KEY ENHANCEMENT WILL ENABLE MASS-MARKET LED ADOPTION

KEVIN O’CONNOR
MOLEX INCORPORATED

As traditional incandescent lights are phased out over the next five years due to tighter energy regulations in all major Western countries, new government standards worldwide will drive market adoption of more efficient lighting choices. LEDs are at the forefront of the shift away from traditional incandescent and fluorescent lights—and toward more sustainable solutions.

Conservatively, LEDs last up to 40 times longer than incandescent bulbs, and five times longer than CFLs (compact fluorescent lamps). By using LED modules rather than conventional lamps, it is now possible to reduce power consumption by as much as 90%. Today’s advanced electronic solutions for LED offer luminaire manufacturers a flexible path forward at a low price point.

There are challenges intrinsic to LED design engineering. Incandescent and fluorescent lights conduct heat through the glass bulb surface. While LEDs run significantly cooler, their effective service life can be shortened considerably without proper thermal management. Heat build-up in the LED junction must be conducted through the back of the LED. With a heat sink and proper thermal management, LED fixtures can last an impressive 50,000 hours at 70% lumen maintenance under normal usage.

LEDs are electronic components requiring a secure connection to a circuit. LED emitters have traditionally been soldered to PCBs and assembled to integrated fixtures without a mechanism to replace or update the LED. A cold solder joint can result in scrapping a high-cost LED array. Even successful designs leave solder joints vulnerable to stress during handling. Fixture manufacturers and lighting OEMs accustomed to traditional lighting have consistently demanded LED modules that more closely emulate traditional lighting.

The new Helieon LED light module combines SSL technology from Bridgelux with interconnect technology from Molex. A two-piece design, the compact Helieon light socket or lamp holder is permanently fastened into the luminaire. The light module inserts into the socket with a push-and-turn to lock the module in place, emulating a traditional light socket for a familiar installation experience—a simple, yet key enhancement to drive mass-market adoption of LED lighting.

Helieon modules for high-volume applications are available in two basic outputs, 800 or 1,200 lumens (roughly comparable to 60W and 90W incandescent bulbs), but can be driven to provide between 500 and 1,500 lumens. Available with narrow and medium flood-beam patterns, users can readily alter the beam angle, color temperature, or light output without removing the luminaire. Switching out the module with an easy turn can lend an entirely new look and feel to a lighting design and space.

An innovative solderless array holder electrically connects the LED fixture to a set of wires. A double-ended wire-trap offers flexibility in wire orientation, and easy field replacements and upgrades. Secure compression power contacts provide a stable connection, even in high-ambient temperatures, and prevent potential failures due to cold or unreliable solder joints. The array holder also facilitates a thermal interface between the LED and heat sink by clamping and applying pressure to thermal interface materials.

Blending best-in-class electrical, thermal, and optical solutions to address practical design issues, advanced electronic technologies are making LED luminaires practical and affordable for mass production. The integration of modular assemblies and array holders will play an increasingly integral role in lighting the way toward OEM development of sustainable and competitively priced products.

Kevin O’Connor is a director of product marketing and business development at Molex.

Using unmatched interconnect technology, Molex provides a solderless solution to mounting LED arrays into OEM designs.