

EST3-Sixty

UL 2572 Listed Mass Notification and UL 864 Listed Fire Alarm



Overview

Fire alarm and Mass Notification/Emergency Communication (MNEC): no matter what the configuration, EST3-Sixty provides a total life safety system. With fire alarm providing the communications backbone, EST3-Sixty is UL2572 Listed for Mass Notification operations, while retaining its UL864 Listing as a fire alarm control system. This unique standing ensures that MNEC functions are in perfect harmony with other life safety operations.

Only EST3-Sixty can ensure that MNEC retains priority over fire alarm events and that Mass Notification will not affect the network response speed of fire reporting mandated by codes and standards.

The benefits of this method are many. Mass Notification now benefits from the survivability and reliability mandated by the fire codes and life safety standards. Costs are reduced because system resources are shared. Installation of a single unified 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 operational unity with single-system responsibility.

The EST3 is modularly listed under the following standards: UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX, UL2572 Mass Notification.
Also listed to ULC-S527, ULC-S303, and ULC/ORD-C1076.

Standard Features

- Listed for Mass Notification/Emergency Communication, Fire, Security, Access Control, and Emergency Voice Alarm
- Voice Over IP Campus Network Paging
- Campus IP Network UL Listed for MNEC/Fire
- True seamless integration of Fire, Security and MNEC functions
- 168-character LCD
- Exceptional alarm response times
- Network supports copper, multi-mode fiber, single-mode fiber, or a combination of all three
- Total network wiring over 160,000 feet
- Eight channels of multiplexed digital audio on a single pair of wires or fiber filament
- 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 Edwards Signature Series detectors and modules
- UL864 Ninth Edition Listed
- UL2572 Mass Notification Listed
- Optional earthquake hardening: OSHPD seismic pre-approval for component Importance Factor 1.5

Mass Notification/ Emergency Communication (MNEC)

During an emergency, building occupants need instructions on when to stay put, when to evacuate, and where to go. They need instructions that reflect the changing conditions of the emergency; instructions that take them to safety one step at a time.

Whether the emergency is a result of a hurricane, tornado, environmental accident, domestic violence, or terrorist threat, response personnel must remain in control of the situation and keep the lines of communication open. EST3-Sixty's MNEC capability accomplishes this by leveraging the power behind the EST3 communications network and offering response personnel the tools they need, not only to warn building occupants of imminent danger, but also guide them to safety.

This requires much more than a simple public address system. Only EST3 benefits from a truly unified communications backbone that can deliver highly survivable MNEC – and simultaneous control of critical building infrastructure functions. Only EST3-Sixty with MNEC unifies emergency communications with threat detection and security control to offer this degree of emergency functionality.

Life Safety Redefined

EST3-Sixty is the name used to describe EST's method of combining fire alarm and Mass Notification into one seamless system. It is not a new system, but rather the logical extension of EST3 architecture into emergency communications.

EST3-Sixty 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 extraordinary efficiency. With added MNEC functions, the possibilities are endless: broadcast to cell phones and other wireless devices; send out email blasts, make use of electronic bulleting boards for emergency communications purposes; or use fire alarm paging functions to offer instructions to building occupants during an emergency – all this through software, with no extra relays or wiring.

Seamless and absolute interplay among functions

From a hardware perspective, the benefits of EST3-Sixty are many. Enclosures, power supplies and backup batteries can be shared by all system functions, as can communication circuits. Now with EST3-Sixty, a simple program rule to unlock the doors replaces additional conduit, wiring and interposing relays. 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 its intuitive segmented display. This event-driven system places all system activity 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 alarm and MNEC functions. Cameras can automatically be directed to preset locations and easily maneuvered by the operator, all from the same screen.

EST3-Sixty establishes a new benchmark

EST3-Sixty elevates the reliability and survivability of MNEC functions to a level found previously only in dedicated fire alarm systems. EST3 is the first UL 864 and UL 2572-listed fire and MNEC platform ever engineered. The result is a whole that is much greater than the sum of its parts.

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

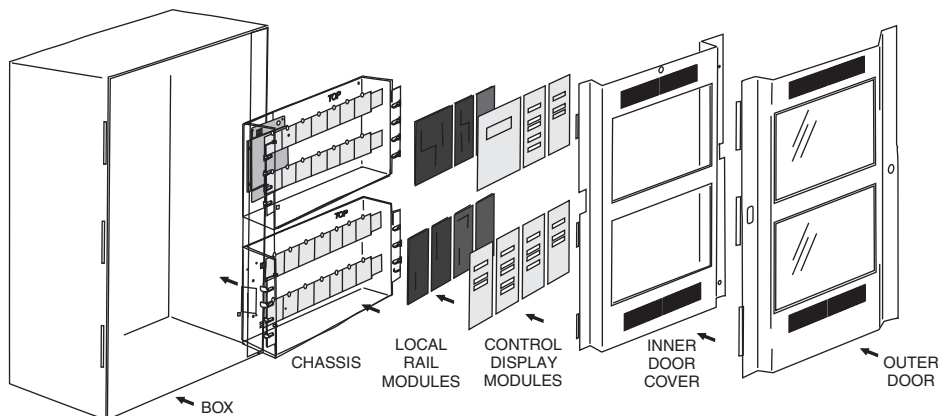
has the capacity to deliver up to 7 amps at 24 Vdc (28 amps total).

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-Sixty Life Safety/MNEC Network uses a multi-priority peer-to-peer token ring protocol. The protocol gives EST3-Sixty 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 any three 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 160,000 ft (48,760 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-Sixty digitized audio can deliver up to eight audio messages *simultaneously* over a single pair of wires. This is plenty of capacity for both fire alarm voice evacuation as well as MNEC purposes.

All audio messages and live pages originate at the Audio Source Unit (ASU) that can store up to 100 minutes pre-recorded audio messages as .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 for MNEC or fire-related instructions;
- 2) Emergency floor evacuation/notification message;
- 3) Alert message on floors above and below the emergency;
- 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 the emergency.

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.

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 transmit-

ted 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.

Enhanced Reliability & Survivability

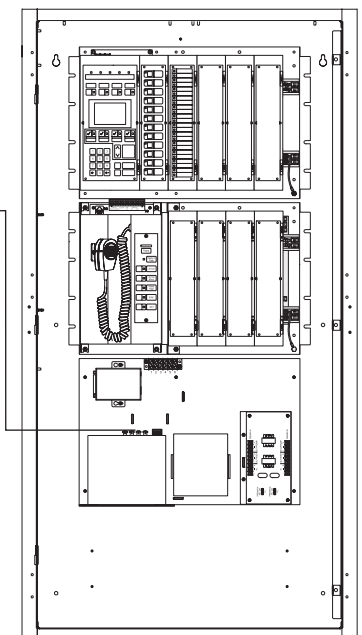
The EST3 uses distributed technology, designed to survive expected and unexpected events including earthquakes. Simple-to-install kits provide internal hardening that meets requirements defined by *Uniform Building Code (UBC 1997)*; *International Building Code (IBC 2006)*; and, *Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and Systems (AC-156)*. Seismic component importance factor of 1.5 can be met by adding appropriate anchorage for local conditions. There is no need for special installation methods for EST3 field devices including signals and detection devices. By following standard mounting methods, along with any local requirements, seismic Importance Factor 1.5 may be gained in order to further enhance system survivability.

On the initiating side, intelligent Signature Series 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

Component Layout

EST3-Sixty Control Panel

MN-BRKT1
Mounting Bracket



For earth quake anchorage including detailed mounting weights and center of gravity detail please refer to Seismic Application Guide 3101676. Approval of panel anchorage to site structure may require local AHJ, structural or civil engineer review.

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. Meanwhile, system components are designed to assist in routine and time-consuming service functions.

System Configuration

The powerful EST3-Sixty 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-Sixty 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.

User Friendly

A comprehensive survey of users and ongoing consultation has 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.

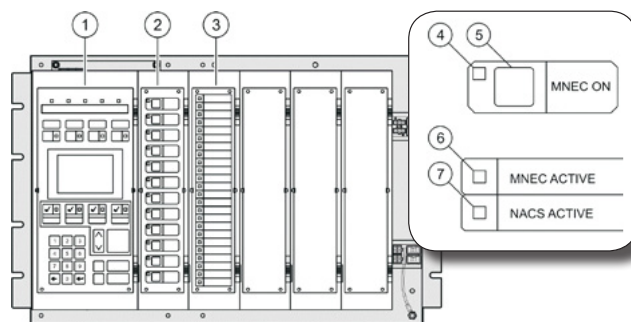
The digital audio system uses only five basic controls to direct all paging messages.

- 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.

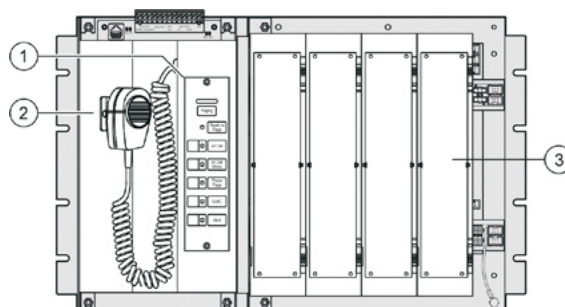
The Firefighters' Telephone Control Unit (FTCU) uses an alphanumeric display to indicate the source of incoming calls. Operators simply scroll through the list and hit the “Connect” button when the desired call is highlighted. There is no need to look through rows of lamps and switches to determine the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

CCS Panel Controls and Indicators



1. 3-LCD
2. 3-12SR or equivalent
3. 3-24R or equivalent
4. MNEC ON button status LED. On indicates MNEC ON button was pressed.
5. MNEC ON button. Press to activate MNEC operation.
6. MNEC status LED. On indicates MNEC operation is active.
7. NAC status LED. On indicates all notification appliance circuits are active.

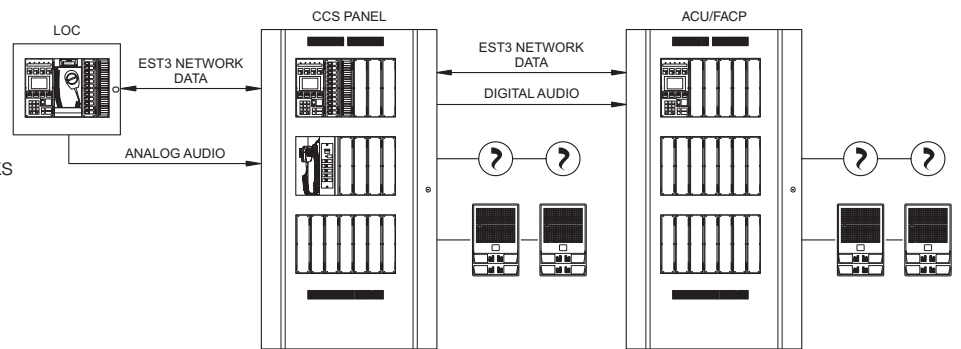
3-ASU Controls and Indicators



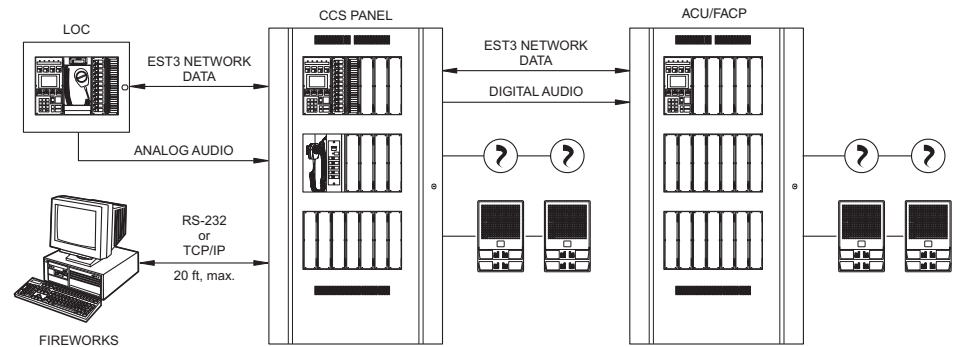
1. Standard paging controls: All Call, All Call Minus (not used), Phone Page (not used), EVAC (not used), Alert (not used)
2. Paging microphone
3. Space for installing optional zone paging controls

Typical Wiring

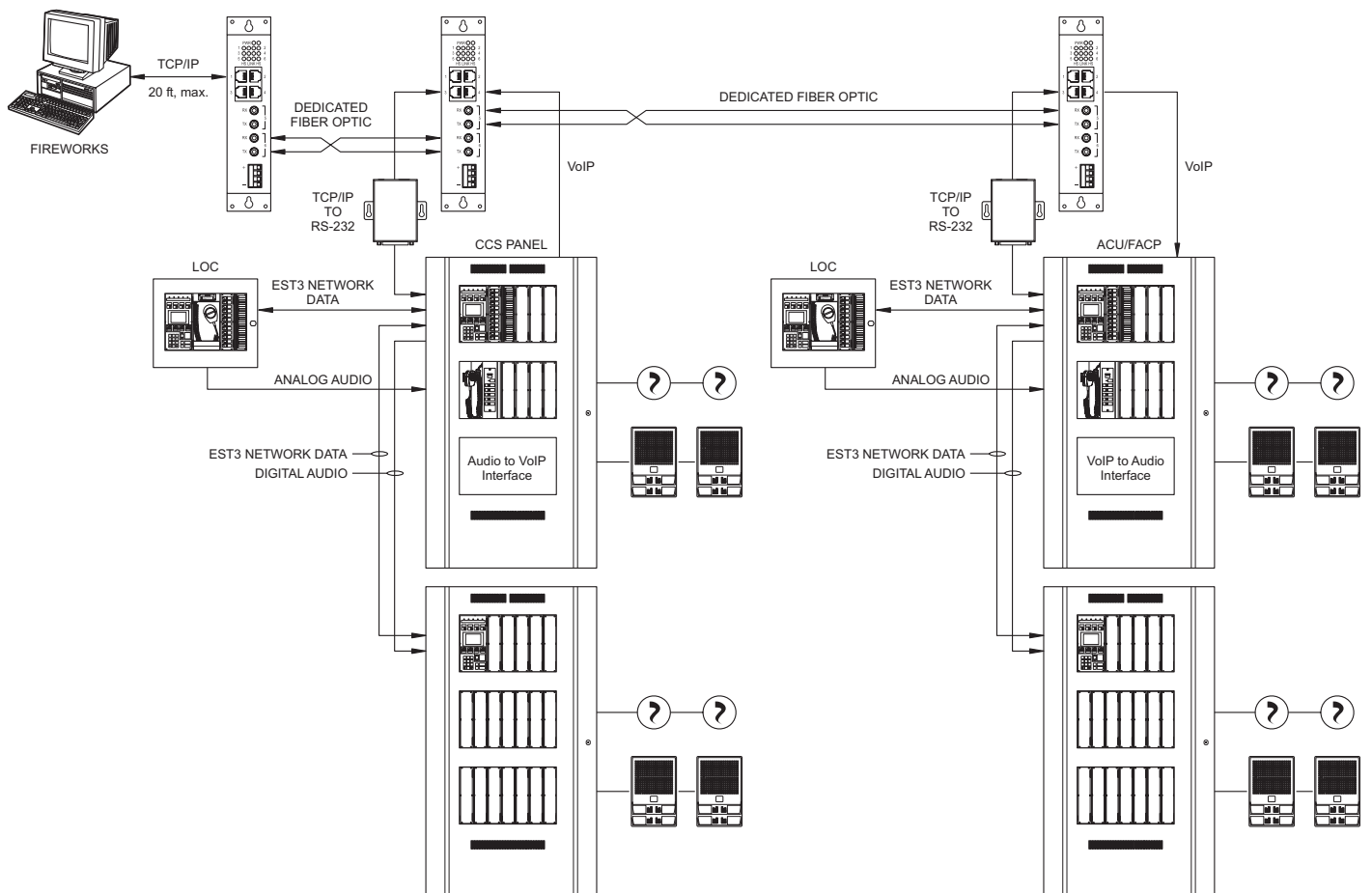
Single EST3-Sixty Network without FireWorks



Single EST3-Sixty Network with FireWorks



Multiple EST3-Sixty Networks with Fireworks on Dedicated UL2572 Listed IP Network using IP & VOIP communications





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Mass Notification Terminology

MNEC - Mass Notification/Emergency Communications

CCS - Central Control System (Main "Head End" for building or Campus)

ACU - Autonomous Unit Control Unit (Individual Building "Main" panel usually combined with FACP).

LOC - Local Operations Center (Annunciator with remote microphone - can be connected to CCS, ASU or used in lieu of ACU)

HPSA - High Power Speaker Array

In-building Mass Notification System - A system used to provide information and instructions to occupants in a building or other space using voice communication, visible signaling and other communication methods

Fire Alarm Control Interface - A product which interfaces the mass notification system with a fire alarm control unit to coordinate signals to and from each other for operational coordination purposes

Local Wide Area Mass Notification System - A system which provides real time information to alert, inform, and instruct people in a building, multiple buildings, outside campus areas, or a combination of these

Wide Area Mass Notification System - A system which provides real time information to areas, including outdoor, in a contiguous or non-contiguous campus, region or global geographical setting

Distributed Recipient Mass Notification System (DRMNS) - A system intended to communicate to targeted individuals that may not be in a contiguous area

Acoustically Defined Space (ADS) - Area or subdivision of an area with specific acoustical conditions