

**Architectural and Engineering Specification for a
Life Safety Emergency Call System
Flash™ / Flare®**

This document is intended to provide performance specifications and operational requirements for the Flash/Flare life safety emergency call system. It is written in a generic format. These specifications may be copied verbatim to form a generic procurement specification.

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PART 1 GENERAL

1.1 System Summary

The contractor shall install an Life Safety Emergency Call System (LSECS). The system shall be used to identify and optionally locate personnel under duress in potentially high-risk situations (e.g. those in correctional, medical, or industrial environments).

The system shall consist of a lightweight, wearable Personal Protection Device (PPD) that communicates over radio frequency (RF) with receivers distributed throughout the building or complex.

A duress alarm shall be initiated by pressing a button on the PPD. Optionally, the PPD shall initiate a duress alarm when a pin attached to a lanyard is pulled out or when the PPD is tilted beyond a specified angle for a specified period of time (man-down feature).

The system shall provide a software interface in which duress alarms can be communicated to operations staff and displayed on user-configurable maps.

1.2 Submittals

- A. Contractor submittals to the facility owner shall include the following, as a minimum:
 - 1. Site conditions report as per part 3.1
 - 2. Configuration and test results for the system after installation and calibration are complete as per part 3.1
 - 3. All manufacturer-supplied software required for the maintenance and operation of the system.

1.3 Spares

- A. The contractor shall deliver to the facility owner spare system components.
- B. For each system component, spares consisting of least one unit or 10% of the number that comprise the system, whichever is greater, shall be provided.

1.4 Warranty

- A. The product shall be under warranty for a minimum of two years from the date of purchase.
- B. The supplier shall make available replacement components, parts or assemblies for a minimum of 10 years from the date of purchase.

1.5 References

- A. Abbreviations and acronyms: The following acronyms and abbreviations are used in this document:
 - 1. AC: Alternating Current
 - 2. CAD: Computer-Aided Design

3. DC: Direct Current
4. LSECS: Life Safety Emergency Call
5. PoE: Power-over-Ethernet
6. PPD: Personal Protection Device
7. RF: Radio Frequency

PART 2 PRODUCTS

2.1 Life Safety Emergency Call System

- A. The contractor shall supply a Life Safety Emergency Call System (LSECS).
- B. The system shall consist of:
 - 1. Lightweight, wearable Personal Protection Devices (PPDs), one per staff member, that communicate over radio frequency (RF) with receivers distributed throughout the building or complex.
 - 2. A software application that alerts operators of received alarms and can display them on user-configurable maps.

2.2 Manufacturers

- A. The Flash and Flare systems from Senstar Corporation (www.senstar.com) meet the requirements stated in this document.

2.3 Regulatory Requirements

- A. The LSECS shall be registered with a nationally registered testing laboratory such as CSA or UL, under the appropriate performance category for duress alarm equipment.
- B. All equipment shall carry the appropriate registration label(s).
- C. The LSECS shall operate within a licensed frequency band that will not be shared by other RF equipment at the same location.
- D. The LSECS shall not operate within the unlicensed FCC Part 15 bands in the United States, or in similarly unregulated bands within other countries.
- E. The LSECS equipment shall carry the appropriate RF registrations for use in the country where it will be installed.

2.4 Manufacturing Quality Requirements

- A. The manufacturer's quality management system shall be certified as conforming to ISO 9001:2008.

2.5 Mechanical Requirements

- A. PPDs:
 - 1. The dimensions shall be equal to or less than 12 x 5.0 x 2.5 cm (4.7 x 2 x 1 inches).
 - 2. The weight shall be equal to or less than 200 g (7 ounces) (including battery).
 - 3. Durability: Other than for cosmetic damage, the PPDs shall not be damaged or malfunction after six drops onto a tiled floor from a height of 1.5 m (5 feet) with one drop on each of the six sides on three orthogonal axes.
 - 4. The PPD enclosure shall have a tamper-resistant construction.

5. The PPD shall include a belt-holster.
 6. The PPD shall include an option for a lanyard with pull-pin.
- B. RF receivers:
1. The dimensions shall be equal to or less than 27 x 22 x 17 cm (10.5 x 8.5 x 6.5 in.)
 2. The RF receiver enclosure shall include mounting flanges to facilitate its installation on a wide variety of surfaces.
 3. The RF receiver shall have the option of using external antennas for increased range.

2.6 Electrical Requirements

- A. PPD:
1. The PPD shall use commercially available 9VDC non-rechargeable batteries.
 2. Battery shall be replaceable by the user or system administrator.
 3. The PPD shall automatically report a low battery condition to the operator's alarm notification system.
 4. Under normal operating conditions (3 test transmissions per day) the PPD battery shall provide a minimum life time of one year before a low battery condition is reported.
 5. The PPD shall be capable of operating normally for at least 15 days following the initial reporting of a low battery condition.
- B. RF receivers:
1. The input voltage for the RF receiver shall be 19VDC and it shall consume less than 4 watts.
 2. The RF receivers shall have the option of being powered from an AC source (115VAC, 50/60 Hz)
 3. The RF receivers shall have the option of being powered via Power-over-Ethernet (PoE).
 4. Each RF receiver shall be capable when operating under AC of including individual integral battery backup. When fully charged, the backup batteries shall provide a minimum of 4 continuous hours of operation following the loss of AC power.
 5. The failure of AC power, resulting in the operation of any installed equipment on the optional backup battery, shall result in a warning alarm within 10 minutes of the condition having been continuously present.

2.7 Environmental Requirements

- A. The PPD shall operate within specifications under the following environmental conditions:
1. Operating temperature: -20°C to 60°C (-4°F to 140°F)

2. Water resistance: The PPD shall not malfunction after being exposed to 30 seconds of heavy rain.
- B. The RF receivers and other installed devices shall operate within specifications under the following environmental conditions:
 1. Operating temperature: 0°C to 60°C (32°F to 140°F)

2.8 RF Requirements

- A. The LSECS shall operate in licensed bands as to avoid potential interference from a third-party.
- B. The LSECS shall support the International Public Safety band, 420 to 470 MHz
- C. It shall be possible to configure the LSECS to operate at any of a number of frequencies within the approved band in order to avoid RF interference from pre-existing RF sources on or near a particular site.
- D. The option shall exist for an external antenna to be used in order to increase the coverage area.
- E. The RF signal shall not be blocked by common building materials, smoke, the human body, or heavy clothing.

2.9 Performance Requirements

- A. The LSECS shall support transmissions up to 1 km (0.6 miles) when PPD has a line-of-sight with an RF receiver equipped with an external antenna.
- B. The LSECS shall support at least 10 alarms within a 10 second time period.
- C. The LSECS shall meet the following system capacity requirements:
 1. A minimum of 4,000 unique PPD identification codes.
 2. A minimum of 24,000 unique locations, or zones, per facility. Any or all zones may be either indoor or outdoor locations.

2.10 Personal Protection Device Functionality

- A. The PPD shall include a button that, when pressed, activates an alarm transmission
- B. Optionally, the PPD shall be capable of generating an alarm if the PPD is taken from the user. This tamper function shall require the use of an optional device, such as lanyard with a pull-pin, which causes an alarm to be generated when it is removed from the PPD.
- C. Man-down feature:
 1. The PPD shall have an optional man-down capability, whereby the PPD automatically transmits a duress alarm when it tilts beyond a user-specified angle for a user-selectable period.
 2. The PPD shall use an internal accelerometer to detect tilt conditions.
 3. The man-down function shall include the following user-programmable features:

- a. Tilt angle
 - b. Audible warning of pending alarm
 - c. Silent mode (no audible warning)
 - d. Time delay before warning of pending alarm
 - e. Warning duration
 - f. Retransmission at user-defined intervals
- D. Each PPD shall be configurable by the system administrator to report a specific identification code, without a return to the factory. This will enable any PPD to be used as a replacement for another PPD that is damaged or otherwise needs to be replaced.
- E. Optionally, each PPD with a pull-pin option shall be capable of being configured by the system administrator to transmit repeatedly after a duress call is initiated by pull-pin activation. In this way, a PPD can be tracked and located if the person carrying it does not remain in one location.

2.11 Alarm Generation and Announcements

- A. Each person requiring the ability to generate a duress alarm shall wear a PPD.
- B. Each PPD user shall be capable of transmitting a duress alarm, which will be reported at the control computer, using one or more of the following activation methods:
- 1. Pressing a button on the PPD.
 - 2. Removing a pin attached to a lanyard from the PPD (optional)
 - 3. Activation of the man-down function (optional)
- C. In devices that support localization, a duress alarm shall always be reported as originating from one location. A duress alarm shall not be reported as originating from more than a single location, or from several possible locations.
- D. A single protection zone may include more than one room, allowing a duress alarm to be reported in multi-room zones.
- E. A single alarm zone may, optionally, include several calibration zones that further subdivide the alarm zone.
- F. In devices that support localization, the location of a duress alarm transmission shall be visually presented on a computer generated graphic floor plan of all, or part, of the facility. The boundary of the zone in alarm shall be highlighted. Optionally, the alarm point within the zone shall be displayed.
- G. The acknowledgement and clearing of duress alarms, and all other alarm handling functions, shall be performed using a computer mouse or touch screen interface. A computer keyboard shall not be required for the alarm processing operation of the LSECS.

- H. The LSECS shall be able to display alarms from multiple PPDs, up to the number of PPDs used in the system.
- I. The LSECS shall report duress alarms with a distinct audible and visual indication that is easily distinguished from equipment, maintenance, and diagnostic alarms.
- J. Optionally, the LSECS shall be capable of generating an EIA-232 data string for each reported alarm. This interface can be used to communicate duress alarms to other systems in the control room, or in remote locations.

2.12 Reliability and Maintenance Requirements

- A. MTBF: The system (excluding consumable items like batteries) shall be less than one failure per two years per 4,645 m² (50,000 square feet) of indoor coverage, and less than one failure per two years per 18,580 m² (200,000 square feet) of outdoor coverage.
- B. The LSECS shall continuously monitor the state of all system hardware. The system shall be capable of immediately reporting a maintenance or diagnostic alarm, upon the detection of a system problem or the failure of a hardware component.
- C. Configuration and upgrades:
 - 1. The RF receivers, transmitters and other hardware items shall be microprocessor based, and shall be designed such that software reconfigurations and software upgrades can be accomplished without removing the units from the site.
 - 2. The unique ID code and frequency of operation for each PPD shall be configurable.
 - 3. Installed equipment shall be capable of receiving software patches or software upgrades from the control computer at the site, without the need to physically access each piece of equipment.
- D. Diagnostics and accuracy checks:
 - 1. The system shall run regular diagnostic checks on all installed equipment,
 - 2. The system shall report any exceptions or failures as alarms on the control computer.
 - 3. The system shall perform a locating accuracy check along with RF receiver functionality verification, a minimum of once per day, to ensure that all receiver equipment is functioning correctly.
- E. The LSECS shall provide notification of the failure of any integrated backup battery by means of a failure alarm or warning alarm.
- F. The LSECS shall create and maintain a record of all system equipment failure notifications.

2.13 Alarm Recording and Storage

- A. The LSECS shall log all duress and warning alarms to a computer hard disk.

- B. Duress alarms shall be displayed as a distinct log, separate from equipment failure and other alarms.
- C. The data logged for each alarm shall include the identification and location of the alarm, the time of the alarm, the time that the alarm condition was acknowledged and the time that the alarm was cleared from the system.
- D. All logged data shall be saved in a current Windows-compatible, commonly accessible data format, from which data can be exported or retrieved by the system administrator, or others, for analysis or to archive.
- E. The LSECS administrator shall be provided with the capability of selecting and printing any, or all, alarms from the alarm logs on demand.

2.14 Installation and Configuration Capabilities

- A. The LSECS shall be capable of locating PPDs accurately in all prescribed parts of a facility without requiring the installation of locating hardware in every room, closet, and other discrete location throughout the facility.
- B. In a correctional services environment, the LSECS shall be capable of locating PPDs accurately, in all prescribed parts of a facility, without requiring the installation of any equipment in the inmates cells.
- C. The distributed RF receivers shall function correctly when mounted in cable chases, above false ceilings, and in other areas, which are not accessible or visible to inmates.
- D. The PPD shall be configurable from a software application running on a Windows-based PC.
- E. It shall be possible to convert and edit Computer-Aided Design (CAD) files of the facility for use as floor plans in the control computer.

2.15 System Security

- A. The LSECS shall provide a minimum of three levels of password protection. Each level of password protection shall allow successively greater levels of access to operating, maintenance, and administrative functions.

2.16 Networking Capabilities

- A. The LSECS shall support the following RF receiver interconnect options:
 1. Standard off-the-shelf 10/100BaseT Ethernet (RJ-45 connectors)
 2. CEBus on AC power line dedicated circuit or shielded twisted pair
 3. CEBus shielded twisted pair backbone between buildings
 4. Fiber backbone between buildings
 5. Wireless backbone between buildings

PART 3 EXECUTION

3.1 Site Assessment

Before installation begins, the installation contractor shall provide a report to the facility's owner documenting any site conditions that may prevent the system from operating satisfactorily.

3.2 System Installation

The system shall be installed in accordance with the manufacturer's recommended procedures as defined in the manufacturer's documentation.

3.1 System Calibration

- A. The installation contractor shall calibrate the system in accordance with the manufacturer's recommended procedures as defined in the manufacturer's documentation.
- B. The installation contractor shall submit to the facility's owner the configuration settings for the system.

3.2 Training

The installation contractor or vendor shall train the maintenance personnel in the system maintenance procedures as described in the manufacturer's product documentation.