



BUILDING OPERATING management

Wireless: Cutting the Ties

Wireless technology can improve IEQ and reduce energy consumption from HVAC systems

Brandon Lorenz, senior editor
December 2007

Most facility executives today probably wouldn't think about operating a large building without some form of building automation system in place.

For years, building automation systems required a network of wires to link components such as temperature sensors and VAV controllers to the automation system. The expense of laying cable — and the sheer difficulty of reaching certain places — has meant some existing buildings simply didn't get the optimum automation system.

“Just about everybody can see the need to do this, but if you have a smaller building, you're probably not willing to spend \$50,000 to save \$5,000 a year,” says Jon Williamson, senior product manager for TAC.

Today, wireless is helping to bring added control to existing buildings that either had limited BAS systems, or simply had controls that weren't optimized for a building's layout because of the need to run wiring. It's a development that is helping to reduce energy consumption and boost indoor environmental quality.

“Wireless opens up a lot of possibilities to create better zoning conditions because you have more opportunities,” says Terry Hoffman, director of marketing, building automation systems, for Johnson Controls. “What gets instrumented gets measured and managed.”

Consider, for example, the 24,000-square foot Masonic Temple in Newbury, Mass. The building's aging control system provided heat for 10 zones, but the zones couldn't communicate with each other, and only two could direct the boiler to start operation.

That was hardly an ideal situation for the historic building, which houses four Masonic organizations and several community organizations. Operating hours are irregular.

Upgrading to a modern wired control system was an unattractive solution. The Federalist building's heavy walls would have been expensive to lay wires in. And documentation on the layout of the building's existing control system was scant.

MORE ON THIS TOPIC

[Browse articles on wireless on FacilitiesNet](#)

[View more BAS, HVAC content](#)

[Search for wireless articles on FacilityZone](#)

“You just don't want to have the labor associated with trying to navigate through a building that's gone through many generations of systems,” Williamson says. “You're talking about a building that started with coal heat.”

The solution was a new control system that used wireless digital temperature sensors in each of the building's 10 temperature zones. The upgrade improved energy efficiency and indoor environmental quality. With the upgrade, each of the 10 zones can now call for heat.

Equally important were the resulting energy savings. Because the wireless technology supports a modern control system, requests for heat can be scheduled in advance and the boiler can be activated automatically. In the first year, the building slashed its consumption of fuel oil by 16 percent — a reduction of 976 gallons, Williamson says. Savings increased to 18 percent in the second year, despite increased building utilization, he adds.

Lowering Installation Costs

Wireless can be valuable in health care facilities because of the unique site challenges, says Kevin Osburn, vice president, systems and solutions, Siemens Building Technologies.

A BAS upgrade at a California hospital, for example, saved significantly on labor and material costs by using wireless. Devices from workstations to sensors needed replacement. Because the existing network was incompatible with the new BAS, all of the hospital's 220 terminal box controllers, in addition to devices such as differential pressure monitors, zone humidifiers, and fire/smoke dampers needed to be added to a new network infrastructure. Wireless was the obvious answer.

“Anyone who has had to design, engineer and install new building automation systems in health care facilities will no doubt recognize the value and flexibility wireless brings to the table,” says Osburn.

Building Applications Vary

Wireless can also improve efficiency in a hotel with dozens of packaged terminal air conditioning (PTAC) units. “A lot of hotels have never been able to afford a full blown automation system because of the investment to rewire the hotel or the downtime that would be required to do the retrofit,” says Daniel Moneta, strategic director for WiSuite.

One hotel replaced the analog thermostats in its PTAC units with digital wireless units. When guests check out, the unit stops running, rather than waiting for housekeeping staff to turn it off.

Wireless also helps improve indoor environmental quality by increasing spaces controlled by a temperature sensor.

“Interior comfort for occupants is incumbent on accurate sensing of ambient conditions,” says Osburn. “Similarly, efficient heating and cooling schemes require accurate inputs as well. Oftentimes, all of that is dependent on the final configuration of the space.”

Another advantage of wireless is that temperature sensors can be relocated easily. Rather than blanket a building with sensors, a sports arena, for example, can change the configuration of its wireless temperature sensors depending on the type of activity occurring, says Rainer Wischinski, vice president of marketing for Spinwave systems.

What’s more, over the life of a building, wireless control systems are more likely to be the more sustainable option because they more easily allow a space to be reconfigured. “We already have customers who tell us, ‘Don’t use wires unless you have to,’” says Hoffman.

Office space can be ideal for wireless because it is often reconfigured, experts say. “As partitions move and walls go up, sometimes secondary thought is given to where the temperature sensor is going to be placed and what heating devices you are going to control,” says Williamson.

Also, when a space is being reconfigured, contractors sometimes cut control wires accidentally, says Williamson. What’s more, wireless systems avoid the need to cut into walls that may contain hazardous materials, such as asbestos.

Building automation isn’t the only application for wireless. One owner of a 12-story office building in Washington, D.C. installed a distributed antenna wireless system that would carry signals of cell phones in the building’s parking garage and throughout the building, and serve as a wireless LAN. The owner is currently exploring using the wireless system to control ballasts in the lights in the parking garage, says Lou Martinage, director of product marketing for Mobile Access.

“All buildings have HVAC systems and I think increasingly that will be part of the wireless equation,” Martinage says. “But I expect it will propagate to other venues as well.”