



White Paper: Interoperable Communications, Alerting and Notification Systems in Public Safety

Abstract

Interoperable alerting and notification systems enable the convergence and integration of previously separate communication channels that include, fixed and mobile networks and devices, paging and monitoring devices and systems, along with the management controls and reporting capabilities that surround them. Increasingly, Public Safety agencies realize that separate communications applications can be combined with one another to make their communications faster and more effective, offering them fail-safe communications.

Federal Signal understands that people, not processes, are the key to success. It is crucial that First Responders have access to the information and communications they need to guide their actions when they need it most. Moreover, collaboration for decision making must be seamless and intuitive. Federal Signal's alerting and notification systems meet the challenge.

Interoperable Communications, Alerting and Notification Systems in Public Safety

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Introduction

The purpose of this white paper is to provide an overview of Federal Signal's ongoing efforts to provide robust alerting and notification solutions to improve public safety, security, and overall communications for first responders and other personnel.

Alerting and notification systems that are enhanced with advanced interoperability technology enable the convergence and integration of previously separate communication channels, fixed and mobile networks and devices, and paging and monitoring devices and systems, along with the management controls and reporting capabilities that surround them. Increasingly, public safety officials realize that separate applications can be combined with one another to make their communications faster and more effective, offering fully integrated fail-safe communications.

Interoperable communications and alerting and notification systems are often categorized into the unified communications space, which is evolving communications technology architecture. Processes are optimized and human communications enhanced with the reduced latency, managed work flows and the elimination of device and media dependencies.



Unified communications can include a variety of elements, such as radio communication, instant messaging, telephony, video, e-mail, voicemail and short message services, white-boarding all of which could be brought into real time and coordinated at once. The concept of presence is also a factor—knowing where intended recipients are and if they are available, in real time—and is itself a key component of unified communications. The goal for unified communications is to integrate all the systems that a user might already be using and enable those systems to work together in real time.

Unified communications is sometimes confused with unified messaging, but it is distinct. Unified communications refers to a real-time delivery of communications based on the preferred method and location of the recipient. On the other hand, unified messaging systems cull messages from several sources (such as e-mail, voice mail and faxes) and hold those messages for retrieval at a later time.

Federal Signal has developed a public safety interoperable communications, alerting and notification vision, which encompasses the needs of public safety communications officials, emergency managers, law enforcement personnel, and firefighters. Fulfilling the vision relies on innovative technology—including out-of-box Federal Signal alerting and notification products, and integrated solutions developed with our partners—that enable first responders to connect with the information they need; use that data to collaborate with people, departments, and agencies; and then develop event-specific scenarios based on situational awareness to help improve communications and decision making.

The Federal Signal solution

Federal Signal provides a SmartMsg™ enabled mission-critical communications and nerve center system to support secure communications interoperability, urgent alert notification, incident scenario management and execution, event monitoring, and cross-agency data sharing and collaboration. This solution is a redundant system that can be rapidly deployed in stationary and mobile configurations, occupies a small and agile footprint, and requires only DC battery power to operate.

The Federal Signal solution includes several easy-to-use application modules that can be deployed together or as individual components of the overall solution. These include:

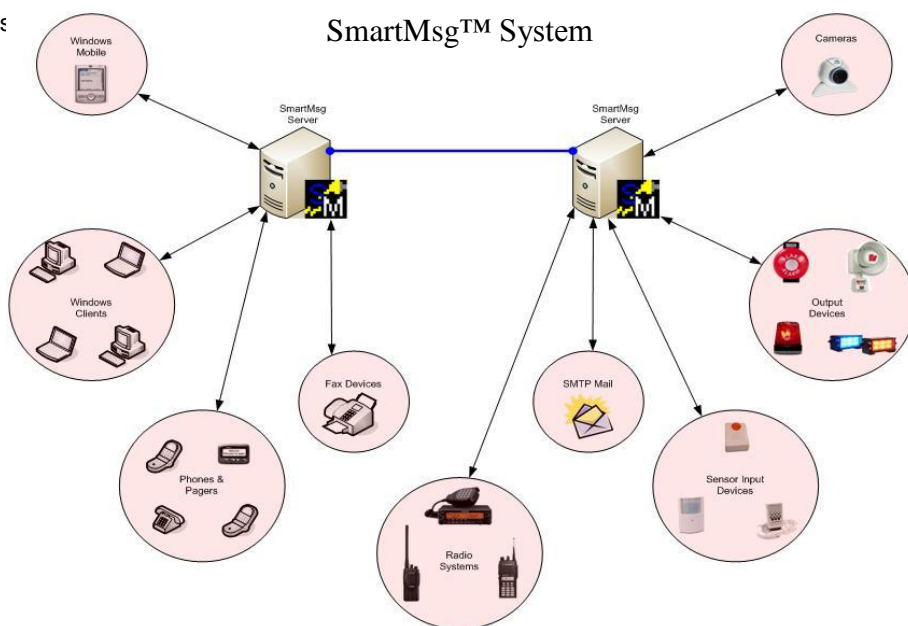
SmartMsg — This industry leading software-centric solution provides comprehensive communications interoperability among multiple agencies and communication devices. Disparate, non-interoperable communication hardware has caused public safety personnel significant difficulty in communicating with each other, and there is still no effective solution in place. In addition to the need for interoperable, live communications, public safety agencies must have the ability to broadcast time-sensitive alerts to both target groups and mass citizenry. SmartMsg includes several key features to enable everyday use of your communications systems.

ScenarioMgr™ — The ScenarioMgr is an add-on module to the SmartMsg solution. ScenarioMgr provides for automating emergency and incident procedures. An agency is able to pre-define automatic procedures (scenarios) for various events based on its own particular needs. Scenarios may include any series of actions including broadcasting alerts, evaluating alert responses, pulling in data from external systems, creating talk groups, activating standby channels and more.

SmartMsg Radio Interface Unit (RIU) — The RIU is an add-on module to SmartMsg that provides an embedded voice-over-IP (VoIP) architecture and enables the simultaneous text and voice broadcast of alert notifications to two-way radios, push-to-talk (“PTT”) enabled devices, PCs, phones, pagers, overhead paging systems and wireless PDAs. The radio interoperable device also enables integrated real-time communication between two-way radio talk groups, PTT groups, phone devices and PCs. This solution supports radios from different manufacturers, across multiple bands and frequencies (including conventional, trunking and short-wave), and pre-defined talk groups. The RIU consists of a compact hardware appliance and a standard PC configuration, which also can operate as a standard server. Once a radio is docked into the RIU appliance, the VoIP architecture effectively enables that radio as a secure virtual repeater. The RIU device also has the ability to function as a sensor unit for remote monitoring of situations integrating trip wires, sensors and video.

“The SmartMsg system has brought about REAL benefits to the District in terms of improved response times, improved patient care, compliance, as well as significant time savings for basic administrative communications,” says John Waters of Ingham Regional, “It has been a sound investment; the SmartMsg solution is built on a platform that can grow and change with our needs, and the fact that Federal Signal has put its name on the product lets us know that we can rely on this product for a long time to come.”

DispatcherMgr™ — The dispatch console is an add-on module to the SmartMsg Solution. The dispatch console is a client tool to facilitate and organize multiple communication groups, with the added ability to set audio options and audio playback. It also supports video communication. It enables the user to set up and communicate with talk groups and standby channels. The dispatch console is useful for communicating with large amounts of users instantly.



Geospear™ — The Geospear GIS (Geographical Information System)

console is an add-on module to the SmartMsg solution. It is intended for use to send alerts based on geographical areas. The GIS console enables SmartMSG alerts to be sent to target areas, with the alert going out to all SmartMsg recipients within the target area coordinates. A user can choose an area on the map to send SmartMsg alerts. To select areas on the map the user can draw circles, rectangles, freeform areas, or select predefined areas of the map like a zip code or county. Specific addresses on the map can also be pinpointed and areas around the point can be selected for sending the alert.

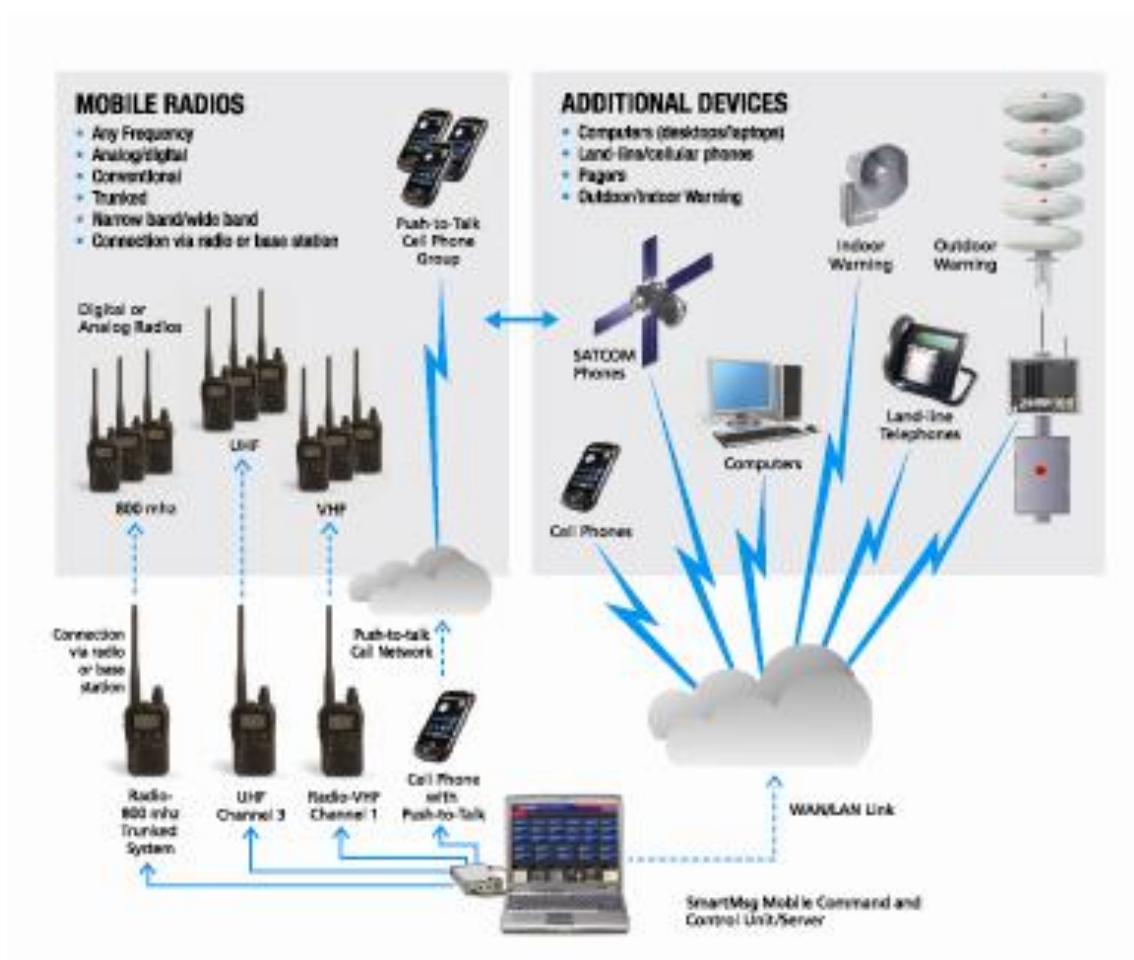


Reaching many different device types with a single message is of major significance for a notification and alerting system. The ability for authorized personnel to send one alert and have it hit everything at once allows for much quicker distribution of messages. A system that provides for broadcasting alerts via various communication mediums is imperative for emergency notifications—if you rely on only one communication medium and that infrastructure is unavailable during a particular crisis, your system is rendered useless.

Pairing site redundancy with the ability to contact different device types at once provides an elevated level of resilience to a system and a higher probability that communications will get out even during the most disastrous situations when normal communication systems may be crippled.

Multi-Device Communications Interoperability Deployment

The diagram below depicts an RIU within a distributed and redundant SmartMsg system, allowing communication between the PSTN, PTT capable phone network, computers and disparate radio systems. Federal Signal's deployment capabilities provide communications interoperability at local and/or geographically dispersed locations and incident sites.



In the next section we will highlight some specific examples of how Federal Signal can help augment your existing communications systems as well as enable all of your communications, alerting and notification needs. This includes a look at day to day uses of the system in public safety, as well as a snapshot of how it can be used for emergency situations within your municipality or county.

Where can Federal Signal help in public safety?

Core to the design of the Federal Signal interoperability solution is the ability to enable every day communications. This approach insures that in the event of a high-priority situation your communications system will be such a familiar communications tool that you will be able to easily get your message, alert and notification out to the appropriate people.

Looking at this from a day to day operation perspective our customers have found many uses that help prepare them when the need to respond to an actual emergency situation.

Day to Day Operational	Emergency Situations
Open Shift Notification and Documentation	Safety Alerts (Bomb Threats, Building Evacuation)
IT Alerts	Decontamination Alert and Response
Asset Management (Water, Power, HVAC, High Value Items)	Notification and seamless communications with staff, First Responders, Dispatch Units, Public Health, Fire, Police, EMS, Hazmat
Alarm Systems	Severe Weather Alerts
Access Control	Crisis / Mass Casualty Alert, Management and Response
Asset Management and Security	Fire Station Paging augmentation or replacement
Instant text "chat" communications	Citizen Alerting and Notification
Video (Motion Detection and Surveillance)	Amber Alerts
"Single Click" Paging Codes (Tied into overhead paging system)	Interoperable Communications for Multi-jurisdictional situations
Monitoring Building Systems (e.g. Water, Power, HVAC)	Public Works dispatch and call-to-action for snow removal, chemical spills, and accidents

One of the core features of the Federal Signal approach to interoperable communications is open architecture that enables our systems to interoperate with your existing solutions. This provides an easy way for you to extend the life of your radio systems, cell and handheld devices, as well as other solutions that your team may use to communicate. Federal Signal enables an "AND" solution, meaning that it enables your existing communications systems to work together with ease. In addition, it is lightweight, flexible, cost effective and easy to get up and running in a very short period of time.

How are public safety customers using Federal Signal alerting and notification systems?

Wayne County Emergency Management Agency

Wayne County, Michigan recently implemented The Federal Signal SmartMsg software system to establish direct emergency communications to the county's residents, businesses and public safety agencies. The software, currently being used to establish complete interoperable communications and public safety alert notifications, will enhance the traditional methods of television and radio for public alert notifications.

Wayne County, the eighth largest county in the nation with more than 2.2 million residents across 43 communities, has deployed SmartMsg Radio Interface Units (RIUs) to provide interoperable communications to the county's homeland security, emergency management and public safety departments.



"Federal Signal SmartMsg not only allows public safety officials in our communities to communicate and collaborate in a way never before possible, but it allows us to better protect the public during emergencies," said Wayne County Executive, Robert Ficano. "Before choosing the SmartMsg platform, 43 separate transactions were required to get a single message out in each of our communities. Now it's one click of the mouse. While you can't put a dollar amount on saving lives, the system is the most comprehensive and cost effective we've seen."

In the event of a natural disaster, terrorist attack, or other emergency crisis incident, Wayne County residents will be notified via home and office telephones, mobile phones, text-based devices or PC's or other personal devices.

Omaha UASI Region

The Omaha Tri-County Urban Area Security Initiative (UASI) Region, composed of the City of Omaha, Douglas County, Sarpy County and Washington County have deployed the Federal Signal SmartMsg interoperable system to enhance emergency management, planning and response within each respective agency's emergency management operations.

In addition to the implementation of SmartMsg alert notification application, the Omaha UASI Region has also licensed the ScenarioMgr module, which is an integrated incident planning and execution tool that enables the definition of tiered response plans, based on incident events and their dependencies with other tasks, Resources, or Procedures. This application module sets a new paradigm in achieving

National Incident Management System (NIMS) compliance and electronic execution of response plans and mutual aid requests. The Omaha UASI region that is implementing the solution includes the tri-county area of Douglas, Sarpy and Washington counties consisting of a population of over 650,000 citizens spanning more than 900 square miles. After considerable planning and competitive evaluation, Federal Signal was awarded the regional contract.

Mission Texas Fire Department

Deputy Chief Rene Lopez, Jr. of the **Mission, Texas Fire Department** said, "After reviewing several different solutions for creating radio interoperability between disparate radio systems now used for incidents that we respond to, we found that Federal Signal's solution provides much more functionality than any of the other solutions available. Additionally, Federal Signal has found the way to make interoperable communications easy, portable, and integrated into their robust alerting solution. We now have the solution we are looking for to achieve our immediate needs for communication interoperability, which includes the opportunity to grow into future projects," Lopez said.

The Federal Signal objective has been to develop a mission-critical communications solution to support secure communications interoperability, urgent alert notification and data sharing. The application solution is a redundant system that can be rapidly deployed in stationary and mobile configurations, occupies a small and agile footprint, and requires only DC battery power to operate. The application is designed to support incident response, emergency preparedness and response, continuity of operations, and major operational events by enabling fully integrated two-way interoperable communications, wide area alerting and data sharing between multiple agencies, communities, first responders and citizens, regardless of communication device.

"When we learned of the radio interoperability initiative for the Mission, Texas, Fire Department, it became immediately evident that, in addition to addressing current requirements, it would be important to discuss future needs as well. It only makes sense to think about the future when evaluating solutions for immediate needs," said John Von Thaden, director of alerting & notification for Federal Signal's Public Safety Systems Division. "The most common mistake with today's world of rapid technology development is selecting a solution for the immediate initiative only, rather than looking out to future needs. Federal Signal is excited to help Mission, Texas, achieve their radio interoperability initiative and looks forward to future expansion of the project to help with data collaboration, public alerting and supplemental communications enhancements for all first responders."

Purchasing Considerations

Where is the company headquartered?

- Federal Signal is headquartered in Oak Brook, Ill., a western suburb of Chicago. The alerting and notification development and deployment teams are headquartered in University Park, Ill., and Birmingham, Mich.
- The Federal Signal Public Safety Systems Division team consists of first responders, industry architects, lead engineers, and software development expertise that is best in the industry.

Does the company have significant experience in interoperable communications and alerting and notification systems?

- Federal Signal has been developing alerting and notification solutions for over 75 years. In 2007, Federal Signal acquired Codespear LLP, a leader in mission-critical interoperable communications systems and integrated the SmartMsg technology into its products.

How many SmartMsg systems have been deployed?

- About 100 installations throughout North America.
- Federal Signal provides not only an interoperable communication system but provides software modules, radio interoperability devices and cables, and sensor boxes all based on a robust back office server system that enables you to quickly scale to support your needs.

How long has the company been serving the public safety market?

- Federal Signal has been meeting the needs of the public safety market for more than 100 years. Federal Signal is responsible for many of North America's largest installations of alerting and notifications systems.

What is the financial viability of the company...will they be around in 10 years to provide support?

- Federal Signal is a \$959 million publicly traded company (NYSE: FSS) with more than 3,500 employees around the world.

Does the company provide a thorough and diverse list of references that will speak to customer's satisfaction with the product, services and the results?

- Federal Signal is widely known to be one of the most trusted names in safety and security, and can provide a list of references that is unmatched by any other company.
- Federal Signal is the clear leader in advanced interoperable communications technology for first responder needs and maintains a broad base of satisfied customers including many leading organization around the globe. This includes a vast array of communities, commercial customers, law enforcement agencies, and universities that include but are not limited to; Michigan State Police - Emergency Management and Homeland Security Division, Wayne County, Michigan - Emergency Management and Homeland Security Division, Omaha Tri-County UASI Region, Kentucky State Police, Mohave County, Arizona, City of Phoenix – Sky Harbor Airport, Chrysler, LLC (Formerly DaimlerChrysler), Ford Motor Company, NYCE Payments Network, Abbeville, South Carolina, Webber International University, Bloomfield Hills, Michigan, Air National Guard, NYC DOITT, and Livingston County HazMat.
- For more information please visit our public safety systems news and information site at: <http://www.alertnotification.com>

Does the company maintain development and manufacturing control for all components of the solution?

- Yes, Federal Signal designs, develops, and assembles all components of its solution including software, API's, protocols, servers, devices, interoperability units, and radio cables, communications engines and software applications.

Does the company offer various application programming interfaces (API) for specific products available in the market place?

- Federal Signal maintains a staff of experienced and dedicated interface and integration engineers to respond to the frequent changes seen in application programming interface and device interoperability requirements within the North American market.

You mention several times that Federal Signal offers a solution for public safety. We already have a system and a lot of other software solutions installed. What do we do next?

- The SmartMsg-enabled system for public safety works as an add-on connectivity layer to your existing communications and software platforms that you may already have installed. It has been designed to stand alone but also easily connects to augment your existing technologies.

- Selected Module / Interfaces examples include but are not limited to:
 - Text to Speech
 - Language Translation
 - SIP / H323
 - Pager
 - Pocket PC
 - HTML
 - Extensible Markup Language (“XML”)
 - Incident management platforms:
E-Team & Previsstar (Formerly RamSafe)
 - Microsoft Active Directory – LDAP,
Novell eDirectory - LDAP
 - Panic Button
 - Video
 - PSTN
 - SMS
 - SMTP
 - e-Fax
 - Data Logger
 - Sensors (motion sensors, contact switches, temperature, etc.)
 - RFID
 - GPS
 - Instant Messenger
 - Common Alerting Protocol (—CAP||)
 - GIS (e.g. ESRI)
 - National Weather Service

Summary and Next Steps

Federal Signal provides this integrated offering to help enable interoperable communications, alerting and notification systems within the healthcare industry. Federal Signal is the leader in communication solutions that can touch virtually any device type and work over any medium. Its SmartMsg solution can reach overhead paging systems, radios, cell phones, pagers, loudspeakers, desktop and laptop computers, landline phones, sat phones, PDAs (PocketPC, Blackberry, etc.) at once. The Federal Signal SmartMsg system provides for rapid development of new interfaces to easily accommodate new device types or communications protocols. In addition, SmartMsg also has a full range of API’s (application programming interfaces) that can enable the sending of specialized messages to other communications, alerting and notification systems automatically.

For more information please visit us at <http://www.alertnotification.com>. You can also reach us anytime at: 1.800.548.7229