



WIRELESS FIRE SYSTEMS

FireCell wireless fire detection in Healthcare

Why choose EMS wireless fire detection for your next healthcare project? An examination of the advantages, the scalability and the technology

Ray Puttock
July 2024

Healthcare and hospitals - Why would you use wireless fire detection in healthcare environments?

The question should probably be "Why would you not use wireless fire detection in healthcare environments"?

With the extremes of this sector, in terms of business continuity and time poverty, it's a given, that every minute counts, as far as clinical care is concerned. Whilst every situation is not a life and death one, almost every user demands instantaneous reaction where their health, or a loved one's health, is concerned. With services pushed to the limit, and these high expectations, it's no wonder downtime is never welcomed, even when it's related to life safety!

The emotional cost of closing a theatre or ward is not the only factor, but also always involves a real financial cost, as private operations and procedures represent a much-needed income to bolster NHS activities or business demands. Financial loss can also be incurred, when medicines or treatments are missed or delayed, adding to the overall drive of keeping any downtime to an extreme minimum.

Let's not forget however, the wide reaching and overarching architecture of health services, not just hospitals but clinics, health centres, local surgeries, research centres, mental health facilities and special care units, amongst others, plus the many private elements supporting NHS services.

The [NHS firecode \(HTM\) 05-03 Part B](#) covers a number of topics, along with 05-02 and 05-01, all giving guidance and management instruction on operational provisions for fire safety at health sector buildings and premises.

The HTM code is separated into 11 key elements to guide management, engineers, fire professionals and Trusts.

- ♣ Part A - Training
- ♣ Part B – Fire detection and alarm systems
- ♣ Part C – Textiles and furnishings
- ♣ Part D – Commercial enterprises on hospital premises
- ♣ Part E – Escape lifts in healthcare premises
- ♣ Part F – Arson prevention and control in NHS healthcare premises
- ♣ Part G – Laboratories on healthcare premises
- ♣ Part H – Reducing false alarms in hospital premises
- ♣ Part J – Guidance on fire engineering of healthcare premises
- ♣ Part K – Guidance on fire risk assessments in complex healthcare premises
- ♣ Part M – Fire Safety in Atria

Each section is an essential part of ensuring fire safety for building users, and clinical staff, along with the building fabric itself.

The design and type of fire detection system, protecting healthcare properties, should still be fully compliant to BS:5839 requisites. Moreover, HTM is intended to supplement BS 5839-1 "Fire detection and fire alarm systems for buildings" by providing recommendations specific to healthcare premises. It is therefore essential, that HTM is read, and adhered to, in conjunction with BS 5839-1 and any other local fire codes or regulations applicable.

The legal requirement of meeting legislative demands, must also be followed at all times, as this is specifically explicit in Article 13:

13. (1) Where necessary (whether due to the features of the premises, the activity carried on there, any hazard present or any other relevant circumstances) in order to safeguard the safety of relevant persons, the responsible person must ensure that— (a) the premises are, to the extent that it is appropriate, equipped with appropriate fire-fighting equipment and with fire detectors and alarms;

Across the immense estate of properties, there are many large and complex buildings, but many, as mentioned previously, can be much smaller. Guidance for the type and category of these smaller systems is also provided in section 4.2 of BS:5839.

There is also a governmental document, for additional direction, "[Fire Safety Risk Assessment – Healthcare Premises](#)" which is one of many such sectorised documents, available from the Department for Communities and Local Government Publications and, is on the DCLG website.

Management teams then work with either experienced in-house engineering teams, or external consultants, as well as independent bodies such as the [IHEEM](#) or [IFE](#), along with perhaps the [FIA – Fire Industry Association](#).

These all ensure best practices are applied, in terms of installation and build, and how to implement and deploy a new or upgraded fire detection system to meet prevailing standards, as well as addressing all localised risk factors.

With the above compliance and reviews in mind, the process of choosing a fire detection system must then be a key consideration, driven by factors such as reliability, reputation, cost and ease of installation. There are also the types of technology available from many manufactures, bringing new innovation to the table on a regular basis.



Ultimately, when all of the above has been considered, we come back to continuity of service, how long, and how much disruption could take place and how might this be mitigated for all the reasons previously mentioned.

The embracement of wireless fire detection technology has been one of the fastest growing sectors of the fire market, exponentially increasing in popularity due to its rapid deployment and enormous reduction in inconvenience. Add to this a much-reduced cost in terms of Health and Safety measures, always, put in place during an installation or remedial works.

Wireless technology has been around, and used, in both security and fire for something like 50 years plus. However, it was the introduction of EN54-25:2008 "Fire detection and fire alarm systems - Components using radio links" that significantly changed the landscape.

This European standard was introduced to ensure that a wireless system would be as good, or better, than a wired system, and has many requirements that manufacturers and wireless fire system developers have to meet, before a system can be certified and introduced on to the market.

Many of the principal developers were fast to meet the standard, and wireless systems like [FireCell from EMS](#) were released as 100% certified to EN54-25, making them a real alternative choice, when specifying a fire detection system.

EN54-25 stipulates that reliability is key, and technological developments to meet the standard are achieved in different ways, with the overriding factor being full compliance with the standard.

Wireless signals from fire devices to panels have to be bi-directional, ensuring a constant and robust "handshake" and therefore, 100% connectivity at all times, as if it were connected with cable.

Battery technology had to be improved, with EN54-25 stipulating a minimum 3-year battery life, with a 30-day backup for replacing depleted batteries. EMS systems now easily exceed this, with 5 years commonly being achieved with FireCell. This is usually one of the first questions asked, when discussing a wireless based system, but with a replacement set of batteries costing little more than a couple of pounds, costs are minimal.



Batteries are commonly replaced, as part of an ongoing maintenance programme, and whilst there is a cost, albeit nominal, remember, there is no need for an expensive wiring test, which can run into many hundreds or thousands each time it is carried out.

A big benefit of having no wiring test, is that you never have to remove fire protection by decommissioning all, or part of a fire system. That's no additional prohibitive cost, incurred for alternative protection or manned services. A real benefit indeed for larger installations.

To coincide of the introduction of EN54-25, the frequency used by fire systems, was set at 868MHz by ETSI across Europe. This frequency, along with the secure wireless technology utilised by manufacturers, ensures robustness and reliability.

Each EMS wireless_FireCell_fire system can only communicate with its own devices, as signals are encrypted and "addressed" to that particular system. What does that mean? Well, this guarantees that any number of FireCell, or any other wireless systems, can operate efficiently and effectively, within close proximity, without any detrimental effects whatsoever.

All of the other common misconceptions about interference are also unfounded: are wireless system affected by 4G or 5G mobile signals? Do they interfere with other radio frequencies or equipment? (always a question asked in healthcare) and can they be blocked? The answer is that EN54-25 gives clear information that none of the above should ever be an issue, on any system that is certified to the standard.

For larger and more complex estates, where there are many buildings remote across a single site, the fire plan can be daunting, in terms of linking systems and thinking about "cause and effect" planning. With the landscape changing, in terms of the advice given in the past, following the Grenfell disaster, it's vitally important to keep adjacent properties aware of what's happening in any fire situation. Commonly this is where fire panels/ systems are connected together, ideally in a network, but sometimes with "fire and fault" connectivity.

The challenge, is getting cable between each structure, okay if there are ducts available, but otherwise it's necessary to have groundworks to add these, and with costs staring at around £150 or so per metre, this can be excessively costly.



These costs are exacerbated where the duct is needed under concrete or even across an access road. In addition, there are often innumerable Health and Safety measures to deploy to protect people using the area. Imagine for a moment, someone falling into an open trench at a hospital! The net effect is that costs often are prohibitive, frequently running into tens of thousands, and occasionally this connectivity is neglected or deferred, until budgets can be agreed.

A solution could be a FireCell “wireless” network, with full addressability across a number of systems, all without cable! This is achieved with the use of additional EMS wireless transmission equipment, linked to each FireCell control. This then gives a complete picture of the entire fire system, across a large site, allowing adjacent systems/building being alerted or evacuated, should a fire occur.

Such a network is extremely easy to deploy, and can be achieved in very short timeframes. The big advantage is cost! No groundworks and much reduced Health and Safety measures, all without cable.

Most fire systems can also be enhanced with the addition of EMS EN54-25 wireless gateways. There are a number of solutions available but essentially, an [EMS gateway/interface \(WZM\)](#) connects into the existing fire-resistant cable, of almost any addressable or conventional system, and allows wireless fire devices to be added.

These EMS gateways can be an ideal solution for an extension or temporary building, giving fire protection in hours. Gateways will support up to 30 wireless devices of any mix – remember that batteries power each device, so the existing fire system does not need to supply power to these additional devices, and system standby is unaffected.

For systems using the XP95 protocol, the [EMS Fusion Loop Module](#) is installed directly onto the loop, and seamlessly connects up to 31 wireless devices of any mix as above – The caveat here is that you cannot exceed loop/panel capacity but you get full addressability across the entire system whether the fire device is wired or wireless.



Gateways provide big advantage, if you need to add notification devices, sounders and perhaps [EN54-23 visual alarm devices \(VAD's\)](#), all of which, if wired, would require increased power from the fire system. This could involve having a larger panel installed, more cable and more back up power for standby, along with all the associated costs, so wireless becomes a very cost-effective and practical solution.

The adoption of a hybrid approach, could be an ideal methodology when upgrading or extending fire systems.

With legislation changes in 2023, and a focus on door controllers, the above gateways are also ideal for adding these retrospectively for compliance. The FireCell door controller (WDC) is 100% wireless and integrates into the system as a device, only releasing the door(s) when the system is activated by a fire situation.

What about the user experience, is this any different? Absolutely not. As far as the user is concerned, it's a fire system and operates in exactly the same way. Information given is the same, and costs for service and maintenance are comparable to an equivalent system using cable. There are a lot of advantages, some already mentioned in terms of cost, speed of installation and lifetime ownership, but the overriding factor is fire safety, which is paramount to any fire system.

The first step to wireless, is to talk to an expert that understands the technology. This is not new technology, it's tried and tested, and governed by European standards, guaranteeing it's every bit as reliable, as any fire system, yet provides a myriad of advantages and cost advantages. EMS has nearly 60 years of wireless knowledge and know-how through development of the technology, and as a pioneer of wireless fire detection. [You can contact any of our wireless experts](#) for support or information located across the UK and Ireland. There are now many, many buildings, across all business sectors that have taken the wireless fire route, including buildings that are national treasures, governmental, educational, commercial and those in the healthcare segment.

For demonstrable healthcare examples, and real-world cases, you can view a number of typical EMS installations, by viewing or downloading the [EMS case study comprehensive PDF publication](#).

The final thought, is that healthcare has so many demands and challenges. Shouldn't fire safety be made easier, quicker and cost-effective, allowing this sector to concentrate on delivering care for all of us, in the safest environment possible?

[Ray Puttock - July 2024](#)