



Smarter fix

John Newton discusses the technology and choices that can make fire system installation more effective, easy and profitable

FIRE DETECTION and alarm systems have changed in recent years, as fire panels and detectors are asked to do more than ever and more technology is pushed into 'the grey box on the wall'.

This enhances performance, but also adds cost. However, it's not the cost of the panel, but rather the installation, commissioning and maintenance that makes up a large chunk of the investment in a system.

What's more, saving time on installation becomes important because a lower lifetime cost of ownership allows more to be invested up front in a better quality, futureproofed system that offers more protection for people and assets.

Fortunately, the leading manufacturers have added a whole raft of features that make installation easier and more economical. These can be broken down into design and mechanical features; system tools; software solutions; and standards, with the best systems offering a strong combination of them all.

Design and mechanics

Installing a fire system is a specialist task and often the team that carries out the first fix – basically putting the boxes and the cables into a site – is not the configuration and commissioning team. Modern systems cater for this staged

approach with first fix options, such as a removable electronics and equipment chassis, allowing the box and the wiring to be installed quickly by the installation team and then commissioned later by a fire specialist.

In order to make this simpler, accessible and pluggable terminal blocks; sufficient and correctly positioned knockouts with ample space for dressing cables; plus cable-tie anchor points or other means of dressing-in cables, while not necessarily glamorous, are certainly important and will save money long past installation. A tidy panel with well-marked cables will be much easier to maintain in future than a rat's nest of wiring.

Terminals should be marked so that they can be easily identified going forward.

System architecture

This can have a big impact on installation time and costs. For example, addressable systems allow many devices to be connected on one loop instead of pulling in many individual radial circuits, as in conventional systems. Additionally, loop-powered technology allows detection devices, sounders and VADs etc, to be connected on the same circuits, saving on cable installation. Built-in short circuit isolators also ensure that these systems continue to operate in the event of a wiring fault.

Different topologies may also be required for different buildings, eg several radial or spur connections, or a loop configuration and panels, should be able to cope with these.

Device choice itself can make installation simpler. Modern wireless detection and loop devices allow the fire system to be placed quickly and easily where it was difficult or impossible previously. These can be standalone or, more often, hybrid systems working as part of a wired system.

Changes and upgrades

For system upgrades and retrofits, panels can be made to fit in with the existing building fabric and within the space available, reducing 'make good' costs. Special enclosures and rack mounting allow off-the-shelf technology to run from non-standard locations.

The panels themselves should cater for design changes, as in practice the building may differ from that on the drawings. It's also important to allow sufficient spare capacity for future expansion, for example if additional detectors, sounders and interfaces need to be installed to comply with updated building specifications or codes of practice. A modular system approach that allows loop capacity to be increased or additional panels to be easily added can make changes simple.



Existing and new systems can often be interlinked and made to work together or connected to a common front-end, so that changeovers can be phased and managed over time and to fit in with budgets or planned shutdowns. This can often be a deal breaker on sites where a fully functioning fire system must be present at all times, and the cost and disruption of installing a complete new system in one go is not possible.

System tools

Once the boxes are on the wall and cables run, the priority is to have a working fire system as soon as possible, and modern panels add more tools than ever before to achieve a powered, operational system quickly. Of course in new buildings, the mains power may not be on and a useful workaround is panels that can be powered up on batteries or run at 110V, saving time and reliance on third party trades.

Devices such as detectors can be addressed manually via pips or DIL switches, or hand held programmers. An invaluable panel feature is the autolearn facility that can quickly find devices connected to the panel, radically reducing configuration time. It can also help with fault finding by identifying missing devices and cable faults.

Fire systems can be complicated and no matter how skilled the installers, it is rare that they are perfect first time. Device and cable faults or noise from unrelated equipment can result in corrupted data at the panel. Rising to the challenge, most high specification panels have

a range of built in diagnostic tools that allow lightweight or detailed fault finding to quickly identify and resolve such issues. For example, Advanced offers a unique 'built-in' oscilloscope, meters and other diagnostics tools as part of the panel, which help identify any cable faults or missing devices. Such features save engineers having to take expensive equipment to site and also display information exactly as interpreted by the panel, while avoiding having to isolate and disconnect wiring from the panel.

A new system should be given a run-in period to eliminate any periodic or transitory errors that are not identified at commissioning. A feature such as 'diagnostic logging mode' will record any 'off-normal' conditions during this run-in period. Such errors may be invisible in normal operational modes, but could lead to potential issues and costs in the longer term.

Another useful feature is 'one man testing' – this records, tests and automatically resets the panel during device testing. Messages can be pushed to a mobile pager or mobile phone to confirm what the panel is displaying, removing the need for a second engineer at the panel. The log provides a complete audit trail of the tested devices that can be included with commissioning certificates.

Software solutions

Modern fire alarm panels are essentially computers requiring in-depth cause and effect programming that details how the system should react to an

