

WGMS™ Administrators Guide

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December 2014
Part Number 00481**

**LIQUID
ROBOTICS**

WGMS™ Administrators Guide

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The Wave Glider mechanism is patented under US Patent Number 7,371,136 and other patents pending. All aspects of the Wave Glider product have been developed at private expense by Liquid Robotics, Inc.

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Revision History

Document Part Number	Revision	Publication Date	Changes
00481	A	May 2013	This is the initial manufacturing release of this document.
00481	B	August 2013	This revision documents features introduced in the WGMS 4.1.4 release including Custom Reports for a wide range of supported sensors, improvements to ADCP C2 and C4 Custom Reports, and information on changes to the WGMS Dashboard and Vehicles Form that support Wave Glider SV3 Vehicles.
00481	C	December 2013	This revision documents features introduced in the WGMS 4.1.5 release including support for SV3 computed course telemetry packets, support for the SV3 New Waypoint with Attributes command, display of MMSI Ignore status in Map View, integration with ArcGIS tile layers, centralized User Delete function, Sentinel acoustic sensor display window, and custom reports pages for Vemco VM4 and Jamstec sensors.
00481	D	December 2013	Information on the SV3 Commands Window has been updated.
00481	E	June 2014	Added features and updates included in WGMS 4.1.6 - for more information see the section called "Changes in Version 4.1.6". Added features and updates included in WGMS 4.1.6.1 - for more information see the section called "Changes in Version 4.1.6.1". The Administrative Tasks - Settings Screen chapter was deleted and the content is now located in the <i>WGMS User Guide</i> in the Administrative Tasks - Settings Page chapter. The Shared Administrative Tasks - Vehicles Screen chapter was deleted and the content is now located in the <i>WGMS User Guide</i> in the Administrative Tasks - Data Page chapter. The Shared Administrative Tasks - System Screen chapter was deleted and the content is now located in the <i>WGMS User Guide</i> in the Administrative Tasks - System Page chapter. The Troubleshooting chapter was deleted and the content is now located in the <i>WGMS User Guide</i> in the Troubleshooting chapter.

Document Part Number	Revision	Publication Date	Changes
			A new chapter, Configuring the Packet Reflector was added. A new chapter, Configuring the Virtual Relay was added.
00481	F	December 2014	New information on WGMS Export REST Services (Chapter 6). New information on WGMS Web Services (Appendix B). Added features and updates included in WGMS 4.1.7 - for more information see the section called "Changes in Version 4.1.7" . Added features and updates included in WGMS 4.1.8 - for more information see the section called "Changes in Version 4.1.8" .

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About this Document

This revision of the *System Administrators Guide for the Liquid Robotics Wave Glider Management System* includes:

- New information on WGMS Export REST Services - for more information see [Chapter 6: WGMS Export REST Services](#).
- New information on WGMS Web Services - for more information see [Appendix B: WGMS Web Services](#).
- WGMS 4.1.7 Release Notes. See [the section called “Changes in Version 4.1.7”](#) for more information.
- WGMS 4.1.8 Release Notes. See [the section called “Changes in Version 4.1.8”](#) for more information.



Important

This WGMS Administrators Guide provides basic system administration information for WGMS users assigned the Admin role for the Liquid Robotics-hosted WGMS service. It is not a comprehensive reference to all aspects of WGMS, or to aspects of WGMS accessible only by Root users. The focus is on the administrative tasks typically performed when setting up an LRI-hosted WGMS Organization.

For information on the mechanical, electrical, communications, and software interfaces for Wave Glider payload development projects, see one of the following documents:

- *Wave Glider® SV2 Interface Control Description*
- *Wave Glider® SV3 Interface Control Description*

Chapter 1. Overview

The Liquid Robotics Inc. (LRI) Wave Glider is a platform for long-duration deployment of ocean surface sensor systems. The Wave Glider Management System (WGMS) software provides browser and programmatic interfaces to allow users 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.

This manual describes the configuration and administration of WGMS with specific reference to three common deployment scenarios:

- Managing an "Organization" comprised of multiple Wave Gliders and multiple Users provisioned on the LRI-hosted WGMS service.
- Managing Mobile WGMS.
- Configuring and managing Wave Gliders being used for payload development and bench testing.

Contact Liquid Robotics Support for advice on configurations not described here.

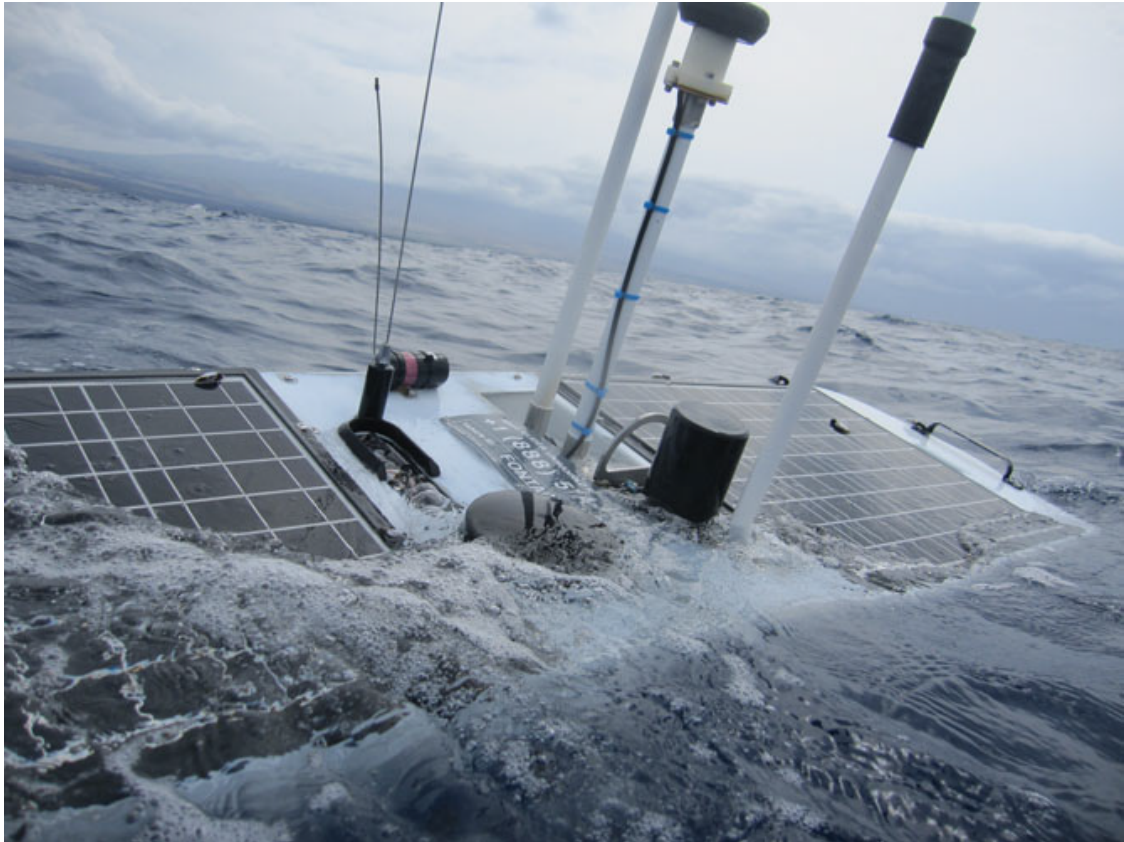
The Wave Glider

There are two Wave Glider models, the SV2 and the SV3.

- For detailed Wave Glider SV2 specifications and payload integration parameters, see the *Wave Glider SV2 Interface Control Description*.
- For detailed Wave Glider SV3 specifications and payload integration parameters, see the *Wave Glider SV3 Interface Control Description*.

The Wave Glider models are composed of a surface "Float" and a submarine "Glider" connected by a flexible "Umbilical." [Figure 1.1](#) shows what the Float looks like on the surface of the ocean. [Figure 1.2](#) shows the basic components and their names.

Figure 1.1. Wave Glider SV2 on Water



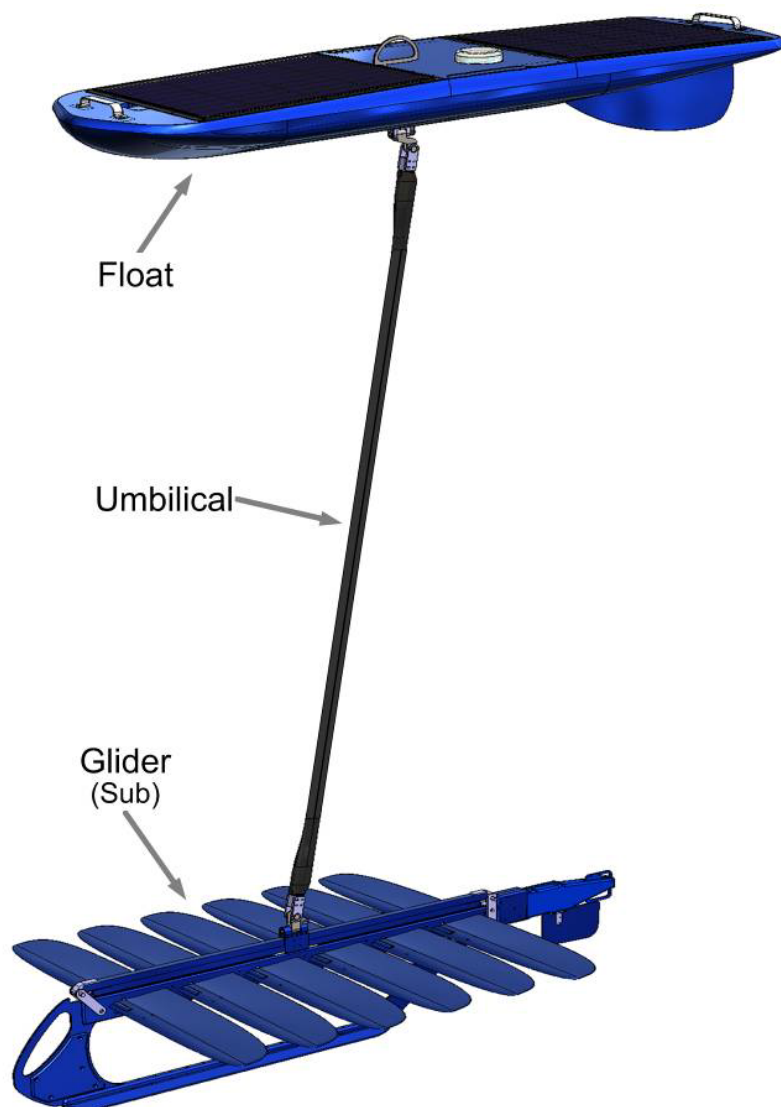
The float rides on the surface of the water. The middle section of the float contains a command and control (C&C) dry box that houses a computer and related command, control, and power management electronics, batteries, and communications antennas.

The Glider provides propulsion by harnessing power from wave action. Steering is provided by an electronically controlled rudder on the glider. The Glider is connected to the Float by a flexible, high-strength Umbilical that also provides power and communications connections between the Float and the Glider.

Connectors on the C&C dry box and on the Glider provide power and communications interfaces for standard, optional, and custom payloads. The Wave Glider platform is designed to accommodate a wide range of sensor integration scenarios.

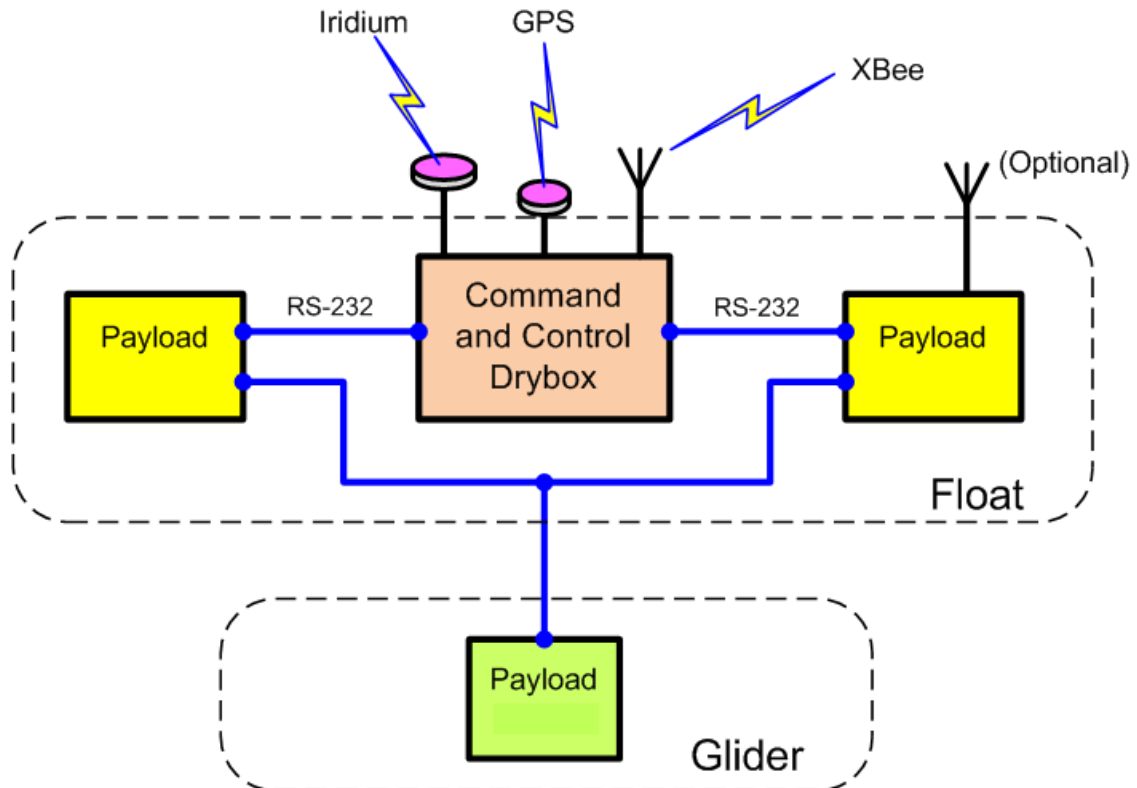
Payload flexibility, long mission capability, and near real-time exchange of data and commands with shore-based applications make the Wave Glider platform suitable for a wide range of missions. A central consideration for the WGMS system administrator is to accommodate those missions.

Figure 1.2. Wave Glider SV2 Vehicle Main Components



Wave Glider Instrumentation and Communications

Figure 1.3 below shows the general configuration of the payload and communications on the Wave Glider SV2. In most cases a system administrator would not need to know the details of this architecture. However, certain administrative tasks refer to some of the illustrated components, so the figure is provided for reference.

Figure 1.3. Wave Glider SV2 Payload and Communications Components

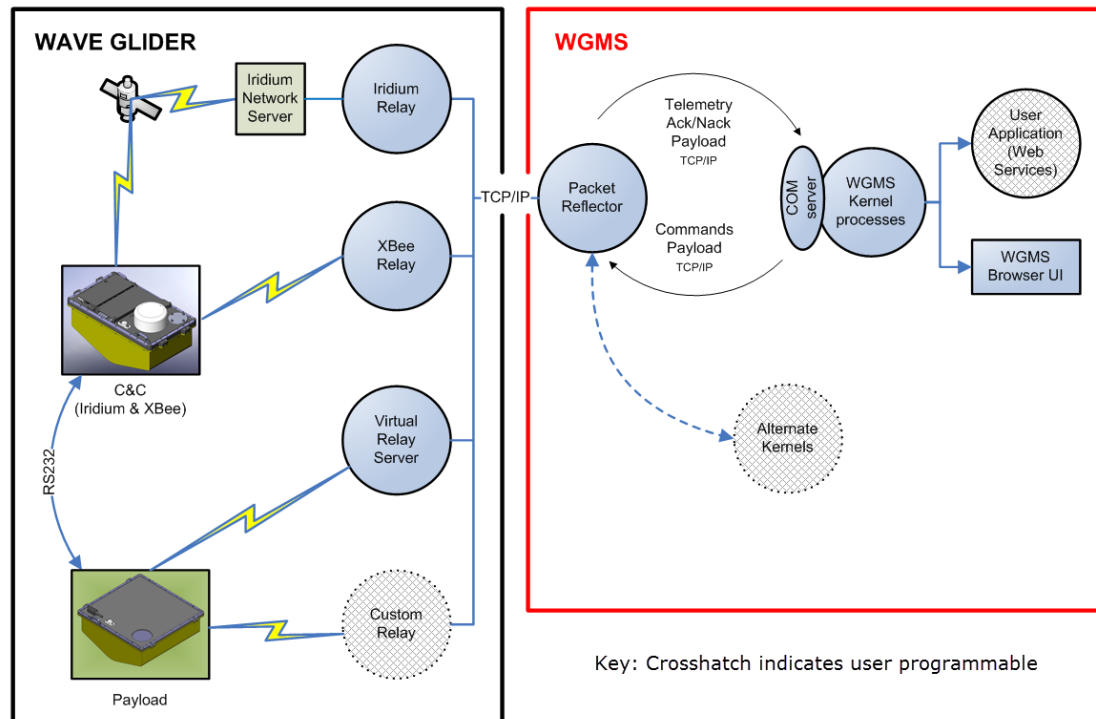
Note the following in the figure:

- The SV2 C&C communicates directly with the external world using the Iridium satellite network or XBee.
- The SV2 C&C can communicate indirectly through payload-based communications equipment.
- The SV2 C&C computer communicates with the payloads via RS232 links.

WGMS Components

Figure 1.4 illustrates the full WGMS configuration, indicating all communications, routing, and processing options. Specific deployments, such as payload development, or Mobile WGMS, will typically use a subset of the modules represented by the illustration.

In the figure, circles represent software modules. Blue circles indicate LRI-supplied components which may be customer or user configurable. Crosshatched circles represent user-modifiable or user-generated components. WGMS components communicate with each other via TCP/IP and may or may not be resident on the same computer.

Figure 1.4. Wave Glider Management System Components

For most applications, commands are sent from a browser UI or a customer-provided application 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 C&C using the indicated communications channel relay. The relay manages the details of the underlying communications technology. Depending on the command addressing, the C&C 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 relay (when on mission, typically the Iridium Server), 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.

WGMS includes the following components:

Iridium Server – For most deployed Wave Gliders the primary mode of communications is Short Burst Data (SBD) packets sent by the Iridium satellite constellation through the Internet to the Packet Reflector. The Iridium Server is actually a group of servers maintained by Iridium Communications, Inc. The Iridium modem on the Wave Glider must be specifically provisioned to communicate with the Packet Reflector through this communications channel.

Communications Relays (Iridium, XBee, Virtual Relay Server, Custom) – It is sometimes beneficial to communicate with the Wave Glider through means other than the primary Iridium/DirectIP/SBD path. Considerations include bandwidth, cost, latency, privacy, security and distance. For example, in a payload development scenario the Wave Glider's Iridium satellite antenna might be unable to see the sky, necessitating an alternate way of communicating.

Relays mask the variations between the underlying communications technologies from the Packet Reflector. Specific duties may include fragmenting and reassembling packets, managing queues and driving the physical interface. For example, the XBee Relay requires that it have serial access to an XBee dongle, and XBee packets are limited to 100 bytes. Custom communications relays can be developed by customers and third parties. They do not need to reside on the same computer as the Packet Reflector or WGMS kernel.

Packet Reflector – A Packet Reflector routes traffic between one or more kernels and one or more relays, including associated protocol processing. Packet Reflectors use TCP/IP for all communications with other processes.

WGMS 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.

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.

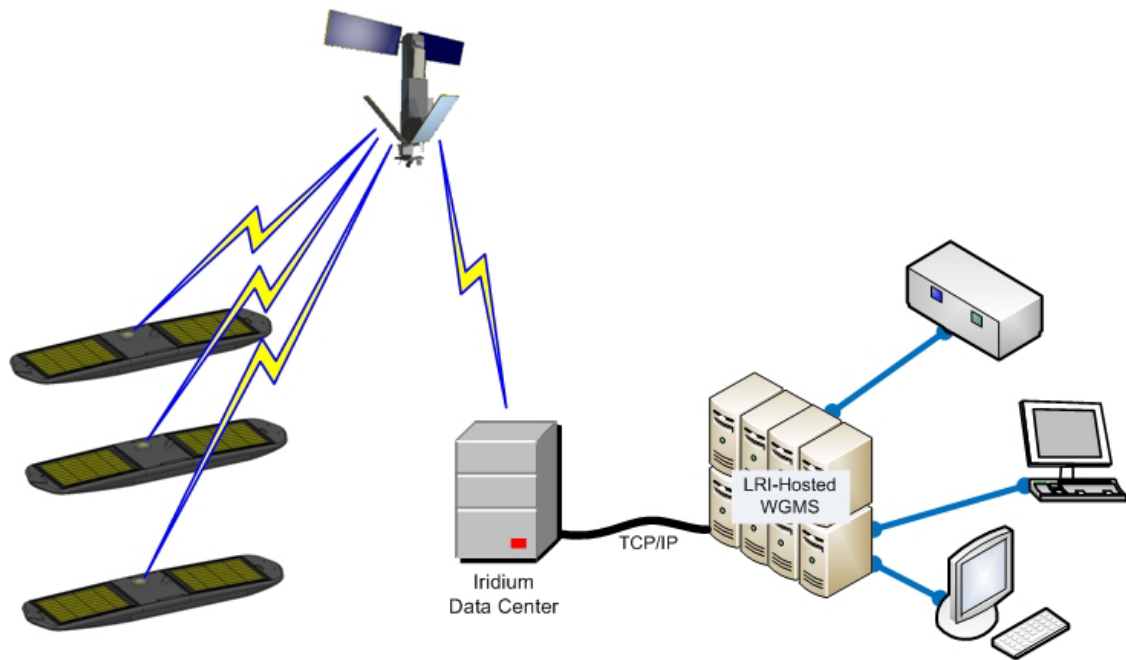
User Application – The WGMS Kernel can be accessed by a non-LRI application using Web Services (SOAP 1.1 or SOAP 1.2) calls over HTTPS. Authentication and authorization are the same as for browser-based access. No additional configuration is required for Web Services access.

Configuring WGMS for Common Scenarios

This section describes considerations and configuration steps necessary to support the three most common deployment scenarios. You may need to combine two or more of these scenarios. For example, you might run a private copy of WGMS that must support both payload developers and Wave Gliders deployed on a mission. LRI Support can advise you on configuration options that will meet your needs.

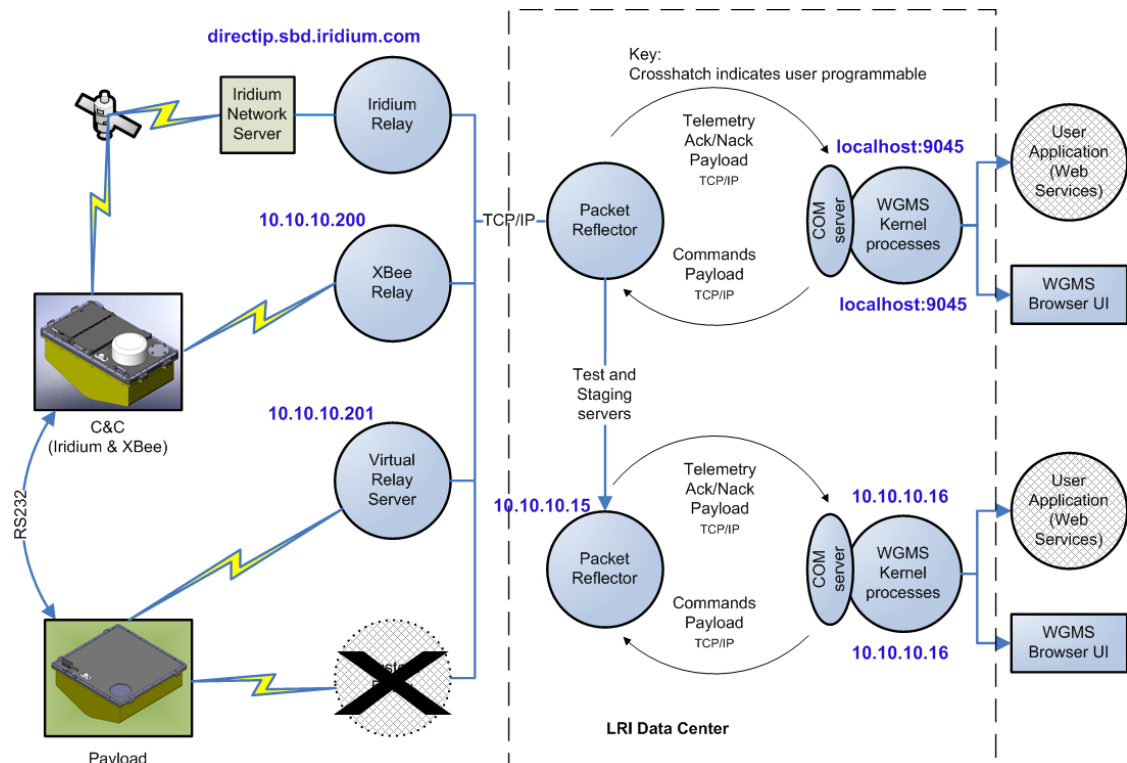
LRI-Hosted WGMS

The most common deployment option is to let LRI manage the hosting of WGMS on your behalf. The WGMS software is deployed on redundant, high performance servers in a secure, high availability data center. LRI Operations staff configure the system for you and administer your system on a 24x7 basis. [Figure 1.5](#) illustrates that deployment option.

Figure 1.5. LRI-Hosted WGMS

With the LRI-hosted service option you are allocated a private domain name in the **<name>.liquidr.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 an LRI-hosted WGMS deployment, LRI 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 LRI’s professional operations team. The typical communications flow is illustrated in [Figure 1.6](#).

Figure 1.6. Wave Glider Deployed with LRI-hosted WGMS

Mobile WGMS

The primary application for the Mobile WGMS configuration is to support Wave Glider deployments when Internet access is unavailable, inconvenient, or too expensive, such as on board a ship. In addition, Mobile WGMS makes it possible for multiple WGMS instances to simultaneously share management of multiple Wave Glider vehicles. For more information see the *Mobile WGMS* chapter in the *WGMS User Guide*.

Payload Development and Shore-Side Testing Using XBee (SV2 Only)

A common work flow is to develop and test a payload in a development lab, then launch the integrated vehicle on its mission. With the Wave Glider SV2, the recommended way to do this is by combining use of an XBee modem and Iridium services.



Note

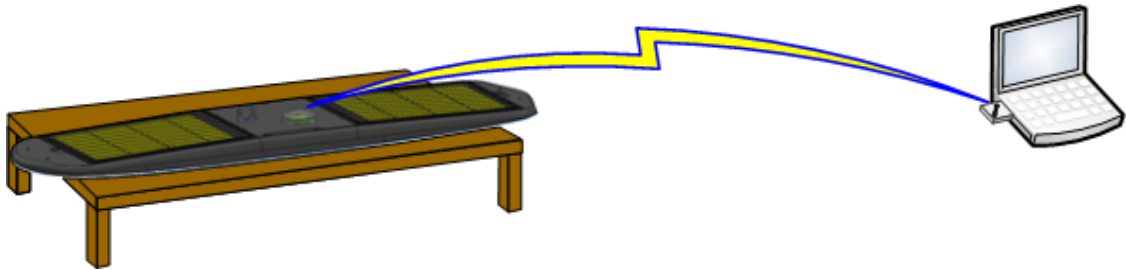
The Wave Glider SV3 includes WiFi and Cell modems that are used for payload development and shore-side testing, instead of XBee. WiFi and Cell communications go through the Virtual Relay Server, rather than the XBee Relay. Cell communications can also be used for Wave Glider missions that are conducted within cellular communications range.

For a Wave Glider on an offshore mission, the only practical means of communications is via satellite, typically the Iridium Communications Inc. constellation. This works well due

to the unobstructed view of the sky from the surface of the sea. However, during payload development and pre-mission testing the use of satellite communications is inconvenient, because the Wave Glider is typically indoors. In addition, satellite bandwidth is expensive and slow in comparison to other technologies.

To meet this need, the Wave Glider SV2 C&C is equipped with an XBee modem. XBee is a low power, medium range, medium speed wireless point-to-point networking protocol based on IEEE 802.15.4. A nearby computer can be equipped with an XBee modem that communicates through a serial port with the LRI-provided XBee Relay. The XBee Relay then communicates with a Packet Reflector in the manner described in the introduction to this chapter. This scenario is illustrated in [Figure 1.7](#), XBee for Local Communications.

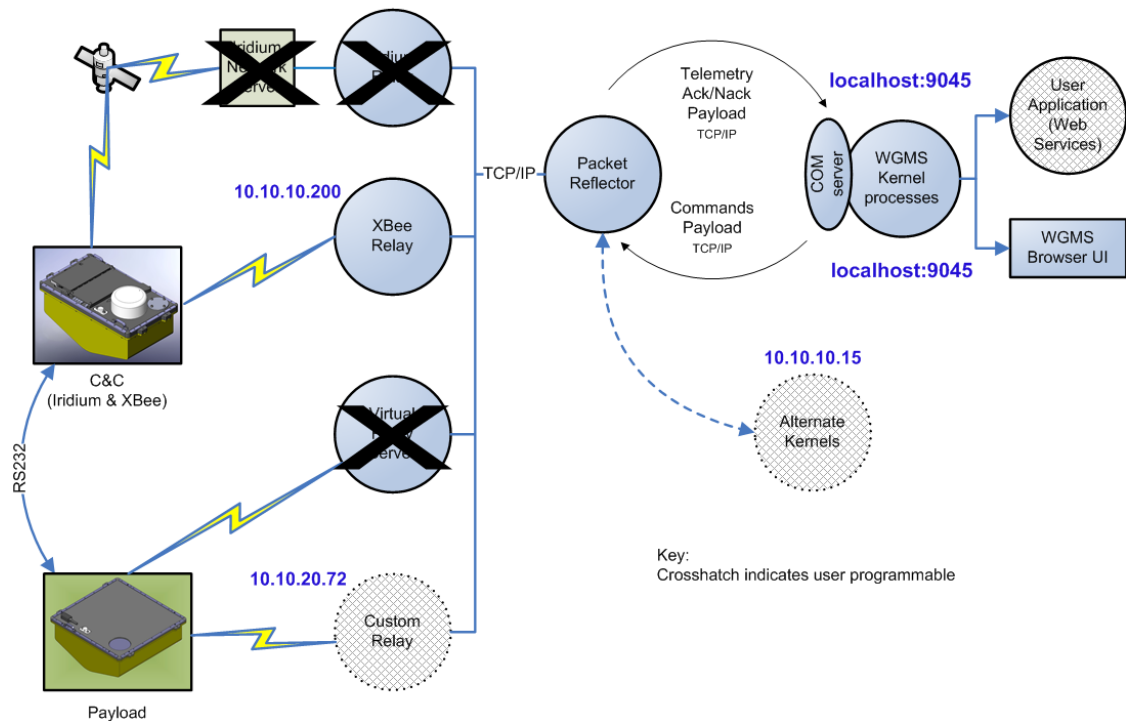
Figure 1.7. XBee for Local Communications



The communications flow is illustrated below in [Figure 1.8](#), XBee Communications.

To use the XBee Relay, you must install the XBee Relay software on a computer with access to an XBee modem that is within range of the XBee modem on the Wave Glider. Depending on conditions, this typically requires that the two modems be within a few hundred meters of each other. Once the software is installed, the Relay must be paired with a Packet Reflector for the LRI-hosted WGMS service. Pairing consists of setting IP addresses and ports appropriately on both sides. In the case of the LRI-hosted WGMS service, there are additional administrative tasks to meet security and other operational requirements. Once the relay is configured, a Wave Glider can be managed using either Iridium or XBee communications channels, or both.

A common scenario is the pre-launch checkout of a Wave Glider. LRI can provide a suggested checklist. If you have a custom payload you may need to modify the LRI checklist. Many of these checks can be performed using the XBee relay, although LRI recommends that the Iridium channel also be exercised prior to launch.

Figure 1.8. XBee Communications

For the XBee Communications scenario in an LRI-hosted WGMS environment, the principal administrative tasks include:

- Obtaining an XBee Modem (dongle) - For more information see [“XBee Hardware”](#) (page 26).
- Installing the XBee Relay on the Computer that hosts the XBee Modem - This step is described in [“XBee Software Configuration”](#) (page 33).
- Configuring the XBee Relay - For more information see [Chapter 3: Configuring an XBee Relay \(SV2 Only\)](#).
- Configuring the target Packet Reflector with the appropriate IP Addresses and Port Numbers - Contact LRI Support for assistance.
- Provisioning the Wave Gliders - For more information see the Liquid Robotics *Wave Glider® User Manual*. All Wave Gliders must be provisioned before you can interact with them using WGMS, even if the hardware is not intended to be sent on a mission.
- Adding Users - For more information see the *Standard Administrative Tasks* section in the *Administrative Tasks - Settings Page* chapter of the *WGMS User Guide*.

Chapter 2. First Time Use of WGMS

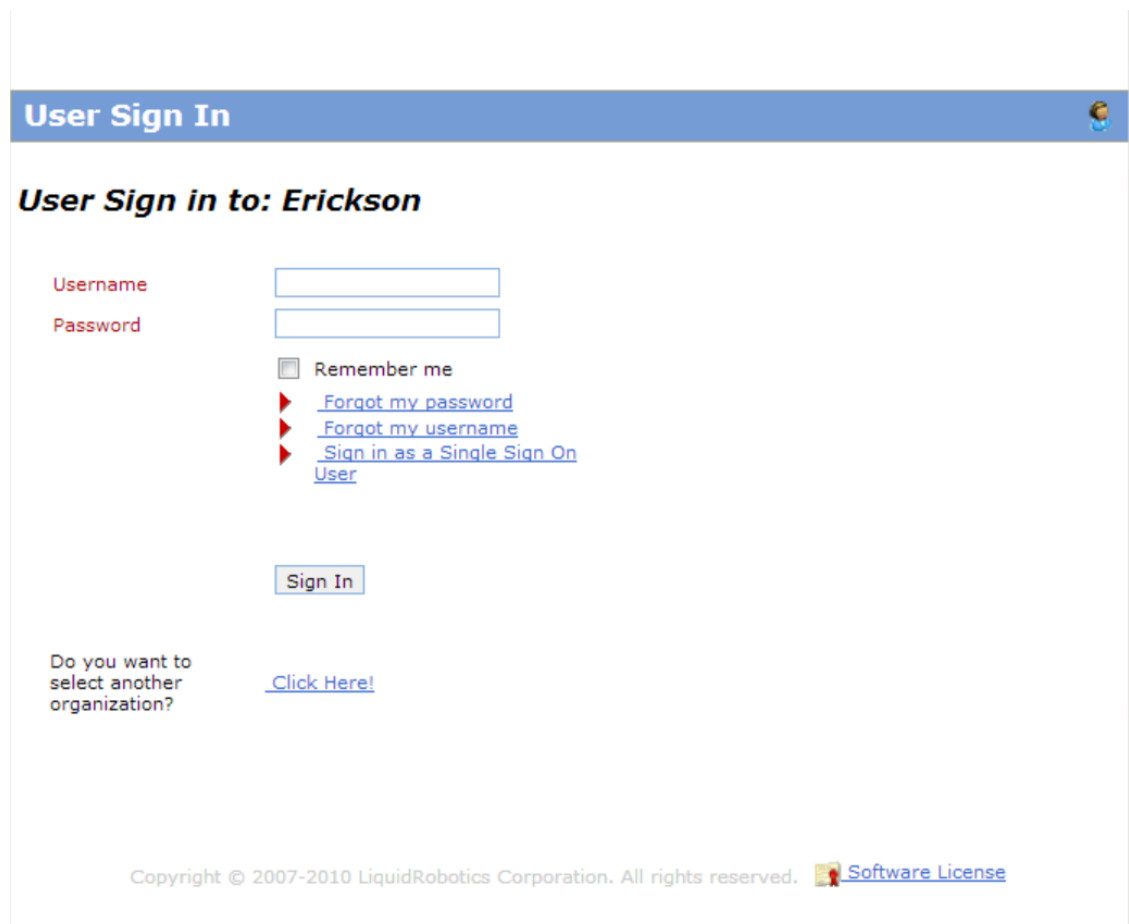
Before using WGMS for the first time, you must login to WGMS. You must also configure the COM server, if you plan to use Mobile WGMS.

Login to WGMS

1. To verify the installation, navigate to your WGMS login screen 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 screen.
 - If you are verifying a Mobile WGMS instance on a laptop or tablet computer, use <http://YourServerDomainName> to access the WGMS login screen.

The following sign-in screen will appear.

Figure 2.1. Sign-In to WGMS Website



The screenshot shows the 'User Sign In' page of the WGMS website. At the top, there is a blue header bar with the text 'User Sign In' and a small user icon on the right. Below the header, the text 'User Sign in to: Erickson' is displayed. The main form area contains two input fields: 'Username' and 'Password'. Below these fields is a checkbox labeled 'Remember me'. To the right of the checkbox are three links: 'Forgot my password', 'Forgot my username', and 'Sign in as a Single Sign On User'. Below these links is a 'Sign In' button. At the bottom of the form area, there is a question 'Do you want to select another organization?' followed by a 'Click Here!' link. At the very bottom of the page, there is a copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to the 'Software License'.

2. Verify the WGMS instance:
 - If you are verifying a hosted WGMS instance on a laptop or tablet computer, WGMS sends a "new user" email message containing the login credentials you need to use.

- If you are verifying a Mobile WGMS instance, login to WGMS with the following credentials:

webadmin@liquidr.com

and use the password:

WGMSlogIn

In both cases the credentials are predefined in the database. You will have the option to change them later.

Figure 2.2. WGMS Login Screen

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

Figure 2.3. Change Username Screen

Change Username

Enter a new Username

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Current Username

Enter New Username

Reenter New Username

Change 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

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

Figure 2.5. Sign In with New Username

The screenshot shows a web application window titled "User Sign In". At the top, there is a menu bar with "File", "Tools", and "Help". Below the menu bar is a button labeled "Options" with a gear icon. The main content area 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 sign-in form includes fields for "Username" (containing "glideradmin1") and "Password" (masked with dots). Below the password field is a checkbox labeled "Remember me". To the right of the checkbox are 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 links. At the bottom left, there is a link "Click Here!" with the text "Do you want to select another organization?" above it. The footer contains the copyright notice "Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved." and a link "Software License" with a small icon.

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](#)

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

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

Figure 2.6. Change Password Screen

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

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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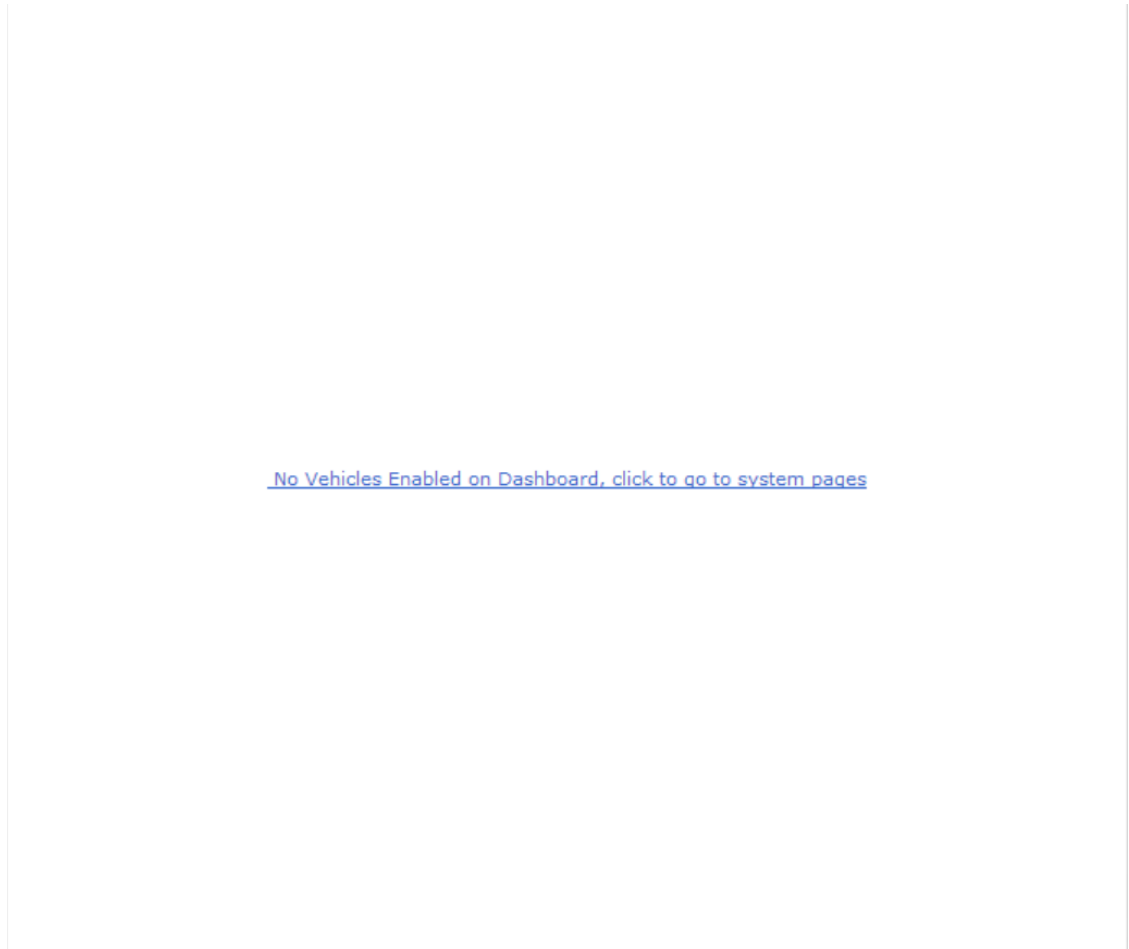
Current Password

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

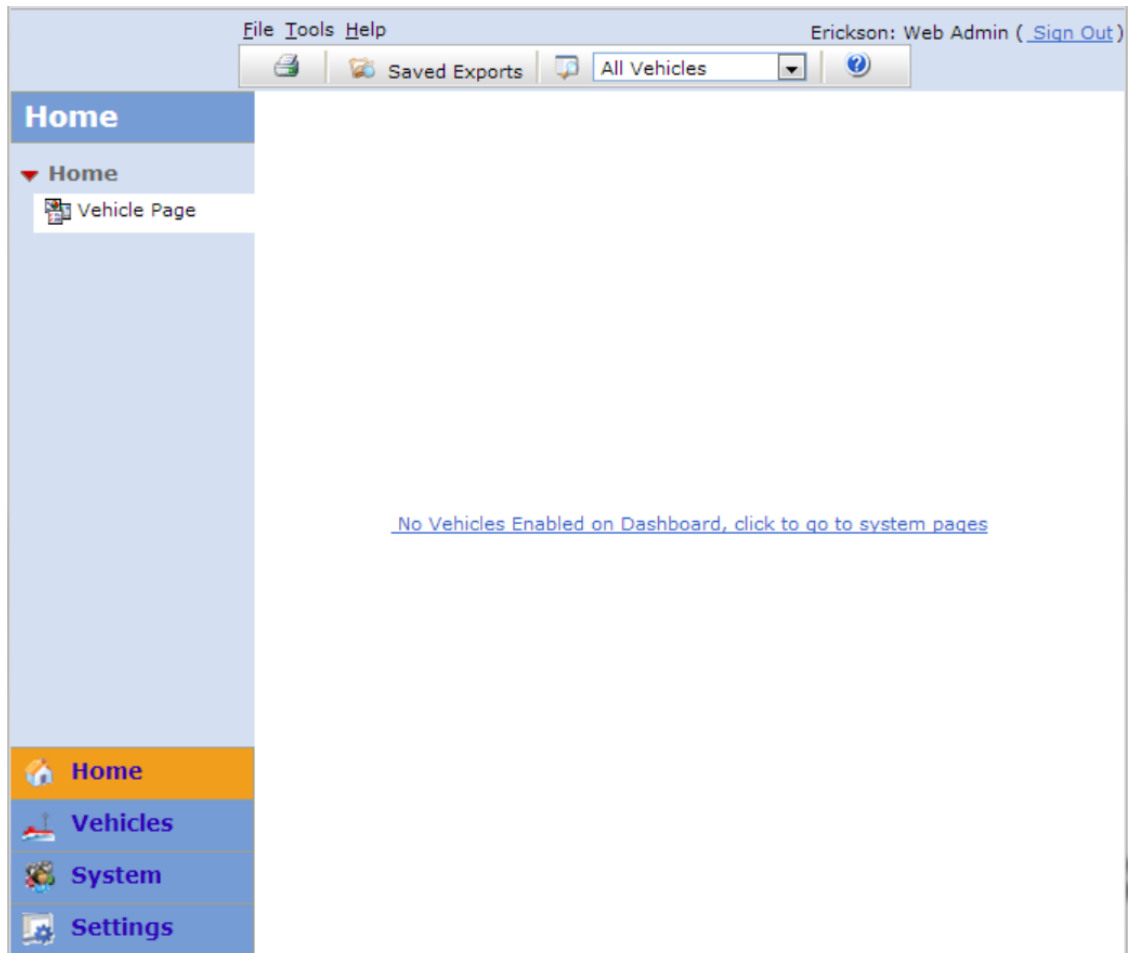
Reenter New Password

6. After changing your password, the initial user interface (UI) display screen will appear. Since no vehicles are defined in the initial database, the display will be empty except for a link to the System Menus.

Figure 2.8. Initial UI Display Screen



7. Click on **No Vehicles Enabled on Dashboard, click to go to system pages** to open the WGMS **Home** screen where you can access the System Menus.

Figure 2.9. UI Display with System Menus

8. The database is preconfigured with webadmin@liquidr.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@liquidr.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 a web application window titled "User Admin Form". The main header area displays "User" and "webadmin@liquidr.com: Edit". Below this, there are tabs for "User", "Multi-Factor Auth", and "Related Info". The "User" tab is active, showing a "User Information" section with various input fields. The "Fleet Association" section is also visible at the bottom.

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	

9. 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 a web application window titled "User Admin Form". The main header area displays "User" and "webadmin@liquidr.com: Edit". Below this, there are tabs for "User", "Multi-Factor Auth", and "Related Info". The "User" tab is selected, showing a form for editing user information. The form is divided into two main sections: "User Information" and "Fleet Association".

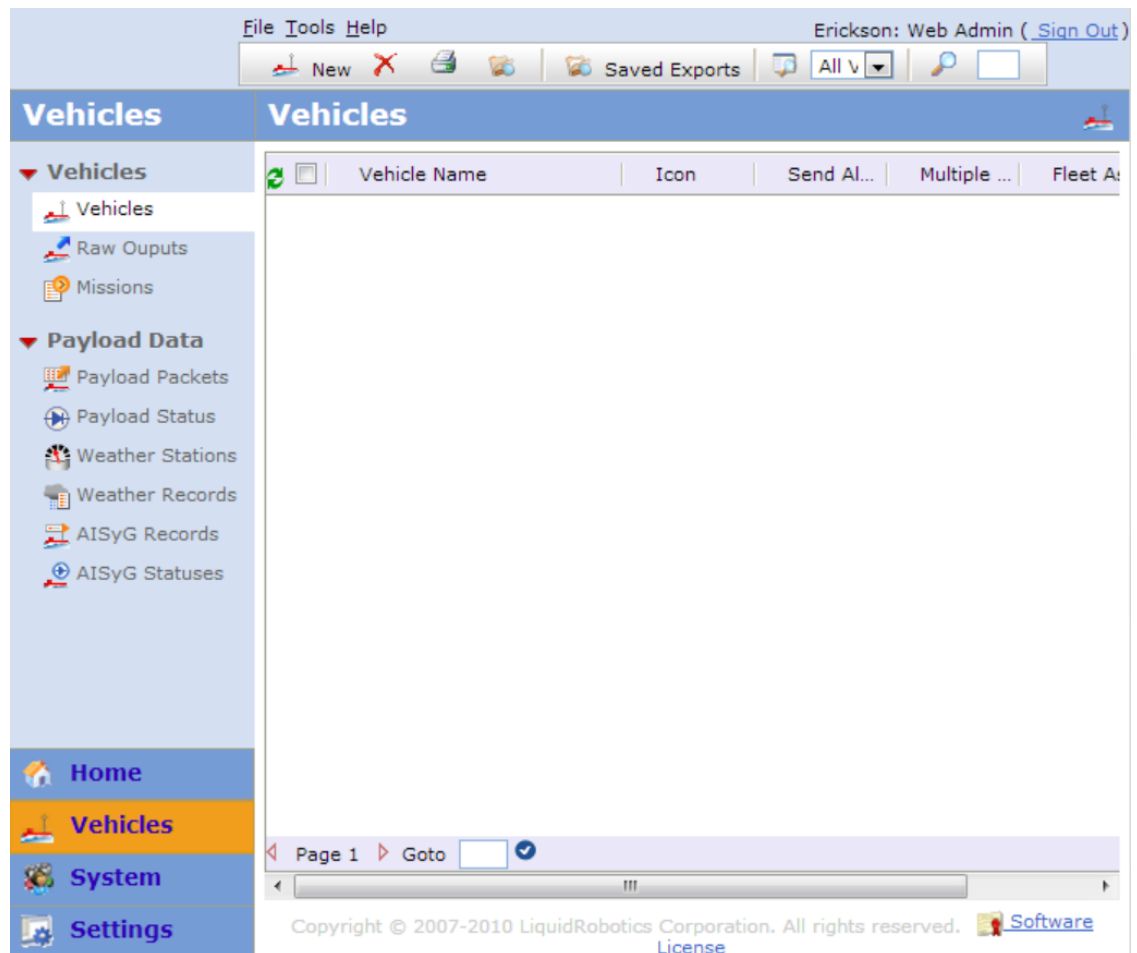
User Information

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	
----------------	--

10. To create a vehicle and its parts, click on **Vehicles** button to open the **Vehicles** list. Follow the vehicle provisioning steps outlined in the chapter titled *Provisioning a Wave Glider* in the *Wave Glider User Manual*.

Figure 2.12. Initial Vehicles List

Configure the COM Server

Note

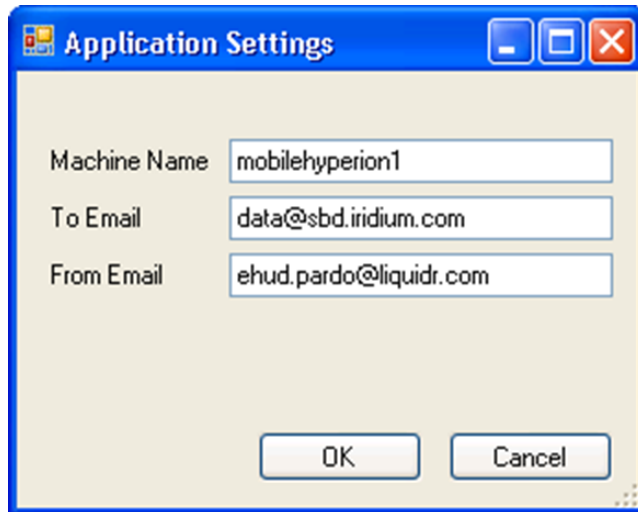
This procedure applies to Mobile WGMS only.

The COM Server links a Packet Reflector to WGMS. Since the COM Server uses TCP/IP to communicate with both the Packet Reflector and WGMS, it is possible for each of these applications to run on a separate computer. For convenience, the LRI WGMS installer installs the COM Server on the same system as the WGMS Kernel. The configuration steps that follow assume that default configuration. Contact LRI for guidance, if you want a different configuration.

The COM Server code consists of a configuration UI and a separate module that runs as a Windows service. The installer deployed the service but did not start it. In this installation step you will run the configuration UI to initialize the COM Server settings and start the COM Server service. Note that the COM Server is a WGMS internal application which is distinct from a communications relay. The COM Server sits between a Packet Relay and a WGMS Kernel. A communications relay, for example, an XBee Relay, sits between a Wave Glider and a Packet Reflector.

Start the COM Server from the Windows Start menu; click **Start**→ **All Programs**→**COM Server** . The following configuration dialog box will appear.

Figure 2.13. COM Server Application Settings Dialog Box



Machine Name – The name of the server hosting the Com Server.

To Email – Should be left unmodified.

From Email – Should be changed to the email address of the administrator for WGMS, such as webadmin@example.com [mailto:webadmin@example.com]. Remember that you may have changed it from the default in the preceding installation step.

Click **OK** to confirm the settings and launch the COM server. The COM Server window will appear.

Figure 2.14. COM Server Window

Communication Server

Management Account COM Settings

Management Account

Server URL

Email

Password

Organization

☒ Listen to Glider Output ☒ Enable Command Timer

☒ Listen to Commands ☒ Enable Configuration Timer

☒ Listen to Configurations ☒ Enable Com Timeout Timer

☒ Enable NMEA Serial Timer ☒ Enable Alarm Escalation Timer

Reflector

Communication Server Starting.
Communication Server Starting.

☒ Log Events Items to display

To configure the COM server, enter:

Server URL – Typically you would replace the domain name (mobilehyperion1 in the example) with your actual domain name.

Email – Replace “ehud.pardo@liquidr.com” with the administrator’s email address (such as webadmin@example.com), and replace the password field with the administrator’s user password.

Organization – Enter the “Org Internal Name” obtained from the Organization Description Dialog. Do not use the “public” name displayed on the Dashboard UI. For more information see the *Editing Organizational Information and Settings* section in the *Administrative Tasks - Settings Page* chapter of the *WGMS User Guide*.

Click the **Listen** button to start the Com Server. Now you can minimize or close the configuration window.

Chapter 3. Configuring an XBee Relay (SV2 Only)

XBee Overview

The XBee radio link is an alternative method of issuing commands to and retrieving data from Wave Gliders. A single XBee Relay can manage multiple active Wave Gliders masking the details of the XBee communications protocol from the WGMS Packet Reflector. The full set of commands available from WGMS can be executed through the XBee interface, with the exception of a few Iridium-specific commands. Similarly, telemetry and other data that are visible in the WGMS UI for Iridium-based communications are also displayed for XBee communications.

Note that the XBee connection is between the Wave Glider and WGMS, not between a particular user and the Wave Glider.

The XBee Relay must be installed on the computer that the XBee transceiver is connected to. The XBee Relay communicates with the WGMS Packet Reflector using TCP/IP, allowing the Packet Reflector to run on the same computer, or a on different computer. A common configuration is to run the XBee Relay on a computer physically near the Wave Glider, with the packets delivered to an instance of WGMS over the Internet. The primary configuration task is to set up the connections between the XBee Relay and the Packet Reflector.

XBee Operation

The XBee system performs the following operations within WGMS.

1. Interfaces the USB (or serial version) of the Digi XBee-PRO modem (dongle) and serves as an XBee Coordinator for the purpose of communicating with Wave Gliders.
2. Automatically recruits Wave Gliders with the same PAN ID to the Coordinator's channel.
3. Implements an LRI level 3 protocol that can carry WGMS messages in place of the Iridium satellite network.
4. Implements the LRI WGMS Communication Channel specification, which enables it to communicate with a Packet Reflector and offer an alternative route for messages between WGMS and the set of Wave Gliders that are detected by the XBee Coordinator.
5. Implements communication console messages through the LRI Level 3 protocol and offers the ability to open a console window for each Wave Glider in range.
6. Decodes Level 2 messages received from WGMS or from the Wave Glider and displays them in a chat window.
7. The configuration of the XBee Relay is stored in the Windows registry; editors for the configuration are available though the XBee Relay GUI.

XBee Range

The XBee radio aboard the Vehicle is low power and short-range. The range of XBee is dependent upon weather and terrain, but generally is not dependable at distances greater than

100 meters. It is best suited for launch-ship communications, payload development, and land-based testing.

XBee Hardware and Software

XBee Hardware

To communicate with the Wave Glider XBee system, you will need to attach a transceiver to the computer that hosts the XBee Relay. The recommended hardware is:

Digi XBee-PRO 802.15.4 USB Adapter, internal wire antenna

Model # XA-A14-CE1P

Figure 3.1. XBee USB Adapter (Dongle)



This is available from Digi at their website, www.digi.com [http://www.digi.com]. It is also available from some electronics distributors.

Plug the transceiver into a USB port in your computer. Plugging in should power it up, indicated by a blinking green light on the end.

Hardware and Software Requirements

The configuration specified below has been tested with the XBee equipment described above in “XBee Hardware ” (page 26). Other configurations may work, but have not been tested.

- PC running Windows 7 or later.
- Microsoft .NET 3.5

- 100 MB of free disk space
- 2 GB of RAM
- XBee modem (Digi XBee USB Adapter S1 Pro)
- WGMS XBee Relay setup package
- Privileges to install software on the PC
- An Internet connection may be required

Installing the Device Driver

The device driver software is available on the Wave Glider documentation CD, or it can be download from the Digi website.

1. On the website, click: **Support** → **Drivers**
2. Go down in the list to select: **XBee / XBee Pro 802.15.4 Adapters**,
3. Click **Select this product**. A screen with download links for different operating systems will appear. In the **Drivers** list, look in the text under **XBIB-U / PKG-U USB Drivers for Windows 98 SE - XP** - there is a hot link for Windows 7 and Vista drivers - click on **can be found here**.
4. Download the ZIP file to your computer. A special directory for the files (e.g., "Digi Driver") is recommended.
5. Extract All content from the ZIP file to the directory.
6. Open the README.TXT file and follow the instructions for installing the software on your computer.

The key configuration parameters are:

Baud Rate: **115,200 bps**

Data Bits: **8**

Stop Bits: **1** (or 2)

Parity: **None**



Note

If necessary, use the Digi diagnostics software X-CTU to detect and configure the modem.

Firmware Updates

If there are problems establishing communications, it may be necessary to update the firmware on the XBee modem. The key parameters for updating are:

Modem Type: **XB24**

Function Set: **XBee PRO 802.15.4**

Establishing Communications

Communication is established by first turning on the Digi transceiver and starting up the XBee Relay. Next, from the WGMS dashboard, turn on the Wave Glider XBee power.



Note

You must power up the Digi transceiver before starting up XBee on the Wave Glider.

The Wave Glider XBee transceiver starts up when the Vehicle is powered up. The typical procedure is to connect the Digi transceiver and then power up the Wave Glider.



Note

The Iridium link can also be used to switch the XBee On or Off. If the Digi transceiver was turned On after the Wave Glider was power up, use the Dashboard control to first turn Off the XBee transceiver, then turn it back On.

You can also cycle power on the Wave Glider Off, then back On. Note that when doing this, wait about 10 seconds after turning the power Off, before turning the Vehicle On again.

XBee Installation

Installation Instructions

The XBee installation files are on the LRI documentation CD. The procedure is as follows:

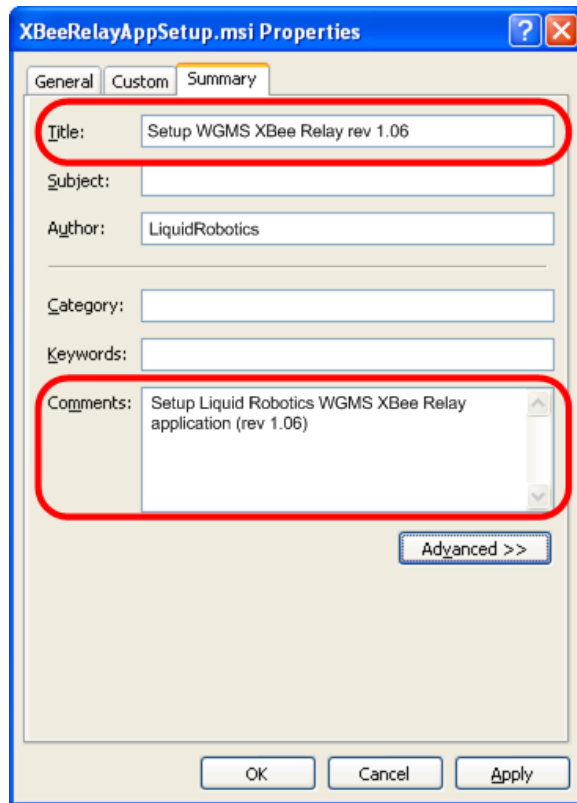
1. Copy the installation files into an accessible directory. The installation files consist of:

SETUP.EXE

XBeeRelayAppSetup.msi

To verify the software revision number, right click on the **XBeeRelayAppSetup.msi** name and select **Properties** from the pop-up menu, then examine the output on the **Summary** tab.

Figure 3.2. XBeeRelayAppSetup.msi Properties



The revision number should be indicated in the **Title** box.

Check the **Comments** box for any notes that may be relevant to your revision.

Click **OK** to exit.

2. Run SETUP.EXE from the directory where the file was placed.

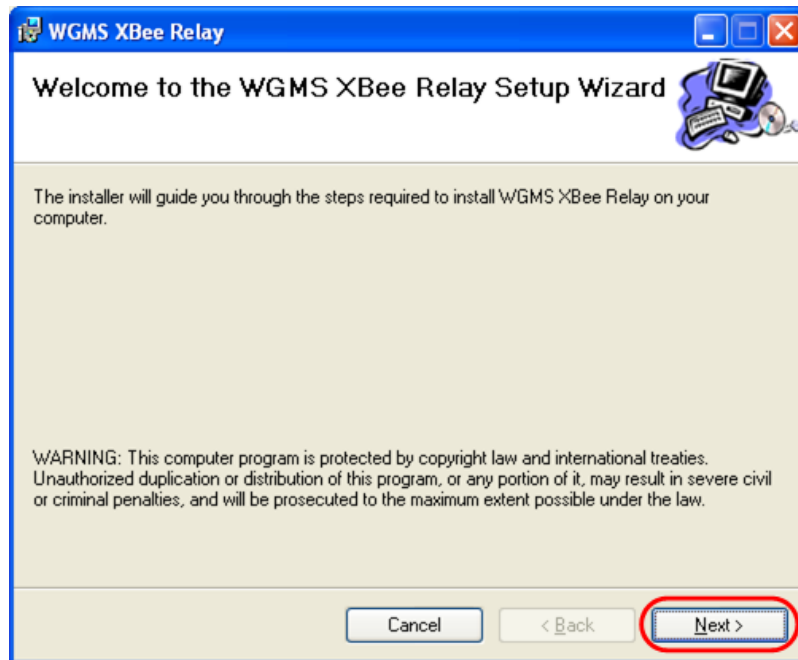


Note

If another version of the software is already installed, you will be prompted to remove it using **Control Panel** → **Add or Remove Programs**.

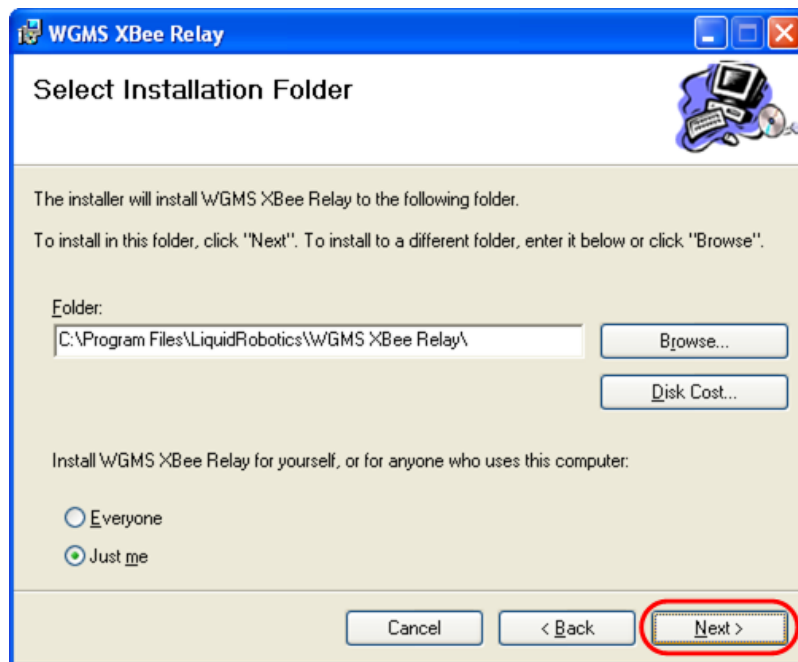
Running SETUP.EXE should bring up the "Welcome" dialog box.

Figure 3.3. XBee Installation Welcome Dialog Box



3. Click **NEXT** on the Welcome dialog box and the **Select Installation Folder** dialog box will appear:

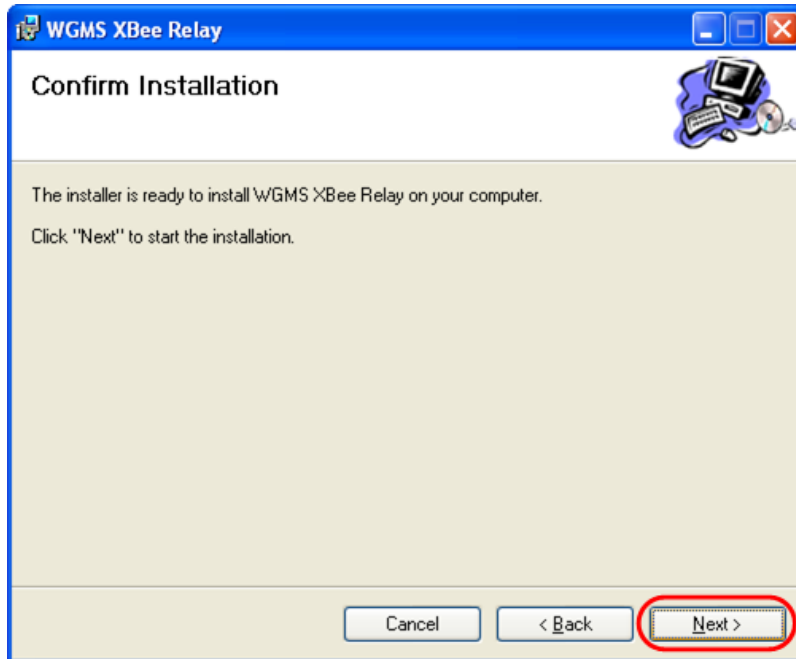
Figure 3.4. XBee Installation Folder Selection Dialog Box



4. Check the installation location and make any changes if needed. Check the radio button at the bottom. In most cases, leave **Just me** selected. Then click the **NEXT** button.

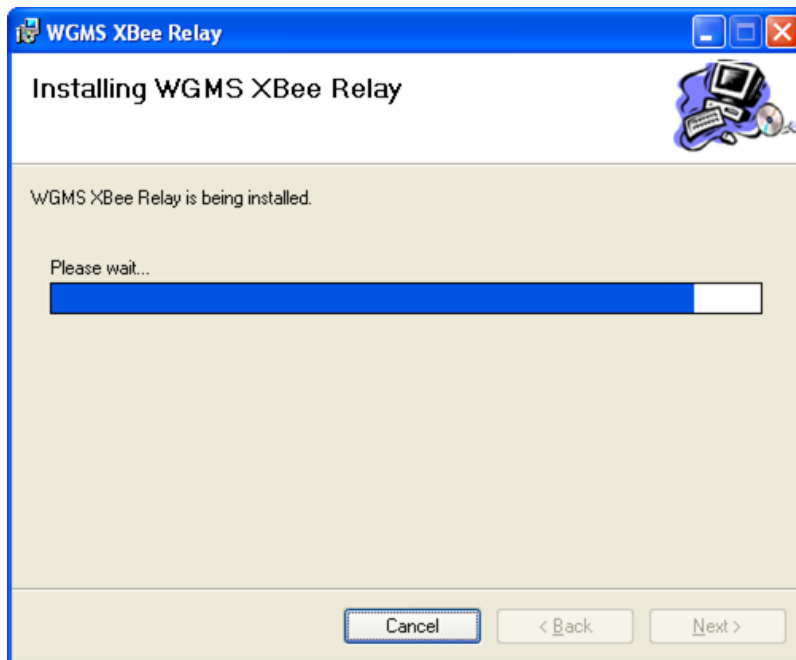
5. A **Confirm Installation** dialog box will appear. Confirm that you want to start the installation by clicking the **NEXT** button.

Figure 3.5. XBee Installation Confirmation Dialog Box



While the program is installing, you will see a progress indicator.

Figure 3.6. XBee Installation Progress Indicator



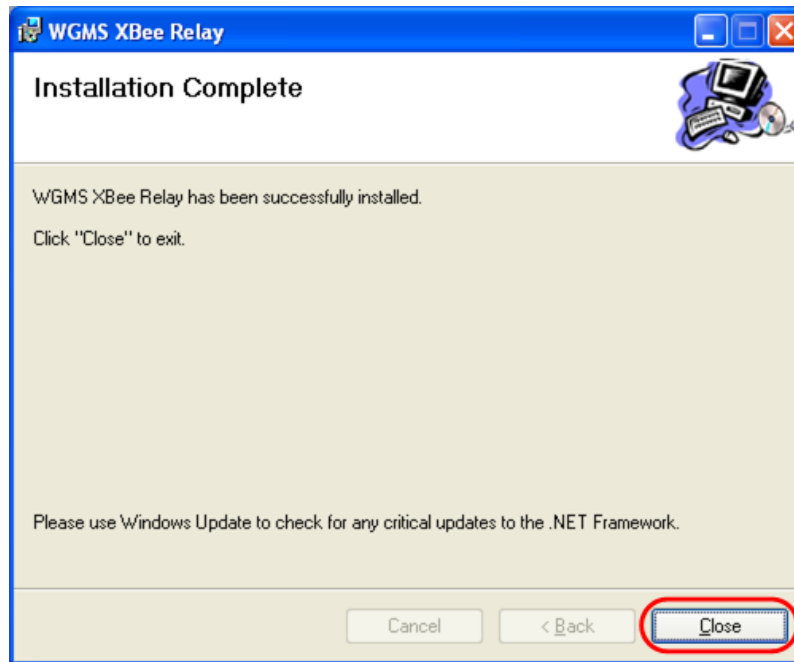


Note

During installation, you may be prompted to install the Microsoft .NET 3.5 Framework.

- When the installation is complete the **Installation Complete** dialog box will appear.

Figure 3.7. XBee Installation Complete Dialog Box



Click the **CLOSE** button to dismiss the box.

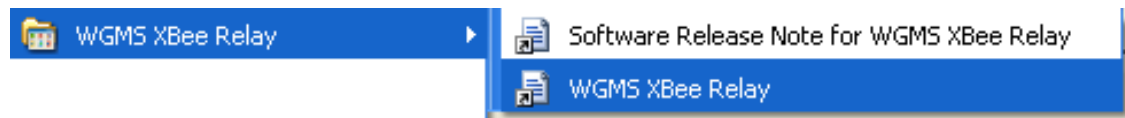
When the installation is completed, start the XBee Relay by clicking on the XBee Relay icon on the screen:

Figure 3.8. XBee Relay Start Icon



If there is no icon on the screen, you can start by clicking the **START** button, then using **Programs → WGMS XBee Relay → WGMSXBee Relay**.

Figure 3.9. XBee Relay Configuration Start



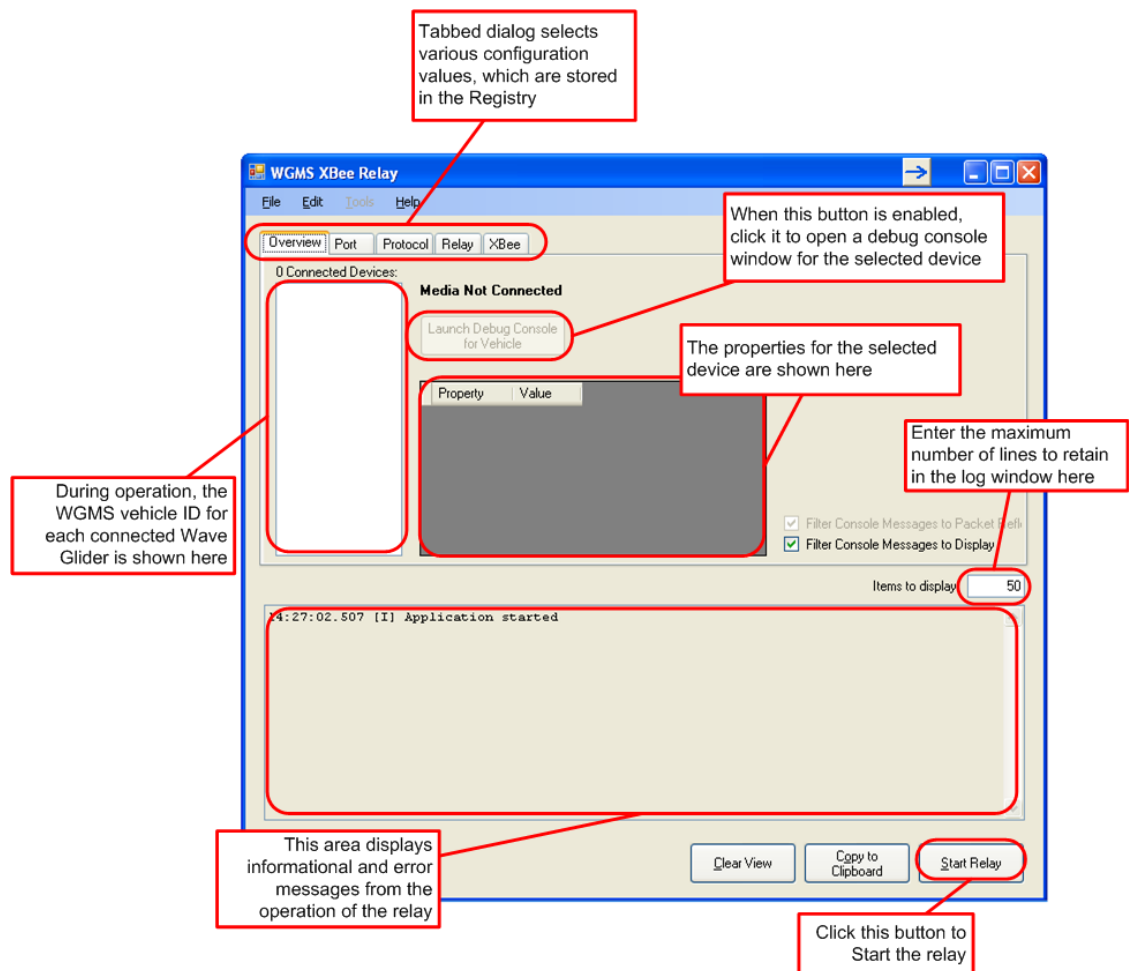
It is a good idea to review the *XBee Software Release Note* prior to configuring the XBee software.

XBee Software Configuration

XBee Start-Up Dialog Box

1. After clicking on the WGMS XBee Relay icon (or one of the other options for launching the program), the start-up dialog box will appear.

Figure 3.10. XBee Relay Start-Up Dialog Box (Annotated)



2. Ensure that the XBee modem (the Digi XBee USB Adapter) is connected, and take note of which serial port is used.

 Note

If necessary, use the Digi diagnostics software **X-CTU** to detect and configure the modem. (This is available from Digi at <http://www.digi.com>)

Setting Port and Network Configurations

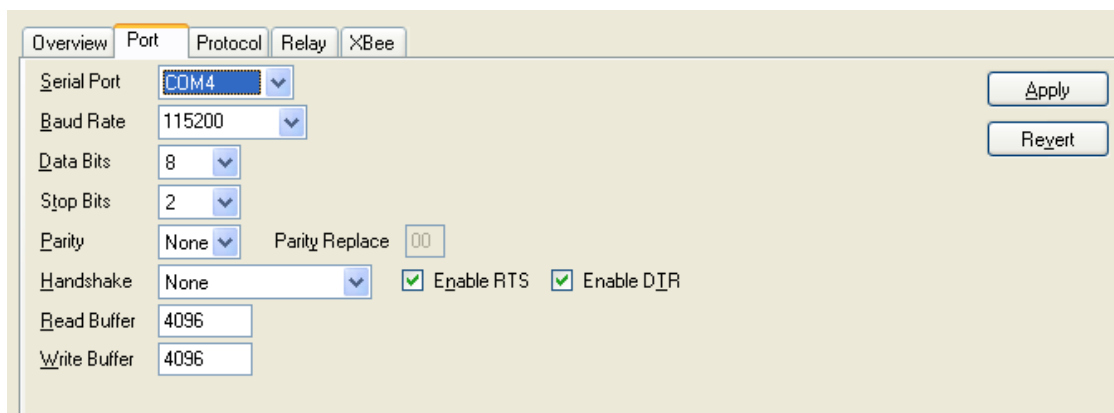
Configure the Relay and XBee network settings before starting the relay:

1. Click the **Port** tab and verify that the correct **Serial Port** is selected (i.e. the one provided by the Digi modem). Only the detected serial ports are listed in the drop-down menu. Click **Apply** to save any changes made.

 Note

The **Revert** button returns the settings to the values they had when you clicked on the **Port** tab; it does not reset them to the default installation values.

Figure 3.11. XBee Port Selection Tab



The screenshot shows a configuration window with five tabs: Overview, Port, Protocol, Relay, and XBee. The 'Port' tab is selected and highlighted. The 'Serial Port' dropdown menu is set to 'COM4'. Other settings include 'Baud Rate' at 115200, 'Data Bits' at 8, 'Stop Bits' at 2, 'Parity' at None, and 'Parity Replace' at 00. The 'Handshake' dropdown is set to None. There are checkboxes for 'Enable RTS' and 'Enable DTR', both of which are checked. The 'Read Buffer' and 'Write Buffer' are both set to 4096. On the right side of the 'Port' tab, there are two buttons: 'Apply' and 'Revert'.

2. Click the **XBee** tab (as shown in Figure 3.11) and verify that the **PAN ID** is correct.

 Note

For hexadecimal numbers, be sure to add the “0x” at the beginning of the number. For example, use 0x5000 to indicate hexadecimal 5000 (20480 decimal).

By default, the modem scans for the clearest channel and uses that. If desired, a specific communication channel can be forced by un-checking the **Scan for Clear Channel** check box. Then specify one of the available channels in the **Fixed Channel** box.

Figure 3.12. XBee Parameter Selection Tab

The screenshot shows the 'XBee' tab selected in the WGMS interface. The 'Scan for Clear Channel' checkbox is checked. The 'Fixed Channel' is set to 12. The 'PAN ID' is 0x5000. The 'Modem Prompt Timeout' is 00:00:02.000. The 'Modem Response Timeout' is 00:00:03.000. The 'Scan Timeout' is 00:01:00.000. The 'Coordinator Restart Timeout' is 00:00:05.000. The 'Configuration Timeout' is 00:00:01.000. There are 'Apply' and 'Revert' buttons on the right.

3. Click **Apply** to save any changes.
4. Click the **Relay** tab to enter the address and port values for the Packet Reflector and the Relay.
 - For the **Relay Address**, click **Suggest Relay IP** to show the first IP Address available on the Relay computer.
 - For the **Packet Reflector Address**, use the **IP Address** and **IP Port** provided separately by Liquid Robotics or by your IT staff. Note that if the IP Port numbers are the same, the IP Addresses must be different.

Figure 3.13. Packet Reflector and Relay Address Selection

The screenshot shows the 'Relay' tab selected in the WGMS interface. The 'Packet Reflector Address' section has 'IP Address' 127.0.0.1, 'IP Port' 0, and 'Protocol' TCP. The 'Relay Address' section has 'IP Address' 10.10.1.172, 'IP Port' 6000, and 'Protocol' TCP. There are 'Apply' and 'Revert' buttons on the right. Below the 'Relay Address' section, there is a checkbox for 'Show Port Communications' and buttons for 'Suggest Relay IP' and 'Set Loopback Addresses'.

5. Click the **Apply** button to save any changes made.

Starting the Relay

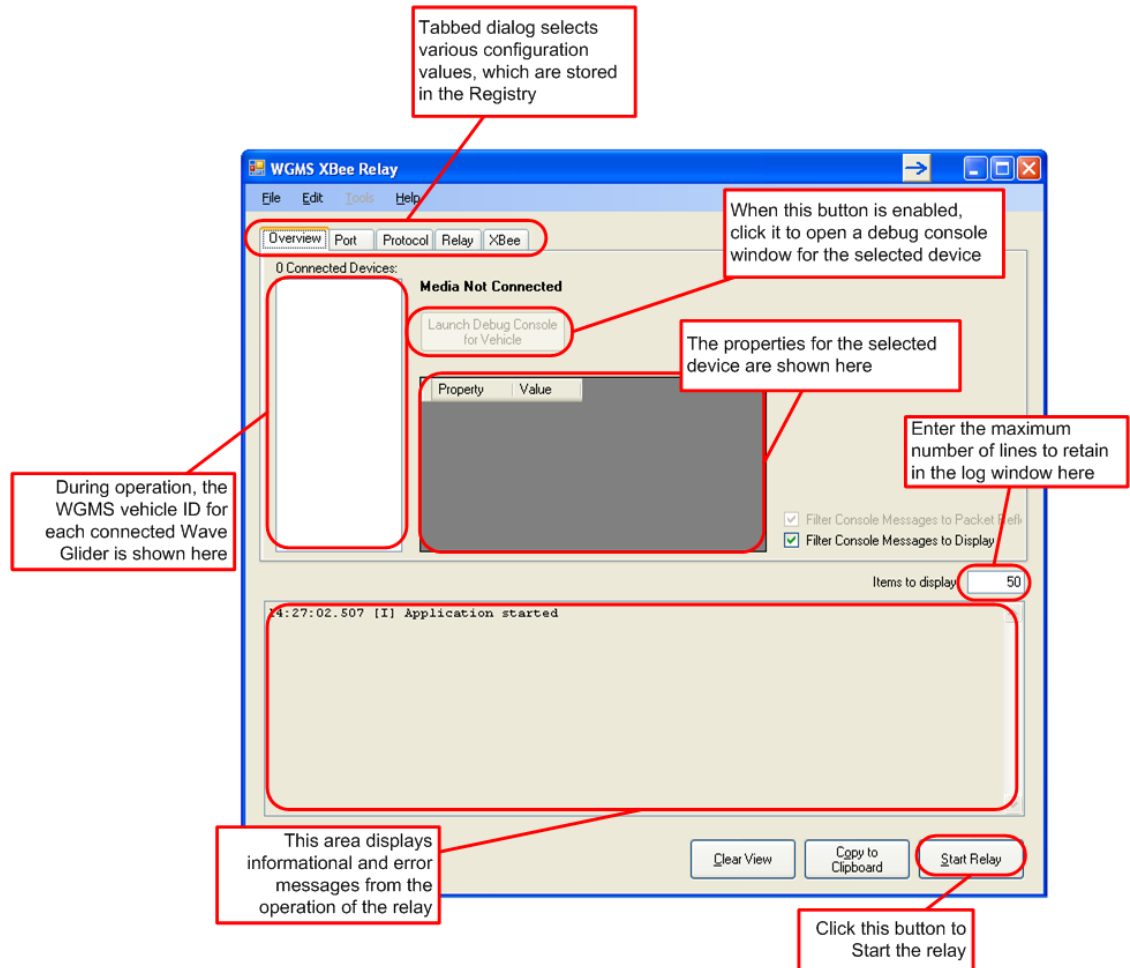
Once the port and network configurations have been set, you can start the Relay.

1. Click the **Start Relay** button in the lower right corner of the WGMS XBee Relay dialog box, see [Figure 3.14](#).

Configuring an XBee Relay (SV2 Only)

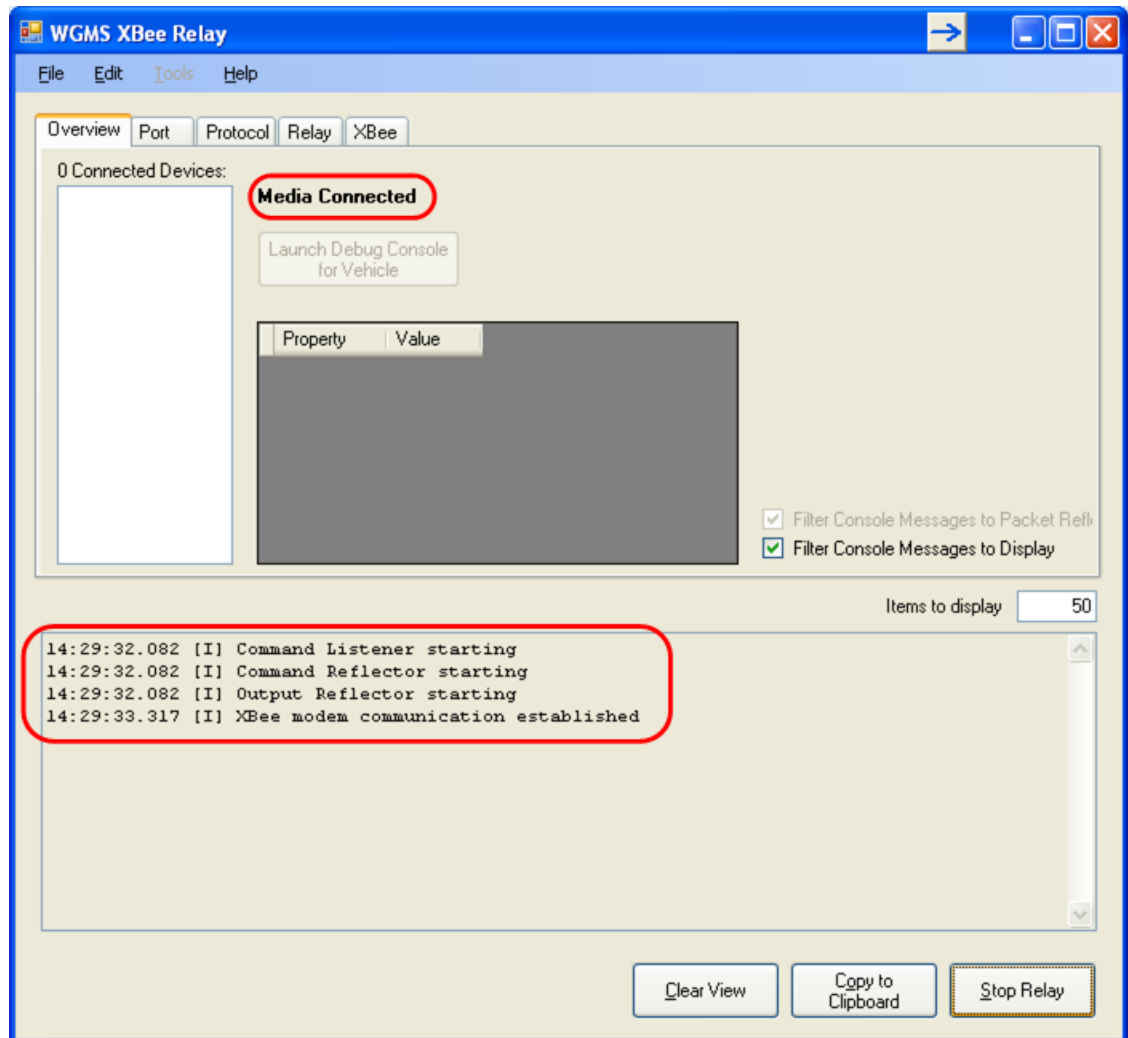
Some configuration values are grayed out during execution. The log display shows events as they occur with a time stamp.

Figure 3.14. Start Relay Button and Log Display



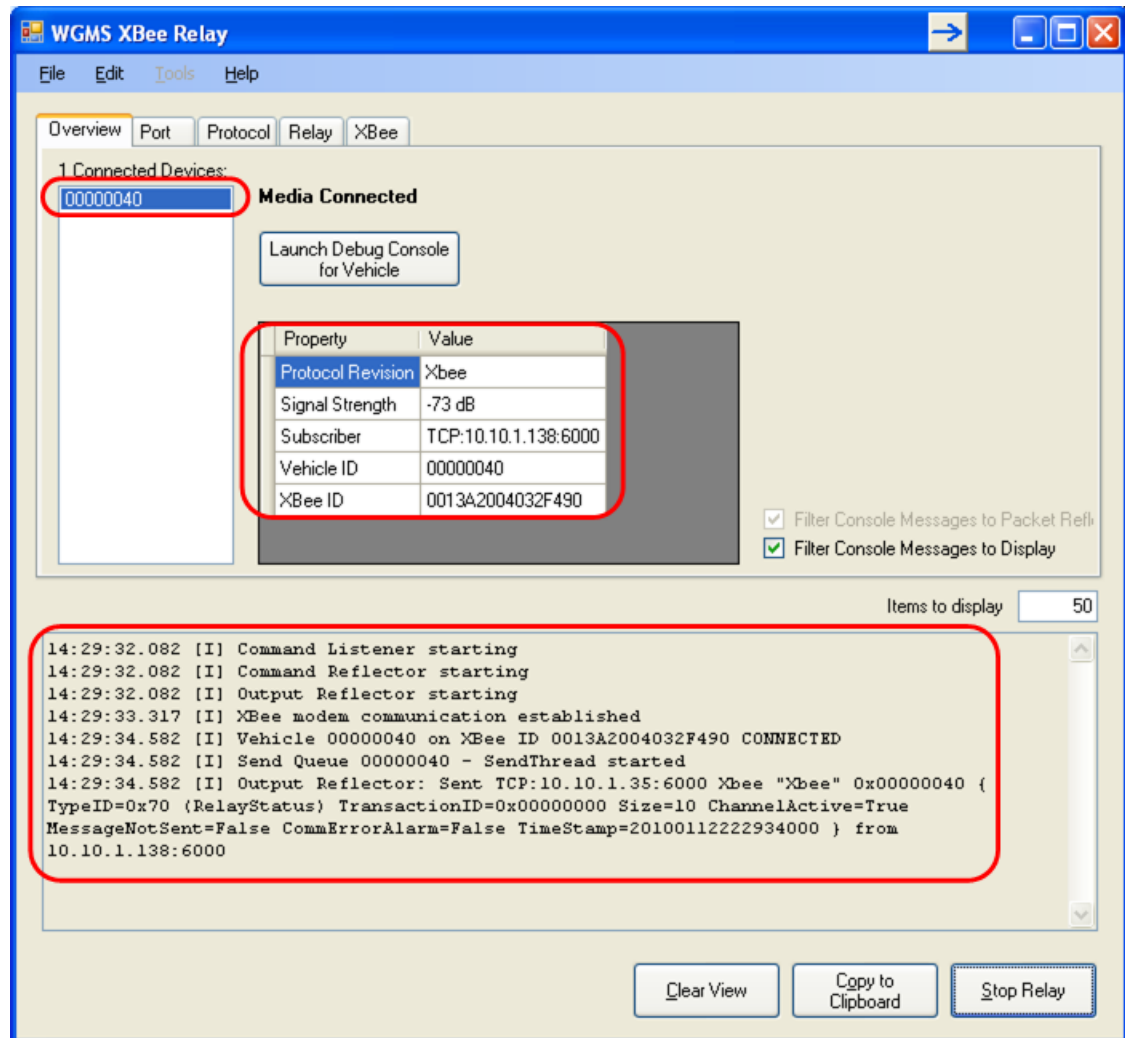
When communication has been established with the modem, the bold indicator field changes from **Media Not Connected** to **Media Connected** and the log shows XBee modem communication established as shown in [Figure 3.15](#) below.

Figure 3.15. Start Relay Media Connected



Any vehicles with active XBee modems and that are in range will connect automatically and appear in the **Connected Devices** list. Details of any selected device are shown in the adjacent **Property | Value** box.

Figure 3.16. XBee Connection Established



The Output Reflector: Sent ... line in the log display indicates successful transmission to the Packet Reflector. If the notification reads Added TCP . . . instead of Sent TCP . . . , the relay was not able to send information to the Packet Reflector.

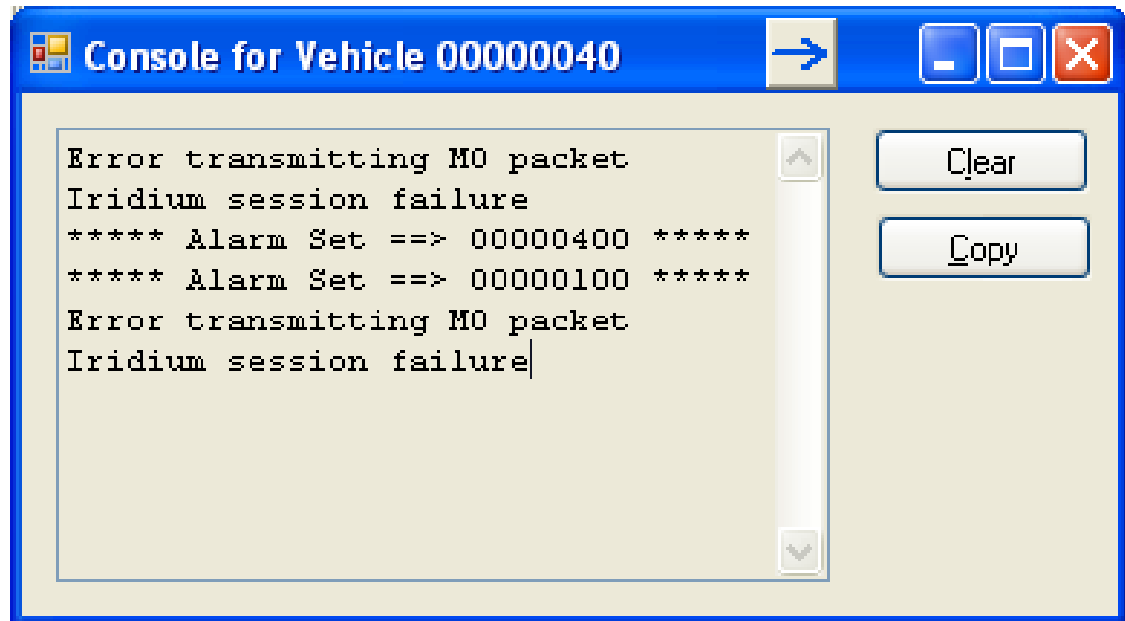


Note

Telemetry is not sent using XBee by default. However, you can issue a WGMS command to set XBee as the default communications channel.

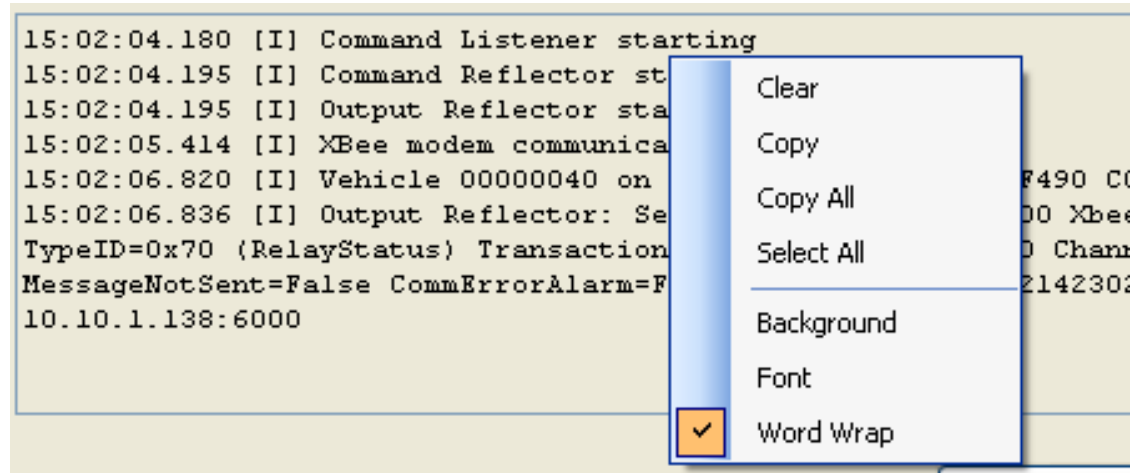
2. To communicate with the Wave Glider's command line console, select a connected device in the **Connected Devices** list and click on **Launch Debug Console for Vehicle**. This will bring up the small **Console for Vehicle...** window:

Figure 3.17. Console for Vehicle Window



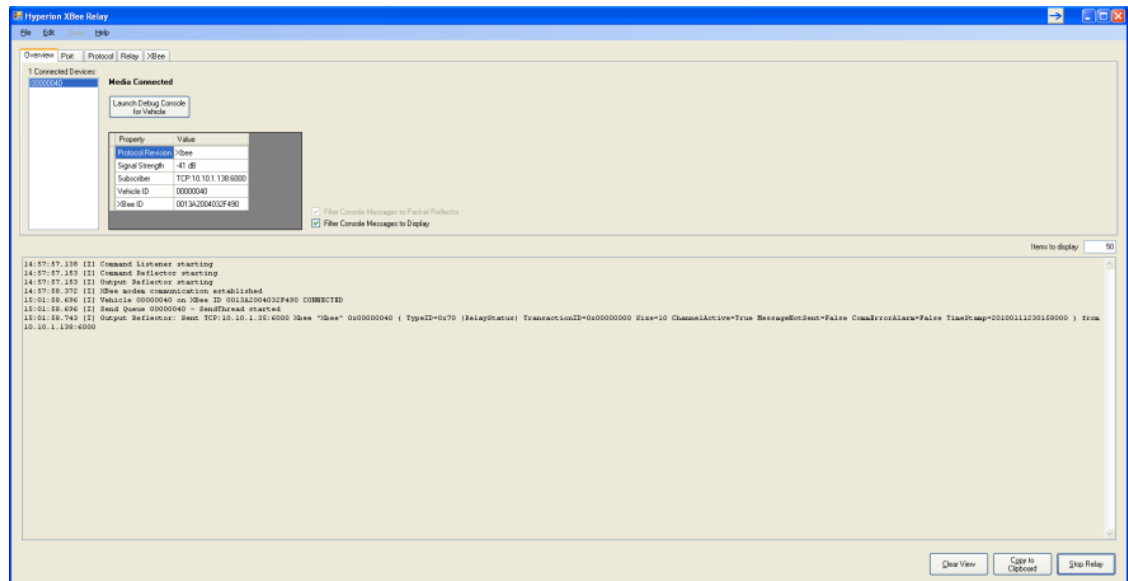
Right click on the window to display a menu of useful functions:

Figure 3.18. Display Window Function Set



Note also that the application window can be resized to take best advantage of the user's screen size:

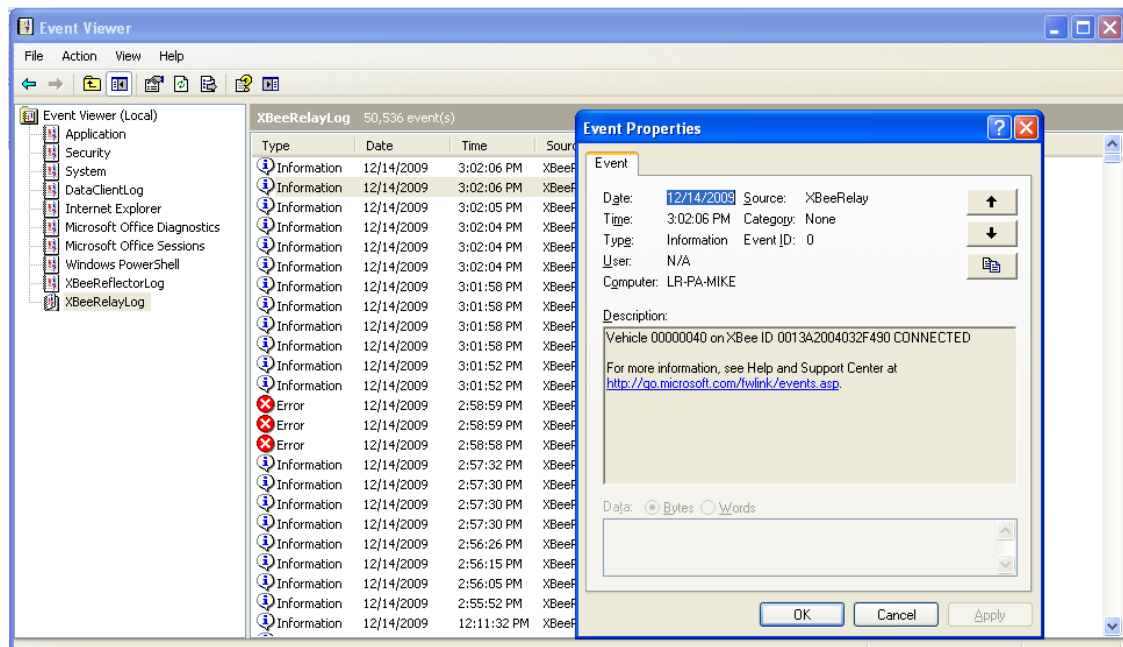
Figure 3.19. Re-Sized Relay Application Form



Saved Events

Events are saved in the system event log under **XBeeRelayLog**, and can be viewed using the Windows Event Viewer applet, which is accessed from the Administrative Tools folder in the Windows Control Panel:

Figure 3.20. Viewing Saved System Events



Using XBee with Hosted WGMS

This procedure describes how to allow communication between XBee and the LRI-hosted WGMS service using a VPN connection.

Required Materials

You will need:

- A zip file containing your assigned VPN Certificate and config file (from Liquid Robotics)
- VPN account information (from Liquid Robotics)
- IP and port assignments for the Xbee Relay (from Liquid Robotics)
- Liquid Robotics WGMS Administrators Guide (from Liquid Robotics)
- Xbee Relay software installed and talking to a vehicle

You will need to install and configure one of the following VPNs depending on which IP address and port Liquid Robotics assigns to you:

- If you are assigned IP address/port **10.20.16.0/24**, you need to install and configure the **Enterprise Customer VPN Service** (OpenVPN Access Server 2.0.10) available at: <https://64.75.5.32/>

See “[Setting Up Enterprise Customer VPN Service](#)” (page 41) for more information.

- If you are assigned IP address/port **10.20.40.0/24**, you need to install and configure the **Classic VPN Service** (OpenVPN 2.1_rc11) available at: <http://swupdate.openvpn.net/community/releases/openvpn-2.1.4-install.exe>

See “[Setting Up Classic VPN Service](#)” (page 45) for more information.

Setting Up Enterprise Customer VPN Service

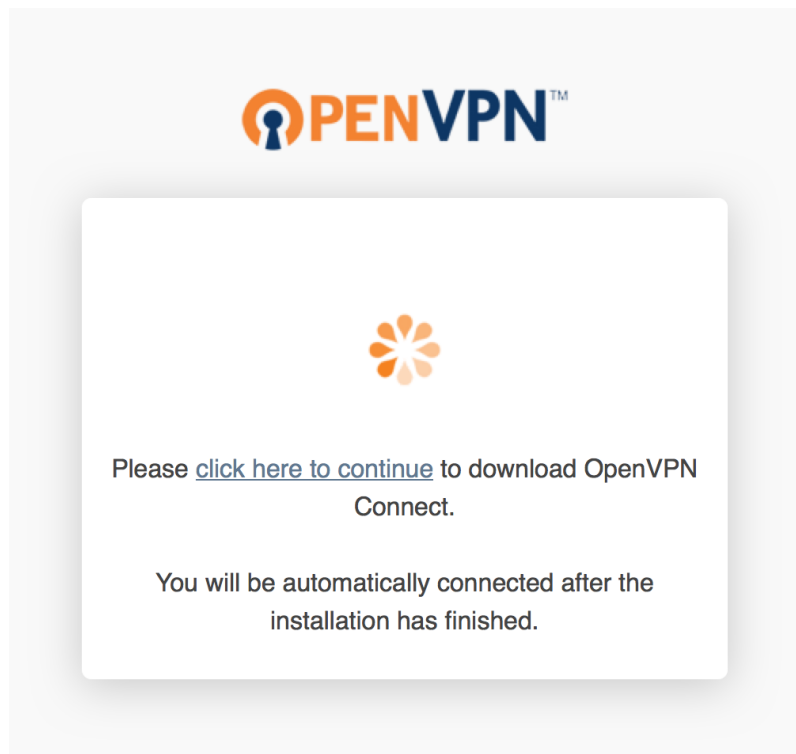
Initial Connection and Client Download:

1. Using a web browser connect to <https://64.75.5.32/> (OpenVPN Access Server 2.0.10).
2. A login page will appear:



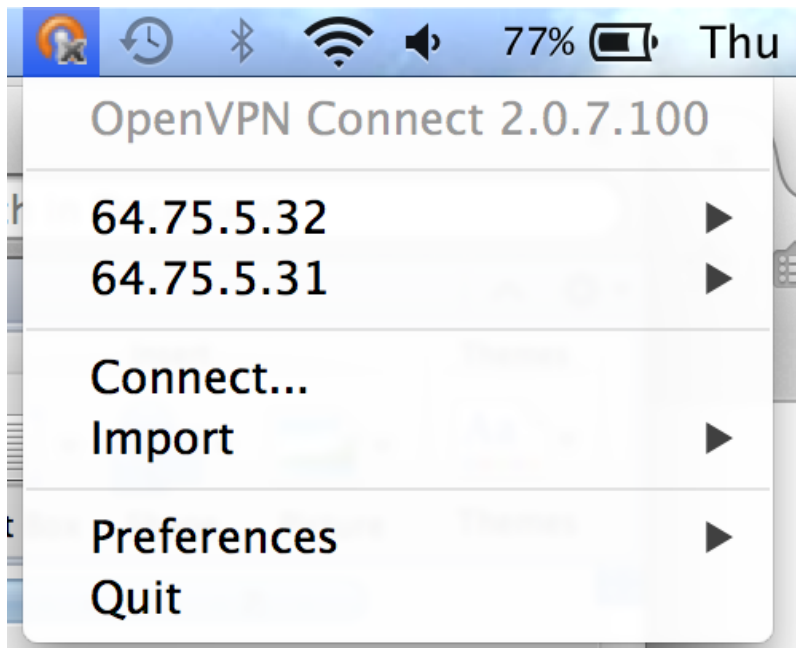
The image shows the OpenVPN login interface. At the top is the OpenVPN logo, which consists of a blue keyhole icon followed by the text "OPENVPN" in blue. Below the logo is a white rectangular box containing the login fields. Inside this box, there is a label "Username" above a text input field, and a label "Password" above another text input field. At the bottom right of the box are two buttons: a grey button labeled "Connect" with a small dropdown arrow, and a blue button labeled "Go".

3. Log in to the VPN server using the login information provided by LRI.
4. After logging in you will be prompted for a download:

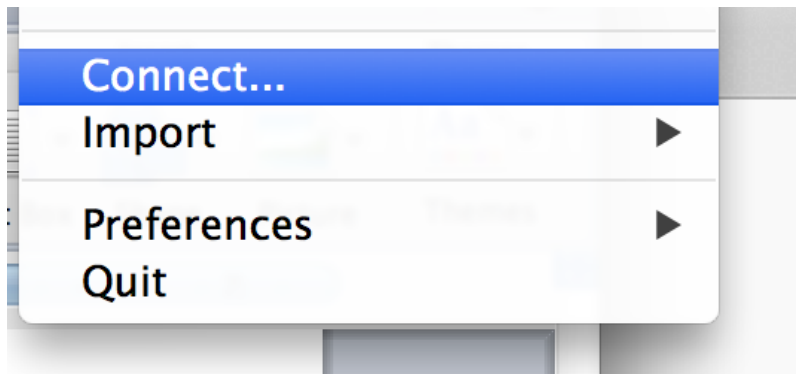


5. Follow the instructions to download and install the VPN client.

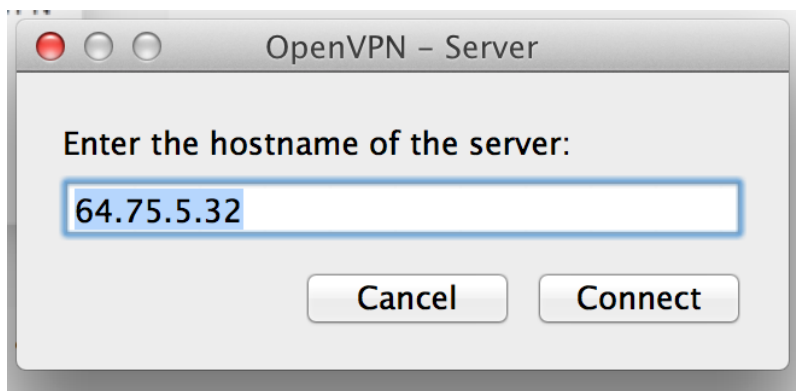
6. Once the client is installed you will be automatically logged in. If you are not automatically logged in, launch the client:



7. Click Connect:



8. Put in the IP 64.75.5.32



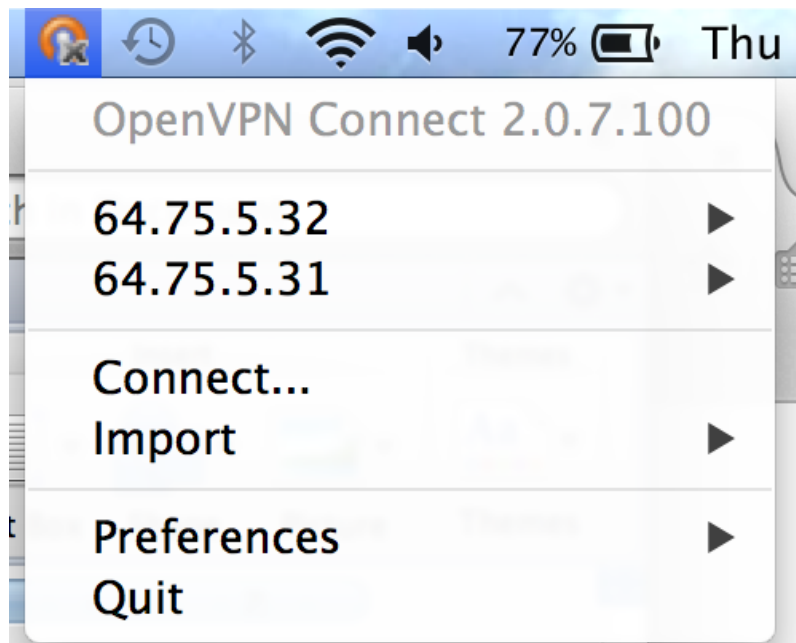
9. Click Connect:



10. When prompted for the UNVERIFIED profile, check **Don't ask again**, and click **Yes**. This will add your login profile to the client.
11. At this point you must completely disable your host (windows) firewall. In order for the XBee relay to work correctly the Windows firewall must be completely off.
12. You should now be connected and able to access the XBee Relay on the ports provided.

To Reconnect or Open a New Session:

1. Open the VPN Client:



2. Select **64.75.5.32**
3. Click **Connect As <Login Name>** to connect to the VPN.
4. At this point you must completely disable your windows firewall to establish bidirectional communication with the XBee Relay and XBee Reflector.

Setting Up Classic VPN Service

1. Using a web browser, connect to: <http://swupdate.openvpn.net/community/releases/openvpn-2.1.4-install.exe>. Download and install the Classic VPN Service (OpenVPN 2.1_rc11).
2. Extract the zip file containing the appropriate certificates and config file to the OpenVPN directory. If you used the default directory, it will be in one of two places.
 - 64-bit Windows – C:\Program Files (x86)\OpenVPN\, or
 - 32-bit Windows – C:\Program Files\OpenVPN\
3. From the Windows Control Panel rename the installed network adapter to **TAP-Bridge**.
 - Windows 7: Start → Control Panel → Network and Internet → Network and Sharing Center → Click on “Change Adapter Settings” in the left column
4. Locate the connection with the device name **TAP-Win32 Adapter V9**. (If you cannot find this device name or the device name is different, make sure that you have installed the correct version of OpenVPN.)
5. Right click on that connection, select Rename, and rename it to **TAP-Bridge** (case-sensitive).



Note

If this adapter has the wrong name, the connection will fail. (If OpenVPN is being run in Windows Vista or Windows 7, it needs to be run as Administrator in order to update the routing tables when it connects.)

6. Go to **Start → Programs → OpenVPN → OpenVPN GUI**.
7. Right click on **OpenVPN GUI** and select Properties.
8. Click on the **Compatibility** tab in the **Properties** dialog.
9. Check the **Run this program as an Administrator** box.
10. Click **OK** to accept the changes.

Configuring the XBee Relay

1. Open the Xbee Relay and go to the **Relay** tab.
2. Enter the Packet Reflector Address provided by LRI:
 - IP Address: 10.20.1.41

- IP Port: <provided>
3. Enter the Relay Address provided by LRI:
 - IP Address: <IP of the VPN connection, provided>
 - IP Port: <provided>

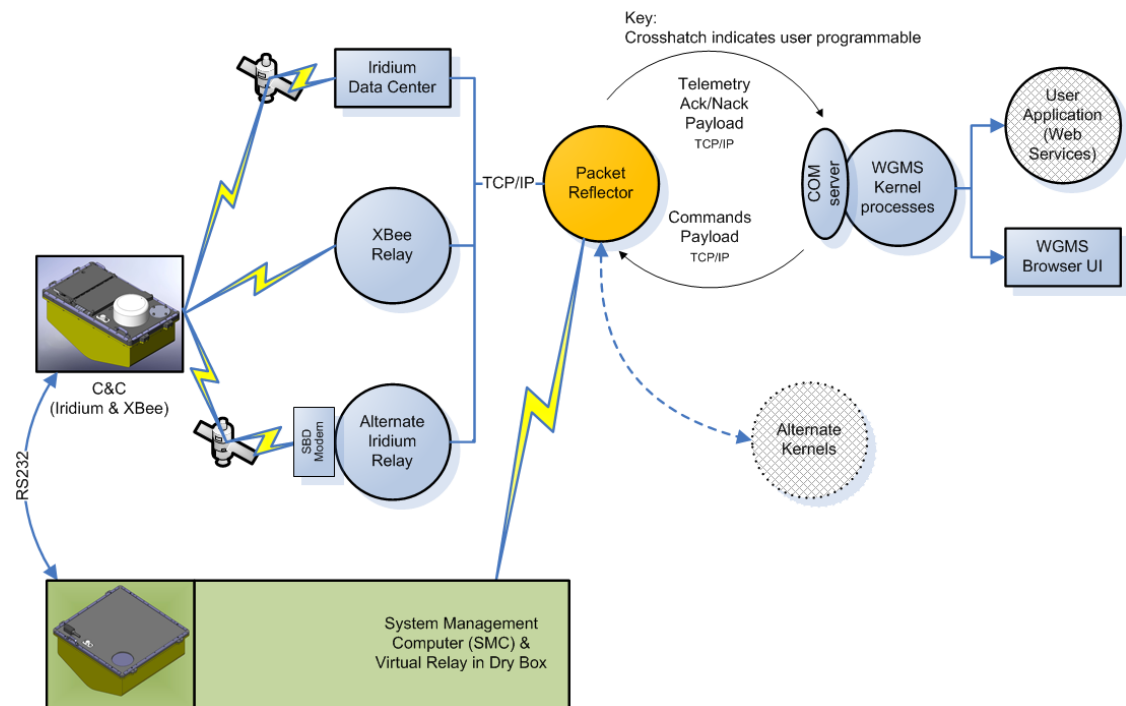
Operation and Verification of IP Address

1. Launch the OpenVPN GUI (**Start** → **Programs** → **OpenVPN** → **OpenVPN GUI**).
2. When the OpenVPN GUI is running, there is an icon in the notification area/systray that looks like two red computer screens. Right click on the icon and select **Connect**.
3. When prompted, enter the username and password provided to you for the Relay VPN.
4. Once connected, the interface will disappear and a notification bubble will pop up letting you know what your IP Address is.
5. Verify that this IP address is the same as the one provided to you by Liquid Robotics. If the VPN address is not the same, contact Liquid Robotics customer support for assistance.

Chapter 4. Configuring the Packet Reflector

The WGMS Packet Reflector is a software based TCP/IP bidirectional router that transfers output data packets between Wave Gliders and WGMS and transmits command packets from WGMS to the Wave Gliders.

Figure 4.1. Data Transfer Overview



Home Screen

The WGMS Packet Reflector [Home Screen](#) includes:

- **Windows Menu Bar**

The Windows menu bar includes **File**, **Edit**, **Tools**, and **Help** menus containing typical options. (Note: The **Customize** option in the **Tools** menu is not supported.)

The **File** menu includes several packet reflector configuration file management options:

- Click **Open** to open a packet reflector configuration file stored on your system.
- Click **Retrieve from WGMS** to retrieve a packet reflector configuration file saved in WGMS.
- Click **Save To File** or **Save To File As** to save a packet reflector configuration file on your system.

- Click **Save To WGMS** to save a packet reflector configuration file in WGMS.

- **Configuration Window associated with 8 Configuration Tabs**

When you click on the **Output Sinks**, **Output Sources**, **Command Sinks**, **Command Sources**, **Configuration Sinks**, **Configuration Sources**, **Settings**, and **Performance** tabs, related configuration fields and settings are displayed below in the Configuration Window. Instructions on using each of the eight configuration tabs are contained in the following chapters:

- [“Configuring Output Sinks” \(page 50\)](#)
- [“Configuring Output Sources” \(page 67\)](#)
- [“Configuring Command Sinks” \(page 70\)](#)
- [“Configuring Command Sources” \(page 86\)](#)
- [“Configuration Sinks” \(page 103\)](#)
- [“Configuration Sources” \(page 103\)](#)
- [“Settings” \(page 103\)](#)
- [“Performance” \(page 105\)](#)

- **Log Window with associated Display Settings**

The log window displays events and performance data that is optionally stored in the Windows system events log under: Control Panel\All Control Panel Items \Administrative Tools -> Computer Management (Local) -> Event Viewer -> Applications and Services Logs -> ReflectorLog. There are 4 display settings associated with the log window:

- **Log Events** check-box

This setting is selected by default to log events to the Windows system events log. If you do not want to log events, deselect this setting.

- **Filter Sink to Source** check-box

This setting is selected by default to prevent incoming command packets from being reflected back to the same IP address subscriber. **For a single computer configuration, this setting should be deselected.**

- **Display Performance Data** check-box

This setting is selected by default to display performance data in the **Performance** tab. If you do not want to display performance data, deselect this setting.

- **Items to display** field

The default setting is 50. The minimum setting is 50 items and the maximum setting is 5000 items. The log window expands when you expand the Packet Reflector home screen. You can also scroll within the Log window to see events and data that have been recorded.

- **Global Enables Window**

The global enables window includes 6 global packet reflector settings:

- **Listen to Output Sources**

This setting is selected by default to listen to output sources. If you deselect this setting, no output sources packets will flow to the packet reflector.

- **Send to Output Sinks**

This setting is selected by default to send output sources packets to the output sinks. If you deselect this setting, no output sources packets will flow to the output sinks. Instead, they will accumulate in the packet reflector and eventually trigger a FIFO buffer overflow.

- **Listen to Command Sources**

This setting is selected by default to listen to command sources. If you deselect this setting, no command sources packets will flow to the packet reflector.

- **Send to Command Sinks**

This setting is selected by default to send command sources packets to the command sinks. If you deselect this setting, no command sources packets will flow to the command sinks. Instead, they will accumulate in the packet reflector and eventually trigger a FIFO buffer overflow.

- **Listen to Configuration Sources**

This check-box is selected by default, but is not relevant to current Wave Glider models. You can ignore it. Also, the Configuration Sources tab is not used with current Wave Glider models. Do not make any configuration settings under this tab.

- **Send Configuration Sinks**

This check-box is selected by default, but is not relevant to current Wave Glider models. You can ignore it. Also, the Configuration Sinks tab is not used with current Wave Glider models. Do not make any configuration settings under this tab.

- **Failover Settings Window**

The failover settings window includes **Master Mode** and **Slave Mode** radio buttons with corresponding **IP Addr** and **Port** fields. These settings must be configured as follows:

- **Slave Mode** must be selected.
 - **IP Addr** must be set to localhost
 - **Port** must be set to 10101



Warning

The GUI will allow you to enter different settings, but they will not be functional. If you do not use the above stated settings, unpredictable results could occur.

- **Start Service/Stop Service Toggle Button**

When the packet reflector service is running this button will be in the Stop Service mode. If you click on Stop Service, the packet reflector service will stop and the button will revert to the Start Service mode. If you click on the button when it is in Start Service mode, the packet reflector service will resume.

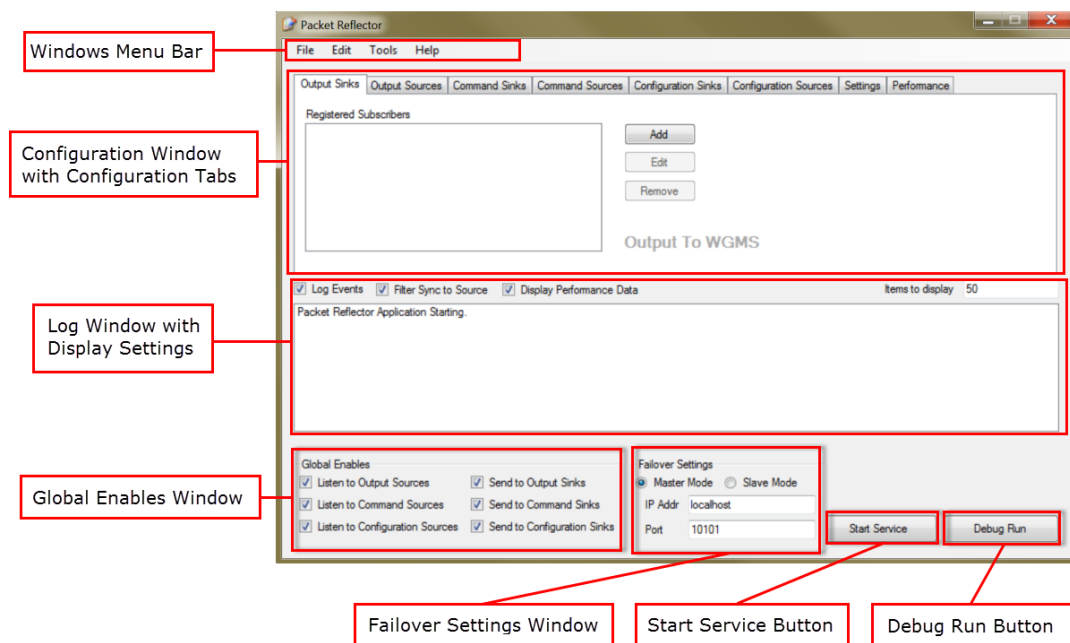
- **Debug Run/Debug Stop Toggle Button**

The Debug Run/Debug Stop toggle button is for LRI internal use only.

Warning

If you click on this button unpredictable results could occur. If you accidentally click on Debug Run, promptly clicking on Debug Stop should return the packet reflector to a predictable state.

Figure 4.2. Home Screen



Configuring Output Sinks

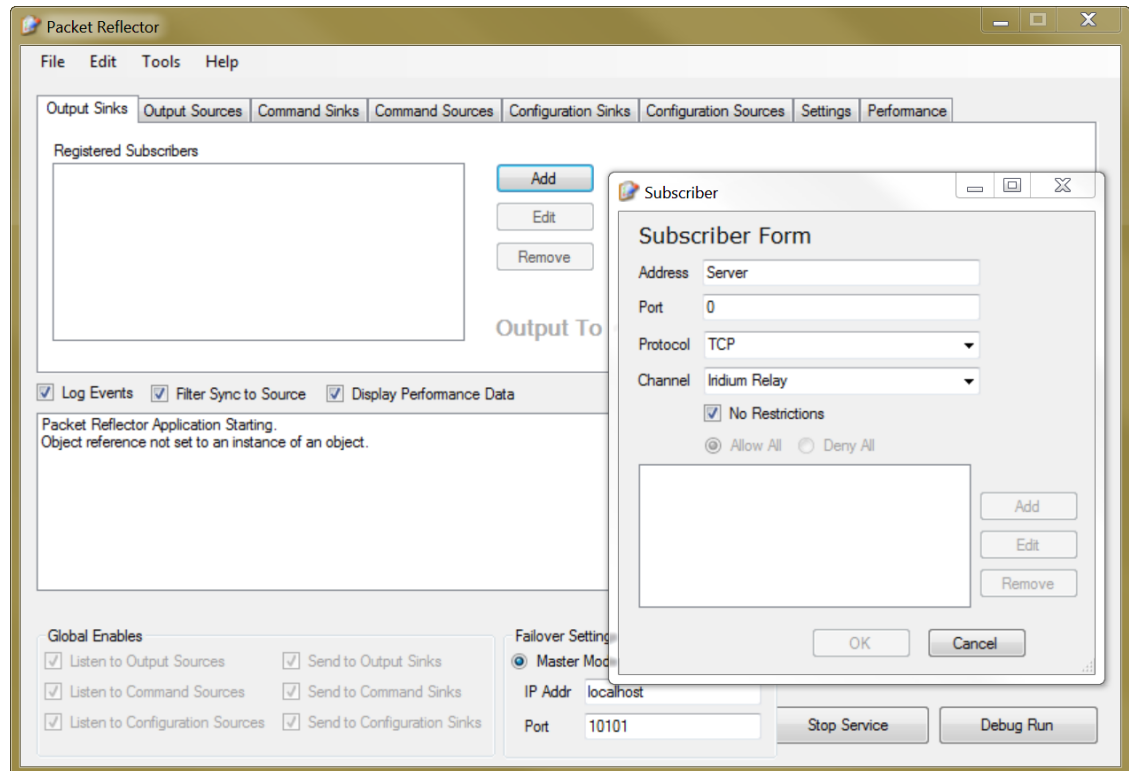
Packet reflector output sinks are subscribers registered to receive Wave Glider data packets from packet reflector output sources. When you click on the **Output Sinks** tab, the **Registered Subscribers** list appears in the configuration window. Registered subscribers can be added, edited, or removed.

Adding Registered Subscribers

To add a registered subscriber:

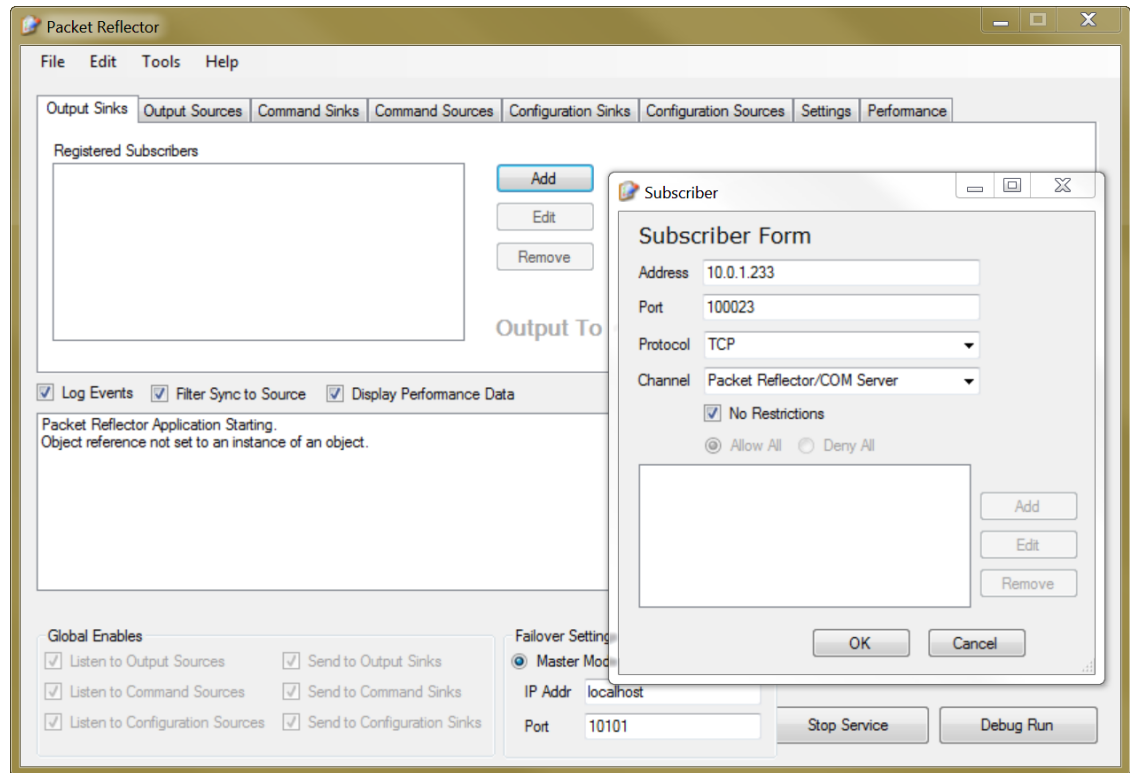
1. Click **Add** and the Subscriber Form will appear.

Figure 4.3. Adding a Registered Subscriber



2. Enter the **Address** (IP address or Fully Qualified Domain Name) of the subscriber.
3. Enter the **Port** used to access the subscriber.
4. Select the data transmission protocol (TCP or UDP) to be used from the **Protocol** drop-down menu. TCP is the default protocol setting and it is recommended.
5. Select the data transmission channel to be used from the **Channel** drop-down menu. There are 7 preconfigured options and 4 custom options, however, only the Packet Reflector/COM Server data transmission channel is supported with output sink subscribers. You must select the **Packet Reflector/COM** Server option.
6. The **No Restrictions** check-box is selected by default. If you do not want to set any restrictions on Wave Glider communication channels that the output sink can receive data packets from, click **OK** and the new unrestricted output sink subscriber will be added to the **Registered Subscribers** list under the **Output Sinks** configuration tab on the packet reflector Home Screen.

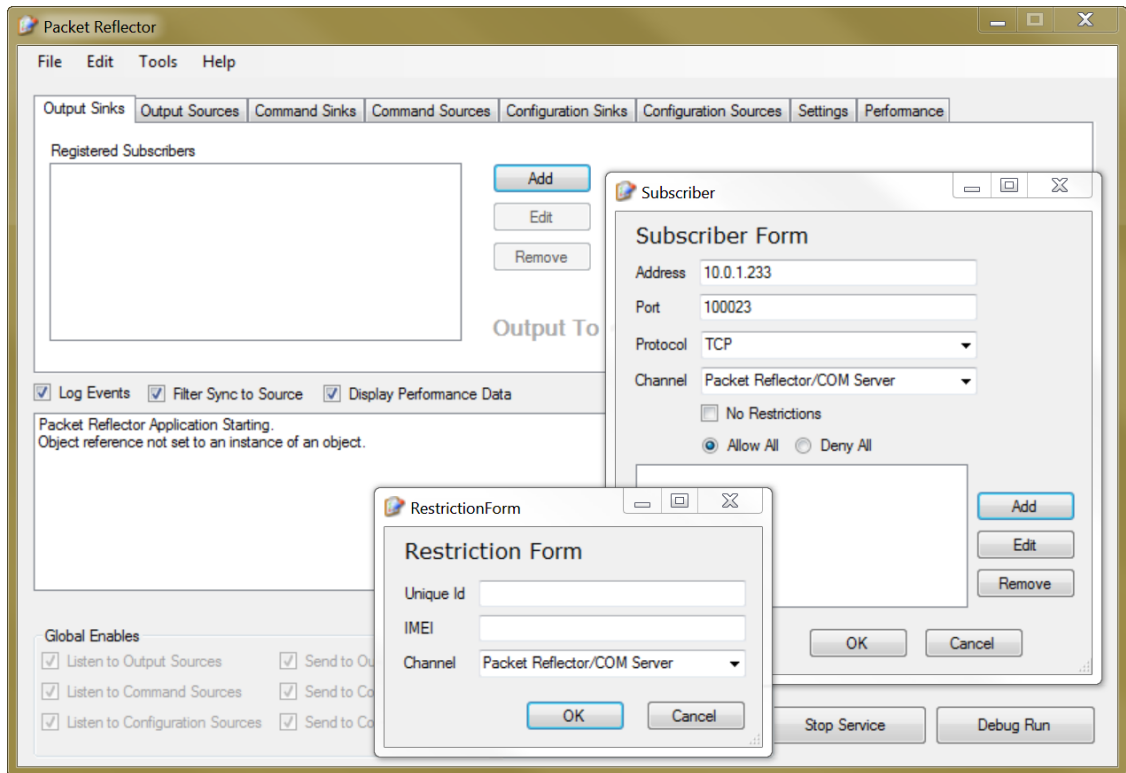
Figure 4.4. Adding a Registered Subscriber - No Restrictions



The following steps explain how you can configure restrictions to limit the Wave Gliders that the output sink subscriber can receive data packets from:

7. If you want to limit the Wave Gliders that the output sink subscriber can receive data packets from to one or more specific Wave Gliders, deselect the **No Restrictions** check-box, select the **Allow All** radio button, and click **Add**. The **Restriction Form** will appear.

Figure 4.5. Adding a Registered Subscriber - Restricted Allow All



8. Enter the **Unique Id** for the Wave Glider that you want to receive data from. You can find this information in the **Vehicle Info** screen on WGMS - click **Vehicle Unique Id**, then click **Edit Part** and the **Part Info** screen will appear. Enter the vehicle **Serial Number** from the **Part Info** screen into the **Unique Id** field in the **Restriction Form**.

Figure 4.6. Wave Glider Vehicle Info - Vehicle Unique Id

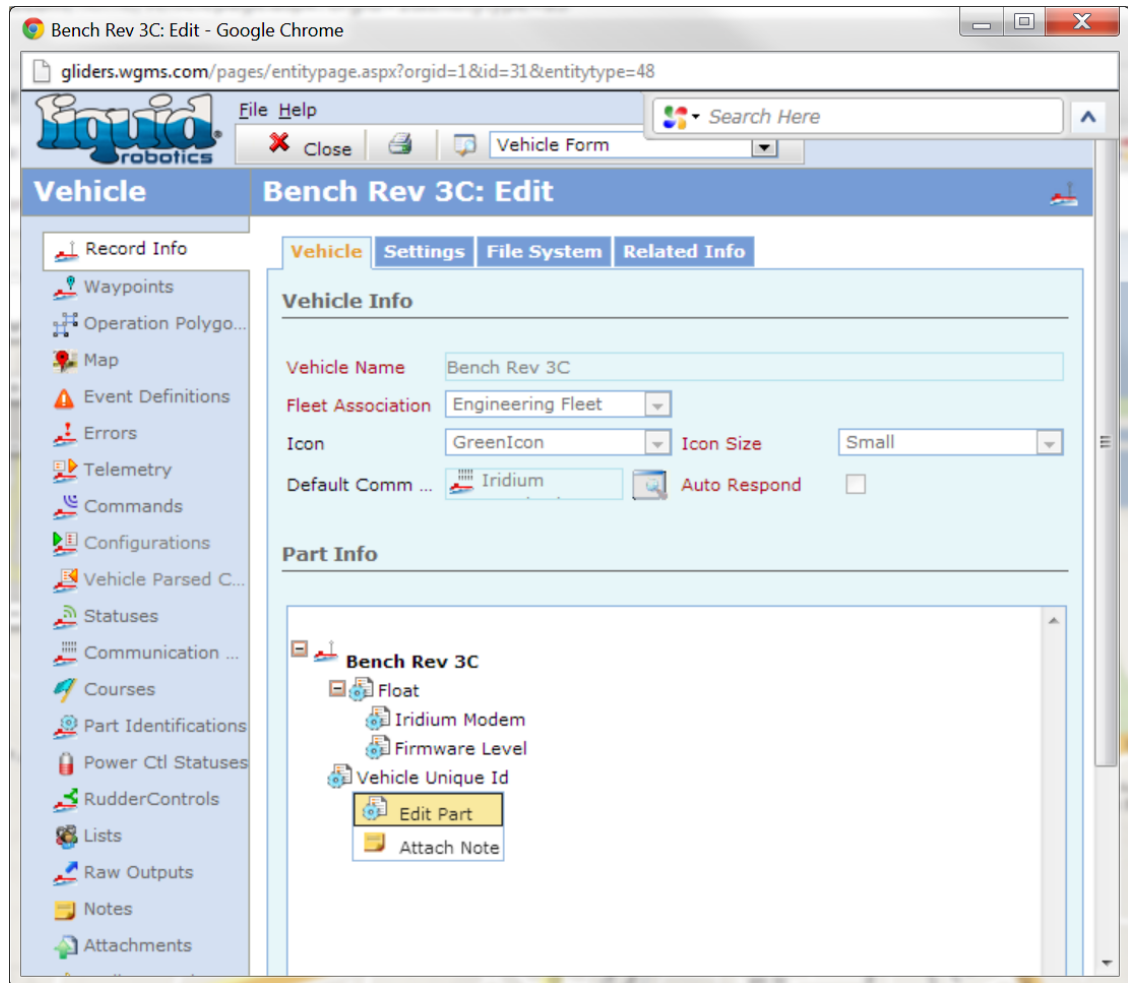


Figure 4.7. Vehicle Unique Id - Part Info

Vehicle Unique Id: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?orgid=1&id=1834&entitytype=49&parenttype=48&parentid=31&vehicleid=31

Part **Vehicle Unique Id: Edit**

Record Info
Sub Parts
Audit Records
Notes

Part Info

Part Name: Vehicle Unique Id

Parent Part: Revision:

Build Date: Expected Life T...:

Part Number: Remaining Life...:

Serial Number: 1094795585 LR Serial Num...:

Type: Unique Id Vehicle Bench Rev 3C

Manufacturer T...: Not Specified

Related Information

Owner: Organization: Gliders

Created On: 201... 15:3... Updated On: 201... 21:3...

Created By: System Admin Updated By: System Admin

9. Enter the International Mobile Station Equipment Identity (**IMEI**) that identifies the Iridium modem on the Wave Glider that you want to receive data from. You can find this information in the **Vehicle Info** screen on WGMS - click **Iridium Modem**, then click **Edit Part** and the **Part Info** screen will appear. Enter the Iridium modem **Serial Number** from the **Part Info** screen into the **IMEI** field in the **Restriction Form**.

Figure 4.8. Wave Glider Vehicle Info - Iridium Modem

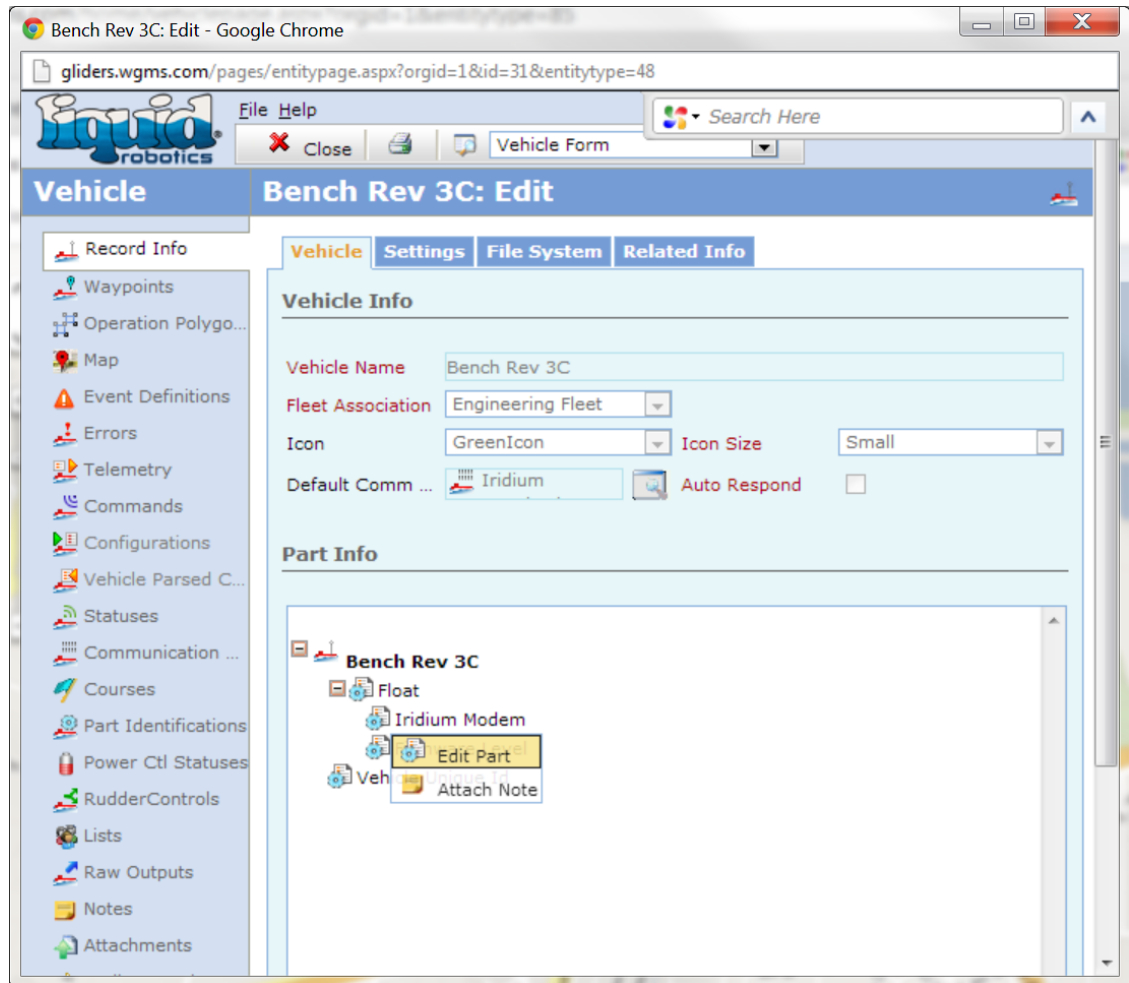


Figure 4.9. Iridium Modem - Part Info

The screenshot shows a web browser window titled 'Iridium Modem: Edit - Google Chrome'. The address bar shows the URL: `pacx.wgms.com/pages/EntityPage.aspx?orgid=1&id=319&entitytype=49&parenttype=49&parentid=318&vehicleid=31`. The page has a blue header with the 'Iridium robotics' logo and a 'File Help' menu. Below the header is a 'Part Form' tab. The main content area is titled 'Iridium Modem: Edit' and contains a 'Part Info' section with the following fields:

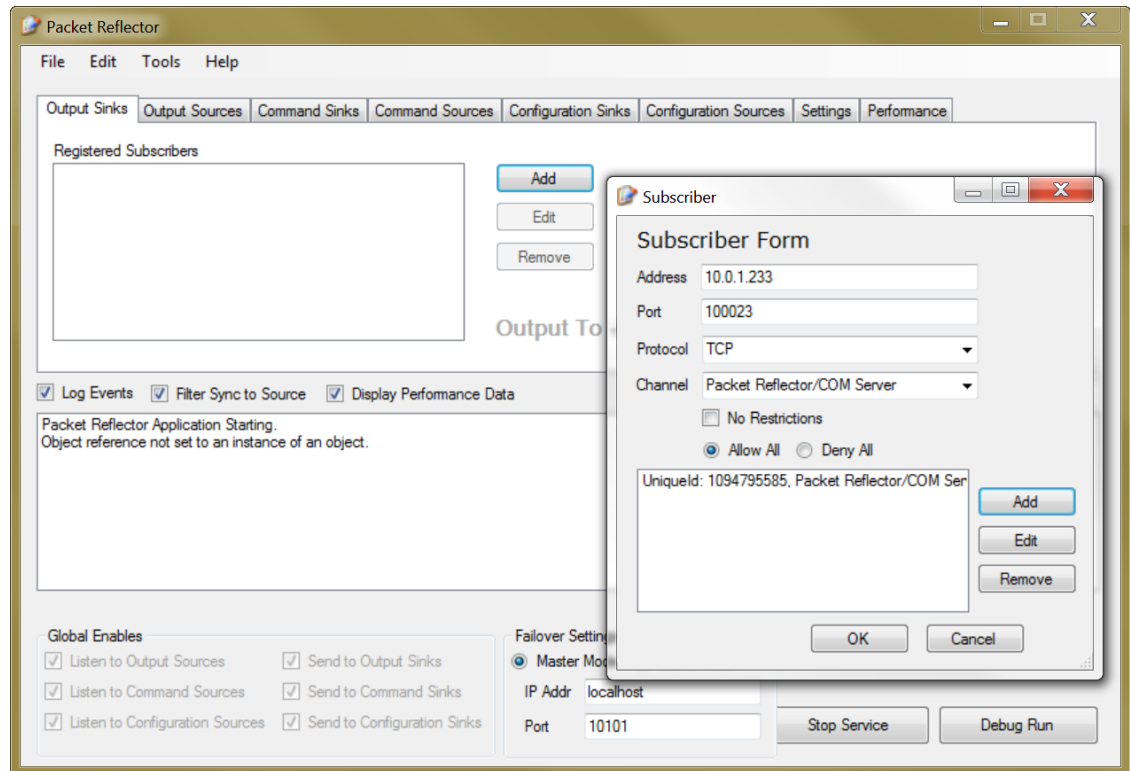
- Part Name:** Iridium Modem
- Parent Part:** Float
- Revision:** (empty)
- Build Date:** (calendar icon)
- Expected Life Time:** 0 minutes
- Part Number:** (empty)
- Remaining Life Ti...:** 0 minutes
- Serial Number:** 300025010508020
- LR Serial Number:** (empty)
- Type:** Iridium Modem
- Vehicle:** Bench Rev 3C
- Manufacturer Type:** 9522B

Below the 'Part Info' section is a 'Related Information' section with the following fields:

- Owner:** (empty)
- Organization:** Gliders
- Created On:** 2008/... 19:15...
- Updated On:** 2011/... 23:52...
- Created By:** System Admin
- Updated By:** Jim Kirklin

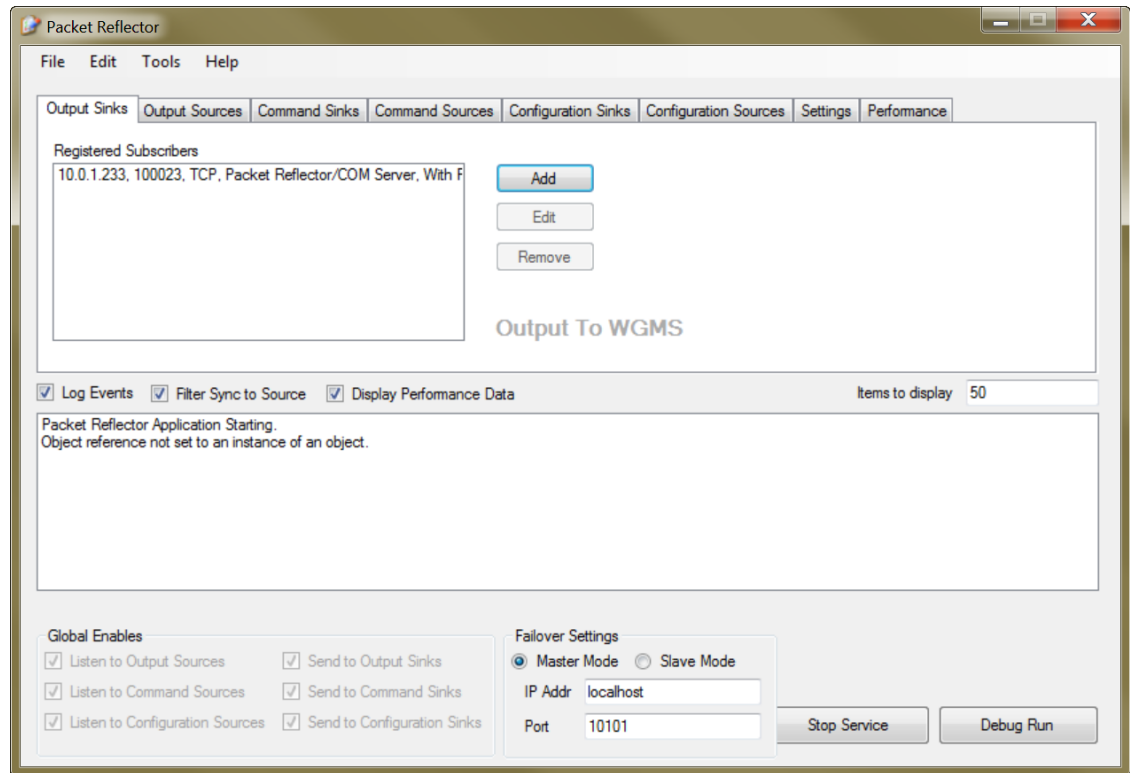
10. Select the data transmission Channel used by the specified Wave Glider for transmitting the data you want to receive. There are 7 preconfigured options and 4 custom options. Note, if you select **Packet Reflector/CommServer** you will receive data from all of the data transmission channels on the specified Wave Glider.
11. Click **OK** on the **Restriction Form** and the Wave Glider will be added to the **Subscriber Form** as an allowed output source.

Figure 4.10. Adding a Restriction to a Subscriber



12. Click **OK** on the **Subscriber Form** and the new restricted subscriber will be added to the **Registered Subscribers** list under the **Output Sinks** tab on the packet reflector Home Screen.

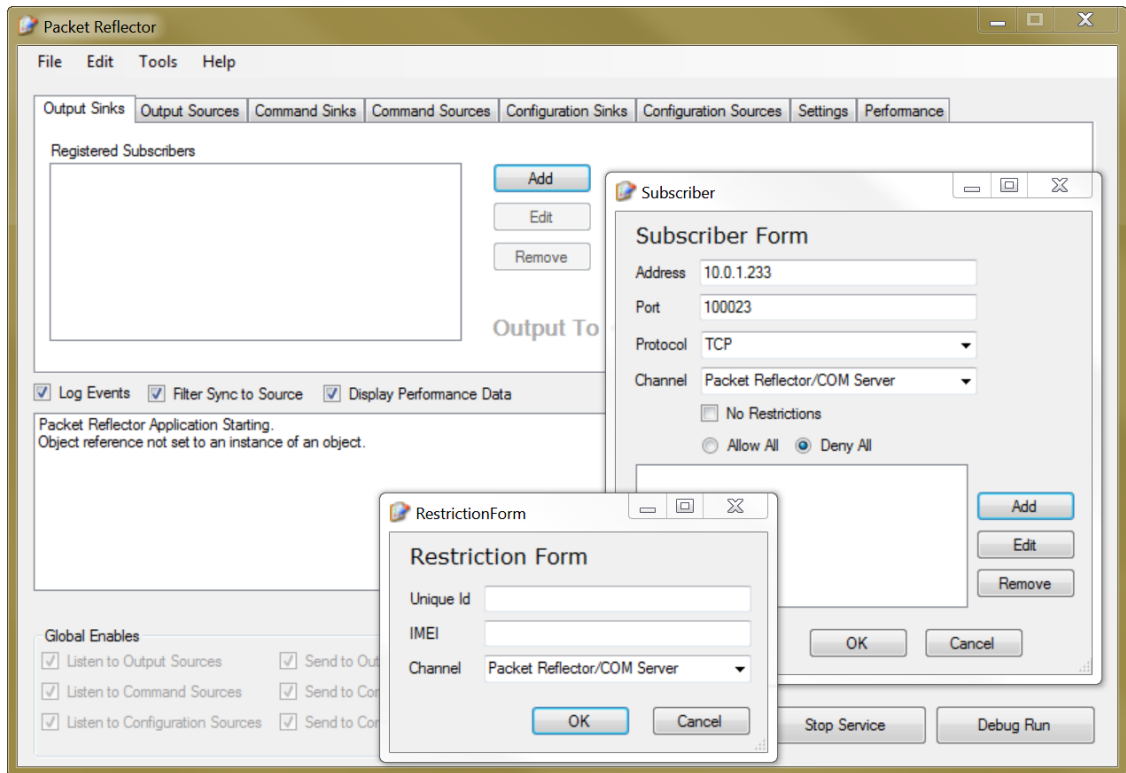
Figure 4.11. Adding a Restriction to a Subscriber



The following steps explain how you can configure restrictions to prevent the subscriber from receiving data from specific Wave Gliders:

13. If you want to prevent the subscriber from receiving data from one or more specific Wave Gliders, deselect the **No Restrictions** check-box, select the **Deny All** radio button, and click **Add**. The **Restriction Form** will appear.

Figure 4.12. Adding a Registered Subscriber - Restricted Deny All



14. Enter the **Unique Id** for the Wave Glider that you do not want to receive data from. You can find this information in the **Vehicle Info** screen on WGMS - click **Vehicle Unique Id**, then click **Edit Part** and the **Part Info** screen will appear. Enter the vehicle **Serial Number** from the **Part Info** screen into the **Unique Id** field in the **Restriction Form**.

Figure 4.13. Wave Glider Vehicle Info - Vehicle Unique Id

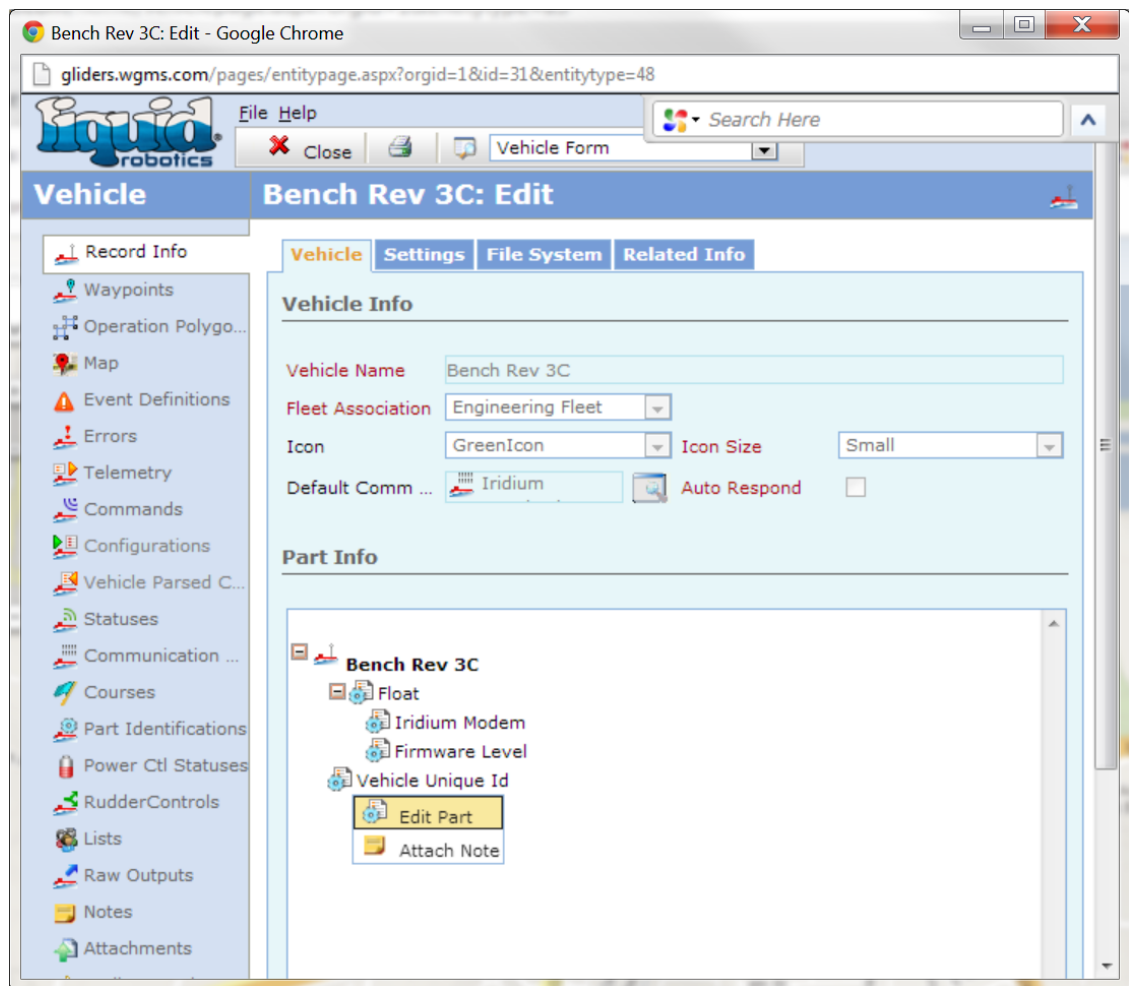


Figure 4.14. Vehicle Unique Id - Part Info

Vehicle Unique Id: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?orgid=1&id=1834&entitytype=49&parenttype=48&parentid=31&vehicleid=31

Part **Vehicle Unique Id: Edit**

Record Info
Sub Parts
Audit Records
Notes

Part Info

Part Name: Vehicle Unique Id

Parent Part: Revision:

Build Date: Expected Life T...:

Part Number: Remaining Life...:

Serial Number: 1094795585 LR Serial Num...:

Type: Unique Id Vehicle Bench Rev 3C

Manufacturer T...: Not Specified

Related Information

Owner: Organization: Gliders

Created On: 201... 15:3... Updated On: 201... 21:3...

Created By: System Admin Updated By: System Admin

15. Enter the International Mobile Station Equipment Identity (**IMEI**) that identifies the Iridium modem on the Wave Glider that you do not want to receive data from. You can find this information in the **Vehicle Info** screen on WGMS - click **Iridium Modem**, then click **Edit Part** and the **Part Info** screen will appear. Enter the Iridium modem **Serial Number** from the **Part Info** screen into the **IMEI** field in the **Restriction Form**.

Figure 4.15. Wave Glider Vehicle Info - Iridium Modem

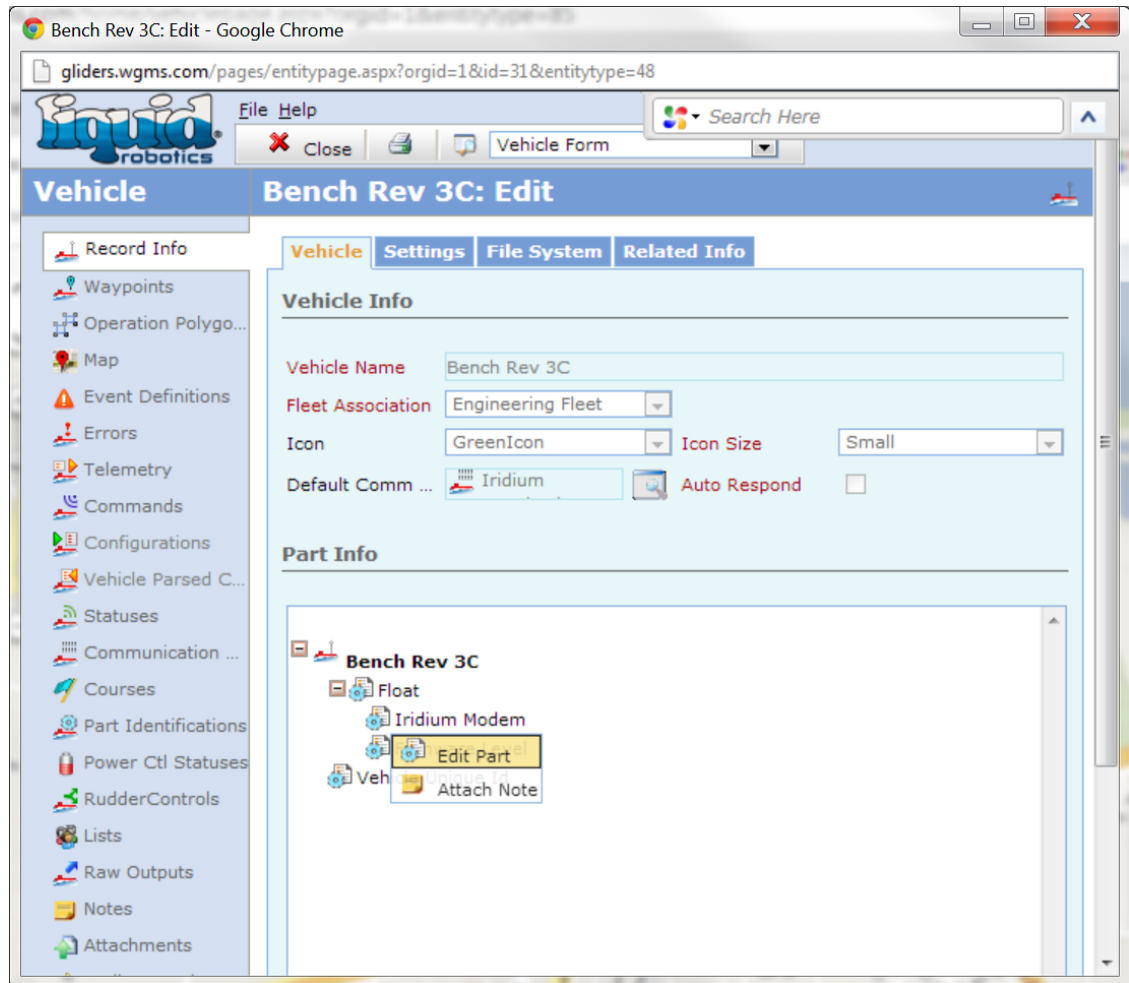


Figure 4.16. Iridium Modem - Part Info

The screenshot shows a web browser window titled 'Iridium Modem: Edit - Google Chrome'. The address bar shows the URL: `pacx.wgms.com/pages/EntityPage.aspx?orgid=1&id=319&entitytype=49&parenttype=49&parentid=318&vehicleid=31`. The page has a blue header with the 'Iridium Modem: Edit' title. On the left, there is a sidebar with links: 'Record Info', 'Sub Parts', 'Audit Records', and 'Notes'. The main content area is titled 'Part Info' and contains the following fields:

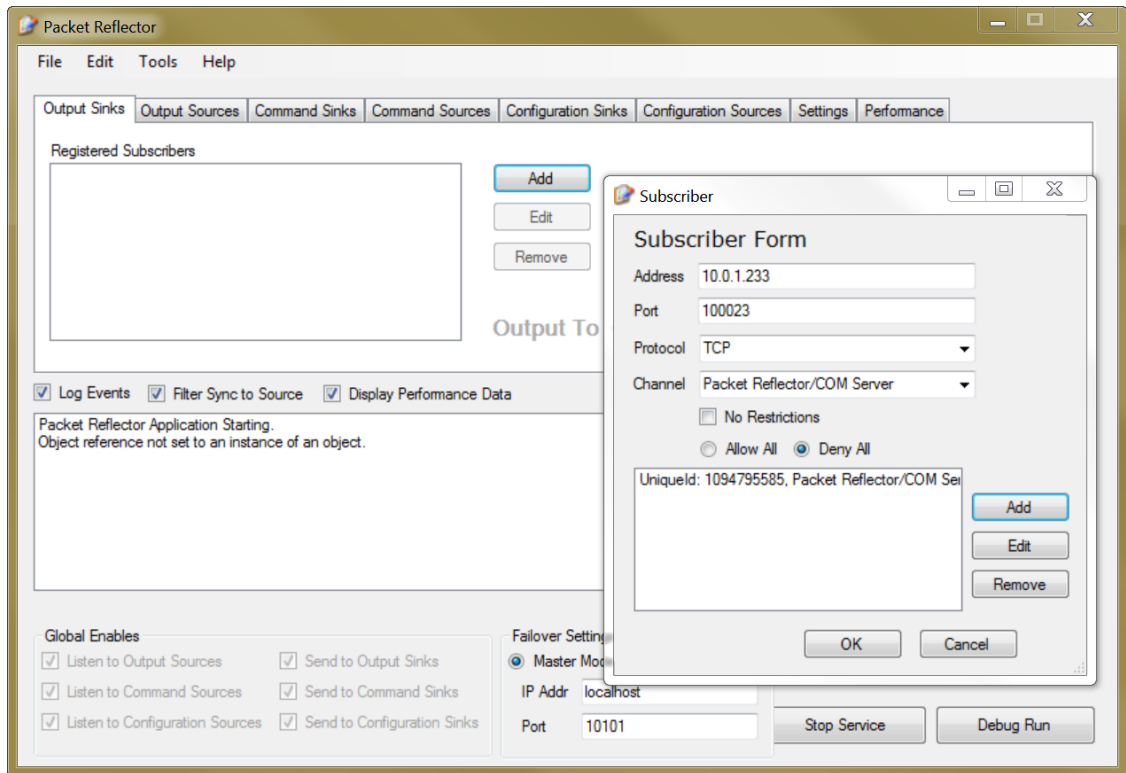
- Part Name:** Iridium Modem
- Parent Part:** Float
- Build Date:** [Calendar icon]
- Part Number:** [Text input]
- Serial Number:** 300025010508020
- Type:** Iridium Modem
- Manufacturer Type:** 9522B
- Revision:** [Text input]
- Expected Life Time:** 0 minutes
- Remaining Life Ti...:** 0 minutes
- LR Serial Number:** [Text input]
- Vehicle:** Bench Rev 3C

Below the 'Part Info' section is a 'Related Information' section with the following fields:

- Owner:** [Text input]
- Organization:** Gliders
- Created On:** 2008/... 19:15...
- Updated On:** 2011/... 23:52...
- Created By:** System Admin
- Updated By:** Jim Kirklin

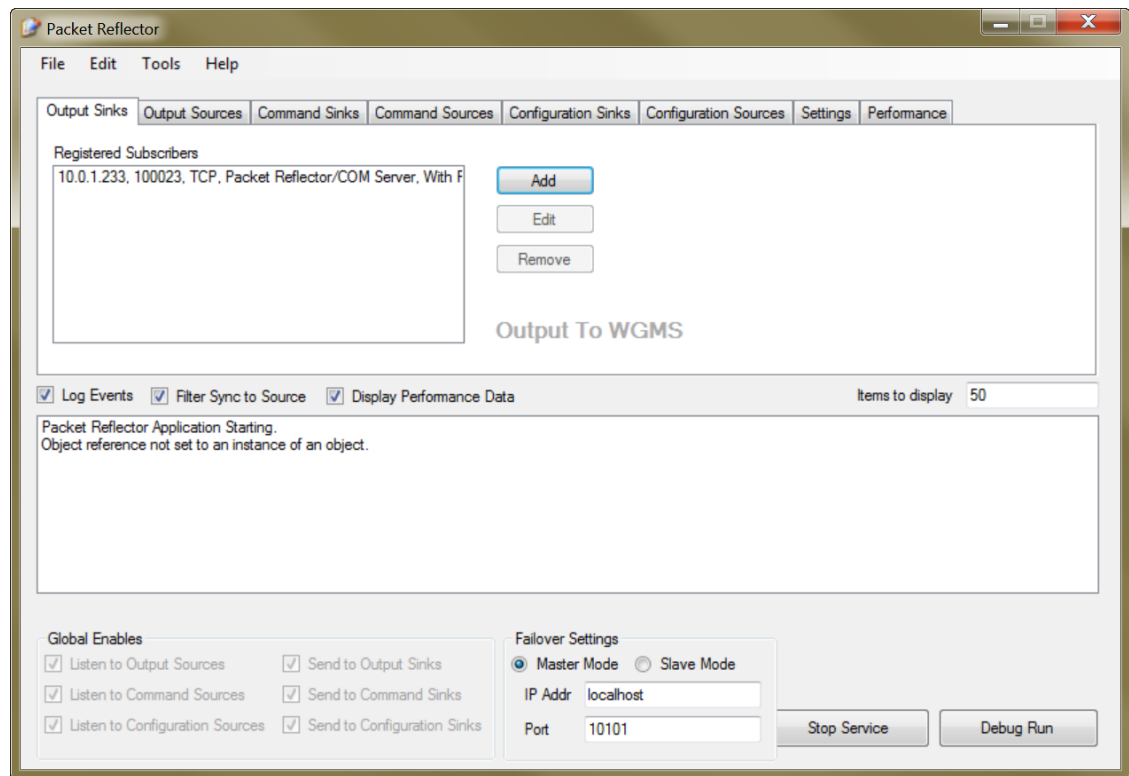
16. Select the data transmission Channel used by the Wave Glider for transmitting the data that you do not want to receive. There are 7 preconfigured options and 4 custom options, however, only the Packet Reflector/COM Server data transmission channel is supported with output sink subscribers because that is the communications link between the packet reflector and WGMS. You must select the **Packet Reflector/COM** Server option.
17. Click **OK** on the **Restriction Form** and the output source will be added to the **Subscriber Form** as a denied output source.

Figure 4.17. Adding a Restriction to a Subscriber



18. Click **OK** on the **Subscriber Form** and the new restricted subscriber will be added to the **Registered Subscribers** list under the **Output Sinks** tab on the packet reflector Home Screen.

Figure 4.18. Adding a Restriction to a Subscriber



Editing Registered Subscribers

To edit a registered subscriber:

1. Select a subscriber in the **Registered Subscribers** list and click **Edit** - a **Subscriber Form** containing the configuration parameters for the selected subscriber will appear.
2. Make edits to the **Address**, **Port**, **Protocol**, and **Channel** fields, as needed.
3. If the **No Restrictions** check-box is selected and you do not need to add any restrictions to the subscriber configuration, click **OK** and the edited subscriber will be added to the **Registered Subscribers** list under the **Output Sinks** tab on the packet reflector Home screen.

If you need to add or edit restrictions to limit the Wave Glider communication channels that the subscriber can receive data from, perform the following steps:

4. Deselect the **No Restrictions** check-box, select the **Allow All** radio button, and click **Add**. The **Restriction Form** will appear.
5. Make edits to the **Unique Id**, **IMEI**, and **Channel** fields, as needed.
6. Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as an allowed output source.

7. Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Output Sinks** tab on the packet reflector Home Screen.

If you need to add or edit restrictions to prevent the subscriber from receiving data from specific Wave Glider communication channels, perform the following steps:

8. Deselect the **No Restrictions** check-box, select the **Deny All** radio button, and click **Add**. The **Restriction Form** will appear.
9. Make edits to the **Unique Id**, **IMEI**, and **Channel** fields, as needed.
10. Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as a denied output source.
11. Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Output Sinks** tab on the packet reflector Home Screen.

Removing Registered Subscribers

To delete a registered subscriber from the packet reflector configuration, select a registered subscriber in the **Registered Subscribers** list and click **Remove**.

Configuring Output Sources

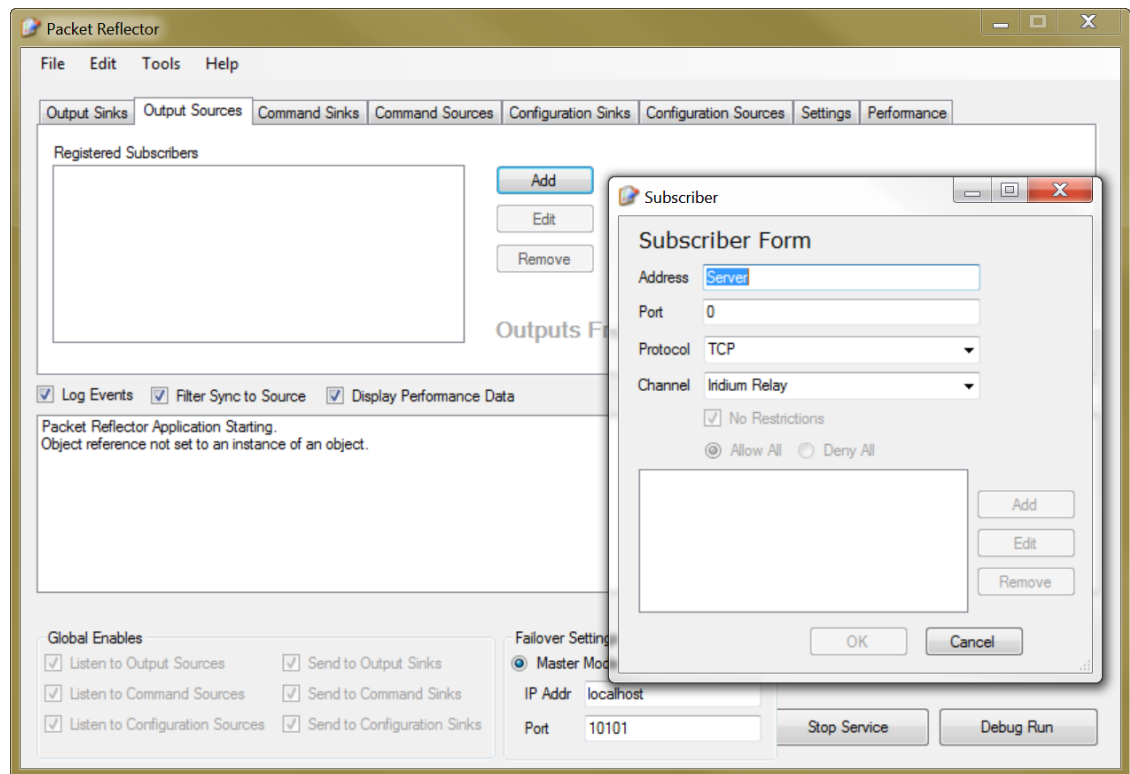
Packet reflector output sources are subscribers registered to send data packets to packet reflector output sinks. When you click on the **Output Sources** tab, the **Registered Subscribers** list appears in the configuration window. Registered subscribers can be added, edited, or removed.

Adding Registered Subscribers

To add a registered subscriber:

1. Click **Add** and the Subscriber Form will appear.

Figure 4.19. Adding a Registered Subscriber

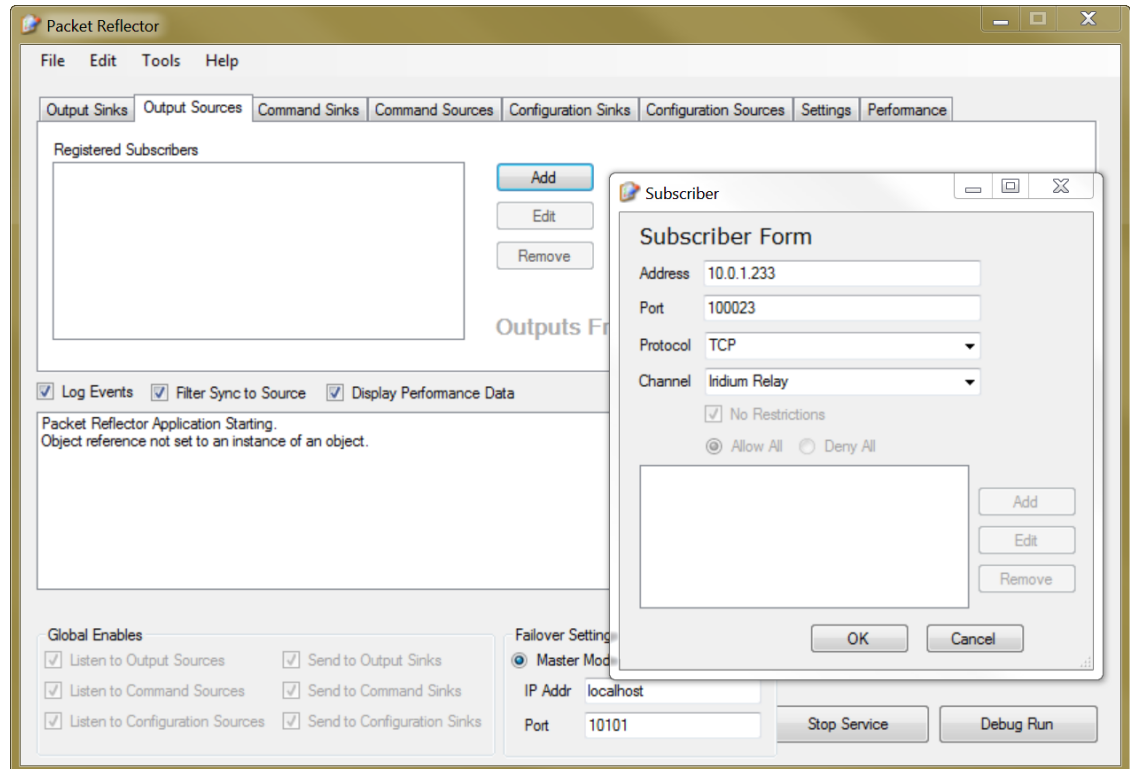


2. Enter the **Address** (IP address or Fully Qualified Domain Name) of the subscriber.
3. Enter the **Port** used to access the subscriber.
4. Select the data transmission protocol (TCP or UDP) to be used from the **Protocol** drop-down menu.
5. Select the data transmission channel to be used from the **Channel** drop-down menu. There are 7 preconfigured options and 4 custom options, as follows:

- **Packet Reflector/COM Server**
- **Iridium Relay**
- **XBee Relay**
- **Serial Relay**
- **WiFi Relay**
- **Alt Iridium Relay**
- **Iridium EMSS Relay**
- **Custom Relay Type 7**
- **Custom Relay Type 8**

- **Custom Relay Type 9**
 - **Custom Relay Type 10**
6. The **No Restrictions** check-box is selected by default. Restrictions cannot be configured on output sources. Click **OK** and the new subscriber will be added to the **Registered Subscribers** list under the **Output Sources** configuration tab on the packet reflector Home Screen.

Figure 4.20. Adding a Registered Output Source Subscriber



Editing Registered Subscribers

To edit a registered subscriber:

1. Select a subscriber in the **Registered Subscribers** list and click **Edit** - a **Subscriber Form** containing the configuration parameters for the selected subscriber will appear.
2. Make edits to the **Address**, **Port**, **Protocol**, and **Channel** fields, as needed.
3. The **No Restrictions** check-box is selected by default. Restrictions cannot be configured on output sources.

Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Output Sources** tab on the packet reflector Home Screen.

Removing Registered Subscribers

To delete a registered subscriber from the packet reflector configuration, select a registered subscriber in the **Registered Subscribers** list and click **Remove**.

Configuring Command Sinks

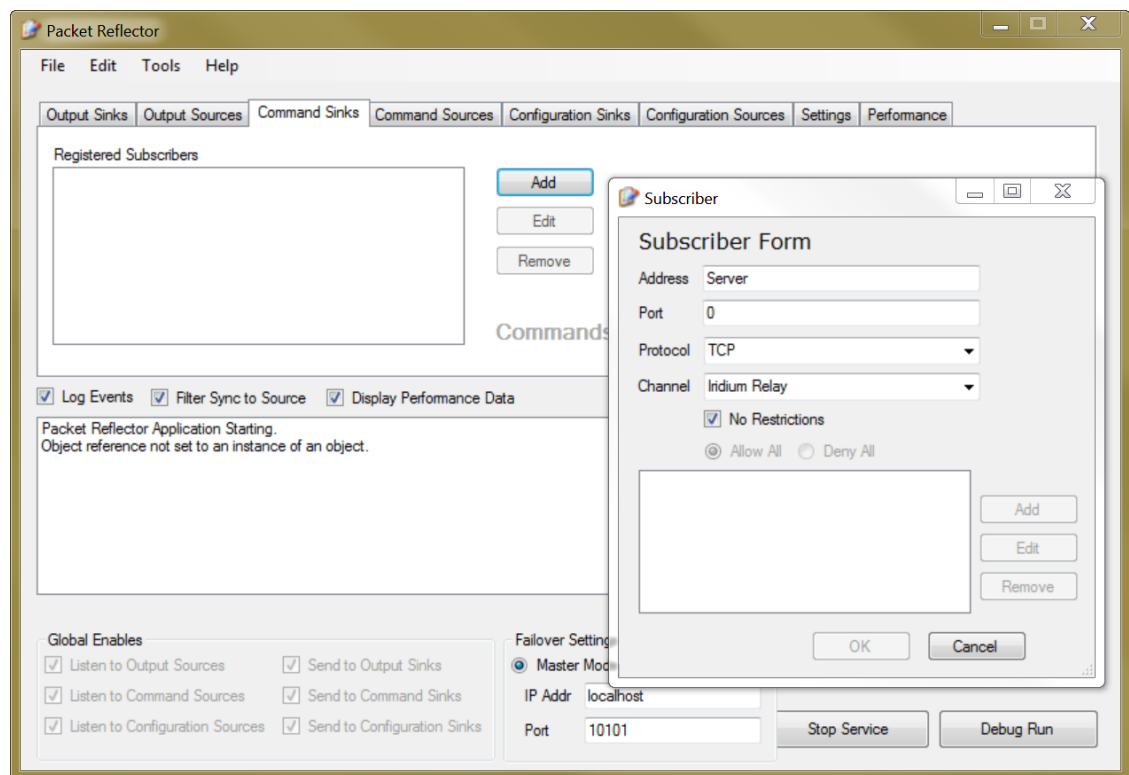
Packet reflector command sinks are subscribers registered to receive command data packets from packet reflector command sources (typically WGMS). When you click on the **Command Sinks** tab, the **Registered Subscribers** list appears in the configuration window. Registered subscribers can be added, edited, or removed.

Adding Registered Subscribers

To add a registered subscriber:

1. Click **Add** and the Subscriber Form will appear.

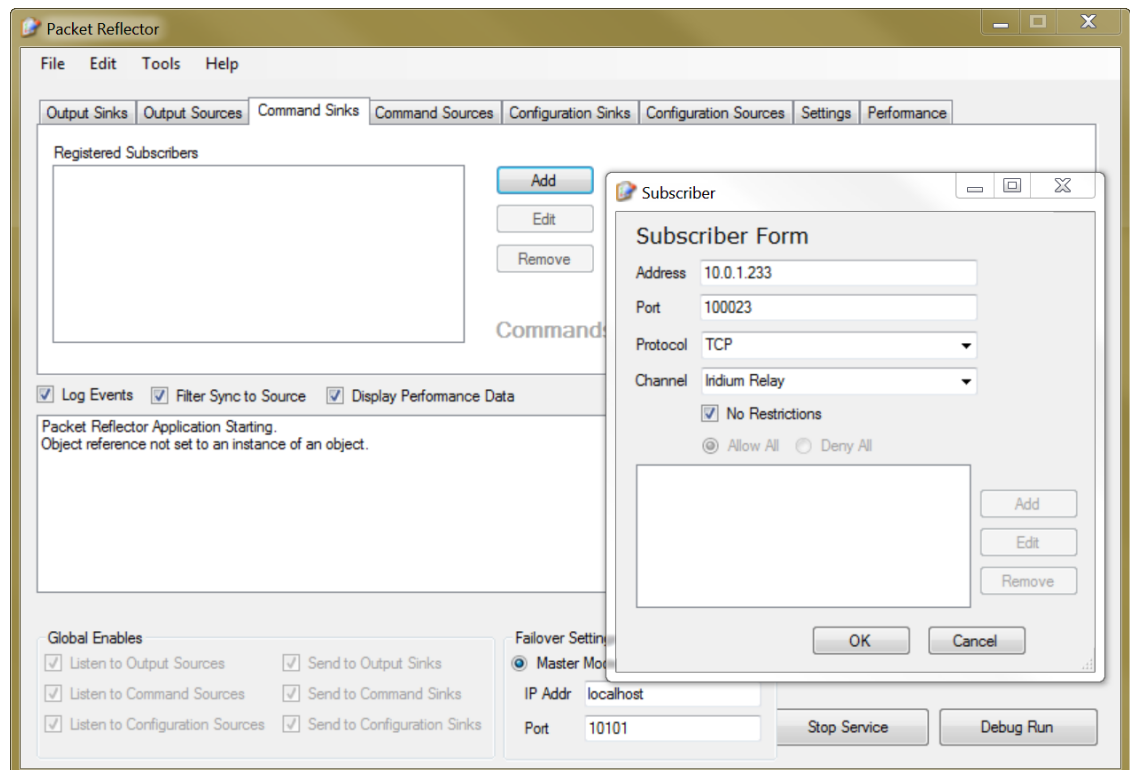
Figure 4.21. Adding a Registered Subscriber



2. Enter the **Address** (IP address or Fully Qualified Domain Name) of the subscriber.
3. Enter the **Port** used to access the subscriber.
4. Select the data transmission protocol (TCP or UDP) to be used from the **Protocol** drop-down menu. TCP is the default protocol setting and it is recommended.
5. Select the data transmission channel to be used from the **Channel** drop-down menu. There are 7 preconfigured options and 4 custom options, as follows:

- **Packet Reflector/COM Server**
 - **Iridium Relay**
 - **XBee Relay**
 - **Serial Relay**
 - **WiFi Relay**
 - **Alt Iridium Relay**
 - **Iridium EMSS Relay**
 - **Custom Relay Type 7**
 - **Custom Relay Type 8**
 - **Custom Relay Type 9**
 - **Custom Relay Type 10**
6. The **No Restrictions** check-box is selected by default. If you do not want to restrict the Wave Glider communication channels that a command sink subscriber can receive command packets over, click **OK** and the new unrestricted command sink subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** configuration tab on the packet reflector Home Screen.

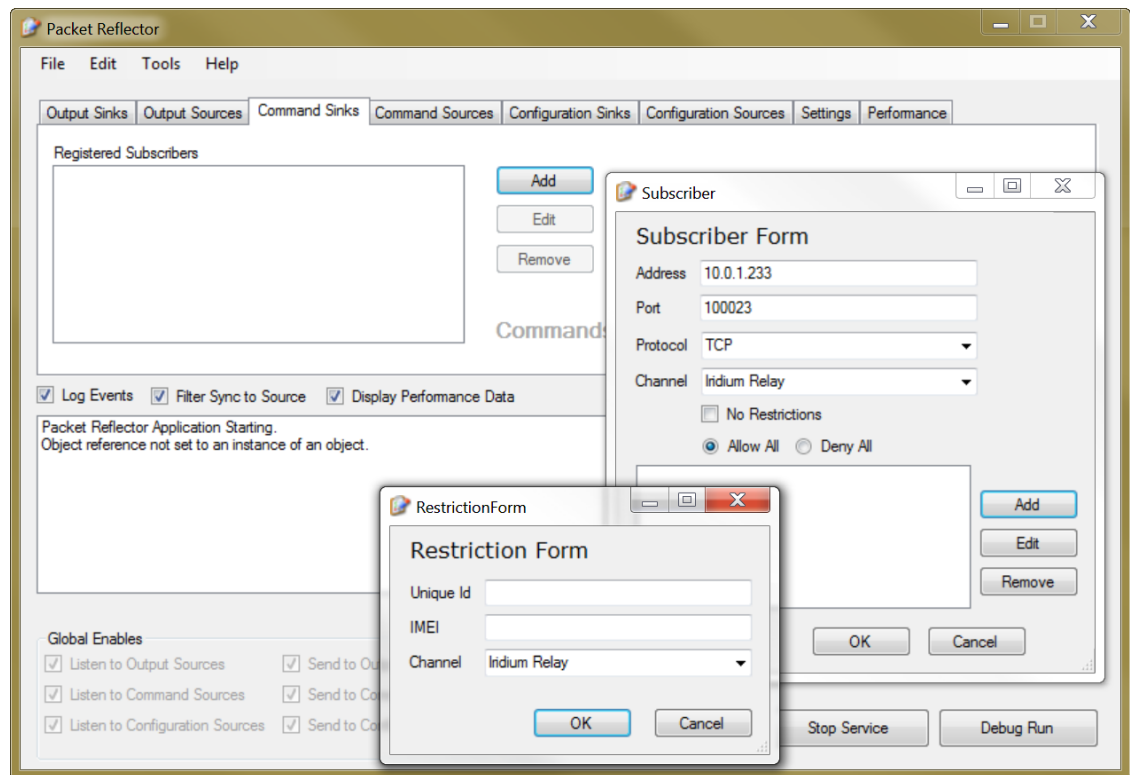
Figure 4.22. Adding a Registered Subscriber - No Restrictions



The following steps explain how you can configure restrictions to limit the communication channels that a Wave Glider can receive command packets over:

7. If you want to limit the command sink subscribers that a Wave Glider can receive data packets from to one or more specific communication channels, deselect the **No Restrictions** check-box, select the **Allow All** radio button, and click **Add**. The **Restriction Form** will appear.

Figure 4.23. Adding a Registered Subscriber - Restricted Allow All



8. Enter the **Unique Id** for the Wave Glider that the command sink subscriber will be allowed to transmit command packets to. You can find this information in the **Vehicle Info** screen on WGMS - click **Vehicle Unique Id**, then click **Edit Part** and the **Part Info** screen will appear. Enter the vehicle **Serial Number** from the **Part Info** screen into the **Unique Id** field in the **Restriction Form**.

Figure 4.24. Wave Glider Vehicle Info - Vehicle Unique Id

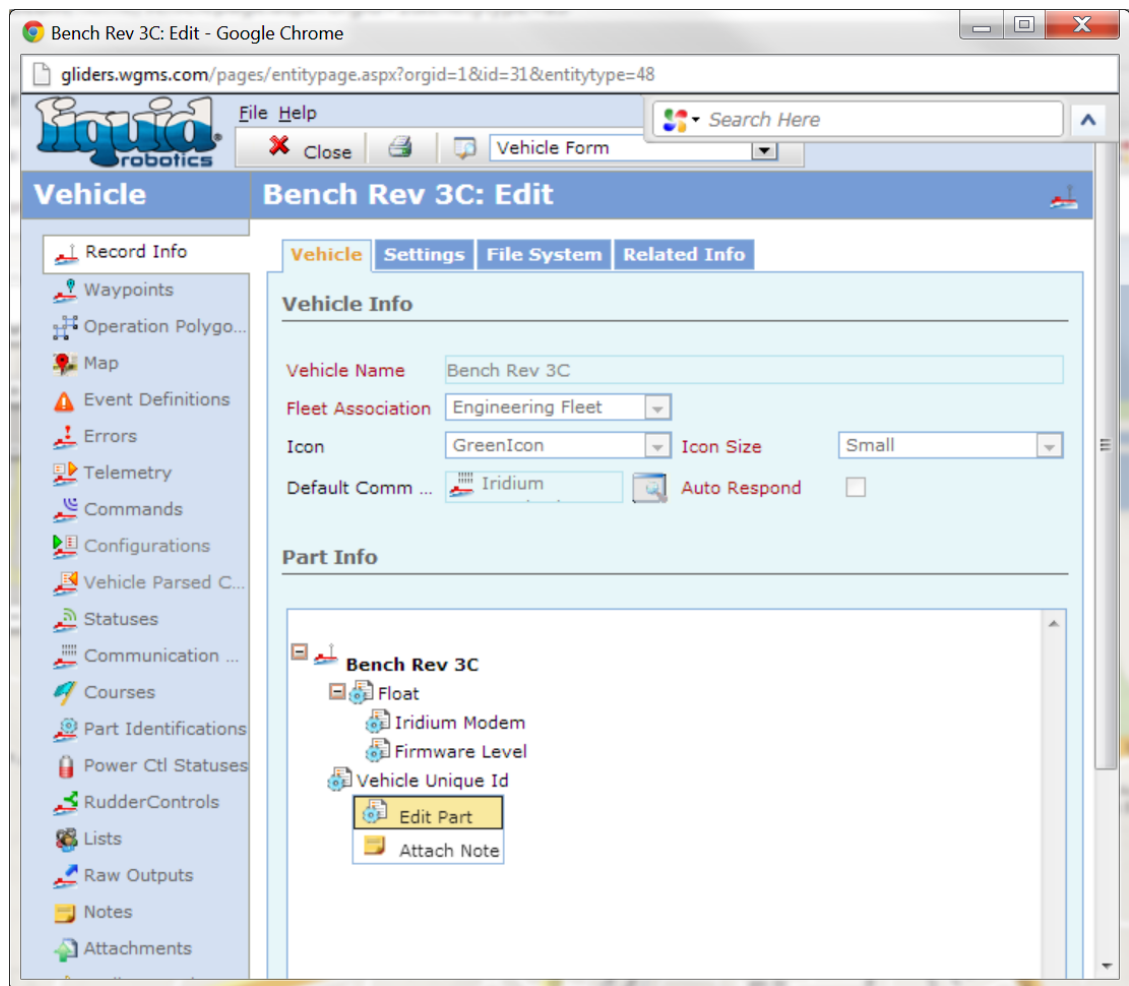


Figure 4.25. Vehicle Unique Id - Part Info

Vehicle Unique Id: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?orgid=1&id=1834&entitytype=49&parenttype=48&parentid=31&vehicleid=31

liquid robotics

File Help

Close Part Form

Search Here

Part **Vehicle Unique Id: Edit**

Record Info

Sub Parts

Audit Records

Notes

Part Info

Part Name: Vehicle Unique Id

Parent Part: [] Revision: []

Build Date: [] Expected Life T...: []

Part Number: [] Remaining Life...: []

Serial Number: 1094795585 LR Serial Num...: []

Type: Unique Id Vehicle

Manufacturer T...: Not Specified

Related Information

Owner: [] Organization: Gliders

Created On: 201... 15:3... Updated On: 201... 21:3...

Created By: System Admin Updated By: System Admin

9. Enter the International Mobile Station Equipment Identity (**IMEI**) that identifies the Iridium modem on the Wave Glider that the command sink subscriber will be allowed to transmit data to. You can find this information in the **Vehicle Info** screen on WGMS - click **Iridium Modem**, then click **Edit Part** and the **Part Info** screen will appear. Enter the Iridium modem **Serial Number** from the **Part Info** screen into the **IMEI** field in the **Restriction Form**.

Figure 4.26. Wave Glider Vehicle Info - Iridium Modem

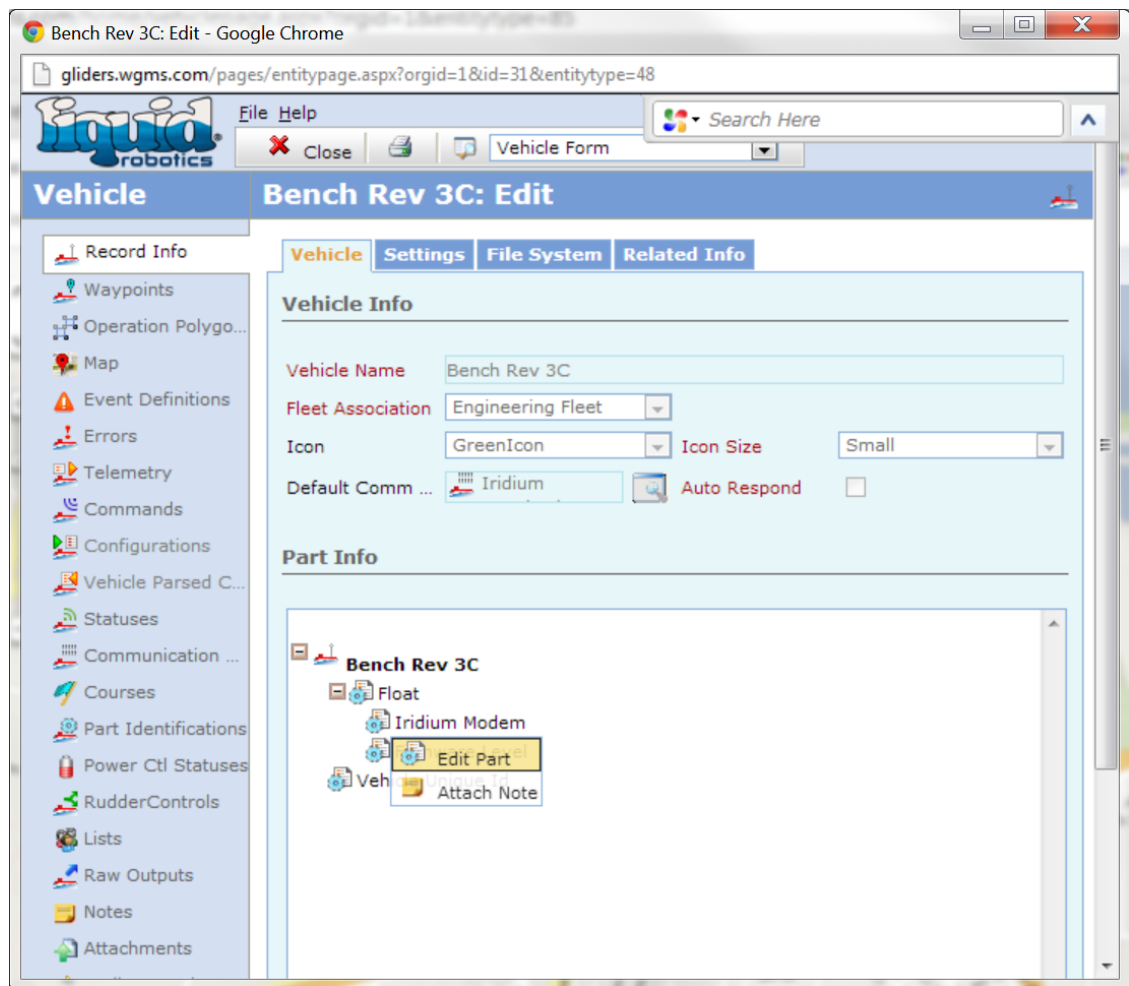


Figure 4.27. Iridium Modem - Part Info

The screenshot shows a web browser window titled 'Iridium Modem: Edit - Google Chrome'. The address bar shows a URL from 'pacx.wgms.com'. The page has a blue header with the 'Iridium Modem: Edit' title. On the left is a sidebar with links: 'Record Info', 'Sub Parts', 'Audit Records', and 'Notes'. The main content area is divided into two sections: 'Part Info' and 'Related Information'.

Part Info

Part Name	Iridium Modem		
Parent Part	Float	Revision	
Build Date		Expected Life Time	0 minutes
Part Number		Remaining Life Ti...	0 minutes
Serial Number	300025010508020		LR Serial Number
Type	Iridium Modem	Vehicle	Bench Rev 3C
Manufacturer Type	9522B		

Related Information

Owner		Organization	Gliders
Created On	2008/... 19:15...	Updated On	2011/... 23:52...
Created By	System Admin	Updated By	Jim Kirklin

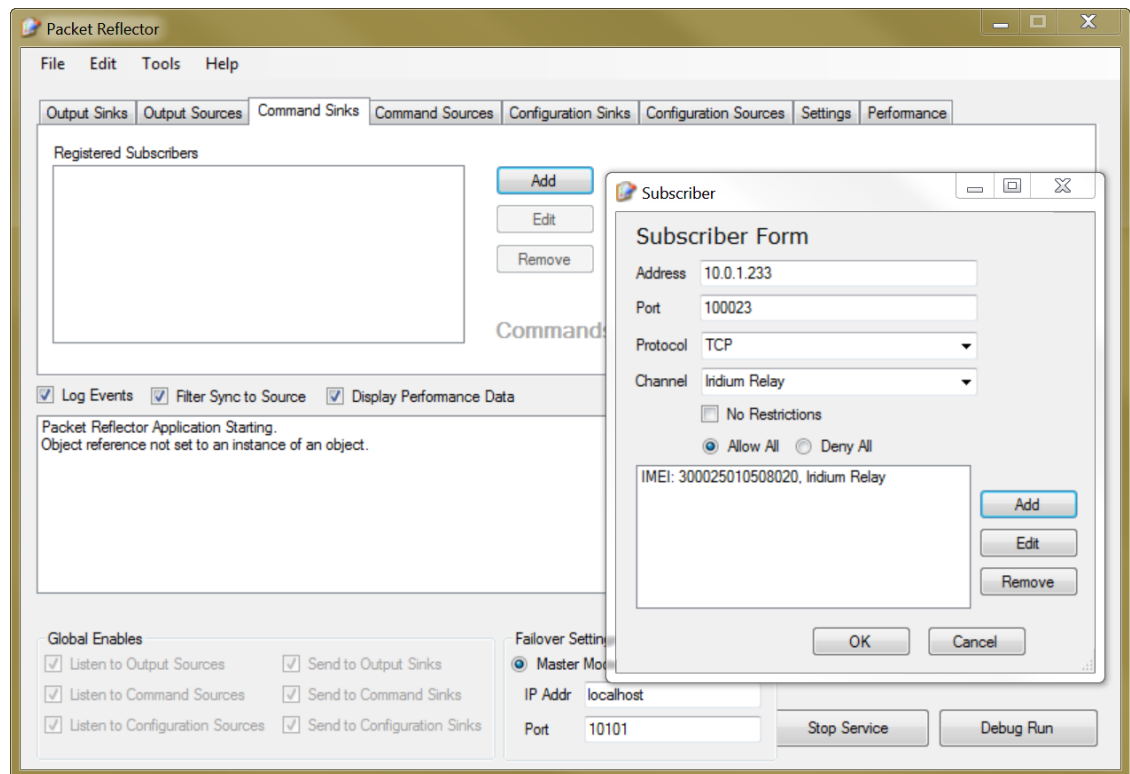
10. Select the Wave Glider transmission Channel used by the command sink subscriber you want to receive command packets from. There are 7 preconfigured options and 4 custom options, as follows:

- **Packet Reflector/COM Server**
- **Iridium Relay**
- **XBee Relay**
- **Serial Relay**
- **WiFi Relay**
- **Alt Iridium Relay**
- **Iridium EMSS Relay**
- **Custom Relay Type 7**
- **Custom Relay Type 8**

- **Custom Relay Type 9**
- **Custom Relay Type 10**

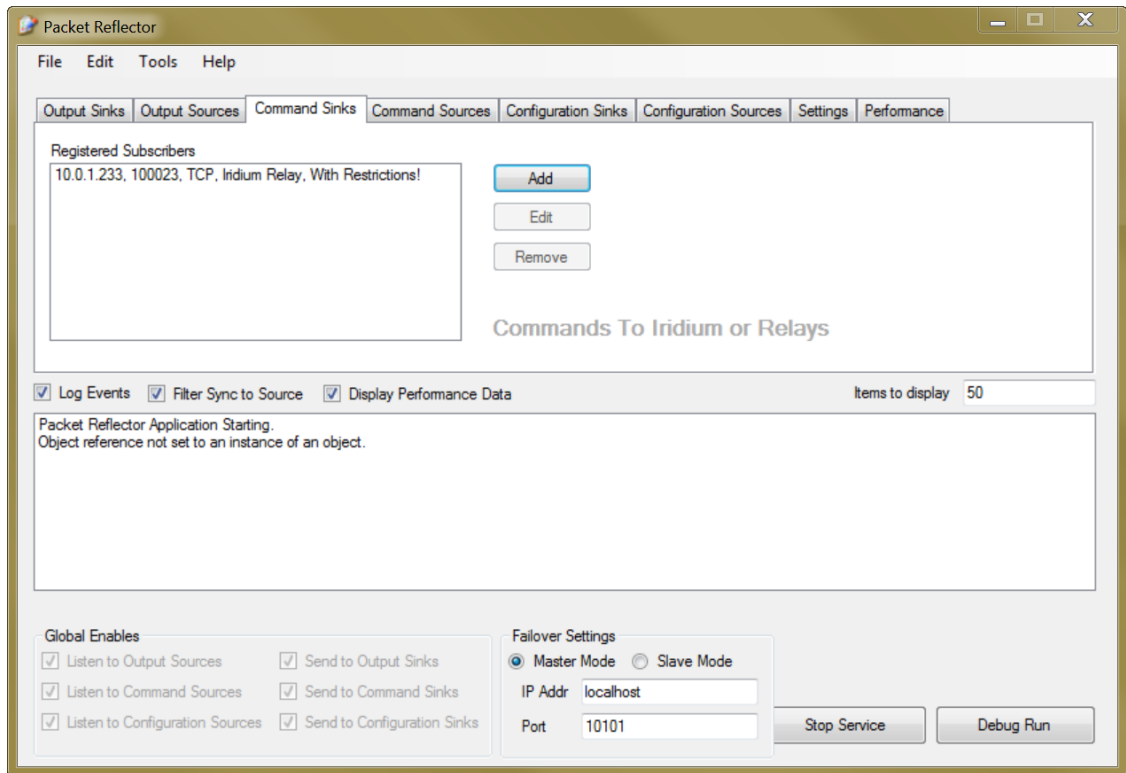
- Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as an allowed command source.

Figure 4.28. Adding a Restriction to the Subscriber Form



- Click **OK** on the **Subscriber Form** and the new allowed subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** tab on the packet reflector Home Screen.

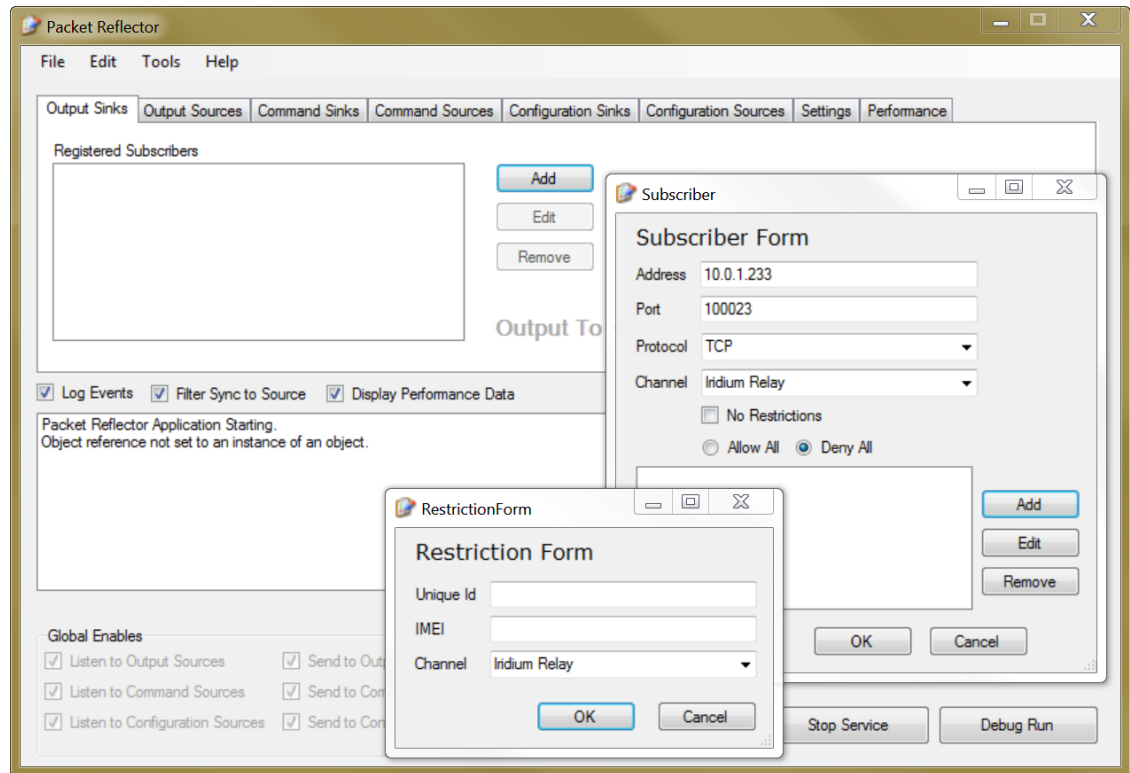
Figure 4.29. Adding a Restricted Subscriber



The following steps explain how you can configure restrictions to prevent the Wave Glider from receiving command packets over specific communications channels:

13. If you want to prevent the Wave Glider from receiving command packets from one or more specific communication channels, deselect the **No Restrictions** check-box, select the **Deny All** radio button, and click **Add**. The **Restriction Form** will appear.

Figure 4.30. Adding a Registered Subscriber - Restricted Deny All



14. Enter the **Unique Id** for the Wave Glider that you do not want command packets transmitted to. You can find this information in the **Vehicle Info** screen on WGMS - click **Vehicle Unique Id** , then click **Edit Part** and the **Part Info** screen will appear. Enter the vehicle **Serial Number** from the **Part Info** screen into the **Unique Id** field in the **Restriction Form**.

Figure 4.31. Wave Glider Vehicle Info - Vehicle Unique Id

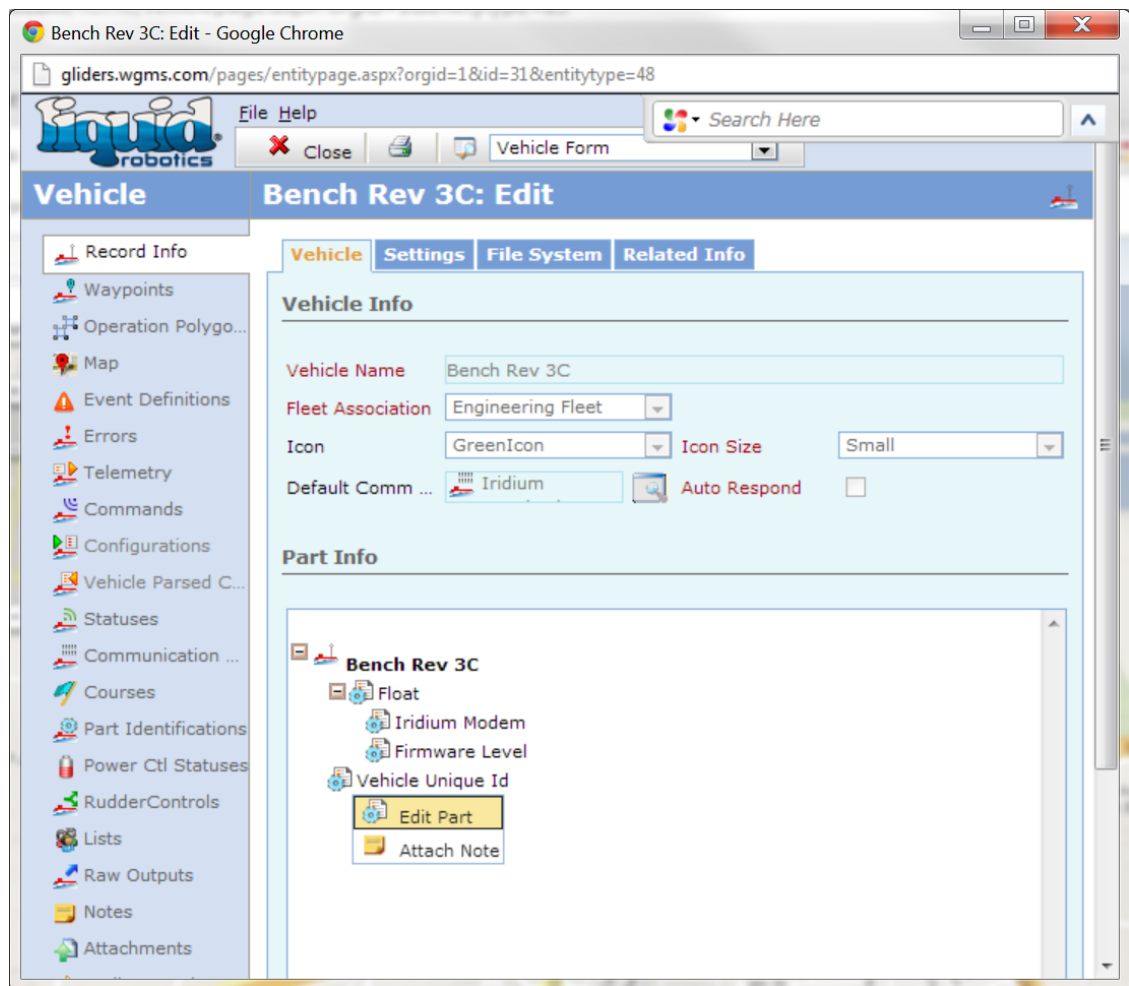


Figure 4.32. Vehicle Unique Id - Part Info

Vehicle Unique Id: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?orgid=1&id=1834&entitytype=49&parenttype=48&parentid=31&vehicleid=31

File Help

Close Part Form

Search Here

Part

Record Info

Sub Parts

Audit Records

Notes

Vehicle Unique Id: Edit

Part Info

Part Name: Vehicle Unique Id

Parent Part: [Field] Revision: [Field]

Build Date: [Field] Expected Life T...: [Field]

Part Number: [Field] Remaining Life...: [Field]

Serial Number: 1094795585 LR Serial Num...: [Field]

Type: Unique Id Vehicle

Manufacturer T...: Not Specified

Related Information

Owner: [Field] Organization: Gliders

Created On: 201... 15:3... Updated On: 201... 21:... [Field]

Created By: System Admin Updated By: System Admin

15. Enter the International Mobile Station Equipment Identity (**IMEI**) that identifies the Iridium modem on the Wave Glider that you do not want command packets sent to. You can find this information in the **Vehicle Info** screen on WGMS - click **Iridium Modem**, then click **Edit Part** and the **Part Info** screen will appear. Enter the Iridium modem **Serial Number** from the **Part Info** screen into the **IMEI** field in the **Restriction Form**.

Figure 4.33. Wave Glider Vehicle Info - Iridium Modem

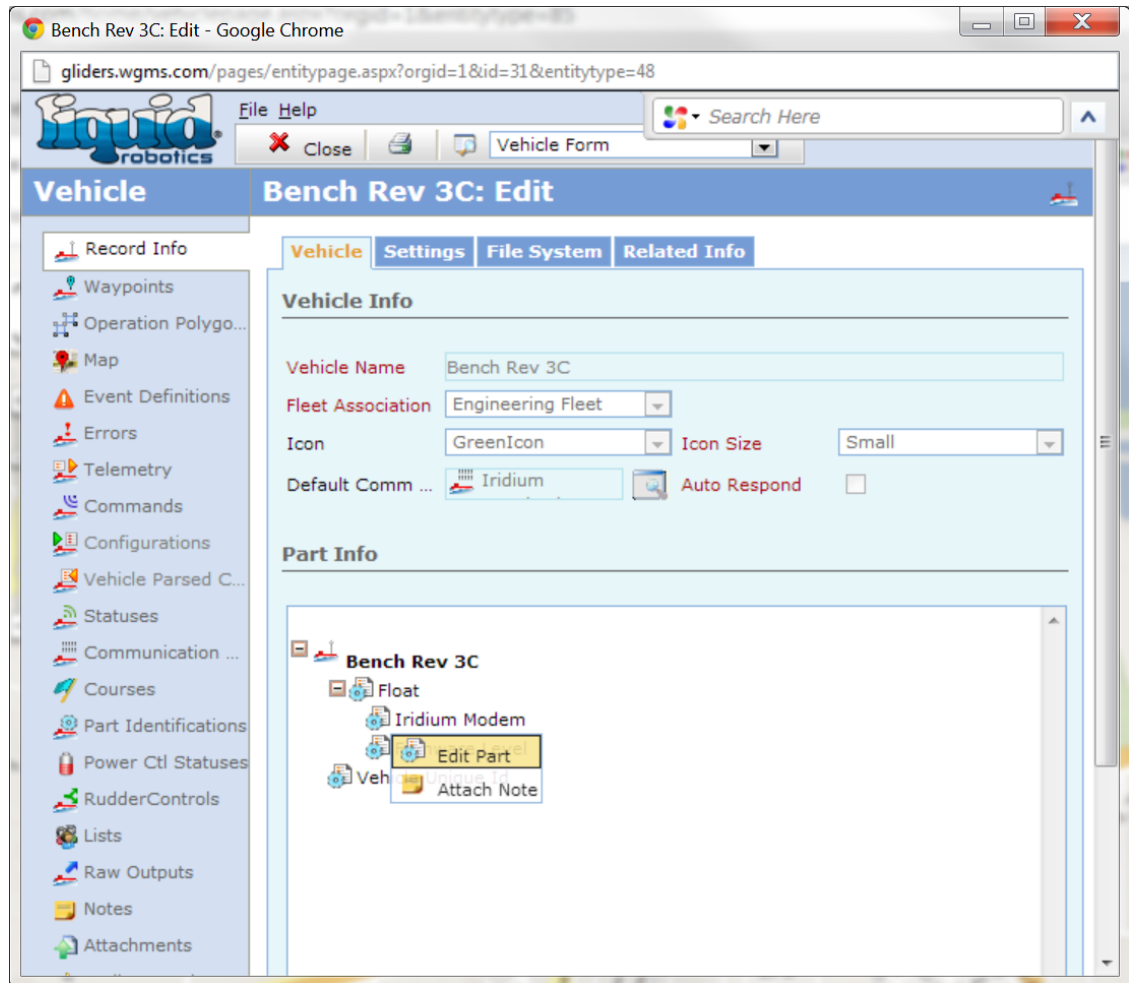


Figure 4.34. Iridium Modem - Part Info

The screenshot shows a web browser window titled 'Iridium Modem: Edit - Google Chrome'. The address bar shows a URL from 'pacx.wgms.com'. The page has a blue header with the 'Iridium Modem: Edit' title. On the left is a sidebar with a tree view containing 'Record Info', 'Sub Parts', 'Audit Records', and 'Notes'. The main content area is divided into two sections: 'Part Info' and 'Related Information'. The 'Part Info' section contains fields for Part Name (Iridium Modem), Parent Part (Float), Revision, Build Date, Expected Life Time (0 minutes), Part Number, Remaining Life Time (0 minutes), Serial Number (300025010508020), LR Serial Number, Type (Iridium Modem), Vehicle (Bench Rev 3C), and Manufacturer Type (9522B). The 'Related Information' section contains fields for Owner, Organization (Gliders), Created On (2008/... 19:15...), Updated On (2011/... 23:52...), Created By (System Admin), and Updated By (Jim Kirklin).

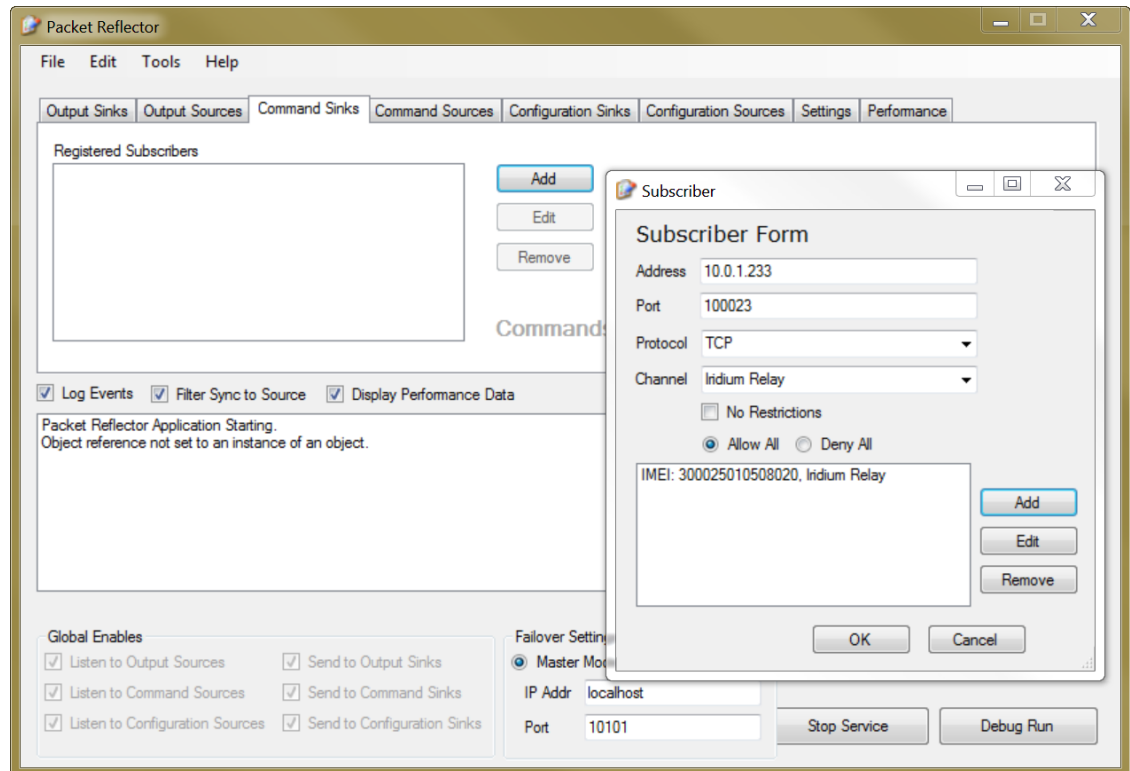
16. Select the Wave Glider communication Channel that you do not want to receive command packets on. There are 7 preconfigured options and 4 custom options, as follows:

- **Packet Reflector/COM Server**
- **Iridium Relay**
- **X Bee Relay**
- **Serial Relay**
- **Wiki Relay**
- **Alt Iridium Relay**
- **Iridium EMSS Relay**
- **Custom Relay Type 7**
- **Custom Relay Type 8**
- **Custom Relay Type 9**

• **Custom Relay Type 10**

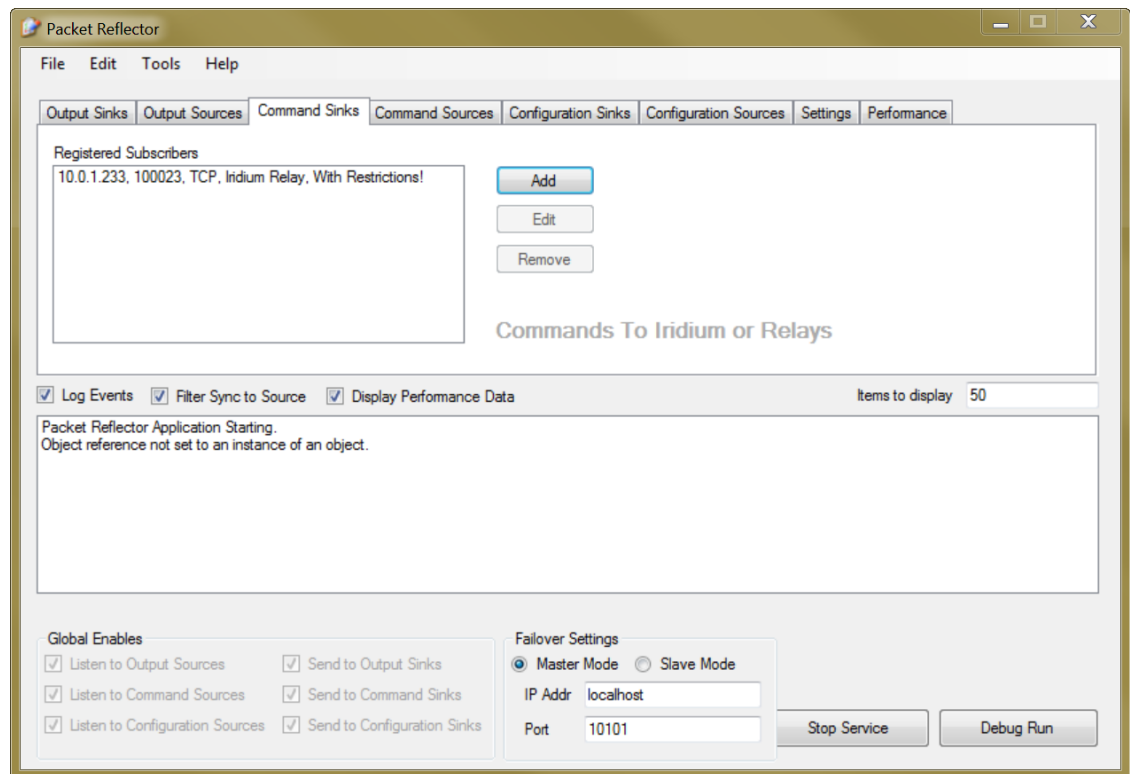
17. Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as a denied command source.

Figure 4.35. Adding a Restriction to the Subscriber Form



18. Click **OK** on the **Subscriber Form** and the new restricted subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** tab on the packet reflector Home Screen.

Figure 4.36. Adding a Restricted Subscriber



Editing Registered Subscribers

To edit a registered subscriber:

1. Select a subscriber in the **Registered Subscribers** list and click **Edit** - a **Subscriber Form** containing the configuration parameters for the selected subscriber will appear.
2. Make edits to the **Address**, **Port**, **Protocol**, and **Channel** fields, as needed.
3. If the **No Restrictions** check-box is selected and you do not need to add any restrictions to the subscriber configuration, click **OK** and the edited subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** tab on the packet reflector Home screen.

If you need to add or edit restrictions to limit the Wave Glider communication channels the subscriber can receive data from, perform the following steps:

4. Deselect the **No Restrictions** check-box, select the **Allow All** radio button, and click **Add**. The **Restriction Form** will appear.
5. Make edits to the **Unique Id**, **IMEI**, and **Channel** fields, as needed.
6. Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as an allowed command source.

7. Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** tab on the packet reflector Home Screen.

If you need to add or edit restrictions to prevent the Wave Glider from receiving command packets over specific communication channels, perform the following steps:

8. Deselect the **No Restrictions** check-box, select the **Deny All** radio button, and click **Add**. The **Restriction Form** will appear.
9. Make edits to the **Unique Id**, **IMEI**, and **Channel** fields, as needed.
10. Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as a denied command source.
11. Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** tab on the packet reflector Home Screen.

Removing Registered Subscribers

To delete a registered subscriber from the packet reflector configuration, select a registered subscriber in the **Registered Subscribers** list and click **Remove**.

Configuring Command Sources

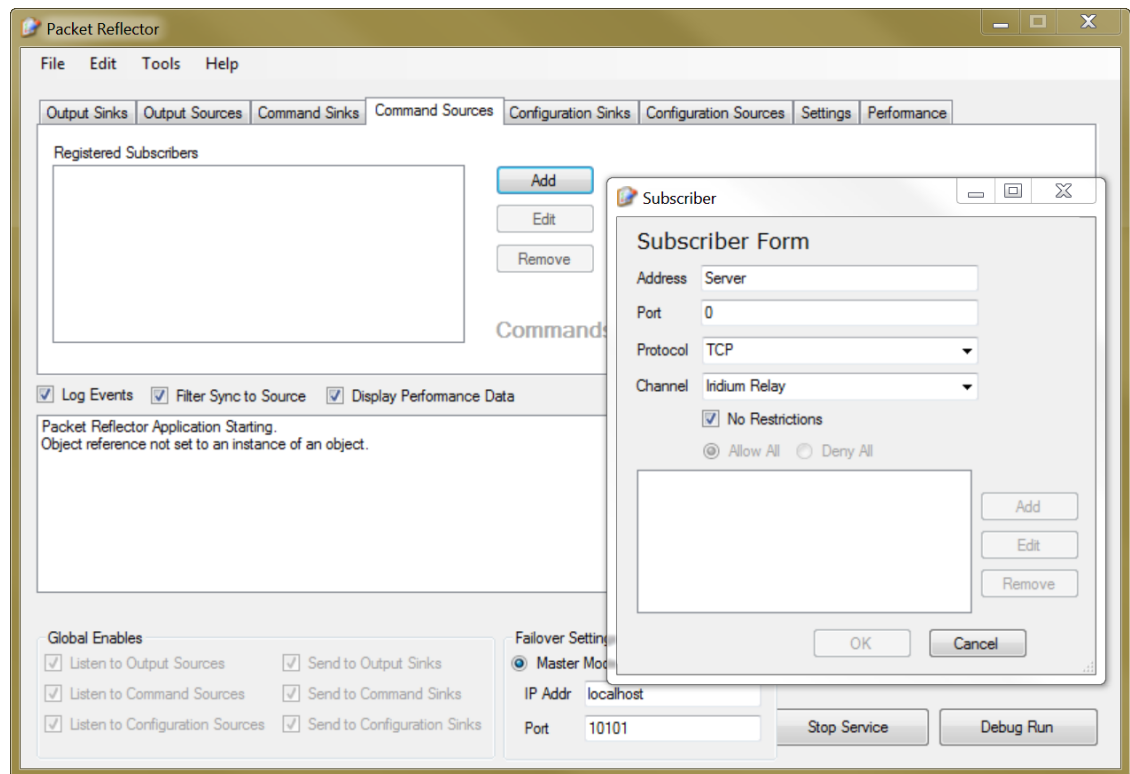
Packet reflector command sources are subscribers registered to send command data packets to packet reflector command sinks. When you click on the **Command Sources** tab, the **Registered Subscribers** list appears in the configuration window. Registered subscribers can be added, edited, or removed.

Adding Registered Subscribers

To add a registered subscriber:

1. Click **Add** and the Subscriber Form will appear.

Figure 4.37. Adding a Registered Subscriber

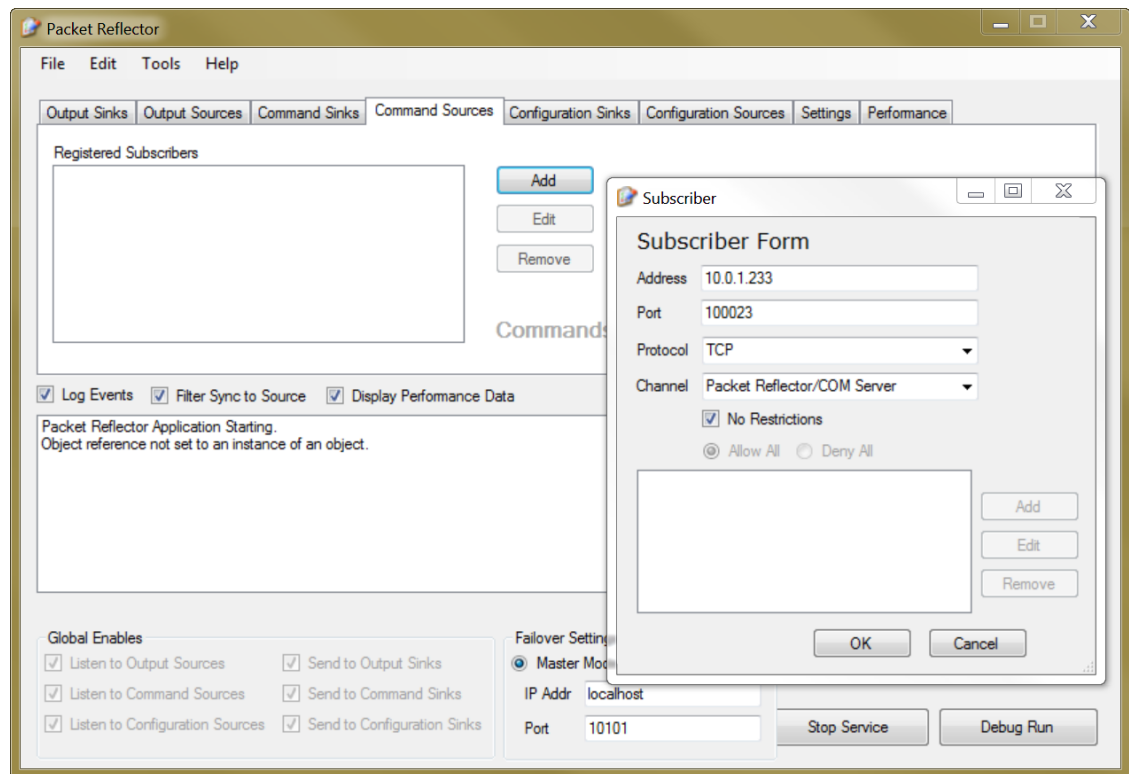


2. Enter the **Address** (IP address or Fully Qualified Domain Name) of the subscriber.
3. Enter the **Port** used to access the subscriber.
4. Select the data transmission protocol (TCP or UDP) to be used from the **Protocol** drop-down menu.
5. Select the data transmission channel to be used from the **Channel** drop-down menu. There are 7 preconfigured options and 4 custom options, as follows:

- **Packet Reflector/COM Server**
- **Iridium Relay**
- **XBee Relay**
- **Serial Relay**
- **WiFi Relay**
- **Alt Iridium Relay**
- **Iridium EMSS Relay**
- **Custom Relay Type 7**
- **Custom Relay Type 8**

- **Custom Relay Type 9**
 - **Custom Relay Type 10**
6. The **No Restrictions** check-box is selected by default. If you do not want to restrict the Wave Glider communication channels command packets can be transmitted over, click **OK** and the new unrestricted subscriber will be added to the **Registered Subscribers** list under the **Command Sources** configuration tab on the packet reflector Home Screen.

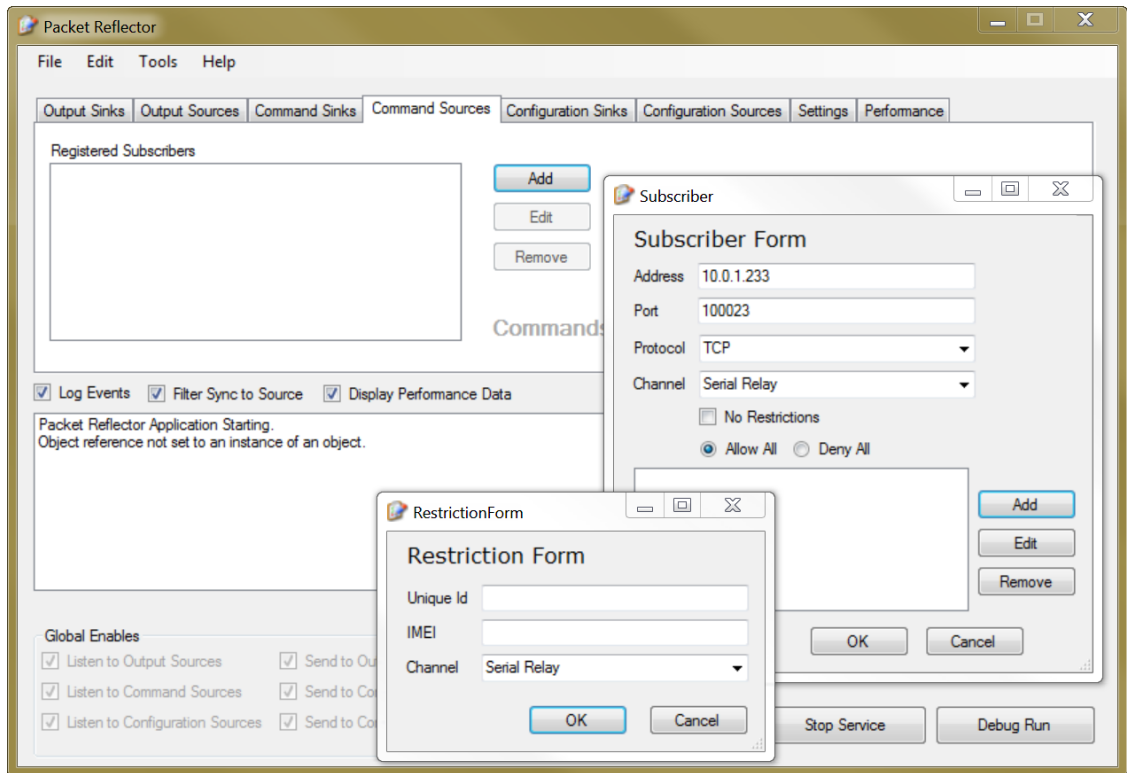
Figure 4.38. Adding a Registered Subscriber - No Restrictions



The following steps explain how you can configure restrictions to limit the Wave Glider communication channels that can receive command packets from the subscriber:

7. If you want to limit the Wave Glider communication channels that can receive command packets, deselect the **No Restrictions** check-box, select the **Allow All** radio button, and click **Add**. The **Restriction Form** will appear.

Figure 4.39. Adding a Registered Subscriber - Restricted Allow All



8. Enter the **Unique Id** for the Wave Glider that you want to restrict command packets transmissions to. You can find this information in the **Vehicle Info** screen on WGMS - click **Vehicle Unique Id**, then click **Edit Part** and the **Part Info** screen will appear. Enter the vehicle **Serial Number** from the **Part Info** screen into the **Unique Id** field in the **Restriction Form**.

Figure 4.40. Wave Glider Vehicle Info - Vehicle Unique Id

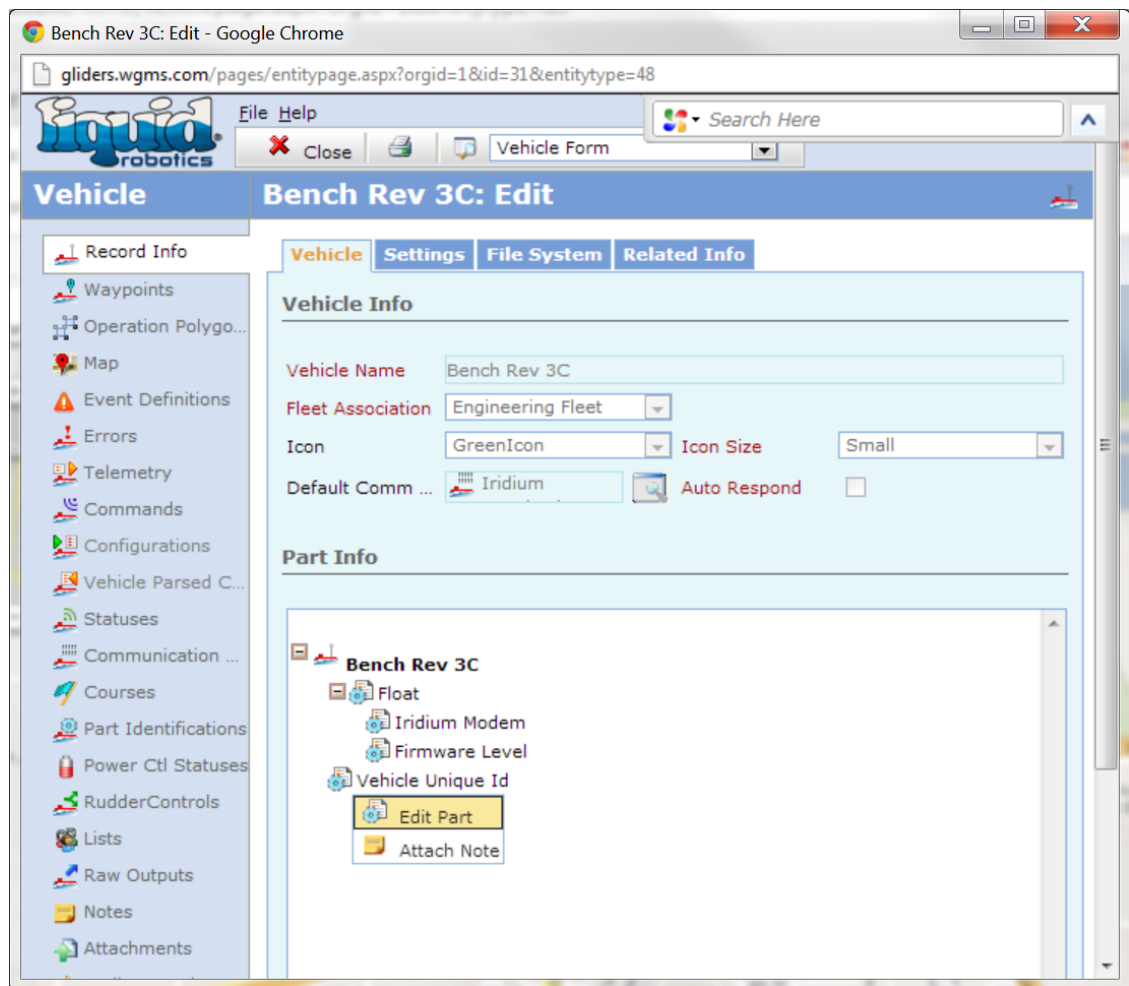


Figure 4.41. Vehicle Unique Id - Part Info

Vehicle Unique Id: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?orgid=1&id=1834&entitytype=49&parenttype=48&parentid=31&vehicleid=31

Part **Vehicle Unique Id: Edit**

Record Info
Sub Parts
Audit Records
Notes

Part Info

Part Name: Vehicle Unique Id

Parent Part: [] Revision: []

Build Date: [] Expected Life T...: []

Part Number: [] Remaining Life...: []

Serial Number: 1094795585 LR Serial Num...: []

Type: Unique Id Vehicle Bench Rev 3C

Manufacturer T...: Not Specified

Related Information

Owner: [] Organization: Gliders

Created On: 201... 15:3... Updated On: 201... 21:...

Created By: System Admin Updated By: System Admin

9. Enter the International Mobile Station Equipment Identity (**IMEI**) that identifies the Iridium modem on the Wave Glider that you want to restrict command packet transmissions to. You can find this information in the **Vehicle Info** screen on WGMS - click **Iridium Modem**, then click **Edit Part** and the **Part Info** screen will appear. Enter the Iridium modem **Serial Number** from the **Part Info** screen into the **IMEI** field in the **Restriction Form**.

Figure 4.42. Wave Glider Vehicle Info - Iridium Modem

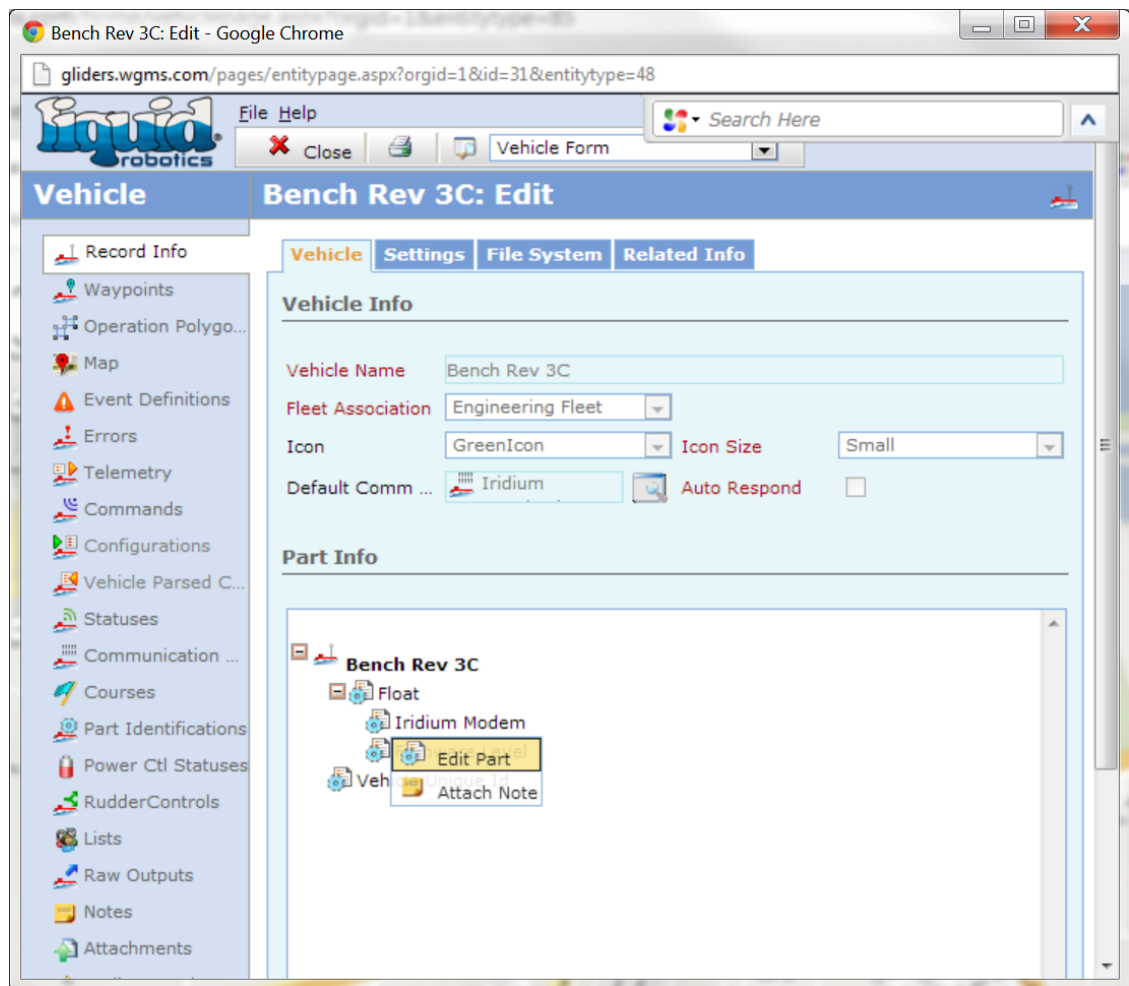


Figure 4.43. Iridium Modem - Part Info

The screenshot shows a web browser window titled 'Iridium Modem: Edit - Google Chrome'. The address bar shows the URL: `pacx.wgms.com/pages/EntityPage.aspx?orgid=1&id=319&entitytype=49&parenttype=49&parentid=318&vehicleid=31`. The page has a blue header with the 'Iridium Modem: Edit' title. On the left is a sidebar with links: 'Record Info', 'Sub Parts', 'Audit Records', and 'Notes'. The main content area is titled 'Part Info' and contains the following fields:

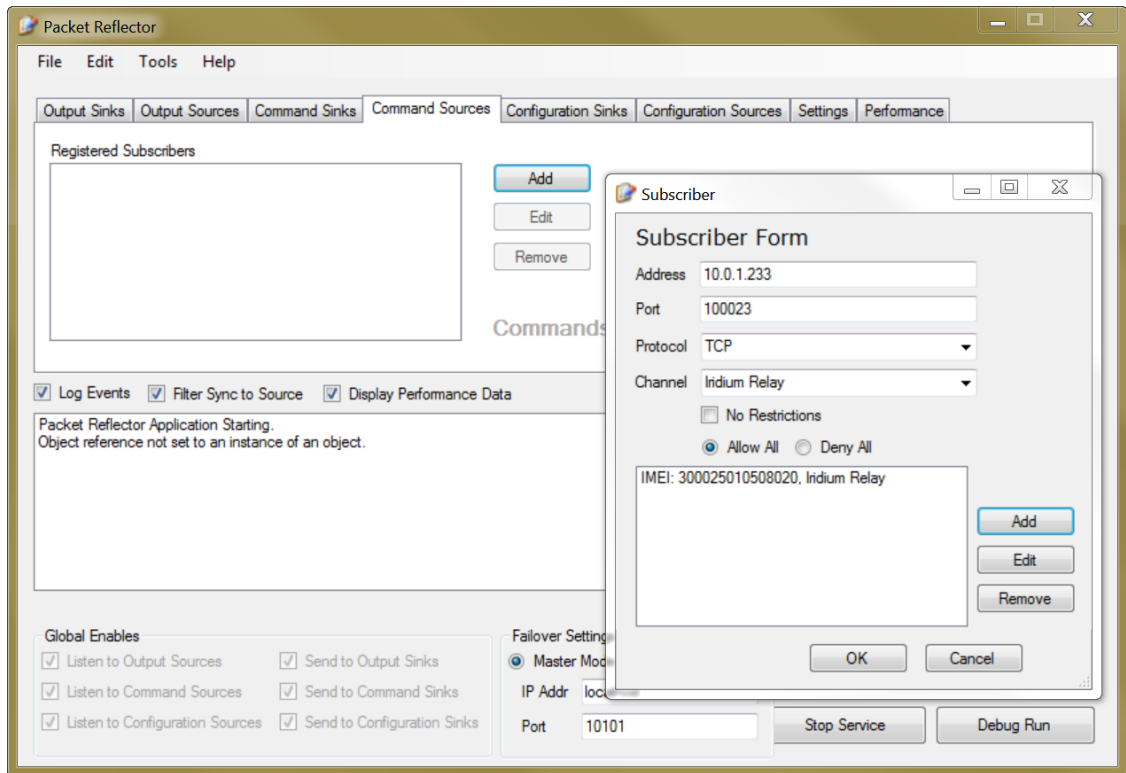
Part Name	Iridium Modem		
Parent Part	Float	Revision	
Build Date		Expected Life Time	0 minutes
Part Number		Remaining Life Ti...	0 minutes
Serial Number	300025010508020		LR Serial Number
Type	Iridium Modem	Vehicle	Bench Rev 3C
Manufacturer Type	9522B		

Below the 'Part Info' section is a 'Related Information' section with the following fields:

Owner		Organization	Gliders
Created On	2008/... 19:15...	Updated On	2011/... 23:52...
Created By	System Admin	Updated By	Jim Kirklin

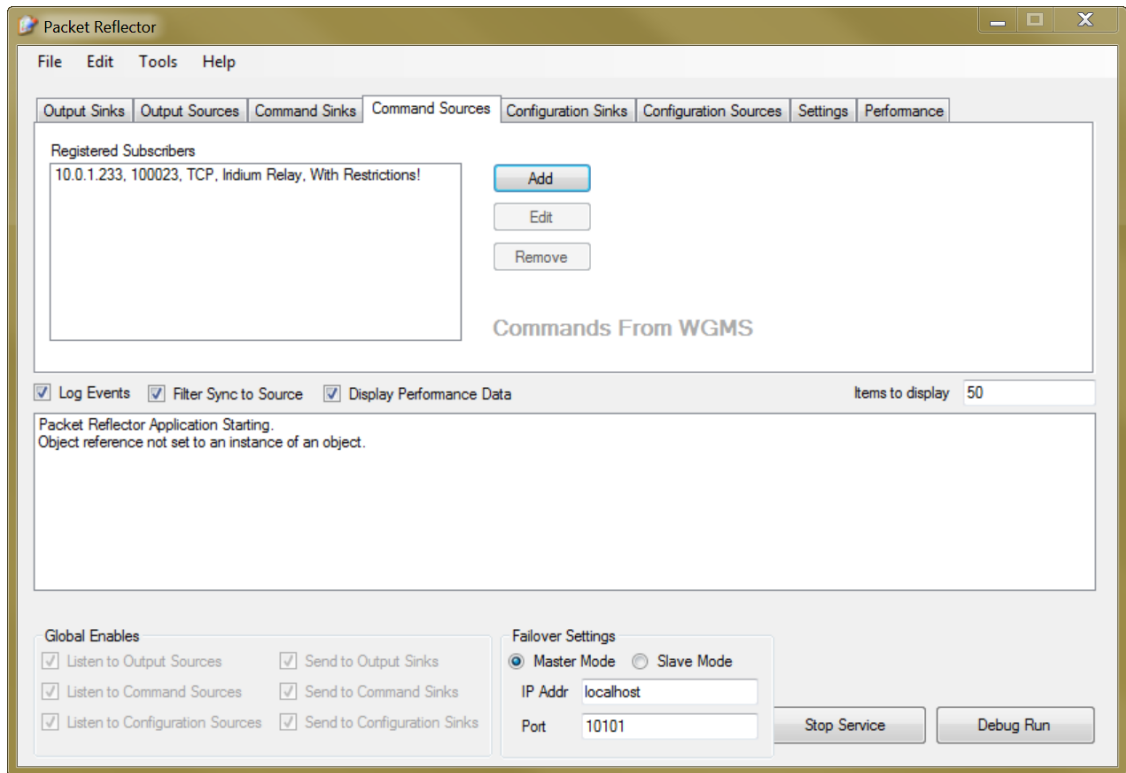
10. Select the Wave Glider communication Channel that you want to receive command packets over. There are 7 preconfigured options and 4 custom options, however, only the **Packet Reflector/COM Server** data transmission channel is supported when restricting command source subscribers. You must select the **Packet Reflector/COM Server** option.
11. Click **OK** on the **Restriction Form** and the Wave Glider communication channel will be added to the **Subscriber Form** as an allowed command source.

Figure 4.44. Adding a Restriction to the Subscriber Form



12. Click **OK** on the **Subscriber Form** and the new allowed subscriber will be added to the **Registered Subscribers** list under the **Command Sinks** tab on the packet reflector Home Screen.

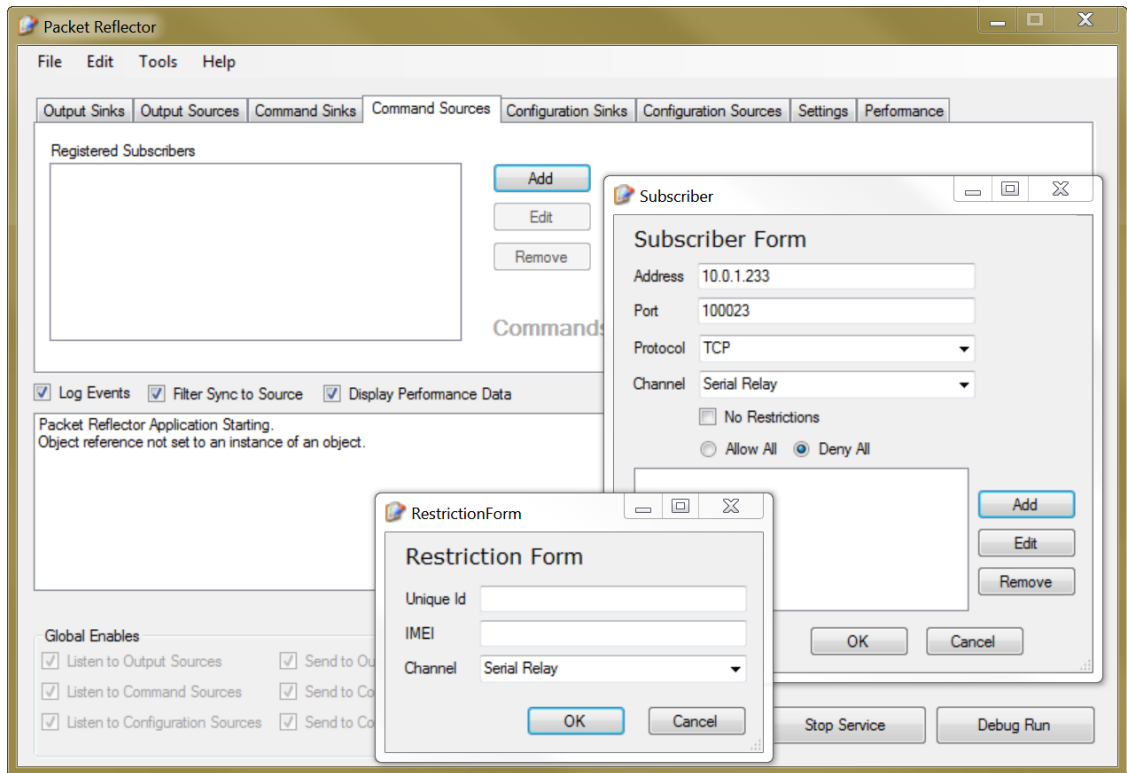
Figure 4.45. Adding a Restricted Subscriber



The following steps explain how you can configure restrictions to prevent the Wave Glider from receiving command packets over specific communications channels:

13. If you want to prevent the Wave Glider from receiving command packets over one or more specific communications channels, deselect the **No Restrictions** check-box, select the **Deny All** radio button, and click **Add**. The **Restriction Form** will appear.

Figure 4.46. Adding a Registered Subscriber - Restricted Deny All



14. Enter the **Unique Id** for the Wave Glider that you want to restrict command packet transmissions to. You can find this information in the **Vehicle Info** screen on WGMS - click **Vehicle Unique Id** , then click **Edit Part** and the **Part Info** screen will appear. Enter the vehicle **Serial Number** from the **Part Info** screen into the **Unique Id** field in the **Restriction Form**.

Figure 4.47. Wave Glider Vehicle Info - Vehicle Unique Id

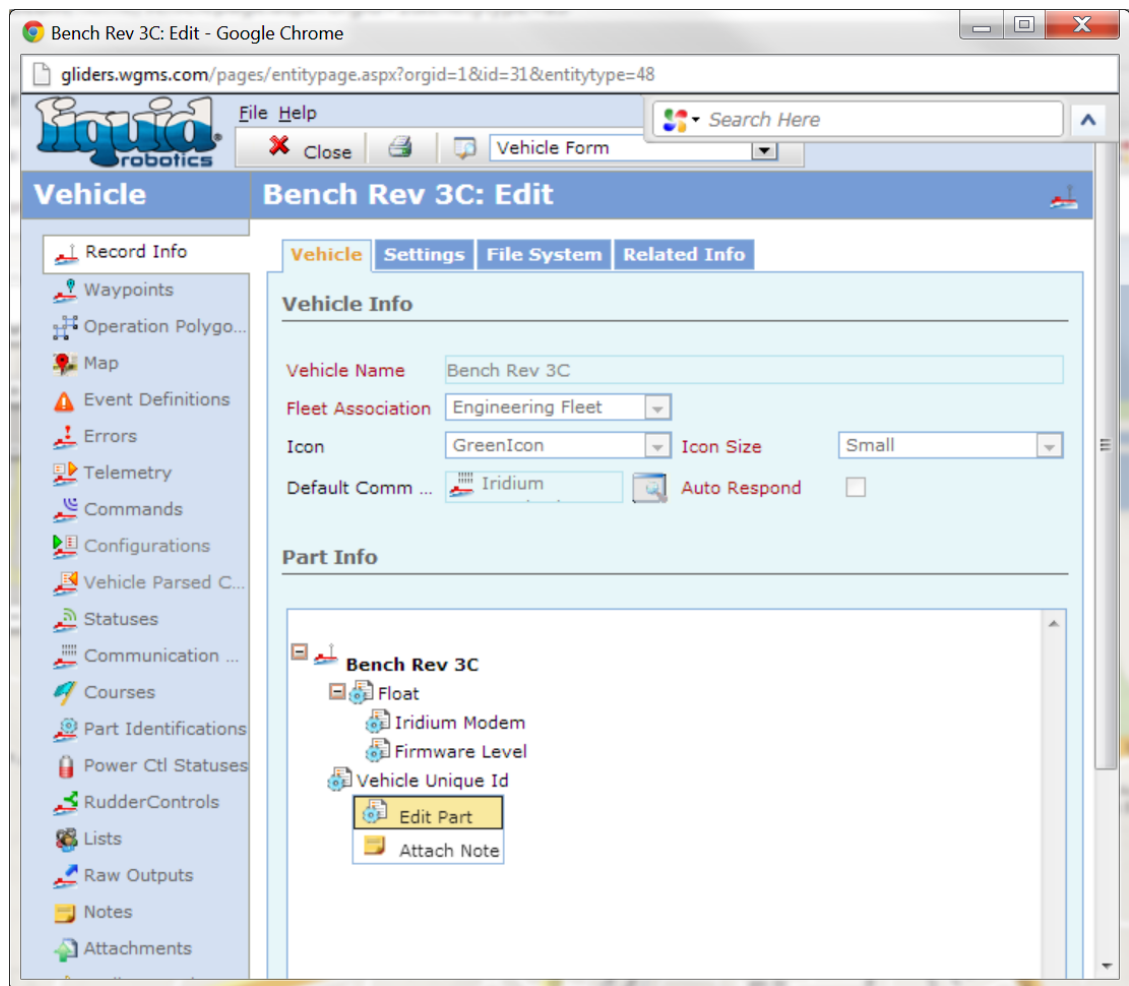


Figure 4.48. Vehicle Unique Id - Part Info

Vehicle Unique Id: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?orgid=1&id=1834&entitytype=49&parenttype=48&parentid=31&vehicleid=31

Part **Vehicle Unique Id: Edit**

Record Info
Sub Parts
Audit Records
Notes

Part Info

Part Name: Vehicle Unique Id

Parent Part: [] Revision: []

Build Date: [] Expected Life T...: []

Part Number: [] Remaining Life...: []

Serial Number: 1094795585 LR Serial Num...: []

Type: Unique Id Vehicle Bench Rev 3C

Manufacturer T...: Not Specified

Related Information

Owner: [] Organization: Gliders

Created On: 201... 15:3... Updated On: 201... 21:3...

Created By: System Admin Updated By: System Admin

15. Enter the International Mobile Station Equipment Identity (**IMEI**) that identifies the Iridium modem on the Wave Glider that you want to restrict command packet transmissions to. You can find this information in the **Vehicle Info** screen on WGMS - click **Iridium Modem**, then click **Edit Part** and the **Part Info** screen will appear. Enter the Iridium modem **Serial Number** from the **Part Info** screen into the **IMEI** field in the **Restriction Form**.

Figure 4.49. Wave Glider Vehicle Info - Iridium Modem

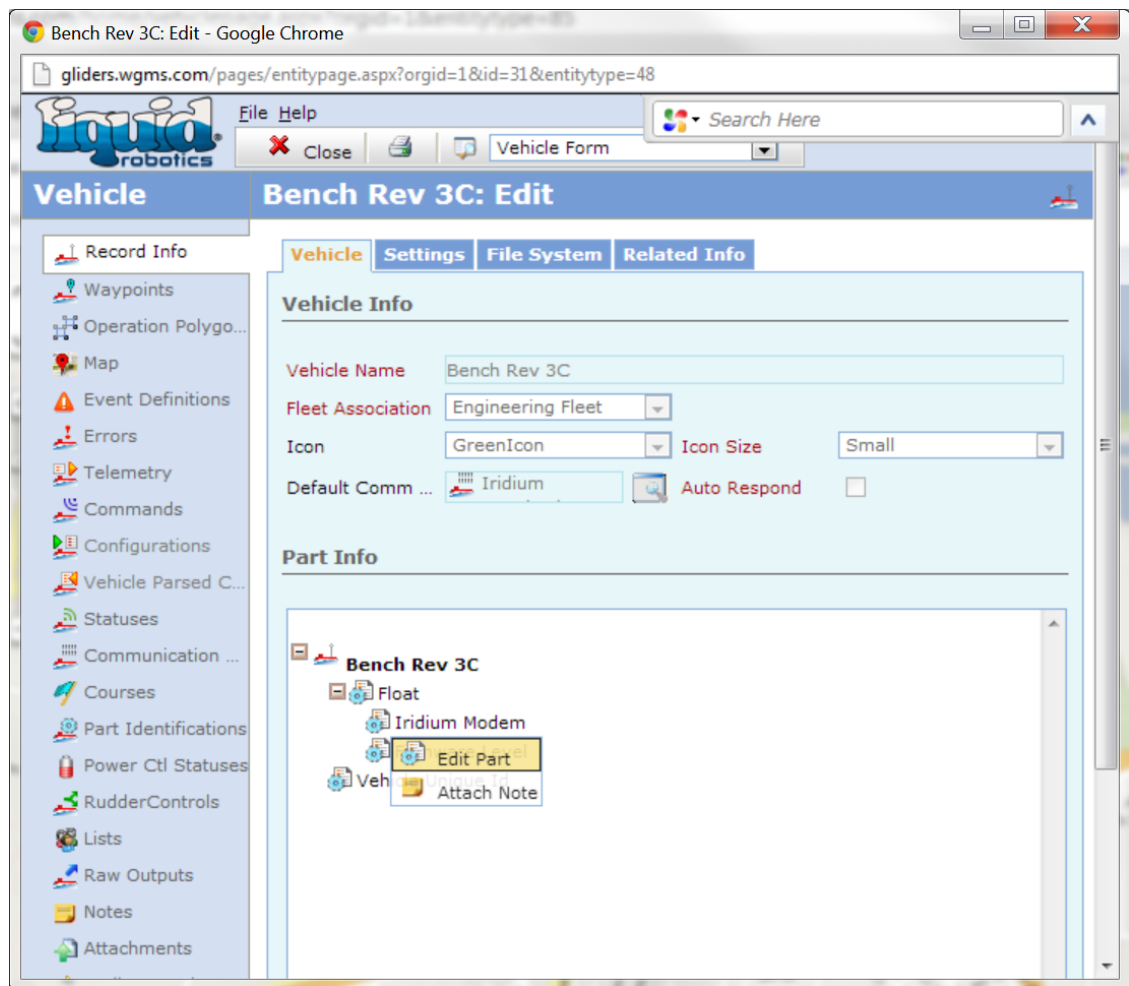


Figure 4.50. Iridium Modem - Part Info

The screenshot shows a web browser window titled 'Iridium Modem: Edit - Google Chrome'. The address bar shows the URL: `pacx.wgms.com/pages/EntityPage.aspx?orgid=1&id=319&entitytype=49&parenttype=49&parentid=318&vehicleid=31`. The page has a blue header with the 'Iridium Modem: Edit' title. On the left, there is a sidebar with links: 'Record Info', 'Sub Parts', 'Audit Records', and 'Notes'. The main content area is titled 'Part Info' and contains the following fields:

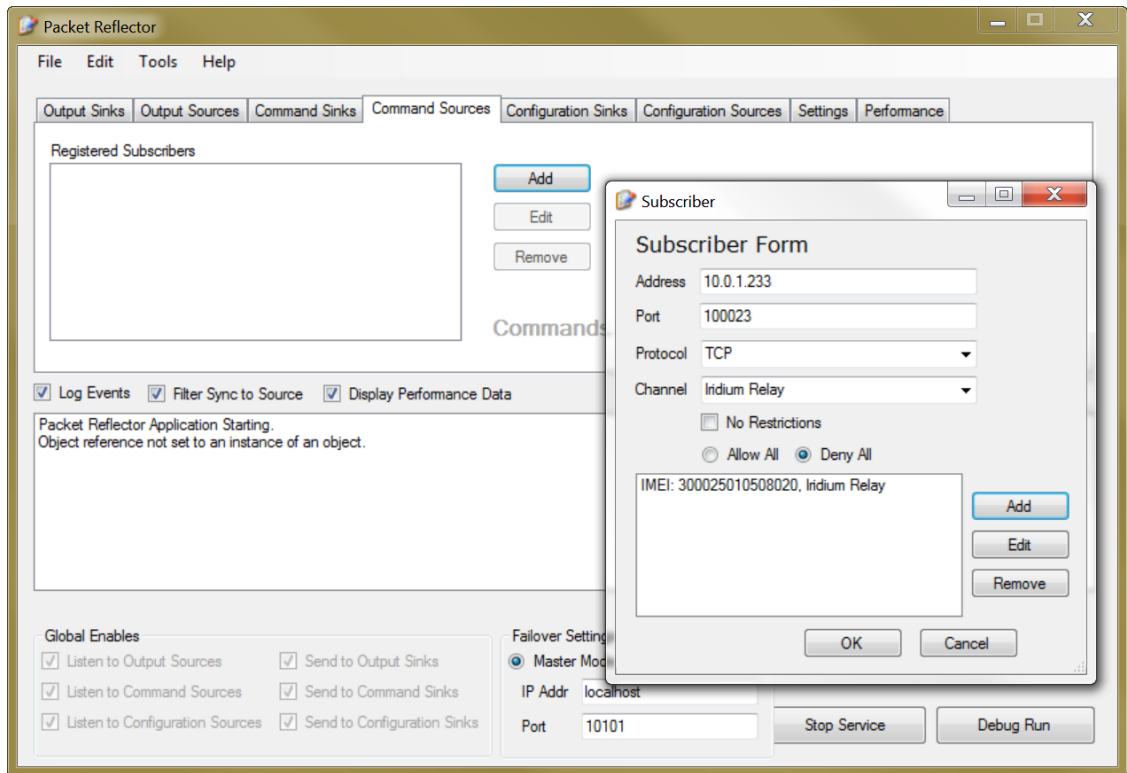
- Part Name:** Iridium Modem
- Parent Part:** Float
- Build Date:** [Calendar icon]
- Part Number:** [Text input]
- Serial Number:** 300025010508020
- Type:** Iridium Modem
- Manufacturer Type:** 9522B
- Revision:** [Text input]
- Expected Life Time:** 0 minutes
- Remaining Life Ti...:** 0 minutes
- LR Serial Number:** [Text input]
- Vehicle:** Bench Rev 3C

Below the 'Part Info' section is a 'Related Information' section with the following fields:

- Owner:** [Text input]
- Organization:** Gliders
- Created On:** 2008/... 19:15...
- Updated On:** 2011/... 23:52...
- Created By:** System Admin
- Updated By:** Jim Kirklin

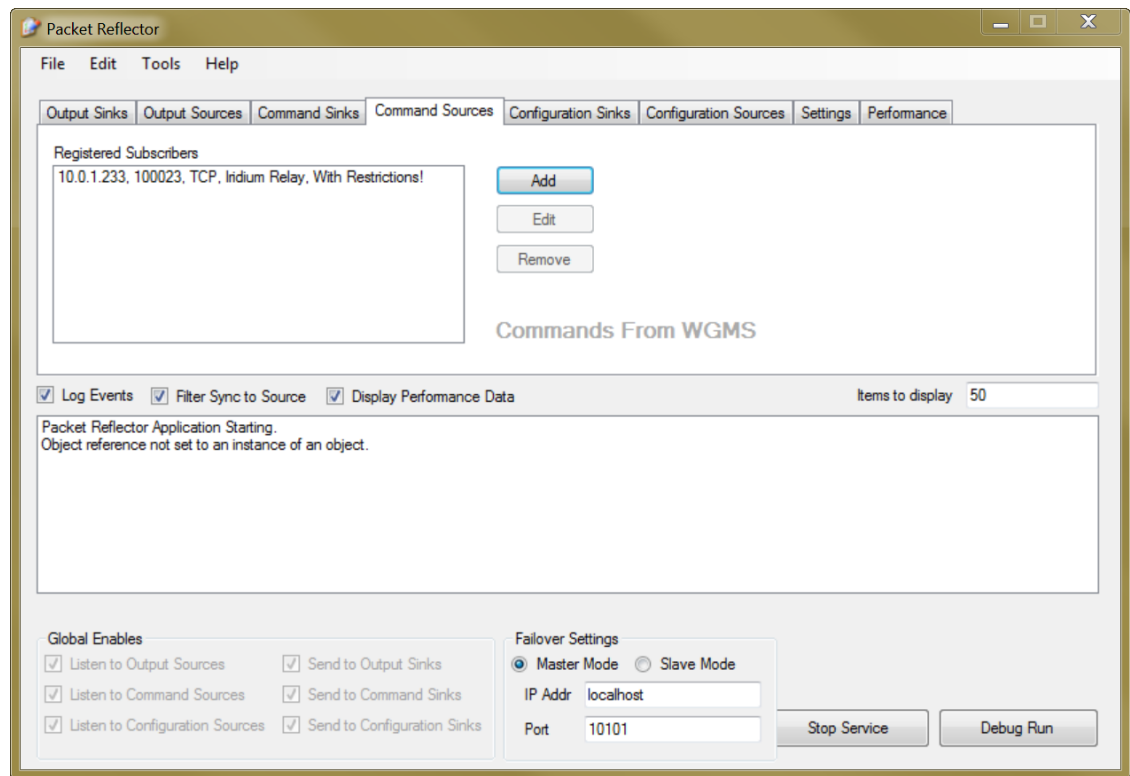
16. Select the Wave Glider communication channel that you do not want to receive command packets over. There are 7 preconfigured options and 4 custom options, however, only the **Packet Reflector/COM Server** data transmission channel is supported when restricting command source subscribers. You must select the **Packet Reflector/COM Server** option.
17. Click **OK** on the **Restriction Form** and the Wave Glider communications channel will be added to the **Subscriber Form** as a denied command source.

Figure 4.51. Adding a Restriction to the Subscriber Form



18. Click **OK** on the **Subscriber Form** and the new restricted subscriber will be added to the **Registered Subscribers** list under the **Command Sources** tab on the packet reflector Home Screen.

Figure 4.52. Adding a Restricted Subscriber



Editing Registered Subscribers

To edit a registered subscriber:

1. Select a subscriber in the **Registered Subscribers** list and click **Edit** - a **Subscriber Form** containing the configuration parameters for the selected subscriber will appear.
2. Make edits to the **Address**, **Port**, **Protocol**, and **Channel** fields, as needed.
3. If the **No Restrictions** check-box is selected and you do not need to add any restrictions to the subscriber configuration, click **OK** and the edited subscriber will be added to the **Registered Subscribers** list under the **Command Sources** tab on the packet reflector Home screen.

If you need to add or edit restrictions to limit the Wave Glider communications channels that the subscriber can send data to, perform the following steps:

4. Deselect the **No Restrictions** check-box, select the **Allow All** radio button, and click **Add**. The **Restriction Form** will appear.
5. Make edits to the **Unique Id**, **IMEI**, and **Channel** fields, as needed.
6. Click **OK** on the **Restriction Form** and the allowed Wave Glider communication channel will be added to the **Subscriber Form**.

7. Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Command Sources** tab on the packet reflector Home Screen.

If you need to add or edit restrictions to prevent command packets from being received over specific Wave Glider communications channels, perform the following steps:

8. Deselect the **No Restrictions** check-box, select the **Deny All** radio button, and click **Add**. The **Restriction Form** will appear.
9. Make edits to the **Unique Id**, **IMEI**, and **Channel** fields, as needed.
10. Click **OK** on the **Restriction Form** and the denied Wave Glider communication channel will be added to the **Subscriber Form**.
11. Click **OK** on the **Subscriber Form** and the edited restricted subscriber will be added to the **Registered Subscribers** list under the **Command Sources** tab on the packet reflector Home Screen.

Removing Registered Subscribers

To delete a registered subscriber from the packet reflector configuration, select a registered subscriber in the **Registered Subscribers** list and click **Remove**.

Configuration Sinks

The Configuration Sinks tab is not used with current Wave Glider models. Do not make any configuration settings under this tab.

Configuration Sources

The Configuration Sources tab is not used with current Wave Glider models. Do not make any configuration settings under this tab.

Settings

The information necessary for WGMS and Wave Gliders to communicate through the packet reflector is configured from the **Settings** tab.

Setting up a Packet Reflector

1. To set up an instance of the packet reflector, click **Settings** from the packet reflector Home screen to open the **Settings** tab.

Figure 4.53. Settings Tab

2. In the **Server URL** field, enter the URL for the WGMS system that stores the packet reflector settings and the WSDL (web services API definition - /webservices/entityAPI.asmx).
3. Enter the email address for the packet reflector administrator in the **Email** field.
4. Enter the WGMS password associated with the email address from Step 3 in the **Password** field.
5. Enter the internal name for your WGMS organization in the **Org Internal Name** field, in most cases this will be set to **liquidr**.
6. Enter the name for the packet reflector you are setting up in the **Packet Reflector Name** field.
7. Enter the IP address for the packet reflector you are setting up in the **Packet Reflector Address** field.
8. Enter the virtual relay port number in the **Virtual Relay Port** field. For a single server machine enter 643. For a dedicated server configuration enter 443.
9. Click **File -> Save To File** on the Windows Menu Bar to save the packet reflector configuration file on your system.

Click the **Save to WGMS** button to save the packet reflector configuration in WGMS.

Other Items under the packet reflector **Settings** tab:

- **Retrieve from WGMS Button** - Click on **Retrieve from WGMS** to select a packet reflector configuration you want to retrieve to run or to edit.
- **Settings Button** - Typically the **Settings** button is not used, however under certain circumstances it can be used to edit the Machine Name. Consult with Liquid Robotics support before making any changes using the **Settings** button.
- **Get/Flush Clients** - Click **Get Clients...** to display a list of subscribers that are in **Encrypted Communication** mode (only when the packet reflector is running).

When the packet reflector is running it caches encryption clients. Clients can be flushed one at a time. Scroll in the clients window to select a client you want to remove, then highlight the client name and click **Flush Client...** When a client has been flushed, the subscriber is forced to re-fetch the encryption keys from WGMS.

Editing Packet Reflector Settings

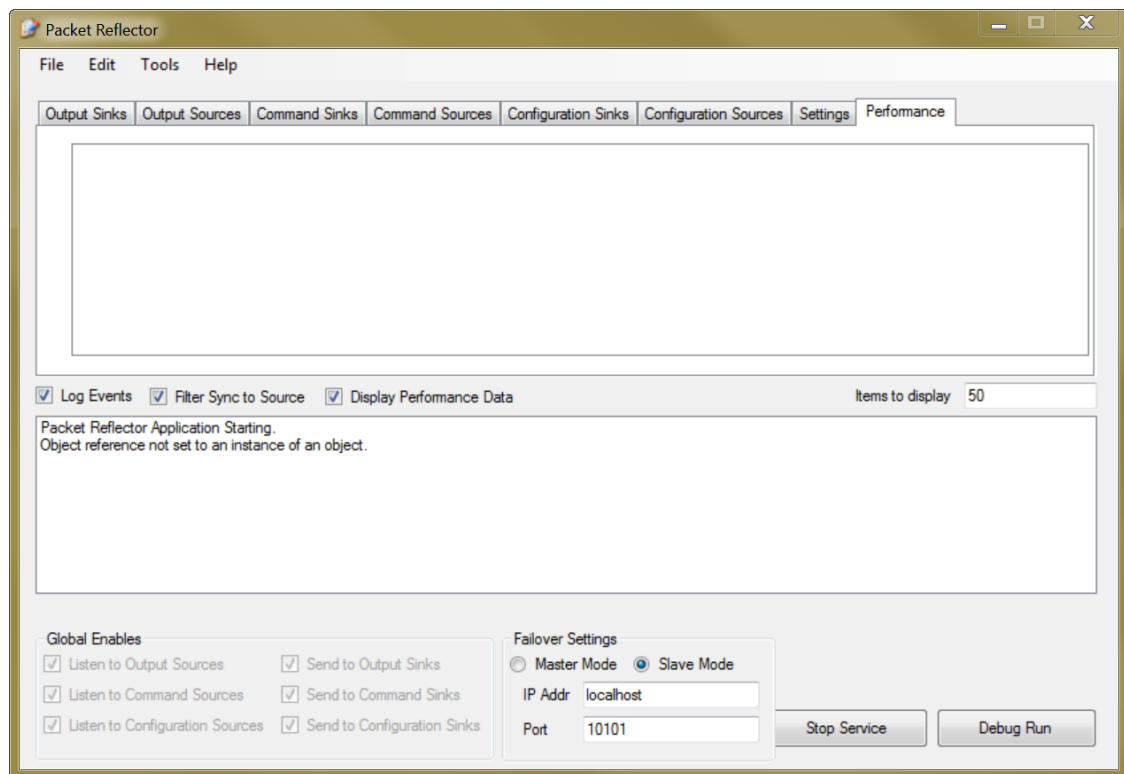
To edit an existing packet reflector configuration:

1. From the Settings tab on the Home screen, select a packet reflector configuration file:
 - By clicking **File** -> **Open** from the Windows Menu Bar and selecting the packet reflector configuration file you want to open.
 - By clicking on **Retrieve from WGMS** under the **Settings** tab on the Packet Reflector Home screen and selecting the packet reflector configuration you want to retrieve.
2. Click **Settings** to populate the fields in the Settings tab with the settings for the packet reflector you selected for editing.
3. Edit the settings fields that you want to change, then click save the edited packet reflector configuration.

Performance

The **Display Performance Data** check-box in the Home Screen Log window must be selected if you want performance data to be displayed under the **Performance** tab in the Home Screen Configuration window. When the **Display Performance Data** check-box is selected and you click the **Performance** tab on the Home Screen, the Performance window appears displaying the queue depths for packets on all subscribers.

Figure 4.54. Performance Window



Chapter 5. Configuring the Virtual Relay Server

A Liquid Robotics Virtual Relay Server is required when you want to establish a direct radio communications link between one or more Wave Gliders and one or more WGMS instances.

Examples of Wave Glider radio communications methods that require the Virtual Relay Server include:

- Mobile WGMS (Racom Radio)
- WiFi
- Iridium RUDICS
- BGAN
- Cell

Typically a Virtual Relay Server and a Packet Reflector are installed on a PC along with a WGMS instance, and a Virtual Relay Client is installed (on a SMC) on each Wave Glider vehicle. The Virtual Relay Server consists of a Virtual Relay Service that runs in the background, and a Virtual Relay Application that you use to configure and manage the Virtual Relay Service. When the Virtual Relay Service is started, it will continue running any time your PC is running, until you deliberately stop the service using the Stop Service function in the Virtual Relay Application.

Regardless of the radio communications method, the TCP/IP protocol is used for data transmissions between WGMS and a vehicle. The LRI Virtual Relay protocol rides on top of the TCP/IP protocol to support encryption and to ensure messages are received by their specified recipients.

Communications between the Virtual Relay Server and WGMS are transmitted through a Packet Reflector in an LRI Data Packet format over TCP/IP.



Note

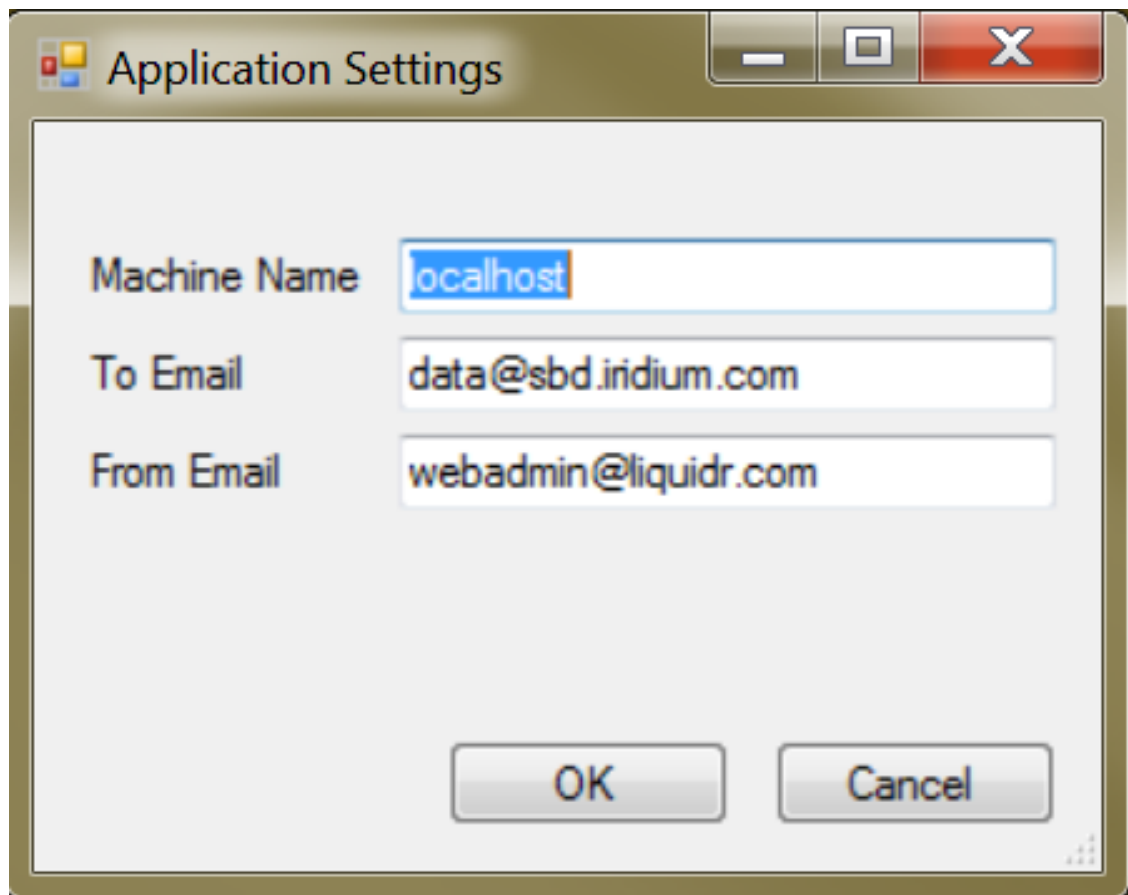
In the case of Mobile WGMS, vehicles must have multiple instances of the Virtual Relay Client installed - one for each instance of WGMS that the vehicle can communicate with.

Virtual Relay Server Configuration Procedure

The Virtual Relay Server and Virtual Relay Clients are factory installed by Liquid Robotics. Use the following procedure to configure a Virtual Relay Server:

1. Click on the  **Virtual Relay Application** icon on your desktop to open the **Application Settings** window.

Figure 5.1. Application Settings Window



2. Accept all default settings and click **OK** - the **Virtual Relay Server** screen will appear. The **Management** tab is selected by default.

If you click on the **Configuration** tab, the **Output Sources**, **Output Sinks**, and **Command Sources** fields will be empty.

Figure 5.2. Virtual Relay Server Main Screen - Management Tab Before Configuration

The screenshot shows the 'Virtual Relay Server' application window with the 'Management' tab selected. The 'Configuration' sub-tab is active, displaying various input fields for server settings. The 'Server URL' field contains 'https://YourServerUrl/webservices/EntityAPI.asmx'. The 'Email' field contains 'webadmin@liquidr.com'. The 'Password' field is masked with dots. The 'Org Internal Name' field contains 'liquidr'. The 'Relay Name' field contains 'Virtual Relay Server'. The 'Virtual Relay Port' field contains '643'. The 'Packet Reflector Address' field contains '10.10.1.41'. A 'Settings' button is located below the input fields. Below the input fields, there are checkboxes for 'Log Events' and 'Filter Messages', both of which are checked. To the right of these checkboxes is a dropdown menu for 'Items to display' set to '50'. At the bottom of the window, there are two buttons: 'Start Service' and 'Debug Run'. The status bar at the bottom of the window displays 'Virtual Relay Application Starting.'

Virtual Relay Server

File Edit Tools Help

Management Configuration

Server URL

Email

Password

Org Internal Name

Relay Name

Virtual Relay Port

Packet Reflector Address

Settings

Relay Settings

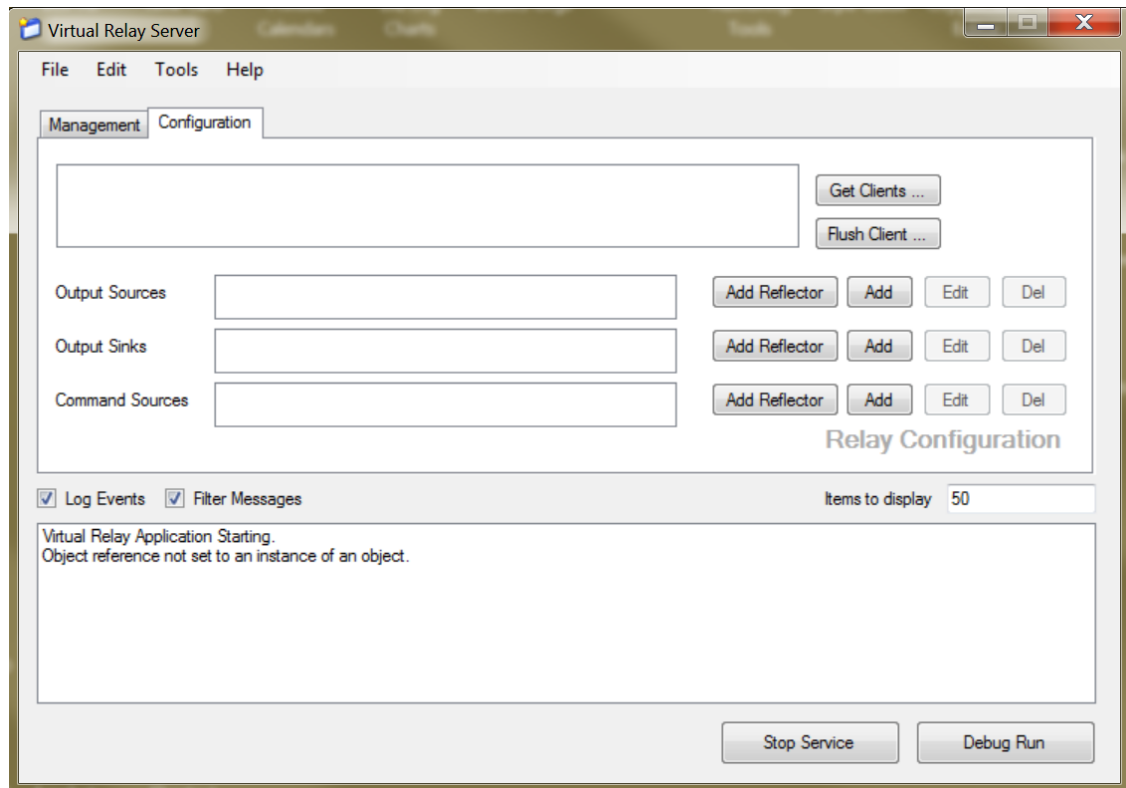
☒ Log Events ☒ Filter Messages

Items to display

Virtual Relay Application Starting.

Start Service Debug Run

Figure 5.3. Virtual Relay Server Main Screen - Configuration Tab Before Configuration



3. In the tool bar of the **Virtual Relay Server** main screen, click on **File > Open > C: > config** and select the **Virtual Relay settings.vrx** file, then click **Open**. The **Virtual Relay settings.vrx** file will correctly populate the fields in both the **Management** and **Configuration** tabs of the Virtual Relay Server screen.

Figure 5.4. Virtual Relay Server Main Screen - Management Tab After Configuration

The screenshot shows the 'Virtual Relay Server' application window with the 'Management' tab selected. The 'Configuration' sub-tab is active, displaying various input fields for server settings. The 'Server URL' is set to 'https://mobilewgms1/webservices/EntityAPI.asmx', 'Email' to 'webadmin@liquidr.com', and 'Password' is masked with dots. The 'Org Internal Name' is 'liquidr' and the 'Relay Name' is 'Virtual Relay Server'. On the right, the 'Virtual Relay Port' is '643' and the 'Packet Reflector Address' is '10.10.2.75'. A 'Settings' button is located below the main configuration fields. Below this, there are checkboxes for 'Log Events' and 'Filter Messages', both of which are checked, and a dropdown for 'Items to display' set to '50'. A status bar at the bottom indicates 'Virtual Relay Application Starting.' and contains 'Start Service' and 'Debug Run' buttons.

Virtual Relay Server

File Edit Tools Help

Management Configuration

Server URL

Email

Password

Org Internal Name Virtual Relay Port

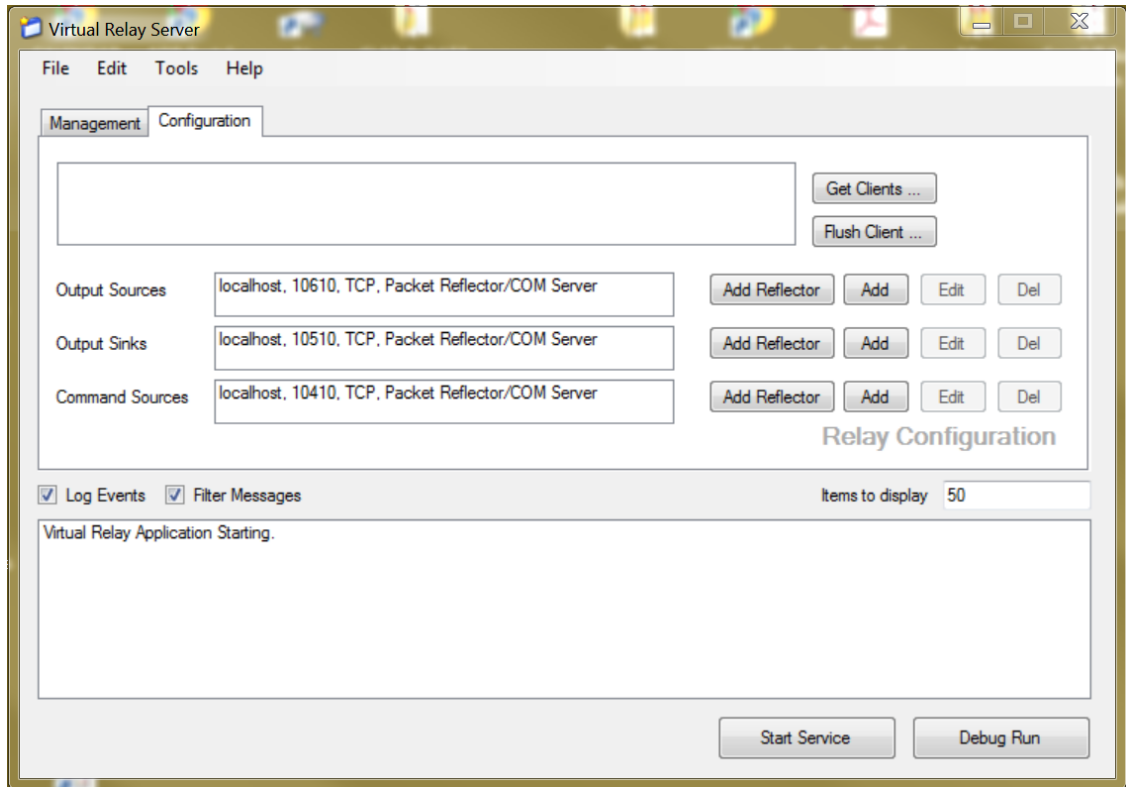
Relay Name Packet Reflector Address

Relay Settings

☒ Log Events ☒ Filter Messages Items to display

Virtual Relay Application Starting.

Figure 5.5. Virtual Relay Server Main Screen - Configuration Tab After Configuration



4. If the **Start Service** button appears, click on it to turn on the Virtual Relay Server.

If the **Stop Service** button appears, this means the Virtual Relay Server was already running when you installed the **Virtual Relay settings.vrx** file. In this case you do not need to take any further action.

5. Click on **Stop Service** to turn the Virtual Relay Server off.

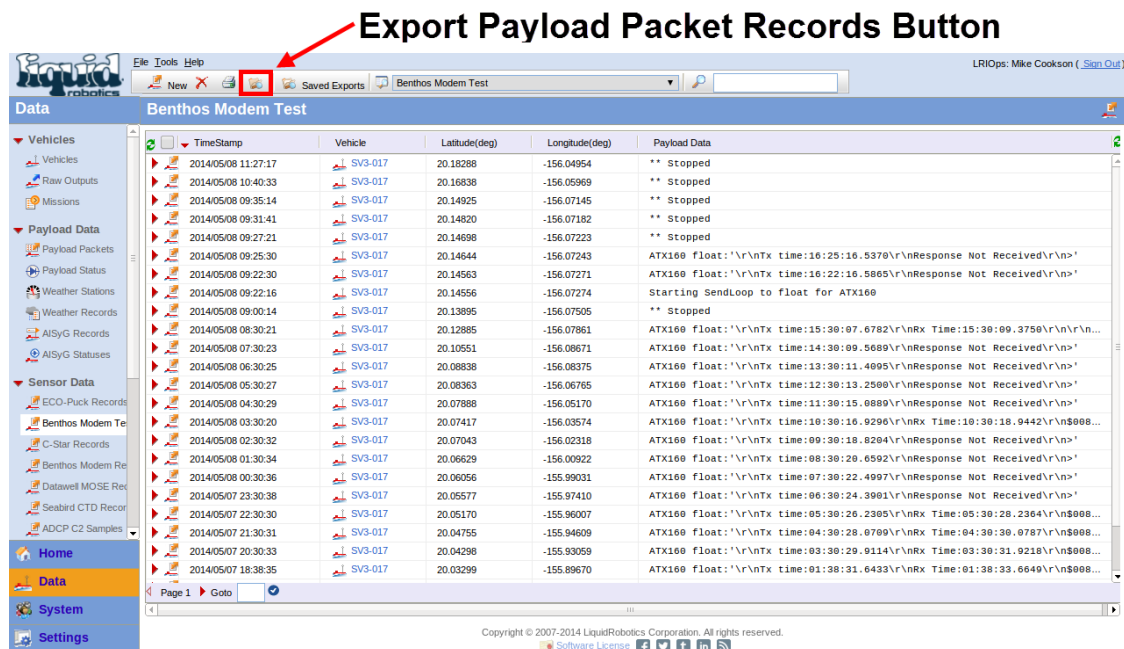
Chapter 6. WGMS Export REST Services

Using WGMS you can set up export filters and save the filtered exports. You can poll the saved exports using **curl** - a Linux utility that is widely supported on other platforms. For more information on **curl** see: [curl and libcurl at http://curl.haxx.se](http://curl.haxx.se) [http://curl.haxx.se/]

Set Up and Poll Exports

Use the following procedure to set up exports and poll them with **curl**:

1. Set up an export. This can be done from many of the WGMS report views. For example, to export sensor data from a Benthos acoustic modem, click **Show System Menus** and then click the **Data** side tab to show all telemetry types. Select **Benthos Modem** from the **Sensor Data** menu in the side tab. The following window will appear:



Notice the **Saved Exports** button in the tool bar. The button to the left of it with a file folder icon is the **Export Payload Packet Records** button.



If you hover your cursor over it, the "Export Payload Packet Records" tool tip will appear. Click on the **Export Payload Packet Records** button and the **Export Payload Packet Records** form will appear with the **Export** tab selected by default.

Export PayloadPacketRecord Records

Export PayloadPacketRecord Records from WGMS to this client.

Export

ColumnXml

CriteriaXml

Preview

Export Filter Name:

Select Column:

Add

Match All Criteria

Select Export Type:

.CSV

Payload Type

Equal

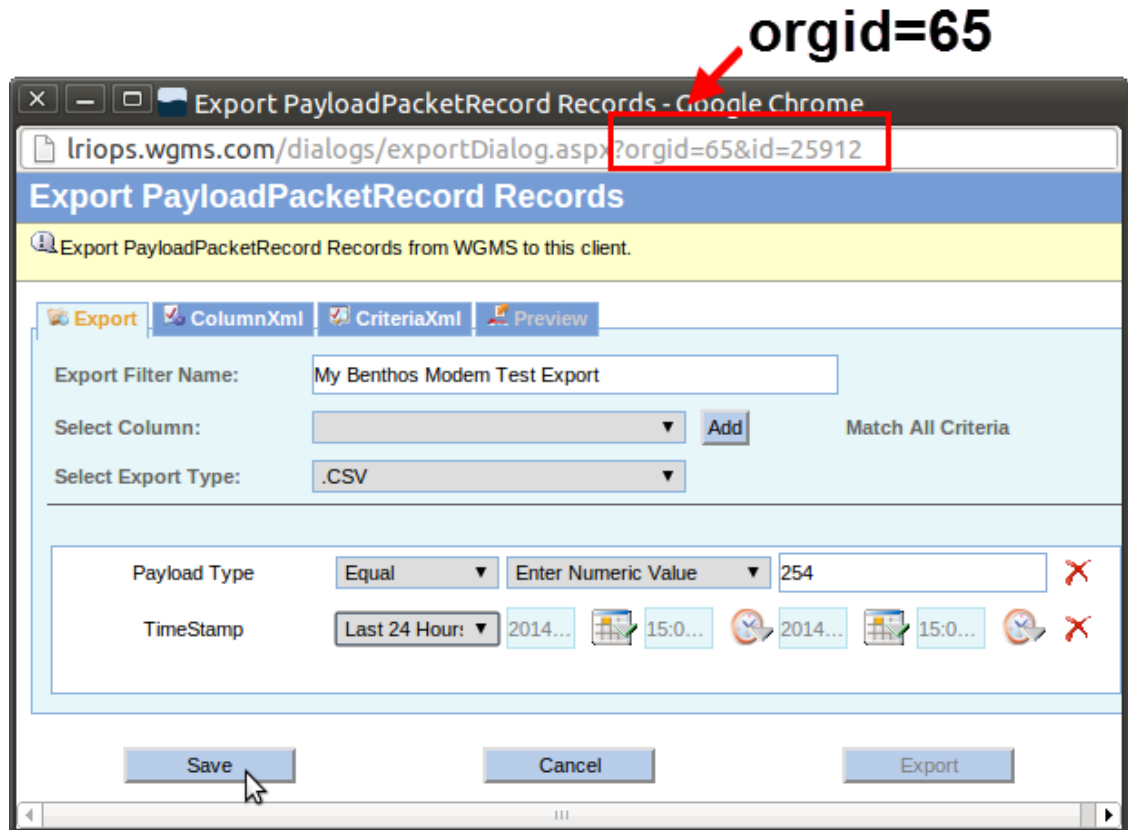
Benthos Modem San

Save

Cancel

Export

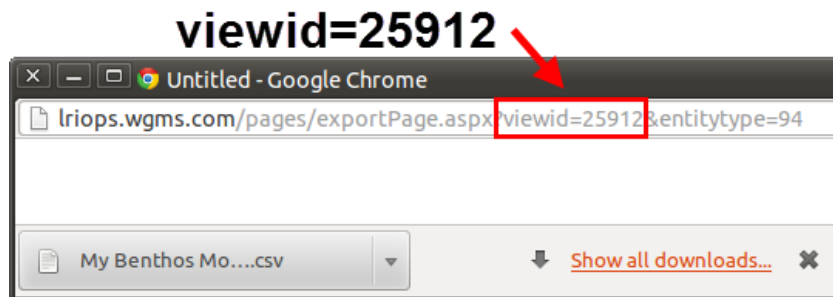
Fill out the form to define the export. In this example, the **Export Filter Name** entered is **My Benthos Modem Test Export**, and **TimeStamp** was selected in the **Select Column:** drop-down menu allowing the TimeStamp to be set at **Last 24 Hours**.



Take note of the `orgid` (65) in the URL at the top of the window - you will need this information later in the procedure.

`lriops.wgms.com/dialogs/exportDialog.aspx?orgid=65&id=25912`

When you finish making entries to the form, click **Save** and a pop-up window will indicate that the export was saved, then click the **Export** button:



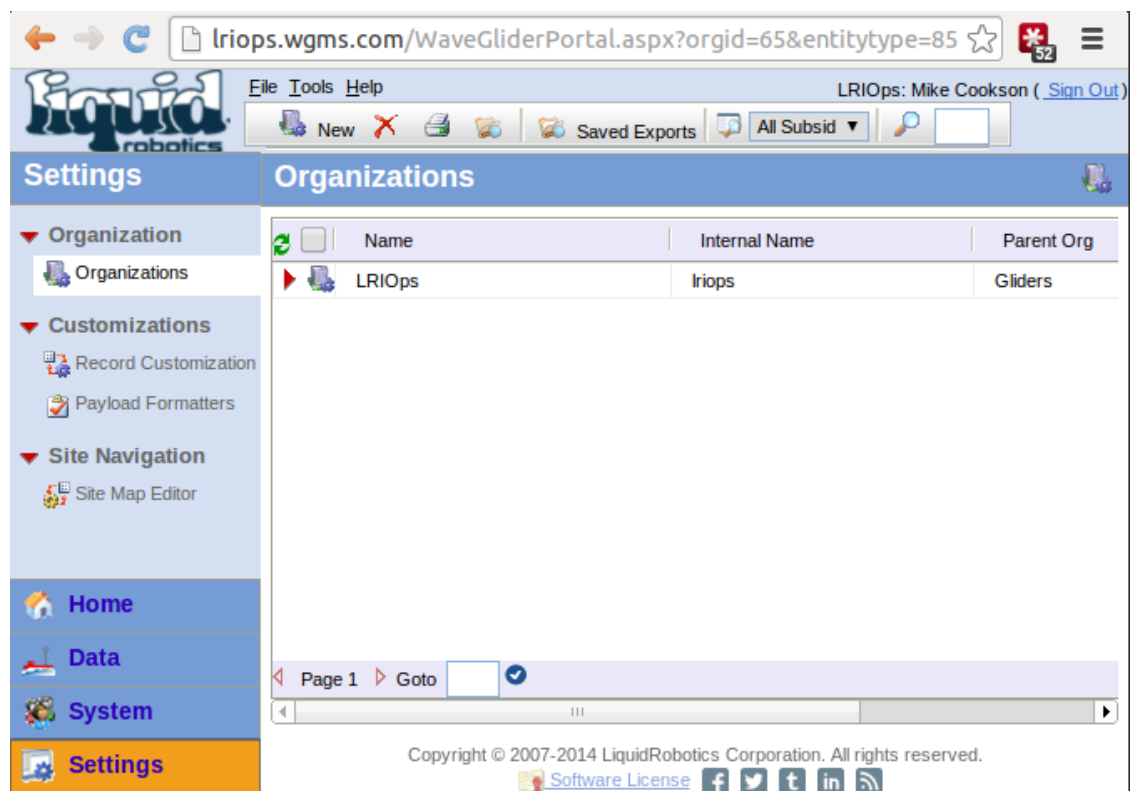
The file is downloaded. Take note of the `viewid` (25912) in the URL at the top of the window - you will need this information later in the procedure.

`http://lriops.wgms.com/pages/exportPage.aspx?viewid=25912&entitytype=94`

2. Create an XML file (for example, `loginsoap.xml`) that carries valid user credentials for WGMS for the given org:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap=
"http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <CreateLoginSession xmlns="http://gliders.liquidr.com/webservicesWebServices">
      <login>WGMS User Email</login>
      <password>password here</password>
      <orgName>org internal name</orgName>
    </CreateLoginSession>
  </soap:Body>
</soap:Envelope>
```

Remember to use the WGMS user e-mail (not the user name). The org internal name can be found in the **Settings** side bar - click **Show System Menus**, then click **Settings**. The **Settings** menu will open with the **Organizations** tab selected by default. For example:



- Issue the following **curl** command to perform a login and save session information in a file named headers:

```
curl -k -H "Content-Type: text/xml; charset=utf-8" --dump-header headers -H "SOAPAction:"
-d @loginsoap.xml -X POST https://gliders.wgms.com/webservices/entityapi.asmx
```

- Now you can issue **curl** commands to run the export in the same org, referencing headers for the session information, as well as the orgid and viewid fields from previous steps:

```
curl -b headers -d "viewid=25912&entitytype=94"
"http://gliders.wgms.com/pages/exportPage.aspx?orgid=65"
```

The output will look something like this:

TimeStamp,Vehicle,Latitude(deg),Longitude(deg),Payload Data,,
2014/05/08 00:30:36,SV3-017,20.06056,-155.99031,ATX160 float:'\r\nTx
time:07:30:22.4997\r\nResponse Not Received\r\n>',' ,
2014/05/07 23:30:38,SV3-017,20.05577,-155.97410,ATX160 float:'\r\nTx
time:06:30:24.3901\r\nResponse Not Received\r\n>',' ,
2014/05/07 22:30:30,SV3-017,20.05170,-155.96007,ATX160 float:'\r\nTx
time:05:30:26.2305\r\nRx Time:05:30:28.2364\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:06.9 MPD:03.3 SPD:-00.2\
r\nHeader stats CRC:Pass SNR:12.9 CCERR:012\r\nMOD:05 ERR:000 SNR:16.6 AGC:41
SPD:-00.2 CCERR:012\r\n\r\n>',' ,
2014/05/07 21:30:31,SV3-017,20.04755,-155.94609,ATX160 float:'\r\nTx
time:04:30:28.0709\r\nRx Time:04:30:30.0787\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:08.3 MPD:03.3 SPD:-00.2\
r\nHeader stats CRC:Pass SNR:13.9 CCERR:013\r\nMOD:05 ERR:000 SNR:17.3 AGC:37
SPD:-00.2 CCERR:013\r\n\r\n>',' ,
2014/05/07 20:30:33,SV3-017,20.04298,-155.93059,ATX160 float:'\r\nTx
time:03:30:29.9114\r\nRx Time:03:30:31.9218\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:09.3 MPD:03.3 SPD:+00.0\
r\nHeader stats CRC:Pass SNR:13.7 CCERR:012\r\nMOD:05 ERR:000 SNR:14.2 AGC:39
SPD:+00.0 CCERR:011\r\n\r\n>',' ,
2014/05/07 18:38:35,SV3-017,20.03299,-155.89670,ATX160 float:'\r\nTx
time:01:38:31.6433\r\nRx Time:01:38:33.6649\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:07.9 MPD:03.4 SPD:-00.2\
r\nHeader stats CRC:Pass SNR:15.9 CCERR:012\r\nMOD:05 ERR:000 SNR:15.6 AGC:38
SPD:-00.2 CCERR:012\r\n\r\n>',' ,
2014/05/07 18:30:37,SV3-017,20.03228,-155.89434,ATX160 float:'\r\nTx
time:01:30:33.5924\r\nRx Time:01:30:35.6072\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:06.3 MPD:03.4 SPD:-00.5\
r\nHeader stats CRC:Pass SNR:12.8 CCERR:011\r\nMOD:05 ERR:000 SNR:11.8 AGC:38
SPD:-00.5 CCERR:010\r\n\r\n>',' ,
2014/05/07 18:30:33,SV3-017,20.03227,-155.89433,Starting SendLoop to float for ATX160, ,
2014/05/07 18:28:35,SV3-017,20.03210,-155.89377,ATX160 float:'\r\nTx
time:01:28:31.9422\r\nRx Time:01:28:33.9554\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:07.0 MPD:03.3 SPD:+00.5\
r\nHeader stats CRC:Pass SNR:12.9 CCERR:011\r\nMOD:05 ERR:000 SNR:11.0 AGC:39
SPD:+00.5 CCERR:010\r\n\r\n>',' ,
2014/05/07 18:28:32,SV3-017,20.03210,-155.89374,Starting SendLoop to float for ATX160, ,
2014/05/07 18:22:55,SV3-017,20.03162,-155.89211,** Stopped, ,
2014/05/07 11:33:05,SV3-017,20.01665,-155.88605,** Stopped, ,
2014/05/07 11:29:51,SV3-017,20.01668,-155.88680,ATX160 float:'\r\nTx
time:18:29:47.7822\r\nRx Time:18:29:49.7544\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:08.9 MPD:00.8 SPD:-00.2\
r\nHeader stats CRC:Pass SNR:14.7 CCERR:013\r\nMOD:05 ERR:000 SNR:14.9 AGC:38
SPD:-00.2 CCERR:013\r\n\r\n>',' ,
2014/05/07 11:19:51,SV3-017,20.01667,-155.88920,ATX160 float:'\r\nTx
time:18:19:48.0805\r\nRx Time:18:19:50.0949\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:08.9 MPD:03.5 SPD:+00.2\
r\nHeader stats CRC:Pass SNR:15.1 CCERR:012\r\nMOD:05 ERR:000 SNR:18.2 AGC:36
SPD:+00.2 CCERR:012\r\n\r\n>',' ,
2014/05/07 11:09:52,SV3-017,20.01670,-155.89155,ATX160 float:'\r\nTx
time:18:09:48.3787\r\nRx Time:18:09:50.3856\r\n\$00800 bits/sec 1 of 4
Rate 1/2 CC 12.50ms MGP\r\nAcquisition stats SNR:10.5 MPD:03.4 SPD:+00.2\
r\nHeader stats CRC:Pass SNR:17.8 CCERR:012\r\nMOD:05 ERR:000 SNR:16.4 AGC:39

```
SPD:+00.2 CCERR:013\r\n\r\n> ', ,  
2014/05/07 11:09:48,SV3-017,20.01670,-155.89157,Starting SendLoop to float for ATX160, ,  
2014/05/07 11:03:26,SV3-017,20.01659,-155.89311,** Stopped, ,  
2014/05/07 09:51:20,SV3-017,20.01555,-155.88605,** Stopped, ,
```

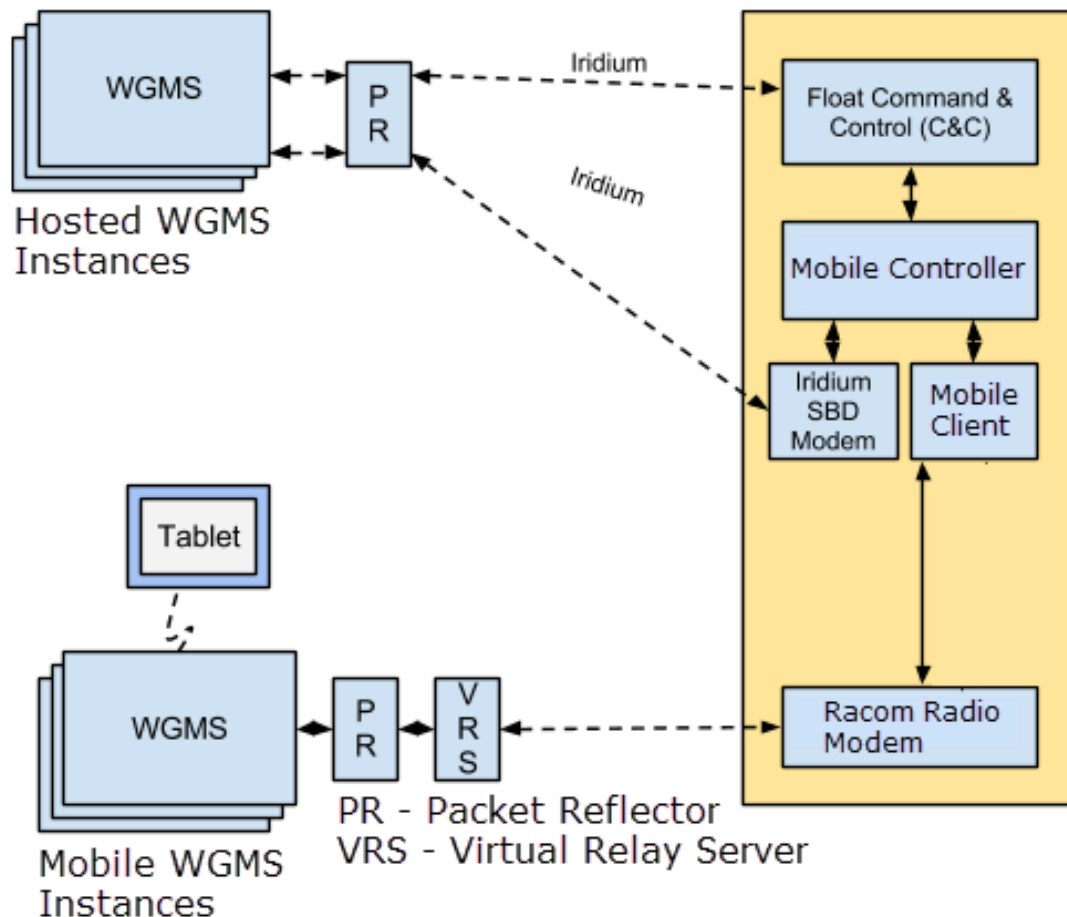
Chapter 7. Configuring Mobile WGMS

Mobile WGMS Overview

Mobile WGMS is an optional Wave Glider feature that enables up to 8 mobile instances of WGMS to seamlessly share management of multiple Wave Glider vehicles. The Mobile WGMS option requires vehicle payload dry box mounted electronics and software components that manage Racom radio communications between mobile provisioned WGMS instances and the vehicle C&C. When Mobile WGMS is activated, any instance of WGMS that has been provisioned for Mobile WGMS by Liquid Robotics can manage any Mobile WGMS enabled Wave Glider that is within Racom radio range. For example, a group of 20 Mobile WGMS enabled Wave Gliders on a mission to monitor an oil field could be simultaneously managed by up to 8 instances of WGMS located on 8 different boats whenever any, or all, of the 20 Wave Gliders are within Racom radio range of any, or all, of the 8 Mobile WGMS instances.

Mobile WGMS is activated on a Wave Glider vehicle only by a hosted instance of WGMS using the standard Iridium satellite network communications channel to the vehicle C&C. When Mobile WGMS is activated on a vehicle, the standard Iridium communications channel to the C&C is replaced by a secondary Iridium communications channel connected to the Mobile Controller application on the vehicle. The Mobile Controller runs on a System Management Computer (SMC) located in a payload dry box. The Mobile Controller coordinates piloting activities between the vehicle C&C and each active Mobile WGMS instance that is within Racom radio range. The Mobile Controller also manages communications between hosted instances of WGMS and the vehicle C&C over the secondary Iridium communications channel, until Mobile WGMS is deactivated and the standard Iridium connection to the C&C is automatically restored.

Figure 7.1. Mobile WGMS



When Mobile WGMS is activated, hosted WGMS instances are treated no differently than mobile provisioned WGMS instances communicating over the Racom radio:

- All WGMS instances share piloting activities.
- All WGMS instances receive vehicle status telemetry.
- All WGMS instances receive payload data transmissions.
- All WGMS instances display a log showing commands initiated by each WGMS instance.

Only by issuing the Deactivate Mobile Mode command which overrides the Mobile Controller and forces it to inactive, can a hosted WGMS instance take direct, unshared control of a Wave Glider.

The Mobile Controller is aware of all mobile provisioned WGMS instances. When a mobile provisioned WGMS instance enters the Racom radio range of a Mobile WGMS activated Wave Glider, the mobile provisioned WGMS instance is automatically registered and assumes active status. The active status of the Mobile WGMS instance, including its piloting enabled status and telemetry enabled status, is displayed on the WGMS UI of all other WGMS instances that are active with the same vehicle.

The Mobile Controller retains a log of the 3 most recent navigation commands sent to the vehicle C&C, including the source of each command. When an active WGMS instance issues the WGMS Sync command to request the current status of a Wave Glider vehicle, a log showing up to 3 of the most recently issued commands is returned. This keeps pilots informed of other pilot's activities in the Mobile WGMS shared control environment. The Mobile Controller log of C&C commands will wrap when log space is exhausted, resulting in the possible loss of older entries. It's important that at least one active WGMS instance subscribes to and stores the Mobile Controller log data, to avoid loss of mission history.

The Mobile Controller broadcasts a heartbeat to all WGMS instances that are active on a Wave Glider vehicle. The Mobile Controller heartbeat informs the WGMS instances that the Mobile Controller is active. The Mobile Controller heartbeat also broadcasts the status of each active WGMS instance (including any hosted WGMS instances) to all other active WGMS instances.

Setting up a Mobile WGMS Enabled Wave Glider Vehicle

To configure a Mobile WGMS enabled Wave Glider Vehicle, the following tasks and settings must be confirmed or completed:

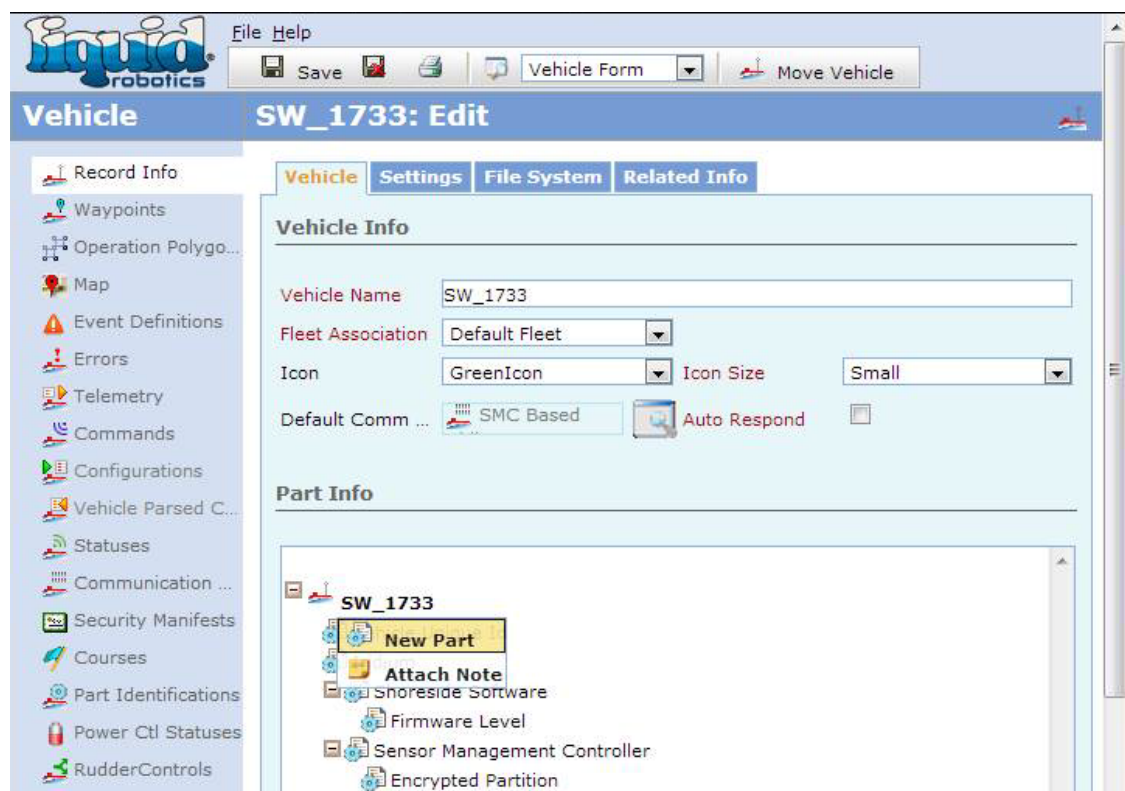
1. Confirm that the Vehicle is configured with the following parts (minimum set):
 - The **Vehicle Unique ID** part must have the same Vehicle Unique ID setting as the setting on the hosted WGMS.
 - The **Firmware Level** must be revision 3.0 or higher.
 - The **Iridium Modem Part (Inactive)** part must have the same IMEI as the setting on the hosted WGMS.
 - The **SMC Based Iridium Modem (Inactive)** part must have the same IMEI as the setting on the hosted WGMS.
2. **Command Formatters** under **Settings** → **Formatters** should have the following minimum set:
 - **Iridium Command**
 - **Secure Iridium Command**
 - **Serial Command**
 - **SMC Based Iridium Command**
 - **Virtual Relay BGAN Command**
 - **Virtual Relay Cell Command**
 - **Virtual Relay Default Command**
 - **Virtual Relay Racom Command**
 - **Virtual Relay RUDICS Command**

- **XBee Command**

3. Use the **Pilot Tools** application to send waypoints and op-regions to the Mobile WGMS vehicle.
4. Use the **Pilot Tools** application to generate a new Key Pair for the security manifests on the Mobile WGMS (under development).

From a Liquid Robotics or customer hosted instance of WGMS, follow this procedure to set up a mobile enabled Wave Glider vehicle:

1. From the **Vehicle** tab for the vehicle you want to enable for Mobile WGMS, add a SMC Based Iridium part to the vehicle parts list (if one does not already exist).



In the new **Part Form**:

- Enter a **Part Name** for the new part.
- Enter the IMEI for the SMC based modem into the **Serial Number** field.
- In the **Type** drop-down menu, select **SMC Based Iridium Part**.
- In the **Manufacturer Type** drop-down menu, select **9522B**.

Part Form

Part SMC Based Iridium Modem: Edit

Part Info

Part Name: SMC Based Iridium Modem

Parent Part: [Field] Revision: [Field]

Build Date: [Field] Expected Life Time: [Field]

Part Number: [Field] Remaining Life Time: [Field]

Serial Number: 300025010423020 LR Serial Number: [Field]

Type: SMC Based Iridium Vehicle: SW_1733

Manufacturer Type: 9522B

Related Information

Owner: [Field] Organization: Gliders

Created On: 3/12/2013 18:11:47 Updated On: 4/25/2013 17:32:51

Created By: System Admin Updated By: Viet Tran

2. Add SMC Based Iridium COM channel (if one does not already exist).

Communication Channels

TimeStamp	Name	Type	Revision...	State
4/29/2013 11:03:18	Xbee Communication Ch...	Xbee	 	☐
3/12/2013 18:12:32	SMC Based Iridium	SMC Iridium	 	☒
3/8/2013 10:32:41	VirtualRelayWiFi Commu...	Virtual Relay WiFi	 	☒
12/8/2010 14:54:06	Iridium Communication ...	Iridium	3.9.4	☒

Under the **Communication Channel** tab, select **SMC Iridium** in **Type** drop-down menu.

The screenshot shows the 'Liquid Robotics' software interface. The main window is titled 'SMC Based Iridium: Edit'. On the left, there is a sidebar with 'Record Info'. The main area has two tabs: 'Communication Channel' (selected) and 'Related Info'. Under the 'Communication Channel' tab, there is a section titled 'Communication Channel Info' containing the following fields:

- Name:** SMC Based Iridium
- Vehicle:** SW_1733
- State:** ☒
- IP Address:**
- IP Port:**
- TimeStamp:** 3/12... 18:1...
- Channel Status:** Clear Text
- Type:** SMC Iridium
- Revision Level:**
- Encrypted Cha...:** ☐
- Security Manifest:**

3. Link the SMC Based Iridium communication channel to the Security Manifest to allow it to communicate in secure mode.

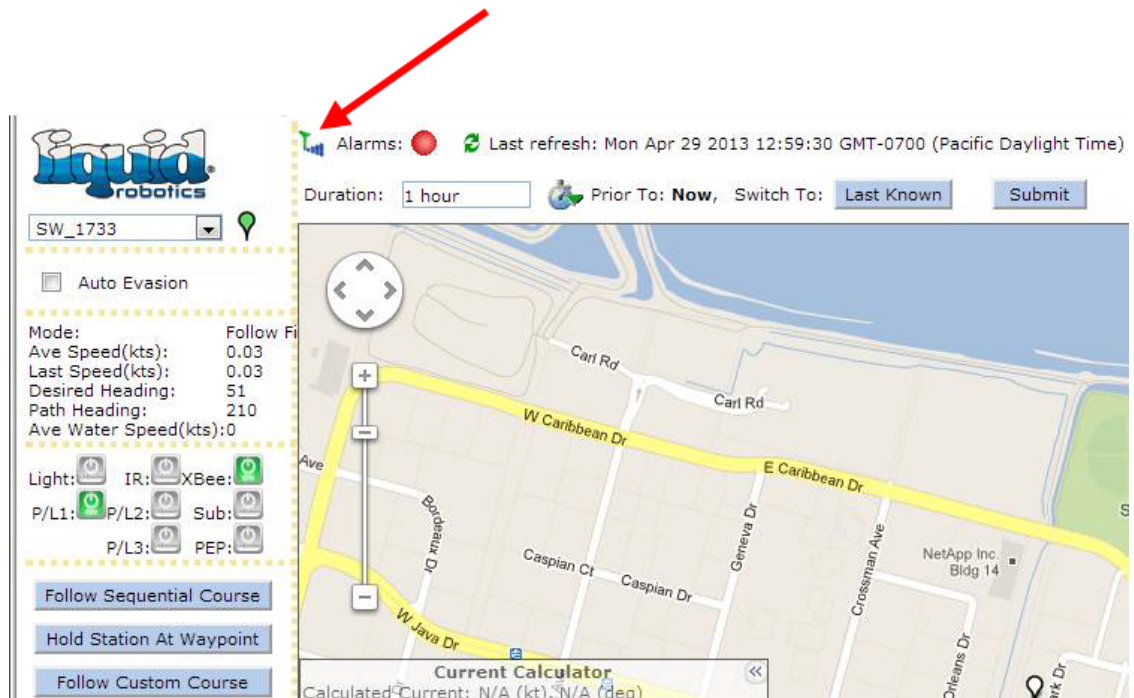
The screenshot shows the 'SMC Based Iridium: Edit' window in the Liquid Robotics software. The interface includes a menu bar with 'File' and 'Help', and a toolbar with 'Save', a printer icon, and a 'Communication Channel Fi' dropdown. The main title bar reads 'Communica... SMC Based Iridium: Edit'. On the left is a sidebar with 'Record Info'. The main area has two tabs: 'Communication Channel' (selected) and 'Related Info'. Below the tabs is a 'Communication Channel Info' section with the following fields:

- Name:** SMC Based Iridium
- Vehicle:** SW_1733 (with an antenna icon)
- Type:** SMC Iridium (dropdown menu)
- State:** ☒ (checkbox icon)
- Revision Level:** (empty text field)
- IP Address:** (empty text field)
- IP Port:** (empty text field)
- TimeStamp:** 3/12... (calendar icon) 18:1... (clock icon)
- Encrypted Cha...:** ☐ (checkbox icon)
- Channel Status:** Clear Text (dropdown menu)
- Security Manifest:** XXX1IridiumC... (with a document icon)

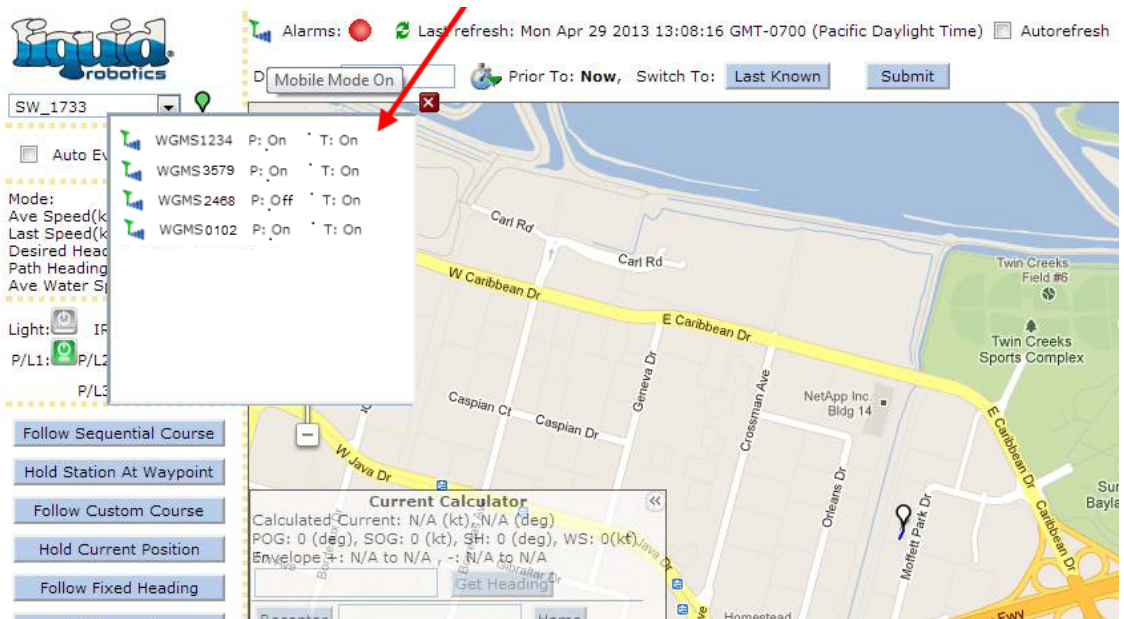
- At this point, if the vehicle in the dashboard is the vehicle you want to enable for Mobile WGMS, you can issue the Activate Mobile Mode command.

- Once the **Activate Mobile Mode** command is ACKed by the vehicle, WGMS will issue an automatic **Set Default Channel to SMC Based Iridium**. This will complete enabling Mobile WGMS on the vehicle.

When Mobile Mode is activated on a vehicle (after successfully issuing an **Activate Mobile Mode** command), an additional icon appears on the WGMS Dashboard for that vehicle on the LRI or customer hosted instance of WGMS:



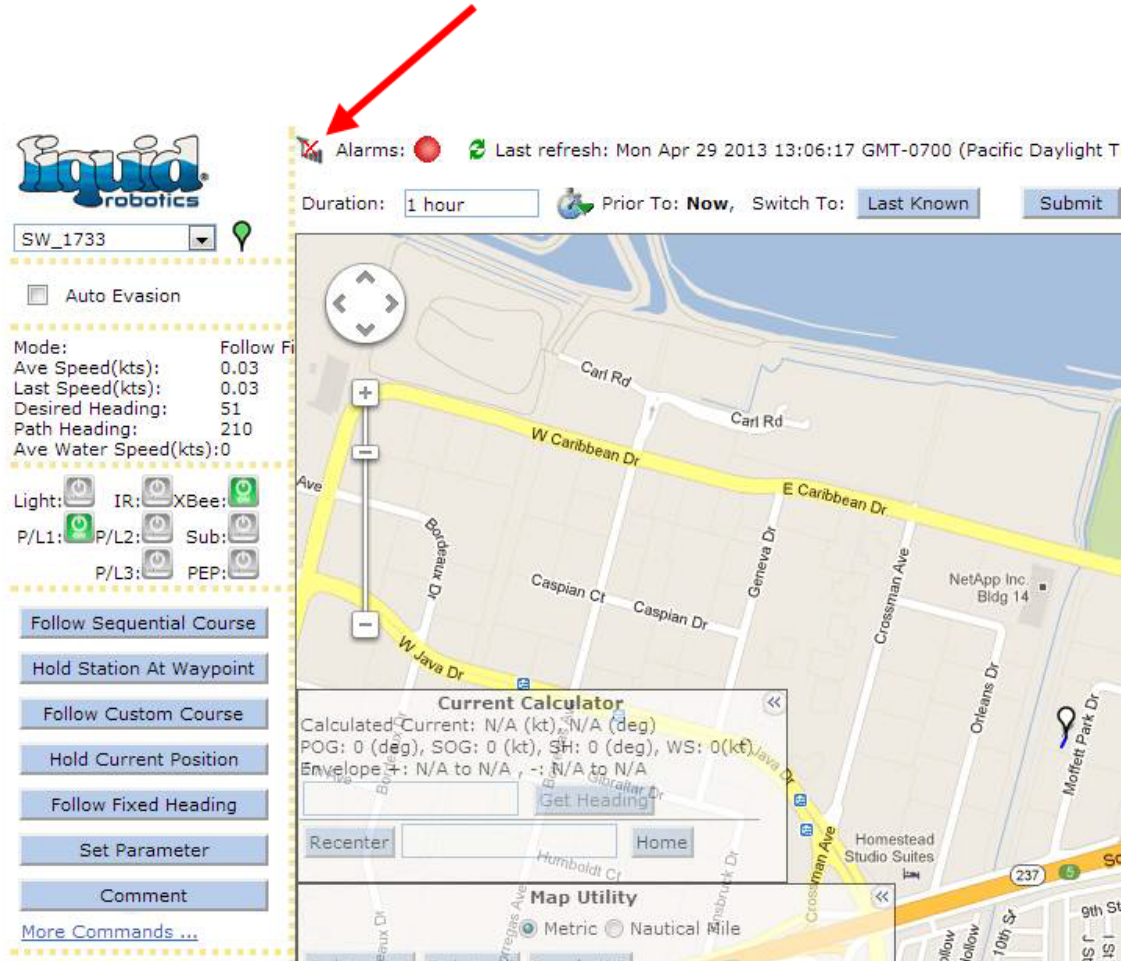
If you click on the icon a floating window will appear displaying all Mobile WGMS systems in range of the vehicle, including the piloting enabled status and telemetry enabled status of each WGMS instance:



- At this point the **Deactivate Mobile Mode** command should appear in the command drop-down list.

7. To deactivate Mobile mode issue the **Deactivate Mobile Mode** command to the vehicle.
8. Once the vehicle ACKs the command, WGMS will issue an automatic **Set Default Channel to Iridium**, and that will complete the process.

When Mobile Mode is deactivated on the vehicle, the icon changes:



Setting up Mobile Provisioned WGMS Instances

To configure a Mobile Provisioned WGMS instance, the following tasks and settings must be confirmed or completed:

1. The **Machine name** must be the laptop serial number. For example, 2HTSA8727.
2. The **Mobile WGMS Id** must be the laptop serial number. For example, 2HTSA8727@ (if the serial number is less than 10 characters in length, it must be padded to 10 characters with @).
3. The **Org admin form** must have **SSL** checked (set to) **off** to allow non-HTTPS API access without a certificate.
4. The **Virtual Relay**, **Packet Reflector** and **COM Server** must all use the same **Server URL**:

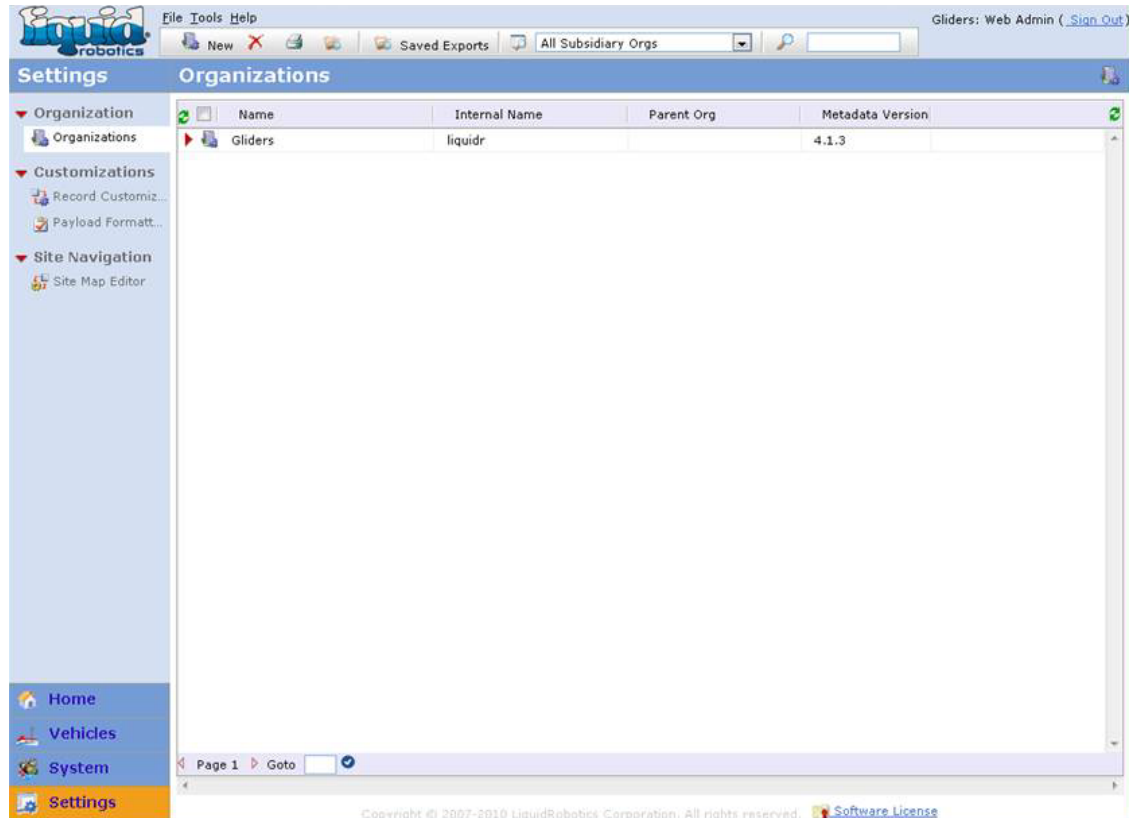
http://localhost/webservices/EntityAPI.asmx

- with the **webadmin@liquidr.com** credentials.

5. The link to **GeoServer** must have the machine name, not localhost, because it is called from the map client. For example, **OpenLayers.Layer.WMS|Geoserver layers - Tiled|[{LAYERS: 'oceanmap'}](http://2HTSA85250:8088/geoserver/osm/wms)**

To set up Mobile WGMS provisioned instances of WGMS in a Wave Glider Organization:

1. Open the **Organizations** form.



2. Select and open the **Org Admin Form**.

The screenshot shows the 'Liquid Robotics' web interface. The top navigation bar includes 'File Help', 'Save', and a dropdown menu with 'Org Admin Form', 'Organization Form', and 'Org Admin Form'. The main header is 'Organization Gliders: Edit'. The left sidebar contains a tree view with 'Record Info', 'Users', 'Roles', 'Permissions', 'Catalog Images', 'System Alarms', and 'Lists'. The main content 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). There is also a 'Company Logo' section with a recommended size of 64x64.

3. Modify settings.

The screenshot shows the same 'Liquid Robotics' web interface, but the 'Maps' tab is now active. The 'Organization Information' section includes a 'Mobile WGMS Enable' checkbox, which is checked, and a 'Mobile WGMS Id' field with the value 'WGMS1234'.

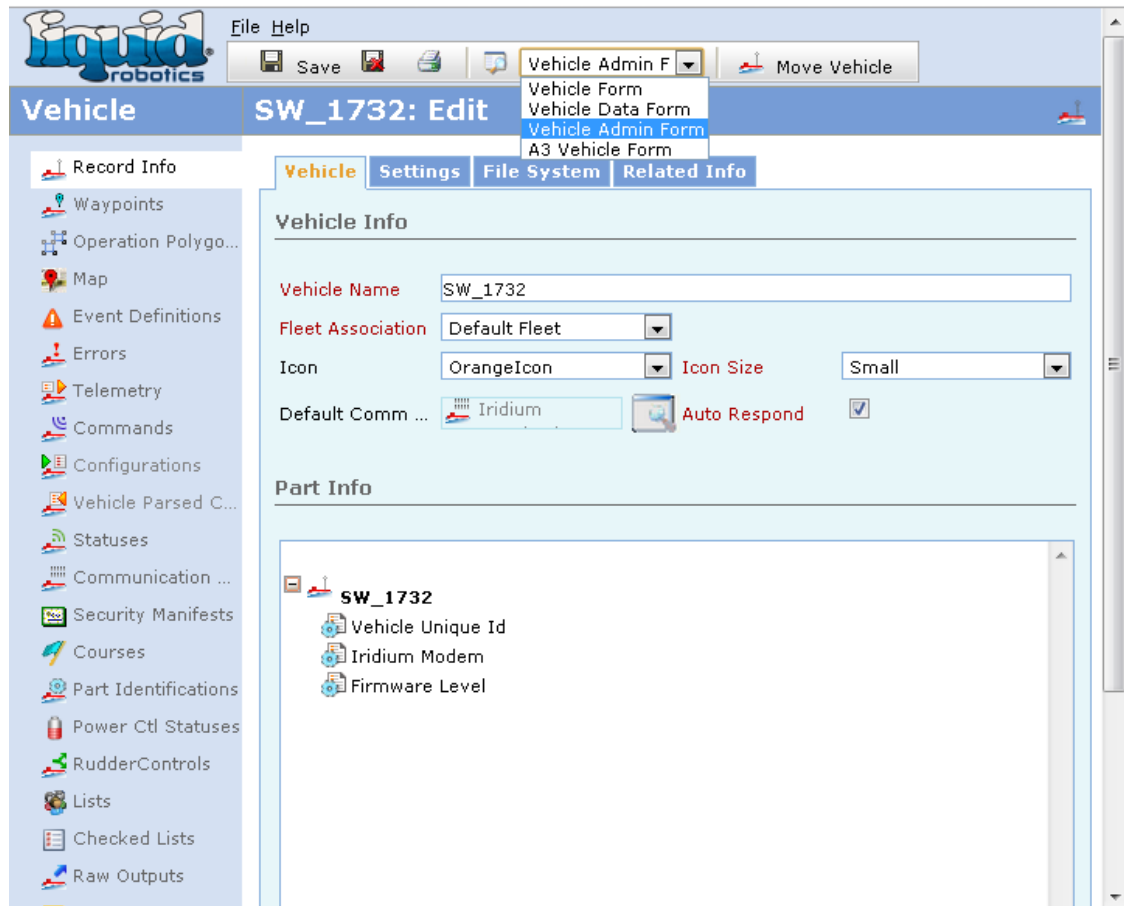
4. Modify map settings to the offline mapping source (if Mobile WGMS is not connected to the internet while piloting).

The screenshot shows the 'Liquid Robotics' web interface for editing glider information. The main title is 'Gliders: Edit'. On the left is a sidebar with 'Record Info' and a list of links: Users, Roles, Permissions, Catalog Images, System Alarms, and Lists. The top navigation bar includes 'File Help', 'Save', and a dropdown menu currently set to 'Org Admin Form'. Below the title bar are tabs for 'Organization', 'Maps' (which is selected), 'Contact Info', 'Formatting Rules', and 'Description'. The 'Maps' tab contains a 'Map Options' section with various map-related settings. A 'Map Headers' section at the bottom contains a text area with OpenLayers WMS layer configuration code.

Map Options	
Google Map En...	☐
Disable Externa...	☒
NOAA Chart	☒
UK Chart	☐
New Zealand C...	☒
Brazil Chart	☒
Google Map AP...	
Add Map Headers	☒
Canada Chart	☒
Australia Chart	☐
Argentina Chart	☒
Map Headers	<pre>OpenLayers.Layer.WMS Geoserver layers - Tiled http://mobilewgms1:8088/geoserver/osm/wms {LAYERS: 'oceanmap'}</pre>

To set up the vehicle to indicate if Piloting is Disabled or if Telemetry is Disabled:

1. Select a vehicle to set as Mobile Enabled, open the form and switch to a Vehicle Admin Form.



2. Set the Piloting and Telemetry disable checks accordingly.

The screenshot shows the 'Vehicle Admin' web interface for 'SW_1732: Edit'. The interface has a top menu bar with 'File' and 'Help', and a toolbar with 'Save', 'Vehicle Admin For', and 'Move Vehicle'. A left sidebar contains 'Record Info' and 'Vehicle Register...'. The main content area has two tabs: 'Vehicle' (selected) and 'Related Info'. Under the 'Vehicle' tab, there is a 'Vehicle Info' section with the following fields and options:

Vehicle Name	SW_1732		
Fleet Association	Default Fleet		
Icon	OrangeIcon	Icon Size	Small
Send Alarm	☐	Multiple Vehicle...	☒
Display For Gue...	☐	Towing	☐
Default Comm ...	Iridium	AIS Forward E...	
AIS Forward E...		Auto Respond	☒
Source Id			
Auto Evasion	☐	Auto Evading	☐
Mobile Pilot Dis...	☐	Mobile Report ...	☐

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To check for other Mobile WGMS instances in range of the vehicle on the dashboard:

1. Issue a Set Default Com Channel command to the RACOM Radio.

Related Record

Select a related record.
Simple Command Form

Command Reason

Vehicle

Command Status

From Waypoint

Heading (deg)

Course

Storage Address

File Type

Com Channel

Part

Read File Name

Disposition

Script Buffer

SW_1732

Created

Unspecified

Iridium Communication

Command Type

Target Waypoint

To Waypoint

Status

Vehicle Rudder ...

Board Address

Operation Type

Upload File

Vehicle File

Security Manifest

Time Field

Set Default Com Chanr

Rudder Center

Rudder Left

Rudder Right

Set Course

Set Rudder Controls

Set Rudder Position

System

Float Reboot

Read Vehicle Unique Id

Retrieve Debug Buffer

Retrieve Identification

Retrieve Power Status

Retrieve Status

Set Default Com Channel

Set Status

Set Vehicle Unique Id

Components

Calibrate Twist

Light Off

Light On

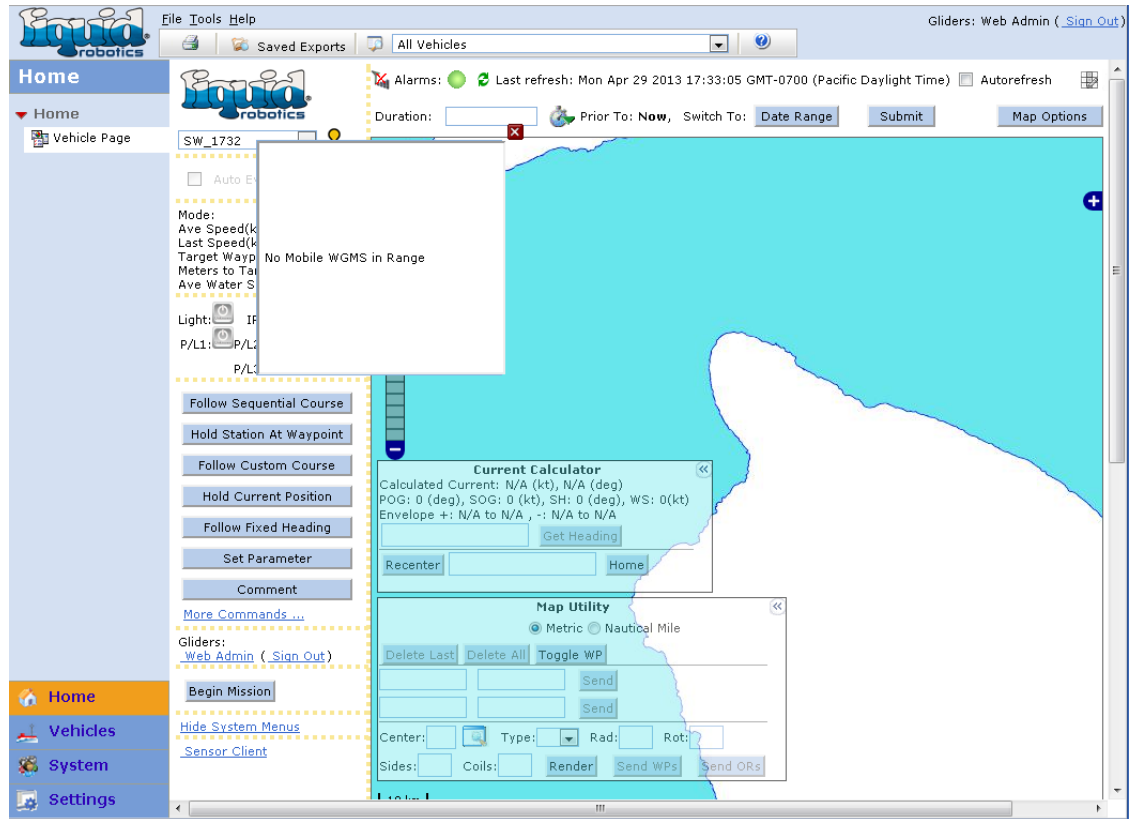
Retrieve Twist Status

Copy ...

Send

Cancel

- Click on the Mobile Enabled icon on the dashboard to find out if any mobile enabled vehicles are in range.



Mobile WGMS Commands

There are three commands that are specific to Mobile WGMS:

- **Activate Mobile Mode** - Activates Mobile WGMS on a Mobile WGMS enabled Wave Glider.
- **Deactivate Mobile Mode** - Deactivates Mobile WGMS on Mobile WGMS enabled Wave Glider.
- **Mobile Sync** - Returns up to 3 of the most recently issued C&C navigation commands from the Mobile Controller log for each vehicle controlled by active WGMS instances. The log is limited to the following commands:
 - Hold Current Position
 - Hold Station At Waypoint
 - Follow Sequential Waypoint Course
 - Right/Left/Center Rudder
 - Follow Fixed Heading
 - Set Rudder Position
 - New waypoint
 - Follow Course And Loop

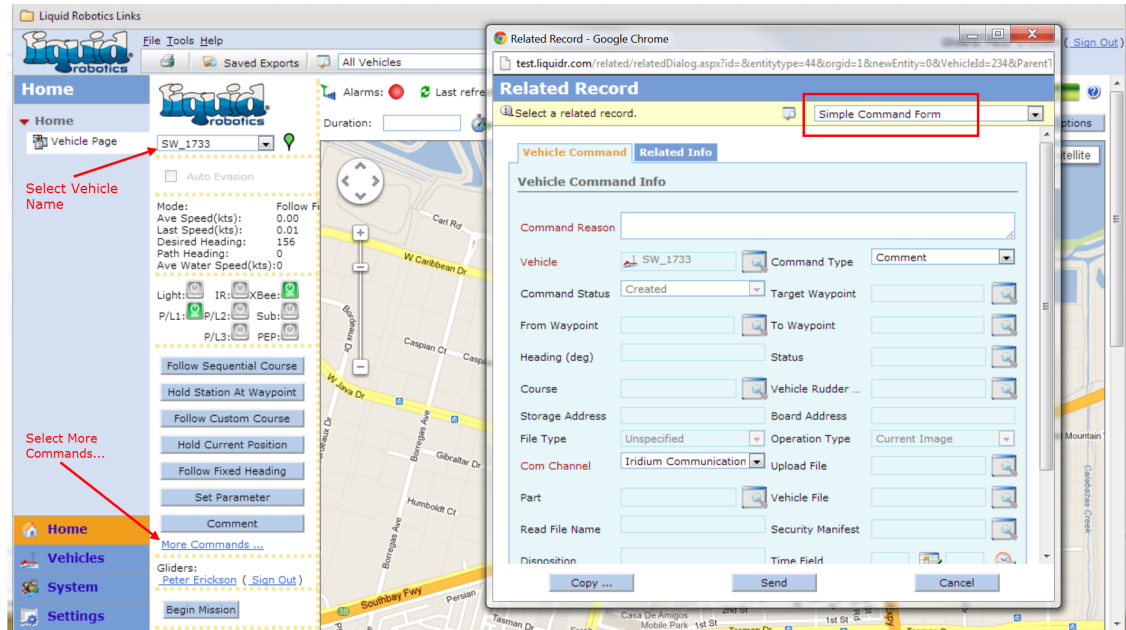
- Follow Course With Options

A new pilot can use this information to know the current destination of a Wave Glider.

These commands are implemented from the WGMS **Simple Command Form**:

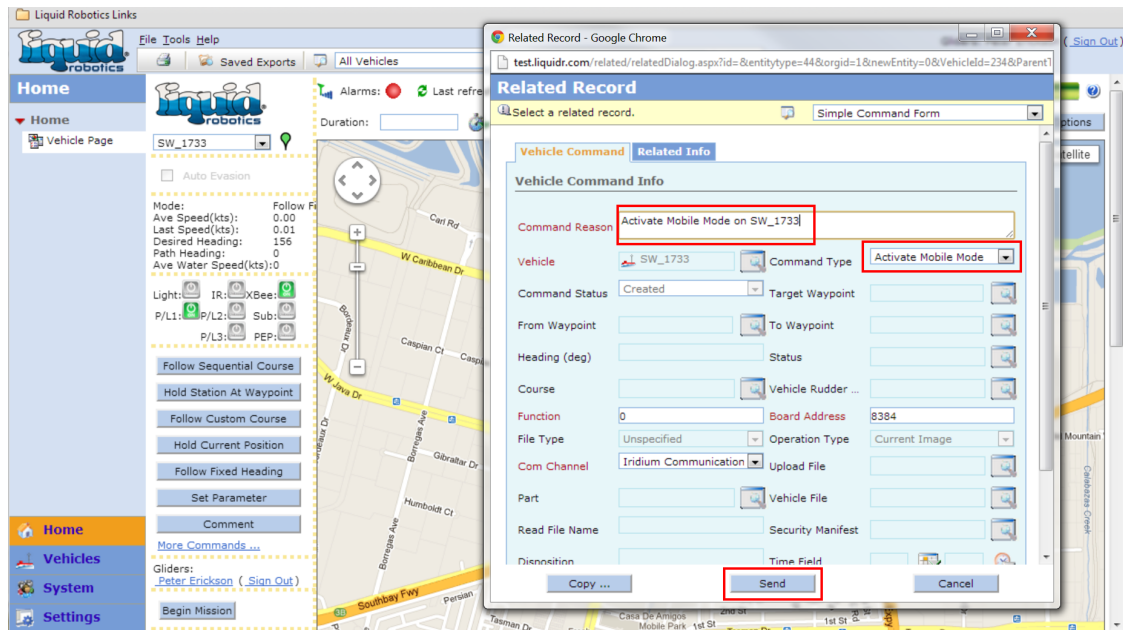
1. From the WGMS **Home** page, select the Wave Glider vehicle you want to activate, deactivate, or sync Mobile WGMS on, then click **More Commands...** to open the **Simple Command Form**.

Figure 7.2. Opening the Simple Command Form



2. From the **Command Type** drop-down menu, select **Activate Mobile Mode**, **Deactivate Mobile Mode**, or **Mobile Sync**.
3. Enter a reason for issuing the command in the **Command Reason** field. All other required fields are automatically populated with default values by WGMS.
4. Click **Send** to issue the command.

Figure 7.3. Issuing the Activate Mobile Mode Command



Chapter 8. Fleets

In WGMS, a Fleet provides a view of a subset of the Vehicles and personnel in an Organization. When Vehicles and personnel are assigned to Fleets, the personnel can view and command only the Vehicles in the Fleets they are assigned to. In an Organization where multiple missions are being conducted, the Vehicles and personnel associated with each mission might be grouped into a Fleet. Similarly, all of the Vehicles in an Organization that are capable of gathering a particular type of data might be grouped into a Fleet. In a WGMS Organization, a Vehicle can be assigned to one Fleet only. If a Vehicle is not assigned to a Fleet, it can be viewed by all personnel who are able to log in to the Organization.

Chapter 9. Contacting Liquid Robotics Inc.

If you cannot determine or correct the cause of a problem, contact LRI.

To expedite resolving the problem, make a brief list beforehand with the following information.

- 1) Wave Glider Model Number.
- 2) Any special or added payloads on the Vehicle.
- 3) Time/date when problem occurred.
- 4) Location of Vehicle when problem occurred.
- 5) Initial indication of problem.
- 6) Any other indications or unusual readings.
- 7) Attempts at corrective actions and their results.

For time-critical problems, call LRI at:

1 (650) 493-6300

or **(888) 574-4574**

and select the option for Customer Service.

For non-critical problems, send the above information via email to:

opscenter@liquidr.com

Appendix A. 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)

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
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
Permissions	••••	••••	••••	•R••	C R U D	What permissions are allowed in the system
Role Permissions	••••	••••	••••	•R••	C R U D	Mapping between roles and permissions
Work flow Events	••••	••••	••••	••••	C R U D	For future use
Inventory Items	••••	••••	••••	••••	C R U D	For future use
Record Customization						
Fields	••••	•R••	•R••	•R U •	C R U D	Metadata for each entity field (user name) (change the name of a column)
Data Views	••••	••••	•R••	C R U D	C R U D	Metadata defining how entities are displayed (column grids) (change column in a grid)
Relationships	••••	••••	•R••	•R••	C R U D	Structure that tells how entities are related. (inverse of foreign keys)
Criteria	••••	••••	•R••	C R U D	C R U D	Additional conditions on grids (filters)
Selects	••••	••••	•R U •	C R U D	C R U D	Values for fields with multiple values
Criteria Groups	••••	••••	•R••	C R U D	C R U D	Grouping class for criteria
Payload	••••	••••	••••	••••	C R U D	Edit Payload display structures
Vehicle Permissions						
Vehicles	••••	•R••	C R U D	C R U D	C R U D	Access to records on vehicles in database (Guests can see vehicles marked "visible for guest")
Commands	••••	•R••	C R U •	C R U •	C R U D	Entities representing commands
Telemetry	•R••	•R••	•R••	•R••	C R U D	Data coming back from vehicles
Statuses	••••	•R••	C R U •	C R U •	C R U D	Statuses coming and going from vehicle
Event Definitions	••••	•R••	C R U D	C R U D	C R U D	Alarm definitions

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
Rudder Controls	••••	•R••	•R••	C R ••	C R U D	Parameters for Rudder Module control loop.
Parameters	••••	•R••	C R U •	C R U •	C R U D	Data user can send to vehicle
Communication Channels	••••	••••	••••	•R U •	C R U D	Automatically created by relays
Parts	•R••	•R••	C R U D	C R U D	C R U D	Manufacturing track listing of what's on vehicle
Courses	••••	•R••	C R U D	C R U D	C R U D	Vehicle routes
Part Identifications	••••	•R••	•R••	•R••	C R U D	Vehicle-generated list of parts
Missions	••••	•R••	C R U •	C R U D	C R U D	Time-delineated vehicle status that states a vehicle is in water.
Operation Polygons	••••	•R••	C R U D	C R U D	C R U D	Geographical area for vehicle presence
File Notifications	••••	••••	••••	••••	C R U D	Entities used during file transfers
Errors	••••	•R••	•R U •	•R U •	C R U D	Vehicle Events
Raw Outputs	•R••	•R••	•R••	•R••	C R U D	Telemetry received from the vehicle
Waypoints	•R••	•R••	C R U D	C R U D	C R U D	Waypoint data associated with a vehicle.
Course Waypoints	••••	•R••	C R U D	C R U D	C R U D	How a course is mapped to a waypoint
Power Control Status	••••	•R••	•R••	•R••	C R U D	Telemetry
Mission Vehicles	••••	•R••	C R U •	C R U •	C R U D	Mapping between missions and vehicles
Operation Coordinates	••••	•R••	C R U D	C R U D	C R U D	Coordinates of an operational polygon
Payload Data Permissions						
Payload Packets	•R••	•R••	•R••	•R••	C R U D	Generic data from the payloads
Payload Statuses	•R••	•R••	•R••	•R••	C R U D	Parsed payload packets
AI SyG Locations	•R••	•R••	•R••	•R••	C R U D	AIS updates
Weather Stations	•R••	•R••	•R••	•R••	C R U D	Weather station telemetry

Permission Type	Guest User	Data Analyst	Master	Admin	Root	Description
AI SyG Statuses	• R • •	• R • •	• R • •	• R • •	C R U D	AIS updates
Weather Reports	• R • •	• R • •	• R • •	• R • •	C R U D	Weather station telemetry
AI SyG Records	• R • •	• R • •	• R • •	• R • •	C R U D	AIS vehicles seen
Site Permissions						
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 Glider's path
Obstacle Locations	• • • •	• • • •	• • • •	• • • •	C R U D	Obstacle telemetry
Vehicle Obstacles	• • • •	• • • •	• • • •	• • • •	C R U D	Mapping between obstacles and vehicles

Appendix B. WGMS Web Services

XML

XML both defines and is the structure of WGMS.

Entities

The primary components of WGMS are Entities. Entities are XML strings used to either store or structure data. Entities can contain other entities. In WGMS, entities are used to:

- 1) Define the structure of the GUI (using metadata stored in the Database).
- 2) Process Iridium data packets received from the Iridium Web Server.
- 3) Define the structure of data stored in the Database.
- 4) Create, delete and update other entities.

XML Data Types

All XML data types are strings of ASCII characters. If numerical values are contained in the string, the number values are stored as characters. For example, the number **-12,345** is stored as the string **"-12345"**.

The strings can be used to represent the following data types in entity description functions:

int – A signed 32-bit integer value.

long – A signed 64-bit integer value.

string – An ASCII string. This string may contain any of the data types described here, as well as XML data definitions.

base64Binary – An XML schema standard used to store binary data. Groups of 6 bits are encoded as one of 64 ASCII characters.

boolean – A single-character string, either "0" or "1". The represented value does not necessarily indicate "True" or "False".

dateTime – A date and time stamp value string, using the ISO 8601 format:

YYYY-MM-DDThh:mm:ss

where:

YYYY = four-digit year

MM = two-digit month (01=Jan, 02=Feb, etc.)

DD = two-digit day of month (01 through 31)

T = separator character

hh = two digit hour (00 through 23)

mm = two digit minute (00 through 59)

ss = two digit second (00 through 59)



Note

Note: The time zone is the zone of the message originator.

Response Strings

All functions return data in the form of a character string. The type of string will be defined by the XML record type. If a function fails to execute, the response string will contain the two-character "-1" string.

Soap Envelopes

The XML envelopes can be in SOAP 1.1 or 1.2 format. In the structure examples shown below:

length: Automatically-created indicating the content length

type: Data type appropriate to the parameter being defined

string: A URL Encoding String

SOAP 1.1 Format

POST /webservices/entityapi.asmx HTTP/1.1

Host: gliders.liquidr.com

Content-Type: text/xml; charset=utf-8

Content-Length: length

SOAPAction: "http://schemas.LiquidRobotics.com/WebServices/EntityName"

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <EntityName xmlns="http://schemas.LiquidRobotics.com/WebServices">
      <ParamName>type</ParamName>
      <ParamName>type</ParamName>
      <...>
    </EntityName>
  </soap:Body>
</soap:Envelope>
```

HTTP/1.1 200 OK

Content-Type: text/xml; charset=utf-8

Content-Length: length

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <EntityNameResponse xmlns="http://schemas.LiquidRobotics.com/WebServices">
      <EntityNameResult>string</EntityNameResult>
    </EntityNameResponse>
  </soap:Body>
</soap:Envelope>
```

SOAP 1.2 Format

POST /webservices/entityapi.asmx HTTP/1.1

Host: gliders.liquidr.com

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap12="http://www.w3.org/2003/05/soap-envelope">
  <soap12:Body>
    <EntityName xmlns="http://schemas.LiquidRobotics.com/WebServices">
      <ParamName>type</ParamName>
      <ParamName>type</ParamName>
      <...>
    </EntityName>
  </soap12:Body>
</soap12:Envelope>
```

HTTP/1.1 200 OK

Content-Type: application/soap+xml; charset=utf-8

Content-Length: length

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap12="http://www.w3.org/2003/05/soap-envelope">
  <soap12:Body>
    <EntityNameResponse xmlns="http://schemas.LiquidRobotics.com/WebServices">
      <EntityNameResult>string</EntityNameResult>
    </EntityNameResponse>
  </soap12:Body>
</soap12:Envelope>
```

Management System Function Summary

Below is a summary of the functions that are used to manage Entities.

Function Name	Description	Ref
<CreateEntity>	Create a new instance of an existing Entity	0
<CreateLoginSession>	Create and returns an encrypted session cookie	0
<DeleteEntity>	Delete a previously-created entity	0
<GetEntityColumnMetadata>	Retrieve from database a single column of metadata for a specified Entity type	0
<GetEntityColumnMetadataSet>	Retrieve from database a multi-column dataset for the specified entity type	0
<GetEntityColumnSelectMetadataSet>	Retrieve from database a named column dataset for the specified entity type	0
<GetEntityMetadata>	Retrieve from the database the complete metadata for the specified entity type	0
<GetEntitySet>	Retrieve from the database a specific set of records of this entity type	0
<GetEntitySetWithCriteria>	Retrieve from the database a specific set of records of this entity type that correspond to the specified criteria.	0
<GetRelatedEntitySet>	Retrieve from the database a set of related records of this entity type	0
<GetRelatedEntitySetWithCriteria>	Retrieve from the database a set of related records of this entity type that correspond to the specified criteria	0
<GetVehicleCommands>	Retrieve from the database date-specific vehicle command data	0
<GetVehicleCrumbs>	Retrieve from the database date-specific vehicle crumb data	0
<GetVehiclePowerCtlStatuses>	from the database date-specific vehicle crumb data	0
<ReadEntity>	Retrieve a single row of entity data from the database	0

Function Name	Description	Ref
<UpdateEntity>	Update a specific entity field in the database	0

Function Descriptions

Create Entity

Creates a new instance of an existing Entity.

Name:

<CreateEntity>

Parameters:

<entityType> int (A record type value assigned by the system)

<entityFieldXml> string (An XML string that defines the Entity)

Response:

<CreateEntityResponse>

<CreateEntityResult> string (The ID# of the Entity)

Create Login Session

Creates and returns an encrypted session cookie for use in consecutive Web Services commands.

Name:

<CreateLoginSession>

Parameters:

<login> string (User's login name)

<password> string (User's password)

<orgName> string (Assigned organization name)

Response:

<CreateLoginSessionResponse>

<CreateLoginSessionResult> string (Cookie text string)

Delete Entity

Deletes a previously-created entity.

Name:

<DeleteEntity>

Parameters:

<entityType> int: (System-assigned record-type value)

<id> long: (ID value of the Entity)

Response:

<DeleteEntityResponse>

<DeleteEntityResult> string ("0" ◇ deleted; "-1" ◇ failed)

Get Entity Column Metadata

Retrieves from the database the column metadata for a specified Entity type.

Name:

<GetEntityColumnMetadata>

Parameters:

<entityType> int (System-assigned record type value)

<columnName> string (Name of the column to be retrieved)

Response:

<GetEntityColumnMetadataResponse>

<GetEntityColumnMetadataResult> string (The column metadata of the specified entity type)

Get Entity Column Metadata Set

Retrieves from the database a single-column dataset for the specified entity type.

Name:

<GetEntityColumnMetadataSet>

Parameters:

<entityType> int (System-assigned record type value)

Response:

<GetEntityColumnMetadataSetResponse>

<GetEntityColumnMetadataSetResult> string (All metadata fields of the specified entity type)

Get Entity Column Select Metadata Set

Retrieve from the database a named column dataset for the specified entity type.

Name:

<GetEntityColumnSelectMetadataSet>

Parameters:

<entityType> int (System-assigned record type value)

<columnName> string (Name of the column to be retrieved)

Response:

<GetEntityColumnSelectMetadataSetResponse>

<GetEntityColumnSelectMetadataSetResult> string (All selects associated with the vehicle type)

Get Entity Metadata

Retrieve from the database the table metadata for the specified entity type.

Name:

<GetEntityMetadata>

Parameters:

<entityType> int (System-assigned record type value)

Response:

<GetEntityMetadataResponse>

<GetEntityMetadataResult> string (The table metadata for the specified entity type)

Get Entity Set

Retrieve from the database specific sorted and filtered metadata for the entity type.

Name:

<GetEntitySet>

Parameters:

<entityType> int (System-assigned record type value)

<columnXml> string (Columns to get)

<pageNumber> int (Page number to get)

<pageSize> int (Number of entries per page)

<sortColumn> string (Column to use for sorting results)

<sortDirection> string (Direction for sorting)

<dataFilter> string (Search string in the sorting column)

Response:

<GetEntitySetResponse>

<GetEntitySetResult> string (The sorted and filtered metadata)

Get Related Entity Set

Retrieve from the database related metadata for the entity type.

Name:

<GetRelatedEntitySet>

Parameters:

<entityType> int (System-assigned record type value)

<id> long (ID value of the entity)

<relatedEntityType> int (Related entity type)

<columnXml> string (Columns to get)

<pageNumber> int (Page number to get)

<pageSize> int (Number of entries per page)

<sortColumn> string (Column to use for sorting results)

<sortDirection> string (Direction for sorting)

<dataFilter> string (Search string in the sorting column)

Response:

<GetRelatedEntitySetResponse>

<GetRelatedEntitySetResult> string (The sorted and filtered metadata of the related entity)

Get Vehicle Commands

Retrieve from the database date-specific vehicle command data.

Name:

<GetVehicleCommands>

Parameters:

<fromTime> dateTime (Begin date for command data)

<toTime> dateTime (End date for command data)

<vehicleId> int (ID number for vehicle)

Response:

<GetVehicleCommandsResponse>

<GetVehicleCommandsResult> string (vehicle command data)

Get Vehicle Crumbs

Retrieve from the database date-specific vehicle crumb data. Data can be telemetry-only or all the combined crumb data.

Name:

<GetVehicleCrumbs>

Parameters:

<combined> boolean ("0" ♦ Telemetry-only; "1" ♦ All data combined)

<fromTime> dateTime (Begin date for crumb data)

<toTime> dateTime (End date for crumb data)

<vehicleId> int (ID number for vehicle)

Response:

<GetVehicleCrumbsResponse>

<GetVehicleCrumbsResult> string (combined list of command, telemetry and alarms)

Get Vehicle Power Control Statuses

Retrieve from the database date-specific vehicle crumb data.

Name:

<GetVehiclePowerCtlStatuses>

Parameters:

<fromTime> dateTime (Begin date for crumb data)

<toTime> dateTime (End date for crumb data)

<vehicleId> int (ID number for vehicle)

Response:

<GetVehiclePowerCtlStatusesResponse>

<GetVehiclePowerCtlStatusesResult> string (Status data)

Read Entity

Retrieve a single row of entity data from the database.

Name:

<ReadEntity>

Parameters:

<entityType> int: (System-assigned record-type value)

<id> long: (ID value of the Entity)

Response:

<ReadEntityResponse>

<ReadEntityResult> string (single row in the database table)

Update Entity

Update a specific entity field in the database.

Name:

<UpdateEntity>

Parameters:

<entityType> int: (System-assigned record-type value)

<id> long: (ID value of the Entity)

<fieldChangeXml> string (New value for the Entity type/ID)

Response:

<UpdateEntityResponse>

<UpdateEntityResult> string ("0" ♦ updated; "-1" ♦ failed)

Example: Create a New Waypoint Using curl

Note, this example creates a new waypoint, but this method can be used to issue any command defined by the XML entity.

To issue a **New Waypoint** command using **curl**:

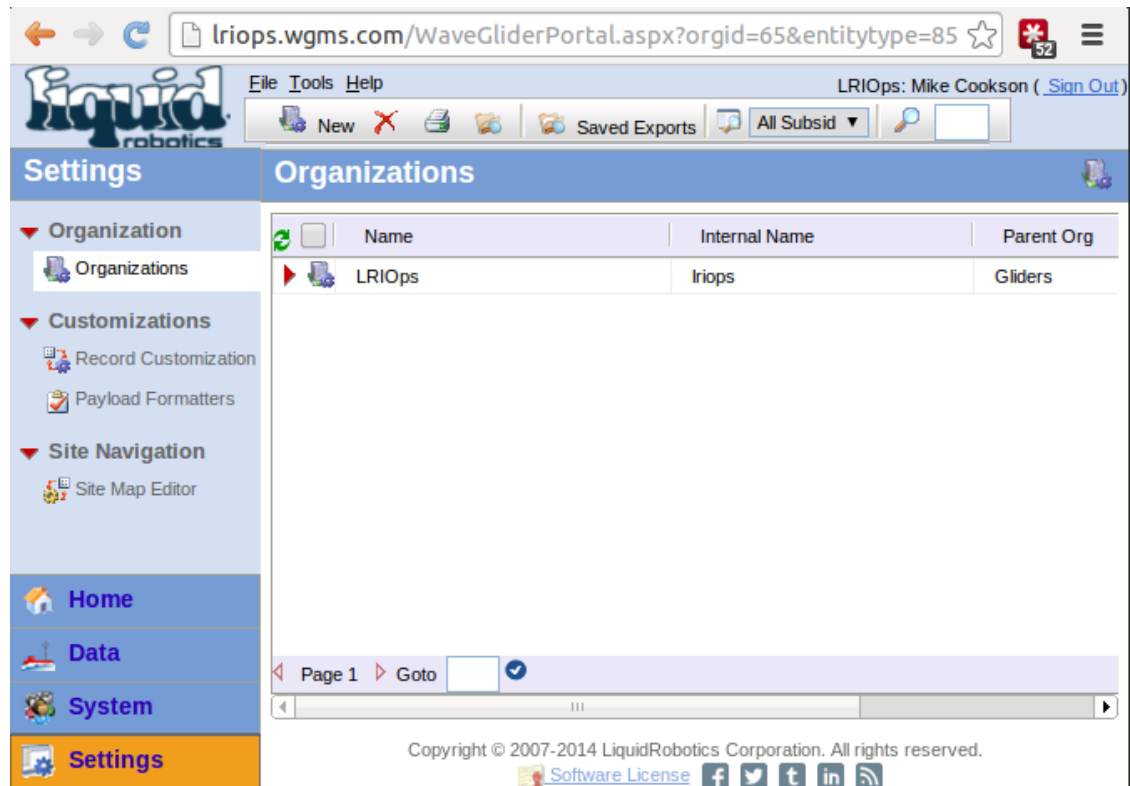
1. Create an XML file (for example, loginsoap.xml) that carries valid user credentials for WGMS for the given org:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap=
```



```
"http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <CreateLoginSession xmlns="http://gliders.liquidr.com/webservicesWebServices">
      <login>WGMS User Email</login>
      <password>password here</password>
      <orgName>org internal name</orgName>
    </CreateLoginSession>
  </soap:Body>
</soap:Envelope>
```

Remember to use the WGMS user e-mail (not the user name). The org internal name can be found in the **Settings** side bar - click **Show System Menus**, then click **Settings**. The **Settings** menu will open with the **Organizations** tab selected by default. For example:



- Issue the following **curl** command to perform a login and save session information in a file named headers:

```
curl -k -H "Content-Type: text/xml; charset=utf-8" --dump-header headers -H "SOAPAction:"
-d @loginsoap.xml -X POST https://gliders.wgms.com/webservices/entityapi.asmx
```

- After a proper login using **curl** as described in step 2 of “Set Up and Poll Exports” (page 113), develop a createentity.xml file with the **New Waypoint** command SOAP 1.1 or SOAP 1.2 XML envelope. You will need to know the VehicleId, and the communications channel being used. For example:

```
<?xml version="1.0" encoding="utf-8"?><soap:Envelope
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"><soap:Body><CreateEntity xmlns=
"http://gliders.liquidr.com/webservicesWebServices"><entityType>53</entityType><entityFi
eldXml>%3Centity%3E%3CWaypointName%3EWaypoint1%3C%2FWaypointName%3E%3CWaypointNumber%3E1%3C%2F
```

```
WaypointNumber%3E%3CVehicleId%3E1547%3C%2FVehicleId%3E%3CCommunicationChannelSelect%3E1%3C%2FCommunicationChannelSelect%3E%3CVisible%3E1%3C%2FVisible%3E%3CWaypointStatus%3E1%3C%2FWaypointStatus%3E%3CLatitude%3E37.41318679%3C%2FLatitude%3E%3CLongitude%3E-122.0062208%3C%2FLongitude%3E%3C%2FentityFieldXml%3E</CreateEntity%3E</soap:Body%3E</soap:Envelope%3E
```

Where the unencoded xml for the **New Waypoint** command is:

```
"<entity>
<WaypointName>Waypoint Name</WaypointName>
<WaypointNumber>Waypoint Number</WaypointNumber>
<VehicleId>Vehicle ID</VehicleId>
<CommunicationChannelSelect>1= Iridium, 2= xbee ...</CommunicationChannelSelect>
<Visible>1</Visible>
<WaypointStatus>0</WaypointStatus>
<Latitude>37.41318679</Latitude>
<Longitude>-122.0062208</Longitude>
</entity>"
```



Note

For more information see [“Soap Envelopes” \(page 146\)](#).

4. Perform this **curl** command to issue the **New Waypoint** command to the vehicle:

```
curl -X POST -L -b headers -d
@createentity.xml http://gliders.wgms.com/webservices/entityapi.asmx --header "Content-
Type:text/xml"
```

Example: Issue a Write Console Script Command Using curl

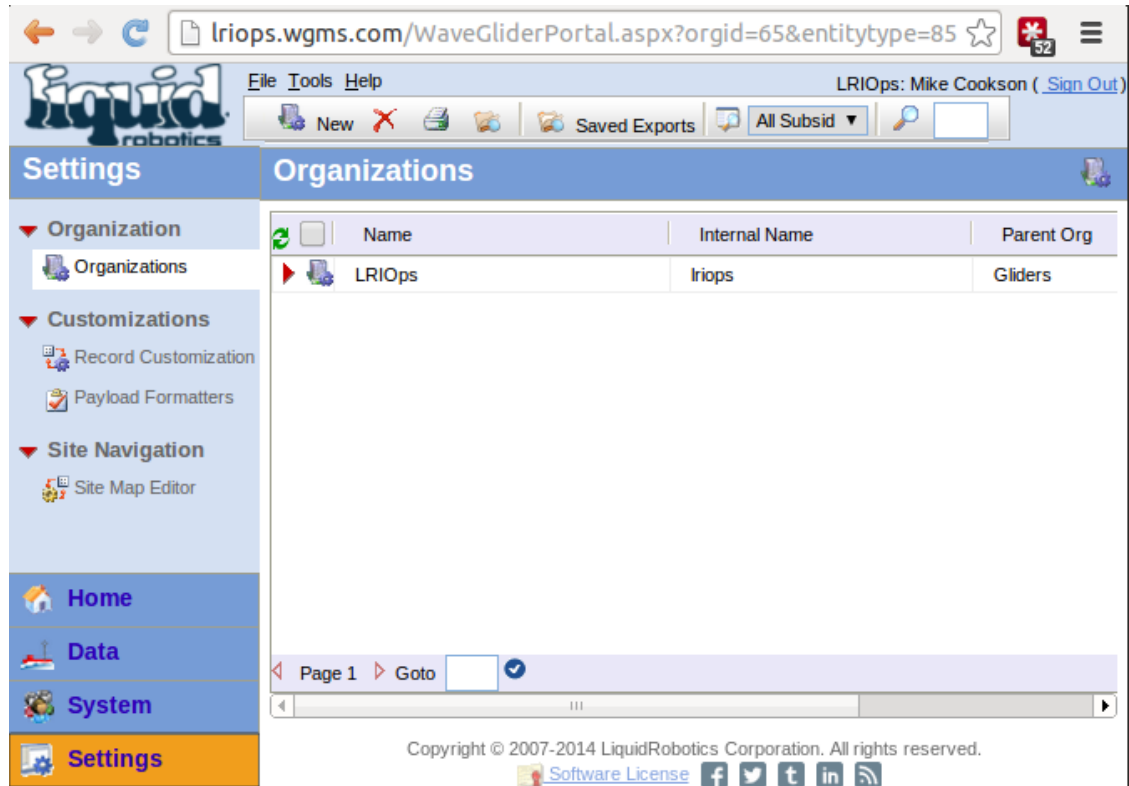
Note, this example issues a Write Console Script command, but this method can be used to issue any command defined by the XML entity.

To issue a **Write Console Script** command using **curl**:

1. Create an XML file (for example, `loginsoap.xml`) that carries valid user credentials for WGMS for the given org:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap=
"http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <CreateLoginSession xmlns="http://gliders.liquidr.com/webservicesWebServices">
      <login>WGMS User Email</login>
      <password>password here</password>
      <orgName>org internal name</orgName>
    </CreateLoginSession>
  </soap:Body>
</soap:Envelope>
```

Remember to use the WGMS user e-mail (not the user name). The org internal name can be found in the **Settings** side bar - click **Show System Menus**, then click **Settings**. The **Settings** menu will open with the **Organizations** tab selected by default. For example:



- Issue the following **curl** command to perform a login and save session information in a file named headers:

```
curl -k -H "Content-Type: text/xml; charset=utf-8" --dump-header headers -H "SOAPAction:"  
-d @loginsoap.xml -X POST https://gliders.wgms.com/webservices/entityapi.asmx
```

- Develop a createentity.xml file with the **Write Console Script** command SOAP 1.1 or SOAP 1.2 XML envelope. You will need to know the VehicleId, the communications channel being used, and the script buffer content. For example:

```
<?xml version="1.0" encoding="utf-8"?>  
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"  
  xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">  
  <soap:Body>  
    <CreateEntity xmlns="http://gliders.liquidr.com/webservicesWebServices">  
      <entityType>44</entityType>  
      <entityFieldXml>%3Centity%3E%3CCommandName%3E%3CCommandName%3C%2FCommandName%3E%3CPayload_String%  
3ECommandDescription%3C%2FPayload_String%3E%3CCommandType%3E37120%3C%2FCommandType%3E%3CVehicleId%  
3EVehicleId%3C%2FVehicleId%3E%3CCommunicationChannelSelect%3E1-Iridium, 2-Xbee%3C%  
2FCommunicationChannelSelect%3E%3CCommandStatus%3E0%3C%2FCommandStatus%3E%3CScriptBuffer%  
3EScriptBufferContent%3C%2FScriptBuffer%3E%3CGliderBoardAddress%3EBoardAddress%3C%  
2FGliderBoardAddress%3E%3COperationType%3E0%3C%2FOperationType%3E%3C%2Fentity%3E</entityFieldXml>  
    </CreateEntity>  
  </soap:Body>  
</soap:Envelope>
```

Where the unencoded xml for the **Write Console Script** command is:

```
"<entity>
```

```
<CommandName>Write Console Script</CommandName>
<Payload_String>Write Console Script</Payload_String>
<CommandType>37120</CommandType>
<VehicleId>Vehicle ID</VehicleId>
<CommunicationChannelSelect>1= Iridium, 2= xbee ...</CommunicationChannelSelect>
<CommandStatus>0</CommandStatus>
<ScriptBuffer>Script to Send</ScriptBuffer>
<GliderBoardAddress>Board Address</GliderBoardAddress>
<OperationType>0</OperationType>
</entity>"
```



Note

For more information see [“Soap Envelopes”](#) (page 146).

4. Issue the following **curl** command, which will issue the **Write Console Script** command to the vehicle:

```
curl -X POST -L -b headers -d
@createentity.xml http://gliders.wgms.com/webservices/entityapi.asmx --header "Content-
Type:text/xml"
```

Appendix C. WGMS Release Notes

Overview

The Wave Glider Management System (WGMS) includes five modules:

- **WGMS Kernel** – the core application that manages the database, the user experience and the web services interface.
- **Communications Server** – the primary function of the Communications Server is to translate between structured text data (XML) and the packed data formats used in message bodies.
- **Packet Reflector** – the Packet Reflector has two important roles. First, it multiplexes/demultiplexes communications through the various transport protocols available. Note that these may vary with vehicle and time. The Packet Reflector is also responsible for sending copies of telemetry information to subscriber Communications Servers.
- **XBee Relay** (optional) – this module manages the transport of messages between the Wave Glider and a Packet Reflector via the XBee communications protocol.
- **Virtual Relay Server** - an interface that connects directly to the Packet Reflector from the SMC board via TCP over several types of networks like WiFi, Cell, BGAN or RUDICS.

Changes in Version 4.1.8

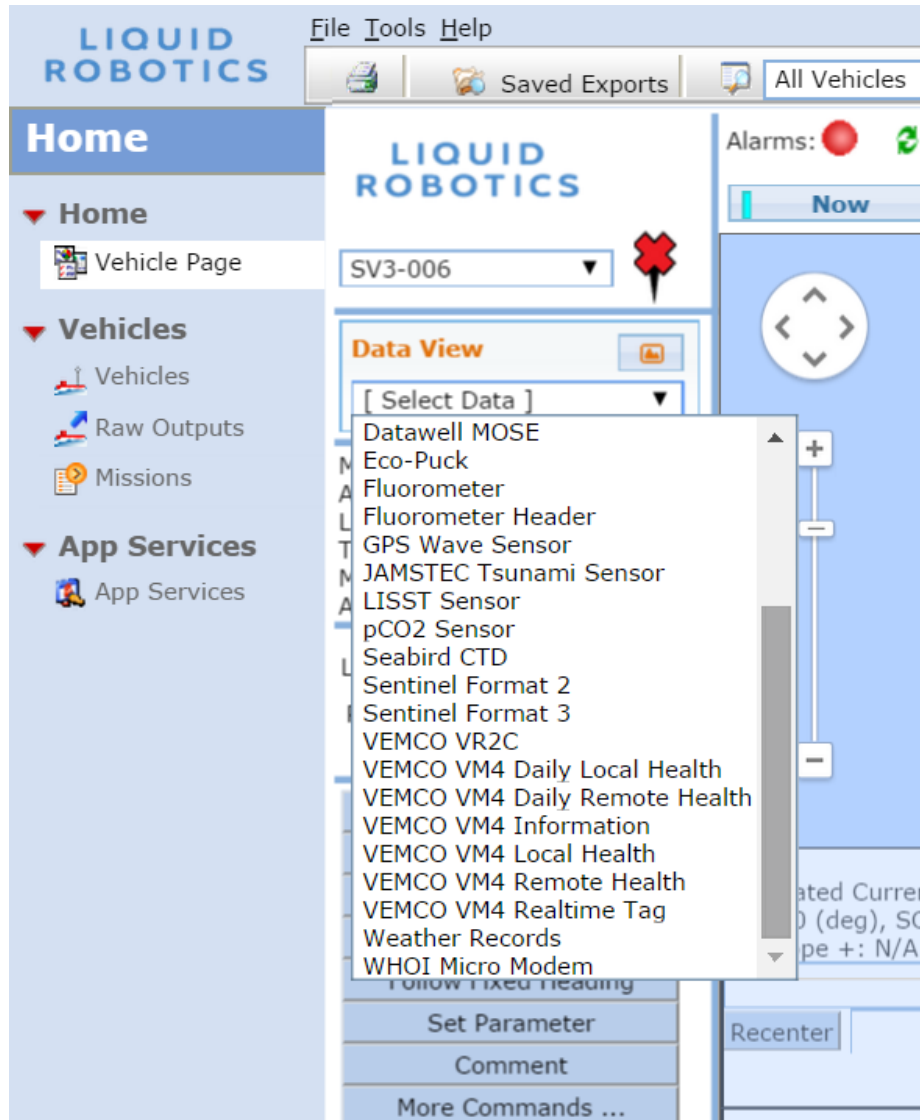
Principal Changes

The 4.1.8 release includes:

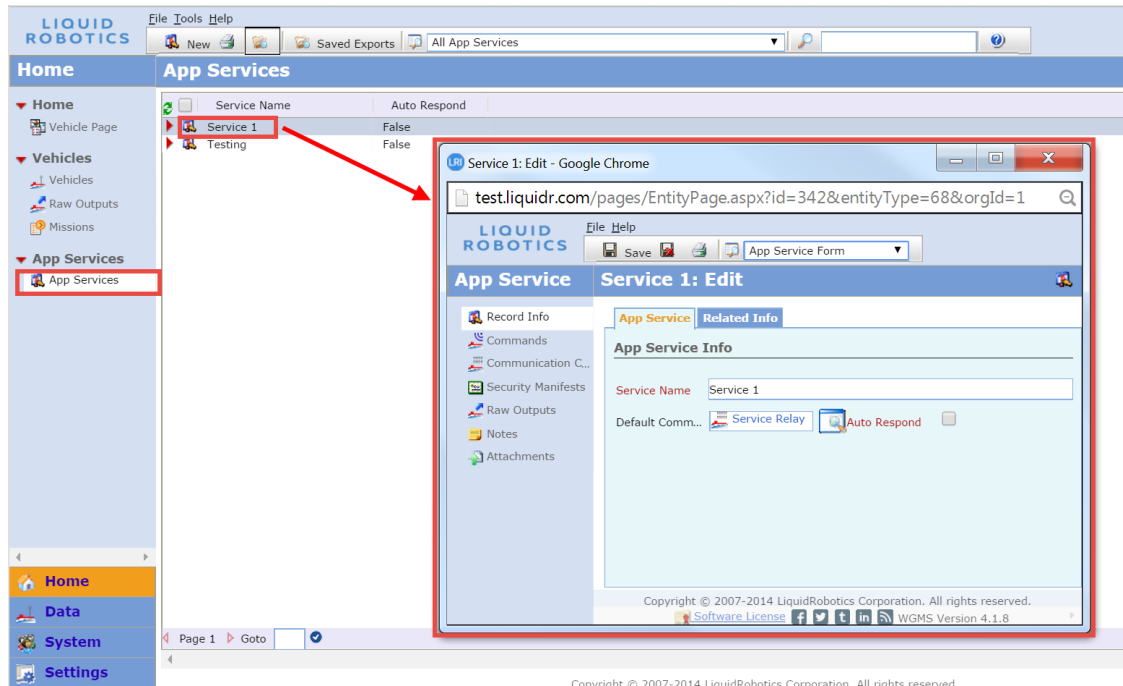
1. Added App Services support for WGMS, which will enable it to record telemetry and issue commands to external apps that perform functions outside of WGMS.
2. New sensor support in Data Views for Sentinel, the GPSWaves Sensor, and Weather Records.
3. Support migration to Azure by changing some DB queries to be more compatible with Azure DB.
4. Many important bug fixes.

User Experience Changes

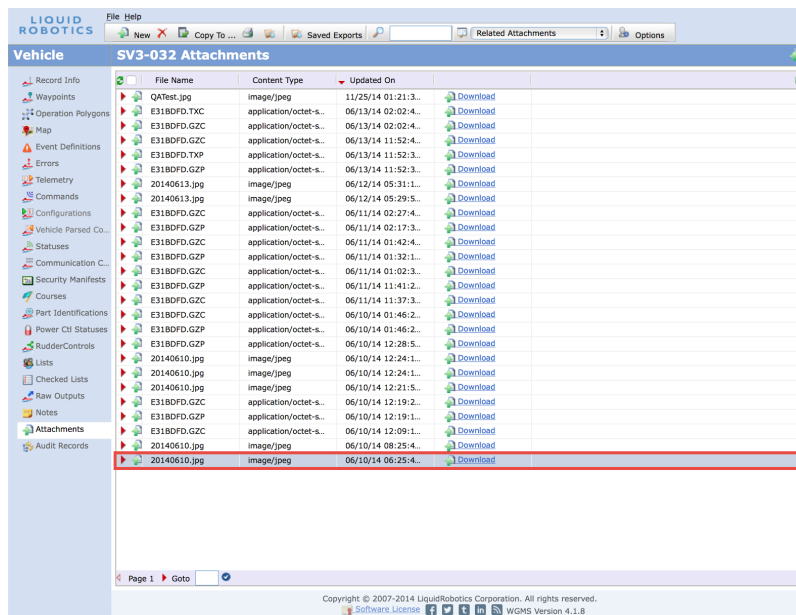
New sensor support in Data Views for Sentinel Format 2, and 3, GPSWaves Sensor, and Weather Records.



A user interface has been added to WGMS to display the status of Regulus services.



Process EXIF tags are available for downloaded images (thumbnails) in WGMS vehicle attachments. A web service has been added to include the time and location (latitude and longitude) for each image generated by the SV3 camera. A button in the toolbar of the vehicle **Attachment** form enables EXIF tags for attached JPEG images. Click on an image attachment:



An Attachment Form for the selected image opens:

Attachment 20140610.jpg: Edit

Record Info

Attachment

Attachment Information

File Name: 20140610.jpg

File Size(B): 11039

Content Type: image/jpeg

Latitude (deg):

Longitude (deg):

TimeStamp:

Entity: SV3-032

Table: Vehicle

Related Information

Owner:

Organization: Gliders

Created On: 06/10/14 06:25:40 am

Updated On: 06/10/14 06:25:40 am

Created By: System Admin

Updated By: System Admin

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Click on the **Process Exif Metadata** button to display the **Latitude**, **Longitude** and **TimeStamp** for the image.

Attachment 20140610.jpg: Edit

Record Info

Attachment

Attachment Information

File Name: 20140610.jpg

File Size(B): 11039

Content Type: image/jpeg

Latitude (deg): 37.4108777777778

Longitude (deg): -122.004438888889

TimeStamp: 06/10/14 06:21:11 am

Entity: SV3-032

Table: Vehicle

Related Information

Owner:

Organization: Gliders

Created On: 06/10/14 06:25:40 am

Updated On: 06/10/14 06:25:40 am

Created By: System Admin

Updated By: System Admin

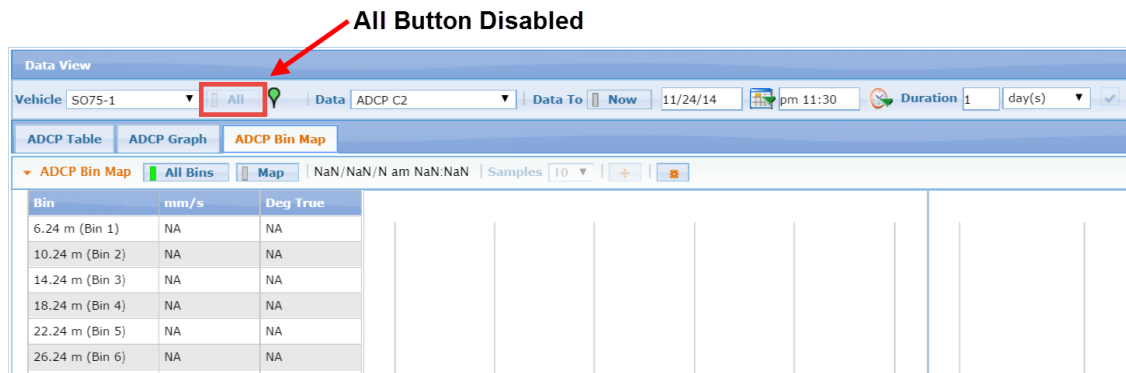
Copyright © 2007-2014 LiquidRobotics Corporation. All rights reserved.
Software License WGMS Version 4.1.8

The Map Utility tool that renders shapes for courses and operating regions now lets you click and drag on circles to create ellipsis. You can also click and drag a side of a square to create a rectangle.

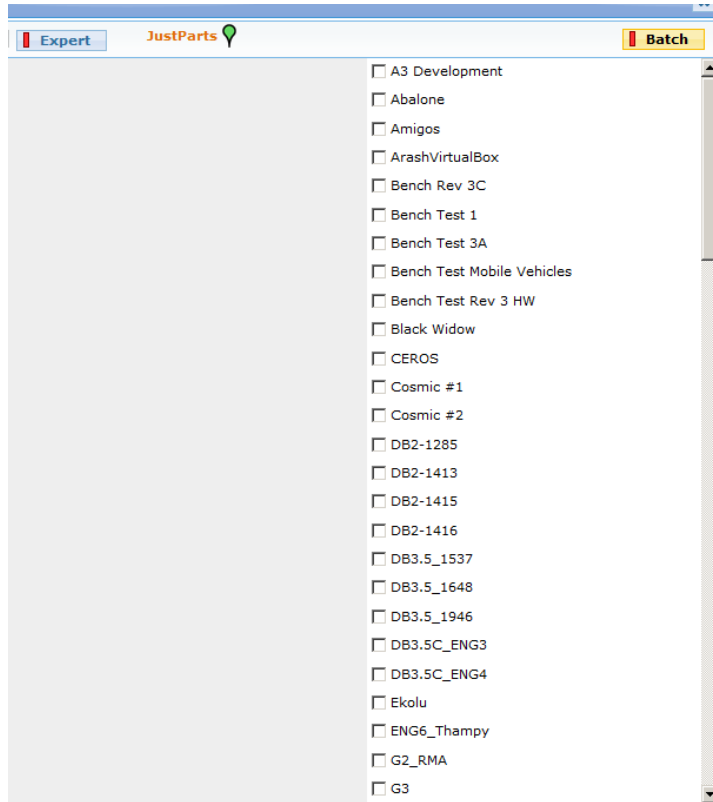
The WGMS help window can now be moved to a second monitor and if you close the help window, it will re-open to the place where you left off when the help window was closed.

When you select a Data View from the WGMS Dashboard, it now opens as a full screen, instead of a window and it remains a full screen when the browser is resized. Data View options will continue to open as windows on mobile devices.

The **Show All** button is now disabled on the ADCP C2 Bin Map data view.



You can now issue a command to multiple SV3 Vehicles within the same WGMS Organization from the SV3 Commands Window. By selecting **Expert** commands in the **Services** or **Devices** tool bar, a **Batch** button will appear. When the **Batch** button is selected, a check box for each SV3 Vehicle in the WGMS Organization will appear. When you issue a command, it will be issued to all of the selected Vehicles simultaneously.



New Features

- HYP-1704 Support Sentinel Shore Side Comms
- HYP-1705 Relay to handle Sentinel formatted packets
- HYP-1706 Support DB schema and entity storage for services and their messages
- HYP-1707 Create a UI for service messages
- HYP-1708 Support trial migration to SQL Azure for WGMS database

HYP-1710	Sentinel Service to publish manifest to render the command window
HYP-1711	Process EXIF tags from downloaded images (thumbnails) attachments
HYP-1713	Modify Firmware Level Part to reflect new Regulus version support
HYP-1715	Pilot tools aspect ratio for shapes rendered for courses and op-regions
HYP-1731	SV3 Read Waypoint ACK
HYP-1733	Support a new type 0x91 payload message for reporting generic payload telemetry
HYP-1744	Adjust how long before WGMS ignores Command Acks
HYP-1761	Allow custom SV3 commands to be issued to multiple vehicles

Improvements and Tasks

HYP-1684	LROG: Add GPS Wave Height and Weather Station Sensor Data to Custom Reports in WGMS
HYP-1717	WGMS Help Feature - 1) Need to be able to move help pop up window once opened to second screen - 2) When you open the window again, the help function has returned to the beginning, not where you were
HYP-1718	Data View open full screen dialog
HYP-1721	"Show All" Button should be disabled on "ADCP C2 Bin Map"

Bug Fixes

HYP-1714	IMEI's, Unique ID's, Auto Respond and Multiple Vehicle are sporadic when moving vehicles
HYP-1727	manual (keyboard) entry of date/time causes problems
HYP-1734	VEMCO VR2C Data doesn't display data
HYP-1736	"Write File Init" fails when attaching a new file on Safari
HYP-1739	The wrong '.' is used when splitting a filename into 8.3 format when doing file uploads
HYP-1741	Custom Report/"Weather Records" sensor: The information on TimeStamp is not correct when the user selects"tt" time format first and searches information using "Weather Records" sensor
HYP-1742	Home: Map Utility and Piloting Tools are overlapped, when the user tries to create an OP or a WP using Map Utility tool.
HYP-1745	Quotes in SV3Command string fields are not being escaped
HYP-1746	Data View: The "Duration" field is displayed a text when the user enters to the "Date View" window
HYP-1747	Data View: WGMS shows an alert when the user tries to create an OP/WP using Map Utility in Sentinel Map

HYP-1748	"Data View" widget doesn't show
HYP-1749	WGMS Data View is set to view in PT time zone causing confusion for users who are using UTC time zone when attempting to view data
HYP-1752	App Services: WGMS shows a server error, when the user clicks on "Copy From" button
HYP-1754	Auto-avoid icon is usually not "lit up" or colored when auto-avoidance is actually on
HYP-1759	The WGMS version should be displayed on the bottom of the page

Changes in Version 4.1.7

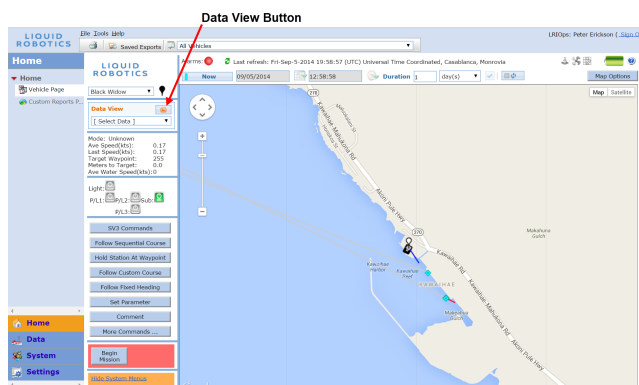
Principal Changes

The 4.1.7 release includes:

1. Improvements to the WGMS Dashboard UI incorporating more HTML 5 elements.
2. The SV3 local web page is incorporated into the vehicle form.
3. Virtual Relay commands are now allowed to be timed out and retried on Iridium (SV3 firmware update required).
4. Many bug fixes.

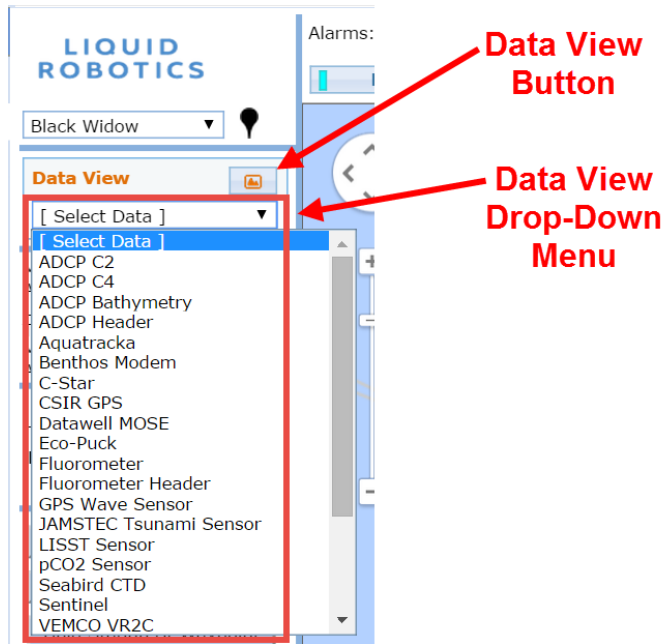
User Experience Changes

A **Data View** button has been added to the WGMS Dashboard for easy access to custom reports.

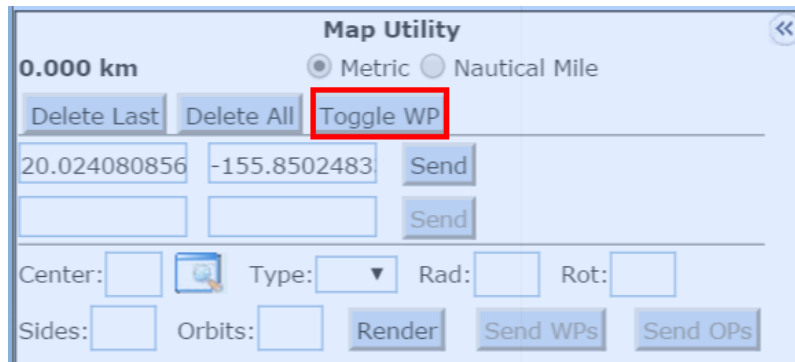


The **Data View** drop-down menu is used to select the type of data that will be displayed in a custom report when the **Data View** button is clicked.

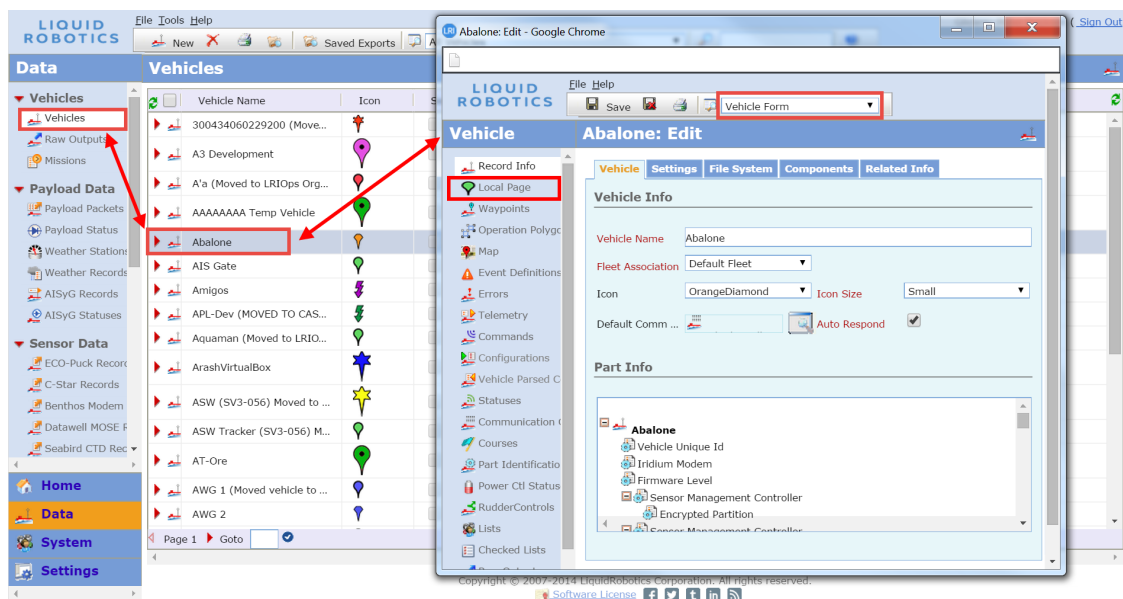
When you click on the **Data View** button, custom reports for the type of data selected in the Data View drop-down menu will be displayed. The **Data View** drop-down menu will continue to display the most recently selected data type, until a different data type is selected.



The **Toggle Waypoint** button state (in the Map Utility) is now preserved when the screen refreshes.



A proxy server has been set up to handle secure SV3 vehicle Web page (local page) access utilizing Active Directory (AD) authentication credentials. The SV3 Vehicle Web page (local page) can now be accessed from the WGMS Vehicle Form.



Click on **Local Page** in the side bar of the **Vehicle Form** and the Web page for that Vehicle will appear.

LIQUID ROBOTICS 888 574 4574 (US) +1 408 636 4205 (International) support@liquidr.com

Vehicle: SV3-1260095230 "Abalone" 930Wh VR INET Hold DRY WiFi 2014-12-12T23:42:03.705Z

Abalone: Overall vehicle status Status Checklist Config Operate Setup Help

**! No functioning sub compass
Rudder missing**

Running
Temp=NaN°C, Press=NaNmb, Wind Speed=NaNkn, Wind Dir=NaN°. Heading=NaN°

Unhappy

- weatherStation
- heading
- rudder
- thruster
- waterSpeed

Happy

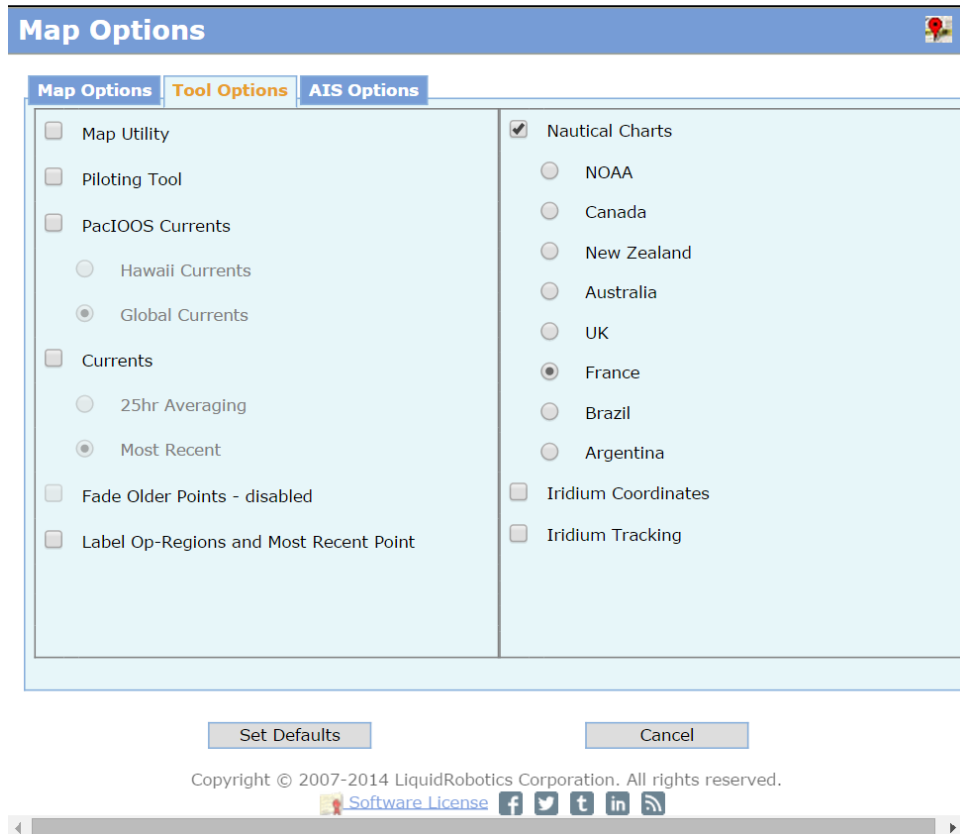
- airmarWaterspeed
- airmarWeatherDeviceDriver
- ais
- AIS
- AMPSManager
- AMPSPowerWrapper
- bulkDataExport
- canTransport
- cellModem
- commandReporter
- communicationsManager
- configurationReporter
- CPUTempMonitor

No NMEA sentences seen yet
No NMEA sentences seen yet
PSHHandler
MMSI: 367155410 (A HUI HOU). Pos=37.411253, -122.004415. t=34:0:NOT_DEFINED, 2014-12-12T2 3:41:42.964Z
[Host(Node=1): P=101.2 kPa, T=29.5°C; HW OK; Uptime: 7 days, 22:13:20] [Thruder is Unavailable] [PydInt01(Node=3): P=101.1 kPa, T=24.4°C; HW OK; Uptime: 7 days, 01:14:16]
Host: 10.10.1.150; Streaming: track alarmLog rudderDebug log :-)
728 cantransport, Uptime: 7 days, 22:09:48
ON (ON) Requested by: operator Requires: ethernetSwitch
Last MD5: 2C 2D 6E 18 48 EF B6 A5 F7 58 80 44 21 60 F8 E7
[virtualRelay, iridiumModem] No Default Channel, Last Command: Read file transaction closed. Have 0 blocked messages.
Last MD5: 36 B9 FC 5B A2 CF 9A 9A 2E 2E C9 C0 CB DB 3F 45
59.2°C

New Payload Devices can be parsed in the CONFIG json.

A **Clear All Alarms for this Vehicle** capability is now exposed to root users only.

French nautical charts are now available in the WGMS Map Options.



Map Options

Map Options | **Tool Options** | **AIS Options**

☐ Map Utility

☐ Piloting Tool

☐ PacIOOS Currents

☐ Hawaii Currents

☒ Global Currents

☐ Currents

☐ 25hr Averaging

☒ Most Recent

☐ Fade Older Points - disabled

☐ Label Op-Regions and Most Recent Point

☒ Nautical Charts

☐ NOAA

☐ Canada

☐ New Zealand

☐ Australia

☐ UK

☒ France

☐ Brazil

☐ Argentina

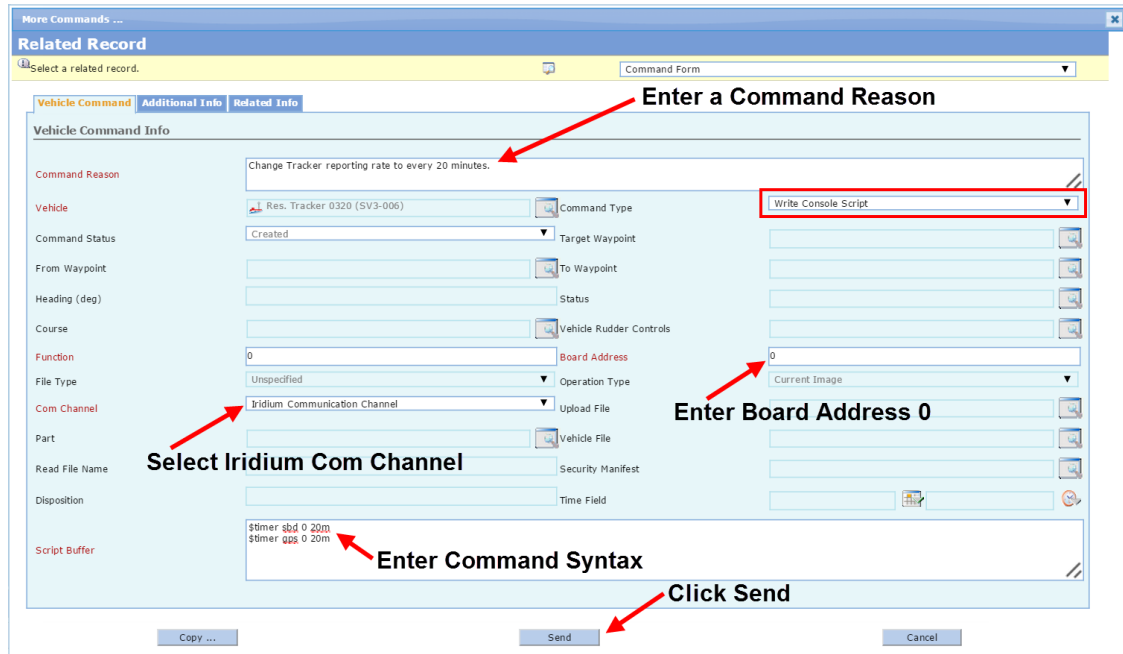
☐ Iridium Coordinates

☐ Iridium Tracking

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[Software License](#) [f](#) [t](#) [t](#) [in](#) [r](#)

Commands can now be issued to the SV3 Resilient Tracker by issuing a **Write Console Script** command from a WGMS command form. For more information, see the *Wave Glider® SV3 Integrated Sensor User Guide for the Xeos Technologies Rover (Resilient Tracker)*.



More Commands ...

Related Record

Select a related record. Command Form

Vehicle Command | **Additional Info** | **Related Info**

Vehicle Command Info

Command Reason Change Tracker reporting rate to every 20 minutes. **Enter a Command Reason**

Vehicle Res. Tracker 0320 (SV3-006) **Command Type** Write Console Script **Enter Board Address 0**

Command Status Created **Target Waypoint**

From Waypoint **To Waypoint**

Heading (deg) **Status**

Course **Vehicle Rudder Controls**

Function 0 **Board Address** 0

File Type Unspecified **Operation Type** Current Image

Com Channel Iridium Communication Channel **Upload File**

Part **Vehicle File**

Read File Name **Security Manifest**

Disposition **Time Field**

Script Buffer \$timer sbd 0 20m
\$timer qss 0 20m **Enter Command Syntax**

Click Send

New Features

- HYP-1516 Preserve Toggle waypoint button state through refresh.
- HYP-1522 Button on Main Page that redirects straight to "Custom Reports" page.
- HYP-1572 Allow SV3 vehicle local page to be accessed via vehicle form on WGMS.
- HYP-1573 Setup proxy to handle secure SV3 page access utilizing AD for authentication.
- HYP-1574 Cleanup Camera Client to work with new SV3 Camera.
- HYP-1590 Parse the new Payload Devices in the CONFIG json.
- HYP-1598 Add clear all alarms for this vehicle exposed to a root user.
- HYP-1657 Add France layer to Nautical Charts.
- HYP-1682 Tracker to allow for Write Console command issued.

Improvements and Tasks

- HYP-1501 Change the email subject when WGMS loses communication with Virtual Relay.
- HYP-1513 Request to streamline the Fast Mailbox Check ON/OFF procedure
- HYP-1521 LROG: ADCP data should display the magnitude and direction on single graph.
- HYP-1526 LROG: Requested Changes from Conoco Philips (see description for details).
- HYP-1530 LROG: Request for ADCP data display to update automatically (graph display does not & will not refresh).
- HYP-1540 Home: WGMS doesn't show the "Mode" correctly when issuing "Hold Current Position" command.
- HYP-1549 Need to re-name the Vehicle Page tab to the Dashboard tab in the Home Page sidebar.
- HYP-1584 Pilot Tool App: The status of the WPs should be "Saved not sent", when "Copy but don't send" option is selected by the user.
- HYP-1592 Courses: WGMS should not show "Send" option when creating one from zero.
- HYP-1621 Need the Pilot Tool to copy the "Owner" field to the new org.
- HYP-1622 WGMS Provisioning - Add a Check Box for Technical Users on User Profile (This allows us to identify WGMS Technical Users).
- HYP-1659 Update the ADCP custom report to have m/s or cm/s.
- HYP-1663 Change "Custom Reports" Link.
- HYP-1670 SV3 commands: WGMS should resize the SV3 UI Commands properly.

Bug Fixes

- HYP-634 Calculated columns don't sort.
- HYP-1454 Added Commands- WGMS should refresh data from top information, when changing the information.
- HYP-1466 Export download link to bypass DLB at gogrid to avoid timeouts.
- HYP-1545 iPhone and iPad browsers crash when more than 4 gliders (and their waypoints) are enabled.
- HYP-1547 Reduce the occurrence of un-acked commands when VR is marginal.

- HYP-1550 File button in Home/Vehicles/System/Settings page toolbars serves no purpose.
- HYP-1551 The Help button and the Help icon on the Home page toolbar should be removed.
- HYP-1568 IE11 Overall System: WGMS opens the form of the "source" entity, when trying to perform a "Copy From" action if the user double -clicks the record.
- HYP-1570 (Safari) Overall System: WGMS has problems rendering the forms on mac.
- HYP-1575 In the "Vehicle/Audit Records" menu, in the "Edit Audit Record" if the user clicks on the "Parent Record " text the WGMS displays an error message.
- HYP-1577 When the user issues a "New Waypoint" command with invalid information WGMS displays an error message.
- HYP-1578 When the user edits user information and leaves the "email" field blank the "save" and "save and close" buttons stop working.
- HYP-1579 In the Record Customization/Fields/Selects a System Error message is displayed, when pressing the "Copy from Another Select" button.
- HYP-1580 When the user issues the Get File List command with an invalid number(4745) in the Storage Address field ,WGMS displays a server error message.
- HYP-1581 The user cannot print the preview of the Role list, in "View Related Role Limits"
- HYP-1582 When the user enters a decimal number on the page navigation tool WGMS displays a system error message.
- HYP-1583 Map Utility (FF Only): WGMS doesn't refresh the fields on "Map Utility" box, when clicking on "Refresh" icon.
- HYP-1585 Event Definition - "Towing Alarm" alarm should not be in the "Alarm Type" list,when the user tries to edit some alarm due it is a deprecated alarm.
- HYP-1586 Event Definition - "Towing Alarm" alarm should not be in the "Alarm Type" list,when the user tries to edit some alarm due it is a deprecated alarm.
- HYP-1588 Home/Missions: When length of "Mission" name is 9 or more characters WGMS shows the name in blank.
- HYP-1589 Part Info (FF/Only): "Part info" box is too small, when maximizing Vehicle Form.
- HYP-1595 Custom Reports - Changing the duration of data displayed is not user friendly.
- HYP-1619 SV3 Commands Truncate ParamLabels.
- HYP-1623 Allow for out of order and mis-ordered file blocks to be re-constructed on file read.
- HYP-1624 SV3: "Script buffer" field must be marked as required, when issuing "Attach script to WP" command.
- HYP-1625 SV3: WGMS shows an error message when the user leaves empty the "Script buffer" field and tries to send the "Attach Script to Waypoint" command.
- HYP-1627 In Map Options, the "Zoom Level" field allows enter characters.
- HYP-1629 When the user enters a big page number on the page navigation tool WGMS displays a system error message.
- HYP-1630 The user can activate NOAA chart from Map Options, if it is deactivate in "Org Admin Form"
- HYP-1631 Custom Report (Chrome/Only): DateTimeControl field is refreshed every time the user changes the Data source.
- HYP-1632 Escape Quote from SV3 Command and Config files.
- HYP-1633 Home Refresh: The user is blocked to create/render WP/OP, if there was information in Map Utility box, when clicking on "Last Refresh" icon.

HYP-1634	SV3 Commands- "Arrival Distance" command is sent, when distance is a negative number.
HYP-1640	Payload type cannot be entered as a numeric value when creating an export for payload packets.
HYP-1641	The form is not closed, when the user clicks on the "cancel" button.
HYP-1642	Modify Iridium Relay to handle MO Confirmation Packets.
HYP-1643	Custom Report: Dragging functionality is not working.
HYP-1644	Line Following status icon not functional.
HYP-1645	Custom Report: Each time the user access "Custom Report" section or switches vehicles WGMS loses its UI, showing a "blank loading"
HYP-1647	Home: "Follow Custom Course" form is displayed when the user submits any information on the fields of timepicker functionality.
HYP-1648	Home: The user cannot close the "Alarm notification" window, when clicking on 'X' button.
HYP-1652	The "Fast Mailbox Check " tooltip is misspelled in the "Home" section.
HYP-1653	Text from System Information-based alarm not un-escaped properly in mouse-over text.
HYP-1656	SV3 use navigation mode from telemetry to calculate stats.
HYP-1660	ONLY IE - No data loaded when accessing "SV3 Commands" window.
HYP-1661	Closed Frames from command buttons are displayed again after principal window resize.
HYP-1662	SV3 Commands - The "SV3 Commands" window is not closed, when the user clicks on "Close" button.
HYP-1664	SV3 commands: The user is not able to receive a response when issuing commands.
HYP-1667	SV3 Command Suite not functioning.
HYP-1668	Home: Dashboard is lost when switching between vehicles.
HYP-1669	Issues with NakWithDescription.
HYP-1683	SV3 VirtualRelay Marginal: If the command is Timedout before it is retried by Iridium it will never be retried.
HYP-1686	"More Commands" window doesn't auto-close when command is sent in WGMS.
HYP-1687	WGMS is crashing when the user uses the "tt" time format first and tries to switch vehicles on "Dashbord" and "Custom Report" sections.
HYP-1689	Mobile devices to use legacy dialog boxes.
HYP-1690	Resizable dialog.

Changes in Version 4.1.6.1

Principal Changes

WGMS 4.1.6.1 includes 2 new features in the UI and 4 bug fixes.

User Experience Changes

In the **<Vehicle Name> Communications** window at the bottom of the **Home** page for the selected Vehicle, the **Battery Power** column displays a colored bar to indicate battery power status. The bar is green for operational, yellow for low, and red for empty. With WGMS 4.1.6.1 this is the default display. You can revert to the legacy display by changing a setting for the Organization in the **Settings** page.

The screenshot shows the WGMS Home page with the Captain America Communications window open. The window displays a table with columns for TimeStamp, Target, SOG (kt), POG (deg), Desired, Sub Hdg, Water Sp, Current Speed, Current Heading, Lat (deg), Lon (deg), Battery Power, Command, and Reason. The Battery Power column shows green bars for all entries, indicating operational status. A red arrow points to the Battery Power column header.

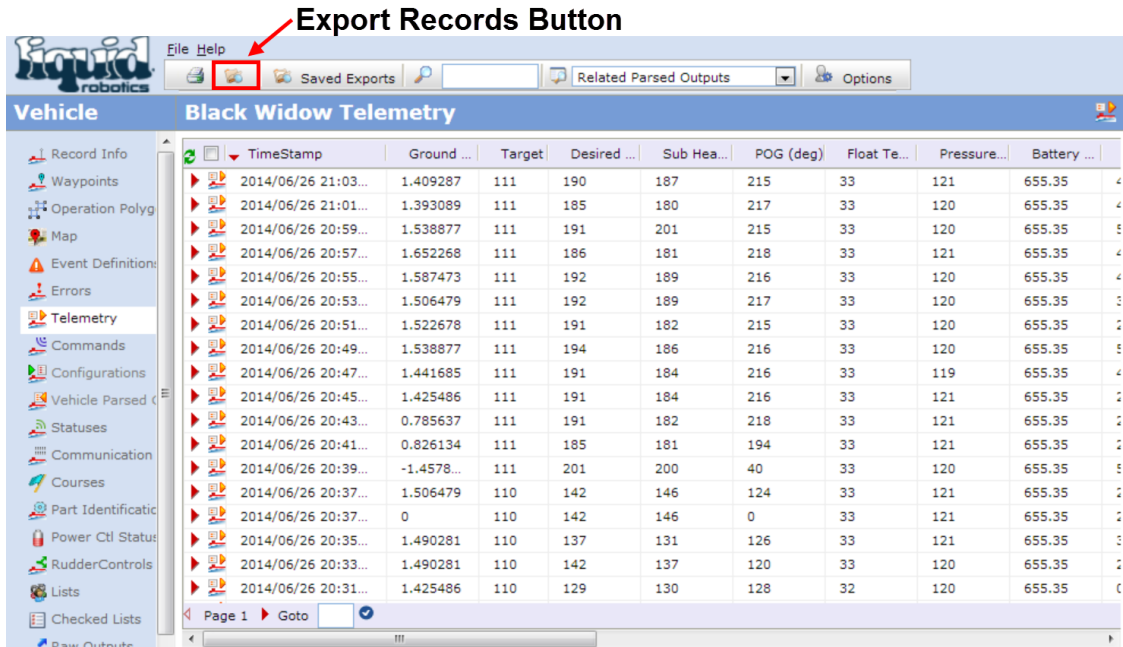
TimeStamp	Target	SOG (kt)	POG (deg)	Desired	Sub Hdg	Water Sp	Current Speed	Current Heading	Lat (deg)	Lon (deg)	Battery Power	Command	Reason
2014/06/26 21:52:22	0	0	0	273	286	0.0000			37.41093	-122.00482	Green		
2014/06/26 21:52:19	0	0	0	273	286	0.0000			37.41093	-122.00482	Green		
2014/06/26 21:47:21	0	0	0	273	286	0.0000			37.41093	-122.00482	Green		
2014/06/26 21:47:19	0	0	0	273	286	0.0000			37.41093	-122.00482	Green		
2014/06/26 21:42:22	0	0	0	273	286	0.0000			37.41093	-122.00482	Green		

WGMS 4.1.6.1 provides optional 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

Click on the **Export Records** button in the tool bar at the top of the **<Vehicle Name> Telemetry** window to open the **Export VehicleParsedOutput Records** dialog.

Export Records Button



The screenshot shows the 'Black Widow Telemetry' window with a table of telemetry data. The table has columns: TimeStamp, Ground, Target, Desired, Sub Hea..., POG (deg), Float Te..., Pressure..., and Battery... The data rows show timestamps from 2014/06/26 21:03 to 2014/06/26 20:31. The 'Export' button is highlighted in the top menu bar.

TimeStamp	Ground	Target	Desired	Sub Hea...	POG (deg)	Float Te...	Pressure...	Battery
2014/06/26 21:03...	1.409287	111	190	187	215	33	121	655.35
2014/06/26 21:01...	1.393089	111	185	180	217	33	120	655.35
2014/06/26 20:59...	1.538877	111	191	201	215	33	120	655.35
2014/06/26 20:57...	1.652268	111	186	181	218	33	121	655.35
2014/06/26 20:55...	1.587473	111	192	189	216	33	120	655.35
2014/06/26 20:53...	1.506479	111	192	189	217	33	120	655.35
2014/06/26 20:51...	1.522678	111	191	182	215	33	120	655.35
2014/06/26 20:49...	1.538877	111	194	186	216	33	120	655.35
2014/06/26 20:47...	1.441685	111	191	184	216	33	119	655.35
2014/06/26 20:45...	1.425486	111	191	184	216	33	121	655.35
2014/06/26 20:43...	0.785637	111	191	182	218	33	121	655.35
2014/06/26 20:41...	0.826134	111	185	181	194	33	121	655.35
2014/06/26 20:39...	-1.4578...	111	201	200	40	33	120	655.35
2014/06/26 20:37...	1.506479	110	142	146	124	33	121	655.35
2014/06/26 20:37...	0	110	142	146	0	33	121	655.35
2014/06/26 20:35...	1.490281	110	137	131	126	33	121	655.35
2014/06/26 20:33...	1.490281	110	142	137	120	33	120	655.35
2014/06/26 20:31...	1.425486	110	129	130	128	32	120	655.35

In the **Select Column:** drop-down menu, select **TimeStamp** and click **Add**.

Export VehicleParsedOutput Records

Export VehicleParsedOutput Records from WGMS to this client.

Export | ColumnXml | CriteriaXml | Preview

Export Filter Name:

Select Column: **Add** **Match All Criteria**

Select Export Type:

Vehicle

- SOG (kt)
- Spare 5
- Structure ID
- Sub Heading (deg) SH
- Sub Heading(deg)
- Sub Leak
- Sub Payload Power
- Sub Pressure
- Sub Reboot
- Sub Temp(degC)
- Sub Temperature
- Sub To Float
- Target
- TimeStamp**
- Umbilical Fault-Sub Hydrogen
- Updated By
- Updated On
- Vehicle Raw Output
- Water Direction
- Water Direction Std Dev

Save **Cancel** **Export**

In the **TimeStamp** drop-down menu, select the time interval for the records export.

As in previous WGMS releases, you also 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.

For information on how you can automatically export records at regular intervals using **curl** see [Chapter 6: WGMS Export REST Services](#).

New Features

- HYP-1617 In the **<Vehicle Name> Communications** window at the bottom of the **Home** page, change the **Battery Power** column to display a graphic bar - the bar is green for operational, yellow for low, and red for empty.
- HYP-1620 WGMS 4.1.6.1 provides optional pre-set Records Export intervals of 3 hours, 6 hours, 12 hours, 24 hours, 7 days, and 30 days.

Bug Fixes

- HYP-1609 SV3 Commands Form does not populate empty tabs with message
- HYP-1610 Certain Devices are not parsed by the UI code on the SV3 commands form

- HYP-1612 Reading config and command json attachments needs to be returned in reverse order of creation
- HYP-1618 Do not issue "retrieve debug buffer" command on alarms for SV3

Changes in Version 4.1.6

Principal Changes

The 4.1.6 release is centered around the migration of WGMS to HTML 5 resulting in new browser compatibility settings:

1. Internet Explorer 11 is supported on Windows (earlier versions of Internet Explorer are not fully compatible with HTML 5).
2. Chrome and Firefox are supported on Windows and Linux.
3. Safari is supported on Apple iOS.
4. Safari and Chrome browsers are supported on iPhone and iPad with iOS 7.1 only.

Other notable WGMS 4.1.6 features include:

1. Better support for SV3 vehicles.
2. Improvements to data acquisition and additional support for compression and Multi-L2 packets.
3. Improvements to Custom Reports and the Sentinel display.
4. Support for version 2 Mobile WGMS features.
5. Numerous bug fixes.

User Experience Changes

The Help window is now scalable.

Improvements have been made to the usability of the WGMS **Map Options > Piloting and Map Utility** tools. See the WGMS online help or the *WGMS User Guide* for more information.

You can cancel a file transfer in progress by opening the command form for the **File Write Init** command that initiated the file transfer and edit the **Command Status** drop-down menu to **TimedOut**:

**Edit
Command
Status To:
"TimedOut"**

Related Record

Select a related record. Simple Command Form

Vehicle Command Related Info

Vehicle Command Info

Command Reason: Download Data

Vehicle: War Machine Command Type: File Write Init

Command Status: TimedOut Target Waypoint:

From Waypoint: To Waypoint:

Heading (deg): Status:

Course: Vehicle Rudder ...

Storage Address: Board Address: 0

File Type: Unspecified Operation Type: Current Image

Com Channel: Iridium Communication Upload File:

Part: Vehicle File:

Read File Name: Security Manifest:

Copy ... Send Cancel

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.

Map Utility

☒ Metric ☐ Nautical Mile

Delete Last Delete All **Toggle WP All**

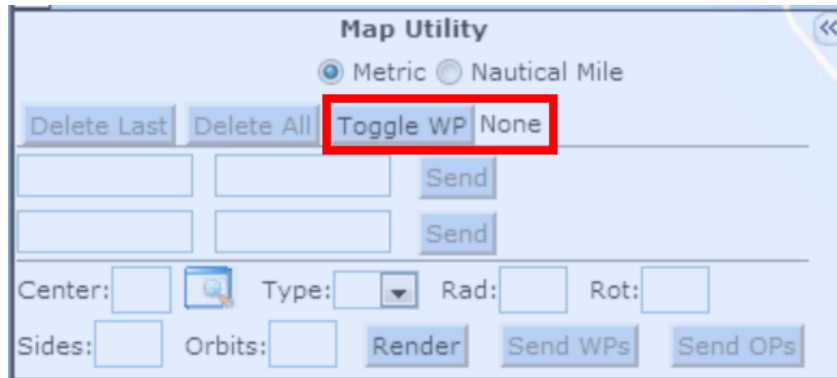
Send

Send

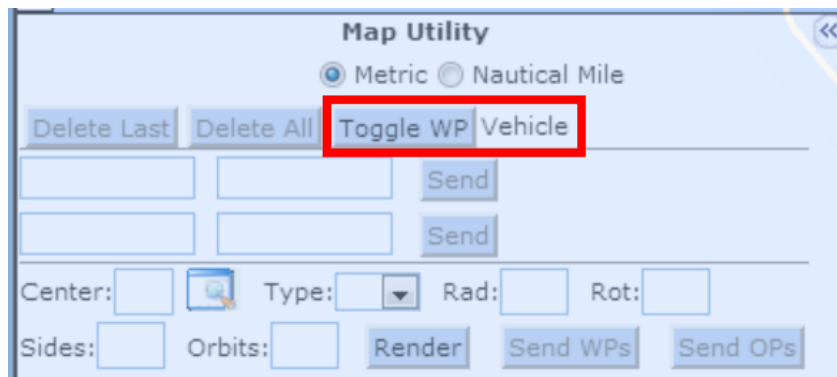
Center: Type: Rad: Rot:

Sides: Orbits: Render Send WPs Send OPs

- **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.



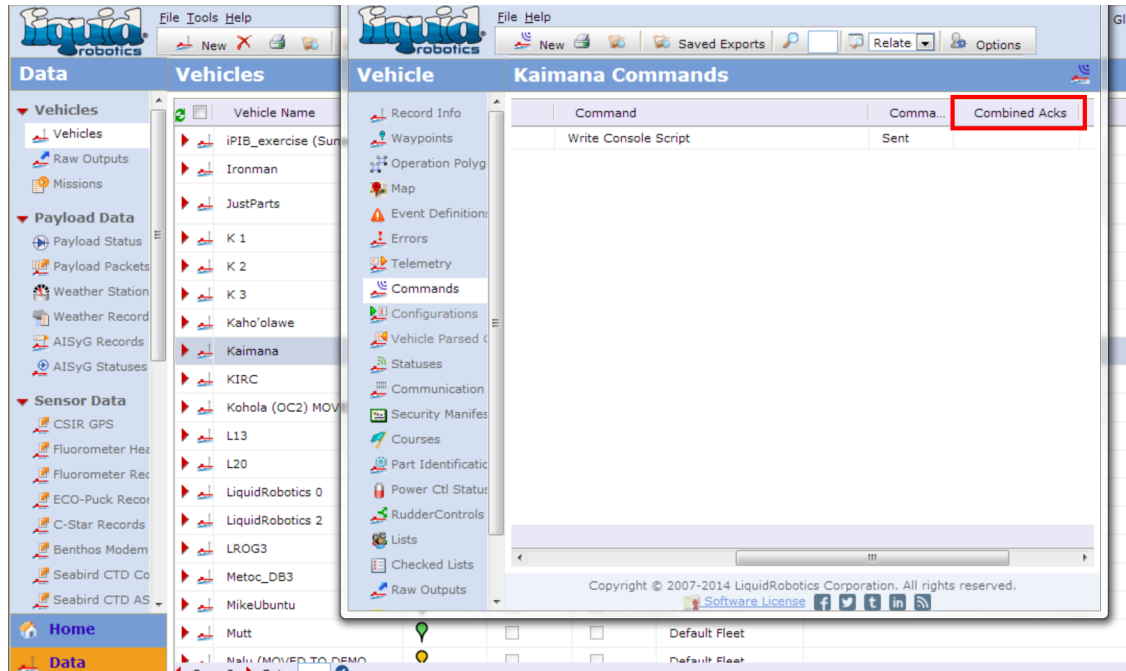
Obstacle Avoidance and Thruster status icons have been added to the WGMS Dashboard toolbar to indicate ON or OFF status:



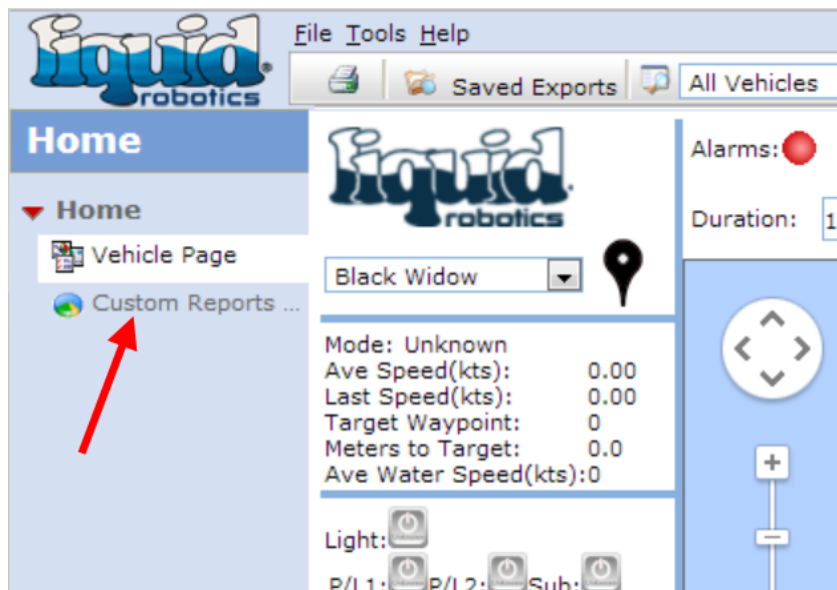
A new **Combined Acks** column in the WGMS Dashboard Commands section and in the Vehicle Commands tab displays a single ACK representing the result of all interim ACKs sent as responses to a command that was issued.:

Kaimana Commands						
TimeStamp	Command Reason	Command	Comma...	Combined Acks	Created By	
10/16/2013 17:15:17	Find out about payloads	Write Console Script	Sent		Peter Erickson	

Page 1 Goto



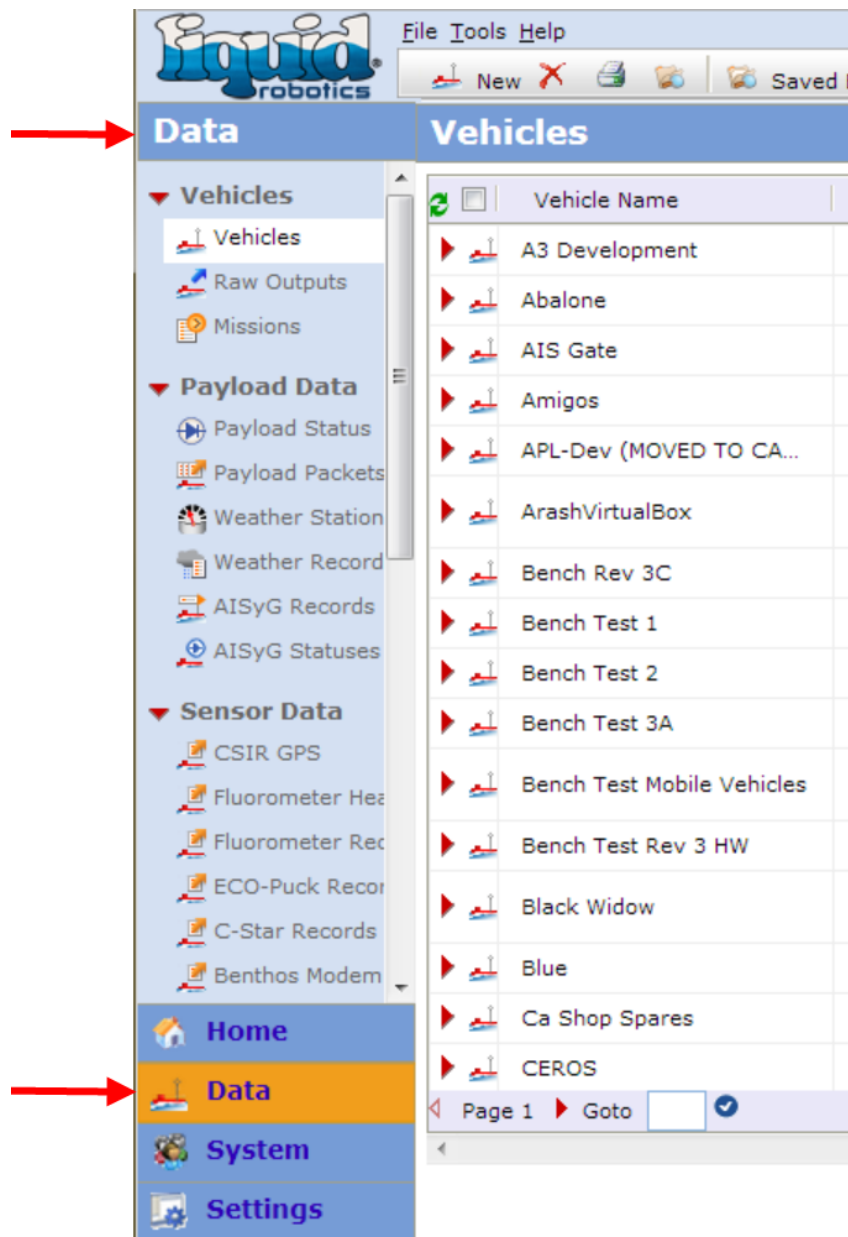
A Custom Reports button has been added to the WGMS Dashboard as another way to get you to the Custom Reports window:



When Line Following parameters are activated, a new Line Following icon changes from grayed-out to a multicolor display:



In the System Menus, the **Vehicles** menu has been re-named and is now referred to as the **Data** menu:



A timestamp has been added to ADCP BIN Map custom reports:

Vehicle	SW_1732 (Raj)	Data	ADCP C2	Data To	3/25/2014
ADCP Table ADCP Graph ADCP Bin Map ADCP Table Rows					
TimeStamp	2/5/2014 15:56:00	2/5/2014 15:52:00	7/30/2013 14:28:05	7/30/2013 14:26:05	
Latitude	37.4108	37.4109	37.4108	37.4108	
Longitude	-122.0044	-122.0044	-122.0044	-122.0044	
Bin Size (m)	1	1	4	4	
Bin 1 Depth (m)	2.1100	2.1100	5.9800	5.9800	
Bin 1 Mag (mm/s)	1904.3366	2408.3665	2089.4425	2324.1420	
Bin 1 Dir (Degrees True)	354.969	347.3602	357.2293	353.6761	
Bin 2 Depth	3.1100	3.1100	9.9800	9.9800	
Bin 2 Mag	1352.3343	2530.8791	2372.2500	2611.2780	
Bin 2 Dir	320.4006	348.7211	358.1399	354.2195	
Bin 3 Depth	4.1100	4.1100	13.9800	13.9800	
Bin 3 Mag	870.0144	1526.0003	2205.3771	2612.1355	
Bin 3 Dir	306.5406	331.89	356.8288	355.4768	

New Features

- HYP-1307 Ability to cancel file transfer
- HYP-1313 User can select to Render Course when creating a "New Course" (check box)
- HYP-1378 Allow for Iridium telemetry aggregation with a single L3 header (9522B large buffer modems)
- HYP-1481 Convert WGMS to HTML5 native application
- HYP-1482 Pilot Tools App: Mobile WGMS Vehicle Provisioning
- HYP-1490 Add dashboard control to show state of the thruster
- HYP-1503 HTTPS enabled orgs should stay in HTTPS for all pages
- HYP-1504 When moving an SV3 vehicle also copy the manifests
- HYP-1505 Add concatenated Acks to the command grid columns
- HYP-1506 Add SV3 obstacle avoidance mode indicator on the dashboard
- HYP-1518 Implement compression headers support for relays using GZIP but allow for pluggable compression algorithms
- HYP-1557 Add custom reports button to dashboard
- HYP-1561 Toggle Waypoint Render mode between all - vehicle - none
- HYP-1542 Create time stamp within WGMS UI for ADCP Bin maps
- HYP-1464 WGMS/Map Option/Map Utility - Corrections and Improvements
- HYP-1484 Make WebHelp display window able to scale to full screen size
- HYP-1402 Improvements to Vehicles Screen in System Menus
- HYP-1403 Move "Reports" tab and menus from "System" system menus to Vehicles system menu AFTER Vehicles system menu is renamed "Data"
- HYP-1528 Custom Reports to support 800x1280 (800 pixels wide)
- HYP-1500 Set parameter- WGMS should not show deprecated parameters on "Parameter" drop-down
- HYP-1501 Change the email subject when WGMS loses communication with Virtual Relay

Bug Fixes

HYP-1447	Commands over virtual relay are generating multiple ACKs
HYP-1535	Using "&" in vehicle name causes the crumbs in Google Map to stop rendering ...
HYP-1558	SV3 Commands No way to specify comms channel
HYP-1316	Current Speed alarm at Vehicle Birth
HYP-1317	Release Notes
HYP-1318	Map Utility Tool Overhaul
HYP-1320	Waypoint Rendering for each vehicle (Red WPs on top of White WPs)
HYP-1419	WGMS clears the Vehicle data when the user changes the Form view from the drop-down, after saving a new vehicle
HYP-1470	ArcGIS0: WGMS switches to Map mode, if the user hit "last refresh" icon when ArcGIS0 mode is on
HYP-1471	Courses: WGMS doesn't allow the user to send a new Course. It displays a warning.
HYP-1475	Pilot Tool App: The app sends the waypoints to the vehicle, when "Don't send to vehicle" option is checked
HYP-1476	Pilot Tool App: "Don't send to vehicle" label should be renamed. The current name is confusing
HYP-1477	Pilot Tool App: Version number is duplicated in 'About' window
HYP-1478	Set Status using the new option does not populate the raw output link
HYP-1480	Map Utility Tool for creating Geometric courses does not send waypoints to vehicle
HYP-1483	WP Generator Tool Not Functioning
HYP-1485	Error message when concatenated acks exceed 256 bytes in Write Console Script
HYP-1486	Path Over Ground (POG) bug
HYP-1487	Home FF: "Alarms" and "Mobile Systems" windows are shown incorrectly
HYP-1488	Overall System: Additional text is shown on "preview" view, when the user want to print a window
HYP-1496	In the Record Customization/Fields/Relationship a System Error message is displayed, when press the "Copy from Another Relationship" button.
HYP-1497	In the "New Payload Formatter" form, a System Error message is displayed, when try to open the "Copy from" functionality.
HYP-1498	When the user wants to export waypoints WGMS allows the user to enter invalid information in the latitude and longitude criteria.
HYP-1507	"SV3 Commands" should not return "Payload" data upon ACK
HYP-1508	In the "Weather Station" new window when the user clicks the "Copy from another Weather station" button the WGMS displays a system error message.
HYP-1514	Increase Packet Reflect (Output Sink Subscriber) Retry buffer size to allow for more time before having to fail-over ...
HYP-1515	display dashboard refresh time in 24hr format (not 12h format)
HYP-1517	Home : "SV3 Commands" window is not properly displayed
HYP-1519	Custom Reports doesn't how the same time format as WGMS

HYP-1527	VFrom: Deprecated functionality is still available in "File" menu
HYP-1529	Sentinel Map does not obey AIS clustering zoom rules
HYP-1531	(Mobile) Map Utility: The user is not allowed to sent WPs when using an existing waypoint number
HYP-1533	WGMS should not allow legacy Hold Current Position or Hold Station at Waypoint for SV3 vehicles
HYP-1534	Command button and parameter fields disappeared when SV3 pop-up window maximized or expanded horizontally
HYP-1552	Waypoints copy to... another vehicle does not work while in Mobile mode
HYP-1553	Clear alarms does not work while in Mobile mode
HYP-1554	Unable to drag pin drop on Mobile WGMS client
HYP-1559	Fast mailbox Check Inoperable on WGMS page
HYP-1492	When the user wants to create a new event definition in the "New Event" dialog with invalid information the WGMS allows it.
HYP-1493	In the "Vehicle/Statuses" menu when the user enters the "Copy from another status" window and creates a new Status the WGMS doesn't display correctly the information.
HYP-1495	In the "Operation Polygons" when the user wants to export the "Notes" with the "Description" criteria the WGMS shows an error message.
HYP-1502	After creating first coordinate in Polygons Coordinates tab, the system closes the form and directs you to Polygons Form
HYP-1520	(IE10&9) Alarms: The alarm record is shown as HTML code
HYP-1562	SV3 Commands- An extra 'H' is shown in top bar
HYP-1355	Negative Ground Speed
HYP-1491	When the user is creating a New Operation Polygon the "Display on Map" check box should be checked by default.

Changes in Version 4.1.5



Note

Do not upgrade to IE 11 if you are running WGMS. WGMS does not support IE 11.

Principal Changes

This is the list of highlights from this version:

1. WGMS paging performance has been up graded by moving from an SQL query requiring two sub-queries to a single query with a function call.
2. Support for SV3 Field Events to be displayed in the WGMS dashboard. A new Field Events reporter ID was created with 4 possible Field Events Notification ID types (0 = Undefined, 1 = Vehicle In The Water, 2 = Vehicle Out of the Water, 3 Launch Checklist Completed).
3. Support for SV3 computed course telemetry packets. An SV3 vehicle can autonomously change its course to avoid obstacles. When an SV3 computes a course that diverges from a custom, or waypoint defined course, it will send WGMS a telemetry packet containing an

array of points on the map (lat/long 32 bit compressed) that define the computed course. The telemetry is plotted on the WGMS map display (similarly to an op-region) for the pilot to observe.

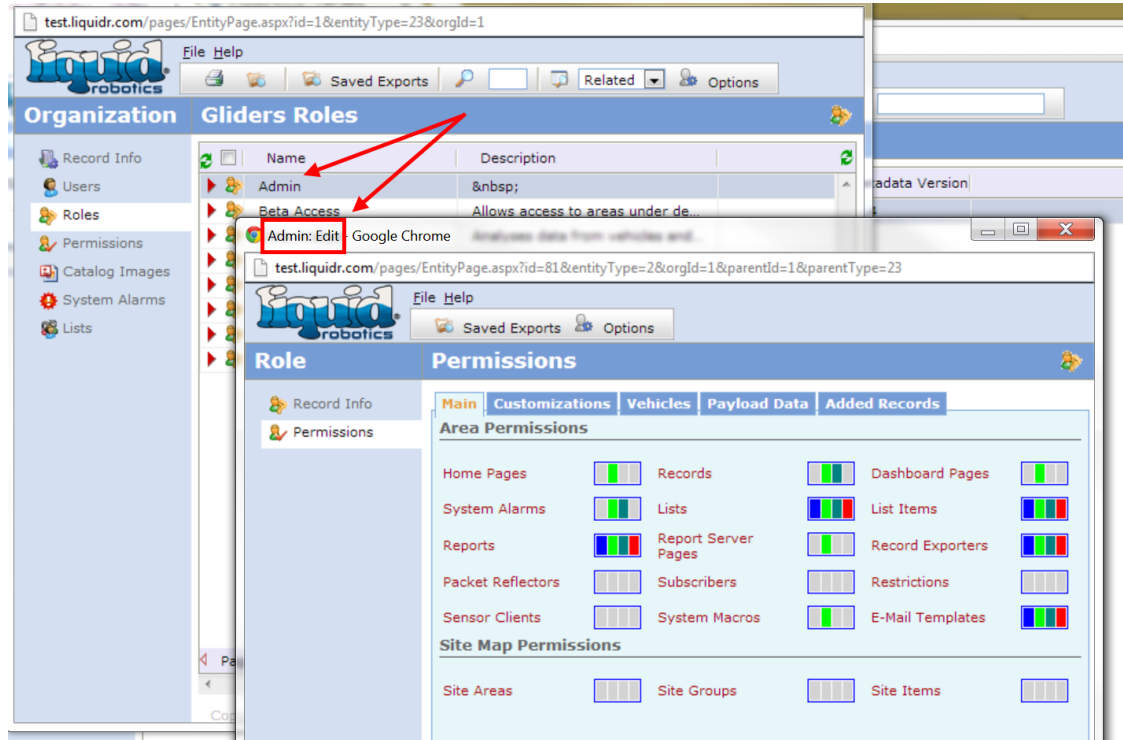
4. Support for the SV3 **New Waypoint with Attributes** command. The **New Waypoint with Attributes** command carries a script that is executed by the SV3 when it arrives at the designated waypoint. Typically the script will turn on a sensor and begin gathering data when the designated waypoint is reached.
5. The WGMS map view now automatically indicates which AIS reporting vessels are being ignored, based on the MMSI Ignore list settings for the vehicle. This feature is activated when **Label Op-Regions and Most Recent Point** in the **Map Options > Tool Options** menu is selected. An **Ignored** label appears next to AIS reporting vessels that are listed in the MMSI ignore list.
6. Integration with ArcGIS server map tile layers. ArcGIS is a geographic information system that is used for creating maps, compiling geographic data, analyzing mapped information, and managing geographic information in a database.
7. A centralized “User Delete” function allows a Root User to delete any User from all WGMS organizations and escalation lists by clicking a button.
8. The Vemco VM4 sensors were added to the Custom Reports page.
9. The JAMSTEC sensor was added to the Custom Reports page.
- 10A Sentinel acoustic sensor display window was added to the WGMS Dashboard.

User Experience Changes

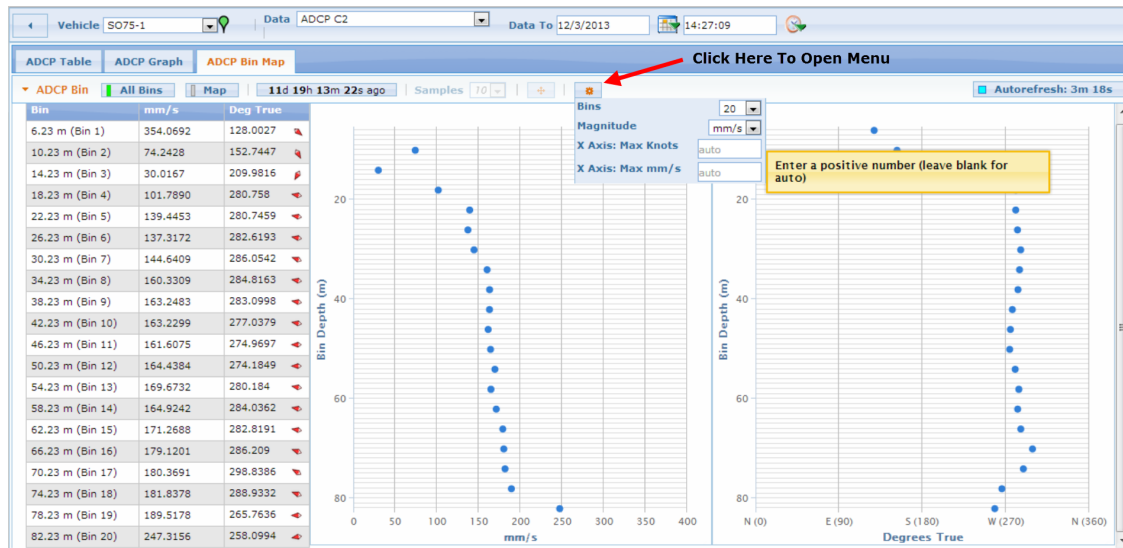
In prior releases, **Last Refresh** on the WGMS Dashboard was reported as a 12-hour Greenwich Standard Time. In 4.1.5 it is reported in UTC:



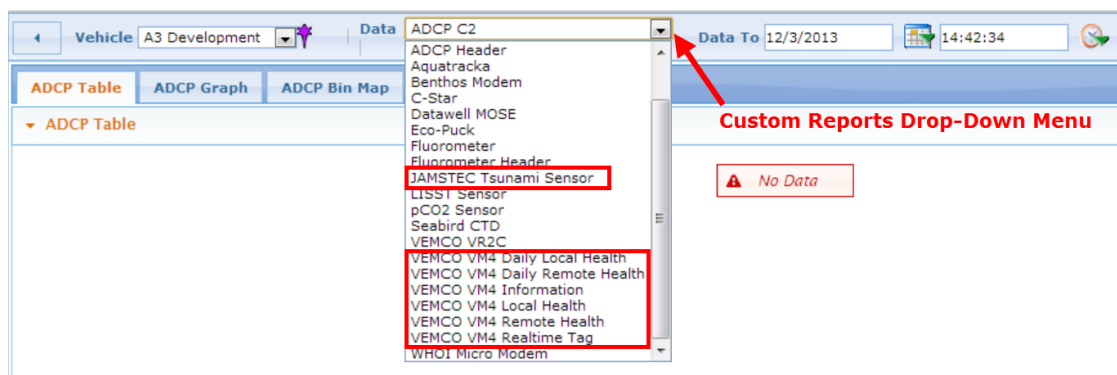
The Role name is now included in the header of the Permissions record so you know which Role you are viewing or editing:



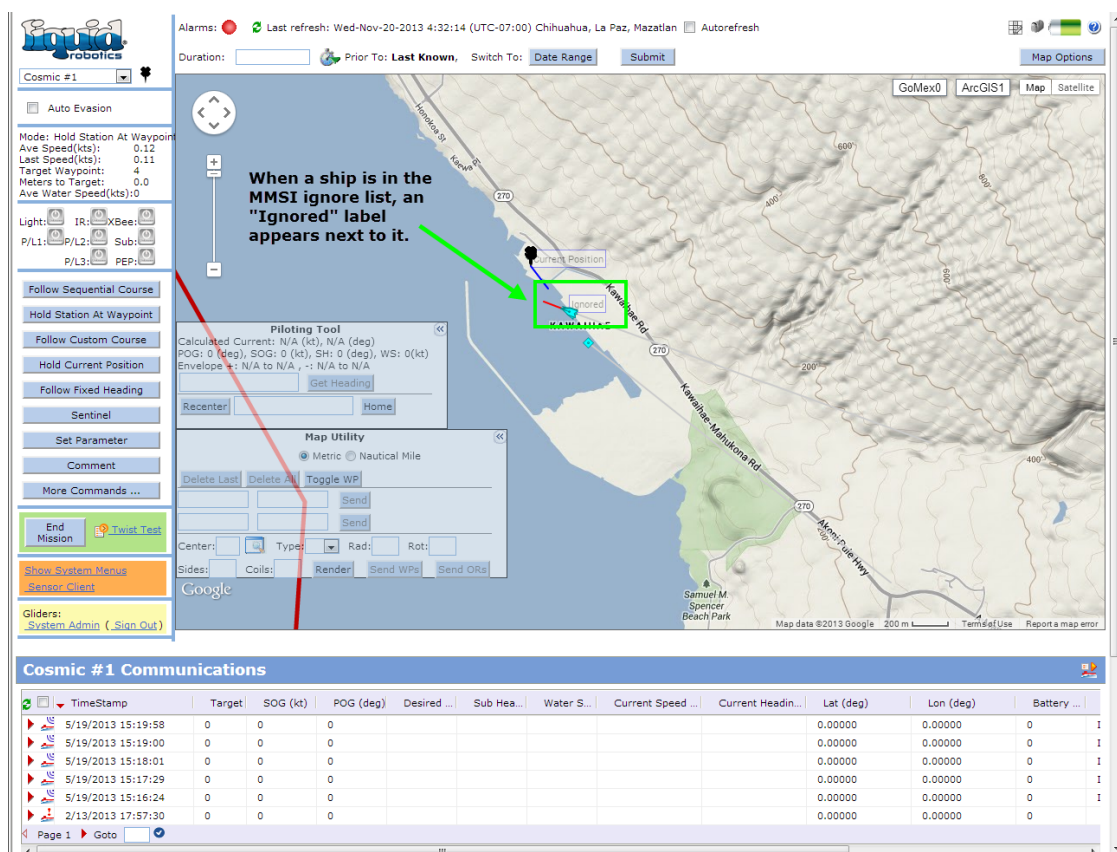
A user scalable X-Axis is included in the ADCP Bin Map display:



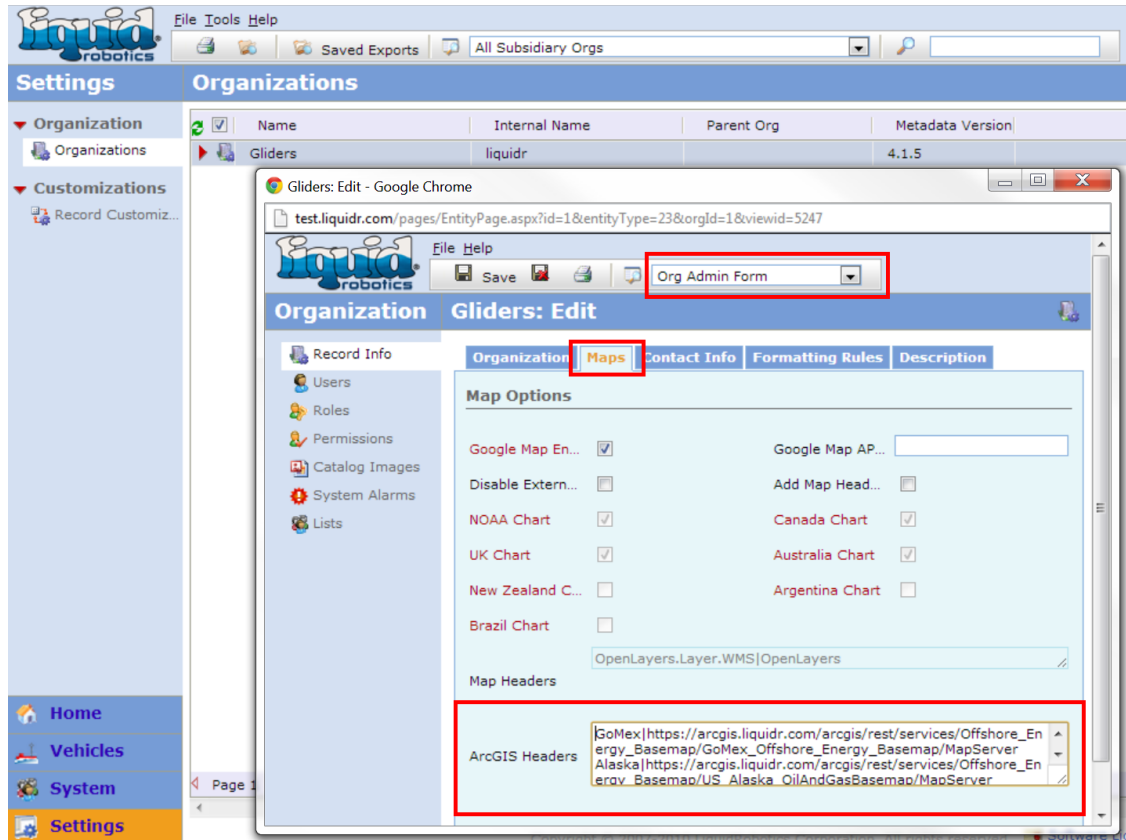
Vemco VM4 and JAMSTEC sensor Custom Report Pages are now available in the WGMS Custom Reports menu:



The WGMS map view now displays a list of all AIS reporting vessels that are being ignored based on the MMSI Ignore list settings for the vehicle:



Integration with ArcGIS server map tile layers - (this feature is under development). From the **Maps** tab on the **Organization Admin Form**, you can enable up to 8 different ArcGIS map layers on the WGMS dashboard by entering the headers for the map layers you want to view in the **ArcGIS Headers** field:



The headers that can be entered in the **ArcGIS Headers** field are:

GoMex|https://arcgis.liquidr.com/arcgis/rest/services/Offshore_Energy_Basemap/GoMex_Offshore_Energy_Basemap/MapServer

Alaska|https://arcgis.liquidr.com/arcgis/rest/services/Offshore_Energy_Basemap/US_Alaska_OilAndGasBasemap/MapServer

Pacific|https://arcgis.liquidr.com/arcgis/rest/services/Offshore_Energy_Basemap/US_Pacific_OilAndGasBasemap/MapServer

UK|https://arcgis.liquidr.com/arcgis/rest/services/Offshore_Energy_Basemap/UK_OilAndGasBasemap/MapServer

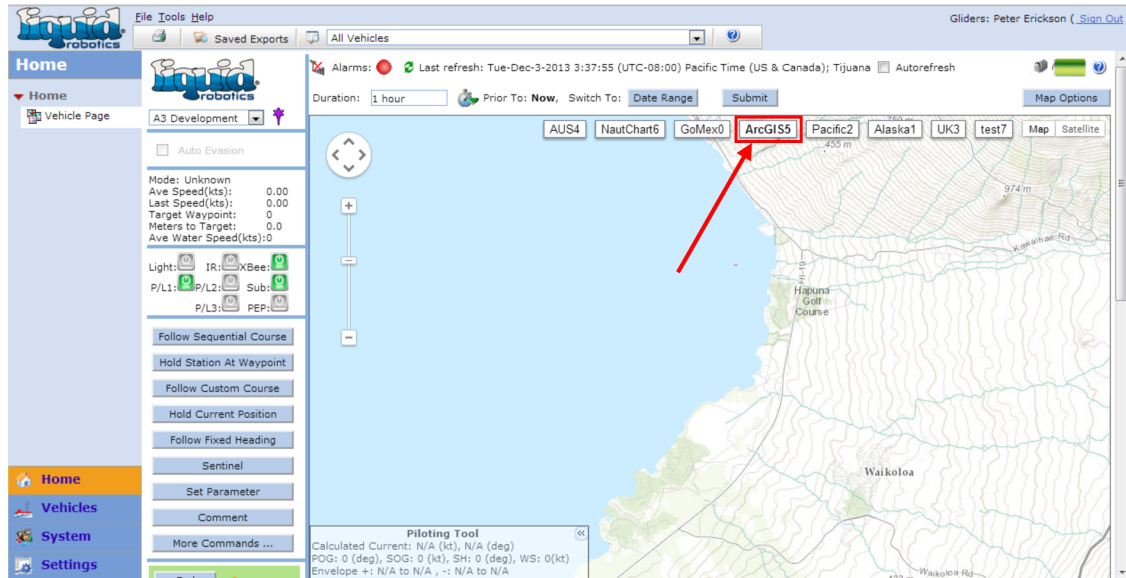
AUS|https://arcgis.liquidr.com/arcgis/rest/services/Offshore_Energy_Basemap/AUS_OilAndGasBasemap/MapServer

ArcGIS|http://server.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer

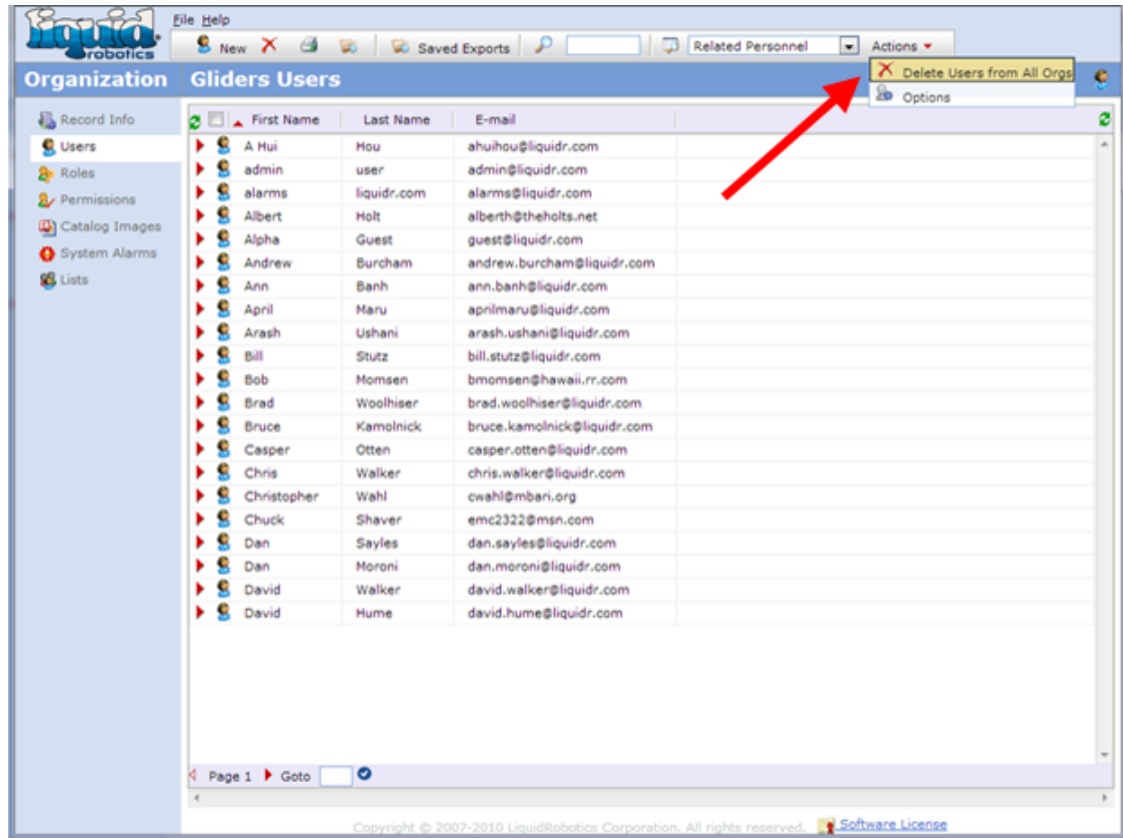
NautChart|https://arcgis.liquidr.com/arcgis/rest/services/Nautical_Charts/NauticalChartDemo_GulfOfMexico/MapServer

test|https://arceast.wgms.com/arcgis/rest/services/WGMS_Test_Buoys/MapServer

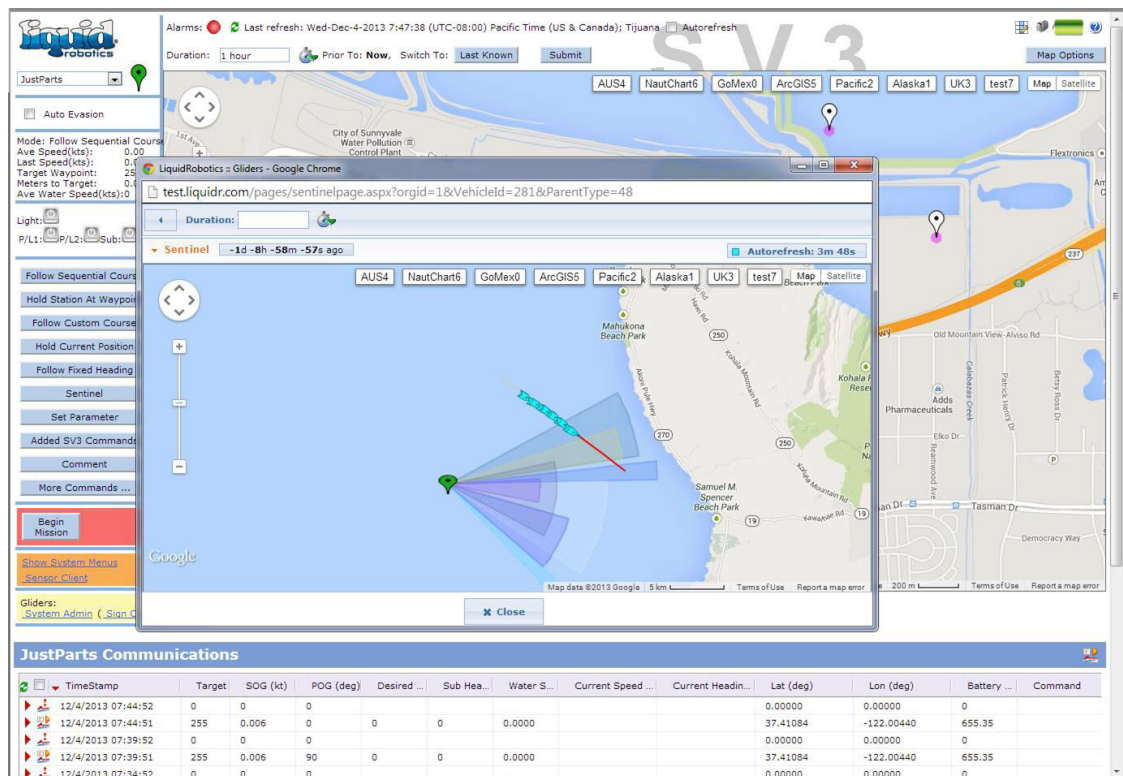
Buttons for each map layer header that you enter will appear on the WGMS dashboard. When you click on a map button to activate a map layer, the text on the button will change to bold face. To close a map layer click the button for that layer and the bold text will return to a regular font.



A centralized **User Delete** function allows a Root User to delete users from all organizations and escalation lists by selecting one or more users and clicking the **Delete Users from All Orgs** button in the **Actions** drop-down menu on the toolbar:



A Sentinel acoustic sensor window is now displayed on the WGMS Dashboard:



New Features

- HYP-1442 Support Computed Course telemetry packets from an SV3 glider.
- HYP-1327 Migrate all Op Regions to Geo-Spatial Extension processing in WGMS.
- HYP-1342 MMSI Ignore List - WGMS should indicate that the vehicle is in "MMSI Ignore List" mode.
- HYP-1397 Potential way to remove users from escalation list or as users from every Org or Vehicle.
- HYP-1415 Create web service for UI to pass user settings to server.
- HYP-1423 Add Auto refresh functionality for custom reports for 4.1.5.
- HYP-1443 Create new command (SV3 only) for New Waypoint with Attributes.
- HYP-1458 Add integration to ArcGIS.
- HYP-1460 Field notifications to be displayed in WGMS dashboard.
- HYP-1463 "Last Refresh", on Dashboard is reported as a 12-hour time listed.
- HYP-1412 Role name is missing from Permissions.
- HYP-1462 Add user scalable "X-Axis" in "ADCP Bin Map."
- HYP-1467 Add Vemco VM4 & JAMSTEC sensors to Custom Reports page.

Bug Fixes

- HYP-1422 iPad Begin Mission button is not working.
- HYP-1441 WGMS Data Paging.
- HYP-1449 Wrong CRC values being sent with courses.
- HYP-1461 Parsing AMPS summary reports to Power Ctl Status packet mixes Vehicles.
- HYP-1338 Map Utility- WGMS should notify the user that an existing waypoint is being replaced.
- HYP-1340 Map Options - A "Select All" checkbox should be displayed, in order to choose all/ none of the Gliders to be displayed on the map.
- HYP-1350 Chrome does not open file dialog when uploading a file on WGMS.
- HYP-1392 Login Issue - Login page looping: NDG org: User
- HYP-1408 Record Customization - The user should have the ability to add lines into text area.
- HYP-1409 (IE10) Courses - Buttons are not displayed properly on Waypoints section.
- HYP-1410 System Macro - Script error when trying to run a macro.
- HYP-1414 Strings pasted into the Write Console Script command Script Buffer can fail character translation with no warning to the user.
- HYP-1416 Piloting Tool in WGMS is named incorrectly in map options as Map Current Calculator - Please rename to Piloting Tool in map options.
- HYP-1417 Mission - Catalog Images and Lists tabs have the same ID.
- HYP-1420 New File Available messages for files of zero-length should create a zero length attachment.
- HYP-1424 The "Print" button in the Notes Print Preview dialog, displays an Internet Explorer Script Error.

HYP-1425	The "Up/Down" buttons in the "Missions/Vehicles" toolbar doesn't work as expected.
HYP-1426	In the "Course/Course Waypoints" dialog, the "Up/Down" buttons, generates a wrong behavior in the list sorting.
HYP-1427	In the "Vehicle/Operation Polygons" when the user wants to create an operation coordinate the WGMS allows negative numbers in the "Order" field.
HYP-1428	"Currency Symbol" label is misspelled, on "Formatting Rules" tab.
HYP-1429	In the vehicle form, in the errors tab, the dropdown list that contains alarm types still has the RF Link Error option instead of having ship to shore link.
HYP-1430	The "Bubble Board Firmware" type is misspelled in the type list.
HYP-1431	In the "Lists" tab of the vehicles window when the user edits a list and clicks on the print button the printing preview window displays the "Options" button.
HYP-1432	The "Follow Waypoint Course" command is misspelled in the command list.
HYP-1433	In the "New Vehicle Status" form the required raw output field is not marked as required.
HYP-1434	The "Up/Down" buttons in the "Obstacles/Vehicles" toolbar doesn't work as expected.
HYP-1435	"Raw Output" is misspelled in Raw Output section within Vehicles module.
HYP-1436	Required fields in Payload Status section are not marked as required fields.
HYP-1439	Users cannot log in immediately after resetting password but must wait 10-30 minutes for it to work.
HYP-1444	The "Site Search" option was not removed from the main toolbar in WGMS.
HYP-1445	Clicking on the light button for SV3 vehicles creates a comment instead of a command.
HYP-1446	Course first waypoint verification was failing.
HYP-1453	BETA: "Float Reboot" command is not supported for SV3 vehicles.
HYP-1456	Sending Courses through different WGMS interfaces generates different commands (include vs. not include CRC of waypoints).
HYP-1459	Remove deprecated Daylight Map from Google Maps.

Changes in Version 4.1.4

Principal Changes

This is the list of highlights from this version:

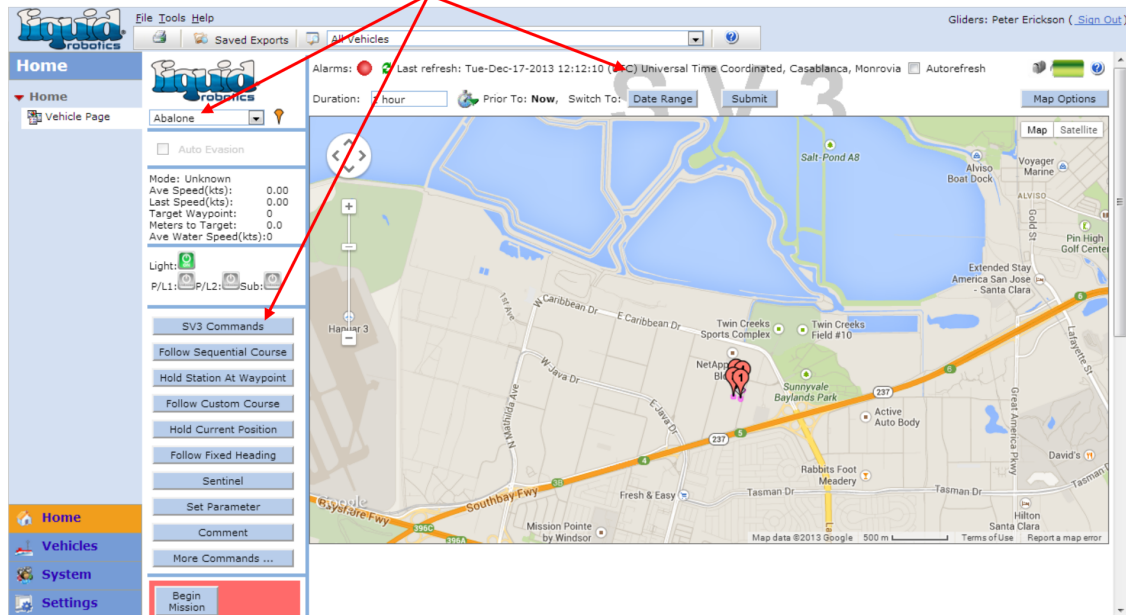
1. Support for SV3 commands. An **SV3** watermark appears in large gray letters in the Map Window header and the **Added SV3 Commands** button appears in the Map Window side bar when an SV3 Vehicle is selected. Clicking on the **Added SV3 Commands** button opens the **Services** window where commands related to the additional functionality of SV3 vehicles can be issued.
2. **Components** tab on the Vehicle Form is activated when an SV3 vehicle is selected. The **Components** tab provides status on AMPS modules.
3. Custom Reports screens for all supported Wave Glider integrated sensors. When you click on the **Custom Reports** tab in the **Reports** menu on the **System** screen side-bar, the

Custom Reports screen opens with ADCP C2 data selected by default. By selecting a data type from the **Data** drop-down menu, you can view custom data reports for sensors that are installed on the selected Vehicle.

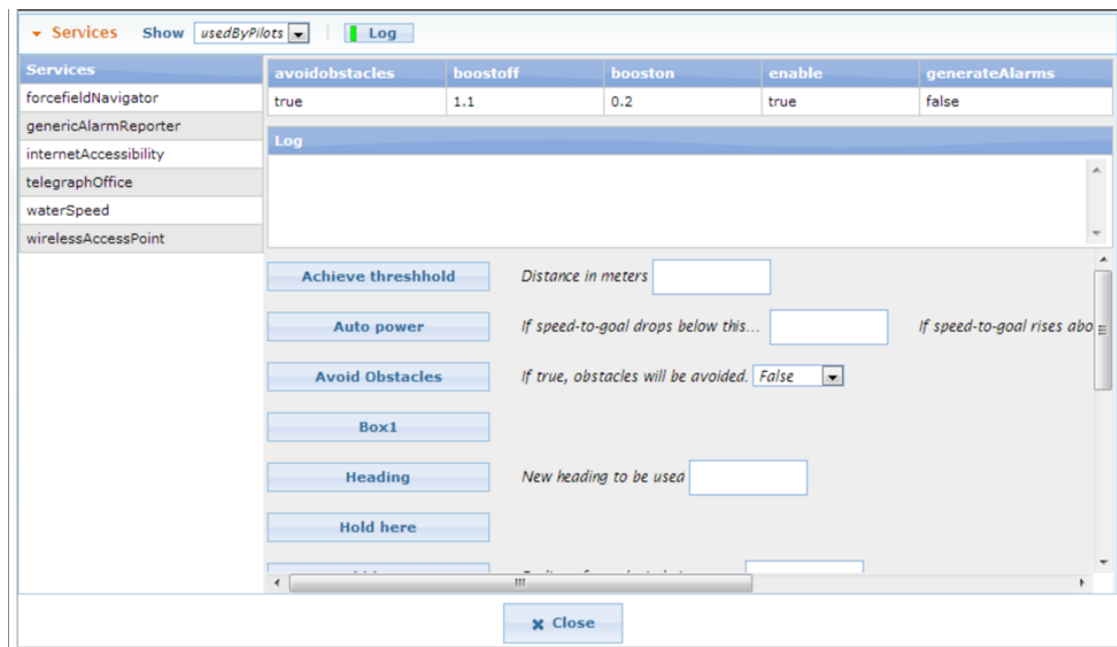
User Experience Changes

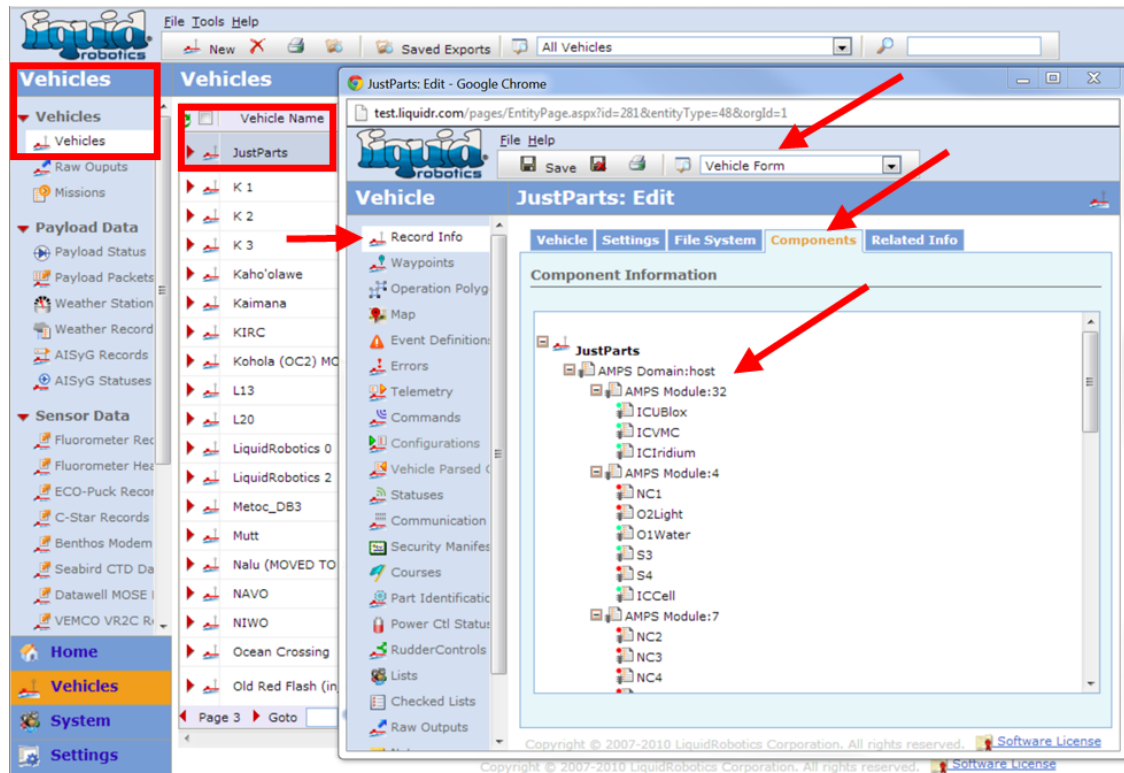
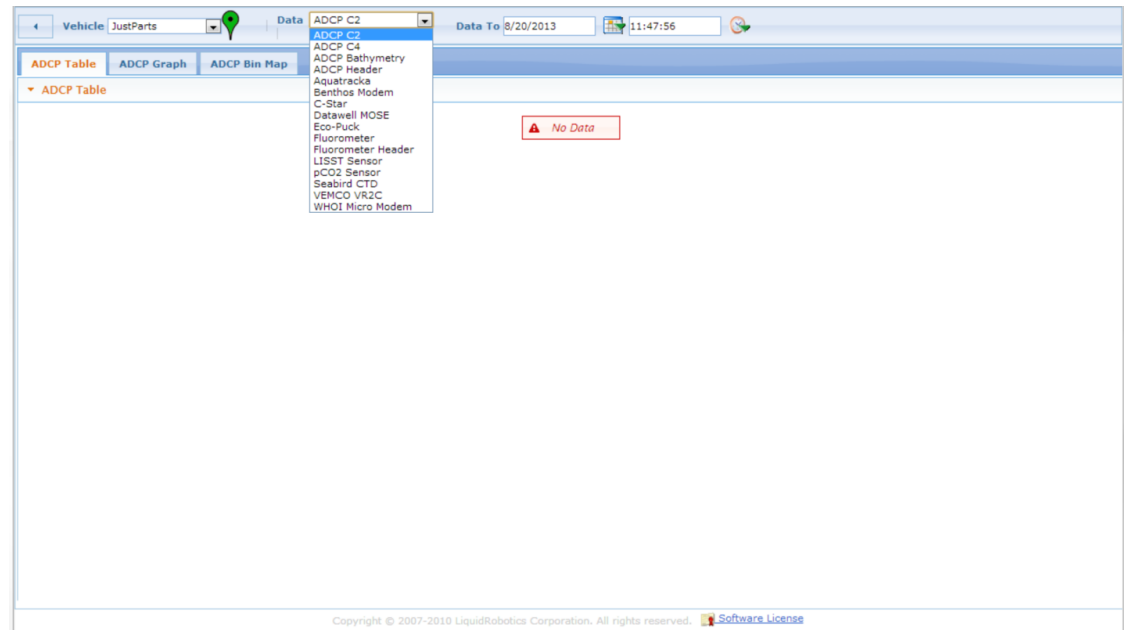
Changes to **Home** screen when an SV3 vehicle is selected:

When an SV3 Vehicle is selected, the "SV3" watermark appears in the WGMS Dashboard and the "SV3 Commands" button appears in the side bar.



Services window appears when **Added Commands** button is clicked:



Components tab:**Custom Reports drop-down menu with supported data types:**

New Features

- HYP-1380 SV3 vehicle status panel to access unique features of next generation vehicle.
- HYP-1381 Custom Reports (All Sensors)

- HYP-1386 Create NACK message with Description.
- HYP-1379 SV3 config JSON processing and conversion to hierarchical parts list.
- HYP-1383 Allow org to customize which command buttons are visible in the dashboard.
- HYP-1382 A small change that could be a significant WGMS usability improvement.

Bug Fixes

- HYP-1396 Custom Report- When the user selects a different vehicle and then clicks on the vehicle Icon, WGMS doesn't display accurate information.
- HYP-1343 When a Proximity Alarm is triggered, the system sends the wrong suggested coordinate to avoid collision by e-mail.
- HYP-1329 Copy Course from one vehicle to another not functioning
- HYP-1333 Courses - "Start Waypoint" lookup should display only the waypoints that belong to the specific course.
- HYP-1328 Bulk Copy of Waypoints in Custom Course Creation.
- HYP-1367 When the user issues a set rudder position command with an invalid heading, WGMS displays an error message.
- HYP-1366 In the "Vehicles/Commands" dialog, WGMS displays a server error message, but not an alert, when the user enters an invalid number (4874961123) in the "Add MMSI" field.
- HYP-1365 When the user issues a read file transaction command, WGMS displays an error message.
- HYP-1364 When the user issues a read file request command WGMS, displays an error message.
- HYP-1368 When the user issues a follow waypoint course command with invalid information, WGMS displays a server error message.
- HYP-1363 In the "Organizations/List" tab the copy to.. button doesn't copy the selected list into another organization.
- HYP-1369 When the user sends a set parameter command with "" characters in the command name, they are not interpreted as plain text.
- HYP-1341 Vehicle Form- The user should have the ability to delete a Storage Controller.
- HYP-1370 In the System/Macro, when you click to select a value for "Parent Entity", a server error message is displayed.
- HYP-1337 Current Calculator widget should be called "Piloting Tool."
- HYP-1362 When you put a vehicle in a mission using the "Begin Mission" button in the home page, the "onMission" button status is not refreshed (Chrome and firefox).
- HYP-1372 Second "payload" field in raw outputs does not wrap.
- HYP-1357 Dashboard Google map switches from satellite back to map mode after refresh and auto-refresh.
- HYP-1336 Map Options - WGMS should display Warning Alert informing that "Fade Older Points" is available, if Open Layer is active.
- HYP-1308 "Copy From Another Select" is throwing "System Error" message in Settings.
- HYP-1335 Missions (IE) - A Script Error is show when the user closes the "Related Record" window.

HYP-1359	Dashboard- Screen auto-refresh is not abiding by user time zone, just machine time zone.
HYP-1393	Firmware Part: A server error is shown when the user enters letters into the "Revision" field.
HYP-1311	Google Maps API V2 is retired in May 2013.
HYP-1390	Command Form (IE10/Only): Command dropdown list is not filtering the command types.
HYP-1371	With the Set Parameter command, when the user adds a criteria and then deletes it, the criteria returns to the bottom of the list instead of returning to its proper opt group.
HYP-1385	Vehicle Form - Communication Channel and Check List tabs have same html ID.
HYP-1388	Timezone Offset.
HYP-1339	Map Utility - WGMS should show the Operation Polygon form when sending data to the vehicle.
HYP-1117	Virtual relay packets don't get forwarded by the packet reflector.

Changes in Version 4.1.3

Principal Changes

This is the list of highlights from this version:

1. Add support for System Information Events.
2. Mobile WGMS feature.
3. Add MMSI ignore list for any proximity alarm and warning issued.
4. Completed ADCP sensor display under Custom Reports Page.

User Experience Changes

System Information Events:

WGMS Release Notes

Liquid Robotics Links

File Tools Help

System Info Events

Gliders: Peter Erickson ([Sign Out](#))

System	Timestamp	Vehicle	Latitude(deg)	Longitude(deg)	Reporter id	Notification ...	Notification ...	Enumerated ...	Text Length	
	5/15/2013 14:13:26	JustParts	0.00000	0.00000	0	1	1	0	22	C
	5/15/2013 14:09:50	JustParts	0.00000	0.00000	0	1	1	0	22	C
	5/15/2013 13:51:14	JustParts	0.00000	0.00000	0	1	1	0	22	C
	5/15/2013 13:30:02	JustParts	0.00000	0.00000	0	1	1	0	22	C
	5/15/2013 13:26:06	JustParts	0.00000	0.00000	0	1	1	0	22	C
	5/15/2013 04:09:21	Gandalf	20.01906	-155.87000	0	1	1	0	22	C
	5/15/2013 03:17:01	Gandalf	19.98773	-155.87000	0	1	1	0	22	C
	5/14/2013 15:50:57	JustParts	37.41084	-122.00440	0	1	1	0	22	C
	5/14/2013 15:42:11	JustParts	37.41086	-122.00439	0	1	1	0	22	C
	5/14/2013 15:22:28	JustParts	37.41081	-122.00437	0	1	1	0	22	C
	5/14/2013 14:17:29	AT-Ore	20.03817	-155.83082	0	0	1	0	32	C
	5/14/2013 14:03:09	JustParts	37.41084	-122.00438	0	1	1	0	22	C
	5/14/2013 13:15:29	AT-Ore	20.03819	-155.83083	0	1	1	0	22	C
	5/14/2013 12:22:32	AT-Ore	20.03818	-155.83079	0	0	43	0	32	C
	5/14/2013 11:31:44	JustParts	37.41089	-122.00440	0	1	1	0	22	C
	5/14/2013 11:29:42	JustParts	37.41087	-122.00438	0	1	1	0	22	C
	5/14/2013 11:25:18	JustParts	37.41085	-122.00440	0	1	1	0	22	C
	5/14/2013 11:19:05	JustParts	37.41085	-122.00441	0	1	1	0	22	C
	5/14/2013 10:16:13	JustParts	37.41086	-122.00443	0	1	1	0	22	C
	5/14/2013 09:46:06	Gandalf	19.98751	-155.87000	0	1	1	0	22	C
	5/14/2013 09:41:06	Gandalf	19.98750	-155.87000	0	1	1	0	22	C
	5/14/2013 08:55:13	JustParts	0.00000	0.00000	0	1	1	0	22	C

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Mobile WGMS feature:

Liquid Robotics

SW_1733

Auto Evasion

Mode: Follow F

Ave Speed(kts): 0.03

Last Speed(kts): 0.03

Desired Heading: 51

Path Heading: 210

Ave Water Speed(kts): 0

Light: IR: XBee: P/L1: P/L2: Sub: P/L3: PEP:

Follow Sequential Course

Hold Station At Waypoint

Follow Custom Course

Alarms: Last refresh: Mon Apr 29 2013 12:59:30 GMT-0700 (Pacific Daylight Time)

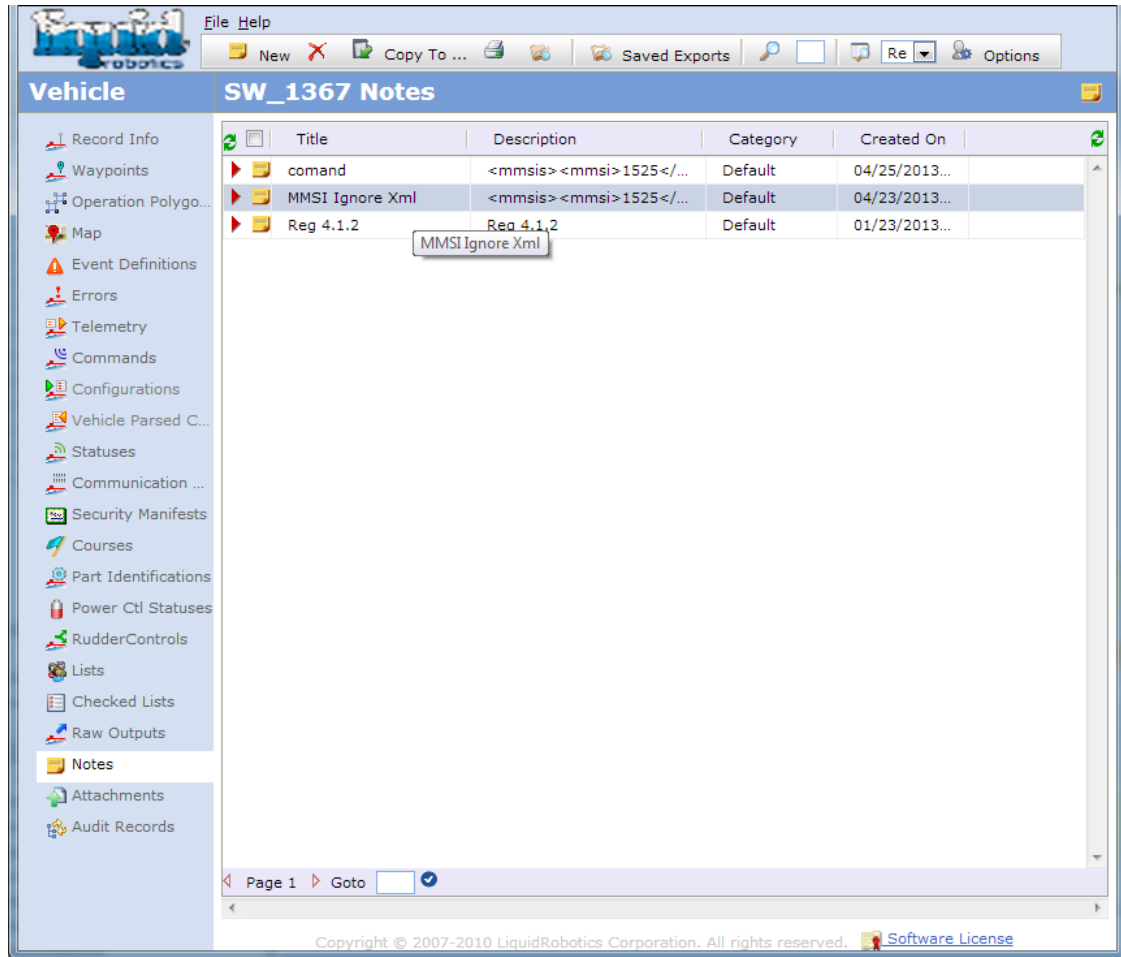
Duration: 1 hour Prior To: Now, Switch To: Last Known Submit

Current Calculator

Calculated Current: N/A (kt), N/A (deg)

MMSI ignore:

WGMS Release Notes



ADCP sensor Custom Reports:

SO75-3

Data To: 4/25/2013

12:32:18

Table

Map

▼ ADCP Table

Rows

Magnitude

mm/s

PayloadPacketRecordId	3734555.0000	3691763.0000	3379028.0000	3378078.0000	3377162.0000	3376268.0000	3375388.0000	3374522.0000	3373762.0000
TimeStamp	11/27/2012 7:41 PM	11/17/2012 2:44 AM	9/27/2012 11:15 AM	9/27/2012 8:15 AM	9/27/2012 5:15 AM	9/27/2012 2:15 AM	9/26/2012 11:15 PM	9/26/2012 8:15 PM	9/26/2012 5:15 PM
Latitude	25.9958	20.0379	20.0382	20.0382	20.0382	20.0382	20.0383	20.0382	19.9664
Longitude	-79.8791	-155.8310	-155.8308	-155.8308	-155.8308	-155.8308	-155.8308	-155.8308	-155.8811
Bin Size (m)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Bin 1 Depth (m)	6.2400	6.2400	6.2400	6.2400	6.2400	6.2500	6.2400	6.2300	6.2400
Bin 1 Mag (mm/s)	20.6155	NA	NA	NA	NA	NA	NA	NA	168.4399
Bin 1 Dir (Degrees True)	129.0939	NA	NA	NA	NA	NA	NA	NA	330.0864
Bin 2 Depth	10.2400	10.2400	10.2400	10.2400	10.2400	10.2500	10.2400	10.2300	10.2400
Bin 2 Mag	284.3132	NA	NA	NA	NA	NA	NA	NA	438.9590
Bin 2 Dir	316.1401	NA	NA	NA	NA	NA	NA	NA	273.7880
Bin 3 Depth	14.2400	14.2400	14.2400	14.2400	14.2400	14.2500	14.2400	14.2300	14.2400
Bin 3 Mag	212.6029	NA	NA	NA	NA	NA	NA	NA	487.8289
Bin 3 Dir	318.8141	NA	NA	NA	NA	NA	NA	NA	277.1833
Bin 4 Depth	18.2400	18.2400	18.2400	18.2400	18.2400	18.2500	18.2400	18.2300	18.2400
Bin 4 Mag	277.2724	NA	NA	NA	NA	NA	NA	NA	575.0443
Bin 4 Dir	296.5651	NA	NA	NA	NA	NA	NA	NA	277.5946
Bin 5 Depth	22.2400	22.2400	22.2400	22.2400	22.2400	22.2500	22.2400	22.2300	22.2400
Bin 5 Mag	277.6058	NA	NA	NA	NA	NA	NA	NA	497.0040
Bin 5 Dir	307.2414	NA	NA	NA	NA	NA	NA	NA	269.7694
Bin 6 Depth	26.2400	26.2400	26.2400	26.2400	26.2400	26.2500	26.2400	26.2300	26.2400
Bin 6 Mag	279.6140	NA	NA	NA	NA	NA	NA	NA	380.4379
Bin 6 Dir	307.4437	NA	NA	NA	NA	NA	NA	NA	263.5101
Bin 7 Depth	30.2400	30.2400	30.2400	30.2400	30.2400	30.2500	30.2400	30.2300	30.2400

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New Features

- HYP-1226 Add support for System Information Events.
- HYP-1264 Add support for Wave Glider SV3 platform.
- HYP-1297 Mobile WGMS feature added.
- HYP-1312 Add MMSI ignore list for any proximity alarm and warning issued.
- HYP-1346 Completed ADCP sensor display under the Custom Reports page.

Bug Fixes

- HYP-1301 WGMS Randomly freezes and locks up.
- HYP-1295 No way to disable CAPTCHA.
- HYP-1304 Both setting a user name and changing passwords result in user not able to log in properly.
- HYP-1305 WGMS automated Email function.
- HYP-1309 Comm Server/Packet Reflector/Iridium Relay don't request correct permissions.
- HYP-1284 Iridium Coordinates Calculation for Southern Hemisphere is wrong.
- HYP-1290 "Serial number" field is not marked as required one and also WGM doesn't ask for it, in order to create the "Iridium Modem" part.
- HYP-1291 Op Region Label gets lost on the Map, when any Nautical chart is activated, if the user zooms in/out the map.
- HYP-1292 A server error is shown when entering invalid data into "meters" and "degrees" fields, if the user wants to move a waypoint.
- HYP-1293 Chrome Only- WGMS saves the changes when accepting the alert and clicking again on "Save" button, when the "Waypoint number" field has invalid data.
- HYP-1294 Errors - A server error is shown in "New Error" dialog, when the user clicks on "Copy from" button.
- HYP-1296 Raw Output - A server error is shown in "New Raw Output" dialog, when the user clicks on "Copy from" button and the clicks on "Save" button.
- HYP-1299 AUTOMATION: Items on a same page must have unique IDs.
- HYP-1303 Firefox prompts for extra confirmation step when exiting forms, dialog box, such as More commands.
- HYP-1310 Overall System- Similarly named entities in the menu will not be distinguished.
- HYP-1314 Pilot Tool - When copying a user into another Org default the users time zone to UTC.
- HYP-1334 Missions (FireFox) - WGMS doesn't respond when the user clicks on any Lookup button, in Mission Form.
- HYP-795 Copy single waypoint does not work.

Changes in Version 4.1.2

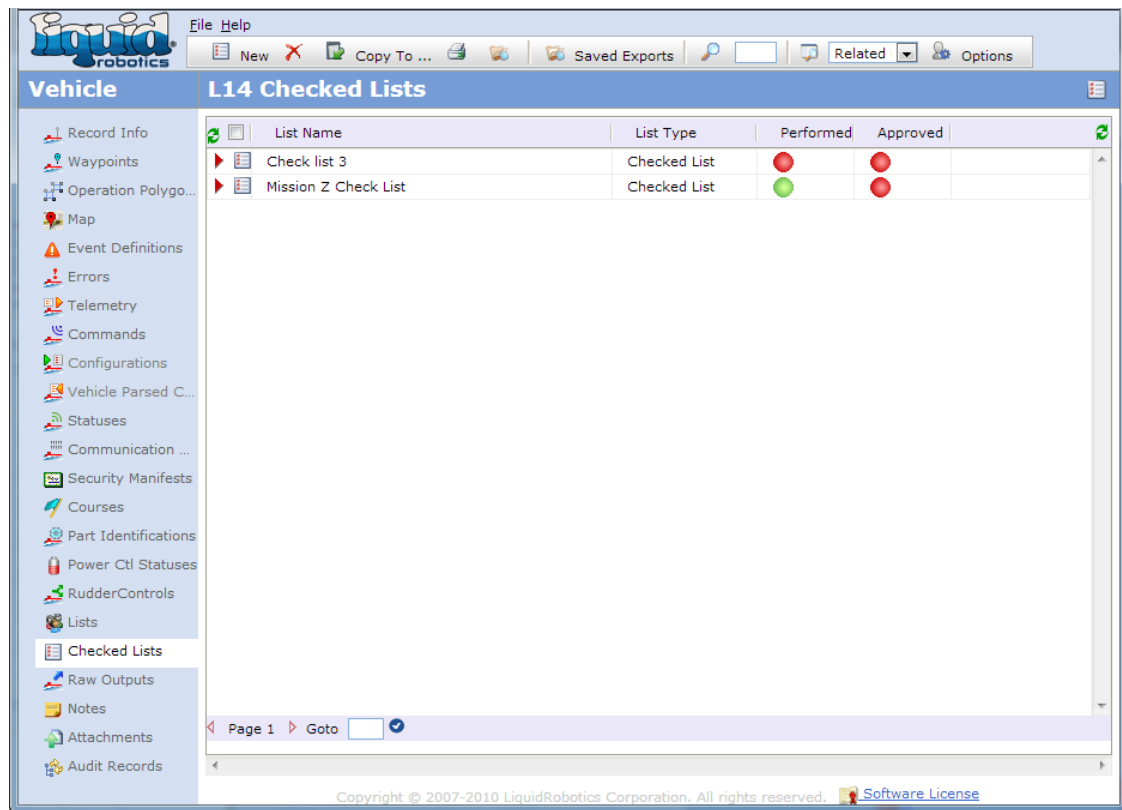
Principal Changes

This is the list of highlights from this version:

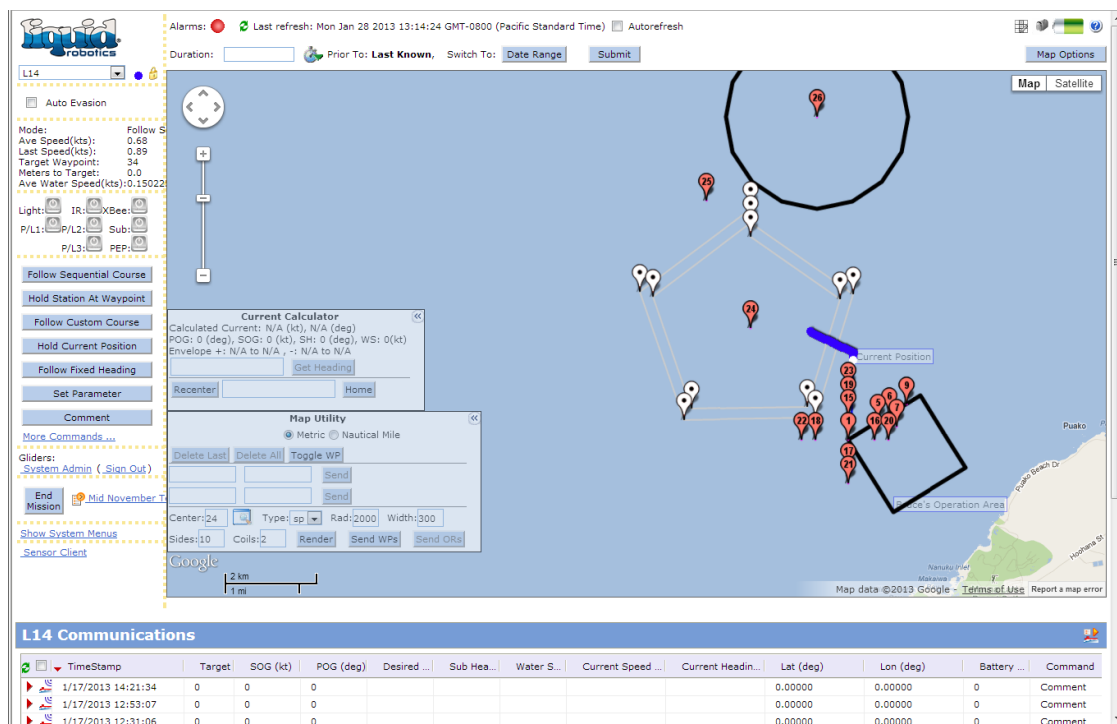
1. Implement Email Templates to allow for editing of email content sent to users when new user is created, user forgot password and user forgot username.
2. Check Lists for vehicles, where items on the list are checked when they are performed and when they are approved.
3. Route planning, allow pilots to create vehicle routes and op regions in different shapes.

User Experience Changes

Check Lists:



Route Planning:



New Features

- HYP-1217 Move Security Manifest Info with the vehicle when moving it to another org
- HYP-1227 Add pilot to escalation list when pilot in charge field in mission form is changed
- HYP-1238 Create a Check List for vehicles to enable ops checkout procedures
- HYP-1258 Add ability to create waypoints in shapes around a center point
- HYP-1276 Add support for Google Maps Nautical Charts using API V3
- HYP-1286 Add estimated transit time for the distance shown in map util based on current glider speed

Bug Fixes

- HYP-1041 Pilot Tool Algorithm Criteria
- HYP-1213 Minimize Piloting Tools with 4.1 release
- HYP-1288 In the "Options/Roles" menu when the user gives new permissions to a role the WGMS doesn't assign them as expected.
- HYP-1223 Data views export form criterias are not prepopulating the values in the export form correctly.
- HYP-1241 Pilot Tool Application should (on setting) forward email to user duplicated
- HYP-1260 PACIOOS global currents should be the nearest 3 hour increment to current time not just 00:00:00Z
- HYP-1261 AIS un-identified vessel info window should display MMSI
- HYP-1269 WGMS displays a server error, when the user enters a decimal number in "Waypoint Number" field

HYP-1270	If a "Part" name has an apostrophe in it, WGMS locks the Part and the user can't manipulate the Part
HYP-1271	Catalog Images - "System error" occurs when trying to upload Images with height greater than width
HYP-1272	WGMS doesn't displayed an alert, when tue user sents a "Set Course" command without a course
HYP-1273	Scrollable Org Select Window
HYP-1274	WGMS doesn't allow to create a Waypoint by clicking on the Offline map, if "Pilot Tool" is unchecked
HYP-1275	WGMS doesn't show OP-Region labels on Google map, if "Daylight Map" is deactivated
HYP-1279	Vehicle info label shows a javascript code in it, when hovering the vehicle icon
HYP-1280	WGMS doesn't send the vehicle to Root Org by clicking on "Transfer Vehicle" button
HYP-1281	WGMS duplicates the Op Region when moving a vehicle from another Org
HYP-1282	WGMS doesn't copy the coordinates when copying an Op Region from another vehicle
HYP-1283	Camera Client doesn't transfer files if Auto Respond is not enabled
HYP-1285	Google Map doesn't work, when "Map utility" and "Pilot Tool" are deactivated and Currents are activated
HYP-1287	WGMS does not permit to add an Item to a List (Escalation/User Group)
HYP-1289	Payload Packet - Packet Reflector ,in the "New" dialog, when the user clicks on the "Copy from another Payload Packet Record " a server error is shown
HYP-1211	WGMS Incorrectly handles filenames with spaces in them

Changes in Version 4.1.1

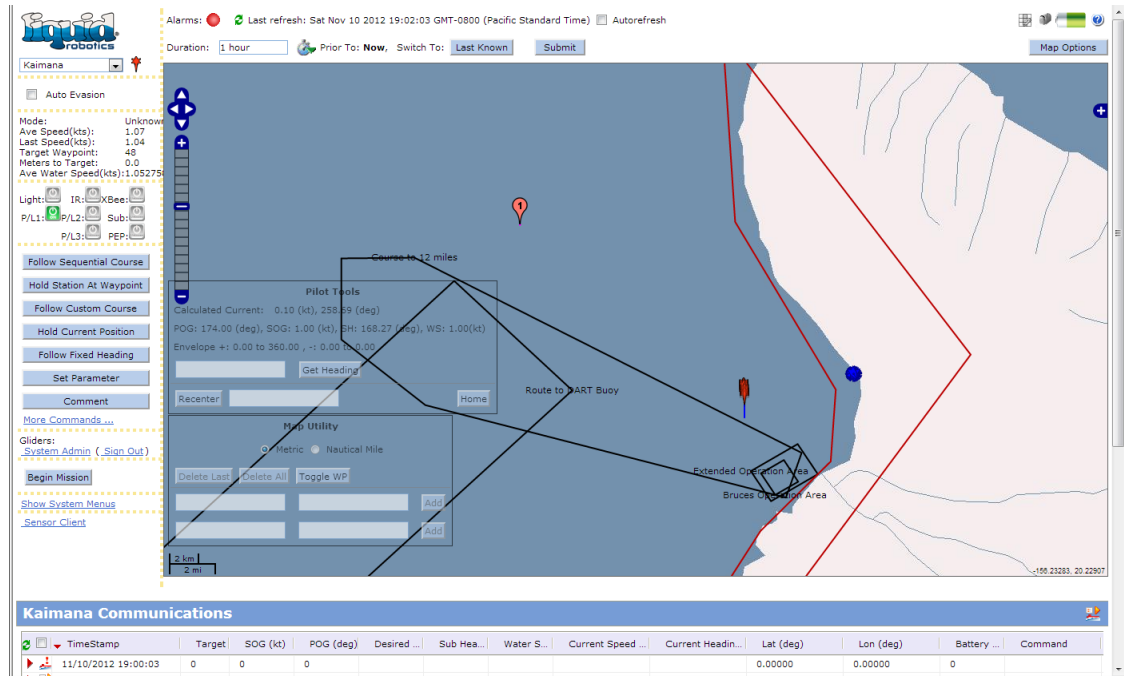
Principal Changes

This is the list of highlights from this version:

1. Implement Offline maps to allow WGMS to be operated on a mobile platform without internet access.
2. Calculated column can now be a result of an expression.

User Experience Changes

Offline Maps in WGMS:



New Features

- HYP-1208 Default event definitions for ops
- HYP-1240 Further processing of level 0 pco2 data from MBARI PCO2 Wave Glider needed
- HYP-1221 Add label for op regions, to show which region is displayed on the map
- HYP-1234 Add offline mapping solution for WGMS
- HYP-1245 Update Vehicle Part Info Page - Add "9602" as an option for Iridium Modem Type

Bug Fixes

- HYP-1212 Change Meta Data to combine Alarms that have the same meaning and confirm validity.... see case description
- HYP-1257 A server error message is displayed when the user clicks on "Cancel" button if "Sign in as a Single Sign On User" option was selected
- HYP-1232 In the "New Criteria" form, when the user leaves the column field marked as required field empty and clicks on the save or save and close button, WGMS does not display an alert.
- HYP-1233 In the "Vehicles/Commands" dialog, WGMS displays a server error message but not an alert ,when the user enters invalid number(1247982) in the Storage Address field
- HYP-1242 Icons from all the "Related Info" sections are behind of their respective textbox.
- HYP-1246 Waypoint is not shown on the map after moving a waypoint relative to another waypoint.
- HYP-1247 In the offline map mode when the user has the pilot tools and map utility checked they are displayed correctly but when the map utility is unchecked both tools disappear

HYP-1249	A server error message is displayed when the user enters invalid data to a coordinate field from Map Utility, then clicks on "Add" button.
HYP-1250	OPs are not shown in offline map, if they have "Displayed on map" on (IE only)
HYP-1251	AIS Speed Vector should use COG when available, and the default to Heading ...
HYP-1254	When issuing commands in WGMS and using () symbols the () become scrambled and display in characters and numbers
HYP-1255	The WGMS allows the creation of users with the same email address(FF Only)
HYP-1256	Password field is not marked as required, on Users form
HYP-1206	Home button in pilot tools for Firefox does not work
HYP-1229	Read file command doesn't automatically populate

Changes in Version 4.1.0

Principal Changes

This is the list of highlights from this version:

1. Fleet (lightweight implementation), allowing users and vehicles to belong to a fleet, and see only a limited number of vehicles in dashboard and map options.
2. Domain User login to allow for a user to be logged into multiple WGMS orgs from a single domain.
3. User friendly export pre-populated with criteria specified in views (sensor data exports in a single click)
4. Many more Nautical charts supported from Geo-Garage, and Daylight map to show day and night areas in the dashboard
5. Program File command directly from vehicle file without attachment (manufacturing process enhancement)
6. Support for multiple crypto chips on the vehicle

User Experience Changes

Fleet Views in Dashboard and Vehicles Grid:

WGMS Release Notes

The screenshot displays the Liquid Robotics WGMS interface. The top navigation bar includes 'File', 'Tools', 'Help', and 'Options'. The main area features a map of Kawaihae Bay, Hawaii, with a 'Pilot Tools' overlay showing a compass and various mission parameters. The left sidebar contains a 'Home' button and a 'Vehicle Page' dropdown. The right sidebar shows a 'Map' button and a 'Satellite' button. The bottom section is titled 'AIS Gate Communications' and includes a table with columns for 'Timestamp', 'Target', 'SOG (kt)', 'POG (deg)', 'Desired ...', 'Sub Hea...', 'Water S...', 'Current Speed ...', 'Current Heading...', 'Lat (deg)', and 'Lon (deg)'.

Domain User Login:

The screenshot shows the 'User Sign In' page for the Liquid Robotics Gliders system. The page has a blue header with the 'Liquid Robotics' logo and the text 'User Sign In'. Below the header, there is a section titled 'User Sign in to: Gliders'. This section contains a login form with the following elements:

- Username** and **Password** input fields.
- A **Remember me** checkbox.
- Links for [Forgot my password](#), [Forgot my username](#), and [Sign in as a Single Sign On User](#).
- A **Sign In** button.

At the bottom of the page, there is a copyright notice: 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a link to the [Software License](#).

User Friendly auto populated export criteria:

Export Vehicle Records

Export Vehicle Records from WGMS to this client.

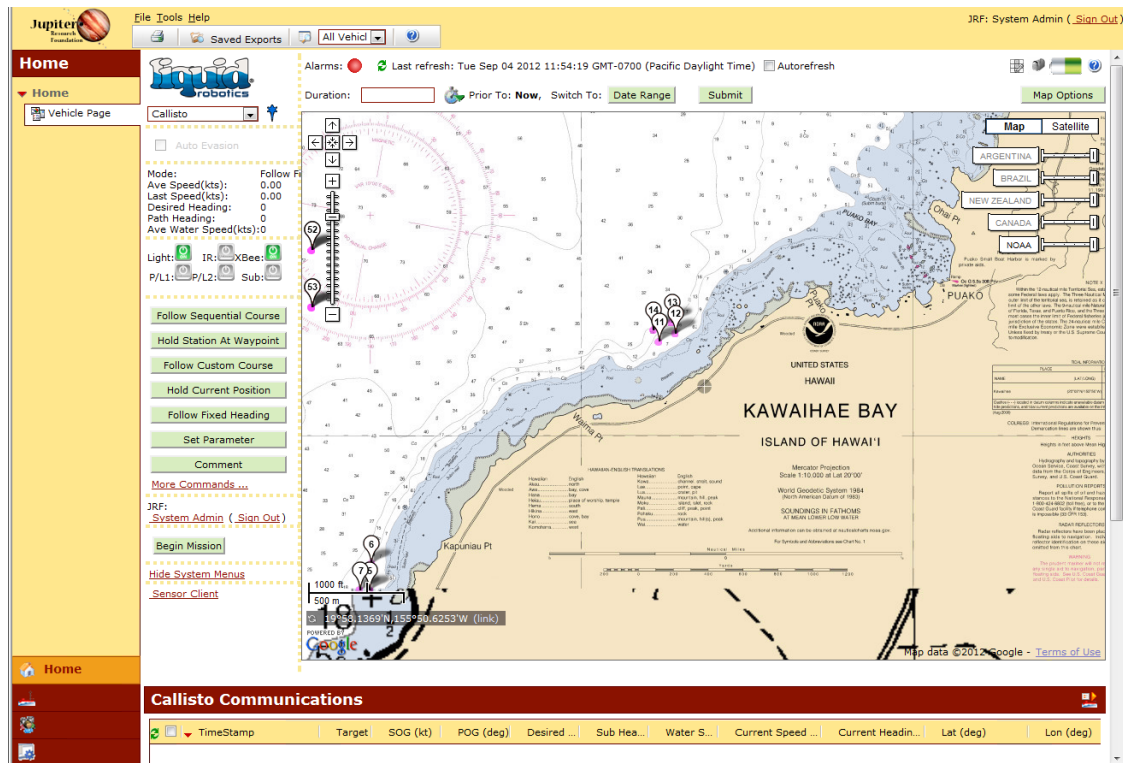
Export Filter Name:

Select Column: **Match All Criteria**

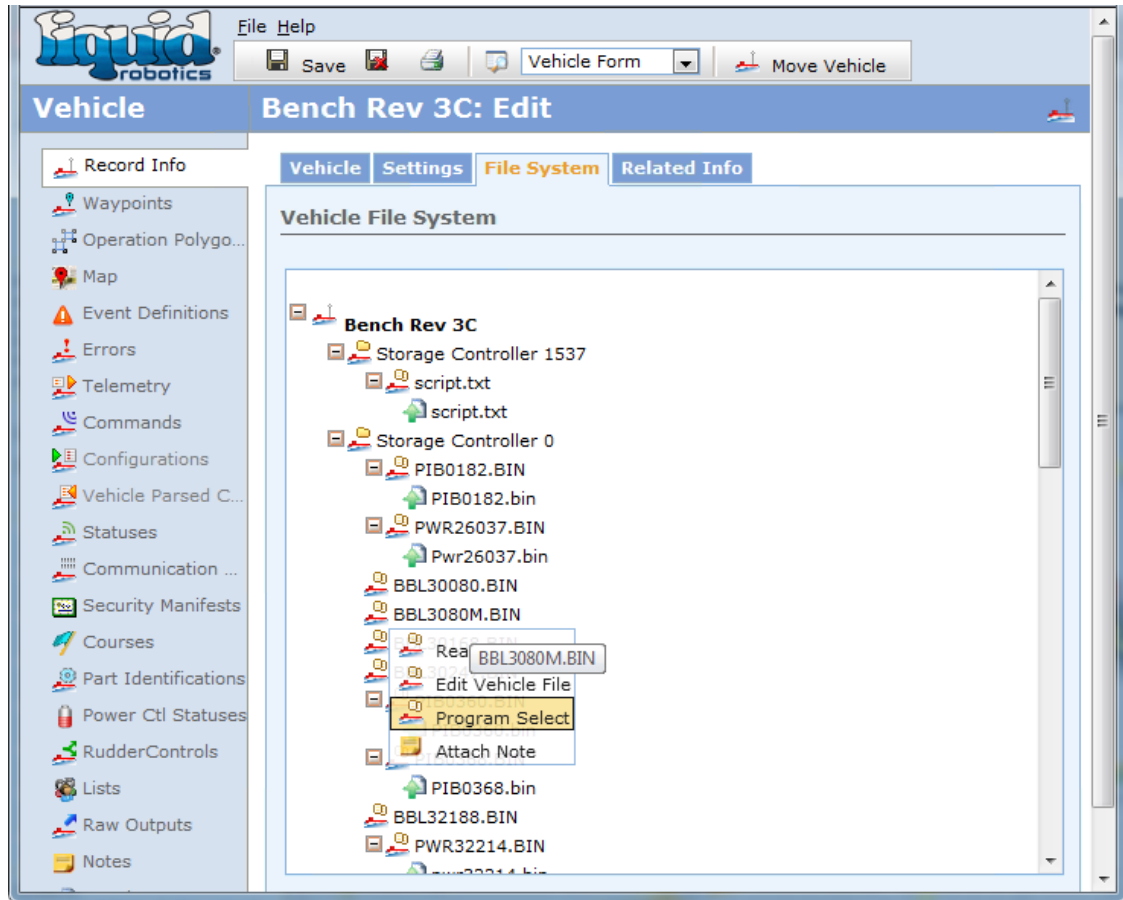
Select Export Type:

Fleet Association:

More Nautical Charts supported:



Program Select from Vehicle file without attachment:



New Features

- HYP-753 Add filter field to vehicle entity (lightweight fleet association)
- HYP-1115 Hiding orgs from org select
- HYP-1163 Exporting sensor data in a more user friendly manner
- HYP-1010 Permit all Write Console Script acknowledgments to be concatenated and saved
- HYP-1057 Make WG file system list entries populate the More Commands file selection, even if there is no attachment (Manufacturing process improvement)
- HYP-1141 Vehicle-specific WGMS macros
- HYP-1177 Integrate Geo-Garage Canada Nautical Charts Layer to Dashboard map.
- HYP-1185 Add PacIOOS global currents map layer
- HYP-1186 Allow Active Directory users to map to WGMS user, and use integrated authentication
- HYP-1201 Add day/night display for the map (date time sensitive) to show pilots when gliders get sunlight
- HYP-1218 Use vehicle public key returned in Secure On Ack to validate the crypto session
- HYP-1093 Display Progress of Read or Write File Transactions

Bug Fixes

HYP-244	Set/Retrieve Parameter Feature
HYP-645	Custom Course Dialog - Up/Down broken - Other Usability Issues
HYP-1169	AIS Outer Angle has the wrong parameter size value
HYP-1195	Path Vector Tool not functioning after crossing equator
HYP-1022	WGMS serves client-side JavaScript files to unauthenticated users
HYP-1108	pilot tools current calculation when WS sensor just turned on averages with 0 readings from previous telemetry
HYP-1164	When the user issues a file write block command WGMS displays an error message.
HYP-1165	When the user issues a set course w/options command WGMS displays an error message.
HYP-1166	When the user issues a set rudder controls command WGMS displays an error message.
HYP-1172	Phone number on About Us page is incorrect
HYP-1173	Toggle WP doesn't always work
HYP-1174	Server error message associated to the optimistic concurrency is misleading.
HYP-1178	Parsing of 4 byte floating point is not working correctly on Calculated columns function byte field
HYP-1181	Raw Packet Time Of Session Display
HYP-1182	The QA team is having problems automating test cases related to the export form.
HYP-1189	Fix export last 24 hours (and all other day specific) conditions to start from user now
HYP-1190	Cleanup URL conversion issues to wgms.com
HYP-1204	additional file attachments appear on vehicle
HYP-1209	When sending a File write Init command the blocks that fail are tried incorrectly.If block 30 failed WGMS retries block 31.
HYP-1215	SECURITY: Admin user can edit root users roles
HYP-1107	Multiple Read File Transaction Closed Commands

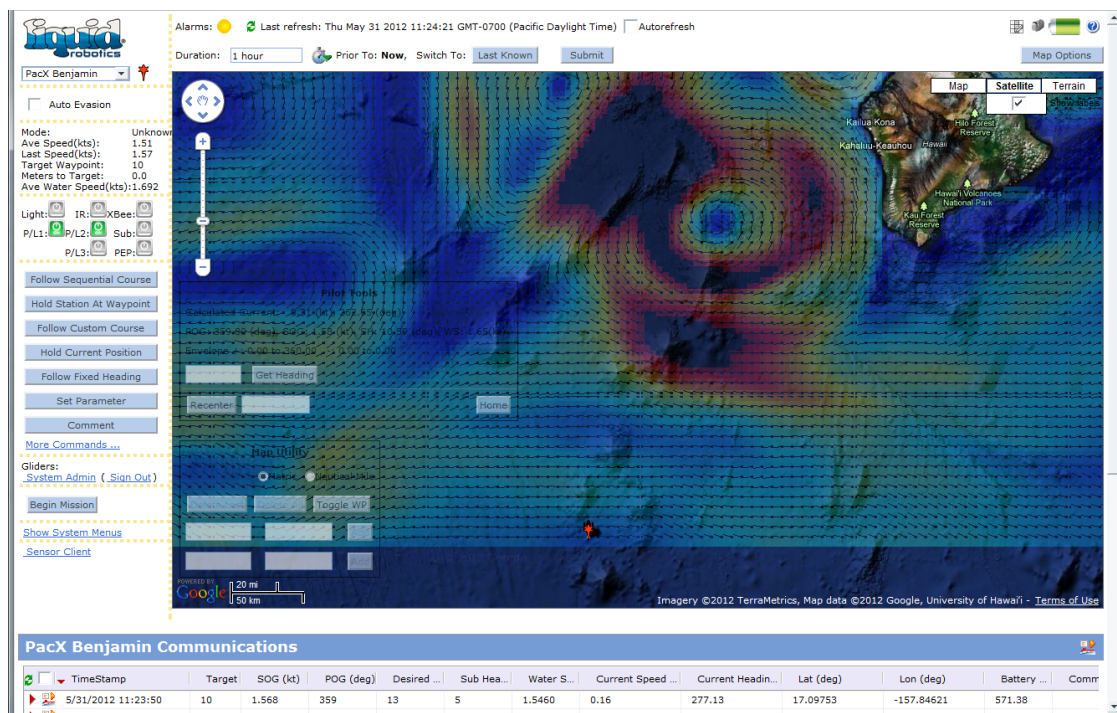
Changes in Version 4.0.5

Principal Changes

This release is mainly a culmination of security bug fixes.

User Experience Changes

New PacIOOS currents display for Hawaii:



New Features

- HYP-1158 Add support for rendering PacIOOS ocean current displays
- HYP-1161 Add Ocean Current column to telemetry

Bug Fixes

- HYP-1140 Default com channel inconsistent
- HYP-1143 SECURITY: In the "Vehicle/Operation Polygons" when the user creates a new operation polygon the polygon name text box allows the user to insert code that creates a button in the application.
- HYP-1134 Payload Statuses and Raw Outputs display same data on vehicle form when in Vehicle Data Form mode
- HYP-1138 Can't send a WGMS command that contains the character '+'
- HYP-1139 Writing HTML encoding sequences in macro editor stores the decoded value rather than the sequence
- HYP-1142 Init File Write where the file's extension is 2 characters wide causes 'Server Error'
- HYP-1144 SECURITY: When the user enters a nonexisting email in the "forgot my username" link WGMS displays an error message that gives too much information.
- HYP-1145 SECURITY: A Admin user can edit users information and obtain root role permissions.
- HYP-1146 SECURITY: A master user can edit users information and obtain root role permissions.
- HYP-1147 The "Move Vehicle" option in the "Vehicle" menu, doesn't copy the vehicle to another organization.

HYP-1148	In the login page after a user asks for a new username with the "forgot username link" WGMS lets that user enter the system with his old username.
HYP-1149	In th login page when the user asks for a new username with the "forgot username link" WGMS shows a message that a new temporary password will be sent instead of a new username.
HYP-1150	Comments on Set Parameter are not properly encoded
HYP-1151	SECURITY: Only include information about Liquid Robotics WGMS DLLs in the AboutUs page
HYP-1152	SHOUT Tracker minute decimal processing bug
HYP-1153	Add support for processing TRIG Tracker Telemetry
HYP-1154	When issuing command ais; wx; water on using Chrome command reason returned reads "ais,wx,water". This happens regularly
HYP-1157	Retrieve Log File command causes ServerError
HYP-1159	Fix ack alarm when vessel name has single quote in it.
HYP-1160	SECURITY: A master user can edit admin users information and obtain Admin role permissions.

Changes in Version 4.0.4

Principal Changes

This release has been centered on several important features:

1. Introduction of encryption Key Values stored in WGMS database, to allow for data acquisition sessions to be preserved.
2. Enhancing the Crypto Library used by the Packet Reflector (Virtual Relay), and Iridium Relays to restart encryption sessions with vehicles.

Changes in Version 4.0.3

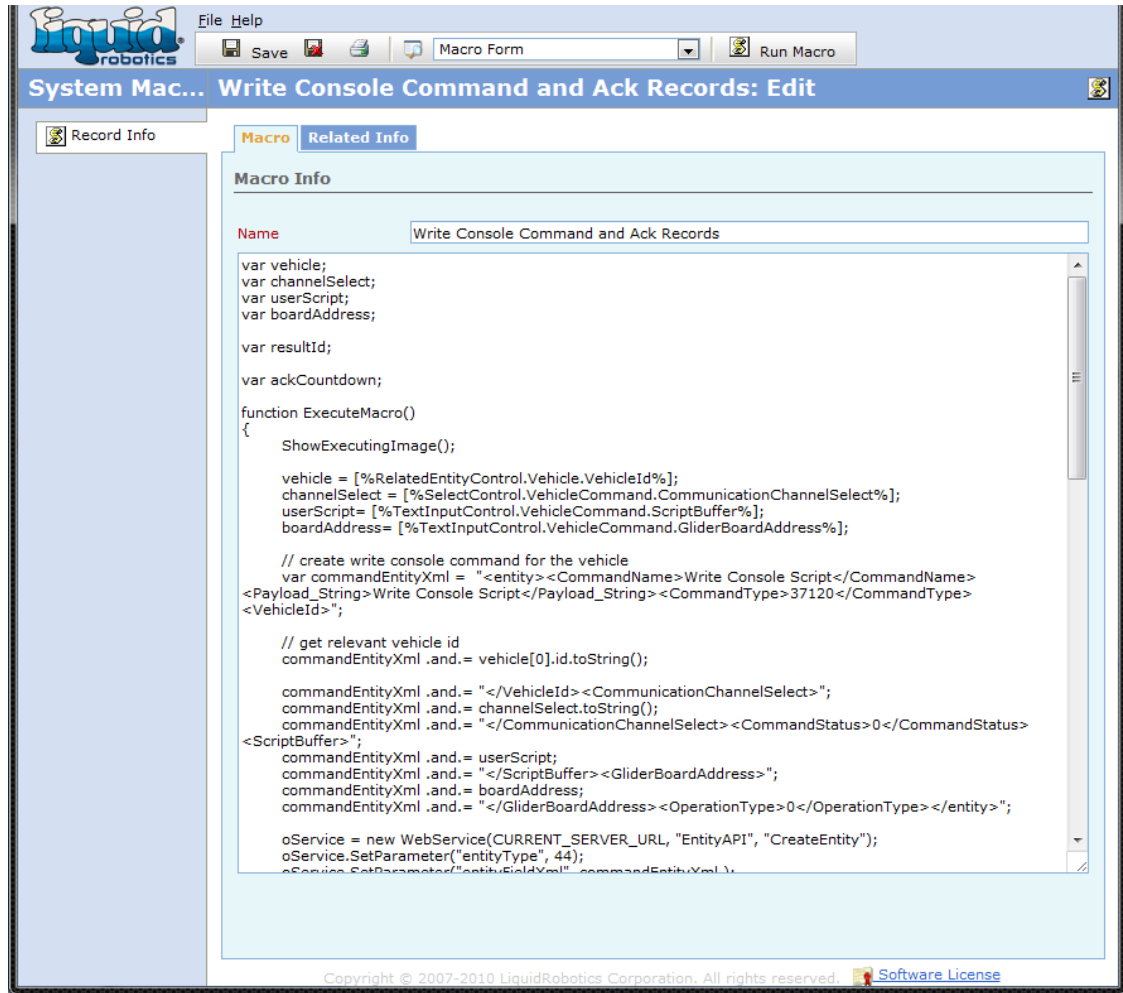
Principal Changes

This release has been centered on several important features:

1. Introduction of Macro scripts in WGMS, to allow for aggregation of actions into a single script.
2. Testing of virtual relays in secure mode
3. Passwords are no longer stored encrypted in the database, but are hashed instead. This means that user forgot password will be given a new temporary one instead of his old password.
4. Migration to Google Maps API level 3, for improved performance.
5. Aggregation of AIS markers in high density areas.

User Experience Changes

Macro editing:



Macro execution:

Write Console Command and Ack Records

Macro Form

Vehicle:  **Bench Rev 3C** 

Com Channel: **Iridium Com Channel** 

Script Buffer: **try this**

Board Address: **0**

Execute **Cancel**

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Google maps API 3 and AIS marker aggregation:

LiquidRobotics File Tools Help | Saved Exports | Default Da |  | Gliders: System Admin ([Sign Out](#))

Home | Vehicle Page | **Bench Rev 3C** 

☐ Auto Evasion

Mode: Rudder: 1.09
Ave Speed(kts): 0.82
Last Speed(kts): 63
Rudder Pos: Center
Path Heading: 63
Ave Water Speed(kts): 0

Light:  
P/L1:  Sub: 
P/L3: 

Follow Sequential Course
Hold Station At Waypoint
Follow Custom Course
Hold Current Position
Follow Fixed Heading
Set Parameter
Comment
[More Commands...](#)

Gliders: [System Admin \(Sign Out\)](#)
[Begin Mission](#)
[Hide System Menus](#)
[Sensor Client](#)

Map Utility
☐ Metric ☐ Nautical Mile
Delete Last **Delete All** **Toggle WP**
Add **Add**

Bench Rev 3C Communications

TimeStamp	Last Spe...	Targ...	Desired ...	Sub Hea...	Path He...	Float Te...	Battery ...	ISS	Command	Command Reason	Error
2/29/2012 12:34:40	0.821	255	999	317	63	29	267.63	5			
2/29/2012 12:37:15	2.44	255	999	317	100	29	267.63	5			

New Features

HYP-834	Commands issued and never responded to by vehicle should be timed out
HYP-1054	Switch to hashing passwords and eliminating stored DB copies of passwords
HYP-620	SMC Encrypted partition and new 0x71 packet support
HYP-968	Add a toggle for displaying way points
HYP-1001	Command Select Grouping
HYP-1050	Display Relay Source for data into WGMS
HYP-1055	Add a display indication on AIS vessels that have towing status
HYP-1059	Allow users to create "Macros" using client side JavaScript
HYP-1065	Google Maps API v3 migration
HYP-1066	Cluster AIS markers in high traffic AIS areas

Bug Fixes

HYP-508	Add hint field to Set Unique Id being the vehicle name
HYP-1075	Command Reason can't contain un-escaped XML characters like &
HYP-1078	Should not be able to resend commands
HYP-1080	System Error caused viewing tracker telemetry
HYP-1089	guest user should not access saved exports button in the toolbar
HYP-1092	Navigation Mode on Dashboard does not always display properly
HYP-1097	Logon Issue for WGMS
HYP-669	KML feature improvements
HYP-701	Retry in file transfer requested when not needed
HYP-1035	USER PIN for Multi factor should be set by the USER only
HYP-1060	Strange screen drawing artifact
HYP-1067	Program Select doesn't work in the Vehicle Form under File System
HYP-1068	In the "Vehicle" form WGMS is taking more than the expected time loading the parts tree
HYP-1070	Adding WGMS username at the time of account creation
HYP-1072	Use mission escalation list for all vehicles in a mission
HYP-1073	In the "More Commands" form, when the user clicks on the "Copy..." button nothing happens
HYP-1077	Timestamp not displaying in correct timezone
HYP-1082	XML sequences in Write Console Ack can disrupt display of Raw Outputs attached to command
HYP-1083	In the "Vehicle/Operation Polygons" when the user wants to create an operation coordinate the WGMS allows invalid longitude and latitude.
HYP-1084	Different parameters are required when the user issues a "File Write Init" command in Chrome and in firefox
HYP-1085	The "Copy from another Macro" button, when the user tries to create a new Macro, the WGMS displays an error message

- HYP-1088 In the System/Macros, when a user tries to execute a Macro after clicking on the related On icon of the vehicle, the WGMS displays an error message. (IE Only)
- HYP-1090 When try to create a new "Storage Controller" in a vehicle the "Copy .." button displays a system error message
- HYP-1095 Iridium Location coordinate display should change
- HYP-1096 When the user enters javascript code or tags in new commands the command list is not blocked but when the user creates a waypoint or an operation polygon with javascript the lists get blocked
- HYP-1076 WGMS User Info Form Improvement

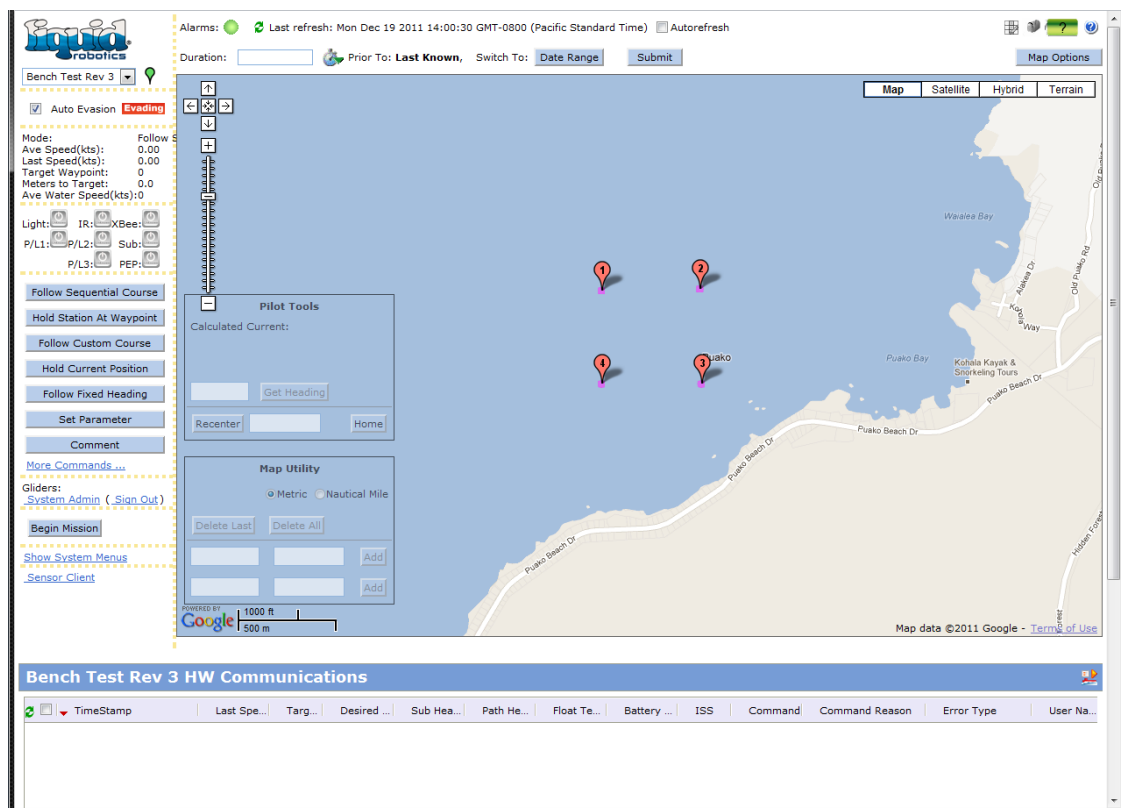
Changes in Version 4.0.2

Principal Changes

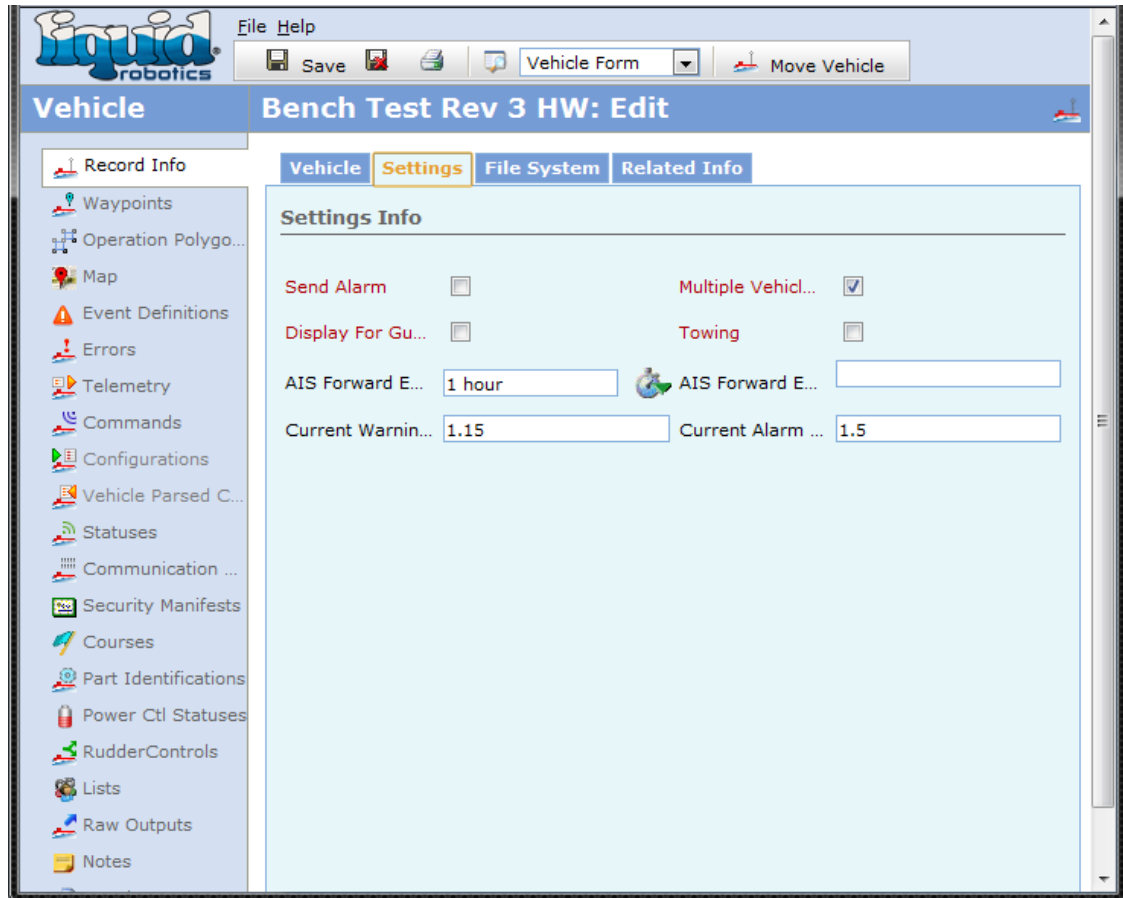
This release has been centered on the introduction of the Virtual Relay Capability, the optional "Auto Evasion" capability in the case of unattended Path Alarms, and the strong current alarm and warning with programmable levels.

User Experience Changes

Auto Evasion enabled vehicles will be issued "Follow Fixed Heading" to escape oncoming AIS vessel in a path alarm state.



New ocean current limits for warning and alarm:



New Features

- HYP-492 Change Dashboard combined outputs
- HYP-924 Virtual Relay - Packet Reflector Protocol
- HYP-1048 Implement Auto Evasion for enabled vehicles
- HYP-1049 Fire Ocean Current warning and alarm for currents stronger than a specified threshold in kt

Bug Fixes

- HYP-663 "Options" should be removed from the task bar
- HYP-668 Data Export: errors when exporting to Excel
- HYP-701 Retry in file transfer requested when not needed
- HYP-1024 Login issue when using Firefox on Linux OS
- HYP-1029 Even though no manifest is associated, Secure On command can be selected (vehicles never show that they are in secure mode)
- HYP-1032 Invalid duration in form input field raises a server exception
- HYP-1051 Email Username sends email and not the username.
- HYP-1052 Battery Icon does not update
- HYP-1053 User Forgot Password Email (Do Not Reply)

Changes in Version 4.0.1

Principal Changes

Release 4.0.1 was mainly about enhanced security functions of WGMS

- Implement username/password for sign in
- Multi-Factor authentication per user
- Stronger password strength requirements
- Fixed security bugs

User Experience Changes

User Admin Form Multi-Factor management tab:

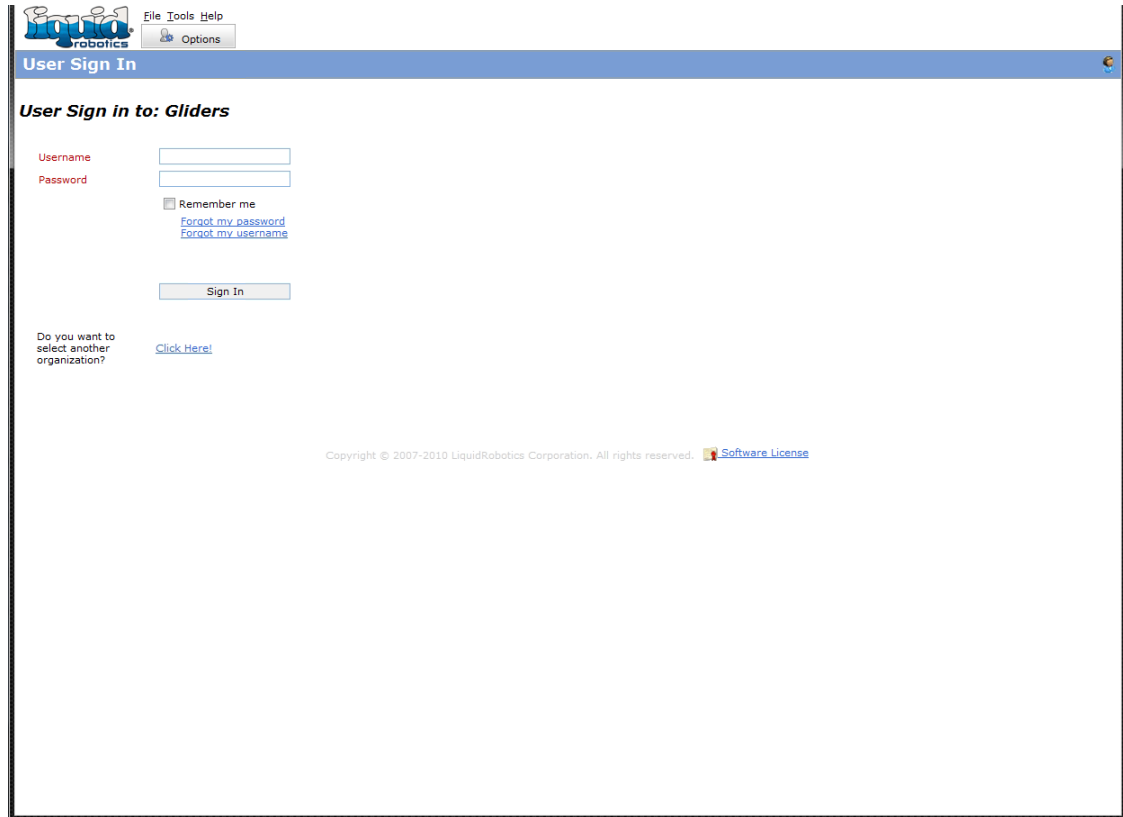
The screenshot shows a web browser window displaying the 'User Admin Form' for the user 'ehud.pardo@liquidr.com'. The interface has a blue header with the 'liquid robotics' logo and a 'File Help' menu. A 'Secure Page' indicator is visible in the top right. The main content area is divided into three tabs: 'User', 'Multi-Factor Authentication' (which is selected and highlighted in orange), and 'Related Info'. The 'Multi-Factor Authentication' tab contains a section titled 'Multi-Factor Authentication Settings'. This section includes a 'Multi-Factor...' checkbox that is checked, a 'Multi-Factor ...' dropdown menu set to 'Standard', a 'PIN' input field, a 'Country Code' input field with the value '1', a 'Dial Interna...' checkbox, and a 'Phone Exten...' input field. A sidebar on the left contains links for 'Record Info' and 'Roles'. The footer of the page states 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and includes a link to the 'Software License'.

User Admin Form:

The screenshot displays a web application interface for managing users. The top navigation bar includes the 'Liquid Robotics' logo, a 'File Help' menu, and a 'Secure Page' indicator. Below this, a breadcrumb trail shows 'User Admin Form'. The main header area displays the title 'User' and the specific user being edited, 'ehud.pardo@liquidr.com: Edit'. A sidebar on the left contains links for 'Record Info' and 'Roles'. The main content area features three tabs: 'User' (selected), 'Multi-Factor Authentication', and 'Related Info'. The 'User Information' section contains a form with the following fields: E-mail (ehud.pardo@liquidr.c), Password (masked with dots), First Name (System), Last Name (Admin), Telephone (408 540 6075), Export Max (100), Pager (4082502521@txt.att.r), Alt Email, Time Zone (UTC-08:00 Pacific Time (US & Canada); Tijuana), Password Expiration checkbox, Account Location checkbox, and Username (masked with dots). An 'Edit' link is present next to the Password field, and an 'Edit Ctr' link is next to the Username field. The footer contains copyright information for Liquid Robotics Corporation (2007-2010) and a link to the 'Software License'.

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Username in User login page:



New Features

- HYP-1026 Multi-factor authentication for selected users in WGMS
- HYP-1009 Use User Id instead of email for users sign in credentials
- HYP-1012 after 3 unsuccessful login attempts for a User Id, account should be locked out
- HYP-1027 Packet Reflector changes for Failover Support

Bug Fixes

- HYP-1034 Vehicles in orgs other than root org don't display secure mode after successful secure session is established
- HYP-1011 IMEI edit should only be allowed for root user
- HYP-1014 Create new Provision Role and reduce Master role parts access
- HYP-1015 User login notifications
- HYP-1019 Require Current Password for Password Changes
- HYP-1020 Setting a user password should force the user to use a strong password
- HYP-1021 Forgot password form can be used to determine valid user IDs
- HYP-1025 In the "Home" page in the "Comment Command" window when the user sends a command the WGMS allows him to enter javascript code that retrieves the browser cookies information in a popup window
- HYP-1028 Fix Iridium Relay Secure Client Cache Ops

HYP-1036	The WGMS creates a new Rudder Control and displays a system error message, when the user leaves necessary information fields empty and uses the "Save " button.
HYP-1037	In Toolbar ,when the user clicks on the "Options" button , the WGSM display an error message.(admin,only).
HYP-1038	The "Copy from another Restriction" option when adding a Restriction, displays an error message.
HYP-1039	In the "More Commands" form, the information of a command is not copied, when the user uses the "Copy..." functionality
HYP-1040	In the "Vehicles/Courses" menu when the user wants to save but don't send a course the button doesn't work

Changes in Version 4.0.0

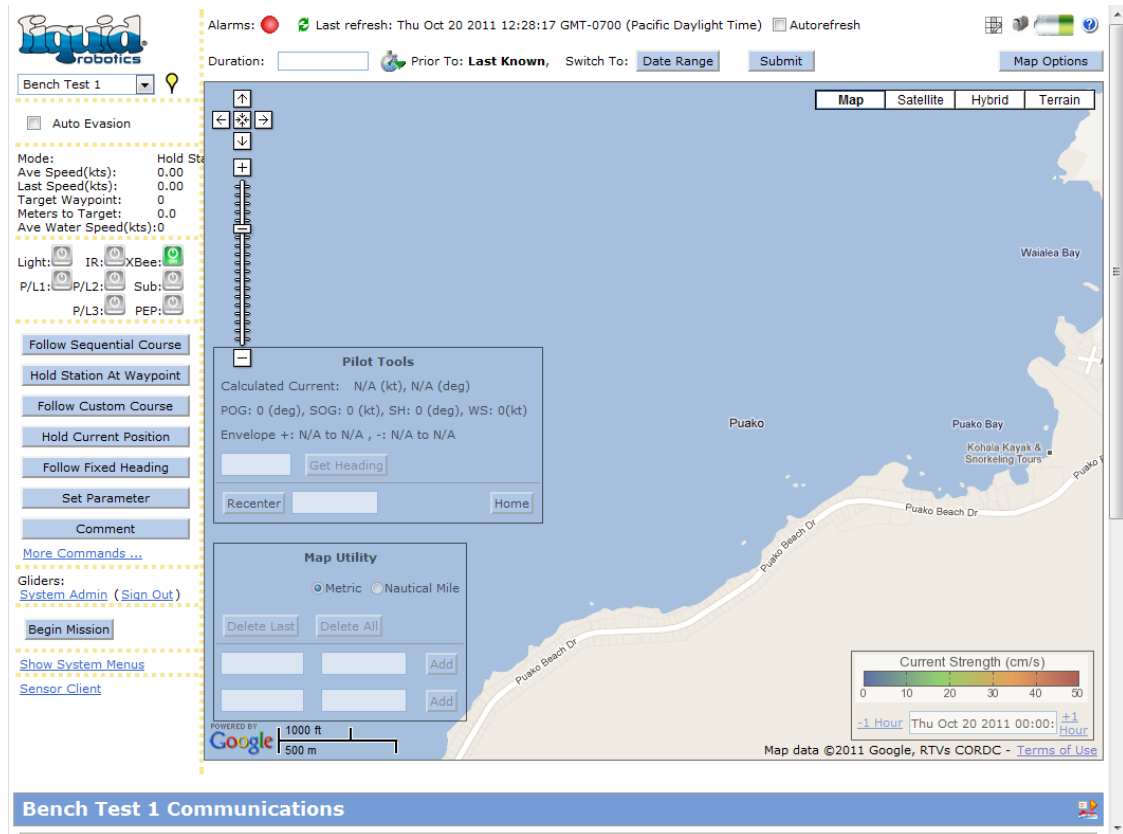
Principal Changes

Release 4.0.0 was mainly about the completion of cross browser compatibility

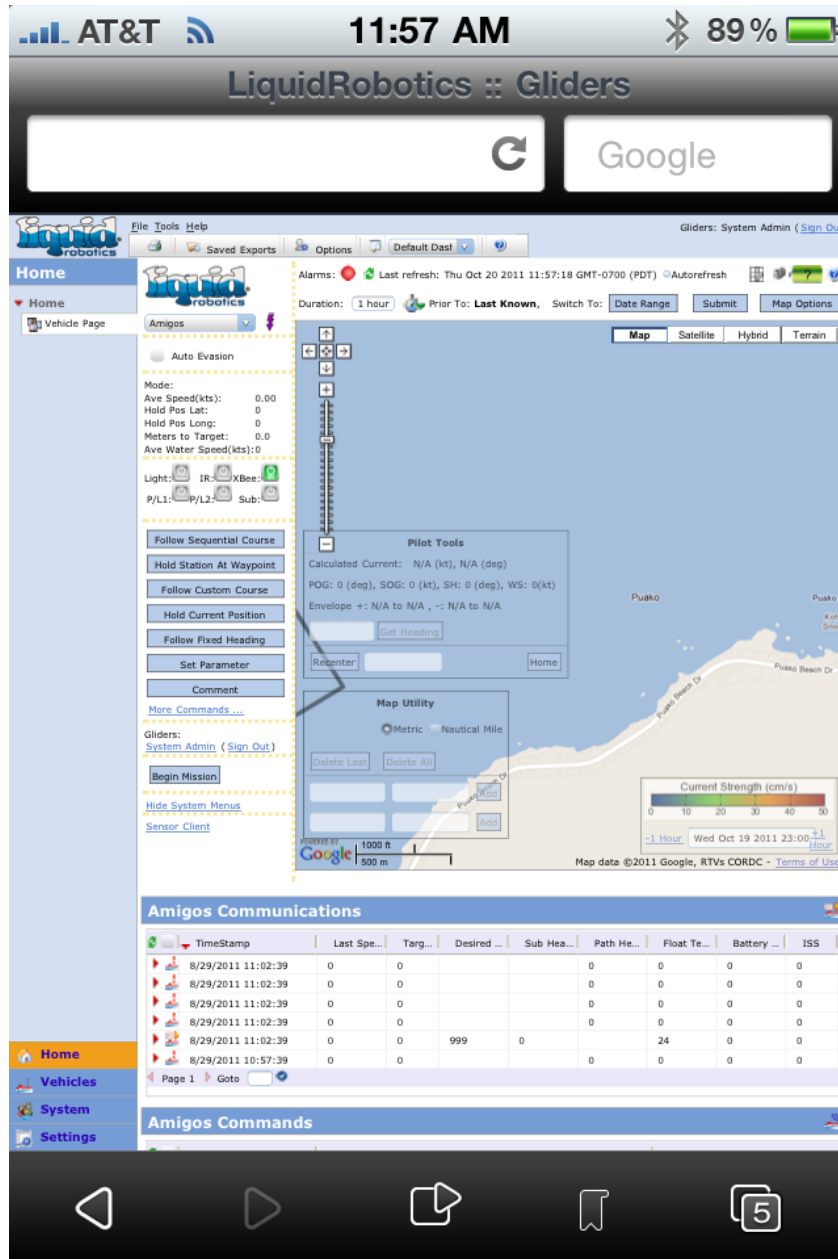
- Cross Browser Date and Time controls
- Line Following indicator control
- Support for both iPad and iPhone browsers

User Experience Changes

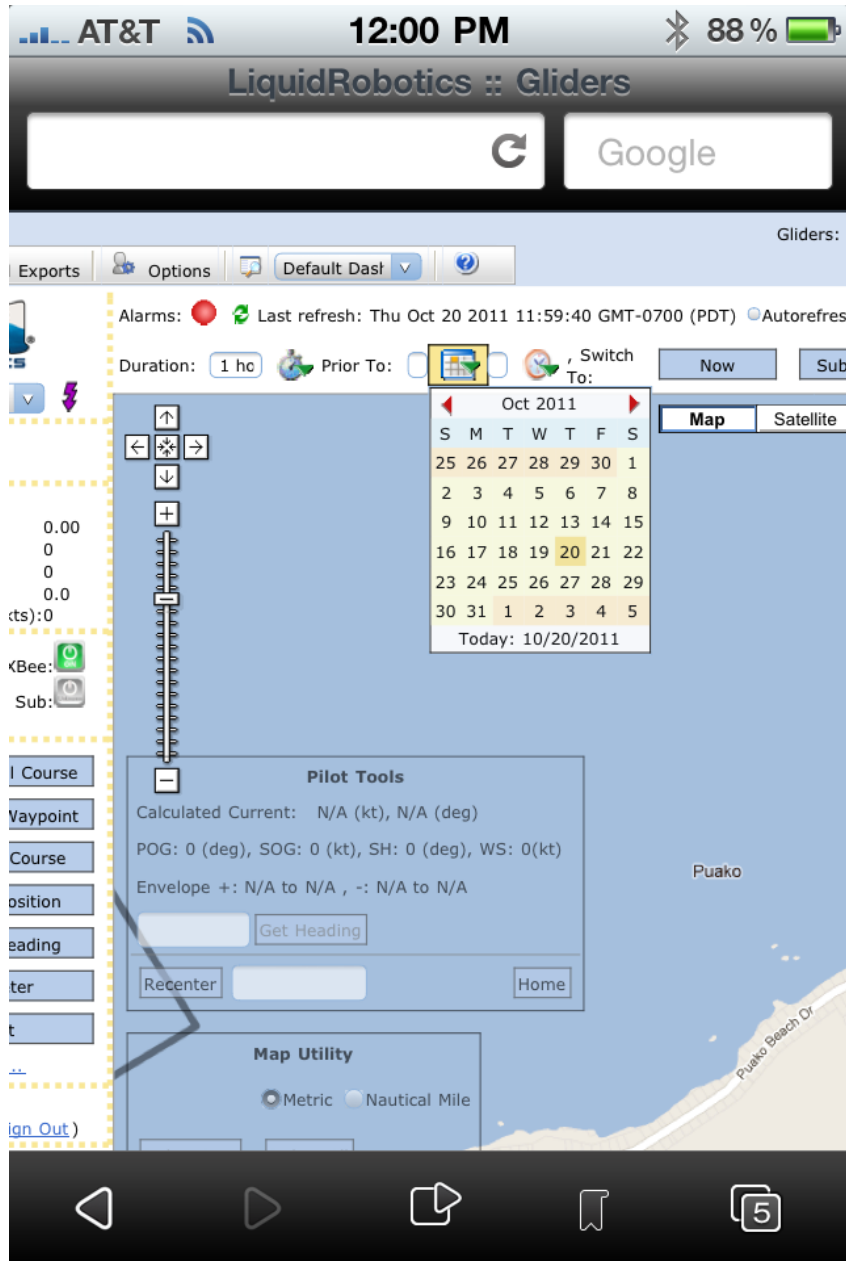
Added Line Following Control:



iPhone and iPad support:



Date and Time Controls (cross browser)



New Features

- HYP-695 Adding water speed columns to telemetry export tool
- HYP-706 Visibility of relay status and errors in WGMS
- HYP-821 Add vehicle Status - Active/Not Active to allow for multiple vehicles designation
- HYP-960 Implement Vehicle Form "Transfer Vehicle" button to allow for Vehicles to be "returned" to root org
- HYP-963 Add average water speed to WGMS dashboard
- HYP-972 Label Datawell MOSE Record Columns
- HYP-975 Observing and Exporting Sensor data out of WGMS with related views

HYP-984	Modify default parts list creation for vehicles
HYP-985	Add recommended direction on Path alarms and warnings
HYP-987	Add Multiply/Add capability to Calculated Columns
HYP-990	Logging command
HYP-696	Adding vehicle name to export tool output

Bug Fixes

HYP-718	Changing and saving export filter doesn't save changes
HYP-965	Some grids don't convert TimeStamp columns to user time zone
HYP-973	Heading Calculation error on Pilot tools.
HYP-739	Mission Document Link: When it isn't a fully-specified link, it gets completed by adding http://test.liquidr.com
HYP-808	Implement Line Following Info Parsing
HYP-910	Add date control popups for Cross Browser functionality
HYP-960	Implement Vehicle Form "Transfer Vehicle" button to allow for Vehicles to be "returned" to root org
HYP-961	Alphabetize "set parmeters" list
HYP-962	Alphabetize glider list in "map options"
HYP-966	In the "Map Options" menu when the user clicks on the "durationPickerOn" icon the time list is partially displayed
HYP-967	In the "Map Options" menu when the user clicks on the Path Vector "durationPickerOn" icon nothing happens
HYP-969	In the "New Course Waypoint" dialog, the "Copy From Another Course Waypoint" functionality displays a System Error message
HYP-970	In the "Weather Station/Weather Reports" menu, the "File/New" option is available for "Admin" and "Master" user roles
HYP-971	In the "Courses/CourseWaypoint" dialog, the List Scrolling bars are not displayed. (FireFox Only)
HYP-976	Fix export last 24 hours criteria load error
HYP-979	The "Copy to Another Note" feature in the "RecordInfo/PartNotes" dialog, displays a System Error message
HYP-980	When creating a new Waypoint with invalid information, the WGMS displays a system error message.
HYP-983	add additional event definitions for the default set created with vehicle
HYP-986	Non sortable columns (such as calculated columns) should not allow user to click - sort header in grid
HYP-988	The Entities Lists are not refreshing after create a new Entity.
HYP-989	When the user tries to print a command, the WGMS displays an error message.
HYP-991	The WGMS displays an error message, when the user enters "0" in the "GoTo" page navigation functionality.
HYP-992	When the user wants to export operation polygons, the WGMS displays an error message
HYP-993	Issue alert when user sends command not in default com channel

HYP-995	Time Field in Data Export Uses AM/PM
HYP-997	The "Part Info" List, doesn't work properly when edit an existent part, selecting the part itself as parent part.
HYP-998	The "Copy To Another Vehicle..." option in the "Course" menu, doesn't copy the course to another vehicle.
HYP-999	The WGMS displays an error message, when the user tries to delete a "Criteria" using the "Delete" button.
HYP-1000	When creating a new Waypoint, the "Save but don't send" feature generates different statuses, when creates it from scratch or use the "Copy from" functionality (Internet Explorer Only)
HYP-1008	Admin use can elevate himself or others to root
HYP-553	Cannot export command history to excel
HYP-920	Time entry & saving issue within "Export PayloadPacket Records"
HYP-939	Breadcrumbs not displayed when latitude or longitude is 0
HYP-974	Time Field in Data Export Uses AM/PM