

# **New simple and efficient interconnect series enables LED lighting market to flourish**

*By Malcolm Ankers, Product Marketing Manager, AVX Elco*

According to the US Department of Energy (DOE), no other lighting technology offers the same potential as Light Emitting Diodes (LED) to save energy and enhance lighting quality and reliability. Added to this is the major economic benefit LEDs deliver thanks to their low energy consumption, long life and low maintenance. Right now is a fantastic time for the lighting industry as it introduces new, creative and exciting lighting solutions.

While magazines will (rightly) print richly-illustrated articles discussing wall washes, ambient/mood lighting, stage effects and more domestic scenes, all enabled by LED technology, the engineering community must solve the more mundane problems that inevitably occur as we look to move from traditional incandescent lighting to the new LED products. One example concerns interconnect where there is an increasing demand for a simpler and more efficient termination method.

One of the major issues hindering the uptake of LED technology in lighting applications is that installers want to stick with old, established formats. So they try to position LED strips into tubes of the same dimensions as fluorescent lighting systems. This demands a flexible means of linking these LED strips together. One simple method is to simply solder a wire between the two LED strips. However, this takes time – wires must be prepared and the solder joint must be created – and it also increases the risk of failure due to dry joints. Another possibility is to use a two part connector system, with one part soldered to the LED PCB strip into which can be plugged a simple cable assembly. Although this approach does not suffer from the inherent reliability problems inherent in the solder/wire process, it is costly and not very versatile, because the cable assemblies will have to be pre-manufactured. Clearly a better process is needed.

Insulation Displacement Connectors (IDC) have been around for very many years – used mainly with flat cables. Some companies, such as AVX Elco, are now offering discrete wire IDC connectors specially designed for the LED lighting industry. To terminate, the connector terminal is simply pressed into the wire displacing the insulation which forms a gas tight joint with the conductors when fully inserted. This has the advantage of being an extremely fast, reliable and repeatable process that requires only the wire to be cut to length on site. No other preparation is necessary and no cable

assemblies need be manufactured in advance. The result is a reduced time to market and a lower installed cost.

Series 9175/9176/9177 connectors from AVX are rated in current at 1A, 10A and 15A respectively with corresponding stranded wire gauges of 26-28 AWG, 18-24 AWG, and 14 – 20 AWG. Maintaining flexibility, these new connectors are available in two and three way configurations, but can also be end stacked to deliver the exact number of terminations required. Alternatively, custom designs can also be developed. With such a wide wire range accommodated within the three product series, a wide variety of applications within the lighting market are accessible, including sports arena signs, street lighting, advertising signs and architectural lights used for building feature enhancement or internal feature lighting. The connectors also suit solar panels, emergency signage and automotive applications – internally or outside of car. Already these new connectors are being used in strip lighting installations.

There are other IDC connectors available on the market designed for LED lighting applications, but these are significantly larger, less easy to rework, and are not end-stackable so they are not as versatile as the AVX offering. In fact, AVX has paid considerable attention to every design aspect of these new connectors. Devices are manufactured from a high temperature Nylon material to withstand the occasional high working temperatures experienced in lighting systems, and the temperature, shock and vibration specifications of series 9175/9176/9177 connectors are based on automotive specifications, resulting in products that are robust and suitable for a wide variety of operating conditions.

Returning to the theme of ease of use, AVX has developed various different tooling options including hand tools for test and development and mass termination blocks for volume production. Devices are tape and reel packaged – with each reel containing significantly more parts than the competition, so reels need changing much less frequently.

The new, emerging LED lighting industry is developing at a rapid pace. With these new, specially-developed connector series AVX is ensuring that the performance of the LED is not compromised by a less-than-perfect interconnect solution.