LIGHTING CONTROLS

POTENTIAL ENERGY SAVINGS CHART

This chart is intended for use by lighting professionals and shows potential estimated savings for lighting controls only. The savings estimates shown do not include the additional savings that can be achieved by upgrading to more energy-efficient lamps and ballasts.

Photos	Control device	Description	Common applications	Average potential energy savings	Comments
	Personal control dimmer	Allows users to manually adjust the light levels in a space.	• Classrooms • Restaurants • Conference rooms • Museums • Private offices • Auditoriums	31%*	Device must be compatible with lamp source (e.g. low voltage, fluorescent, LED)
	Occupancy sensor (auto-on) Single gang box	Detects occupancy, turning lights ON automatically. If no motion is detected after a specified length of time, lights switch OFF automatically.	• Private offices • Open offices • Restrooms • Storage areas • Break rooms • Warehouses • Parking garages	24%*	Many Occupancy Sensors can also behave as a Vacancy Sensor depending upon how it is programmed. Match device type and technology (e.g. Passive Infrared, UltraSonic, Dual Tech, Microphonic) to device location (e.g. wall, ceiling fixture mount) to prevent false OFFs.
	Occupancy sensor (auto-on) Wall	Detects occupancy, turning lights ON automatically. If no motion is detected after a specified length of time, lights switch OFF automatically.	• Private offices • Open offices • Restrooms • Storage areas • Break rooms • Warehouses • Parking garages	24%*	Many Occupancy Sensors can also behave as a Vacancy Sensor depending upon how it is programmed. Match device type and technology (e.g. Passive Infrared, UltraSonic, Dual Tech, Microphonic) to device location (e.g. wall, ceiling fixture mount) to prevent false OFFs.
	Occupancy sensor (auto-on) Ceiling	Detects occupancy, turning lights ON automatically. If no motion is detected after a specified length of time, lights switch OFF automatically.	• Private offices • Open offices • Restrooms • Storage areas • Break rooms • Warehouses • Parking garages	24%*	Many Occupancy Sensors can also behave as a Vacancy Sensor depending upon how it is programmed. Match device type and technology (e.g. Passive Infrared, UltraSonic, Dual Tech, Microphonic) to device location (e.g. wall, ceiling fixture mount) to prevent false OFFs.
	Occupancy sensor (auto-on) In-fixture	Detects occupancy, turning lights ON automatically. If no motion is detected after a specified length of time, lights switch OFF automatically.	• Private offices • Open offices • Restrooms • Storage areas • Break rooms • Warehouses • Parking garages	24%*	Many Occupancy Sensors can also behave as a Vacancy Sensor depending upon how it is programmed. Match device type and technology (e.g. Passive Infrared, UltraSonic, Dual Tech, Microphonic) to device location (e.g. wall, ceiling fixture mount) to prevent false OFFs.

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	Electronic time clock	Keeps lights ON for a specified length of time after which the lights are automatically turned OFF.	• Landscape/facades • Parking lot/garages • Auto dealerships • School/business campuses • Malls • Auditoriums	24 - 28%*	Ensure device operates all lamp sources you are trying to control.
	Bi-level switching	Device which can manually, automatically, or in combination, provide two levels of lighting power in a space (not including off).	• Warehouses • Cold storage • Private offices • Open offices • Break rooms	31%	Can be jarring to occupants in space when changing light levels.
	Wireless on/off/ switch	Devices providing manual control of lighting loads in response to wireless sensors and controls.	• Conference rooms • Classrooms	31% - 36%*	
	Pre-set scene selection	Device which can be programmed to dim lighting loads in a space with the touch of a button.	• Conference rooms • Classrooms • Restaurants • Hospitality	31% - 36%*	Programming last scene to ALL OFF is natural choice for most users.
	Daylighting control	Devices which sense changes in daylight, then adjust interior light levels accordingly.	• Open offices • Private offices • Big box retail • Any location where required by energy code	28% - 36%*	Open Loop sensor: measures only the daylight contribution. Closed Loop sensor: measures both natural and artificial light.
	Energy management systems	Device designed to program, monitor, and control the lighting, and all other mechanical systems in a building.	• Whole buildings • School/business campuses	24-38%*	Proper commissioning is a must for greatest savings potential.
	Plug load control	Turns plug load devices (e.g. desk lamps, personal heaters, monitors) ON or OFF based upon occupancy.		15-50%**	Operates best with line of sight to occupant when using PIR technology.

Notes:

- *Proper commissioning along with end-user training and periodic recalibration is essential to achieving maximum energy savings.*
- *Computer simulations of lighting controls savings tend to significantly overestimate (by at least 10 percent) the average savings obtainable from daylighting in actual buildings.*

Sources:

Williams, A. et al, 2012 Lighting Controls in Commercial Buildings, Leakos, pages 161-180.

**Moorefield, L., B. Frazer and P. Bendt, Ph.D. 2011. Office Plug Load Field Monitoring Report. California Energy Commission, PIER Energy Related Environmental Research Program. CEC-500-2011-010.*