

Easily Commissioned Lighting Controls

A pilot study examining energy usage and light levels under default commissioning protocols was conducted with three lighting controls systems paired with two LED luminaire arrays, as well as an LED luminaire system with integrated lighting controls. The LRC characterized system operational characteristics, commissioning, and energy savings under field conditions. The purpose of this pilot study was threefold: to evaluate the default control characteristics of each system; to examine power demand differences between zone controls and luminaire-integrated controls; and to examine the power demand differences when different luminaires were used with the same control system.



Test areas: the daylighted office space (above) and the daylighted conference area.



Controls components tested (clockwise from upper left): Lutron Energy Tripak[®]; Cree SmartCast[™]; Philips SpaceWise; WattStopper DLM.

The pilot study was limited to one daylighted office space and one daylighted conference space. System power and light levels were logged in each space, but occupancy was not independently monitored. Daylight conditions and occupancy varied between the spaces and from week to week.

Significant energy savings were seen for all the lighting control systems in nearly all of the applications. However, two of the four systems tested did not allow occupants to increase light levels when the lights were overly dimmed due to daylight.

Sponsors

Bonneville Power Administration (BPA)
Lighting Energy Alliance (Efficiency Vermont,
Energize Connecticut, National Grid)

The LRC found that:

- The controls systems were simple to install, but three of the four control systems came without sufficient setup documentation, leading to an increased setup time.
- Lighting control systems should allow occupants to override the default light levels to prevent frustration and confusion.
- Significant energy savings are possible compared to time clock control, baseline conditions and/or power density requirements.
- Manual-on controls saved energy compared to automatic-on controls.
- Energy savings are as dependent on the system design (control algorithm and luminaire combination) as on whether the controls were zone or luminaire-integrated.
- Connecting different luminaires to the same lighting control system may result in different light levels and power demand, as the driver's current response to the dimming control voltage varies by manufacturer and driver design.
- LED luminaires with luminaire-integrated controls from different manufacturers had different control algorithms, leading to variations in power demand and light levels.
- All of the LED luminaires tested demonstrated low power factor (< 0.9) when dimmed.