

**DIMMABLE SOLID STATE  
UNDERWATER LED LAMP**

**Q-LED II  
120VAC/160VDC**

**OPERATING AND MAINTENANCE MANUAL**

SERIAL NUMBER: \_\_\_\_\_

SALES ORDER: \_\_\_\_\_

 **ROS**  
REMOTE OCEAN SYSTEMS  
5618 Copley Drive  
San Diego, CA 92111-7902  
TEL: (858) 565-8500  
FAX: (858) 565-8808  
[www.rosys.com](http://www.rosys.com)

## **WARRANTY**

Remote Ocean Systems, Inc (hereinafter called "**ROS**") warrants its products as slated below to the conditions specified.

**ROS** warrants this product, when operated under normal conditions, to be free from defects in material or workmanship for a period of two years 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) **ROS** is properly notified of such defects by Purchaser, 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 in 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 charges.
- (d) This warranty shall be governed by the laws of the State of California.

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**'s discretion) the product of 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.

### **LIMITATION 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 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 products. 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.

TEL: (001) 858-565-8500

FAX: (001) 858-565-8808

E-mail: [support@rosys.com](mailto:support@rosys.com)

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## **1 INTRODUCTION**

This manual describes the installation and operation of the ROS Model Q-LED II underwater light. This lamp utilizes a high output LED light array. This product line represents the latest generation of LED array powered models. This version of the Q-LED has the same profile than the previous model with the exception that the connector is higher on the Q-LED II.

Like a conventional lamp, light dimming is achieved by decreasing or increasing the input source voltage. Lights powered by AC voltage can be dimmed using an AC phase control dimmer. If powered by DC voltage, Pulse Width Modulation (PWM) may be used to dim the light.

The lamp is designed as a zero maintenance product. For problems or questions not covered in this manual, please contact the factory or one of our authorized representatives.

ROS, Incorporated, reserves the right to change or modify designs or specifications as part of its continuing product improvement program.

## 2 GENERAL DESCRIPTION

The Q-LED II is designed to illuminate underwater scenes for video recording, and general underwater illumination. It is designed to run continuously underwater.

The Q-LED II provides a maximum light output of 5400, a typical color temperature of 5600°K, and consumes a maximum of 150 VA of power.

The housing, and all machined internal components of the Q-LED II are made of 6061-T6 aluminum, which is hard anodized for protection from corrosion followed by an external white enamel powder coating. Other external hardware, such as screws are provided in stainless steel.

Unlike conventional lamps, the Q-LED II uses a solid state LED light array.

The LED light engine is secured in the housing via a special assembly. The forward end of the Q-LED II is sealed with an o-ring between the housing and a deepwater-rated window. The rear side of the Q-LED II is sealed by the connector o-ring. Another o-ring seals the base to the main housing.

When operating the Q-LED II, a variable light intensity can be achieved by increasing or decreasing the input voltage just like any other conventional filament type lamp. Because the LED array requires a minimum driving voltage, dimming may not be linear at low levels. Additionally, the light output can be adjusted via an AC phase control dimmer if powered by AC power, or PWM if powered by DC power.

The Q-LED II can be used as a conventional ON/OFF lamp.

The electrical connection to the lamp is made via an underwater connector.

### 3 LAMP OPERATION

#### 3.1 POWER

##### **AC**

Operation of the Q-LED II requires an input voltage between 0 – 120VAC 50/60Hz. The lamp draws 150 VA of power at maximum light intensity. Maximum light intensity is measured at 120 VAC. They begin to output light at 70 VAC (typical).

##### **DC**

Although the Q-LED is intended to be an AC powered light, it can also be powered by DC power. The 120 VAC version can run off of DC power from 0-160 VDC. Maximum light intensity is measured at 160 VDC. They begin to output light at 95 VDC (typical).

#### 3.2 TEMPERATURE PROTECTION

The Q-LED II is electronically protected from overheating via a thermal cut-off switch. The light will run for approximately 4 minutes in air (at an ambient temperature of 20°C (68°F)) before automatically powering down. There is no reset; the light will automatically re-illuminate once it has cooled to a safe operating temperature.

#### 3.3 RECOMMENDED OPERATION

The thermal protection is intended as a failsafe feature to protect the light from unintentional damage from extended use in air. It is not recommended to intentionally run the light out of water for any extended period as it will reduce the product lifespan.

### 4 SPECIFICATIONS

#### 4.1 ELECTRICAL

<b>Light Model</b>	<b>Operating voltage</b>	<b>Turn on voltage</b>
120 VAC	0 - 120VAC 50/60Hz	70VAC
	0 – 160VDC	95VDC
Operating Current:	1.2 A typical @ 120VAC	
	0.5 A typical @ 160VDC	
Power Consumption:	AC powered – 150 VA max at full intensity	
	DC powered – 80 W typical at full intensity	

## 4.2 PERFORMANCE

Lamp Type:	Ultra High-intensity White LED Array
Light Color Temperature:	5,600° K (typical)
Illumination Life:	50,000 hours at 100% intensity After 50,000 hours of operation within specifications, the LED array will deliver a maximum of 70% of the original maximum output.
Dimming:	AC Powered - Light is dimmed via input voltage or AC phase control DC Powered – Light is dimmed via input voltage or PWM. A modulation frequency of 1 kHz or higher is recommended to avoid flicker on the video.
Thermal Protection:	Auto-resetting
Light Output:	5400 lumens (all output is directed within forward beam pattern) 1800 lux @ 1m (in air) typical
Beam Angle:	80° x 80°
Color Rendering Index:	70 (typical halogen light ~40; typical fluorescent light ~56)



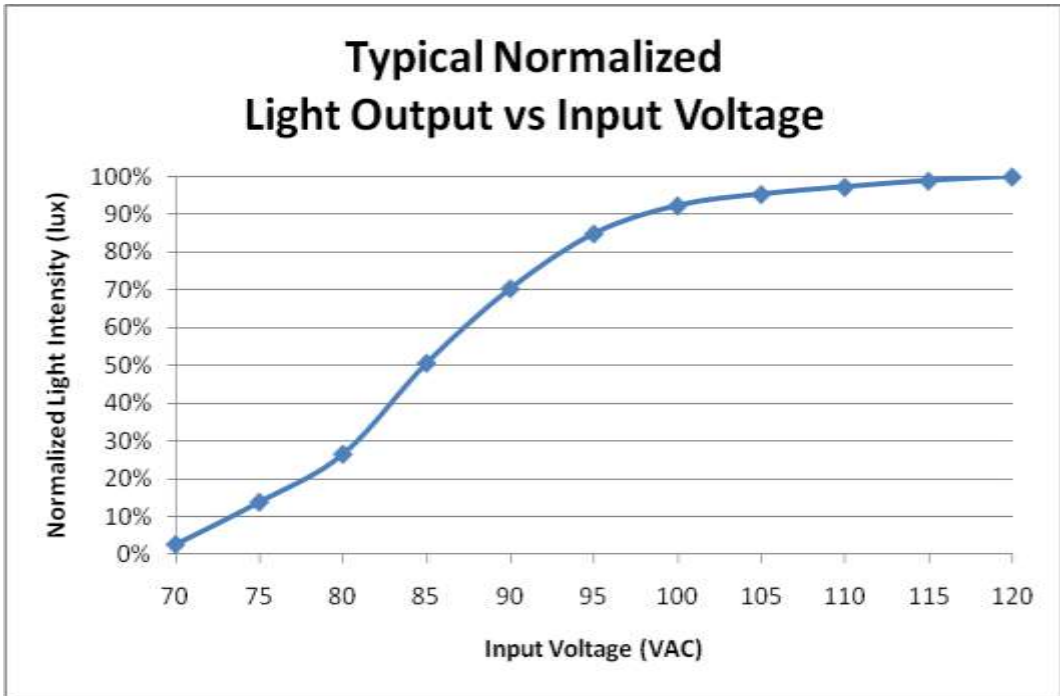


Figure 1: Typical 120 VAC Q-LED II Normalized Light Output vs. Input Voltage

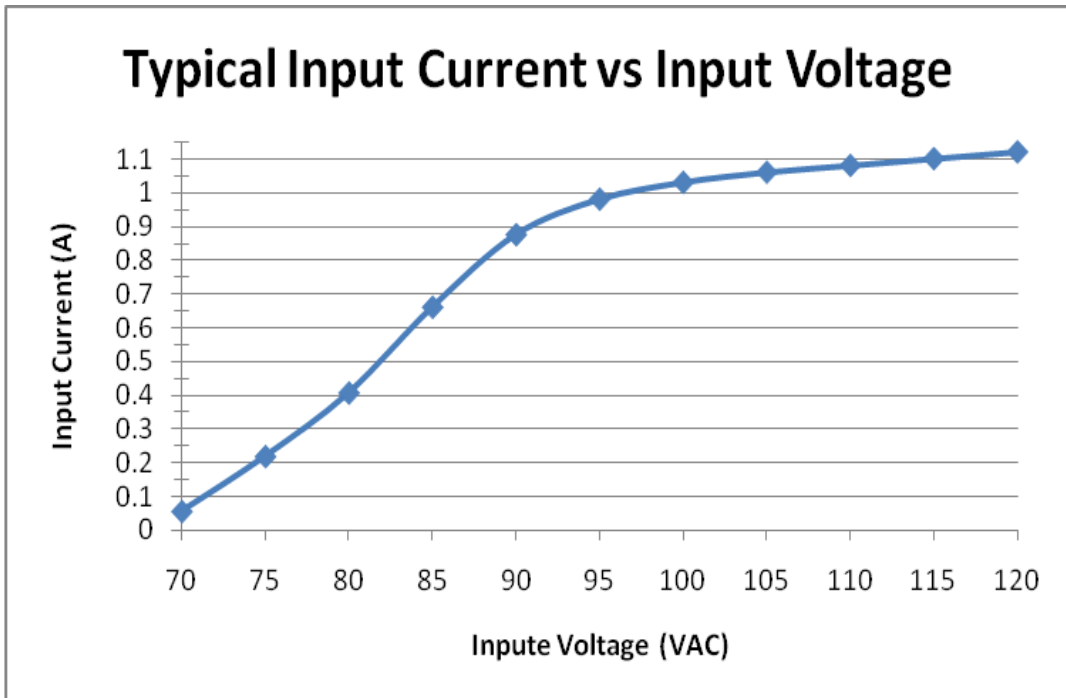


Figure 2: Typical 120 VAC Q-LED II Input Current vs. Input Voltage

### **4.3 MECHANICAL**

Housing Material:	Anodized 6061-T6 Aluminum
Housing Finish:	White powder coated enamel finish
Operating Depth:	4,000m (~13,000 ft), (6,000m optional)
Operating Temperature:	Operates in water temperatures of -2 to 40°C (28.4 to 104°F)
Mounting:	Four ¼ -20 tapped holes in base on 2.0 in [50.8mm] bolt circle equally spaced at 90 degrees
Size (w/o connector):	7.61in [193.4mm] (H) x 2.50in [63.5mm] (W) x 2.50in [63.5mm] (D)
Window:	Flat port

### **4.4 ENVIRONMENTAL**

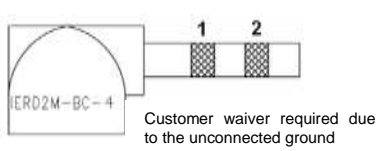
Weight in Air:	3.65 lb (1.66 kg)
Weight in Water:	1.93 lb (0.88kg)

## **5 VIDEO COMPATIBILITY**

Although it is strongly suggested to match AC power frequency with video format frequency, the QLED II was specifically designed to be universally functional in all power/video combinations. This compatibility allows the light to perform in domestic and international applications.

## 6 CONNECTOR WIRING

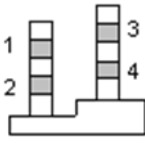
The Q-LED II can be configured with any of the 11 standard underwater connector options. Alternate customer-specified connectors and wiring standards are available, and details of these configurations are normally included in a manual addendum.



**-01**

IERD2M-BC-4  
ROS# 60-04010-4

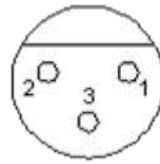
1 = Load  
2 = Neutral



**-02**

IESQ4M-BC-1  
ROS# 60-04020-4

1 = Load  
2 = Earth Ground  
3 = Neutral  
4 = Earth Ground



**-03**

IE-55-1503-BCR/  
5507-1503  
ROS# 60-04016-4

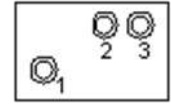
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3 = Earth Ground



**-04**

XSG-3BCL-HP-SS  
ROS# 60-01122-4

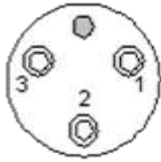
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2 = Load  
3 = Neutral



**-05**

LPBH-3-MP  
ROS# 60-01010-4

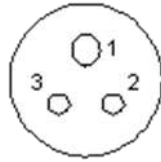
1 = Load  
2 = Neutral  
3 = Earth Ground



**-06**

BH-3-MP W/LOCK  
SLEEVE  
ROS# 60-04080-4

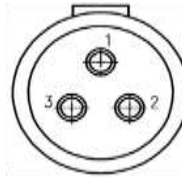
1 = Earth Ground  
2 = Load  
3 = Neutral



**-07**

MSAJ-3-BCR  
ROS# 60-01059-4

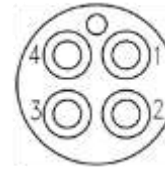
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2 = Load  
3 = Neutral



**-11**

CRE/SEACON-  
MSAJ-3-BCR  
ROS# 60-01146-4

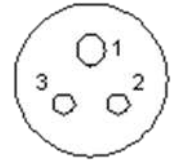
1 = Earth Ground  
2 = Load  
3 = Neutral



**-12**

MCBH-4-MP-1/2"  
ROS# 60-01003-4


1 = Earth Ground  
2 = Load  
3 = Neutral  
4 = N/C



**-13**

RMG-3-BCL-SS  
ROS# 60-01158-4

1 = Earth Ground  
2 = Load  
3 = Neutral

<b>QLED-II 10-00325-</b>	<b>CONNECTOR</b>	01	1 PIN , IERD2M-BC-4	
	02	2 PIN, IESQ4M-BC-1		
	03	5507-1503		
	04	XSG-3-BCL-HP-SS		
	05	LPBH-3-MP		
	06	BH-3-MP W/LOCK SLV		
	07	MSAJ-3-BCR		
	08	DELETED		
	09	DELETED		
	10	DELETED		
	11	CRE/SEACON MSAJ-3-BCR		
	12	MCBH-4-MP-1/2"		
	13	RMG-3-BCL-SS		
	14	LPBH-3-MP-SS-1/2"		
	CS	CUSTOMER SPECIFIED		

**-14**  
 LPBH-3M-SS-1/2"  
 ROS# 60-01180-4  
 1 = Load  
 2 = Neutral  
 3 = Earth Ground

## 7 INSTALLATION AND OPERATION

When you receive your Q-LED II, carefully unpack it and inspect all components. Please contact the factory immediately if damage has occurred during shipping.

### 7.1 OPERATIONAL CHECK

After unpacking your Q-LED II, a brief operational check should be made prior to installation of the unit. The following procedure is recommended:

1. Place the light on a table with the connector up.
2. Make sure controller or power source is turned off.
3. Apply a small amount of silicone spray lubricant to the mating connector and carefully attach it to the bulkhead connector.
4. Apply 120VAC 50/60Hz power and observe the lamp emit light.
5. If you notice any issues with the functionality of the light, please contact the factory immediately.

**CAUTION:** Do not look directly at the light. The light output from the array is powerful enough to cause pain and/or damage to the eyes.

## **7.2 INSTALLATION**

The Q-LED II can be operated at any attitude. The unit should be installed by securely mounting the light housing to a stable surface. The threaded ¼- 20 tapped mounting holes are an integral feature of the Q-LED II; mounting clamps are not required. Refer to installation outline drawing (ROS P/N 10-00369) for specific installation dimensions. If mounting brackets are required for your application, QL brackets are available for purchase (ROS P/N 70-08251-01), and allow the light to easily be oriented in any direction.

## **7.3 INTERCONNECTION**

Interconnection is made via the underwater connector. To mate the connector, **TURN POWER OFF**, clean both halves of the connector, lubricate the mating connector lightly with food grade silicone spray, and push together.

The other end of the cable attaches to the required power source

## **8 MAINTENANCE**

The Q-LED II is designed as a zero maintenance lamp. Please contact ROS or an authorized sales rep. if you have any questions.

### **APPENDIX**

10-00369	Installation Outline Drawing, Q-LED III and II
70-08251	Bracket, LED, QL, AI