

As technology improves, wireless alarm systems are becoming more prevalent. Learn more about how wire-free or partially wired systems can be used to great advantage in commercial applications.

History & Applications of Wireless Fire Alarm Systems

By Scott Barrett

Since 1981, the commercial wireless fire alarm and communications industry has made great strides in industry recognition as technological advancements have allowed wireless systems to now compete directly with conventional addressable systems.

Early wireless products lacked both performance features and industry approvals, which restricted their use for mandated fire alarm installations until the mid 1980s. In 1987, UL wrote the first standards for wireless under the UL 864 standard for control units and accessories for fire alarm systems, and shortly thereafter followed with the UL 268 standard for smoke detectors, as well as listings for other wireless components and accessories for UL 864 compliance.

In 1987, commercial wireless systems were formally adopted into the NFPA 72A standard. Today, the requirements of commercial wireless systems are found in NFPA 72, *National Fire Alarm and Signaling Code*, under chapter 6 in the 2007 edition and under chapter 23 in the current 2010 edition.

There are two basic forms of commercial wireless systems available. Some manufacturers' products are "true wireless," meaning all communication from initiating devices to repeaters is relayed via air until received at the central control unit. Other manufacturers' wireless products are only wireless from the initiation point to a "receiver" from which point data is then transferred via wiring or other means such as a SLC (signaling line carrier) loop. There are also various forms of transmission formats. Some manufacturers relay on single channel transmission while others have moved to a more sophisticated and secure format known as FHSS (frequency hopping spread spectrum).

One of the major advantages to FHSS is that it gives manufacturers the ability to meet the 200-second supervisory reporting rule. In 2007, the NFPA 72 chapter 6 committee amended the exception rule requiring all commercial wireless products to adhere to the 200-second reporting rule beginning in January 2013. This exception can be found in chapter 23 of the 2010 edition of NFPA 72.

Wireless System Features

Some listed wireless products offer control function capabilities such as activation of appliance circuits, elevator recall, HVAC control, and more. In these cases the control units send commands to repeaters which have supervised addressable outputs and interconnect with the equipment to be activated or controlled. This part of the installation requires wiring; however, through strategic placement of repeaters, the amount of wiring is reduced.

All initiating devices and repeaters are required to be supervised for low battery, tamper, EOL (end of line) violation, AC power loss, unwanted interference, and polling. Requirements for wireless systems can be found in chapter 23 of NFPA 72 under "Special Requirements for Low Power Radio Systems."

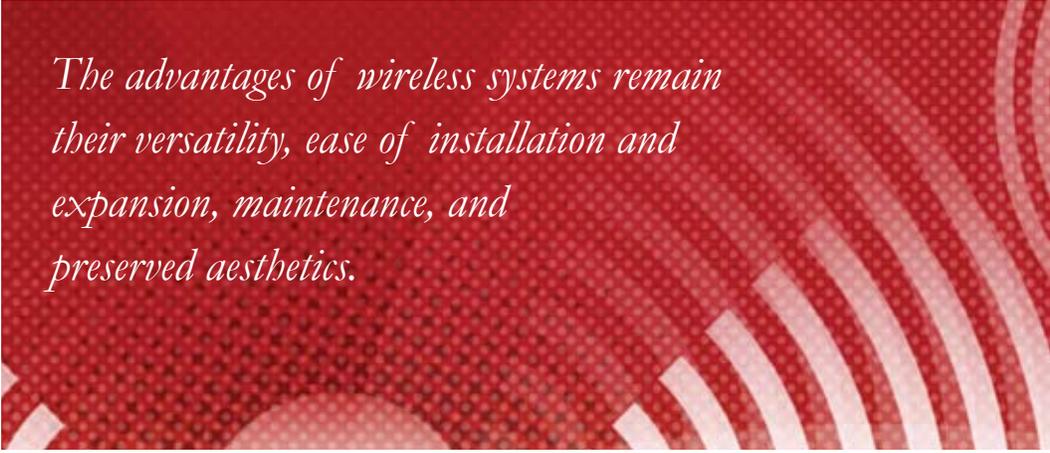
No FCC licensing is required either by the installing contractor or user when installing a low power wireless system that conforms to FCC allotments for low power radio. Low power wireless systems have been installed in every conceivable occupancy and application, including high-rise office buildings, hotels, industrial complexes, historic structures, colleges

and universities, hospitals, nursing homes, and even naval ships.

Combining Conventional with the New

Hybrid systems utilizing both wireless and conventional methods are becoming more prevalent in installations as the combination of both technologies offers in many cases both design advantages and cost-effective alternatives.

An example of this, and one of the more prevalent markets over the past five years, has been multi-family apartment complexes and campus-type settings such as colleges and universities. In multi-family apartment complexes, many jurisdictions require the individual



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monitoring of each alarm type and building to be point addressed off-premise. Conventional theory is to utilize phone lines in each building, which results in several monitored accounts per property, or to interconnect each building via underground SLC loops which have their own inherent problems such as lightning and ground faults.

The hybrid combination allows for the use of conventional systems in the buildings that are responsible for the detection and notification appliances. Connected to the outputs of the conventional panels are supervised transmitters that will relay the alarm-type information to a central location that is interconnected to a communicator for off-premise monitoring. This application eliminates all cost associated with the individual monitored accounts and underground SLC loops, while providing the same notification at a reduced and ongoing savings to the client.

Advantages to Wireless

Wireless fire alarm technology today offers safeguards and protocols that assure effective and reliable transmission of data and can provide the same capabilities as conventional systems.

The advantages of wireless systems remain their versatility, ease of installation and expansion, maintenance, and preserved aesthetics. In most cases, wireless systems afford cost advantages to the client not only in the initial installation price but with hidden factors such as refurbishing cost, downtime, and disruption to operations.

The elimination of wiring affords clients an alternative means to obtain protection, which might not be otherwise available due to eco-

nomic, aesthetic, or environmental constraints. Examples include buildings with asbestos, historical sites, multiple building facilities with damaged or antiquated underground wiring, college dormitories, industrial plants, hospitals and nursing homes, hotels, marine vessels, and a variety of other commercial properties and applications where a fast, efficient, and economical installation is desired. ❖

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