

## **PART 1 GENERAL**

### **1.1 Document Purpose**

The purpose of this document is to specify the Guide Specifications and Bid Criteria for the design, supply, installation, commissioning, and associated training for a RoamAlert system as manufactured by Stanley Healthcare Solutions. This facility has the Stanley Healthcare RoamAlert in use and requires new additions to be compatible with existing equipment.

### **1.2 Important Statement**

The RoamAlert system is designed to assist staff in providing a high degree of safety for residents/patients and assets. The RoamAlert system is designed to be one component of a comprehensive protection program. As with every security system, Stanley Healthcare Solutions highly recommends regular system operational checks to verify functional integrity.

### **1.3 Warranty**

The installed equipment, not including Tags or consumables shall be warranted by the manufacturer to be free of defects in material and workmanship for a period of one (1) year from date of shipment from the factory.

### **1.4 References**

- A. Underwriters Laboratories Standard
  - 1. ITE UL 60950, #E218113
  - 2. ALVY UL 294 PB 4982
- B. Canadian Standards Association
  - 1. CSA-C22.2 NO. 60950-00
  - 2. CSA-C22.2 No. 601.1 - M90
- C. National Electrical Code

### **1.5 System Description**

The RoamAlert System is composed of the following components:

- A. Door Controller kit comprised of the following sub-components
  - 1. Door Controller
  - 2. Exciter antenna
  - 3. Exciter antenna cable
  - 4. Receiver antenna
  - 5. Door contact

6. Door contact cable
  7. Access Keypad
  8. Keypad Cable
- B. Elevator Controller kit comprised of the following sub components:
1. Elevator Controller
  2. Surface mounted exciter antennas (2) with cables
  3. Power Supply
  4. Access Keypad and cable
  5. Interface relay and cable
- C. Receivers comprised of the following sub components:
1. Receiver
  2. Receive antenna
- D. Server Computer which is available in two versions comprised of the following sub components:
1. RoamAlert Plug-in Server Bundle:
    - a. PC (monitor not included)
    - b. Network Manager
    - c. RoamAlert Server Software
    - d. One-year Software Maintenance Agreement
    - e. Complete Configuration
  - Or
  2. Self-Install Server Bundle (PC & monitor not included):
    - a. RoamAlert Server Software
    - b. RS-232 to RS-485 Converter or Network Manager
    - c. One-year Software Maintenance Agreement
- E. Workstation Computer which is available in two versions comprised of the following sub components:
1. RoamAlert Workstation Bundle:
    - a. PC (monitor not included)
    - b. RoamAlert application software
  - Or
  - c. RoamAlert Workstation License
  - d. RoamAlert application software

- F. I/O-8 Module
- G. Central Power Supply
- H. RS-485 Communication network
- I. Ethernet network
- J. Tags
  - 1. Wrist Tag with Tag Pulse
  - 2. Wrist Tag without Tag Pulse
  - 3. Asset Tag
  - 4. Pendant Tag
  - 5. SB Tag
- K. Pocket Tag Reader (Tag configuration and test tool)
- L. Tag Rack

## **1.6 System Operation**

### **A. Door Controller Kits**

The RoamAlert system shall create a perimeter around the protected area using Door Controller Packs at each of the egress points. The Door Controller packs detect Tags worn by residents/patients or attached to Assets, and upon detection may perform any or all of the functions described in Sec. 2.17.

### **B. Elevator Controller Kits**

Elevator Controller Packs shall be used when egress is possible via an elevator. Elevator Controller Packs are mounted on the elevator car, with the antennas mounted inside the car to detect Tags within the car. When a Tag enters the elevator car the Elevator Controller may perform any or all of the functions as described in Sec. 2.18.

### **C. Receivers**

Receivers shall be placed at specified intervals within the protected perimeter to receive signals generated by the Tag as described in 2.19.

### **D. RoamAlert Application Software (Server software)**

RoamAlert Application Software and central database shall reside on the Server Computer. The Server receives status information from the Door Controllers, Elevator Controllers, and Receivers via an RS-485 Network. The Server also provides an Ethernet network connection to which Workstations may be connected. All of the functions of a client Workstation are available at the Server, which may be used on a day-to-day basis by the user. Specific Software features and functions are described in Sec. 2.6– 2.14.

E. RoamAlert Remote Application Software (Remote License)

RoamAlert Remote Application Software and a secondary database shall reside on each of the Workstation Computers. The workstation computers shall allow the user to access the remote software capabilities of the RoamAlert system. Administrative account access is restricted to the server PC only.

F. I/O-8 Module

The I/O-8 Module shall provide transistor connections that allow external relays to be used to enable the integration of other manufacturers' equipment into the RoamAlert System.

G. Central Power Supply

A Central Power Supply shall provide eight (8) eight independent, fuse protected, 24 VDC trigger controlled outputs.

H. RS-485 Network

An RS-485 Network shall be used to communicate Door Controller and Receiver status to a server computer.

I. Ethernet Network

An Ethernet Network shall be used to communicate data between the Server and the Workstations. The computers shall communicate via TCP/IP.

J. Wrist Tag with Tag Pulse

Wrist Tags worn by residents/patients shall be detected by the Door Controllers placed at each egress point, generating a Wander alarm. The Tag shall also indicate a low battery condition 30 days prior to the Tag becoming inoperative due to a low battery. The Wrist Tag shall emit a Tag Pulse every 16 seconds to enable the system to fully supervise the Tag. The system shall alarm if the Tag Pulse is not received by the system. The Wrist Tag shall be constructed of a high impact plastic that is easily cleaned. The Wrist Tag shall carry a one-year warranty.

K. Wrist Tag without Tag Pulse

Wrist Tags worn by residents/patients shall be detected by the Door Controllers placed at each egress point, generating a Wander alarm. The Tag shall also indicate a low battery condition when brought into the field of a protected egress point 30 days prior to the Tag becoming inoperative due to a low battery. The Wrist Tag shall be constructed of a high impact plastic that is easily cleaned. The Wrist Tag shall carry a three-year warranty.

L. Asset Tag

Asset Tags shall be detected by the Door Controllers placed at each egress

point. The Tag shall also indicate a low battery condition 30 days prior to the Tag becoming inoperative due to a low battery. The Tag shall create a Tag Pulse at 16-second intervals to enable the system to fully supervise the Tag. The system shall alarm when the Tag Pulse is not received by the system. The Asset Tag shall carry a three-year warranty.

M. Pendant Tag

The Pendant Tag shall have two compatible functions: to be worn by hospital staff and employees to enable automatic bypass of Door Controllers placed at each egress point; and to enable staff or residents/patients to call for assistance from anywhere within the coverage area. The Pendant Tag shall be usable for real-time locating in a receiver-based RoamAlert system. The Pendant Tag shall carry a one-year warranty.

N. Pocket Tag Reader

The Pocket Tag Reader shall test all types of Tags and display the electronic serial number and battery status. The Pocket Tag Reader shall have capabilities to test field strength and function as a diagnostic tool for technicians and installers of the RoamAlert system.

O. Tag Rack

The Tag Rack shall store up to 42 Tags. Tags shall have their pulse disabled while in the Tag rack so as to conserve battery life.

## **PART 2     PRODUCT DESCRIPTION**

### **2.1     Component Quantities**

The quantities of components shall be determined and installed by the contractor based on the requirement to provide a fully operational wander prevention system as per the intent of the specific application as shown on the shop drawings and as recommended by the manufacturer.

### **2.2     Server Computer**

The Server Computer shall be IBM Compatible with the following specifications or better:

- A. CPU shall be a minimum of Intel® Celeron®, 3.0 GHz
- B. RAM shall be a minimum of 2 GB
- C. Hard Disk shall be a minimum of 100GB
- D. CDR/W shall be 52x24x52
- E. Ethernet card shall be 100BaseTX
- F. Operating System shall be Windows 7 SP2 or SP3
- G. Warranty period is administered by the computer manufacturer

### **2.3     Workstation Computer (Console)**

The Workstation Computer shall be IBM Compatible with the following specifications or better:

- A. CPU shall be an Intel® Celeron®, 2.2 GHz
- B. RAM shall be 1 GB
- C. Hard Disk shall be 40GB
- D. CDR/W shall be 52X24x52
- E. Ethernet card shall be 100BaseTX
- F. Operating System shall be Windows 7 SP2 or SP3
- G. Warranty period is administered by the computer manufacturer

### **2.4     Ethernet LAN**

An isolated 100Mb Ethernet Local Area Network shall be constructed in order for the Server and Workstation computers to communicate utilizing Dynamic TCP/IP protocol. The Server and workstation may reside on an existing LAN however LAN traffic and stability must be taken into consideration.

### **2.5     RS-485 Network**

An isolated RS-485 Network shall be constructed utilizing proper RS-485 communications cable, the rating of which adheres to Code. Door Controllers, Elevator Controllers, Receivers. I/O 8 Modules and all other potential family RS-485 devices shall be connected in this network adhering to RS-485 protocols. This network shall be interfaced to the RoamAlert Server.

## 2.6 Server Software

The Server Software shall have three levels of security, User, Supervisor and Administrator, each protected by user names and passwords. The capacity shall be 1000 users. In addition to the functions listed under the pertinent section below, the User screen shall provide the following features:

- A. Graphical Floor Plan, displayed prominently on the screen. The floor plan shall be stored on the Server hard disk, in a bitmap format.
- B. Mode Indication, indicating the current mode the software is operating in: User, Supervisor or Administrator.
- C. Assigned Tag Count
- D. Unassigned Tag Count
- E. Day/Date/Time
- F. Number of active alarms
- G. Device Icons shall indicate the location of all Door Controllers, Elevator Controllers, Receivers, and I/O-8 Modules when in an alarm state. The Server and Workstation icons are displayed at all times.
- H. Active Alarm Indication shall be displayed on the Graphical Floor Plan, using separate icons to differentiate between Wrist Tags, Pendant Tags and Asset Tags. An alarm identifier shall appear as a text description of the alarm, indicating the location of the device (Door Controller, Elevator Controller, I/O-8 Module or Receiver), the name of the resident/patient, and the date and time of the alarm event. The alarm event shall also be indicated by a user defined sound, stored on the Hard Disk as a .wav file. Separate sounds may be configured for Wrist Tags and Asset Tags.

## 2.7 User Mode Functionality

The User Mode shall require a User Level password and user name in order to access the following functions:

- A. The Admit feature shall be accessible via a single-click button on the User Screen. When the Admit button is selected an Admit Wizard shall guide the user through the process of associating Wrist Tags and Asset Tags to their respective resident/patient or asset. Tags which are currently associated to residents/patients or assets will not be selectable in this screen to prevent Tags being associated with more than one resident/patient or asset.
- B. The Discharge feature shall be accessible by a single-click button on the User Screen. When the Discharge Button is selected a Discharge Wizard shall guide the user through the process of disassociating the Tag from the resident/patient or asset. Tags which are not associated to a resident/patient or asset will not be available in this wizard.
- C. The Accept Alarm feature shall be accessible by a single-click button on the user screen. As an alternative, the alarm may be selected by double-clicking the text description of the alarm. In either case, the Accept Alarm wizard shall guide the user through the process. When an alarm is accepted a note must be entered into the wizard to describe the details of the alarm. This note may be selected from a drop down menu box with pre-defined annotations that are customizable by each facility. The drop down annotations are defined by a supervisor in the Supervisor Mode, see Sec. 2.8.
- D. The Edit button shall allow the user to edit the resident/patient or asset information

without discharging and readmitting the resident/patient.

- E. The Mute button shall allow the user to mute the alarm sound without a user name and password being entered. It is possible to disable the Mute button within the Administrator Mode if this functionality is not desired.
- F. The Locate feature shall allow the user to locate any Tag with Tag Pulse within the protected perimeter. Upon entering the Locate function, a tree-structured list of assigned Tags organized by floor, Tag type and category will appear. A user can locate one or more Tags in the system by floor, by Tag type and by category (for Pendant and Asset Tags). The physical locations of Tag shall be indicated on the floor plan by the appropriate Tag icon.
- G. The Transport button shall allow the user to designate a Tag for transport out of the protected perimeter. When the Transport button is selected a Transport wizard text box shall appear guiding the user through the Transport process. The transport feature shall allow the user to select a Tag for transport, assigning the Tag a specified duration of leave from the protected perimeter in fifteen minute intervals to a maximum of 72 hours. The Tag which has been selected for transport will be automatically bypassed through any of the perimeter doors during the following 15 minutes, and will then be in Transport mode for the duration selected in the Transport wizard. If the Tag is not transported through any of the doors within 15 minutes, the transport feature will be automatically cancelled. When a Tag in transport mode is returned to the protected perimeter, it must be reactivated manually.

## **2.8 Supervisor Mode Functionality**

The Supervisor Mode shall require a Supervisor Level password and user name in order to access the following functions as selectable tabs:

- A. The Activity Log shall record all events, including general information, alarms, warnings, acceptance of alarms, Tag status changes, software status, communication errors, node failures, attempted security breaches, software configuration changes, console errors and system errors. The Activity Log shall have the following buttons to provide ease of use. The Activity Log shall be stored for a minimum of 30 days, configurable by the user, with the ability to backup the Activity Log to a folder on the computer network.
- B. Date Navigator buttons to jump to the First Day, Previous Day, Next Day, and Last Day of the Activity Log.
- C. Annotation button to annotate the Activity Log entry.
- D. Auto Refresh button to suspend writing to the activity log while it is being used.
- E. Activity Display Filter Setup to set up criteria for viewing events in the Activity log.
- F. Print button to print the currently displayed Activity Log data.

## **2.9 Administration Mode Functionality**

Administration Mode shall require a Administrator Level user name and password in order to access the following functions:

- A. RoamAlert Settings

The Settings tab shall contain the following user configurable checkbox options:



1. **Filter Door Events** shall cause each door open and close event to be written the activity log.
  2. **Show Noise Status** shall cause RF noise status events to be displayed.
  3. **Nurse Saver Mode** shall suppress Exit alarms when the door is closed and there is no danger of a Tag exiting the protected perimeter.
  4. **Use Screen Saver** shall display a screen saver after five minutes of user inactivity.
  5. **Show Floor Plan Icons** shall cause floor plan icons to be hidden until an alarm associated with the associated device takes place.
  6. **Use Small Icon Size** shall cause floor plan icons to be displayed at a smaller size to aid viewing of floor plans with many icons.
  7. **Alarm On Unassigned TIF** shall display TIF alarms from Tags that are stored improperly.
  8. **Enable Mute Button** shall enable users to access the Mute button.
  9. **Warn on Tag Not in Inventory** shall select the option of displaying a warning when a Tag is seen that is not in the Tag database.
  10. **Multi Floor TIC Discriminator**, shall select the option of displaying alarms only to the floor the Tag is referenced with
  11. **Activity Log Keep Last x Days** shall select how many days of the activity log to keep on file.
  12. **Backup Folder** shall select the location for backup storage.
  13. **Missed Tag Pulse Actions** shall select how the system responds to configured missing Tag Pulse signals.
  14. **Message Port** settings shall select the serial port to connect to the system and the messaging baud rate to communicate with the Tags.
  15. **System Background Color** shall provide a background color palette to select the desired color of the display properties.
- B. Activity Log
1. The Activity log tab shall have the same properties as the Activity Log tab in Supervisor mode.
- C. Tags
1. The Tags tab shall have the same properties as the Tags tab in Supervisor mode.
- D. Users
1. The Users tab shall have the same properties as the User tab in Supervisor mode.
- E. Floors
1. The Floors tab shall allow the Administrator to import floor plans from a bitmap file into the application. This tab shall also allow the user to drag and drop Door Controller, Elevator Controller, Receiver and I/O-8 Module icons onto the imported floor plans in the application.
- F. Consoles
1. The Consoles tab shall allow the Administrator to add workstation consoles to the Ethernet network. Each console shall be configurable with the following filters: 3

Tag ID range filters, 2 Tag Type filters, and alarm suppression filters. This feature is used to partition each console to respond to the selected type of alarms, and the selected alarm zones.

G. Nodes

1. The Nodes tab shall allow the Administrator to add or delete Door Controller, Elevator Controller, Receiver, and I/O-8 Module devices to/from the system's database.

H. Links

1. The Links Tag shall allow the Administrator to add or delete and configure links. Links shall enable a logical condition to be related to an I/O 8 Module channel, configurable by the Administrator.

I. RS485 Network

1. The RS485 Network tab shall add or delete and configure the baud rate of any attached RS-485 network drivers.

J. Sounds

1. The sound notification tab shall allow the Administrator to customize alarm sounds by importing a .wav file into the application

K. Messaging

1. The Paging/Messaging Interface shall allow for notification of alarms to be sent directly to a messaging device such as a pager.

L. Annotations

1. The Annotation tab shall allow the Administrator to add/delete preconfigured annotations to be selected by the user when accepting an alarm.

M. Categories

1. The Categories tab shall allow the Administrator to classify Tags into groups to enable the Tags to bypass specified Door Controllers without generating an alarm.

## 2.10 Tags

The Tag Database shall record all Tags in the facility inventory. Each Tag shall be listed with the Tag ID, Tag status, assigned by, date time assigned and warranty expiry date. The Tag database shall have the following buttons:

- A. Add New Tag shall initiate the Add New Tag wizard, which will guide the supervisor through the process of adding a Tag manually or using a Tag Link to automatically read the tag serial number.
- B. Delete Tag shall delete the Tag from the Tag Database, however not the records pertaining to the Tag in the activity log.
- C. Tag Properties shall include information containing Tag serial number, status, Tag expiry date, Tag assignment, assigning user, Tag pulse supervision, location history and Category.
- D. Print, which shall print the Tag database list.

## **2.11 Users**

The Users Database shall record all users authorized to access the software. The User Database shall list Login Name, Full Name, Access group, Status, Assigning user, Date/Time assigned. The User Database shall have the following buttons:

- A. Add New User shall initiate the Add New User wizard, which will guide the Supervisor through the process of adding a new user.
- B. Delete User shall allow the Supervisor to delete a current User with an equal or lower access level.
- C. Properties shall display the properties of the user including: Login name, Full name, Password (hidden), PIN code, Access rights, and a checkbox to disable login for that user.
- D. Print, which will print the user list.

## **2.12 Annotations**

The Annotations database shall provide the user with automatic alarm annotation entries. The Annotations database shall have the following buttons:

- A. Add New Annotation shall enable the Supervisor to add new annotations, which will be made available in a drop down list to the user when an alarm is acknowledged.
- B. Delete Annotation shall allow the Supervisor to delete the Annotation.
- C. Properties shall allow the Supervisor to view or edit the Annotation.

## **2.13 Tag Categories**

The RoamAlert system is capable of providing customized levels of access for residents/patients of different cognitive ability. The Tag Categories shall allow for organizing Tags into groups to enable Tag groups to bypass specified Door Controllers without generating an alarm.

- A. Add New Tag Category shall allow for defining and configuring a Tag class for Tags.
- B. Delete Tag Category shall allow the Supervisor to delete a Tag Category.
- C. Properties shall allow the Supervisor to view and edit the Tag Category.

## **2.14 Notification to Messaging Devices**

The RoamAlert system shall be capable of automatically forwarding alarm notifications to messaging devices such as pagers. This feature has the following sub-components:

- A. Pager View shall list all configured messaging devices and include: device ID, notification events, console and optional notes.
- B. Add New Messaging Device shall invoke the Messaging Device Wizard, which will guide the user through the addition of a new messaging device. Notification events that can be sent to messaging devices includes: Notify on Exit Alarm, Notify on Duress Alarm, Notify on Alarm Acceptance, and Notify on a Communication Alarm. The workstation/console from where the notification events are generated is also selected.
- C. Delete Messaging Device shall invoke the Delete Messaging Device Wizard, which will guide the user through the deletion of a messaging device.
- D. Properties shall allow the properties of the messaging devices to be edited including the notification events to be sent to a specific messaging device and the workstation/consoles from which the notifications will be generated.
- E. Print shall allow a hardcopy print out of the Pager View.

## **2.15 Workstation Software**

Workstation software shall be installed at each RoamAlert workstation. The software features are identical to the User and Supervisor mode features on the Server. For security purposes Administration mode shall not be available on RoamAlert workstations to prevent unauthorized changes to system parameters.

## **2.16 Alarm Output Module**

The Alarm Output Module shall connect to either the Server or Workstation RS-232 serial port. The Alarm Output Module shall incorporate 2 Form-C relay outputs, one to notify on TIF and the other to notify on TIC.

## **2.17 Door Controllers**

The Door Controller shall be mounted at each egress point to detect Tags attempting to exit the protected perimeter. The Controller shall also detect Tag initiated communication messages such as Duress alarms and low battery signals. The Controller shall communicate all Tag messages and Controller status to the RoamAlert Server. The Controller shall also provide audible and visual indicators via local alarm annunciation devices, which shall include an Access Keypad mounted near the egress point. The Door Controller circuit board shall consist of a 433.9 MHz receiver to receive signals from the Tags, and a 307 kHz transmitter to send information to the Tags.

- A. Standalone Operation
  - 1. This Door Controller shall be fully capable of operating in stand-alone mode in the event of loss of communication with the RoamAlert Server.
- B. Front Panel Connections
  - 1. The front panel shall provide easy access to a number of different output formats as well as allowing inputs to alter some of its automatic functions as necessary.
    - a. Input Voltage

The Controller shall operate on 24 VDC rated at 1.5 A, including current required to operate the maglock.

b. RS-485

The Controller shall have an RS-485 connection to communicate information to the RoamAlert Server.

c. Wiegand Output

The Tag IDs and status as well as Controller serial number and status information shall be output in Wiegand format on 2 of the output pins.

d. Door Switch Input

The Controller shall use the Door Switch input to disable alarm reporting when the door is closed. This is known as the Nurse Saver Feature. Although Tags are still detected and reported to the RoamAlert Server, no alarms shall be annunciated until the door opens. At that time, all the Tags are re-read by the Controller so that only the Tags that are still in the field will cause an alarm. The door switch is also useful during bypass as the controller will detect the door opening and then terminate the bypass as soon as the door closes. In the event that a Tag is detected at the door with the door being closed, and the Tag remains at the door for a period exceeding 55 seconds, a Loiter alarm is created.

e. Override In

Override In shall disable the Door Controller exciter field in order that no Tags are read and no Exit or Loiter are reported to the RoamAlert console. Shorting the Override In line to system ground will activate this function. The Override In shall ignore Duress alarms, Low Battery alarms, or Tag Pulse messages from the Tag.

f. Unlock In

Unlock In provides a temporary release of the door, by dropping the Mag Out voltage to zero, for a maglock override such as that from a fire alarm control. New alarms and messaging are still allowed.

g. Alarm In

Alarm in will cause an immediate lockup of the door with the local and remote alarm annunciators on.

h. Maglock Output

The MagOut line shall supply a minimum of 1A at 24 VDC to a magnetic door lock when Tags are detected in the field.

i. Auxiliary Relay Outputs

The Controller shall provide 2 Form-C dry relay contacts. Relay 1 will activate on TIF and door open, or Loiter, if selected. Relay # 2 is configurable for activation on TIF, TIC, or bypass.

2. Front Panel Indicator

This indicator shall be solid red in stand-alone mode. In a networked system, the indicator shall be solid green to indicate normal communications, and alternate

red/green to report communications failure.

### 3. Internal Mode Switch

An internal mode switch shall provide the Controller the following function Responses:

- a. Test Mode used for Exciter Field set-up
- b. Latched or unlatched alarm options
- c. Relay #2 configuration for activation on TIF, TIC, or Bypass.

### 4. Exciter Antenna Status Alarm

The Controller shall have the ability to detect the status of the Exciter Antenna and report a problem to the RoamAlert Server in the event it senses either of the following:

- a. SRA Exciter Antenna is disconnected from the Controller
- b. The Exciter Field is significantly turned down ( $< 4.5V$ ) to the point where an exciter field hardly exists.

### 5. Physical Installation

The Door Controller shall be designed for surface wall or shelf mounting. All wiring to and from the Door Controller shall be terminated on a plug-in, polarized terminal strip so that wiring remains intact should Door Controller replacement become necessary. The Door Controller housing shall be constructed of zinc dichromate plated steel with a flip top lid for easy access. The Door Controller shall require a 24 VDC power source and shall be connected to a surge-protected emergency generator circuit if available.

### 6. The Receiver Circuit shall have the following functions:

- a. Threshold / RX Sensitivity Switch (R3 Receiver only)

The Threshold switch may be adjusted to increase or reduce the sensitivity of the Receiver and therefore the range of detection of Tags. It is also used to remove some of the background RF noise on the radio channel if the Controller is having trouble detecting Tags. The adjustment raises the RF field strength required for Tags to trigger the Controller into alarm, and reduces the detection field range. Maximum sensitivity is "9," and minimum sensitivity is "1." Setting to "0" turns the Receiver input OFF.

- b. Threshold / RX Sensitivity (R4 Receiver only)

R4 Receivers are autosensing for maximum range.

- c. Receiver Activity Indicator

The Receiver Activity Indicator shall blink briefly when valid data is received by the Controller. Continuous activation indicates the presence of RF noise. No indication signifies that the receiver section is not operational.

### 7. Exciter Antenna

The Exciter Antenna shall be designed for surface wall, ceiling, or floor mounting, or concealed within the ceiling or wall structure of the area to be protected. The antenna wiring shall consist of a factory prepared 7.5 meter (25 foot) RG59U coaxial cable with BNC connectors from the antenna to the Door Controller. A single Exciter Antenna

shall have a field range of approximately 10 feet. Two antennae connected to the Door Controller shall have a range of 16 feet.

## **2.18 Elevator Controllers**

The Elevator Controllers shall prevent an elevator car from moving should a Tag enter the elevator car. The Exciter Antennas transmit a 307 kHz radio signals that create a detection zone inside the elevator. When a Tag enters the detection zone, it transmits its identity at 433 MHz to the Elevator Controller's Receiver Antenna, and a pre-alarm shall sound in the elevator car. Should the Tag exit the elevator car within the 11-second pre-alarm time period, the system will reset, the pre-alarm will clear, and the elevator will resume its normal operation. Should a Tag remain on board the elevator, an Exit Alarm will occur and the elevator doors will remain open preventing the elevator from moving. In Exit alarm mode, the elevator system will attempt to automatically reset every 10 seconds. When the Tag is removed from the elevator car, reset will automatically occur at the end of the last 10 second time period, the audible alarm will cease, and the elevator will resume its normal operation.

### **A. Elevator Bypass**

A keypad "Bypass" operation shall enable the transportation of one or more Tags by entering a valid bypass code on the keypad during the alarm period. The alarm will clear and the elevator will resume its normal operation. The Bypass light on the keypad will activate and remain on until all the bypassed Tags have left the elevator. The Bypass will only apply to Tags that are currently in the field. Any new Tags detected after the Bypass request will initiate a pre-alarm. In the event of fire or other emergency the elevator control system shall override the RoamAlert Elevator System. In addition, a set of terminals shall be provided that, when shorted by a dry set of contacts from the Fire Alarm system, will inhibit and override the operation of the RoamAlert elevator system.

### **B. Pre-Alarm**

The Elevator Interface shall enter a Pre-Alarm state as soon as it detects a Tag in its field. The Access Keypad shall indicate the pre-alarm, which will provide 10 seconds for a bypass code to be entered.

### **C. Exit Alarm**

An Exit alarm shall be indicated locally by a steady Alarm light on the Access Keypad. This alarm shall continue until all the Tags leave the detection field or the user requests a Bypass.

## **2.19 Receivers**

The Receiver shall receive the Duress alarm, Low Battery or Tag Pulse Message from the Tag at 433 MHz and report the status to the RoamAlert Server. The Receiver shall be powered by 24 VDC. Status indicators shall indicate RF activity, power and network status.

## **2.20 I/O-8 Module**

The I/O-8 Module shall be connected to the rest of the system via the RS-485 network. The user shall be able to configure each of the 8 ports as an input or output from the RoamAlert Server, as follows.

#### A. Input Zone

Two types of inputs shall be configurable at the RoamAlert Server:

1. Latching Input: The RoamAlert Server shall report an alarm when the zone is in alarm, and will remain in alarm condition until the zone input returns to the normal/default state and the user accepts the alarm.
2. Non-Latching Input: The RoamAlert Server shall report the alarm as long as the zone is in alarm and will automatically clear the alarm when the input condition returns to normal/default state.

Every Input Zone shall be configured to have a certain default input state. An input zone is said to be in alarm when the input condition is other than this default state. The two basic states shall be:

3. Normally Closed (NC): The normal state is when the zone contact is closed and an alarm is generated when the zone contact opens
4. Normally Open (NO): The normal state is when the zone contact is open and an alarm is generated when the zone contact closes

The Input Zone shall be configurable as a Supervised or Non-Supervised zone depending on whether an end-of-line termination resistor is installed at the input zone. Configuring the zone as a Supervised zone will help to detect whether the input switch is being tampered with, i.e. if the switch is hard-wired or open circuited.

#### B. Output Zone

The Output Zone shall be controlled by the Links feature at the RoamAlert Server. Links allows the user to link the occurrence of one or more predefined conditions such as time, input zone conditions, Exit alarm or Communication Failure alarm to act as a trigger (Link Trigger) which causes the system to carry out certain operations (Link Action) on one of the output zones specified during Link setup. A link can be triggered in one of three ways:

1. Time and Day triggered: Link actions are carried out during the Link ON period.
2. Alarm trigger: Link actions are carried out anytime the Link trigger condition is met.
3. Combination of 1 and 2 above: Link actions are carried out when the Link trigger condition is met during the Link ON period.

When a Link is active (all the trigger conditions are met), the link action causes the output state on the selected output zone to change from the normal state to the opposite state.

### 2.21 Central Power Supply

The Central Power Supply shall have 8 independent, fuse protected 24 VDC 1.25A outputs with a total current capacity of 10 A, supplied with a line voltage of 115 VAC. A fire alarm input shall be provided which will switch off power to four, or eight, outputs to deactivate maglocks. A Form-C relay output enables alarm monitoring, or trigger to other auxiliary devices. A battery backup shall provide continuous power to all devices in the case of a power failure.



## 2.22 Tags

Tags shall be of the “semi-active” type, operating at a frequency of 433.9 MHz. Tags shall be water-resistant. Each Tag shall have a unique ID number, with the serial number visible on the surface. Tag weight shall be 1/3 ounce (9 grams) or less. All Tags shall carry a one-year warranty, with the exception of the Asset Tag and Wrist Tag without Tag Pulse, which shall have a three-year warranty. Four types of Tags shall be available:

- A. Wrist Tag with Tag Pulse
- B. The Wrist Tag with Tag Pulse shall be a semi-active Tag that sends the following information wirelessly to the RoamAlert system:
  - 1. Exit Alarm (Tag in Field (TIF)): generated when the Tag enters a Door Controller's exciter field.
  - 2. Tag Pulse (Tag Locating Message (TLM)): regular signal generated every 16 seconds to indicate proper functionality.
  - 3. Low Battery message: sent when Tag has 30 days of life remaining.

- C. Wrist Tag without Tag Pulse

The Wrist Tag without Tag Pulse shall be an active Tag that sends the following information wirelessly to the RoamAlert system:

- 1. Exit Alarm (Tag in Field (TIF)): generated when the Tag enters a Door Controller's exciter field.
  - 2. Low Battery message: sent when Tag has 30 days of life remaining.

- D. Pendant Tag

The Pendant Tag shall be an active Tag that sends the following information wirelessly to the RoamAlert system:

- 1. Tag in Field (TIF) message: if enabled, shall cause exit doors to automatically unlock when the Tag enters a Door Controller's exciter field.
  - 2. Tag Pulse (Tag Locating Message (TLM)): regular signal generated to indicate proper functionality. Configurable from 16 second to 24 hour interval.
  - 3. Duress Alarm: generated when the button on Pendant Tag is pressed.
  - 4. Low Battery message: sent when Tag has 30 days of life remaining.

- E. Asset Tag

The Asset Tag shall be an active Tag that sends the following information wirelessly to the RoamAlert system:

- 1. Exit Alarm (Tag in Field (TIF)): generated when the Tag enters a Door Controller's exciter field.
  - 2. Tamper Alarm (Tag Initiated Communications (TIC)): generated when the tamper circuit has been activated (i.e. the Tag is removed from an asset).
  - 3. Beacon Signal (Tag Locating Message (TLM)): regular signal generated to indicate proper functionality. Configurable from 16 second to 24 hour interval.
  - 4. Low Battery message: sent when Tag has 30 days of life remaining.

### **2.23 Pocket Tag Reader**

The Pocket Tag Reader shall be battery operated with a backlit LCD screen for reading, testing and configuring RoamAlert tags. It shall display Tag electronic serial number and provide quick Pass/Fail indication for evaluating Tag performance and enabling/disabling Tag Pulse signals. It shall also enable and disable TIF on Pendant Tags. Furthermore, the configuration tool shall provide technical functionalities for reading, testing and configuring RoamAlert tags, as well as analyzing system and field parameters. The device also shall have its own internal low battery indication.

### **2.24 Tag Rack**

The Tag Rack shall provide a central storage cabinet that helps to extend the battery life of Wrist Tags. The metal Tag Rack cabinet shall be wall-mountable and easily cleaned. The Tag Rack door shall be left-hand opening and can be fitted with an optional lock for additional security. Labels shall be provided to record Tag serial numbers with specific Tag Rack locations. Each Tag rack shall accommodate up to 42 Tags.

## **PART 3 EXECUTION**

### **3.1 Contractor Qualifications**

- A. The Contractor shall hold all necessary permits or licenses required by city, state and national regulations.
- B. A copy of all such permits or licenses must be posted on site prior to, and during execution.
- C. The Contractor shall employ a minimum of three qualified technician holding a (RAC1) certified training certificate from the manufacturer.
- D. The Contractor shall provide on request a minimum of 5 Roam Alert references of similar installations.

### **3.2 General Installation**

- A. The Contractor shall ensure that all system components are installed as per the equipment manufacturers' specifications.
- B. The Contractor shall ensure all system components and wiring are installed in compliance with all local, state, or national codes in effect.
- C. A minimum of two qualified technician holding a certified training certificate from the manufacturer shall be involved in the installation.

### **3.3 Site Management Responsibility**

The Contractor shall provide an on-site project manager who is responsible for all aspects of the system installation.

### **3.4 Changes**

Prior to proceeding with any changes or claims for project extras, the Contractor shall provide written notice, and secure prior approval from the Customer, and substantiate actual costs of each change or claim. The cost of each change shall be based upon the unit price list and cost

breakdowns provided with the bid response.

### **3.5 System Components**

- A. Prior to the delivery to the site for actual installation, all devices or requested sub-systems shall be assembled in the manufacturer's facility and shall be fully tested and any software configuration shall be performed at this time.
- B. The Contractor shall record all serial numbers and provide a copy to the Customer.

### **3.6 Power Requirements**

- A. The Contractor shall identify all power sources and mark the appropriate breakers with the system device identity and location.
- B. The Contractor shall provide a backup power system for critical components in the event of a power failure and provide UPS power if required. For the system PCs the contractor shall provide UPS power sufficient to sustain power to the PCs, monitors, printers and peripheral equipment for up to ten minutes.

### **3.7 Cable and Wire**

- A. All wire and cable shall be tied down and terminated and conform to all local, state, or national codes. All cable must meet the network specifications for which they are deployed (e.g. RS-485, TCP/IP).
- B. After installation and prior to termination the Contractor shall check all wire and cable for grounds, shorts and open circuits on any conductors or shields.
- C. The Contractor shall visually inspect all wire and cable runs for bends or kinks less than the recommended radius as recommended by the cable manufacturer. Grommets and strain relief shall be provided where necessary.
- D. All wire, cable and terminal blocks shall be identified by labels, Tags or other permanent markings. The markings shall clearly identify the function, source and destination of all cabling, wiring and terminals

### **3.8 Preparation Prior to Site Commissioning**

- A. All system components shall be fully installed, and operational. Any components that require adjustment or tuning shall be fully adjusted and tuned.
- B. All work areas shall be cleaned and clear of debris.
- C. All necessary patching and painting shall be complete.
- D. All extra materials and spares shall be delivered and properly stored on site.
- E. Test, tuning and adjustment data shall be recorded and delivered to the Customer, as built drawings are completed and made ready for inspection.

### **3.9 Site Commissioning**

Site Commissioning shall be performed by a manufacturer representative or manufacturer-trained contractor. A site commissioning report shall be delivered to the Customer prior to System Acceptance.

**3.10 As Built Drawings, Site Documentation**

- A. The Contractor shall provide 2 copies of As Built Drawings to the Customer.
- B. The Contractor shall provide copies of all user documentation and manuals to the Customer.

**3.11 In-Service Training**

- A. The Contractor shall supply at least 30 minutes of In-Service Training, performed by factory trained personnel.
- B. In-Service Training shall be coordinated with the Customer representative of Nursing and shall include all staff associated with the RoamAlert wander prevention system.

**3.12 System Acceptance**

- A. Acceptance of the system shall require a demonstration of the system performance, reliability, and proof of proper operation of all components.
- B. All Documentation must be delivered as described in Sec 3.10, 3.11

**END OF SECTION**