

## LIGHTING LAYOUT GUIDE SERIES

CONTROLS GUIDE 1

### KEY TIPS

Make sure to talk with a controls representative to verify compatibility between the control device chosen and the lighting load.

Also be aware of current local codes. Increasingly, energy codes require the installation of control devices in certain applications.

# LIGHTING CONTROLS

## THE OPPORTUNITY

No lighting upgrade is complete without taking steps to avoid unnecessary energy consumption by leaving lights off when they are not needed. By defining the amount of time a lighting system stays on, lighting controls can save a great deal of energy by automatically turning off the system once the occupants leave a space. More energy can be saved, either by manual dimming or by automatic dimming in response to daylight.

## THE SOLUTION

Meet energy management objectives by using controls for lighting systems that provide energy and cost savings through reduced power or reduced time of use. Controls can also enhance the aesthetic appeal of a space with the ability to bring about changes in function by creating emotional appeal, offering flexibility of lighting quality, mood, and color.

## POTENTIAL ENERGY SAVINGS

SPACE TYPE	FACILITY	APPROXIMATE EXPECTED SAVINGS*
Private Office	Occupancy Sensor	38%
	Multilevel Switching	22%
	Manual Dimming	6-9%
	Daylight Harvesting (Sidelighting w/photosensor)	50-70%
Open Office	Occupancy Sensor	35%
	Multilevel Switching	16%
	Daylight Harvesting (Sidelighting w/photosensor)	40%
	Personal Dimming Control	11%
Classroom	Occupancy Sensor	55%
	Multilevel Switching	8%
	Daylight Harvesting (Sidelighting w/photosensor)	50%

\*DiLouie, C. (2013). "Estimating Energy Savings with Lighting Controls". Lighting Controls Association, 16 Sept. 2013. Web. 13 July 2015.



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LIGHTING NETWORK

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## COMMON LIGHTING CONTROLS

TYPE	DESCRIPTION	APPLICATIONS	BENEFITS	LIMITATIONS
<p>Occupancy Sensor (Auto On)</p>	<p>Detects occupancy, turns lights ON automatically. If no motion detected after specified time, lights switched OFF automatically.</p>	<p>Private Offices Open Offices Restrooms Parking Garages Warehouses</p>	<p>No need to turn lights OFF. Saves energy. May be useful if user is physically unable to turn lights ON.</p>	<p>More costly than timers. False OFFs can occur by little movement in area. Lower user acceptance in occupied spaces with stationary tasks. Must be compatible with light sources.</p>
<p>Vacancy Sensor (Manual On)</p>	<p>User turns light ON, light turns OFF automatically. Light stays ON as long as motion is detected. Recommended over Occupancy Sensors)</p>	<p>Private Offices Open Offices Storage Rooms</p>	<p>Light will turn OFF automatically if user forgets. Saves energy.</p>	<p>More costly than Timers. False OFFs can occur by little movement in area. Lower user acceptance in occupied spaces with stationary tasks. Must be compatible with light sources.</p>
<p>Motion Sensor</p>	<p>Turns lights ON instantly when motion is detected. Typically used in exterior security applications.</p>	<p>Walkways Parking Lots Loading Docks Security Lighting</p>	<p>Some models gradually fade OFF once motion is no longer detected. Can be integral to fixture, switch, or stand alone.</p>	<p>If sensor is aimed improperly, false ON occurs too easily.</p>
<p>Photocell / Daylight Sensor</p>	<p>Senses changes in daylight, adjusts interior light levels accordingly.  Continuous dimming provides greater savings and user acceptance.</p>	<p>Grocery Stores Big Box Retail Warehouses All spaces with Daylight Zones, per Energy Codes</p>	<p>Saves energy. Can be installed in the space being controlled, or integral to the fixture(s).</p>	<p>As a stand-alone component, compatibility with CFL's may be problematic. For best operation, must be exposed to bright light. For open loop photosensors, northern orientation is optimal.</p>
<p>Timer</p>	<p>Turns lights ON for selected amount of time, after which the lights turn OFF.</p>	<p>Exterior Lighting</p>	<p>Can be inexpensive. Electronic versions can be programmable and will adjust for time changes.</p>	<p>Advanced electric models adjust automatically for variations of day/night cycles, and seasonal time changes.</p>
<p>Dimmer</p>	<p>User has the ability to vary the light levels in the space.</p>	<p>Auditoriums Classrooms Conference Rooms Museums Restaurants</p>	<p>Can be inexpensive. Fairly easy to install. Flexible light levels. Saves energy.</p>	<p>Must be compatible with lamp type, i.e., low voltage, line voltage, fluorescent, LED. Fluorescent dimming is more expensive. Various dimmer/light combinations may produce different dimming experiences, so mockup of desired combination is encouraged.</p>
<p>Scene Controller</p>	<p>In conjunction with dimming system, dims all lighting loads in a space with the touch of a button.</p>	<p>Auditoriums Classrooms Conference Rooms Restaurants</p>	<p>Multiple lighting 'scenes' can be programmed by user. Scenes at levels below full output will save energy.</p>	<p>More expensive than individual dimmers but, considerably cheaper than whole building Energy Management System.</p>
<p>Plug Load Controller</p>	<p>Turns plug load devices like portable task lights, ON and OFF based on occupancy, using personal PIR sensor.</p>	<p>Open Offices Private Offices</p>	<p>Programmable time delay up to 30 minutes. Saves energy.</p>	<p>Coverage is dependent on placement of sensor. PIR technology only operates in line of sight, so sensor must 'see' occupant in order to turn/keep devices ON. If device is used incorrectly, could cause cellphone or computer chargers to turn OFF unexpectedly.</p>