WGMS™ Administrators Guide

Revision C
December 2013
Part Number 030-00481

WGMS™ Administrators Guide

Copyright © 2013 LRI, Inc.

Confidential and proprietary information. Valid license or other authorization from LRI, Inc. required for possession, use or copying.

Trademarks

Liquid Robotics®, LRI, Wave Glider®, Wave Glider Management System, WGMS, and SHARC® are worldwide trademarks of LRI, Inc. Other products and company names mentioned herein may be the trademarks of their respective owners.

Patents

The Wave Glider product is subject to the following patents: Chile (48.628), China (2011 101405179), Egypt (25194), Indonesia (P0027767), Israel (192828), Japan (2009533257), New Zealand (570562 and 592743), Singapore (144487), South Africa (200806769), U.S. (7,371,136, 7,641,524, 8,043,133, and 8,287,323). Additional U.S. and non-U.S. patent applications are pending. All aspects of the Wave Glider product have been developed at private expense by LRI, Inc.

Warranty

The information contained herein is subject to change without notice. The only warranties for LRI, Inc. products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as a warranty. LRI, Inc. is not liable for technical or editorial errors or omissions contained herein.

Revision History

Document Part Number	Revision	Publication Date	Changes
030-00481	A	May 2013	This is the initial manufacturing release of this document.
030-00481	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.
030-00481	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.

Table of Contents

About this Document x
1. Overview 1
The Wave Glider 1
Wave Glider Instrumentation and Communications 3
WGMS Components 4
Configuring WGMS for Common Scenarios 6
LRI-Hosted WGMS 6
Mobile WGMS 8
Payload Development and Shore-Side Testing Using XBee (SV2 Only) 8
Changes to WGMS Dashboard for Wave Glider SV3 10
2. First Time Use of WGMS 13
Login to WGMS 13
Configure the COM Server 24
3. Configuring an XBee Relay (SV2 Only) 27
XBee Overview 27
XBee Operation 27
XBee Range 27
XBee Hardware and Software 28
XBee Hardware 28
Hardware and Software Requirements 28
Installing the Device Driver 29
Firmware Updates 29
Establishing Communications 30
XBee Installation 30
Installation Instructions 30
XBee Software Configuration 36
XBee Start-Up Dialog Box 36
Setting Port and Network Configurations 36
Starting the Relay 38
Saved Events 41
Using XBee with Hosted WGMS 42
Required Materials 42
Configuring OpenVPN 42
Configuring the XBee Relay 43
Operation and Verification of IP Address 43
4. Administrative Tasks - Settings Screen 45
Show System Menus 45
Settings Screen 45
System Menus - Menu Bar and Tool Bar 46
Organizations, Users and Roles 46
Organizations 46
Users 47
Roles 47
Typical Organization Initialization Tasks 48
Accessing the Organization Info 48
Editing Organization Information and Settings 48
Editing the Organization Tab Settings 50
Editing the Maps Tab Settings 53
Editing the Contact Info Tab Settings 54
Editing the Formatting Rules Tab Settings 55
Editing the Description Tab Information 56

Standard Administrative Tasks 57
Adding New Users 57
Assigning or Removing User Roles 62
Deleting a User 65
Specialized Administrative Tasks 67
Accessing an Organization 68
Viewing Roles for an Organization 68
Viewing Permissions 70
Changing Permissions 73
Changing Catalog Images 73
Advanced Organization Options 75
Advanced Settings Options - Record Customization 76
5. Shared Administrative Tasks - Vehicles Screen 78
Vehicles Screen Overview 78
View or Edit Vehicle Data 80
Viewing Vehicle Parts Information 81
Adding or Changing Vehicle Alarm Thresholds 83
Viewing Sensor Data Records 89
6. Shared Administrative Tasks - System Screen 91
System Screen Overview 91
Updating Lists 92
Exporting Records 96
Viewing Custom Reports 97
Custom Reports Table Format 100
Custom Reports Graph Format 102
ADCP C2 and ADCP C4 Data Display 103
ADCP C2 and C4 Table Format 105
ADCP C2 and C4 Graph Format 107
ADCP C2 Bin Map Format 108
7. Mobile WGMS 112
Mobile WGMS Overview 112
Setting up a Mobile WGMS Enabled Wave Glider Vehicle 113
Setting up Mobile Provisioned WGMS Instances 121
Mobile WGMS Commands 127
8. Troubleshooting a WGMS Installation 130
I don't see any Vehicles when I start the WGMS 130
There is no response from the Vehicle 130
Commands are not being ACKed/NAKed 131
A Vehicle no longer responds to WGMS commands 131
Map is not being displayed in the WGMS Dashboard 132
XBee doesn't seem to be working 132
I'm not getting Iridium messages 132
Mobile WGMS is not working 133
I changed and then lost the Administrator's password 133
Interpreting Packet Reflector Log Records 133
Packet Reflector Dialog 133
Packet Reflector Error Messages 133
"Command Listener *[source]* Fatal Error: *[message]* " 134
"Command Listener *[source]* Packet receive Error: *[message]*" 135
"Command Reflector: *[subscriber]*, packet echo data mismatch *[message]*" 135
"Command Reflector: *[subscriber]*, packet echo length mismatch *[message]* " ... 136
"Command Reflector: *[subscriber]*, Send *[message]* " 136
"Output Listener Error: *[subscriber]*, Packet Receive *[message]* " 137
"Output Listener Fatal Error: *[subscriber]*, *[message]*" 137

"Output Reflector Fatal Error: *[subscriber]*" 138
"Output Reflector Error: *[subscriber]*, Send: *[message]*" 138
Interpreting Com Server Log Records 138
Packet Reflector Dialog 139
Com Server Error Messages 139
"Command Listener – ERROR CreateVehicleCommand *[date/time] [message]* " 140
"Command Listener – ERROR: *[message]* " 140
"Command Listener – FATAL ERROR: *[message]* " 140
"Command Queue Failed to set Command Status to Sent: *[message]* " 141
"Command Queue Packet Error" 141
"Command Queue Read Failed" 141
"Output Listener – ERROR: *[message]* " 142
"Output Listener – FATAL ERROR: *[message]* " 142
"Output Writer – ERROR CreateVehicleOutput: *[date/time]*, buffer=*[hex_buffer]*, *[message]* " 142
"Output Writer – ERROR: *[message]* " 143
"Output Writer – FATAL ERROR: *[message]* " 143
9. Contacting Liquid Robotics Inc. 145
A. Roles and Permissions 146
B. Checklists 150
Provisioning Checklist 150
Mission Planning Checklist 150
Mission Operation Checklist 151
C. XML, Soap and Entities 152
XML 152
Entities 152
XML Data Types 152
Response Strings 153
Soap Envelopes 153
SOAP 1.1 Format 153
SOAP 1.2 Format 154
Management System Function Summary 155
Function Descriptions 156
Create Entity 156
Create Login Session 156
Delete Entity 156
Get Entity Column Metadata 157
Get Entity Column Metadata Set 157
Get Entity Column Select Metadata Set 157
Get Entity Metadata 158
Get Entity Set 158
Get Related Entity Set 159
Get Vehicle Commands 159
Get Vehicle Crumbs 160
Get Vehicle Power Control Statuses 160
Read Entity 160
Update Entity 161
D. WGMS Release Notes 162
Overview 162
Changes in Version 4.1.5 162
Principal Changes 162
User Experience Changes 163
New Features 168

Bug Fixes 168
Changes in Version 4.1.4 170
Principal Changes 170
User Experience Changes 170
New Features 172
Bug Fixes 172
Changes in Version 4.1.3 173
Principal Changes 173
User Experience Changes 174
New Features 175
Bug Fixes 176
Changes in Version 4.1.2 176
Principal Changes 176
User Experience Changes 177
New Features 178
Bug Fixes 178
Changes in Version 4.1.1 179
Principal Changes 179
User Experience Changes 179
New Features 179
Bug Fixes 180
Changes in Version 4.1.0 180
Principal Changes 180
User Experience Changes 181
New Features 183
Bug Fixes 184
Changes in Version 4.0.5 185
Principal Changes 185
User Experience Changes 185
New Features 185
Bug Fixes 185
Changes in Version 4.0.4 186
Principal Changes 186
Changes in Version 4.0.3 186
Principal Changes 186
User Experience Changes 187
New Features 188
Bug Fixes 189
Changes in Version 4.0.2 190
Principal Changes 190
User Experience Changes 190
New Features 191
Bug Fixes 191
Changes in Version 4.0.1 192
Principal Changes 192
User Experience Changes 192
New Features 193
Bug Fixes 194
Changes in Version 4.0.0 194
Principal Changes 194
User Experience Changes 194
New Features 196
Bug Fixes 196

List of Figures

1.1. Wave Glider SV2 on Water 2
1.2. Wave Glider SV2 Vehicle Main Components 3
1.3. Wave Glider SV2 Payload and Communications Components 4
1.4. Wave Glider Management System Components 5
1.5. LRI-Hosted WGMS 7
1.6. Wave Glider Deployed with LRI-hosted WGMS 8
1.7. XBee for Local Communications 9
1.8. XBee Communications 10
2.1. Sign-In to WGMS Website 13
2.2. WGMS Login Screen 14
2.3. Change Username Screen 15
2.4. Accept License and Change Default Username 16
2.5. Sign In with New Username 17
2.6. Change Password Screen 18
2.7. Changing the Default Password 19
2.8. Initial UI Display Screen 20
2.9. UI Display with System Menus 21
2.10. Initial User Admin Form 22
2.11. Edited Email - Initial User Admin Form 23
2.12. Initial Vehicles List 24
2.13. COM Server Application Settings Dialog Box 25
2.14. COM Server Window 26
3.1. XBee USB Adapter (Dongle) 28
3.2. XBeeRelayAppSetup.msi Properties 31
3.3. XBee Installation Welcome Dialog Box 32
3.4. XBee Installation Folder Selection Dialog Box 32
3.5. XBee Installation Confirmation Dialog Box 33
3.6. XBee Installation Progress Indicator 34
3.7. XBee Installation Complete Dialog Box 35
3.8. XBee Relay Start Icon 35
3.9. XBee Relay Configuration Start 35
3.10. XBee Relay Start-Up Dialog Box (Annotated) 36
3.11. XBee Port Selection Tab 37
3.12. XBee Parameter Selection Tab 37
3.13. Packet Reflector and Relay Address Selection 38
3.14. Start Relay Button and Log Display 38
3.15. Start Relay Media Connected 39
3.16. XBee Connection Established 40
3.17. Console for Vehicle Window 41
3.18. Display Window Function Set 41
3.19. Re-Sized Relay Application Form 41
3.20. Viewing Saved System Events 42
4.1. System Menus Tool Bar 46
4.2. Organziations List 48
4.3. Organization Form 49
4.4. Org Admin Form 50
4.5. Org Admin Form - Organization Tab 51
4.6. Changing Logo 52
4.7. Image Library Dialog Box 53
4.8. Org Admin Form - Maps Tab 54
4.9. Org Admin Form - Contact Info Tab 55

4.10. Org Admin Form - Formatting Rules Tab 56
4.11. Org Admin Form - Description Tab 57
4.12. Organizations Window 58
4.13. Organization Dialog Box 58
4.14. Example List of Users 59
4.15. User: New Form 60
4.16. Completed New User Account Example 61
4.17. Organization Form 62
4.18. WGMS Organization Users Example 63
4.19. User Admin Form Example 64
4.20. User Related Roles Form 65
4.21. Organization Form 66
4.22. Name Selected for Deletion 67
4.23. Users Dialog Box Toolbar 67
4.24. Deletion Confirmation Dialog Box 67
4.25. Organizations List 68
4.26. Roles List 69
4.27. Master Role Form 70
4.28. Master Role Description 70
4.29. Master Role Form 71
4.30. Master Role Permissions Window 72
4.31. Permission Icon Descriptions 72
4.32. Master Vehicles Permissions 73
4.33. Catalog Images List 74
4.34. Image Library Upload Dialog Box 74
4.35. Image Library Remove Dialog Box 75
4.36. Advanced Organization Options Side Tabs 76
4.37. Record Customization Side Tab 77
5.1. Vehicles Screen - Vehicles List 78
5.2. Example - Vehicle Form 80
5.3. Example Expanded Part Info Tree 82
5.4. Edit Part or Attach Note 82
5.5. Part Form for the Iridium Modem 83
5.6. Vehicle Form 84
5.7. Event Definitions List 85
5.8. New Event Definition - Alarm Counts Form 86
5.9. New Event Entered - Alarm Counts Form 87
5.10. Save and Close Event Definition 87
5.11. Updated Event Definitions List 88
5.12. Edit Event Definition - Alarm Counts Form 89
5.13. Sensor Data - Fluorometer Records List 90
6.1. System Screen 91
6.2. Lists Side Tab - All Lists 92
6.3. Escalation List - List Form 93
6.4. New Icon 93
6.5. List Item Form 94
6.6. Contact List Records 94
6.7. Example New List Item 95
6.8. Select Name in List Form 95
6.9. Delete List Item Icon 95
6.10. List Deletion Dialog Box 96
6.11. Delete Record Dialog Box 96
6.12. Record Exports List 96
6.13. Example - Export Dialog Box 97

6.14. Opening the Custom Reports Screen 99
6.15. Custom Reports Screen - No Data Available 99
6.16. Data Drop-Down Menu 100
6.17. Custom Reports Screen With Data - Table Format 101
6.18. Changing the Columns that are Displayed 101
6.19. Custom Reports Screen - Graph Format 102
6.20. Custom Reports Screen - Graph Format Time Settings 102
6.21. Custom Reports Screen - Graph Format Time Slider 103
6.22. Opening the Custom Reports Screen 104
6.23. Custom Reports Screen No ADCP C2 Data 104
6.24. ADCP Custom Reports Screen - Table Format 105
6.25. Custom Reports Tool Bar 105
6.26. ADCP C2 and C4 Table Format Tool Bar 106
6.27. Rows Drop-Down Menu 106
6.28. Compass Icons 107
6.29. Custom Reports Screen - ADCP C2 Graph Format 107
6.30. ADCP Graph Format - Time Settings 108
6.31. ADCP Graph Format - Time Slider 108
6.32. Select ADCP Bin Map Display 109
6.33. ADCP Bin Map in All Bins Mode 109
6.34. ADCP Bin Map in Map Mode 110
7.1. Mobile WGMS 112
7.2. Opening the Simple Command Form 128
7.3. Issuing the Activate Mobile Mode Command 129

About this Document

This revision of the *System Administrators Guide for the Liquid Robotics Wave Glider Management System* includes the WGMS 4.1.5 Release Notes:

- See the section called “ Changes in Version 4.1.5” for more information.

Important

This WGMS Administrators Guide provides basic system administration information for individuals assigned the WGMS 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 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 the *Wave Glider® 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.

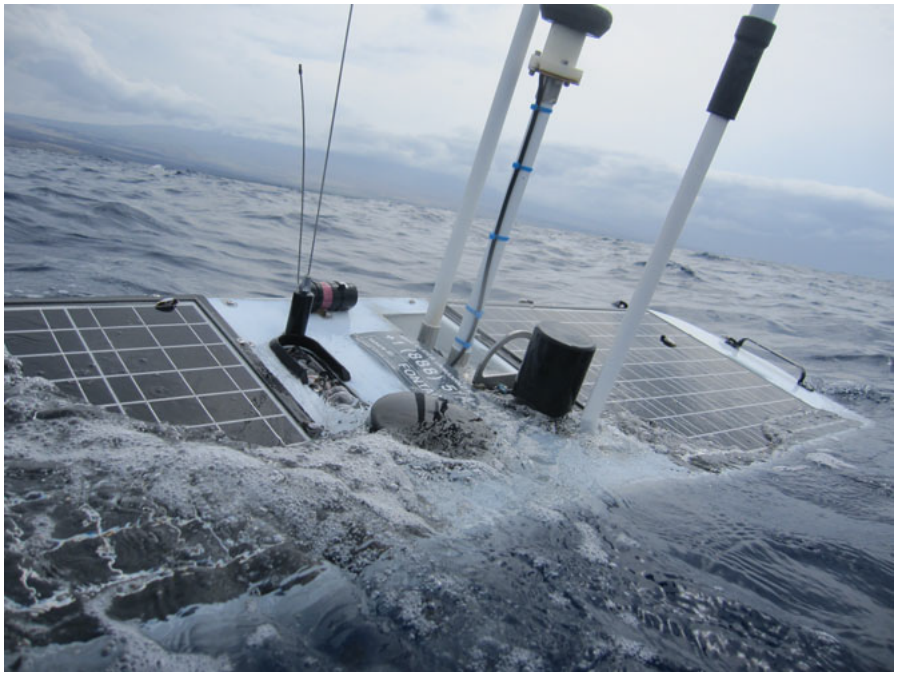
The Wave Glider

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.

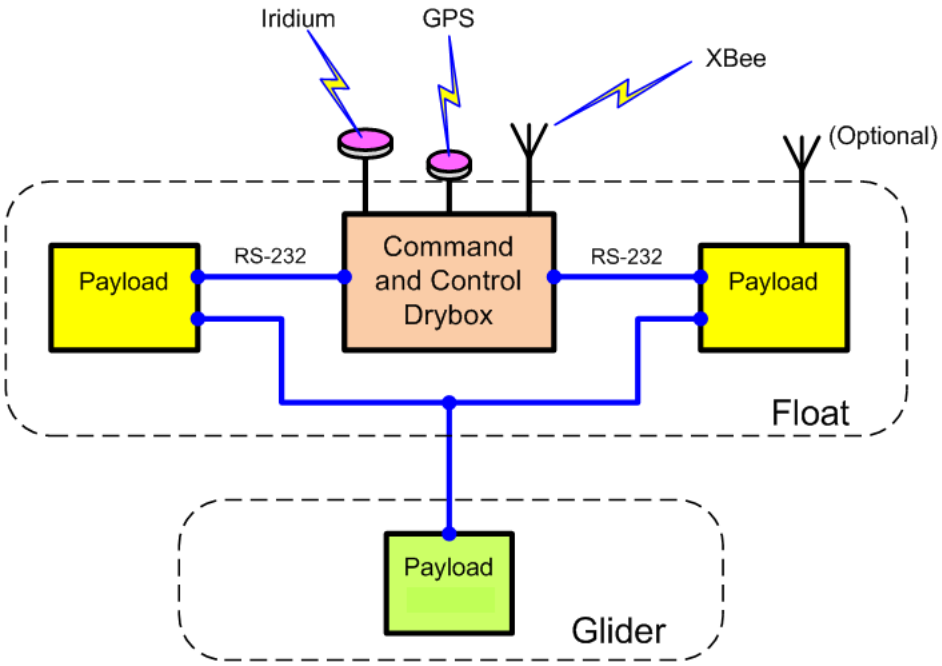
Figure 1.2. Wave Glider SV2 Vehicle Main Components

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.

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:

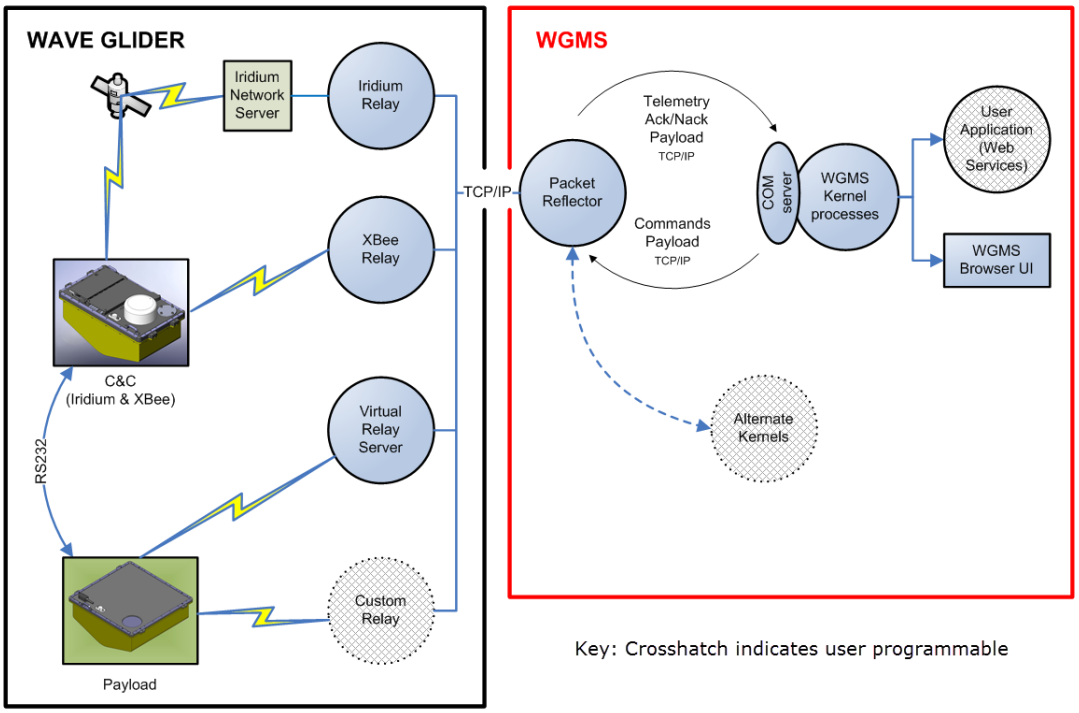
- The SV2 C&C communicates directly with the external world using the Iridium satellite network or XBee.
- The SV2 C&C can communicate indirectly through payload-based communications equipment.
- The SV2 C&C computer communicates with the payloads via RS232 links.

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.

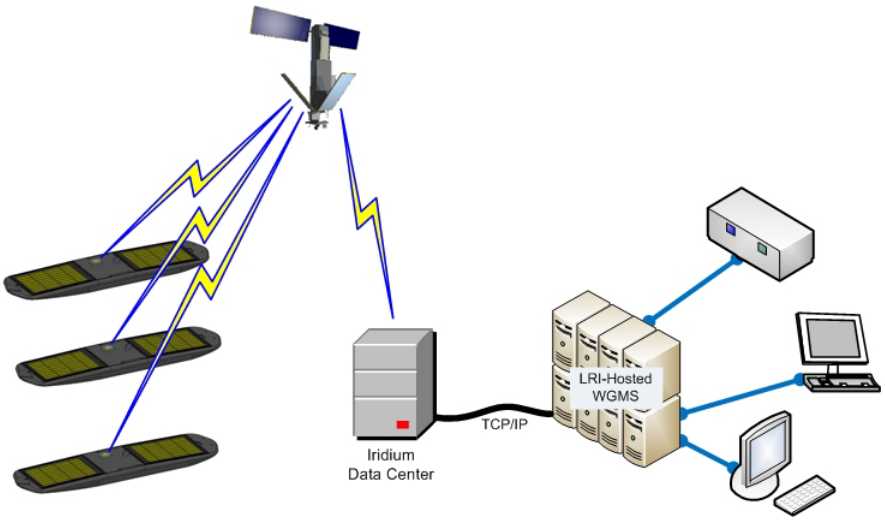
Configuring WGMS for Common Scenarios

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.

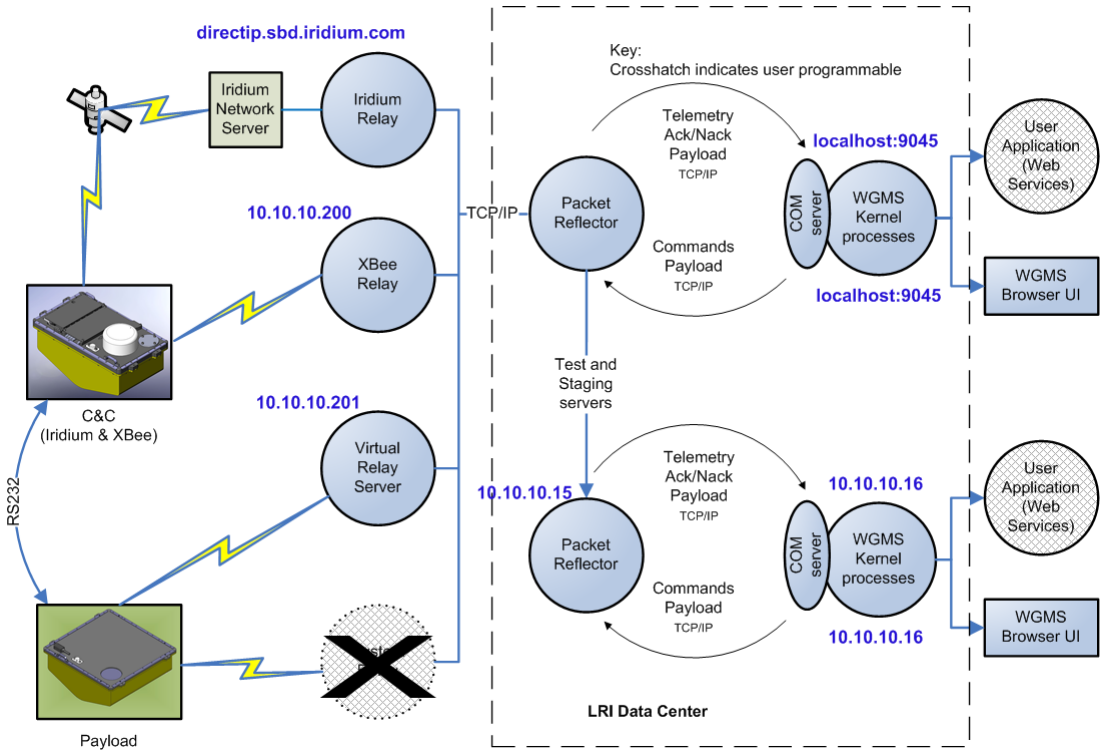
Figure 1.5. LRI-Hosted WGMS



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 Chapter 7: *Mobile WGMS*.

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

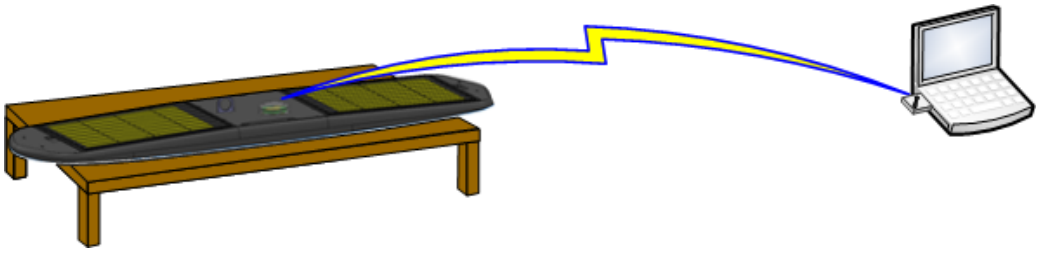
The Wave Glider SV3 includes WiFi and Cell modems that are used for payload development and shore-side testing, instead of XBee. WiFi and Cell communications go through the Virtual Relay Server, rather than the XBee Relay. Cell communications can also be used for Wave Glider missions that are conducted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

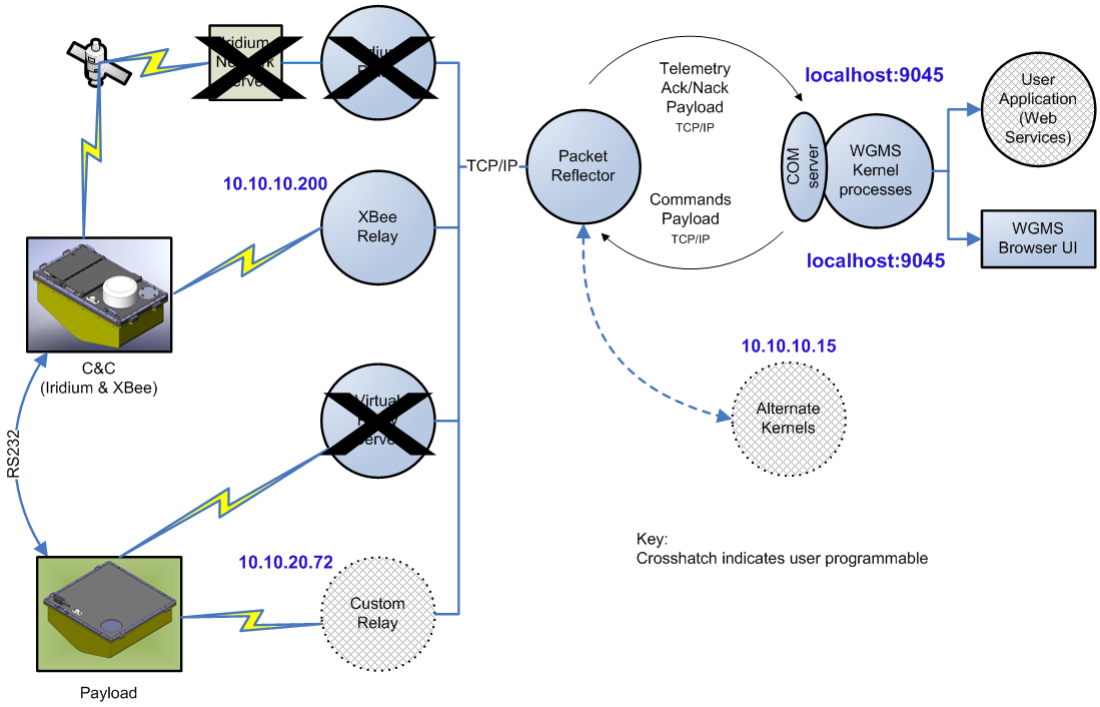


The communications flow is illustrated below in Figure 1.8, XBee Communications.

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 provides a suggested checklist (see Appendix B: *Checklists*). 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



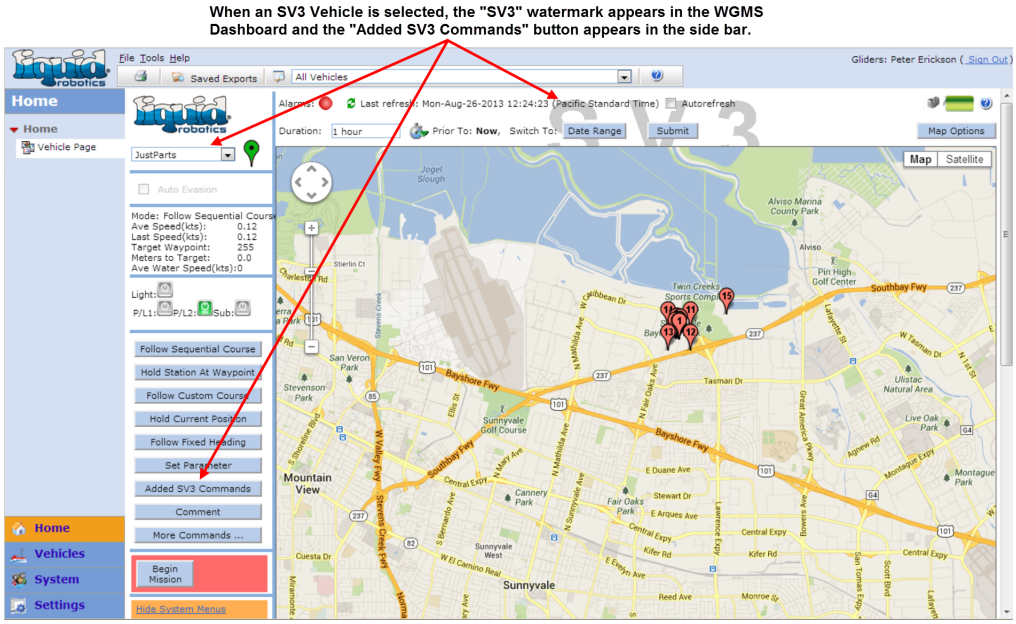
For the XBee Communications scenario in an LRI-hosted WGMS environment, the principal administrative tasks include:

- Obtaining an XBee Modem (dongle) - For more information see “XBee Hardware ” (page 28).
- Installing the XBee Relay on the Computer that hosts the XBee Modem - This step is described in “XBee Software Configuration” (page 36).
- 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 Chapter 4: *Administrative Tasks - Settings Screen* .

Changes to WGMS Dashboard for Wave Glider SV3

When a Wave Glider SV3 vehicle is selected from the vehicle selection drop-down menu on the WGMS Dashboard:

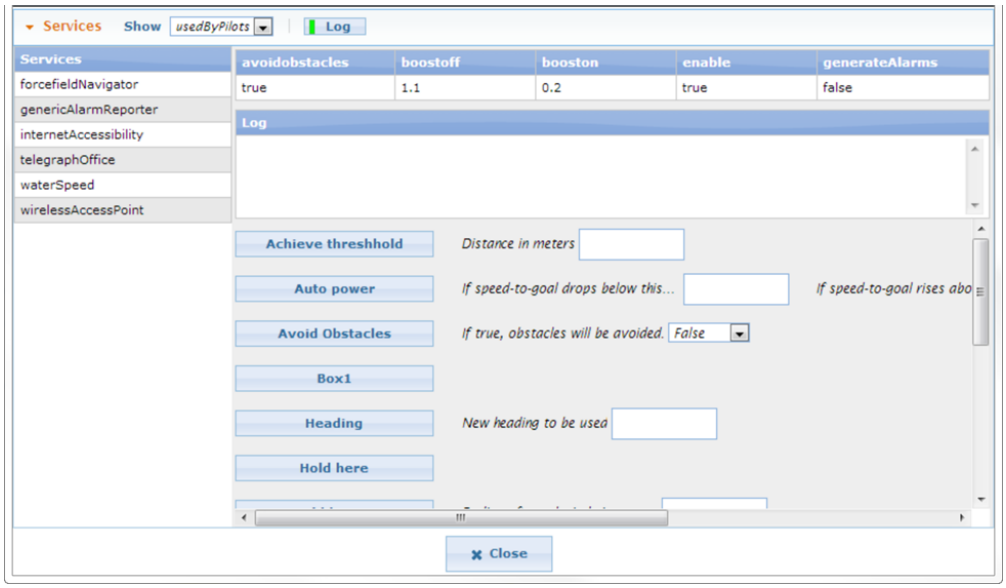
- The **SV3** watermark appears in large gray letters at the top of the WGMS Dashboard and the **Added SV3 Commands** button appears in the Dashboard side bar.



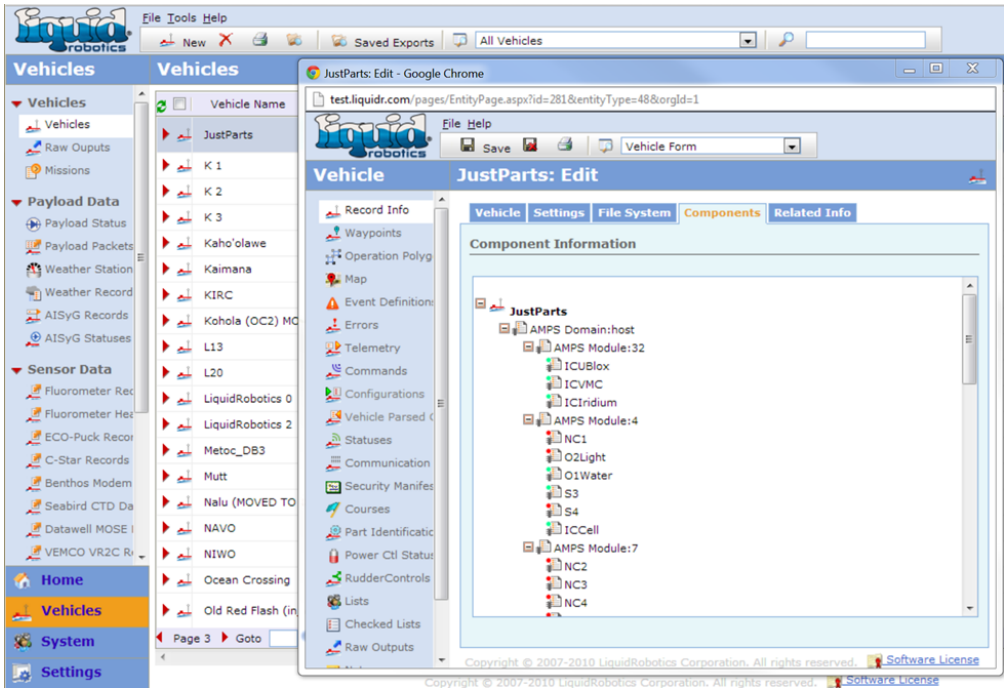
- Clicking on the **Added SV3 Commands** button opens the **Services** window where commands and vehicle data that are available on SV3 vehicles only can be accessed.

Note

This feature is under development. If you issue set a waypoint using the Services window, it will be sent directly to the Vehicle, without being recorded by WGMS. For this reason, the waypoint will not appear on the map view in the WGMS Dashboard.



- The **Components** tab on the **Vehicle Form** is activated. The **Components** tab provides status on AMPS modules.


File Tools Help
New
Saved Exports
All Vehicles
Vehicles
Vehicles
Vehicles
Raw Ouputs
Missions
Payload Data
Payload Status
Payload Packets
Weather Station
Weather Record
AISyG Records
AISyG Statuses
Sensor Data
Home
Vehicles
System
Settings
Vehicle Name
JustParts
K 1
K 2
K 3
Kaho'olawe
Kaimana
KIRC
L13
L20
LiquidRobotics 0
LiquidRobotics 2
Metoc_DB3
Mutt
NAVO
NIWO
Ocean Crossing
Page 3
Goto
JustParts: Edit - Google Chrome
test.liquidr.com/pages/EntityPage.aspx?id=281&entityType=48&orgId=1
File Help
Save
Vehicle Form
Vehicle
JustParts: Edit
Record Info
Waypoints
Operation Polyg
Map
Event Definition
Errors
Telemetry
Commands
Configurations
Statuses
Communication
Courses
Lists
Checked Lists
Raw Outputs
Vehicle
Settings
File System
Components
Related Info
Component Information
JustParts
AMPS Domain:host
AMPS Module:32
ICUBlox
ICVMC
ICIridium
AMPS Module:4
NC1
O2Light
O1Water
S3
S4
ICCell
AMPS Module:7
NC2
NC3
NC4
Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.
Software License

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

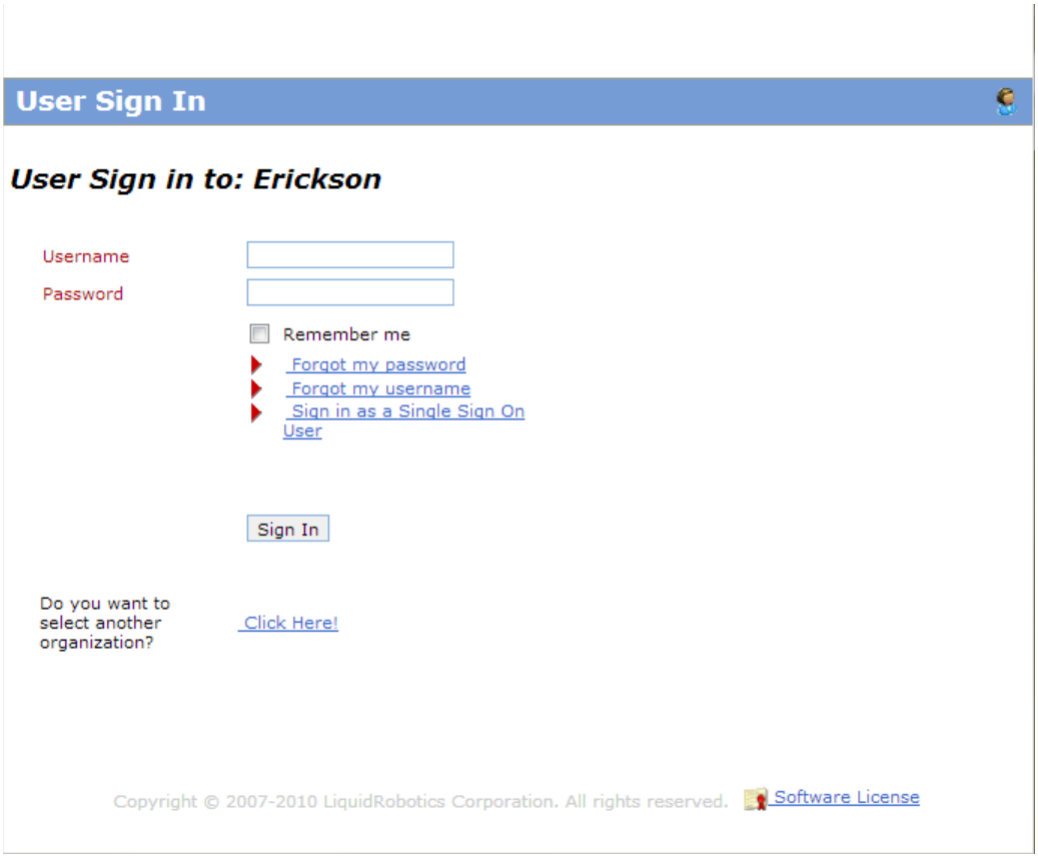
1. To verify the installation, navigate to your WGMS login screen using a browser.

   - 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



2. • 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:

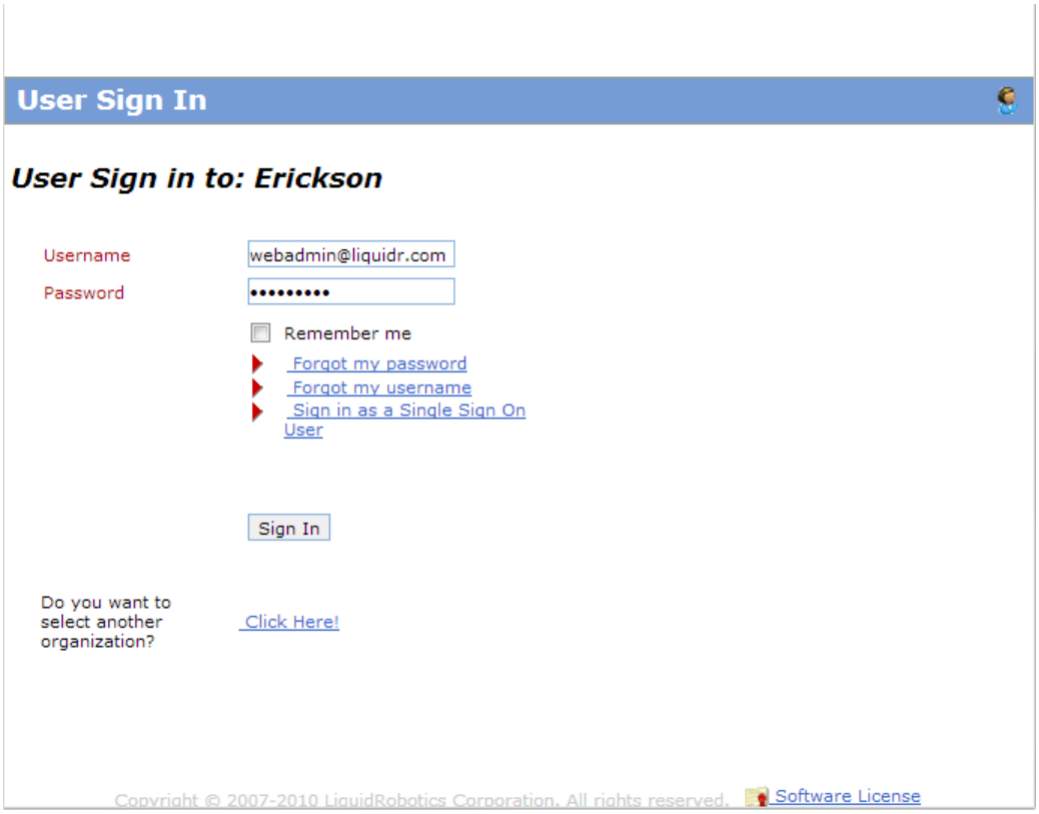
webadmin@liquidr.com

and use the password:

WGMSlog!n

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



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

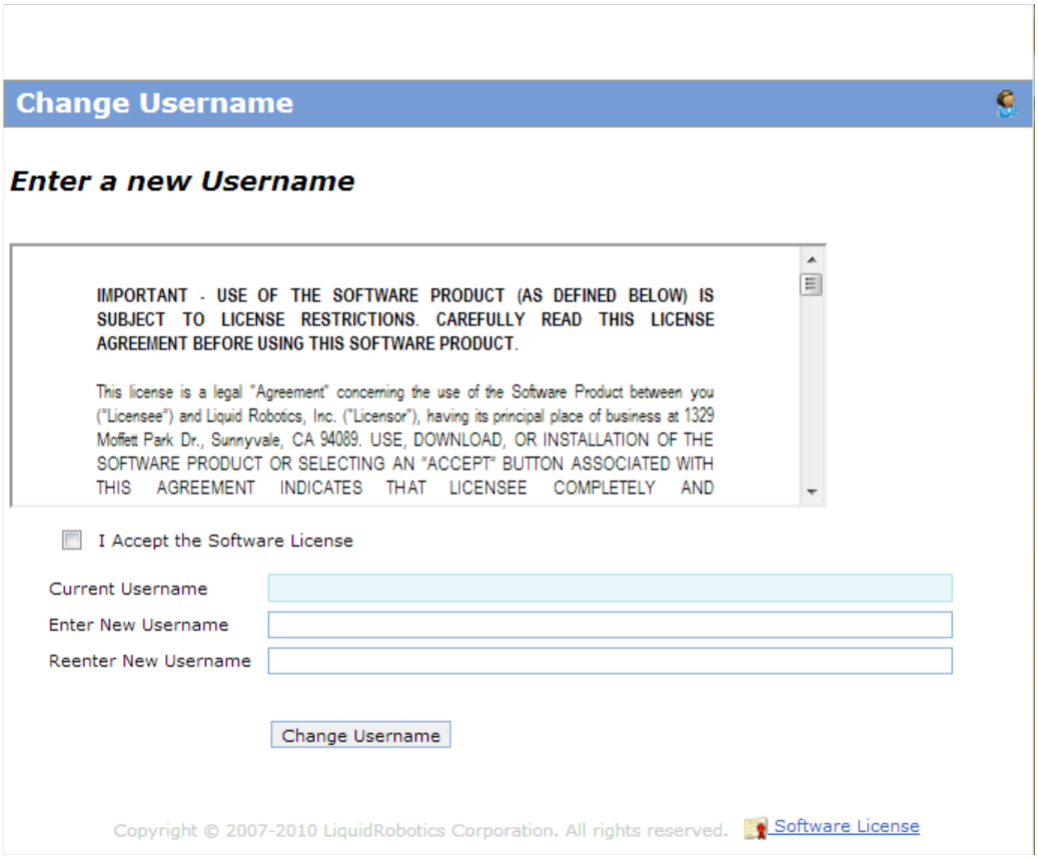
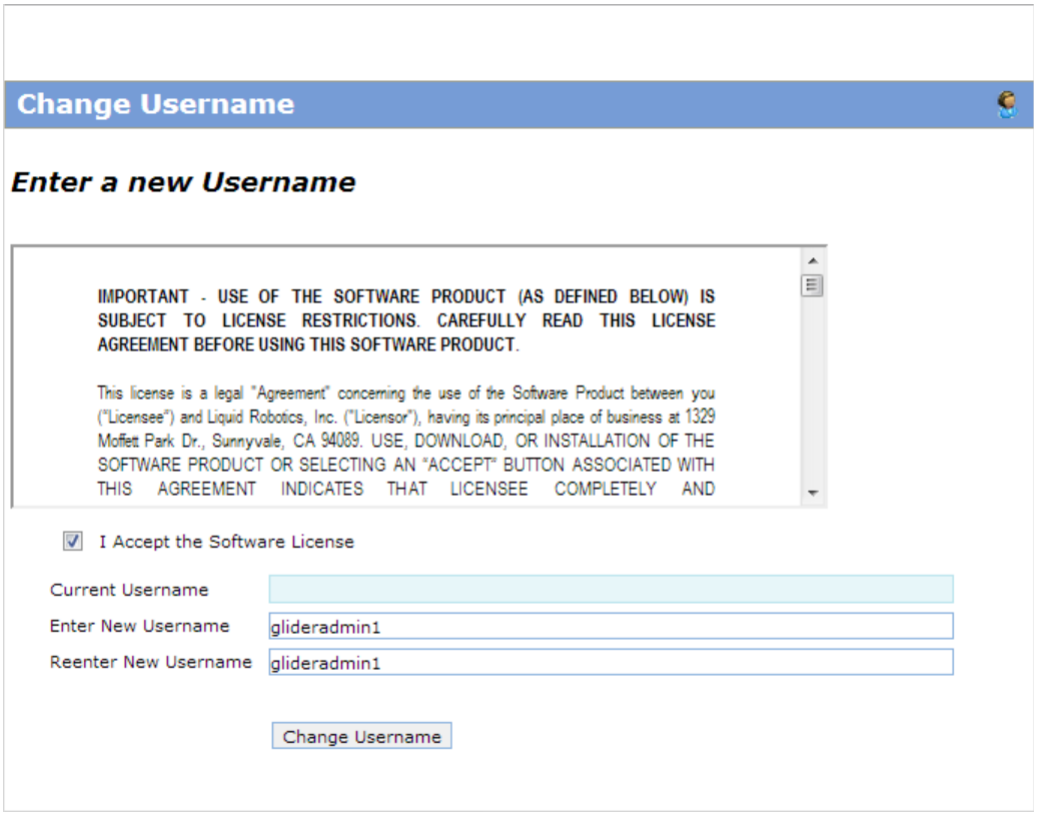
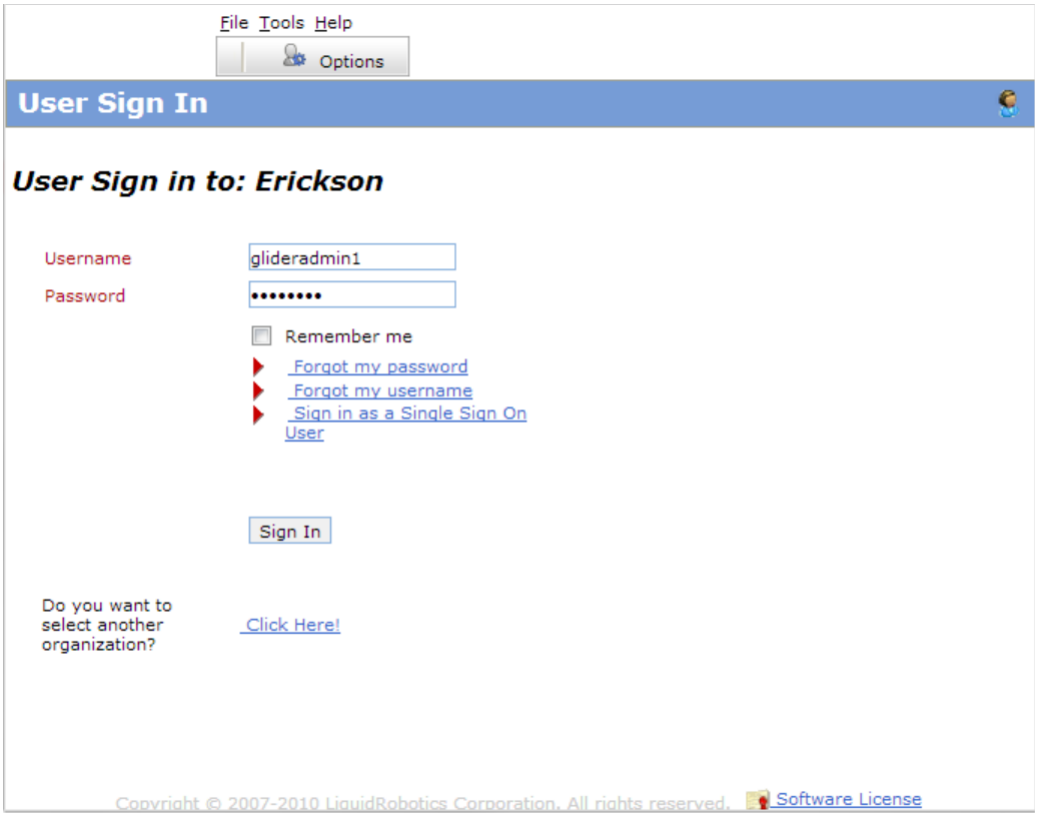


Figure 2.4. Accept License and Change Default Username



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

Figure 2.5. Sign In with New Username



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

Figure 2.6. Change Password Screen

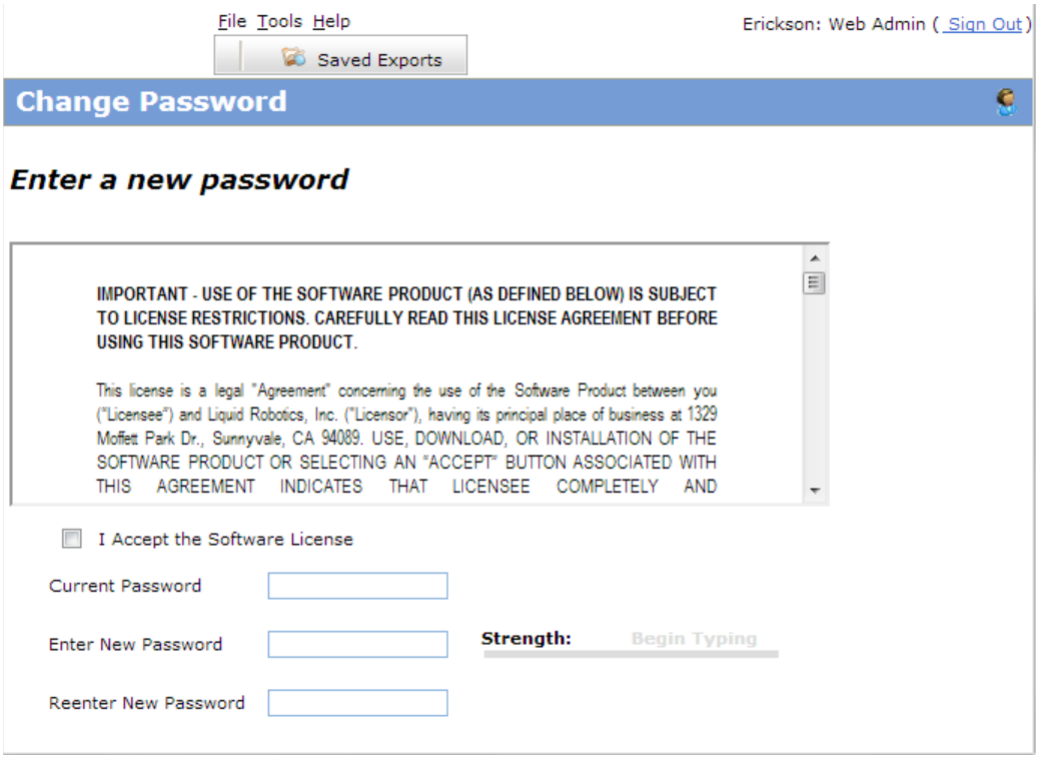
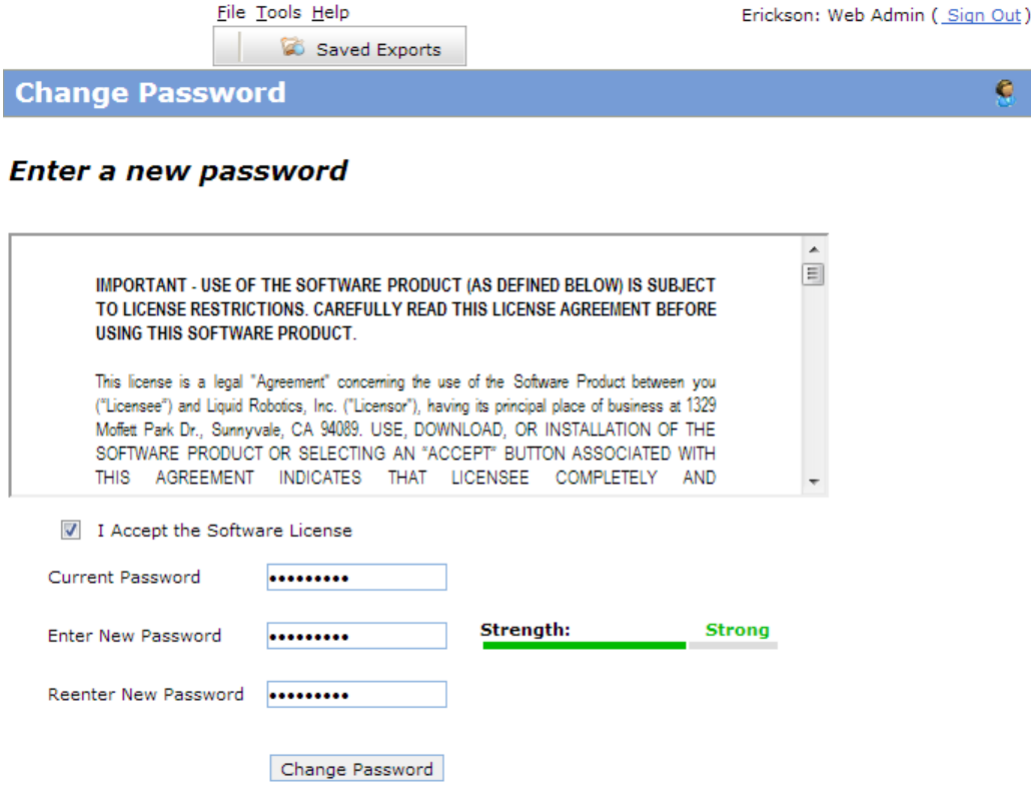


Figure 2.7. Changing the Default Password

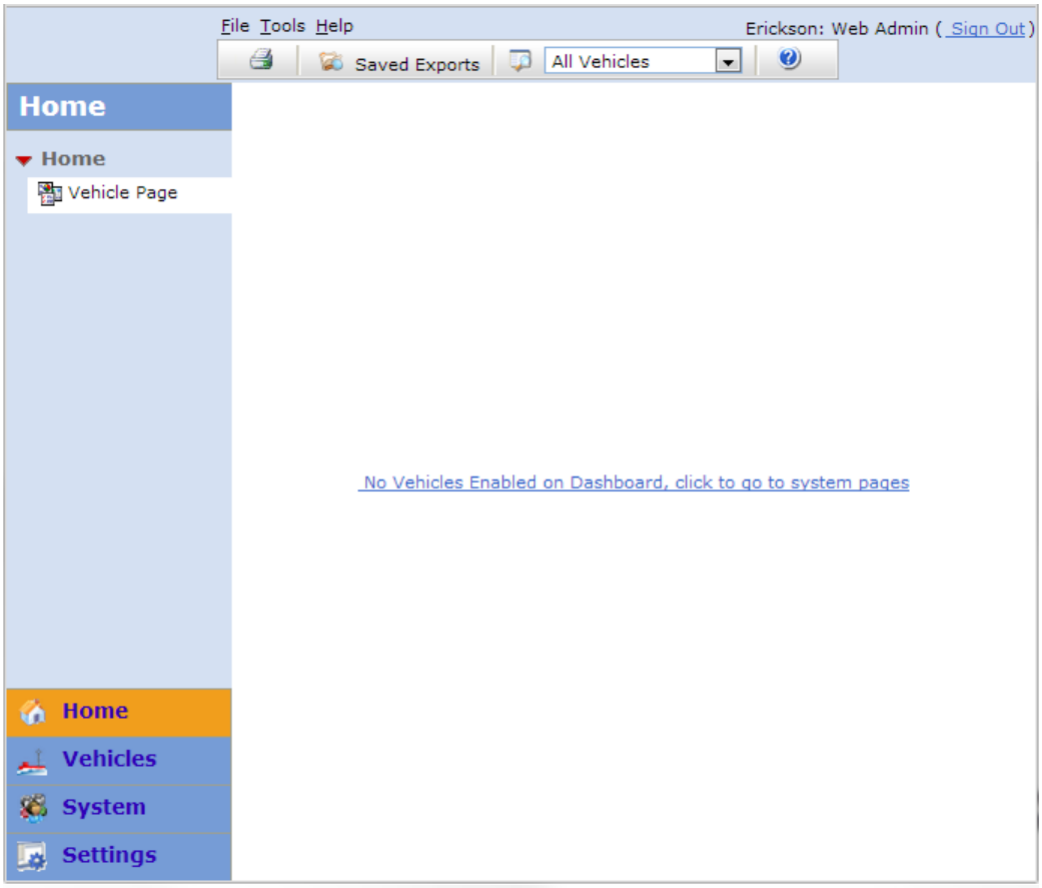


6. After changing your password, the intitial user interface (UI) display screen will appear. Since no vehicles are defined in the initial database, the display will be empty except for a link to the System Menus.

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.

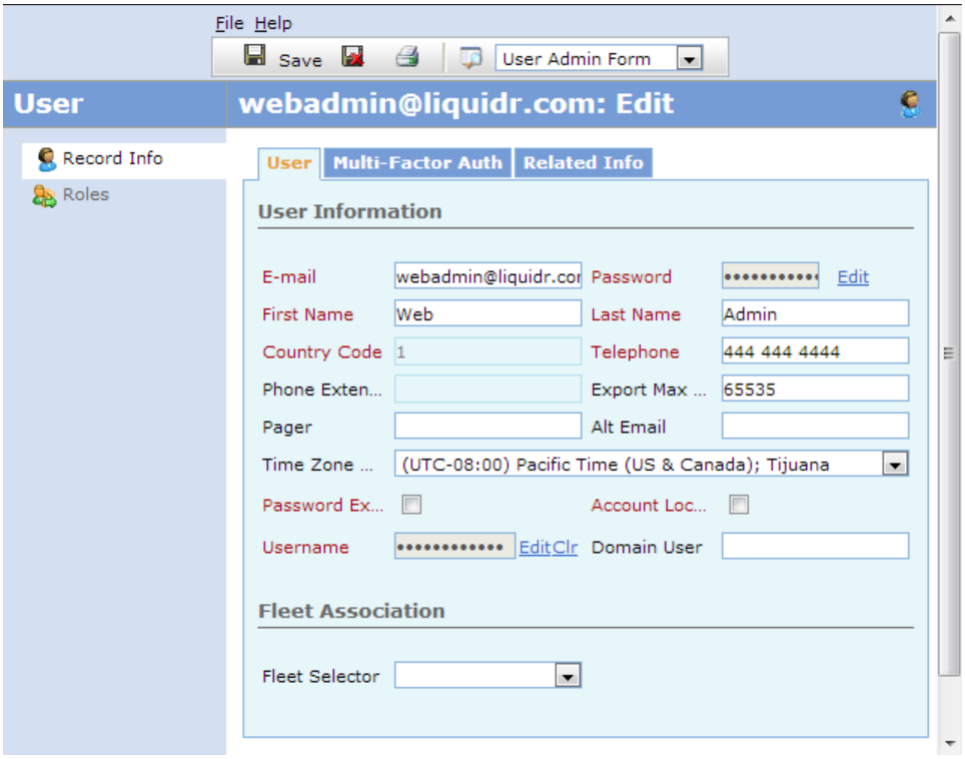
Figure 2.9. UI Display with System Menus



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.

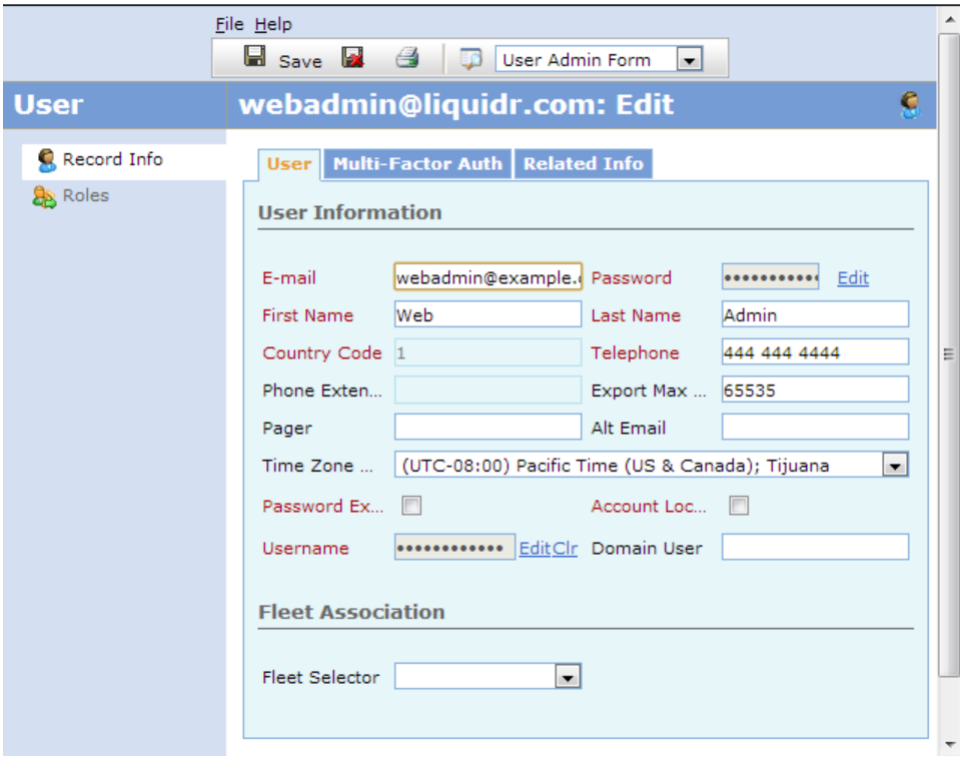
   To change the default administrator email for your WGMS deployment, you first change it in the WGMS UI. Log in as webadmin@liquidr.com and click on **Tools**, then select **Options** from the drop-down menu to open the User Admin Form.

Figure 2.10. Initial User Admin Form



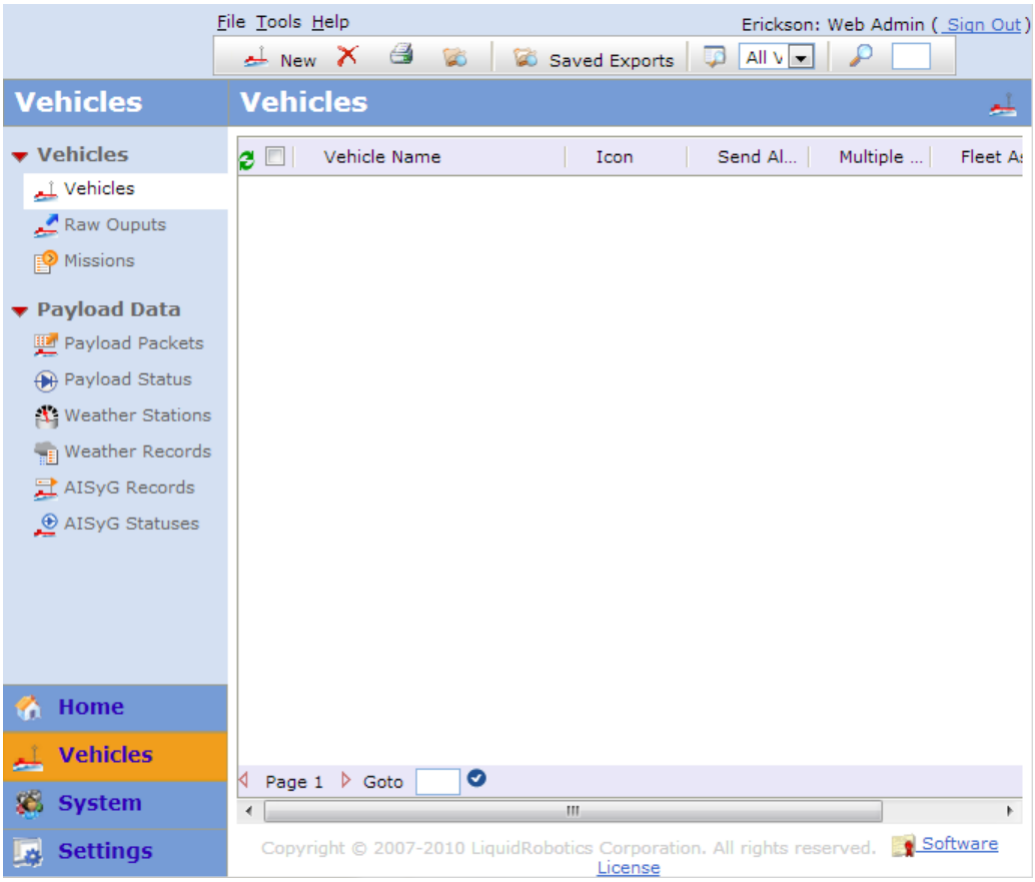
9. Change the E-mail field to the appropriate email (for example webadmin@example.com) and then click Save and Close button in the menu bar at the top of the User Admin Form.

Figure 2.11. Edited Email - Initial User Admin Form



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

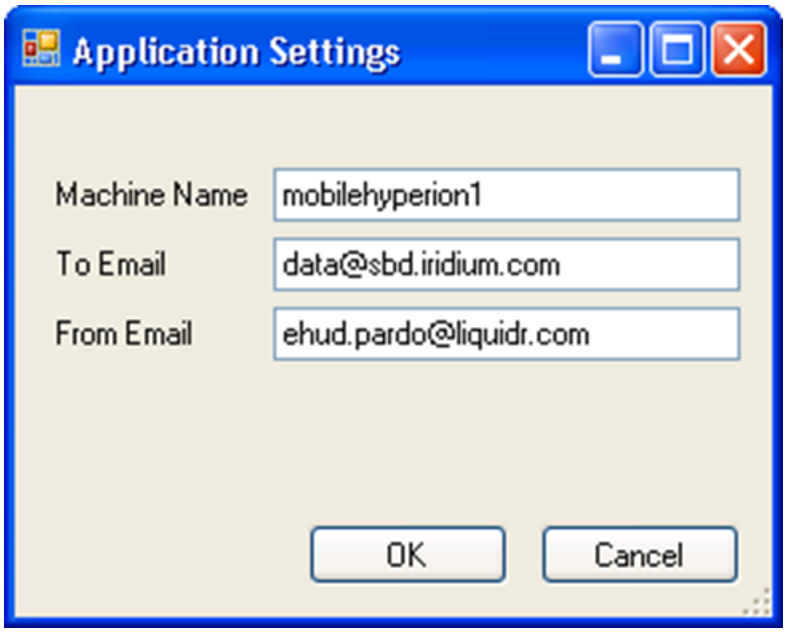
This procedure applies to Mobile WGMS only.

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



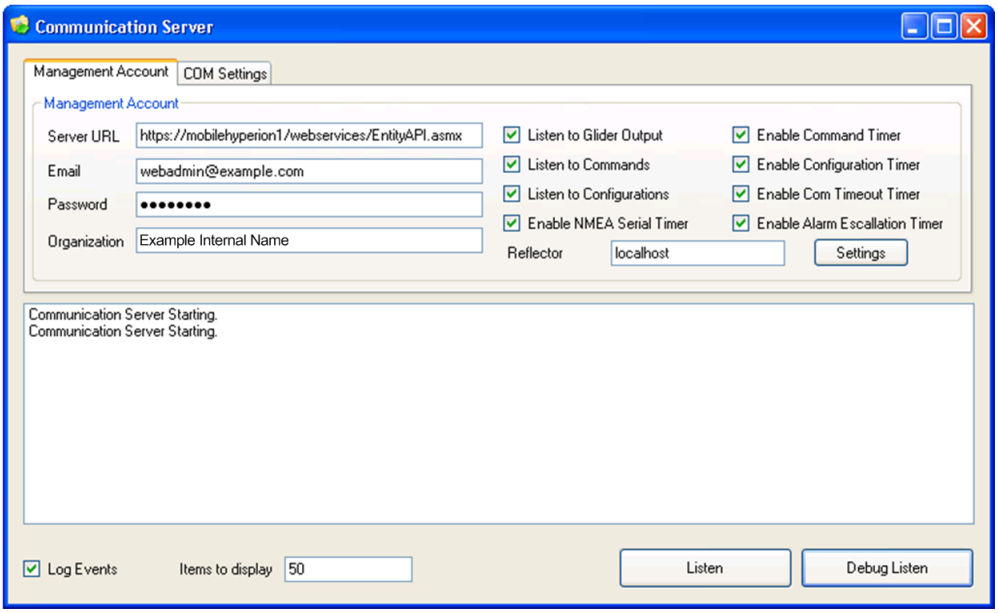
Machine Name – The name of the server hosting the Com Server.

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



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 “ Editing Organization Information and Settings” (page 48).

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 28). 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: **XBP24**

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:

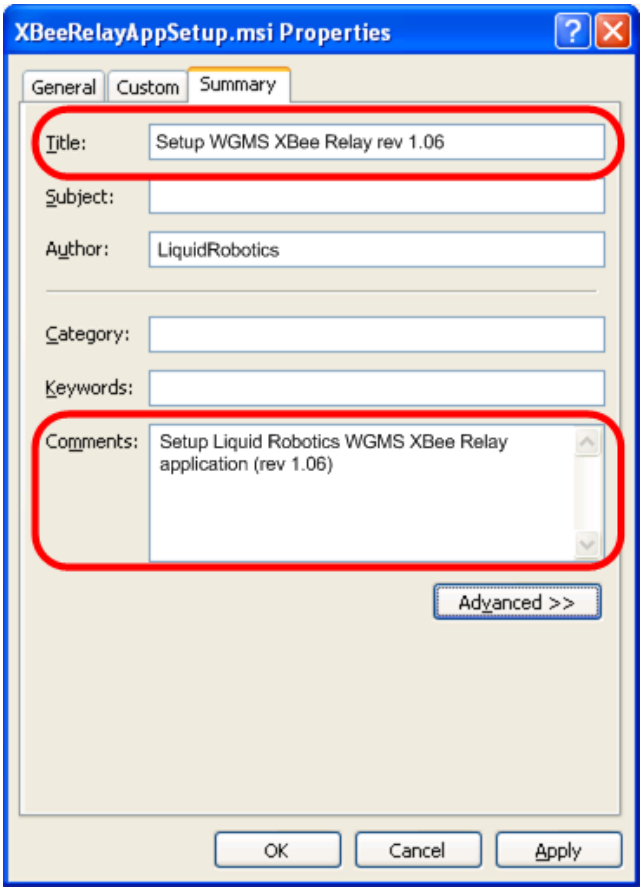
1. Copy the installation files into an accessible directory. The installation files consist of:

   SETUP.EXE

   XBeeRelayAppSetup.msi

   To verify the software revision number, right click on the **XBeeRelayAppSetup.msi** name and select **Properties** from the popup 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.

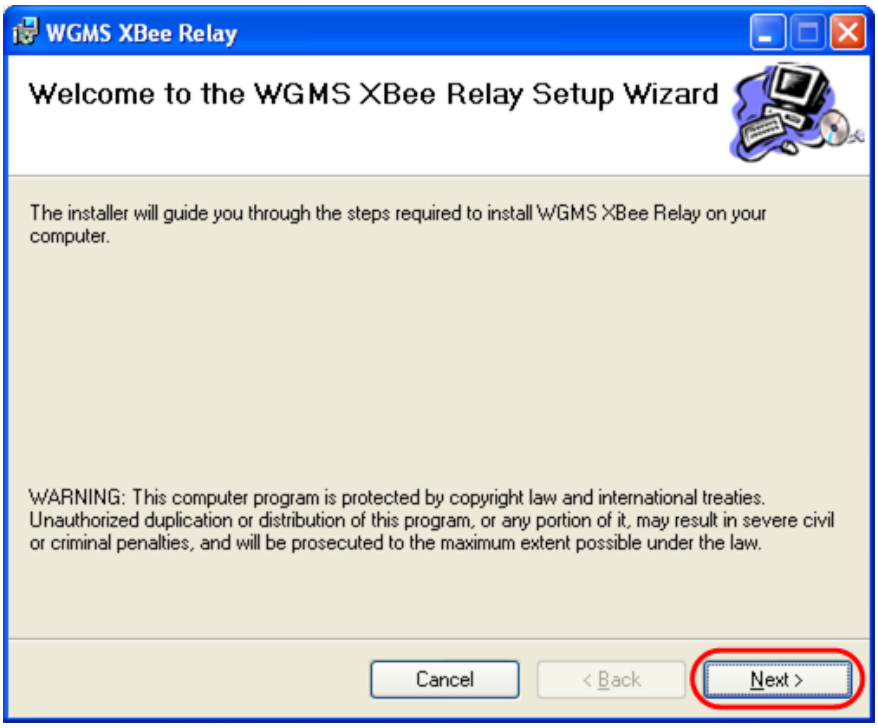
2. Run SETUP.EXE from the directory where the file was placed.

Note

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

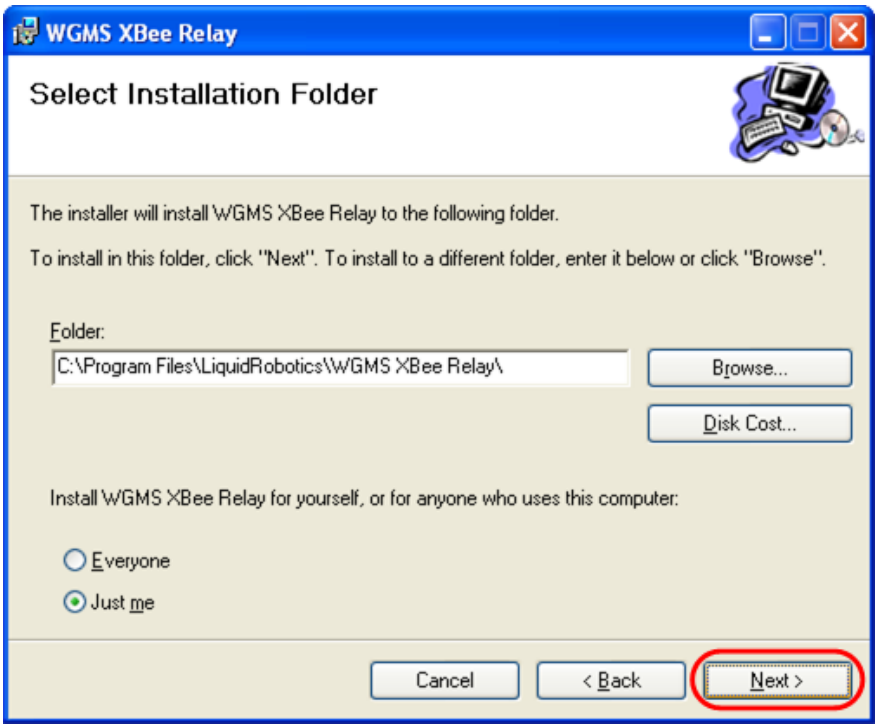
Running SETUP.EXE should bring up the "Welcome" dialog box.

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:

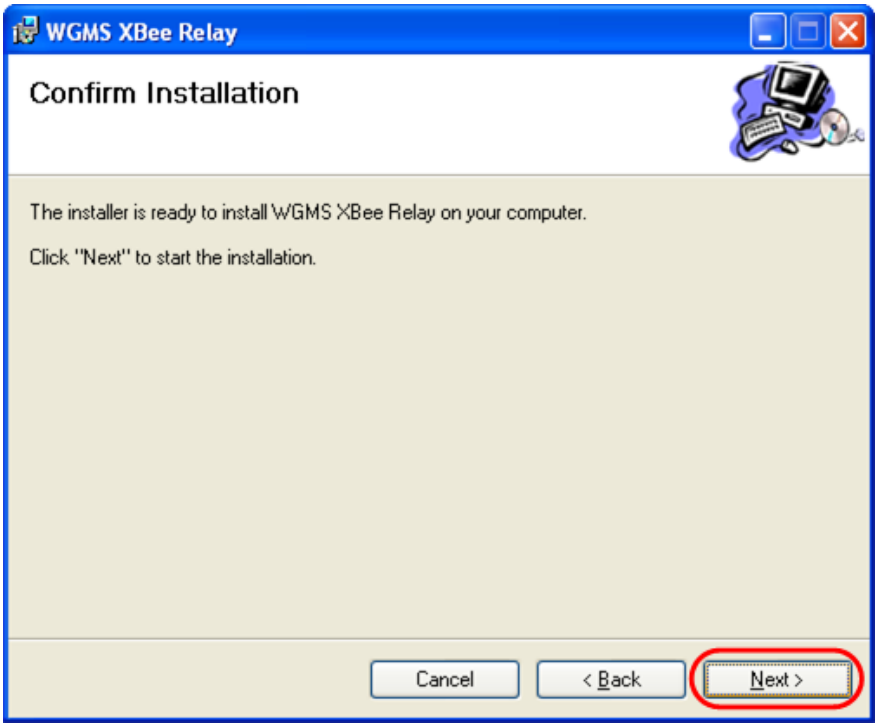
Figure 3.4. XBee Installation Folder Selection Dialog Box



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.

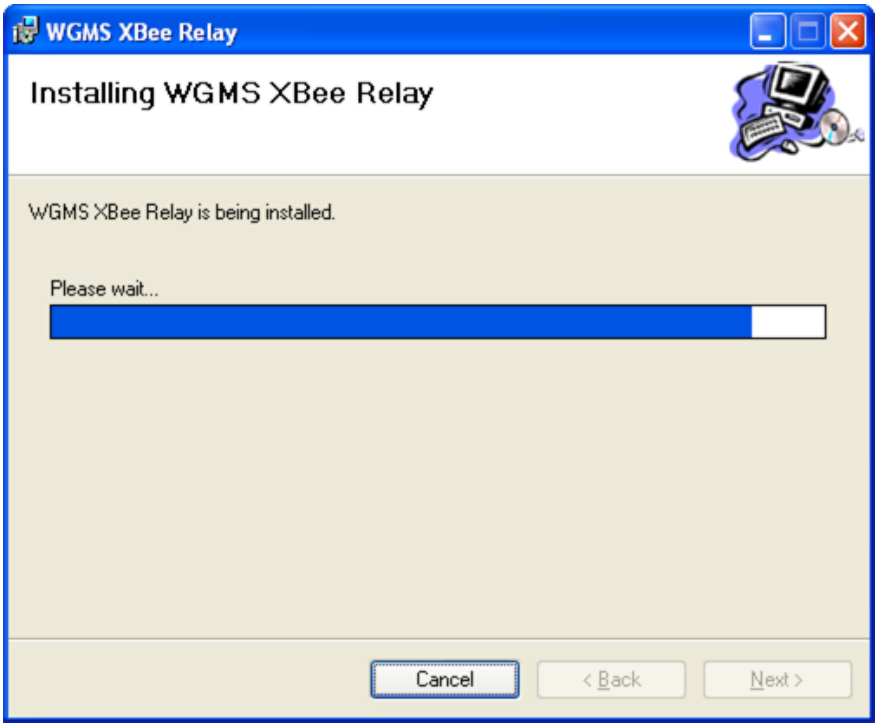
5. A **Confirm Installation** dialog box will appear. Confirm that you want to start the installation by clicking the **NEXT** button.

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

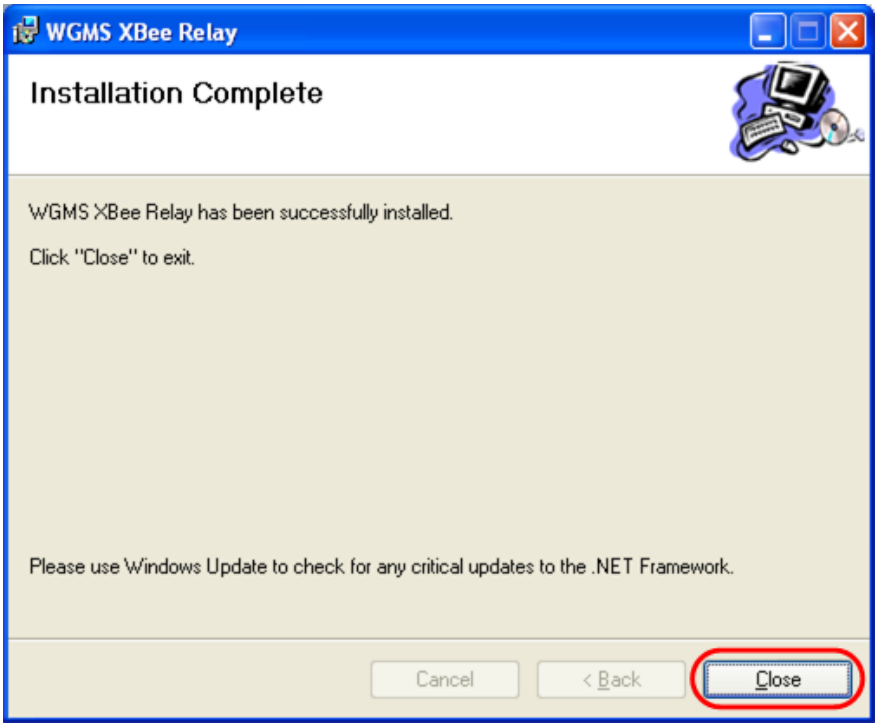


Note

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

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

Figure 3.7. XBee Installation Complete Dialog Box



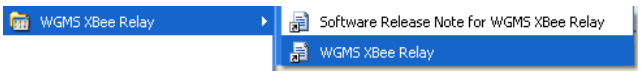
Click the **CLOSE** button to dismiss the box.

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



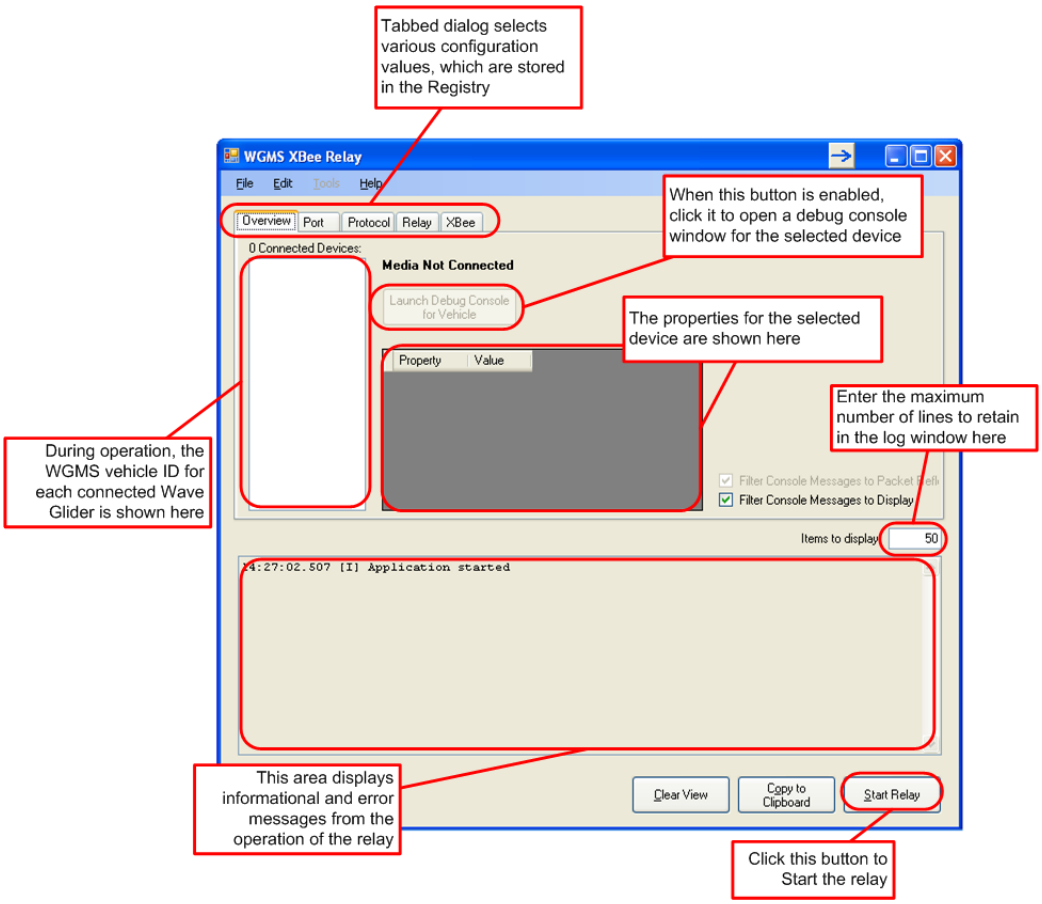
It is a good idea to review the *XBee Software Release Note* prior to configuring the XBee software.

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

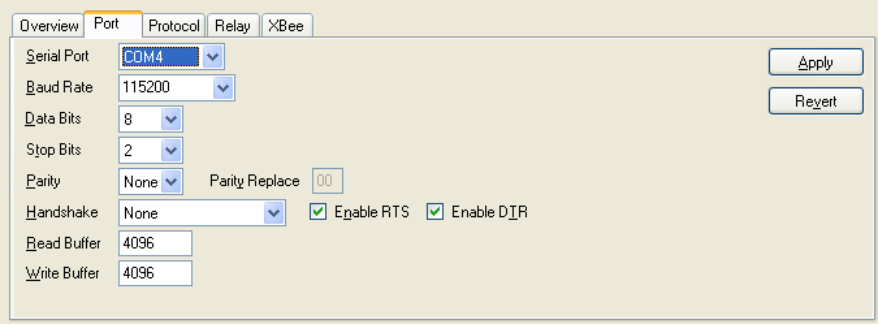
Configure the Relay and XBee network settings before starting the relay:

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



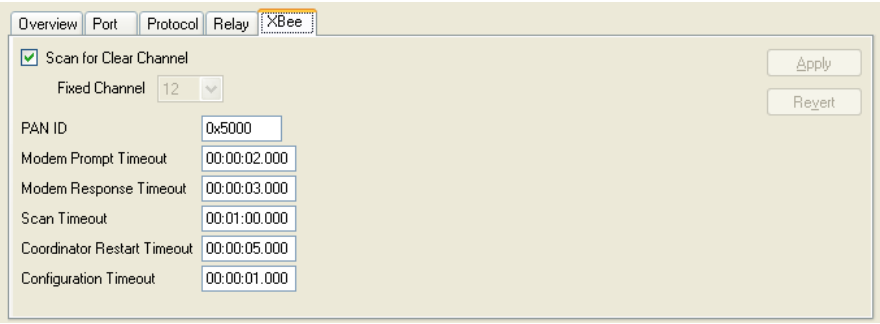
2. Click the **XBee** tab (as shown in Figure 3.11) and verify that the **PAN ID** is correct.

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** checkbox. Then specify one of the available channels in the **Fixed Channel** box.

Figure 3.12. XBee Parameter Selection Tab



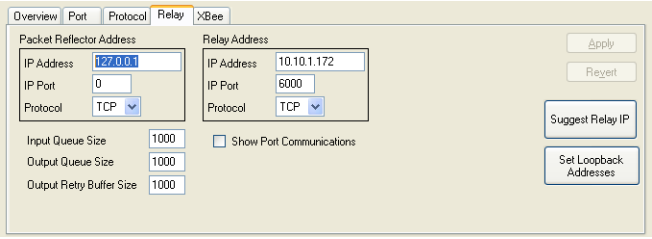
3. Click **Apply** to save any changes.

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



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

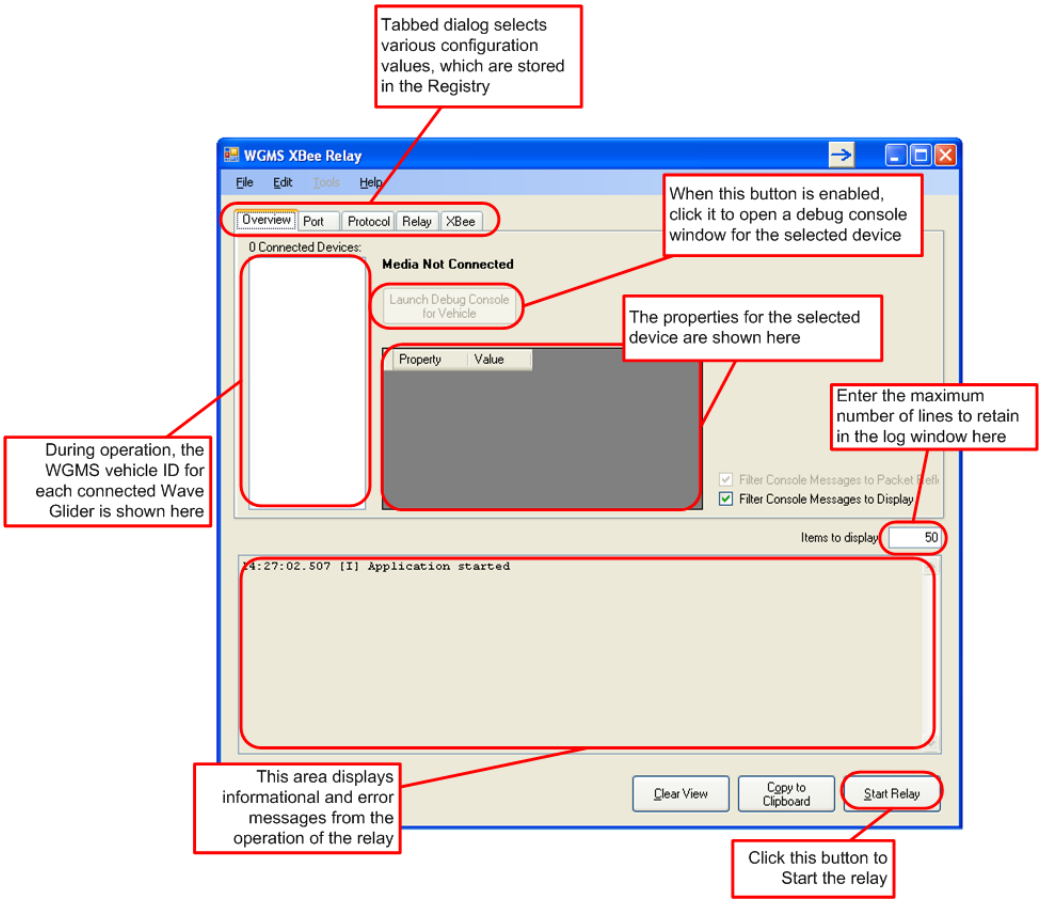
Starting the Relay

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.

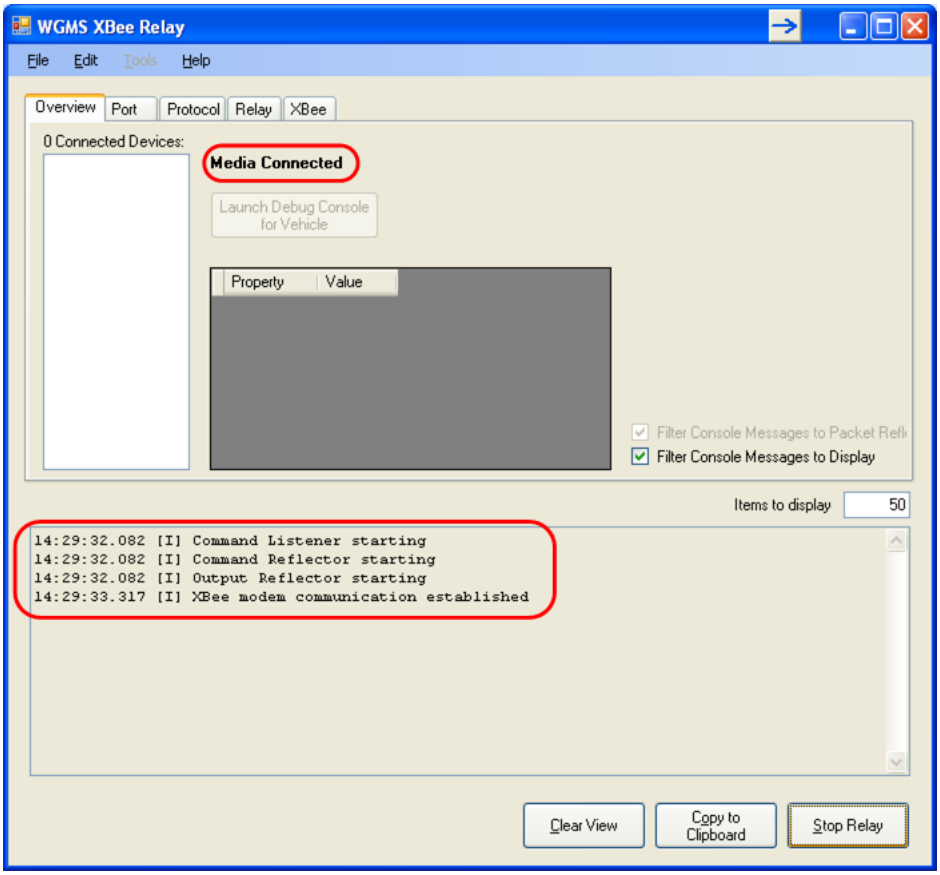
   Some configuration values are grayed out during execution. The log display shows events as they occur with a time stamp.

Figure 3.14. Start Relay Button and Log Display



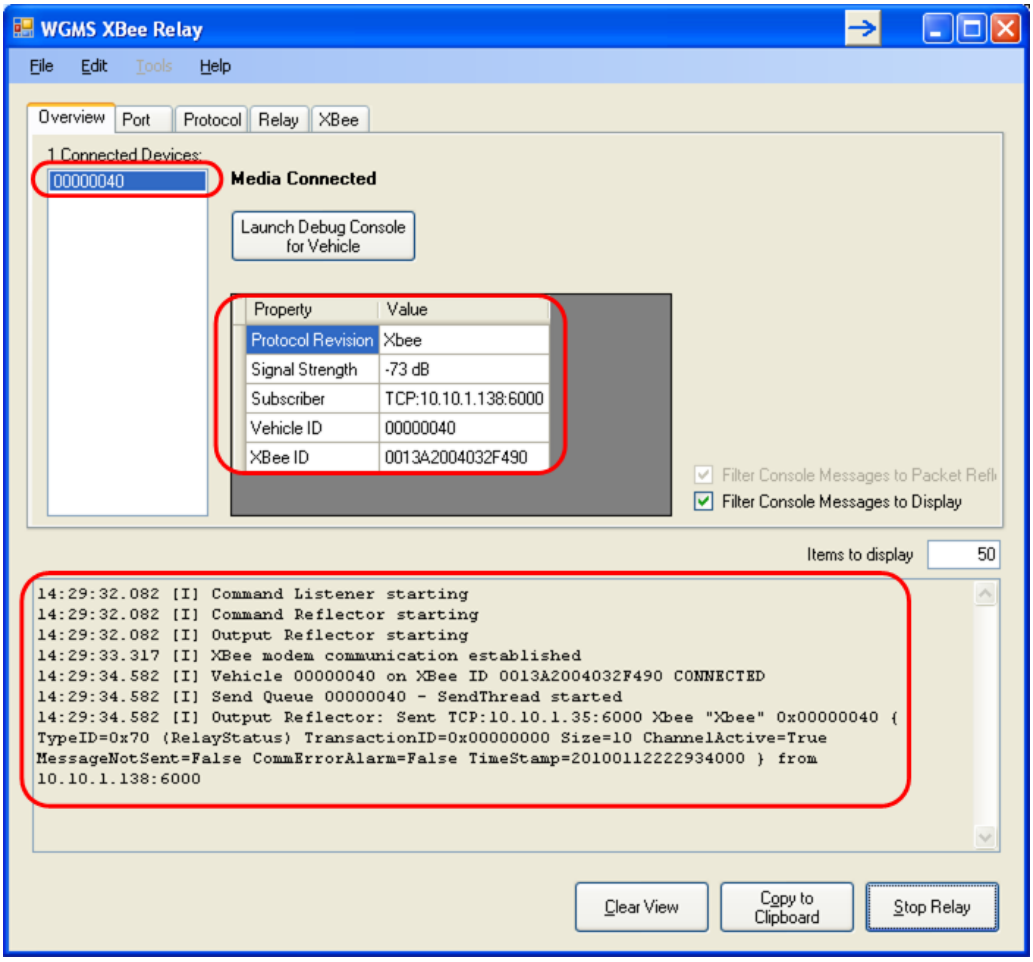
When communication has been established with the modem, the bold indicator field changes from **Media Not Connected** to **Media Connected** and the log shows `XBee modem communication established` as shown in Figure 3.15 below.

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



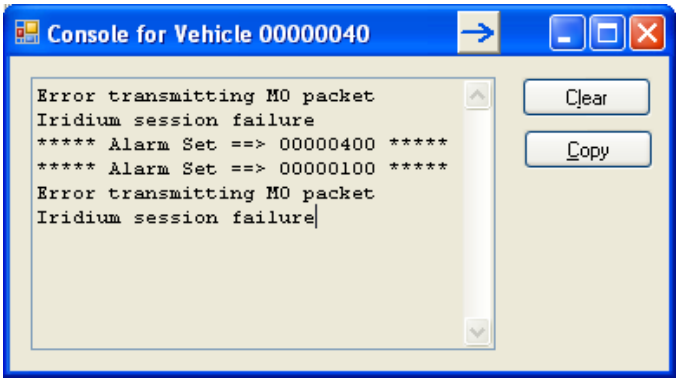
The `Output Reflector: Sent …` line in the log display indicates successful transmission to the Packet Reflector. If the notification reads `Added TCP...` instead of `Sent TCP...`, the relay was not able to send information to the Packet Reflector.

Note

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

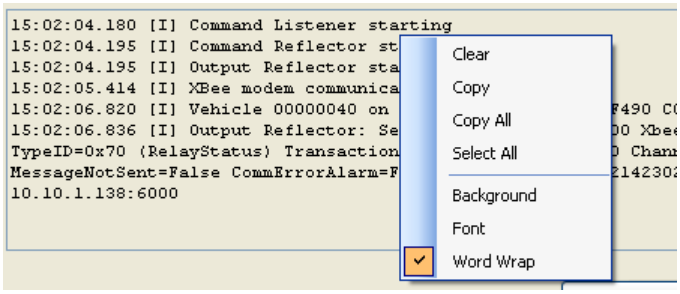
2. To communicate with the Wave Glider's command line console, select a connected device in the **Connected Devices:** list and click on **Launch Debug Console for Vehicle**. This will bring up the small **Console for Vehicle...** window:

Figure 3.17. Console for Vehicle Window



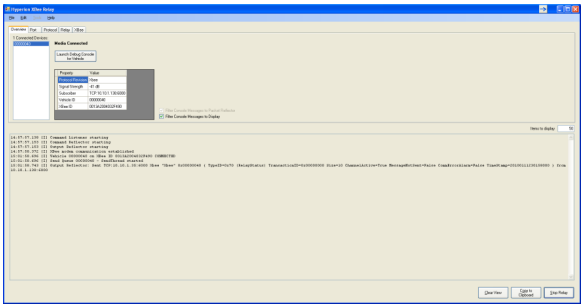
Right click on the window to display a menu of useful functions:

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:

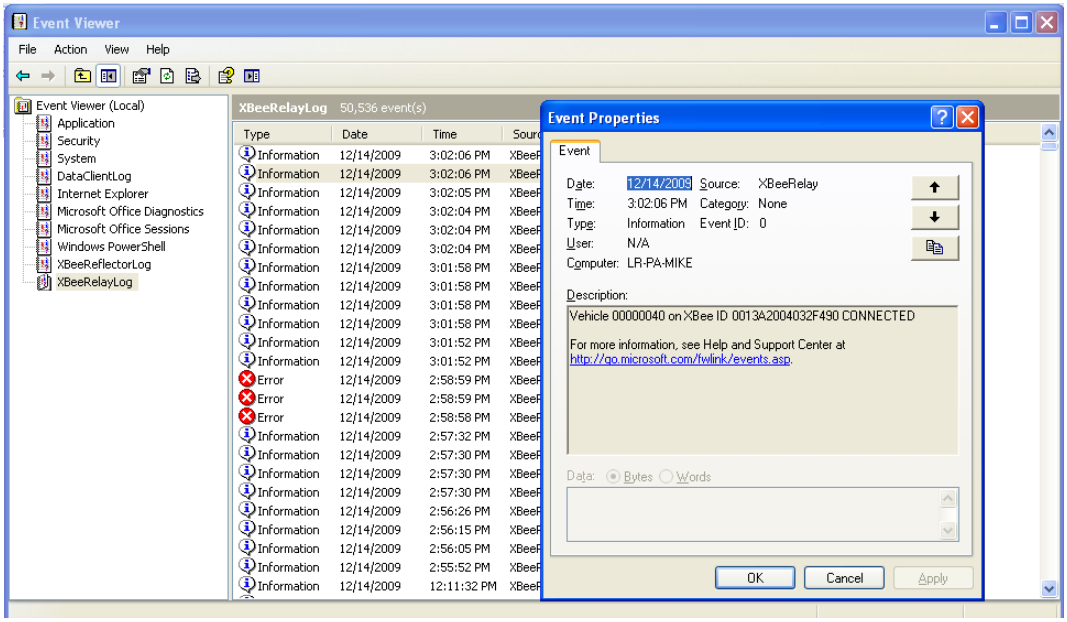
Figure 3.19. Re-Sized Relay Application Form



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

- OpenVPN 2.1.4

  (Available at http://swupdate.openvpn.net/community/releases/openvpn-2.1.4-install.exe)

- Xbee Relay software installed and talking to a vehicle
- 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 Wave Glider System Administration Manual (from Liquid Robotics)

Configuring OpenVPN

1. Download and install OpenVPN.
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. Administrative Tasks - Settings Screen

This chapter describes tasks that are accessible to System Administrators from the **Settings** screen. Chapter 5: *Shared Administrative Tasks - Vehicles Screen* and Chapter 6: *Shared Administrative Tasks - System Screen* describe tasks that System Administrators can perform, but which can also be performed by users assigned to other roles.

Show System Menus

Clicking the **Show System Menus** link on the WGMS Dashboard will display an extended set of site navigation options in the lower left corner of the Dashboard, including access to the **Settings** screen. If you have been assigned an Admin (System Administrator) role, the following buttons are displayed:

	When you click **Show System Menus**, the **Home** navigation button in the System Menus is selected by default displaying the **Home** screen with the **Vehicle Page** side tab open. The Vehicle page (screen) is the same as the Dashboard that is displayed when the System Menus are hidden, except for a Menu Bar and a Tool Bar at the top of the screen.
	Opens to a list of Vehicle records containing data on all of the Vehicles in the Organization. Side tabs also provide access to payload data and sensor data.
	Opens to a list of Alarm records for all Vehicles in the Organization. Side tabs also provide access to record exports, custom reports, and system information.
	Opens to a list of Organization records. A side tab provides access to record customization settings.

If you do not see the **Settings** button, you have not been assigned an Admin Role. You must be assigned an Admin Role, or a more privileged role, to perform most system administration tasks.

Settings Screen

The Organizations side tab in the **Settings** screen is typically used to manage User information. There are also many other tasks such as modifying Organization contact information that can be performed from the Organizations side tab.

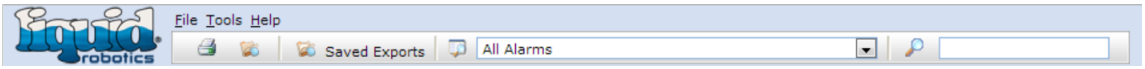
The Customizations side tab in the **Settings** screen should not be used unless guided by LRI support personnel.

Liquid Robotics does not recommend records customization without first consulting with the Liquid Robotics Support Organization to avoid unexpected results.

System Menus - Menu Bar and Tool Bar

When you click **Show System Menus** to display the System Menus buttons (Home, Vehicles, System, Settings), a Menu Bar and a Tool Bar are displayed at the top of the Dashboard and remain in place for all of the System Menus screens.

Figure 4.1. System Menus Tool Bar



The **System Menus** tool bar includes:

- **File** button - Can be used to exit the window.
- **Tools** button - Can be used to call the User options dialog. There is also a site search utility that is not implemented.
- **Help** button - Provides Liquid Robotics contact information and details on the installed WGMS software version.
- **Print** button - Extracts the current window for printing.
- **Export** button - Brings up the **Export System Records** dialog box for a type of record, based on the side-bar tab that is selected. For example, if the **Alarms** tab is selected, the **Export System Alarm Records** dialog box will be displayed.
- **Saved Exports** button - Brings up a **Related Record** dialog box with all of the types of records that have been exported in alphabetical order. By double-clicking on the name of a record type, or single-clicking on the adjacent icon, an **Export Records** dialog box will appear.
- **Select View** drop-down menu - brings up different views based on the tab that is selected in the side-bar, if there are any.
- **Search** button - enter key words in the adjacent field and click the search icon.

Organizations, Users and Roles

Organizations

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

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

2. With Mobile WGMS, there is a single Organization for each Mobile WGMS installation.

An Organization has an alphanumeric name that can be changed. There is also an LRI-assigned “Org Internal Name” for the Organization that is visible to System Administrators and must not be changed. The Org Internal Name is used by the WGMS API. For more information see “ Editing Organization Information and Settings” (page 48)

Users

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

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

Roles

WGMS Users are assigned Roles by the WGMS System Administrator.

The defined Roles are:

- **Guest User:** A Guest User can only view the status of Vehicles that have been configured for display to guests.
- **Data Analyst:** A Data Analyst can view existing Vehicle and WGMS data and can download WGMS database data.
- **Master:** A Master manages Vehicle provisioning, mission planning or operations, as well as payload and web services development.
- **Admin:** A System Administrator has all the permissions required to go through the day-to-day administration of WGMS, adding users, managing customizations, and managing data.
- **Developer:** An incremental role that allows a user to gain access to payload data.
- **Root:** A Root user has full access to all aspects of the Vehicle and WGMS. A user with the Root role will either be an LRI developer or a customer under close direction from LRI.

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

Create, **Read**, **Update**, and **Delete**.

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

See “Viewing Roles for an Organization” (page 68) for a more detailed explanation of Roles and Permissions.

See Appendix A: *Roles and Permissions* for a listing of the various permissions available to each Role.

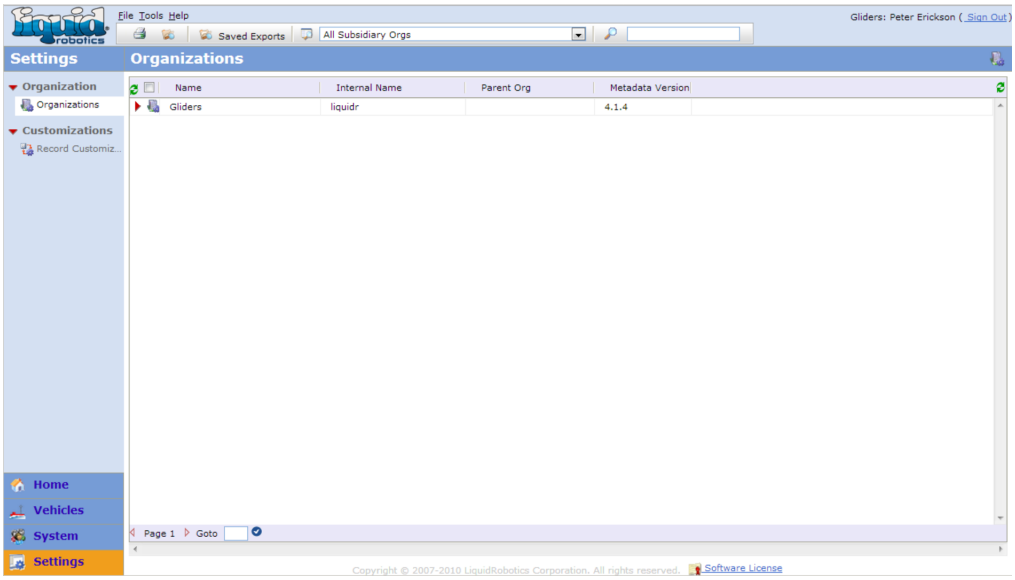
Typical Organization Initialization Tasks

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

Accessing the Organization Info

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

Figure 4.2. Organziations List



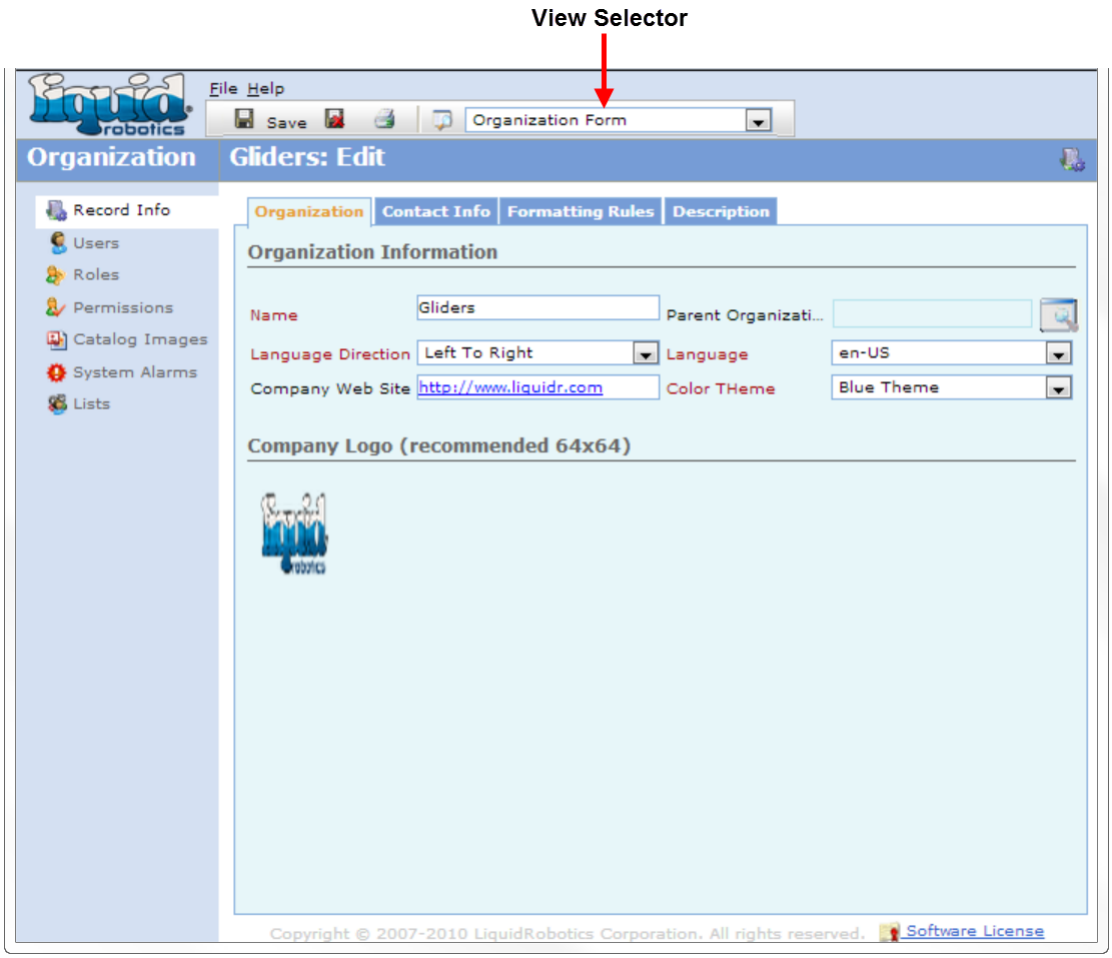
If this is the initial WGMS set-up, only one Organization will be listed. Double-click on the Organization name, or single-click on the icon to the left of the name and an Organization form will appear. See Figure 4.3.

Editing Organization Information and Settings

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

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

Figure 4.3. Organization Form

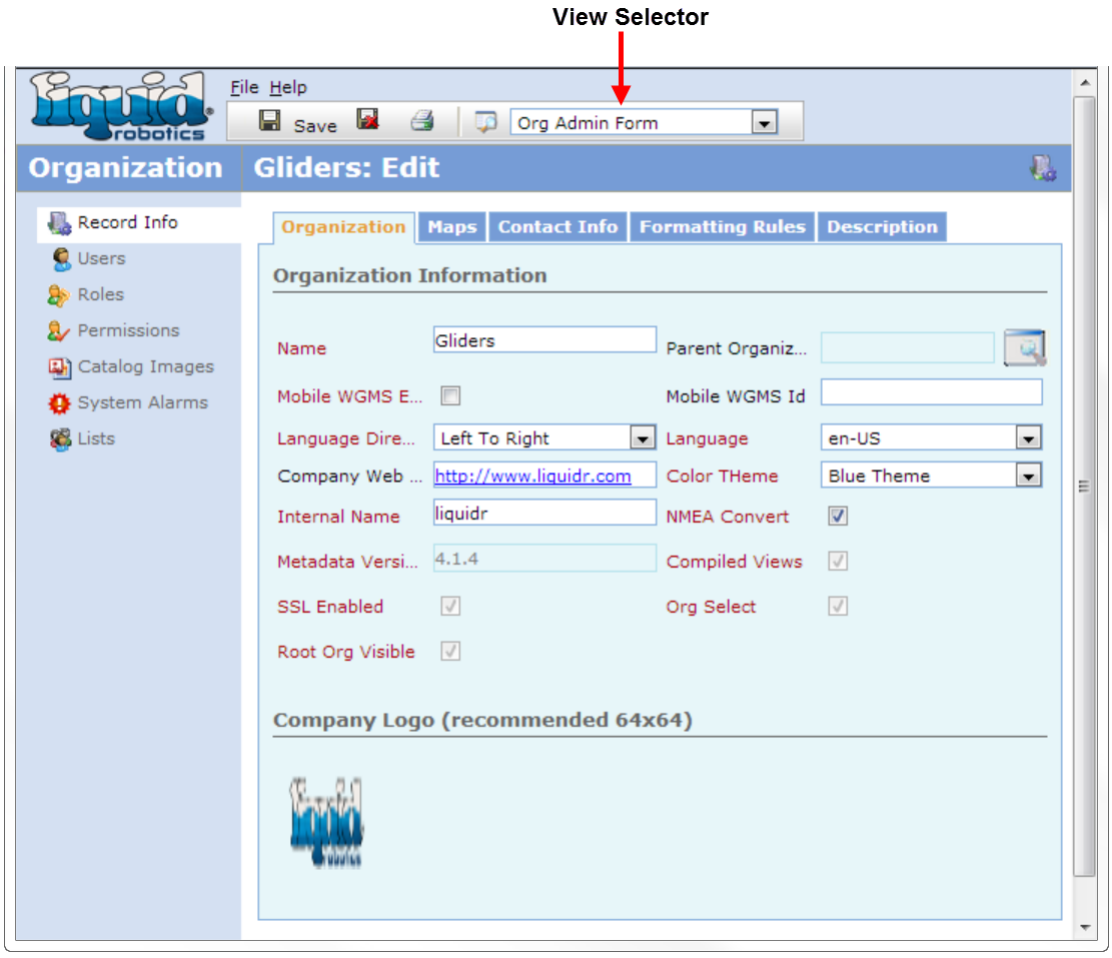


Select **Org Admin Form** in the View Selector drop-down menu to expose all of the settings that a WGMS Administrator can edit. The Org Admin Form has five tabs:

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

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

Figure 4.4. Org Admin Form

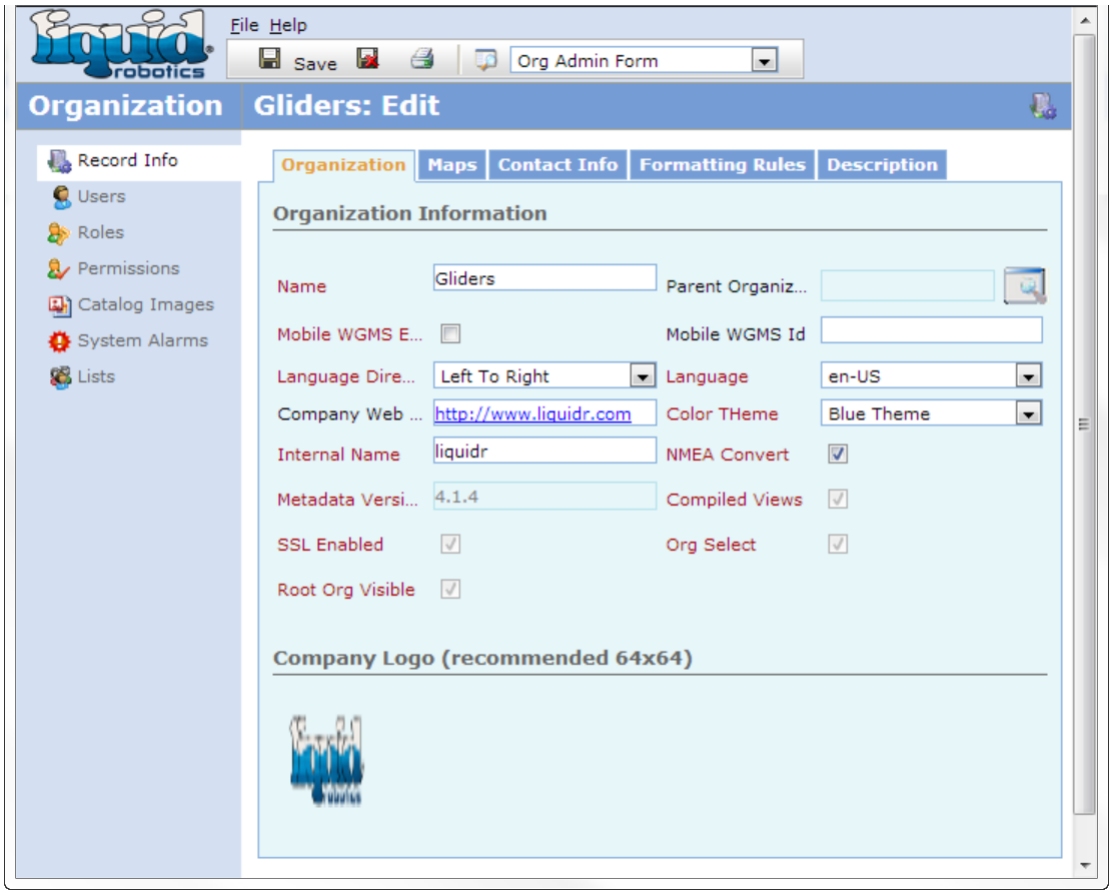


Editing the Organization Tab Settings

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

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

Figure 4.5. Org Admin Form - Organization Tab



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

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

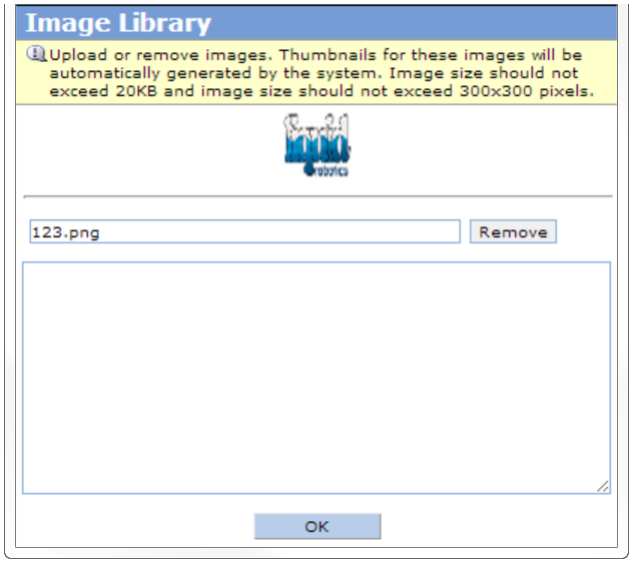
Note

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

Figure 4.6. Changing Logo

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

Figure 4.7. Image Library Dialog Box



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

Editing the Maps Tab Settings

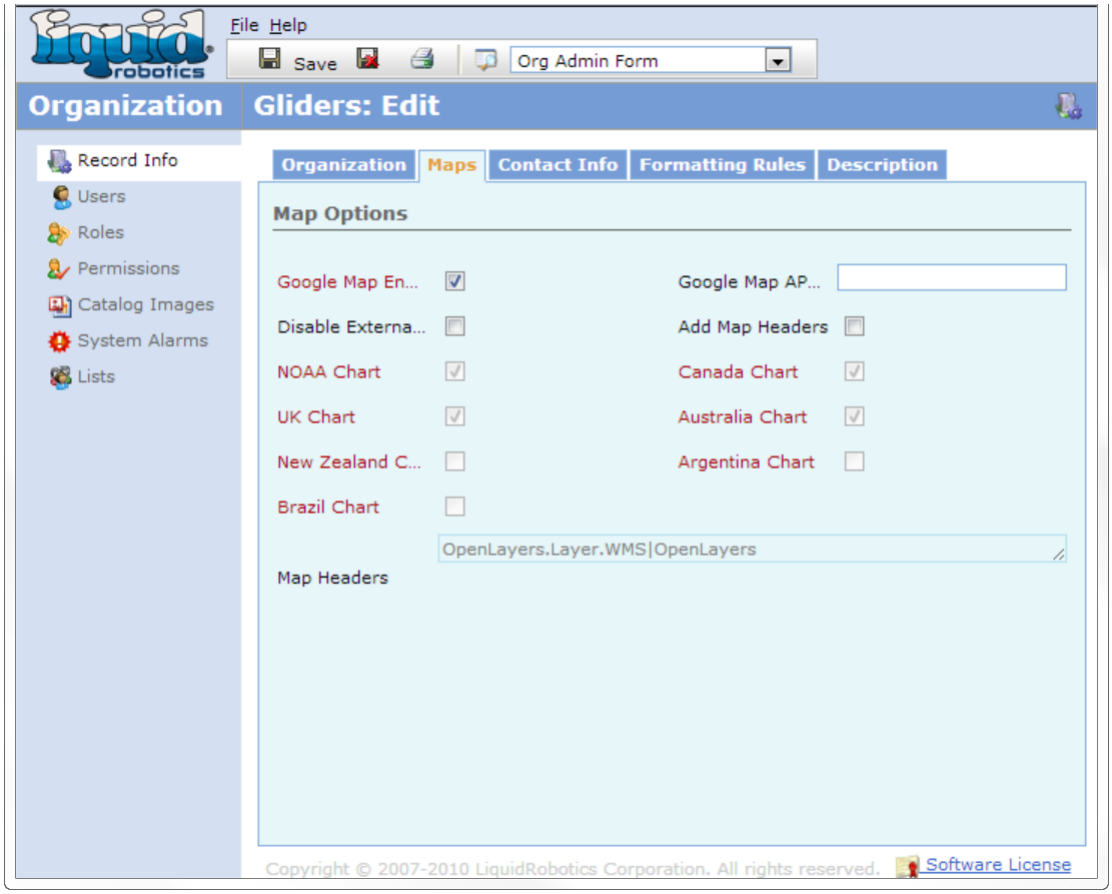
The entries under the **Maps** tab allow you to edit the map options that will be available on the WGMS dashboard.

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

Note

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

Figure 4.8. Org Admin Form - Maps Tab

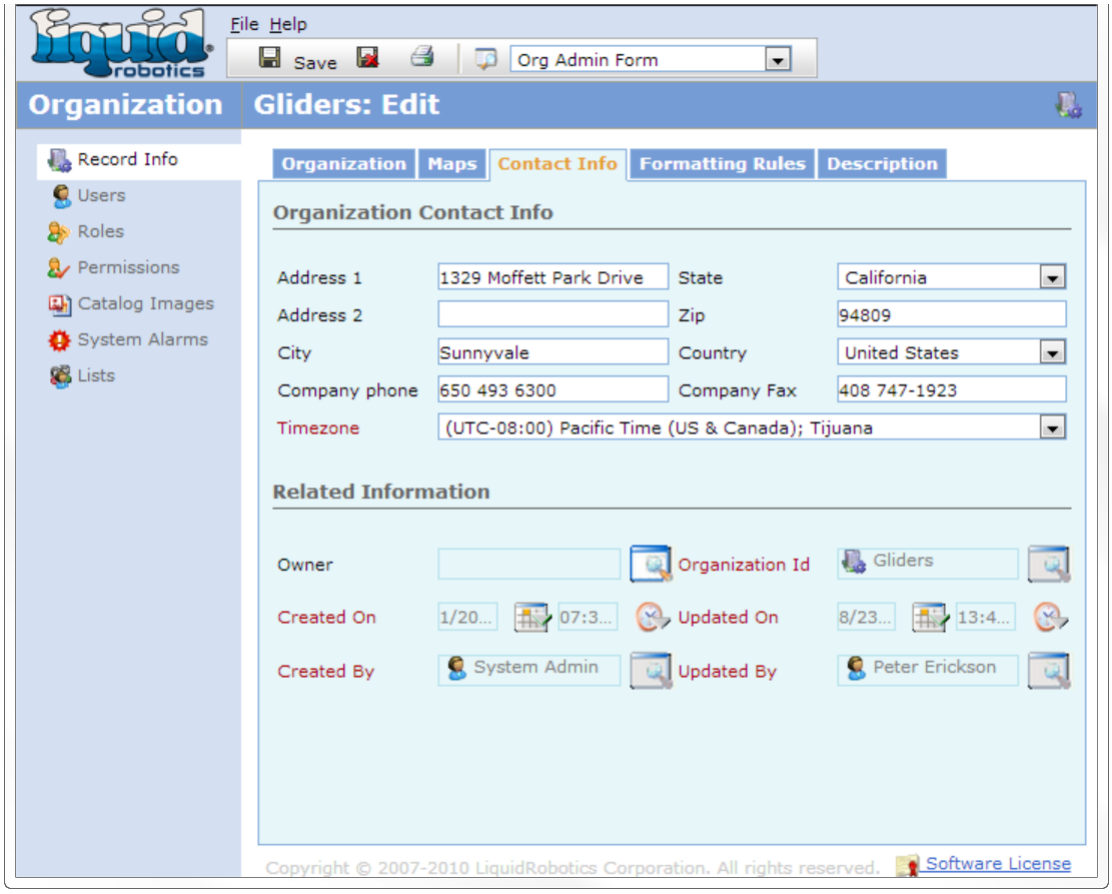


Editing the Contact Info Tab Settings

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

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

Figure 4.9. Org Admin Form - Contact Info Tab

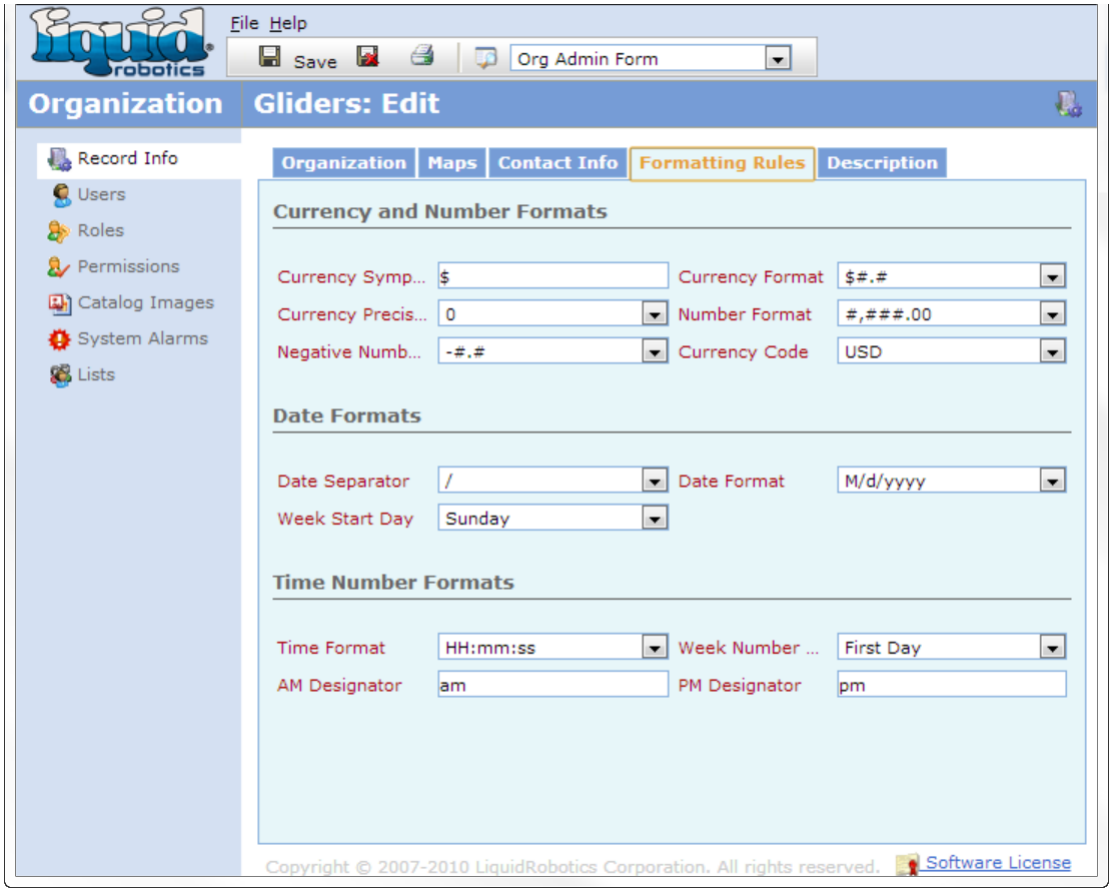


Editing the Formatting Rules Tab Settings

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

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

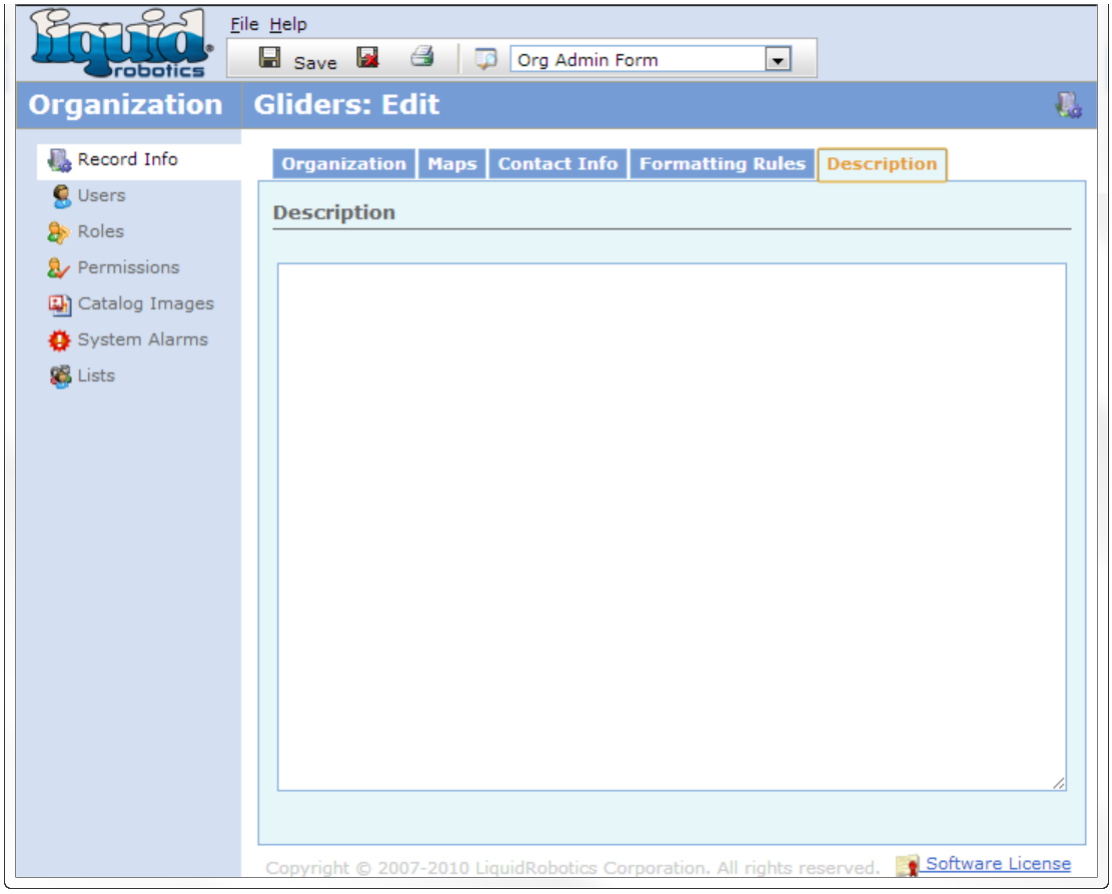
Figure 4.10. Org Admin Form - Formatting Rules Tab



Editing the Description Tab Information

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

Figure 4.11. Org Admin Form - Description Tab



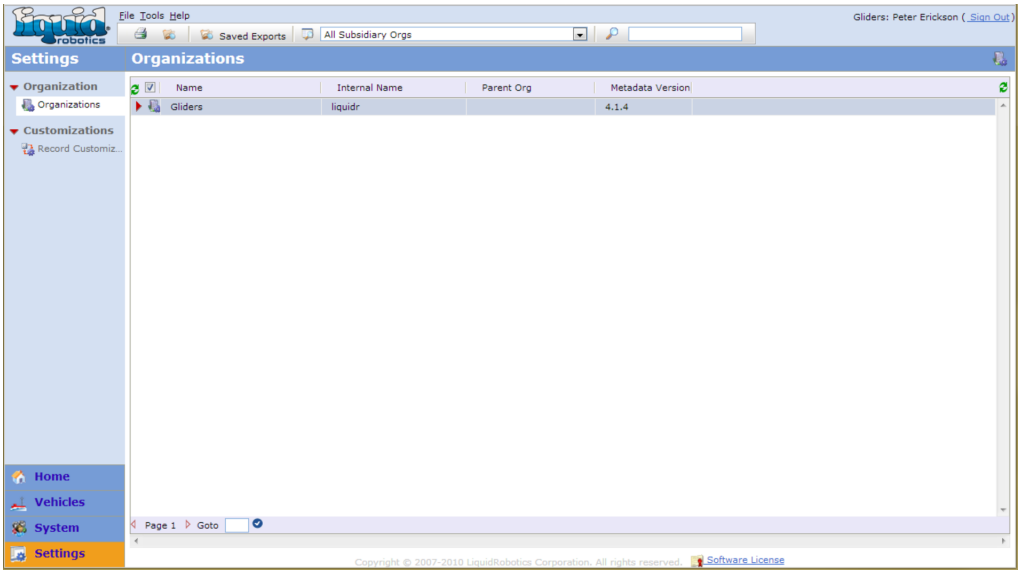
Standard Administrative Tasks

Adding New Users

To add a new User to an Organization:

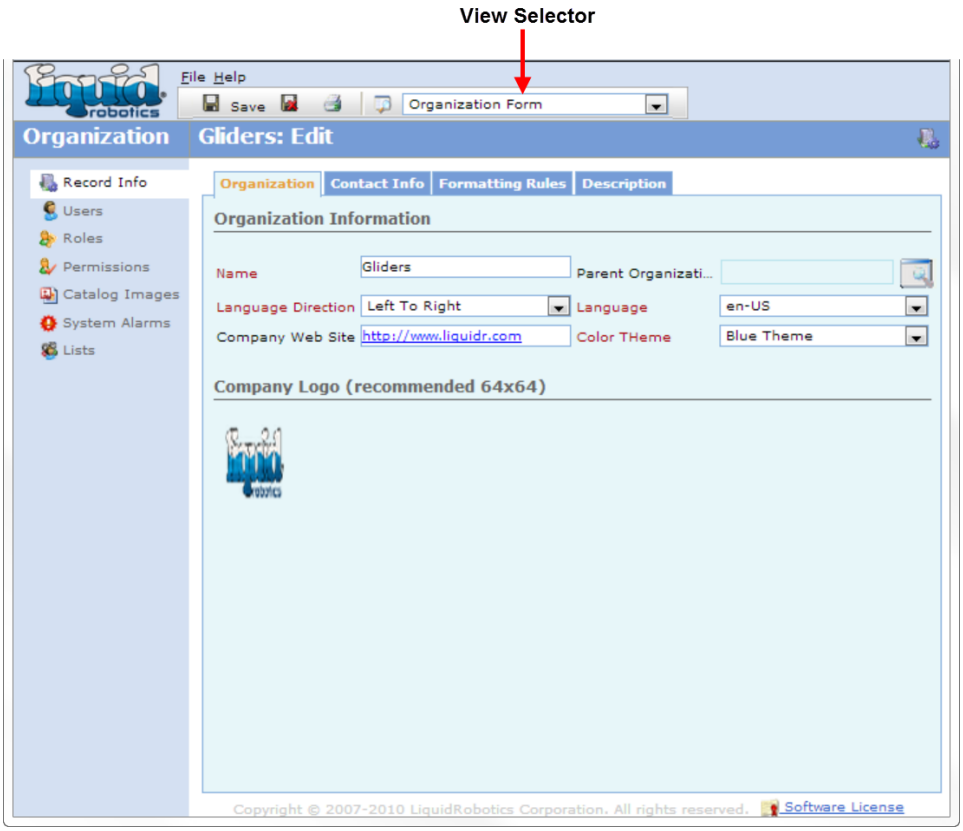
1. Click on **Settings** in the **System Menus** to open the Organizations list where you will see a single Organization that you are authorized to use and log in to.

Figure 4.12. Organizations Window



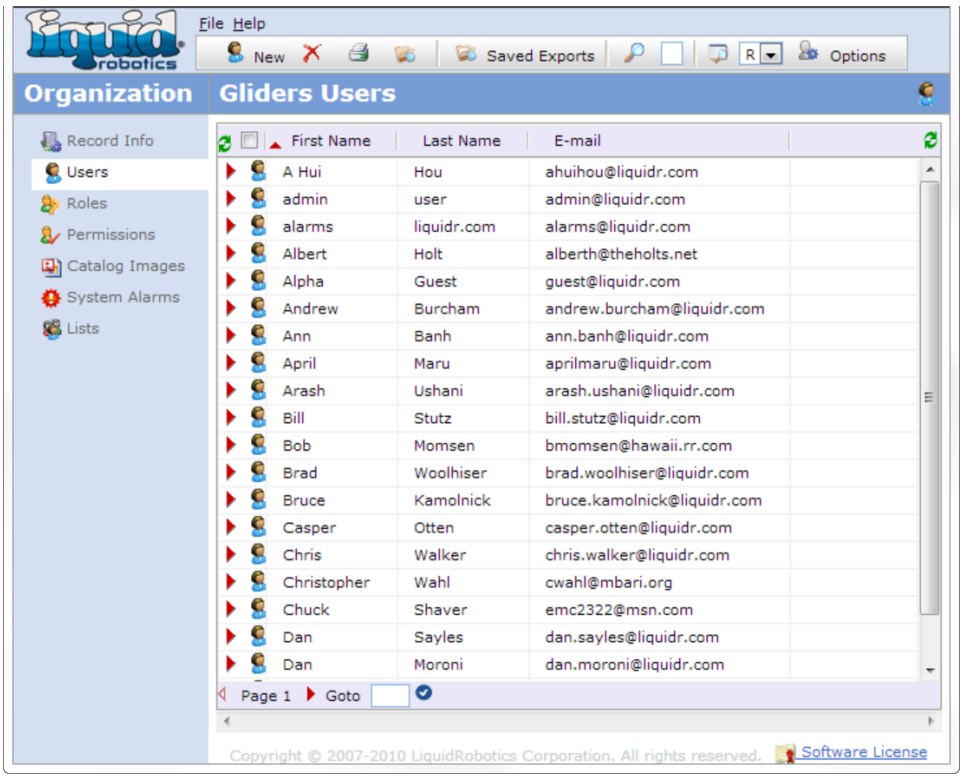
2. Double-click on an Organization name, or single-click on the icon to the left of an Organization name and the **Organization** dialog box will appear.

Figure 4.13. Organization Dialog Box



3. Click the **Users** side tab to open a list of individuals who have been granted access to the Organization. The list will be similar to the Figure 4.14, below.

Figure 4.14. Example List of Users

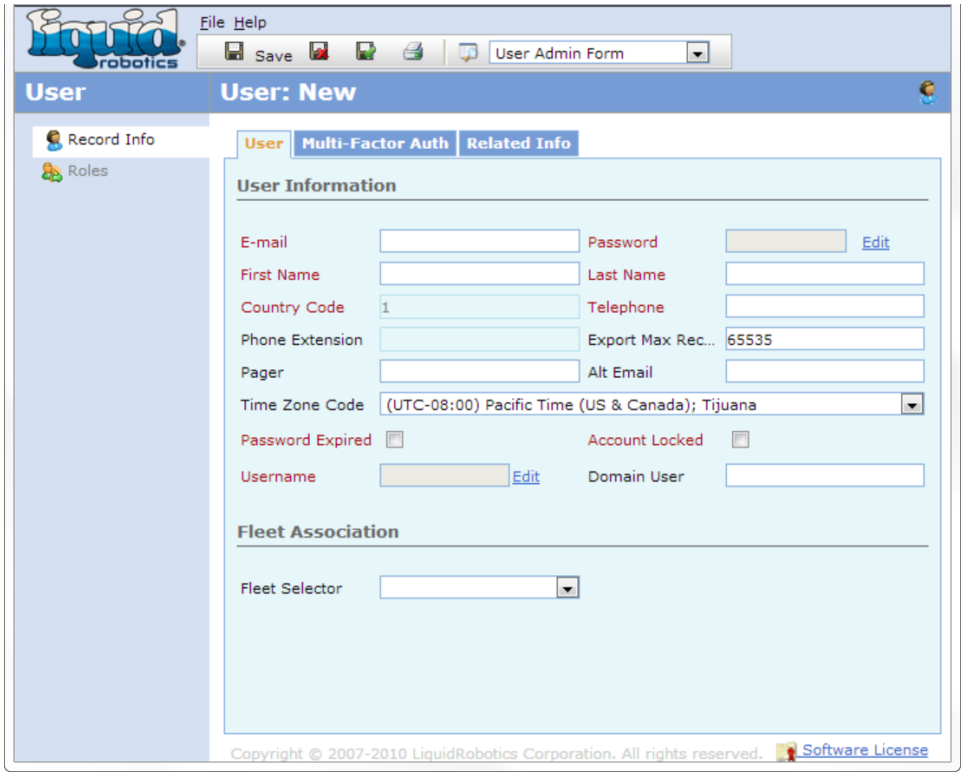


4. Click on New in the tool bar to open the **User: New** form. The **User: New** form has three tabs:

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

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

Figure 4.15. User: New Form



Note

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

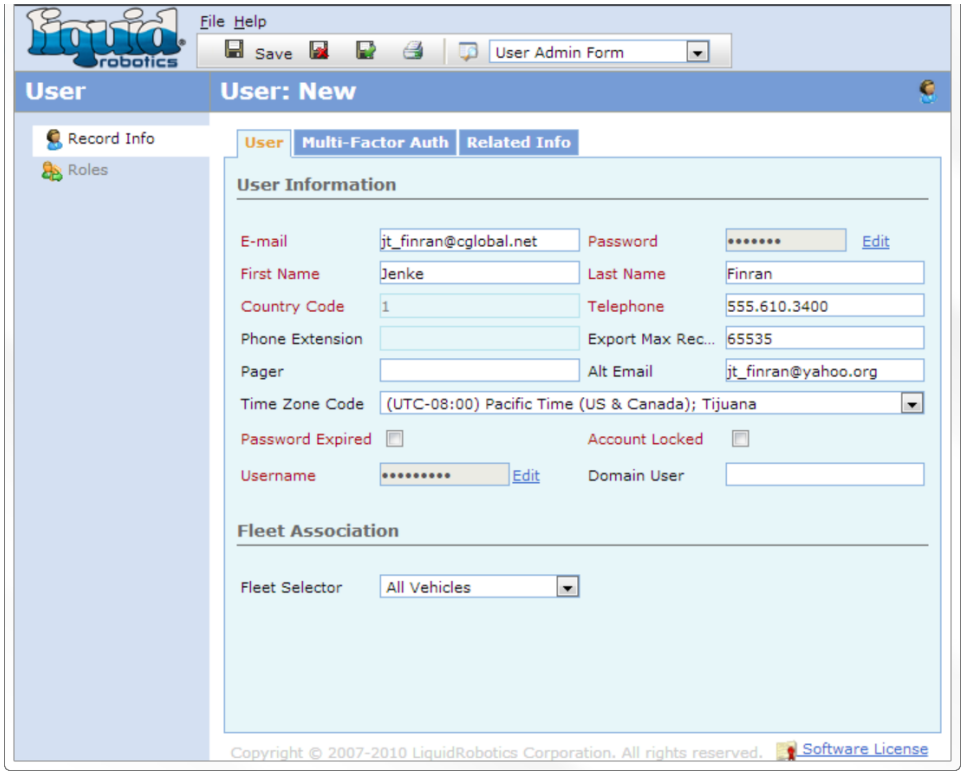
The fields in the **User: New** form include:

- **E-mail**: The primary email address of the User. This will be used as the user's login ID and for email to the User.
- **Password**: The initial password for the User. All Roles except "Guest User" have the permission to change their own password.
- **FirstName/Last Name**: The User's name.
- **Country Code**: The country code preface to the User's telephone number.
- **Telephone**: The User's 9-digit telephone number, starting with the Area Code. The number can contain blanks or dashes.
- **Phone Extension**: The User's extension, if applicable.
- **Export Max Records**: The number of Excel records that the User can download at one time from various lists. Typically, the number should be less than the default 65535. The recommended value is 2000 or less.

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

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

Figure 4.16. Completed New User Account Example



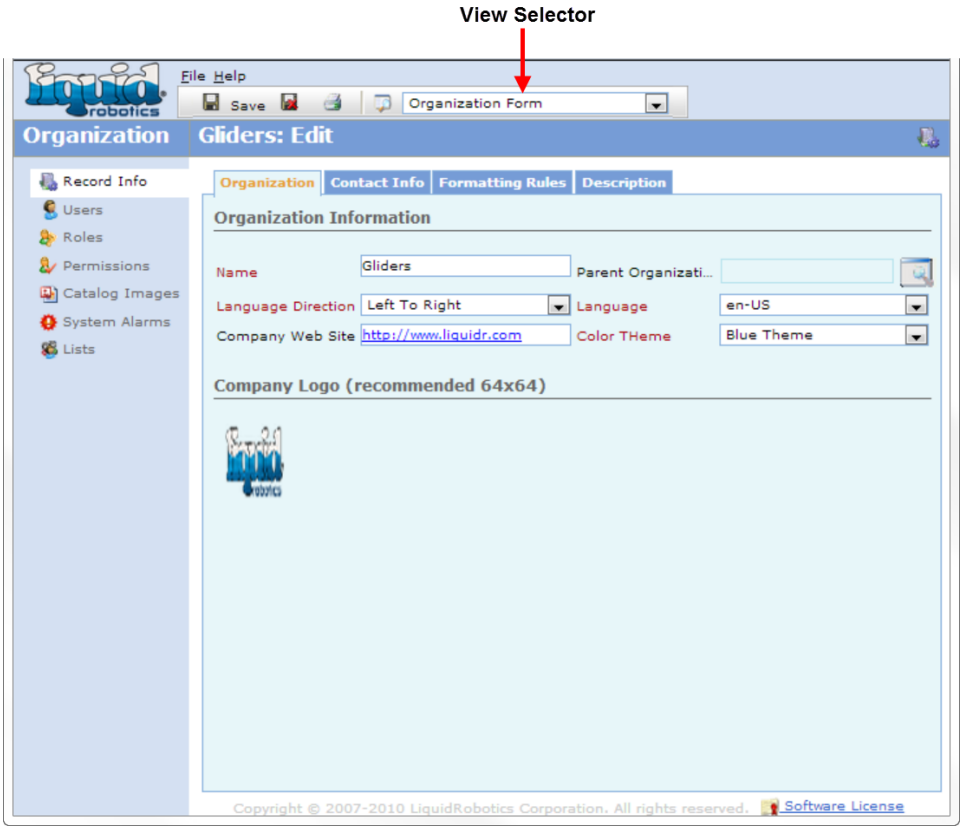
When the required information in the **User: New** form is completed, the **Roles** tab in the side-bar will become active.

Assigning or Removing User Roles

To assign a Role to a User:

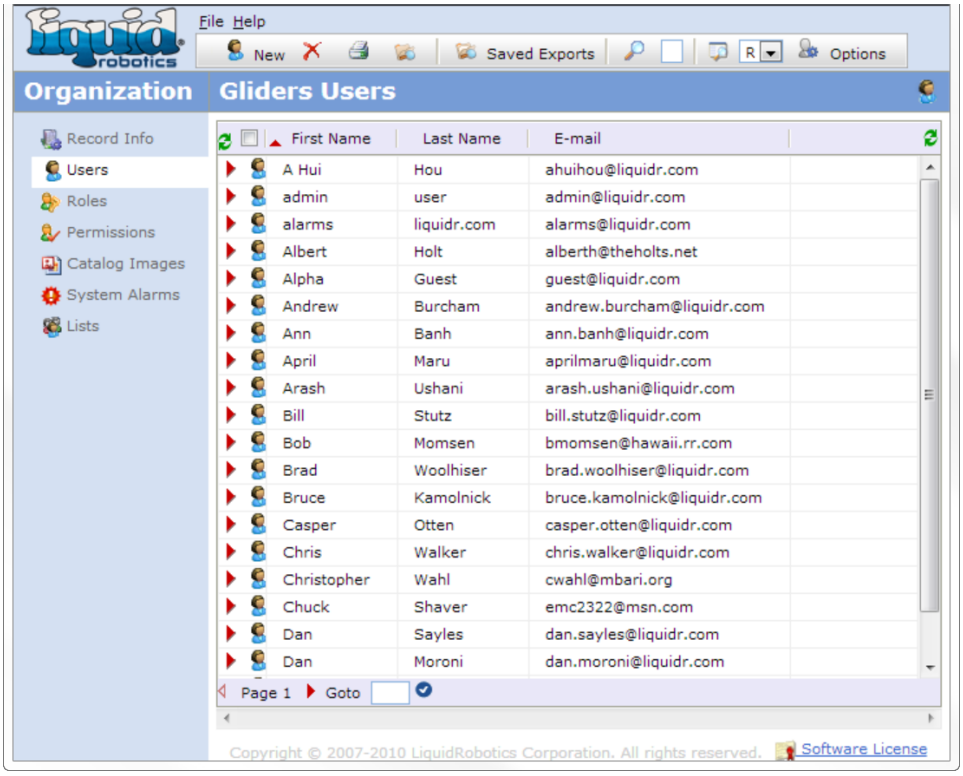
1. Click on **Settings** in the **System Menus** to open the list of Organizations managed by the instance of WGMS you are using, then double-click on an Organization name, or single-click on the icon to the left of an Organization name, and the **Organization** form will appear.

Figure 4.17. Organization Form



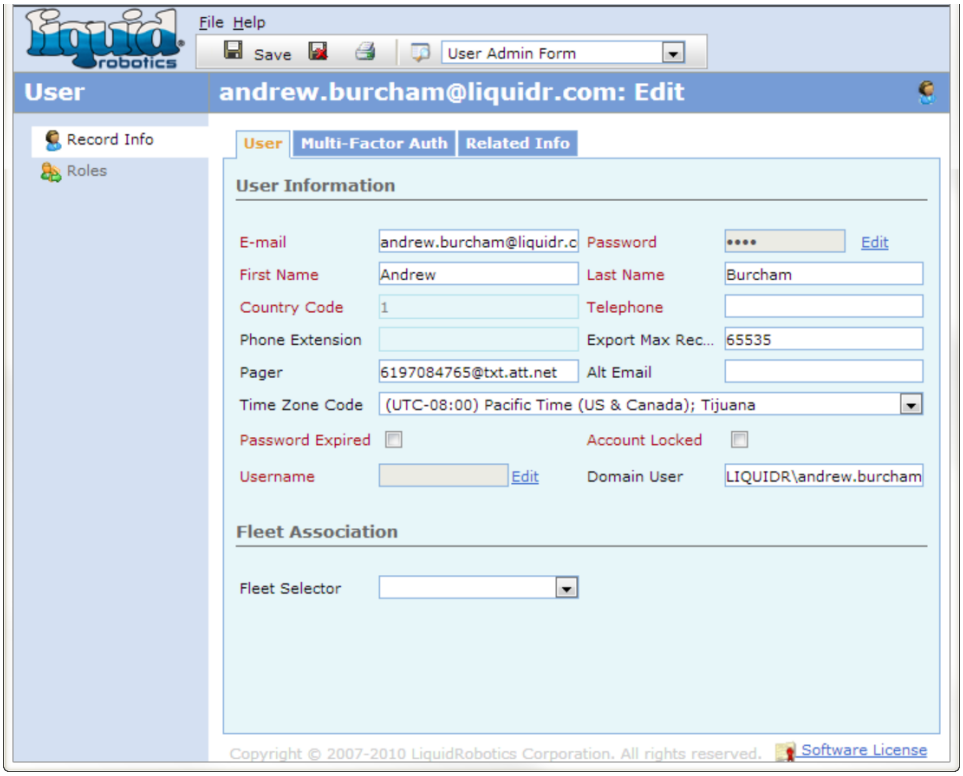
2. Click the **Users** side tab to open a list of individuals who have been granted access to the Organization.

Figure 4.18. WGMS Organization Users Example



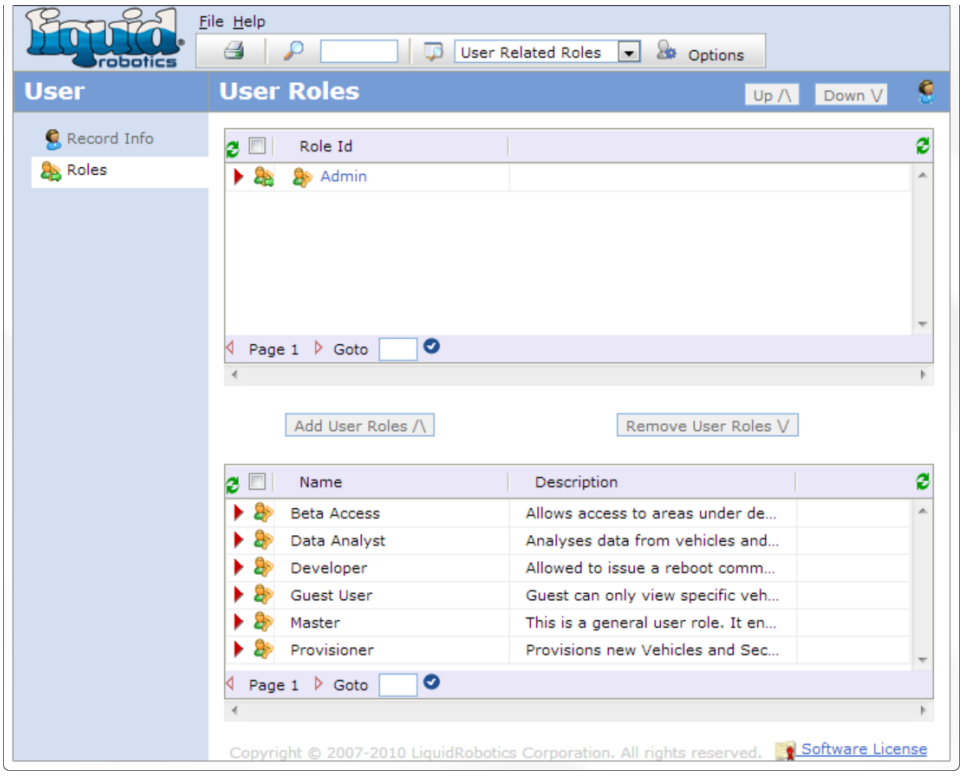
3. To select a User, double-click on a User name, or single-click on the icon to the left of a User name, and the **User Admin Form** for that User will appear.

Figure 4.19. User Admin Form Example



4. Click the **Roles** side tab and the **User Related Roles** form will appear as shown in Figure 4.20

Figure 4.20. User Related Roles Form



The upper section of the form contains the Roles assigned to the User. The lower section contains all of the available Roles. Although it is possible to assign more than one Role to a user, it is rarely necessary.

5. Click on a Role in the lower section of the **User Related Roles** form to select it, then click **Add User Roles** to assign that Role to the User. The Role will appear in the upper section of the **User Related Roles** form.

To remove a Role for a User:

1. In the upper section of the **User Related Roles** form, click on a Role to select it.

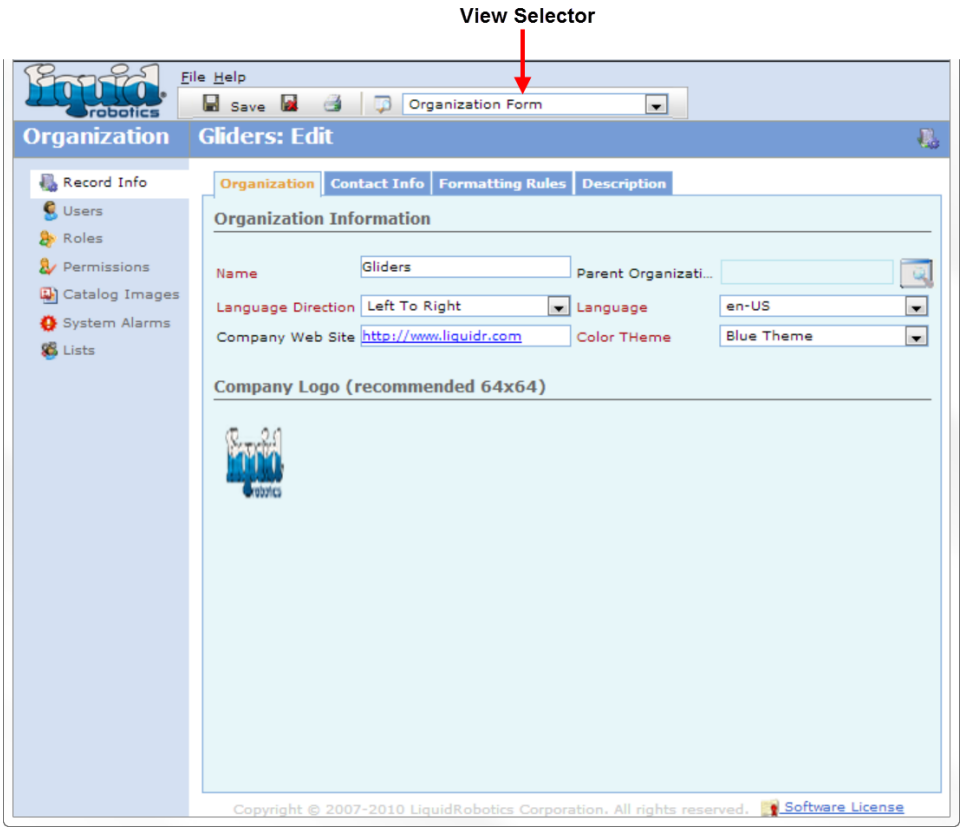
2. Click **Remove User Roles** to remove the Role from the User. The Role will move to the lower section of the **User Related Roles** form.

Deleting a User

To delete a User from an organization:

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

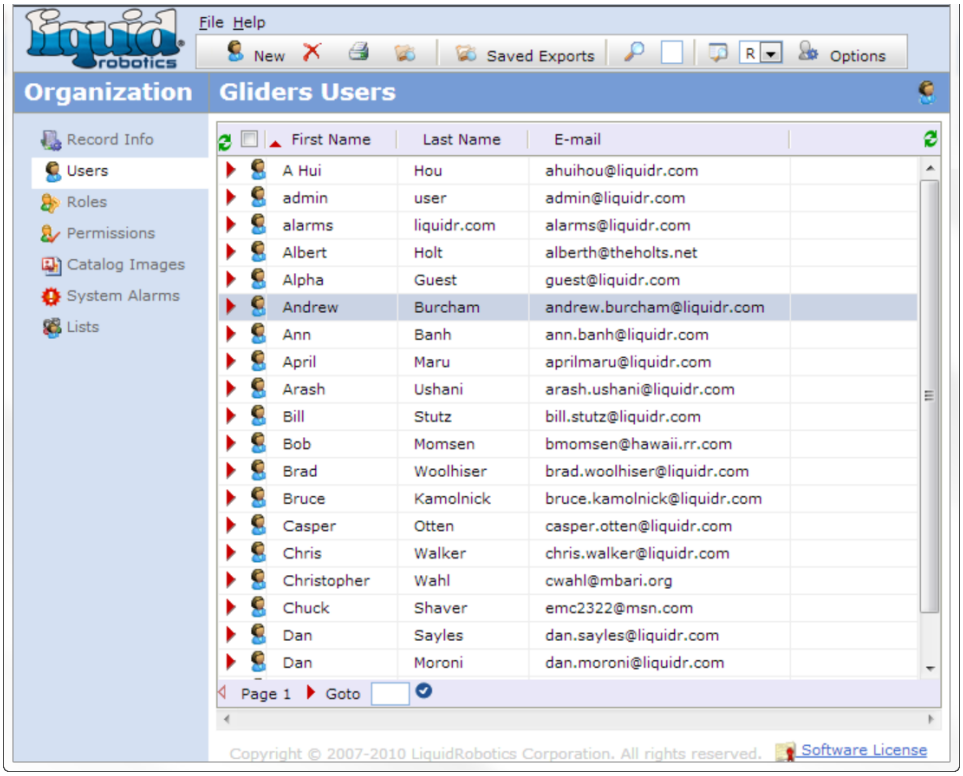
Figure 4.21. Organization Form



2. Click on the Users side tab to open the Users list.

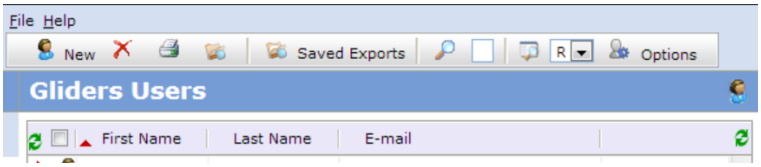
3. Select the name of the User you want to delete by clicking on it. For example, the name Andrew Burcham is selected in Figure 4.22 below.

Figure 4.22. Name Selected for Deletion



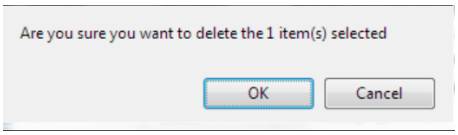
4. Click the delete icon in the toolbar:

Figure 4.23. Users Dialog Box Toolbar



5. A confirmation request dialog box will appear:

Figure 4.24. Deletion Confirmation Dialog Box



6. Click **OK** to permanently delete this User profile from the system.

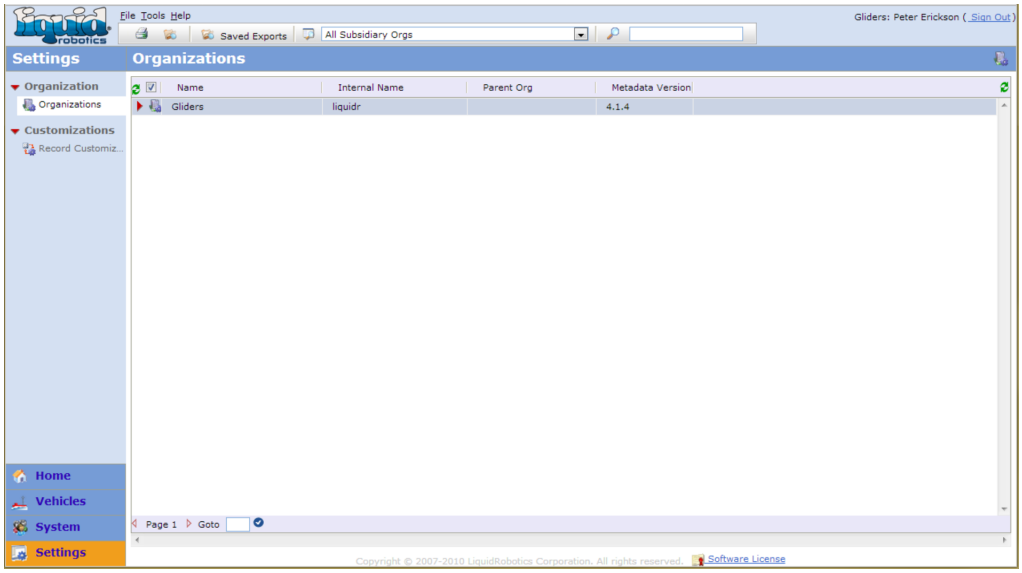
Specialized Administrative Tasks

The WGMS UI allows a System Administrator to view and change fundamental aspects of the system. It is strongly recommended that you contact LRI before making changes, as some changes may have unintended consequences.

Accessing an Organization

Click on **Settings** in the System Menus and the **Settings** screen will open on the **Organizations** side tab displaying the list of Organizations you are assigned to:

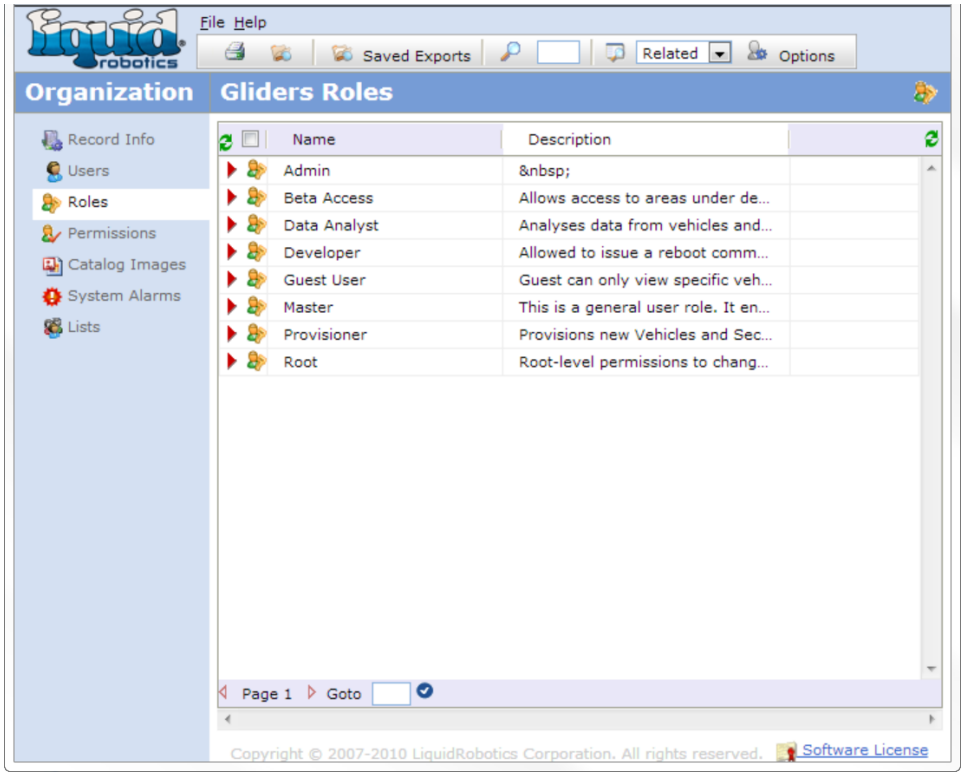
Figure 4.25. Organizations List



Viewing Roles for an Organization

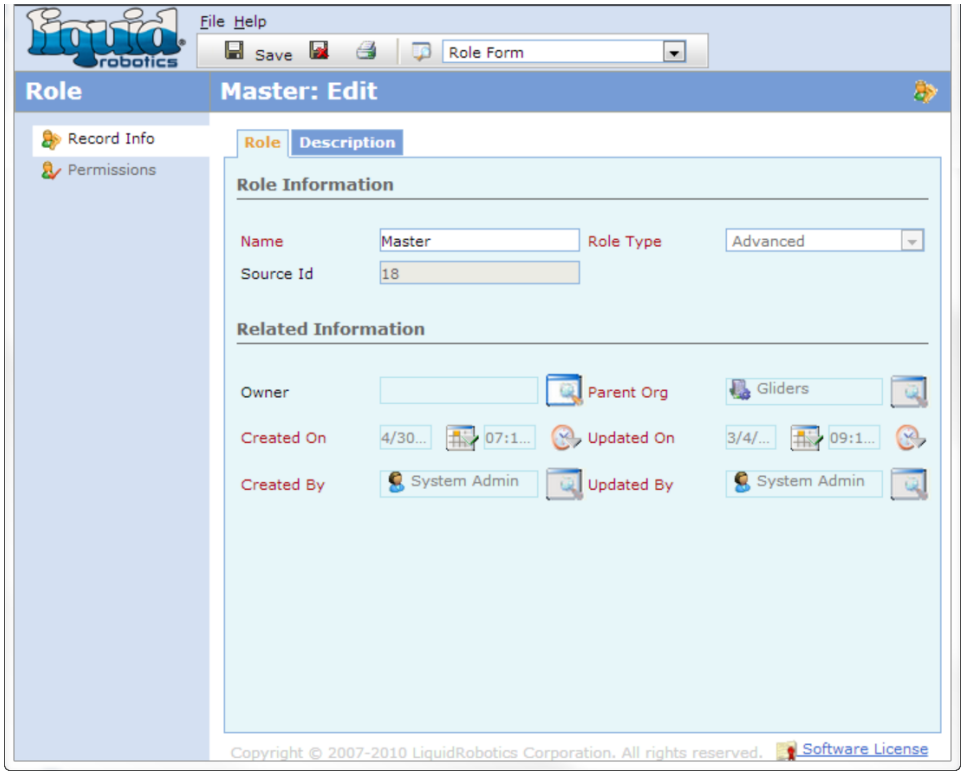
To view the Roles available within an Organization, double-click on the Organization name, or single-click on the icon to the left of the Organization name and the **Organizations Form** will appear. Click on the **Roles** side tab and the **Roles** list for the selected Organization will appear as shown in Figure 4.26.

Figure 4.26. Roles List



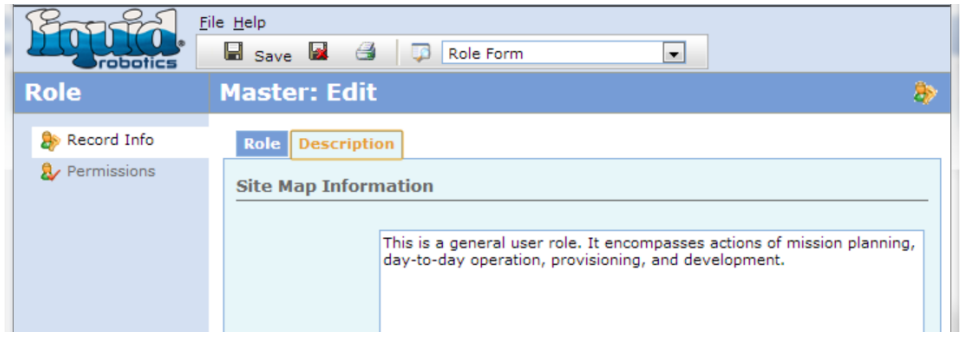
For more information on a Role, double-click on a Role name, or single click on the icon to its left. For example, double-clicking on **Master** will bring up the form shown in Figure 4.27.

Figure 4.27. Master Role Form



Click on the Descriptions tab to view the Role description as shown in Figure 4.28.

Figure 4.28. Master Role Description



Viewing Permissions

To view the Permissions granted for each Role in an Organization:

1. Click **Settings** in the **System Menus**

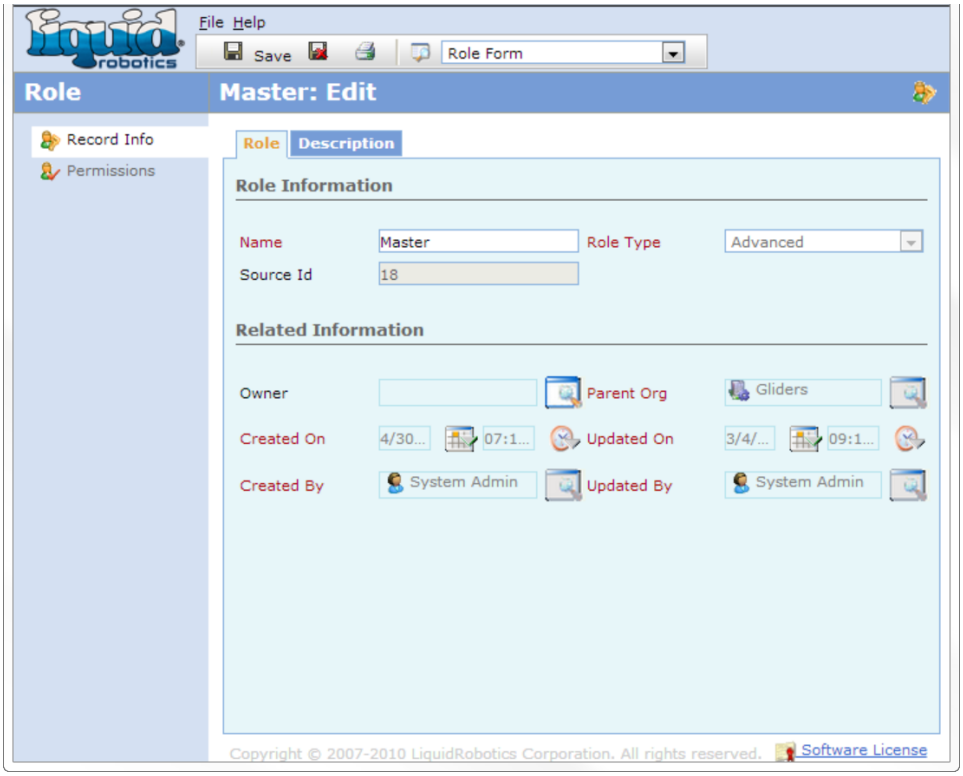
   and the **Settings** screen will open with the **Organizations** side tab selected displaying the **Organizations** list.

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

3. Click on the **Roles** side tab.

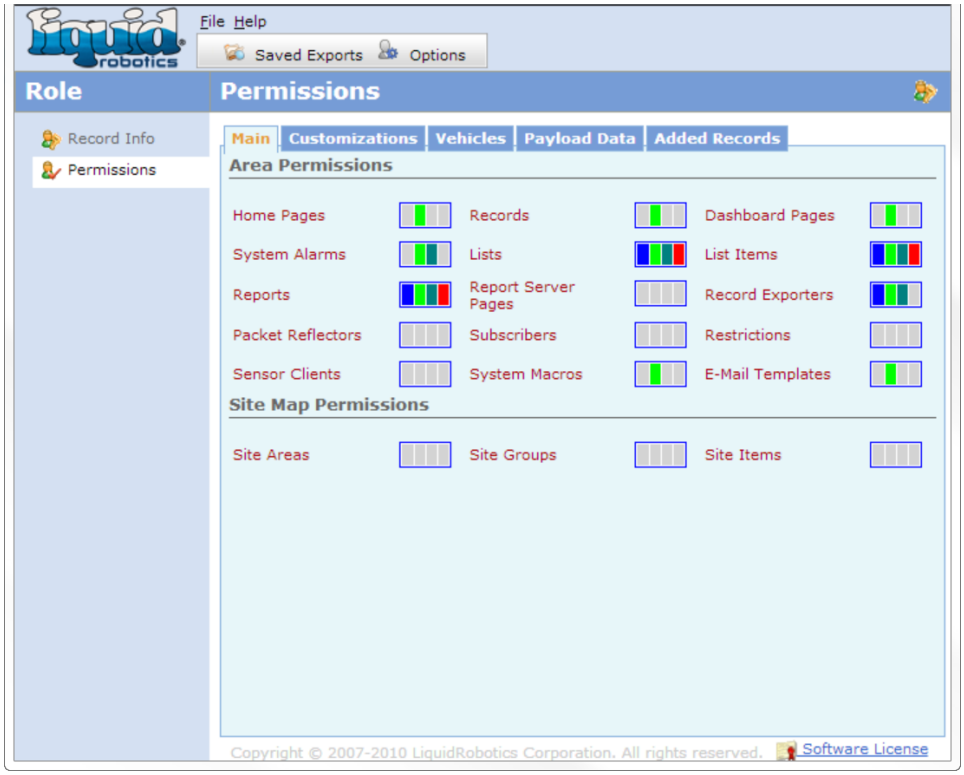
4. Double-click on a Role, for example, **Master**, or single-click on the icon to the left of that Role, and the **Role Form** will appear.

Figure 4.29. Master Role Form



5. Click on the **Permissions** side tab and the **Permissions** window for the Master Role will appear. The **Permissions** window is used to edit the permissions associated with a specific Role for a specific Organization.

Figure 4.30. Master Role Permissions Window



The **Permissions** window includes five tabs where different categories of permissions can be edited:

- **Main**
- **Customizations**
- **Vehicles**
- **Payload Data**
- **Added Records** (This tab is not commonly used, consult with LRI before using to avoid unexpected results.)

There is a four part icon associated with each type of permission. Moving from left to right, the color of each of the 4 boxes in the icon indicate if the Role has permission to Create, Read, Update, or Delete the type of permission the icon is associated with, as shown in Figure 4.31.

Figure 4.31. Permission Icon Descriptions

The colors of the boxes indicate the permission status:

- **Gray**: Does not have permission
- **Blue**: Create permission
- **Light Green**: Read permission
- **Dark Green**: Update permission
- **Red**: Delete permission

For example, Figure 4.32 shows some of the Vehicles permissions for the Master Role.

Figure 4.32. Master Vehicles Permissions

Changing Permissions

Changing the Permissions for a Role requires a Root Role and is strongly discouraged. Keep in mind that changing a Permission for a Role affects all Users that have been assigned that Role. For more information, contact the LRI Support Organization.

Changing Catalog Images

Custom images (such as your company/agency logo) must be stored in the WGMS database for use in the GUI. To view custom images:

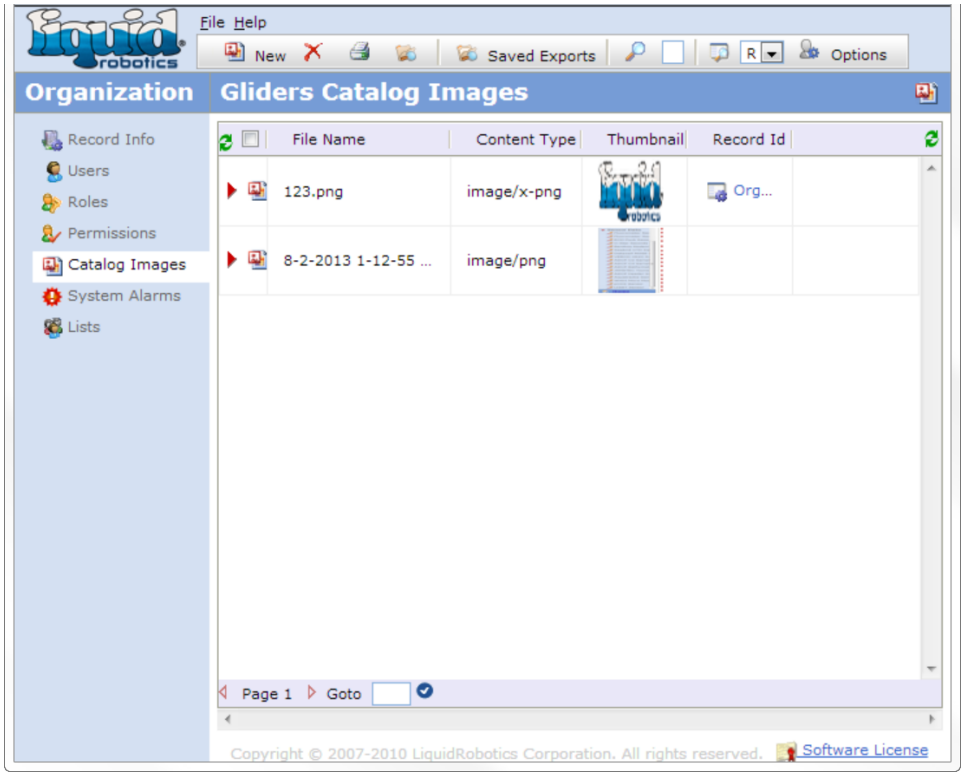
1. Click **Settings** in the **System Menus**

   and the **Settings** screen will open with the **Organizations** side tab selected displaying the **Organizations** list.

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

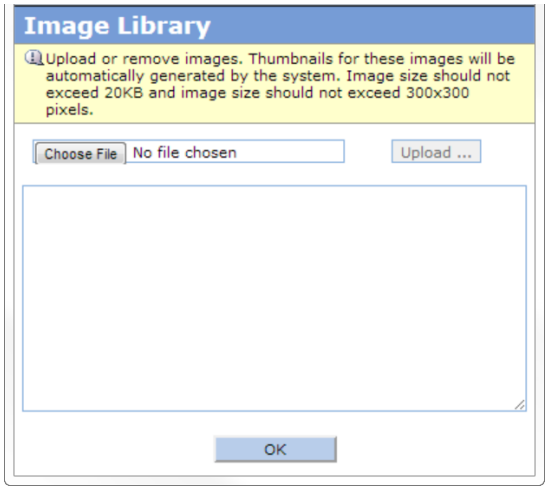
3. Click on the **Catalog Images** side tab and the **Catalog Images** list for the Organization you selected will appear.

Figure 4.33. Catalog Images List



To add a new image click on the new image icon New in the tool bar near the top of the dialog box and an **Image Library** dialog box will appear.

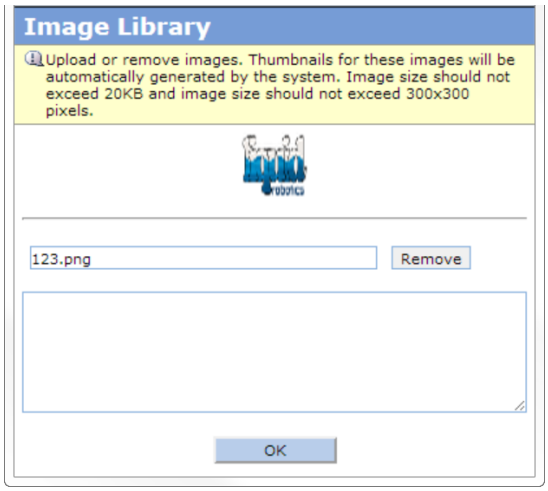
Figure 4.34. Image Library Upload Dialog Box



Click **Choose File** to browse and select an image, then click **Upload...**. A thumbnail of the uploaded image and related information will appear in the **Image Library** dialog box. If you want to keep the image, click **OK** and the image will appear in the **Catalog Images** list.

To remove an image from the WGMS database, from the **Catalog Images** dialog box double-click on the image file name, or single click on the logo to the left of the image file name and an **Image Library** dialog box will appear displaying the image file name with a **Remove** button adjacent to it. Click **Remove** and then click **OK** to delete the image and the image will be removed from the **Catalog Images** list (you may have to refresh your browser for the image to be removed from the **Catalog Images** list).

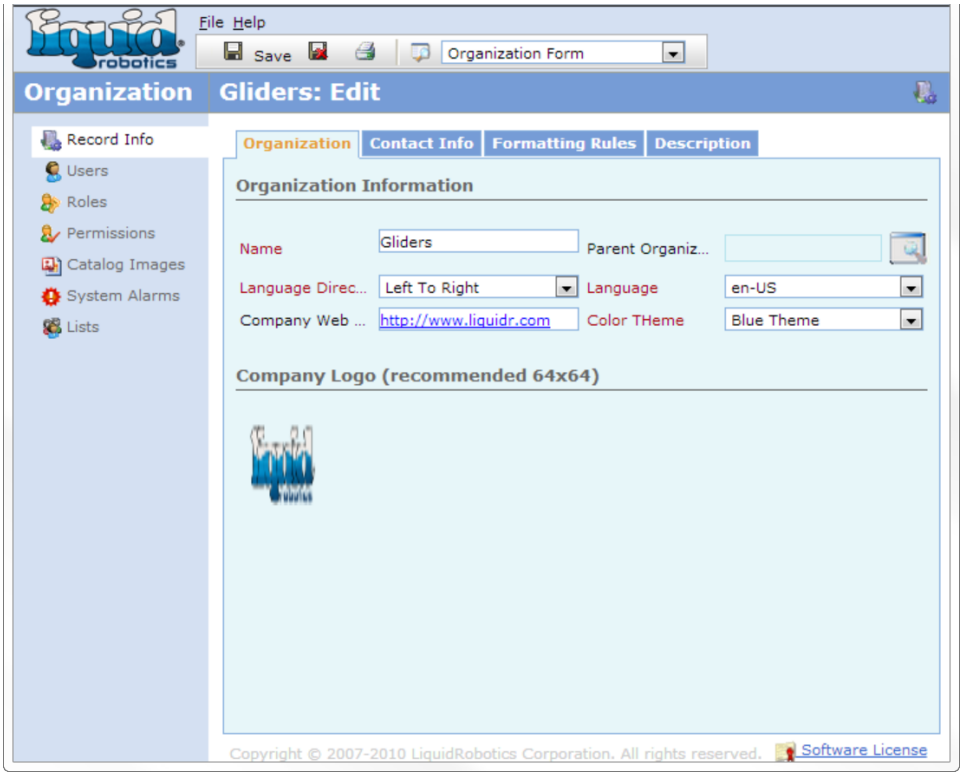
Figure 4.35. Image Library Remove Dialog Box



Advanced Organization Options

The **Permissions**, **System Alarms** and **Lists** side tabs on the **Organization Form** control basic aspects of the UI and the WGMS database. A Root Role is required to change them. These options should not be modified without the direct involvement of LRI Customer Support.

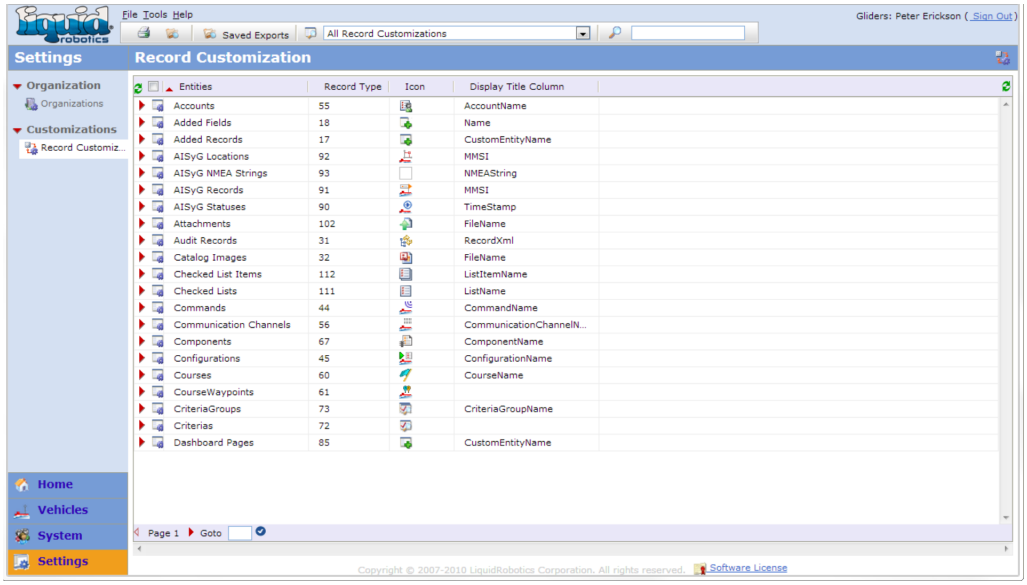
Figure 4.36. Advanced Organization Options Side Tabs



Advanced Settings Options - Record Customization

The **Customizations** menu in the side-bar of the **Settings** screen includes the **Record Customization** side tab. Record Customizations are available to Root users only. They support very specialized use cases and should not be modified without the direct involvement of LRI Customer Support. Incorrectly applied changes can result in significant damage to your database.

Figure 4.37. Record Customization Side Tab



Chapter 5. Shared Administrative Tasks - Vehicles Screen

This chapter is focused on tasks that can be performed from the menus in the **Vehicles** screen by System Administrators and by Users who do not have Admin Role permissions. From the menus in the **Vehicles** screen you can view and edit information on individual vehicle configurations, vehicle payloads, and raw vehicle and sensor data.

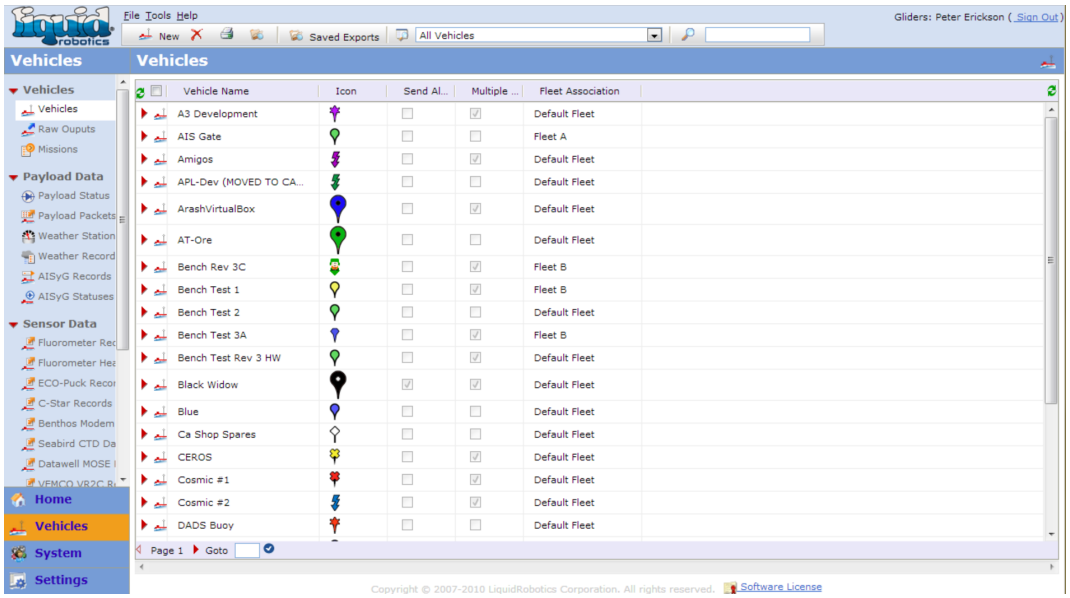
Vehicles Screen Overview

Vehicle-specific data is typically accessed from the **Vehicles** screen by Users who are assigned a Master Role. This section provides an overview of the **Vehicles** screen, followed by information on some specific tasks that can be performed from the **Vehicles** menu side tabs. Additional information on the **Vehicles** screen is provided in the *Wave Glider User Manual* .

To select a vehicle, click on the

button and the **Vehicles** screen will appear with the **Vehicles** side tab selected by default displaying the **Vehicles** list.

Figure 5.1. Vehicles Screen - Vehicles List



The **Vehicles** menu in the side-bar of the **Vehicles** screen includes:

- **Vehicles** - This side tab is open when the Vehicles window appears. It includes a list of all of the Vehicles in the Organization and their map display icons.
- **Raw Outputs** - This side tab lists different types of raw data packets recently received from all Vehicles in the Organization. The packets are listed in the order they were received by WGMS.
- **Missions** - This side tab lists currently active Missions.

The **Payload Data** menu in the side-bar of the **Vehicles** screen includes:

- **Payload Status** - This side tab lists recently-received payload status data from each vehicle in the Organization.
- **Payload Packets** - This side tab lists recently-received payload packets from each vehicle in the Organization .
- **Weather Stations** - This side tab lists weather stations for which data is available.
- **Weather Records** - This side tab lists weather station data received from each vehicle in the Organization.
- **AISyG Records** - This side tab lists AIS data records from each vehicle in the Organization.
- **AISyG Statuses** - This side tab lists AIS system status for each vehicle in the Organization.

From the **Sensor Data** menu in the side-bar of the **Vehicles** screen you can view sensor data records from each vehicle in the Organization that is able to generate a specific type of data. The sensor data side tabs include:

- **Fluorometer Records**
- **Fluorometer Header Records**
- **ECO-Puck Records**
- **C-Star Records**
- **Benthos Modem Records**
- **Seabird CTD Data**
- **Datawell MOSE Records**
- **VEMCO VR2C Records**
- **ADCP C2 Samples**
- **ADCP C4 Samples**
- **ADCP Bathymetry Samples**
- **JAMSTEC Tsunami Sensor Data**
- **ADCP Header Samples**
- **Aquatracka Samples**
- **WHOI Micro Modem**
- **pCO2 Sensor**
- **LISST Sensor**

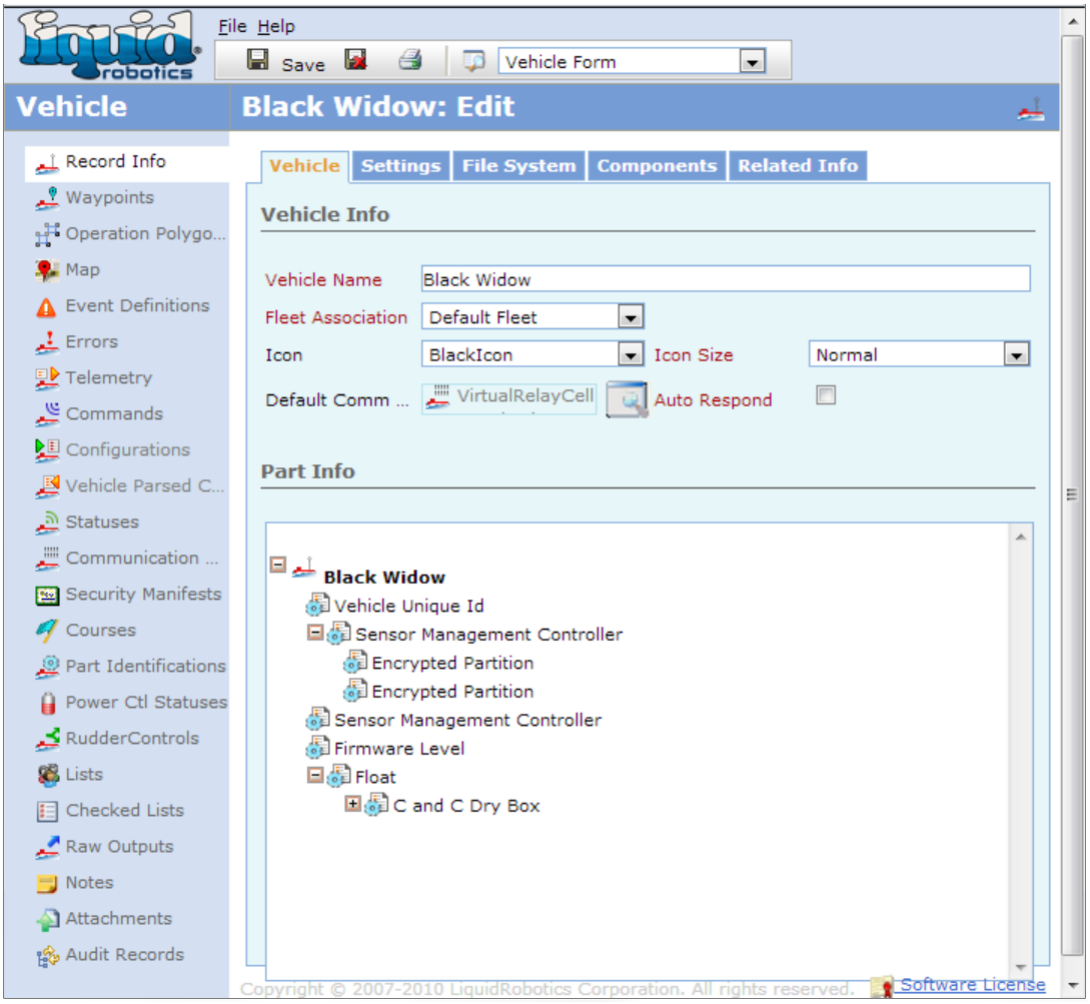
For more information see “Viewing Sensor Data Records” (page 89).

View or Edit Vehicle Data

To select a vehicle, click on the Vehicles button and the **Vehicles** screen will appear with the **Vehicles** side tab selected by default displaying the **Vehicles** list.

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

Figure 5.2. Example - Vehicle Form



The side tabs for the Vehicle Form include:

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

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

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

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

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

Errors: Latest error messages received from the Vehicle.

Telemetry: Latest telemetry data received from the Vehicle.

Commands: Latest commands sent to the Vehicle.

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

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

Statuses: Latest Status data received from the Vehicle.

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

Part Identifications: Lists Hardware/Software version numbers.

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

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

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

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

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

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

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

Viewing Vehicle Parts Information

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

To view parts information for a vehicle:

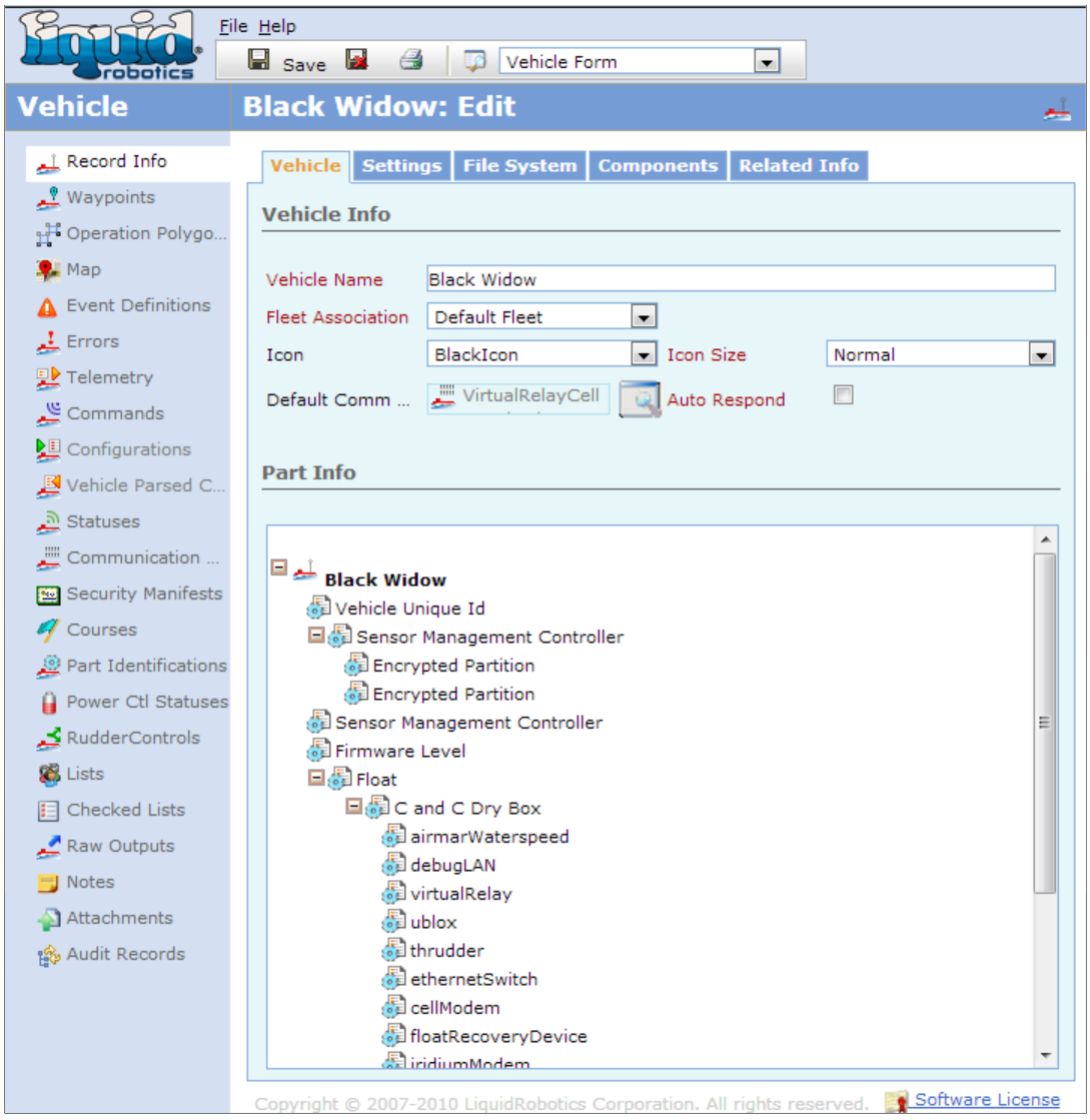
1. Select a vehicle, by clicking on the

button to open the **Vehicles** screen. The **Vehicles** side tab will be selected by default displaying the **Vehicles** list.

2. Select a vehicle from the **Vehicles** list by double-clicking on the vehicle name, or clicking on the vehicle icon. The **Vehicle Form** for that vehicle will appear with the **Vehicle** tab open.

3. The parts information tree is in the **Part Info** section at the bottom of the vehicle tab window.

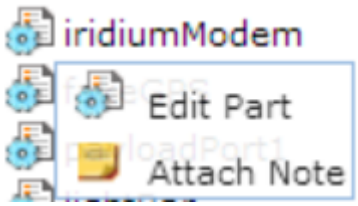
Figure 5.3. Example Expanded Part Info Tree



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

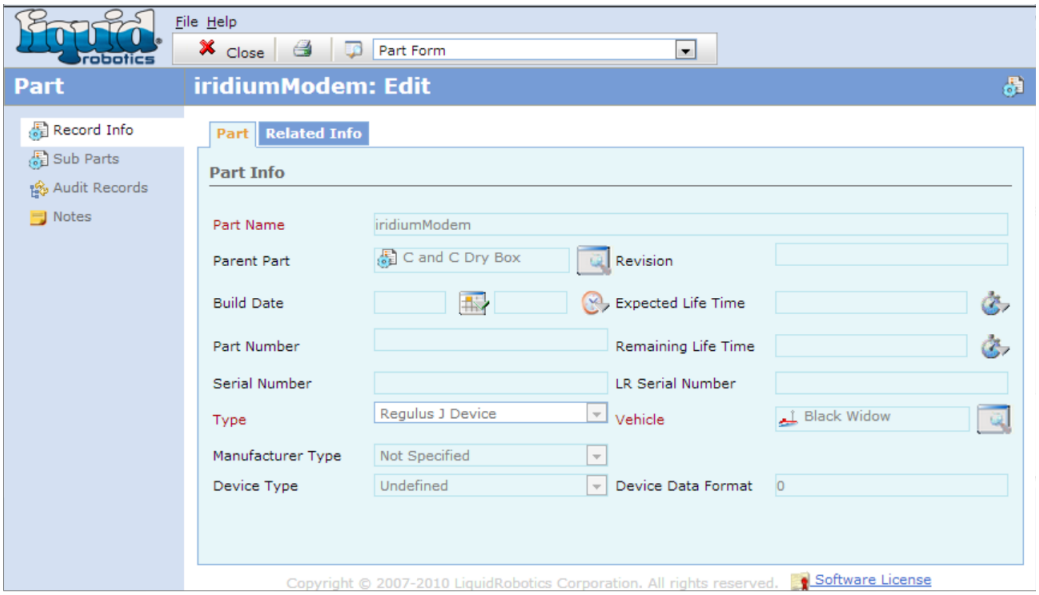
1. Click on the part name and a small dialog box will appear with two options - **Edit Part** or **Attach Note** (the Attach Note option opens a form where you can add notes about the part).

Figure 5.4. Edit Part or Attach Note



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

Figure 5.5. Part Form for the Iridium Modem



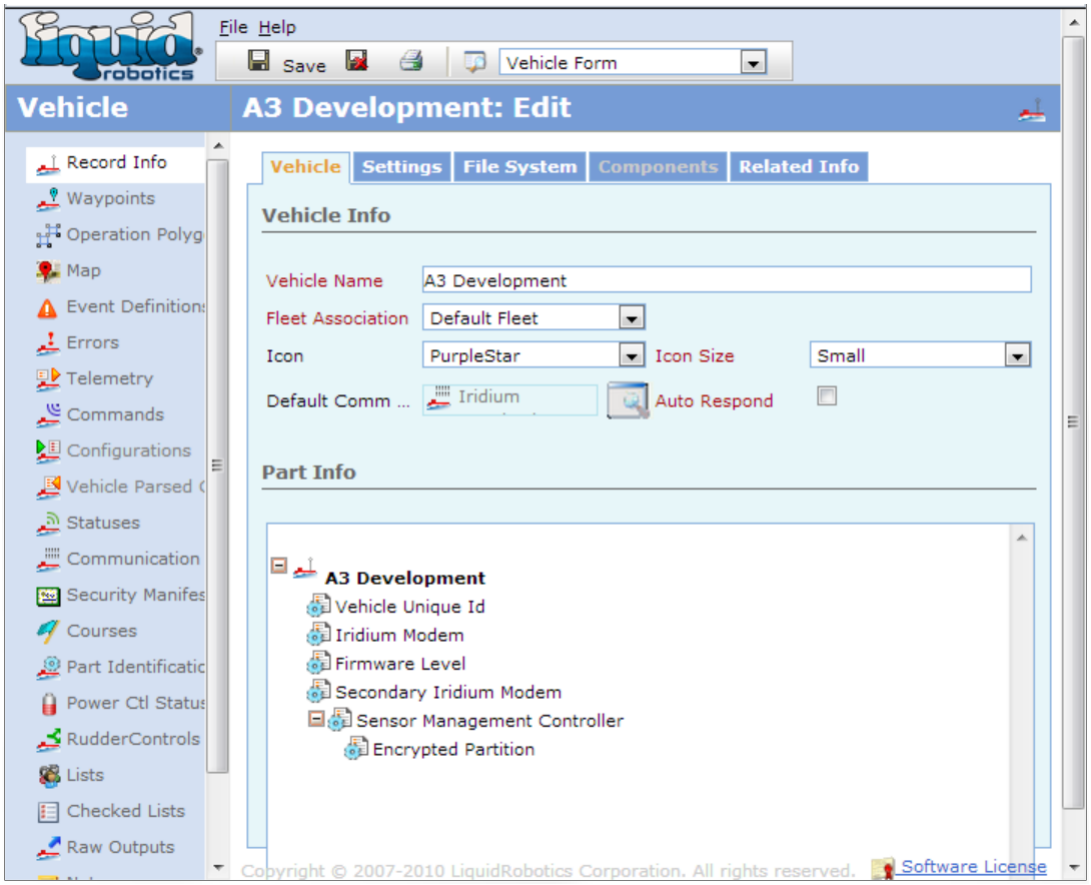
Adding or Changing Vehicle Alarm Thresholds

To add or change alarm thresholds for a vehicle:

1. Click **Show System Menus**, then click on the Vehicles button to open the **Vehicles** screen. The **Vehicles** tab will be selected by default displaying the **Vehicles** list.

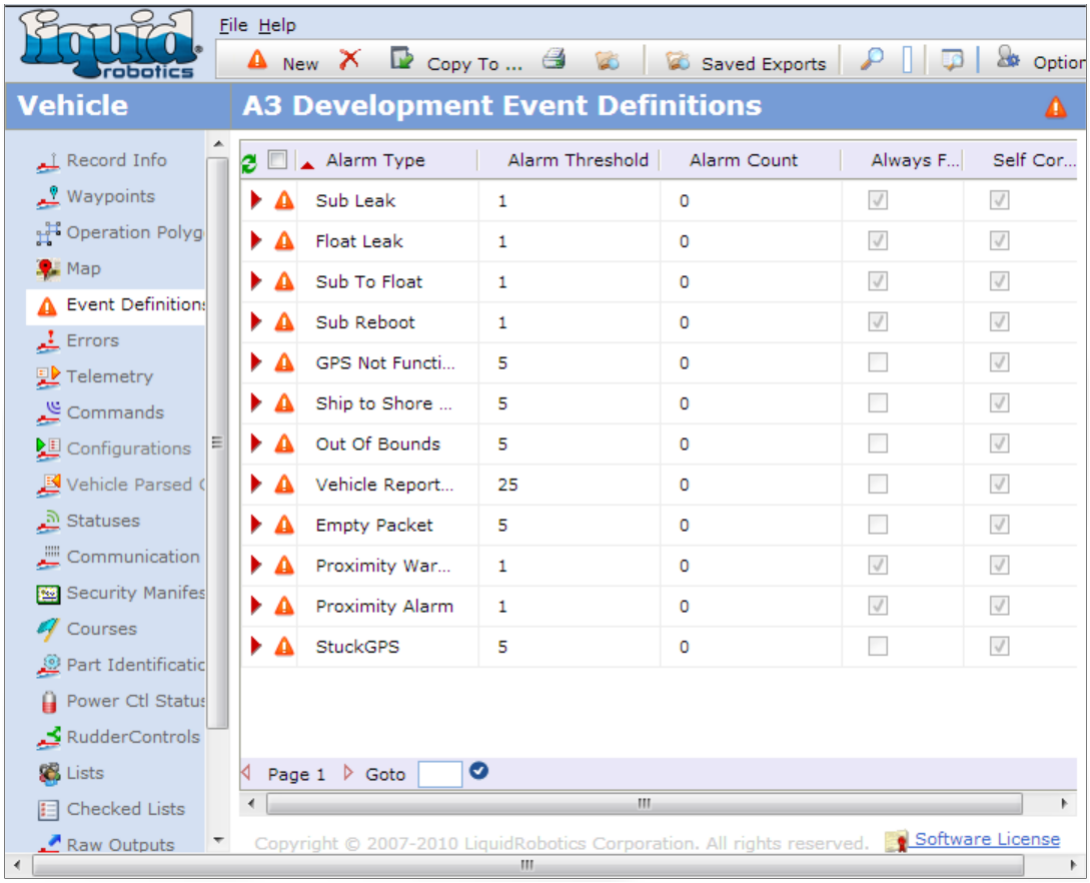
2. Select a vehicle from the **Vehicles** list by double-clicking on the vehicle name, or clicking on the vehicle icon. The **Vehicle Form** for that vehicle will appear with the **Record Info** side tab selected and the **Vehicle** tab open.

Figure 5.6. Vehicle Form



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

Figure 5.7. Event Definitions List



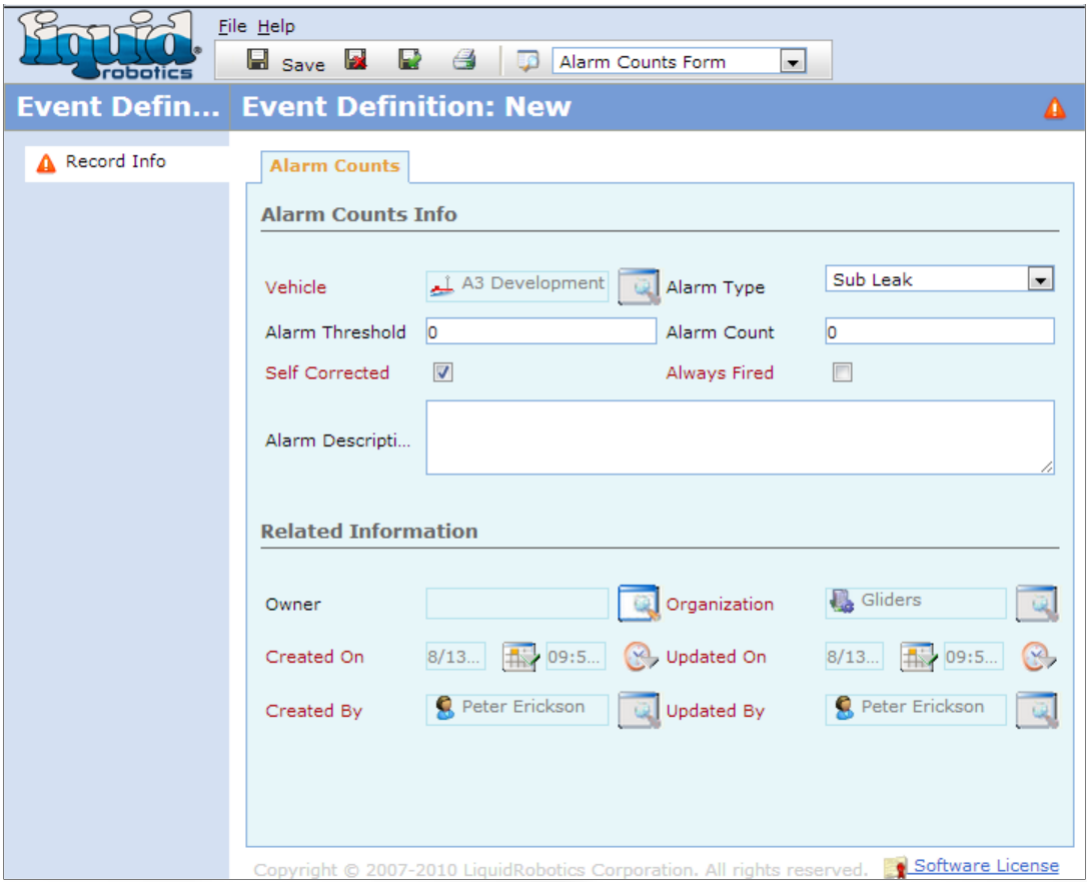
There are a minimum of nine Alarm Types that must be specified for each Vehicle. These alarm types and their default Alarm Threshold values are:

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

Note that **File Read Timeout** is not in the Figure 5.7, and therefore must be added.

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

Figure 5.8. New Event Definition - Alarm Counts Form

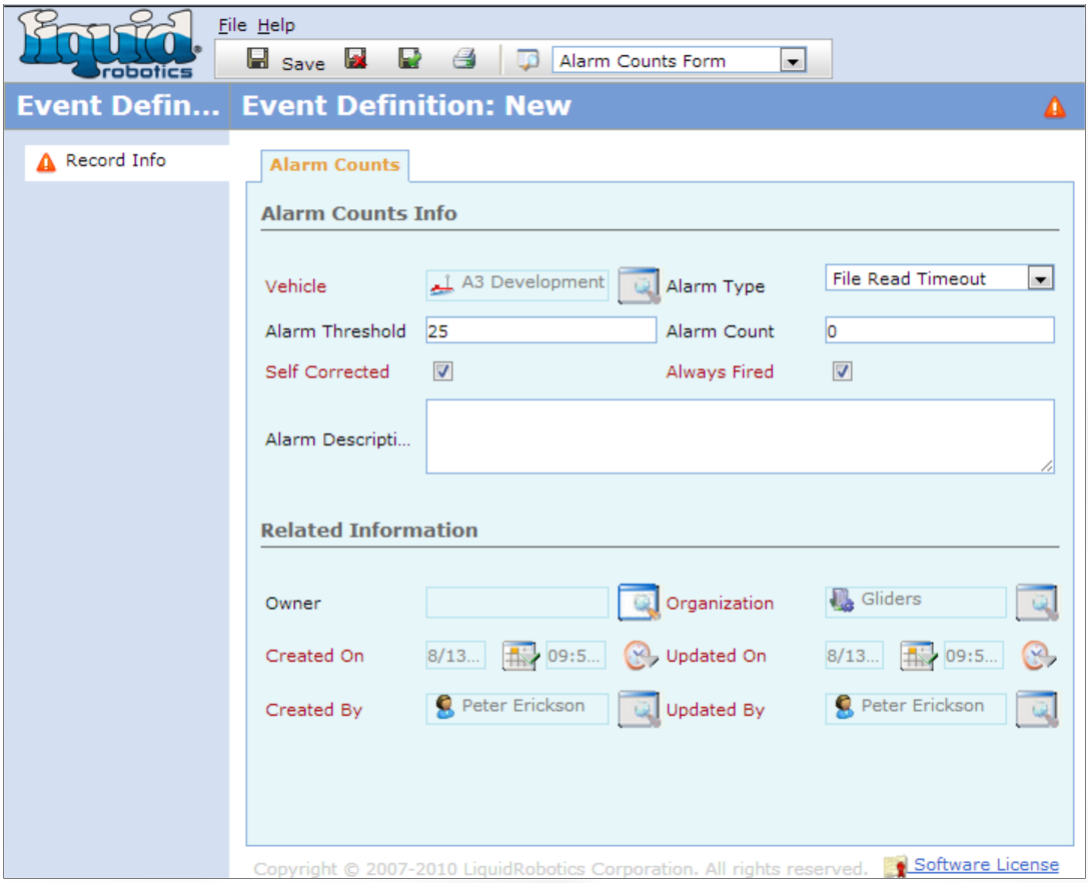


Enter the data as follows:

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

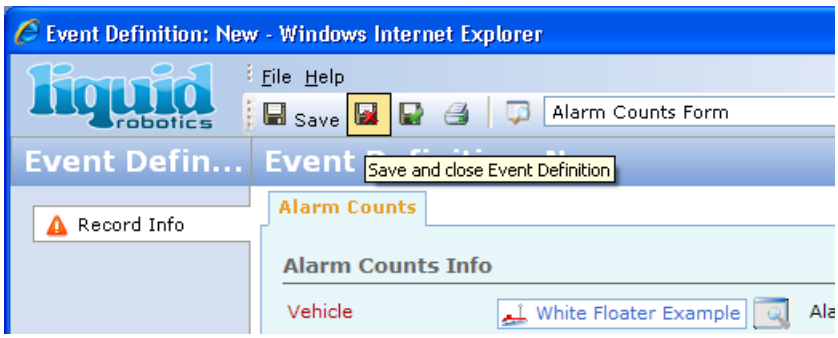
When complete, the upper part of the dialog should look similar to:

Figure 5.9. New Event Entered - Alarm Counts Form



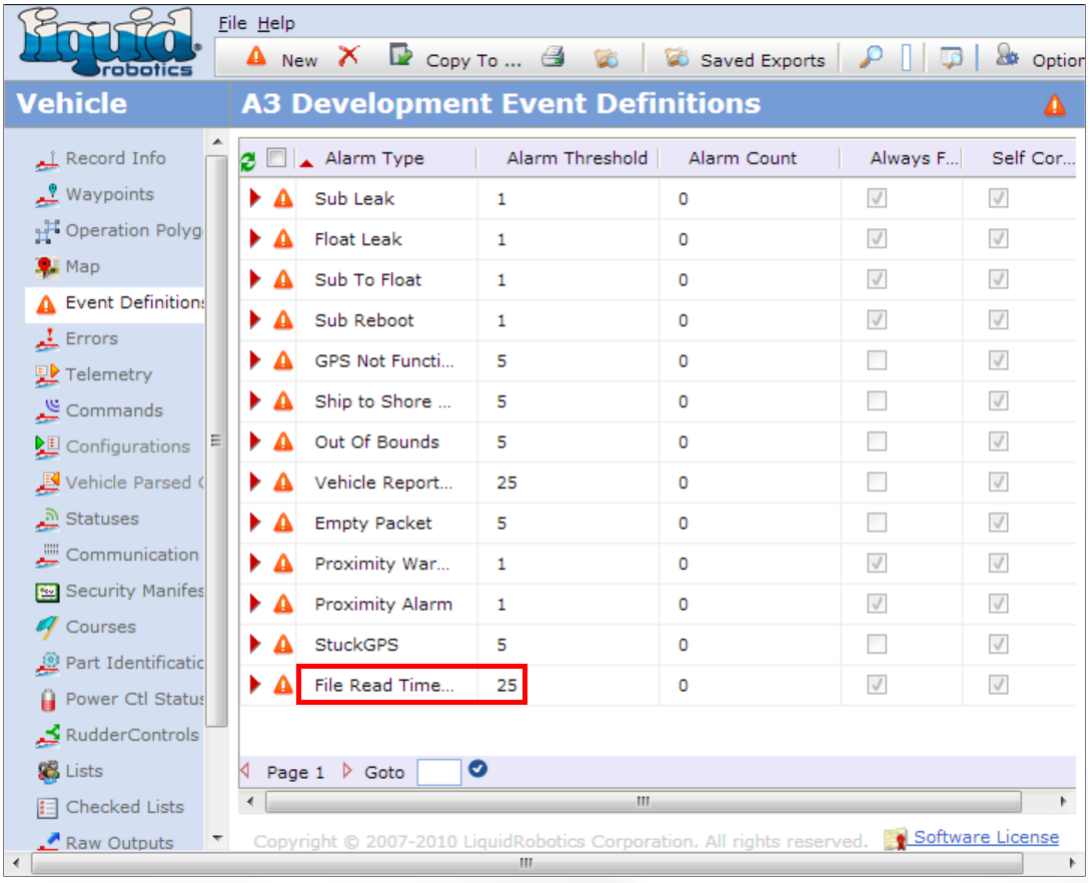
Click the [Save and Close Event Definition] icon in the tool bar to save the data and exit the Alarm Counts Form.

Figure 5.10. Save and Close Event Definition



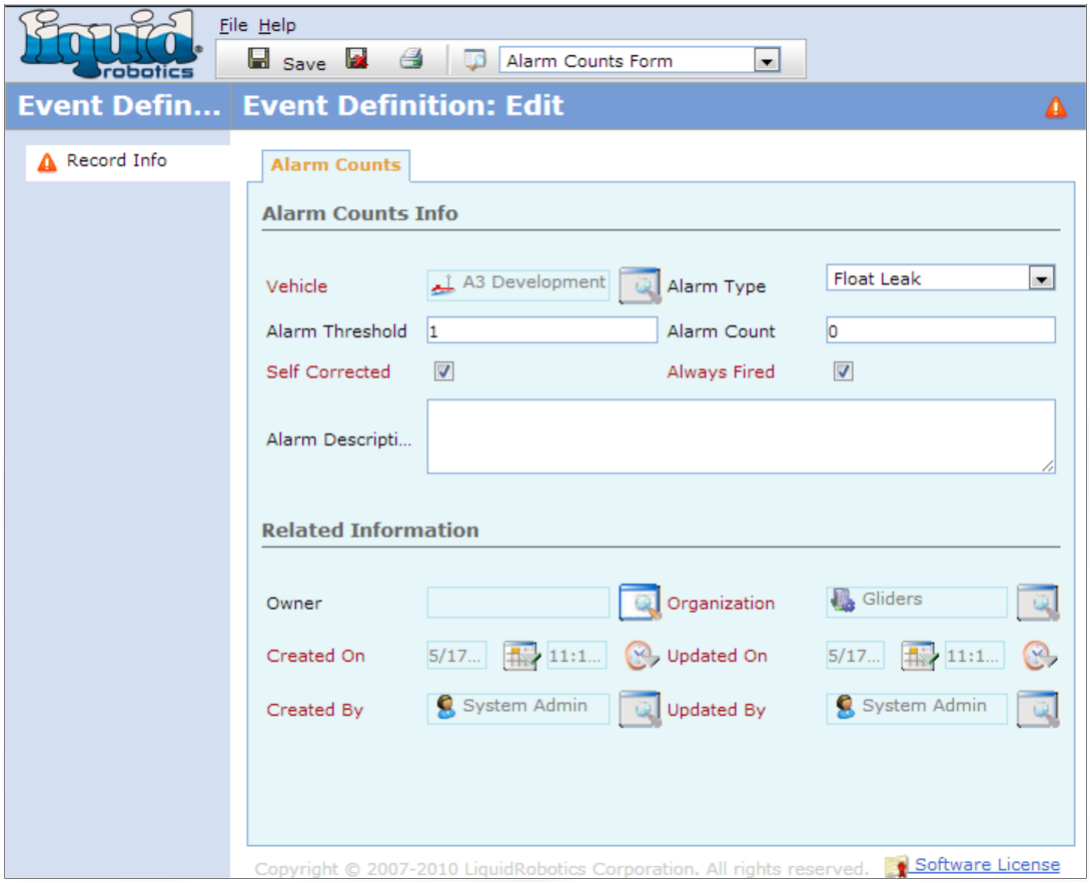
The **File Read Timeout** entry should now appear in the **Event Definitions** list.

Figure 5.11. Updated Event Definitions List



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

Figure 5.12. Edit Event Definition - Alarm Counts Form



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

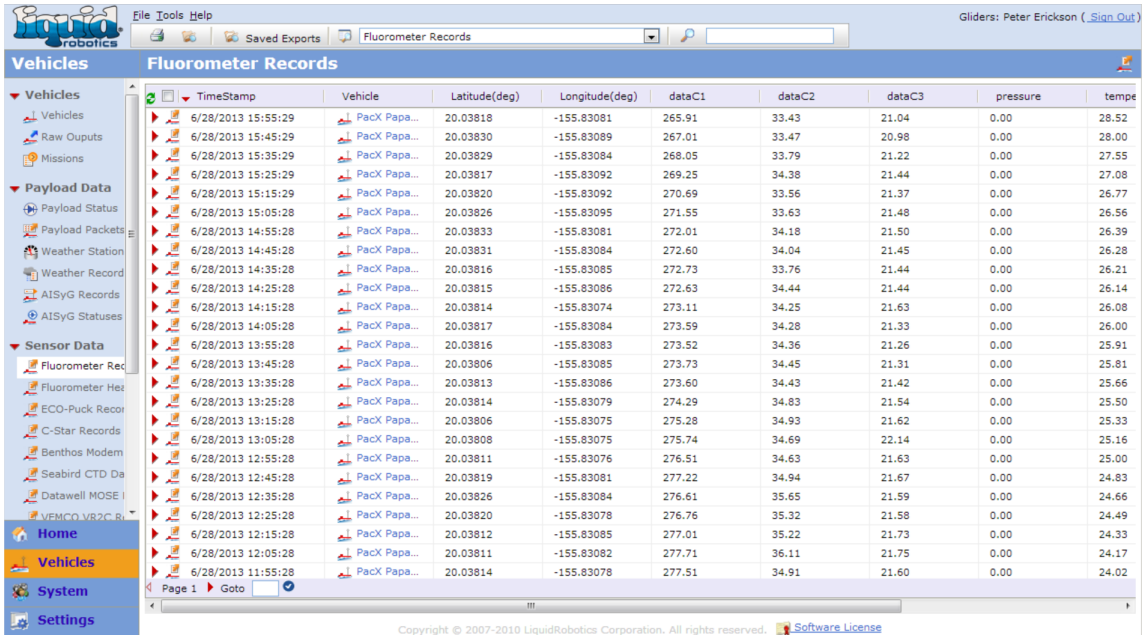
Viewing Sensor Data Records

To view sensor data records, click on the Vehicles button to open the **Vehicles** screen.

A record of each type of sensor data transmission, from each vehicle, is provided in chronological order from the different tabs of the **Sensor Data** menu in the side-bar of the **Vehicles** screen.

Click on a data type side tab in the **Sensor Data** menu and a window will appear with a list of records for each vehicle that has a payload generating that type of data. For example, if you click on **Fluorometer Records**, a screen with the most recent fluorometer records for each vehicle that generates fluorometer data will appear.

Figure 5.13. Sensor Data - Fluorometer Records List



Chapter 6. Shared Administrative Tasks - System Screen

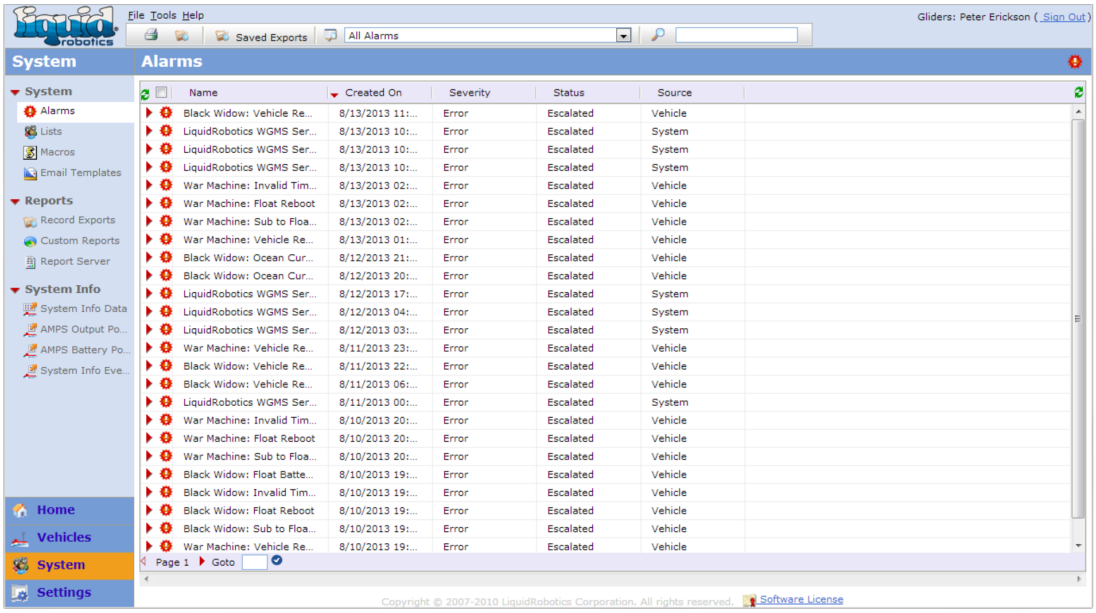
This chapter is focused on tasks that can be performed from the menus in the **System** screen by System Administrators and by Users who do not have Admin Role permissions. From the menus in the **System** screen you can view alarms, escalation lists, exported records, custom reports, and system data telemetry records for each vehicle.

System Screen Overview

Information is typically accessed from the **System** screen by Users who are assigned a Master Role. This section provides an overview of the **System** screen, followed by information on some specific tasks that can be performed from the **System** screen side tabs. Additional information on the **System** screen is provided in the *Wave Glider User Manual* .

Click on the System button and the **System** screen will appear with the **Alarms** side tab selected displaying the **Alarms** list.

Figure 6.1. System Screen



The **System** menu in the side-bar includes the following side tabs:

- **Alarms** - Chronological list of Alarms from all Vehicles.
- **Lists** - Shows the Escalation Lists for different Vehicles and allows editing.
- **Macros** - Lists vehicle-specific WGMS macros.
- **Email Templates** - Lists email templates.

The **Reports** menu in the side-bar includes the following side tabs:

- **Record Exports** - Lists records that have been exported.
- **Custom Reports** - Used to create, view and archive information related to Vehicle operations.
- **Report Server** - This option is only available to Root users. Contact LRI for more information.

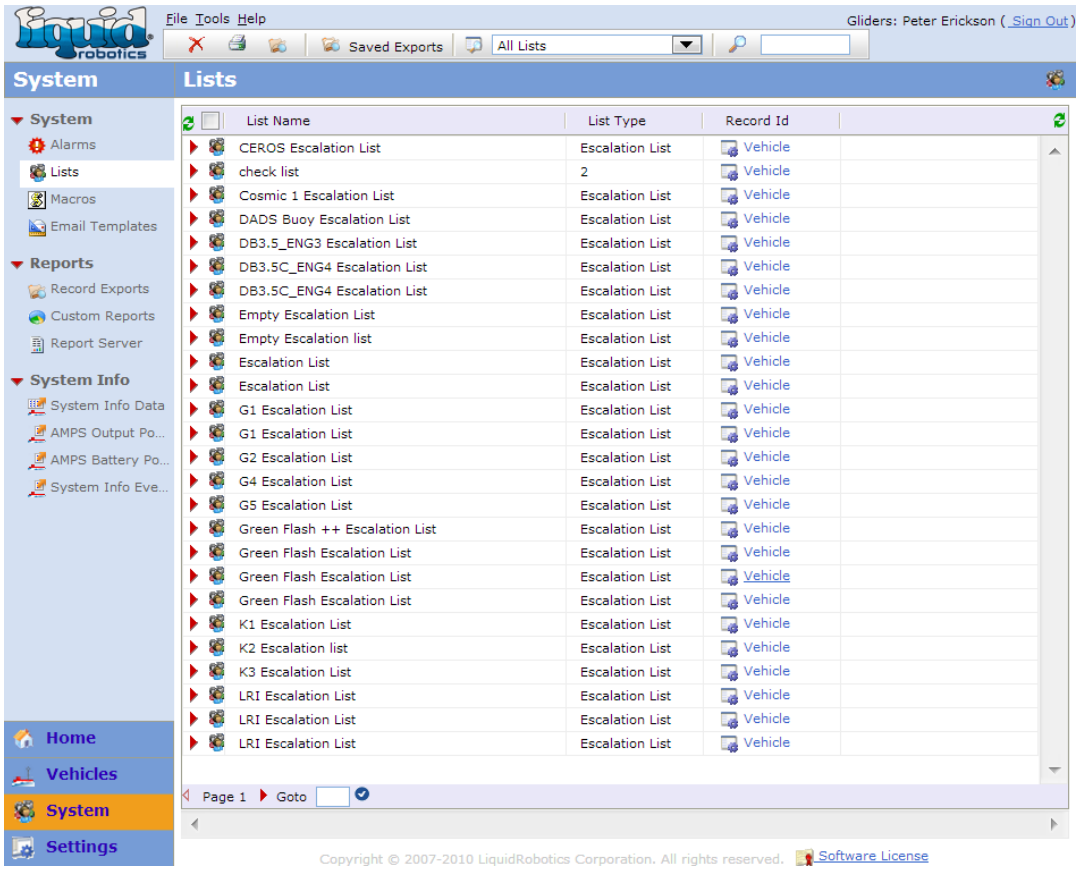
The **System Info** menu in the side-bar includes the following side tabs:

- **System Info Data** - View system information data records from each vehicle in the Organization in the order that they were transmitted.
- **AMPS Output Power Status** - SV3 Only
- **AMPS Battery Port Details** - SV3 Only
- **System Info Events** - View system information event records from each vehicle in the Organization in the order that they were transmitted.

Updating Lists

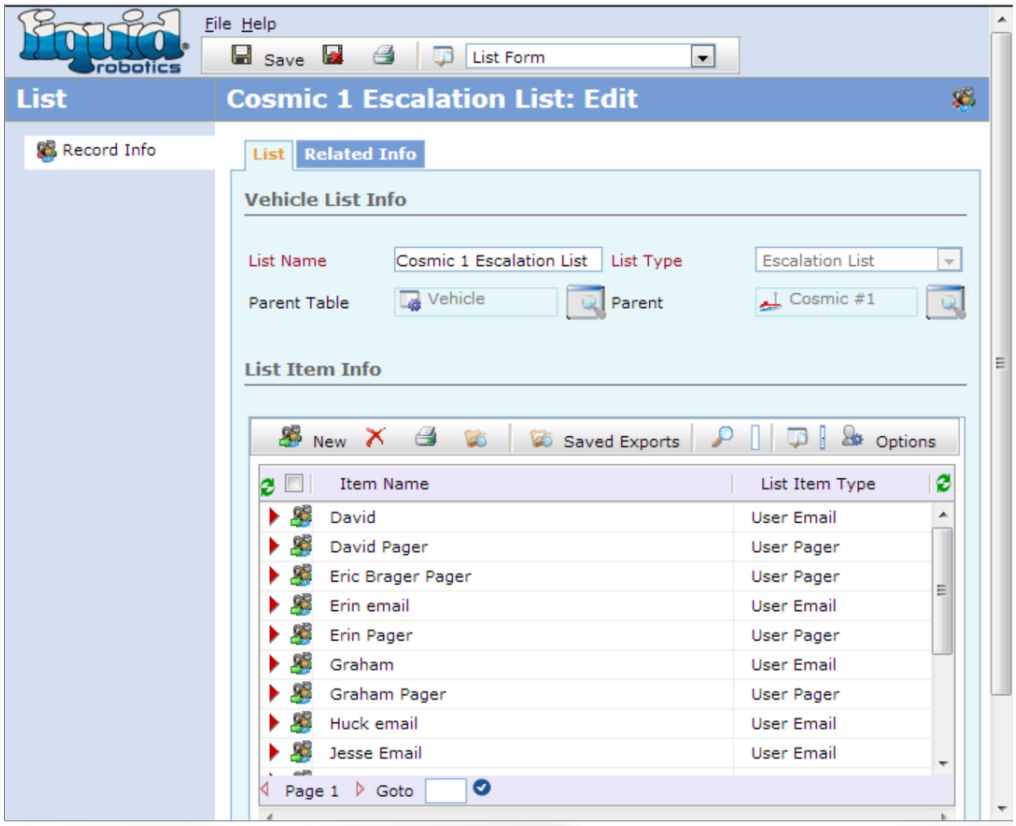
Escalation Lists for Alarm notifications are the primary type of list that System Administrators may need to modify. Click the **Lists** side tab in the **System** menu and the **All Lists** list will appear:

Figure 6.2. Lists Side Tab - All Lists



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

Figure 6.3. Escalation List - List Form



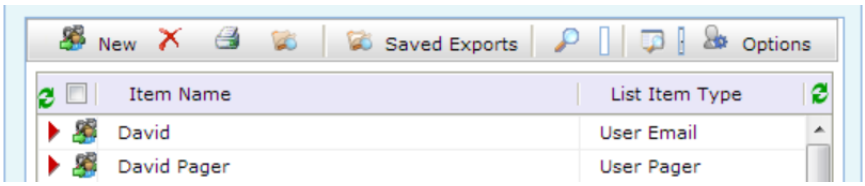
Typically, you will be adding or deleting a name from the list.

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

1. Click on the New icon

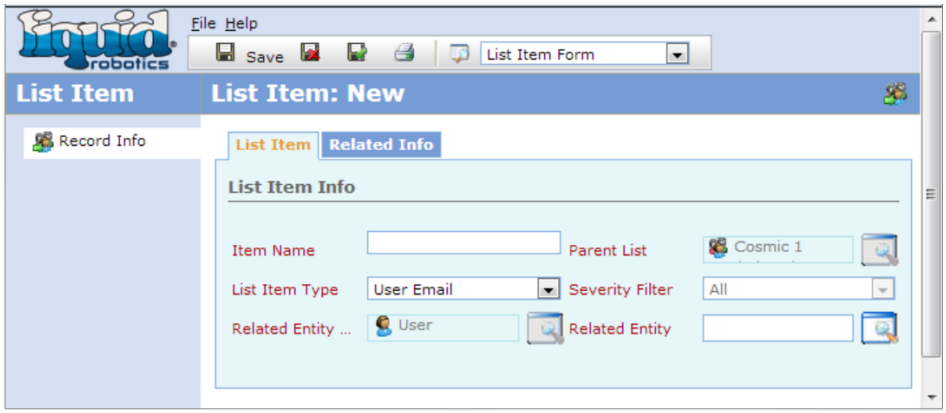
:

Figure 6.4. New Icon



A **List Item Form** will appear:

Figure 6.5. List Item Form

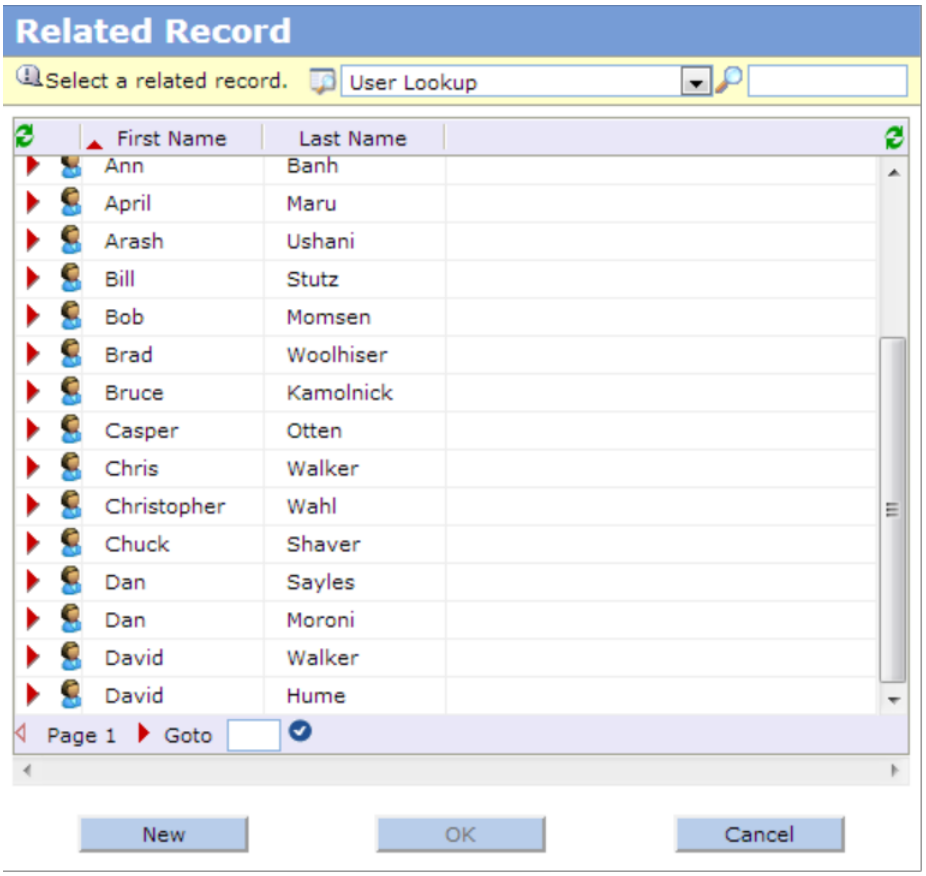


2. Enter the **Item Name** that you want to appear in the list, for example, Chuck.

3. Select the **List Item Type** in the drop-down menu, for example, **User Email**.

4. Next, click on the icon to the right of the **Related Entity** box. This will bring up a list of names to select from. The name and other information should have already been entered as described in " Adding New Users" (page 57).

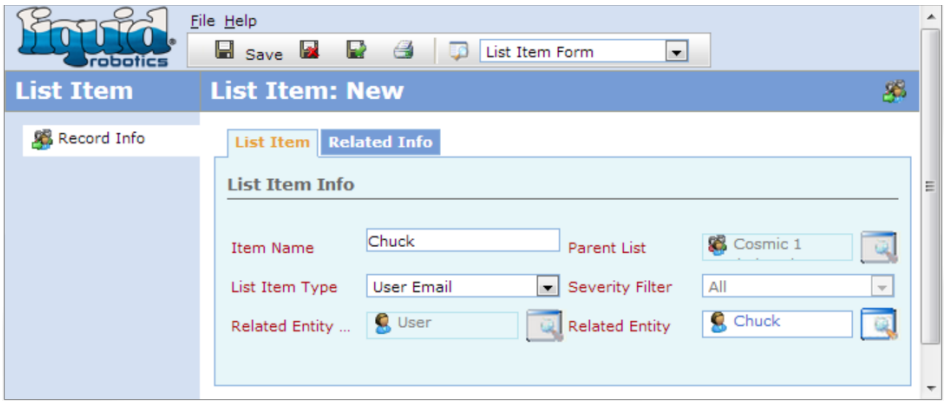
Figure 6.6. Contact List Records



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

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

Figure 6.7. Example New List Item

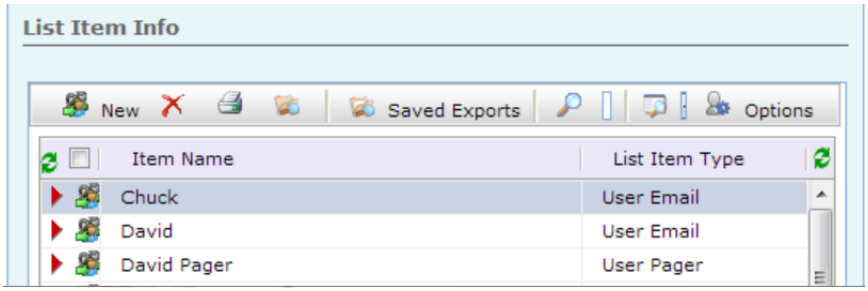


6. Click the [Save and close List Item] icon to exit back into the **List Form**. The new name will be added to the list.

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

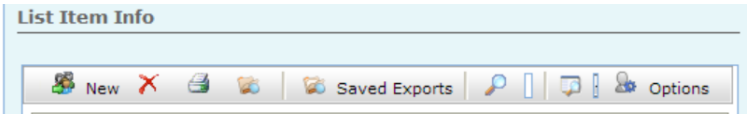
1. Click on a name to select it.

Figure 6.8. Select Name in List Form



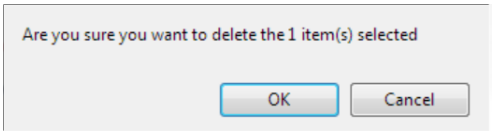
2. Click the Delete [Delete List Item] icon above the list:

Figure 6.9. Delete List Item Icon



You will be asked to confirm the deletion.

Figure 6.10. List Deletion Dialog Box



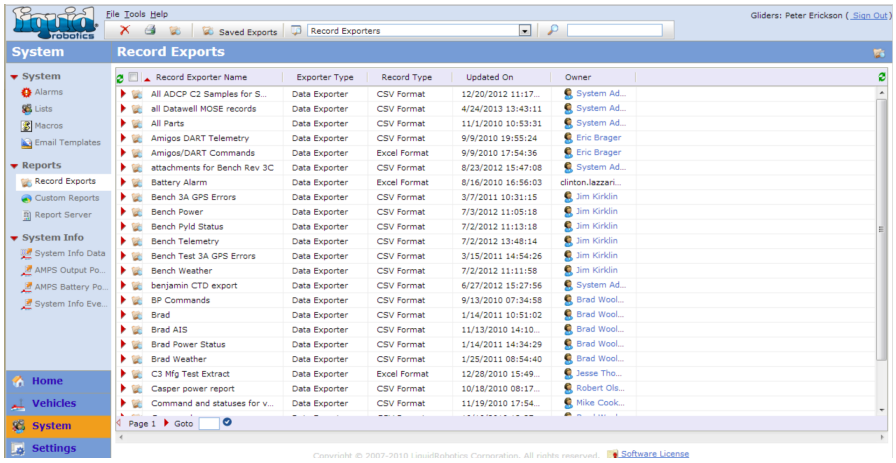
Click **OK** and the **Delete Record** dialog box will appear to confirm the deletion - again. Click **OK** to close the **Delete Record** dialog box and remove the name from the list. Note that this will only delete the name from the list - the User data will remain in the database.

Figure 6.11. Delete Record Dialog Box

Exporting Records

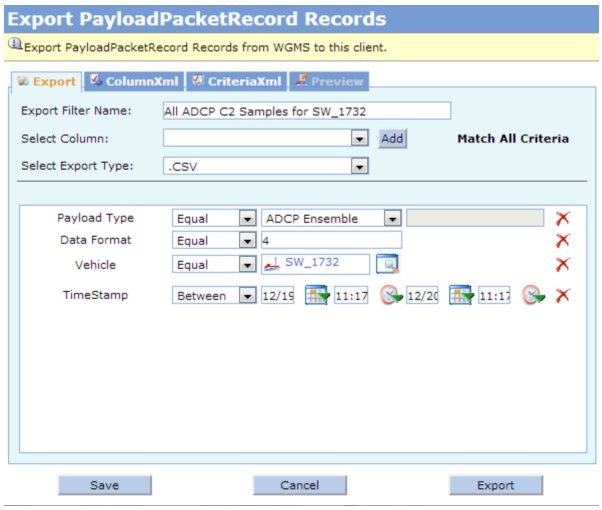
Click on the **Record Exports** side tab in the **Reports** menu on the side-bar to open the **Record Exports** list.

Figure 6.12. Record Exports List



To export a copy of a record (data) from the WGMS database to your computer, click on the record export icon next to the **Record Exporter Name**, or double click anywhere in the row that contains the **Record Exporter Name** - an Export dialog box will appear. For example, when you double click on the **All ADCP C2 Samples for SW_1732** Record Exporter Name, an **Export PayloadPacketRecord Records** dialog box appears.

Figure 6.13. Example - Export Dialog Box



After editing the Export dialog box:

1. Click **Save** to save the export record. A window will confirm that the export record was created successfully. Click **OK** to close the window

2. Click **Export** to export a copy of the data to your computer.

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

Similar export dialog boxes are available for Part Records, Vehicle Parsed Output Records, Vehicle Command Records, Attachment Records, Vehicle Error Records, Vehicle Power Status Records, Vehicle Payload Status Records, and Weather Report Records.

Viewing Custom Reports

Use the **Custom Reports** screen to, view data from vehicle operations. A Custom Report displays data from a specific payload on a specific vehicle.

The following browsers are supported for viewing WGMS Custom Reports:

Browser	Version	Platform	Display
Internet Explorer	9, 10	Windows	Desktop
Firefox	20.0.1 (or later)	Windows	Desktop
Safari	6.0.4 (or later)	Mac	Desktop
Safari	(latest)	iPad (iOS 6.1 or later)	Mobile
Chrome	26.0.1410.64 m (or later)	Windows	Desktop
Chrome	(latest)	Android (4.0 or later)	Mobile

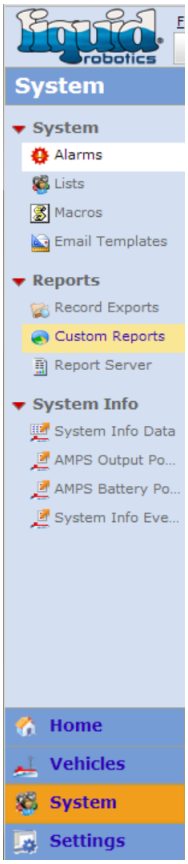
There are Custom Reports available for the following Wave Glider integrated payloads:

- **ADCP C2**
- **ADCP C4**
- **ADCP Bathymetry**
- **ADCP Header**
- **Aquatracka**
- **Benthos Modem**
- **C-Star**
- **Datawell MOSE**
- **Eco-Puck**
- **Fluorometer**
- **Fluorometer Header**
- **LISST Sensor**
- **pCO2 Sensor**
- **Seabird CTD**
- **VEMCO VR2C**
- **WHOI Micro Modem**

To view Custom Reports:

1. Click on **Show System Menus** to open the WGMS system menus.
2. Click on the **System** button to open the **System** screen.
3. Click on the **Custom Reports** side tab in the **Reports** menu on the side-bar.

Figure 6.14. Opening the Custom Reports Screen



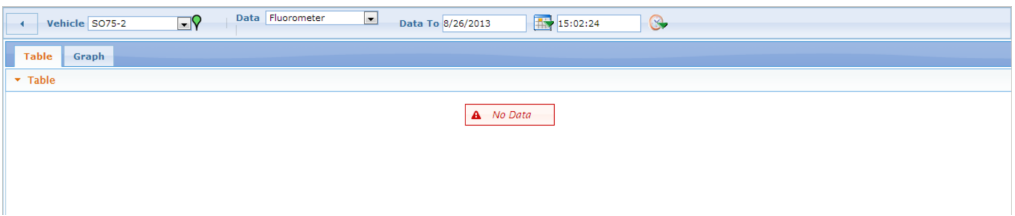
The Custom Reports screen for the selected vehicle will appear.

The toolbar at the top of the Custom Reports screen includes a drop down menu that displays the name of the vehicle that the data in the custom report comes from. If you want to view data from a different vehicle, you can select one from the drop down menu.

Data can be viewed in either of two formats, depending on which tab is selected:

- **Table** - This data format appears when the **Table** tab is selected. By default, the Custom Reports screen opens with the **Table** tab selected displaying data in a tabular format.
- **Graph** - This data format appears when the **Graph** tab is selected displaying data in a a variety of graphs depending on the variables you select.

Figure 6.15. Custom Reports Screen - No Data Available



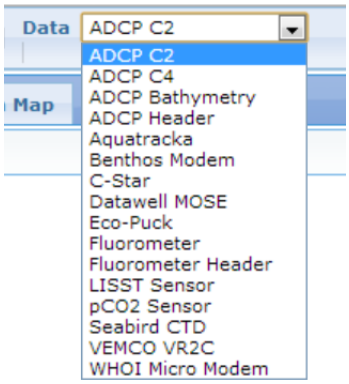
The data type in the **Data** drop-down menu will vary depending on what data type was last viewed in the Custom Reports screen. In Figure 6.15, the Custom Reports screen opened with **Fluorometer** selected in the **Data** drop-down menu, but the No Data icon indicates that the selected vehicle in the **Vehicle** drop-down menu (**SO75-2**) is not generating Fluorometer data. This is the expected behavior for the Custom Reports screen. If the selected vehicle does not have a payload that generates the selected data type, the **No Data** icon will appear, instead of data.

Note

The Custom Reports screens for all of the supported data types have a similar format, except for the ADCP C2 and ADCP C4 data types. For information on viewing the ADCP C2 and C4 data types, see “ADCP C2 and ADCP C4 Data Display” (page 103).

If you know the type of data that you want to view, and you know the selected vehicle is capable of generating that data type, select it from the **Data** drop down menu.

Figure 6.16. Data Drop-Down Menu



If you do not know which data types the selected vehicle is capable of generating, you will need to work your way through the list in the **Data** drop-down menu to determine what data types are available from the selected vehicle.

Note

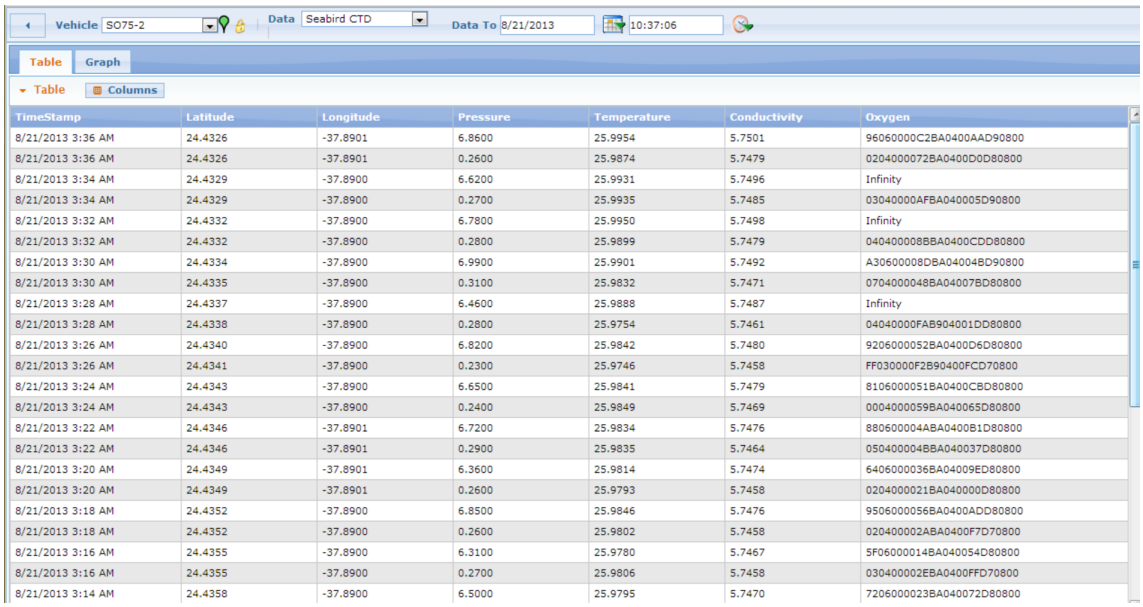
A future WGMS release will automatically populate the **Data** drop-down menu with only the data types that are available from the selected vehicle.

If a data type selected in the **Data** drop-down menu is available for the selected vehicle, an animated loading icon will appear temporarily while the data loads, then the Custom Report screen will display data.

Custom Reports Table Format

By default, the Custom Reports screen opens to the **Table** tab and displays all of the columns available for a selected data type.

Figure 6.17. Custom Reports Screen With Data - Table Format

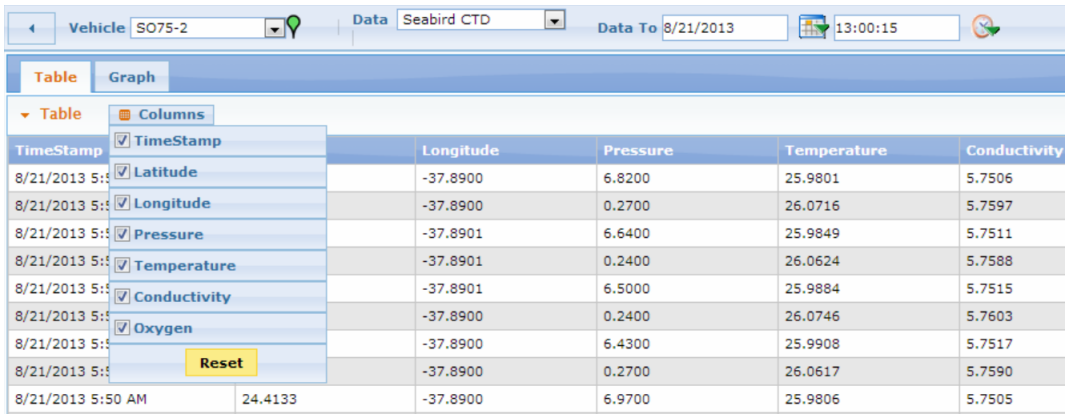


TimeStamp	Latitude	Longitude	Pressure	Temperature	Conductivity	Oxygen
8/21/2013 3:36 AM	24.4326	-37.8901	6.8600	25.9954	5.7501	96060000C2BA0400AAD90800
8/21/2013 3:36 AM	24.4326	-37.8901	0.2600	25.9874	5.7479	0204000072BA0400D0D80800
8/21/2013 3:34 AM	24.4329	-37.8900	6.6200	25.9931	5.7496	Infinity
8/21/2013 3:34 AM	24.4329	-37.8900	0.2700	25.9935	5.7485	03040000AFBA040005D90800
8/21/2013 3:32 AM	24.4332	-37.8900	6.7800	25.9950	5.7498	Infinity
8/21/2013 3:32 AM	24.4332	-37.8900	0.2800	25.9899	5.7479	040400008BBA0400CDD80800
8/21/2013 3:30 AM	24.4334	-37.8900	6.9900	25.9901	5.7492	A30600008DBA04004BD90800
8/21/2013 3:30 AM	24.4335	-37.8900	0.3100	25.9832	5.7471	0704000048BA04007BD80800
8/21/2013 3:28 AM	24.4337	-37.8900	6.4600	25.9888	5.7487	Infinity
8/21/2013 3:28 AM	24.4338	-37.8900	0.2800	25.9754	5.7461	04040000FAB904001DD80800
8/21/2013 3:26 AM	24.4340	-37.8900	6.8200	25.9842	5.7480	9206000052BA0400D6D80800
8/21/2013 3:26 AM	24.4341	-37.8900	0.2300	25.9746	5.7458	FF030000F2B90400FCD70800
8/21/2013 3:24 AM	24.4343	-37.8900	6.6500	25.9841	5.7479	8106000051BA0400CBD80800
8/21/2013 3:24 AM	24.4343	-37.8900	0.2400	25.9849	5.7469	0004000059BA040065D80800
8/21/2013 3:22 AM	24.4346	-37.8901	6.7200	25.9834	5.7476	880600004ABA0400B1D80800
8/21/2013 3:22 AM	24.4346	-37.8901	0.2900	25.9835	5.7464	050400004BBA040037D80800
8/21/2013 3:20 AM	24.4349	-37.8901	6.3600	25.9814	5.7474	6406000036BA04009ED80800
8/21/2013 3:20 AM	24.4349	-37.8901	0.2600	25.9793	5.7458	0204000021BA040000D80800
8/21/2013 3:18 AM	24.4352	-37.8900	6.8500	25.9846	5.7476	9506000056BA0400ADD80800
8/21/2013 3:18 AM	24.4352	-37.8900	0.2600	25.9802	5.7458	020400002ABA0400F7D70800
8/21/2013 3:16 AM	24.4355	-37.8900	6.3100	25.9780	5.7467	5F06000014BA040054D80800
8/21/2013 3:16 AM	24.4355	-37.8900	0.2700	25.9806	5.7458	030400002EBA0400FFD70800
8/21/2013 3:14 AM	24.4358	-37.8900	6.5000	25.9795	5.7470	7206000023BA040072D80800

For some data types you will need to scroll to the right to see all of the columns. To limit the number of columns displayed:

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

Figure 6.18. Changing the Columns that are Displayed



TimeStamp		Longitude	Pressure	Temperature	Conductivity
8/21/2013 5:5		-37.8900	6.8200	25.9801	5.7506
8/21/2013 5:5		-37.8900	0.2700	26.0716	5.7597
8/21/2013 5:5		-37.8901	6.6400	25.9849	5.7511
8/21/2013 5:5		-37.8901	0.2400	26.0624	5.7588
8/21/2013 5:5		-37.8901	6.5000	25.9884	5.7515
8/21/2013 5:5		-37.8900	0.2400	26.0746	5.7603
8/21/2013 5:5		-37.8900	6.4300	25.9908	5.7517
8/21/2013 5:5		-37.8900	0.2700	26.0617	5.7590
8/21/2013 5:50 AM	24.4133	-37.8900	6.9700	25.9806	5.7505

Note

The Custom Report screen provides similar functionality on a tablet, but the navigation is slightly different. When using a tablet, allow extra time for Custom Report screens to generate.

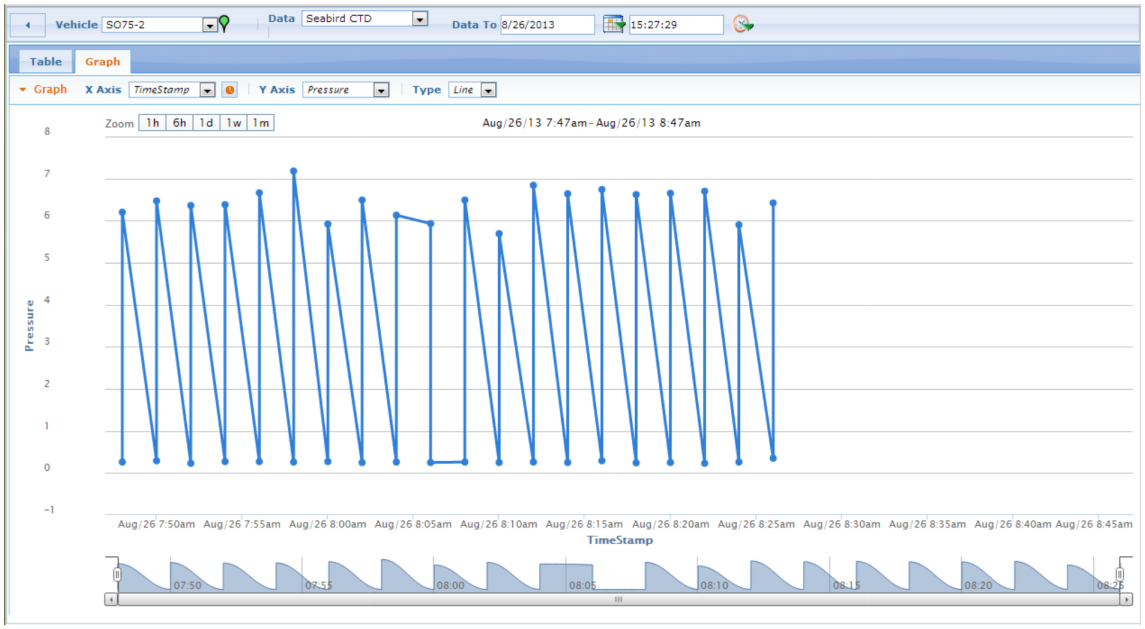
By default, the custom report for a selected data type will display all available data. You can limit the amount of historical data that is displayed by changing the **Data To:** date and time

settings. Changing the date and time settings will update the custom report screen that you are viewing.

Custom Reports Graph Format

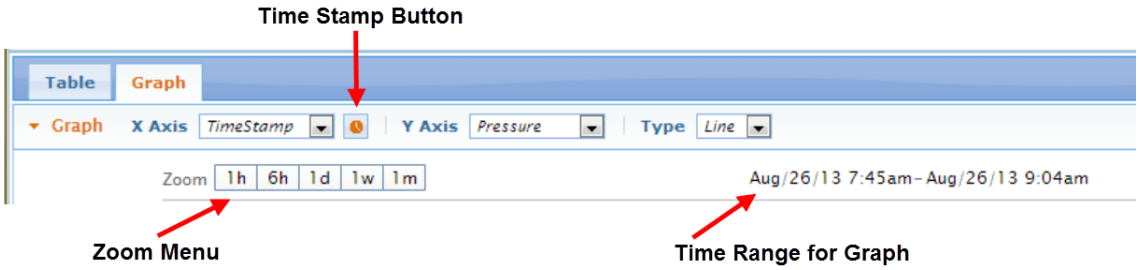
Click on the **Graph** tab to view the graphical data display for the selected vehicle and data type.

Figure 6.19. Custom Reports Screen - Graph Format



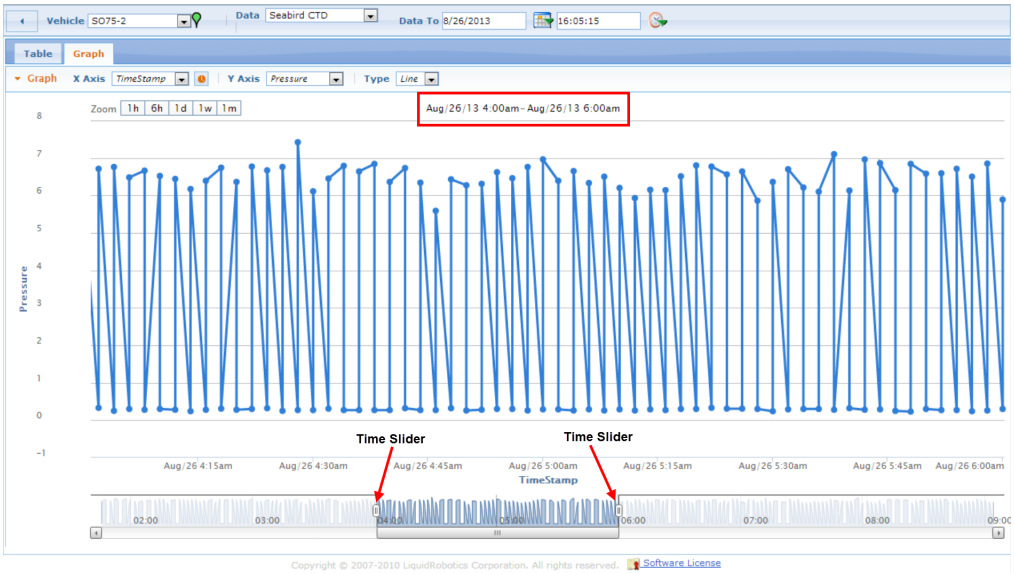
The selections made in the **X Axis** and **Y Axis** drop-down menus determine how the data is displayed. Displaying the **Time Stamp** on the X Axis with one of the other variables displayed on the Y Axis graphs the Y Axis data over time. This is the most widely used combination of X and Y Axis variables. The **Time Stamp** button adjacent to the **X Axis** drop-down menu can also be used to set the X Axis to **Time Stamp**. The **Type** drop-down menu is used to add or remove the line that connects the data points on the graph. Click on one of the selections in the **Zoom** menu to display data for the last hour, 6 hours, 1 day, 1 week, or 1 month. The Time Range indicates when the data display begins and ends.

Figure 6.20. Custom Reports Screen - Graph Format Time Settings



The **Time Slider** buttons in the time line at the bottom of the **Graph** display can also be used to adjust the time range for the data display.

Figure 6.21. Custom Reports Screen - Graph Format Time Slider



Note

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

ADCP C2 and ADCP C4 Data Display

The WGMS Custom Report for the Wave Glider integrated Teledyne RD Instruments Workhorse Monitor ADCP displays C2 data in a Table format, a Graph format, and a Bin Map format. C4 data is displayed in Table and Graph formats only. The WGMS Custom Report display for all other data types, including ADCP Bathymetry and ADCP Header data, is described in “Viewing Custom Reports ” (page 97)

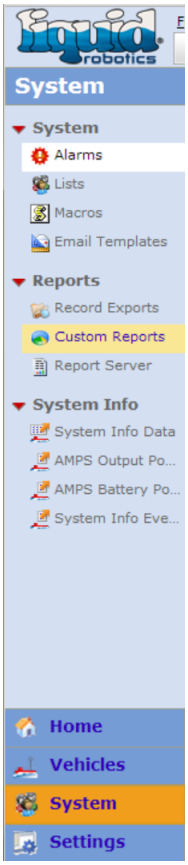
The following browsers are supported:

Browser	Version	Platform	Display
Internet Explorer	9, 10	Windows	Desktop
Firefox	20.0.1 (or later)	Windows	Desktop
Safari	6.0.4 (or later)	Mac	Desktop
Safari	(latest)	iPad (iOS 6.1 or later)	Mobile
Chrome	26.0.1410.64 m (or later)	Windows	Desktop
Chrome	(latest)	Android (4.0 or later)	Mobile

To view the Custom Report for ADCP data from a specific Wave Glider vehicle:

1. Click on **Show System Menus** to open the WGMS system menus.
2. Click on the **System** button to open the **System** screen.
3. Click on the **Custom Reports** side tab in the **Reports** menu on the side-bar.

Figure 6.22. Opening the Custom Reports Screen



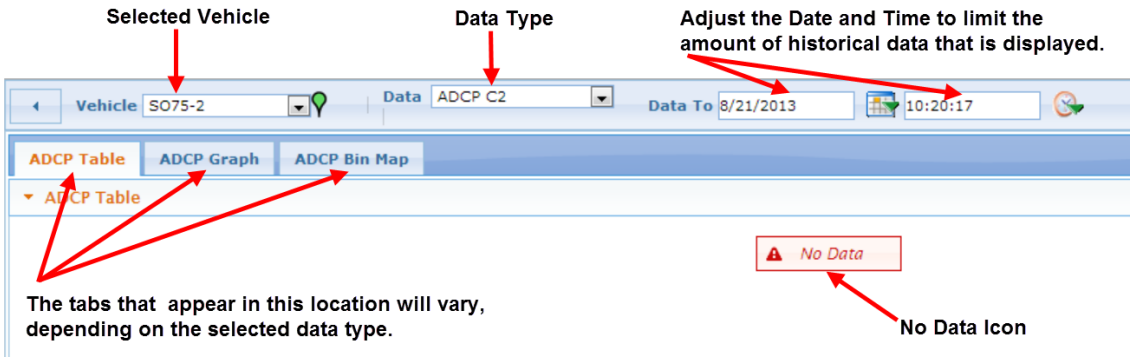
The Custom Reports screen for the selected vehicle will appear.

Note

You can also select vehicles from a menu in the tool bar on the ADCP Custom Report screen.

If there is no data available, the screen will be empty.

Figure 6.23. Custom Reports Screen No ADCP C2 Data



If data is available for the selected vehicle (changed to **SO75-3**), an animated loading icon will appear temporarily while the data loads, then the Custom Report screen will display data as illustrated in Figure 6.24.

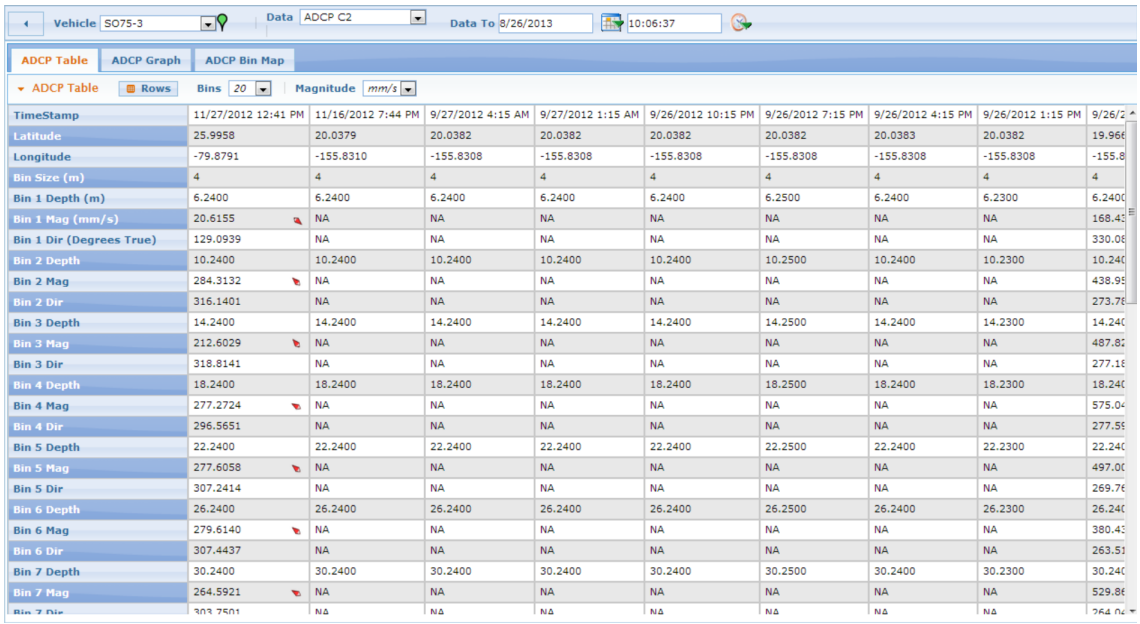
ADCP C2 and C4 Table Format

The Custom Report for ADCP C2 and C4 data displays data in the **Table** format by default, as illustrated in Figure 6.24

Note

The Custom Report screen provides similar functionality on a tablet, but the navigation is slightly different. When using a tablet, allow extra time for Custom Report screens to generate.

Figure 6.24. ADCP Custom Reports Screen - Table Format

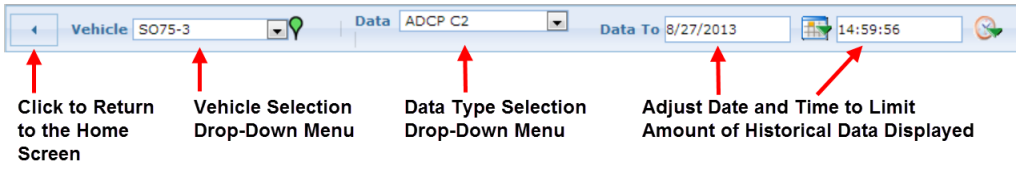


TimeStamp	11/27/2012 12:41 PM	11/16/2012 7:44 PM	9/27/2012 4:15 AM	9/27/2012 1:15 AM	9/26/2012 10:15 PM	9/26/2012 7:15 PM	9/26/2012 4:15 PM	9/26/2012 1:15 PM	9/26/2
Latitude	25.9958	20.0379	20.0382	20.0382	20.0382	20.0382	20.0383	20.0382	19.966
Longitude	-79.8791	-155.8310	-155.8308	-155.8308	-155.8308	-155.8308	-155.8308	-155.8308	-155.8
Bin Size (m)	4	4	4	4	4	4	4	4	4
Bin 1 Depth (m)	6.2400	6.2400	6.2400	6.2400	6.2400	6.2500	6.2400	6.2300	6.240
Bin 1 Mag (mm/s)	20.6155	NA	NA	NA	NA	NA	NA	NA	168.4
Bin 1 Dir (Degrees True)	129.0939	NA	NA	NA	NA	NA	NA	NA	330.0
Bin 2 Depth	10.2400	10.2400	10.2400	10.2400	10.2400	10.2500	10.2400	10.2300	10.24
Bin 2 Mag	284.3132	NA	NA	NA	NA	NA	NA	NA	438.9
Bin 2 Dir	316.1401	NA	NA	NA	NA	NA	NA	NA	273.7
Bin 3 Depth	14.2400	14.2400	14.2400	14.2400	14.2400	14.2500	14.2400	14.2300	14.24
Bin 3 Mag	212.6029	NA	NA	NA	NA	NA	NA	NA	487.8
Bin 3 Dir	318.8141	NA	NA	NA	NA	NA	NA	NA	277.1
Bin 4 Depth	18.2400	18.2400	18.2400	18.2400	18.2400	18.2500	18.2400	18.2300	18.24
Bin 4 Mag	277.2724	NA	NA	NA	NA	NA	NA	NA	575.0
Bin 4 Dir	296.5651	NA	NA	NA	NA	NA	NA	NA	277.5
Bin 5 Depth	22.2400	22.2400	22.2400	22.2400	22.2400	22.2500	22.2400	22.2300	22.24
Bin 5 Mag	277.6058	NA	NA	NA	NA	NA	NA	NA	497.0
Bin 5 Dir	307.2414	NA	NA	NA	NA	NA	NA	NA	269.7
Bin 6 Depth	26.2400	26.2400	26.2400	26.2400	26.2400	26.2500	26.2400	26.2300	26.24
Bin 6 Mag	279.6140	NA	NA	NA	NA	NA	NA	NA	380.4
Bin 6 Dir	307.4437	NA	NA	NA	NA	NA	NA	NA	263.5
Bin 7 Depth	30.2400	30.2400	30.2400	30.2400	30.2400	30.2500	30.2400	30.2300	30.24
Bin 7 Mag	264.5921	NA	NA	NA	NA	NA	NA	NA	529.8
Bin 7 Dir	303.7501	NA	NA	NA	NA	NA	NA	NA	264.0

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

The toolbar at the top of the Custom Reports screen includes a drop down menu that displays the name of the vehicle that the data in the custom report comes from. If you want to view data from a different vehicle, you can select one from the drop down menu.

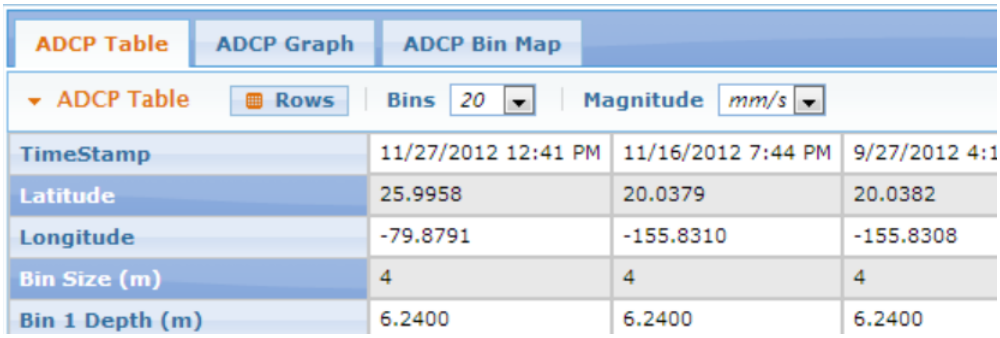
Figure 6.25. Custom Reports Tool Bar



By default, a custom data screen will display all available data. To see it all you must scroll to the right, until you reach the end. You can limit the amount of historical data that is displayed by changing the **Data To:** date and time settings. Changing the date and time settings will update the custom report screen that you are viewing.

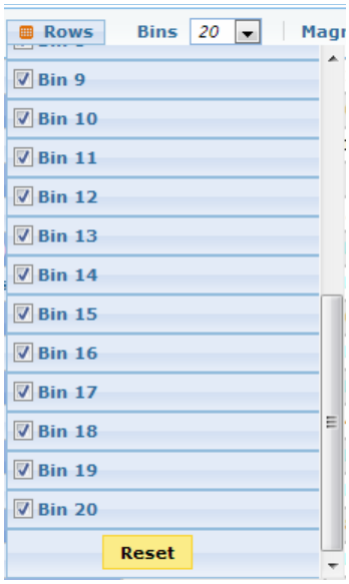
The ADCP Table format tool bar located at the top of the table includes **Rows**, **Bins**, and **Magnitude** menus that allow you to modify the data that will be displayed in the table.

Figure 6.26. ADCP C2 and C4 Table Format Tool Bar



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

Figure 6.27. Rows Drop-Down Menu



- Use the Bins 20 drop-down menu to limit the number of Bins that are displayed in the ADCP Table.

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

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

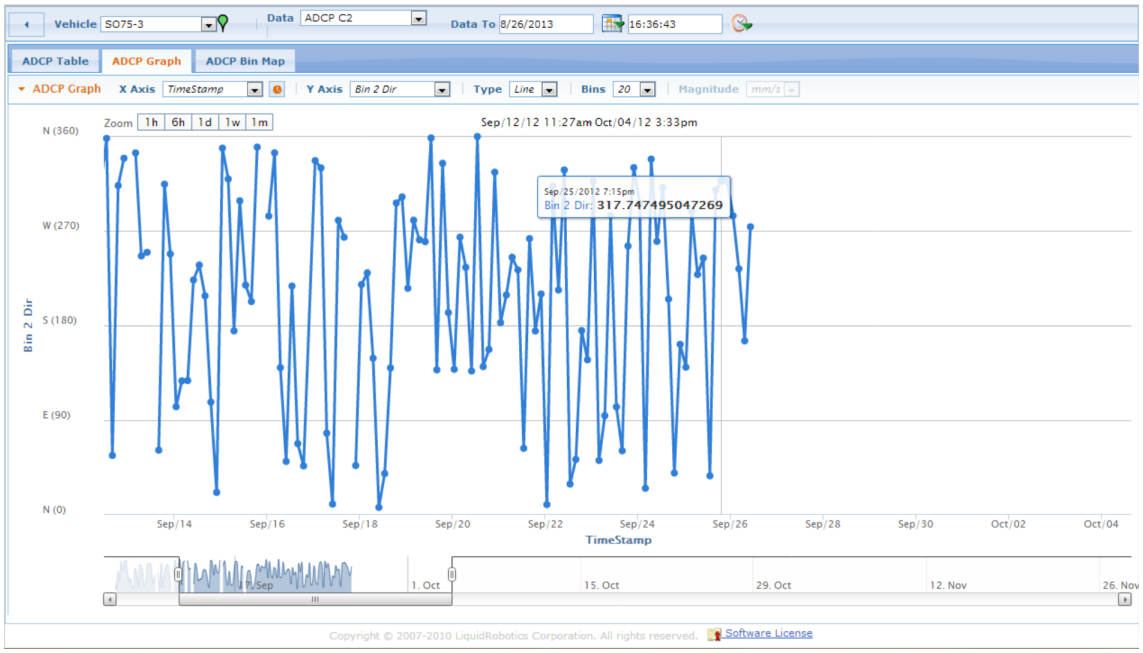
Figure 6.28. Compass Icons

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

ADCP C2 and C4 Graph Format

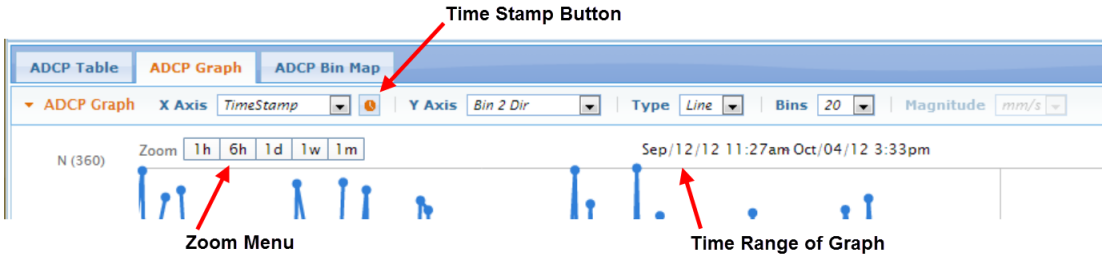
The Custom Report for ADCP C2 and C4 data includes an **ADCP Graph** option. Click on the **ADCP Graph** tab to view a graphical display of C2 or C4 data for the selected vehicle.

Figure 6.29. Custom Reports Screen - ADCP C2 Graph Format



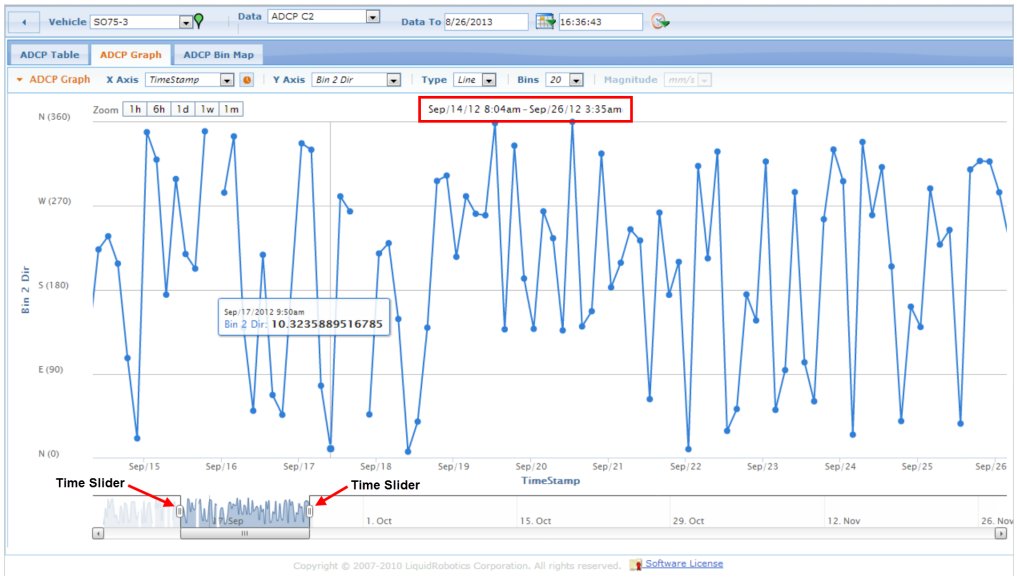
The selections made in the **X Axis** and **Y Axis** drop-down menus determine how the data is displayed. Displaying the **Time Stamp** on the X Axis with one of the other variables displayed on the Y Axis graphs the Y Axis data over time. This is the most widely used combination of X and Y Axis variables. The **Time Stamp** button adjacent to the **X Axis** drop-down menu can also be used to set the X Axis to **Time Stamp**. The **Type** drop-down menu is used to add or remove the line that connects the data points on the graph. Click on one of the selections in the **Zoom** menu to display data for the last hour, 6 hours, 1 day, 1 week, or 1 month. The Time Range indicates when the data display begins and ends.

Figure 6.30. ADCP Graph Format - Time Settings



The **Time Slider** buttons in the time line at the bottom of the graph can also be used to adjust the time range for the data display.

Figure 6.31. ADCP Graph Format - Time Slider



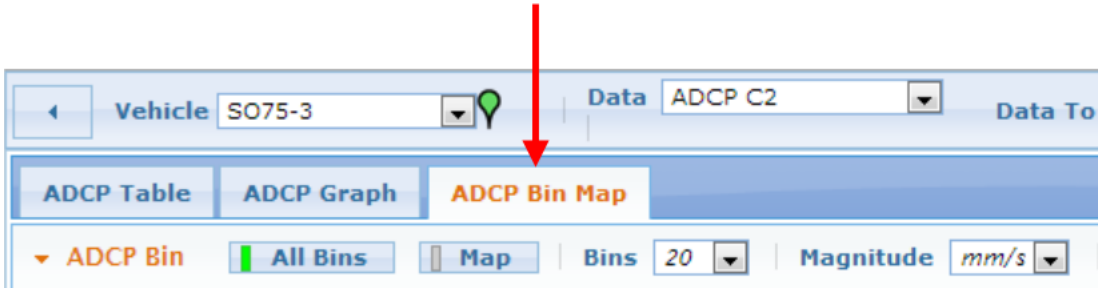
Note

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

ADCP C2 Bin Map Format

The Custom Report for ADCP C2 data includes a tab for a **Bin Map** data display. To view the ADCP C2 Bin Map format, click on the **Bin Map** tab.

Figure 6.32. Select ADCP Bin Map Display

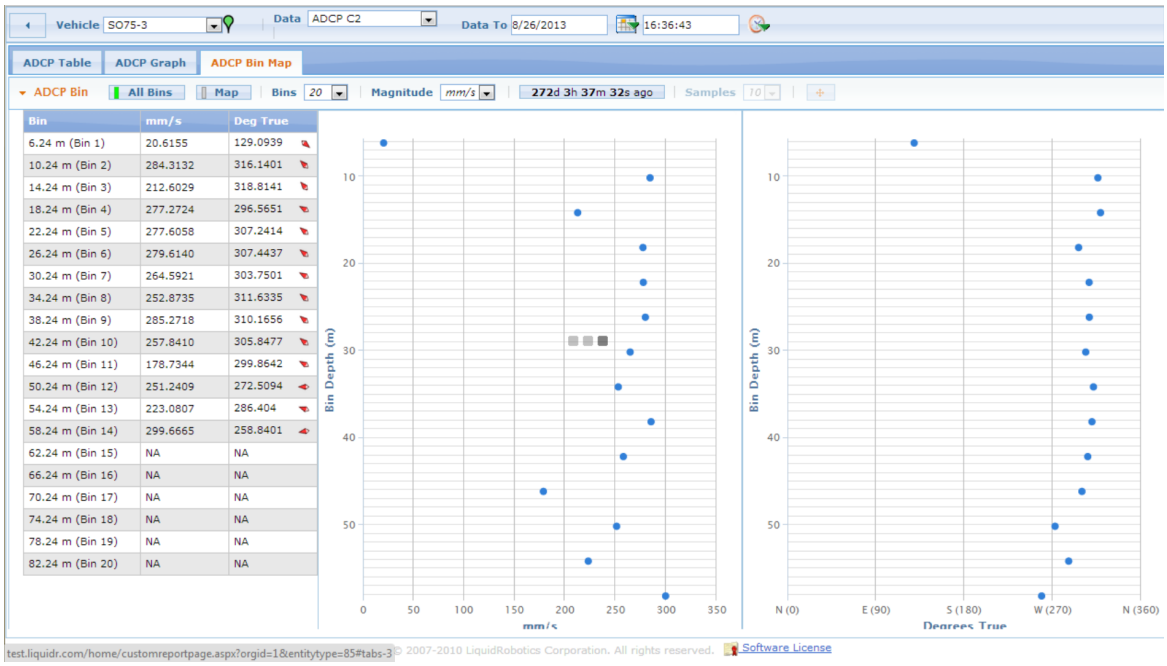


The ADCP Bin Map format displays the most recent ADCP data. It is automatically updated every 120 seconds and will redraw itself only if new data is found. The time when the ADCP Bin Map data was last updated, and the time that has passed since then are displayed in the time window:

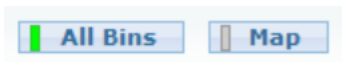
The ADCP Bin Map format displays data in two modes: **All Bins** and **Map**. All Bins is the default mode when you select the ADCP Bin Map data format.

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

Figure 6.33. ADCP Bin Map in All Bins Mode

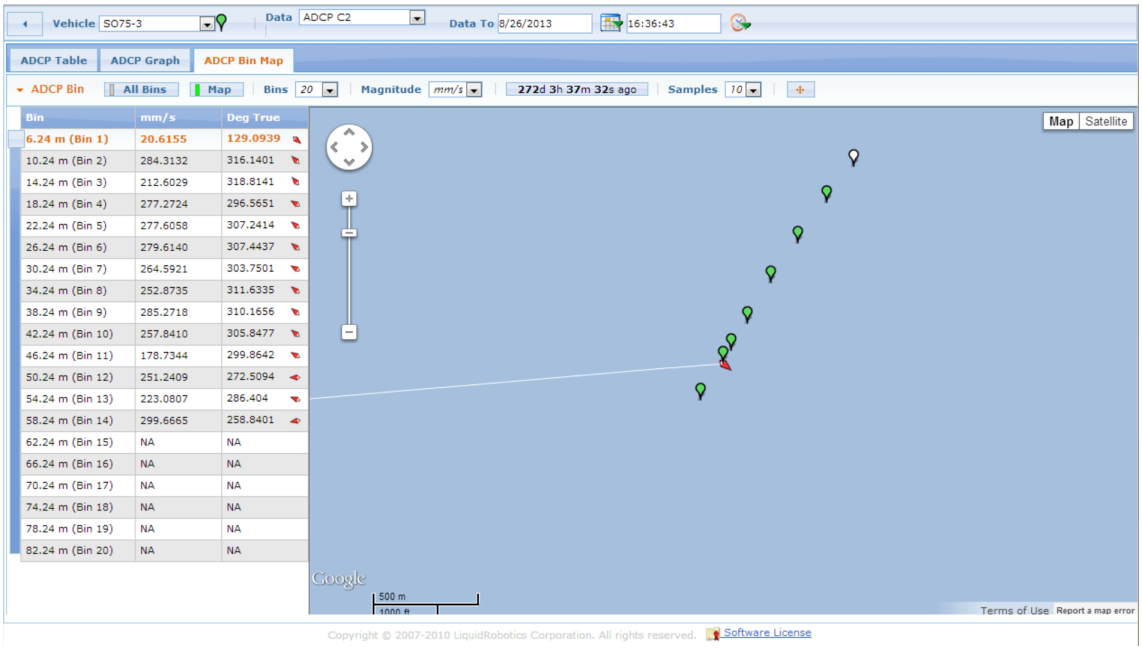


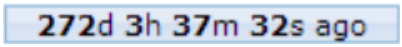
Click on the **Map** button to display the Map mode.



Map mode displays the same Bin Depth table that appears in All Bins mode. When you click on a row in the Bin Depth table, a compass icon locating that ADCP data point on a world map is displayed on the adjacent Map panel.

Figure 6.34. ADCP Bin Map in Map Mode

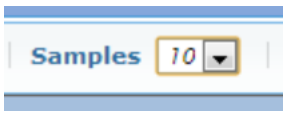


The time when the ADCP Bin Map data was last updated, and the time that has passed since then are displayed in the time window. 

Use the

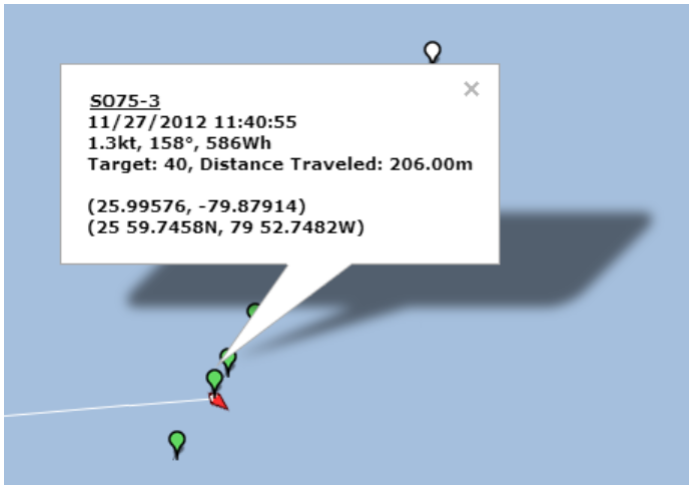
drop-down menu to set the units for rows in the Bin Depth table. The options are **mm/s** or **Knots**. When you change the **Magnitude** setting, the ADCP Table regenerates with the selected unit of magnitude.

When you click on a Bin Depth row in the Bin Depth table, the text in the row changes color and the associated data points are displayed in the Map panel. You have the option to display the most recent data sample, or the 5, 10, 15, or 20 most recent data samples for this Bin Depth. You can adjust the number of samples displayed by changing the setting in the **Samples** drop-down menu. The default setting is 10.



Clicking on the button will re-center the map display.

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


SO75-3
11/27/2012 11:40:55
1.3kt, 158°, 586Wh
Target: 40, Distance Traveled: 206.00m
(25.99576, -79.87914)
(25 59.7458N, 79 52.7482W)

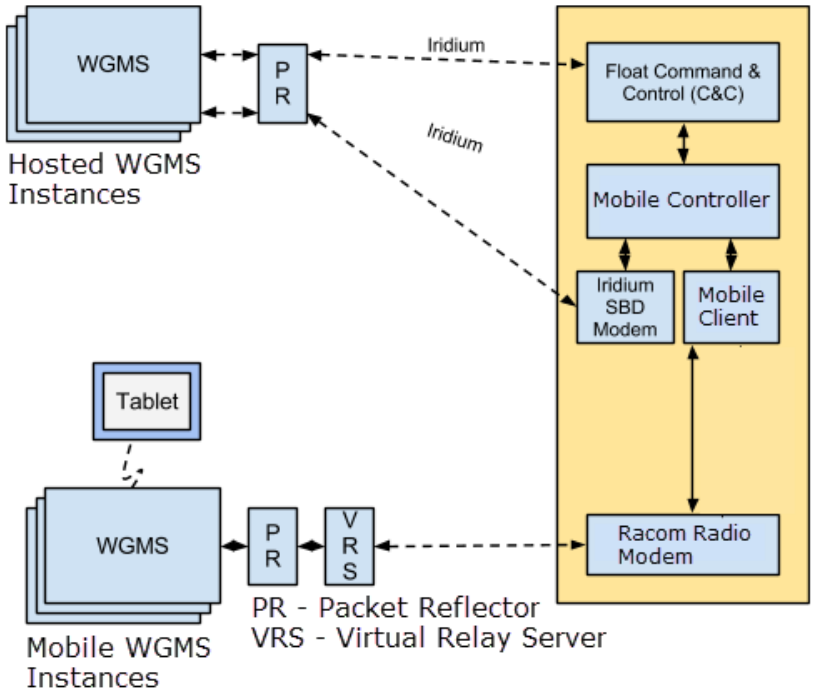
Chapter 7. Mobile WGMS

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

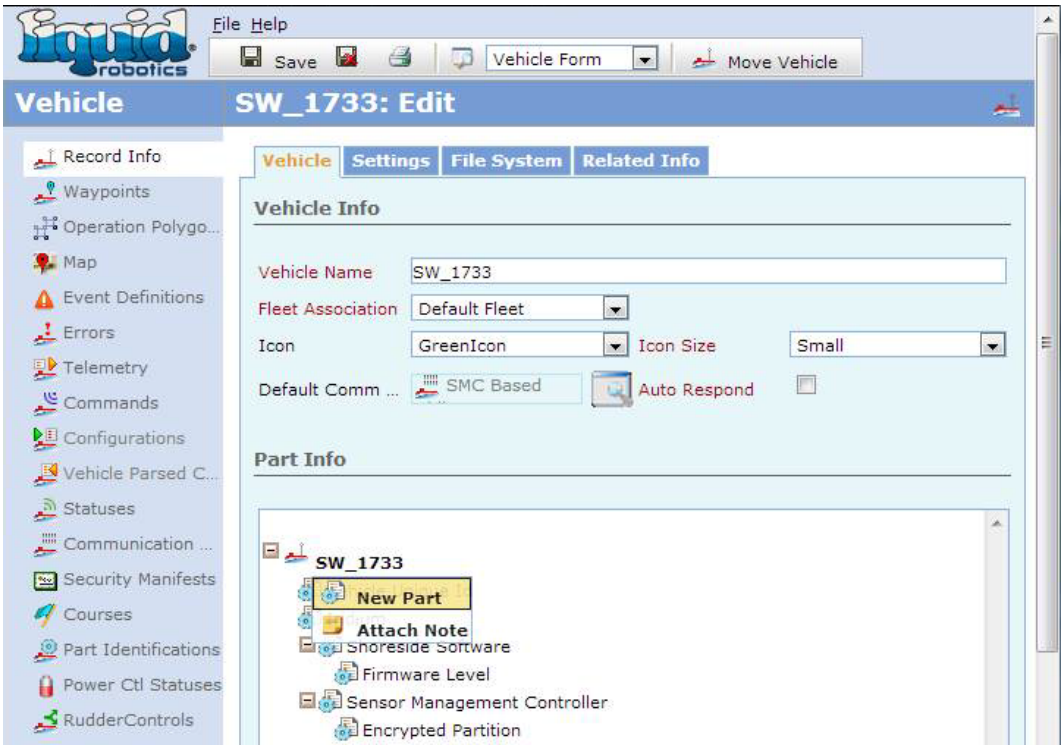
To configure a Mobile WGMS enabled Wave Glider Vehicle, the following tasks and settings must be confirmed or completed:

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).

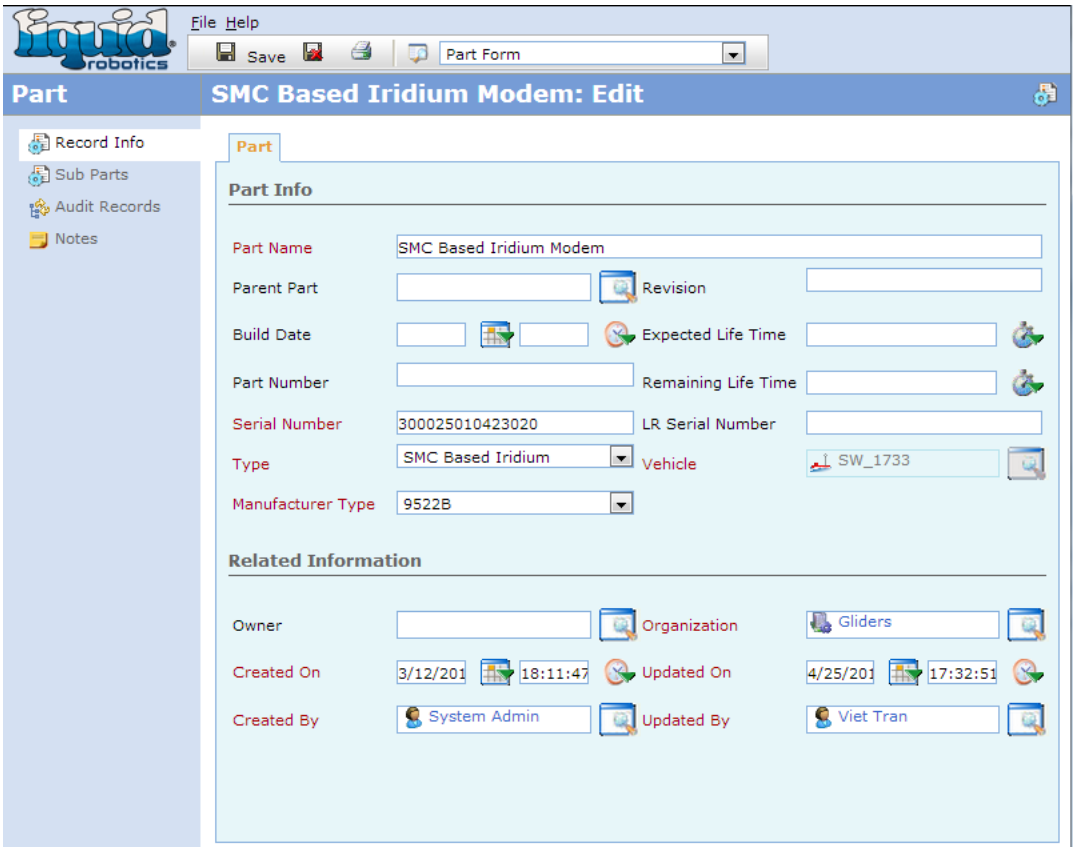
From a Liquid Robotics or customer hosted instance of WGMS, follow this procedure to set up a mobile enabled Wave Glider vehicle:

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).

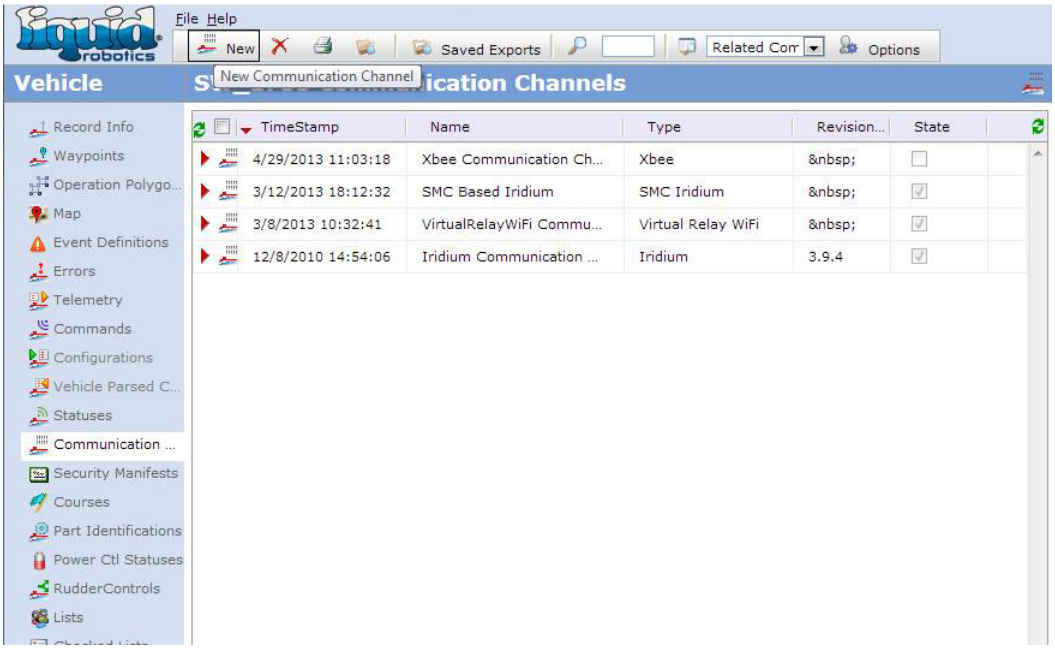


In the new **Part Form**:

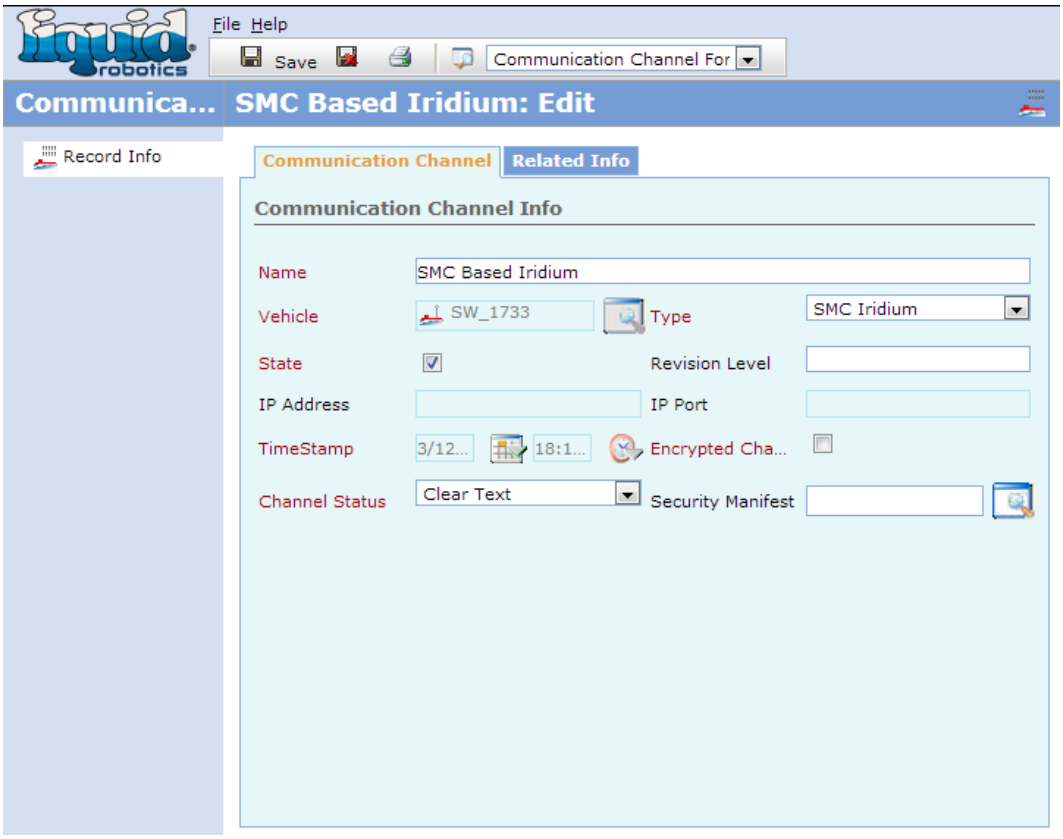
- Enter a **Part Name** for the new part.
- Enter the IMEI for the SMC based modem into the **Serial Number** field.
- In the **Type** drop-down menu, select **SMC Based Iridium Part**.
- In the **Manufacturer Type** drop-down menu, select **9522B**.



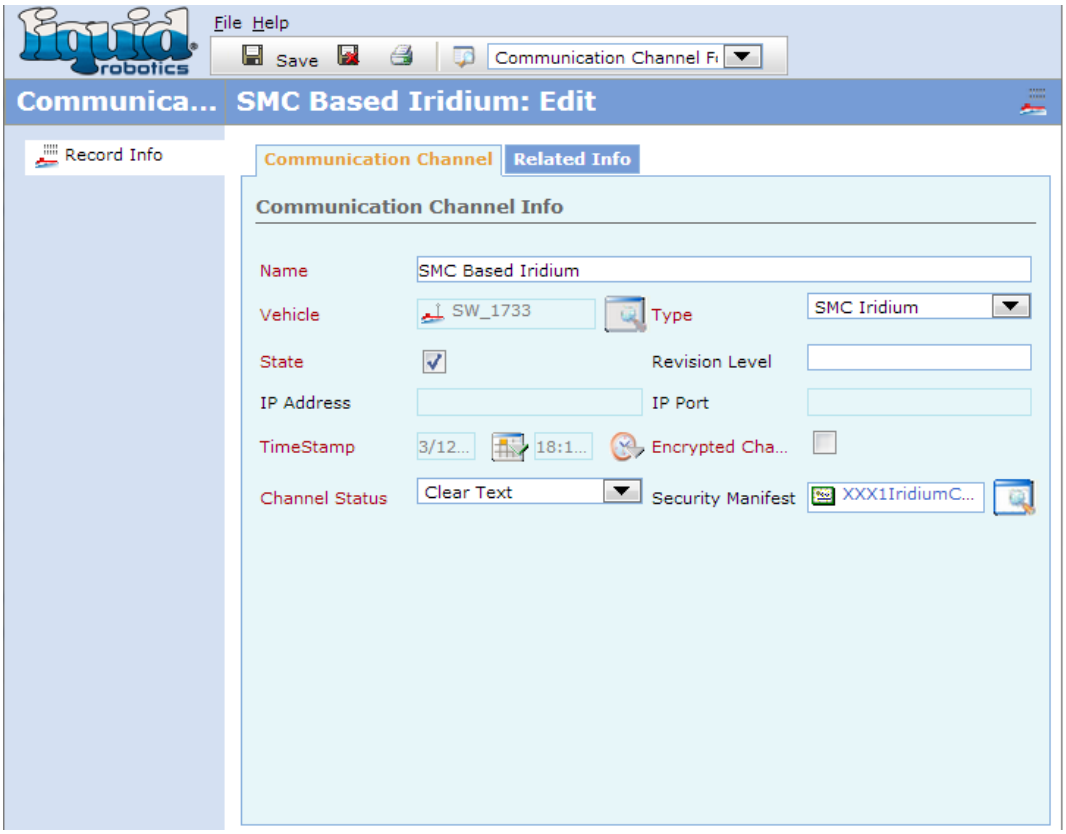
2. Add SMC Based Iridium COM channel (if one does not already exist).



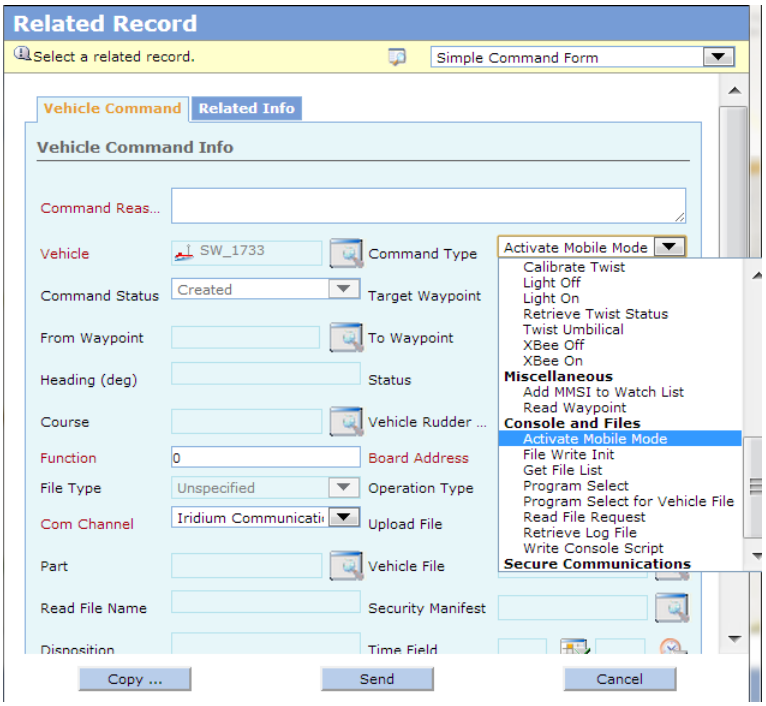
Under the **Communication Channel** tab, select **SMC Iridium** in **Type** drop-down menu.



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

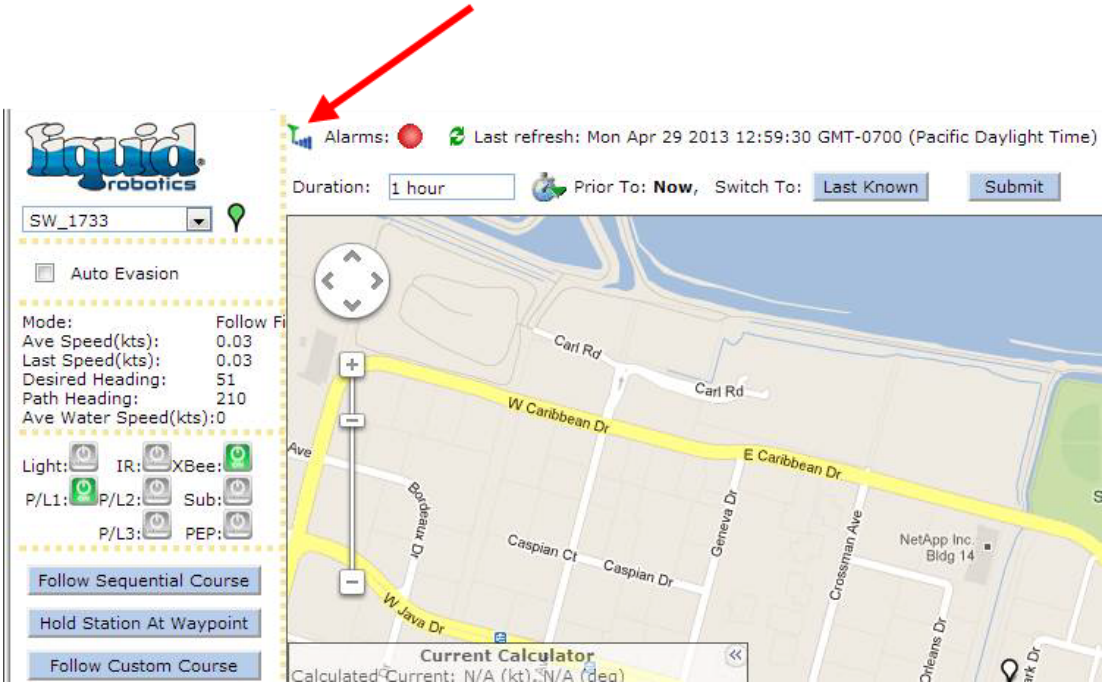


4. At this point, if the vehicle in the dashboard is the vehicle you want to enable for Mobile WGMS, you can issue the Activate Mobile Mode command.

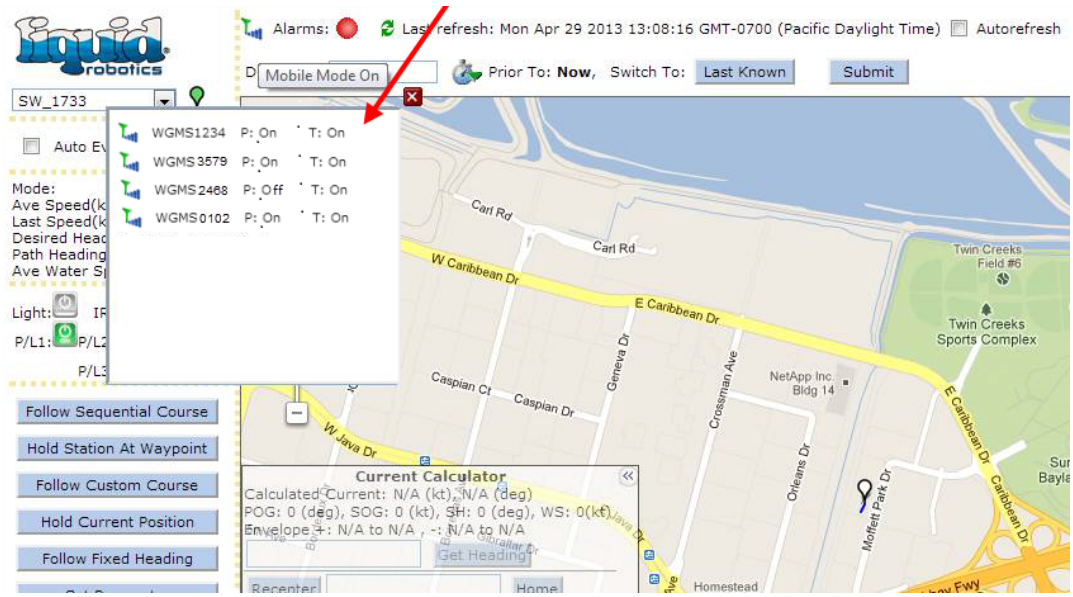


5. Once the **Activate Mobile Mode** command is ACKed by the vehicle, WGMS will issue an automatic **Set Default Channel to SMC Based Iridium**. This will complete enabling Mobile WGMS on the vehicle.

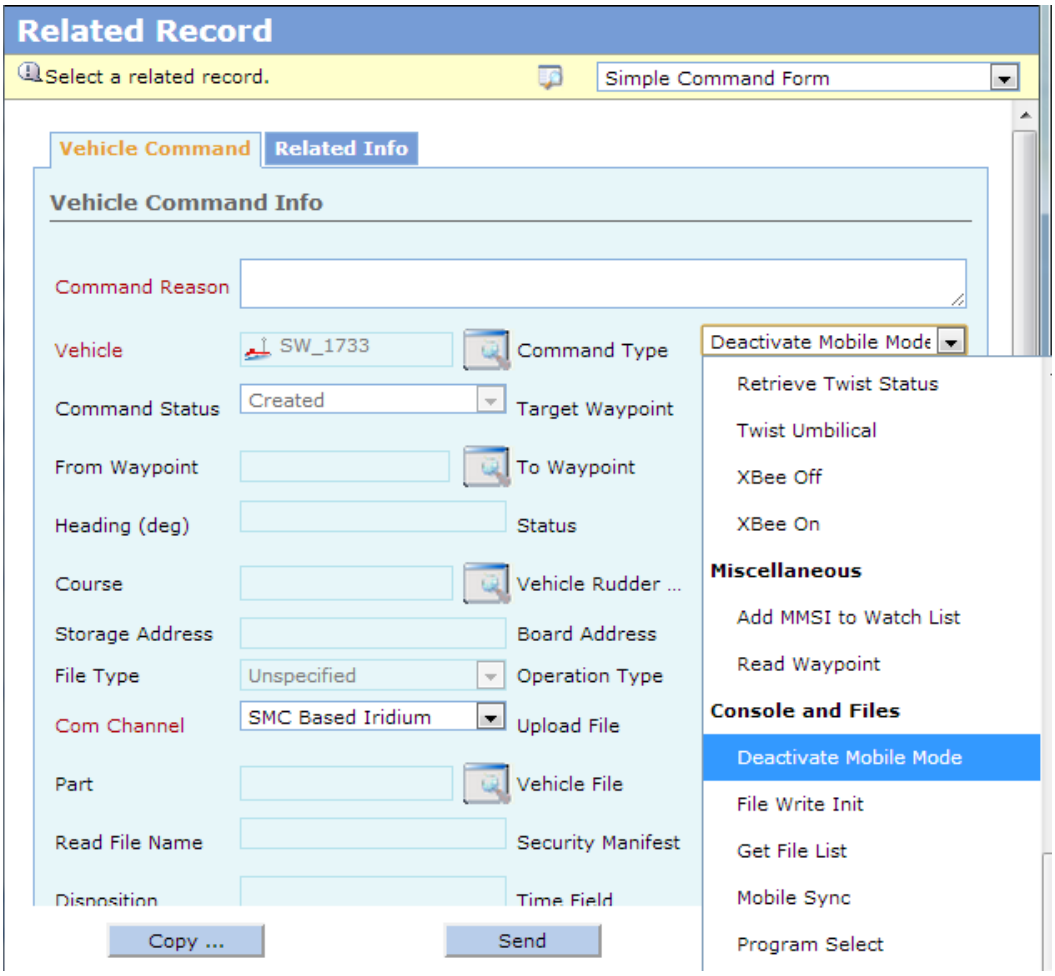
   When Mobile Mode is activated on a vehicle (after successfully issuing an **Activate Mobile Mode** command), an additional icon appears on the WGMS Dashboard for that vehicle on the LRI or customer hosted instance of WGMS:



   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:



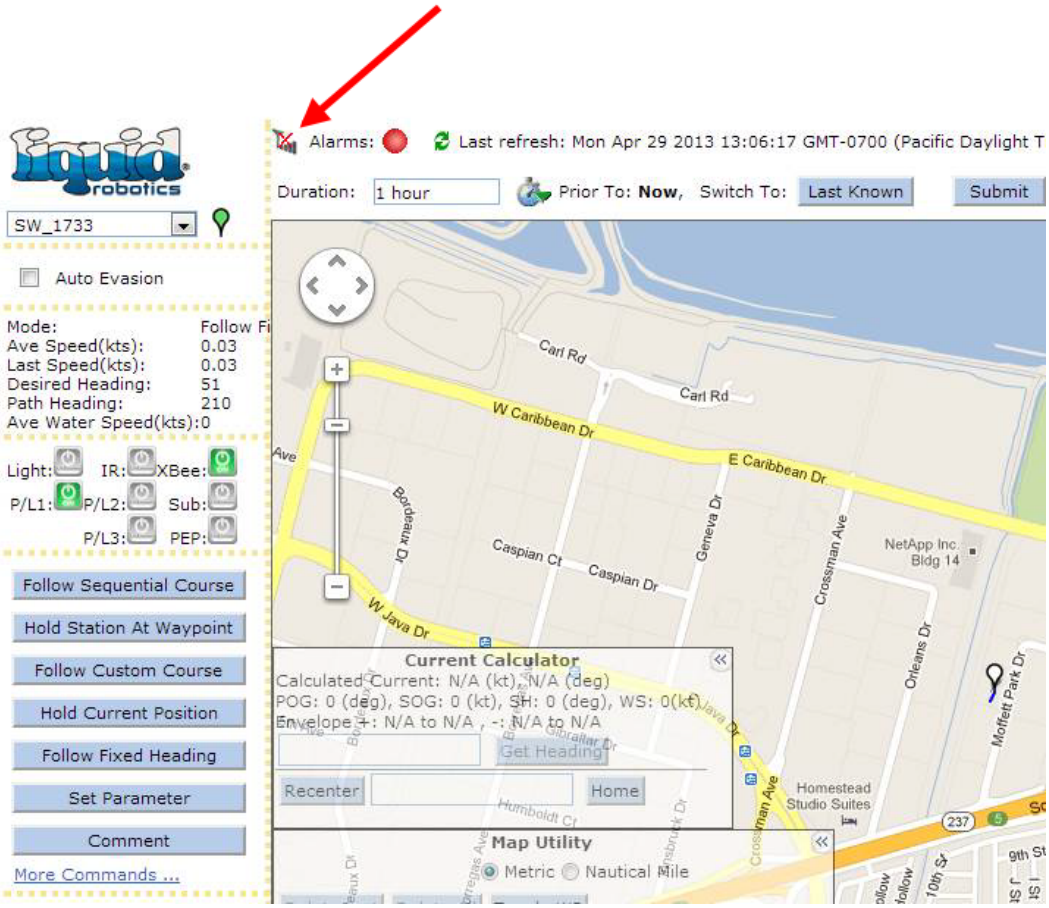
6. At this point the **Deactivate Mobile Mode** command should appear in the command drop-down list.



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**:

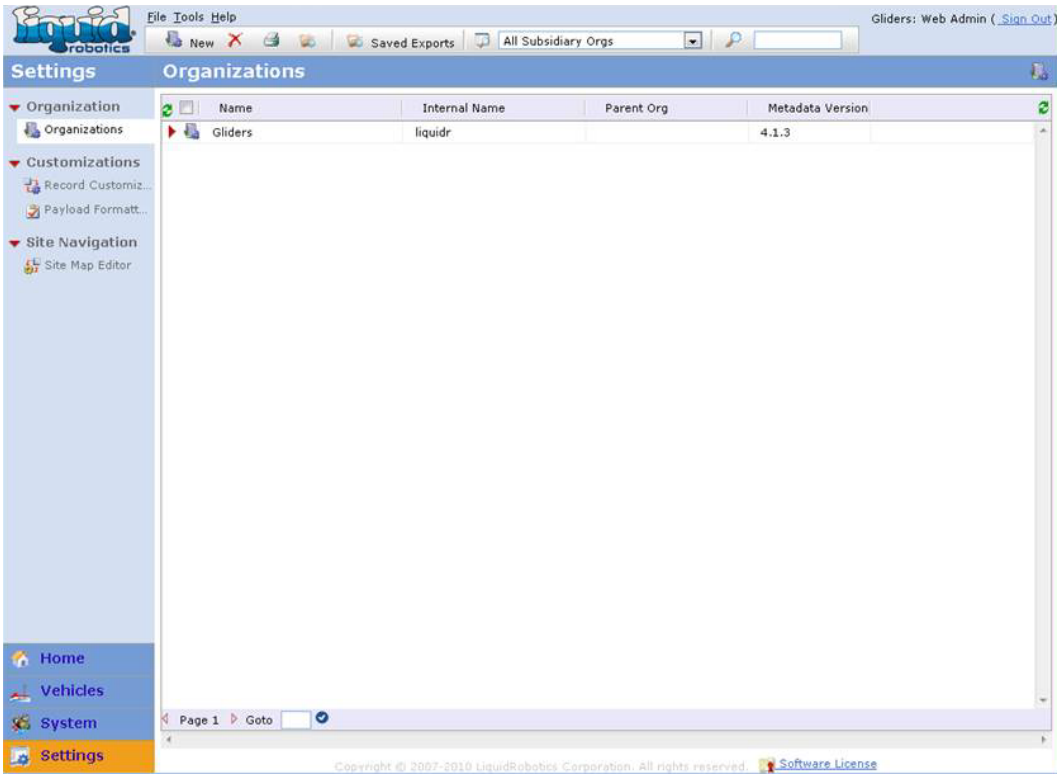
   http://localhost/webservices/EntityAPI.asmx

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

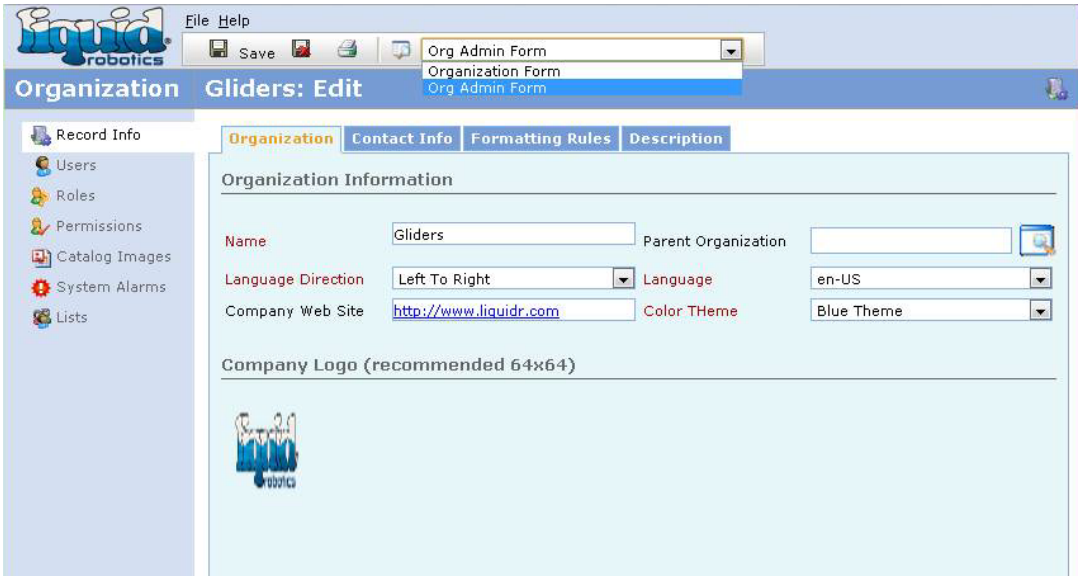
5. The link to **GeoServer** must have the machine name, not localhost, because it is called from the map client. For example, **OpenLayers.Layer.WMS|Geoserver layers - Tiled| http://2HTSA85250:8088/geoserver/osm/wms|{LAYERS: 'oceanmap'}**

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**.

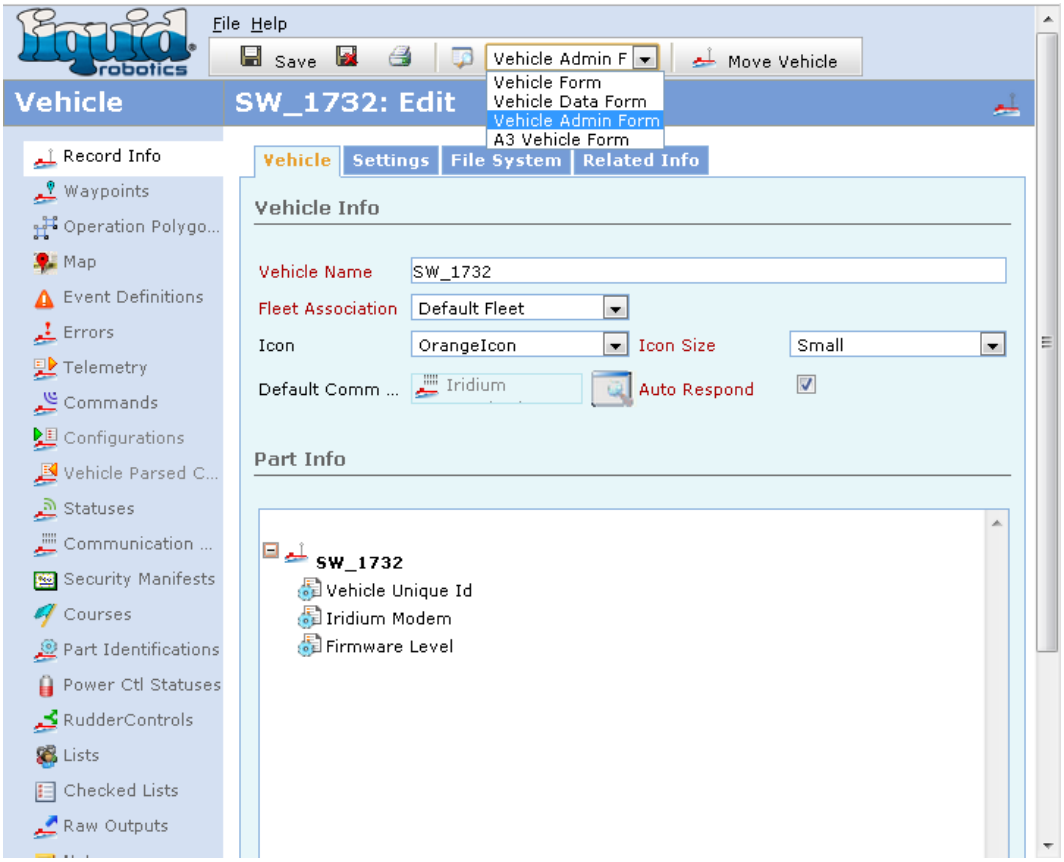


3. Modify settings.

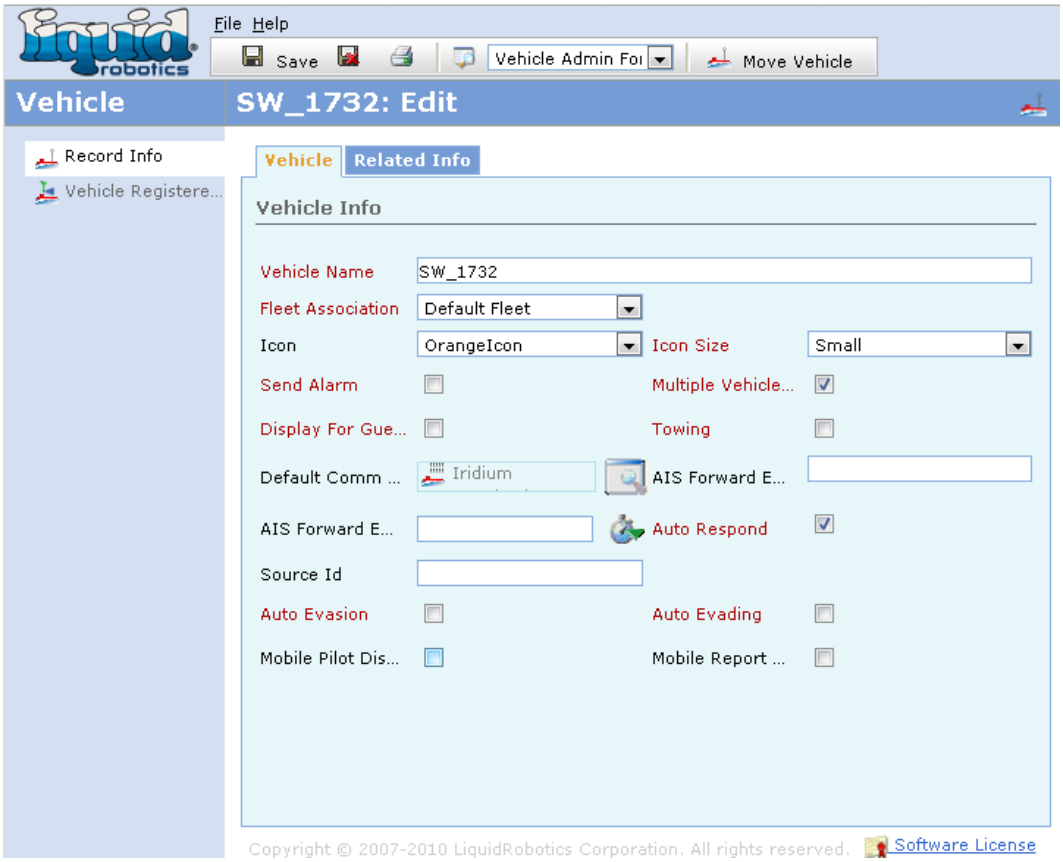
4. Modify map settings to the offline mapping source (if Mobile WGMS is not connected to the internet while piloting).

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.

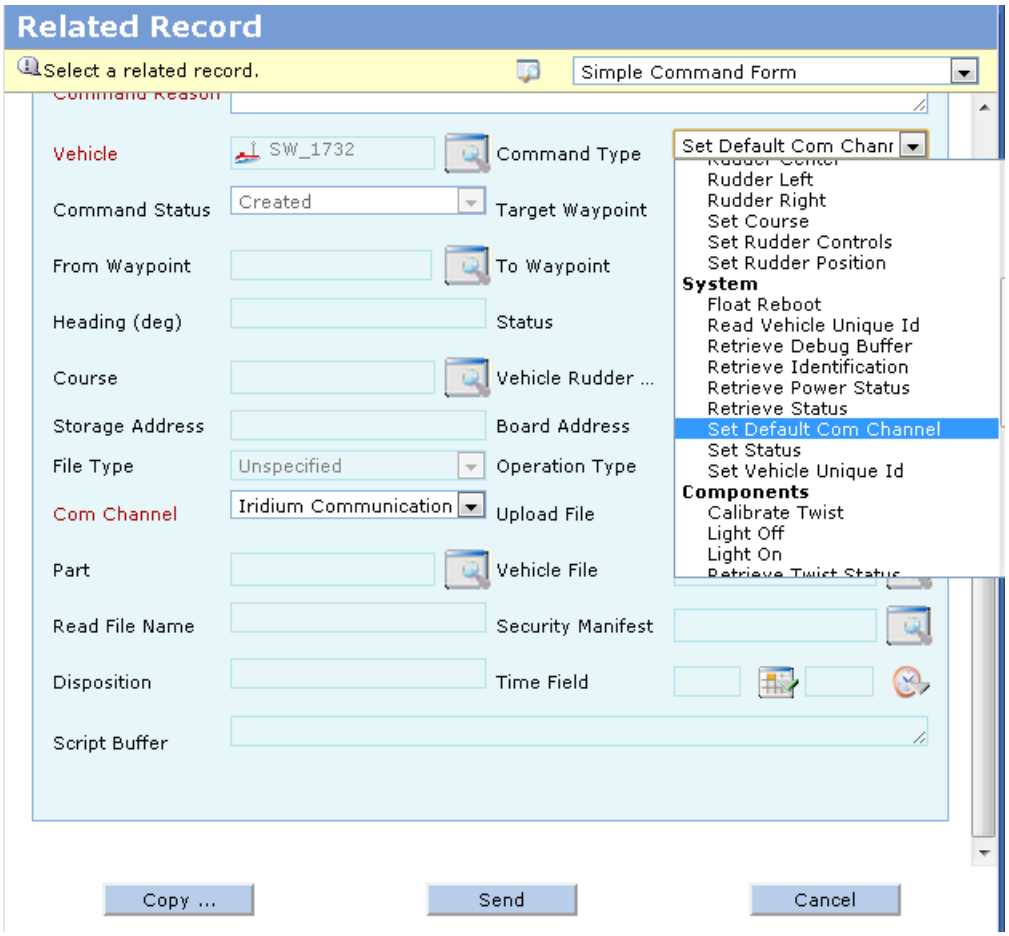


2. Set the Piloting and Telemetry disable checks accordingly.

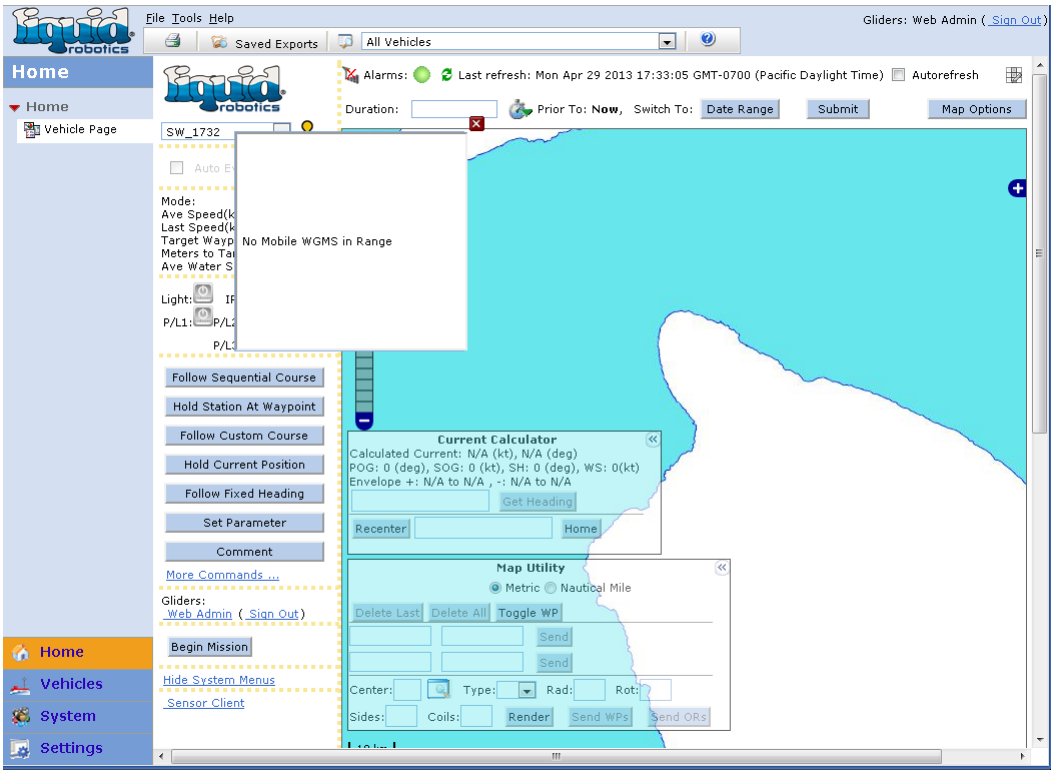


To check for other Mobile WGMS instances in range of the vehicle on the dashboard:

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



2. 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:

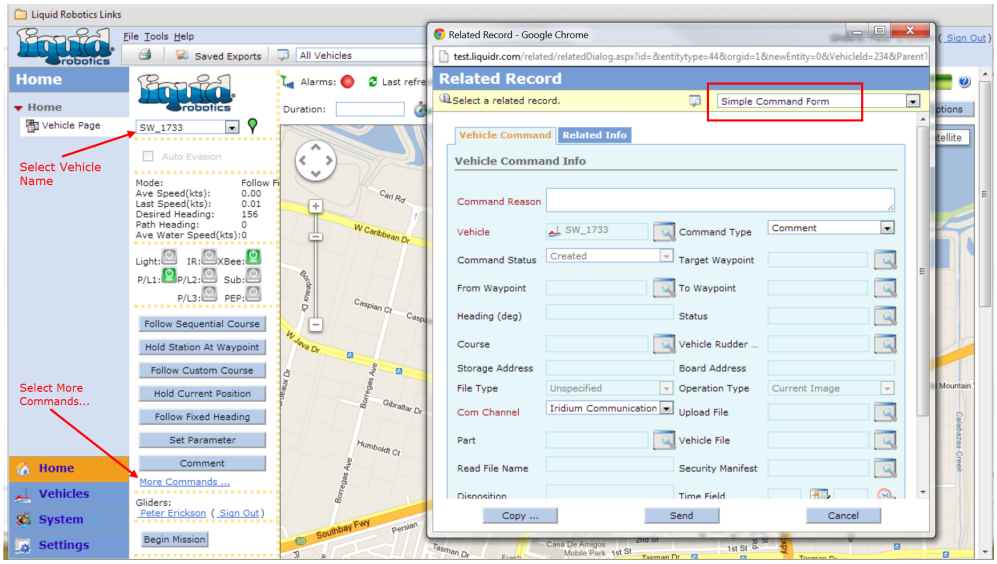
- **Activate Mobile Mode** - Activates Mobile WGMS on a Mobile WGMS enabled Wave Glider.
- **Deactivate Mobile Mode** - Deactivates Mobile WGMS on Mobile WGMS enabled Wave Glider.
- **Mobile Sync** - Returns up to 3 of the most recently issued C&C navigation commands from the Mobile Controller log for 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** screen, 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

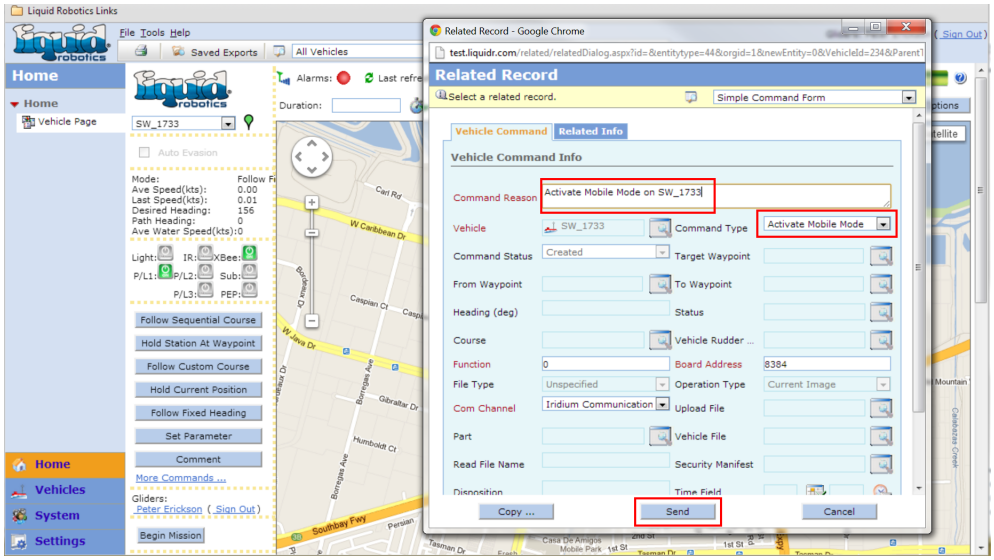


2. From the **Command Type** drop-down menu, select **Activate Mobile Mode**, **Deactivate Mobile Mode**, or **Mobile Sync**.

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. Troubleshooting a WGMS Installation

This chapter describes various problem scenarios and suggested responses. There are also sections on interpreting the Packet Reflector and Com Server log error messages.

I don't see any Vehicles when I start the WGMS

The Vehicles page is empty	
Possible Causes	**Actions**
If not LRI-Hosted, when WGMS is initially installed, there are no Vehicles.	Enter the Vehicles and data.
If LRI-Hosted, someone inadvertently deleted all the Vehicles in the list.	Re-enter the Vehicle data.

There is no response from the Vehicle

On start-up, there is no response from the Vehicle	
Possible Causes	**Actions**
There is no Internet connection.	Verify the Internet connection.
Vehicle is not powered On.	On shore: Check Vehicle Power. Off shore: Attempt to contact using XBee.
Relay not configured correctly.	Check connections to Relay hardware.
The Iridium modem was deleted from the parts table.	Check that the Iridium modem is listed in the Parts List.
The wrong IMEI was entered for the Vehicle.	Check the IMEI number in the Parts List against the Vehicle delivery documents.
The Packet Reflector/COM Server is not running	Check Packet Reflector and Com Server Dialog windows.
The Address and/or Port values are incorrect.	Check the Address and Port values. Check Com Server for log for error messages.
The WGMS Unique ID number is not the same as the predefined Vehicle Unique ID number.	Check the Unique IDs as follows: 1. Open a debug window on the Relay 2. Get the WGMS Unique ID 3. Open the WGMS Vehicle form 4. Click on “Unique ID Part” to get the ID 5. If the IDs do not match, follow the procedure described in “Viewing Vehicle Parts Information” (page 81)

Commands are not being ACKed/NAKed

Receiving Telemetry, but no response to Commands	
Possible Causes	**Actions**
Vehicle is powered off.	Verify that power is on.
Relay is not configured correctly.	Check connections to Relay hardware.
There is no Internet connection.	Verify the Internet connection.
The Iridium modem was deleted from the parts table.	Check that the Iridium modem is listed in the Parts List.
The wrong IMEI was entered for the Vehicle.	Check the IMEI number in the Parts List against the Vehicle delivery documents.
The Packet Reflector or COM Server is not running.	Check the buttons and click if necessary.
The Address and/or Port values are incorrect.	Check the Address and Port values.
Command Timer Box not checked.	Check “Enable Command Timer” box.

A Vehicle no longer responds to WGMS commands

Vehicle was operating correctly, then stopped responding to commands	
Possible Causes	**Actions**
Lost Internet connection.	Verify the Internet connection.
Temporary Iridium communications loss.	Wait 10 to 15 minutes to confirm that Iridium loss is not temporary.
Batteries fully discharged.	Check the last telemetry battery level. Check for any previous System alarms.
Vehicle electronics malfunction.	If close to the Vehicle, try communicating via XBee. Check for any previous System alarms.
If still receiving telemetry, Vehicle mechanical failure.	If close to the Vehicle, try communicating via XBee. Notify Mission Operator to prepare for recovery.
Com Server Fatal Error.	Check Com Server Log for error messages. Restart Com Server.
Packet Reflector Fatal Error.	Check Packet Reflector Log for errors. Restart Packet Reflector.

Map is not being displayed in the WGMS Dashboard

The Google map is not being displayed on the Dashboard page	
Possible Causes	**Actions**
No Internet connection – Error Message.	Verify the Internet connection
API Key not specified.	Enter the API key
Wrong API key – Error Message.	Check/update the API key. A pop-up message should advise you on what to do.
No check in the “Display Google Maps” checkbox.	Check the maps checkbox

XBee doesn't seem to be working

Cannot communicate via the XBee connection	
Possible Causes	**Actions**
XBee startup can take up to 1 minute.	Wait at least 1 minute after startup before sending commands.
XBee reception is turned off on Vehicle.	Turn on XBee via Iridium.
Vehicle is too far away.	Move within 100 meters of Vehicle.
Wrong XBee IP address on the Packet Reflector	Check Packet Reflector IP address.
Wrong IP address for your computer.	Check computer IP address.
Wrong PAN ID number.	Check XBee PAN ID.
Multiple XBee connections with same PAN ID.	Go through one Relay to avoid problem.

I'm not getting Iridium messages

Communications with XBee works, but not through Iridium	
Possible Causes	**Actions**
Lost Internet connection.	Check Internet connection.
Temporary Iridium communications loss.	Wait 10 minutes to verify.
Packet Reflector configuration set to wrong IP address or port number.	Re-check IP address and port number. If “correct” values are set, contact your VAR to verify the IP address and/or port number.
Packet Reflector/COM server not running.	Check the buttons and click if necessary.
System was configured for Mobile WGMS	Confirm that the Wave Glider modem is configured for DirectIP.

Mobile WGMS is not working

Cannot establish Iridium Mobile WGMS communications	
Possible Causes	**Actions**
Iridium signal is blocked.	If indoors, move outdoors with a clear view of the sky.
Temporary Iridium communications loss.	Wait 10 minutes to verify.
System was not configured for Mobile WGMS.	Confirm that the Wave Glider modem is configured for ISU-to-ISU.
Incorrect Packet Reflector configuration.	Check the Packet Reflector IP addresses and port numbers.
Incorrect Virtual Relay Server configuration.	Check the Virtual Relay Server address and port values.

I changed and then lost the Administrator's password

Cannot remember or find the Administrator’s password	
Host	**Actions**
Hosted by LRI.	Contact LRI to reset the password.

Interpreting Packet Reflector Log Records

This section only applies if you are using Mobile WGMS.

Packet Reflector Dialog

When a Packet Reflector is running, it logs all of the communications that it handles. These are displayed in the log window of the Packet Reflector dialog.

To access the **Packet Reflector** dialog, click on the Packet Reflector desktop icon.

Many of the log records are self-explanatory and indicate normal operation. Certain messages indicate problems. The error messages, their meanings and possible responses are described below.

Packet Reflector Error Messages

Packet Reflector errors can be caused by a failure to specify a valid Command/Output Source/Sink, by corrupted data, by time-outs, or by a device being off-line.

Note that there are two levels of error messages: “Error” and “Fatal Error”

Error: A problem occurred that was handled. If a certain type of error occurs occasionally, it is usually not a problem. If the same error occurs repeatedly, then some action should be taken to fix the problem.

Fatal Error: The problem was so serious that either the Packet Reflector or the Com Server stops. This requires a re-start of the Packet Reflector.

Note

To re-start, click the **STOP SERVICE** button, then click **START SERVICE**.

The table below shows the error messages in alphabetic order. Each error message is linked to its detailed description in the following sections.

Error Message Format
"Command Listener *[source]* Fatal Error: *[message]* "
"Command Listener *[source]* Packet receive Error: *[message]*"
"Command Reflector: *[subscriber]*, packet echo data mismatch *[message]*"
"Command Reflector: *[subscriber]*, packet echo length mismatch *[message]* "
"Command Reflector: *[subscriber]*, Send *[message]* "
"Output Listener Error: *[subscriber]*, Packet Receive *[message]* "
"Output Listener Fatal Error: *[subscriber]*, *[message]*"
"Output Reflector Fatal Error: *[subscriber]*"
"Output Reflector Error: *[subscriber]*, Send: *[message]*"

"Command Listener *[source]* Fatal Error: *[message]* "

Originator: Packet Reflector Command Source

Fields:

[source] – The name of the Source from which the Packet Reflector is receiving the command. This will always be a Com Server.

[message] – A Windows error message indicating the cause of the error.

Explanation:

An unrecoverable error occurred during receipt of a Command from the *[source]*.

The problem is caused by a communications problem between the Packet Reflector and the referenced Com Server.

Responses:

1. Re-start the Packet Reflector.

   If the problem keeps occurring:

2. If the Packet Reflector and the Com server are both running on the same computer, look for a problem with the hardware electronics.

3. If the Packet Reflector is not running in the same computer as the referenced Com Server, check for a connection problem between the two computers (e.g., a bad cable).

"Command Listener *[source]* Packet receive Error: *[message]*"

Originator: Packet Reflector Command Source

Fields:

[source] – The name of the Source from which the Packet Reflector is receiving the command. This will always be a Com Server.

[message] – A Windows error message indicating the cause of the error.

Explanation:

An error occurred during receipt of a Command packet from the source.

The error can be caused by:

a. A problem with the structure of the packet.

b. Communication overloading of the Packet Server.

c. A communications problem between the Packet Reflector and the referenced Com Server.

Responses:

If the error occurs continuously:

1. If the Packet Reflector and the Com server are both running on the same computer, look for a problem with the electronics in the computer.

2. If the Packet Reflector is not running in the same computer as the referenced Com Server, check for a connection problem between the two computers (e.g.,a bad cable).

"Command Reflector: *[subscriber]*, packet echo data mismatch *[message]*"

Originator: Packet Reflector Command Sink

Fields:

[subscriber] –The name of the subscriber to whom the command is being sent. This can be any connection other than the local WGMS.

[message] – A Windows error message indicating the type of error.

Explanation:

When a subscriber receives a command packet, it echoes it back to the Packet Reflector. The Packet Reflector then checks to verify that the data in echoed packet matches the sent packet. If they do not, the error message is sent.

The problem is usually caused by a bad network connection.

Responses:

1. Re-check the network connection between the Packet Reflector computer and the hardware where the subscriber resides.

2. If the problem persists, contact LRI.

"Command Reflector: *[subscriber]*, packet echo length mismatch *[message]* "

Originator: Packet Reflector Command Sink

Fields:

[subscriber] –The name of the subscriber to whom the command is being sent. This can be any connection other than the local WGMS.

[message] – A Windows error message indicating the type of error.

Explanation:

When a subscriber receives a command packet, it echoes it back to the Packet Reflector. The Packet Reflector checks that the lengths of the two packets match. If they do not, the error message is sent.

The problem is usually caused by a bad network connection.

Responses:

1. Re-start the Packet Reflector.

2. If the problem persists, contact LRI.

"Command Reflector: *[subscriber]*, Send *[message]* "

Originator: Packet Reflector Command Sink

Fields:

[subscriber] –The name of the subscriber to whom the command is being sent. This can be any connection other than the local WGMS.

[message] – A Windows error message indicating the type of error.

Explanation:

The Packet Reflector cannot send a command to the stated subscriber. This can be caused by:

a. The subscriber hardware is turned off.

b. The subscriber hardware is disconnected from the Packet Reflector hardware.

c. One or more of the subscriber values (IP Address, Port, Protocol or Channel) is incorrect.

Responses:

1. Check that the correct address values have been set.
2. Check the connection between the Packet Reflector hardware and the subscriber hardware.

"Output Listener Error: *[subscriber]*, Packet Receive *[message]* "

Originator: Packet Reflector Output Source

Fields:

[subscriber] –The name of the subscriber from whom an output was received. This will typically be Iridium, Virtual Relay Server or XBee.

[message] – A Windows error message indicating the type of error.

Explanation:

An output packet was received by the Packet Reflector, but there is a problem with the packet format. This can be caused by:

a. The packet type is in a format that the Packet Reflector is not configured to recognize.

b. The data in the packet was corrupted.

c. The time allotted to read the packet exceeded the time-out limit.

In general, there was likely an error in the setup of the communications infrastructure, such as a Relay or the Iridium.

Responses:

1. If the problem occurs only on a single subscriber, check the connection and configuration of that subscriber.
2. If this error seems to be occurring on multiple subscribers, check the Packet Reflector configuration.

"Output Listener Fatal Error: *[subscriber]*, *[message]*"

Originator: Packet Reflector Output Source

Fields:

[subscriber] –The name of the subscriber from whom an output was received. This will typically be Iridium, Virtual Relay Server or XBee.

[message] – A Windows error message indicating the type of error.

Explanation:

This error message indicates that there has been a serious failure of the Packet Server hardware.

Responses:

1. Verify that the Packet Reflector Hardware is operating.
2. Re-start the Packet Reflector.
3. If the problem persists, contact LRI.

"Output Reflector Fatal Error: *[subscriber]*"

Originator: Packet Reflector Output Sink

Fields:

[subscriber] – The name of the subscriber to whom an output was being sent. This will usually be a Com Server, another WGMS or another Packet Reflector.

Explanation:

The Packet Reflector could not send an output message to the subscriber.

Responses:

1. Re-start the Packet Reflector.
2. If the problem persists, contact LRI.

"Output Reflector Error: *[subscriber]*, Send: *[message]*"

Originator: Packet Reflector Output Sink

Fields:

[subscriber] – The name of the subscriber to whom an output was being sent. This will usually be a Com Server, another WGMS or another Packet Reflector.

[message] – A Windows error message indicating the type of error.

Explanation:

The Packet Reflector cannot send an output to the stated subscriber. This can be caused by:

a. The subscriber hardware is turned off.

b. The subscriber hardware is disconnected from the Packet Reflector hardware.

c. One or more of the subscriber values (IP Address, Port, Protocol or Channel) is incorrect.

Responses:

1. Check that the correct address values have been set.
2. Check the connection between the Packet Reflector hardware and the subscriber hardware.

Interpreting Com Server Log Records

This section only applies if you are using Mobile WGMS.

Packet Reflector Dialog

When the Com Server is running, it logs all of the communications that it handles. These are displayed in the log window of the Com Server UI, as shown below.

To access the Com Server log, double-click on the “Com Server” icon on the Windows desktop. If there is no icon, click **Start** → **All Programs** → **Com Server**.

Many of the log records are self-explanatory and indicate normal operation. Certain messages indicate problems. The error messages, their meanings and possible responses are described below.

An important factor in Com Server operation is the Security Certificate. If there is a certificate problem, this can be diagnosed as follows:

1. Stop the Com Server operation.
2. Copy the URL in the “Reflector” window.
3. Paste the URL into the address field of a browser and go to that address.
4. If the window comes up with an “Entity API” header, the certificate is OK.
5. If a “Security Alert” dialog comes up, follow the instructions given.

Com Server Error Messages

Com Server errors are typically caused when the system receives data that the system is not prepared to receive.

Note that there are two levels of error messages: “Error” and “Fatal Error”

Error: A problem occurred that was handled.

Fatal Error: The problem was so serious that either the Com Server stops. This requires a re-start of the Com Server.

Note

To re-start, click the “Stop Service” button, then click “Start Service”).

The table below shows the messages in alphabetic order. Each message is described in more detail in the referenced sections.

Error Message Format
"Command Listener – ERROR CreateVehicleCommand *[date/time] [message]* "
"Command Listener – ERROR: *[message]* "
"Command Listener – FATAL ERROR: *[message]* "
"Command Queue Failed to set Command Status to Sent: *[message]* "
"Command Queue Packet Error"
"Command Queue Read Failed"
"Output Listener – ERROR: *[message]* "
"Output Listener – FATAL ERROR: *[message]* "

"Output Writer – ERROR CreateVehicleOutput: *[date/time]*, buffer=*[hex_buffer]*, *[message]* "
"Output Writer – ERROR: *[message]* "
"Output Writer – FATAL ERROR: *[message]* "

"Command Listener – ERROR CreateVehicleCommand *[date/time] [message]* "

Originator: COM Server Command Listener

Fields:

[date/time] – Date and time error was detected.

[message] – A Windows error message indicating the type of error.

Explanation:

The Com Server is trying to write to WGMS, but is not able to. This can be caused by:

a. The WGMS hardware is disconnected or not operating.

b. The WGMS software is not running.

c. There is a bad security certificate.

Responses:

1. Check that WGMS hardware is connected and running.
2. Check that WGMS is operating.
3. Check the Security certificate.

"Command Listener – ERROR: *[message]* "

Originator: COM Server Command Listener

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

A time-out occurred while reading a message from the WGMS. This is most likely due to a connectivity problem between the Com Server and WGMS.

Responses:

Verify connectivity between Com Server and WGMS.

"Command Listener – FATAL ERROR: *[message]* "

Originator: COM Server Command Listener

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

There is a major problem with the operation of the Com Server.

Responses:

1. Re-start the Com Server.
2. If the problem persists, contact LRI.

"Command Queue Failed to set Command Status to Sent: *[message]* "

Originator: COM Server Command Queue

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

Incorrect credentials on Com Server or WGMS are bad. Usually, this is the result of the Com Server or WGMS being set-up by someone without System Admin privileges.

Responses:

1. In the “Management Account” boxes of the Com Server window, change the email address (and password) to that of a System Administrator.

"Command Queue Packet Error"

Originator: COM Server Command Queue

Explanation:

Com Server couldn’t make contact with the Packet Reflector, in order to send a command. This is usually caused by an Incorrect Packet Reflector address. Or, the Packet Reflector hardware may not be operating.

Responses:

If the problem is persistent:

1. Check that the Packet Reflector hardware is operating.
2. Check that the Packet Reflector address is correct.

"Command Queue Read Failed"

Originator: COM Server Command Queue

Explanation:

The Com server couldn’t read commands coming from the WGMS. This can be caused by:

a. The WGMS hardware is disconnected or not operating.

b. The WGMS software is not running.

c. There is a bad security certificate.

Responses:

1. Check that WGMS hardware is connected and running

2. Check that WGMS is operating.

3. Check the Security certificate

"Output Listener – ERROR: *[message]* "

Originator: COM Server Output Listener

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

A time-out occurred while reading a message from the Packet Reflector. This is most likely due to a connectivity error between the Com Server and the Packet Reflector.

Responses:

Verify connectivity between Com Server and the Packet Reflector.

"Output Listener – FATAL ERROR: *[message]* "

Originator: COM Server Output Listener

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

There is a major problem with the operation of the Com Server. Most likely, there was a hardware crash

Responses:

1. Check operation of the Packet Reflector Hardware.

2. Re-start the Com Server.

3. If the problem persists, contact LRI.

"Output Writer – ERROR CreateVehicleOutput: *[date/time]*, buffer=*[hex_buffer]*, *[message]* "

Originator: COM Server Output Writer

Fields:

[date/time] – Date and Time of error.

[hex_buffer] – The message sent to WGMS

[message] – A Windows error message indicating the type of error.

Explanation:

The Com Server sent a message to WGMS. WGMS responded, but does not recognize the originator of the packet and cannot process it.

This is most likely caused by a packet being sent from a Vehicle that is not in the database of the WGMS.

Responses:

1. Check that the Vehicle is in the database.
2. If running multiple WGMS systems, check the Packet Reflector routing.

Note

This error will cause an email to be automatically generated and sent to the registered System Admin

"Output Writer – ERROR: *[message]* "

Originator: COM Server Output Writer

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

This is a general error indicating a problem between the Com Server and WGMS. This is usually caused by:

a. The WGMS hardware is not running or is disconnected.

b. The address of the WGMS has been incorrectly set.

c. There is a Certificate Error

Responses:

1. Check the WGMS hardware connectivity.
2. Verify that WGMS is running
3. Check the address set in WGMS

"Output Writer – FATAL ERROR: *[message]* "

Originator: COM Server Output Writer

Fields:

[message] – A Windows error message indicating the type of error.

Explanation:

An unrecoverable error occurred when the Com Server was attempting to communicate with the WGMS

Responses:

1. Check operation of the WGMS Hardware.
2. Re-start the Com Server.
3. If the problem persists, contact LRI.

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:

support@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
AISyG 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
AISyG Statuses	• R • •	• R • •	• R • •	• R • •	C R U D	AIS updates
Weather Reports	• R • •	• R • •	• R • •	• R • •	C R U D	Weather station telemetry
AISyG 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. Checklists

Provisioning Checklist

1. Enter a Vehicle into the Database
    a. Determine Vehicle name and icon
    b. Add name to Vehicles List
2. Initialize the Part Info tree
    a. Add basic Float info
    b. Add Shoreside Software info
3. Add Event Definitions
    a. Add 9 Basic Alarm Types
4. Add Operation Polygons
    a. Establish Operational Area
    b. Operation Inclusion
    c. Operation Exclusion
5. Add Waypoints
    a. Cross-check with other Vehicles
6. Add/Update Escalation List
7. Complete the Part Info Tree
    a. Power-Up Vehicle
    b. Get/Verify Part Data
8. Enter Part Serial Numbers
9. Completion
    a. Generate Provisioning report

Mission Planning Checklist

Mission Planning Checklist

1. Plan the Course
    a. Operational area
    b. Weather conditions

   c. Navigation mode
2. Waypoints
   a. Add or change
   b. Check/Change the Arrival Distance
3. Operation Polygons
   a. Add or modify
4. Specify the Course
   a. Using Waypoints
   b. Non-Waypoint

Mission Operation Checklist

1. Pre-Launch Check
   a. Telemetry
2. Start Mission
   a. Enter start-Mission data
   b. Coordinate with launch crew
   c. Monitor initial Telemetry data
3. Running a Mission
   a. Monitor Telemetry data
   b. Check Alarms
4. Completing a Mission
   a. Coordinate with recovery crew
   b. Enter end-Mission comment

Appendix C. XML, Soap and Entities

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)

Appendix D. WGMS Release Notes

Overview

The Wave Glider Management System 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 4.1.5

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.

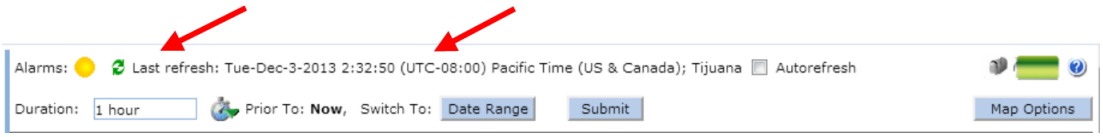
8. The Vemco VM4 sensors were added to the Custom Reports page.

9. The JAMSTEC sensor was added to the Custom Reports page.

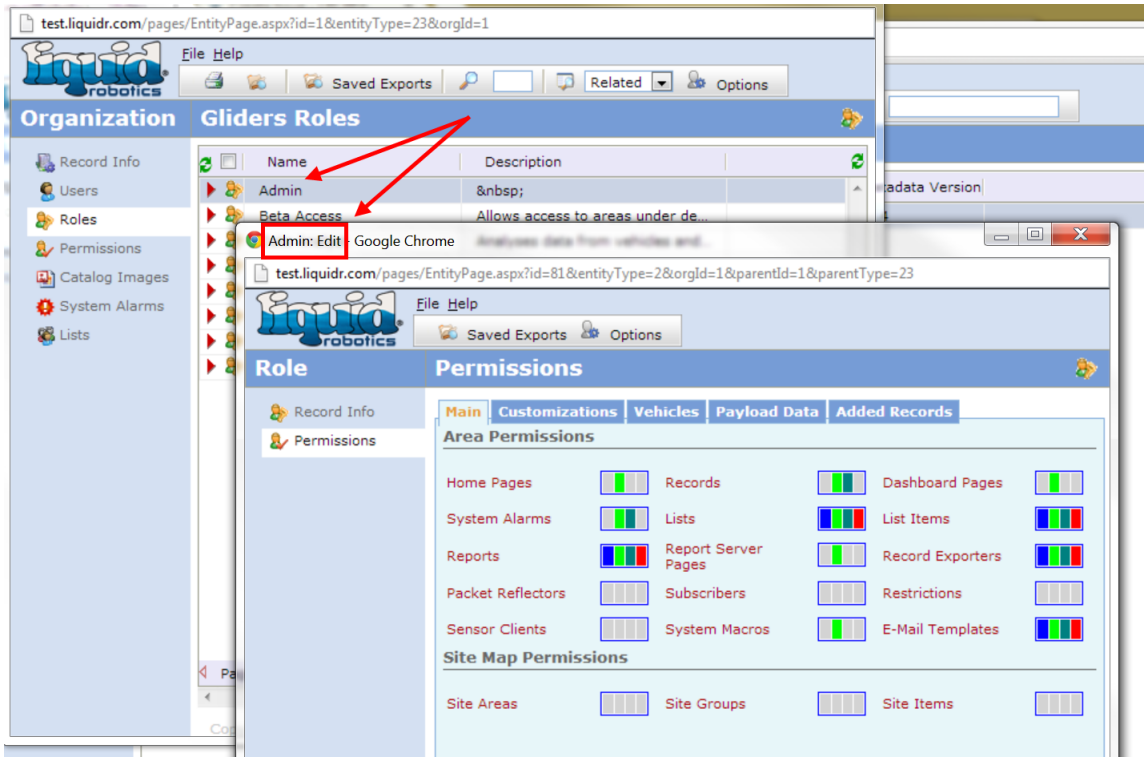
10. A Sentinel acoustic sensor display window was added to the WGMS Dashboard.

User Experience Changes

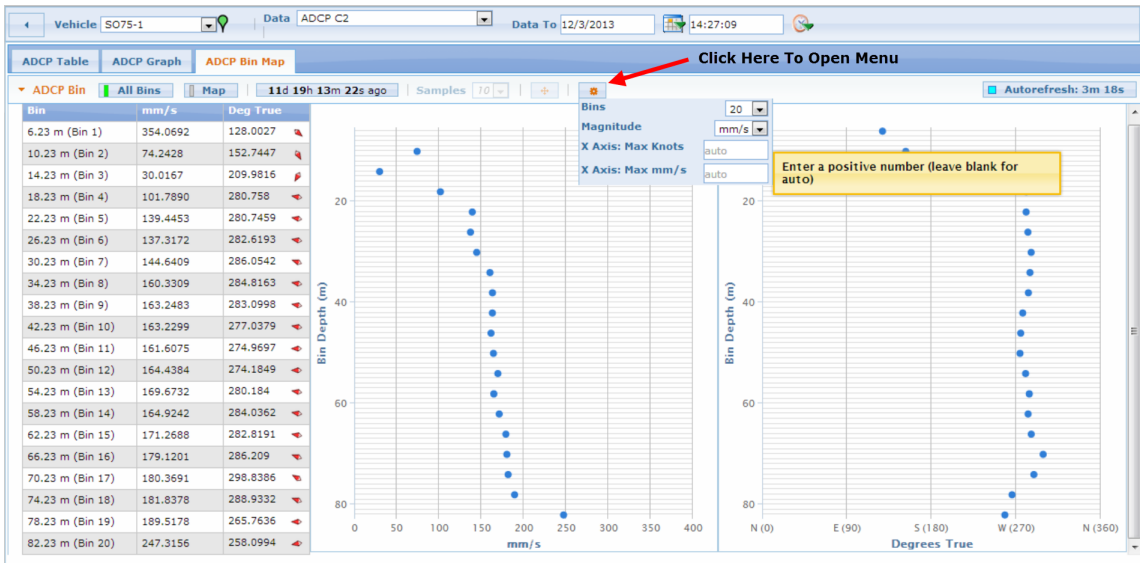
In prior releases, **Last Refresh** on the WGMS Dashboard was reported as a 12-hour Greenwich Standard Time. In 4.1.5 it is reported in UTC:



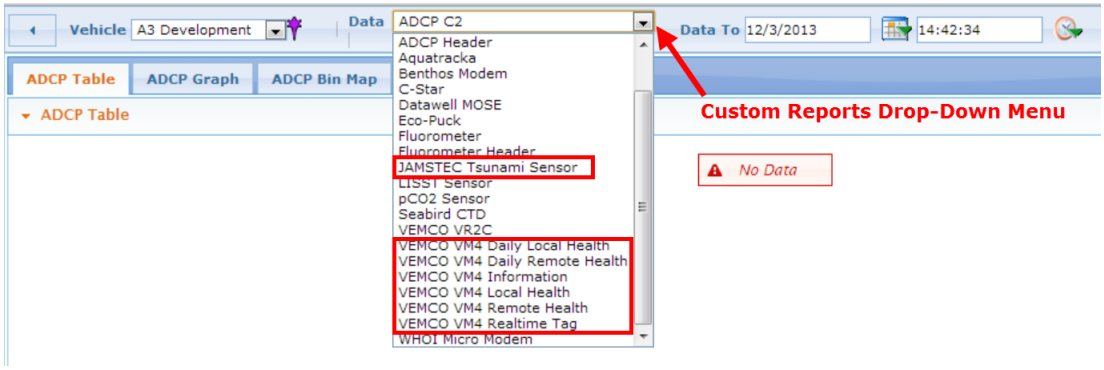
The Role name is now included in the header of the Permissions record so you know which Role you are viewing or editing:



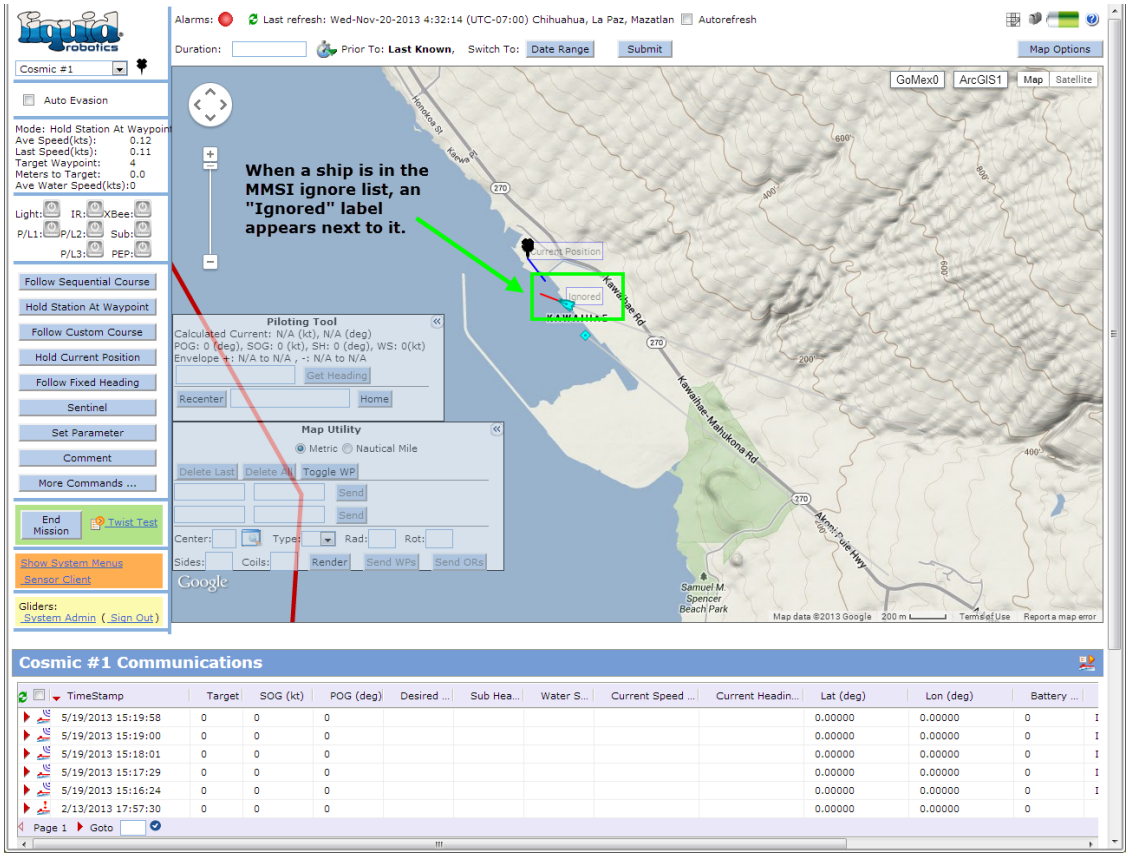
A user scalable X-Axis is included in the ADCP Bin Map display:



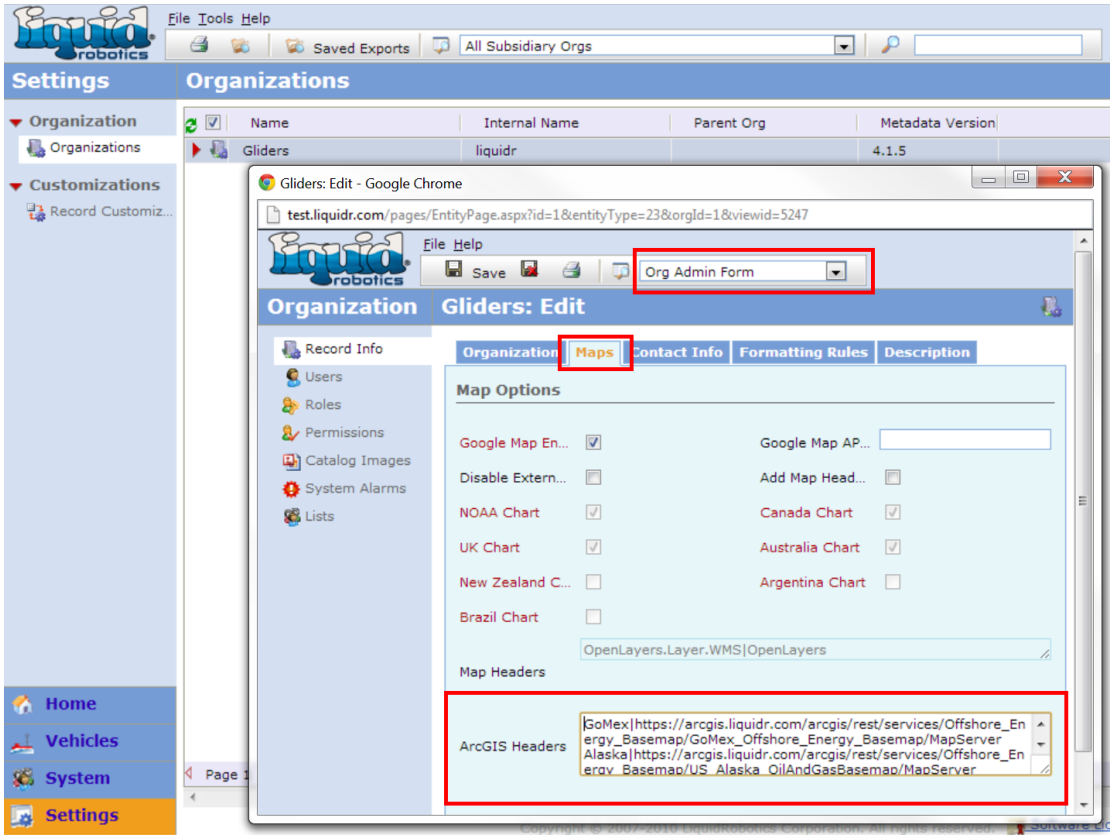
Vemco VM4 and JAMSTEC sensor Custom Report Pages are now available in the WGMS Custom Reports menu:



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:



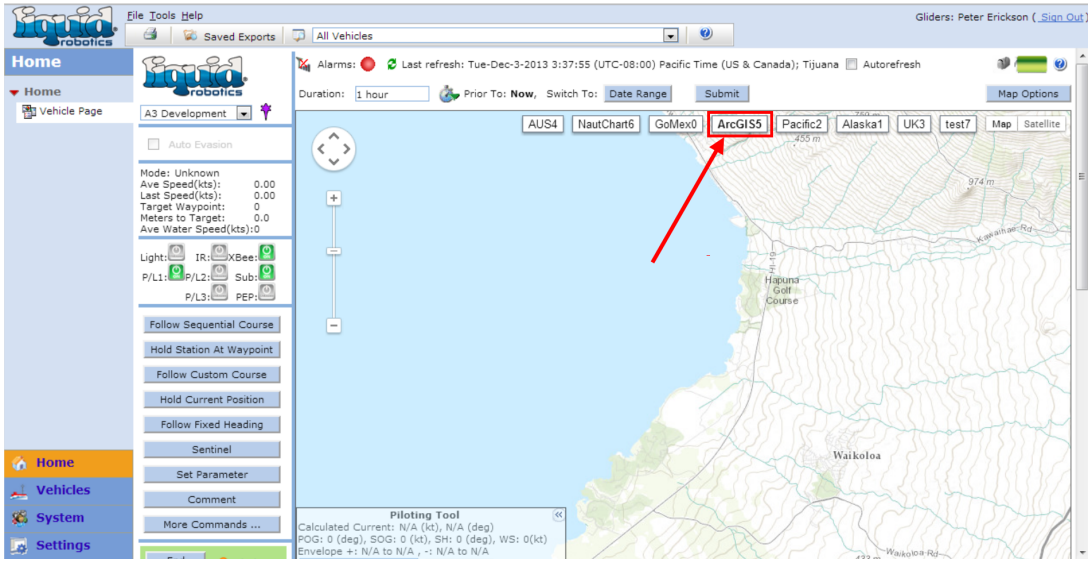
Integration with ArcGIS server map tile layers - (this feature is under development). From the **Maps** tab on the **Organization Admin Form**, you can enable up to 8 different ArcGIS map layers on the WGMS dashboard by entering the headers for the map layers you want to view in the **ArcGIS Headers**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



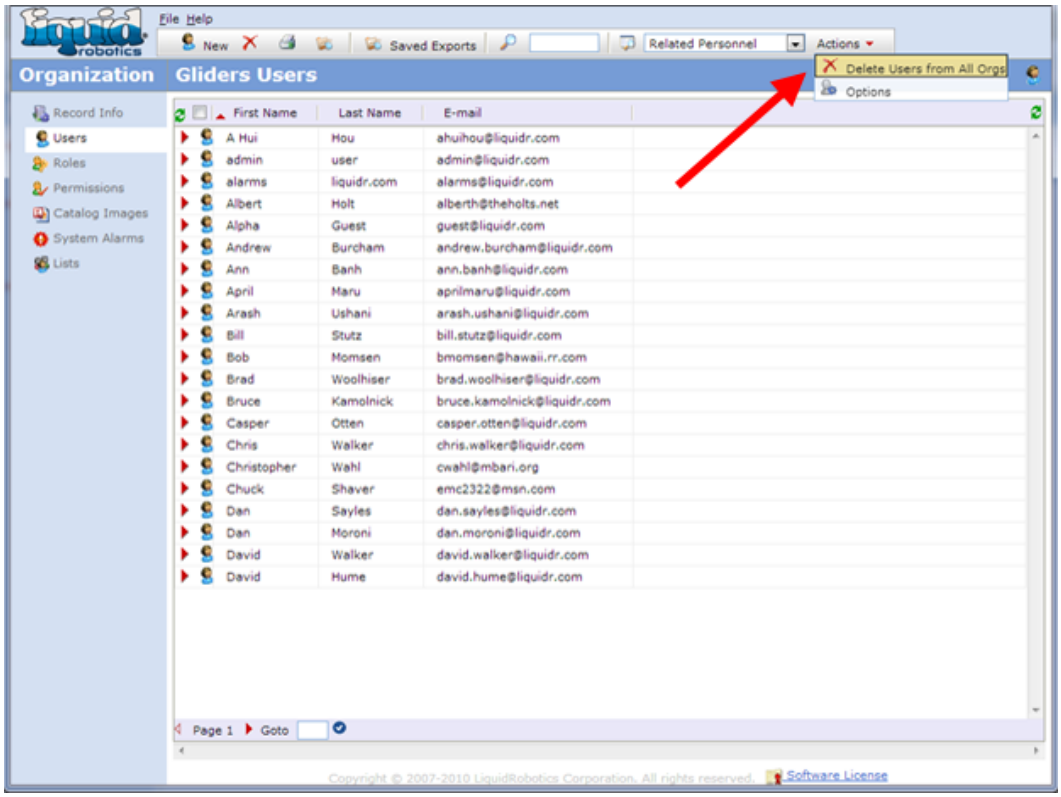
The headers that can be entered in the **ArcGIS Headers** field are:

```
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
```

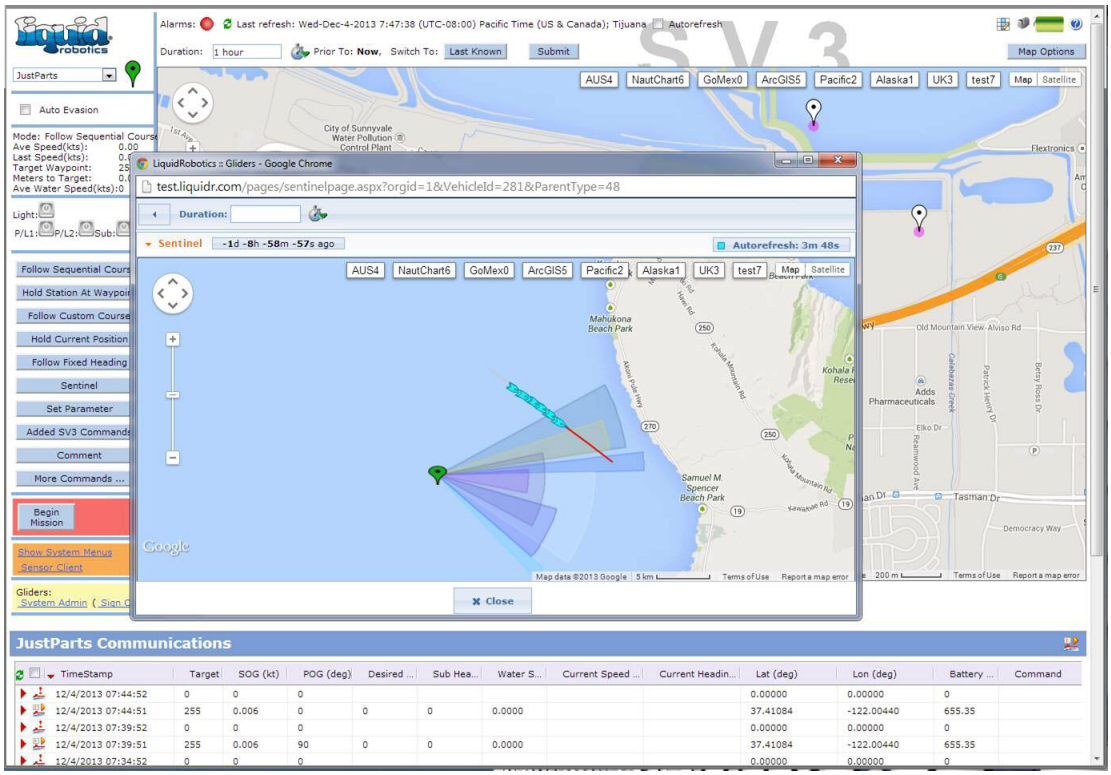
Buttons for each map layer header that you enter will appear on the WGMS dashboard. When you click on a map button to activate a map layer, the text on the button will change to bold face. To close a map layer click the button for that layer and the bold text will return to a regular font.



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:

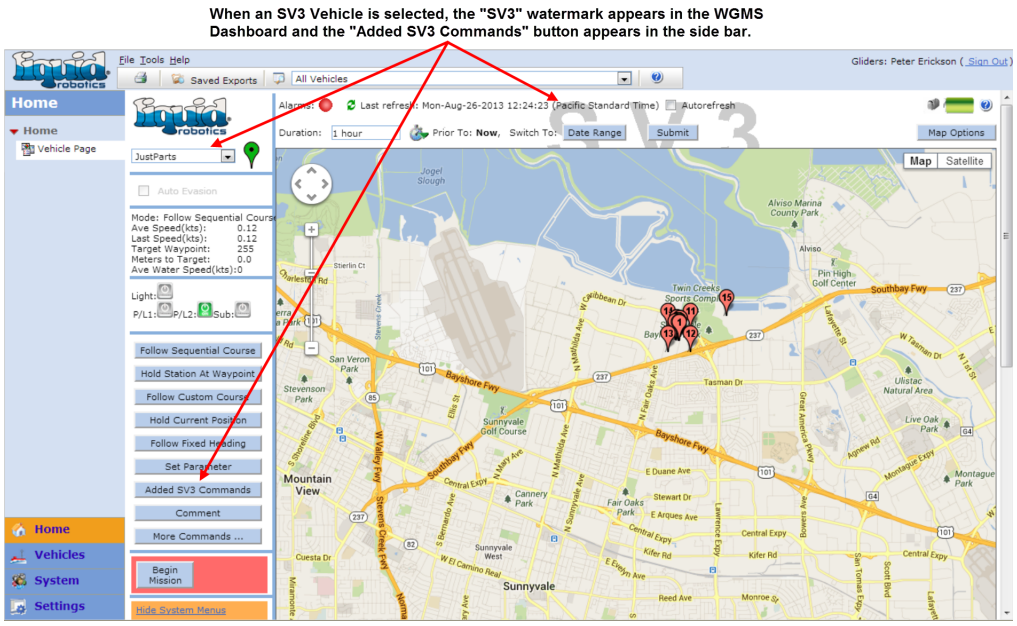
1. Support for SV3 commands. An **SV3** watermark appears in large gray letters in the Map Window header and the **Added SV3 Commands** button appears in the Map Window side bar when an SV3 Vehicle is selected. Clicking on the **Added SV3 Commands** button opens the **Services** window where commands 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.

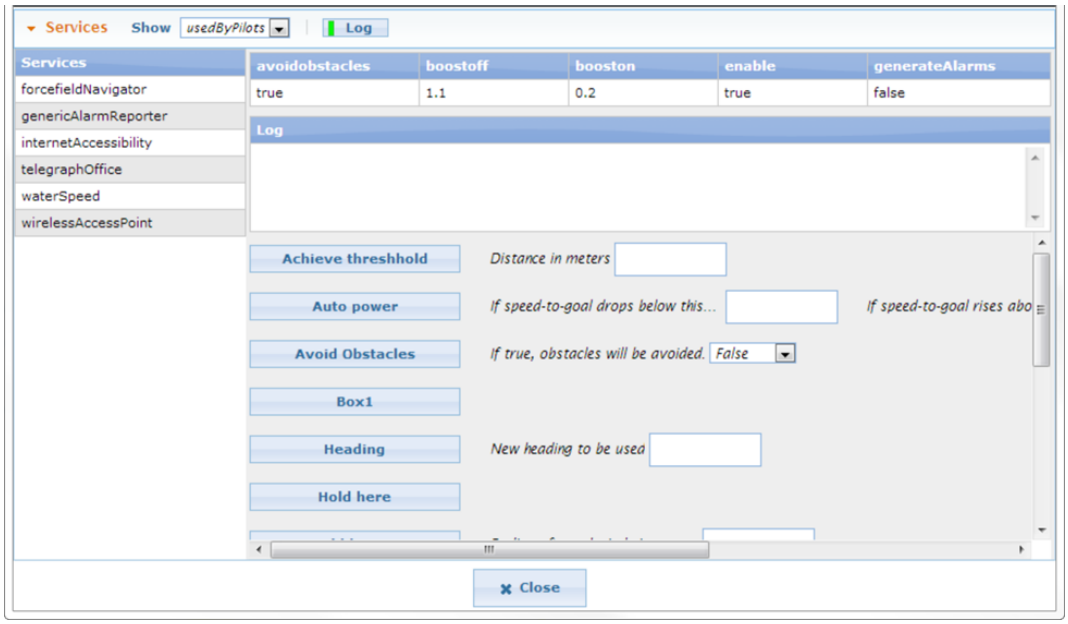
3. Custom Reports screens for all supported Wave Glider integrated sensors. When you click on the **Custom Reports** tab in the **Reports** menu on the **System** screen side-bar, the Custom Reports screen opens with ADCP C2 data selected by default. By selecting a data type from the **Data** drop-down menu, you can view custom data reports for sensors that are installed on the selected Vehicle.

User Experience Changes

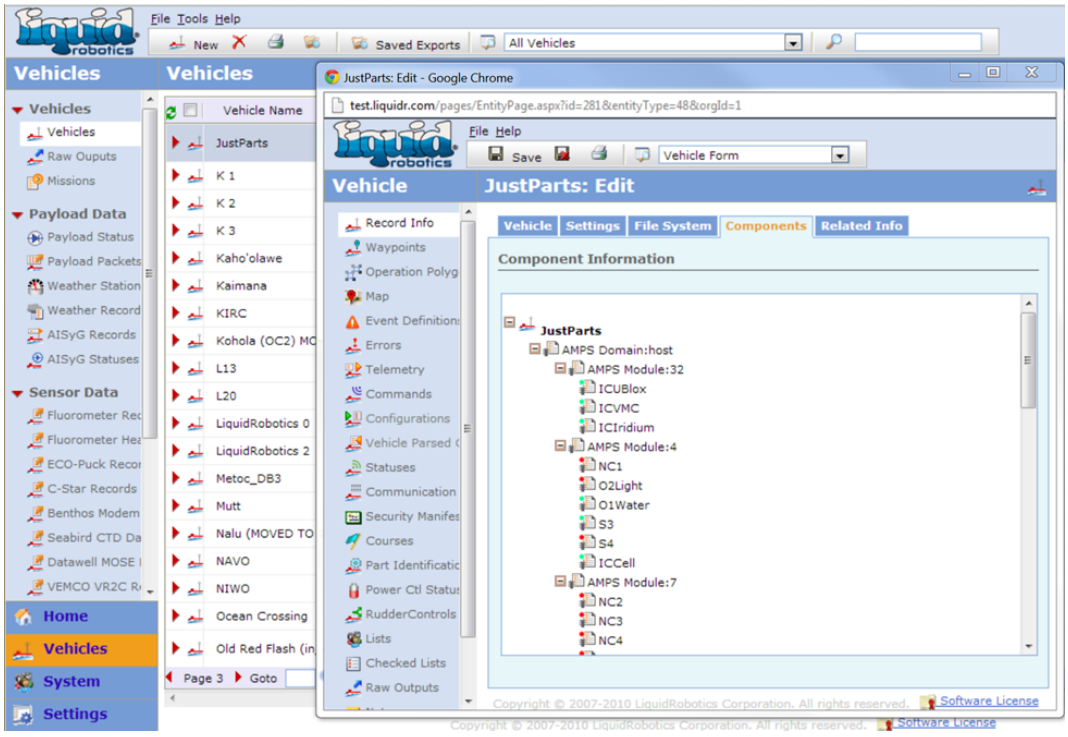
Changes to **Home** screen when an SV3 vehicle is selected:



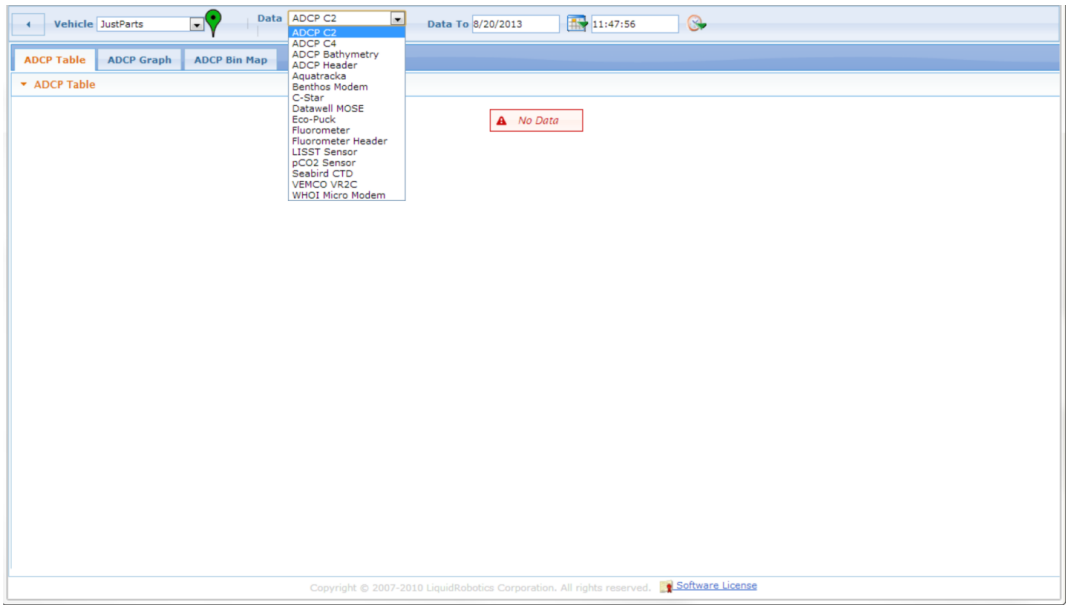
Services window appears when **Added Commands** button is clicked:



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

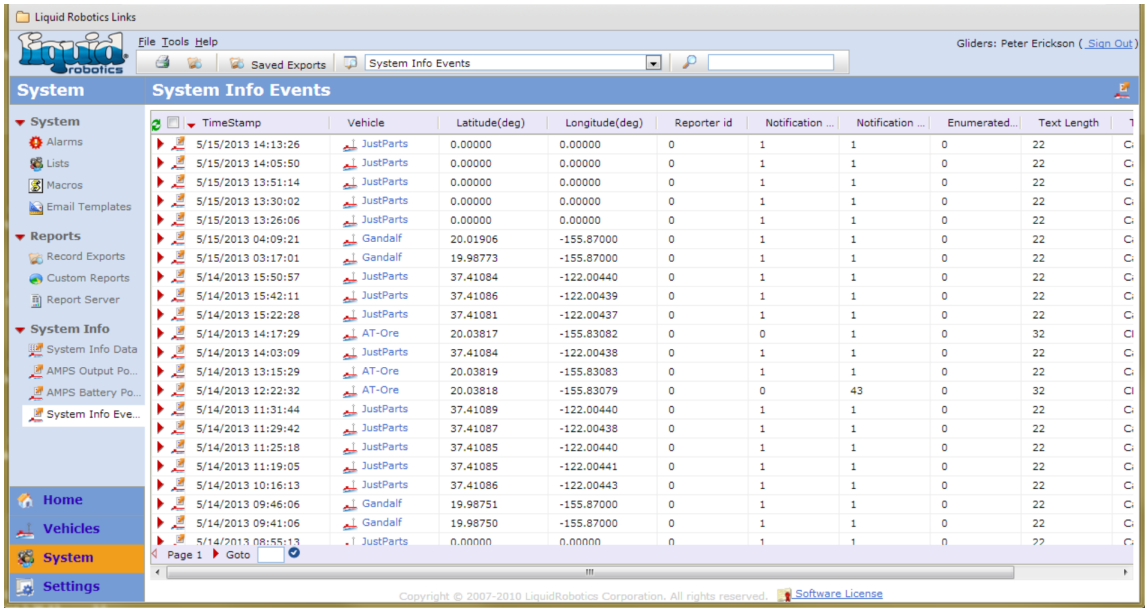
This is the list of highlights from this version:

1. Add support for System Information Events.
2. Mobile WGMS feature.
3. Add MMSI ignore list for any proximity alarm and warning issued.

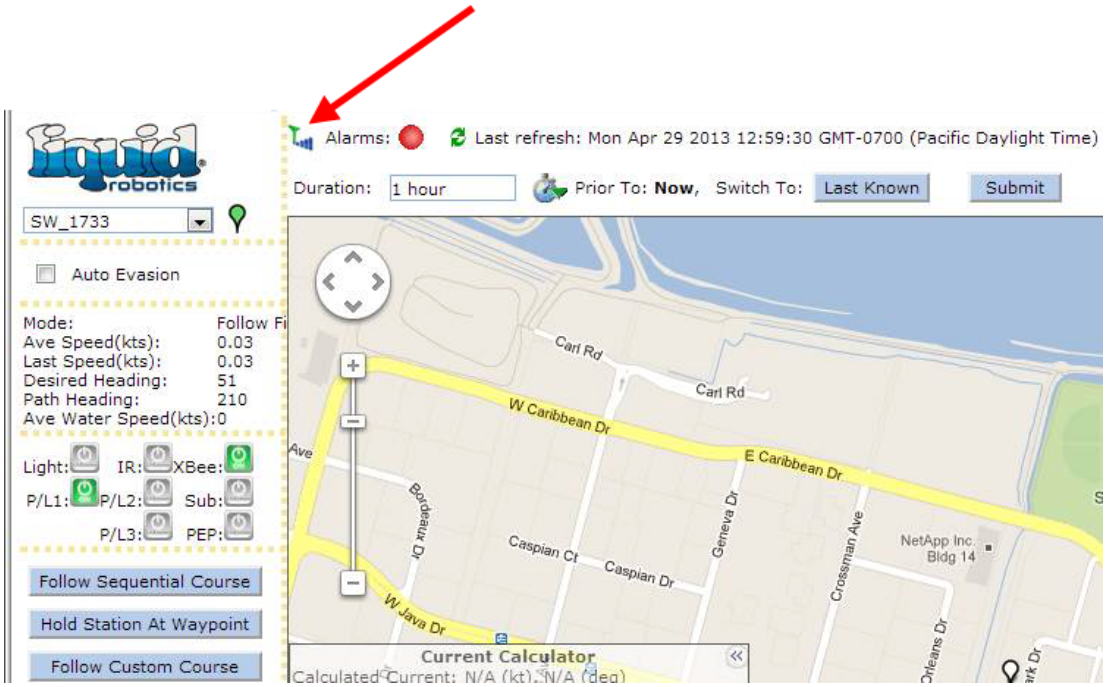
4. Completed ADCP sensor display under Custom Reports Page.

User Experience Changes

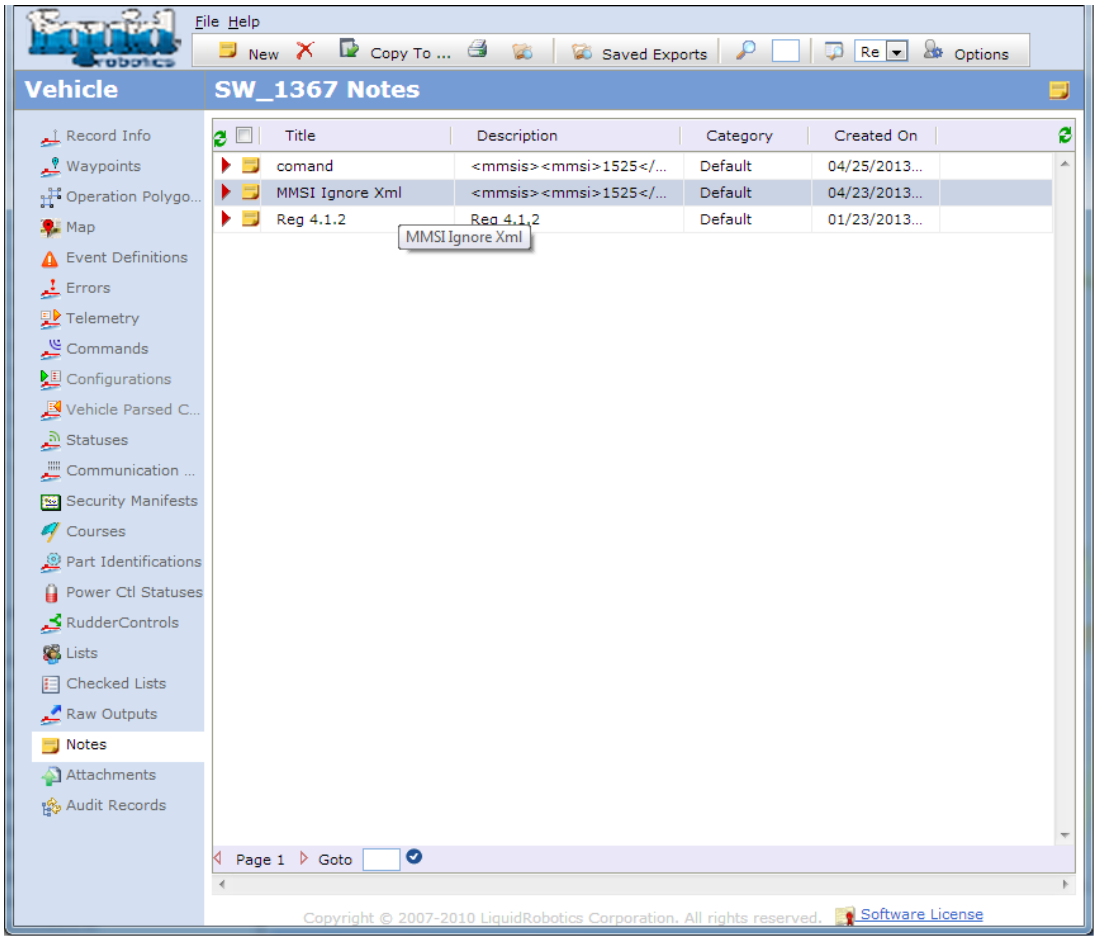
System Information Events:



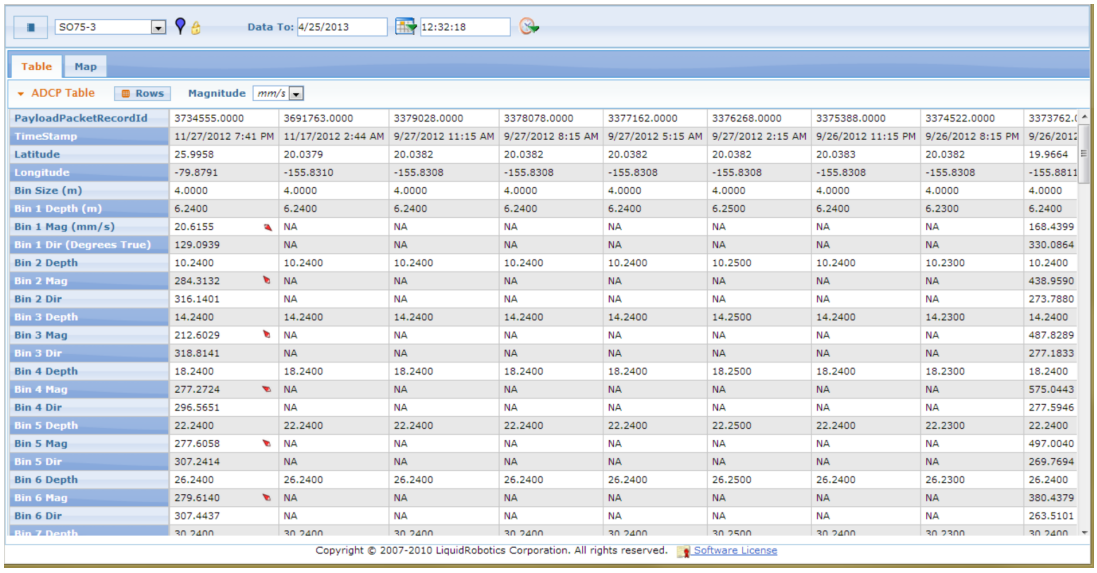
Mobile WGMS feature:



MMSI ignore:



ADCP sensor Custom Reports:



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:

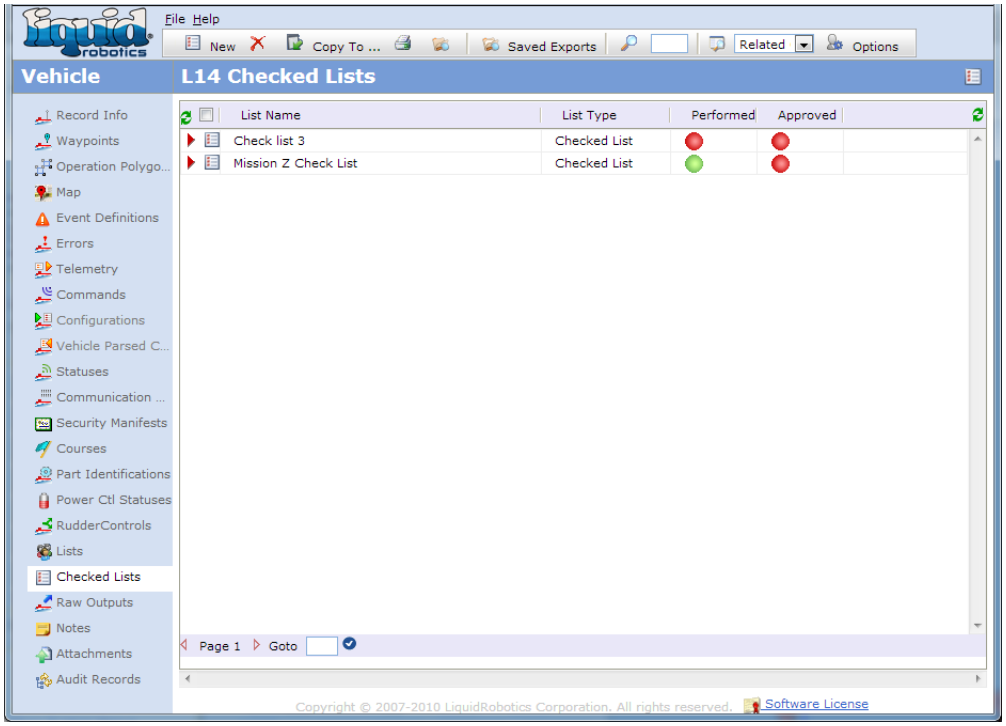
1. Implement Email Templates to allow for editing of email content sent to users when new user is created, user forgot password and user forgot username.

2. Check Lists for vehicles, where items on the list are checked when they are performed and when they are approved.

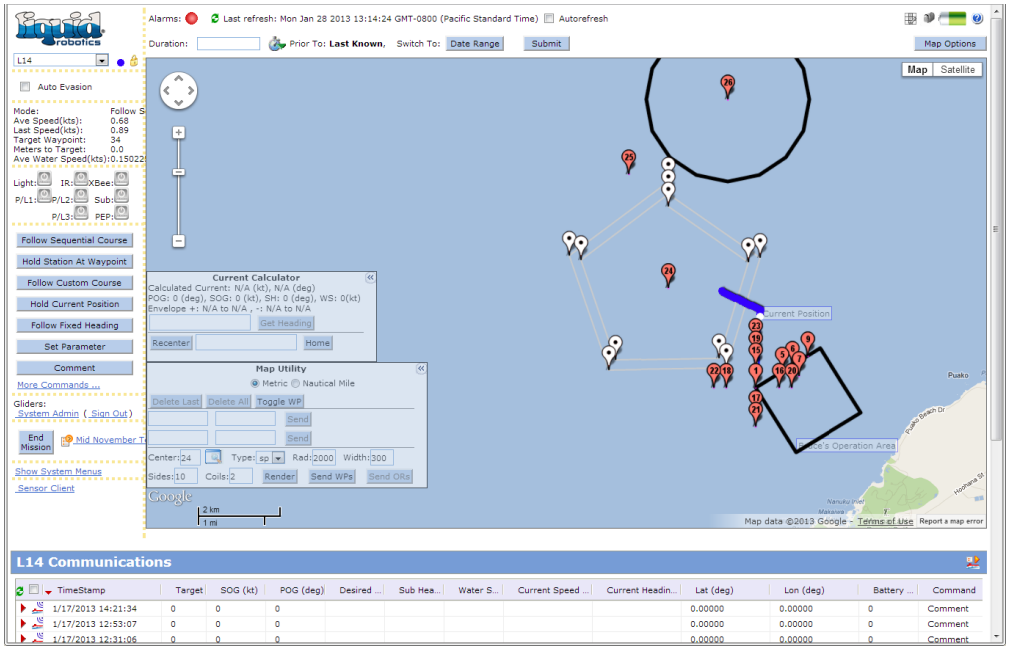
3. Route planning, allow pilots to create vehicle routes and op regions in different shapes.

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 asign 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 errror, 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

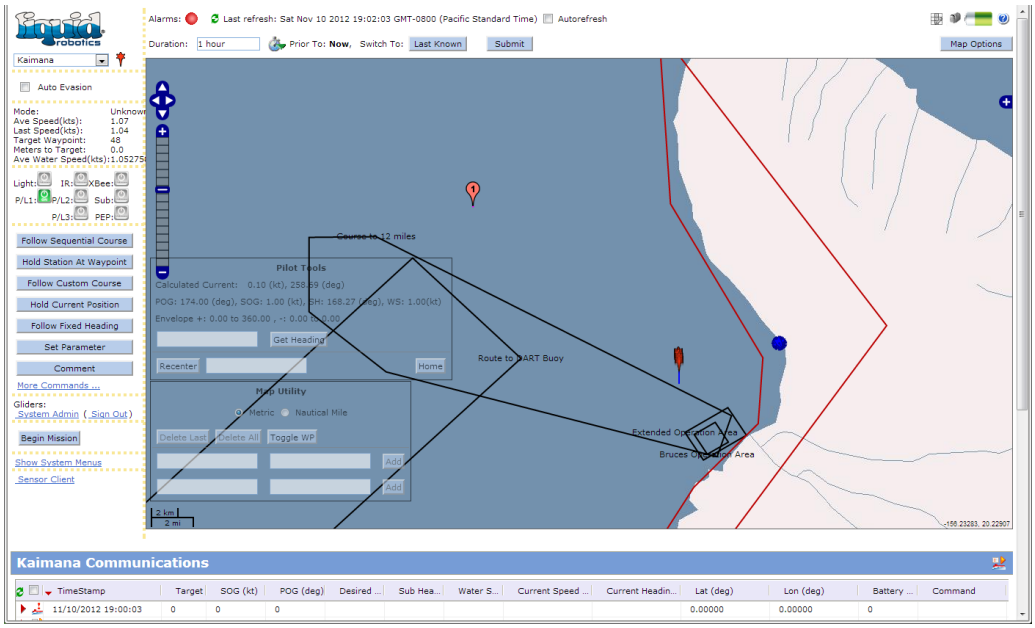
This is the list of highlights from this version:

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)

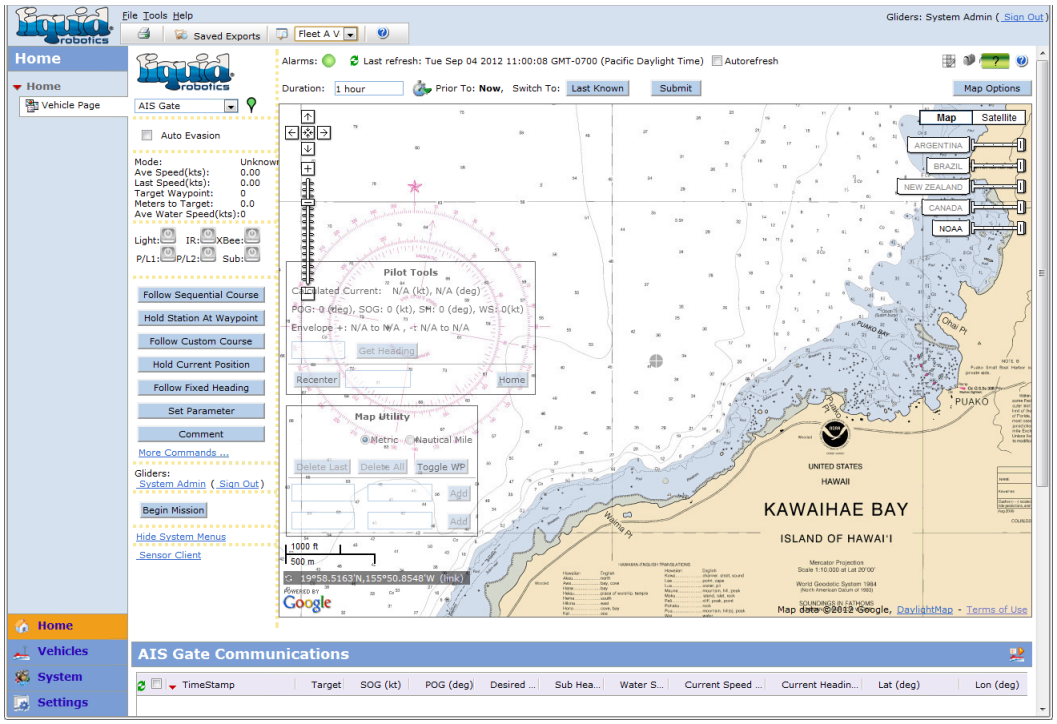
4. Many more Nautical charts supported from Geo-Garage, and Daylight map to show day and night areas in the dashboard

5. Program File command directly from vehicle file without attachment (manufacturing process enhancement)

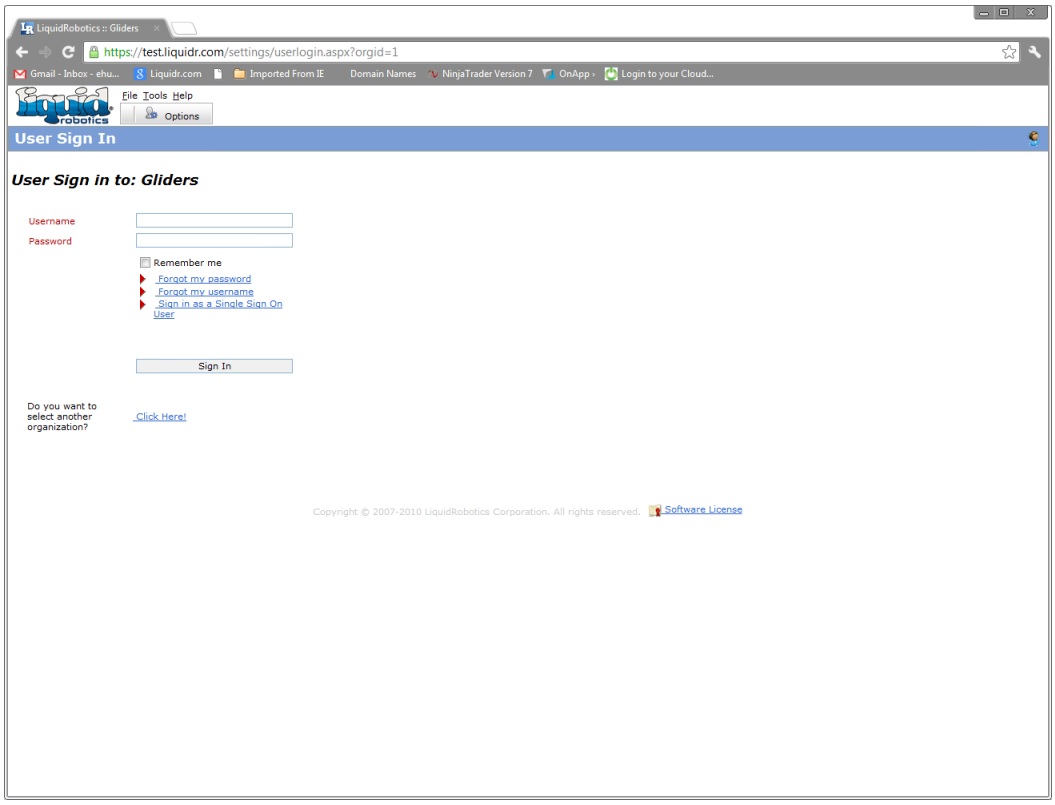
6. Support for multiple crypto chips on the vehicle

User Experience Changes

Fleet Views in Dashboard and Vehicles Grid:

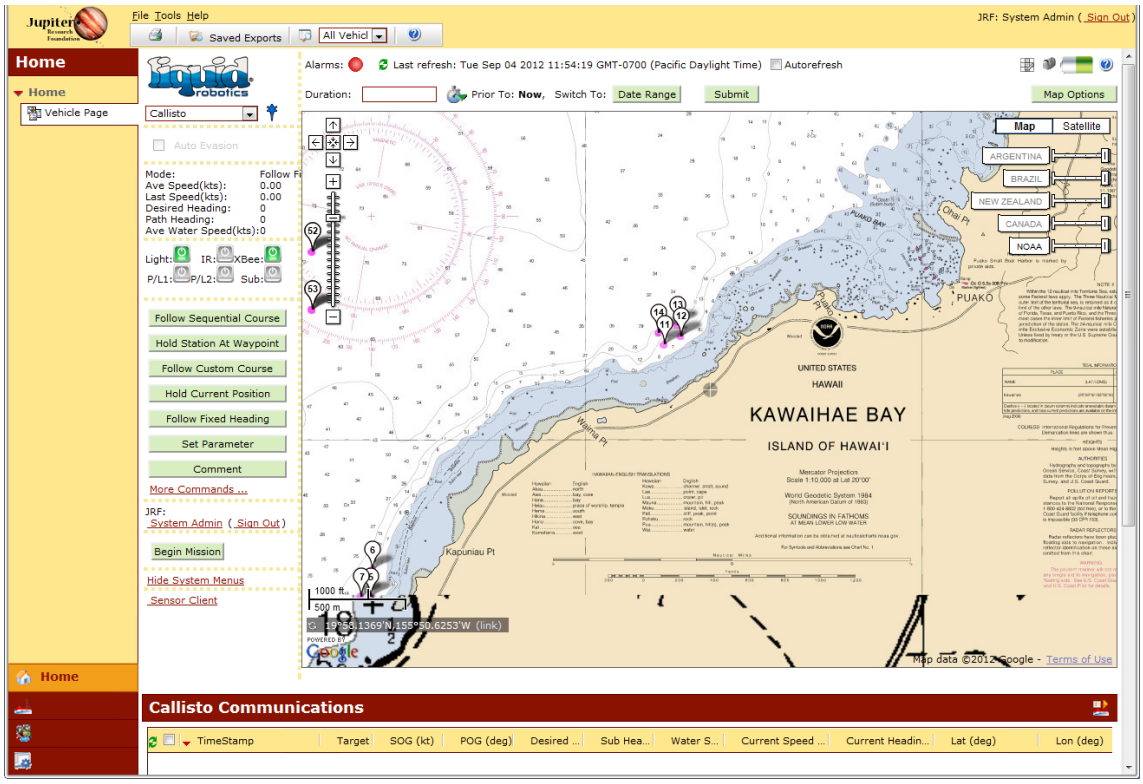


Domain User Login:

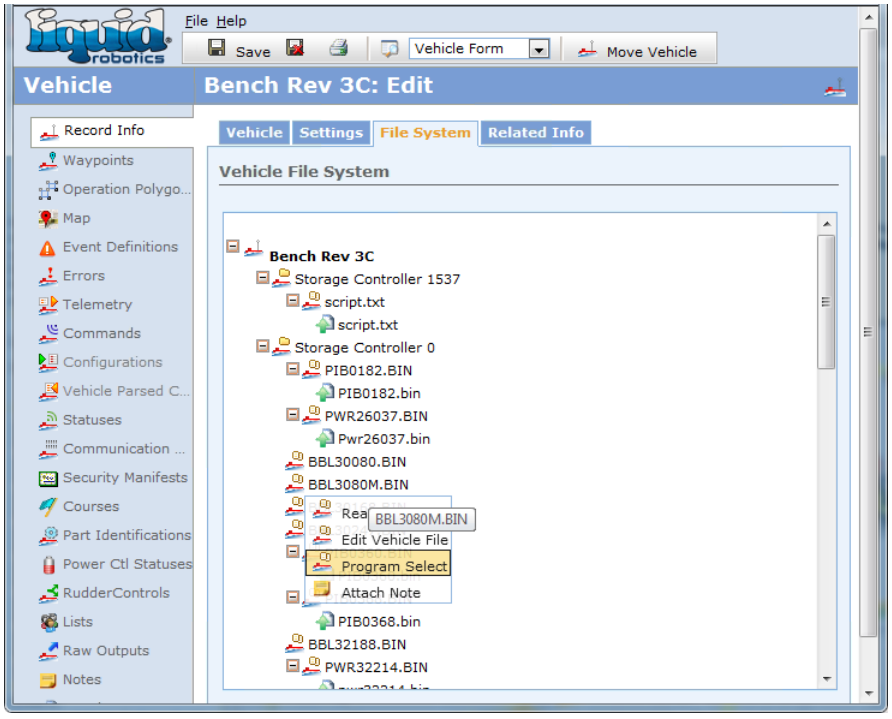


User Friendly auto populated export criteria:

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

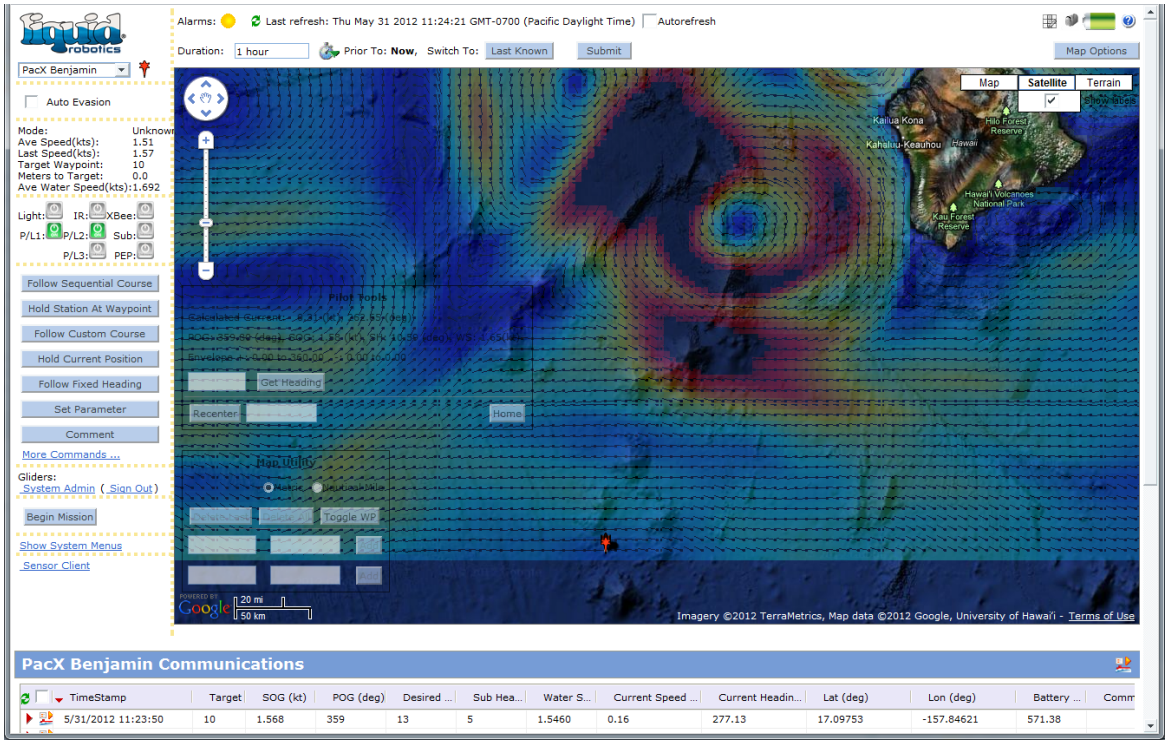
Changes in Version 4.0.5

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 to 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

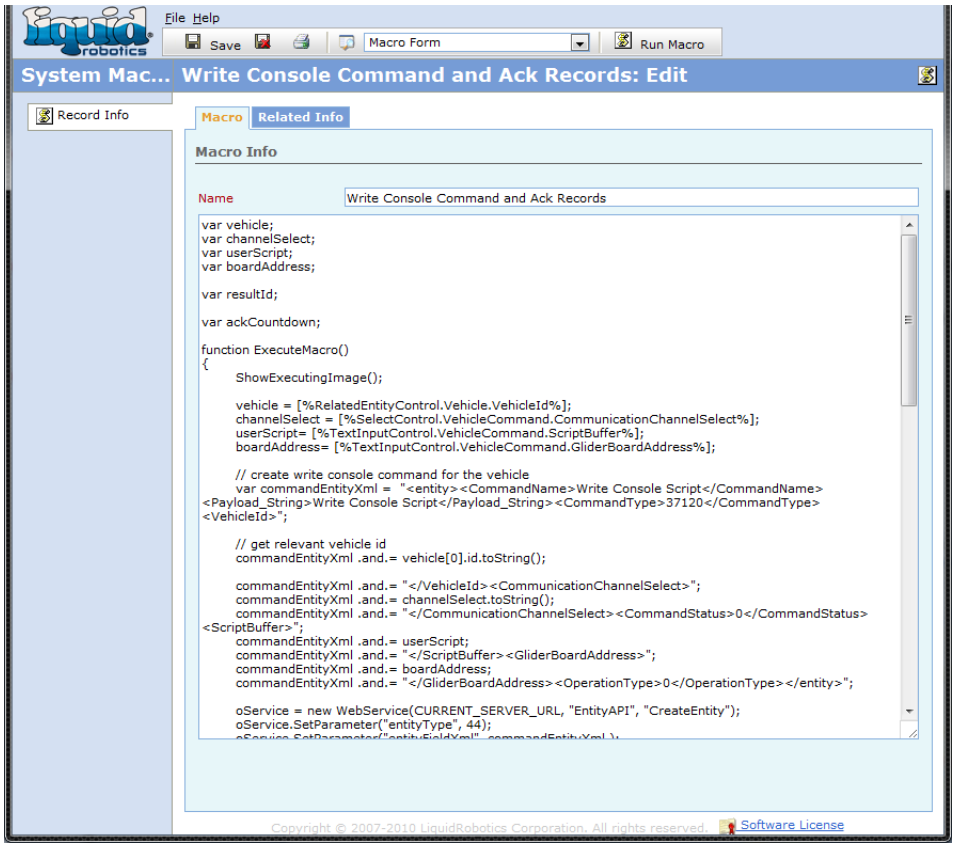
3. Passwords are no longer stored encrypted in the database, but are hashed instead. This means that user forgot password will be given a new temporary one instead of his old password.

4. Migration to Google Maps API level 3, for improved performance.

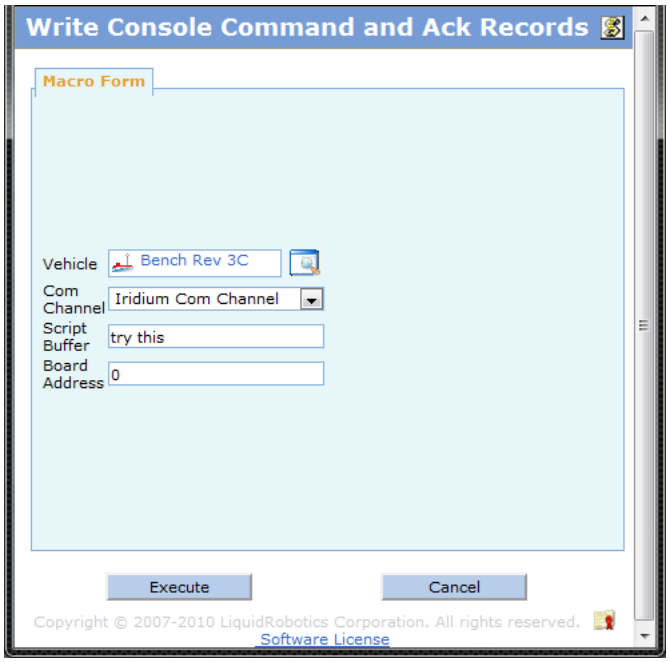
5. Aggregation of AIS markers in high density areas.

User Experience Changes

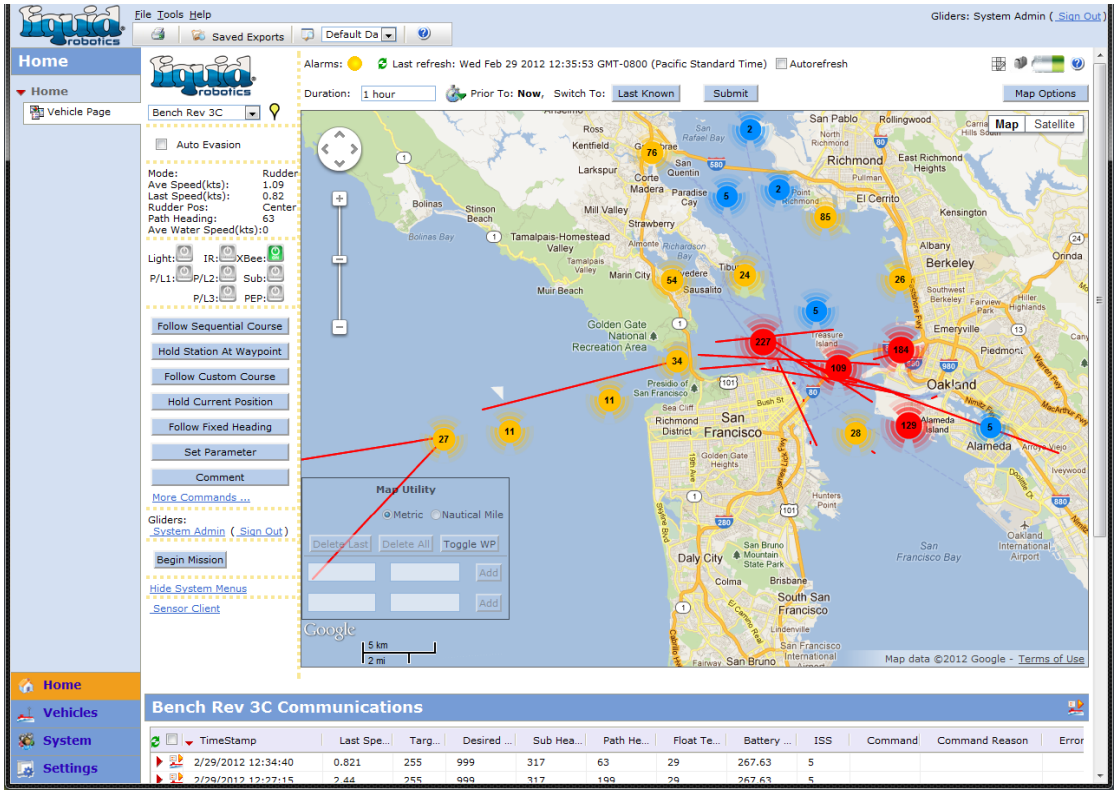
Macro editing:



Macro execution:



Google maps API 3 and AIS marker aggregation:



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 relatedOn 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

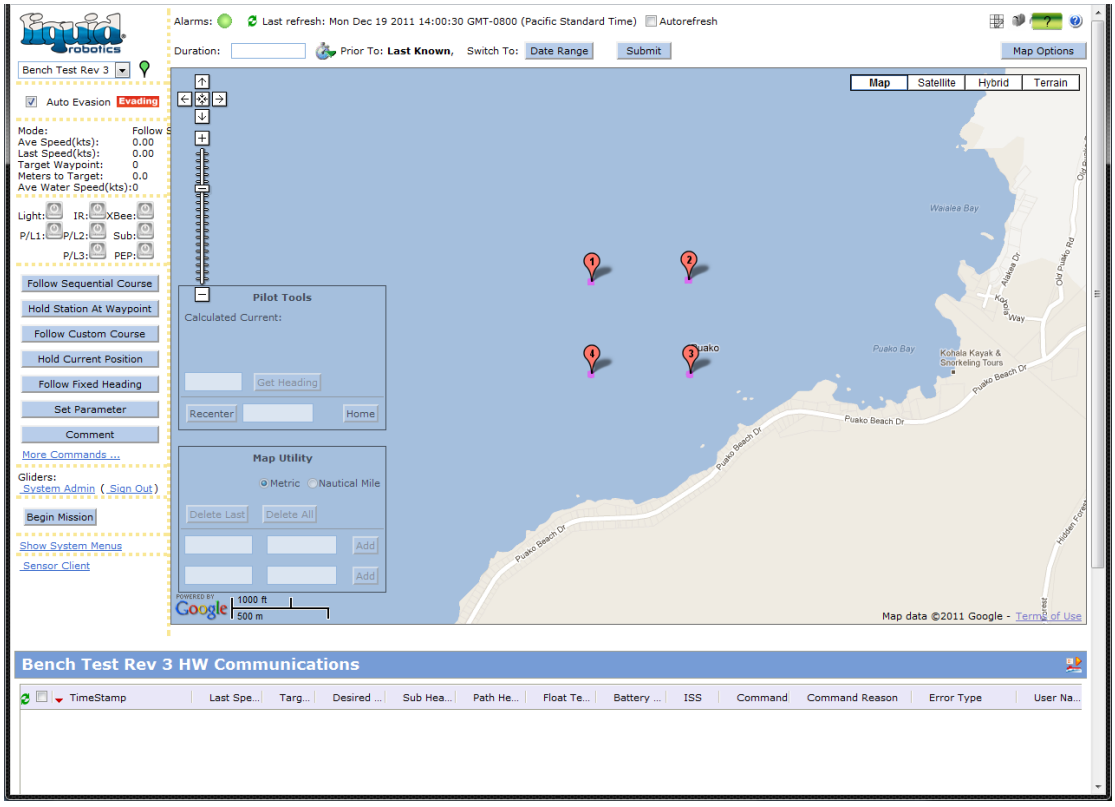
Changes in Version 4.0.2

Principal Changes

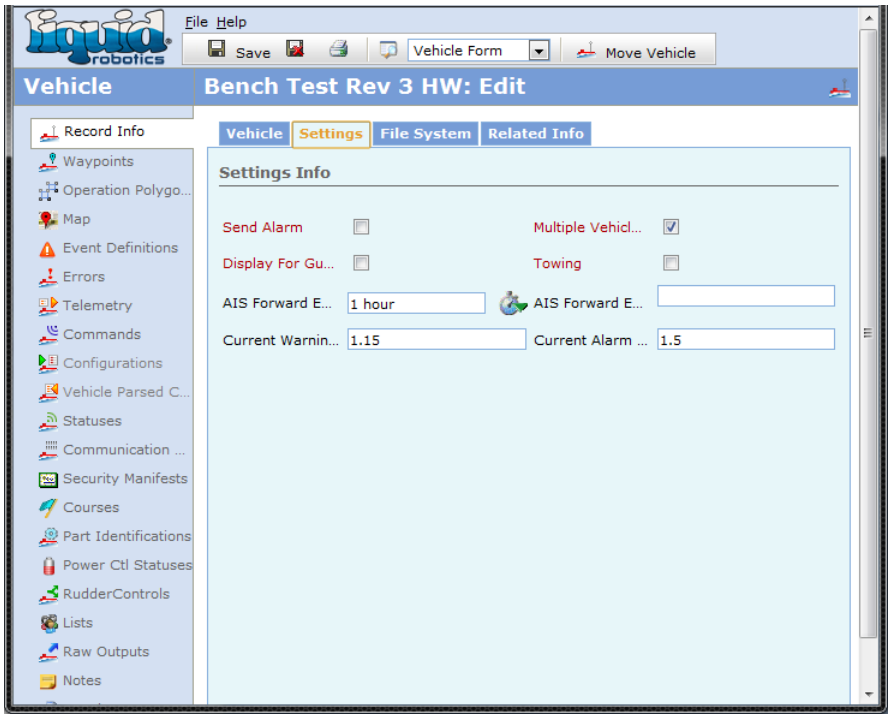
This release has been centered on the introduction of the Virtual Relay Capability, the optional “Auto Evasion” capability in the case of unattended Path Alarms, and the strong current alarm and warning with programmable levels.

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

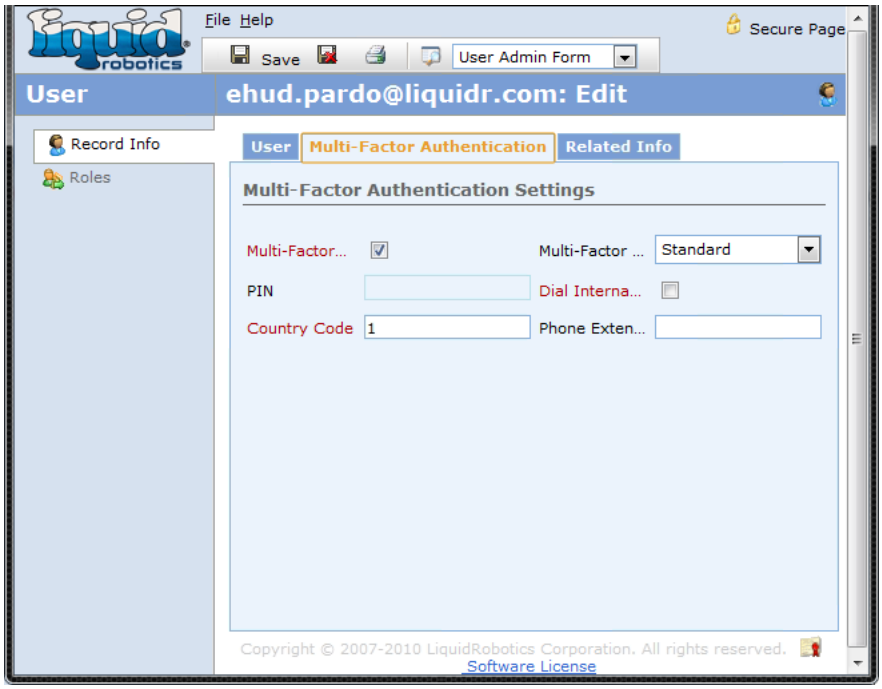
Principal Changes

Release 4.0.1 was mainly about enhanced security functions of WGMS

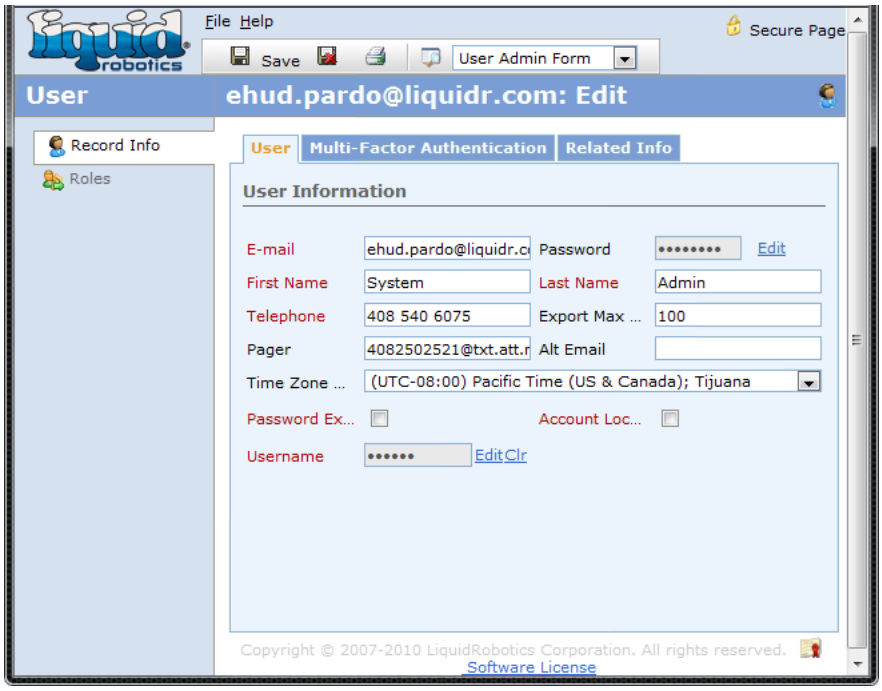
- Implement username/password for sign in
- Multi-Factor authentication per user
- Stronger password strength requirements
- Fixed security bugs

User Experience Changes

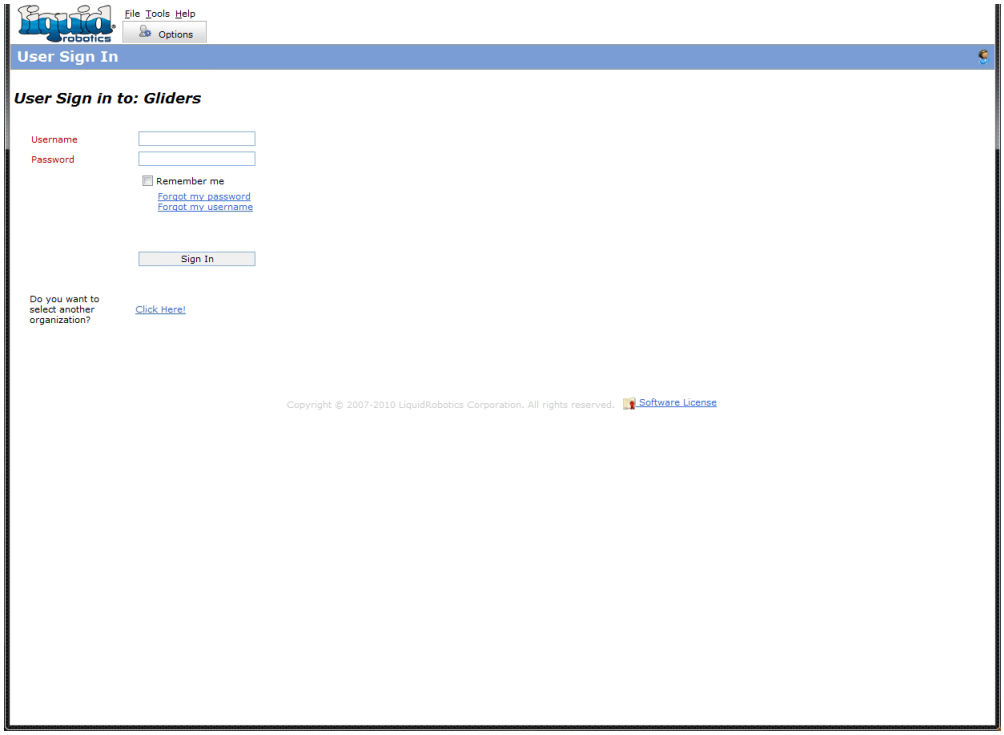
User Admin Form Multi-Factor management tab:



User Admin Form:



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

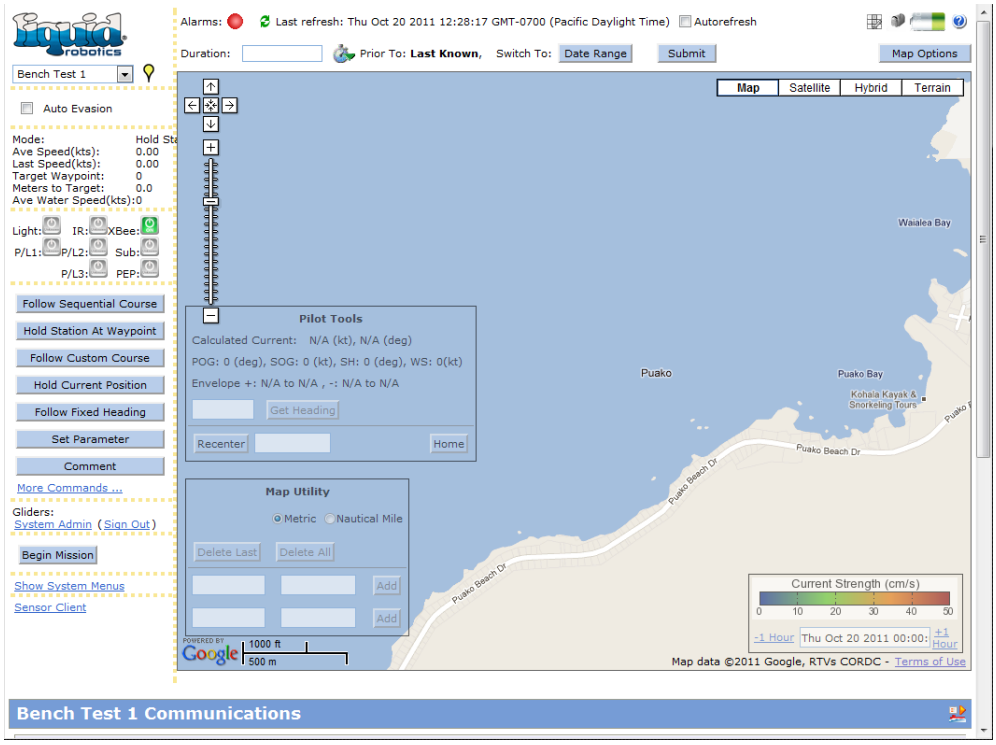
Principal Changes

Release 4.0.0 was mainly about the completion of cross browser compatibility

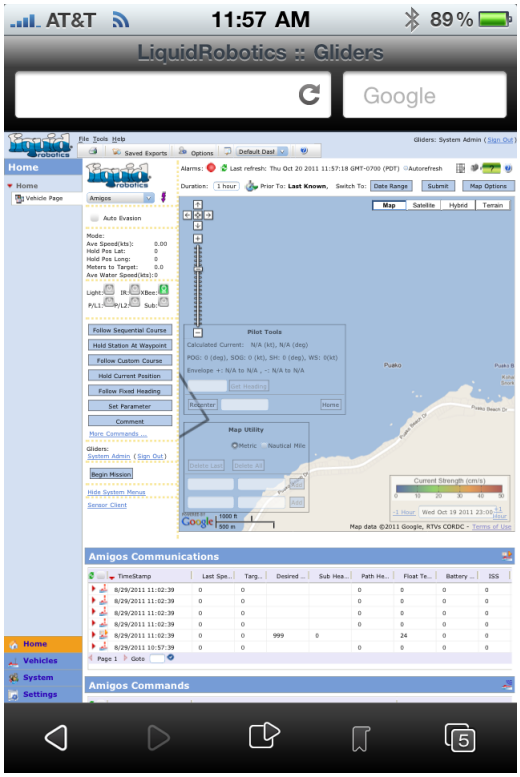
- Cross Browser Date and Time controls
- Line Following indicator control
- Support for both iPad and iPhone browsers

User Experience Changes

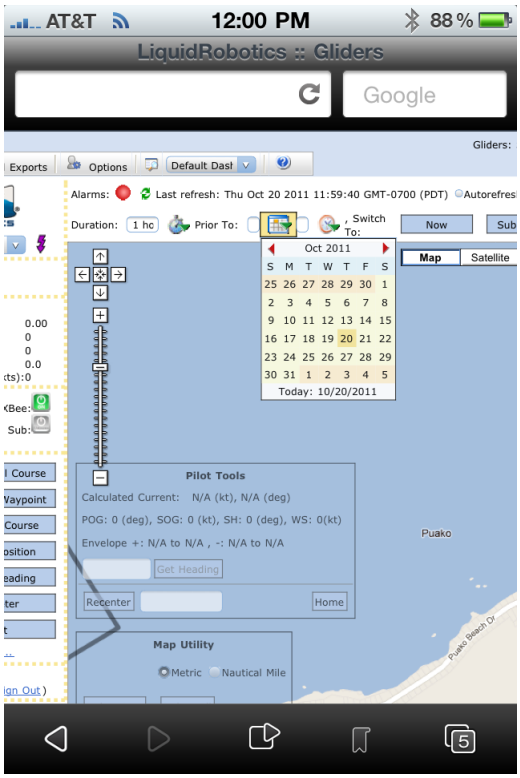
Added Line Following Control:



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 parmaters" 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