

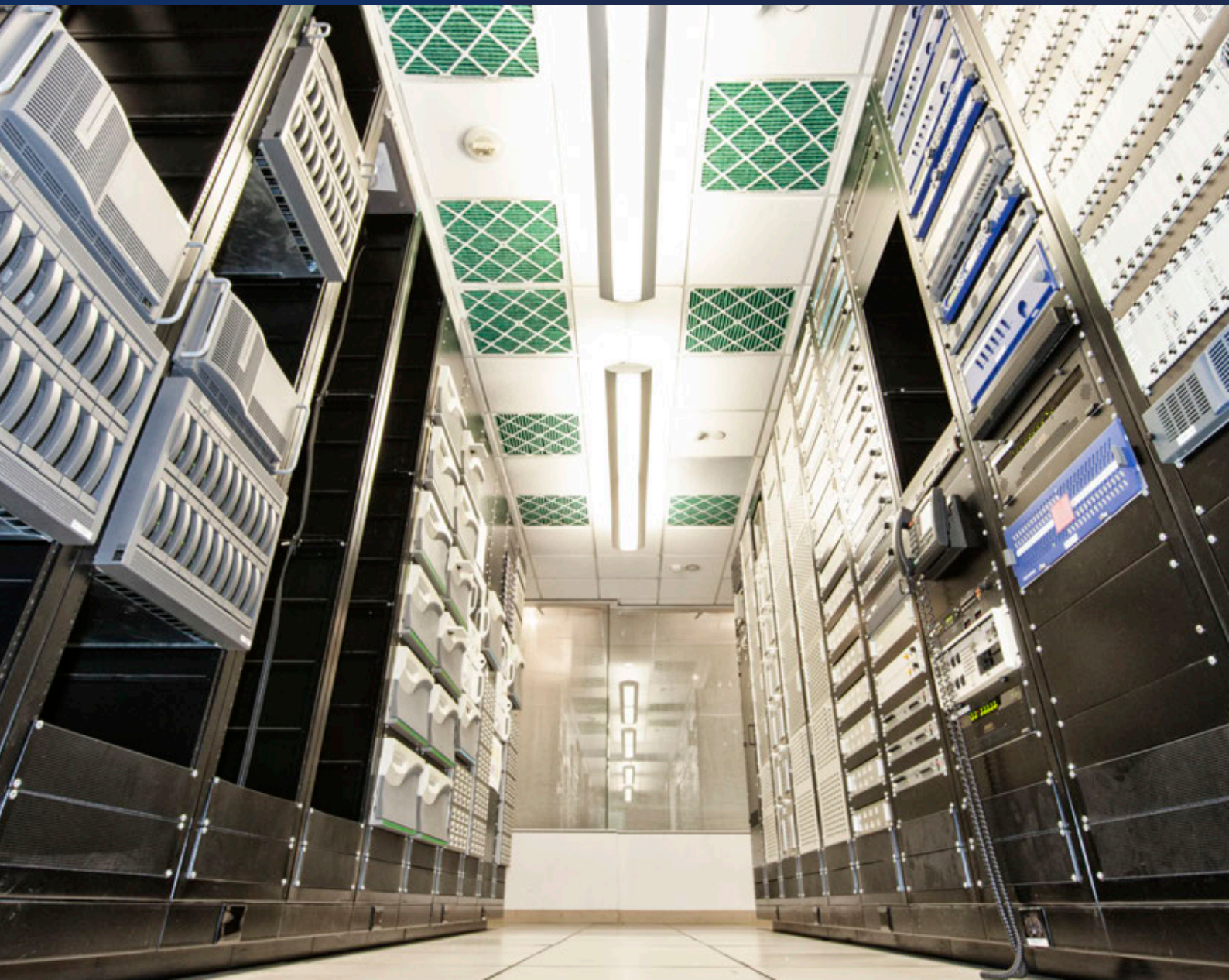
Fire Safety Strategies in Data Centres

The Case For Centralised Fire Alarm Management and Risk Mitigation



Introduction

Data centres are critical to modern digital infrastructure, supporting businesses, public services, and cloud computing. The UK currently has approximately 10 million square metres of data centre space, spanning around 1,250 commercial facilities, with expectations for significant growth. While fires in data centres are relatively rare, their consequences can be severe, leading to service disruptions, financial loss, and reputational damage.



A Brief History of Data Centre Fires

Despite the relative rarity of major fires, we should not be complacent.

In March 2021, a catastrophic fire broke out at one of OVHcloud's four data centres in Strasbourg, France. The blaze completely destroyed the European cloud service provider's SBG2 data centre, a 2-megawatt facility that housed around 30,000 servers. It also caused partial damage to the neighbouring SBG1 facility, which was subsequently decommissioned and dismantled.

In March 2023, a fire occurred at the Maxnod Datacentre, operated by Adeli, in Saint-Trivier-sur-Moignans, Ain, France. Spanning 8,611 square feet (800 square meters), the facility sustained significant damage that necessitated a complete reconstruction of the building. The equipment within the data centre was also completely destroyed.

The cause of the fire was traced back to the battery room of the facility's solar panels, believed to have been ignited by a lithium-ion battery. The fire also resulted in extensive damage to the data centre's fiber optic cables, impacting local fiber-to-the-home (FTTH) services.

In August 2020, Telstra, Australia's largest wireless carrier and broadband provider, experienced a fire in their London Hosting Centre at the Isle of Dogs. A small part of a supply room on the third floor was damaged. A faulty UPS triggered the circuit breakers, causing the fire. Thankfully, no injuries were reported.



A Brief History of Data Centre Fires

Causes of Data Centre Fires

The main causes of data centre fires are electrical failures, overheating lithium-ion batteries, inadequate maintenance, and human error.

Electrical Failures

Electrical failures, like overloaded circuits, malfunctioning equipment, or defective wiring, generate heat that can cause fires. Key phenomena include:

- **Electrical Surges:** Sudden voltage increases can overload circuits and ignite fires, especially in inadequately protected equipment.
- **Arc Flashes:** Low-impedance connections causing high-intensity flashes can easily ignite materials in environments rich in fuel sources.

Lithium-ion Batteries

Used for backup power, lithium-ion batteries have a high energy density and can overheat or get damaged, leading to thermal runaway - a self-escalating reaction causing fires and explosions. Their prevalence in data centres, due to their advantages, poses a higher fire risk than lead-acid batteries.

Inadequate Maintenance

Neglecting regular cleaning and maintenance of servers, power supplies, and cooling systems leads to dust accumulation and overheating, increasing fire risks.

Human Error

Errors during installation, maintenance, or daily operations, like improper cable connections or not following safety protocols, can create fire hazards in data centres.



Why Data Centres need a strategy

According to Savills UK, the UK currently has around 10 million square metres of data centre space, representing approximately 1,250 commercial data centres, equating to roughly 10 million square meters. The UK data centre market is expected to grow significantly, with capacity potentially doubling in the near future.

Data centre fires are relatively rare, however, the Uptime Institute has recorded 14 fires among its membership over the last six years. Considering there are 8,000 data centres globally, one might regard data centre fires as an unlikely threat.

However, in the event of data centre fires, businesses and service providers face significant challenges with wide-ranging consequences. These entities must prioritise robust fire prevention and response strategies to ensure business continuity and safeguard client trust.

Many businesses and service providers often rely on cloud services to operate efficiently and serve their customers. A data centre fire can lead to prolonged service interruptions, resulting in immediate business disruptions. For small businesses, a data centre fire can mean an inability to access critical data, leading to operational paralysis, in summary:

- Data Loss meaning essential records and customer information are at risk
- Loss of Client Trust with reputational damage leading to client retention issues

Therefore, it is important to assess your readiness to mitigate the fire risk that could potentially impact an entire facility.



Addressing Data Centre Fire Mitigation

As with any commercial building, developing a thorough fire risk assessment (FRA) is the first step and in the case of a data centre additionally focusing on the parts of digital infrastructure posing the highest business risk. This involves pinpointing key ignition sources and critical areas to protect within the data centre in addition to:

- Ensuring the integrity of fire compartments
- Reviewing and updating existing fire suppression and mitigation plans
- Updating disaster recovery strategies to enhance physical site security against fire damage
- Reliable documentation, preferably digitally held
- Proper equipment labelling
- Annual fire safety inspections
- Documented technical hardware refresh cycle
- Written procedures, especially for fire suppression
- Coordinated facility maintenance
- Risk management and planning aided by centralised alarm management
- Effective early fire detection and suppression systems



A Holistic Approach

Fire Suppression Systems

Data centres use fire suppression systems to manage and extinguish fires. These systems include:

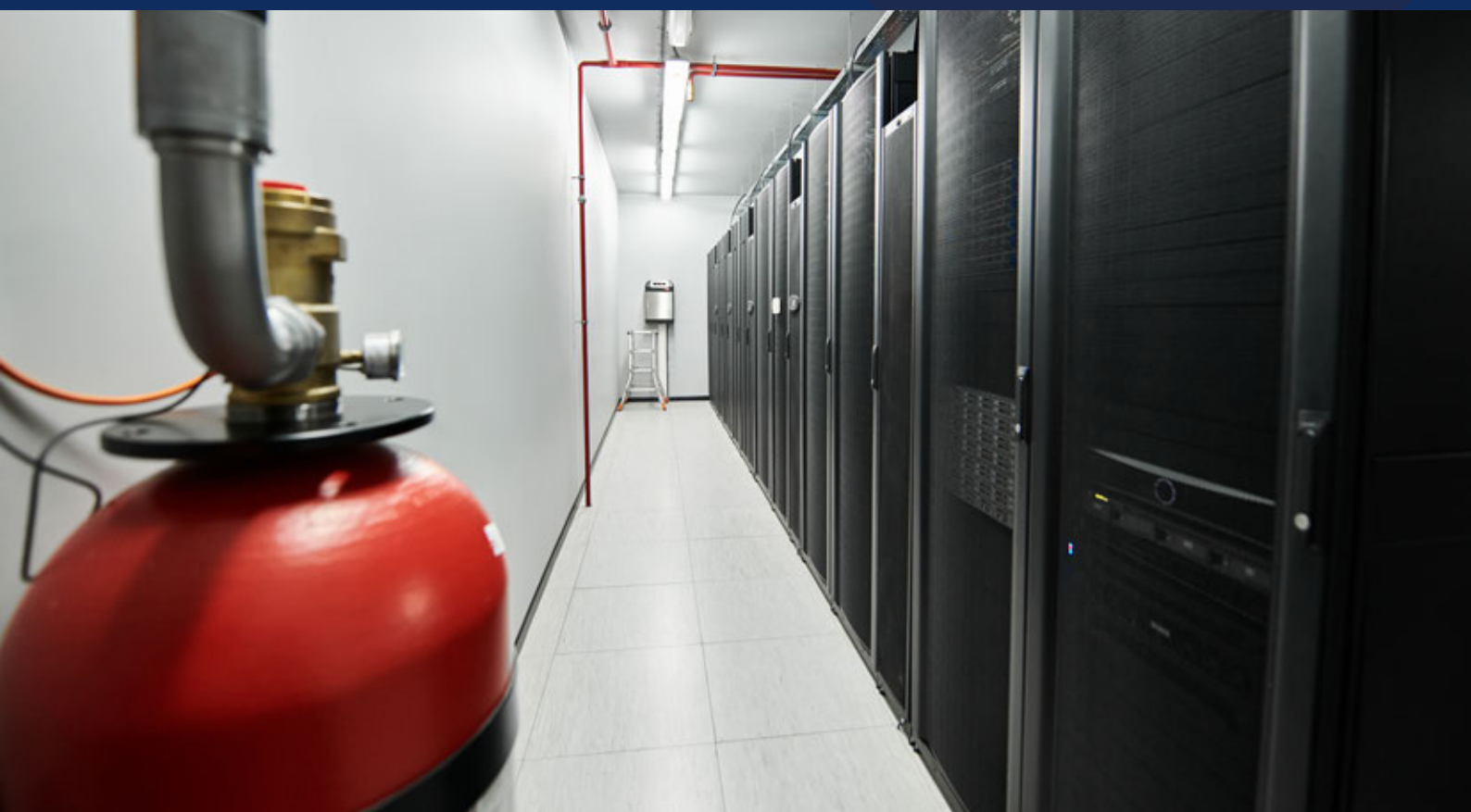
- **Gaseous Agents:** These displace oxygen or disrupt the chemical reaction of a fire.
- **Water Sprinklers:** Used less frequently due to potential water damage to equipment but can be effective in certain designs.
- **Pre-Action Sprinklers:** Triggered by preliminary fire detection, reducing the risk of accidental discharge.

Early Fire Detection

Early fire detection relies on systems designed to identify the presence of fire at the earliest stage. Data centres employ:

- **Smoke Detectors:** Installed throughout the facility, these detect smoke particles, with some systems providing very early smoke detection.
- **Heat Detectors:** Activated by temperature changes, indicating a potential fire.
- **Flame Detectors:** These sensors detect infrared or ultraviolet radiation emitted by flames.

Prompt detection facilitates quicker activation of fire suppression systems and evacuation protocols, reducing potential damage.



A Holistic Approach

Maintenance and Inspections

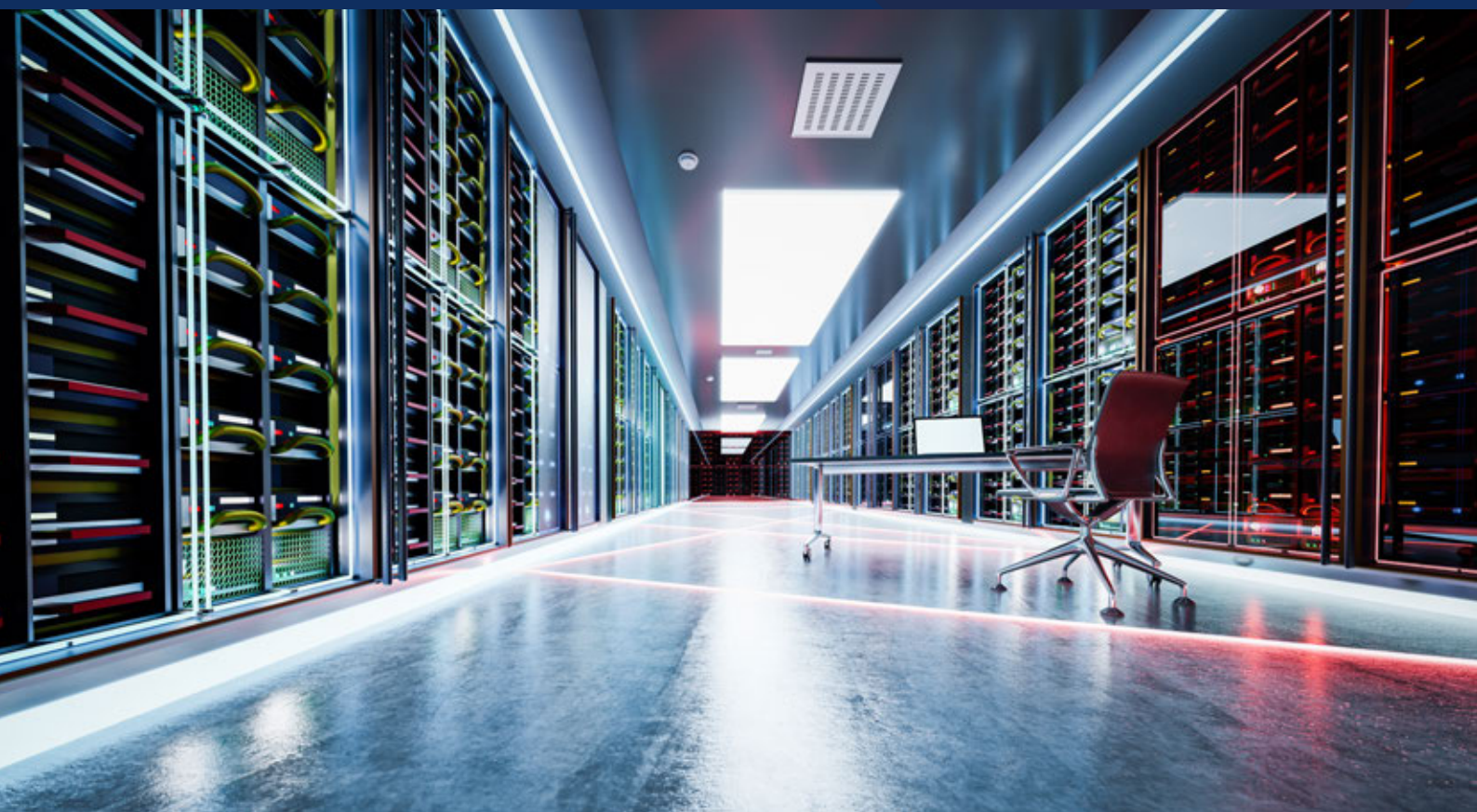
Conducting maintenance and inspections is essential for ensuring all fire prevention and suppression equipment remains operational. A standard maintenance schedule includes:

- **Regular Testing of Fire Systems:** To verify functionality.
- **Inspection of Physical Barriers:** Such as fire-rated walls and floors, to ensure their integrity.

Centralised alarm management

For over 25 years Drax Technology has pioneered the application of centralised alarm management to enhance the fire safety in commercial buildings including the then emerging data centre sector.

By gathering critical alarm system information as a centralised source of truth, building operators have been able to respond to incidents swiftly whilst automatically gathering vital information about system performance, events and maintenance. Accessible anywhere in the world, our alarm system solution provides intuitive tools that allow users to monitor and respond to incidents whilst auditing testing and maintenance operations.



Benefits of adopting Drax Technology

Safety Assurance — Protecting critical infrastructure, equipment, and personnel is a top priority for any data centre. Drax Technology enables efficient management and monitoring of fire and life safety systems, significantly reducing the risk of fire-related incidents and ensuring rapid response.

Regulatory Compliance — Data centres must adhere to stringent fire safety and operational regulations. Our compliance platform supports adherence to local, national, and industry-specific standards, mitigating the risk of legal action, fines, and reputational damage.

Operational Efficiency — Managing fire safety across large-scale data centres is inherently complex. By centralising fire and life safety systems through a single interface, Drax Technology streamlines operations, facilitating easier tracking of inspections, maintenance, and compliance across all facilities.

Real-Time Monitoring — With data centres often operating across multiple locations, tracking fire events and responses in real time is crucial. By centralising alarms and utilising mobile technology, Drax Technology provides instant alerts on potential fire hazards and system faults, ensuring rapid intervention.

Cost Savings — Proactive fire safety management helps prevent costly downtime, equipment loss, and legal fees associated with fire damage or regulatory breaches. Drax Technology supports data centres in optimising asset lifecycle management, maintenance schedules, and resource allocation, leading to significant long-term cost savings.

Data-Driven Insights — Our software solutions offer powerful data analytics and reporting features, providing critical insights into compliance trends, risk areas, and system performance, helping data centre operators make informed decisions and improve safety measures.

Benefits of adopting Drax Technology

Emergency Preparedness — In emergencies, a reliable fire safety management system ensures quick and effective responses. This includes automated alerts, integration with suppression systems, and real-time monitoring to prevent system failures or data loss.

Reputation Protection — Maintaining high safety and compliance standards safeguards a data centre's reputation. Demonstrating robust fire safety measures builds trust among clients, stakeholders, and regulatory bodies, reinforcing operational reliability.

Sustainability Initiatives — Effective fire safety management aligns with sustainability goals by reducing energy waste from system failures, optimising operational efficiency, and preventing unnecessary resource expenditure.

Commitment to Innovation — Investing in advanced fire safety technology showcases a data centre's commitment to innovation, modernisation, and the adoption of industry-leading solutions to enhance operational efficiency and risk management.



Why Drax Technology?



Trusted Globally

For more than 25 years we have been market-leading in creating technology-driven innovative fire and life safety compliance solutions



Unrivalled System Connectivity

Extensive list of technical integrations that allow you to connect all your safety systems in one place



Multiple Manufacturer Integrations

It doesn't matter what your fire panel is, or how many panels you have, Drax Technology connects all your system



Reinforces Your Asset Investment Strategy

Install onto existing or new fire alarm networks, regardless of each of your fire alarm panel manufacturers



100% Scalable System

Easily adaptable to accommodate data centre expansions, and evolving fire safety requirements, ensuring seamless protection as your facility grows.



Consistent Solution

Keep your data centre running efficiently without the worry of unnecessary disruptions



Enhanced Network Connections

Utilise existing IT infrastructure or run over 4G, saving time and installation costs



Proactive Compliance Management

Stay ahead of evolving fire safety regulations by having real-time data, automated reporting, and compliance tracking

Compatible with more than just fire alarms

Create a centralised view of all critical alarm devices (not just fire) and identify the location of a fire, pre-alarm, fault and disablement. Integrations across campus can include:



Fire Alarms



Intruder Alarms



Flood Alarms



Gas Alarms



Disabled Refuge Alarms



Nurse Alarms



Panic Alarms



Sprinkler Systems



Plant Alarms



World-leading fire alarm management solutions for Data Centres

No two projects are the same.
If you're unsure about how to
integrate our systems, speak to
one of our experts.

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