PALS Sentry
Staff Safety Systems

Engineering Specifications

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SECTION 28 XX XX - STAFF DURESS SYSTEM

PART 1 General

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 BACKGROUND AND SCOPE

A. The contractor shall provide a complete Staff Duress system (the "System") including Tags, locating devices, infrastructure and locating software, including, but not limited to all devices shown in Part 2 of this specification. The protected area shall be all areas within the buildings shown on the drawings (as defined by the Owner) unless otherwise noted. Outdoor protected areas shall be as shown on the drawings.

1.3 SUMMARY

A. This system includes Tags that can be worn by individuals. When a condition that requires attention is encountered, the holder will initiate and alarm by activating their device. Tags will then transmit an alarm status to the Receivers that is then forwarded to Gateways positioned in the facility. The location engine appliance ('HubSens') translates incoming data from Gateways to determine the location and status of the Tag. Upon alarm activation, The HubSens will interpret the data and publish Receiver status via the HubSens API. This information is then forwarded to the appropriate PrismUI station(s). If you are using PrismUI for mapping, this information will also be displayed in the appropriate PrismUI maps.

1.4 DEFINITIONS

A. Insert as needed.

1.5 SUBMITTALS

A. Provide a complete finalized bill of materials, manufacturers data sheets, floor plans with paging areas and speaker interconnection, etc. to indicate the entire scope of what is being provided.

B. Provide complete CAD generated 1/8” scale drawings detailing installation locations of equipment. Symbols used shall match those shown on the contract drawings.

C. Provide detailed one-line drawings of systems. Each system drawing shall detail the field wiring and typical wiring termination details for all devices.

1. Include plans, elevations, sections, and attachment details.

2. Include details of equipment assemblies. Indicate dimensions, weights, required clearances, method of field assembly, components, and location and size of each field connection.

3. System Narrative that describes how the system is intended to operate.

4. Site Assessment report from the manufacturer and installation contractor.

5. Manufacturer’s data sheets and manuals for all hardware and software to be provided.

D. All diagrams required for installation of the system including, but not limited to system block diagrams and wiring diagrams for field terminated devices.

1. Console layouts.

2. Control panels.

3. Rack arrangements.

4. Calculations: For sizing backup battery.

5. Wiring Diagrams: For power, signal, and control wiring

6. Identify terminals to facilitate installation, operation, and maintenance.

7. Single-line diagram showing interconnection of components.

8. Cabling diagram showing cable routing.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data

B. Configuration and test results for the system after installation and calibration are complete.

1.7. QUALITY ASSURANCE

A. The Contractor shall be authorized to install the System by the Manufacturer.

B. The Contractor shall have at least Five (5) years of installation and engineering experience with the specified system on projects of not less than $500,000 and shall have successfully installed at least XX Systems in that time period.

C. The Contractor shall be fully trained and certified by the Manufacturer

D. The Manufacturer shall have a proven testing procedure established to properly commission and document the installation and performance of the System to project specifications.

1.8. SPARES

A. For each system component deployed, the contractor shall deliver (x) units or 10% of the number of the components used in the system, whichever is greater.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. The following products have been approved by the Owner ('Approved Products'). It is the Contractor's responsibility to provide a system using the Approved Products that meets or exceeds the performance specifications. All deviations from the performance specifications must be clearly identified in the product data submittal.

1. PALS Sentry, Actall
2. <insert additional as approved>

B. The Contractor shall supply a Staff Duress System that meets or exceeds the performance requirements detailed in this Specification.

C. All products must be pre-approved by the owner prior to bid submittals. Vendors that feel their products meet the minimum performance requirements may submit their products for pre- approval by the Owner.

D. Any products submitted for approval shall not be proprietary. Non-proprietary products are defined as: Systems, products, replacement parts and/or services that are available from three or more un-related (competitive) vendors.

E. The warranty for all Approved Products will be Two (2) years from the date of Commissioning.

F. Manufacturer(s) of Approved Product(s) shall certify in writing that replacement components, parts and assemblies will be available for at least 10 years from the date of commissioning.

2.2 FUNCTIONAL DESCRIPTION OF SYSTEM

A. Provide a new System that provides the location of all alarm conditions initiated by Tags issued to carriers in the facility when queried. The Specification is performance based; it is up to the contractor to provide complete and operational system that meets the performance criteria to the Owner. The System shall identify and locate alarming Tags when activated within the desired protected area(s) of the Facility. The System shall operate using Ultrasonic (US) and Radio Frequency (RF) technologies only. Alarms shall be received from all the areas of the defined by the owner in the drawings. Due to the variations in system layouts, exact locations of devices may not be shown on the drawings.

B. Receivers will be placed to locate an event within an area that can be specifically and uniquely identified via the API so that responding personnel can locate the person(s) or asset(s) from inside the identified zone without extensive searching.

2.3 SYSTEM DESCRIPTION

A. Compatibility of Components: Coordinate component features to form an integrated system. Match components and interconnections for optimum performance of specified functions.

B. Equipment shall be modular and fully rated for continuous duty unless otherwise indicated. Select equipment for normal operation on input power supplied per Manufacturer's directives.

C. Equipment Mounting: Where rack, cabinet, or console mounting is indicated, equipment shall be designed to mount in a 19-inch housing complying with EIA/ECA310-E.

D. Weather-Resistant Equipment: Listed and labeled by a qualified testing agency for duty outdoors or in damp locations.

E. All conduit, exposed boxes, devices, etc., installed within this project must be anti-ligature conforming. Wherever possible, backboxes and conduit shall be in wall flush mounted. Where the only option available is surface mounting, the installation shall be done with standard EMT conduit with pick proof caulk installed around all surfaces and openings where ligature items may be looped through or secured. Flat device and box surfaces must be provided with angled blocks secured to the top of the box to ensure no ligature items may be looped over the top. All new installed conduit, boxes, devices, etc., will be subject to inspection to ensure these requirements are met.

F. Locating devices should be able to locate Persons carrying Tags in the following areas:

1. Dayrooms
2. Kitchen
3. Laundry
4. Program areas
5. Additional areas (as required)

G. The System shall not be capable of identifying and locating Tags as they are moving from zone to zone within the defined protected area.

H. The System shall provide access to Event location and status via Ethernet-based API for event display and resolution.

I. The System shall provide sufficient and reliable RF signal coverage to ensure 100% alarm and locating reception within the protected area.

J. The System shall identify, log, and report the event location for all Receiverss active in the system. Systems that report more than one location for an alarm or asset/tag shall not be acceptable under any condition.

L. The System shall be expandable.

N. The System shall interface to all PLC and touch screen systems.

P. The System shall publish all events to its API within Three (3) seconds of physical occurrence.

2.4 LOCATING ENGINE AND GUI

A. Locating Engine

1. Hardware shall be as specified by the System Manufacturer and rated for 24X7X365 operation. Current specifications can be found at www.actall.net/atlas.
2. The Location Engine shall use Linux Ubuntu 20.04 or Debian Operating System.
3. <Insert Backup and redundancy language>

B. Administrative Workstations

1. Workstations shall use a Windows 11 Professional Operating System.

2. Administrative, testing and monitoring Workstations shall be installed with the same core software package and shall be interchangeable without re-installing software or changing hardware.

2.5 GATEWAYS

A. Gateways Part #60004

1. Gateways will be installed as per manufacturer's design directives.

2. The quantity of Gateways will be installed to properly govern all Locator traffic and alarm traffic from Tags, per Manufacturer's design.

3. Each Gateway will be powered by Power over Ethernet (POE) at a minimum of 1.4A and will connect to the main Alarm Computer via Ethernet.

2.6 RECEIVERS

Receivers are electronic decoding devices receiving the signal from the ultrasonic transmitters, transmitting an alarm signal capable of activating a system annunciator and illuminating a lamp on the receiver plate, under normal conditions, to indicate the ultrasonic signal has been received.

A. Receivers Parts # RS 100-L, RS 120-L, RS 140-L

1. Receivers shall be securely mounted to a ceiling or wall, either flush or surface mounted in an electrical 2-gang box. Each receiver installation shall include a

stainless steel faceplate. Where receiver installation may require it, a steel guard may be attached with spandrel head fasteners.

2. Effective signal transducer receiver range for reception of ultrasonic signal shall be less than, or equal to, 50 feet (for location specific response) along an axis direct to the receiver front surface. The receivers shall be field-adjustable to set range. Effective range shall include signal reception with steel receiver guard in place, where applicable. The system shall provide receiver units of single, dual, and quad head design, and weather-resistant or vandal-resistant models available for use at any points deemed appropriate.

3. Areas in which receivers are required should be indicated on the drawings. The number of receivers required in each designated area shall be as determined by the product specifications of the system's manufacturer for total coverage area.
4. Each receiver shall transmit each alarm state received to the headend control unit via a LoRaWAN radio uniquely addressed and wired to the relay output available on the receiver. A sufficient number of LoRaWAN gateways will be installed to appropriately manage the projected traffic of the number of installed receivers.
5. Receivers shall be powered by 12 or 24VDC.
6. No data or home run wiring is required for these units to properly function. Each unit can be powered separately or in parallel on the same supply circuit.
7. Receivers will receive status information from the Tags sent at 43 KHz, and relay that information wirelessly to the Gateway Network at 900MHz.
8. Receivers are designed to mount onto standard, Two Gang (US) electrical boxes. Depth of electrical boxes shall be capable of housing a transformer to power a Locator when required.
9. Receivers are designed to mount onto standard, Two Gang (US) electrical boxes. Depth of electrical boxes shall be capable of housing a transformer to power a Locator when required.
10. Receivers can be ceiling or wall mounted.

2.7 TAGS

Transmitters shall be of a size, shape, and weight to be considered portable by any wearer. It shall be capable of activating any receiver within the system. It must be able to be activated with one hand. It shall be able to be reset and used again.

A. Electronic Transmitter - Model LC-210:

The transmitter shall be grenade type activation, i.e., pulling a pin that assures continuous hands-free operation. By attaching the clip on the lanyard to a belt loop or buttonhole the unit cannot be removed from an individual without being activated. The transmitter shall have two transducers. The transmitter shall have "man-down" capability and shall be powered by lithium batteries rated at five years shelf life or 250 hours of continuous operation or by 9-volt alkaline batteries rated at one year or 70 hours of continuous operation. The transmitter shall have a low- battery indicator and stainless-steel belt clip. This device should be capable of performing, if necessary, within this same system in place of or in conjunction with a mechanical counterpart.

B. Electronic Transmitter - Model LC-110:

The transmitter shall weigh approximately 1.5 ounces and shall be operated by a 12-volt power supply. When worn properly the transmitter shall have one transducer directed away from the wearer. It shall have a low battery indicator in the form of a yellow LED mounted at the top of the unit, where it may be easily viewed by the wearer. The transmitter shall be a receptacle allowing it to be worn around the neck and a metal clip on the back of the unit, allowing for attachment to most articles of clothing. The transmitter shall be grenade type action, i.e., pulling a pin that assures hands-free operation. By attaching the clip on the lanyard to a belt loop or buttonhole the unit cannot be removed from an individual without being activated. This device should be capable of performing, if necessary, within the same system in place of or in conjunction with a mechanical counterpart.

c. P-105 Pen Transmitter

The transmitter shall be a non-battery powered transmitter, having no electronics. The device shall be simple enough to be worn in a shirt or blouse pocket. The unit, upon activation, shall send only a single, continuous signal. This device shall be capable of performing, if necessary, within this same System in place for in conjunction with an electronic counterpart when single frequency receiver devices are specified.

2.8 CONDUCTORS AND CABLES

A. Receivers

Jacketed, 18 AWG minimum, not greater than 16 AWG, 2 conductors, shielded plenum.

B. Gateways

Category 6A or higher performance 4-pair balanced twisted-pair cabling as specified in ANSI/TIA-568-C.2 and ANSI/TIA-568-C.2-1 is recommended.

PART 3 – EXECUTION

3.1 WIRING METHODS

A. Wiring Method:

1. Install cables in pathways and cable trays except within consoles, cabinets, desks, and counters. Conceal pathway and cables except in unfinished spaces.

2. Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

B. Wiring within Enclosures:

1. Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF CABLES

3.3 INSTALLATION

3.4 GROUNDING

3.5 FIELD QUALITY CONTROL

3.6 SYSTEM STARTUP

3.7 ADJUSTMENTS

3.8 DEMONSTRATION/TRAINING

END OF SECTION