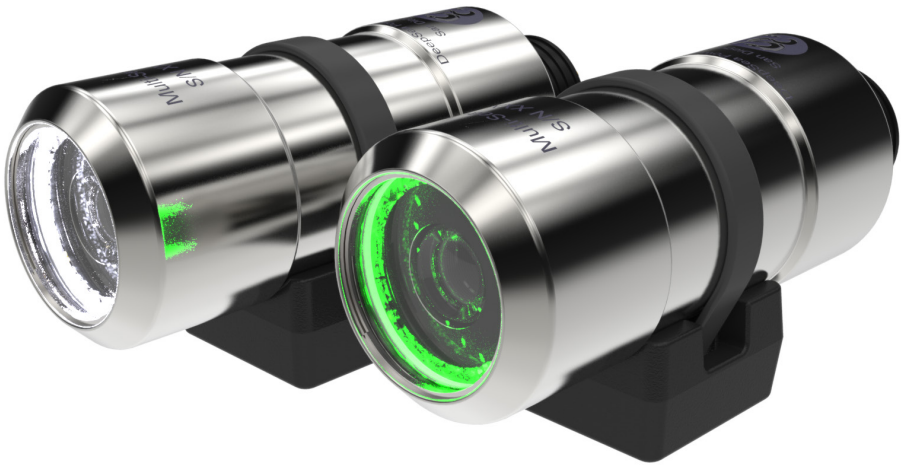
DEEPSEA Power & Light®

LED Multi SeaCam®



Operator's Manual

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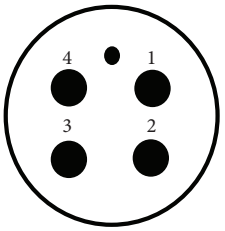
sales@deepsea.com

Rev. 03/12/19

Specification Overview

	MSC-1055	MSC-1065	MSC-2065
Optical Specifications			
Lens	2.8 mm, f/2.8	5 mm, f/2.8	3.0 mm, f/2.0
Focus	Fixed focus, wide angle	Fixed focus	Fixed focus, wide angle
Depth of Field	10 cm [4 in.] to infinity	30 cm [12 in.] to infinity	10 cm [4 in.] to infinity
FOV in Air	106º H x 78º V x 149º D	77º H x 56º V x 98º D	95º H x 75º V x 130º D
FOV in Water	77º H x 59º V x 98º D	57º H x 45º V x 71º D	75º H x 60º V x 85º D
Video Specifications			
Image Sensor	1/3 inch CCD image sensor	1/2 inch CCD image sensor	1/3 inch CCD image sensor
Number of Pixels	537 H x 505 V (EIA)	811 H x 508 V (EIA); 795 H x 596 V (CCIR)	768 H x 494 V (NTSC); 752 H x 582 V (PAL)
Resolution	400+ TV lines horizontal	570 TV lines horizontal	460 TV lines horizontal
Scene Illumination	0.27 Lux at f2.8	0.01 Lux at f2.8	1.1 Lux at f2.0
Signal to Noise	More than 45 dB	46 dB	More than 45 dB
Video Output	1.0 volt peak-to-peak into 75 ohm		
Video Format	EIA (RS170)	EIA (RS170) or CCIR	NTSC or PAL
Environmental Specifications			
Depth Rating	4,000 m		
Operating Temp.	-20º C to 40º C [-4º F to 104º F]	-10º C to 40º C [14º F to 104º F]	-30º C to 40º C [-22º F to 104º F]
Electrical Specifications			
Power	11~30 VDC Below 14 VDC, the LED output maybe diminished.	11~30 VDC Below 14 VDC, the LED output maybe diminished.	11~30 VDC Below 14 VDC, the LED output maybe diminished.
Current	Camera 110 mA LED's 0~250 mA Total max 360 mA	Camera 160 mA LED's 0~250 mA Total max 410 mA	Camera 200 mA LED's 0~250 mA Total max 450 mA
LED Color Ring	Green	Green	White
Mechanical Specifications			
Housing	Titanium		
Port	Sapphire		
Outer Diameter	47.4 mm [1.86 in.]		
Overall Length (w/o connector)	106.5 mm [4.19 in.]		
Weight in Air	459 g [16 oz.]		
Weight in Water	112 g [4 oz.]		

Standard Connector

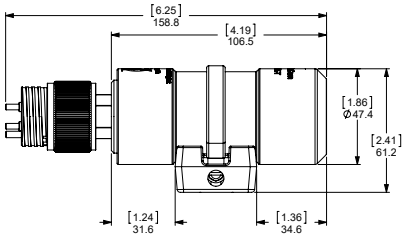


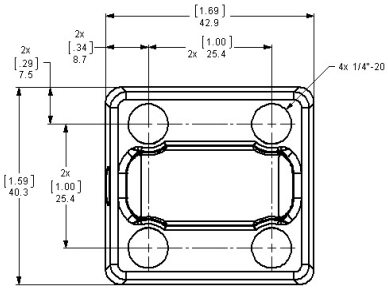
BH4MP

1 = Ground
2 = Power
3 = Video
4 = Not Used

*Other connectors and pin-out options are available upon request.

Dimensions





[inch]
mm

** Specifications subject to change without notice.*

Table of Contents

Safety Symbols

In this operator's manual and on the product, safety symbols are used to communicate important safety information. This section is provided to improve understanding of these symbols.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER indicates a hazardous situation which, if not avoided, could result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in damage to the product or bodily harm.

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE indicates information that relates to the protection of property.

This symbol means read the operator's manual carefully before using the equipment. The operator's manual contains important information on the safe and proper operation of the equipment.

This symbol means always wear safety glasses with side shields or goggles when handling or using this equipment to reduce the risk of eye injury.

This symbol indicates the risk of electrical shock.

General Notes and Warnings

The LED Multi SeaCam supports a variety of connectors, camera modules, depth ratings, and pin-outs. By looking into the front port of the camera, the user can see the model, depth rating, video format as well as the pin out orientation. Be sure to verify pin-out orientation before use.

It is very important when preparing the system for deployment that the cable, at both the camera and topside ends, be carefully dressed to provide complete strain relief to the connectors. Failure of the strain relief provisions will almost certainly damage the connectors and possibly other elements of the system.

DANGER

Do not operate any high voltage electrical equipment in or around water without using a Ground Fault Interrupt circuit (GFI) and an isolation transformer, especially when divers are in the water.

WARNING

Never place the camera in a vice or other hard clamping tool. Should it become necessary to hold the camera more tightly than can be managed by hand, use a clean, good quality strap wrench.

Pre and Post Dive Inspection

Rinse your LED Multi SeaCam in fresh water after use in saltwater.
Always check to make sure that the rear bulkhead connector assembly is secured before deployment. Before and after each deployment, check the following areas for damage, wear or corrosion:

- Rear bulkhead connector assembly
- Video cable
- Front window

Operation Procedures

Operation Instruction

1. Prepare a power supply with 11-30 VDC output.
2. Plug the red [positive(+)] and black [negative(-)] banana plugs of the camera cable into their respective jacks on the power supply.
3. Plug the BNC connector on the topside of the cable into the monitor or VCR video-in jack (a BNC-to-RCA adapter may be required by the monitor/VCR in use).
4. Lubricate the camera bulkhead connector with an appropriate silicone lubricant (spray type rec-

ommended), and using a linear motion plug the female inline connector into the male bulkhead connector on the back of the camera.
5. Screw the locking sleeves together firmly (hand tight-do not use tools). The camera is now ready for operation; switch the power supply ON to power the camera. The camera draws a maximum of 410mA of current during operation, and will work when supplied between 11-30 volts DC.

LED Ring Operation

The LED ring built into this camera will operate in four modes: Hi, Med, low, Off. The illumination is adjusted by toggling the power to the camera on and off. If camera is powered by a buffered power supply, leave switch in off position for at least 3 seconds when toggling through LED illumination levels. If power is off for more than 10 seconds the camera will default to the Hi setting.

⚠DANGER

After each deployment, carefully check to make sure the camera has not flooded. It is possible for the camera to partially flood and then reseal itself while underwater. Upon surfacing, the camera can become internally pressurized, which may be potentially dangerous. Additionally, if the power remains on when the camera has partially flooded, it is possible for electrolytic generation of an explosive mixture of hydrogen and oxygen gases. If a camera appears flooded upon removal from the water, it should be treated as potentially dangerous. Point the camera away from persons and valuable equipment and make sure that the power is disconnected. See the Flooding Repair Procedure for more information.

Flooding Repair Procedure

If the camera stops working while underwater, you should assume that it has been flooded. When working on a potentially flooded camera, it is important to use appropriate personal protective equipment to include, at a minimum, eye and hand protection.

1. Immediately turn off the power to the unit.
2. Open the housing by removing the rear end cap-retaining ring. Grasp the rear end cap in one hand and the camera housing in the other. With care, separate the two components using a linear motion. If required gently twist components while separating.
3. Pour out any water trapped in the housing.
4. If the camera is completely flooded, rinse the internal components with clean fresh water in order to minimize contamination and corrosion.
5. Allow parts to dry in air or a convection oven set at 60° C (190° F). IMPORTANT! DeepSea Power & Light cannot be responsible for any damage incurred during emergency field repairs. Such repairs should be undertaken only as a last resort and by qualified personnel.

Troubleshooting

1. If the camera stops working while underwater assume that it has been flooded. See Flooding Repair procedure.
2. Once it has been determined that the camera is not flooded, or if it does not turn on during pre-deployment checks, troubleshoot in the following sequence:
   a. Check the cable/inline connector to make sure that correct voltage and current are being supplied, and that the correct sockets are being used. See page 2 of this manual for electrical specs and connector pin-outs.
   b. Remove the connector. Inspect the assembly for visual signs of wear. Use a multi-meter check for continuity or shorts in the connector. Try a spare connector, if available.
   c. Check the wires that go from the power supply to the camera base for wear. If they appear worn, replace them.
   d. Check to make sure that the power supply board is securely attached to the camera. If it is loose, check for damage on the board. If there appears to be no damage, reattach the board to the camera. Try using a spare driver board if available.
   e. If the camera still does not work, return it to DSPL using the RMA Procedure.

RMA Procedure for Repair

Should it be necessary to return your camera to the factory, follow the procedure for the Flooded Camera Repair above, and by leaving the connector partially unscrewed. For warranty and non-warranty repairs please contact DeepSea Power & Light for a RMA number prior to returning your item. Please have your light model number, serial number and any other pertinent information along with a description of the

problem, on hand when you call, or include them in a fax or e-mail. When shipping your item, be sure that the freight is pre-paid (CODs will not be accepted) and that the RMA number is clearly printed on the outside of the box. All shipments should be sent to the address below:

DeepSea Power & Light
Attn: RMA ####
4033 Ruffin Road
San Diego, CA 92123-1817
U.S.A
Tel: (858) 576-1261
Fax: 858-576-0219
Email: RMA@deepsea.com

Warranty Information

Limited Warranty

Seller warrants that the goods (except internal electronic components) sold under this contract will be free from defect in material and workmanship for a period of one year from the date of shipment from the factory, if they have been properly used. Internal electronic components are warranted for 90 days from the date of shipment from the factory, if they have been properly used. This warranty will be limited to the repair or replacement of parts and the necessary labor and services required to repair the goods. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY. This warranty is the exclusive and only warranty to pass with the goods under this contract. No agent, employee, or representative of the Seller has any authority to bind Seller to any information, representation, or warranty concerning the goods sold under this contract, and unless an affirmation, representation, or warranty made by an agent, employee, or representative is specifically included within this contract, it will not be enforceable by Buyer. If notice of defect is given to DeepSea Power & Light LLC within such 90 day or one year warranty period, the sole obligation of DeepSea Power & Light LLC shall be to furnish new or repaired parts free of charge in exchange for parts which have been proved defective and does not include any other costs such as the cost of removal of the defective part, installation, labor, or consequential damages of any kind, the exclusive remedy being to require DeepSea Power & Light LLC to furnish such new parts. Under no circumstances shall the Buyer be entitled to recover any incidental damages as that term is defined in Commercial Code §2715.