EOD Workspace 6.10.0

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GREENSEA

Document History

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001	2023.01.11	v6.10.0 release	CM	PK/DD

Table of Contents

1 Overview

EOD Workspace is built on the OPENSEA platform for a customizable system interface specifically tailored to the EOD Operator. Workspace assists in task automation, search and survey, and object identification. Automation allows operators to focus on accomplishing higher level operations and completing mission objectives. EOD Workspace is tablet and PC compatible.

1.1 Release v6.10.0

This manual includes new features, updates, and bug fixes: since v6.9.0 release.

2 User Interface

2.1 System Conventions

2.1.1 Icons and Buttons

- **Green - Enabled**. Feature is available, and is currently enabled. Click an enabled icon to disable.
- **Blue - Disabled**. Feature is available, but is not currently enabled. Click a disabled icon to enable.
- **Gray - Inactive**. Feature is unavailable.

2.1.2 Widget Bounding Boxes

Some widgets have a bounding box, primarily used in the sensor widgets in the User Preferences and Diagnostics Views. Bounding box color indicates sensor status. There are three possible states:

- **Gray - Inactive**. Indicates the sensor or process connecting to the sensor is inactive. There has been no data communicated to the widget that is monitoring this sensor.
- **Red - No Communications**. Indicates the sensor or process connecting to the sensor is active, but there is no data being transmitted to the widget. This can indicate that there is a problem with Workspace/sensor communications.
- **Green - Widget Communicating**. Indicates the sensor or process connecting to the sensor is active, and there is data being transmitted to the widget.

2.1.3 LED Status Indicators

Widgets may contain status indicators that simulate LED status lights and display in red or green.

- **Solid Green - Status OK**. Indicates a normal status or associated process is running.
- **Solid Red - Status Not OK**. Indicates a fault status or the associated process is not running.

2.1.4 Keyboard Shortcuts

Hotkey	Command
F1	Change Flight View to default 3-View Split layout.
F2	Change Flight View to Video only layout.
F3	Change Flight View to Sonar only layout.
F4	Change Flight View to Mission only layout.
F5	Change Flight View to Sonar/Video layout.
F6	Toggle Flight View tabs.
Alt+1	Open Flight View.
Alt+2	Open User Preferences View.
Alt+3	Open Diagnostics View.

2.2 Flight View

Flight View is the primary view for mission operations. All navigational readouts, vehicle control and mission planning tools are in this view.

Flight View consists of six main functional areas: Heading Bar, Depth and Altitude Bar, Control Bar, Map Display, Sonar and Video Display, and Flight View Tabs. These areas are described in this section.

Flight View (Default 3-View Split)

2.2.1 Heading Bar

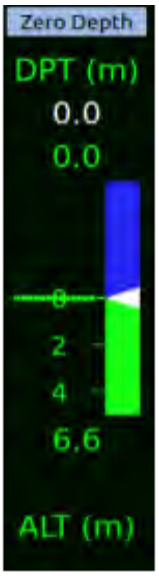
The Heading Bar, located at the top of the Flight View screen, displays the current Heading in the context of the compass.

2.2.1.1 Current Heading and Setpoint

The current vehicle heading is displayed in green. If auto-heading is enabled, the Heading Setpoint is displayed in white. The setpoint is also known as the commanded heading.

Current Heading (Green) Heading Setpoint (White)

2.2.2 Depth and Altitude Bar



DPT/ALT Bar

The Depth and Altitude Bar, located at top left of the Flight View screen, tracks the depth and/or altitude of the vehicle in meters or feet depending on user settings, which can be changed in User Preferences View, Navigation tab, Position Format.

2.2.2.1 Zero Depth

Zero Depth sets the current vehicle depth to zero, and is used anytime the operator notices a discrepancy between the surface position and what the depth/alt bar is displaying.

NOTE: Upon vehicle startup, the system reads vehicle pressure and automatically sets depth to zero without operator input.

NOTE: Using Zero Depth when the vehicle is not on the surface may result in unexpected vehicle motion.

2.2.2.2 Depth (DPT)

Current vehicle depth is displayed at the top of the tracker. If Auto-depth is enabled, the depth setpoint is displayed as a white number above the current vehicle depth.

2.2.2.3 Altitude (ALT)

The vehicle's current altitude is displayed at the bottom of the tracker. If Auto-altitude is enabled, the altitude setpoint is displayed as a white number below the current vehicle altitude.

2.2.2.4 Vehicle Setpoint

The vehicle setpoint is shown by both a white number (displayed DPT or ALT where appropriate) and white marker on the visual tracking bar. The setpoint is the depth (or altitude) that the vehicle attempts to achieve and hold.

2.2.2.5 Visual Tracking and Breadcrumb Trail

The current and recent vehicle position in the water column is tracked by the green dots (breadcrumbs). The spacing of these dots can show how quickly the vehicle is moving vertically. If Doppler Velocity Log (DVL) bottom lock is achieved, the bottom track displays (when in range) with orange breadcrumbs.

The vehicle tracking bar displays three colors:

- Blue - Above water.
- Green - In water.
- Orange - Tracks the location of the bottom.
- Red - Vehicle has exceeded the recommended operational depth of 300 meters.

2.2.3 Control Bar

The Control Bar, located at bottom left of the Flight View screen, provides access to system and vehicle functions. Each Icon in the control bar can have three possible states.

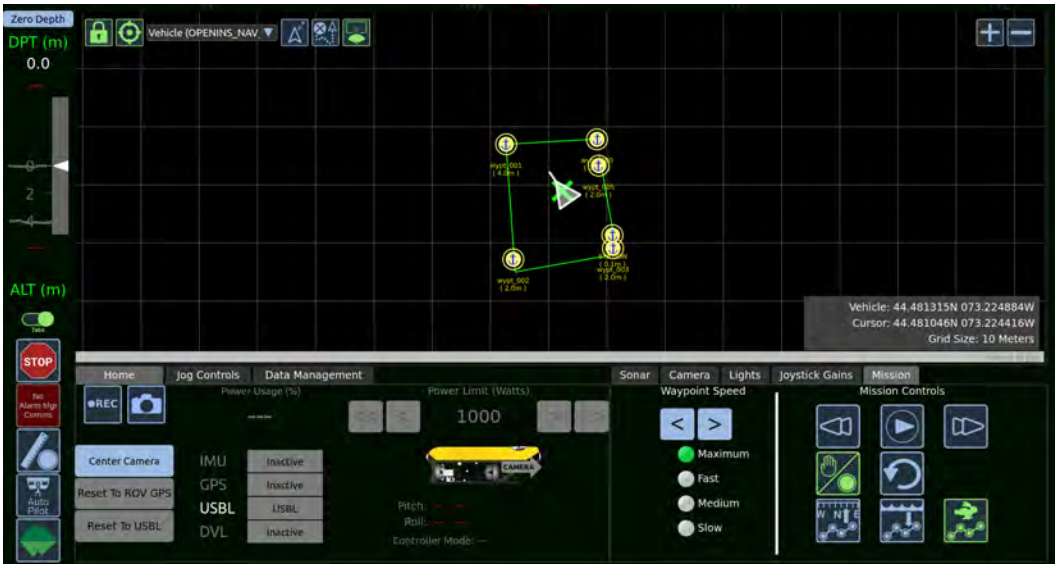
- Enabled (green) - function is enabled.
- Disabled (blue) - function is disabled.
- Inactive (gray) - function is unavailable.

The Alarm indicator and View Selector are also included in the Control Bar for alerts and access to other views. Control Bar functions are described in the following paragraphs.

2.2.3.1 Tabs

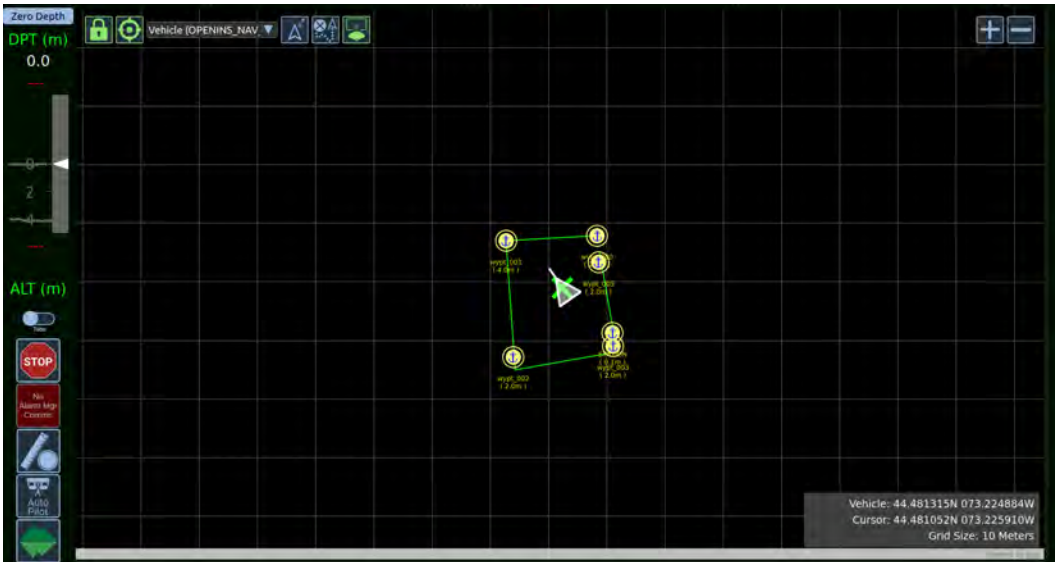
Enable (show)/disable (hide) Flight View tabs. Tabs are shown by default at startup.

Enabled



Tabs Enabled

Disabled



Tabs Disabled

2.2.3.2 Stop

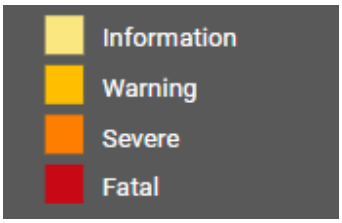
Immediately stops the vehicle and creates an active station-keeping waypoint at the current vehicle location and holds that position.

2.2.3.3 Alarm Indicator

The Alarm indicator alerts the operator to triggered system events. There are three possible states:

No Alarms - No triggered alarms.

Alarm(s) Triggered - One or more alarms triggered. The icon changes to an exclamation point with the number of events triggered. Alarm severity is color coded: Informational (yellow), Warning (orange), Severe, (dark orange), Fatal (red).



Alarm Color Codes

No Comms - Displays if there is no communication with the alarm manager.

2.2.3.3.1 Alarms Window

Tap or click the Alarm icon to open the Alarms window listing all triggered alarms color coded by severity.

- **Ack All** (Acknowledge All) - Clears all triggered alarms.
- **Cancel** - Closes the window only. Alarms are not cleared.

NOTE: If the event continues after acknowledging the alarm, the alarm reappears. Acknowledgement does not resolve the trigger event.

Alarms Window (Two Alarms Shown)

See also Alarm View Tab, and Alarms.

2.2.3.4 Map Tools

Open the Map View Tools flyout.

Measure Tool - Toggle Measure Mode. When enabled, *Measure Mode* displays on the map. Click or tap the map, and drag to get a distance and bearing measurement. See also Create Distance and Bearing Measurement.

NOTE: A new measurement is created each time the Map is tapped/clicked until Measure Mode is disabled

Markers Tool - Toggle Markers mode. When enabled, click or tap the map to add a marker. See also Marker.

Waypoints Tool - Toggle Waypoint Mode. When enabled, click or tap the map to add a new Waypoint to the current mission. This can be used to quickly create missions on the fly. See also Waypoint, Mission, Create Mission.

Region Tool - Toggle Region Mode. When enabled, *Region Mode Click Map to Set Reference* displays on the map. Click or tap the map to add a new point defining a region. See also Create and Edit Regions.

2.2.3.5 Autopilot Controls

Open the autopilot flyout.

Toggle Auto-Heading - When enabled, the vehicle maintains and follows the heading setpoint to direct the vehicle, starting with the current heading. Control Inputs move the setpoint.

Toggle Auto-Depth - When enabled, the vehicle maintains and follows the depth set point, starting with the current depth. Control Inputs move the setpoint.

NOTE: Enabling Auto Depth disables Auto Altitude.

Toggle Auto-Altitude - When enabled, the vehicle maintains and follows the depth set point, starting with the current altitude. Control Inputs move the setpoint.

NOTE: Enabling Auto Altitude disables Auto Depth.

Toggle Auto-Pitch - When enabled, the vehicle maintains and follows the Pitch setpoint. Pitch can be controlled and zeroed from the controller.

Toggle Auto-Roll - When enabled, the vehicle maintains the current roll. Roll can be zeroed from the controller.

Toggle Positioning Mode - When enabled, Positioning creates a waypoint at the vehicle position. While positioning is active, control inputs move the vehicle. When inputs return to null, Workspace creates a waypoint at the vehicle location. When positioning is disabled, the vehicle stops and is returned to direct user control.

Toggle Point of Interest (POI) Mode - When enabled, mouse-click or double tap the Map to place a Point of Interest marker. Vehicle control then orients toward the POI. Lateral changes to Orbit in terms of vehicle control.

2.2.3.6 View Selector

Open the View Selector flyout to select a Flight View layout or open another View.

Change Flight View to default 3-View Split (mission, sonar, and video) layout (keyboard shortcut is F1).

Change Flight View to Video only layout (keyboard shortcut F2).

Change Flight View to Sonar only layout (keyboard shortcut F3).

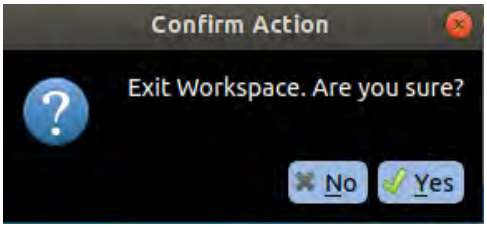
Change Flight View to Mission only layout (keyboard shortcut F4).

Change Flight View to Sonar/Video only layout (keyboard shortcut F5).

Open User Preferences View. Keyboard shortcut Alt+2.F

Open Diagnostics View. Keyboard shortcut Alt+3.

Exit Workspace. Shutdown Workspace application; confirm action.

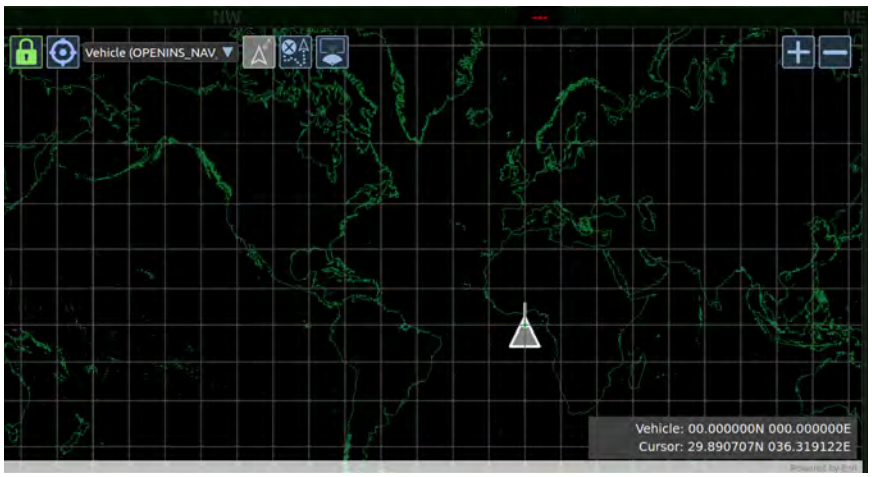


NOTE: Workspace now runs in full screen mode for better performance, and cannot be resized, or shutdown by closing the window (clicking X). Exit Workspace performs a graceful shutdown.

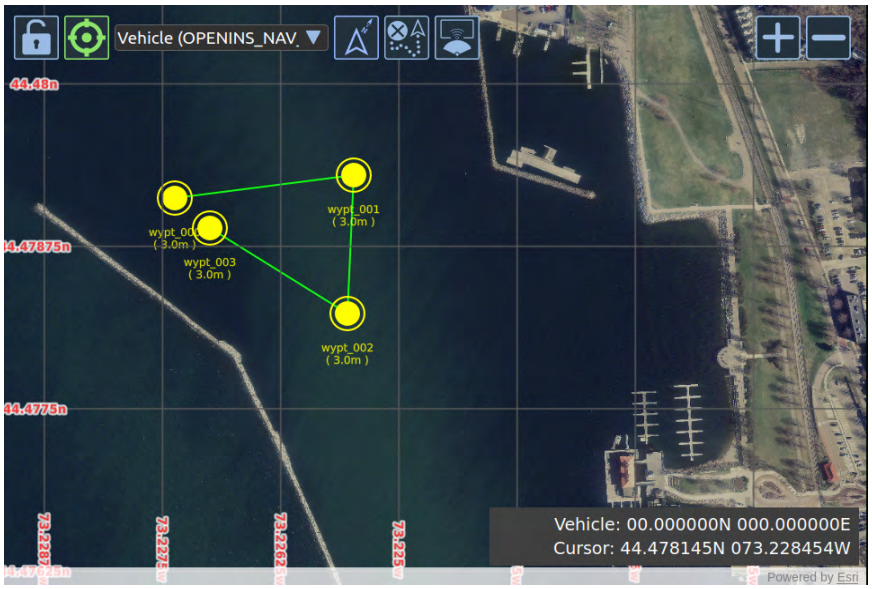
2.2.4 Map Display

The Map display, located in the center of the Flight View screen, is a two-dimensional display of mission and navigation information.Vehicle and vessel position, active charts, and mission files are viewable on the Map. This section describes Map Objects, Map Controls, and Map Menus and functions.

NOTE: At system startup, a global coastline basemap displays, accurate to approximately 10 meters, to assist in initial location. This map is not accurate enough to be used navigationally and can be hidden using the Data Management tab/Charts subtab once zoomed in to the operational area.



Map Display - Global Coastline Basemap



Map Display - Imported Chart

See also Charts Subtab, Import Chart, Show/Hide Chart or Basemap.

2.2.4.1 Map Objects

Objects displayed on the Map represent various mission components: Waypoint, Mission, Marker, and Navigation Sources.

2.2.4.1.1 Waypoint

A waypoint is part of a mission route, and is used to control vehicle positioning.There are four types of waypoints: Active, Station, Non-Station, and Locked.

Active Waypoint

Station Waypoint

Non-Station Waypoint

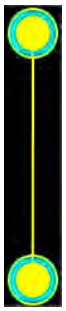

Locked Waypoint

- **Active Waypoint** - Marked with a green X, the waypoint the vehicle is currently transiting to, or is holding at. Autopilot Jog Controls move this waypoint.
- **Station Waypoint** - Labeled STATION. A station waypoint can also be the active waypoint. When the station waypoint is the active waypoint, moving the controller moves the vehicle. When the controller returns to null, the station waypoint moves to the current vehicle position.
- **Non-Station Waypoint** - Labeled anything other than STATION (ex: wypt_001). If a non-station waypoint is the active waypoint, moving the controller moves the vehicle. When the controller returns to null, Workspace creates a new Active STATION Waypoint in the current active mission.
- **Locked Waypoint** - A locked waypoint cannot be moved and is indicated with an anchor. Lock/Unlock all waypoints using Map Controls/Global Lock, and a single waypoint using either of the Waypoint menus. Any waypoint type can be locked/unlocked.

2.2.4.1.2 Mission

A mission is one or more waypoints connected by a route. A mission can be active, inactive, or executing.


Inactive Mission


Active Mission


Executing Mission

- **Inactive Mission** - The mission is imported and displays on the Map but is not the active mission, indicated by a thin solid line.
- **Active Mission** - The selected mission on the Map or in the Data Management tab/Missions subtab, waypoints highlight cyan. New waypoints are added to the end of the active mission.
- **Executing Mission** - The mission currently executing, indicated by a dashed route line.

2.2.4.1.3 Marker

A marker is used to mark a specific location on the map. Markers are saved in the Data Management/Markers subtab. Markers are not part of a mission route. New markers are locked by default when created.


Marker


Locked Marker

- Unlock/lock all markers: toggle Map Controls/Lock icon.
- Unlock/lock a single marker: right-click a marker and select **Unlock/Lock Marker**, or unselect/select Locked checkbox in Data management/Markers subtab.

2.2.4.1.4 Navigation Sources

Display vehicle, beacon, and vessel icons on the Map. Configure icons in User Preferences View/Navigation tab/Navigation Sources.


The vehicle object marks the vehicle location and heading. Vehicle source is preconfigured.


A beacon object tracks an individual sensor input for the vehicle. The following beacons are preconfigured:

- Topside GPS Position (Green)
- ROV GPS Position (Cyan)
- USBL Position (Yellow)


A vessel object marks a surface vessel location and heading.

2.2.4.2 Map Controls

Use Map Controls to toggle the following Map functions:


Global Lock - Enabled by default. Locks all waypoints and markers on the Map. Disable to unlock all waypoints and markers.


Centering - Locks the chart on the selected navigation object in the drop-down menu to the right of the icon. A centered object snaps back to map center if moved off the Map.


Heading Up - View Map vehicle heading up. Becomes active when Centering is enabled. When enabled, the vehicle centers on the Map and always points up. The Map rotates around the vehicle.


Clear Trails - Removes any trails from Navigation Sources (vehicle, vessel, beacon).


Sonar Overlay - Overlay sonar fan on the Map at the vehicle location.


Zoom In/Out - Zoom in and out on the Map. Alternatively, scroll the mouse wheel or pinch/spread fingers on the touchscreen.

2.2.4.3 Map Menus

Currently, menus are a mix of both new touchscreen menus and legacy mouse-only right-click menus. Both menu types are described in the following sections.

NOTE: All touchscreen menus can also be accessed using a mouse.

NOTE: For overlapping objects on the Map, right-click the top object to open an object selection menu, or zoom in enough to view underlying objects.

2.2.4.3.1 Position and General Menus

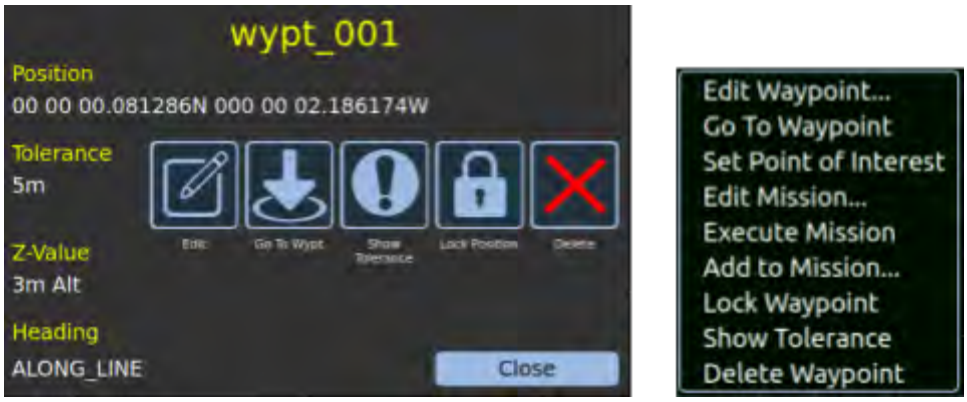
Double-tap or double-click an open area on the Map to open the touchscreen Position menu, or right-click an open area on the Map to the legacy General menu. Options are described below.

Position Menu (Touchscreen), General Menu (Legacy)

Touchscreen	Legacy	Description
Add Marker	Add Marker Here	Create a marker at the selected location on the Map. See also Map Tools/Marker Mode.
Add Waypoint	Add Waypoint Here	Add a waypoint to the end of the active mission at the selected location on the Map. See also Map Tools/Waypoint Mode.
—	Add and Go To Waypoint	Add a waypoint at the selected location, enables Positioning, and commands the vehicle to transit to the selected location. This Waypoint is the first waypoint in a new mission. The newly created mission becomes the active mission.
Set POI	Set Point of Interest	Set a point of interest and enable Point of Interest Mode. Vehicle controls orient toward the Point of Interest. See also Autopilot Controls/POI, and Set POI.
Copy Position	Copy Mouse Position	Copy position coordinates of tapped/cursor location on the Map.
Set Vehicle Position	Set Vehicle to Mouse Position	Reset vehicle position to selected location on the Map. See also Autopilot Controls/Positioning, and Set Vehicle Position.
		WARNING: If Positioning is enabled and a new position is set, the vehicle attempts to reposition itself to the active waypoint, which can cause significant vehicle movement.
—	Create Region	Open Create a Rectangular Region window to create a region. See also Map Tools/Region Mode, Region Menus, and Create and Edit Regions.

2.2.4.3.2 Waypoint Menus

Double-click or double-tap a waypoint to open the touchscreen Waypoint menu, or right-click on a waypoint to open the legacy Waypoint menu. Options are described below.



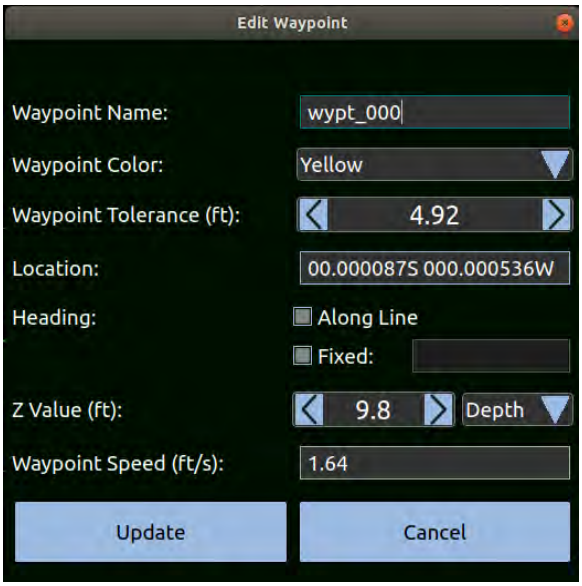
Waypoint Menus

Touchscreen	Legacy	Description
Edit	Edit Waypoint	Open the Edit Waypoint window to edit waypoint attributes.
Go To Waypoint	Go To Waypoint	Command the vehicle to go to the selected Waypoint. This changes the current mission to the mission that includes the selected waypoint.
—	Set Point of Interest	Set a point of interest and enable Point of Interest Mode. Vehicle controls orient toward the Point of Interest. See also Position Menu, Autopilot Controls/POI, and Set POI.
—	Edit Mission	Edit active mission attributes. See also Mission Menu, Data Management Tab/Missions Subtab.
—	Execute Mission	Start the active mission. See also Mission Menu, Data Management Tab/Missions Subtab.
—	Add to Mission	Add the selected waypoint to a new mission or merge with another mission. See also Mission Menu, Data Management Tab/Missions Subtab.
Show Tolerance	Show Tolerance	Show/hide the tolerance surrounding the waypoint.
Lock Position	Lock Waypoint	Lock/unlock waypoint position. Locked waypoints cannot be moved. See also Map Controls/Lock.
Delete	Delete Waypoint	Delete the selected waypoint.
Close	—	Close the menu.

2.2.4.3.2.1 Edit Waypoint Window

Select Edit on the Waypoint menu to open the Edit Waypoint window and edit the fields described below.

NOTE: Waypoint settings impact vehicle behavior on the way to and at the *active* waypoint. Once the next waypoint is active, the vehicle uses the values set for that waypoint.



Edit Waypoint Window

Field	Description
Waypoint Name	The name of the waypoint.
Waypoint Color	The color of the waypoint.
Waypoint Tolerance	The radius around a waypoint that the vehicle reaches to consider the waypoint achieved, before continuing to the next waypoint if the mission is not paused.
Location	The waypoint coordinates (displays in units defined in User Preferences View/Position Format).
Heading	The heading the vehicle maintains to the waypoint. • *Along Line* - vehicle heading points along the line while transiting to the waypoint. • *Fixed* - vehicle heading remains fixed at a set parameter while transiting to the waypoint; can cause vehicle instability. **NOTE**: For Fixed and Along Line to function properly, Auto Heading control and Waypoint Heading Override (Lock) control must be enabled so that the waypoint settings are used.
Z-Value	The waypoint vertical position, either depth or altitude; informed by waypoint tolerance.
Waypoint Speed	The vehicle speed while transiting to the active waypoint.

2.2.4.3.3 Mission Menu

Right-click on a mission route (waypoint connector line) to open the legacy Mission menu. Options are described below.

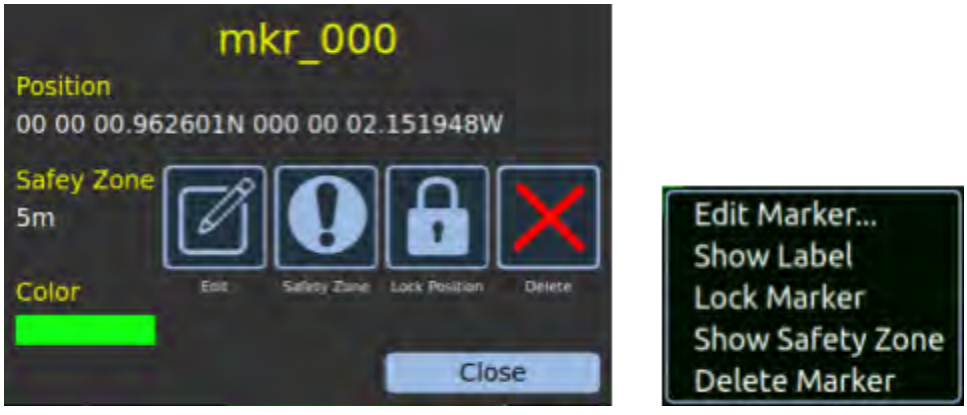
NOTE: Touchscreen users can access mission functions using the Data Management tab/Missions subtab, and the lock function using the Global Lock control on the Map.

Mission Menu

Option	Description
Edit Mission...	Open the Edit Mission Window for the selected Mission.
Add to Mission…	Open a dialogue to add the selected mission to another mission.
Lock Mission Waypoints	Lock all waypoints in the selected mission.
Remove Mission	Delete the selected Mission.
Execute Mission	Command the vehicle to execute the selected mission.

2.2.4.3.4 Marker Menus

Double-tap or double-click a marker to open the touchscreen Marker menu, or right-click on a marker to open the legacy Maker menu. Marker details display on the left of the touchscreen menu. Menu options are described below.

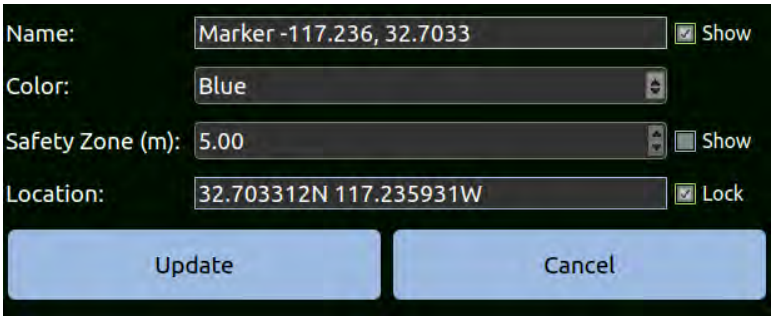


Marker Menus

Touchscreen	Legacy	Description
Edit	Edit Marker	Open the Edit Marker window and edit marker details.
Safety Zone	Show Safety Zone	Display the safety zone surrounding the marker. A Safety Zone is a visual indicator on the Map noting an area to be cautious of.
		NOTE: The Safety Zone is a visual indicator only, and does not prevent the vehicle from entering the area if commanded.
Lock Position	Lock Marker	Lock/unlock marker position. Locked markers cannot be moved. Use Map Controls/Global Lock to lock/unlock all markers.
Delete	Delete Marker	Delete the selected marker.
Close	—	Close the menu.

2.2.4.3.4.1 Edit Marker Window

Select Edit on the Marker menu to open the Edit Marker window and edit the fields described below. Marker Location (Position), Safety Zone, and Color display on the left of the Marker menu.

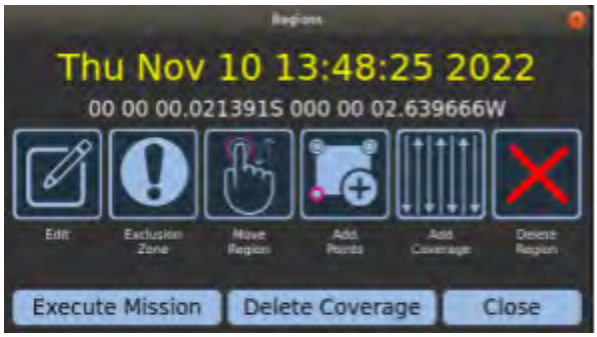


Edit Marker Window

Field	Description
Name	Edit marker name; option to show/hide name on the Map.
Color	Edit marker color.
Safety Zone	Edit safety zone radius; option to show/hide the safety zone.
Location	Marker position coordinates (in user-defined units); option to lock/unlock location.

2.2.4.3.5 Region Menus

Double-click or double-tap a region to open the touchscreen Region menu, or right-click on a region to open the legacy Region menu.



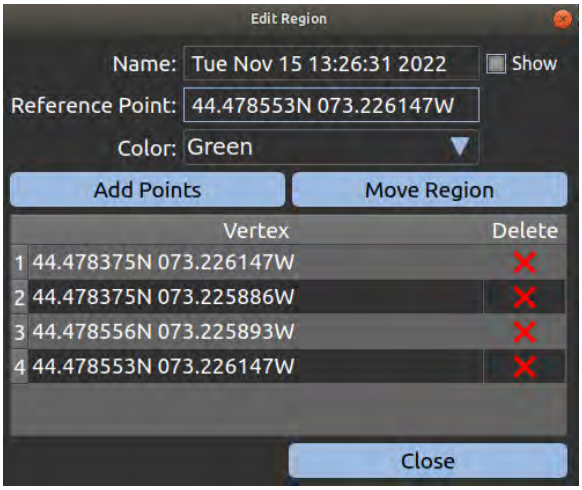
Region Menus

Touchscreen	Legacy	Description
Edit	Edit Region	Open the Edit Region window and edit region details.
Exclusion Zone	Toggle Exclusion Zone	Change region from a survey area to an exclusion zone. Alerts the operator to avoid that area; region displays as red. Visual alert only; does not prevent the vehicle from entering the zone. See also Toggle Region/Exclusion Zone.
Move Region	—	Move the region to another location on the Map.
Add Points	—	Add points to the region.
Add Coverage	Add Coverage	Define and add a survey pattern to the region: *Mow*, *Gapped*, *Sawtooth*.
Delete Coverage	Remove Coverage	Delete survey pattern.
Execute Mission	Execute Mission	Start the mission.
Delete Region	Delete Region	Delete the region.
Close	—	Close the menu.

2.2.4.3.5.1 Edit Region Window

To open the Edit Region Window, double tap/click the region on the Map, right-click the region on the Map, or double-click a region in list in the Data Management tab/Regions subtab.

The Edit Region window allows adding/deleting region points, and moving the region to another location.



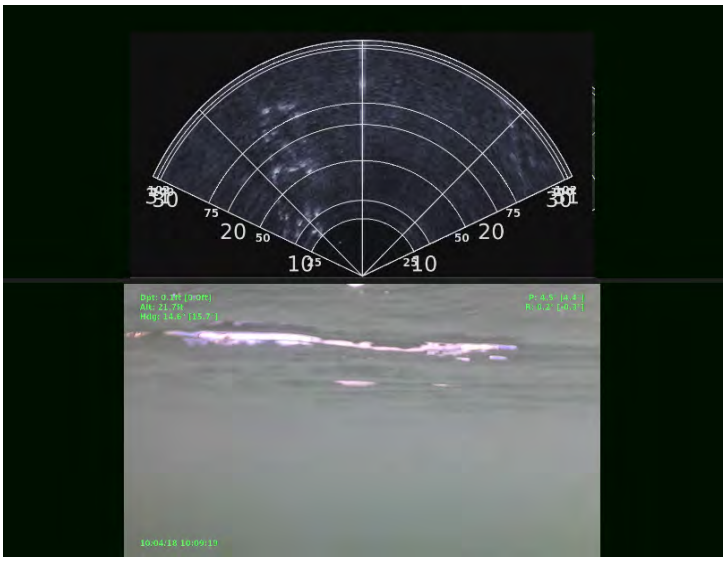
Edit Region Window

Command	Description
Add Points	Enable Regions Mode and tap or left-click on the Map and add points to the region being edited. Any points added to a region creates a convex polygon; the Region tool cannot create concave polygons.
Move Region	Enable Regions Mode and tap or left-click on the Map to move the region to the new location. Region movement is based on the reference point.
Close	Close the window.

See also Create and Edit Regions.

2.2.5 Sonar and Video Display

The Sonar/Video Display shows the video feed for the sonar and camera. Use the View Selector or hotkeys F1 through F5 to cycle display layouts to sonar/video, sonar only, video only, and 3-view split (mission/sonar/video).



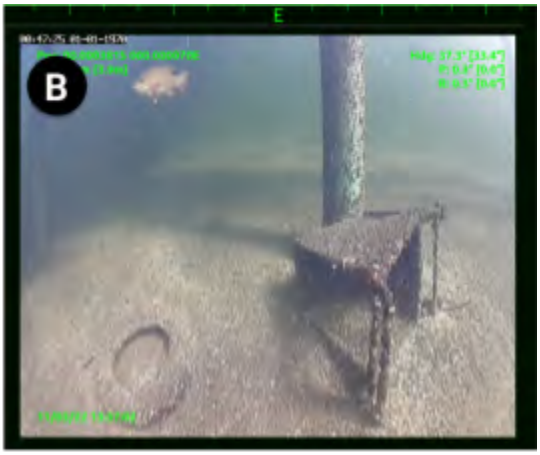
Sonar/Video Display

2.2.5.1 Video Modes and Picture in Picture (PiP)

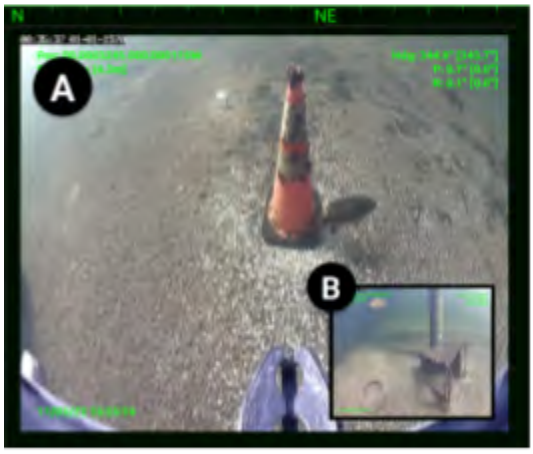
Tap or right-click on the video display to cycle through video modes. PiP functionality is available when two cameras are connected.

- Video A only
- Video B only
- Video A with Video B PiP
- Video B with Video A PiP

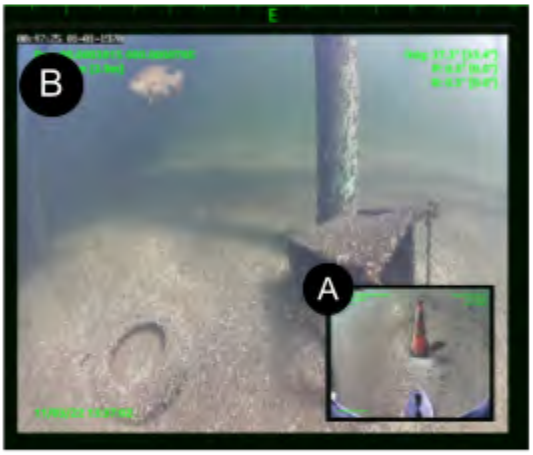
Video A Only



Video B Only



Video A with Video B PiP

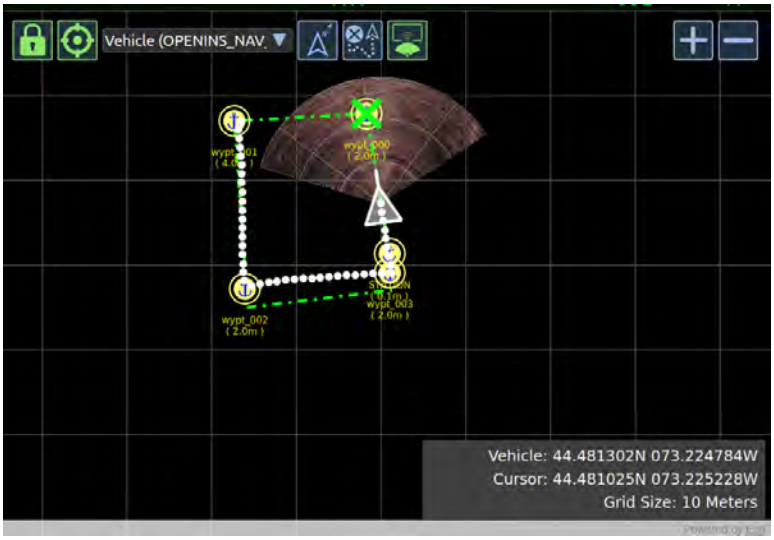


Video B with Video A PiP

2.2.5.2 Sonar Overlay on Map

Enable the Sonar icon located on the Map Controls bar to display the sonar fan on the Map.

Sonar Icon Enabled



Sonar Overlay on Map

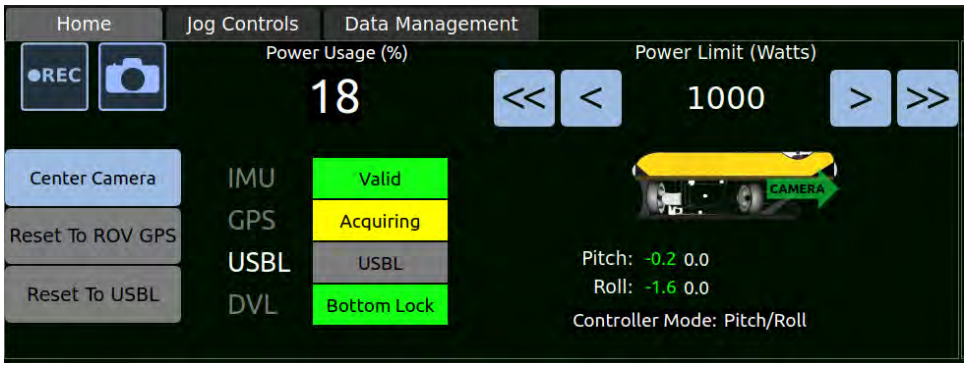
See also Flight View, Sonar Tab and Camera Tab for sonar and camera controls.

2.2.6 Flight View Tabs

The Flight View tabs provide easy access to vehicle controls, and system and mission data during mission operations. Tabs are displayed by default upon Workspace startup. Toggle tabs on/off at any time using the Tabs control on the Control Bar.

2.2.6.1 Home Tab

The Home tab provides a centralized location to access frequently used controls and important system and mission information.



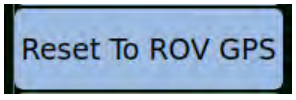
Flight View Tabs - Home Tab

2.2.6.1.1 Quick Controls

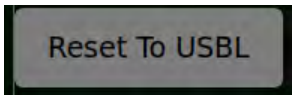
Manually start recording a log.

Take a screenshot of the current UI.

Return the camera tilt to the center position.



Set vehicle location to the GPS location (If available).



Set vehicle location to the USBL location (If available).

2.2.6.1.2 Power Usage

Displays the percentage of the power limit the vehicle is using.

2.2.6.1.3 Power Limit (Watts)

Set the vehicle power draw limit to prevent blackouts due to a drop in voltage.

The Power Limit can be set from 0 to 1500 watts. Increase/decrease in increments of 25 using < >, and 100 using << >>.

Power Limit (Watts)

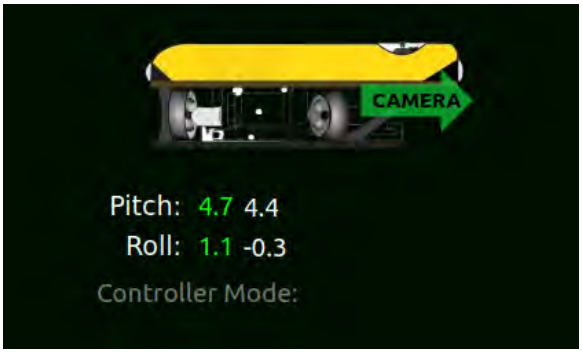
2.2.6.1.4 Sensor Status

Sensor Status

Displays vehicle sensors communication status.

- Green - Sensor is functioning as expected and reporting data.
- Yellow - Sensor is initializing or acquiring data.
- Gray - Sensor is unavailable or not communicating.
- Red - Sensor fault, not functional.

2.2.6.1.5 Vehicle Information



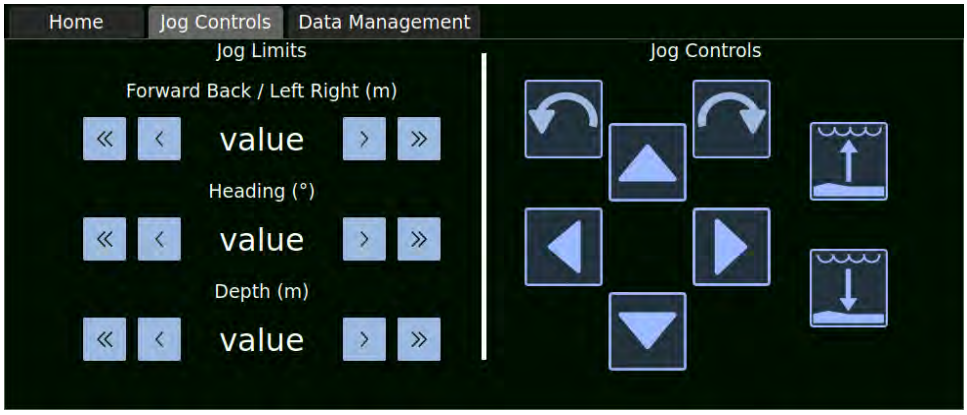
Vehicle Information

Displays the following vehicle information:

- Camera angle in relation to the vehicle.
- Pitch/Roll (green text) and Pitch/Roll setpoint (white text).
- Current controller mode: Camera, Pitch/Roll, Sonar, or Manip.

2.2.6.2 Jog Controls Tab

Controls for lateral and vertical vehicle movement.



Jog Controls Tab

2.2.6.2.1 Jog Limits

Set joystick controller jog limits for vehicle movement: lateral (front/back, left/right), vertical (up/down), and heading (rotational). Use smaller limits for operation in tight spaces and near sensitive targets. Alternatively, set Jog Limits in User Preferences, Vehicle tab.

Reduce or increase the jog value by:

- 0.1 ft or 0.1 m depending on imperial or metric.
- 2 degrees.

Reduce or increase the jog value by:

- 1 ft or 1 m depending on imperial or metric.
- Heading by 10 degrees.

2.2.6.2.2 Jog Controls

Jog vehicle forward by the Forward Back/Left Right set value.

Jog vehicle back by the Forward Back/Left Right set value.

Jog vehicle left by the Forward Back/Left Right set value. .

Jog vehicle right by the Forward Back/Left Right set value.

Jog vehicle rotation left by the Heading set value.

Jog vehicle rotation right by the Heading set value.

Jog vehicle up by the Depth set value.

Jog vehicle down by the Depth set value.

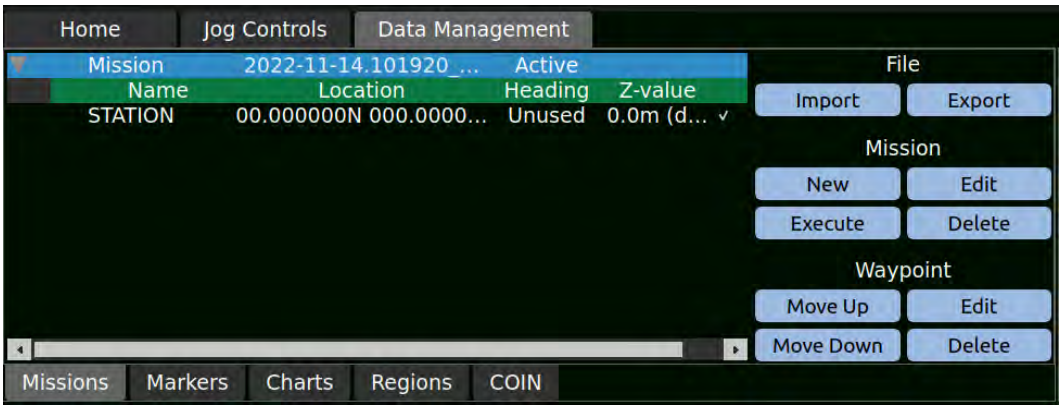
2.2.6.3 Data Management Tab

Manage mission data: Missions, Markers, Charts, Regions, and COIN (US Navy use only).

2.2.6.3.1 Missions Subtab

The Mission subtab displays the missions currently in Workspace. Missions can be inactive (unselected), active (selected), or executing (the mission the vehicle is currently running). New Waypoints are added to the end of the current Active Mission, and are locked by default.

Expand a mission in the list to view all waypoints in that mission; view location, heading, and Z Value (altitude or depth) for each. Selecting a waypoint enables the Waypoint command buttons.



Data Management Tab - Missions Subtab

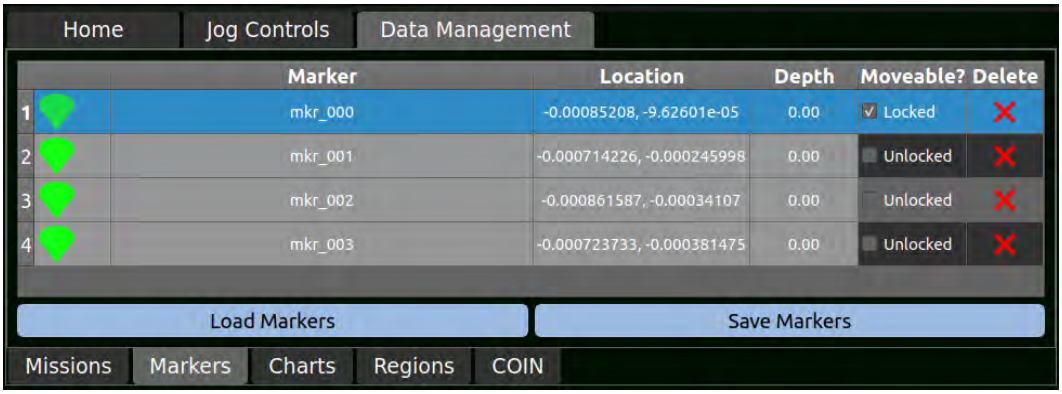
2.2.6.3.1.1 Missions Subtab Commands

Manage mission data using the command buttons at tab right. See also Import Mission.

- File
    - **Import** - Open Load Data File window to load a mission file.
    - **Export** - Open Save Data File window to save a mission file.
- Mission
    - **New** - Open Edit Mission window to create a new mission.
    - **Edit** - Open Edit Mission window to edit the selected mission.
    - **Execute** - Command the vehicle to execute the selected mission.
    - **Delete** - Delete the selected mission.
- Waypoint
    - **Move Up** - Move the waypoint up in the list of mission waypoint order.
    - **Move Down** - Move the waypoint down in the list of mission waypoint order.
    - **Edit** - Open the Edit Waypoint window to edit the selected waypoint.
    - **Delete** - Delete the selected Waypoint.

2.2.6.3.2 Markers Subtab

The Markers subtab lists all created markers. Use this tab to manage mission markers; lock/unlock markers on the Map (default is locked), delete markers, load saved markers, and save new markers. See Marker Menus to create and edit markers.



Data Management Tab - Markers Subtab

2.2.6.3.2.1 Marker Subtab Commands

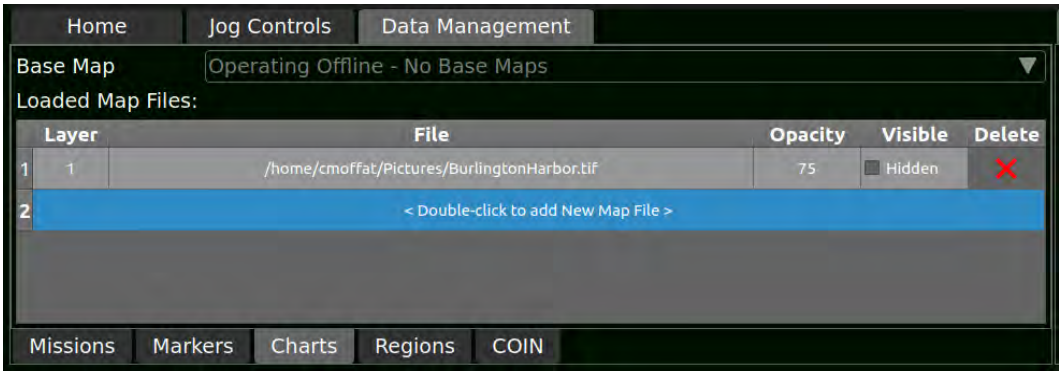
- **Load Markers** - Open Load Regions File window to load a region file.
- **Save Markers** - Open Save Regions File window to save a region file.

2.2.6.3.3 Charts Subtab

The Charts subtab lists all imported chart files. Also, add and select chart files to display on the Map from this tab.

Accepted file types:

- Map files: *.031
- Raster Files: *.tif *.tiff
- KML Files: *.kml *.kmz
- KAP Files: *.kap

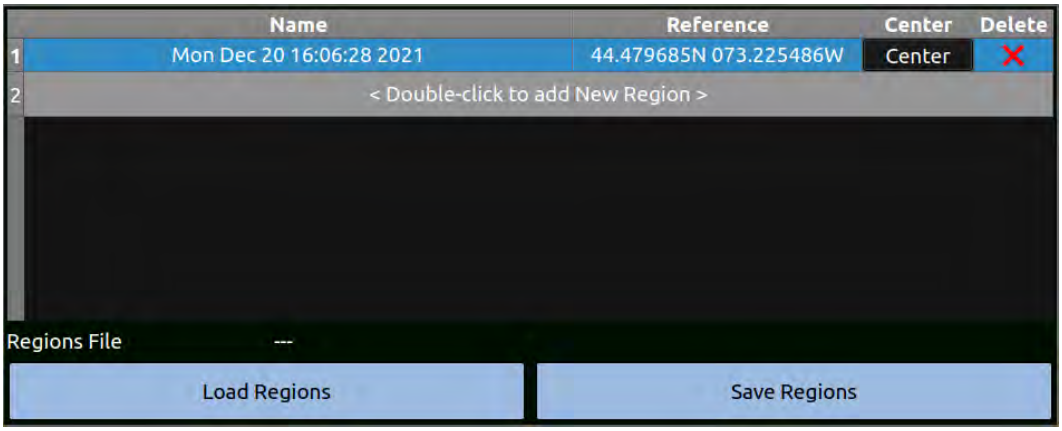


Data Management Tab - Charts Subtab

See also Import Chart, and Show/Hide Chart or Basemap.

2.2.6.3.4 Regions Subtab

The Regions subtab lists all created regions. Use this tab to manage mission regions.



Data Management Tab - Regions Subtab

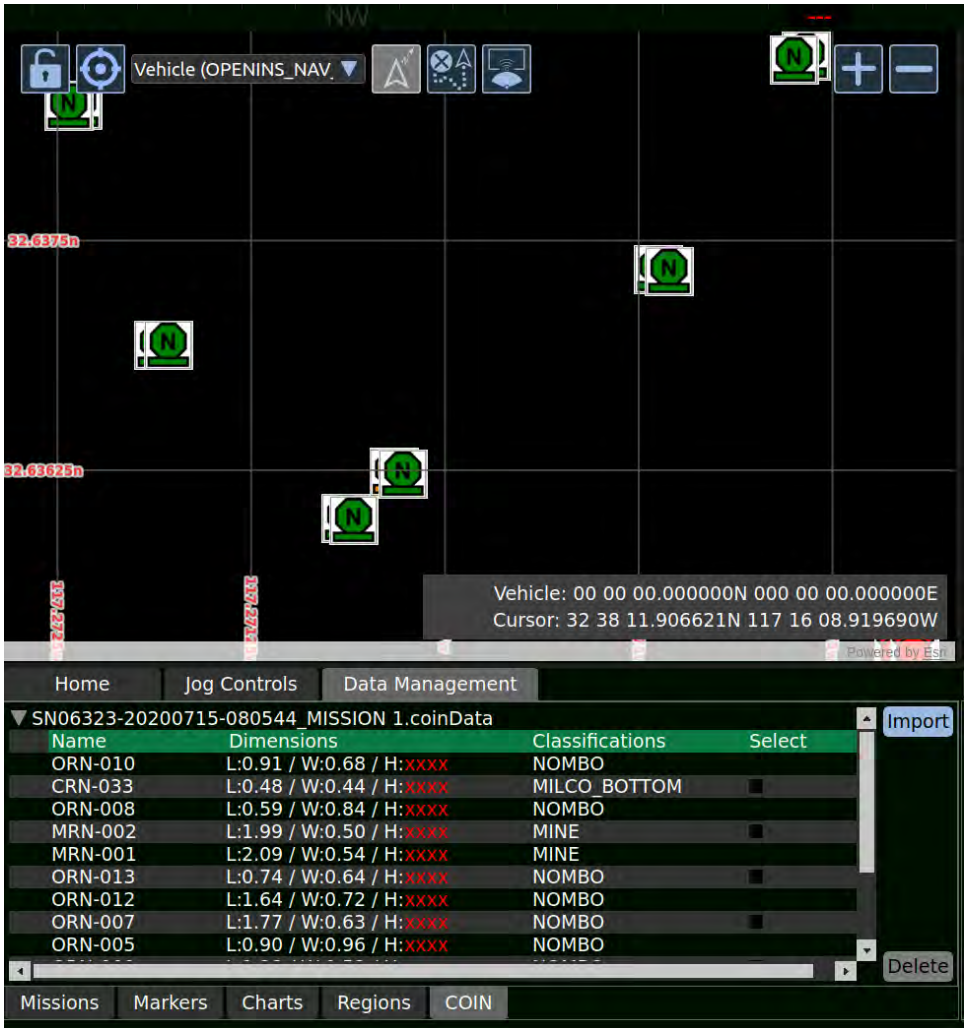
2.2.6.3.4.1 Region Subtab Commands

- **Double-click to add New Region** - Open Edit Region window to create a region.
- **Load Regions** - Open Load Regions File window to load a region file.
- **Save Regions** - Open Save Regions File window to save a region file.

See also Region Menus, Map Tools/Regions Mode, and Create and Edit Regions.

2.2.6.3.5 COIN Subtab

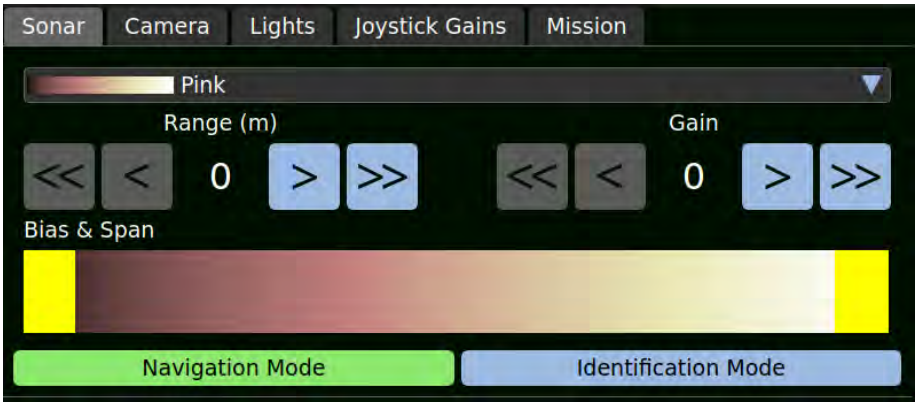
For US Navy use only. The COIN subtab is used to import data points from the US Navy Common Operator Interface (COIN) system into Workspace to display on the Map. Once imported, COIN points persist across Workspace sessions, reimport is not required.



Data Management Tab - COIN Subtab (Shown with COIN Points Displayed on the Map)

2.2.6.4 Sonar Tab

Use the Sonar tab controls to adjust sonar fan attributes: Color Palette, Range, Gain, Bias and Span, and also toggle between Navigation Mode and Identification Mode.

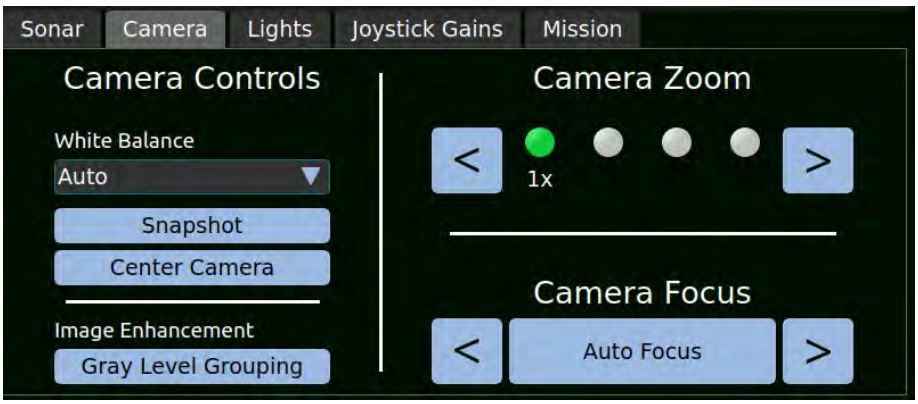


Sonar Tab

Control	Description
Color Palette Menu	Select a color for the sonar display. Although color selection is a personal preference, certain colors may reveal some features better than others.
Range	Adjust range to the minimum appropriate distance to maximize object sizes on the sonar fan. When operating close to an object, reduce range; when searching a large area, extend the range.
Gain	Adjust gain (image brightness) according to personal preference and local conditions.
Bias & Span	Move slider tabs left/right to filter sonar display color-mapped intensities; move the whole bar left/right to adjust the span that the color mapping displays. Any intensity below the lower threshold is black, and above is displayed at the maximum value.
Navigation Mode	Enable to provide longer sonar range at lower resolution.
Identification Mode	Enable to provide more detail at shorter ranges, e.g., to identify objects/targets.

2.2.6.5 Camera Tab

Use Camera tab controls to adjust video feed attributes.



Camera Tab

Control	Description
White Balance	Select a camera white balance setting based on current lighting conditions. **Auto** is the default.
	NOTE: Auto controls the automatic adjustment of the light source color temperature, while Auto Tracking White Balance (**ATW**) continuously adjusts camera color balance in accordance with any change in color temperature.
Snapshot	Take a snapshot of the camera view
	NOTE: To take a *screenshot*, use the Camera icon on the Home tab.
Camera Center	Return the camera to the center.
	NOTE: Camera position displays in Vehicle Information on the Home tab.
Image Enhancement/ Gray Level Grouping	Enable **Gray Level Grouping** (GLG) to enhance image contrast.
	NOTE: Image Enhancement GLG function is available in EOD Workspace US Navy Only version.
Camera Zoom	Adjust camera zoom level: 1x, 1.5x, 2x, 3x.
Camera Focus	Adjust camera focus manually or enable **Auto Focus**.

2.2.6.6 Lights Tab

Use the Lights tab to adjust vehicle LED lights brightness. Adjust each individually or enable Gang to simultaneously adjust both the Narrow and Wide LED sliders at the same intensity.

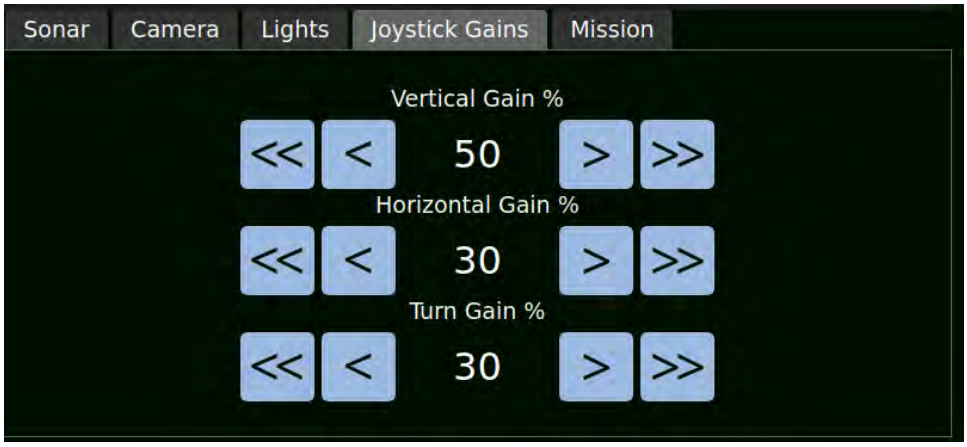
Lights Tab

2.2.6.7 Joystick Gains Tab

Used to adjust the gains for the currently connected controller. Increase/decrease the gain values in increments of 5 or 10 percent.

Recommended gains for normal operation:

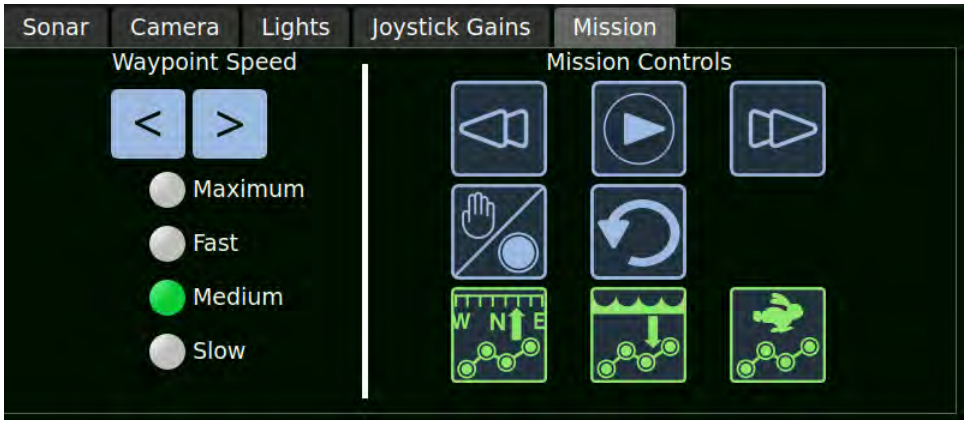
- Vertical Gain: 50%
- Horizontal Gain: 30%
- Turn Gain: 30%



Joystick Gains

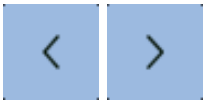
2.2.6.8 Mission Tab

Use the Mission tab to control vehicle behavior while executing a mission.



Missions Tab

2.2.6.8.1 Waypoint Speed



Increases or decreases the speed of the vehicle as it travels to a waypoint. The current speed is marked by the green LED.

NOTE: Default speed, Medium, is recommended.

2.2.6.8.2 Mission Controls

Previous Waypoint - The previous waypoint in the mission becomes the active waypoint.

Execute Mission - Starts the currently selected mission.

Next Waypoint - The next waypoint in the mission becomes the active waypoint.

Hold at Waypoint - Stop and hold the vehicle at the active waypoint; the vehicle does not move to the next waypoint until commanded.

Reverse Mission - Execute the mission in reverse waypoint order.

Waypoint Overrides are enabled by default so that the active waypoint setting (the waypoint the vehicle is transiting *to*) is used when corresponding Autopilot controls are enabled.

Waypoint Heading Override

- Enabled - Vehicle heading is controlled by the active waypoint heading setting when Auto Heading is enabled.
- Disabled - Vehicle heading is controlled by joystick inputs only.

Waypoint Z Override

- Enabled - Vehicle depth/altitude is controlled by the active waypoint depth or altitude setting when Auto Depth or Auto Altitude is enabled.
- Disabled - Vehicle depth/altitude is controlled by joystick inputs only.

NOTE: When Z Override is enabled, the vehicle uses the depth/alt mode set in the *active* waypoint. If in auto alt, but the upcoming waypoint specifies a depth, the switch from auto alt to auto depth can move the vehicle significantly.

Waypoint Speed Override

- Enabled - Vehicle speed is controlled by the active waypoint speed setting. Automatically disables when Waypoint Speed controls are used to adjust speed (Slow, Medium, Fast, Maximum).
- Disabled - Vehicle speed is controlled by joystick inputs only.

2.3 User Preferences View

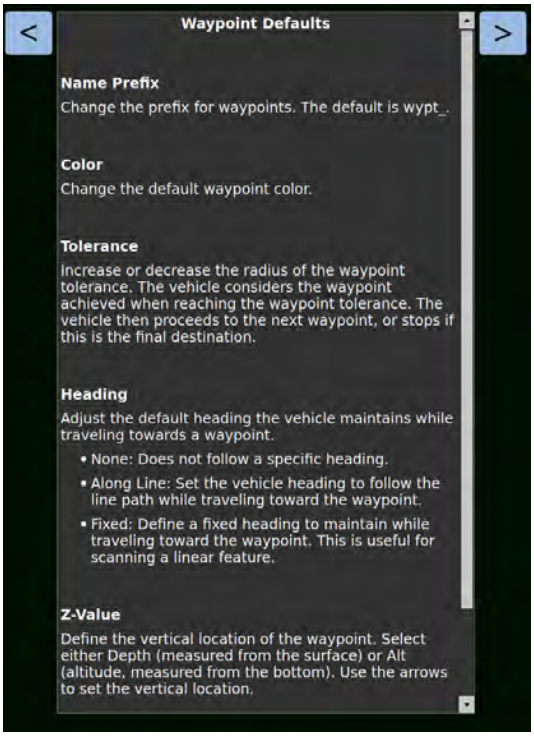
User Preferences View is a group of tabs used to set Workspace user preferences for Mission Setup, Navigation, Vehicle, and Display.

Select the View Selector (Greensea icon) and then User Preferences (Gear icon) or use keyboard **Alt+2** to open User Preferences View.

View Selector - User Preferences

2.3.1 Help Text Window

At the right of the User Preferences View tabs is the Help Text window, which describes the use of each tab section. Use the arrows to page left/right through the help text.



User Preferences View - Help Text Window

2.3.2 Mission Setup Tab

Use the Mission Setup tab to set user preferences for mission data: Waypoint Defaults, Mission Defaults, and Data Logging.

User Preferences View - Mission Setup Tab

2.3.2.1 Waypoint Defaults

Set default waypoint attributes. Editing waypoint defaults does not affect existing waypoints, only waypoints created after defaults are edited.

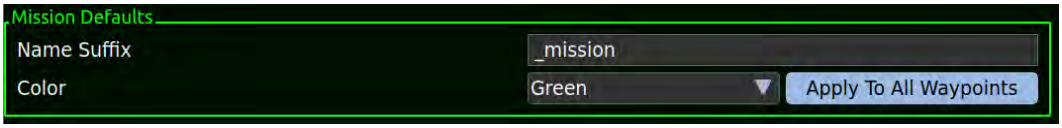
Mission Setup Tab - Waypoint Defaults

Setting	Description
Name Prefix	Set a new default prefix for waypoints. Standard default is wypt_.
Color	Set the default waypoint color.
Tolerance	Set the radial distance from the waypoint where the vehicle considers the waypoint achieved. Set tolerance farther from the waypoint when precise navigation is less important; and closer to the waypoint when operating in tight spaces, and when following the route is important. Use arrows to adjust tolerance setting parameters.

Setting	Description
Heading	Set the default heading mode the vehicle maintains while transiting towards a waypoint. • *None* - No heading constraints are necessary. • *Fixed* - The vehicle faces a fixed direction. Useful for scanning a linear feature. This setting can cause vehicle instability while transiting toward a waypoint. • *Along Line - The vehicle faces the active waypoint.* Use arrows to adjust heading setting parameters.
	NOTE: For Fixed and Along Line to function properly, Auto Heading control and Waypoint Heading Override (Lock) control must be enabled so that the waypoint settings are used.
Z-Value (m)	Set the default vertical location of the waypoint. Select either Depth (measured from the surface) or Alt (altitude, measured from the bottom). Use arrows to adjust z-value setting parameters.
Speed	Set the default vehicle transit speed to a waypoint. Maximum speed depends on the vehicle. Use arrows to adjust speed setting parameters. Display speed as: • *Speed* - Display velocity the vehicle is attempting to maintain (Speed m/s). • *Effort* - Display percent thruster effort (Speed %).

2.3.2.2 Mission Defaults

Set default mission attributes. Editing mission defaults does not affect existing missions, only missions created after defaults are edited.



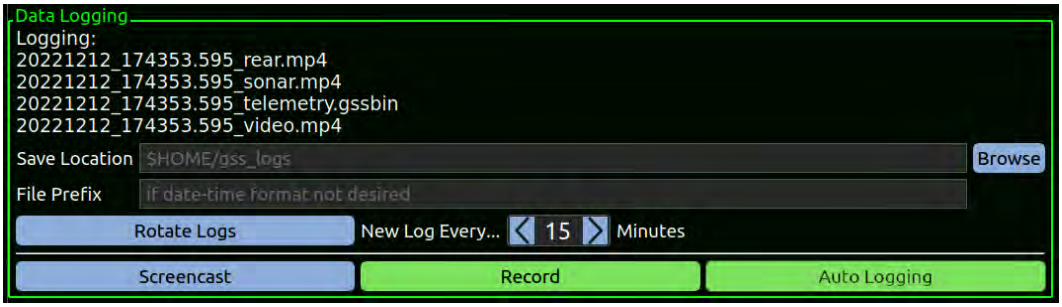
Mission Setup Tab - Mission Defaults

Setting	Description
Name Prefix	Set a new default suffix for missions. Standard default is _mission.
Color	Select the default color of the routes (lines) connecting mission waypoints.
Apply To All Waypoints	Apply the default color to all waypoints.

2.3.2.3 Data Logging

Set data logging preferences.

NOTE: System runtime data is automatically logged upon vehicle startup and is saved as a CSV file in the gss_logs directory. See also System Runtime Data Logging.



Mission Setup Tab - Data Logging

Setting	Description
Logging	Displays log file details when recording.
Save Location	Edit the saved logs location on the topside computer. Default location is $HOME/gss_logs.
File Prefix	Set the file prefix. Default is data-time format.
Rotate Logs	Start a new log at the selected Minutes interval (maximum time a log records before stopping and then immediately starting a new log. Rotating logs every 15 minutes is recommended to break long logs into manageable segments and prevent data loss.
Screencast	Record on-screen activity. For a static screenshot, use the Camera quick-control on the Home tab.
Record	Manually start/stop a log (same as ●**REC** quick control on the Home tab).
Auto Logging	Automatically starts logging when the vehicle reaches a depth of 1.25m.

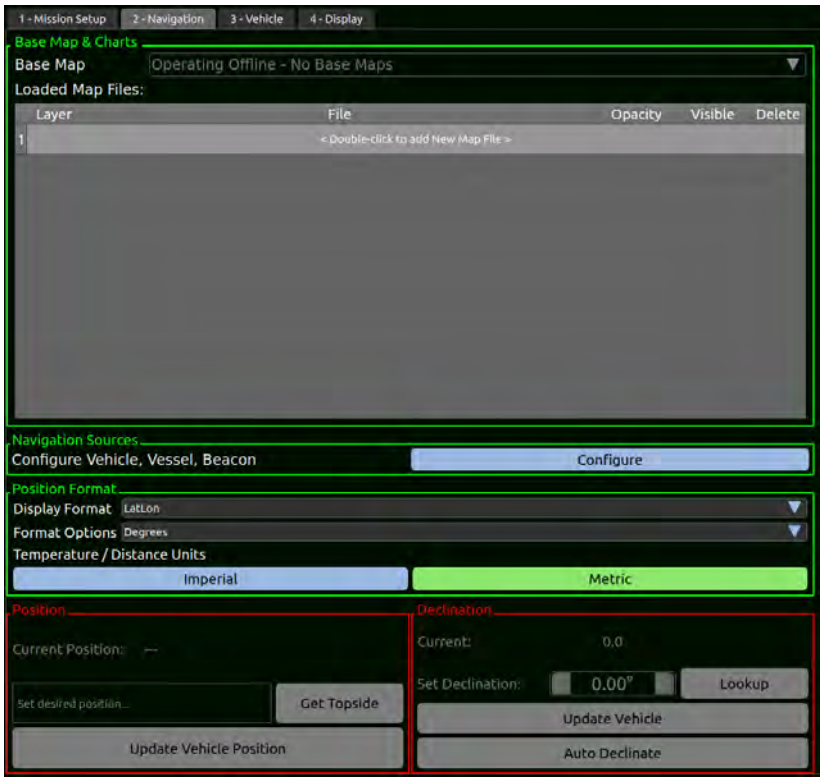
NOTES:

- Auto Logging is enabled by default. Disable only in situations where logging is not critical to mission success.
- Auto Logging auto-starts a log only; a manual stop is still required by disabling Record here or on the Home tab.

See also Record Data Logs.

2.3.3 Navigation Tab

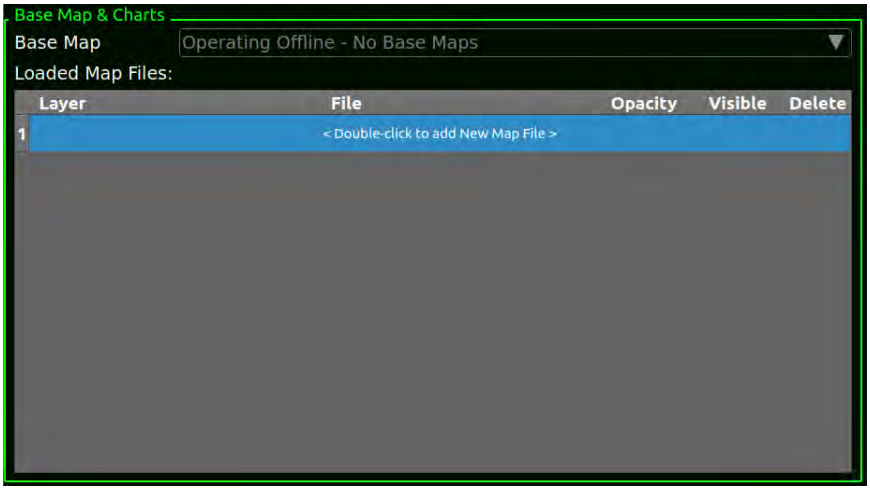
Use the Navigation tab to set user preferences for Base Map & Charts, Navigation Sources, Position Format, Position, and Declination.



User Preferences View - Navigation Tab

2.3.3.1 Base Map & Charts

Import map files (ENC charts and GeoTIFF aerial imagery) to display on the Map.



Navigation Tab - Base Map & Charts

Setting	Description
Base Map	Select a base map display from the drop-down menu; must be online.
Loaded Map Files	Displays a list of loaded map files. Double-click to add a new file.

2.3.3.2 Navigation Sources

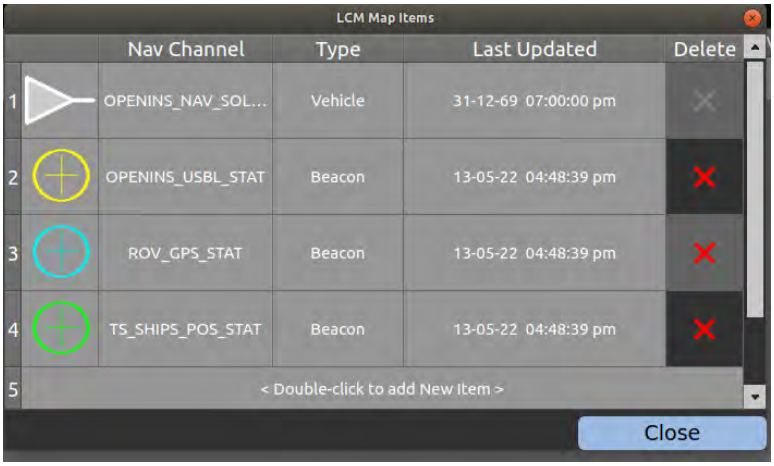
Configure how position data from different navigation sources display on the Map. Click Configure to open LCM Map Items window to add/configure vehicle, vessel, and beacon navigation items.

Navigation Tab - Navigation Sources

2.3.3.2.1 LCM Map Items

Commonly used data sources are configured to display automatically, including vehicle navigation solution, vehicle GPS, topside GPS and USBL acoustic positioning system. Color, size, and trail length can be customized for each item type.

- Double-click a navigation source to edit its configuration.
- Double-click at window bottom to add/configure a new vehicle, vessel, or beacon.

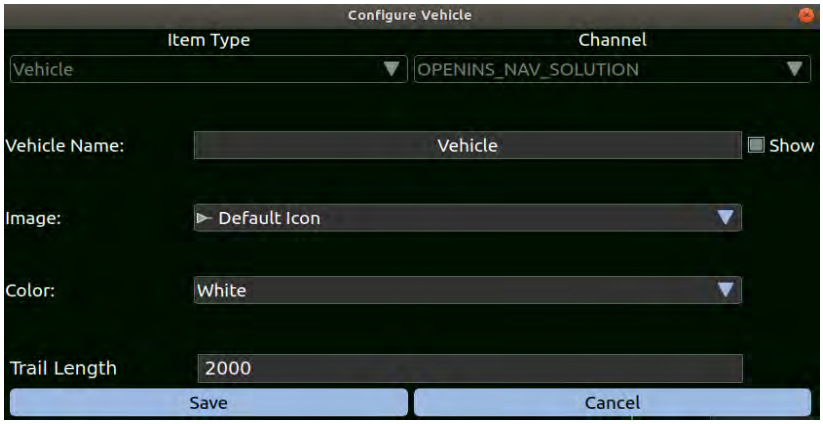


Navigation Sources - LCM Map Items Window

2.3.3.2.1.1 Configure Vehicle

Configure a Vehicle navigation source.

- Create/edit a vehicle icon; set attributes, such as color and trail length.
- Select vehicle position broadcast channel.

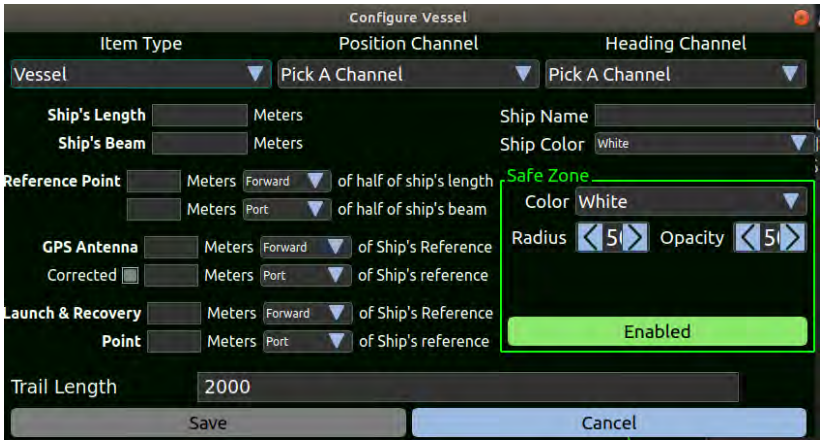


Configure Vehicle Window

2.3.3.2.1.2 Configure Vessel

Configure a Vessel navigation source.

- Create/edit a vessel (ship) icon; set attributes such as ship length and beam, name, color, reference points, GPS antenna, launch/recovery, and safe zone.
- Select position and heading broadcast channels.

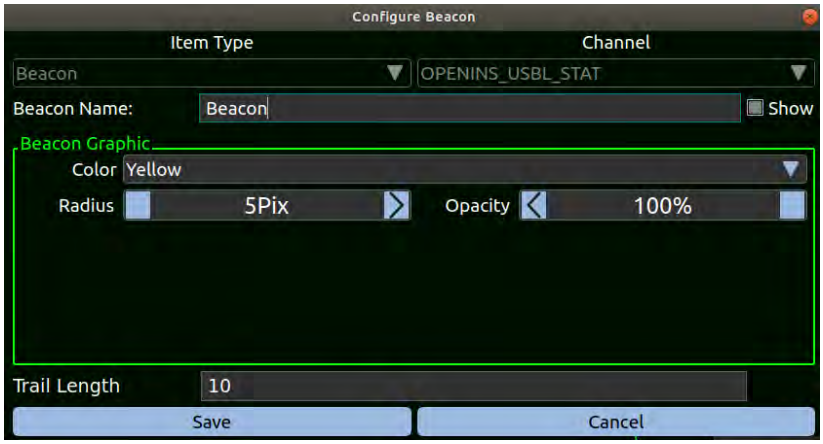


Configure Vessel Window

2.3.3.2.1.3 Configure Beacon

Configure beacon settings.

- Create/edit a beacon icon; set attributes such as name, color, and radius.
- Select beacon broadcast channel.
- The sensor must be receiving valid data for the beacon to display.



Configure Beacon Window

2.3.3.3 Position Format

Configure position format.

Navigation Tab - Position Format

Setting	Description
Display Format	Select coordinate display format: LatLon, GARS GeoRef, MGRS, USNG, or UTM.
Format Options	Select format options for selected coordinate display formats: • *LatLon* - Degrees, Degrees Decimal Minutes, or Degrees Minutes Seconds. • *MGRS* - Auto, AA Scheme Zone 1 or 60, AL Scheme Zone 1 or 60. • *UTM* - Latitude Band or North/South.
	NOTE: Not all coordinate display formats have format options.
Temperature/ Distance Units	Auto populates *Set desired position…* with topside GPS position (if available).

2.3.3.4 Position

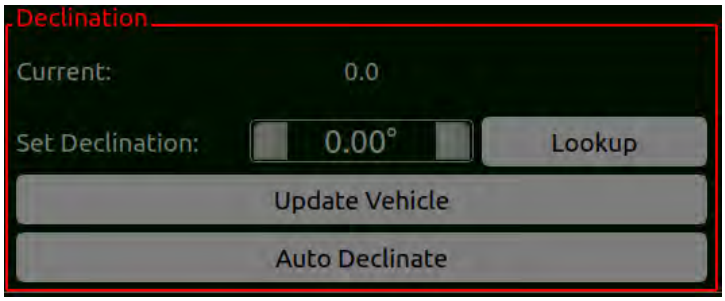
Configure topside and vehicle position settings.

Navigation Tab - Position

Setting	Description
Current Position	Current vehicle navigation solution; the calculated vehicle position based on available navigation sensor inputs.
Set desired position…	Position data is sent to the vehicle; manually enter or populate using **Get Topside**.
Get Topside	Auto populates *Set desired position…* field with topside GPS position (if available).
Update Vehicle Position	Once the vehicle acquires a valid GPS fix while surfaced, reset vehicle position to vehicle GPS position to remove accumulated error in the position solution.

2.3.3.5 Declination

Configure vehicle declination settings.



Navigation Tab - Declination

Setting	Description
Current	Displays the current vehicle declination.
Set Declination	Manually enter vehicle declination value, or auto populate using *Lookup*.
Lookup	Auto populates *Set Declination* with the current declination (requires a valid position).
Update Vehicle	Sends *Set Declination* value to the vehicle.
Auto Declinate	When enabled, the appropriate declination is sent to the vehicle and displays in both the Current and Set Declination fields.
	NOTE: If the lookup fails, no value is sent to the vehicle and Set Declination value remains 0.00, Current value is not altered. The system continues to retry a declination lookup every 5 seconds as long as valid GPS messages are present.

2.3.4 Vehicle Tab

Use the Vehicle tab to set Joystick Gains, ROV Power, Jog Controls, and Invert Z-Axis preferences.

User Preferences View - Vehicle Tab

2.3.4.1 Joystick Gains

Set joystick controller gains.

Vehicle Tab - Joystick Gains

Setting	Description
Vertical, Horizontal, and Turn Gains (in %)	Increase or decrease the impact of controller inputs on the vehicle response: • Increase gains for faster responsiveness. • Decrease gains for slower responsiveness; which can help with fine control of the vehicle when performing delicate tasks. • Use << >> to increase/decrease in increments of 5%; use < > to increase/decrease in increments of 1%. Recommended settings for normal operations: • Vertical Gain: 50% • Horizontal Gain: 30% • Turn Gain: 30%

2.3.4.2 ROV Power

Set the available power the vehicle can draw.

Vehicle Tab - ROV Power

Setting	Description
Power Limit (watts)	Set the available power the system can draw. • Increase power limit when operating in rough water or strong currents. Maximum power limit is 1500 watts. • Decrease power limit to slow the vehicle when operating in power-restrained setting to avoid system blackouts and brownouts. **NOTE**: Decreasing Power Limit also decreases available power for system components.

2.3.4.3 Jog Limits

Set joystick controller jog limit preferences for vehicle movements: lateral (front/back, left/right), vertical (up/down), and heading (rotational). Use smaller limits for operation in tight spaces and near sensitive targets. Also set Jog Limits in the Flight View Jog Controls tab.

Vehicle Tab - Jog Limits

Setting	Description
Forward Back/ Left Right	Set lateral vehicle movement jog limits (meters or feet). • Increase value to extend lateral movements for longer distances. • Decrease value to shorten lateral movements for safe target approach.
Heading	Set vehicle heading jog limits (degrees). • Increase value for large individual heading changes. • Decrease value for small heading changes to safely turn the vehicle.
Depth	Set vehicle depth jog limits (meters or feet). • Increase value to extend up/down (z-axis) movements in the water column for longer distances. • Decrease value to shorten up/down movements in the water column.

2.3.4.4 Z-Axis

Set joystick Z-Axis (vertical) control preference.

Vehicle Tab - Z-Axis

Setting	Description
Invert Z-Axis	Enable to invert right joystick function so that pressing forward surfaces, and back submerges the vehicle.

2.3.5 Display Tab

Set display preferences for Map Settings and Front and Rear Camera Video Overlay.

User Preferences View - Display Tab

2.3.5.1 Map Settings

Edit various map settings such as waypoint and marker labels, text color and size, and background color and opacity.

NOTE: Affects Map text only, not the entire Workspace UI text.

Display Tab - Map Settings

2.3.5.2 Front and Rear Camera Video Overlay

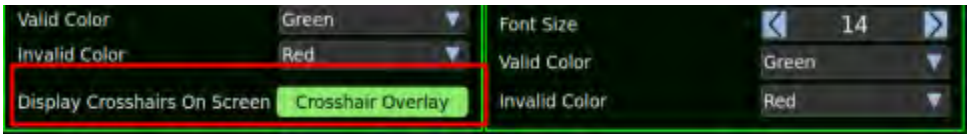
Independently enable/disable front and rear camera overlay displays on screen and on video log, and also set overlay attributes.

Display Tab - Front and Rear Camera Video Overlay

2.3.5.2.1 Display Reticle Overlay

NOTE: Applicable to Disruptor-mounted vehicles.

The front camera includes an additional Reticle Overlay setting to display reticle overlay on screen when aiming the Disruptor. The point of aim is approximately 12 inches below and 12 inches forward of the front camera.



Front Camera Video Overlay - Reticle Overlay

2.4 Diagnostics View

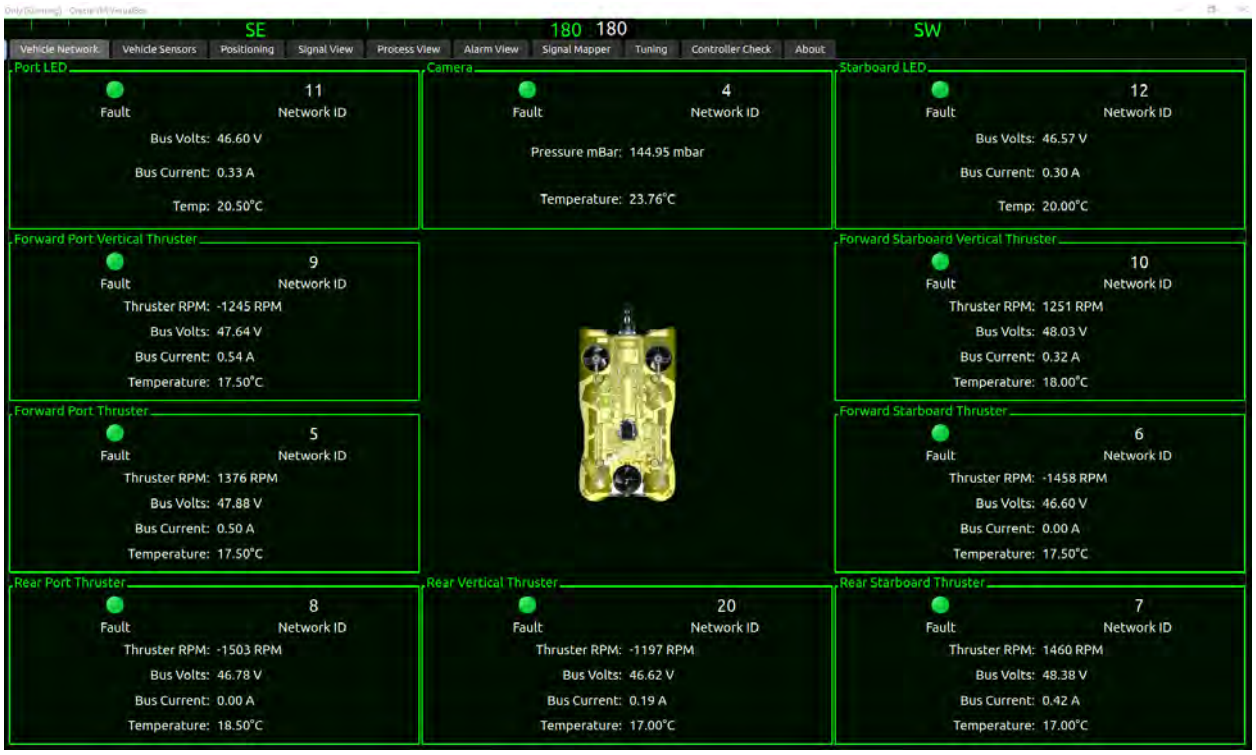
Diagnostics View is a group of tabs used to monitor and manage various system components; mainly for troubleshooting: monitor system status, view/edit processes, manage alarms, control tuning, and view installed software.

Select the View Selector (Greensea icon) and then Diagnostics View (Stethoscope icon) or use keyboard Alt+3 to open Diagnostics View.

View Selector - Diagnostics View

2.4.1 Vehicle Network Tab

The Vehicle Network tab displays operational statuses of devices connected to the network; port and starboard LED, camera, and thruster network data. The LED for each identifies if the device has faulted (green, no fault; red, fault).



Diagnostics View - Vehicle Network Tab

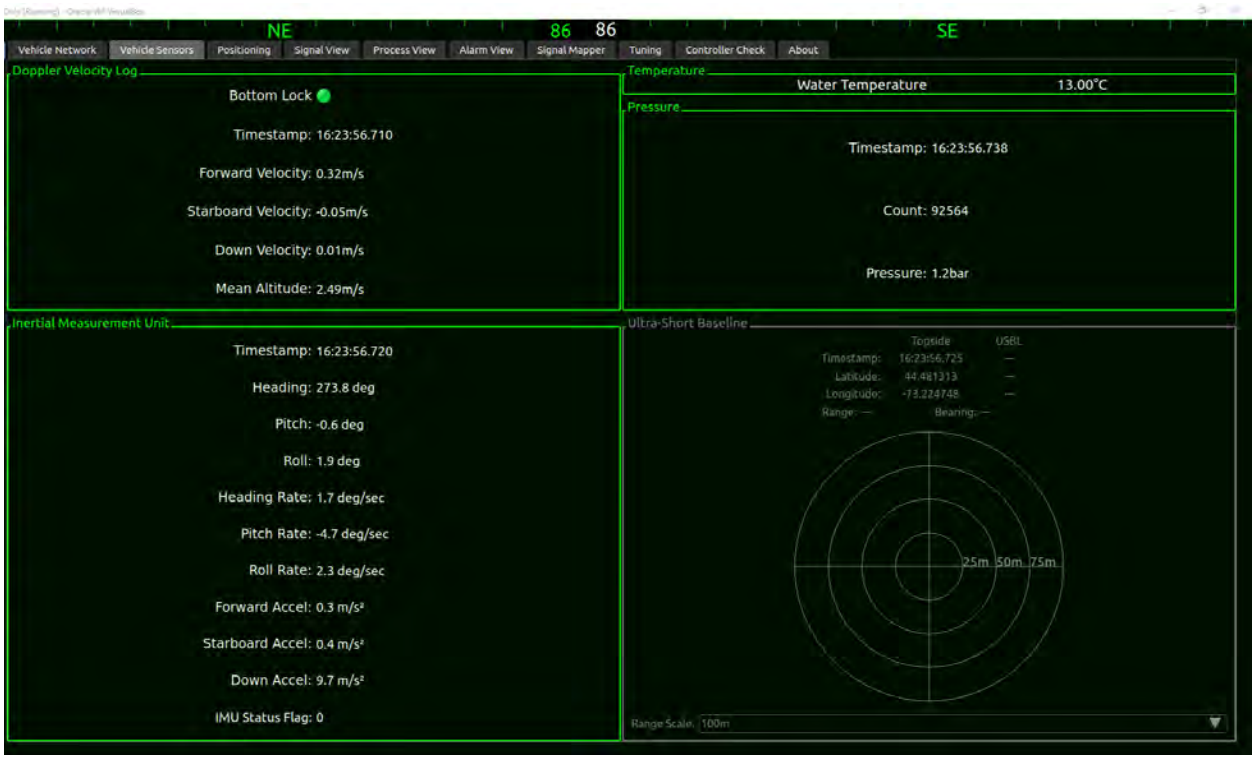
2.4.2 Vehicle Sensors Tab

Provides the status for the Inertial Measurement Unit (IMU), Pressure Sensor, Doppler Velocity Log (DVL), and Ultra Short Baseline (USBL). If there are problems with these sensors, this is the first place to look. The Temperature widget displays the current water temperature data received from the pressure sensor.

Each sensor is surrounded by a bounding box that has three possible states:

- Green (normal operations)
- Red (no communications)
- Gray (inactive)

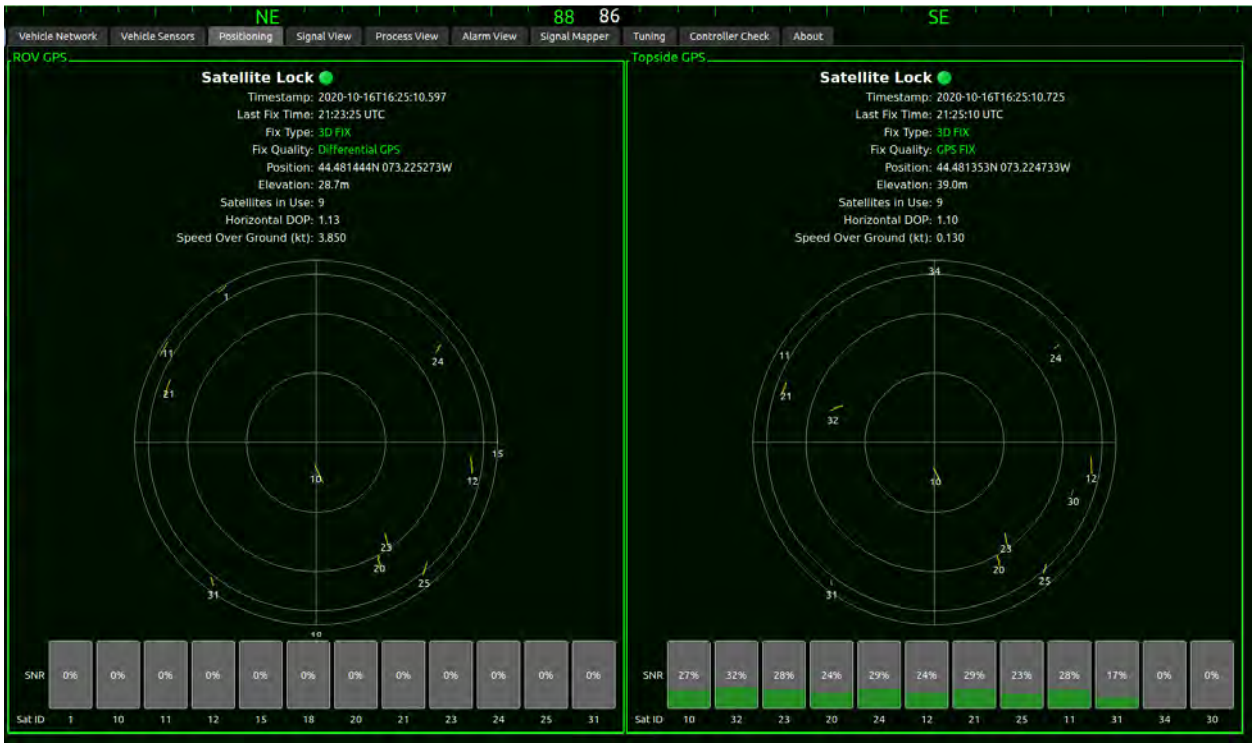
See also System Conventions.



Diagnostics View - Vehicle Sensors Tab

2.4.3 Positioning Tab

The Positioning tab displays vehicle and topside GPS status and data (If present). Data includes satellite lock/no lock, signal strength or signal to noise ratio (SNR), satellite ID, and GPS fix data.



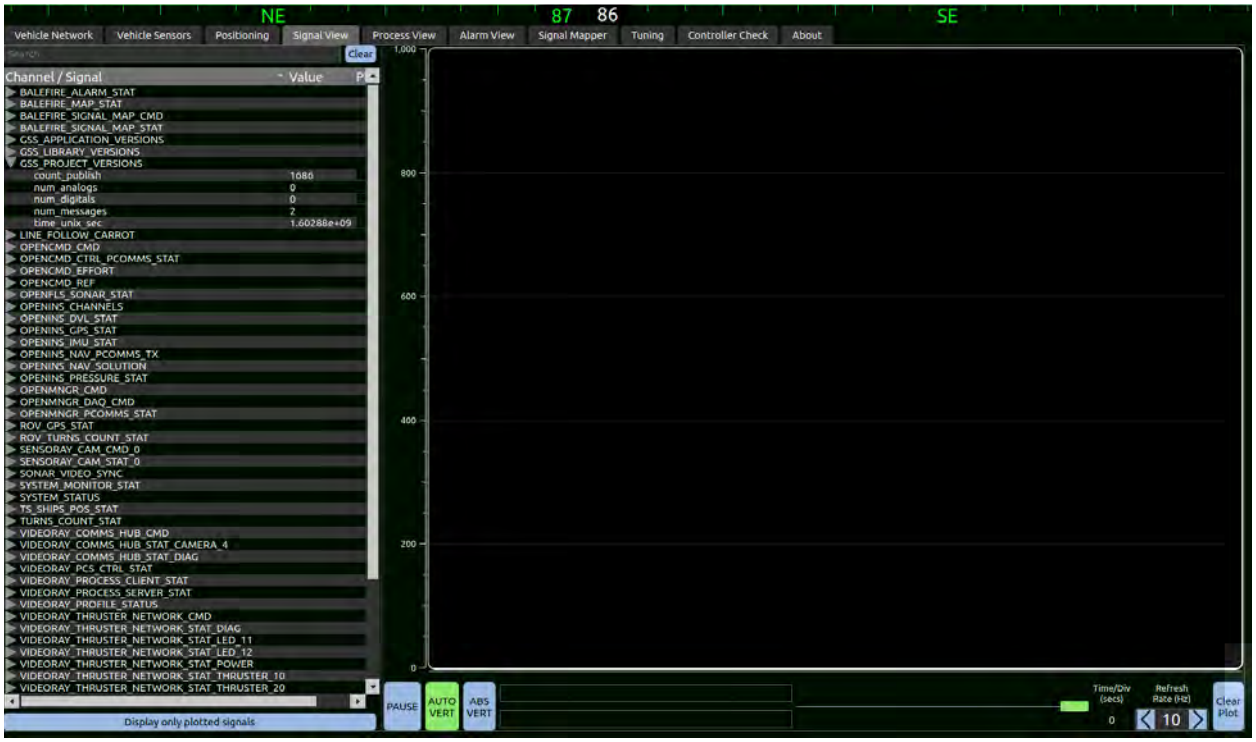
Diagnostics View - Positioning Tab

2.4.4 Signal View Tab

The Signal View tab lists all channels and signals observed on the network. Select the caret at the left of a channel to expand/collapse a list of the signals associated with that channel.

The Data Plotter application is used to confirm that a new test channel/signal pair is successfully created. When a signal is selected, Signal View plots the current signal on the y-axis as a function of time on the x-axis. The signal plot has several settings including range control on the x-axis, plot refresh frequency, and automated y-axis vertices depending on the input signal (y-axis) range.

To select a signal to view in the plot, click the checkbox next to the right of the signal name. Multiple signals can be plotted at once. When a signal is selected for plotting, the signal text is highlighted in the same color that it appears in the plotter utility.



Diagnostics View - Signal View Tab

2.4.4.1 Signal View Functions

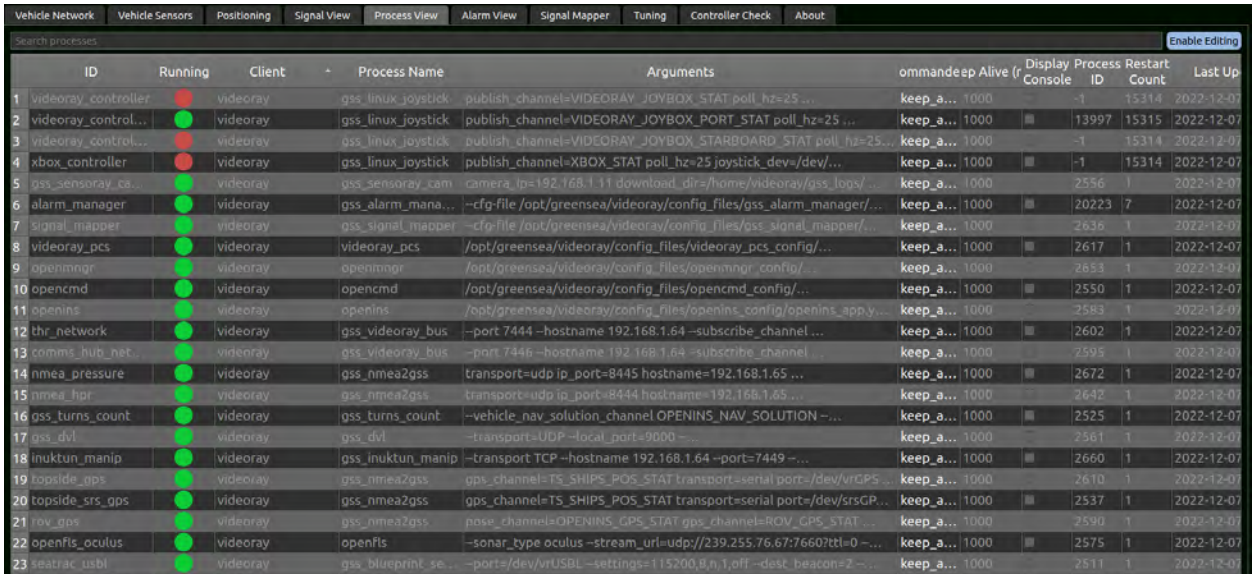
Available Signal View functions are described below.

Function	Description
Search	The search field above the channel and signal list allows the filtering of channels and signals based on keywords. Use either signal or channel names.
	NOTE: Search field is case sensitive.
Clear	Clears the channel and signal list. Channels and signals repopulate as Workspace observes traffic across the network.
	NOTE: Clearing active channels and signals does not clear the search field.

Function	Description
Display Only Plotted Signals	Removes all signals that are not currently selected for plotting from the active channels and signals.
Pause	Toggles the stream of real-time data to the plotter. When disabled, real-time data can be observed.
Auto Vertical	Selects the y-axis maximum and minimum values from the data value default.
Absolute Vertical	Sets user-defined maximum and minimum y-axis values.
Use Local Time	Switches the plot reference from the data feed to local time, or the computer time.
Clear Plot	Clears the graphical plot.
Refresh Rate	Changes the rate (Hertz) that the data is plotting with the toggle arrows.
Time/Division in seconds	Adjusts the time rate division in seconds via the scroll bar at the bottom right of the plotter.
Zoom	Zooms in on the plot when the plot screen is clicked on at the desired zoom point and dragged out. Zooming in on the plot automatically pauses the plotter.

2.4.5 Process View Tab

Process View lists all active applications on the system and current status.



Diagnostics View - Process View Tab

2.4.5.1 Process View Fields

There are multiple fields for each process, these are described below.

Field	Description
ID	The ID used by the process server and process client in their management of processes.
Client	The name of the computer on which a given application is running.
Last Updated	The time of the last process client update.
Process Name	The specific application name.
Arguments	The arguments used to call a given application.
Process ID	The Operating System identifier for a given process.
Restart Count	The number of times the process has restarted. An indexing value may indicate a problem with that process.
Running	Status LED indicates if the application is running (green) or not running (red). An LED that is alternating green and red indicates the process is restarting and failing.
Commanded	The commanded state of the process: *Start*, *Keep Alive*, and *Stop*. ● *Start* - The system has issued a one time start command for the process. ● *Keep Alive* - The system attempts to keep a process alive by attempting to restart the process in the event it stops. ● *Stop* - The system has issued a command to stop the process.
Keep Alive (ms)	The length of time a process can be dead before the keep-alive command attempts to restart the process.
Publish Console	Publish the standard output from the selected process; displays in a frame above the Process View window. Useful for troubleshooting a process.

2.4.6 Alarm View Tab

The alarm view is used to create and manage alarm events. An alarm triggering event can be placed on any signal, and the alarm view can be used to assign a severity level to reflect the situation. Alarms created in Alarm View do not have to be an emergency, they can also be used to monitor signals for specific conditions. When an alarm is generated, the event displays in the alarm history until cleared.

The alarm view has two main areas: Current Status, which lists active alarms (left) , and Past events, which lists triggered events (right).

See also Alarm Indicator, and Alarms.

Diagnostics View - Alarm View Tab

2.4.6.1 Alarm View Commands

Use the Alarm View commands to interact with alarms.

Command	Description
Enable Editing	Enable editing to create and edit alarms.
Save Alarms	Save the current set of alarms to a configuration file. Saving alarm configuration before editing alarms is recommended.
Restore Alarms	Restore a saved set of alarms from a configuration file.
Advanced View	Enable access to edit all alarm fields.
Clear Events	Clear the alarm history from the Past Events section. Clears alarms that have triggered and returned to a non-alarm state, not currently active alarms. The Past Events section repopulates as new alarms are triggered.

2.4.6.2 Alarm View Fields

Each alarm is defined by eight fields that determine how the alarm is interpreted by Workspace. Each field is described below.

Field	Editable	Description
Active	No	The current alarm status.
Channel	Yes	The channel the alarm is monitoring.
Signal	Yes	The Signal the Alarm is monitoring.
Comparison	Yes	Less, equals, or greater. When combined with Thresh (threshold), sets the criteria that triggers the alarm.
Thresh	Yes	When combined with Comparison, the value that triggers the alarm.
Delay(s)	Yes	The length of time the alarm criteria must persist before an alarm is triggered.
Severity	Yes	This is the severity of the triggered alarm. There are four alarm severity levels: Info (yellow), Warning (light orange), Severe (dark orange), and Fatal (red). See also Alarm Indicator.
Message	Yes	The message that is part of the alert when the alarm is triggered.
Delete	Yes	Deletes the alarm from the current Workspace session only. The alarm is not deleted from the configuration file and is initialized when Workspace restarts.

2.4.6.3 Advanced Fields

Field	Editable	Description
Status Changed	No	The timestamp of when the alarm was last changed.
ID	No	The unique identifier for the alarm. An auto-generated field by process client.
Transform	Yes	The signal mapper syntax for the Comparison, Threshold, and Delay fields. Changing one affects the other and creates an event.
Priority and Request	Yes	Set priority value and the action to follow the alarm state.
Action	Yes	Publish an LCM command based on an alarm. example: publish=channel:signal

2.4.6.4 Default Alarms

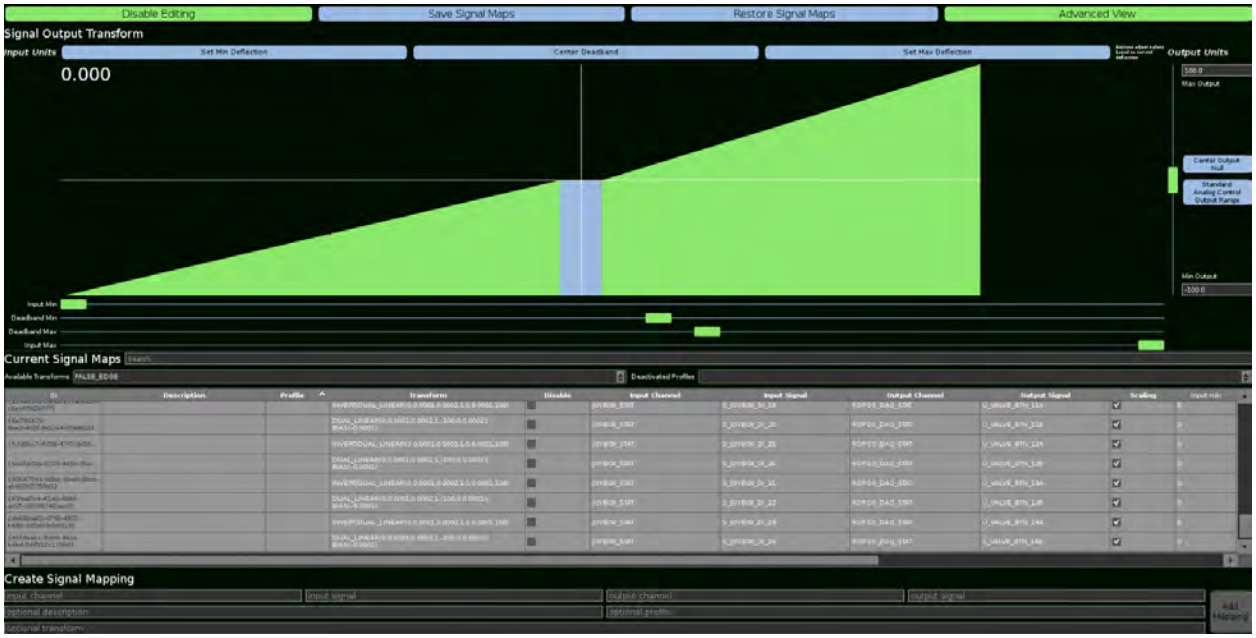
Default alarms and definitions are listed below. See also Alarms.

Alarm	Severity	Color	Definition
Pitch Control	Info		Pitch Control error is too large; could indicate that the vehicle is stuck on an obstacle.
Roll Control	Info		Roll Control error is too large; could indicate that the vehicle is stuck on an obstacle.
Depth Setpoint Far	Info		Depth setpoint error is too large; could indicate the setpoint is beyond the bottom. The vehicle may be running into the ground.
Alt Setpoint Far	Info		Altitude setpoint error is too large. This could indicate that the setpoint is beyond the bottom. The vehicle may be running into the ground.
Heading Control	Info		Heading Control error is too large; could Indicate that the vehicle is stuck on an obstacle.
Thruster Comms Slow	Warning		Communications to the thruster network has slowed. Typically means a fault within the thruster system. Check thrusters or power to the vehicle.
LED Hot	Warning		LED light temperature is hotter than recommended.
Auto Positioning is Unavailable	Warning		DVL has lost bottom lock and Dynamic Positioning and POI are unavailable; can mean the vehicle is either too close or too far from the bottom.
Disk Space Less Than 10Gb	Warning		Computer disk space is below recommended log space requirements.
Nav Initializing	Severe		Occurs when the vehicle is powering on. Wait until this clears before piloting the vehicle.
Depth Fail	Severe		Pressure sensor failure.

2.4.7 Signal Mapper Tab

The Signal Mapper is a fundamental component of Workspace and the overall vehicle software architecture. The Signal Mapper tab provides a graphical interface to configure signal outputs. An understanding of the vehicle control system architecture is required to effectively use the signal mapper.

The signal mapper utility provides a range of transformation options from simple inversions to scalable two-axis controls and configurable dead-bands. Any transformation may be chained with others to provide more complex behaviors such as two-axis control with variable biases, stick locking, and optional secondary or tertiary functions.



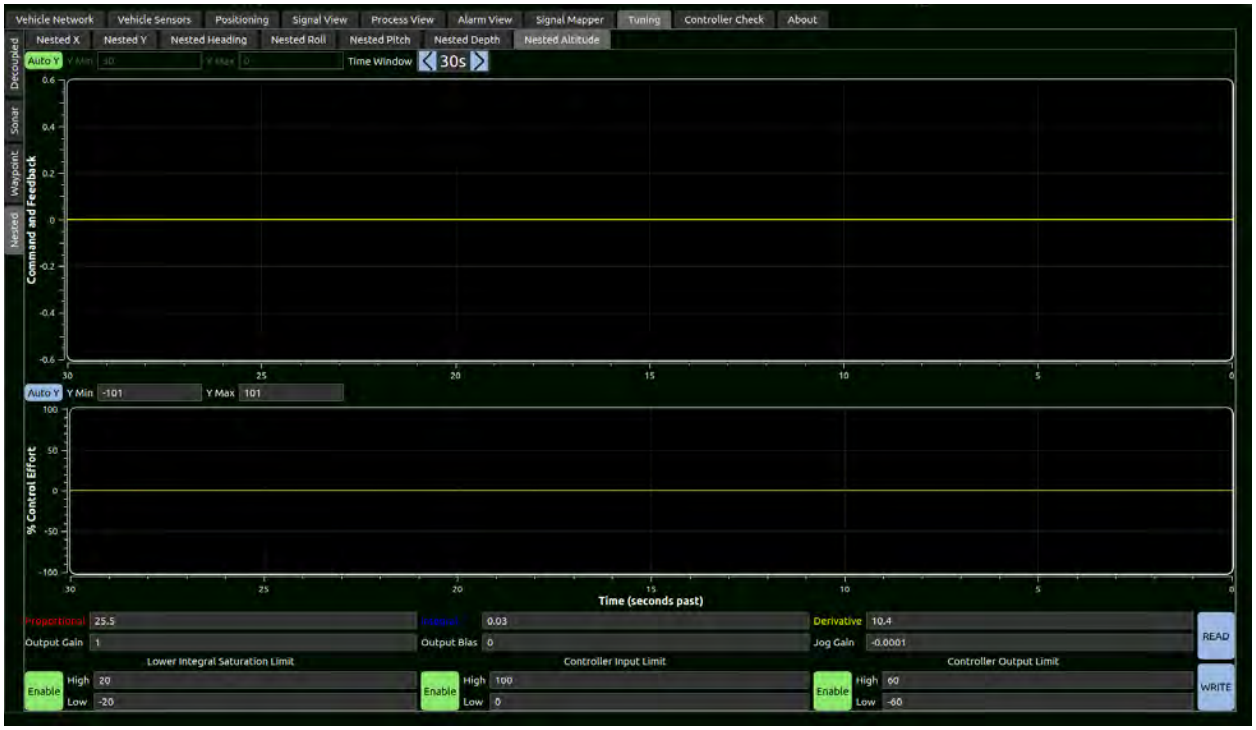
Diagnostics View - Signal Mapper Tab

2.4.7.1 Signal Mapper Commands

The Signal Mapper commands manage the state of the Signal Mapper application; create and edit signal maps, save, and restore signal maps. Commands are described below.

Command	Description
Enable/Disable Editing	Create and/or edit signal mappings.
Save Signal Maps	Save the current set of signal maps to a configuration file.
Restore Signal Maps	Restore a saved set of signal maps from a configuration file.
Advanced View	Access all editable signal mapping fields.
Apply Changes	Only available after a change has been made in signal mapper. Applies changes made in signal mapper to the system.
Add Mapping	Only available when creating a signal map in the utility. Adds the newly created signal map to the Current Signal Maps list.

2.4.8 Tuning Tab



Diagnostics View - Tuning Tab

2.4.8.1 Tuning Field Definitions

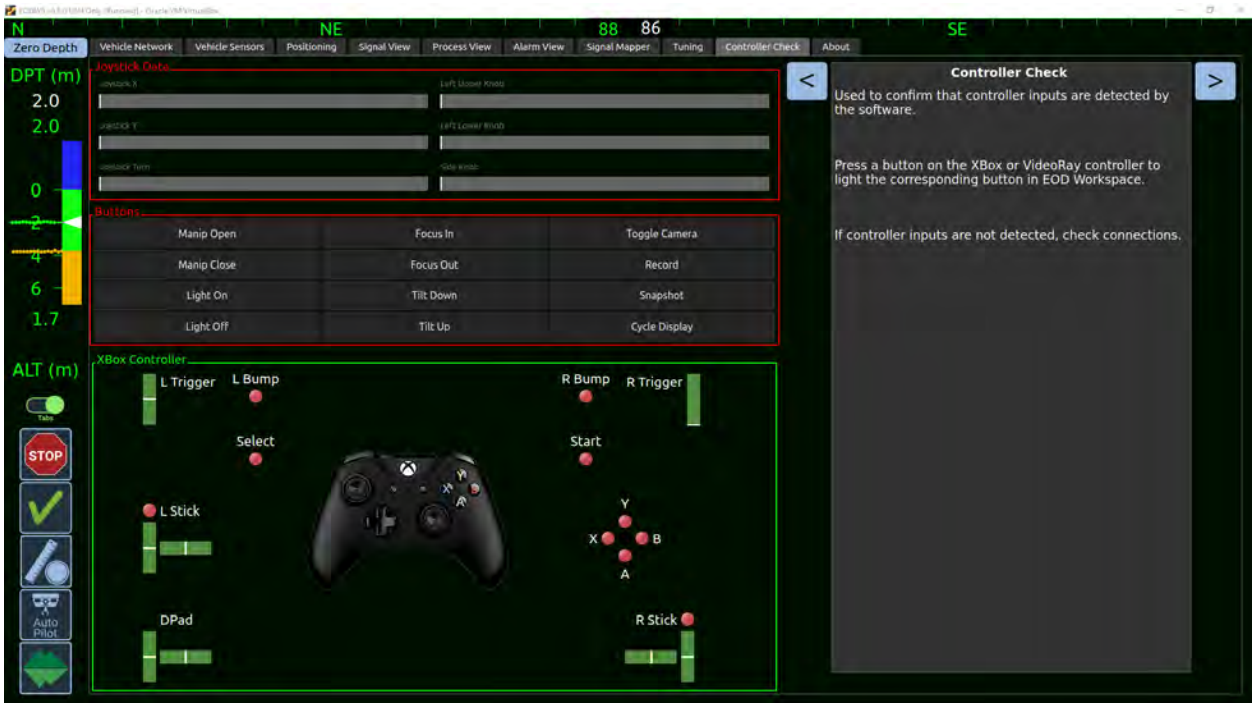
Field	Definition
Proportional (P)	The proportional gain weights the proportional amount of error between the commanded state and the current state of the output; it is mapped directly to the effort. The more the error amount, the more effort output.
Output Gain	The controller output final scalar multiplier.
Integral (I)	The integral gain weights the sum of error over time. This is important because a proportional error weighted at 5% or less may not seem like much, but it keeps growing over time. It effectively multiplies accumulated error. The integral gain is most often used to adjust steady-state errors and tracking errors.
Output Bias	Scalar value added to controller output.
Derivative (D)	The weighting applied to the rate of change of the error between the commanded state and the current state. It multiplies the rate of change in the current state (from the commanded state) by the specified gain value (D). Faster changes result in higher derivative terms. The derivative term is implemented to produce a braking component such that the term resists change.
Jog Gain	The rate of change of set point during a control input jog. Example: The joystick adjusts the heading setpoint when auto-heading is active by this amount multiplied by the total % deflection.

Field	Definition
Lower Integral Saturation Limit	Enable high/low limits. Limit on the error integral controller term. Used to prevent the integral term from becoming excessively large or small.
Controller Input and Output Limits	Enable high/low limits. Limit the range of commanded input/output signals.

2.4.9 Controller Check Tab

Confirm controller inputs are detected by the system. Engage a control on the Xbox or VideoRay IP65 controller to light the corresponding control on the Controller Check tab. Controller stick movement is also indicated. If controller inputs are not detected, check connections.

See also Verify Controller Communications.



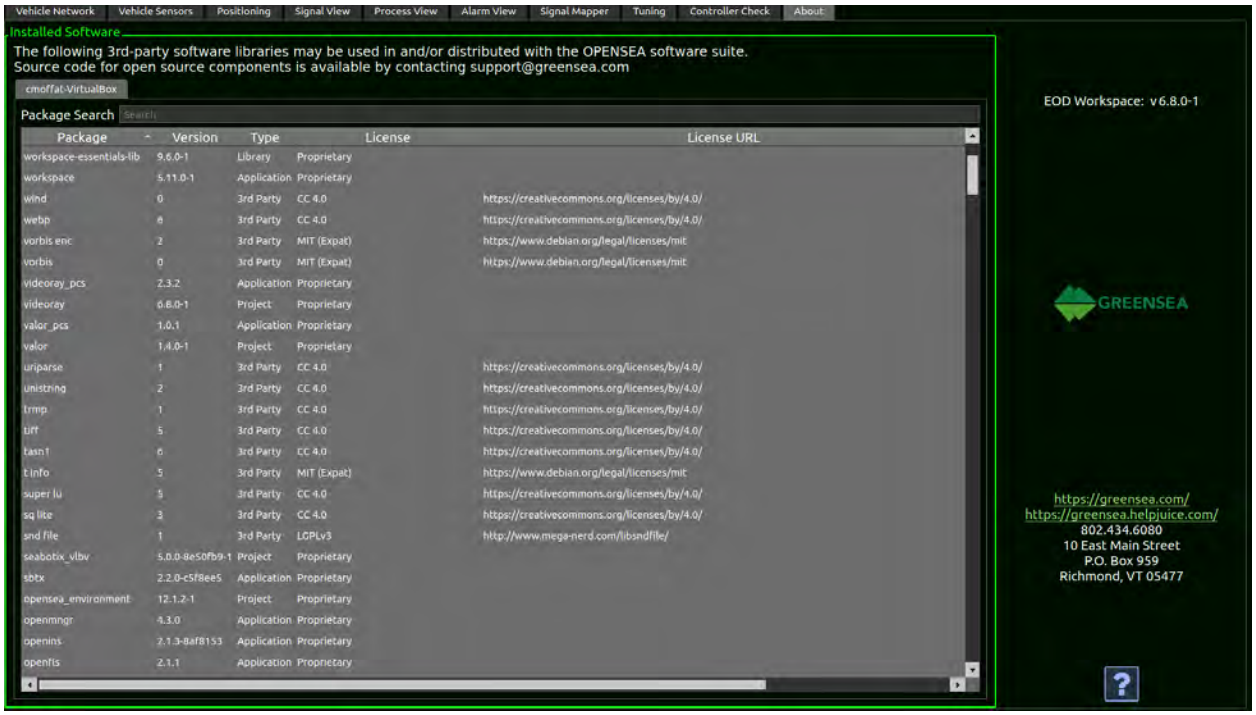
Diagnostics View - Controller Check Tab

2.4.10 About Tab

The About tab lists all programs currently installed on the system on the left; and the EOD Workspace version, Greensea links and contact information is displayed on the right. The Question Mark icon at the bottom opens this manual.

Third-party software libraries may be used in the OPENSEA software suite. Source code for open source components is available by contacting support@greensea.com.

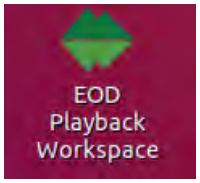
- Linux builds - all libraries are dynamically linked.
- Windows builds - all libraries are dynamically linked except Geographiclib and yaml-cpp, which are statically linked.



Diagnostics View - About Tab

2.5 EOD Playback Workspace

EOD Playback Workspace allows the replay of log files without vehicle communications. EOD Playback Workspace is automatically installed with EOD Workspace and creates a separate desktop icon to launch the application.



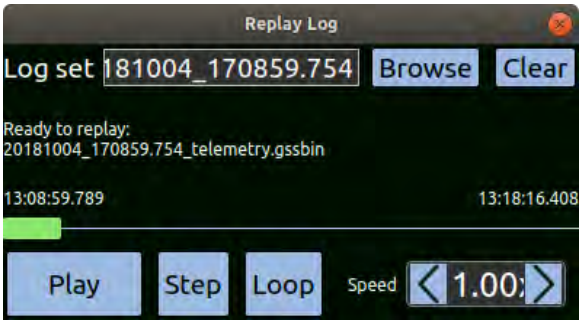
EOD Playback Workspace Desktop Icon

EOD Playback Workspace adds two icons to Flight View in the lower left corner of the Map: Play Log and Convert to CSV. Navigate through views in EOD Playback Workspace the same as EOD Workspace.

EOD Playback Workspace - Play Log and Convert to CSV Icons

2.5.1 Replay Log Window

Open the Replay Log window. Play a log and control a log currently playing. Available commands: Browse, Clear, Play, Step (forward one message at a time), and Loop (continuous replay). Also set the playback speed.

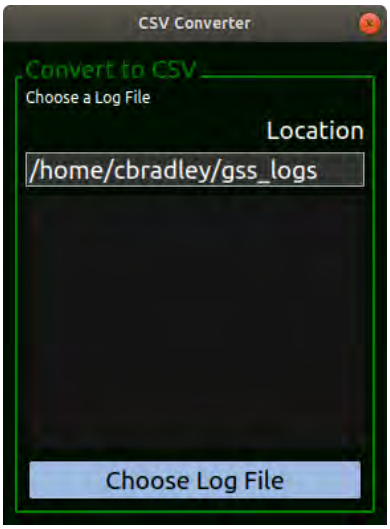


Replay Log Window

See also Playback Log File.

2.5.2 Convert to CSV Window

Convert/export channel and signal data from a log to a CSV file.



CSV Converter Window

See also Export Log Data as CSV.

3 Operation

3.1 System Startup

WARNING: Do not operate subsea vehicles out of water for more than 30 minutes and check vehicle temperature often. Subsea vehicles typically use water to cool themselves and may overheat when operating out of water.

NOTE: Perform vehicle pre-flight inspection, setup, and power-on procedures in accordance with vehicle operation manual.

3.1.1 Power On System

1. Power on topside computer.
2. Null all controller inputs.
3. On the topside computer, launch Workspace.
4. To create or import a mission, see Mission Management.

3.1.2 Test System

1. Verify EOD Workspace is communicating with the vehicle:
    a. On Flight View, verify Heading and Depth/Altitude bars are green and updating.
    b. On Flight View, verify Sonar and Video are playing.
    c. On Flight View, Home tab, verify Sensor Status is updating.
2. Use the controller to test thruster movement in every direction.

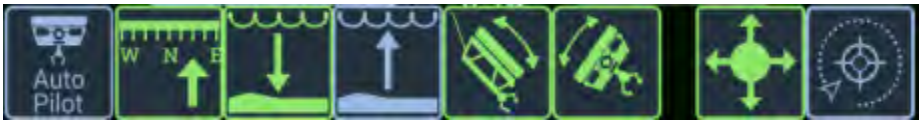
3.1.3 Launch Vehicle

1. Launch vehicle in accordance with vehicle operation manual.
2. In Workspace, Flight View, confirm zero depth on Depth/Altitude bar.

    NOTE: Upon vehicle startup, the system reads vehicle pressure and automatically sets depth to zero without operator input.

3. On the Control Bar, enable all Auto Pilot controls (auto heading, auto depth, auto pitch, auto roll) and Positioning.

    NOTE: Positioning  must be enabled to automatically execute a mission.



Auto Pilot Controls and Positioning Enabled

3.2 System Shutdown

3.2.1 Recover Vehicle

1. Transit the vehicle to the recovery location.
2. Disable all Auto Pilot controls (auto heading, auto depth, auto pitch, auto roll).
3. Return all controller inputs to neutral and power off the vehicle to minimize risk to recovery personnel and vehicle.
4. Recover vehicle and perform post-flight inspection in accordance with vehicle operation manual.

3.2.2 Power Down System

1. Power off the vehicle.
2. Copy important mission files from the topside computer, and delete unnecessary log files.
3. On the Control Bar, select  (Exit Workspace), and then select **Yes** at the confirmation prompt to shutdown Workspace.

   NOTE: Exiting Workspace is recommended to prevent accidental data loss or other unexpected problems that can occur with a hard shutdown (forced shutdown by interruption of power).
4. Power off the topside computer.
5. To replay logs, use EOD Playback Workspace. See also Mission Analysis.

3.3 Mission Management

Missions can be created ahead of time and saved, imported, as well as created on the fly.

3.3.1 Create/Edit Mission

1. In Flight View, select Data Management tab. Toggle Tabs selector to show tabs if necessary.
2. Under Mission, click **New**.
3. Enter the Mission name; default is YYYY-MM-DD.TIME_mission.
4. Select the Mission Color.
5. Click **OK**.

3.3.1.1 Quick-Create Mission

This method can be used if no missions are currently created in Workspace.

1. On the Control Bar, select  (Mission Tools/Waypoint) to enable Waypoint Mode. Waypoint Mode displays on the Map and remains active until disabled.
2. Tap or left-click on the Map to begin adding waypoints.
3. When done, remember to select the tool again to disable Waypoint Mode.

3.3.2 Add Waypoints to an Existing Mission

3.3.2.1 Add Waypoints (Direct Map)

1. Left-click or tap on a route (waypoint line) in the mission to select the mission (the waypoints highlight).
2. Right-click desired waypoint location on the Map.
3. Select **Add Waypoint Here** from the menu.
4. Repeat steps 1 and 2 to continue adding waypoints.

3.3.2.2 Add Waypoints (Map Tools)

1. On the Control Bar, select  (Mission Tools/Waypoint) to enable Waypoint Mode. Waypoint Mode displays on the Map and remains active until disabled.
2. Tap on a route (waypoint connector line) in the mission to select the mission (the waypoints highlight).
3. Left-click or tap desired waypoint location on the Map. Repeat to continue adding waypoints.
4. When done, remember to select the tool again to disable Waypoint Mode.

3.3.3 Change Waypoint Order

1. Select the Waypoint on the Map to change.
2. In Flight View, click the Data Management tab, Mission subtab.
3. Under Waypoint, click **Move Up** or **Move down** to move either up or down in the mission order.

3.3.4 Edit Waypoint Details

1. Select a waypoint in the Map to open the Edit Waypoint window:
    a. Double-tap or double-click a waypoint, and then select **Edit**; or right-click a waypoint, and then select **Edit Waypoint…** to open the Edit Waypoint window.
2. Edit waypoint details as appropriate for the mission. See Edit Waypoint Window for setting descriptions, if necessary.
3. When finished editing, click **Update**.

3.3.5 Edit Waypoint Defaults

Edit the defaults for all waypoints.

NOTE: Editing waypoint defaults does not change previously created waypoints.

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select Mission Setup tab.
3. In the Waypoint Defaults area, edit the waypoint defaults as appropriate. See Waypoint Defaults for setting descriptions, if necessary.

3.3.6 Save Mission

1. In Flight View, click the Data Management tab (show tabs if hidden).
2. Under File, click **Export** to open the file browser.
3. Browse and select a location to save the mission, enter a filename and click **Save**. Saves missions, waypoints, and markers.

3.3.7 Import Mission

1. In Mission View, click the Data Management tab (show tabs if hidden).
2. Under File, click **Import** to open the file browser.
3. Browse and select a mission to import, and click **Open**.

3.3.7.1 Mission CSV File Format

The mission is constructed from the lines of the file following the column descriptions. One waypoint is created per line, and waypoints are created in the order the lines appear in the file.

Imported missions via a CSV file prepared using the following format:

Name	Latitude	Longitude	Heading	Speed	Altitude	Tolerance
wypt_001	36.76893	-121.923239	0	0.15	2.5	0.5

Any line starting with a # is a comment and is ignored. The first non-comment line contains a comma-separated list of the following:

- *Name* - A string that is displayed on screen to identify the waypoint. If a name is not specified the waypoint is named wypt_ , where is an integer number that is incremented for every waypoint.
- *Latitude (Required)* - Can be decimal degrees (DD.dddddd), degrees decimal minutes (DD MM.mmmm), or degrees minutes seconds (DD MM SS.ssss).
- *Longitude (Required)* - Can be decimal degrees (DD.dddddd), degrees decimal minutes (DD MM.mmmm), or degrees minutes seconds (DD MM SS.ssss).
- *Heading* - The desired vehicle heading while executing a waypoint in degrees.
- *Speed* - The speed in m/s.
- *Depth or Altitude* - The desired depth or altitude (only one can be present) in meters.
- *Tolerance* - The distance from the waypoint the vehicle considers the waypoint completed in meters. If no tolerance is specified, tolerance defaults to 3m.

3.3.8 Import Chart

NOTE: Plain image files such as JPEGs cannot be used because they do not contain location data.

Accepted File Types:

- Map files: *.031
- Raster Files: *.tif *.tiff
- KML Files: *.kml *.kmz
- KAP Files: *.kap

1. In Flight View, select the Data Management tab (toggle Tabs if hidden).
2. Select the Charts subtab at the bottom of the Data Management tab.
3. Double-click **<Double-click to add New Map File>**.
4. Use the file viewer to select a chart (map file) to import.
5. The chart displays on the Map and is listed in the Charts subtab.

3.3.8.1 Show/Hide Chart or Basemap

Show/hide a chart or basemap by highlighting the chart/basemap listed on the Charts subtab, and selecting/unselecting the checkbox for that chart in the Visible column.

3.3.9 Create a Distance and Bearing Measurement

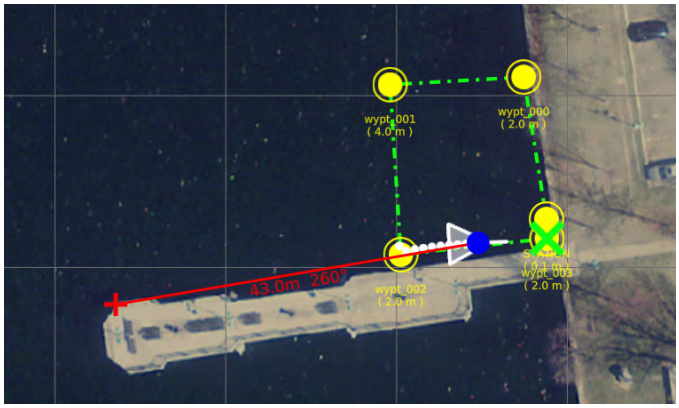
1. On the Control Bar, select  (Mission Tools/Measure) to enable Measure Mode. Measure Mode displays on the Map and remains active until disabled, select tool again to disable.

    a. **Normal Measurement** - Tap or left-click and hold a location on the Map for the stationary endpoint, then drag to desired location and release.

    b. **Rubber Band Measurement** - Tap or left-click and hold a location on the Map for the stationary endpoint, then drag to the navigation source and when the endpoint highlights with a blue circle, release.

    A rubber band measurement attaches to a navigation source for a continuous measurement, updated with the distance from that object to another point; for example, the distance from the vehicle to a target.

Normal Measurement



Rubber Band Measurement

3.3.9.1 Delete Measurement

1. To delete a measurement, disable Measure Mode and then double-tap or double-click the measurement to delete; or right-click on the measurement and select **Delete**.

3.3.10 Create and Edit Regions

Create a region on the Map using Map Tools, or the right-click method.

3.3.10.1 Create Region (Map Tools)

1. Select Map Tools  , and then Region tool  to enable Region Mode. Region Mode displays on the Map and remains active until disabled. Select the tool again to disable.
2. Click (or tap) the Map to add points to define the region.
    a. The first point is the reference point, highlighted with a pink circle.
    b. While creating a region, a point is added to the region every time the map is clicked.
3. When finished defining the region, click the green **Add Points**.
4. The Add Points button turns blue (disables), and points can no longer be added to the region.

Define Region (Left), Region Reference Point (Right)

3.3.10.2 Create Region (Right-Click Map)

NOTE: Using the right-click method creates a rectangular region.

1. Right-click a location in the map to create the region. (This is the reference point.)
2. Select **Create Region** to open the Create Rectangular Region window.
3. Optional: Edit region name in the Region Name field.
4. Optional: Edit reference point location in the Location field.
5. Define rectangle **Width**, **Height**, and **Angle**. The Angle is rotated around the reference point.
6. Select **Create Region** to save and create the region.

3.3.10.3 Edit Region

1. Open Edit Region window using one of the following methods:
    a. Double-tap or double-click a region to open the Regions menu, and the select **Edit**
    b. Right-click and select **Edit Region**.
    c. Double-click a region listed in the Data Management tab/Regions subtab.
2. Select **Add Points**, **Move Region**, or red **X** to delete point(s) as applicable.

3.3.10.3.1 Add/Remove Region Coverage

To add region coverage:

1. Open Define Region Coverage window using one of the following methods:
    a. Double-tap or double-click a region to open the Regions menu, and then select **Add Coverage**.
    b. Right-click and select **Add Coverage**.
2. Define coverage parameters and select **Add Coverage**.

To remove region coverage:

1. Double-tap or double-click a region to open the Regions menu and select **Delete Coverage**, or right-click a region, and then select **Remove Coverage**.

3.3.10.3.2 Toggle Region/Exclusion Zone

A region can be changed from a survey area to an exclusion zone indicating an area to avoid. Easily toggle between the two.

NOTE: An Exclusion Zone is a visual indicator only. Enabling **Exclusion Zone** does not prevent the vehicle from entering the zone if commanded.

1. Double-tap or double-click a region to open the Regions menu and select **Exclusion Zone**, or right-click a region and then select **Toggle Exclusion Zone**.
2. Select **Exclusion Zone** (touchscreen menu) or **Toggle Exclusion Zone** (legacy menu) to change back to a region.

3.3.11 Record Data Logs

Record camera, sonar, and telemetry data logs during a mission.

3.3.11.1 Set Data Logging Preferences

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select Mission Setup tab and set the following as applicable.
    a. Enable **Rotate Logs** to start a new log at the set interval. Every 15 minutes is recommended to break long logs into manageable segments and prevent data loss.
    b. Enable **Screencast** to record on-screen activity. For a static screenshot, use the Camera icon on the Home tab.
    c. Enable **Record** to manually start/stop a log (same as **●REC** quick-control on Home tab).
    d. **Auto Logging** (enabled by default) auto-starts a log when the vehicle reaches a depth of 1.25 m and also enables **Record**. Auto Logging only starts a log; manually stop a log by disabling **Record**.

3.3.11.2 System Runtime Data Logging

System runtime data logging is automatic upon system startup. The following data is saved every two seconds to *gss_logs/videoray_runtime_log.csv* and can be copied and shared as needed.

- Log start date and time
- Power module serial number for the specific vehicle.

  NOTE: Report power module replacement separately so usage data can be accurately tracked.
- Total run time (in minutes)
- Total dive time (time below 1.25m depth, in minutes)
- Dive count (dives below 1m depth)

The log captures multiple dives during one session. Run time and dive are cumulative each time the vehicle is powered on, and the number of dives increment with each descent below one meter.

3.3.11.3 Disable Automatic Logging

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select Mission Setup tab.
3. In the Data Logging area, click **Auto Logging**.
4. Manually start a log using the **●REC** quick-control on the Home tab, or **Record** in User Preferences View/Mission Setup tab/Data Logging.System Run Time Data Logging

NOTE: Auto Logging is enabled by default to ensure logs are captured during a mission. Disable **Auto Logging** *only* in situations where logging does not impact mission success.

NOTE: Disabling Auto Logging does not disable System Runtime Data Logging.

3.4 Mission Execution

3.4.1 Add and Go To Waypoint

1. In Flight View, select **Auto Pilot** control.
2. Enable Positioning.

3. Right-click the location on the Map for the vehicle to transit to.
4. Select **Add and Go To Waypoint** from the popup.

3.4.2 Go To Waypoint

1. Enable Positioning.

2. Right-click the waypoint for the vehicle to transit to.
3. Select **Go To Waypoint**.

3.4.3 Execute Mission (Map)

NOTE: Mouse right-click method.

1. Right-click a mission on the Map to open Mission menu
2. Select **Execute Mission**.

3.4.4 Execute Mission (Data Management Tab)

NOTE: Touchscreen method, but can also use mouse.

1. Select the Data Management tab.
2. Select the Missions subtab.
3. Select a mission from the list.
4. Under Mission, select **Execute**.

3.5 Point of Interest

Set a Point of Interest (POI) and orient control inputs to that point of interest. POI can be set using either the Position menu or the General menu.

NOTE: POI requires the vehicle to be in station-keeping mode, with DVL lock.

NOTE: Enabling POI disables Positioning, and enabling Positioning disables POI.

3.5.1 Set POI

1. Ensure the vehicle is in station-keeping mode, with DVL lock.
2. From the Control Bar, select **Auto Pilot** 

to open the Auto Pilot flyout.
3. Select **Point of Interest** to enable POI Mode.

4. Either double-tap or double-click a location on the Map to open the Position menu and select **Set POI**; or right-click a location on the Map to open the General menu, and select **Set Point of Interest**.

3.5.2 Vehicle Control and POI Mode

The following control changes occur when POI is enabled.

- Controller Forward/Back moves the vehicle toward or away from the POI.
- Controller Left/Right orbits clockwise or counterclockwise around the vehicle.
- Controller Depth operates using Fly-By-Wire controls.
- Controller Heading is disabled while in POI Mode.

3.6 Navigation

3.6.1 Set Position

If the vehicle position shown in Workspace does not reflect the known position of the vehicle, manually change the vehicle position using one of the two methods below.

WARNING: Manually setting a new vehicle position while Positioning is enabled may cause unexpected vehicle motion as the vehicle tries to reacquire its current active waypoint.

Disabling Positioning before manually setting a new position is recommended. 

3.6.1.1 Set Position (Map)

1. Right-click or double-tap a location on the Map.
2. Select **Set Vehicle to Mouse Position**.

3.6.1.2 Set Position (User Preferences/Navigation Tab)

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select the Navigation tab.
3. In the Position area (bottom left), enter the desired position in the **Set Desired Position…** field.
4. Select **Update Vehicle Position**.

3.6.2 Set Declination

When navigating, understanding the difference between magnetic north and true north is required. Magnetic north is dependent upon location on Earth. True north (geodetic north) is the direction along the surface of the Earth towards the geographic North Pole. The angular difference between magnetic north and true north is the declination.

To operate using true north, identify vehicle declination. If using a GPS, Workspace provides options to update vehicle declination.

3.6.2.1 Manually Set Declination

If unable to use auto-declination, manually set the vehicle declination.

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select the Navigation tab.
3. In the Declination area, if the vehicle has an accurate and valid position, click **Lookup Declination**. Alternatively, manually enter the vehicle position in the **Set Declination** field.
4. Select **Update Vehicle**.

3.6.2.2 Automatically Set Declination

WARNING: The Auto Declination feature requires that the vehicle have a valid position.

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select the Navigation tab.
3. In the Declination area, select **Auto Declinate** to enable (turns green).

3.6.3 Set Zero Depth

WARNING
- **Failure to zero depth before diving may cause unexpected motion if using auto depth.**
- **Using zero depth while using auto-depth may cause unexpected vehicle motion.**
- **Do not zero depth while submerged. This results in an incorrect depth.**

NOTE: Upon vehicle startup, the system reads vehicle pressure and automatically sets depth to zero without operator input.

The Zero Depth button sets the current vehicle depth to zero, and is used anytime the operator notices a discrepancy between vehicle surface position and what the depth/alt bar is displaying.

1. Click **Zero Depth** 

at the top of the depth and altitude bar.
2. At the confirmation prompt, select **Apply**.

3.6.4 Edit/Create a Navigation Source

The vehicle and three beacons are preconfigured.

- Topside GPS Position (Green)
- ROV GPS Position (Cyan)
- USBL Position (Yellow)

To edit, or create a new navigation source:

1. Select  or use keyboard **Alt+2** to open User Preferences View.
2. Select the Navigation tab.
3. In Navigation Sources section, select **Configure** to open the LCM Map Items window.
4. At the bottom of the LCM Map Items window, double-click **<Double-Click to add New Item>**.
5. Select **Item Type** (beacon, vehicle, or vessel**)** and then select a **Channel** for communications.
6. Fill out the rest of the fields for the navigation source as appropriate.
7. Select **Save**.

3.6.5 Reset Vehicle to the GPS Location

1. In Flight View, open the Home tab.
2. Select **Reset To ROV GPS**.

3.7 Alarms

Acknowledge and clear alarm events.

3.7.1 Acknowledge Alarms

Alarms can be acknowledged two ways; from the Flight View Control Bar or from the Diagnostics View Alarm View tab.

1. Control Bar: Select the Alarm indicator on the Control Bar to open the Alarms window, and then select **Ack All**.
2. Alarm View tab:
    a. Select  or use keyboard **Alt+3** to open Diagnostics View.
    b. Select the Alarm View tab.
    c. Select **Ack All Alarms** in the Current Status area (far right).

3.7.2 Clear Events

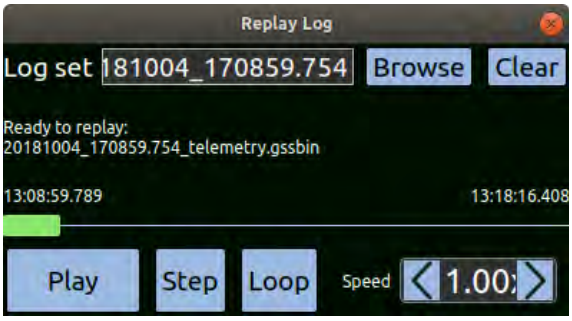
1. Select  or use keyboard **Alt+3** to open Diagnostics View.
2. Select the Alarm View tab.
3. Select **Clear Events** in the Past Events area (upper-right corner).

> **NOTE**: Clearing Alarms only clears previous events. Currently active alarms are not cleared, previously cleared events reappear if triggered again.

3.8 Mission Analysis

3.8.1 Playback Log File

1. Launch EOD Playback Workspace from the desktop.
2. Select **Play Log** in the lower left corner of the Map to open the Replay Log window.
3. Select **Browse**.
4. Use the file browser to select a log file ending with *telemetry.gssbin*.
5. Select **Play**. If desired, select **Step** to step through the replay, and **Loop** to continuously replay the log when it ends.



Replay Log Window

3.8.2 Export Log Data as CSV

1. Launch Playback EOD Workspace from the desktop.
2. Select **Convert to CSV** in the lower left corner of the Map.
3. Select **Choose Log File**.
4. Browse for a file ending with TELEMETRY.GSSBIN.
5. Select the Channel to convert from the Convert to CSV list. (Use Shift+Click or CTRL+Click to select multiple channels).
6. Select **Convert to CSV**.

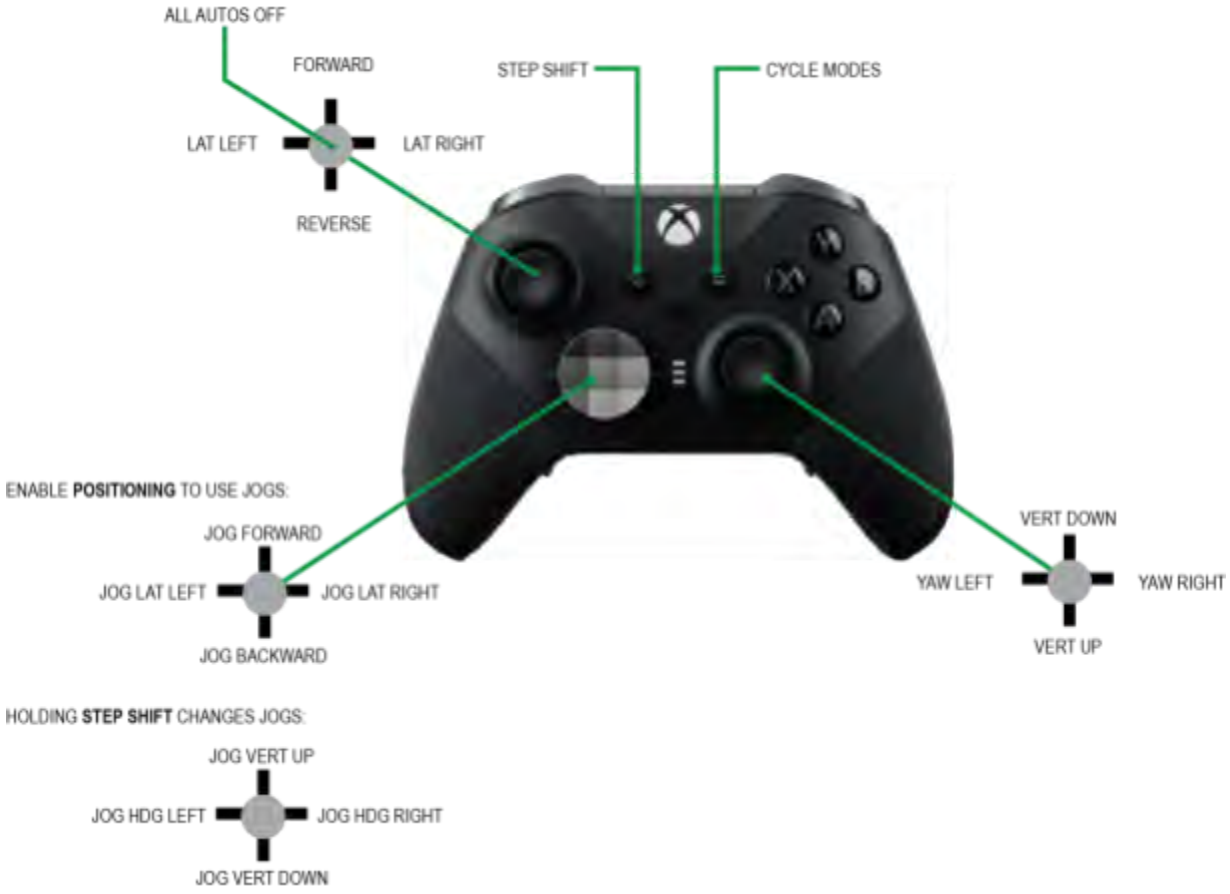
CSV Converter Window

4 Appendix - Controller Mapping

4.1 Tablet Controller Inputs

Tablet Controller

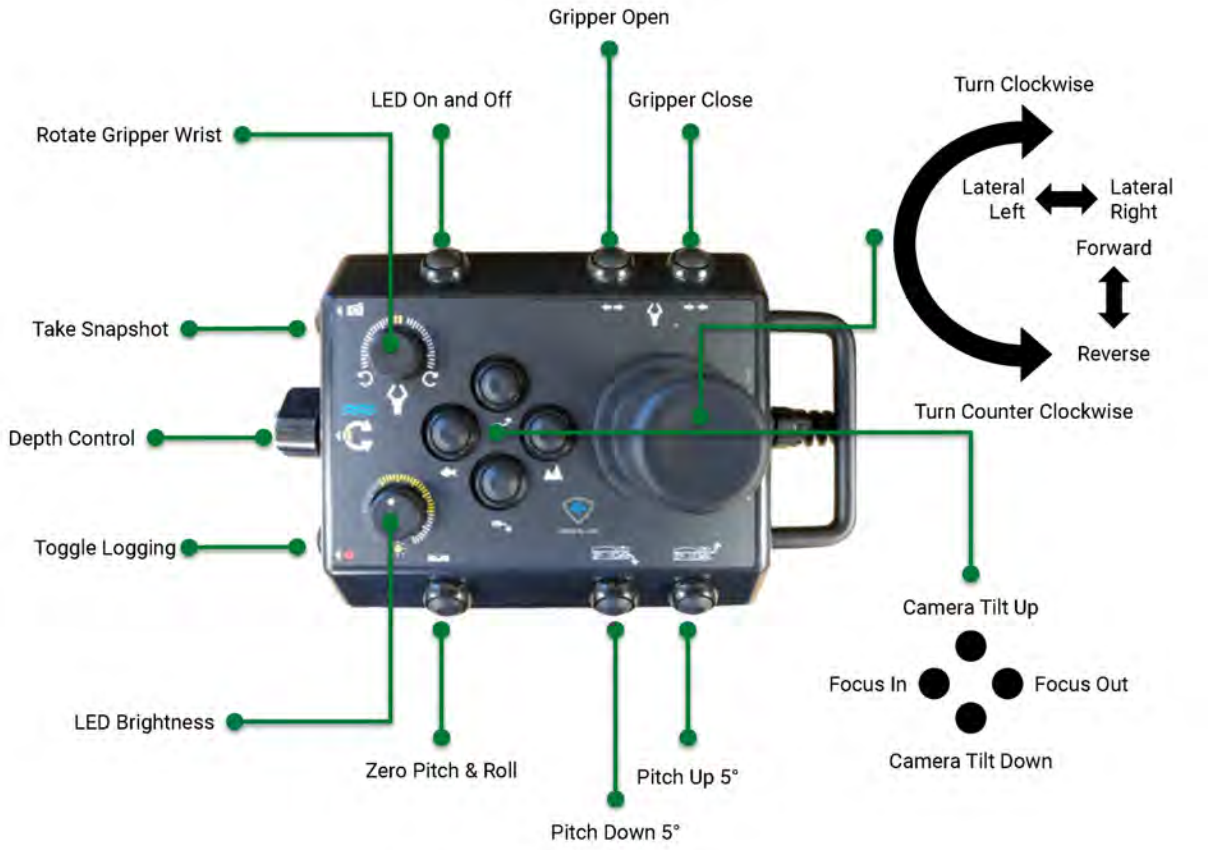
4.2 Xbox Controller Inputs



Xbox Controller

	Mode			
Button	Pitch/Roll	Camera	Sonar	Manip
Left Shoulder	N/A	Decrease LED Brightness	N/A	N/A
Right Shoulder	Zero Pitch/Roll	Increase LED Brightness	N/A	N/A
X	Roll CCW 5°	Camera Focus In	Decrease Sonar Gain	Rotate CCW
B	Roll CW 5°	Camera Focus Out	Increase Sonar Gain	Rotate CW
Y	Pitch Up 5°	Camera Tilt Up	Increase Sonar Range	Manip Open
A	Pitch Down 5°	Camera Tilt Down	Decrease Sonar Range	Manip Close

4.3 IP65 Controller Inputs



IP65 Controller

4.4 Verify Workspace/Controller Communications (Troubleshooting)

1. On the Control Bar, select  or use keyboard Alt+3 to open Diagnostics View.
2. Select the Controller Check tab.
3. Verify controller inputs are communicating (green). If not, check hardware connection.