

WGMS™ User Guide

Piloting, Mission Preparation, and Data Management

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WGMS™ User Guide: Piloting, Mission Preparation, and Data Management

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05910	A	June 2014	This is the initial release of this document.
05910	B	March 2015	Revision B of this document was released to make corrections to content in the “ Latitude and Longitude Representation ” (page 64) section in Ch. 4: "Using the WGMS Interface"
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About this Document

This document is a reference to the Liquid Robotics Wave Glider Management System (WGMS). The audience is WGMS users assigned a Master Role or lower.

The Wave Glider is a platform for long-duration deployment of ocean surface sensor systems. WGMS provides browser and programmatic interfaces for people and applications to send commands to the Wave Glider, including its payloads, and to receive data from the Wave Glider and its payloads. WGMS is easily configured to support a variety of deployment scenarios.



Note

This document is focused on WGMS features and functionality independent of browser context menus accessed with a mouse right-click, or from the browser toolbar.



Note

"Sub" is the preferred naming convention for the sub-marine wave motion propulsion component of the Wave Glider vehicle. "Glider" is an alternate (and discouraged) term used to refer to the Sub. If you see the term "Glider" used in this manual, it will be because "Glider" appears in the WGMS User Interface and has not yet been changed to "Sub."

For detailed information on the Wave Glider SV2 and the commands you can issue to the SV2 using WGMS, see the most recent revision of the Wave Glider® SV2 Interface Control Description.

For detailed information on the Wave Glider SV3 and the commands you can issue to the SV3 using WGMS, see the most recent revision of the Wave Glider® SV3 Interface Control Description.

WGMS Release Notes are available in the WGMS online help and on the Liquid Robotics Open Oceans Portal.

Chapter 1. WGMS Overview

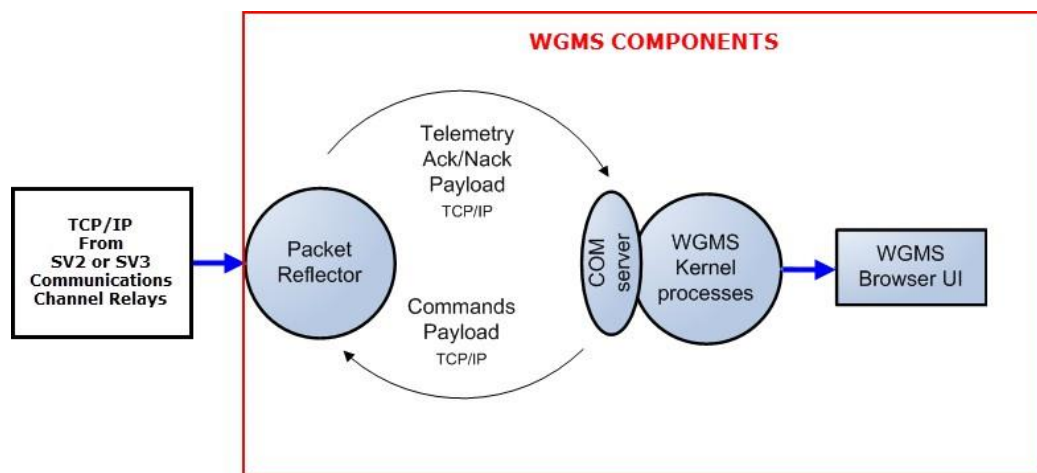
WGMS is a Web application for remote Wave Glider mission management that includes piloting and data management tools. From the WGMS [UI](#) you can:

- Access administrative tools
- Access mission preparation tools
- Access piloting tools
- Issue commands to the vehicle
- Issue commands to payloads
- Display and Store vehicle data
- Display and Store system data
- Display and Store payload data

WGMS System Components

[Figure 1.1](#) illustrates the components of a complete WGMS configuration.

Figure 1.1. Wave Glider Management System Components



WGMS includes the following components:

- **Packet Reflector** – A Packet Reflector routes traffic between one or more WGMS kernels and one or more communications relays, including associated protocol processing. Packet Reflectors use TCP/IP for all communications with other processes.
- **COM Server** – The COM Server interfaces between the Packet Reflector and the WGMS server application in the kernel. The COM Server communicates with the kernel using Web Services.

- **WGMS Kernel Processes** – These include the WGMS Kernel and the database server. WGMS also uses email for sending alarms to users, so the host system must have the ability to send email. Primary services include filters for access control, data consistency, and concurrency management. Communications with application programs is through Web Services technologies. Communications with browsers rely on standard HTML and JavaScript. WGMS relies on Microsoft SQL Server.
- **WGMS Browser UI** – This is the dashboard UI for managing the Wave Glider. Communications with browsers use standard HTML and JavaScript over a mix of HTTP and HTTPS. No additional configuration is required for browser access.

Regardless of the communications channel between a Wave Glider Vehicle and WGMS, the Packet Reflector receives and transmits TCP/IP and the WGMS components communicate with each other using TCP/IP. WGMS components can be resident entirely on one computer, or on multiple computers.

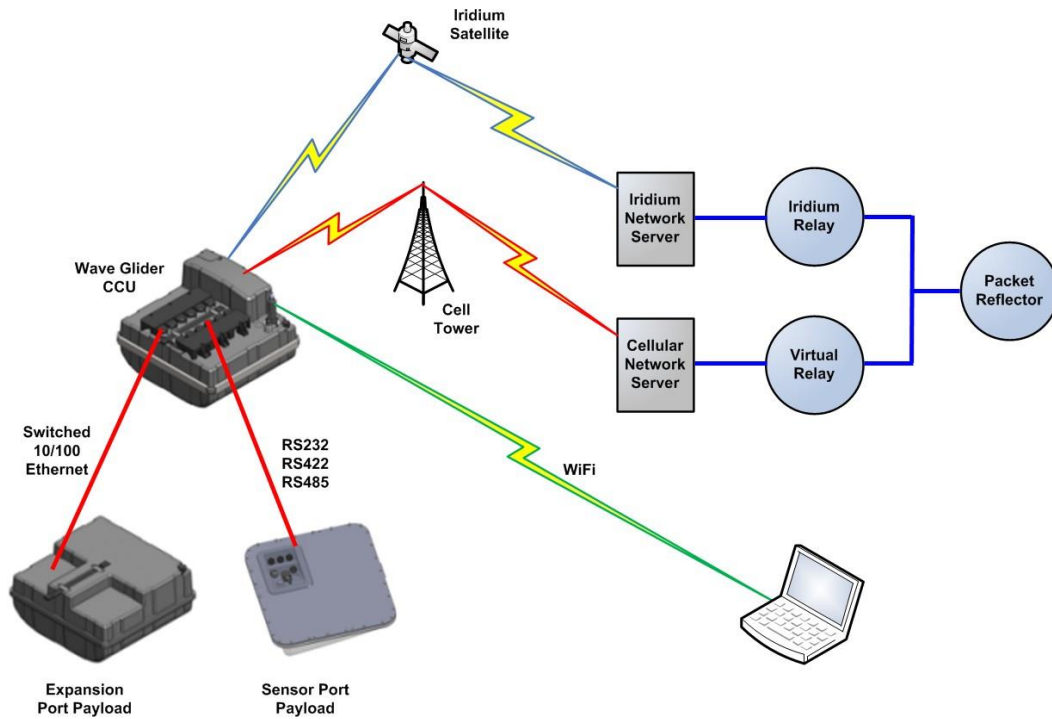
Commands are sent from the WGMS browser UI to the WGMS kernel. The kernel performs authentication, authorization and validation checks on the request. Once approved, it passes the command in an internal format to the Packet Reflector to be forwarded to the Wave Glider Vehicle using the indicated communications channel relay. The communications channel relay manages the details of the underlying communications technology. Depending on the command addressing, the Wave Glider Vehicle either executes the command locally, or forwards it to a payload for processing.

Data such as telemetry is returned from the Wave Glider through a similar mechanism. It is sent to the appropriate communications relay which forwards it to the appropriate Packet Reflector. The Packet Reflector performs validations and some protocol processing and then forwards the data to one or more WGMS Kernels, based on the configuration. The WGMS Kernel stores the data in its database for later use.

Typical WGMS Communications Scenarios

Wave Glider Vehicles can use a variety of channels to communicate with WGMS, depending on mission locale and requirements:

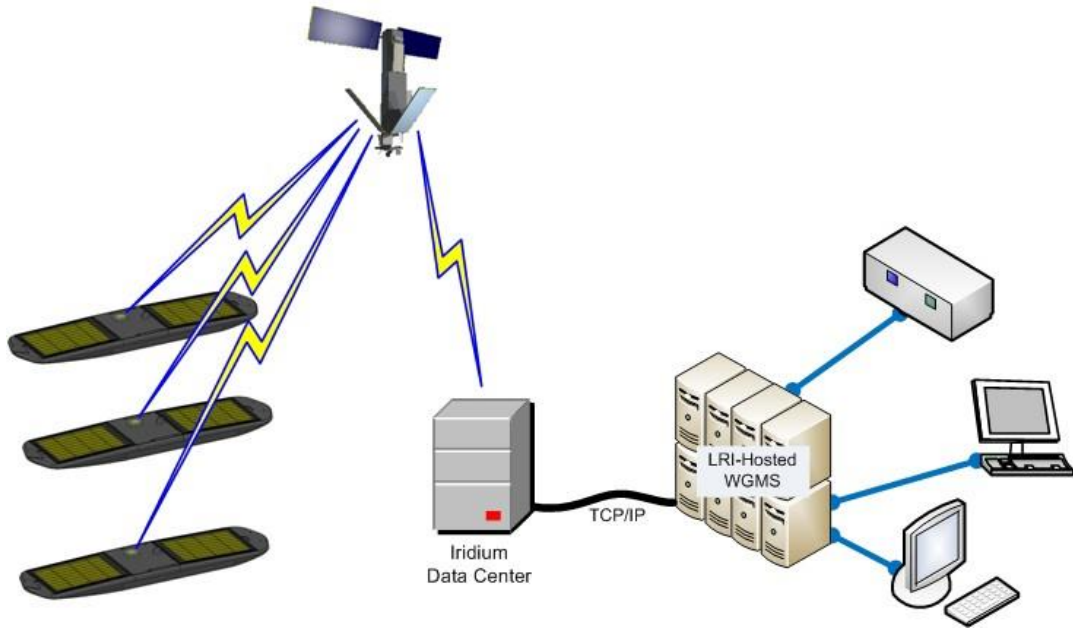
- For world-wide long range offshore operations, Wave Glider Vehicles typically use the Iridium Satellite Network. WGMS connects to the Iridium Satellite Network over an Internet link to an Iridium data center.
- For near shore or near ship operations XBee (SV2 only), Wi-Fi, and Cellular communications are supported.
- XBee (SV2) and Wi-Fi (SV3) communications are typically used for onshore payload development and testing.

Figure 1.2. Example: Some Wave Glider SV3 Communications Channels

For more information on Wave Glider and WGMS supported communications channels see the most recent revision of the *Wave Glider SV2 Interface Control Description* or the *Wave Glider SV3 Interface Control Description*.

Liquid Robotics-Hosted WGMS

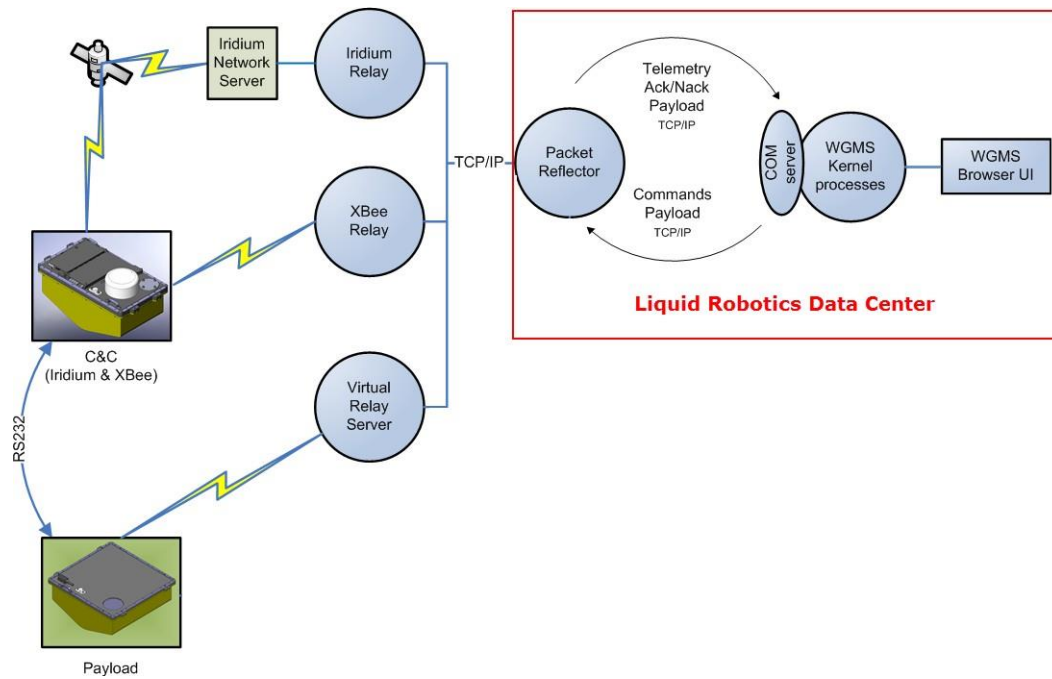
The most common deployment option is Liquid Robotics hosted WGMS. The WGMS software is deployed on redundant, high-performance servers in two secure, high availability data centers. Liquid Robotics Operations and Support Staff configure the system for you and administer your system(s) on a 24x7 basis. [Figure 1.3](#) illustrates this deployment option.

Figure 1.3. Liquid Robotics-Hosted WGMS

With the Liquid Robotics hosted service option you are allocated a private domain name in the **<name>.liquid-robotics.com** format, to be shared by all of your users and Wave Gliders. Your users log in to this domain to manage the Wave Gliders associated with the domain. The private domain is known in WGMS as an “Organization” or “Org”. Since authentication credentials and permissions are managed on a per-Org basis, you can be confident that you control who has access to your Wave Gliders and what privileges they have been granted.

With a Liquid Robotics hosted WGMS deployment, Liquid Robotics Operations handles all of the configuration details on your behalf. Typically, the commercial Iridium satellite constellation is used for communications. You have direct operational control of your Wave Gliders, backed up by Liquid Robotics’s professional operations team. The typical communications flow is illustrated in [Figure 1.4](#).

Figure 1.4. Example: Wave Glider SV2 Deployed with Liquid Robotics-hosted WGMS



Chapter 2. First Time Use of WGMS

Before using WGMS for the first time, you must login to WGMS.

1. To verify the WGMS installation, navigate to your WGMS login page using a browser.
 - If you are verifying a hosted WGMS instance on a laptop or tablet computer, use <http://YourOrgName.wgms.com> to access the WGMS login page.
 - The following sign-in page will appear.

Figure 2.1. Sign-In to WGMS Website

User Sign In

User Sign in to: Erickson

Username

Password

☐ Remember me

▶ [Forgot my password](#)

▶ [Forgot my username](#)

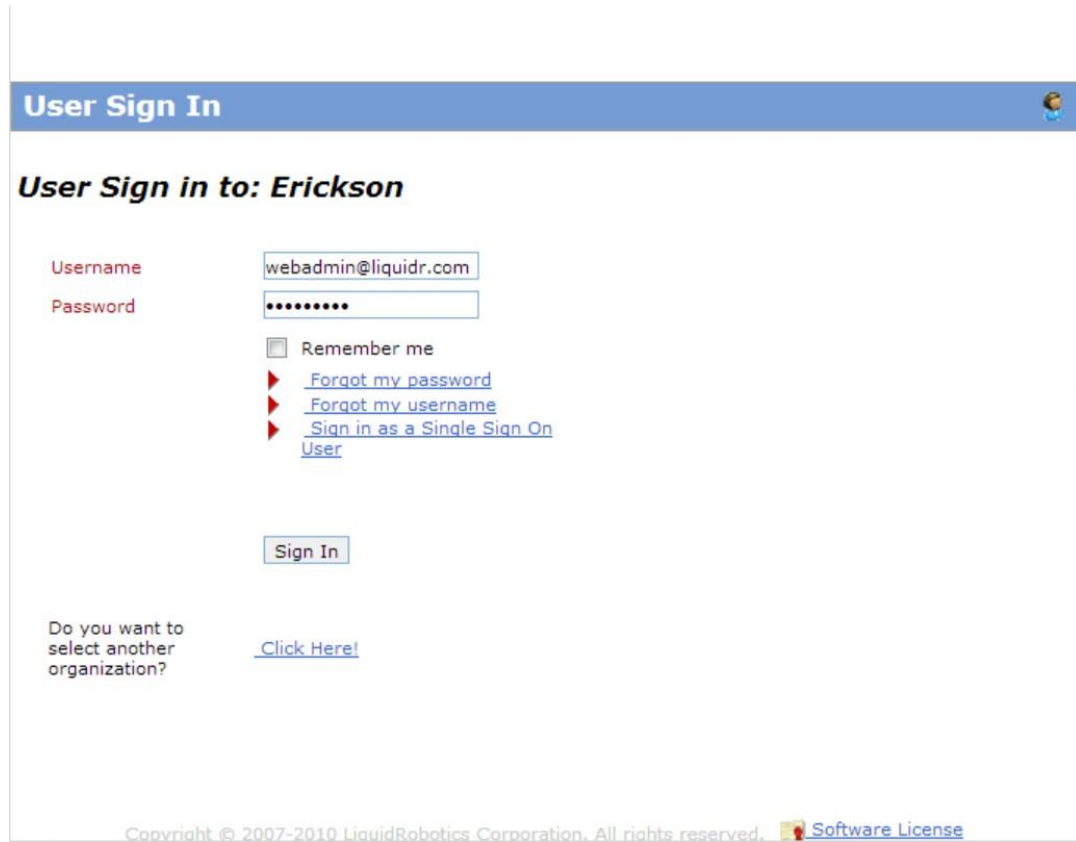
▶ [Sign in as a Single Sign On User](#)

Do you want to select another organization? [Click Here!](#)

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- The credentials are predefined in the database. You will have the option to change them later.

Figure 2.2. WGMS Login Page



The screenshot shows the 'User Sign In' page for the WGMS application. The page has a blue header bar with the text 'User Sign In' and a small user icon. Below the header, the text 'User Sign in to: Erickson' is displayed. The login form includes fields for 'Username' (containing 'webadmin@liquidr.com') and 'Password' (masked with dots). There is a 'Remember me' checkbox and three links: 'Forgot my password', 'Forgot my username', and 'Sign in as a Single Sign On User'. A 'Sign In' button is located below the form. At the bottom left, there is a link 'Click Here!' with the text 'Do you want to select another organization?'. The footer contains the copyright notice 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to the 'Software License'.

2. You will be asked to accept the Software License and change your Username on first login. Note: the **Current Username** field will be "grayed-out" and can be ignored.

Figure 2.3. Change Username Page

Change Username

Enter a new Username

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☐ I Accept the Software License

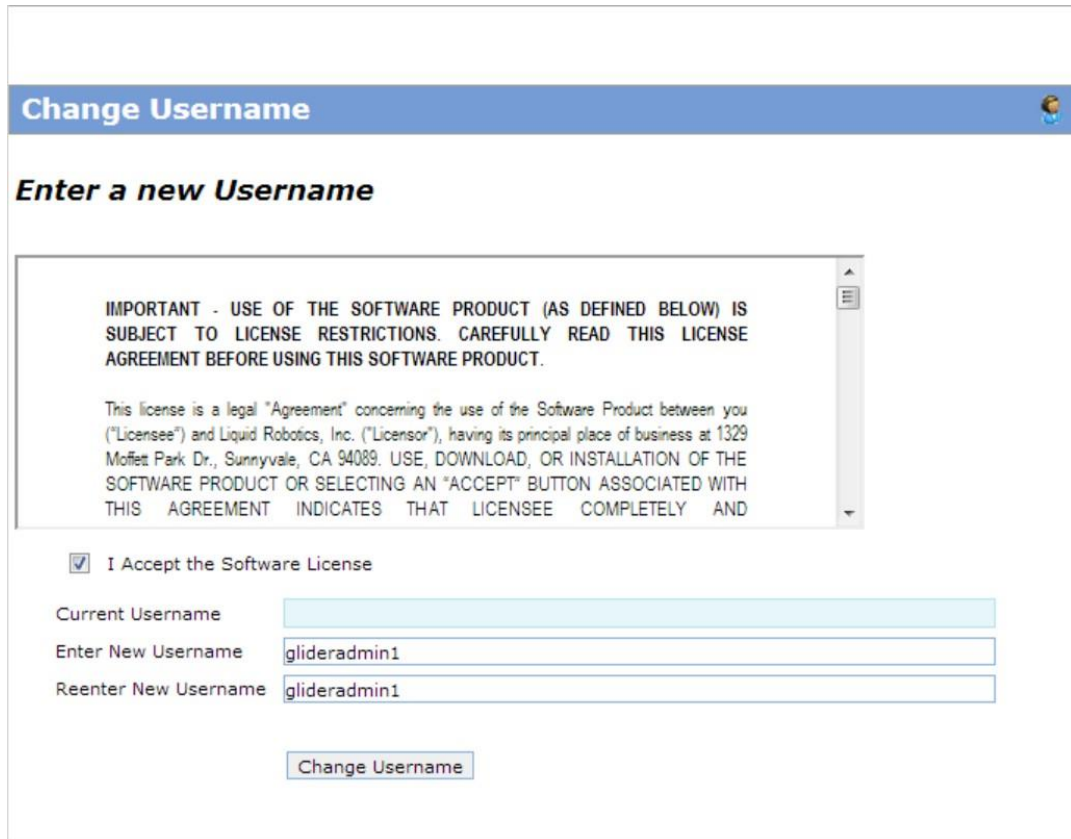
Current Username

Enter New Username

Reenter New Username

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Figure 2.4. Accept License and Change Default Username



Change Username

Enter a new Username

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Current Username

Enter New Username

Reenter New Username

3. After changing your Username, you will be prompted to sign in using your new Username:

Figure 2.5. Sign In with New Username

File Tools Help

Options

User Sign In

User Sign in to: Erickson

Username: glideradmin1

Password:

☐ Remember me

▶ [Forgot my password](#)

▶ [Forgot my username](#)

▶ [Sign in as a Single Sign On User](#)

[Sign In](#)

Do you want to select another organization? [Click Here!](#)

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4. After signing in with your new Username, you will be prompted to create a new password:

Figure 2.6. Change Password Page

[File](#) [Tools](#) [Help](#)

 Saved Exports

Erickson: Web Admin ([Sign Out](#))

Change Password

Enter a new password

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Current Password

Enter New Password

Reenter New Password

Strength:

Begin Typing

Figure 2.7. Changing the Default Password

File Tools Help Erickson: Web Admin ([Sign Out](#))

Saved Exports

Change Password

Enter a new password

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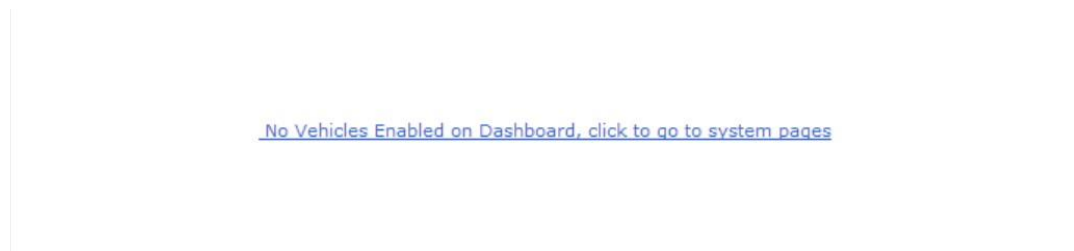
Current Password

Enter New Password **Strength:****Strong**

Reenter New Password

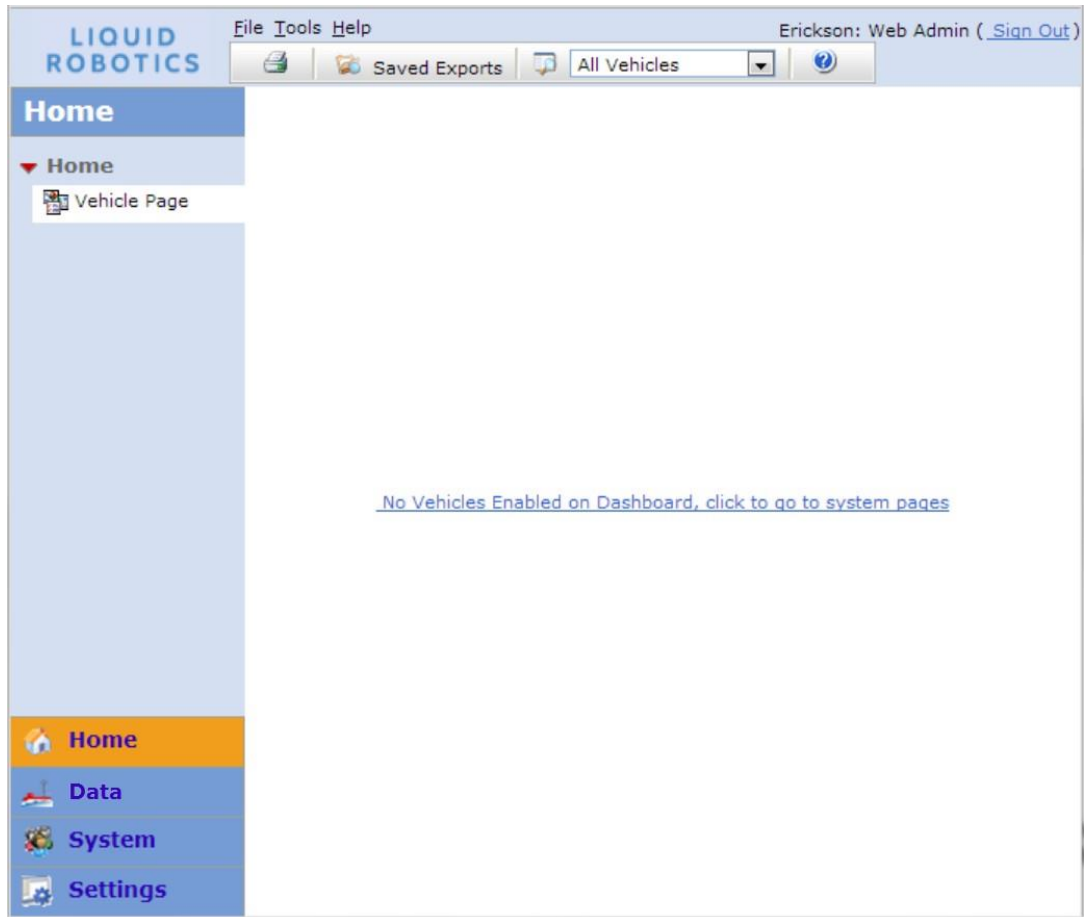
[Change Password](#)

- After changing your password, the initial user interface (UI) display page will appear. If no vehicles have been defined in the initial database by Liquid Robotics, the display will be empty except for a link to the System Menus.

Figure 2.8. Initial UI Display Page

- Click on **No Vehicles Enabled on Dashboard, click to go to system pages** to open the WGMS **Home** page where you can access the SystemMenus.

Figure 2.9. UI Display with System Menus



7. The database is preconfigured with `webadmin@liquid-robotics.com` as the initial system administrator user. That address is also that user's account name and login ID. You may change it if you wish.

To change the default administrator email for your WGMS deployment, you first change it in the WGMS UI. Log in as `webadmin@liquid-robotics.com` and click on **Tools**, then select **Options** from the drop-down menu to open the User Admin Form.

Figure 2.10. Initial User Admin Form

The screenshot shows the 'User Admin Form' for editing the user 'webadmin@liquidr.com'. The interface includes a menu bar with 'File' and 'Help', and a toolbar with 'Save', 'Print', and 'User Admin Form' dropdown. The left sidebar has 'Record Info' and 'Roles' links. The main content area has tabs for 'User', 'Multi-Factor Auth', and 'Related Info'. The 'User' tab is active, showing 'User Information' and 'Fleet Association' sections.

User Information

E-mail	webadmin@liquidr.com	Password		Edit
First Name	Web	Last Name	Admin	
Country Code	1	Telephone	444 444 4444	
Phone Exten...		Export Max ...	65535	
Pager		Alt Email		
Time Zone ...	(UTC-08:00) Pacific Time (US & Canada); Tijuana			
Password Ex...	☐	Account Loc...	☐	
Username		EditClr	Domain User	

Fleet Association

Fleet Selector

8. Change the E-mail field to the appropriate email (for example webadmin@example.com) and then click Save and Close button  in the menu bar at the top of the User Admin Form.

Figure 2.11. Edited Email - Initial User Admin Form

The screenshot shows the 'User Admin Form' for editing the user 'webadmin@liquidr.com'. The interface includes a sidebar with 'Record Info' and 'Roles' links. The main form has tabs for 'User', 'Multi-Factor Auth', and 'Related Info'. The 'User' tab is active, showing 'User Information' and 'Fleet Association' sections.

User Information

E-mail	webadmin@example..	Password		Edit
First Name	Web	Last Name	Admin	
Country Code	1	Telephone	444 444 4444	
Phone Exten...		Export Max ...	65535	
Pager		Alt Email		
Time Zone ...	(UTC-08:00) Pacific Time (US & Canada); Tijuana			
Password Ex...	☐	Account Loc...	☐	
Username		EditClr	Domain User	

Fleet Association

Fleet Selector

9. To create a vehicle and its parts, click on **Vehicles** tab to open the **Vehicles** list. Follow the vehicle provisioning steps outlined in [Chapter 6: Administrative Tasks - Data Page](#).

Figure 2.12. Initial Vehicles List

The screenshot shows the 'Vehicles' list page in the Liquid Robotics WGMS. The sidebar includes links for 'Home', 'Vehicles', 'Raw Outputs', 'Missions', 'App Services', and 'Settings'. The main area displays a table with columns: 'Vehicle Name', 'Icon', 'Send Ala...', 'Multiple ...', and 'Fleet Association'. The table is currently empty. The footer includes copyright information and the version number 'WGMS Version 4.2.0.3'.

Chapter 3. WGMS UI Overview

All Wave Glider Piloting, Data Management and Mission Management tasks can be performed from the WGMS UI.

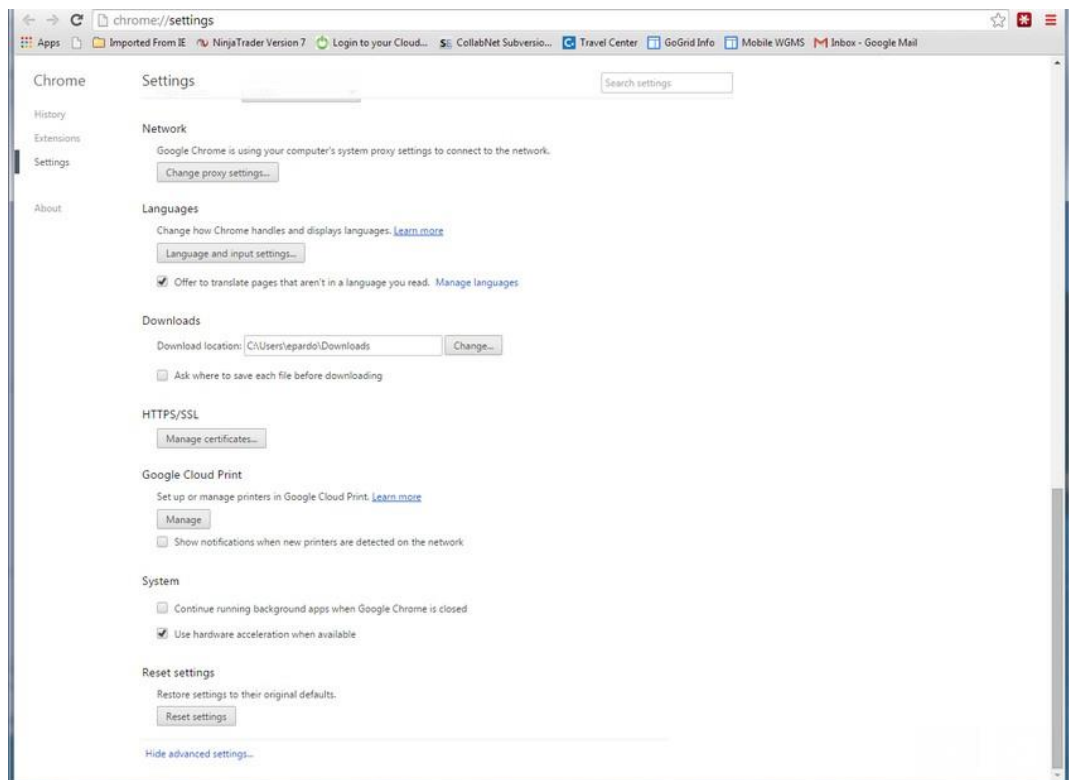
WGMS supports recent versions of the following browsers:

- Chrome
- Internet Explorer
- Safari (on Apple iOS only)
- Firefox



Note

When using Google Chrome, Liquid Robotics recommends clearing the cache upon exiting Chrome. You should also turn OFF (un-check) the **Continue running background apps when Google Chrome is closed** option in the **System** section of the **Settings** tab advanced settings:



WGMS UI Architecture

The WGMS UI is comprised of HTML Web pages displayed in windows. There are five primary WGMS web pages that open to full screen, and a wide range of smaller windows containing lists, forms, and dialogs.

Each primary WGMS web page is organized for performing related tasks or accessing related data. These pages are described in [“The Five Primary WGMS Pages”](#).

The primary WGMS web pages include menus with links to lists containing related data records. All Wave Glider Vehicle data, WGMS system data, and Wave Glider integrated sensor data, is displayed in lists where each row contains a data record. Each data record is linked to a form where you can view, and in some cases edit, the record data.

The primary WGMS pages also include links to modal "dialog" windows for issuing commonly used commands and for changing the WGMS display settings and other administrative tasks.

Related WGMS windows are linked to one another facilitating a variety of ways to get from one window to another. Typically, there is more than one way to complete the same task. This manual explains how to perform tasks starting from one of the primary WGMS pages. This manual does not explain the various other ways you may be able to perform a task from a different starting point. The intent is to shorten the learning curve. As your experience and confidence using WGMS increases, you may discover other ways to complete tasks based on the links between related windows.

Accessing the WGMS User Interface

To use the on-line WGMS user interface, you must have role-based access rights and privileges that are assigned by the System Administrator for the WGMS Organization you want to work with. The System Administrator has access to all of the WGMS program settings and features, including some privileges not available to any other users.

Gaining Access

Roles

Your WGMS System Administrator will set up an account for you, give you the URL for signing on, and assign an initial password. The System Administrator will also assign you an appropriate Role, as described below. Contact the System Administrator if you have problems with WGMS, or if you want to perform tasks that are not available to the Role assigned to you. For more information see [Chapter 2: First Time Use of WGMS](#).

All Users of WGMS are assigned Roles that determine what features they have access to, and what tasks they can perform.

The Roles are:

Guest User: A Guest User can only view the status of Vehicles that have been configured for display to guests.

Data Analyst: A Data Analyst can view existing Vehicle and WGMS data and can download from the WGMS database data.

Master: A Master manages Vehicle provisioning, mission preparation or operations, as well as payload and web services development.

Admin: A System Administrator who has all the permissions required to handle the day-to-day administration of WGMS, adding users, managing customizations, and managing data.

Developer: A Developer is an incremental role that allows a user to gain access to payload data.

Root: A Root user has full access to all aspects of the Vehicle and WGMS. A user with the Root role will either be a Liquid Robotics developer or a customer under close direction from Liquid Robotics.

Some features described in this document may not be displayed or may not be operative on your system. That is because you have been assigned a Role that does not allow access to, or control of, that feature. More information on Roles is provided in the *WGMS Administrators Guide*.

The Five Primary WGMS Pages

All WGMS UI entities are HTML Web pages contained in windows. The five primary WGMS pages are windows that open to completely fill your display, similar to a "screen" in a desktop application. Each primary WGMS page has a toolbar, a sidebar and sections containing piloting tools or data. The five primary WGMS pages are:

- **Dashboard** - The main piloting page that includes the map display and easy access to data and commands typically used by Pilots. For more information see [“WGMS Dashboard”](#).
- **Home Page** - Expands the Dashboard to include easy access to the menus for the **Home**, **Data**, **System**, and **Settings** pages. For more information see [“WGMS Home Page”](#).
- **Home Page** - Display and edit information for all Vehicles, Raw Outputs, Missions, and App Services.
- **Data Page** - Display Payload Data and Sensor Data. For more information see [“Data Page”](#).
- **System Page** - Display and edit WGMS Alarms, Reports and System information. For more information see [“System Page”](#).
- **Settings Page** - Display and edit WGMS Organization settings. For more information see [“Settings Page”](#)

WGMS Dashboard

When you log in, WGMS opens to the **Dashboard**, which is the page where Pilots spend most of their time. The **Dashboard** is also included as a major section of each of the other 4 WGMS pages. Unless you have a large, very-high resolution monitor, you will not see the entire **Dashboard** - you will need to use the scroll bars to move around.

Figure 3.1. WGMS Dashboard SV3 Vehicles

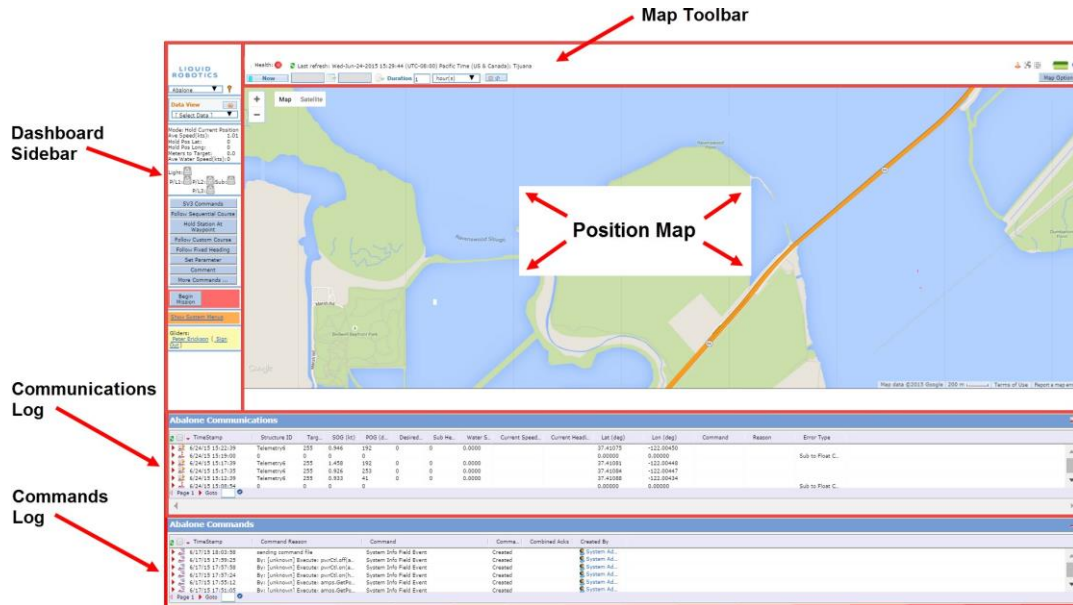
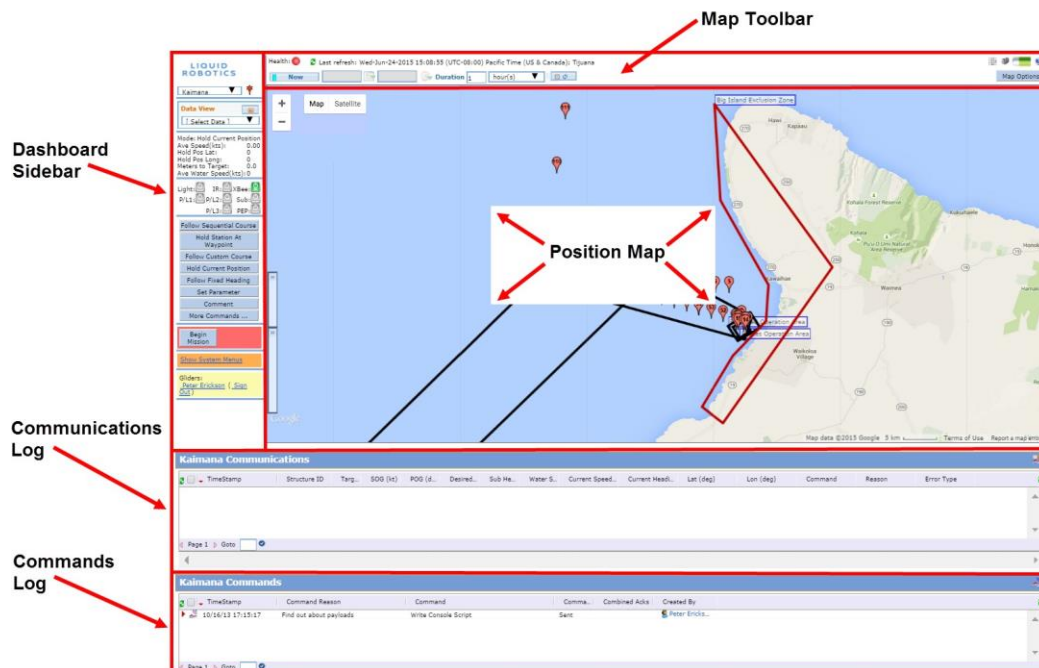


Figure 3.2. WGMS Dashboard SV2 Vehicles



The WGMS Dashboard for both SV3 and SV2 vehicles includes the following five sections:

- WGMS Position Map
- Map Toolbar (slightly different on SV3 than on SV2)

- Dashboard Sidebar (slightly different on SV3 than on SV2)
- Communications Log
- Commands Log



Note

If you are looking at a blank map, the Position Map has probably defaulted to full zoom-in and is showing you a very small patch of water or land. In this case, use the zoombar in the upper-left corner of the Position Map to zoom out (note the position of the slider in [Figure 3.1.](#))



Note

Depending on your Organization and the particular Vehicle you are monitoring, the Position Map and other data may appear different than the screen captures in this document. For example, the color scheme may be different based on the WGMS administrative settings, and the custom reports and command menus available may be different, depending on which Vehicle you are viewing. In any case, using WGMS will be the same. It is instructive to be logged in to WGMS while reading this document so you can interact with some of the WGMS features.

Position Map

The Position Map appears in the standard Google Map format and can be manipulated using the same methods. When you use the map controls there is no need to click the refresh icon - the display will refresh automatically. An annotated position map image is shown in [Figure 3.3.](#) For more information see “[Using the Position Map](#)”.

Figure 3.3. WGMS Position Map



Map Toolbars

The Map Toolbar for an SV3 Vehicle is slightly different than the Map Toolbar for an SV2 Vehicle.

SV3 Map Toolbar

The SV3 Map Toolbar is located directly above the Position Map on the WGMS Dashboard.

Figure 3.4. SV3 Map Toolbar

For more information see [“Using the Position Map Toolbar”](#).

SV2 Map Toolbar

The SV2 Map Toolbar is located directly above the Position Map on the WGMS Dashboard.

Figure 3.5. SV2 Map Toolbar

For more information see [“Using the Position Map Toolbar”](#).

Communications Log

The Communications log, located directly below the Position Map on the WGMS Dashboard, lists all telemetry and error messages received from the selected Vehicle and all commands sent to the selected Vehicle.

Figure 3.6. Communications Log

Timestamp	Structure ID	Target	SOG (kt)	POG (deg)	Desired	Sub Hea...	Water S...	Current Speed	Current Heading	Lat (deg)	Lon (deg)	Command	Reason	Error Type
08/05/2015 20:49:35	Telemetry0f	0	102	290	287	-32.7680	0.00	0.00	20.03791	-155.83090				
08/05/2015 20:44:35	Telemetry0f	0	270	290	287	-32.7680	0.00	0.00	20.03791	-155.83094				
08/05/2015 20:39:35	Telemetry0f	0	284	290	287	-32.7680	0.00	0.00	20.03791	-155.83091				
08/05/2015 20:37:48	0	0	0						0.00000	0.00000				Out of Bounds ...
08/05/2015 20:37:49	Telemetry0f	255	0.931	83	290	287	0.0050	0.00	20.03790	-155.83086				
08/05/2015 20:34:35	Telemetry0f	0	87	290	286	-32.7680	0.00	0.00	20.03789	-155.83097				

For more information see [“Communications Log”](#).

Commands Log

The Commands log, located directly below the Communications log on the WGMS Dashboard, lists all commands sent to the selected Vehicle and the status of each command received from the selected Vehicle. Commands sent to the selected Vehicle are also listed in the Communications log.

Figure 3.7. Commands Log

Quick Silver Commands					
Timestamp	Command Reason	Command	Command Status	Combined Acks	Created By
08/05/2015 16:17:13	Thruster PDC Rebooted @ 2015-04-22T...	System Info Field Event	Created		System Admin
08/05/2015 00:58:11	By: hawaii, Execute: fh.forceRudder(0)	System Info Field Event	Created		System Admin
08/05/2015 00:50:17	Read File Transaction Closed	Read File Transaction Closed.	Acked		System Admin
08/05/2015 00:49:48	Read File Request	Read File Request from Vehicle.	Acked		System Admin
08/05/2015 00:49:47	sending command file	System Info Field Event	Created		System Admin
08/05/2015 00:47:45	Read File Transaction Closed	Read File Transaction Closed.	Acked		System Admin

For more information see “Commands Log”.

Dashboard Sidebar

The Dashboard Sidebar for an SV3 Vehicle is slightly different than the Dashboard Sidebar for an SV2 Vehicle. The primary difference is the **SV3 Commands** button, which appears on the SV3 Dashboard sidebar only. The Dashboard sidebar runs vertically along the left side of the Position Map on the WGMS Dashboard.

Figure 3.8. WGMS SV3 Dashboard Sidebar

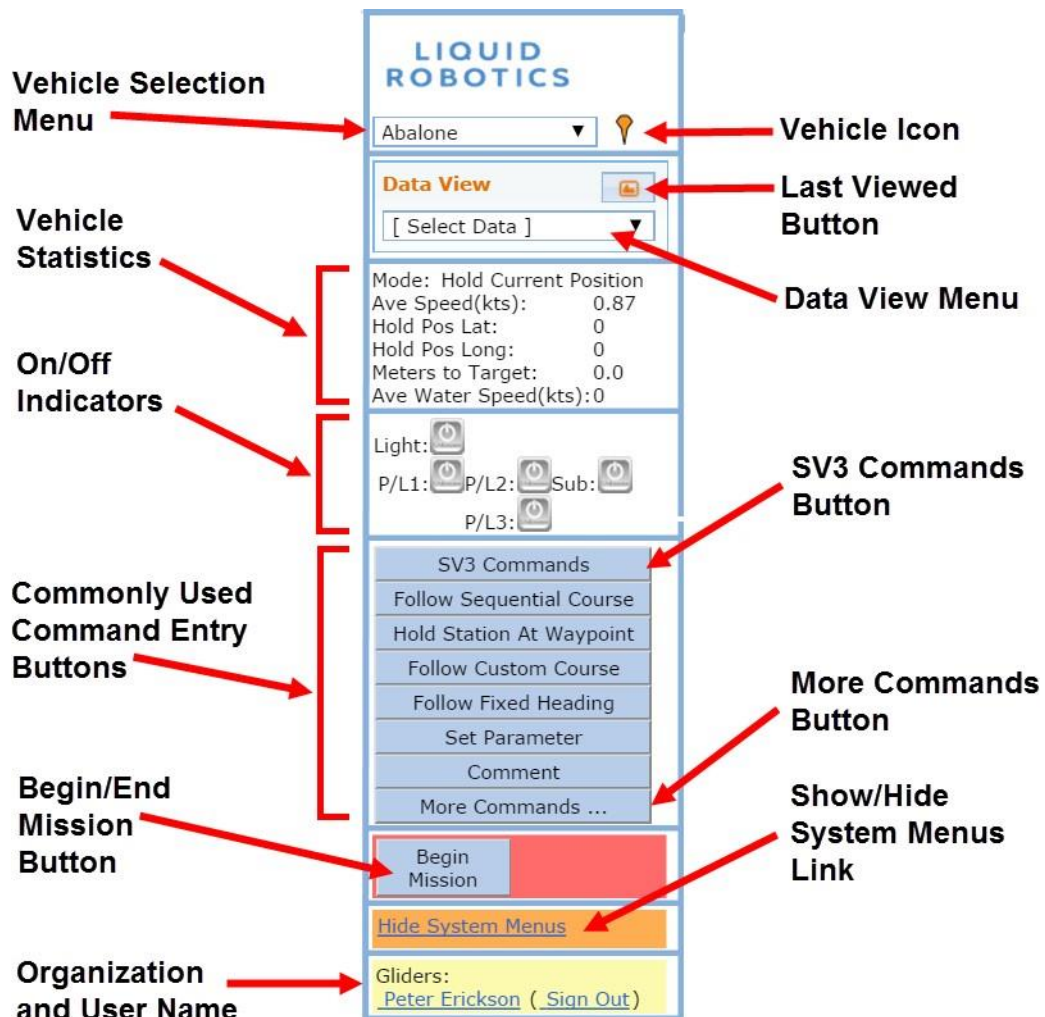
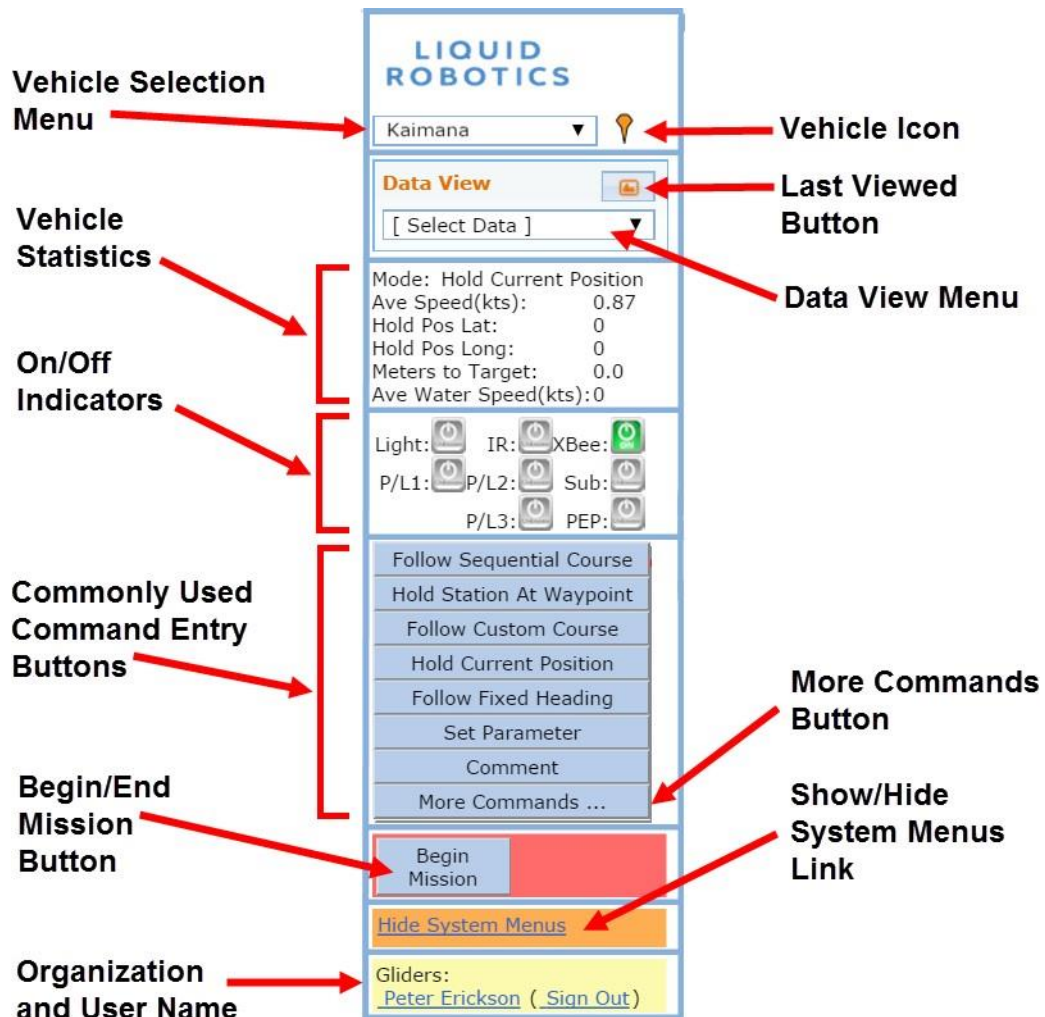


Figure 3.9. WGMS SV2 Dashboard Sidebar



For more information see “Using the Dashboard Sidebar”.

Show System Menus Link

When you click on the [Show System Menus](#) link, the WGMS Home page will open.

Figure 3.10. Show System Menus Link

[Show System Menus](#)

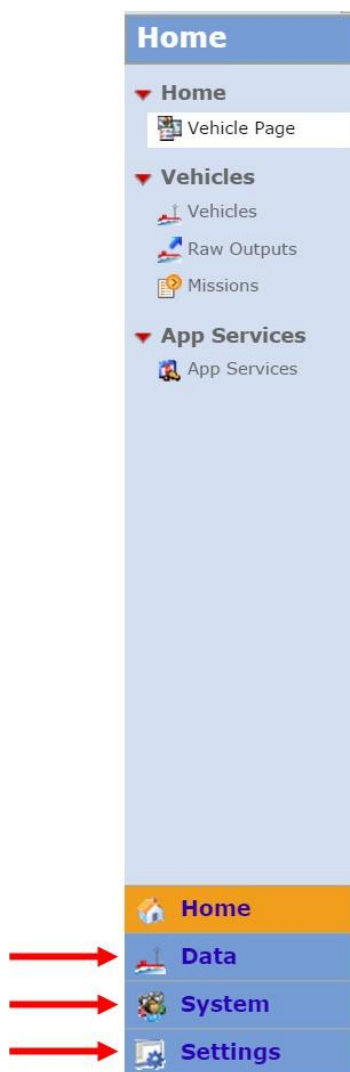
The **Home** page sidebar and toolbar are hidden in the WGMS **Dashboard** view to allow more page space for piloting operations. You can return to the full-screen WGMS **Dashboard** by clicking on **Hide System Menus** in the **Dashboard** sidebar. The link changes back to **Show System Menus** when the full-screen **Dashboard** is displayed.

Figure 3.11. Hide System Menus Link

[Hide System Menus](#)

The buttons at the bottom of the **Home** page sidebar open the **Data** page, the **System** page, and the **Settings** page.

Figure 3.12. Home Page, Data Page, and System Page Buttons



- From the **Home** page you can display and edit information for all Vehicles. You can also display and edit information on Missions and you can add or export app services. For more information see [“WGMS Home Page”](#).
- From the **Data** page you can view data for all payloads and integrated sensors. For more information see [“Data Page”](#).
- From the **System** page you can display and edit WGMS system parameters, view reports, and view system data and events, including AMPS status. For more information see [“System Page”](#).

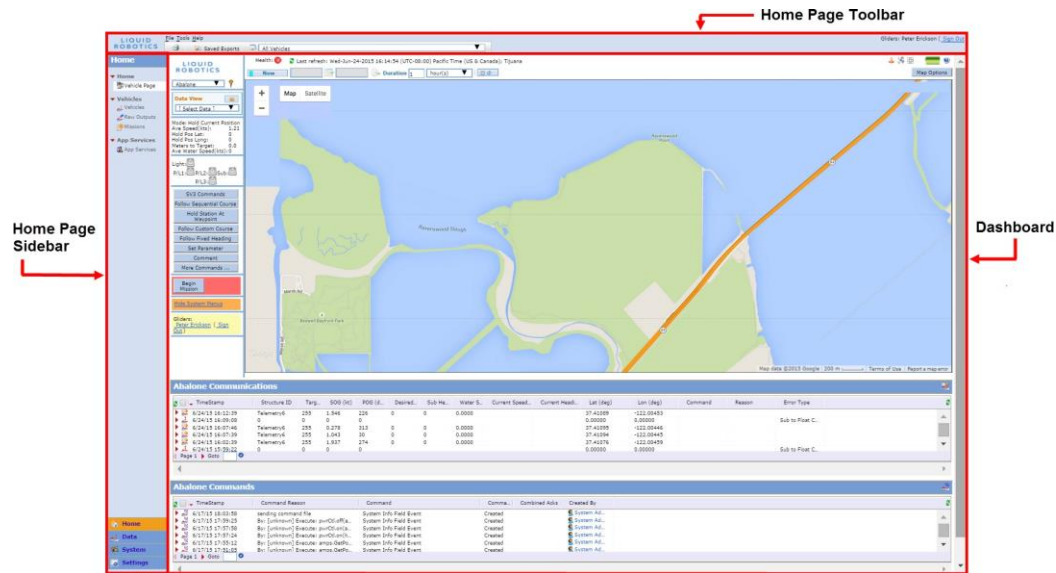
- From the **Settings** page you can display and edit WGMS Organization settings and customize records. For more information see “[Settings Page](#)”.

For more information see “[Using the Dashboard Sidebar](#)”.

WGMS Home Page

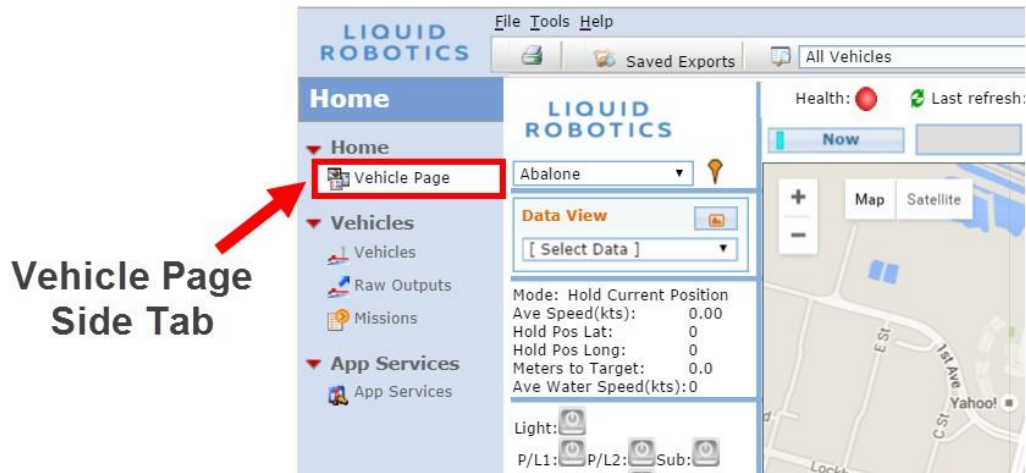
When you click on **Show System Menus** in the WGMS **Dashboard** sidebar, the full WGMS **Home** page is displayed. The WGMS **Home** page includes the WGMS **Dashboard**, flanked by the **Home** page toolbar and the **Home** page sidebar.

Figure 3.13. WGMS Home Page (SV3 Vehicle)



When the **Home** page first opens, the **Vehicle Page** side tab under the **Home** menu in the **Home** page sidebar is selected by default.

Figure 3.14. Vehicle Page Side Tab

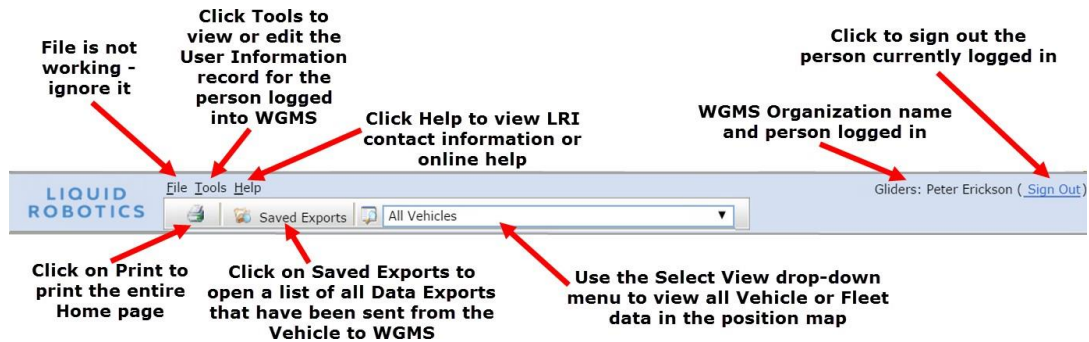


The **Vehicle Page** side tab displays the WGMS **Dashboard**, but in a smaller version that allows space for the **Home** page sidebar and toolbar.

Home Page Tool Bar

The **Home** page toolbar runs across the top of the **Home** page.

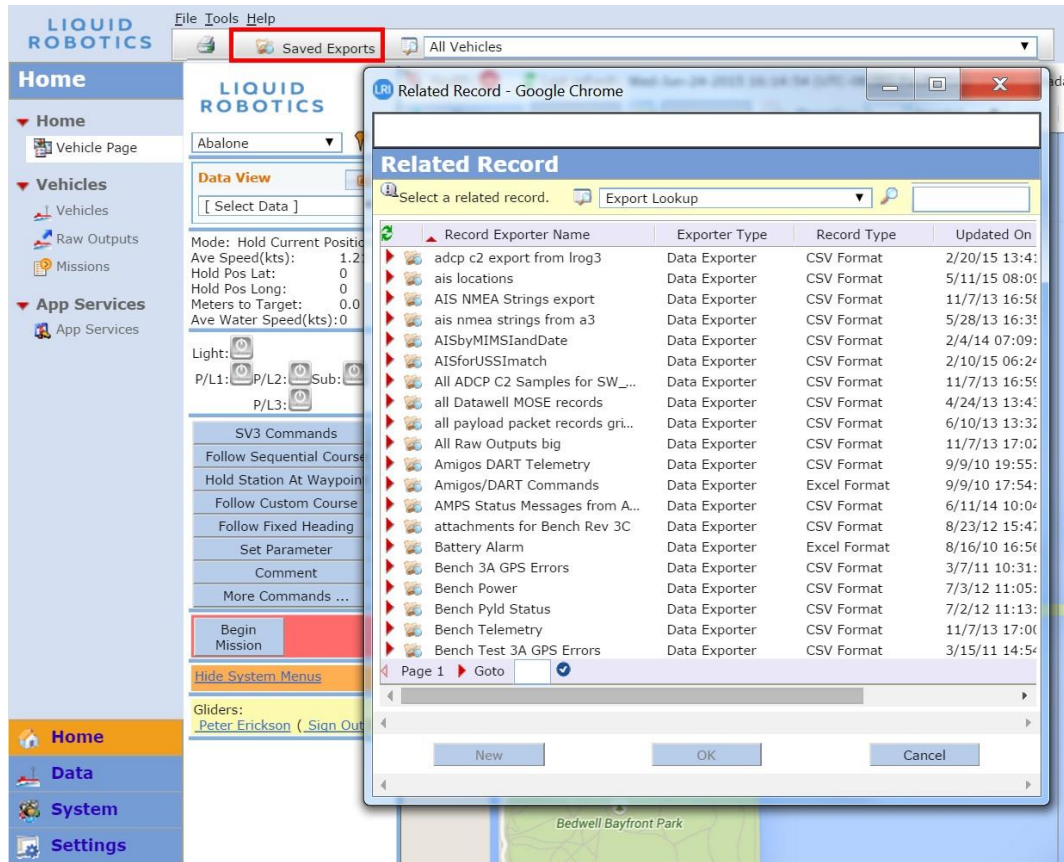
Figure 3.15. Home Page Toolbar



The **Home** page toolbar includes:

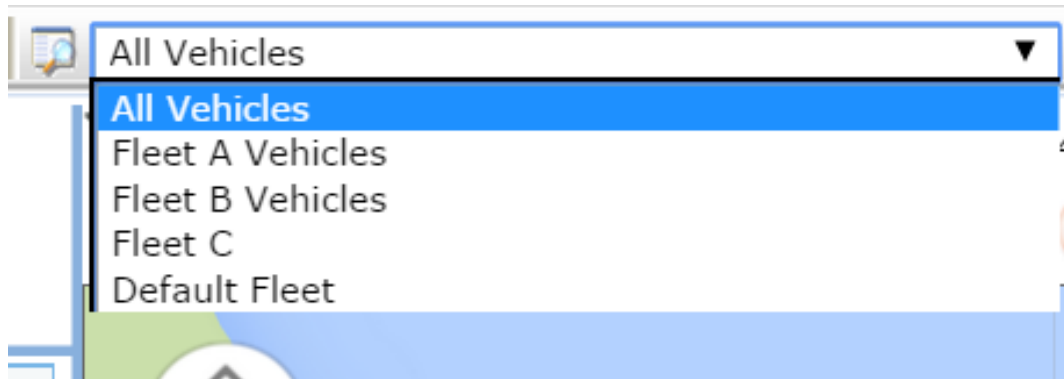
- Two click access (**Tools > Options**) to the user information record for the person logged in to WGMS.
- One click access (**Help**) to online help and LRI contact information.
- A **Print** button to print the entire **Home** page.
- One click access (**Saved Exports**) to a list containing all saved data export records.

Figure 3.16. Saved Exports Button



- A "Select View" drop-down menu to select which Vehicle data you want displayed in the Position Map. This feature provides a quick way to display data on the Position Map for all Vehicles in the WGMS Organization, or for individual Fleets in the WGMS Organization.

Figure 3.17. Select View Drop-Down Menu





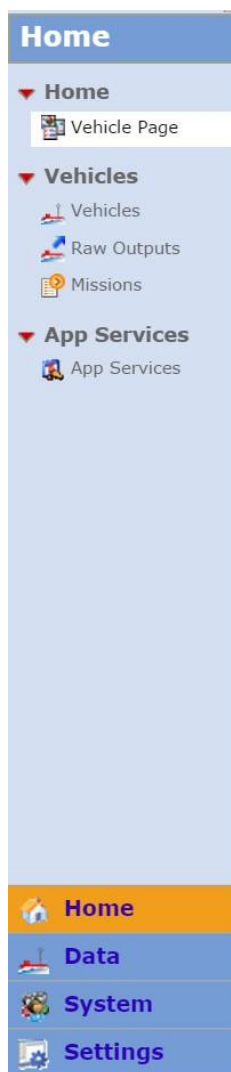
Note

A Fleet provides a view of a subset of the Vehicles and personnel in an Organization. For information on setting up Fleets see the *WGMS Admin Guide*.

Home Page Sidebar

The **Home** page sidebar contains 3 menus, **Home**, **Vehicles**, and **App Services**.

Figure 3.18. Home Page Sidebar



Home Menu

The **Home** menu contains the **Vehicle Page** sidetab that displays the WGMS **Dashboard**. When you click on **Show System Menus** in the WGMS **Dashboard** sidebar, the WGMS **Home** page opens with the **Vehicle Page** side tab selected.

Vehicles Menu

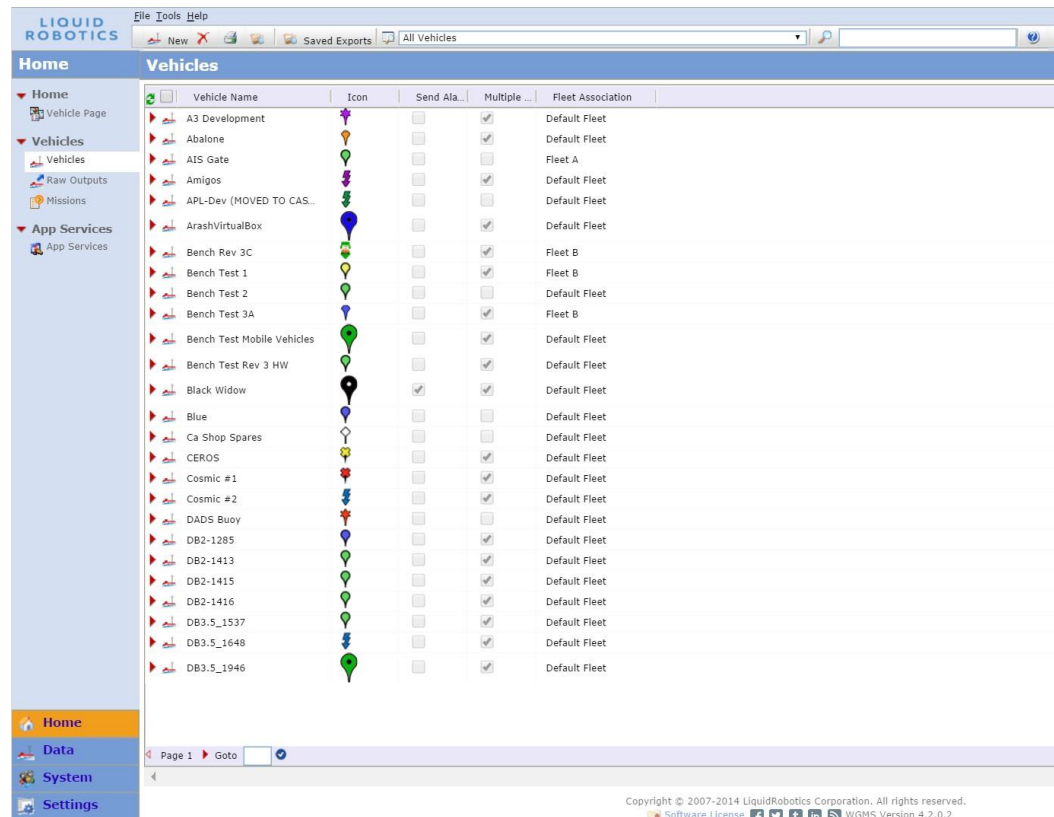
There are 3 side tabs under the **Vehicles** menu:

- **Vehicles**
- **Raw Outputs**
- **Missions**

Vehicles Side Tab

The **Vehicles** side tab opens the **Vehicles** window. The **Vehicles** window displays a list of all of the vehicles in the WGMS Organization, along with the vehicle icon, send alarms status, multiple vehicles display status, and Fleet association.

Figure 3.19. Vehicles Window



Each line item (record) in the **Vehicles** window is preceded by an **arrow** and an **icon** followed by the vehicle icon that appears in the position map, the vehicle's Send Alarms status, the Multiple Vehicle Display status, and Fleet Association.

When you click on an **arrow** , a window opens. If there is additional information associated with the record, it will appear in this window. Note, this feature does not work well in all browsers.

When you click on an **icon** , a Vehicle form opens. The Vehicle form contains extensive information about the selected vehicle and also allows you to edit some of that information. For more information see [Chapter 4: Using the WGMS Interface](#).

The **Vehicles** tab toolbar is similar to the **Home** page toolbar, except that it includes buttons to add or delete vehicles from the WGMS Organization.

Figure 3.20. Vehicles Toolbar



Click on the **New** button to open a **Vehicle: New** form where you can enter information to add a new vehicle to the WGMS Organization.

Select an existing vehicle from the list in the **Vehicles** window and click on the delete button - you will be prompted to ensure you really want to delete the vehicle from the WGMS Organization, before being allowed to click **OK** to delete the vehicle.

Raw Outputs Side Tab

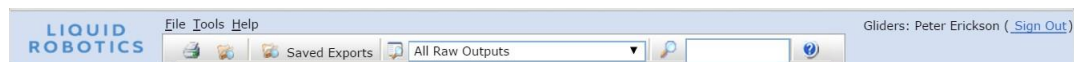
The **Raw Outputs** side tab opens the **Raw Outputs** window. The **Raw Outputs** window displays a chronological list of all data packets generated by vehicles in the WGMS Organization you are logged into. Each row in the list represents a data packet and includes the name of the vehicle that generated the data, along with the communications modem ID (IMEI), Structure Type, and related information.

Figure 3.21. Raw Outputs Window

Vehicle	IMEI	Structure Type	Parsed FL	Created On	TimeStamp
Quick Silver	VR Cell	Telemetry6	✓	1/26/16 16:51:...	1/26/16 16:51:...
Gandalf	VR Cell	RelayStatus	✓	1/26/16 16:51:...	1/26/16 16:51:...
Thor	VR Cell	RelayStatus	✓	1/26/16 16:51:...	1/26/16 16:51:...
War Machine	VR Cell	Telemetry6	✓	1/26/16 16:51:...	1/26/16 16:51:...
SV3-059 COPPERBOT...	VR Cell	RelayStatus	✓	1/26/16 16:51:...	1/26/16 16:51:...
SV3-116 (SINGAINDO)	VR Cell	RelayStatus	✓	1/26/16 16:51:...	1/26/16 16:51:...
SV3-032	VR Cell	RelayStatus	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-007	VR Cell	Telemetry6	✓	1/26/16 16:50:...	1/26/16 16:50:...
Sea Snails	VR Cell	Telemetry6	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-004	300434060701190	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-006	300434060705200	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-063 EXTRA COPP...	300434060620310	IridiumStatus	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-063 EXTRA COPP...	VR Cell	Telemetry6	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-004	300434060701190	Telemetry6	✓	1/26/16 16:50:...	1/26/16 16:50:...
Thor	VR Cell	Telemetry6	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-063 EXTRA COPP...	VR Cell	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-063 EXTRA COPP...	VR Cell	RelayStatus	✓	1/26/16 16:50:...	1/26/16 16:50:...
G3	300025010703740	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
Black Widow	VR Cell	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
Black Widow	VR Cell	RelayStatus	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-007	VR Cell	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-007	VR Cell	RelayStatus	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-059 COPPERBOT...	VR Cell	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SV3-033	VR Cell	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SpongeBob	VR Cell	PayloadPacket	✓	1/26/16 16:50:...	1/26/16 16:50:...
SpongeBob	VR Cell	RelayStatus	✓	1/26/16 16:50:...	1/26/16 16:50:...

The Raw Outputs Toolbar is the same as the Home page toolbar except for the addition of the Export Raw Outputs button.

Figure 3.22. Raw Outputs Toolbar

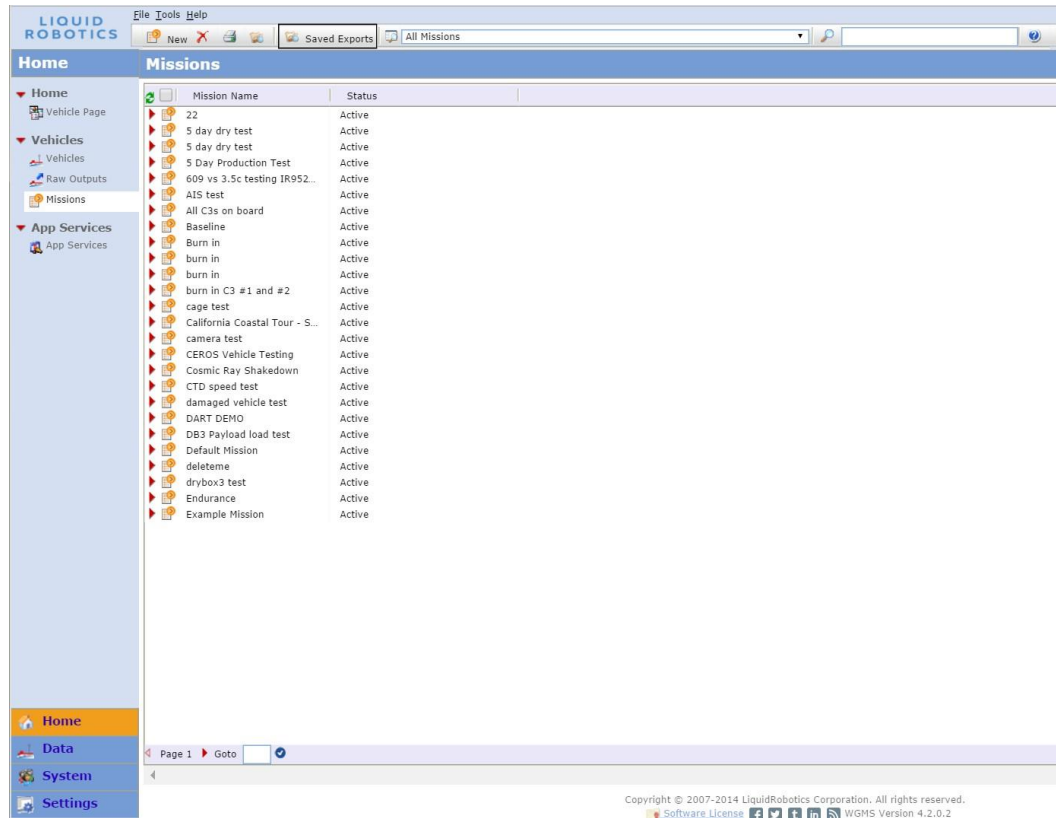


Click on the export raw outputs button to open an **Export VehicleRawOutput Records** form where you can enter information to specify which raw output records you want to export to your system.

Missions Side Tab

The **Missions** side tab opens the **Missions** window. The **Missions** window displays a list of all of the missions that have been entered into WGMS for the WGMS Organization you are logged into, along with the status of each mission (Active or Expired). By clicking on the icon at the beginning of each row, a Mission form will open where you can view or edit detailed information on the mission.

Figure 3.23. Missions Window



The **Missions** tab toolbar is similar to the **Home** page toolbar, except that it includes buttons to add missions to, or delete missions from, the WGMS Organization.

Figure 3.24. Missions Toolbar



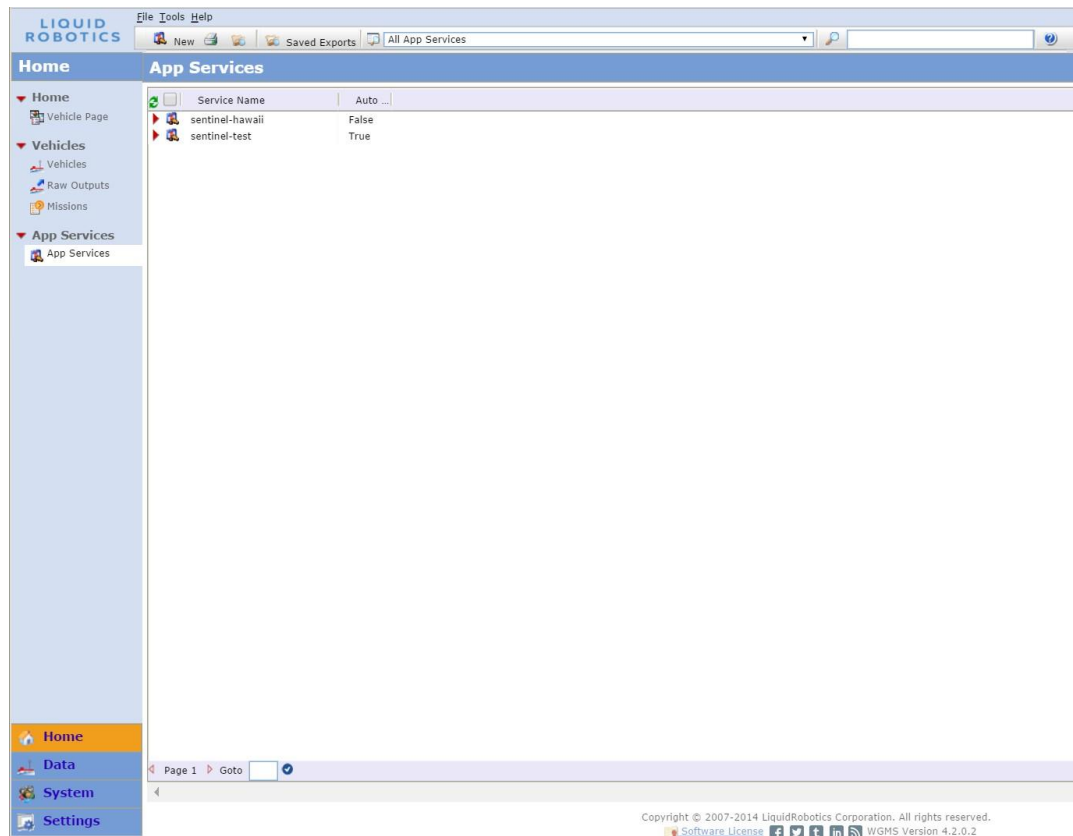
Click on the **New** button to open a **Mission: New** form where you can enter information to add a new mission to the WGMS Organization.

Select an existing Mission from the list in the **Missions** window and click on the delete button - you will be prompted to ensure you really want to delete the mission from the WGMS Organization, before being allowed to click **OK** to delete the mission.

App Services Menu

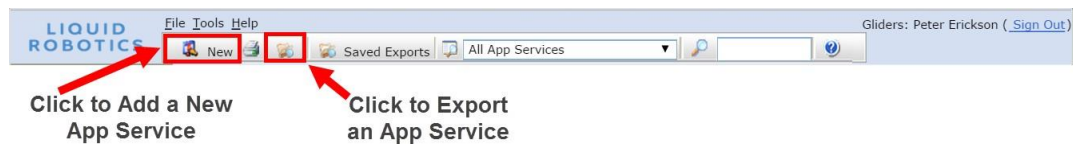
The **App Services** menu includes the **App Services** side tab. The **App Services** side tab opens the **App Services** window. For more information on the App Services menu, contact the Liquid Robotics Customer Support Organization - see “[Contacting Liquid Robotics](#)”.

Figure 3.25. App Services Window



The **App Services** toolbar is similar to the **Home** page toolbar, except that it includes buttons to add app services to, or export app services from, the WGMS Organization.

Figure 3.26. App Services Toolbar



Click on the **New** button to open an **App Service: New** form where you can enter information to add a new app service to the WGMS Organization.

Select an existing app service from the list in the **App Services** window and click on the export button - an **Export AppService Records** form will open where you specify the app service records you want to export to your system.

Data Page

When you click on the **Data** button in the WGMS **Home** pagesidebar, the WGMS **Data** page is displayed. The **Data** page opens to the **Payload Status** tab, flanked by the **Data** page sidebar and toolbar. The **Payload Status** tab provides a chronological list of the payload data received from all of the Vehicles in the WGMS Organization. Each row in the list includes detailed information on data received from a specific payload on a specific vehicle.

Figure 3.27. Data Page

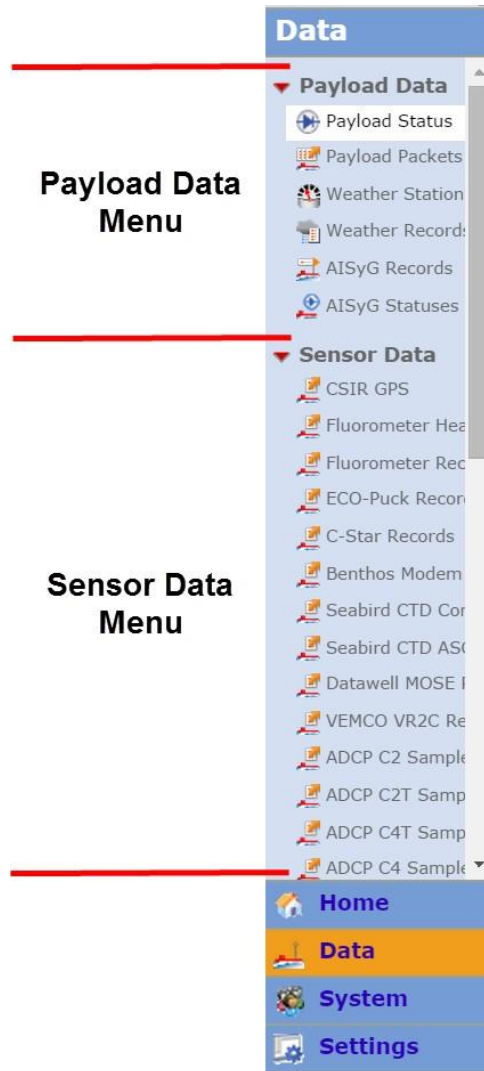
The screenshot displays the WGMS UI Data Page. The left sidebar contains a 'Data' menu with sub-items: 'Payload Data' (selected), 'Sensor Data', 'Home', 'System', and 'Settings'. The main area shows the 'Payload Status' list, which is a table with columns: TimeStamp, Vehicle, Payload, Board Id, Payload Port, Humid Temp(de...), Humidity(%), Pressure Temp (...), and Pressure(kPa). The table lists various data points for different vehicles and payloads, including SW, SV3, and VEMCO VR2C. The bottom of the page shows a 'Page 1' indicator and a 'Goto' button. The footer contains copyright information for LiquidRobotics Corporation and the WGMS Version 4.2.0.1.

TimeStamp	Vehicle	Payload	Board Id	Payload Port	Humid Temp(de...)	Humidity(%)	Pressure Temp (...)	Pressure(kPa)
4/12/19 14:18:18	SW...	4/1...	0	0	26	55	23	98
4/12/19 14:18:18	SW...	4/1...	0	2	29	42	28	107
4/12/19 14:18:17	SW...	4/1...	0	1	23	63	23	100
4/12/19 14:00:38	SW...	4/1...	3	0	26	55	23	99
4/12/19 14:00:38	SW...	4/1...	5	2	29	42	28	111
4/12/19 14:00:38	SW...	4/1...	4	1	23	64	23	100
4/11/19 10:37:07	SW...	4/1...	3	0	35	34	31	98
4/11/19 10:37:07	SW...	4/1...	4	2	32	37	33	101
4/11/19 10:37:07	SW...	4/1...	5	1	31	34	30	103
4/11/19 10:05:12	SW...	4/1...	3	0	24	56	21	99
4/11/19 10:05:12	SW...	4/1...	4	2	29	42	29	99
4/11/19 10:05:12	SW...	4/1...	5	1	29	38	29	103
12/6/15 15:55:21	SV3...	12/...	3	0	15	24	15	97
12/6/15 15:50:39	SV3...	12/...	8	0	17	64	17	123
12/6/15 15:40:14	SV3...	12/...	3	0	15	24	15	97
12/6/15 15:35:31	SV3...	12/...	8	0	17	64	17	123
12/6/15 15:25:09	SV3...	12/...	3	0	15	24	15	97
12/6/15 15:20:25	SV3...	12/...	8	0	17	64	17	122
12/6/15 15:10:03	SV3...	12/...	3	0	15	24	15	98
12/6/15 15:05:18	SV3...	12/...	8	0	17	64	17	123
12/6/15 14:54:58	SV3...	12/...	3	0	15	24	15	98
12/6/15 14:50:12	SV3...	12/...	8	0	17	64	17	122
12/6/15 14:39:52	SV3...	12/...	3	0	15	23	15	97
12/6/15 14:35:05	SV3...	12/...	8	0	17	65	17	122
12/6/15 14:24:46	SV3...	12/...	3	0	15	24	15	98
12/6/15 14:19:59	SV3...	12/...	8	0	17	64	17	122

Data Page Sidebar

The **Data** page sidebar includes two menus, **Payload Data** and **Sensor Data**:

Figure 3.28. Data Page Sidebar

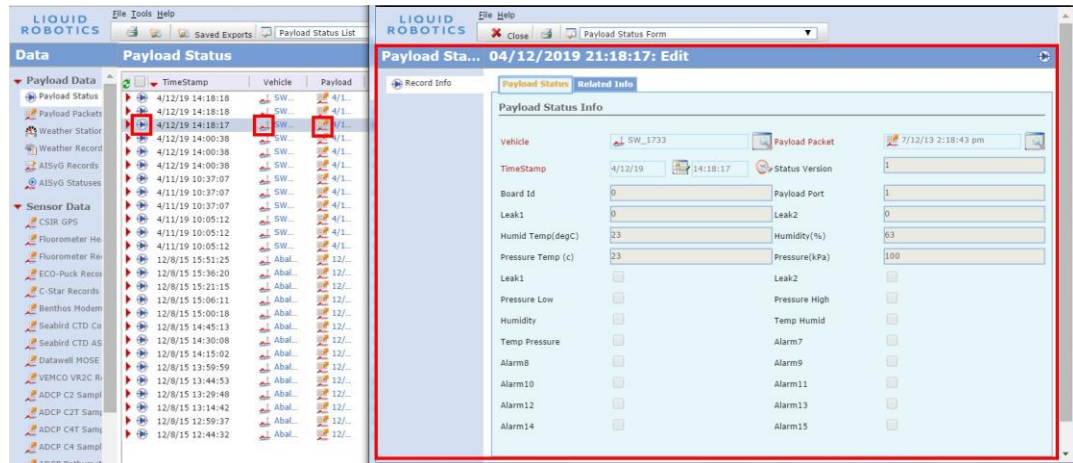


Each tab under the **Payload Data** and **Sensor Data** menus is a list of records. Each record is preceded by an **arrow** and an **icon**.

When you click on the **arrow** , a window opens. If there is additional information associated with the record, it will appear in this window. Note, this feature does not work well in all browsers.

When you click on any **icon** associated with a record, a form opens containing the details for the associated record. Depending on your WGMS Role and the type of form you are viewing, you may have the ability to edit the record. For example, by clicking on the Vehicle icon  associated with the Vehicle named SW_1733, the Vehicle Form for opens.

Figure 3.29. Example: Click on Icon in Record Listing



Data Page Sidebar - Payload Data Menu

The **Payload Data** menu includes six tabs:

- **Payload Packets Tab** - A chronological list of all payload packets transmitted from each Vehicle in the organization. The form associated with each record contains the binary output. This information is also contained in the **Raw Outputs** tab under the **Vehicles** menu, but the **Raw Outputs** tab includes all output, not just payload packets.
- **Payload Status Tab** - A chronological list of payload status records for all Vehicles in the Organization. The form associated with each record contains information on the payload and its environment (temperature, pressure, humidity), if applicable.
- **Weather Stations Tab** - A list of weather stations available to the Vehicles in the Organization. The form associated with each weather station includes a chronological list of weather data broadcasts from that station.
- **Weather Records Tab** - A list of weather records from weather stations available to the Vehicles in the Organization.
- **AISyG Records Tab** - A chronological list of all AIS Relay Gateway records for all Vehicles in the Organization. The form associated with each AIS Relay Gateway record provides details on the vessel the AIS broadcast originated from.
- **AISyG Statuses Tab** - A chronological list of all AIS Relay Gateway status records for all Vehicles in the Organization. Some, but not all AIS receivers generate status data.

Data Page Sidebar - Sensor Data Menu

The **Sensor Data** menu includes a tab for each Liquid Robotics supported Wave Glider-integrated sensor that has been entered into WGMS by the WGMS Administrator. Each tab is a chronological list of sensor-specific data records for all Vehicles in the Organization. For each type of sensor, data records from all of the Vehicles in the Organization equipped with that sensor are displayed in chronological order. The form associated with each record includes raw sensor output.

The number of tabs under the **Sensor Data** menu will vary depending on how many different types of sensors there are across all of the vehicles in the WGMS Organization. For example, the **Sensor**

Data menu for a large WGMS Organization with a variety of WaveGlider configurations might include any or all of the following sensor data tabs:

- **CSIR GPS**
- **Fluorometer Header Records**
- **Fluorometer Records**
- **ECO-Puck Records**
- **C-Star Records**
- **Benthos Modem Records**
- **Seabird CTD Compressed**
- **Seabird CTD ASCII Records**
- **Datawell MOSE Records**
- **Vemco VR2C Records**
- **ADCP C2 Samples**
- **ADCP C2T Samples**
- **ADCP C4T Samples**
- **ADCP C4 Samples**
- **ADCP Bathymetry Samples**
- **JAMSTEC Tsunami Sensor Data**
- **ADCP Header Samples**
- **Aquatracka Samples**
- **WHOI Micro Modem**
- **pCO2 Sensor**
- **LISST Sensor**
- **Vemco VM4 Information**
- **Vemco VM4 Realtime Tag**
- **Vemco VM4 Local Health**
- **Vemco VM4 Remote Health**
- **Vemco VM4 Daily Local Health**

- **Vemco VM4 Daily Remote Health**
- **Sonardyne Tsunami Sensor Data**
- **GPS Waves Sensor Data**
- **CEFAS Format 0**
- **CEFAS Format 1**
- **Marine Magnetics Magnetometer Records**
- **Generic Payload String**

Data Page Toolbars

The Data page displays different toolbars depending on which menu and which tab under that menu is selected.

The Select View drop-down menu and the Search utility in each of these toolbars can be configured by an Administrator with a WGMS Root user Role. By default, the Select View drop-down menu is set to display all of the records in a tab.

The Search utility is also configured by an Administrator with a WGMS Root user Role. It can search some, or all, of the columns in a tab. The settings can vary depending on the WGMS Organization you are in. To find out which columns can be searched, check with the Root level Administrator for your WGMS Organization. Alternatively, you can determine which columns can be searched by entering a keyword that you know exists in a column. If that column can be searched, all records containing the keyword you entered will be listed.

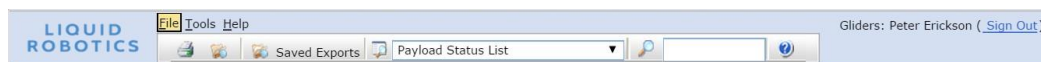
Payload Data Menu Toolbars

There are six tabs under the **Payload Data** menu:

- **Payload Packets**
- **Payload Status**
- **Weather Stations**
- **Weather Records**
- **AISyG Records**
- **AISyG Statuses**

All of these tabs have the same toolbar with the exception of the Select View drop-down menu, which is specific to the list that is associated with each tab.

Figure 3.30. Payload Data Tabs Toolbar



Sensor Data Menu Toolbars

All of the **Sensor Data** tabs have the same toolbar. The Select View drop-down menu in the toolbar will display the type of sensor data that corresponds to the tab selected in the **Sensor Data** menu. By selecting a different data type in the Select View drop-down menu, the sensor data for that newly selected data type will be displayed.

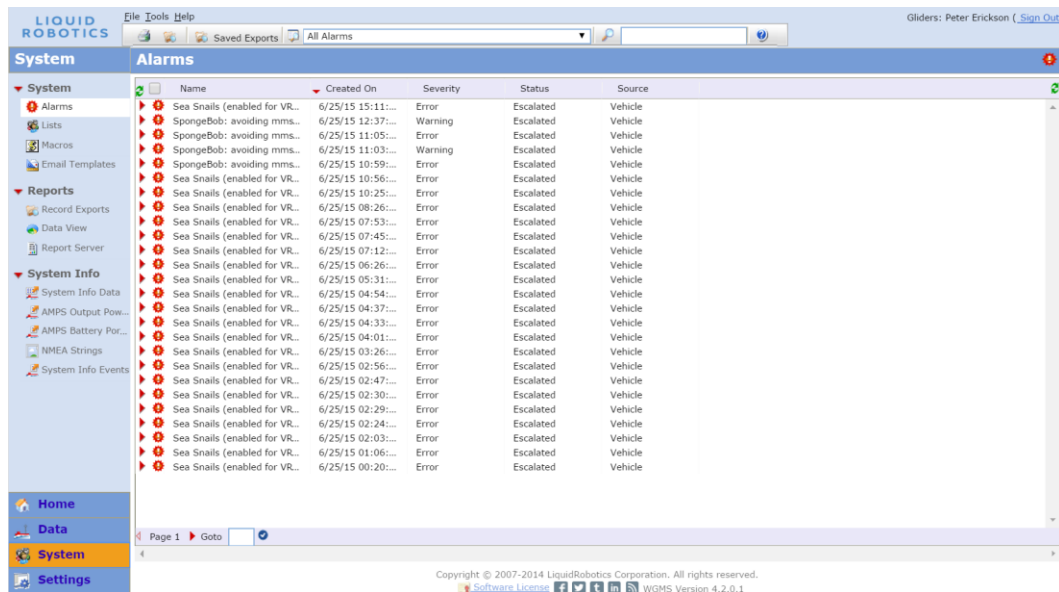
Figure 3.31. Sensor Data Tabs Toolbar



System Page

When you click on the **System** button in the WGMS **Home** page sidebar, the WGMS **System** page is displayed. The **System** page opens to the **Alarms** tab, flanked by the **System** page sidebar and toolbar. The **Alarms** tab lists system alarms in chronological order with links to detailed alarm records.

Figure 3.32. System Page



System Page Sidebar

The **System** page sidebar includes three menus.

- **System** menu
- **Reports** menu
- **System Info** menu

Figure 3.33. System Page Sidebar



Each tab under the **System**, **Reports**, and **System Info** menus is a list of records. Each record is preceded by an **arrow** and an **icon**.

When you click on the **arrow** , a window opens. If there is additional information associated with the record, it will appear in this window. This feature does not work well in all browsers. However, the same information is also available in the form that opens when you click on the **icon** associated with the record.

When you click on the **icon** associated with a record, a form opens containing the details for the associated record. Depending on your WGMS Role and the type of form you are viewing, you may have the ability to edit the record.

System Menu

The **System** menu includes 4 tabs:

- **Alarms Tab** - A chronological list of all system alarms with links to detailed alarm records.

- **Lists Tab** - A list of Escalation Lists or User Group Lists that have been created by the WGMS Administrator.
- **Macros Tab** - A list of macros that have been created by the WGMS Administrator to streamline specific tasks. The use of WGMS Macros is beyond the scope of this user guide. If you have questions about WGMS Macros, contact Liquid Robotics Customer Support - see “[Contacting Liquid Robotics](#)”.
- **Email Templates Tab** - A list of email templates created by the WGMS Administrator for notifications that are frequently sent.

Reports Menu

The **Reports** menu includes 2 tabs:

- **Record Exports** tab - A chronological list of records that have been exported.
- **Data View** tab - Takes you to a data viewing window where you can select a vehicle, a data type, and a time frame, and then display that data in a table, a graph, or a map. For more information see: “[Data View Page - Custom Reports](#)”

System Info Menu

The **System Info** menu includes 1 tab:

System Page Toolbars

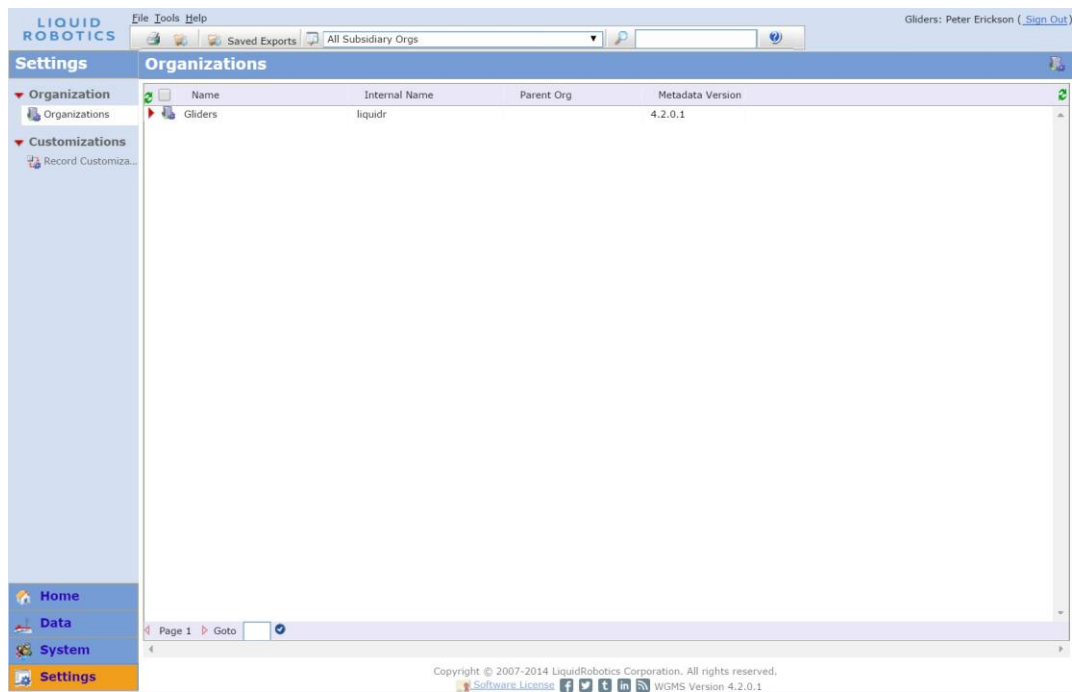
The System page displays different toolbars depending on which menu and which tab under that menu is selected.

The Select View drop-down menu and the Search utility in each of these toolbars can be configured by an Administrator with a WGMS Root user Role. By default, the Select View drop-down menu is set to display all of the records in a tab.

The Search utility is also configured by an Administrator with a WGMS Root user Role. It can search some, or all, of the columns in a tab. The settings can vary depending on the WGMS Organization you are in. To find out which columns can be searched, check with the Root level Administrator for your WGMS Organization. Alternatively, you can determine which columns can be searched by entering a keyword that you know exists in a column. If that column can be searched, all records containing the keyword you entered will be listed.

Settings Page

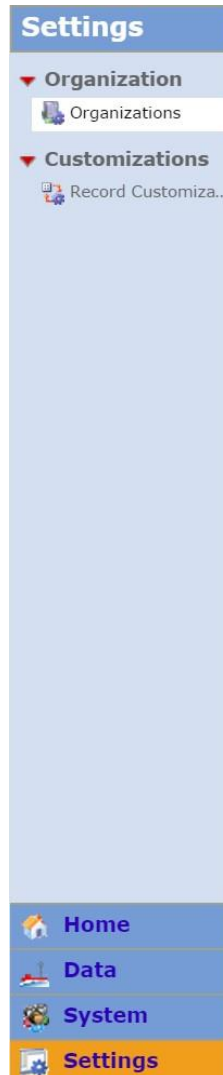
When you click on the **Settings** button in the WGMS **Home** page sidebar, the WGMS **Settings** page is displayed. The **Settings** page opens to the **Organizations** tab, flanked by the **Settings** page sidebar and toolbar. The **Organizations** tab lists all of the WGMS Organizations you are logged into with links to detailed Organization records.

Figure 3.34. Settings Page - Logged Into 1 Organization

Settings Page Sidebar

The **Settings** page sidebar includes 2 menus:

- **Organization** menu
- **Customizations** menu

Figure 3.35. Settings Page Sidebar

Each tab under the **Organization** and **Customizations** menus is a list of records. Each record is preceded by an **arrow** and an **icon**.

When you click on the **arrow** , a window opens. If there is additional information associated with the record, it will appear in this window. This feature does not work well in all browsers. However, the same information is also available in the form that opens when you click on the icon associated with the record.

When you click on the **icon** associated with a record, a form opens containing the details for the associated record. Depending on your WGMS Role and the type of form you are viewing, you may have the ability to edit the record.

Organization Menu

The **Organization** menu includes one tab:

- **Organizations** tab - A list of records for WGMS Organizations you are logged into. Each Organization record is linked to an Organization Form where you can view Organization details, and an Organization Admin Form where Organization information can be edited by a WGMS Administrator.

Customizations Menu

The **Customizations** menu includes one tab:

- **Record Customization** tab - A list of records for WGMS UI entities. Each entity record is linked to a Metadata Tables form where entity display parameters can be edited by a WGMS Administrator.

Settings Page Toolbars

The toolbars associated with each tab under the Settings page menus are the same, except for the Select View drop-down menu, which varies depending on which tab is selected.

Figure 3.36. Organizations Tab Toolbar



Figure 3.37. Record Customizations Tab Toolbar



With the **Organizations** tab, **All Subsidiary Orgs** is the default selection in the Select View drop-down menu.

With the **Record Customization** tab, **All Record Customizations** is the default selection in the Select View drop-down menu.

The Select View drop-down menu in each of these toolbars can be configured by an Administrator with a WGMS Root user Role. By default, the Select View drop-down menu is set to display all of the records in a tab.

The Search utility in each of these toolbars can search some, or all, of the columns in a tab. It can be configured by an Administrator with a WGMS Root user Role. The settings can vary depending on the WGMS Organization you are in. To find out which columns can be searched, check with the Root level Administrator for your WGMS Organization. Alternatively, you can determine which columns can be searched by entering a keyword that you know exists in a column. If that column can be searched, all records containing the keyword you entered will be listed.

Chapter 4. Using the WGMS Interface

This chapter explains WGMS UI features typically used by individuals assigned a **Master**, **Data Analyst** or **Guest User** role.



Note

Pilots should be assigned a **Master** role.

Toolbar Icons

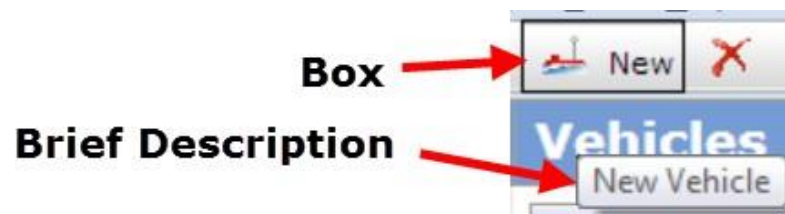
Toolbar icons are located on the toolbars associated with the **Home**, **Data**, **System**, and **Settings** page menu options that appear when [Show System Menus](#) is selected. Each menu option in the sidebar has a corresponding toolbar. Toolbar icons are small pictograms that behave like buttons, sometimes paired with a word indicating the icon type. Left-clicking on a toolbar icon initiates an action.

Figure 4.1. Example: Toolbar Icons



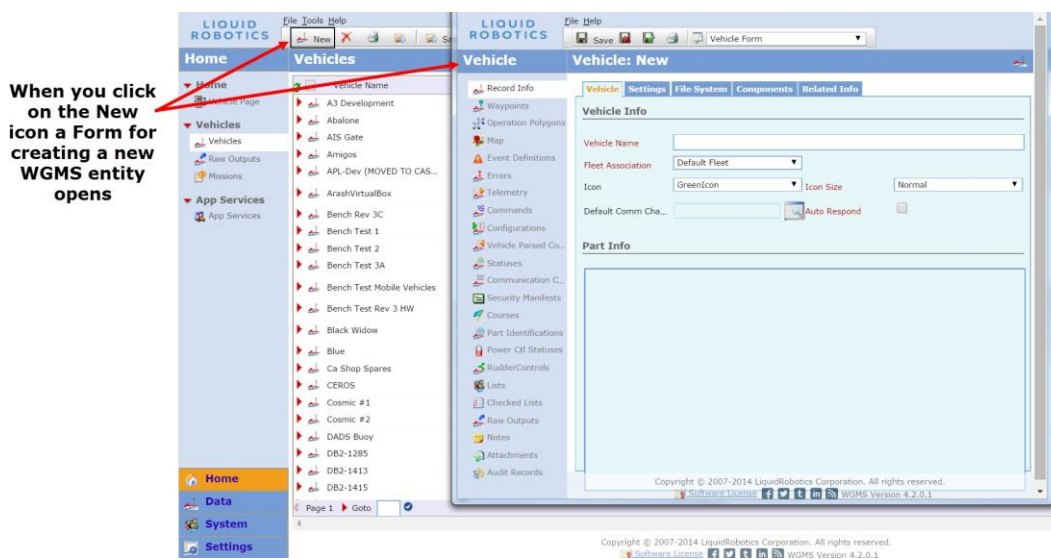
When you hover your cursor over a toolbar icon, a brief description will appear and a box with a black border will surround the icon and any text associated with it, making it look like a button.

Figure 4.2. Hover Cursor Over Toolbar Icon



The  icon is used to add a new entity to WGMS. When you click on it a form opens where you can create a new entity.

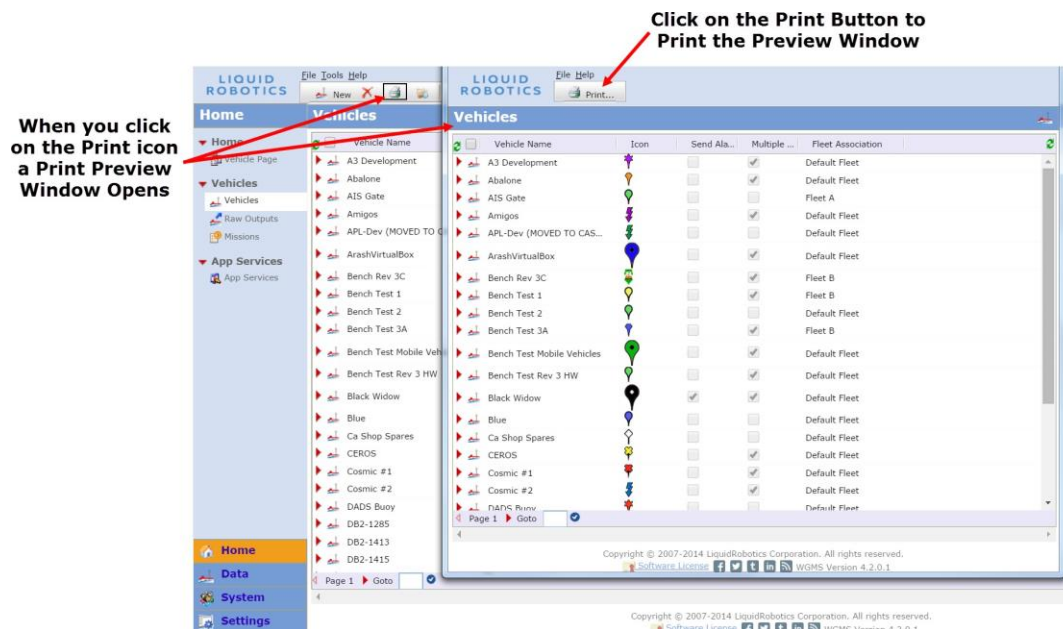
Figure 4.3. Example: New Icon



The  icon deletes selected items.

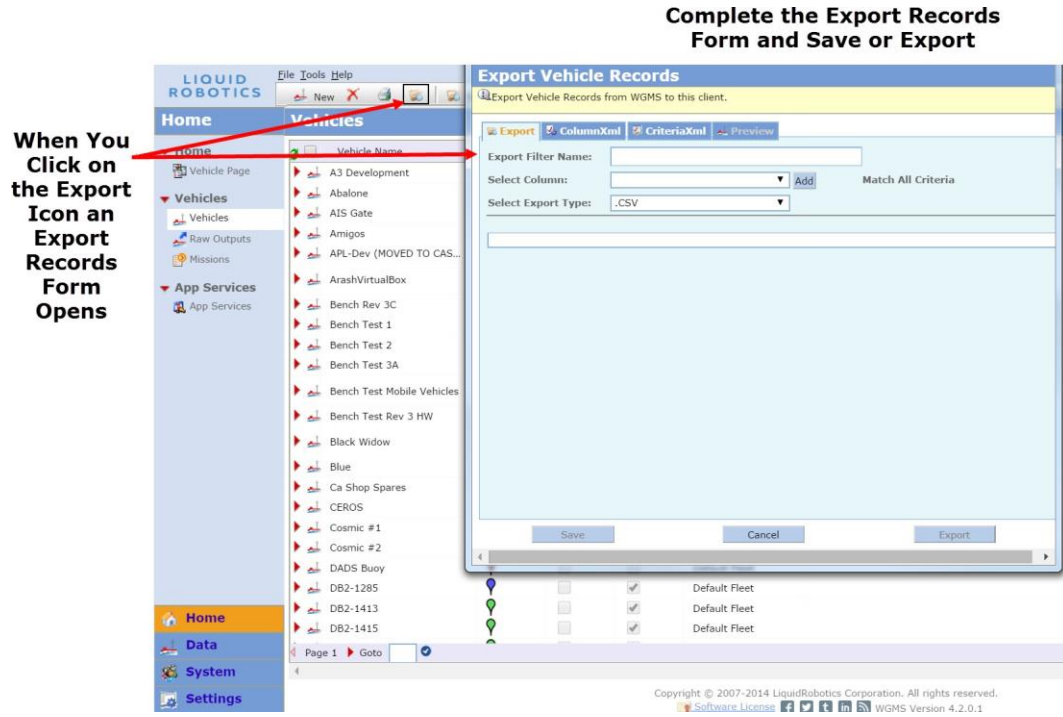
The  icon opens a print preview window that displays the content you are viewing. Click on the **Print** button to send that information to a printer.

Figure 4.4. Example: Print Icon



The  icon opens an Export Records form that you can use to export information.

Figure 4.5. Example: Export Icon



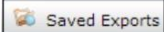
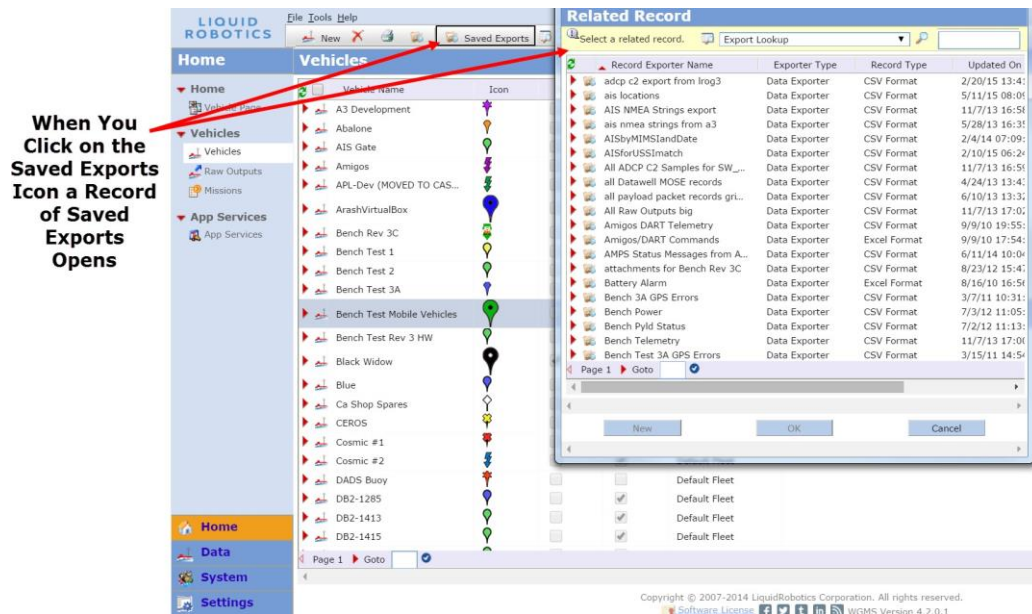
The  icon opens an Export Records form that you can use to export information.

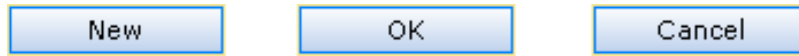
Figure 4.6. Example: Saved Exports Icon



Buttons

Buttons are similar to icons, in that they initiate an action, but buttons always include text describing their function. Typically, buttons are used in sets to select alternate actions. [Figure 4.7](#) shows three WGMS buttons.

Figure 4.7. Example Buttons



Links

Links are references to other data displays. Links are displayed as blue, underlined text. [Figure 4.8](#) shows a link that is commonly used on the WGMS **Dashboard**.

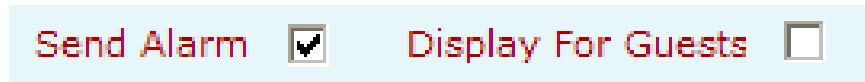
Figure 4.8. Example Link

[Hide System Menus](#)

Check Boxes

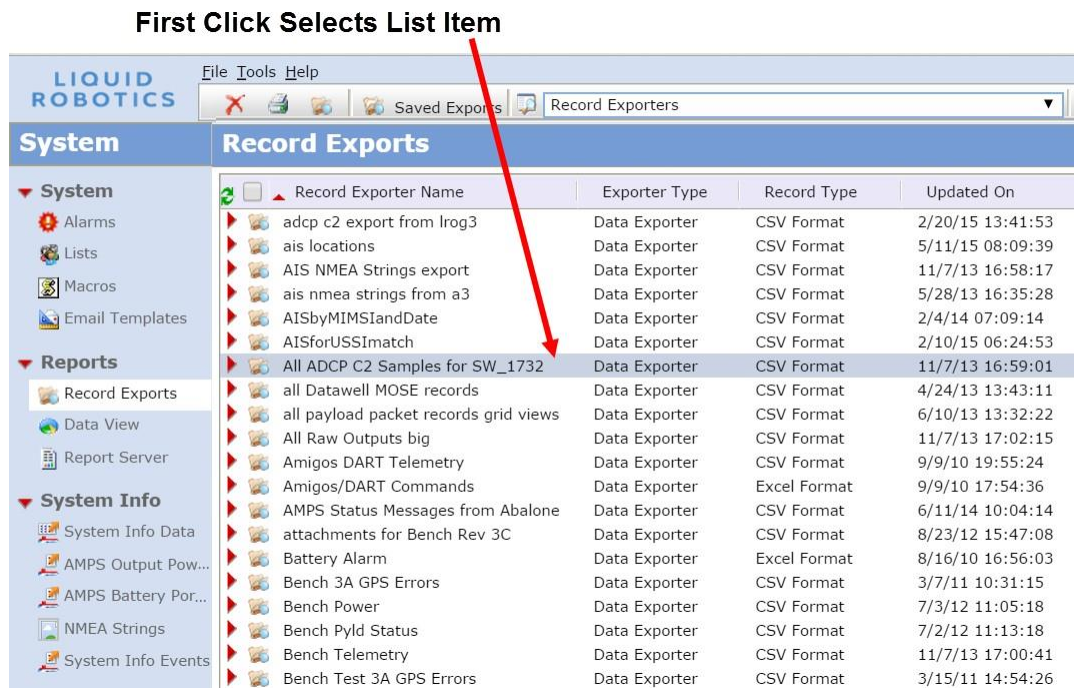
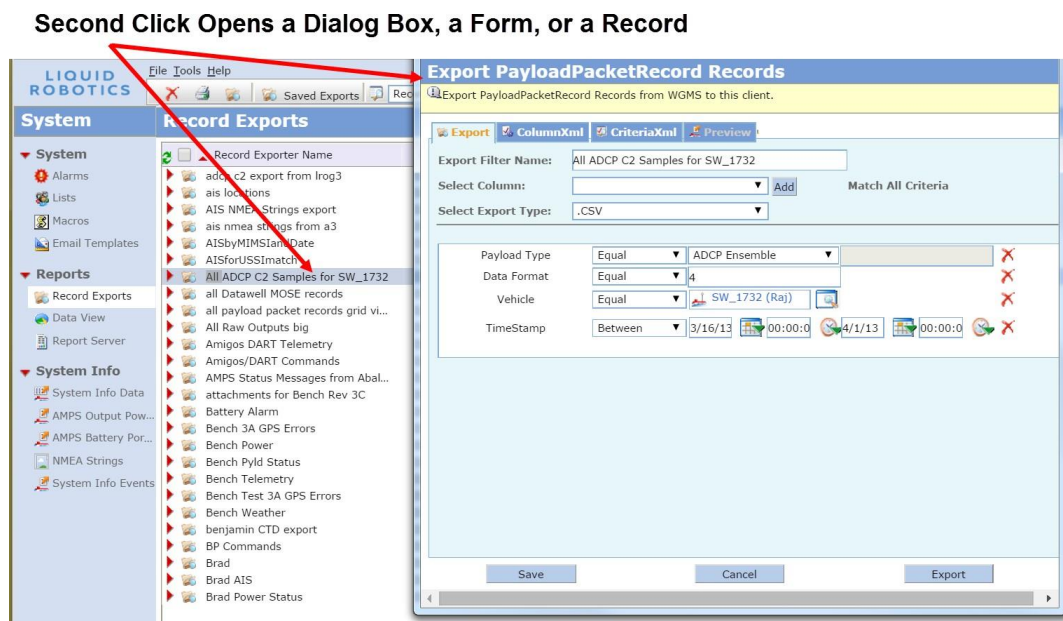
Check boxes are used to select or de-select items. Clicking in an empty box will put a check in the box (select the item). Clicking a checked box will delete the check (de-select the item).

Figure 4.9. Example Checked and Unchecked Boxes



Single and Double Clicking

An action will be initiated when you hover your cursor over an icon, button, or link and single-click with the left mouse button. When you select an item from a column in a list, you typically have to double-click on the item name (text) with the left mouse button to call up a window (WGMS dialog box, form, or record) related to that item. The first click selects the item and the second click opens a dialog box, a form, or a record.

Figure 4.10. Example: Single Click on List Item**Figure 4.11. Example: Double Click on List Item**

Text Input Boxes

Text input boxes are used to enter text strings, including numbers. They are designed for direct text entry.

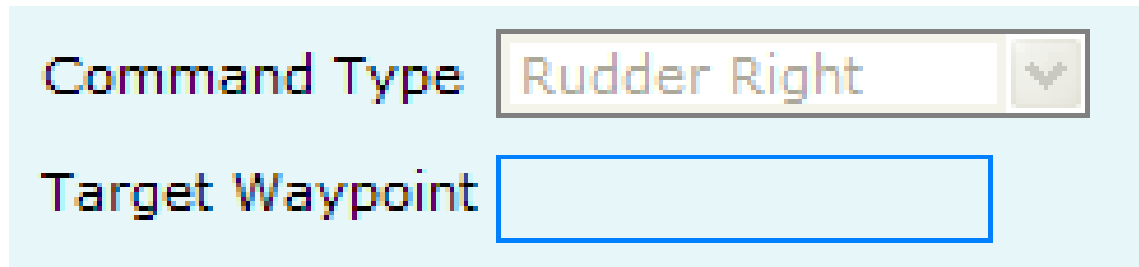
Click in the box, then enter the text. If the text is longer than the box, the text will continue out the left side of the box. Use the **Home** or **End** keys to move to the beginning or end of the text string. Figure 4.12 shows an Input Box for entering a telephone number.

Figure 4.12. Example: Text Input Box



Grayed-out text in the box indicates that the entry is predefined, and cannot be changed (Figure 4.13). A non-White box background indicates that the box is "closed" and no data can be entered.

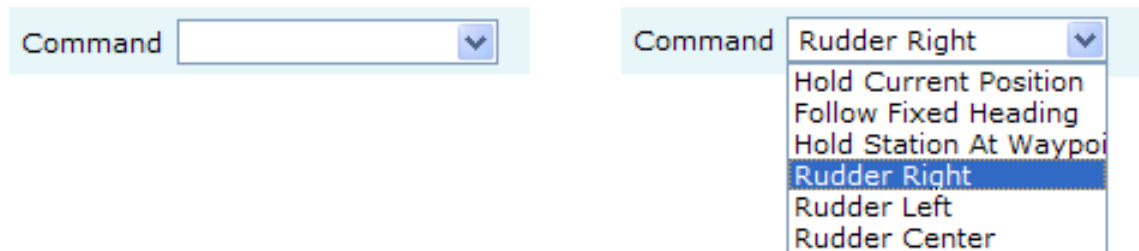
Figure 4.13. Example: Predefined and No-Entry Text Boxes



Drop-down Menus

Drop-down menus include a downward pointing arrow on the right side of a selection box. Text cannot be entered directly. Instead, click on the arrow and a menu will appear. Click on a menu item to make an entry into the box, as shown below (Figure 4.14).

Figure 4.14. Example: Drop-down Menu



Icon Selection Boxes

Icon selection boxes have a Click to select... icon on the right side of the selection box (Figure 4.15). Click on the icon and a window will open with a list of items you can select from. Hover your cursor over an item, then click to select it. The window will close, and the item you selected will appear in the selection box.

Figure 4.15. Example: Icon Selection Box



Pages

All WGMS UI entities are HTML Web pages contained in browser windows. WGMS pages, for example, the WGMS Home page or the WGMS Dashboard are windows that open to completely fill the display, similar to what would be referred to as a "screen" in a desktop application. WGMS pages can be resized once they are opened. Each WGMS page has a toolbar, a sidebar and sections containing piloting tools or data. The WGMS UI has five primary pages:

- **Dashboard** - The piloting page - provides the largest map display.
- **Home Page** - Expands the Dashboard to include buttons to access the Data, System, and Settings pages and associated menus.
- **Data Page** - Display and edit information for all Vehicles and their payloads.
- **System Page** - Display and edit WGMS System information.
- **Settings Page** - Display and edit WGMS Settings information.

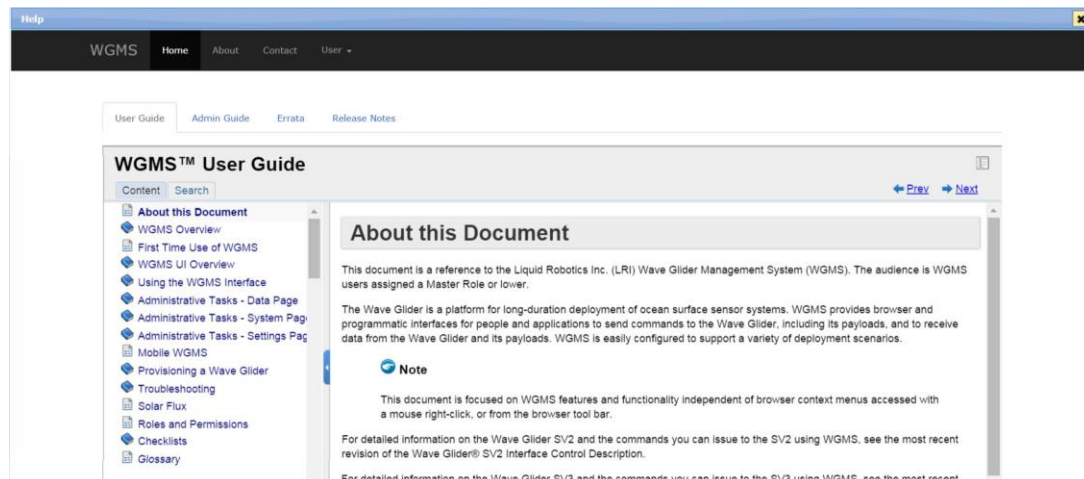
Some common usage features of WGMS pages are:

- The display can be re-sized by placing the cursor over any edge of the page. When an arrow appears, you can hold down the left mouse button to move the border to re-size the page.
- A green refresh icon  can be clicked to re-display a page so new data or display settings will appear.

Help Icon

Click on the help icon  located on the right side of the toolbar for each WGMS page or window, to access WGMS reference documentation.

Figure 4.16. Click Help: Access WGMS Documentation



Lists

WGMS lists contain data records. All Wave Glider Vehicle data, WGMS system data, and Wave Glider integrated sensor data, is displayed in lists where each row contains a data record.

A universal feature of all the lists is that they can be sorted by clicking on the column heading above the column you want to use for sorting. A small red triangle will appear, indicating ascending (up-pointing) or descending (down-pointing) sorting. Single-click on the column heading to reverse the sorting direction.

Note that some lists have a default sorting order for one of the columns, such as **Local Time** in the following example.

Figure 4.17. List Sorting Example

	Local Time	Last Speed(kt)	Target WP	Desired Heading(°)	Sub Heading(°)	Path Heading	Float Temp(°C)	Battery Total Power	ISS
	5/4/2010 2:49 pm	2.586	13	196	196	193	26	521.09	5
	5/4/2010 2:47 pm	2.214	13	195	193	194	26	520.79	4
	5/4/2010 2:45 pm	2.168	13	193	194	193	26	520.49	3
	5/4/2010 2:43 pm	2.006	13	194	194	194	26	520.16	0
	5/4/2010 2:41 pm	2.245	13	199	199	199	26	519.84	5
	5/4/2010 2:39 pm	2.819	13	209	209	209	26	519.58	3

Changing List Column Widths

On some lists, a column may be too narrow to display all of the heading text or the data. If you place your mouse cursor over any column separator bar in the header row, a column width adjustment tool will appear, but it will not allow you to adjust the column width. This is an unresolved bug.

To view the full column header text, hover your cursor over the column heading cell and a tooltip will appear with the full name of the column heading.

To view all of the information contained in each column, click on the icon at the start of each row to open a record containing all of the information contained in the row.

List Page Selection

WGMS windows that display lists can contain lists that span multiple pages due to a limited number of line items that can be displayed on each list page. The default setting is 25-line items per list page. However, your WGMS System Administrator can change this setting. At the bottom left corner of each list page, the number of the page you are viewing is displayed with backward and forward pointers (triangles) on either side of it.

Figure 4.18. List Page Selector

Vehicles						
	Vehicle Name	Icon	Send Al...	Multiple ...	Fleet Association	
	Papa Mau (PCX_1)		☐	☒	Default Fleet	
	PCX_4 (Fontaine Maru - ...		☐	☐	Fleet A	
	Piccard Maru (PCX_3)		☒	☒	Default Fleet	
	Quick Silver		☐	☒	5	
	RV Holiday'13		☐	☐	Default Fleet	
	RV MEP (WPs & ORs)		☐	☒	Default Fleet	
	RV Trainer		☐	☐	Default Fleet	
	Sea Monkey		☐	☒	5	
	Shield		☒	☒	5	
	SSC-3 New		☐	☒	5	
	SSC-3_1		☐	☒	Default Fleet	
	SSC-4		☐	☒	Default Fleet	
	SV3-001		☐	☒	5	
	SV3-001 Tracker		☐	☒	5	
	SV3-002		☐	☒	5	
	SV3-002 Tracker		☐	☒	5	
	SV3-003		☐	☒	5	
	SV3-003 Tracker		☐	☒	5	
◀ Page 2 ▶ Goto ⓘ Page Selector						

If the right triangle is solid (as in the example above), you can click on it to go forward to the next page. If the left triangle is solid, you can click it to go backward to the previous page.

You also have the option to enter the page number you want to display in the **Goto** text box, then click on the adjacent ⓘ icon to go directly to that page.

Records

WGMS records are the line items that populate WGMS lists. A record provides some basic information about the data it represents, for example, the type of data and a time stamp. Each record is linked to a WGMS form where detailed information can be viewed and, in some cases, edited.

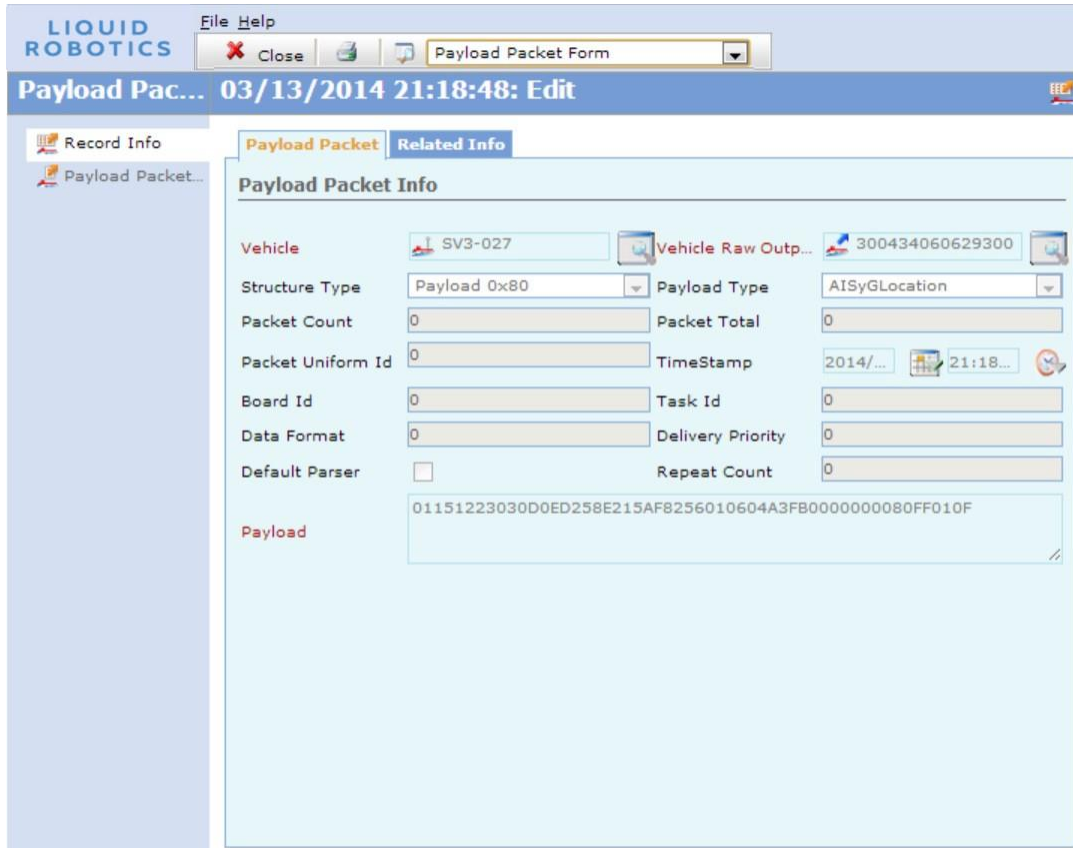
Figure 4.19. A Typical WGMS Record

Payload Packets						
  TimeStamp	Vehicle	Structure Type	Payload Type	Board Id	Task Id	Payload Data
 2014/03/13 21:18:48	 SV3-027	Payload 0x80	AISyGLocation	0	0	01151223030D0ED258E215AF82...

Forms

WGMS Forms are used to create or edit data records. For example, click on the Record Info icon  associated with each data record to open a form where you can view, and in some cases edit, the data.

Figure 4.20. A Typical WGMS Form



The screenshot shows the 'Payload Packet Form' in the Liquid Robotics WGMS interface. The window title is 'Payload Packet Form' and the status bar indicates '03/13/2014 21:18:48: Edit'. The form is divided into two tabs: 'Payload Packet' (selected) and 'Related Info'. The 'Payload Packet' tab contains the following fields:

- Vehicle:** SV3-027
- Vehicle Raw Outp...:** 300434060629300
- Structure Type:** Payload 0x80
- Payload Type:** AISyGLocation
- Packet Count:** 0
- Packet Total:** 0
- Packet Uniform Id:** 0
- TimeStamp:** 2014/... 21:18...
- Board Id:** 0
- Task Id:** 0
- Data Format:** 0
- Delivery Priority:** 0
- Default Parser:** ☐
- Repeat Count:** 0
- Payload:** 01151223030D0ED258E215AF8256010604A3FB0000000080FF010F

Dialog Boxes

Dialogs, or Dialog Boxes, are modal windows - they will not close, unless you take some action. Some dialogs are simple confirmation requests. For example: "Do you want to copy these 3 items?" Other dialogs can be quite complex, with multiple icons, entry boxes, check boxes and buttons.

Dialogs typically contain one or more buttons (such as **OK**, **Send**, **Save**, and **Cancel**) that are used to exit and close the box.

Figure 4.21. A Typical WGMS Dialog Box

Hold Station At Waypoint Command

Send this command to Abalone.

Vehicle Command | **Related Info**

Vehicle Command Info

Command Reason: [Text Area]

Vehicle: [Abalone] Command Type: [Hold Station At Waypoint]

Command Status: [Created] Target Waypoint: [Text Field]

From Waypoint: [Text Field] To Waypoint: [Text Field]

Heading (deg): [Text Field] Status: [Text Field]

Course: [Text Field] Vehicle Rudder Contr...: [Text Field]

Storage Address: [Text Field] Board Address: [Text Field]

File Type: [Unspecified] Operation Type: [Current Image]

Com Channel: [Iridium Communication Channel] Upload File: [Text Field]

Part: [Text Field] Vehicle File: [Text Field]

Read File Name: [Text Field] Security Manifest: [Text Field]

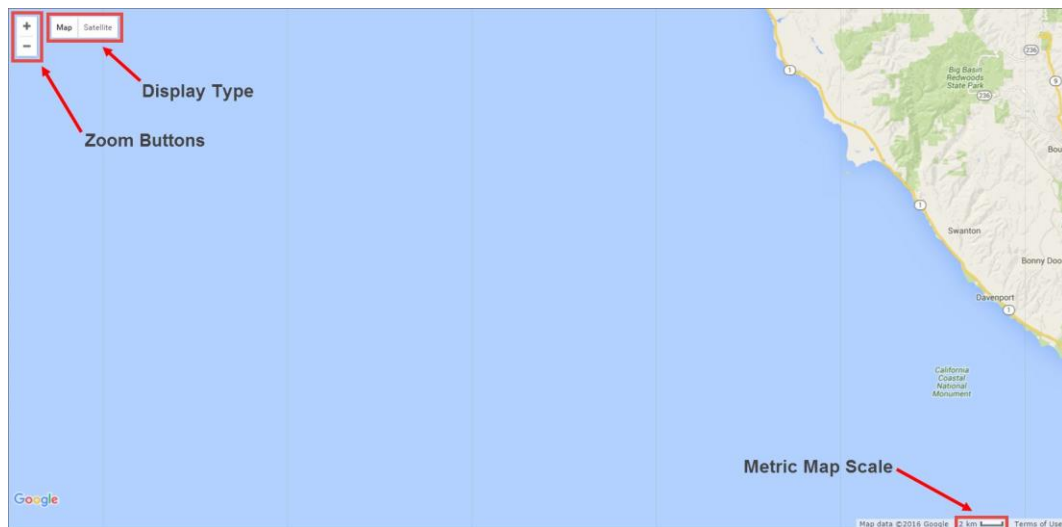
Disposition: [Text Field] Time Field: [Text Field]

Script Buffer: [Text Area]

[Send] [Cancel]

Using the Position Map

The WGMS position map appears in the standard Google Map format and can be manipulated using the same methods. When you use the zoom and map/satellite view controls, there is no need to click the refresh icon - the display will refresh automatically. An annotated position map image is shown in [Figure 4.22](#), followed by basic explanations of the map display features.

Figure 4.22. Position Map Display Features

- Reposition the map by placing the mouse cursor in the map image and holding down the left mouse button. When the cursor changes to a "clenched hand" symbol, keep the left mouse button pressed and "pull" the map around with the clenched hand.
- Zoom in or out by clicking on the **Zoom** buttons in the upper left corner of the position map. You can also Zoom in or out using your mouse scroll wheel.
- The metric scale of the map appears in meters or kilometers at the lower edge of the position map and automatically adjusts when you zoom in or out.
- The **Map** and **Satellite** buttons in the upper left corner of the position map are used to select different display types:
 - **Map**: The standard line-drawn map, as shown in [Figure 4.22](#).
 - **Satellite**: Shows a photographic aerial view.
 - **Terrain**: When you click on the **Map** button, the **Terrain** check box appears. The **Terrain** option modifies the **Map** display. When **Terrain** is selected the position map will show the topography of any land that appears in the position map.

Figure 4.23. Terrain Option for the Map Display Type



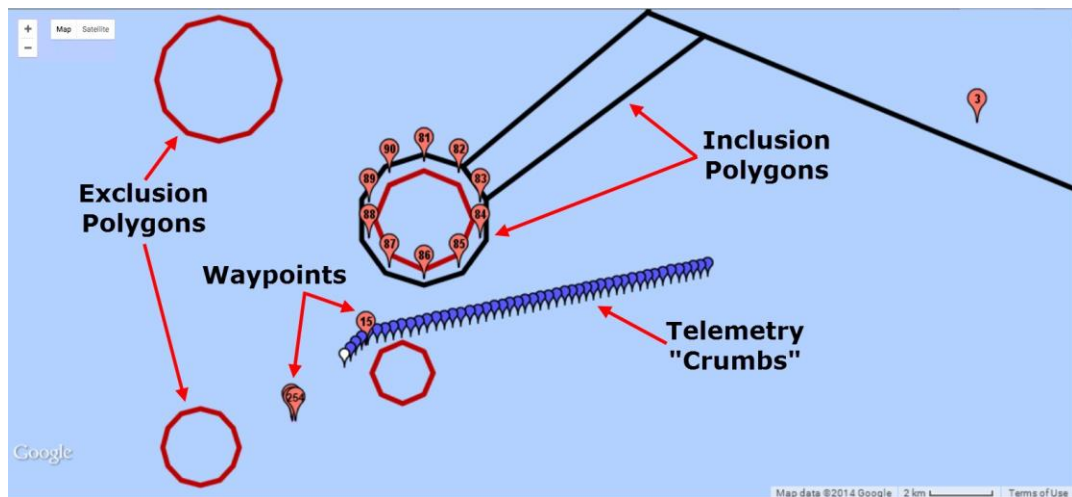
Note

Without a fast broadband connection, moving and scaling of the map can take several seconds. If you have a slow connection, move or scale the map in small increments, and then wait for it to re-paint.

Vehicle Symbols

As shown below, WGMS uses various icons and other markings to indicate properties associated with the Vehicles displayed on the map (Figure 4.24). There is a setting accessible from the **Map Options** button in the Map Toolbar that determines which Vehicles (along with the icons and parameters configured on those Vehicles) will be displayed in the Position Map. For more information see “[Map Options](#)”.

Figure 4.24. Position Map Vehicle Symbols



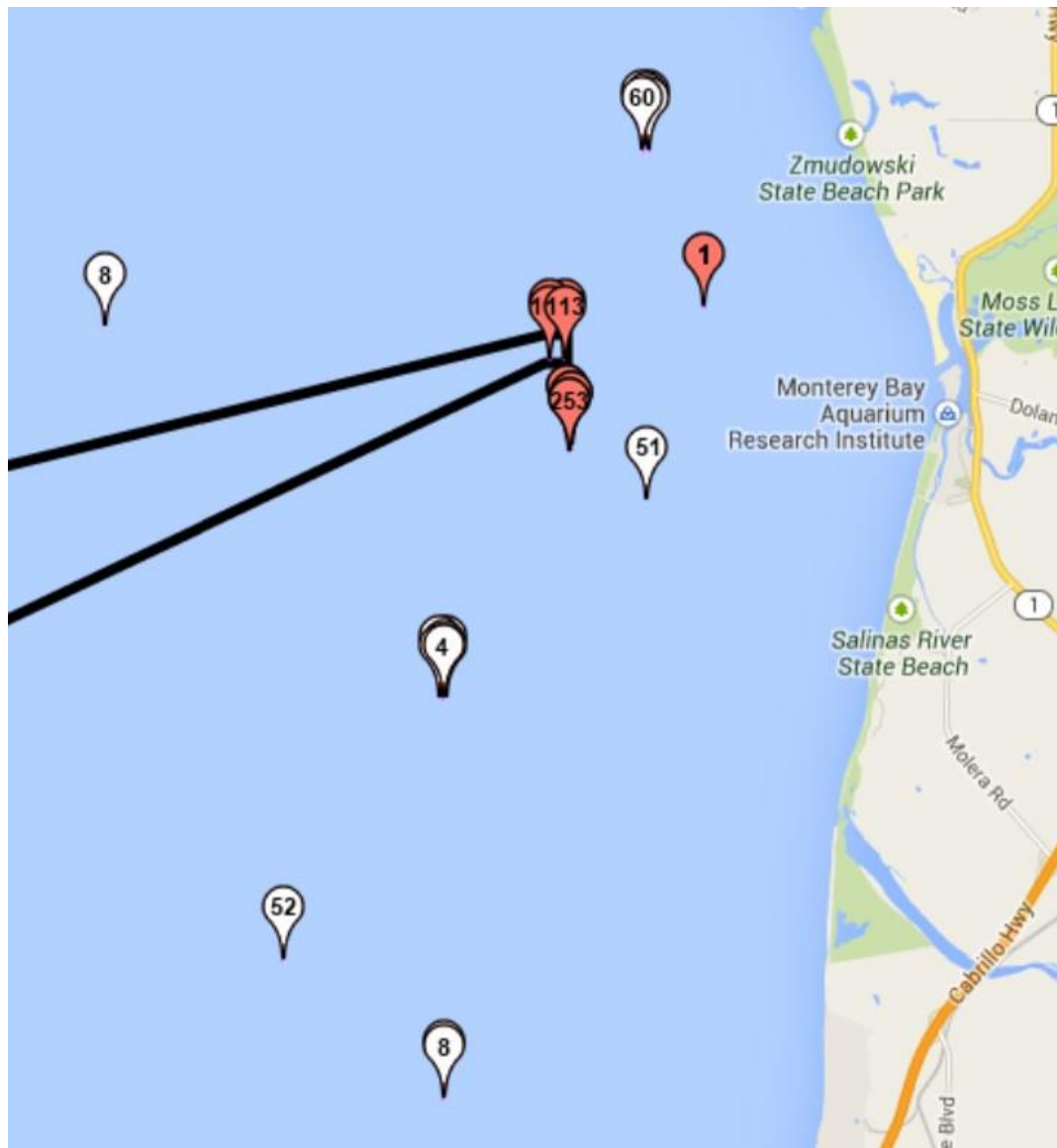
- **Inclusion Polygons:** Closed black Operation Polygons. If the Vehicle travels outside of this boundary, it will trigger an "Out of Bounds" alarm. For information on configuring Inclusion Polygons for a Vehicle see “[Adding Operation Polygons](#)”
- **Exclusion Polygons:** Closed red Operation Polygons. If the Vehicle travels inside this boundary, it will trigger an alarm. For information on configuring Exclusion Polygons for a Vehicle see “[Adding Operation Polygons](#)”
- **Waypoints:** Icons that are associated with GPS locations used to define the course a Vehicle will follow. For more information see “[Waypoints](#)”.
- **Telemetry Crumbs:** A series of Vehicle icons displayed on the Position Map indicating the position of the vehicle at each telemetry transmission as the Vehicle progresses along a course. Each Vehicle is assigned a Vehicle Icon as explained in [Chapter 6: Administrative Tasks - Data Page](#). For more information see “[Telemetry Crumbs](#)”.

Waypoints

Waypoints are icons that are associated with GPS locations used to define the course a Vehicle will follow. Waypoints are:

- Configured for each Vehicle. When a course is defined for a Vehicle, it must be defined by the Waypoints that are configured for that Vehicle.
- The same Waypoint can be configured on multiple Vehicles.
- Each Waypoint is assigned a whole number value from 1 to a maximum of 254.
- Waypoints that are configured on the Vehicle you have selected in the Vehicles drop-down menu on the Dashboard are red on the Position Map display.
- If you set **Map Options** to display information on Vehicles other than the Vehicle you have selected in the Vehicles drop-down menu on the Dashboard, the Waypoints configured on those Vehicles will be white on the Position Map display.

Figure 4.25. Waypoints for Selected Vehicle (Red) and Other Vehicles (White)



- When you click on a Waypoint, a pop-up will display the Vehicle name, the Waypoint number and name, and the position (latitude and longitude) of that Waypoint. There is also a link to the Record where that Waypoint was created.

Figure 4.26. Waypoint Pop-Up

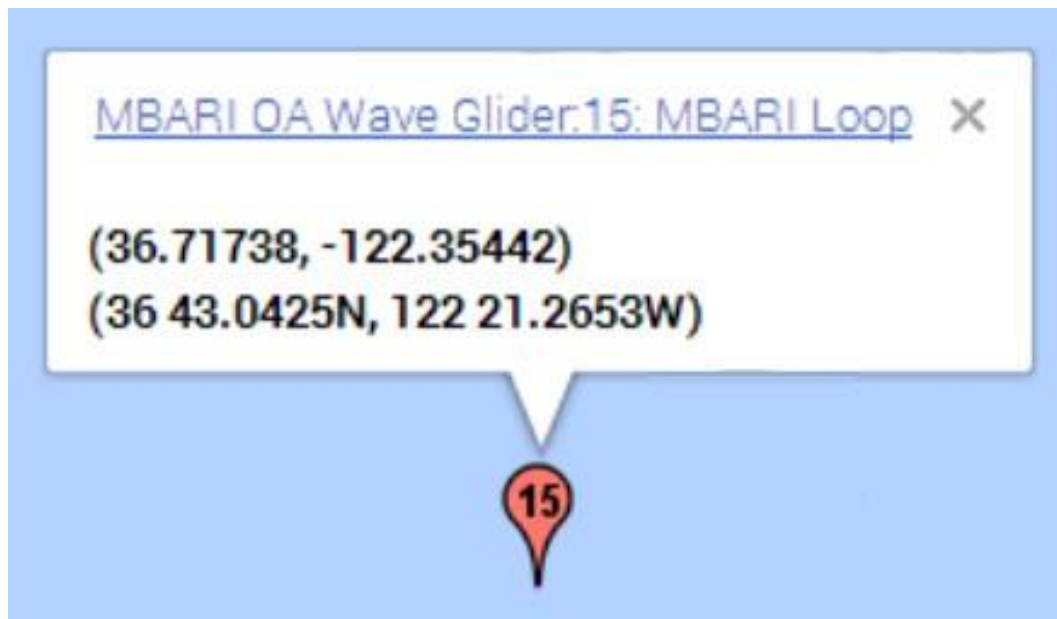
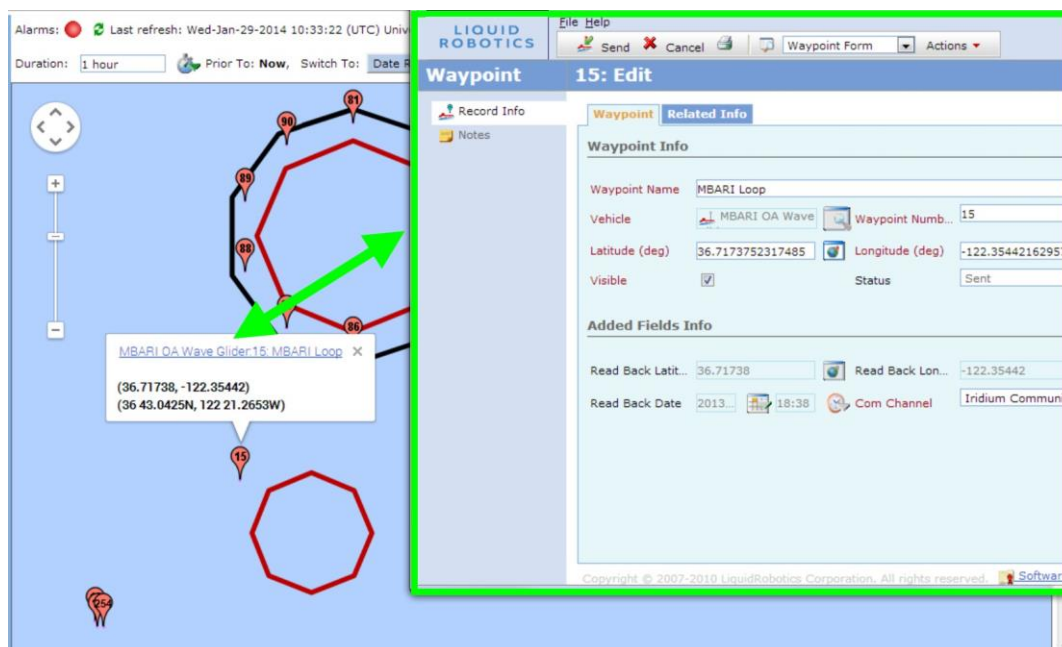


Figure 4.27. Click on Link to Open Waypoint Record



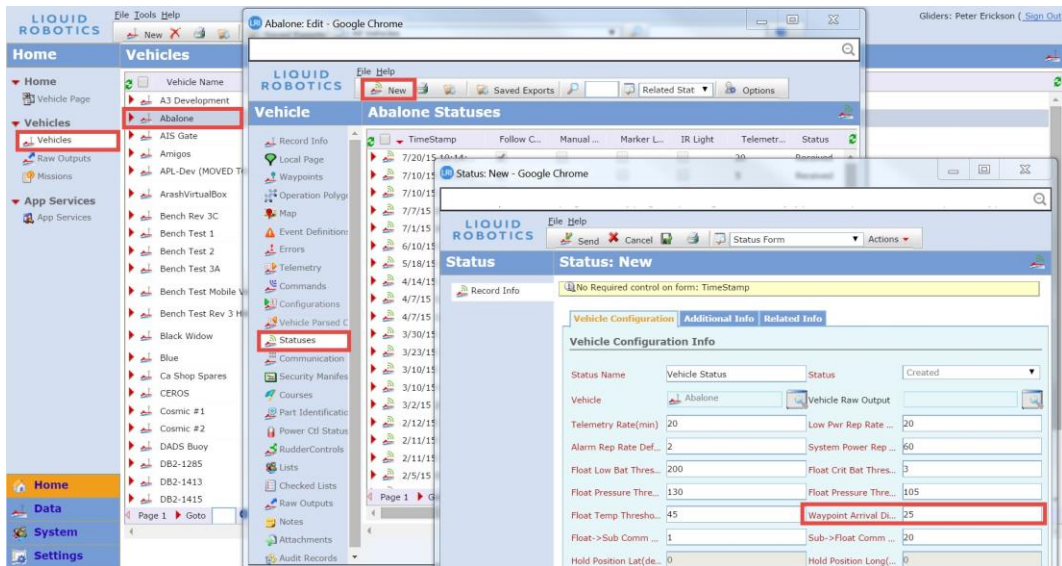
- There is a setting that determines how close a Vehicle needs to get to the precise coordinates of a Waypoint to satisfy the condition that it has arrived. This distance is called the **Arrival Distance** for the Waypoint.

Once a Vehicle is within the Arrival Distance of a Waypoint, programmatically it has arrived at that Waypoint. The relative size of the Arrival Distance for a Waypoint appears as a purple circle at the tip of the Waypoint icon. You may need to zoom in to see it.

Figure 4.28. Arrival Distance Circle

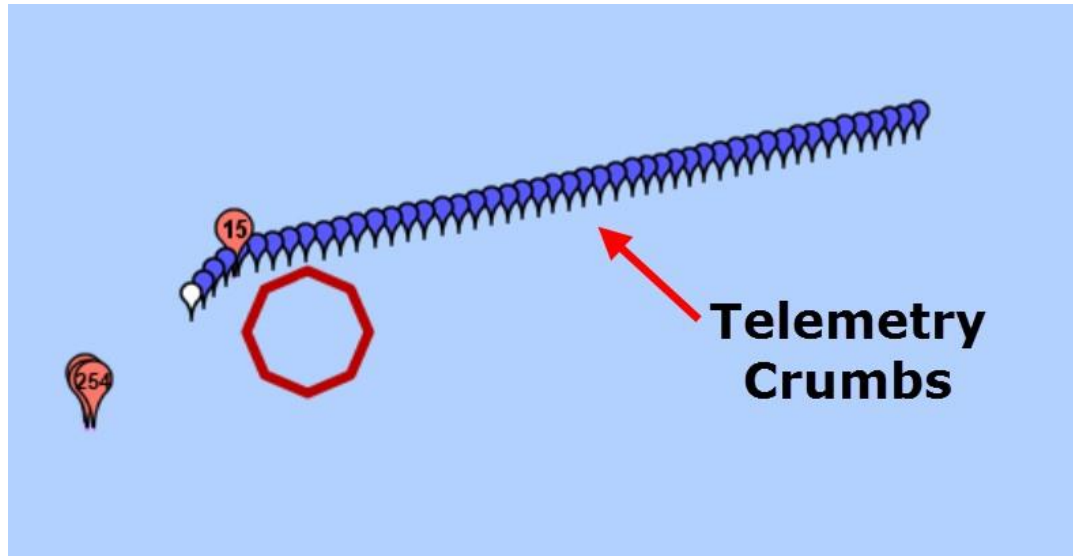


Arrival Distance is set globally for all of the Waypoints configured for a Vehicle. The default Arrival Distance setting is 20 meters. You can change the Arrival Distance by clicking on the **Vehicles** side tab in the **Vehicles** menu on the System Menus **Home** page. Select a vehicle to open the menu for that vehicle, then select the **Statuses** side tab. Click on **New** in the toolbar and a dialog box will open where you can edit the **Waypoint_Arrival_Distance** field.



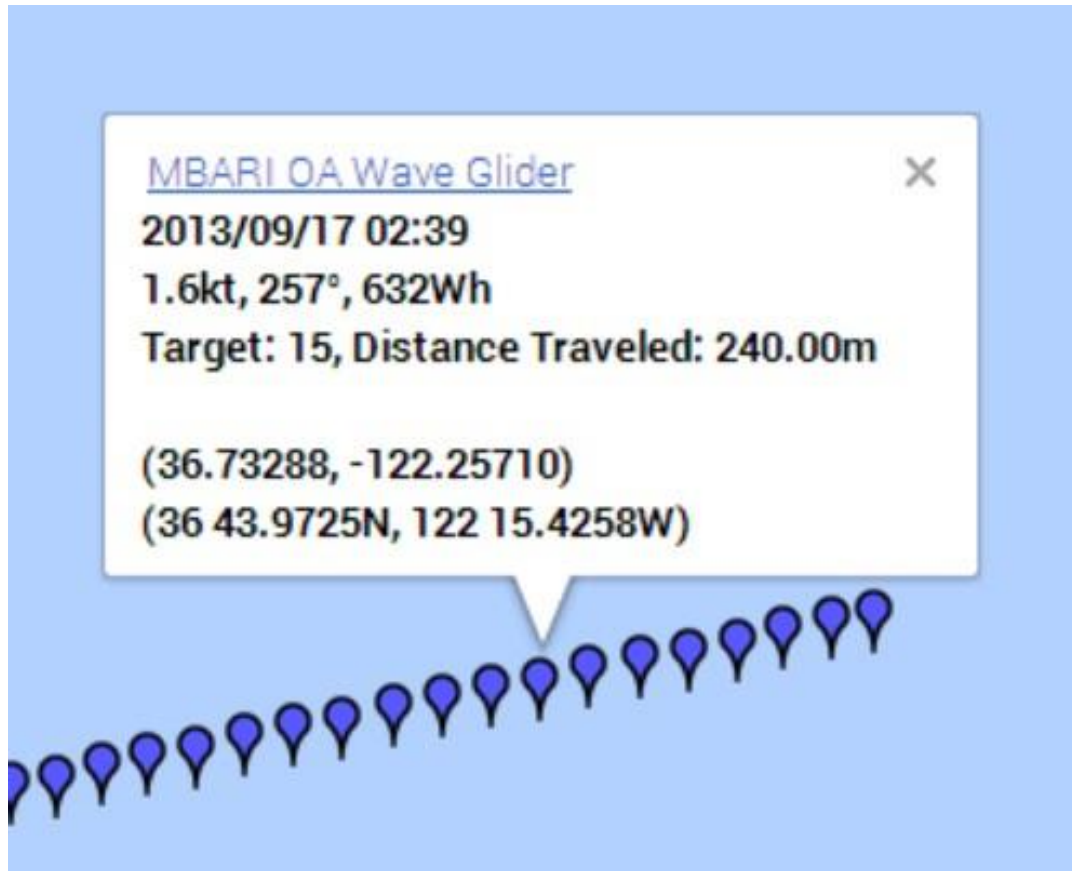
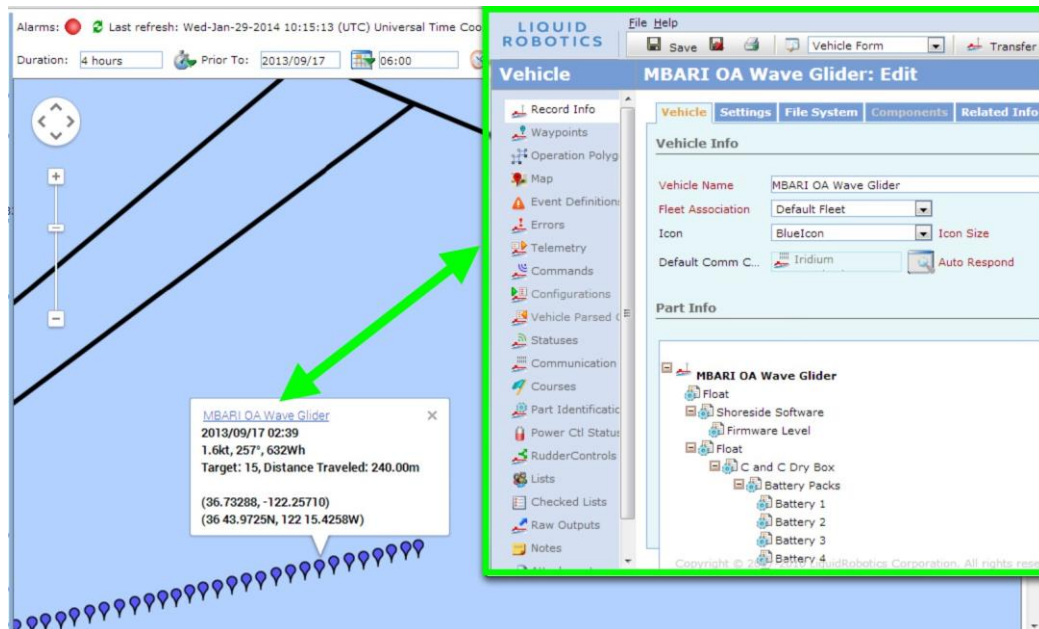
Telemetry Crumbs

Telemetry crumbs are a series of Vehicle icons displayed on the Position Map indicating the position of the vehicle at each telemetry transmission as the Vehicle progresses along a course. Telemetry crumbs are displayed for the time frame selected in the Duration settings on the Position Map toolbar. The default time frame is 1 hour. For more information on time frame settings see [“Using the Position Map Toolbar”](#).



When you click on a Telemetry Crumb (Vehicle icon), a pop-up will display:

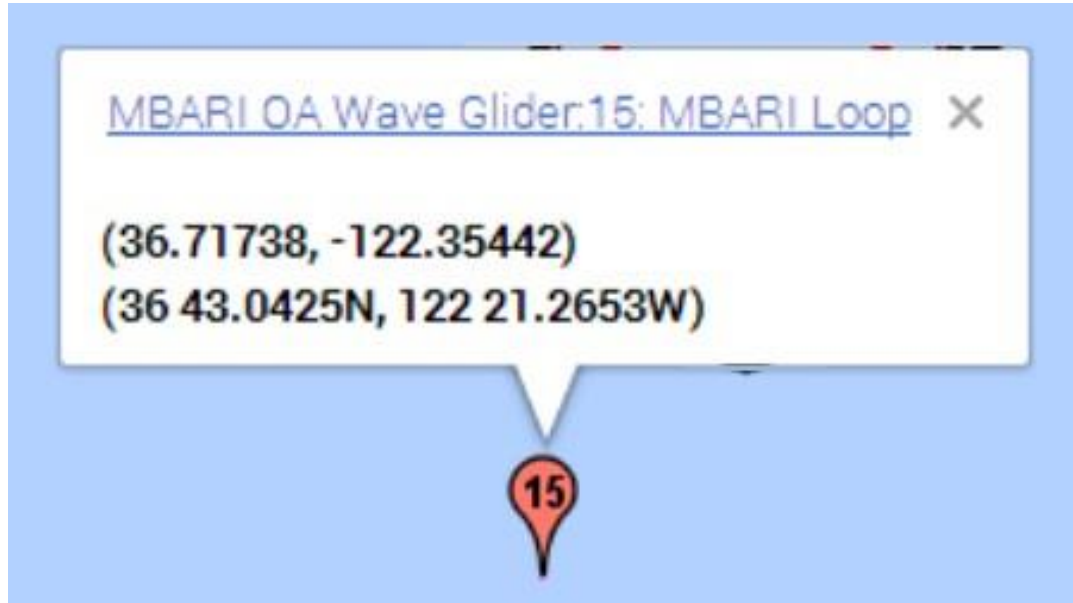
- The Vehicle name.
- The Date and Time of the telemetry transmission.
- The speed and direction of the Vehicle.
- The battery power level.
- The target Waypoint number.
- The distance travelled since the previous telemetry transmission.
- The position of the Vehicle (latitude and longitude) when the telemetry transmission was initiated.
- There is also a link to the Record where the Vehicle was provisioned.

Figure 4.29. Telemetry Crumb (Vehicle Icon) Pop-Up**Figure 4.30. Click on Link to Open Vehicle Record**

Latitude and Longitude Representation

WGMS displays latitude and longitude coordinates in the **Decimal Degrees Format** and in the **Decimal Minutes Format**.

Figure 4.31. Example : Latitude and Longitude Displayed in WGMS



- **In Decimal Degrees Format:**

Positive Latitude Values = North

Negative Latitude Values = South

Positive Longitude Values = East

Negative Longitude Values = West

If WGMS Displays this → **(36.71738, -122.35442)**

The Latitude and Longitude are → **36.71738 degrees North, 122.35442 degrees West**

- **In Degrees Minutes Format:**

If WGMS Displays this → **(36 43.0425N, 122 21.2653W)**

The Latitude and Longitude are → **36 degrees, 43.0425 minutes North, 122 degrees, 21.2653 minutes West**

Using the Position Map Toolbar

The Position Map toolbar for an SV2 Vehicle is slightly different than the Position Map toolbar for an SV3 Vehicle.

SV2 Position Map Toolbar

The SV2 Position Map toolbar is located directly above the Position Map on the WGMS Dashboard.

Figure 4.32. SV2 Position Map Toolbar

The SV2 Position Map toolbar features include:

- Vehicle Health Status and Health Information Retrieval. For more information see: [“Vehicle Health Status”](#)
- Manual Refresh - click the green  manual refresh icon to manually refresh the Position Map. The last time that the Position Map was refreshed is displayed to the right of the manual refresh icon.
- Time Frame Settings for Vehicle data that is displayed in the Position Map. For more information on using the Time Frame Settings see [“Specifying the Data Time Frame”](#)
- Auto Refresh - click the auto refresh button  and the Position Map will automatically refresh every 5 minutes. When auto refresh is active, the display looks like this , with the clock counting down from 5 minutes to zero for each automatic refresh cycle. Click the auto refresh button again to turn auto refresh OFF.
- Line Following icon - The Line Following icon is Gray when Line Following is OFF, and Multi-Colored when Line Following is ON. Line Following is turned ON or OFF by the parameter of the **SV2 Set Parameters** command.
- Message Notification and Retrieval. For more information see [“Fast Mailbox Check \(SV2 Only\)”](#).
- Battery Power Level indicator. For more information see [“Battery Status Indicator”](#).
- Access to online help.
- Access to Position Map options that determine what data is displayed, how data is displayed, piloting tools, and the ability to enable or disable the display of AIS data. Click on the **Map Options** button to access the Position Map display options. See [“Map Options”](#) for more information.

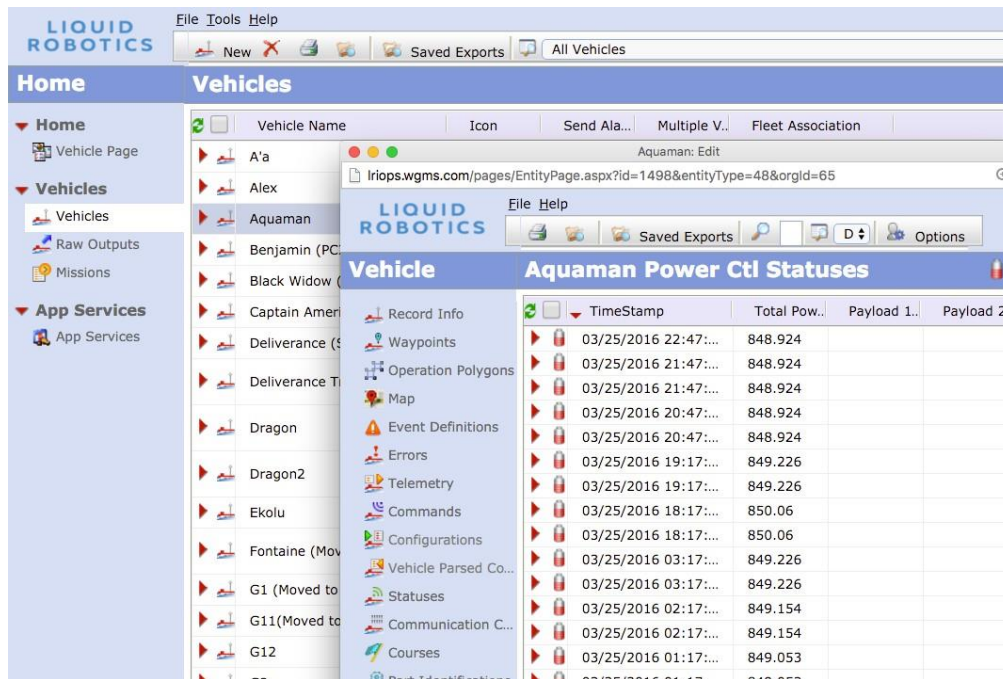
SV3 Position Map Toolbar

The SV3 Position Map toolbar is located directly above the Position Map on the WGMS Dashboard.

Figure 4.33. SV3 Position Map Toolbar

The SV3 Map toolbar features include:

- Health Status and Health Information Retrieval. For more information see [“Vehicle Health Status”](#).
- Manual Refresh - click the green  manual refresh icon to manually refresh the Position Map. The last time that the Position Map was refreshed is displayed to the right of the manual refresh icon.
- Time settings that determine the time frame for Vehicle data displayed in the Position Map. For more information on using the Time Frame Settings see [“Specifying the Data Time Frame”](#).
- Auto Refresh - click the auto refresh button  and the Position Map will automatically refresh every 5 minutes. When auto refresh is active, the display looks like this , with the clock counting down from 5 minutes to zero for each automatic refresh cycle. Click the auto refresh button again to turn auto refresh OFF.
- Obstacle Avoidance ON/OFF icon that is Gray when Obstacle Avoidance is OFF and Green or Yellow when Obstacle Avoidance is ON. Obstacle Avoidance is turned ON or OFF using the SV3 **Avoid Obstacles** command. The **Avoid Obstacles** command is accessed from the **navigator** tab in the **Services** menu of the SV3 Commands Window. To be certain of the Obstacle Avoidance status, you should go to the **navigator** tab in the **Services** menu of the SV3 Commands Window and view the status of the **Avoid Obstacles** command.
- Thruster ON/OFF icon that is Gray when the Thruster is OFF and Green when the Thruster is ON. The Thruster is turned ON or OFF manually (or automatically) based on a group of SV3 commands that also set the Thruster speed and power consumption limitations. The Thruster commands are accessed from the **thruster** tab in the **Devices** menu of the SV3 Commands Window. To be certain of the Thruster status, you should go to the **thruster** tab in the **Devices** menu of the SV3 Commands Window and view the status of the Thruster commands.
- Line Following icon that is Gray when Line Following is OFF and Multi-Colored when Line Following is ON. Line Following is turned ON or OFF using the SV3 **Line Following** command. The **Line Following** command is accessed from the **navigator** tab in the **Services** menu of the SV3 Commands Window. To be certain of the Line Following status, you should go to the **navigator** tab in the **Services** menu of the SV3 Commands Window and view the status of the **Line Following** command.
- Battery Power Level indicator. To be certain of the battery power level, you should also go to the **Vehicles** side tab in the **Home** page **Vehicles** menu, then click on the icon adjacent to the **Vehicle Name** to open the **Vehicle** page. Click on the **Power Ctl Statuses** side tab on the **Vehicle** page to view chronological records of the vehicle power level.



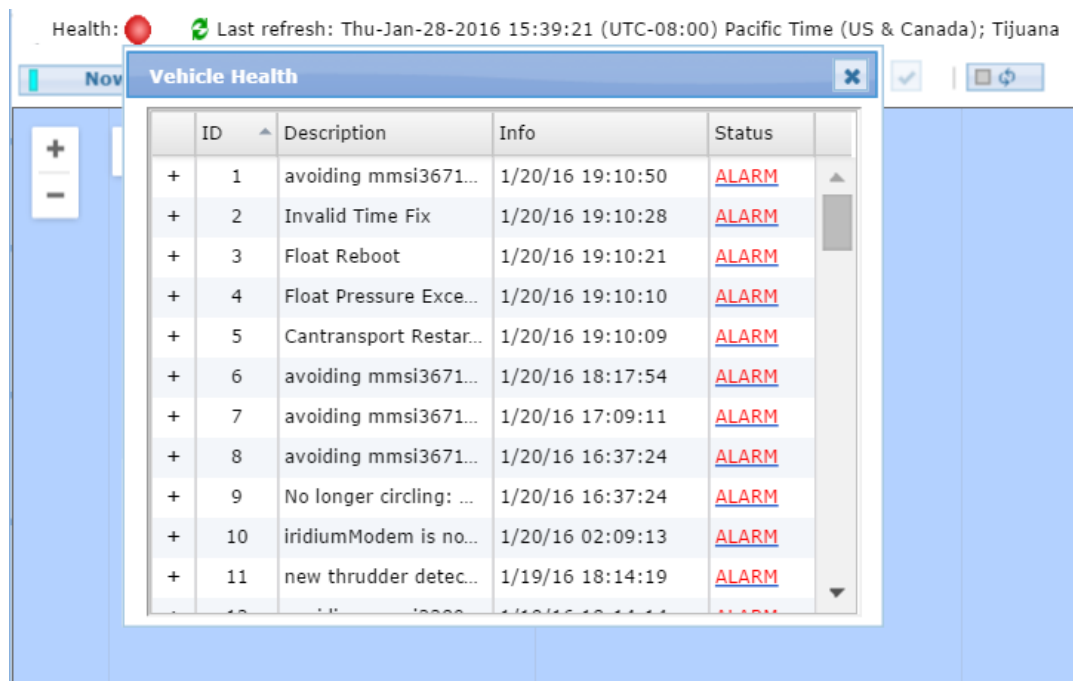
- Access to online help.
- Access to Position Map options that determine what data is displayed, how data is displayed, piloting tools, and the ability enable or disable the display of AIS data. Click on the **Map Options** button to access the Position Map display options. See “[Map Options](#)” for more information.

Vehicle Health Status

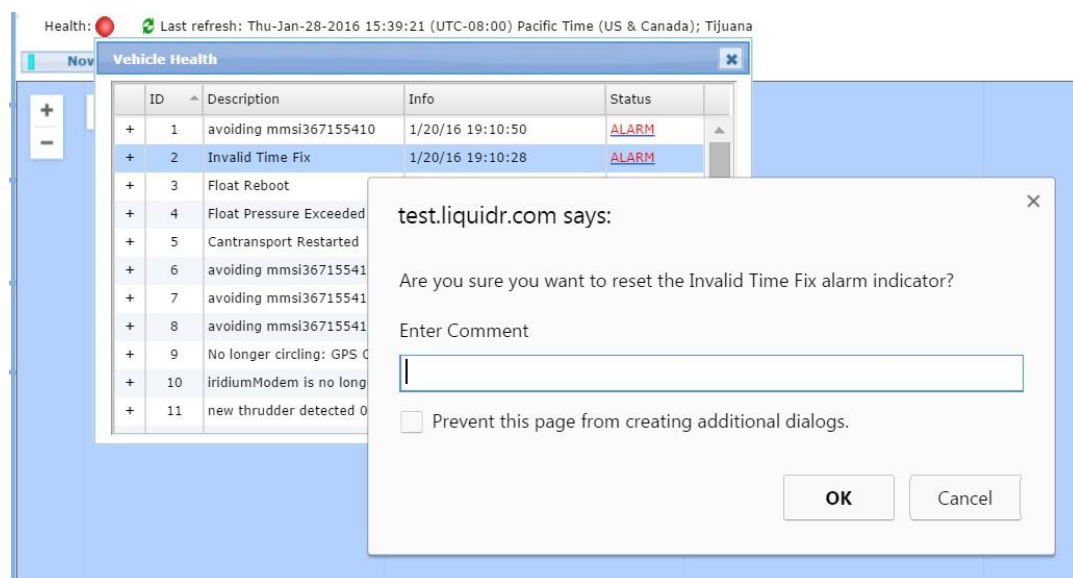
The circular Health icon in the Position Map toolbar indicates the health status of the Vehicle:

- A Red health icon  in the Position Map toolbar indicates that there are one or more active alarms.
- A Yellow health icon  in the Position Map toolbar indicates that there were one or more active alarms, but they have been self-corrected by the Vehicle.
- A Green health icon  in the Position Map toolbar indicates that there are no active alarms on the system.

When you click on a Red **Health** icon in the Position Map toolbar, a **Vehicle Health** window opens listing all active alarms. The status of these alarms will be: ALARM.

Figure 4.34. Example: Vehicle Health Window - ALARM

To reset an alarm, click on **ALARM** in the Status column of the active alarms window to open an alarm reset dialog box where you must enter a comment, before clicking OK to reset the alarm. Resetting an alarm will remove it from the alarm list, but a record of the alarm will remain in the WGMS database.

Figure 4.35. Alarm Reset Dialog Box

When you click on a Yellow **Health** icon in the Position Map toolbar, a **Vehicle Health** window opens listing alarms that have been self-corrected by the vehicle. The status of these alarms will be: **SELF CORR.**

Figure 4.36. Example: Vehicle Health Window - SELFCORR

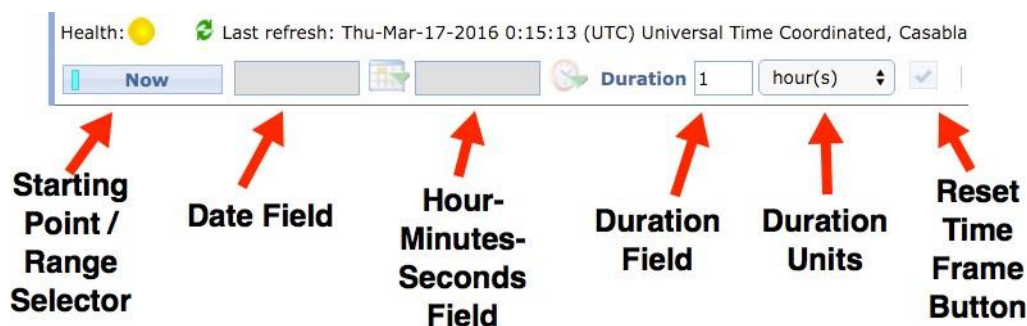
Vehicle Health ✕				
	ID ▲	Description	Info	Status
+	1	Float Reboot	02/16/2015 22:42:51	<u>SELFCORR</u>
+	2	Invalid Time Fix	02/16/2015 22:42:50	<u>SELFCORR</u>
+	3	Float Pressure Exceed...	02/16/2015 21:28:47	<u>SELFCORR</u>
+	4	Repeating Telemetry ...	02/13/2015 22:44:25	<u>SELFCORR</u>
+	5	Sub to Float Comms E...	02/11/2015 03:05:46	<u>SELFCORR</u>
+	6	File Read Timeout for ...	02/05/2015 00:41:12	<u>SELFCORR</u>
+	7	File read: B1CCF57.G...	02/04/2015 23:34:10	<u>SELFCORR</u>
+	8	Float Battery Low	01/30/2015 17:36:05	<u>SELFCORR</u>

When you click on a Green **Health** icon in the Position Map toolbar, a **Vehicle Health** window will open announcing that an "**Alarm is not on**", followed by a status of: OK.

[illegible]

Specifying the Data Time Frame

All Vehicle data is stored in the WGMS database, but there are time frame settings on the Position Map toolbar that allow you to specify a start and end point for vehicle data that is displayed in the Position Map, including telemetry crumbs. The time frame settings on the Position Map toolbar also control the time frame for data that is displayed in the Communications log and the Commands log at the bottom of the WGMS Dashboard. **All time settings are in Universal Time Coordinated (UTC).**



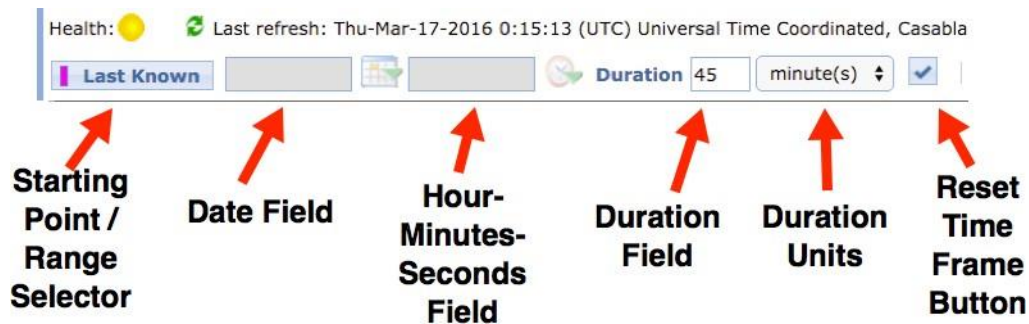
The default time frame for the data that is displayed in the Position Map is for 1 hour prior to the current time. Notice that the **Starting Point/Range** selector is set to **Now** and the **Duration** is set to 1 hour. The **Duration Units** can be set to minutes, hours or days.

Whenever you change the time frame settings, you need to click on the **Reset Time Frame** button to implement the new time frame settings on the Position Map.

In addition to **Now**, the **Starting Point/Range** selector has two other settings; **Last Known** and **Date Range**. Each time you click on the **Starting Point/Range** selector it will change to one of the other two setting options.

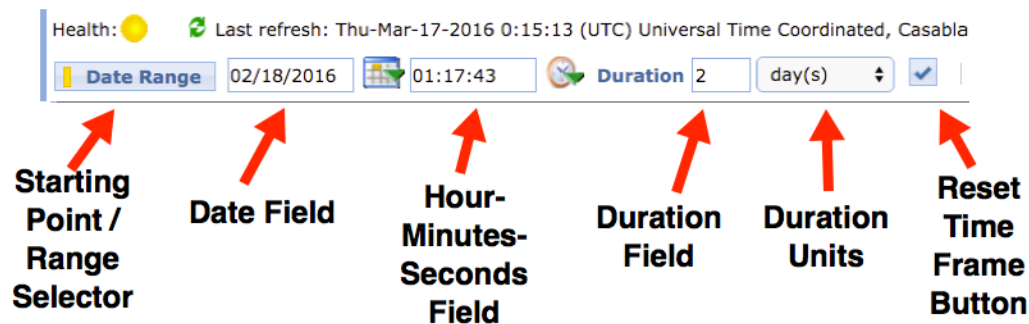
When the **Last Known** setting is selected, the data displayed on the Position Map will be for a time frame prior to the last time data was logged on the vehicle. The default time frame is 1 hour prior to the last time data was logged, but you can use the **Duration** and **Duration Units** settings to make that time frame shorter or longer.

Figure 4.39. Example : Display Data for 45 Minutes Prior to Last Known Data



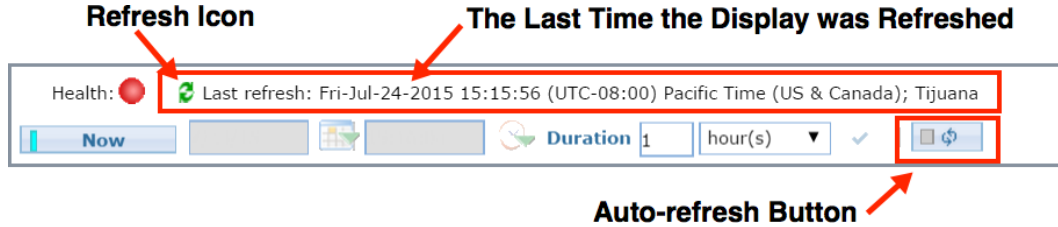
When the **Date Range** setting is selected, the data displayed on the Position Map will be for a time frame prior to the date and time that is entered into the **Date** and **Hour-Minutes-Seconds** fields. These fields remain grayed out until **Date Range** is selected. Click on the calendar icon next to the **Date** field to select a date, then click on the clock icon next to the **Hour-Minutes-Seconds** field to select a time. The default time frame is 1 hour prior to the time that you set with the **Date** and **Hour-Minutes-Seconds** settings, but you can use the **Duration** and **Duration Units** settings to make that time frame shorter or longer.

Figure 4.40. Example : Display Data for 2 Days Prior to 02/18/2016 at 01:17:43



Refresh and Auto-refresh

You have the option to refresh the Position Map manually, or automatically. **Last refresh:** indicates the time of the most recent refresh (manual or automatic).

Figure 4.41. Refresh Icon, Time of Last Refresh and Auto-refresh

- Click on the green refresh icon  to manually refresh the Position Map.
- Click on the **Auto-refresh** button to initiate automatic refresh cycles. When you click on the **Auto-refresh** button, a digital timer begins counting down from 5 minutes to zero, at which point the Position Map is refreshed and a countdown to the next automatic refresh begins. When **Auto-refresh** is active, clicking on the **Auto-refresh** button will turn the automatic refresh cycle OFF.

Figure 4.42. Auto-refresh Cycle Countdown**Note**

Even if the **Auto-refresh** button has been activated, you can still refresh the Position Map manually at any time by clicking on the **Refresh** icon  - the automatic refresh cycle will be briefly interrupted, but it will resume when the manual refresh is completed.

Fast Mailbox Check (SV2 Only)

**Note**

On SV3 vehicles there is no Fast Mailbox Check icon on the SV3 Map Toolbar. On SV3 vehicles the Fast Mailbox Check function is automated with respect to Obstacle Avoidance - it turns ON when Obstacle Avoidance is activated, and it turns OFF when Obstacle Avoidance is deactivated.

The Fast Mailbox Check feature is typically used to accelerate the telemetry report rate when circumstances require commands to be issued and acknowledged at a faster pace. With the default telemetry configuration, the Vehicle downloads telemetry to the Iridium Satellite Network servers and uploads commands that are cached on the Iridium servers every 5 minutes. When Fast Mailbox Check is turned on, the telemetry report rate is shortened to 1 minute. The default telemetry report rate can be changed, but the Fast Mailbox Check allows you to quickly toggle between the default and fast telemetry cycles without changing the default setting.

The Fast Mailbox Check icon is gray when the Fast Mailbox Check feature is turned off.

The Fast Mailbox Check icon is blue with a large green package sticking out of it when Fast Mailbox Check is turned on.

Table 4.1. Fast Mailbox Check Icon: OFF and ON

When you click on the Fast Mailbox Check icon a **Set Parameter Command** dialog box opens (this is the same dialog box that opens when you click on the **Set Parameters** button in the Dashboard sidebar).

If Fast Mailbox Check is turned OFF, follow this procedure to turn it ON:

1. Click on the Fast Mailbox Check icon to open the **Set Parameters Command** dialog box.
2. Enter a reason for turning Fast Mailbox Check on in the **Enter Reason:** field of the **Set Parameters Command** dialog box.
3. Click once in a white area of the **Set Parameters Command** dialog box to activate the Send button.
4. Click Send to issue the command to turn on the Fast Mailbox Check feature.



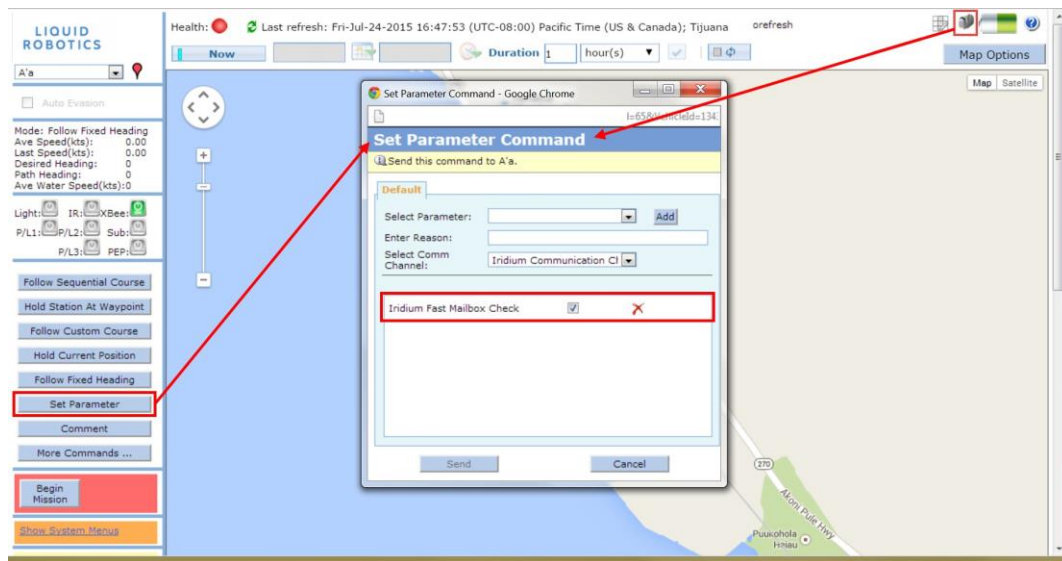
Note

Fast Mailbox Check turns on automatically when an AIS hit is detected, but it will remain turned ON until it is turned OFF manually.



Note

You do not need to add a check-mark in the Iridium Fast Mailbox Check check box - the **Set Parameters Command** dialog box opens with that check box checked.

Figure 4.43. Turn Fast Mailbox Check ON

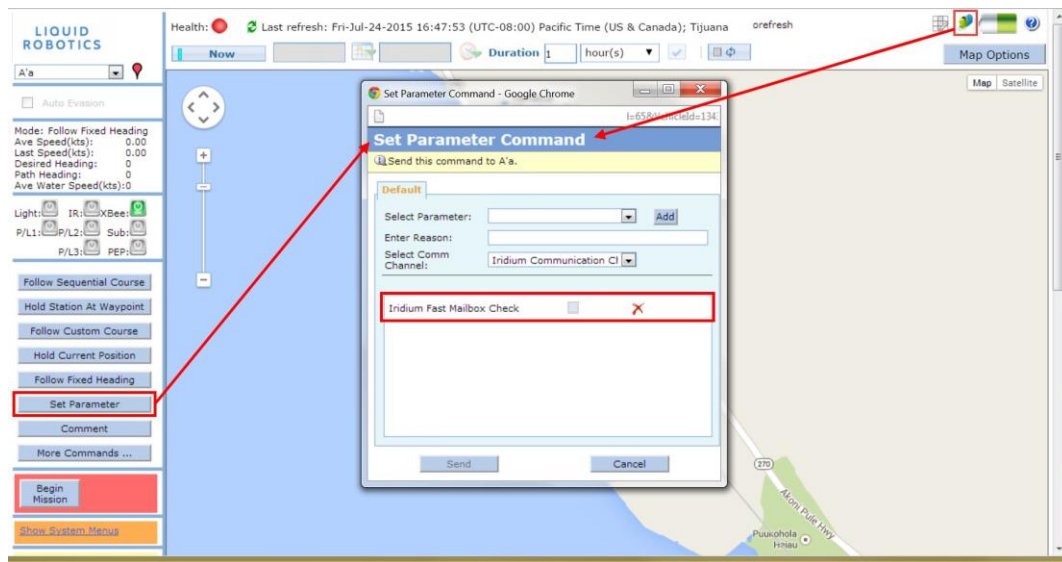
If Fast Mailbox Check is turned ON, follow this procedure to turn it OFF:

1. Click on the Fast Mailbox Check icon to open the **Set Parameters Command** dialog box.
2. Enter a reason for turning Fast Mailbox Check off in the **Enter Reason:** field of the **Set Parameters Command** dialog box.
3. Click once in a white area of the **Set Parameters Command** dialog box to activate the Send button.
4. Click Send to issue the command to turn on the Fast Mailbox Check feature.



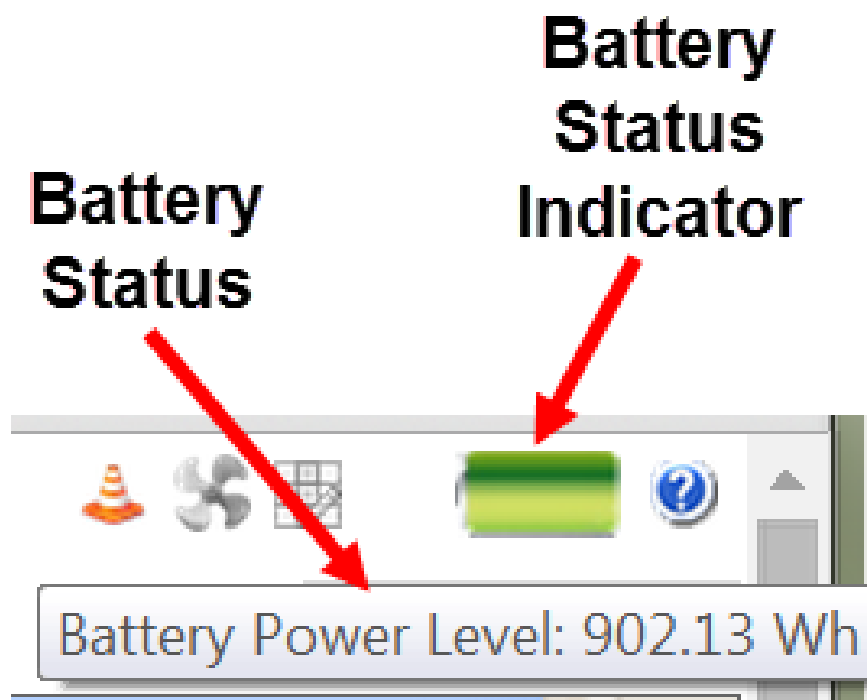
Note

You do not need to remove the check-mark in the Iridium Fast Mailbox Check checkbox - the **Set Parameters Command** dialog box opens with that checkbox unchecked.

Figure 4.44. Turn Fast Mailbox Check OFF

Battery Status Indicator

The Battery Status Indicator icon provides a quick visual check on the battery power level. You can get precise information on the battery power level by hovering your cursor over the Battery Status Indicator icon.

Figure 4.45. Click on Battery Status Indicator

To be certain of the battery power level, you should also go to the **Vehicles** side tab in the **Home** page **Vehicles** menu, then click on the icon adjacent to the **Vehicle Name** to open the **Vehicle**

page. Click on the **Power Ctl Statuses** side tab on the **Vehicle** page to view chronological records of the vehicle power level.

The screenshot shows the Liquid Robotics WGMS interface. On the left is a sidebar with 'Home' and 'Vehicles' sections. The 'Vehicles' section lists various vehicles like A'a, Alex, Aquaman, Benjamin (PC), Black Widow, Captain America, Deliverance (S), Deliverance T, Dragon, Dragon2, Ekolu, Fontaine (Mov), G1 (Moved to), G11(Moved to), and G12. The main window displays the 'Aquaman Power Ctl Statuses' table. The table has columns for 'TimeStamp', 'Total Pow...', 'Payload 1...', and 'Payload 2...'. The data shows power levels for Aquaman on 03/25/2016.

TimeStamp	Total Pow...	Payload 1...	Payload 2...
03/25/2016 22:47:...	848.924		
03/25/2016 21:47:...	848.924		
03/25/2016 21:47:...	848.924		
03/25/2016 20:47:...	848.924		
03/25/2016 20:47:...	848.924		
03/25/2016 19:17:...	849.226		
03/25/2016 19:17:...	849.226		
03/25/2016 18:17:...	850.06		
03/25/2016 18:17:...	850.06		
03/25/2016 03:17:...	849.226		
03/25/2016 03:17:...	849.226		
03/25/2016 02:17:...	849.154		
03/25/2016 02:17:...	849.154		
03/25/2016 01:17:...	849.053		
03/25/2016 01:17:...	849.053		

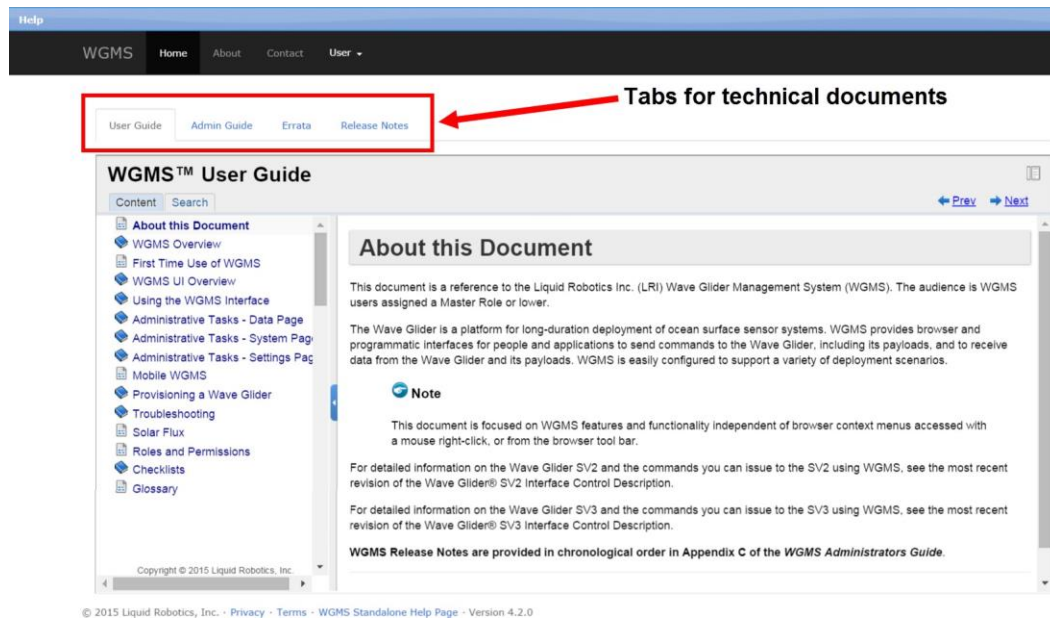
Online Help

Click on the **Help** icon  to open a help menu with tabs for HTML versions of the WGMS User Guide, WGMS Admin Guide, WGMS Errata, and WGMS Release Notes.

Figure 4.46. Online Help Icon



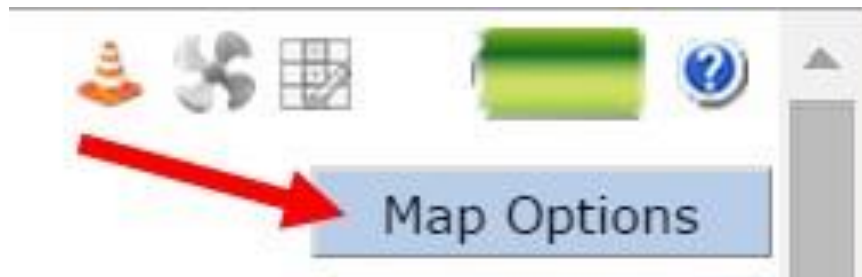
Figure 4.47. Online Help Menu



Map Options

The **Map Options** button is located just below the Battery Status icon in the Map toolbar.

Figure 4.48. Map Options Button



Click on the **Map Options** button to open the Map Options dialog box.

The **Map Options** dialog box includes three tabs where you can select a variety of Position Map display and tools options:

- **Map Options**
- **Tool Options**
- **AIS Options**

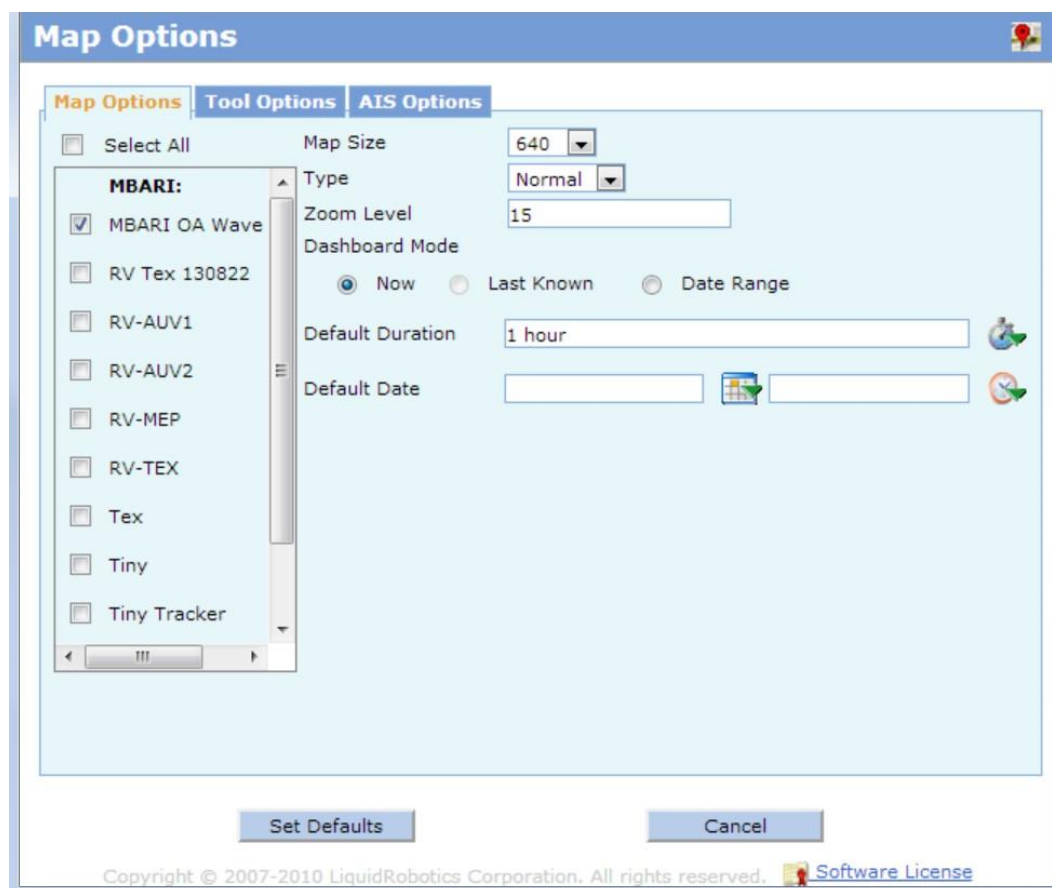
The **Map Options** dialog box opens to the **Map Options** tab by default.

The settings you make in the three tabs of the **Map Options** dialog box determine how the Position Map display in the WGMS Dashboard will appear when you log in to WGMS. When you make changes

in the **Map Options** dialog box, click the **Set Defaults** button to exit the dialog, then click the green refresh icon  in the Map toolbar to display the changes on the Position in the Map toolbar to display the changes on the Position Map.

To exit the **Map Options** dialog box without making any changes, click the **Cancel** button.

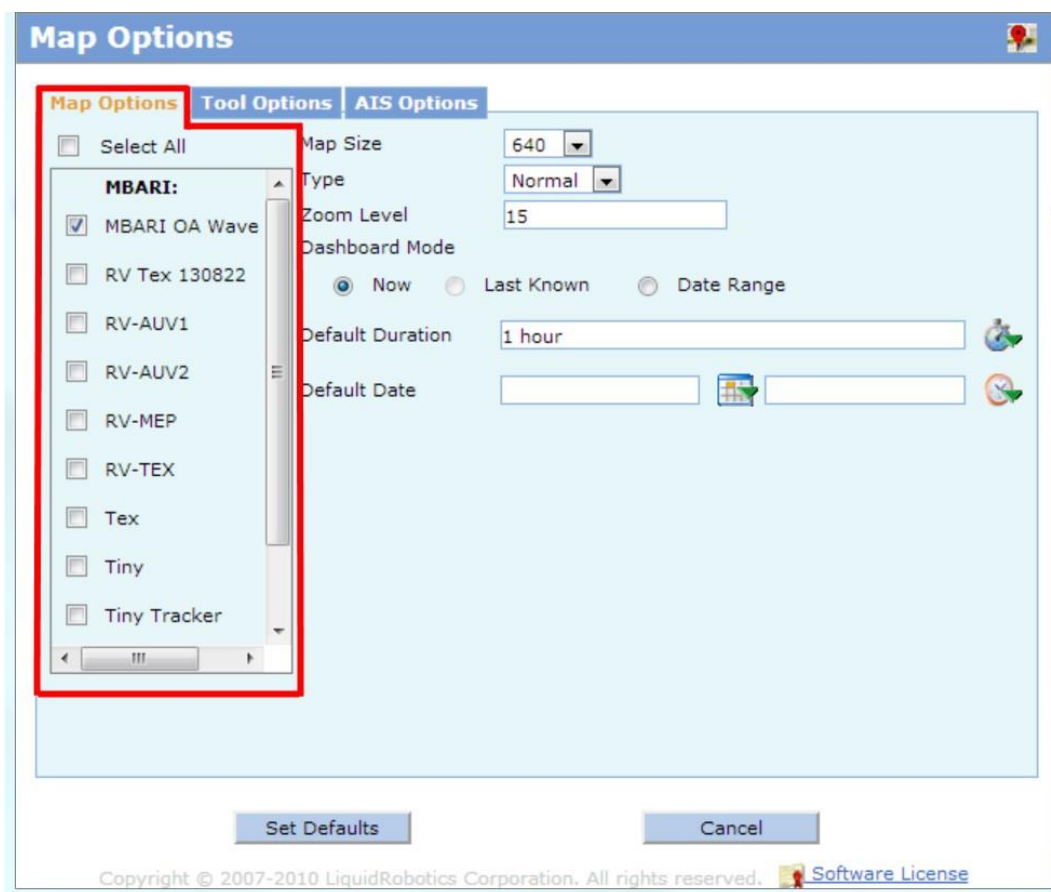
Figure 4.49. Map Options Dialog Box Open to the Map Options Tab



Map Options Tab

From the **Map Options** tab you can set the default Position Map display parameters.

The **Map Options** Vehicle menu allows you to select the Vehicle information you want displayed in the Position Map.

Figure 4.50. Map Options Vehicle Menu

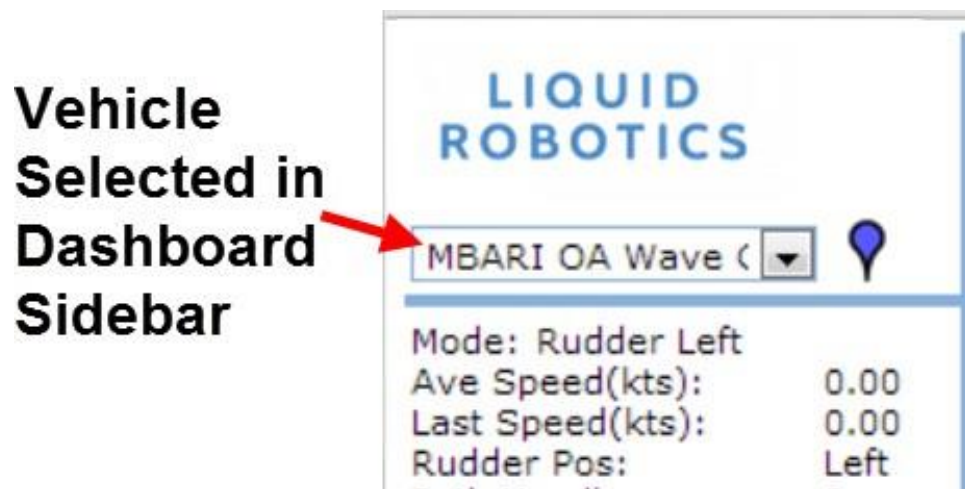
You can use the **Select All** check box to display data for all of the Vehicles in your WGMS organization, or you can select a few Vehicles for viewing using the check boxes.



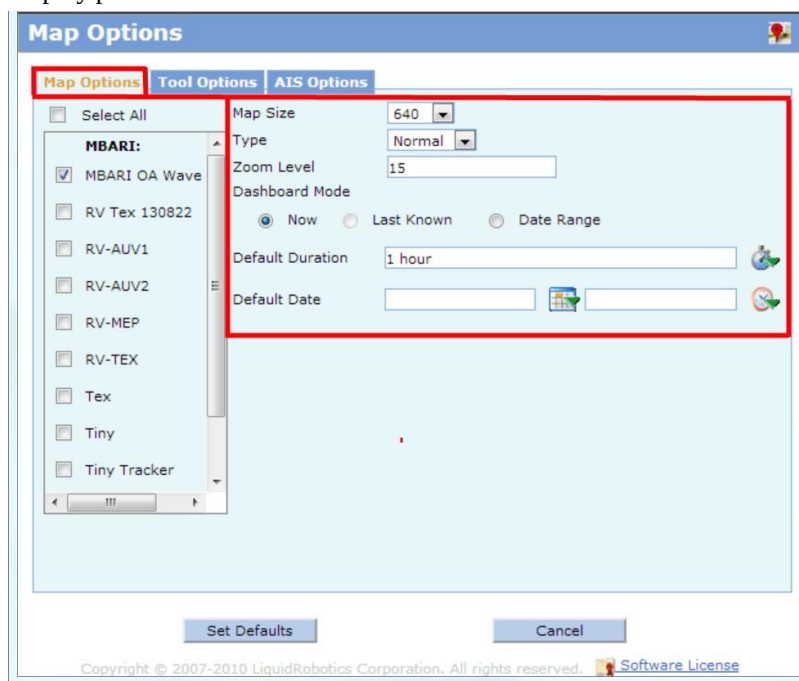
Note

By default, information for the Vehicle that is selected in the Dashboard sidebar will be displayed in the Position Map - even if you deselect that Vehicle in the **Map Options** menu.

Figure 4.51. Vehicle Selected in Dashboard Sidebar



The **Map Options** tab also allows you to set the Position Map size, type, zoom, and time frame display parameters.



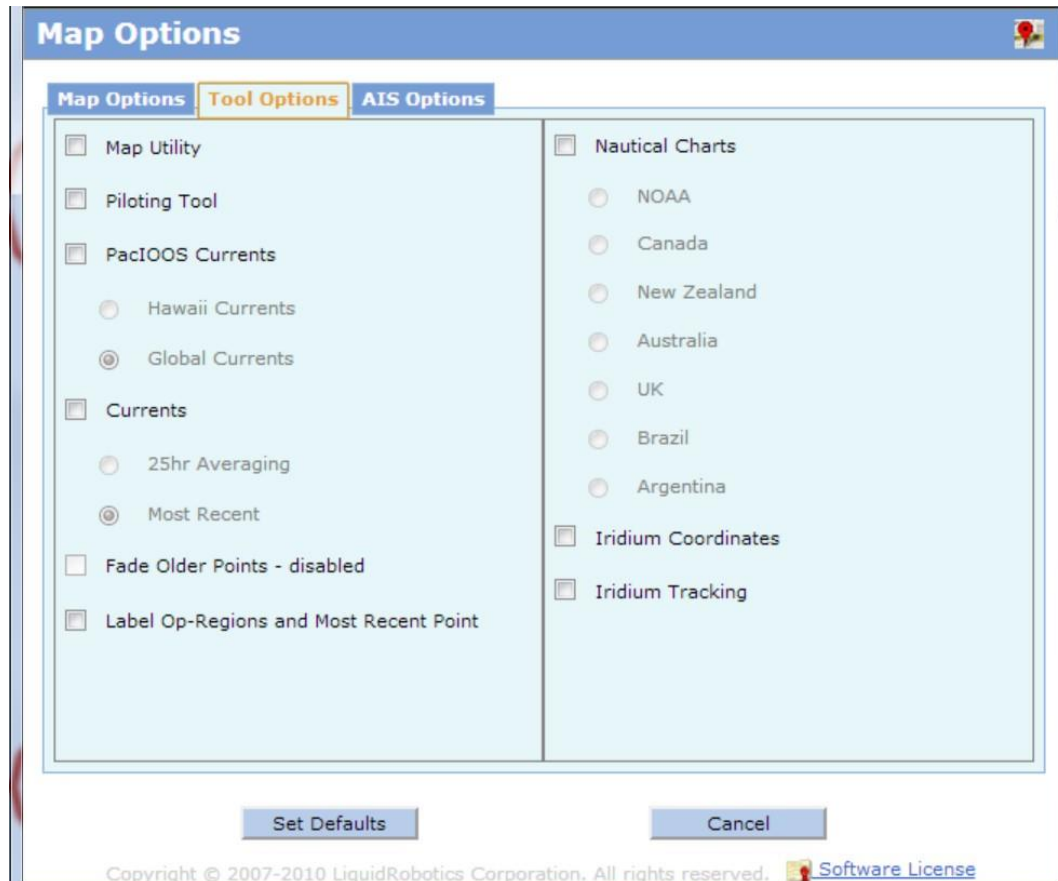
- **Map Size** - Use the drop-down menu to set the vertical dimension of the Position Map to 480, 640, 720, or 1080 pixels.

- **Type** - Use the drop-down menu to set the default Position Map type to Normal, Satellite, Hybrid, or Terrain.
- **Zoom Level** - Enter a whole number value ranging from 1 to 18 to set the default Position Map zoom level. Larger zoom numbers display smaller regions on the Position Map. The default zoom setting is 15.
- **Dashboard Mode** - Click on a radio button to select a time frame for the data displayed on the Position Map. There three options:
 - **Now** - Sets the Position Map to display the last hour of Vehicle data.
 - **Last Known** - This feature is under development and is available for Beta users only.
 - **Date Range** - Sets the Position Map to display Vehicle data for a time frame (**Default Duration**) prior to a specified date and time (**Default Date**). For more information on how to use these settings see [“Specifying the Data Time Frame”](#).

Tool Options Tab

From the **Tool Options** tab you can click on check boxes and radio buttons to select a variety of Position Map piloting enhancements.

Figure 4.52. Tool Options Tab



- **Map Utility**

The **Map Utility** provides a way to quickly create waypoints, courses, and Operation Polygons for the Vehicle you have selected in the Vehicle drop-down menu in the Dashboard sidebar.

Detailed instructions on using the **Map Utility** are provided in [“Using the Map Utility”](#).

- **Piloting Panel**

The **Piloting Panel** calculates headings that the selected Vehicle is capable of following and its expected path over ground (POG) and speed over ground (SOG), based on currents data and water speed calculations.

Detailed instructions on using the **Piloting Panel** are provided in [“Using the Piloting Panel”](#).

- **PacIOOS Currents**

This feature is no longer supported by PacIOOS.

- **Currents**

Select **Currents** to display currents data on the Position Map. The source for these currents are the HFRADAR Derived Surface Currents mapping from the Coastal Observing Research and Development Center (CORDC) at University of California San Diego (UCSD). Use the radio buttons to select **25hr Averaging** or **Most Recent** data. After selecting **Currents** data and refreshing the Position Map it may take several seconds for the data to appear in the display.

Figure 4.54. Select Currents Check Box 25 hr Averaging

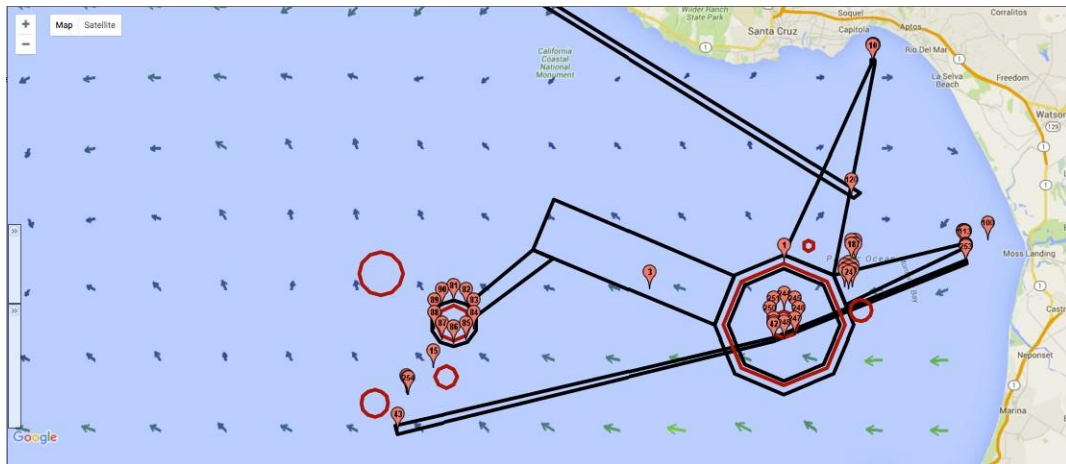
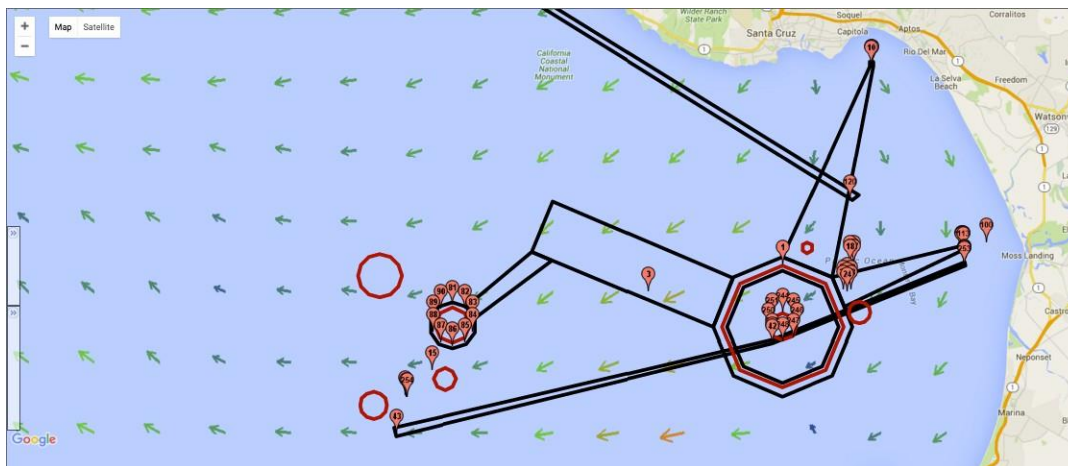


Figure 4.55. Select Currents Check Box Most Recent

- **Fade Older Points**

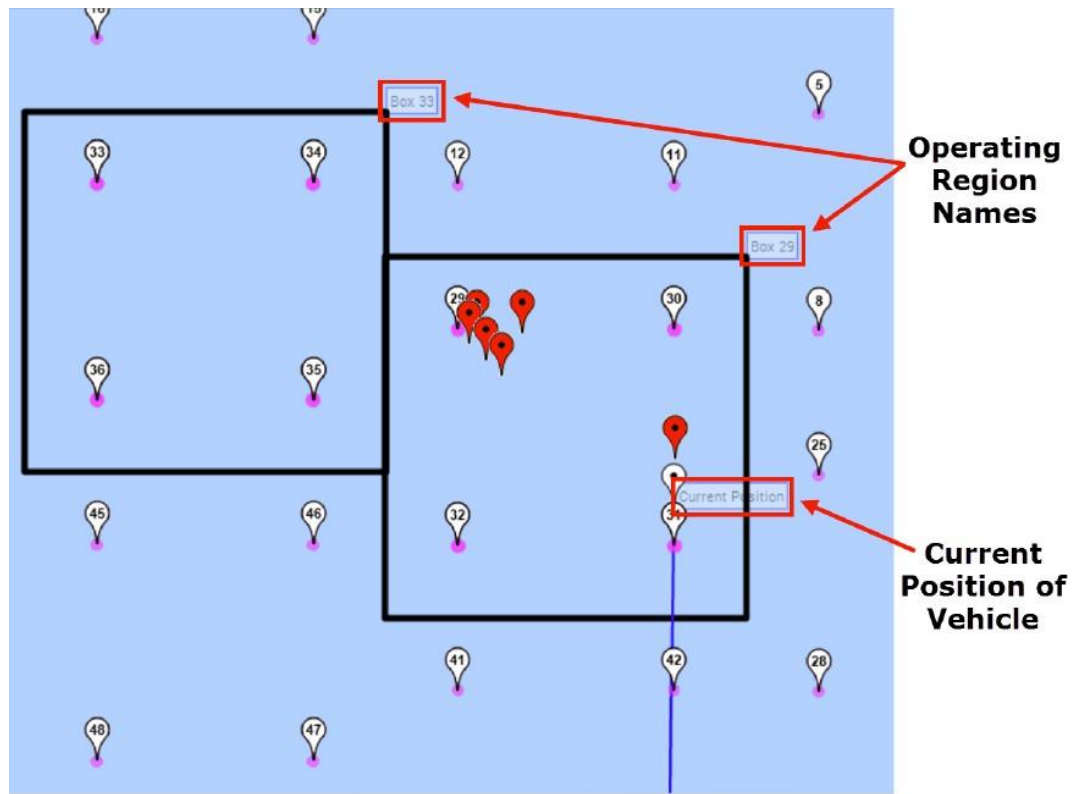
This feature is no longer supported by Google Maps.

- **Label Op-Regions and Most Recent Point**

Select **Label Op-Regions and Most Recent Point** to:

- Display the names of Operation Polygons (Inclusion and Exclusion Polygons) on the Position Map.
- Indicate on the Position Map the current position of the Vehicle selected in the Dashboard sidebar.

Figure 4.56. Select Label Op-Regions and Most Recent Point



- **Nautical Charts**

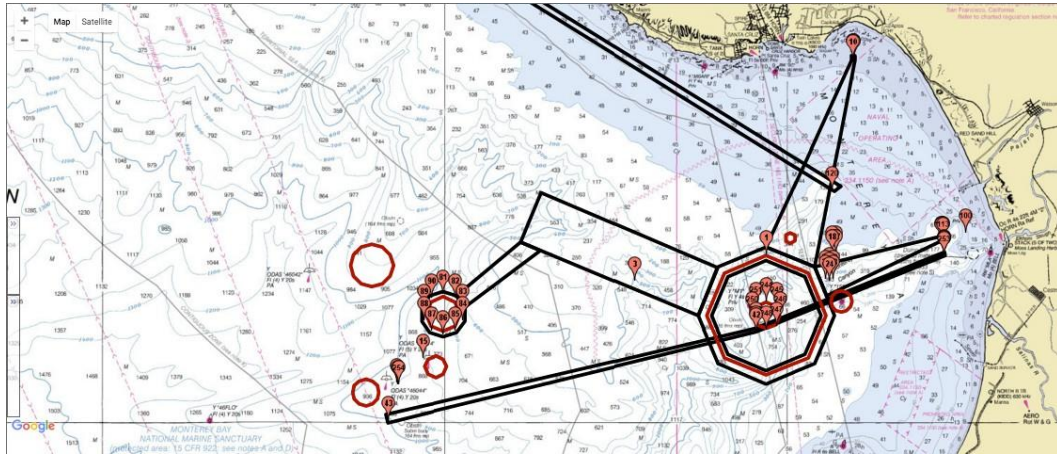
Select the **Nautical Charts** check-box, then click on the radio button adjacent to the type of nautical chart you want to display in the Position Map. Only the chart types you are subscribed to will be active. If you are not subscribed, the radio button and chart name will be grayed-out.

Figure 4.57. Nautical Charts Check Box



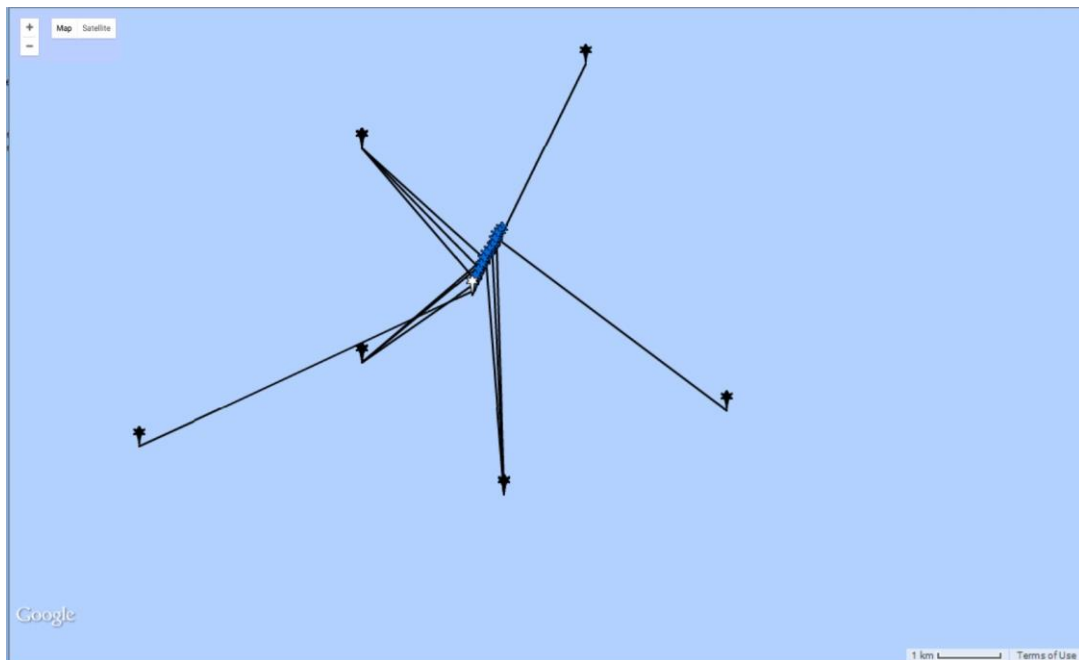
☒ Nautical Charts

- ☒ NOAA
- ☐ Canada
- ☐ New Zealand
- ☐ Australia
- ☐ UK
- ☐ Brazil
- ☐ Argentina

Figure 4.58. Example: NOAA Nautical Charts Display

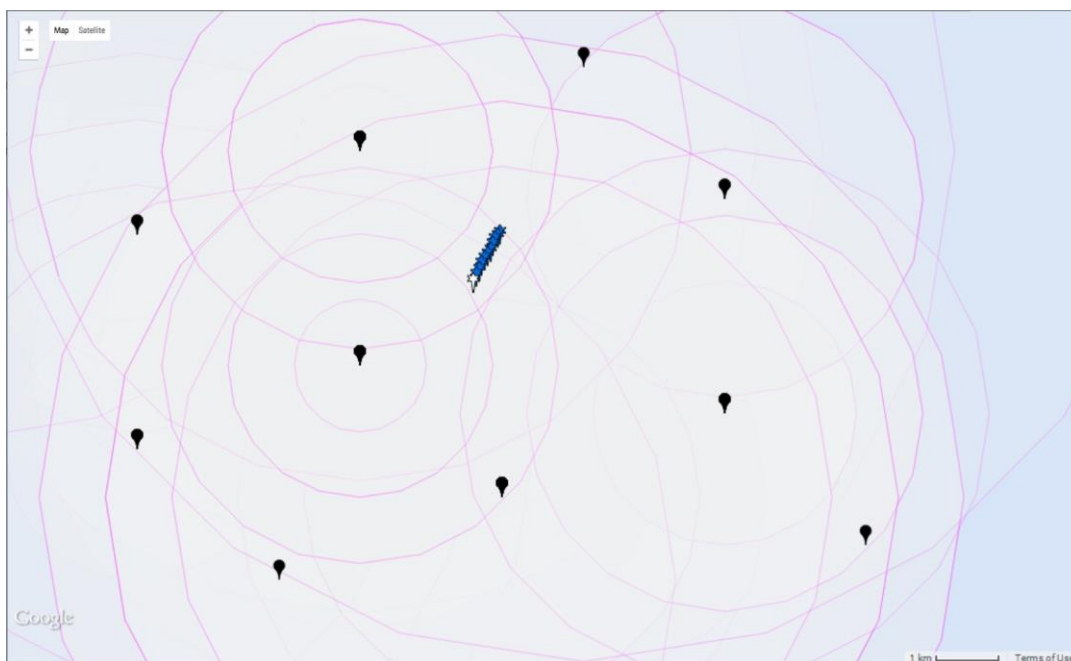
- **Iridium Coordinates**

This option was implemented to assist with tracking Wave Gliders if their on-board GPS receivers are malfunctioning. When **Iridium Coordinates** is selected, the Position Map will display black icons that represent how the Iridium satellite interprets the position of the Vehicle.

Figure 4.59. Iridium Coordinates Enabled

- **Iridium Tracking**

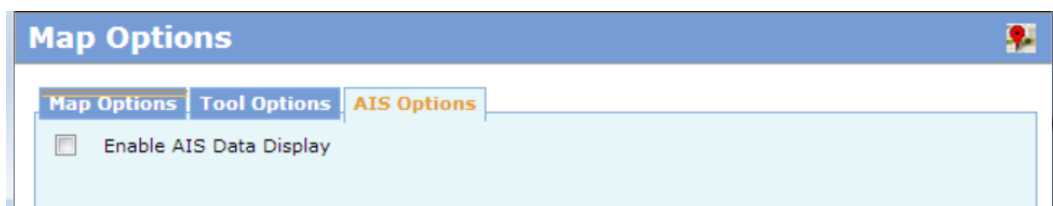
This option was implemented to assist with tracking Wave Gliders if their on-board GPS receivers are malfunctioning. When **Iridium Tracking** is selected, a circle will appear on the Position Map surrounding the Iridium interpreted location of the Vehicle. The circle represents the radius of uncertainty as reported by Iridium.

Figure 4.60. Iridium Tracking Enabled

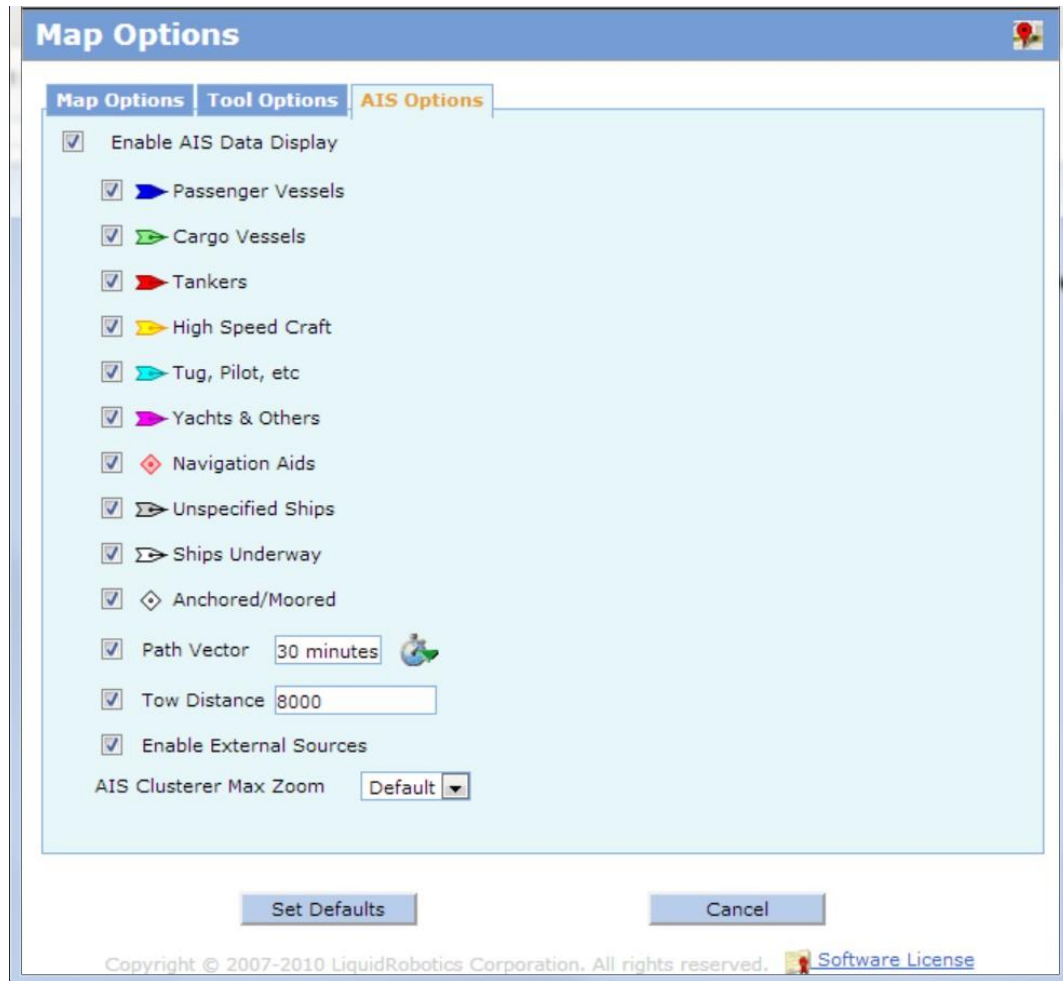
AIS Options Tab

You can view or edit the AIS settings that are enabled on the Position Map from the **AIS Options** tab.

When you click on the **AIS Options** tab it displays the AIS settings that are currently enabled. If the **Enable AIS Data Display** checkbox is not selected, the **AIS Options** tab will look like [Figure 4.61](#).

Figure 4.61. AIS Options Tab - AIS Data Display Disabled

When the **Enable AIS Data Display** checkbox is selected, the **AIS Options** tab will display the default AIS settings - see [Figure 4.62](#).

Figure 4.62. AIS Options Tab - AIS Data Display Enabled

When the **Enable AIS Data Display** checkbox is selected:

- The default AIS settings include every category of vessel, including vessels that are anchored or moored. The icons next to the check-boxes are the same icons that appear in the Position Map when you zoom in. When you click an AIS icon in the Position Map, a window opens displaying information about the vessel (or navigational aid) represented by that icon.
- The default **Path Vector** is set to display the projected path (a red line) of a vessel extending 30 minutes into the future (for vessels that broadcast path vector data). Liquid Robotics pilots recommend changing the default **Path Vector** to 1 hour.
- The default **Tow Distance** is set to 8000 meters. The feature is currently disabled.
- **Enable External Sources** is enabled by default. When Enable External Sources is selected, the Position Map will display all available AIS data. When Enable External Sources is disabled, the Position Map will only display AIS data within range of the Vehicle on-board AIS receiver.
- The **AIS Clusterer Max Zoom** is set to **Default** (which is the same as **12**) by default. You can select settings of 7, 8, 9, 10, 11, or 12 from the AIS Clusterer MaxZoom drop-down menu. The

higher the numerical setting, the less detailed the AIS data displayed on the Position Map will be. Higher AIS Clusterer MaxZoom settings group nearby vessels into clusters for navigational purposes.

You can edit the AIS settings by de-selecting vessel types that you do not want displayed on the Position Map. You can edit or de-select the **Path Vector**, **Tow Distance**, and **AIS Clusterer Max Zoom** settings to meet your piloting requirements. You can also de-select **Enable External Sources** if you do not want this data to be displayed.

Click the **Set Defaults** button to save the settings that appear in the **AIS Options** dialog box- they will become the default AIS data display settings after the Position Map is refreshed (by clicking the green refresh icon in the Position Map toolbar).

To change the default AIS data display options you must return to the **AIS Options** tab and either make edits or deselect the **Enable AIS Data Display** check box- then click on the **Set Defaults** button to save your changes.

Click the **Cancel** button to close the Map Options dialog box without making any changes.

Figure 4.63. AIS Options Tab - Enable AIS Data Display Selected

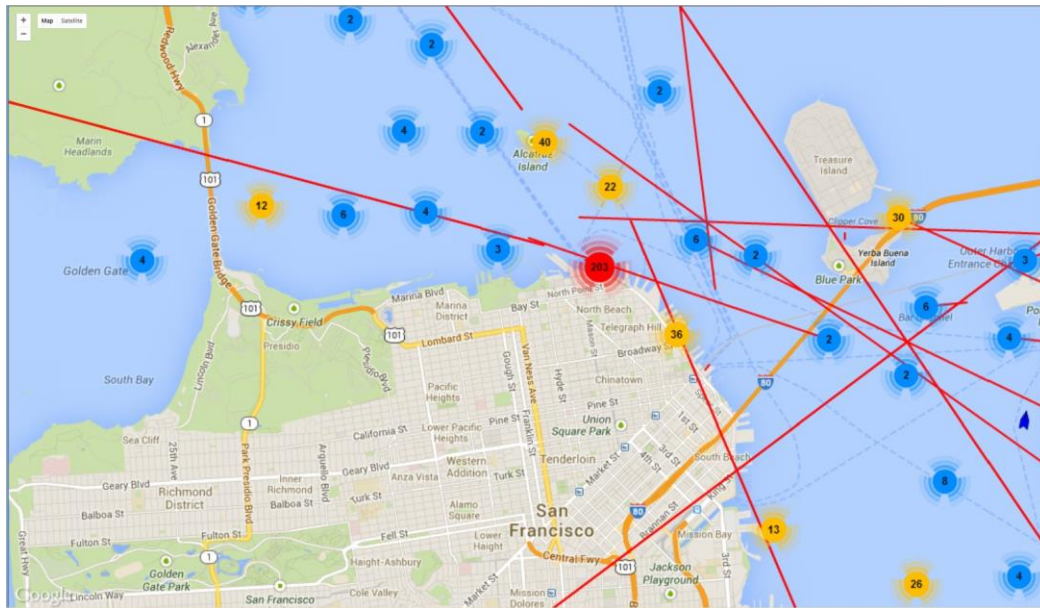


Figure 4.64. AIS Options Tab - Enable AIS Data Display Selected

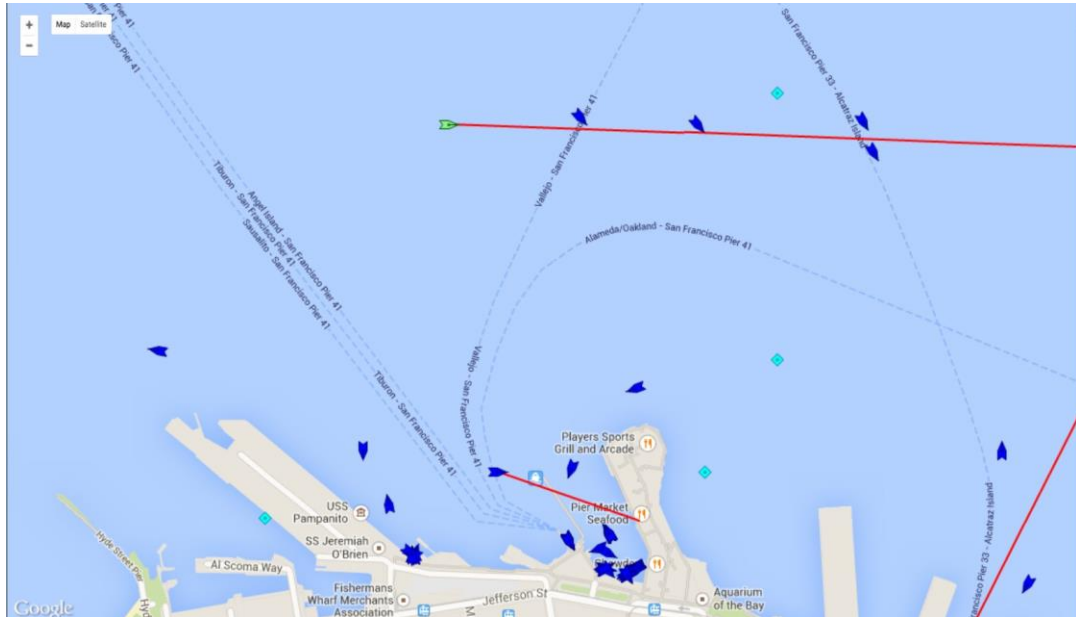
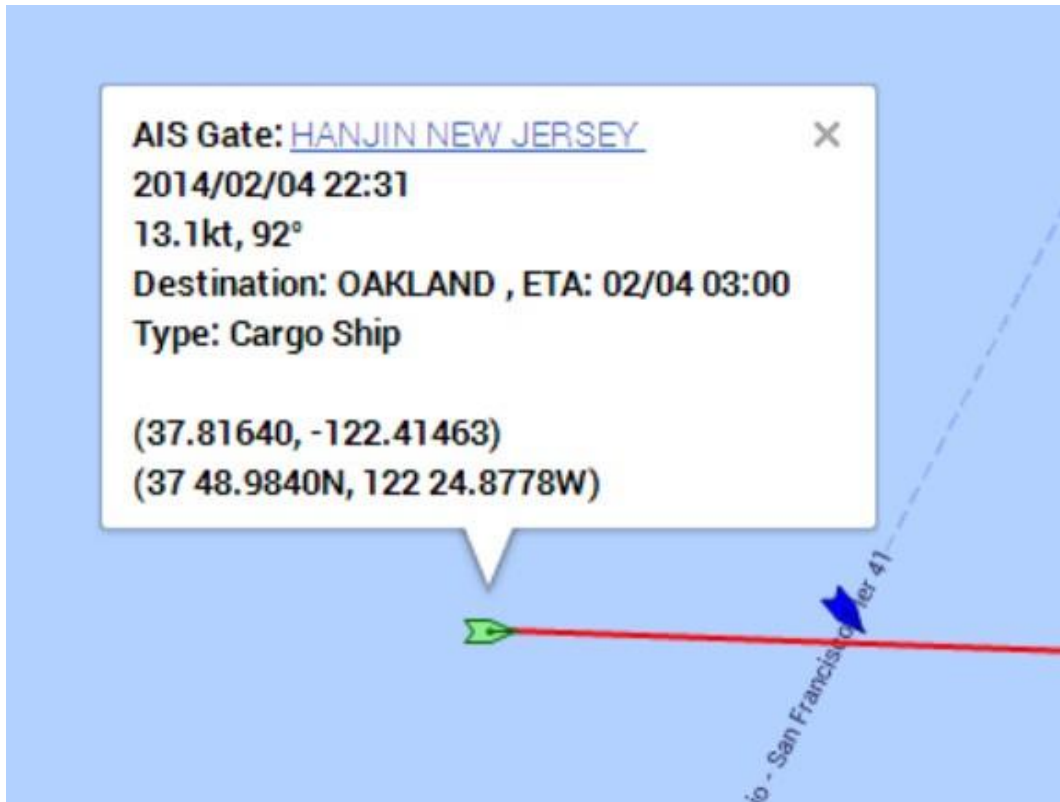


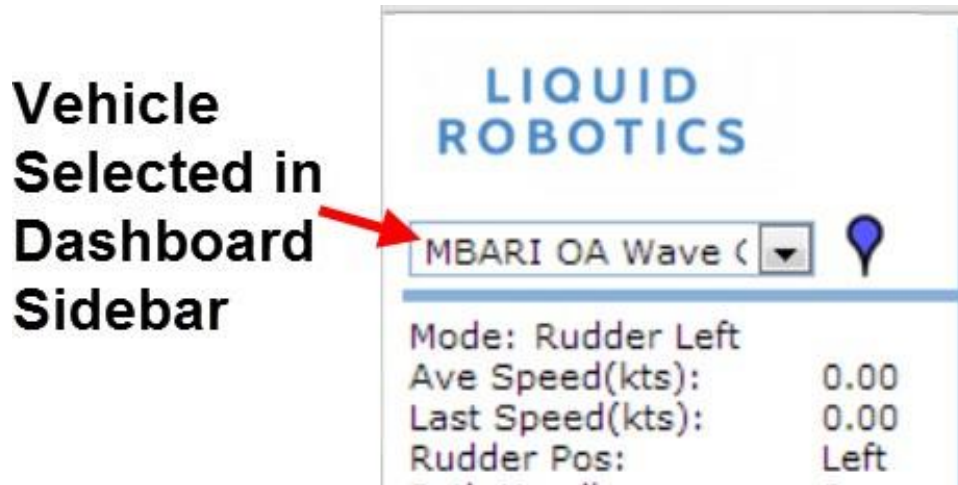
Figure 4.65. AIS Options Tab - Enable AIS Data Display Selected



Using the Map Utility

The **Map Utility** provides a way to quickly measure distances and create courses, or Operation Polygons, for the Vehicle selected in the Dashboard sidebar.

Figure 4.66. Vehicle Selected in Dashboard Sidebar

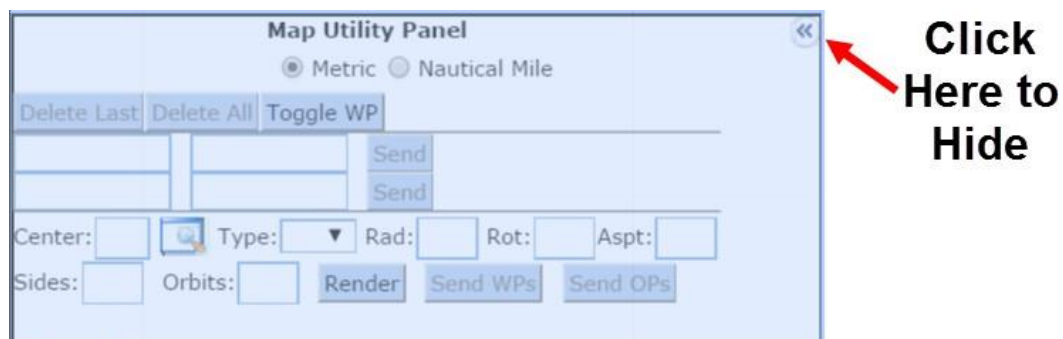


To enable the **Map Utility**:

1. Click the **Map Options** button in the **Position Map** toolbar to open the **Map Options** dialog box.
2. Click on the **Tool Options** tab.
3. Select the **Map Utility** checkbox.
4. Click on **Set Defaults**.
5. Refresh the Position Map (click the green refresh icon in the Position Map toolbar) to display the **Map Utility**.

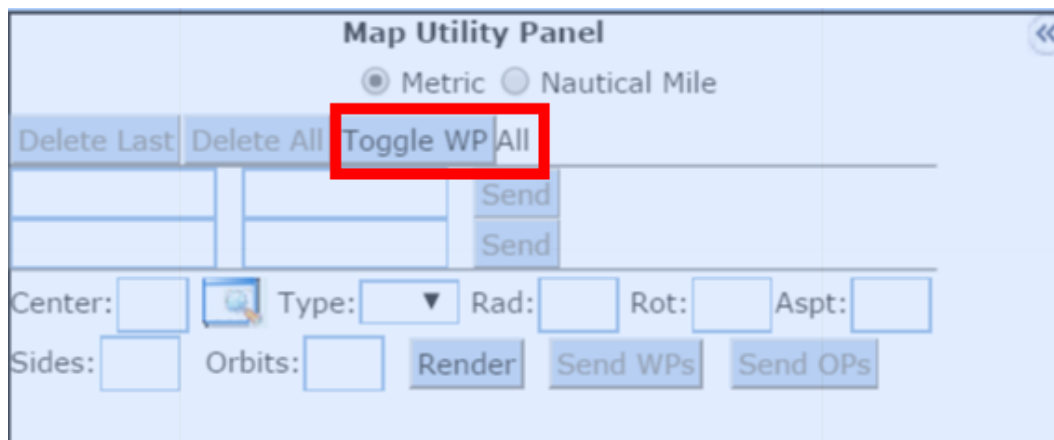
The **Map Utility** appears on the lower left side of the Position Map. You can hide the **Map Utility** by clicking on the  icon.

Figure 4.67. Map Utility Displayed on the Position Map

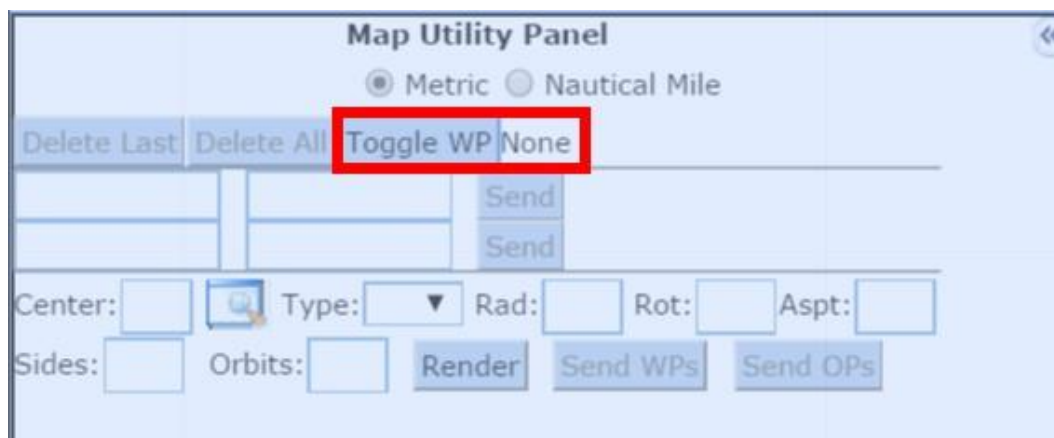


By clicking on the **Toggle WP** button in the **Map Utility** waypoints can be displayed in one of three modes:

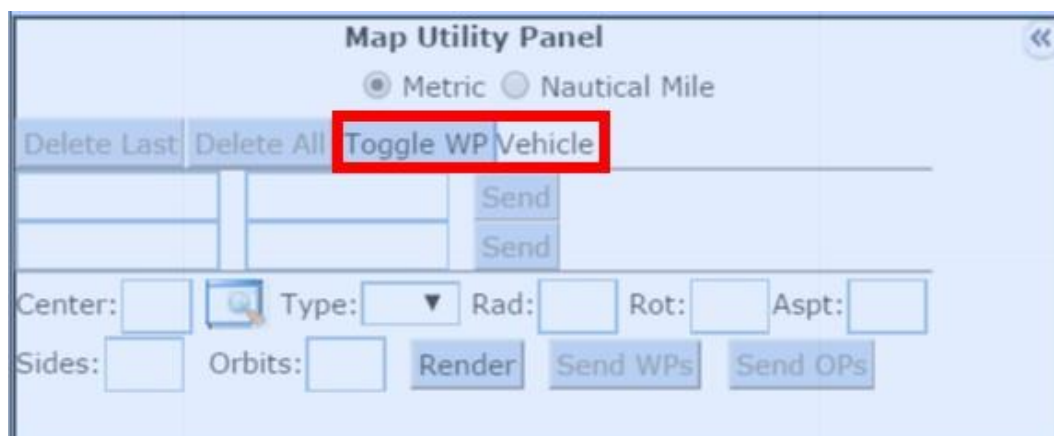
- **All** - displays all waypoints for all Vehicles displayed in the WGMS Dashboard.



- **None** - hides all waypoints for all Vehicles displayed in the WGMS Dashboard.



- **Vehicle** - displays only the waypoints for the Vehicle selected in the Vehicles drop-down menu.





Note

This feature is useful for improving visibility when you want to create new waypoints in a region that contains a lot of existing waypoints.



Important

Before using the **Map Utility**, select the **Metric** radio button or the **Nautical Mile** radio button to set the units of measure you want to work with.

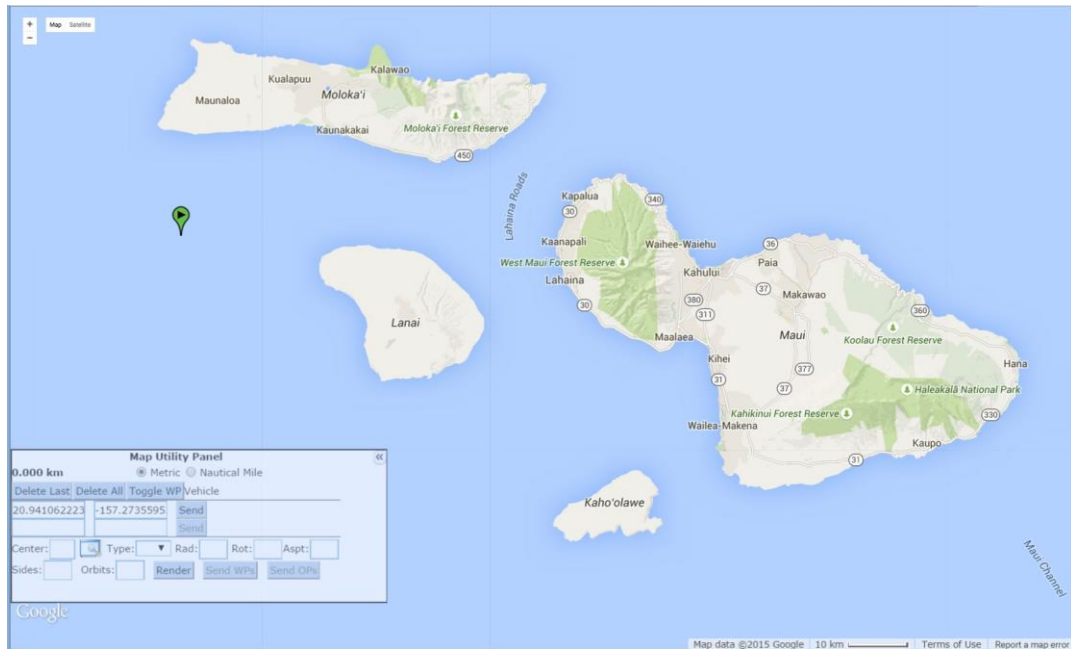
The following sections show you how to use the **Map Utility** to:

- “Measure a Distance on the Position Map”
- “Create Waypoints ”
- “Create a Circular Course”
- “Create a Circular Operation Polygon”
- “Create a Square Course”
- “Create a Square Operation Polygon”
- “Create a Spiral Course”

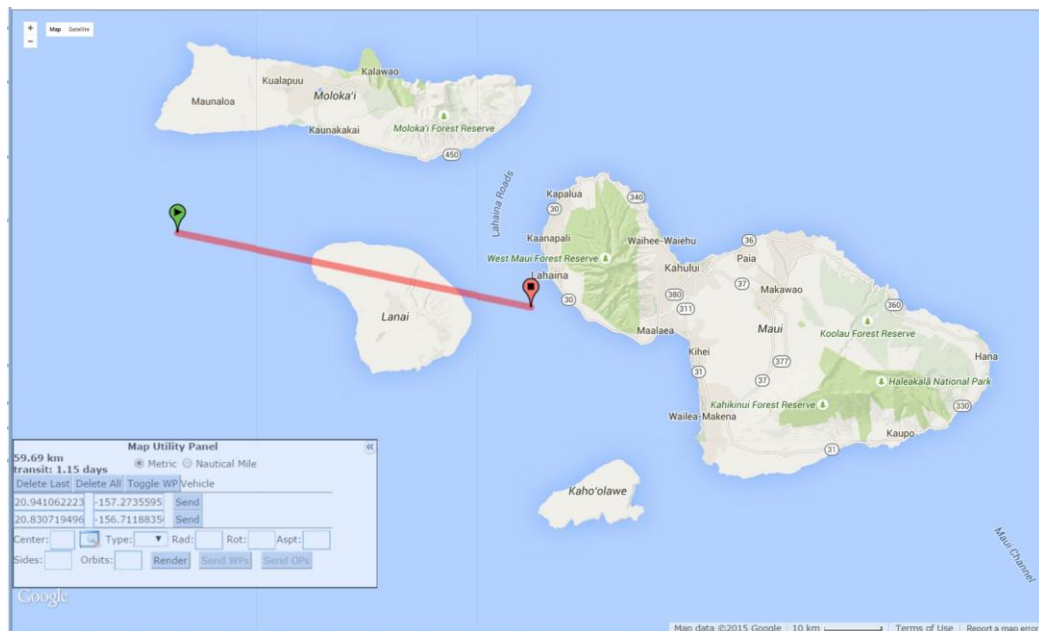
Measure a Distance on the Position Map

You can use the **Map Utility** to measure distances in metric units or nautical miles:

1. Select the **Metric** radio button or the **Nautical Mile** radio button to set the units of measure you want to work with.
2. Click once on the Position Map at the start of the distance you want to measure - a green starting point icon will appear and the **Map Utility** will display its coordinates.

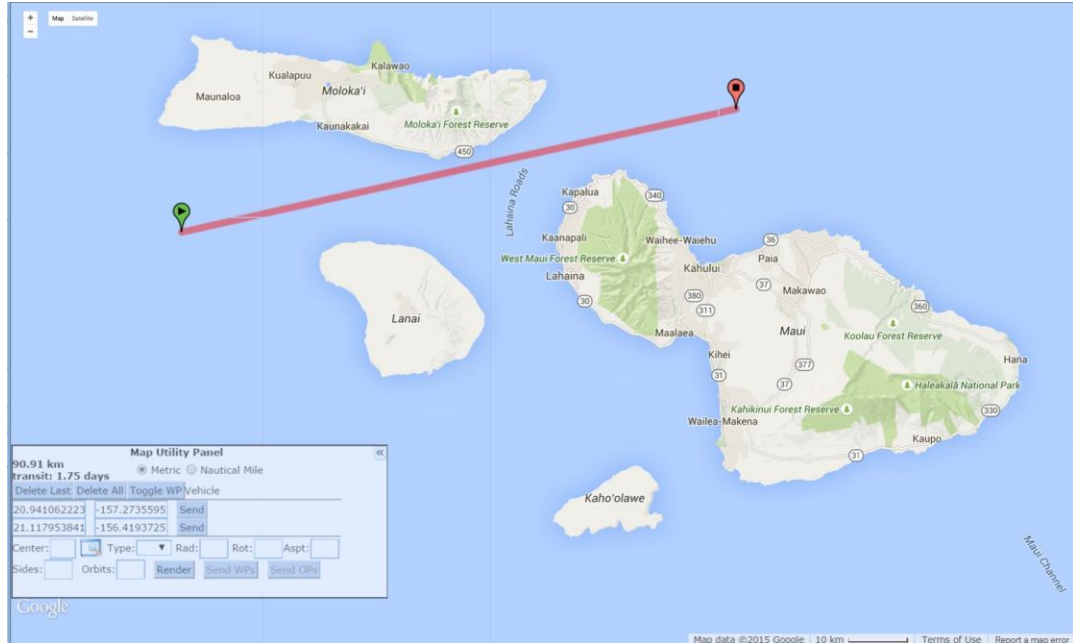
Figure 4.68. Example : Set Starting Point for Distance Measurement

- Click once on the Position Map at the end of the distance you want to measure and a red end point icon will appear with a red line connecting it to the green starting point icon. The distance between the red and green icons, and their coordinates, are displayed in the **Map Utility**.

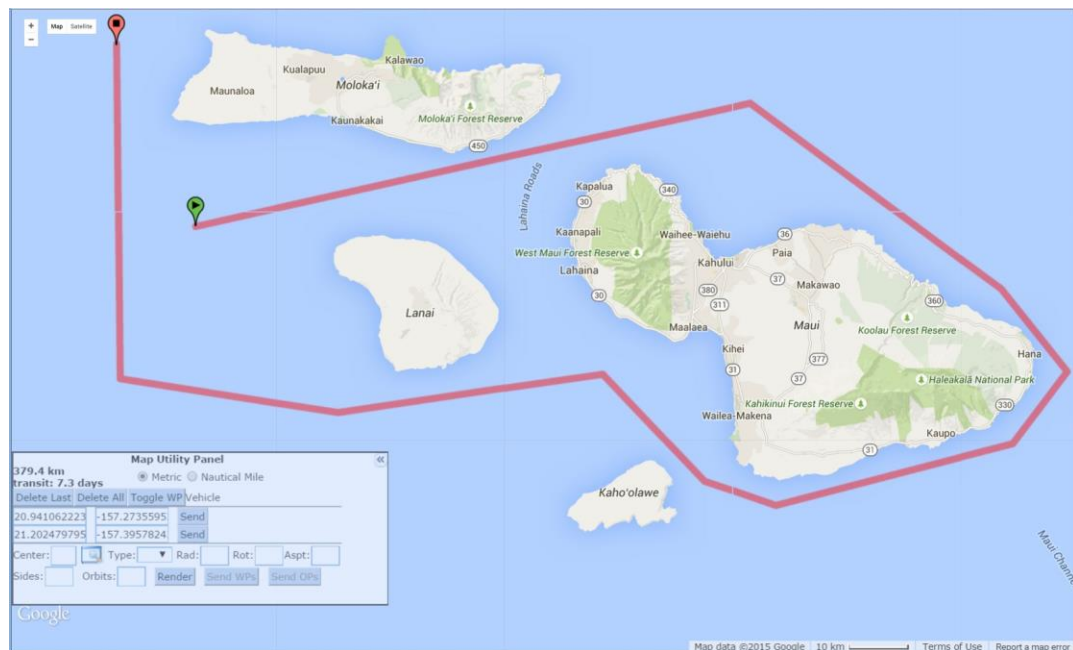
Figure 4.69. Example : Set End Point for Distance Measurement

- Click and drag either the green starting point icon or the red end point icon to change the distance being measured. For example, click and drag the red end point northward so the red line connecting it to the green icon does not come in contact with land.

Figure 4.70. Example : Move End Point



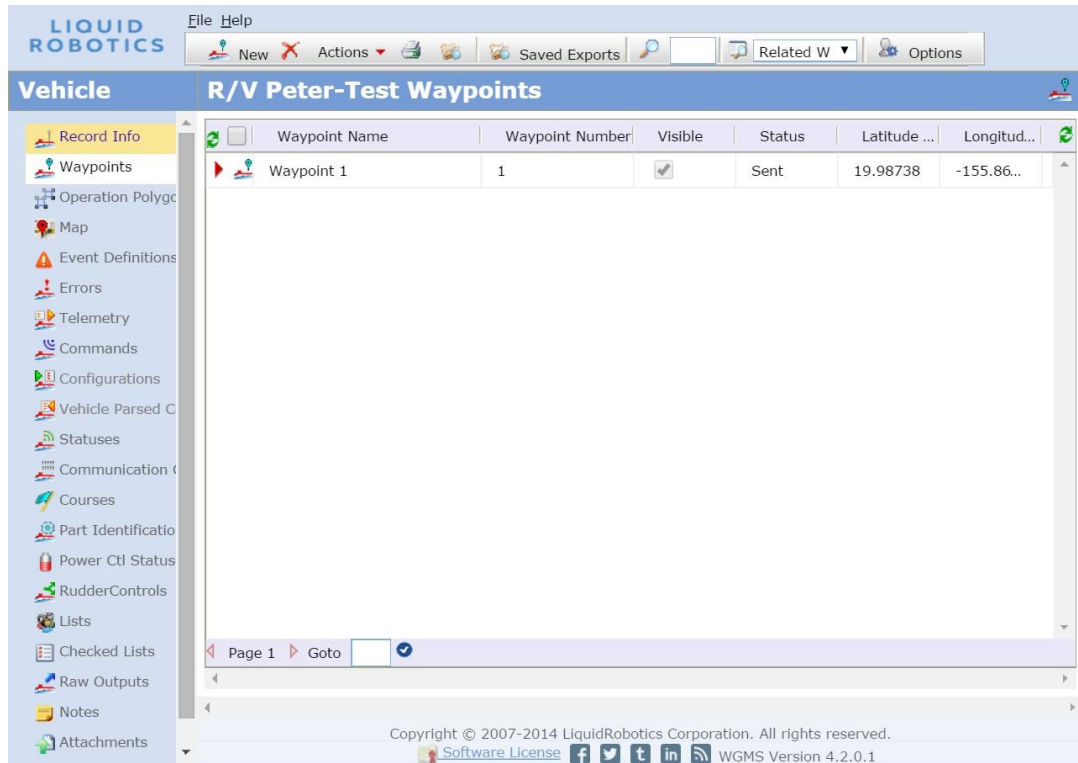
- To include additional "legs" to the distance being measured, you can click on the Position Map to add more red end point icons. Each time you click a new red endpoint will appear on the Position Map and the red line will follow previous end points back to the green starting point icon. The cumulative distance for all of the "legs" and the coordinates for the green starting point icon and the red end point icon are displayed in the **Map Utility**.

Figure 4.71. Example: Add Legs to Distance Measurement

6. In the **Map Utility**, click **Delete Last** to remove the last red end point icon position, or click **Delete All** to remove all of the distance measurement icons.

Create Waypoints

In this example, the **Metric** radio button is selected and no waypoints have yet been created for the Vehicle R/V Peter-Test - the waypoints list for R/V Peter-Test is empty. This procedure can be used to create waypoints, one at a time. You will need to repeat the procedure for each waypoint you want to create and save to a Vehicle.

Figure 4.72. No Waypoints Have Been Created for R/V Peter-Test

1. Click on the Position Map where you want to create a waypoint and a green waypoint icon will appear at that location.

Figure 4.73. Click to Create a Waypoint on the Position Map

The coordinates for the waypoint you just created are displayed in the **Map Utility**. At this point the waypoint has been defined, but it has not been saved to the Vehicle R/V Peter-Test. If you do not want to save this waypoint, click **Delete Last** - the waypoint will be deleted and the green icon will be removed from the Position Map display.

2. If you want to save this waypoint to the Vehicle R/V Peter-Test, click the **Send** button in the **Map Utility** and a **Waypoint: New** form will open displaying the coordinates for the waypoint.

Figure 4.74. Waypoint: New Form

The screenshot shows the 'Waypoint: New' form in the Liquid Robotics WGMS interface. The form is titled 'Waypoint: New' and has a sidebar with 'Record Info' and 'Notes'. The main area has two tabs: 'Waypoint' (selected) and 'Related Info'. Under 'Waypoint Info', there are fields for 'Waypoint Name' (Waypoint 1), 'Vehicle' (R/V Peter-Test), 'Waypoint Number' (1), 'Latitude (deg)' (19.9873844123982), 'Longitude (deg)' (-155.868358612061), 'Visible' (checked), and 'Status' (Created). Under 'Added Fields Info', there are fields for 'Read Back Latitu...', 'Read Back Longi...', 'Read Back Date', and 'Com Channel' (Iridium Communication).

- Click **Send** in the toolbar of the **Waypoint: New** form to save the waypoint to the waypoint list for R/V Peter-Test. You will notice that the green waypoint icon on the Position Map is now red and it has the number 1. Since this is the first waypoint created for R/V Peter-Test, it is automatically assigned the number 1. WGMS automatically assigns numbers to waypoints based on the order in which they are created. However, you have the option to edit the **Waypoint Name** and the **Waypoint Number** fields in the **Waypoint:New** form. It is important to be aware of waypoint numbers that are already in use, to avoid over-writing an existing waypoint with a new one that has different coordinates.

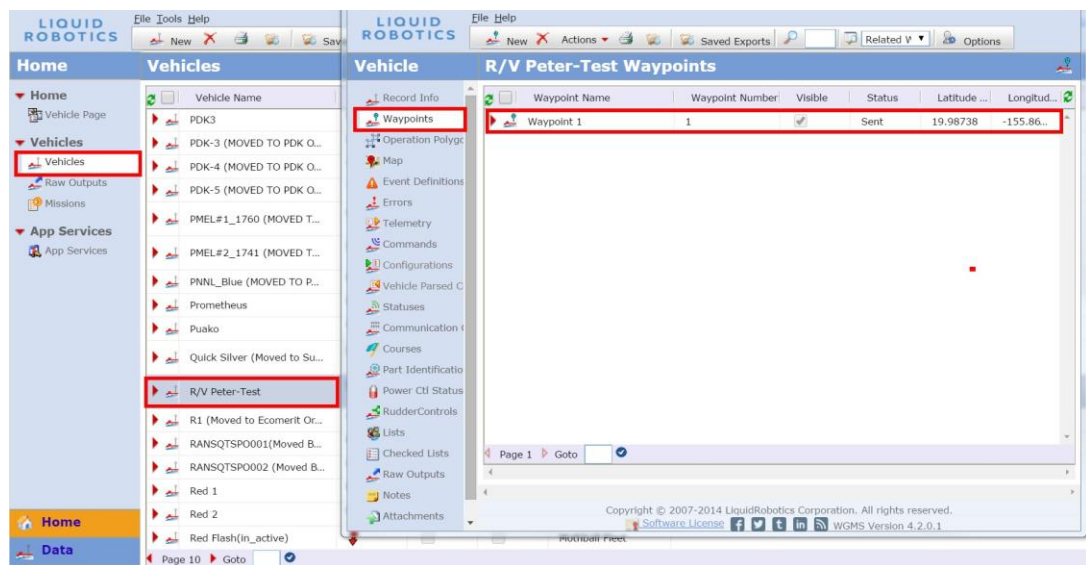


Note

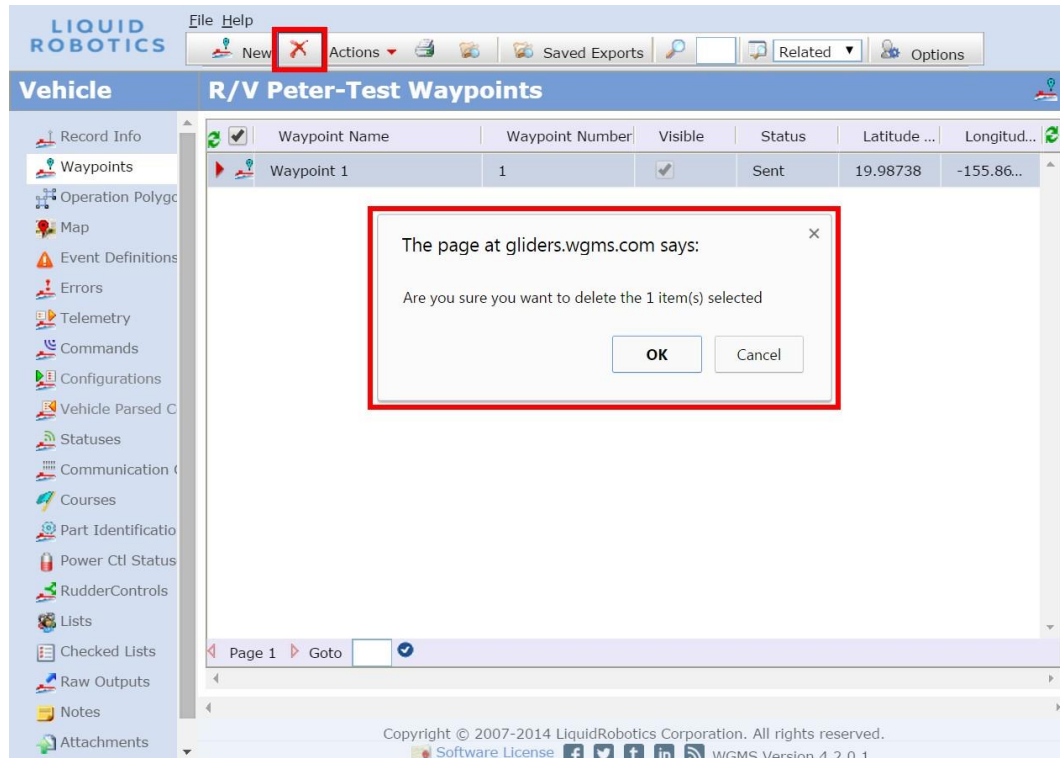
WGMS allows for a maximum of 254 waypoints to be defined for each Wave Glider vehicle.

Figure 4.75. Waypoint on the Position Map is Red and Numbered 1

If you open the waypoint list for R/V Peter-Test by selecting the **Vehicles** side tab under the **Vehicles** menu, clicking on **R/V Peter-Test** and then clicking on the **Waypoints** side tab, you will see Waypoint 1 in the list.

Figure 4.76. New Waypoint Saved to the Vehicle Waypoint List

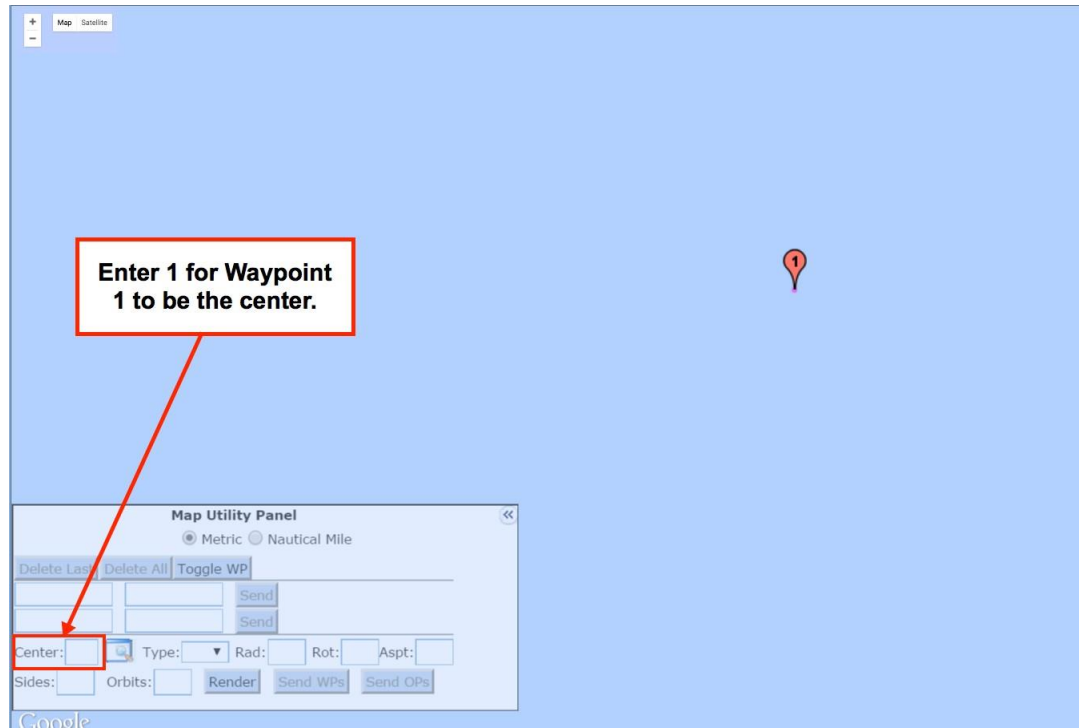
If you want to delete Waypoint 1, click in a white area of the Waypoint 1 row in the waypoint list for R/V Peter-Test to highlight that row, then click on the  icon and a delete confirmation dialog box will appear. Click **OK** in the delete confirmation dialog box to complete the waypoint deletion.

Figure 4.77. Delete the Waypoint from the Waypoint List

Create a Circular Course

In this example, the **Metric** radio button is selected and one waypoint (waypoint 1) has been created for the Vehicle R/V Peter-Test. To create a circular course, an existing waypoint must be defined as the center of the circle.

Figure 4.78. Creating a Circular Course with Waypoint 1 in the Center



1. In the **Map Utility**, enter **1** (for waypoint 1) in the **Center:** field. Waypoint 1 will be the center of the circular course.



Note

To view a list of the existing waypoints for the Vehicle, click on the  icon next to the **Center:** field to open the **Waypoint Lookup** list for the Vehicle.

Related Record

Select a related record.

Waypoint Lookup

	Waypoint...	Waypoint Name	Visible	Status	Vehi
	1	Waypoint 1	☒	Sent	

Page 1 Goto

New

OK

Cancel

2. Select **Circle** in the **Type:** drop-down menu in the **Map Utility Panel**.
3. Enter 1000 in the **Rad:** field. This is the radius (in meters) of the circular course you are creating.
4. Enter **0** in the **Rot:**(Rotation) field. This setting determines the location of the first waypoint in the series of waypoints that make up the circular course. When **Rot:** is set to **0** the first (lowest numbered) waypoint that the **Map Utility** generates for the circular course (waypoint 2 in this example) will be located at the northernmost point on the perimeter of the circle. If you enter 150 in the **Rot:** field, waypoint 2 will be rotated 150 meters clockwise from the northernmost point on the perimeter of the circle.
5. Enter nothing in the **Aspt:** field. This setting determines the aspect ratio of the circle. By entering nothing, the result will be an aspect ratio of 1, which is the default. You will get the same result if you enter 1 in the **Aspt:** field. If you enter any number greater than 0 or 1, the circle will become increasingly elliptical, the larger the number.
6. Enter **10** in the **Sides:** field. When you create a circular course, it is made up of a series of straight lines between waypoints. The **Sides:** field determines how many waypoints will be connected to define the circular course.

7. Click the **Render** button to display a preview of the circular course on the Position Map. At this point the waypoints for the circular course have been defined, but they have not been saved to the Vehicle R/V Peter-Test.

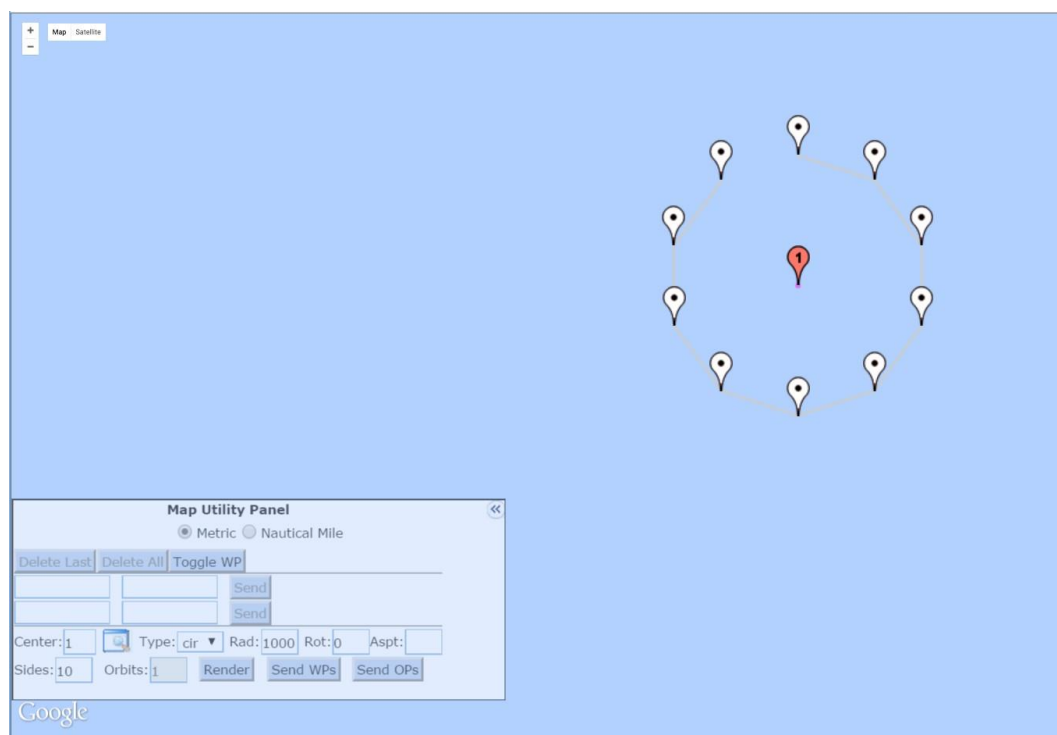


Note

If you want to make any changes, you can edit the parameters in the **Map Utility Tool** and click on **Render** again to display the changes on the Position Map.

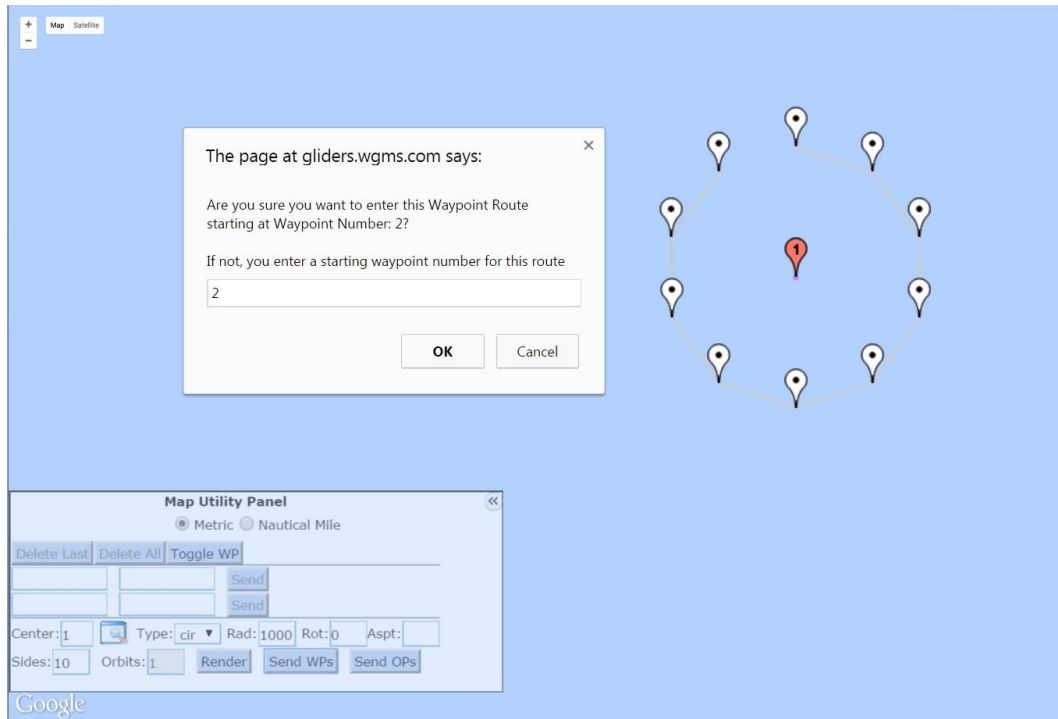
If you do not want to edit or save these waypoints, click the **Delete All** button and they will all be removed from the Position Map.

Figure 4.79. Example : Render a Circular Course



8. If you are ready to save the 10 new waypoints displayed in the preview as a circular course, click the **Send WPs** button.

When you click the **Send WPs** button, a dialog box will open providing you with an opportunity to change the starting waypoint for the circular course.

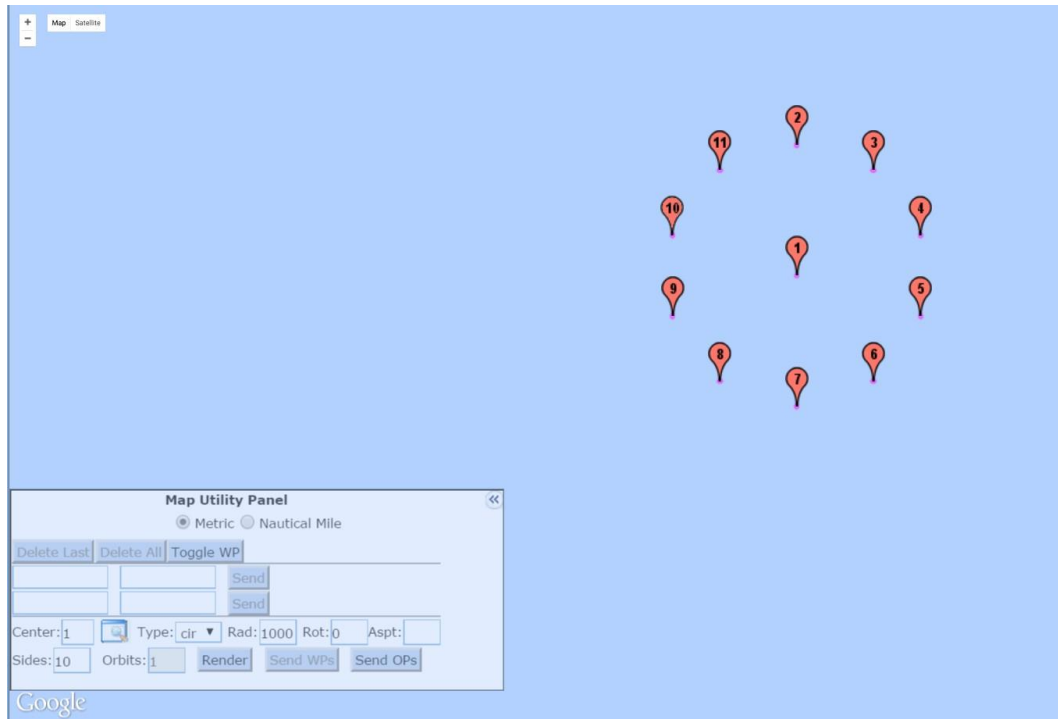
Figure 4.80. Click the Send WPs Button

9. Click **OK** to display the new red waypoints numbered 2 through 11 on the Position Map. They are also automatically added to the Waypoint list for the Vehicle.



Note

You have the option to change the starting waypoint number for the new course you are creating. To do this, enter the waypoint number you want to be the starting point for the course before you click **OK**. By changing the starting waypoint number, the waypoint numbers for the new course will begin at the number you enter and continue consecutively.

Figure 4.81. New Waypoints Sent to Vehicle and Displayed on Position Map**Figure 4.82. New Waypoints Saved to the Vehicle Waypoint List**

LIQUID
ROBOTICS

File Help

New Actions Saved Exports Related W Options

Vehicle

R/V Peter-Test Waypoints

Record Info

Waypoints

Operation Polygons

Map

Event Definitions

Errors

Telemetry

Commands

Configurations

Vehicle Parsed Co...

Statuses

Communication C...

Courses

Part Identifications

Power Ctl Statures

RudderControls

Lists

Checked Lists

Raw Outputs

Notes

Attachments

Audit Records

Waypoint Name	Waypoint Number	Visible	Status	Latitude ...	Longitud...
Waypoint 1	1	☒	Sent	19.98021	-155.95...
Waypoint 10	10	☒	Sent	19.98298	-155.95...
Waypoint 11	11	☒	Sent	19.98747	-155.95...
Waypoint 2	2	☒	Sent	19.98919	-155.95...
Waypoint 3	3	☒	Sent	19.98747	-155.94...
Waypoint 4	4	☒	Sent	19.98298	-155.94...
Waypoint 5	5	☒	Sent	19.97743	-155.94...
Waypoint 6	6	☒	Sent	19.97294	-155.94...
Waypoint 7	7	☒	Sent	19.97122	-155.95...
Waypoint 8	8	☒	Sent	19.97294	-155.95...
Waypoint 9	9	☒	Sent	19.97743	-155.95...

Page 1 Goto

If you want to delete waypoints from the Vehicle waypoint list, select the rows containing waypoints you want to delete (selected rows will be highlighted), then click on the  icon and a delete confirmation dialog box will appear. Click OK in the delete confirmation dialog box to complete the waypoint deletion.

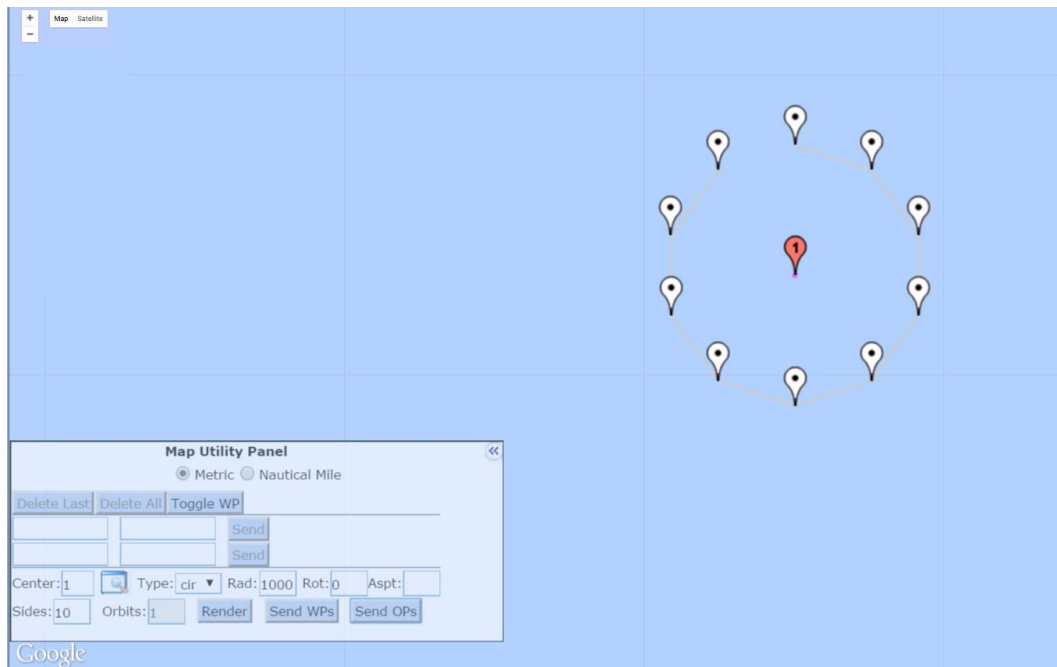
Create a Circular Operation Polygon

An Operation Polygon is a boundary on the Position Map. You can set alarms to be sent to WGMS and autonomous obstacle avoidance behavior to be enabled, when a Vehicle approaches an Operation Polygon boundary. Operation Polygons can be saved as Inclusion Zones, or Exclusion Zones. An Inclusion Zone defines a region that a Vehicle is allowed to operate in. An Exclusion Zone defines a region where a Vehicle is not allowed to operate. An Inclusion Zone is typically used to define an Operation Polygon where a Vehicle is gathering data or performing test maneuvers. An Exclusion Zone is typically used to define an Operation Polygon where a Vehicle could run into rocks, shallow water, navigation aids, heavy marine shipping traffic, or other Wave Glider Vehicles on nearby missions.

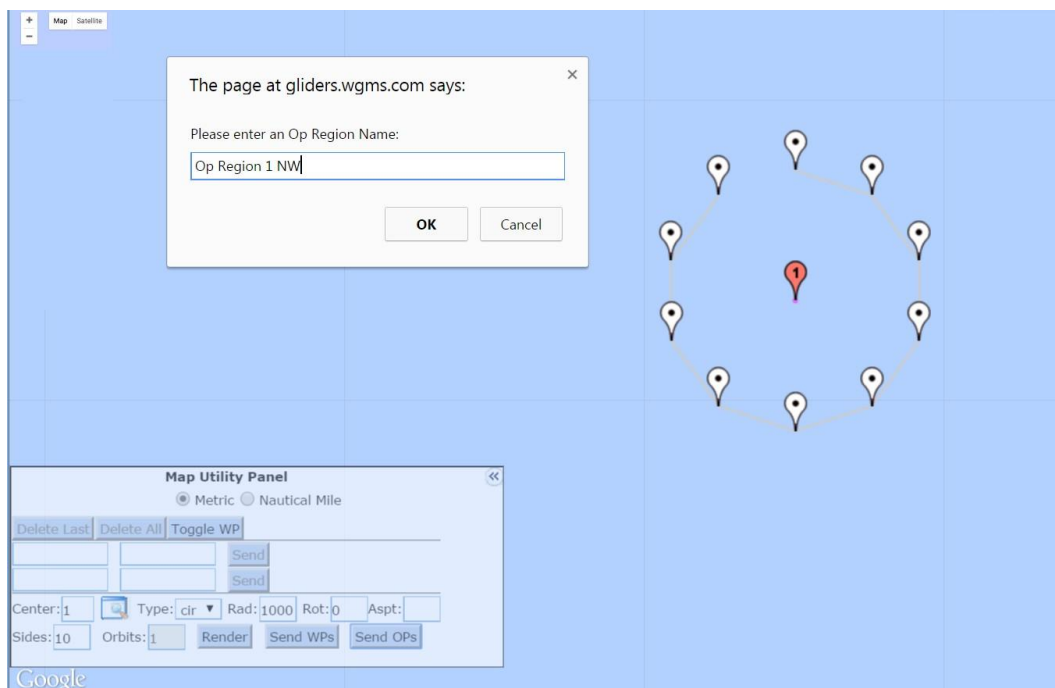
To create a circular Operation Polygon:

1. Follow Steps 1 - 8 in the “[Create a Circular Course](#)” procedure to define the circular Operation Polygon boundaries.

Figure 4.83. Example : Render a Circular Operation Polygon



2. In Step 9, click on **Send OPs** (instead of clicking on **Send WPs**). A dialog box will appear asking you to enter an **Op Region Name**. Enter a unique name or append a number to the default "Op Region" that is in the name field. The name must be different than any other Operation Polygon that has been saved for the Vehicle (for this example the name Op Region 1 NW was used).

Figure 4.84. Example: Click on Send OPs Button

3. Click **OK**. The Operation Polygon you created will be saved to the Vehicle. It will appear as black lines on the Position Map, and it will also be included in the **Operation Polygons** list for the Vehicle.

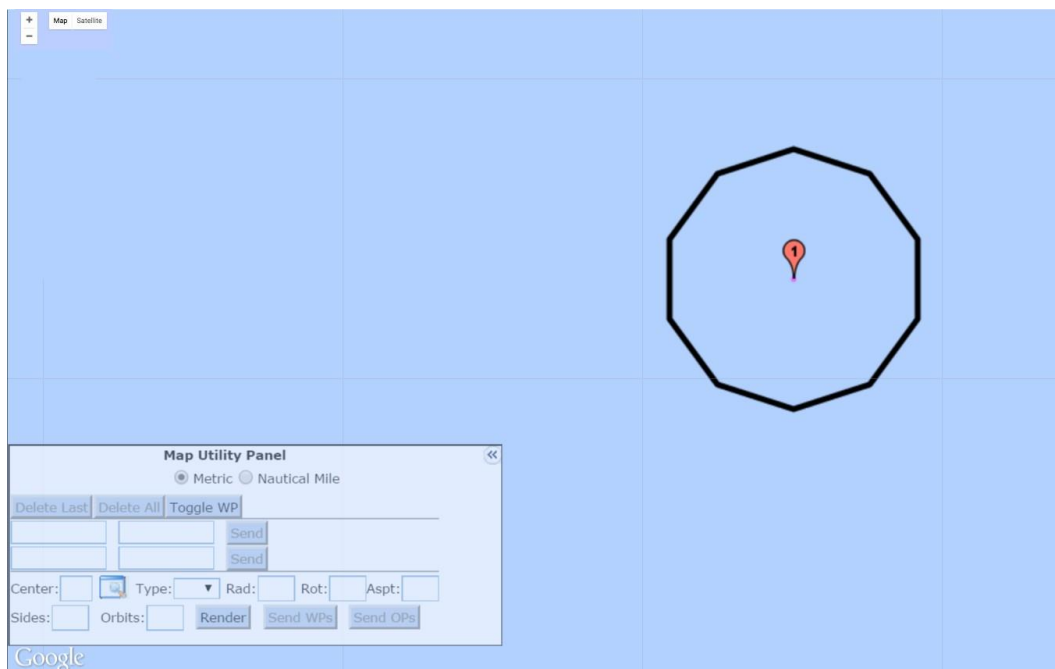
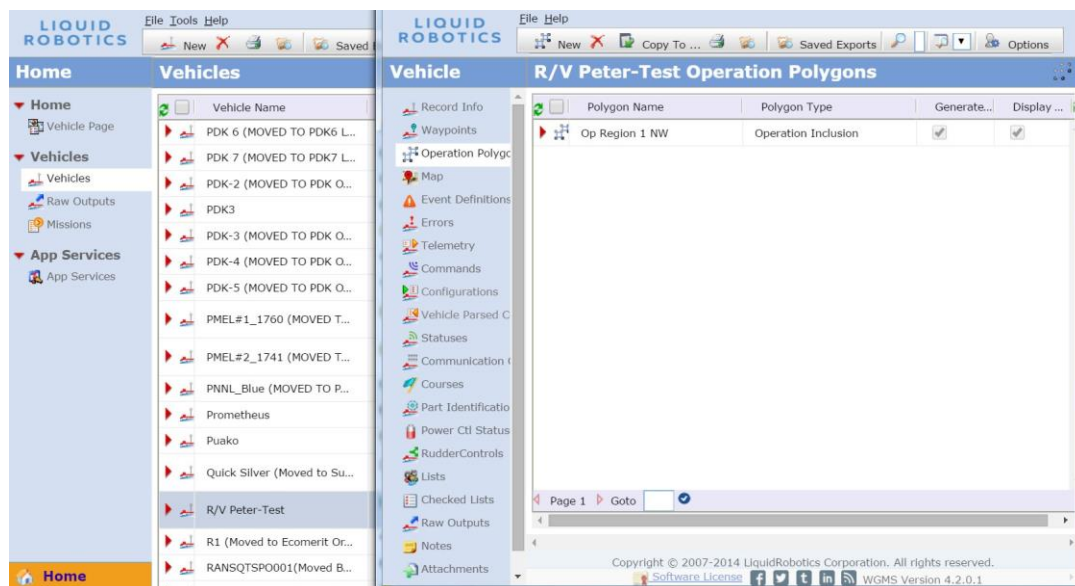
Figure 4.85. Example: Operation Polygon Created

Figure 4.86. Example: Operation Polygon Added to Vehicle Operation Polygons List



4. By default, Operation Polygons are saved as Inclusion Zones. If an Exclusion Zone is what you wanted, you can make edits from the Operation Polygons list for the Vehicle by clicking on the  icon next to the Operation Polygon you want to edit - this action will open an edit form for that Operation Polygon.

Figure 4.87. Example: Operation Polygon Edit Form - Default Exclusion Zone

The screenshot displays the 'Op Region Square 1: Edit' form in the Liquid Robotics WGMS interface. The form is titled 'Op Region Square 1: Edit' and is part of the 'Operation Polygon Form'. The 'Polygon' tab is selected, showing the 'Polygon Info' section. The 'Polygon Name' is 'Op Region Square 1'. The 'Vehicle' is 'R/V Peter-Test'. The 'Polygon Type' is set to 'Operation Exclusion' (highlighted with a red box). The 'Generate Alarms' and 'Display On Map' checkboxes are both checked. The 'Related Information' section shows fields for 'Owner', 'Organization', 'Gliders', 'Created On', 'Updated On', 'Created By', and 'Updated By'. The 'Created By' and 'Updated By' fields are populated with 'Peter Erickson'. The footer of the form includes the copyright notice 'Copyright © 2007-2014 LiquidRobotics Corporation. All rights reserved.' and the version 'WGMS Version 4.2.0.1'.

5. Select **Operation Exclusion** from the drop-down menu in the **Polygon Info** section of the **Op Region 1 NW: Edit** form. Then click **Save** in the toolbar.

Figure 4.88. Example: Operation Polygon Edit Form - Change to Inclusion Zone

The screenshot displays the 'Operation Polygon Edit Form' in the WGMS interface. The form is titled 'Op Region 1 NW: Edit'. On the left, there is a sidebar with 'Record Info', 'Coordinates', and 'Notes'. The main form area is divided into sections: 'Polygon Info' and 'Related Information'. In the 'Polygon Info' section, the 'Polygon Name' is 'Op Region 1 NW', the 'Vehicle' is 'R/V Peter-Test', and the 'Polygon Type' is set to 'Operation Exclusion' (highlighted with a red box). There are checkboxes for 'Generate Alarms' and 'Display On Map'. The 'Related Information' section includes fields for 'Owner', 'Organization', 'Created On', 'Updated On', 'Created By', and 'Updated By'. The footer contains copyright information and social media links.

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File Help

Save

Operation Polygon Form

Operation P... Op Region 1 NW: Edit

Record Info

Coordinates

Notes

Polygon

Polygon Info

Polygon Name Op Region 1 NW

Vehicle R/V Peter-Test

Polygon Type Operation Exclusion

Generate Alarms ☒

Display On Map ☒

Related Information

Owner

Organization

Gliders

Created On 07/3... 00:1...

Updated On 07/3... 00:1...

Created By Peter Erickson

Updated By Peter Erickson

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Software License

WGMS Version 4.2.0.1

6. The edited Operation Polygon will appear as an Exclusion Zone in the Vehicle Operations Polygons list, and the lines that define the Operation Polygon in the Position Map will be red.

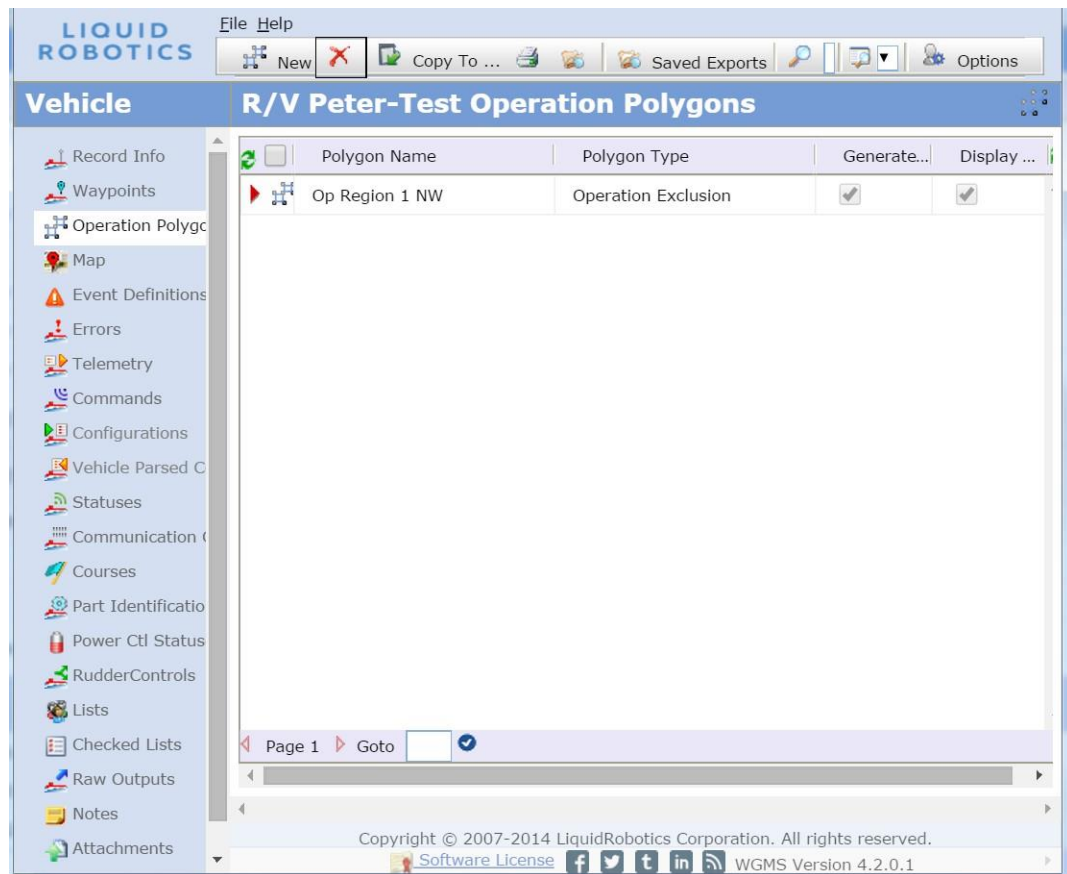
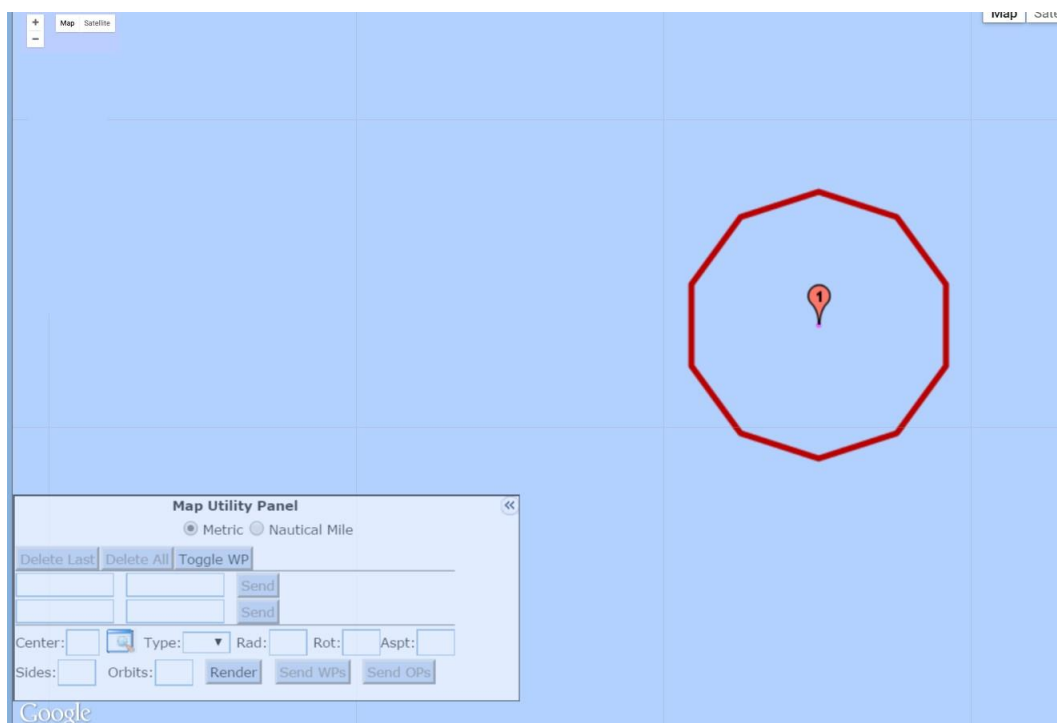
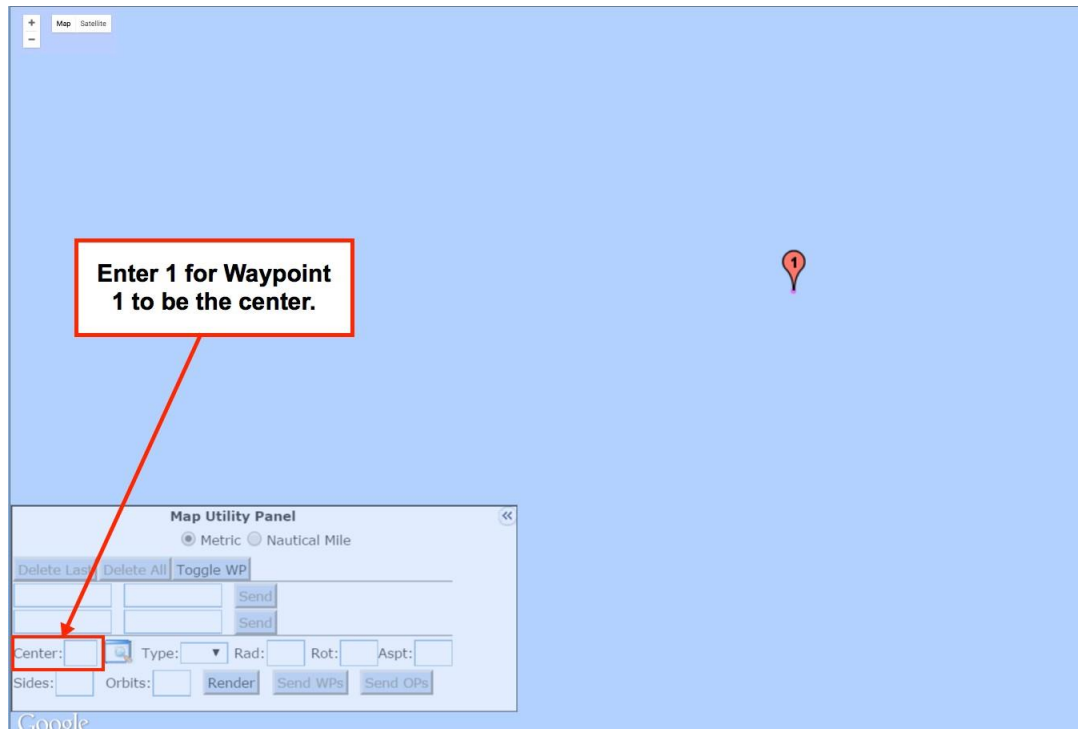
Figure 4.89. Example: Operation Polygon Saved as Exclusion Zone

Figure 4.90. Example: Circular Exclusion Zone

If you want to delete an Operation Polygon from the Vehicle Operation Polygons list, select the row containing Operation Polygon you want to delete (selected row will be highlighted), then click on the  icon and a delete confirmation dialog box will appear. Click **OK** in the delete confirmation dialog box to complete the Operation Polygon deletion.

Create a Square Course

In this example, the **Metric** radio button is selected and one waypoint (waypoint 1) has been created for the Vehicle R/V Peter-Test. To create a square course, an existing waypoint must be defined as the center of the square.

Figure 4.91. Creating a Square Course with Waypoint 1 in the Center

1. In the **Map Utility**, enter **1** (for waypoint 1) in the **Center:** field. Waypoint 1 will be the center of the square course.



Note

To view a list of the existing waypoints for the Vehicle, click on the  icon next to the **Center:** field to open the Waypoint Lookup list for the Vehicle.

2. Select **Square** in the **Type:** drop-down menu.
3. Enter **2000** in the **Width:** field. When you create a square course with the **Map Utility**, the "width" of the square is equal to the length of each side.
4. Enter **0** in the **Rot:**(Rotation) field. This setting determines the location of the first waypoint in the series of waypoints that make up the square course. When **Rot:** is set to **0** the northernmost side of the square course will be horizontal (running east to west) and the first (lowest numbered) waypoint that the **Map Utility** generates for the square course (in this case waypoint 2) will be located at the northeast corner of the square. If you enter 45 in the **Rot:** field, waypoint 2 will be rotated 45 degrees clockwise from the northeast corner of the square.
5. Enter nothing in the **Aspt:** field. This setting determines the aspect ratio of the square. By entering nothing, the result will be an aspect ratio of 1, which is the default. You will get the same result if you enter 1 in the **Aspt:** field. If you enter any number greater than 0 or 1, the square will become increasingly rectangular, the larger the number.
6. By default, **4** will be entered in the **Sides:** field. When you create a square course, it is made up of a series of straight lines between waypoints. The **Sides:** field determines how many waypoints will be connected to define the course.

7. Ignore the **Orbits:** field, it is used for spiral courses only. For more information see “[Create a Spiral Course](#)”.
8. Click the **Render** button to display a preview of the square course on the Position Map. At this point the waypoints for the square course have been defined, but they have not been saved to the Vehicle R/V Peter-Test.

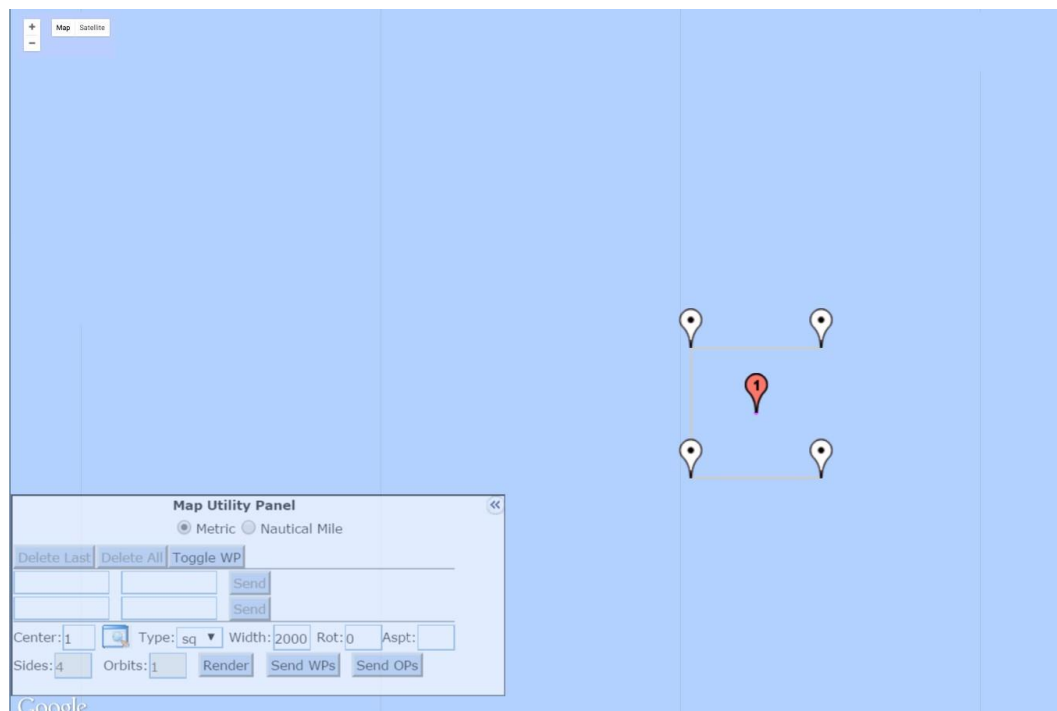


Note

If you want to make any changes, you can edit the parameters in the **Map Utility** and click on **Render** again to display the changes in the Position Map.

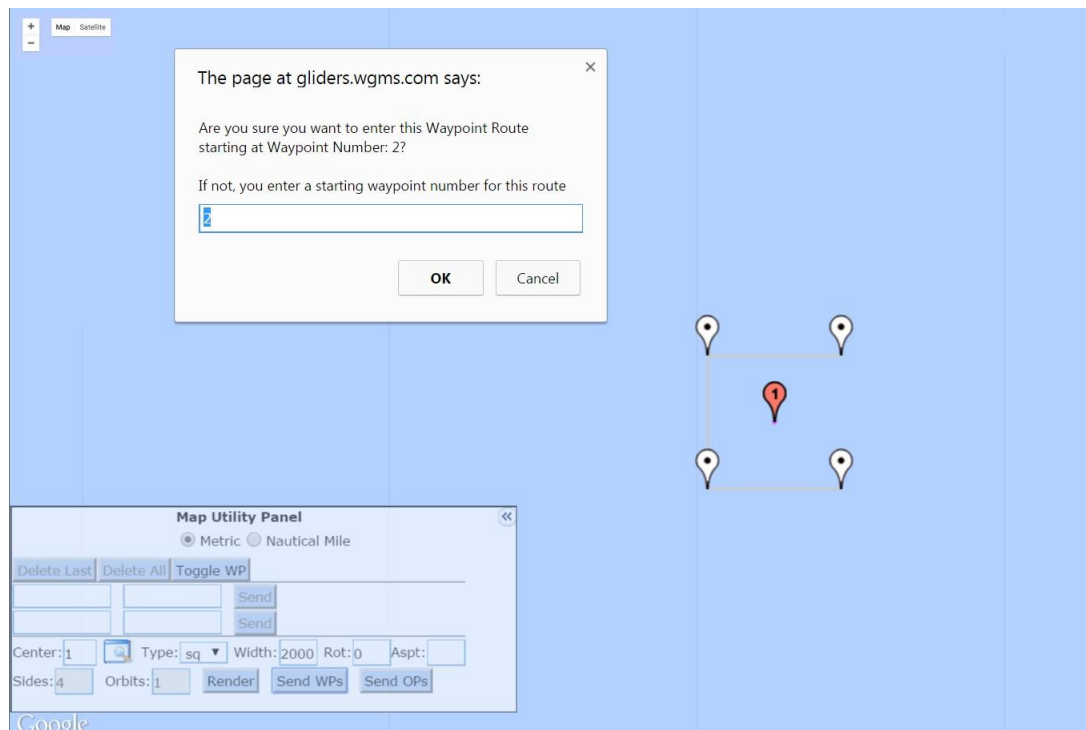
If you do not want to edit or save these waypoints, click the **Delete All** button and they will all be removed from the Position Map.

Figure 4.92. Example : Render a Square Course



9. If you are ready to save the 4 new waypoints displayed in the preview as a square course, click the **Send WPs** button.

When you click the **Send WPs** button, a dialog box will open providing you with an opportunity to change the starting waypoint for the square course.

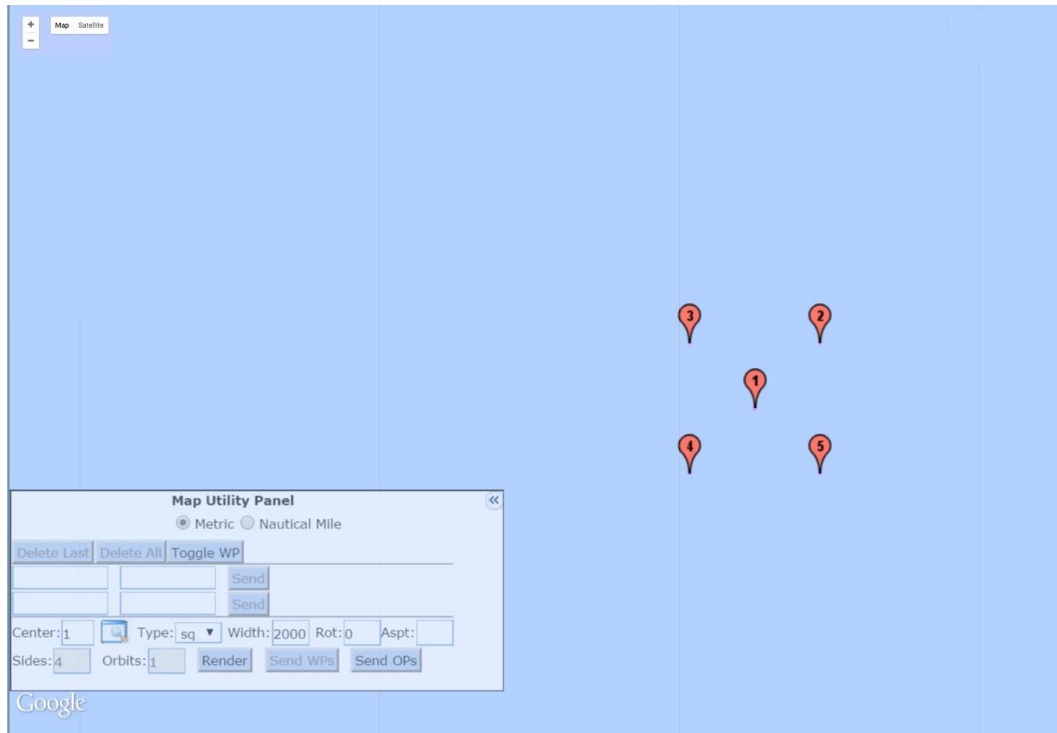
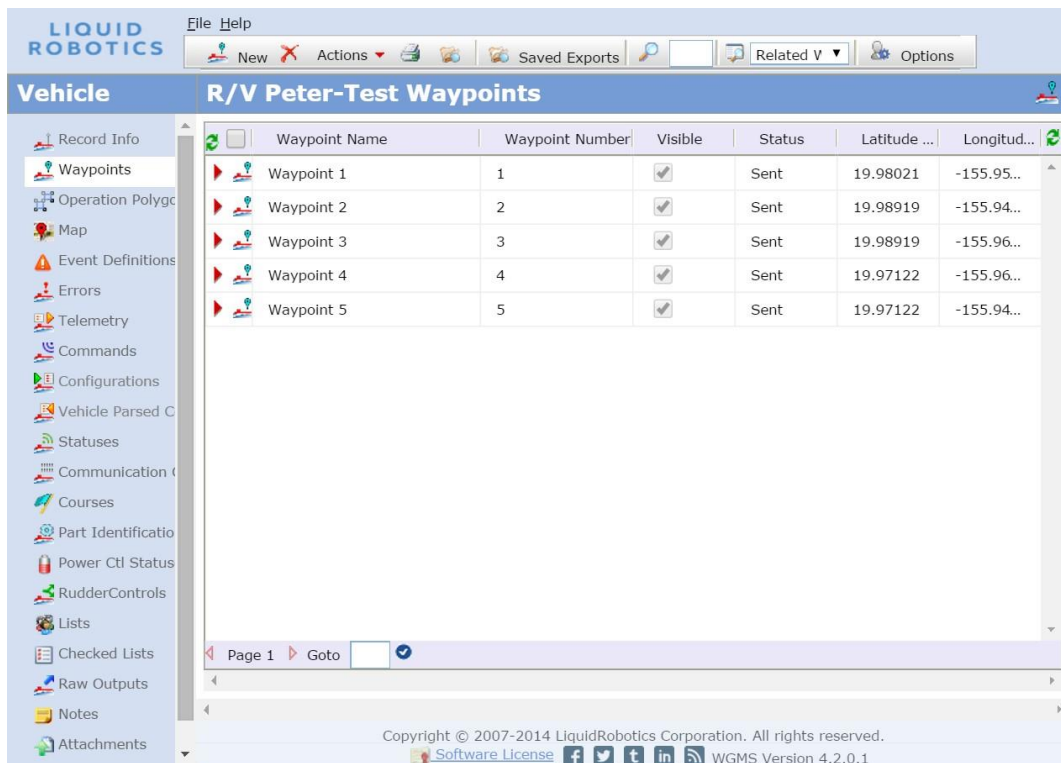
Figure 4.93. Click the Send WPs Button

10. Click **OK** to display the new red waypoints numbered 2 through 5 on the Position Map. They are also automatically added to the waypoint list for the Vehicle. After you click OK, if the waypoint numbers you entered are already in use, WGMS will ask you if you want to proceed. To avoid losing existing waypoints, always check existing waypoint numbers, before setting new waypoints. Also, a maximum of 254 waypoints can be defined on each WaveGlider Vehicle. Note: there is both a waypoint name and a waypoint number - both can be edited.



Note

You have the option to change the starting waypoint number for the new course you are creating. To do this, enter the waypoint number you want to be the starting point for the course before you click **OK**. By changing the starting waypoint number, the waypoint numbers for the new course will begin at the number you enter and continue consecutively.

Figure 4.94. New Waypoints Sent and Displayed on Position Map**Figure 4.95. New Waypoints Saved to the Vehicle Waypoint List**

If you want to delete waypoints from the Vehicle waypoint list, select the rows containing waypoints you want to delete (selected rows will be highlighted), then click on the  icon in the toolbar and a delete confirmation dialog box will appear. Click **OK** in the delete confirmation dialog box to complete the waypoint deletion.

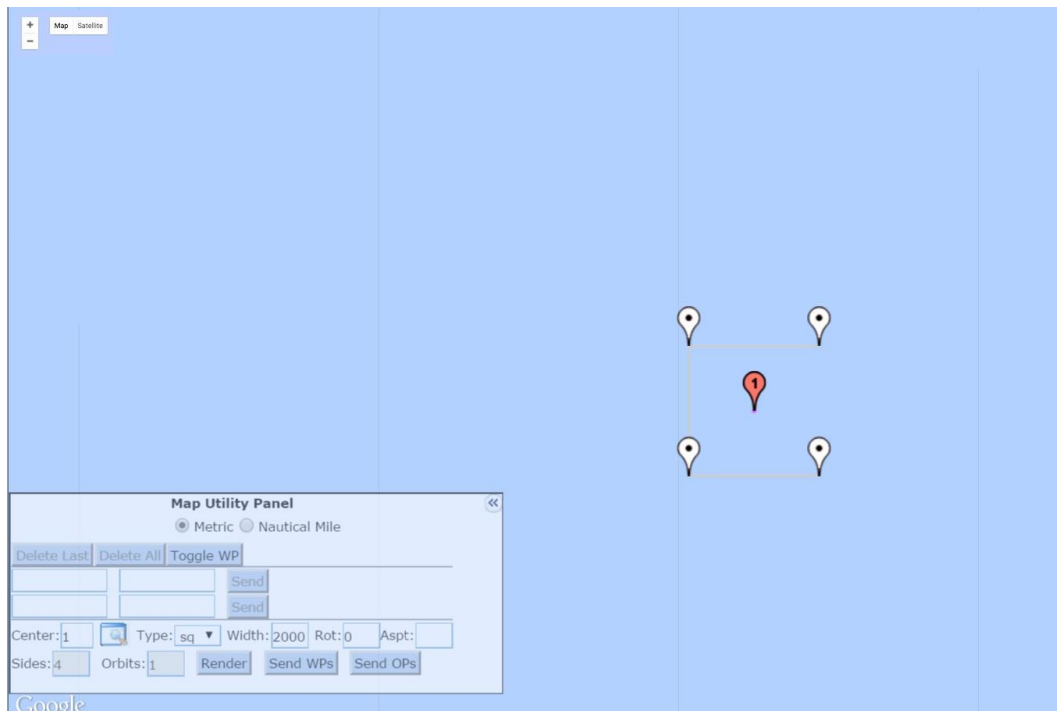
Create a Square Operation Polygon

An Operation Polygon is a boundary on the Position Map. You can set alarms to be sent to WGMS and autonomous obstacle avoidance behavior to be enabled, when a Vehicle approaches an Operation Polygon boundary. Operation Polygons can be saved as Inclusion Zones, or Exclusion Zones. An Inclusion Zone defines a region that a Vehicle is allowed to operate in. An Exclusion Zone defines a region where a Vehicle is not allowed to operate. An Inclusion Zone is typically used to define an Operation Polygon where a Vehicle is gathering data or performing test maneuvers. An Exclusion Zone is typically used to define an Operation Polygon where a Vehicle could run into rocks, shallow water, navigation aids, heavy marine shipping traffic, or other Wave Glider Vehicles on nearby missions.

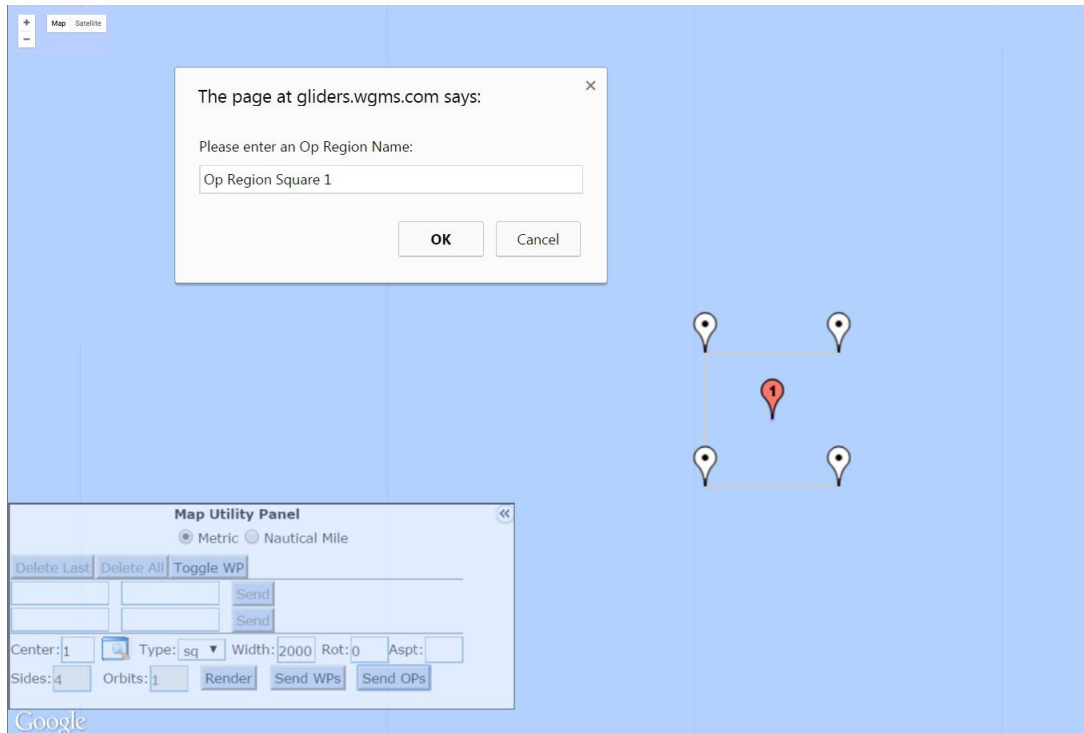
To create a square Operation Polygon:

1. Follow Steps 1 - 8 in the “[Create a Square Course](#)” procedure to define the square Operation Polygon boundaries.

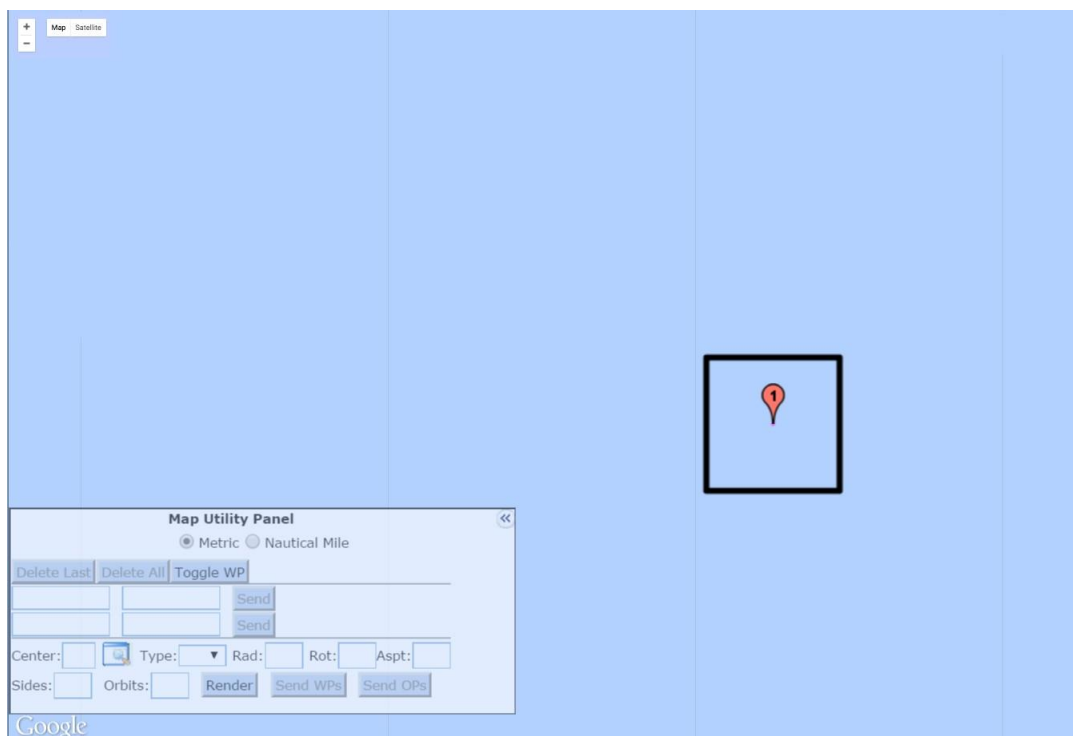
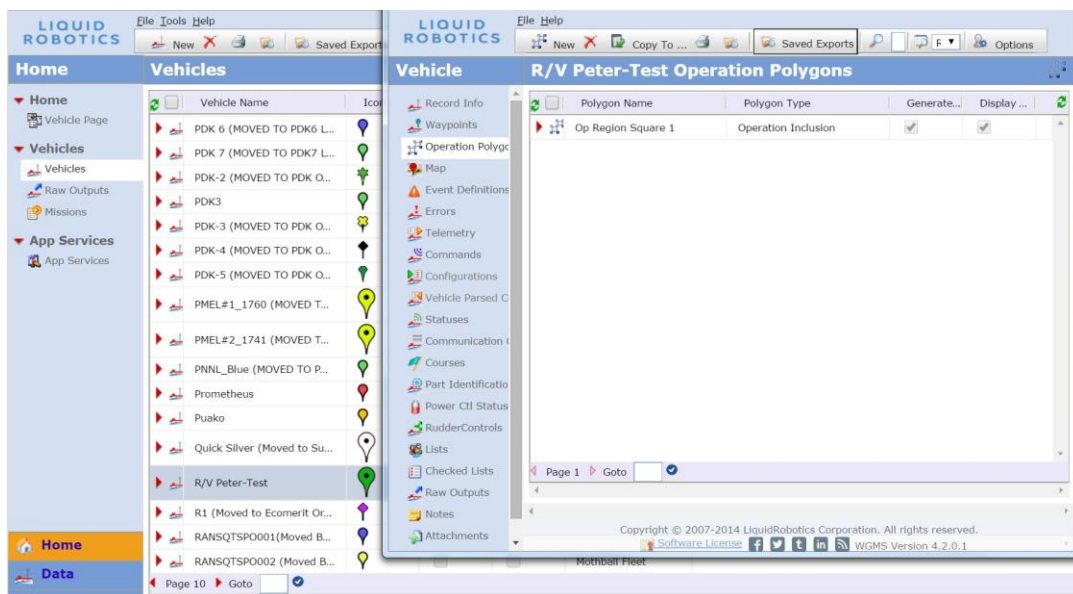
Figure 4.96. Example : Render a Square Operation Polygon



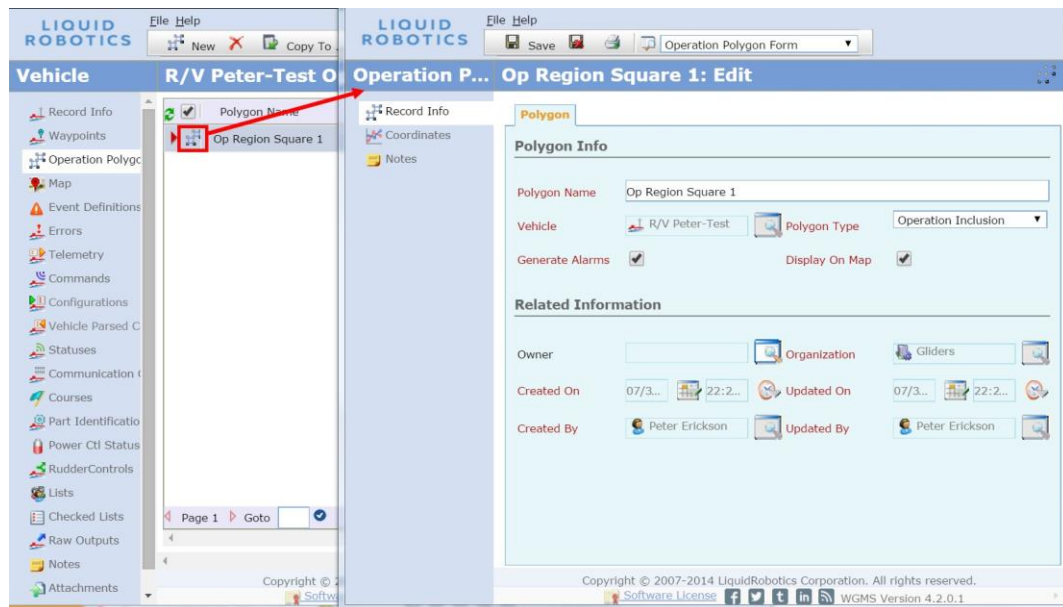
2. In Step 8, click on **Send OPs** (instead of clicking on **Send WPs**). A dialog box will appear asking you to enter an **Op Region Name**. Enter a unique name or append a number to the default "Op Region" that is in the name field. The name must be different than any other Operation Polygon that has been saved for the Vehicle.

Figure 4.97. Example: Click on Send OPs Button

3. Click **OK**. The Operation Polygon you created will be saved to the Vehicle. It will appear as black lines on the Position Map, and it will also be included in the **Operation Polygons** list for the Vehicle.

Figure 4.98. Example : Inclusion Zone**Figure 4.99. Example : Op Region 44 Added to Vehicle Operation Polygons List**

4. By default, Operation Polygons are saved as Inclusion Zones. If an Exclusion Zone is what you wanted, you can make edits from the Operation Polygons list for the Vehicle by clicking on the icon next to the Operation Polygon name to open the edit form for that Operation Polygon.

Figure 4.100. Example: Operation Polygon Edit Form - Default Inclusion Zone

5. Select **Operation Exclusion** from the drop-down menu in the **Polygon Info** section of the **Op Region: Edit** form. Then click **Save** in the toolbar. Note that Generate Alarms is not checked by default and must be checked in order for the vehicle to generate alarms.

Figure 4.101. Example: Operation Polygon Edit Form - Change to Exclusion Zone

The screenshot displays the 'Operation Polygon Edit Form' in the Liquid Robotics WGMS interface. The form is titled 'Op Region Square 1: Edit'. The 'Save' button in the top toolbar is highlighted with a red box. The 'Polygon Type' dropdown menu is also highlighted with a red box and is set to 'Operation Exclusion'. The form includes the following fields and options:

- Polygon Name:** Op Region Square 1
- Vehicle:** R/V Peter-Test
- Polygon Type:** Operation Exclusion
- Generate Alarms:** ☒
- Display On Map:** ☒
- Related Information:**
 - Owner:** [Empty field]
 - Organization:** [Empty field]
 - Gliders:** [Empty field]
 - Created On:** 07/3... 22:2...
 - Updated On:** 07/3... 22:2...
 - Created By:** Peter Erickson
 - Updated By:** Peter Erickson

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6. The edited Operation Polygon will appear as an Exclusion Zone in the Vehicle Operations Polygons list, and the lines that define the Operation Polygon in the Position Map will be red.

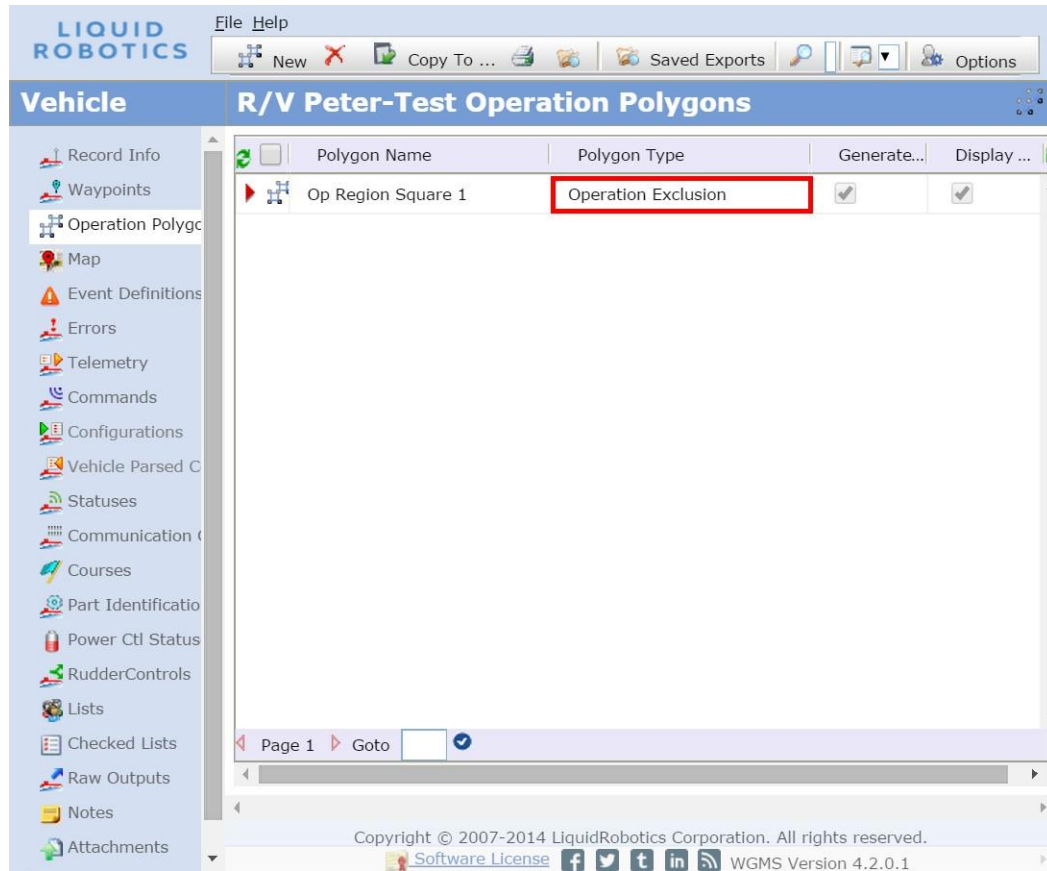
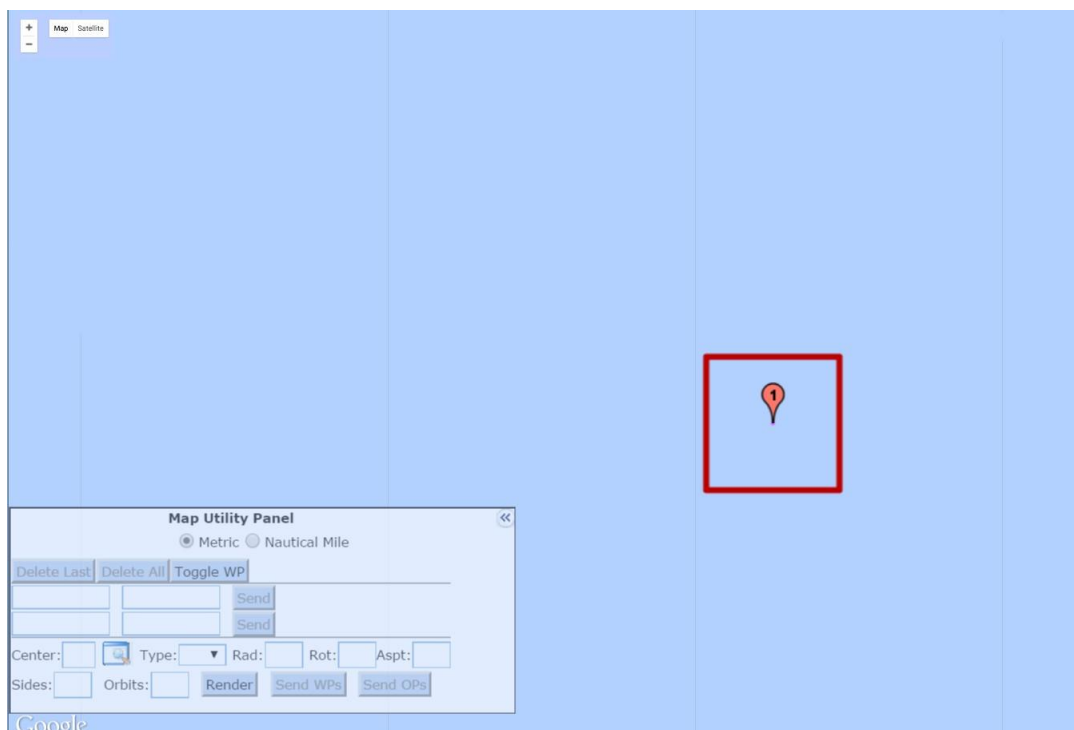
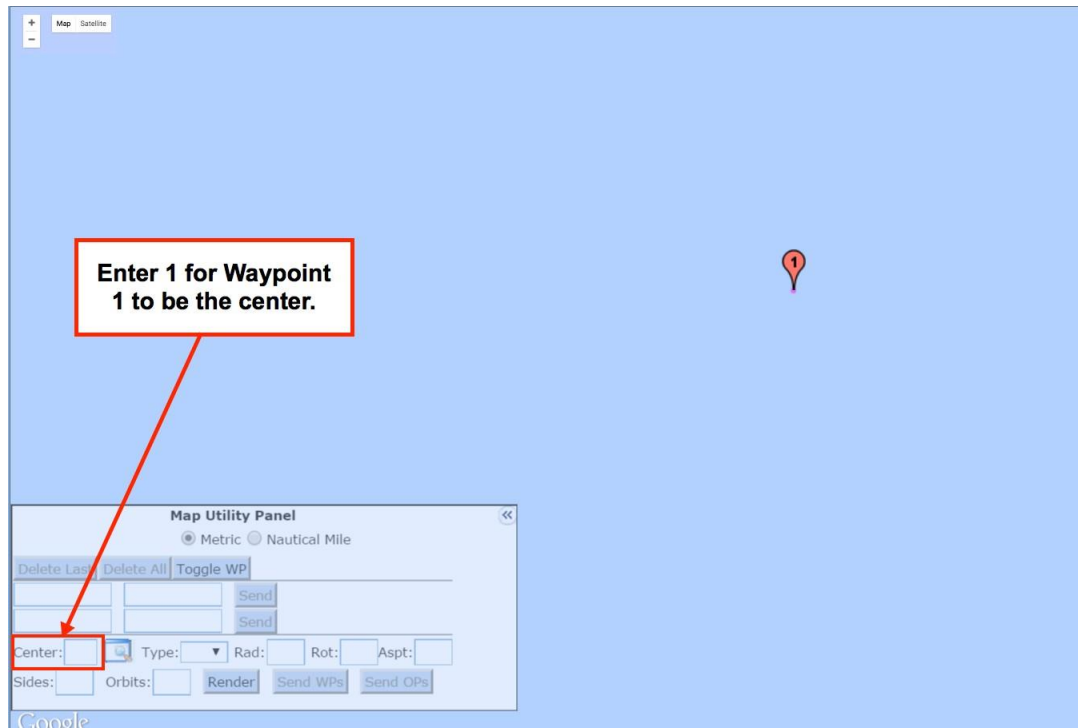
Figure 4.102. Example: Operation Polygon Saved as Exclusion Zone

Figure 4.103. Example: Circular Exclusion Zone

If you want to delete an Operation Polygon from the Vehicle Operation Polygons list, open the Op Region Edit form for the vehicle and select the row containing Operation Polygon you want to delete (selected row will be highlighted), then click on the  icon. A delete confirmation dialog box will appear. Click **OK** in the delete confirmation dialog box to complete the Operation Polygon deletion.

Create a Spiral Course

In this example, the **Metric** radio button is selected and one waypoint (waypoint 1) has been created for the Vehicle R/V Peter-Test. To create a spiral course, an existing waypoint must be defined as the center of the spiral.

Figure 4.104. Creating a Spiral Course with Waypoint 1 in the Center

1. In the **Map Utility**, enter **1** (for waypoint 1) in the **Center:** field. Waypoint 1 will be the center of the spiral course.



Note

To view a list of the existing waypoints for the Vehicle, click on the  icon next to the **Center:** field to open the Waypoint Lookup list for the Vehicle.

2. Select **Spiral** in the **Type:** drop-down menu.
3. Enter **500** in the **Rad:** field. In this example the radius is 500 meters. For a spiral course, the radius is the distance between the center waypoint (waypoint 1 in this example) and the starting waypoint for the spiral (waypoint 2 in this example).
4. Enter **600** in the **Width:** field. This setting determines the distance (800 meters) between each of the 5 coils.
5. Enter nothing in the **Aspt:** field. This setting determines the aspect ratio of the spiral. By entering nothing, the result will be an aspect ratio of 1, which is the default. You will get the same result if you enter 1 in the **Aspt:** field. If you enter any number greater than 0 or 1, the spiral will become increasingly elliptical, the larger the number.
6. Enter **60** in the **Sides:** field. When you create a spiral course, it is made up of a series of straight lines between waypoints. The **Sides:** field determines how many waypoints will be connected to define the spiral course.
7. Enter **5** in the **Coils:** field. This is the number of 360 degree circuits the Vehicle will make to complete the spiral course.

8. Click the **Render** button to display a preview of the spiral course on the Position Map. At this point the waypoints for the spiral course have been defined, but they have not been saved to the Vehicle R/V Peter-Test.

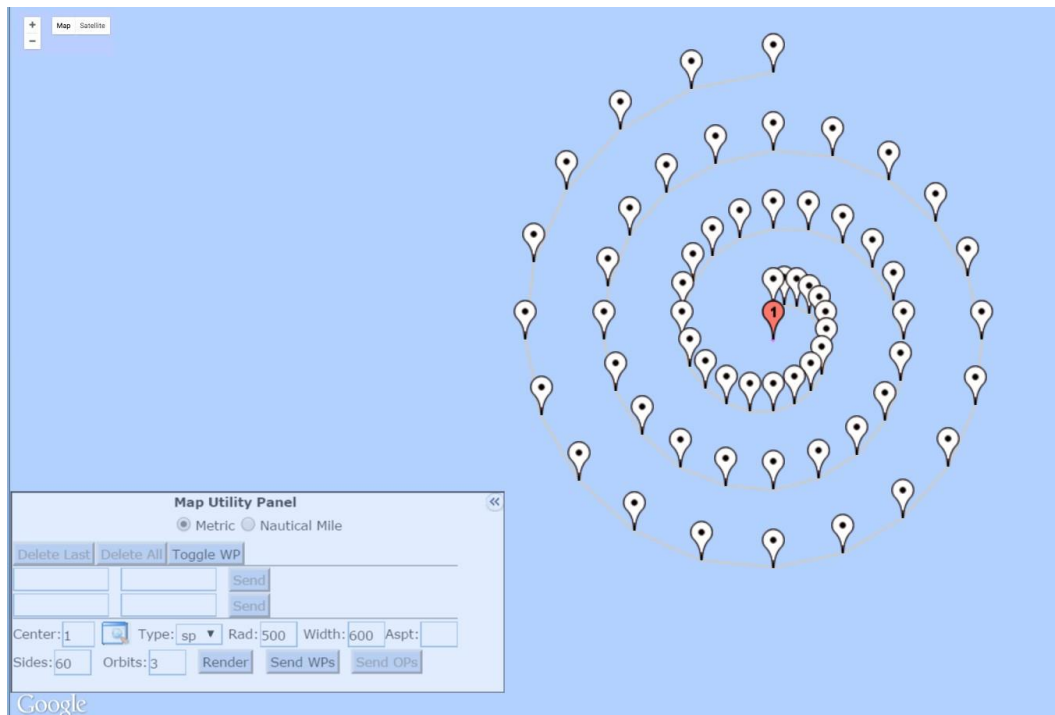


Note

If you want to make any changes, you can edit the parameters in the **Map Utility** and click on **Render** again to display the changes in the Position Map.

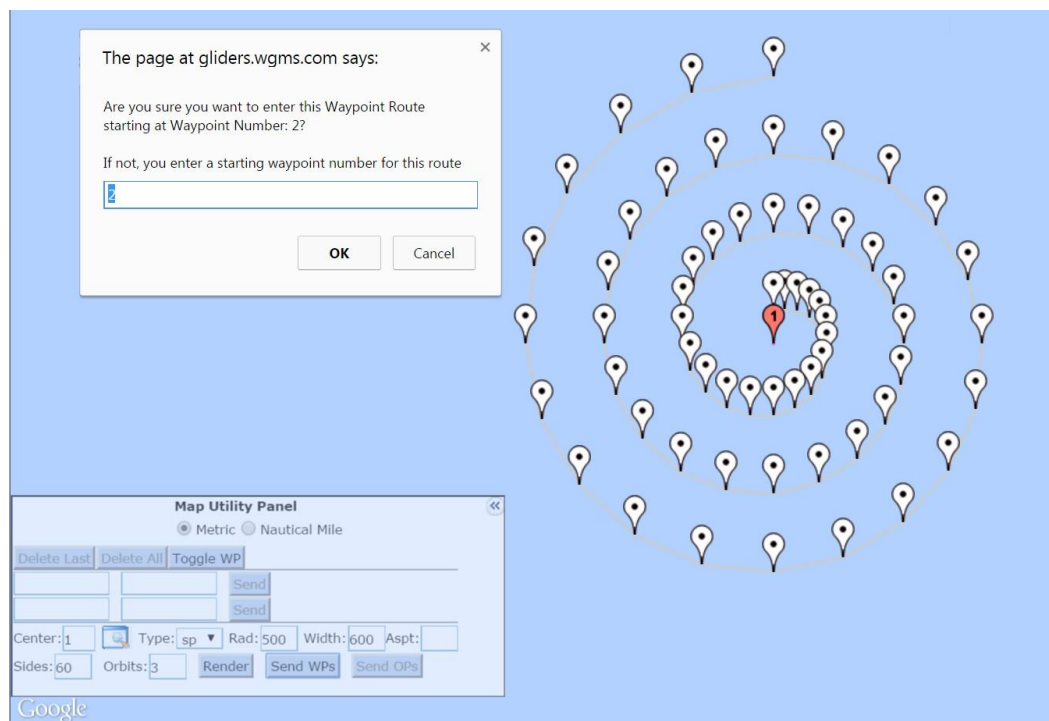
If you do not want to edit or save these waypoints, click the **Delete All** button and they will all be removed from the Position Map.

Figure 4.105. Example: Render a Spiral Course



9. If you are ready to save the 60 new waypoints displayed in the preview as a spiral course, click the **Send WPs** button.

When you click the **Send WPs** button, a dialog box will open providing you with an opportunity to change the starting waypoint for the spiral course.

Figure 4.106. Click the Send WPs Button

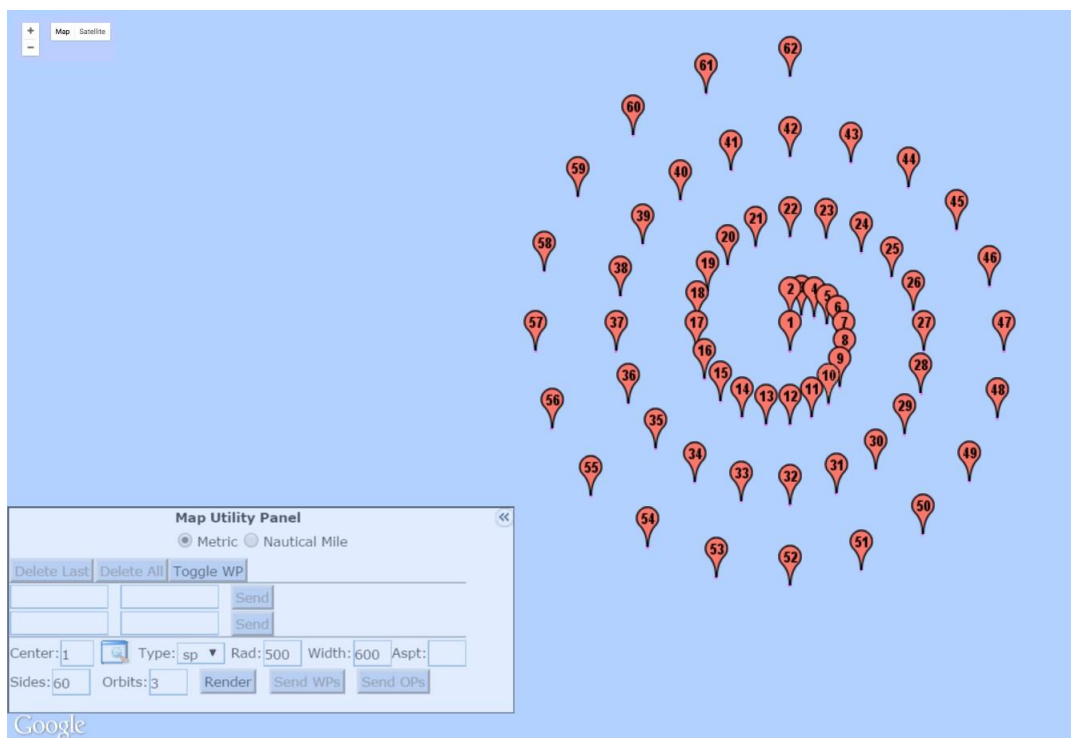
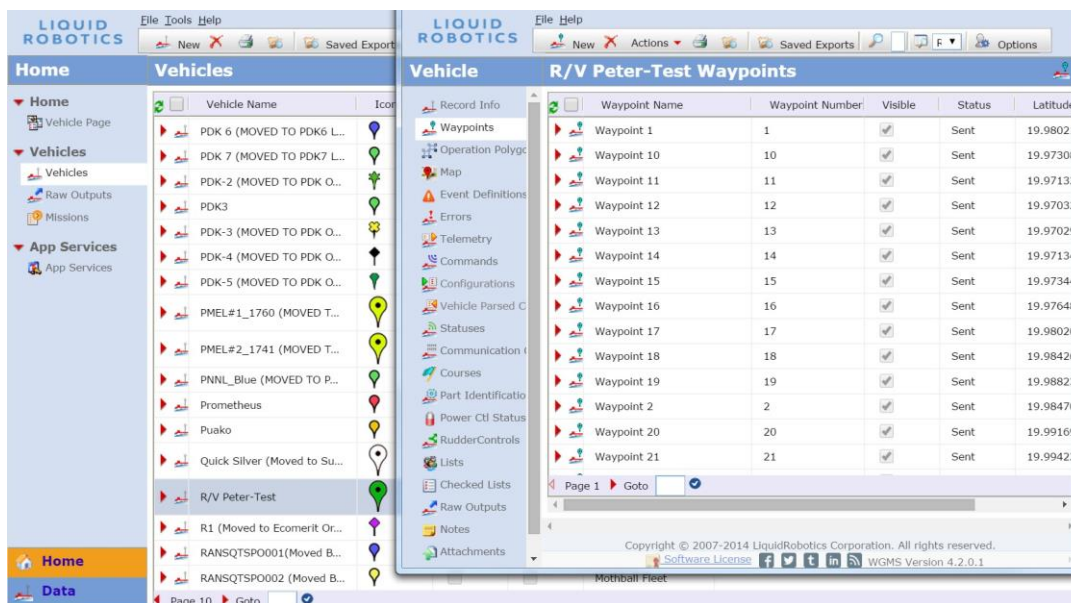
10. Click **OK** to display the new red waypoints numbered 2 through 62 on the Position Map. They are also automatically added to the Waypoint list for the Vehicle.



Note

You have the option to change the starting waypoint number for the new course you are creating. To do this, enter the waypoint number you want to be the starting point for the course before you click **OK**. By changing the starting waypoint number, the waypoint numbers for the new course will begin at the number you enter and continue consecutively.

Click **OK**, or change the starting waypoint number and click **OK**. The new red waypoints numbered 2 through 62 will be displayed on the Position Map and added to the Waypoint list for the Vehicle.

Figure 4.107. Click the Send WPs Button**Figure 4.108. New Waypoints Saved to the Vehicle Waypoint List**

If you want to delete waypoints from the Vehicle waypoint list, select the rows containing waypoints you want to delete (selected rows will be highlighted), then click on the  icon and a delete confirmation dialog box will appear. Click OK in the delete confirmation dialog box to complete the waypoint deletion.

Using the Piloting Panel

The **Piloting Panel** has two functions:

- Quickly calculates the headings that the selected Vehicle is capable of following and its expected speed over ground (SOG), based on currents data and water speed calculations.

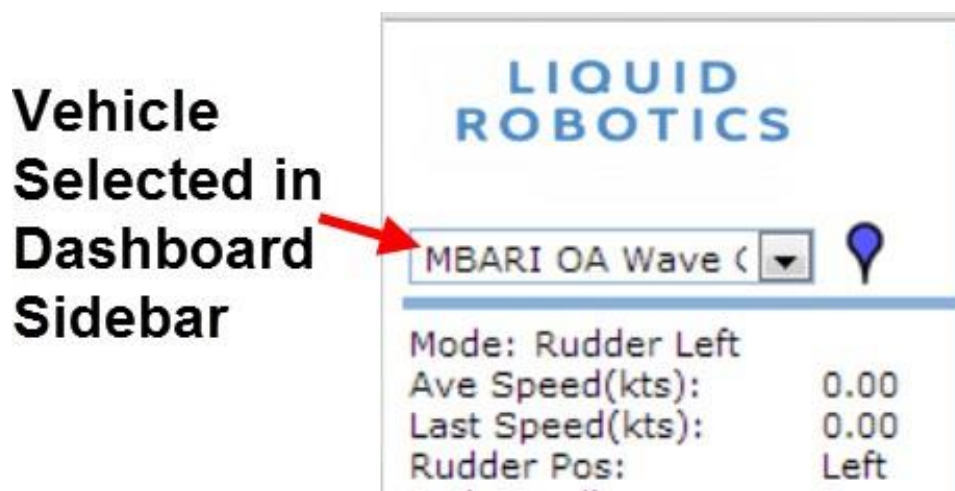


Note

If the Vehicle water speed sensor is not functioning, the **Piloting Panel** will not be able to calculate headings.

- Quickly centers the Position Map on a specific waypoint, or on the most recent telemetry crumb indicating the selected Vehicle location.

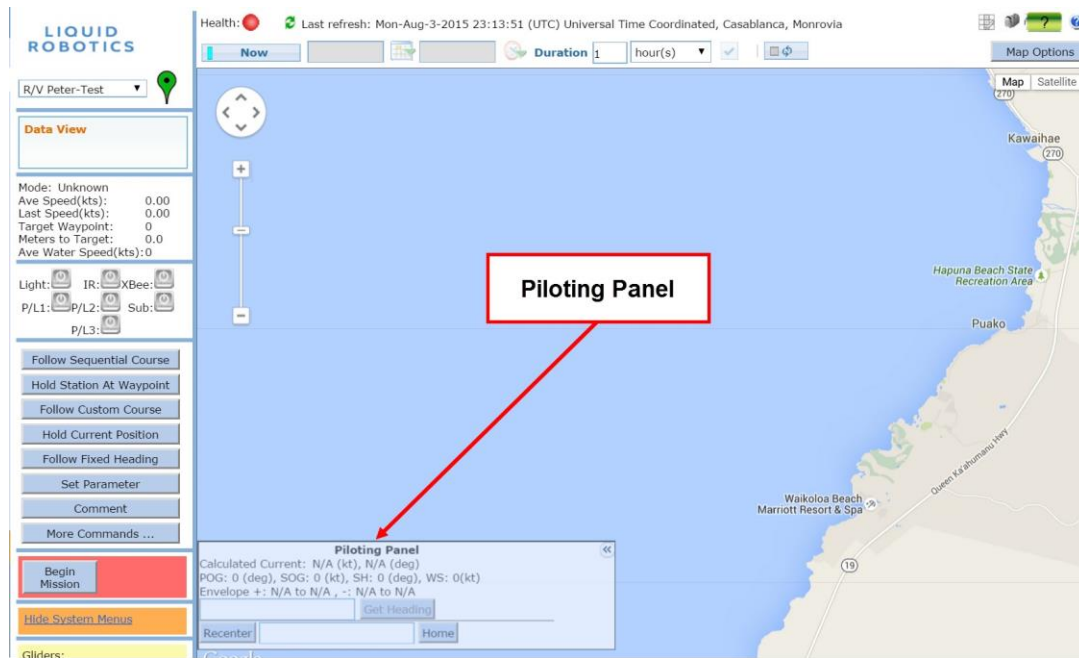
Figure 4.109. The Selected Vehicle



To display the **Piloting Panel**:

1. Click the **Map Options** button in the **Position Map** toolbar to open the **Map Options** dialog box.
2. Click on the **Tool Options** tab.
3. Select the **Piloting Panel** checkbox.
4. click on **Set Defaults**.
5. Refresh the Position Map (click the green refresh icon in the Position Map toolbar) to display the **Piloting Panel**.

The **Piloting Panel** appears on the lower left side of the Position Map. You can hide the **Piloting Panel** by clicking on the  icon.

Figure 4.110. Piloting Panel Displayed on Position Map

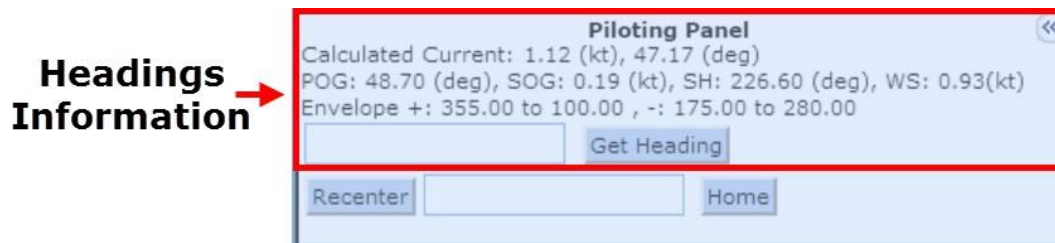
Using the Piloting Panel for Vehicle Headings Information

The **Piloting Panel** provides information on the range of headings that the selected Vehicle can follow based on ocean currents and water speed data.



Note

The Piloting Panel relies on the Water Speed Sensor to calculate currents. The Water Speed sensor must be turned ON and functioning properly for the piloting panel to work properly.

Figure 4.111. Piloting Panel - Headings Information

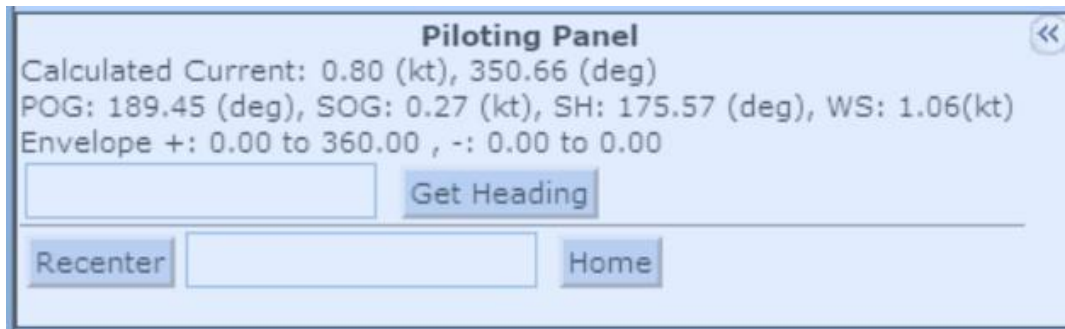
When the Vehicle speed sensor is operating, the **Piloting Panel** displays the following information:

- **Calculated Current** - the speed (knots) and direction (degrees) of the current where the Vehicle is located.
- **Path Over Ground (POG)** - the path over ground that the vehicle is following (in degrees).
- **Speed Over Ground (SOG)** - the Vehicle speed over ground (in knots).

- **Sub Heading (SH)** - the heading that the Sub component of the Vehicle is following (in degrees). The POG and the SH are not necessarily the same.
- **Water Speed (WS)** - the Vehicle speed over water (in knots).
- **Envelope** - the range of headings that the **Piloting Panel** is able to predict Vehicle performance for (in degrees).

In Figure 4.112, the **Envelope** calculated by the **Piloting Panel** is **+: 0.00 to 360.00, -: 0.00 to 0.00** indicating that the Vehicle will be able to make positive speed over ground on any heading between 0 and 360 degrees.

Figure 4.112. Example: Piloting Panel Envelope 360 Degrees Positive



In Figure 4.113, the **Envelope** calculated by the **Piloting Panel** is **+: 355.00 to 100.00, -: 175.00 to 280.00**.

The **+: 355.00 to 100.00** indicates that the Vehicle will be able to make positive speed over ground on any heading between 355 and 100 degrees.

The **-: 175.00 to 280.00** indicates that the Vehicle will not be able to overcome the current, resulting in a negativespeed over ground on any heading between 175 and 280 degrees.

Figure 4.113. Example: Piloting Panel Envelope Positive and Negative



If you enter a heading between 355 and 100 degrees in the **Get Heading** field and click the **Get Heading** button, the **Piloting Panel** will display the heading the Vehicle needs to be following to actually achieve the heading you entered, taking the current and other variables into account. The **Piloting Panel** will also display the calculated speed over water for the Vehicle on that heading.

For example, when a heading of 45 degrees is entered, the **Piloting Panel** calculates that the Vehicle will follow a 45 degree heading when it is commanded to follow a 45 degree heading and it will do so at a speed over water of 2.5 knots. In this example, the Vehicle is taking advantage of the current.

Figure 4.114. Example: Get Heading For 45 Degrees

Piloting Panel <<

Calculated Current: 1.38 (kt), 44.71 (deg)
POG: 67.45 (deg), SOG: 0.30 (kt), SH: 219.00 (deg), WS: 1.11(kt)
Envelope +: 355.00 to 95.00 , -: 175.00 to 275.00

45 **Get Heading** 2.50 (kt), 45.00 (deg)

Recenter **Home**

When a heading of 90 degrees is entered, the **Piloting Panel** calculates that the Vehicle will follow a 90 degree heading when it is commanded to follow a 152.05 degree heading, and it will do so at a speed over water of 1.5 knots. In this example the Vehicle is impacted by the current.

Figure 4.115. Example: Get Heading For 90 Degrees

Piloting Panel <<

Calculated Current: 1.38 (kt), 44.71 (deg)
POG: 67.45 (deg), SOG: 0.30 (kt), SH: 219.00 (deg), WS: 1.11(kt)
Envelope +: 355.00 to 95.00 , -: 175.00 to 275.00

90 **Get Heading** 1.50 (kt), 152.05 (deg)

Recenter **Home**

When a heading of 135 degrees is entered, the **Piloting Panel** indicates that a calculated heading and speed over water is not available (N/A). This is expected, because 135 degrees is not a heading that is included in the calculated **Envelope**. A close examination of the calculated **Envelope** shows that headings between 95 and 175 degrees, as well as headings in the range between 275 and 355 degrees, are not included. This means WGMS did not have sufficient data to predict Vehicle behavior on these headings.

Figure 4.116. Example: Get Heading For 135 Degrees

Piloting Panel <<

Calculated Current: 1.38 (kt), 44.71 (deg)
POG: 67.45 (deg), SOG: 0.30 (kt), SH: 219.00 (deg), WS: 1.11(kt)
Envelope +: 355.00 to 95.00 , -: 175.00 to 275.00

135 **Get Heading** N/A (kt), N/A (deg)

Recenter **Home**

When a heading of 225 degrees is entered, the **Piloting Panel** calculates that the Vehicle will follow a 255 degree heading when it is commanded to follow a 225 degree heading, but it will do so at a speed

over water of -0.28 knots (negative 0.28 knots). In this example, the Vehicle is able to maintain a 225 degree heading, but it is not able to overtake the current.

Figure 4.117. Example: Get Heading For 225 Degrees



Note

If the Vehicle speed sensor is not functioning, the **Get Heading** button on the **Piloting Panel** will be grayed-out. The **Piloting Panel** cannot provide headings information unless the Vehicle speed sensor is operating.

Using the Piloting Panel to Center the Position Map

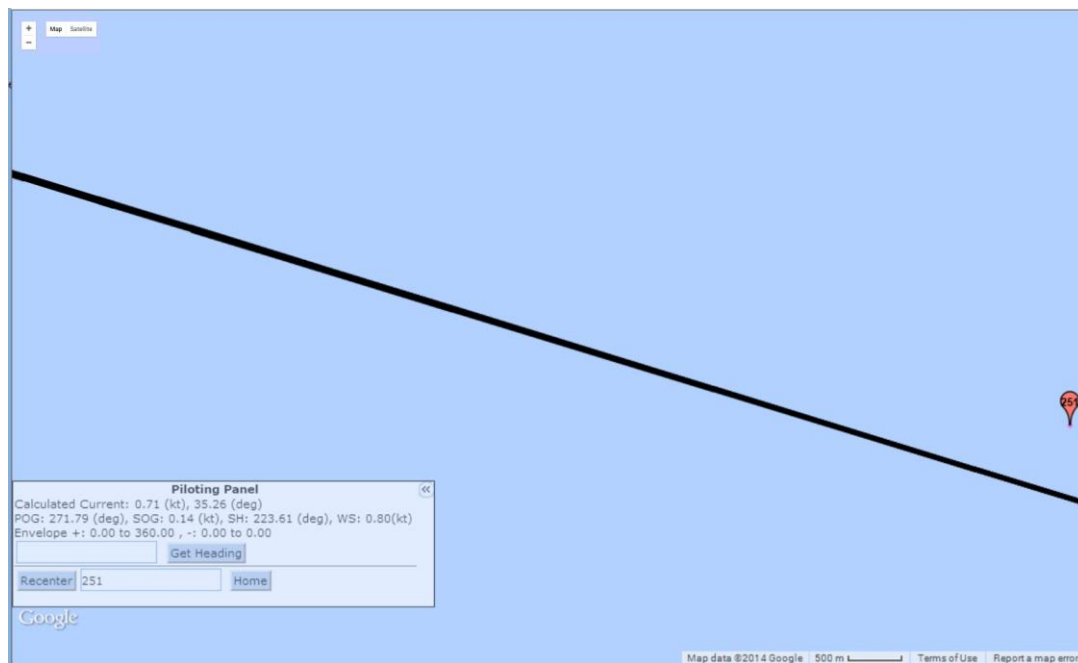
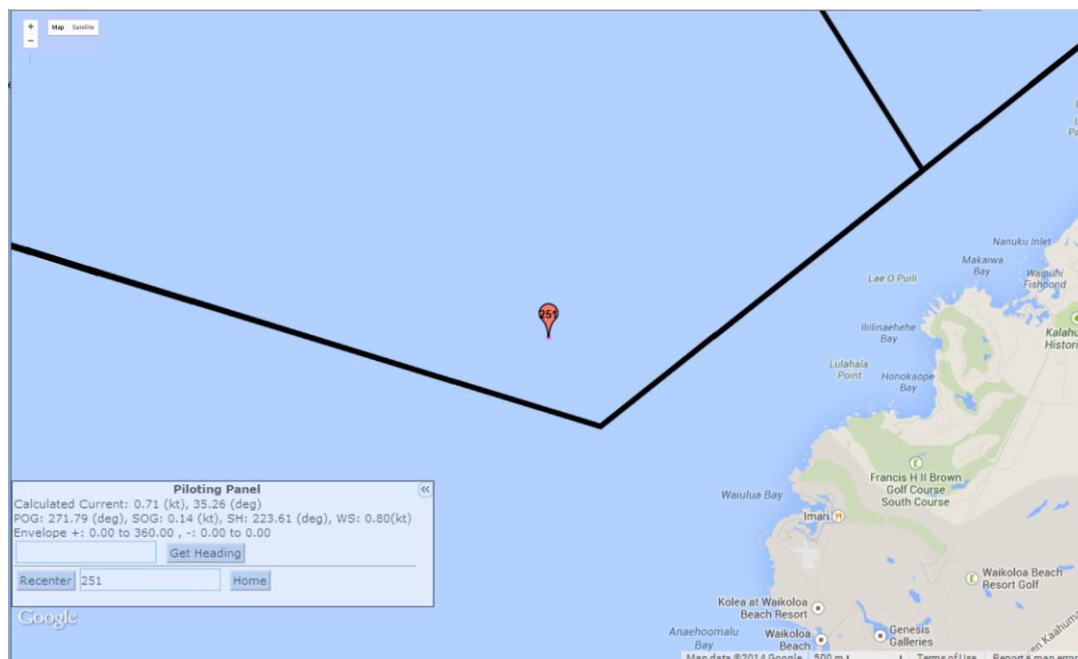
The **Piloting Panel** can quickly center the Position Map on a specific waypoint, or on the most recent telemetry crumb indicating the selected Vehicle location.

Figure 4.118. Piloting Panel Displayed on Position Map



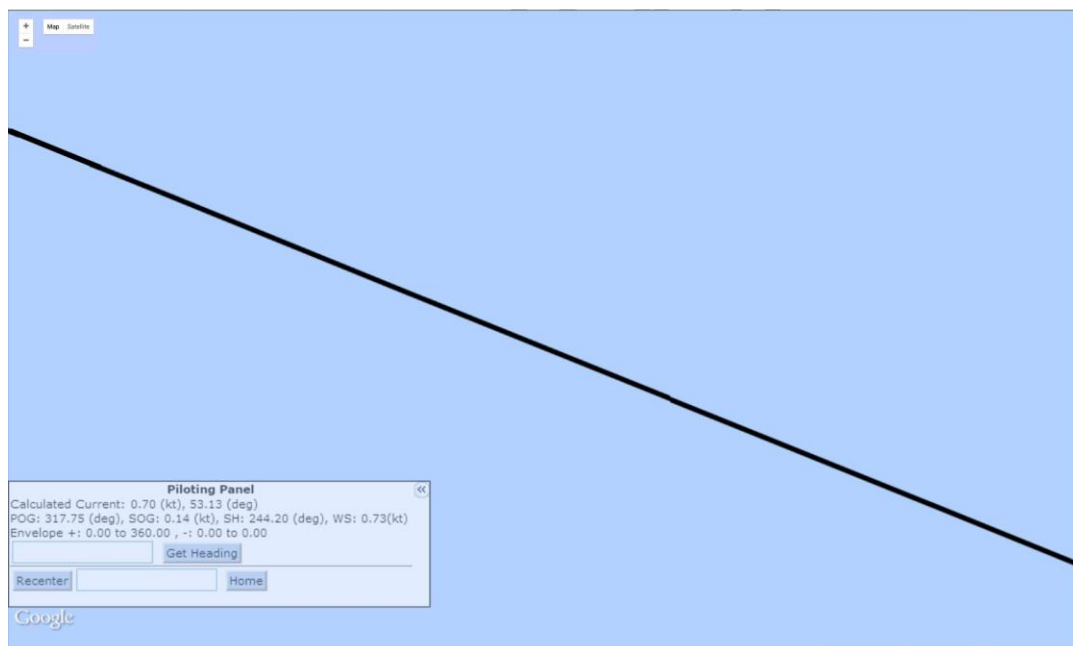
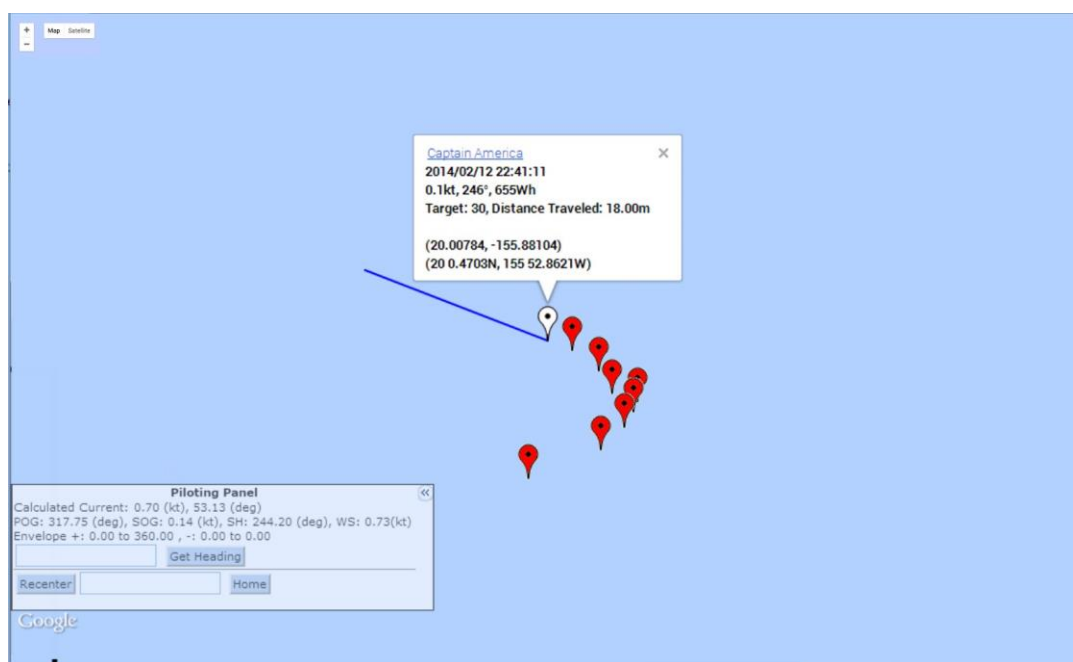
To recenter the Position Map on a specific waypoint: Enter the waypoint number in the **Recenter** field and click **Recenter**.

For example, when you enter waypoint number 251 and click on **Recenter** the display shifts to place waypoint 251 in the center of the Position Map.

Figure 4.119. Enter Waypoint 251 in the Recenter Field**Figure 4.120. Click Recenter to Center the Position Map**

To center the Position Map on the most recent telemetry crumb indicating the current location of the selected Vehicle: Click the **Home** button.

For example, with Captain America as the selected Vehicle, when you click on the **Home** button the display shifts to place the most recent Captain America telemetry crumb in the center of the Position Map. At times the user must change the zoom level (using +/- buttons on the map) in order for the Home button to activate and be clickable.

Figure 4.121. Click Home to Center the Position Map**Figure 4.122. Position Map Centered on the Most Recent Location of the Selected Vehicle**

Using the Dashboard Sidebar

The Dashboard sidebar provides easy access to frequently used piloting information and commands. The primary difference between the SV3 and SV2 Dashboard sidebars is the SV3 Commands button, which is available on SV3 vehicles only, and the default Vehicle Statistics that are displayed.

Figure 4.123. WGMS SV3 Dashboard Side-Bar

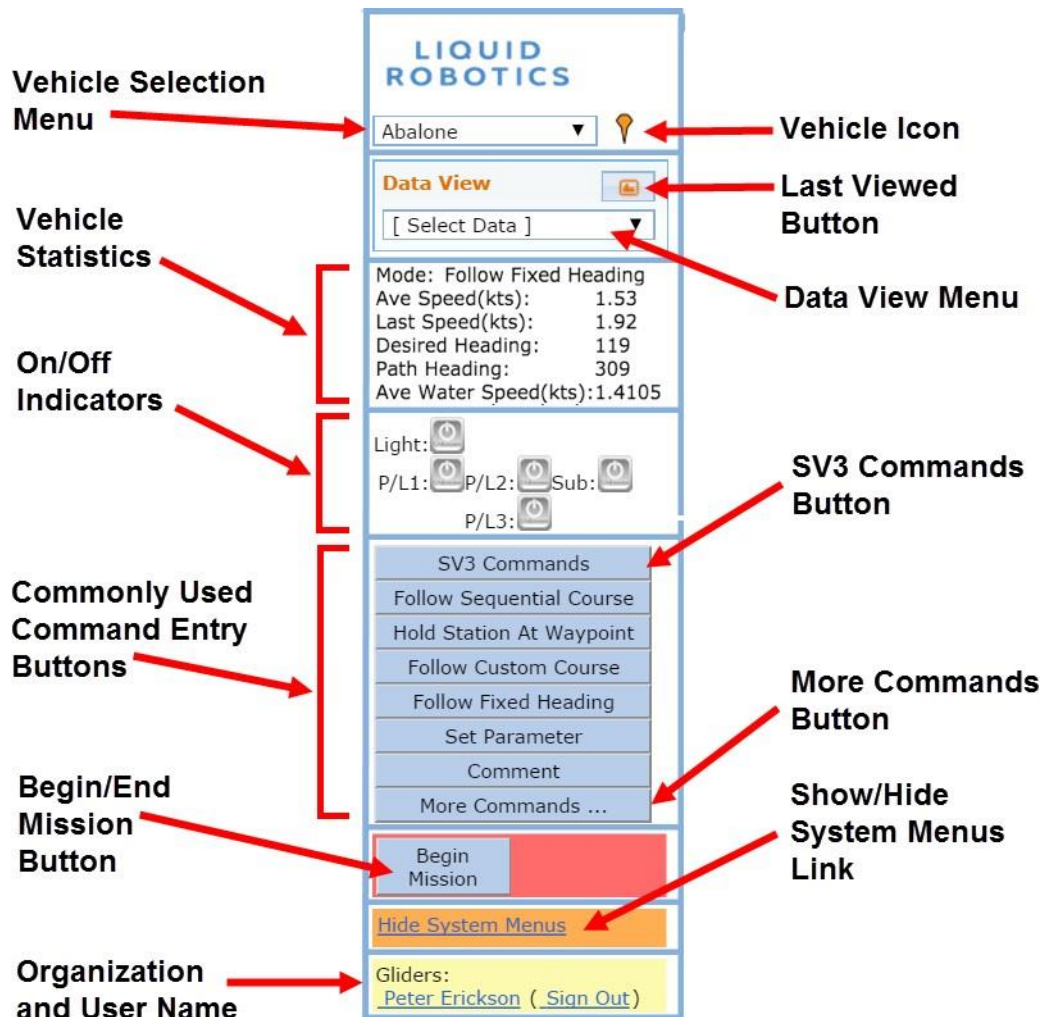
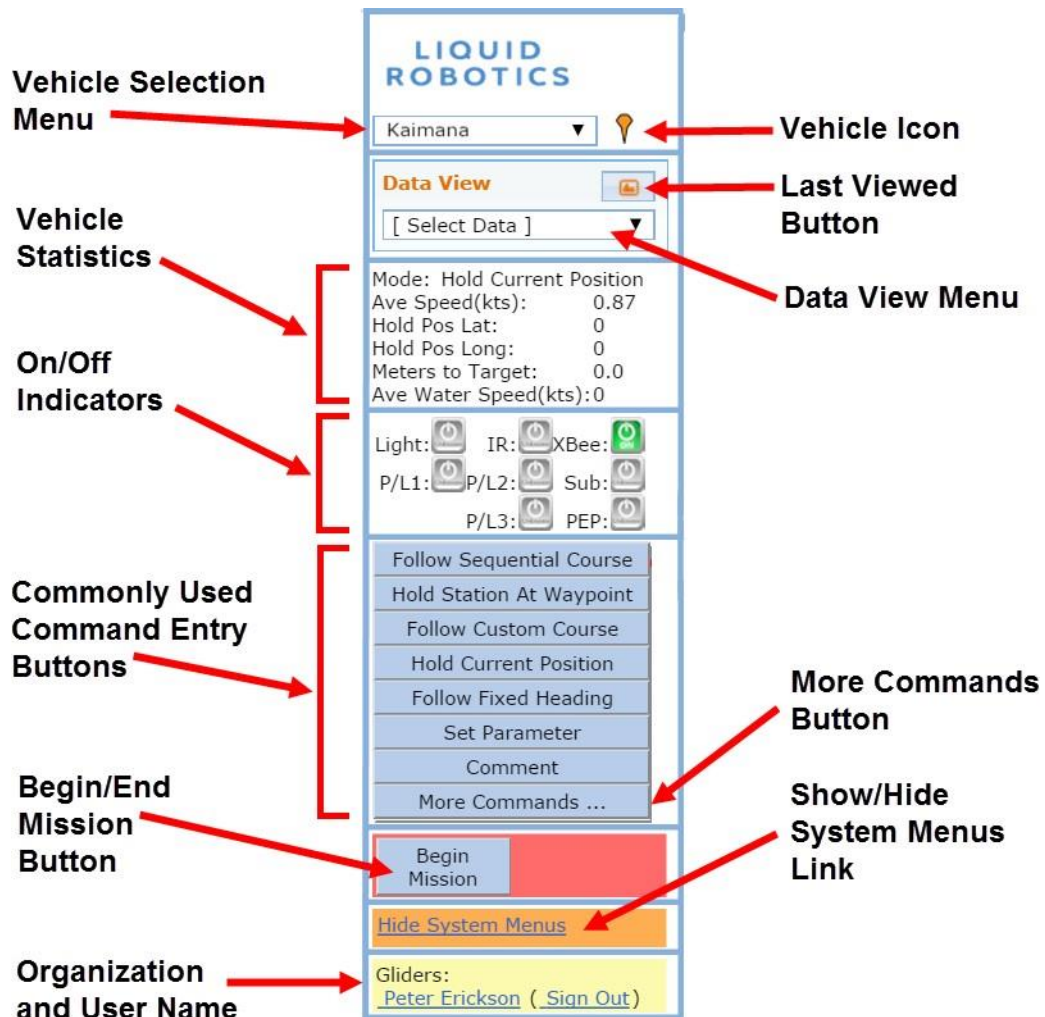


Figure 4.124. WGMS SV2 Dashboard Side-Bar



- **Vehicle Selection Menu** - This is where you select the vehicle that you want to issue commands to or display and export data from.
- **Vehicle Icon** - The icon associated with the selected vehicle is displayed here - if you click on it, the Vehicle Form page for the selected vehicle will open.
- **Last Viewed Button** - Click on this button to open a Custom Report for the data type most recently viewed. For more information see: "[Data View Page - Custom Reports](#)"
- **Data View Menu** - Use this drop-down menu to open a Custom Report for the selected data type. For more information see: "[Data View Page - Custom Reports](#)"
- **Vehicle Statistics** - A list of statistics for the selected vehicle that are frequently used by Pilots when making navigation decisions.
 - **Mode** - The last command that was issued to the selected vehicle.
 - **Ave Speed(kts)** - The selected vehicle's average speed over ground (in knots).

- **Last Speed(kts)** - The selected vehicle's speed over ground reported in the last telemetry broadcast (in knots).
- **Target Waypoint** - The next waypoint in the selected vehicle's course. Unless you issue any navigation command other than Follow Sequential Course, a target waypoint of 255 will be displayed.
- **Meters to Target** - The distance in meters in a straight line between the selected vehicle and the next waypoint in the course (at the time of the most recent telemetry broadcast).
- **Ave Water Speed(kts)** - The selected vehicle's speed over water (in knots). The water speed sensor must be turned ON. If it is turned off, a water speed of 0 will be displayed.
- **On/Off Indicators** - Indicate if devices are powered on (green icon), or off (grey icon). The icons that appear in the Dashboard sidebar depend on the selected vehicle and its configuration. The following list includes all possible icons:
 - Light: Indicates if the marker light on the weather station mast is turned on.
 - IR: Indicates if the Iridium modem is powered on (SV2 only).
 - XBee: Indicates if the XBee modem is powered on (SV2 only).
 - P/L1: Indicates if payload 1 is powered on.
 - P/L2: Indicates if payload 2 is powered on.
 - P/L3: Indicates if payload 3 is powered on.
 - PEP: Indicates if the Payload Extra Power port is in use (SV2 only).
 - Sub: Indicates if power is being supplied to the Sub payload (the rudder is always powered on).
- **Commonly Used Command Entry Buttons** - Each of these buttons brings up a pre-configured command dialog where you can issue the command named on the button to the vehicle selected in the Vehicle Selection Menu, with a minimum of mouse clicks and keystrokes.
- **SV3 Commands Button** - Opens a window that includes commands associated with SV3 services, devices, and payloads. This button appears only when an SV3 Vehicle is selected in the Vehicle Selection Menu. For more information see “[SV3 Commands Window](#)”
- **More Commands Button** - Opens a Command Form with a drop-down menu where you can select and issue any command that is not an "SV3 only" command. To issue commands that are available to SV3 vehicles only, click on the SV3 Commands button.
- **Begin/End Mission Button** - Opens a dialog where you can select an existing (pre-configured) mission for the selected vehicle to join or create a new mission for the selected vehicle.
- **Show/Hide System Menus Link** - Click on [Show System Menus](#) to open the full WGMS Home page, which includes the WGMS Dashboard. Click on [Hide System Menus](#) to display the WGMS dashboard only.
- **Organization and User Name** - Lists the name of the WGMS Organization you are logged into and the user name you logged in with. If you click on the user name, a User Form will open displaying information about the user. Your ability to edit fields in the User Form depends on the Role you are assigned in the WGMS Organization. You can click on [Sign Out](#) to log out.

Communications Log

The Communications Log is located directly below the Position Map on the WGMS Dashboard. The Communications Log lists:

- All telemetry received from the selected Vehicle.
- All commands sent to the selected Vehicle.
- All error messages received from the selected Vehicle.



Note

The time frame for the data displayed in the Communications Log is based on the time frame settings in the **Position Map** toolbar. For information on changing the time frame see [“Specifying the Data Time Frame”](#).

Figure 4.125. Communications Log

Timestamp	Structure ID	Target	SOG (kt)	POG (deg)	Desired	Sub Hea.	Water S.	Current Speed	Current Heading	Lat (deg)	Lon (deg)	Command	Reason	Error Type
08/05/2015 20:49:35	Telemetry0xf	0	102	290	287	-32.7680	0.00	0.00	20.03791	-155.83090				
08/05/2015 20:44:35	Telemetry0xf	0	270	290	287	-32.7680	0.00	0.00	20.03791	-155.83094				
08/05/2015 20:39:35	Telemetry0xf	0	284	290	287	-32.7680	0.00	0.00	20.03791	-155.83091				
08/05/2015 20:37:48	0	0	0	0					0.00000	0.00000				Out of Bounds ...
08/05/2015 20:37:45	Telemetry0xf	255	0.931	83	290	287	0.0000		20.03790	-155.83086				
08/05/2015 20:34:35	Telemetry0xf	0	87	290	286	-32.7680	0.00	0.00	20.03789	-155.83097				

The following telemetry data received from the selected Vehicle is displayed in the Communications Log:

- **Time Stamp** - The time when the telemetry was received by WGMS. (If the row contains command information, this will be the time when the command was sent from WGMS. If the row contains error information, this will be the time when the error information was received by WGMS.)
- **Structure ID** - The type of communication protocol structure followed by its hex identifier, for example, Telemetry 0xf, or Telemetry 6.
- **Target** - The next waypoint in the course the selected Vehicle is following - this will be 255 if the vehicle is holding station, or on a custom course.
- **SOG (kt)** - The selected Vehicle's speed over ground in knots.
- **POG (deg)** - The actual heading (position over ground) of the selected Vehicle's Float in degrees.
- **Desired Heading (deg)** - The heading set in WGMS for the selected Vehicle (in degrees).
- **Sub Heading (deg) SH** - The actual heading of the selected Vehicle's Sub in degrees.
- **Water Speed (kt) WS** - The selected Vehicle's speed over water in knots - this will display 0, if the water speed sensor is turned OFF.
- **Current Speed (kt)** - The speed of the current impacting the selected Vehicle in knots - this will display 0, if the water speed sensor is turned OFF.
- **Current Heading (deg)** - The direction of the current impacting the selected Vehicle in degrees - this will display 0, if the water speed sensor is turned OFF.
- **Lat (deg)** - The GPS latitude coordinate for the selected Vehicle in decimal degrees.

- **Lon (deg)** - The GPS longitude coordinate for the selected Vehicle in degrees.
- **Command** - The type of command that was issued. The **Command** column in the Communications Log mirrors the **Command** column in the Commands Log.
- **Reason** - A comment associated with the command. Entered by the User when the command was issued (created). The **Reason** column in the Communications Log mirrors the **Command Reason** column in the Commands Log.
- **Error Type** - The type (name) of error that was reported.

Clicking on the red triangle  icon at the left end of each row in the Communications Log brings up any additional data sent with the telemetry broadcast.

The icon at the left end of each row in the Communications Log indicates if the row contains telemetry or command data:

- The  icon indicates telemetry data. If you click on the icon a Parsed Output Form containing additional information about the telemetry will open.
- The  icon indicates command data. If you click on the icon, a Command Form containing additional information about the command will open.
- The  icon indicates error data. If you click on the icon, an Error Form containing additional information about the error will open.

Commands Log

The Commands Log is located directly below the Communications Log on the WGMS Dashboard. The Commands Log lists:

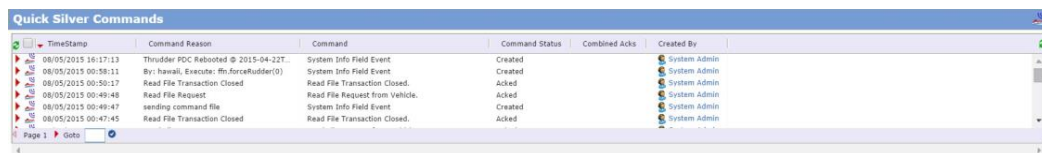
- All commands that have been sent to the selected Vehicle.
- The combined ACKs associated with each command - a combined ACK is a single ACK representing the result of all interim ACKs sent as responses to a command that was issued.
- The status of each command received from the selected Vehicle, over the time frame specified in the Position Map toolbar.



Note

The time frame for the data displayed in the Commands Log is based on the time frame settings in the **Position Map** toolbar. For information on changing the time frame see [“Specifying the Data Time Frame”](#).

Figure 4.126. Commands Log



Timestamp	Command Reason	Command	Command Status	Combined Acks	Created By
08/05/2015 16:17:13	Thruster POC Rebooted @ 2015-04-22T...	System Info Field Event	Created		System Admin
08/05/2015 00:58:11	By: hawaii, Executor: Rn:forceRudder()	System Info Field Event	Created		System Admin
08/05/2015 00:58:17	Read File Transaction Closed	Read File Transaction Closed	Acked		System Admin
08/05/2015 00:49:48	Read File Request	Read File Request from Vehicle	Acked		System Admin
08/05/2015 00:49:47	sending command file	System Info Field Event	Created		System Admin
08/05/2015 00:47:45	Read File Transaction Closed	Read File Transaction Closed	Acked		System Admin

The following command data for the selected Vehicle is displayed in the Commands Log:

- **Time Stamp** - The time when a command was sent from WGMS, or the time when the status of a command was received from the selected Vehicle.
- **Command Reason** - A comment associated with the command. Entered by the User when the command was issued (created).
- **Command** - The type of command that was issued.
- **Combined Acks** displays a single ACK representing the result of all interim ACKs sent as responses to a command that was issued.
- **Created By** - The person who originated the command.

Clicking on the red triangle  icon at the left end of each row in the Commands Log brings up any additional data associated with the command.

The  icon at the left end of each row in the Communications Log indicates if the row contains command data. If you click on the icon, a Command Form containing additional information about the command will open.

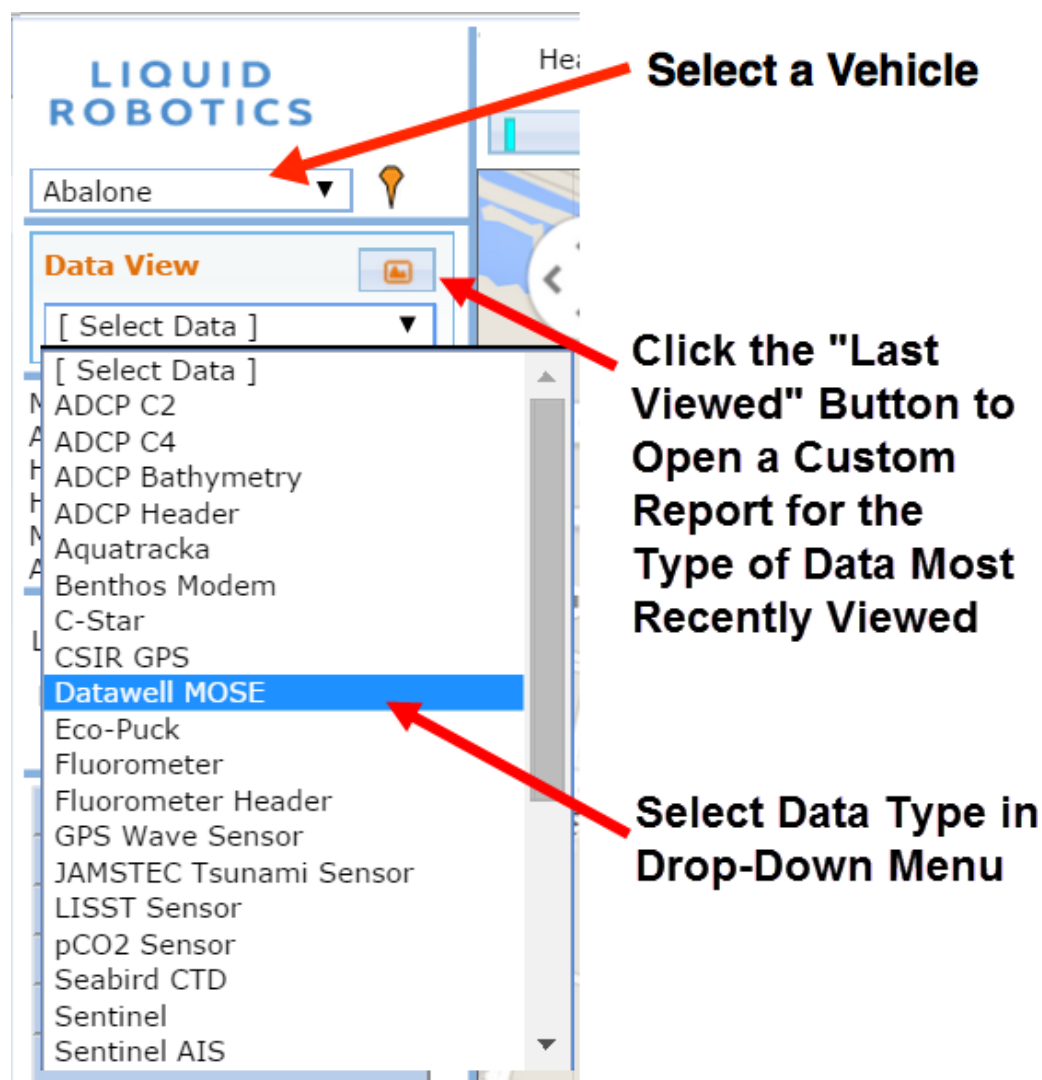
Data View Page - Custom Reports

From the WGMS Data View page you can generate custom reports to display data from Wave Glider operations in tabular, graphical, and map formats. A custom report displays data from a specific sensor or payload on a specific vehicle.

The following browsers are supported for viewing custom reports that are generated on the WGMS Data View page:

Browser	Version	Platform	Display
Internet Explorer	11	Windows	Desktop
Firefox	20.0.1 (or later)	Windows, Linux	Desktop
Safari	6.0.4 (or later)	Mac	Desktop
Safari	(latest)	iPhone and iPad with iOS 7.1 only	Mobile (iOS 7.1 and later)
Chrome	26.0.1410.64 m (or later)	Windows, Linux	Desktop
Chrome	(latest)	Android (4.0 or later), iPhone and iPad with iOS 7.1 only	Mobile

To generate a custom report, select a vehicle in the **Vehicle** drop-down menu, then click on the type of data you want to view in the **Data View** drop-down menu located in the WGMS Dashboard sidebar.

Figure 4.127. Selecting a Vehicle and a Data Type

When you click on the datatype in the **Data View** drop-down menu, the **Data View** page will open.

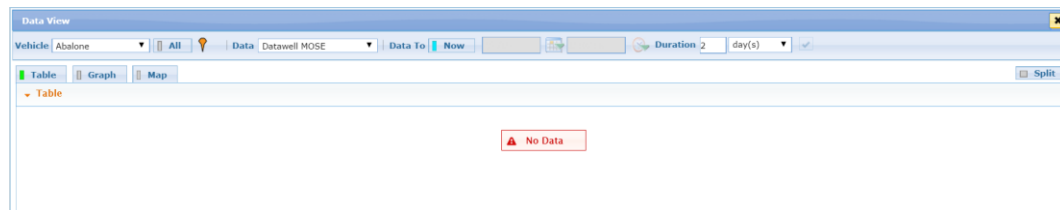
When the datatype selected in the **Data View** drop-down menu is available for the selected vehicle, an animated loading icon  appears temporarily while the data loads, then the **Data View** page displays the data in a tabular custom report format.

Figure 4.128. Data View Page

PayloadPacketRecordId	TimeStamp	Latitude	Longitude	Hs (m)	Tp (s)	Dp (deg)	Samples	Fs (Hz)	Sample Gaps
20966072	03/17/2016 22:30:00	19.9904	-155.8693	1.0258	8.6768	317.8242	7200	4.0006	0
20965986	03/17/2016 21:30:59	19.9895	-155.8621	1.0660	5.0686	0.5462	7200	4.0006	0
20965936	03/17/2016 21:00:59	19.9949	-155.8621	1.0767	5.7520	201.5117	7201	4.0006	0
20965884	03/17/2016 20:30:59	19.9937	-155.8692	1.0134	6.1678	31.4594	7200	4.0006	0
20965832	03/17/2016 20:00:58	19.9897	-155.8639	1.2611	5.3887	344.0866	7200	4.0006	0
20965780	03/17/2016 19:30:58	19.9964	-155.8640	1.0682	7.8759	219.1399	7201	4.0006	0
20965726	03/17/2016 19:00:58	19.9899	-155.8693	1.2134	5.3887	284.0953	7200	4.0006	0
20965709	03/17/2016 18:30:57	19.9931	-155.8621	1.2769	5.3887	286.2658	7200	4.0006	0
20965684	03/17/2016 18:00:57	19.9964	-155.8690	1.0167	8.6768	328.2786	7200	4.0006	0
20965670	03/17/2016 17:30:57	19.9897	-155.8649	1.1881	5.0686	330.8034	7200	4.0006	0
20965644	03/17/2016 17:00:57	19.9962	-155.8622	1.1320	6.6485	262.2353	7200	4.0006	0
20965616	03/17/2016 16:30:56	19.9927	-155.8692	1.0494	7.2103	241.3468	7200	4.0006	0
20965590	03/17/2016 16:00:56	19.9908	-155.8622	1.1832	3.9079	339.4609	7200	4.0006	0
20965569	03/17/2016 15:30:56	19.9965	-155.8646	1.1545	7.8759	29.1742	7200	4.0006	0
20965547	03/17/2016 15:00:56	19.9897	-155.8684	1.1157	7.8759	321.7948	7200	4.0006	0
20965524	03/17/2016 14:30:55	19.9928	-155.8621	1.0956	4.3019	306.3765	7200	4.0006	0
20965503	03/17/2016 14:00:55	19.9965	-155.8664	1.0711	7.8759	245.1245	7200	4.0006	0
20965484	03/17/2016 13:30:55	19.9897	-155.8672	1.0082	7.8759	305.6053	7200	4.0006	0
20965464	03/17/2016 13:00:55	19.9932	-155.8622	1.0385	4.3019	287.8408	7200	4.0006	0
20965443	03/17/2016 12:30:54	19.9964	-155.8670	1.0571	7.2103	296.0971	7201	4.0006	0

If you have used the **Data View** page previously, you can return to the customreport for the type of data you most recently viewed by clicking on the **Last Viewed** button adjacent to the **Data View** drop-down menu - the **Data View** page will open displaying the most recently viewed customreport for the selected vehicle.

If the **Data View** page opens with a red **No Data** message on a blank page, it means that you have requested a data type that the selected vehicle does not produce, or that the type of data you selected was not generated by the vehicle during the time frame that is set on the **Data View** page toolbar. An explanation of how you can change the time frame settings on the **Data View** toolbar is provided later in this section.

Figure 4.129. Data View Page - No Data Available

If you do not know which vehicles in an Organization are capable of generating the type of data you want to view, open the **Data** page in the **System Menu** sidebar and select the type of data you want to view in the **Sensor Data** menu. If any vehicle in the Organization has generated that type of data, it will appear in the list of SystemData records that are displayed. For example, in [Figure 4.130](#) you can see that the vehicle named SV3-014 generated Datavell MOSE data.

Figure 4.130. Datowell MOSE Records

Timestamp	Vehicle	Latitude(deg)	Longitude(deg)	Significant Wave...	Average Period ...	Peak Period (s)	Peak Direction (...)	Number of Spec...	Samples for
8/6/15 12:30:00	SV3-014	29.37743	-95.00808	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 12:00:00	SV3-014	29.37736	-95.00809	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 11:30:00	SV3-014	29.37743	-95.00811	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 11:00:00	SV3-014	29.37739	-95.00811	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 10:30:00	SV3-014	29.37737	-95.00808	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 10:00:00	SV3-014	29.37731	-95.00808	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 09:30:00	SV3-014	29.37736	-95.00810	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 09:00:00	SV3-014	29.37740	-95.00803	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 08:30:00	SV3-014	29.37737	-95.00807	0.0000	0.0000	0.0000	0.0000	0	0
8/6/15 08:00:00	SV3-014	29.37738	-95.00805	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 14:00:00	SV3-014	29.37737	-95.00805	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 13:30:00	SV3-014	29.37750	-95.00812	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 13:00:00	SV3-014	29.37748	-95.00813	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 12:30:00	SV3-014	29.37745	-95.00810	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 12:00:00	SV3-014	29.37736	-95.00807	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 11:30:00	SV3-014	29.37742	-95.00801	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 11:00:00	SV3-014	29.37741	-95.00811	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 10:30:00	SV3-014	29.37739	-95.00808	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 10:00:00	SV3-014	29.37739	-95.00809	0.0000	0.0000	0.0000	0.0000	0	0
8/5/15 08:30:00	SV3-014	29.37735	-95.00809	0.0000	0.0000	0.0000	0.0000	0	0
8/4/15 12:30:00	SV3-014	29.37741	-95.00806	0.0000	0.0000	0.0000	0.0000	0	0
8/4/15 11:00:00	SV3-014	29.37725	-95.00805	0.0000	0.0000	0.0000	0.0000	0	0
8/4/15 10:30:00	SV3-014	29.37733	-95.00807	0.0000	0.0000	0.0000	0.0000	0	0
8/4/15 10:00:00	SV3-014	29.37742	-95.00808	0.0000	0.0000	0.0000	0.0000	0	0
8/4/15 09:30:00	SV3-014	29.37737	-95.00806	0.0000	0.0000	0.0000	0.0000	0	0
8/4/15 09:00:00	SV3-014	29.37735	-95.00808	0.0000	0.0000	0.0000	0.0000	0	0

By looking at the data records in the **Sensor Data** menu, you can determine which vehicles in the Organization have generated which types of data, and when that data was generated. This information may make it easier for you to use the **Data View** pages successfully.

The **Data View** page has a similar format for most types of data except for the ADCP C2, and the ADCP C4 data types. For information on viewing the ADCP C2 and C4 custom reports, see “[ADCP C2 and ADCP C4 Data Display](#)”.

The toolbar at the top of the **Data View** page includes buttons and menus that allow you to select vehicles, data types and time frames:

Figure 4.131. Data View Page Toolbar



- **Vehicle Drop-Down Menu** - This menu displays the name of the vehicle that generated the data currently displayed. It can also be used to display data from a different vehicle.
- **All button** - Displays the selected type of data from all the vehicles in the WGMS Organization that generated that type of data within the selected time frame. A gray panel on the left side of the button indicates that it is **OFF**. A turquoise panel on the left side of the button indicates that it is **ON**. See **Data To Selector** (below in this list) for information on time frame settings.
- **Vehicle Icon** - This is the icon associated with the vehicle name that appears in the vehicle drop-down menu.
- **Data Type Drop-Down Menu** - This menu displays the type of data that you selected to be displayed. It can also be used to display a different data type.

- **Data To Selector** - Sets the most recent end of the data display time frame. Includes the **Now** button, a **Date Selector** and a **Time Selector**. The **Data To Selector** is used with the **Data Duration Selector** to determine the time frame for the data display.



Note

The time frame settings for the **Data View** page operate similarly to the time frame settings in the **Display Map** toolbar. For more information see [“Specifying the Data Time Frame”](#).

- **Data Duration Selector** - Determines the length of the data display time frame in minutes, hours, or days. The **Data Duration Selector** is used with the **Data To Selector** to determine the time frame for the data display.

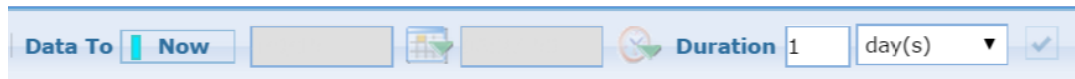


Note

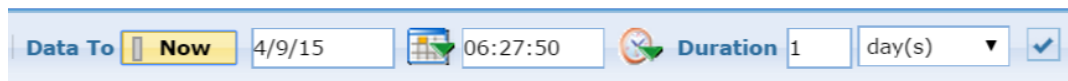
The time frame settings for the **Data View** page operate similarly to the time frame settings in the **Display Map** toolbar. For more information see [“Specifying the Data Time Frame”](#).

- **Reset Time Frame Button** - Click on this button to manually refresh the Web page after a change is made to time frame settings for the data display.

In the following example, the data that was generated over the last hour is displayed:



In the following example, the data that was generated over a one day time frame ending on 4/9/15 at 06:27:50 UTC is displayed:



Data View - Table Format

By default, the **Data View** page opens to the **Table** tab. If data is available, a tabular custom report will be generated.

Figure 4.132. Data View - Table Format

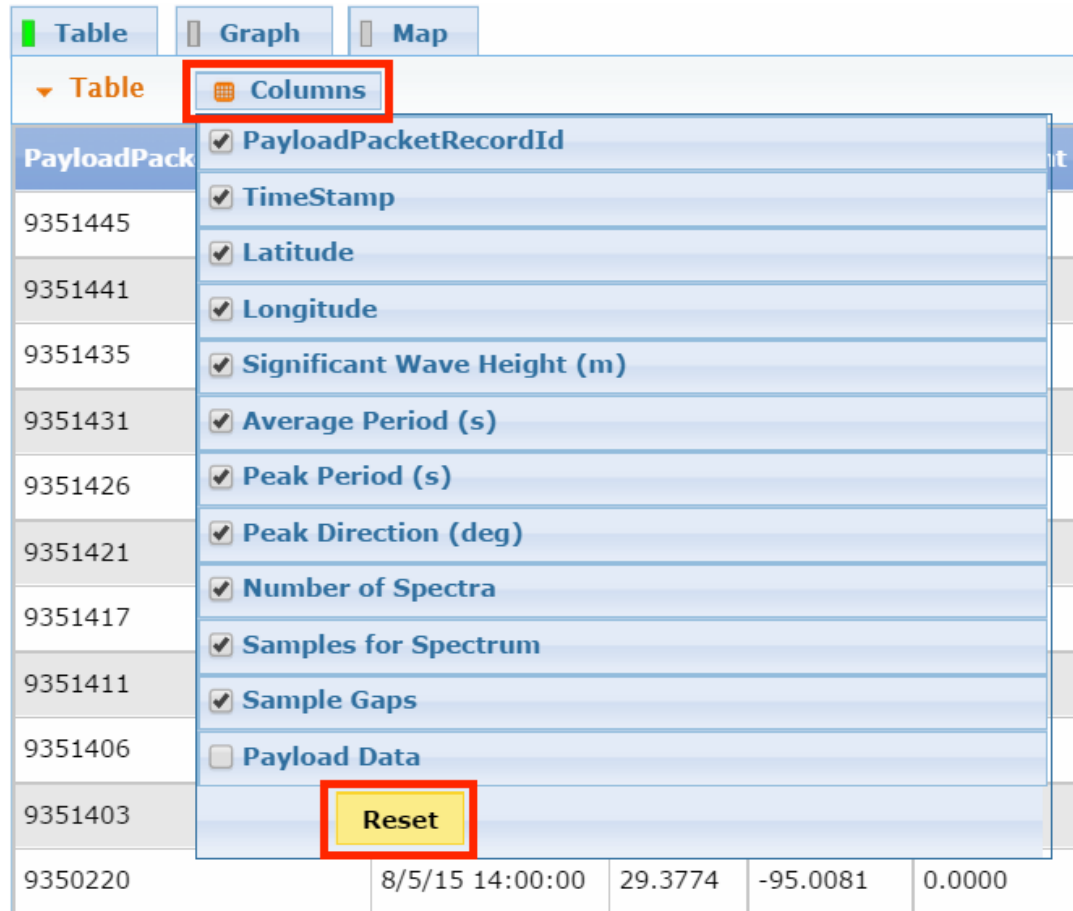
Payload/RecordId	TimeStamp	Latitude	Longitude	Significant Wave Height (m)	Average Period (s)	Peak Period (s)	Peak Direction (deg)	Number of Spectra	Samples for Spectrum	Sample Gaps
9351445	8/6/15 12:30:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351441	8/6/15 12:00:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351435	8/6/15 11:30:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351431	8/6/15 11:00:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351426	8/6/15 10:30:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351421	8/6/15 10:00:00	29.3773	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351417	8/6/15 09:30:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351411	8/6/15 09:00:00	29.3774	-95.0080	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351406	8/6/15 08:30:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9351403	8/6/15 08:00:00	29.3774	-95.0080	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350220	8/5/15 14:00:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350075	8/5/15 13:30:00	29.3775	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350069	8/5/15 13:00:00	29.3775	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350062	8/5/15 12:30:00	29.3775	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350056	8/5/15 12:00:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350049	8/5/15 11:30:00	29.3774	-95.0080	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350044	8/5/15 11:00:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350037	8/5/15 10:30:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535
9350032	8/5/15 10:00:00	29.3774	-95.0081	0.0000	0.0000	0.0000	0.0000	0	0	65535

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For some data types you will need to use the horizontal scroll bar to see all of the columns.

To limit the number of columns displayed:

1. Click on the **Columns** button - a drop-down menu listing the column names will appear with the default columns selected.
2. Un-check the check box next to each column name that you do not want displayed and that column will instantly be removed from the Custom Report.
3. To restore the columns that are selected by default, click the **Reset** button.

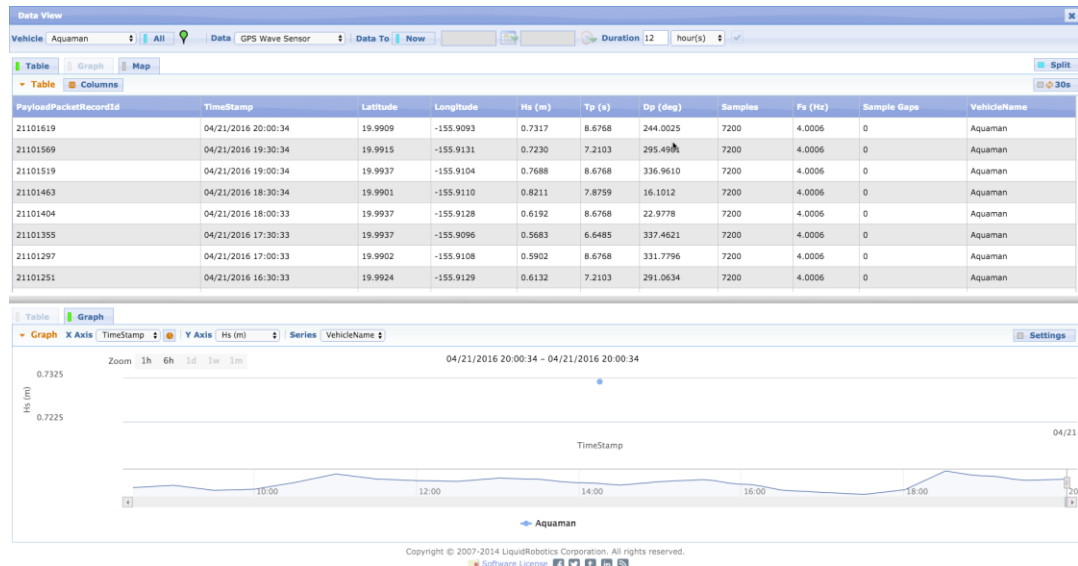
Figure 4.133. Changing the Columns that are Displayed

In the upper right-hand corner of there is a **Split** button and a **Reset** button.

Figure 4.134. Split Button and Reset Button

When you click on the **Split** button, the little box on the button turns turquoise blue and both the **Table** format and the **Graph** format of the selected data is displayed. By clicking on the **Split** button again, the little box on the button grays out and only the **Table** format is displayed. (See “[Data View - Graph Format](#)” for more information on the Graph format.)

Figure 4.135. Split Display - Table and Graph



When you click on the **Reset** button, the little box on the button turns turquoise blue and the display resets, then the numbers on the button count down from 30s (thirty seconds) to zero, and the display resets again. The display will continue to reset every 30 seconds until you click on the **Reset** button again to stop the reset cycling. The little box on the button will gray out and the display will stop resetting.

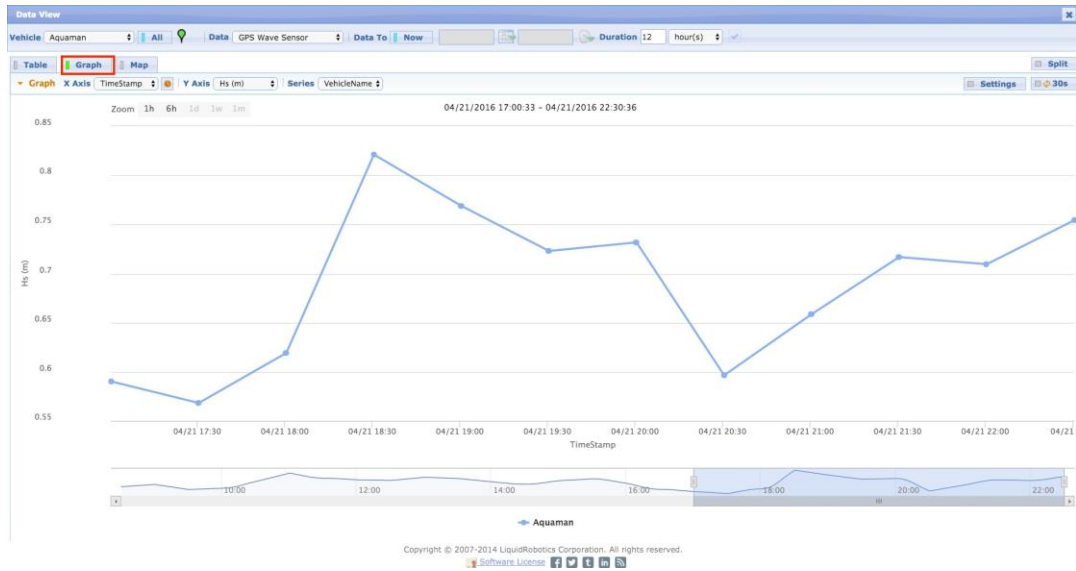


Note

The **Data View** page provides similar functionality on a tablet, but the navigation is slightly different. When using a tablet, allow extra time for custom reports to generate.

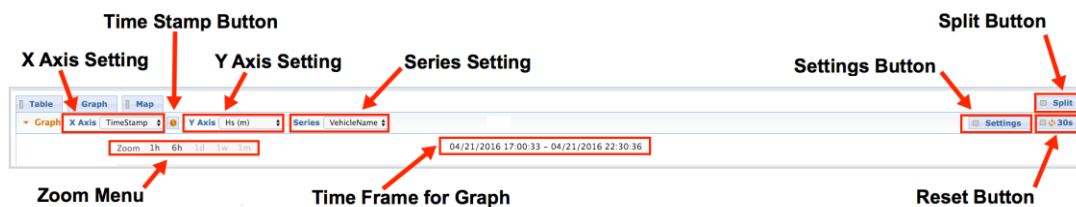
Data View - Graph Format

Click on the **Graph** tab to view the graphical data display for the selected vehicle, data type, and time frame.

Figure 4.136. Custom Reports Page - Graph Format**Note**

If all data is not displayed, it is because the dataset is too large to load all at one time. Scroll horizontally to the right to display more data.

In the **Graph** format toolbar, the selections made in the **X Axis** and **Y Axis** drop-down menus determine how the data is displayed. Displaying the **TimeStamp** on the X Axis with one of the other variables displayed on the Y Axis graphs the Y Axis data over time. This is the most widely used combination of X and Y Axis variables.

Figure 4.137. Graph Format toolbar

The **X Axis** drop-down menu lets you select from **Time Stamp**, **Hs (m)**, **Tp (s)**, **Dp (deg)**, **Samples**, **Fs (Hz)**, and **Sample Gaps** to be graphed along the X Axis.

The **Time Stamp** button adjacent to the **X Axis** drop-down menu can be used to set the X Axis to **TimeStamp** with a single click, if the X Axis is at some other setting.

The **Y Axis** drop-down menu lets you select from **Hs (m)**, **Tp (s)**, **Dp (deg)**, **Samples**, **Fs (Hz)**, and **Sample Gaps** to be graphed along the Y Axis.

**Note**

The options available in the **X Axis** and **Y Axis** drop-down menus may not always result in a useful or meaningful graph. Knowledge of the data being measured is necessary to choose X and Y Axis variables that make sense.

The **Series** drop-down menu lets you select from **Vehicle Name**, **Hs (m)**, **Tp (s)**, **Dp (deg)**, **Samples**, **Fs (Hz)**, and **Sample Gaps** for the data points that are displayed in the graph.

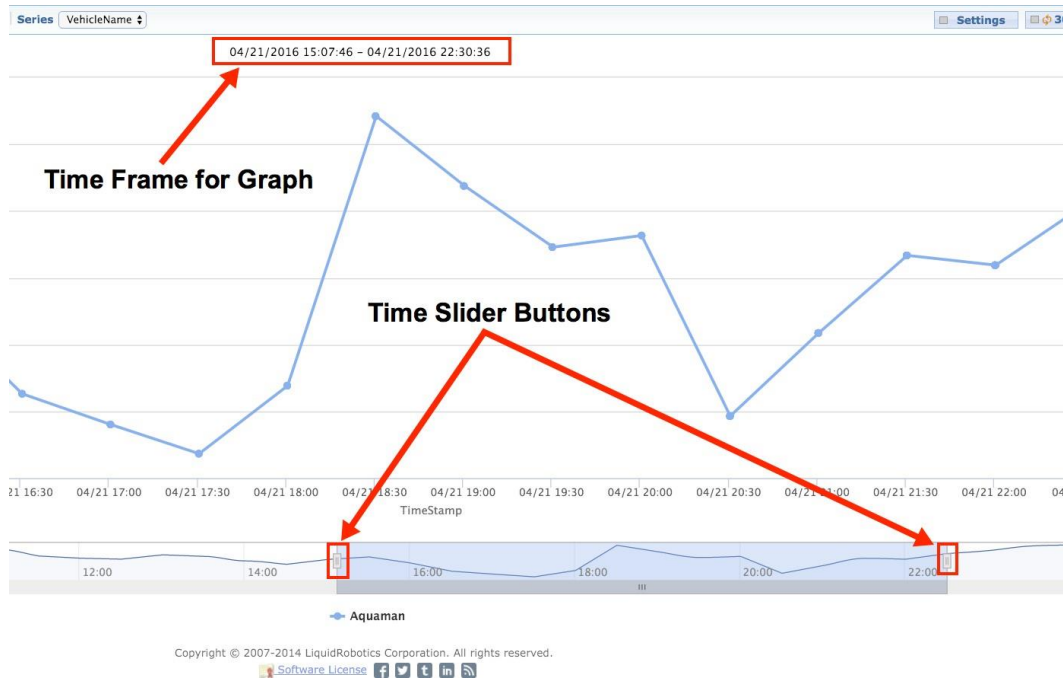
The **Settings** button opens the **Advanced** drop-down menu that is used to add or remove the line that connects the data points on the graph, and to change the time format.

The **Zoom** menu lets you quickly view the data over different time frames without changing the time frame settings for the Graph. Click on one of the selections in the **Zoom** menu to display data for the last hour, 6 hours, 1 day, 1 week, or 1 month. The **Time Slider** at the bottom of the display will adjust to indicate when the data display begins and ends.

The **Time Frame** for the graph reflects the location of the two **Time Slider** buttons.

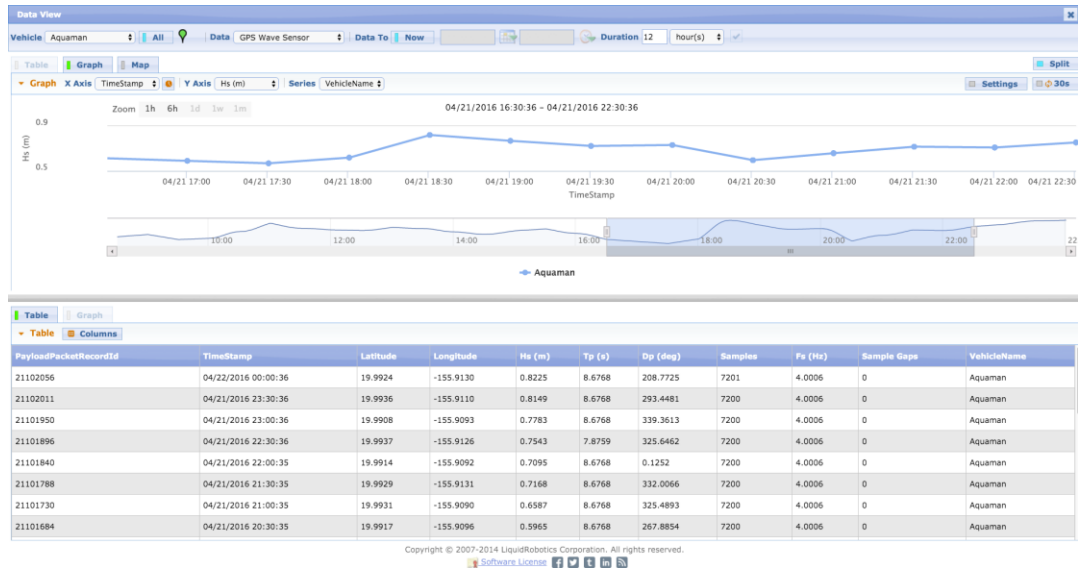
The **Time Slider** buttons in the timeline at the bottom of the **Graph** display can also be used to adjust the time range for the data display by dragging them to the left or right.

Figure 4.138. Custom Reports Page - Graph Format Time Slider



The **Split** button lets you view both the **Graph** format and the **Table** format for the selected data in the same window. When you click on the **Split** button, the little box on the button turns turquoise blue and both the **Graph** format and the **Table** format for the selected data is displayed. By clicking on the **Split** button again, the little box on the button grays out and only the **Graph** format is displayed. (See “[Data View - Table Format](#)” for more information on the **Table** format.)

Figure 4.139. Split Display - Graph and Table



The **Reset** button controls when the display will refresh. When you click on the **Reset** button, the little box on the button turns turquoise blue and the display resets, then the numbers on the button count down from 30s (thirty seconds) to zero, and the display resets again. The display will continue to reset every 30 seconds until you click on the **Reset** button again to stop the reset cycling. The little box on the button will gray out and the display will stop resetting.

Data View - Map Format

For information on the Data View Map Format contact the Liquid Robotics Support Organization.

Figure 4.140. Data View - Map Format



ADCP C2 and ADCP C4 Data Display

The WGMS CustomReport for the Wave Glider integrated Teledyne RD Instruments Workhorse Monitor ADCP displays C2 data in a Table format, a Graph format, and a Bin Map format. C4 data is displayed in Table and Graph formats only. The Table and Graph formats for ADCP C2 data are the same for ADCP C4 data. The WGMS CustomReport display for all other data types, including ADCP Bathymetry and ADCP Header data, is described in “[Data View Page - CustomReports](#)”

The following browsers are supported:

Browser	Version	Platform	Display
Internet Explorer	11	Windows	Desktop
Firefox	20.0.1 (or later)	Windows, Linux	Desktop
Safari	6.0.4 (or later)	Mac	Desktop
Safari	(latest)	iPhone and iPad with iOS 7.1 only	Mobile (iOS 7.1 and later)
Chrome	26.0.1410.64 m (or later)	Windows, Linux	Desktop
Chrome	(latest)	Android (4.0 or later), iPhone and iPad with iOS 7.1 only	Mobile

This section explains the ADCP C2 and C4 **Table** format, **Graph** format, and **Bin Map** format displays. ADCP C2 and C4 customreports are generated using the same procedure that is used to generate all other customreports, for more information see: “[Data View Page - CustomReports](#)”

ADCP C2 and C4 Table Format

The CustomReport for ADCP C2 and C4 data displays the **Table** format by default, as illustrated in [Figure 4.141](#)



Note

The CustomReport page provides similar functionality on a tablet, but the navigation is slightly different. When using a tablet, allow extra time for CustomReport pages to generate.

Figure 4.141. Custom Reports Page - ADCP Table Format

	21104398	21104363	21104341	21104307	21104287	21104251	21104228	21104192	21104172	21104135
PayloadPacketRecordId	21104398	21104363	21104341	21104307	21104287	21104251	21104228	21104192	21104172	21104135
Timestamp	04/22/2016 21:43:06	04/22/2016 21:27:06	04/22/2016 21:11:06	04/22/2016 20:55:06	04/22/2016 20:39:06	04/22/2016 20:23:06	04/22/2016 20:07:06	04/22/2016 19:51:06	04/22/2016 19:35:06	04/22/2016 19:19:06
Latitude	20.0381	20.0371	20.0363	20.0311	20.0257	20.0279	20.0280	20.0235	20.0225	20.0175
Longitude	-155.8702	-155.8669	-155.8625	-155.8662	-155.8664	-155.8666	-155.8619	-155.8619	-155.8667	-155.8674
Bin Size (m)	1	1	1	1	1	1	1	1	1	1
Bin 1 Depth (m)	2.1200	2.1200	2.1200	2.1200	2.1200	2.1200	2.1200	2.1200	2.1200	2.1200
Bin 1 Mag (mm/s)	131.0153	191.8020	177.5387	156.0288	110.4943	102.5280	78.7210	34.2053	82.5651	122.5439
Bin 1 Dir (Degrees True)	305.9952	309.4996	337.4794	322.0284	291.2237	290.556	295.5885	307.875	163.1014	152.8076
Bin 2 Depth	3.1200	3.1200	3.1200	3.1200	3.1200	3.1200	3.1200	3.1200	3.1200	3.1200
Bin 2 Mag	178.0365	199.0100	193.0518	168.5052	128.7866	149.1643	123.5678	63.9531	82.4924	124.3101
Bin 2 Dir	295.2696	307.4457	327.0508	312.1136	283.9283	293.2995	293.8683	296.9657	149.3936	171.6743
Bin 3 Depth	4.1200	4.1200	4.1200	4.1200	4.1200	4.1200	4.1200	4.1200	4.1200	4.1200
Bin 3 Mag	208.2402	210.6395	196.4001	158.0032	145.5232	154.0292	115.3170	72.0902	83.2406	118.9285
Bin 3 Dir	286.1722	310.5718	323.0718	306.5073	278.2971	293.7359	291.8937	293.7204	163.9601	160.3462
Bin 4 Depth	5.1200	5.1200	5.1200	5.1200	5.1200	5.1200	5.1200	5.1200	5.1200	5.1200
Bin 4 Mag	89.2693	323.6603	181.2015	252.6025	205.8470	264.9396	164.4384	87.0517	56.0892	42.0119
Bin 4 Dir	347.0535	282.4904	15.0333	349.0459	321.9053	276.9372	311.0548	88.0251	11.3099	1.3639
Bin 5 Depth	6.1200	6.1200	6.1200	6.1200	6.1200	6.1200	6.1200	6.1200	6.1200	6.1200
Bin 5 Mag	358.6210	572.8499	513.3585	628.1720	430.2488	501.0908	398.6477	454.0595	372.4648	339.8485
Bin 5 Dir	69.0887	265.3942	58.1366	23.0549	351.0412	260.3497	336.6504	93.9148	5.083	8.6308
Bin 6 Depth	7.1200	7.1200	7.1200	7.1200	7.1200	7.1200	7.1200	7.1200	7.1200	7.1200

The ADCP Table format is a rotated table. The table header is the left column. Data is displayed in descending chronological order, from left-to-right. Scrolling to the right will automatically load more data. The table body also scrolls vertically to reveal all rows.

The toolbar at the top of the **Data View** page includes buttons and menus that allow you to select vehicles, data types and time frames:

Figure 4.142. Data View Page Toolbar

- **Vehicle Drop-Down Menu** - This menu displays the name of the vehicle that generated the data currently displayed. It can also be used to display data from a different vehicle.
- **All** button - Displays the selected type of data from all the vehicles in the WGMS Organization that generated that type of data within the selected time frame. A gray panel on the left side of the button indicates that it is **OFF**. A turquoise panel on the left side of the button indicates that it is **ON**. See **Data To Selector** (below in this list) for information on time frame settings.
- **Vehicle Icon** - This is the icon associated with the vehicle name that appears in the vehicle drop-down menu.
- **Data Type Drop-Down Menu** - This menu displays the type of data that you selected to be displayed. It can also be used to display a different data type.
- **Data To Selector** - Sets the most recent end of the data display time frame. Includes the **Now** button, a **Date Selector** and a **Time Selector**. The **Data To Selector** is used with the **Data Duration Selector** to determine the time frame for the data display.



Note

The time frame settings for the **Data View** page operate similarly to the time frame settings in the **Display Map** toolbar. For more information see [“Specifying the Data Time Frame”](#).

- **Data Duration Selector** - Determines the length of the data display time frame in minutes, hours, or days. The **Data Duration Selector** is used with the **Data To Selector** to determine the time frame for the data display.

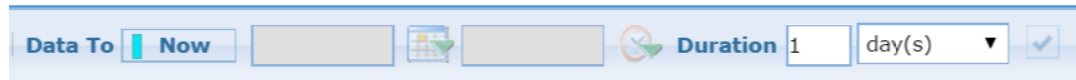


Note

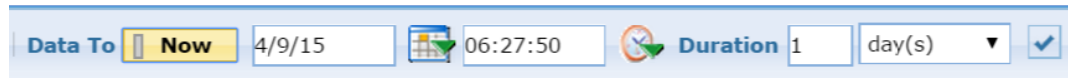
The time frame settings for the **Data View** page operate similarly to the time frame settings in the **Display Map** toolbar. For more information see [“Specifying the Data Time Frame”](#).

- **Reset Time Frame Button** - Click on this button to manually refresh the Web page after a change is made to time frame settings for the data display.

In the following example, the data that was generated over the last hour is displayed:



In the following example, the data that was generated over a one day time frame ending on 4/9/15 at 06:27:50 UTC is displayed:

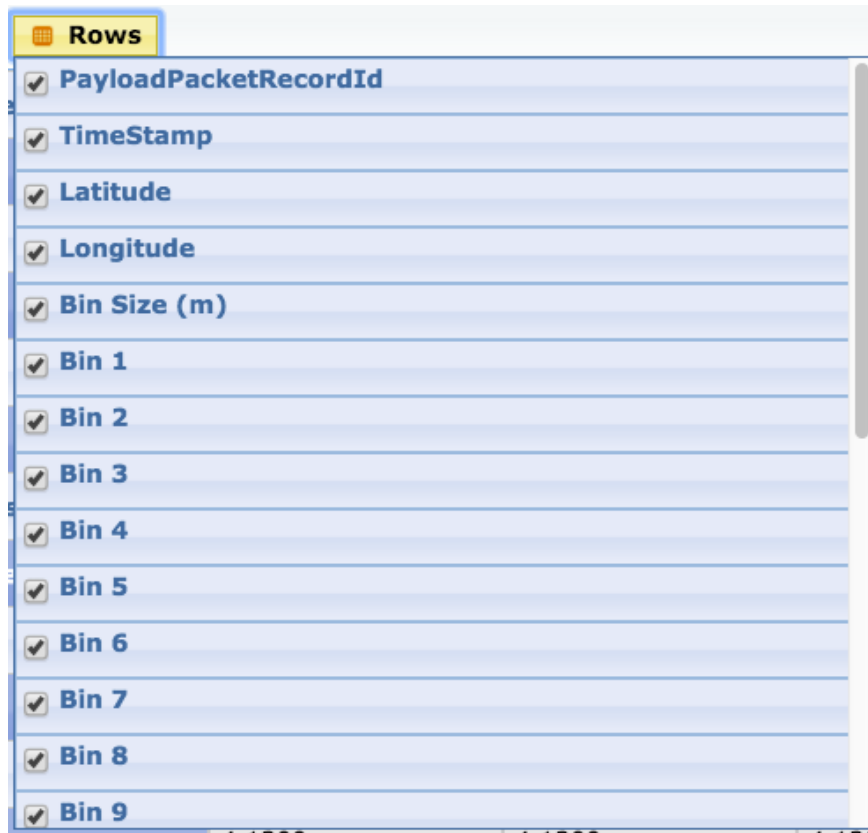


The ADCP Table format toolbar located at the top of the table includes **Rows** and **Settings** menus that allow you to modify the data that will be displayed in the table.

Figure 4.143. ADCP C2 and C4 Table Format toolbar

ADCP Table										Split
ADCP Table										Settings 30s
PayloadPacketRecordId	21104398	21104363	21104341	21104307	21104287	21104251	21104228	21104192	21104172	21104135
TimeStamp	04/22/2016 21:43:06	04/22/2016 21:27:06	04/22/2016 21:11:06	04/22/2016 20:55:06	04/22/2016 20:39:06	04/22/2016 20:23:06	04/22/2016 20:07:06	04/22/2016 19:51:06	04/22/2016 19:35:06	04/22/2016 19:19:06
Latitude	20.0381	20.0371	20.0363	20.0311	20.0257	20.0279	20.0280	20.0235	20.0225	20.0175
Longitude	-155.8702	-155.8669	-155.8625	-155.8662	-155.8664	-155.8666	-155.8619	-155.8619	-155.8667	-155.8674

- Click on the **Rows** button to display a drop-down menu listing every row in the ADCP Table. Un-checking a row removes it from the display. Re-checking a row restores it to the display. Clicking on **Reset** at the bottom of the drop-down menu will restore all of the rows in the ADCP Table. Clicking anywhere outside of the drop-down menu will collapse it.

Figure 4.144. Rows Drop-Down Menu

- Click on the **Settings** button to access the **Bins** and **Magnitude** settings menus.

Figure 4.145. Settings: Bins and Magnitude Menus

The screenshot shows a settings window with a 'Settings' button highlighted by a red rectangle. Below it, the 'Advanced' section is expanded, showing 'Bins' set to 20 and 'Magnitude' set to mm/s. There are also 'Split' and '30s' buttons at the top right, and an 'Ok' button at the bottom right.

Use the **Bins** menu to limit the number of Bins that are displayed in the ADCP Table.

Use the **Magnitude** menu to set the units for the **Bin Mag** rows in the ADCP Table. The options are **mm/s**, **m/s**, or **Knots**. When you change the **Magnitude** setting, the ADCP Table regenerates with the selected units of magnitude.

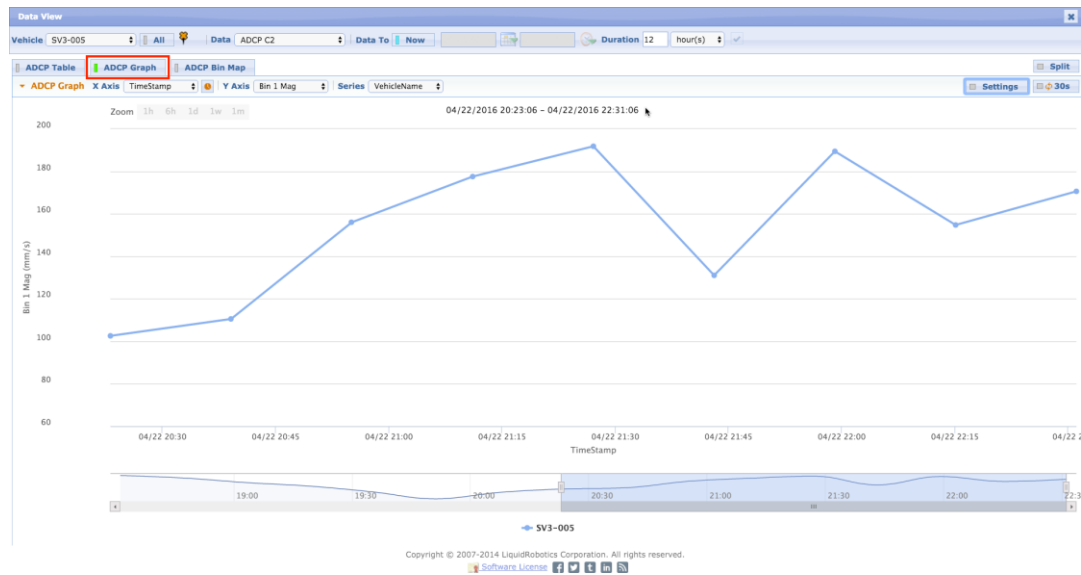
- The compass icons  in the Bin Mag rows of the ADCP Table are accurate to within 10 degrees of the direction the red end of the icon is pointing toward.

Figure 4.146. Compass Icons

Bin 1 Mag (mm/s)	21.0950 	35.3553 	36.0555 	58.2151 	12.0416 
Bin 1 Dir (Degrees True)	148.5704	81.8699	199.4400	355.0729	228.3665
Bin 2 Depth	10.2400	10.2400	10.2400	10.2400	10.2400
Bin 2 Mag	217.5132 	50.4777 	135.2072 	270.9336 	374.9587 

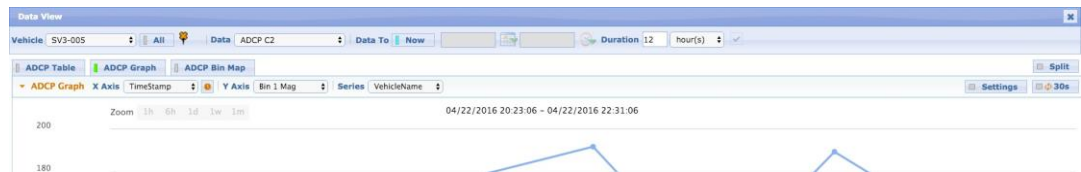
ADCP C2 and C4 Graph Format

Click on the **ADCP Graph** tab to view a graphical display of C2 or C4 data for the selected vehicle.

Figure 4.147. Data View - ADCP Graph Format**Note**

If all data is not displayed, it is because the dataset is too large to load all at one time. Scroll horizontally to the right to display more data.

The ADCP Graph format toolbar located at the top of the graph includes **X Axis**, **Y Axis** and **Series** drop-down menus and **Settings**, **Split**, and **Reset** buttons that allow you to modify the data display.

Figure 4.148. ADCP C2 and C4 Graph Format Toolbar

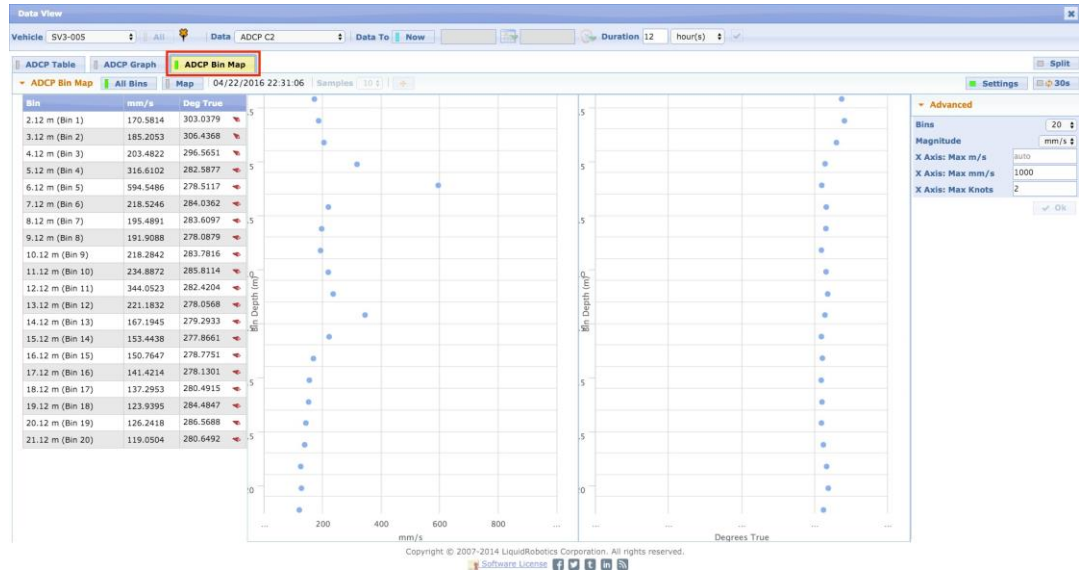
The buttons and menus in the ADCP Graph format toolbar operate the same as the buttons and menus in the Graph format toolbar for other data types. The difference is in the variables you can select in the **X Axis**, **Y Axis**, and **Series** menus, and in the settings you can modify when you use the **Settings** button to open the **Advanced** settings menu. For more information see “[Data View - Graph Format](#)”.

**Note**

The options available in the **X Axis** and **Y Axis** drop-down menus may not always result in a useful or meaningful graph. Knowledge of the data being measured is necessary to choose X and Y Axis variables that make sense.

ADCP C2 Bin Map Format

The CustomReport for ADCP C2 data includes a **Bin Map** option. Click on the **Bin Map** tab to view the ADCP C2 Bin Map display.

Figure 4.149. Data View - ADCP C2 Bin Map Format

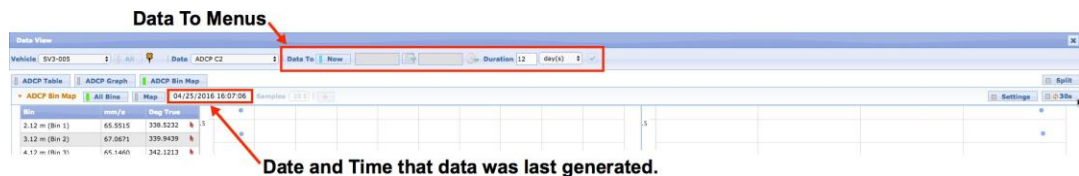
The ADCP C2 Bin Map format has two modes: **All Bins** mode and **Map** mode. All Bins is the default mode when you select the ADCP Bin Map data format.

All Bins Mode

The ADCP Bin Map format opens with the **All Bins** mode selected for the date and time set in the **Data To** menu. It is automatically updated every 120 seconds and will redraw itself only if new data is found.

If no data was generated during the time frame displayed in the **Data To** menu, the display will be empty.

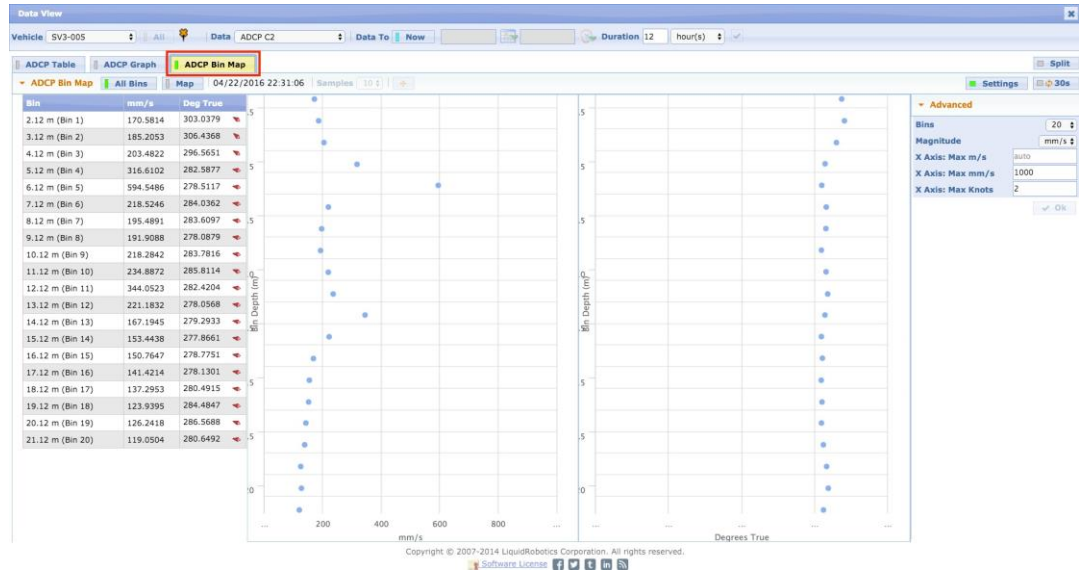
The date and time that data was last generated is displayed in the Bin Map toolbar.

Figure 4.150. Date and Time of Bin Map Data

Entering a time frame in the **Data To** menu that includes the date and time that data was last generated (or some time frame when data is known to have been generated) will populate the Bin Map display with that data.

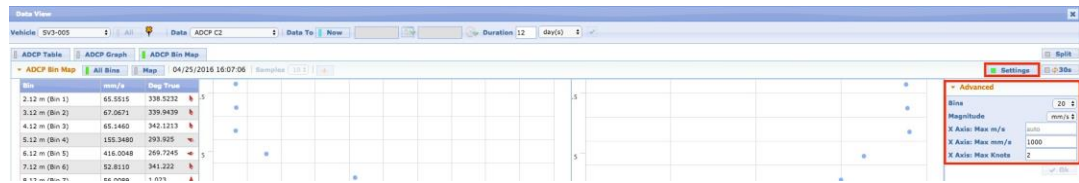
All Bins mode displays a Bin Depth table with two charts to the right of it. One chart displays bin depth relative to speed (in mm/s or Knots). The other chart displays bin depth relative to compass degrees true.

Figure 4.151. ADCP C2 Bin Map Format - All Bins Mode



The **Settings** button on the **All Bins** toolbar opens the **Advanced** window with drop-down menus where you can set the number of Bins and the Magnitude. Bins can be set to as few as 1, up to a maximum of 100. The default setting is 20. Magnitude sets the speed relative to Bin Depth to mm/s or Knots. The default setting is mm/s. There are also three settings to modify the X Axis.

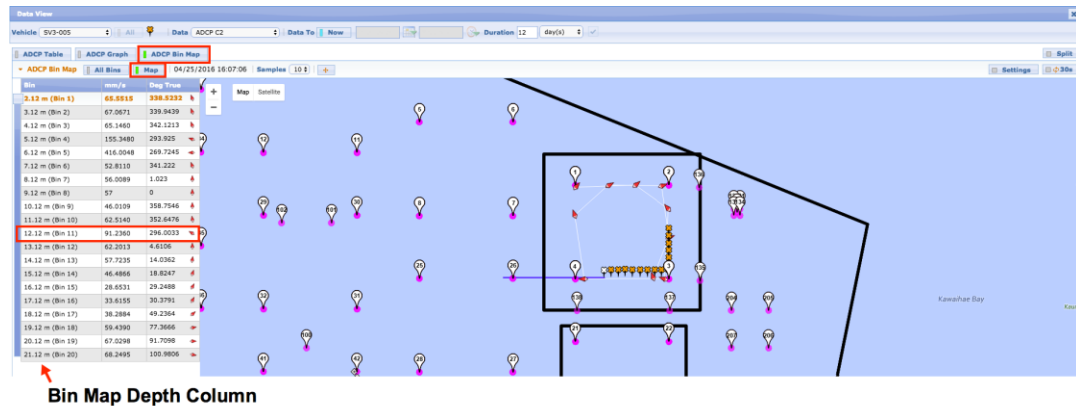
Figure 4.152. Settings Button - All Bins Mode Toolbar



The **Split** and **Reset** buttons on the **All Bins** toolbar work similarly to the **Split** and **Reset** buttons for all other Data View formats. See “Data View - Table Format” for more information.

Map Mode

Click on the **Map** button to display the Map mode.

Figure 4.153. Data View - ADCP C2 Bin Map - Map Mode with Data

Map mode displays the same Bin depth column that appears in **All Bins** mode. When you click on a row in the Bin depth column, the compass icons locating the ADCP data points associated with that row appear on a world map in the adjacent Map panel. The number of data points displayed depends on the setting in the **Samples** drop-down menu in the **Map** mode toolbar. The default setting is 10. The range is from 1 to 20.

Figure 4.154. Map Mode Toolbar

The date and time when data was last generated is displayed in the **Map** mode toolbar.

You can adjust the number of samples displayed by changing the setting in the **Samples** drop-down menu. The default setting is 10.

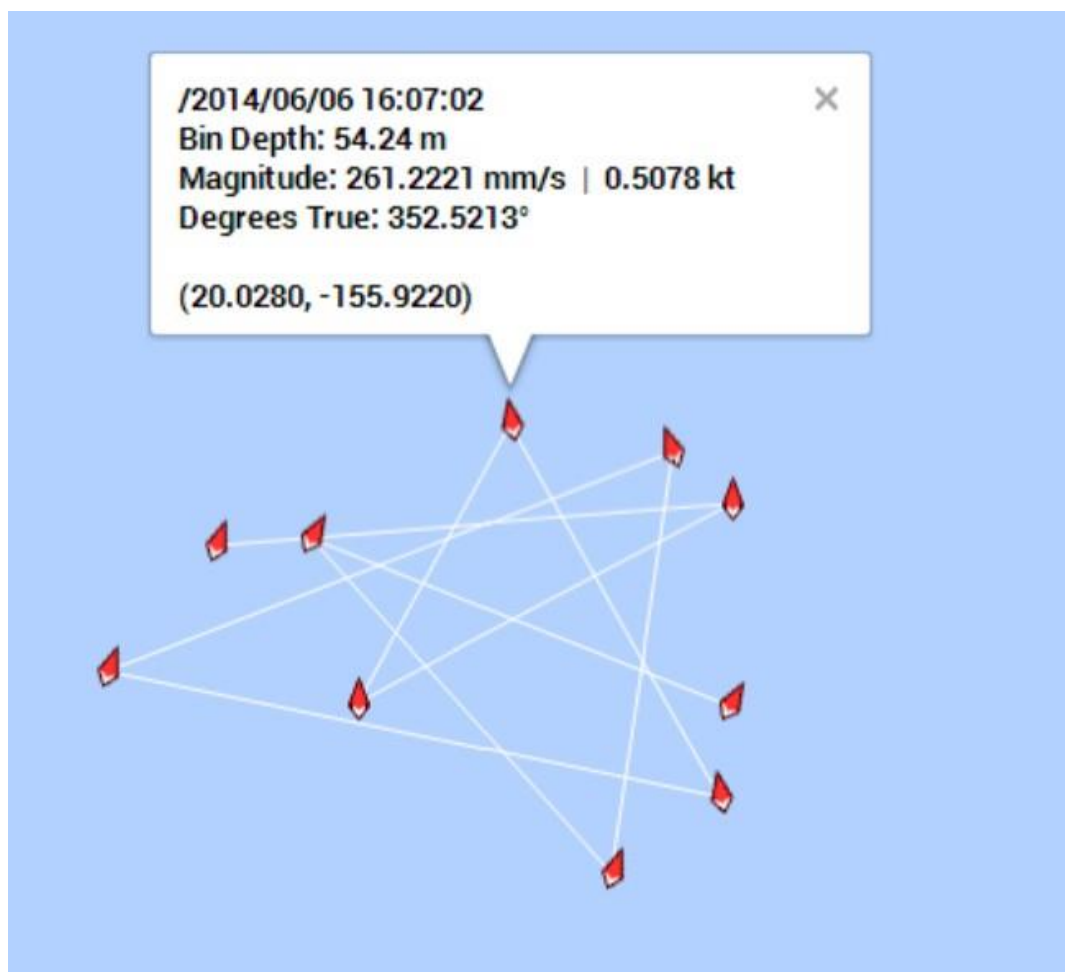
If you drag the map to a different position, or change the scale, you can use the **Recenter** button



to center the map on the data points selected in the Bin depth column.

The **Settings** button on the **Map** toolbar opens a window with drop-down menus where you can set the number of Bins and the Magnitude. Bins can be set to as few as 1, up to a maximum of 100. The default setting is 20. Magnitude sets the speed relative to Bin Depth to mm/s or Knots. The default setting is mm/s.

The compass icons on the map are accurate to within 10 degrees of the direction the red end of the icon is pointing toward. Clicking on a compass icon will display all of the information associated with that data sample.



SV3 Commands Window

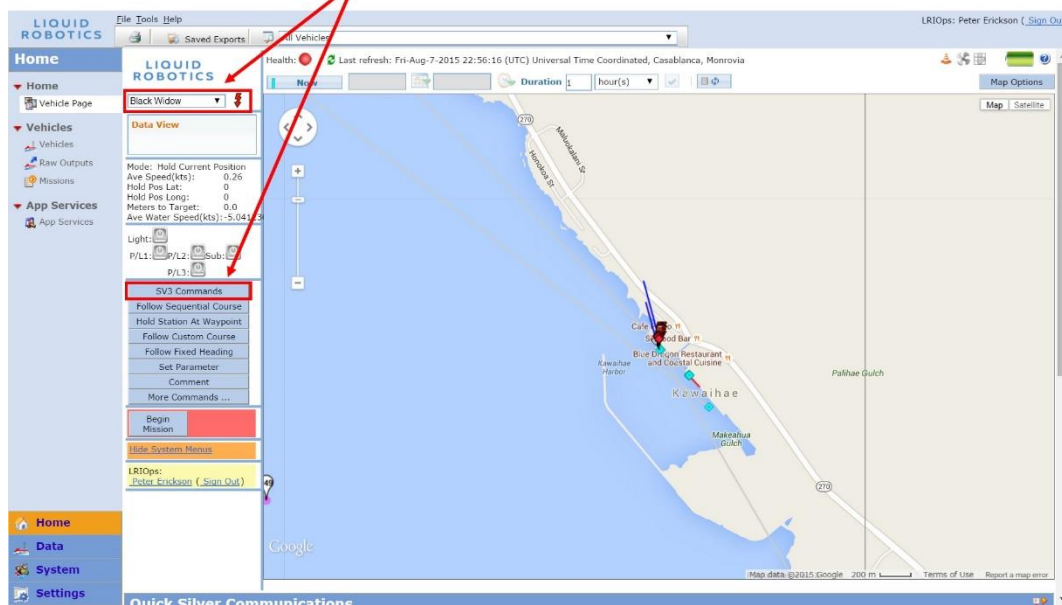


Note

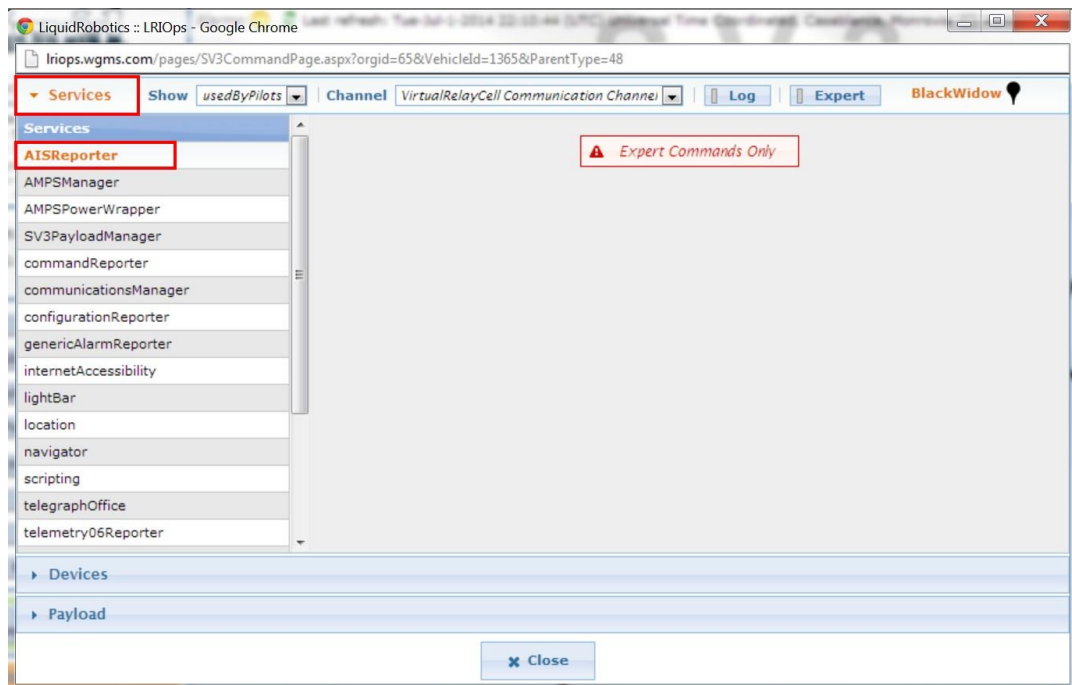
The **SV3 Commands Window** is populated dynamically based on the specific configuration of the Wave Glider SV3, the version of Regulus running, and the installed sensor suite software. On each SV3 Vehicle, Regulus generates a Configuration Manifest and a Commands Manifest. The manifests are parsed to populate the WGMS SV3 Commands Window. What you see on your system may not be identical to the information provided here. Depending on how the SV3 is configured you may see more, or fewer, command options. For more information on the manifests see *Chapter 11. Payload Development - Software Environment* in the *Wave Glider SV3 Interface Control Description*. If you have questions or concerns about any commands or features in the SV3 Commands Window, contact the Liquid Robotics Support organization - see “[Contacting Liquid Robotics](#)”.

When a Wave Glider SV3 vehicle is selected from the vehicle selection drop-down menu on the WGMS Dashboard, the **SV3 Commands** button appears in the Dashboard sidebar:

When an SV3 Vehicle is Selected, the SV3 Commands Button Appears in the Dashboard Sidebar.



Clicking on the **SV3 Commands** button opens the **SV3 Commands Window** where SV3 services, device management, and payload management commands can be executed. The **SV3 Commands Window** opens to the **Services** menu with the side tabs listed in alphabetical order. The first side tab in the **Services** menu is selected by default.



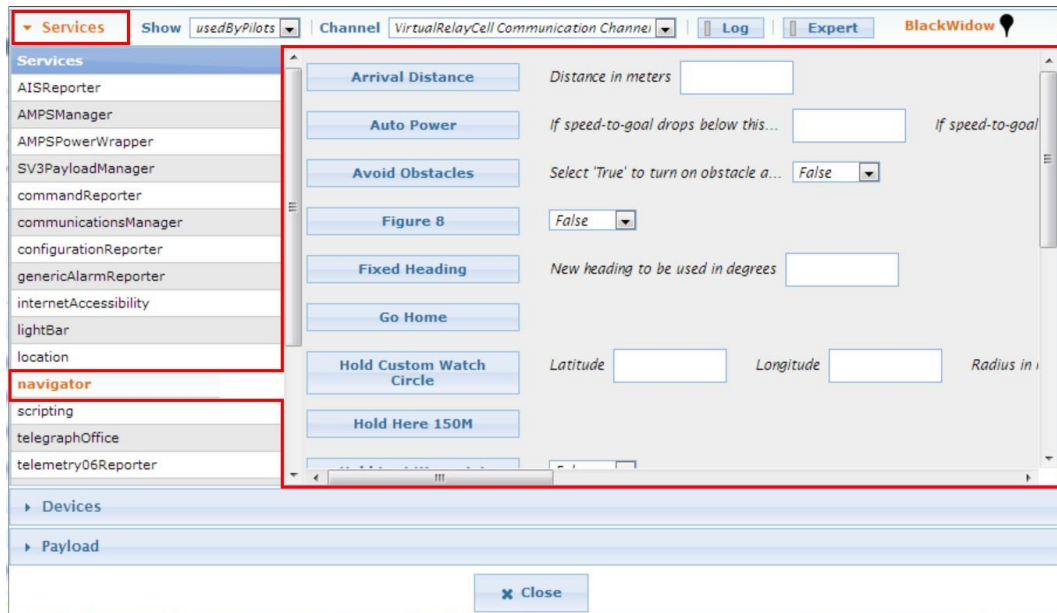
The Services menu includes tabs with piloting and management commands, as well as commands for LRI plug-ins that are installed on the Vehicle, for example the camera option.

When you click on one of the **Services** menu side tabs, the command buttons and related information for the **Services** side tab you selected will appear in the **SV3 Commands Window**.



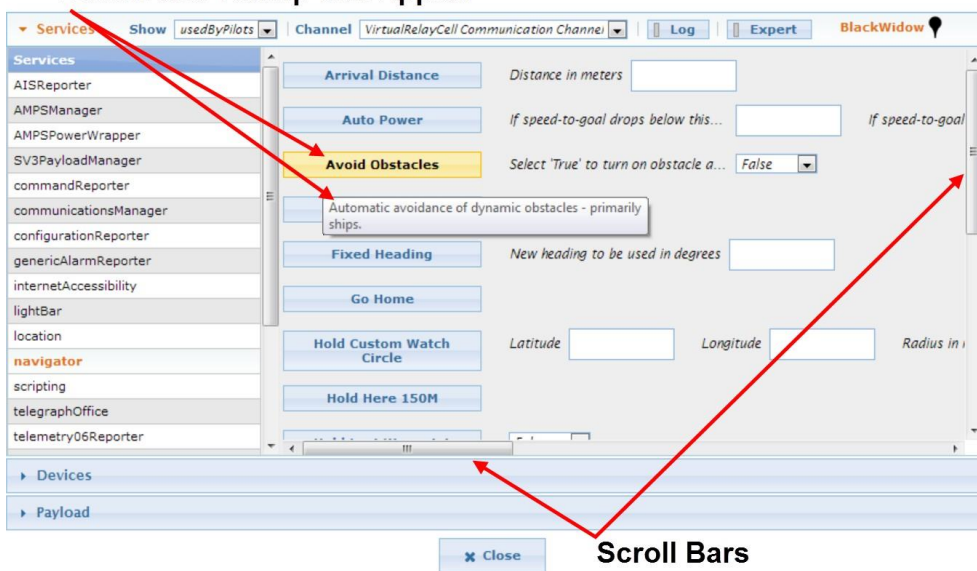
Note

Depending on the browser you are using, if the local browser zoom is not set at 100%, the command buttons may not appear when you click on a side tab.



When you move your cursor over a command button, the button will turn yellow and a tooltip for that command will appear. Depending on which command you are looking at, there may also be fields or drop-down menus for entering or selecting parameters.

Hover Cursor Over Command Button and Tooltip Will Appear

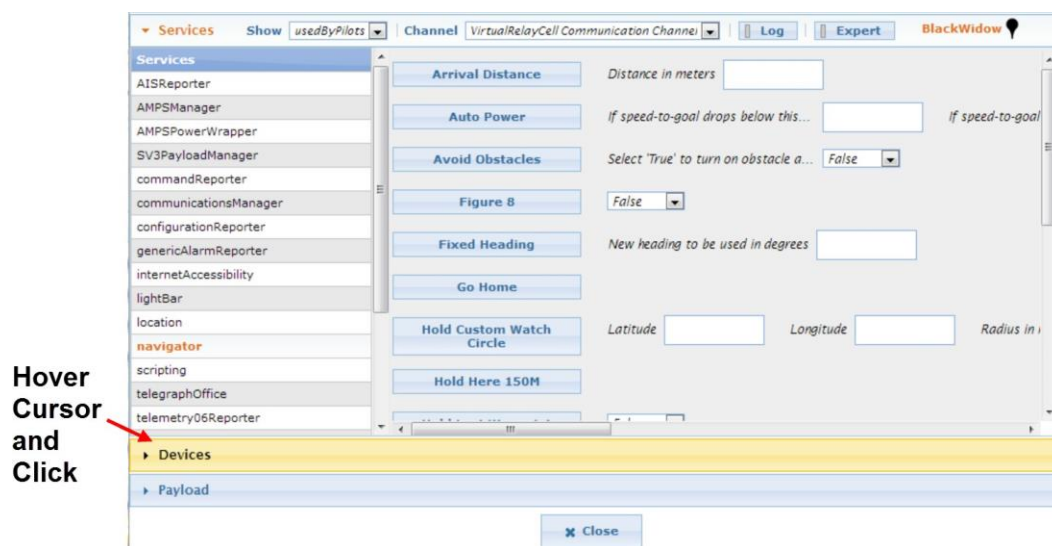


If the information in the side tab you select exceeds the length or width of the display, there will be vertical and horizontal scroll bars available so you can scroll to see all of the command information.

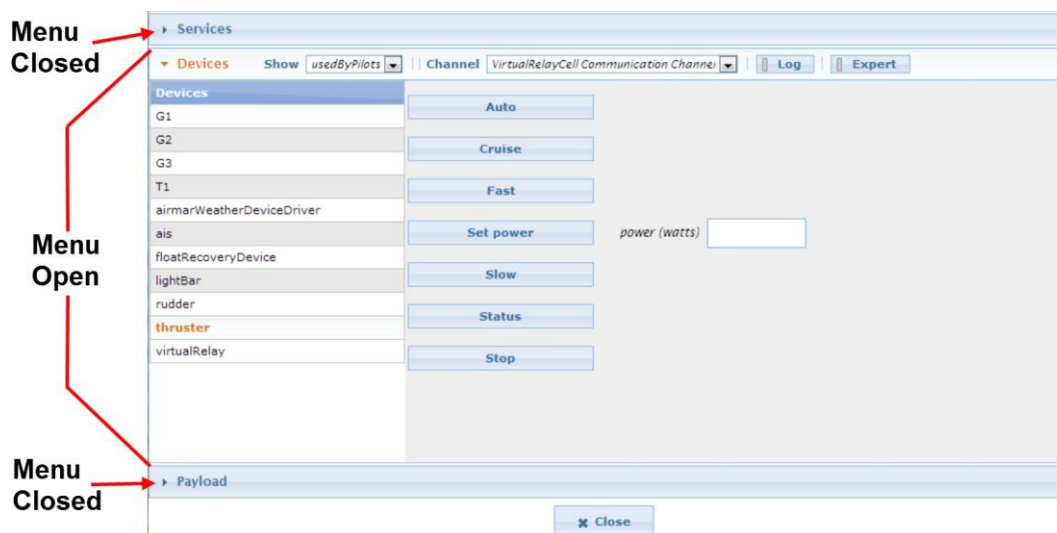
In addition to the **Services** menu, the **SV3 Commands Window** has two other menus that function similarly:

- **Devices** - This menu provides easy access to commands that are associated with SV3 devices that are registered with Regulus.
- **Payload** - This menu provides easy access to commands that are associated with SV3 payloads that are registered with Regulus.

To open a menu in the SV3 Commands Window, hover your cursor over the unopened menu bar to highlight it, then click.

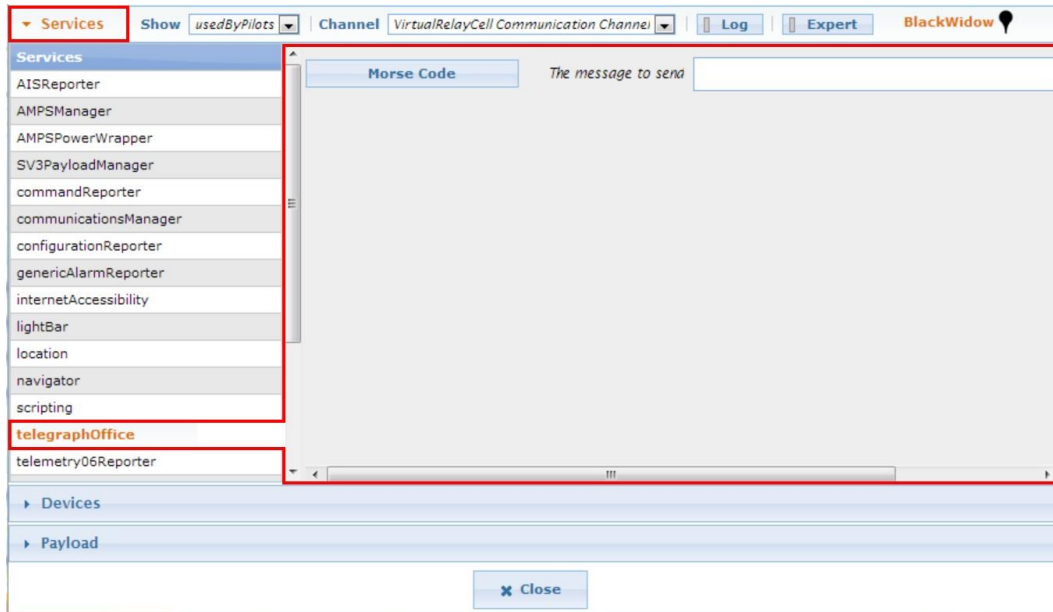


The selected menu will open and the other menus will be closed.



When you click on a side tab in any of the SV3 Command Window menus, the commands associated with that side tab will be displayed. For example, if you are viewing the **navigator** side tab in the

Services menu and you click on the **telegraphOffice** side tab, the commands associated with the **telegraphOffice** side tab will be displayed.

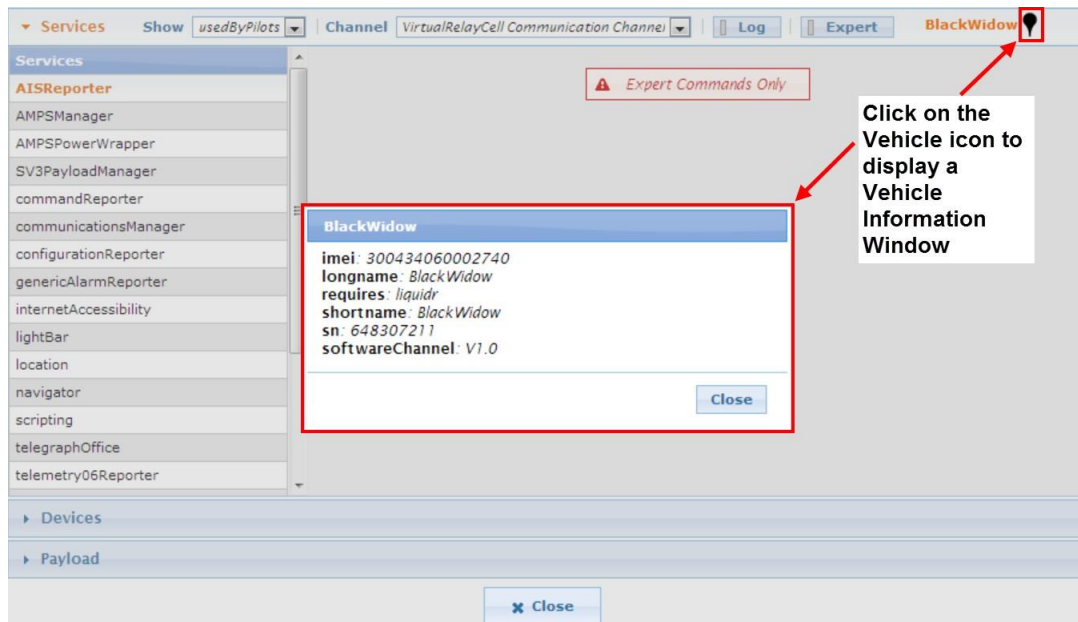


The **Services**, **Devices**, and **Payload** menus in the SV3 Commands Window all have the same toolbar:



The name of the menu that is currently open is displayed in orange lettering on the left side of the toolbar, and the name of the SV3 Vehicle you are interacting with is displayed in orange lettering on the right side of the toolbar, along with its icon.

Click on the Vehicle icon next to the Vehicle name to open a Vehicle Information window that displays the Vehicle IMEI and serial number along with other vehicle-specific information.

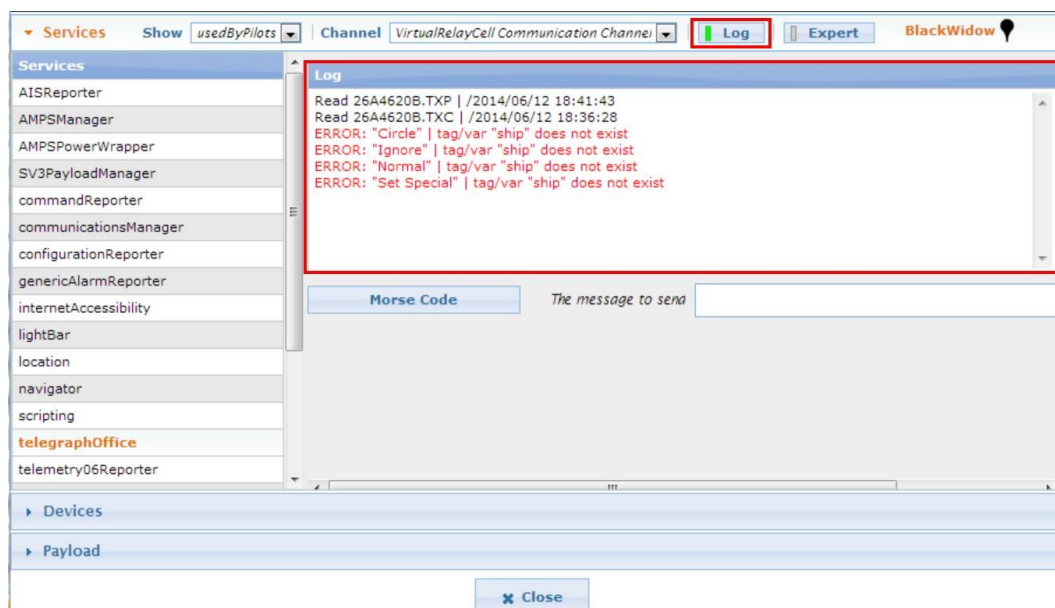


The **Show** drop-down menu allows you to select **usedByPilots** or **All**:

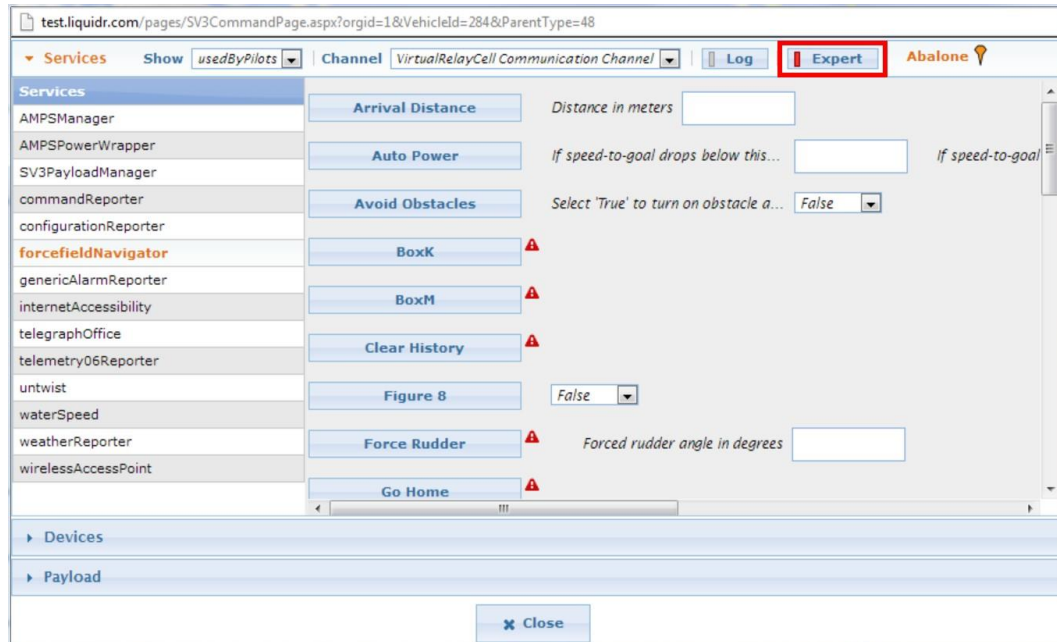
- When **usedByPilots** is selected, the side tabs that are typically used by Pilots are displayed.
- When **All** is selected, all available side tabs are displayed.

The **Channel** drop-down menu is used to select the communications channel you want to use to send commands and receive telemetry from the SV3 Vehicle.

The **Log** button can be toggled to display a log of all SV3 command activity, or to hide it. A vertical green bar appears on the **Log** button when the log is displayed. The vertical bar is grayed-out when the log is hidden. Use the log to verify command status.



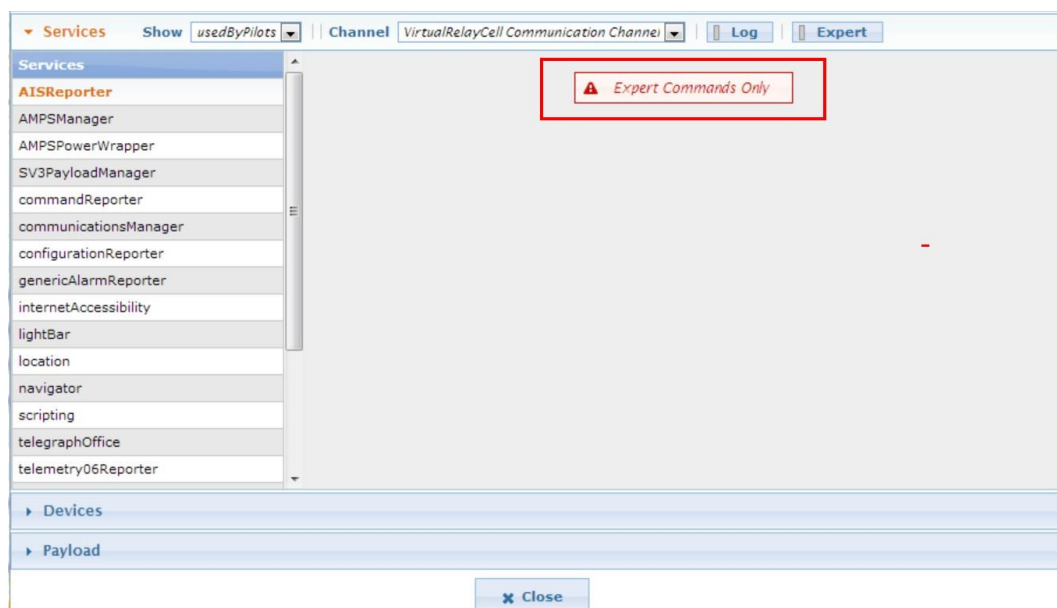
The **Expert** button can be toggled to display expert level commands in addition to standard commands:



Caution

Expert commands should not be issued without first learning about the possible outcomes, which could include putting the vehicle at risk. Contact the Liquid Robotics Support Organization for information on SV3 expert commands.

A vertical red bar appears on the **Expert** button when the expert commands are displayed and a red caution icon appears next to each expert command. The vertical bar is grayed-out when the expert commands are hidden. If a side tab includes only expert level commands and the **Expert** button is not activated (the vertical bar is grayed-out), an **Expert Commands Only** notice will appear in the SV3 Commands Window:

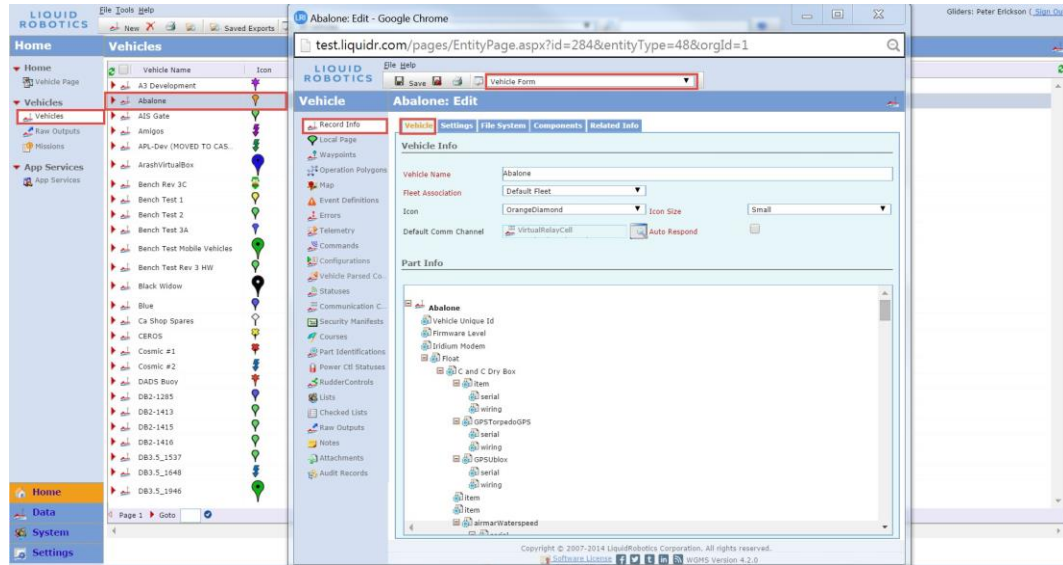


SV3 AMPS Modules Status Information

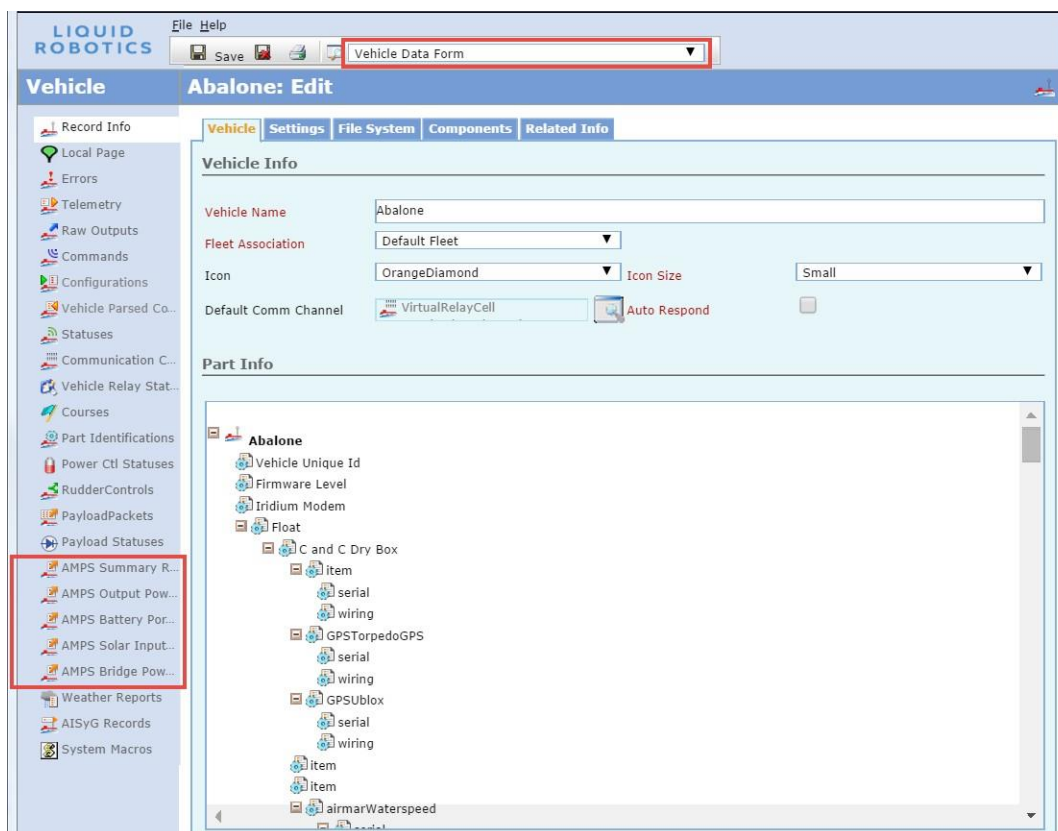
The status of the SV3 AMPS modules for each SV3 vehicle can be accessed when the Vehicle Data Form is selected:

1.

From the **Vehicles** page, click on the  icon adjacent to the vehicle name and the **Vehicle Form** will open to the **Record Info** side tab with the **Vehicle** tab selected by default:



2. Select the **Vehicle Data Form** from the drop-down menu in the toolbar and side tabs to access AMPS status information will appear:



There are 5 AMPS status side tabs - when you select an AMPS status side tab, a window containing a chronological list of system information packet records will appear. AMPS system information is automatically updated on an hourly basis by default, or it can be updated manually by sending a **Retrieve Power Status** command using the More Commands button option on the WGMS dashboard.

• **Figure 4.155. AMPS Summary Report**

LIQUID ROBOTICS File Help

Saved Exports AMPS Summary Report Detail Options

Vehicle **Abalone System Information Packet Records**

Record Info	TimeStamp	Vehicle	Report Versi...	Total Batter...	Solar Power ...	Output Port ...	Battery Char.
Local Page	03/17/15 10:02:31	Abalone	1	910672	0	11754	-2
Errors	03/17/15 09:02:31	Abalone	1	910672	0	11796	-2
Telemetry	03/17/15 08:02:31	Abalone	1	910773	0	11834	-2
Raw Outputs	03/17/15 07:02:31	Abalone	1	911246	0	11717	-2
Commands	03/17/15 06:02:31	Abalone	1	911375	0	11728	-1
Configurations	03/17/15 05:02:31	Abalone	1	911375	0	11698	-2
Vehicle Parsed Co...	03/17/15 04:02:31	Abalone	1	911389	0	11797	-2
Statuses	03/17/15 03:02:31	Abalone	1	911446	0	11692	-2
Communication C...	03/17/15 02:02:31	Abalone	1	911909	0	11762	-1
Vehicle Relay Stat...	03/17/15 01:02:31	Abalone	1	912010	0	11738	-2
Courses	03/17/15 00:02:31	Abalone	1	912010	0	11805	-2
Part Identifications	03/16/15 23:02:31	Abalone	1	912025	0	11765	-2
Power Ctl Statuses	03/16/15 22:02:31	Abalone	1	912054	0	11732	-2
RudderControls	03/16/15 21:02:31	Abalone	1	912196	0	11809	-2
PayloadPackets	03/16/15 20:02:31	Abalone	1	912239	0	11661	-2
Payload Statuses	03/16/15 19:02:31	Abalone	1	912239	0	11650	-2
AMPS Summary R...	03/16/15 18:02:31	Abalone	1	912254	0	11620	-2
AMPS Output Pow...	03/16/15 17:02:31	Abalone	1	912283	0	11748	-2
AMPS Battery Por...	03/16/15 16:02:31	Abalone	1	912369	0	11735	-1
AMPS Solar Input...	03/16/15 15:02:31	Abalone	1	912384	0	11748	-2
AMPS Bridge Pow...	03/16/15 14:02:31	Abalone	1	912384	0	11757	-2
Weather Reports	03/16/15 13:02:31	Abalone	1	912398	0	11711	-1
AI SyG Records	03/16/15 12:02:31	Abalone	1	912384	0	11778	-2
System Macros	03/16/15 11:02:31	Abalone	1	912298	0	11653	-1
	03/16/15 10:02:31	Abalone	1	912283	0	11724	-1
	03/16/15 09:02:31	Abalone	1	912283	0	11674	-2

Page 1 Goto

• **Figure 4.156. AMPS Output Power Report**

LIQUID ROBOTICS File Help

Saved Exports AMPS Output Power Status Options

Vehicle **Abalone System Information Packet Records**

Record Info	TimeStamp	Vehicle	Pwr Domain	Port Type	Msg. Num. o...	Total Num. ...	Format Rev...
Local Page	03/17/15 10:02:39	Abalone	3	1	6	6	1
Errors	03/17/15 10:02:38	Abalone	1	1	12	23	1
Telemetry	03/17/15 10:02:38	Abalone	1	1	11	23	1
Raw Outputs	03/17/15 09:02:40	Abalone	3	1	6	6	1
Commands	03/17/15 09:02:38	Abalone	1	1	12	23	1
Configurations	03/17/15 09:02:38	Abalone	1	1	11	23	1
Vehicle Parsed Co...	03/17/15 08:02:40	Abalone	3	1	6	6	1
Statuses	03/17/15 08:02:39	Abalone	1	1	12	23	1
Communication C...	03/17/15 08:02:39	Abalone	1	1	11	23	1
Vehicle Relay Stat...	03/17/15 07:02:40	Abalone	3	1	6	6	1
Courses	03/17/15 07:02:38	Abalone	1	1	12	23	1
Part Identifications	03/17/15 07:02:38	Abalone	1	1	11	23	1
Power Ctl Statuses	03/17/15 06:02:40	Abalone	3	1	6	6	1
RudderControls	03/17/15 06:02:39	Abalone	1	1	12	23	1
PayloadPackets	03/17/15 06:02:39	Abalone	1	1	11	23	1
Payload Statuses	03/17/15 05:02:40	Abalone	3	1	6	6	1
AMPS Summary R...	03/17/15 05:02:38	Abalone	1	1	12	23	1
AMPS Output Pow...	03/17/15 05:02:38	Abalone	1	1	11	23	1
AMPS Battery Por...	03/17/15 04:02:40	Abalone	3	1	6	6	1
AMPS Solar Input...	03/17/15 04:02:38	Abalone	1	1	12	23	1
AMPS Bridge Pow...	03/17/15 04:02:38	Abalone	1	1	11	23	1
Weather Reports	03/17/15 03:02:40	Abalone	3	1	6	6	1
AI SyG Records	03/17/15 03:02:38	Abalone	1	1	12	23	1
System Macros	03/17/15 03:02:38	Abalone	1	1	11	23	1
	03/17/15 02:02:40	Abalone	3	1	6	6	1
	03/17/15 02:02:38	Abalone	1	1	12	23	1

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• **Figure 4.157. AMPS Battery Port Report**

LIQUID ROBOTICS

File Help

Saved Exports

AMPS Battery Port Details

Options

Vehicle

Abalone System Information Packet Records

TimeStamp	Vehicle	Pwr Domain	Port Type	Msg. Num. o...	Total Num. ...	Format Revi..
03/17/15 10:02:38	Abalone	1	2	10	10	1
03/17/15 09:02:38	Abalone	1	2	10	10	1
03/17/15 08:02:39	Abalone	1	2	10	10	1
03/17/15 07:02:38	Abalone	1	2	10	10	1
03/17/15 06:02:39	Abalone	1	2	10	10	1
03/17/15 05:02:38	Abalone	1	2	10	10	1
03/17/15 04:02:38	Abalone	1	2	10	10	1
03/17/15 03:02:38	Abalone	1	2	10	10	1
03/17/15 02:02:38	Abalone	1	2	10	10	1
03/17/15 01:02:38	Abalone	1	2	10	10	1
03/17/15 00:02:38	Abalone	1	2	10	10	1
03/16/15 23:02:38	Abalone	1	2	10	10	1
03/16/15 22:02:38	Abalone	1	2	10	10	1
03/16/15 21:02:38	Abalone	1	2	10	10	1
03/16/15 20:02:38	Abalone	1	2	10	10	1
03/16/15 19:02:38	Abalone	1	2	10	10	1
03/16/15 18:02:38	Abalone	1	2	10	10	1
03/16/15 17:02:37	Abalone	1	2	10	10	1
03/16/15 16:02:37	Abalone	1	2	10	10	1
03/16/15 15:02:37	Abalone	1	2	10	10	1
03/16/15 14:02:37	Abalone	1	2	10	10	1
03/16/15 13:02:37	Abalone	1	2	10	10	1
03/16/15 12:02:37	Abalone	1	2	10	10	1
03/16/15 11:02:37	Abalone	1	2	10	10	1
03/16/15 10:02:37	Abalone	1	2	10	10	1
03/16/15 09:02:37	Abalone	1	2	10	10	1

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• **Figure 4.158. AMPS Solar Input Port Report**

LIQUID ROBOTICS

File Help

Saved Exports

AMPS Solar Input Port Details

Options

Vehicle

Abalone System Information Packet Records

TimeStamp	Vehicle	Pwr Domain	Port Type	Msg. Num. o...	Total Num. ...	Format Revi..
03/17/15 10:02:38	Abalone	1	3	4	4	1
03/17/15 09:02:38	Abalone	1	3	4	4	1
03/17/15 08:02:39	Abalone	1	3	4	4	1
03/17/15 07:02:38	Abalone	1	3	4	4	1
03/17/15 06:02:39	Abalone	1	3	4	4	1
03/17/15 05:02:38	Abalone	1	3	4	4	1
03/17/15 04:02:38	Abalone	1	3	4	4	1
03/17/15 03:02:38	Abalone	1	3	4	4	1
03/17/15 02:02:38	Abalone	1	3	4	4	1
03/17/15 01:02:38	Abalone	1	3	4	4	1
03/17/15 00:02:38	Abalone	1	3	4	4	1
03/16/15 23:02:38	Abalone	1	3	4	4	1
03/16/15 22:02:38	Abalone	1	3	4	4	1
03/16/15 21:02:38	Abalone	1	3	4	4	1
03/16/15 20:02:38	Abalone	1	3	4	4	1
03/16/15 19:02:38	Abalone	1	3	4	4	1
03/16/15 18:02:38	Abalone	1	3	4	4	1
03/16/15 17:02:37	Abalone	1	3	4	4	1
03/16/15 16:02:37	Abalone	1	3	4	4	1
03/16/15 15:02:37	Abalone	1	3	4	4	1
03/16/15 14:02:37	Abalone	1	3	4	4	1
03/16/15 13:02:37	Abalone	1	3	4	4	1
03/16/15 12:02:37	Abalone	1	3	4	4	1
03/16/15 11:02:37	Abalone	1	3	4	4	1
03/16/15 10:02:37	Abalone	1	3	4	4	1
03/16/15 09:02:37	Abalone	1	3	4	4	1

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A window containing detailed information for that record will open, for example:

The screenshot shows a web application window titled "LIQUID ROBOTICS" with a menu bar containing "File" and "Help". Below the menu bar is a toolbar with "Close", "Print", and "System Info Record Form" buttons. The main header area displays "System Inf..." and "03/17/2015 17:02:31: Edit". A sidebar on the left contains a "Record Info" tab. The main content area has two tabs: "System Information Packet" (selected) and "Related Info". Under the "System Information Packet" tab, the "System Information Packet Info" section contains the following fields:

- TimeStamp:** 03/17/15, 10:02:31, Vehicle, Abalone
- System Information Packet:** 03/17/15 10:02:33 am
- Latitude(deg):** 37.4108166666667
- Longitude(deg):** -122.004473333333
- Record Data:** 0150E50D0000000000EA2D0000FEFFFFFF00000000170104010002040000030400000404000005040100060401000105010002050000030501000405000005050000060500000705000008050000010700000207000003070000040701000507000006070000012001000220010003200100

The **AMPS Output Power Report**, **AMPS Solar Input Port Report**, and the **AMPS Bridge Power Port Report** side tabs include system information packet records that contain information on functions that are frequently queried by pilots. These are functions that are available on every Wave Glider SV3 vehicle, as opposed to functions associated with custom payloads or optional equipment.



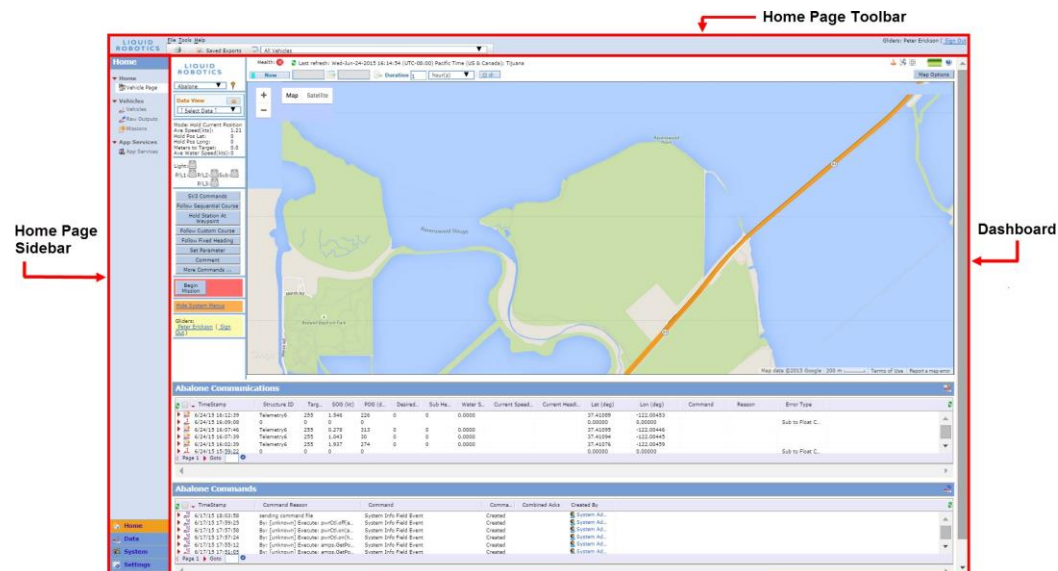
Note

There may be more than 2 AMPS domains. Also, the table configuration on WGMS may require scrolling through the columns of the different AMPS pages to isolate the desired Domain-Module-Port.

Chapter 5. Administrative Tasks - Home Page

When you select **Show System Menus** on the WGMS **Dashboard**, the **Home** page sidebar appears with the **Vehicle Page** side tab selected. The **Vehicle Page** side tab is actually the WGMS **Dashboard** - they are identical. The WGMS **Dashboard** with the **Home** page sidebar open is referred to as the **Home** page.

Figure 5.1. WGMS Home Page



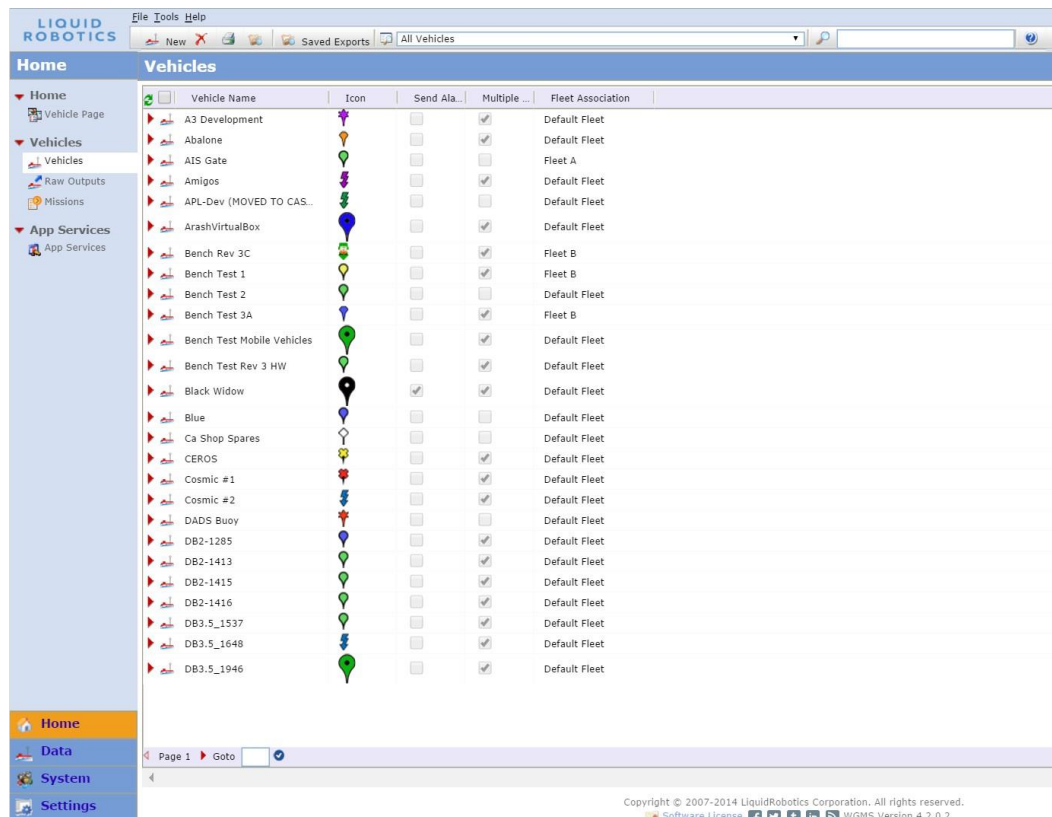
This chapter is focused on tasks that can be performed from the menus in the **Home** page by System Administrators and by Users who do not have Admin Role permissions. Vehicle-specific data is typically accessed from the **Home** page by Users who are assigned a Master Role. From the menus on the **Home** page you can view and edit information on individual vehicle configurations, raw outputs, missions, and app services. For an overview of the **Home** page UI, see “[WGMS Home Page](#)”.

View or Edit Vehicle Data

Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** page sidebar.

In the **Home** page side bar, under the **Vehicles** menu, click on the **Vehicles** side tab to open the **Vehicles** window containing a list of all of the vehicles in the WGMS Organization you are logged in to:

Figure 5.2. Vehicles Window



In the **Vehicles** list, double-clicking on a vehicle name in the **Vehicle Name** column, or single-clicking on the icon next to the vehicle name, will display a **Vehicle Form** for that vehicle. For example, selecting **Black Widow** will bring up the following **Vehicle Form**:

Figure 5.3. Example - Vehicle Form

The screenshot shows the 'Vehicle Form' for 'Black Widow: Edit'. The interface includes a top menu bar with 'File' and 'Help', and a toolbar with 'Save' and a dropdown menu set to 'Vehicle Form'. The main window is divided into a left sidebar and a right content area. The sidebar lists various vehicle-related functions: Record Info, Waypoints, Operation Polygons, Map, Event Definitions, Errors, Telemetry, Commands, Configurations, Vehicle Parsed Configurations, Statuses, Communication, Security Manifests, Courses, Part Identifications, Power Control Statuses, Rudder Controls, Lists, Checked Lists, Raw Outputs, Notes, Attachments, and Audit Records. The right content area has tabs for 'Vehicle', 'Settings', 'File System', 'Components', and 'Related Info'. The 'Vehicle' tab is active, showing 'Vehicle Info' and 'Part Info' sections. The 'Vehicle Info' section contains fields for 'Vehicle Name' (Black Widow), 'Fleet Association' (Default Fleet), 'Icon' (BlackIcon), 'Icon Size' (Normal), and 'Default Comm' (VirtualRelayCell). The 'Part Info' section displays a hierarchical tree of components for the 'Black Widow' vehicle, including 'Vehicle Unique Id', 'Sensor Management Controller', 'Encrypted Partition', 'Firmware Level', 'Float', and 'C and C Dry Box'. The bottom of the window shows a copyright notice for Liquid Robotics Corporation and a 'Software License' link.

The side tabs for the Vehicle Form include:

Record Info: Basic info on the Vehicle, and the parts definition tree. This information can be edited.

Waypoints: Lists all the Waypoints assigned to the Vehicle. This information can be edited.

Operation Polygons: Lists all the Operation Polygons assigned to the Vehicle. This information can be edited.

Map: Displays a Position Map of the Vehicle location. Identical to the Dashboard map.

Event Definitions: Definitions of Alarm types and parameters. This information can be edited.

Errors: Latest error messages received from the Vehicle.

Telemetry: Latest telemetry data received from the Vehicle.

Commands: Latest commands sent to the Vehicle.

Configurations: Legacy option, pre-Model 08 Wave Gliders.

Vehicle Parsed Configurations: Legacy option, pre-Model 08 Wave Gliders.

Statuses: Latest Status data received from the Vehicle.

Communication Channels: A list containing a record for each communication channel that has been enabled on the Vehicle.

Security Manifests: A list of Mobile WGMS Security Manifest records for Mobile WGMS enabled Vehicles.

Courses: Lists Courses assigned to Vehicle. This information can be edited.

Part Identifications: Lists Hardware/Software version numbers.

Power Ctl Statuses: Latest Power Control Status data received from the Vehicle.

Rudder Controls: Latest rudder-control commands sent to the Vehicle.

Lists: Alarm Escalation and User Group lists. This information can be edited.

Checked Lists:

Raw Outputs: Latest raw data packets received from the Vehicle.



Note

Raw outputs from all the vehicles in the WGMS organization you are logged in to can be viewed in chronological order by clicking on the **Raw Outputs** side tab under the **Home** page **Vehicles** menu.

Notes: User-entered text notes for the Vehicle. This information can be edited.

Attachments: User-entered links to files associated with the Vehicle. This information can be edited.

Audit Records: Changes or updates made to the Vehicle and/or its parts.

Viewing Vehicle Parts Information

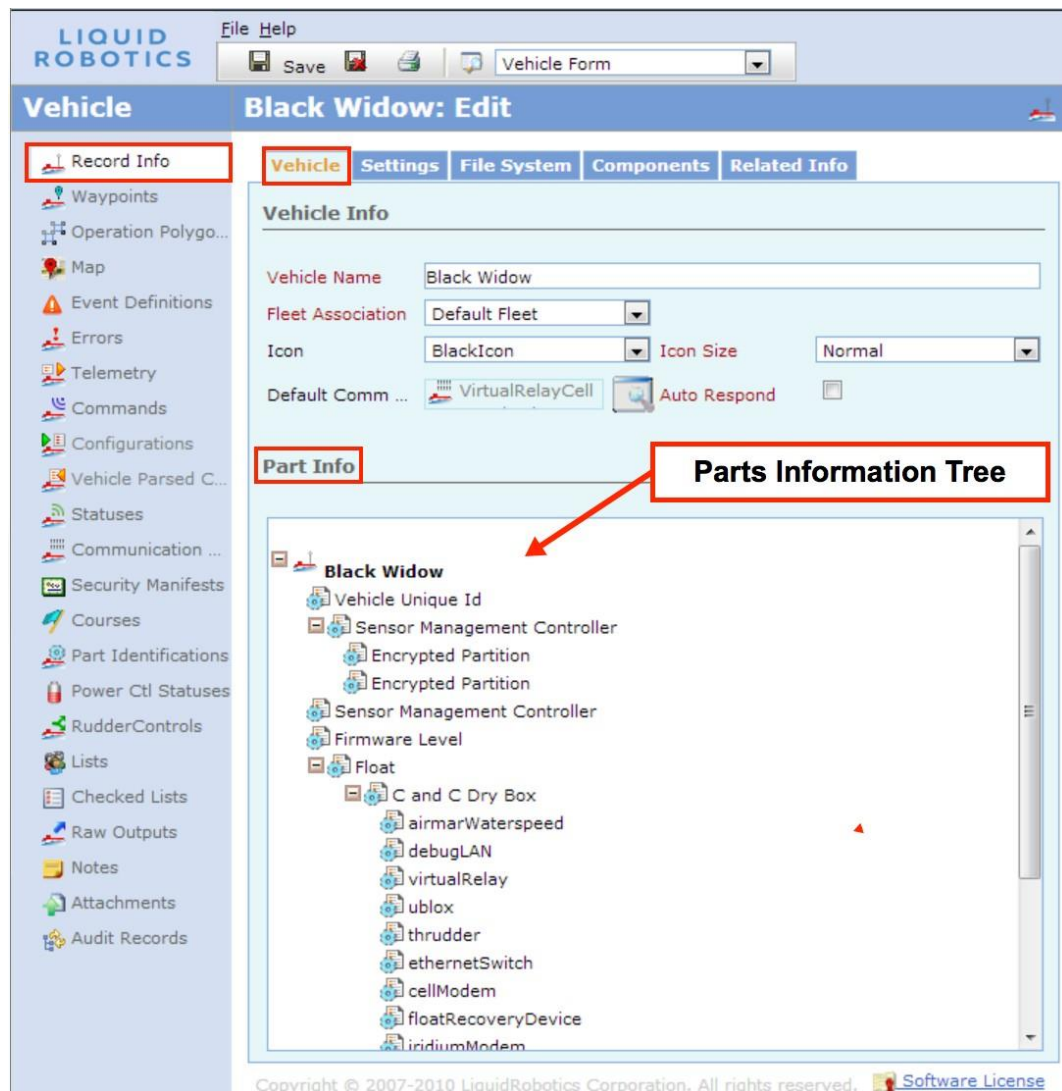
A Wave Glider's parts information is initially entered by someone with a Root Role. A System Administrator is permitted to view vehicle parts information, but not to change it.

Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** page sidebar.

To view parts information for a vehicle:

1. In the **Home** page side bar, under the **Vehicles** menu, click on the **Vehicles** side tab to open the **Vehicles** window containing a list of all of the vehicles in the WGMS Organization you are logged in to.
2. Select a vehicle from the **Vehicles** list by double-clicking on the vehicle name or clicking on the vehicle icon. The **Vehicle Form** for that vehicle will appear with the **Record Info** side tab open.
3. The parts information tree is in the **Part Info** section at the bottom of the **Vehicle** tab window.

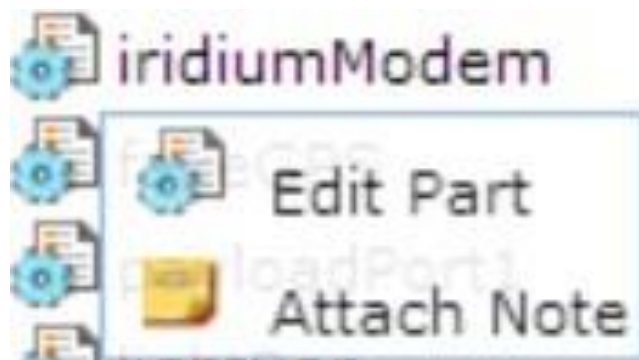
Figure 5.4. Example Expanded Part Info Tree



To view data on any of the items in the parts list:

1. Click on the part name and a small dialog box will appear with two options - **Edit Part** or **Attach Note** (the Attach Note option opens a form where you can add notes about the part).

Figure 5.5. Edit Part or Attach Note



2. Click **Edit Part** and the **Part Form** with the part information will appear.

Figure 5.6. Part Form for the Iridium Modem

Adding or Changing Vehicle Alarm Thresholds

Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** pagesidebar.

To add or change alarm thresholds for a vehicle:

1. In the **Home** page side bar, under the **Vehicles** menu, click on the **Vehicles** side tab to open the **Vehicles** window containing a list of all of the vehicles in the WGMS Organization you are logged in to:
2. Select a vehicle from the **Vehicles** list by double-clicking on the vehicle name or clicking on the vehicle icon. The **Vehicle Form** for that vehicle will appear with the **Record Info** side tab selected and the **Vehicle** tab open.

Figure 5.7. Vehicle Form

The screenshot shows the 'Vehicle Form' interface for 'A3 Development: Edit'. The interface has a top menu bar with 'File' and 'Help'. Below it is a toolbar with 'Save' and a dropdown menu showing 'Vehicle Form'. The main header is 'Vehicle A3 Development: Edit'. On the left is a sidebar with a tree view containing: Record Info, Waypoints, Operation Polyg, Map, Event Definition, Errors, Telemetry, Commands, Configurations, Vehicle Parsed C, Statuses, Communication, Security Manifes, Courses, Part Identification, Power Ctl Status, RudderControls, Lists, Checked Lists, and Raw Outputs. The main content area has tabs: 'Vehicle' (selected), 'Settings', 'File System', 'Components', and 'Related Info'. Under the 'Vehicle' tab, there are two sections: 'Vehicle Info' and 'Part Info'. The 'Vehicle Info' section contains: 'Vehicle Name' (A3 Development), 'Fleet Association' (Default Fleet), 'Icon' (PurpleStar), 'Icon Size' (Small), 'Default Comm ...' (Iridium), and 'Auto Respond' (checkbox). The 'Part Info' section contains a tree view for 'A3 Development' with items: Vehicle Unique Id, Iridium Modem, Firmware Level, Secondary Iridium Modem, Sensor Management Controller, and Encrypted Partition. At the bottom, there is a copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a 'Software License' link.

3. Click on the **Event Definitions** side tab and the **Event Definitions** list will appear.

Figure 5.8. Event Definitions List

Alarm Type	Alarm Threshold	Alarm Count	Always F...	Self Cor...
Sub Leak	1	0	☒	☒
Float Leak	1	0	☒	☒
Sub To Float	1	0	☒	☒
Sub Reboot	1	0	☒	☒
GPS Not Functi...	5	0	☐	☒
Ship to Shore ...	5	0	☐	☒
Out Of Bounds	5	0	☐	☒
Vehicle Report...	25	0	☐	☒
Empty Packet	5	0	☐	☒
Proximity War...	1	0	☒	☒
Proximity Alarm	1	0	☒	☒
StuckGPS	5	0	☐	☒

There are a minimum of nine Alarm Types that must be specified for each Vehicle. These alarm types and their default Alarm Threshold values are:

- Sub To Float [1]
- Sub Reboot [1]
- GPS Not Functioning [15]
- RF Alarm [5]
- Out of Bounds [3]
- Communication Timeout [15]
- Empty Packet [5]
- Stuck GPS [5]
- File Read Timeout [25]

Note that **File Read Timeout** is not in the Figure 5.8, and therefore must be added.

To add a new Alarm Type, click on the **New** icon  in the toolbar. The **Alarm Counts Form** will appear.

Figure 5.9. New Event Definition - Alarm Counts Form

The screenshot shows the 'New Event Definition - Alarm Counts Form' in the Liquid Robotics software. The form is titled 'Event Definition: New' and includes sections for 'Alarm Counts Info' and 'Related Information'.

Alarm Counts Info

- Vehicle:** A3 Development
- Alarm Type:** Sub Leak
- Alarm Threshold:** 0
- Alarm Count:** 0
- Self Corrected:** ☒
- Always Fired:** ☐
- Alarm Descripti...:** (Empty text area)

Related Information

- Owner:** (Empty field)
- Organization:** Gliders
- Created On:** 8/13... 09:5...
- Updated On:** 8/13... 09:5...
- Created By:** Peter Erickson
- Updated By:** Peter Erickson

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Enter the data as follows:

1. In the **Alarm Type** boxdrop-down menu select **File Read Timeout**.
2. In the **Alarm Threshold** field, enter the threshold number (default setting is 25). The Alarm Threshold is the number of times the alarm will notify before stopping.
3. Verify that the **Self Corrected** box is checked.
4. Add a check in the **Always Fired** box.

When complete, the upper part of the dialog should look similar to:

Figure 5.10. New Event Entered - Alarm Counts Form

LIQUID ROBOTICS File Help

Save [Icons] Alarm Counts Form

Event Defin... **Event Definition: New**

Record Info

Alarm Counts

Alarm Counts Info

Vehicle: A3 Development Alarm Type: File Read Timeout

Alarm Threshold: 25 Alarm Count: 0

Self Corrected: ☒ Always Fired: ☒

Alarm Descripti...

Related Information

Owner: [Field] Organization: Gliders

Created On: 8/13... 09:5... Updated On: 8/13... 09:5...

Created By: Peter Erickson Updated By: Peter Erickson

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Click the [Save and Close Event Definition] icon  in the toolbar to save the data and exit the Alarm Counts Form.

Figure 5.11. Save and Close Event Definition

LIQUID ROBOTICS File Help

Save [Icons] Alarm Counts Form

Event Defin... **Event Definition: New**

Record Info

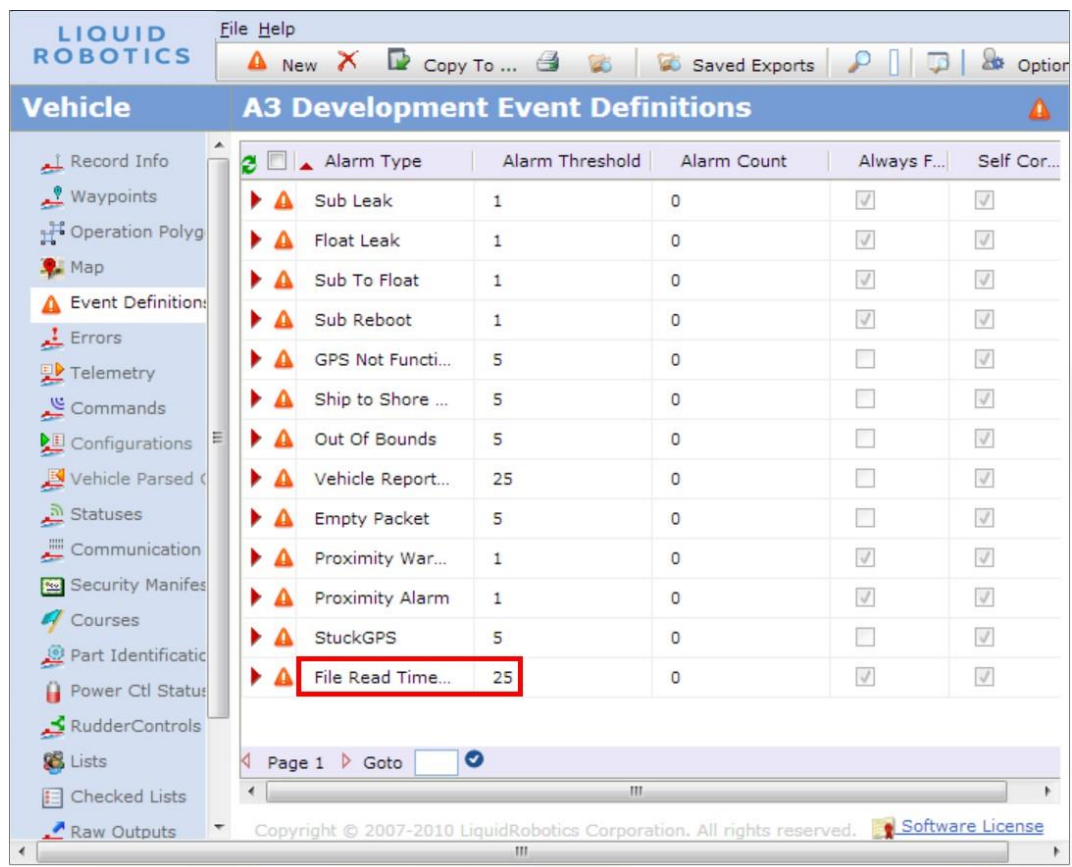
Alarm Counts

Alarm Counts Info

Vehicle: White Floater Example

The **File Read Timeout** entry should now appear in the **Event Definitions** list.

Figure 5.12. Updated Event Definitions List



The screenshot shows the 'A3 Development Event Definitions' window in the Liquid Robotics software. The left sidebar contains a tree view with categories like Record Info, Waypoints, Operation Polyg, Map, Event Definitions, Errors, Telemetry, Commands, Configurations, Vehicle Parsed C, Statuses, Communication, Security Manifes, Courses, Part Identificatio, Power Ctl Status, RudderControls, Lists, Checked Lists, and Raw Outputs. The main area displays a table of event definitions. The 'File Read Time...' row is highlighted with a red box.

Alarm Type	Alarm Threshold	Alarm Count	Always F...	Self Cor...
Sub Leak	1	0	☒	☒
Float Leak	1	0	☒	☒
Sub To Float	1	0	☒	☒
Sub Reboot	1	0	☒	☒
GPS Not Functi...	5	0	☐	☒
Ship to Shore ...	5	0	☐	☒
Out Of Bounds	5	0	☐	☒
Vehicle Report...	25	0	☐	☒
Empty Packet	5	0	☐	☒
Proximity War...	1	0	☒	☒
Proximity Alarm	1	0	☒	☒
StuckGPS	5	0	☐	☒
File Read Time...	25	0	☒	☒

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To edit an existing alarm type in the **Event Definitions** list, double-click on the name of the alarm type, or single-click on the icon next to the alarmtype name. An **Alarm Counts Form Event** will appear.

Figure 5.13. Edit Event Definition - Alarm Counts Form

LIQUID ROBOTICS File Help

Save Print Close Alarm Counts Form

Event Defin... Event Definition: Edit

Record Info

Alarm Counts

Alarm Counts Info

Vehicle A3 Development Alarm Type Float Leak

Alarm Threshold 1 Alarm Count 0

Self Corrected ☒ Always Fired ☒

Alarm Descripti...

Related Information

Owner Organization Gliders

Created On 5/17... 11:1... Updated On 5/17... 11:1...

Created By System Admin Updated By System Admin

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Edit the data value(s) as necessary, then click the [Save and Close Event Definition] icon in the toolbar to save your edits and exit the dialog box.

Chapter 6. Administrative Tasks - Data Page

The **Data** page is accessed from the side panel that appears when you select **Show System Menus** on the WGMS **Home** page. This chapter is focused on tasks that can be performed from the menus in the **Data** page by System Administrators and by Users who do not have Admin Role permissions. Vehicle-specific data is typically accessed from the **Data** page by Users who are assigned a Master Role. From the menus on the **Data** page you can view and edit information on **Payload Data** and **Sensor Data**. For an overview of the **Data** page UI, see “Data Page”.

Viewing Payload Data

To view the payload data for a vehicle:

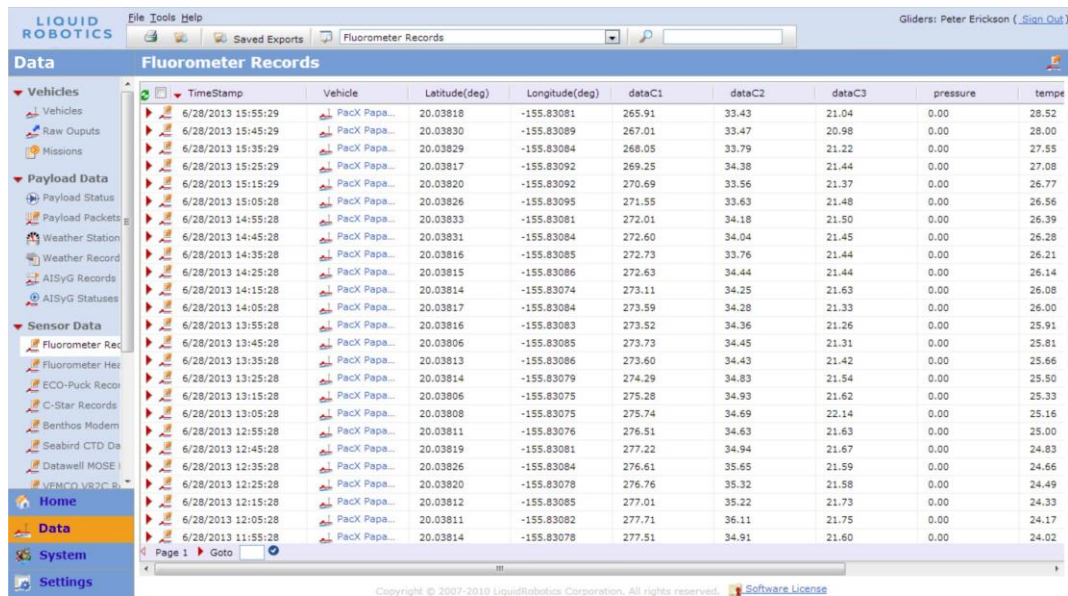
1. Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** page sidebar.
2. Click on the  **Data** button in the **Home** page sidebar to open the **Data** page.
3. Click on any of the 6 side tabs under the **Payload Data** menu to view payload data records in chronological order for all of the vehicles in the WGMS Organization you are logged in to. The side tabs are:
 - **Payload Packets**
 - **Payload Status**
 - **Weather Stations**
 - **Weather Records**
 - **AISyg Records**
 - **AISyg Statuses**

Viewing Sensor Data Records

To view the sensor data for a vehicle:

1. Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** page sidebar.
2. Click on the  **Data** button in the **Home** page sidebar to open the **Data** page.
3. Click on any of the side tabs under the **Sensor Data** menu to view sensor data records in chronological order for all of the vehicles in the WGMS Organization you are logged in to. There will be a side tab for each type of sensor data that is being generated by vehicles contained in the WGMS Organization you are logged into.

For example, if you click on the **Fluorometer Records** side tab, a window with the most recent fluorometer records for each vehicle that generates fluorometer data will appear.

Figure 6.1. Sensor Data - Fluorometer Records List

The screenshot shows the 'Fluorometer Records' window in the Liquid Robotics software. The left sidebar contains a tree view with categories: Vehicles, Payload Data, and Sensor Data. Under 'Sensor Data', 'Fluorometer Records' is selected. The main area displays a table of records. The table has columns: TimeStamp, Vehicle, Latitude(deg), Longitude(deg), dataC1, dataC2, dataC3, pressure, and temperature. The records are sorted by TimeStamp in descending order. The bottom of the window shows a status bar with 'Page 1', a 'Goto' field, and a copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved. Software License'.

TimeStamp	Vehicle	Latitude(deg)	Longitude(deg)	dataC1	dataC2	dataC3	pressure	tempe
6/28/2013 15:55:29	Pack Papa...	20.03818	-155.83081	265.91	33.43	21.04	0.00	28.52
6/28/2013 15:45:29	Pack Papa...	20.03830	-155.83089	267.01	33.47	20.98	0.00	28.00
6/28/2013 15:35:29	Pack Papa...	20.03829	-155.83084	268.05	33.79	21.22	0.00	27.55
6/28/2013 15:25:29	Pack Papa...	20.03817	-155.83092	269.25	34.38	21.44	0.00	27.08
6/28/2013 15:15:29	Pack Papa...	20.03820	-155.83092	270.69	33.56	21.37	0.00	26.77
6/28/2013 15:05:28	Pack Papa...	20.03826	-155.83095	271.55	33.63	21.48	0.00	26.56
6/28/2013 14:45:28	Pack Papa...	20.03833	-155.83081	272.01	34.18	21.50	0.00	26.39
6/28/2013 14:45:28	Pack Papa...	20.03831	-155.83084	272.60	34.04	21.45	0.00	26.28
6/28/2013 14:35:28	Pack Papa...	20.03816	-155.83085	272.73	33.76	21.44	0.00	26.21
6/28/2013 14:25:28	Pack Papa...	20.03815	-155.83086	272.63	34.44	21.44	0.00	26.14
6/28/2013 14:15:28	Pack Papa...	20.03814	-155.83074	273.11	34.25	21.63	0.00	26.08
6/28/2013 14:05:28	Pack Papa...	20.03817	-155.83084	273.59	34.28	21.33	0.00	26.00
6/28/2013 13:55:28	Pack Papa...	20.03816	-155.83083	273.52	34.36	21.26	0.00	25.91
6/28/2013 13:45:28	Pack Papa...	20.03806	-155.83085	273.73	34.45	21.31	0.00	25.81
6/28/2013 13:35:28	Pack Papa...	20.03813	-155.83086	273.60	34.43	21.42	0.00	25.66
6/28/2013 13:25:28	Pack Papa...	20.03814	-155.83079	274.29	34.83	21.54	0.00	25.50
6/28/2013 13:15:28	Pack Papa...	20.03806	-155.83075	275.28	34.93	21.62	0.00	25.33
6/28/2013 13:05:28	Pack Papa...	20.03808	-155.83075	275.74	34.69	22.14	0.00	25.16
6/28/2013 12:55:28	Pack Papa...	20.03811	-155.83076	276.51	34.63	21.63	0.00	25.00
6/28/2013 12:45:28	Pack Papa...	20.03819	-155.83081	277.22	34.94	21.67	0.00	24.83
6/28/2013 12:35:28	Pack Papa...	20.03826	-155.83084	276.61	35.65	21.59	0.00	24.66
6/28/2013 12:25:28	Pack Papa...	20.03820	-155.83078	276.76	35.32	21.58	0.00	24.49
6/28/2013 12:15:28	Pack Papa...	20.03812	-155.83085	277.01	35.22	21.73	0.00	24.33
6/28/2013 12:05:28	Pack Papa...	20.03811	-155.83082	277.71	36.11	21.75	0.00	24.17
6/28/2013 11:55:28	Pack Papa...	20.03814	-155.83078	277.51	34.91	21.60	0.00	24.02

Chapter 7. Administrative Tasks - System Page

The **System** page is accessed from the side panel that appears when you select **Show System Menus** on the WGMS **Home** page. This chapter is focused on tasks that can be performed from the menus in the **System** page by System Administrators and by Users who do not have Admin Role permissions. Information is typically accessed from the **System** page by Users who are assigned a Master Role. From the menus in the **System** page you can view alarms, escalation lists, exported records, and system data telemetry records for each vehicle. For an overview of the **System** page UI, see “SystemPage”.

Updating Lists

Escalation Lists for Alarm notifications are the primary type of list that you may need to modify. To view the Escalation Lists for a vehicle:

1. Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** page sidebar.
2. Click on the  button in the **Home** page sidebar to open the **System** page.
3. Click on the **Lists** side tab under the **System** menu to open the **Lists** window where you can view all of the lists for all of the vehicles in the WGMS Organization you are logged in to. Most, if not all of the lists in the **Lists** window will be escalation lists for alarm notifications.

Figure 7.1. Lists Side Tab - Lists Window

The screenshot shows the 'Lists' window in the Liquid Robotics software. The left sidebar contains a navigation menu with categories: System (Alarms, Lists, Macros, Email Templates), Reports (Record Exports, Custom Reports, Report Server), and System Info (System Info Data, AMPS Output Po..., AMPS Battery Po..., System Info Eve...). The 'System' category is selected, and the 'Lists' sub-category is active. The main area displays a table of lists.

List Name	List Type	Record Id
CEROS Escalation List	Escalation List	Vehicle
check list	2	Vehicle
Cosmic 1 Escalation List	Escalation List	Vehicle
DADS Buoy Escalation List	Escalation List	Vehicle
DB3.5_ENG3 Escalation List	Escalation List	Vehicle
DB3.5C_ENG4 Escalation List	Escalation List	Vehicle
DB3.5C_ENG4 Escalation List	Escalation List	Vehicle
Empty Escalation List	Escalation List	Vehicle
Empty Escalation list	Escalation List	Vehicle
Escalation List	Escalation List	Vehicle
Escalation List	Escalation List	Vehicle
G1 Escalation List	Escalation List	Vehicle
G1 Escalation List	Escalation List	Vehicle
G2 Escalation List	Escalation List	Vehicle
G4 Escalation List	Escalation List	Vehicle
G5 Escalation List	Escalation List	Vehicle
Green Flash ++ Escalation List	Escalation List	Vehicle
Green Flash Escalation List	Escalation List	Vehicle
Green Flash Escalation List	Escalation List	Vehicle
Green Flash Escalation List	Escalation List	Vehicle
K1 Escalation List	Escalation List	Vehicle
K2 Escalation list	Escalation List	Vehicle
K3 Escalation List	Escalation List	Vehicle
LR1 Escalation List	Escalation List	Vehicle
LR1 Escalation List	Escalation List	Vehicle
LR1 Escalation List	Escalation List	Vehicle

At the bottom of the window, there is a footer with the text: Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved. [Software License](#)

To edit an escalation list, double-click on the **List Name** or single-click on the icon next to the **List Name** and a **List Form** will appear.

Figure 7.2. Escalation List - List Form

LIQUID ROBOTICS File Help

Save [Icons] List Form

List Cosmic 1 Escalation List: Edit

Record Info

List Related Info

Vehicle List Info

List Name: Cosmic 1 Escalation List List Type: Escalation List

Parent Table: Vehicle Parent Cosmic #1

List Item Info

New [Icons] Saved Exports [Icons] Options

Item Name	List Item Type
David	User Email
David Pager	User Pager
Eric Brager Pager	User Pager
Erin email	User Email
Erin Pager	User Pager
Graham	User Email
Graham Pager	User Pager
Huck email	User Email
Jesse Email	User Email

Page 1 Goto []

Typically, you will be adding or deleting a name from the list.

To add a name to the list in the **List Form**:

1. Click on the New icon  New :

Figure 7.3. New Icon

New [Icons] Saved Exports [Icons] Options

Item Name	List Item Type
David	User Email
David Pager	User Pager

A **List Item Form** will appear:

Figure 7.4. List Item Form

The screenshot shows a web application window titled "LIQUID ROBOTICS". The main header area contains a "File Help" menu and a toolbar with icons for Save, Print, and a dropdown menu currently showing "List Item Form". Below the header, the page is divided into two main sections. The left section is titled "List Item" and contains a "Record Info" link. The right section is titled "List Item: New" and contains two tabs: "List Item" (which is selected) and "Related Info". The "List Item" tab displays a "List Item Info" form. This form includes several input fields: "Item Name" (an empty text box), "List Item Type" (a dropdown menu currently showing "User Email"), "Parent List" (a dropdown menu currently showing "Cosmic 1"), "Severity Filter" (a dropdown menu currently showing "All"), and "Related Entity" (a dropdown menu currently showing "User"). There are also icons for saving and deleting the item.

2. Enter the **Item Name** that you want to appear in the list, for example, Chuck.
3. Select the **List Item Type** in the drop-down menu, for example, **User Email**.
4. Next, click on the icon to the right of the **Related Entity** box. This will bring up a list of names to select from. The name and other information should have already been entered as described in “[Adding New Users](#)”.

Figure 7.5. Contact List Records

The screenshot shows a 'Related Record' dialog box. At the top, there is a header bar with the title 'Related Record'. Below the header, there is a search bar with the text 'Select a related record.' and a dropdown menu labeled 'User Lookup'. The main area of the dialog is a table with two columns: 'First Name' and 'Last Name'. The table contains 15 rows of contact records. Each row has a small red triangle icon to the left of the first name. The records are as follows:

First Name	Last Name
Ann	Banh
April	Maru
Arash	Ushani
Bill	Stutz
Bob	Momsen
Brad	Woolhiser
Bruce	Kamolnick
Casper	Otten
Chris	Walker
Christopher	Wahl
Chuck	Shaver
Dan	Sayles
Dan	Moroni
David	Walker
David	Hume

At the bottom of the table, there is a pagination bar showing 'Page 1' and a 'Goto' button. Below the table, there are three buttons: 'New', 'OK', and 'Cancel'.

5. Double-click on a name, or click on the icon next to a name, to select it.

For example, selecting Chuck Shaver would add the name as a Related Entity in the **List Item Form**:

Figure 7.6. Example New List Item

The screenshot shows the 'List Item: New' form. The sidebar on the left has a 'Record Info' section. The main area has two tabs: 'List Item' and 'Related Info'. The 'List Item Info' section contains the following fields:

- Item Name: Chuck
- List Item Type: User Email
- Parent List: Cosmic 1
- Severity Filter: All
- Related Entity: User
- Related Entity: Chuck

6. Click the [Save and close List Item] icon  to exit back into the **List Form**. The new name will be added to the list.

To delete a name from the list in the **List Form**:

1. Click on a name to select it.

Figure 7.7. Select Name in List Form

The screenshot shows the 'List Item Info' form with a list of items. The list has the following columns: 'Item Name' and 'List Item Type'.

Item Name	List Item Type
Chuck	User Email
David	User Email
David Pager	User Pager

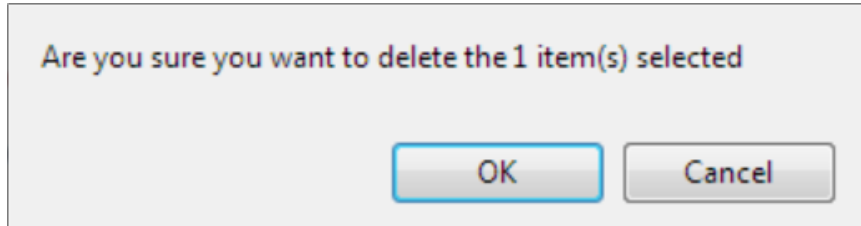
2. Click the Delete [Delete List Item] icon  above the list:

Figure 7.8. Delete List Item Icon

The screenshot shows the 'List Item Info' form with the 'Delete' icon (red X) above the list.

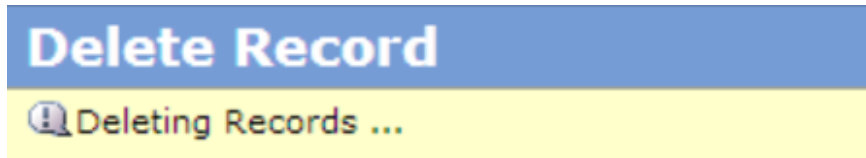
You will be asked to confirm the deletion.

Figure 7.9. List Deletion Dialog Box

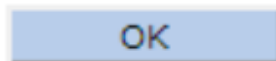


Click **OK** and the **Delete Record** dialog box will appear to confirm the deletion - again. Click **OK** to close the **Delete Record** dialog box and remove the name from the list. Note that this will only delete the name from the list - the User data will remain in the database.

Figure 7.10. Delete Record Dialog Box



Done.



Exporting Records

1. Select **Show System Menus** on the WGMS **Dashboard**, to open the **Home** page sidebar.
2. Click on the  **System** button in the **Home** page sidebar to open the **System** page.
3. Click on the **Record Exports** side tab under the **Reports** menu to open the **Record Exports** window where you can view all of the record exports for all of the vehicles in the WGMS Organization you are logged in to.

Figure 7.11. Record Exports List

Record Exporter Name	Exporter Type	Record Type	Updated On	Owner
All ADCP C2 Samples for S...	Data Exporter	CSV Format	12/20/2012 11:17...	System Ad...
all Datavell MOSE records	Data Exporter	CSV Format	4/24/2013 13:43:11	System Ad...
All Parts	Data Exporter	CSV Format	11/1/2010 10:53:31	System Ad...
Amigos DART Telemetry	Data Exporter	CSV Format	9/9/2010 19:55:24	Eric Brager
Amigos/DART Commands	Data Exporter	Excel Format	9/9/2010 17:54:36	Eric Brager
attachments for Bench Rev 3C	Data Exporter	CSV Format	8/23/2012 15:47:08	System Ad...
Battery Alarm	Data Exporter	Excel Format	8/16/2010 16:56:03	clinton.jazzari...
Bench 3A GPS Errors	Data Exporter	CSV Format	3/7/2011 10:31:15	Jim Kirklin
Bench Power	Data Exporter	CSV Format	7/3/2012 11:05:18	Jim Kirklin
Bench Pyld Status	Data Exporter	CSV Format	7/2/2012 11:13:18	Jim Kirklin
Bench Telemetry	Data Exporter	CSV Format	7/2/2012 13:48:14	Jim Kirklin
Bench Test 3A GPS Errors	Data Exporter	CSV Format	3/15/2011 14:54:26	Jim Kirklin
Bench Weather	Data Exporter	CSV Format	7/2/2012 11:11:58	Jim Kirklin
benjamin CTD export	Data Exporter	CSV Format	6/27/2012 15:27:56	System Ad...
BP Commands	Data Exporter	CSV Format	9/13/2010 07:34:58	Brad Wool...
Brad	Data Exporter	CSV Format	1/14/2011 10:51:02	Brad Wool...
Brad AIS	Data Exporter	CSV Format	11/13/2010 14:10...	Brad Wool...
Brad Power Status	Data Exporter	CSV Format	1/14/2011 14:34:29	Brad Wool...
Brad Weather	Data Exporter	CSV Format	1/25/2011 08:54:40	Brad Wool...
C3 Mfg Test Extract	Data Exporter	Excel Format	12/28/2010 15:49...	Jesse Tho...
Casper power report	Data Exporter	CSV Format	10/18/2010 08:17...	Robert Ols...
Command and statuses for v...	Data Exporter	CSV Format	11/19/2010 17:54...	Mike Cook...

To export a copy of a record (data) from the WGMS database to your computer, click on the record export icon next to the **Record Exporter Name**, or double click anywhere in the row that contains the **Record Exporter Name** - an Export dialog box will appear.

For example, when you double click on the **All ADCP C2 Samples for SW_1732** Record Exporter Name, an **Export PayloadPacketRecord Records** dialog box appears.

Figure 7.12. Example - Export Dialog Box

Export PayloadPacketRecord Records

Export PayloadPacketRecord Records from WGMS to this client.

Export ColumnXml CriteriaXml Preview

Export Filter Name: All ADCP C2 Samples for SW_1732

Select Column: Add Match All Criteria

Select Export Type: .CSV

Payload Type	Equal	ADCP Ensemble		X
Data Format	Equal	4		X
Vehicle	Equal	SW_1732		X
TimeStamp	Between	12/19 11:17	12/20 11:17	X

Save Cancel Export



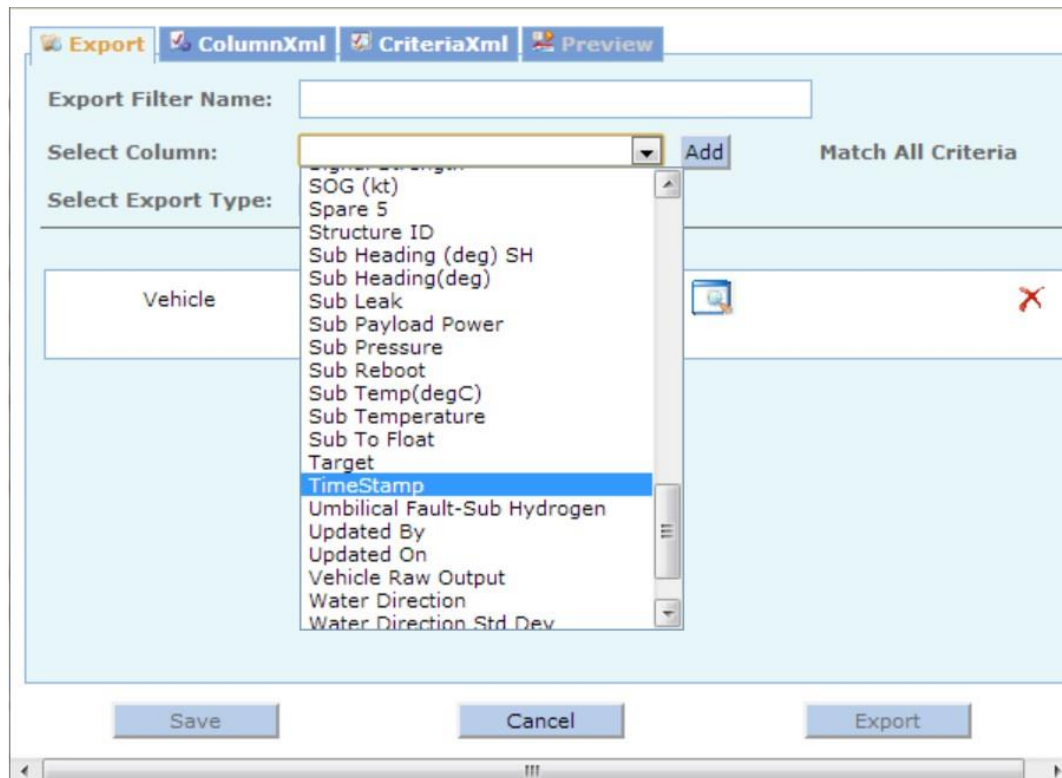
Note

You can also bring up an **Export Records** dialog from any window that includes an **Export Records** button  in its toolbar by clicking on the **Export Records** button.

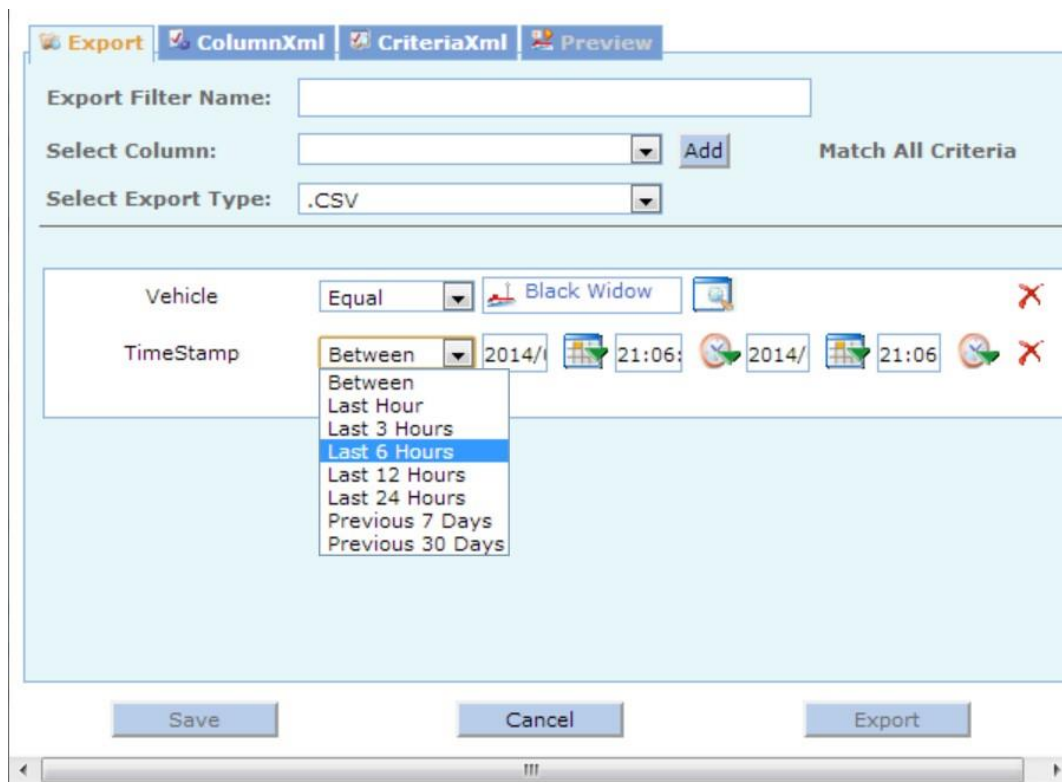
You will need to edit the fields in the **Export Records** dialog box to define the export parameters. Depending on the type of records being exported and whether you opened an **Export Records** dialog from the **System > Reports > Record Exports** menu, or from a Vehicle-specific window, some of the **Export Records** dialog fields may be pre-populated for you.

The **Export Records** dialog **Select Column** drop-down menu contains a wide range of parameters. Each time you select a parameter and click **Add** it will appear in the field at the bottom of the **Export Records** dialog.

For example, if you select **TimeStamp** and click **Add**.



A drop-down menu will allow you to select the time interval for the records export.



You have the option to specify a custom records export interval by selecting **Between** and setting a date/time range in the fields adjacent to the calendar and clock icons or you can select from pre-set Records Export intervals of:

- Last Hour
- Last 3 Hours
- Last 6 Hours
- Last 12 Hours
- Last 24 Hours
- Previous 7 Days
- Previous 30 Days

After editing the Export Records dialog box:

1. Click **Save** to save the export record. A window will confirm that the export record was created successfully. Click **OK** to close the window.
2. Click **Export** to export a copy of the data to your computer.

Click **Cancel** to close the Export dialog box after you export a record, or to cancel an export operation.

Similar export dialog boxes are available for:

- Part Records
- Vehicle Parsed Output Records
- Vehicle Command Records
- Attachment Records
- Vehicle Error Records
- Vehicle Power Status Records
- Vehicle Payload Status Records
- Weather Report Records

For information on how you can automatically export records at regular intervals using **curl** see the *Using curl to Poll WGMS* chapter in the *WGMS Administrators Guide*.

Chapter 8. Administrative Tasks - Settings Page

The **Settings** page is accessed from the side panel that appears when you select **Show System Menus** on the WGMS **Home** page. This chapter describes tasks that are accessible to System Administrators (or higher Roles) from the **Settings** page. The **Settings** page is focused on WGMS Organization administrative tasks and Customizing WGMS records. Although these tasks cannot be performed by WGMS users with a Master Role (or lower), they are tasks many WGMS users may want to be aware of. For an overview of the **Settings** page UI, see “[Settings Page](#)”

About WGMS Organizations, Users, and Roles

Organizations

Liquid Robotics hosted WGMS has a multi-tenant SaaS architecture that places customers into separate WGMS Organizations all running on the same hardware and software. A WGMS Organization provides a mechanism whereby multiple such groups can share a single physical copy of WGMS, but control access to data and Wave Gliders as if they had their own copy.

1. With Liquid Robotics hosted WGMS, Liquid Robotics uses a single instance of WGMS to support multiple Organizations. The Organization serves as a privacy barrier between Liquid Robotics customers. Each Organization has a private copy of its data, a private set of authorized users, separate user authentication controls and its own set of Wave Gliders to manage. Users may be aware of the existence of other Organizations, or have access to more than one Organization, depending on the login options offered on the Liquid Robotics hosted system.

An Organization has an alphanumeric name that can be changed. There is also an Liquid Robotics assigned “Org Internal Name” for the Organization that is visible to System Administrators and must not be changed. The Org Internal Name is used by the WGMS API. For more information see “[Editing Organization Information and Settings](#)”

Users

Users are members of an Organization. They have an email address and a temporary password which serve as their initial login. After their first login users are prompted to establish a Username and permanent password that will become their WGMS credentials.

Users are created and removed by a System Administrator, who also can reset passwords.

Roles

WGMS Users are assigned Roles by the WGMS System Administrator.

The defined Roles are:

- **Guest User:** A Guest User can only view the status of Vehicles that have been configured for display to guests.

- **Data Analyst:** A Data Analyst can view existing Vehicle and WGMS data and can download WGMS database data.
- **Master:** A Master manages Vehicle provisioning, mission preparation or operations, as well as payload and web services development.
- **Admin:** A System Administrator has all the permissions required to go through the day-to-day administration of WGMS, adding users, managing customizations, and managing data.
- **Developer:** An incremental role that allows a user to gain access to payload data.
- **Provisioner:** A Provisioner can provision new vehicles and security manifests.
- **Beta User:** A Beta User can access WGMS changes and new features that are under development.
- **Root:** A Root user has full access to all aspects of the Vehicle and WGMS. A user with the Root role will either be a Liquid Robotics developer or a customer under close direction from Liquid Robotics.

Each Role has differing “Permissions” that restrict what actions a user can take and what commands they can use. The types of Permissions are:

Create, Read, Update, and Delete.

For example, a Data Analyst can only read Mission data. A Master has permission to create, read or update a mission, but cannot delete it. An Admin can create, read, update and delete mission data. It is possible for a user to be assigned more than one Role. However, this is rarely necessary.

See “[Viewing Roles for an Organization](#)” for a more detailed explanation of Roles and Permissions.

See [Appendix B: Roles and Permissions](#) for a listing of the various permissions available to each Role.

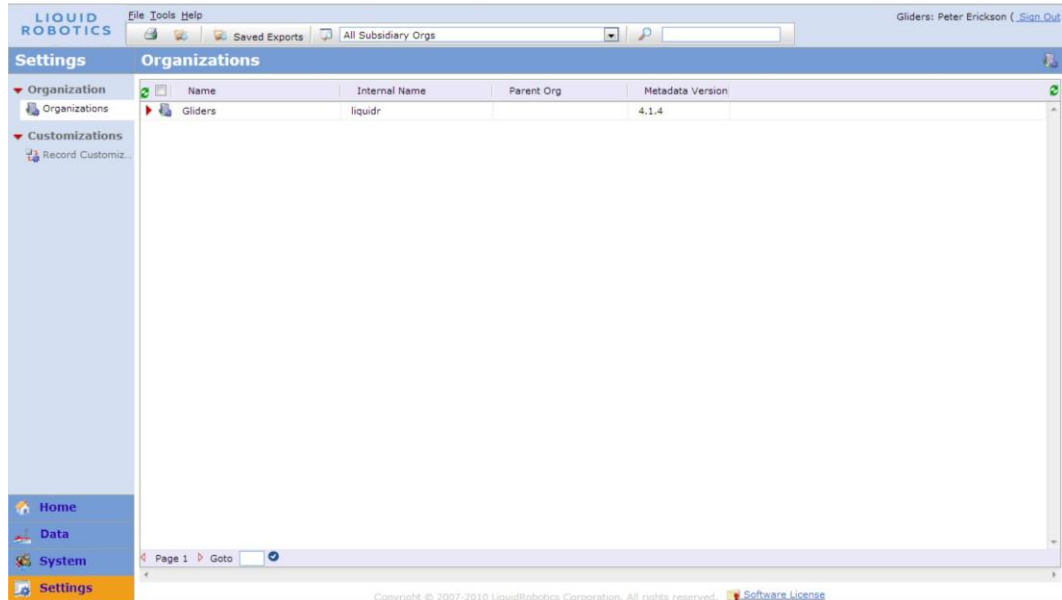
Typical Organization Initialization Tasks

For Liquid Robotics hosted Organizations, set-up is provided as part of the Liquid Robotics service. The following sections describe typical initialization tasks.

Accessing the Organization Info

Click on **Show System Menus**, then click on **Settings** and the **Settings** page will open on the **Organizations** side tab displaying a list with a single Organization that you are authorized to use and log in to:

Figure 8.1. Organizations List



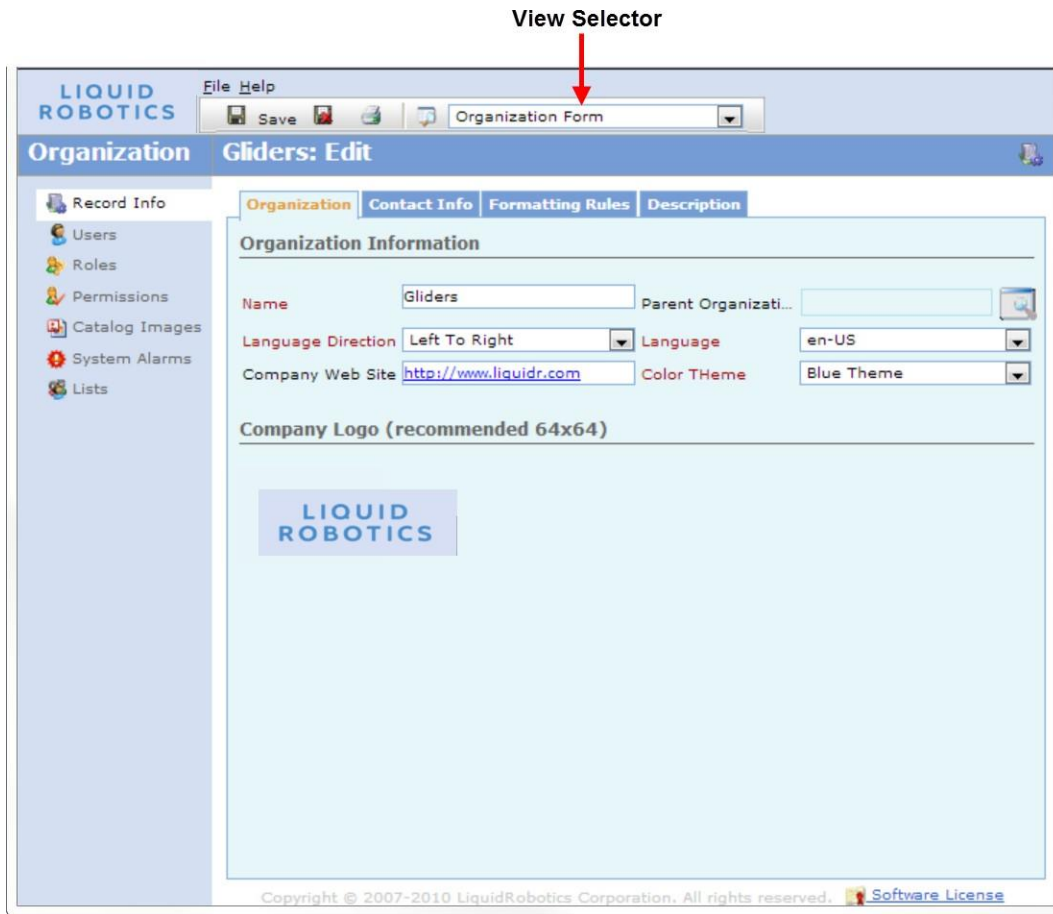
If this is the initial WGMS set-up, only one Organization will be listed. Double-click on the Organization name, or single-click on the icon to the left of the name and an Organization form will appear. See [Figure 8.2](#).

Editing Organization Information and Settings

The Organization form is used to edit Organization information and settings. It is also used to format the GUI associated with each Organization.

The Organization form opens on the **Organization** tab with **Organization Form** selected in the View Selector, by default.

Figure 8.2. Organization Form



The screenshot shows the 'Organization Form' in the Liquid Robotics software. The form is titled 'Gliders: Edit' and has a 'View Selector' dropdown menu at the top. The form contains fields for Name, Language Direction, Language, Company Web Site, and Color Theme. A red arrow points to the 'View Selector' dropdown menu.

Organization Form Fields:

- Name:** Gliders
- Language Direction:** Left To Right
- Language:** en-US
- Company Web Site:** <http://www.liquidr.com>
- Color Theme:** Blue Theme

Company Logo (recommended 64x64):

LIQUID ROBOTICS

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Select **Org Admin Form** in the View Selector drop-down menu to expose all of the settings that a WGMS Administrator can edit. The Org Admin Form has five tabs:

- **Organization**
- **Maps**
- **Contact Info**
- **Formatting Rules**
- **Description**

To add or edit settings and information in the Org Admin Form tabs, make a change and then click on the **Save** icon, or the **Save and Close** icon, in the toolbar at the top of the form. Required settings appear in red.

Figure 8.3. Org Admin Form

View Selector

The screenshot shows the 'Org Admin Form' window. At the top, there is a 'View Selector' dropdown menu. Below it, the 'Organization' tab is selected, displaying various configuration fields. The 'Name' field is set to 'Gliders'. The 'Parent Organiz...' field is empty. The 'Mobile WGMS E...' checkbox is unchecked. The 'Mobile WGMS Id' field is empty. The 'Language Dire...' dropdown is set to 'Left To Right'. The 'Language' dropdown is set to 'en-US'. The 'Company Web ...' field contains the URL 'http://www.liquidr.com'. The 'Color Theme' dropdown is set to 'Blue Theme'. The 'Internal Name' field contains 'liquidr'. The 'NMEA Convert' checkbox is checked. The 'Metadata Versi...' field contains '4.1.4'. The 'Compiled Views' checkbox is checked. The 'SSL Enabled' checkbox is checked. The 'Org Select' checkbox is checked. The 'Root Org Visible' checkbox is checked. At the bottom, there is a 'Company Logo (recommended 64x64)' section with a placeholder image of the 'LIQUID ROBOTICS' logo.

Editing the Organization Tab Settings

The entries under the **Organization** tab allow you to edit Organization configuration details.

To add or edit information, make a change and then click on the **Save** icon, or the **Save and Close** icon, in the toolbar at the top of the form. Required settings appear in red.

Figure 8.4. Org Admin Form - Organization Tab

The screenshot shows the 'Org Admin Form - Organization Tab' for 'Gliders: Edit'. The form is part of the 'LIQUID ROBOTICS' application. The left sidebar contains links to Record Info, Users, Roles, Permissions, Catalog Images, System Alarms, and Lists. The main content area has tabs for Organization, Maps, Contact Info, Formatting Rules, and Description. The 'Organization' tab is selected, displaying the following fields:

- Name:** Gliders
- Parent Organization:** (empty)
- Mobile WGMS Enable:** ☐
- Mobile WGMS Id:** (empty)
- Language Direction:** Left To Right
- Language:** en-US
- Company Web Site:** http://www.liquidr.com
- Color Theme:** Blue Theme
- Internal Name:** liquidr
- NMEA Convert:** ☒
- Metadata Version:** 4.1.4
- Compiled Views:** ☒
- SSL Enabled:** ☒
- Org Select:** ☒
- Root Org Visible:** ☒

Below the fields is a section for the **Company Logo (recommended 64x64)**, which displays the 'LIQUID ROBOTICS' logo.

- **Name:** The Organization name used in the GUI. This comes initially set with a placeholder name. Enter the name you want to use.
- **Parent Organization:** Leave this blank.
- **Mobile WGMS Enable:** Enables Mobile WGMS on a vehicle that supports Mobile WGMS.
- **Mobile WGMS Id:** Used to set or edit the Mobile WGMS Id.
- **Language Direction:** Specifies the placement of the GUI components, including the test positions. Does not change the text itself. The options are:
 - **Left to Right:** The default setting.
 - **Right-to-Left:** Placement positions are reversed.
- **Language:** Specifies the language used. The options are:
 - **en-US:** English, United States. (Default)
 - **en-GB:** English, Great Britain
 - **he-IL:** Hebrew, Israel
- **Company Web Site:** (Optional) URL for the Organization's parent company or agency.

- **Color Theme:** Specifies the color scheme for the GUI. Options are:
 - **Gray Theme**
 - **Green Theme**
 - **Blue Theme**
 - **Maroon Theme**
- **Internal Name:** A name used only by WGMS - Do not change the Internal Name.
- **NMEA Convert:** Box checked → Convert incoming AIS data to NMEA format and store in the database. The NMEA data will also be immediately output on a previously -designated serial port. This option is typically used when there is no Internet connection to the WGMS.
- **MetadataVersion:** Software version number. For reference use when contacting LRI customer support.
- **Compiled Views:** A check in this box indicates to cache the compiled views. This will speed up the response of the GUI. It is recommended that the box always be checked.
- **SSL Enabled:** A check indicates that the Secure Sockets Layer is enabled. It is recommended that the box be checked if an SSL Certificate has been installed.
- **Org Select:**
- **Root Org Visible:**



Note

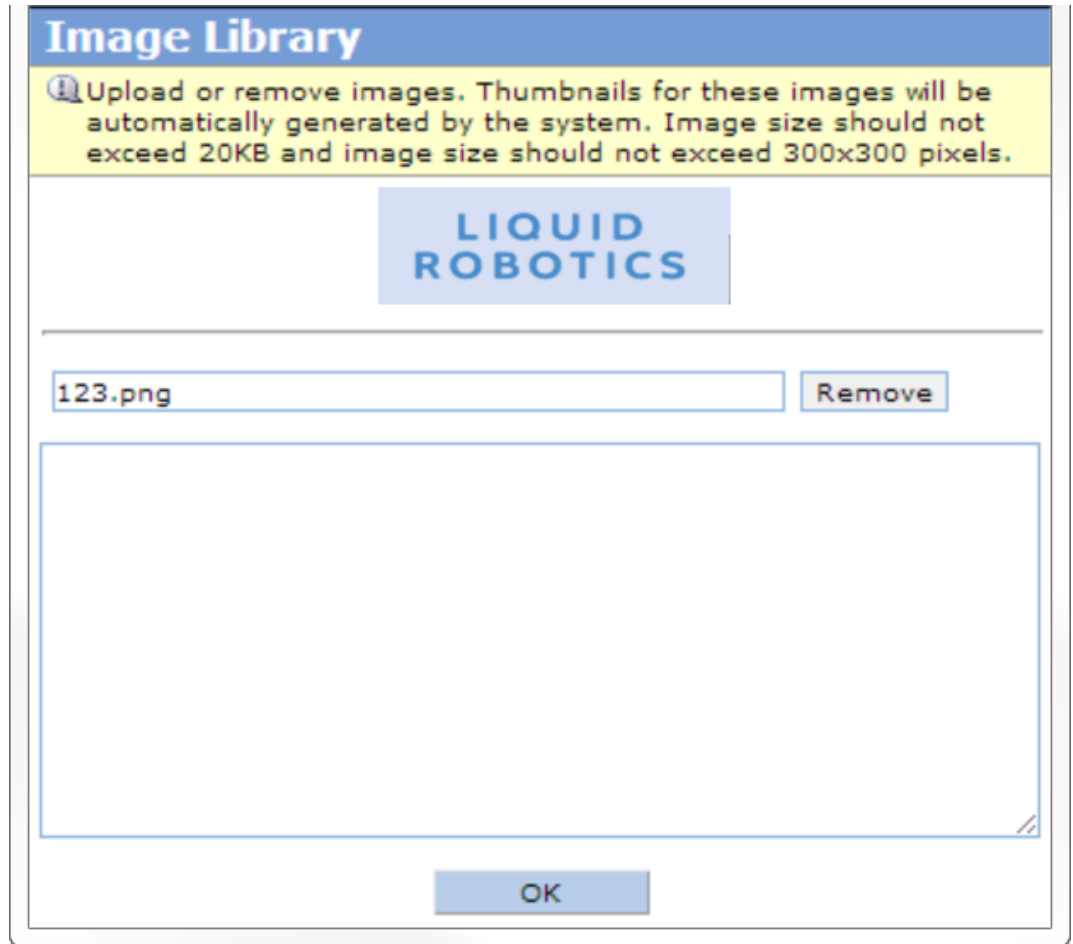
The logo used in the GUI can be changed to denote your company/agency.

Figure 8.5. Changing Logo



Clicking on the logo image will bring up the following dialog:

Figure 8.6. Image Library Dialog Box



Note the restrictions indicated at the top of the **Image Library** dialog box. Enter the name of the file containing the logo image and click **OK**. If you do not want a logo, click **Remove** and then click **OK**.

Editing the Maps Tab Settings

The entries under the **Maps** tab allow you to edit the map options that will be available on the WGMS dashboard.

To add or edit settings and information, make a change and then click on the **Save** icon, or the **Save and Close** icon, in the toolbar at the top of the form. Required settings appear in red.



Note

When **Google Map Enabled** is selected so Google maps are enabled on the WGMS dashboard, make sure that the **Add Map Headers** box is not checked.

Figure 8.7. Org Admin Form - Maps Tab

The screenshot shows the 'Org Admin Form - Maps Tab' interface. The top bar includes the 'LIQUID ROBOTICS' logo and a menu with 'File' and 'Help'. Below this is a toolbar with 'Save', 'Print', and 'Org Admin Form' (with a dropdown arrow). The main content area is titled 'Gliders: Edit' and features a sidebar on the left with navigation links: 'Record Info', 'Users', 'Roles', 'Permissions', 'Catalog Images', 'System Alarms', and 'Lists'. The main panel has tabs for 'Organization', 'Maps' (highlighted), 'Contact Info', 'Formatting Rules', and 'Description'. Under the 'Maps' tab, there's a section 'Map Options' with a list of map providers and their settings. The list includes 'Google Map En...' (checked), 'Disable Externa...' (unchecked), 'NOAA Chart' (checked), 'UK Chart' (checked), 'New Zealand C...' (unchecked), 'Brazil Chart' (unchecked), 'Google Map AP...' (text input), 'Add Map Headers' (unchecked), 'Canada Chart' (checked), 'Australia Chart' (checked), and 'Argentina Chart' (unchecked). Below this is a text field for 'Map Headers' containing 'OpenLayers.Layer.WMS|OpenLayers'. At the bottom, there's a copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to 'Software License'.

Editing the Contact Info Tab Settings

The entries under the **Contact Info** tab allow you to edit Organization contact information.

To add or edit settings and information, make a change and then click on the **Save** icon, or the **Save and Close** icon, in the toolbar at the top of the form. Required settings appear in red.

Figure 8.8. Org Admin Form - Contact Info Tab

The screenshot shows the 'Org Admin Form' with the 'Contact Info' tab selected. The interface includes a top toolbar with 'File', 'Help', 'Save', and a dropdown menu showing 'Org Admin Form'. Below the toolbar is a blue header bar with 'Organization' and 'Gliders: Edit'. A left sidebar contains a tree view with 'Record Info' (selected), 'Users', 'Roles', 'Permissions', 'Catalog Images', 'System Alarms', and 'Lists'. The main content area has tabs for 'Organization', 'Maps', 'Contact Info' (active), 'Formatting Rules', and 'Description'. Under the 'Contact Info' tab, the 'Organization Contact Info' section contains fields for Address 1 (1329 Moffett Park Drive), Address 2, City (Sunnyvale), Company phone (408 636 4205), Company Fax (408 737 1923), State (California), Zip (94809), Country (United States), and Timezone ((UTC-08:00) Pacific Time (US & Canada); Tijuana). Below this is the 'Related Information' section, which displays 'Owner' (empty), 'Organization Id', 'Gliders', 'Created On' (1/20... 07:3...), 'Updated On' (8/23... 13:4...), 'Created By' (System Admin), and 'Updated By' (Peter Erickson). The footer contains copyright information: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a 'Software License' link.

Editing the Formatting Rules Tab Settings

The entries under the **Formatting Rules** tab allow you to edit currency, number, date, and time formats.

To add or edit settings, make a change and then click on the **Save** icon, or the **Save and Close** icon, in the toolbar at the top of the form. Required settings appear in red.

Figure 8.9. Org Admin Form - Formatting Rules Tab

The screenshot shows the 'Org Admin Form' window with the 'Formatting Rules' tab selected. The window has a menu bar with 'File' and 'Help', and a toolbar with 'Save' and 'Org Admin Form' dropdown. The sidebar on the left contains links to 'Record Info', 'Users', 'Roles', 'Permissions', 'Catalog Images', 'System Alarms', and 'Lists'. The main content area has tabs for 'Organization', 'Maps', 'Contact Info', 'Formatting Rules', and 'Description'. The 'Formatting Rules' tab is active, showing three sections: 'Currency and Number Formats', 'Date Formats', and 'Time Number Formats'. Each section contains various input fields and dropdown menus for configuring system-wide formatting rules.

Currency and Number Formats			
Currency Symp...	\$	Currency Format	\$#.##
Currency Preci...	0	Number Format	#,###.00
Negative Numb...	-.##	Currency Code	USD

Date Formats	
Date Separator	/
Date Format	M/d/yyyy
Week Start Day	Sunday

Time Number Formats	
Time Format	HH:mm:ss
Week Number ...	First Day
AM Designator	am
PM Designator	pm

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Editing the Description Tab Information

The **Description** tab provides a place where you can enter free-form notes about the Organization. Enter a text description of your company or agency, or any other information you consider relevant to the Organization. Click on the **Save** icon, or the **Save and Close** icon, in the toolbar at the top of the form. The text will be saved but otherwise is not used.

Figure 8.10. Org Admin Form - Description Tab

The screenshot displays the 'Org Admin Form' interface for 'Liquid Robotics'. The top menu bar includes 'File' and 'Help'. Below it, a toolbar contains 'Save', a printer icon, a document icon, and a dropdown menu showing 'Org Admin Form'. The main content area is divided into a sidebar and a main panel. The sidebar, under the 'Organization' header, lists 'Record Info', 'Users', 'Roles', 'Permissions', 'Catalog Images', 'System Alarms', and 'Lists'. The main panel, titled 'Gliders: Edit', features five tabs: 'Organization', 'Maps', 'Contact Info', 'Formatting Rules', and 'Description'. The 'Description' tab is selected, revealing a large text input area. The footer contains the text 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a 'Software License' link.

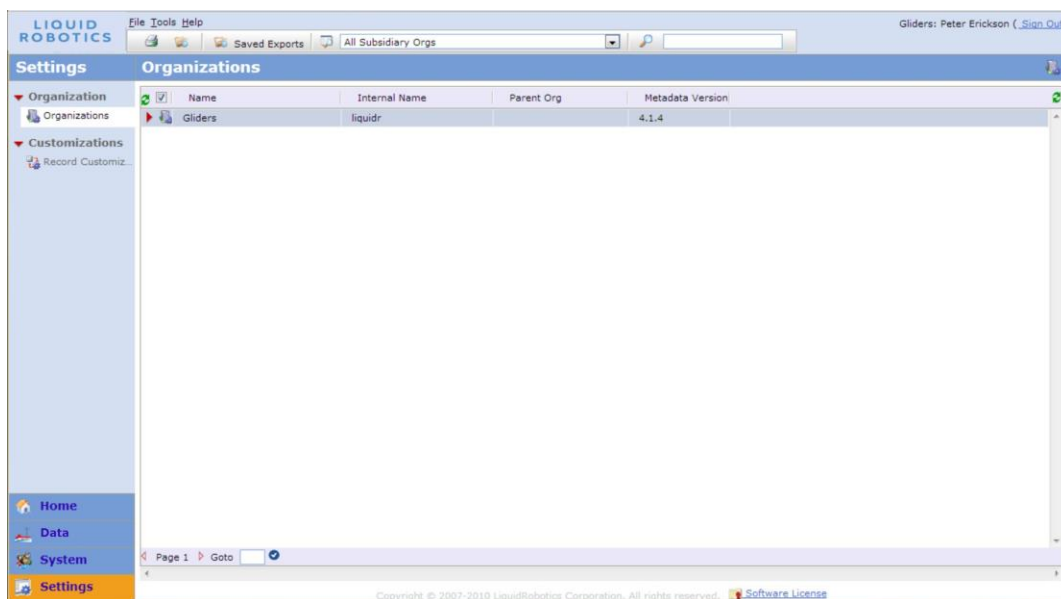
Standard Administrative Tasks

Adding New Users

To add a new User to an Organization:

1. Click on **Settings** in the **System Menus** to open the Organizations list where you will see a single Organization that you are authorized to use and log in to.

Figure 8.11. Organizations Window



2. Double-click on an Organization name, or single-click on the icon to the left of an Organization name and the **Organization** dialog box will appear.

Figure 8.12. Organization Dialog Box

View Selector

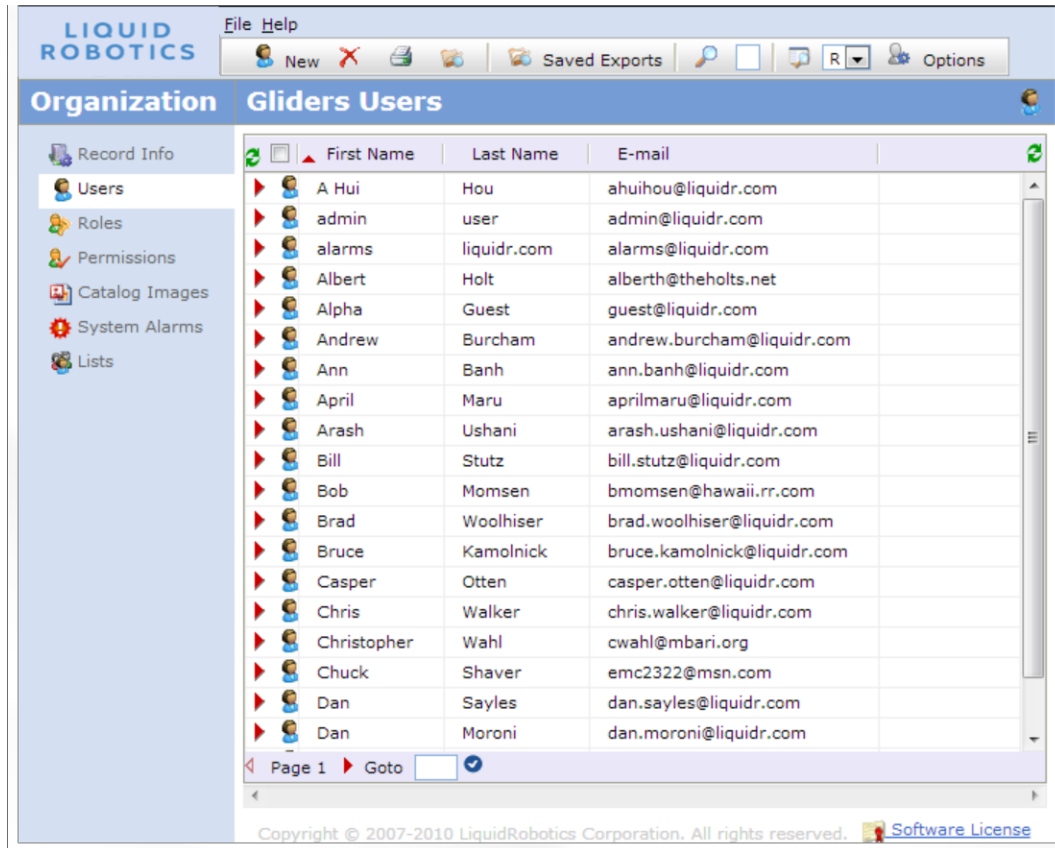
The screenshot shows the 'Organization Gliders: Edit' dialog box. The 'View Selector' dropdown menu is highlighted with a red arrow. The 'Organization' tab is selected, displaying the 'Organization Information' section. The fields are as follows:

Field	Value
Name	Gliders
Parent Organization	
Language Direction	Left To Right
Language	en-US
Company Web Site	http://www.liquidr.com
Color Theme	Blue Theme

The 'Company Logo' section shows a placeholder for a 64x64 pixel logo with the text 'LIQUID ROBOTICS'.

3. Click the **Users** side tab to open a list of individuals who have been granted access to the Organization. The list will be similar to the [Figure 8.13](#), below.

Figure 8.13. Example List of Users



4. Click on New  in the toolbar to open the **User: New** form. The **User: New** form has three tabs:

- **User**
- **Multi-Factor Auth**
- **Related Info**

The **User** tab will be selected by default.

Figure 8.14. User: New Form

The screenshot shows the 'User: New' form within the 'User Admin Form' window. The form is divided into two main sections: 'User Information' and 'Fleet Association'. The 'User Information' section contains various input fields for user details, including E-mail, Password, First Name, Last Name, Country Code, Telephone, Phone Extension, Export Max Rec..., Pager, Alt Email, Time Zone Code, Password Expired, Account Locked, Username, and Domain User. The 'Fleet Association' section includes a 'Fleet Selector' dropdown menu. The form is part of a larger application window with a menu bar (File, Help) and a toolbar (Save, Print, Copy, Paste, Undo, Redo). The footer of the window displays the copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to the 'Software License'.



Note

In the toolbar at the top of the window **User Admin Form** appears in the view selector - this format is visible only to System Administrators. Other Users will see the **User Form**, which is similar, but does not show the **Password Expired** and **Account Locked** options along with a few other differences (you can view the User Form by selecting **User Form** in the view selector).

The fields in the **User: New** form include:

- **E-mail:** The primary email address of the User. This will be used as the user's login ID and for email to the User.
- **Password:** The initial password for the User. All Roles except "Guest User" have the permission to change their own password.
- **FirstName/Last Name:** The User's name.
- **Country Code:** The country code preface to the User's telephone number.
- **Telephone:** The User's 9-digit telephone number, starting with the Area Code. The number can contain blanks or dashes.
- **Phone Extension:** The User's extension, if applicable.

- **Export Max Records:** The number of Excel records that the User can download at one time from various lists. Typically, the number should be less than the default 65535. The recommended value is 2000 or less. For large exports, the recommended value is 100000.
- **Pager:** This field is not a telephone number. It is an email address link to the User's pager. Alarms are emailed to the pager via this address.
- **Alt Email:** A secondary email address for the User, if available.
- **Time Zone Code:** The preferred time zone of the User. Time stamps will be displayed in this time zone. Pull down to select.
- **Password Expired:** A password can be manually expired using this check box. The common use is to create the User data with an administrator-selected password and to check this box. The first time a new User logs in, they will be prompted for the administrator-selected password and then must immediately change the password. If you leave the box unchecked, they can use whatever password you selected indefinitely.
- **Account Locked:** For new Users, leave this box unchecked. A check in the box indicates that the User has been denied access to their account.
- **Username:** This is the username defined by the user after the first login.
- **Domain User:** Domain user name for the LRI Corporate network. Used in single sign on, requires both domain and user name, for example, LIQUIDR\lri.user

As an example, a completed User account form might look like:

Figure 8.15. Completed New User Account Example

The screenshot shows the 'User: New' form in the Liquid Robotics User Admin interface. The form is divided into two main sections: 'User Information' and 'Fleet Association'. The 'User Information' section contains fields for E-mail, Password, First Name, Last Name, Country Code, Telephone, Phone Extension, Export Max Rec..., Pager, Alt Email, Time Zone Code, Password Expired, Account Locked, Username, and Domain User. The 'Fleet Association' section contains a Fleet Selector dropdown menu. The form is titled 'User: New' and has tabs for 'User', 'Multi-Factor Auth', and 'Related Info'. The 'User' tab is selected. The form is titled 'User: New' and has tabs for 'User', 'Multi-Factor Auth', and 'Related Info'. The 'User' tab is selected. The form is titled 'User: New' and has tabs for 'User', 'Multi-Factor Auth', and 'Related Info'. The 'User' tab is selected.

User Information	
E-mail	jt_finran@cglobal.net
Password	*****
First Name	Jenke
Last Name	Finran
Country Code	1
Telephone	555.610.3400
Phone Extension	
Export Max Rec...	65535
Pager	
Alt Email	jt_finran@yahoo.org
Time Zone Code	(UTC-08:00) Pacific Time (US & Canada); Tijuana
Password Expired	☐
Account Locked	☐
Username	*****
Domain User	

Fleet Association	
Fleet Selector	All Vehicles

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When the required information in the **User: New** form is completed, the **Roles** tab in the side-bar will become active.

Assigning or Removing User Roles

To assign a Role to a User:

1. Click on **Settings** in the **System Menus** to open the list of Organizations managed by the instance of WGMS you are using, then double-click on an Organization name, or single-click on the icon to the left of an Organization name, and the **Organization** form will appear.

Figure 8.16. Organization Form

View Selector

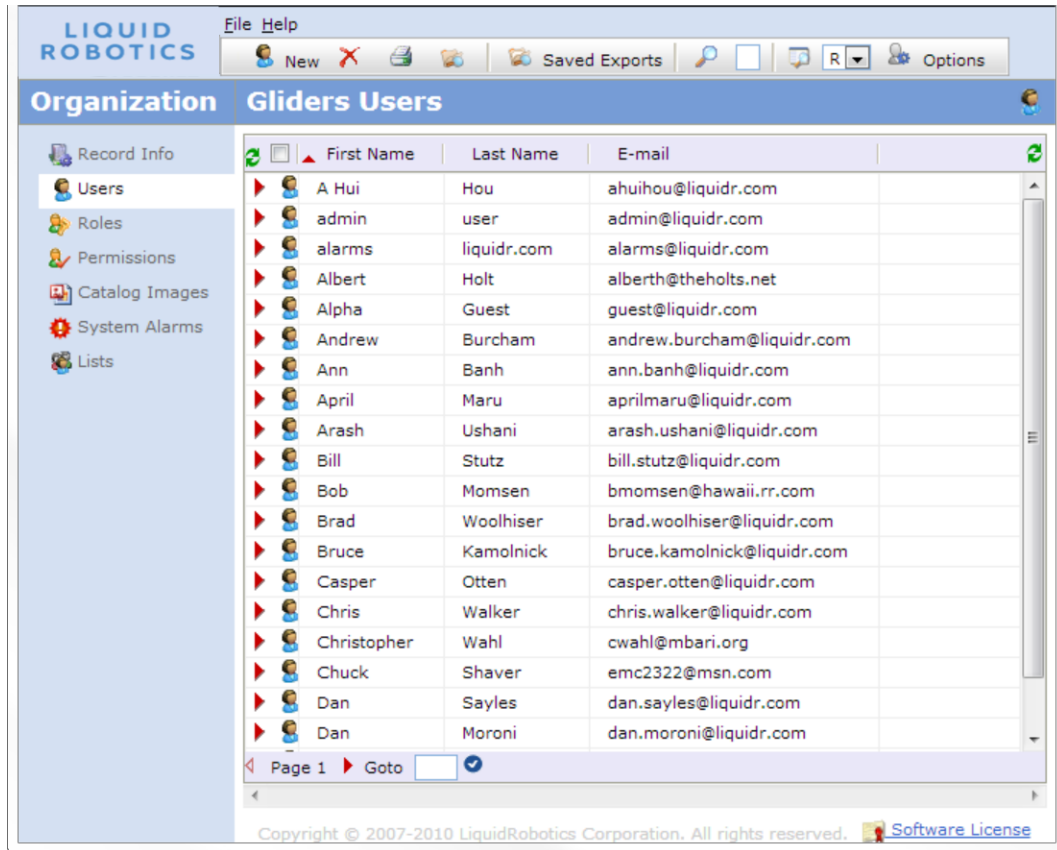
The screenshot shows the 'Organization Form' in the Liquid Robotics software. The interface includes a top menu bar with 'File' and 'Help' options, and a 'Save' button. Below this is a 'View Selector' dropdown menu, indicated by a red arrow. The main content area is titled 'Organization' and 'Gliders: Edit'. It features a sidebar with 'Record Info' and 'Users' tabs. The 'Organization Information' section contains the following fields:

- Name:** Gliders
- Parent Organization:** (empty field)
- Language Direction:** Left To Right
- Language:** en-US
- Company Web Site:** <http://www.liquidr.com>
- Color Theme:** Blue Theme

Below these fields is a section for the 'Company Logo (recommended 64x64)', which displays the 'LIQUID ROBOTICS' logo. The footer of the form includes the copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to the 'Software License'.

2. Click the **Users** side tab to open a list of individuals who have been granted access to the Organization.

Figure 8.17. WGMS Organization Users Example



- To select a User, double-click on a User name, or single-click on the icon to the left of a User name, and the **User Admin Form** for that User will appear.

Figure 8.18. User Admin Form Example

The screenshot shows a web application window titled "LIQUID ROBOTICS" with a menu bar containing "File" and "Help". Below the menu bar is a toolbar with "Save", "Print", and "User Admin Form" (selected). The main content area is titled "User" and "alpha.guest@liquid-robotics.com: Edit". On the left, there is a sidebar with "Record Info" and "Roles" tabs. The "Record Info" tab is active, showing a "User" tab and "Multi-Factor Auth" and "Related Info" sub-tabs. The "User Information" section contains the following fields:

Field	Value	Field	Value
E-mail	alpha.guest@liquid-robotics	Password	****
First Name	Alpha	Last Name	Guest
Country Code	1	Telephone	
Phone Extension		Export Max Rec...	65535
Pager	1234567891@txt.xyz.net	Alt Email	
Time Zone Code	(UTC-08:00) Pacific Time (US & Canada); Tijuana		
Password Expired	☐	Account Locked	☐
Username		Domain User	LIQUIDR\alpha.guest

The "Fleet Association" section contains a "Fleet Selector" dropdown menu.

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4. Click the **Roles** side tab and the **User Related Roles** form will appear as shown in Figure 8.19

Figure 8.19. User Related Roles Form

The screenshot shows the 'User Related Roles' form. The 'User' section on the left has a sidebar with 'Record Info' and 'Roles'. The 'User Roles' section on the right has a table with 'Role Id' and 'Admin' roles. Below this table are buttons for 'Add User Roles' and 'Remove User Roles'. At the bottom, there is a table listing available roles: Beta Access, Data Analyst, Developer, Guest User, Master, and Provisioner, each with a description. The form also includes a footer with copyright information and a software license link.

The upper section of the form contains the Roles assigned to the User. The lower section contains all of the available Roles. Although it is possible to assign more than one Role to a user, it is rarely necessary.

5. Click on a Role in the lower section of the **User Related Roles** form to select it, then click **Add User Roles** to assign that Role to the User. The Role will appear in the upper section of the **User Related Roles** form.

To remove a Role for a User:

1. In the upper section of the **User Related Roles** form, click on a Role to select it.
2. Click **Remove User Roles** to remove the Role from the User. The Role will move to the lower section of the **User Related Roles** form.

Deleting a User

To delete a User from an organization:

1. Click on **Settings** in the **System Menus** to open the list of Organizations managed by the instance of WGMS you are using, then double-click on an Organization name, or single-click on the icon to the left of an Organization name, and the **Organization** form will appear.

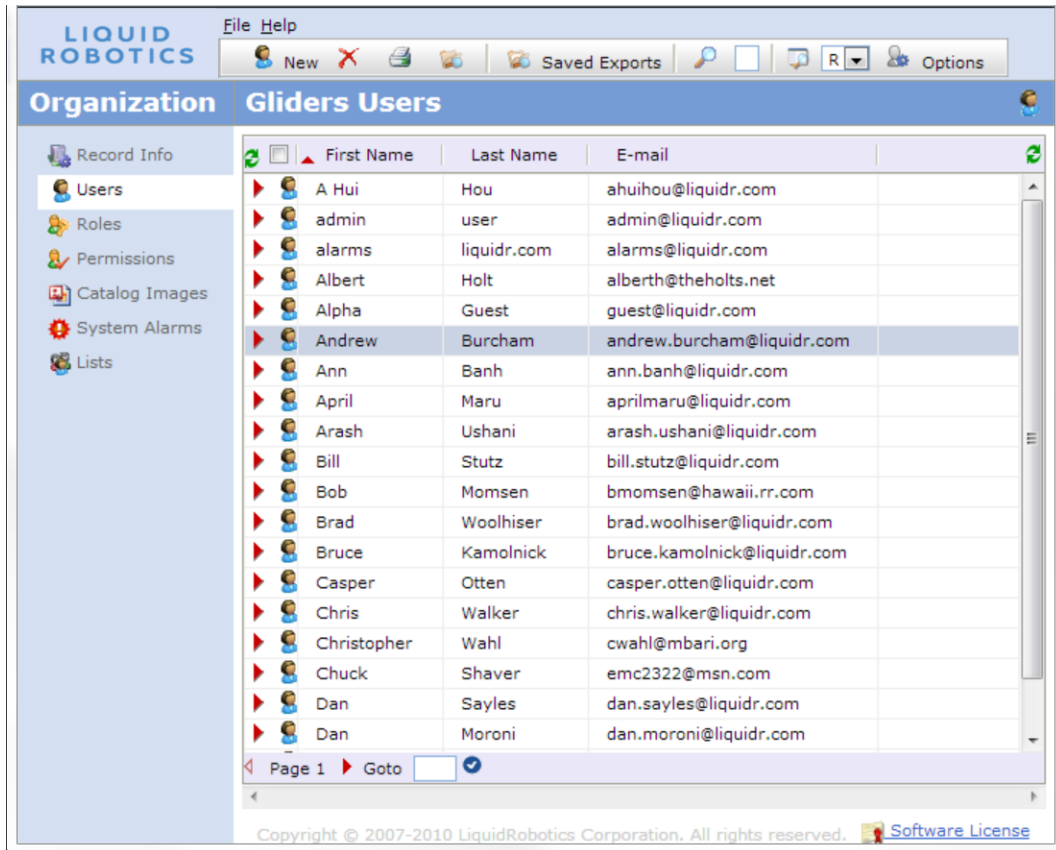
Figure 8.20. Organization Form

View Selector

The screenshot shows the 'Organization Form' in the Liquid Robotics software. The interface includes a top menu bar with 'File' and 'Help', and a toolbar with 'Save' and 'Organization Form' (indicated by a red arrow labeled 'View Selector'). The main window is titled 'Organization' and 'Gliders: Edit'. On the left is a sidebar with 'Record Info' and 'Users'. The main area has tabs for 'Organization', 'Contact Info', 'Formatting Rules', and 'Description'. The 'Organization' tab is active, showing 'Organization Information' with fields for Name (Gliders), Parent Organization, Language Direction (Left To Right), Language (en-US), Company Web Site (http://www.liquidr.com), and Color Theme (Blue Theme). Below these is a 'Company Logo' section with a recommended 64x64 size. The footer contains copyright information and a 'Software License' link.

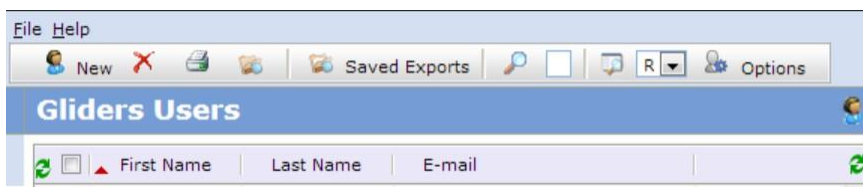
2. Click on the Users side tab to open the Users list.
3. Select the name of the User you want to delete by clicking on it. For example, the name Andrew Burcham is selected in [Figure 8.21](#) below.

Figure 8.21. Name Selected for Deletion



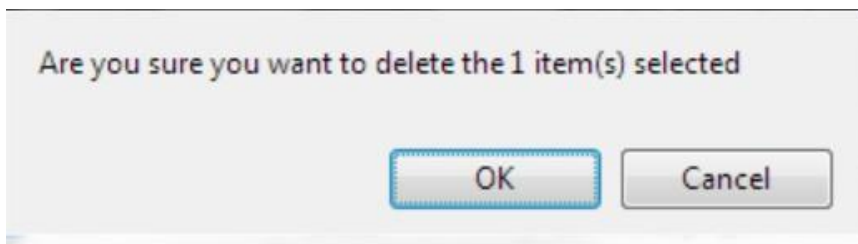
4. Click the delete icon  in the toolbar:

Figure 8.22. Users Dialog Box Toolbar



5. A confirmation request dialog box will appear:

Figure 8.23. Deletion Confirmation Dialog Box



6. Click **OK** to permanently delete this User profile from the system.

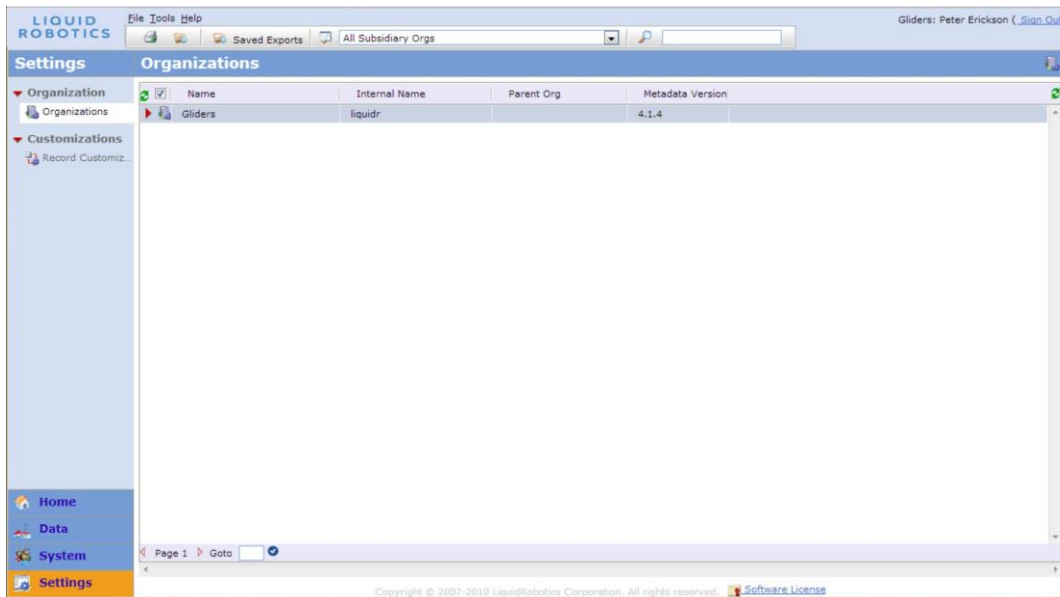
Specialized Administrative Tasks

The WGMS UI allows a System Administrator to view and change fundamental aspects of the system. It is strongly recommended that you contact Liquid Robotics before making changes, as some changes may have unintended consequences.

Accessing an Organization

Click on **Settings** in the System Menus and the **Settings** page will open on the **Organizations** side tab displaying the list of Organizations you are assigned to:

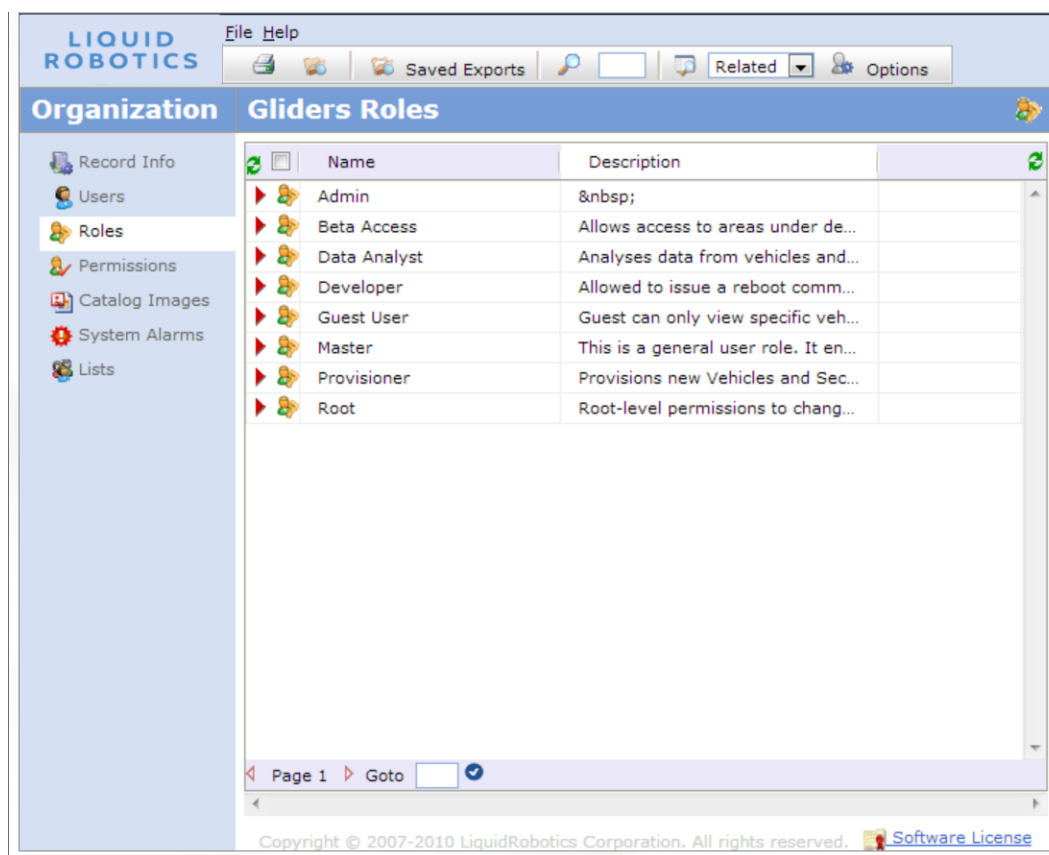
Figure 8.24. Organizations List



Viewing Roles for an Organization

To view the Roles available within an Organization, double-click on the Organization name, or single-click on the icon to the left of the Organization name and the **Organizations Form** will appear. Click on the **Roles** side tab and the **Roles** list for the selected Organization will appear as shown in Figure 8.25.

Figure 8.25. Roles List



For more information on a Role, double-click on a Role name, or single click on the icon to its left. For example, double-clicking on **Master** will bring up the form shown in Figure 8.26.

Figure 8.26. Master Role Form

Click on the Descriptions tab to view the Role description as shown in Figure 8.27.

Figure 8.27. Master Role Description

Viewing Permissions

To view the Permissions granted for each Role in an Organization:

1. Click **Settings** in the **System Menus**

and the **Settings** page will open with the **Organizations** side tab selected displaying the **Organizations** list.

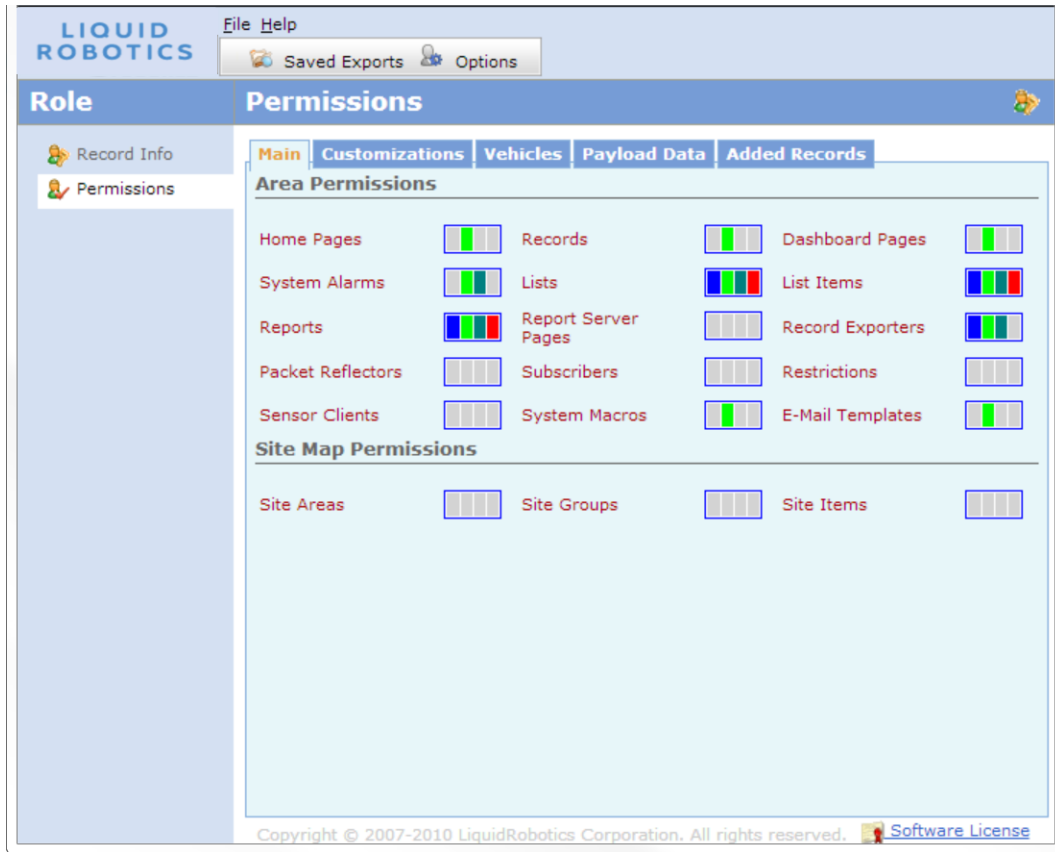
2. Double-click on an Organization name, or single-click on the icon to the left of an Organization name and the **Organization Form** for that Organization will appear.
3. Click on the **Roles** side tab.
4. Double-click on a Role, for example, **Master**, or single-click on the icon to the left of that Role, and the **Role Form** will appear.

Figure 8.28. Master Role Form

The screenshot shows the 'Master: Edit' window for the 'Role Form'. The interface has a blue header with the 'LIQUID ROBOTICS' logo and a menu bar with 'File' and 'Help'. Below the header is a toolbar with 'Save', 'Print', and a dropdown menu set to 'Role Form'. The main content area is divided into a left sidebar and a main panel. The sidebar has two tabs: 'Record Info' (selected) and 'Permissions'. The main panel has two tabs: 'Role' (selected) and 'Description'. Under the 'Role' tab, there is a 'Role Information' section with fields for 'Name' (Master), 'Source Id' (18), and 'Role Type' (Advanced). Below this is a 'Related Information' section with fields for 'Owner', 'Created On', 'Created By', 'Parent Org', 'Updated On', and 'Updated By'. The 'Owner' field is empty, 'Created On' is 4/30/... 07:1..., 'Created By' is System Admin, 'Parent Org' is Gliders, 'Updated On' is 3/4/... 09:1..., and 'Updated By' is System Admin. At the bottom of the window, there is a copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to the 'Software License'.

5. Click on the **Permissions** side tab and the **Permissions** window for the Master Role will appear. The **Permissions** window is used to edit the permissions associated with a specific Role for a specific Organization.

Figure 8.29. Master Role Permissions Window

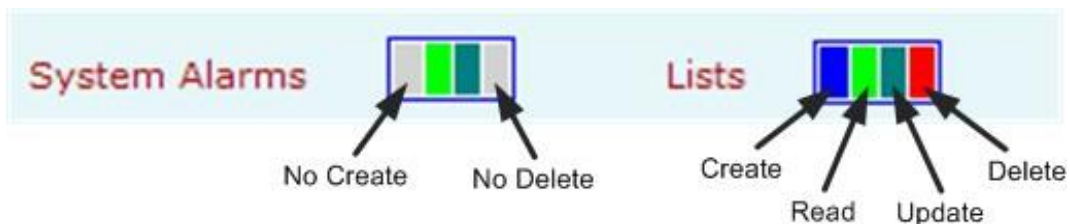


The **Permissions** window includes five tabs where different categories of permissions can be edited:

- **Main**
- **Customizations**
- **Vehicles**
- **Payload Data**
- **Added Records** (This tab is not commonly used, consult with LRI before using to avoid unexpected results.)

There is a four part icon associated with each type of permission. Moving from left to right, the color of each of the 4 boxes in the icon indicate if the Role has permission to Create, Read, Update, or Delete the type of permission the icon is associated with, as shown in Figure 8.30.

Figure 8.30. Permission Icon Descriptions



The colors of the boxes indicate the permission status:

- **Gray:** Does not have permission
- **Blue:** Create permission
- **Light Green:** Read permission
- **Dark Green:** Update permission
- **Red:** Delete permission

For example, [Figure 8.31](#) shows some of the Vehicles permissions for the Master Role.

Figure 8.31. Master Vehicles Permissions



Changing Permissions

Changing the Permissions for a Role requires a Root Role and is strongly discouraged. Keep in mind that changing a Permission for a Role affects all Users that have been assigned that Role. For more information, contact the Liquid Robotics Support Organization.

Changing Catalog Images

Custom images (such as your company/agency logo) must be stored in the WGMS database for use in the GUI. To view custom images:

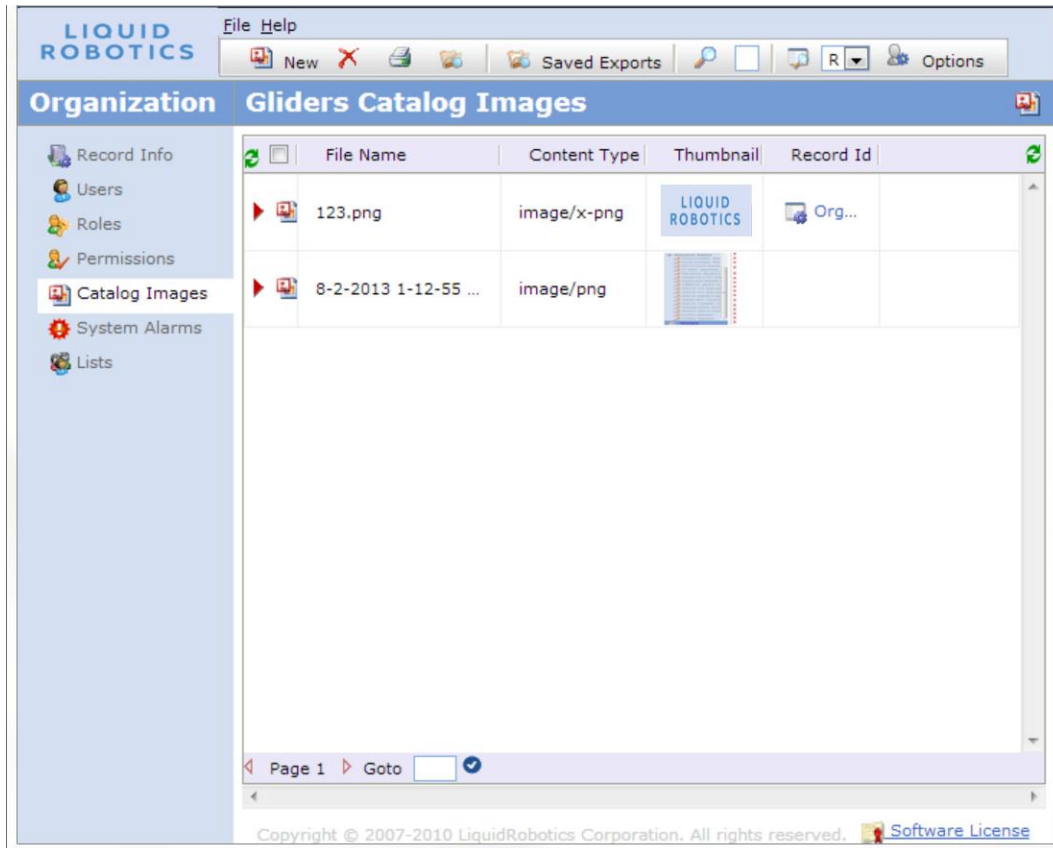
1. Click **Settings** in the **System Menus**

and the **Settings** page will open with the **Organizations** side tab selected displaying the **Organizations** list.

2. Double-click on an Organization name, or single-click on the icon to the left of an Organization name and the **Organization Form** for that Organization will appear.

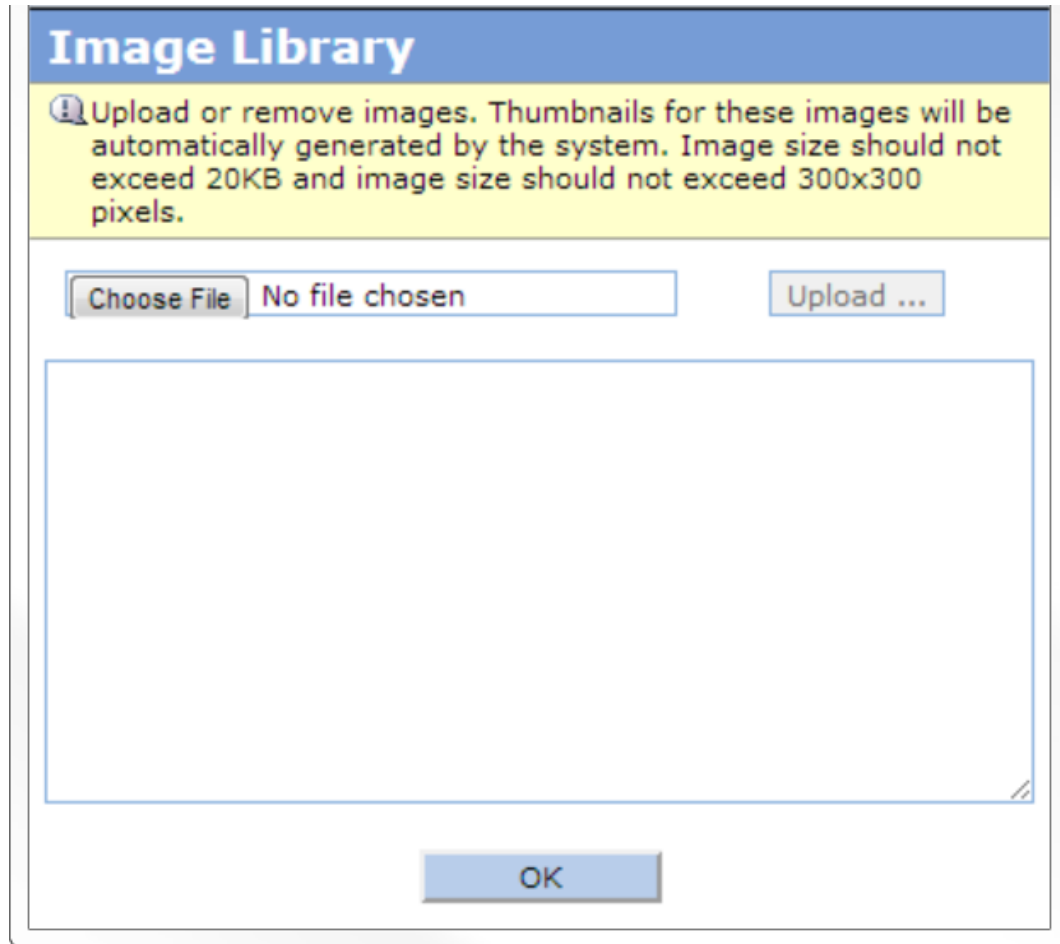
3. Click on the **Catalog Images** side tab and the **Catalog Images** list for the Organization you selected will appear.

Figure 8.32. Catalog Images List



To add a new image click on the new image icon  **New** in the toolbar near the top of the dialog box and an **Image Library** dialog box will appear.

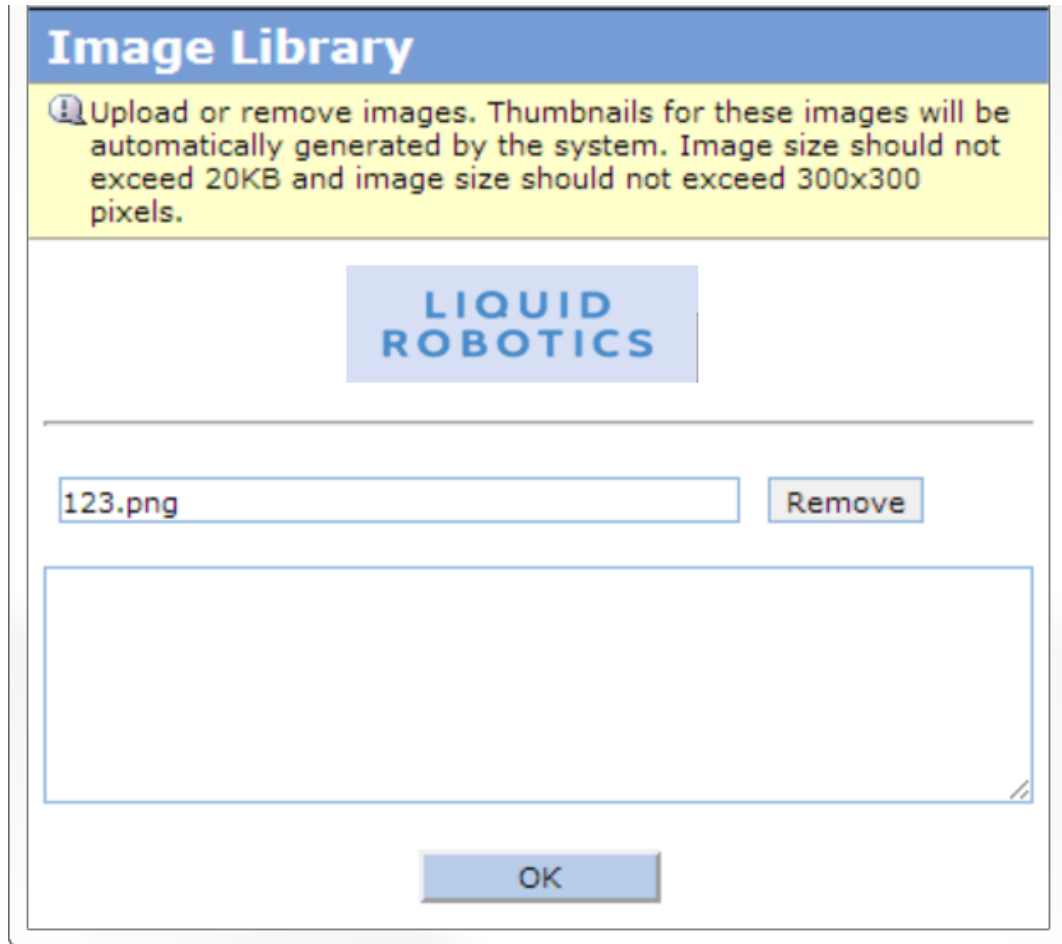
Figure 8.33. Image Library Upload Dialog Box



Click **Choose File** to browse and select an image, then click **Upload. ..** A thumbnail of the uploaded image and related information will appear in the **Image Library** dialog box. If you want to keep the image, click **OK** and the image will appear in the **Catalog Images** list.

To remove an image from the WGMS database, from the **Catalog Images** dialog box double-click on the image file name, or single click on the logo to the left of the image file name and an **Image Library** dialog box will appear displaying the image file name with a **Remove** button adjacent to it. Click **Remove** and then click **OK** to delete the image and the image will be removed from the **Catalog Images** list (you may have to refresh your browser for the image to be removed from the **Catalog Images** list).

Figure 8.34. Image Library Remove Dialog Box



Advanced Organization Options

The **Permissions**, **System Alarms** and **Lists** side tabs on the **Organization Form** control basic aspects of the UI and the WGMS database. A Root Role is required to change them. These options should not be modified without the direct involvement of Liquid Robotics Customer Support.

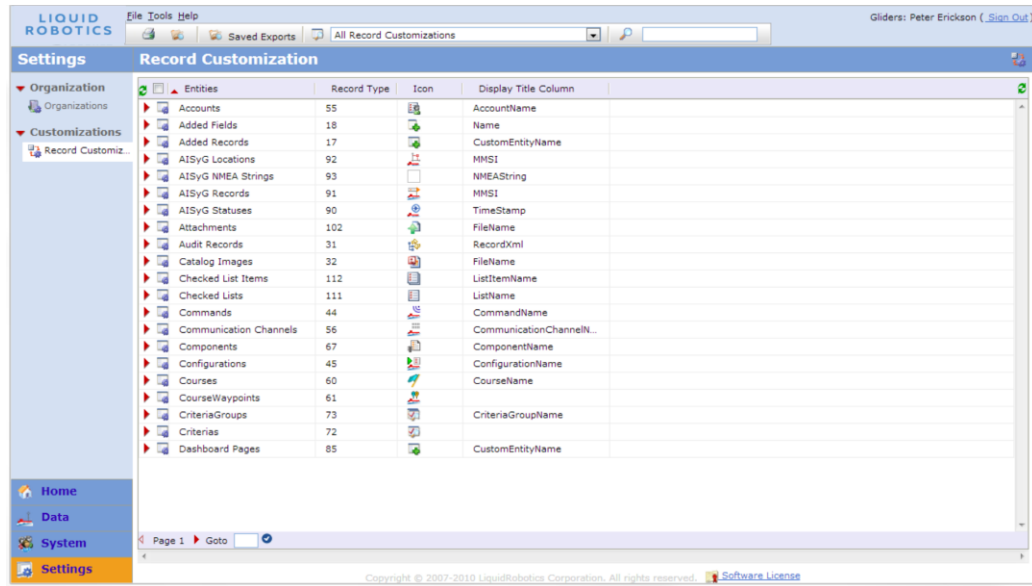
Figure 8.35. Advanced Organization Options Side Tabs

The screenshot displays the 'Gliders: Edit' interface. On the left, a sidebar contains icons and labels for 'Record Info', 'Users', 'Roles', 'Permissions', 'Catalog Images', 'System Alarms', and 'Lists'. The main window has a top menu bar with 'File' and 'Help', and a toolbar with 'Save' and a dropdown menu currently set to 'Organization Form'. Below the toolbar, a blue header bar reads 'Organization Gliders: Edit'. The main content area features four tabs: 'Organization' (highlighted), 'Contact Info', 'Formatting Rules', and 'Description'. Under the 'Organization' tab, the 'Organization Information' section includes the following fields: 'Name' (text box with 'Gliders'), 'Parent Organiz...' (text box with a selection icon), 'Language Direc...' (dropdown menu with 'Left To Right'), 'Language' (dropdown menu with 'en-US'), 'Company Web ...' (text box with 'http://www.liquidr.com'), and 'Color THeme' (dropdown menu with 'Blue Theme'). Below these fields is a 'Company Logo (recommended 64x64)' section containing a placeholder image of the 'LIQUID ROBOTICS' logo. At the bottom of the page, a copyright notice reads 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' followed by a 'Software License' link.

Advanced Settings Options - Record Customization

The **Customizations** menu in the side-bar of the **Settings** page includes the **Record Customization** side tab. Record Customizations are available to Root users only. They support very specialized use cases and should not be modified without the direct involvement of Liquid Robotics Customer Support. Incorrectly applied changes can result in significant damage to your database.

Figure 8.36. Record Customization Side Tab



Chapter 9. Provisioning a Wave Glider

This chapter covers the general steps required to provision a new Wave Glider Vehicle.

If the Vehicle is new (to your Organization), its data and configuration will need to be entered into the WGMS system database. If the Vehicle has already been named and entered into the system, you can skip this chapter.

For details on Vehicle unpacking and assembly, refer to one of the following:

- *Wave Glider SV2 Unpacking and Assembly Guide*
- *Wave Glider SV3 Unpacking and Assembly Guide*

For information on configuring payloads for the Float and Sub, refer to one of the following:

- *Wave Glider SV2 Interface Control Description*
- *Wave Glider SV3 Interface Control Description*

Provisioner Role Requirements

WGMS Roles are assigned by a System Administrator and each Role grants specific privileges for mission controls when using WGMS. See “[Roles](#)” for more information.

In order to provision a Vehicle you will need to be assigned either **Master** or **Admin** Role privileges.

Entering a Vehicle into the Database

Organizations

When you logged on to WGMS, you selected your Organization. All of the descriptions in this chapter refer to provisioning Vehicles within that Organization.

Even if you are allowed to log into more than one Organization, you cannot directly copy or otherwise transfer information from one Organization to another.

Vehicle Name

The first step is to come up with a unique name for your Vehicle. It can be whimsical ("Shark Bait"), descriptive ("Yellow Boat") or indicate its purpose ("#5 Weather Station").

All database information for the Vehicle (for example, Waypoints, Inclusion polygons, and Exclusion polygons) will be associated only with that Vehicle name.

The Vehicle name can have a maximum of 128 characters and can include blanks, numbers or any printable keyboard character. However, most of the name display boxes in the user interface show about 20 characters. If your Organization has more than one Vehicle, it is best if the first characters of your Vehicle name are descriptive and unique. For example,

#1 North Station, Acme Oceanic Inc.

#2 South Station, Acme Oceanic Inc.

would be preferable to...

Acme Oceanic Inc. Station North#1

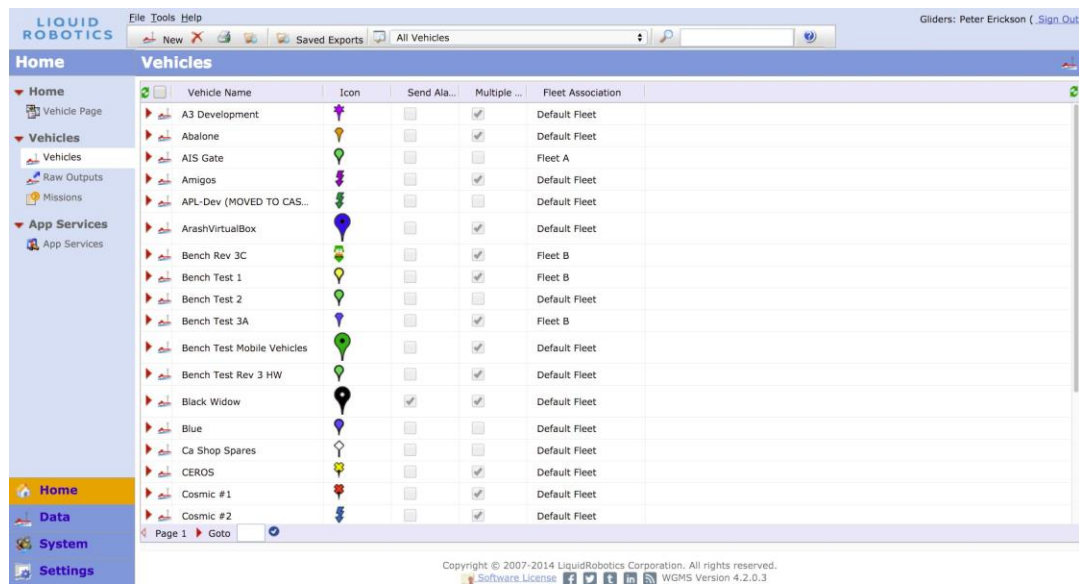
Acme Oceanic Inc. Station South#2

There is nothing to prevent provisioning different Wave Gliders with the same name. The database will store each Vehicle's data separately. However, this practice is not recommended because it will lead to confusion about which Vehicle's data is being referenced.

Create and Name a New Vehicle

Sign in to the WGMS **Dashboard** and click on **Show System Menus** to bring up the **Home** page. Next, click on the **Vehicles** side tab under in the **Vehicles** menu to bring up the **Vehicles** page.

Figure 9.1. Data Page, Vehicles Tab



Only 26 Vehicles are shown on each page. If there are more than 26 Vehicles in the list, the right-pointing triangle at the bottom of the list of Vehicles will be solid. Click on the solid triangle to go to the next page, or enter the page number you want to jump to in the **Goto** field and click on the check-mark next to the **Goto** field.

Figure 9.2. Changing Pages in the Vehicles Tab



To create a new Vehicle in the Organization you are logged into, click on **New** in the **Home** page toolbar and a **Vehicle: New** form will open with the **Vehicle** tab selected by default. Note that there are also tabs on the **Vehicle: New** form for **Settings**, **File System**, **Components**, and **Related Info**.

Figure 9.3. Click on New

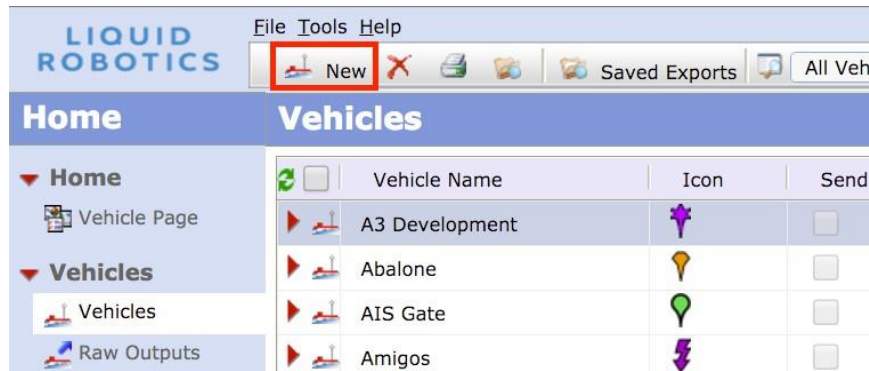


Figure 9.4. Vehicle: New Form

Vehicle Tab

The screenshot shows the 'Vehicle: New' form. At the top, there is a menu bar with 'File' and 'Help'. Below it is a toolbar with 'Save' and 'Vehicle Form' buttons. The form has a navigation pane on the left with a list of items: 'Record Info', 'Waypoints', 'Operation Polyg...', 'Map', 'Event Definitions', 'Errors', 'Telemetry', 'Commands', 'Configurations', 'Vehicle Parsed C...', 'Statuses', 'Communication', 'Security Manifes', 'Courses', 'Part Identificatio...', 'Power Ctl Status', 'RudderControls', 'Lists', 'Checked Lists', and 'Raw Outputs'. The main area of the form is divided into two sections: 'Vehicle Info' and 'Part Info'. The 'Vehicle Info' section contains the following fields:

- Vehicle Name**: A text input field.
- Fleet Association**: A dropdown menu with 'Default Fleet' selected.
- Icon**: A dropdown menu with 'GreenIcon' selected.
- Icon Size**: A dropdown menu with 'Normal' selected.
- Default Comm C...**: A text input field.
- Auto Respond**: A checkbox.

The 'Part Info' section is currently empty. At the bottom of the form, there is a copyright notice: 'Copyright © 2007-2014 LiquidRobotics Corporation. All rights reserved.' and a 'Software License' link.

You must enter information, or make selections, for all items that appear in red text for each tab in the **Vehicle: New** form.

In the **Vehicles** tab of the **Vehicle: New** form:

1. Enter a name for the Vehicle in the **Vehicle Name** field.
2. Select a fleet association for the Vehicle in the **Fleet Association** drop-down menu. The **Default Fleet** contains all of the Vehicles in the Organization. If any other fleets have been defined, they will be sub-sets of the Vehicles in the Default Fleet.

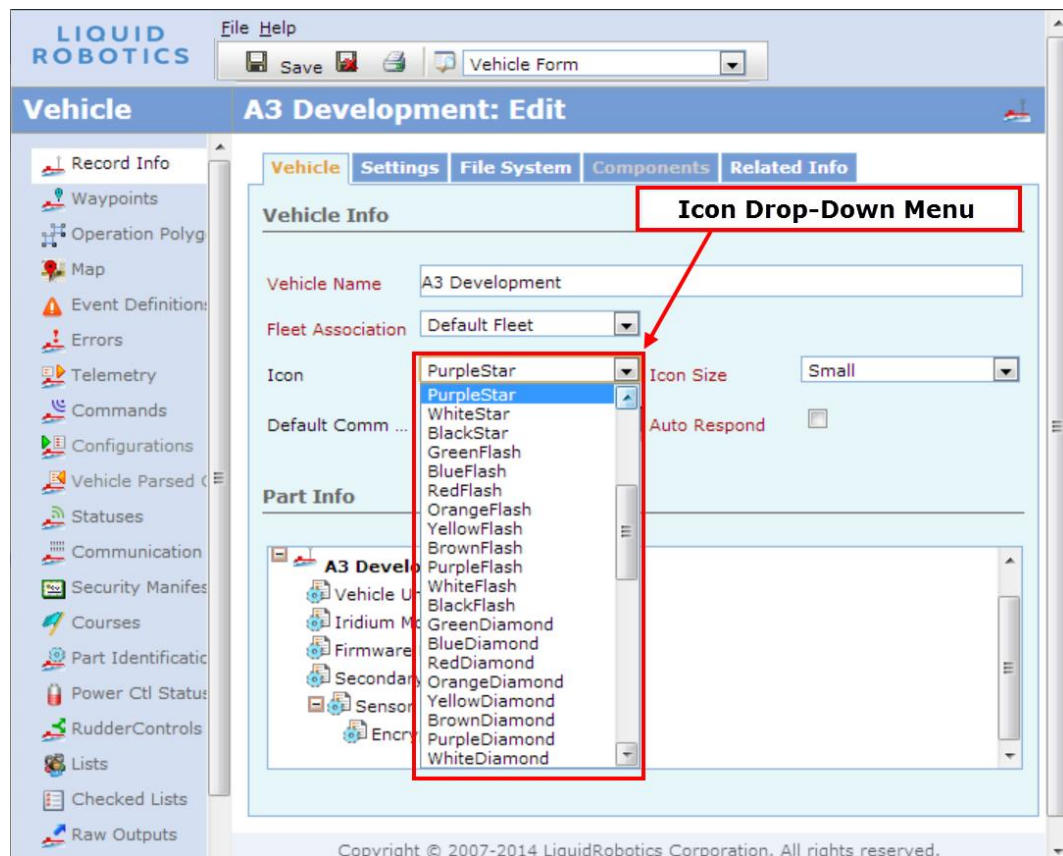


Note

A Fleet provides a view of a subset of the Vehicles and personnel in an Organization. For information on setting up Fleets see the *WGMS Admin Guide*.

3. Select an icon from the Icon drop-down menu - it will be used to represent the Vehicle on the Position Map. There are 7 shapes and 4 cartoon characters. The shapes can be any one of 9 colors.

Figure 9.5. Vehicle Icon Drop-Down Menu



4. Select the Icon Size, Normal or Small. The recommended size is Small.
5. Select the **Auto Respond** check-box. The Auto Respond check-box should always be selected, except in the rare situation where the same Vehicle is controlled by more than one WGMS instance, or if the Vehicle is configured for Mobile WGMS. If either of these circumstances apply, consult with your WGMS Administrator for guidance.



Note

You cannot enter information in the **Part Info** box. This data is entered in a different dialog. See [“Initializing the Part Info Tree \(SV2 Only\)”](#) for more information.

In the **Settings** tab of the **Vehicle: New** form:

1. Vehicle alarms are always recorded in the database, and they also appear in the Communications list below the Position Map in the Dashboard. Checking the **Send Alarm** box specifies that each alarm will also be sent to an Escalation List.
2. Checking the **Multiple Vehicle Display** box specifies that the vehicle will be available for selection in the Vehicle drop-down menu on the WGMS Dashboard.
3. Checking the **Display for Guests** box specifies that the Vehicle can be viewed by persons within your Organization with Guest User privileges.
4. Checking the **Towing** box specifies that the towing alarm will be checked (this feature is deprecated).

The **File System** tab is not currently in use.

The **Components** tab is not currently in use.

The **Related Info** tab is automatically populated for you.

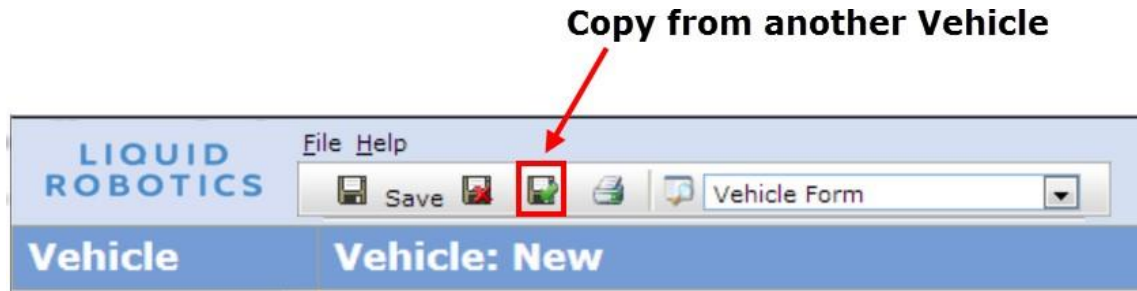
After all of the required new Vehicle data has been entered:

- Click **Save** in the **Vehicle** page toolbar to save the new Vehicle information and keep the **Vehicle: New** form open.
- Click the **Save and close Vehicle** icon in the **Data** page toolbar to save the new Vehicle information and close the **Vehicle: New** form. You can then open the **Vehicle: Edit** form for the newly created Vehicle to add Vehicle part information. See [“Initializing the Part Info Tree \(SV2 Only\)”](#) for more information.

Figure 9.6. Click Save or Save and close Vehicle



Click the **Copy from another Vehicle** icon to open a **Related Record** that lists all of the Vehicles in the Organization that you are logged into. By selecting a Vehicle in the **Related Record** and clicking **OK**, the information for that Vehicle will be copied into the **Vehicle: New** form. At this point, you can make edits, for example, changing the Vehicle Name, before clicking **Save** in the **Vehicle: New** form toolbar. Note: Once you click Save, the **Copy from another Vehicle** icon no longer appears in the toolbar.

Figure 9.7. Copy from another Vehicle

Initializing the Part Info Tree (SV2 Only)

The Part Info tree specifies the basic characteristics of your new Vehicle. The steps below show how to create the initial Part Info data, then “[Completing the Part Info Tree \(SV2 Only\)](#)” describes how to complete the tree using data sent from the Vehicle.

Obtaining the IMEI Number

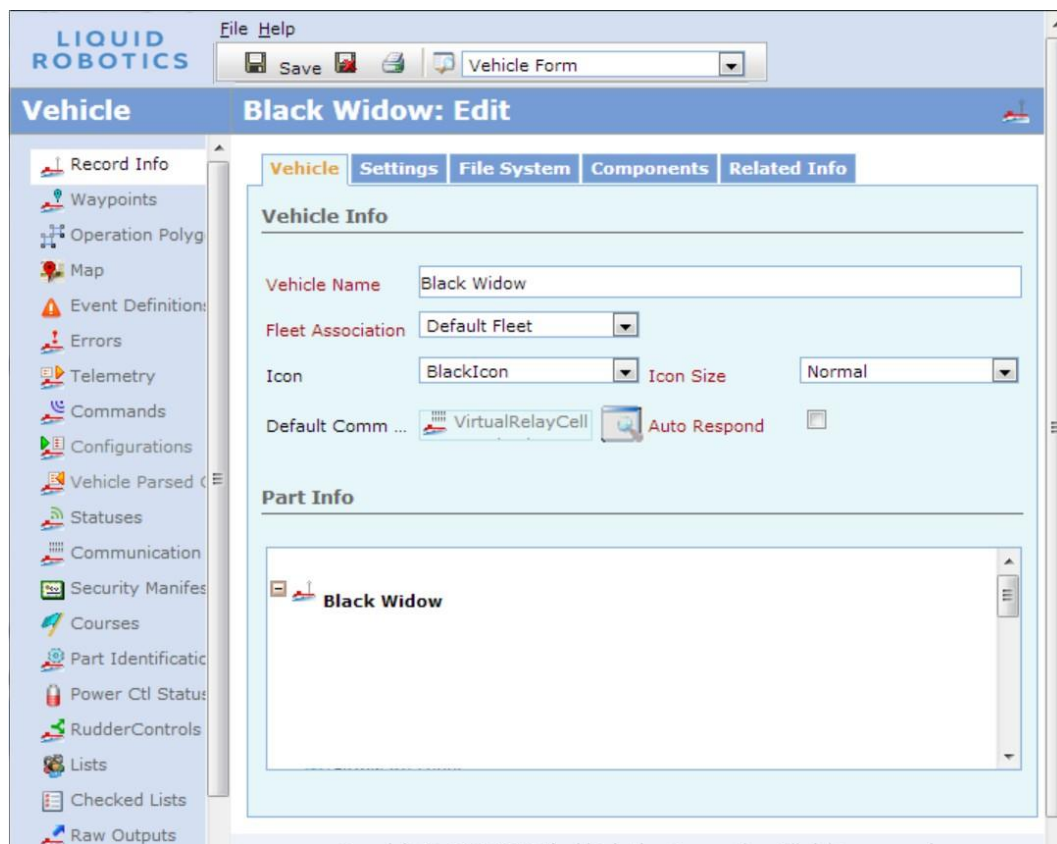
In order to set up the Part Info data, you will need the IMEI number of the Iridium modem in the Vehicle. The IMEI is the “phone number” of the modem. It is a 15-digit number starting with the numbers: **300034012**. The number can be obtained as follows:

1. The IMEI should be on the Packing Slip that accompanied the Vehicle.
2. If the Packing Slip is not available, the IMEI may be shown on the top of the C&C drybox in the Vehicle. You will need to remove the turtledeck cover to access the C&C box (SV2 only).
3. If neither of the above sources yields the IMEI and you are working with an SV2 Vehicle, you can obtain it using an XBee connection to issue XBee command number 96 [Show Modem IMEI]. XBee should then return the number (SV2 only).

Adding Part Info Data

If the **Vehicle: New** form was closed, re-open it by selecting the newly created Vehicle from the list in the **Vehicles** tab on the **Home** page.

Note that the form's header is now **Vehicle Name: Edit**, rather than **Vehicle: New**, and the **Part Info** box now contains the Vehicle name, as shown in the example below ([Figure 9.8](#)).

Figure 9.8. New Vehicle Edit Dialog Box

First, add the Float and its basic sub-assemblies to the Part Info tree:

1. Right click on the Vehicle name in the **Part Info** box. Select "New Part" and left click. The dialog box below should appear (Figure 9.9):

Figure 9.9. New Part Dialog Box

Related Record -- Webpage Dialog

Related Record

Part

Part Info

Part Name:

Parent Part: Revision:

Build Date: Expected Life Time:

Part Number: Remaining Life Time:

Serial Number: LR Serial Number:

Type: Vehicle:

Related Information

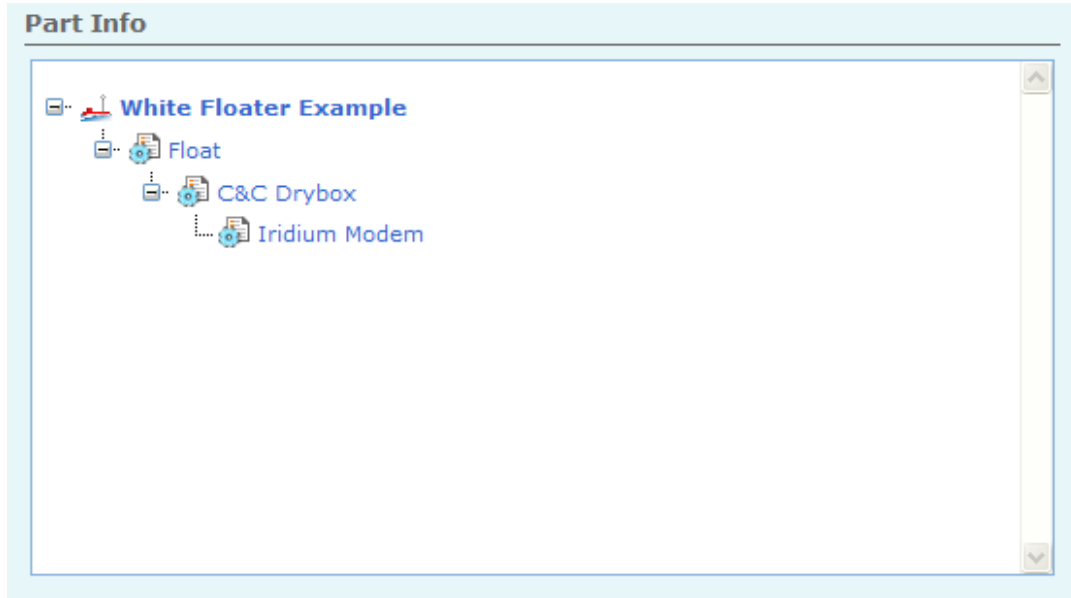
Owner: Organization:

Created On: Updated On:

Created By: Updated By:

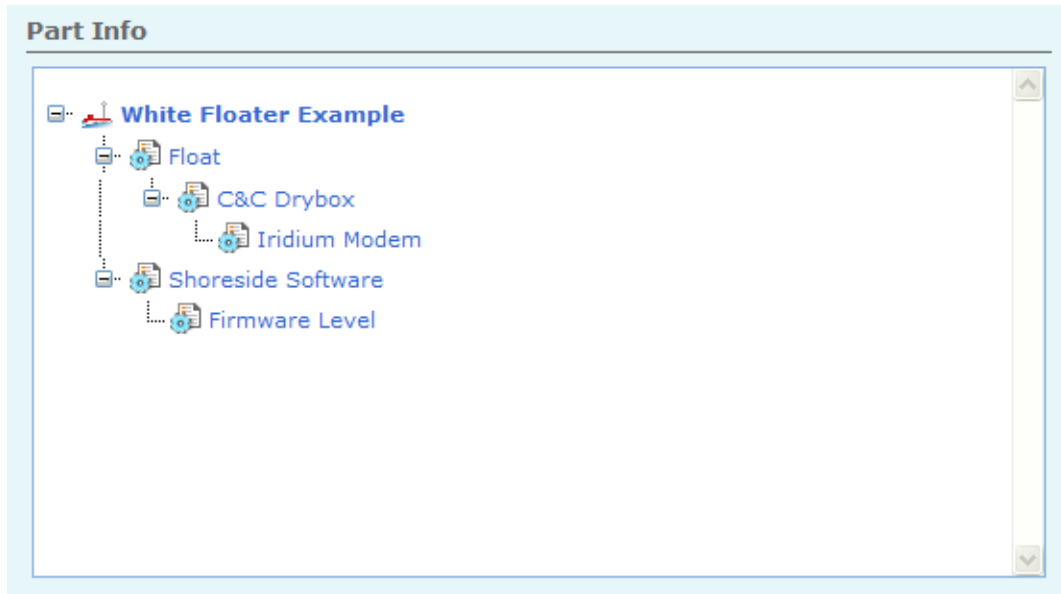
http://gliders.liquidr.com/related/relatedDialog.aspx?entitytype=49&parenttype=48&parentid=... Internet

2. For the **Part Name**, enter Float.
3. For the **Type**, leave Sub Assembly.
4. Click the **Save** button at the bottom center. The dialog box will close, and "Float" should now show in the **Part Info** box below the Vehicle name.
5. In the **Part Info** box, right click on "Float", then select "New Part" to again bring up the dialog box.
6. Add a new **Part Name** of C&C Drybox. Leave the **Type** as Sub Assembly. Click the **Save** button to close the dialog box.
7. Now, right click on "C&C Drybox", and again select "New Part" to bring up the dialog box.
8. Add a new **Part Name** of Iridium Modem. For the **Type** click down to select from the list "Iridium Modem".
9. In the **Serial Number** field, type in the 15-digit IMEI number you obtained earlier, as described in "Obtaining the IMEI Number".
10. Click **Save** to exit. The **Part Info** box should now look similar to Figure 9.10:

Figure 9.10. Part Info Box with Float Info

Next, add the basic software data to the Part Info tree:

1. Right click on the Vehicle name at the top, and click New Part to bring up the dialog box.
2. Add a new **Part Name** of Shoreside Software. Leave the **Type** as "Sub Assembly".
3. Click **Save** to exit.
4. Now, right click on Shoreside Software, and then New Part.
5. Add a new **Part Name** of Firmware Level. Click down to set the **Type** as "Firmware Level".
6. In the **Revision** field, enter:
 - **2.0** - For **SV2 Vehicles** with C&C Revision 2.0
 - **3.0** - For **SV2 Vehicles** with C&C Revision 3.0
 - **3.5** - For **SV2 Vehicles** with C&C Revision 3.5
 - **4.0** - For **SV3 Vehicles**
7. Click **Save** to exit the dialog box. The **Part Info** box should now look like [Figure 9.11](#):

Figure 9.11. Part Info Box Initial Setting

This completes the initial setting of the **Part Info** box. Instructions for adding more parts data are provided in [“Completing the Part Info Tree \(SV2 Only\)”](#).

For now, click Save to exit the **Vehicle: Edit** dialog.

Adding Event Definitions

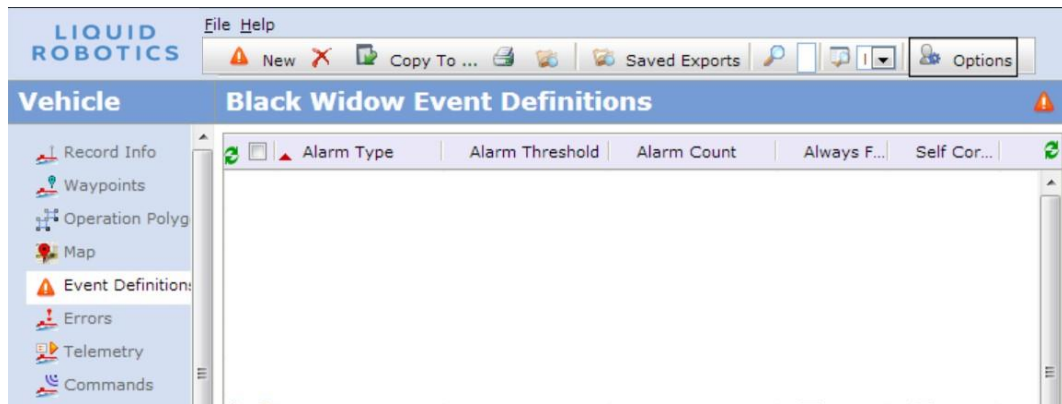
All alarms have default values to indicate when each type of alarm will be triggered, and what the response should be. Event Definitions are used to modify these defaults.

There are two ways Event Definitions can be added:

- If this is your first Vehicle, you will need to enter each of the definitions manually, as described in [“Creating New Event Definitions”](#).
- If your Organization has another Vehicle that has already been provisioned, and has similar characteristics to your new Vehicle, then you can copy over the definitions from the other Vehicle, as described in [“Copying Event Definitions”](#).

Creating New Event Definitions

Double-click on the Vehicle name in the list of vehicles on the **Vehicles** tab of the **Home** page. When the **Vehicle Info** window comes up, click on the **Event Definitions** tab in the side bar. You should get a box with no definitions, similar to [Figure 9.12](#):

Figure 9.12. Event Definitions Empty Specification

You want to add nine sets of alarm values. To start, click on the New [New Event Definition] icon. This should bring up the dialog box shown in Figure 9.13:

Figure 9.13. New Event Definition Dialog

First, set the **Sub To Float** alarm:

1. In the **Alarm Type** box, pull down to select Sub To Float.
2. In the **Alarm Threshold** box, enter the number 1.
3. Verify that the **Self Corrected** box is checked.

4. Add a check in the **Always Fired** box.
5. Click the left Save [Save Event Definition] icon to save the data, but not exit the dialog.

Next, set the **Sub Reboot** alarm.

1. In the **Alarm Type** box, pull down to select SubReboot.
2. In the **Alarm Threshold** box, enter the number 1.
3. Add checks in the **Self Corrected** and **Always Fired** boxes.
4. Click the Save [Save Event Definition] icon to save the value.

Next, set the **GPS Not Functioning** Alarm:

1. Select GPS Not Functioning.
2. Set the **Alarm Threshold** to 15.
3. Check the **Self Corrected** and **Always Fired** boxes, then Save.

Next, set the **RF Alarm**:

1. Select RF Alarm.
2. Set the **Alarm Threshold** to 5.
3. Check the **Self Corrected** and **Always Fired** boxes, then Save.

Repeat the procedure to set the remaining Alarm Type names and Threshold numbers:

- Out of Bounds [3]
- Communication Timeout [15]
- Empty Packet [5]
- Stuck GPS [5]
- File Read Timeout [25]

The final Event Definitions box should now look similar to [Figure 9.14](#):

Figure 9.14. Completed Event Definitions Specification

Alarm Type	Alarm Threshold	Alarm Count	Always F...	Self Cor...
Sub Leak	1	0	☒	☒
Float Leak	1	0	☒	☒
Sub To Float	1	0	☒	☒
Sub Reboot	1	0	☒	☒
GPS Not Functi...	5	0	☐	☒
Ship to Shore ...	5	0	☐	☒
Out Of Bounds	5	0	☐	☒
Vehicle Report...	25	5	☐	☒
Empty Packet	5	0	☐	☒
Proximity War...	1	0	☒	☒
Proximity Alarm	1	0	☒	☒
StuckGPS	5	0	☐	☒
File Read Time...	25	0	☐	☒

Any of the above data values (including the Alarm Type name) can be changed by double-clicking on a name to call up a dialog box for editing.

Copying Event Definitions

To copy Event Definitions from another Vehicle, do the following:

1. From the **Home** page, locate another Vehicle that is identical or similar to your new Vehicle.
2. Double-click on the other Vehicle's name to bring up its Vehicle Info.
3. On the side bar, click on the **Event Definitions** tab to bring up the dialog for event definitions. The box should be similar to [Figure 9.15](#).
4. Click in the **Select All** checkbox. A check should appear in the box, and all the items below should be selected (indicated by a blue-grey background).

Figure 9.15. Event Definitions Copy Dialog

5. Click on the icon for Copy To ... [Copy to another Event Definition]. Click **OK** when queried with "Are You Sure....?"
6. A new **Related Record** dialog box should come up, showing a current list of the Vehicles. Single-click on the name of your new Vehicle (the one to want to copy the event data to). The name should be highlighted in Blue-Gray, similar to [Figure 9.16](#):

Figure 9.16. Copy-To Dialog Box (Event Definition)

Vehicle Name	Icon	Send Al...
Bench Test Mobile Vehicles		☐
Bench Test Rev 3 HW		☐
Black Widow		☒
Blue		☐
Ca Shop Spares		☐
CEROS		☐
Cosmic #1		☐
Cosmic #2		☐
DADS Buoy		☐
DB2-1285		☐

7. To copy the data, click the **OK** button at the bottom center.
8. You should now see a small box with the words "Records Copied". Click on the **OK** button at the bottom.
9. Close the **Event Definitions** dialog box for the Vehicle you copied from.

You can cross-check that the values were copied. Double click on your Vehicle's name on the **Home** page to bring up the **Vehicle Edit** page, then click on "Event Definitions" on the side bar. You should see the copied values.



Note

There may be more Alarm Types than shown in the above [Figure 9.15](#). However, the five shown are considered the "minimum set" necessary.

Changing or Deleting Event Definitions

Event Definitions can be changed or added by double-clicking on an Alarm Type name to call up a dialog box for editing. (You can even change the Alarm Type name itself.)

Deleting Event Definitions requires Master or Admin Role privileges.

Adding Operation Polygons

Operation Polygon Definition

Recall that there are two types of Operation Polygons, Inclusion and Exclusion.

- Inclusion Polygons are used to define the "boundary" of a course. If the Vehicle goes outside an Inclusive Polygon boundary, an Alarm will be issued.
- Exclusion Polygons are used to define "off-limits" areas where the Vehicle is not supposed to go.

If the Vehicle crosses into one of these areas, an Alarm will be issued.

An Operation Polygon is specified as a series of points. Each of the points has:

1. A sequence number (the "Order" number)
2. A Latitude position value
3. A Longitude position value

The polygon is defined by connecting each of the position points in the specified order. The polygon is closed by connecting the last point with the first. The Order numbers need not start at zero or one, though that is recommended. Also, the numbers do not need to be sequential (i.e., you can skip numbers).

The minimum number of points (sides) is three, and there is no maximum limit. The polygon can be any shape but must enclose a single area (i.e., none of the defining edges can cross). The points have to be specified in a counter-clockwise order.

In addition to defining the points, you assign each Operation Polygon a descriptive name (e.g., "Marine Sanctuary Exclusion"). Each Operation Polygon has the option of being displayed (or not) on the Dashboard map. Typically, an Alarm will be sent if the Vehicle crosses an Operation Polygon boundary, but this feature can be disabled.

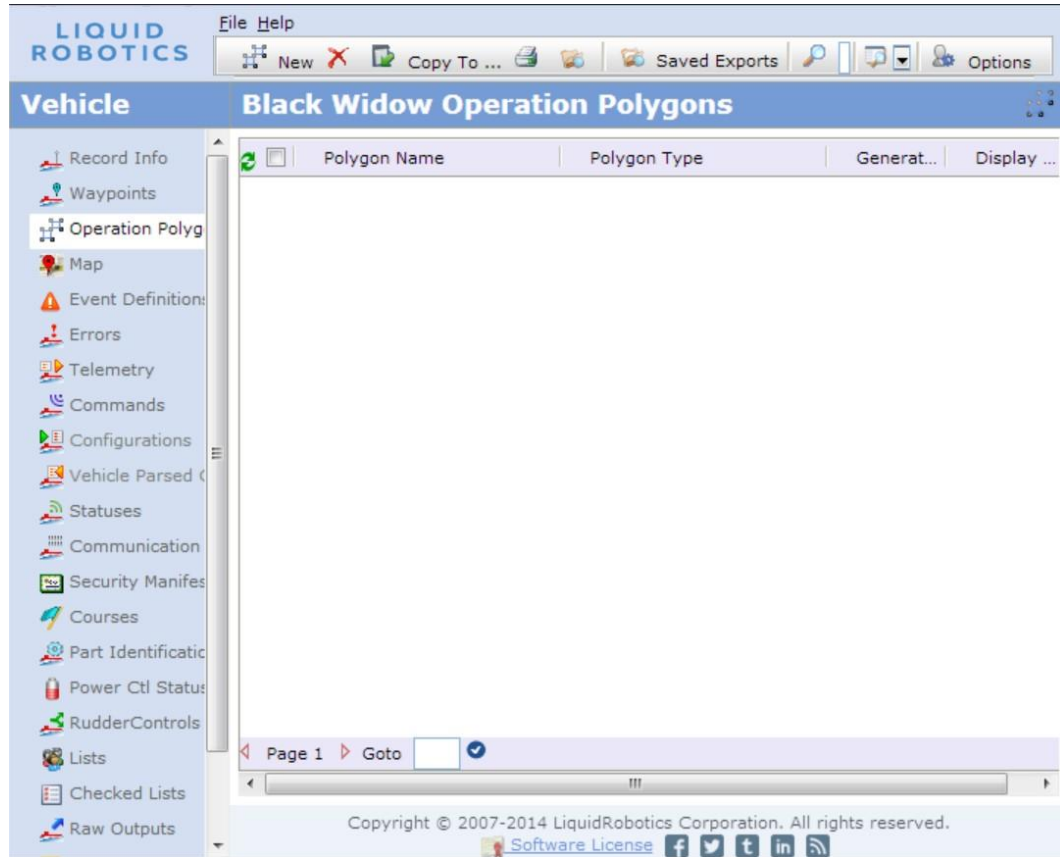
As with Event Definitions, Operation Polygons can be either defined "from scratch" ("[Creating New Operation Polygons](#)"), or copied over from another Vehicle ("[Copying Operation Polygons](#)").

Creating New Operation Polygons

You can create a new Operation Polygon from the Position Map using the **Map Utility**, or from the **Operation Polygon** tab in the **Vehicle** window. For information on creating new Operation Polygons using the **Map Utility** see "[Using the Map Utility](#)". The following procedure is for creating new Operation Polygons from the **Vehicle** window.

Go to the **Home** page and double-click on the new Vehicle's name, which will bring up the **Vehicle** window. Then click on the **Operation Polyg...** tab on the left side. You should get a box with no definitions, similar to [Figure 9.17](#):

Figure 9.17. Operation Polygons List (Empty)



To add a new Operation Polygon, click on the New [New Operation Polygon] icon. This should bring up the dialog page [Figure 9.18](#):

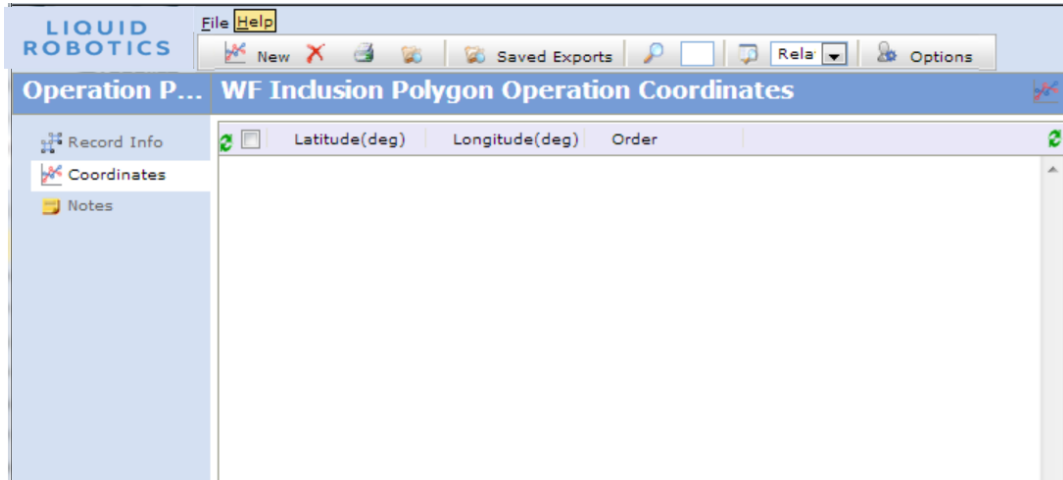
Figure 9.18. New Operation Polygon Definition

Fill in the following:

1. In the **Polygon Name** box, enter a name for the polygon. This name should be descriptive of the polygon, such as "Shipping Lane Exclusion".
2. In the **Polygon Type** box, pull down to select one of the two options:
 - Operation Inclusion
 - Operation Exclusion
3. Click in the box for **Generate Alarms** if you want the Vehicle to issue an alarm if the polygon boundary is crossed.
4. Click in the box for **Display on Map** if you want the Operation Polygon to be visible on the Dashboard map.
5. Click the left Save [Save Operation Polygon] icon to save the data, but not exit the dialog.

For the example below, assume that the assigned Polygon Name was "WF Inclusion Polygon".

The next step is to assign the set of points defining the polygon. Click on the **Coordinates** tab to bring up the dialog for defining the Lat/Long coordinates and Order number, as shown below (Figure 9.19).

Figure 9.19. Operation Polygon Coordinates List (Empty)

Now, click on the New [New Operation Coordinate] icon. This should bring up a dialog box to enter the coordinates and Order number [Figure 9.20](#):

Figure 9.20. New Operation Coordinates Entry Dialog
**Note**

The icons to the right of the **Latitude** and **Longitude** entry boxes call up a dialog that converts degrees and minutes to the required degrees and fractions format.

In the box:

1. Enter the **Order** number. It is suggested that you start from 0 or 1 and count up.
2. Enter the **Latitude** in degrees and fractions (positive → N, negative → S).

3. Enter the **Longitude** in degrees and fractions (positive → E, negative → W).
4. After all of the coordinates have been entered and show up in the coordinates page, return to the **Record Info** tab and select Save and close icon. Click on the left-side Save [Save Operation Coordinate] icon. This saves the values and clears the box for another entry.
5. Repeat steps 1 thru 4 until all the points for "WF Inclusion Polygon" have been entered.
6. Finally, after all of the coordinates have been entered and show up in the coordinates page, return to the **Record Info** tab and select the **Save and close** icon, then click the X in the upper right to close the dialog box.

At this point, the polygon has been defined. Re-opening (or refreshing) the Operation Polygon Coordinates List will show the set of coordinates that have been defined for the polygon named "WF Inclusion Polygon" (Figure 9.21).

Figure 9.21. Operation Polygon Coordinates List

Latitude	Longitude	Order
32.66649	-117.293334	1
32.66859	-117.289041	2
32.67368	-117.287264	3
32.67876	-117.289042	4
32.68086	-117.293334	5
32.67876	-117.297625	6

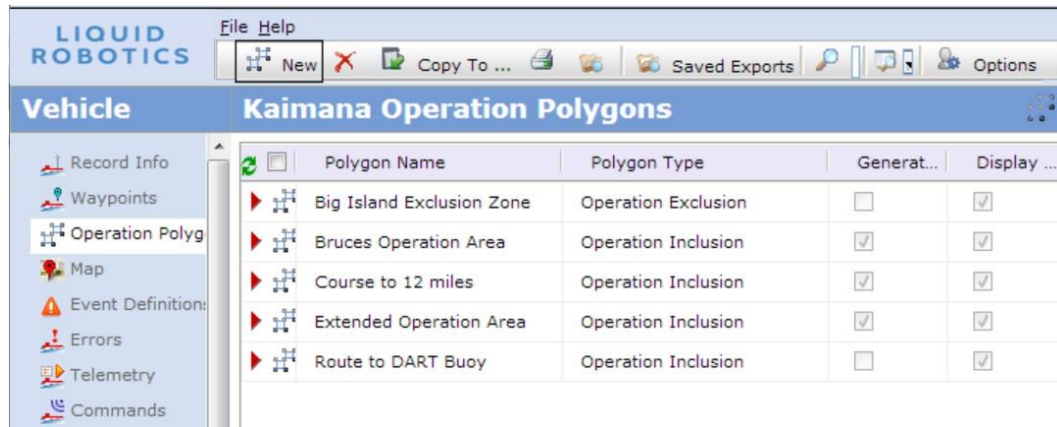
If you re-open (or refresh) the **Vehicle Operation Polygons** box, you will now see an entry for the polygon just defined (Figure 9.22):

Figure 9.22. New Operation Polygon Specification

Polygon Name	Polygon Type	Generat...	Display ...
WF Inclusion Polygon	Operation Inclusion	☒	☒

For each additional polygon, click on the New icon to repeat the procedure defined above.

When complete, the above specification box will likely have multiple Inclusion and Exclusion polygons, such as the example list shown below (Figure 9.23):

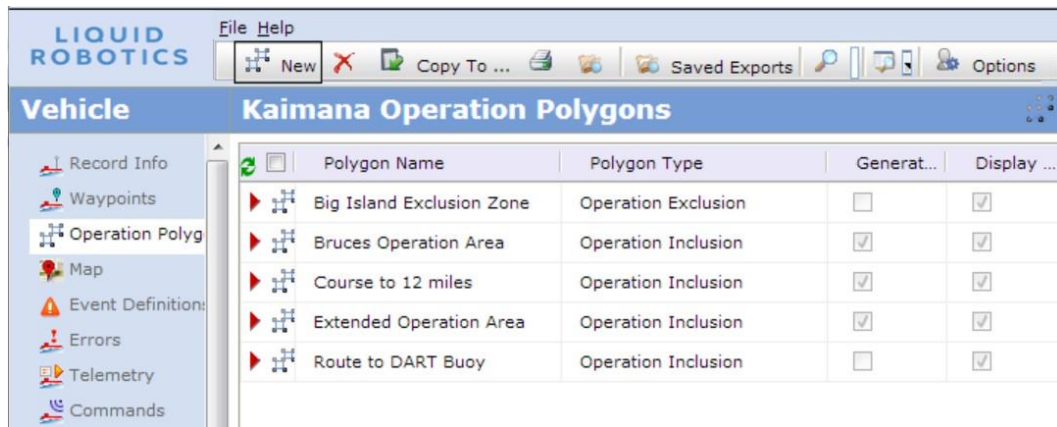
Figure 9.23. Example Operation Polygons List

Copying Operation Polygons

When copying Operation Polygons, the assumption is that the new Vehicle will be operating in essentially the same area as the Vehicle whose data is being copied. The copied polygons can then be deleted or edited as necessary.

The procedure for copying is:

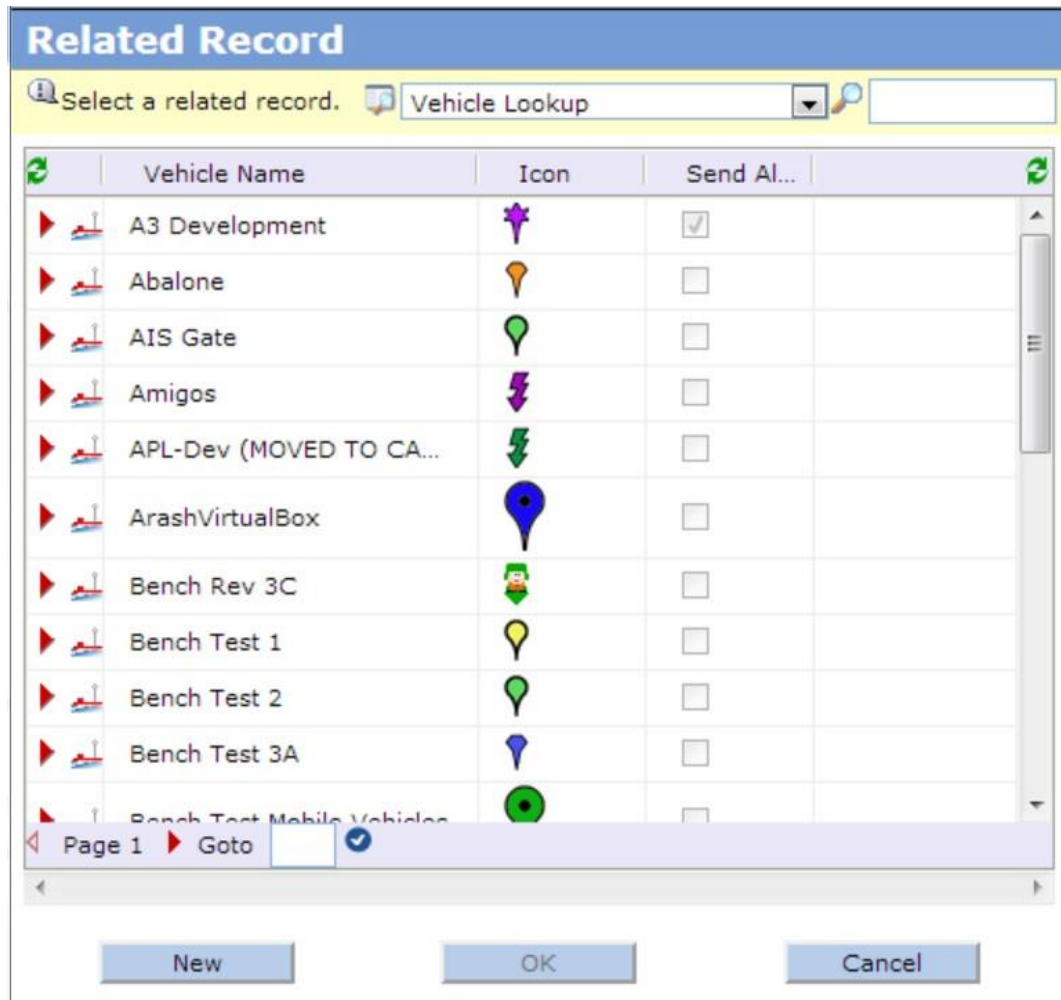
1. On the **Home** page, locate another Vehicle in your Organization that operates in the same region as your new Vehicle.
2. Double-click on the other Vehicle's name to bring up its Vehicle Data.
3. On the left side, click on the **Operation Polygons** tab to show the polygons defined for that Vehicle. The window should be similar to (Figure 9.24):

Figure 9.24. Operation Polygons Copy Dialog

4. Hold down the **Ctrl** key and left-click to select each of the polygons that you want to copy. Or, click in the box to the left of **Polygon Name** to select all. The selected lines will turn Blue-Gray. (**Ctrl**-clicking a selected line will un-select it.)
5. Click on the icon for Copy To... [Copy to another Operation Polygon]. Click **OK** when queried on the copy.

6. A new **Related Record** dialog page should come up, showing a current list of Vehicles:

Figure 9.25. Copy-To Dialog Box (Polygons)



7. Click on the name of your new Vehicle (the one to want to copy the polygons to). The name line should be highlighted in Blue-Gray (as shown above).
8. Click the center **OK** button.
9. Expect to see a small box with the words "Records Copied", then click on its **OK** button.

Cross-check that the values were copied: On the **Vehicle** page, double click on the new Vehicle's name to bring up the **Vehicle Edit** page, then click on Operation Polygons on the left bar.

Adding Waypoints

Each Vehicle has its own set of Waypoints. As with other data, the Waypoint numbers and values can be created (see “[Creating New Waypoints](#)”), or copied from another Vehicle (see “[Copying Waypoints](#)”).

Creating New Waypoints

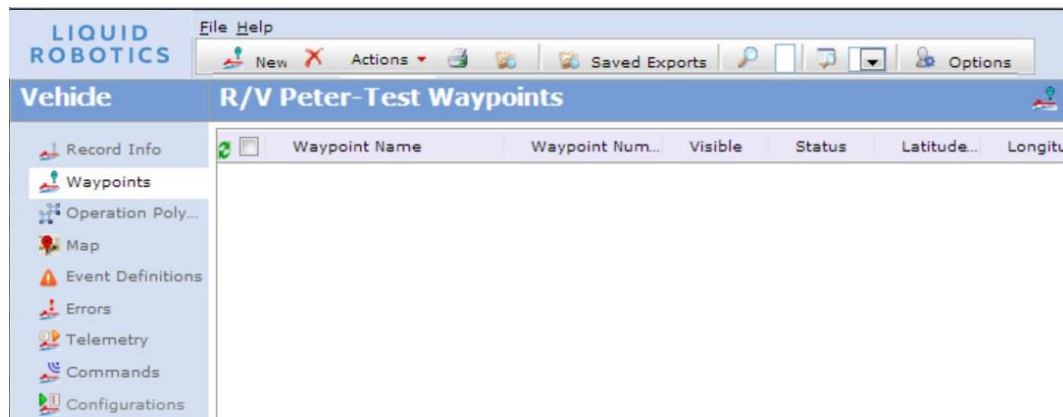
You can create new Waypoints from the Position Map using the **Map Utility**, or from the **Waypoints** tab in the **Vehicle** window. For information on creating new Waypoints using the **Map Utility** see “[Using the Map Utility](#)”. The following procedure is for creating new Waypoints from the **Vehicle** window.

As before, bring up the **Home** page and double-click on the new Vehicle's name. This will call up the familiar **Vehicle** window.

Click on the **Waypoints** tab on the left side.

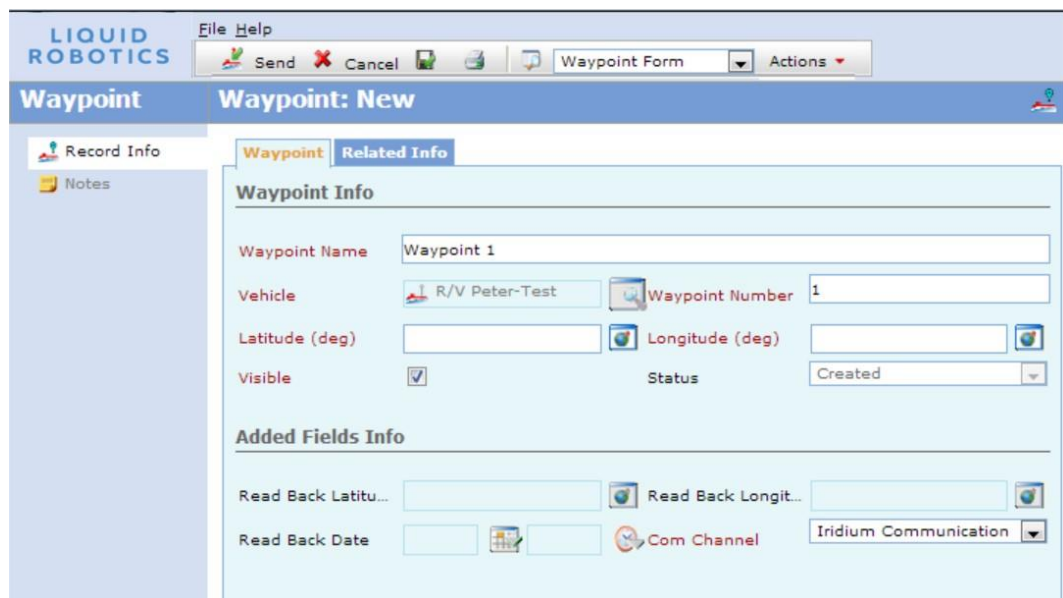
Selecting the **Waypoints** tab should show an empty Waypoints list, similar to (Figure 9.26):

Figure 9.26. Empty Waypoint List



To create a new Waypoint, click on the New [New Waypoint] icon near the upper left. That should bring up the **New Waypoint** dialog page (Figure 9.27):

Figure 9.27. New Waypoint Dialog



1. Enter the **Waypoint Name**. This should be descriptive of the Waypoint's position and purpose.
2. Enter both the **Latitude** and **Longitude** Coordinates in Decimal Degree format (ie "36.55572")
3. Change the **WaypointNumber** if desired. The value in the box is initially set to the previous largest number, plus one. You can change the number, but if the number is used for an existing Waypoint, you will overwrite that Waypoint's coordinates.
4. Check the **Visible** box if you want to see the Waypoint on the map.
5. Click the left Save [Save Waypoint] icon to save the Waypoint, and leave the box open.

Repeat steps 1 through 5 for each new Waypoint.

When done, click the right Save [Save and Close Waypoint] icon to save the Waypoint and close the dialog box. (Or, click the X at the upper right of the box). There will be no "Are you sure?" confirmation.

Re-open or refresh the Vehicle Waypoints list. You should see the names and values you entered, similar to (Figure 9.28):

Figure 9.28. Example New Waypoints List

Vehicle	Kaimana Waypoints						
	Waypoint Name	Waypoint Num...	Visible	Status	Latitude ...	Longitud...	
	300 Meter Box 3, Point 1	11	☒	Sent	19.96727	-155.87...	
	300 Meter Box 3, Point 2	12	☒	Sent	19.96996	-155.87...	
	300 Meter Box 3, Point 3	13	☒	Sent	19.96996	-155.87...	
	300 Meter Box 3, Point 4	14	☒	Sent	19.96727	-155.87...	
	300 Meter Box 4, Point 1	16	☒	Sent	19.96898	-155.88...	
	300 Meter Box 4, Point 2	17	☒	Sent	19.97167	-155.88...	
	300 Meter Box 4, Point 3	18	☒	Sent	19.97167	-155.88...	
	300 Meter Box 4, Point 4	19	☒	Sent	19.96898	-155.88...	
	300 Meter Box, Shoe Box...	7	☒	Sent	19.97482	-155.88...	
	300 Meter Box, Shoe Box...	8	☒	Sent	19.97341	-155.88...	
	300 Meter Box, Shoe Box...	9	☒	Sent	19.97921	-155.87...	
	A Channel 1	109	☒	Sent	20.09830	-156.15...	
	A Channel 2	110	☒	Sent	20.17270	-156.13...	
	A Channel 3	111	☒	Sent	20.24280	-156.12...	



Note

A way of creating new Waypoints from the Position Map in the Dashboard is described in "Using the Map Utility"

Copying Waypoints

Where possible, it is easier to add initial Waypoints by copying selected Waypoints from another Vehicle operating in the same area. Waypoints can be changed or added as necessary later.

To copy Waypoints:

1. Locate another Vehicle that operates in the same region as the one you are provisioning.

2. Double-click on the other Vehicle's name to bring up its Vehicle Data.
3. Click on the **Waypoints** tab on the left to bring up a list of the Waypoints defined for that Vehicle.

The Waypoints list should generally look like (Figure 9.29):

Figure 9.29. Waypoints List for Copying

Vehicle	Kaimana Waypoints						
- Record Info - Waypoints - Operation Polyg - Map - Event Definitions - Errors - Telemetry - Commands - Configurations - Vehicle Parsed C - Statuses - Communication - Security Manifes - Courses - Part Identificati - Power Ctl Status - RudderControls	Waypoint Name	Waypoint Numb...	Visible	Status	Latitude ...	Longitud...	
	300 Meter Box 3, Point 1	11	☒	Sent	19.96727	-155.87...	
	300 Meter Box 3, Point 2	12	☒	Sent	19.96996	-155.87...	
	300 Meter Box 3, Point 3	13	☒	Sent	19.96996	-155.87...	
	300 Meter Box 3, Point 4	14	☒	Sent	19.96727	-155.87...	
	300 Meter Box 4, Point 1	16	☒	Sent	19.96898	-155.88...	
	300 Meter Box 4, Point 2	17	☒	Sent	19.97167	-155.88...	
	300 Meter Box 4, Point 3	18	☒	Sent	19.97167	-155.88...	
	300 Meter Box 4, Point 4	19	☒	Sent	19.96898	-155.88...	
	300 Meter Box, Shoe Box...	7	☒	Sent	19.97482	-155.88...	
	300 Meter Box, Shoe Box...	8	☒	Sent	19.97341	-155.88...	
	300 Meter Box, Shoe Box...	9	☒	Sent	19.97921	-155.87...	
	A Channel 1	109	☒	Sent	20.09830	-156.15...	
	A Channel 2	110	☒	Sent	20.17270	-156.13...	
	A Channel 3	111	☒	Sent	20.24280	-156.12...	

4. In the list, use the **Ctrl**-click to select those waypoints that you want to copy over to your new Vehicle.



Note

You can only select 20 records at a time from the list. If you want to copy more than 20 Waypoints, you'll need to repeat the copy operation (steps 4 thru 8) multiple times.

5. Click on the Copy To ... [Copy to another Waypoint] icon. When queried on the copy, click **OK**.
6. A new **Related Record** dialog page should come up, showing the current list of Vehicles (similar to Figure 9.25).
7. Single-click on the name of your new Vehicle, which should highlight it in Blue-Gray. Then, click the **OK** button.
8. Expect a box with the words "Records Copied", and click on its "OK" button.

Cross-check that the values were copied: Double-click on your Vehicle's name on the **Vehicle Page** to bring up its Vehicle Data, then click on the **Waypoints** tab on the left. You should see the newly-copied Waypoints.

Adding a List

A Vehicle can reference multiple lists of data. There are currently two types:

- An Escalation List specifies the people to contact (and the order of contact) in case of a serious alarm or other emergency involving a Vehicle.

- A Group List contains the names of people with some associated purpose (such as the people who support a specific Vehicle).

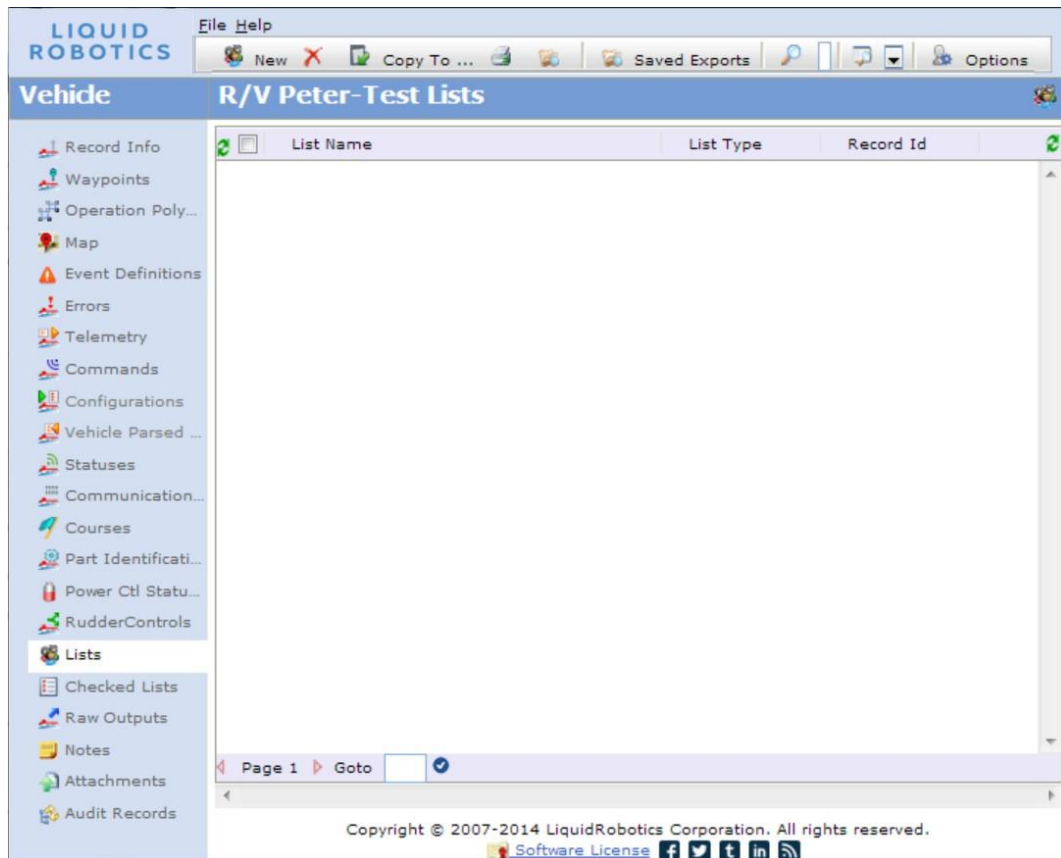
As with other data, a list can be created (see “[Creating a New Escalation List](#)”), or copied from another Vehicle (“[Copying Existing Escalation Lists](#)”).

Creating a New Escalation List

To create an Escalation List from scratch:

1. Go to the **Home** page and double-click on the new Vehicle's name, which will bring up the **Vehicle Data** window.
2. Click on the **Lists** tab on the left. You should get a box with no lists, similar to ([Figure 9.30](#)):

Figure 9.30. Lists (Empty)

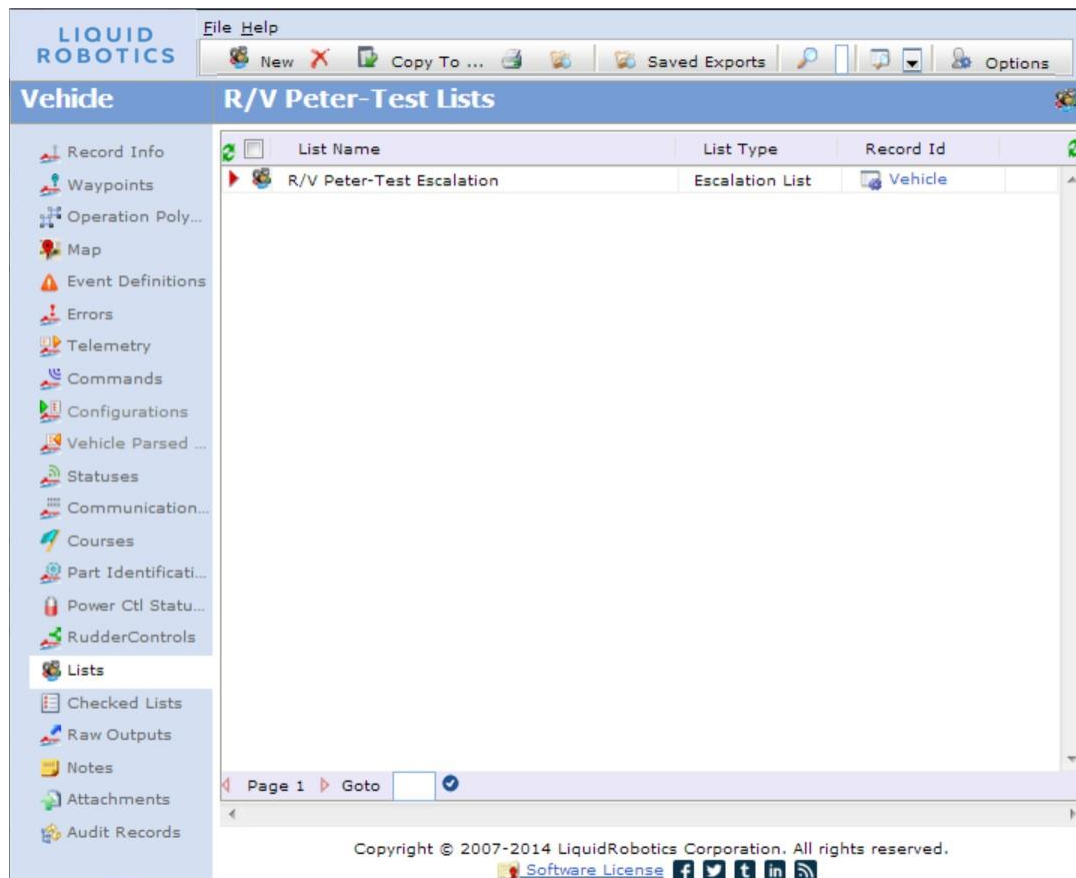


3. Click on the New [New List] icon. This will bring up the **New List** dialog box shown below in [Figure 9.31](#).
4. Enter your choice of a List Name, as shown in the example below ([Figure 9.31](#)).

Figure 9.31. New List Dialog Example

The screenshot shows the 'List: New' dialog box in the LIQUID ROBOTICS software. The dialog has a menu bar with 'File' and 'Help', and a toolbar with 'Save', 'Close', and 'List Form'. The main area is divided into two tabs: 'List' and 'Related Info'. The 'List' tab is active, showing 'Vehicle List Info' and 'List Item Info' sections. The 'Vehicle List Info' section contains fields for 'List Name' (R/V Peter-Test Escalation), 'List Type' (Escalation List), 'Parent Table' (Vehicle), and 'Parent' (R/V Peter-Test). The 'List Item Info' section is empty.

5. Click on the Save [Save and close List] icon near the top. The **Lists** page should now show the new Escalation List name entered ([Figure 9.32](#)).

Figure 9.32. Escalation List Name Entry

- Now, double-click on the **R/V Peter-Test Escalation** name. This will bring up the dialog to enter new items in the list (Figure 9.33).

Figure 9.33. Escalation List Edit Dialog (Empty)

The screenshot shows the 'R/V Peter-Test Escalation: Edit' dialog in the Liquid Robotics software. The interface includes a menu bar (File, Help), a toolbar (Save, List Form), and a title bar. A sidebar on the left contains 'Record Info'. The main content area has tabs for 'List' and 'Related Info'. Under the 'List' tab, there are two sections: 'Vehicle List Info' and 'List Item Info'. The 'Vehicle List Info' section contains fields for 'List Name' (R/V Peter-Test Escalation), 'List Type' (Escalation List), 'Parent Table' (Vehicle), and 'Parent' (R/V Peter-Test). The 'List Item Info' section contains a toolbar with 'New', 'Saved Exports', and 'Options', and a table with columns 'Item Name' and 'List Item Type'. The table is empty. At the bottom, there is a 'Page 1' indicator and a 'Goto' field.

7. Click on the New [New List Item] icon just above the list data box. This should bring up the dialog that allows you to enter a new list item (Figure 9.34).

Figure 9.34. New List Item Dialog

8. For the "ItemName", enter the name of a contact person and an indication of the communications mode (e.g., "Chuck Pager").
9. For the **List Item Type**, use the pull down to select one of three choices:
 - User Email
 - User Pager
 - User AltEmail
10. Click on the icon to the right of the **Related Entity** box. This should bring up a list of the contact people in your Organization, similar in format to (Figure 9.35):

Figure 9.35. Contact List Records

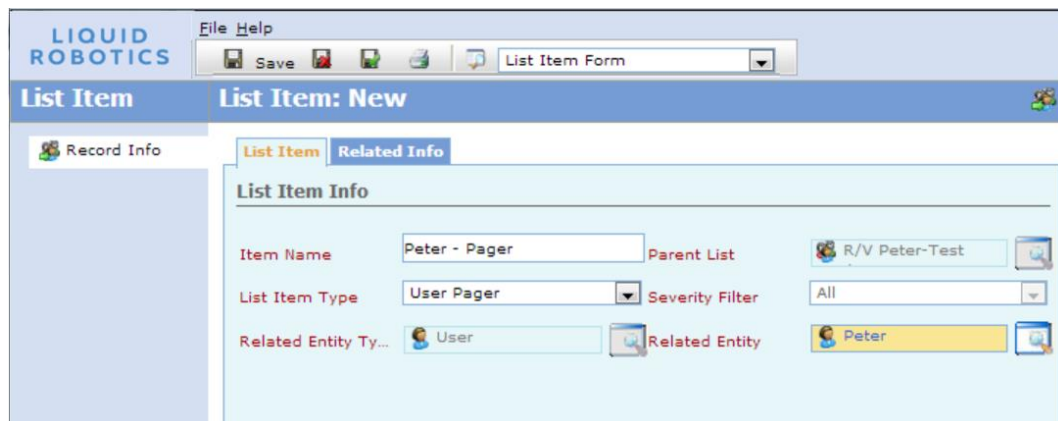
The screenshot shows a 'Related Record' dialog box. At the top, there is a header bar with the title 'Related Record'. Below the header, there is a search bar with the text 'Select a related record.' and a dropdown menu labeled 'User Lookup'. The main area of the dialog is a table with two columns: 'First Name' and 'Last Name'. The table contains a list of contact records, each with a small icon to the left of the first name. The records are as follows:

First Name	Last Name
Al	Estencion
alarms	liquidr.com
Alex	Kexel
Alpha	Guest
Amy	Rubsamen
Andre	Madeira
Andrew	Burcham
Andrew	Poole
Andrew	Trapani
Ann	Banh
April	Maru
Arash	Ushani
Beth	Goodwin
Bill	Vass
Bill	Stutz
Billy	Middleton
Bob	Momsen
Brad	Woolhiser
Brian	Anderson

At the bottom of the table, there is a pagination bar with the text 'Page 1' and a 'Goto' button. Below the table, there are three buttons: 'New', 'OK', and 'Cancel'.

11. Click on the name of the person you want to go into the **Related Entity** box. Then Click the center **OK** button.

A completed List Item entry would look similar to (Figure 9.36):

Figure 9.36. New List Item Example Entry

The screenshot shows a web application window titled "LIQUID ROBOTICS". The window has a menu bar with "File" and "Help", and a toolbar with "Save" and "List Item Form". The main content area is titled "List Item: New" and contains a "Record Info" sidebar and a "List Item Info" section. The "List Item Info" section has the following fields:

- Item Name: Peter - Pager
- List Item Type: User Pager
- Related Entity Ty...: User
- Parent List: R/V Peter-Test
- Severity Filter: All
- Related Entity: Peter

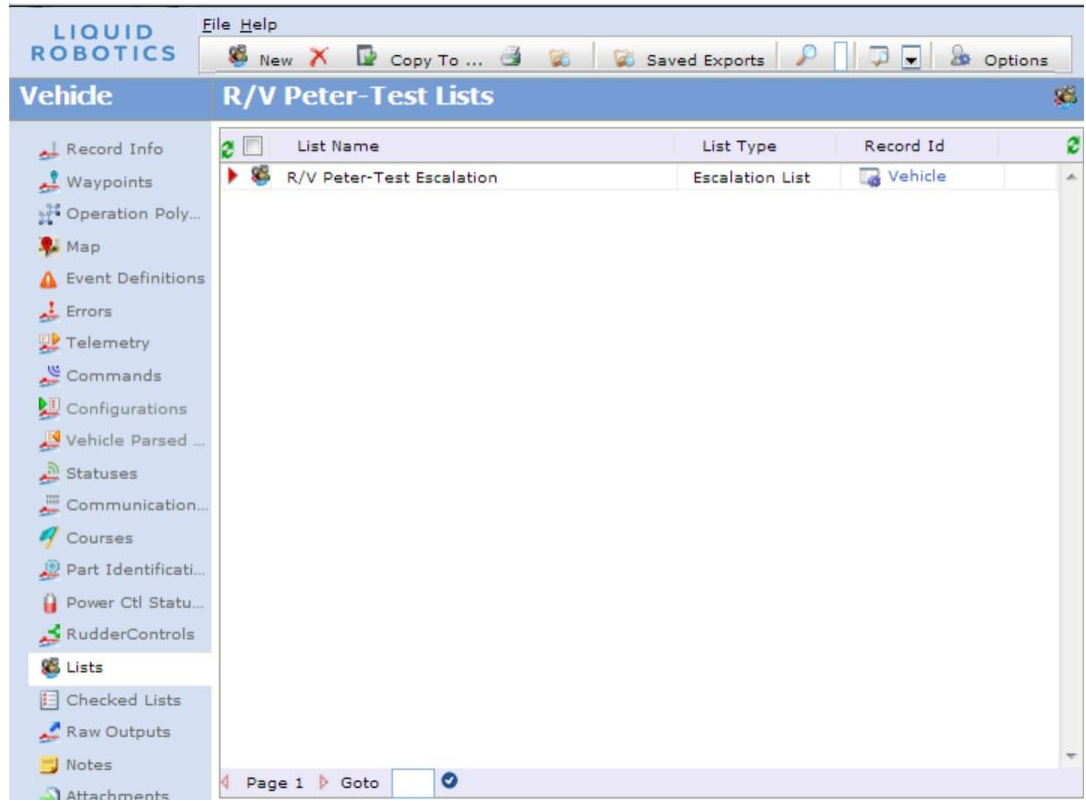


Note

The name in the **Related Entity** box is now a link to the contact information for that person.

12. Click on the Save [Save List Item] icon to save the new list item.
13. Repeat steps 7 thru 12 for each person (and contact method) that you want to be in the Escalation List.

When the names have been entered, the new Escalation List should look similar to (Figure 9.37):

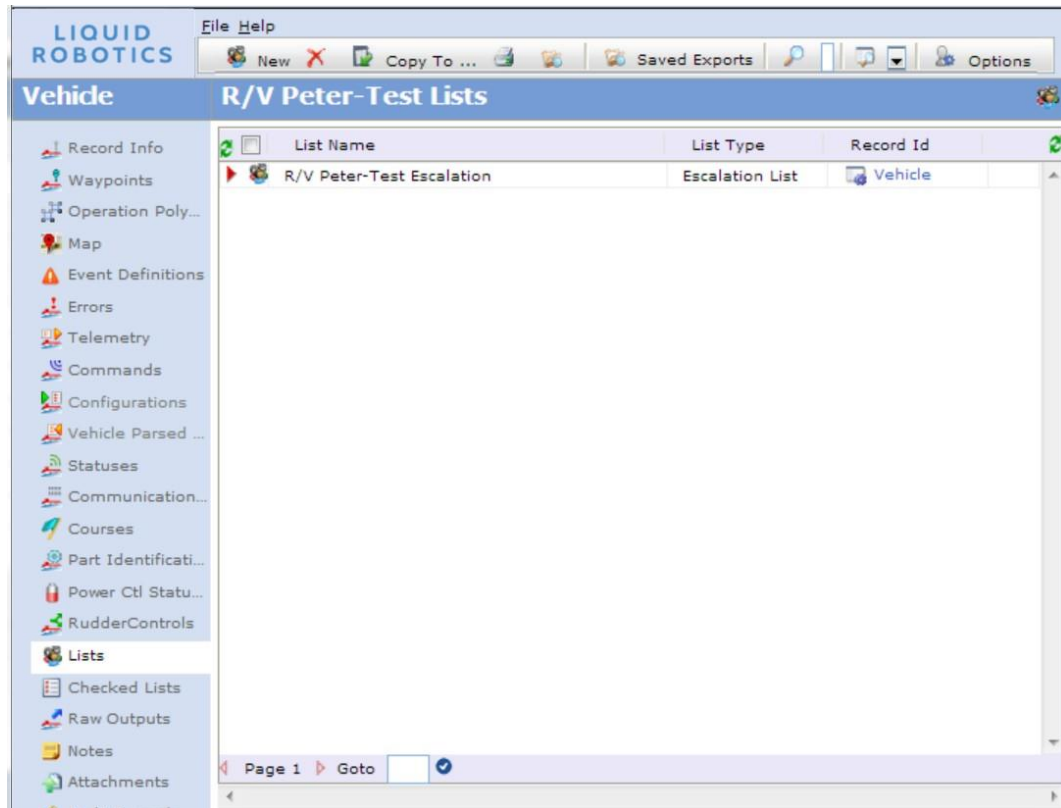
Figure 9.37. Example New Escalation List

Copying Existing Escalation Lists

As with other data, you can create an Escalation list by copying from another of your Organization's Vehicles.

To copy Escalation lists:

1. Locate another Vehicle whose Escalation list you want to use.
2. Double-click on that Vehicle's name to bring up its Vehicle data.
3. Click on **Lists**, to bring up the lists defined for that Vehicle. Usually, there is only the Escalation list as shown below (Figure 9.38):

Figure 9.38. List of Vehicle Lists

4. Click on one or more Escalation lists to select them, then click on the **Copy To...** A list of Vehicles in your Organization will appear.

Figure 9.39. Vehicle Selection List

Vehicle Name	Icon	Send AL...
A3 Development		☐
A'a (Moved to LRIOps ...)		☐
AAAAAAA Temp Vehicle		☐
Abalone		☐
AIS Gate		☐
Amigos		☐
APL-Dev (MOVED TO CA...)		☐
Aquaman (Moved to LR...)		☐
ArashVirtualBox		☐
AT-Ore		☐
AWG 1 (Moved vehicle t...)		☐
AWG 2		☐
Bench Rev 3C(Moved 1...)		☐

- Click on the name of the Vehicle you want to copy the list(s) to, then click the **OK** button.
- A window with the words **Records Copied** will appear - you must click on the **OK** button to complete the copying task and close the window.
- Confirm that the Escalation list, or lists, were copied by opening the Vehicle data form for the Vehicle you copied to and then clicking on the **Lists** side tab. The copied list(s) should be there.

Completing the Part Info Tree (SV2 Only)

For SV2 Vehicles, the Part Info tree that was started in “[Initializing the Part Info Tree \(SV2 Only\)](#)” can now be completed by downloading the information from the new Vehicle. **For SV3 Vehicles, the Part Info tree is completed automatically when you power on the Vehicle and the CCU completes its boot sequence.**

Powering Up the Vehicle

First, locate the Vehicle so that it has a clear view of the sky. This is necessary to get good Iridium reception.

Next, power up the Vehicle. If you have the Original C&C Drybox, start power by connecting one of the Solar Panel cables to either one of the C&C Drybox Solar Panel connectors ([Figure 9.40](#)). Alternatively, connect a shorting plug designed to mimic solar panel connection.

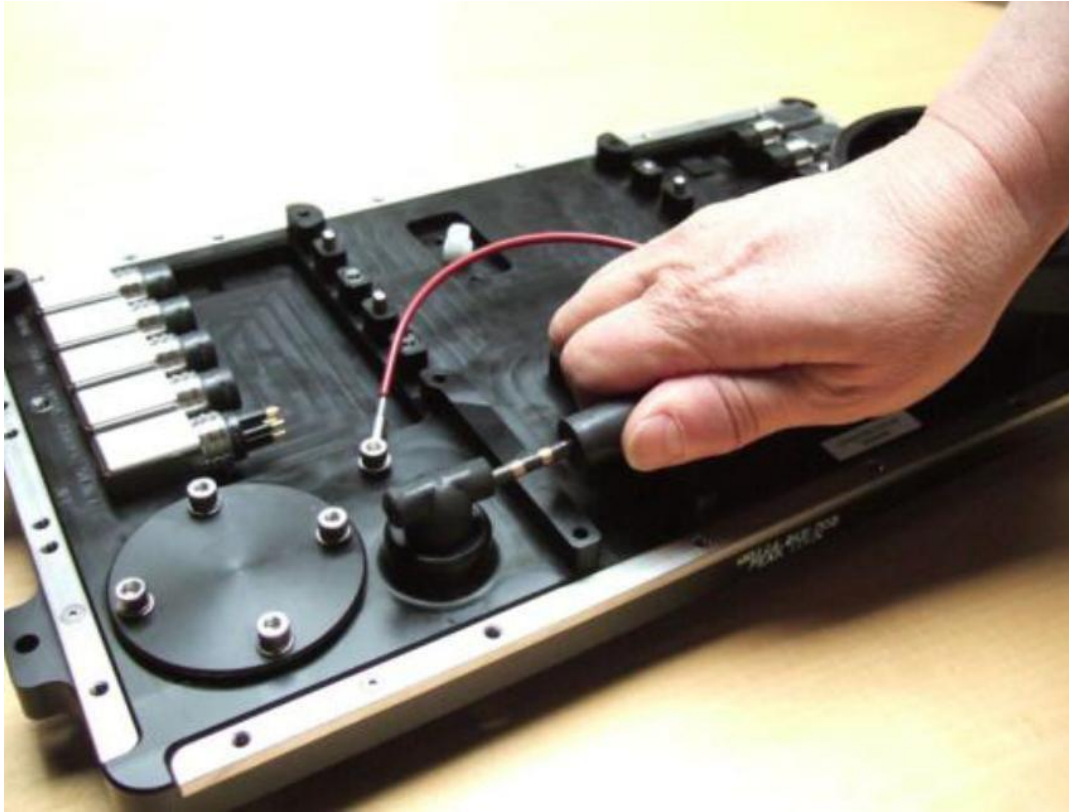
Figure 9.40. Attaching a Solar Panel Connector



The light should turn on, indicating that the electronics have been powered-up.

If you have the Revised C&C drybox, start power by inserting the power key on the top of the drybox, as shown in [Figure 9.41](#). There is no need to connect a solar panel.

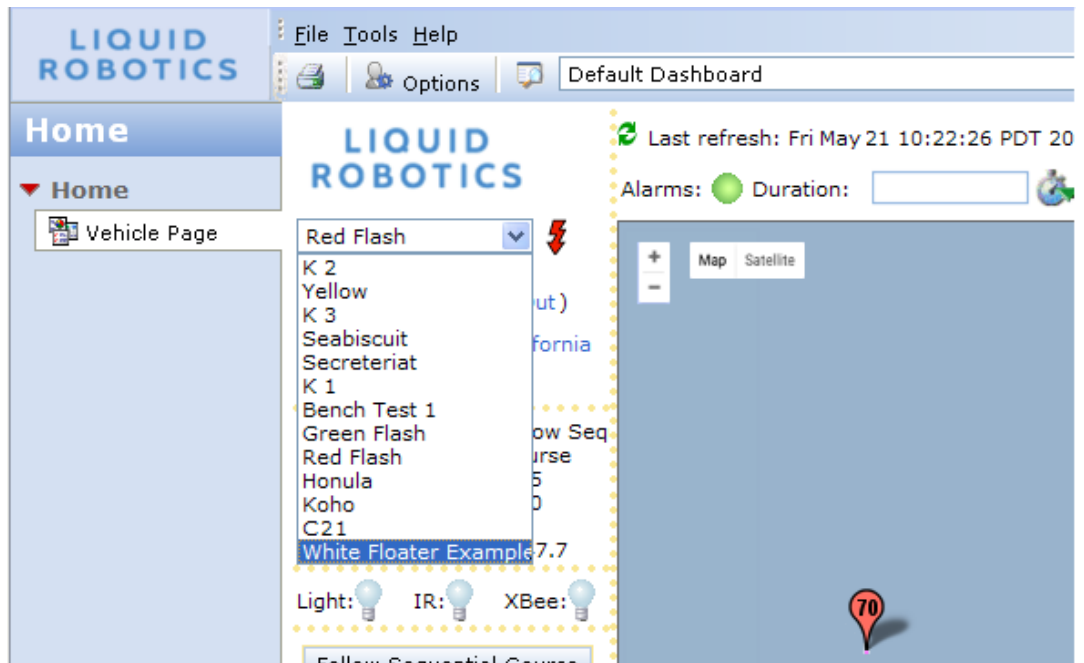
Figure 9.41. Inserting the Power Key



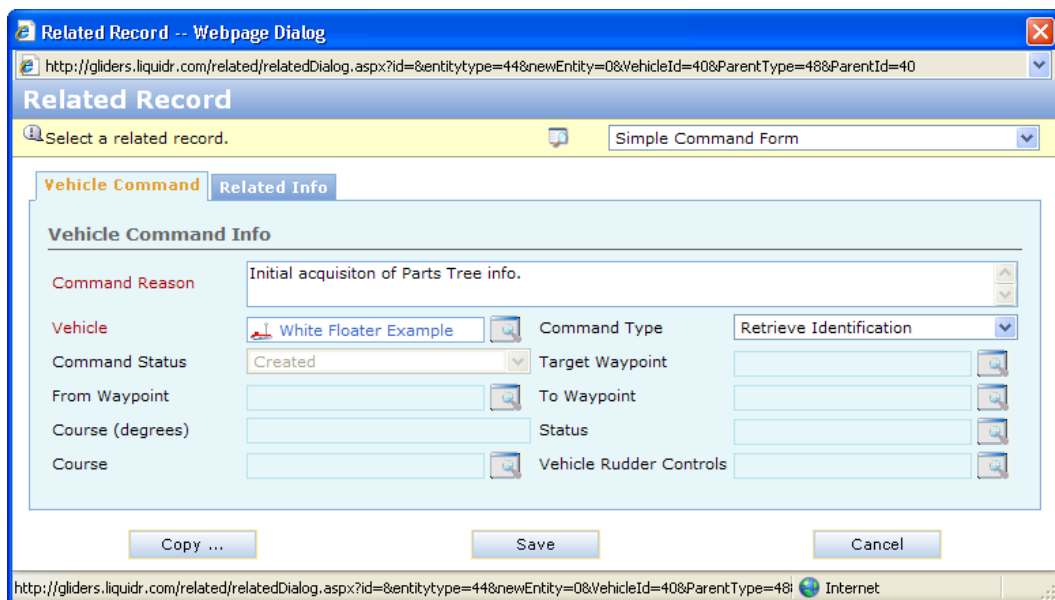
Getting Part Info Data

When Vehicle powers on, it will start transmitting telemetry records and respond to commands. The following action is needed to complete the Part Info tree:

1. Select the name of new Vehicle in the select box, as shown in [Figure 9.42](#):

Figure 9.42. Vehicle Name Select

2. Next, click the **More Commands...** link below the other **Command** buttons. This should bring up the **Vehicle Command** dialog.
3. In the **Command Type** box, select the **Retrieve Identification** command (Figure 9.43). Enter an appropriate comment in the **Command Reason** box.
4. Send the command to the Vehicle by clicking the **Save** button at the bottom.

Figure 9.43. Retrieve Identification Command Dialog

5. Monitor the Telemetry List on the Dashboard. Wait for the command to be ACK'ed by the Vehicle.



Note

Note that you will have to refresh the screen to see the telemetry updates.



Note

The default telemetry transmission interval is 2 minutes. However, the interval could be set to a longer time.

6. Single-click on the icon to the right of **Vehicle** name in the WGMS Dashboard, shown below (Figure 9.44).

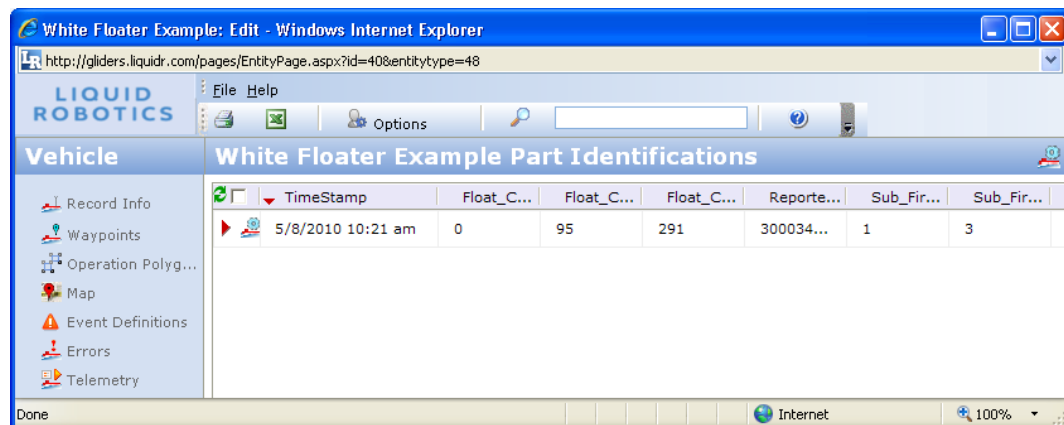
Figure 9.44. Vehicle Icon



This should bring up the **Vehicle Data** window.

7. Click on the **Part Identification** tab on the left. This should bring up the Part Identifications data received from the Vehicle, similar to Figure 9.45:

Figure 9.45. Received Part Identification



8. Double-click on the time stamp in the line to open the **Part Identification Edit** form. It should appear similar to Figure 9.46:

Figure 9.46. Part Identification Edit Dialog

04/08/2010 17:21:48: Edit - Windows Internet Explorer
 http://gliders.liquidr.com/pages/EntityPage.aspx?id=51&entitytype=62&parentId=38&parentType=48

LIQUID ROBOTICS

Part Identif... 05/08/2010 10:21:18: Edit

Record Info

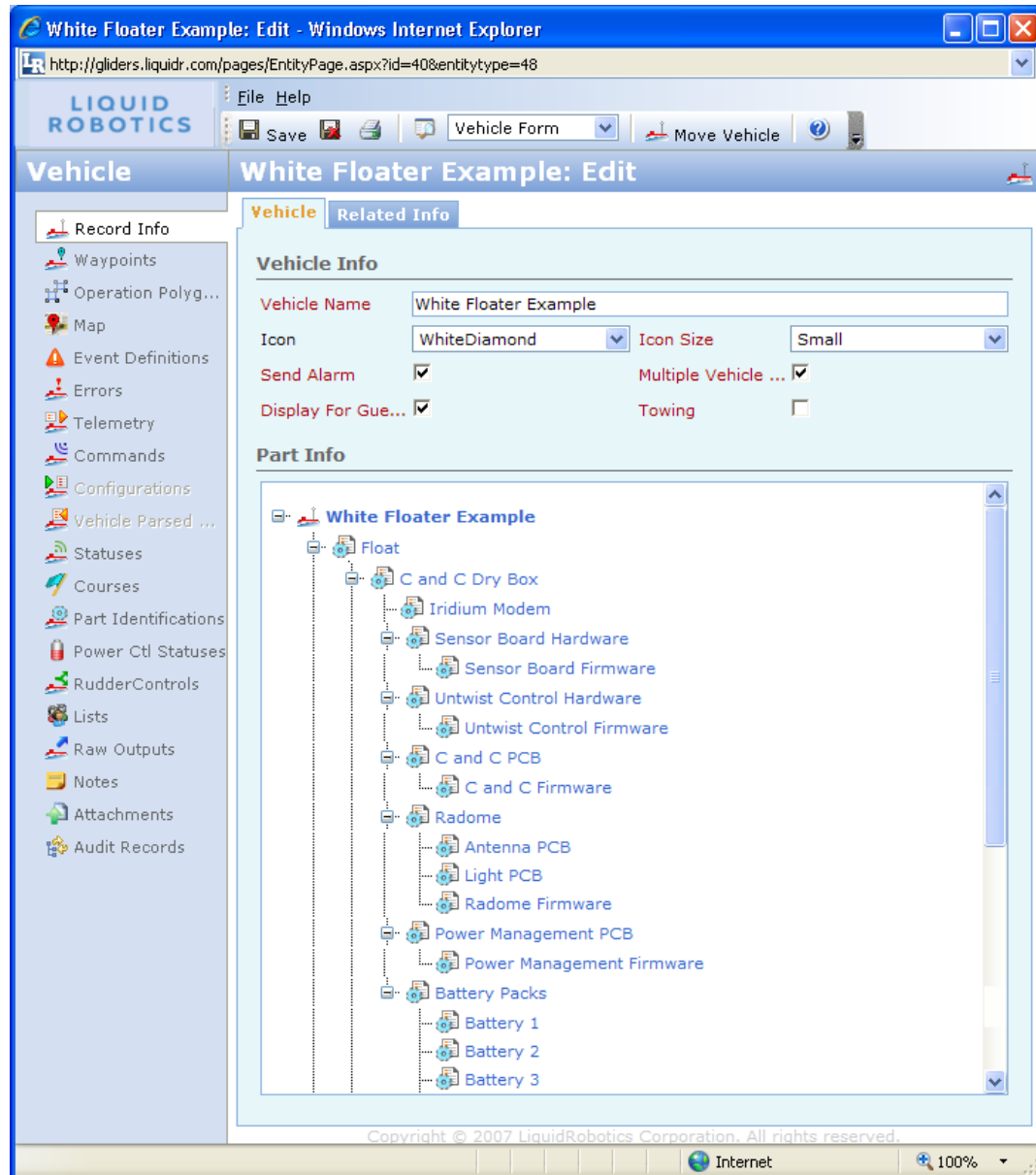
Part Identification Info

Vehicle	White Floater Example	Vehicle Raw Output	300034012240280
Hour	10	Minute	21
Second	18		
Month	5	Day	8
Year	10	TimeStamp	5/8/2010 10:21 am
Float_CC_Major_Version	0	Float_CC_Minor_Version	96
Float_CC_Build_Number	459	Reported_IMEI	300034012240280

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Done Internet 100%

9. Click on the **Sync to Parts** text or icon near the top of the form. You should receive a message from the system that it synchronized the parts successfully.
10. Click on the **Record Info** tab of the **Vehicle Data** window. This should now display the completed Part Info tree, showing all data for Vehicle parts (Figure 9.47).

Figure 9.47. Completed Part Info Data Tree**Note**

Be sure to power-off the Vehicle once the data has been transferred.

Adding Serial Numbers (SV2 Only)

Now that the complete Part Info tree has been created, the part serial numbers for your new Vehicle can be entered. This is optional, but recommended. **For SV3 Vehicles, the part serial numbers are completed automatically when you power on the Vehicle and the CCU completes its boot sequence.**

Numbers can be entered for the:

- Float
- Sub
- Umbilical

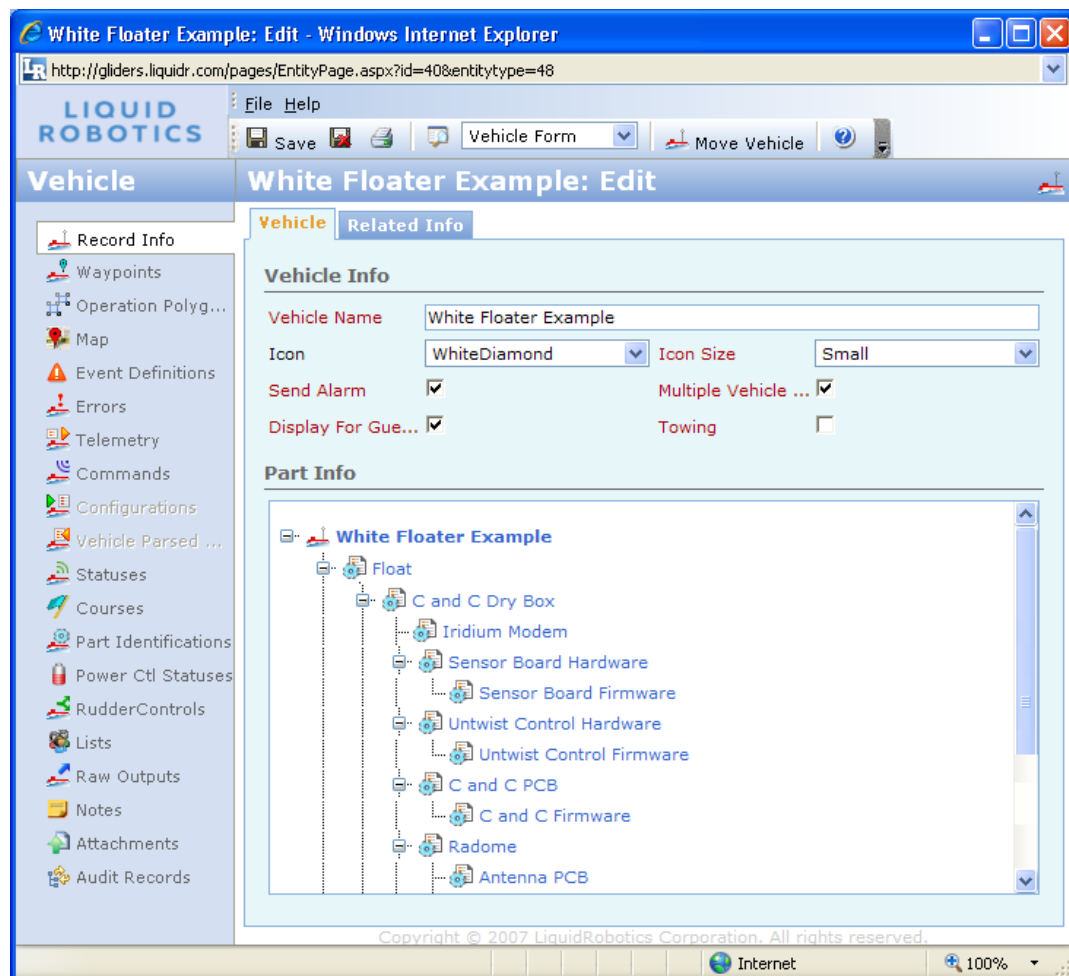
Each serial number should be listed in the Packing Slip, or on the part itself.

Setting the Float Serial Number

Add the Float Serial Number as follows:

1. Click on the Vehicle Icon on the **Dashboard** page to bring up the **Vehicle Edit** box (Figure 9.48).

Figure 9.48. Vehicle Edit with Part Info



2. In the **Part Info** box, single-click on "Float" to call up the Float Info dialog (Figure 9.49).

Figure 9.49. Float Part Info Dialog

The screenshot shows a web-based dialog box titled "Related Record -- Webpage Dialog". Inside, there's a "Related Record" section with a dropdown menu set to "Part Form". Below this is the "Part Info" section, which contains several input fields: "Part Name" (set to "Float"), "Parent Part", "Build Date", "Part Number", "Serial Number" (highlighted with a dashed blue box), "Type" (set to "Sub Assembly"), "Revision", "Expected Life Time" (set to "0 minutes"), "Remaining Life Time" (set to "0 minutes"), "LR Serial Number", and "Vehicle" (set to "White Floater Example"). Below the "Part Info" section is the "Related Information" section, which includes fields for "Owner", "Created On", "Created By", "Organization", "Updated On", and "Updated By". At the bottom of the dialog are "Save" and "Cancel" buttons. The status bar at the bottom shows the URL "http://gliders.liquidr.com/related/relatedDialog.aspx?id=436&entitytype=49&parenttype=48&parentid=4" and "Internet".

3. Enter the Float serial number in the left-side box labeled **Serial Number**. (Do not enter data in the **LR Serial Number** box).
4. Click the **Save** button, bottom left, to save the value and close the dialog box.

Setting Remaining Serial Numbers

Using the same procedure described in “[Setting the Float Serial Number](#)” (page 276), you can set the serial numbers for the Sub and the Umbilical.

Complete Vehicle Provisioning

To complete the Vehicle provisioning process, enter a comment stating that the new Vehicle has been provisioned. Doing this is optional, but recommended.

Commenting On Provisioning

1. Click on the **Comment** command button on the **Dashboard** page to open the dialog box for entering a comment ([Figure 9.50](#)).
2. In the **Command Reason** box, enter a comment indicating that initial provisioning of the new Vehicle has been completed.

Figure 9.50. Provisioning Completed Comment

Comment Command -- Webpage Dialog

Comment Command

Send this command to White Floater Example.

Vehicle Command Related Info

Vehicle Command Info

Command Reason Provisioning completed

Vehicle White Floater ...

Command Status Created

Command Type Comment

From Waypoint

To Waypoint

Course (degrees)

Status

Course

Vehicle Rudder ...

Send Cancel

http://gliders.liquidr.com/dialogs/commandDialog.aspx?id=&entitytype=44&newE Internet

3. Click the **Send** button.

The software will record the comment, along with your name and a timestamp, in the WGMS database. This completes the initial provisioning process for the Vehicle.

Chapter 10. Troubleshooting

Typically troubleshooting involves addressing problems that may occur when the Vehicle is being tested prior to launch, or when responding to alarms when the Vehicle is on a Mission.

Troubleshooting a WGMS Installation

This section describes various WGMS installation problems scenarios and suggested responses. There is also information on interpreting the Packet Reflector log and Com Server log error messages.

I don't see any Vehicles when I start the WGMS

The Vehicles tab on the Home page is empty	
Possible Causes	Actions
If not Liquid Robotics Hosted, when WGMS is initially installed, there are no Vehicles.	Enter the Vehicles and data.
If Liquid Robotics Hosted, someone inadvertently deleted all the Vehicles in the list.	Re-enter the Vehicle data.

There is no response from the Vehicle

On start-up, there is no response from the Vehicle	
Possible Causes	Actions
There is no Internet connection.	Verify the Internet connection.
Vehicle is not powered On.	On shore: Check Vehicle Power. Off shore: Attempt to contact using XBee (SV2 Only).
Relay not configured correctly.	Check connections to Relay hardware.
The Iridium modem was deleted from the parts table.	Check that the Iridium modem is listed in the Parts List.
The wrong IMEI was entered for the Vehicle.	Check the IMEI number in the Parts List against the Vehicle delivery documents.
The Packet Reflector/COM Server is not running	Check Packet Reflector and Com Server Dialog windows.
The Address and/or Port values are incorrect.	Check the Address and Port values. Check Com Server for log for error messages.
The WGMS Unique ID number is not the same as the predefined Vehicle Unique ID number.	Check the Unique IDs as follows: 1. Open a debug window on the Relay 2. Get the WGMS Unique ID 3. Open the WGMS Vehicle form 4. Click on "Unique ID Part" to get the ID

On start-up, there is no response from the Vehicle	
Possible Causes	Actions
	5. If the IDs do not match, follow the procedure described in “Viewing Vehicle Parts Information”

Commands are not being ACKed/NAKed

Receiving Telemetry, but no response to Commands	
Possible Causes	Actions
Vehicle is powered off.	Verify that power is on.
Relay is not configured correctly.	Check connections to Relay hardware.
There is no Internet connection.	Verify the Internet connection.
The Iridium modem was deleted from the parts table.	Check that the Iridium modem is listed in the Parts List.
The wrong IMEI was entered for the Vehicle.	Check the IMEI number in the Parts List against the Vehicle delivery documents.
The Packet Reflector or COM Server is not running.	Check the buttons and click if necessary.
The Address and/or Port values are incorrect.	Check the Address and Port values.
Command Timer Box not checked.	Check “Enable Command Timer” box.

A Vehicle no longer responds to WGMS commands

Vehicle was operating correctly, then stopped responding to commands	
Possible Causes	Actions
Lost Internet connection.	Verify the Internet connection.
Temporary Iridium communications loss.	Wait 10 to 15 minutes to confirm that Iridium loss is not temporary.
Batteries fully discharged.	Check the last telemetry battery level. Check for any previous System alarms.
Vehicle electronics malfunction.	If close to the Vehicle, try communicating via XBee (SV2 Only). Check for any previous System alarms.
If still receiving telemetry, Vehicle mechanical failure.	If close to the Vehicle, try communicating via XBee (SV2 Only). Notify Mission Operator to prepare for recovery.
Com Server Fatal Error.	Check Com Server Log for error messages. Restart Com Server.
Packet Reflector Fatal Error.	Check Packet Reflector Log for errors. Restart Packet Reflector.

Map is not being displayed in the WGMS Dashboard

The Google map is not being displayed on the Dashboard page	
Possible Causes	Actions
No Internet connection – Error Message.	Verify the Internet connection
API Key not specified.	Enter the API key
Wrong API key – Error Message.	Check/update the API key. A pop-up message should advise you on what to do.
No check in the “Display Google Maps” checkbox.	Check the maps checkbox

XBee doesn't seem to be working (SV2 Only)

Cannot communicate via the XBee connection	
Possible Causes	Actions
XBee startup can take up to 1 minute.	Wait at least 1 minute after startup before sending commands.
XBee reception is turned off on Vehicle.	Turn on XBee via Iridium.
Vehicle is too far away.	Move within 100 meters of Vehicle.
Wrong XBee IP address on the Packet Reflector	Check Packet Reflector IP address.
Wrong IP address for your computer.	Check computer IP address.
Wrong PAN ID number.	Check XBee PAN ID.
Multiple XBee connections with same PAN ID.	Go through one Relay to avoid problem.

I'm not getting Iridium messages

Communications with XBee works, but not through Iridium	
Possible Causes	Actions
Lost Internet connection.	Check Internet connection.
Temporary Iridium communications loss.	Wait 10 minutes to verify. These outages can sometimes last up to an hour.
Packet Reflector configuration set to wrong IP address or port number.	Re-check IP address and port number. If “correct” values are set, contact your VAR to verify the IP address and/or port number.
Packet Reflector/COM server not running.	Check the buttons and click if necessary.
System was configured for Mobile WGMS	Confirm that the Wave Glider modem is configured for Direct IP.

Mobile WGMS is not working

Cannot establish Iridium Mobile WGMS communications	
Possible Causes	Actions
Iridium signal is blocked.	If indoors, move outdoors with a clear view of the sky.

Cannot establish Iridium Mobile WGMS communications	
Possible Causes	Actions
Temporary Iridium communications loss.	Wait 10 minutes to verify. These outages can sometimes last up to an hour.
System was not configured for Mobile WGMS.	Confirm that the Wave Glider modem is configured for ISU-to-ISU.
Incorrect Packet Reflector configuration.	Check the Packet Reflector IP addresses and port numbers.
Incorrect Virtual Relay Server configuration.	Check the Virtual Relay Server address and port values.

I changed and then lost the Administrator's password

Cannot remember or find the Administrator's password	
Host	Actions
Hosted by LRI.	Contact LRI to reset the password.

Troubleshooting C&C and CCU Initiated Alarms

Alarms detected by the C&C are sent as telemetry data. They are displayed on the WGMS Dashboard and accessed by clicking on the Alarms icon.

A summary of the C&C alarms is given below. More complete descriptions and responses are given in the sections referenced.

Table 10.1. C&C-Initiated Alarms

Alarm Type	Description	Ref.
Sub Leak Alarm	Water leak detected in Rudder Module.	“Sub Leak Alarm”
Float Leak Alarm	Water leak detected in the C&C or CCU Drybox.	“Float Leak Alarm”
Sub-to-Float Comm Error	C&C computer detected a datacomm error from the Rudder Module computer.	“Sub-to-Float Comm Error”
Payload Alarm	Communications problem between the C&C computer and a payload.	“Payload Alarm”
Float Battery Low	C&C / CCU battery level is below the defined "Low Battery Power" value.	“Float Battery Low”
Umbilical Fault	Umbilical integrity problem detected.	“Umbilical Fault”
GPS Not Functioning	Vehicle has not received a valid GPS fix within a specified time.	“GPS Not Functioning”
Sub Reboot Alarm	An automatic re-boot occurred on the Rudder Module computer.	“Sub Reboot Alarm”

Alarm Type	Description	Ref.
Float-to-Sub Comm Error	Rudder Module computer detected a datacomm error from the C&C / CCU computer.	“Float-to-Sub Comm Error”
Float Temperature Exceeded	Temperature in the C&C / CCU Drybox is above the "Float Temperature Threshold".	“Float Temperature Exceeded”
Float Pressure Outside Range	Pressure in the C&C / CCU Drybox is outside the "Float Pressure Threshold" values.	“Float Pressure Outside Range”
EEPROM Error	Error uploading data from EEPROM to Flash during re-boot.	Figure 9.38
Float Reboot Alarm	An automatic re-boot occurred on the C&C / CCU computer.	“Float Reboot Alarm”

Troubleshooting WGMS Initiated Alarms

Some SV2 style alarms are initiated by the WGMS software:

Table 10.2. WGMS SV2 Software Alarms

Software Alarm	Explanation	Ref.
Report Timeout	No telemetry was received for 25 minutes	“Report Timeout”
Link Error	Error in Iridium data packet	“Link Error”
Invalid GPS	GPS time-stamp or coordinates are all zeros	“Invalid GPS”
Empty Record	Iridium packet from Vehicle contains no data	“Empty Record”
Checksum Error	Data packet checksum is not correct	“Checksum Error”
Out of Bounds	Outside/Inside of Operation Polygon	“Out of Bounds”



Note

There are also SV3-only alarms initiated by Regulus. Contact the Liquid Robotics Support Organization for more information.

General Alarm Response

Generally, the first response to any alarm is to check other sensors to both verify the problem, and determine the cause of the alarm.

Vehicle retrieval is sometimes the best option, but in certain cases, it's acceptable to monitor the telemetry to see if the alarm has any detrimental effect on Vehicle performance.

Intermittent Alarms

Alarms on the Wave Glider are not self-resetting; an alarm will continue until the triggering problem has been fixed. Occasionally, an alarm may be caused by a temporary electrical or communications glitch. Thus, if an alarm shows only on a single telemetry transmission, it is probably not cause for concern. Obviously, if the same alarm shows up relatively often, some action needs to be taken.

Multiple Alarms (Examples do not apply to SV3)

Often, one problem on the Vehicle will trigger more than one alarm. In this case, correlating the alarms and their meanings can be a useful diagnostic tool. For example, a "Low Float Pressure" alarm by itself may not be an issue, but if there is also a "Float Leak" alarm, there probably is a problem.

XBee Communication (SV2 Only)

It can be helpful to have XBee available. This gives you an alternate method of communication for troubleshooting, though it does require close proximity to the Vehicle.

XBee also allows re-booting of the system without System Administrator ("Admin") privileges. However, re-booting the system is generally a solution of last resort. Re-booting may temporarily reset the alarm, but not address the root cause.

Contacting Liquid Robotics

If you've tried the solutions suggested below, and the problem persists, see "[Contacting Liquid Robotics](#)".

C&C Alarm Responses

Responses to the C&C alarms are described below. The responses generally assume that the Vehicle is operational in the water.

Responses to the Shore alarms are given in "[Shore Alarm Responses](#)".

Sub Leak Alarm

A water leak was detected in the Rudder Module. Salt water in the Rudder Module can damage or short out the rudder-control electronics and result in failure of the Vehicle steering mechanism.

Responses:

1. Check for a Float-Sub comm error alarm. If there is, immediately initiate Vehicle retrieval.
2. If no other alarms, monitor. If the alarm continues for more than one hour, initiate Vehicle retrieval.

Float Leak Alarm

A water leak was detected in the C&C Dry Box. Salt water in the C&C can short out the batteries and eventually result in failure of the communications electronics. Telemetry failure can make locating the Vehicle difficult.

Responses:

1. Check the Float C&C pressure. If the pressure is OK, monitor. If the pressure is low, immediately initiate Vehicle retrieval.
2. Check for a change in the battery storage capacity. If it is decreasing rapidly (especially in daytime), initiate Vehicle retrieval.

Sub-to-Float Comm Error

The C&C / CCU computer detected a datacomm transmission error from the Sub's rudder controller. Unless the problem is persistent, it is probably not critical.

Responses:

1. Monitor. If the alarm continues for more than 10 minutes, command the Vehicle to make a 90° turn and check telemetry to verify a correct response.
2. If no response to the 90° turn (or an incorrect response), try again. If still no response, prepare for Vehicle retrieval.

Payload Alarm

Indicates a general problem with a payload. Possibly a data transmission error between the C&C and one (or both) of the Payloads. It also may be an electrical or environmental issue.

Responses:

1. Check if a payload is supposed to be transmitting data, but is not.
2. If a payload is transmitting data, check the data for correctness.
3. Check the Payload currents on the Power Controller Status.

Float Battery Low

C&C / CCU battery capacity level is below the specified "Low Battery Power" value. This could be the result of several days' operation with limited sunlight, failure of a solar panel, or high current draw from a payload. This condition will trigger a longer telemetry interval in order to conserve power.

Responses:

1. Check the solar panel outputs.
2. Turn off power to the payloads and check if the alarm stops.
3. Check the present and previous battery energy values in the telemetry data.
4. Turn off lights, center the rudder and check if the alarm stops.
5. If no solution, prepare for Vehicle retrieval.

Umbilical Fault

The C&C continually checks the current in the Umbilical wires. This alarm indicates either a broken conductor or possibly a damaged (or broken) Umbilical.

Responses:

1. Check the course on the telemetry to verify that the Umbilical has not broken.
2. Check telemetry for an abnormal slowdown in Vehicle speed.
3. Command the Vehicle to make a 90° turn and use telemetry to verify a correct response.
4. Check for a Float-Sub communications alarm.
5. If poor directional control or other alarm, prepare for Vehicle retrieval.

GPS Not Functioning

The Vehicle has not received a valid GPS fix for two minutes. The GPS signal can be lost for several minutes, but longer outages usually indicate a problem with the Vehicle. There may be an electronics failure, or possibly something is blocking the antenna.

Responses:

1. For SV2 Vehicles, cycling the "Bubble Power" in the parameter settings often fixes this issue.
2. If telemetry stops after receiving the alarm, initiate immediate retrieval.
3. If the telemetry is OK, check to see how long the problem has been going on.
4. Check the battery voltage levels.
5. If the problem persists for more than 20 minutes, prepare for retrieval.

Sub Reboot Alarm

An error occurred in the Rudder Module computer, causing a re-boot. If this happens only once, it may not be a problem. However, if it occurs often (or continuously), it's probably serious.

Responses:

1. Turn the Vehicle 90° and monitor the course. Then turn the Vehicle back 90° onto the original course.
2. If no response (or an incorrect response) to the maneuvers, prepare for Vehicle retrieval.

Float-to-Sub Comm Error

The Sub rudder-control computer detected a datacomm transmission error from the C&C computer. Unless the problem is persistent, it is probably not critical.

Responses:

1. Monitor. If alarm continues for more than 10 minutes, command Vehicle to make a 90° turn and check telemetry to verify a correct response.
2. If no response to the 90° turn (or an incorrect response) prepare for Vehicle retrieval.

Float Temperature Exceeded

The temperature in the C&C / CCU Drybox is above the "Float Temperature Threshold". This may be caused by high outdoor temperatures and direct sunlight, especially if the Turtledeck has become detached. At

night, or if the outside temperature is moderate, the alarm may indicate either an electronics error or a battery problem.

Responses:

1. If the Vehicle is not in water, shade the C&C / CCU box from direct sunlight.
2. If on water during the day, power down as much as possible and monitor.
3. Check for rapid drop in battery capacity.
4. If the float pressure is high and rising, initiate retrieval.
5. Monitor. If the temperature alarm persists, prepare for retrieval.

Float Pressure Outside Range

The pressure in the C&C / CCU Drybox is above or below the "Float Pressure Threshold" values. It is most likely that the pressure has gone below the minimum pressure value. If it goes above the pressure limit, check the float temperature alarm.

Responses:

1. Check the Float pressure value.
2. If the pressure value is within the OK range, re-boot and see if the alarm goes off again.
3. If the pressure value is too low, monitor for a Float leak alarm.
4. If low pressure or a Float leak alarm, initiate Vehicle retrieval.

EPROM Error

During the initial power-up booting, the system transfers data from EEPROM to Flash memory, using error checking. This alarm is activated if there is an error in the data transfer.

Responses:

1. Try re-booting. If the error occurs again, contact LRI.

Float Reboot Alarm

A serious error occurred on the C&C / CCU computer, causing a re-boot. This can happen occasionally due to a temporary electrical glitch. If it occurs repeatedly, there is a serious problem.

Responses:

1. Turn the Vehicle 90° and monitor the course. Then turn the Vehicle back 90° onto the original course.
2. If no response (or an incorrect response) to the maneuvers, prepare for Vehicle retrieval.



Note

After a Float Reboot, the IR light will be OFF, and the visible light will be ON in a low-power-consumption mode. The Shore-side software will attempt to restore the light to the

state that it was in prior to the re-boot. This will result in a Vehicle ACK of the light ON/OFF command.

Shore Alarm Responses

The Shore alarms are generated by the software not the C&C / CCU computer. Often, this occurs when there is an error in the telemetry data.

Report Timeout

No telemetry has been received from the Vehicle for 25 minutes.

Responses:

1. Waiting up to an hour often reveals if it is an iridium connection issue.
2. Check previous telemetry for alarms or other anomalies.
3. Check the last-transmitted battery power level. If it is low, the C&C / CCU computer may have reverted to a longer (lower-power) telemetry interval.
4. If battery power is low, consider Vehicle retrieval.

Link Error

Each Iridium message contains a descriptive header followed by a data packet. This alarm indicates that the Iridium message header has flagged an error in the data packet.

Responses:

1. Check previous and subsequent telemetry for errors.
2. Monitor. If the alarm persists, consider Vehicle recovery.

Invalid GPS

The GPS time-stamp is received from the satellites. The coordinates are computed aboard the Vehicle. This alarm is generated if either the time-stamp is zero, or the coordinates compute to zero.

Responses:

1. Check previous telemetry for possible position errors.
2. Monitor. If the alarm persists, consider Vehicle retrieval.

Empty Record

The Iridium message from the Vehicle consists of a header followed by a data packet. This alarm indicates that the data packet is empty.

Responses:

1. Monitor to check if this is a sporadic event, or a constant occurrence.
2. If the error occurs consistently, plan on Vehicle retrieval.

Checksum Error

Each Iridium data packet contains an error-checking checksum. This alarm indicates that the data has been corrupted. This may be a one-time communications glitch, or it may indicate a problem with the Vehicle computer or antenna.

Responses:

1. Monitor to check if this is a sporadic event, or a constant occurrence.
2. If error occurs consistently, plan on Vehicle retrieval.

Out of Bounds

The Vehicle has moved outside its Operation Polygon. Or else it has entered an Exclusionary Polygon. This alarm can be triggered by a one-time data transmission error.

Responses:

1. Check the telemetry crumbs on the Dashboard Position Map.
2. Check the Vehicle's Waypoints and commanded course to verify that it was not deliberately sent to its current position.
3. If off-course, issue a heading command that will take the Vehicle back into bounds.
4. Monitor. If the Vehicle does not respond to the heading command, initiate retrieval.

Other Vehicle Problems and Actions

The responses below generally assume that the Vehicle is on-shore during testing or pre-launch.

No XBee Connection (SV2 Only)

The XBee should power up when the Vehicle electronics are first turned on, or when the system is re-booted.

Responses:

1. Move closer to the Vehicle. When initiating contact, the range should be under 20 meters.
2. Verify that the serial port speed is set to 115,200 bps on the computer terminal software.
3. Verify that the PAN ID has been set correctly.
4. Check that the dongle for the XBee is fully plugged into the computer.
5. Turn on the XBee connection using the Dashboard Iridium link.

No Iridium Connection

The Iridium connection is initiated by the Vehicle at the Telemetry intervals. The interval can be set for an especially long time (as much as 24 hours). Also, if the batteries are low, the Vehicle may revert to the "Low Battery" telemetry rate, which is typically longer than the standard rate (to conserve battery power).

Responses:

1. Check that the correct Vehicle is selected on the Dashboard.
2. Refresh the Dashboard page.
3. Use the Dashboard to check the strength of the last-sent Telemetry data. The column "ISS" indicates the Iridium Signal Strength, from 0 to 5. Level zero indicates no signal.
4. Use XBee (SV2 Only) to get the IMEI and verify that it is the correct one for the Vehicle.

LED Light Won't Turn ON/OFF

The visible LED lights turn ON whenever the system is powered-up. If it fails to do this, there is probably an electrical failure in the C&C box, requiring repair. If the light was ON at power-up, but fails to turn OFF, or if it won't go from OFF to ON, then it's probably a software or communications issue.

Responses:

1. Check that other commands (e.g., rudder position) work.
2. If using XBee (SV2 Only), try using the Dashboard.
3. If using the Dashboard, try using XBee (SV2 Only).

IR Light Won't Turn On/OFF

The IR light is not visible, even in a dark room. Typically, it can be seen on the view screen of a digital camera. It can also be checked using an IR "Viewing Card" (SV2 Only).

If it's verified that the light is not turning on, try the responses described in "[LED Light Won't Turn ON/OFF](#)".

No Float Payload Power

When the system is powered up (or re-booted), power to the payloads is turned off. The payload power needs to be explicitly turned on.

Also, the maximum current that can be supplied to any payload is limited to one Amp. Any attempt to use more current will result in power to that payload being shut off.

Responses:

1. Check that the payload is connected to the correct connector on the C&C Drybox.
2. Check the connectors on C&C and Payload Dryboxes.
3. Check for an over-current alarm.
4. Check the power status for low batteries.

No Sub Payload Power From C&C

As with the Float payloads, Sub payload power is off when the Vehicle power is turned on. Also the maximum current that can be supplied to both the Rudder motor and Sub payload combined is one Amp.

Responses:

1. Verify that rudder can move. If not, check both the Float and Rudder Module Umbilical connectors. Also check the Umbilical for cracks or tears.
2. Check for an over-current alarm.
3. Check the power status for low batteries.
4. Disconnect the Sub payload power cable from the Rudder Module, then re-connect.

Float Continuously Reboots

This indicates a serious electronics problem. Contact LRI.

Sub Continuously Reboots

This indicates a serious electronics problem. Contact LRI.

Contacting Liquid Robotics

If you need assistance, contact Liquid Robotics Customer Support.



Important

Before contacting Liquid Robotics Customer Support, please have the following information available for the Vehicle(s) you are contacting Customer Support about:

- Wave Glider Model Number
- Wave Glider Serial Number
- Any special or added payloads on the Vehicle.
- Time/Date when problem occurred.
- Location of Vehicle when problem occurred.
- Initial indication of problem.
- Any other indications or unusual readings.
- Attempts at corrective actions and their results.

The Liquid Robotics Customer Support organization is available 24/7.

Telephone:

(US) 888-574-4574

(International) 1-408-636-4205

Email:

support@liquid-robotics.com

Appendix B. Roles and Permissions

Roles and permissions are shown in the table below. In the table, the “C-R-U-D” codes indicate the following permissions:

- **C – Create** User can add a new entity.
- **R – Read** User can access information about an entity.
- **U – Update** User can update a previously created entity.
- **D – Delete** User can delete an entity.

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
Area Permissions						
Home Pages	• R • •	• R • •	• R • •	• R • •	C R U D	Grids and top levels of the main window.
System Alarms	• R • •	• R • •	• R U •	• R U •	C R U D	Information for alarm escalation
Records	• • • •	• • • •	• R • •	• R U •	C R U D	Top-level metadata records. (outputs, vehicles, permissions)
Lists	• • • •	• R • •	C R U D	C R U D	C R U D	Escalation lists, user groups (future)
Dashboard Pages	• R • •	• R • •	• R • •	• R • •	C R U D	Allows user to edit dashboard pages.
List Items	• • • •	• R • •	C R U D	C R U D	C R U D	Items in a list
Report	• • • •	C R U D	C R U D	C R U D	C R U D	Data reports
Users, Roles Permissions						
Users	• • • •	• R U •	• R U •	C R U D	C R U D	User data
Organizations	• • • •	• R • •	• R • •	• R U •	C R U D	Organization parameters
Notes	• • • •	C R U D	C R U D	C R U D	C R U D	Any entity can have a note attached (user, vehicle) (html or text)
Accounts	• • • •	• • • •	• • • •	• • • •	C R U D	For future use
Catalog Images	• • • •	• R • •	C R U D	C R U D	C R U D	Logos, images, photographs
Roles	• • • •	• • • •	• • • •	• R U •	C R U D	Editing the roles available in the system
User Roles	• • • •	• • • •	• • • •	C R U D	C R U D	Mapping between users and roles
Audit Records	• • • •	• R • •	• R • •	• R • •	C R U D	Entity change history (parts, vehicle changes)
Vendors	• • • •	• • • •	• • • •	• • • •	C R U D	For future use
Attachments	• • • •	• R • •	C R U D	C R U D	C R U D	Files attached to an entity

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
Permissions	••••	••••	••••	•R••	CRUD	What permissions are allowed in the system
Role Permissions	••••	••••	••••	•R••	CRUD	Mapping between roles and permissions
Work flow Events	••••	••••	••••	••••	CRUD	For future use
Inventory Items	••••	••••	••••	••••	CRUD	For future use
Record Customization						
Fields	••••	•R••	•R••	•RU•	CRUD	Metadata for each entity field (user name) (change the name of a column)
Data Views	••••	••••	•R••	CRUD	CRUD	Metadata defining how entities are displayed (column grids) (change column in a grid)
Relationships	••••	••••	•R••	•R••	CRUD	Structure that tells how entities are related. (inverse of foreign keys)
Criteria	••••	••••	•R••	CRUD	CRUD	Additional conditions on grids (filters)
Selects	••••	••••	•RU•	CRUD	CRUD	Values for fields with multiple values
Criteria Groups	••••	••••	•R••	CRUD	CRUD	Grouping class for criteria
Payload	••••	••••	••••	••••	CRUD	Edit Payload display structures
Vehicle Permissions						
Vehicles	••••	•R••	CRUD	CRUD	CRUD	Access to records on vehicles in database (Guests can see vehicles marked "visible for guest")
Commands	••••	•R••	CRU•	CRU•	CRUD	Entities representing commands
Telemetry	•R••	•R••	•R••	•R••	CRUD	Data coming back from vehicles
Statuses	••••	•R••	CRU•	CRU•	CRUD	Statuses coming and going from vehicle
Event Definitions	••••	•R••	CRUD	CRUD	CRUD	Alarm definitions
Rudder Controls	••••	•R••	•R••	CR••	CRUD	Parameters for Rudder Module control loop.
Parameters	••••	•R••	CRU•	CRU•	CRUD	Data user can send to vehicle

Roles and Permissions

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
Communication Channels	••••	••••	••••	•RU•	CRUD	Automatically created by relays
Parts	•R••	•R••	CRUD	CRUD	CRUD	Manufacturing track listing of what's on vehicle
Courses	••••	•R••	CRUD	CRUD	CRUD	Vehicle routes
Part Identifications	••••	•R••	•R••	•R••	CRUD	Vehicle-generated list of parts
Missions	••••	•R••	CRU•	CRUD	CRUD	Time-delineated vehicle status that states a vehicle is in water.
Operation Polygons	••••	•R••	CRUD	CRUD	CRUD	Geographical area for vehicle presence
File Notifications	••••	••••	••••	••••	CRUD	Entities used during file transfers
Errors	••••	•R••	•RU•	•RU•	CRUD	Vehicle Events
Raw Outputs	•R••	•R••	•R••	•R••	CRUD	Telemetry received from the vehicle
Waypoints	•R••	•R••	CRUD	CRUD	CRUD	Waypoint data associated with a vehicle.
Course Waypoints	••••	•R••	CRUD	CRUD	CRUD	How a course is mapped to a waypoint
Power Control Status	••••	•R••	•R••	•R••	CRUD	Telemetry
Mission Vehicles	••••	•R••	CRU•	CRU•	CRUD	Mapping between missions and vehicles
Operation Coordinates	••••	•R••	CRUD	CRUD	CRUD	Coordinates of an operational polygon
Payload Data Permissions						
Payload Packets	•R••	•R••	•R••	•R••	CRUD	Generic data from the payloads
Payload Statuses	•R••	•R••	•R••	•R••	CRUD	Parsed payload packets
AI SyG Locations	•R••	•R••	•R••	•R••	CRUD	AI updates
Weather Stations	•R••	•R••	•R••	•R••	CRUD	Weather station telemetry
AI SyG Statuses	•R••	•R••	•R••	•R••	CRUD	AI updates
Weather Reports	•R••	•R••	•R••	•R••	CRUD	Weather station telemetry
AI SyG Records	•R••	•R••	•R••	•R••	CRUD	AI vehicles seen
Site Permissions						

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
Site Areas	••••	••••	••••	••••	C R U D	Allows different orgs to change page structure (home, vehicles...)
Site Groups	••••	••••	••••	••••	C R U D	Groups of items (Vehicles, Payload data)
Site Items	••••	••••	••••	••••	C R U D	Items that appear within a group
Custom Entity						
Added Records	••••	••••	••••	••••	C R U D	Ability to add new entities without changing the database
Added Fields	••••	••••	••••	••••	C R U D	
Added Mappings	••••	••••	••••	••••	C R U D	Relationships between added records and existing entities
Collision Avoidance Permissions						
Obstacles	••••	••••	••••	••••	C R U D	Obstacle in the Wave Glider's path
Obstacle Locations	••••	••••	••••	••••	C R U D	Obstacle telemetry
Vehicle Obstacles	••••	••••	••••	••••	C R U D	Mapping between obstacles and vehicles

Glossary

Acknowledged / Ack (Alarm)	The alarm was reset by a User.
Active (Alarm)	The alarm was issued, but no other action has been taken.
Admin (Role)	A User who has all the permissions required to go through the day-to-day administration of the WGMS, add users, manage customizations, and deal with data.
AIS	Automatic Identification System
AISyG	Automatic Identification System
Alarm	A message either from the Vehicle C&C or from the Shore-based software indicating that a problem has occurred.
API	Application Programming Interface
Arrival Distance	Distance from a Waypoint at which the C&C computer assumes that the Vehicle has “arrived” at the Waypoint.
Audit Records	Record of changes or updates made to a Vehicle and/or its parts.
AWAC	Acoustic Wave and Current Profiler
BGAN	Broadband Global Area Network
Checkbox	A yes/no selection box in a Dialog Box. Checking one box does not preclude checking another (also see Radio Button).
Coastal Explorer	A mapping service that provides a DVD with nautical maps. Used as an alternative to Google Maps.
Command and Control Drybox	The center-mounted Drybox in the Wave Glider Float. Contains the main control computer and communications equipment.
Command Packets	Data packets containing Commands sent to the Vehicle.
Commands	Messages sent to the Vehicle for control or to request status.
COTS	Commercial, Off-The-Shelf
Course	The path a Vehicle is attempting to follow (also see Track).
Create (Permission)	A Role permission that allows creation of a Vehicle-related system parameter.
Dashboard	The Home Page of the User Interface to the Wave Glider Management System.
Data Analyst (Role)	A User who looks at existing Vehicle and WGMS data and can download database data.
Database (WGMS)	The part of the WGMS that stores configuration and communications data for one or more Vehicles.
Delete (Permission)	A Role permission that allows deletion of a Vehicle-related system parameter.

Glossary

Dialog Box	An on-screen box that typically requests data to be entered.
Drybox	A sealed watertight container on either the Sub or the Float. Typically used for housing electronics.
EMSS	Enhanced Mobile Satellite Service
Errors	Messages sent by the Vehicle or the Shore-based software indicating a problem.
Escalation List	A prioritized list of people to contact in case of an error.
Events	Types of Alarms.
Float	The part of the WaveGlider Vehicle that rides on the surface of the water.
Glider	"Glider" is an alternate (and discouraged) term that has been used in the past to refer to the Sub (the Sub is the sub-marine wave motion propulsion component of the WaveGlider vehicle).
Global Positioning System (GPS)	A satellite-based broadcasting system that allows determination of geographical coordinates.
GPS	Global Positioning System
Google Maps	A mapping service provided by Google.
GSM	Global System for Mobile Communications
Guest User (Role)	Someone allowed to view certain Vehicle data, but who cannot create or modify any system parameters.
GUI	Graphical User Interface
Home Page	The initial page that comes up on the browser after logging onto the WGMS system.
Hyperion	An alternate name for the WGMS Kernel
Icon	A small pictogram on a GUI. Typically, clicking on the Icon will start some other action.
IMEI	International Mobile Equipment Identity
International Mobile Equipment Identity (IMEI)	A 15-digit number used by the Iridium system to identify handsets and modems that can connect with the Iridium system.
IP	Internet Protocol
IP Address	Equivalent to IP Number.
IP Number	Internet Protocol Number. A combination of numbers that defines the destination of TCP or UDP data. Of the form xxx.xxx.xxx.xxx, where "xxx" represents a number from 1 to 255 (e.g., 10.10.5.145).
Iridium	A constellation of satellites that provides world-wide voice and data transmission. WaveGlider Vehicles use the SBD form of transmission.
Iridium Network Server	A server maintained by the Iridium Corporation that provides access to the Iridium system via the Internet.

ISU	Iridium Subscriber Unit
LRI	Liquid Robotics, Inc.
M2M	Mobile-to-Mobile
Master (Role)	A User who manages Vehicle provisioning, mission preparation and operations, as well as payload and Web services development.
Menu	Allows selection of one or more items from a list.
Mission	A set of Vehicle operational actions, either by itself, or in cooperation with other Vehicles.
MTBF	Mean Time Between Failures
National Marine Electronics Association (NMEA)	An industry association that creates standards for, and certifies electronics used in marine applications.
NMEA	National Marine Electronics Association
Operation Region	A user-defined closed region in the water that defines limits on where a Vehicle should go. Commonly referred to as an "Operation Polygon."
Operation Polygon	A user-defined closed region in the water that defines limits on where a Vehicle should go. Sometimes referred to as an "Operation Region" in the WGMS UI.
Org	Abbreviation for Organization.
Organization	An entity that operates one or more Wave Glider Vehicles. Each Organization has its own data, and that data cannot be accessed by any other Organization.
Page	A browser window that displays data, and typically has links to other pages and data.
Part Identifications	Lists of hardware and software version numbers.
Payload Drybox	A Drybox that is optionally installed on/in a Vehicle. The Float has provision for two internal dryboxes. Payload Dryboxes may also be mounted externally on the Glider.
Permissions	For each Role, the specifications of what system parameters are allowed to be Created, Read, Updated and/or Deleted.
Privileges	Refers to the combined set of Permissions for someone who has been granted multiple Roles.
Protocol (Internet)	Method by which data is sent from one computer to another on the Internet.
Radio Button	One of a set round-icon selection options. Only one option can be selected (also see Checkbox).
Raw Outputs	Data packets received from the Vehicle as-is, with no processing.
Read (Permission)	A Role permission that allows read-only viewing of WGMS system parameters.
Roles	A set of Permissions granted to a person that allows them specific types of access to WGMS system parameters.

Glossary

Self-Corrected (Alarm)	An Alarmsituation corrected itself.
Shore-Side (Software)	Refers to any software that does not reside on the Vehicle. WGMS software in a laptop on a boat is still considered “Shore-Side”.
Short Burst Data (SBD)	An Iridium data communications method that utilizes small data packets.
Status Data	Information sent via Telemetry indicating the operational status (position and system health) of the Vehicle.
Sub	"Sub" is the preferred naming convention for the sub-marine wave motion propulsion component of the Wave Glider vehicle. "Glider" is an alternate (and discouraged) term that has been used in the past to refer to the Sub.
System Page	An alternate page used to display all System information for an Organization's Vehicle(s).
Tab	A label in the WGMS GUI. Tabs may be placed near the top of a window, or on the left side. Clicking on a tab selects different data on a Page.
Telemetry	Data sent from the Vehicle on a periodic basis. Typically sent every two minutes.
Tether	An alternate (and incorrect) term for the Umbilical.
Toolbar	A bar, typically along the top of a window, that contains data entry boxes and icons.
Track	The path a Vehicle actually traverses in the water when it is trying to stay on a course (also see Course).
UI	User Interface - In the case of WGMS this would be a graphical user interface.
Umbilical	The flexible connecting cord between the Float and the Glider. Contains power and signal conductors, as well as strengthening elements.
Update (Permission)	A Role permission that allows updating of a Vehicle-related system parameter.
Vehicle	An alternate term used to describe the Wave Glider Float + Umbilical + Glider system.
Data Page	A page that provides links to all Vehicle information for all of the Vehicles in an Organization.
Wave Glider Management System (WGMS)	The combined software package that is used to manage communications to and from a Vehicle.
Waypoint	A geographical point defined by Lat/Long coordinates. Used to define a Vehicle's Course or holding position.
Web Services	Automated information services that are conducted over the Internet, using standardized formats and protocols.
XBee	A short-range low-to-medium bandwidth radio communications method included with SV2 Vehicles only.