Lumen Light R2



Introduction

This page is the most recent *Lumen* documentation page. If you have an older *Lumen* Light, you may wish to refer to the archived documentation page: *Lumen* Light R1 (Retired July 2018) (http://docs.bluerobotics.com/lumen/).

The *Lumen* Light is a sealed LED light which can supply up to 1500 lumens at depths of up to 950 meters. The *Lumen* Light can be smoothly dimmed with a servo PWM signal or simply turned on/off with a switch. Up to six lights can be daisy-chained together and controlled with a single signal, requiring only one penetration into a watertight enclosure.

Quick Start (on/off with no PWM signal source)

- 1. Connect the power wires to a power source
 - Red: +10-48 volts
 - Black: Ground
- 2. Connect the yellow signal wire to the the power wire directly or through a switch to turn on to full brightness

Quick Start (dimming with PWM signal)

- 1. Connect the signal wire to the appropriate microcontroller pin
 - Yellow: PWM (3-48 volts)
- 2. Connect the power wires to a power source
 - Red: +10-48 volts
 - Black: Ground
- 3. Provide a servo PWM pulse from 1100 μs (off) to 1900 μs (brightest)

Specifications

Specification Table

For further information please see the Cree XLamp MK-R LED Data Sheet

(http://www.cree.com/~/media/Files/Cree/LED%20Components%20and%20Modules/XLamp/Data%20and%20Binning/XLampMKR.pdf). The specific LED model used is MKRAWT-00-0000-0B00H4051.

Electrical		
Item	Value	
Supply Voltage (V _{in})	7 - 48 volts	

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Electrical		
Full Brightness Supply Voltage (V _{in})	10 - 48 volts	
PWM Logic Voltage	3 - 48 volts	
Peak Current	15 / V _{in} amps	
Light		
Maximum Brightness	1,500 lumens	
Color Temperature	6,200 kelvin	
Cable		
Cable Diameter	4.3 mm	0.17 in
Cable Length	1 m	39 in
Cable Jacket	Black Urethane	
Conductor Insulation	Polypropylene	
Conductor Gauge	22 AWG	
Wires	Black - Ground	
	Red - Power	
	Yellow - Signal	
Physical		
Pressure Rating ¹	950 m	3120 ft
Overall Length	68.9 mm	2.71 in
Overall Diameter	37 mm	1.46 in
Bracket Mounting Hole Spacing	19 mm	0.75 in
Bracket Screw Size	М3	
Weight in Air (w/ 1m cable)	102 g	3.60 oz
Weight in Water (w/ 1m cable)	53 g	1.87 oz
Maximum Temperature when Run in Air	55° C	130° F
Beam Angle	135 degrees in water	

[1] Pressure rating is based on testing and a conservative safety factor.

2D Drawings

Lumen Light Assembly



3D Model

All 3D models are provided in zip archives containing the follow file types:

- SolidWorks Part (.sldprt)
- IGES (.igs)
- STEP (.step)
- STL (.stl)

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Lumen Light	
Lumen Light R2 Assembly	LUMEN-ASM-LIGHT-R2.zip (/lumen-r2/cad/LUMEN-ASM-LIGHT-R2.zip)

Installation

The *Lumen* Light can be easily installed using the included threaded M3 mounting holes.

Using the Threaded Holes

The two threaded holes are best used when you have access to install a screw that tightens into the holes. This applies to most ROVs. Note that the threaded holes have the same size and spacing as the thruster mounting holes so you can use a thruster mounting bracket or hole pattern.

1. Drill two holes between 3.1mm and 3.3mm (0.12-0.13") in diameter 19mm (0.75") apart on the part you wish to mount the light.



2. Install two M3x0.5 screws through the holes that you just drilled. We recommend 316 stainless steel screws and they should be roughly 1.5 - 3.0mm longer than the thickness of the part that you are mounting to. Optional: Apply a small dab of Medium-strength (blue) threadlocker such as Loctite 243 to the M3 screws.



3. Attach the *Lumen* onto the screws and tighten until hand tight. Be careful to avoid over-tightening and stripping the threads.



Daisy Chain Connection

The *Lumen* Light can be daisy chained (https://en.wikipedia.org/wiki/Daisy_chain_%28electrical_engineering%29) using the following procedure:

A Use caution if you disassemble and reassemble your *Lumen* Light. The black screws are made of aluminum and will break if over-torqued. We recommend using a torque wrench and applying no more than 20lbs of force when reassembling.

[Due to differences in internal wire connections, New Instructions COMING SOON]

Example Code

Arduino

This example uses the Arduino Servo library to control the light brightness. This provides an update rate of 50 Hz and can use any pin on the Arduino board as the "servoPin".

If you've never used Arduino before, we suggest checking out some tutorials! (https://www.arduino.cc/en/Tutorial/HomePage)

```
#include <Servo.h>
byte servoPin = 9;
Servo servo;
void setup() {
   servo.attach(servoPin);
   servo.writeMicroseconds(1100); // send "off" signal to Lumen light
}
void loop() {
   int signal = 1700; // Set signal value, which should be between 1100 and 1900
   servo.writeMicroseconds(signal); // Send signal to Lumen light
}
```

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