

ECHELON HELPS UC DAVIS **CUT ENERGY COSTS BY 89%** WITH INTELLIGENT WALL PACK LIGHTING UPGRADE

Project Highlights

Energy savings
89%

Lifetime energy cost savings
\$753/fixture

Lifetime maintenance savings
\$233/fixture

Occupancy rate
20%



In 2012, UC Davis upgraded its exterior lighting, including street and area fixtures, wall packs, and post top fixtures, as part of the university's Smart Lighting Initiative. The wall pack retrofit incorporated a dimmable LED source, motion sensor, and wireless controls into each unit. The retrofit integrated the wall packs into a campus-wide adaptive lighting control system that offers an intelligent, networked approach to lighting and energy management. The lighting upgrade resulted in an 89% reduction in energy use for the wall packs on campus. Project data suggests that energy savings attributable to the LED upgrade alone was 47% with the remaining 42% attributable to the use of adaptive controls.

The Challenge

Wall packs typically employ high-intensity discharge (HID) light sources, such as high-pressure sodium (HPS) and metal halide (MH) lamps. These sources are only moderately efficacious, contribute significantly to light pollution, and their light generally measures poorly on the color rendering index (CRI). Natural light is classified as having a CRI of 100, the best possible. Lower CRI values indicate that a light source causes the color of objects to appear unnatural compared to objects illuminated by a natural light source.

Because wall packs operate during off-peak hours, they often waste energy lighting unoccupied spaces at full output levels for hours every night. Replacing inefficient sources with LED technologies and adding photocells, occupancy sensors, and controls to wall packs dramatically reduces this energy waste. Incorporating these fixtures into a networked control system further maximizes energy savings.

Content from this case study was previously published in "Adaptive LED Wall Packs" by the California Lighting Technology Center (CLTC), UC Davis in March 2013.
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***Lumewave by Echelon™* Intelligent Lighting Solution**

The project team designed a solution that bundled an LED source with a motion sensor and a wireless control device. As a result, the team replaced each wall pack with a fully programmable and dimmable luminaire, capable of ON/OFF bi-level switching and 0-10V continuous dimming.

Each wall pack had a *Lumewave by Echelon* TOP900-TL wireless lighting control module installed via a NEMA twist-lock receptacle. The module serves as the point of communication between each fixture and the *Lumewave by Echelon* lighting control network. The network gateway serves as a central communication point for the control modules on the network while also providing network access for users to adjust operations. Echelon's central management system software allows administrators to set the fixtures to automatically turn ON and OFF at preset times (or defer to integrated daylight sensors), change dimming schedules, modify bi-level functionality, and send commands to luminaires within the system. Administrators can also create fixture groups, event schedules and control profiles, monitor energy use patterns, and receive automatic alerts from fixtures when maintenance issues are detected.

The Results

The State Partnership for Energy Efficient Demonstrations (SPEED) program and California Lighting Technology Center (CLTC) partnered with UC Davis Facilities Management, Utilities, and Design and Construction Management, to install 101 LED wall packs on 13 different buildings across the UC Davis campus. The LED luminaires stay ON for an average of 12 hours each evening, operating at 20% of full light output until a motion sensor triggers, at which point the corresponding wall packs switch to a higher light level. High-end trimming allows the fixtures to be programmed to use 80% instead of 100% of full power output. The new wall packs use just under 14W in low mode and 45W in high mode, less than one-third of the electricity used by the original luminaires.

The lighting system upgrade resulted in energy savings of 89%, with approximately 42% due to adaptive controls. Each LED wall pack will save about 741 kWh annually. At UC Davis' low electricity rate of 7.5 cents per kWh, annual energy and maintenance cost savings total \$986 per fixture. Facilities that pay higher rates can expect even greater economic returns.

Learn More

For more information about *Lumewave by Echelon* products call +1 408-938-5200 or visit www.echelon.com.

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