

# Automatic Mustering & Personnel Location System

## Why Automatic Mustering?

- **Conventional manual systems such as T Cards, Entry/ Exit Logs & Card Reader Systems rely on personnel to make the action of signing in & out**
- **100% tag read rate means no false alarms of missing personnel**
- **Fastest possible certainty of site evacuated - manual systems take much more time due to no overall visibility of total number of people on plant & / or at muster areas**
- **Locate missing personnel with pin point accuracy**
- **Improved safety of personnel**

## Suitable for all Hazardous Process Industries

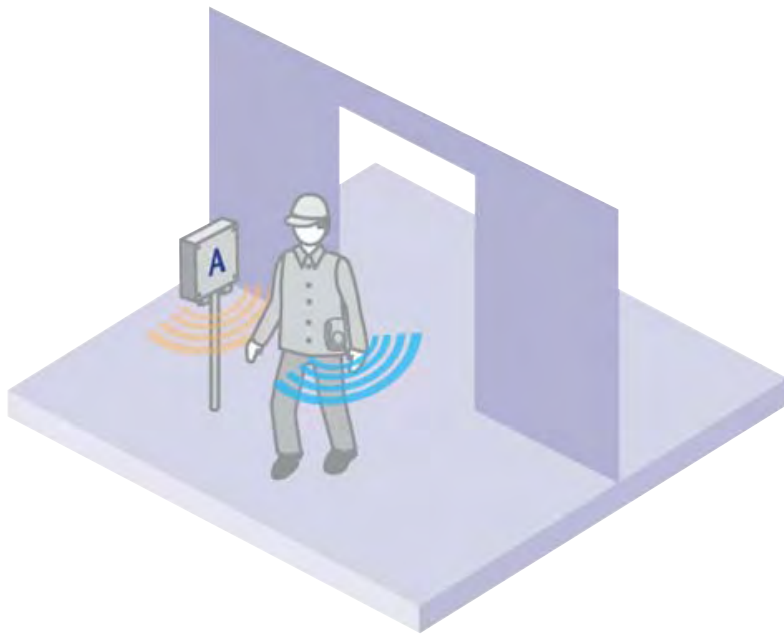
- **Offshore Production Platforms, Drilling Rigs, FSO & FPSO**
- **Oil Refineries & Gas Processing facilities**
- **Pharmaceutical & Chemical plants**
- **Any hazardous facility where speed of evacuation & certainty of all personnel being safely off the plant is critical**
- **Intrinsically safe & explosion proof versions of hardware**

## System Features & Capabilities

- Scales from tens to thousands of personnel
- 802.11 standards based system protects investment & helps with ROI of already installed WLAN's
- Automatic opening & closing of gates on site entrance/exits
- Can grow with user requirements to a complete site wide personnel & asset location & tracking solution
- Lone worker features e.g. emergency call button, personnel temperature monitor & motion detection
- Web browser based user interface for desk top PC's & mobile PDA's
- Historical database to review practice or live musters as well as exact location trail around site

# Location Principles

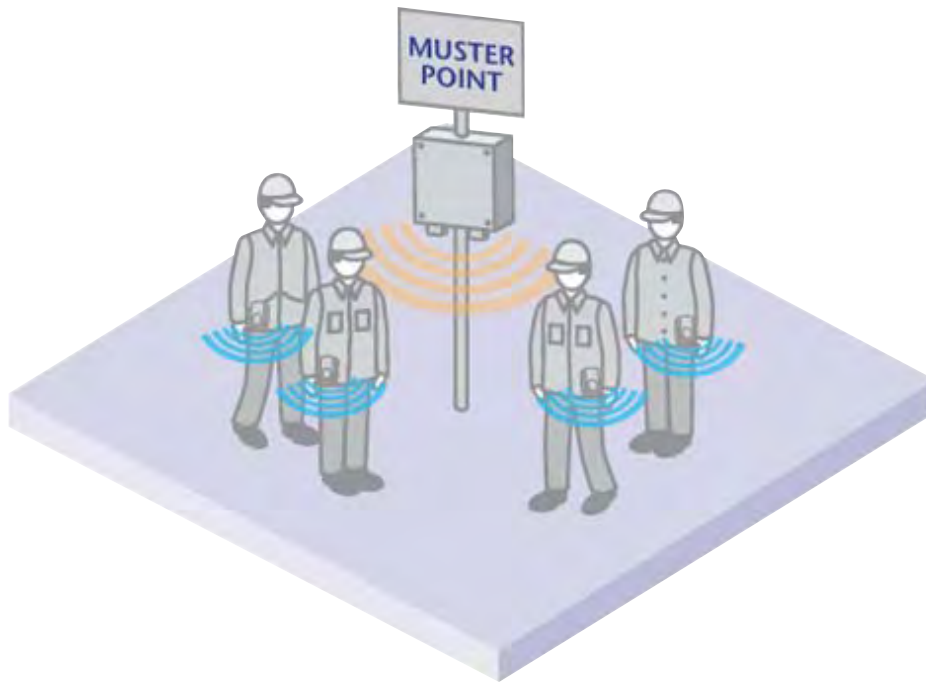
## Location Tracking - Position by Choke Point Detection



In locations such as entries & exits Extronics Tag Exciter causes the tag to transmit & it's location is then known to be within the field of the Exciter.

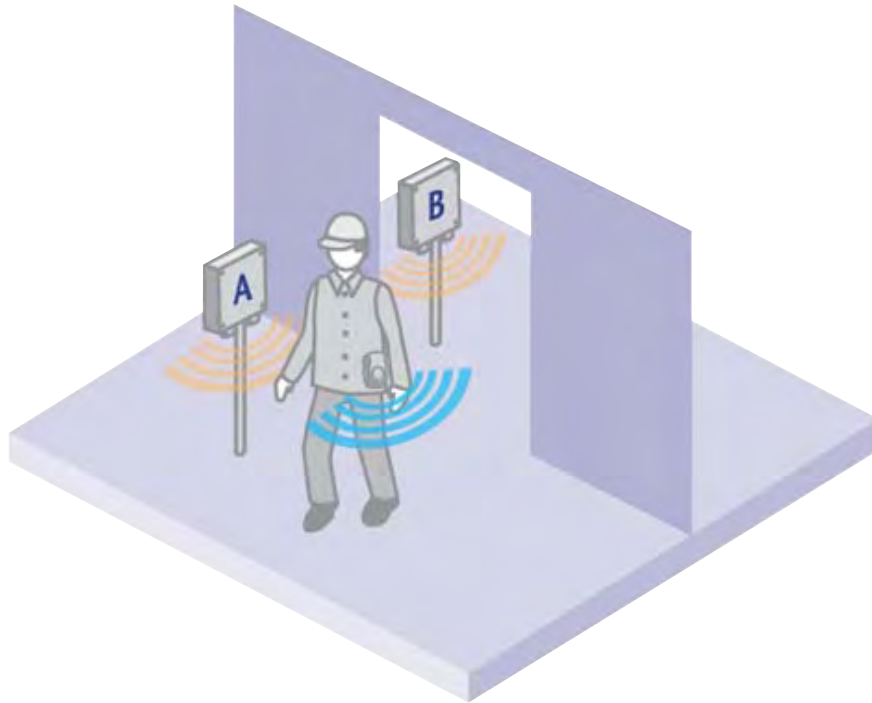
Also used for floor differentiation or change tags properties such as turning it off or altering blink rate

## Location Tracking - Position by Choke Point Detection



- **Ideal for use as a Muster Point**
- **Multiple Exciters are used to cover larger areas**

## Location Tracking – Entrance & Exit Detection & Counting

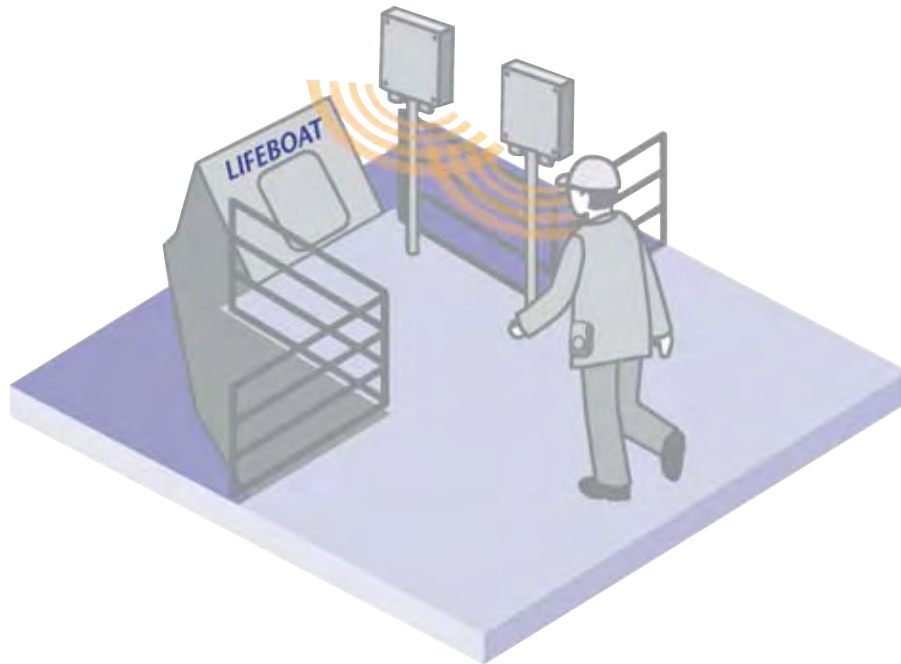


In locations such as entries & exits, two Extronics Tag Exciters can be used together to detect direction of movement.

“In” sequence A then B

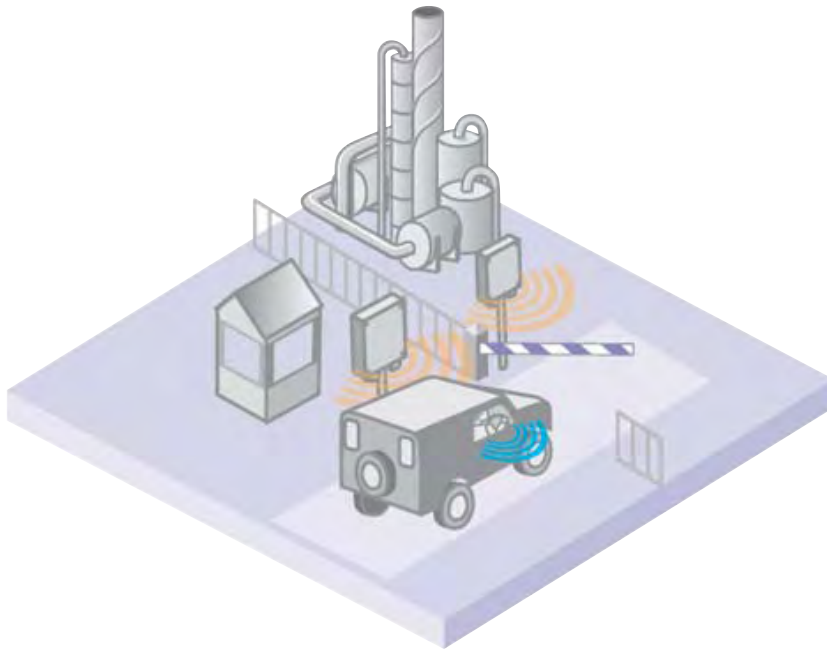
“Out” sequence B then A

## Location Tracking – Entrance & Exit Detection & Counting



In locations such as entries & exits, two Extronics Tag Exciters can be used together to detect direction of movement e.g. Counting personnel into a life boat on an offshore platform

## Location Tracking – Entrance & Exit Detection & Counting

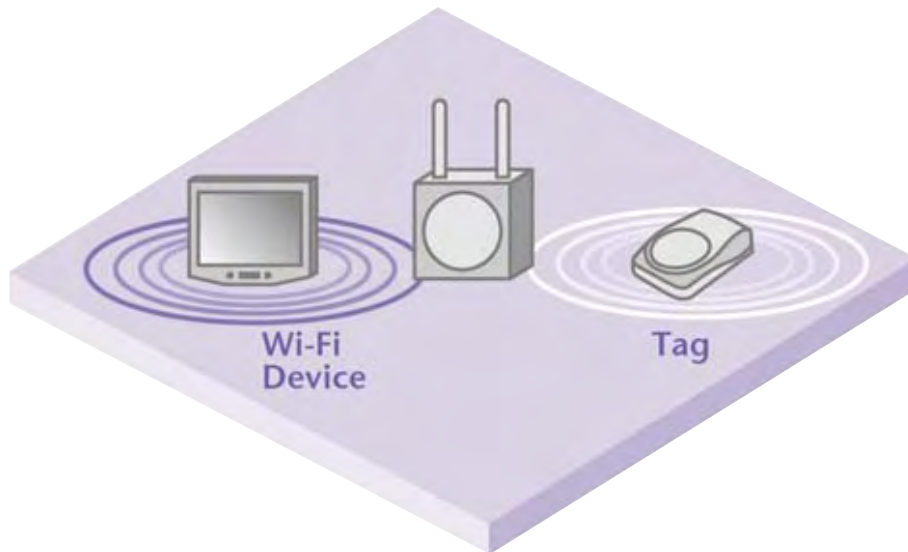


In locations such as entries & exits two Extronics Tag Exciters can be used together to detect direction of movement

e.g. Site entrances & exits

Automatic gate opening & closing possible

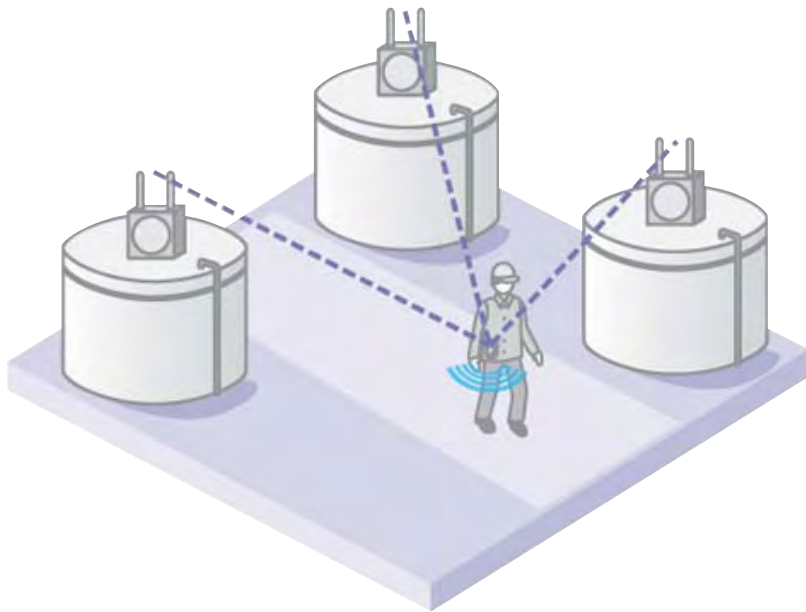
## Location Tracking – Position by Presence Detection



This method of location of an Extronics WiFi tag or WiFi device is zone based.

Hence only to the vicinity of a particular access point or location receiver

## Location Tracking – Position by Triangulation



At least three access points or location receivers determine the position of a tag using either the tags' RSSI (received signal strength indicator) or TDOA (time difference of arrival) of the tag's radio signal. This allows calculation of the location to between 3 to 30 metre accuracy depending on type & density of infrastructure

# Hardware Components

## iTAG100 Active RFID WiFi Tag



- ATEX Zone 0 certified for all hazardous areas including gassy mines
- FM Intrinsically Safe Class I, II, III Division 1
- US Mine Safety & Health Administration Approved
- Small battery powered tag for tracking people & assets
- Motion sensor for tracking if a person or asset is mobile & for battery life enhancement
- Call button for instant alert emergency assistance & temperature sensor (options)
- Up to 4 years battery life

## iTAG100 Mounting Options



The iTAG100 has multiple mounting options & can be provided with a suitable adapter depending on the asset geometry. As standard, the tag is supplied for strap or clip mounting.

## EX2000 Tag Exciter



- **Safe area indoor version**
- **125KHz field up to 0.5 to 6.5 metres**
- **Can reprogram or activate / deactivate tags**
- **Can be chained to cover wide entrance & exits**
- **Applications include floor differentiation, entrance/exit monitoring, direction & precise location of people/assets**

## iCITE100 Tag Exciter



- Zone 1 & US Class I Zone 1 & Class 1 Div 2
- 125KHz field up to 0.5 to 6.5 metres
- Can reprogram or activate / deactivate tags
- Can be chained to cover wide entrance & exits
- Applications include floor differentiation, entrance/exit monitoring, direction & precise location of people/assets

## WiFi Access Points

- Zone 2 or Zone 1 & 21 certified (Class I Div 1 pending)
- RSSI – Received Signal Strength Indication based location
- 802.11 a/b/g WiFi WLAN
- Intrinsically safe antenna outputs for connection of Extronics iANT200 antennas
- IP66 Marine grade aluminium enclosure
- Fibre or CAT5 Ethernet
- Options on power supply, lightning arrestor, enclosure heating & cooling



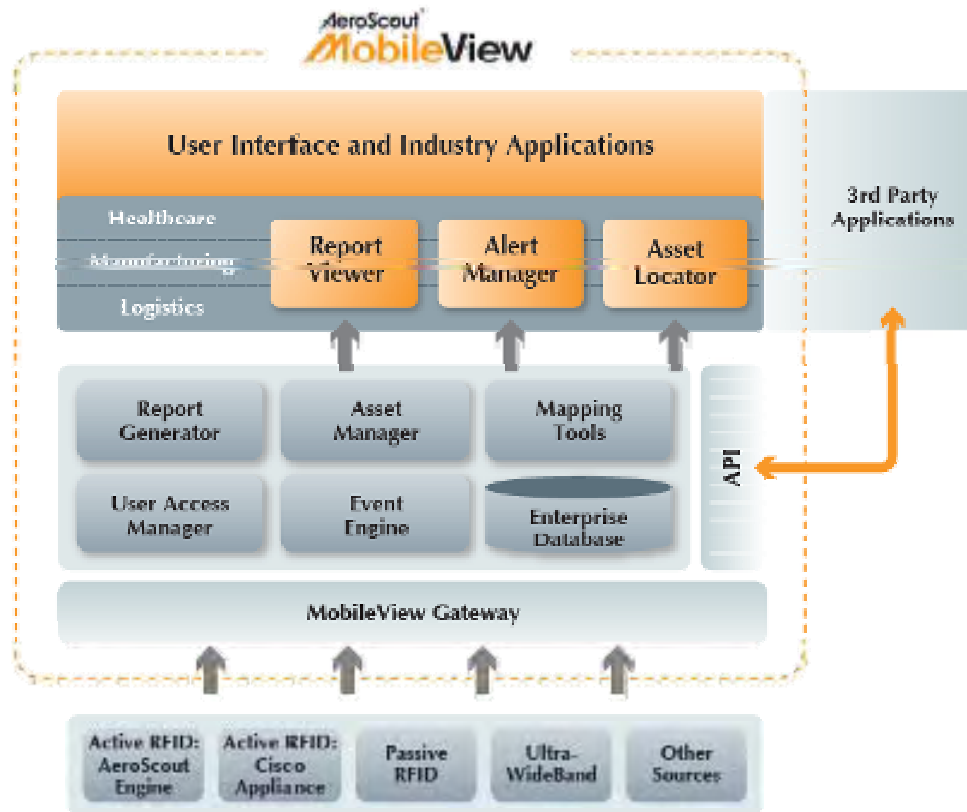
## Location Receiver



- Zone 1 (Class I Div 1 pending)
- TDOA – Time Difference Of Arrival based location for outdoors or large buildings as well as RSSI – Received Signal Strength Indication
- Intrinsically safe antenna outputs for connection to Extronics iANT200 series of antennas
- Up to 200 metres range with TDOA location calculation principle with 3 to 6 metre location accuracy outdoors

# Software

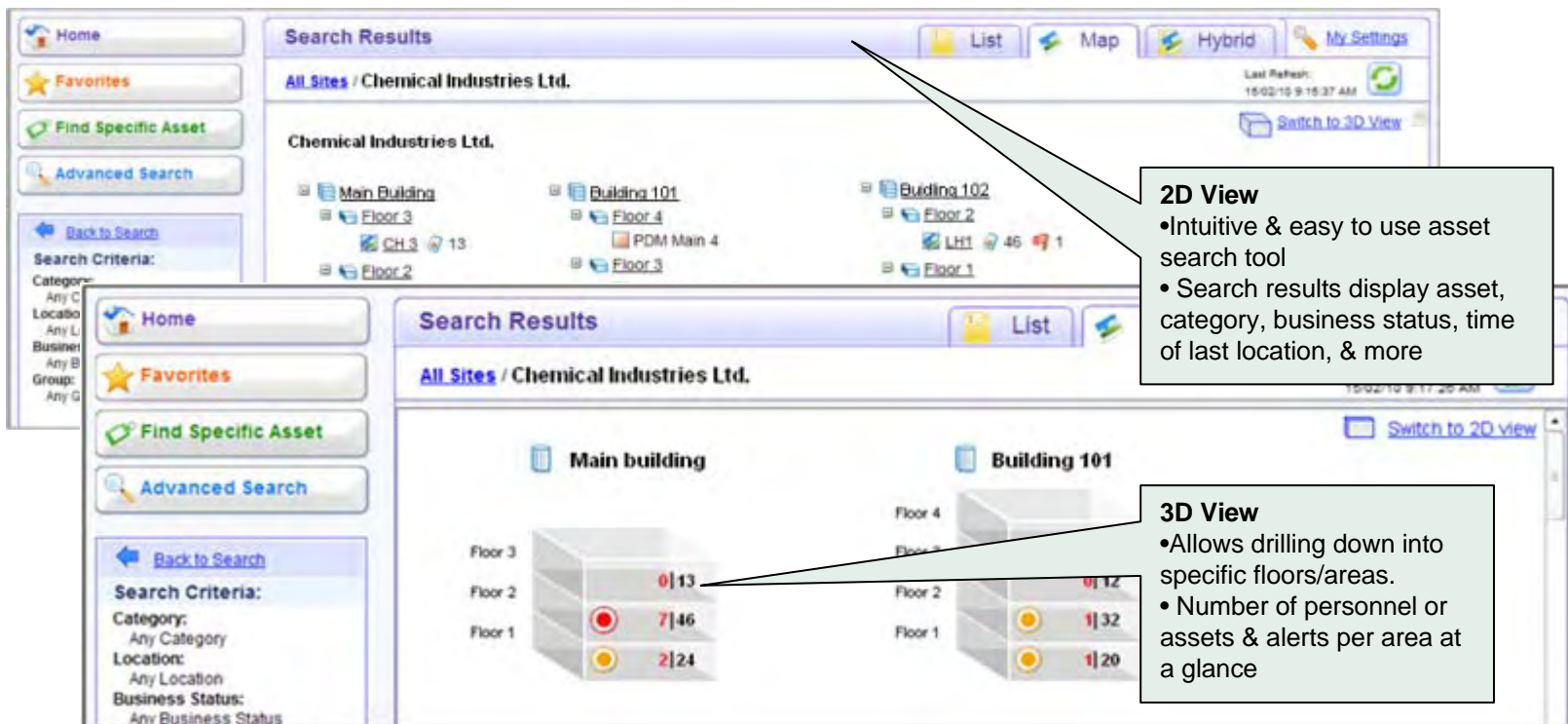
## MobileView 4.0



- Powerful software platform for true site wide visibility – Modules include;
- Locator, Manager, Report Generator & Viewer, Event Engine, Alert Manager, Mapping Tools & User Access Manager
- Mobile Gateways for a variety of visibility sources
- API for enterprise application integration

## Site Level View

Site-level view presents several facilities & summarises the number of people in the plant or a specific plant or area & alerts at each site at a glance



The screenshot displays the software interface for 'Chemical Industries Ltd.' in a 2D view. The interface includes a sidebar with navigation options like 'Home', 'Favorites', 'Find Specific Asset', and 'Advanced Search'. The main content area shows a tree view of assets under 'Chemical Industries Ltd.', including 'Main Building', 'Building 101', and 'Building 102'. A callout box for '2D View' points to the search results area, highlighting features like intuitive search, asset details, and refresh options. A second callout box for '3D View' points to a 3D floor plan view of the 'Main building', showing asset counts per floor (e.g., Floor 1: 7|46, Floor 2: 2|24).

**2D View**

- Intuitive & easy to use asset search tool
- Search results display asset, category, business status, time of last location, & more

**3D View**

- Allows drilling down into specific floors/areas.
- Number of personnel or assets & alerts per area at a glance

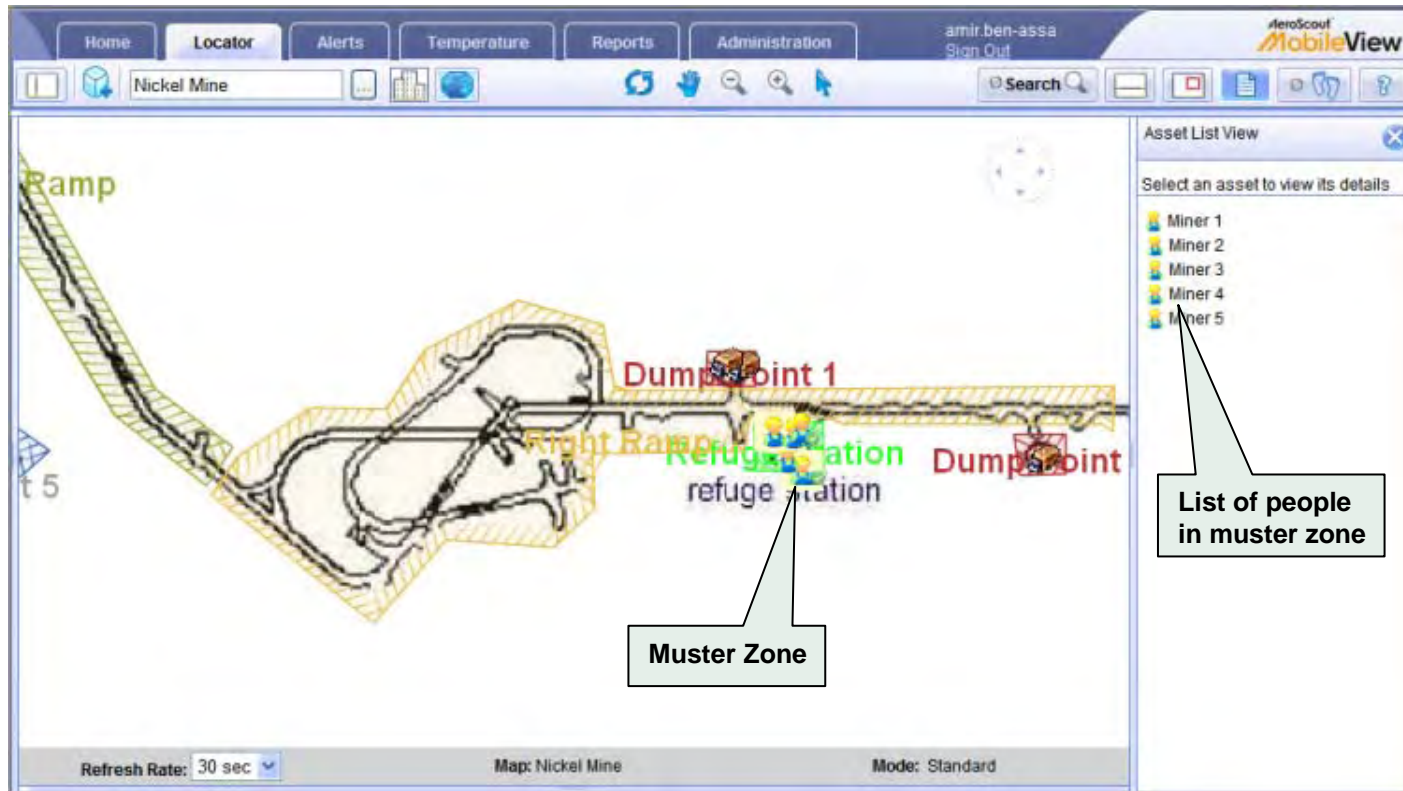
## Real - Time View

Real-time view of people in each unit / area

The screenshot displays the AeroScout MobileView software interface for a Nickel Mine. The interface includes a navigation menu with options: Home, Locator, Alerts, Temperature, Reports, and Administration. The user is logged in as amir.ben-assa and can Sign Out. The main area shows a site map with various units and areas labeled, such as Drav Unit 1, Drav Unit 2, Drav Unit 3, Drav Unit 4, Drav Unit 5, Center Ramp, and Dump Unit 1. A callout box titled "Location & status information" points to a person icon on the map, displaying details for "Mine Electrician 2" with a timestamp of 07/07/08 9:04:09 PM. The details include Location: Nickel Mine/Right Ramp, Status: Available, and Category: M Electrician. A callout box titled "List of people in unit/ area" points to a list of personnel on the right side of the interface. The list includes Miner 1 through Miner 5, Mechanic 2 through Mechanic 5, Driver 1, Mechanic 1, Worker 1, and Driver 2 through Driver 4. The interface also shows a Refresh Rate of 30 sec, Map: Nickel Mine, and Mode: Standard.

## Muster Point View

Drill down to each Muster Point & see number of personnel assembled instantly. When personnel enter the muster zone the status changes into “mustered” & appears with a check mark on the map



The screenshot displays the MobileView software interface for a Nickel Mine. The main map shows a yellow-hatched area labeled "Muster Zone" containing a "Refuge station" and "Dump point 1". A callout box points to this area with the text "Muster Zone". On the right, the "Asset List View" panel shows a list of assets: Miner 1, Miner 2, Miner 3, Miner 4, and Miner 5. A callout box points to this list with the text "List of people in muster zone". The interface includes a navigation menu (Home, Locator, Alerts, Temperature, Reports, Administration), a search bar, and a status bar at the bottom with "Refresh Rate: 30 sec", "Map: Nickel Mine", and "Mode: Standard".

## Locate Missing People

Instantly locate the whereabouts of missing personnel in the event of emergency evacuation procedures

The screenshot displays the Aeroscout MobileView software interface. At the top, there are navigation tabs: Home, Locator, Alerts, Reports, and Administration. The current view is 'Locator'. Below the tabs is a search bar with fields for 'Find:', 'In: Asset Name', 'Category:', 'Status:', and 'Location:'. A search button and a 'Clear' button are also present. Below the search bar, it shows 'Results 1 - 24 of 24'. A table lists the results with columns for Category, Name, Location, Status, ID, MAC, and Last Update. Below the table is a floor plan map of 'Area 1' with various rooms labeled, such as 'ONCOLOGY / MFM / GENETICS'. A red square icon on the map indicates a person's location. A callout box points to the map with the text 'Easy to use navigation tools'. At the bottom, there is a 'Refresh Rate: 10 sec' dropdown and 'Map: Area 1' and 'Mode: Standard' labels.

Category	Name	Location	Status	ID	MAC	Last Update
Equipment	Asset 1	Area 1			000CCC000003	28/12/07 4:08:50 AM
Equipment	Asset 2	Area 1	Available		000CCC000007	28/12/07 4:08:50 AM
Equipment	Asset 3	Area 1	In Use		000CCC000008	28/12/07 4:08:50 AM
Equipment	Asset 4	Area 1	In Use		000CCC00000F	28/12/07 4:08:48 AM
Beds	Bed 3	Area 1			000CCC000002	28/12/07 4:08:51 AM
Beds	Bed 4	Area 1	In Maintenance		000CCC000004	28/12/07 4:08:51 AM

## Historical View

Database stores location data for review at later date

**AeroScout MobileView**  
LOGO Asset History - Showing history for: Wheel Chair 12

General Tags History Other

Select the period for which you would like to see the location history:

From: Jan 1, 2008 At: 0 : 0 : 0  
To: Jan 9, 2008 At: 0 : 0 : 0  
Report Strategy: zone Show History Map

**Personnel or asset historical trail along the map & in between maps**

**Timeline indicates time & date of personnel or asset location at each point**

History Panel: --- error not set --- From: 16/10/2007 17:07 To: 17/10/2007 20:52

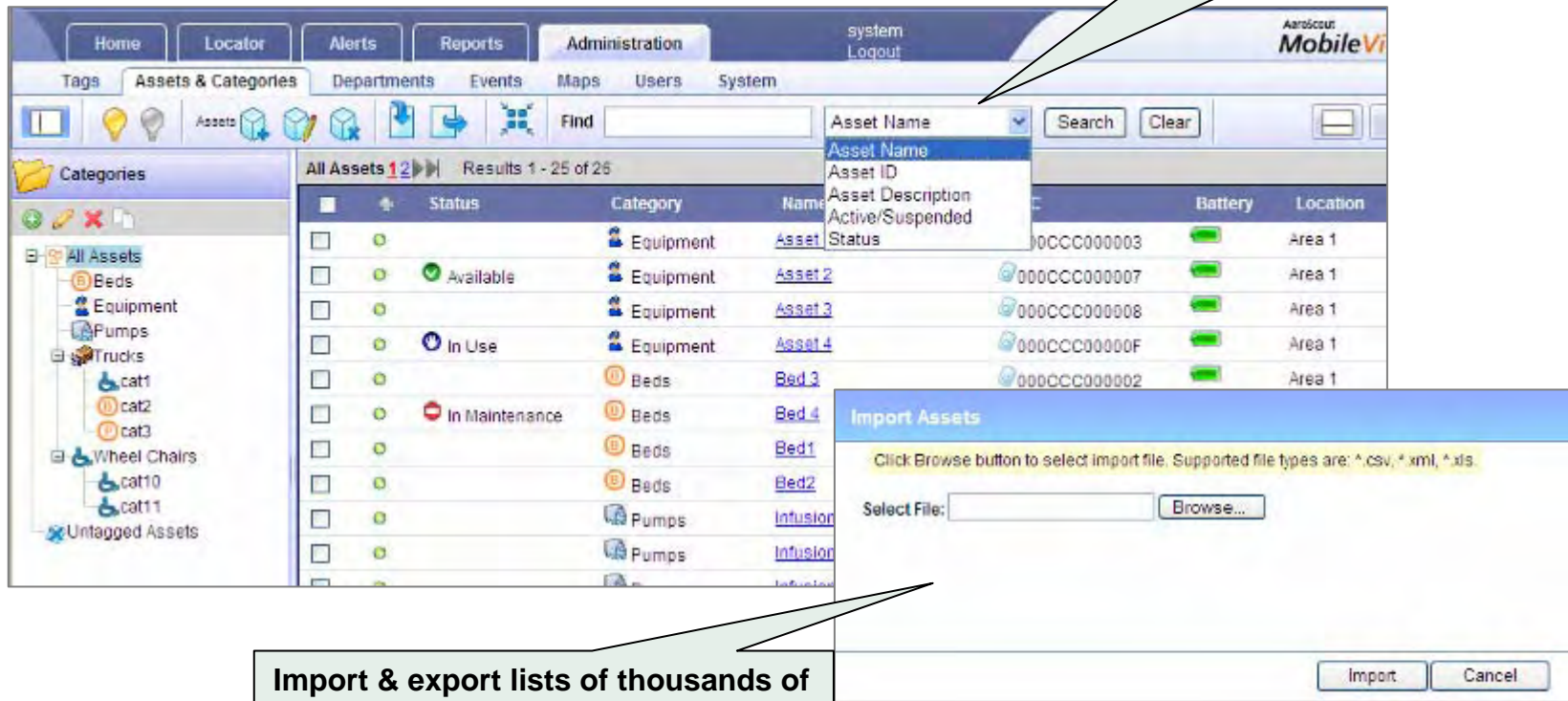
17:07 16/10/2007 07:00 17/10/2007 18:07 19:30

The screenshot displays a detailed floor plan of a facility with various rooms labeled, such as 'ADMINISTRATION', 'GENERAL OB/GYN', and 'PROCEDURE AREA'. A green line traces the historical path of 'Wheel Chair 12' across the map. A callout box points to this trail. Another callout box points to a specific location on the map, which is highlighted with a green square and labeled '20:52'. Below the map, a timeline shows the sequence of location points with their corresponding dates and times: 17:07 on 16/10/2007, 07:00 on 17/10/2007, 18:07 on 17/10/2007, and 19:30 on 17/10/2007. A 'History Panel' at the bottom indicates a date range from 16/10/2007 17:07 to 17/10/2007 20:52.

## Personnel Management

Easily manage & integrate large numbers of people

Quick personnel search tool  
All personnel are displayed with icons, name, tag, battery status, location & status



Status	Category	Name	Asset ID	Battery	Location
Available	Equipment	Asset1	0000000003	Full	Area 1
Available	Equipment	Asset2	0000000007	Full	Area 1
Available	Equipment	Asset3	0000000008	Full	Area 1
In Use	Equipment	Asset4	000000000F	Full	Area 1
In Maintenance	Beds	Bed3	0000000002	Full	Area 1
Available	Beds	Bed4			
Available	Beds	Bed1			
Available	Beds	Bed2			
Available	Pumps	Infusion			
Available	Pumps	Infusion			

Import & export lists of thousands of people  
Supports XML, Excel or Text files

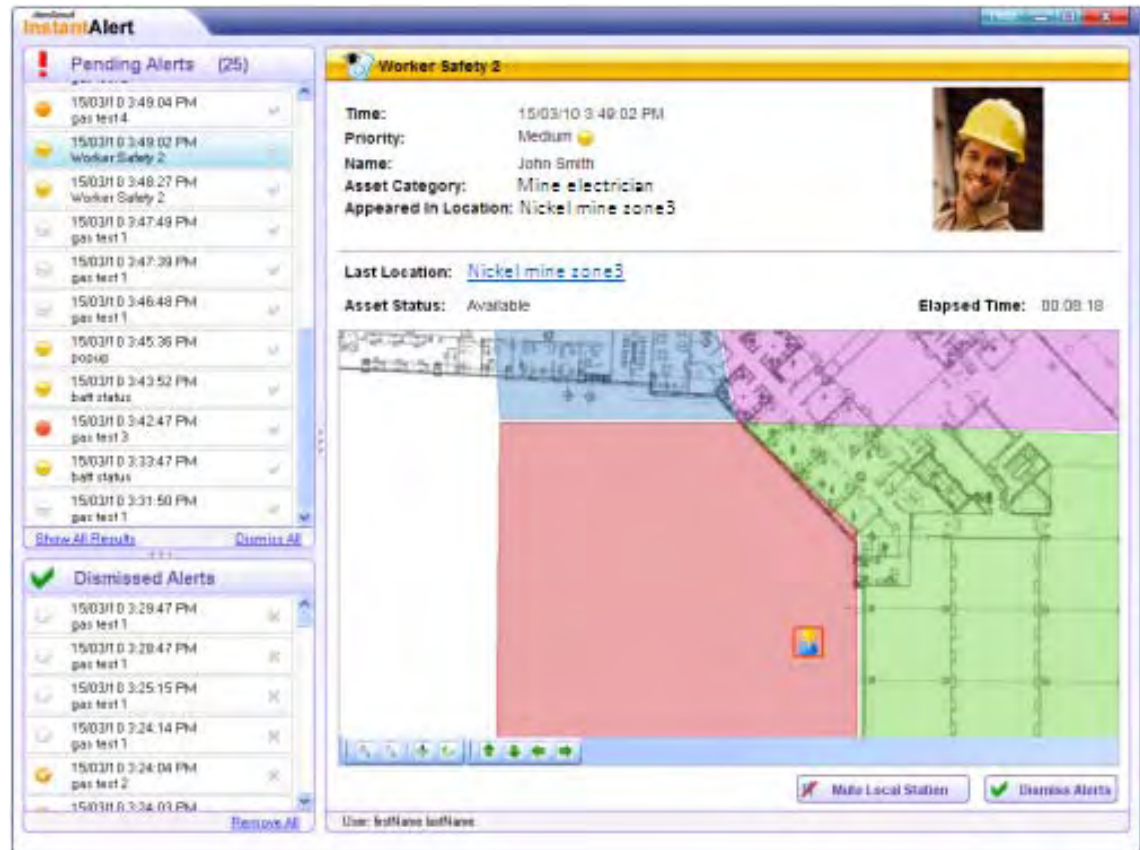
## Injury & Distress Alerting



- **Intrinsically Safe Certification Pending**
- **Workers can press the tag's panic button in case of distress**
- **When a person is not in motion for a period of time**
- **Tag activates a buzzer & allows the user to cancel the alarm**
- **If the user does not respond the tag sends an immediate alert to the control room**

## Injury & Distress Alerting

- Security personnel receive an alert with the person's current location
- Popup window
- Pager message
- IP Phone instant message



The screenshot displays the 'InstantAlert' software interface. On the left, there is a list of 'Pending Alerts (25)' and 'Dismissed Alerts'. The 'Pending Alerts' list includes entries such as 'gas test 4', 'Worker Safety 2', and 'gas test 1' with timestamps from 15/03/10 3:48:04 PM to 3:31:50 PM. Below this list are buttons for 'Show All Results' and 'Dismiss All'. The 'Dismissed Alerts' list shows similar entries with 'X' icons and a 'Remove All' button at the bottom.

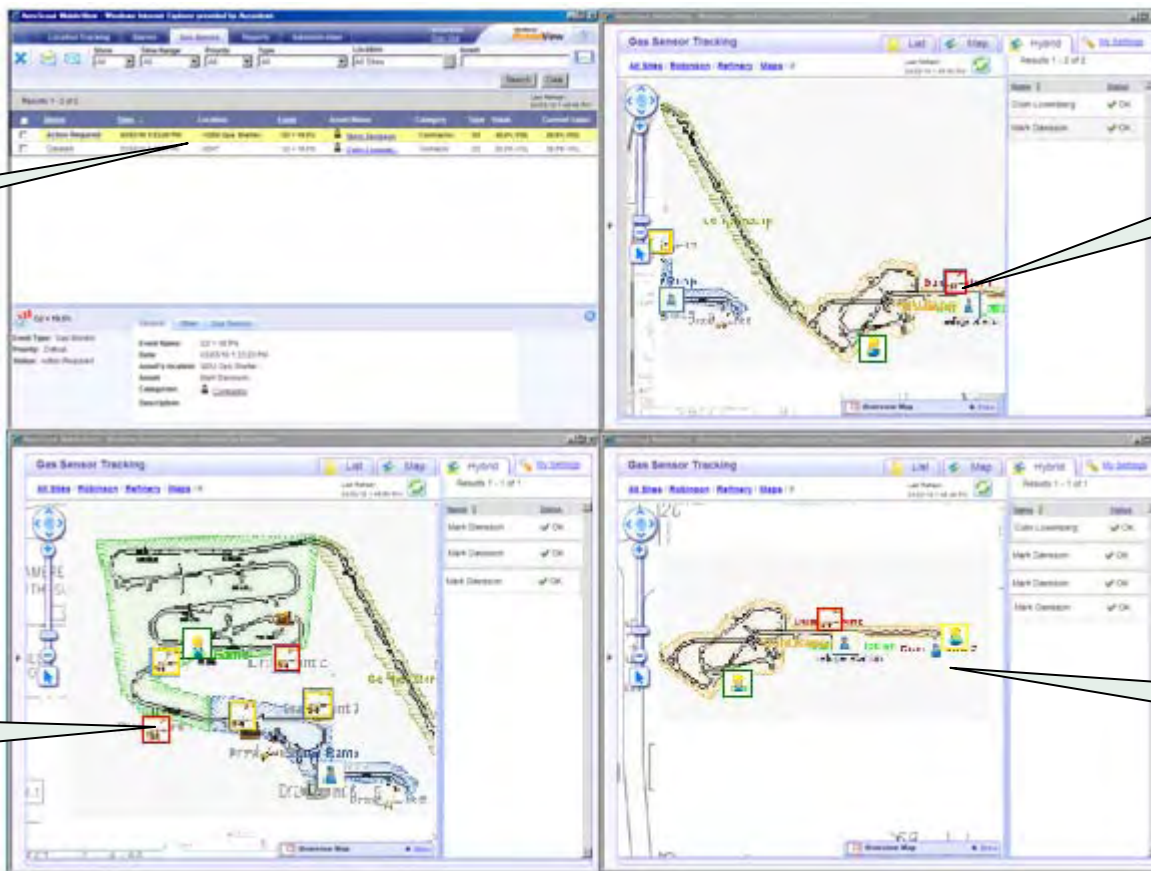
The main window displays a detailed view for a 'Worker Safety 2' alert. It includes a photo of a worker in a yellow hard hat. The alert details are as follows:

- Time:** 15/03/10 3:49:02 PM
- Priority:** Medium
- Name:** John Smith
- Asset Category:** Mine electrician
- Appeared in Location:** Nickel mine zone 3

Additional information shown includes 'Last Location: Nickel mine zone 3', 'Asset Status: Available', and 'Elapsed Time: 00:08:18'. A map view shows a red location marker on a site plan. At the bottom right, there are buttons for 'Make Local Station' and 'Dismiss Alerts', and a user field showing 'User: testName testName'.

## Injury & Distress Alerting

Control room operators can view several areas & alerts at-a-glance



The screenshot displays a software interface with four main panels. The top-left panel shows a 'List of Alerts' table with columns for 'Alert Name', 'Location', 'Last', 'Assignment', 'Category', 'Start', 'Status', and 'Current user'. Below the table is a detailed view of a selected alert. The top-right panel shows a 'View of Central Ramp' map with various sensor locations and status indicators. The bottom-left panel shows a 'View of West Ramp' map, and the bottom-right panel shows a 'View of East Ramp' map. Each map view includes a 'List' button and a 'Map' button, and a sidebar with 'Mark Decision' options.

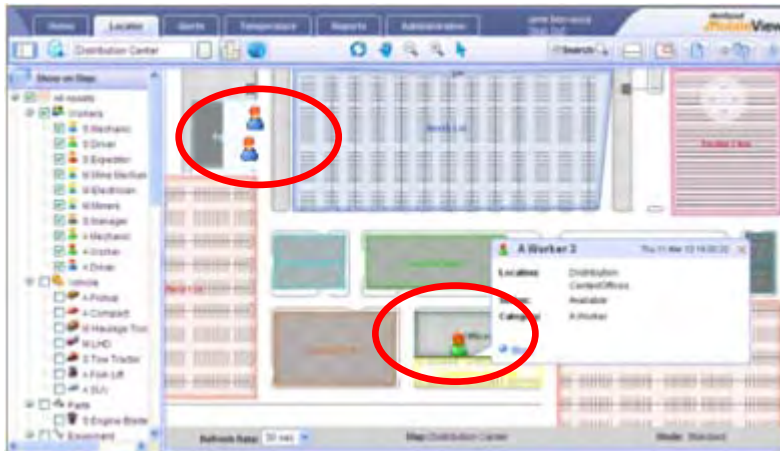
List of Alerts

View of Central Ramp

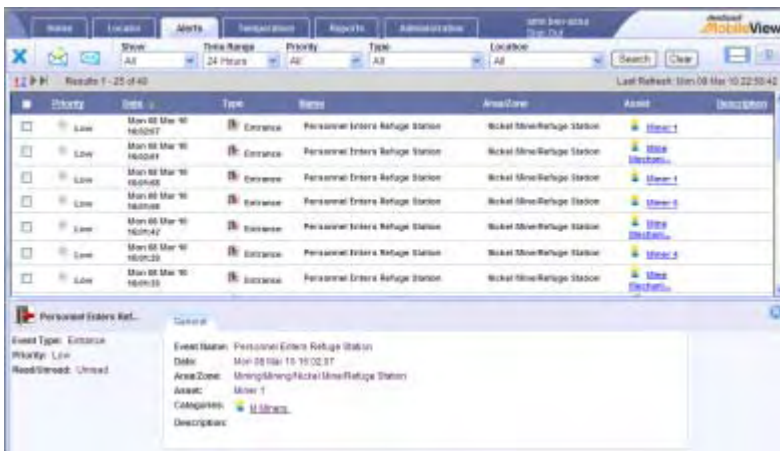
View of West Ramp

View of East Ramp

## Injury & Distress Alerting



Location of worker in distress as well as dynamic display of rescue team



Alerts dashboard & reports

## Handheld Locator & Manager



- Add, edit & remove people or assets
- Search for people/assets & view in list or map view
- Disconnected mode for users who are not always in WiFi coverage area
- Runs on Windows Mobile 5.0 OS
- UI designed for stylus free use
- Barcode functionality means Tags can be assigned to people or assets in 1-2-3 steps;
- Scan Tag barcode – Assign name – Press OK!

## Events & Alerts

- Create events which are monitored by MobileView
- If activated an alert/alarm is initiated with notification by Email, Web Service, HTTP post, JMS Queue, Skype Chat, XML
- Alert Viewer

Events

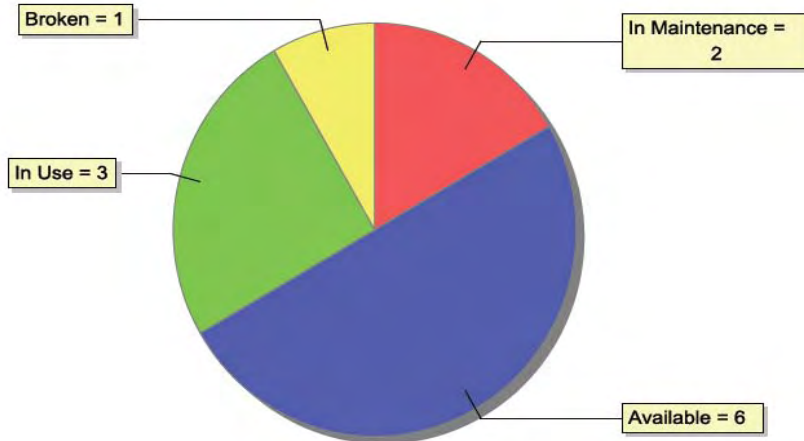
**Event Types**

- Absence (0)
- Battery Level (4)
- Call Button (0)
- Dwell (0)
- Entrance (0)
- Exit (0)
- Foe (0)
- Friend (0)
- In Sight (0)
- Location Update (0)
- Motion status (0)
- Out Of Sight (1)
- Overflow (0)
- Shortage (0)
- Tamper (0)
- Telemetry (0)
- Temperature (0)

Alerts								
Home		Locator		Alerts		Reports	Administration	system Logout
Show	Last	Priority	Type	Area				
All	All	All	All	All		Search Clear		
Results 426 - 439 of 439								
<input type="checkbox"/>	Priority	Date	Type	Name	Area/Zone	Asset		
<input type="checkbox"/>	Low	28/12/07 4:07:43 AM	Battery Level	Low	Site/Building 1/Floor 1/Area A	<a href="#">Wheel 2</a>		
<input type="checkbox"/>	High	28/12/07 4:07:43 AM	Battery Level	High Bat Status	Site/Building 1/Floor 2/Area 1	<a href="#">Pump 4</a>		
<input type="checkbox"/>	Critical	28/12/07 4:07:43 AM	Battery Level	Critical	Site/Building 1/Floor 2/Area 1	<a href="#">Bed1</a>		
<input type="checkbox"/>	Low	28/12/07 4:07:43 AM	Battery Level	Low	Site/Building 1/Floor 2/Area 1	<a href="#">Wheel 1</a>		
<input type="checkbox"/>	Medium	28/12/07 4:07:43 AM	Battery Level	Medium Bat Status	Site/Building 1/Floor 2/Area 1	<a href="#">Truck 2</a>		
<input type="checkbox"/>	High	28/12/07 4:07:43 AM	Battery Level	High Bat Status	Site/Building 1/Floor 1/Area A	<a href="#">Infusion Pump7</a>		
<input type="checkbox"/>	Medium	28/12/07 4:07:42 AM	Battery Level	Medium Bat Status	Site/Building 1/Floor 2/Area 1	<a href="#">Truck 1</a>		
<input type="checkbox"/>	Medium	28/12/07 4:07:42 AM	Battery Level	Medium Bat Status	Site/Building 1/Floor 2/Area 1	<a href="#">Truck 2</a>		

## Powerful Reporting

By Business Status:



- Standard reports as well as customised reports possible
- Create reports on people or assets or historical data for printout or export to other applications

## Event Dashboard & Reports

- Event Dashboard & reports provide accurate mustering data & event recording for post event analysis
- Exact time of mustering
- How long it takes to muster
- Count of people at muster points

Event Type	Event Name	Severity	Description	Asset Name	Location	Date
Entrance	Personnel Enters Refuge Station	Low		Miner 1	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:02:11
Entrance	Personnel Enters Refuge Station	Low		Mine Mechanic 2	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:02:05
Entrance	Personnel Enters Refuge Station	Low		Miner 1	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:02:02
Entrance	Personnel Enters Refuge Station	Low		Miner 5	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:02:01
Entrance	Personnel Enters Refuge Station	Low		Mine Mechanic 1	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:01:45
Entrance	Personnel Enters Refuge Station	Low		Miner 4	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:01:43
Entrance	Personnel Enters Refuge Station	Low		Mine Mechanic 3	Mining/Mining/Nickel Mine/Refuge Station	Tue 09 Mar 10 16:01:43

## Feature Rich API

The AeroScout logo, with 'AeroScout' in orange and 'Enterprise Visibility Solutions' in smaller black text below it.

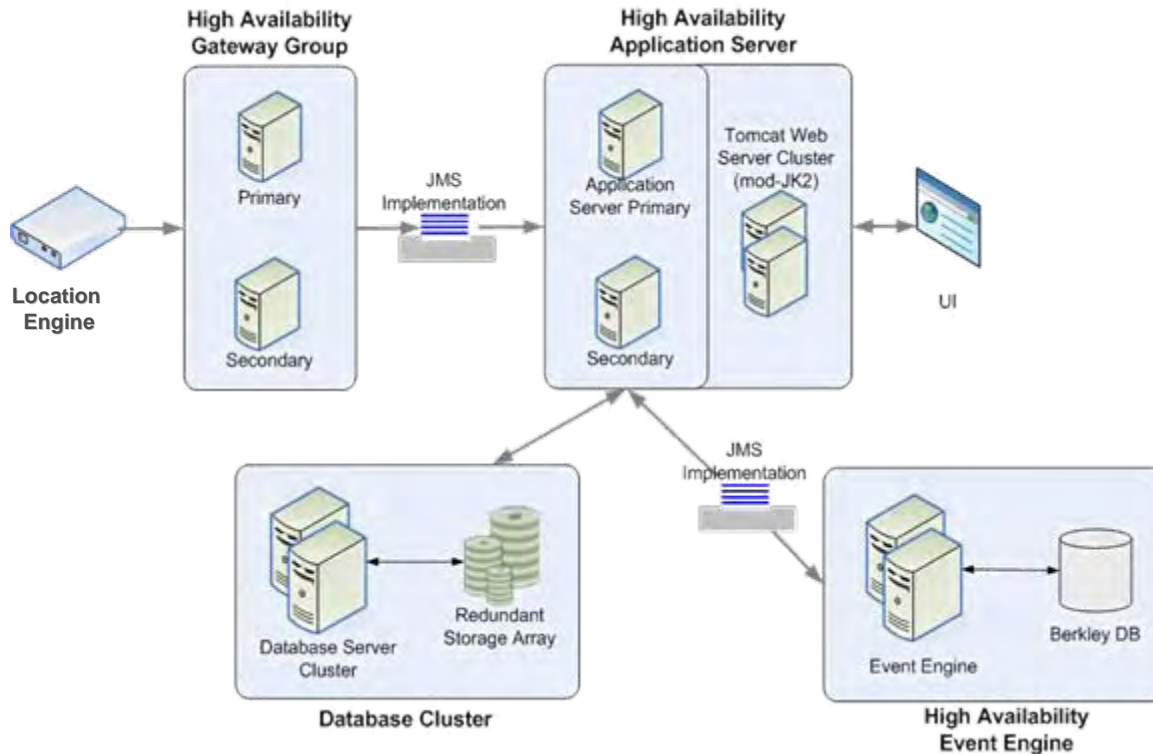
**AeroScout**<sup>®</sup>  
Enterprise Visibility Solutions

**AeroScout MobileView v4.0  
Integration Guide**

- Easily integrate MobileView into existing site software systems such as SAP, Site DCS, MRP & ERP systems
- Variety of methods to facilitate the simplest to the most complex integrations
- Standard templates & guides to simplify integration

## High Availability Architecture

Support for both hardware & software high availability, database clustering & load balancing of MobileView components



# Conclusion

## Extronics & AeroScout



## Product Roadmap



- Ultra Wide B& (UWB) location principle support for sub 1 metre location accuracy in dense metallic environments such as processing units & offshore oil platforms
- Combined WiFi & UWB Tag with intrinsic safety certification
- Enhanced personnel safety features such as man down, human life signs monitoring & voice communication

## High Availability Architecture



- RF site surveys, network planning & cable infrastructure surveys
- Coverage performance guarantees to meet your requirements
- Documentation to include installation plans, electrical diagrams & “cells of coverage” diagrams etc
- Commissioning of Mustering, Location & WLAN systems with benchmark testing to prove performance

## Summary

- **Most flexible automatic people & asset visibility system on the market**
- **100% tag read rate means no false alarms**
- **Multiple location technologies ensures lowest total system cost by applying granular approach to accuracy requirements**
- **Scales from tens to thousands of people & assets**
- **Can be used for telemetry by adding tag based sensors**
- **Web browser software enables system access anywhere**
- **Feature rich API enables easy integration with other software applications such as SAP, MRP, ERP & site DCS**