

Building Automation Will Drive ZigBee Adoption

Systems using the communication standard for active 2.4 MHz RFID devices will be widely deployed in 2008, according to a report from market research firm ABI Research.

By Mary Catherine O'Connor

Jan. 2, 2007—Five major vendors of building-automation systems, [Honeywell](#), [Johnson Controls](#), [Siemens](#), [TAC](#) and [Trane](#) have introduced wireless products based on ZigBee recently. ZigBee, a communication standard for active 2.4 MHz, low-power, wireless RFID devices designed for sensor networks, will be widely deployed in 2008, according to a new report from market research firm ABI Research. ZigBee networks can be used for such things as digitally control lighting, HVAC, access control or safety systems (exit lighting and emergency lighting systems), and in comprehensive systems that combine these various building monitoring networks into single building automation platforms.

It predicts that constructors of offices and other commercial buildings will be the biggest adopters of ZigBee networks. Adoption will be slower by companies that erect factories and other industrial buildings and by the home-construction industry, where proprietary wireless sensor networks that use proprietary RF protocols, such as X-10 and Z-Wave, already have a foothold.

The report says that the growth ZigBee market for lighting and HVAC systems will see the most growth. ZigBee technology for lighting and HVAC generated \$72,400 and \$95,300 in revenue, respectively, in 2005, and it estimates they will generate \$15,371,800 and \$19,012,500, respectively, by 2008.

ZigBee sensors are typically battery-operated—though they are also available in versions that run off AC line current—and are compliant with the IEEE 802.15.4 standard for wireless personal area networks. The [ZigBee Alliance](#), an industry group that includes providers of building automation systems, is working to certify that ZigBee sensors from different vendors will interoperate.

"ZigBee Alliance is an outstanding group to work with," says Barry Coflan, director of product management, worldwide, for TAC, which sells ZigBee sensor networks for HVAC and building security systems. "We've worked with lots of groups to develop similar standards in the past, but the ZigBee Alliance has been doing a great job of promoting its specification. Its member companies are developing products that use sound engineering, and the Alliance is not politically motivated. More than anything, I think these are the reasons that ZigBee networks will be successful."

A ZigBee sensor contains a radio transceiver that transmits a unique ID number, one or more sensors and a microprocessor to store data and control the sensor or sensors attached to the device. When multiple sensors are deployed together, they each form serve as a node on a network, wherein each node sends data to and receives it from any other nodes within its communication range. This enables the nodes to form a mesh, or ad hoc, network that can self-organize. Typical RFID networks, by contrast, include RFID tags, or sensors, that communicate directly to a single interrogator.

The environments inside buildings can be more closely monitored by using ZigBee sensor networks, rather than wired sensor networks, because with ZigBee, more sensors can be easily placed throughout a building, including in places where installing wired sensors would be difficult. More temperature sensors deployed in a building means that heating and cooling within specific rooms or zones can be controlled at a more granular level, allowing energy to be used more efficiently. Within these monitored areas, ZigBee-controlled thermostats can communicate with ZigBee-controlled baffles to modify airflow in HVAC duct systems. ZigBee control modules in the lighting fixtures can send an alert to building-control systems that a bulb will soon burn out and should be replaced. Using this could save waste, as some building management companies currently replace all bulbs in a building periodically, whether or not they are or are nearly exhausted.

Coflan says that using ZigBee sensors for building automation is also helpful in university or school settings, where access to rooms is limited while classes are in session, and that installing wireless thermostats can take less time and labor than rewiring existing thermostats.

In all building markets, the technology will be embraced largely for new, or "greenfield" construction, because it would be too costly to replace wired sensor networks already installed in existing buildings in the United States and Europe, according to Stan Schatt, ABI Research vice president and practice director of networking. For this reason, he says, ABI expects ZigBee to see the biggest uptake in fast-growing Asian building markets.

But Coflan says TAC is also finding a market for ZigBee networks in buildings constructed many years ago, because they are not easy to rewire and sometimes contain asbestos that cannot be disturbed.

RELATED_ARTICLES ZigBee networks can also be used for tracking assets or products by attaching ZigBee tags to pallets or mobile assets. Location of these tags can be determined by tracking which of the nearby stationary ZigBee sensors (such as those in lighting fixtures) are reading them at any given time.

Saint Luke's East-Lee's Summit, a new hospital located in Lee's Summit, Mo., near Kansas City, recently completed testing of an RFID patient-tracking system that uses RFID tags and transceivers communicating over the ZigBee protocol (see [Hospital Tries ZigBee to Track Patients](#)). Now, the hospital is gearing up to test RFID's value in tracking hospital staff and assets. The Chicago Fire Department has also tested a ZigBee-based system for tracking firefighters responding to emergencies inside buildings (see [Chicago Fire Dept. Tests ZigBee-based RFID System](#)).

Copyright ©2005 RFID Journal, Inc. All Rights Reserved