imtra PowerLED and PWM Dimmer Installation Instructions

The IMTRA PowerLED series of spots & fixtures include the following models:

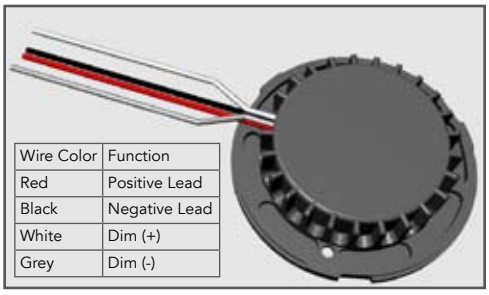
- Ventura PowerLED
- Avalon 105 and Avalon 155 PowerLED
- Tacoma 105, 155 and 180 PowerLED
- Gibraltar PowerLED
- Hatteras PowerLED
- Portland PowerLED
- Norfolk PowerLED

These high brightness LED downlights are uniquely suited for marine and automotive installation. Their design is based on solid state, Light Emitting Diode (LED) technology that offers greater reliability, lower power consumption, and less radiated heat than traditional incandescent lamps. When operated properly, these products will provide years of trouble free operation.

All these products are available with a choice of LED color and a selection of bezel finishes. When installed and operated with an IMTRA approved PWM dimmer, up to 30 fixtures can be varied simultaneously through the full range of light output, from full bright to off, from one dimmer. Higher capacity dimming is possible. Please contact Imtra for more details on dimming of more than 30 lights on a single circuit.

Imtra PowerLED Installation

Before beginning, please read these instructions. Verify the ship's voltage and obtain the appropriate tools necessary to complete the installation. The wire type and circuit protection used int he installation of these products should be selected in accordance with any applicable regulatory standards and codes in order to provide each unit with its rated power consumption. Using a DVM or oscilloscope, verify the power at each unit has the correct voltage. Imtra PowerLED products operate with input voltage of 10-30VDC from breaker panel supplied by ship's batteries. Ensure the breaker is turned off before beginning the installation.



Wire Color	Function
Red	Positive Lead
Black	Negative Lead
White	Dim (+)
Grey	Dim (-)

Each of these products is designed to dissipate heat generated within the LED circuit through its integral heatsink/housing. It is important that the unit not be wrapped in insulation and that it be exposed to open airspace above the ship's "headliner". This allows for proper convection along the unit's cooling fins and will assure a junction temperature that will result in maximum life of the LED diode(s).

Each IML PowerLED product has four lead wires. The red (pos.) and black (neg.) lines are for power. The white and gray wires are for the dimmer interface. If an Imtra PWM dimmer is to be used, the white input lead is to be connected to the "DIM - out" signal from the Imtra dimmer. The gray lead is "ground" or "return" and should be connected to the "Dim – return" lead on the Imtra dimmer. If dimming is not to be used, each "dim" line should be individually capped and stowed.

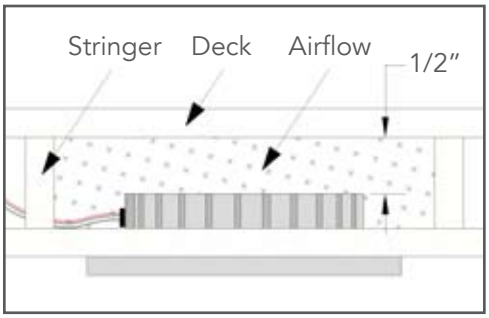
*Note: Power provided to the IML PowerLED must not go through conventional dimmers which would affect voltage input. Power must come directly from power source (i.e. battery, DC power supply).

Installation Recommendations

Thermal Management

Imtra PowerLED products are designed for extremely long lifetimes (in excess of 35,000 hours of use), which for most boat owners, could exceed the time of boat ownership. With any power LED based product, thermal management provisions of the fixture (good design practices) and how it is installed are key to achieving this long life.

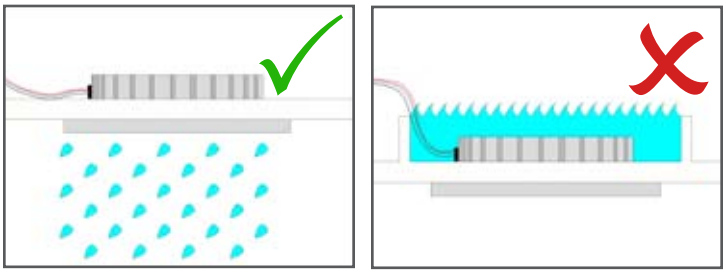
- Allow for some volume of airspace around fixture to allow convective mechanism to work.
- Provide some airflow in overhead ceiling compartments.
- Avoid covering LED fixtures with insulation, foam or other materials that will prevent convection or conduction cooling.
- Provide ½" minimum overhead airspace above fixture.



Ingress Protection

Imtra PowerLED products have an IP Rating (Ingress Protection) of IP65 to protect them from ingress of foreign materials and substances that could cause premature failure. These ratings are for "exposed" areas of the fixtures, and are not applicable to the concealed part of the fixtures (i.e. behind the mounting surface). The space where the fixture is installed must be free from water intrusion.

- Do not submerge lights in water
- Do not install fixtures in compartments that may fill with water
- Ensure proper drainage of areas where fixtures are mounted
- Do not recess fixtures into areas where water may accumulate.



Limited Warranty

Imtra warrants the light-emitting LSA (LED spotlight assembly) component of our IML PowerLED spot lights & fixtures for 5 years from the date of purchase. If the LSA should cease to function within 5 years, return the complete spot light assembly to Imtra for repair or replacement.

This warranty does not apply to damage resulting from actions of the user such as misuse, improper wiring/installation, operation outside of specification, improper maintenance or repair, unauthorized modification, lightning strike or damage from a power surge.

The trim ring (bezel) of the IML Power LED spot lights are warranted for either two years (stainless steel or powder coated) or one year (gold or satin-nickel) depending on the finish of the fixture.

Imtra specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Imtra's total liability is limited to repair or replacement of the product.

The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

If it should become necessary to return a fixture for service during or beyond the warranty period, please refer to Imtra's standard Return Policy as detailed on Imtra's website (www.imtra.com) or call Imtra customer service at (508) 995-7000.

No returns are accepted without a Return Authorization (RA) number.

PWM Dimmer Installation

For installation of Imtra PWM Dimmer, refer to **Figure 1** (picture of dimmer) and either **Figure 2 or 3** (Dimmer wiring diagram).

Input voltage range is 10-30VDC.

The red and black lines are for power.

The Dim-Out (white wire) of the dimmer connects to the Dim-In (white wire) from the LSA.

Connect the Dim-Return (gray wire) of the dimmer to the Dim-Return (gray wire) of the IML PowerLED.

For multiple LED units, always connect your wiring using a parallel circuit to assure each device receives the same voltage.

Each Dimmer supports up to 30 IML PowerLED units.

The dimmer is compatible with any normally-open momentary pushbutton switch (closure type) control device.

It is recommended that the dimmer module be located within 30' of the first control switch (i.e. the yellow and green control wires). This minimizes the possibility of electromagnetic interference.

Wire the yellow and green wires across this type of switch. The dimmer supports a 3-way on/off control feature whereby a second (or more) switch can be used to turn on or off the IML PowerLED.

These additional momentary pushbutton switches may be wired in parallel to the yellow and green control lines.

In order to avoid interference between Imtra PowerLED lights and PWM Dimmer Modules and other electronics, it is recommended that they are wired according to the schematic found in **Figure 2**.

In instances where interference is not a concern (systems independent of radio equipment, instruments, navigation systems, etc.), single wire dimming can be achieved by simply omitting the grey wire connections. Please refer to **Figure 3** for wiring Imtra PowerLEDs and Dimmer Modules for single-wire dimming.

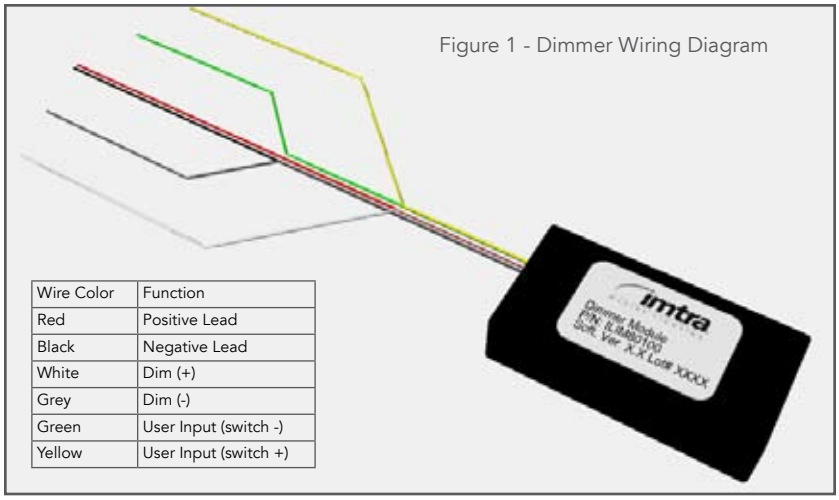


Figure 1 - Dimmer Wiring Diagram

Wire Color	Function
Red	Positive Lead
Black	Negative Lead
White	Dim (+)
Grey	Dim (-)
Green	User Input (switch -)
Yellow	User Input (switch +)

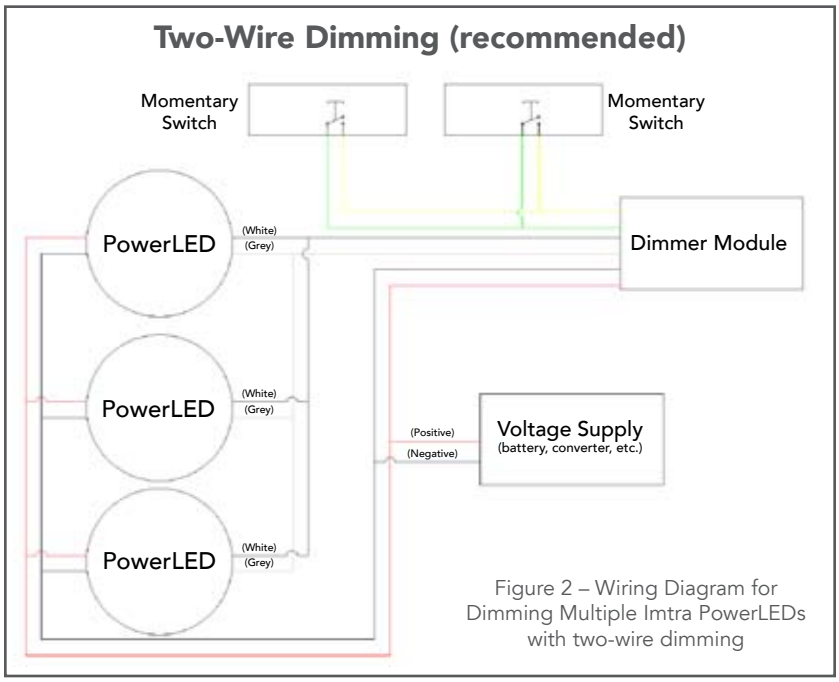


Figure 2 – Wiring Diagram for Dimming Multiple Imtra PowerLEDs with two-wire dimming

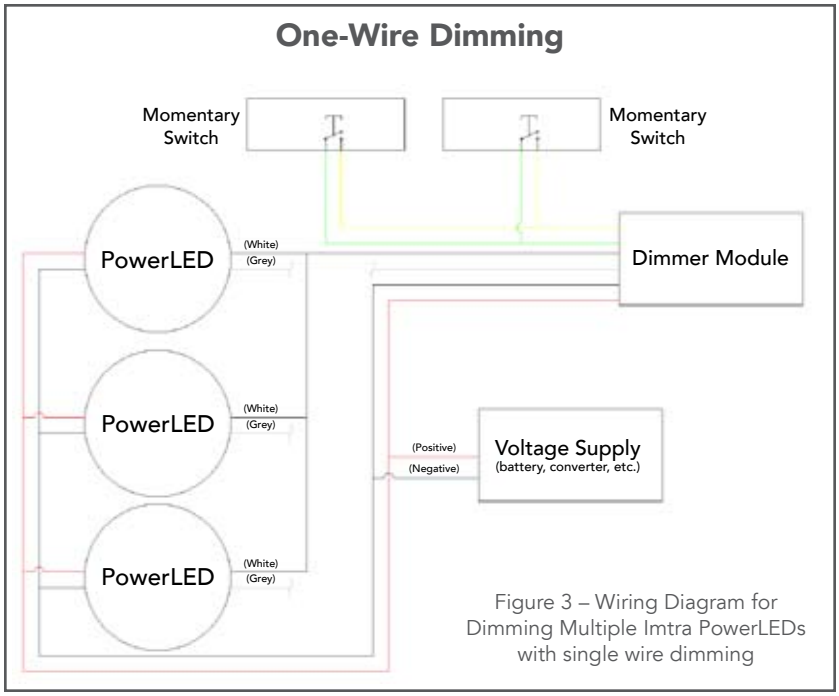


Figure 3 – Wiring Diagram for Dimming Multiple Imtra PowerLEDs with single wire dimming

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