

Modular Infrastructure Showcases LED Lighting

What if lighting were as easy to change as the furniture or artwork in a room? Traditional lighting has never been truly flexible — permanently installed luminaires and “portable” lighting tethered to electrical socket locations largely make up the interior lighting market. But the nature of LED lighting could change all that. In 2004, the LRC began a project with seed money from ASSIST to create a new building interior infrastructure for solid-state lighting that was demonstrated in an initial laboratory prototype. In 2012, LRC researchers and OSRAM Sylvania engineers completed a field demonstration of a modular, dc-powered interior infrastructure for LED lighting in a corporate conference room at Paramount Pictures in Hollywood, California. This first-of-its-kind demonstration showcased a sustainable lighting system that can adapt to both changing technology and space needs, as well as energy savings without sacrificing lighting quality.

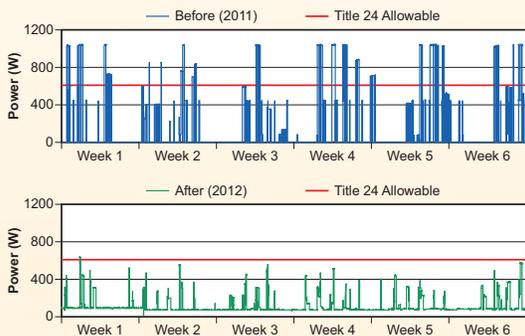


Conference room lighting system before (above) and after (right) the installation of the dc-powered infrastructure grid with LED-lighted tiles. Different color schemes and nine layers of light are available.



Occupant Survey and Energy Comparison

Surveys showed that users felt the lighting in the conference room was much better than before. The most notable aspect was that the improved lighting with the new LED system was achieved at a much lower power demand, on average 61% lower compared with the previous lighting system, which consisted of linear fluorescent and incandescent lamps. A lesson learned from this demonstration is that a reduction in standby power from the power module and sensors is required to maximize energy savings.



Power demand over a six-week period, before and after.

Field Demonstration

The field demonstration consisted of a low-voltage, dc-powered modular tile grid system that included LED lighting. The tiles were composed of an LED lighting fixture, a controller, and a hook used for electrical connection. A custom frame and bracket system accommodated the tiles, which were purchased commercially and retrofitted to house the lighting components. The lighting was controlled by a wireless switch, and all components were integrated into the grid system. The power to the grid was provided from a power module. To change the layout of the lighting, the tiles could easily be taken down and moved to any location.



Laboratory development of the movable LED-lighted wall tiles for the field demo.

Sponsors

California Energy Commission, OSRAM Sylvania

Demonstration Site Host

Paramount Pictures, Hollywood, CA



For more information, visit www.lrc.rpi.edu/programs/solidstate/or_adaptableSSL.asp.



Lighting
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