



LIFE SAFETY & INCIDENT MANAGEMENT

Technology Focus Series

Signature

Intelligent detection for life safety applications

s e r i e s



See what's possible now.



Signature

Intelligent detection for life safety applications

s e r i e s

Signature Series Factbook

Intelligent detection for life safety applications

© 2018 United Technologies Corporation. All rights reserved.

EDWARDS is a registered mark in the United States and other countries.

1016 Corporate Park Drive, Mebane, NC 27302

E85000-0371

This guidebook is for information only and is not intended as a substitute for verbatim legislated requirements. For authoritative specifications regarding the application of life safety, security, and access control systems, consult current editions of applicable codes and standards. For authoritative interpretation of those codes and standards, consult your local authority having jurisdiction.

While every effort has been made to ensure the accuracy and completeness of this guidebook, the authors and publishers assume no responsibility for errors, inaccuracies, omissions, or any inconsistencies herein.

EDWARDS and *Signature Series* are trademarks of United Technologies Corporation.

In 1872 when Robert Edwards installed an electrically-operated gas lamp igniter in a New York City church, he began a tradition of innovation that would chart the course of building safety and security for the next 140 years. Today the company that bears his name draws on this rich legacy of inventiveness, and benefits from fresh new alliances established with one underlying goal: uncompromised excellence.

Signature Series exemplifies that vision of excellence, and demonstrates why EDWARDS is among the fastest growing building systems providers today. It's also why, with more than a century of solid growth behind us, you can put your trust in EDWARDS.





From pioneering work in multisensor technology, to innovative breakthroughs, EDWARDS is regarded as the leader in cutting edge detection and alarm solutions. Today the Signature Series line is synonymous with innovation and quality, and its technology is widely regarded as having achieved some of the most significant and forward-looking advances in modern life safety and emergency communications.

innovative



Making the most of the latest detection technology, Signature Series detectors continually monitor the protected space with their on-board sensors, which are finely tuned to detect the characteristic properties of combustion. Detection data is gathered and run through sophisticated algorithms that track the sensor readings over time to known signatures of fires. Only when a match is found will an alarm condition occur. This means that a Signature Series detector can distinguish between a harmless puff of dust and a wisp of smoke; between hot, humid weather and a serious life safety condition.



Signature Series alarm decisions are made right at the detector. This method of distributed intelligence makes for a more robust system, and stable, more efficient communications.

intelligent



Optical detectors see smoke, but not all fires produce it.

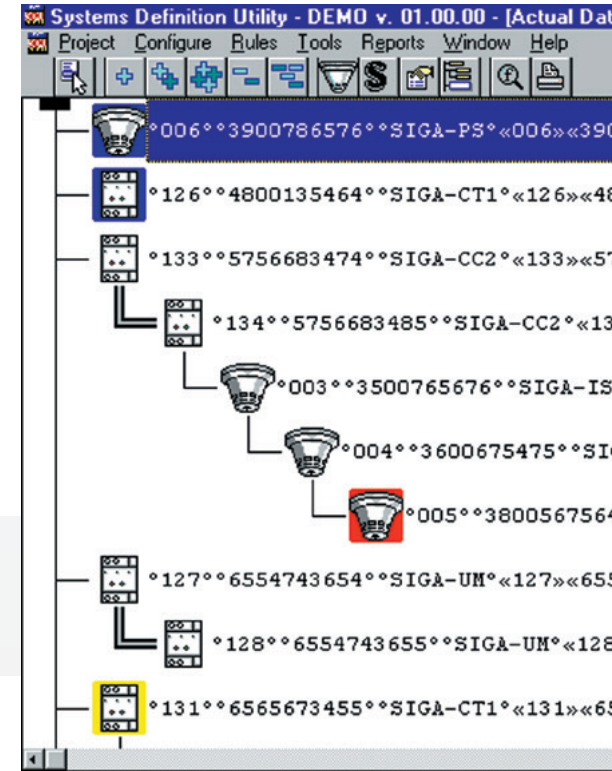
Heat detectors spot temperature changes,
but these fluctuations don't always indicate fire.

reliable



Signature Series intelligence features Automatic Device Mapping – a function of the powerful Signature Loop Controller, which maps where each device is installed relative to other devices on the circuit. Thanks to this innovation, device conflicts and unexpected address vacancies are now a thing of the past.

addressable



The Signature Series System Definition Utility program employs an intuitive graphical user interface to generate layouts or as-built drawings – complete with branch wiring (T-taps), device types, and their addresses.



Thanks to distributed intelligence, Signature Series devices only need to transmit data for supervision purposes and when there is a change of state to report. This significantly lowers communications demands on the system, allowing for exceptionally stable data transmission — so stable in fact, that Signature Series devices do not require expensive shielded cable, and in most retrofit situations can use existing wiring without loss of function or response time. This can translate into huge cost savings and high-performance features — it's a win-win.

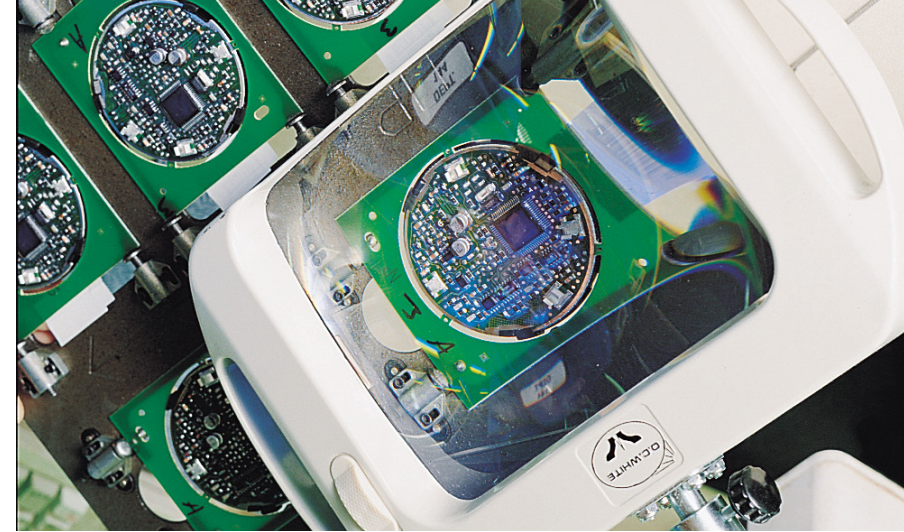
cost effective

Highly efficient Signature Series design means existing wiring can be used in most retrofit situations, while twisted-pair wiring is sufficient for new installations — no shielded cable required.





With diagnostic routines so accurate that a ground fault can be pinpointed down to the location of a single module address; with environmental compensation and self-testing so reliable that routine sensitivity calibration is not required for NFPA compliance; and, with automatic day/night sensitivity adjustment — Signature Series is a hands-down favorite among installers and facility managers. For good reason: a Signature Series solution is not only reliable — it's serviceable as well. In fact, it pretty much looks after itself.



Quality and reliability is built into every Signature Series component. It's part of a strong corporate culture and a deep commitment to international quality standards — not only for manufacturing processes — but for training and service functions as well.

serviceable

The airport terminal was a hive of activity when the evacuation message was suddenly broadcast over the life safety audio system. Thousands of anxious travelers were herded to the exits as staff and security personnel tried their best to reassure the crowds that they'd reach their destinations and their connecting flights despite the fact that the terminal would have to be emptied. Tempers flared. Flights were missed. And a good deal of money was lost. No one was injured in the fire, and only minimal property damaged resulted. But the costs were both real – and avoidable.

Distributed Intelligence

The need for speed.

The fire started in a maintenance room on the departures level. But because the initial flames were fed by cleaning fluid, they produced little smoke. The smoke detector just outside the room failed to respond until the fire had spread into the walls. It wasn't until emergency response personnel arrived on the scene

that the fire was discovered. But by then the terminal had already filled with smoke.

This story, though hypothetical, illustrates just how fragile the integrity of a fire alarm system can be, and just how serious the outcome can get. False alarms and the unpredictable nature of fires make a dangerous combination. But advances in

technology have cleared the way for new products and approaches that would make it virtually impossible for this airport's system to fail.

In recent years, designers and manufacturers of fire alarm systems have pushed beyond conventional technologies into the realm of distributed intelligence. Like most revolutionary ideas, distributed intelligence rests on a deceptively simple premise: spread the computing power of a life safety system among its devices, free the control panel from intensive yet mundane processing tasks; and, decentralize the system's core processing functions.

Fail-safe systems with device-level autonomy

In itself, distributed intelligence is nothing new. The Internet was originally conceived of, decades ago, as a means of providing a kind of command and control system that would support military communications in the event of war. On a smaller scale, modern life safety and mass notification systems provide much the same fail-safe backup that enable them to continue to provide basic system functions, even if a control panel or network node wiring is compromised.

What is new is the capacity of today's intelligent life safety devices to do much more than simply send

Distributed intelligence has knocked the perennial bugs out of today's life safety systems. But can any fire detection be reliable under all conditions? The answer is yes.

information to the control panel. As a result, the task of processing data and making decisions is now being shared by the control panel and its connected devices.

Sharing the processing burden saves money

This means there is less data required to make the journey back and forth. By being

economical with data, panels today are more efficient and quicker to respond than ever before. And because there is less data traffic, the need for costly high-capacity communications wiring has become a thing of the past. In fact, Signature Series life safety devices can be installed on existing wiring. This cuts retrofit costs by about a third,

while at the same time delivering all the advantages of multisensor technology and distributed intelligence.

Intelligent detection systems monitor their surroundings and adjust themselves to compensate for naturally-occurring environmental conditions. In other words, they know the difference between smoke and something that may look like smoke.

The driving force behind this development has been the need for a design that is more reliable and less susceptible to nuisance alarms. This has been accomplished through modifications to the way information is processed, as well as to the way

it is gathered. Nonetheless, though tremendous gains in detector reliability have been made over the past few years, the basic principles of detection have remained largely unchanged. Optical and heat sensors – the mainstays of any fire alarm system – still have their own specific applications for which they are best suited.

Because of the unpredictable nature of fire, manufacturers have found it necessary to modify detectors so they perform reasonably well under a wide range of conditions. For example, optical detectors — ideally suited to slow smoldering fires — must also be able to

New-generation life safety devices
compare values received from
on-board sensors to
predetermined algorithms that
profile different types of fires.

respond to a fast flaming fire. The result is a device that operates reasonably well, but not optimally.

The trade-off has come at a price, and nuisance alarms used to be an expected inconvenience. The problem stems from the fact that detectors that are sensitive to smoke are also sensitive to dust; those sensitive

to heat can also be affected by normal fluctuations in ambient temperature.

EDWARDS engineered the means of overcoming this problem. With the introduction of the Signature Series family of intelligent fire detectors, sliding alarm thresholds became possible for the first time.

This enabled the device

to monitor its own sensitivity and “understand” its environment. If dust or humidity levels increase the chance of a false alarm, the device itself is able to compensate automatically by raising its own alarm threshold.

There is no danger, however, that the threshold will be pushed so far as to compromise the device’s ability to detect fire: before that point is reached, the device sends out a message that it’s time for a cleaning.

Environmental compensation heads off nuisance alarms

True multisensor detectors offer a clear advantage over

single-application detectors. But since this type of system essentially comprises three different types of detector, is the cost prohibitive? It would be if we were still in the early stages of this technology, but fortunately, the field is maturing. What once would have been a cumbersome, expensive proposition, has emerged as an efficient, versatile, and cost-effective solution to life-safety needs.

Signature Series detectors also adjust their alarm thresholds to compensate for environmental conditions that could generate a false alarm. They don't simply see things in black and white. As true

The device can determine whether there is an actual danger, or whether one of its sensors is reacting to a non-threatening environmental condition such as dust or humidity.

analog devices, they adjust for subtle changes in humidity, air pressure, temperature, and even dirt. They even perform their own sensitivity tests and track important details such as alarm history, number and types of internal troubles, date of manufacture, and the date it was last cleaned. The Signature

Series system even tracks where each device is connected in the building wiring relative to the control panel and other devices. All this information is used to head-off problems before they occur and ensure all the detectors are working at peak efficiency 100 percent of the time.

Putting these elements

together – the microprocessor plus the latest fire and CO sensing techniques – results in multi-sensing capacity that represents technology at its best: reliable, cost-efficient and unobtrusive.

Had an intelligent system supporting multisensor detectors been installed in the terminal described earlier, the building probably wouldn't have had to be evacuated. The detector would have caught the situation before the fire spread. The fire would have been put out with all but a few building occupants even being aware that there was a problem in the first place. ■



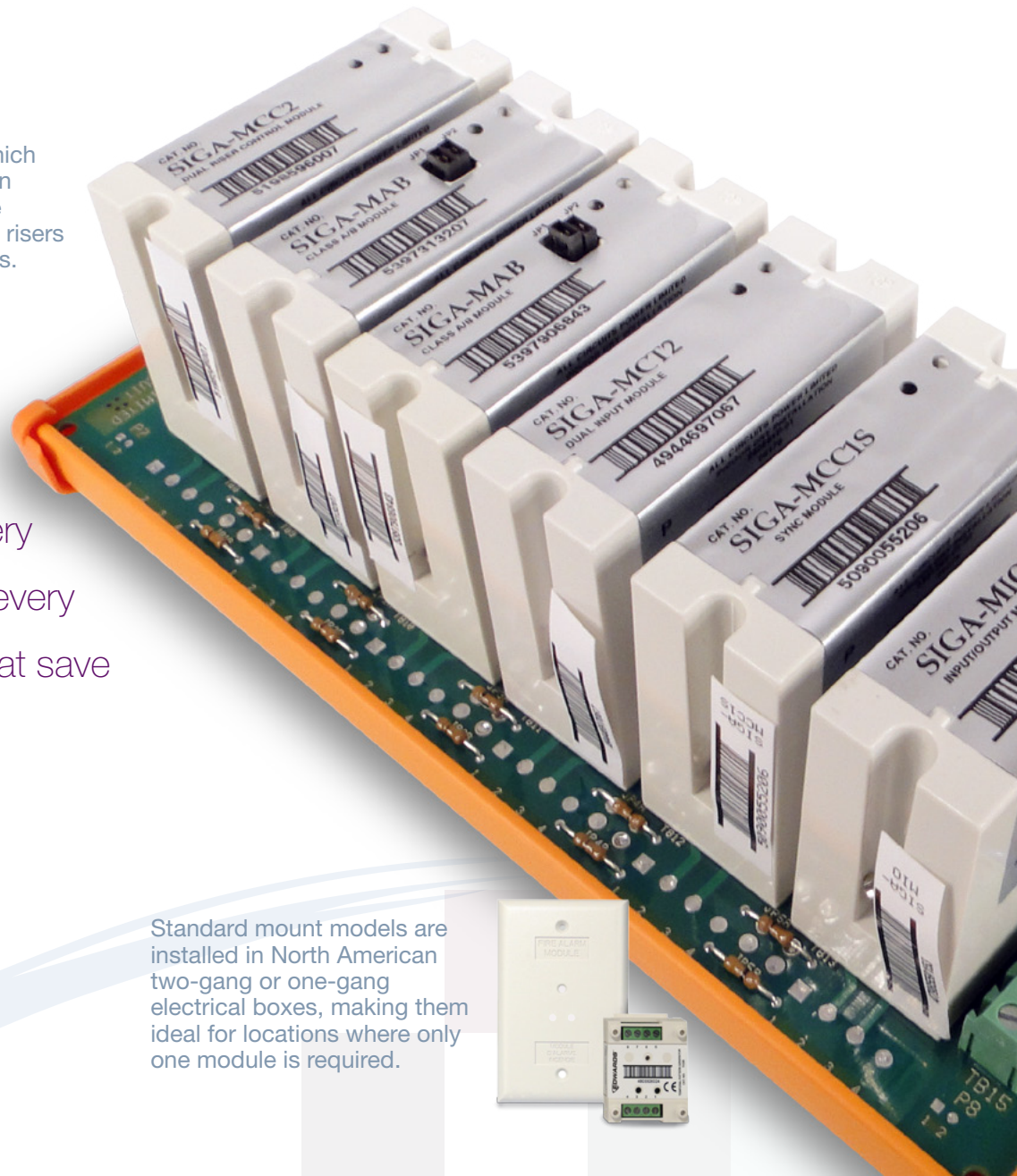
Signature Series input/output modules are powerful yet flexible devices that allow the life safety system to interact with the world beyond its Signature loop controller.

Signature Series modules do so by interfacing with equipment such as waterflow, HVAC, and smoke control systems, audible and visible signals, telephones, door closers, fans, dampers, elevators, and other equipment so that a life safety event generates an automatic and coordinated initial response. The function of each module is determined by an installer-selected personality code, which is set during system configuration. This exclusive Signature Series innovation provides elegant system interoperability — at a fraction of the cost and time when compared with other methods.

Plug-in style modules mount to motherboards, which make this installation option ideal where more than one module is required. All wiring connections are made to terminal blocks on the motherboard, and risers may be shared among any or all attached modules.

Design flexibility built right into every application with a module to suit every need — and mounting options that save time and money.

flexible



Standard mount models are installed in North American two-gang or one-gang electrical boxes, making them ideal for locations where only one module is required.







At less than two inches deep, Signature Series duct smoke detectors are ideal for installation in HVAC systems, where space is always at a premium.

No building is an island. No application is truly like another. That's why we made Signature Series as sophisticated as the buildings they go into.



efficient

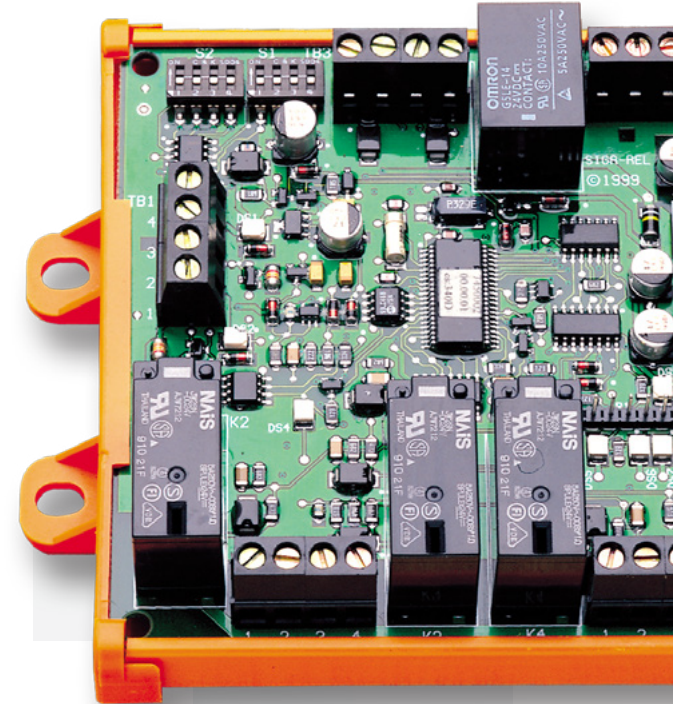


Complex installations require special equipment. But there's nothing that says the solution needs to be complicated. Signature Series represents just the right balance of sophistication and simplicity for any application.



Only Signature Series motion detectors and security modules offer an efficient and cost-effective means of adding security functions to your fire system infrastructure.

integrated



The Signature Series releasing module controls sprinkler pre-action routines and the initiation of suppression system deluge functions. It is easily configured in the field and offers a wide range of options to safeguard people and property.

From our intelligent small building iO systems, to the new EST3X mid-sized solution, and our flagship EST3 mass notification platform — Signature Series demonstrates that high performance doesn't have to come at a cost premium, and that no truly innovative technology stands still for long.



EST3X:
Equally at home at the center of a simple single-building standalone system as it is as part of a sophisticated life safety network.

compatible



EST3:
UL listed fire alarm and mass notification on a single, fully integrated platform.

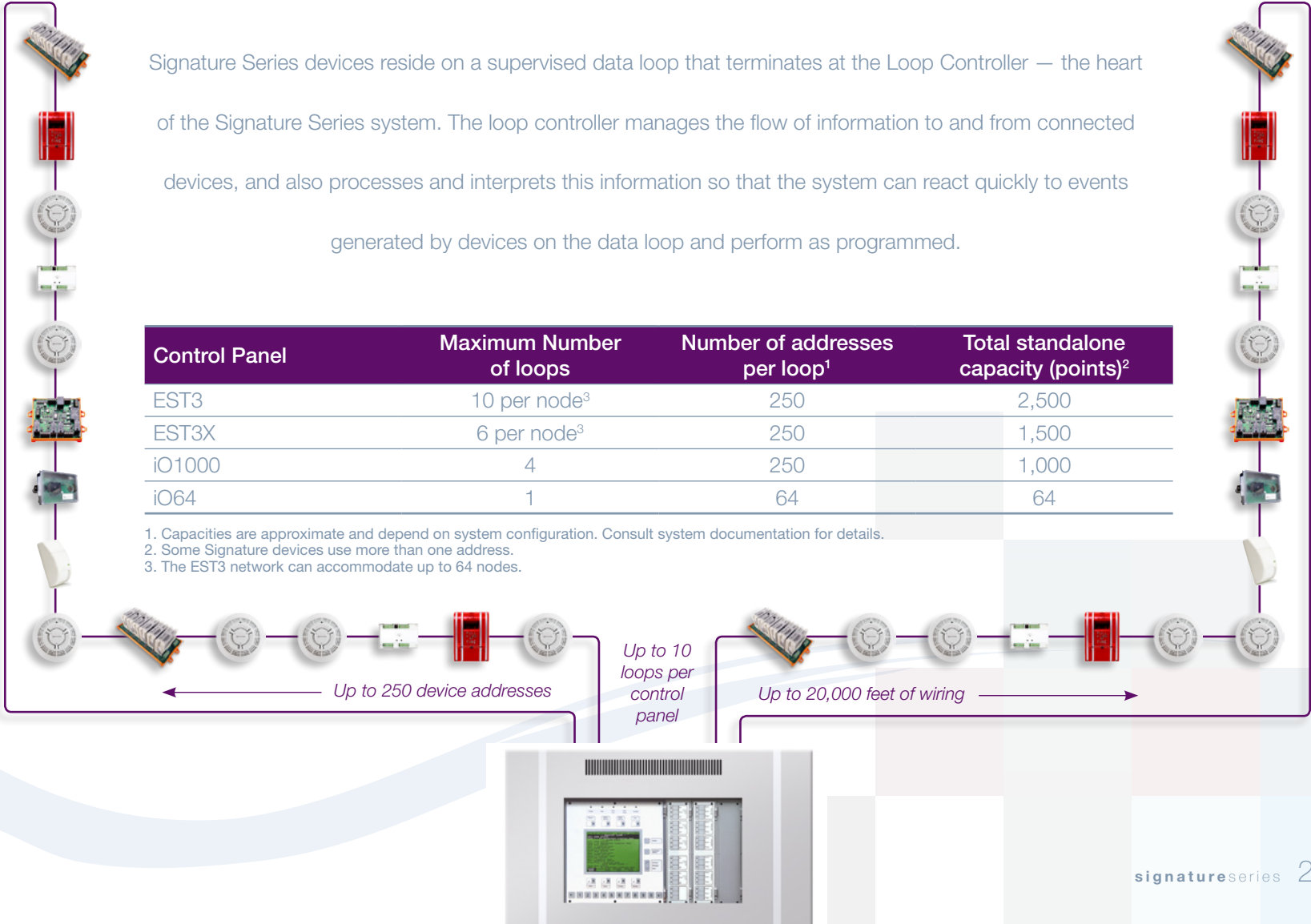


iO Series:
The performance of high-end intelligent processing in an uncomplicated package designed expressly for small building applications.

Signature Series devices reside on a supervised data loop that terminates at the Loop Controller — the heart of the Signature Series system. The loop controller manages the flow of information to and from connected devices, and also processes and interprets this information so that the system can react quickly to events generated by devices on the data loop and perform as programmed.

Control Panel	Maximum Number of loops	Number of addresses per loop ¹	Total standalone capacity (points) ²
EST3	10 per node ³	250	2,500
EST3X	6 per node ³	250	1,500
iO1000	4	250	1,000
iO64	1	64	64

1. Capacities are approximate and depend on system configuration. Consult system documentation for details.
2. Some Signature devices use more than one address.
3. The EST3 network can accommodate up to 64 nodes.



Principles of Detection	Publication #
Brochure: Signature Series	85000-0334
White Paper: Distributed Intelligence	85000-0327

Data Sheets	Publication #
Detectors	
Smoke Detector	85001-0646
Heat Detector	85001-0647
CO Detector	85001-0648
Multisensor Smoke, Heat and CO Detector	85001-0649
Multisensor Smoke and Heat Detector	85001-0650
Multisensor Smoke and CO Detector	85001-0651
Sounder Bases for Intelligent Detectors	85001-0640
Low Profile Duct Smoke Detectors	85001-0584

Pull Stations and Modules	
Manual Pull Stations	85001-0279
Control Relay Modules	85001-0239
High Power Control Relay Module	85001-0644
Single-Dual Input Modules	85001-0241
Data Loop Isolator Modules	85001-0271
Signal Modules	85001-0237
Signal Modules with Class A Operation	85001-0609
Class A, B Signal Modules	85001-0275
Monitor-Tamper-Waterflow Modules	85001-0297
Digital Message Module	85001-0363
Releasing Module	85001-0531
Input-Output Modules	85001-0533
Riser Monitor Modules	85001-0535
Synchronization Output Module	85001-0543
Plug-in Module Motherboards	85001-0365

accessible

Today Signature Series intelligence
protects some of the world's most
cherished landmarks. That's because
architects and engineers have come to
know that a Signature solution is a safe
bet. But don't take our word for it.

Find out more.

Contact your local EDWARDS Strategic

Partner today.



EDWARDS Strategic Partners:

Innovation, leadership, and a rich tradition of excellence...

Whether EDWARDS life safety systems are protecting the lives and livelihoods of the people who make businesses run, or the lives entrusted to the care of public institutions; whether they're charged with protecting the guests of the world's finest hotels, or preserving irreplaceable artifacts that bring history to life; EDWARDS stands alone as the brand closely associated with some of the most important and far-reaching developments in the life safety industry today.

Our strength is in our Strategic Partners — the people and organizations we entrust with the technology that has charted the course of life safety protection for decades. Strategic Partners are not middlemen or go-betweens. They are independent contractors who add value to the EDWARDS life safety solution. As insiders, they enjoy exclusive access to products, custom design innovations, and factory training. Yet as successful independent contractors, they are adept at ensuring that each submittal is strong and competitive, and that each bid is locally relevant to your installation. As local businesses they not only have to earn your trust — they have to keep it.

See what's possible now...

Contact your EDWARDS Strategic Partner today!

