

**Architectural and Engineering Specification for a  
Personal Alarm System System (PAS)**

This document is intended to provide performance specifications and operational requirements for the Senstar Personal Alarm System (PAS). 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 a Personal Alarm System (PAS). The system shall be used to locate personnel under duress (e.g. corrections officers, administrative staff, nurses, counselors, etc).

The system shall consist of a lightweight, wearable Personal Protection Device (PPD) that uses ultrasonic signals (40 kHz) with receivers distributed throughout the building or complex. As ultrasonic signals do not penetrate walls or ceilings, the system shall be able to locate personnel on a per-room basis.

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

The system shall include a built-in microphone on each receiver so that operators can listen in or record the audio in the location in which the duress alarm occurred.

Alarm, audio, and self-test outputs from the receivers shall be collected and relayed to the site's control room equipment.

### **1.2 Submittals**

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

## 1.5

### References

- A. Abbreviations and acronyms: The following acronyms and abbreviations are used in this document:
1. AC: Alternating Current
  2. DC: Direct Current
  3. PAS: Personal Alarm System
  4. PPD: Personal Protection Device

## **PART 2 PRODUCTS**

### **2.1 Personal Alarm System**

- A. The contractor shall supply a Personal Alarm System (PAS).
- B. The system shall consist of:
  - 1. A lightweight, wearable Personal Protection Device (PPD) that communicates over ultrasonic frequency with receivers distributed throughout the building or complex.
  - 2. A device that consolidates the alarm, audio, and self-test events from the receivers and provides an interface to the site's control room equipment.

### **2.2 Manufacturers**

- A. The PAS from Senstar Corporation ([www.senstar.com](http://www.senstar.com)) meets the requirements stated in this document.

### **2.3 Regulatory Requirements**

- A. The PAS 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).

### **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 9.7 x 6.1 x 2.3 cm (3.8 x 2.4 x 0.9 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 an option for a belt-holster.
  - 6. The PPD shall include a pendant option with a pull-ring.
- B. Ultrasonic receivers:
  - 1. The receiver enclosures shall be installed in wall or ceiling receptacles and include a protective faceplate.

2. The receiver faceplate shall be affixed with tamper-resistant screws.

## 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 via an audio notification.
  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 reporting of a low battery condition.
- B. Ultrasonic receivers:
  1. The input voltage for the receiver shall be 12 to 48 VDC and shall draw no greater than 40 mA.
  2. The receivers shall have the option of being used with a heater unit. The input voltage for the heater unit shall be 12 to 24 VDC and draw no greater than 1A.

## 2.7 Environmental Requirements

- A. The PPD shall operate within specifications under the following environmental conditions:
  1. Operating temperature:  $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$ )
  2. Water resistance: The PPD shall not malfunction after being exposed to 30 seconds of heavy rain.
- B. The ultrasonic receivers and other installed devices shall operate within specifications under the following environmental conditions:
  1. Operating temperature:  $0^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  ( $0^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$ )
  2. The ultrasonic receivers shall include a heater option.

## 2.8 Transmission/Reception Requirements

- A. The PAS shall communicate using ultrasonic signals.
- B. The ultrasonic signals shall be modulated to eliminate false alarms generated by other devices or objectives.
- C. The PPD, when activated, shall generate an omni-directional signal so that the device does not need to be pointed or directed at the nearest receiver.
- D. The receiver faceplate shall include a red LED that illuminates whenever an alarm is received.

## 2.9 Performance Requirements

- A. The coverage range of each ultrasonic receiver shall be configurable but shall support a nominal diameter distance of 30 m (100 feet).

## 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. The PPD shall be available in a pendant configuration that activates an alarm transmission with a pull-ring.
- D. 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 specific angle for a period of time.
  - 2. The PPD shall emit a warning tone prior to generating the alarm from the man-down position.

## 2.11 Alarm Generation and Announcements

- A. Each person using the PAS shall wear a PPD.
- B. Each PPD user shall be capable of transmitting a duress alarm, which will be reported at the control center, 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)
  - 4. Removing a pull ring (pendant model)
- C. The front panel of the ultrasonic receivers shall include an option (Local Annunciation Panel, or LAP) for visual and audio notifications of up to four zone alarms.
  - 1. The LAP shall include push-bottoms for acknowledging each alarm (silencing the audio tone) and clearing the alarm.

## 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 m<sup>2</sup> (50,000 square feet) of coverage.
- B. The PAS shall be able to test the state of all system hardware. The system shall be capable of reporting a diagnostic alarm upon the detection of a system problem.



- C. The system shall be able to perform diagnostic checks on PPDs and ultrasonic receivers.

**PART 3 EXECUTION**

**3.1 Site Assessment**

- A. 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**

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

**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 Product Guide.
- B. The installation contractor shall submit to the Owner the calibration and configuration settings for each processor in the system.
- C. The installation contractor shall submit to the Owner a response plot for each zone in the system.

**3.2 Training**

- A. The installation contractor or vendor shall train the Owner's maintenance personnel in the calibration and system maintenance procedures as given in the manufacturer's product documentation.