Total Light Management™

Save energy in the right light

LUTRON®

save energy with Lutron™ ®

Total Light Management™

Lutron® solutions control the light in any space and can improve productivity, save up to 60%[1] of lighting energy, and reduce operating costs—and may deliver a payback of 3 years.



Lutron solutions are completely expandable—from a single room to hundreds of rooms in a building system.

The benefits of light control

Save energy and protect the environment

Lutron light control solutions can save significant amounts of energy when the appropriate light control strategies are applied.

Corporations and universities using Lutron systems regularly report reducing lighting energy usage by 60%[1]. These major reductions in energy use can shrink a building's carbon footprint, lower greenhouse gas emissions, and reduce nighttime light pollution.

Increase productivity and comfort

Proper lighting is beneficial for employees working in an office space. The improved comfort and workplace satisfaction brought by daylighting, task-appropriate electric lighting, and individual lighting control can result in increased productivity.[2]

Save money

Improve the bottom line by increasing employee productivity, reducing energy and labor costs, as well as maintenance and operating costs associated with ongoing facility management activities, such as re-lamping.

Sources can be found on page 17.

Lutron® light control: Maximize energy savings

Total Light Management™ can save more electricity than any other building system.

Because lighting uses more electricity than any other building system,[3] Lutron lighting control gives building owners and facility managers the power to save more electricity than any other control technology at their disposal.[1]

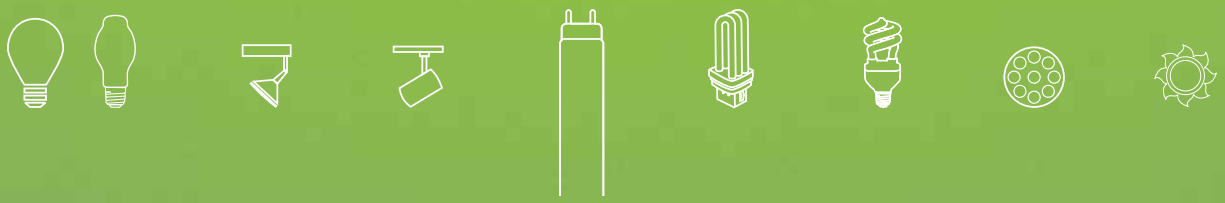
The basics:

Dimming saves energy
For every percentage reduction in lighting levels using a dimmer, there is a nearly equal reduction in the energy usage of the dimmed light source.

Sensors reduce lighting electricity
Occupancy/vacancy sensors turn lights on when a space is occupied and off or dimmed when it is vacant. Lutron offers sensors with patented XCT™ sensing technology to detect minor motion.

Daylight sensors continually measure ambient daylight and adjust lighting levels to reduce unnecessary electric lighting and provide even illumination throughout a space.

Lutron solutions work with a broad range of light sources: incandescent, halogen, low-voltage, fluorescent, LED and daylight



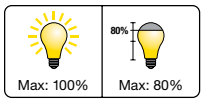
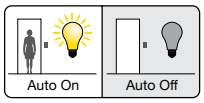
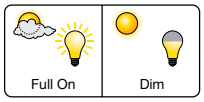
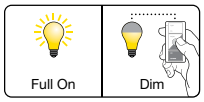
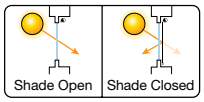
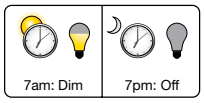
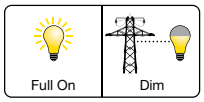
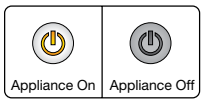
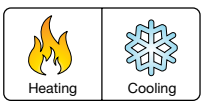
Sources can be found on page 17.

Energy-saving light control strategies

Combine light control strategies to maximize efficiency

When dimming is used in combination with Lutron sensors the system can deliver lighting energy savings up to 60%[1]. Add solar shading for a solution that provides additional savings from a reduction in HVAC.

Energy-saving light control strategies

Strategy		Potential savings
	**High-end trim** sets the maximum light level based on customer requirements in each space.[4]	10–30% Lighting
	**Occupancy/vacancy sensing** turns lights on when occupants are in a space and off when they vacate the space.[5]	20–60% Lighting
	**Daylight harvesting** dims electric lights when daylight is available to light the space.[6]	25–60% Lighting
	**Personal dimming control** gives occupants the ability to set the light level.[7]	10–20% Lighting
	**Controllable window shading** moves shades to reduce glare and solar heat gain.[8]	10–20% Cooling
	**Scheduling** provides scheduled changes in light levels based on time of day.[9]	10–20% Lighting
	**Demand response** automatically reduces lighting loads during peak electricity usage times.[10]	30–50% During peak period
	**Plug load control** automatically turns off loads after occupants leave a space.[11]	15–50% of Controlled Loads
	**HVAC integration** Controls heating, ventilation, and air conditioning systems through contact closure.[12]	5–15% HVAC

Sources can be found on page 17.

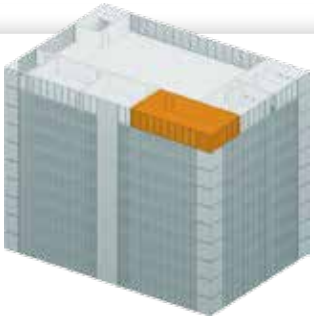
Expandable, energy-saving light control solutions

Standalone solutions

- Simple, standalone light controls that are perfect for retrofit applications with easy installation and setup
- The simplest and lowest-cost way to start saving energy

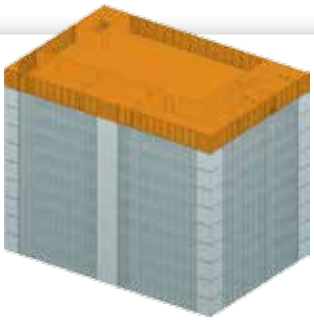
Single-space solutions

- Combine wireless occupancy sensors, daylight sensors, and dimming controls for a simple lighting system that saves energy and improves productivity
- Quick and easy solution for new construction or retrofit application



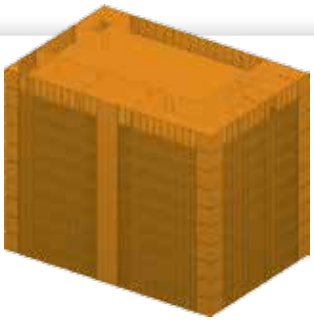
Small area solutions

- Combine light and shade control to build wireless mini-systems that improve the usability of a multi-purpose space and save more energy



Multiple room/Entire floor solutions

- Expand the system with digitally addressable dimming ballasts for significant yearly savings from reduced energy costs, increased lamp life, and lower maintenance costs
- Reassign lighting fixture groups as floorplan changes, with no need for rewiring



Entire building/Campus solutions

- Manage, monitor, and report on all the lighting energy usage in a building for optimal energy performance and increased productivity, while minimizing maintenance and operating costs

Standalone solutions

Easily retrofit standalone, energy-saving light control solutions to improve employee comfort and productivity.

- **Dimmers**
  Every time you dim the lights you save energy. We offer dimmers to control all light sources, including incandescent, halogen, and dimmable compact fluorescent bulbs, as well as LEDs.

Potential lighting energy savings

15%[7]

- **Occupancy/vacancy sensing switch**
  An occupancy/vacancy sensing switch saves energy by ensuring lights are off when a room is unoccupied.

Potential lighting energy savings

30%[5]

- **Dual-circuit occupancy/ vacancy sensing switch**
  This sensing switch provides control of two circuits from one switch and is ideal for bi-level switching. It also helps meet codes such as ASHRAE 90.1 2010.

Potential lighting energy savings

30%[5]

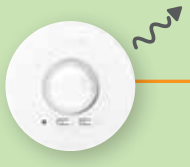
Energy-saving strategies

Occupancy/vacancy sensing[5]	20–60% lighting
Personal dimming control[7]	10–20% lighting

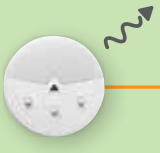
Sources can be found on page 17.

Single-space solutions

switches + sensors + modules



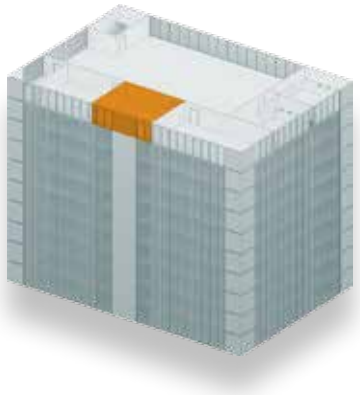
Radio Powr Savr™ wireless occupancy/vacancy sensor
provides energy savings by ensuring lights are off when rooms are unoccupied



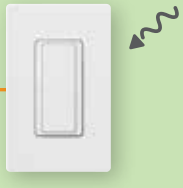
Radio Powr Savr wireless daylight sensor
increases energy savings by automatically turning off electric light when daylight is sufficient

PowPak® plug-in appliance module
receives commands from sensors or wireless controls to conveniently save energy by turning off phantom loads (devices that draw power even when turned off or idling); device located on the floor under the desk

Energi TriPak® solutions are another simple and cost-effective way to start saving energy today. The Radio Powr Savr wireless occupancy sensor and Maestro Wireless switch combination offers an energy-saving solution that installs in minutes and saves money. Add a daylight sensor to reduce electric light usage when daylight is available. Add PowPak appliance modules to control appliance loads or desk lamps.



Maestro Wireless® lamp dimmer
provides manual control and dims table lamps in response to wireless sensors and controls



Maestro Wireless switch
(120/277V, no neutral wire)
links multiple dimmers or switches to Radio Powr Savr sensors (10 devices total) to control additional zones of light in a space

Alternate solution:

NEW PowPak dimming module with EcoSystem®
can incorporate digital ballasts and LED drivers to add dimming control to a single space (mounted above ceiling)

Energy-saving strategies

▶ Occupancy/vacancy sensing [5]	20–60% lighting
▶ Daylight harvesting [6]	25–60% lighting
▶ Plug load control [11]	15–50% of controlled load

Potential lighting energy savings

45%

Sources can be found on page 17.

Small area solutions

controls + sensors + ballasts + shades

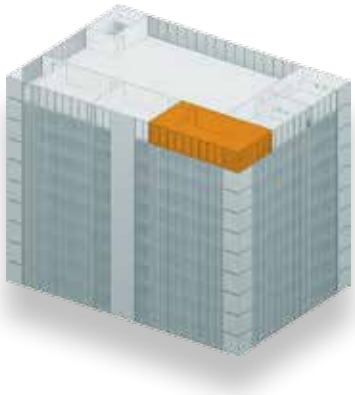
Radio Powr Savr™ wireless occupancy/vacancy sensor
provides energy savings by ensuring lights are off when rooms are unoccupied

Radio Powr Savr wireless daylight sensor
gradually dims lights in response to the amount of available daylight

Sivoia® QS Wireless shades
move quietly to eliminate glare and reduce heating and cooling costs

Pico® wireless controls
provides tabletop, handheld, or wall-mount controls that adjust lights or shades from anywhere in the room

Combine light and shade control to build wireless mini-systems that improve the usability of a multi-purpose space and save more energy. These mini-systems can be easily expanded at any time to control multiple rooms or larger spaces and are suitable for both new construction and retrofit solutions.



EcoSystem® H-Series digital dimming ballasts
provides cost-effective, digitally addressable 1% dimming ballasts that work with wired and wireless sensors and controls—ideal for any application, both retrofit and new construction

Hi-lume® A-Series LED driver
allows LED driver to offer smooth, continuous 1% dimming for virtually any LED fixture, whether it requires constant current or constant voltage

GRAFIK Eye® QS Wireless with EcoSystem
provides customizable preset light control with built-in timeclock that allows users to adjust the lights and shades for any task and save energy at the touch of a button

Energy-saving strategies

▶ High-end trim [4]	10–30% lighting
▶ Occupancy/vacancy sensing [5]	20–60% lighting
▶ Daylight harvesting [6]	25–60% lighting
▶ Personal dimming control [7]	10–20% lighting
▶ Controllable window shades [8]	10–20% cooling
▶ Timeclock scheduling [9]	10–20% lighting

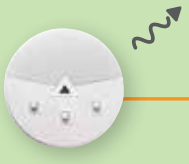
Potential lighting energy savings

60%

Sources can be found on page 17.

Multi-room and entire floor systems

controls + sensors + ballasts + shades

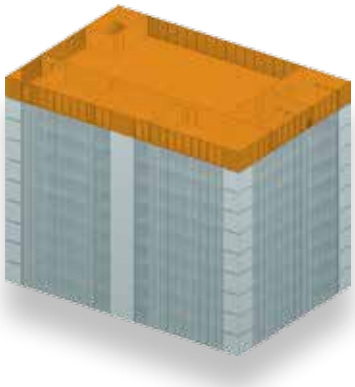


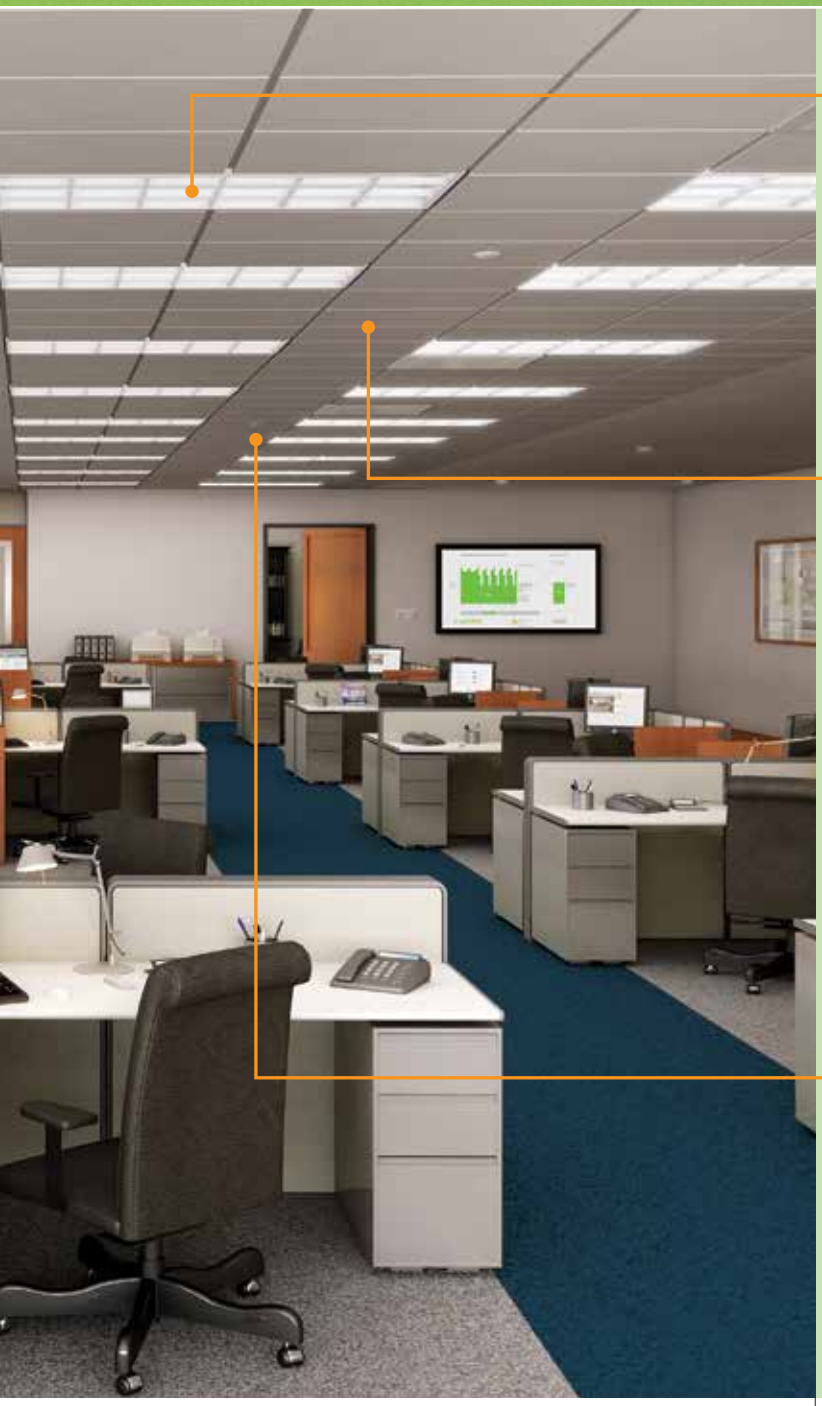
Radio Powr Savr™ wireless daylight sensor
gradually dims lights in response to the amount of available daylight

Sivoia® QS Wireless shades
adjust quietly to eliminate glare and reduce heating and cooling costs

Pico® wireless controls
provides tabletop, handheld, or wall-mount controls that adjust lights or shades from anywhere in the room

Tie multiple rooms together, up to an entire floor, with these flexible solutions. Integrate daylight and occupancy sensors for significant energy savings. Easily design, install, and reconfigure to meet the changing needs of any space.





EcoSystem® H-Series digital dimming ballasts
provides cost-effective, digitally addressable 1% dimming ballasts that work with wired and wireless sensors and controls—ideal for any application, both retrofit and new construction

Energi Savr Node™ with EcoSystem
allows for easy integration of sensors and EcoSystem digital ballasts. Energi Savr Node with EcoSystem communicates with wireless devices through the QS sensor module (above right) to minimize wiring for easy installation

Energi Savr Node for 0–10 V dimming and switching applications are also available

Radio Powr Savr wireless occupancy and vacancy sensor
provides energy savings by ensuring lights are off when rooms are unoccupied

Energy-saving strategies

▶ High-end trim [4]	10–30% lighting
▶ Occupancy/vacancy sensing [5]	20–60% lighting
▶ Daylight harvesting [6]	25–60% lighting
▶ Personal dimming control [7]	10–20% lighting
▶ Controllable window shades [8]	10–20% cooling
▶ Timeclock scheduling [9]	10–20% lighting

Potential lighting energy savings

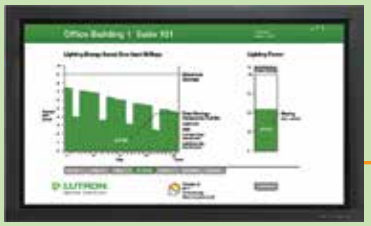
60%

Sources can be found on page 17.

Whole building solutions

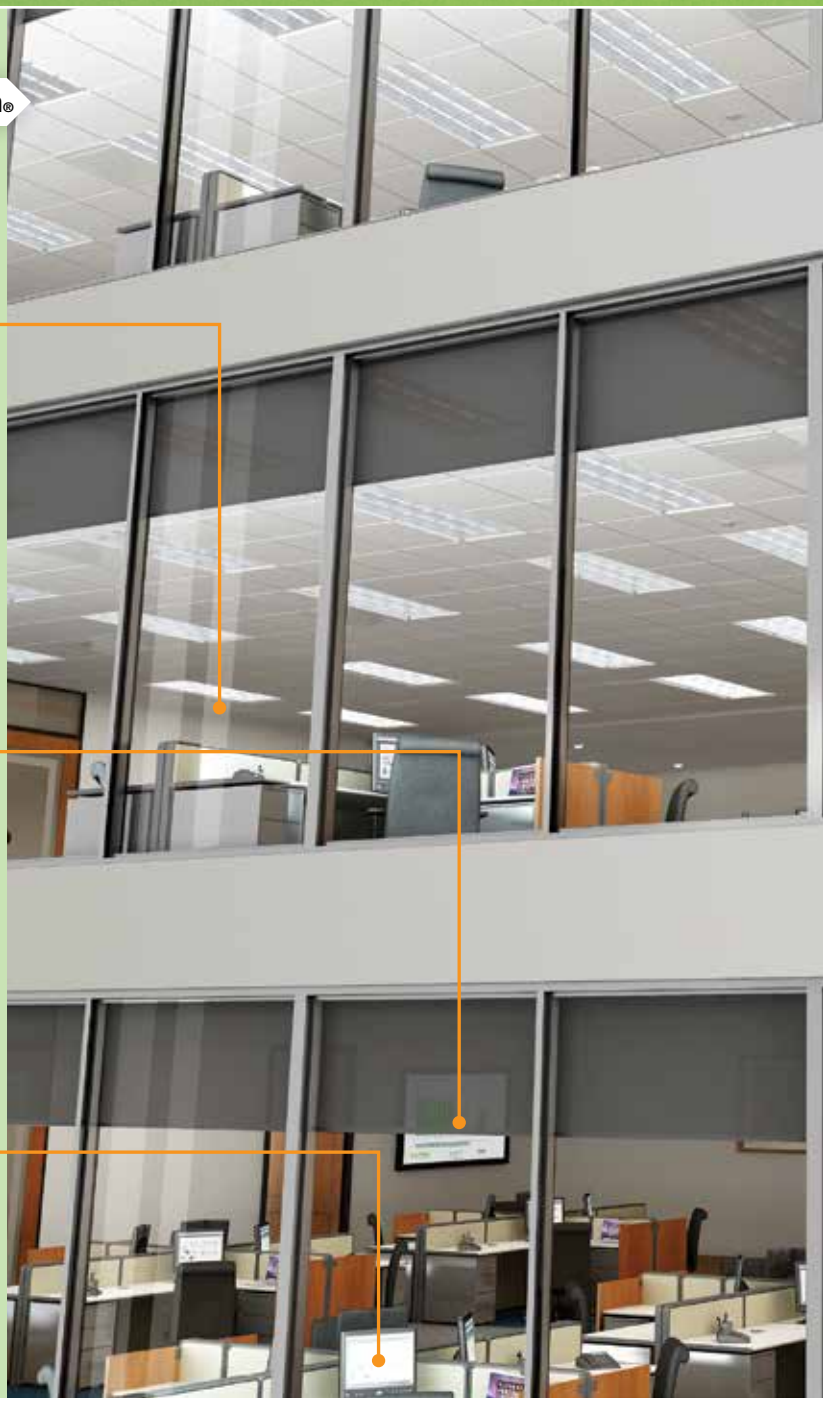
controls + sensors + ballasts + shades + Quantum®

Quantum hub
connects all system components for Total Light Management™ of an entire building or campus

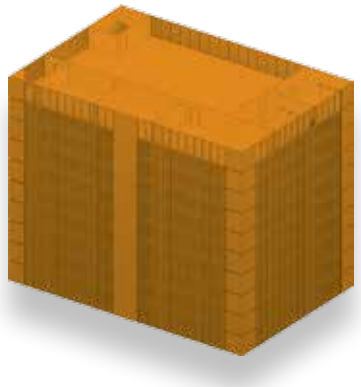


GreenGlance®
energy-saving display software exhibits a real-time snapshot and historic view of the energy savings delivered by Quantum solutions

Personna® PC
gives occupants control of their lighting fixtures and automated window treatment from any device that can run a web browser



Easily expand systems by adding Quantum functionality to control multiple floors, a whole building, or an entire campus.
Facility managers can configure, control, manage, monitor, and report on all the lighting in a building from a central location. By maximizing the use of daylight and minimizing waste, a Quantum system allows you to save significant amounts of energy and money.

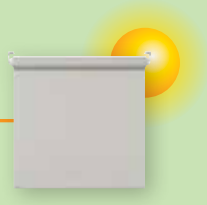


Q-Admin™ software
allows facility managers to control lights and shades, set timeclocks, and configure, monitor, analyze, and report on the light in an entire building

IntelliDemand™ loadshed
IntelliDemand loadshed allows facility managers to shed a percentage of the system lighting output to reduce peak demand charges and comply with demand response programs.

Q-Control+ app

Provides a simple user interface for end-users, facility managers, and lighting designers to control and monitor the lights and shades from anywhere in the building using a mobile iPad® platform.



Hyperion™ solar-adaptive shading with Sivoia® QS shades
creates a shade adjustment schedule based on the angle of the sun to effectively manage daylight entering each façade. Shades maximize daylight harvesting and prevent heat glare from entering a space.

Energy-saving strategies

▶ High-end trim [4]	10–30% lighting
▶ Occupancy/vacancy sensing [5]	20–60% lighting
▶ Daylight harvesting [6]	25–60% lighting
▶ Personal dimming control [7]	10–20% lighting
▶ Controllable window shades [8]	10–20% cooling
▶ Timeclock scheduling [9]	10–20% lighting
▶ Demand response [10]	30–50% during peak period

Potential lighting energy savings

60% +

Sources can be found on page 17.

iPad is a trademark of Apple® Inc., registered in the U.S. and other countries.

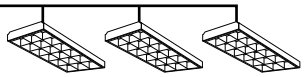
How it all works together

Key

- QS link (RS-485)
- Interprocessor communication link
- Power panel link (RS-485)
- EcoSystem® loop
- Building Ethernet network
- Wireless Radio Frequency (RF) connection
- Line voltage

To additional floors

Standalone and single-space solutions



Switched lighting loads

Maestro Wireless® switch

Radio Powr Savr™ wireless occupancy sensor

OR

PowPak® relay module with Softswitch®

Whole building solutions

To Internet

GreenGlance®, on a client PC and LCD display

Q-Admin™ on client PC

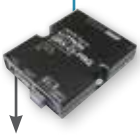
Q-Manager™ server

Quantum® hub

To BMS by others (BACnet IP)

QS smart panel power supply

Hyperion™ solar adaptive shading



RS232/ Ethernet interface

To Non-Lutron devices:

- touchscreens
- A/V equipment
- HVAC equipment

To XP switching panel loads:

- exterior lighting
- non-dim ballasts (hallways, bathrooms, stairwells)

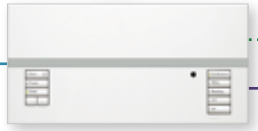
XP switching panels

To GP/LP dimming panel loads:

- lobbies and atriums
- auditoriums
- training rooms
- cafeterias

GP/LP dimming panels

Small area solution



GRAFIK Eye® QS Wireless with EcoSystem

seeTouch® QS wallstation

Pico® wireless control

Radio Powr Savr wireless occupancy sensor

Radio Powr Savr wireless daylight sensor

EcoSystem H-Series ballasts

Hi-lume® A-Series LED Driver

QS smart panel power supply

Sivoia® QS shades

Multi-room and entire floor solution

EcoSystem H-Series ballasts

Energi Savr Node™ with EcoSystem

QS sensor module

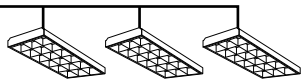
Radio Powr Savr wireless occupancy sensor

seeTouch QS wallstation

Pico wireless control

Radio Powr Savr wireless daylight sensor

Energi Savr Node with Softswitch



Switched lighting loads

QS smart panel power supply

Sivoia QS shades

LEED®, incentives, codes, and standards

Lutron light controls help meet the requirements for LEED, local and federal energy codes, and other incentives.

LEED 2009

Lutron light management solutions contribute toward earning LEED points.

LEED—Leadership in Energy and Environmental Design—is a rating system administered by the United States Green Building Council (USGBC). LEED provides a national standard for what constitutes a green building. It offers a set of scientifically based performance criteria and a point system for LEED project certification.

Lutron solutions can make a considerable contribution to the minimum of 40 points required for LEED certification.

Lutron solutions can contribute to:

- 40 or more of the 110 possible points in LEED NC (new construction), CS (core and shell development) or S (schools)
- 35 of the 110 possible points in LEED CI (commercial interiors)
- 39 of the 110 possible points in LEED EB (existing buildings)

For more information about the LEED program visit www.usgbc.org.

Incentives

Lutron products and solutions in your building may be eligible for prescriptive or custom utility incentives and rebates.

Utility rebates
To help building owners and professionals choose energy-efficient products, Lutron offers a utility incentives website, drawing attention to rebates and incentives that promote energy efficient lighting systems.

To view the utility incentives available in your state, go to www.lutron.com/epact or contact your local provider.

Tax incentives
Effective January 1, 2006 to December 31, 2013, EPAct 2005 (Energy Policy Act of 2005) provides a tax break incentive for energy efficient lighting. Lutron controls provide energy savings and help to meet these requirements.

For additional questions or comments, please email incentives@lutron.com.

Building energy codes/standards

Lutron products and solutions meet many building codes and standards for light control in commercial buildings.
Standards and codes such as ASHRAE 90.1, IECC (International Energy Conservation Code), and California's Title 24 all have mandatory requirements for lighting such as those in the table below:

Requirement	Lutron Solution
Automatic lighting shut-off	occupancy sensors or timeclocks
Multi-level lighting (light level reduction)	dimming, scene/zone controls
Space control	wallbox dimmers, scene/zone controls
Daylight zone control	EcoSystem® dimming ballast with daylight sensors

To learn about code requirements in your state and the Lutron solutions that apply, go to www.lutron.com/energycodes.

Sources

1 Compared with manual (non-automated) controls, up to 60% lighting energy savings is possible on projects that utilize all of the lighting control strategies (occupancy sensing, high-end trim, personal control and daylight harvesting). Actual energy savings may vary, depending on prior occupant usage, among other factors.
2 Light Right Consortium. Research Study on the Effects of Lighting on Office Workers.
3 Energy Information Administration. September 2008. 2003 Commercial building energy consumption survey (CBECS).
4 Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161-180.
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