Lutron energy-saving products

NEW

PowPak® dimming module with EcoSystem (actual size)

Radio Powr Savr™ occupancy/vacancy sensor (actual size)

Pico® wireless control (actual size)

Quick Install Energy Solutions

Featuring Energi TriPak®

Hong Kong Edition

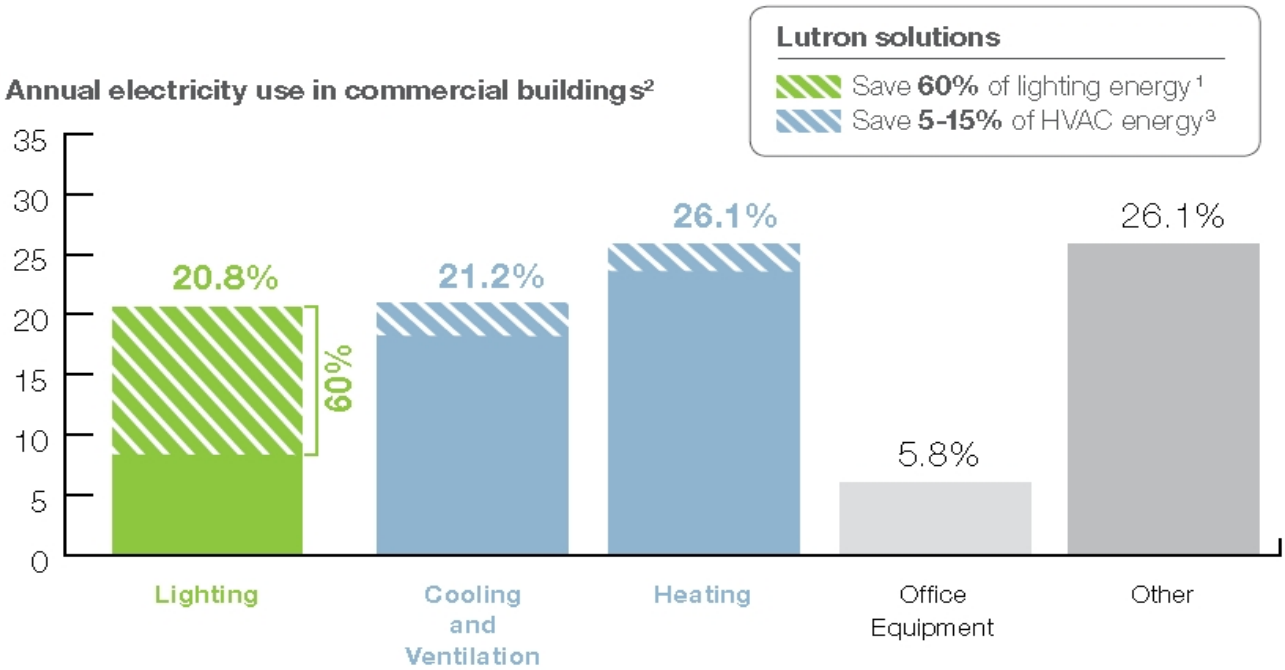
LUTRON®

save energy with Lutron™ ®

Energi TriPak®

Energi TriPak is a family of wireless energy-saving products featuring Radio Powr Savr™ sensors, Pico® controls and PowPak® load controllers. These components, when combined:

- save up to 60%[1] of lighting electricity usage
- increase occupant comfort and productivity
- control virtually all loads
- reduce installation and programming costs



Lighting typically accounts for 20.8% of electricity usage in new construction and retrofit commercial applications, which include spaces such as classrooms and offices. These applications benefit from Energi TriPak energy savings through strategies like automatic occupancy/vacancy sensing and daylight harvesting.

Studies show that proper lighting is beneficial to space occupants. By providing task-appropriate lighting and individual lighting control, Energi TriPak improves comfort and occupant satisfaction, resulting in increased productivity.[4]

Energi TriPak requires no additional wiring. The components communicate wirelessly via Lutron's reliable Clear Connect® Radio Frequency (RF) technology. In addition, simple button press programming eliminates the need for factory commissioning.

Sources located on back cover.

Energi TriPak design and application guide

Energi TriPak®

What is Energi TriPak?

Energi TriPak consists of transmitting devices that send out radio frequency (RF) commands to the load controllers. The load controllers receive the RF command and perform the appropriate action based on the information received.

Transmitting devices

Sense

Radio Powr Savr™ wireless sensors

Occupancy/vacancy

Daylight

Adjust

Pico® wireless control

Wall-mount

Tabletop

Hand-held

Load controllers

Conserve

PowPak® load controllers

Dimming module with EcoSystem®

Relay module with Softswitch®

CCO module

PowPak Stairwell Fixture

Lutron® Clear Connect™ Wireless Signal **Sent**

Lutron® Clear Connect™ Wireless Signal **Received**

Benefits and energy-saving control strategies

Ease of installation and programming

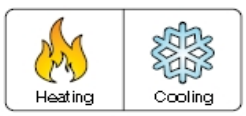
- All points of control are wireless for simple installation with no new wiring
- Simple button programming procedures for all devices

Cost-effective

- Contractor programmable
- Overall labour and cabling costs reduced due to wireless communication – no additional wiring

Save energy and money

Simply incorporate the following energy-saving control strategies:

		Potential savings
	**Occupancy/vacancy sensing** turns lights on when occupants are in a space and off or dimmed when they vacate the space.	20–60% Lighting[1]
	**Daylight harvesting** dims electric lights when daylight is available to light the space.	25–60% Lighting[2]
	**High-end trim** sets the maximum light level based on customer requirements in each space.	10–30% Lighting[3]
	**Personal dimming control** gives occupants the ability to set the light level.	10–20% Lighting[4]
	**Plug load control** automatically turns off loads after occupants leave a space.	15–50%[5] Non-Electronic
	**HVAC integration** controls heating, ventilation and air conditioning systems through contact closure.	5–15%[6] HVAC

[1]Source: VonNieda B, Maniccia D, & Tweed A. 2000. An analysis of the energy and cost savings potential of occupancy sensors for commercial lighting systems. Proceedings of the Illuminating Engineering Society. Paper #43.
[2]Source: Reinhart CF. 2002. Effects of interior design on the daylight availability in open plan offices. Study of the American Commission for an Energy Efficient Enviornment (ACE) Conference Proceedings. To achieve maximum lighting savings, automated shades are utilized.
[3]Source: Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161-180.
[4]Source: Galasiu AD, et al. 2007. Energy saving lighting control systems for open-plan offices: A field study. Leukos. 4(1) pg 7-29.
[5]Source: Ecos. 2011. Commercial office plug load savings assessment. California Energy Commission PIER Program.
[6]Source: Lutron study based on reduction in heating (base 60°F) and cooling (base 55°F) degree days with a 2°F thermostat setback and 60% space un-occupancy. EnergyPlus modeling simulations were conducted and predicted similar savings.

Energi TriPak® application — Public bathroom

In public spaces, such as bathrooms, lighting is often on even when the space is unoccupied. Automatic lighting control with occupancy sensing is an ideal energy-saving lighting solution.

Energy-saving strategies

Occupancy sensing

Potential energy savings:

20-60%

Radio Powr Savr™ ceiling-mount occupancy/vacancy sensor communicates with load controllers to turn lights on or off based on occupancy

Lutron® Clear Connect™ Wireless Signal **Sent**

Lutron® Clear Connect™ Wireless Signal **Received**

PowPak® relay module with Softswitch®
switches loads in response to wireless sensors and controls (mounted in ceiling)

Energi TriPak® application — Private office

For a private office application, personal control of light levels is of utmost importance. Independent research indicates that occupants are up to 15% more productive when they can tailor the lighting to their needs.*

* Light Consortium. Research Study on the Effects of Lighting on Office Workers. http://www.lightright.org.research/index.htm

Energy-saving strategies

Personal control
Occupancy/vacancy sensing
Daylight harvesting
High-end trim

Potential energy savings:

60%

Radio Powr Savr™ daylight sensor
communicates with load controllers to dim or turn lights on or off based on amount of daylight available

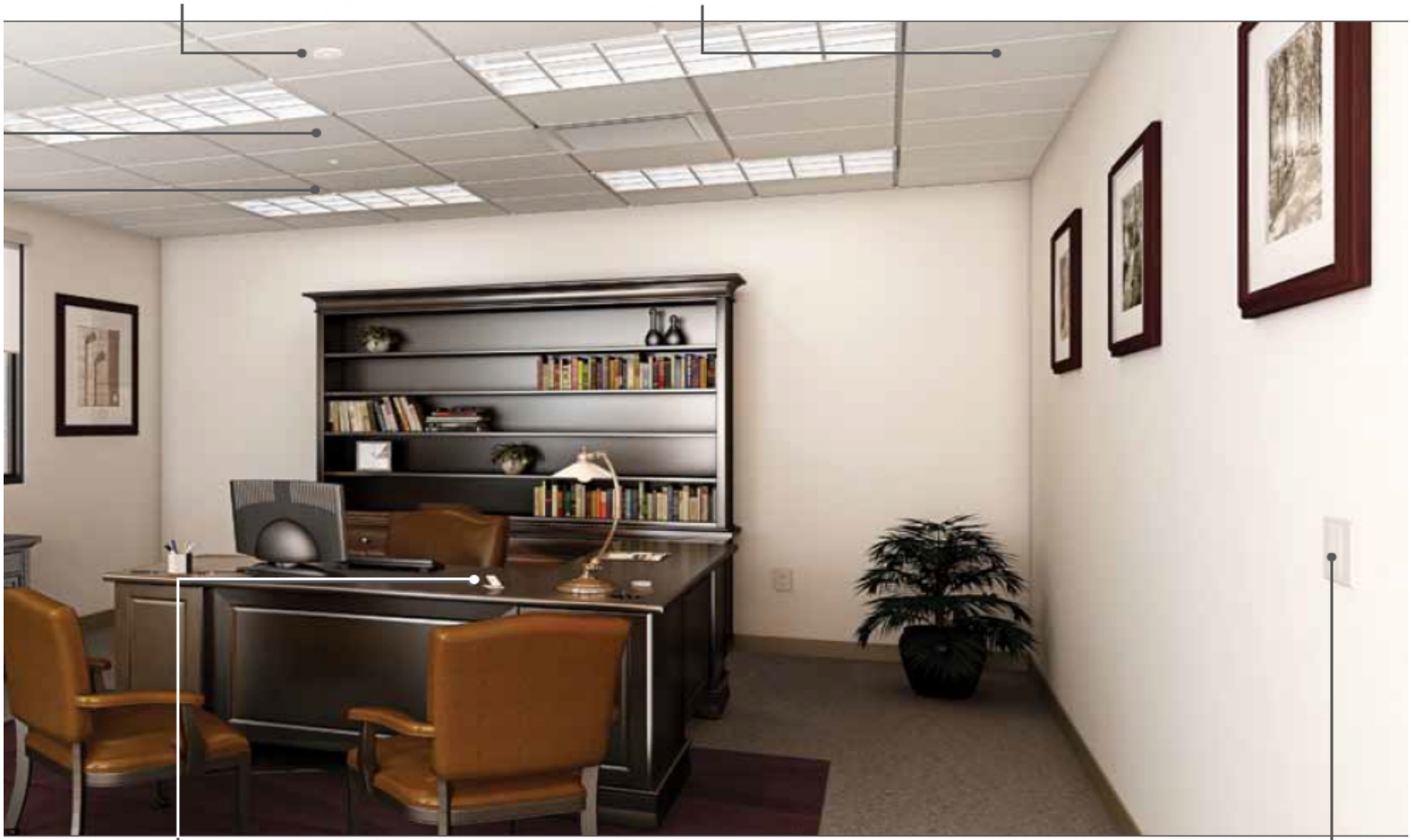
EcoSystem® H-Series digital ballast
combines superior 1% dimming performance and Lutron reliability

Lutron® Clear Connect™
Wireless Signal **Sent**

Lutron® Clear Connect™
Wireless Signal **Received**

Radio Powr Savr ceiling-mount occupancy/vacancy sensor
communicates with load controllers to dim or turn lights on or off based on occupancy

PowPak® dimming module with Ecosystem
dims lighting loads in response to wireless sensors and controls (mounted in ceiling)



Pico® wireless controls
manually control loads with wireless controls that can be placed on the wall or tabletop

Energi TriPak® application — Conference room

A conference room must accommodate a wide range of activities and users. The lighting control must be able adapt to each of the scenarios while being simple and easy to use.

Energy-saving strategies

Personal control
Occupancy/vacancy sensing
Daylight harvesting
High-end trim

Potential energy savings:

60%

PowPak® dimming module with Ecosystem
dims lighting loads in response to wireless sensors and controls (mounted in ceiling)

EcoSystem® 5-Series LED driver
combines guaranteed performance with smooth, flicker-free dimming to 5%

Lutron® Clear Connect™ Wireless Signal **Sent**

Lutron® Clear Connect™ Wireless Signal **Received**

Radio Powr Savr™ daylight sensor
communicates with load controllers to dim or turn lights on or off based on amount of daylight available

Radio Powr Savr corner-mount occupancy/vacancy sensor
communicates with load controllers to dim or turn lights on or off based on occupancy

Pico® wireless control
manually control loads with wireless controls that can be placed on the wall or tabletop

EcoSystem H-Series digital ballast
combines superior 1% dimming performance and Lutron reliability

Energi TriPak® application — Classroom

A best-practice classroom combines energy efficiency with a high quality learning environment. Classroom lighting plays a particularly critical role because of the direct relationship between good lighting and student performance.*

* Phillips, R. W. (1997). Educational Facility Age and the Academic Achievement of Upper Elementary School Students. Unpublished Doctoral Dissertation. University of Georgia.

Energy-saving strategies

Personal control
Occupancy/vacancy sensing
Daylight harvesting
High-end trim

Potential energy savings:

60%

Lutron® Clear Connect™ Wireless Signal **Sent**

Lutron® Clear Connect™ Wireless Signal **Received**

PowPak® dimming module with EcoSystem® dims lighting loads in response to wireless sensors and controls (mounted in ceiling)

Pico® wireless controls manually control loads with wireless controls that can be placed on the wall or tabletop

EcoSystem® H-Series digital ballast
combines superior 1% dimming performance and Lutron reliability

Radio Powr Savr™ daylight sensor
communicates with load controllers to dim or turn lights on or off based on amount of daylight available

PowPak contact closure output module
integrates with HVAC system or other third-party equipment through contact closures, allowing the equipment to respond to wireless commands (mounted in ceiling)

Radio Powr Savr corner mount occupancy/vacancy sensor
communicates with load controllers to dim or turn lights on or off based on occupancy

Energi TriPak® — How to design a system

Define your space

The appropriate control solution is defined by the needs of the space and its occupants. Use the following steps to plan and design an ideal energy-saving solution.

Step 1 Is control of overhead lighting required?

When switching is desired —

Select the control(s) required based on style and load capacity . . . . . **pgs. 14-16**

When dimming is preferred —

Select the EcoSystem® ballast and/or driver when utilising the PowPak® dimming module with EcoSystem . . . . . **pgs. 17-18**

Step 2 Is third-party equipment integration required?

Select the PowPak contact closure output module . . . . . **pg. 19**

Step 3 Is occupancy/vacancy sensing required?

Select the style of the Radio Powr Savr™ occupancy/vacancy sensor based on mounting and coverage requirements . . . . . **pg. 20**

Step 4 Is daylight harvesting required?

Select the Radio Powr Savr daylight sensor..... **pg. 21**

Step 5 Are personal or additional points of control required?

Select the style of the Pico® wireless control required..... **pg. 22**

Step 1a Overhead light control selection

PowPak® relay module

Design statement: The PowPak relay model is designed for spaces where local control is not currently available, but is required.

PowPak relay module dimensions
W: 72 mm
H: 87 mm
D: 32 mm

Lutron® Clear Connect™ Wireless Signal **Received**

Features

- 5 A or 16 A general purpose switch
- Receives input from up to 9 Pico® wireless controls, 6 Radio Powr Savr™ occupancy/vacancy sensors, and 1 Radio Powr Savr daylight sensor via Lutron reliable Clear Connect™ RF technology
- Model available with a dry contact closure output for integration with 3rd party equipment; contact closure output provides occupancy status
- 220-240 V~ input

Benefits

- Save energy with the addition of occupancy sensing, daylight harvesting and personal control without the need for additional wires
- Button press programming to associate the module with the Radio Powr Savr sensors and Pico wireless controls

Mounting

- Mounts through 20 mm knockout on electrical boxes

Models

RMQ-5R-DV-B – 5 A general purpose switch
RMQ-16R-DV-B – 16 A general purpose switch
RMQ-5RCCO1-DV-B – 5 A general purpose switch with (1) contact closure output
RMQ-16RCCO1-DV-B – 16 A general purpose switch with (1) contact closure output

PowPak® dimming module with EcoSystem®

Design statement: Specify the PowPak dimming module with EcoSystem for the application that requires dimming of fluorescent and LED fixtures and simple reconfiguration of lighting zones.

PowPak dimming module with EcoSystem dimensions
W: 72 mm
H: 87 mm
D: 32 mm

Lutron® Clear Connect™ Wireless Signal **Received**

Features

- Controls up to 32 EcoSystem H-Series ballasts, Hi-lume A-Series LED drivers and/or EcoSystem 5-Series LED drivers
- Receives input from up to 9 Pico wireless controls, 6 Radio Powr Savr occupancy/vacancy sensors, and 1 Radio Powr Savr daylight sensor via Lutron reliable Clear Connect RF technology
- Lutron EcoSystem technology facilitates individual ballasts addressing, connection of multiple control devices, and control of ballasts individually or in groups
- 220-240V~ input

Benefits

- Facilitates simple reconfiguration of the space without having to move a single wire
- Dimming saves money and energy—for every percentage reduction in lighting levels, there is a nearly equal reduction in the energy usage of the dimmed light source
- Additional savings can be achieved through high-end trim, occupancy sensing, daylight harvesting and personal control without the need for additional wires
- Button press programming means no commissioning required

Mounting

- Mounts through 20mm knockout on electrical boxes

Models

RMQ-ECO32-DV-B – controls up to 32 EcoSystem H-Series ballasts, Hi-lume A-Series LED drivers and/or EcoSystem 5-Series driver

For more information on ballasts and LED drivers, please contact the local Lutron office.

PowPak Stairwell Fixture

Design statement: Specify a PowPak Stairwell Fixture for significant energy savings in stairwells.

Stairwell fixture
W: 1299 mm
H: 111 mm
D: 98 mm

Lutron® Clear Connect™
Wireless Signal **Received**

Features

- 1 or 2 lamp – T5-HE or T5-HO
- 220-240 V~ input voltage
- Ceiling or surface mount
- Field adjustable unoccupied light level (1%-50%) and occupied light level (40%-100%)

Benefits

- Ability to save over 80% of lighting energy usage
- Group multiple fixtures to a single occupancy sensor and/or multiple occupancy sensors to a single fixture
- Wireless sensors allow for sensor mounting in locations for best coverage with no additional wiring
- Quick return on investment

Mounting

- Ceiling or wall surface mount

Models

FXSW12814HDU51Q – 1 lamp, T5 28W stairwell fixture
FXSW22814HDU51Q – 2 lamp, T5 28W stairwell fixture
FXSW15414HDU51Q – 1 lamp, T5 54W stairwell fixture
FXSW25414HDU51Q – 2 lamp, T5 54W stairwell fixture

Step 1b Ballast/LED driver selection

EcoSystem® H-Series Ballast

Design statement: Utilise EcoSystem H-Series ballasts when using the PowPak® dimming module with EcoSystem to continuously dim fluorescent lamps to 1%.

EcoSystem H-Series ballast dimensions
W: 30 mm
H: 25 mm
L: 359 mm

Features

- Continuous, flicker-free dimming from 100% to 1% for T5 and T5HO lamps
- Guaranteed performance with all EcoSystem controls
- Programmed rapid-start design preheats lamp cathodes ensures full-rated lamp life while dimming and cycling
- Lamps turn on to any dimmed level without going to full brightness
- Operates at 220 – 240 VAC, 50/60 Hz (CE marked)

Benefits

- With models available for T5, and T5HO, use EcoSystem H-Series ballasts throughout any space
- Digitally configured zones can be changed without re-wiring
- Responds to the Radio Powr Savr wireless daylight and occupancy/vacancy sensors, and Pico wireless controls
- 100% performance tested and burned in at factory

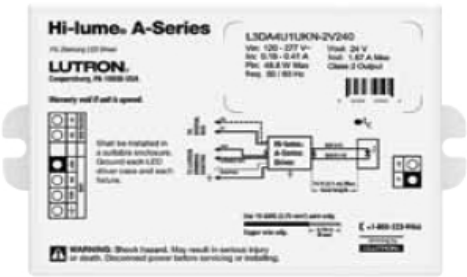
Models

EHDT514ME110 – T5, 14W, 1-lamp, 220-2240V, 1.0 BF
EHDT514ME210 – T5, 14W, 2-lamp, 220-2240V, 1.0 BF
EHDT521ME110 – T5, 21W, 1-lamp, 220-2240V, 1.0 BF
EHDT521ME210 – T5, 21W, 2-lamp, 220-2240V, 1.0 BF
EHDT524ME110 – T5HO, 24W, 1-lamp, 220-2240V, 1.0 BF
EHDT524ME210 – T5HO, 24W, 2-lamp, 220-2240V, 1.0 BF
EHDT528ME110 – T5, 28W, 1-lamp, 220-2240V, 1.0 BF
EHDT528ME210 – T5, 28W, 2-lamp, 220-2240V, 1.0 BF
EHDT539ME110 – T5HO, 39W, 1-lamp, 220-2240V, 1.0 BF
EHDT539ME210 – T5HO, 39W, 2-lamp, 220-2240V, 1.0 BF
EHDT554ME110 – T5HO, 54W, 1-lamp, 220-2240V, 1.0 BF
EHDT554ME210 – T5HO, 54W, 2-lamp, 220-2240V, 1.0 BF

EcoSystem® 5-Series LED driver

Design statement: Utilise EcoSystem 5-Series LED drivers when using the PowPak® dimming module with EcoSystem for continuous, flicker-free dimming of LEDs to 5%.

EcoSystem 5-Series LED driver dimensions
W: 54 mm
H: 31 mm
L: 215 mm



Hi-lume A-Series LED driver dimensions (Case type K)
W: 76 mm
H: 25 mm
L: 124 mm

Hi-lume A-Series LED driver dimensions (Case type M)
W: 30 mm
H: 25 mm
L: 362 mm

Features – EcoSystem 5-Series LED driver
- Continuous, flicker-free constant current dimming from 100% to 5%
- Supports all standard current levels (up to 35 Watts)
- Guaranteed performance with all EcoSystem controls
- Independently mounted driver
- Lamps turn on to any dimmed level without going to full brightness
- Operates at 220 – 240 VAC, 50/60 Hz (CE and ENEC marked)

Features – Hi-lume A-series LED driver
- Continuous, flicker-free dimming from 100% to 1%
- Supports a wide range of current and voltage levels (up to 53W)
- Guaranteed performance with all EcoSystem controls
- Lamps turn on to any dimmed level without going to full brightness
- Operates at 120-277 VAC, 50/60 Hz (UL recognized)

Benefits
- Works with the most common LED fittings (downlights, coves, base lighting, etc)
- Digitally configured zones can be changed without re-wiring
- Works with the Radio Powr Savr™ wireless daylight and occupancy/vacancy sensors, and Pico® wireless control through the PowPak EcoSystem
- Rated lifetime of 50,000 hours
- 100% performance tested and burned in at factory
- Patented thermal foldback mechanism protects the driver
- Automatic device replacement

Models
For the latest information, availability, and model numbers, please contact the local Lutron office.

Step 2 Third-party integration control selection

PowPak® contact closure output module

Design statement: A PowPak CCO module is designed for spaces where integration with third-party equipment through contact closures is desired.

PowPak contact closure output module dimensions
W: 72 mm
H: 87 mm
D: 32 mm

Lutron® Clear Connect™ Wireless Signal **Received**

Features

- Single dry contact closure device
- Receives input from up to 9 Pico® wireless controls, 6 Radio Powr Savr™ occupancy/vacancy sensors, and 1 Radio Powr Savr daylight sensor via Lutron reliable Clear Connect® RF technology
- Voltage: 24V AC/DC
- Maximum load of 1 A @ 24 VAC or 0.5 A @ 24 VDC; no minimum load required

Benefits

- Button press programming to associate the module with the Radio Powr Savr sensors and Pico wireless controls

Mounting

- Mounts through 20mm knockout on electrical boxes

Models

RMQ-CCO1-24-B – One contact closure output

Step 3 Occupancy/vacancy sensor selection

Radio Powr Savr™ wireless occupancy/vacancy sensors

Design statement: Specify a wireless occupancy/vacancy sensor to turn lights on and/or off based on the space occupancy.

Radio Powr Savr wireless ceiling mount occupancy/vacancy sensor dimensions
W: 102 mm
H: 102 mm
D: 33 mm

Radio Powr Savr wireless wall/corner mount occupancy/vacancy sensor dimensions
W: 46mm
H: 110mm
D: 34mm

Lutron® Clear Connect™
Wireless Signal **Sent**

Features
- Available in ceiling-mount, wall-mount, corner-mount and hallway options
- Lutron® XCT signal processing technology greatly enhances the performance of PIR sensors, enabling them to "see" fine motions
- Utilises Lutron reliable Clear Connect® RF technology to communicate wirelessly with wireless load controllers
- RF range: 9 m through walls
- 10-year battery life design

Benefits
- Front-accessible buttons make setup easy
- Sensors have simple test modes to verify ideal locations during installation

Models

Ceiling-mount
LRF7-OCRB-P-WH—occupancy/vacancy sensor

Wall-mount
LRF7-OWLB-P-WH—occupancy/vacancy sensor

Corner-mount
LRF7-OKLB-P-WH—occupancy/vacancy sensor

Hallway
LRF7-OHLB-P-WH—occupancy/vacancy sensor

Accessories
L-CMDPIRKIT—ceiling-mount sensor lens masking kit
L-CRMK-WH—ceiling-mount sensor recess-mounting bracket
WGOMNI-CPN3688—wire guard for ceiling-mount sensor
WGWS-CPN3688—wire guard for wall-mount and hallway sensors
STI-9618-CPN3688—wire guard for corner-mount sensor

Step 4 Daylight sensor selection

Radio Powr Savr wireless daylight sensor

Design statement: Specify a wireless daylight sensor to dim or switch zones of light in response to available daylight.

Radio Powr Savr wireless daylight sensor dimensions
W: 41 mm
H: 41 mm
D: 17 mm

Lutron® Clear Connect™
Wireless Signal **Sent**

Features

- Utilises Lutron reliable Clear Connect RF technology to communicate wirelessly with wireless load controllers (remote-mount modules); a load controller can communicate with only one daylight sensor
- RF range: 9 m through walls
- Features Lutron reliable proportional daylight open loop control
- Has a light range (0-100,000 lux) and a photopic response matches human eye
- Designed to give a linear response to changes in viewed light level
- One sensor is capable of switching and continuous dimming of multiple zones
- 10-year battery life

Benefits

- Simple calibration
- Multiple ceiling-mount methods available for different ceiling materials
- Front accessible test buttons make setup easy

Models

LRF7-DCRB-WH – daylight sensor

Step 5 Wireless control selection

Pico® wireless controls

Design statement: Use a Pico wireless control anywhere in the space to control loads with a touch of a button.

Handheld

Pico wireless control dimensions
W: 66 mm
H: 33 mm
D: 8 mm

Tabletop

Single pedestal **Dual pedestal**

Wall-mount

Single gang faceplate **Dual gang faceplate**

Features

- Utilises Lutron® reliable Clear Connect® RF technology to communicate wirelessly with wireless load controllers
- RF range: 9 m through wall
- Available in multiple button configurations with options for preset and raise/lower buttons
- 10-year battery life

Benefits

- Easily add a new and/or additional point of control without the need for new wires
- Easy configuration for use as a handheld control, wall-mount control, or table top control with use of the optional pedestal

Models

Pico wireless controls

PQ-2B-MXX-L01 – 2-button
PQ-2BRL-MXX-L01 – 2-button with Raise/Lower
PQ-3B-MXX-L01 – 3-button
PQ-3BRL-MXX-L01 – 3-button with Raise/Lower

Pedestals

L-PED1-XX – Single pedestal
L-PED2-XX – Double pedestal
L-PED3-XX – Triple pedestal
L-PED4-XX – Quadruple pedestal

Accessories

PFP-1-B-FXX-CPN5692 – Single gang faceplate
PFP-2-B-FXX-CPN5692 – Dual gang faceplate

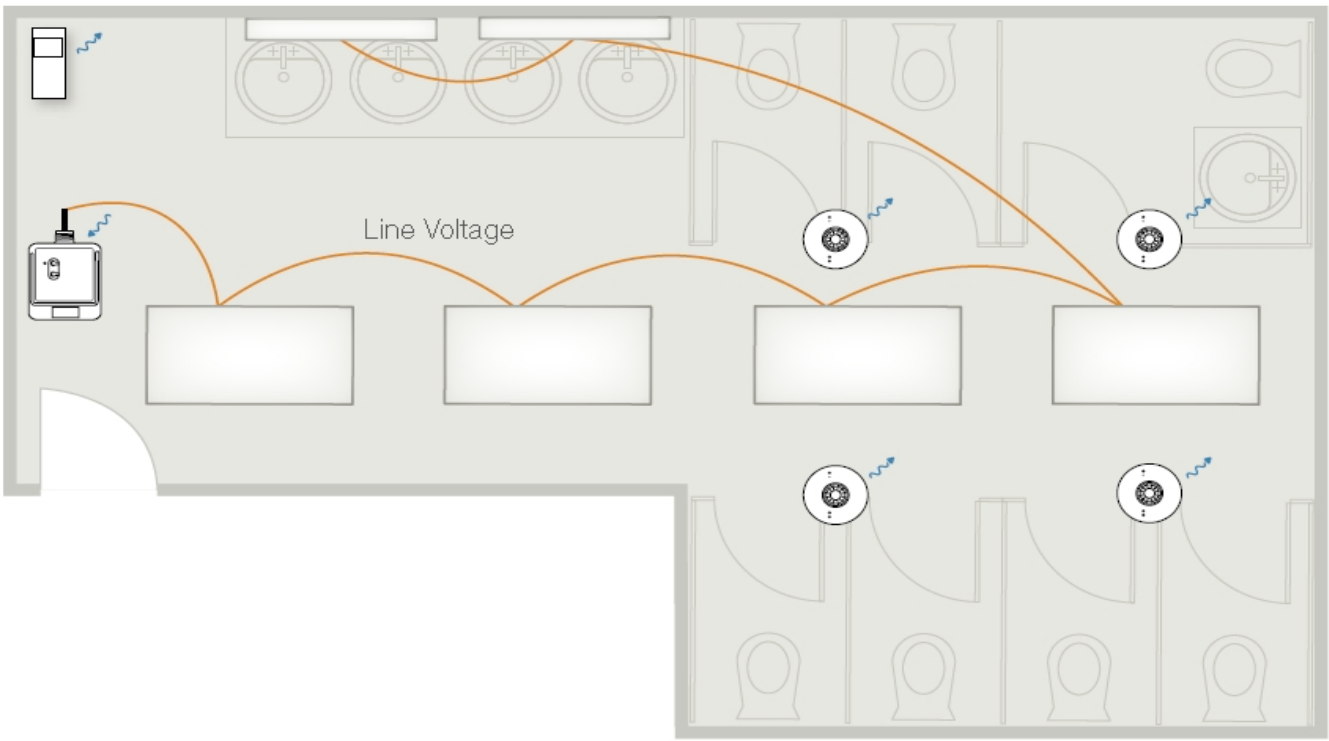
XX in the model number represents colour/finish code

For the latest information, availability and model numbers, please contact the local Lutron office.

Energi TriPak® — Concept drawings

Public bathroom – **switching, 1 zone**

Energy-saving strategies: Occupancy/vacancy sensing



PowPak® relay module with Softswitch®

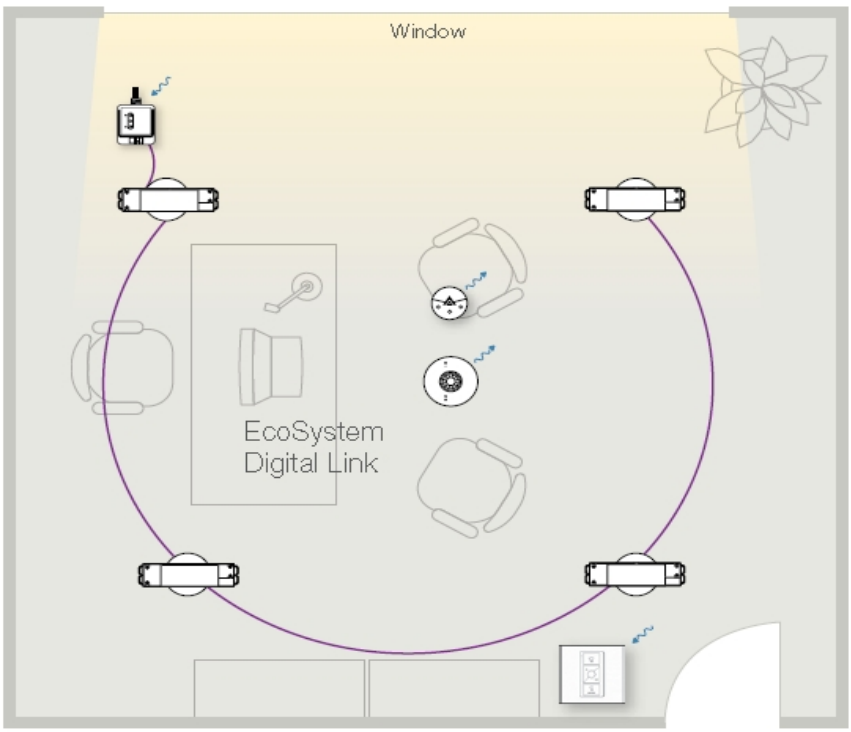
Radio Powr Savr™ occupancy/vacancy sensor (corner-mount)

Radio Powr Savr occupancy/vacancy sensor (ceiling-mount)

Energi TriPak® — Concept drawings

Private office – **dimming, 1 zone**

Energy-saving strategies: Occupancy/vacancy sensing, daylight harvesting, personal control, high-end trim



PowPak® dimming module with Ecosystem

Pico® wireless control

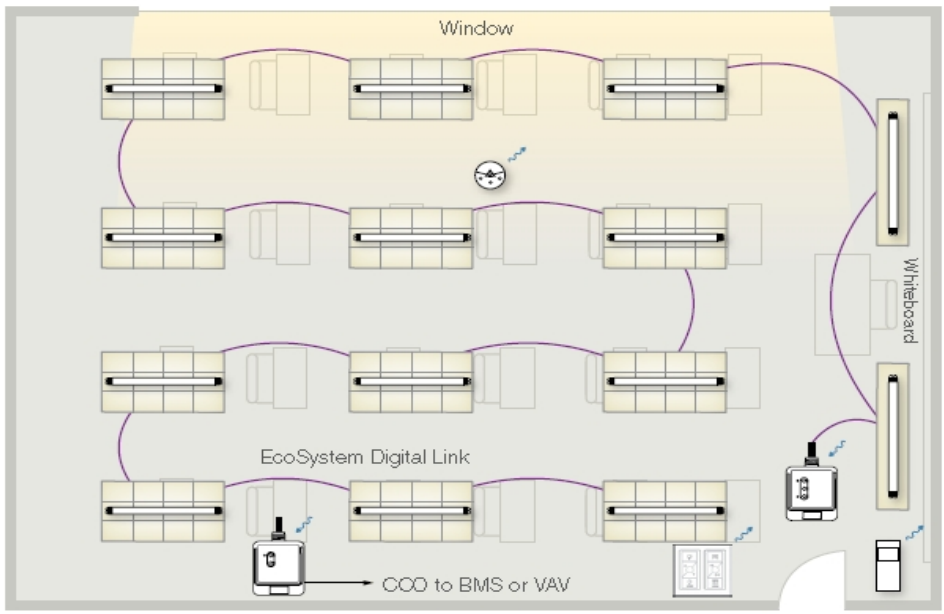
EcoSystem® 5-Series LED driver

Radio Powr Savr™ occupancy/vacancy sensor (ceiling-mount)

Radio Powr Savr daylight sensor

Classroom – **dimming, 2 zones**

Energy-saving strategies: Occupancy/vacancy sensing, daylight harvesting, personal control and high-end trim



Pico wireless controls

PowPak contact closure output module

PowPak dimming module with EcoSystem

EcoSystem H-Series digital ballast

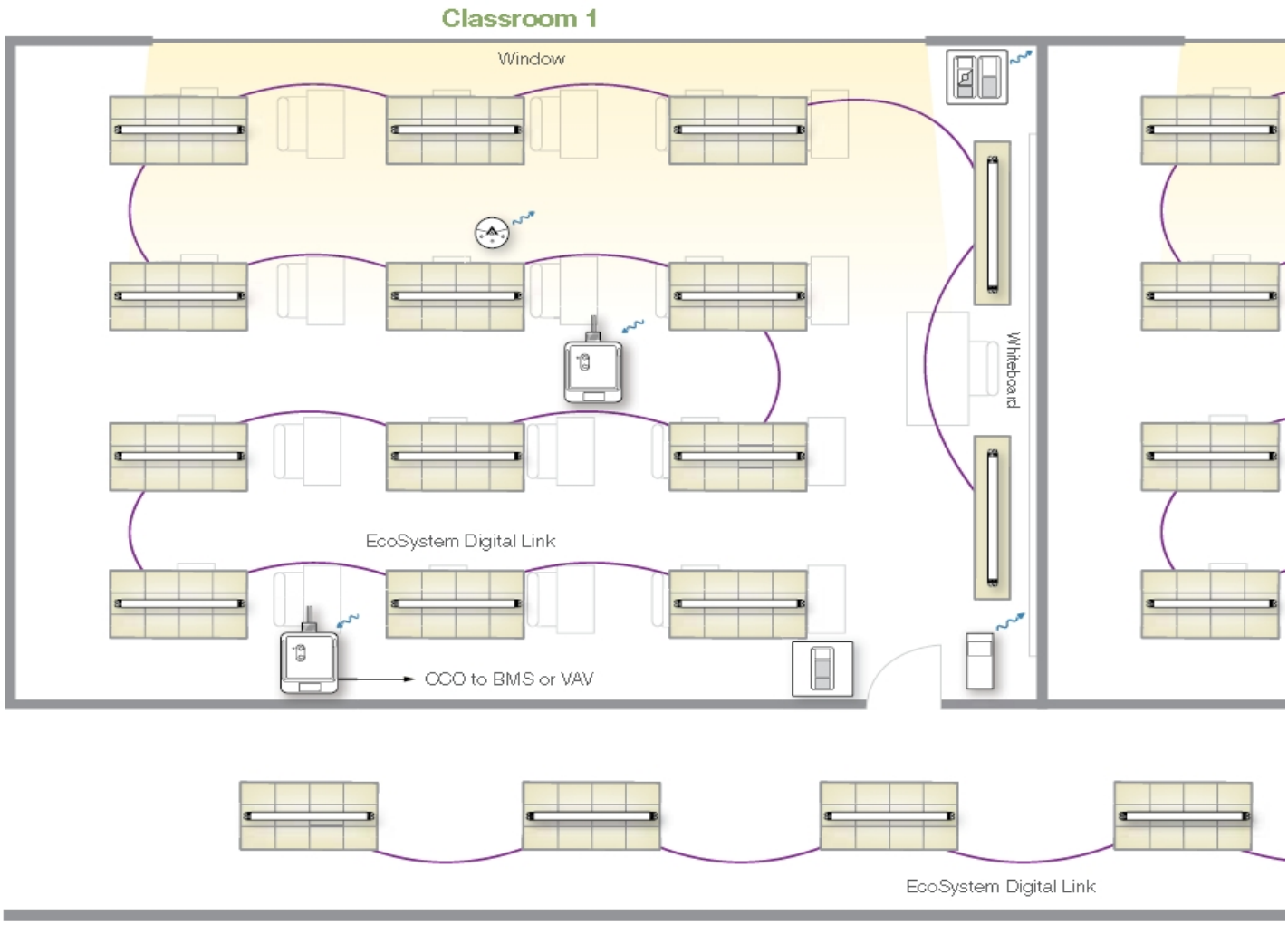
Radio Powr Savr occupancy/vacancy sensor (corner-mount)

Radio Powr Savr daylight sensor

Energi TriPak® — Concept drawings

School: Classroom/hallway – **dimming, 4 zones**

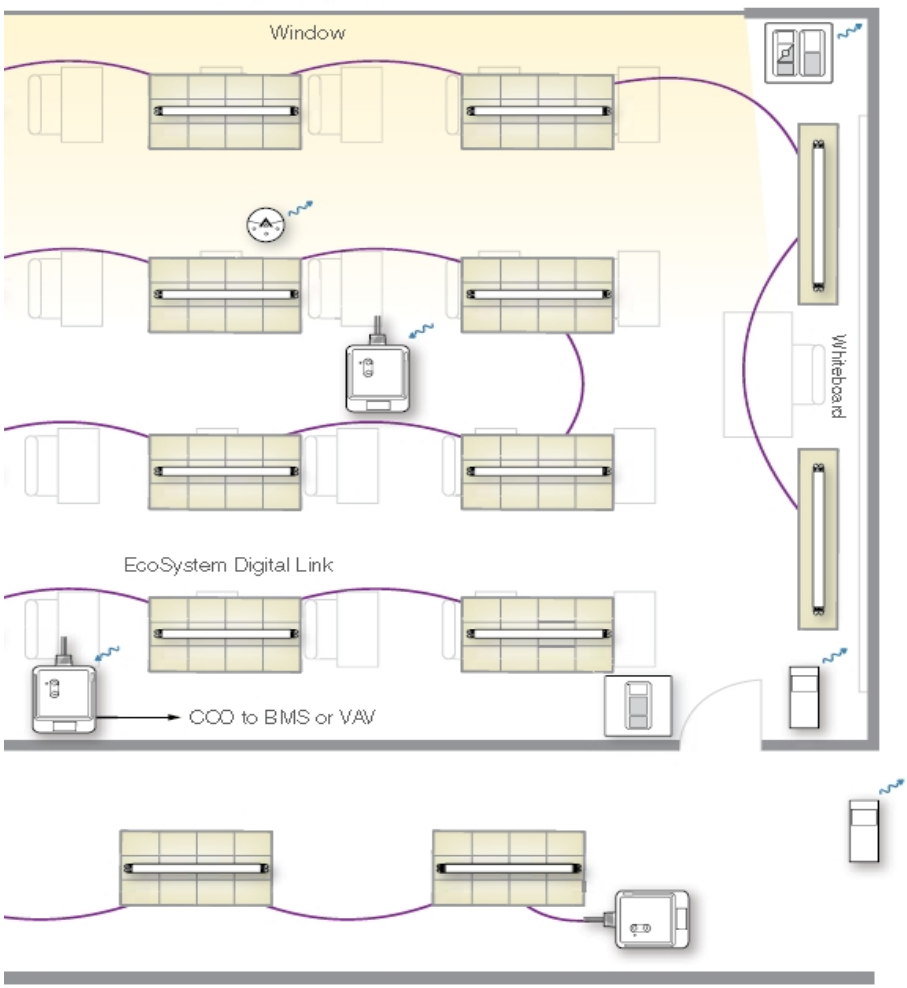
Classroom energy-saving strategies: Occupancy/vacancy sensing, daylight harvesting, personal control and high-end trim
Hallway energy-saving strategies: Occupancy/vacancy sensing, and high-end trim



Note: The occupancy sensors in the classroom also communicate with the hallway PowPak, ensuring that the corridor lighting remains on when the classrooms are in use.

PowPak® contact closure output module

Classroom 2



Pico® wireless controls

Radio Powr Savr occupancy/vacancy hallway sensor

Radio Powr Savr daylight sensor

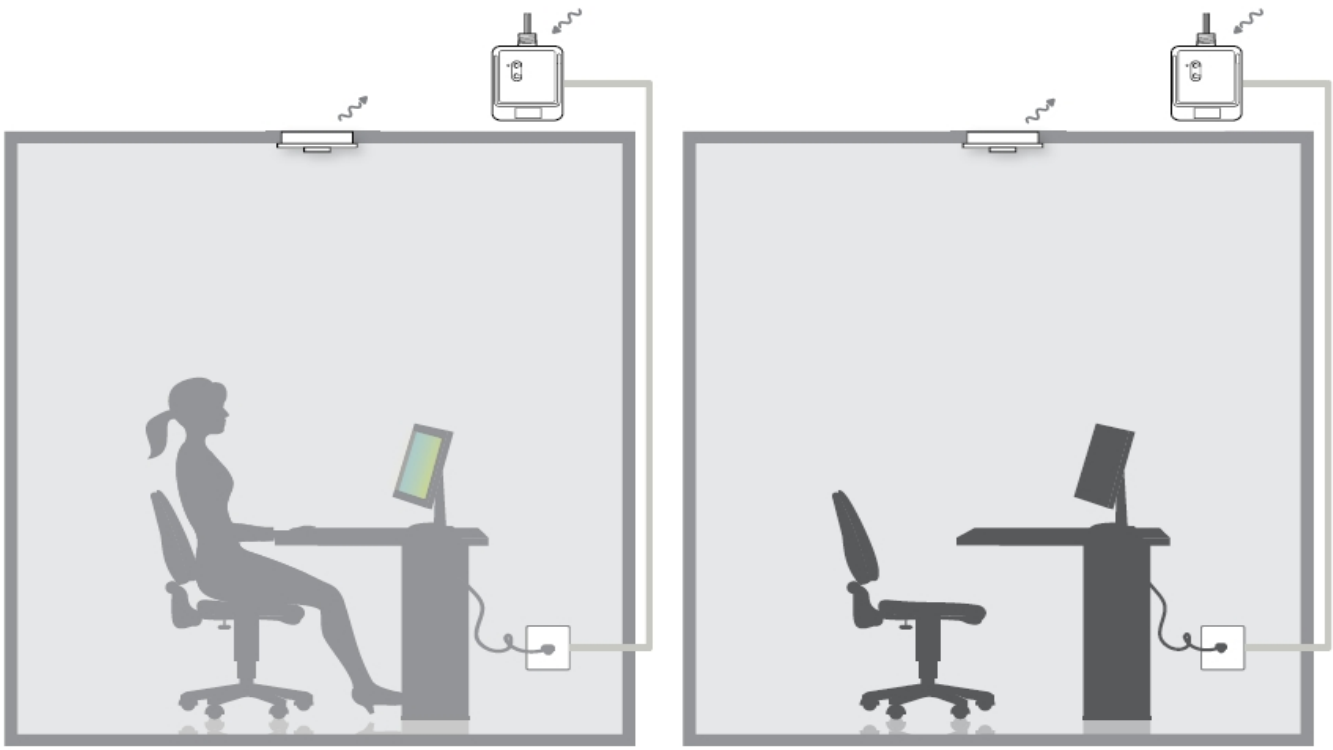
PowPak dimming module with EcoSystem

EcoSystem® H-Series digital ballast

Energi TriPak® — How it works

Plug load control by switching receptacles

Plug loads, such as task lighting, computer monitors and printers, account for 10–15% of commercial energy usage[1]. By utilising the PowPak® relay module and a Radio Powr Savr™ occupancy/vacancy sensor to switch receptacles, energy savings can be obtained.
The occupancy/vacancy sensor communicates room occupancy wirelessly to the relay module. Based on the occupancy status received, the relay module switches the power on or off to the receptacles, reducing the amount of energy consumed.



Occupied **Unoccupied**

Radio Powr Savr occupancy/vacancy sensor (ceiling-mount)

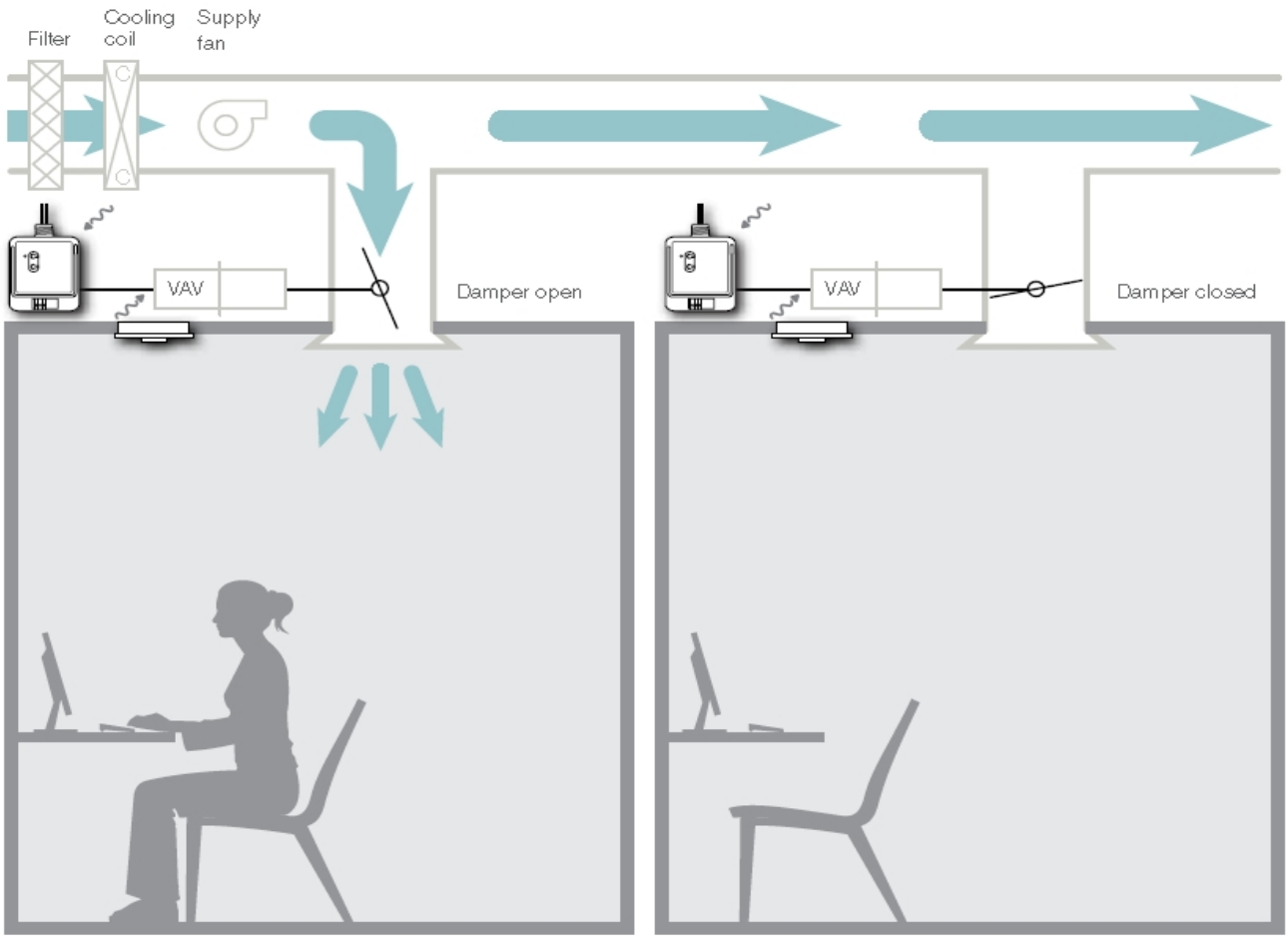
PowPak relay module

Lutron® Clear Connect™ Wireless Signal **Sent**

Lutron® Clear Connect™ Wireless Signal **Received**

Variable Air Volume (VAV) integration

In response to information received from Radio Powr Savr™ occupancy/vacancy sensor, the PowPak® contact closure output module communicates room occupancy to the VAV terminal unit. By not heating or cooling an unoccupied room, the electricity consumed by the HVAC system can be reduced.



Radio Powr Savr occupancy/vacancy sensor (ceiling-mount)

PowPak contact closure output module

Lutron® Clear Connect™ Wireless Signal **Sent**

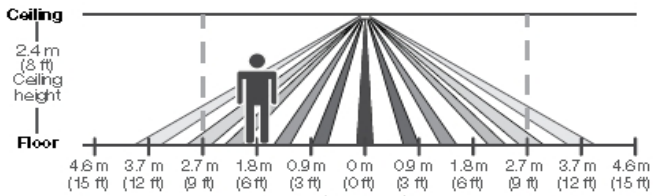
Lutron® Clear Connect™ Wireless Signal **Received**

Energi TriPak® — Sensor coverage diagrams

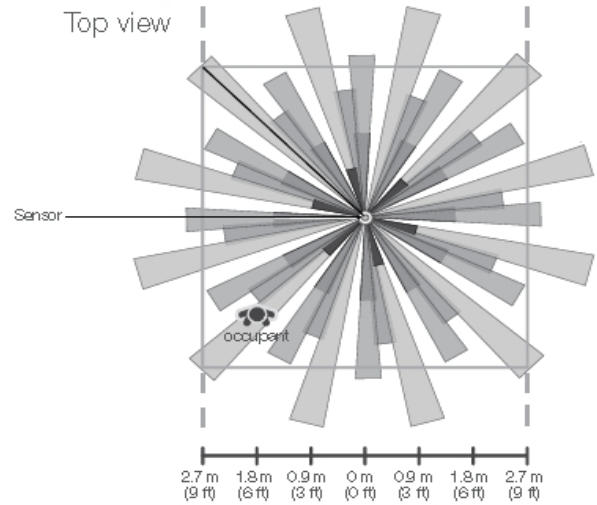
Ceiling-mount, 360°

Coverage varies by ceiling height

Floor view



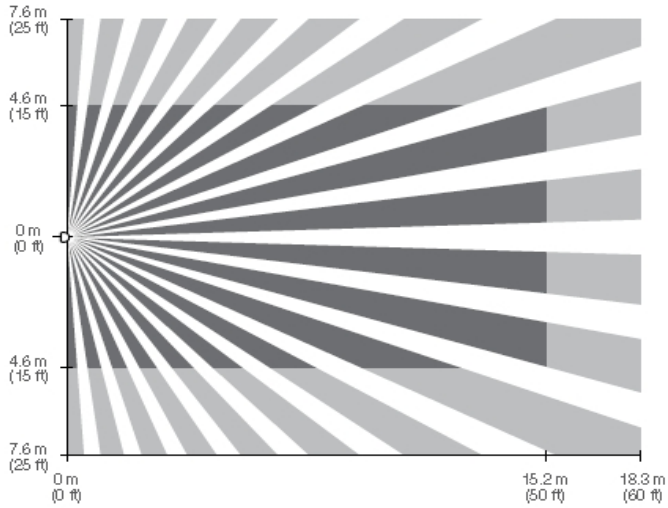
Top view



Wall-mount*, 180°

139 m² (1,500 ft²)—minor motion;
278.7 m² (3,000 ft²)—major motion

Top view



Key:

- Minor motions
- Major motion

Ceiling-mount sensor coverage chart (for sensor mounted in center of room)

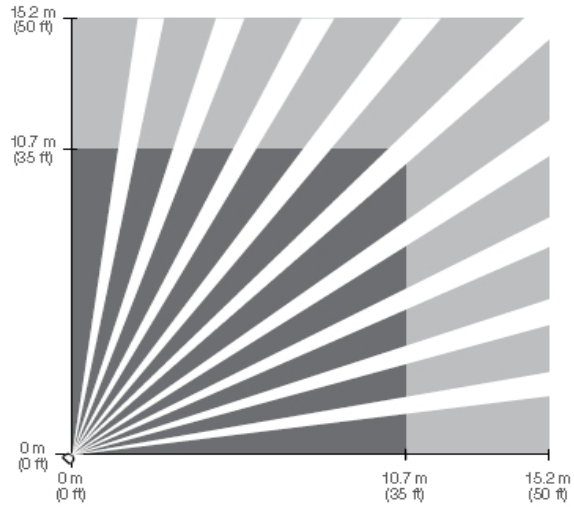
Ceiling height	Max. room dimensions for complete floor coverage	Radius of coverage at floor
2.4 m (8 ft)	5.5 x 5.5 m (18 x 18 ft)	4.0 m (13 ft)
2.7 m (9 ft)	6.1 x 6.1 m (20 x 20 ft)	4.4 m (14.5 ft)
3.0 m (10 ft)	6.7 x 6.7 m (22 x 22 ft)	4.9 m (16 ft)
3.7 m** (12 ft)	7.9 x 7.9 m (26 x 26 ft)	5.8 m (19 ft)

Sensor mounting shown at 2.1 m (7 ft) mounting height should be between 1.6 and 2.4 m (6 and 8 ft)
3.7 m (12 ft) is the maximum mounting height allowed

Corner-mount*, 90°

113.8 m² (1,225 ft²)—minor motion;
232.3 m² (2,500 ft²)—major motion

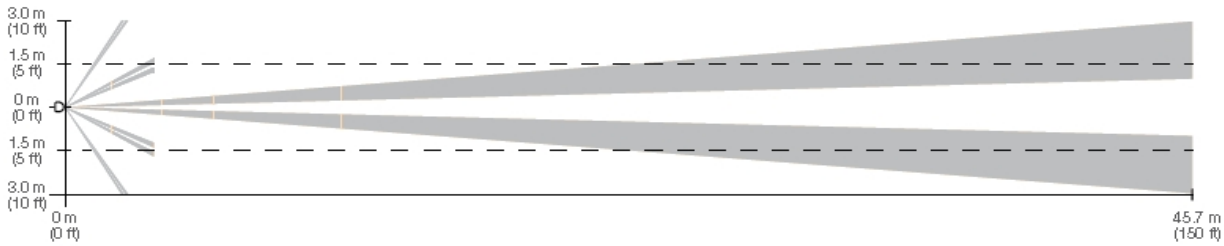
Top view



Hallway*, long narrow field of view

Coverage varies by hallway width and length

Top view



Hallway sensor maximum recommended length chart (sensor centered within hallway)

Width of hallway	Length of hallway
1.6 m or less (6 ft)	15.2 m (50 ft)
2.4 m (8 ft)	30.5 m (100 ft)
3.0 m or more (10 ft)	45.7 m (150 ft)

* Sensor mounting shown at 2.1 m (7 ft) mounting height should be between 1.6 and 2.4 m (6 and 8 ft)

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 Source: Bertoldi, P. et al. 2012. Energy Efficiency Status Report 2012. Joint Research Centre.
3 Lutron study based on reduction in heating (base 60°F) and cooling (base 55°F) degree days with a 2°F thermostat setback and 60% space vacancy. EnergyPlus modeling simulations were conducted and predicted similar savings.
4 Light Right Consortium. 2003. “Lighting Quality & Office Worker Productivity,” Research Study, Albany, N.Y.

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