

## FAQs

### Underwater Lights

#### What Should I Look For In Underwater Lights?

##### **Brightness:**

Brightness is very important as too little will spoil the experience. Fortunately, too much light can be dimmed with Lumishore products. Fixture lumens are the only true measure of brightness of white light.

##### **Lumens vs Fixture Lumens:**

A Lumen is a measure of light output usually from the bare LED chip in ideal but unrepresentative laboratory conditions. A Fixture Lumen measures the true light output from the finished light fixture and considers all losses through electronic inefficiencies and any secondary optics to give. The fixture lumen is the only figure that should be considered when considering a light's brightness.

##### **Colors available in each light:**

Blue and white are the most popular single colors. White for clear water and blue for other applications. However, every color and combination can be 'right' depending upon the boat owner and their guests' mood and needs. The standard now is for blue and white in every light as a minimum.

Full color change is the ultimate option, which deliver the greatest range of colors, scenes and zones.

##### **Beam angles:**

Due to their unrivalled brightness, Lumishore underwater lights have the farthest reach together with widest beam angles, allowing the light to penetrate deep into the water, to create a beautiful, uninterrupted halo of light around your vessel.

60° is a narrow, focused beam

90° is a wide beam

110° is an ultra-wide beam

##### **Type of light fixture (install-ability):**

For leisure marine purposes there are 3 primary types of light:

Surface Mount (SMX) lights attach to the exterior of the hull with screw fittings and epoxy resin, and a small cable hole. The electronic components (LED drivers) are integrated within the light, and they do not have shafts going through the hull and the electronic components (LED drivers) are integrated within the light. They may be made from a metal or polymer.

Thru-Hull lights (THX) have a shaft, usually a standard 1"/25mm in diameter, installed through the hull. Thru-Hull light fittings, have the added security of internal attachment, as well as being fixed using epoxy externally, and also benefit from external drivers which can be installed in easily accessible locations, and the ability to easily bond to the vessel's protective bonding system.

Thru-Hull Interchangeable (TIX) lights share the benefits of thru-hull fixtures above, and additionally enable the LED light unit (LED cartridge) from inside the hull without having to haul-out or lift the vessel out of the water. All Lumishore TIX (Interchangeable Thru-Hull) lights have the additional benefit of integrated internal drivers, which means fewer components to be installed, thereby reducing installation time, wiring runs, complexity, and costs.

### **Flush-fit vs proud-mount:**

Ideally all lights would mount flush with the hull. This protects the light and the hull and ensures laminar water flow is not restricted. Uniquely, all Lumishore thru-hull and thru-hull interchangeable lights fit flush with the hull.

### **How Many Lights Do I Need?**

This is very much a matter of individual choice and budget. Normally, people focus on the transom and a small wrap-around with specialist applications (like fishing) also favouring lights shining downwards (we only ever recommend thru-hull or interchangeable lights for downward facing lights).

You will need less with Lumishore lights, as they are brighter and have a broader beam to avoid those 'shark teeth' effects.

### **What Color Looks Best**

It depends very much on water conditions. White light is best in the clearest conditions and shallower sandy waters, like in the Bahamas. Blue is most versatile for changing water conditions and green is best for murky, green or brown waters.

### **Can They Be Mounted To The Hull Sides Or Bottom?**

Thru-Hulls and Interchangeable Thru-Hulls are all flush-fit so are recommended for transom, sides and bottoms. Surface Mounts are low profile, therefore we cannot recommend they be installed anywhere but the transom so that they do not hinder lamina flow and hull security is not compromised.

### **How Far Apart Should Lights Be Placed?**

The key to light spacing is ensuring a nice even spread of light. You can easily replicate your desired lighting effect on a piece of paper. Lumishore lights with a wide or ultra-wide beam angle require fewer lights than competing lights with narrow beams. As a guideline, we say 1m – 2m apart on the transom but that can be varied.

### **How Far Under The Water Line Should I Mount The Lights?**

There will be no damage to the lights if they come out of the water when switched on, but the key consideration is to install the lights deep enough, so they do not come out of the water whilst rolling at anchor, and not distract other boaters nearby. Consequently, installing the lights at a depth of 20cms / 4" or more to the top of the light is normal.

## **How Far Does The Light Penetrate Into The Water?**

This really depends on the water conditions in your area, the clearer the water the further the light penetration.

## **How Should I Clean My Underwater Lights?**

Please refer to the instruction manual that came with your lights.

## **Can Lumishore Lights Run Out Of Water?**

Lumishore lights are designed to run underwater, however all Lumishore lights will run out of water. If the lights remain dry for a protracted length of time, they will dim slightly in order to protect the electronics and electricians using a technique called intelligent thermal dimming.

## **How Do You Ensure That All Lights Are Protected From Water Ingress? Are They Waterproof?**

We employ the Lumishore quad-seal process to ensure against water ingress for all lights. There are 4 stages of sealing to minimize the chance of any water ingress. This ensures that in the unlikely event of a damaged lens, the light unit remains sealed to ip68 to protect the vessel from any water ingress. Our lenses are sealed to the bodies using a 3-part process to ensure the strongest bonding possible, using the best epoxies available. We consult with one of the world's leading epoxy experts on this process. The unit is sealed immediately behind the led array and the entire body is potted with a polyurethane sealant – to make sure the connector at the rear of the light is also ip68 rated. You can choose your Lumishore lights with peace-of mind.

## **What Is RDMX And Why Is It Good For Me?**

RDMX, or Return DMX, is a 2-way DMX communications protocol. This unique feature allows the compatible MFD and/or compatible STV 2204-i Display (plus any connected phone/tablet) to communicate with the lights – and for each individual EOS Color Change light in the system to communicate back to the displays. This 2-way communication, which is unique to Lumishore's underwater lighting systems, allows many advanced and valuable features, such as: automatic light discovery– automatic install, simplifying installation and saving time and costs.

## **How Does Sound-to-light Work? Does It Need Integrating?**

The Lumi-Link Command Center includes in-built integrated Sound-to-Light as standard. No additional integration is required, simply connect your sound output cable to the Command Center's Sound-to-Light input. The lights are synchronised to the frequencies of the music, giving a far more beautiful and pleasing effect than only to the beat.

The Sound-to-Light feature automatically splits the audio input into 3 music frequency bands: low frequencies, mid frequencies, and high frequencies. You can choose and allocate a color to each of these the frequency bands – and for best results, choose a different color for each frequency band. You can also adjust the sensitivity slider to compensate for variation in volume of the input music.

Choose a low sensitivity for quieter music and a high sensitivity for louder music. This sensitivity setting changes the response of the lights, to a level that obtains the desired effect.

## **Which MFD's Are Compatible With Lumi-link? And Which Lights Can Be Connected?**

Lumishore has partnered with the world's leading suppliers of multi-functional displays (MFD's), including Garmin, Simrad, Raymarine, B&G and Furuno. All Lumishore's EOS color change and SUPRA dual color lights (with the exception of the SMX23) connect in plug-and-play, with no integration required.

## **Can I Control My Lumishore Lights From My Mobile Phone Or Tablet?**

Lumishore's EOS Color Change lights and SUPRA Dual Color lights (with the exception of the SMX23) can be controlled by any internet capable smart device connected to the boat's Wi-Fi via the connected compatible MFD or optional STV 2204-i.

## **Why Are Individual Chips Better Than Rgbw – 'quadrant' – 4-in-1 Chips?**

4-in-1 chips are prone to poor color match as they cannot be binned which leads to potential color differences between lights (and color differences are exacerbated underwater). Individual chips enable creation of the right amount of light specific to the marine environment, as opposed to the above water experience which is entirely different and for which the 4-way chips are designed. For example, underwater red light needs more power than blue light.

## **Can Lumishore Lights Be Installed On AC?**

Yes, Lumishore has AC Installation kits available for AC operation.

## **Is LED Binning Important For Underwater Lights?**

LED chips are sorted and graded (binned) against several critical parameters. This is important, not only for output consistency but also for color matching. Particularly in the underwater environment, where color and its saturation in water are crucial in relation to lighting effects.

Lumishore's arrangements with its suppliers provide the tightest binning possible and every LED used by Lumishore has its own unique part supplier number to ensure consistency of color, output and water penetration each time.

## **Why Are Lumishore Products Better Than Competing Lights?**

Lumishore products are better in every aspect of performance that a potential customer should consider:

- Value - Lumishore lighting systems are the best value on the market in terms of true light output per dollar and in available functionality.
- Brightness - Lumishore's fixture lumen outputs are genuine, accurate and far superior to others and in the case of all our lights we publish genuine numbers.
- Functionality - the functionality, including unique synchronization and individual light control on our SUPRA and EOS Series ranges are far more superior and have more features than any competing lights, giving improved performance and visual effects.
- Light beam and effects - Lumishore's wide and ultra-wide beam angles provide the stunning swimming pool effect that everyone aspires to. They provide not only a seamless pool effect, but the depth provides the richness and clarity of color others do not achieve.

## **What Makes Lumishore's EOS Series Better Than Competing Products?**

They are the only fully controllable color change underwater lights available on the market, delivering the greatest range of colors, scenes and zones. Due to Lumishore's intelligent, dynamic channel management, EOS underwater lights are brighter in every color and mixed colors. Unique light discovery and light auto-install function also simplifies the system setup and reduces installation time.

Lumishore's EOS systems are 100% compatible with the world's leading MFD's, as well as smart devices, giving you unprecedented lighting control at your fingertips. No additional programming or software required.

## **What Features Make Lumishore Products More Reliable Than Others?**

We have a number of advanced built-in features to ensure that your lights will not only provide the ultimate underwater lighting experience, but also prove to be reliable over time. Lumishore's background is based upon working lives committed to advanced LED technology. It is this expertise that lies at the core of every Lumishore light.

- Array design - our own proprietary HICOB arrays
- Driver electronics - in-house designed by our technical experts using
- Advanced features and their specialist knowledge gained over 20 years of designing and developing advanced led lighting
- Use of high-quality marine materials including high-grade marine bronze

In addition to our build quality, Lumishore products have been put through rigorous testing both in the laboratory and workshop. Our test programs include:

- Immersion testing of all lights and drivers
- Vibration testing
- Thermal testing
- EMC testing and practical noise interference testing (EMC/EMI)
- Output testing at all stages of production in our advanced integrating spheres
- Testing in the real-world marine environment on our own customer fleet

## **Type Approval**

### **Do Lumishore Lights Have Type Approval**

Yes - ABS, RINA, DNV-GL Classification Approvals and full Lloyd's Type Approval, including safety-critical EMI/EMC testing and compliance.

# **Above Water Lights - The LUX Collection**

## **Why Is The LUX Lighting Collection Unique?**

The LUX Lighting Collection is the only marine specific lighting to offer unique 5-channel CRGBW above-water smart lighting. This means you can finely color tune each light, with complete white temperature-tuning from cold to warm white and any temperature in between, as well as delicate hues and tones and more vibrant colors.

## **What Is 'CRGBW'?**

Every Lux light unit has cold white, red, green, blue and warm white LEDs integrated. This is unique in marine lighting

## **How Can Lux Lights Be Controlled?**

Lux lights can be controlled by any combination of:

- One or many compatible MFDs (Multi-Function Displays), and/or
- One or many optional Lumishore STV224i Displays, and/or
- Local switch controls
- Plus, any internet compatible smart device (phone, tablet etc) connected to the Wi-Fi

## **Can Lux Lights Be Dimmed?**

Yes, every Lux light unit can be dimmed as a standard function. No additional dimming units need to be installed.

## **Can LUX Lights Be Installed Outside?**

Yes. Lumishore's Lux Lighting Collection units are designed to be installed as interior and/or exterior lighting fixtures.

## **How Many Command Centers Are Needed?**

Only one Command Center is needed per boat.

## **How Are Lux Light Control Modules, Strip Light Drivers And Illuminated Speaker Drivers Connected To The Command Center?**

LUX Control Modules and Drivers are connected to each other and to the Command Center with DMX cable, in a 'daisy chain' installation.

## **How Many Lights Can Be Connected To Each LUX Light Control Module?**

Up to 16 downlights, courtesy lights and/or livewell can be connected to each Lux Light Control module, and one module is needed per lighting zone.

## **How Many Strips Can Be Connected To Each Strip Light Driver?**

Up to 10 linear meters (33') of Superbright strip and/or Superbright Neon Flex strips can be connected to each SL/SNL Strip Light Driver.

## **Can I Cut My Own Lengths Of LUX Strip Lights?**

Yes. The IP68 Superbright Cut and Seal Strip Light can be cut in 100mm intervals to the length you want. Each Cut and Seal strip includes a sealing kit to ensure it remains completely water tight, creating two custom-cut strips from each standard length.

## **What Integration Is Needed For Sound-to-light And How Does It Work?**

Sound-to-light, controlled by 3 frequency levels in the music, is a standard feature of the Command Center and needs no integration – simply plug the music output cable into the Command Center's Sound-to-Light input.

## **What Is A HIGH CRI' And Why Is It Important?**

CRI – or Color Render Index – is a measure of light in relation to how the light affects the color of objects. A light with a high CRI means colors remain faithful and are not distorted. A high CRI light is therefore very important in choosing interior and exterior above water lighting.

## **Warranty**

### **What's My Warranty Period?**

#### **Underwater Lights**

- All Thru-Hull and Interchangeable Thru-Hull models carry a 3 year warranty.
- All Surface Mount models carry a 2 year warranty, with the exception of SMX11 which has a 1 year warranty.
- Accessories carry a 2 year warranty.

#### **Above water Lights - The Lux Lighting Collection**

- All Lux Lighting products carry a 2 year warranty.
- Accessories carry a 2 year warranty.

## **Underwater Lights**

### **What Should I Look For When Purchasing Underwater Lights?**

Everyone should do a thorough analysis of competing products before buying underwater lights and it is important to try and validate conflicting claims to dismiss the erroneous ones.

**Brightness** - is very important as too little will spoil the experience. Fortunately, too much light can be dimmed with Lumishore products. Fixture lumens are the only true measure of brightness of white light. Beware - the unscrupulous do make false claims. We know because we test a lot of competitor light offerings using the correct calibrated test equipment.

**Lumens vs Fixture Lumens** - A Lumen is a measure of light output usually from the bare LED chip, and is measured and in ideal, but in unrepresentative, laboratory conditions. Lumens alone are not meaningful to the user - because a Lumens measure does not indicate the light you will get delivered from a finished light fixture. Fixture Lumens, on the other hand, is a measure of the true light output, sometimes referred to as 'delivered light', you will get from a finished light fixture. Fixture Lumens are always lower than Lumens for the same light unit and take into account all losses through electronic inefficiencies and any secondary optics to give the all-important measure of useful light you will get from the finished light unit. Fixture lumens are the only figures that should be considered meaningful to the light output when assessing a light's brightness.

**Colors available in each light-** Blue and white are the most popular single colors. White for clear water and blue for other applications. However, every color and combination can be 'right' depending upon the boat owner and their guests' mood and needs. Lumishore offer a range of options to suit the vessels requirements.

The standard now is for blue and white or white and warm white in every light as a minimum. These can also be operated in single color mode if required.

Beware of claims for dual color lights that outputs are those of single color lights when outputs are actually ½ that. A reliable company (like Lumishore) should only quote fixture lumens of the actual output in white only.

Full color change is the ultimate option which when combined with individual light control gives full control of color and scenes for the ultimate underwater lighting experience. These units contain RGB+W individual LED's for the ultimate effect and using Lumishore's controllers, it's possible to create any color by mixing a combination of the four.

**Beam angles-** they need to be as wide and even as possible. The width gives the 'swimming pool effect' whilst the depth provides the richness and depth of color.

60° is a narrow, focused beam

90° is a wide beam

110° is an ultra-wide beam

All Lumishore's weld-in range offer the ultra-wide 110° beam angle with the exception of the SY220 and 250 which can also be selected in a focussed 60 ° beam angle.

**Functionality-** is key to the enjoyment of multi-color lights with a range of functions. Lumishore offers the most extensive range of features available to the user. If you are buying multi-color lights, do ask if they are synchronized to avoid potentially offensive lighting effects. Lumishore lights are the only underwater lights, which are synchronized by a switch.

## **Are Lumishore Lighting Systems Designed And Developed For The Marine Environment?**

Yes - all Lumishore lights, drivers, controllers, accessories, middleware and software and accessories are designed and developed by us in-house specifically for the marine environment



and come with a specific IP rating.

## **How Many Lights Do I Need?**

This is very much a matter of individual choice and budget. This varies from vessel to vessel, with the most popular choice being the full wrap around the vessel. Our design team are happy to offer advice and recommendation when it comes to deciding how many units would look best.

With Lumishore's ultra-wide 110° beam angles, you will likely need less with Lumishore lights than competitor lights as this allows for the spacing between each unit to be increased.

## **Can They Be Mounted To The Hull Sides Or Bottom?**

Our weld-in offerings can be located anywhere on the vessel including the underside of the hull, bulbous bow and stern.

## **How Far Under The Water Line Should I Mount The Lights?**

The key consideration here is to ensure that lights are mounted deep enough so that they do not come out of the water whilst rolling at anchor, as this can be distracting to other boaters near you. Our normal recommendation is for the units to be mounted at least 250mm below the light load waterline of the vessel. There will be no damage to the lights if they come out of the water occasionally.

## **How Far Apart Should Lights Be Placed?**

The key to light spacing is ensuring a nice even spread of light. You can easily replicate your desired lighting effect on a piece of paper. Lumishore lights with wide or ultra-wide beam angles require fewer lights than competing lights with narrow beams. Depending on the model selected, this can vary anywhere up to 5M between units.

## **Can The Lights Be Installed Where Tanks May Be Located?**

Yes, the unique design of the SY310 unit from Lumishore allows the unit to be maintained from the outside of the vessel. This can therefore be placed within fuel/water/oil tanks.

## **Are Extra Cofferdams Required For Each Light?**

No, depending on the model selected and the location, our models allow for installation without the requirement for any additional cofferdams, even when located within tanks.

## **Do Long Angled Flanges Reduce The Output And Beam Angle?**

The SY225, SY300/310 have been designed to eliminate the requirement for long angled flanges that often reduce the beam angle and therefore output of the lights. Regardless of hull angle,

these models are installed using flush flanges in all locations, regardless of hull angle, therefore maintaining the ultra-wide 110° beam angle.

## **Does Lumishore Have Built In WI-FI And An App? Do I Need To Buy Additional WI-FI?**

Yes. No additional Wi-Fi or supporting units are required as Wi-Fi functionality is built-in to Lumishore controllers. The latest STV2204-i Display from Lumishore allows wireless communication from anywhere aboard the vessel using a mobile device. Wired to the ethernet backbone of the vessel, the 2204-i in conjunction with the Lumi-Link Command Center allows full control of the underwater lighting system.

## **How Do You Ensure That All Lights Are Protected From Water Ingress? Are They Waterproof?**

We employ the Lumishore quad-seal process to ensure against water ingress for all our lights. There are 4 stages of sealing to minimize the chance of any water ingress. This ensures that in the unlikely event of a damaged lens the light unit remains sealed to IP68 to protect the vessel from any water ingress. Our lenses are sealed to the bodies using a 3-part process to ensure the strongest bonding possible using the best epoxies available. We consult with one of the world's leading epoxy experts on this process. The unit is sealed immediately behind the led array and the entire body is potted with a polyurethane sealant. Just to make sure connector at the rear of the light is also ip-68 rated. You can choose your Lumishore lights with peace-of mind.

## **Do You Offer Any Design Or Commissioning Services?**

Lumishore offer full support throughout the concept, design, positioning, installation, and commissioning stages of any projects. Our team is experienced and dedicated to providing the best recommendations to best suit the owner/vessels requirements.

## **Why Are Lumishore Products Better Than Competing Lights?**

Lumishore products are better in every aspect of performance that a potential customer should consider:

- Value - Lumishore lighting systems are the best value on the market in terms of true light output per dollar and in available functionality. This also applies to the installation and maintenance costs of our systems which have been greatly reduced.
- Brightness - Lumishore's fixture lumen outputs are genuine, accurate and far superior to others and in the case of all our lights we publish genuine and verified numbers. When considering output, Fixture Lumens is the most accurate measurement available and should not be confused with Wattage or Lumen values.
- Functionality - the functionality, including unique synchronization and individual light control on our SUPRA and EOS light ranges are far superior and have far more features than any competing lights giving improved performance and visual effects whether you are fishing or relaxing. This includes strobe, fade, chase, and sound-to-light features.
- Light beam and effects - Our latest patented Louvre design maintains Lumishore's ultra-wide, 110° all round, true beam angles regardless of hull angle. This provides the stunning swimming pool effect that everyone aspires to. They provide not only a seamless halo effect, but the depth provides the richness and clarity of color others do not achieve.

## How Can I Compare Brightness Of Competing Lights?

It is very difficult to compare the brightness of competing lights. Companies provide lots of conflicting information but there are a few pointers to help understanding:

- While we know Lumishore lights are the brightest, the customer obviously cannot 'know' that. We will always provide a customer with a side-by-side comparison of competing lights if we have tested them. We buy and test a lot of competitor's lights, but you may not consider that enough.
- Ideally the customer could do a side-by-side in-water lighting comparison for the lights he is considering at the same time in their own cruising ground. Unfortunately, this is impractical, so we have to consider other methods.
- Seeing existing installations is obviously very helpful.
- Photos on the Internet and brochures are unreliable. Even the best cameras are confused by night-time conditions and underwater lights can exaggerate the lighting effect. If it looks too bright and lacks sharpness then a photo is probably unrepresentative whilst obviously modern technology allows many forms of wilful distortion.
- Night-time video is more reliable than photos in terms of accuracy as you invariably have a broader and wider seascape and greater perspective. However it is not totally accurate.
- A very simple but inaccurate methodology is to count the LEDs. Most single and multi-chip LEDs used by underwater lighting companies are 3-watt LEDs (Lumishore white LEDs are actually 10-watt but that is exceptional).
- The only true accurate measure of light output is fixture lumens - it is only really valid for white light as a comparator and needs sophisticated equipment to measure. It cannot be measured with handheld light meters.
- In order to perform these measurements Lumishore has its own calibrated integrating spheres. These enable us to accurately claim what our outputs are and ensure that every light is tested to that standard ensuring consistency each and every time. Many companies (including us) quote lumen or data lumen or real lumen numbers – they are all wildly inaccurate and are theoretical outputs of LEDs in laboratory (and other) conditions not in the real world in a light fixture with the inherent inefficiencies involved in specific lights. These numbers mean nothing.

## What Should I Ask Light Manufacturers About Outputs (fixture lumens) On Their Lights?

Ask the right questions about their light outputs in order to get faith in their claims and ask for supporting information:

- Do you own calibrated integrating spheres that are used to measure your light outputs?
- Are your declared fixture lumens the result of those measurements?
- Send me the charts and data points for the light I'm thinking of buying.
- Do you calibrate and test each and every light in production (because inefficiencies in production can and do exist)?

## Type Approval

### Do Lumishore Lights Have Type Approval?

Yes – Full ABS, RINA, DNV & Lloyds Type Approvals and Lumishore is the only underwater LED lighting manufacturer with full Lloyd's Type Approval, including safety-critical EMI/EMC testing and

compliance. Our weld-in range has also been tested for Ice Class vessels by Lloyds.

## **Warranty**

### **What's My Warranty Period?**

All Superyacht Weld-in systems carry a standard 2 year warranty with the option to extend this to a maximum of 3 years when a commissioning package is included.