in logging and security capabilities of LabVIEW Datalogging and Supervisory Control Module, which allow us to check the status of the system and suspend alarms remotely via the Web.



Detailed Web pages show individual temperature and humidity monitoring devices and the FieldPoint node to which they connect.

Monitoring consists of verifying at a regular interval that the measured value still sits within the programmable range. The monitoring system generates an alarm state if the measure value falls out of range.

Monitored devices missing a sensor (from disconnection, short, or open-circuit conditions) also generate an alarm. Programmable delays prevent outgoing alarms for temporary disruptions. Each alarm-status has an associated color and symbol, including those

stating that the signal is good, there is a network outage, an alarm status has sounded, and more.

Remote Monitoring Using a Web Browser

Using a Web browser, we can access two types of views. The main view represents the physical layout of the system, modeled on the

building floor plans. This facilitates assessing the global state of the system, and provides an intuitive means of navigating through the facility to access the configuration and state details for individual devices and sensors. Yellow indicates an alarm condition that did not cause an outgoing alarm, while red indicates an alarm condition that did notify the alarm monitoring company. Clicking on a particular location in the floorplan view will "zoom" to a more detailed floorplan, indicating the locations of each of the devices that are being monitored, and their status

We can access several of these views – one for each section of building complex. Intranet users can immediately see if a particular location operates under normal conditions or if a temperature or humidity falls out of range. When a particular sensor falls out of range past the delay time, a relay connected to the building alarms system opens. This causes the building alarm to sound, which notifies the alarm company. The alarm company then notifies a designated employee, who logs in from home and

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verifies the status of the system. The alarm then suspends remotely through the Web interface for a set duration – for example, one hour. The employee can then enter the building, determine what caused the alarm, and remedy the situation.

Using the LabVIEW Datalogging and Supervisory Control Module, in combination with the Fieldpoint Modules and the Fieldpoint OPC server, we developed a reliable, user-friendly monitoring and logging system that runs 24 hours a day that we can easily adapt to future changes such as additional input channels, other OPC clients, and PID control of output channels.

User Configurable Alarm Parameters

On the server machine, we can access the Web pages as individual windows or in other ways. Clicking on a device/sensor in the location view “zooms” to the corresponding device view (assuming the user logs in as either an operator or an administrator), which displays information about the monitored device. Here, the administrator can change such parameters as the alarm limits and delay times. He can also suspend the alarming on the device for maintenance reasons.

Clicking on the Open Trend Panel button opens the trend view, which displays an interactive chart that plots past data retrieved from the Citadel historical database. We can customize these views to show data for a given time span and range. In addition, we can view the current alarms and the

alarm log. We modified the standard alarm logging for LabVIEW Datalogging and Supervisory Control Module to require the operator to enter a comment with each alarm acknowledgement. We can read these comments when viewing the historical alarm and event log.

We can also export data to a comma delimited file. After we select which channels to export, and a time span and resolution, we use a standard file dialog box to save the file to any desired location.

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