

# The DaySwitch™: Simple, Low-Cost, Effective Daylighting

The United States Department of Energy estimates that lighting accounts for one-quarter of the total energy required by U.S. businesses. In response, manufacturers have developed dimming systems designed to reduce energy use from electric lighting when daylight is available.

However, typical dimming systems have several drawbacks, including high initial cost and difficult photosensor programming and installation. As a result, dimming systems have not permeated the market.

## Simplifying daylighting controls

The LRC set out to improve upon existing daylight harvesting technology and design a system that meets the following goals:

- Easy to incorporate into existing fixtures
- Inexpensive to manufacture
- Achieves high energy savings
- Does not annoy occupants
- Affordable design and programming costs
- Self-commissioning

The result was the DaySwitch™, a low-cost option for harvesting daylight automatically without sacrificing accuracy. It is inexpensive to manufacture and installs in individual light fixtures.



The DaySwitch installs in two easy steps. First, the microcontroller is installed inside the luminaire to switch the lamps on and off. Second, the photosensor is connected to the microcontroller via wires and is mounted outside the luminaire to measure daylight levels in the space.



The DaySwitch consists of a microcontroller (top) that switches the luminaire on and off, and a photosensor (bottom) that measures daylight levels and sends a signal to the microcontroller.

## How the DaySwitch™ works

The DaySwitch™ eliminates wasted or unwanted electric light by sensing when sufficient daylight is available to take the place of electric light, and then responds by turning off the fixture. When daylight decreases, the device turns the light back on.

A built-in microcontroller automatically calibrates the DaySwitch™, allowing for self-commissioning and easy installation and maintenance. The design also includes a light-to-frequency photodiode that, together with the microcontroller, provides accuracy over a wide range of light levels (1 to 12,000 lux).

Commercial customers can expect a two- to five-year payback in retrofit applications and a one- to three-year payback when the DaySwitch™ is built into fixtures installed in new construction.

## Sponsors

California Energy Commission

New York State Energy Research and Development Authority