

NEW PowPak®  
dimming module  
with 0-10V control  
available from March 2014

# Lutron energy-saving products



PowPak® dimming  
module with EcoSystem®  
(actual size)

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

Pico® wireless  
control (actual size)

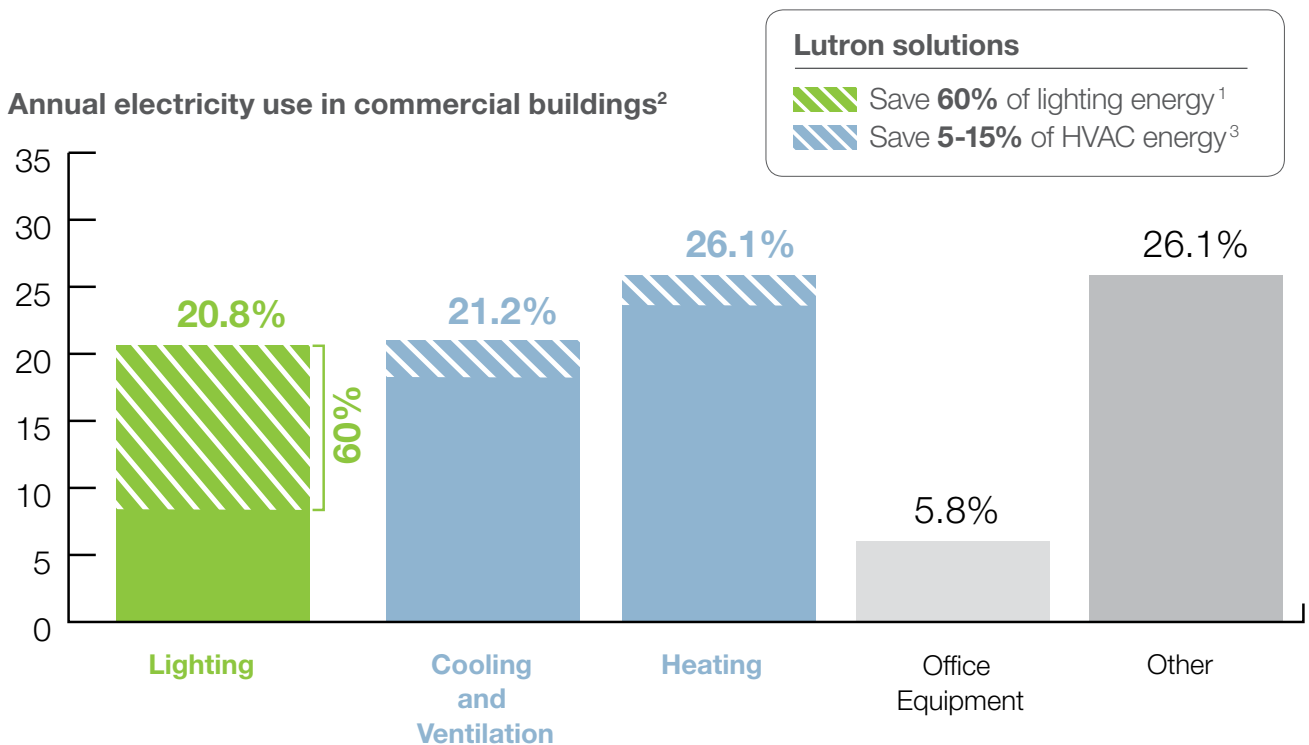
## Quick Install Energy Solutions Featuring Energi TriPak®



# 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%<sup>1</sup> of lighting electricity usage
- increase occupant comfort and productivity
- control virtually all loads
- reduce installation and programming costs



Lighting typically accounts for 20.8%<sup>2</sup> 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.<sup>4</sup>

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.

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# 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

##### Switch



Relay module

Rania® RF switch

##### Dim



Dimming module with EcoSystem®

Dimming module with 0-10V control

##### Integrate



Contact closure output module



## Benefits and energy-saving control strategies

### Ease of installation and programming

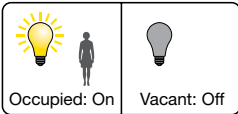
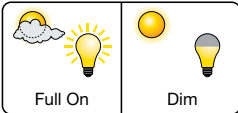
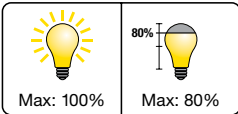
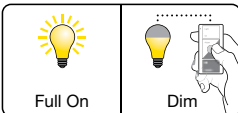
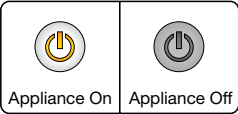
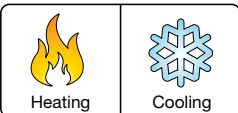
- All points of control are wireless for simple installation with no new wiring
- Simple button programming procedures for all devices

### 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                       |
|---|---|---|
|   | <b>Occupancy/vacancy sensing</b><br>turns lights on when occupants are in a space and off or dimmed when they vacate the space. | 20–60% Lighting <sup>5</sup>            |
|  | <b>Daylight harvesting</b><br>dims electric lights when daylight is available to light the space.                               | 25–60% Lighting <sup>6</sup>            |
|  | <b>High-end trim</b><br>sets the maximum light level based on customer requirements in each space.                              | 10–30% Lighting <sup>7</sup>            |
|  | <b>Personal dimming control</b><br>gives occupants the ability to set the light level.  | 10–20% Lighting <sup>8</sup>            |
|  | <b>Plug load control</b><br>automatically turns off loads after occupants leave a space.  | 15–50% <sup>9</sup><br>Controlled loads |
|  | <b>HVAC integration</b><br>controls heating, ventilation and air conditioning systems through contact closure.                  | 5–15% <sup>3</sup><br>HVAC              |

Sources located on back cover.

# 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 lighting energy savings:

# 50%<sup>5</sup>



Sources located on back cover.



### Radio Powr Savr™ ceiling-mount occupancy/vacancy sensor

communicates with load controllers to turn lights on or off based on occupancy





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



# Energi TriPak® application — Private office

Providing personal lighting control in a private office application helps improve occupant comfort.

## Energy-saving strategies

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

Potential lighting energy savings:

# 45%



### 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 ceiling-mount occupancy/vacancy sensor**

communicates with load controllers to dim or turn lights on or off based on occupancy



**PowPak® dimming module with 0-10V control**

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 desk top

# Energi TriPak® application — Conference room

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

## Energy-saving strategies

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

Potential lighting 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%



### 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.<sup>10</sup>

## Energy-saving strategies

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

Potential lighting energy savings:

# 60%



Sources located on back cover.



**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 desk top



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



**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. 13-14**

#### When dimming is preferred —

Select the EcoSystem LED driver and/or ballast when utilising the PowPak® dimming module with EcoSystem . . . . . **pg. 15**

Select the PowPak® dimming module with 0-10V control . . . . . **pgs. 16-18**



### 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**



# Energi TriPak® components — How to design a system

## Step 1 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

#### **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
- 16 A model features patented Softswitch® technology—extends relay life to an average of 1,000,000 cycles
- 220-240V~ 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**

- Module should be installed using the mounting tabs on the enclosure (screws not provided). Module can also be installed in a junction or marshalling box using the conduit nut provided. Consult local and national electrical codes for proper installation.

#### **Models**

**RMK-5R-DV-B** – 5 A general purpose switch

**RMK-16R-DV-B** – 16 A general purpose switch



# Energi TriPak® components — How to design a system

## Rania® RF switch

**Design statement:** Specify a Rania RF switch for applications in which a local switch already exists and dimming is not required.



### Rania RF switch dimensions

W: 86 mm

H: 86 mm

D: 28 mm

### Features

- Digital on/off two-wire tap switch – no neutral required
- Controls up to 5 A lighting or 4 A motor loads
- Utilises Lutron® reliable Clear Connect® RF technology to communicate wirelessly with up to 9 transmitting devices (Radio Powr Savr sensors and/or Pico® wireless controls)
- Controls always operate locally, do not require system control

### Benefits

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

### Mounting

- Mountable in round or square back boxes with a minimum depth of 35 mm
- Trim ring is available for 25 mm back boxes

### Models

**RS-SA05-B-FXX-M** – Rania RF switch, frameless

**RS-SA05-B-IXX-M** – Rania RF switch with frame/insert faceplate

**RS-SA05-B-BXX-M** – Rania RF switch with black frame/metal insert faceplate

**RRF-SA05-B-FXX-M** – Rania RF switch and Radio Powr Savr sensor frameless package

**RRF-SA05-B-IXX-M** – Rania RF switch and Radio Powr Savr sensor with frame/insert faceplate package





## 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

### Features

- Controls up to 32 EcoSystem H-Series ballasts, EcoSystem 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

- Module should be installed using the mounting tabs on the enclosure (screws not provided). Module can also be installed in a junction or marshalling box using the conduit nut provided. Consult local and national electrical codes for proper installation.

### Models

**RMK-ECO32-DV-B** – controls up to 32 EcoSystem H-Series ballasts, EcoSystem LED drivers and/or EcoSystem 5-Series LED driver

For more information on EcoSystem H-Series ballasts, EcoSystem LED drivers, and 5-Series LED drivers, please visit [www.lutron.com/europe](http://www.lutron.com/europe)



# Energi TriPak® components — How to design a system

## PowPak® dimming module with 0-10V control

**Design statement:** Specify the PowPak dimming module with 0-10V control for the application that requires dimming of module with 0-10V fixtures and simple reconfiguration of lighting zones.



### **PowPak dimming module with 0-10V control dimensions**

W: 72 mm

H: 87 mm

D: 32 mm

### **Features**

- Controls 0-10V controlled fixtures together
- 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
- Switches up to 5 A total
- 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**

- Module should be installed using the mounting tabs on the enclosure (screws not provided). Module can also be installed in a junction or marshalling box using the conduit nut provided. Consult local and national electrical codes for proper installation

### **Models**

**RMK-5T-DV-B** – controls up to 5 A of 0-10V controlled fixtures together



## 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
- Power failure memory ensures lights turn on to the last commanded level after a power outage
- Operates at 220 – 240 VAC, 50/60 Hz (CE compliant. ENEC certified)

### 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

For the latest information and model numbers, visit [www.lutron.com/europe](http://www.lutron.com/europe)

# Energi TriPak® components — How to design a system

## 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

Note: Lutron also offers a 1% dimming LED driver. For more information on the EcoSystem LED Driver, visit [www.lutron.com/europe](http://www.lutron.com/europe)

### Features

- Continuous, flicker-free dimming from 100% to 5%
- Supports a wide range of current levels (up to 35 watts)
- Guaranteed performance with all EcoSystem controls
- Independently mounted driver
- LEDs turn on to any dimmed level without going to full brightness
- Power failure memory ensures lights turn on to the last commanded level after a power outage
- SELV output. Can be remote mounted up to 15m from the fixture for maximum flexibility
- Protected from miswire of input power to EcoSystem control inputs
- Operates at 220 – 240 VAC, 50/60 Hz (CE compliant. ENEC certified)

### Benefits

- Works with the most common LED downlights
- Fits in 60 mm ceiling cutouts
- 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% end-of-line performance-tested

### Models

- Select compatible fixtures with confidence using the High Performance Fixture List to find LED fixtures containing Lutron LED drivers at [www.lutron.com/findafixture](http://www.lutron.com/findafixture)

For the latest information, availability, and model numbers, visit [www.lutron.com/5seriesLED](http://www.lutron.com/5seriesLED)

## 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

#### 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: 24 V 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

- Module should be installed using the mounting tabs on the enclosure (screws not provided). Module can also be installed in a junction or marshalling box using the conduit nut provided. Consult local and national electrical codes for proper installation.

#### Models

**RMK-CCO1-24-B** – 1 contact closure output



# Energi TriPak® components — How to design a system

## 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



#### 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

**LRF3-OCR2B-P-WH**—occupancy/vacancy sensor

##### Wall-mount

**LRF3-OWLB-P-WH**—occupancy/vacancy sensor

##### Corner-mount

**LRF3-OKLB-P-WH**—occupancy/vacancy sensor

##### Hallway

**LRF3-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

#### 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 1 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
- 1 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

**LRF3-DCRB-WH** – daylight sensor



# Energi TriPak® components — How to design a system

## 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

#### Double pedestal

#### Wall-mount



#### Single gang faceplate

#### Double 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

**PK-2B-MXX-L01** – 2-button

**PK-2BRL-MXX-L01** – 2-button with Raise/Lower

**PK-3B-MXX-L01** – 3-button

**PK-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** – Double gang faceplate

XX in the model number represents colour/finish code

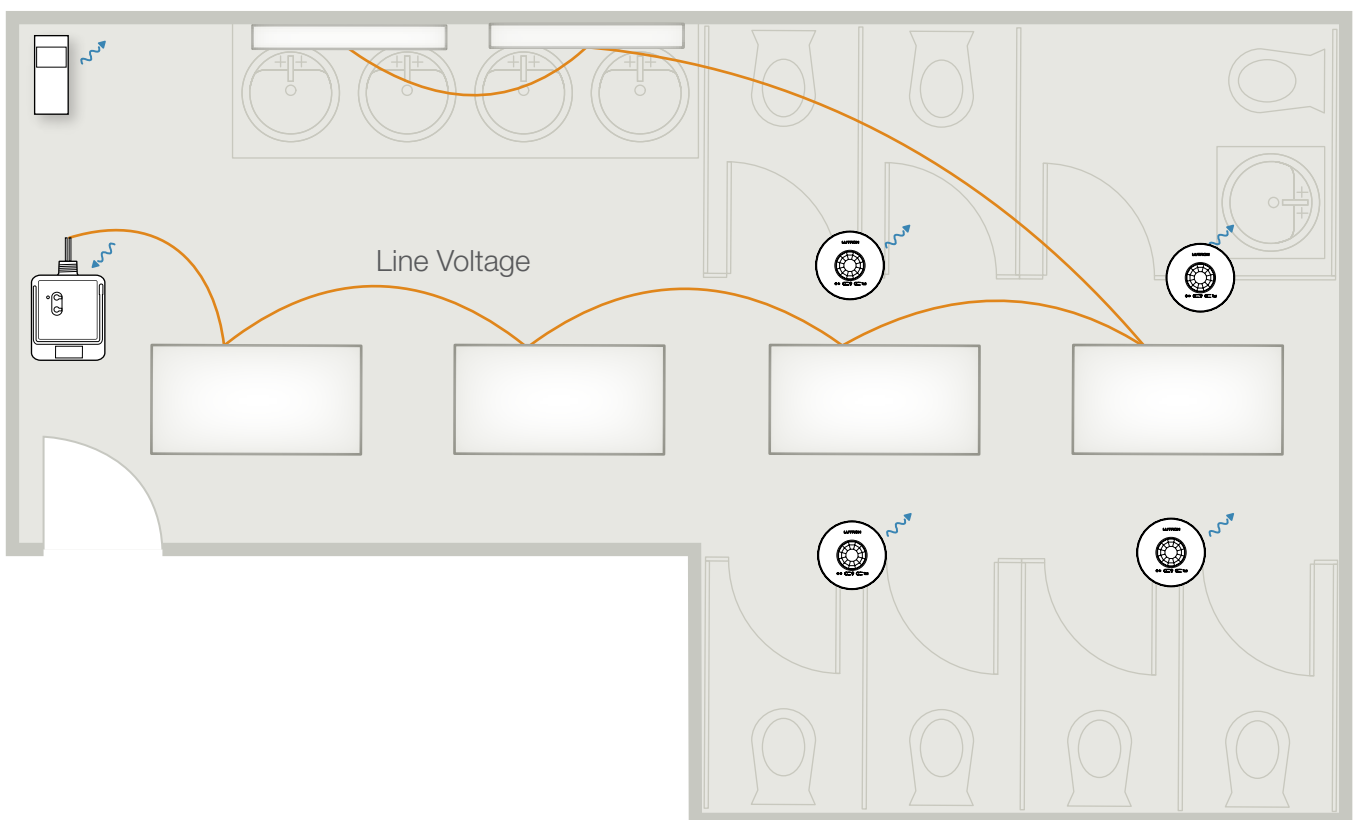
Visit [www.lutron.com/europe](http://www.lutron.com/europe)



# 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)**

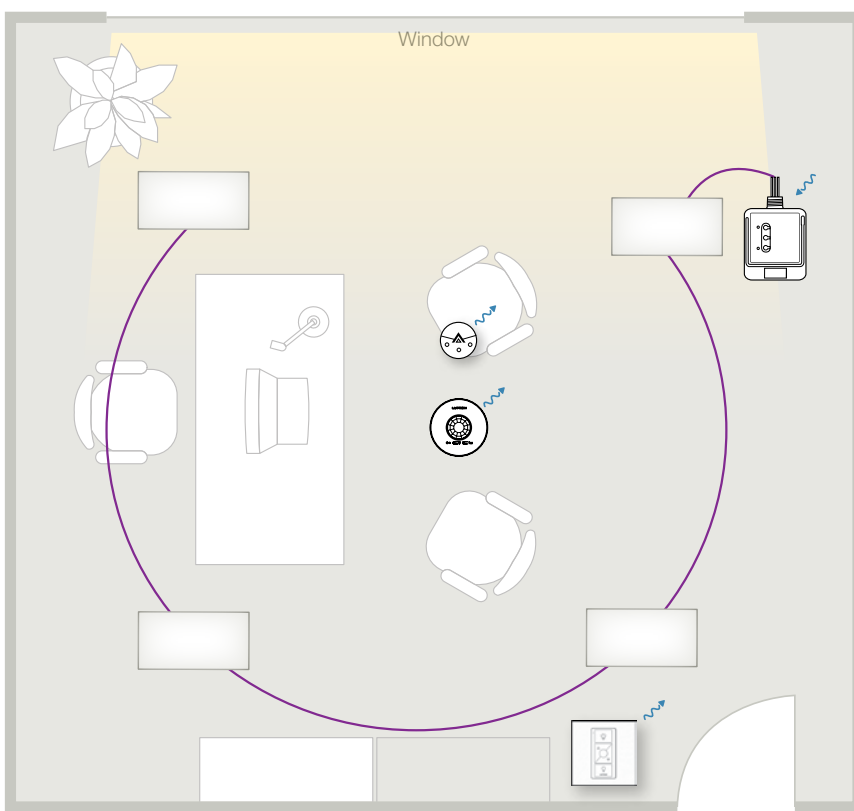


**Radio Powr Savr occupancy/vacancy sensor (ceiling-mount)**

# Energi TriPak® — Concept drawings

## Private office – dimming, 1 zone

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



**PowPak®**  
dimming module  
with 0-10V  
control



**Pico®** wireless  
control



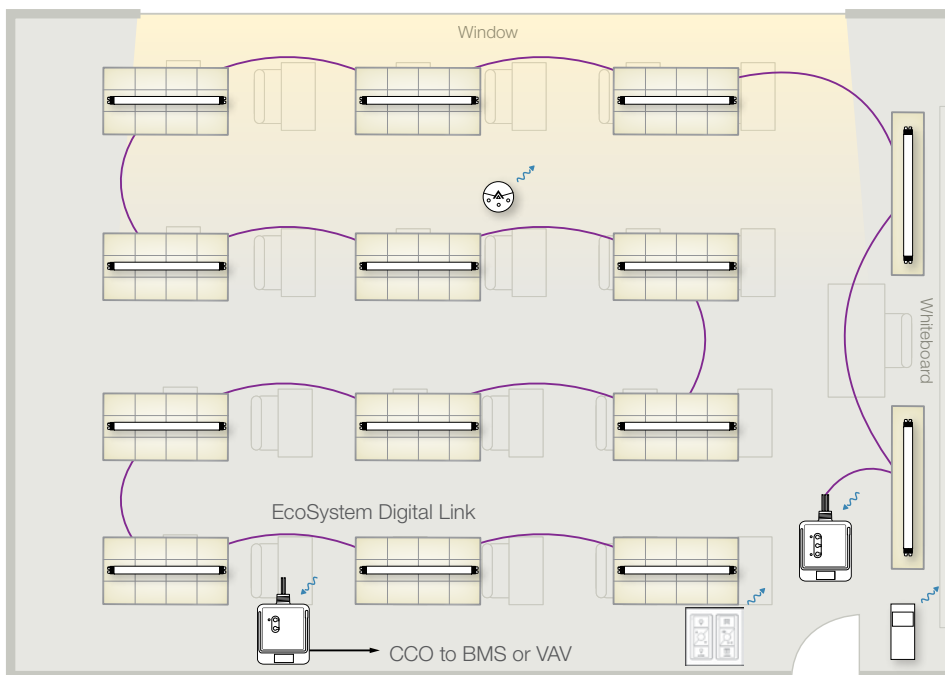
**Radio Power Savr™**  
occupancy/vacancy  
sensor (ceiling-mount)



**Radio Power Savr**  
daylight  
sensor

## Classroom – dimming, 2 zones

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



**Pico wireless controls**



**PowPak contact closure output module**



**PowPak dimming module with EcoSystem**



**EcoSystem 5-Series LED driver**



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



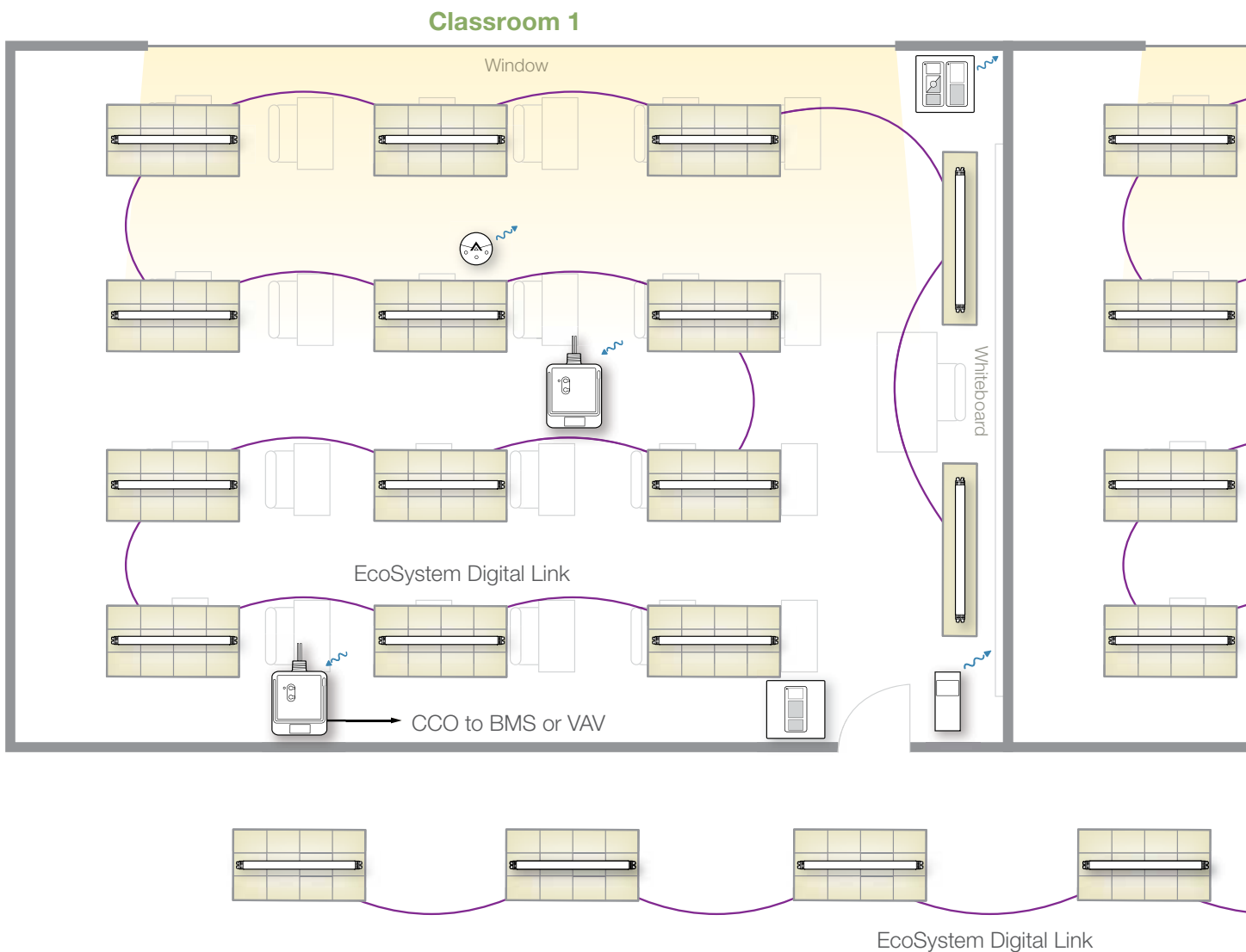
**Radio Powr Savr daylight sensor**

# Energi TriPak® — Concept drawings

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

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

**Hallway energy-saving strategies:** Occupancy/vacancy sensing, and high-end trim

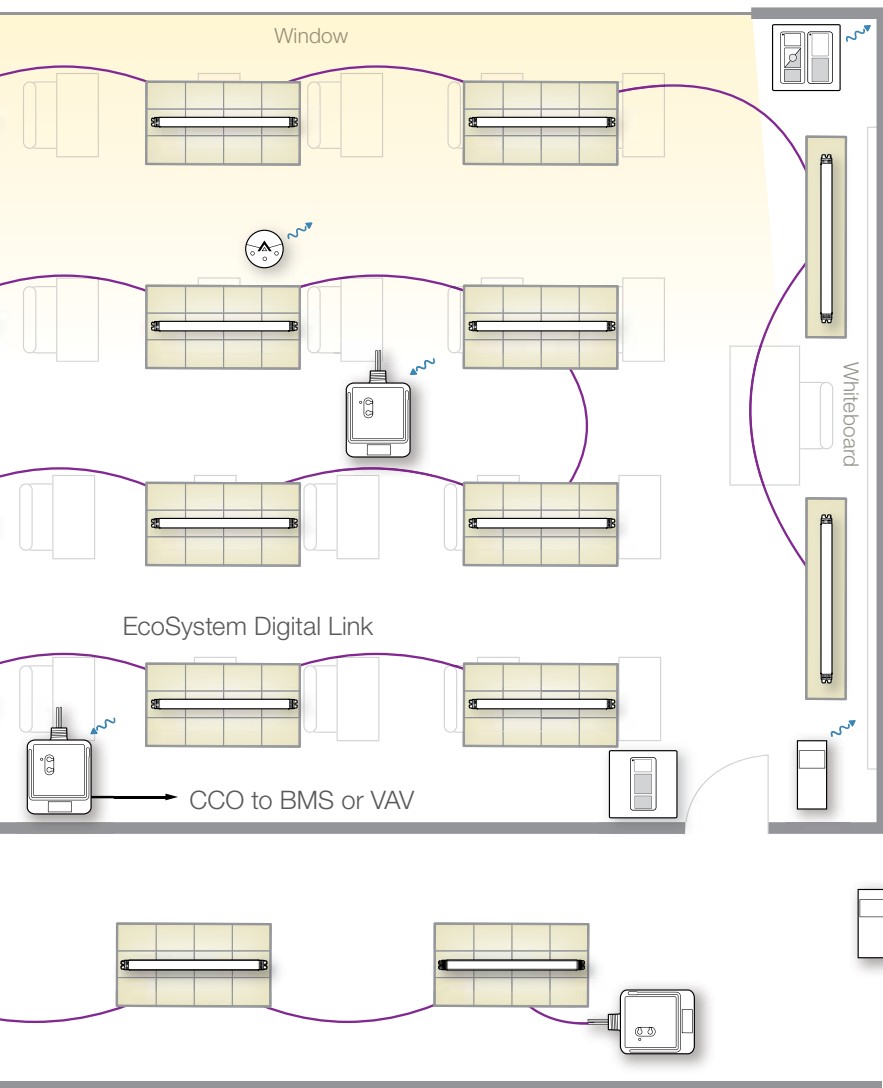


**Note:** The occupancy sensors in the classroom also communicate with the hallway PowPak, ensuring that the corridor lighting remains on when the classrooms are in use.



**PowPak® contact closure output module**

## Classroom 2



**Pico® wireless controls**



**Radio Powr Savr™ occupancy/vacancy sensors (corner-mount and hallway)**



**Radio Powr Savr daylight sensor**



**PowPak dimming module with EcoSystem**

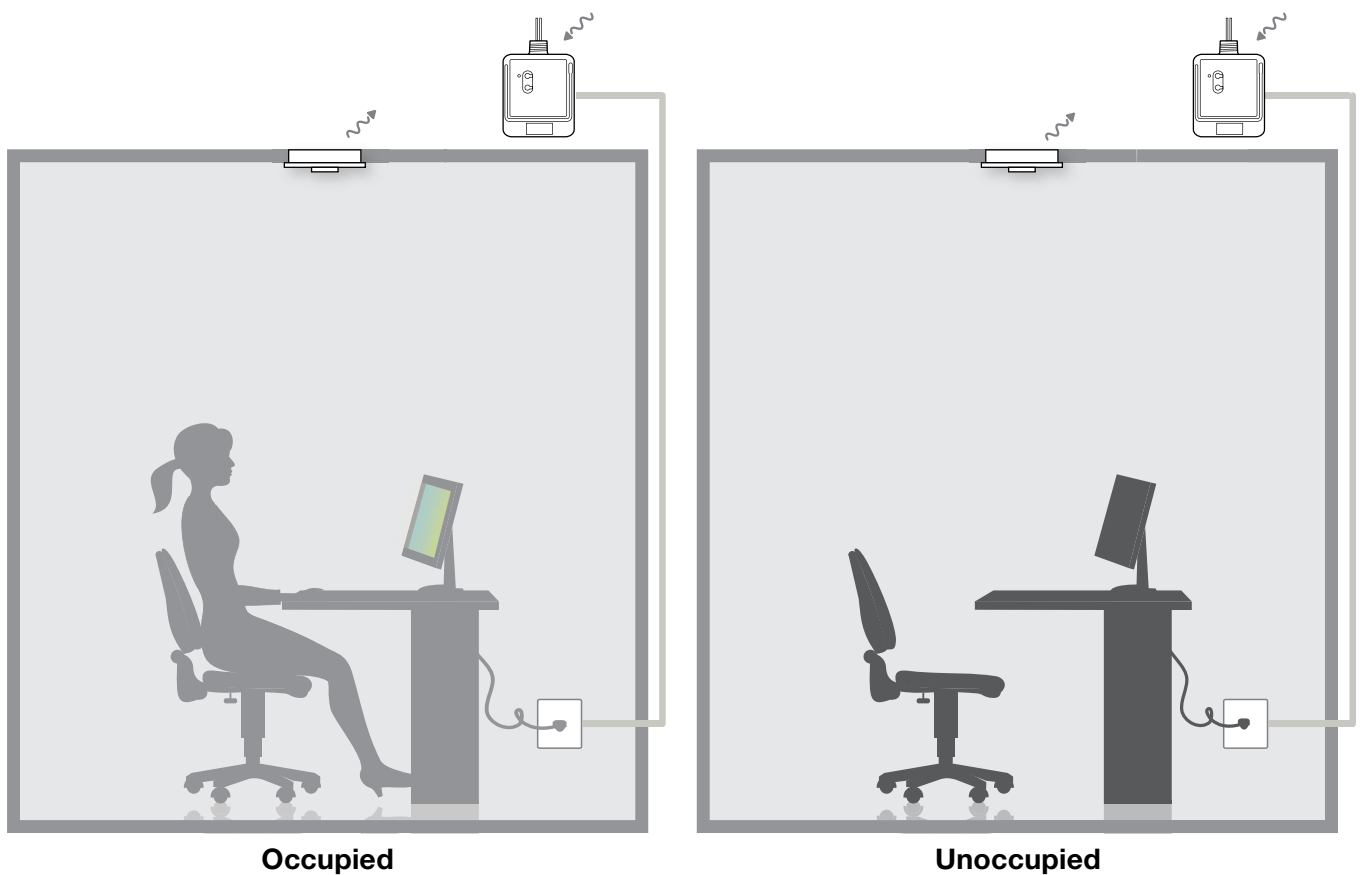


**EcoSystem® H-Series digital ballast**

# Energi TriPak® — How it works

## Plug load control by switching receptacles

Plug loads, such as task lighting, computer monitors and printers, account for greater than 5% of commercial electricity usage<sup>2</sup>. By utilising the PowPak® relay module with Softswitch® 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.



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

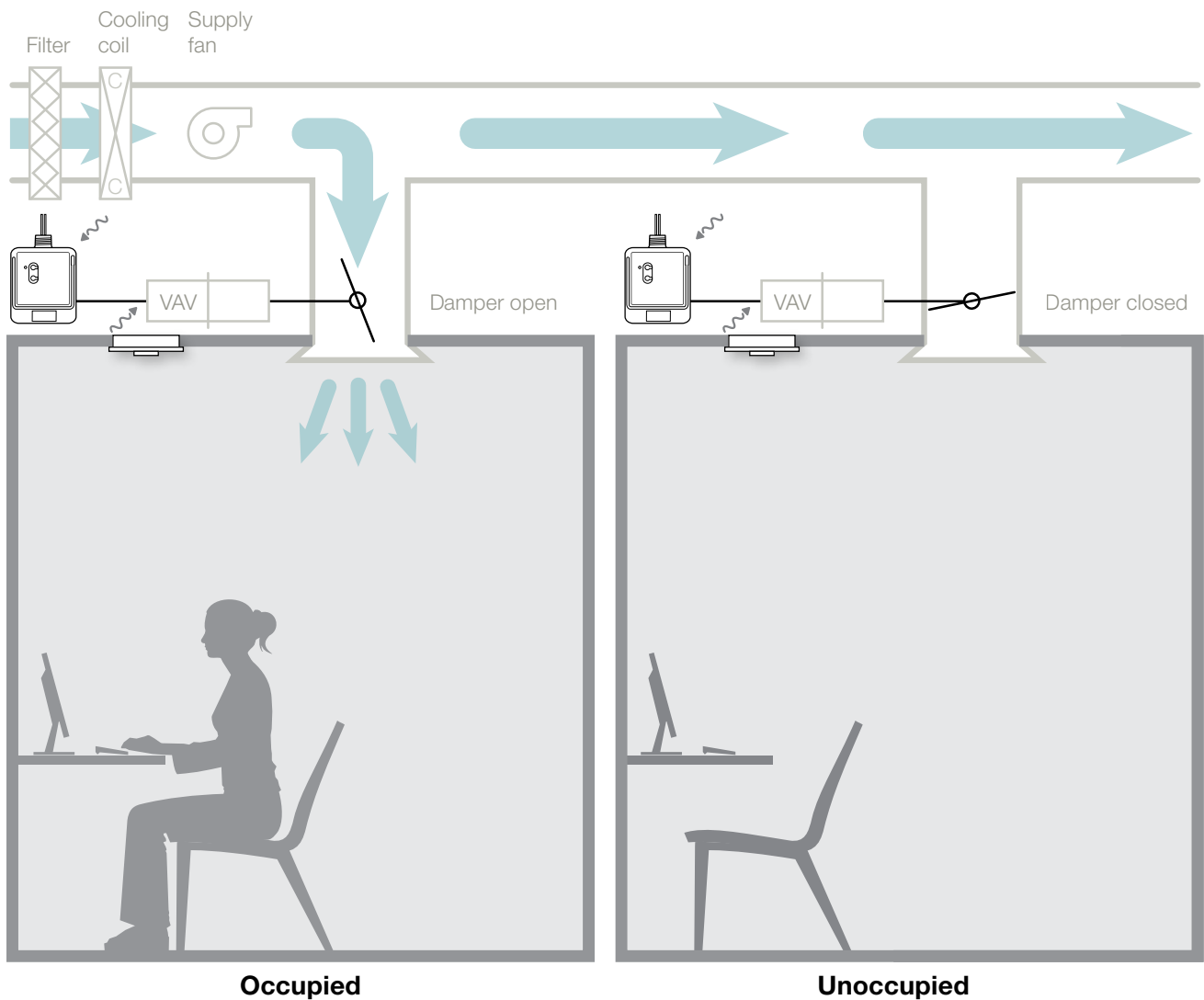


PowPak relay module with Softswitch



## 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



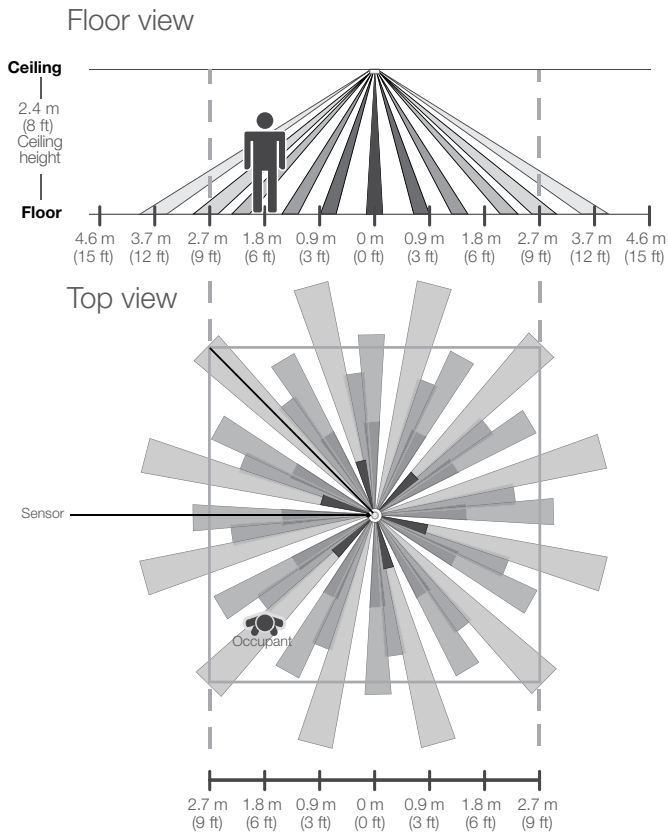
**Lutron® Clear Connect™**  
Wireless Signal **Sent**

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

# Energi TriPak® — Sensor coverage diagrams

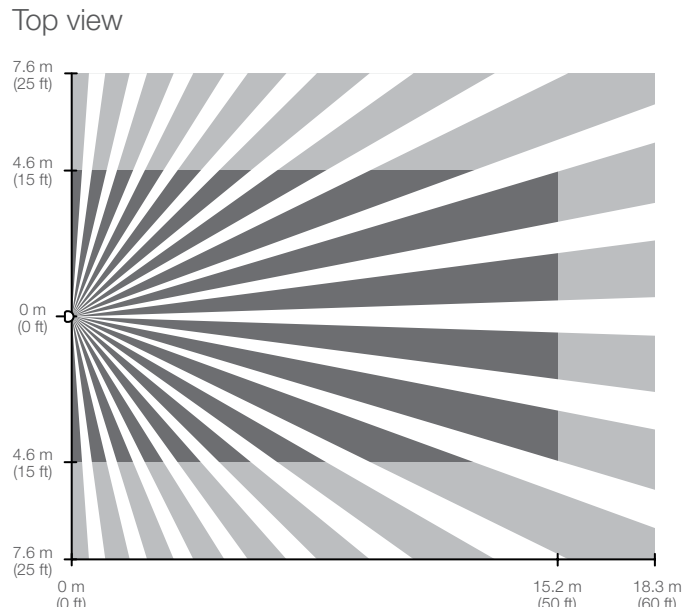
## Ceiling-mount, 360°

Coverage varies by ceiling height



## Wall-mount\*, 180°

139 m<sup>2</sup> (1,500 ft<sup>2</sup>) — minor motion;  
279 m<sup>2</sup> (3,000 ft<sup>2</sup>) — major motion



### 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)

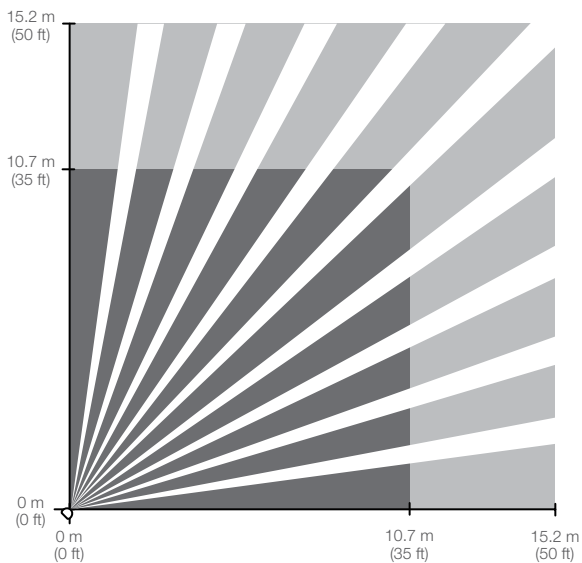
\*\* 3.7 m (12 ft) is the maximum mounting height allowed



## Corner-mount\*, 90°

**114 m<sup>2</sup> (1,225 ft<sup>2</sup>)—minor motion;  
232 m<sup>2</sup> (2,500 ft<sup>2</sup>)—major motion**

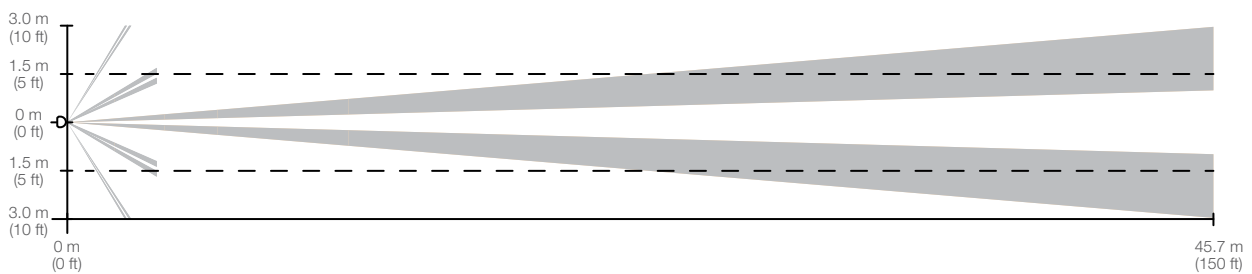
Top view



## 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)

# Energi TriPak® – Ordering information

| Model number                                      | Description   |
|---|---|
| <b>PowPak® relay module</b>                       |   |
| RMK-5R-DV-B                                       | 5 A general purpose switch  |
| RMK-16R-DV-B                                      | 16 A general purpose switch with Softswitch®  |
| <b>PowPak dimming module with EcoSystem®</b>      |   |
| RMK-ECO32-DV-B                                    | Controls up to 32 EcoSystem H-Series ballasts, EcoSystem LED drivers and/or EcoSystem 5-Series LED drivers  |
| <b>PowPak dimming module with 0-10V control</b>   |   |
| RMK-5T-DV   | Controls up to 5A of 0-10V ballasts, LED drivers or fixtures  |
| <b>Rania® RF switch</b>                           |   |
| RS-SA05-B-FXX-M                                   | Rania, RF switch, frameless   |
| RS-SA05-B-IXX-M                                   | Rania, RF switch, frame and insert faceplate  |
| RS-SA05-B-BXX-M                                   | Rania, RF switch, black frame/metal insert faceplate  |
| <b>Rania RF switch package</b>                    |   |
| RRF-SA05-B-FXX-M                                  | (1) Rania RF switch (frameless) and (1) Radio PowrSavr ceiling-mount occupancy/vacancy sensor               |
| RRF-SA05-B-IXX-M                                  | (1) Rania RF switch (frame/insert faceplate) and (1) Radio Powr Savr ceiling-mount occupancy/vacancy sensor |
| <b>PowPak contact closure module</b>              |   |
| RMK-CCO1-24-B                                     | (1) contact closure output  |
| <b>Radio Powr Savr™ occupancy/vacancy sensors</b> |   |
| LRF3-OCR2B-P-WH                                   | Ceiling-mount, 360° field of view, occupancy/vacancy sensor   |
| LRF3-OWLB-P-WH                                    | Wall-mount, 180° field of view, occupancy/vacancy sensor  |
| LRF3-OKLB-P-WH                                    | Corner-mount, 90° field of view, occupancy/vacancy sensor   |
| LRF3-OHLB-P-WH                                    | Hallway occupancy/vacancy sensor  |
| <b>Accessories</b>                                |   |
| 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  |
| <b>Radio Powr Savr daylight sensor</b>            |   |
| LRF3-DCRB-WH                                      | Ceiling-mount daylight sensor   |

**XX in the model number represents colour/finish code:** Pico wireless controls matte colours — AW = Arctic White, BL = Black. **Pedestal gloss colours** — WH = White, BL = Black.

**Faceplate colours and metal finishes** — AW = Arctic White, MN = Midnight, BN = Bright Nickel, SN = Satin Nickel, BB = Bright Brass, SB = Satin Brass.

| Model number | Description |
|--------------|-------------|
|--------------|-------------|

### Pico® wireless controls

|                 |                           |
|-----------------|---------------------------|
| PK-2B-MXX-L01   | 2 Button                  |
| PK-2BRL-MXX-L01 | 2 Button with Raise/Lower |
| PK-3B-MXX-L01   | 3 Button                  |
| PK-3BRL-MXX-L01 | 3 Button with Raise/Lower |

### Accessories

|                     |  |
|---------------------|--|
| L-PED1-XX           | Pico wireless control single pedestal    |
| L-PED2-XX           | Pico wireless control double pedestal    |
| L-PED3-XX           | Pico wireless control triple pedestal    |
| L-PED4-XX           | Pico wireless control quadruple pedestal |
| PFP-1-B-FXX-CPN5692 | Single gang faceplate                    |
| PFP-2-B-FXX-CPN5692 | Double gang faceplate                    |

### EcoSystem H-Series ballasts

|                   |  |
|-------------------|--|
| EHD T514 M E 1 10 | T5, 14W, 1-lamp, 220-240V, 1.0 ballast factor  |
| EHD T514 M E 2 10 | T5, 14W, 2-lamp, 220-240V, 1.0 ballast factor  |
| EHD T521 M E 1 10 | T5, 21 W, 1-lamp, 220-240V, 1.0 ballast factor |
| EHD T521 M E 2 10 | T5, 21 W, 2-lamp, 220-240V, 1.0 ballast factor |
| EHD T524 M E 1 10 | T5, 24W, 1-lamp, 220-240V, 1.0 ballast factor  |
| EHD T524 M E 2 10 | T5, 24W, 2-lamp, 220-240V, 1.0 ballast factor  |
| EHD T528 M E 1 10 | T5, 28W, 1-lamp, 220-240V, 1.0 ballast factor  |
| EHD T528 M E 2 10 | T5, 28W, 2-lamp, 220-240V, 1.0 ballast factor  |
| EHD T539 M E 1 10 | T5, 39W, 1-lamp, 220-240V, 1.0 ballast factor  |
| EHD T539 M E 2 10 | T5, 39W, 2-lamp, 220-240V, 1.0 ballast factor  |
| EHD T554 M E 1 10 | T5, 54W, 1-lamp, 220-240V, 1.0 ballast factor  |
| EHD T554 M E 2 10 | T5, 54W, 2-lamp, 220-240V, 1.0 ballast factor  |

### EcoSystem 5-Series LED Driver

|                  |                                     |
|------------------|-------------------------------------|
| LDE53E1CRN-RA070 | 20 to 35 W, 0,700 A, 27,7 to 50,0 V |
| LDE53E1CRN-JA105 | 20 to 35 W, 1,050 A, 18,8 to 33,3 V |
| LDE53E1CRN-LA140 | 18 to 35 W, 1,400 A, 12,9 to 25,0 V |
| LDE52E1CRN-PA050 | 12 to 25 W, 0,500 A, 24,0 to 50,0 V |
| LDE52E1CRN-FA070 | 12 to 25 W, 0,700 A, 16,4 to 35,7 V |
| LDE52E1CRN-MA105 | 12 to 25 W, 1,050 A, 11,0 to 23,8 V |
| LDE52E1CRN-KA140 | 13 to 25 W, 1,400 A, 9,3 to 17,9 V  |
| LDE51E1CRN-GA035 | 8 to 18 W, 0,350 A, 22,2 to 51,4 V  |
| LDE51E1CRN-NA050 | 8 to 15 W, 0,500 A, 15,0 to 30,0 V  |
| LDE51E1CRN-QA070 | 7 to 15 W, 0,700 A, 10,0 to 21,4 V  |

### Rania RF switch and Rania RF switch packages matte and metallic colours –

AW = Arctic White, MC = Mica, AR = Argentum. **Rania RF switch metal finishes –**

BB = Bright Brass, BC = Bright Chrome, BN = Bright Nickel, AU = Gold, SB = Satin Brass, SC = Satin Chrome, SN = Satin Nickel, QB = Antique Brass, QZ = Antique Bronze

## Sources

- 1 Compared with manual (non-automated) controls, up to 60% lighting energy savings is possible on projects that utilise 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 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 un-occupancy. EnergyPlus modeling simulations were conducted and predicted similar savings.
- 4 Light Right Consortium. 2003. "Lighting Quality & Office Worker Productivity," Research Study, Albany, N.Y.
- 5 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.
- 6 Reinhart CF. 2002. Effects of interior design on the daylight availability in open plan offices. Study of the American Commission for an Energy Efficient Environment (ACE) Conference Proceedings. To achieve maximum lighting savings, automated shades are utilised.
- 7 Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161-180.
- 8 Galasiu AD, et al. 2007. Energy saving lighting control systems for open-plan offices: A field study. Leukos. 4(1) pg 7-29.
- 9 Ecos. 2011. Commercial office plug load savings assessment. California Energy Commission PIER Program.
- 10 Phillips, R. W. (1997). Educational Facility Age and the Academic Achievement of Upper Elementary School Students. Unpublished Doctoral Dissertation. University of Georgia.

### WORLDWIDE HEADQUARTERS

Lutron Electronics Co., Inc.  
7200 Suter Road  
Coopersburg, PA 18036-1299  
USA  
Toll-free: 1 888 LUTRON1  
TEL: +1 610 282 3800  
FAX: +1 610 282 1243  
intsales@lutron.com

### EUROPEAN HEADQUARTERS

Lutron EA Ltd.  
6 Sovereign Close  
London, E1W 3JF  
UK  
FREEPHONE: 0800 282 107  
TEL: +44 (0)20 7702 0657  
FAX: +44 (0)20 7480 6899  
lutronlondon@lutron.com

### ASIAN HEADQUARTERS

Lutron GL Ltd.  
#07-03 Tower Fifteen  
15 Hoe Chiang Road  
Singapore 089316  
TEL: +65 6220 4666  
FAX: +65 6220 4333  
lutronsea@lutron.com

### INTERNATIONAL OFFICES

#### Brazil: São Paulo

TEL: +55 11 4327 3800

#### China: Beijing

TEL: +86 10 5925 1340

#### China: Guangzhou

TEL: +86 20 2885 8812

#### China: Hong Kong

TEL: +852 2104 7733

#### China: Shanghai

TEL: +86 21 6165 0990

#### Colombia: Bogotá

informacion@lutron.com

#### France: Paris

TEL: +33 1 56 59 16 64

#### Germany: Berlin

TEL: +49 (0)30 971045-90

#### India: Bangalore

TEL: +91 22 4030 0485

#### India: Gurgaon

TEL: +91 12 4439 0130

#### India: Mumbai

TEL: +91 22 4070 0867

#### India: Delhi

TEL: +91 124 471 1900

#### Italy: Milan

FREEPHONE: 800 979 208

#### Japan: Tokyo

TEL: +81 3 5575 8411

#### Mexico: Mexico D.L.

Toll-free: +1 888 2352910

#### Russia: Moscow

FREEPHONE: 007 495 6496094

#### Spain: Barcelona

TEL: +34 93 222 11 80

#### Spain: Madrid

TEL: +34 91 567 84 79

#### Saudi Arabia: Riyadh

TEL: +966 (1) 462 8000

#### UAE: Dubai

TEL: +971 4 299 1224



[www.lutron.com/energitripak](http://www.lutron.com/energitripak)

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