

Lighting Controls Technologies for Energy Reduction in Commercial Applications



Lighting Control Solutions

- Occupancy sensors
 - Wired Sensors
 - Wireless occupancy sensing solutions for retrofits
- Relay control panels
- Daylight harvesting systems
- Intelligent ballast and lighting control system
- Dimming



Why are lighting controls used?

Cost of Energy

- Energy costs have been steadily rising over the years and that trend is expected to continue
- Occupancy sensors and other lighting control technologies are the most cost effective methods of reducing energy used for lighting

Energy Codes

- Almost all state now have requirements for new construction to meet specific energy guidelines and occupancy sensors and lighting controls are part of the solution

LEED Program

- The US Green Building Council has set up standards for both new and retrofit building to meet environment goals.
- Reducing energy used for lighting in one of the criteria for LEED certification

Return on Investment

- Lighting amounts to approximately 50% of all electricity used in commercial structures such as offices, retail and medical facilities.
- Occupancy sensors and lighting controls can dramatically lower energy used for lighting
- Payback times can be reduced to as little as one year

Occupancy Sensor Savings by Use



Occupancy area	Energy savings
Private office	13-50%
Classroom	40-46%
Conference room	22-65%
Restrooms	30-90%
Corridors	30-80%
Storage areas	45-80%

(Data provided by U.S. Environment Protection Agency)

Energy Management Occupancy Sensors

Wall Switch Sensors

- Simple to install
- Cost effective method to add occupancy sensors
- PIR and Multi-Tech
- Single and Dual Relays



Infrared



**Infrared
Adaptive & Photocell**



**Infrared
Dual Relay**



**Multi-Tech Single
and Dual Relay**

Energy Management Occupancy Sensors

Ceiling Mount & Wall Mount

- Allow for wider applications than wall switch sensor
- Can cover wider and larger spaces than wall switch sensor
- Sensor can “see” over barriers or partitions



Infrared



Ultrasonic



Multi-Tech

Wireless Lighting Controls



- Permits installation with no additional wiring
- Some products are self powered-no batteries needed.
- Optimum solution for retro-fit applications
- Saves labor and time on installations
 - Completed system costs are approximately 50% less than wired controls
 - Installation requires 75% less time to install
 - Does minimal disruption to work space during installation

Wireless Value Proposition

- **It's all about...**
 - **The money (ROI)! (for each of us!)**
 - **Green Problem Solving!**



Contractor Value

- Labor savings of up to 75% over hardwire
- Installs in ¼ of the time over other
- Utilizes existing wiring no additional or new required
- Quicker project time = More projects can get done daily!
- Self powered = no batteries = reduced callbacks/maintenance



End User Value

- Energy Savings Annually – Energy Rebates
- Less impact to business during conversion
- No batteries required is maintenance free for reoccurring savings
- More lighting and HVAC control flexibility for additional savings
- Lowest phantom power consumption of any RF product

Relay Controls

Lighting controls for any size application

- Offices
- Warehouses
- Manufacturing
- Healthcare
- Educational
- Military Facilities



Relays control multiple loads automatically for:

- Energy Management
- Security
- Outdoor Lighting

Daylight Harvesting

- An innovative automated control strategy that maximizes the use of natural daylight and minimizes the use of electrical light in response to the variable availability of natural light in a space
- Also known as daylighting control or automatic daylight dimming or switching
- Taking advantage of natural lighting to control and lower energy costs



Benefits of Daylight Harvesting

Benefits:

- Improved environment/productivity
- Increased energy savings
- Code compliance

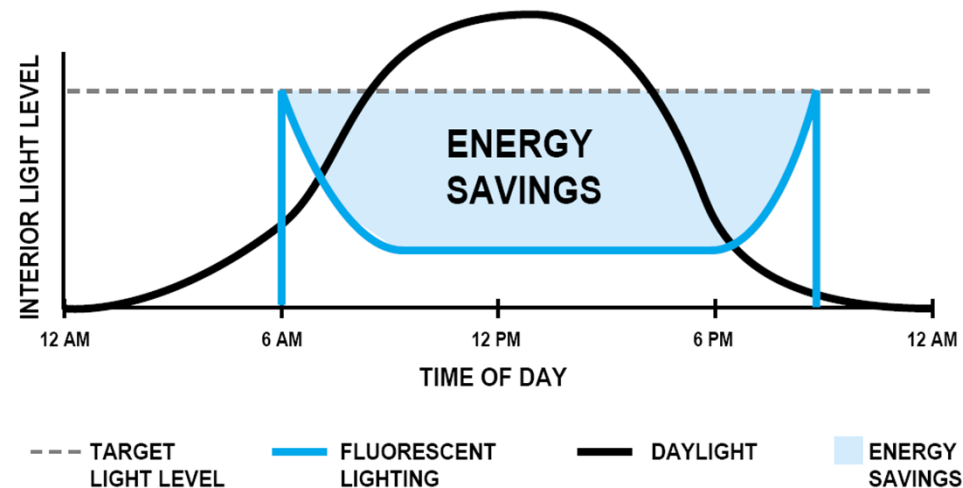


Benefits of Daylight Harvesting

35-60+% energy savings

Lights turned down or off when not required:

- Saves electricity
- Reduces greenhouse gas emissions
- Saves money



Energy Management Daylight Harvesting System Components

Electric lighting systems

- Lamps, ballasts, and fixture placement and spacing

Photosensors

- Ceiling-, wall-, or fixture-mounted device that automatically measures light level entering the space or at the task service, and signals the controller when a threshold is reached (light levels are increasing or decreasing)

Controllers

- A control unit, such as a dimmable ballast or low-voltage relay, that receives the photosensor signal as an input and issues a command to connected dimming or switching controls to adjust light output accordingly

Dimming or switching controls

- Devices that receive the command signal from the controller as an input and as an output adjusts the light output of the controlled electric lighting system by dimming or switching

