

ROS Lightning

OPERATION AND MAINTENANCE MANUAL



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WARRANTY

ROS, Inc. (hereinafter called "**ROS**") warrants its products as stated below subject to the conditions specified.

ROS warrants its products, when operated under normal conditions, to be free from defects in material or workmanship for a period of one year from the date of purchase provided that inspection by **ROS** discloses that such defects developed under normal and proper use. **ROS** products repaired or replaced pursuant to this warranty shall be warranted for the unexpired portion of the warranty applying to the original product. The liability of **ROS** under this warranty shall exist subject to the following conditions:

- (a) Purchaser properly notifies ROS of such defects and the defective product is returned to ROS, transportation charges paid by Purchaser.
- (b) ROS shall be released from all obligations under its warranty in the event repairs or modifications are made by persons not authorized by ROS.
- (c) Representations and warranties made by any person, including distributors and representatives of ROS, which are inconsistent or conflict with the terms of this warranty, shall not be binding upon ROS unless reduced to writing and approved by an officer of ROS. ROS shall in no event be liable for other direct, special, incidental, consequential, indirect or penal damages.
- (d) The laws of the State of California shall govern this warranty.

In the event the defect is determined to be within the terms of this warranty then **ROS** agrees to repair and/or replace (at **ROS**' discretion) the product or defective portion at no charge to the Purchaser. This warranty does not apply to expendable items or to normal wear-and-tear, and is conditional upon performance of normal preventative maintenance procedures.

Our commitment to quality and customer service directs us to constantly strive to improve our products. The materials and specifications presented in our manuals and data sheets are correct and accurate to the best of our knowledge, and are presented in good faith. However, the information is not guaranteed and is subject to change without notice.

LIMITATIONS OF REMEDIES

Purchaser assumes all risk and liability for results obtained in any installation, operation, or use of the product. Purchaser's sole remedy for any breach of warranty by vendor shall be limited to the "express remedies" set forth above. Otherwise, in no event shall vendor, its agents, or employees be liable to the original purchaser or any third party for any consequential or incidental damages or expenses of any nature arising directly out of or in connection with the use of vendor projects, even if vendor has been advised of the possibility of such damages or expenses. In any event, unless otherwise contrary to state law, vendor liability under this limited warranty shall not exceed the purchase price of the product.

CUSTOMER ASSISTANCE

ROS, Inc. uses a worldwide network of stocking distributors and representatives who are familiar with our products and are able to provide assistance during installation and/or operation of these products.

If you have any questions or problems with this product that are not covered by this manual or instruction, please contact our agent in your area, or contact us directly by phone or FAX or e-mail.

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CHANGE RECORD

<u>REV</u>	<u>DESCRIPTION</u>	<u>DATE</u>
X1	SEE EC-01258	12DEC12
A	SEE EC-01564	15APR13

1 WARNINGS



WARNING: Assembly, disassembly, connecting cables, or disconnection of cables, must only occur when the Lightning is disconnected from the power source.

- Please be cautious anytime you are dealing with Lightning. The light is extremely bright and looking directly at the array while it is on could pose a health risk such as blindness.
- Be careful when handling the light and/or cables due to exposed male pins on the connectors. The pins can be damaged if they are bumped excessively. Any damage may result in difficulty when connecting cables or possible flooding for those connections that are underwater.
- When handling the cables, do not pull or tug on the cables more than necessary. Connector damage may result.
- If operating the Lightning in air, for example to check functionality prior to deployment, please be aware that the housing can reach temperatures of 40°C. It may be too hot to comfortably touch the Lightning with your bare hand.

2 DESCRIPTION

The ROS Lightning LED lamp is a revolutionary underwater LED lamp. Its technology gives the end user the capability of having a lamp that will accommodate a number of different input voltages and dimming ranges. The ROS Lightning utilizes the most advanced LEDs on the market; which when integrated with various 6000m housing options makes it the most flexible light on the market.

Available in power inputs from 24VDC up to 120VAC, the ROS Lightning will support many power inputs. At these various power inputs the lamp typically draws about 150 watts of power and generates an astounding 10,000 lumens. For general ambient lighting you can use the flood option, or for a more directed light source you can use the spot option.

Please be cautious anytime dealing with LED lighting. The light is extremely bright and looking directly at the array while it is on could pose a health risk. While most LED lights suffer from thermal degradation, the ROS lightning is thermally protected at the LED so there is never a problem with overheating.

3 PART NUMBER CONFIGURATION

PART NUMBER	MATERIAL	POWER	FLOOD OR SPOT	DIMMING CONTROL	CONNECTOR	
10-20075	A = ALUMINUM	1 = 24VDC 2 = 120VAC	F=FLOOD S=SPOT	A=0-5 VDC B=0-10 VDC C=RS485* D=PHASE CONTROL** E=NONE (FULL ON) *REQUIRES 4 OR MORE PIN CONNECTOR ** PHASE CONTROL IS NOT AVAILABLE WITH 24 VDC	AL X X X X X X X X N/A X X	01=MCBH-4-MP SS <i>SUBCONN</i> 02=LPMBH-4-MP BRASS <i>IMPULSE</i> 03=BH-4-MP BRASS <i>SUBCONN</i> 04=SEANET 101 SS <i>SCHILLING</i> 07=5507-1503 SS <i>SEACON</i> 09=LPBH-3-MP BRASS <i>SUBCONN</i> 10=BH-3-MP BRASS <i>SUBCONN</i> 12=MSAJ-3-BCR-CRE AL <i>SEACON</i> 13=RMG-3-BCL SS <i>SEACON</i> 16=LPMBH-4-MP SS <i>IMPULSE</i> 17=MCBH-5M-SS <i>SUNCONN</i> CS=CUSTOMER SPECIFIED

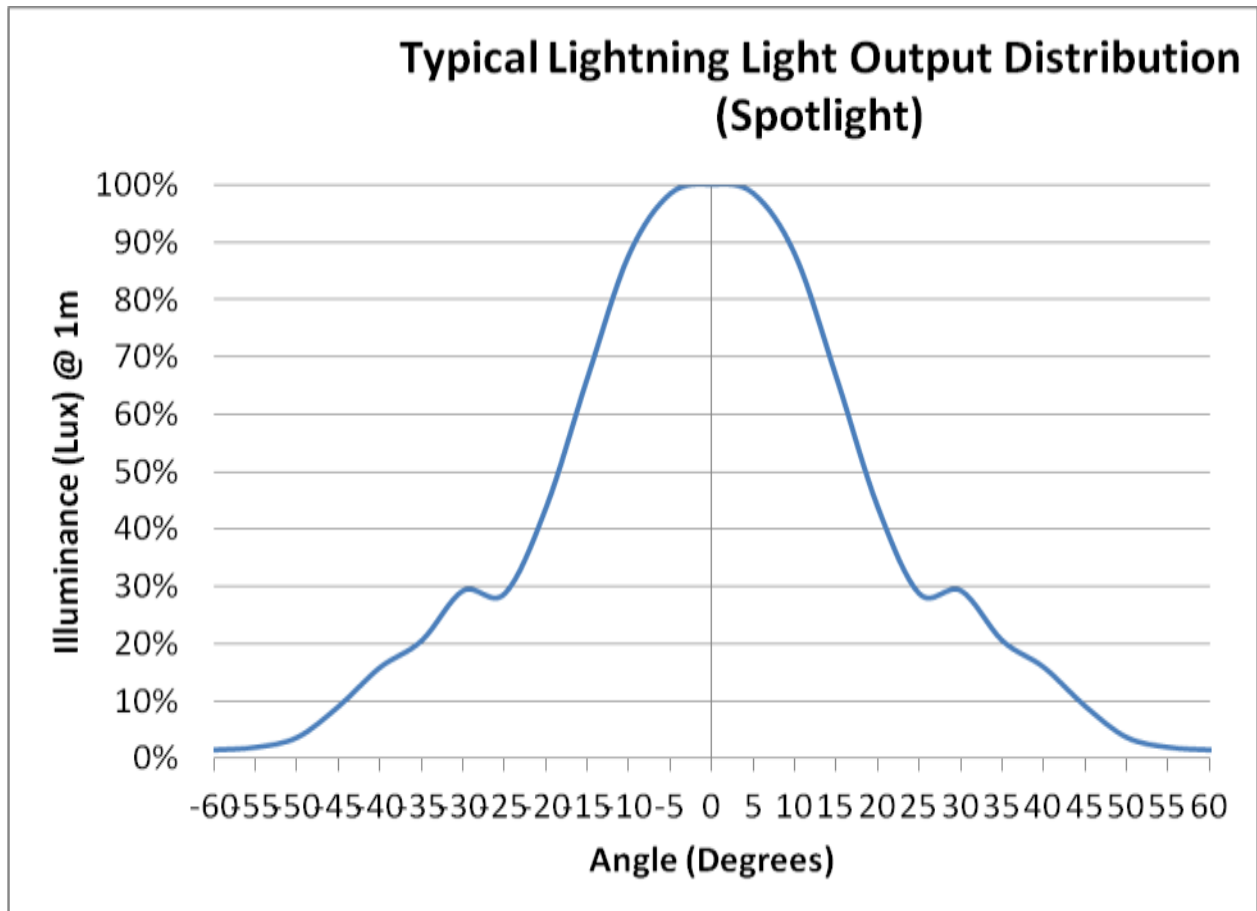
Example: 10-20075-A1FC04=LIGHTNING, ALUMINUM, 24 VDC, FLOOD, RS485, SEANET 101 CONNECTOR

4 PRODUCT SPECIFICATIONS

4.1 General Specifications

Mechanical	
Housing Material (optional)	Hard Anodized 7075 T6 AL Electro-polished Stainless Steel
Window Material	Optical Grade Acrylic
Mounting Options	Optional Mounting collar
Weight in Air	6.6lb (3.0kg) AL
Weight in Salt Water	3.5lb (1.7kg) AL
Implodible Volume	6 in ³ (98.3CM ³)
True Lumens / Watt	65
Thermal Protection	Thermal fold back of array when LED reaches 95°C
Environmental	
Depth Rating	6,000 MSW (20,000 ft)
Min/Max Operating Temperature	-10°C to 40°C
Storage Temperature	-25°C to 85°C, depending on external connector
End of Life Light Output	70% Rated Intensity ~50,000 Hrs
Optical	
Color Temperature	6200 K Nominal
Lumen Output	Floodlight – 10,000 Lumen Nominal Spotlight – 8,000 Lumen Nominal
Lux Output	Floodlight – 5,500 Lux (min) Spotlight – 18,000 Lux (min)
Beam Pattern	Floodlight – 90° ½ Intensity Angle Spotlight – 38° ½ Intensity Angle
Color Rendering Index (CRI)	65
Electrical	
Max Power Draw	24 VDC – 6.25A, 150W Nominal 120 VAC – 1.25A, 150W Nominal
Input Voltage Ranges	24VDC – 18 to 30 VDC 120VAC – 108 to 132 VAC _{rms}
Dimming Control Modes	24VDC – RS-485, 0-5VDC, 0-10VDC, None (full on) 120VAC – Phase Control, 0-5VDC, 0-10VDC, None (full on)
Control System	Half duplex RS-485 (standard), Supported baud rates 9.6K, 19.2K, 57.6Kbps (factory set)
Communication Protocol	ROS 21-30022

4.2 Light Output



5 INSTALLATION/ GENERAL FUNCTIONALITY

Your new LED lamp is intended for years of service free use. The lamp is not intended to be serviced or troubleshot in the field. Please contact your sales representative for any issues with your new LED lamp.

To install your new LED lamp, use the bolt pattern provided on the back of the lamp or an available ROS mounting clamp. Note that your connector configuration will have a specific wiring configuration. The wiring for your lamp will be designated on the supplied test certification, but the standard wiring configuration can be found in Section 5.

6 CONNECTOR WIRING/CONFIGURATIONS

NOTE: For **DC Units** 4 Pins are required for RS-485 Lamps and 3 Pins are required for Analog Control Lamps.

NOTE: For **AC Units** 5 Pins are required for RS-485 and Analog Control Lamps



CAUTION: Do not apply power to RS-485 pins as it will damage the RS-485 driver electronics.

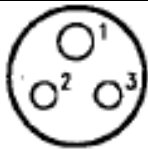
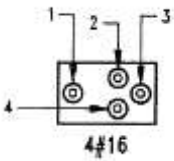
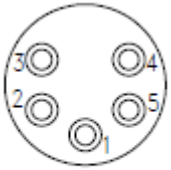
24 VDC				120 VAC		
RS485 (Except -04 Configuration)	Analog 0-5 or 0-10VDC	RS485 (-04 Configuration)	None (Full on)	RS485	Analog 0-5 or 0-10VDC	Full on or Phase Control
1 - DC Common	1 - DC Common	1 - +26VDC	1 - DC Common	1 - Ground	1 - Ground	1 - Ground
2 - +24 VDC	2 - +24 VDC	2 - 26VDC RET	2 - +24 VDC	2 - Load	2 - Load	2 - Load
3 - RS 485 A	3 - Analog Dimming Input	3 - GND		3 - Neutral	3 - Neutral	3 - Neutral
4 - RS-485 B		4 - N/C		4 - RS 485 A	4 - DC Common	
		5 - RS485-B		5 - RS-485 B	5 - Analog Dimming Input	
		6 - RS485-A				
		7 - N/C				

Note: If a connector has more pins than is listed in the table above, all other pins that are not listed are not connected.

Example: 24 VDC, RS485 light with a 6 pin connector would be:

1 - DC Common, 2 - +24 VDC, 3 - RS485 A, 4 - RS485 B, 5 - Not Connected, 6 - Not Connected.

 4 CONTACT W/ GUIDE PIN	 4#16	 4 CONTACT	 MATING SIDE VIEW NOT TO SCALE SEANET SHELL NOT SHOWN
-01 MCBH-4-MP SS SUBCONN	-02 LPMBH-4-MP BRASS IMPULSE	-03 BH-4-MP BRASS SUBCONN	-04 SEANET 101 SS SCHILLING
-07 5507-1503 SS SEACON	-09 LPBH-3-MP BRASS SUBCONN	-10 BH-3-MP BRASS SUBCONN	-12 MSAJ-3-BCR CRE SEACON

			
-13 RMG-3-BCL SS SEACON	-16 LPMBH-4-MP SS IMPULSE	-17 MCBH-5-MP SS SUBCONN	

7 ROUTINE MAINTENANCE

The ROS Lightning is intended to be maintenance free. Be sure to clean your lamp with fresh water after each deployment. A visual inspection is always helpful in assessing the integrity of the lamp. In the event the lamp stops working, please contact ROS customer service. For troubleshooting see Section 8.

8 TROUBLESHOOTING

Problem	Typical Causes	Action
Product won't power on	Not connected properly	Check cables and power supply
		Check wiring
		Verify your have serial communication
		Verify proper input power
Communication issues	Not connected properly	Verify RS-485 to RS-232 converter is plugged in correctly
		Verify correct COM port
Light is dimly lit	Over temperature	Allow light to cool
Condensation or water on the window	Connector leak or o-ring seal failure	Return to ROS for repair

9 REFERENCE DOCUMENTS

DOC NUMBER	ROS DOCUMENT DESCRIPTION
10-00234	APPLICATION NOTE, INTERCONNECTING RS-485 COMPONENTS
21-30022	RS-485 COMMUNICATION PROTOCOL
21-30034-01	HELIOS CONTROL SOFTWARE
10-20099	INSTALLATION AND OUTLINE DRAWING
21-03030	HELIOS MANUAL