LABOR RELATIONS

UNITED STATES
POSTAL SERVICE

May 28, 2021

Mr. Brian Wagner
President
National Association of Postal Supervisors
1727 King Street, Suite 400
Alexandria, VA 22314-2753

Certified Mail Tracking Number:
7019 2280 0001 6261 1026

Dear Brian:

This is in further reference to the Postal Service's previous correspondence concerning the Sensor Enabled Location Systems (SELS) technology, which is currently being tested at the Atlanta, GA Mail Recovery Center (MRC); Merrifield, VA Processing and Distribution Center (P&DC); Dulles, VA P&DC; and the Portland, OR P&DC. The most recent letter was dated December 16, 2020, which advised that the SELS technology will soon be tested at the Michigan Metroplex.

Enclosed is please find two copies of a document titled *Capabilities & General Information – Factory of the Future: Sensor Enabled Location System (SELS) Pilot Effort*, one with and one without track changes.

The revisions to this document reflect a new functionality of the SELS technology, whereby managers and supervisors will be able to view employees on-screen by their names and role. This information will be viewable only by management and is intended to provide managers and supervisors an enhanced ability to effectively and efficiently assign employees to areas of need within the mail processing environment.

The subject functionality will be enabled and available for use by supervisors and managers at the above referenced test sites on June 5.

Please contact Mike Faber at 215-432-0613 if you have any questions concerning this matter.

Sincerely,

Shannon R. Richardson
A/Manager
Contract Administration (APWU)

Enclosures

475 L'ENFANT PLAZA SW
WASHINGTON DC 20260-4100
WWW.USPS.COM

(CA2021-177)

Capabilities & General Information

Factory of the Future: Sensor Enabled Location Systems
(SELS) Pilot Effort

Contents

Abstract

This document is intended to provide a high-level overview of the sensor enabled location systems (SELS) Pilot effort functionalities with respect to functionality, capability and privacy. This document also includes photos of the technology and screenshots of the various applications. Information included in this document should be considered USPS proprietary and competitive information. **This document and all information disclosed in the document are for internal USPS use only and must not be shared with anyone or any source outside of the immediate USPS organization.**

Capabilities and Functions

Location Awareness Area

"Tracking Area" is the proprietary sensing technology's term for sensing area. The sensing technology is an enabler that provides location awareness within the mail processing environment on the workroom floor. This technology requires the system implementer to define the perimeter of the work floor. System is intended to identify location of vehicles, capture dwell time within work zones, and identify space utilization.
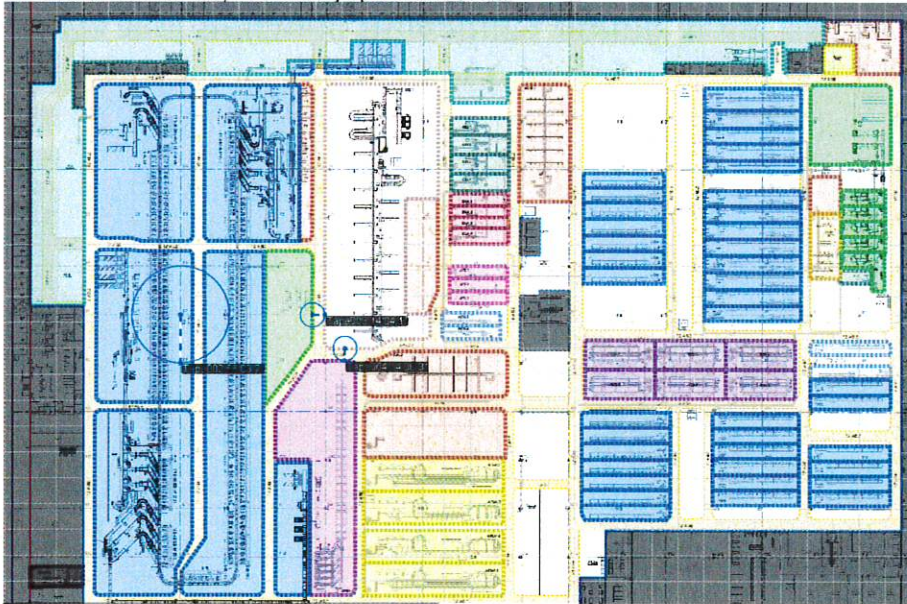

Figure 1 Tracking Area border definition is within the gray outer perimeter

Holes

"Holes" is the proprietary sensing technology's term for redacted sensing areas that allow badges or tags' current actual position to become "invisible" to the system. The sensing technology requires the implementer to define a hole within both work zones and work floor tracking areas. Badges or tags that are physically within these "virtually fenced" spaces will show up on the perimeter of the privacy holes. Union offices, break areas, and administrative back offices, have privacy holes. Privacy holes can and are expected to be tuned to ensure employees' actual location is not reported by the sensing system.
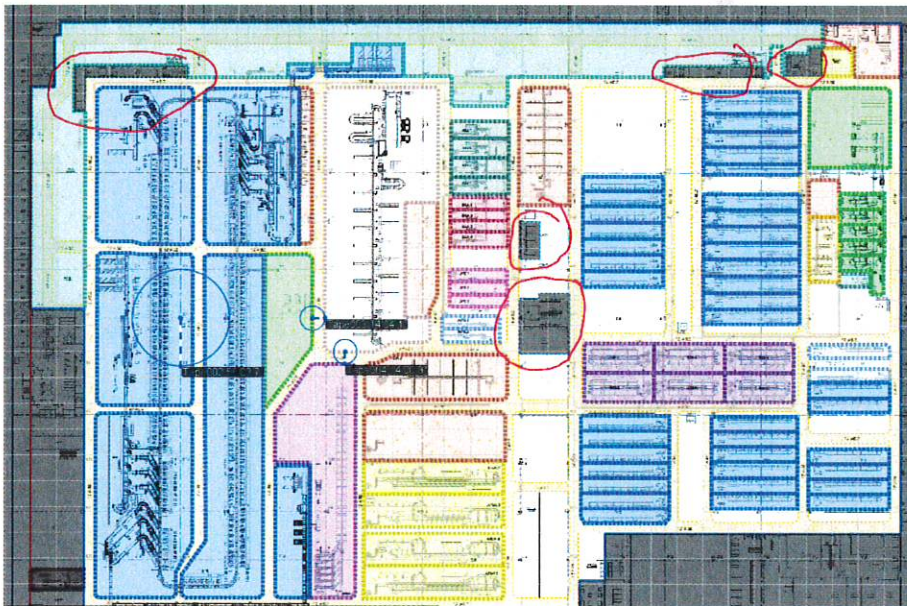

Figure 2 Privacy Holes circled in red. Note: Union office in middle of floor intentionally has an exaggerated privacy hole that extends several feet beyond the perimeter of the actual physical office.

Badge Naming Convention

The badges do not have employee's names displayed or stored at the moment. SELS will combine and display employee names as well as role type. The badges generally follow a naming convention like:

MHA_0001

MailHandler_0001

PSE_0001

Clerk_0001

Supervisor_0001

Maintenance_0001

Display of Badge Position

The general floorplan ~~does not~~will visually display the location of badges worn by employees with some limited exceptions. The system aggregates the data from the badges inside a work zone and displays the count of badges, as well as a list of badge names and employee ~~. Note: badge name is not the employee's name. The~~names. The general floorplan will display the location of vehicle tags.

Supervisors ~~do not~~will have the ability to look at the employee's location, in real time, ~~beyond~~ to ~~knowing~~identify which work zone the employee badge is detected at.

~~Exceptions~~Specific use cases where this is beneficial to USPS:

1. Employee pressed the button on their badge
2. Facility Emergency
3. Replaying historical information for site layout or mail flow optimization

~~3.~~ Expected date of implementation of displaying badge location on the work room floor, as well as Employee name associated with badge, is June 5, 2021.

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Replay of Badge Position

All replays are restricted. Each new replay file request is logged. Replays show the badge names and badge positions overlaid on the floorplan along with the path taken within the time range.
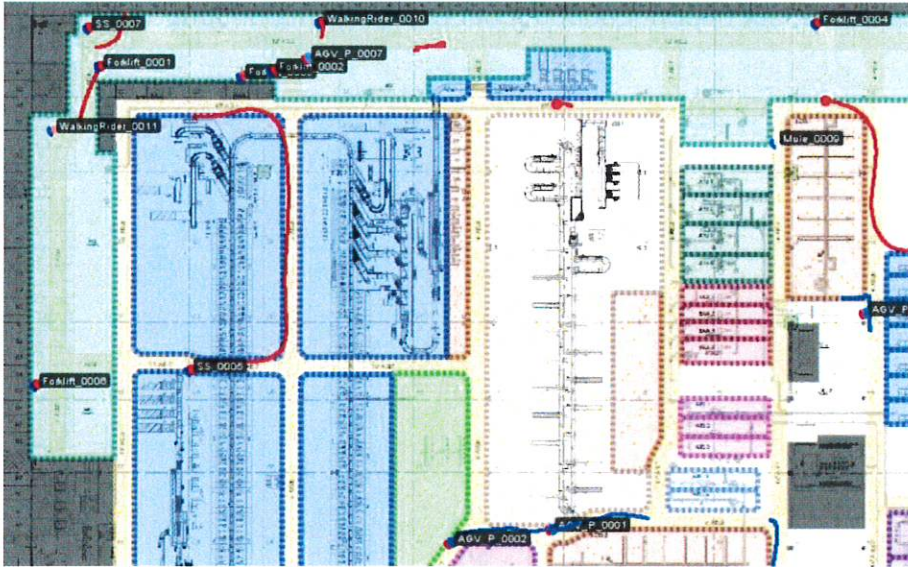
Figure 3 Replay Sample View. Note: Badges physically in Privacy Hole bounded areas and outside of tracking area definition will display as near walkway or exit.

Zone Staffing Level Displays

The zone staffing level displays present~~s~~ both the count of badges broken down by badge type, as well as badge names and employee name. The display ~~does not~~will show location of the badge as a position overlaid on a floorplan.

Search

The search feature does not currently allow individuals to search using an employee's name. However, for usability, this is a feature that may be added in the near future.

Reports

All SELS reports use the badge name. ~~No employee's name or employee ID number is used.~~

Infrastructure Requirements

SELS badges and tags require a proprietary Bluetooth antenna infrastructure to detect and calculate the badge's approximate position on the workroom floor. There are no proprietary Bluetooth antennas installed outside of the facility or in restrooms/locker rooms. Specialized infrastructure, combined with carefully tuned tracking areas and privacy holes, limits identification of SELS badges to the work room floor.

Photos

These are sample screen captures of the software applications and photos of the technology hardware specific to Quuppa technology implemented in Merrifield, Virginia and Portland, Oregon. Software application evolves and will continue to improve; therefore, screen captures may vary from current software application. The screen captures are dated December 21, 2020.

Antenna

Figure 4 BLE Antenna
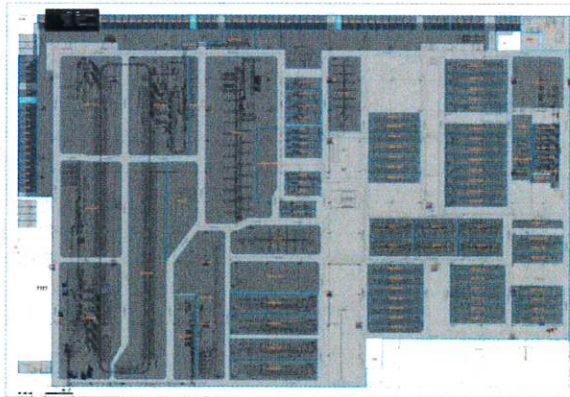
Badge

Figure 5 Sample BLE Badge

Factory of the Future

Figure 6 Factory of the Future w/Intelligent Work Zones, Vehicle Location, Dock States

Live Zone Report

Figure 7 Realtime tabular zone information with count of badges and list of badges per work zone

Maintenance Log

Figure 8 Realtime digital log to input problems and solutions for automation

Live Alerts Log

Figure 9 Realtime digital log to input problems and solutions for automation

Zone Health Report

Start Machine	Zone Name / Alert	LastOccupied / Machine Status	# Staff	Optimal Staffing	Machine Jams/Hour
✔	AFSM200-101 / Activate Alert	December 29, 2020 10:20:00 AM / Active	12	0-15	3
✔	AFSM_Placeholder / Activate Alert	December 29, 2020 10:20:00 AM / Active	6	0-15	3
✔	DBCS-101 / Activate Alert	December 29, 2020 10:20:00 AM / Active	5	0-15	0
✔	Dock1 / Activate Alert	December 29, 2020 10:20:00 AM / Active	11	0-15	0
✔	Dock2 / Activate Alert	December 29, 2020 10:20:00 AM / Active	2	0-15	2

Figure 10 Realtime Zone Health Status

SELS Work Hour Report

Tag Name	Total Work Time	
Badge_065	348:53:48	
Clock In: December 8, 2020 11:15:33 AM	Clock Out: December 9, 2020 8:06:59 AM	Total Work Time: 20:51:26
Clock In: December 9, 2020 12:18:32 PM	Clock Out: December 11, 2020 10:06:23 AM	Total Work Time: 45:47:51
Clock In: December 15, 2020 2:28:40 PM	Clock Out: December 15, 2020 5:04:09 PM	Total Work Time: 02:35:29
Zone: EBR003	Time In: December 15, 2020 2:28:39 PM	Time Out: December 30, 2020 9:49:13 AM
Zone: EBR005	Time In: November 24, 2020 2:20:50 PM	Time Out: December 30, 2020 9:49:13 AM
Zone: Manual Letters	Time In: December 8, 2020 1:49:28 PM	Time Out: December 30, 2020 9:49:13 AM
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Figure 11 Clock Ring Timestamps based on button presses in Electronic Badge Reader Zones and continuous dwell time of at least five minutes per non-walkway/non electronic badge reader zone

Conceptual Work Zone Recommender

Hello Badge_Sim_0003! Please proceed to zone ManualSection1 now.

Figure 12 Display to indicate work zone assignment with work zone dwell time. Conceptual representation

Conceptual Zone Health Display

Figure 13 Good: No detected issues with work zone

Figure 14 Warning: No employee call requests; Understaffed; Degraded Machine Performance

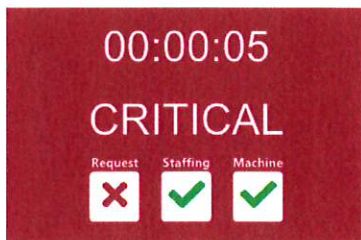*Figure 15 In Progress: Supervisor or Maintenance Personnel Detected in Work Zone with active Alarm*

Figure 16 Critical: Active employee call request; No detected issues with staffing or automation

Suspected Tampered Badge

A suspected tampered badge is an event where the sensor enabled badge suddenly stops reporting. Events that can trigger this alert type: when the badge is submerged in fluids, crushed, opened, dropped, thrown, and or physically concealed within mail transport/processing equipment. These events do not create a low battery warning and have lost signal for over 20 minutes, where the last reported zone was still within a work zone/non-exit zone. This system generated event does not indicate the intent of employee or distinguish between accidental or intentional.
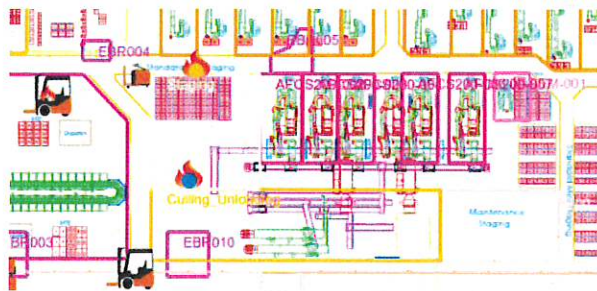
Figure 131317 Event where badge stopped reporting for at least 20 minutes without both exiting the work floor and having a known low battery status. Badges with flame icons suggest tampering events detected.

Alert Subscription (Supervisor Only)

Figure 141418 Allows supervisors to subscribe to work zone alerts related to employee call requests, low battery warnings, and badge tampering events

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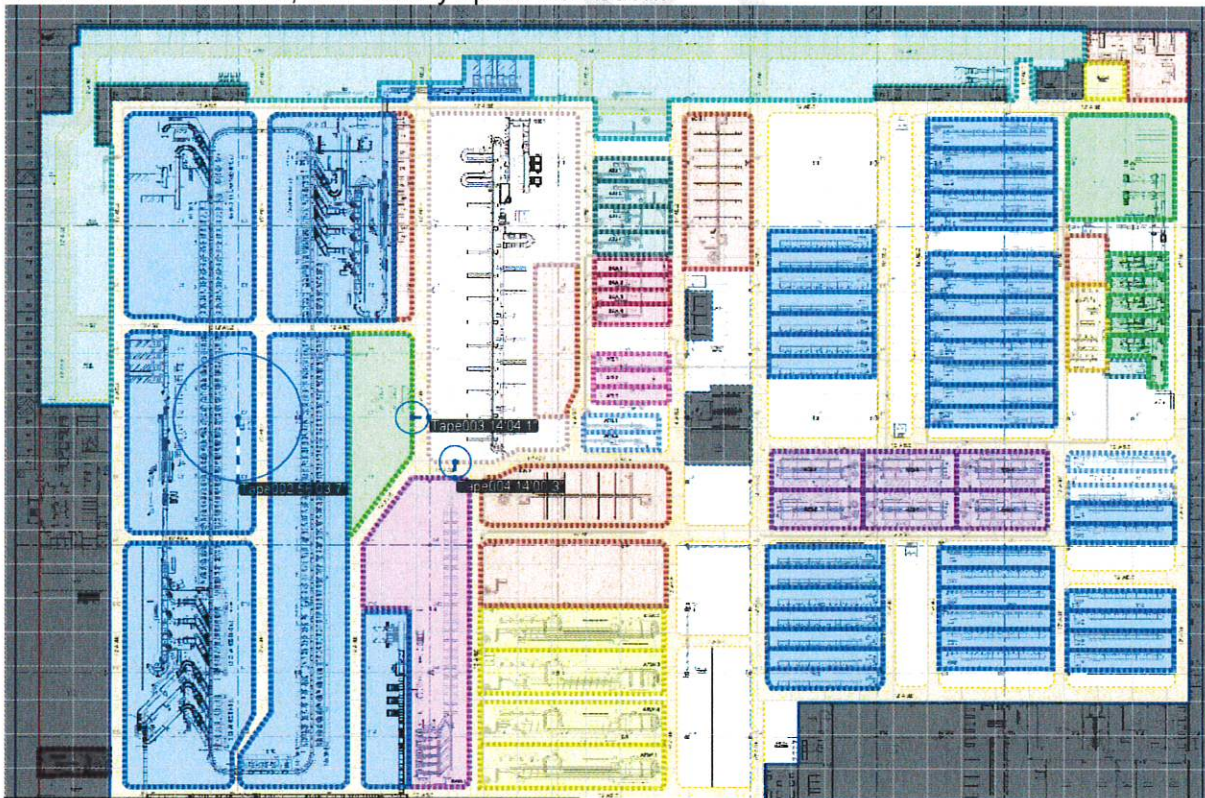

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Supervisors will have the ability to look at the employee's location, in real time, to identify which work zone the employee badge is detected at.

Specific use cases where this is beneficial to USPS:

1. Employee pressed the button on their badge
2. Facility Emergency
3. Replaying historical information for site layout or mail flow optimization

Expected date of implementation of displaying badge location on the work room floor, as well as Employee name associated with badge, is June 5, 2021.

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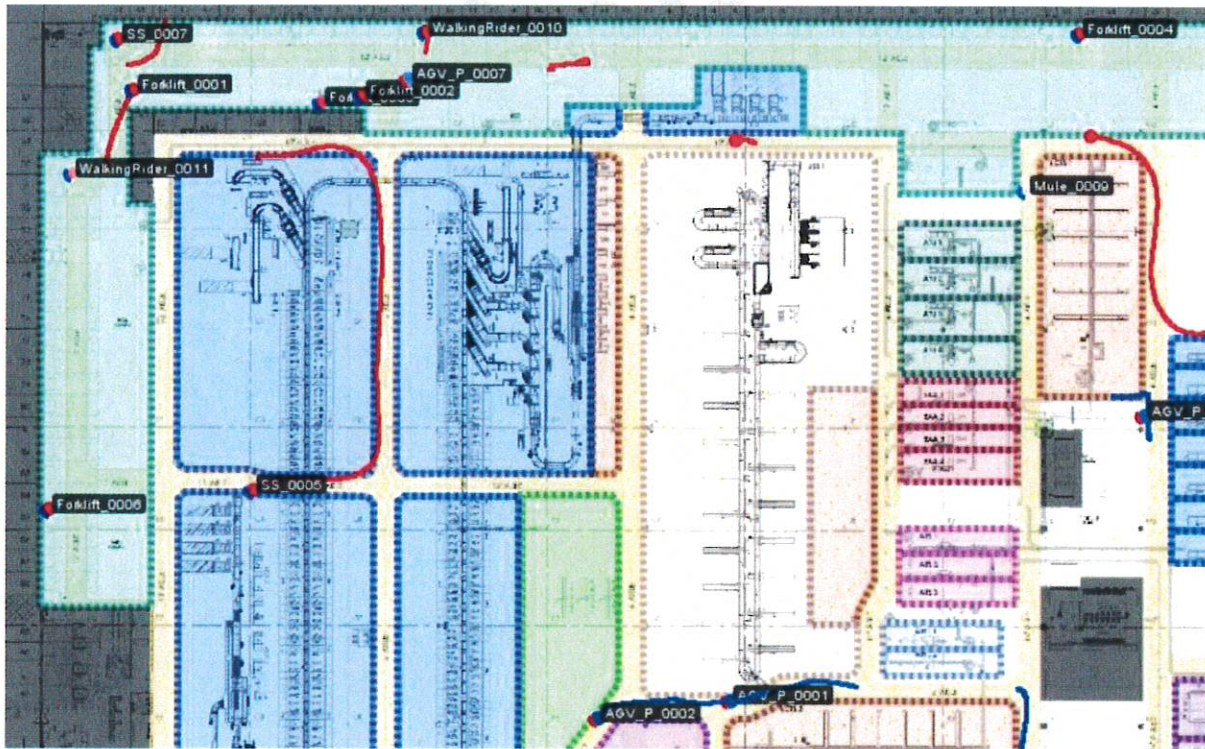

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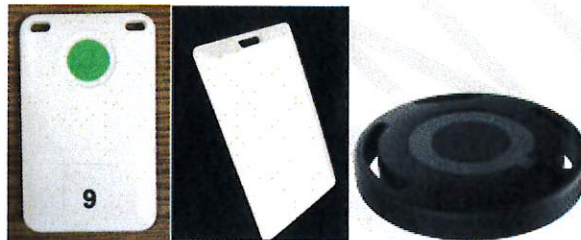

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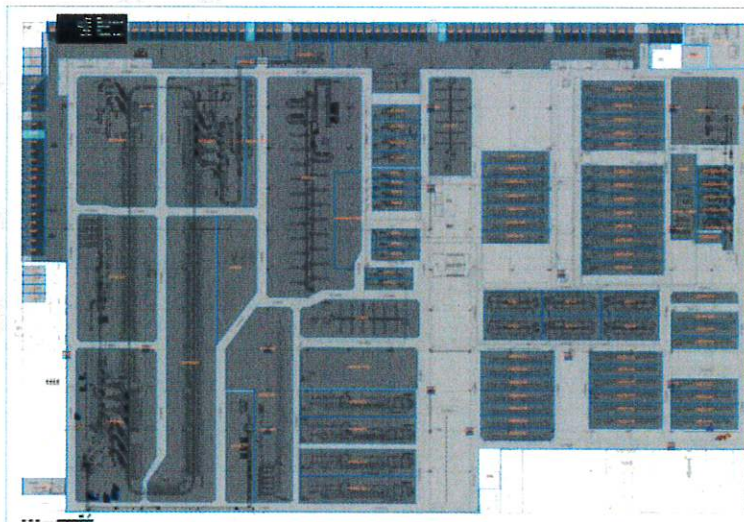## Badge

Figure 5 Sample BLE Badge

Factory of the Future

Figure 6 Factory of the Future w/Intelligent Work Zones, Vehicle Location, Dock States

Live Zone Report

Floor Plan

Oulopa High Bay

```
+  Zone: AFSM200-101
Count: 0
+  Zone: AFSM_Placeholder
Count: 6
+  Zone: DBCS-101
Count: 0
+  Zone: Dock1
Count: 0
+  Zone: Dock2
Count: 0
+  Zone: EBR001
Count: 0
+  Zone: EBR002
Count: 3
+  Zone: ManualSection2
Count: 0
+  Zone: ManualSection3
Count: 2
-  Zone: SensorWorkZone
Count: 5
     Tag: Badge_007

     Tag: Forklift_0001

     Tag: Forklift_0002

     Tag: Supervisor_005

     Tag: a4da22e00261
```

Figure 7 Realtime tabular zone information with count of badges and list of badges per work zone

Maintenance Log

12/14/2020 10:05:26 AM   🗓   12/30/2020 10:05:26 AM   🗓

[Refresh Zone Alerts Log] [Export CSV]

tagAlert	tagClear	start	duration	end	zones	status	problem	solution
Badge_Sim_0001	Badge_Sim_0001	Monday, December 14, 2020 11:32:00 AM	01:01:48	Monday, December 14, 2020 12:33:48 PM	AFSM_Placeholder	normal	unknown	self resolved, left zone
Badge_Sim_0000	Badge_Sim_0000	Monday, December 14, 2020 11:32:13 AM	01:01:35	Monday, December 14, 2020 12:33:48 PM	SensorWorkZone	normal	unknown	self resolved, left zone
Badge_Sim_0000	Badge_Sim_0000	Monday, December 14, 2020 4:11:06 PM	00:17:35	Monday, December 14, 2020 4:28:41 PM	SensorWorkZone	normal	unknown	self resolved, left zone
Badge_Sim_0000	Badge_Sim_0000	Monday, December 14, 2020 4:58:00 PM	19:46:31	Tuesday, December 15, 2020 12:44:31 PM		normal	unknown	self resolved, left zone
Badge_Sim_0001	Supervisor_Sim_0000	Monday, December 14, 2020 5:32:02 PM	00:40:02	Monday, December 14, 2020 6:12:04 PM	SensorWorkZone	normal	unknown	supervisor cleared
Badge_Sim_0001	Supervisor_Sim_0000	Monday, December 14, 2020 6:12:05 PM	00:01:58	Monday, December 14, 2020 6:14:03 PM	SensorWorkZone	normal	unknown	supervisor cleared

Figure 8 Realtime digital log to input problems and solutions for automation

Live Alerts Log

[Refresh Zone Alerts] [Update Problems and Solutions]

tag	start	zones	status	problem	solution	
Badge_Sim_0010	Monday, December 28, 2020 10:03:38 AM	Alert2	normal ▾			
Badge_Sim_0007	Monday, December 28, 2020 9:56:43 AM	Alert2	normal ▾			
8ADA	Wednesday, October 28, 2020 10:41:23 AM	Alert2	normal ▾			

Figure 9 Realtime digital log to input problems and solutions for automation

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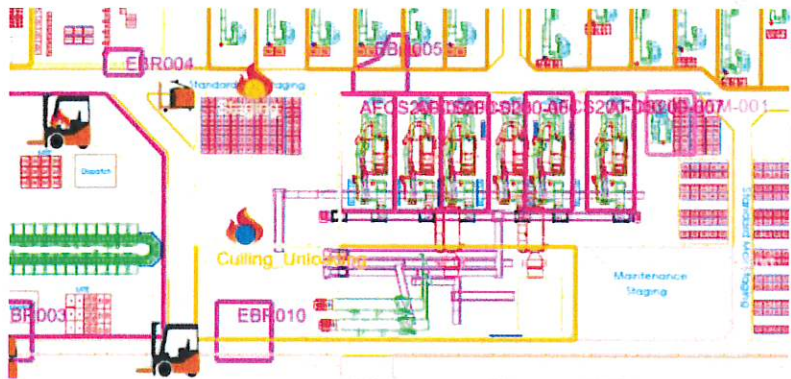

Figure 13 Event where badge stopped reporting for at least 20 minutes without both exiting the work floor and having a known low battery status. Badges with flame icons suggest tampering events detected.

Alert Subscription (Supervisor Only)

Figure 14 Allows supervisors to subscribe to work zone alerts related to employee call requests, low battery warnings, and badge tampering events