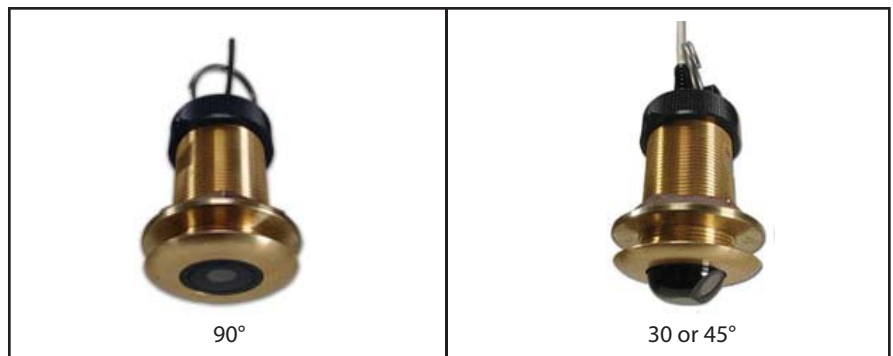


DropShot 20/20 Installation Guide

Version 1.1



DropShot 20/20 Retractable Through the Hull Mounted Underwater Video System

APPLICATION: The DropShot 20/20 is designed to provide a marine vessel operator a live video feed of what is directly below or behind the vessel. The camera is limited in viewing distance by water clarity. Typically a through hull camera is intended for vessels operating in clear water environments.

- 90° Camera - Straight Down Viewing
- 30° Camera - Typical Running Gear Monitoring
- 45° Camera - Typical Forward Looking

WARNING: None of the DropShot 20/20 Cameras is intended as a navigational aid.

CAUTION: Never use solvents. Cleaners, fuel, sealants, paint, and other products may contain strong solvents, such as acetone, which attack many plastics, greatly reducing their strength.

What is Included

- Camera Head
- Inter-Connect Cable
- Through Hull Fitting
- Retaining Ring - Safety Wire - Washer
- Installation Manual

Mounting Location

- Choose an accessible spot inside the vessel with adequate headroom for the height of the housing, tightening the nuts, and removing the camera.
- Choose a location away from interference caused by power and radiation sources such as: the propeller(s) and shaft(s), other machinery, other echosounders, and other cables.
- If the camera will be aimed at the bottom, choose a location with a minimum deadrise angle.
- If the camera will be used above headway speed, the water flowing under the hull must be smooth with a minimum of bubbles

Auxillary Lighting

The DropShot 20/20 is very light sensitive. It is not required to use auxillary lighting in daylight conditions. However if you wish to install auxillary lighting please follow the following guidelines.

- Choose a location at least 2 feet from the camera so not to overilluminate.
- Make sure the light power is kept isolated from the camera power.

To see our line of LED hull illumination systems visit: www.splashcam.com/titanxlite.com

Installation

WARNING: Always wear safety goggles and a dust mask.

Hole Drilling

1. Drill a 1/8" pilot hole from inside the hull. If there is a rib, strut or other hull irregularity near the selected mounting location, drill from the outside.
 2. Using 2" hole saw, cut a hole from outside the hull. Sand and clean the area around the hole, inside and outside, to ensure that the sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either mild household detergent or a weak solvent (alcohol) before sanding.
- Metal hull—Remove all burrs with a file and sandpaper. Do not install a Bronze Through Hull into an Aluminum Hull.

Bedding

Apply a 2mm (1/16") thick layer of marine sealant around the lip of the housing that contacts the hull and up the sidewall of the housing. The sealant must extend 1/4" higher than the combined thickness of the hull, the washer(s), and the hull nut. This will ensure there is sealant in the threads to seal the hull and to hold the hull nut securely in place.

Installing

WARNING: The O-rings must be intact and well lubricated to make a watertight seal.

WARNING: Be sure the camera insert is fully inserted into the housing and the cap nut is screwed on completely to make a watertight seal.

WARNING: Always attach the safety wire to prevent the insert from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.

CAUTION: Never pull, carry, or hold the camera by the cable as this may sever internal connections.

1. From outside the hull, push the housing into the mounting hole using a twisting motion to squeeze out excess sealant
2. From inside the hull, slide the washer onto the housing.
3. Screw the hull nut in place. Tighten with channel lock pliers.
Cored Fiberglass Hull— Do not over-tighten, crushing the hull.
Wood hull—Allow for the wood to swell.
4. Remove any excess marine sealant on the outside of the hull to ensure smooth water flow over the camera.
5. After the marine sealant cures, inspect the O-rings on the camera insert (replace if necessary) and lubricate them with the silicone lubricant supplied. Also lubricate the interior bore of the housing above the lip of the valve.
6. Slide the camera insert into the housing. Note the arrow on the top of the insert. The direction that the arrow points will correspond to the top of the display screen. Adjust the insert to point in the intended direction. Screw the cap nut several turns until the threads are engaged. Continue to tighten the cap nut. Be careful not to rotate the housing and disturb the sealant. Hand-tighten only. Do not over tighten.
7. Attach the safety wire

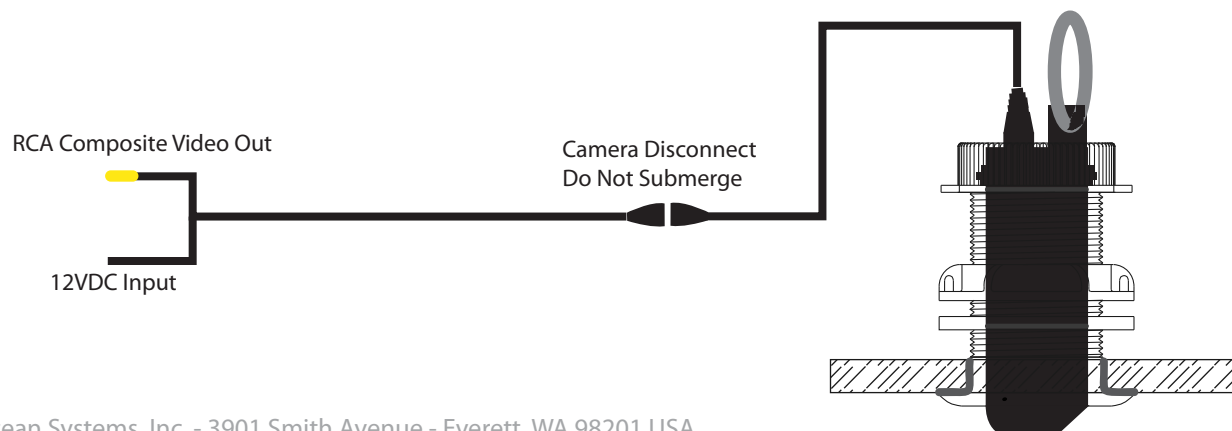
Cable Installation & Connections

WARNING: It is not recommend to shorten the cable or remove the connector to ease cable routing. If the cable is cut, the video signal will be significantly degraded. If you must shorten the cable cut from the power/video side and not the camera side.

WARNING: Do not submerge the camera disconnect plug.

1. Route the cable to the video display. Use grommets to avoid tearing the cable jacket when passing it through the bulkhead(s) and other parts of the boat. To reduce electrical interference, separate the camera cable from other electrical wiring and the engine. Coil any excess cable and secure it in place with cable ties to prevent damage.
2. Connect the camera to the display at the video input jack. The camera has a RCA connector. A RCA to BNC adapter is included if needed to connect to the video display.
3. To connect the power leads, see the color code below.

Red 12 VDC+
Black 12 VDC



Checking For Leaks

WARNING: Do not leave the boat in the water unchecked for several days.

When the boat is placed in the water, immediately check the through hull camera for leaks. Very small leaks may not be easily observed. Do not leave the boat in the water for more than 2 hours before checking it again. If there is a small leak, there will most likely be considerable bilge water accumulation after 1 day. If a leak is observed, repeat "Bedding" and "Installing"

Installing The Blanking Plug

To protect the camera, use the blanking plug when:

- The boat will be removed from the water.
- Aquatic growth buildup on the camera lens is suspected due to poor images on the display.

WARNING: The O-rings must be intact and well lubricated to make a watertight seal.

WARNING: Be sure the blanking plug is fully inserted into the housing and the cap nut is screwed on completely to make a watertight seal.

WARNING: Always attach the safety wire to prevent the blanking plug from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.

Camera Head Cleaning

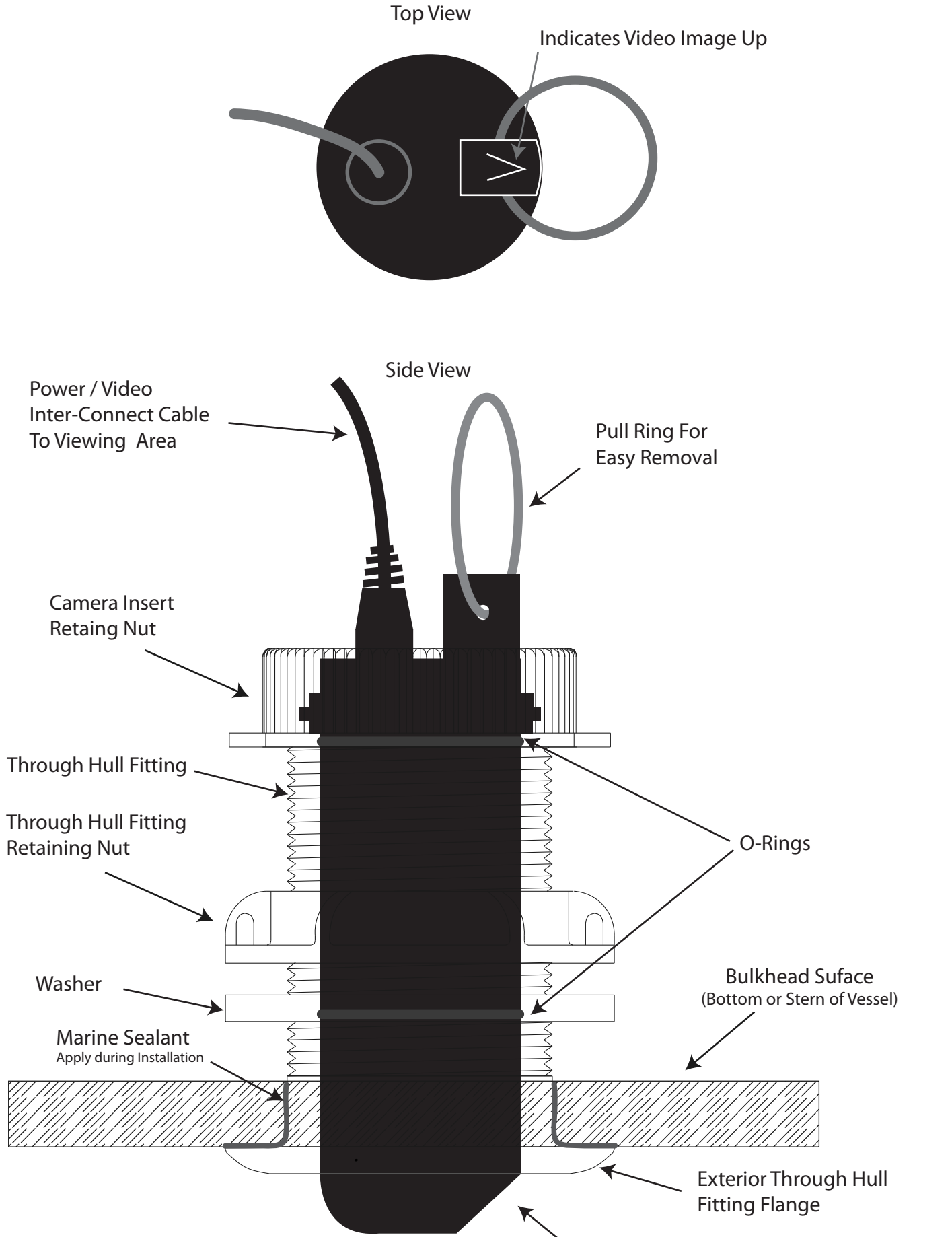
Aquatic growth can accumulate rapidly on the camera's surface reducing performance within weeks. Clean the insert with a Scotch-Brite® scour pad and mild household detergent, being careful to avoid scratching the lens.

O-Ring Servicing

WARNING: The O-rings must be the correct size, intact, and well lubricated to make a watertight seal. O-rings must be free of abrasions and cuts to ensure a watertight seal. Replacement O-rings are available. Install two O-rings on the camera insert and two O-rings on the blanking plug

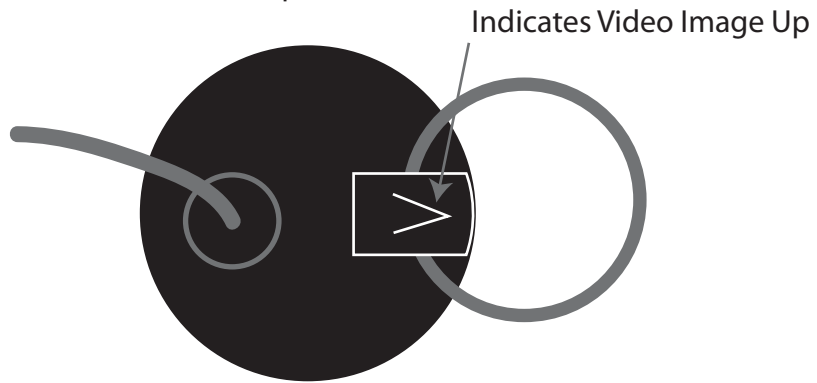
Camera Specifications	
Video Signal:	Composite
Resolution:	480 TV Lines
Focus:	Fixed 1 inch to focal infinity
Lens:	4mm
Iris:	Electronic
Operating Temp:	-10 to 55 C
Light Sensitivity:	0.15 lux
Input Voltage:	12 VCD
Current Consumption:	210 mA
Video Out Jack:	RCA or BNC
Physical Specifications	
Through Hull Fitting:	Bronze
Camera Housing:	Urethane
Available Cable Lengths:	50, 100, 150ft
Through Hull Fitting Dimensions:	2" diameter / 3.25" length

DropShot 20/20 Through Hull Camera Forward / Rear View

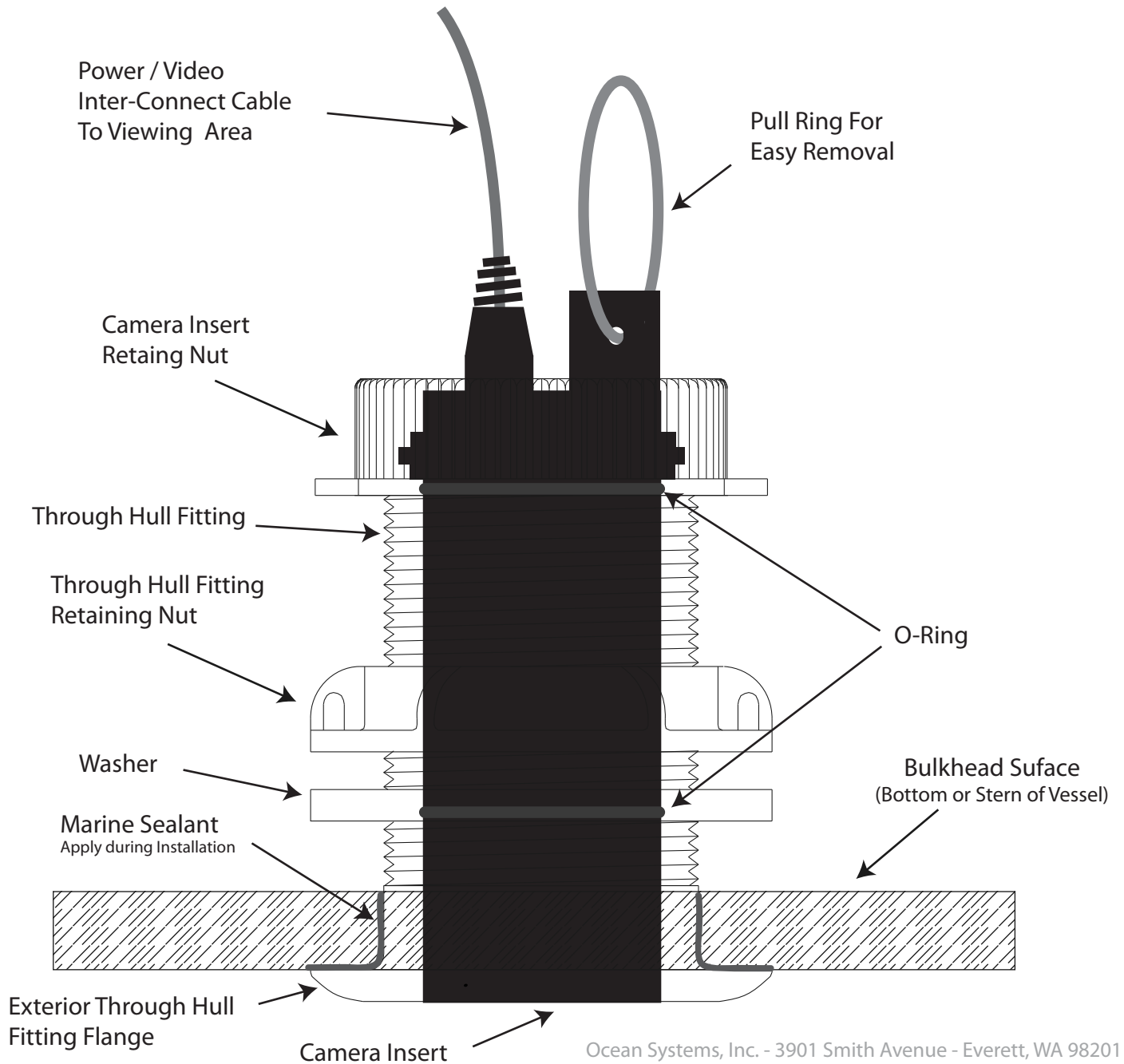


DropShot 20/20 Through Hull Camera 90 Degree Orientation

Top View



Side View



RMA and Warranty

Conditions of the Warranty

Ocean Systems reserves the right to determine if a repair is subject to the warranty agreement. Damages caused by products being dropped or mishandled are not covered by this warranty. Also damage caused by over-voltage conditions on any of the I/O connectors is not covered by this warranty.

Labor and defects are covered for the warranty period of two years from the original date of purchase. If you discover a defect, please refer to our Return Merchandise Policy below. The warranty covers all Ocean Systems, Inc. hardware defective in material or workmanship. During the warranty period, Ocean Systems, Inc, at its opinion, will repair or replace product or product components, which in its opinion proved defective. Parts and components used in the repair process may be recycled or repaired, at Ocean Systems, Inc's discretion. This warranty service will be performed at no charge to the registered owner, provided the product is shipped prepaid to Ocean Systems, Inc... Ocean Systems, Inc. will return the repaired product via a like carrier, in the continental United States within 5 business days, shipping time excluded. Ocean Systems, Inc. reserves the right to determine whether a needed repair is subject to the warranty as per its provisions stated herein. The warranty will be void in the opinion of Ocean Systems, Inc, the product has been damaged through an accident, misuse, misapplication, or as a result of service or modification performed not authorized in writing by Ocean Systems, Inc.

WARNING: The following are NOT covered under warranty:

- Damage due to the use of an improper power supply.
- Damage due to exposure to water. (Camera head excluded)
- Damaged inter-connect cable is not covered under warranty under any circumstance.

Obtaining an RMA

It is our policy that all material and repair returns, whether in warranty or not, are only accepted if an RMA (Return Merchandise Authorization) number has been issued for the product(s) being returned. Any unauthorized shipments may be returned, un-repaired at the customer's expense.

Email Ocean Systems, Inc at support@splashcam.com to obtain an RMA number. Items must be returned within 10 days of receiving RMA number. Returned product must have the RMA number clearly marked on the outside of the package.

RMA numbers and return address may be obtained from Technical Support at 1-800-355-4234 or 425-258-0778