

ATLAS RTLS

Real Time Locating and Safety System

Operational Overview

Engineering Specifications

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The Specification contains details on all hardware in the ATLAS system; you should include only the devices that are applicable to your installation. Where applicable, choices in the specification are noted by the choices surrounded by brackets, in BOLD type <**choice 1/choice 2**>

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Narrative

Purpose:

The RTLS System shall contain Staff Duress functionalities that provide a means for the wearer to summon for assistance.

Summary:

Provide an Integrated Staff Duress Locating System (the 'System') of the type, size, capacity, and characteristics as indicated herein. Program system and assign device/zone numbers as per bid documents and owner's directives. All systems, products, and equipment shall be rated for 24-hour per day continuous operation. Equipment shall be rated for operation at 110V, 60Hz AC power, unless otherwise noted. All devices exposed to traffic in secure areas shall be non-ligature mounts with high impact housings (HK7 rating or higher) with tamper proof screws.

The System shall be capable of functioning as either a stand-alone system or as an integrated sub-system with an interface to the Physical Security Information Management System (PSIM) so that the other systems are prompted for support as necessary. The System is capable of interfacing to the PSIM via a RESTful API over Ethernet or standard Form C contacts.

Retrofit Language:

The System is designed to operate in new construction or as a replacement for existing RTLS systems. If the System is used as a retrofit/replacement for Bosch Security Escort, the System shall be capable of utilizing at least 70% of the existing field architecture (power supplies, backplates, domes) of the existing Security Escort system (if applicable). When used as a replacement for an existing Bosch deployment, the System shall ensure that all Locators are installed in ligature-resistant enclosures.

If the System is used as a retrofit/replacement for Actall PALS 9000, the System shall be capable of utilizing at least 90% of the existing field architecture (power supplies, backboxes) of the existing system.

Acceptable Technologies:

The Staff Duress System shall be the ATLAS Real-Time Locating System manufactured by Actall Corporation or approved equal.

Basis of Design:

This system is designed using the ATLAS Duress System, as manufactured by Actall Corporation. The system includes Tags that are worn on by the staff and Locators positioned in the ceilings or walls on opposite sides of ingress and egress points between zones within the facility. Throughout daily activities, Tags will transmit their ID number and status to the Locators positioned in the facility. Locators will then wirelessly transmit the data to the Gateway Network, which then shall send that data to the HubSens Location Appliance via Ethernet. The Location Appliance will translate the available Locator information to determine the location of the Tag. Upon alarm activation, The Locating Appliance will interpret this

data and publish the appropriate Tag ID, condition, and location via the HubSens API. This information is then forwarded to the appropriate PrismUI station(s).

Operational Overview:

The System shall continuously supervise all devices specified herein. If a fault occurs, the Locating Engine API shall publish an event for the Prism User Interface (UI) to indicate an alarm function on screen. It shall be possible, via System software, to visually read out which component in the System is at fault, also indicating date and time of that fault. Systems without full supervision and reporting of faults via software will not be accepted.

The System shall provide the capability (through software programming) to allow individual buildings to receive only alarms associated with that building at their respective UIs so as not to disturb or disrupt other buildings during an alarm situation. The System shall also provide the capability to transmit all alarms to the control center(s) for full site wide alarm status via wireless transmissions to the Gateways and then by Ethernet to the Location Engine Server(s).

System Devices and Tags shall be field programmable using hardware and/or software provided by the Manufacturer. The system shall have remote programming capabilities via a commercially available remote access program accessible through a PrismUI Administrative Workstation and remote access provided by means of internet connectivity.

Tags are powered with commercially available, disposable Lithium-Ion batteries. The normal life of the battery will be between 3 and 28 months, depending upon the features programmed into the Tag and the duty assignment of the person using the device. Once the Tag battery has passed its low-voltage threshold (typically with 1 week of battery life remaining), a low battery indication will also be transmitted to the Location Engine Server(s), and a visual indicator will be present upon the Tag. Upon a low battery condition, the Tag will still operate for approximately 7 days. Spare batteries can be stocked and distributed at the issuance point for easy replacement by the user or control officer.

Locators are placed throughout the facility in accordance with the zoning diagrams attached hereto. Each Locator will be installed in accordance with Manufacturer's instructions and drawings. Multiple Locators may be installed inside of single zones for additional granularity. Tags will be programmed to emit a ping message in accordance with Manufacturer's instructions. Tags are programmed to broadcast a transmission on preprogrammed intervals. Each transmission will include the ID number and status of the Tag. This data is wirelessly transmitted to the Locator and then wirelessly to the Gateway network.

The ID numbers of the Tags and the Locators are then transmitted via Ethernet to the Location Engine Server(s) and logged in the appropriate User Interface(s). Certain Locators will be capable of operating as test points throughout the facility. Alarm messages received from Tags whose location resolves to a test point Locator will not display as an active alarm in the Crisis Controller software. Rather, they will display on the appropriate Test Screen UI and be logged as a test in the System.

Normal Operation:

Tags will be (permanently) assigned to all staff, volunteers, and contractors when entering the facility. Tag wearers shall be able to initiate an alarm when using the Tag by utilizing the available notification options on the device that they are assigned. Visitors to the facility shall be issued Tags on a temporary basis while inside the institution or facility. Tags can be worn using the attached belt clip, the belt or shoulder (epaulet) holster, neck straps, or lapel clip. If the Tag is placed in a pocket, care should be used to affix the clip to the pocket to prevent accidentally triggering an alarm (if applicable).

Once issued and activated, Tags will transmit messages to the Atlas network at a predetermined interval. These transmissions will be fully supervised within a time window set by the Owner. The Tags are powered with a commercially available, disposable Lithium-Ion battery. The normal life of the battery will be dependent upon the type of Tag, the features used by the Tag and the duty assignment of the person using the device. A low battery indication will also be transmitted to the HubSens Location Appliance to indicate replacement, and a visual indicator will be present upon the Tag itself. The Low Battery condition will/will not display in the User Interface. Once a low battery condition has been reached, the Tag will continue to operate for approximately 7 days. Spare batteries can be stocked and distributed at the issuance point for easy replacement by the user or control officer.

Locators shall be installed throughout the facility (per manufacturer's instructions) as indicated on the drawings. Multiple Locators may be installed inside of single zones for additional granularity and/or alarm reception. Tags will be programmed to transmit a message on a regular interval in accordance with the manufacturer instructions. That message will include the ID number and status of the Tag will be received by the Locators and then wirelessly transmitted to the Gateway network. That information is then transmitted via Ethernet to the Location Engine then published to the API. Certain Locators will be capable of being programmed as test points throughout the facility. Alarm messages received from Tags whose location resolves to a test point Locator will record as an active alarm in the Location Engine.

The RTLS/Staff Duress System shall have the capability to manage all system information and data via Ethernet the PrismUI Administration workstation. This will allow selected personnel to monitor selected areas for alarm activity generated throughout the day. All individual systems must be compatible with the system and software at the main monitoring CPU.

Administrative Operations:

The Owner shall establish a Tag issuance point where spare Tags and batteries are stocked. It may also be necessary to issue Tags to visitors from this location (staff will need to have the ability to add/update personal information on any person utilizing the Tag). In addition, all persons assigned to a Tag should routinely test the unit at the issuance point. If their identity has been changed or the unit swapped, a name change will be required within the alarm database.

Issuing Tags should be performed on a dedicated, PrismUI administrative workstation at a predetermined point and not on the main Prism User Interface in the Control Center (if deployed). This will prevent alarm reception from being interrupted or delayed by system administration activities.

Testing Tags can be performed on any PrismUI administrative workstation or on a Prism Test Station dedicated to that task.

The PrismUI administrative station(s) will be designed to provide comprehensive and periodic reports. Monthly summary reports shall, at a minimum, provide alarm totals for a desired period and alarm distribution by category (incident type). Other periodic reports shall include device detail reports and a Tag assignment report.

Emergency Operation:

Employees with Tags will, at a minimum, be able to activate alarms via Pushbutton (PANIC). Each Tag type contains different features; some Tags have multiple alarm types. Each alarm type shall be capable of operating independently, and each shall send a unique alarm code to the Location Engine. When an alarm is activated, the Location Engine will publish that event to its API and that information is capable of being annunciated on any PrismUI monitoring station, including audio and visual notifications. The alarm details will be displayed in text form (Date/Time, Name, Current and Previous Location, Alarm Type, Unit ID and Alarm Status) on the User Interface. The User Interface (SHALL/SHALL NOT) be capable of loading the appropriate graphic map displaying the alarm location. If the mapping option is chosen, a flashing icon will be displayed within the zone indicated by the alarm. The User Interface shall log the alarm data into the database and shall have the capability of printing the data on a local printer.

If Control personnel are assigned to monitor events, he/she will click the “acknowledge” icon on the monitor to silence the tone if programmed to do so. A solid icon will now be displayed at the alarm location. Control personnel may reset and clear the alarm event as soon as it is categorized. If the device condition has not cleared after the alarm has been reset, the alarm will clear in the Active Alarm window and appear in the Queue Alarm window, until the device condition has been cleared. After resetting the alarm, the alert monitoring screen shall automatically return to normal operational mode if no other alarms are pending and/or active.

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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/RTLS system including Tags, locating devices, infrastructure and locating software, including, but not limited to all devices shown in Part X of this specification (the "System"). The protected area shall be all areas within the buildings shown on the drawings unless otherwise noted. Outdoor protected areas shall be as shown on the drawings.

1.3 SUMMARY

A. Section includes:

1. Tags
2. Locators
3. Gateways
4. Tag Testing Station(s)
5. Power Supplies
6. Equipment Racks
7. Network Switches (POE)
8. Locating Engine and GUI
9. Conductors and Cables
10. Backup Power Supplies

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 by the Manufacturer.
- B. The Contractor shall have at least Five (5) years of design and engineering experience with the specified RTLSS on projects of not less than \$100,000
- C. The Contractor shall be fully trained and certified by the Manufacturer

1.8.1 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. It is the Contractor's responsibility to provide a system that meets or exceeds the performance specifications. All deviations from the performance specifications must be clearly identified in the product data submittal.
 - 1. ATLAS RTLS, Actall
 - 2. [insert additional as needed]
- B. The Contractor shall supply a Real Time Locating and Safety 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. Approved products will not be proprietary. Non-proprietary products are defined as: The products, replacement parts and service are available from three or more un-related (competitive) vendors.
- E. The warranty for all Approved products will be Two years from the date of Commissioning.
- F. Vendors of Approved Products shall make replacement components, parts and assemblies available for 10 years from the date of purchase.

2.2 FUNCTIONAL DESCRIPTION OF SYSTEM

- A. Provide a new Real Time Location and System (the 'System') that provides the Zone location and status of all Tags issued 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 Radio Frequency (RF) technologies only. Systems using an alternate technology (or hybrid technologies) shall not be acceptable. Alarms shall be received from all the secure areas of the building, as defined by the owner. Due to the variations in system layouts, exact locations of devices may not be shown on the drawings.
- B. All network and locating devices will be placed to locate a Tag as follows:
 - 1. Locate the event within an area that can be specifically and uniquely identified on the GUI and by description that responding personnel can locate the person(s) or asset(s) while in the identified area without extensive searching.
 - a. The event is in Hallway A. A person responding to Hallway A can visually survey the entire area and identify the Tag(s) associated with the event. Acceptable.

- b. The location of the Tag is in Dayroom 100. A person responding to Dayroom 100 cannot visually survey the entire area. The Responder can go to the sub-location associated with the Locator indicated in the GUI and visually identify the Tag(s) associated with the event. Acceptable.
- c. The location of the event is in Room 225. The GUI indicates that the Tag(s) associated with the event could be in adjacent areas/floors. Unacceptable.

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, 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. (add as Required)
- G. The System shall identify and locate non-alarming Tags as they are moving from zone to zone within the defined protected area. As the location of the Tag changes, the new information is updated in the API.
- H. The System shall provide access to Tag location and status via Ethernet-based API for event display and resolution. The API shall include (at a minimum)

1. Zonal Tag location
 2. Nearest Locator to Tag
 3. Tag Status
 4. Field Device Health
 5. <Insert additional requirements as needed>
-
- 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 current location (Zone and nearest Locator) and status for all Tags active in the system. Systems that report more than one location for an alarm or asset/tag shall not be acceptable under any condition.
 - K. Detection of Tag in alarm shall be independent of movement direction and speed.
 - L. The system shall be expandable.
 - M. Systems that rely on path of travel to determine location are unacceptable.
 - N. The System shall interface to all PLC and touch screen systems.
 - O. The system shall include hardware/software capable of testing safety devices by users in the areas that they are working. The testing capabilities shall include individual and multiple user access.

2.4 LOCATING ENGINE AND GUI

A. HubSens Locating Appliance

1. Hardware shall be as specified by the System Manufacturer. Current specifications can be found at www.actall.net/atlas.
2. HubSens locating appliance uses a Linux Ubuntu 22.04 Operating System.

B. PrismUI Workstations

1. Prism UI workstations use a Windows 11 Professional Operating System.
2. All Prism UI workstations shall be installed with the same alarm software package and shall be interchangeable without re-installing software, changing hardware or working through an array of settings.

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 LOCATORS

A. Locators - Part #60003-XX

1. Locators shall be powered by 12VDC. Each Locator shall draw no more than 40mA under normal operations.
2. Locators will be installed on opposite sides of ingress and egress points between zones and in rooms where room-level location determination is desired.
3. Locators can be programmed to a maximum of 65,535 different ID codes via a hardware interface. Each code will be associated with a zone or distinct area that will relate to the software program to a specific data entry when an alarm transmission is received from a Tag.
4. 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.
5. Locators will receive ID and status information from the Tags sent at 2.4 GHz, and relay that information wirelessly to the Gateway Network at 900MHz.
6. Locators 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.
7. Locators can be ceiling or wall mounted.

2.7 TAGS

A. Heavy Duty Personal Tag (HT) – Part #60001

1. The HT shall be a compact (less than 6.75 inch²) and lightweight unit capable of initiating three types of alarms:
 - a. Push Button: Activation manually by pressing a momentary button. Button will be recessed to prevent accidental activation and reset condition will be transmitted automatically
 - b. Pull Cord: Alarm activation by removal of pull cord mechanism from HT. Reset condition shall be transmitted by replacing the Pull Cord mechanism. HT shall be capable of operating without the pull cord mechanism, if desired by the Owner.
 - c. Person Down: Alarm Activation by tilting the HT more than 60 Degrees (\pm 15 degrees) from upright position. Reset condition is transmitted by returning the

HT to an upright position. This feature shall include the capability of setting a period of user-defined warning tones on the HT prior to alarm activation.

2. HT alarms shall be transmitted at a frequency less than 1Ghz and at a power output capable of being received through two justice grade walls (filled concrete with steel rebar space not less than 6 inches apart), without the use of repeaters or amplifiers. On alarm the HT shall transmit:
 - a. HT ID
 - b. Method of Activation
 - c. Low Battery Condition (if applicable)
3. The HT shall transmit a non-alarm supervision signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
4. The HT shall transmit a low battery signal when appropriate and continue to operate for a minimum of 7 days after the condition is set.
5. The HT shall display a low battery notification on the device itself.
6. The HT shall display a condition on the device alerting the User that the device is not connected to the network.
7. The HT shall display a condition on the device that the alarm has been sent. This display shall turn off once the alarm has been acknowledged at the appropriate PrismUI station.
8. The HT shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) and water exposure without breaking, failure to perform or malfunction. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
9. The HT shall have an IP54 International Protection Rating
10. The HT shall include a spring-loaded plastic or pre-formed metal belt clip capable of being used on a standard duty belt.
11. The HT shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.
12. The HT will have a 6-month battery life with normal usage on a 24-hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

B. Light Duty Staff Tag (LT-1) Parts #60007, 60007XL

1. The LT-1 shall be a small (less than 3.25 inches²) and lightweight unit capable of activating a push button alarm. Button will be recessed to prevent accidental activation and reset condition will be transmitted automatically.
2. The LT-1 shall transmit a non alarm supervision signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
3. The LT-1 shall transmit a low battery signal when appropriate and continue to operate for a minimum of 4 days after the condition is set.
4. The LT-1 shall display a low battery notification on the device itself.

5. The LT-1 shall display a condition on the device that the alarm has been sent.
6. The LT-1 shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) and water exposure without breaking, failure to perform or malfunction. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
7. The LT-1 shall have an IP65 International Protection Rating.
8. The LT-1 shall be capable of utilizing commercially available neck lanyards, badge reels or clips.
9. The LT-1 shall have the option to be fitted with a wristband for wear by either employees or patients.
10. The LT-1 shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.
11. The LT-1 will have a 6 month battery life with normal usage on a 24 hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

C.Light Duty Staff Tag (LT-2) Parts #60008, 60008XL

1. The LT shall be a small (less than 3.25 inches²) and lightweight unit capable of activating push button alarms. The LT-2 has two distinct buttons. Either button will be recessed to prevent accidental activation and reset conditions will be transmitted automatically.
2. The LT-2 shall have an option of an additional button to activate one alarm condition and two notification conditions. The additional conditions shall be configurable by the Owner in the RTLSS software.
3. The LT-2 shall transmit a non-alarm supervisory signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
4. The LT-2 shall transmit a low battery signal when appropriate and continue to operate for a minimum of 4 days after the condition is set.
5. The LT-2 shall display a low battery notification on the device itself.
6. The LT-2 shall display a condition on the device that the alarm has been sent.
7. The LT-2 shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) and water exposure without breaking, failure to perform or malfunction. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
8. The LT-2 shall have an IP65 International Protection Rating.
9. The LT-2 shall be capable of utilizing commercially available neck lanyards, badge reels or clips.
10. The LT-2 shall have the option to be fitted with a wristband for wear by either employees or patients.
11. The LT-2 shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.

12. The LT-2 will have a 6 month battery life with normal usage on a 24 hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

D. Light Duty Badge Tag (LT-B) Part # 60019

1. The LT-B shall be a small (approx. 3.5X2.25) and lightweight unit capable of holding a standard size ID or HID access card. The unit shall be capable of activating alarms via a pull-down slide switch and a push button alarm. Button will be recessed to prevent accidental activation and reset condition will be transmitted automatically.
2. The LT-B shall have an option of an additional button to activate one alarm condition and two notification conditions. The additional conditions shall be configurable by the Owner in the PrismUI software.
3. The LT-B shall transmit a non-alarm supervision signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
4. The LT-B shall transmit a low battery signal when appropriate and continue to operate for a minimum of 4 days after the condition is set.
5. The LT-B shall display a low battery notification on the device itself.
6. The LT-B shall display a condition on the device that the alarm has been sent.
7. The LT-B shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) without breaking, failure to perform or malfunction. The LT-B is only water resistant. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
8. The LT-B shall be capable of utilizing commercially available neck lanyards, badge reels or clips.
9. The LT-B shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.
10. The LT-B will have a 6-month battery life with normal usage on a 24-hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

E. Asset Tracking Tags (AT) Part # 60006

1. The AT shall be a small (less than 3.25 inches²) and lightweight unit and does not include any alarming capability.
2. The AT shall transmit a non-alarm supervision signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
3. The AT shall transmit a low battery signal when appropriate and continue to operate for a minimum of 4 days after the condition is set.
4. The AT shall display a low battery notification on the device itself.

5. The AT shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) and water exposure without breaking, failure to perform or malfunction. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
6. The AT shall be attached with either two-way tape or Velcro.
7. The AT shall have the option to be fitted with a wristband for wear by either employees or patients.
8. The AT shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.
9. The AT will have a 12-month battery life with normal usage on a 24 hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

F. Patient Tag (PT) Part # 60017

1. The PT shall be a small (less than 3.25 inches²) and lightweight unit and does not include any alarming capability.
2. The PT shall transmit a non-alarm supervision signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
3. The PT shall transmit a low battery signal when appropriate and continue to operate for a minimum of 4 days after the condition is set.
4. The PT shall display a low battery notification on the device itself.
5. The PT shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) and water exposure without breaking, failure to perform or malfunction. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
6. The PT shall be attached with either removable or cut resistant bands.
7. The PT shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.
8. The PT will have a 12-month battery life with normal usage on a 24-hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

G. Inmate/Patient Secure Tracking Tags (IT) Part #60018

1. The IT shall be a small (less than 3.25 inches²) and lightweight unit and does not include any direct alarming capability.
2. The IT shall transmit a non alarm supervision signal on a frequency adjustable by the Owner. The device shall also display a notification that this transmission is being sent to the User.
3. The IT shall transmit a low battery signal when appropriate and continue to operate for a minimum of 4 days after the condition is set.
4. The IT shall display a low battery notification on the device itself.

5. The IT shall be constructed to withstand normal usage including drop (20ft), temperature (0-50C) and water exposure without breaking, failure to perform or malfunction. The Vendor shall provide all testing procedures and certify that the tests have been performed including all electronic components, clips and accessories.
6. The IT shall have an IP67 International Protection Rating.
7. The IT shall be equipped with a no-cut band and generate an alarm condition when the band is cut or removed from the housing.
8. The process to attach the band and activate the IT shall be less than 20 seconds and require no special tools.
9. The IT shall operate using a commercially available, disposable battery. Units using rechargeable batteries will not be acceptable.
10. The IT will have a 9-month battery life with normal usage on a 24 hour duty cycle. Vendor will provide calculations and assumptions used to arrive at this figure.

2.8 TEST STATIONS

PMT Test Station

- A. Provide Tag Testing station that a user can perform a self-test at any time after being issued a PMT.
- B. The Tag Test station shall allow the Tag to be activated by the user and will not generate a Tag alarm on the RTLS.

2.9 CONDUCTORS AND CABLES

- A. Locators
 - 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

Wiring Method:

- Install cables in pathways and cable trays except within consoles, cabinets, desks, and counters.
- Conceal pathway and cables except in unfinished spaces.
- Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

Wiring within Enclosures:

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