lamina®

Bright Lights. Bright Ideas.™

BL-4000 SERIES

RGB+ Developer Kit

New!

Lamina Light Sources

As the market leader in the development and manufacture of super-bright LED arrays, Lamina brings solid state lighting to applications which until now were only possible with traditional lighting sources.

Lamina's LED arrays are manufactured by combining high brightness LEDs from industry-leading LED manufacturers with Lamina's proprietary packaging technology, multilayer Low Temperature Co-Fired Ceramic on Metal (LTCC-M). LTCC-M is a breakthrough in thermal performance for LED packaging technology, a key factor in determining LED life and reliability. Unmatched thermal performance coupled with package interconnectivity allow Lamina to densely cluster multiple LEDs to achieve exceptionally high luminous intensity in very small footprints. Lamina's light sources are available in white, RGB and monochrome, from 1W to 100W, and also in custom packages up to 1000W.

Lamina LED Light sources provide:

- **HIGH LUMINOUS FLUX IN SMALL FOOTPRINT**

- **SUPERIOR THERMAL PERFORMANCE FOR IMPROVED RELIABILITY**

- **LONG LIFE AND HIGH LUMEN MAINTENANCE**

- **SUSTAINABLE DESIGN – RoHS COMPLIANT[1]**

- **CUSTOM SIZES, SHAPES AND CONFIGURATIONS AVAILABLE**

BL-4000 RGB+ Developer Kit

Lamina's new Developer Kit series enables users to quickly discover the world of solid state lighting and realize the power of Lamina's super-bright LED arrays. This kit is intended for the rapid evaluation and prototyping of LED lighting solutions based on the Lamina BL-4000 RGB+ Light Source. 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 Light Source Assembly, a matched, commercially available, LED constant current driver, Optics, and prewired DC connections from the light source to the driver.

- **FEATURES LAMINA'S BL-4000 RGB+ LED LIGHT SOURCE DELIVERING 120 LUMENS OF BLENDED RGB LIGHT AND INDEPENDENT COLOR CONTROL**

- **THE BL-4000 RGB+ IS SOLDERED TO LAMINA'S EZCONNECT BOARD AND ATTACHED TO LAMINA'S RADIAL HEAT SINK**

- **LEDdynamics™ 4016 QUADPUCK DMX DRIVER INTERFACE CONFIGURED WITH THREE 350MA LUXDRIVE™ BUCKPUCKS**

- **LAMINA MEDIUM AND WIDE OPTICS IN OPTIC HOLDERS FOR EASY ATTACHMENT TO THE EZCONNECT BOARD**

- **FULLY ASSEMBLED AND READY TO PLUG IN WORLDWIDE**

TYPICAL APPLICATIONS

ARCHITECTURAL LIGHTING

- **DECORATIVE AND ACCENT**
- **COVE AND UNDER-SHELF**
- **GARDEN AND PATHWAY**
- **STEP LIGHTS**

ARCHITAINMENT

LCD BACKLIGHTING

SIGNAGE & CHANNEL LETTERS

SIGNALS

- **AIRFIELD TAXIWAY**
- **TRAFFIC**
- **SECURITY**
- **BEACONS**
- **RAIL**

MACHINE VISION

MEDICAL

1. ALL LAMINA LIGHT SOURCES ARE RoHS COMPLIANT. LAMINA IS CONVERTING LAMINA ACCESSORIES AND DEVELOPER KITS TO BE RoHS COMPLIANT WELL IN ADVANCE OF THE 1 JULY 2006 DEADLINE.

To see how you can realize all these design benefits, to request a sample, or to speak with an engineer about your design, contact Lamina at 800.808.5822 or 609.265.1401 or visit www.laminaceramics.com.

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![lamina logo]

Bright Lights. Bright Ideas.™

BL-4000 RGB+ Developer Kit Contents
P/N DK-04F0-0396

Item	Description	QTY	Lamina Part Number	Notes
1	Light Source Assembly BL-4000 RGB+ (P/N BL-43F0-0305) Light Source soldered to EZConnect Board and attached to Radial Heat Sink, 1.00" thick, with screws and thermal joint compound	1	800-0352 BL-43F0-0305 Light Source attached to EZConnect Board 800-0345-1 1.00"(2.54cm) Thick Radial Heat Sink	
2	4016 QuadPuck DMX Driver Interface configured with three 350mA BuckPucks and prewired EZConnect Wire Harness	1	800-0401 RGB 350mA DMX Driver 800-0354 EZConnect Wire Harness	LEDdynamics 04016-DE350-3
3	Medium Optic w/holder, 30º Beam Angle	1	FHS-HMB1-LC01-H	
4	Wide Optic w/holder, 45º Beam Angle	1	FHS-HWB1-LC01-H	
5	60W Universal AC Adapter, 100-240VAC/50-60Hz Input, 24VDC Output	1	210-0132	Phihong PSA60W-240
6	US style AC Power Cord	1	210-0137	Phihong AC15WNA
7	European style Adapter Plug, 230VAC	1	210-0133	Franzus NW-1C
8	UK style Adapter Plug, 230VAC	1	210-0135	Franzus NW-135C
9	ANZAC/China style Adapter Plug, 230VAC	1	210-0134	Franzus NW-2C
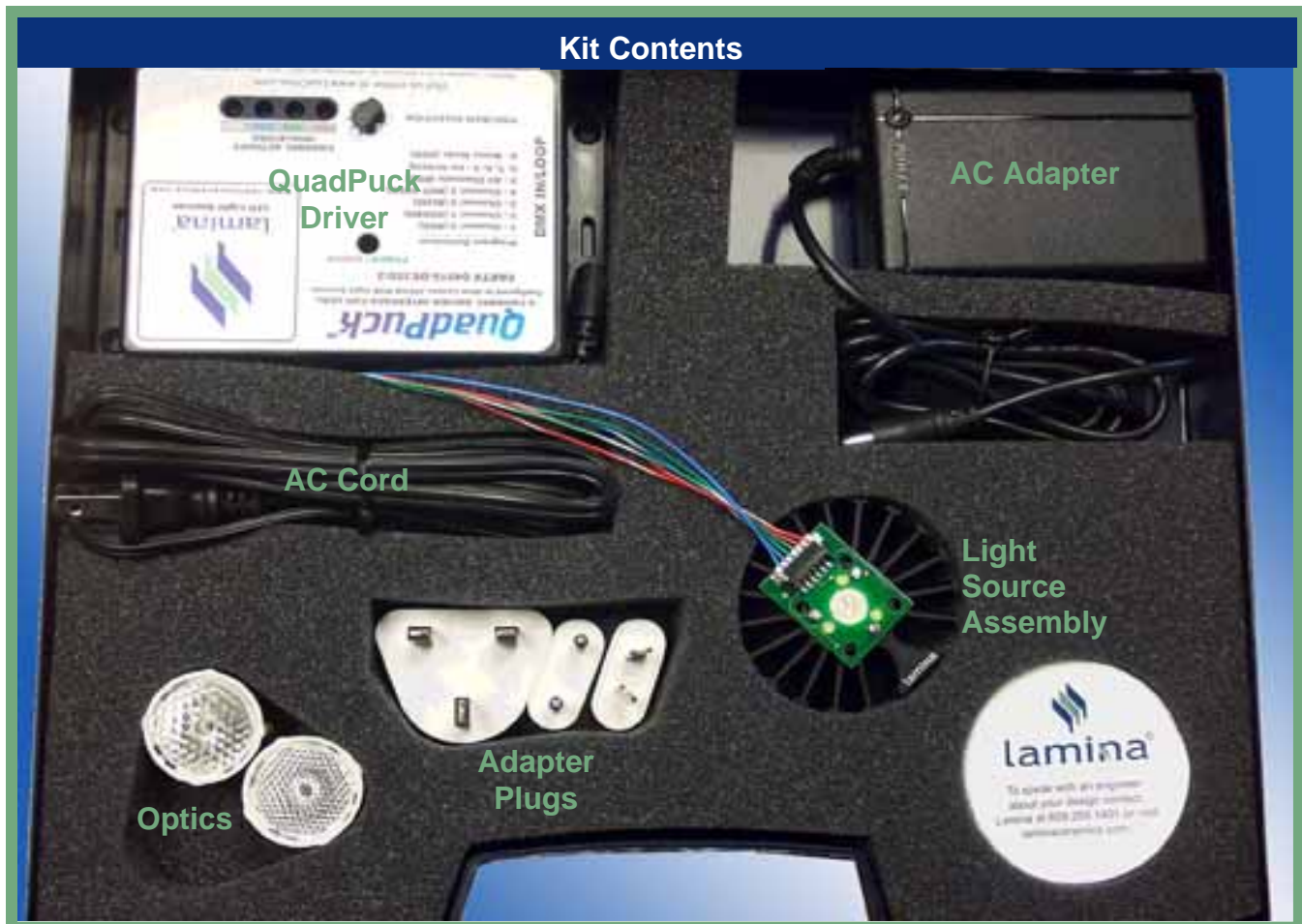
Kit Contents

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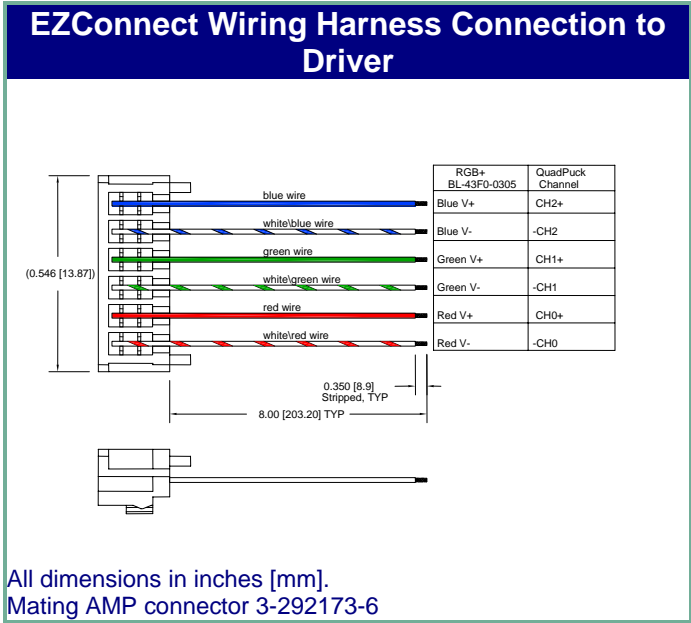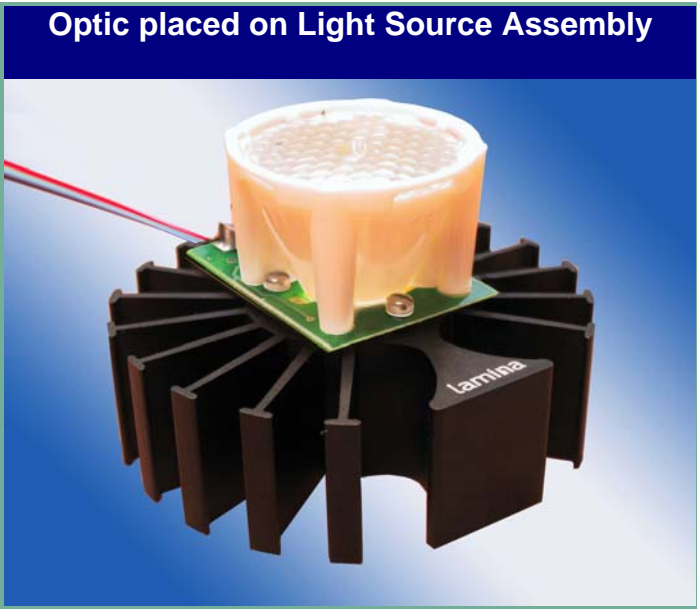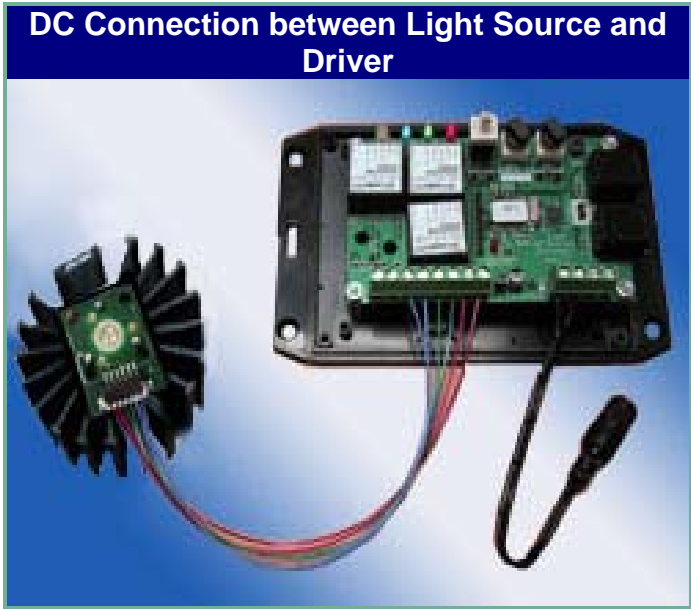
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Operating Instructions

1. Remove the Light Source Assembly and QuadPuck driver from the kit case and place them on a suitable work surface near an AC power outlet. Please verify the EZConnect Wire Harness remains correctly attached between the light source and QuadPuck driver after removal from the kit case.

2. Next remove the AC Adapter from the kit and plug the AC Adapter's DC plug into the DC power jack cable connected to the QuadPuck. After removing the AC power cord from the kit, plug the AC power cord into the AC Adapter. See the photos below for the proper connections.

3. Set the QuadPuck driver's PROGRAM SELECTION knob to the desired setting for powering individual RGB colors, All RGB Channels (Blended White), or RGB Demo Mode. The PROGRAM SELECTION settings are indicated on the QuadPuck cover label. By default, the QuadPuck is set to PROGRAM SELECTION 1 – Channel 0 (RED). The RGB Demo Mode will automatically sequence through the BL-4000 RGB primary and binary color combinations to demonstrate the color possibilities and optimal color mixing capabilities of Lamina's BL-4000 RGB Light Source.

4. **Careful, Lamina LED Light Sources are extremely BRIGHT. Before powering up, direct the light source away from your eyes, place an optic over the light source, or wear suitable protective eyewear.** Plug the AC Adapter's power cord into a 100-240VAC/50-60Hz power outlet using the adapter plugs if required. The light source will now be illuminating depending on the PROGRAM SELECTION setting. **Please note:** *After PROGRAM SELECTION 8 – RGB Demo Mode is selected, there is about a five (5) second delay before the automatic sequence begins. Also, the RGB Demo Mode must be selected prior to powering up the QuadPuck to ensure RGB Demo Mode is entered, and the QuadPuck must be powered down to change the setting once RGB Demo Mode is selected.*

5. To test the included optics, insert the legs of the optic holder into the four corner holes in Lamina's EZConnect board. The EZConnect board is designed to align the optic to the center of the light source and allow the optic to rest on the light source surface.

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

Quick View of Kit ready to power up

DC Connection between Light Source and Driver

Optic placed on Light Source Assembly

EZConnect Wiring Harness Connection to Driver

	RGB+ BL-43F0-0305	QuadPuck Channel
blue wire	Blue V+	CH2+
white\blue wire	Blue V-	-CH2
green wire	Green V+	CH1+
white\green wire	Green V-	-CH1
red wire	Red V+	CH0+
white\red wire	Red V-	-CH0

(0.546 [13.87])

0.350 [8.9] Stripped, TYP

8.00 [203.20] TYP

All dimensions in inches [mm].
Mating AMP connector 3-292173-6

DC Connection between Light Source and Driver

The DC connection between the light source and the QuadPuck driver is shown in the above photo. The EZConnect Wiring Harness is keyed to mate with the EZConnect board in only one orientation. The QuadPuck driver channels are identified as CH0, CH1, and CH2 on its printed circuit board next to the row of four (4) paired terminal blocks. The table above shows the wiring connections between the EZConnect Wiring Harness and the QuadPuck driver.

BL-4000 Optics

For further information about the optics including specifications and permanent attachment, please obtain the Lamina BL-4000 Optics data sheet by visiting Lamina's website, www.LaminaCeramics.com.

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Attaching to Your Fixture or Assembly

The Light Source Assembly can be mounted in several configurations. Ideally, the light source should be configured horizontally, thereby allowing the heat to radiate through the vertically oriented fins. Alternate assembly positions are also possible. The orientation of the fins will determine how efficiently the heat sink can dissipate the thermal energy.

Configuration options with BL-4000 RGB Light Sources

One (1) or two (2) BL-4000 RGB light sources can be connected in series using the included QuadPuck driver. Please note that only a single light source is included in this kit.

1 to 2 Lamina BL-4000 RGB Light Sources
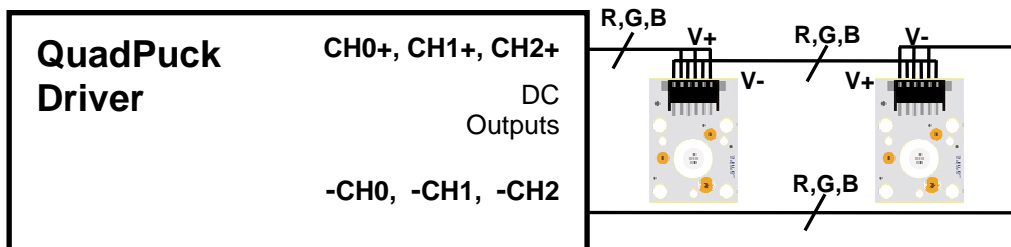
Handling Precaution

Contact with the silicone based encapsulant on the surface of the light source 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 arrays must be handled from the sides.

Further Prototyping Information and Support

Additional information regarding the BL-4000 series of Light Sources, Optics, Heat Sinks, Accessories, Developer Kits, compatible Drivers, and Applications Notes can be found by visiting Lamina's website, www.LaminaCeramics.com.

Also, please visit Lamina's website, www.LaminaCeramics.com, for more information on Lamina's complete line of LED light sources and Lamina's worldwide distribution network.

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