

MV-LED II DC

OPERATION AND MAINTENANCE MANUAL



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TABLE OF CONTENTS

WARRANTY	III
CUSTOMER ASSISTANCE.....	IV
CHANGE RECORD	1
1 DESCRIPTION.....	2
2 PRODUCT SPECIFICATIONS	3
2.1 GENERAL SPECIFICATIONS	3
2.2 LIGHT DISTRIBUTION.....	4
2.3 LIGHT OUTPUT VS. DIMMING CONTROL	4
3 INSTALLATION/ GENERAL FUNCTIONALITY.....	5
4 CONNECTOR WIRING.....	6
5 ROUTINE MAINTENANCE	7
6 TROUBLESHOOTING.....	7
7 BILL OF MATERIAL.....	8
8 REFERENCE DOCUMENTS.....	9

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>
A	Initial release	03FEB12
B	SEE EC-01134	28AUG12
C	SEE EC-01333	19APR13
D	SEE EC-02192	11FEB15

1 DESCRIPTION

The MV-LED II is a 24VDC LED spotlight designed to illuminate underwater scenes for video recording, and general underwater illumination. It is designed to run continuously underwater.

The MV-LED II provides a typical light intensity **7500 Lux** at one meter, a typical color temperature of 6300K, and consumes **45 watts** of power (typical). The MV-LED II is available with hard anodized aluminum, 316 stainless steel and titanium housing constructions.

Unlike conventional lamps, the MV-LED II uses a solid state LED light array. The MV-LED II is offered in 24 VDC with the option to control the light via RS 485 or 0-5, 0-10VDC analog control. All versions are fully dimmable. Dimming method varies by model. The MV-LED II can also be used as a conventional ON/OFF lamp.

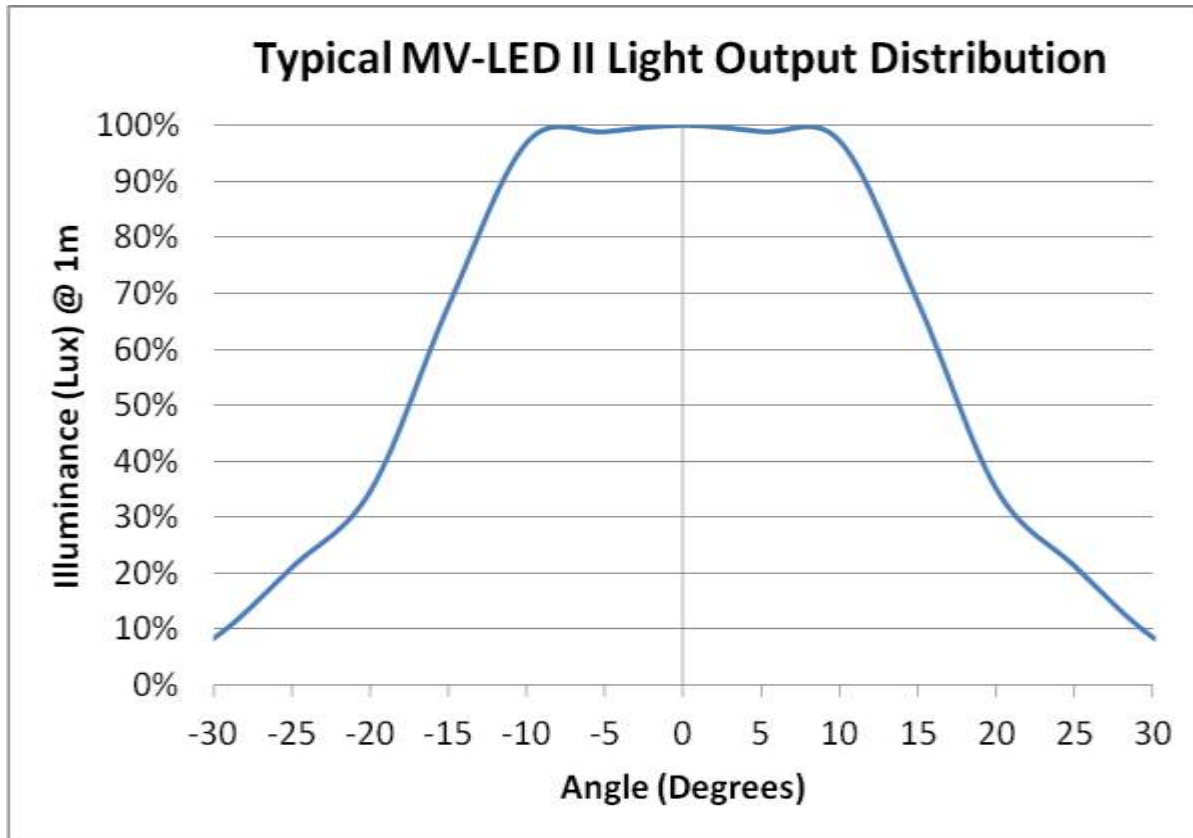
The LED light engine is secured in the housing via a special assembly. The forward end of the MV-LED is sealed with an o-ring between the housing and a deepwater-rated window, 6000m (10,000psi). The rear side of the MV-LED is sealed by the connector o-ring.

2 PRODUCT SPECIFICATIONS

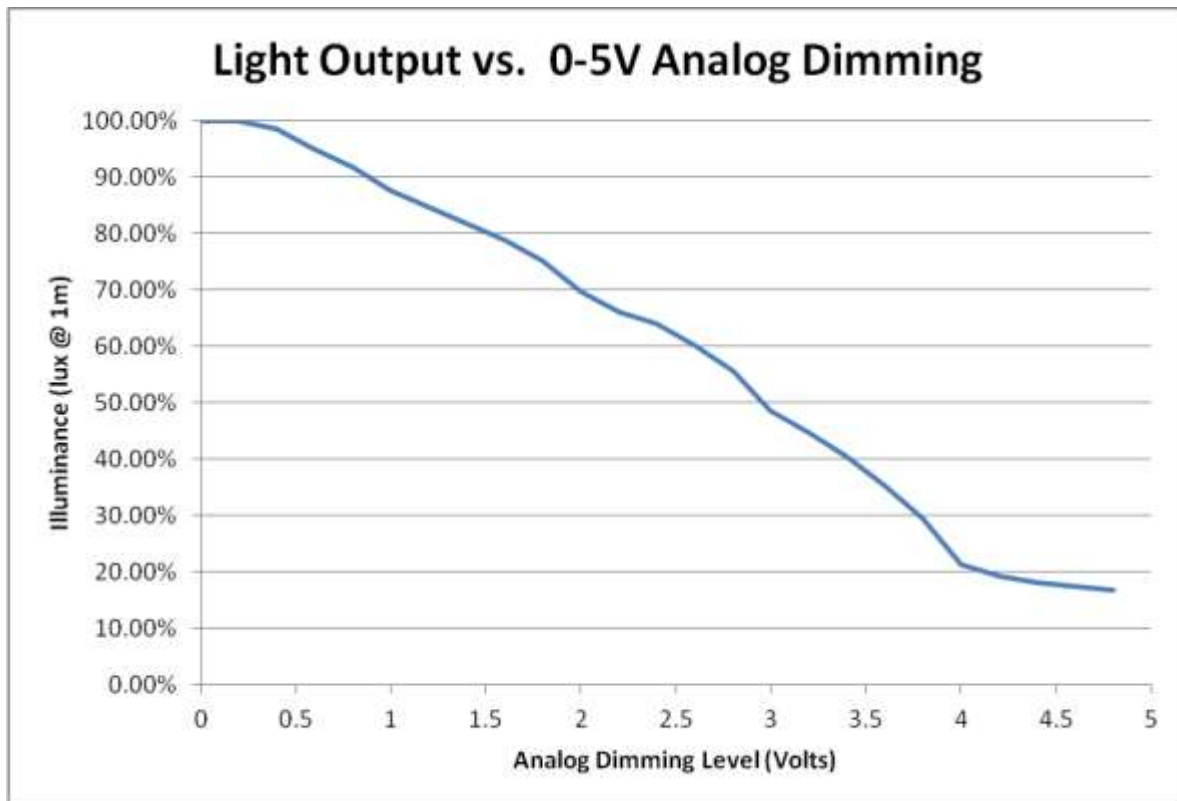
2.1 General Specifications

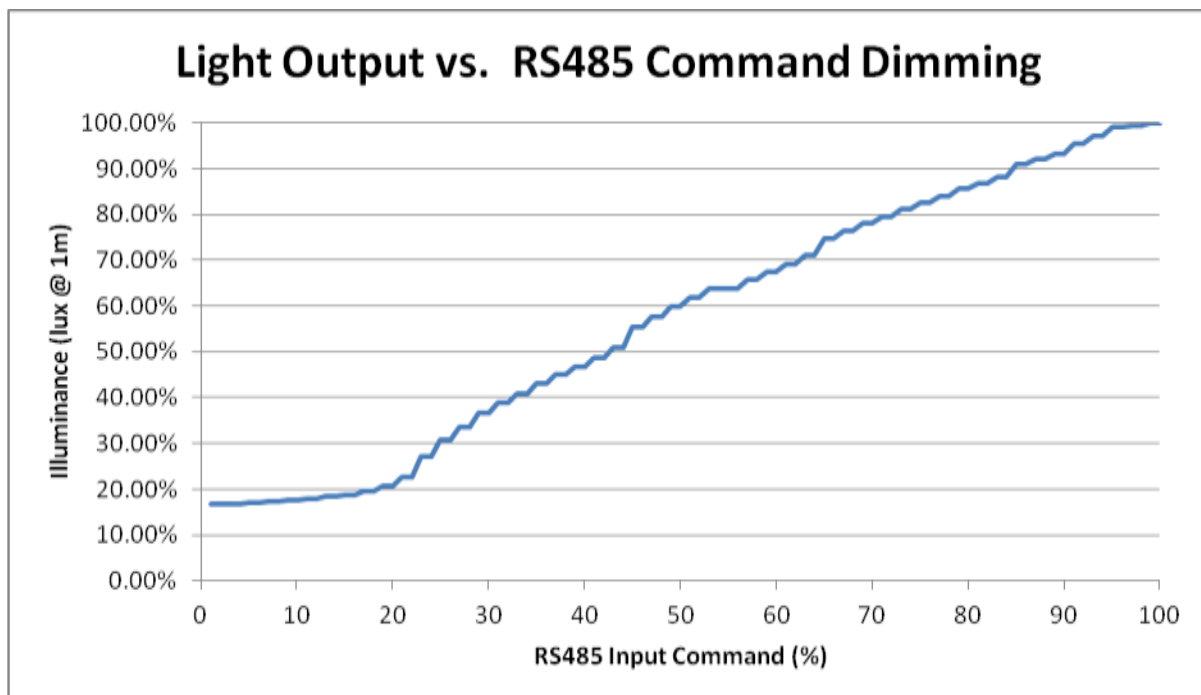
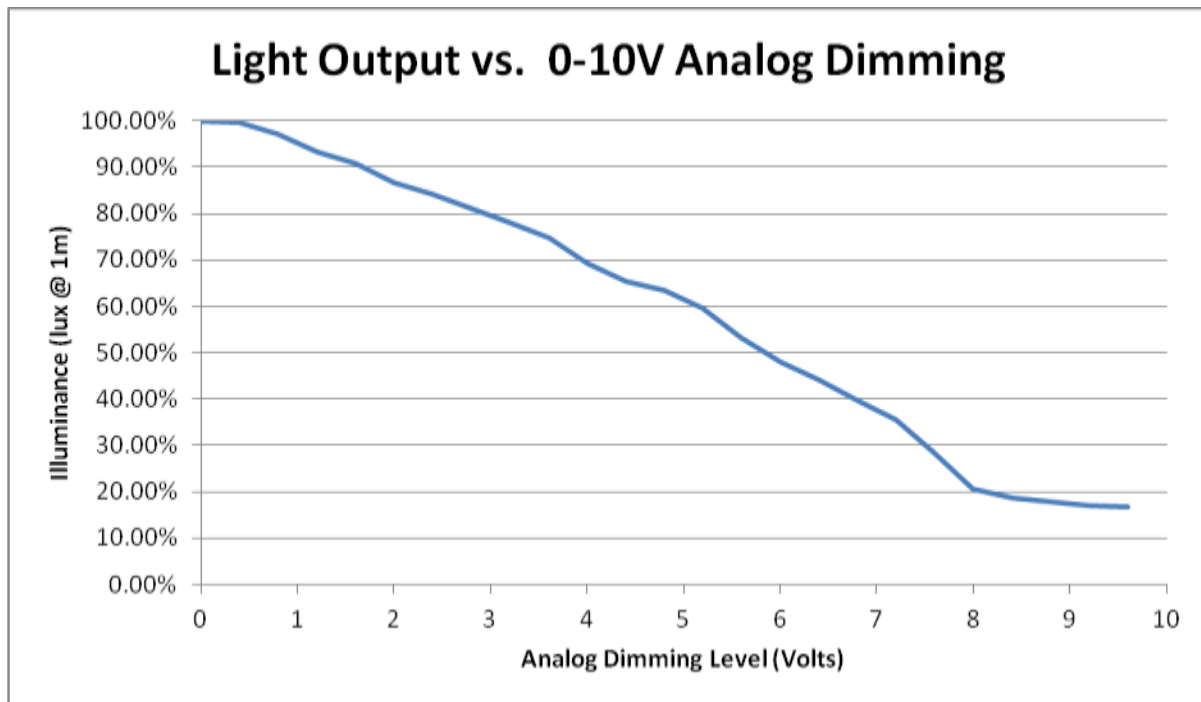
Mechanical	
Housing Material	Hard Anodized 6061-Al Titanium
Window Material	Optical Grade Acrylic
Mounting Options	Optional Mounting Collar
Weight in Air	2.5 lb (1.13kg) – Al
Weight in Salt Water	1.5 lb (.67 kg) – Al
Thermal Protection	Thermal fold back of array when LED reaches 95°C
Environmental	
Depth 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 ~30,000 Hrs
Optical	
Color Temperature	6300 K Nominal
Lumen Output	3100
True Lumens / Watt	71
Center Intensity	7500 Lux (typical)
Beam Angle (half intensity angle)	Spotlight – 36 degrees (conical)
Color Rendering Index (CRI)	80
Electrical	
Max Power Draw	1.8A, 48W Nominal
Input Voltage Ranges	24 to 30 VDC
Dimming Control Modes	24VDC – RS-485 0-5VDC 0-10VDC
Control System	Half duplex RS-485 (standard), Supported baud rates 9.6K, 19.2K, 57.6Kbps (Set at Factory)
Communication Protocol	ROS 21-30022

2.2 Light Distribution



2.3 Light Output vs. Dimming Control





3 INSTALLATION/ GENERAL FUNCTIONALITY

Operation of the MV-LED II requires an input voltage between 24 and 30 VDC. The lamp draws 45 Watts (typical) of power at maximum light intensity. Mount the lamp in any orientation using either the optional mounting clamp or your own mounting clamp.

The MV-LED II is protected from an over temperature condition. When the internal temperature of the MV-LED II reaches 60°C, it will automatically reduce its intensity to

10% of the maximum light output. When the internal temperature returns to the safe operating range the light will return to full intensity. During this self regulating temperature protection the MV-LED II will not respond to commands to increase light. If the MV-LED II internal temperature reaches 63.5°C it will reduce its intensity to 0% until the temperature returns to the safe operating range.

Serial communication is still available while the MV-LED II RS485 is in temperature protection mode.

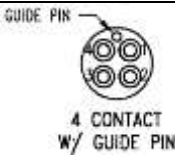
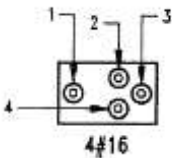
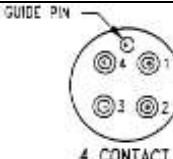
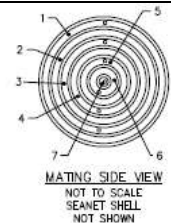
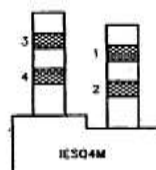
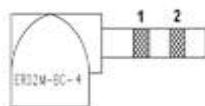
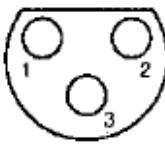

The thermal protection is intended as a failsafe feature to protect the light from unintentional damage from extended use in air. It is not recommended to intentionally run the light out of water for any extended period as it will reduce the product lifespan.

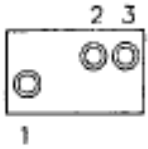
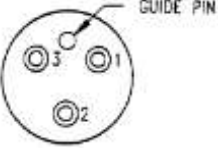
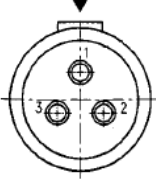
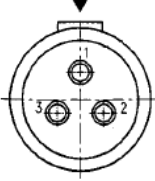
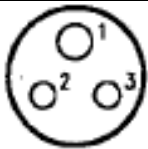
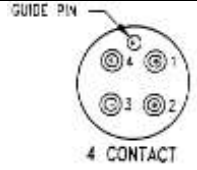
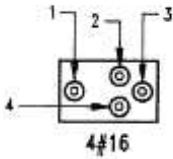
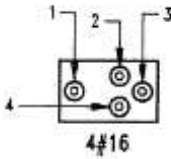
4 CONNECTOR WIRING

NOTE: 4 Pins are required for RS-485 lamps and 3 pins are required for analog control lamps.

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

RS-485 All Configurations BUT -04	RS-485 -04 Configuration	Analog (0-5VDC,0-10VDC) All Configurations
1 - DC Common 2 - +24 VDC 3 - RS 485 A 4 - RS-485 B	1 - +26VDC 2 - 26VDC RET 3 - GND 4 - N/C 5 - RS485-B 6 - RS485-A 7 - N/C	1 - DC Common 2 - +24 VDC 3 - Analog Dimming Input 4 - Not Connected

			
-01 MCBH-4-MP	-02 LPMBH-4-MP	-03 BH-4-MP	-04 SEANET 101
			
-05 IESQ4M	-06 IERD2M-BC-4	-07 5507-1503	-08 XSG-3-BCL-HP-SS

			
-09 LPBH-3-MP	-10 BH-3-MP	-11 MSAJ-3-BCR (IMP)	-12 MSAJ-3-BCR (SEA)
			
-13 RMG-3-BCL-SS	-14 BH-4-MP (PEEK)	-15 LPMBH-4-MP-Ti	-16 LPMBH-4-MP-SS

5 ROUTINE MAINTENANCE

The MV-LED II 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 7.

6 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 or off	Over temperature	Allow light to cool
Condensation or water on the window	Connector leak or o-ring seal failure	Return to ROS for repair

7 BILL OF MATERIAL

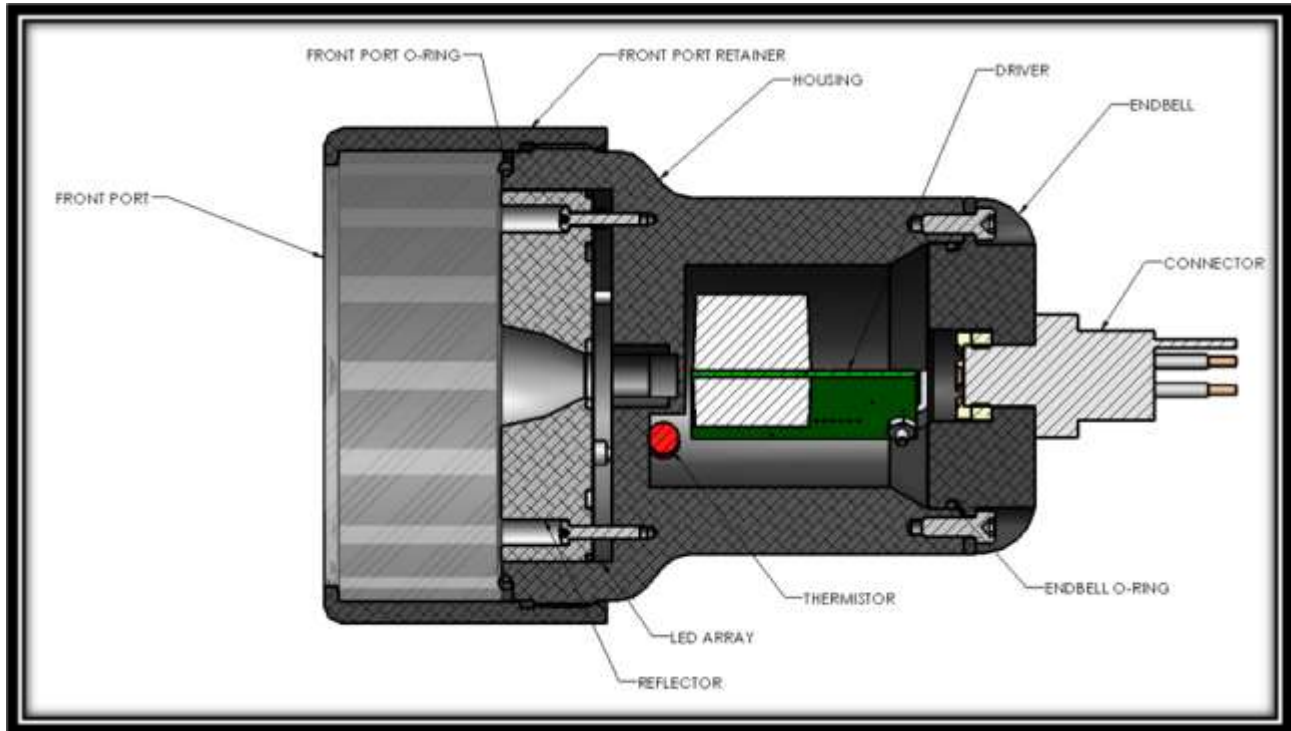


Figure 1 (MV-LED II DC)

PART DESCRIPTION	ROS PART NUMBER
FRONT PORT RETAINER	10-00506-01 (Aluminum)
	10-00606-01 (Titanium)
HOUSING	10-00508-01 (Aluminum)
	10-00607-01 (Titanium)
DRIVER	10-00562-01
ENDBELL	Connector Dependant, Contact Factory
CONNECTOR	See Connector Layout
ENDBELL O-RING	60-20031-4
THERMISTOR	65-02226-4
LED ARRAY	10-00559-01
REFLECTOR	10-20051-01
FRONT PORT	10-00507-01
FRONT PORT O-RING	60-20149-4

8 REFERENCE DOCUMENTS

DOC NUMBER	ROS DOCUMENT DESCRIPTION
10-00234	APPLICATION NOTE, INTERCONNECTING RS-485 COMPONENTS
10-00551	WIRING DIAGRAM, MV-LED RS485
10-00567	WIRING DIAGRAM, MV-LED DC
21-30022	RS-485 COMMUNICATION PROTOCOL