

## Assembly Recommendations

Lamina's Titan Series Light Engines are designed for attachment to a heat sink with conductive epoxy, or screw down for flange mount devices with thermal grease in the joint. For attachment using screws a 4-40 UNC round head or metric equivalent M3 x 0.5 cheese head screw, 18-8 SS is recommended. When mounting the light engine, position the four screws in the center of each of the four slots. Tighten the four screws evenly, first to about 0.89 inch pounds (56 Newton-centimeters), and then tighten each to a maximum torque of 5 inch pounds (45 Newton-centimeter). Flatness requirement of the surface that the light engine is mounted to is 0.001 inch/inch (1mm/meter). To prevent damage when using conductive epoxy do not use mounting screws.

## Notes

1. This product uses silicone materials for superior optical performance. Do not expose the part to fluids that may react with silicone compounds. See Dow Chemical Form 45-0113D-01, Silicone Fluid Resistance Guide.
2. Ray trace models are available upon request.
3. Lamina may make process or materials changes affecting the performance or other characteristics of our products. These products supplied after such changes will continue to meet published specifications, but may not be identical to product supplied as samples or under prior orders.

## Warranty Statement

Lamina Ceramics Inc. (Seller) extends warranty on goods produced by the Seller for one (1) year from original date of shipment, that the goods sold hereunder are new and free from substantive defects in workmanship and materials. This warranty extends only to the Buyer and not to indirect purchasers or users. Seller's liability under the foregoing warranty is limited to replacement of goods or repair of defects or refund of the purchase price at the seller's sole option. The above warranty does not apply to defects resulting from the improper or inadequate maintenance, unauthorized modification, improper use or operation outside of Seller's specifications for the product, abuse, neglect or accident.

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## Patents

Lamina's light engines may be covered by pending patents and/or one or more of the following U.S. and/or International patents 5876536, 6709749 B, 595880, 6017642, 5565262, 5681444, 5653834, 5581876, 5847935, 5514451, 5747931, 5925203, 5725808, 5929510, 5858145, 5866240, 5953203, 6055151, 614076, 6011330, 6399230, 6914501, 6168490, 6191934, 614075, 6160469, 6300267, 6471805, 6518502, 6739047, 6720859, 6759940, 6518502, 6670856 B1, 6720859, 6713862 B2, WO 00/47399, WO 00/26152, WO 98/19339, 5082804, ZL99808762.9, 69623930, 69628549, 69629572, 805785, 69628549, 843621, 932500, 805785, 812258, 843621, 932500, 805785, 812258, 843621, 932500, 3327556, 3267299, 3226281, 3405545, 320630, 295695, 284068, 546471, 805785, 812258, 843621, 6455930, 6759940, 6713862, 7095053, 7098483.

# Titan RGB Developer Kit

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## Titan, NT-5000 RGB Developer Kit

Lamina's **NEW Titan RGB Developer Kit** enable users to quickly discover the world of solid state lighting and realize the power of Lamina's super-bright LED light engines. This kit is intended for the rapid evaluation and prototyping of LED lighting solutions based on the Lamina Titan RGB light engine. The kit is fully assembled and includes everything needed to jump start your design efforts. As shown in the Developer Kit Contents table and photo, this comprehensive kit includes a RGB light engine, a commercially available LED constant current driver, and prewired DC connections.



Figure 1.

**Overall Case Size - 12" x 9" x 3"**

Titan, NT-5000, RGB Developer Kit - DK-05F0-0398				
Item	Description	Qty.	P/N	Notes
1	Driver Sub-Assembly, 1000mA, QuadPuck™	1	160-0252 Assembly	N/A
2	Light Source and Heat Sink, RGB	1	160-0250 Assembly	N/A
3	Plug Adapter, AC, China/ANZAC	1	210-0134	Franzus NW-2C
4	Plug Adapter, AC, UK	1	210-0135	Franzus NW-135C
5	Plug Adapter, AC, Europe	1	210-0133	Franzus NW-1C
6	Universal Switching Adapter, 50-60W, DC Output +12V	1	210-0132	Philhong PSA60W-240
7	AC Notebook Power Cord, 6' Two Wire, US Version	1	210-0137	Philhong AC15WNA

### Operating Instructions

1. Remove the RGB light engine assembly and driver from the kit case and place them on a suitable work surface near an AC power outlet. Please verify the DC/DC connection cable is correctly attached between the light engine and driver. Also, verify the AC power cord is properly connected to the power supply.

2. Connect the DC power supply to the QuadPuck™ controller using coaxial connector.
3. **CAUTION. Lamina LED Light Sources are extremely bright!** Before applying power, direct the light source away from your eyes or wear suitable protective eye wear.

Plug the AC Adapter's power cord into a 100-240 VAC/50-60 Hz power outlet using the adapter plugs if required. The light source will now be illuminating depending on the Program Selection setting. Program selection options are printed on the front of the driver. Please note: After selecting the preprogrammed color changing Demo Mode (position 8) the driver will stay in this mode until you disconnect the power to the driver. To get out of the Demo Mode move the selector switch to another position and then reconnect the power to the driver.

NOTE: Please unplug the AC power before connecting or disconnecting the LED light engine to avoid potential damage to the light engine or the driver.

### Connecting Two Lamina Titan, RGB Light Engine Assemblies



Figure 2.

### Attaching to your Fixture or Assembly

The RGB light engine Assembly can be mounted in several configurations. Ideally, the light engine should be configured horizontally, thereby allowing air to flow through the vertically oriented fins. Alternate assembly positions are also possible. The orientation of the fins and the surrounding environment will determine how efficiently the heat sink can dissipate the thermal energy.

### Handling Precaution

Contact with the silicone based encapsulant on the surface of the light engine must be avoided to prevent damage. Do not apply pressure to the silicone based encapsulant or allow it to come into contact with sharp objects. Lamina LED light engines must be handled from the sides.

### Further Prototyping Information and Support

Additional information regarding the Titan series of light engines, optics, heat sinks, accessories, developer kits, compatible drivers, and applications notes can be found by visiting Lamina's website.

### Electrical Connections

When using constant current LED drivers with high compliance voltage (Advance, LEDworks, etc. or a custom driver) the output of the supply must be connected to the part before power is applied to the input of the supply. For more information refer to Lamina's connection application note which can be found on the website.