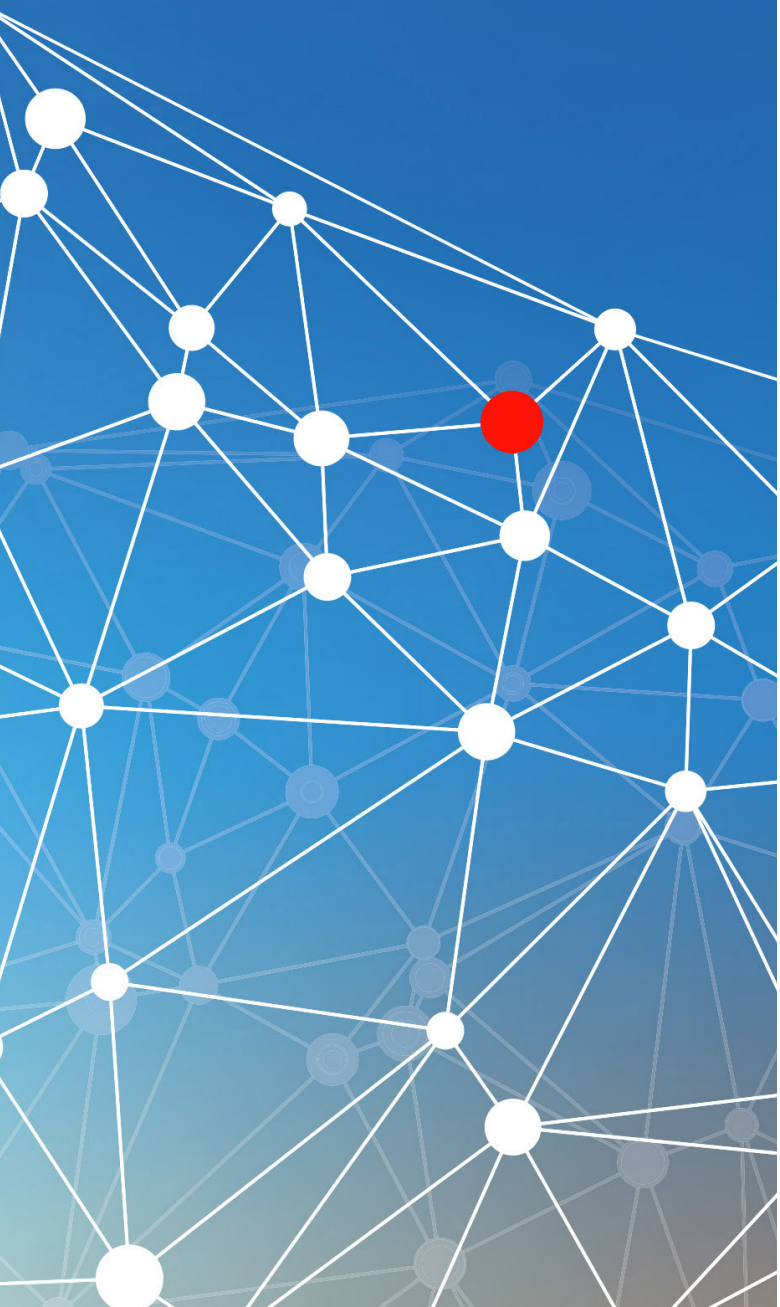
Product and Market Positioning

WIRELESS FIRE DETECTION



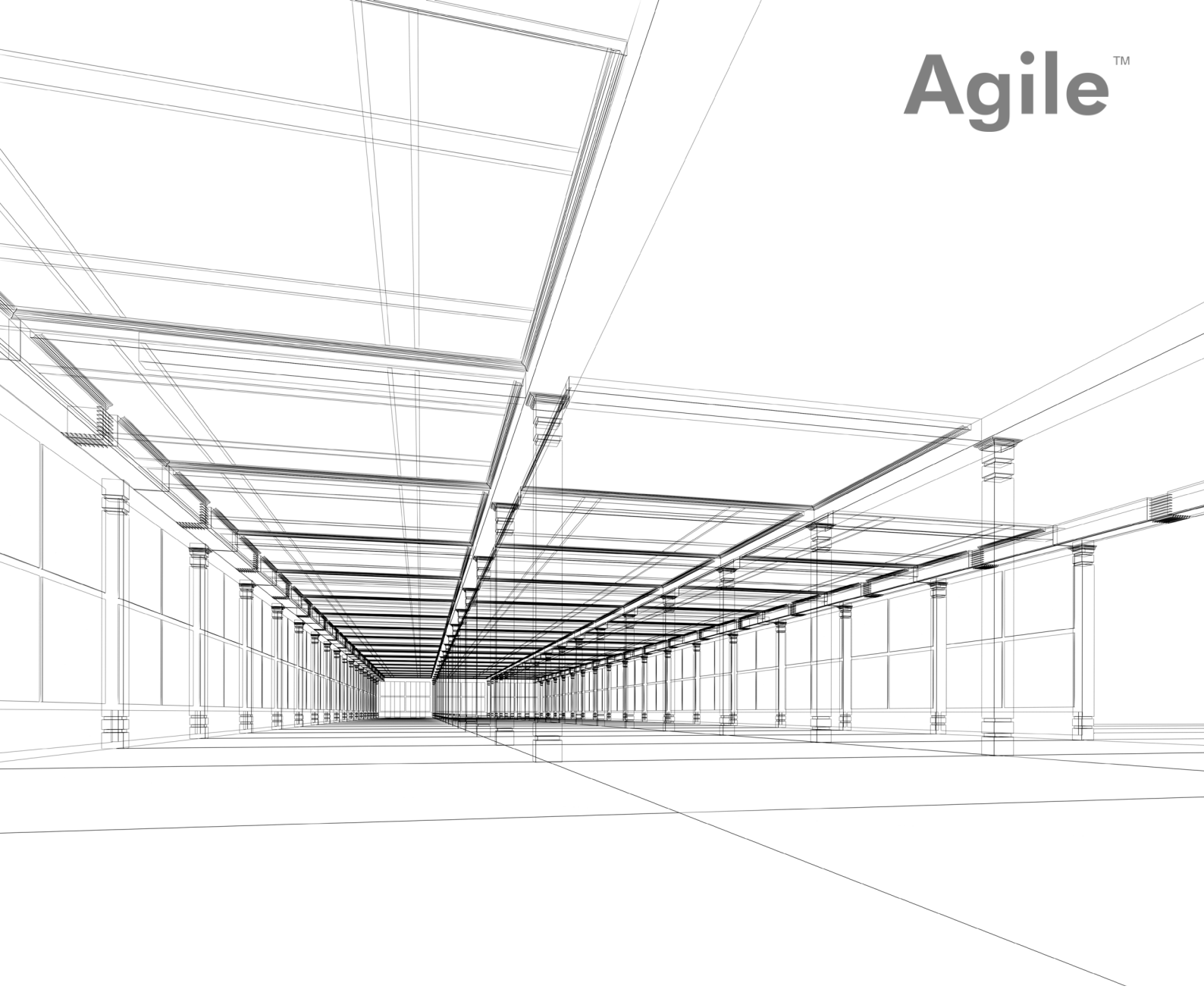
THE MARKET

The current wireless fire detection market is oriented towards mixed wired and wireless systems, as a common way of extending or upgrading existing installations or installing new systems without the impact of running hard wiring throughout the building.

The most common wireless fire system technology is the star network, in which multiple wireless devices are in direct communication with either a central wireless gateway or a repeater *(See Figure 1, page 3).*

The primary issue with star network technology is that without any resilience in the network, the communications are at risk of failure if environmental conditions affect the signal integrity. Moreover, it is difficult and costly to adapt a star network to increase reliability. Another issue is limited flexibility to cover larger areas, requiring the use of expensive repeaters/batteries or wiring to add additional gateways.

The introduction of Agile mesh network based wireless communication technology is set to overcome the main disadvantages of the star network by providing a more robust technology that delivers better communication reliability and installation flexibility.



MESH TECHNOLOGY BENEFITS

The use of wireless mesh networks is already well established and growing in many different sectors. For example, it is used in industrial safety facilities where continuous system monitoring and operator communication is required and also in commercial buildings where extended internet access is required to cover large areas.

The main driver for growth in wireless fire detection systems is the availability of mesh network technology as it provides greater security, reliability and adaptability than star network technology.

Reliability
The Agile wireless mesh system offers greater communication reliability as there are multiple communication paths between each gateway and device transmitter and receiver. If one device is inoperable the rest of the devices will communicate with each other. Path redundancy offers a safe way to reroute signals through alternative paths in the case of broken communication links. Frequency diversity across 18 RF channels prevents interference.

Adaptability
Mesh networks can adapt easily to environmental or architectural constraints, making the job of installation simpler. The Agile wireless mesh system offers repeaters as an additional way to fit the network to virtually any building map.

Scalability
Mesh networks are more scalable than star networks. In the Agile wireless mesh system new devices can be added without incurring additional work having to create a completely new network.

MULTIPATH COMMUNICATION RELIABILITY

Overcoming the deficiencies of star wireless network systems

Star Networks

In a star network a central gateway, mounted either in a convenient central position within the protected building or adjacent to the control panel, provides the wireless interconnect directly between the control panel and each of the devices.

The main issue with this approach is that if the signal integrity between the gateway and device becomes corrupted due to interference or attenuation, the device is completely lost to the system. Such a system has no resilience against this kind of failure, therefore items such as metal filing cabinets can break wireless communications in a star wireless network, leaving the area unprotected.

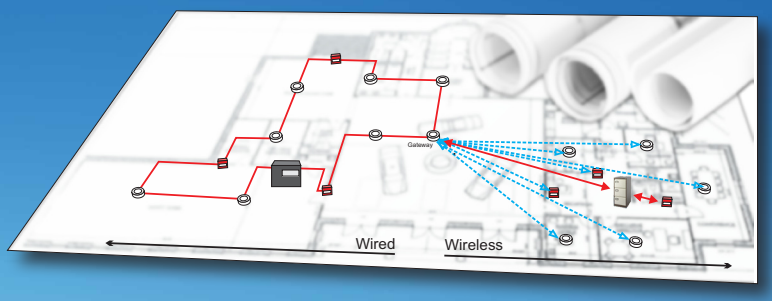


Figure 1 - Star network: What usually happens when a communication link breaks

Mesh Networks

In a mesh network each device acts as an independent router. This allows for multiple continuous connections and reconfiguration around broken or blocked paths. Communication reliability is a function of device density: the network resilience can be enhanced very simply by adding extra nodes, ensuring that each device has two or more potential communication paths for exchanging data.

In the Agile wireless mesh system network two communication paths between each device and the gateway are established, but only one link is used. A rerouting mechanism will reroute the communication through the secondary link in case the primary link is lost, ensuring that the area is fully protected.

EN54-25 requires that communication paths are not susceptible to interference from either inherent or external sources. The Agile multichannel frequency hopping technology and a high number of channels provide greater tolerance to interference ensuring that this requirement is met.

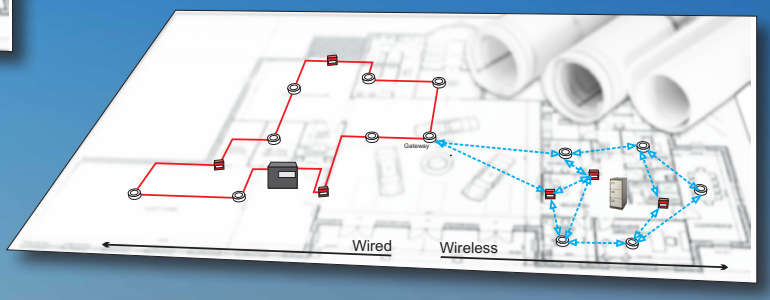
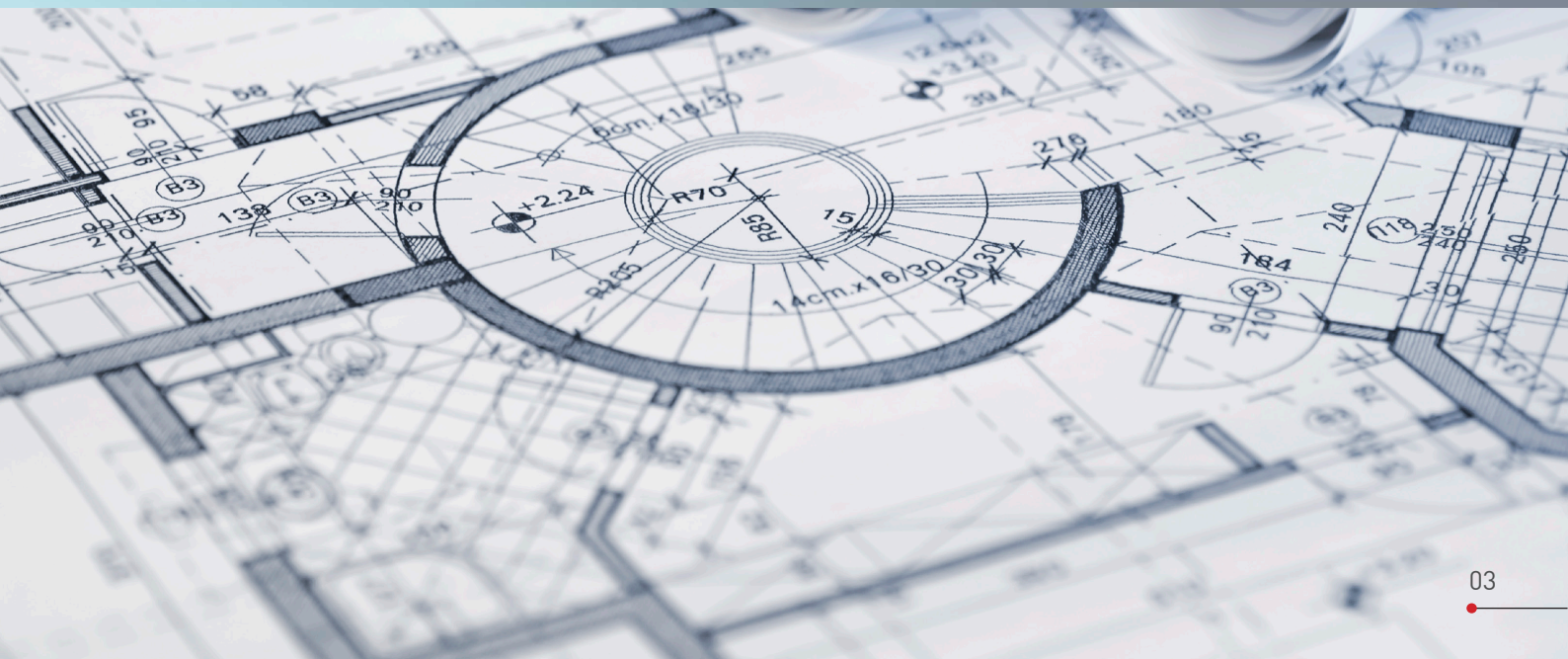


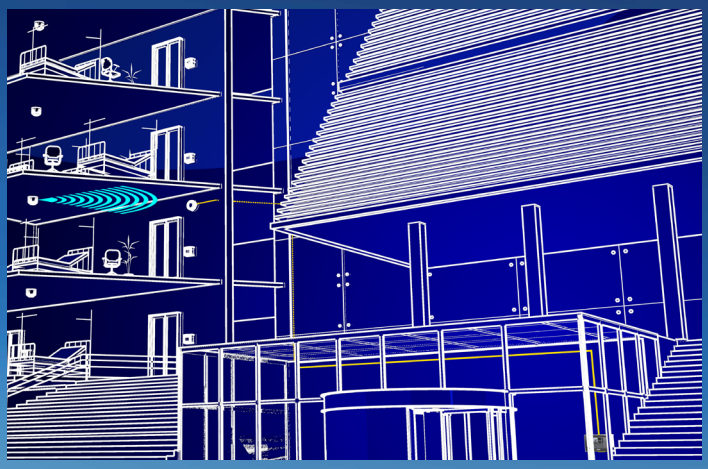
Figure 2 – Mesh Network: What happens if a communication link breaks in a mesh network



SYSTEM PERFORMANCE

The Agile platform is optimised to achieve robust communication with reduced power consumption. Wireless devices maintain the same performance of their equivalent wired devices with sophisticated, built-in routing algorithms to reach five years average service life in standard conditions. Whilst patented monitoring technology provides accurate battery service life prediction.

Each gateway can address up to 32 devices and has a free air range of 400m, higher than any competitive product. On average this means 30-40m in indoor environments. In practice, this allows the panel to be positioned where required in the building without having to worry about interconnectivity. In addition, twin antennas in each device mitigates against positioning difficulties.



SYSTEM FLEXIBILITY

Agile Mesh Network Technology enables reliable wireless network coverage over a wide variety of building footprints, keeping field strength measurements during the site survey to a minimum.

Repeaters can be added to the system at a later stage to improve communication performance in buildings with high structural attenuation.

CONFIGURATION AND DIAGNOSTICS

The Agile platform includes comprehensive PC-based Agile IQ software tools for easy design, configuration and diagnostics.

The intuitive software allows you to simulate the system design, helping to reduce the time and effort of doing extensive surveys. It generates a report advising on the number of devices required, enables the configuration of all wireless devices in a few clicks and includes comprehensive diagnostics showing battery and device status. In addition, the use of an Agile USB dongle and laptop enables the onsite tracking of performance and identification of faults, without the need of a hardwired connection to any device.

WIRELESS EN54-25 STANDARD

EN54-25 references three areas in which the networking technology and system design must conform:

Site attenuation

When designing the system, attenuation caused by the signal passing through walls and other solid parts of the building must not affect the ability of the system in signaling potentially dangerous situations. Given the variable nature of the environments, no specific figures for field strength are quoted. The Agile platform, with its multiple paths between each device and the gateway ensures that the communication messages are routed around the building in the most efficient manner, ensuring maximum signal strength at each location.

Alarm signal integrity

The second requirement of EN54-25 is the ability of the detector or call point to communicate reliably with the control panel to initiate the alarm. The Agile multi path mesh technology ensures that there is always at least one communication link between each device and the gateway.

Interference immunity

EN54-25 requires that communication paths are not susceptible to interference from either inherent or external sources. The Agile multichannel frequency diversity technology and high number of channels ensure that this requirement is met.

DEVICE RANGE

The Agile range includes wireless devices based on the robust field proven wired detector range:

- Multi criteria PTIR detectors
- Photo detectors
- Thermal detectors (58°C fixed, Rate of Rise)
- WCP manual call point
- DKM German call points

The Agile range includes accessories and tools to assist the designer, commissioning engineer and installer in deploying the wireless system:

- Gateway, Repeater and Agile USB wireless dongle
- Agile IQ PC-based software for wireless system design, configuration and diagnostics
- HW Tools (Bag for installer kit, Poles with removal heads)

IN SUMMARY

Agile mesh technology is designed to satisfy the demands of wireless communication reliability and flexibility without compromising on battery service life or device performance.

The platform will provide installers and system integrators with a secure, robust and scalable solution which can be used in a wide variety of applications where wired systems cannot be deployed or where they are economically unviable.

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FEATURES AND BENEFITS

EXCLUSIVITY & COMPATIBILITY		Secure Access	Access to the wireless system is granted to authorized installers by means of a branded USB wireless dongle
		Patented Technology	Multiple patents filed to cover wireless system features - wave cascade protocol, battery monitoring technology, fast output activation, low idle mode power consumption, output synchronization.
		Seamless integration with existing panels	Wireless devices appear the same as their wired equivalents on the panel. Wireless devices can easily be added to existing wired systems to reduce the cost of system extensions.
		Familiar device Look and Feel	Wireless devices have the same look and feel as their wired equivalents, making the installer's job simpler. The gateway, the main communication interface between the panel and the wireless communication devices, plugs into a standard detector base. Addresses are set using the familiar rotary switches.
COMMUNICATION RELIABILITY		2 communication paths	Mesh network technology provides two connection paths between each wireless device and the gateway, guaranteeing communications security comparable to a loop wired system and overcoming deficiencies of star network wireless systems.
		18 RF channels	18 wireless channels are provided for maximum performance and communication reliability - 12 at 865 - 868MHz, six at 868 - 870MHz.
		Channel diversity	Capability to switch between channels at different frequencies maximizes reliable communications – reducing interference and ensuring a clean signal.
		Antenna diversity	Two integrated antennas make the devices less susceptible to positioning faults.
SYSTEM MONITORING		Wireless monitoring via Agile USB dongle	A USB wireless dongle connected to Agile IQ allows you to monitor the wireless mesh network without any hardwired connection. Management software provides a visual picture of the entire network operation.

FEATURES AND BENEFITS

ADVANCED DETECTION TECHNOLOGY		Optimized Wireless Product Range	The multicriteria PTIR detector out-performs optical, photo-thermal and thermal detectors and combines the fastest fire detection with outstanding immunity to false alarms, making it ideal for protection of historical premises. The WCP waterproof manual call point is field-proven and can be installed in wet or dusty environments. Repeaters are a method of providing a wireless device where higher communication reliability is required and a fire device (detector, MCP etc) is not necessary.
PERFORMANCE		Optimized Performance	The wireless interface module has a free air range of 400 m. Battery service life is five years on average.
COST EFFECTIVE & FAST INSTALLATION		Wide wireless network coverage	Mesh network technology enables coverage over a wide variety of building footprints, reducing the need for extensive field strength measurements to be taking during the site survey.
REDUCED COST OF OWNERSHIP		Reduced installation time	Wireless fire systems significantly reduce installation time when compared with wired equivalents.
		Easy site surveying, commissioning and diagnostics	A USB wireless dongle and Agile IQ software allows site surveys, configuration and diagnostics tasks to be easily undertaken.
SYSTEM MONITORING		Smart battery monitoring technology	Smart monitoring technology provides accurate battery service life prediction, reducing unplanned maintenance requirements. Four batteries are included within each device and sophisticated battery management software allows an average five-year replacement in standard conditions
INSTALLATION FLEXIBILITY		Enables temporary systems to be easily installed	Wireless systems are the only realistic method of providing coverage during building construction, a time when the risk of fire is significantly higher.