
TM X-XX-X

TECHNICAL MANUAL

CENTAUR TRAINING MANUAL

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TM X-XX-X

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CHAPTER 1. INTRODUCTION

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1-1. PURPOSE. This manual provides training and guidance for the CENTAUR (Capabilities to Enhance NBC Threat Awareness, Understanding, and Response) solution. It contains an overview of and descriptions of the various components of this prototype with operational instructions for system operators.

1-2. SCOPE. This manual covers technical and training information for all sections of the CENTAUR Architecture including sensors, sensor management systems, command posts, analytics engine, and Q. The information in this manual is primarily of relevance to operators, and mostly contains tutorial-type content on the everyday use of the system and its features. Information on maintenance and troubleshooting is limited within the document.

1-3. EXPLANATION OF ABBREVIATIONS AND TERMS. Abbreviations and special terms used in this manual are explained in the glossary.

CHAPTER 2. CENTAUR BACKGROUND

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2-1. CENTAUR HISTORY AND NETWORK OVERVIEW. CENTAUR (Capabilities to Enable NBC Threat Awareness, Understanding, and Response). Primary function is the detection of Biological and Chemical Warfare Agents. CENTAUR System Capabilities include detection of biological and chemical threats, monitoring of environmental conditions, built-in test (BIT), alarms and fault reporting, command and control, and data archival for system performance monitoring, forensic evidence, and analytics.

2-2. CENTAUR ARCHITECTURE. The CENTAUR solution consists of sensors, Sensor Management Systems (SMS), Command Posts, Analytics Engines, and Q. CENTAUR is compliant with the D.O.D Integrated Sensor Architecture (ISA).

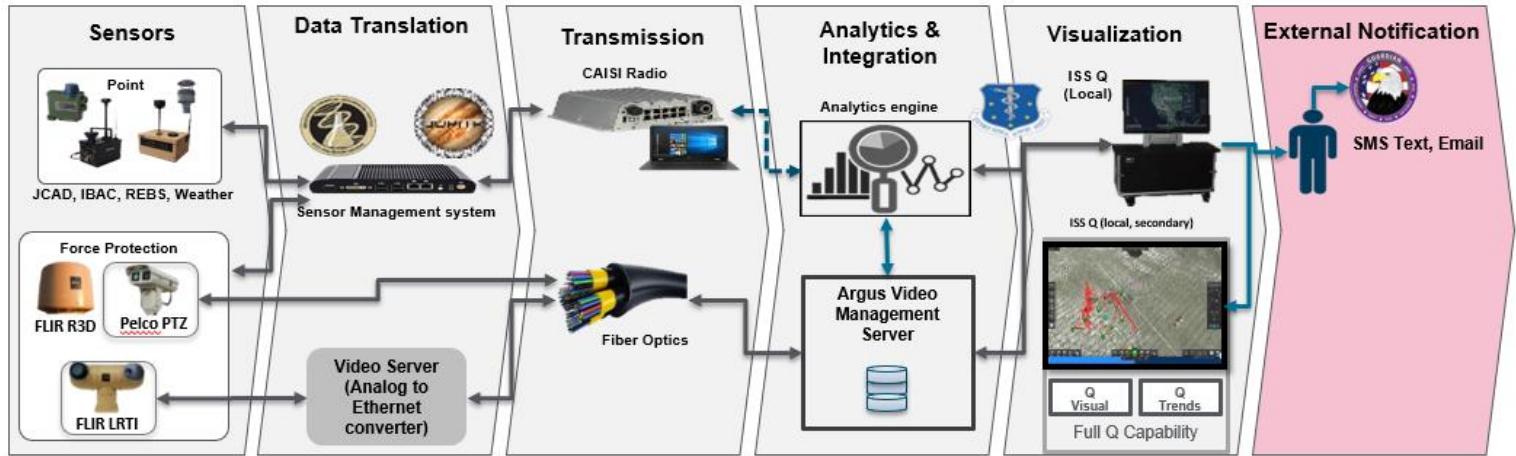


Figure 1. Centaur Architecture

CHAPTER 3. SENSORS

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3-1. SENSOR OVERVIEW. The IBAC does detection and collection only without agent identification. Detection normally triggers the collection process, which forces air through a filter to gather agent samples. The filter is manually collected and analyzed for agent identification. These sensors report meteorological conditions and GPS location data.

Note: Different sensors are manufactured by different companies and so they may use different names for the same properties or settings.



Figure 2. IBAC Sensor

The AIO2 is an all-in-one weather sensor. Provides measurements of wind speed, wind direction, ambient air temperature, relative humidity, and barometric pressure.



Figure 3. AIO2 Sensor

Merlin Viper is an in-development radiological/nuclear sensor system. More details to come as integration progresses.



Figure 4. Merlin Viper Sensor

FLIR Ranger R3D is a dual mode ground surveillance radar – can switch fast scan and doppler. Operates in the Ka-band. Low minimum detection velocity (MDV) detects slow-moving threats such as walkers and crawlers.



Figure 5. FLIR Ranger R3D Radar

Pelco Esprit Series PTZ Camera is a high-definition, high-speed camera system. 30x optical zoom camera with a tilt range of +36° to -85° from horizontal. 360° continuous pan rotation at 100° per second.



Figure 6. Pelco Esprit Series PTZ Camera

The FLIR Ranger MS-LRTI is equipped with a day/low-light CCD camera and cooled InSb thermal imager. Overlay visible camera video onto 640x512 cooled thermal imagery with continuous 2° to 30° FOV optical zoom in real time.

FLIR Ranger MS-LRTI



Figure 7. FLIR Ranger MS-LRTI Camera

The REBS periodically runs an agent identification process and reports the results to the CP. The identification is presumptive. REBS does not report meteorological conditions. REBS does not report GPS location data in the CENTAUR configuration.



Figure 8. REBS Sensor

The JCAD performs airborne chemical agent detection only. There is no sample collection. The alarm category (e.g. “nerve,” “blister,” “toxin”) is reported to the operator. It is small, lightweight, and low power. JCAD does not report meteorological conditions or GPS location data.



Figure 9. JCAD Sensor

3-2. SENSOR MANAGEMENT SYSTEM. Used to configure and control each sensor. Resides between the CP and one or more sensors. Controlled by the CP, typically not directly by an operator. Feeds data into an CP. Devices can connect via Ethernet or Serial.

Each sensor is configured and controlled by an SMS software module running on customized hardware connected by cables to the sensor itself. Important sensor control commands can be issued through the SMS as well as through the sensor's buttons and keypad. The SMS resides between the CP and the bio sensor. Operators normally interact with the CP and not with SMSs.



Figure 10. Sensor Management System

CHAPTER 4. SENSOR MANAGEMENT SYSTEM

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4-1. SMS OVERVIEW. The SMS is a computer which connects multiple sensors, and resides in between the Command Post (CP) and the sensors. It's controlled by the CP, and usually not directly by an operator. It feeds sensor status and data to the CP. Devices connect to it using Ethernet and/or Serial.



Figure 11. SMS

4-2. SMS MAIN SCREEN. This is roughly what the SMS screen looks like. SMS appearance will vary somewhat depending on your particular SMS sensor configuration.

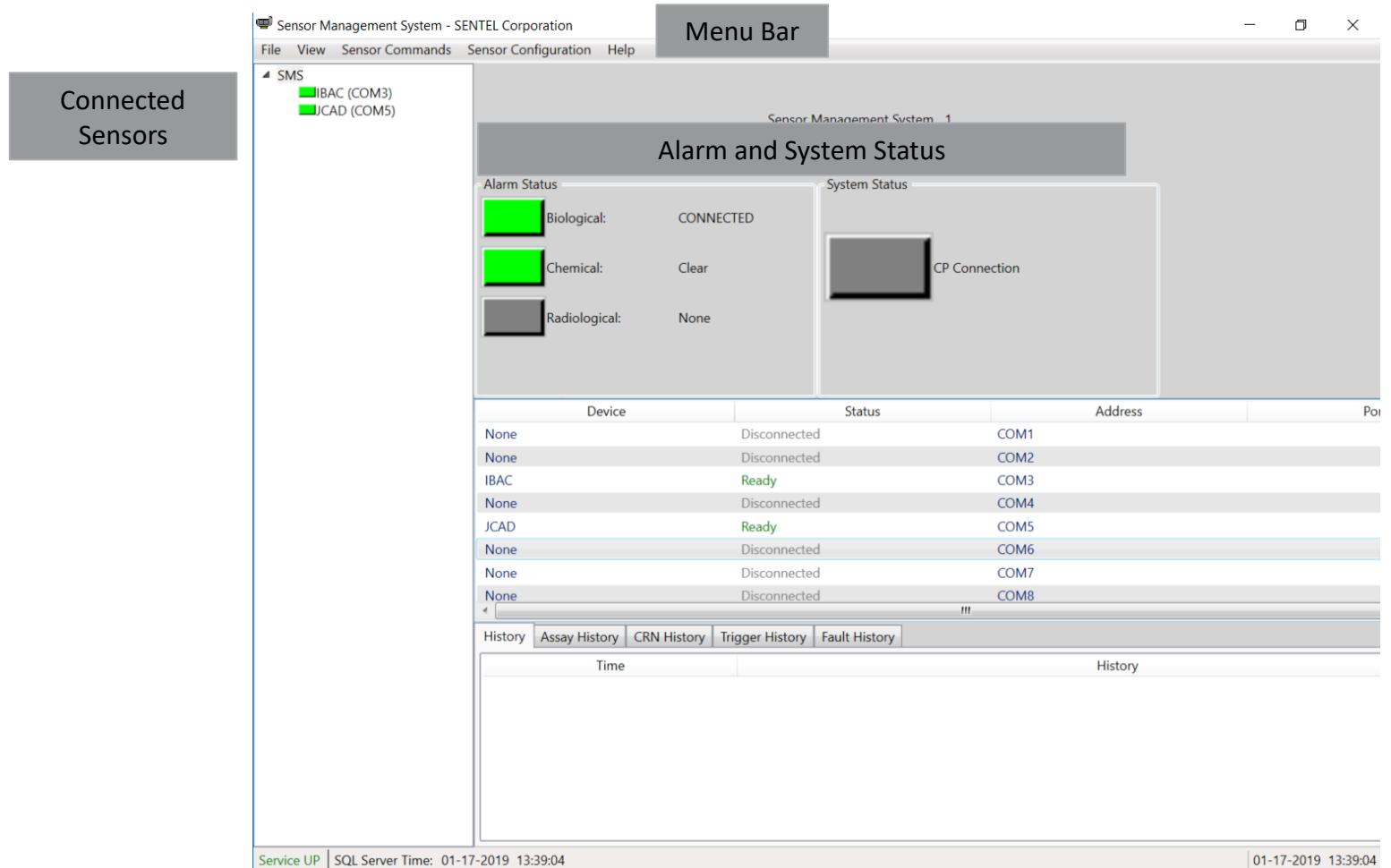


Figure 12. SMS Main Screen

4-3. ALARM AND CONNECTION STATUS. The color of the alarm and system status boxes tell the operator whether or not a sensor is connected properly, disconnected, or alarmed.

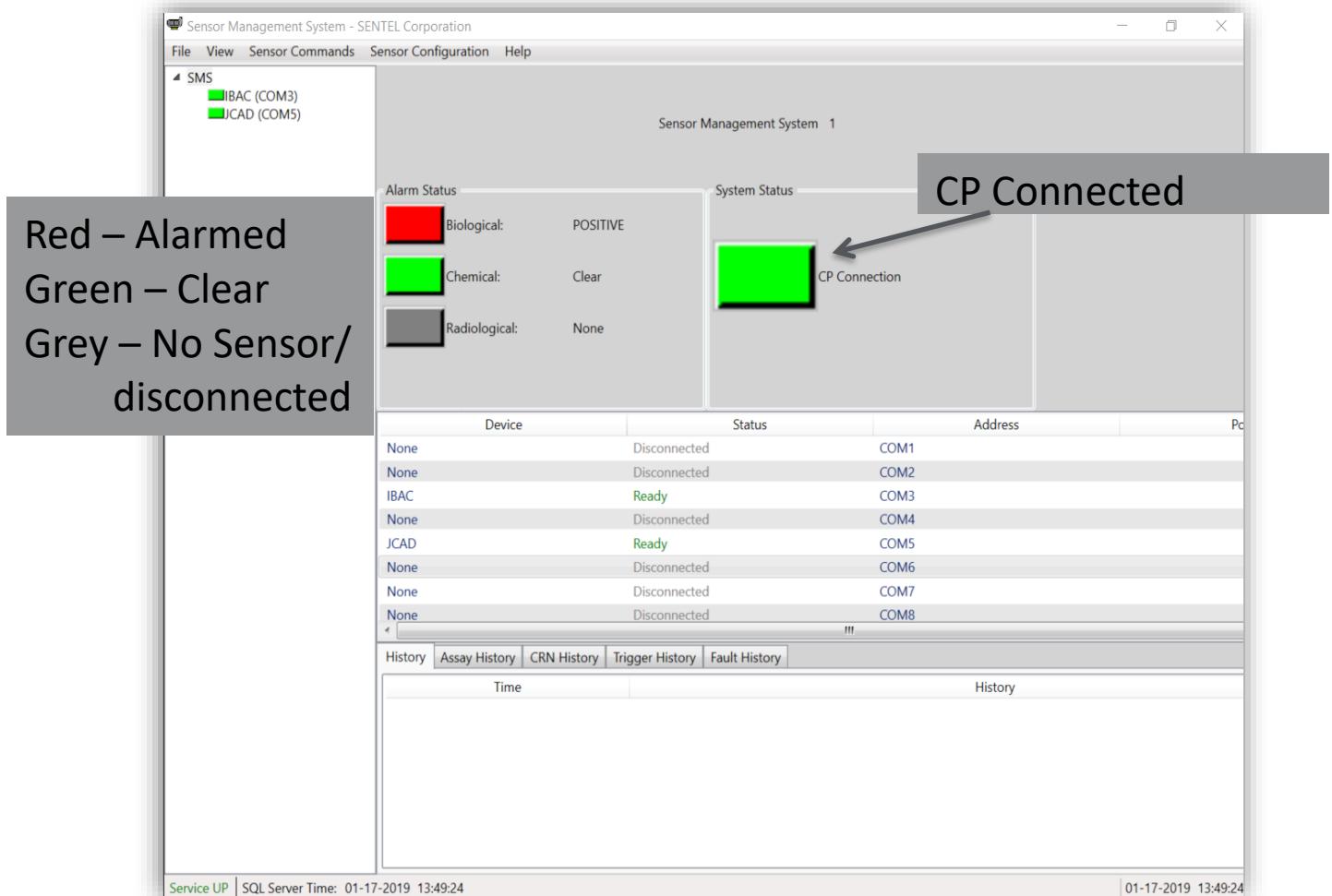


Figure 13. Alarm and Connection Status Screen

4-4. SENSOR PAGES. Click on the name of a connected sensor to view details about its connection state, data, faults, alarms, and settings. The available data and settings on this page differ depending on the sensor.

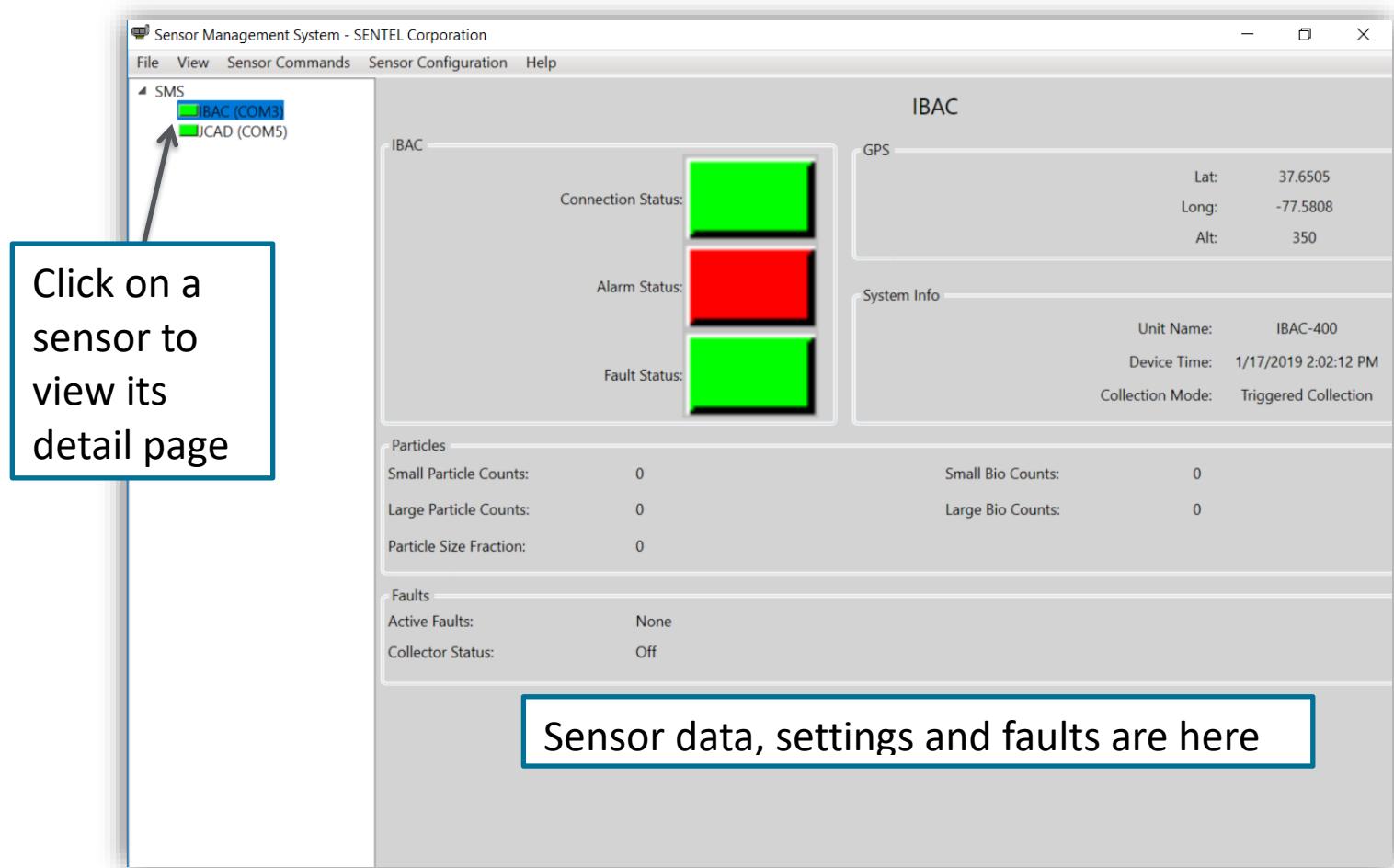


Figure 14. Sensor Pages Screen

4-5. SENDING SENSOR COMMANDS. Some sensors have commands on their page in the UI.



Figure 15. Sensor Page Screen

If you don't see a command on the sensors UI page click on Sensor Commands to view and send one of the commands available to a sensor. Sensors each have a different number of commands – most of these commands are typically sent from the CP.

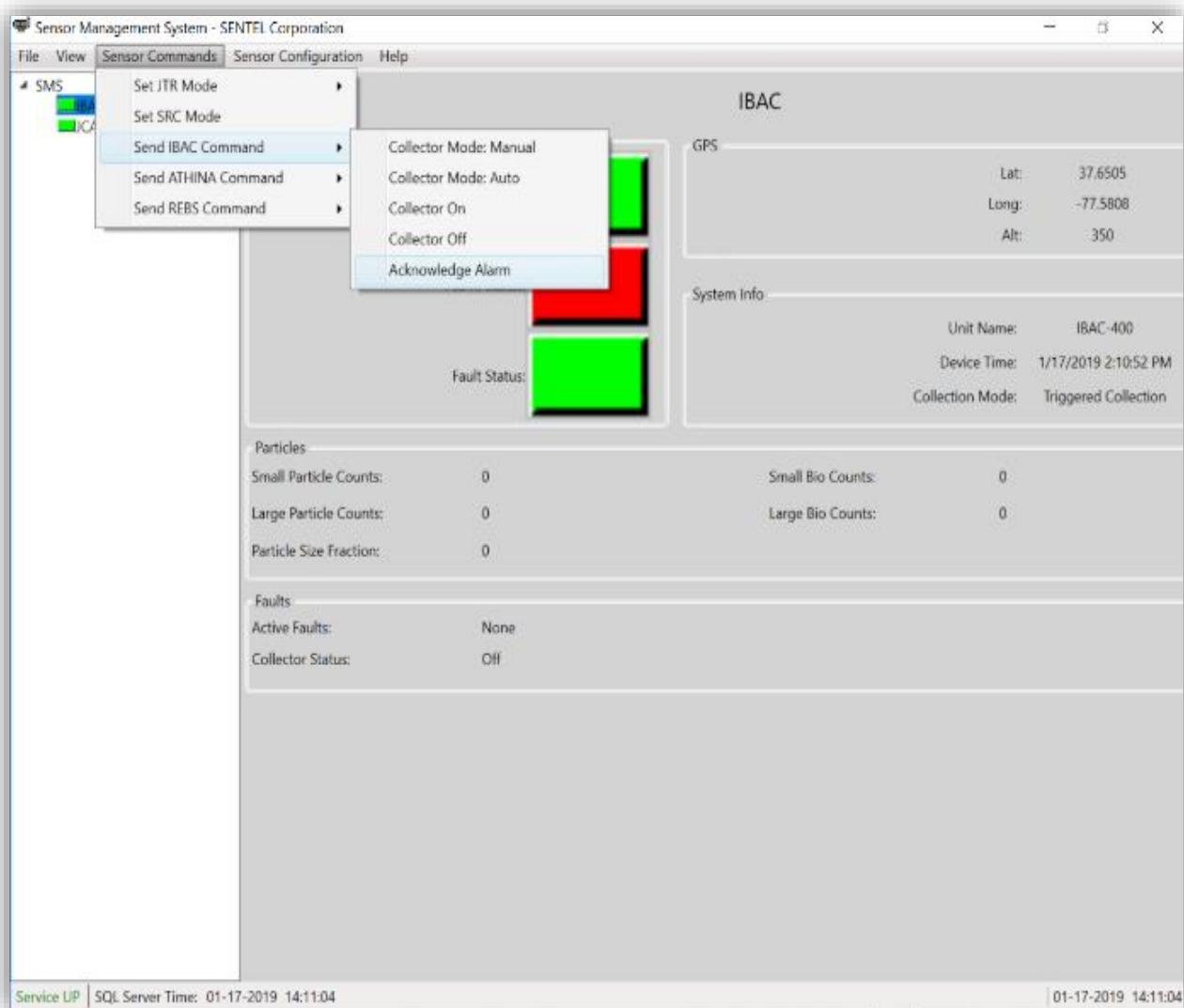


Figure 16. Sensor Commands Screen

4-6. ADDING/REMOVING SENSORS. To add or remove a sensor, make sure the sensor is connected properly and click Sensor Configuration, and then Configure Devices.

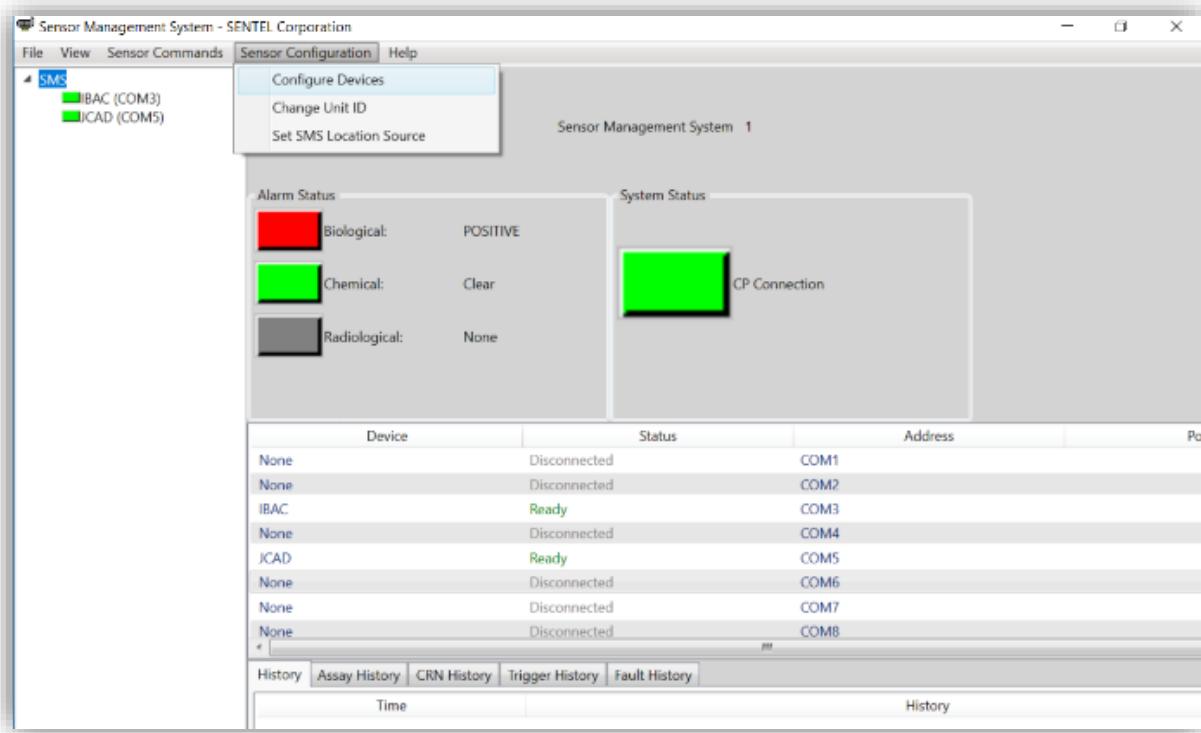
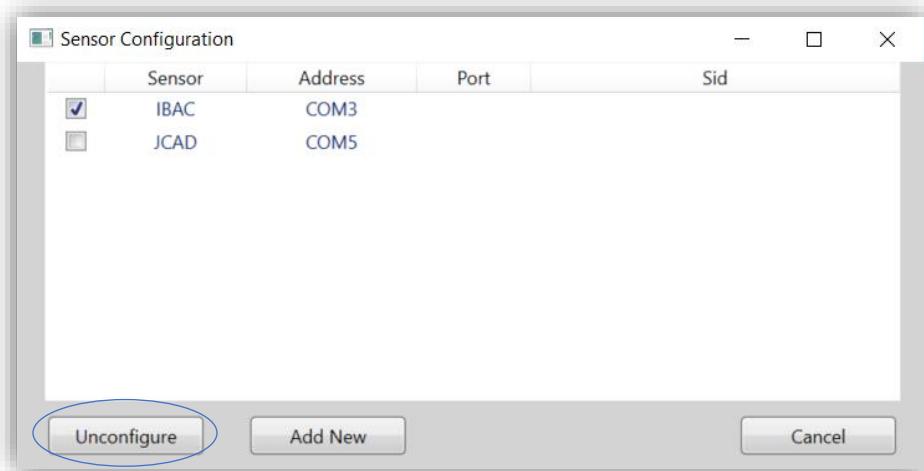


Figure 17. Configure Devices Screen

Once in the sensor configuration window, to remove a sensor, check its box and click Unconfigure. To add a sensor, click Add New.



To remove a sensor, check its box and click Unconfigure

Figure 18. Removing a Sensor

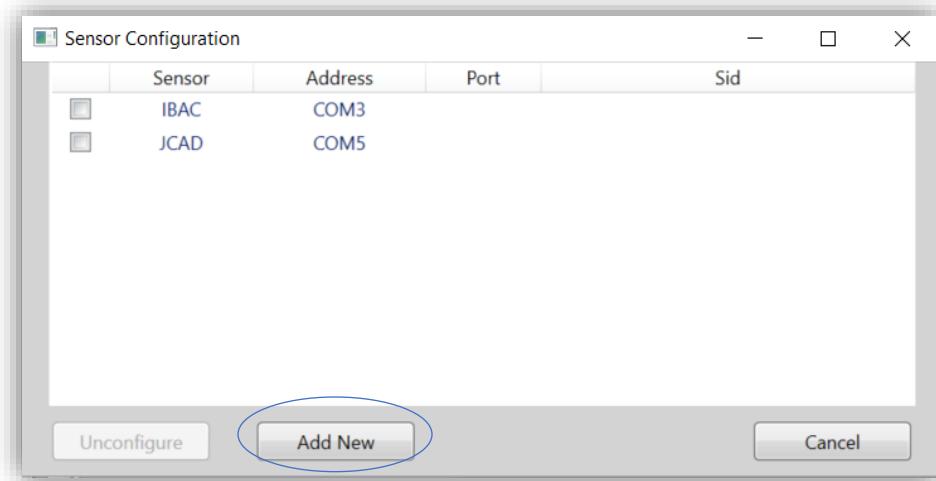


Figure 19. Adding a Sensor

To add the sensor, use the drop down boxes to choose the sensor and its connection type, and what port or IP address you want to use. Then click OK.

To add a sensor, click Add New

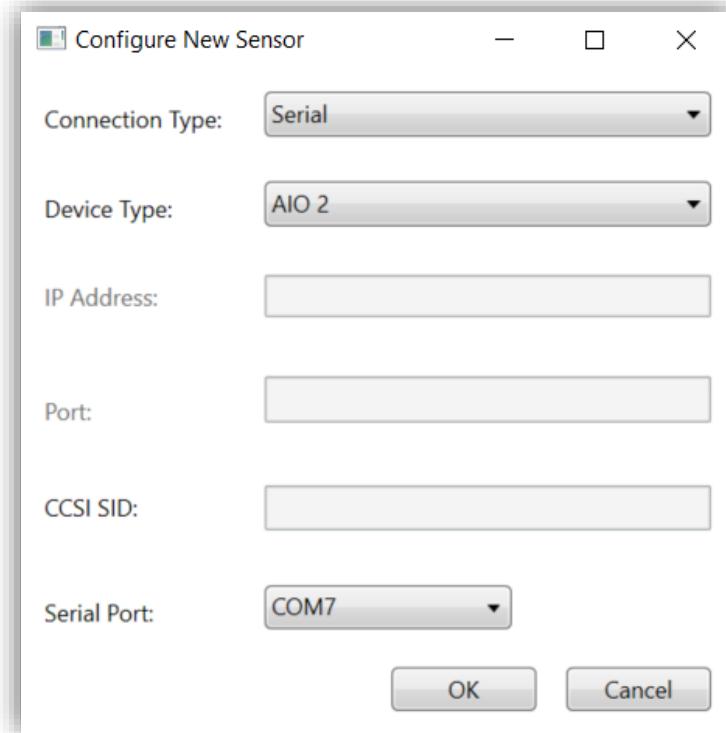


Figure 20. Configure New Sensor Screen

4-7. OTHER SMS INFORMATION. Click on the help section of the menu bar to access the “About Sensor” button. You can view more information about this SMS build, which can be useful for maintenance and reporting issues.

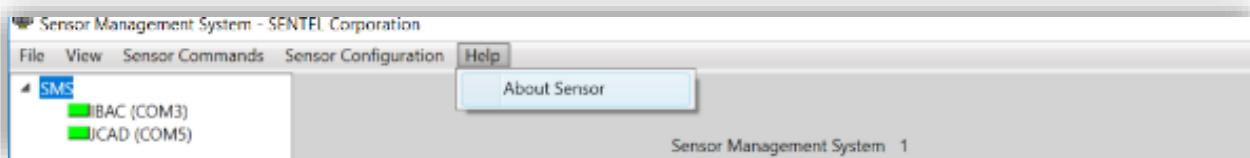


Figure 21. About Sensor Button

Click on the help section of the menu bar to access the “About Sensor” button.

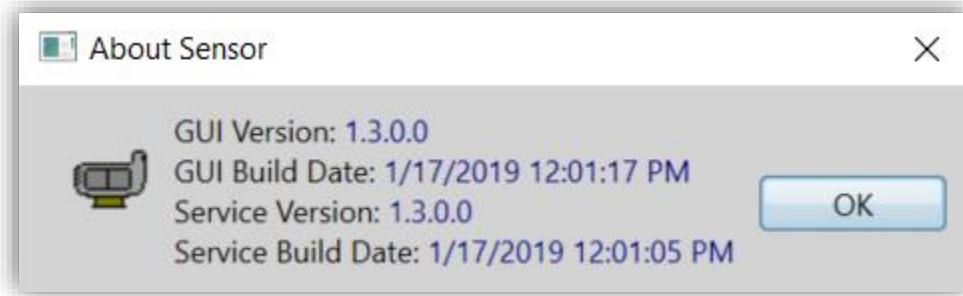


Figure 22. About Sensor Screen

You can view more information about this SMS build, which can be useful for maintenance and reporting issues.

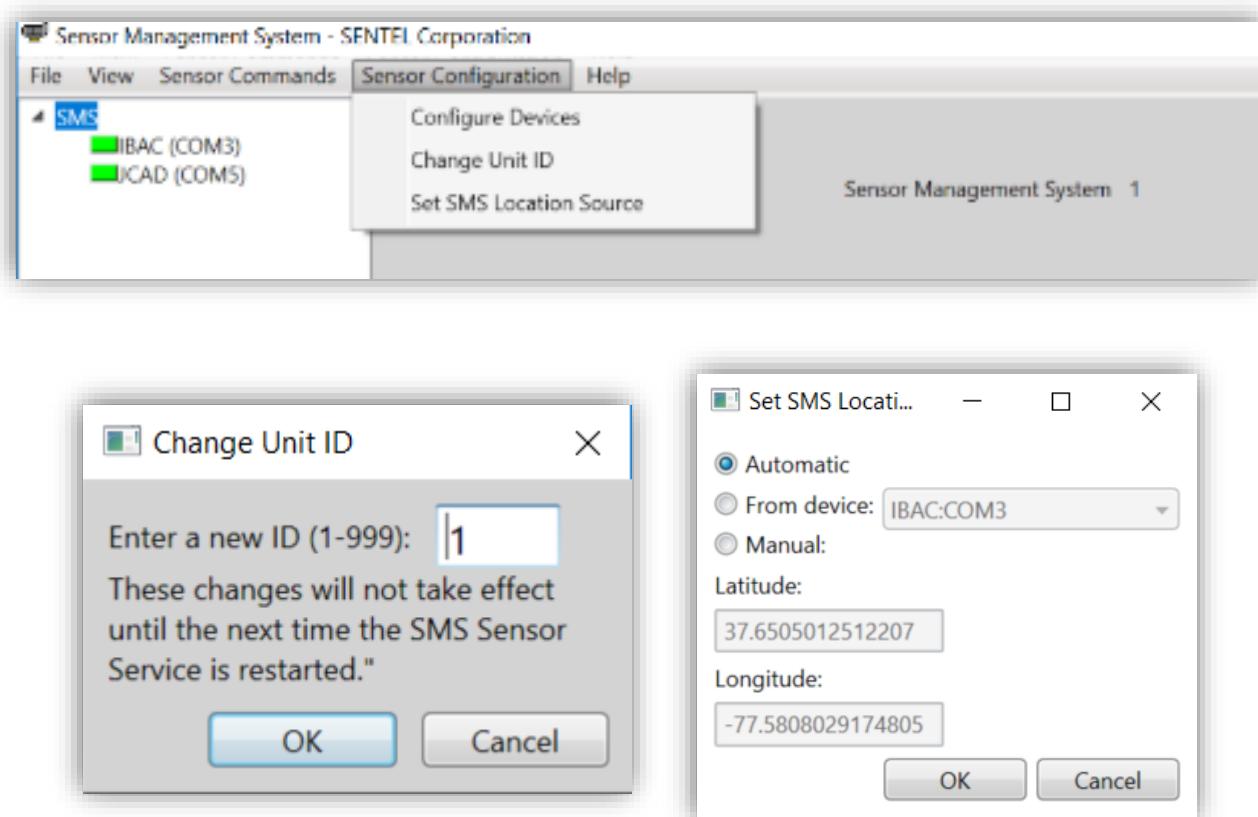


Figure 23. Sensor Configuration Options

You can also change the SMS' ID number, and change the source of its location, or set the location manually. Click on Sensor configuration and use Change Unit ID, or set SMS Location source to do this.

CHAPTER 5. COMMAND POST

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5-1. COMMAND POST MAIN SCREEN. All the SMSs in an area feed into a CP, which provides a user friendly environment for seeing what is going on and issuing commands to SMSs and sensors. The CP has audible and visual alarms that go off when a CBRN agent is detected or identified.

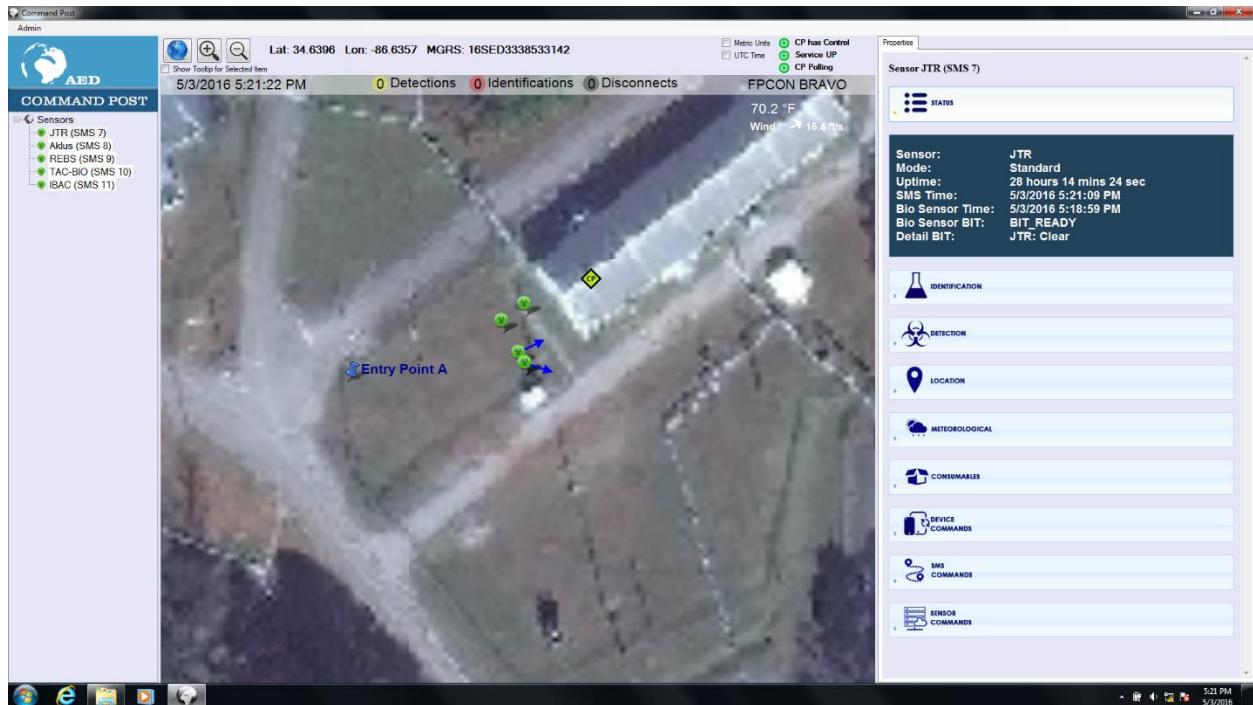


Figure 24. Command Post Main Screen

5-2. COMMAND POST LAYOUT.

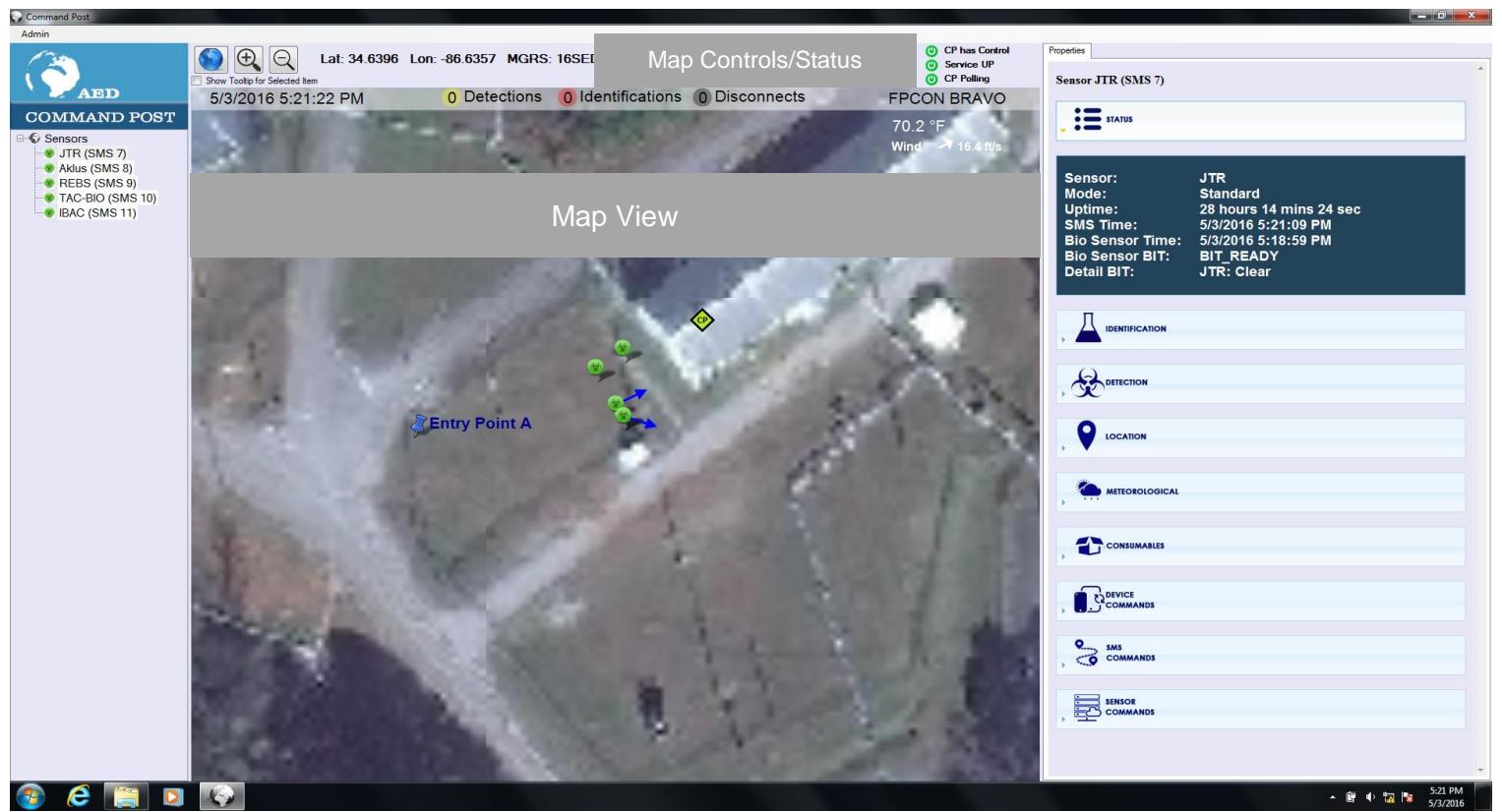


Figure 25. Command Post Layout

5-3. BIOLOGICAL/CHEMICAL AGENT. When a sensor detects a biological or chemical agent, this dialog is displayed and an audible alarm sounds. Acknowledge and Acknowledge All turns off the audible alarm and dismisses the popup.

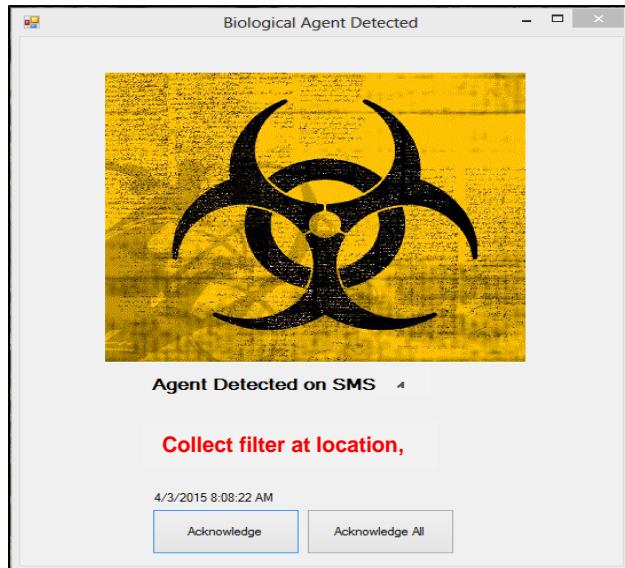


Figure 26. Detection of Biological/Chemical Agent

5-4. BIOLOGICAL AGENT IDENTIFICATION. When a sensor identifies an agent, this dialog is displayed and an audible alarm sounds. Acknowledge and Acknowledge All turns off the audible alarm and dismisses the popup.

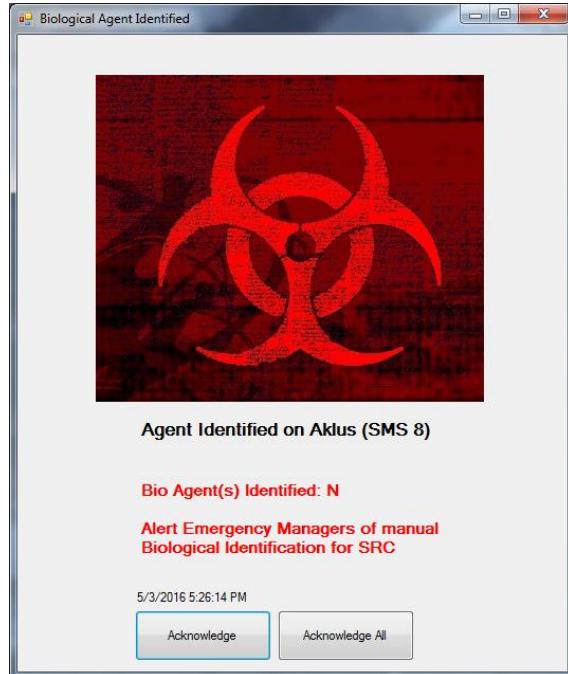


Figure 27. Identification of Biological Agent

5-5. MENU BAR.

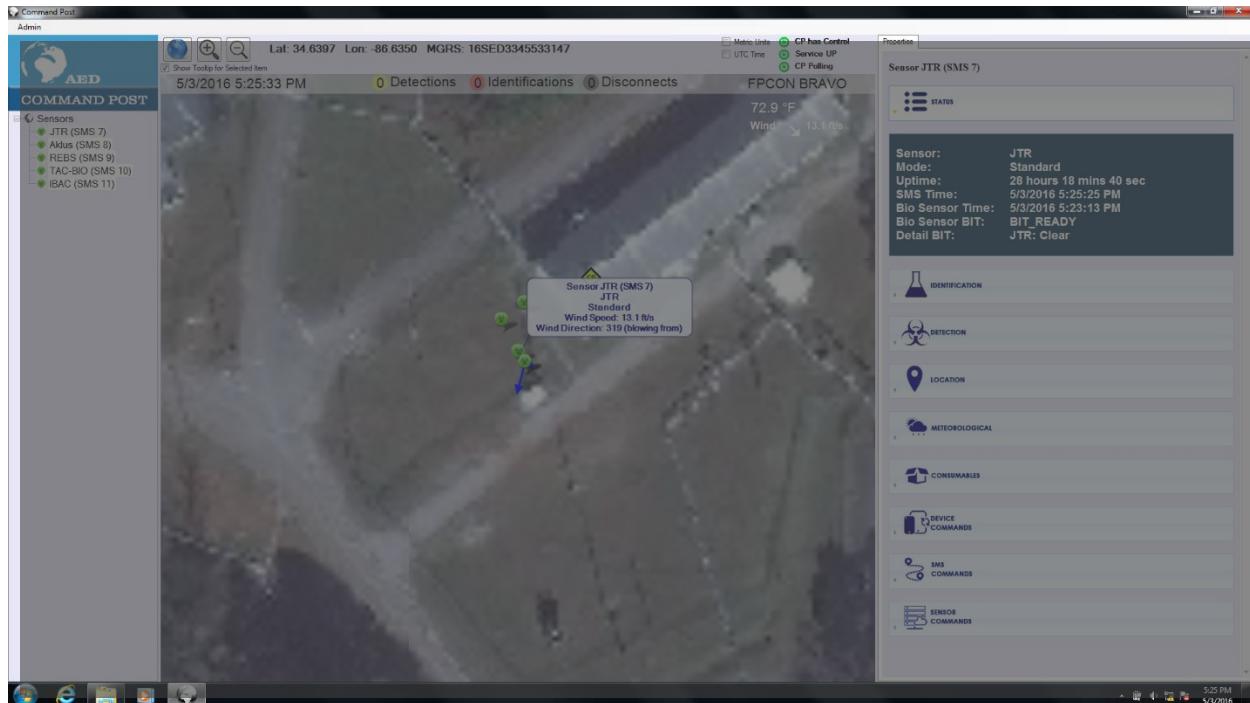


Figure 28. Menu Bar

5-6. MENU BAR: ADMIN MENU. Near the top of the CP application is the CP Menu Bar. It leads to a submenu of features that are normally not used by CP Operators. These options are for administrators only. They will not be used by the average operator.

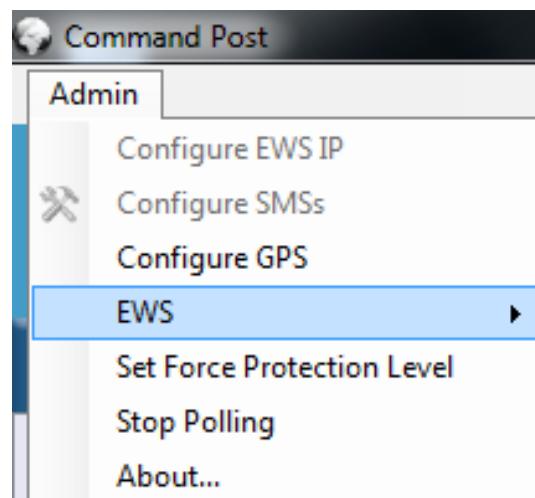


Figure 29. Admin Menu

5-7. ADMIN MENU: CONFIGURE EWS IP. This feature allows an administrator to set or modify the IP address of the EWS. These options are for administrators only. They will not be used by the average operator.

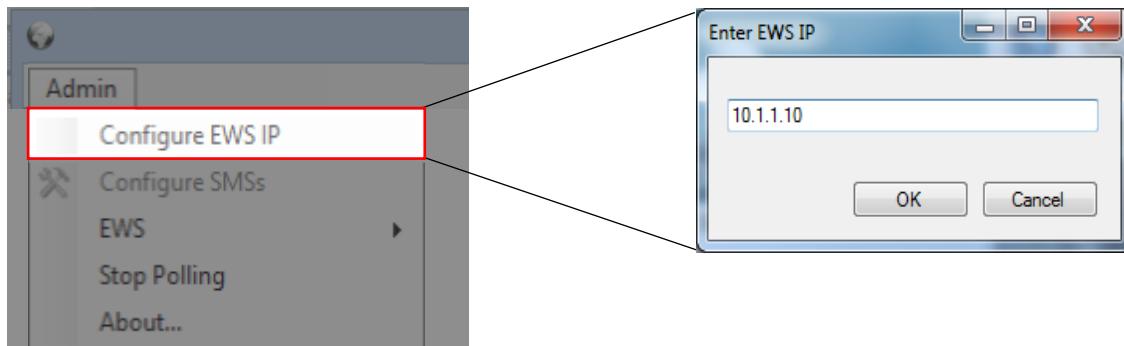


Figure 30. Configure EWS IP Address

5-8. ADMIN MENU: CONFIGURE SMS. The ID column displays the unique numeric ID for each SMS. The IP Address column displays the unique IP address of each SMS. The Polling column displays whether or not this particular SMS should be polled. This sensor will be polled if and only if this setting and the global polling setting are both set to "True." These options are for administrators only. They will not be used by the average operator.

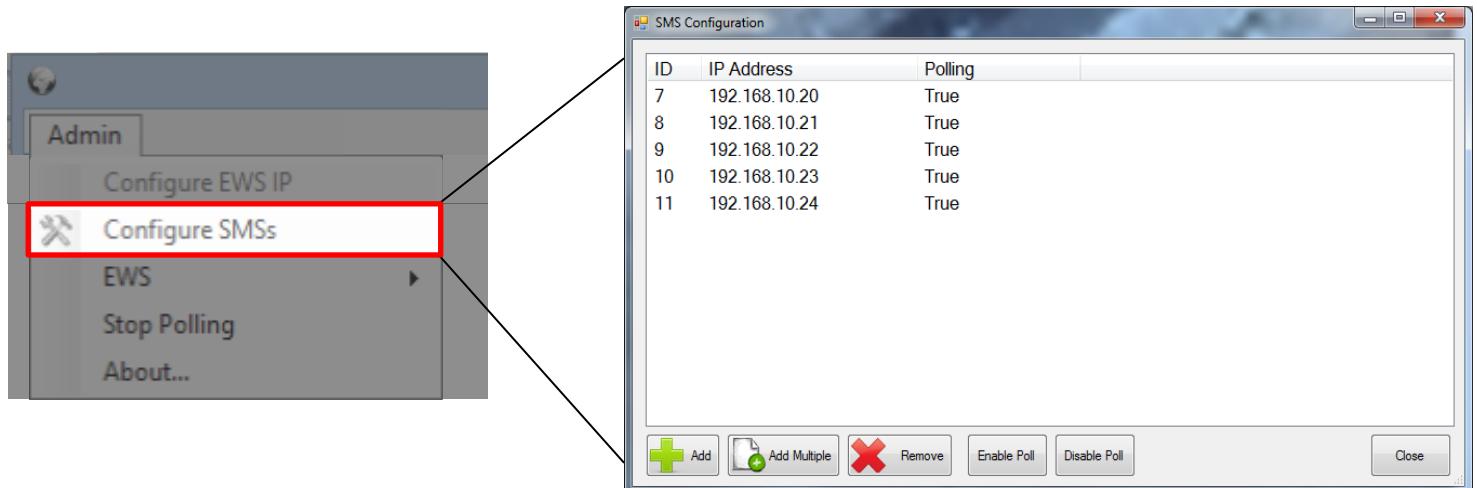


Figure 31. Configure SMS

5-9. ADMIN MENU: CONFIGURE GPS. Set the location of the CP. The CP icon will show up in the given location on the map. These options are for administrators only. They will not be used by the average operator.

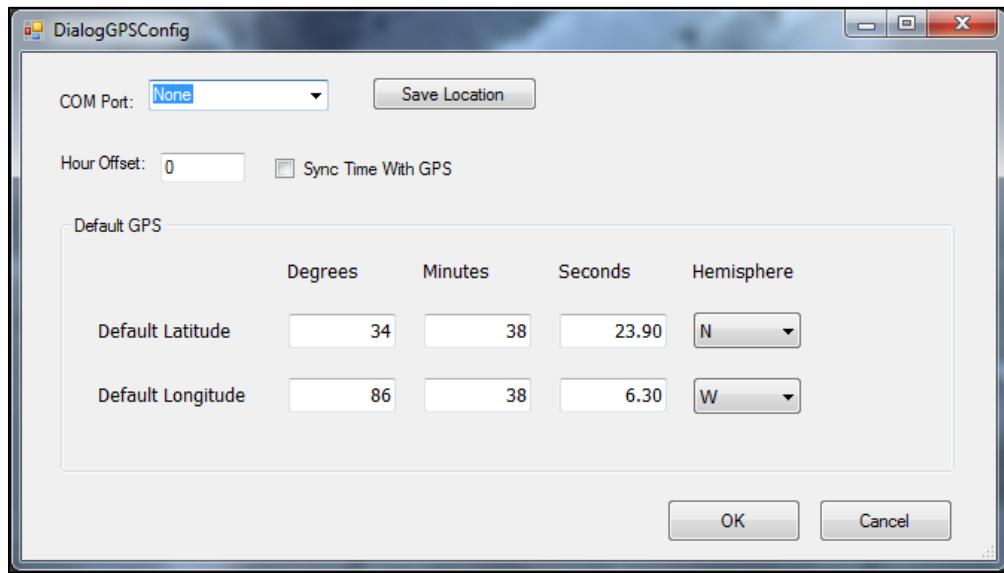


Figure 32. Configure GPS Screen

5-10. EWS CONTROL REQUEST. Early Warning System can request control of the biosensors. If the EWS requests control from you then you will see the confirmatory prompt. You will not see this prompt unless the EWS triggers it by asking the CP for control. Then it shows up automatically.



Figure 33. EWS Control Request Screen

5-11. CP HAS CONTROL.

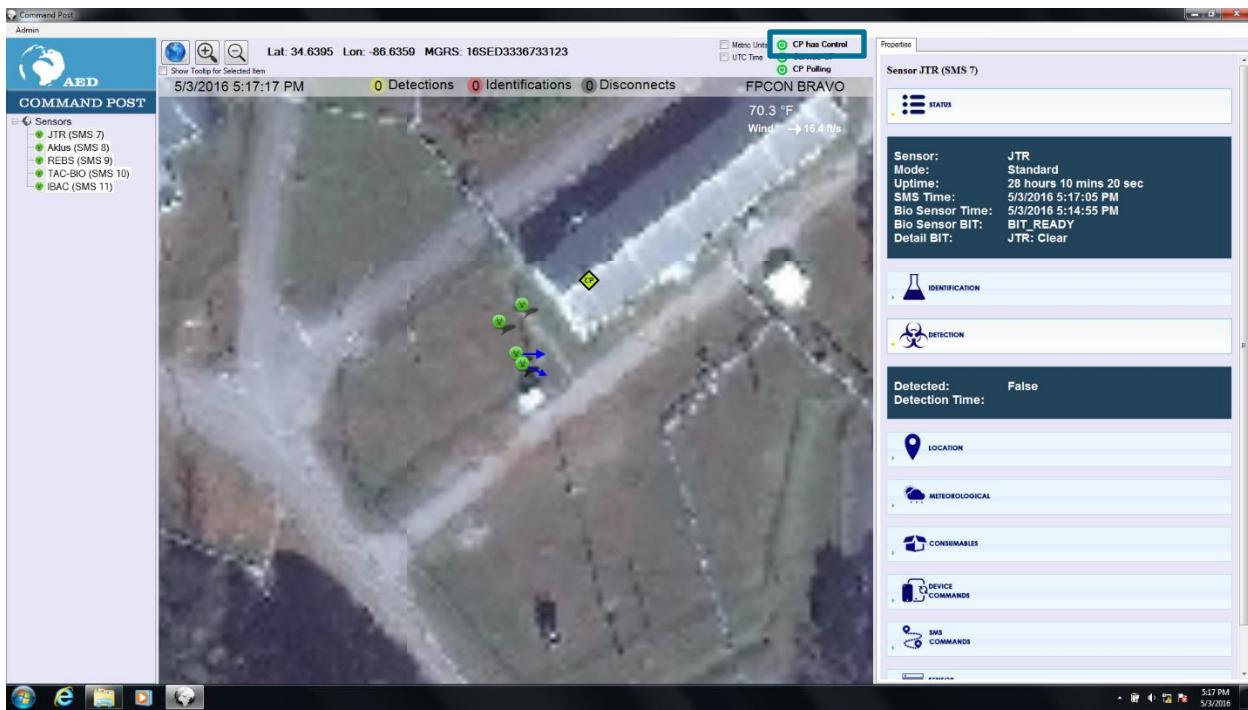


Figure 34. Command Post Screen with CP Control

5-12. EWS HAS CONTROL.

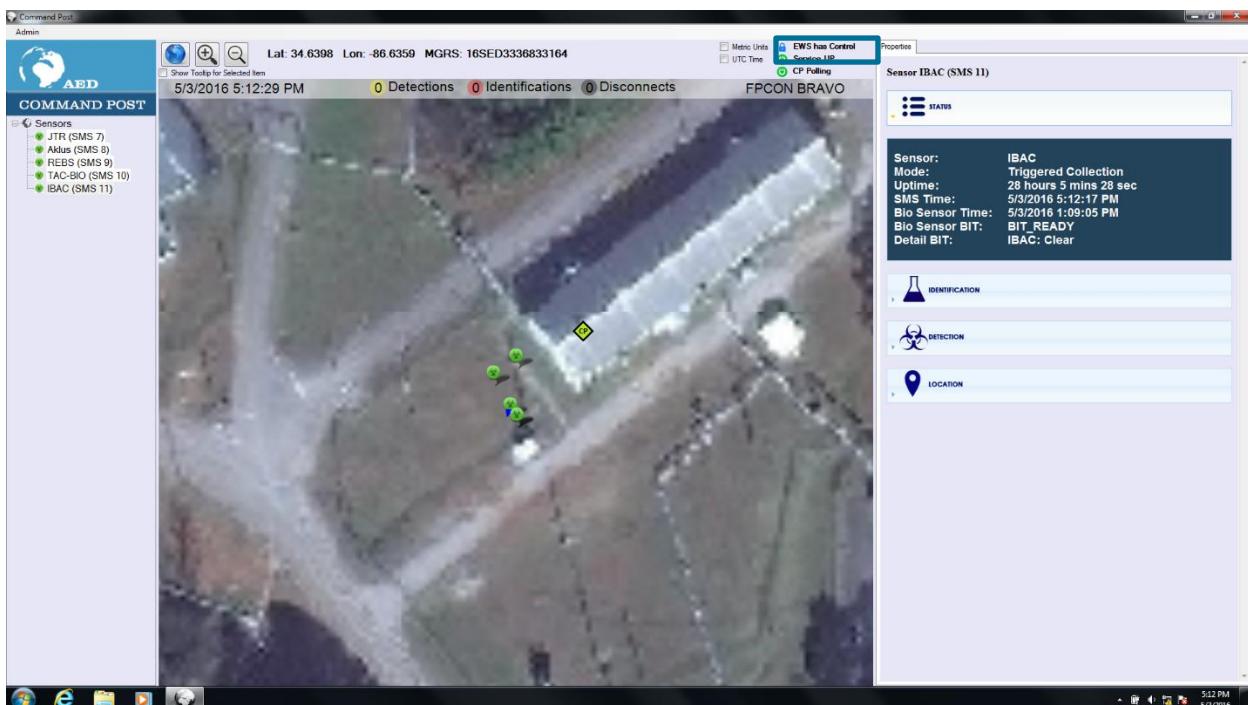


Figure 35. Command Post Screen with EWS Control

5-13. EWS CONTROL ADMIN.

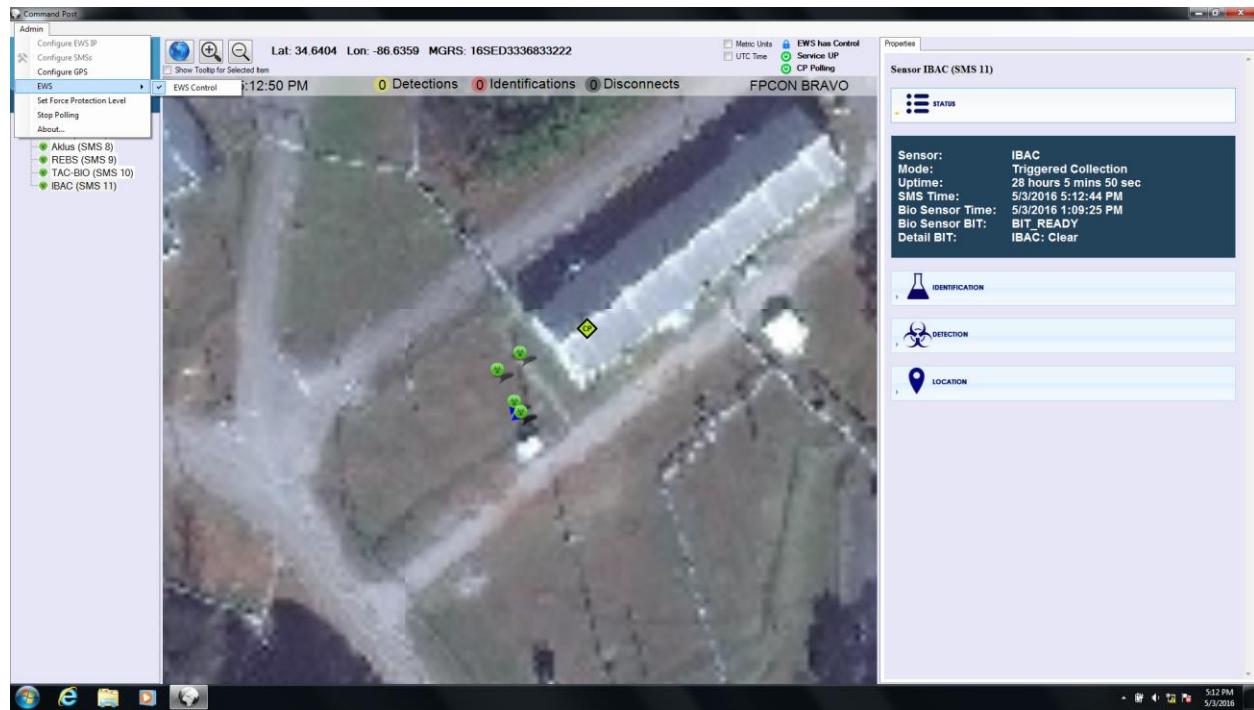


Figure 36. EWS Control Admin

5-14. ADMIN MENU: EWS CONTROL. This feature allows an administrator to toggle EWS's ability to send commands to the CP SMSs. Either the CP or the EWS may be in control of the SMSs, but not both at any one time. These options are for administrators only. They will not be used by the average operator.

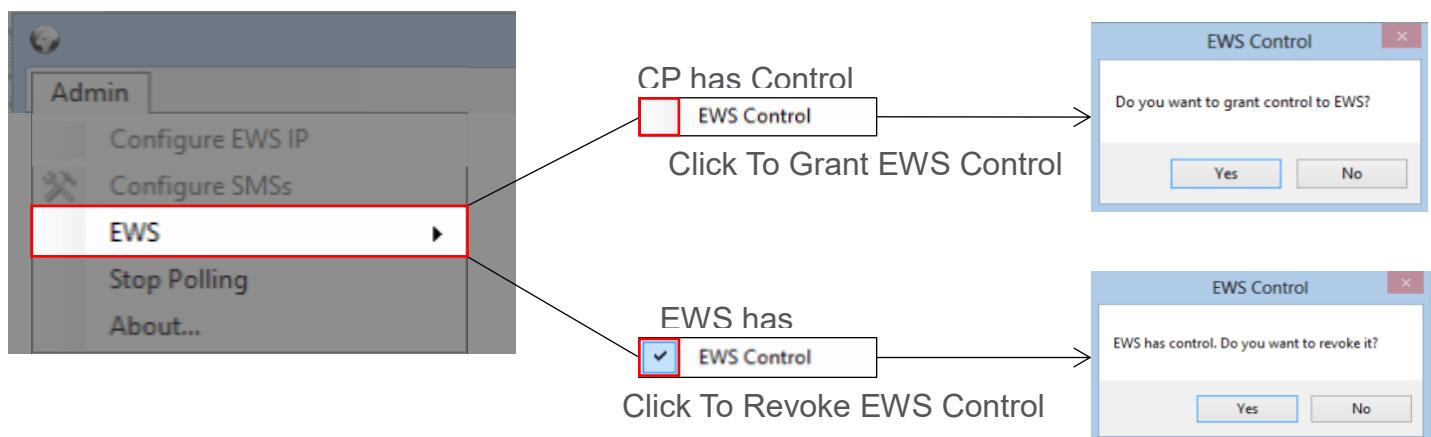


Figure 37. Toggle EWS Control

5-15. CP REVOKES EWS CONTROL. CP can revoke EWS control.

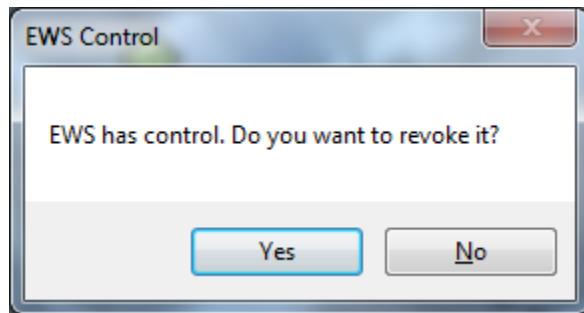


Figure 38. Revoke EWS Control Screen

5-16. ADMIN MENU: SET FORCE PROTECTION LEVEL. Set the Force Protection level (FPCON) at the deployment location. The selected FPCON is displayed on the GUI. These options are for administrators only. They will not be used by the average operator.

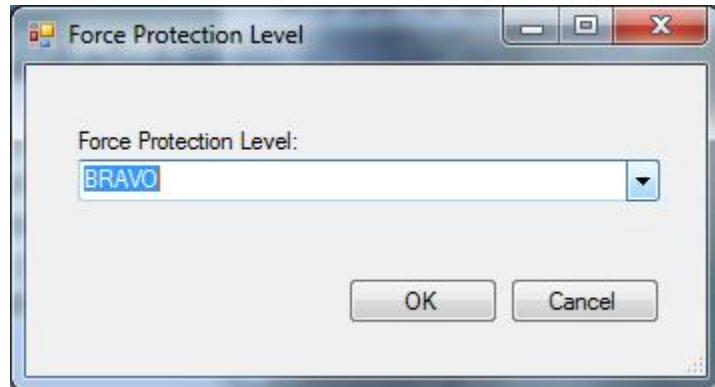


Figure 39. Set Force Protection Level

5-17. ADMIN MENU: SMS POLLING. This feature allows an administrator to start and stop polling for data from the configured SMSs. These options are for administrators only. They will not be used by the average operator.

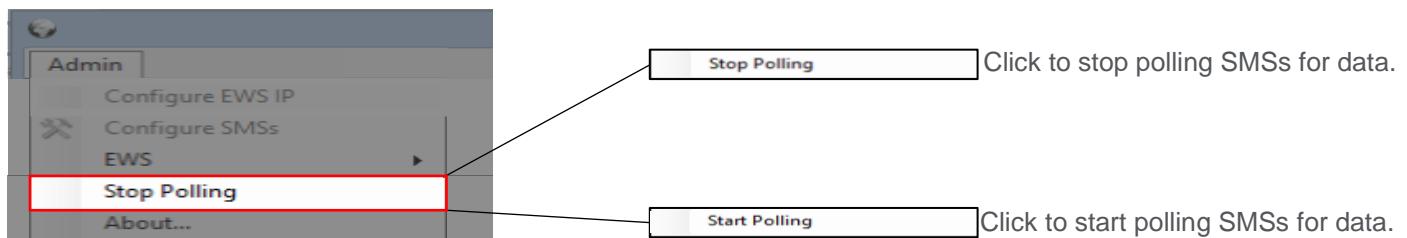


Figure 40. Start/Stop Polling for Data

5-18. ADMIN MENU: ABOUT DIALOG. This feature allows an administrator to view CP information.

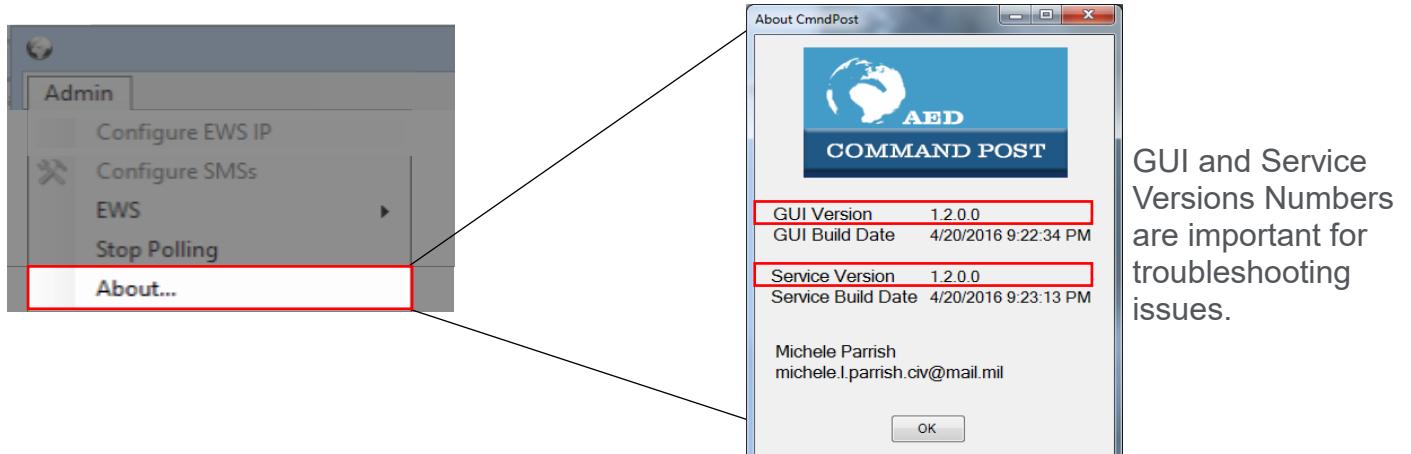


Figure 41. About Dialog Box

5-19. SENSOR TREE.

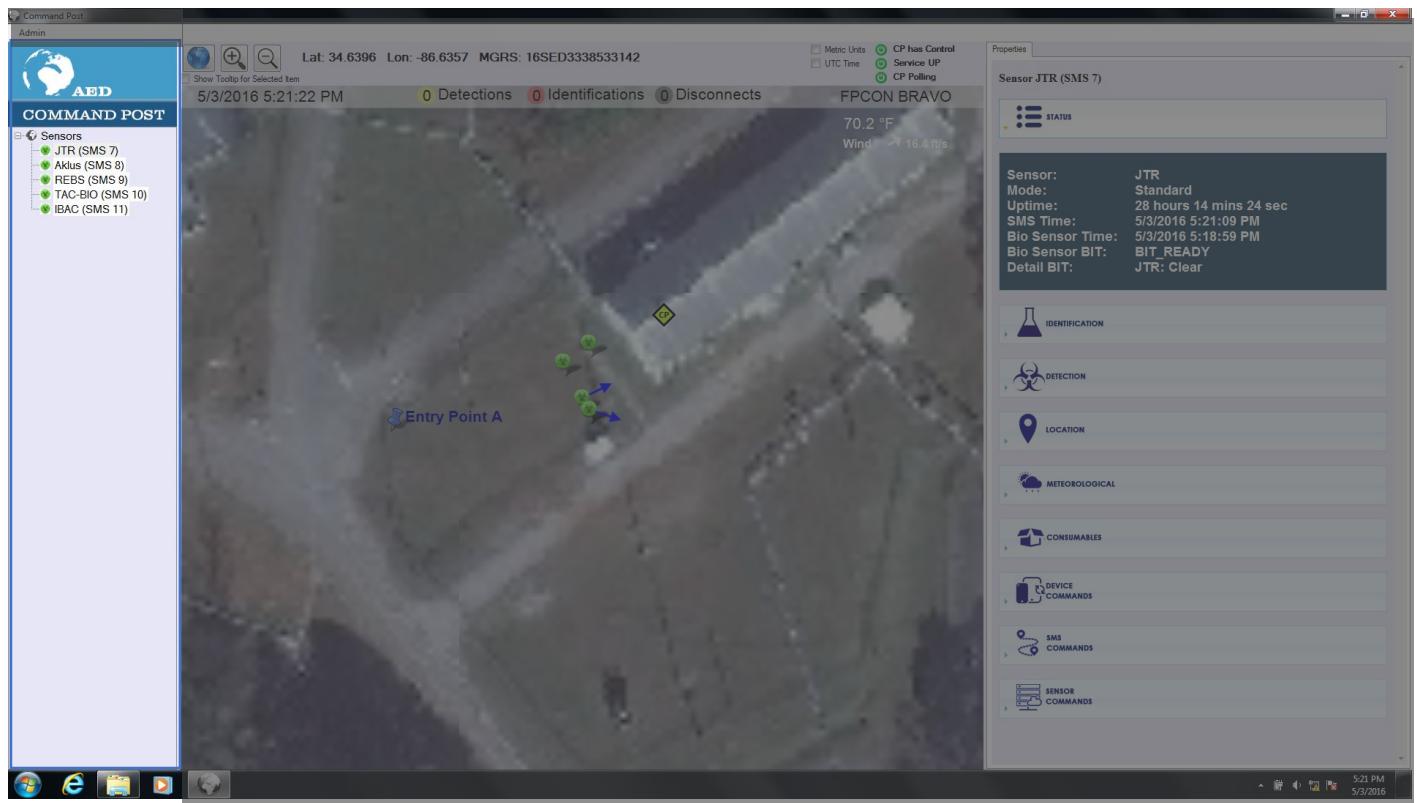


Figure 42. Sensor Tree Screen

The sensor tree displays a list of all configured SMSs. The SMS icon is normally green, but changes for certain events. If an agent is identified, then the agent name is displayed. This area displays a list of all configured SMSs. An SMS will be listed here if it is being polled. You can expand and contract branches of the tree by clicking on the small '+' and '-' icons.

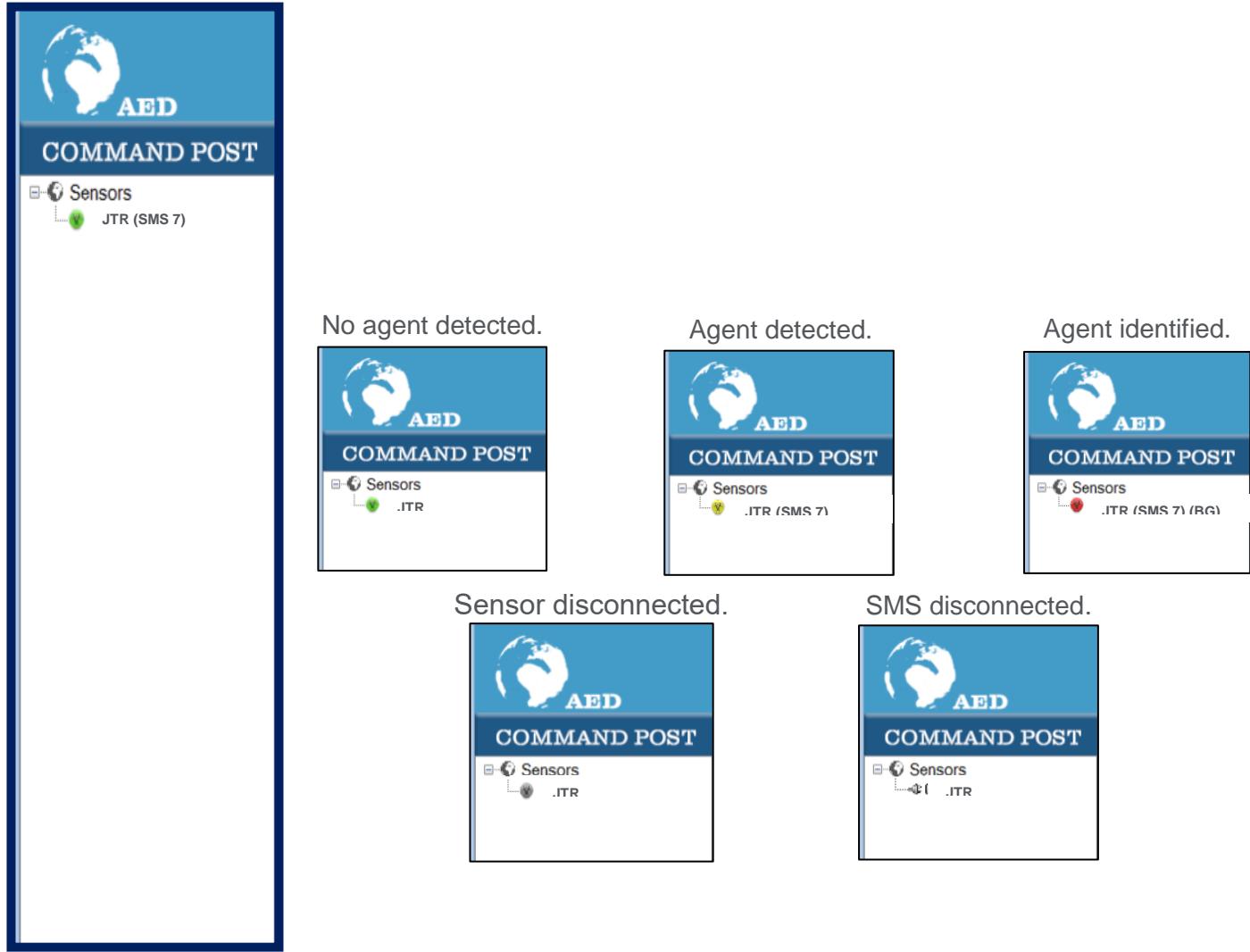


Figure 43. Possible Event Types

5-20. SMS CONTEXT MENU. Right clicking on a sensor in the tree will bring up the context menu. Zoom Top centers the map and zooms to a standard level. Manual Identification manually sets the device to have a particular alarm state. Rename changes the SMS display name. Override GPS specifies the SMS location manually. Clear ID clears the ID state of a sensor.

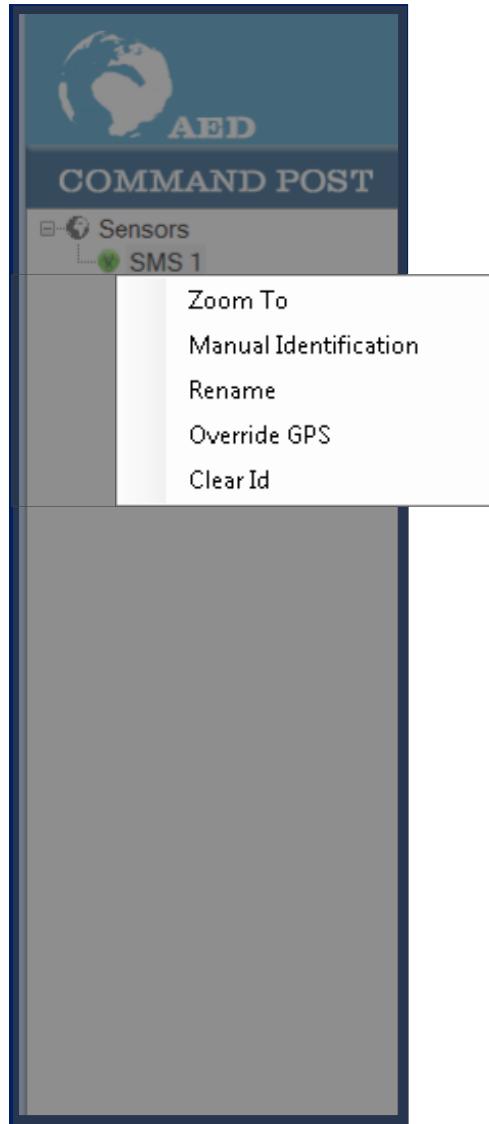


Figure 44. Context Menu

5-21. SMS CONTEXT MENU: MANUAL IDENTIFICATION. “Status” sets a desired alarm state. “Clear” represents a negative identification, “Bio ID” represents a positive identification, and “No Report” represents an inconclusive result. “Time” sets a desired time (UTC) for the alarm state to be recorded as having taken effect. The default is the current time. The “Report Type” will be either “Confirmatory” or “Presumptive.” “Identifiers” select zero or more identifiers used to make the identification. “Agent Code” adds the identified agent code(s). If the identifier code is not listed, send the positive identification with an empty agent list.

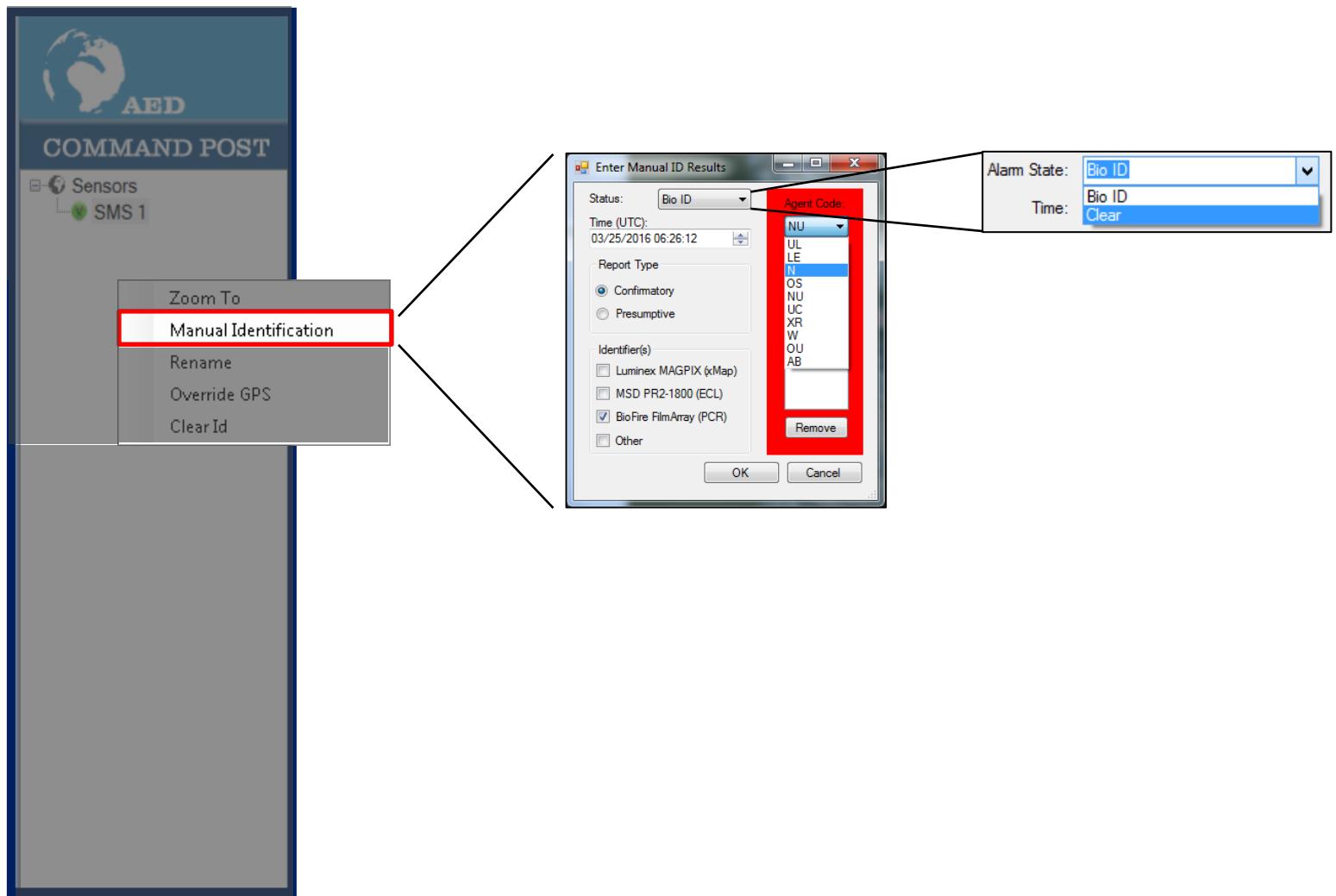


Figure 45. Manual Identification Option

5-22. SMS CONTEXT MENU: RENAME. This feature changes the displayed name of an SMS.

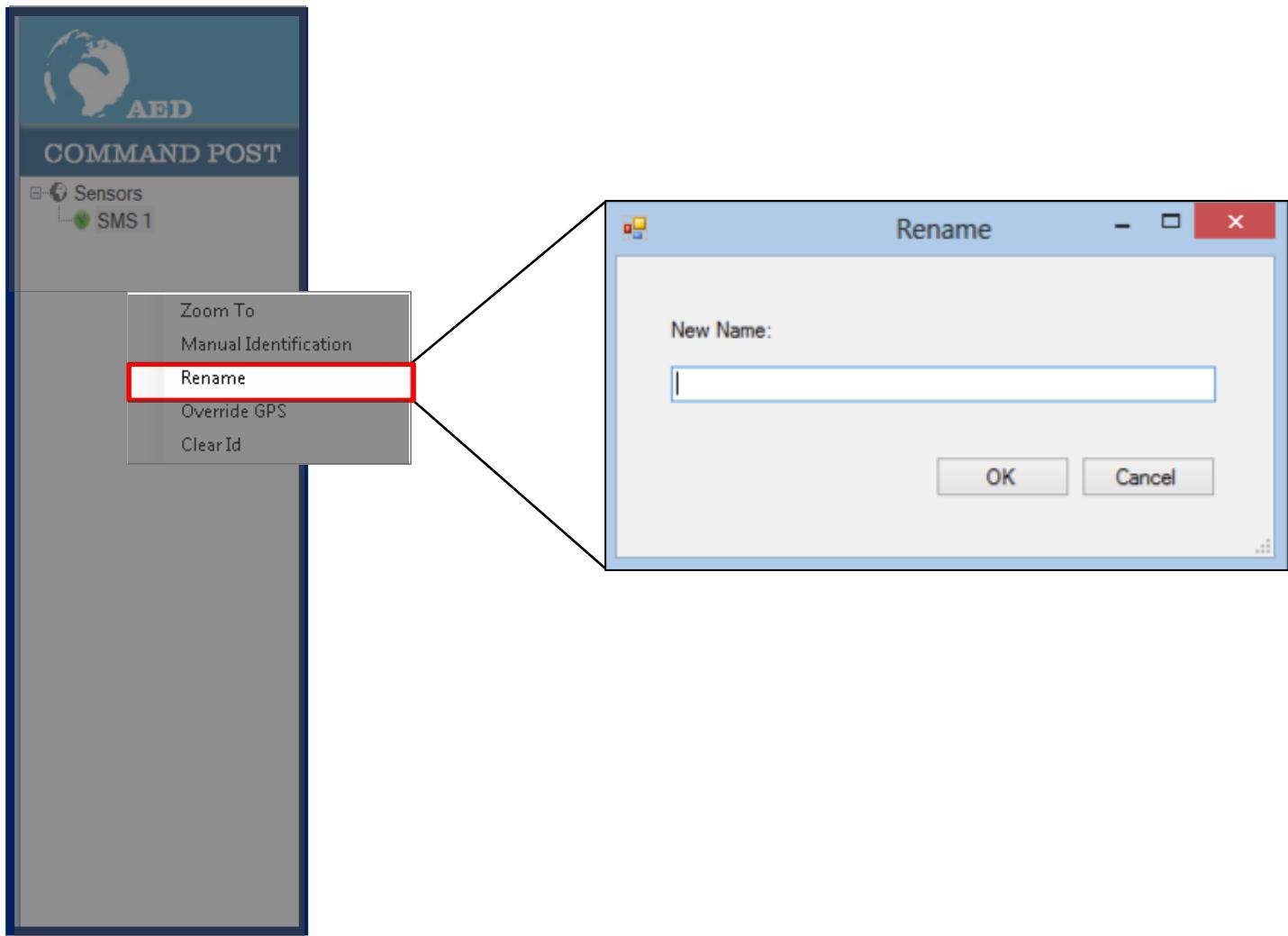


Figure 46. Rename Option

5-23. SMS CONTEXT MENU: OVERRIDE GPS. If the GPS for a sensor is inoperational or incorrect, use this option to override the GPS data for that sensor. Check the appropriate checkboxes, which will allow you to enter a specific latitude or longitude.

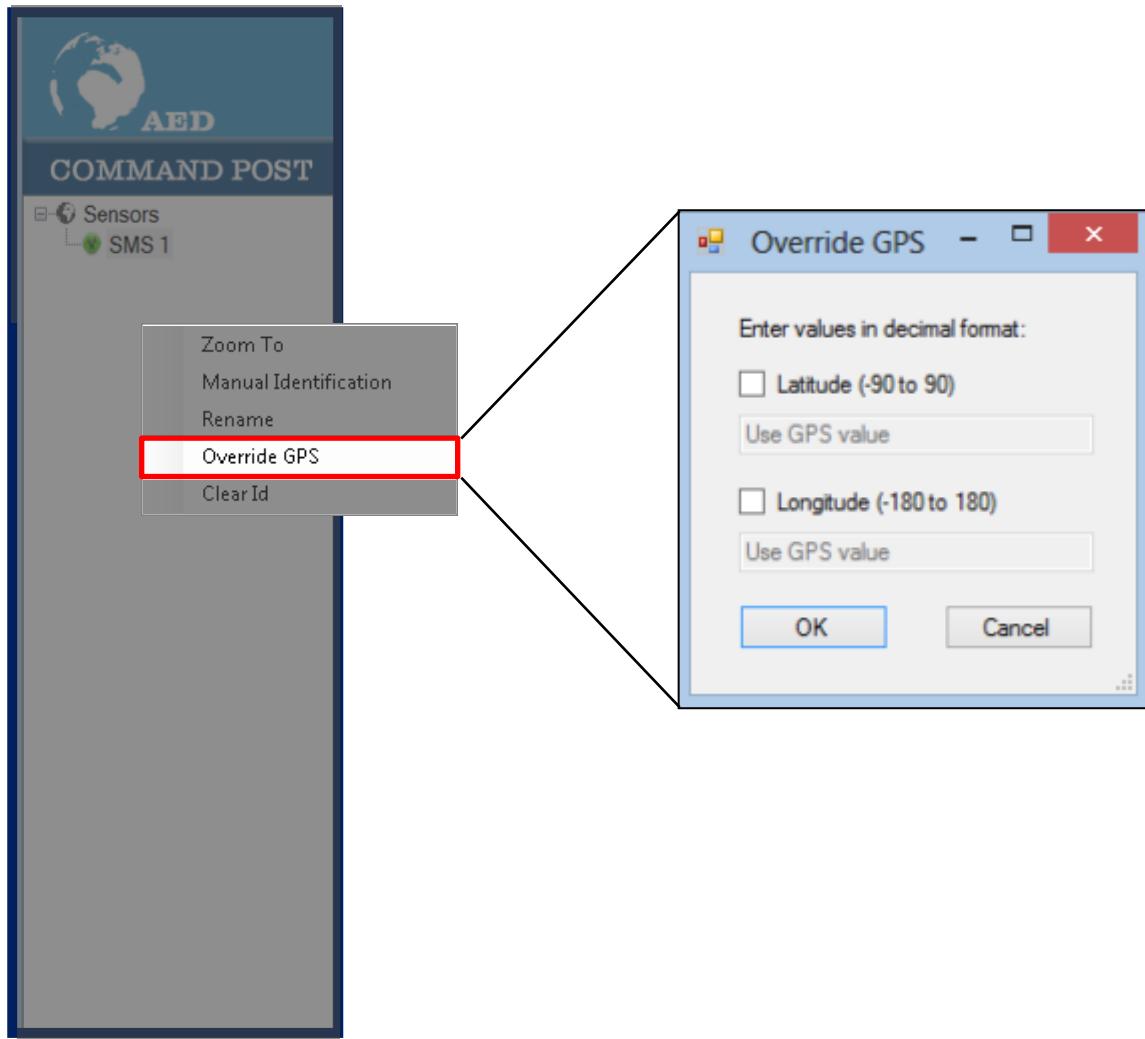


Figure 47. Override GPS Option

5-24. SMS CONTEXT MENU: CLEAR ID. Positive identifications for the JTR will turn its icon red until another positive or negative identification occurs. Use this menu option to clear the positive ID state and change the icon back to green.

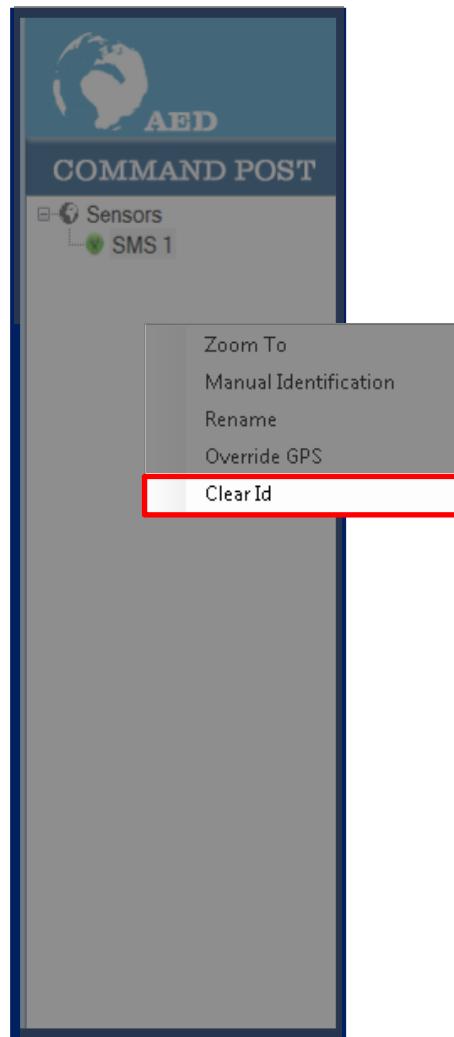


Figure 48. Clear ID Option

5-25. MAP OVERVIEW: MAP AND CONTROLS.

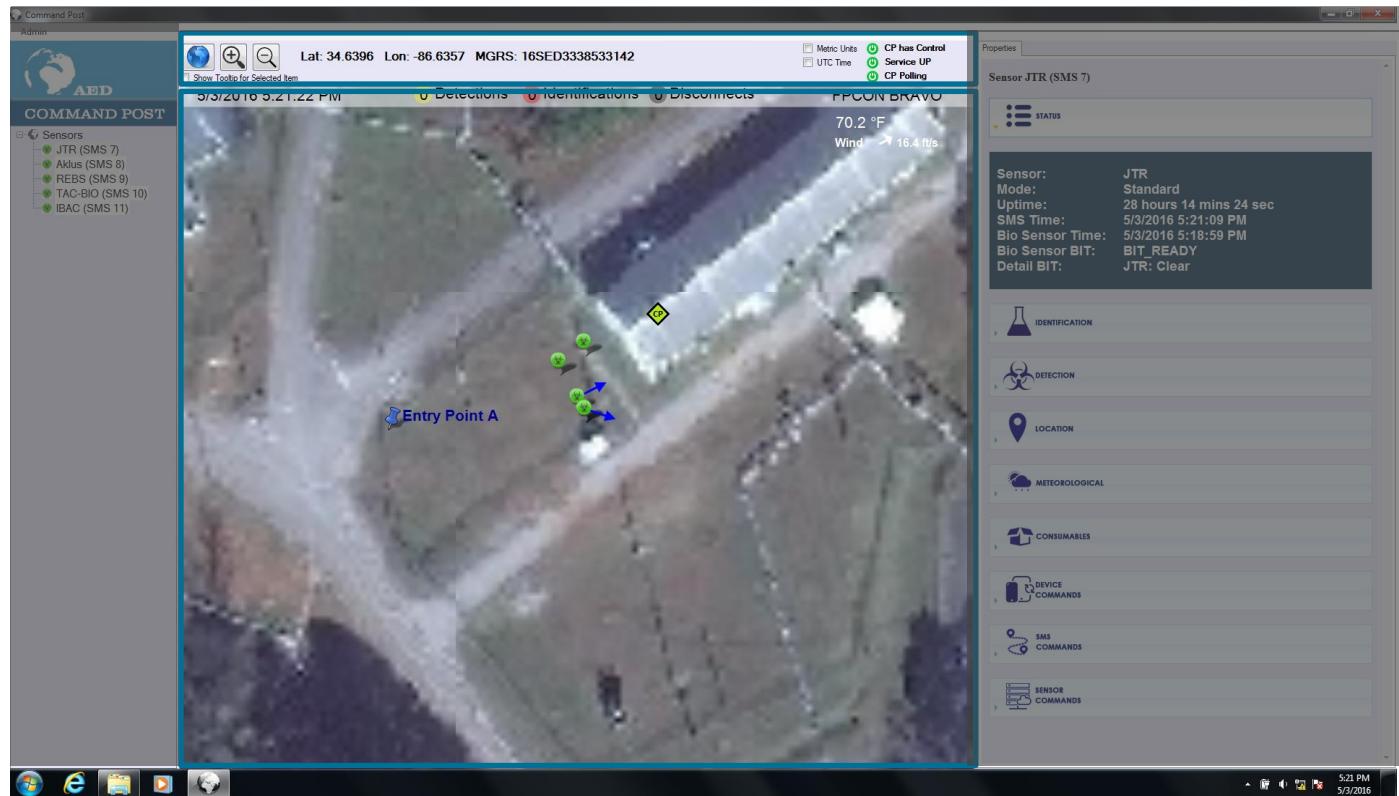


Figure 49. Map and Controls Screen

5-26. MAP CONTROL BAR. CP Status Indicators: Indicates if EWS or CP is controlling the sensor, indicates if the CP communication service is functional, indicates if the CP is polling the SMSs.

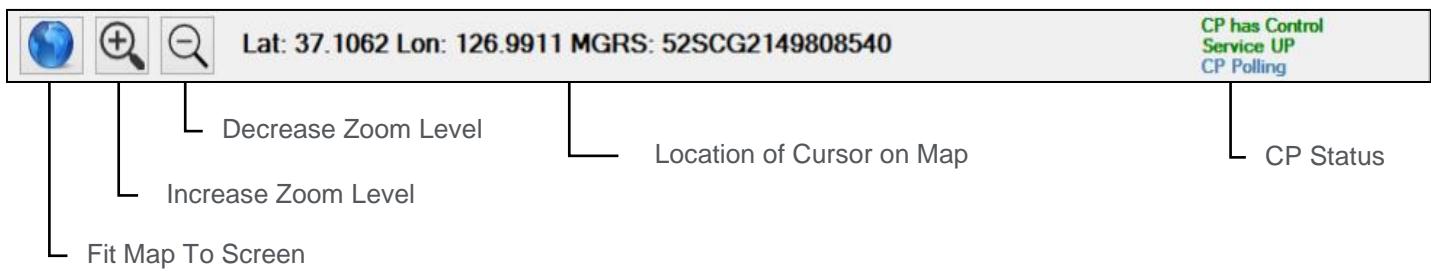


Figure 50. Map Control Bar

5-27. MAP OVERVIEW.

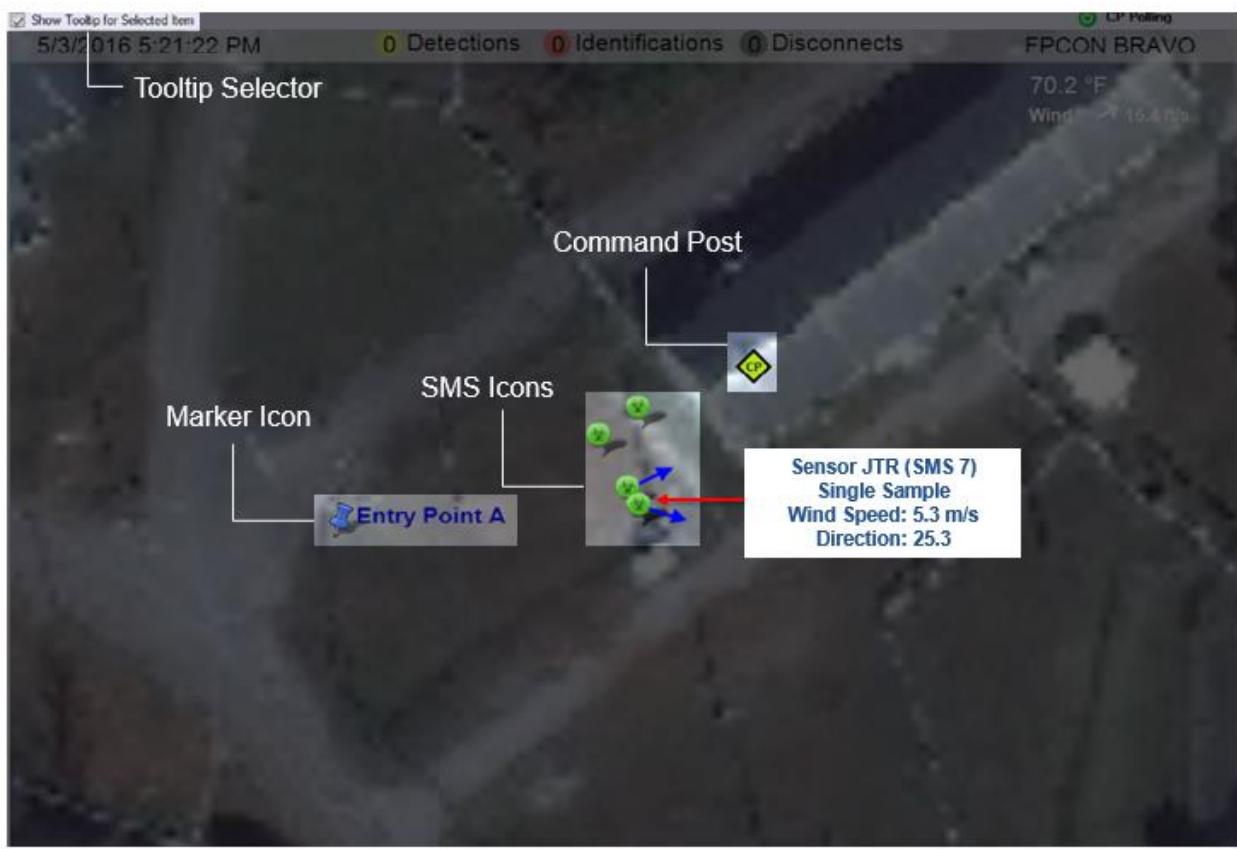


Figure 51. Map Overview

5-28. MAP: SENSOR ICONS. These icons each represent a sensor. The arrow represents wind direction and speed. In this case the wind is blowing from north-east to south-west. The arrow length indicates windspeed. Actual wind measurements are displayed in the tooltip and the Properties section. The icon pattern indicates what kind of device you are looking at. In this case it is a bio sensor. The icon color indicates the state of the device: Green indicates no agents have been detected, Yellow indicates agent(s) have been detected, Red indicates agent(s) have been identified and agent name(s) are displayed in the associated popup and in the Identification panel of the Properties section, Grey indicates the sensor or SMS is not communicating with the CP. Note that most recent agent data are still displayed in the associated tooltip.



Green – No agents have been detected.



Yellow – Indicates agent(s) have been detected.



Red – Indicates agents(s) have been identified. Agent name(s) are displayed in the associated popup and in the Identification panel of the Properties section.



Grey – The sensor or SMS is not communicating with the CP.

Figure 52. Sensor Icon Color Indications

5-29. MAP: TOOLTIPS. When the tooltip selector checkbox is checked, the tooltip for the selected SMS is always visible. If it is unchecked, then no tooltip is displayed. The tooltip is always visible when the mouse cursor is hovering over the icon.

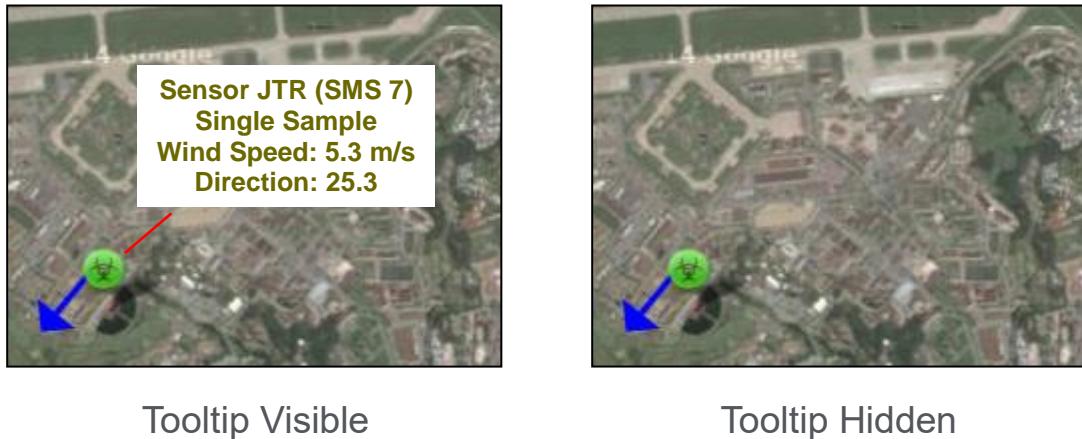


Figure 53. Tooltip Visibility

5-30. MAP: ADD MARKER. Right mouse clicking on the map brings up a menu that allows you to add a marker, measure the distance between two points on the map, or go to a location. Clicking on “Add Marker” brings up a dialog box. Enter and save the marker’s name. The marker will appear where you initially clicked on the map. You can use the left mouse to drag it to a new location. Right mouse clicking on the marker brings up a menu that allows you to either remove this marker from the map or measure the distance between two points.

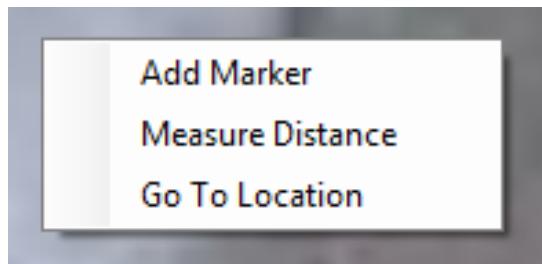


Figure 54. Add Marker Menu

5-31. MAP: MARKERS. Clicking on “Add Marker” brings up a Marker Name dialog box. Right mouse clicking on the marker brings up a menu that allows you to either remove this marker from the map or measure the distance between two points.

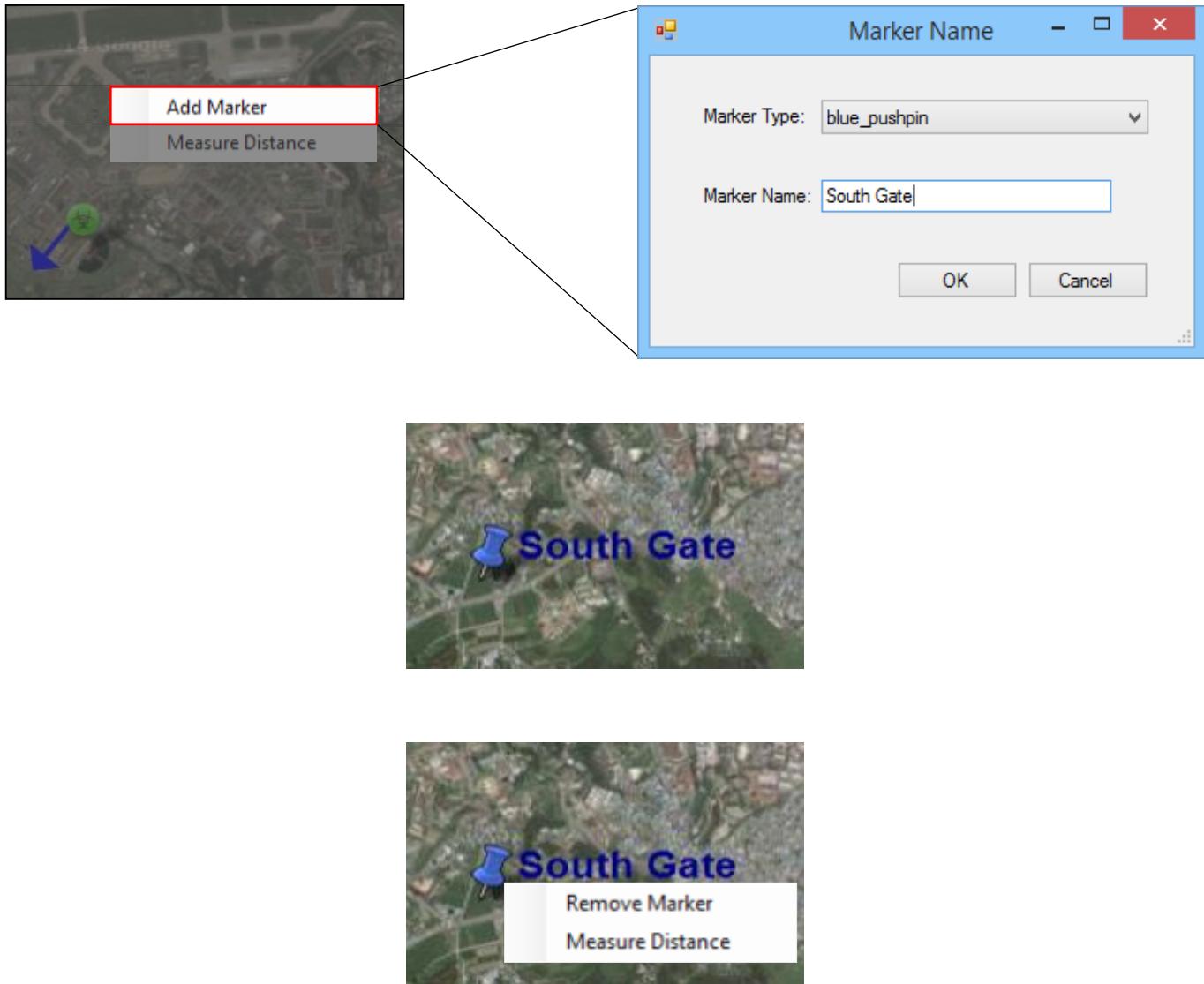


Figure 55. Add Marker Options

5-32. MAP: MEASURING DISTANCE. Right mouse clicking on the map brings up a menu that allows you to either add a marker or measure the distance between two points on the map. Clicking on “Measure Distance” brings up a dialog box of instructions. Left mouse click on one point and then another on the map to see the distance between those points.

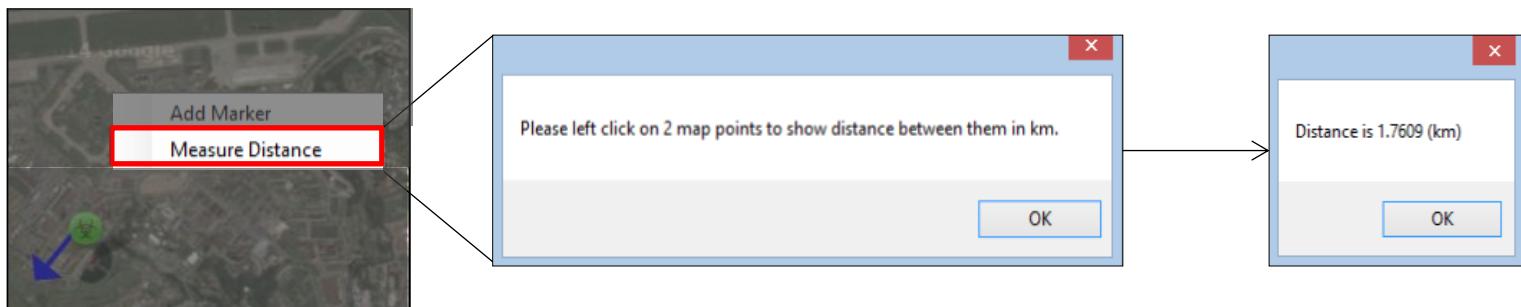


Figure 56. Measure Distance Option

5-33. MAP: GO TO LOCATION. Type in a location, either in latitude/longitude or MGRS. Click OK, and the map will be centered there.

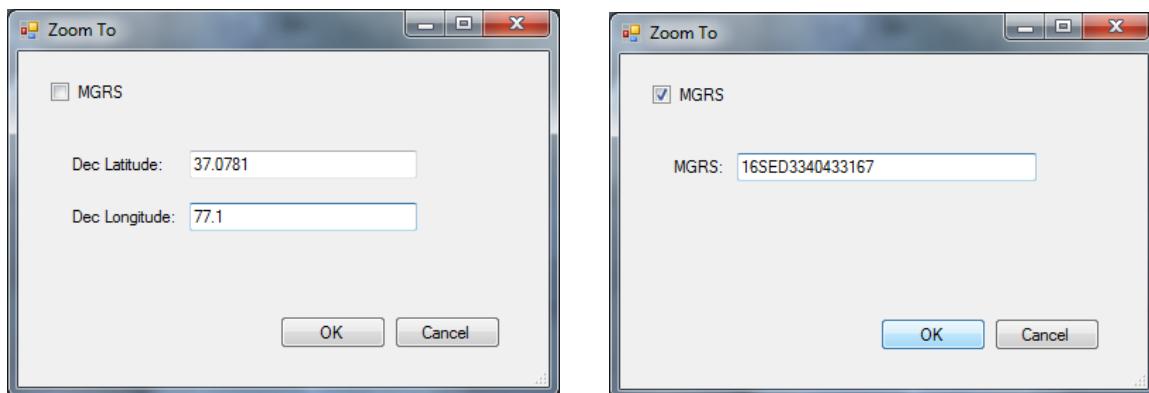


Figure 57. Go To Location Option

5-34. PROPERTIES PANE.

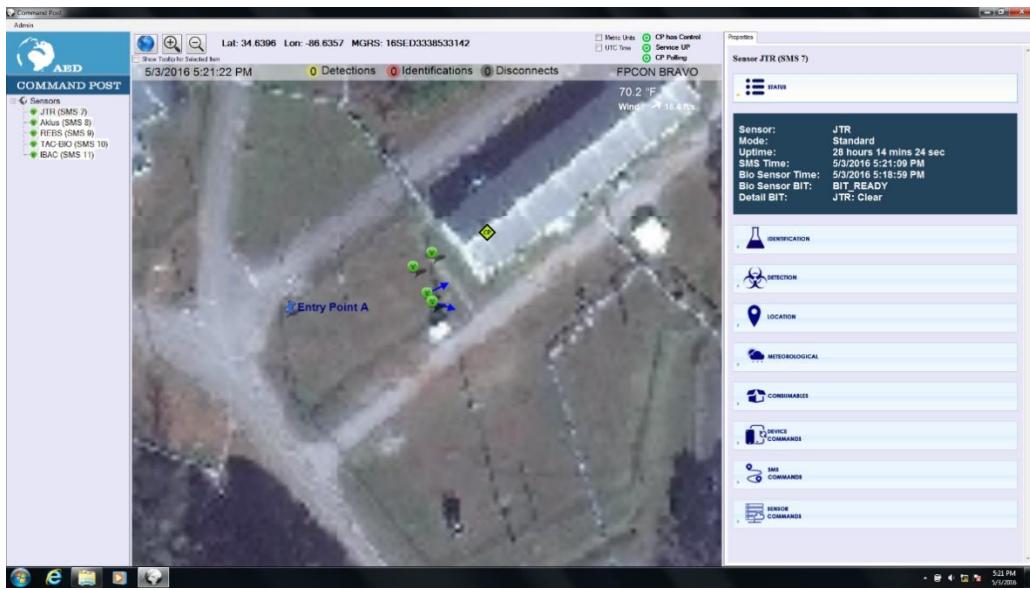


Figure 58. Properties Pane

This is typical of what is displayed in the Properties Pane section for the currently selected sensor. The top of this section indicates the currently selected sensor. If no sensor is currently selected then nothing is displayed. Each section of the Properties section is called a “panel.” Note that if a panel in this section is not relevant for the currently selected sensor it will not be displayed.

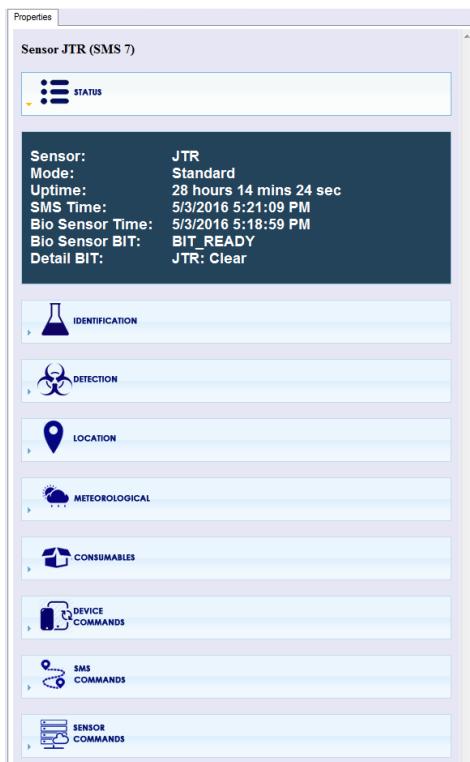


Figure 59. Properties Pane Panels

5-35. PROPERTIES PANE: STATUS. Sensor displays the model of the sensor (IBAC, LRTI, REBS, etc.). Mode displays the Bio Mode the sensor is currently in. Uptime displays the length of time the SMS has been up. This time is updated every few seconds. SMS Time displays the last reported time from the SMS. Bio Sensor Time displays the internal bio sensor time. Bio Sensor BIT displays the Built In Test (BIT) status of the sensor. Values include BIT_READY, BIT_DISCONNECTED, BIT_FAULTED, and BIT_WARNING. Detail BIT displays additional information about the BIT status. Particle Count displays the count of biological particles present.

The screenshot shows the 'Properties' pane for a 'Sensor JTR (SMS 7)' device. The 'STATUS' tab is selected, displaying the following sensor properties:

Sensor:	JTR
Mode:	Standard
Uptime:	28 hours 14 mins 24 sec
SMS Time:	5/3/2016 5:21:09 PM
Bio Sensor Time:	5/3/2016 5:18:59 PM
Bio Sensor BIT:	BIT_READY
Detail BIT:	JTR: Clear

Below the status panel, a vertical list of tabs is visible, each with a small icon:

- IDENTIFICATION
- DETECTION
- LOCATION
- METEOROLOGICAL
- CONSUMABLES
- DEVICE COMMANDS
- SMS COMMANDS
- SENSOR COMMANDS

Figure 60. Status Panel

5-36. PROPERTIES PANE: IDENTIFICATION. Result displays the name(s) of the agents identified by this sensor. “Clear” means no agents are currently identified. Time displays the UTC time this identification occurred.

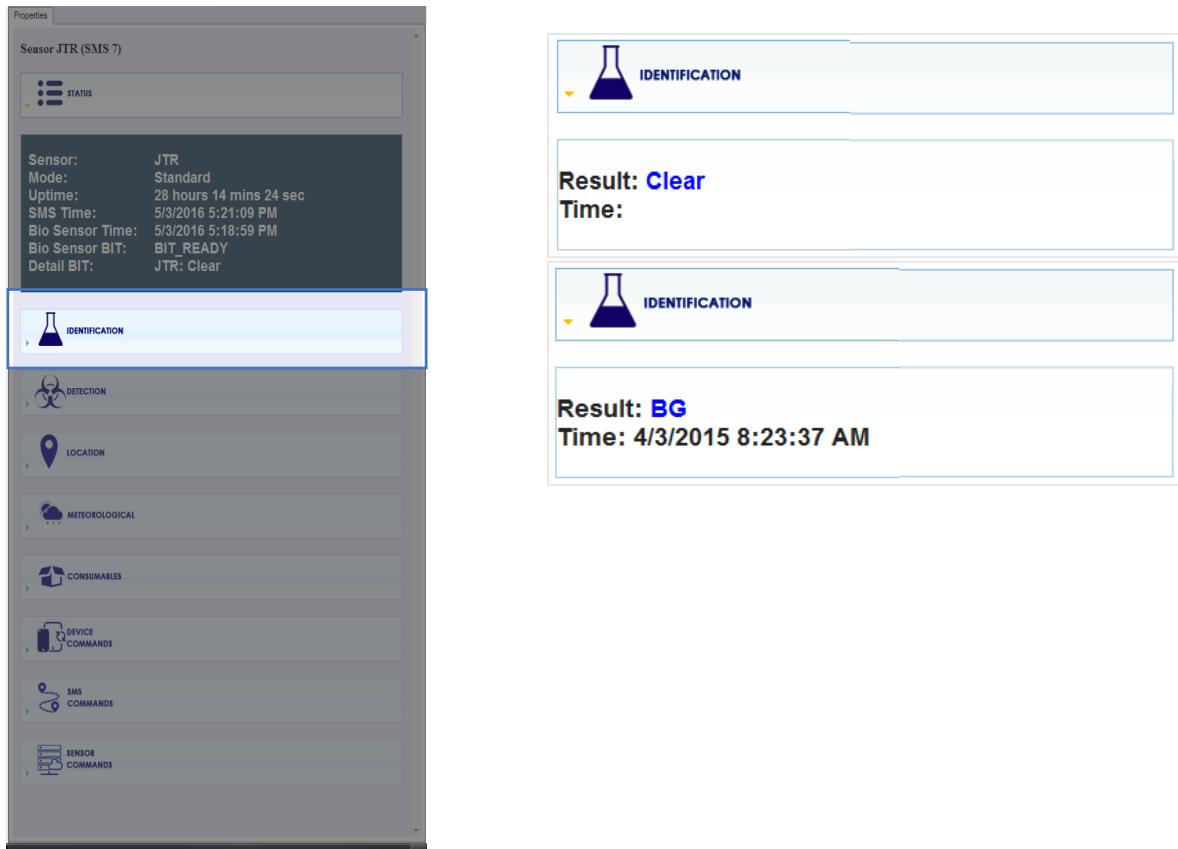


Figure 61. Identification Panel

5-37. PROPERTIES PANE: DETECTION. Detected displays the detection state, this may be “True” or “False.” Detection Time displays the UTC time this detection occurred.

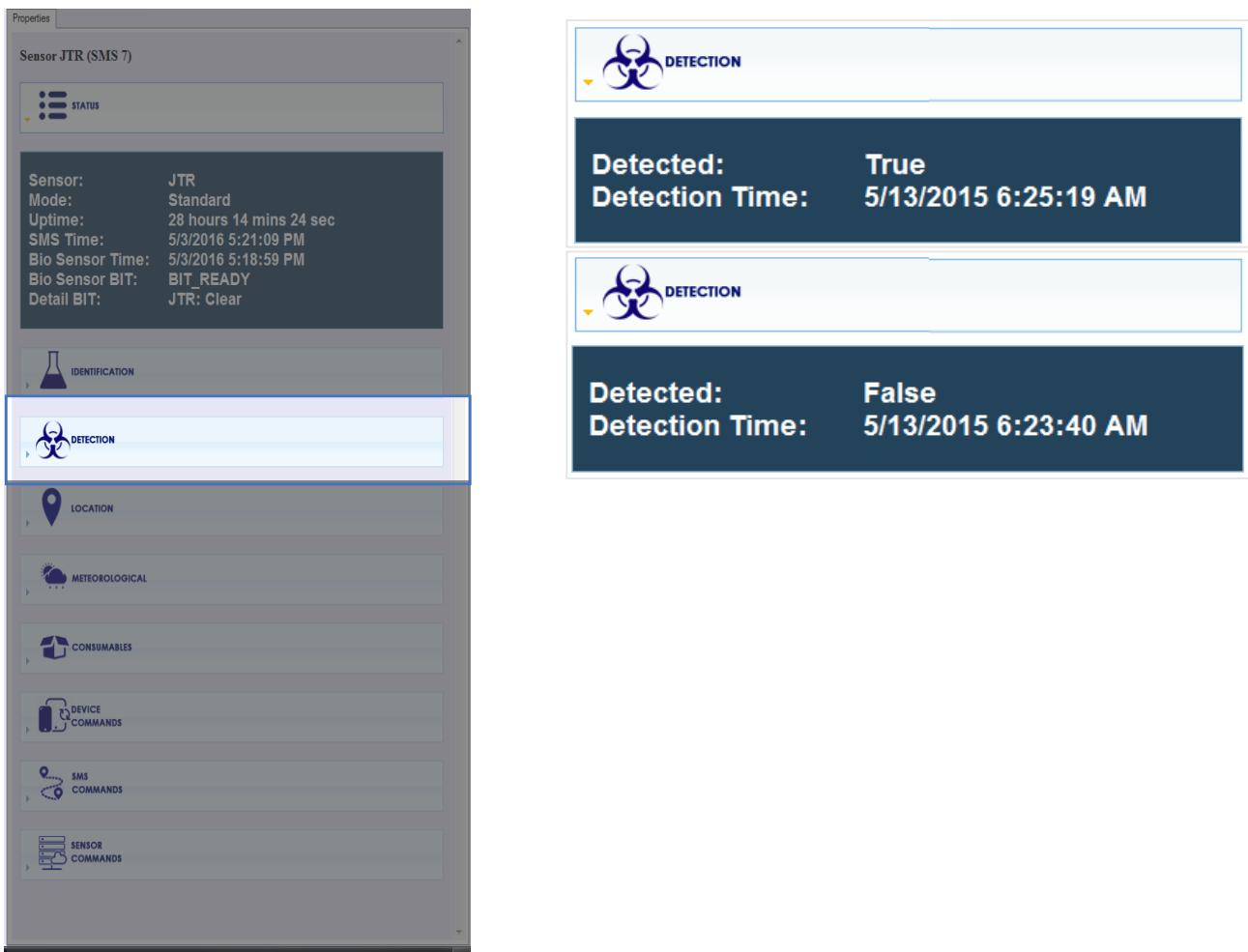


Figure 62. Detection Panel

5-38. PROPERTIES PANE: LOCATION. Latitude displays the latitude of the sensor, in decimal units. Longitude displays the longitude of the sensor, in decimal units. MGRS displays the MGRS (Military Grid Reference System) location of the sensor. Elevation displays the height above sea level of the sensor.

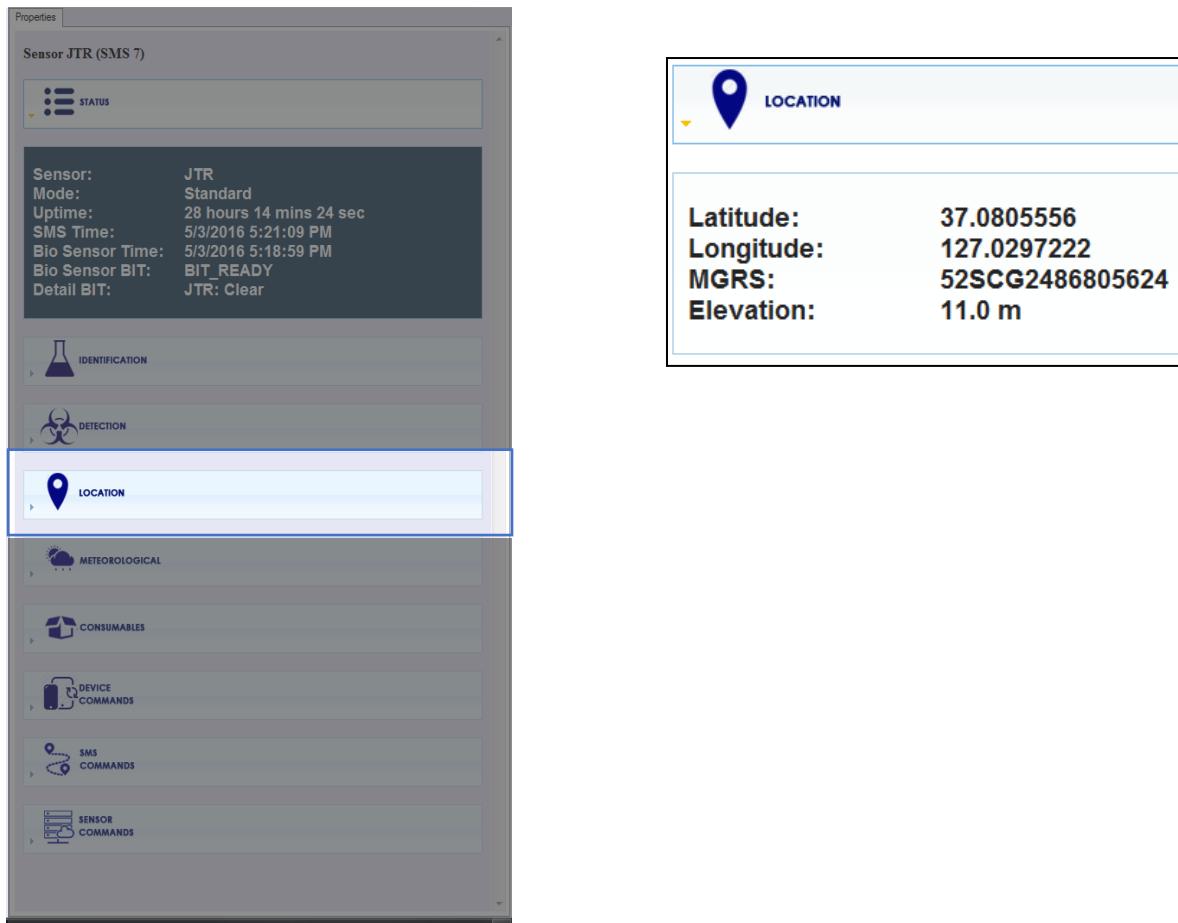


Figure 63. Location Panel

5-39. PROPERTIES PANE: CONSUMABLES. Consumable displays the name and current level of various consumables at the device. Note this section will not appear if the device has no consumables to report.

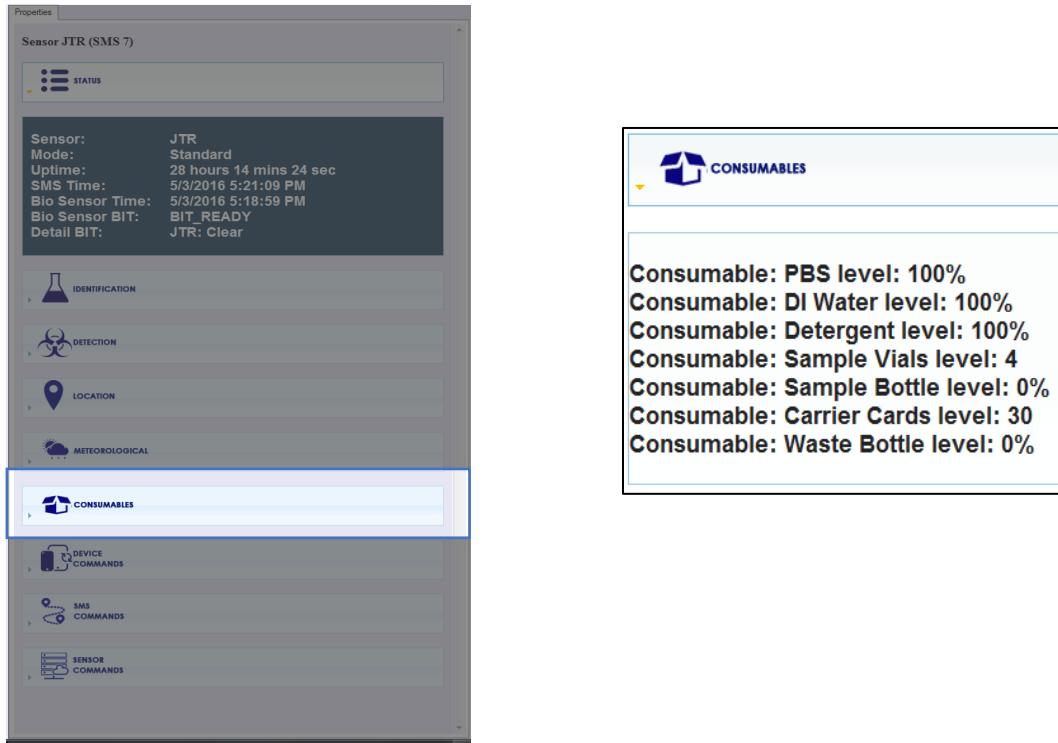


Figure 64. Consumables Panel

5-40. PROPERTIES PANE: REBS DEVICE COMMANDS. In Mode Auto the sensor periodically runs the identification process, in Mode Single it runs the identification process once, Mode Replenishment prepares sensor for consumable replenishment, and Stop puts the sensor in standby mode.

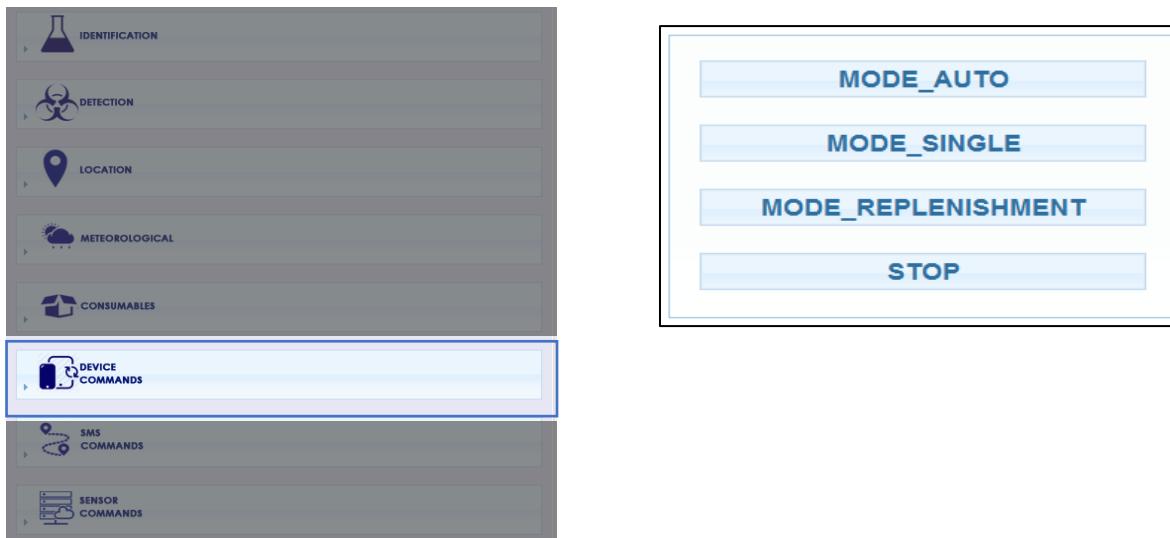


Figure 65. REBS Device Commands Panel

5-41. PROPERTIES PANE: IBAC DEVICE COMMANDS. Mode Auto automatically collects upon agent detection. Mode Manual puts the collector into “Manual” mode. Collector On turns the collector on. Collector Off turns the collector off. Simulate Alarm simulates a one-second alarm on the IBAC. It is not used during operations.

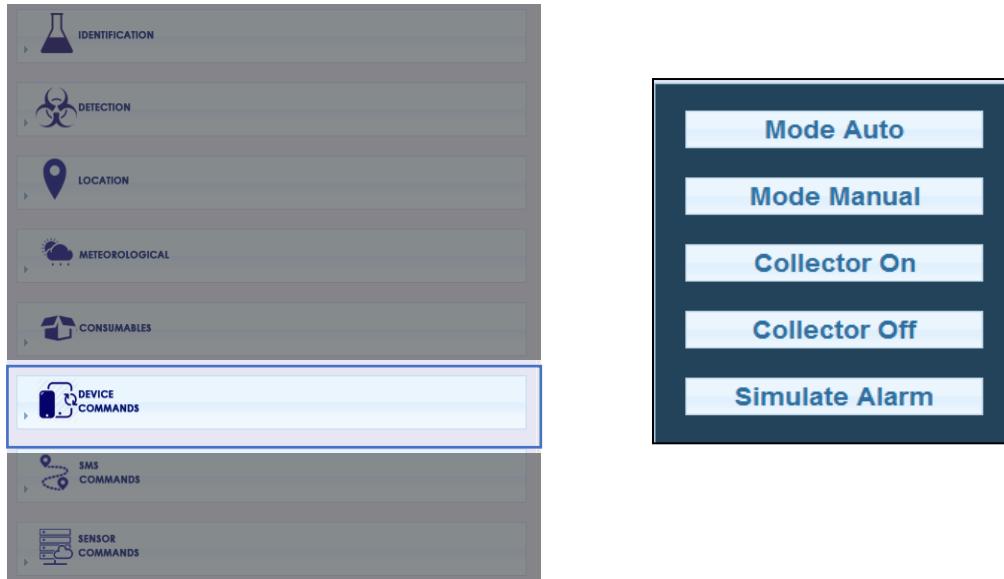


Figure 66. IBAC Device Commands Panel

5-42. PROPERTIES PANE: SMS COMMANDS. These commands are used for turning on/off relays. This section is not used for CENTAUR.

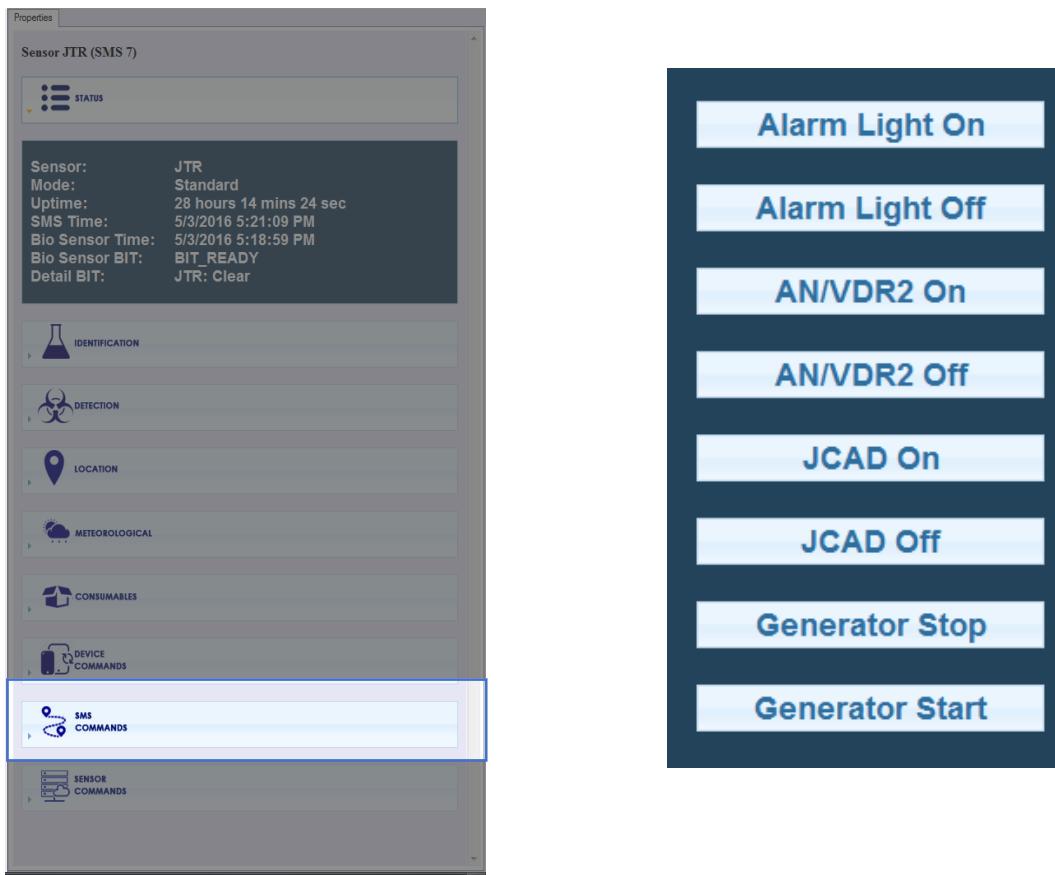


Figure 67. SMS Commands Panel

5-43. PROPERTIES PANE: SENSOR COMMANDS. In Command Name enter the name of the command to send to the sensor. Command Parameters includes parameters to send along with this command. Execute Command sends the command to the sensor. This section is not used for CENTAUR. Note the CP cannot send commands to sensors when EWS has control.

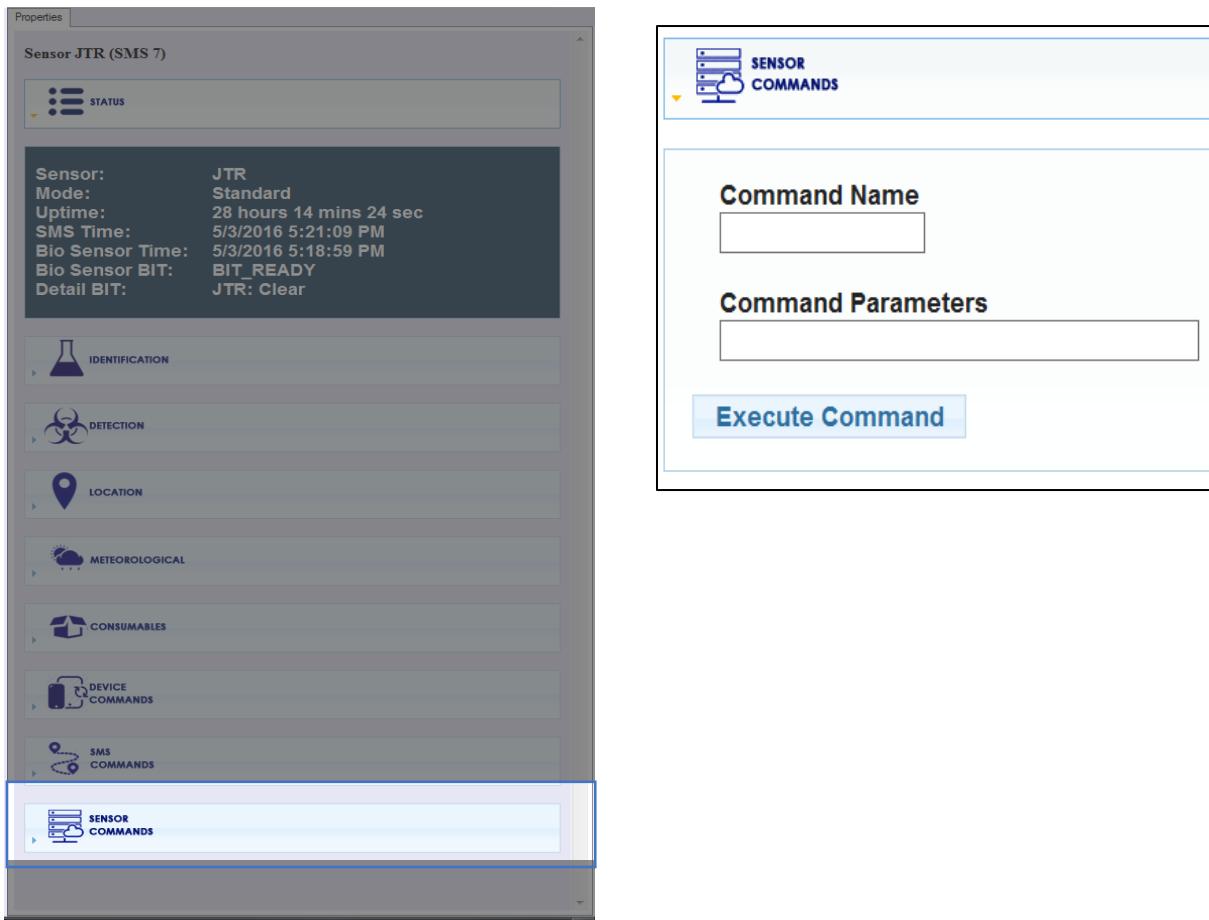


Figure 68. Sensor Commands Panel

CHAPTER 6. ARGUS VIDEO MANAGEMENT SYSTEM

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6-1. ARGUS OVERVIEW. Primary function is real-time monitoring of digital video streams. ARGUS System Capabilities are to support RTSP video streams, display real-time digital video feed, monitor video connection status, and Digital Video Recording (DVR) for data archival and playback.

6-2. LOGIN. This is the login screen. Operators are required to login to access the ARGUS web application.



Figure 69. Argus Login Screen

6-3. MAIN SCREEN. Once logged in, the operator is presented with the Main Screen.

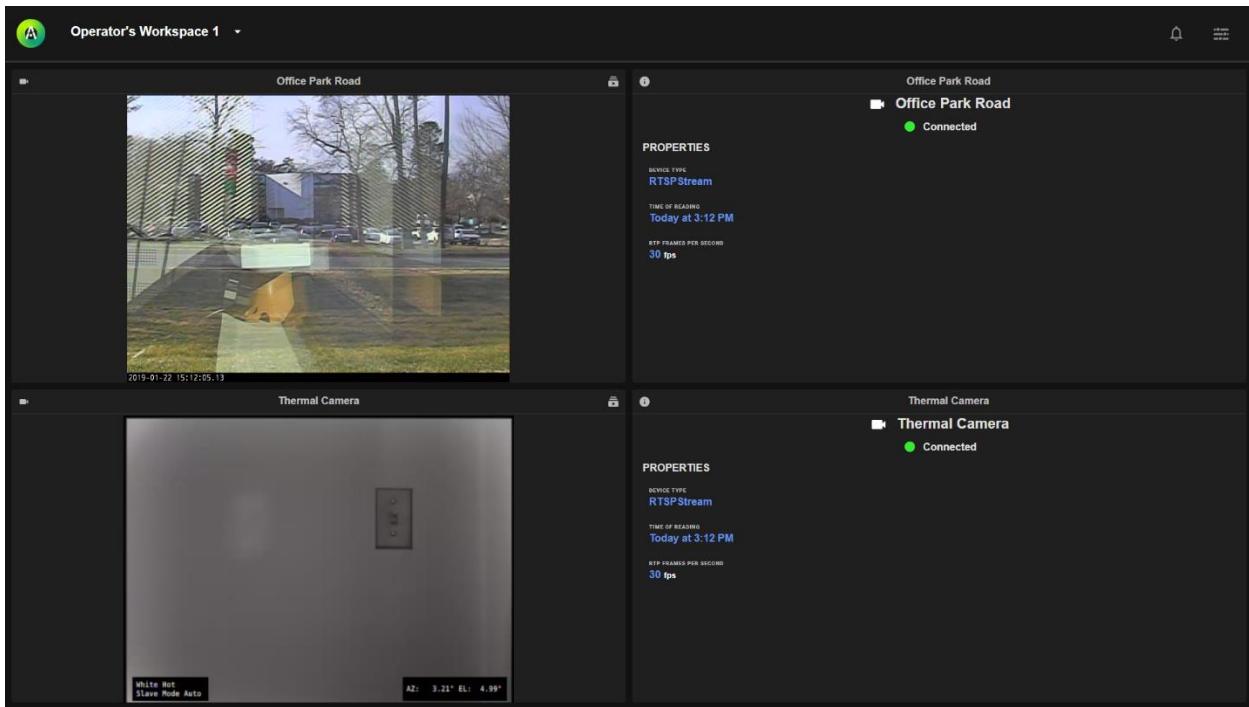


Figure 70. Argus Main Screen

6-4. MAIN SCREEN: OVERVIEW. At the top is the navigation bar for navigating the application. Below is the default workspace of the operator. The default workspace is currently determined by the operator's previous session.

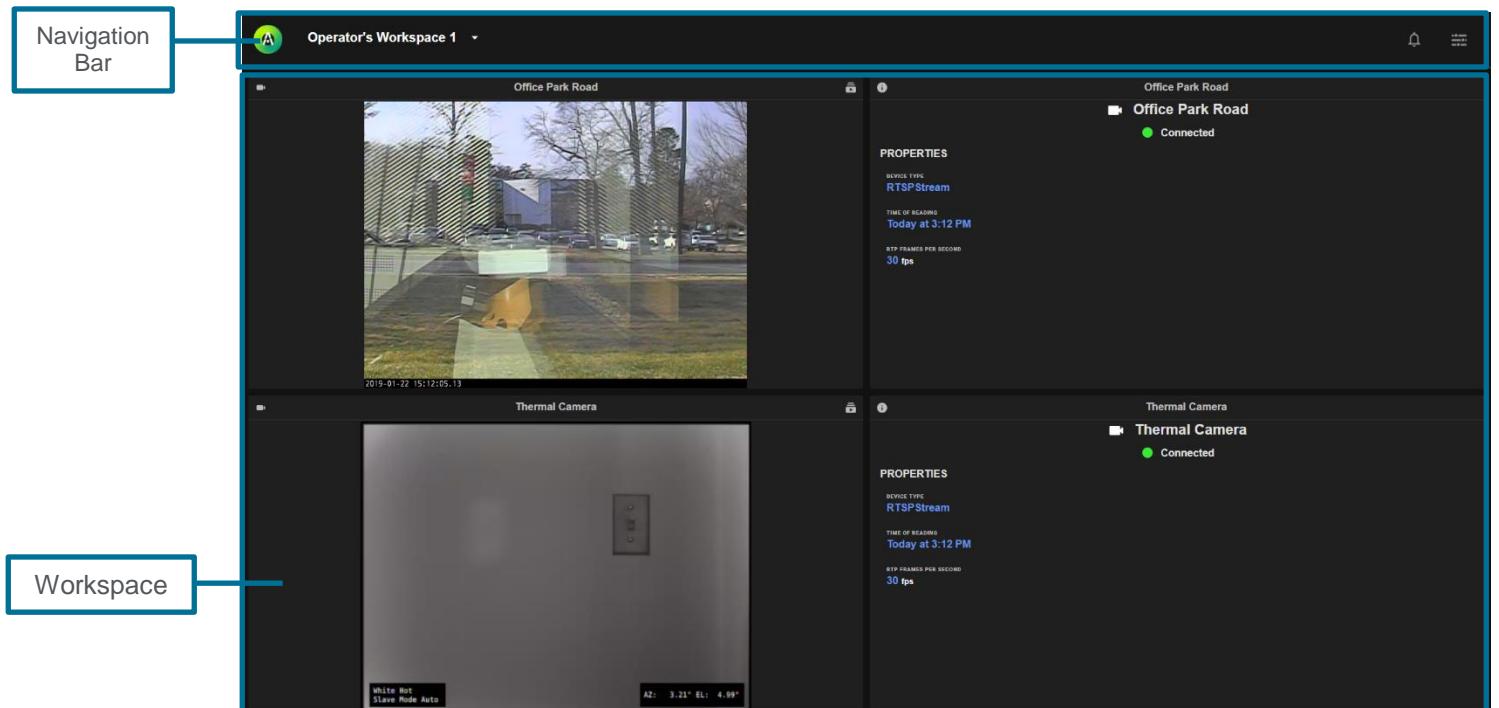


Figure 71. Main Screen Layout

6-5. MAIN SCREEN: NAVIGATION BAR. In the navigation bar, there are 3 button options. Workspace Selection presents a drop-down list to switch workspaces. Notifications displays a count of unread system notifications such as device connection status. Settings displays a settings menu for application configuration.

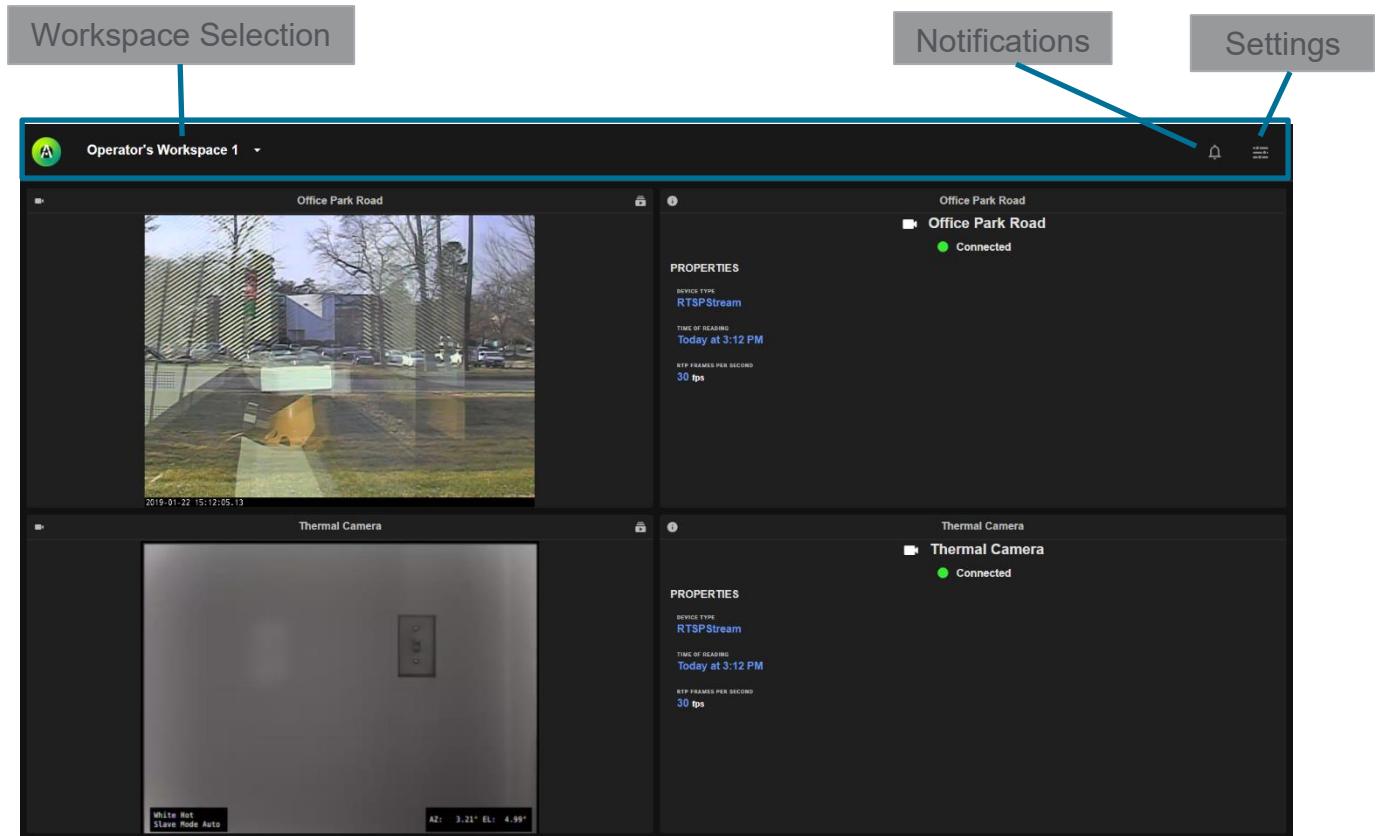


Figure 72. Navigation Bar Components

6-6. WORKSPACE SELECTION. Selecting “Workspace Selection” button presents a drop-down menu. In the drop-down, the following options can be taken: search for a specific workspace, navigate to the video search screen for playback of DVR data, switch to the operator’s private workspaces or view publicly shared workspaces, and add/create a new workspace.

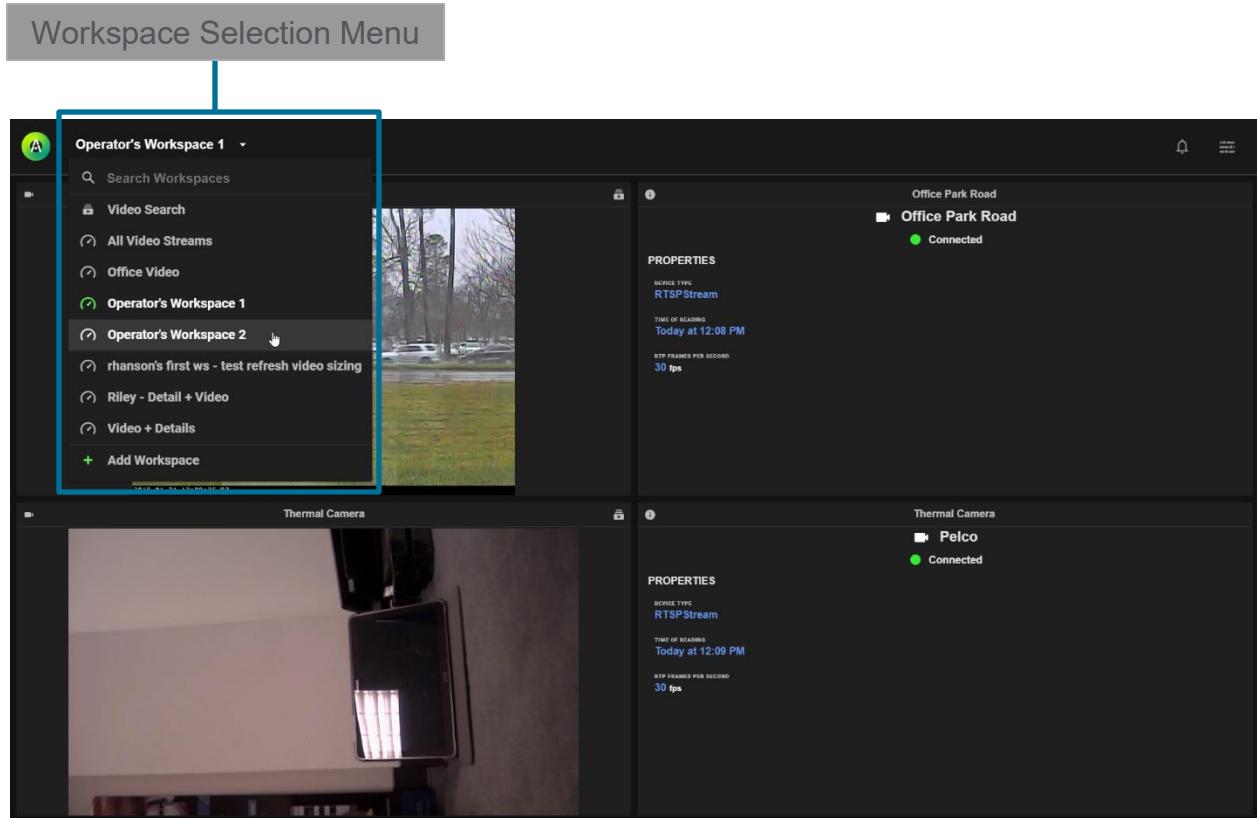


Figure 73. Workspace Selection Menu

Example below. Here we have switched to a workspace with two video streams. An operator may only view his own workspaces or shared/public workspaces from other operators.

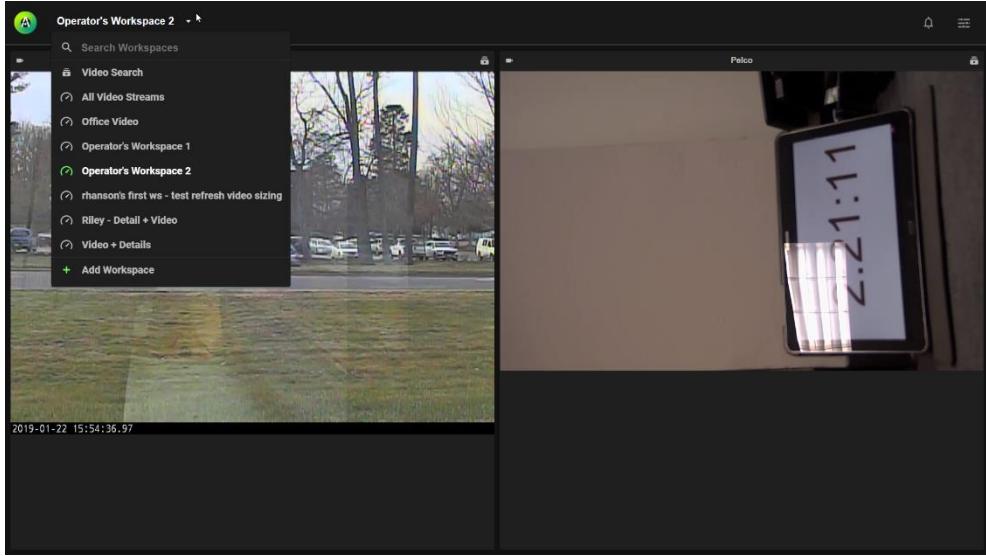


Figure 74. Workspace with Two Video Streams

6-7. ADD WORKSPACE. To create a new workspace, select “Add Workspace” from the Workspace Selection menu.

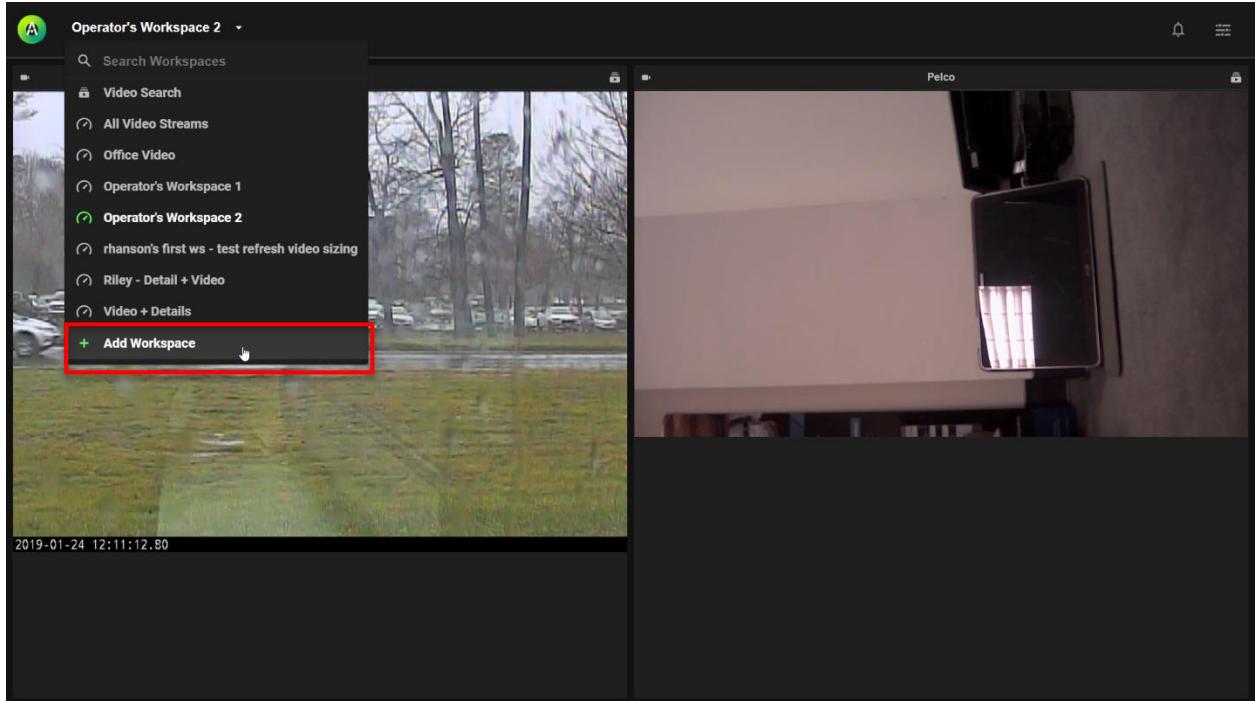


Figure 75. Add New Workspace

6-8. WORKSPACE CONFIGURATION. This is the Workspace editing screen. At the top there are options for adding components, cancel, save, and rename workspace.

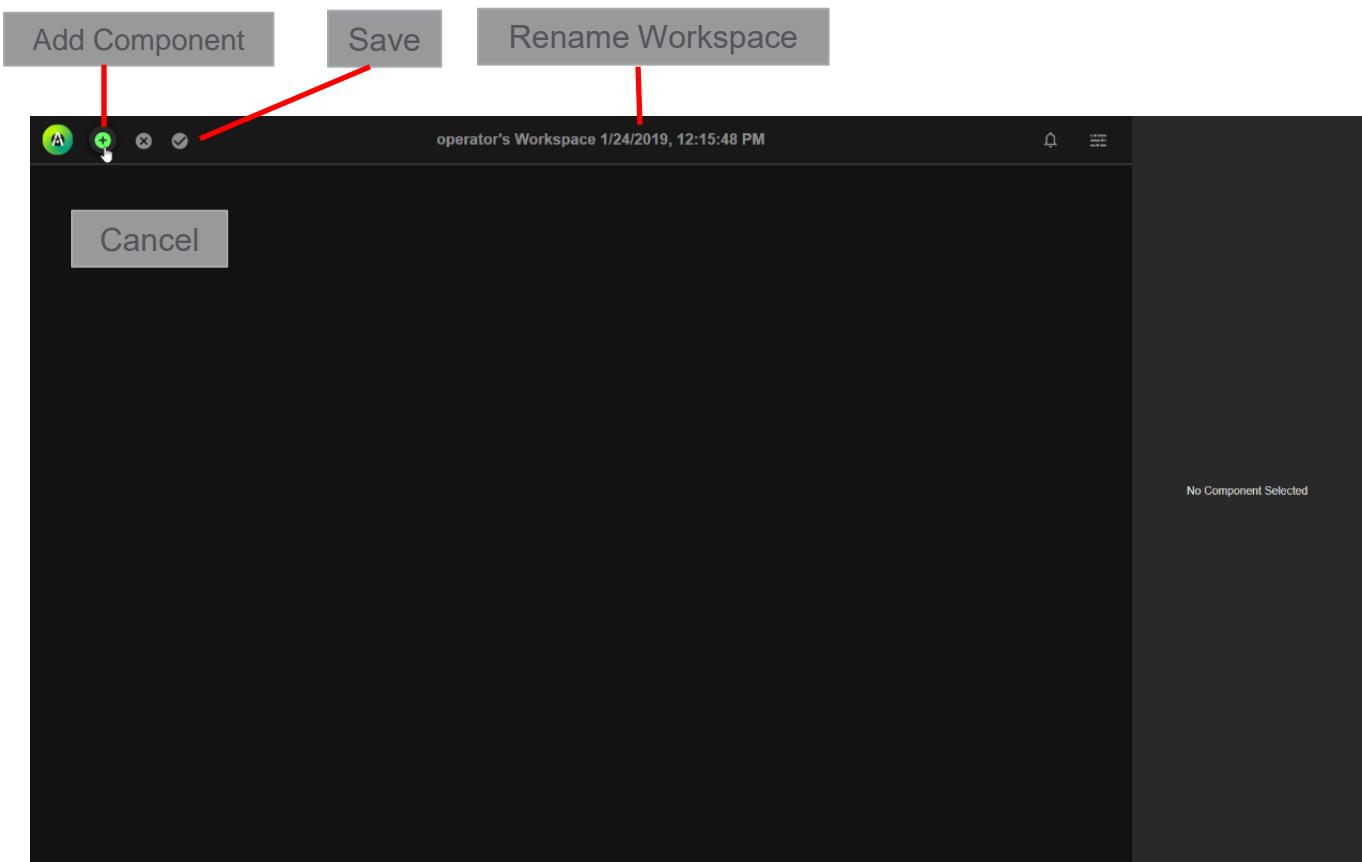


Figure 76, Workspace Editing Screen

The component list options are broken down into three categories. Share Workspace makes the workspace publicly viewable by other operators. Components lists the available components to add to the workspace, such as "Video" which displays a video stream and "Detailed Status" which displays information about a video stream. Layouts lists preset layout arrangements based on the number of components in the workspace.

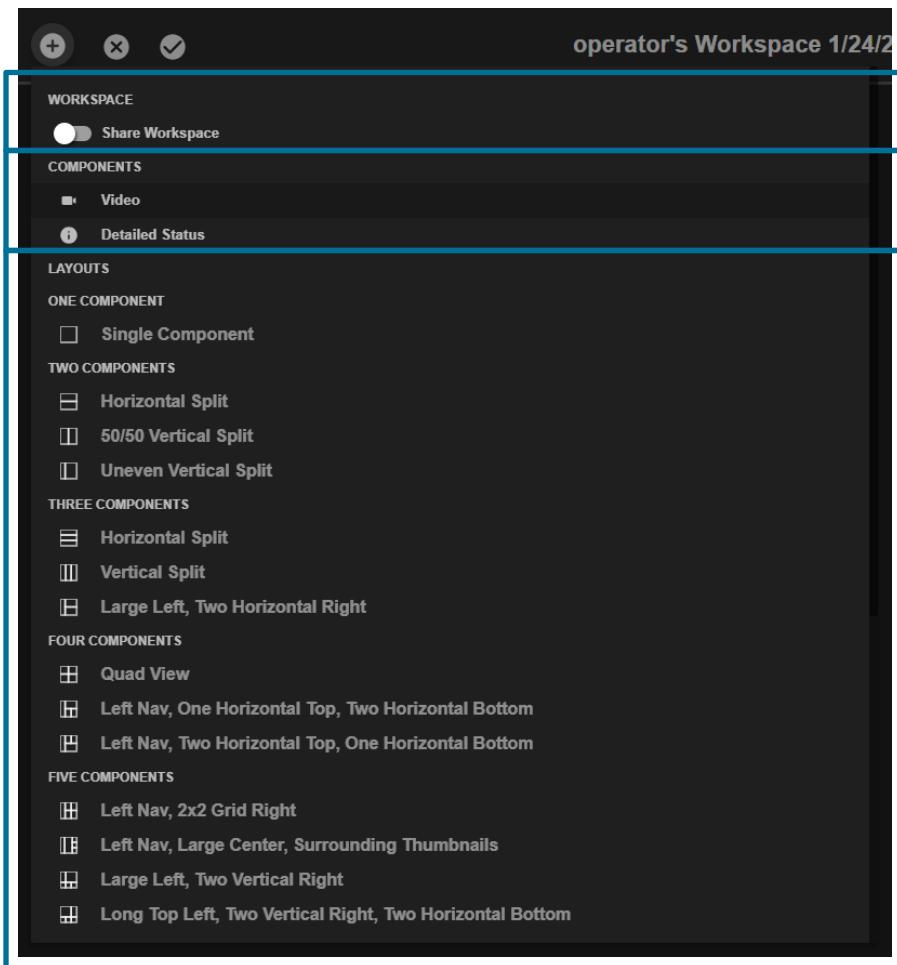


Figure 77. Component List Options

Example below. Here we've added a Video Component and a Detailed Status Component. On the right is a context-sensitive Component Configuration pane.

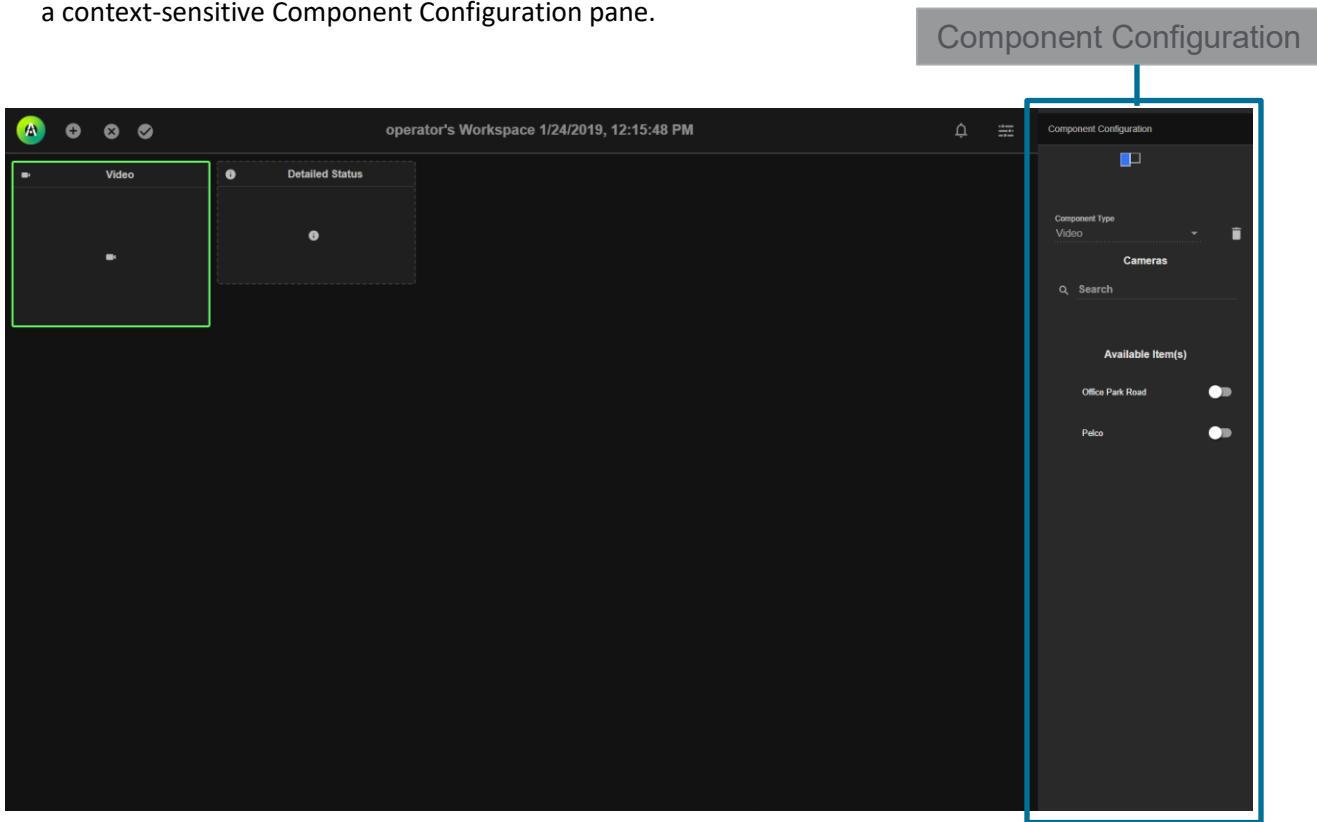


Figure 78. Adding Components to Workspace

In the Component Configuration Pane are various options for configuring a selected component. In this case, have a Video component selected. Component Graphic displays a graphical indicator of the selected component. Component Type indicates the select component type along with a delete icon. Camera Search allows for searching for available cameras by name or keyword tag. Available Item(s) lists all available configured cameras in the system.

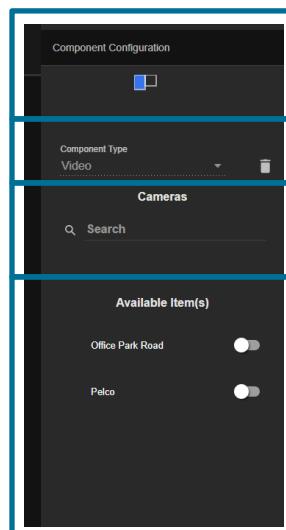


Figure 79. Component Configuration Pane

Example below. Here we've selected a camera for the component. Once a camera is toggled on, the camera is displayed in a Selected Item(s) list and the video feed is displayed in the component.

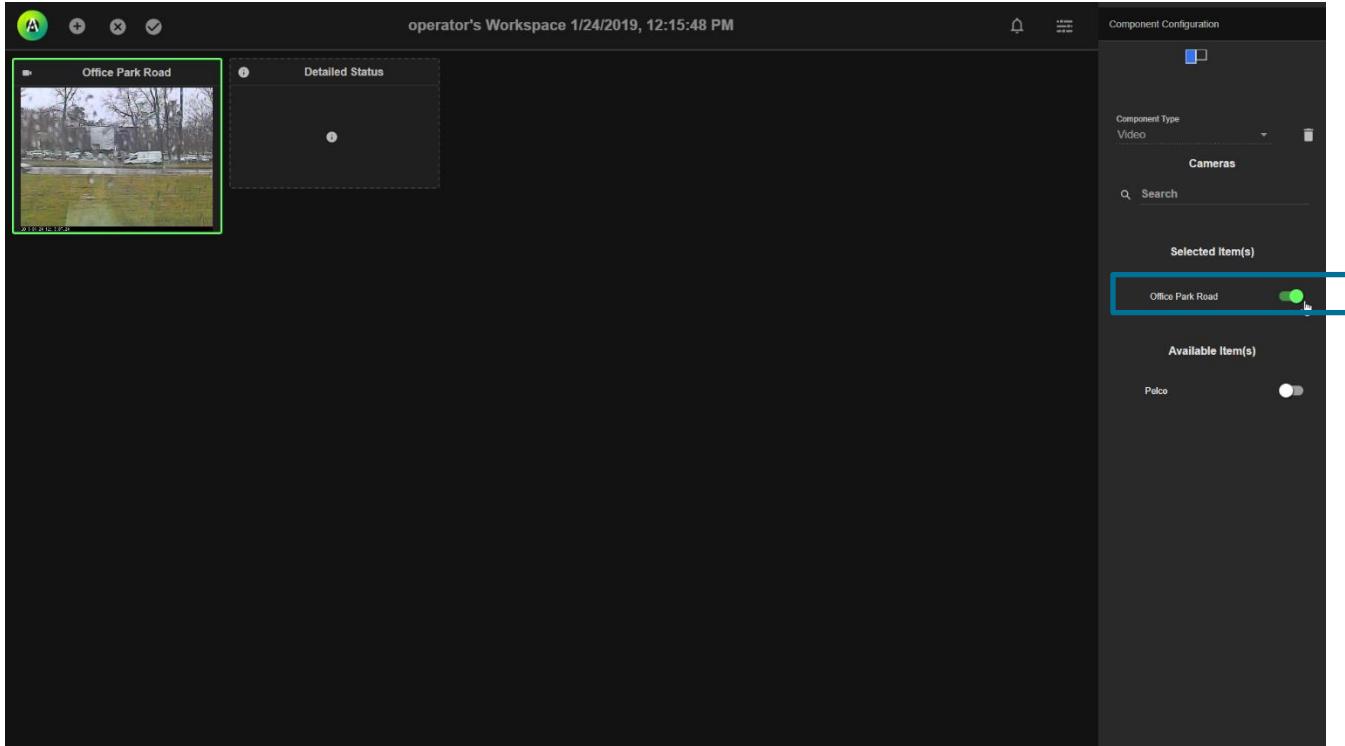


Figure 80. Selecting a Camera

Example below. Here we have selected to monitor the status of the camera "Office Road Park" from the previous screen. The detailed status component displays device status information such as Connection State, protocol, and framerate.

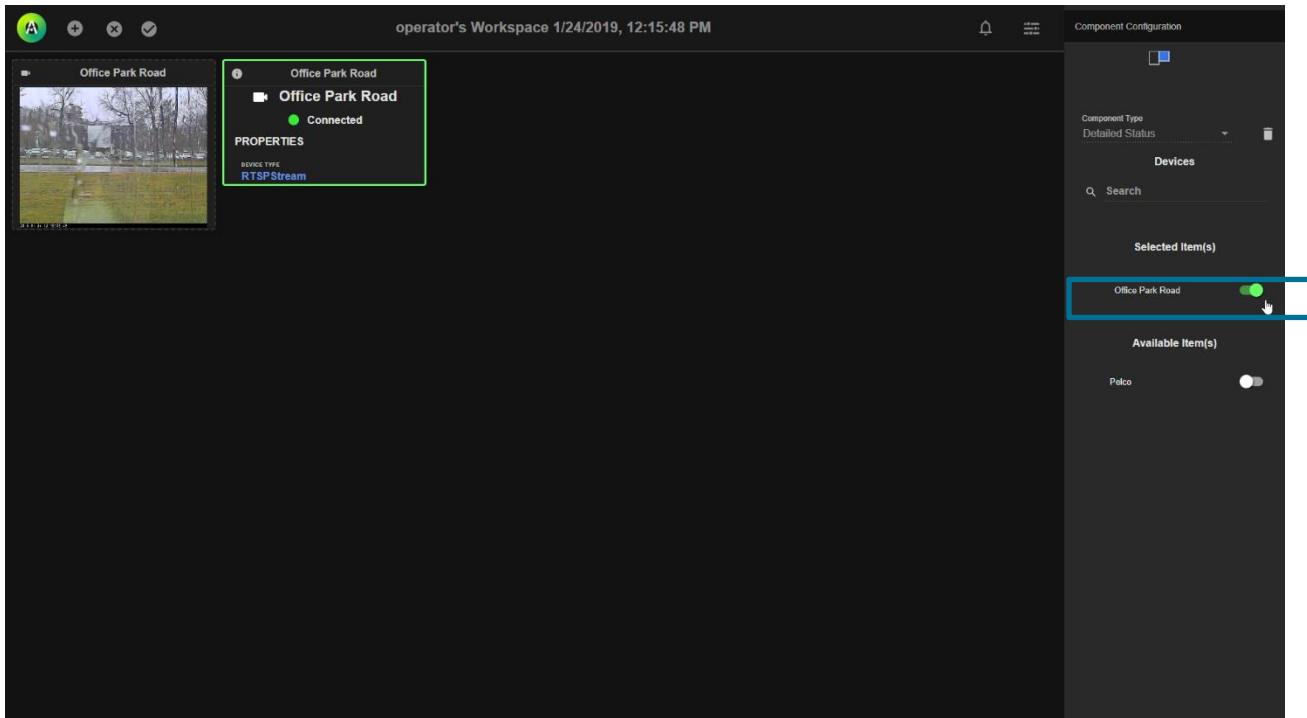


Figure 81. Monitor Camera Status

Example below. At the top, we have renamed the workspace. Since there are two components, we select a Two Component layout from the list.

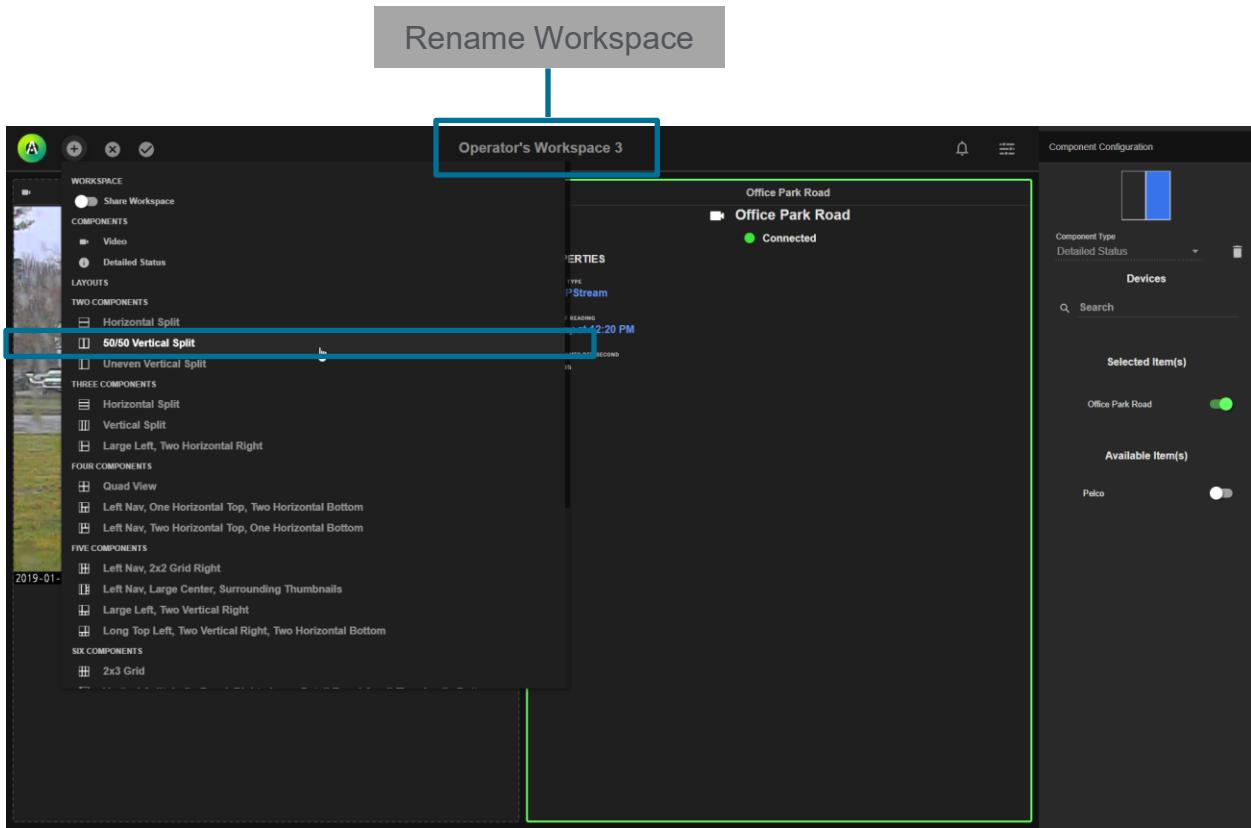


Figure 82. Rename Workspace

Once the workspace is saved, we've returned to the Main Screen.

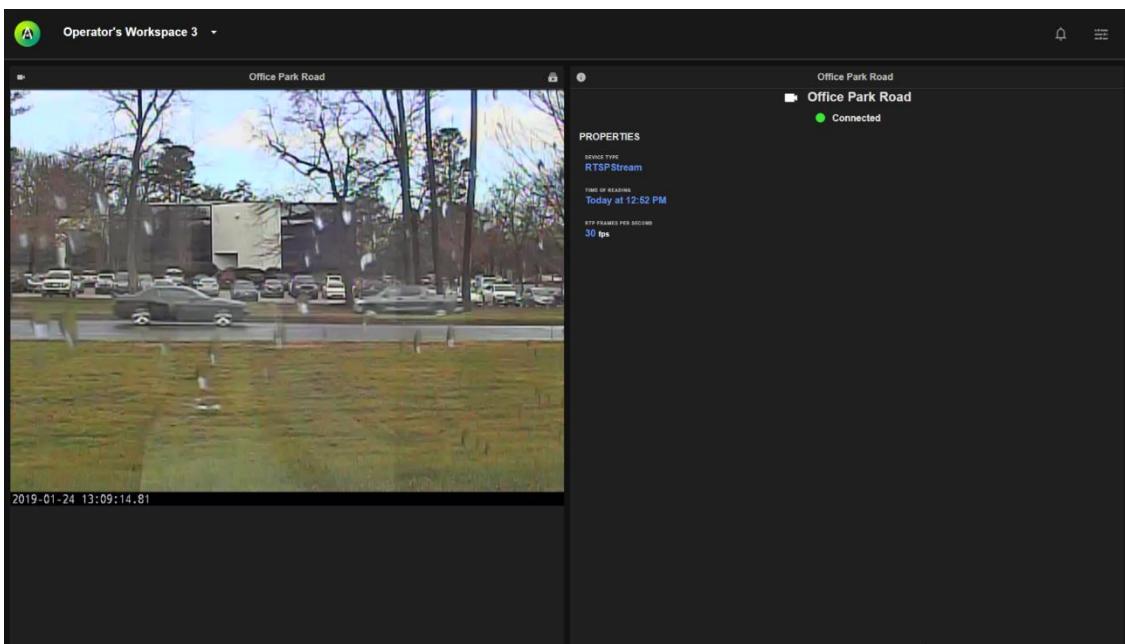


Figure 83. Return to Main Screen

6-9. VIDEO SEARCH. This is the Video Search screen. Here the user can playback recorded video data. On the right there are search and filter options for finding videos. At the bottom are the search results based on the search options selected.

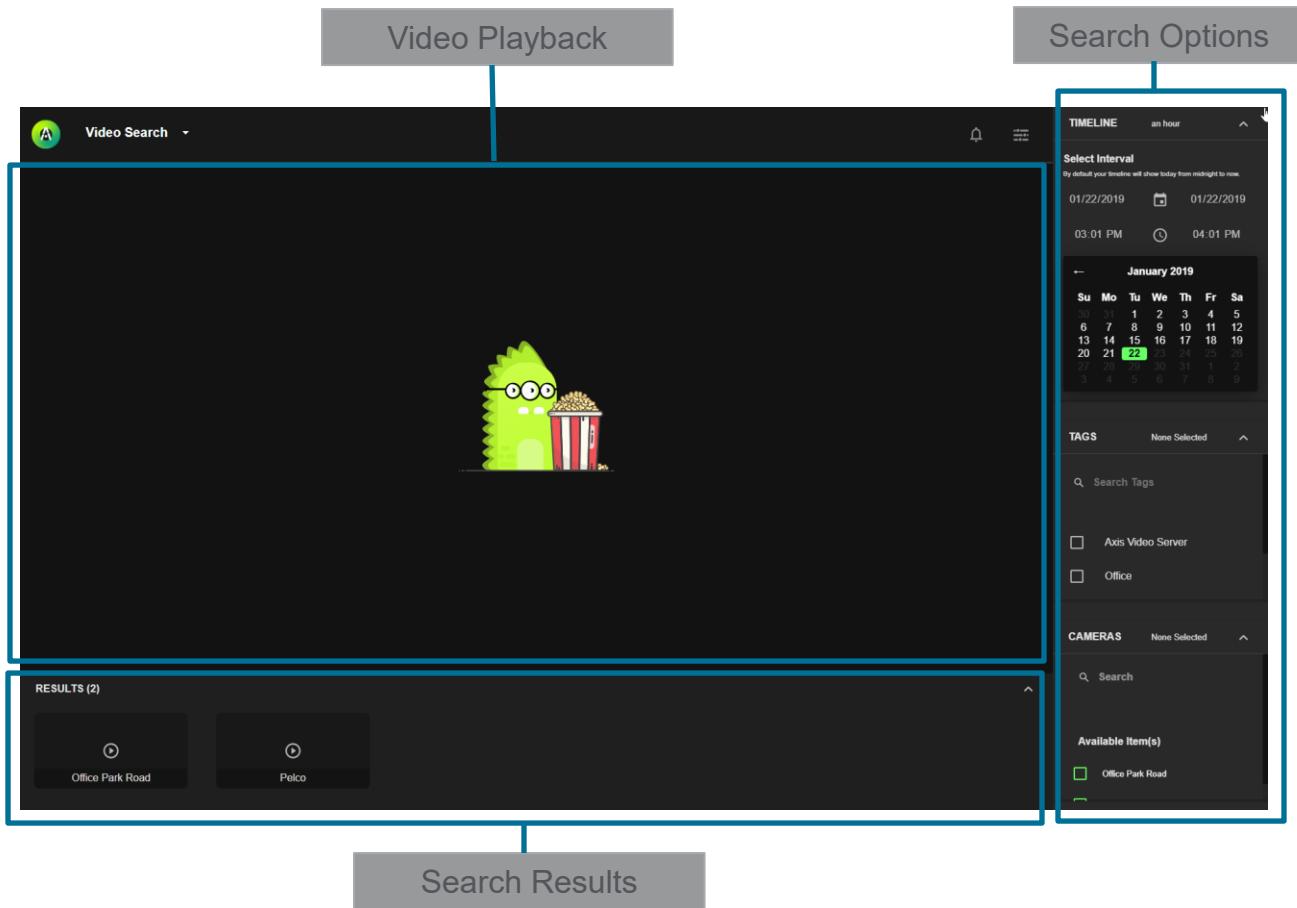


Figure 84. Video Search Screen

Search options has three categories. Timeline allows for searching for video within a time and date range. Tags allows filtering video results by camera tag keywords. Cameras allows filtering video results by specific cameras.

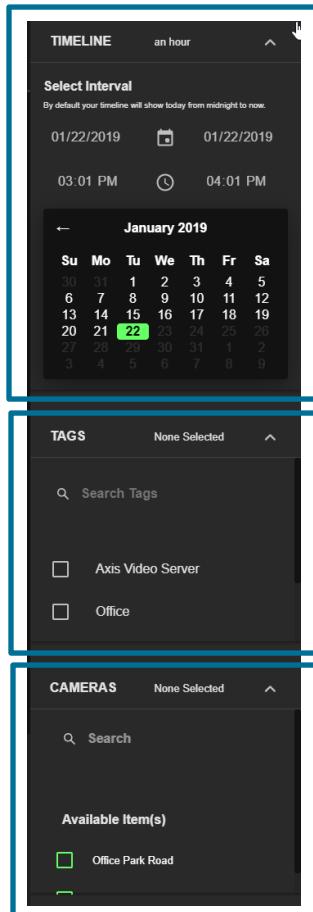


Figure 85. Search Options Categories

Once search options are selected, video results are displayed if found. Selecting a video begins video playback above the results.

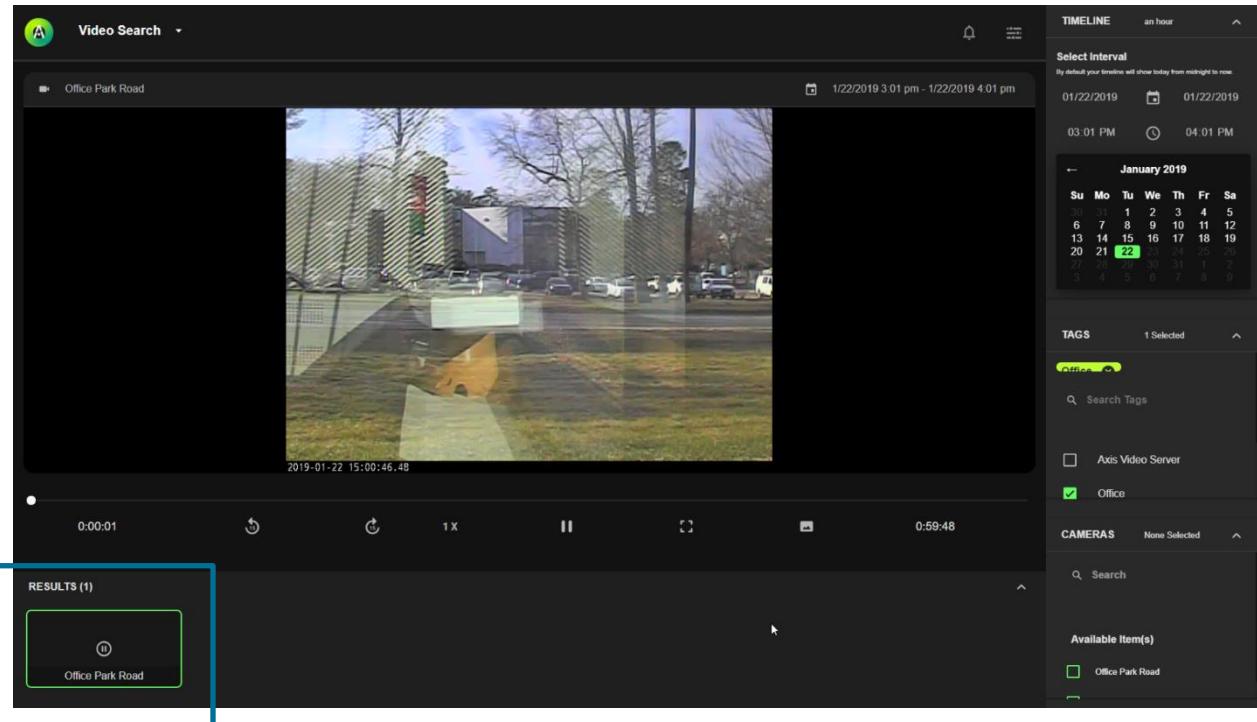


Figure 86. Selecting a Video

Video player buttons from left to right: Current time displays current time in video, skip back jumps back 15 seconds, skip forward jumps forward 15 seconds, play rate sets play rate from the following options [1/4x, 1/2x, 1x, 2x, and 4x], play/pause pauses and resumes video playback, fullscreen maximizes the video, screenshot downloads a screenshot of the current frame, total time displays total video length.

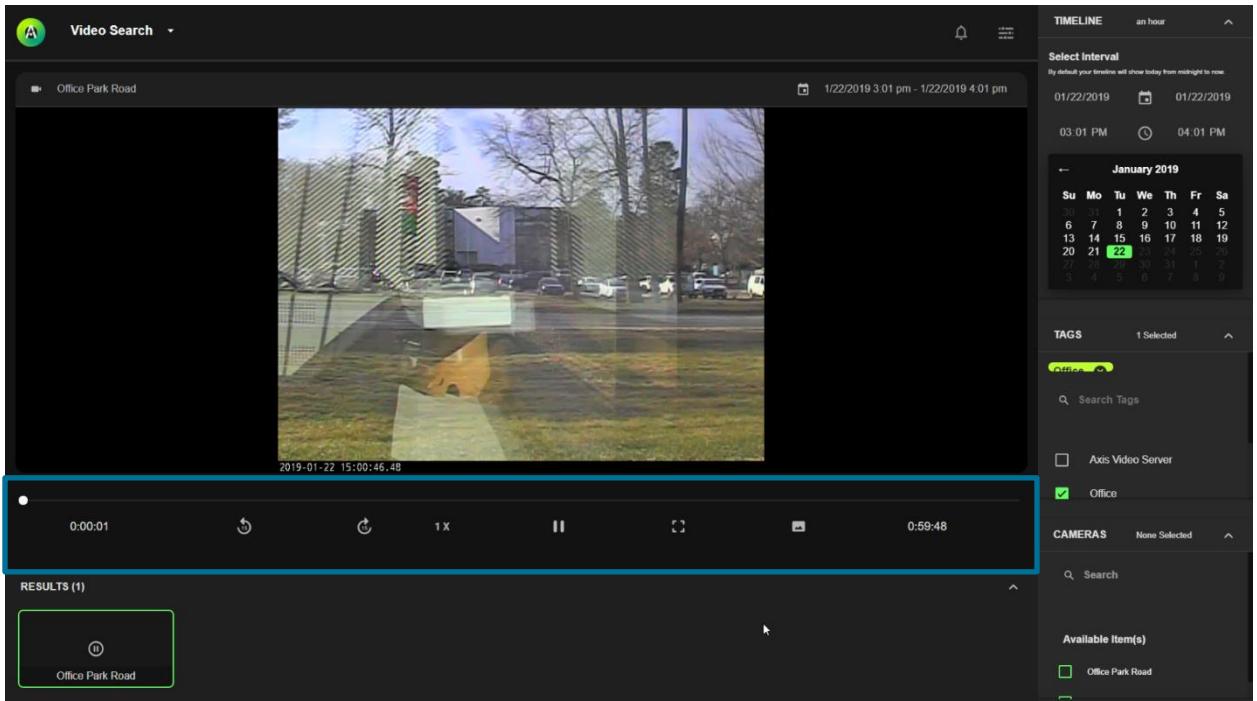


Figure 87. Video Player Buttons

Notifications icon displays a numbered badge when there are unread notifications. Clicking on the Notifications icon displays all recent notifications.

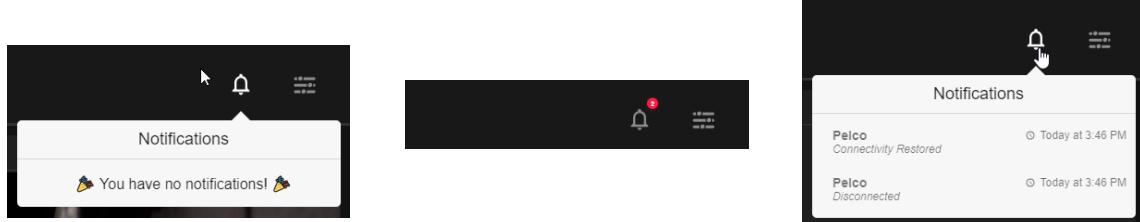


Figure 88. Notifications Icon

6-11. SETTINGS MENU. The settings menu contains four options: Edit grid allows temporary editing of workspace components, Management navigates to the management screen, Theme allows selection of themes, and Signout logs out of the applications.

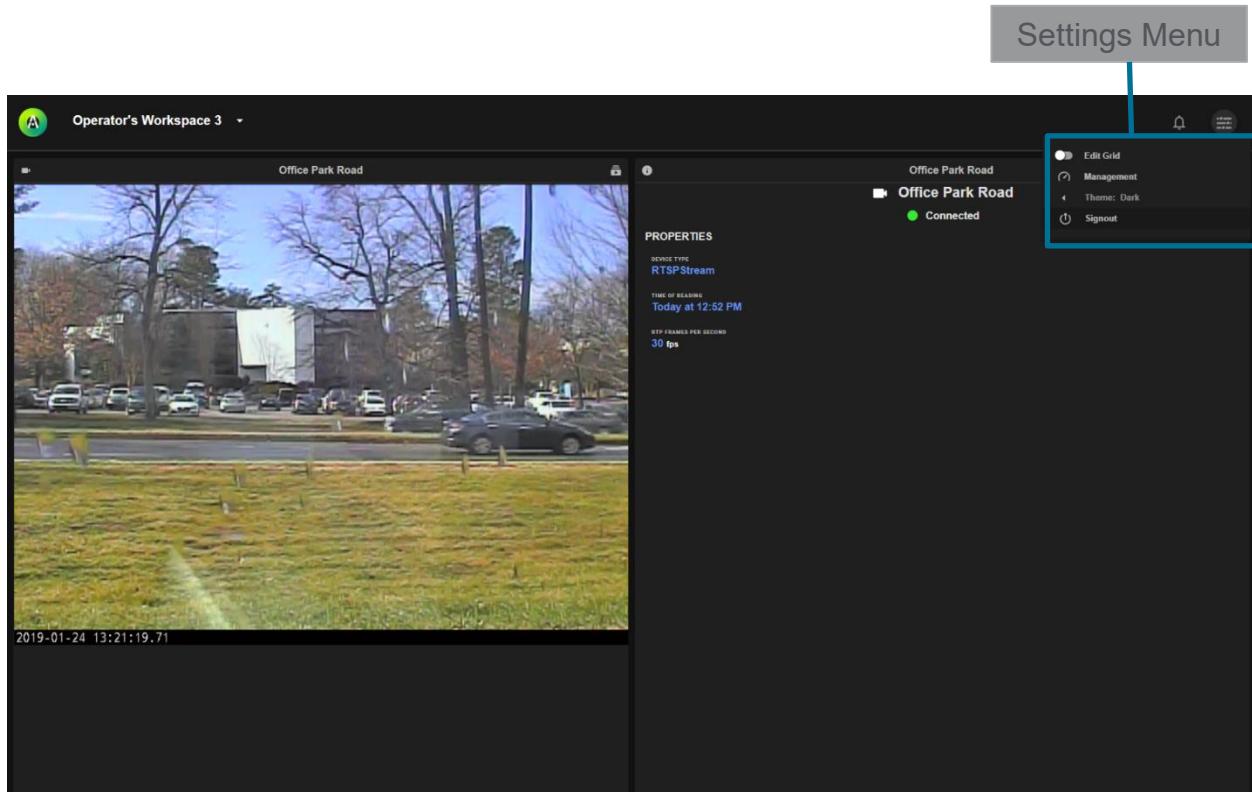


Figure 89. Settings Menu

There are two theme options, Dark and Light, for operator's preference and enhanced readability.
Example: This is the UI with the Light theme applied.

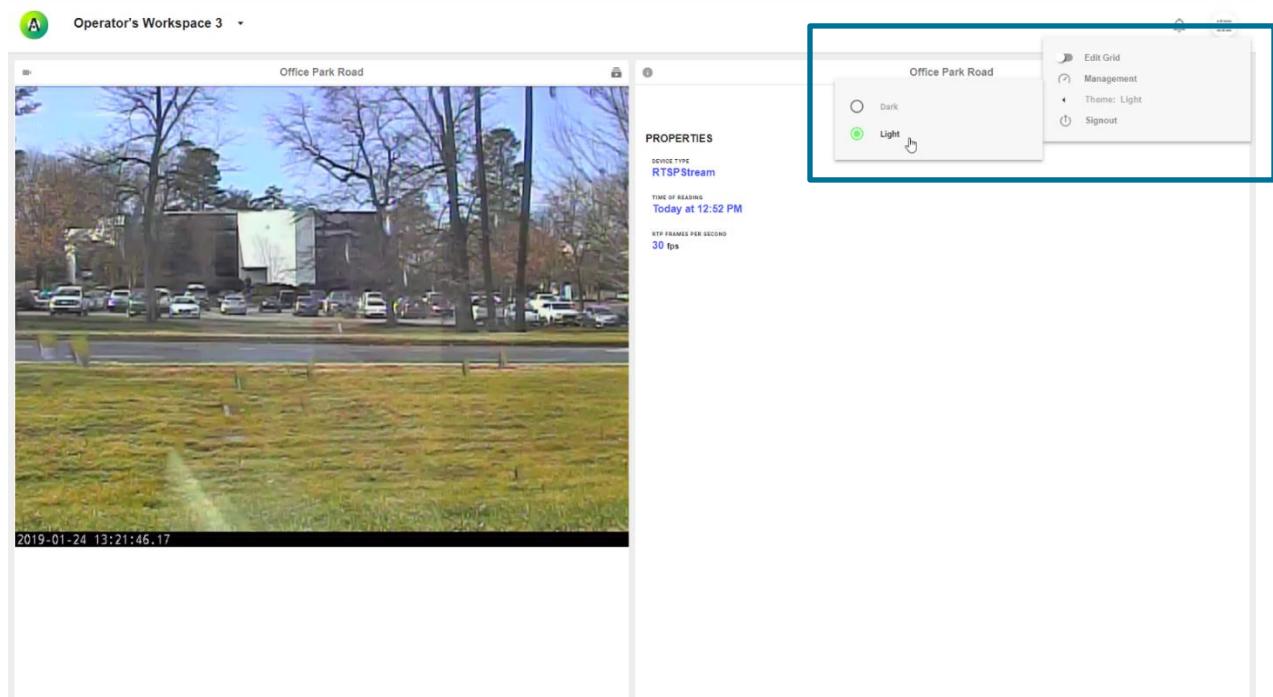


Figure 90. User Interface with Light Theme

6-12. MANAGEMENT SCREEN. This is the Management Screen. Here the workspaces, users, and sensors can be configured.

The screenshot shows the 'Management Screen' with a tab bar at the top labeled 'Workspaces', 'Users', and 'Sensors'. The 'Workspaces' tab is active. Below the tabs is a search bar and a button to '+ Add Workspace'. The main area displays a table titled 'Workspaces' with columns: NAME, COMPONENTS, TAGS, SHARED, and ACTIONS. The table lists several workspaces:

NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	4	...	<input type="checkbox"/>	<input type="checkbox"/>
Office Video	1	Full Screen	<input type="checkbox"/>	<input type="checkbox"/>
Operator's Workspace 1	2	...	<input type="checkbox"/>	<input type="checkbox"/> <input type="pencil"/> <input type="trash"/>
Operator's Workspace 2	2	...	<input type="checkbox"/>	<input type="checkbox"/> <input type="pencil"/> <input type="trash"/>
rhanson's first ws - test refresh video sizing	1	rhanson	<input type="checkbox"/>	<input type="checkbox"/>

At the bottom of the screen, there are pagination controls: 'Page: 1', 'Rows per page: 5', and '1-5 of 7'.

Figure 91. Management Screen

At the top there are three sub-sections for the Management Screen: workspaces for configuring workspaces, users for managing users, and sensors for configuring sensors.

Workspace Sub-sections

The screenshot shows the 'Workspaces' sub-section of the Management Screen. At the top, there is a navigation bar with tabs for 'Workspaces' (which is selected), 'Users', and 'Sensors'. Below the navigation bar is a search bar labeled 'Search Workspaces' and a button labeled '+ Add Workspace'. The main area displays a table of workspaces:

NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	4	...	🔓	🔗
Office Video	1	Fullscreen	🔓	🔗
Operator's Workspace 1	2 2	...	🔒	🔗 🖊️ 🗑️
Operator's Workspace 2	2	...	🔒	🔗 🖊️ 🗑️
rhanson's first ws - test refresh video sizing	1 1	rhanson	🔓	🔗

At the bottom right of the table, there are pagination controls: 'Page: 1', 'Rows per page: 5', and '1-5 of 7'.

Figure 92. Subsections of Management Screen

6-13. WORKSPACE MANAGEMENT. This is the Workspace Management view.

Workspace Management

Operator's Workspace 2WorkspacesUsersSensors

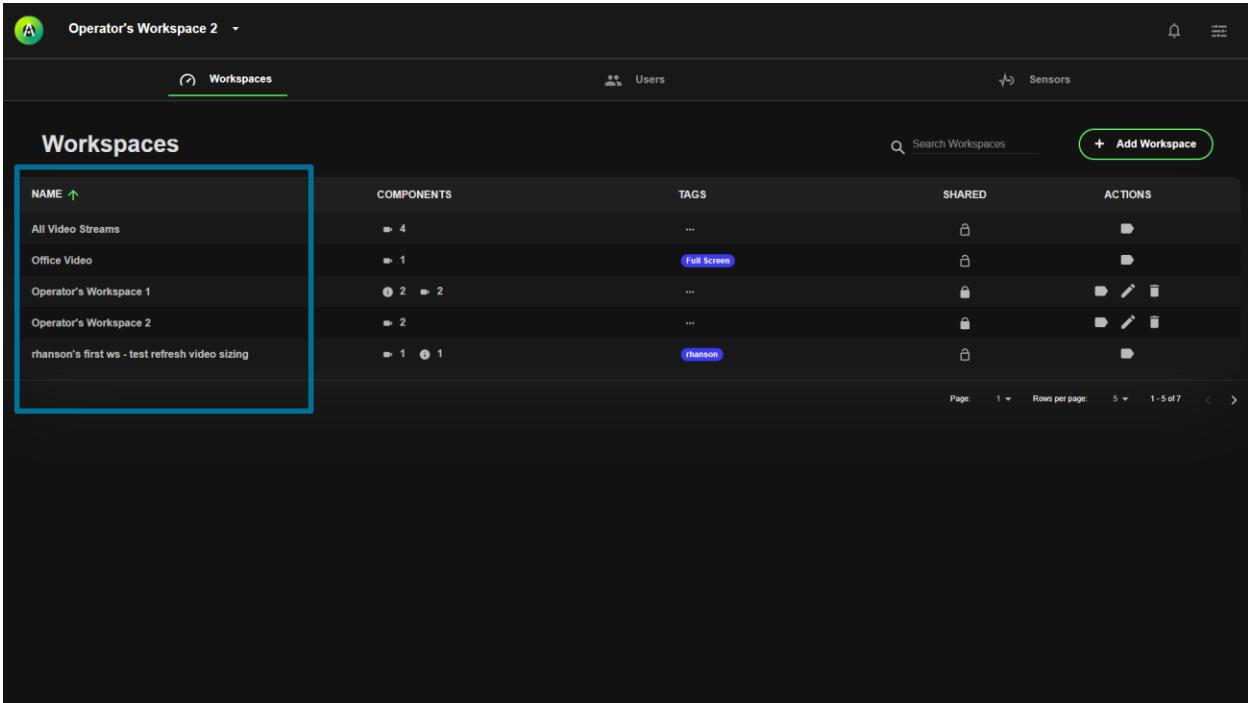
Workspaces

NAME ↑	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	4	...		
Office Video	1			
Operator's Workspace 1	2 2	...		
Operator's Workspace 2	2	...		
rhanson's first ws - test refresh video sizing	1 1	(rhanson)		

Page: 1 / 1Rows per page: 51-5 of 7

Figure 93. Workspace Management View

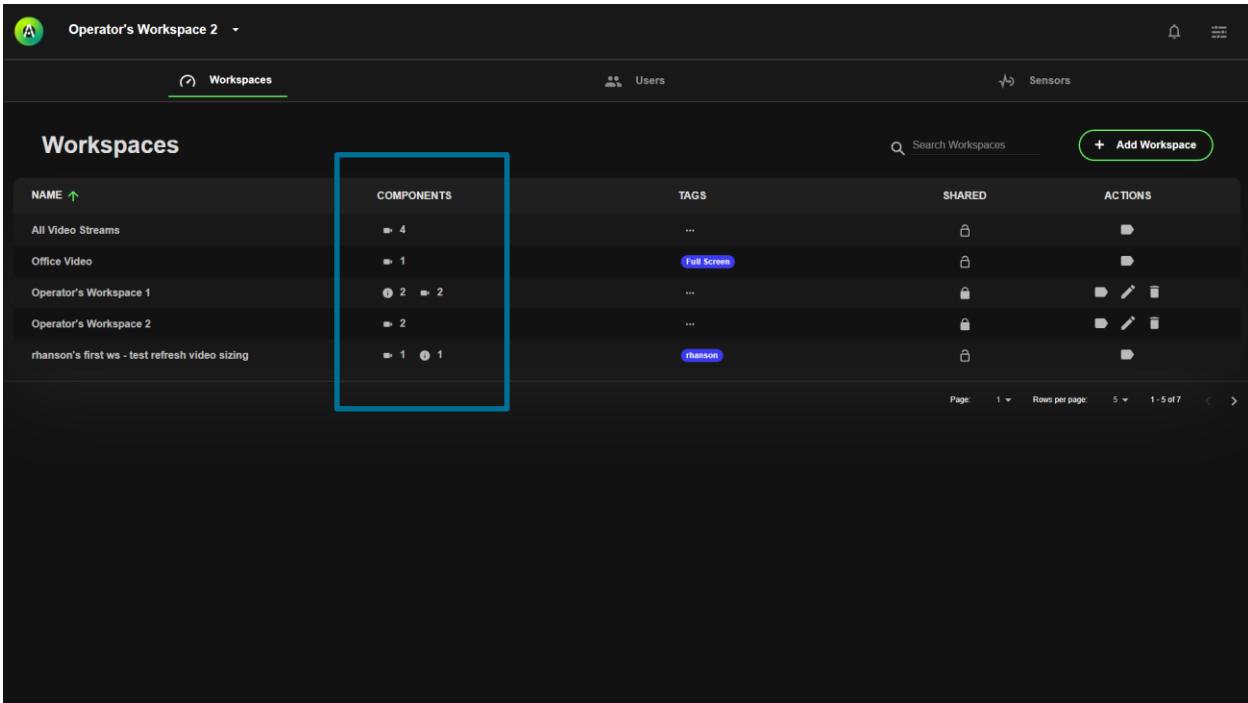
This column lists the name of the workspace.



NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	■ 4	...	🔓	▶
Office Video	■ 1	Full Screen	🔓	▶
Operator's Workspace 1	● 2 ■ 2	...	🔒	▶ ⚙️ 🗑️
Operator's Workspace 2	■ 2	...	🔒	▶ ⚙️ 🗑️
rhanson's first ws - test refresh video sizing	■ 1 ● 1	rhanson	🔓	▶

Figure 94. Workspace Names Column

This column lists the types and quantities of the components configured in each workspace.



NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	■ 4	...	🔓	▶
Office Video	■ 1	Full Screen	🔓	▶
Operator's Workspace 1	● 2 ■ 2	...	🔒	▶ ⚙️ 🗑️
Operator's Workspace 2	■ 2	...	🔒	▶ ⚙️ 🗑️
rhanson's first ws - test refresh video sizing	■ 1 ● 1	rhanson	🔓	▶

Figure 95. Component Types and Quantities Column

The Camera icon denotes configured Camera components. The Info icon denotes Detailed Status components.



Figure 96. Video and Info Icons

Workspaces can be tagged with keywords for easy searching.

The screenshot shows a user interface for managing workspaces. At the top, there's a header with a profile icon, the text "Operator's Workspace 2", and various navigation links like "Users" and "Sensors". Below the header is a search bar and a button to "Add Workspace". The main area is titled "Workspaces" and contains a table with the following data:

NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	4	...	🔓	▶
Office Video	1	...	🔓	▶
Operator's Workspace 1	2 2	...	🔒	▶ ⚒
Operator's Workspace 2	2	...	🔒	▶ ⚒
rhanson's first ws - test refresh video sizing	1 1	Full Screen, rhanson	🔓	▶

A blue rectangular box highlights the "TAGS" column for the last row, which lists the tags "Full Screen" and "rhanson".

Figure 97. Tags Column

This column denotes the shared/public status.

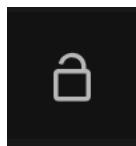
The screenshot shows a user interface for managing workspaces. At the top, there are tabs for 'Workspaces' (which is selected), 'Users', and 'Sensors'. Below the tabs is a search bar labeled 'Search Workspaces' and a button '+ Add Workspace'. The main area is titled 'Workspaces' and contains a table with the following columns: NAME, COMPONENTS, TAGS, SHARED, and ACTIONS. The 'SHARED' column is highlighted with a blue border. The table rows are as follows:

NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	4	...	Unlocked (Open)	Copy, Delete
Office Video	1	Full Screen	Locked (Open)	Copy, Delete
Operator's Workspace 1	2 2	...	Unlocked (Open)	Copy, Edit, Delete
Operator's Workspace 2	2	...	Unlocked (Open)	Copy, Edit, Delete
rhanson's first ws - test refresh video sizing	1 1	rhanson	Unlocked (Open)	Copy, Edit, Delete

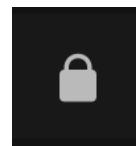
At the bottom of the table, there are pagination controls: 'Page: 1', 'Rows per page: 5', and '1-5 of 7'.

Figure 98. Shared/Public Status Column

The Unlocked icon denotes a shared workspace which is viewable by other operators on the application. The Locked icon denotes a private workspace which is viewable only by the operator the workspace belongs to.



Shared/ Public



Private

Figure 99. Lock and Unlocked Icons

This column contains actions that an operator can take.

The screenshot shows a user interface for managing workspaces. At the top, there are tabs for 'Workspaces' (which is selected), 'Users', and 'Sensors'. Below the tabs is a search bar labeled 'Search Workspaces' and a button to '+ Add Workspace'. The main area is titled 'Workspaces' and lists several entries:

NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	■ 4	...	🔒	[Icon: Label]
Office Video	■ 1	Full Screen	🔒	[Icon: Edit]
Operator's Workspace 1	● 2 ■ 2	...	🔒	[Icon: Label]
Operator's Workspace 2	■ 2	...	🔒	[Icon: Edit]
Rhanson's first ws - test refresh video sizing	■ 1 ● 1	Rhanson	🔒	[Icon: Delete]

At the bottom right, there are pagination controls: 'Page: 1', 'Rows per page: 5', and '1-5 of 7'.

Figure 100. Actions Column

There are three options: label icon allows tagging of workspaces, pencil icon allows editing of workspace components, trashcan icon deletes the workspace. Operators may only edit and delete their own workspaces.

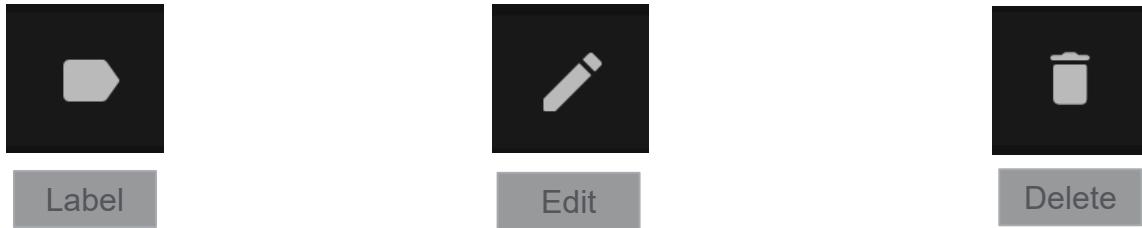


Figure 101. Label, Edit, Delete Icons

6-14. USER MANAGEMENT. This is the User Management view. All user accounts with user information are listed.

The screenshot shows a dark-themed user interface for managing users. At the top, there's a header with a profile icon, the text "Operator's Workspace 2", and several navigation links like "Workspaces" and "Sensors". Below the header is a title bar with "Users" and a search bar labeled "Search Users". The main area is a table with the following columns: USERNAME, FIRST NAME, LAST NAME, ROLE, and ACTIONS. The data rows are:

USERNAME	FIRST NAME	LAST NAME	ROLE	ACTIONS
aboyd	Andrew	Boyd	Operator	
maintainer			Maintainer	
operator			Operator	
pmaxwell	Pete	Maxwell	Operator	
rhanson	Riley	Hanson	Operator	

At the bottom right of the table, there are pagination controls: "Page: 1", "Rows per page: 20", and "1 - 5 of 5". A blue rectangular box highlights the "Users" title bar.

Figure 102. User Management View

A user may edit their own account details.

This screenshot is identical to Figure 102, but it highlights the row for the user "operator" with a blue box around the entire row. The "Edit" icon in the "Actions" column for this row is also highlighted with a blue box.

Figure 103. Edit Account Details

Password, name, and contact information can be updated. Username and account role cannot be updated by an operator account.

The screenshot shows a user interface for managing users. At the top, there's a navigation bar with 'Operator's Workspace 2', 'Workspaces', 'Users' (selected), and 'Sensors'. A search bar says 'Search Users'. Below the navigation is a table of users with columns 'USERNAME' and 'FIRST NAME'. One row is selected, showing 'operator' and 'Andrew'. A modal dialog titled 'MODIFY USER' is open over the table. It contains two sections: 'Login Credentials' (Username: operator) and 'User Info' (First Name: Andrew). It also includes fields for 'Old Password', 'New Password', 'Confirm New Password', and 'Email Address'. Below these is a radio button group for 'Role' with 'operator' selected. At the bottom of the modal are 'Save' and 'Cancel' buttons. The background table shows other users: 'maintainer' (First Name: Riley), 'operator' (First Name: Pete), and 'rhanson' (First Name: Riley). The 'Actions' column for each user shows their role: Operator for all.

Figure 104. Modify User Screen

6-15. SENSOR MANAGEMENT. This is the Sensor Management view. Configured sensors are listed with connection status and port settings.

The screenshot shows a sensor management interface. At the top, it has the same navigation bar as Figure 104: 'Operator's Workspace 2', 'Workspaces', 'Users', and 'Sensors' (selected). A search bar says 'Search Sensors'. Below the navigation is a table titled 'Sensors' with columns 'SENSOR NAME', 'STATUS', 'PORT', and 'TAGS'. Two sensors are listed: 'Office Park Road' (Connected, RTSPVideo1, Tags: Richmond, Axis Video Server, Road) and 'Pelco' (Connected, RTSPVideo2, Tags: ...). The 'Sensors' tab is highlighted with a blue border. The background table shows other sensors: 'RTSPVideo3' (Connected, RTSPVideo3, Tags: ...), 'RTSPVideo4' (Connected, RTSPVideo4, Tags: ...), and 'RTSPVideo5' (Connected, RTSPVideo5, Tags: ...). The 'Actions' column for each sensor shows their status: Connected for all.

Figure 105. Sensor Management View

Sensors can be tagged with keywords for searching.

The screenshot shows the 'Sensors' page in a web application. At the top, there are navigation links for 'Workspaces', 'Users', and 'Sensors'. A search bar labeled 'Search Sensors' is on the right. Below the header, a table lists two sensors:

SENSOR NAME	STATUS	PORT
Office Park Road	Connected	RTSPVideo1
Pelco	Connected	RTSPVideo2

A blue box highlights the 'TAGS' column for both rows. It contains three tags: 'Richmond', 'Axis Video Server', and 'Road'. At the bottom of the table, there are pagination controls: 'Page: 1', 'Rows per page: 20', and '1 - 2 of 2'.

Figure 106. Tag Sensor with Keywords

Maintainer can tag, edit, and delete all public workspaces.

The screenshot shows the 'Workspaces' page in a web application. At the top, there are navigation links for 'Workspaces', 'Users', and 'Sensors'. A search bar labeled 'Search Workspaces' and a 'Add Workspace' button are on the right. Below the header, a table lists five workspaces:

NAME	COMPONENTS	TAGS	SHARED	ACTIONS
All Video Streams	4	...	🔓	
maintainer's Workspace 1/21/2019, 8:09:52 PM	1	...	🔒	
maintainer's Workspace 1/8/2019, 12:21:36 PM	1 1	...	🔒	
Office Video	1	Full Screen	🔓	
rhanson's first ws - test refresh video sizing	1 1	rhanson	🔓	

A blue box highlights the 'ACTIONS' column for all rows. Each row contains four icons: a video camera, a pencil, a lock, and a trash bin. At the bottom of the table, there are pagination controls: 'Page: 1', 'Rows per page: 5', and '1 - 5 of 7'.

Figure 107. Maintainer Workspace Actions

Maintainers can create new user accounts. Maintainers can edit existing user accounts and change their account type.

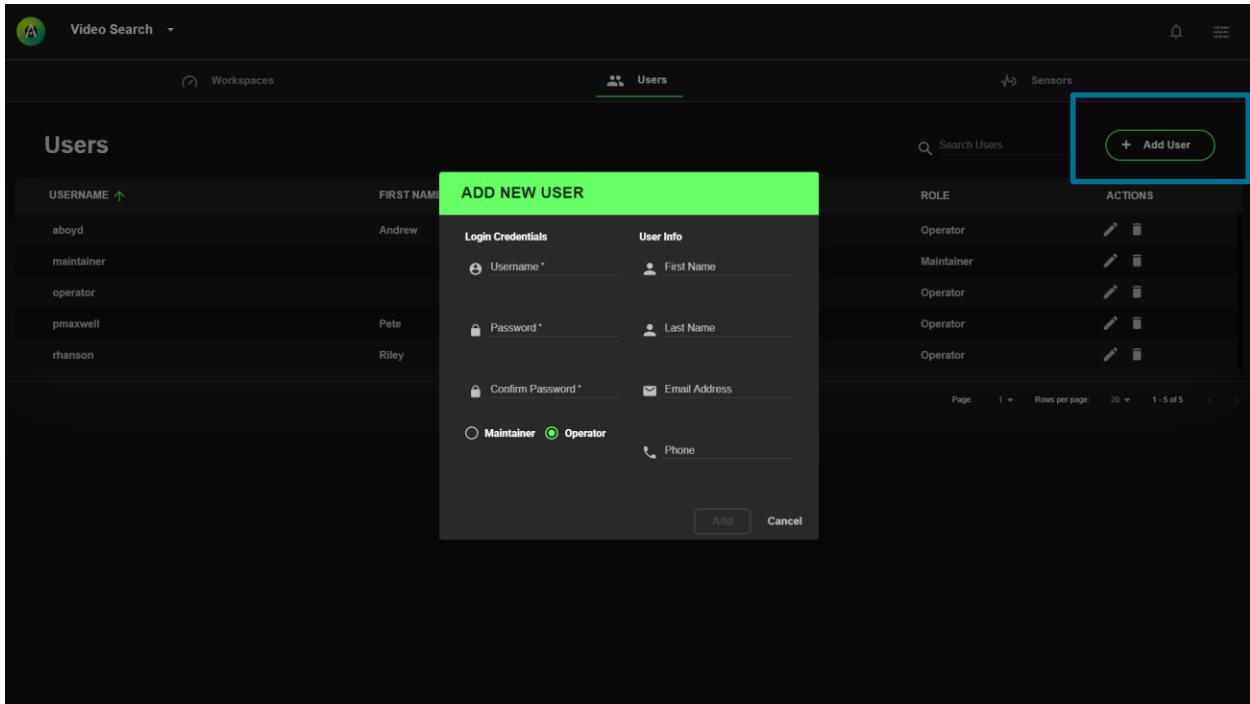


Figure 108. Add New User

Maintainers can configure new sensors. Example: This is the dialog for configuring a new sensor.

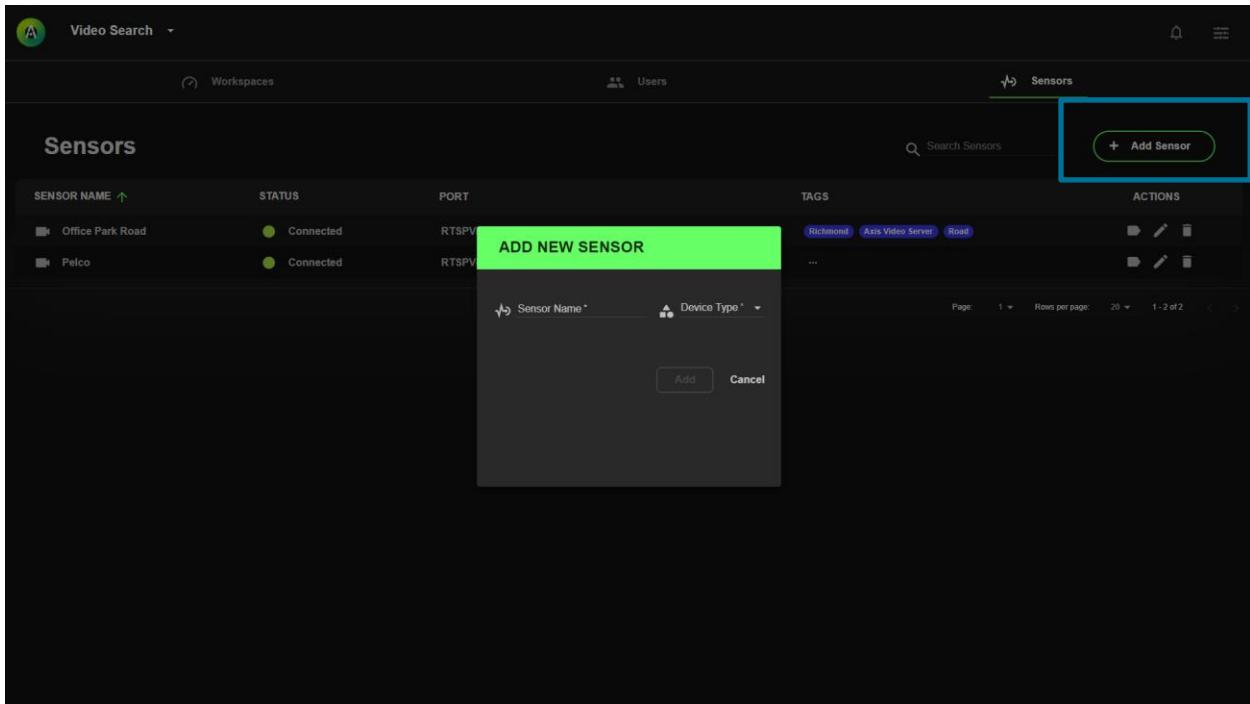


Figure 109. Configure New Sensor

Once the sensor name and device type is entered, additional required input fields are displayed for configuring the camera.

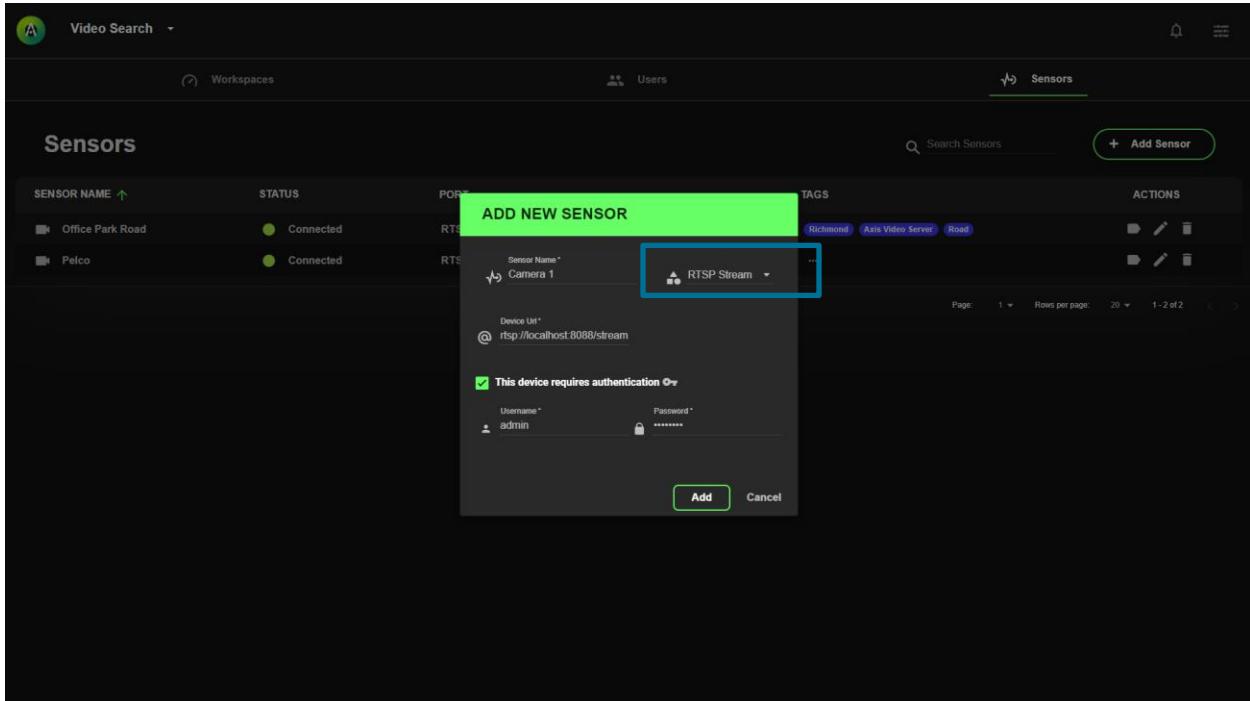


Figure 110. Configure New Sensor cont.

CHAPTER 7. INTEGRATED SENSOR ARCHITECTURE (ISA)

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7-1. ISA OVERVIEW. The Integrated Sensor Architecture (ISA) is developed within the Night Vision and Electronic Sensors Directorate (NVESD) of the Communications-Electronics Research Development and Engineering Center (CERDEC) of the U.S. Army. The primary goal of ISA is to enable systems to readily integrate into an existing network and dynamically share data, information, and capabilities to help achieve Situational Awareness (SA). ISA is an interoperability solution designed to accomplish data, information, and capability sharing within a tactical environment. ISA applies standards and technologies to address the highly constrained communications, ever-changing conditions, and cybersecurity demands that are characteristic of the tactical domain.

7-2. ISA TERMINOLOGY. Command is a task that an ISA component can perform upon request, Observable is information that a component can publish about observations that it makes. Property is information that a component can report about its current status. ISA capability is a property, observable, or command declared by an ISA component. ISA component is a component that complies with the ISA interface and supports the required ISA behaviors. ISA controller is a collection of core ISA services acting as a single unit to provide ISA functionality. An ISA controller comprises a single instance of each core ISA service. ISA service is a service defined for ISA, including core and optional services.

7-3. ISA COMPOSITION.

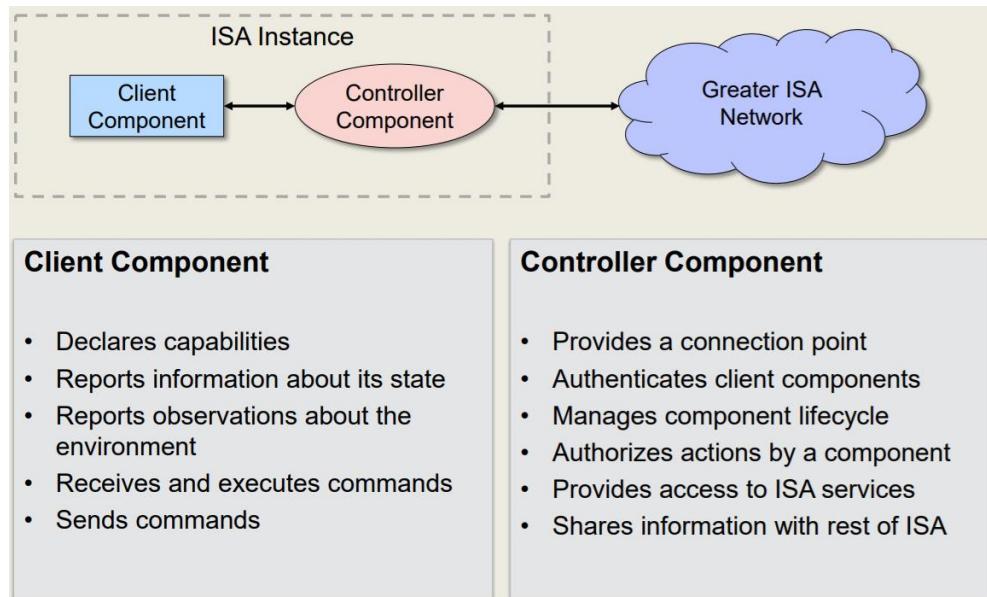


Figure 111. ISA Composition

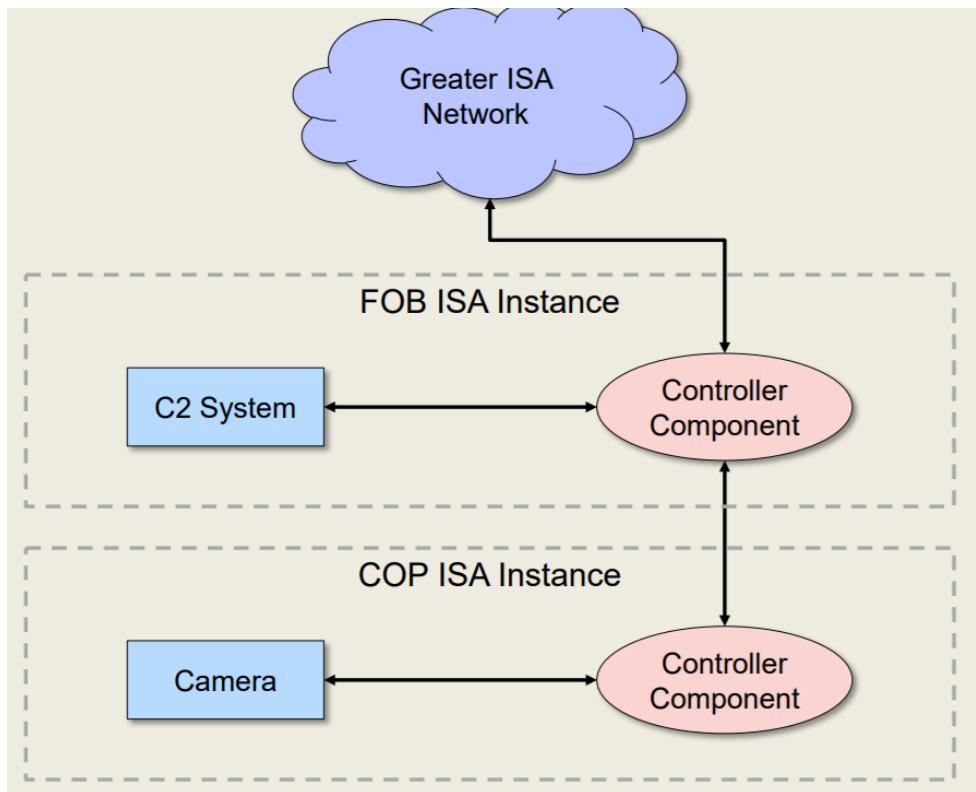


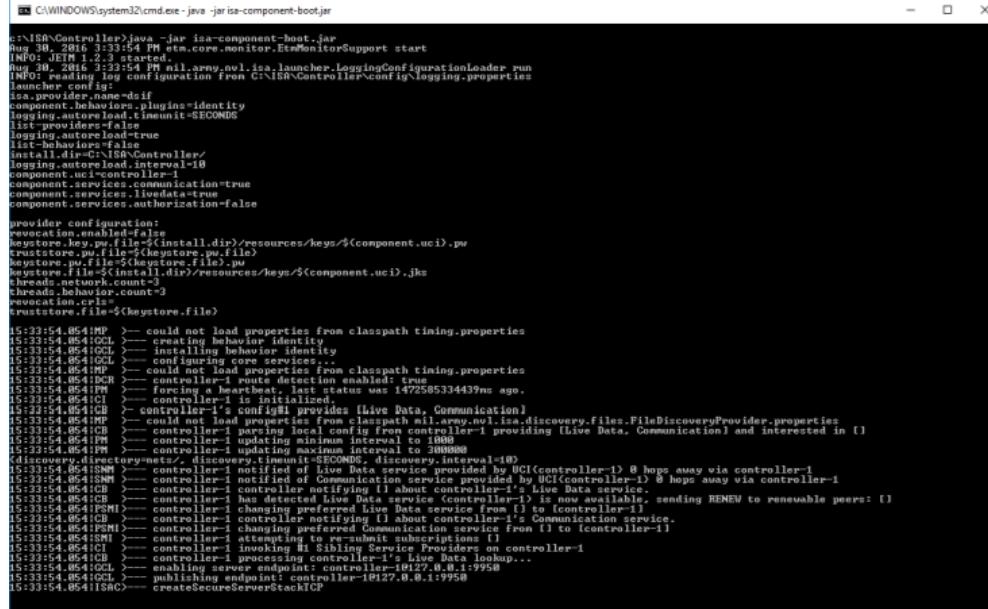
Figure 112. ISA Composition cont.

7-4. ISA SOFTWARE OVERVIEW. Most of this software will be preinstalled and setup upon arrival of the other components in the CENTAUR system. We will summarize the capabilities of the relevant software modules here in case they need to be adjusted by an operator.

ISA 6.0 Software: Controller, Diagnostics, Compliance Tool, Configurator, RaptorX Plugin* and Data Generator*.

*We wont be covering these tools, as they are not expected to be used by an operator.

7-5. ISA CONTROLLER. The ISA controller is the server software to which clients connect. For ISA 6.0, it has been in Java (from Erlang). It can run on Windows or Linux. It will typically be run on the same machine as the Q visual system. There can be one or many controllers.



```
C:\WINDOWS\system32\cmd.exe - java -jar isa-component-boot.jar
...
Aug 30, 2016 3:33:54 PM etm.core.monitor.EtmMonitorSupport start
INFO: [EtmMonitorSupport] EtmMonitorSupport start
Aug 30, 2016 3:33:54 PM mil.army.nvl.isa.launcher.LoggingConfigurationLoader run
INFO: reading log configuration from C:\ISA\Controller\config\logging.properties
...
15:33:54.054 [main] INFO  mil.army.nvl.isa.provider.IdentityProvider
isa.provider.name=dsif
component.behaviors.plugins=identity
component.behaviors.timeout=5000MS
list.providers=false
logging.autoreload=true
logging.level=INFO
install.dir=c:\ISA\Controller\
logging.autoreload.interval=10
component.uci=controller
component.services.communication=true
component.services.livedata=true
component.services.authorization=false
provide.configuration:
resocation.enabled=false
keystore.location= ${install.dir}/resources/keys/${component.uci}.pw
truststore.pufile=<keystore.pufile>
keystore.pu_file=<keystore_file>.pu
keystore.jks_file=<keystore_file>.jks
keystore.wks_file=<keystore_file>/resources/keys/${component.uci}.wks
http.port=network.port<-3
threads.behavior.count=3
resocation.crls=
truststore.file=<keystore_file>
...
15:33:54.054 [MP] > could not load properties from classpath timing.properties
15:33:54.054 [DCR] > could not load properties from classpath identity.properties
15:33:54.054 [DCR] > installing behavior identity
15:33:54.054 [DCR] > configuring core services...
15:33:54.054 [DCR] > could not load properties from classpath timing.properties
15:33:54.054 [DCR] > controller-1 route detection enabled: true
15:33:54.054 [PM] > forcing a heartbeat. last status was 1472585334439ms ago.
controller-1 is initialized
15:33:54.054 [CB] > controller-1 providing [Live Data, Communication]
15:33:54.054 [MP] > could not load properties from classpath mil.army.nvl.isa.discovery.files.FileDiscoveryProvider.properties
15:33:54.054 [CB] > controller-1 parsing local config from controller-1 providing [Live Data, Communication] and interested in []
15:33:54.054 [CB] > controller-1 updating max interest to 300000
15:33:54.054 [PM] > controller-1 updating maximum interval to 300000
<Discovery.directory=nets, discovery.timeout=5SECONDS, discovery.interval=10>
15:33:54.054 [PSMI] > controller-1 notified of live Data service provided by HC1(controller-1) 0 hops away via controller-1
15:33:54.054 [PSMI] > controller-1 notified of live Data service provided by HC1(controller-1) 0 hops away via controller-1
15:33:54.054 [CB] > controller-1 notifying [I] about controller-1's Live Data service.
15:33:54.054 [CB] > controller-1 has detected Live Data service (controller-1) is now available. sending RENEW to renewable peers: []
15:33:54.054 [PSMI] > controller-1 notifying [I] about controller-1's Communication service.
15:33:54.054 [PSMI] > controller-1 changing preferred Communication service from [] to [controller-1]
15:33:54.054 [CB] > controller-1 invoking HI Sibling Service Providers on controller-1
15:33:54.054 [CB] > controller-1 processing controller-1's Live Data lookup...
15:33:54.054 [CB] > enabling server endpoint controller-1@127.0.0.1:9950
15:33:54.054 [CB] > publishing endpoint controller-1@127.0.0.1:9950
15:33:54.054 [ISAC] > createSecureServerStackICF
```

Figure 113. ISA Controller Screen

7-6. DIAGNOSTICS.

- Visualize ISA message traffic:

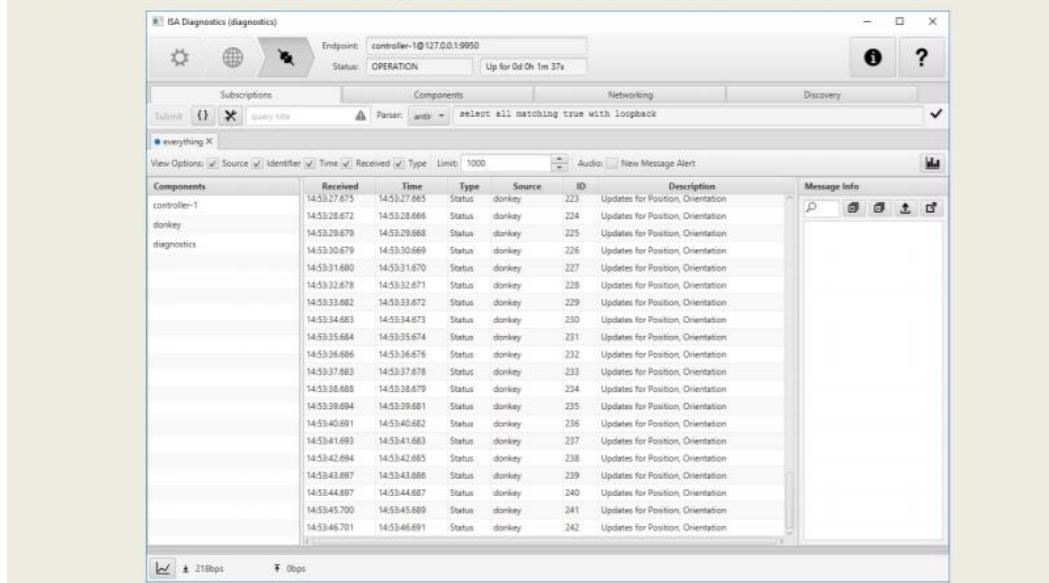


Figure 114. Visualize ISA Message Traffic

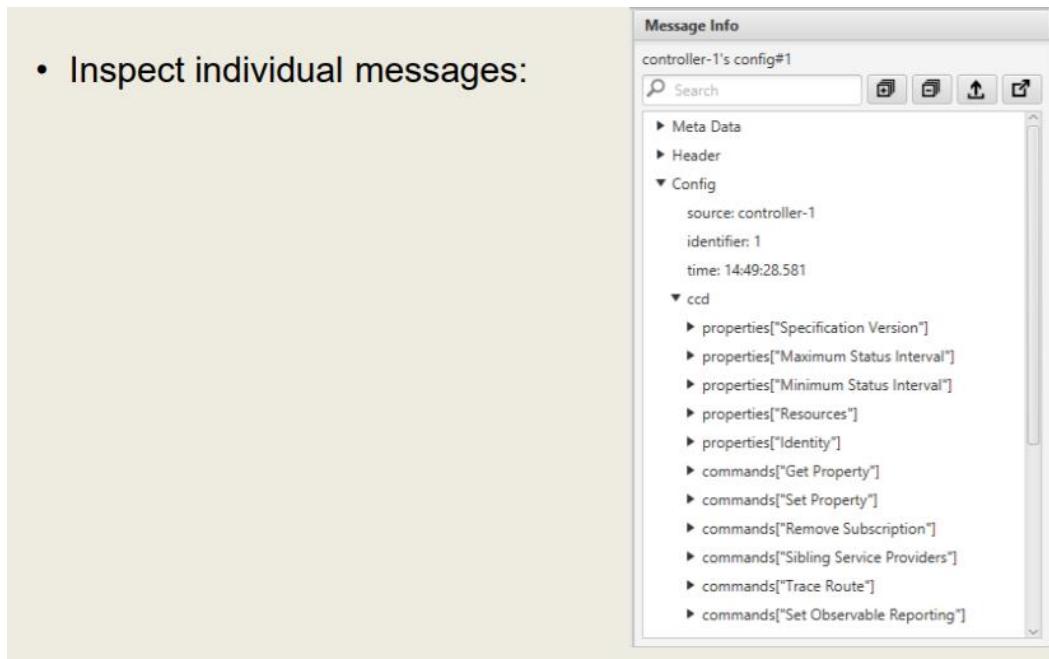


Figure 115. Inspect Individual Messages

- Display Config and Status for each component:

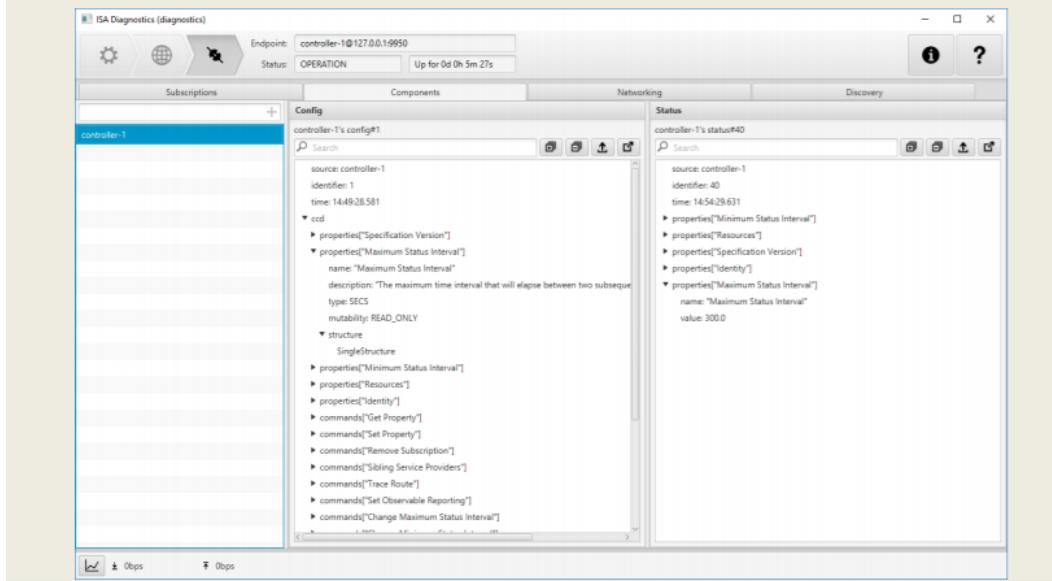


Figure 116. Display Config and Status for Each Component

- Display a network map:

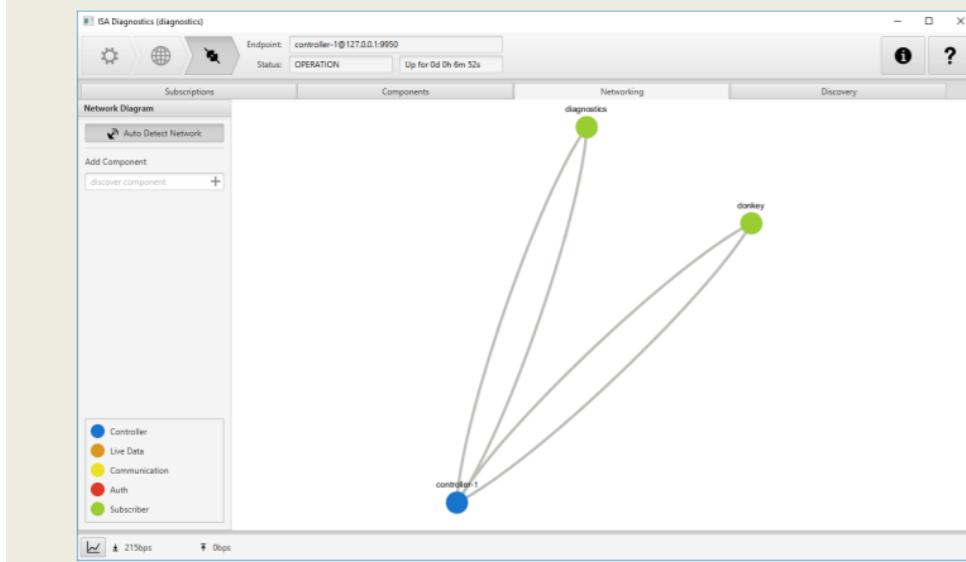


Figure 117. Display a Network Map

- Issue Discover requests to find messages:

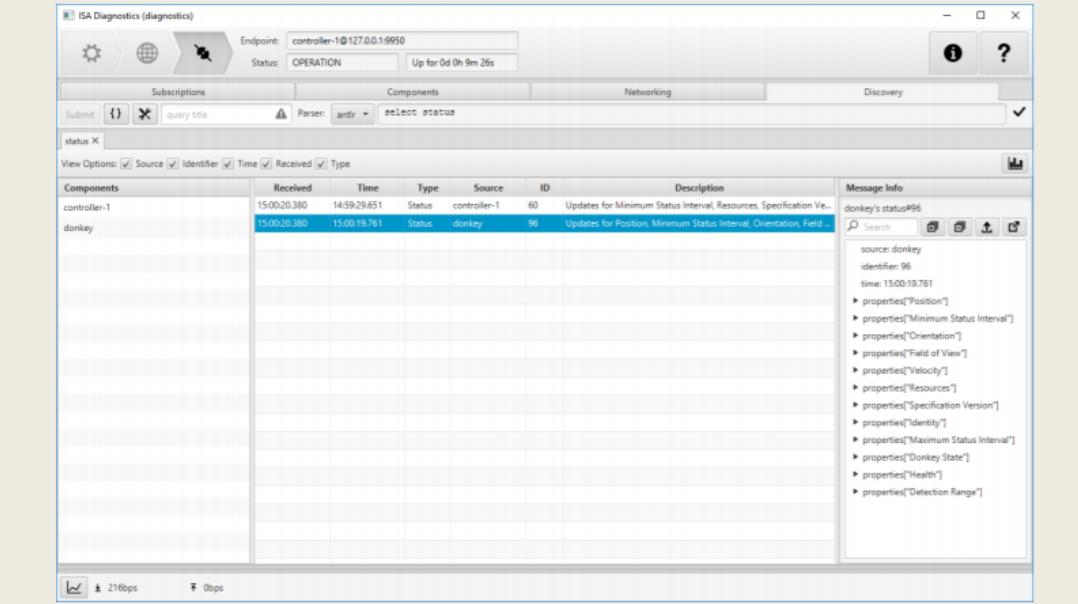


Figure 118. Issue Discover Requests to Find Messages

- Display a graph of the send/receive rate:



- Build a custom subscription query:

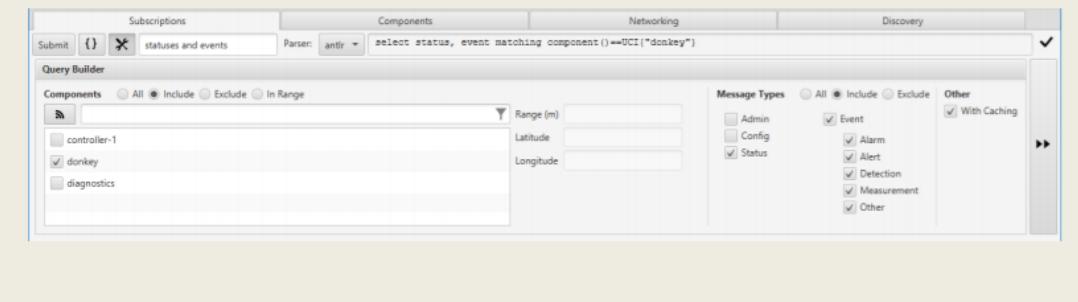


Figure 119. Display Graph and Build Query

7-7. ISA COMPLIANCE TOOL OVERVIEW.

- Validates a component's adherence to the requirements:
 - Tests property and command handling
 - Examines messages
 - Compares message contents against known types
- Displays errors and warnings in real time
- Generates a report
- Can act as an ISA controller or client component:
 - Controller mode: component being evaluated connects to it
 - Client component mode: connects to a controller and evaluates other components connected to the controller

Figure 120. Compliance Tool Overview

7-8. ISA COMPLIANCE TOOL.

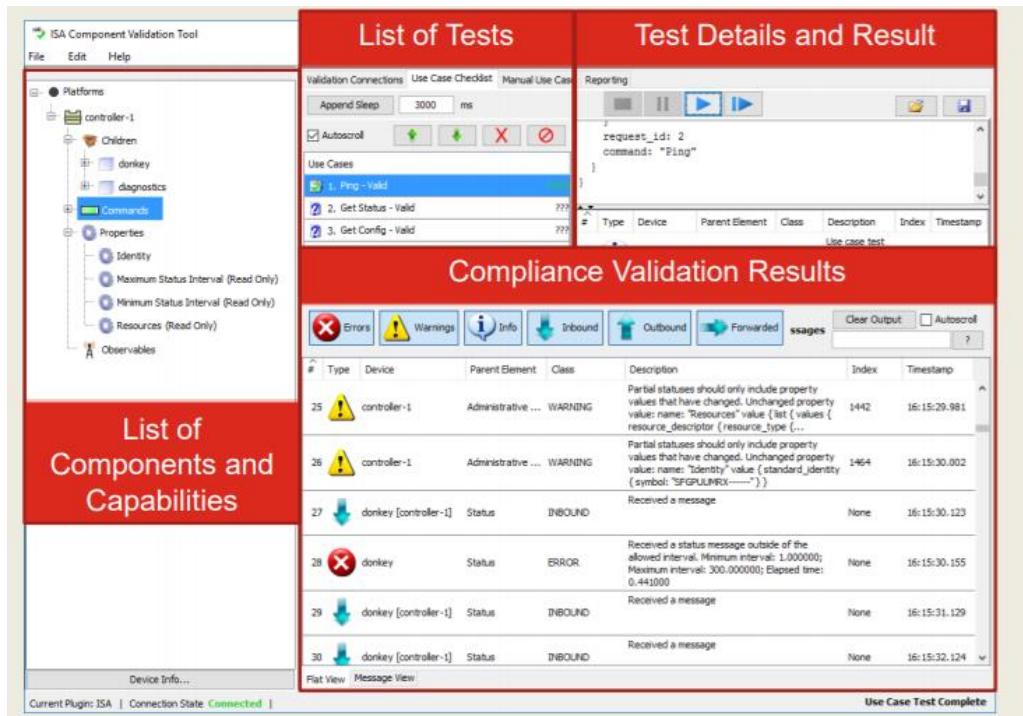


Figure 121. ISA Compliance Tool Screen

7-9. CONFIGURATION.

- The ISA Configurator provides a graphical interface for configuring ISA components such as the Controller and Data Generator

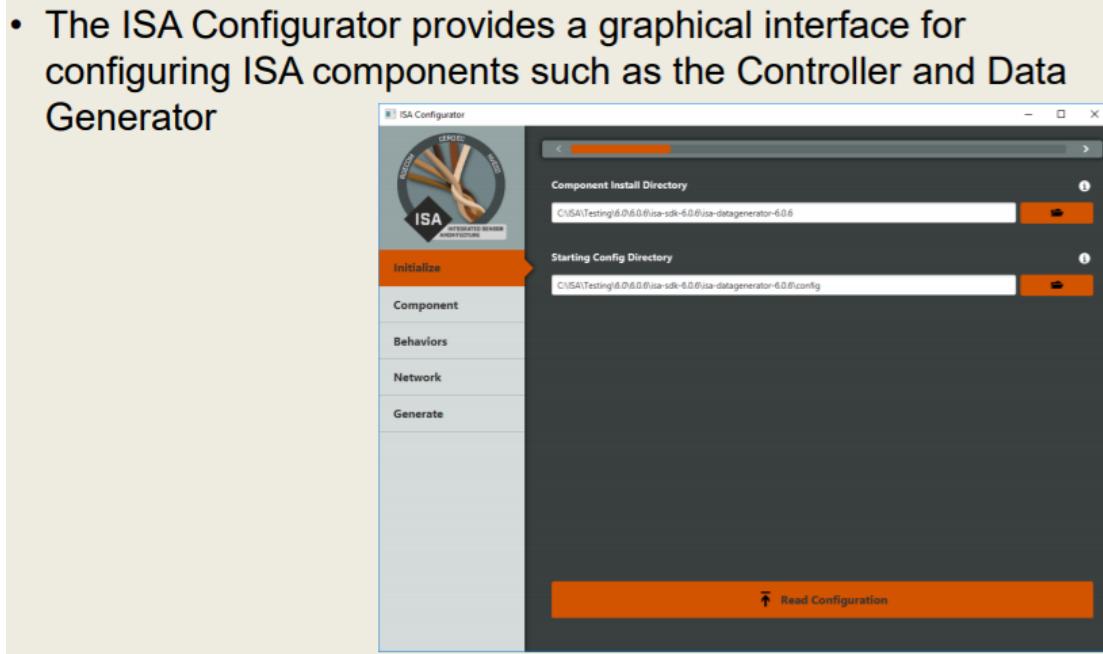


Figure 122. ISA Configurator

7-10. RUNNING THE SOFTWARE COMPONENTS. Navigate to the ISA installation directory and use the following commands to run the software components: ISA Compliance Tool: `java -jar isa-compliance-tool-6.0.9\isa-validator.jar`, ISA Configurator: `java -jar isa-configurator-6.0.9\isa-configurator-boot.jar`, ISA Controller: `java -jar isa-controller-6.0.9\isa-component-boot.jar`, ISA Diagnostics: `java -jar isa-diagnostics-6.0.9\isa-diagnostics-boot.jar`.

7-11. CENTAUR ISA NETWORK DIAGRAM. The CENTAUR ISA service communicates with the SMS in order to wrap sensor data in ISA messages. It then sends those messages to the ISA Controller where they are routed to the proper destination. Similarly to the SMS, the Command Post will have an ISA service to wrap messages and communicate with the controller.

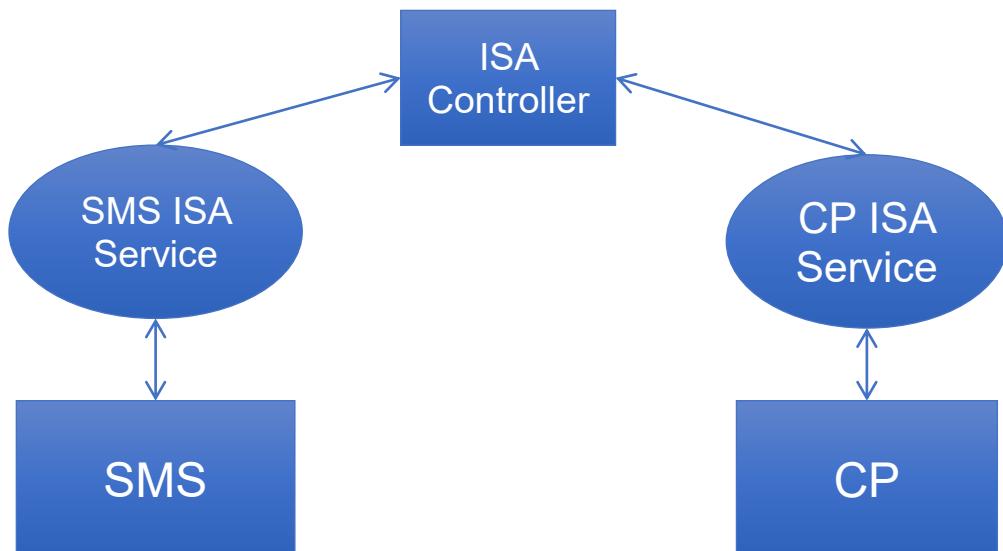


Figure 123. ISA Network Diagram

7-12. CENTAUR SMS ISA SERVICE. The CENTAUR ISA service is written in Java and wraps SMS sensor data into ISA messages before sending them to the controller. The SMS ISA service runs on each SMS, and should be started after the SMS is started and configured properly. To run the CENTAUR SMS ISA service, go to where the jar files exists and execute the following in the command line.

Java -jar SMStoISA.jar

CHAPTER 8. Q DATA FLOW GUIDE

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8-1. DATA OVERVIEW.

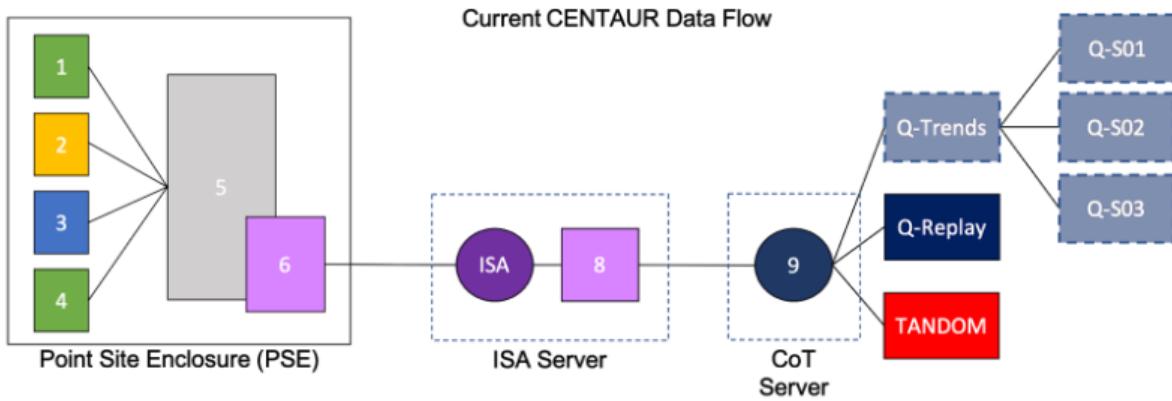


Figure 124. Data Flow Diagram

The Sensor Management System (SMS) <#5> handles communicating with the sensors in the Point Site Enclosure (PSE) to include IBACK <#1>, JCAD <#2>, AIO2 Weather <#3> and in some PSEs REBS <#4>. On the SMS is a service called Parrot <#6> that takes the data from the SMS and sends it to the ISA Controller <ISA>. The ISA controller handles connections to multiple PSEs and is the data distribution system for the system. During the initial integration the Q components and TANDOM (Network Analytic) utilized Cursor-on-Target (CoT) messages. To enable the system to communicate with ISA, Parrot is again used in a ISAtCoT Bridge mode <#8>. This service translates the ISA message to a CoT format and sends it to the CoT Server <#9>. Q-Replay, Q-Trends, and TANDOM all subscribe to the CoT feed for processing and visualizing the data.

8-2. DATA FLOW MONITORING.

Q-Trends provides a capability to monitor the reporting status of most of the components of the systems. On the Live Data dashboard within Q-Trends the top two charts can be used to monitor the status of data flowing through the system. The graphic below shows the CoT Traffic by Station, and is sometimes referred to as the rainbow chart. From this example we see that there 16 stations reporting, but based on the width of the colored lines we can see that 3 systems are not reporting the same amount of data as the other.

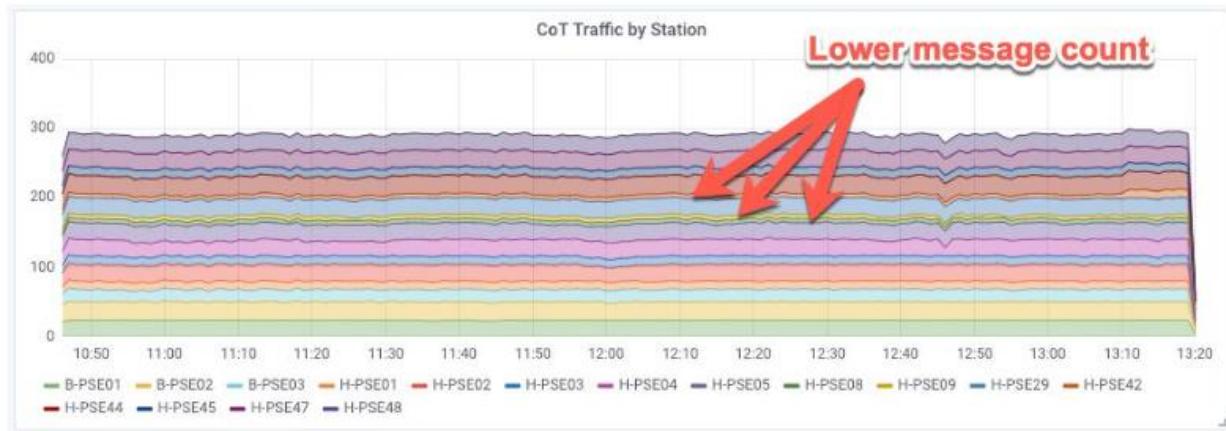


Figure 125. CoT Traffic by Station

By clicking on the legend values to filter the graph we can see that H-PSE08, H-PSE09 and H-PSE42 have fewer messages per time bucket than others. You can use the Dashboard Filter to select those sensors and determine which sensors on those stations is reporting.

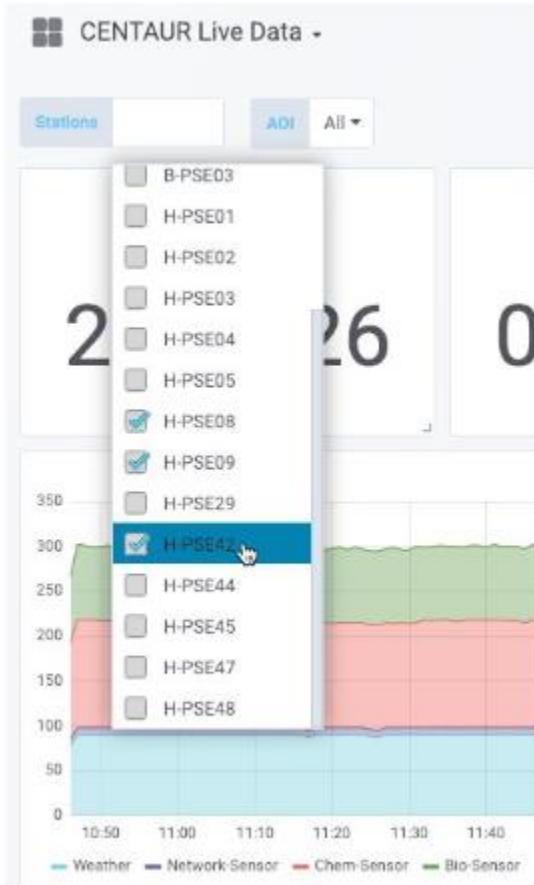


Figure 126. Dashboard Filter

On the CoT Traffic by Type graph you can see that of the three stations only the weather sensor is producing messages until the end of the timeframe when a Bio-Sensor starts reporting.

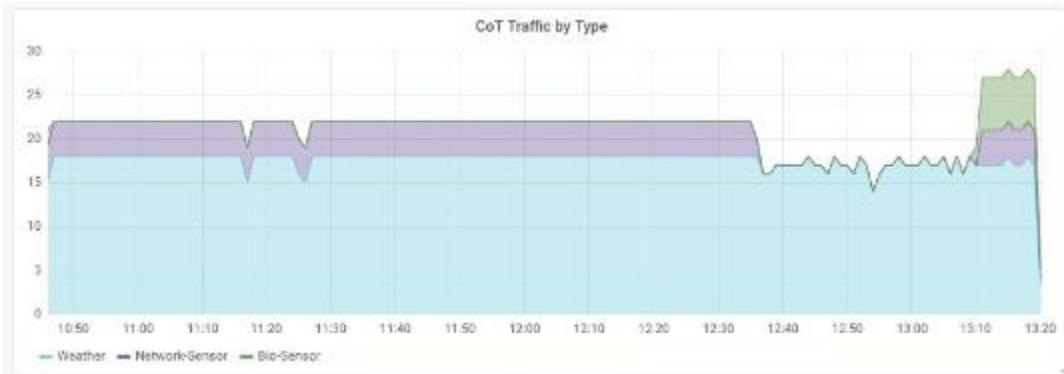


Figure 127. CoT Traffic by Type

Comparing the above graphic to the CoT Traffic by Station you can see the increase in message traffic on H-PSE42 indicating that the bio-sensor traffic is originating from that station.

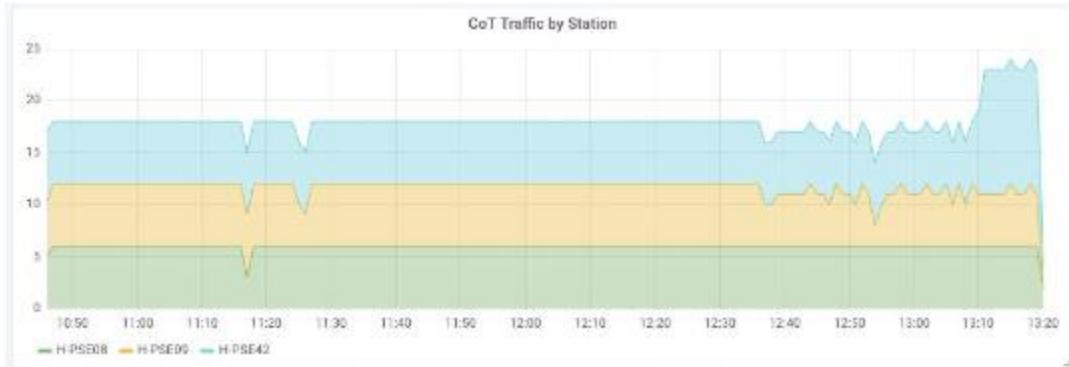


Figure 128. CoT Traffic by Station

8-3. DATA FLOW TROUBLESHOOTING. This section will describe the troubleshooting steps to complete for specific scenarios.

a. Complete loss of data: If the rainbow chart looked like the chart below there are several steps you can take to resolve the situation. Follow the Questions below to resolve the issue.

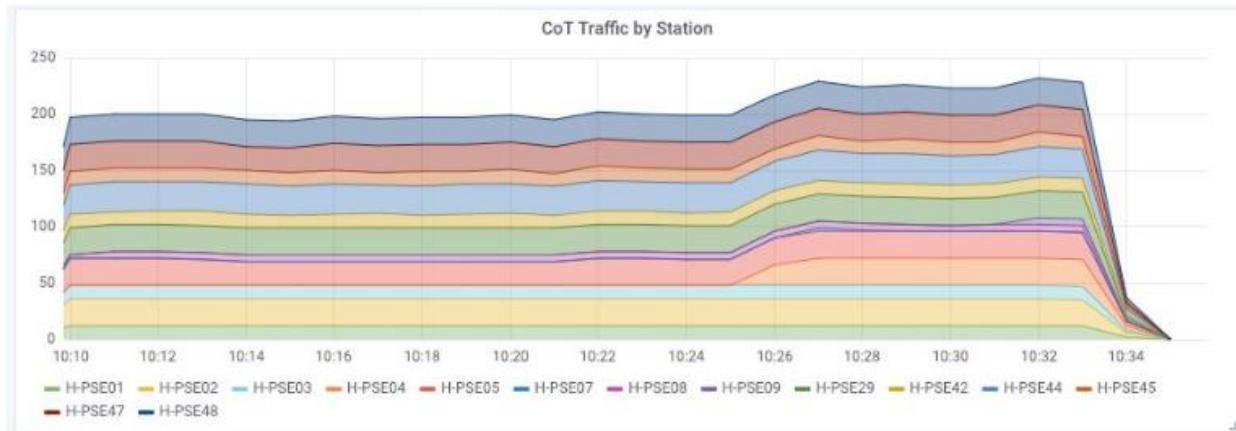


Figure 129. Complete Loss of Data

1. Do you still have access to any of the Stations via the CPC or Ping tests?
 - a. If Yes, continue to next question
 - b. If No, you might have a network/radio related issue.
2. Are you still receiving data in Q-Replay?
 - a. If Yes, then the ingestion on Q-Trends has stopped, restart the Q-Trends Virtual Machine in XenCenter.
 - b. If No, see next question
3. Try restarting the Cot_Srv VM in XenCenter, did this resolve the problem?

- a. If Yes, log event as an issue with the CoT Server in the daily log
 - b. If No, see next question
4. Try restarting the ISA_Svr VM in XenCenter, wait 60 secs and then restart the Parrot_Svr VM, did this resolve the problem?

NOTE: You may need to restart the Parrot Service on the remaining SMS to restore full sensor reporting after an ISA_Svr restart.

- a. If Yes, log the event as an issue with the ISA Svr in the daily log
- b. If No, you may need to contact FSE or remote support

b. Loss of some or several sensors: If the rainbow chart looked like the chart below, where you had good data then a sharp decrease in number of stations reporting and then several up and down sensors it is most likely that the ISA Controller is running out of memory and will eventually stop, as seen below. This has been seen when the network connectivity is having issues and the ISA controller is timing out on connections to the Parrot-SMS service on one or many SMSs.

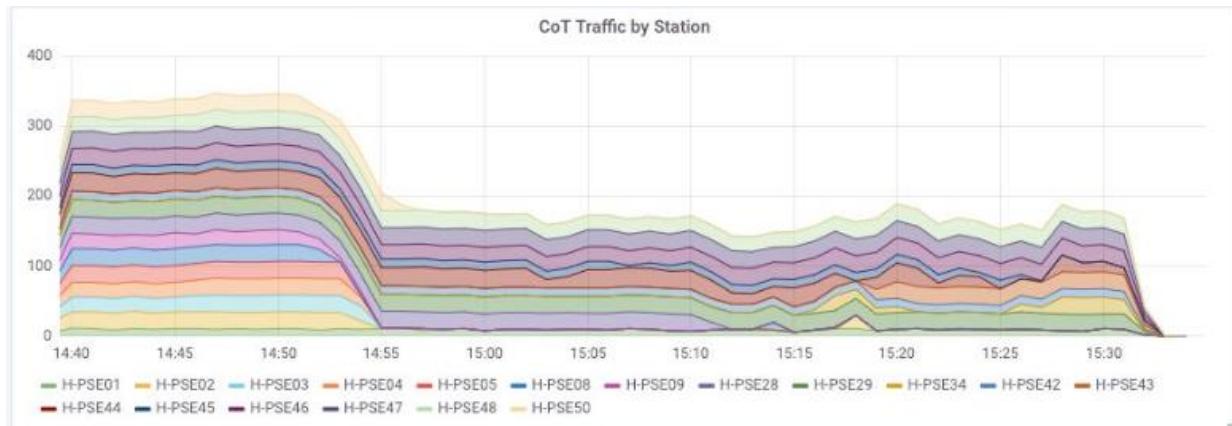


Figure 130. Loss of Some or Several Sensors

1. Try restarting the ISA_Svr VM in XenCenter, wait 60 secs and then restart the Parrot_Svr VM, did this resolve the problem?

NOTE: You may need to restart the Parrot Service on the remaining SMS to restore full sensor reporting after an ISA_Svr restart.

- a. If Yes, log the event as a ISA out of memory error in the daily log file, if possible capture the network link state colors for the CAISI radios.
 - b. If No, see the next question
2. Try remoting into the affected station SMS and restarting the Parrot Service, did this resolve the problem?
- a. If Yes, log the event as a Parrot-SMS issue in the daily log file.
 - b. If No, you may need to contact FSE or remote support.

c. Loss of a single station: This can happen when the Parrot Service on the SMS is no longer reporting to the ISA Controller or the network can longer reach the station.

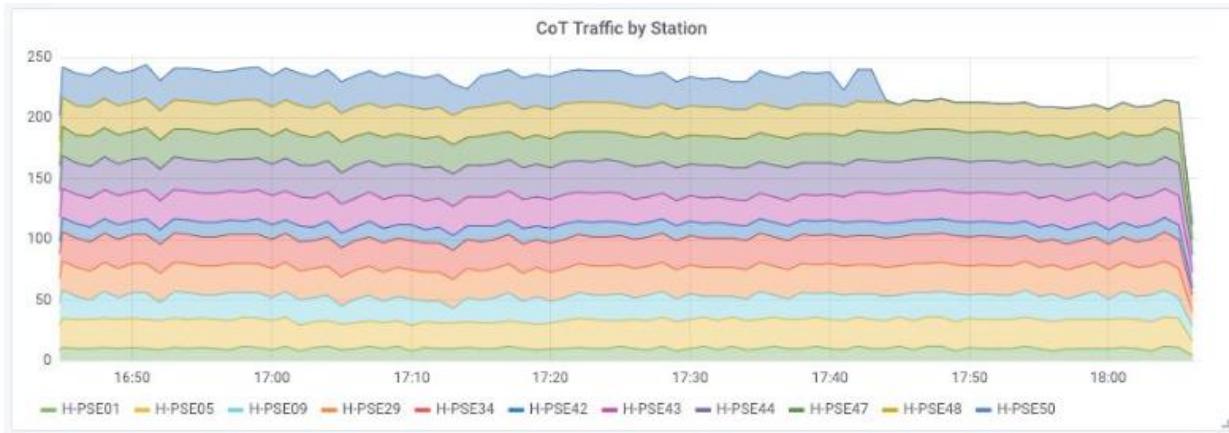


Figure 131. Loss of a Single Station

1. Try remoting into the affected station SMS and restarting the Parrot Service, did this resolve the problem?
 - a. If Yes, log the event as a Parrot-SMS issue in the daily log file.
 - b. If No, you may need to contact FSE or remote support.

CHAPTER 9. Q REPLAY USER MANUAL

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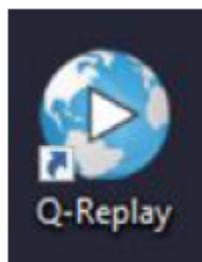
9-1. THE Q ARCHITECTURE. The Q is typically deployed while connected to a network of sensors, those sensors can vary between Chemical, Biological or Radiation Point Sensors, Ground Surveillance Radar (GSR) or Standoff detection systems such as LiDAR. Additionally other “Big Data” sources can be visualized in Q-Replay as determined by the mission. Each sensor sends a message to a central message source using either the Integrated Sensor Architecture (ISA) or a Cursor-on-Target (CoT) Server. The Q connects to either of those networks and visualizes and stores the message it receives.

The Q contains two primary visualization tools, Q-Replay and Q-Trends. Q-Replay is a geo-temporal touch enabled common operating picture used to view live and historical data. Q-Trends provides trending information from all available data and is used to store all the data for both Q-Trends and Q-Replay playback.

9-2. Q-REPLAY OVERVIEW. Q-Replay is real-time data visualization tool that enables users to view multiple streams of data in real-time to provide situational awareness on a single pane of glass. Q-Replay is optimized for touchscreen operations and built with an intuitive interface that is familiar ensuring training time is minimized and user adoption is maximized. All data is time-synchronized to a common timeline that uses DVR like controls to enable viewing the geospatial and the temporal aspects of the data.

- a. Q-Replay User Guide: This user guide is designed for Q-Replay users to quickly familiarize themselves with the system’s tools, applications, and overall capabilities. This guide touches on some features of the external data available, but does not go into specifics on IT/Network backend support.
- b. Q-Trends User Guide: The Q-Trends user guide is the companion to the Q-Replay User Guide and should be referenced for understanding the additional trending capabilities available to the user.

9-3. NAVIGATING Q-REPLAY. Q-Replay is a windows software application and can be accessed by double clicking on the Blue Globe icon on the desktop.



*Figure 132. Q-Replay
Desktop Icon*

Once Q-Replay has opened, users will see an image similar to the one below. From this screen, users can begin using any number of available tools to customize and run the platform. The screen and tools are organized into the following sections to simplify operations while maximizing map viewing area:

- Map Control Tools
- Timeline Control Tools
- Data Creation Tools
- Data Management Tools
- Geo-Temporal Shortcuts

Refer to the General Q-Replay Tools section to learn more about each of the various tools and their applications.

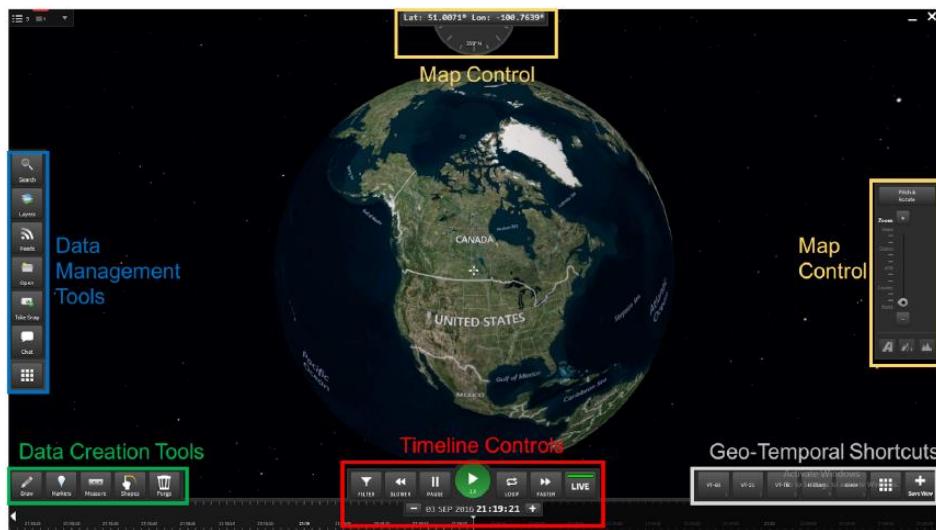


Figure 133. Q-Replay Main Screen

Entity Details: Q-Replay displays data as entities on the map, each entity can have different visual characteristics or detail properties. Each entity shown can display additional information about that entity. The image below shows the different areas of the entity detail window.

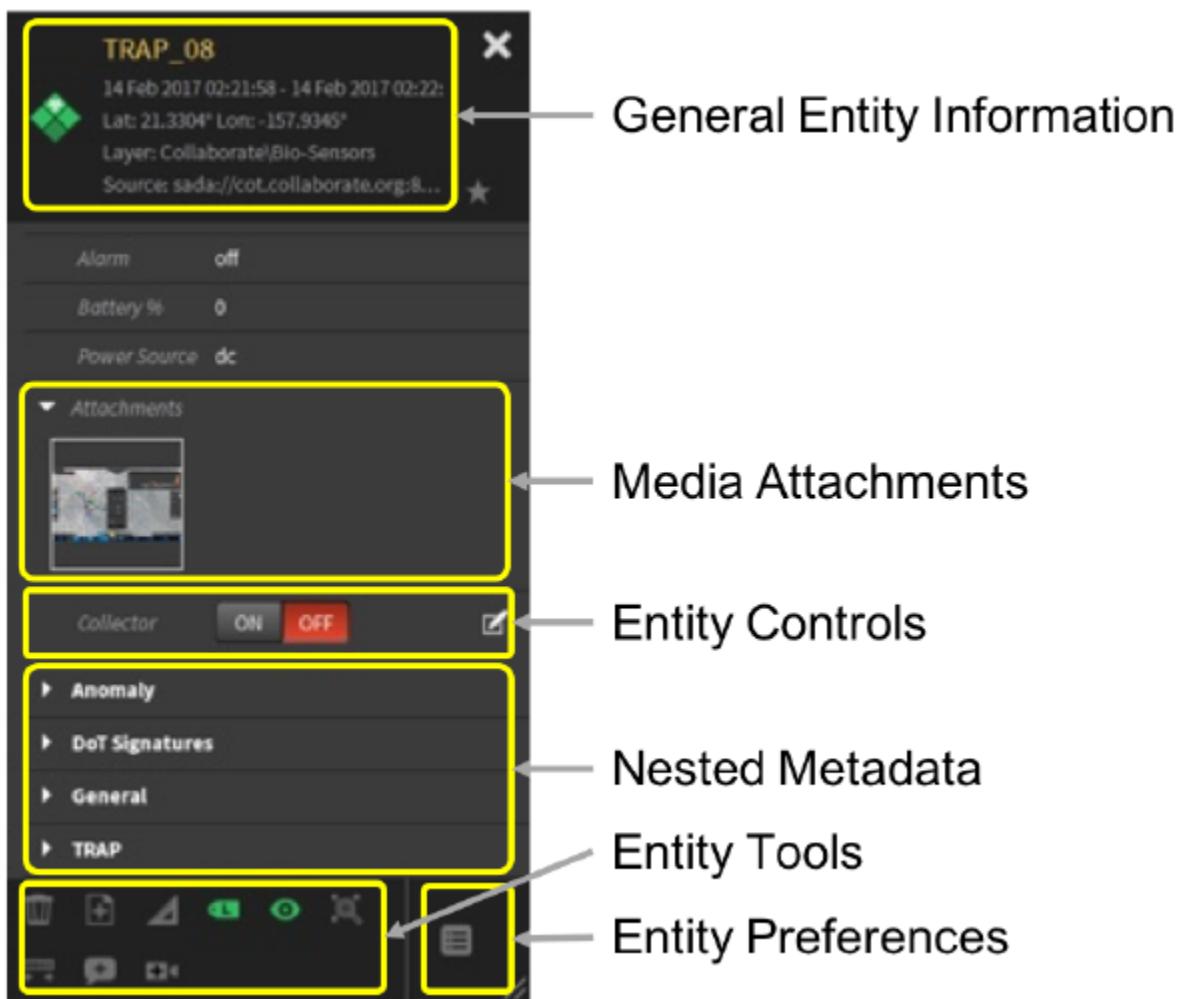


Figure 134. Entity Detail Window Sections

Entity Details sections:

- General Information- Contains the Name, Temporal Information, Location, Layer Name and Source of Entity
- Media Attachments- If available will show a thumbnail of the attached media, selecting the thumbnail will bring up a larger view
- Entity Controls – If available will allow the user to send a message to that entity for an action (e.g. On/Off Sample Collection Switch)
- Nested Metadata – Organized metadata from the entity, can be expanded or collapsed to view additional information
- Entity Tools – Available tools for that entity, refer to Appendix for a list of tools
- Entity Preferences – Change how the entity is displayed within Q-Replay

9-4. Q-REPLAY SENSOR ICONOLOGY. Q-Replay uses an advanced Iconology to display environmental monitoring sensors that enables the user to get a quick understanding of the sensor status at a glance. This is accomplished by utilizing familiar icons for sensor types into a diamond pattern and use remaining quadrants to show operational information.

a. Sensor Icons: Each sensor within Q-Replay has its own icon.

(1). Sensor Quadrant Indications: The sensor icon is used to indicate the type of sensor, any secondary payloads, actions or warnings.

- Top quadrant – Indicates the type of sensor (Biological, Chemical Radiation)
- Left quadrant – Indicates a secondary warning process such as anomaly detection (if available)
- Right quadrant – Indicates if there are any errors reported by the sensor
- Bottom quadrant – Indicates an action reported from one of the sensors

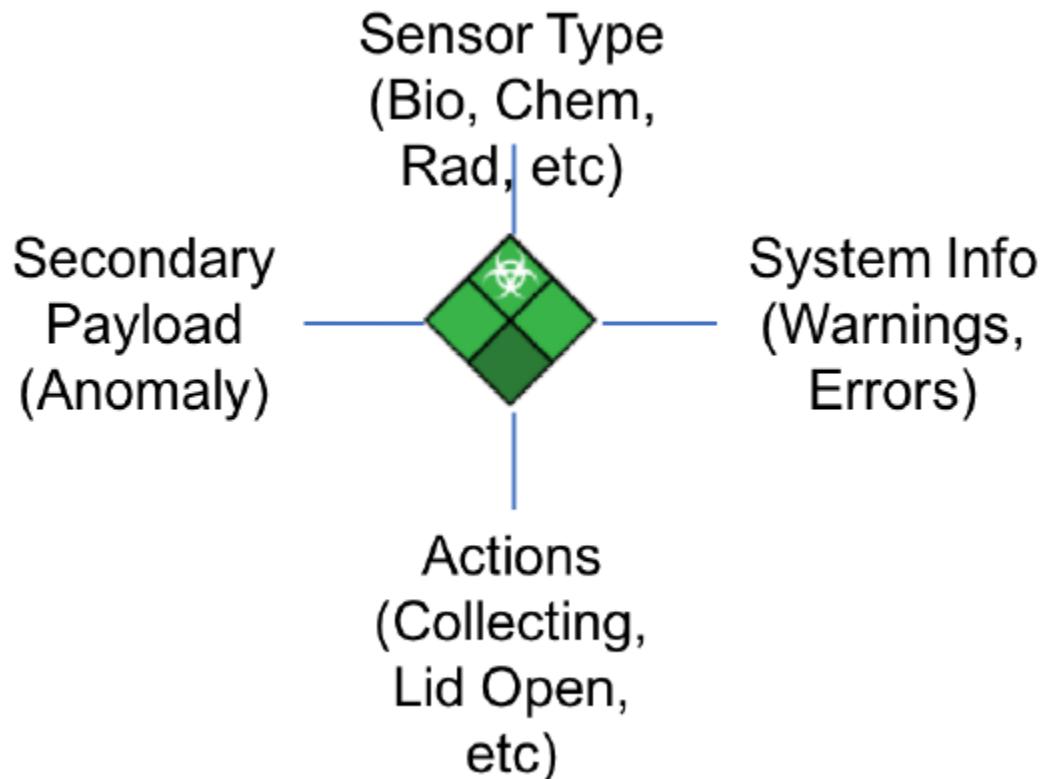


Figure 135. Sensor Icon Quadrant Indications

(2). Color Indications: Each sensor has different capabilities, some have the ability to detect anomalous events others can provide a warning state. Others may just be operating or alert and some may purely be a value (e.g. Meteorological Sensors, Noise Sensors, etc). The possible colors in hierarchical order are:

- Black – Sensor is reporting an error that values cannot be trusted
- Red – Sensor is reporting a Alarm/Alert state
- Yellow – Sensor is reporting a Warning state (if Applicable)
- Orange – Sensor is reporting an Anomaly (if Applicable)
- Green – Sensor is reporting no detections and is operational

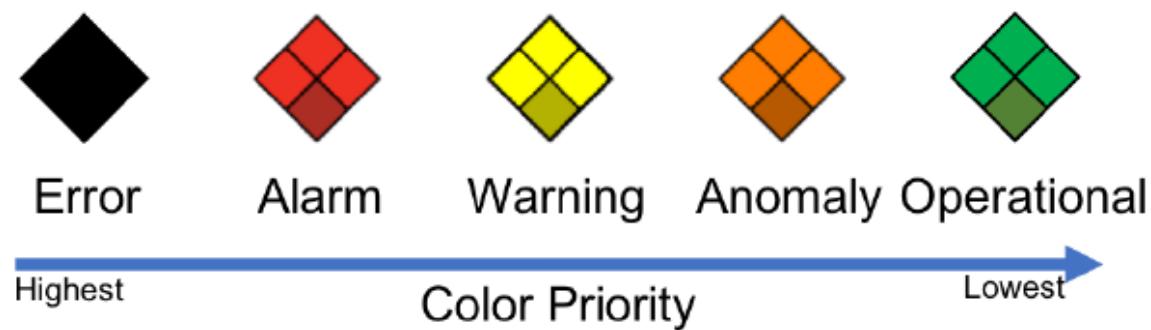


Figure 136. Sensor Icon Color Indications

(3). Action Indications: In the lower quadrant of the Station is the Action icon, this indicates something is occurring on the station. Possible actions are:

- Collection – Presented with a Blue “Recycle” icon indicates one of the sensors in the act of collecting a sample
 - Lid Open – Presented with a Yellow Diagonal line indicates the collector lid is open or no filter is present
 - Collection Paused – Presented with a Yellow “Recycle” icon with a diagonal line indicates that the sensor is trying to collect but the lid is open or no filter is present
- b. Station Rollup Icons: Often times multiple sensor types are co-located to use common power and communication equipment, this would cause icons from individual sensors to overlap covering a critical status and alarm information. To prevent this, Q-Replay has the concept of a Sensor Station that rolls up the overall status of multiple sensors to a common icon.

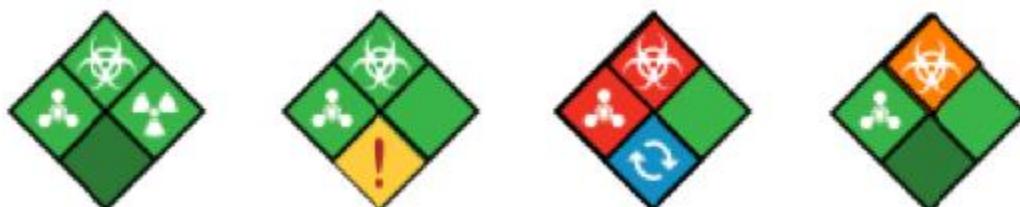


Figure 137. Station Rollup Icons

(1). Station Quadrant Indications: The station icon is used to indicate the three major types of sensors present on the station and any action/issue that is occurring.

- Left quadrant – Indicates there are at least one Chemical Sensor reporting
- Top quadrant – Indicates there are at least one Biological Sensor reporting
- Right quadrant – Indicates there are at least one Radiation/Nuclear Sensor reporting
- Bottom quadrant – Indicates an action or issue reported from one of the sensors

(2). Color Indications: Each sensor has different capabilities, some have the ability to detect anomalous events others can provide a warning state. Others may just be operating or alert and some may purely be a value (e.g. Meteorological Sensors, Noise Sensors, etc). The possible colors are:

- Black – Sensor is reporting an error that values cannot be trusted
- Red – Sensor is reporting a Alarm/Alert state
- Yellow – Sensor is reporting a Warning state (if Applicable)
- Orange – Sensor is reporting an Anomaly (if Applicable)
- Green – Sensor is reporting no detections and is operational

(3). Action Indications: In the lower quadrant of the Station is the Action icon, this indicates something is occurring on the station. Possible actions are:

- Collection – Presented with a Blue “Recycle” icon indicates one of the sensors in the act of collecting a sample
- Lid Open – Presented with a Yellow Diagonal line indicates the collector lid is open or no filter is present
- Collection Paused – Presented with a Yellow “Recycle” icon with a diagonal line indicates that the sensor is trying to collect but the lid is open or no filter is present
- Issue – Presented with a Yellow/Red exclamation mark indicates the sensor is reporting an issue

(4). Station Details: A station icon can be opened to view the individual sensor information including all the associated metadata.

9-5. SENSOR OVERVIEW.

a. Point Sensors

(1). JCAD Sensor (Chemical Sensor): The JCAD Sensor is a Chemical point sensor that detects and classifies chemical vapors around the sensor. JCADs report the detection of chemicals using a 0 to 5 bar level, and only when an agent gets above a three will the sensor go into alarm. The sensor can report on six simultaneous agents and can be viewed within the “Agent” fields on the entity details.

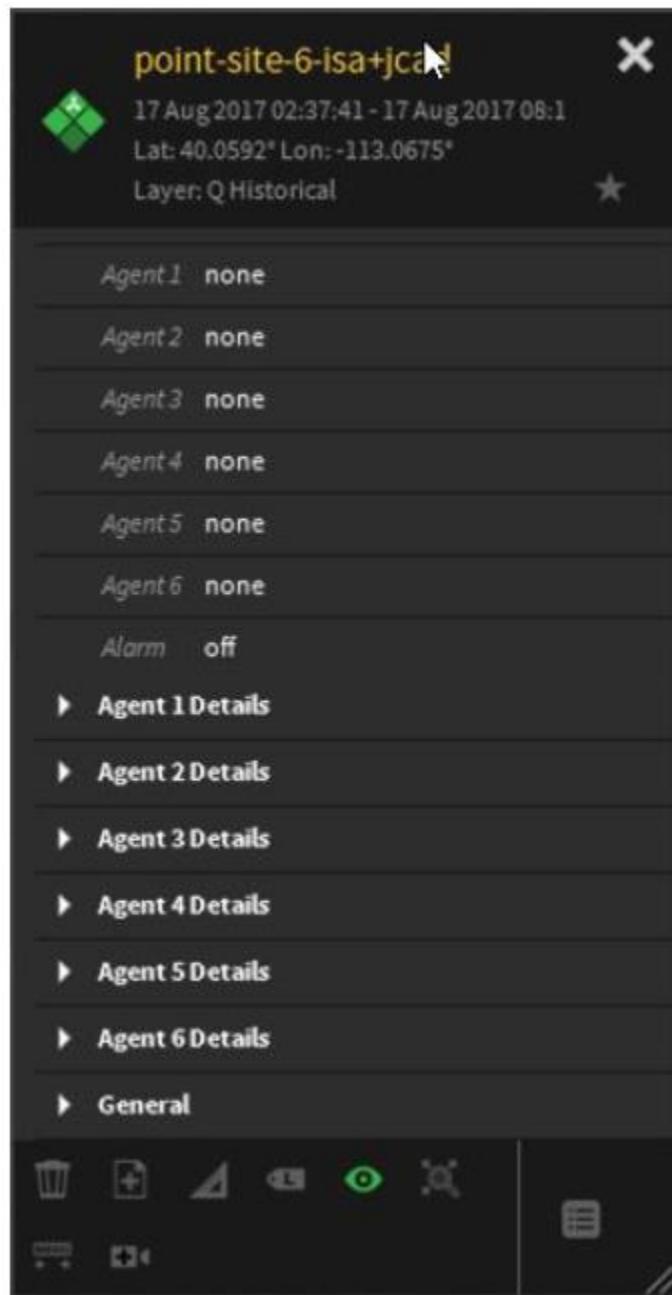


Figure 138. JCAD Chemical Agent Information

(2). IBAC Sensor (Biological Sensor): The IBAC Sensor is a Biological Aerosol point sensor that detects biological agents in the air. The IBAC sensor will alarm when the internal algorithm determines a hazardous material is present however the sensor also reports counts for size and type of particles. These particle counts can be trended in Q-Trends.

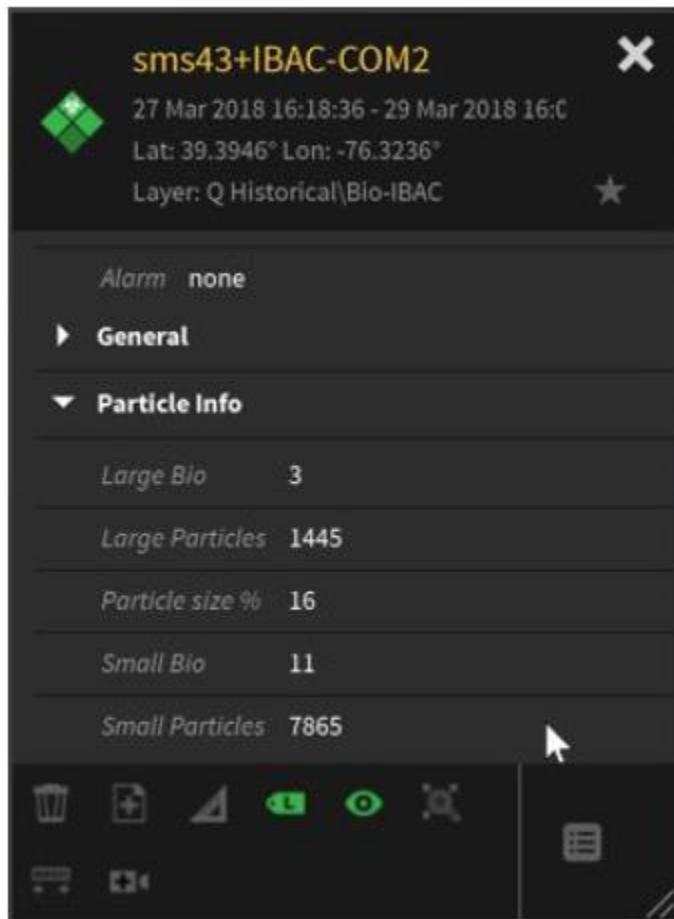


Figure 139. IBAC Biological Agent Information

(3). REBS Sensor (Biological Sensor): The REBS Sensor is a Biological confirmation system that continually monitors the air and analyzes for Biological materials. If an agent is detected the unit will alarm and the type of hazardous material is reported under the Current Analysis field.

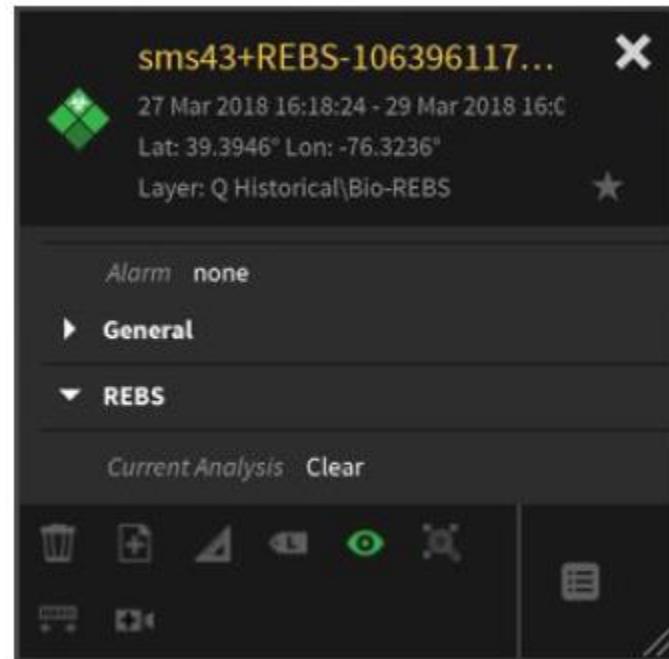


Figure 140. REBS Biological Agent Information

(4). TACBIO Sensor (Biological Sensor): The TACBIO Sensor is a Biological Aerosol point sensor that detects biological agents in the air. The TACBIO sensor will alarm when the internal algorithm determines a hazardous material is present however the sensor also reports counts for various particles and sizes. These counts can be trended in Q-Trends.

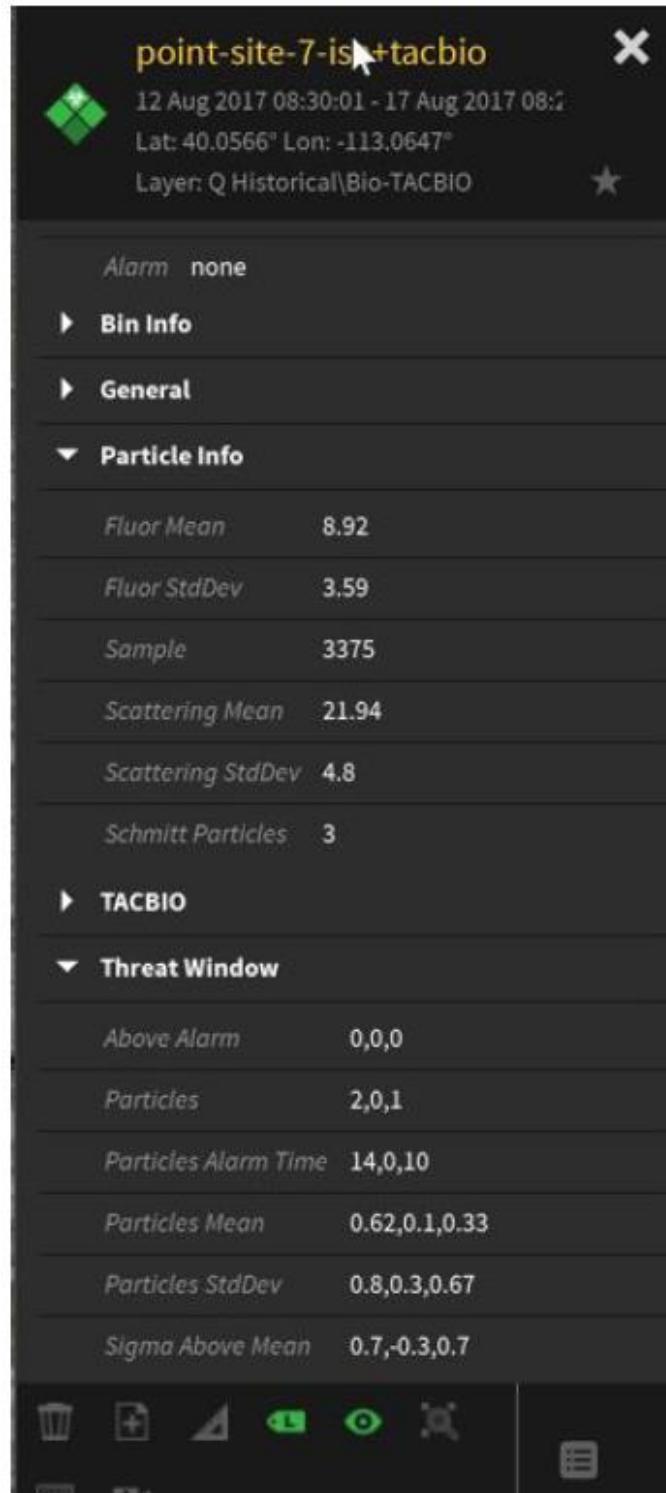


Figure 141. TACBIO Biological Agent Information

(5). TRAP (Biological Sensor): The TRAP sensor is used to detect biological aerosols based on material signatures and aerosol anomalies. Each TRAP sensor contains signature based Degree of Threat (DoT) detection and an anomaly detection analytic. Within Q-Replay the primary and secondary analytics are visualized using the diamond iconology.

The images below show views of DoT signature status as well as Anomaly and Anomaly Model status. Anomaly is reported in two types. An anomaly type I is when the sensor first detects an anomaly. An anomaly type II is when the sensor has seen the model previously and is seeing that same model again. Each type II anomaly is reported as a unique model name to the sensor, meaning that two different sensors could detect the same anomaly model but list them as separate model names.

The figure consists of two side-by-side screenshots of the Q-Replay software interface, both titled "TRAP_03".

Left Screenshot (Sensor Overview):

- Header:** TRAP_03, timestamp: 22 Oct 2016 20:33:34 - 22 Oct 2016 21:02, location: Lat: 30.2256° Lon: -97.9073°, layer: Collaborate.org\Bio-Sensors, source: sada://cot.collaborate.org:8... (with a star icon).
- General Settings:** Alarm off, Battery % 0, Power Source dc.
- Collector Control:** A button labeled "Collector" with "ON" and "OFF" options, currently set to "ON".
- Section Headers:** ▶ Anomaly, ▼ DoT Signatures, ▶ General, ▶ TRAP.
- Toolbars:** Bottom left toolbar with icons for trash, add, search, etc. Bottom right toolbar with icons for list, message, etc.

Right Screenshot (Detailed Sensor Status):

- Header:** TRAP_03, timestamp: 22 Oct 2016 20:33:34 - 22 Oct 2016 21:02, location: Lat: 30.2256° Lon: -97.9073°, layer: Collaborate.org\Bio-Sensors, source: sada://cot.collaborate.org:8... (with a star icon).
- General Settings:** Alarm off, Battery % 0, Power Source dc.
- Collector Control:** A button labeled "Collector" with "ON" and "OFF" options, currently set to "ON".
- Anomaly Status:** ▼ Anomaly, Anomaly Type I off, Anomaly Type II off, Model background Normal.
- Section Headers:** ▶ DoT Signatures, ▶ General, ▶ TRAP.
- Toolbars:** Bottom left toolbar with icons for trash, add, search, etc. Bottom right toolbar with icons for list, message, etc.

Figure 142. TRAP Biological Agent Information

The TRAP entity details also provides a limited control of the sensor by allowing the Replay user to turn on/off sample collection remotely. This can be accomplished using the On/Off switch next to collector, Replay will then send a message to the sensor to manually turn on the collection capability which will run through the preconfigured time.

Replay will indicate the sensor is collecting when the next status message comes from that device by changing the icon according to the iconology as well as indicate in the switch. Collection can be stopped on a sensor by sliding the switch to the off position.

Note: Collector commands are only available with Replay is in Live mode and will be greyed out at other timeline positions.

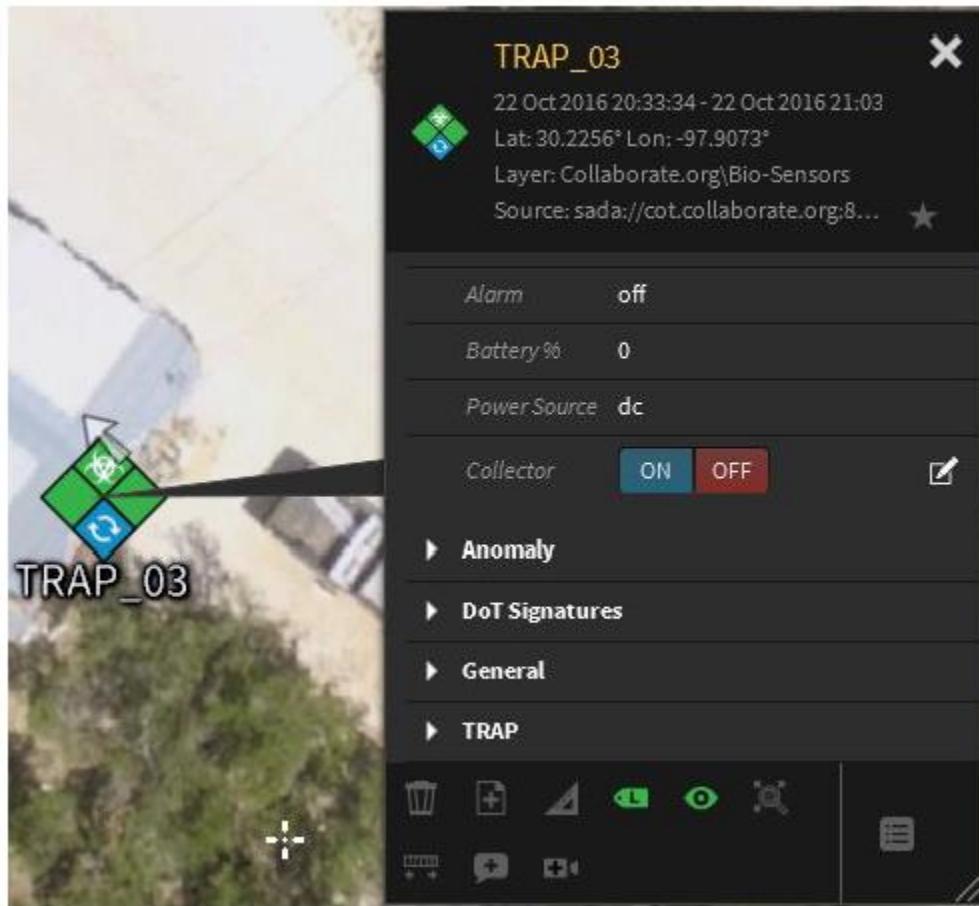


Figure 143. Control Sample Collection

b. Meteorological Sensor

The weather sensor is displayed slightly higher than a sensor or station icon as a wind direction arrow and is listed as a separate layer within the layers manager. The direction of the arrow indicates the air flow, similar to a wind field where wind is flowing from the back of the arrow to the front. The wind icon IS NOT similar to a wind barb that points to the direction the wind is coming from.

The arrow icon size and orientation will update according to the wind speed (mph) and direction and will be oriented in the correct direction regardless of the map orientation.

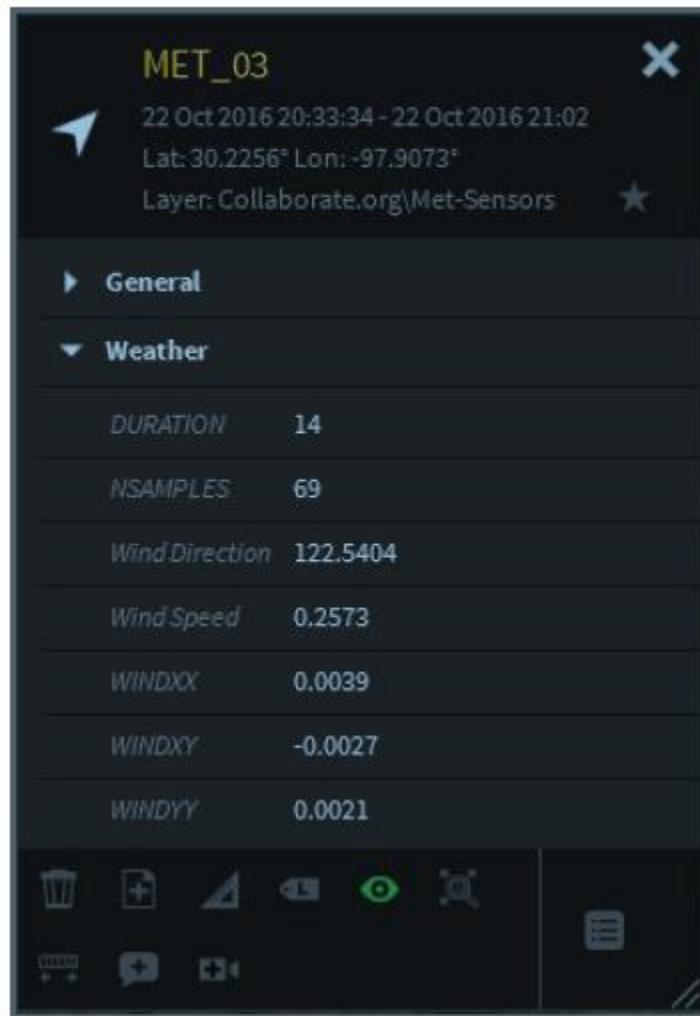


Figure 144. Meteorological Sensor Information

c. TRAN – Network Analytic

TRAN is a network analytic that takes values from all sensors and determines what the entire network is reporting and can often times improve detection times, reduce false positives on single sensors and will provide a plume estimation based on the data. Q-Replay visualizes TRAN in two ways, the overall status of the TRAN analytic (Polygon around Sensors) and a Plume ellipse when detected.

The TRAN status is visualized by three colors:

- Green Polygon: All systems below threshold
- Yellow Polygon: TRAN is in warning state where a detection is possible
- Red Polygon: TRAN is in Alert indicating a network detection has been made

TRAN reports a plume when in warning or alert state and will provide a separate plume for each signature loaded into the sensors. There may be times when multiple plumes are reported from TRAN some in warning state and some in alert state. The color of the plume matches the color of the state as indicated above.

The image below (taken from testing at Dugway Proving Grounds) shows that TRAN is in Alert, TRAP_090 is in Alert and TRAP_100 is detecting a type I anomaly. The Red ellipse in the center of the polygon is TRANs estimation for the plume. The blue polygon below is a summary of LiDAR data from Dugway used for accuracy measurement.



Figure 145. TRAN Status

Each plume has visualization properties that can be accessed via the Entity Details or Layers Manager. Included in the Plume properties is the ability to enable/disable plume origin estimation.

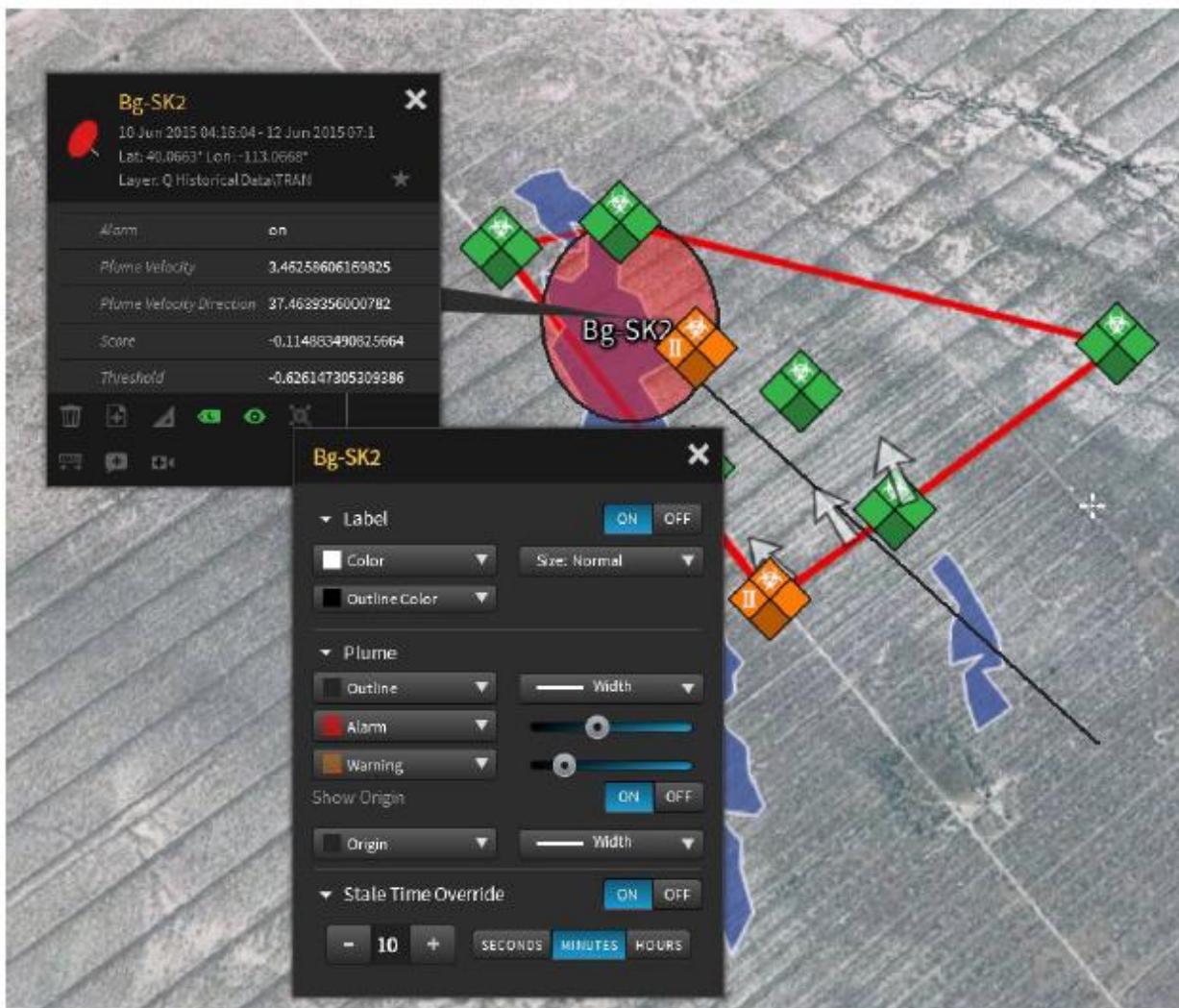


Figure 146. TRAN Visualization Properties

d. Station Roll-up Manager

Often times multiple different sensors are co-located to share power and communications, this can lead to Sensor Icons overlapping on the map making it difficult to monitor all sensors. Q-Replay can merge those sensors into a common Station Icon and rollup alarms and actions to the station icon. To create a station for multiple sensors open the Station App located in the Data Management Tools section of Q-Replay

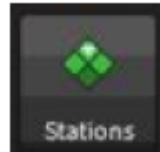


Figure 147. Station Application Icon

Once open, use the lasso tool to draw a circle around the set of icons you wish to display as a station.

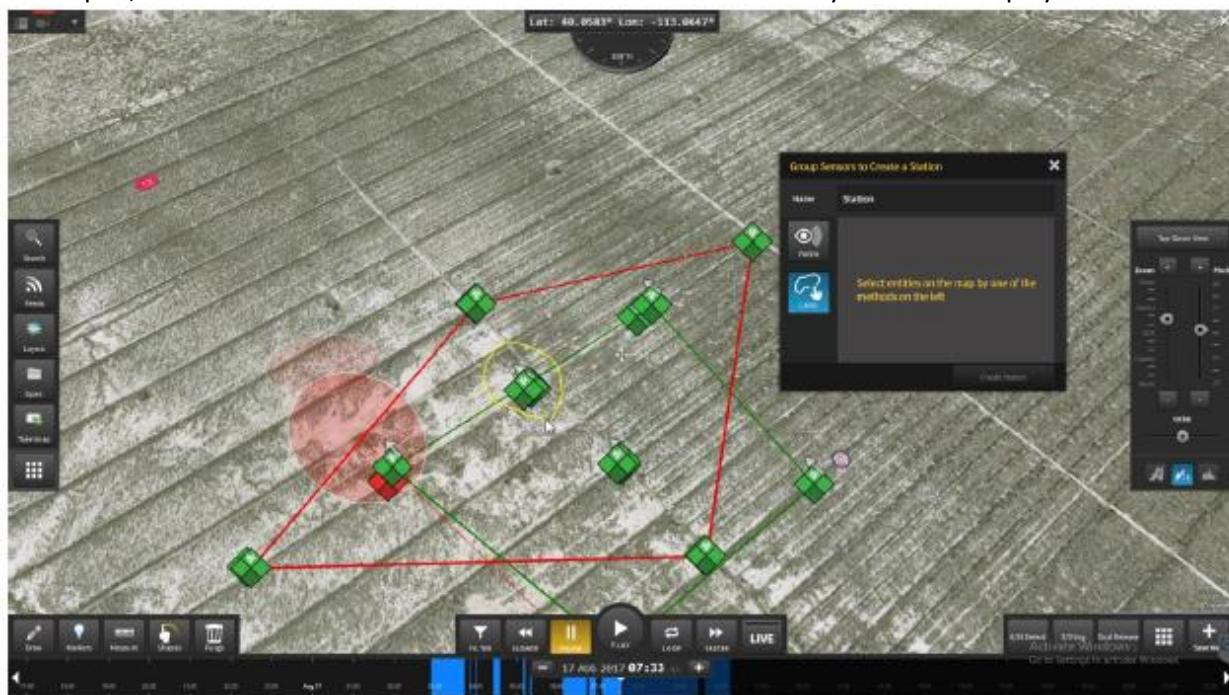


Figure 148. Using the Lasso Tool

The Station Manager will list the entities within that lasso area, review and select only the sensors you wish to roll up. If additional entities that are not sensor entities are listed they will not be included in the roll up, such as Met Sensors.



Figure 149. Select Stations to Roll Up

Add a unique name to the station and click on the Create Station button on the lower right corner of the window. Q-Replay will replace the current icons with the station icon when it receives a new message. If using historical data to create stations the station icon will appear if you repeat your search. After creating stations the view is simplified and users can maintain a better situational awareness without losing information. The first image below shows the same event before stations are created, where the second image shows with stations created.

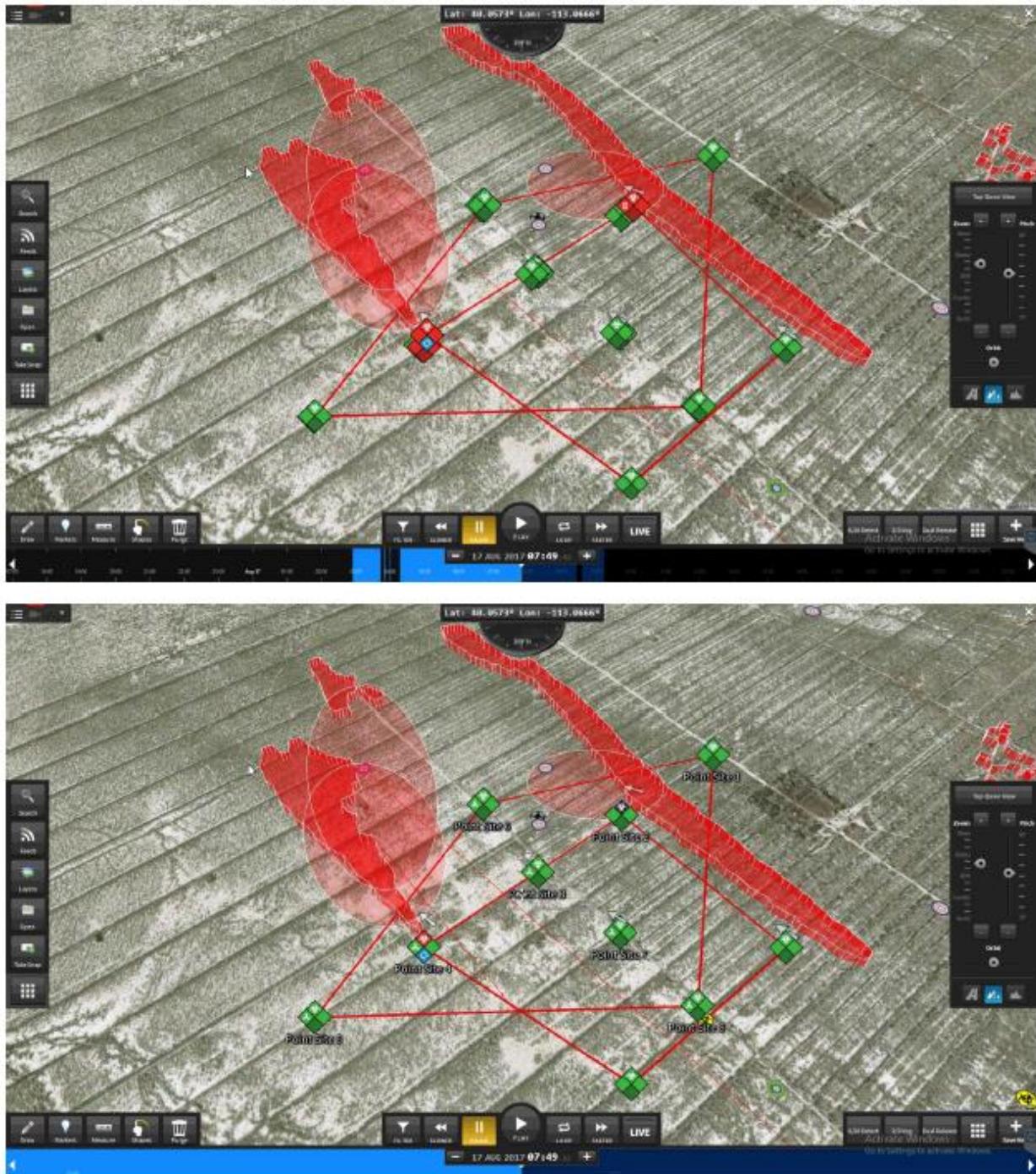


Figure 150. Creation of Stations

The metadata for each sensor is rolled up within the station entity details window to still allow access to the raw data and results.

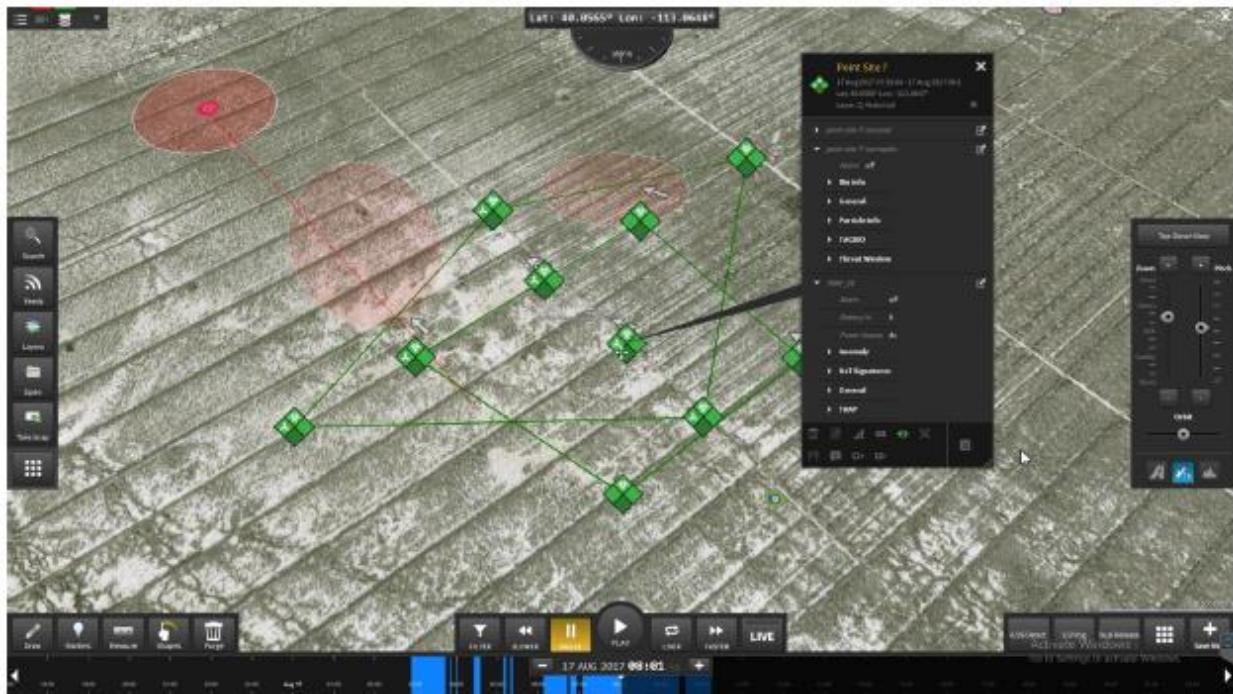


Figure 151. View Sensor Metadata

e. Video Feeds

Q-Replay has the ability to pull in Real-Time Streaming Protocol (RTSP) video feeds that can be attached to any entity. Once attached the video stream is cached/recoded locally while being viewed so if the timeline is scrubbed the video will play from that point in time.

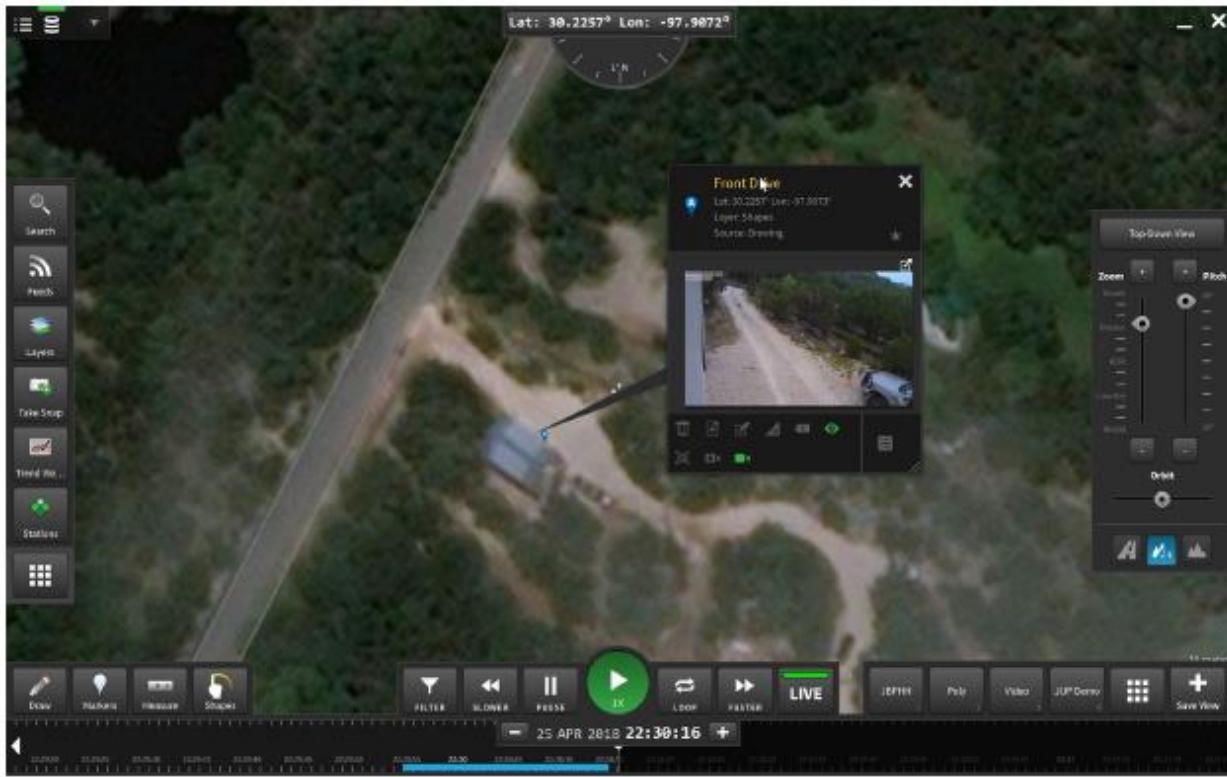


Figure 152. Video Stream with Timeline

Once the entity is being viewed a horizontal line (multiple available colors) is shown on the timeline to indicate how much video is available.

Attaching a Stream: A video can be attached to many different entity types within Q-Replay, to attach to an entity open the entity details window and click on the Add Video icon (Camera with a + sign). This will open up the entity's video info window. Copy the RTSP feed URL into the dialog box and click Ok.

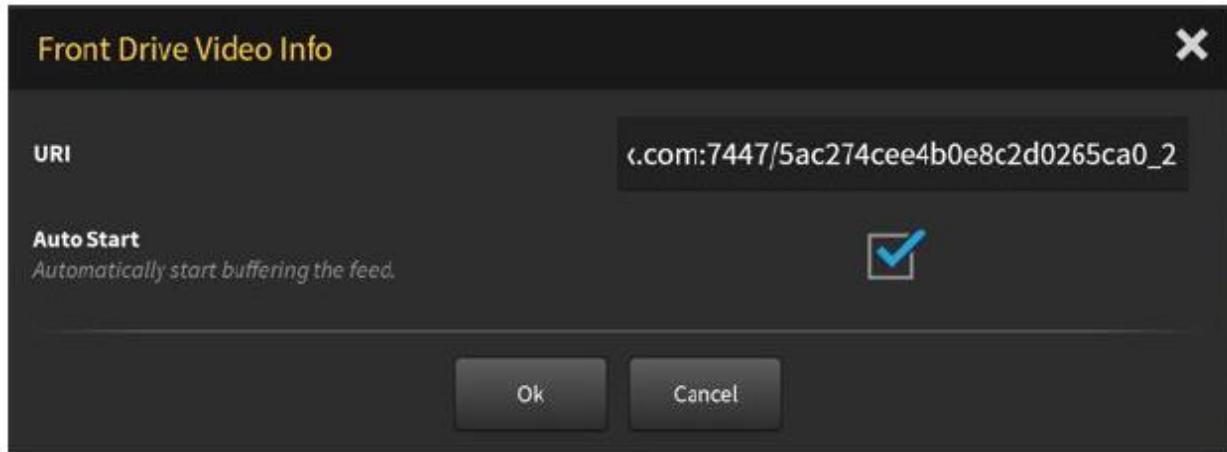


Figure 153. Attach a Stream to an Entity

Once Q-Replay connects to the feed the video will show within the entity details window. The entity details window can be resized to see a larger video or by clicking the Pop-out button the video will become its own window.

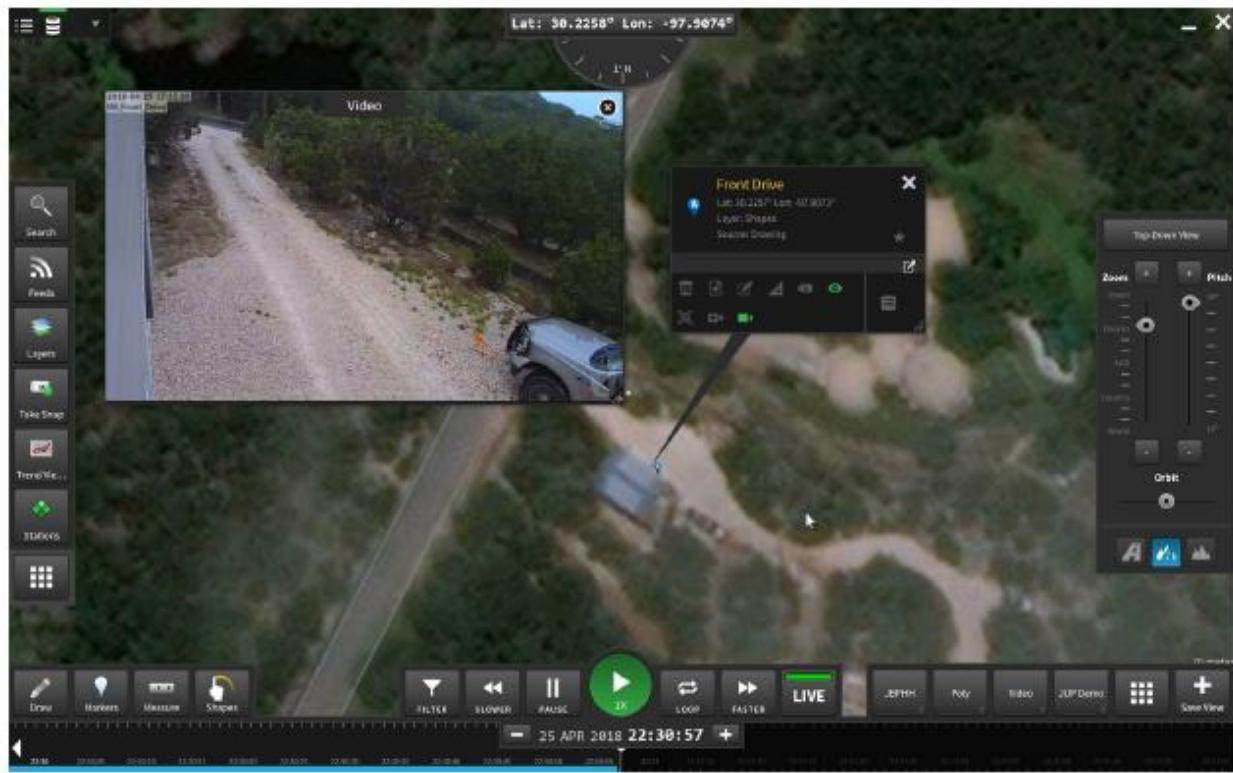


Figure 154. Resize Entity Details Window

Moving the timeline to a historical point that has a video cache will jump the playback of the video to that point. If multiple video feeds are available Q-Replay will separately cache those feeds and indicate in a different color on the timeline the cache locations for each feed.

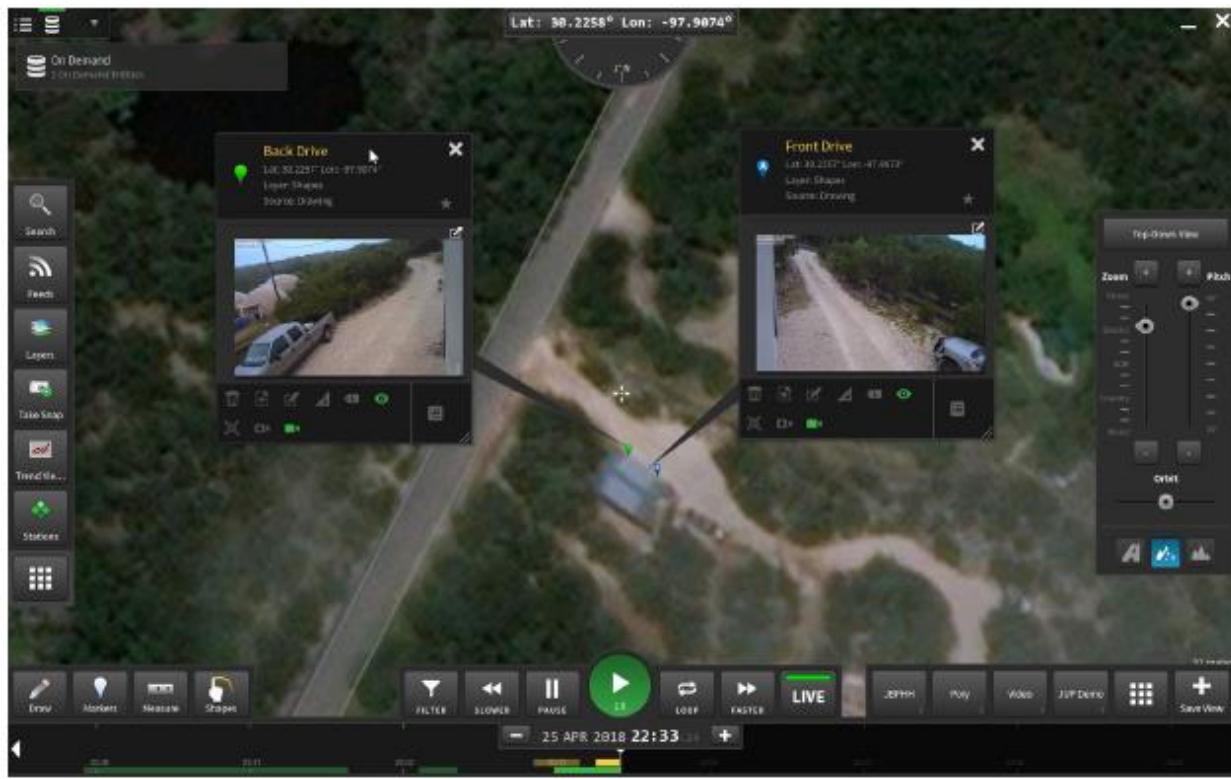


Figure 155. Cached Video Feeds

NOTE: Cached video feeds can grow quite large, if a performance degradation is noticed after viewing a feed for a long time you may need to move/delete the cache. Typically the folder containing the video cache is located at C:\Q-Video-Archive

f. Trend Viewer

Trend Viewer is a Q-Replay data management application that is used to summarize Sensor data based on the timeline zoom level. This is helpful to quickly summarize a period of time and if necessary change the timeline to go back to that point in time for review.

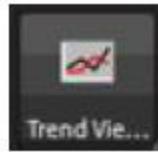


Figure 156. Trend
Viewer Icon

The image below shows a summary of all events during a week long test at Dugway Proving Grounds.



Figure 157. Summary of Events Screen

By clicking on a bar of interest the replay timeline and time position is zoomed into that location and can continue to be zoomed in to review the event.



Figure 158. Zoom into Location

The Trend Viewer also can filter out events by deselecting the checkboxes on the left of the viewer.

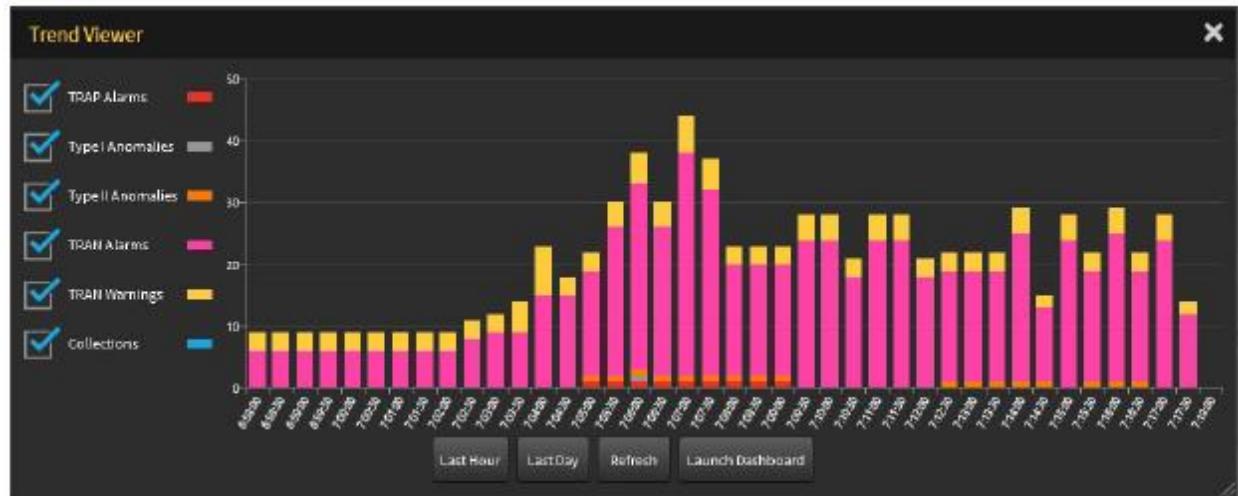


Figure 159. Filter Out Events

In the below example the user removed the TRAN Alarms and Warnings from the trend viewer clearly showing the TRAP Alarms and several Anomaly types within the data.

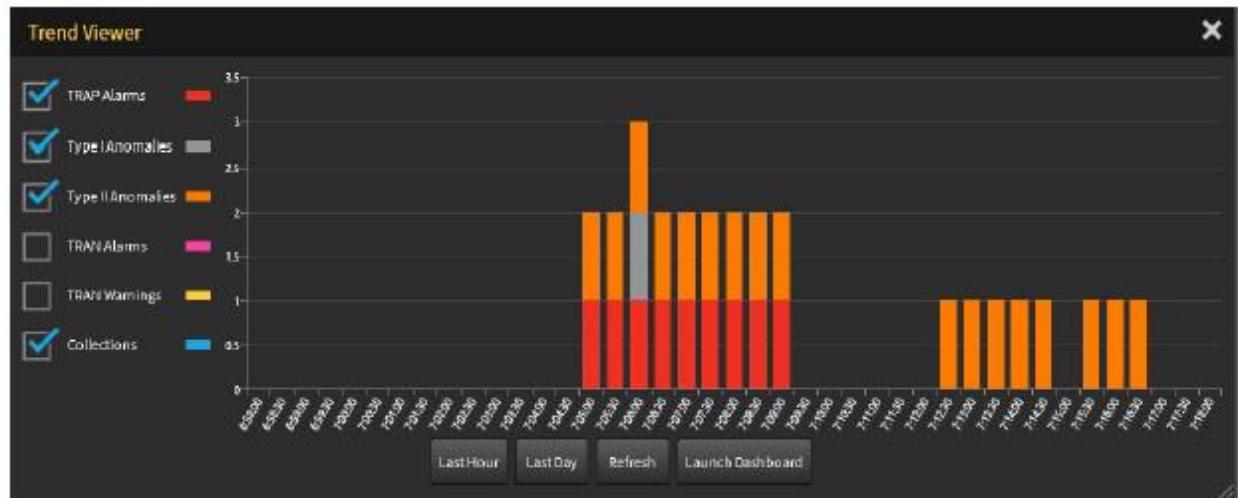


Figure 160. Filtered Out Events

If the Q-Replay timeline zoom level or position is changed the Trend Viewer will update the chart automatically. There are two timeline shortcuts to enable the user to quickly zoom the timeline to the last hour or last day. If additional information is needed for the given trend viewer graph the Launch Dashboard button will launch the Q-Trends Dashboard with the same time constraints as the Trend viewer is displaying.

9-6. GENERAL Q-REPLAY TOOLS. The Q-Replay tools are located on the home screen, which control Q-Replay navigation, data creation, data management and timeline operations. By grouping the tools in logical areas of the map and with similar functions the learning curve for new users is minimized.

- a. Map Controls: The navigation of the Q-Replay map has been designed for touchscreen manipulation using common gestures for pan, zoom in/out, tilt and rotate. The Map Control tools which are located on the right side and top center of the screen can assist the user in navigation beyond touch gestures. Q-Replay navigation can also be accomplished through mouse/scroll wheel and keyboard shortcut usage.



Figure 161. Map Control Tools

(1). Zoom Control

On-screen control: The Zoom slider bar allows users to zoom in and out using the slide bar or the “+” and “-“ buttons at the top and bottom of the “Zoom” section. The slide bar is labeled with regions for approximate map zoom altitudes; from Street (closest zoom) to World (furthest zoom).

Touchscreen Gesture: When utilizing a touchscreen the user can control zoom levels using a common two finger pinch gesture.

Mouse Control: Traditional zoom in/out functions using the mouse scroll wheel or by right-click and moving cursor up and down. Please note that when using the mouse scroll wheel, the map will zoom to the fixed crosshair point on the map; right-click zooming will focus on the mouse cursor location on map.

(2). Pitch and Top-Down View

On-screen Control: The “Pitch” function allows user to change map angle view from 90 degrees (looking straight down) to 10 degrees (low-angle horizon). Pitch is controlled using the slide bar. The “Top-Down View” button (located on the top of the toolbar) will automatically set and lock the map to a 90 degree viewing angle, but still allow user to zoom in and out.

Touchscreen Gesture: When utilizing a touchscreen, a two finger swipe up or down, controls the pitch of the map.

Mouse Control: Clicking the Scroll-wheel and moving the mouse up or down will control the pitch of the map.

(3). Orbit

The orbit feature will rotate the map around the center of the screen (crosshairs) it can be set in either clockwise or counter-clockwise directions and several speeds. The user can increase the speed of rotation using the slide bar in the desired location. Users can stop the rotation by sliding button back to the center. This is useful in monitoring a large area during an incident.

(4). Map layer Shortcuts

The Map Layer Shortcuts allow the user to swap between Imagery, Hybrid, and Road basemaps. These are based on Bing Maps and allow the user to quickly change the underlying imagery to best visualize the situation. The map layer shortcuts are located below the orbit slider bar on the right hand side of the screen, if you do not see the Map Layer Shortcuts please refer to the Section: Adding Default Map Shortcuts.

(5). Compass

On-screen Control: The Compass (located at top of Q-Replay map) can be selected to rotate map as well. Users can set specific bearing on the compass by clicking and dragging it left or right.

Touchscreen Gesture: When utilizing a touchscreen, a two finger rotate gesture will rotate the map.

Mouse Control: Clicking the Scroll-wheel and moving the mouse left or right will control the rotation of the map.

b. Timeline Controls

The Timeline Controls allows a user to manipulate current and archived data feeds to Q-Replay. Users can play, pause, loop and filter data to conceptualize, visualize and analyze multiple and simultaneous events from local to global scales. Similar to a DVR the Play, Pause, Slower and Faster buttons control the playback speed of the events on Q-Replay. To return to current time click the “Live” button and Q-Replay will automatically return to current time and 1x playback speed.



Figure 162. Timeline Controls

The filter button enables Q-Replay users to limit the data that is shown on the screen based on entity age. For example, if the screen is cluttered due to too many historical tracks the filter button will limit those tracks to a user defined timeframe, e.g 4 hrs.

The loop function allows users to set specific start and end points on the timeline to automatically Q-Replay the scenario, this can be useful in determining temporal patterns in the data. To use the loop function, select the “Loop” button and adjust the start and end timeline points to the desired times.

Timeline: The Timeline covers the entire lower portion of the screen and allows users to easily move backwards and forwards in time. Q-Replay users can zoom in and out of the timeframe using a pinch gesture, by clicking the “-” and “+” buttons or scroll wheel zooms with the mouse over the timeline. Playback speed is determined by the zoom level of the timeline so as the timeline is zoomed in playback will slow, which is indicated at the lower portion of the Play button. Blue tick marks on the timeline indicate an event/update within Q-Replay.

c. Shortcuts

Q-Replay makes switching between two different events easy in both geospatial and temporal space by utilizing the shortcuts tool in the lower right corner of the screen. Up to 5 shortcuts can be displayed on the screen but additional shortcuts can be saved in the additional shortcuts button (grid icon). To navigate to a shortcut simply press the desired button.



Figure 163. Shortcuts Tool

To add a shortcut click the + Save View button, It will open a small window allowing you to name the view, save the Layer Visibility, Timeline position and current open entities. This is useful to referring back to an event in both time and space and having the correct layers turned on/off.

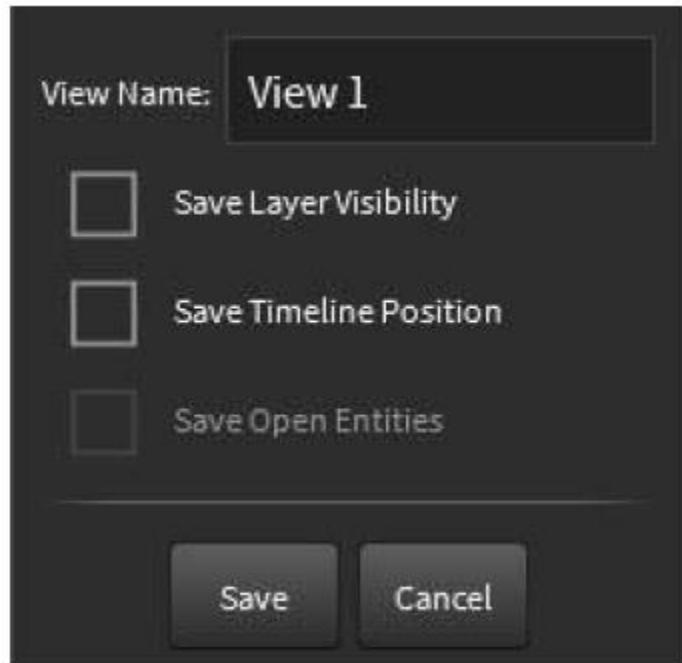


Figure 164. Add a Shortcut

To edit a shortcut press and hold or right-click the shortcut until the edit shortcut window appears. Similar to the add shortcut window you can change the view, time, and open entities. You can also remove the shortcut by clicking the Delete button.

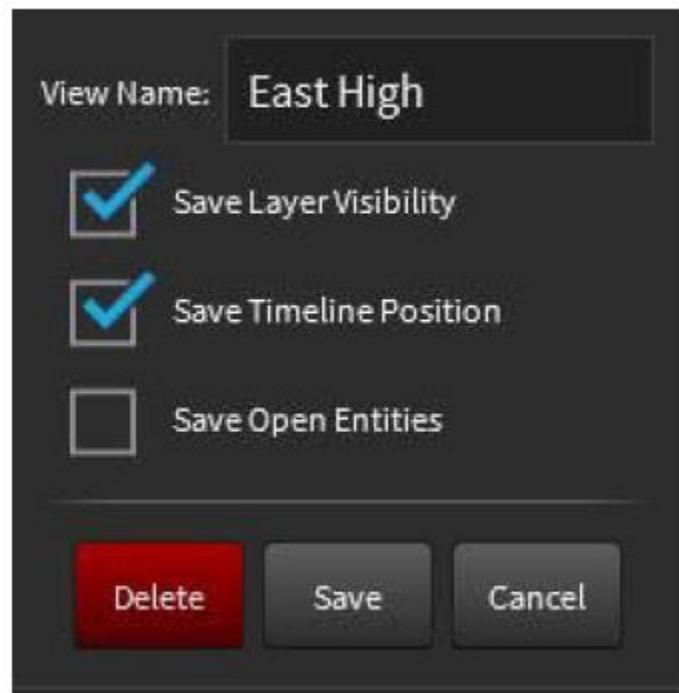


Figure 165. Edit a Shortcut

To organize the shortcuts or add them to the addition shortcuts area click and drag to the desired placement.

d. Notification Tool

The notification tool informs users of any Q-Replay status changes such as success or issues with uploads/downloads, and stream statuses. The window will display a yellow or red triangle icon indicating there is a notification update. Once selected, user can read and delete notification if desired.



Figure 166. Notification Tool

e. Data Creation Tools

The Data Creation tools are located in the toolbar at the bottom left corner of the screen. These tools enable users to create data within Q-Replay to include time based whiteboard notations, add markers for points of interest, measure distances, add various 2D and 3D shapes, and purge historical data within Q-Replay.

Note: using these tools typically stops the movement of the timeline, you can return to playback or live by pressing the Play button in the lower center of the screen.



Figure 167. Data Creation Tools

(1). Draw

The “DRAW” feature on Q-Replay allows users to free draw directly to the map using a variety of colors, line weights and styles turning Q-Replay into a whiteboard. These whiteboard lines are time tagged and can be useful during playback of an event as they will not appear until the timeline reaches that time.

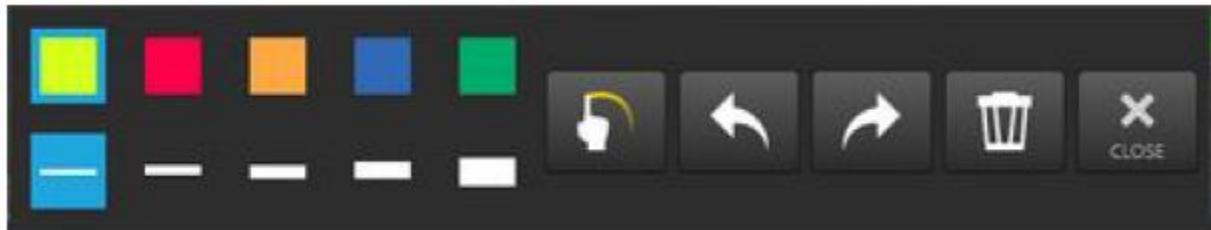


Figure 168. Draw Toolbar

Users can use the toolbar to select the color and thickness of the line. When the pointer finger icon is highlighted in blue, subsequent drawings will fade after 5 seconds. Clicking the undo arrow button will delete the last line drawn and clicking the redo arrow button will reinstate the last line drawn. Users can delete the picture entirely by clicking the trashcan button.

Q-Replay will not keep a record of images drawn on the screen once Q-Replay is closed. In order to save a drawing, the user can use the Take Snap / PowerPoint tool or Export tool (see Section: Export Tool.) to save a local copy of the data.

(2). Markers

The “Markers” feature allows a user to choose and assign various icons to display on the Q-Replay map. To create a marker, click on the marker icon and select from the list of icons.

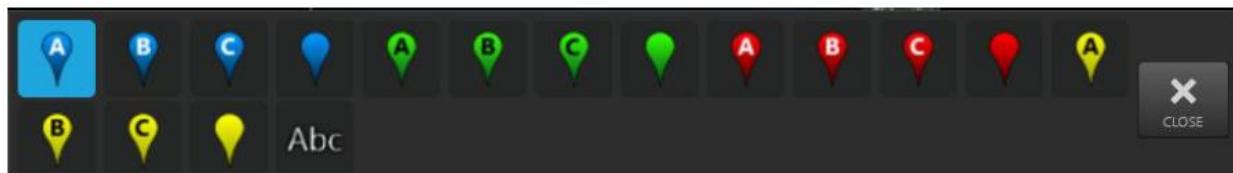


Figure 169. Markers Toolbar

After an icon is selected, the Shape Details window will appear. This window enables Q-Replay users to change the name of the marker, change the icon (imported pictures can also be used as icons), enter a description of the entity and copy the description to other shapes. Selecting the check box next to Date allows the entity to appear during timeline playback. When the box is not checked the item is available at all positions on the timeline. To apply the changes, select “Apply”.

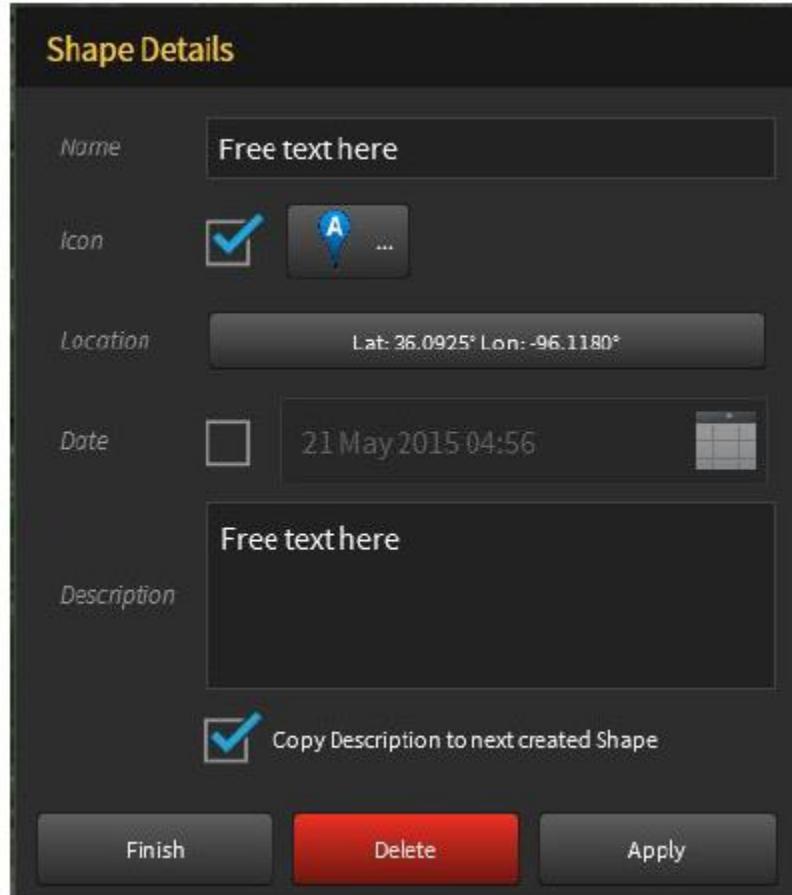


Figure 170. Shape Details Window

(3). Measure

The “Measure” feature allows user to measure distances, perimeters, volumes, arcs, and more using various shape tools. To measure, click the icon and then select line, polygon, circle, freeline or freedraw.



Figure 171. Measure Toolbar

Use a cursor or finger to draw lines, polygons and circles on the map (drag to increase and decrease length and size) or freedraw the area to be measured. Measurement numbers are displayed in real-time as the user makes changes to the shape. Q-Replay users can view distance in metric or imperial units and choose smaller or larger units of measure (see orange box below). Q-Replay users can save measurements or clear them from the map.



Figure 172. View Distance and Units of Measurement

(a). Measurement Types

Measurement type is a function that allows users to toggle between various measurement approaches.

- Ground: will measure the distance between points by factoring in changes in terrain elevations.
- Horizontal: will measure the horizontal point-to-point distances (i.e. “straight as a crow flies”)
- Straight: will measure the point-to-point distances to include horizontal and vertical distances



Figure 173. Measurement Types

(b). Elevation Profile

The elevation profile, available on line measurements, displays elevation statistics for the line drawn on the map. As the user hovers over the graph the corresponding location on the map is highlighted. It also allows users to locate the minimum and maximum elevations along the path and steepest inclination and declination across the path.



Figure 174. Elevation Profile

(4). Shapes

The “Shapes” feature allows user to create various shapes in Q-Replay. These shapes can be used to highlight areas of interest and/or create graphic representations of buildings or entities that can be molded and scaled for common operational picture (COP) briefings. Users can manipulate colors, data, measurements, and visibility. To use this function, select the Shapes button on the toolbar and select the desired shape from the menu. Create the shape by selecting a point and dragging to the desired location on the map. Choose line and fill color from the palate and shape label.

To create a 3D shape ensure you are in Tilt and Rotate mode and tilt slightly until the extrude icon appears on the shape. This will allow you to extrude the shape vertically as well as opens up additional options on the shapes detail window.

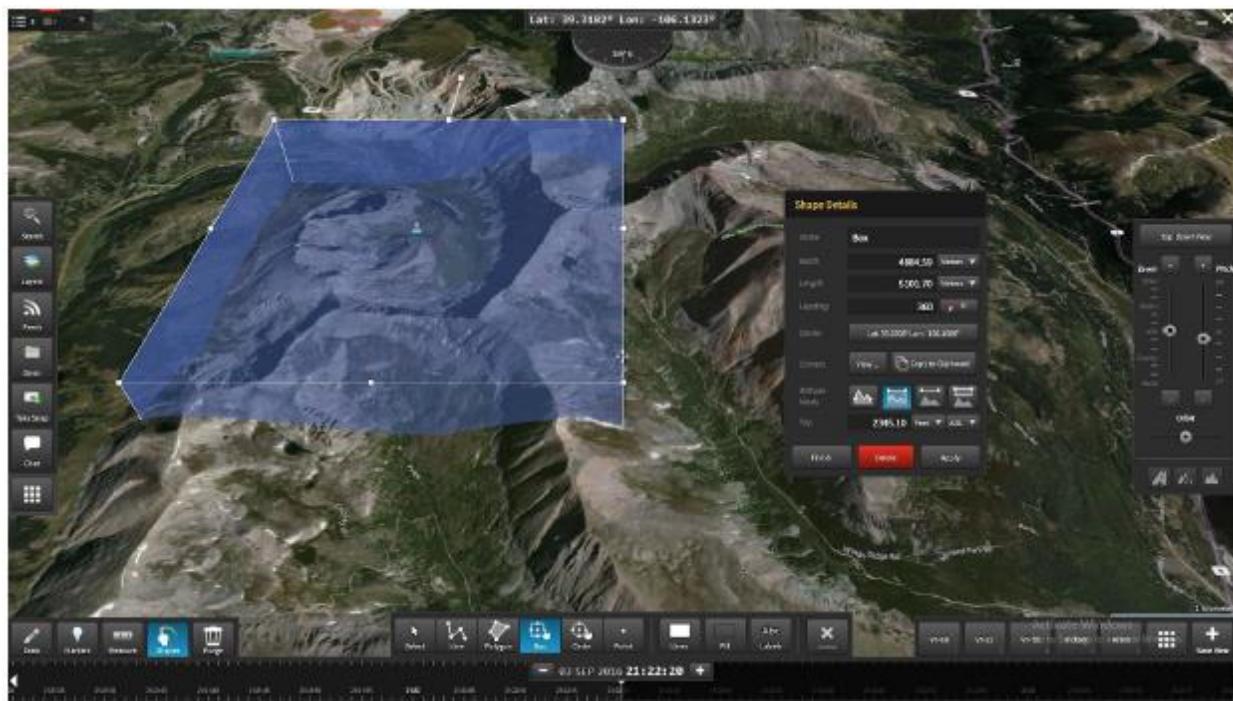


Figure 175. Create a 3D Shape

Click on “Select” to move the object. Use the Shape Details box to set preferences and save/delete the shape. To exit back to the map, re-select the highlighted Shapes button.

(5). Purge

The “Purge” feature allows user to remove old entity status from Q-Replay. To purge old data click on the trash can icon and select the timeframe to keep. For example, to remove all data from Q-Replay but keep the last 3 hours click on the 3 Hours button. Q-Replay will ask you to confirm the removal of data.

f. Data Management Tools

The Q-Replay data management tools are located on the left/middle side of the Q-Replay screen. It functions as a filtering and management toolbar for controlling feeds, and layers. Users can click and drag tabs to arrange and organize in the preferred order within the toolbar. The bar can expand to hold all tabs or collapsed to hide all function tabs inside the “Tools” tab (grid icon). The graphic below shows differently configured toolbars that were arranged by dragging and dropping tabs into and out of the Tools tab.

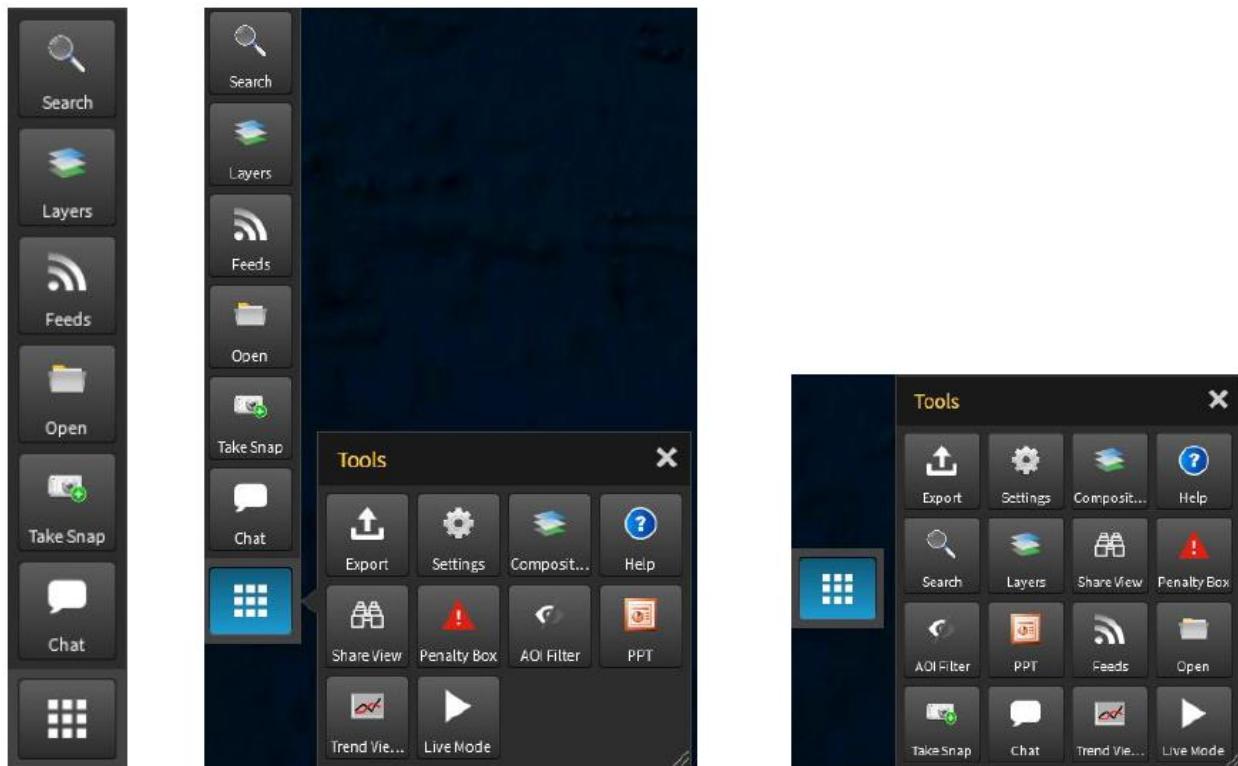


Figure 176. Data Management Tools

(1). Feeds Manager

Users can utilize the Feeds Manager tab to control and add data feeds in Q-Replay. The top section of the window aids in filtering and finding existing feeds. To enable Q-Replay to connect to the source and start ingesting data click on the ON/OFF toggle button next to the desired feed. The user can turn all feeds ON/OFF using the bottom toggle button.

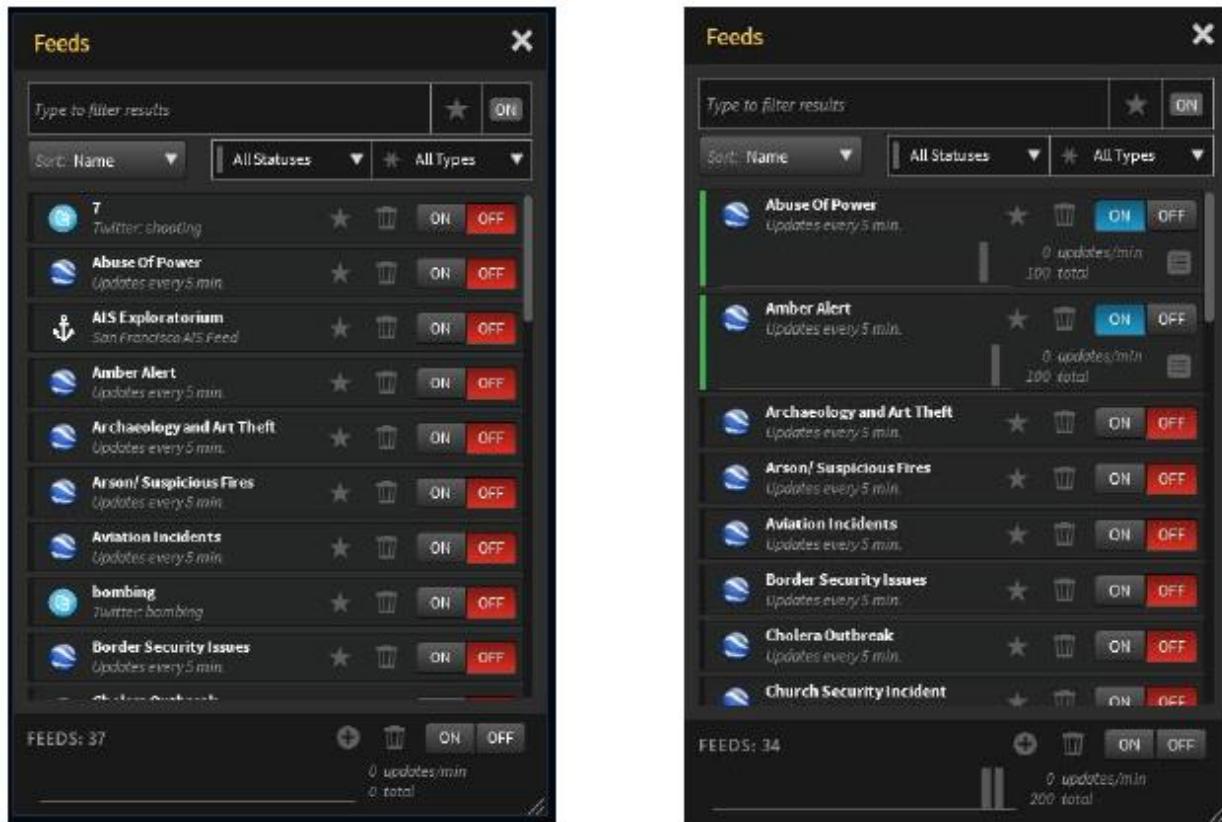


Figure 177. Feeds Manager

When a feed is activated a color status bar indicates whether Q-Replay connected properly and is receiving data. Green bars indicate a connection is made and data is being received, a Yellow bar indicates a connection is made but no data has been received and a Red status bar indicates the connection failed. Once data is being received the user can see a summary of event rates for all feeds at the bottom of the feeds manager. To see the individual feed rates touch the feed name and a feed specific histogram will appear.

To add a new feed, regardless of type click on the circular + icon in the lower right corner of the Feeds Manager.

(a). Adding an Advanced CoT Feed

The Advanced CoT Feed allows Q-Replay to connect to a TCP based stream of CoT formatted message traffic. This feed has several customizations for the BETS / TRAP sensors but also allows generic CoT traffic and custom visualization based on Mapping Files. The Mapping files (Located in the C:\ProgramData\Ringtail Design\Q-Replay\Data\CoTMappings folder) can be customized to change

icons based on XML elements in the CoT message. Create or modify a mapping file for each CoT message type you would like to visualize.

In the Add Feed Wizard, click on the Advanced CoT Feed button, the next window will request the Name of the Feed, this will be displayed in the Feed Manger once the wizard is complete.

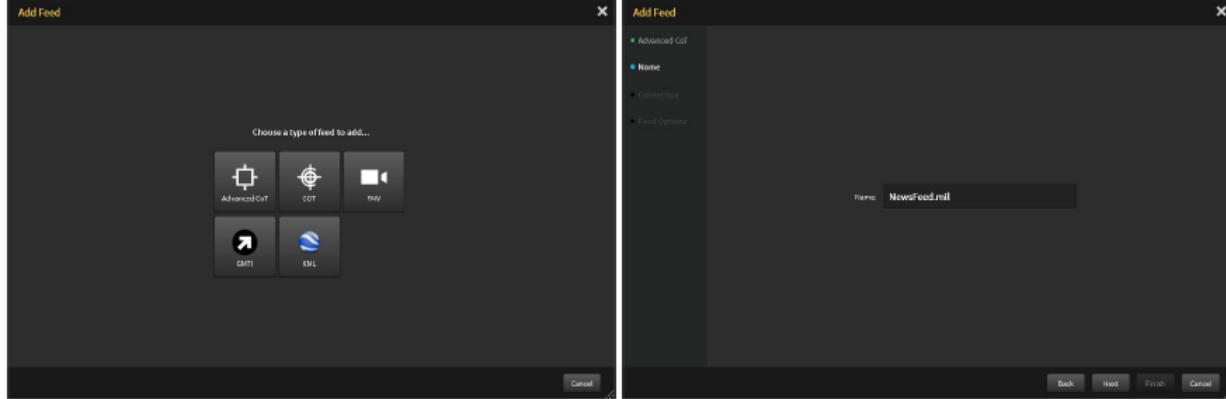


Figure 178. Advanced CoT Feed

After clicking next enter the connection information which includes URL (Fully Qualified Domain Name or IP Address) and the port. Clicking Next presents the Feed Options step of the wizard and allows you to set characteristics of how Q-Replay handles the feed, such as auto start the feed, mark it as a favorite.

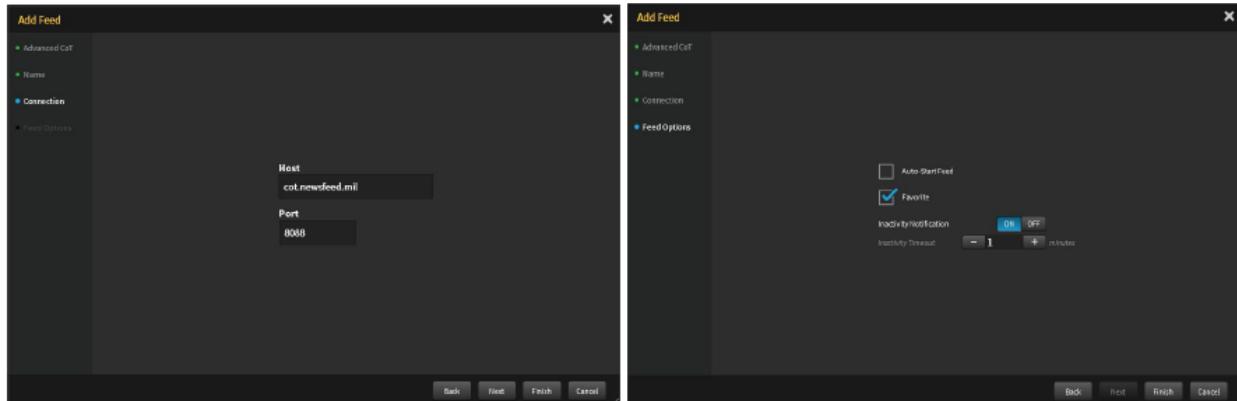


Figure 179. Advanced CoT Feed Options

(b). Adding a CoT Feed

The CoT Feed allows Q-Replay to connect to an UDP based stream of CoT formatted message traffic. This feed is typically used with Blue Force Tracking based CoT messages and allows Icon customization based on the CoT type field. The Mapping files (Located in the C:\ProgramData\Ringtail Design\Q-Replay\Data\CoT folder) can be customized to change icons based on the CoT code in the message. All mappings for this feed are contained in one Comma Separated Values (CSV) file.

In the Add Feed Wizard, click on the CoT Feed button, the next window will request the Name of the Feed, this will be displayed in the Feed Manger once the wizard is complete.

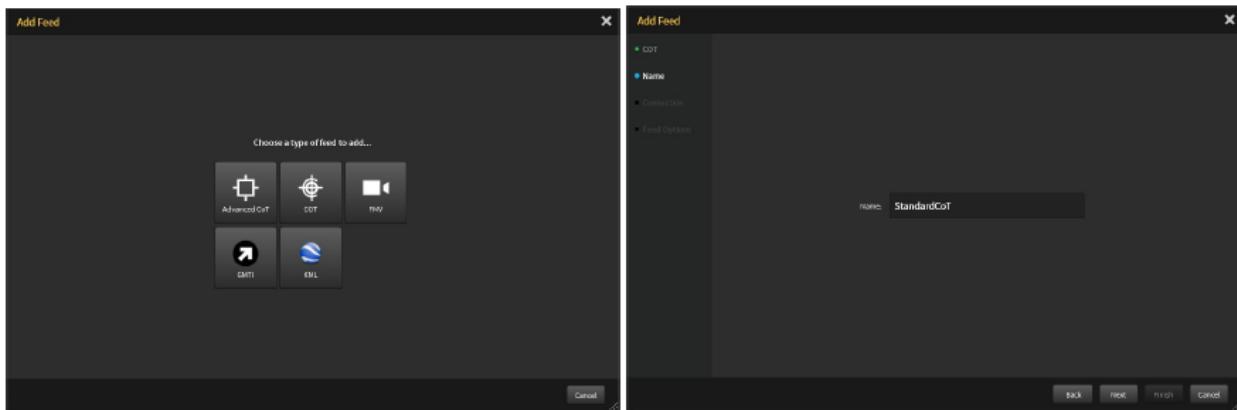


Figure 180. CoT Feed

After clicking next enter the connection information which includes IP Address and the port. Clicking Next presents the Feed Options step of the wizard and allows you to set characteristics of how Q-Replay handles the feed, such as auto start the feed, mark it as a favorite.



Figure 181. CoT Feed Options

(c). Adding a GMTI Feed

The GMTI Feed allows Q-Replay to subscribe to UDP Ground Moving Target Indication (GMTI) streams. GMTI data is indicated by color shaded arrows indicating the movement away or towards the collection sensor. The image below indicates how GMTI will look with in Q-Replay.

In the Add Feed Wizard, click on the GMTI Feed button, the next window will request the Name of the Feed, this will be displayed in the Feed Manager once the wizard is complete.

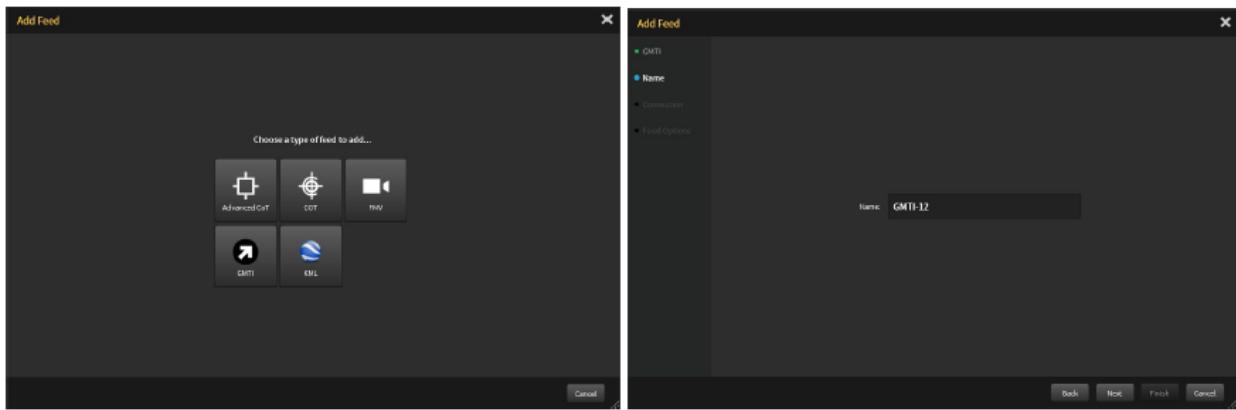


Figure 182. GMTI Feed

After clicking next enter the connection information which includes IP Address and the port.

Clicking Next presents the Feed Options step of the wizard and allows you to set characteristics of how Q-Replay handles the feed, such as auto start the feed, mark it as a favorite.

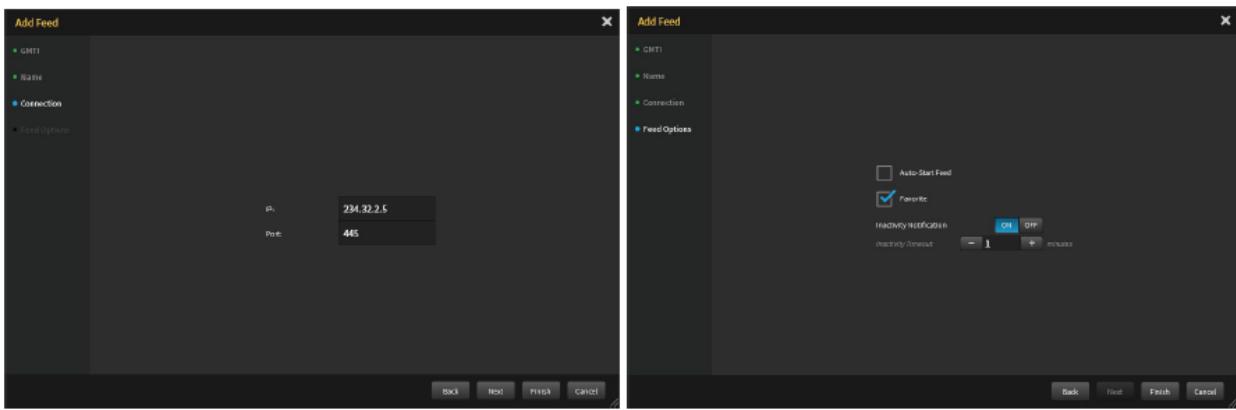


Figure 183. GMTI Feed Options

(d). Adding a KML Feed

Q-Replay comes pre-populated with feeds from GlobalIncidentMap.com, but additional KML feeds can be added by clicking on the plus sign in the lower right corner. Once clicked select KML from the available options. On the following screen choose the name that will be displayed in the Feed Manager and click Next.

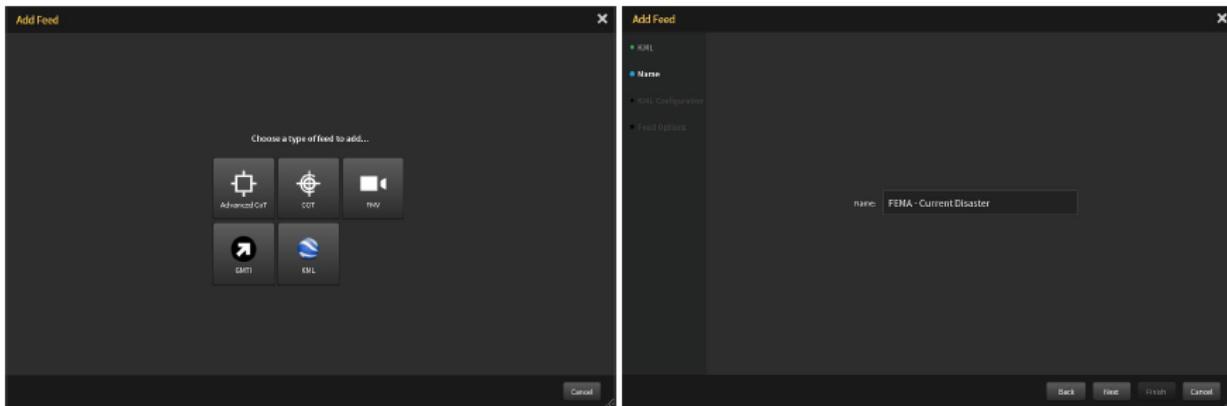


Figure 184. KML Feed

Enter the URL for the KML Feed to add and select how often the feed is updated. In the below example the feed is updated every time the map is moved, but a temporal option could be used, depending on the data.

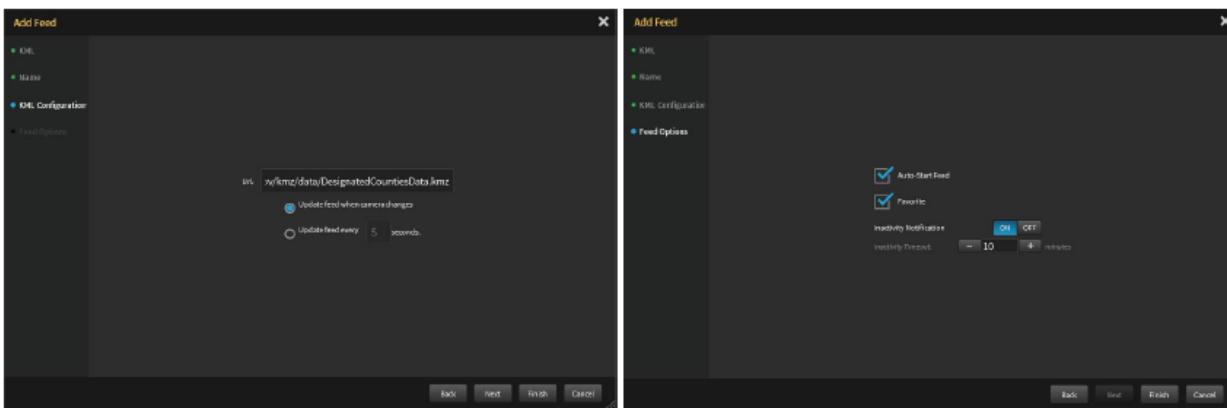


Figure 185. KML Feed Options

The final step is to choose whether or not to have the feed start automatically when Q-Replay starts, if this feed should be listed in the feed favorites and whether or not Q-Replay should notify the user when the feed has stopped delivering data. Once the feed is added it will be displayed in the Feeds Manager, in this case filtered by “Favorites”

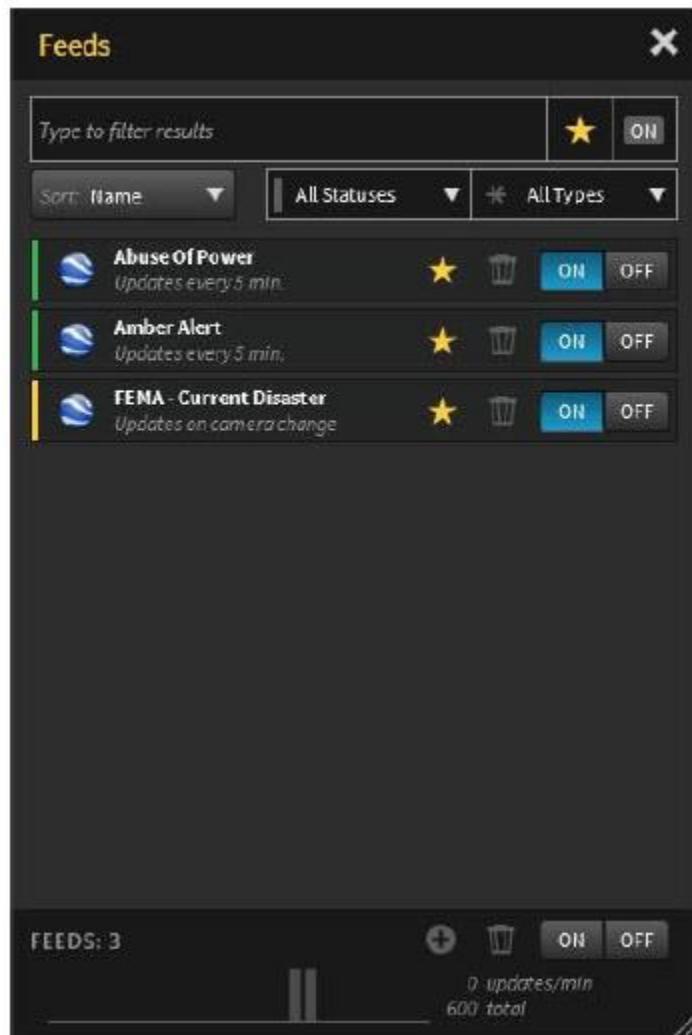


Figure 186. Feeds Filtered by Favorites

Once the feed starts receiving data it will be displayed on the Q-Replay map. In this example the feed is a FEMA Current Disaster areas which can be found at:

<https://www.fema.gov/data-feeds>



Figure 187. Data Displayed on Map

(2). Search Tool

The “Search” tool enables users to conduct searches of archived feed data or twitter data. To simplify search, Q-Reply breaks it up into four sections: Time, Location, Keyword and Sources. In the time section users can search by last 24 hours, last 48 hours, last 7 days, last 30 days or a custom time range.

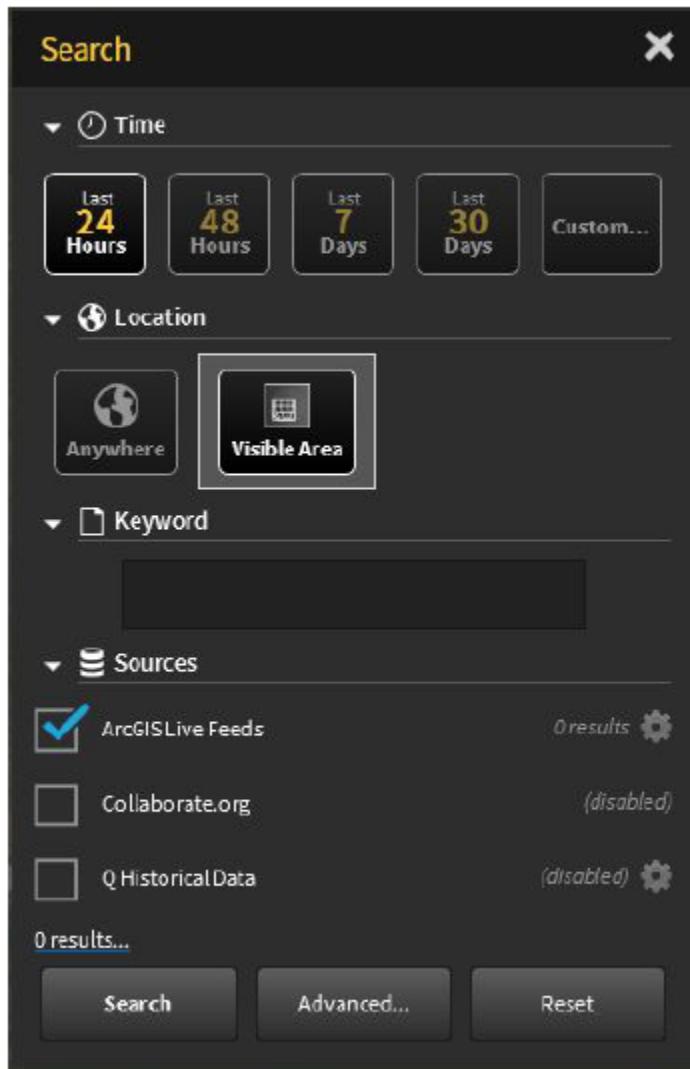


Figure 188. Search Tool

Selecting a Custom Timeframe opens up the time editor where the user can set the start and end times. By clicking on the Calendar button you can set the date and time.

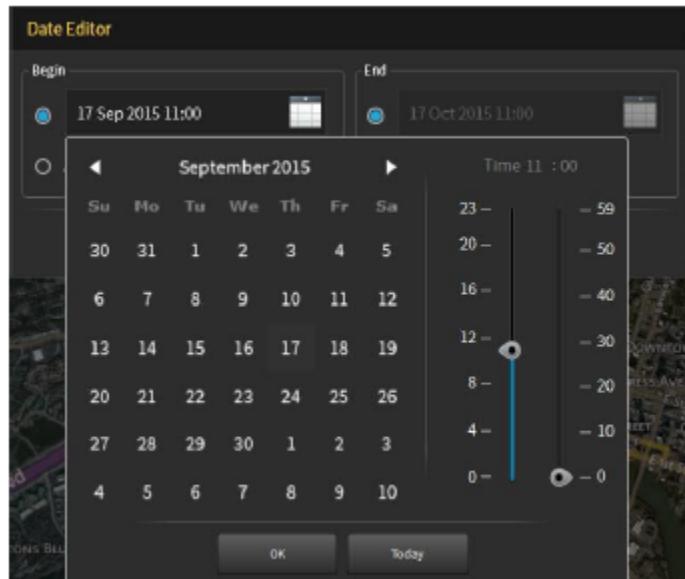


Figure 189. Calendar Button View

The location section offers two quick search parameters; Anywhere in the world and The current visible area Q-Replay map is showing.

Keywords are not a required field but are useful in narrowing the search results if the datasource supports it.

In the sources tab you can search all datasources or specify a source. To conduct a search click on the Search button. You will notice a progress bar next to the Source and when complete the number of results. The results are displayed on the map or you can click on the yellow link below sources to view the results in a filtered layer window.

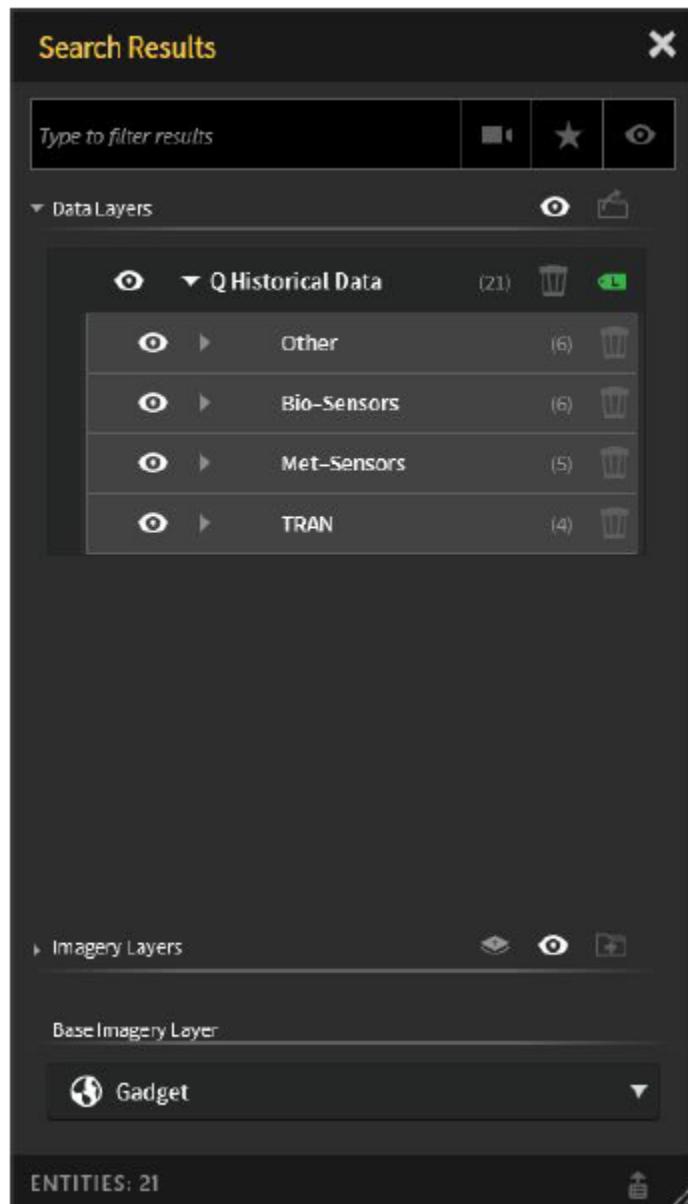


Figure 190. Search Datasources

Additionally, you can limit the search to certain feeds by selecting the Gear icon next to sources. You will see the available feeds in the archive and can turn on/off feeds depending on your search criteria.

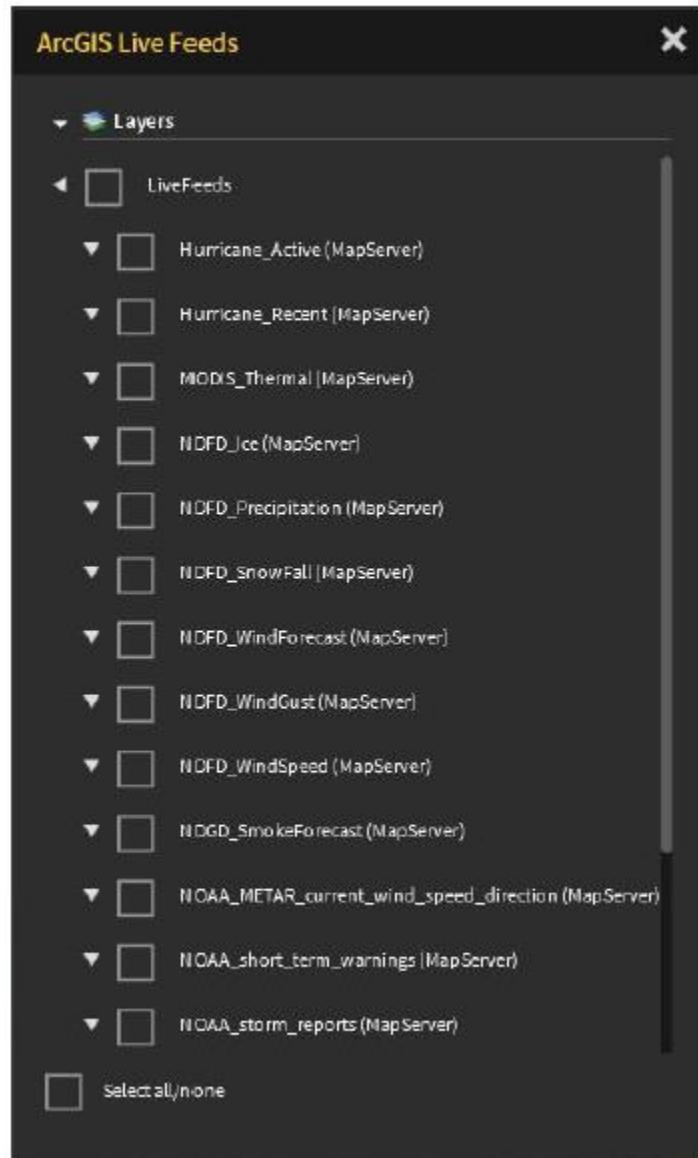


Figure 191. Limit Search

(3). Open Tab

The “Open” tab enables users to access, open and import supported data files into Q-Replay from the local computer or shared network drive. To access a file or files, select the “Open” icon, and then choose the drive and folder of files to access. Files that are available for import are displayed in the browser window, select the desired files and then select the Open option. Please note that not all files are supported; however, Q-Replay does support KML/KMZ, XLS/CSV and limited Shapefile support.

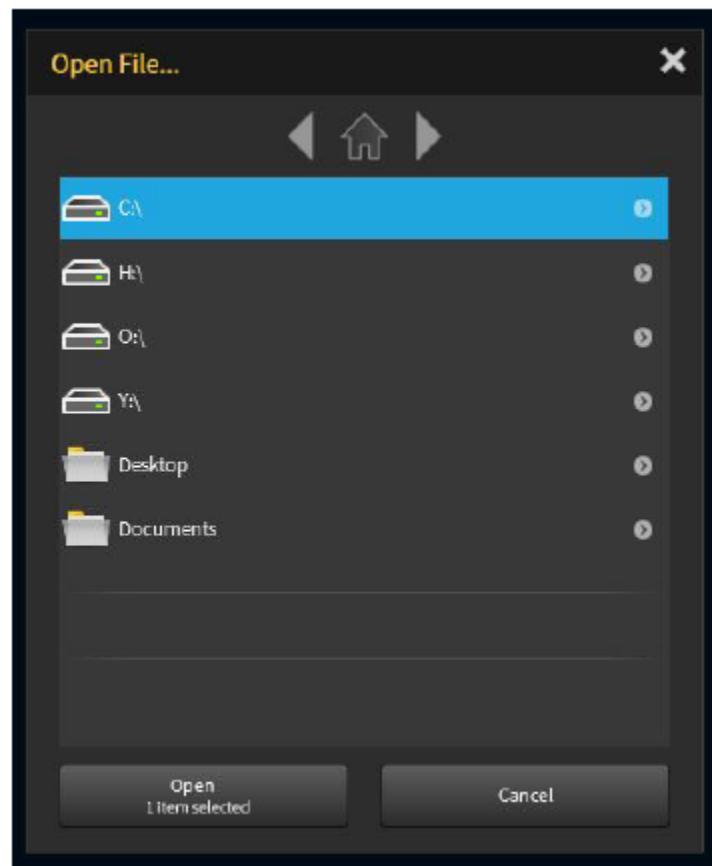


Figure 192. Open Tab

XLS/CSV Import Wizard

Q-Replay automatically detects if an Excel or Comma Separated Values file has been selected for import and launches a wizard to help map out the fields for proper displaying of the data. If more than one CSV file is selected then a wizard for each file will be started as the first is finished. The first screen of the CSV wizard is for mapping the required fields that Q-Replay needs to properly display on the map. Required fields include Name, Unique ID (which can be the same) and Location. If the information is time based it will show up on the timeline. As fields are mapped the preview of data columns are selected as Blue. Once complete with this mapping click Next to continue mapping or Finish to plot the data on Q-Replay Map.

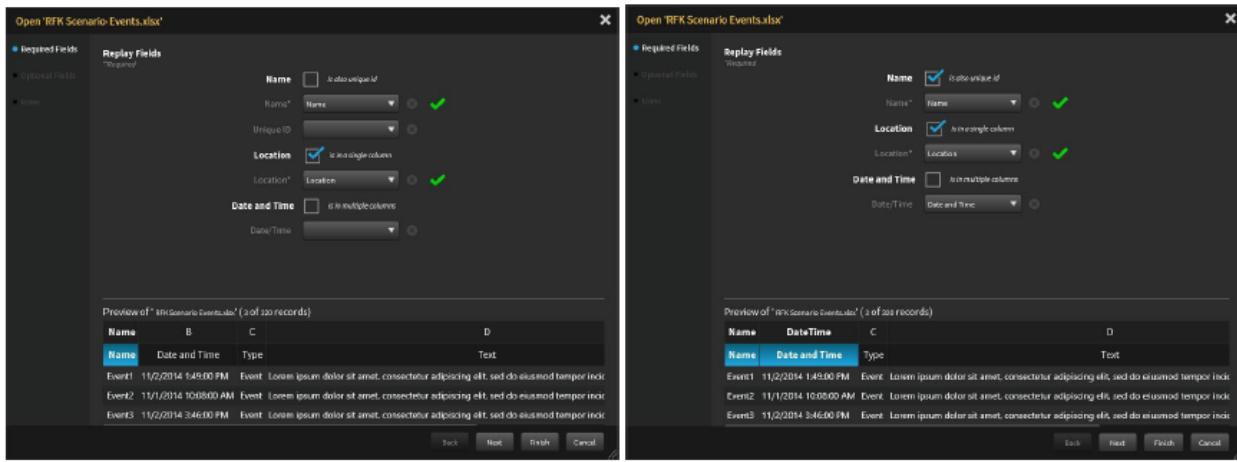


Figure 193. XLS/CSV Import Wizard

Because there is often additional data within an Excel/CSV that the user may want to connect to the entity the Optional Fields pages allows you to add them to the Entity Details window. Selected fields on this page highlight the columns as yellow to indicate which have been chosen.

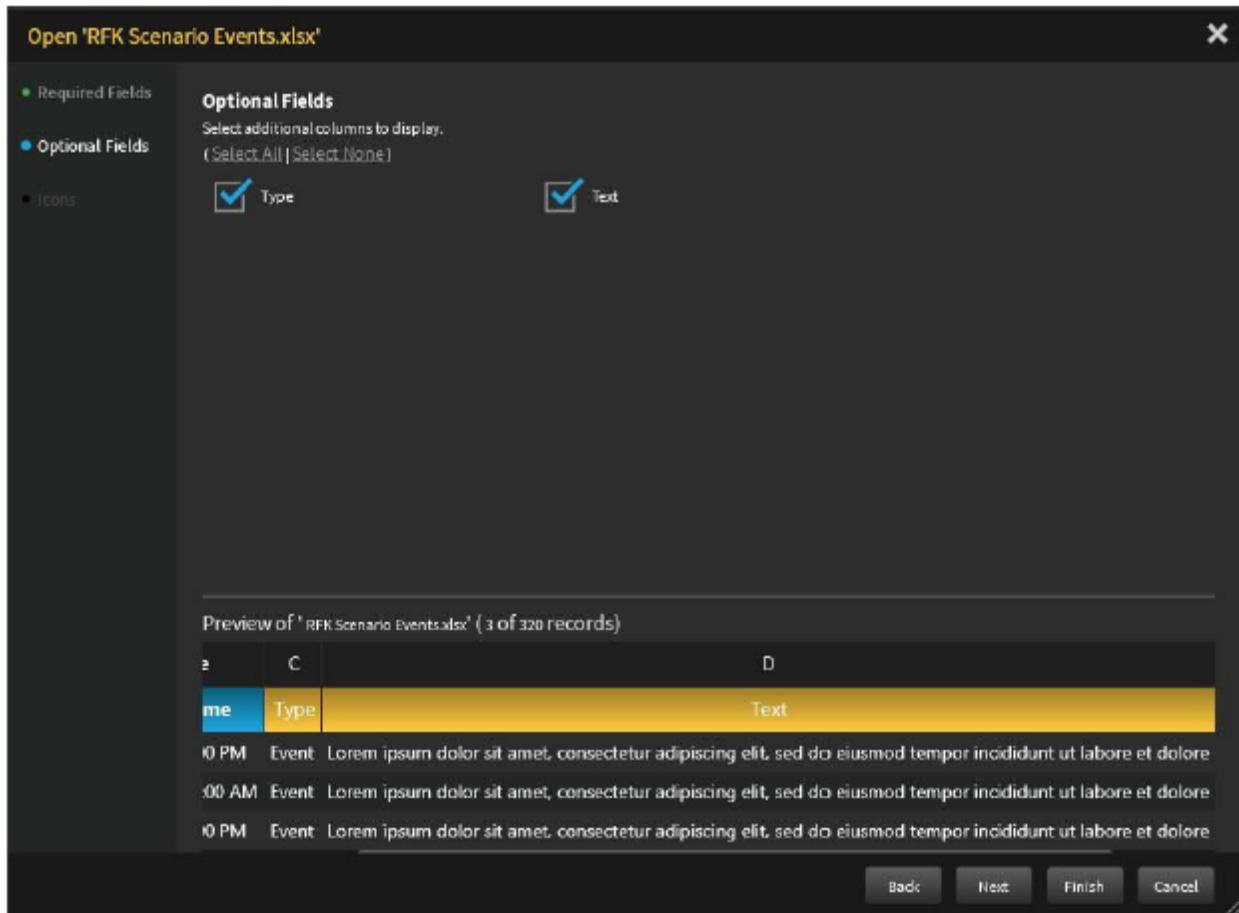


Figure 194. Optional Fields Page

On the final screen of the Excel/CSV import wizard Q-Replay allows the user to add icons to the data being displayed. This can be one icon for all the data in the file or can be an icon based on a “category” field which will allow the user to map an icon to each category.

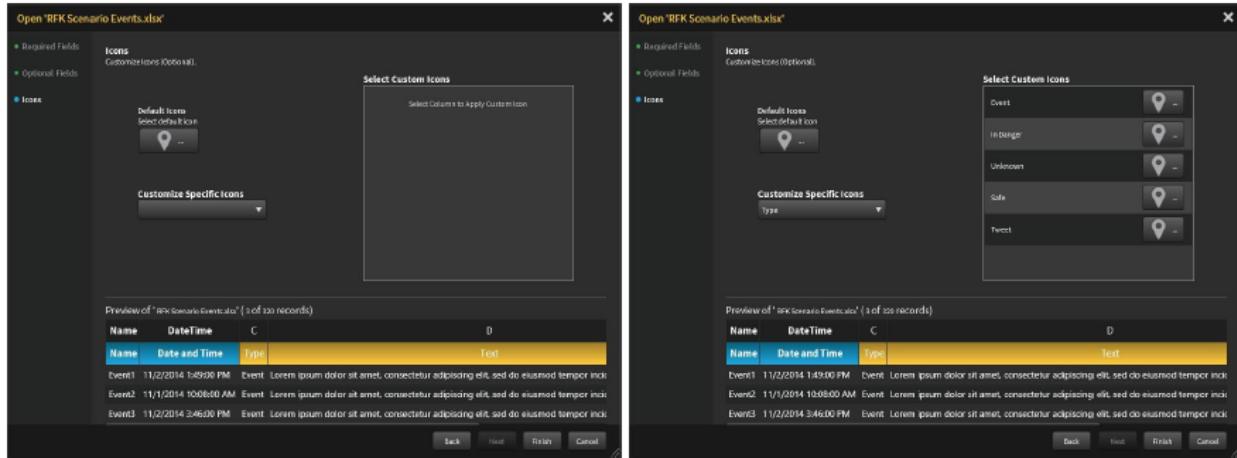


Figure 195. Add Icons to Data

To Map the icons click on the current icon button, the select an icon window appears, click Browser or drag and drop icons into the drop area to map that icon. Once completed Q-Replay shows mapped icons. Click Finish to display the imported CSV on the Q-Replay map.

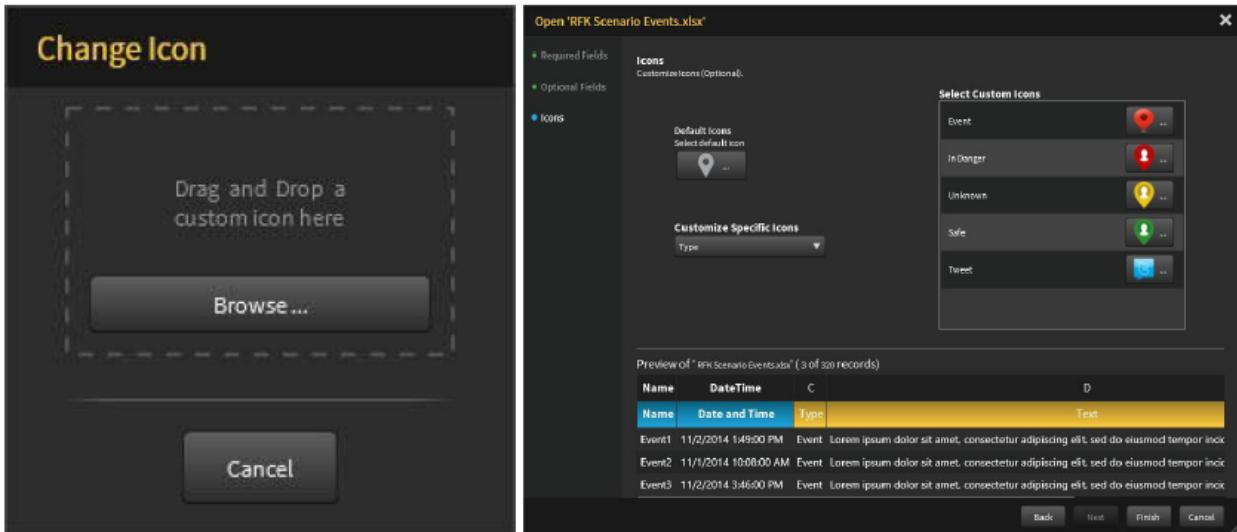


Figure 196. Map Icons

After the file has been imported you will see the results displayed on the map as seen below.

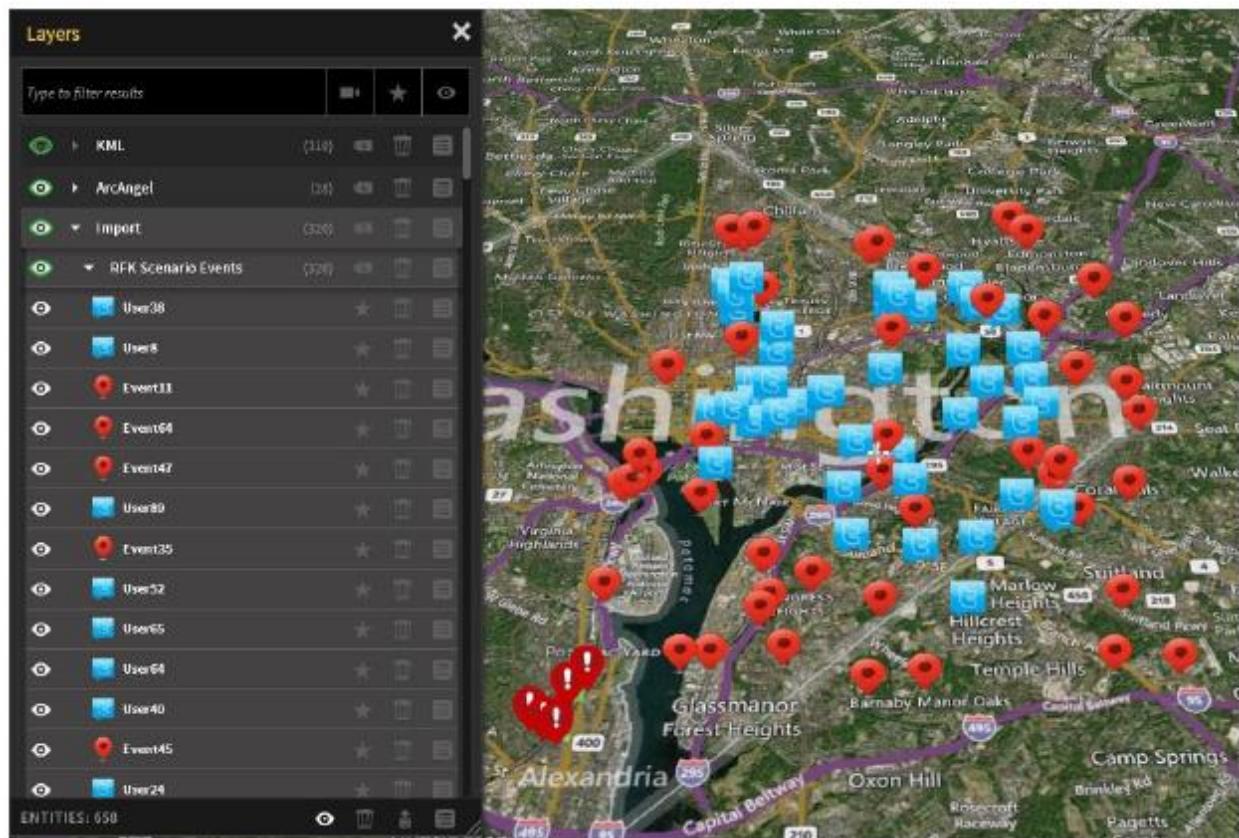


Figure 197. Mapped Icons Displayed

(4). Layers Manager

The Layers manager is a summary of all data currently in Q-Replay and enables the user to set display options for the data. Data entities are automatically grouped by type based on the source or type of data. The number of grouped entities contained within a group is displayed on the right side group name. The total entities loaded into Q-Replay is located on the bottom right of the window.

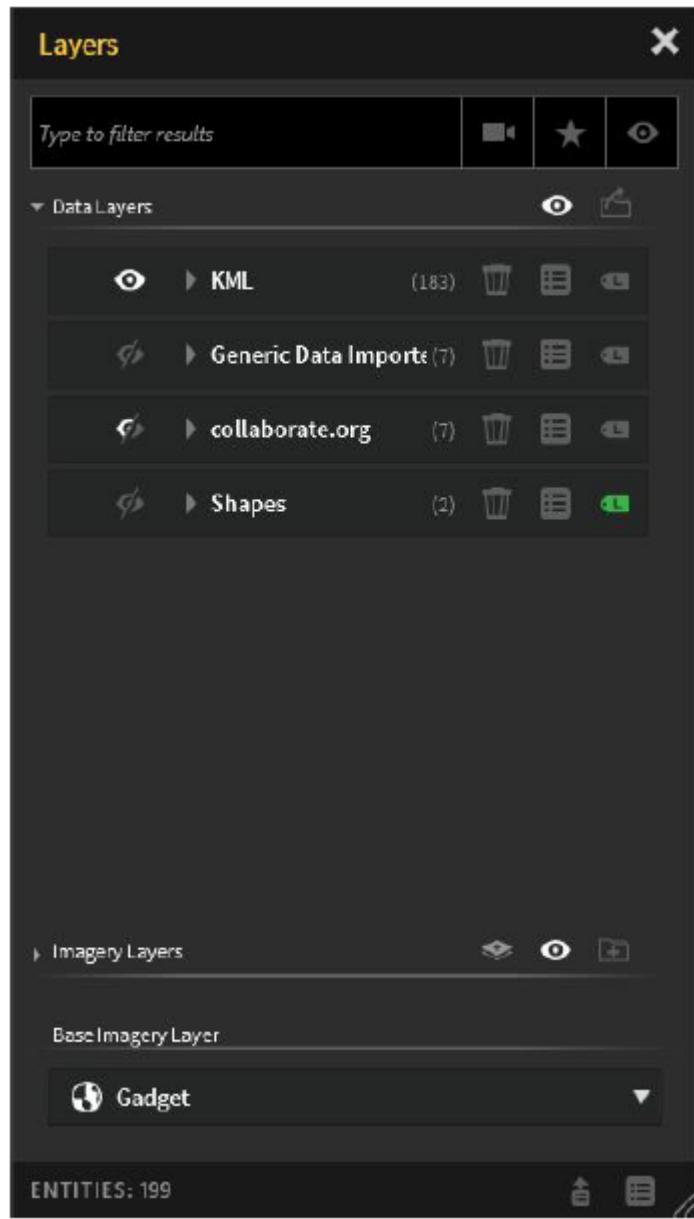


Figure 198. Layers Manager

(5). Show/Hide Entity Layers

To make entities visible or invisible on the Q-Replay map, the user can simply click on the eye icon to the left of the entity description. By selecting a group or individual entity, the user can customize what is displayed on the Q-Replay map. The different eye icons indicate the viewing status of entity fields. The greyed out slashed eye signifies that the corresponding entity is not displayed on the map (but is still present). A half greyed out slashed eye indicates that there are some sub-entities in the column that are visible and some that are not. The Q-Replay user can click on the half greyed out slashed icon to turn all sub-entities on or off.

(b). Filtering Layers

Q-Replay enables users to filter layers to speed up layer management. The primary filtering feature is the Filter / Search box allowing the user to type in keywords, this will filter the layer manager to only layers containing that keyword.

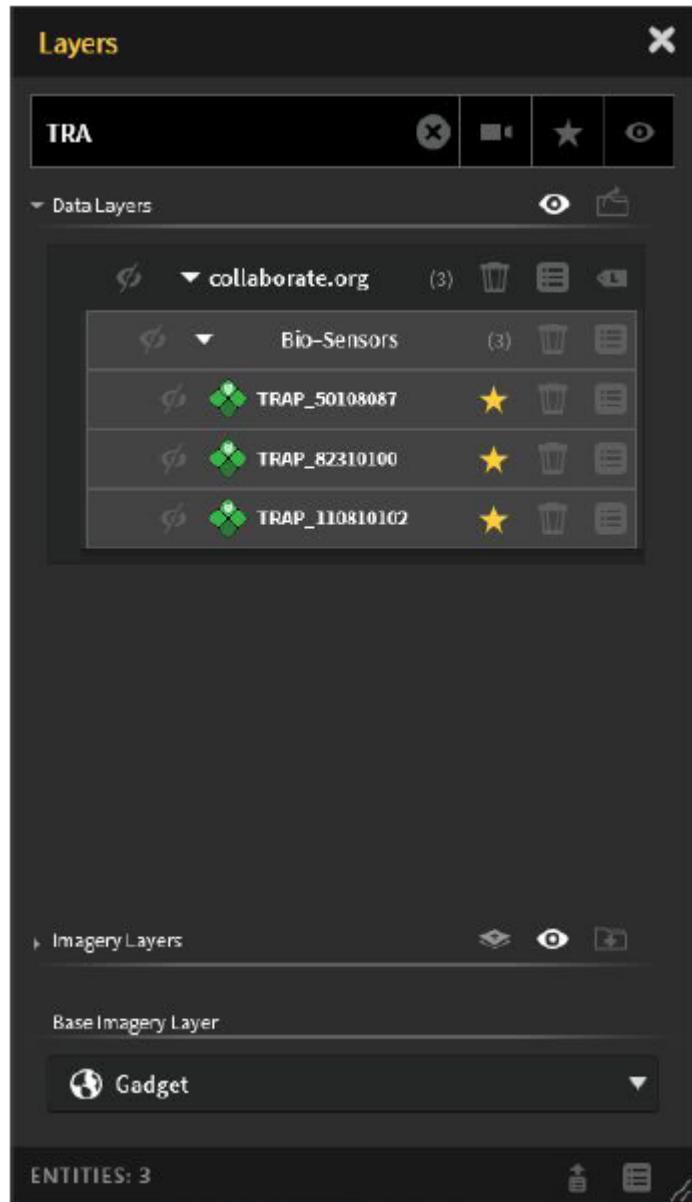


Figure 199. Filter Layers

Another option for filtering the layers manager is to assign a layer to favorites. To do this drill down to the layer and click the Star icon. You can then filter the layer manager to show only favorites by clicking on the Star in the upper portion of the layers manager.

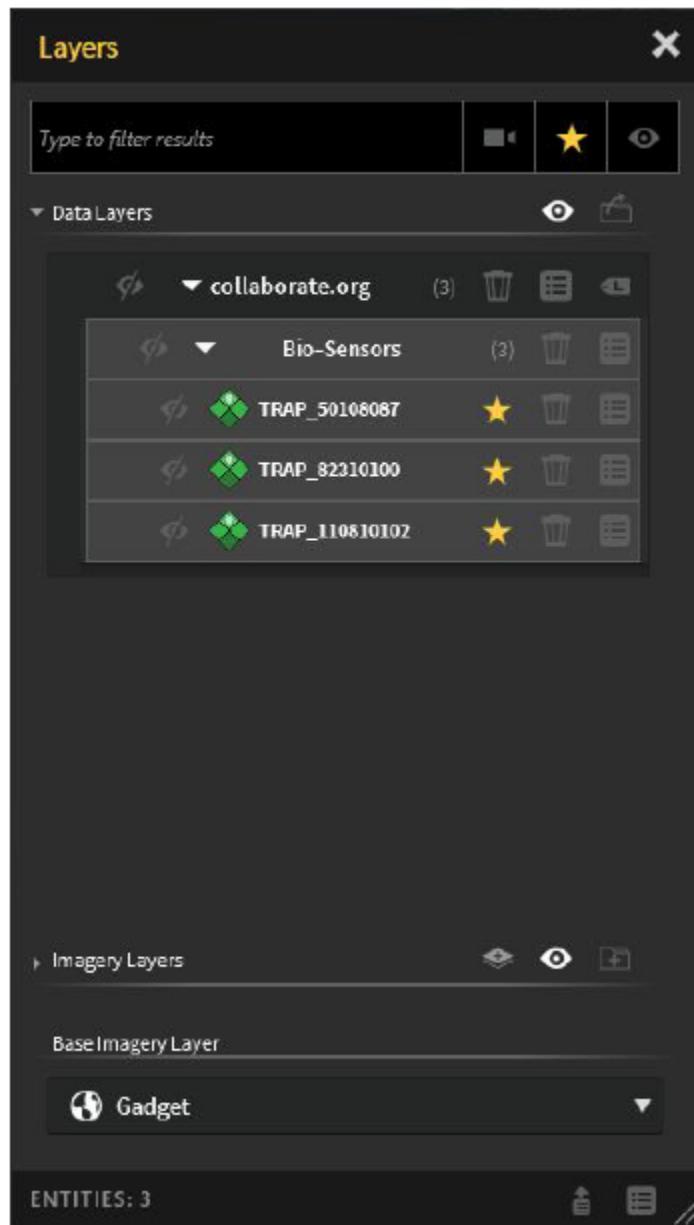


Figure 200. Assign a Layer to Favorites

Users can also filter the layer manager by displaying layers that are currently visible by selecting the eye icon in the upper portion of the layers manager.

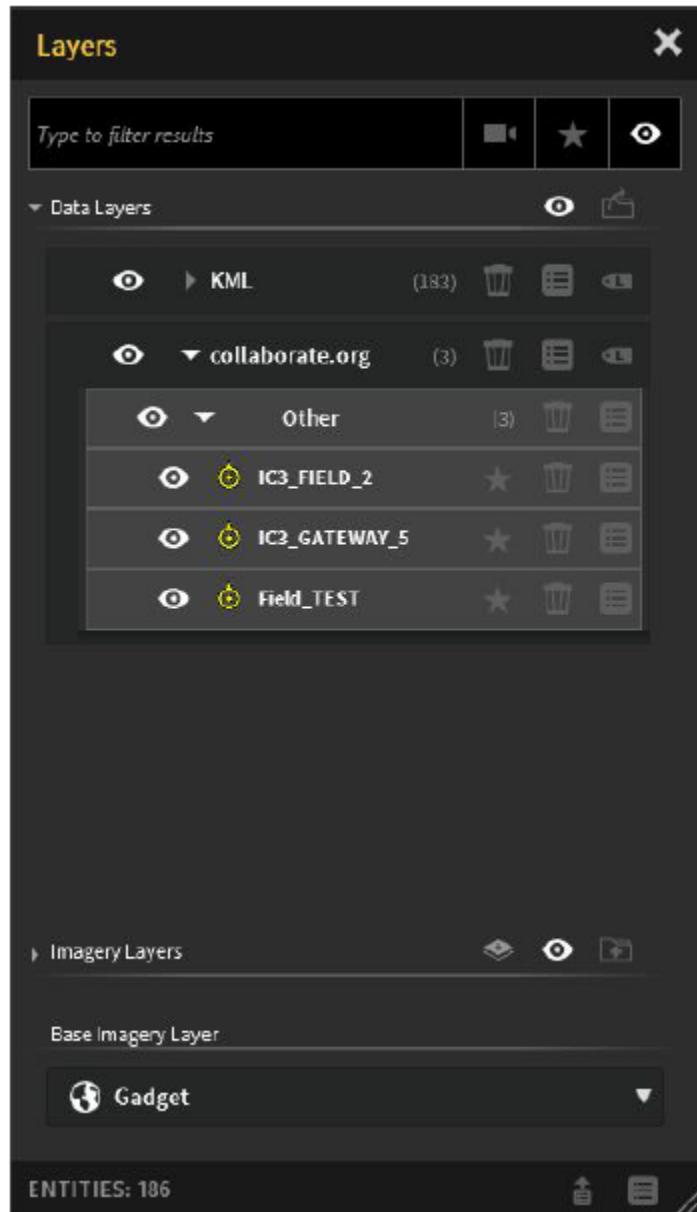


Figure 201. Filter by Visible Layers

(c). Select Entity Layers

When a user selects an entity layer, an individual entity window will appear. The entity window contains general and entity-specific tools for customizing the Q-Replay map view (see red box in graphic below). Please refer to the entity tools section of this manual for specific tools.

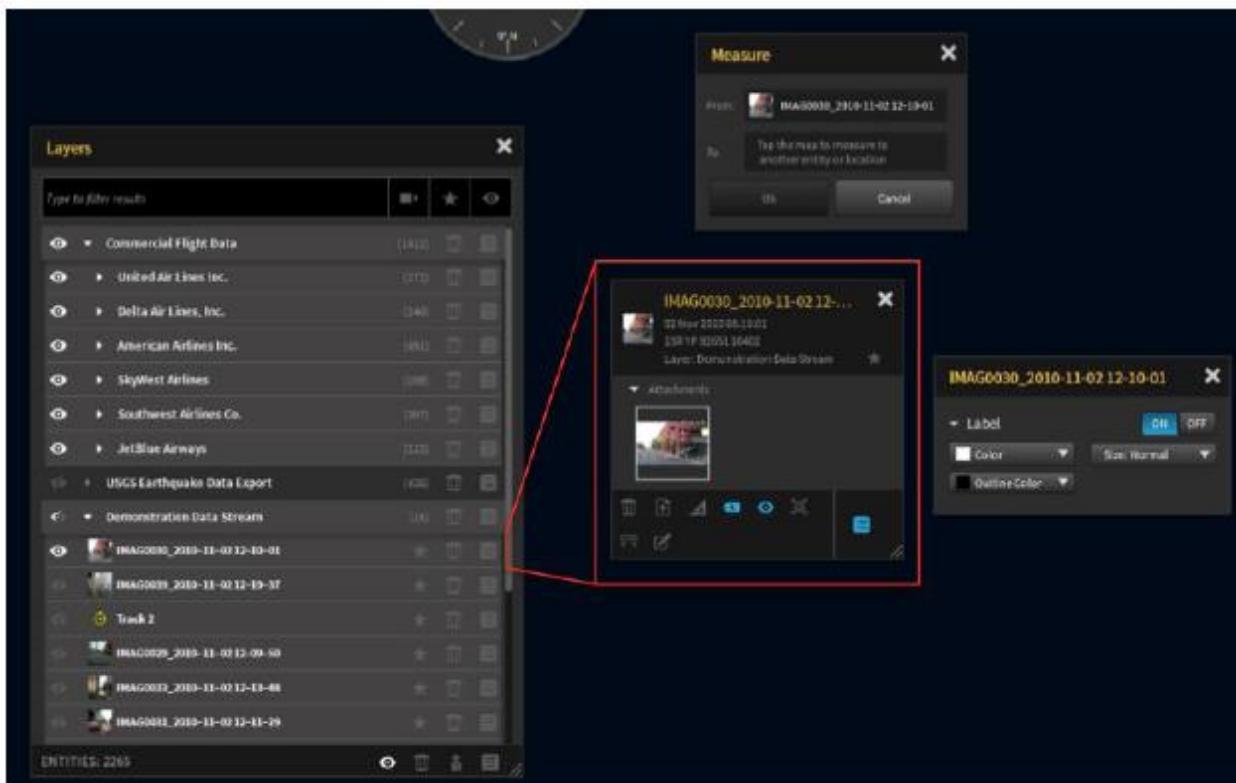


Figure 202. Select Entity Layers

(d). Layer Details Control

The visual display of layers is typically set by default, however the user can change the visual preferences of the layer by clicking on the details icon next to the layer name. Users have the ability to change the entity (lowest level) or the group (highest level) and all sub entities by clicking on the corresponding details icon. Visual Preferences change depending on layer type so some options may be different depending on entity types.

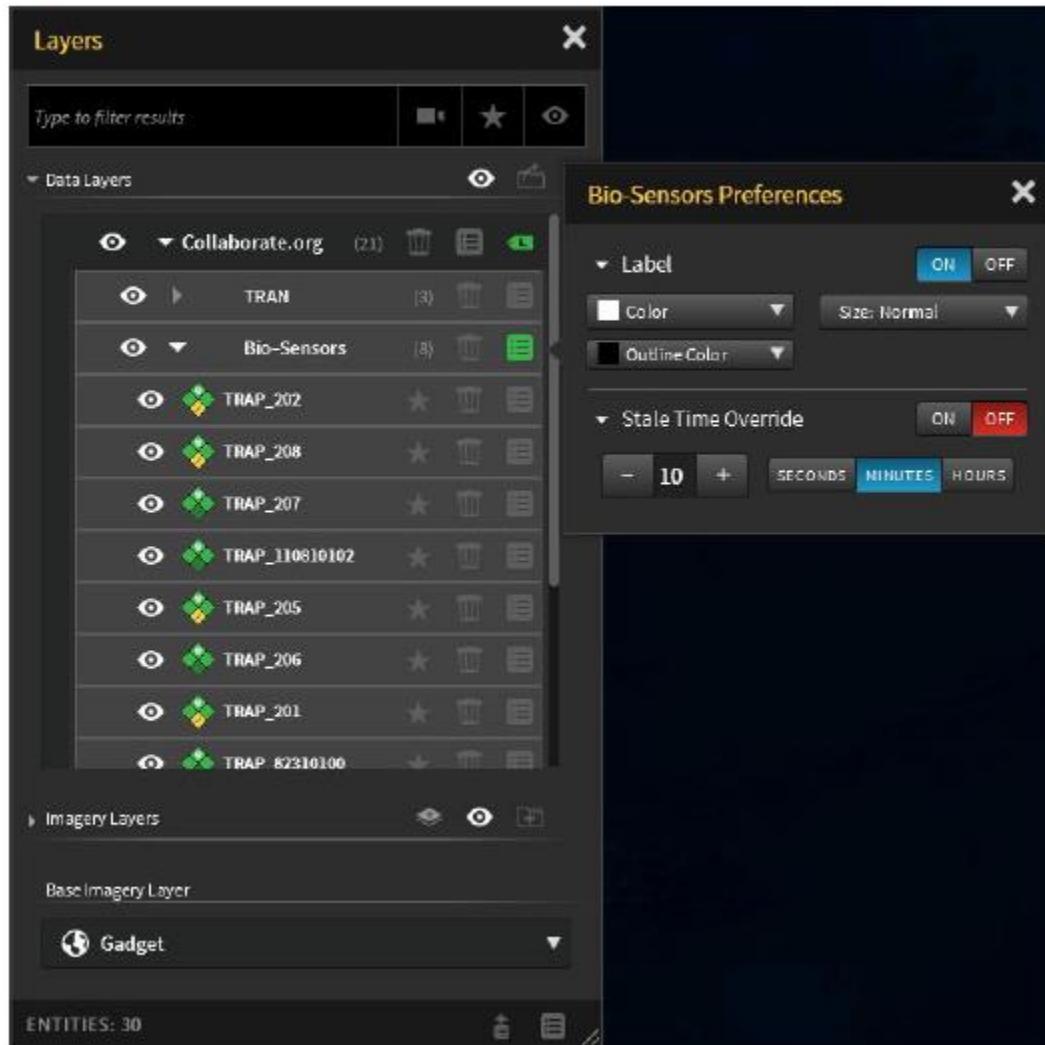


Figure 203. Layer Details Control

(e). Imagery Layers

The Imagery Layers of the Layer Manager allows users to manage basemap sources as well as WMS data layers that are displayed on Q-Replay. It is also where the Map Layer Shortcuts are set up that are displayed under the Zoom/Tilt controls on the right side of the screen.

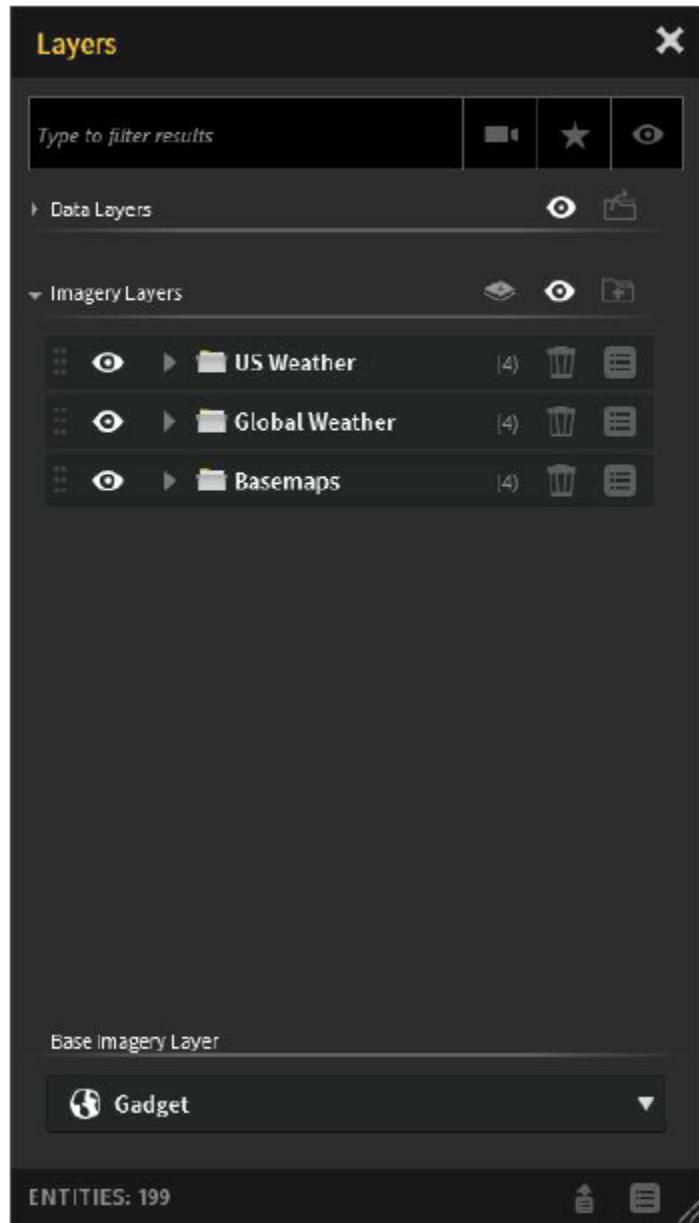


Figure 204. Imagery Layers

(f). Adding Default Map Shortcuts

Q-Replay has the ability to quickly switch between Maps, Hybrid, and Imagery only views of Bing Maps. To add those options, click on the “Add Layer” button next to the Imagery Layers section. Select the Default button. You will see a drop down menu with Bing Maps and Bing Aerial, select one and click finish.

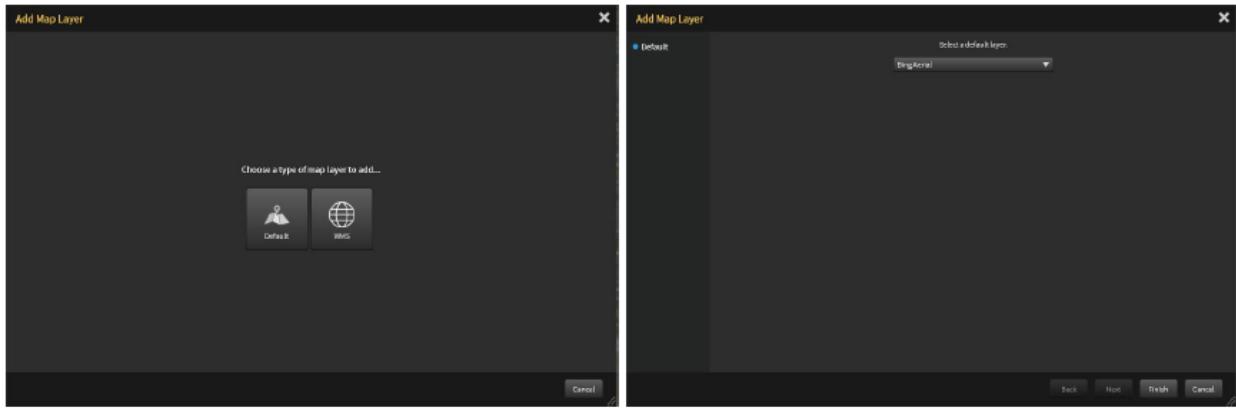


Figure 205. Add Default Map Shortcuts

You will see the new layer listed in the Map Layers window and you will notice the Map Layer shortcuts have appeared under the Zoom/Tilt controls.

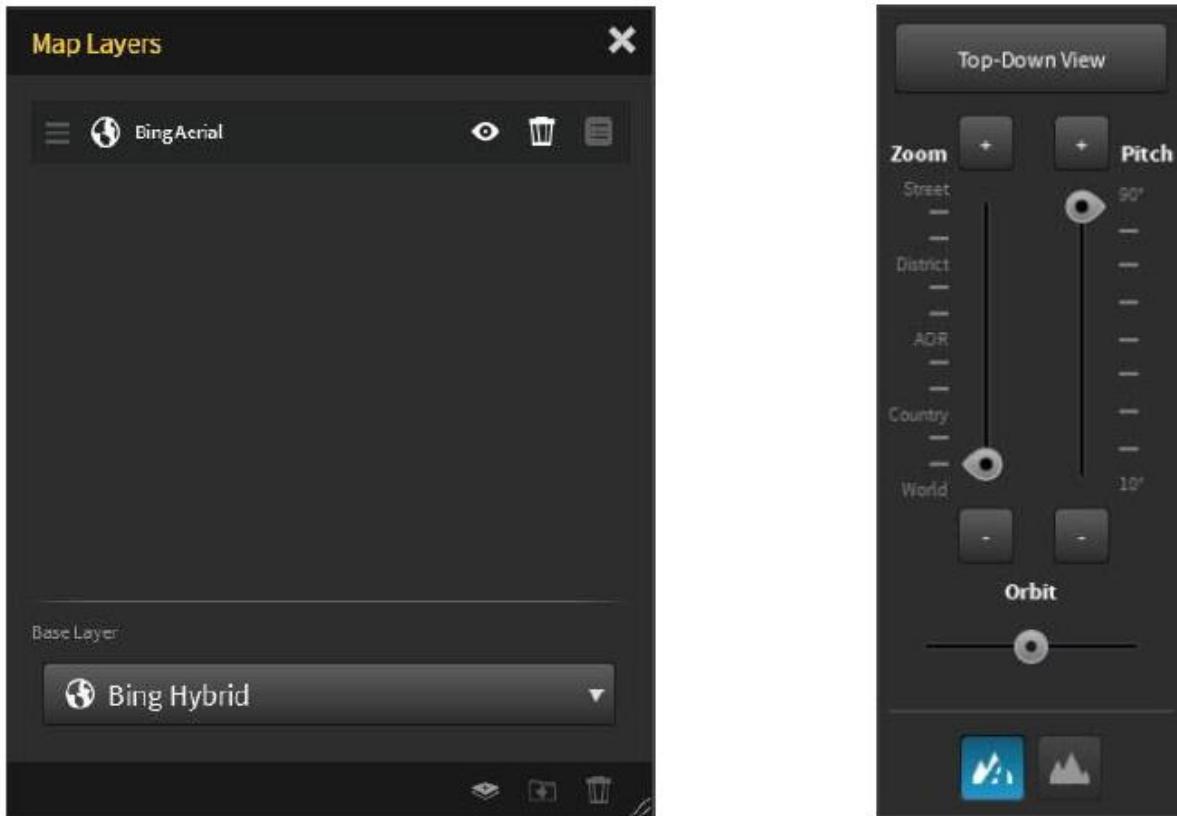


Figure 206. Map Layers Window and Shortcuts

Repeat the steps to add the remaining layer and all three shortcuts will appear.

(g). Organizing Map Layers into Folders

As you use Q-Replay more and find additional Layers to add you might find the need to organize them into folders. To add a folder click on the “Add Folder” button on the far right side of the Imagery Layers section. A folder named New Folder will appear, you can change the name by clicking on the folder preferences button. To add map layers into the folder click on the expand tree button next to the folder name and drag the desired layers into the folder by clicking on the handle bars (3 horizontal lines) and dropping them in the folder.

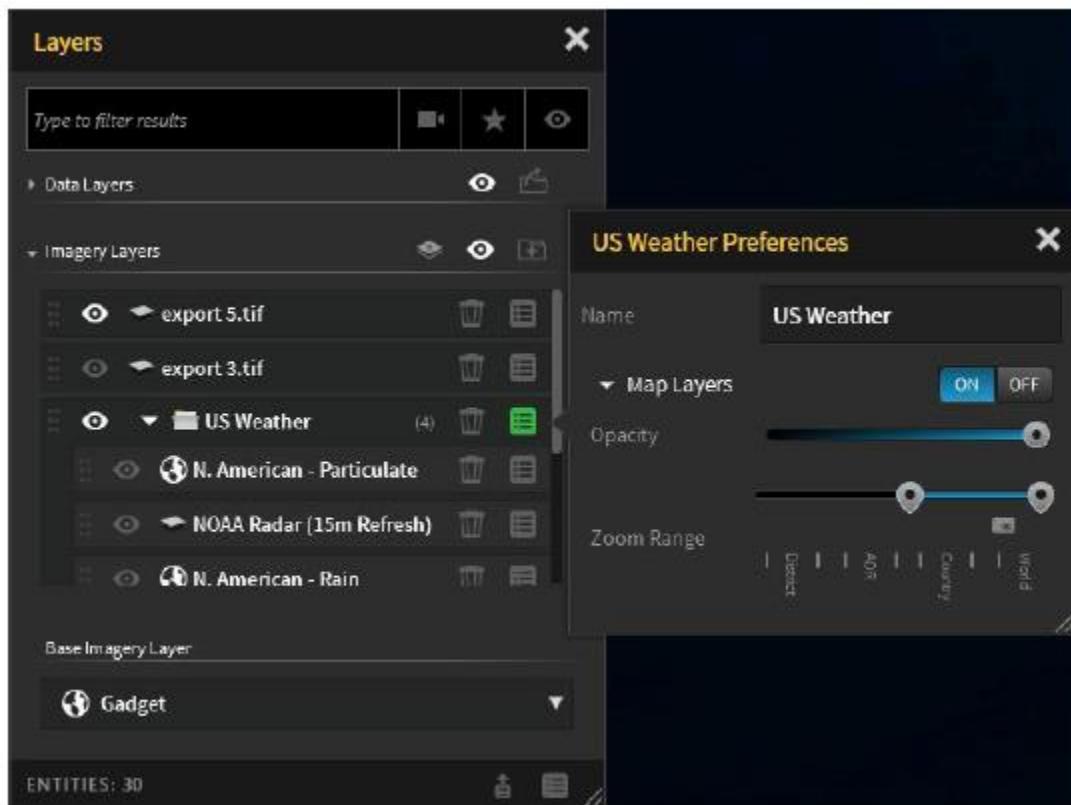


Figure 207. Organize Map Layers into Folders

(h). Adding WMS Layers

Q-Replay has the ability to connect to Web Mapping Service (WMS) layers to be used as the basemap or as an augmentation layer. This can be useful for using different imagery sources, map caching capabilities or public/free data layers. To add a WMS layer click on the “Add Layer” icon next to the Imagery Layers section and select WMS.

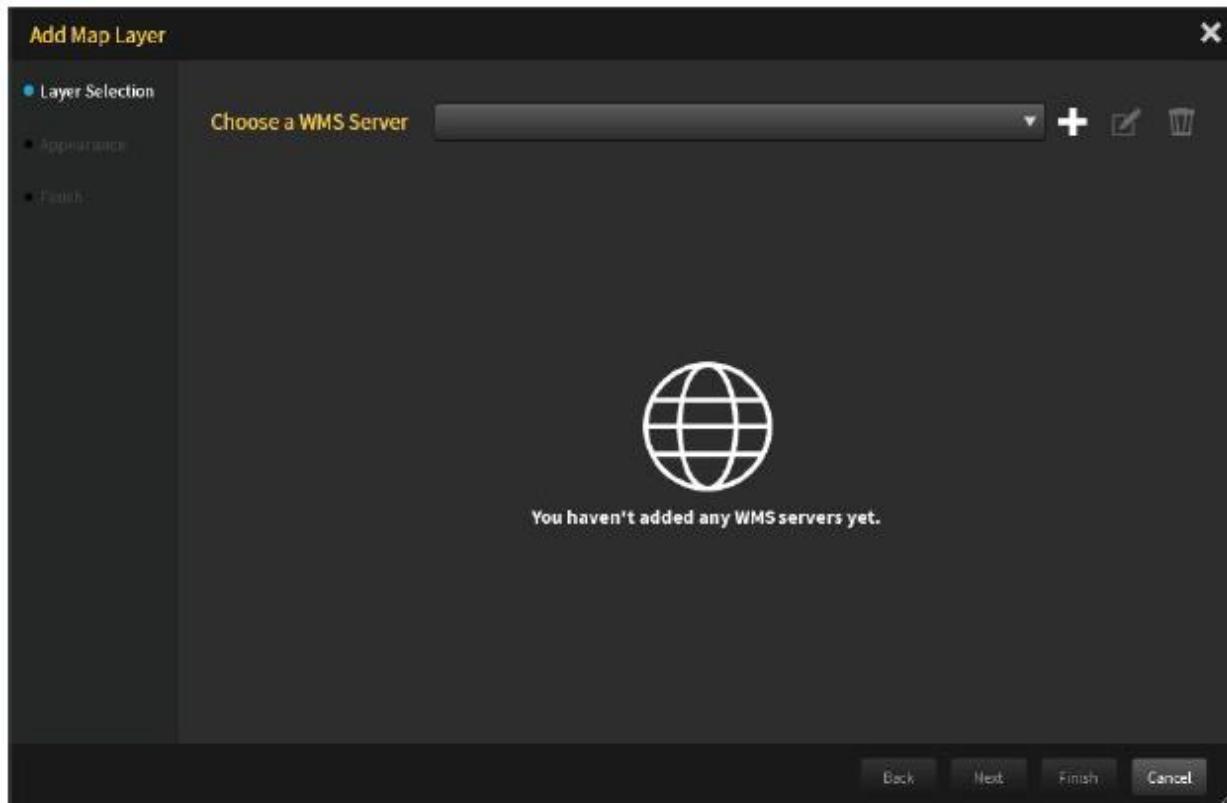


Figure 208. Connect to a WMS Server

To add a WMS server click on the + sign next to the WMS server dropdown. Enter the WMS server url and a name to be displayed on the dropdown. Q-Replay will automatically check connectivity to the server and give a green checkmark indicating a successful connection.

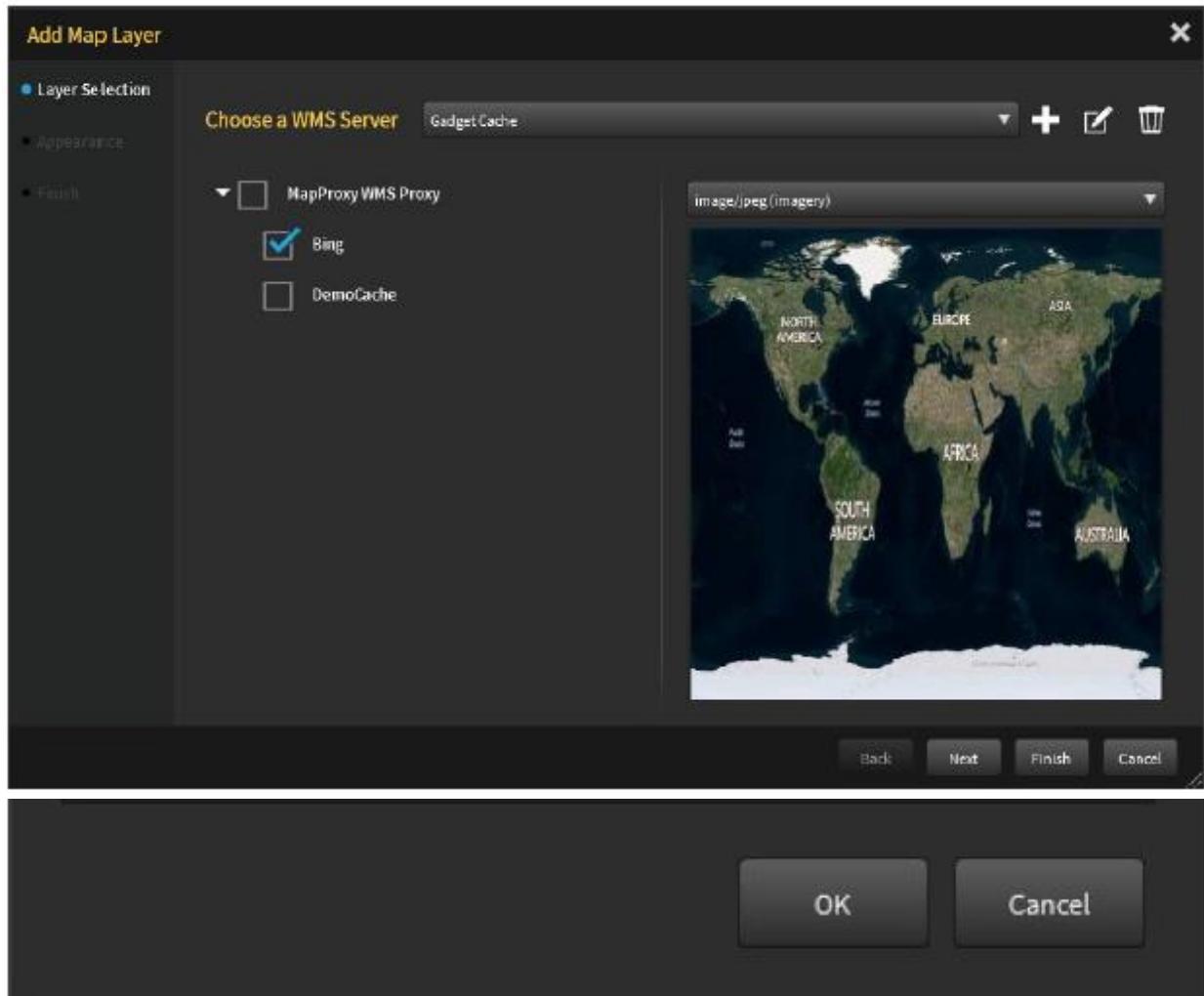


Figure 209. Add a WMS Server

Once the WMS server is added a screen displaying the available layers on the server. To add a layer select the desired layer in the left pane and a preview will be displayed in the right. Both imagery and vector layers can be added as a layer within Q-Replay. To change they type of layer use the dropdown above the preview to select the layer type.

Multiple layers can be combined into one Q-Replay layer, however visualization control within Q-Replay will be at the combined layer level. Add multiple layers by selecting multiple available layers. Click next to proceed in the wizard.

Hint: if the Imagery server only covers a portion of the globe, it might be best to select imagery/png (vector) so any blank space is transparent and the base map will show through.

The next step of the WMS wizard is to set the appearance of the layer to include Layer Order (if multiple WMS layers are being combined into one, Opacity of the layer, Visibility Range (Zoom Level) and Refresh Interval. Opacity and Visibility Range can be adjusted later however Layer Order and Refresh Interval cannot be changed without recreating the layer.

Refresh Interval is important if the data updates, such as weather WMS feeds. These updates will not be scrollable on the timeline but the latest information will be displayed for the layer.

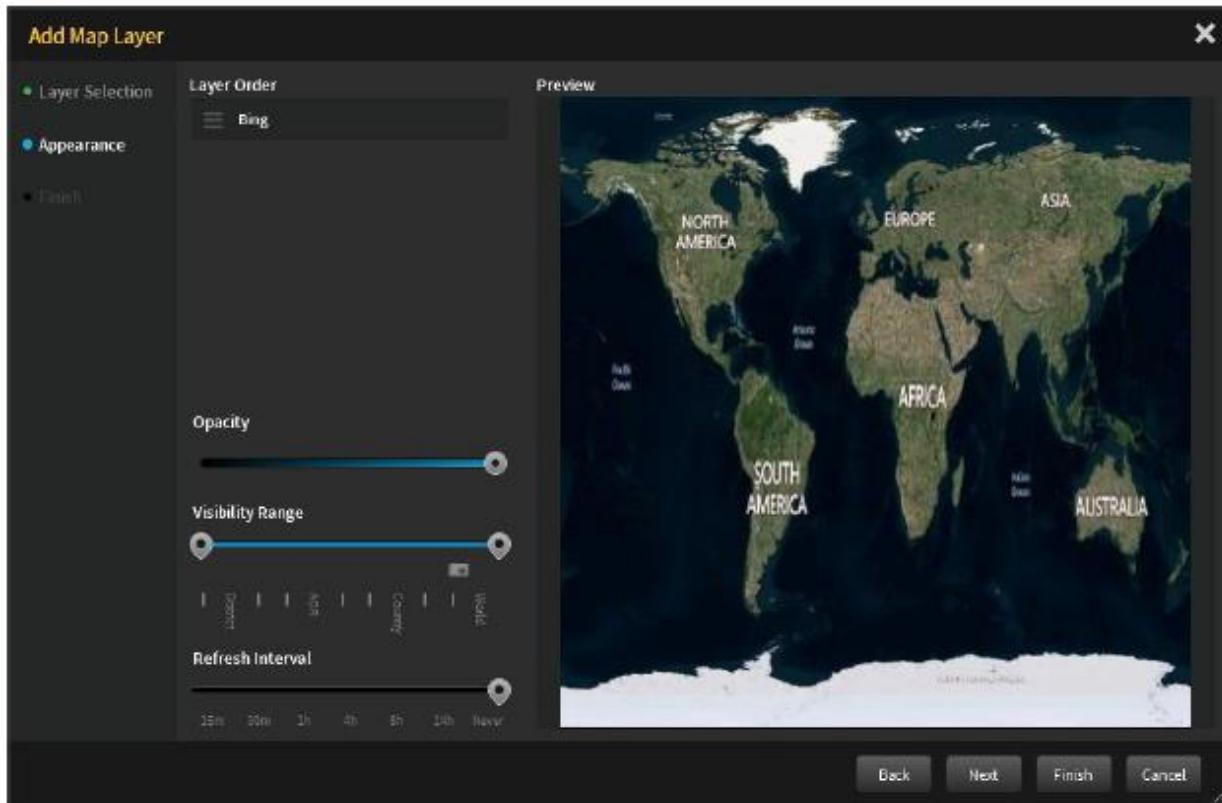


Figure 210. Set Appearance of Layer

After clicking next you can create a custom name for the layer to be displayed in the Layer Manager or keep the auto-generated one. Finish the WMS layer creation by clicking Finish.

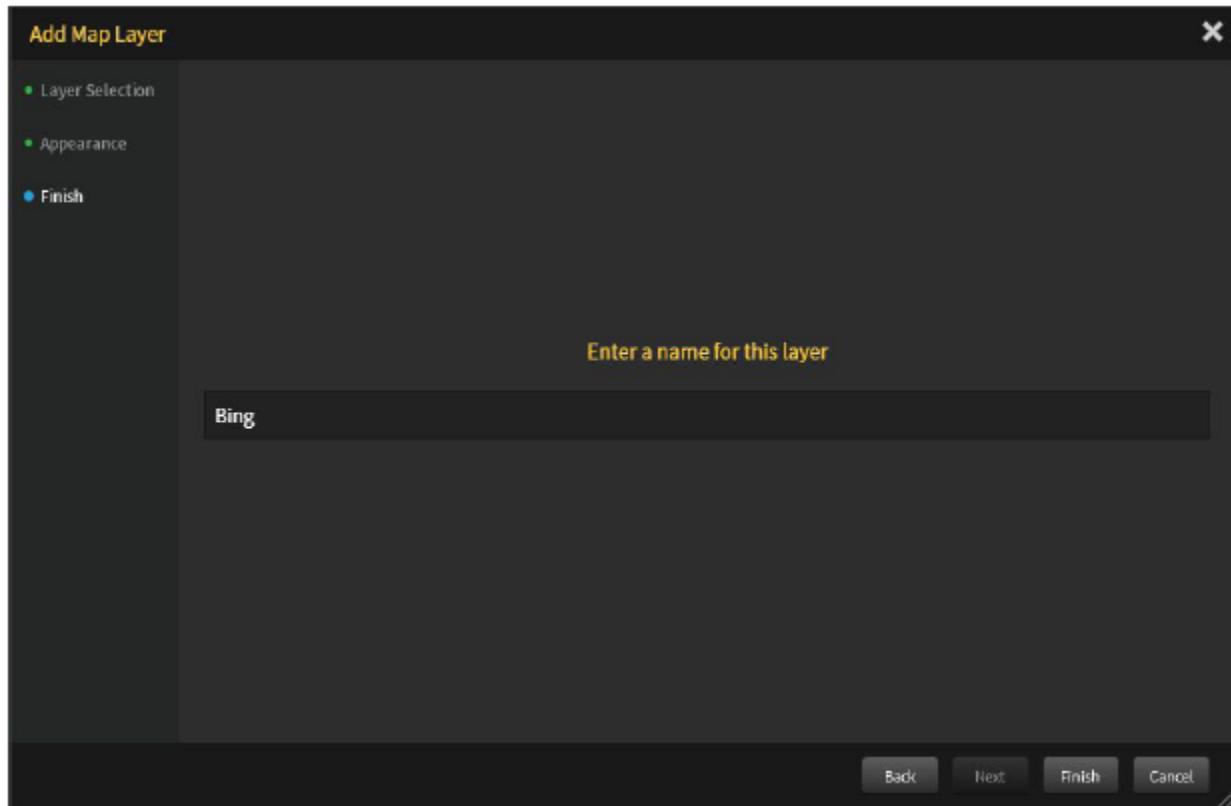


Figure 211. Name Layer

(i). Updating Imagery Layer Preferences

Imagery layer preferences can be updated at the folder level of for each individual layer. Access the layer or folder properties by clicking on the preferences icon next to the layer name. In this window the display name, opacity and zoom range can be changed based on user preferences.

Opacity: Adjusting the opacity slider to the right allows objects or layers underneath that layer more visible. Adjusting the opacity slider to the left hides more of the lower layers. This option is useful when displaying vector or polygon layers over imagery.

Zoom Range: Adjusting the zoom range allows Q-Replay to hide and show the layer based on the zoom level of the map. A camera icon on below the slider shows the current zoom level of the map. This is helpful for cleaning up the view as the user zooms in, for example if the user is displaying the Provinces and Districts of a country then a slight overlap of the zoom range would enable only the Provinces to be shown at broader zoom levels, a slight overlap showing both Provinces and Districts and medium zoom levels and only districts at higher zoom levels.

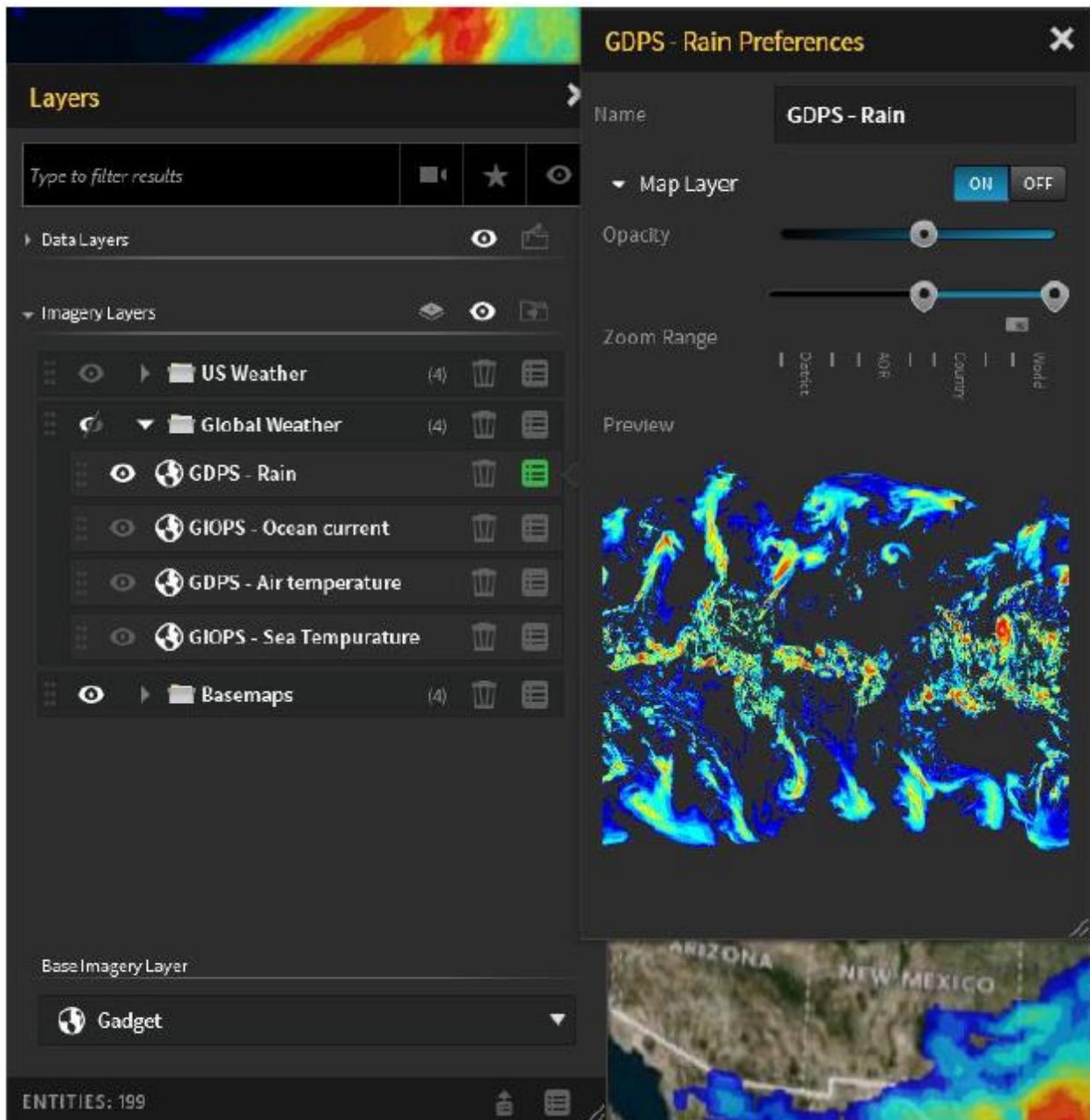


Figure 212. Update Imagery Layer Preferences

(5). PowerPoint Tool

The PowerPoint tool enables Q-Replay users to capture multiple screenshots and then automatically create a PowerPoint Presentation (.ppt). Clicking on the PowerPoint tab will bring up a separate PPT window. Click on the camera icon to take a screenshot of the current map and entities. Note, the Screenshot will not include any entity detail windows that are open. The image will then appear in the next pane inside the window. User can take multiple images and manipulate Q-Replay map in the background while PPT window is still up. To delete screenshots, select the screenshots to be deleted and click the trashcan icon.

Once an Q-Replay user has captured the desired screenshots, the user can select the picture(s) to be exported to PowerPoint. Once the picture(s) have been selected, the user can click the PPT icon to automatically launch and export photos to PowerPoint.

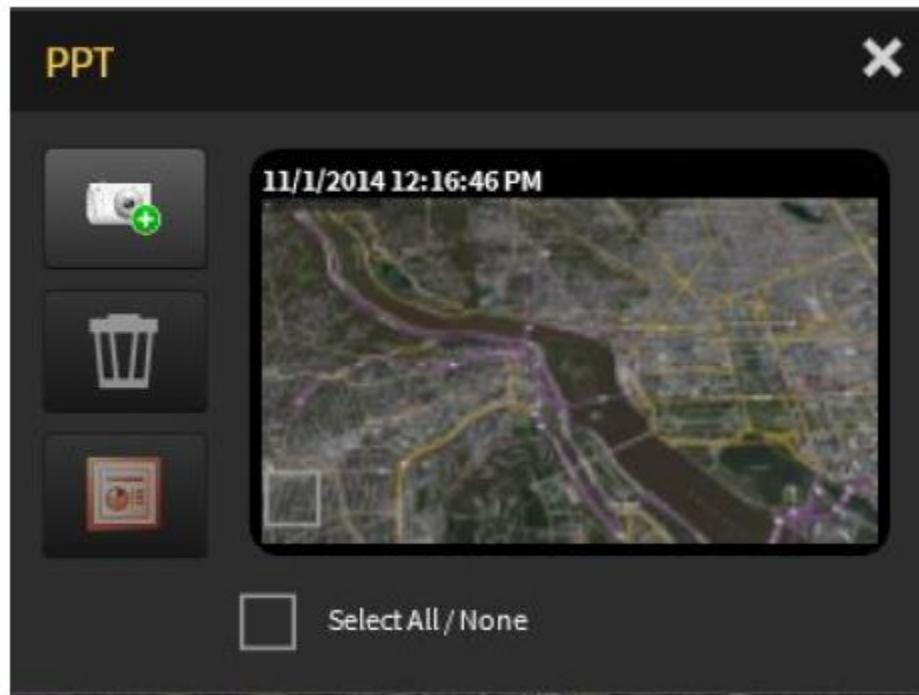


Figure 213. PowerPoint Tool

(6). Take Snap Tool

The Take Snap Tool is located in the Data Management Apps and is short cut to the camera icon located in the Powerpoint Tool. This allows the user to quickly capture a screenshot without having to open a separate tool and later go back and export the images to Powerpoint.

(7). Export Tool

The “Export” tab enables user to export entities from the Q-Replay environment through two different methods: The “Visible” option (all entities on the visible map will be exported) or the “Lasso” option (users select all entities to export). The entities that have been selected are displayed in the center of the Export tool and can be reviewed prior to export. This is good for limiting the export to only certain types of data to export.

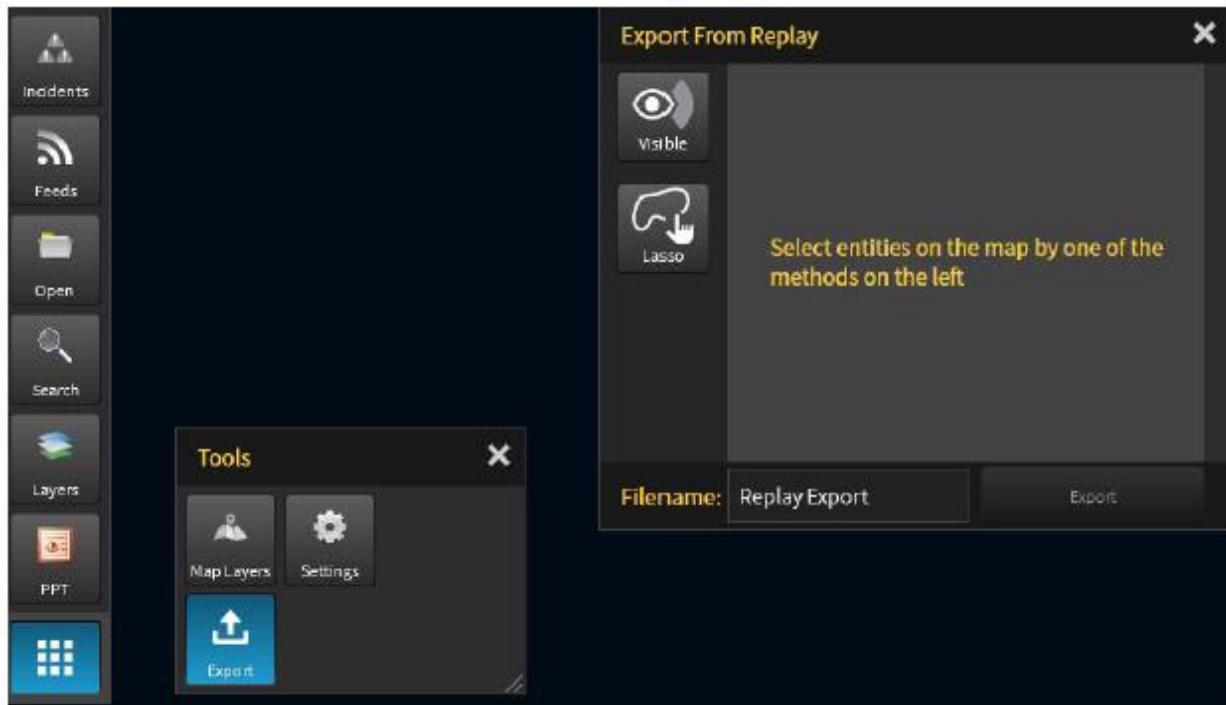


Figure 214. Export Tab

Once entities are selected, change the filename and click export. Q-Replay saves the export in the users Documents folder and asks if they would like to view the location, this will open Windows Explorer to the Documents folder. The export is saved as a.KMZ file that can be opened in Google Earth. If the entities selected have temporal data that information is exported as well and a time slider will show up in Google Earth. This is a very powerful feature as temporal data in Q-Replay is then sharable with other users not using Q-Replay but still getting the benefits of the temporal aspect.

(8). Live Mode

Live Mode was developed to maximize map screen real estate by hiding the timeline, shortcuts and data creation tools. The data management tools are combined into a single window. This mode is essentially running Q-Replay at the “Live” time and is useful for monitoring current operations. To exit Live mode click on the Live Mode button and Q-Replay will return to standard tools and controls.



Figure 215. Live Mode

(9). Share view

Shared view allows two Q-Replay units to send the current view from one Q-Replay device to another. When selected available Q-Replay units will be displayed in the shared view window. To send your current view (Location, Timeline Position and Zoom level) click on the Send View button.

NOTE: This capability uses multicasting, so routers within the network need to pass the multicast traffic.

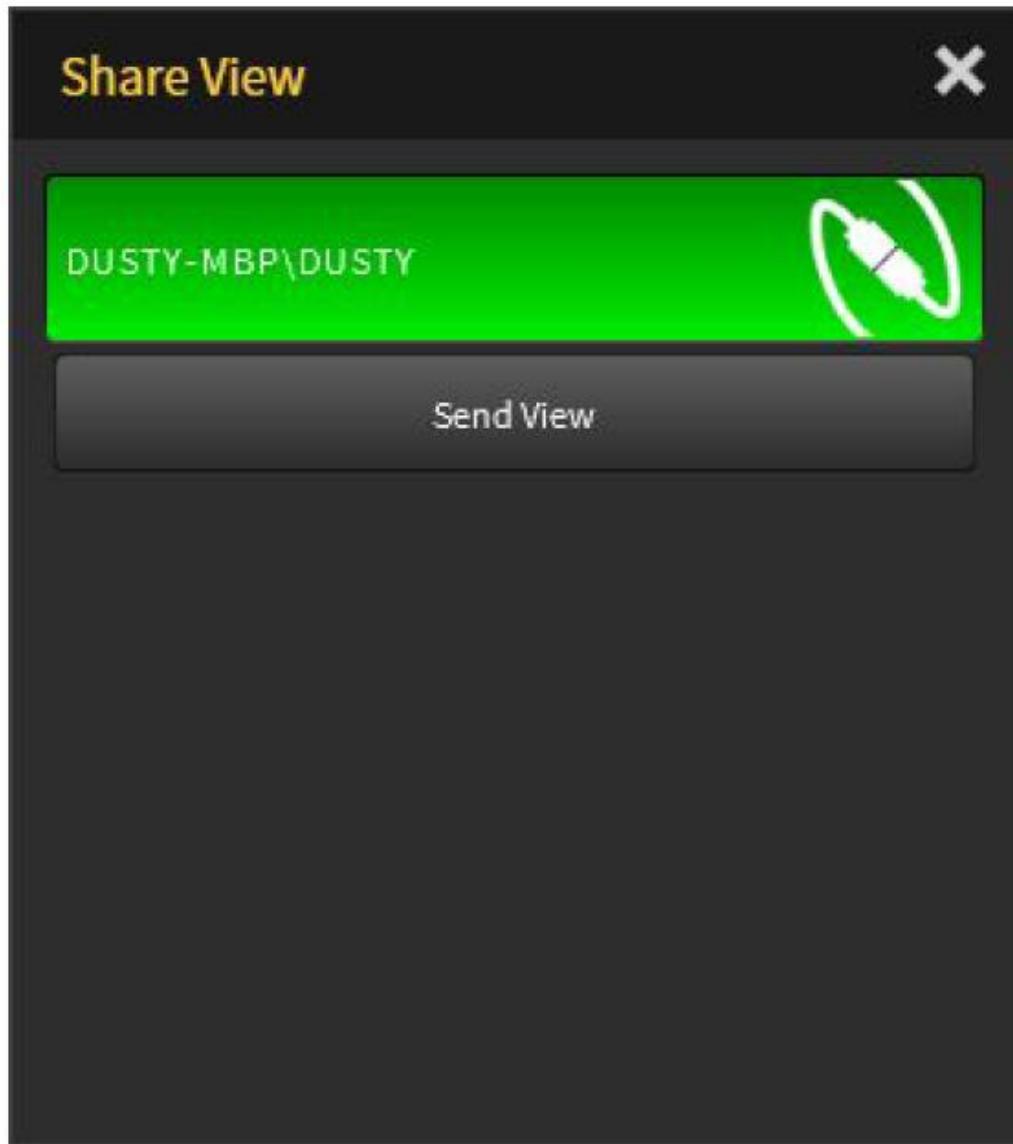


Figure 216. Share View

On the other Q-Replay they will be prompted to accept the new view request, click Yes to zoom to that location otherwise click No to resume current view.

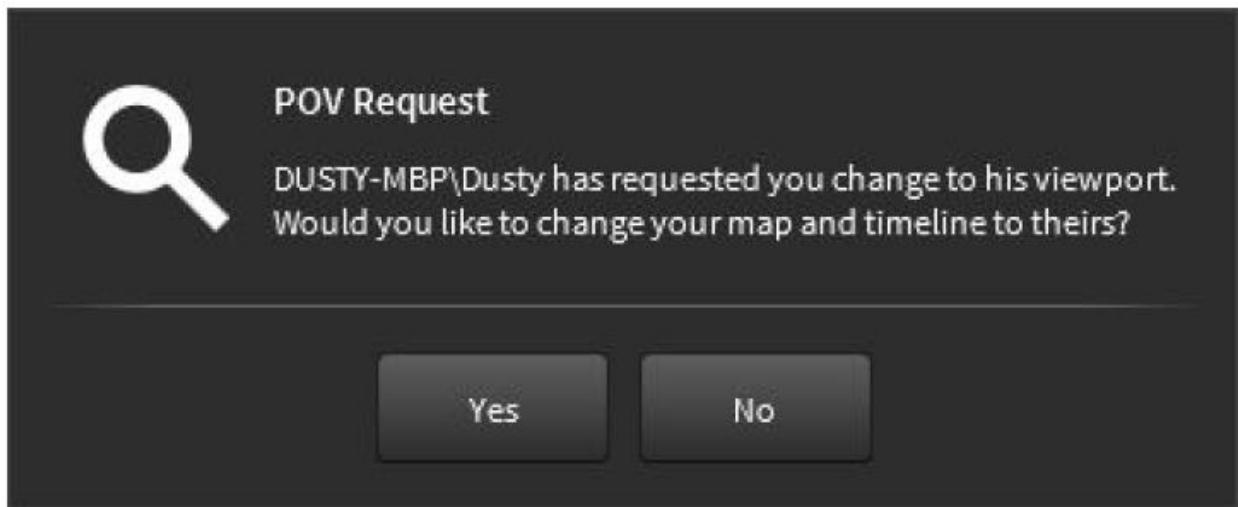


Figure 217. Accept/Reject Request

(10). AOI Filter

The AOI Filter allows you to filter entities and events to a defined region. This is useful when connected to global feeds but focused on a particular region of interest. In the AOI Filter window you can define the color that shades the rest of the globe as well as define the region using Fast Draw or a Circular region.

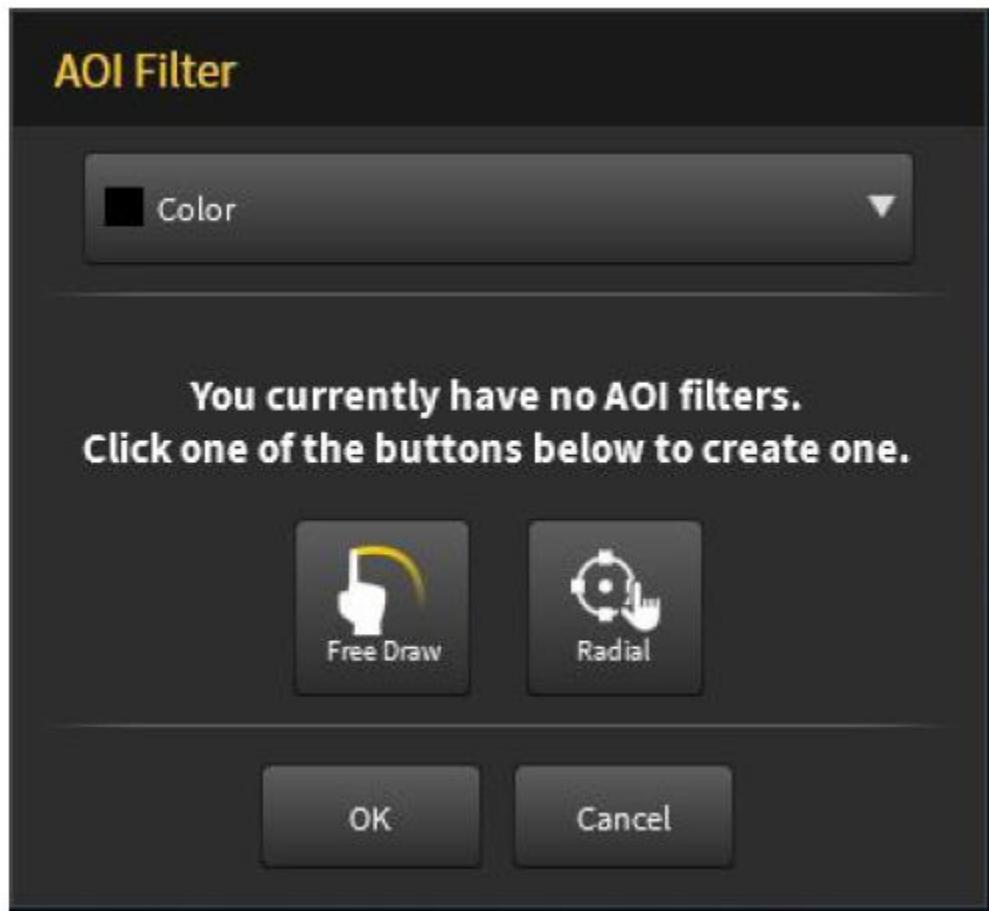


Figure 218. AOI Filter

Once the region is defined you can name it and active it as desired. In the image below you can see the defined region in blue with some entities in the San Francisco area. Once the AOI Filter is activated the entities in the Bay area will be filtered out.

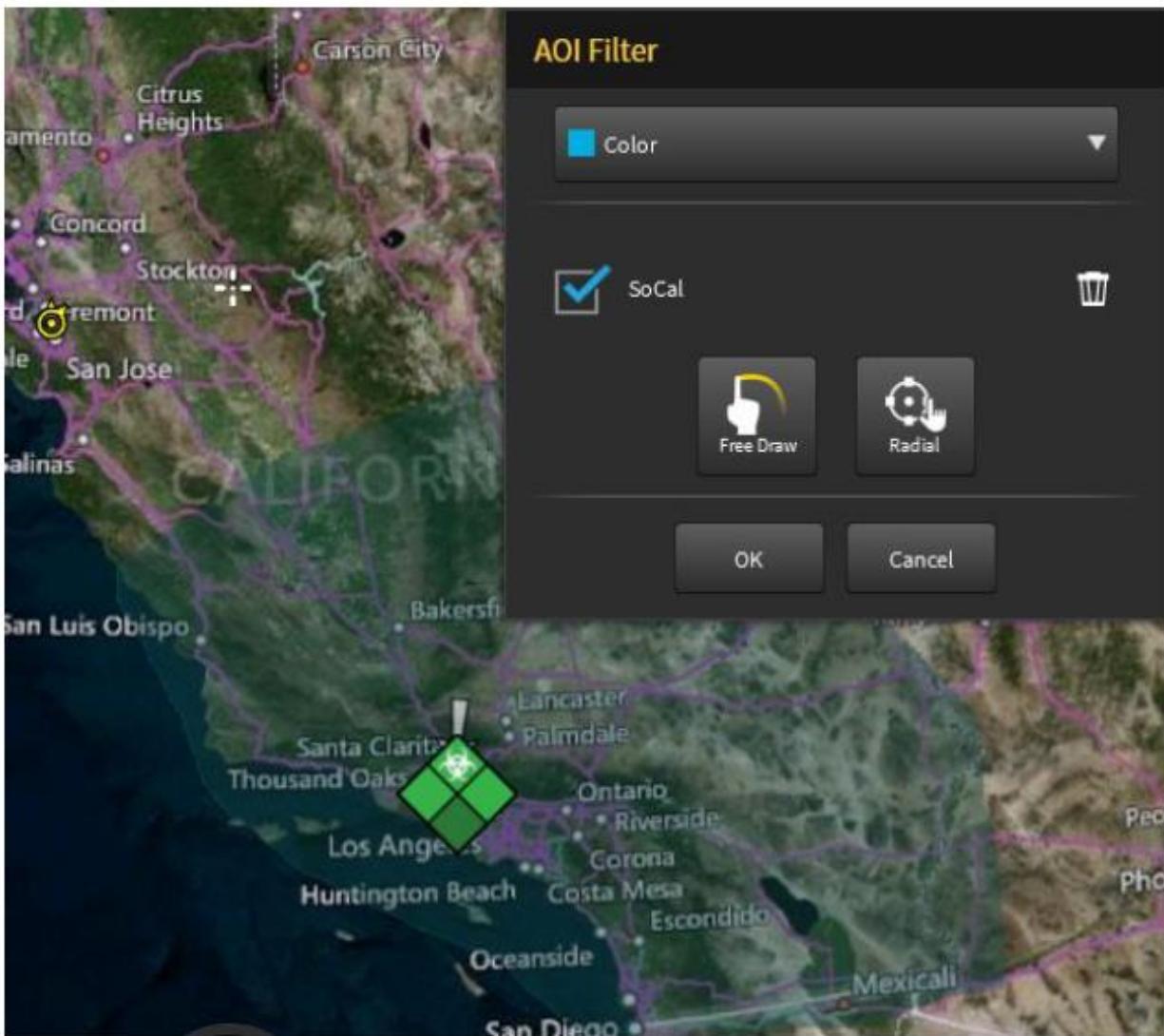


Figure 219. Applying a Filter

Notice the region is blue (as defined by that AOI) and only the entities within the AOI are showing.

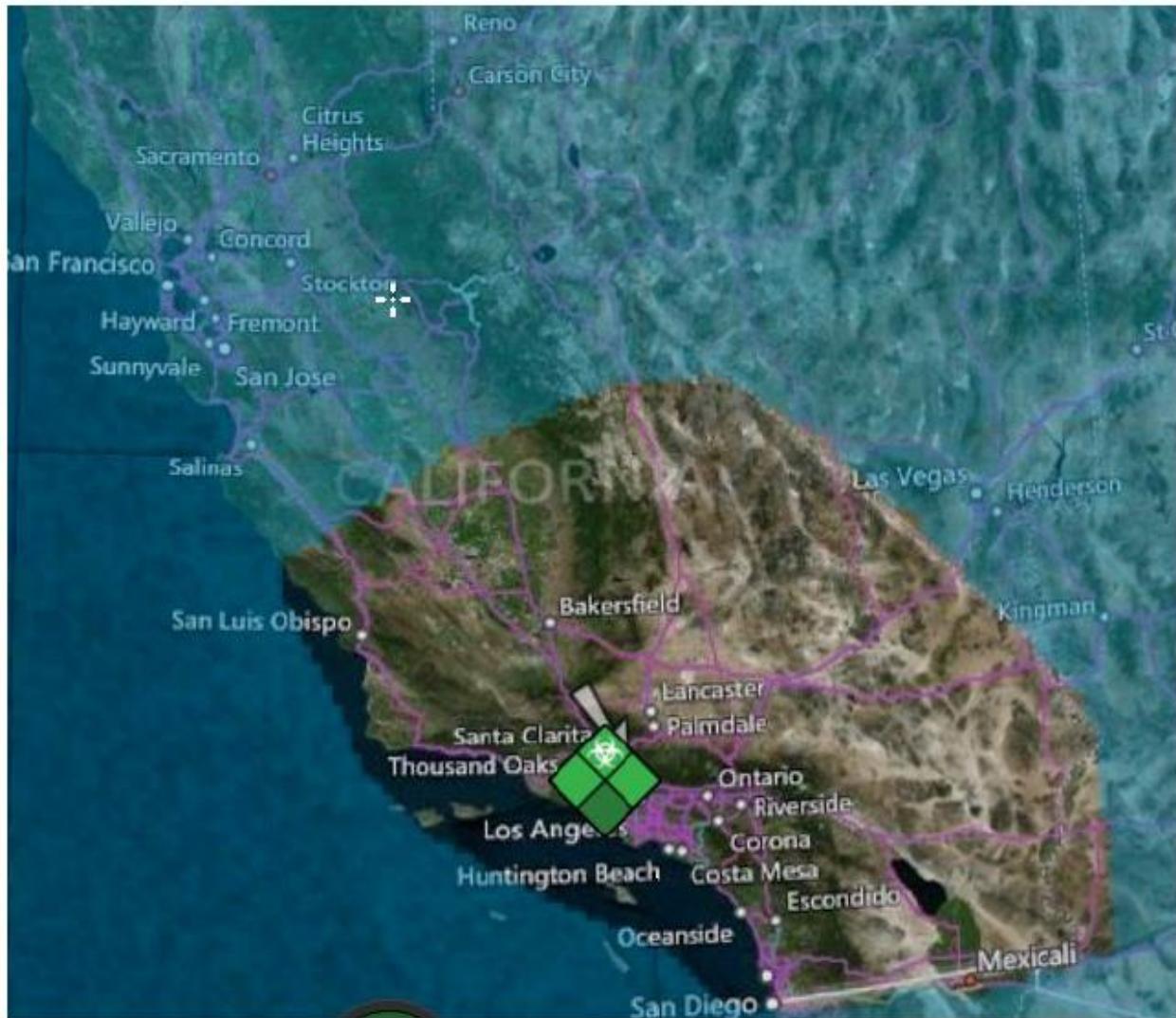


Figure 220. Filtered Out Map

(11). Chat

The chat application allows Q-Replay users to monitor IRC and Lync chat rooms. Once configured a number of rooms can be monitored at the same time using either a Grid layout or a Tab layout. In Grid layout it will expand automatically as the number of chat rooms are opened.

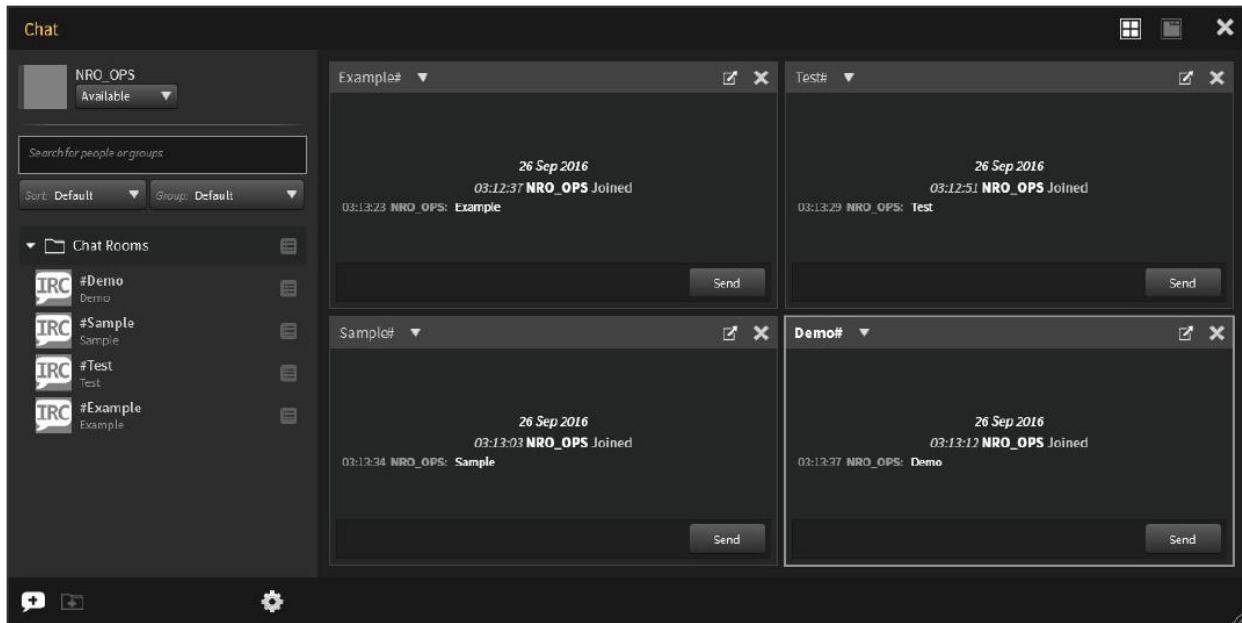


Figure 221. Chat Application

Below is an example of tabular layout. As updates are made the tab will change color to indicate activity.

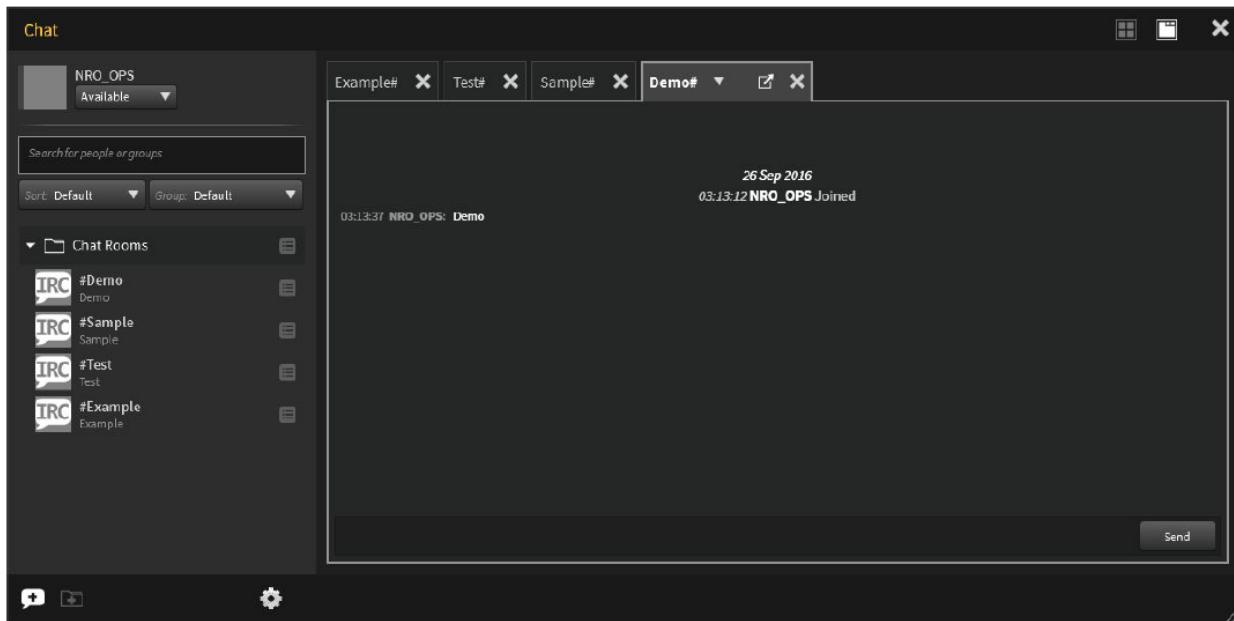


Figure 222. Chat Application Tabular Layout

Chat windows can also be undocked from the Chat client as needed.

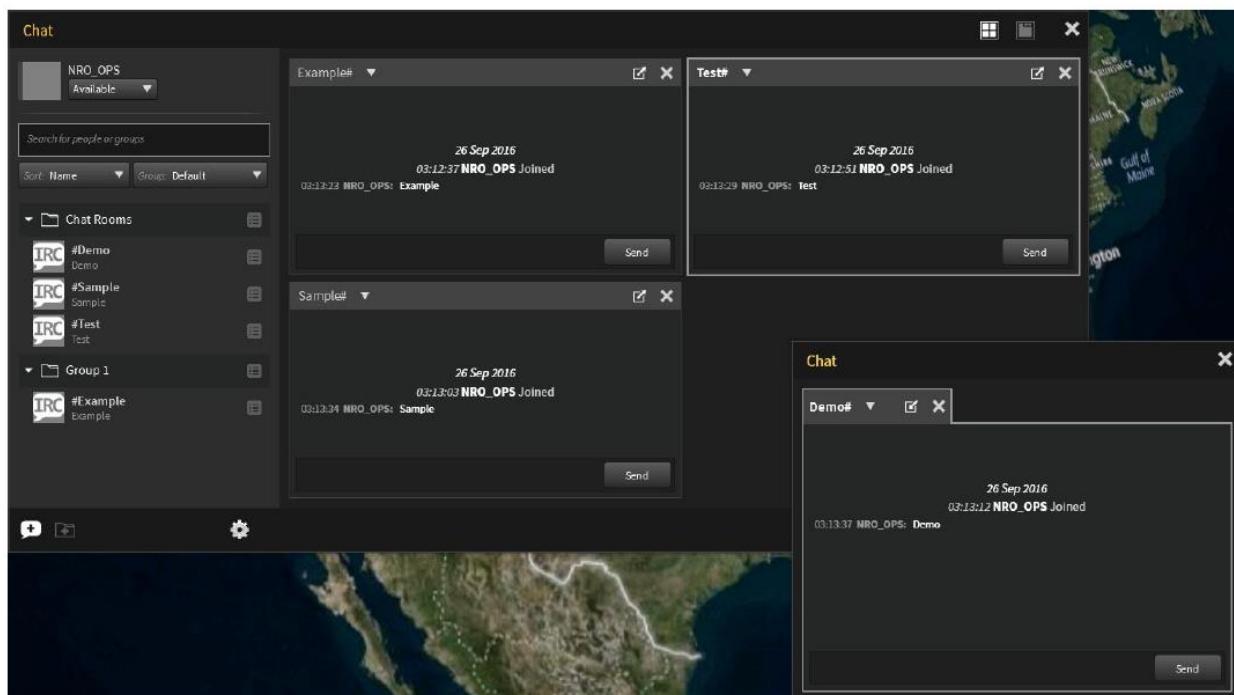


Figure 223. Undock Chat Window

If certain entities are communicating through IRC, the chat room can be associated with that entity by clicking on the Chat + icon in the entity details. This allows the Q-Replay user to open up that Entity and shortcut to the Chat room for communicating without looking through many windows for the right room.

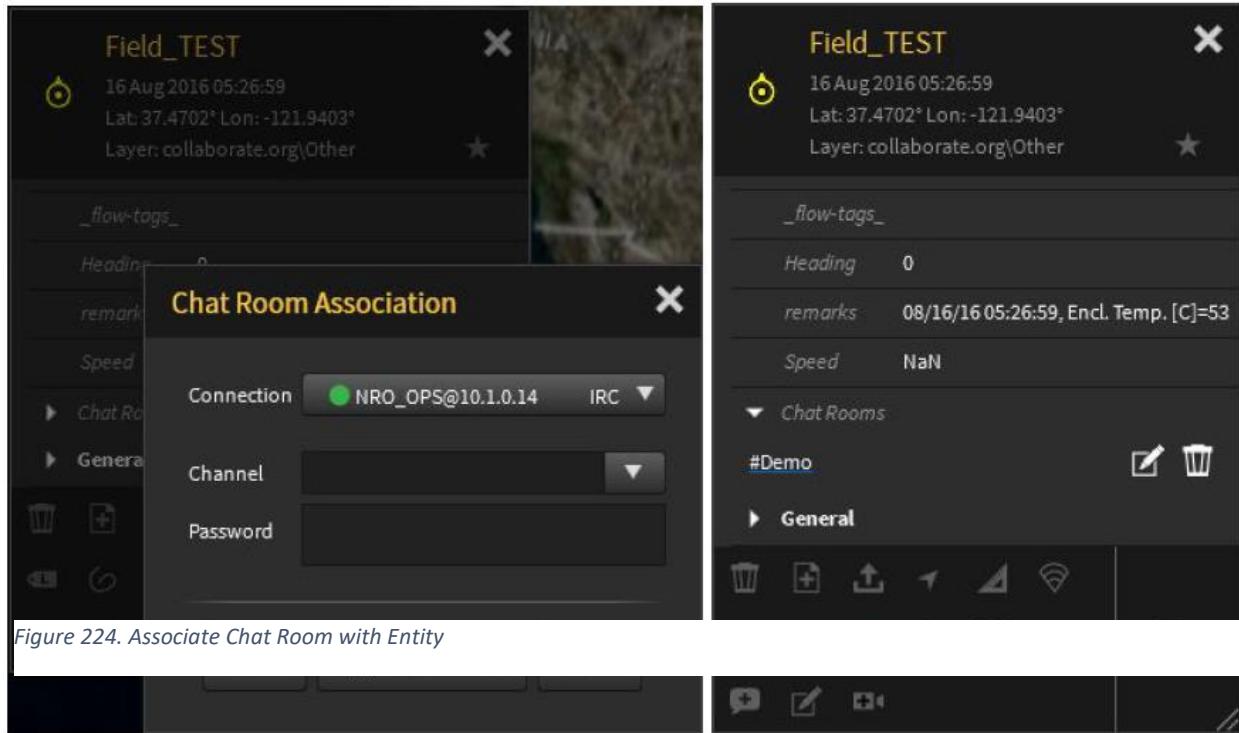


Figure 224. Associate Chat Room with Entity

9-7. CONFIGURING Q-REPLAY.

a. Settings Manager

The “Settings” tool enables users to set preferences for Q-Replay configuration. This can be useful for changing default settings like map coordinates, shortcut keys, connecting to specific ArcAngel Servers or Updating Twitter credentials.

(1). About

The “About” tab displays version information for all of the plugins that comprise the Q-Replay platform.

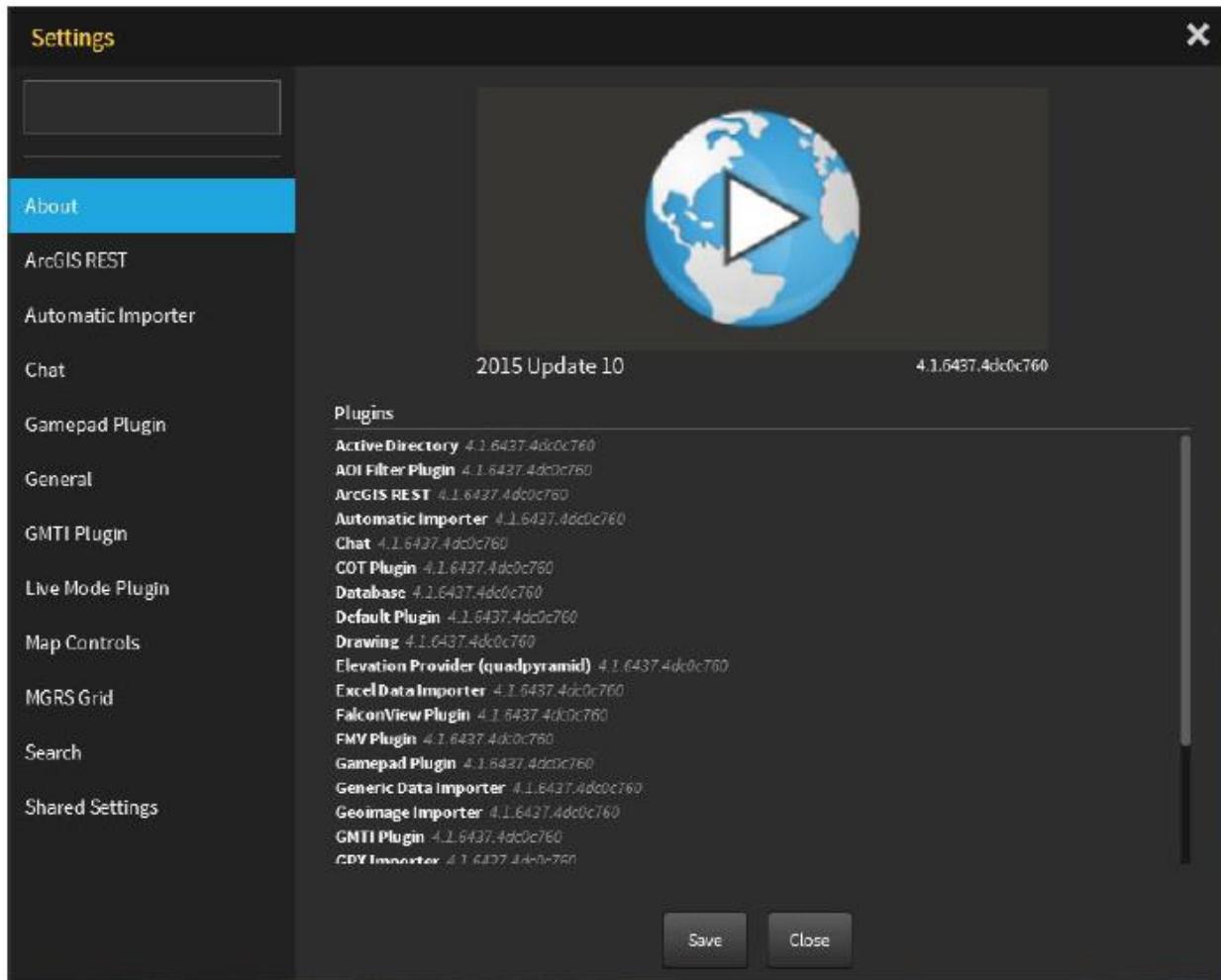


Figure 225. About Tab

(2). ArcGIS Rest

The ArcGIS REST configuration allows you to connect Q-Replay to and ArcGIS Rest service. Configuration includes the Display name and the URL of the service. Multiple ArcGIS REST services can be connected using the Add Feed button. Once a connection is added a restart of Q-Replay is required.

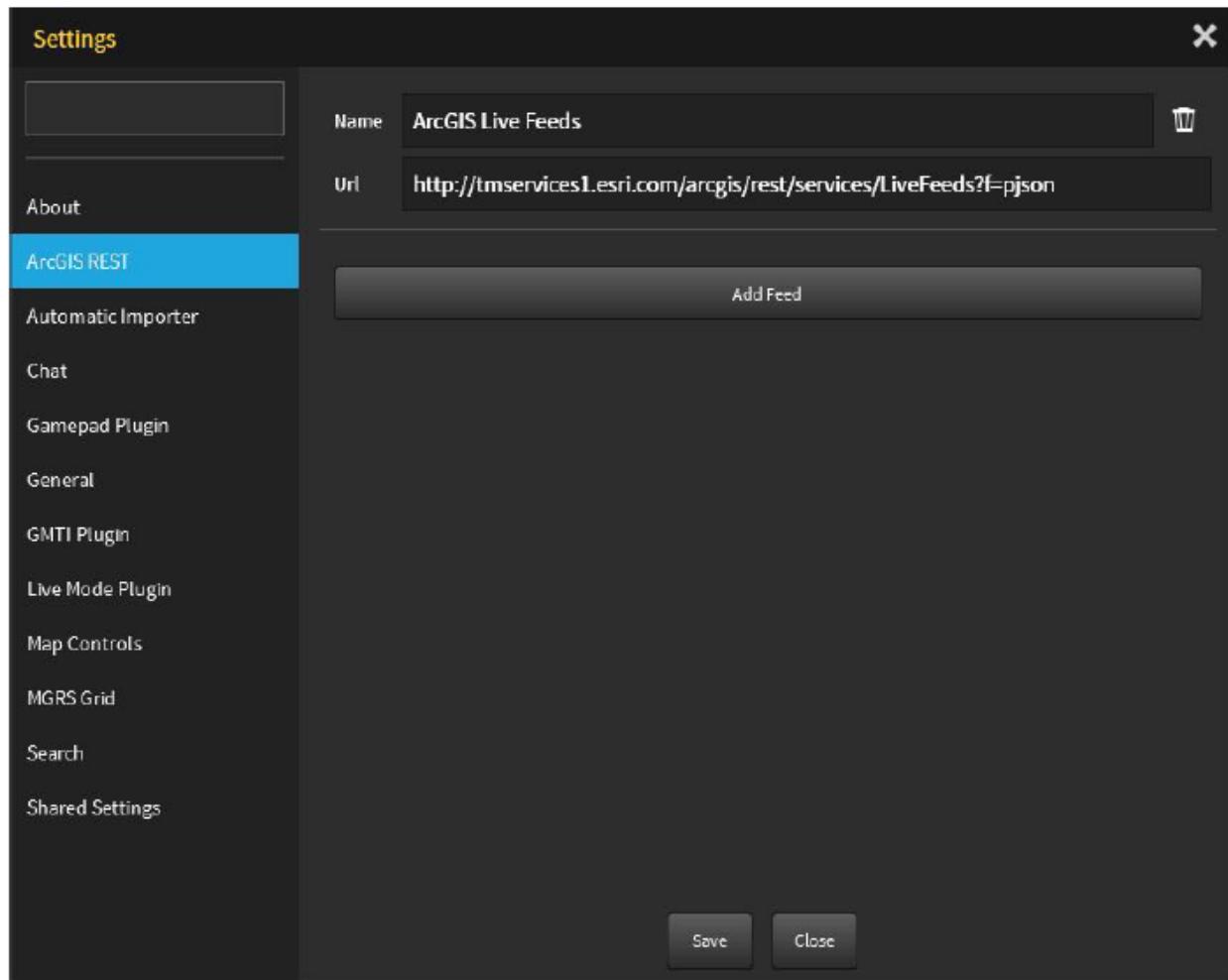


Figure 226. ArcGIS Rest Tab

Once the source is added and Q-Replay is rebooted they will show up in the Search tool as a data source.

(3). Automatic Importer

The Automatic Importer tab enables user to set preferences for importing data files when Q-Replay is started. The dropdown menu has three options: Choose Files to Open, Automatically Import Files, and Do Nothing.

Choose Files to Open – If this option is selected, files that were previously opened in Q-Replay will appear during the startup and users will have the ability to choose specific files to load for that session. This is useful to preserve memory, system performance, and/or customize the specific Q-Replay session. If selected, user must manually select files whenever a new session of Q-Replay is opened.

Automatically Import Files – This option allows user to select the files that will automatically load when Q-Replay is initiated and bypass the manual option.

Do Nothing – No files will be displayed when Q-Replay is opened.

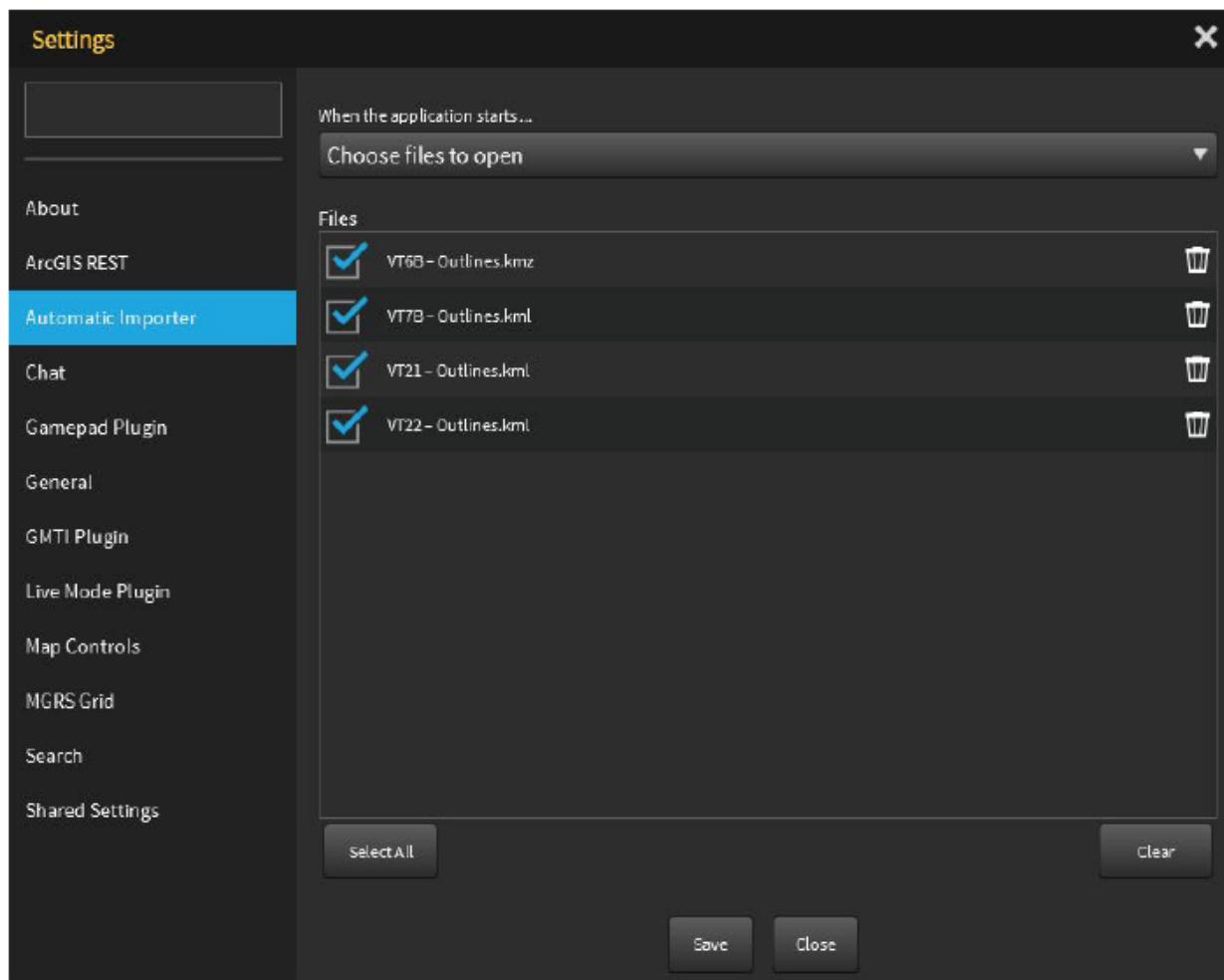


Figure 227. Automatic Importer Tab

(4). Chat

The Chat settings window allows the user to define the chat server connections as well as how the notifications are made within Q-Replay. To add a new IRC server click on the Add button at the lower portion of the window.

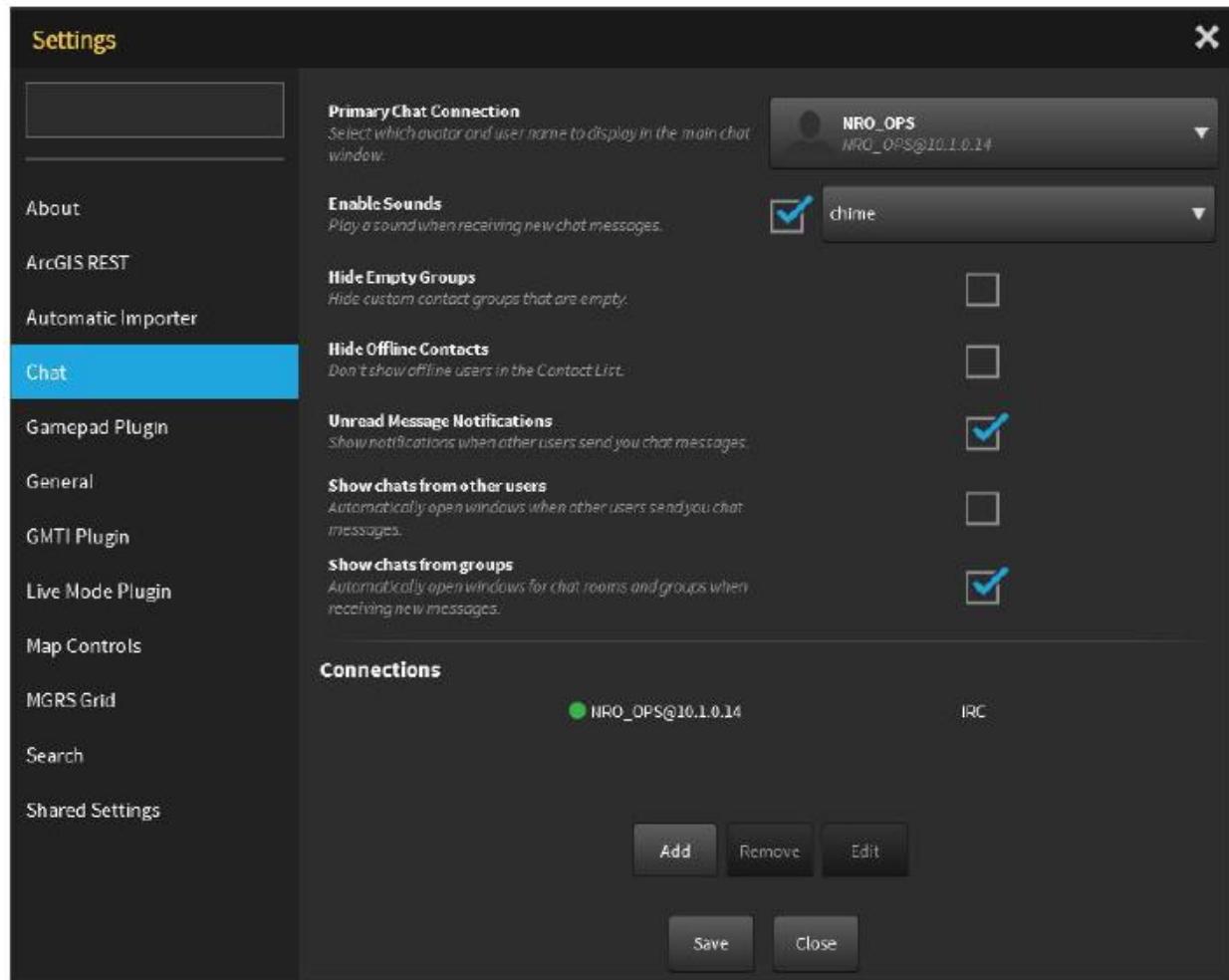


Figure 228. Chat Tab

The new Chat connection window is where you define the type of chat server for the connection, the Host, Port and username and password for the connection.

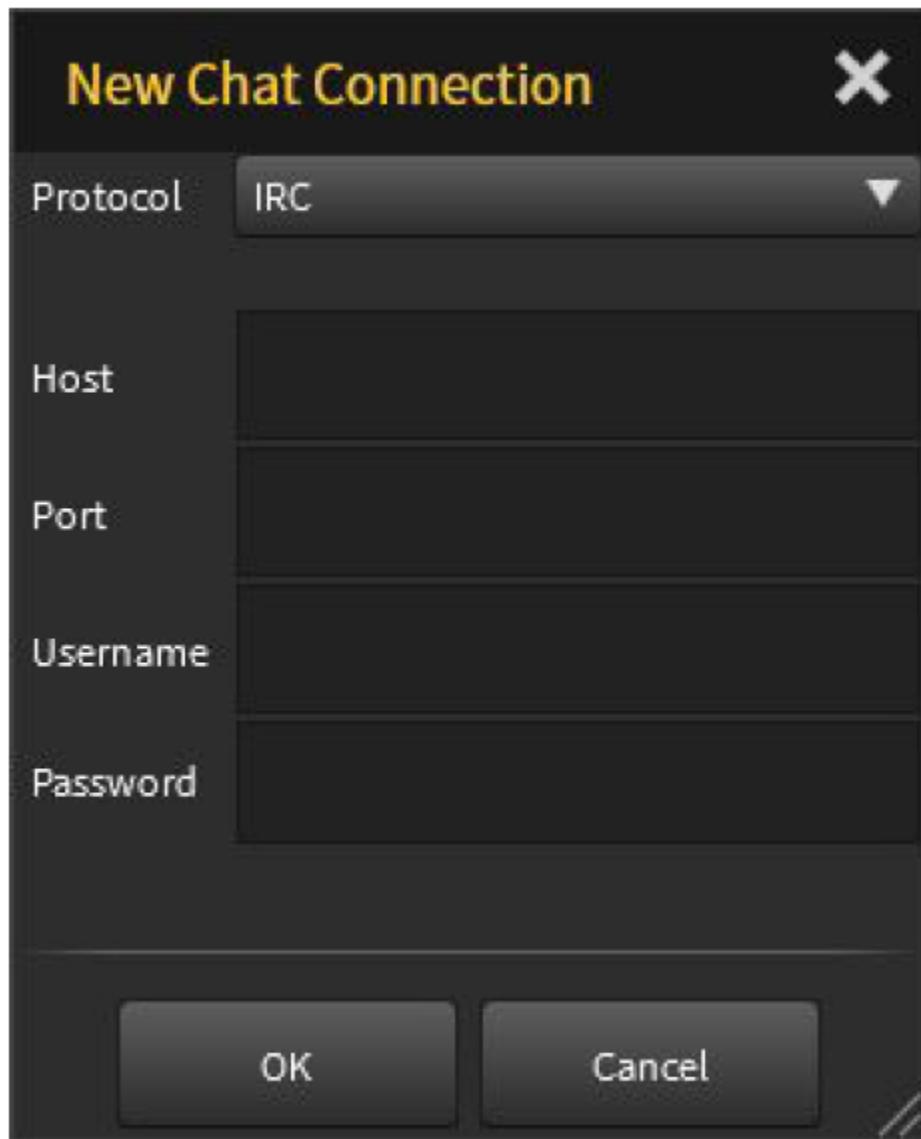


Figure 229. New Chat Connection Window

(5). Gamepad Plugin

The Gamepad plugin allows an XBOX controller to be used to move the Q-Replay map around and allows the user to assign tasks to the buttons.

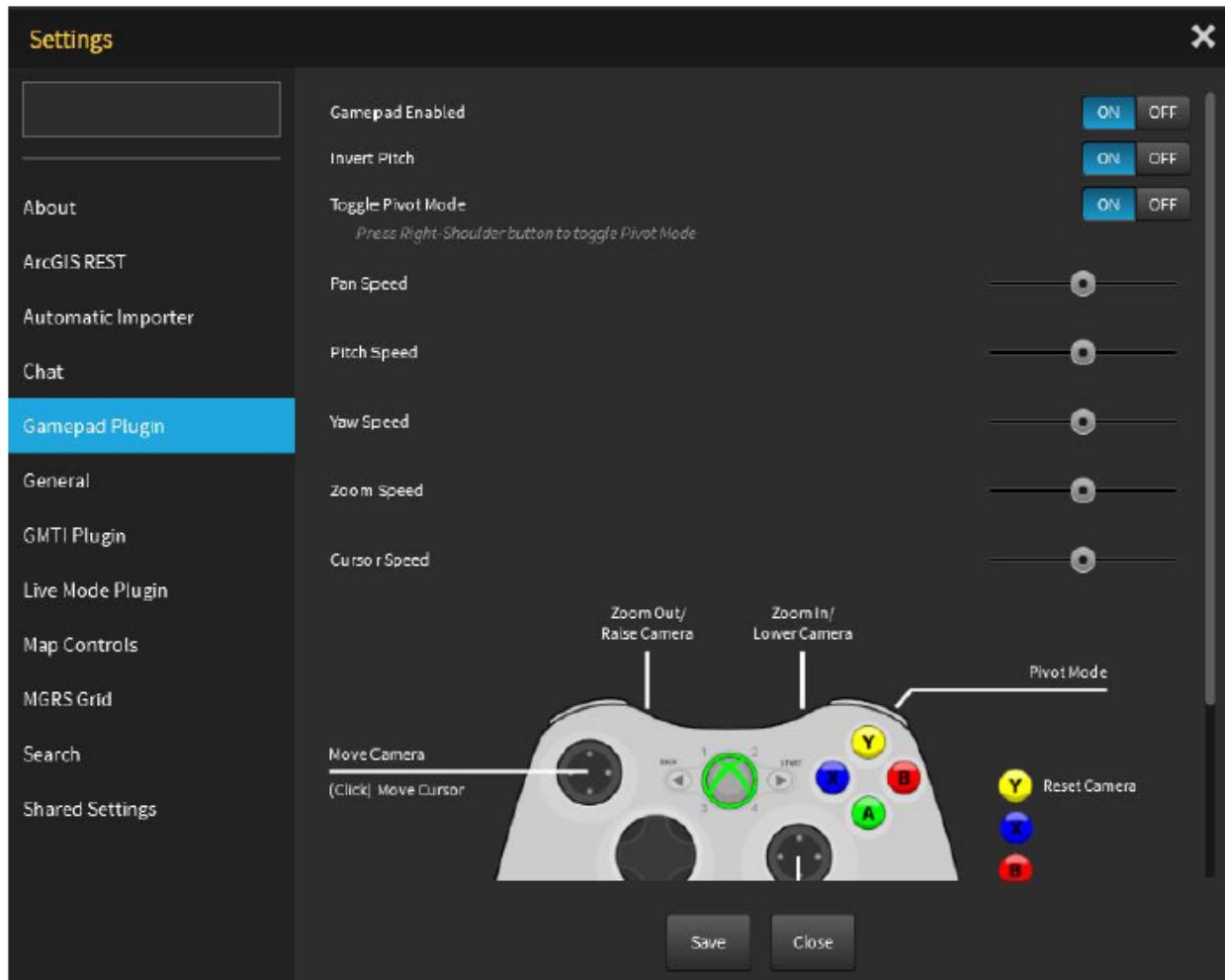


Figure 230. Gamepad Plugin

(6). General

The “General” tab allows users to choose various settings of applications inside Q-Replay.

Display – enables user to choose which Q-Replay is displayed on if multiple screens are connected to that computer.

Location Format – allows user to choose between Decimal Degrees, Degrees/Minutes/Seconds, or MGRS.

Measurement Format – options include Metric or Imperial.

Mouse Zoom Mode – options include Zoom to Crosshair or Zoom to Cursor.

Crosshair – Enable this option to show the crosshairs at the center of the screen. Although used for zooming in the above setting it also allows users to get precise coordinates in the top Navigation (Compass / Location)

Overlapping Entities – Enabling this feature will display all entities at a click location which can be useful if many layers have been added to Q-Replay

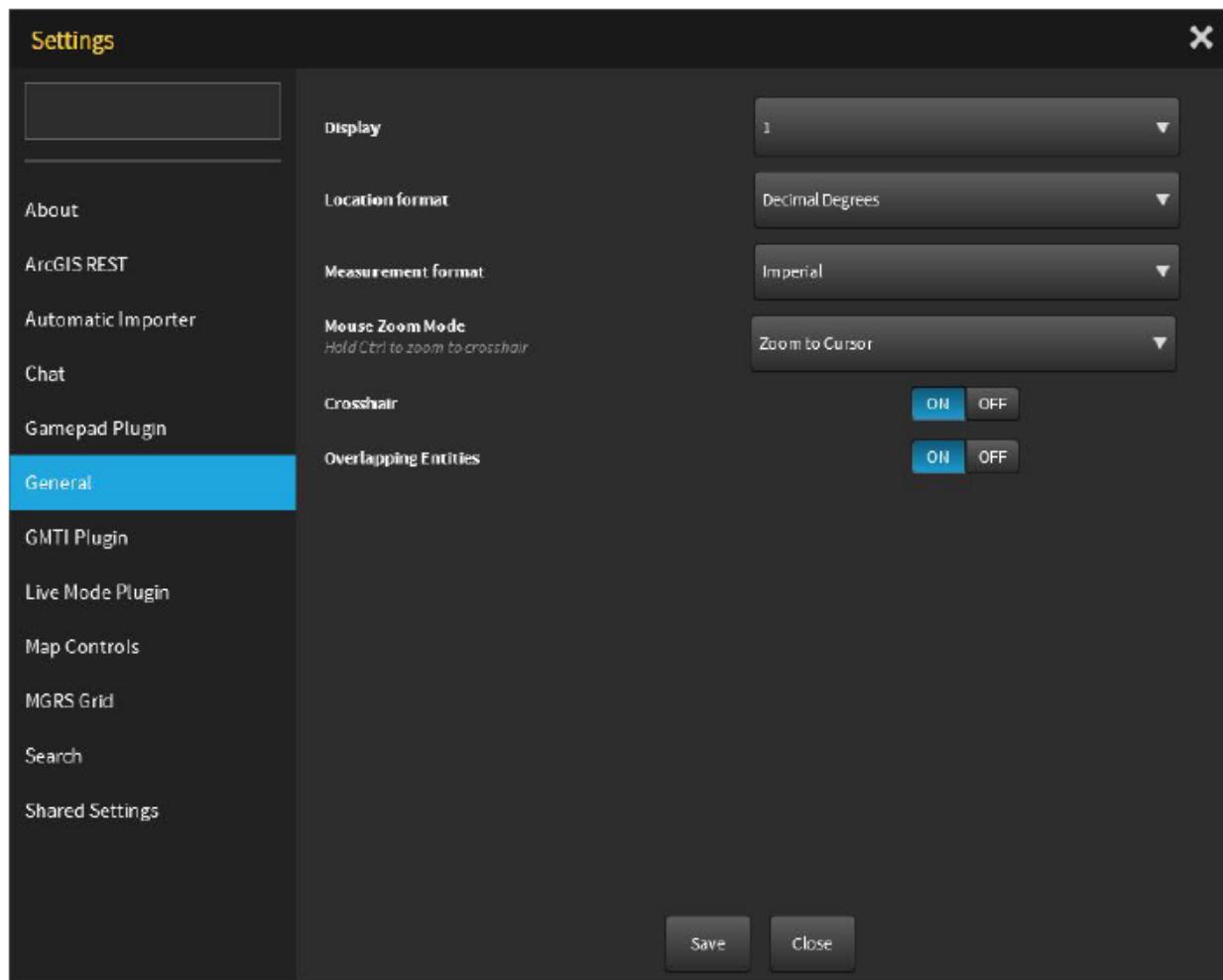


Figure 231. General Tab

(7). GMTI Plugin

If connected to a GMTI feed the GMTI Plugin settings allows you to change the color of the icons on the map.

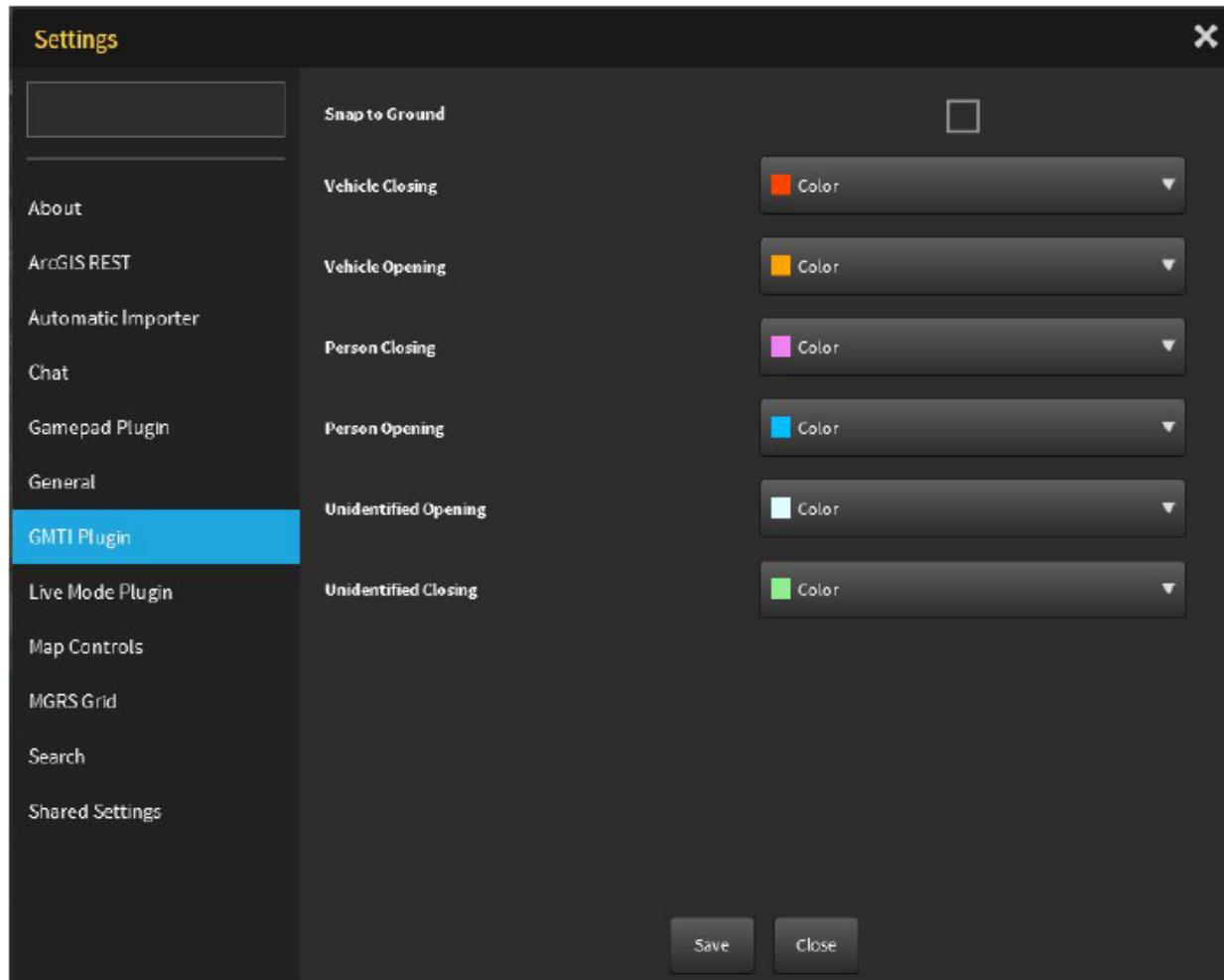


Figure 232. GMTI Plugin Tab

(8). Live Mode Plugin

The Live Mode plugin allows the user to define the maximum age of entities on the map. The default is 1 min.

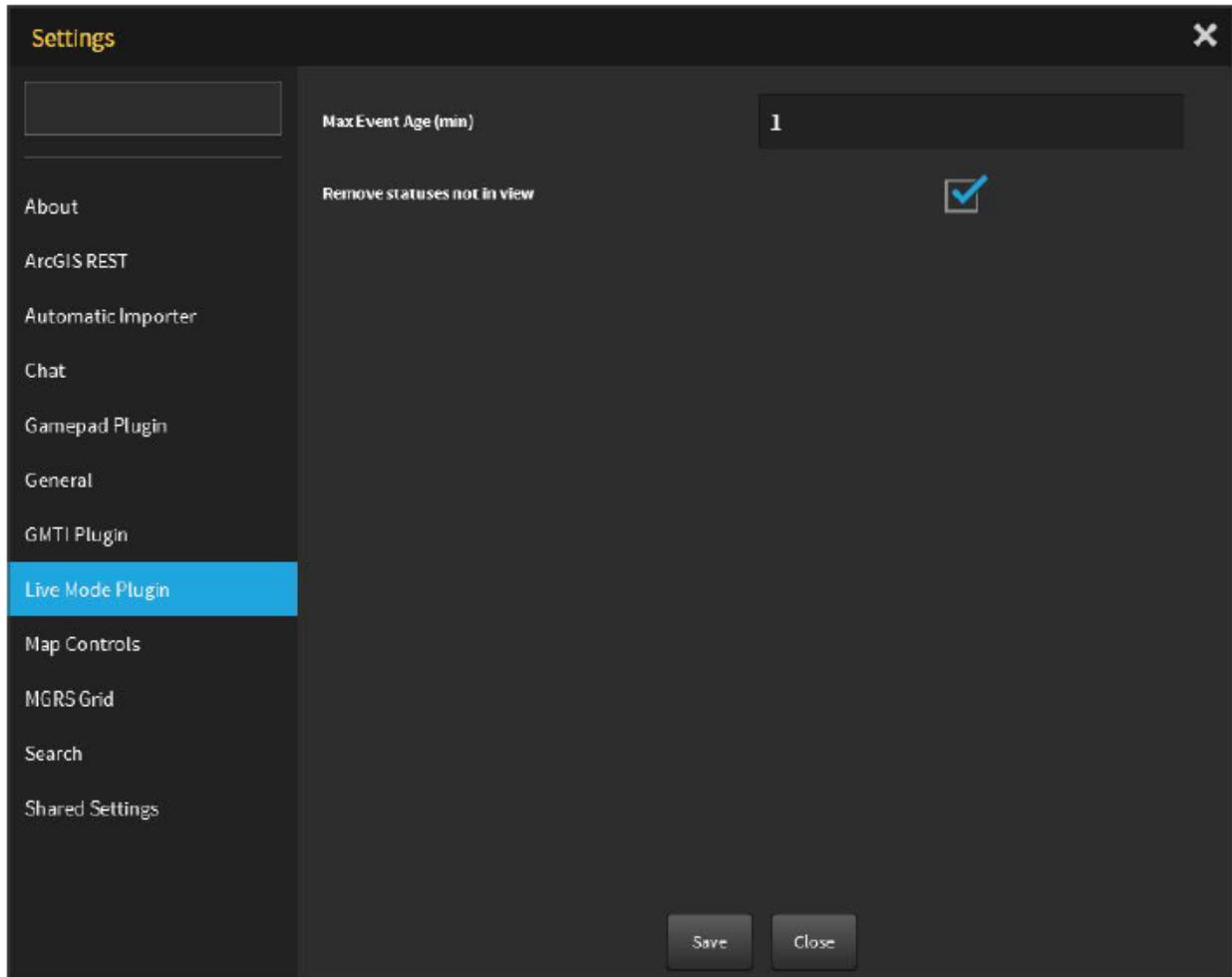


Figure 233. Live Mode Plugin Tab

(9). Map Controls

This tab enables users to set specific keyboard shortcuts (hot keys) for controlling the map without use of a mouse or touchscreen. Users can change the defaults by clicking on a button next to the action and pressing the new key to map to that action.

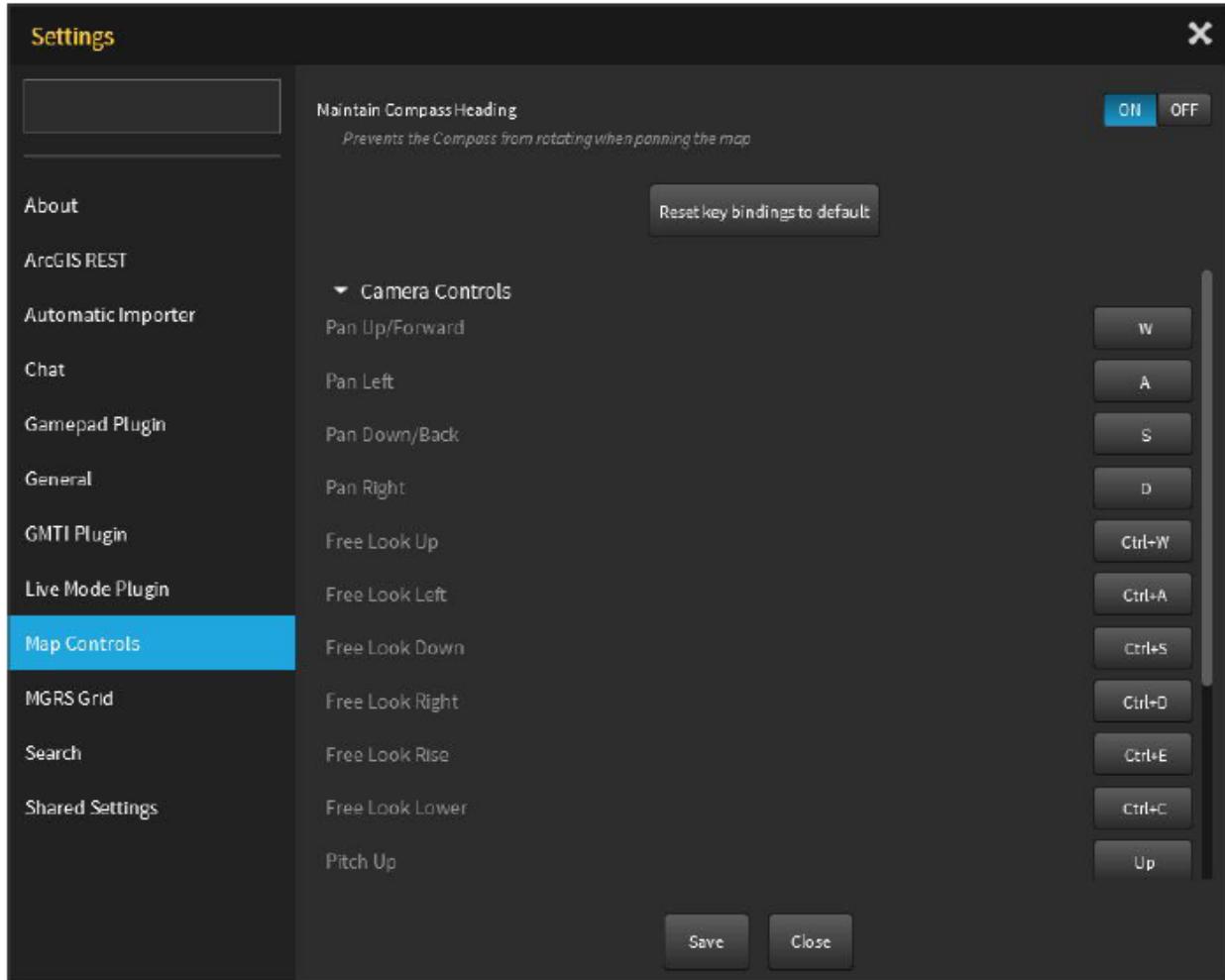


Figure 234. Map Controls Tab

(10). MGRS Grid

The MGRS tab allows users to display Military Grid Reference System lines on the map. This is useful if dealing with US Military customers.

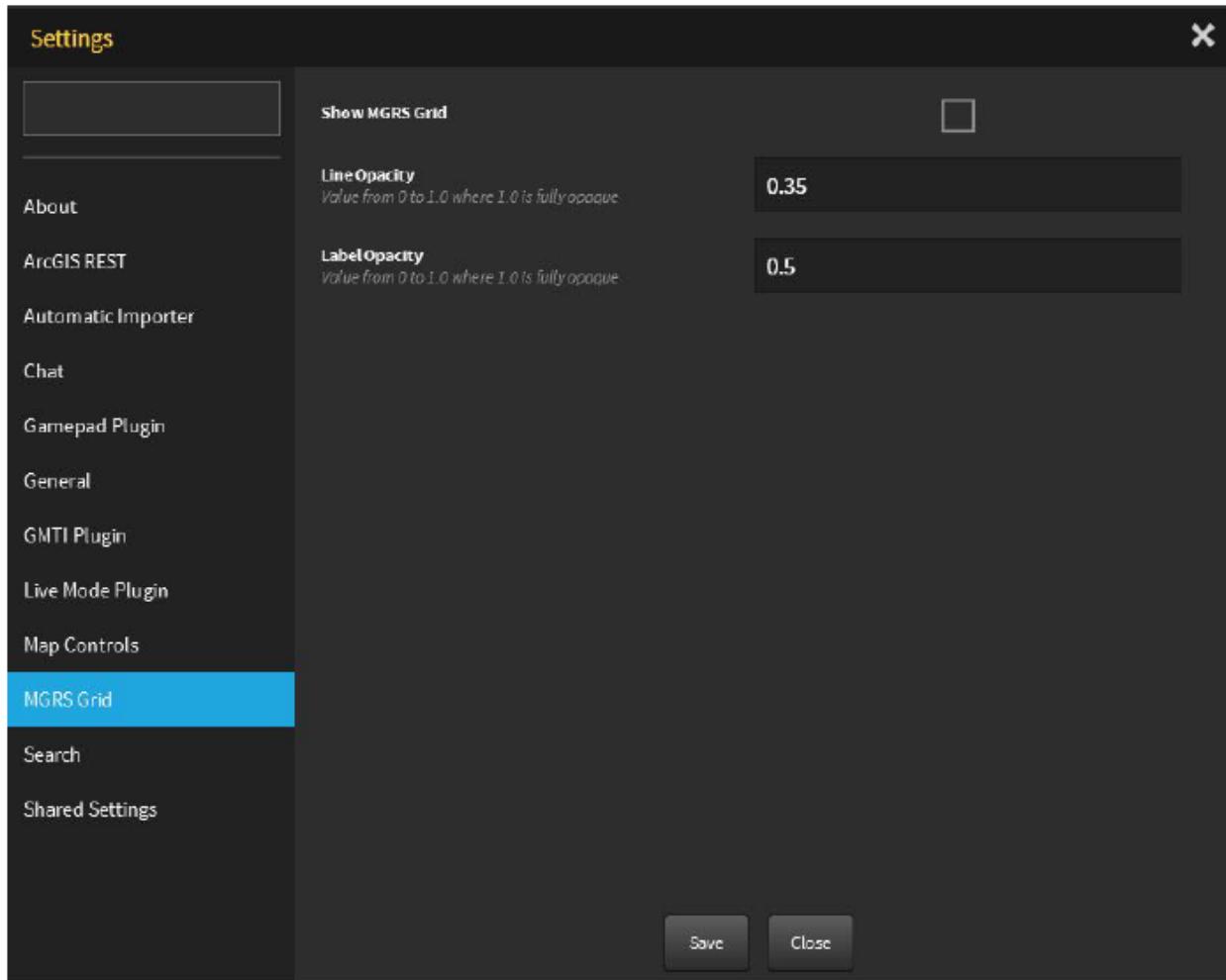


Figure 235. MGRS Grid Tab

(11). Search

The “Search” tab allows users to toggle select preferences for Q-Replay functions during searches including auto zoom on results, close on complete, reset on close, and clear previous results.

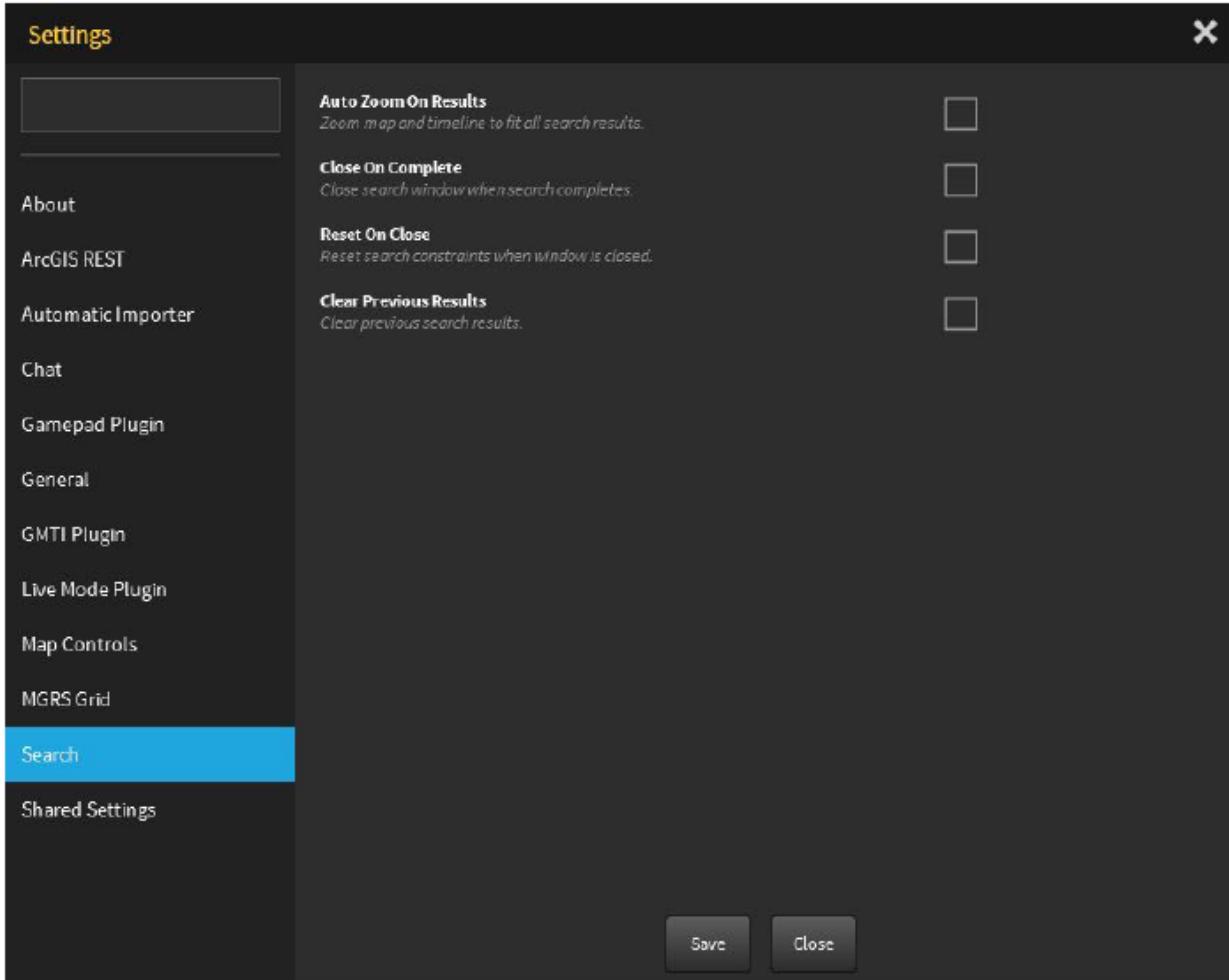


Figure 236. Search Tab

(12). Shared Settings

The Shared Settings allows a user to export the user specific feeds, filters and map layers to a single file that can be imported in by other users to increase the speed of setting up the feeds and settings. This can also be used to backup configurations. The exported file will be stored in the following location.

C:\Users\<><Username>>\AppData\Local\Ringtail Design\Q-Replay\Data\Profiles\<><filename>>.rpa

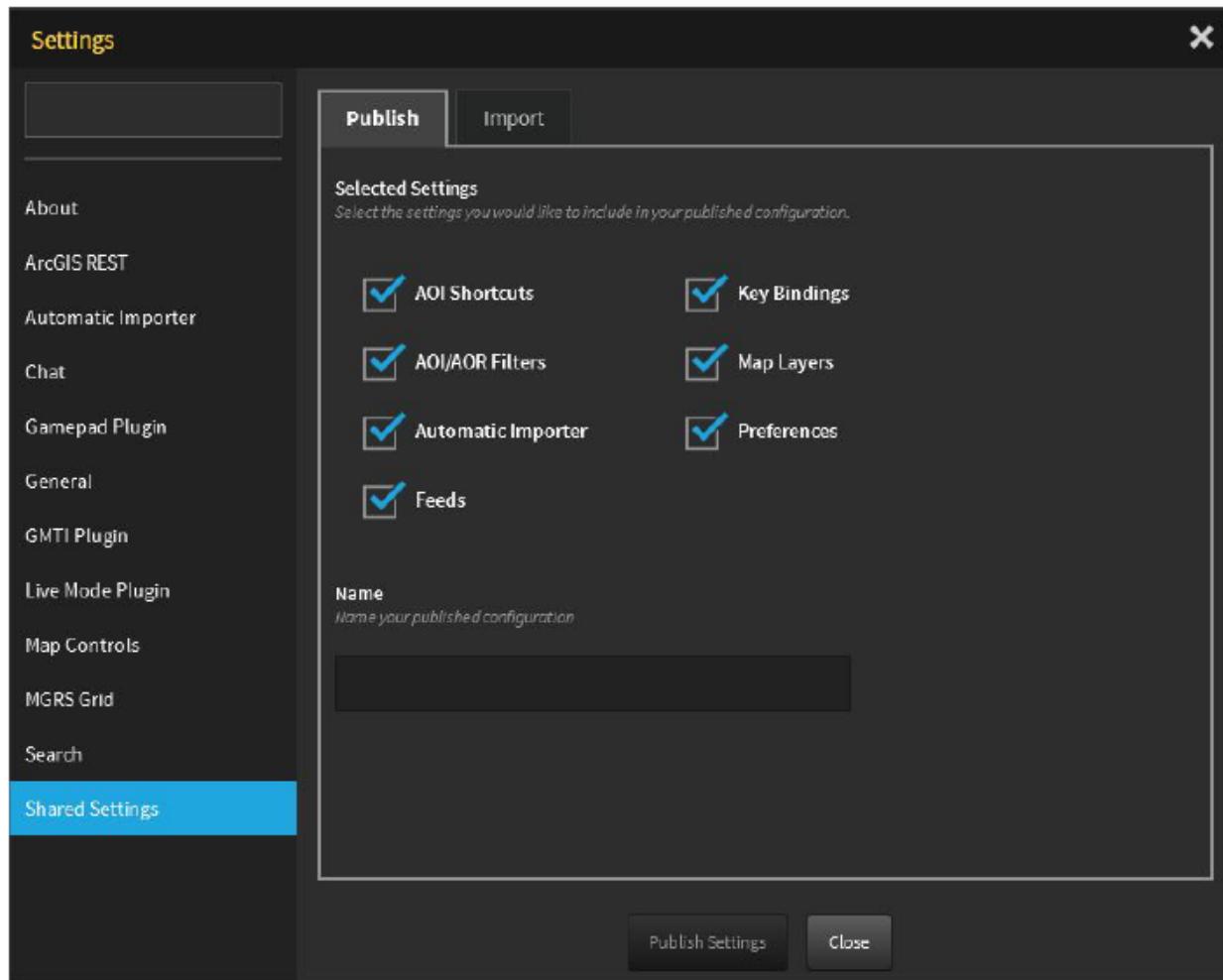


Figure 237. Shared Settings Tab

To import the settings, copy the file into the new users folder path above and click on the Import tab in the Shared Settings window, select the file and click Apply.

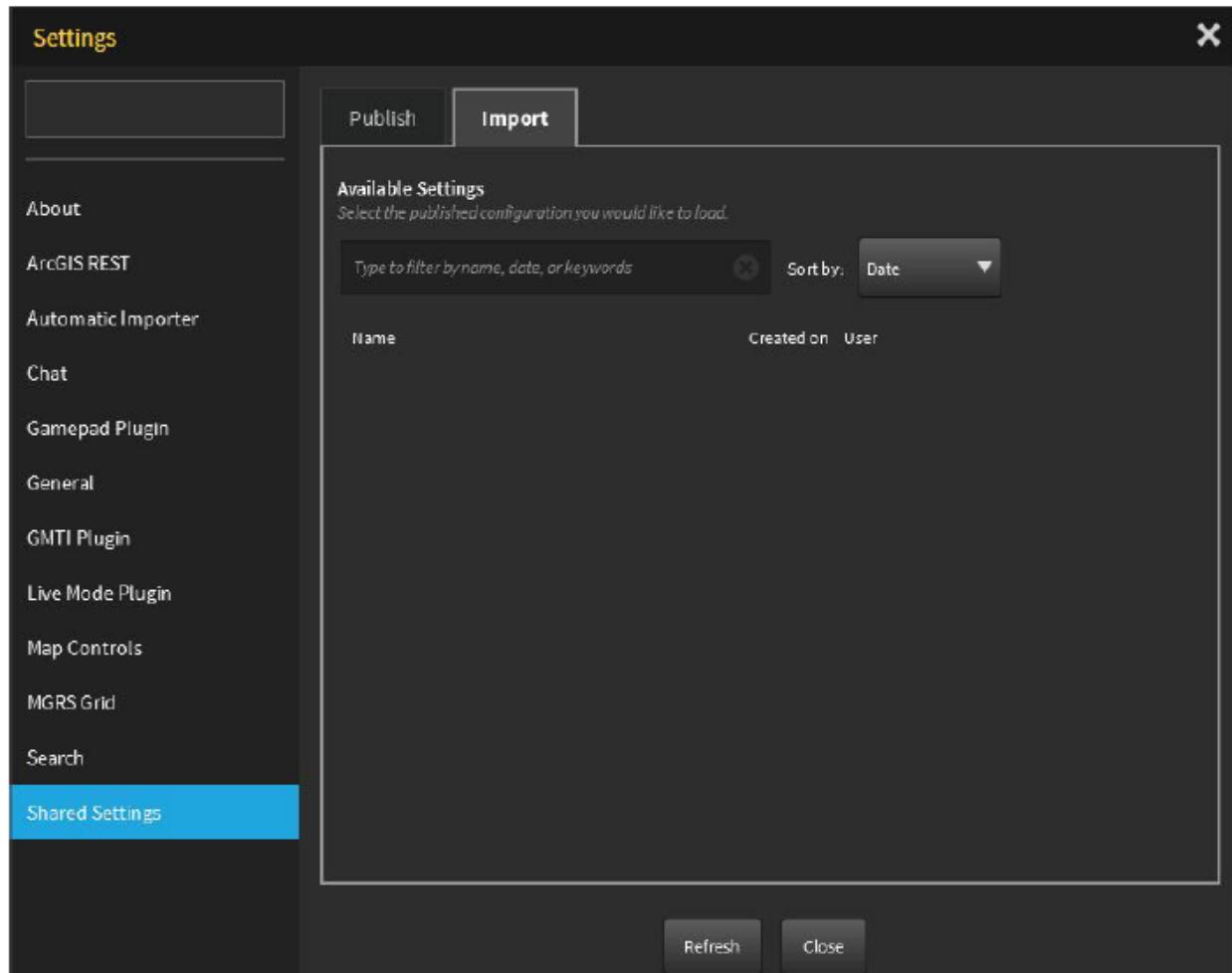


Figure 238. Import Settings

9-8. APPENDIX A – ENTITY TOOLS.



Follow: This option will automatically center the entity on the map and actively follow its movement. Select the icon again and it will orient map to direction of entity travel and actively follow

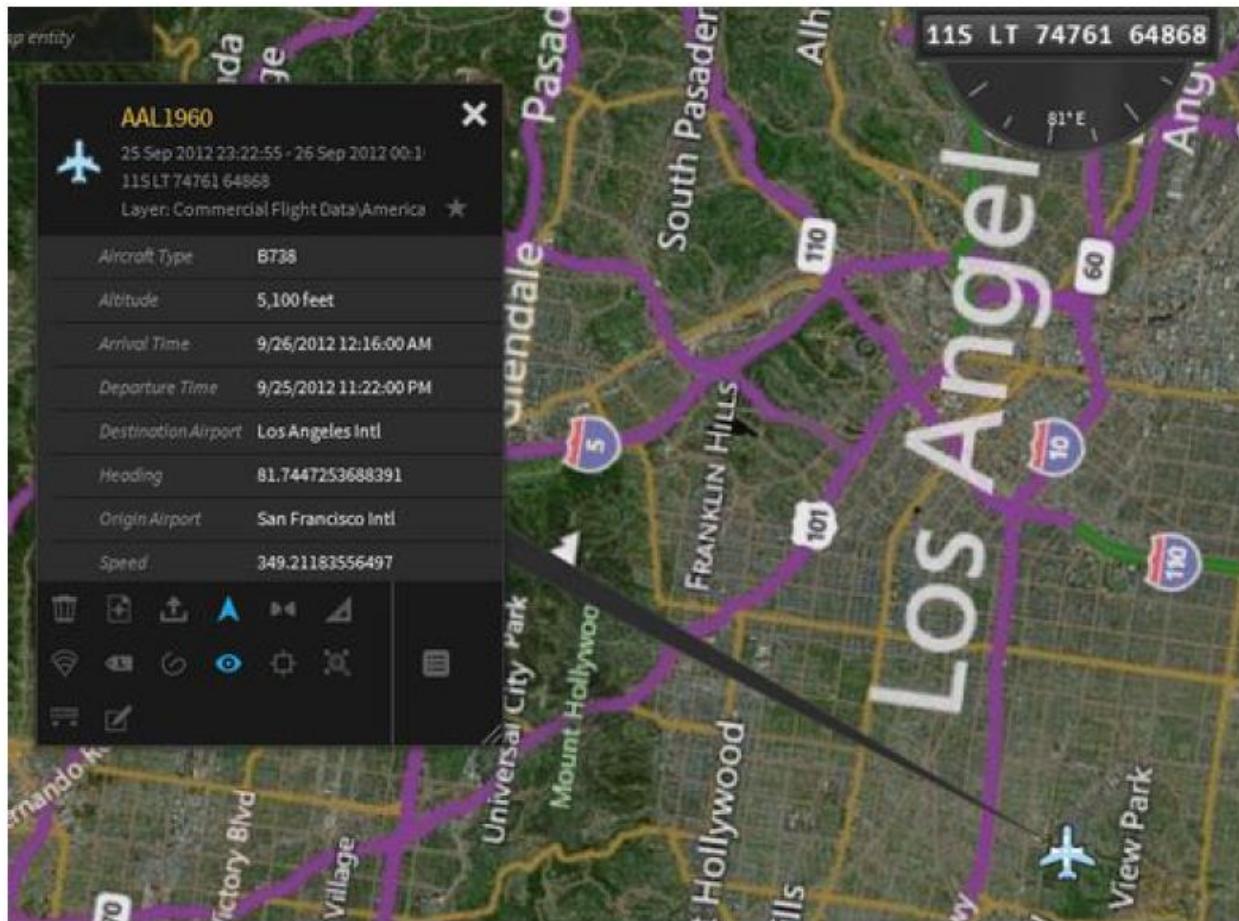


Figure 239. Following Entity on Screen



Measure: This measures distance between entity and a point on the map user selects
Note: distance will automatically change from feet to miles, or meters to kilometers

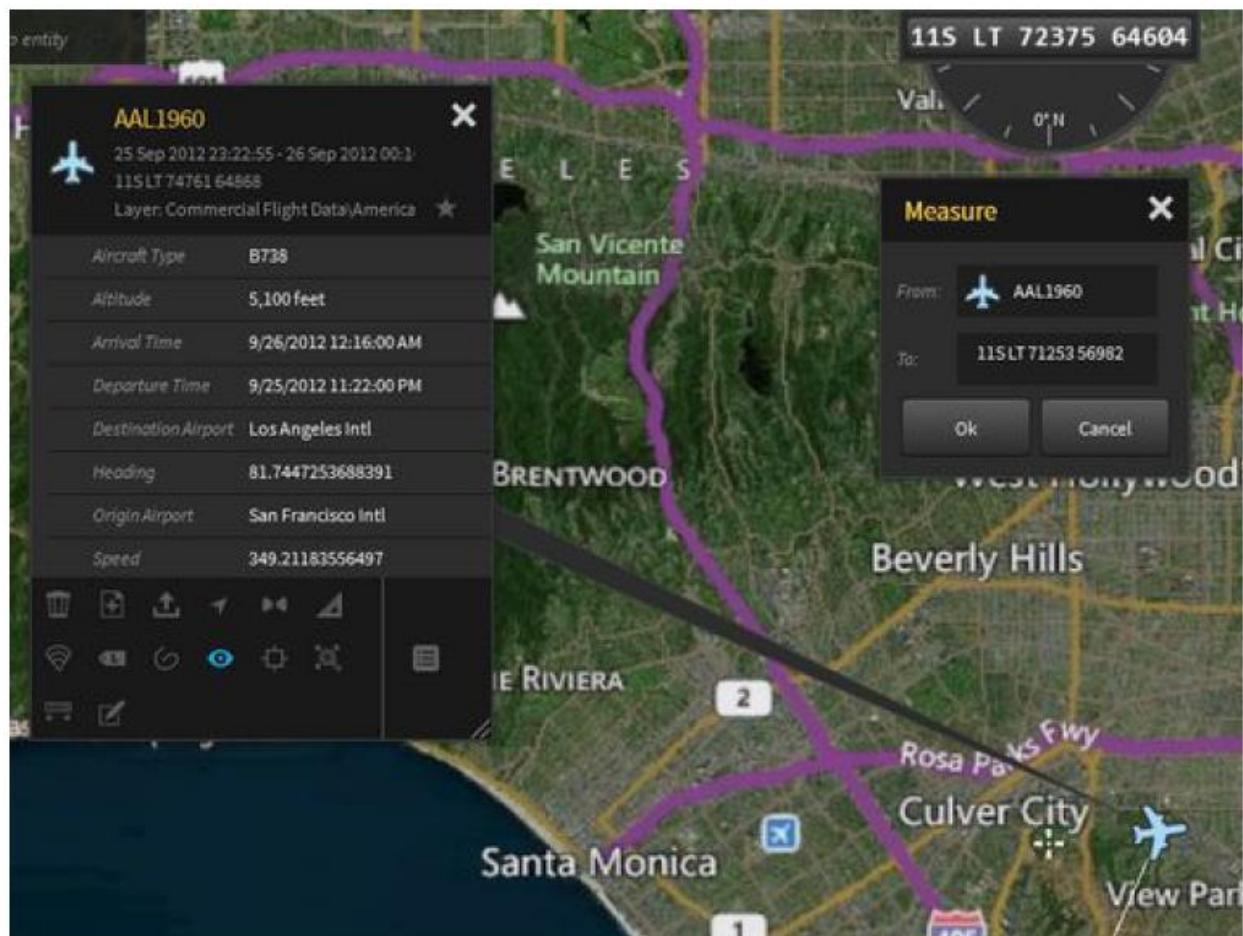


Figure 240. Measure Distance between Entity and Point on Map



Movement Projection: Gives an arc probability projection based on average distance and direction

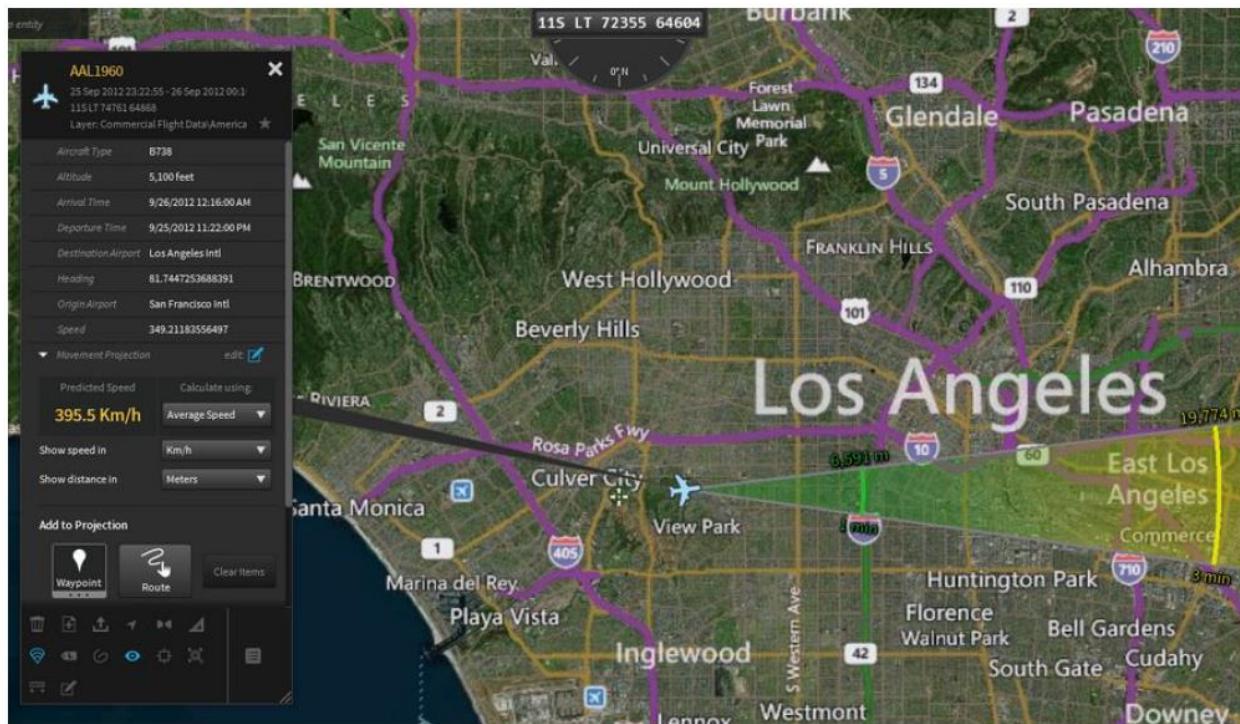
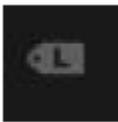


Figure 241. Movement Projection



Show Labels: Displays unique entity name

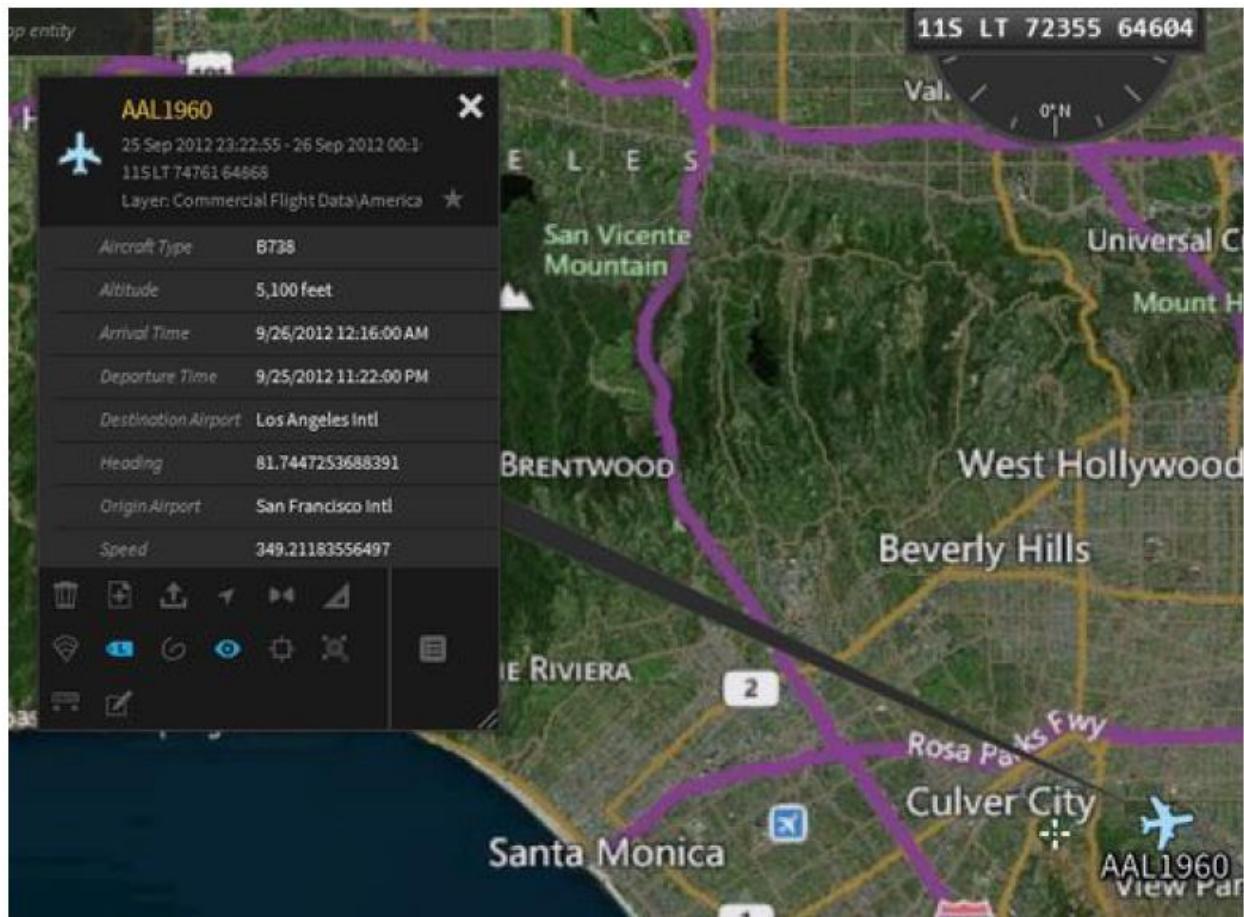


Figure 242. Show Labels on Screen



Show Tracks: Displays entity tracks of movement

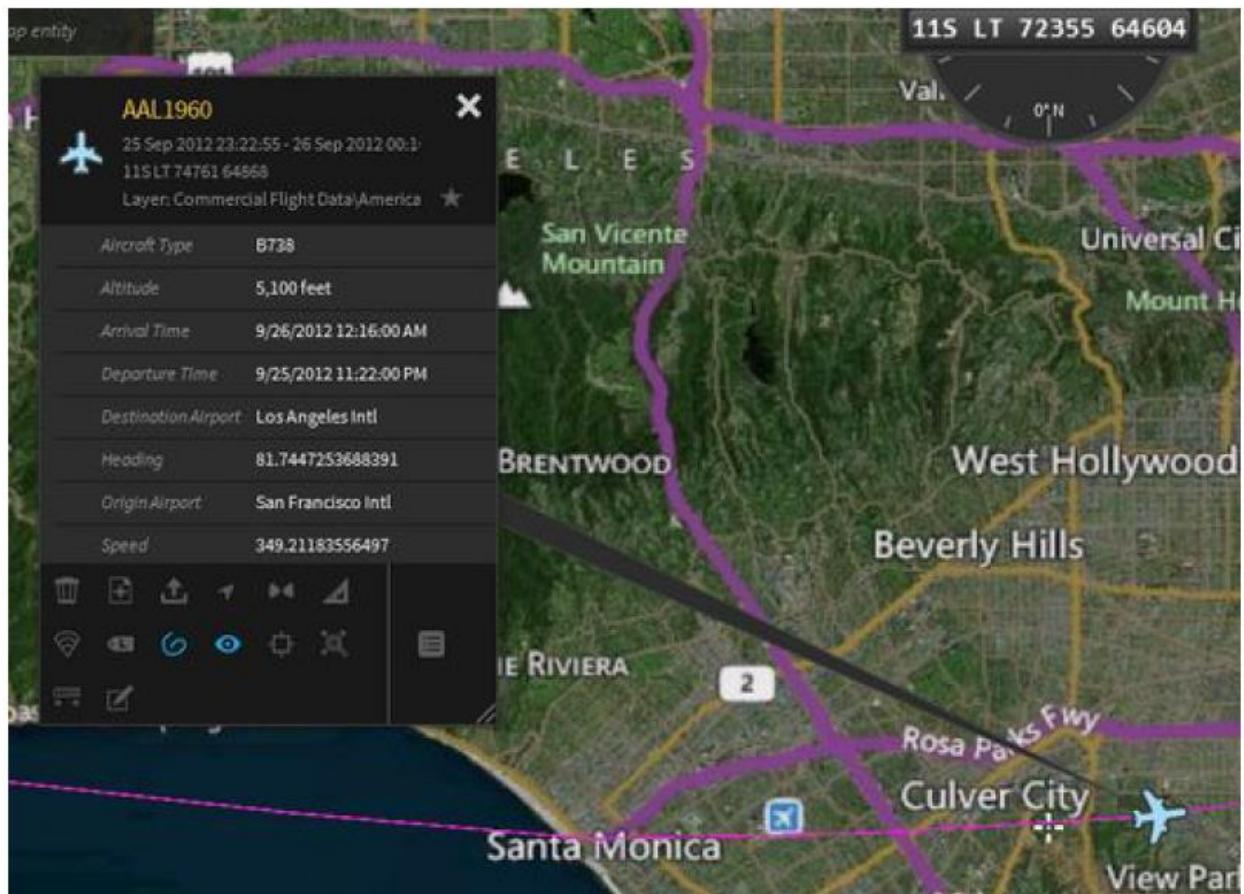
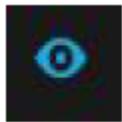


Figure 243. Show Tracks on Screen



Show/Hide: Will show or hide entity on map

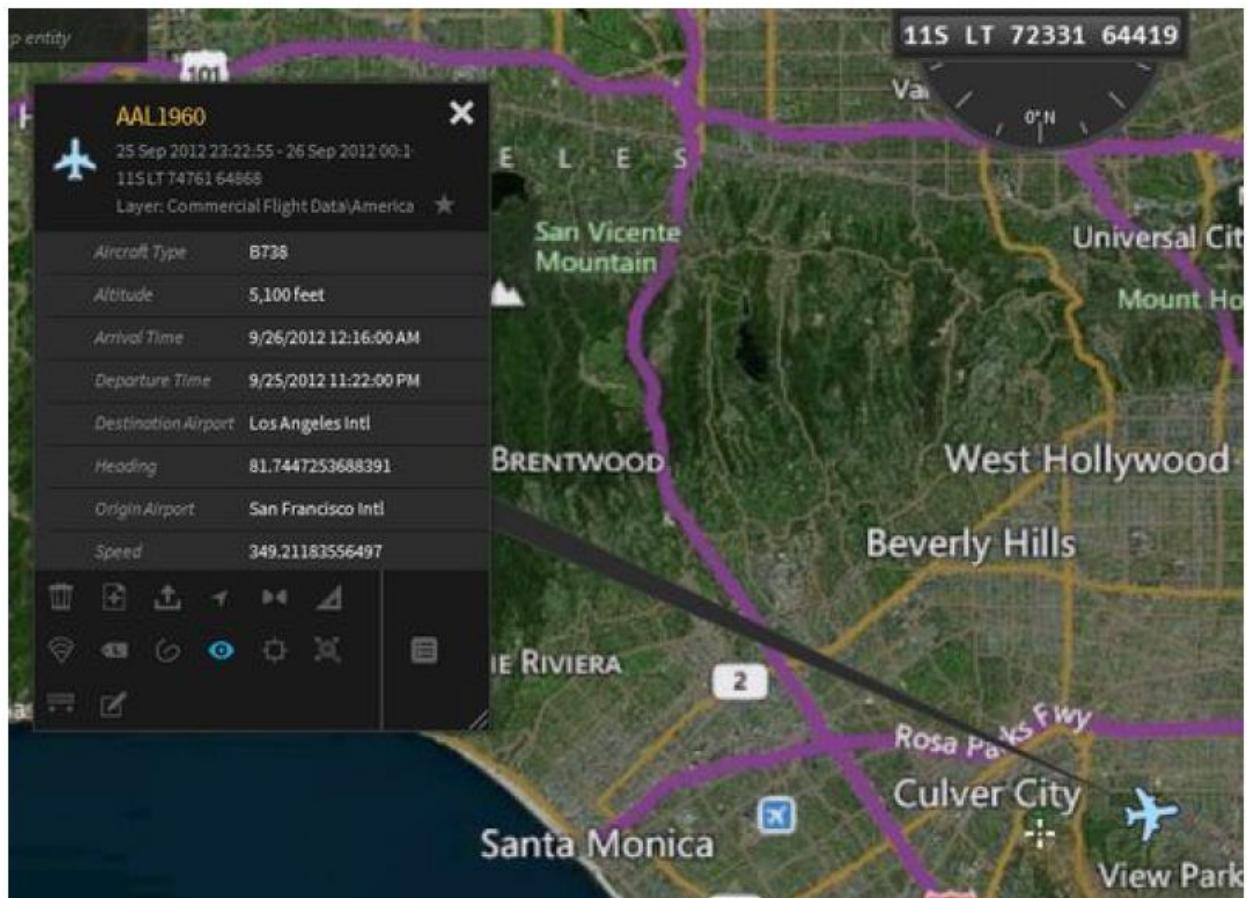
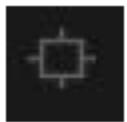


Figure 244. Show or Hide Entity



Unit Highlight: This option highlights entity within an active, green tracking box

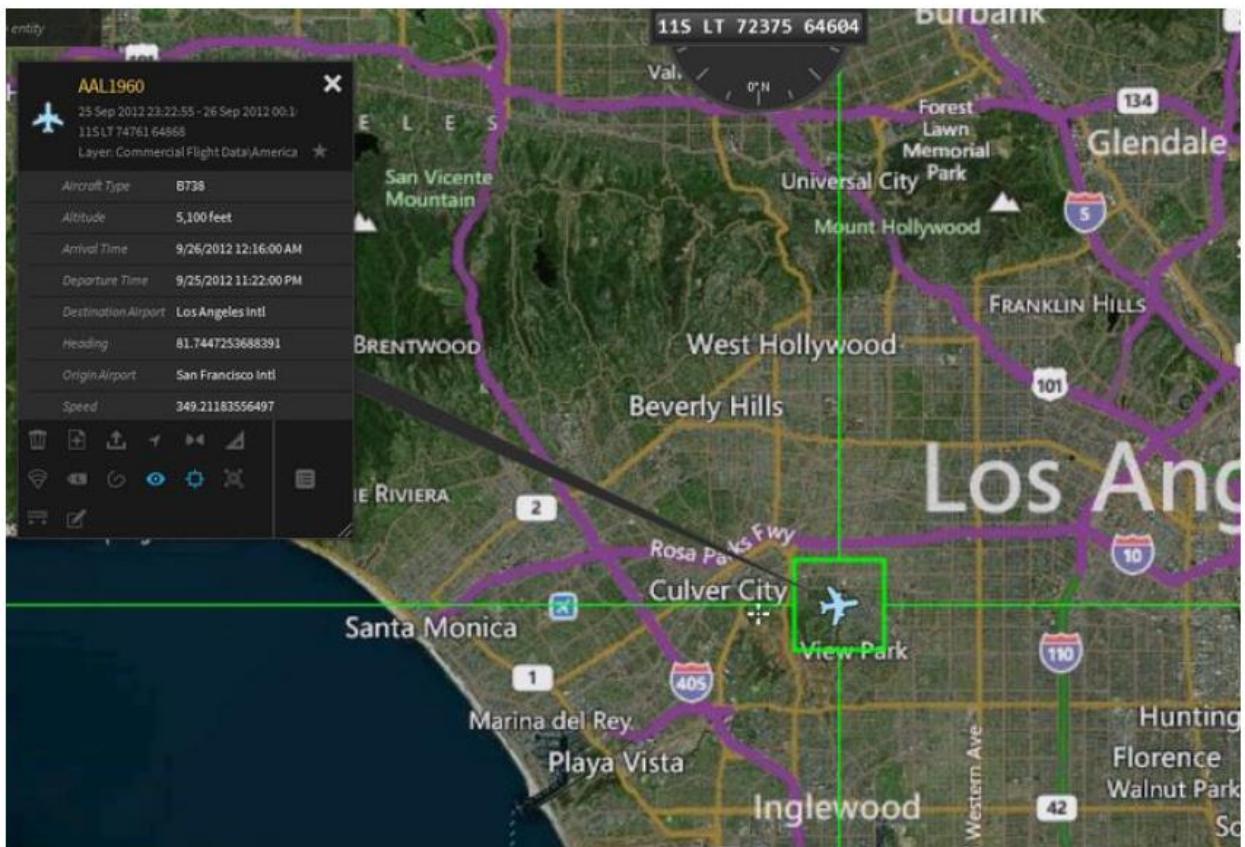


Figure 245. Unit Highlight Entity



Edit: Allows user to edit details of entity, including changing names and icons

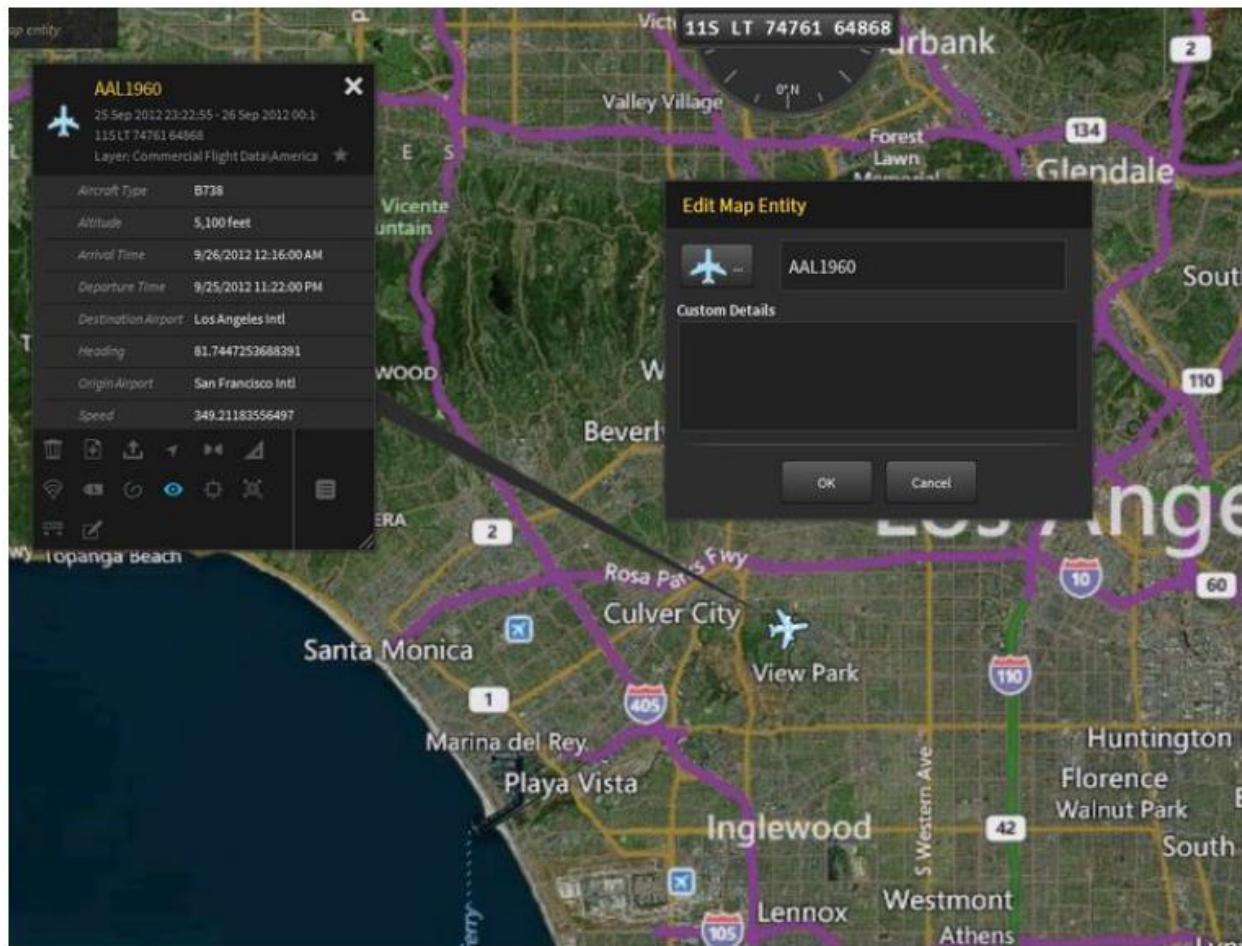


Figure 246. Edit Entity

CHAPTER 10. Q REPLAY ALARM NOTIFICATION

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10-1. Q-REPLAY AUDIBLE NOTIFICATIONS. To assist in operator awareness to critical events Q-Replay will provide an audible notification for data coming from either a CoT message or ISA message. Audible notifications are enabled by default and cover Sensor Alarm/Warnings and Network Analytic Alarm/Warnings. Below are the four potential alarms:

Sensor Notifications:

- “Sensor Alarm” will be played when a message is received indicating an alarm
- “Network Analytics” will be played when a message is received indicating a alarm

Note: The Audible Alert will only occur every ten seconds

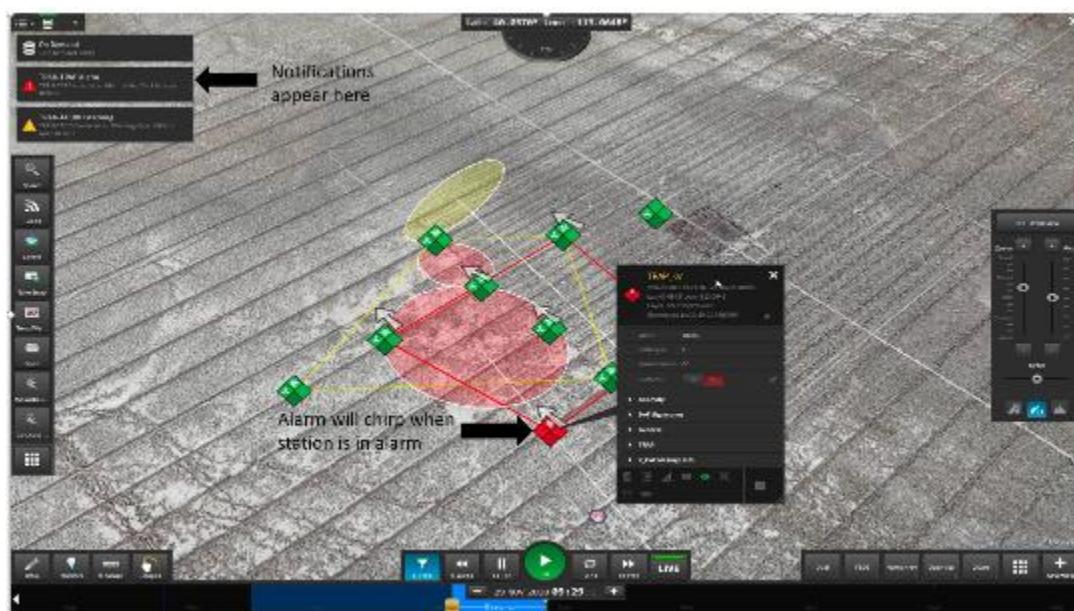


Figure 247. Audible Notifications Screen

10-2. Q-REPLAY VISUAL NOTIFICATIONS. To assist the operator by visually displaying notifications that are critical to Q-Replay. Visual notifications will display at the top left corner and cover errors, alarms/warning, network analytic alarms/warnings. The Visual Notification will be used for general purpose notifications, not specific to stations and network analytics. Below are potential notifications that may be displayed.

Visual Notifications:

- Station/Network analytic changes from Operational to Warning or Alarm
- Data is not being received
- General errors from Q-Replay

The Visual Notification also allows the user to click and view the details pertaining to the Notification.

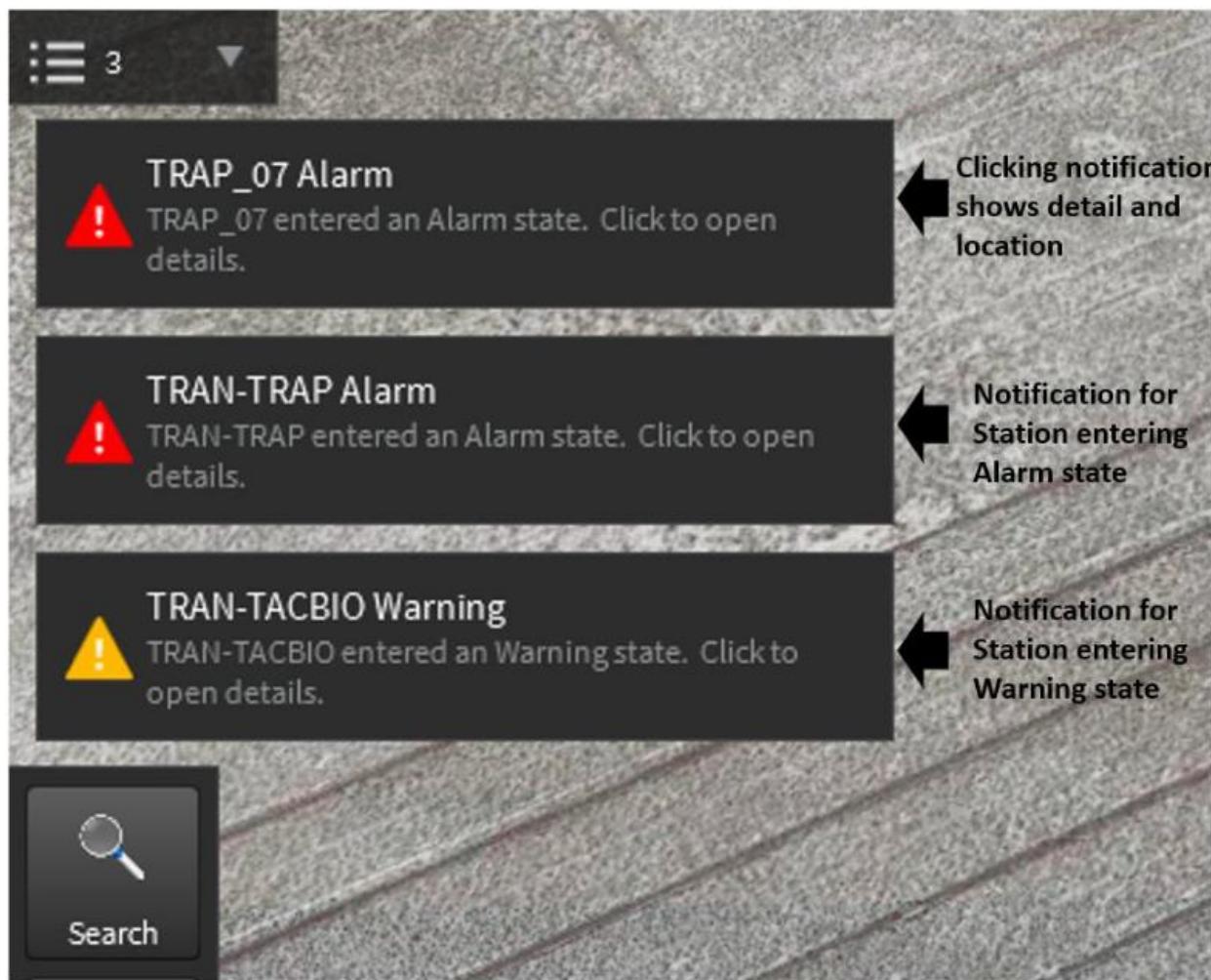


Figure 248. Visual Notifications Screen

CHAPTER 11. Q TRENDS USER MANUAL

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11-1. THE Q ARCHITECTURE. The Q is typically deployed while connected to a network of sensors, those sensors can vary between Chemical, Biological or Radiation Point Sensors, Ground Surveillance Radar (GSR) or Standoff detection systems such as LiDAR. Additionally other “Big Data” sources can be visualized in Q-Replay as determined by the mission. Each sensor sends a message to a central message source using either the Integrated Sensor Architecture (ISA) or a Cursor-on-Target (CoT) Server. The Q connects to either of those networks and visualizes and stores the message it receives.

The Q contains two primary visualization tools, Q-Replay and Q-Trends. Q-Replay is a geo-temporal touch enabled common operating picture used to view live and historical data. Q-Trends provides trending information from all available data and is used to store all the data for both Q-Trends and Q-Replay playback.

11-2. Q-TRENDS GENERAL OVERVIEW. Q-Trends is a near real-time charting application that users can create custom charts and map visualizations to look at sensor values for long term trending analysis. It enables deeper investigations into events as well as Health and Status monitoring of the sensor systems.

a. Login Screen

To access Q-Trends use a web browser such as Chrome or Firefox and open the page given to you by the ISS Support Personnel. Typical URLs are <http://172.26.26.10:3000>.

You will be presented with a login screen, contact your ISS Support personnel or FSE to get an account on Q-Trends. Enter your username and password and click **Login**.

b. Home Screen



Figure 249. Home Screen

Once logged in you will be shown the home screen, here you can see your favorite Dashboards or commonly used dashboards.

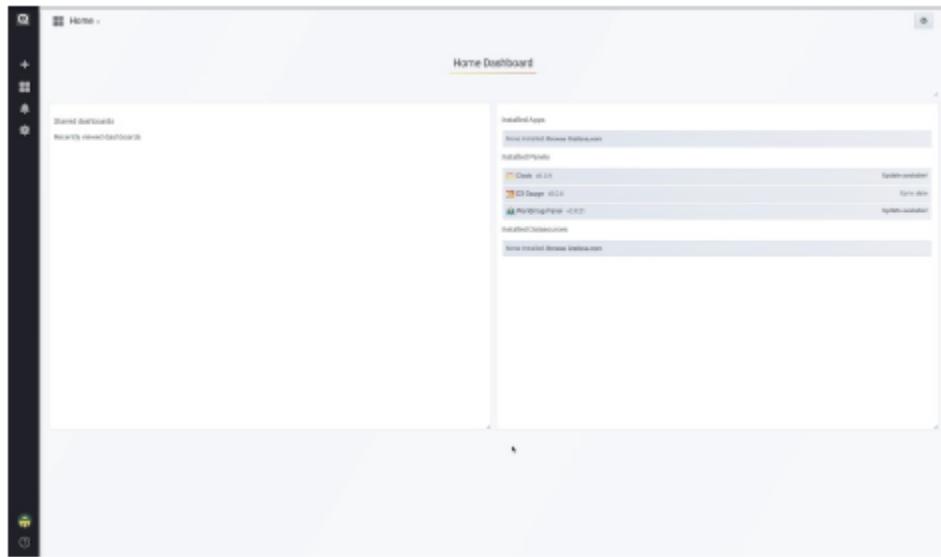


Figure 250. Dashboards Screen

To access the existing dashboards click on the Home button in the upper left hand corner of the screen. Dashboards can be organized into folders with specific permissions for each folder. Q-Trends will have a Default folder with protected dashboards, these are preconfigured by ISS to maximize viewing visibility of the data. Users can save these default dashboards and modify as desired for personal preferences.

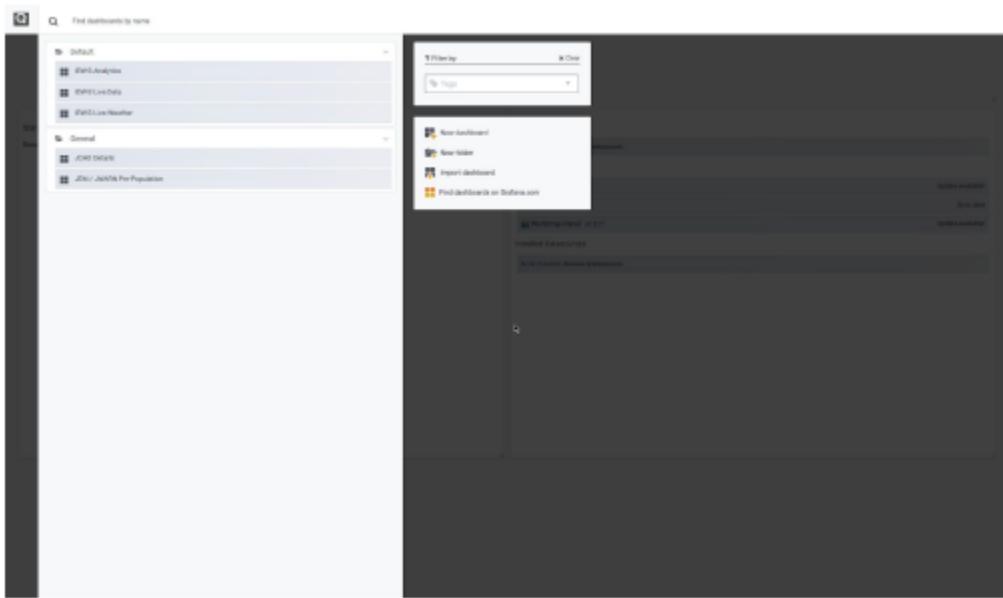


Figure 251. Organize Dashboards into Folders

c. Dashboards

Dashboards are a way to display many different types of data in different visualizations but all connected to the same timeframe. The dashboard below shows an example of several different visualizations. Charts can be used to summarize data flow, alarms or show detailed values from a set of sensors.



Figure 252. Dashboard Visualizations

d. Time Controls

Time is the common denominator for all charts, tables and maps within Q-Trends. This enables the user to compare different data across the same timespace. To set the time, **click** on the button in the upper right corner of Q-Trends and the options will appear for setting time.

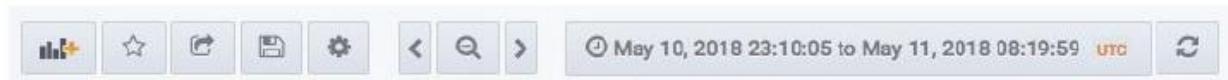


Figure 253. Time Controls

The image below shows available options for selecting a timeframe.

Q-Trends is connected to the same data stream as Q-Replay so new information is continually updating. For monitoring live data the user can use the **Refreshing every:** dropdown to select an update rate and select **Apply**. This capability only works if using a *Last X minutes/days/months* selection.

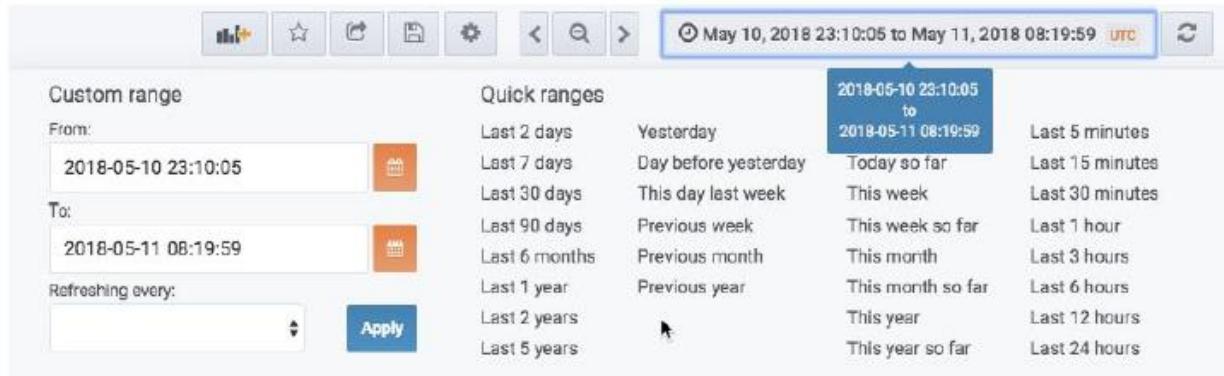


Figure 254. Selecting a Timeframe

Time can also be controlled by selecting data (via click and drag) on a visualization, the selected region will be the new custom timeframe and all other charts will update to the set timeframe. This is useful when investigating irregular data from one chart and seeing the results on all the charts. The example below demonstrates zooming the timeline from one chart in a dashboard by selecting the spikes in the lower left chart.



Figure 255. Selecting Data on a Visualization

The result of the zoom is displayed below, notice how all other charts/graphs/tables are updated to show the new timeframe.



Figure 256. Zoomed in Selection Results

To return to the previous timeframe use the browser back button or set the time frame using the time controls in the upper right corner.

e. Filtering Data

(1). Dashboard Filtering

In the upper left corner of the dashboard will display options for filtering all applicable graphs by a configured variable. Filtering the dashboard can be limited to one or multiple variables by selecting the checkbox next to the desired variable(s). Once selected, **click** anywhere outside of the drop down to apply the filter.

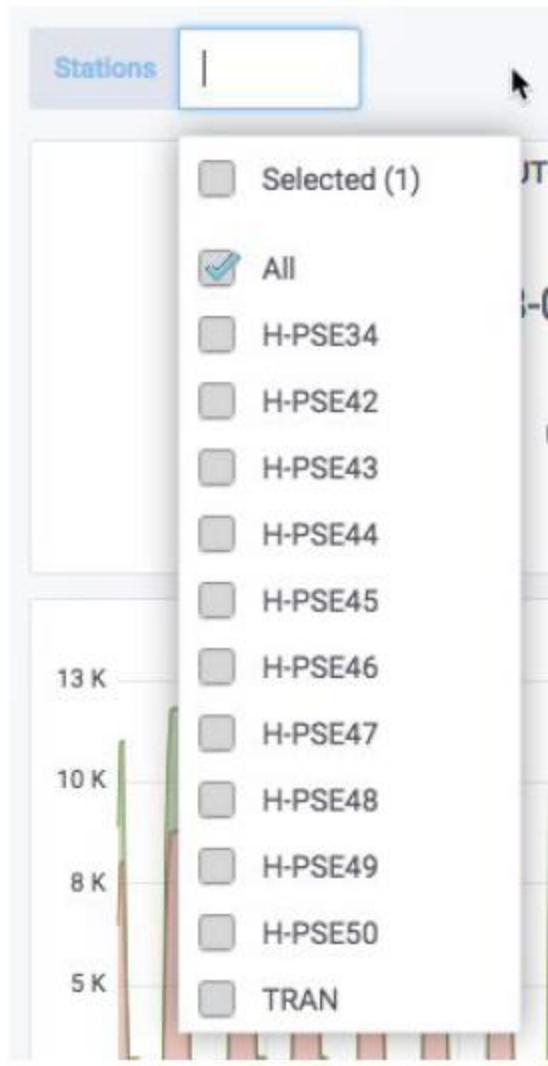


Figure 257. Filter Data

To clear the filter, select the **All** option on the list of options.

(2). Individual Chart Filtering

To minimize screen real estate charts show the same metric for each sensor/station. Often times it is useful to filter an individual chart/graph to show only the data from a particular sensor/station. This can be done by clicking on the desired sensor/station in the legend. The Example below shows an unfiltered chart by station.

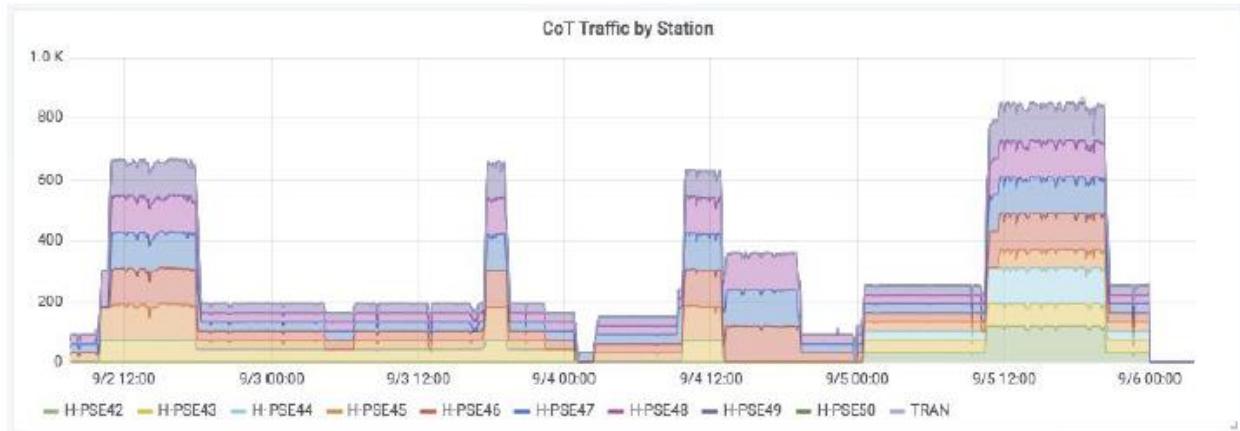


Figure 258. Unfiltered Chart by Station

After selecting H-PSE42 only the data from that station is displayed. This filtering easily shows when this station was reporting data. To remove an individual chart filter **click** on the selected legend item again to show all the data.

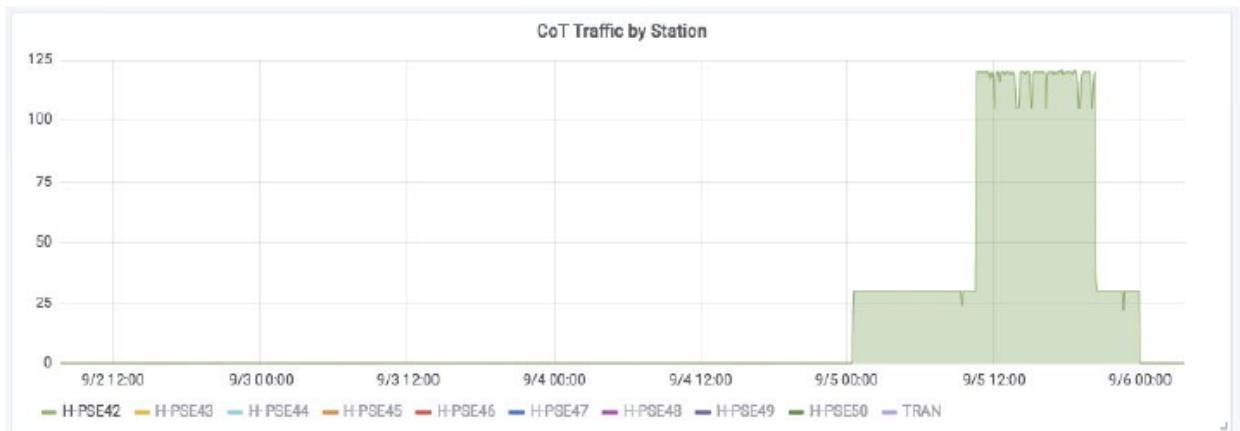


Figure 259. Filtering Chart from Single Station

f. Drill Down Dashboard

Some charts can have a drill down dashboard that allow users to look further into the information summarized in the chart/graph. If a drill down has been defined, in the upper left corner of the chart/graph will show an icon as seen below.

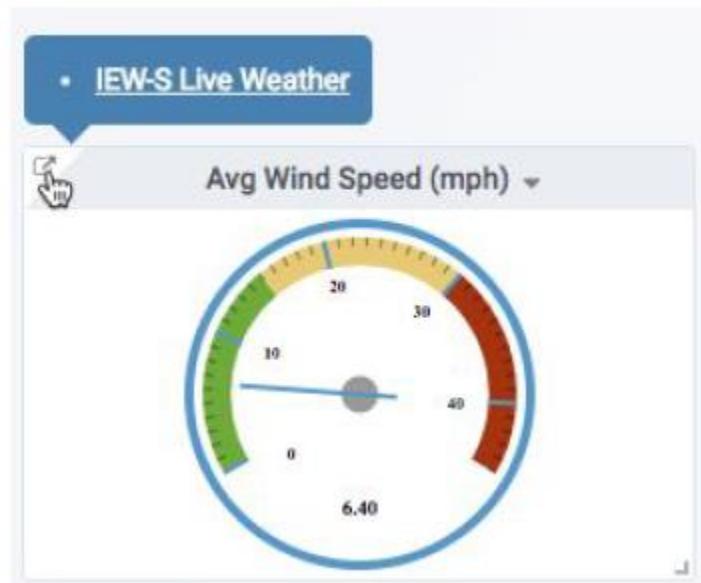


Figure 260. Drill Down Dashboard Icon

Hover over that icon to display a list of drill down dashboards. Clicking on the link will either change the page to that dashboard or open a new browser window depending on how it was defined.

g. Exporting Visualization Data

Q-Trends is great for visualizing large amounts of data, but you may be requested to export out the data for use with Excel or other tools. Q-Trends allows users to export out the data from a visualization, however, it is the data from the visualization and not the raw data. This means that if the graph is showing average values over time with a time step of 30 secs, the export will contain the averaged values and not the raw data that created the averages.

To export the data from a visualization ensure your time frame is the desired timeframe and hover over the title of the visualization. The title bar will turn grey and a drop down will appear next to the title.

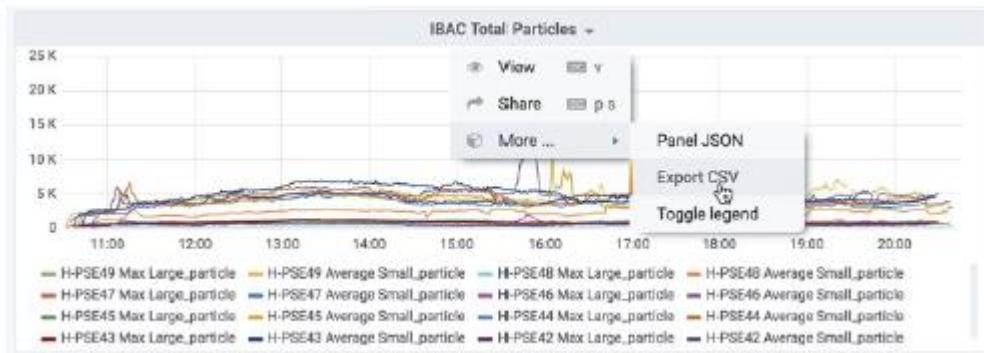


Figure 261. Export Data from Visualization

Click the Drop down and expand out the **More** section and select **Export to CSV** option.

The *Export CSV* pop-up appears with several options. If the visualization you are exporting is showing multiple items in the legend select the **Series as Columns** in the mode drop down, this will put each legend item as a column value with time being the first column. Once ready click the **Export** button.

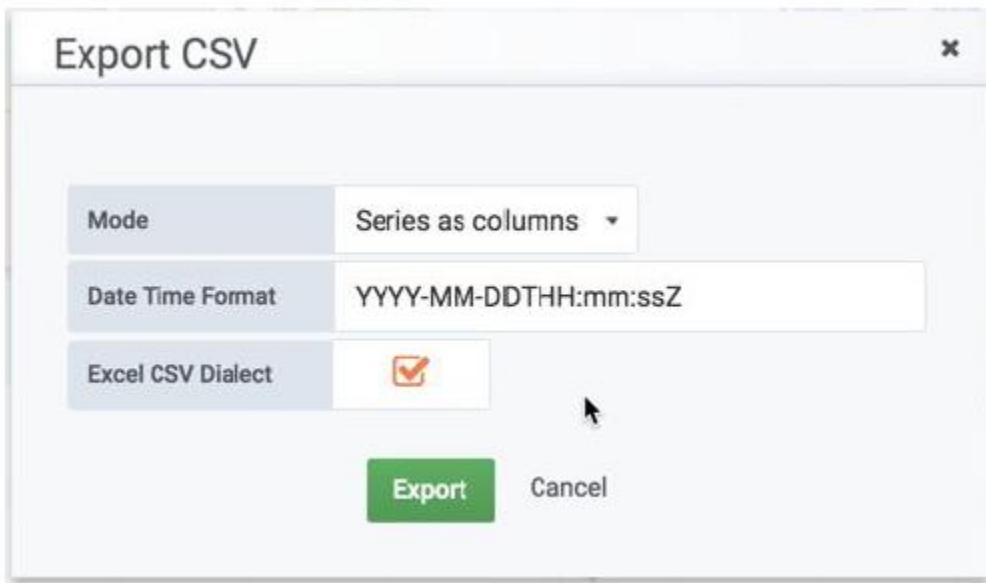


Figure 262. Export CSV Pop-Up

Once exported, open up the Comma Separated Values (CSV) file using your spreadsheet tool of choice to see the results.

The screenshot shows a Microsoft Excel spreadsheet with the title bar "gratoms_data_export.csv". The spreadsheet contains a large amount of data starting from row 1 and column A. Most of the data consists of null values ('null') across many columns. Interspersed among these nulls are several numerical values, such as 9.333, 1.000, 2.000, 4.000, 8.000, 10.000, 12.000, 14.000, 16.000, 18.000, 20.000, 22.000, 24.000, 26.000, 28.000, 30.000, 32.000, 34.000, 36.000, 38.000, 40.000, 42.000, 44.000, 46.000, 48.000, 50.000, 52.000, 54.000, 56.000, 58.000, 60.000, 62.000, 64.000, 66.000, 68.000, 70.000, 72.000, 74.000, 76.000, 78.000, 80.000, 82.000, 84.000, 86.000, 88.000, 90.000, 92.000, 94.000, 96.000, 98.000, 100.000, etc. There are also some blank rows and rows with single values like 0 or 1. The data is heavily redacted with black bars.

Figure 263. Exported Results

11-3. CENTAUR DASHBOARDS. This section provides an overview of the default dashboards provided for the Centaur Program. There are three default dashboards, Live-Data, Live-Analytics, Live-Weather. Each of those dashboards will be reviewed in the following sections.

a. Live-Data Dashboard

The Live-Data dashboard is intended to be a one stop for all pertinent information to the operation and performance of the system.

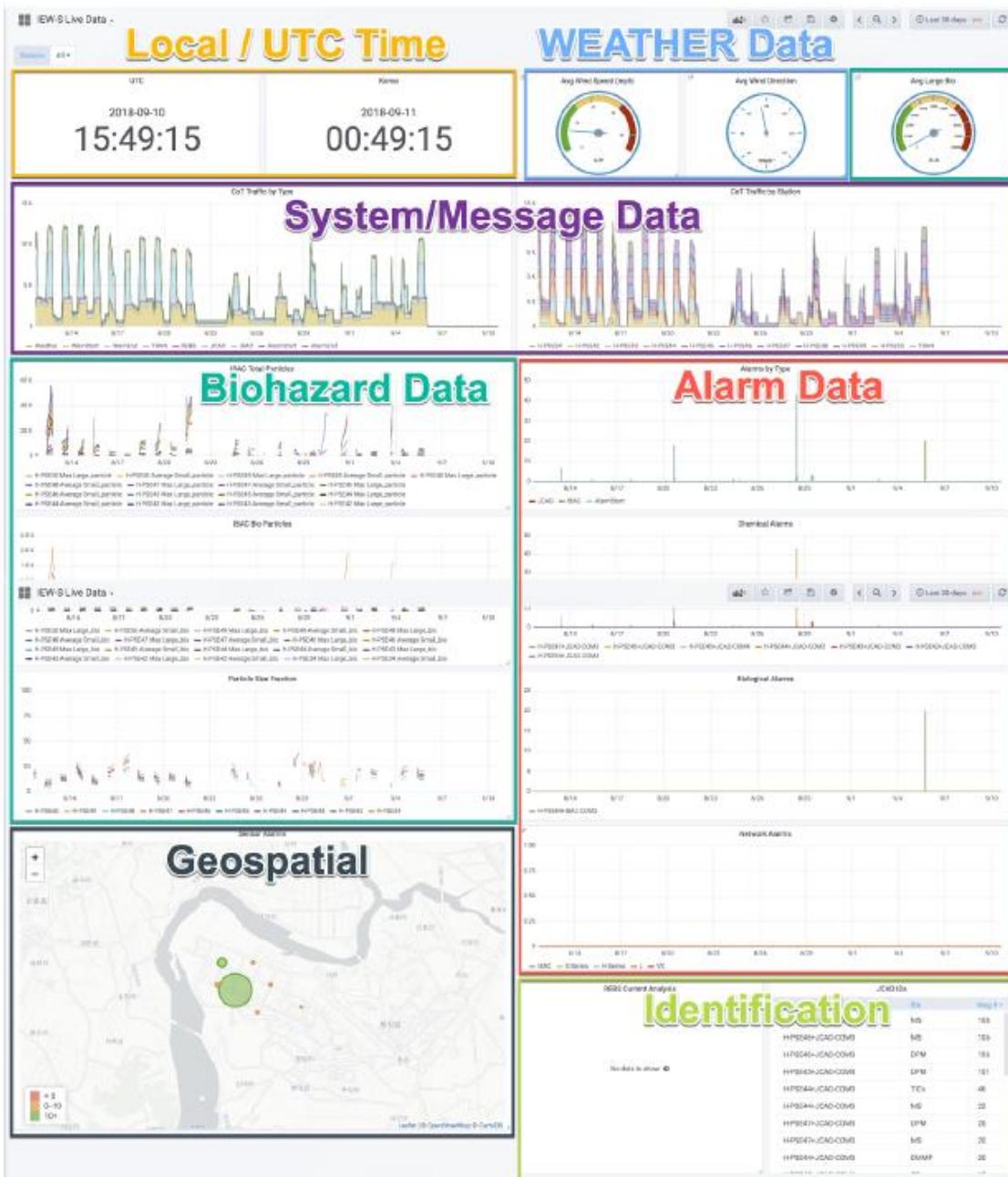


Figure 264. Live-Data Dashboard

(1). Local/UTC Time

This section shows current local and UTC time, these clocks **DO NOT** change with the timeframe configured. All times for data in Q-Trends are stored in UTC timeframe. Users can change their user accounts preferences to show data in the local browser time however it is suggested to remain in UTC as Q-Replay and other tools use UTC.

(2). Weather Data

These two charts summarize the Average Wind Speed and Direction for the selected timeframe across all reporting weather sensors.

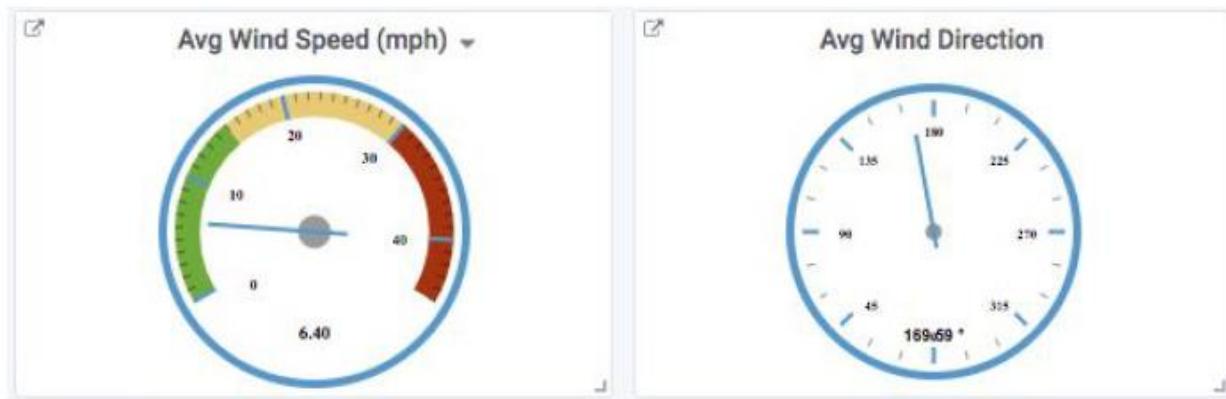


Figure 265. Weather Data Charts

DRILL DOWN Dashboard: Each of these graphics have drill downs that will take you to the Live Weather dashboard for the time frame selected.

(3). System/Message Data

These charts allow the user to understand which type of data or station that Q-Trends received over the given timeframe. These charts are sometimes referred to as the Rainbow charts because if all systems are reporting as expected they will show a solid row of colors. Understanding which type of data is reporting will tell you which sensors on a station may or may not be reporting.

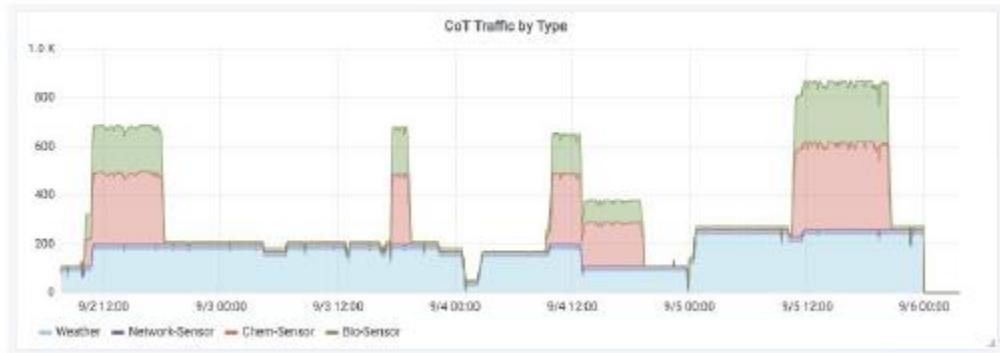


Figure 266. Traffic by Type Chart

The above graphic shows that Weather and Network-Sensor traffic was flowing for a majority of the time. However the Chem and Bio sensors were not.

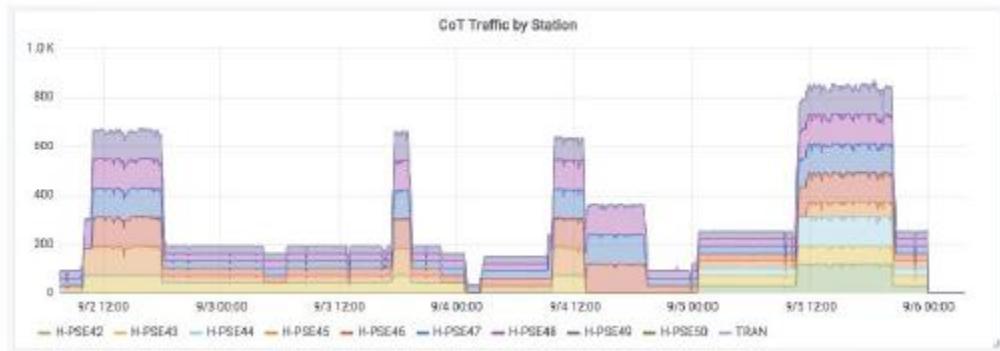


Figure 267. Traffic by Station Chart

Given the same timeframe the Traffic by Station graphic shows which station were reporting and when. Using either Dashboard filtering or individual chart filtering between these two charts can inform the user which stations might need attention if not reporting.

(4). Alarm Data Section

This section summarizes the alarm/warning activity for all sensors in the selected timeframe. The Alarms by Type roles up to show sensors by the category they are in (Chem-Sensor, Bio-Sensor, Network-Sensor). The charts below it break out each category by individual sensors. These charts can be useful to zoom in on alarm events and look for the raw data responses from bio sensors or the listed detection types from JCAD or REBS sensors.

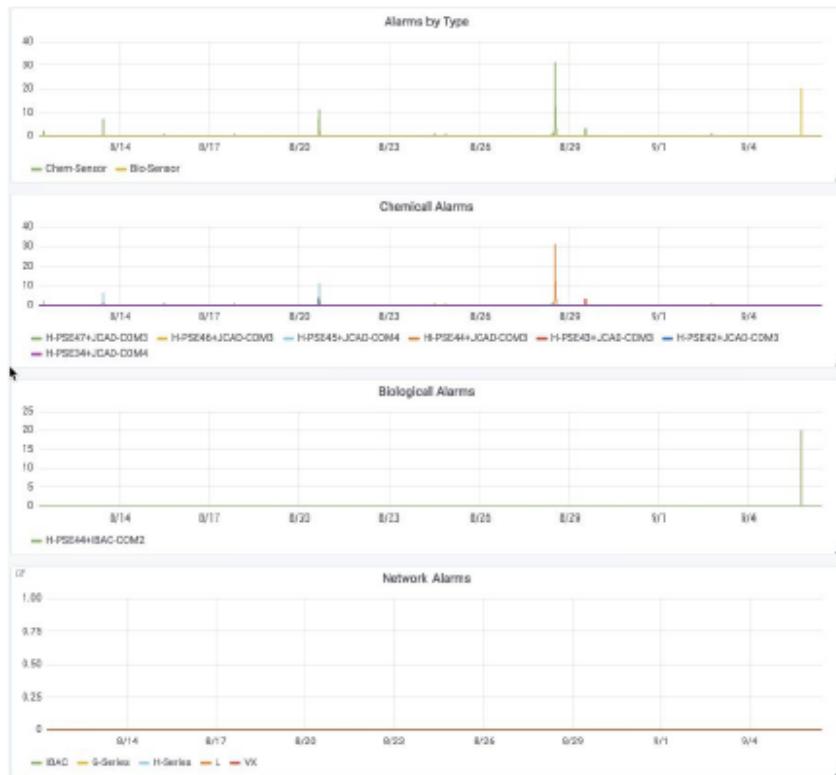


Figure 268. Alarm Data Summary Charts

DRILL DOWN Dashboard: The Network Alarms chart will drill down to the Live-Analytics dashboard for the selected timeframe.

(5). Biohazard Data

These charts show the total particles, total bio particles and particle size fractions for each of the sensors. Both large and small particle sizes are shown for each particle type. These charts can be useful in determining if during an alarm there was a bio response over the given timeframe.

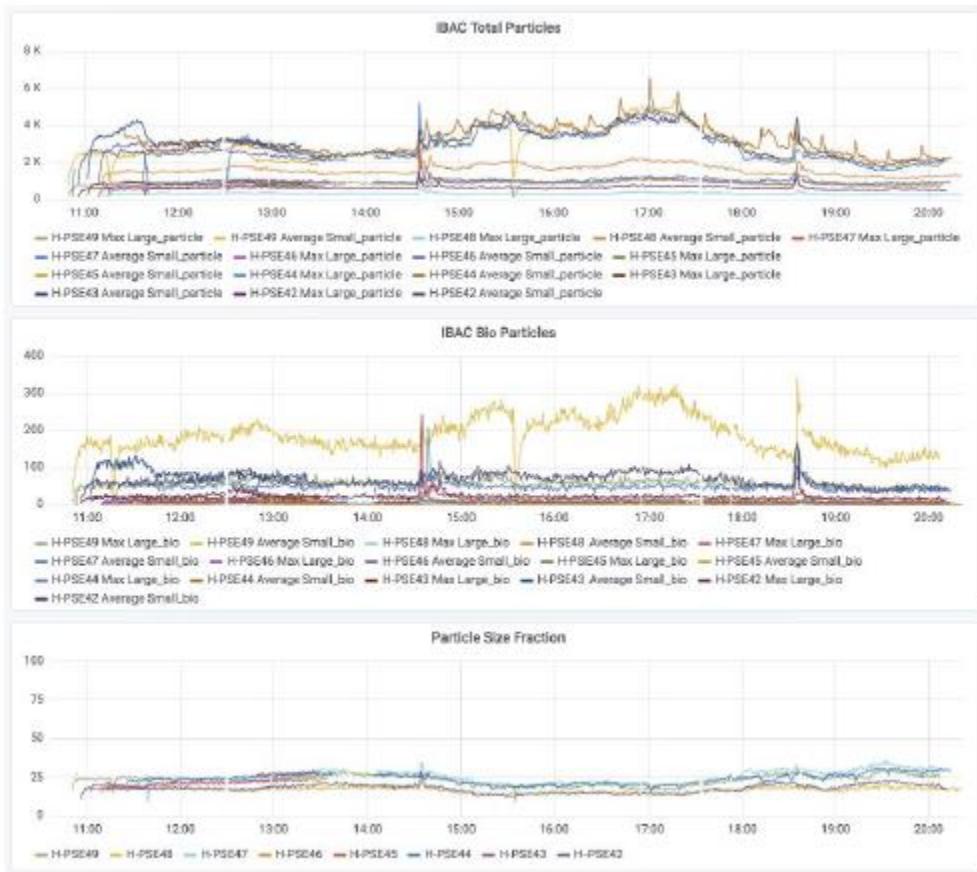


Figure 269. Biohazard Data Chart

(6). Identification Section

This section displays the ID of the detected material and the total number of messages where that material was in alarm. This can be used to understand which sensor is reporting which material.

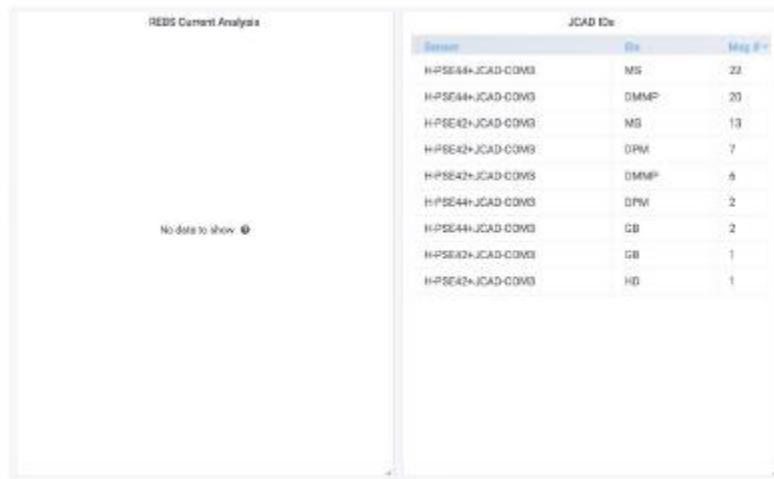


Figure 270. Identification Screen

Note: Often times sensors report more than one material, one may have a higher bar count but that is not reflected in this graphic.

(7). Geospatial

This chart shows where on the map the alarms for the given time period were, although not as detailed as Q-Replay it gives a quick overview of where and the relative number of messages at each location while looking at the detailed sensor information.

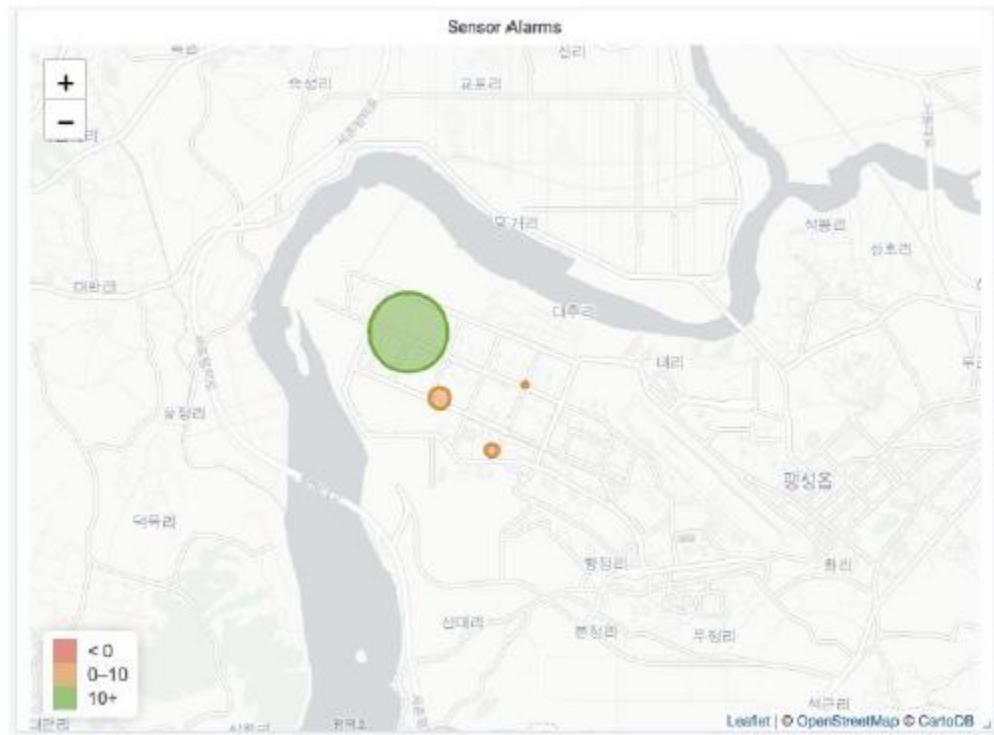


Figure 271. Geospatial Screen

b. Live Analytics Dashboard

The Live Analytics dashboard contains some of the same information the Live Data dashboard does but allows you to look at the performance of the network analytic (TANDOM).

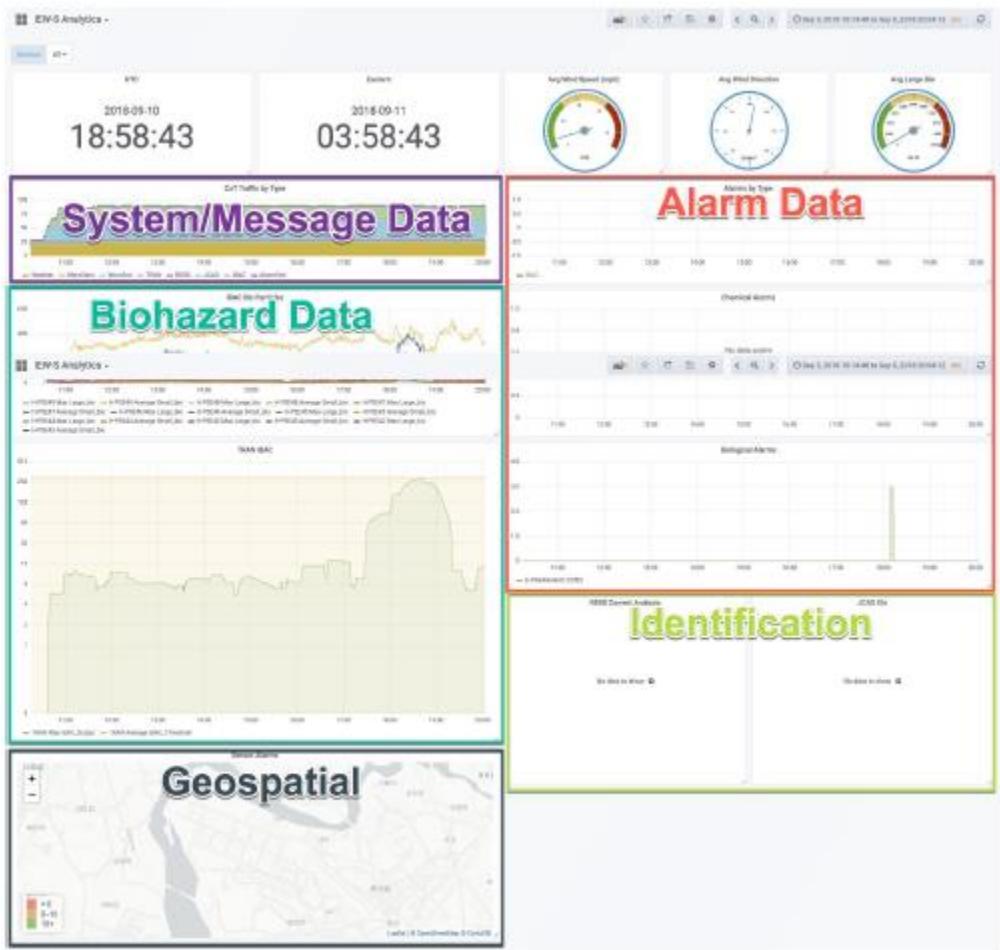


Figure 272. Live Analytics Dashboard

TANDOM provides a score and a threshold to monitor the performance of the analytic. For the most part if the Score is above the Threshold the analytic is in alarm, if it is close to the threshold it will be in Warning. However, these are not hard and fast rules, TANDOM has false alarm mitigation meaning more than one sensor needs to be contributing to the score.

TANDOM also does not take into account the individual sensor alarms but uses a proprietary algorithm to monitor the raw data, this means that even though an individual sensor(s) is alarming does not always mean TANDOM will be in warning/alarm.

Additional information on TANDOM can be obtained from Arete Associates.

c. Live Weather Dashboard

Weather plays a large part in the monitoring of the system as each station has a weather sensor and the data provided is used by TANDOM for network analytics. The Live Weather dashboard provides a summary of the data collected by the individual weather sensors.

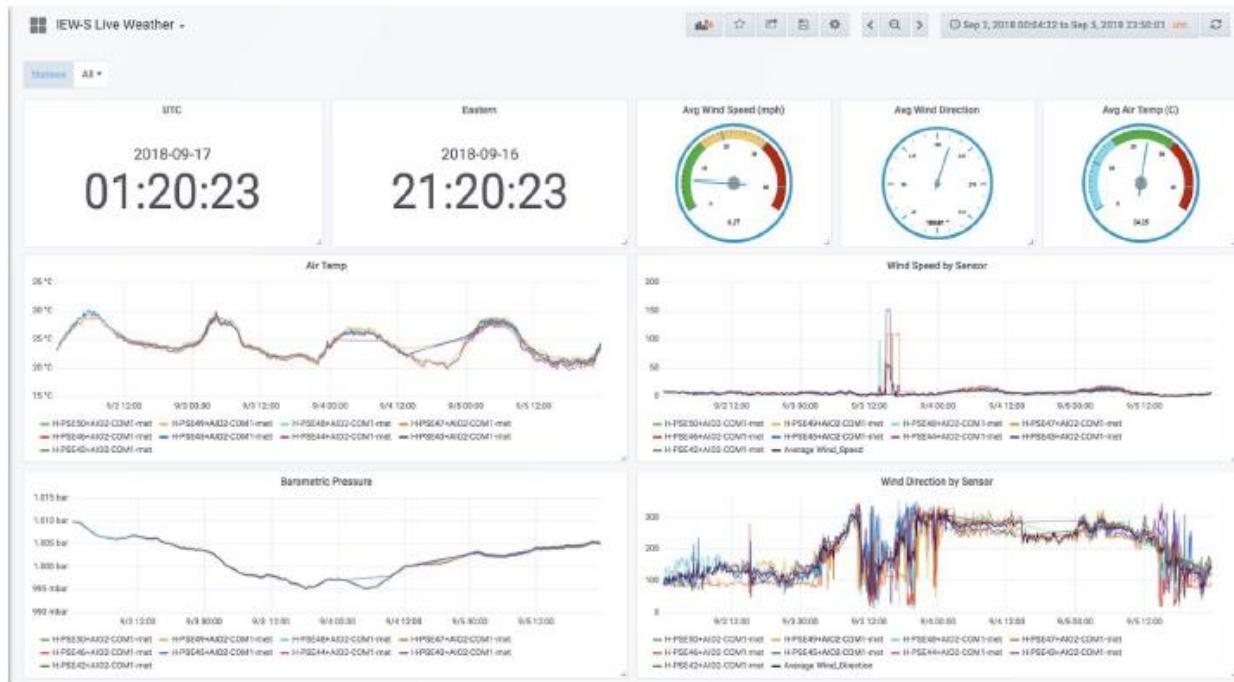


Figure 273. Live Weather Dashboard

11-4. CUSTOMIZING DASHBOARDS. Q-Trends has the three dashboards saved in the default folder that are protected from editing/changes, however a template Live Data can be duplicated and modified by users with edit permissions to customize the layout and charts shown. Customizing dashboards requires **Edit** privileges on your user account, if you do not have Edit rights contact your FSE or ISS Support for that change.

a. Starting a new template

To create a new dashboard from a template, open the template dashboard and click on the settings icon (Gear) in the upper right side of the page.

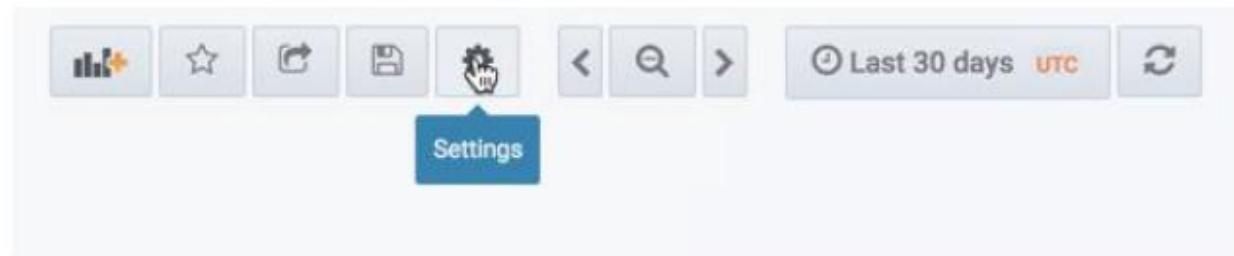


Figure 274. Create New Dashboard

The Dashboard settings window appears, click the **Save As** button on the left side of the page.

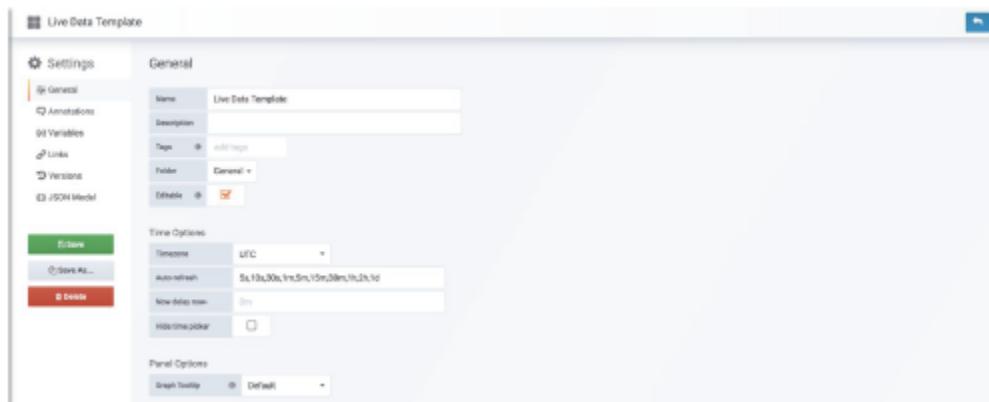


Figure 275. Dashboard Settings Window

A **Save As...** pop-up opens, enter the new name and location to save the dashboard and click **Save**.

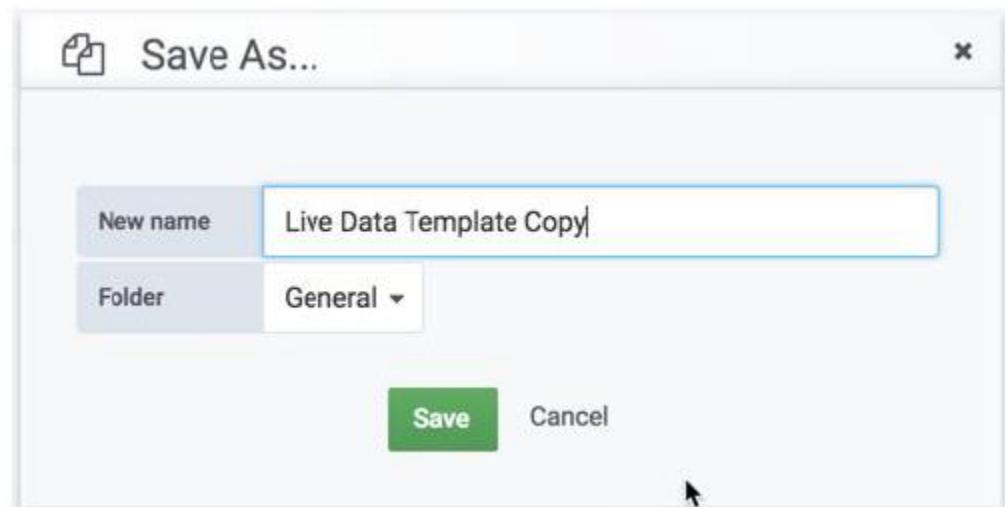


Figure 276. Save As Pop-Up

The new dashboard is opened and the user can change the layout or data within the dashboard.

b. Saving Changes

After modifying a dashboard you need to save changes to ensure it is available the next time you login. To save changes click on the **Disk** icon in the upper right corner.

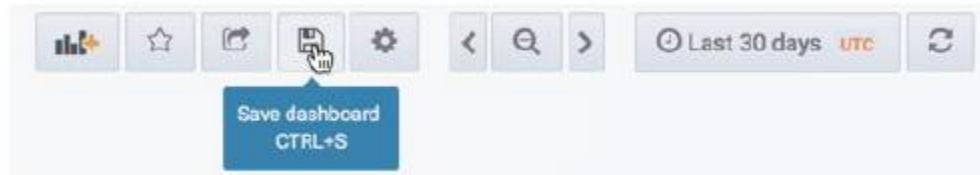


Figure 277. Save Changes Icon

The **Save Changes** pop-up appears giving you options to save the time range or add a note to what was changed. The time range change is useful when saving dashboards of specific events for later review. Click **Save** when ready.

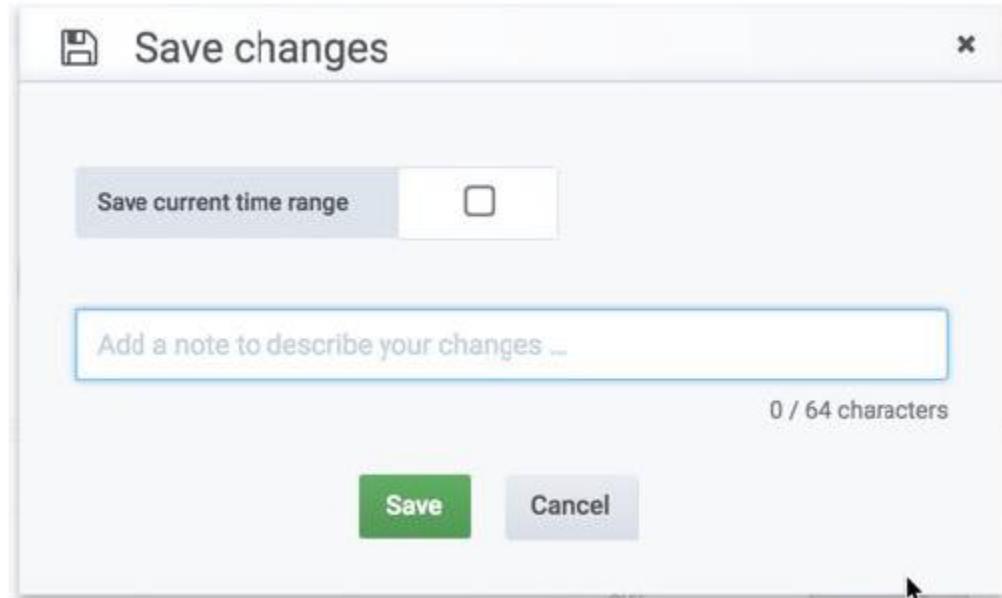


Figure 278. Save Changes Window

Q-Trends will prompt you if you navigate away from the page without saving, if you do not wish to save changes click **Cancel** and the dashboard will be returned to its last saved state.

c. Moving Visualizations

Each visualization can be arranged within a dashboard by hovering over the title of a graph / chart. The title background will shade darker and the graph can be moved via click and drag.

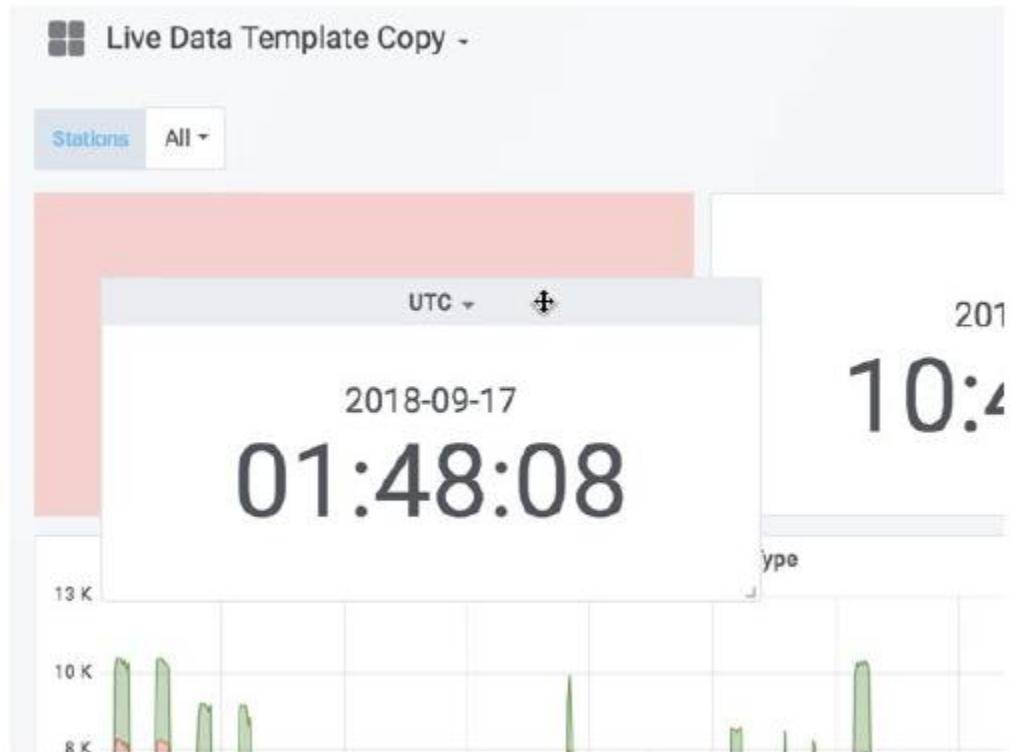


Figure 279. Move Around Visualization

As the visualization is moved around the dashboard the other existing visualizations will adjust up or down as needed. The Red shadow shows where the visualization will stay if released.

d. Resizing Visualizations

To resize a visualization, click and drag the lower right corner to the desired size. As with moving the other charts will adjust to make room for the new size.

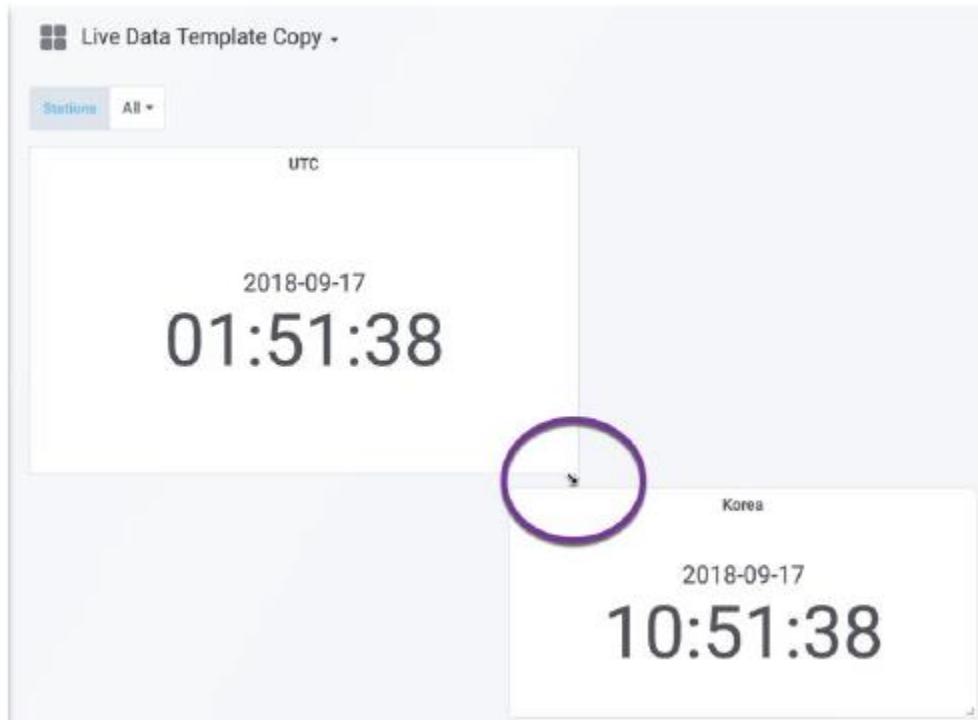


Figure 280. Resize a Visualization

e. Removing Visualizations

To remove a visualization, hover over the title and click the **Drop Down** icon. Select the **Remove** option.

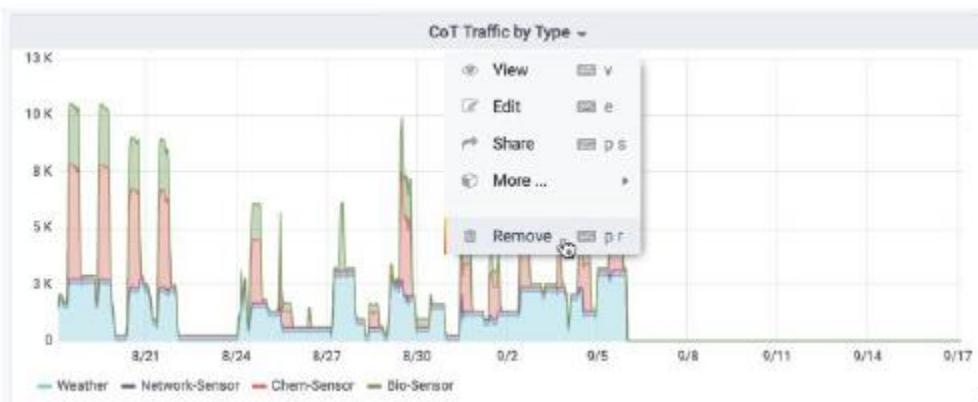


Figure 281. Remove a Visualization

f. Editing a Visualization

Editing a visualization allows the user to change the parameters to what is being visualized. Overall this is fairly straightforward once you understand how the data is structured and simple queries to limit data shown. Take a look at some of the existing visualizations to see examples of how data is queried and visualized for idea. To access the visualization edit screen, hover over the title and click the **Drop Down** icon. Select the **Edit** option.

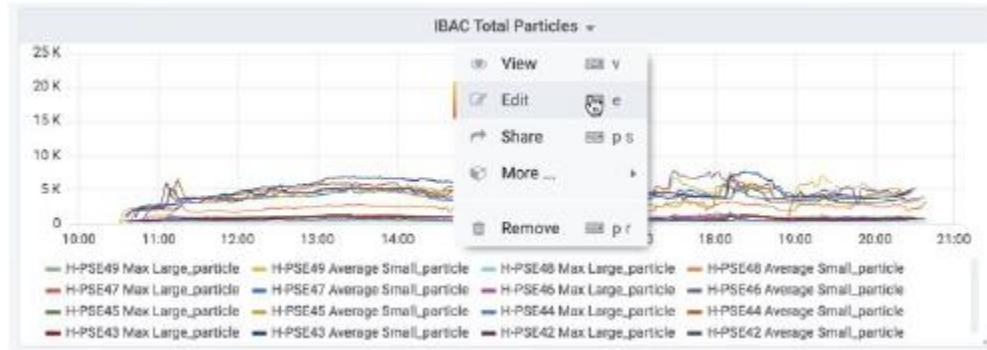


Figure 282. Edit a Visualization

The edit screen opens showing a larger preview of the chart / graph, the query used to filter the data, the metrics displayed and how that data is grouped. Tabs in the middle section, just below the chart preview provide multiple options for changing the visualization of the graph.



Figure 283. Edit Screen

To support getting the user manual to users currently using Q-Trends in the field, this section will be added to in future versions of the manual to expand on chart, table, and other visualization creations.

CHAPTER 12. Q SHUTDOWN AND STARTUP INSTRUCTIONS

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12-1. Q SHUTDOWN AND START-UP PROCEDURES. This guide will walk an FSE or User through the steps to gracefully shutdown a Q Visualization system and the start up procedure and checks once powered back on. Though compact in overall size there are multiple physical machines and virtual machines running on the Q.

12-2. Q SHUTDOWN PROCEDURES.

a. Virtual Machine Shutdown

1. On the Q-Vis computer (primary touchscreen) open up XenCenter listed in the Windows programs folder
2. Log into the Virtual Machine Pool by double clicking on the **Gadget-SN0005** pool listed in the left pane.

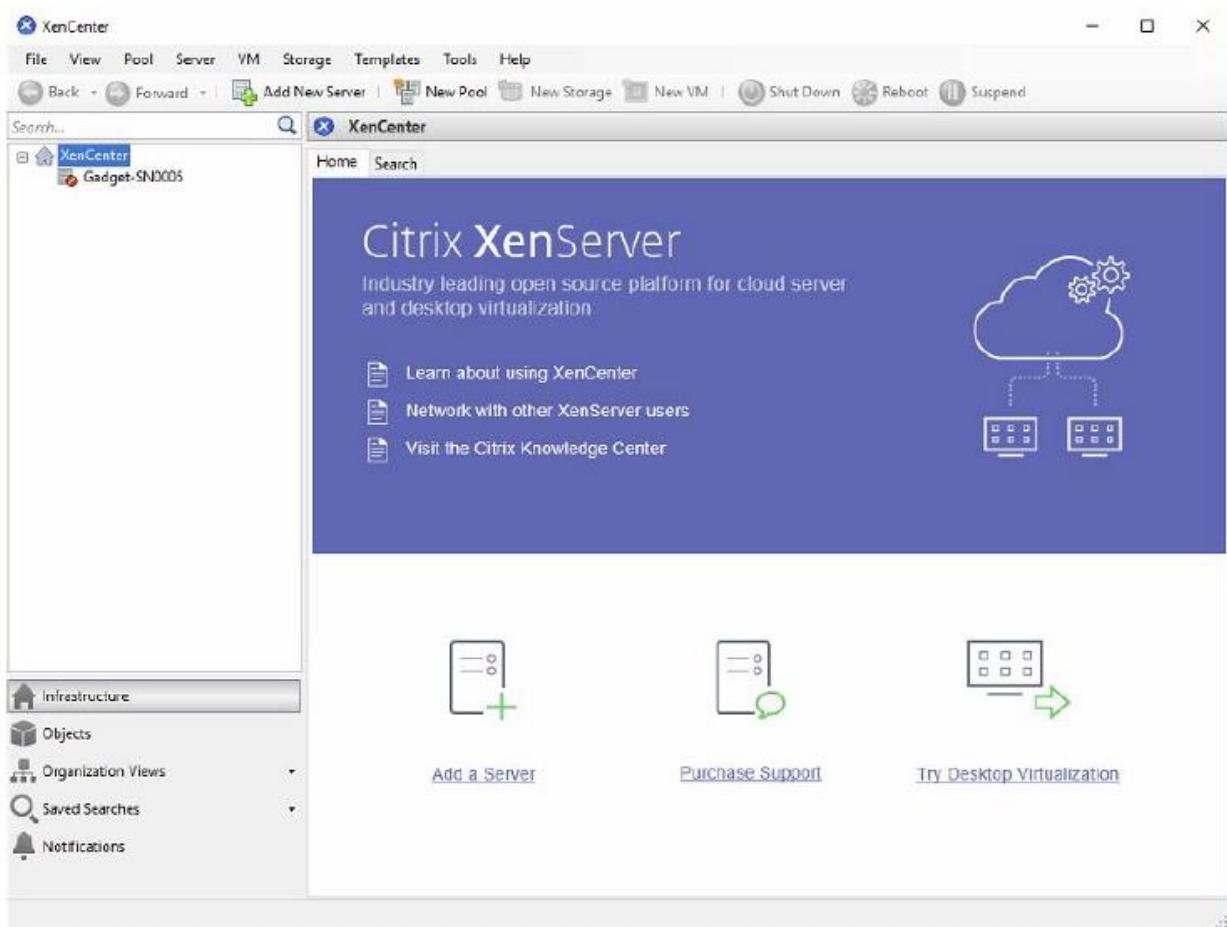


Figure 284. XenCenter Screen

3. In the *Connect to Server* window, enter the Hypervisor username and password and click **Connect**.

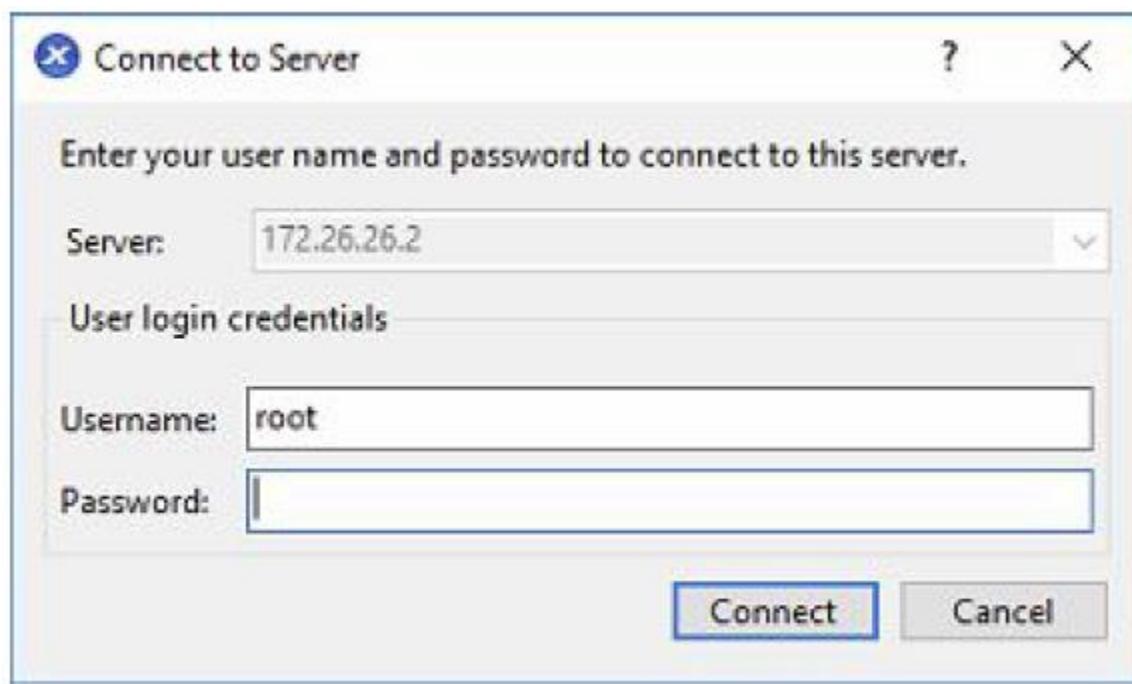


Figure 285. Connect to Server Window

4. In the left tab two hosts will show up under the Gadget-SN0005 Pool, expand each host down to see the list of VMs.

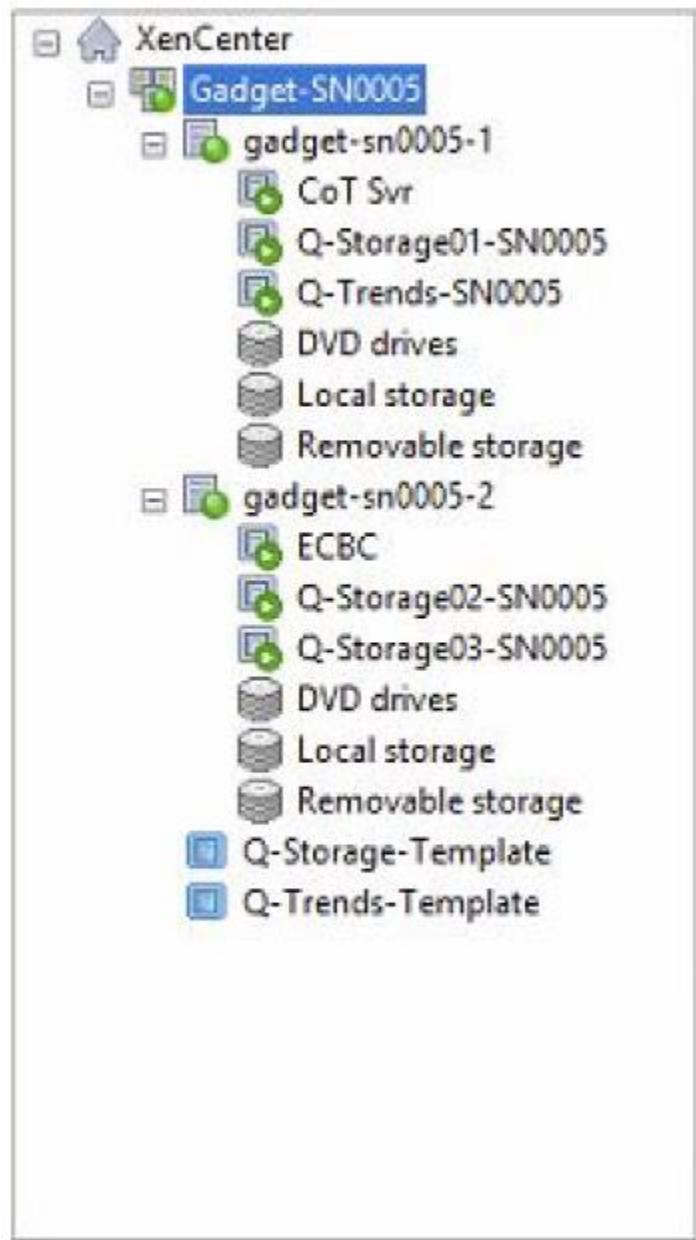


Figure 286. List of Virtual Machines

5. Shutdown Q-Trends VMs by right clicking the Q-Trends VM and selecting shutdown, on the *Shutdown VM* window click **Yes**

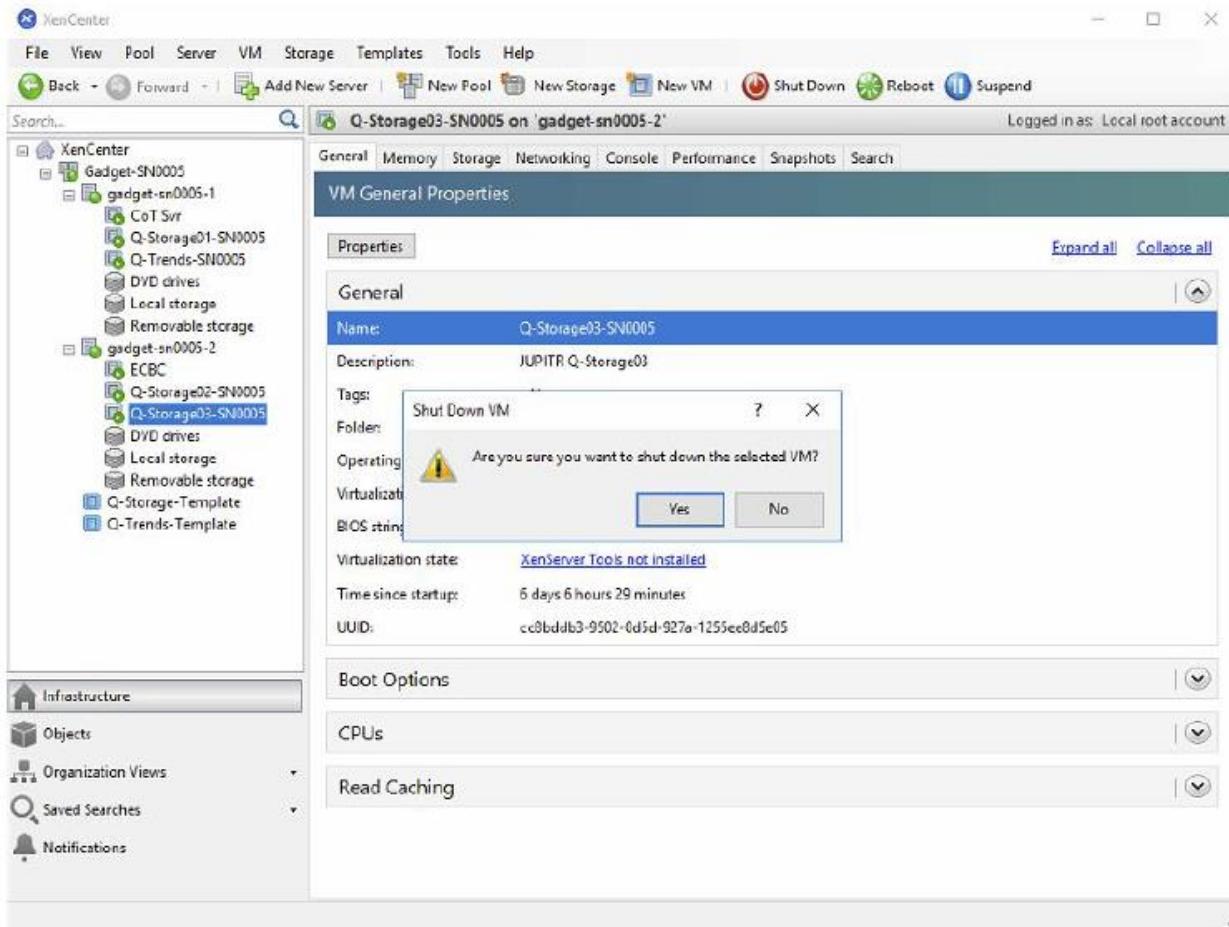


Figure 287. Shut Down Selected Virtual Machine

6. Repeat the step for all Q-Storage VMs listed in the tree, not waiting between VMs to send the next shutdown command.

7. Once Q-Trends is shutdown you can now repeat the shutdown for the remaining VMs (CoT_Svr and ECBC).

8. Once all VMs are shutdown (Red Badge on Icon) you can now shutdown the Gadget-SN0005-2 Hypervisor by right clicking on the Host and choosing Shutdown. Wait for the host to fully shutdown before shutting down the Pool Master (Gadget-SN0005-1)

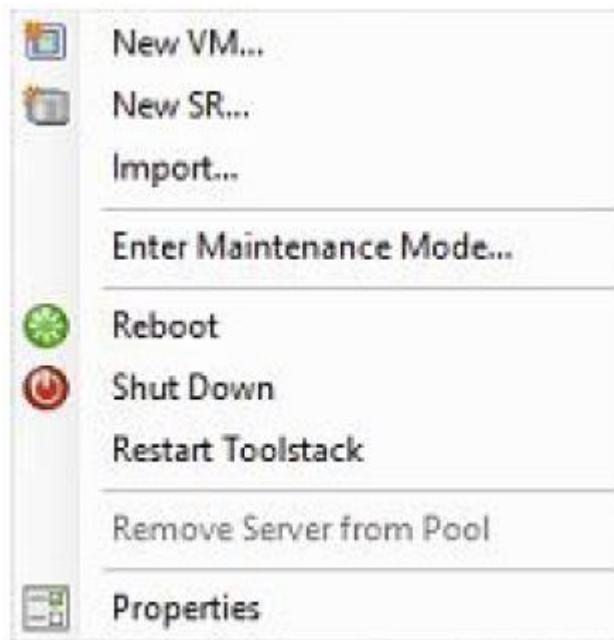


Figure 288. Shutdown Gadget-SN0005-2 Hypervisor

9. Once the secondary host is powered down, repeat the steps for the Pool Master

10. Close XenCenter once all VMs and Hosts are powered down.

b. TRAN Gadget Shutdown

The TRAN Gadget runs AGM 10, to power it down you can do one of two steps, using Remote Desktop log in and select shutdown, or clicking the power button on the physical machine (top gadget in back of Q) for less than 5 secs to start the automated shutdown process.

1. From the Q-Vis computer open up Remote Desktop Services by clicking on the *Windows* button and typing **mstsc** . Select **Remote Desktop Connection**.
2. In the computer field type **172.26.26.4** and click **Connect** .
3. Enter the username and password for the TRAN machine and click **OK**.
4. Shut the computer down using the standard Windows 10 Shutdown steps.

c. Q-Vis Shutdown

The Q-Vis runs AGM 10, power it down using the standard Windows 10 Shutdown steps

12-3. Q STARTUP PROCEDURES AND CHECKS.

a. Physical Machine Power on

Once connected to power the physical machines should power on automatically, to verify confirm there are blue lights on the front of each of the Gadgets and a red light is visible through the case of the Q-Vis computer.

b. System Checks

1. The Virtual Machines will automatically start when the hypervisor is started, to verify connect via XenCenter and ensure all VMs have **Green** badges on them.
2. Once the VMs are fully booted open up Q-Trends to ensure data is being ingested into the system. <http://172.26.10:3000>
3. If sensors are on and the data ingestion system is working properly the graphs on IEW-S Live Data dashboard should start to populate.
4. Open up Q-Replay and start the CoT feed, data should populate on the map.

CHAPTER 13. CENTAUR CLOUD

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13-1. CENTAUR CLOUD. This guide will walk an FSE or User through the steps to create a secure connection to the CoT or ISA server hosted on a temporary cloud server. As CENTAUR Cloud is operationalized these steps may change.

a. Connect to Cloud Via Putty

Save Certification Key: Save the public key to a local location, for this example the cert key is saved under C:\Data and is called q-mobile-0001.ppk.

Create a profile:

1. Open Putty on your windows desktop
2. Enter the IP address in the *Host Name (or IP address)* field: 178.128.179.50
3. Enter a name in the *Saved Sessions* field: Centaur Cloud

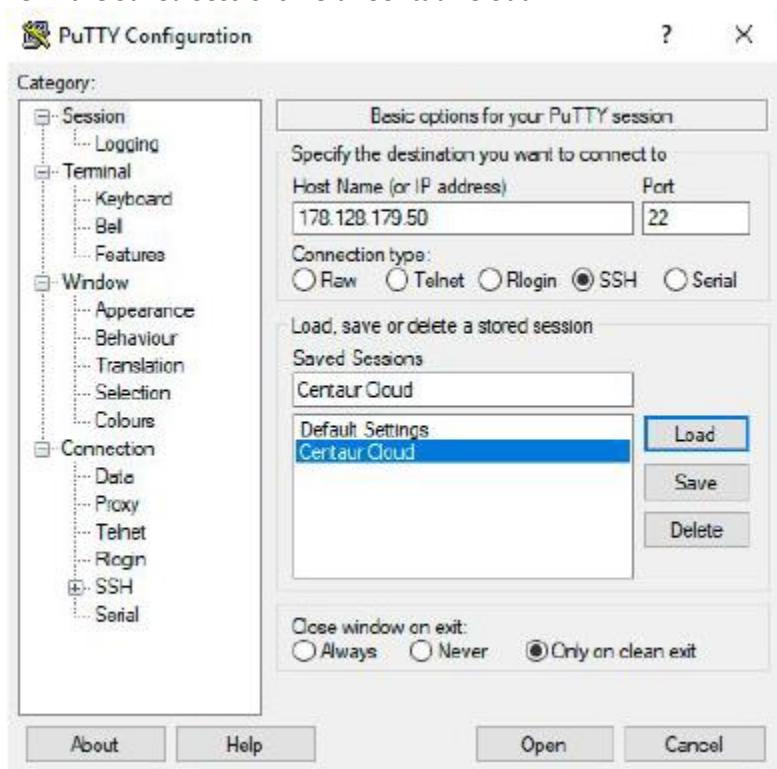


Figure 289. Putty Session Screen

4. In the directory tree on left select the *Connection -> Data* node.

5. In the *Auto-login username* field enter the username: **root**

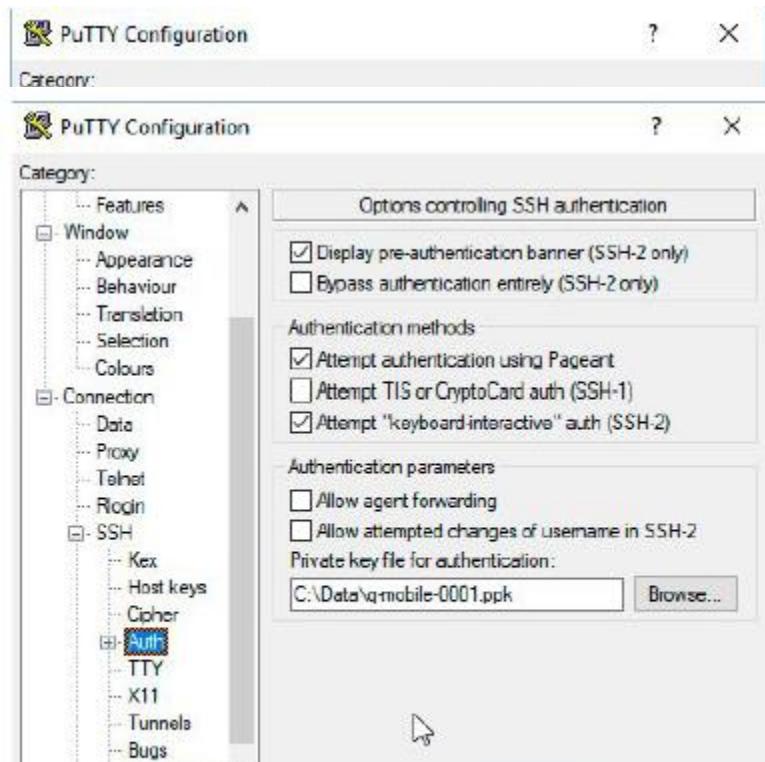


Figure 290. Putty Data Screen

Figure 291. Putty Authentication Screen

In the directory tree on left select *Connection -> SSH -> Auth* and enter the file path to the cert in the *Private key file for authentication* field.

6. In the directory tree on left select *Connection* -> *SSH* -> *Tunnels* and enter the following to add a Local Forwarding to the remote CoT server
 - a. In the *Source port* field enter a port number, for example **7777**
 - b. In the *Destination* field enter: **127.0.0.1:8088**

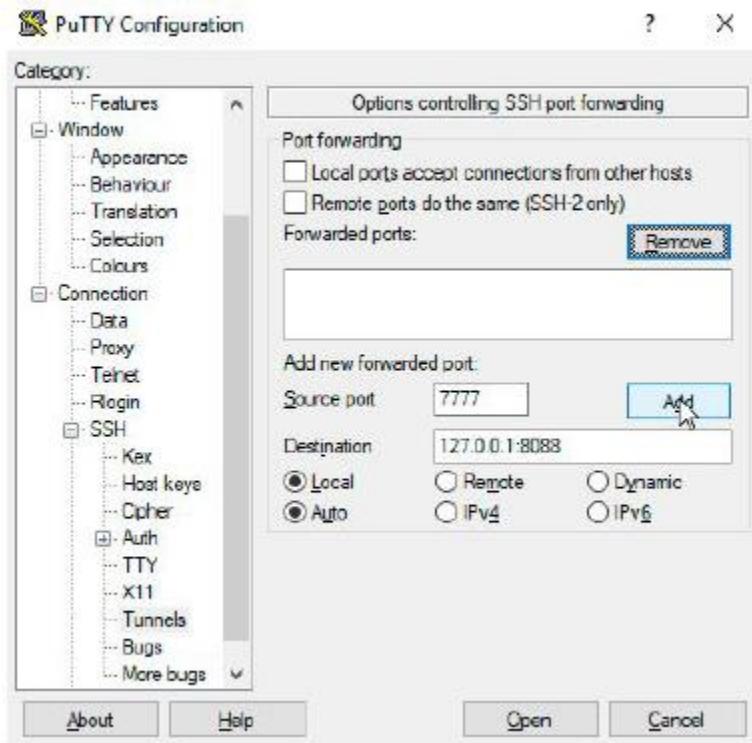


Figure 292. Putty Port Forwarding Screen

7. Click the *Add* button and the *Forwarded ports* field should display as below

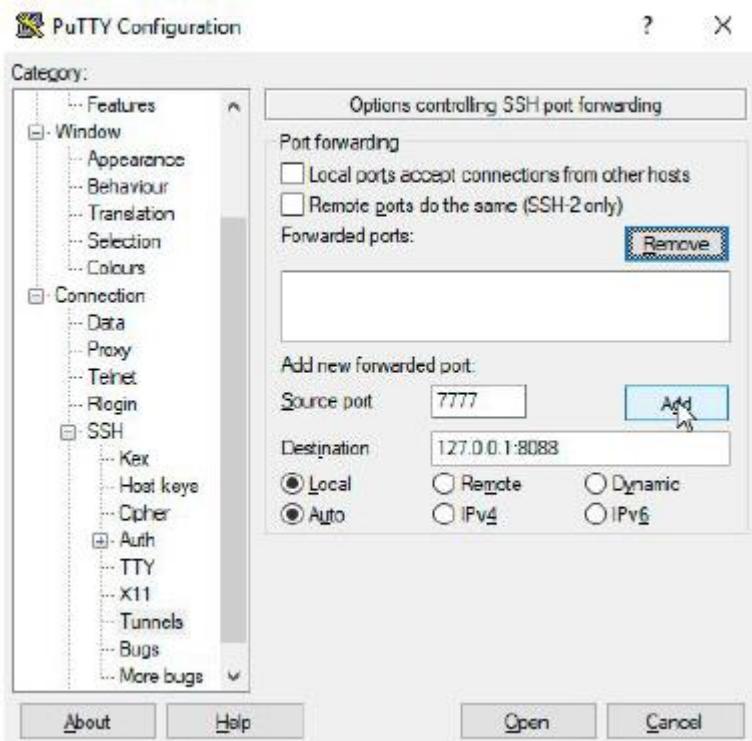


Figure 293. Putty Forwarded Ports Screen

8. Repeat the steps to add a local port to **9950** for the same connection for connecting to the ISA controller hosted there.
- In the *Source port* field enter a port number, for example **7778**
 - In the *Destination* field enter: **127.0.0.1:9950**
9. Scroll the left directory to the top and select *Sessions*
10. Click the *Save* button to save all the settings

Open Connection to CENTAUR Cloud: Once a Putty Profile has been saved it can be loaded by selecting the profile and clicking *Load*. Once loaded click *Open*. This will open a putty window and you should see you are connected as root.

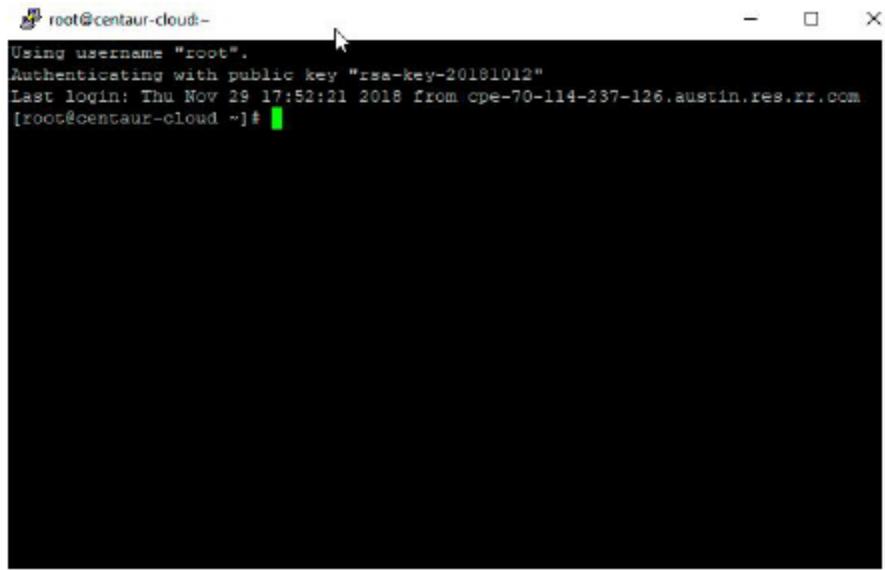


Figure 294. Putty Window Connected as Root

You are now connected to CENTAUR Cloud. Below are the endpoints on your local machine you have created

- CoT Server: 127.0.0.1:7777
- ISA Server: 127.0.0.1:9950

GLOSSARY

Acronyms and Abbreviations

BIT	Built in Test
CENTAUR	Capabilities to Enable NBC Threat Awareness, Understanding, and Response
CERDEC	Communications-Electronics Research Development and Engineering Center
COP	Common Operational Picture
CoT	Cursor-on-Target
CP	Command Post
DoT	Degree of Threat
FPCON	Force Protection Level
GMTI	Ground Moving Target Indication
GSR	Ground Surveillance Radar
ISA	Integrated Sensor Architecture
MGRS	Military Grid Reference System
NVSED	Night Vision and Electronic Sensors Directorate
PSE	Point Sensor Enclosure
RTSP	Real-Time Streaming Protocol
SA	Situational Awareness
SMS	Sensor Management System
VM	Virtual Machine
WMS	Web Mapping Service