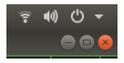
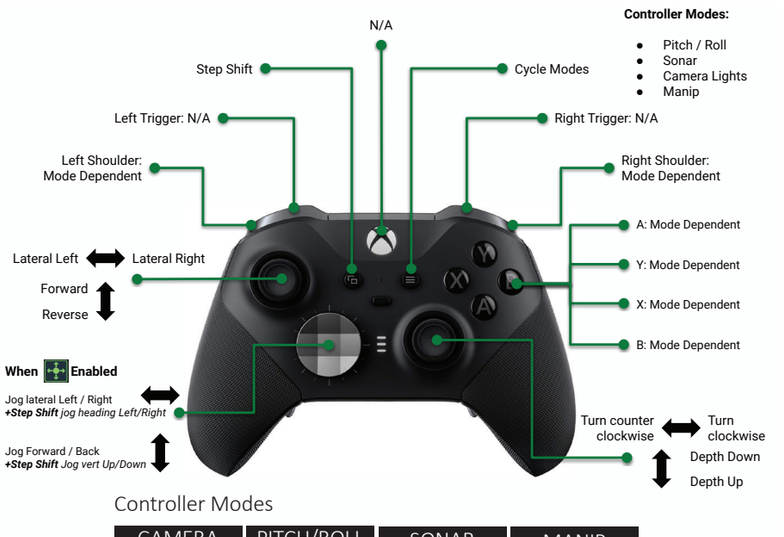
4 Recovering the System Post Dive Check List

1. Disable auto controls and stop recording. 

   Auto-Depth 
   Auto-Heading 
   Auto-Pitch 
   Auto-Roll 
   Station Keep 
2. Retrieve the ROV.
3. Close the Greensea EOD Workspace by clicking on the red X on the top right corner of the EOD Workspace window. 
4. Press the ROV Mains Power Switch. 
5. Turn off the Operator Control Console using the Power Switch. 

6. Secure the ROV and disconnect the tether.
7. Disconnect the tether from the Operator Control Console.
8. Place tether caps on all of the tether connectors (submersible, tether).
9. Visually inspect the system for damage that might have occurred during your operation.
10. Rinse the salt water from the system and soak the submersible for 30 minutes in fresh water.
11. Store the manipulator by pushing it back and engaging the storage set screws.
12. Return all components to their storage cases.

Xbox Controller

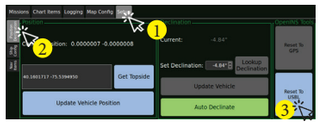


Controller Modes

	CAMERA	PITCH/ROLL	SONAR	MANIP
A	Tilt Down	Pitch (-)5	Range (-)	Close
X	Focus In	Roll (-)5	Gain (-)	Rotate Left
Y	Tilt Up	Pitch (+)5	Range (+)	Open
B	Focus Out	Roll (+)5	Gain (+)	Rotate Right
RB	Lights On	Zero/Level	N/A	
LB	Lights Off	N/A	N/A	

3 Pre Dive Check List

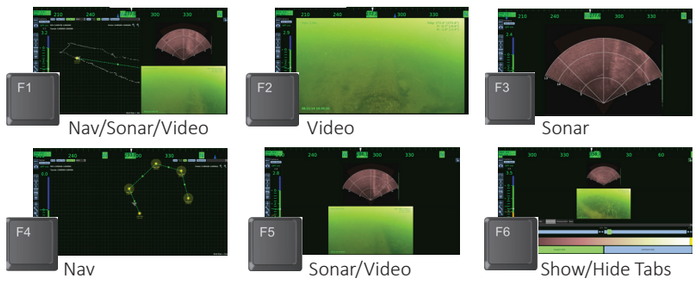
Using the Controller/Test the System:

1. Verify all thrusters respond to the controller inputs as expected.
2. Verify main camera tilts all the way up and all the way down.
3. Verify main camera focus - in and out.
4. Verify LED light function. Both LED modules dim until off and increase until full illumination.
5. **Deploy Vehicle.**
6. Ballasting the system.
   Watch the system to determine if the ROV is too heavy or buoyant. If necessary adjust the ballast. 20
7. Align the submersible GPS to the vehicle position by clicking Reset To GPS.
8. Verify location.
9. Verify declination (use Auto). 

10. Enable auto controls (they will turn green when enabled).

    Auto-Depth 
    Auto-Heading 
    Auto-Pitch 
    Auto-Roll 
    Station Keep 
11. Begin operations and recording. 

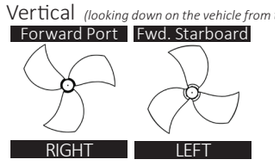
Views

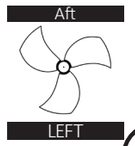


Thruster Propeller Reference

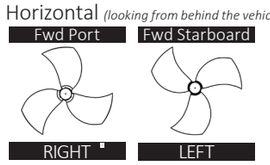
all propeller images are referenced from looking down at the acorn nut

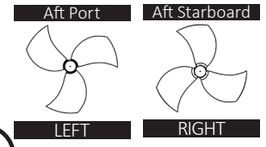
Vertical *(looking down on the vehicle from the rear)*

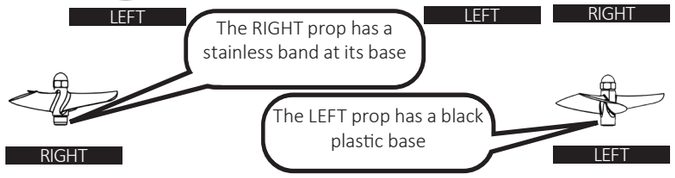




Horizontal *(looking from behind the vehicle)*

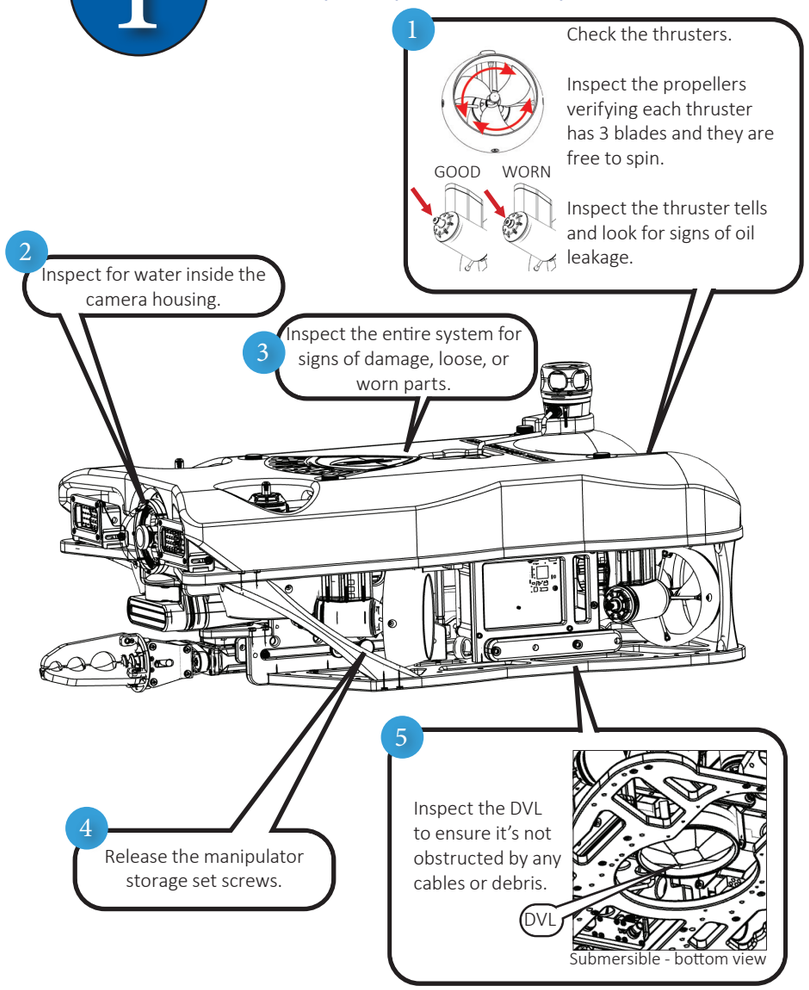






Quick Reference Guide

1 Visually Inspect the System

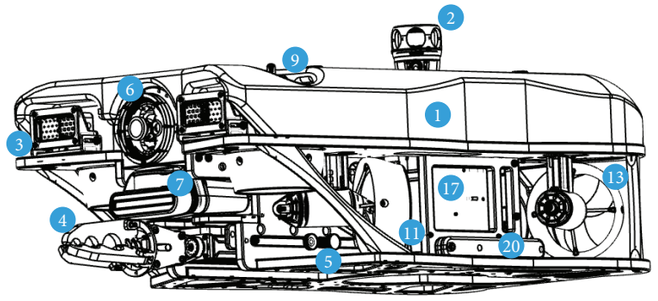


VideoRay

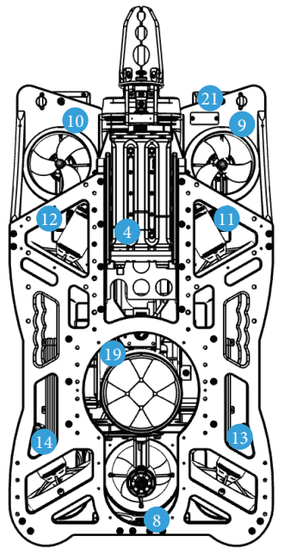
GREENSEA

VideoRay Part Number 72281 rev 4 201005

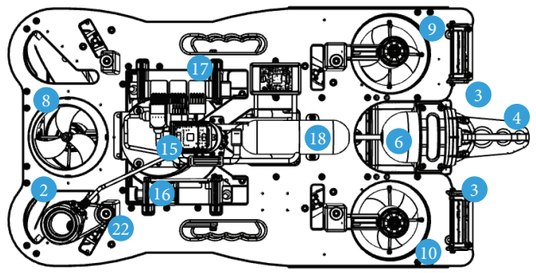
The Defender System



1. Float *part number 70779*
2. USBL Beacon *part number 70693*
3. LED Lighting Module *part number 70023 (QTY 2)*
4. Rotating Manipulator *part number 70824*
5. Manipulator Storage Set Screw *(One on each side)*
6. HD Camera Module *part number 70044*
7. Multibeam 750D Sonar *part number 71047*
8. Vertical Rear Thruster *part number 70503*
9. Vertical Port Thruster *part number 70503*
10. Vertical Starboard Thruster *part number 70503*
11. Forward Port Thruster *part number 70503*
12. Forward Starboard Thruster *part number 70503*
13. Rear Port Thruster *part number 70503*
14. Rear Starboard Thruster *part number 70503*
15. Submersible GPS Module *part number 70809*
16. Power Module *part number 70160*
17. Communications Module *part number 70191*
18. AHRS Module *part number 70273*
19. Navigation DVL *part number 71044*
20. Ballast *part number 71044*
21. Serial Number Plate
22. Float Block Screw



Bottom view



Top view

23. Operator Control Console (OCC) *part number 70218*
24. High Definition Display
25. Display Brightness
26. Universal Power Plug 100-124 volts AC
27. OCC Power On|Off Switch
28. ROV Power Mains/Emergency Stop
29. Line Insulation Monitor
30. HDMI Ports
31. Auxiliary Ethernet Port
32. Controller USB Port
33. Keyboard USB Port
34. Tether Whip Connection
35. Auxiliary 12 Volts (5 amp max)
36. Accessory USB Ports
37. Compass Bar
38. Depth and Altitude Tracker
39. Sonar feed
40. Video feed
41. Record button
50. Rear Y frame
51. Strain relief bolt
52. Test strain relief

2 Connecting & Powering On

⚠WARNING: Do not connect or disconnect cables while system is powered.
⚠CAUTION: ALL ROV submerged connections must be terminated.
⚠CAUTION: Follow the steps in order when starting the system.

Connecting the System

1. Remove caps and connect the tether and strain relief to the vehicle - lubricate if necessary. (Manual - Defender Strain Relief) See figures A & B.
2. Connect the tether to the OCC tether whip. 34 Tether
3. Remove the ROV float block.
4. Inspect all 5-pin and 9-pin connectors to ensure they are seated. See figure C. CAUTION: If the connectors are not fully seated, clean, lubricate, and reseat them. Feed the USBL accessory cable through the GPS hole in the float block and replace and secure the float block. Extend the manipulator.
5. Install the ROV USBL Beacon on the vehicle using the rear starboard float block screw. Connect the accessory cable.
6. Connect the hand controller to the OCC controller USB port. 32 Controller
   CAUTION: Do not connect more than one hand controller to the system at a time.
7. Connect the keyboard to the OCC keyboard USB port. 33 Keyboard
8. Insert the 5Hz GPS USB cable into one of the USB ports. CAUTION: Don't connect more than one topside GPS to the system at a time. 36 Accessory USB
9. Insert the USBL power cable into a 12V power port. 35 Auxiliary 12 Volts 5 Amp Max
10. Insert the USBL USB cable into one of the accessory USB ports. 36 Accessory USB
11. Confirm that the ROV POWER MAINS is fully depressed.
12. Connect the OCC power cord to the OCC and a power source.
13. Turn on the OCC.

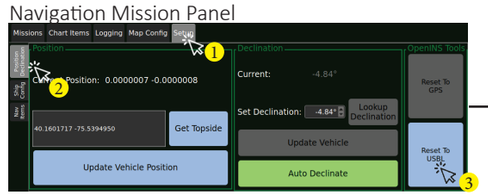
14. Turn on the ROV POWER MAINS. Twist the Red Power Mains button clockwise.

15. Click on the EOD Workspace icon to launch.

Verify System Connectivity

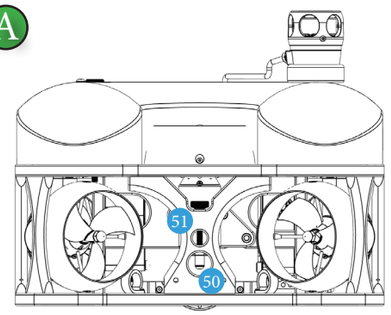
1. Heading - The compass bar will turn green when connected. 37
2. Depth - The Depth and Altitude Tracker will turn green when connected. 38
3. Sonar - Imagery will display in the sonar window 39 when the sonar has connected.
4. Video - Imagery will appear in the video window 40 when the camera has connected.
5. Confirm GPS positioning telemetry is updating in EOD Workspace. see figure D
6. Topside and ROV GPS - The Satellite Lock button will be green. The Satellite ID bars will show signal strength as a green bar at the bottom of the window. Then exit the diagnostics mode by clicking the  icon.

Navigation Mission Panel



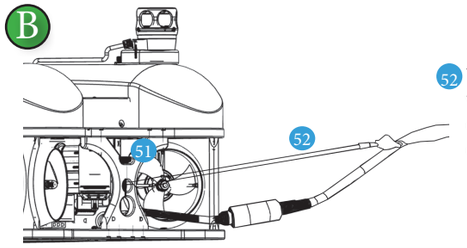
50 Route the whip to the right of the rear Y frame.

A



51 Attach the strain relief bolt through the eye hole of the strain relief cable.

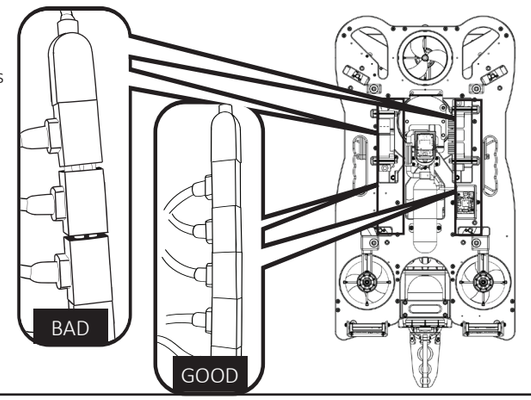
B

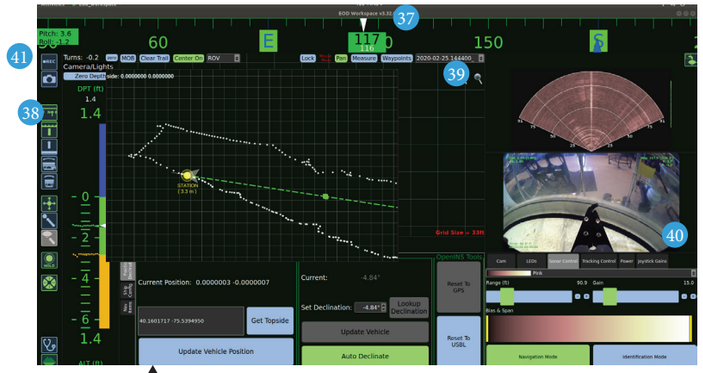


52 Test the strain relief to verify the stress is on the cable not the tether or connector.

C

If the connectors are spaced, do not place the system in water. Clean, lubricate and reseat the connectors.





D

Exit Diagnostics

Positioning Alarm should disappear when the vehicle has been launched into the water