

Overview

Fire, security, and access control, no matter what the combination, EST3 provides a total life safety system. With fire alarm providing the backbone, EST3 meets all legislated requirements – namely, that life safety takes precedence among the activities orchestrated by the control panel. Only a truly synergistic system design can assure that a high volume card access activity will not affect the priority and network response speed of fire reporting mandated by codes and standards.

The benefits of this method are many. Security and card access functions now benefit from the survivability and reliability mandated by the fire codes and life safety standards. Costs will be reduced because system resources are shared. Installation of a single integrated system is vastly more efficient than installing multiple interconnected systems. There is no finger pointing, patchwork protocols or gateways that combine one system with another. Just the simple elegance of a single system unencumbered by needless redundancy. EST3 achieves true system synergy with single-system responsibility.

Standard Features

- Listed for Fire, Security, and Access Control
- True seamless integration of Fire, Security and Access Control functions
- 168-character LCD
- Exceptional alarm response times
- Total network wiring over 300,000 feet
- Eight channels of multiplexed digital audio on a single pair of wires
- Zoned, distributed and banked audio amplifier options
- Local, Proprietary, and Central Station system operations
- In retrofit applications, existing wiring may be used if code compliant
- Supports GE Security Signature Series detectors and module
- Designed in accordance with ISO-9000 quality standards
- Supports over 4,000 access controlled doors
- Up to 255 security partitions
- Arm/Disarm keypad and system status display

EST3 Life Safety System with Security and Access Control



Life Safety Redefined

Synergy is the name used to describe GE Security's method of combining fire, access control, and security functions into one seamless system. Synergy is not a new system, but rather the logical extension of EST3 architecture into security and access control.

Synergy promotes the sharing of resources. It makes a simpler system. One that's easier to service and less trouble to program than several separate systems. EST3 has always been an event-driven system that orchestrates all fire alarm functions with extreme efficiency. With added security and access control functions, the possibilities are endless: unlock access controlled doors when there's a fire alarm; use integrated audio to issue audible intruder alert messages – all through software, with no extra relays or wiring.

Seamless and absolute interplay among functions

From a hardware perspective, the benefits of synergy are many. Enclosures, power supplies and backup batteries can be shared by all system functions, as can communication circuits. Now with EST3, a simple program rule to unlock the doors replaces additional conduit, wiring and interposing relays. Want to disarm security partitions automatically when an authorized cardholder enters the building? Another system rule provides the solution, thanks to this new level of interaction. Elevator connections also benefit by using the same supervised control relay package for both elevator recall and elevator access control, and that minimizes wiring.

The *FireWorks* PC-based graphic annunciation and control package is available to coordinate system events on a quad-screen display. This event-driven system places all system events in immediate view and command of the operator. Drivers are available for many major CCTV equipment manufacturers, facilitating the smooth integration of CCTV with fire, security, and access control functions. Cameras can automatically be directed to preset locations and easily maneuvered by the operator, all from the same screen.

Synergy establishes new benchmarks

EST3 with synergy elevates the reliability and survivability of security functions to a level found previously only in dedicated fire alarm systems. In addition to traditional fire alarm devices, products used to achieve synergy include motion detectors, security input modules and access controllers. These connect on network wiring and draw power from the same sources supplying fire alarm components. Thanks to this breakthrough, dozens of Signature Series multisensor detectors can co-exist with dozens of Signature Series motion detectors – *on the same pair of wires*. This degree of system unity is simply unprecedented.

EST3 is the first UL 864/ULC-S527-listed fire and security platform ever engineered. The result is a whole that is much greater than the sum of its parts: true synergy.

Outstanding Features

The EST3 is a modular life safety system uniquely designed to meet the needs of any size facility, be it a single panel system or a multi-panel network.

System components are arranged in layers, starting with the backbox and finishing with inner and outer doors. Cabinets are available with room for up to 20 modules and system batteries up to 65 AH. A single 24-volt battery can act as the secondary power supply for all four internal power supplies. Once the backbox is installed, up to four power supplies can be installed in the chassis assembly. The power supplies use a unique paralleling arrangement that ensures the optimum use of each supply. Each supply has the capacity to deliver up to 7 amps at 24 Vdc (28 amps total).

The function of each life safety network panel is determined by the Local Rail Modules (LRMs) plugged into the panel's chassis. An extensive variety of modules are available, including central processing units, input/output circuit modules, communication modules, security/access control modules, and audio amplifier modules. Please refer to the individual LRM module catalog sheets for specific details of module functionality.

The top layer of the LRMs is referred to as the user interface layer. This layer is made up of the Main Display Interface module and a system of generic control/display modules. Any control/display module can mount on any LRM. This maximizes flexibility of design for custom systems. The inner and outer doors finish and secure the enclosure.

A single panel can support up to 2,500 addressable points, provide 28 amps @ 24 Vdc, provide access control for up to 124 doors, and still have room for future expansion. If a single panel is not large enough or you need to distribute functionality throughout the project, then you can network up to 64 panels together!

Networking/Communications

The EST3 Life Safety Network uses a multi-priority peer-to-peer token ring protocol. The protocol gives EST3 the exceptionally fast alarm response time of less than three seconds across the network, virtually independent of the total number of nodes. The EST3 token ring network configuration also affords long distances between panels. The distance between panels on #18 AWG (1.0 mm²) is 5,000 ft (1,523m) for both network control and digital audio signals. Supporting a maximum of 64 panels on a network, the total network length can be in excess of 300,000 ft (9,1400 m). Network and audio communication are via RS-485 serial ports. Each two-wire circuit supports Class A (Style 7) or Class B (Style 4) wiring configurations. Fiber optic media is also available.

As an indication of the high level of system integration, off-premise communications is handled by the Modcom modem communicator module. This module provides the Digital Alarm Communicator Transmitter (DACT) function, sending system status signals for up to 255 accounts to up to 80 different central monitoring stations and/or commercial paging carriers. The Modcom also acts as a V.32bis 14.4K-baud modem for uploading and downloading of system data remotely via the telephone network.

Digital Audio

EST3 digitized audio can deliver up to eight audio messages *simultaneously* over a single pair of wires!

All audio messages and live pages originate at the Audio Source Unit (ASU) that can store up to 32 minutes pre-recorded audio messages as computer "WAV" files. These messages can be automatically directed to various areas in a facility under program control. On the receiving end, zoned amplifiers installed in remote fire alarm cabinets receive and decode the digital messages. The messages are then amplified and sent out to the speakers.

The availability of eight different channels opens a number of new *simultaneous* notification possibilities:

- 1) Live voice page;
- 2) Fire floor evacuation message;
- 3) Alert message on floors above and below the fire;
- 4) Stairwell evacuation reinforcement message;
- 5) Elevator cab information messages;
- 6) Lobby message instructing occupants to exit the building;
- 7) Concourse instructions to occupants not to enter the lobby;
- 8) Other instructions to areas not directly affected by fire.

Any combination of the eight audio channels can be automatically directed to any or all areas of the building, with total manual override as required. Eight channel capability assures that one message is never interrupted in order to process another, a common fault with two-channel systems. This eliminates any chance of confusing the occupants with conflicting messages. Security notification messages can easily be integrated into the audio system, and act as a great deterrent as well as reducing the risk of false alarms.

Survivability is also an integral part of EST3's digitized audio system. Default audio messages are continuously transmitted to all network amplifiers by the ASU. These messages provide audio supervision for the digital audio chain, and act as a default signal if the network data circuit fails or should message control information fail to reach the ASU. If the audio data circuit fails, each amplifier generates a 1KHz temporal (3-3-3) tone that is transmitted during an alarm. In the event of an amplifier failure, a backup audio amplifier is automatically substituted for the failed amplifier in the cabinet, restoring audio capability. In the unlikely event of multiple amplifier failures, the backup amp replaces the amplifier actively processing the highest priority message in the cabinet. When messages are no longer directed to a failed amplifier such as when a high priority page message ends, the backup amp is dynamically reassigned to the next highest priority failed amplifier actively processing messages

The Firefighters Telephone Control unit (FTCU) provides two-way communications between remotely located phones and the fire command center. The alphanumeric display makes operation intuitive, and a single switch permits the phone signals to be used to issue pages in the facility.

Digitized audio increases notification messaging flexibility, reduces wiring and installation costs, provides enhanced supervision and survivability, and is easy to use.

Security/Access Control

All Signature Series security devices use the same high-quality components found in the fire devices. In fact, Signature security and access devices are listed for both fire and security applications. There is no system degradation when both fire and security devices are installed on the same circuit, however when requested by the AHJ, additional separation can be provided using SIGA-IM Isolator modules to isolate the effects of an open/shorted or grounded circuit. If more separation is required, simply install two circuits. An additional level of separation can be provided when two modules are used. When the highest level of separation is desired, separate cabinets can be provided for each module.

Card Reader Controllers (CRC) and Keypad/Displays (KPDISPs) are connected to the EST3 panels using a dedicated Security/Access Control module (3-SAC). This module offers one Class A or two Class B supervised circuits, seamlessly blending access control and security control functions into the system. Class A circuits can be configured to Style 6 wiring.

All cardholder information is retained in the memory of the individual Card Reader Controller (CRC) that is installed at each door. Each CRC retains cardholder data for up to 36,000 cardholders, including schedules and holidays. A history file in the CRC retains up to the last 20,000 events. Schedules and filters are used to eliminate unwanted entries in the history file. Additional options are available to eliminate most routine traffic on the network.

Cardholder information is downloaded into the CRCs from the Access Control Database Program. This Windows® based program can be run on any modem-equipped PC. The PC connects via switched public telephone line to the Modcom modem communication module, and the information is sent to the individual CRCs using the network communication circuits. Similarly, history information can be uploaded from the CRCs into the Access Control Database Program.

Security functions supported by the system include 255 partitions, arming and disarming of partitions, and off-premise transmission of opening and closing information. An attractive programmable 128 x 64 dot Graphic LCD Keypad/Display is used for arming/disarming of the system, as well as system status functions. Security devices can be easily programmed to interact with system Fire and Access Control functions. All security devices benefit from the high level of supervision and diagnostic tools provided by the EST3 system.

Enhanced Reliability & Survivability

The EST3 uses distributed technology, designed to survive expected and unexpected events. Intelligent Signature detectors can make alarm decisions on their own, and do not involve other system components in this important decision-making process. Sensor-based technology must communicate data to a remotely located common panel where alarm decisions are made. Failure of this centralized processor can cripple sensor-based systems. With EST3, a panel CPU failure does not disable a panel's ability to provide protection. In the event of a CPU failure, the intelligent device controllers can still receive alarms and distribute the alarm information to all other modules in the panel. Modules in the panel are capable of responding with a programmed standalone alarm response.

When a network is wired in a Class B configuration, a single break or short on the wiring isolates the system into two groups of panels. Each group continues to function as a peer-to-peer network, working with their combined databases. When wired using a Class A configuration, a single break or short on the network wiring causes the system to isolate the fault, and network communication continues uninterrupted – without any loss of function. Should multiple wiring faults occur, the network re-configures into many sub-networks and continues to respond to alarm events from every panel that can transmit and receive network messages. Survivability is maximized as responses originating and executed by a single panel are always carried out because a copy of the system database is stored in the panel's memory.

Scheduled maintenance improves system availability, and EST3 is designed to make system maintenance easy. System components are designed to assist in routine and time-consuming service functions.

- EST3 service groups are defined by location, not by system wiring. There is no need to disable an entire floor to test a single device.
- According to their UL listings, Signature Series detectors do not require routine sensitivity testing – a real timesaver.
- Comprehensive internal and external monitoring quickly identifies most problems to a component level, including ground faults that can be identified down to the module.
- Parts are easy to replace. Modules plug in and use automatic addressing and plug-in field wiring. No DIP switches are used.
- Firmware in system modules and Signature devices is easily upgraded as new advances in detection and control technology are made available.
- Advanced system diagnostics are provided in the EST3 System Definition Utility.

User Friendly

A comprehensive survey of users resulted in system features and controls that are easy to use.

The main display interface shows the operator the first and most recent system events – without ever touching a single control! All system events are sent to one of four message queues. Alarm messages are never intermixed with trouble or supervisory signals, eliminating confusion. Need more information? The “Details” switch provides additional information about the highlighted device. The operator can easily review supervisory, trouble, and monitor messages by simply selecting the appropriate message queue. After a few minutes of inactivity, the system automatically returns to displaying the first and most recent events.

Optional manual control switches and display modules can be arranged on the system operator layer to suit the application. These modules can be used to provide additional HVAC controls, manual selection of audio circuits, or other required manual control functions.

The digital audio system uses only five basic controls to direct all paging messages.

- ALL CALL directs page messages to all zones in the facility.
- Page to EVACUATION automatically directs page messages to the fire area.
- Page to ALERT automatically directs page messages to the areas receiving the alert message.
- All Call Minus automatically directs page messages to the areas NOT receiving the evacuation or alert messages.
- Page by Phone selects the firefighters' telephone system as the source for paging.

The Firefighters' Telephone Control Unit (FTCU) uses an alphanumeric display to indicate the source of incoming calls. Operators simply scroll through the list and hit the “Connect” button when the desired call is highlighted. There is no need to look through rows of lamps and switches to determine the source of calls. Up to five remote locations can be in simultaneous two-way communications with the FTCU.

System Configuration

The powerful EST3 System Definition Utility (SDU) helps define flexible system operations in a fraction of the time required by other systems. Based on an object-oriented system of rules, virtually all EST3 operating features are software-controlled. This gives the designer great flexibility in integrating fire, security, and access control functions into a single seamless design.

A report generator provides a complete library of system reports that are invaluable for troubleshooting, including a printout of Signature device connections as the devices are actually wired.

Use of software-based components permits the SDU to add new features to the system. Even the Signature Series devices are capable of upgrading firmware as new detection algorithms become available.

Feature Synopsis

- Agency Listing/Approval
Various components are approved by ULI, ULC, FM, and CE.
Please refer to individual component catalog sheets for details.
- System Components
- Cabinets/Attack Rated Doors
- Power/Booster Supplies
- Central Processor Module
- Signature Controller
- Audio Amplifiers
- Audio Source Unit
- Alphanumeric Display
- Control Display Modules
- Firefighter's Telephone Control Unit
- Network Communication Cards
- Initiating Device Circuit Module
- Off Premise Signaling Module
- Remote Annunciators
- Security/Access Control Module
- FireWorks PC based graphic display and control w/CCTV interface

Please refer to component catalog sheets for additional details.

Engineering Specification

Please refer to the *SpecBuilder* CD ROM for a detailed system Guide Specification.

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Typical Wiring

