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# Continuous fault monitoring on construction sites

**Fire safety:**  
Why is  
continuous  
fault monitoring  
so important?



# Introduction

On a major construction project, having a network of linked fire alarms is critical to ensuring that in the event of a fire, everyone is warned immediately. This is typically achieved wirelessly, given the hazards around trailing cables, and therefore the crucial factor is ensuring constant connectivity across the network so that whenever and wherever an alarm unit is triggered, the message always gets out across the site.

## What is continuous fault monitoring and why is it so important?

### → Means to give a warning

Given the constantly changing nature of a construction site, and the very possible risk of an alarm station becoming damaged or disconnected, the alarm system must have an integral warning system to alert the site team rapidly – this is called Continuous Fault Monitoring. And to be compliant with EN54-25 that warning needs to happen within 400 seconds.

Continuous fault monitoring means that the fire alarm panel is constantly checking that radio signals can be sent and received between all parts of the system. Once a fault is recognised, the panel will register this and show a fault warning to indicate the problem needs to be investigated.

**“The crucial factor is ensuring constant connectivity”**

### → Avoiding a fatal situation

Without continuous fault monitoring, any part of the system could become damaged or disconnected without anyone knowing – which, in the event of a fire on site, could rapidly escalate the situation as in the following examples:

- The call point alarm unit in a remote part of the site has been tampered with and has been disconnected. A fire later breaks out and the nearest worker hits the alarm, but it fails to activate the rest of the system, so the evacuation is delayed while a working call point is found. In a fire, a delay in raising the alarm can be fatal.
- An automatic detection unit fitted in a high-risk area has been damaged and is no longer functioning. A fire breaks out overnight and no alarm is triggered, and no one is alerted until the fire has significantly progressed, causing complete project failure and even a danger to life if the project is situated near other occupied buildings.

### But if the system has been set up correctly in the first place, why should it suddenly fail? What's the risk of a single point of failure?

Radio signals, although invisible, are at least as susceptible to breakage or interruption as cables. For example, if they are disrupted by ‘noisy’ radio equipment in the vicinity or other RF blocking materials, or even if the battery on the unit is running low.

In a permanent building, radio signals can be negatively impacted from time to time, but on a construction site, the environment is far more dynamic. You can expect radio signals to be blocked periodically during the course of the building programmes, as walls go up and different equipment arrives on-site, hence the need to know quickly when things aren’t working as they should be. In these situations, simply repositioning some of the equipment usually rectifies the problem.

The other real risk is when equipment becomes damaged or goes missing. Knowing something is wrong is a big step on the way to correcting it.

*“What is the likely cost of having a fire in your site accommodation and the detector failing to trigger the alarm because it's disconnected?”*

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# Why is this fundamental to EN54 compliance?

EN54-25 is a British Standard for permanent radio linked alarm systems. Whilst legislation doesn't specifically require it on a construction site, it is often specified as a condition of insurance, and the underlying principle is that the system has no single point of failure. The only way to ensure this critical element can be achieved is for the system to continually fault monitor itself and flag up any loss of communication rapidly. The requirement set by EN54 is that this 'loss of communication' warning is raised within 400 seconds. That's less than 7 minutes! (EN54-25: Section 4.2.6)

Some systems marketed as EN54 compliant take 6 hours or more to register a fault, and often the fault may only be noticed during a fire drill or periodic inspection. A lot could burn down in that time! So that's definitely a question you need to ask your supplier – does the system have continuous fault monitoring and will that be within 400 seconds?

For your confidence, when using the Howler radio linked systems, if any wireless unit loses connection with the network within 400 seconds of the last communication, a message will appear on the Indicator Station to warn you.

**“Early warning of loss of comms is critical”**

## Is my fire insurance void if my system does not have a 400-second loss of comms monitor?

If your Insurer has specified that you use an EN54 compliant system, then yes, it is possible that they would refuse to cover damage if the system you are using does not have Continuous Fault Monitoring that would raise the alert within 400 seconds.

Many insurers are insisting on this standard for larger and high-risk projects, and even with lower risk projects, EN54 is often specified. If in doubt, do check with your insurer as mistakes can be costly.

## Is it really that critical?

If my insurer hasn't actually specified EN54, do I need to bother? Is this just about 'compliance'?

No, it really is vital. Although a major fire that sees a loss of life and injuries is rare on a construction site, there are frequent fires on construction sites (on average one every day), most of which are detected and extinguished in those few minutes before they become unmanageable.

Early warning of loss of communications is critical; not only because of the cost of lives and injuries, but also in the cost of downtime and hassle when equipment isn't performing correctly.

*“If some of the sounders don't activate on your fire drill, how much longer does the drill take? What's the cost increase?”*

Larger contractors and insurers are increasingly using EN54 as the standard to work to, and it makes good sense. There's not much point in spending money on a fire alarm system if you can't be sure it is working effectively at all times.

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