Commercial Application Guide

Code Compliance | Lighting Controls

IECC 2018
This document summarizes the lighting and receptacle control requirements for commercial buildings. It is for information purposes only. It is not meant to replace your state’s or local jurisdiction’s official energy code. Please refer to your local building energy code or authority having jurisdiction for your precise requirements. Only the authority having jurisdiction can guarantee code compliance.

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</table>

*Go to lutron.com/references for more information.

Lutron Product Capabilities: Commercial Applications

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<td>Multi-level lighting control</td>
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<td>Daylight harvesting</td>
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<td>Receptacle control</td>
<td>•</td>
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<td>Timeclock</td>
<td>•</td>
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<tr>
<td>Automated Demand Response*</td>
<td>•</td>
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<tr>
<td>HVAC integration</td>
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<td>**</td>
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</table>

<table>
<thead>
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<th><strong>Multi-level lighting control</strong></th>
<th><strong>Daylight harvesting</strong></th>
<th><strong>Receptacle control</strong></th>
<th><strong>Timeclock</strong></th>
<th><strong>Demand response</strong></th>
<th><strong>Energy monitoring</strong></th>
<th><strong>BACnet integration</strong></th>
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</thead>
<tbody>
<tr>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

* For the latest information on products compatible with the Vive wireless hub go to lutron.com/vive.
** Requires QS timeclock.
† Automated Demand Response capability requires signal from a third-party device.

Codes can sometimes be complicated and difficult to navigate. This commercial application guide provides examples of how Lutron products can be used to meet or exceed code requirements. This guide focuses on Vive and Vive compatible solutions, but our other control systems offer similar features.
Summary of Requirements for Lighting and Receptacle Controls

IECC 2018

<table>
<thead>
<tr>
<th>Manual Control</th>
<th>Description</th>
<th>Code provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch</td>
<td>Lighting shall be capable of turning ON and OFF. There shall be at least one manual device for control of the lighting within a space. See code for spaces that allow remote location of control.</td>
<td>C405.2.5</td>
</tr>
<tr>
<td>Dimmer or scene control</td>
<td>Lighting shall be capable of being reduced by at least 50% of maximum lighting power. There shall be at least one manual control device for light reduction within a space. See code for spaces that allow remote location of control. Automatic daylight control may be used instead of manual control.</td>
<td>C405.2.2.2</td>
</tr>
</tbody>
</table>

**Other***

<table>
<thead>
<tr>
<th>Minimum control type</th>
<th>Description</th>
<th>Code provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeclock</td>
<td>Interior: Scheduled control, based on time-of-day, turns lighting ON or OFF based on typical occupancy. Occupancy sensors also comply as an alternate to using a timeclock. Exterior: Scheduled control, based on time-of-day and sunrise/sunset (requires astronomical timeclock), turns lighting ON or OFF based on typical occupancy and daylight.</td>
<td>C405.2.6.2 C405.2.6.3 C405.2.6.4</td>
</tr>
<tr>
<td>Occupancy sensor</td>
<td>Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 20 minutes or less.</td>
<td>C405.2.1</td>
</tr>
<tr>
<td>Full ON</td>
<td>When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to maximum lighting power.</td>
<td>C405.2.1.1 Exception</td>
</tr>
<tr>
<td>Partial ON</td>
<td>When initiated by a timeclock or occupancy sensor, lighting is automatically turned ON to 50% or less of maximum lighting power.</td>
<td>C405.2.1</td>
</tr>
<tr>
<td>Manual ON</td>
<td>Lighting is turned ON manually by an occupant.</td>
<td>C405.2.1.1</td>
</tr>
<tr>
<td>Full OFF</td>
<td>When initiated by a timeclock or occupancy sensor, lighting is automatically turned OFF.</td>
<td>C405.2.1</td>
</tr>
<tr>
<td>Partial OFF</td>
<td>When initiated by a timeclock or occupancy sensor, lighting is automatically reduced by at least 50% of maximum lighting power (50% for parking garages). Automatic full OFF also complies.</td>
<td>C405.2 Exception C405.2.6.3</td>
</tr>
<tr>
<td>Daylight responsive control</td>
<td>Interior: A sensor which adjusts lighting in response to available daylight is required for sidelight and skylight zones. Some spaces, including offices and classrooms require dimming. See the “Daylight Zone Requirements” diagrams for more information. Exterior: A photosensor can be used as an alternate to the dawn/dusk peration of an astronomical timeclock.</td>
<td>C405.2.3 C405.2.6.1</td>
</tr>
<tr>
<td>Receptacle control</td>
<td>Receptacle control is not required by this energy code.</td>
<td>N/A</td>
</tr>
<tr>
<td>Demand response</td>
<td>Demand response is not required by this energy code.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

For areas being used as a path of egress or fixtures being used for emergency, verify compliance with your local authority having jurisdiction. Acceptance (functional) testing is required for all new construction applications to ensure that control hardware and software are calibrated, programmed and functioning properly (Code provision C408.3).

Enhanced Digital Lighting Controls is one compliance path of the Additional Efficiency Package requirement (Section C406).

1 Luminare level lighting controls (LLLC) can be can be used as an alternate compliance path. See Section C405.2 for more information.

Daylight Zone Requirements:
Sidelighting and skylighting daylight zones must be controlled separately from toplighted zones. North, South, East, and West zones must also be controlled separately.

Daylight Exceptions:
Daylight control is not required when the total lighting power of a daylight zone is 150W or less, or when the total glazing area is 24 sq. ft. or less. Other exceptions exist, based on space type, window area, neighboring obstructions, and glass transmittance.
The compliant solutions listed below are suggested based on total installed cost, simplicity of design, and basic functional needs for the space. These solutions represent one of multiple compliant options to meet lighting and receptacle control requirements. ASHRAE 90.1 2016 can also be used as a compliance option in meeting IECC 2018 requirements. Applications in this guide will illustrate these solutions and/or alternate solutions for advanced functionality.

### Suggested Code Compliant Solutions

#### IECC 2018

<table>
<thead>
<tr>
<th>Manual Control</th>
<th>Arum</th>
<th>Classroom, Lecture Hall, Training Room</th>
<th>Conference, Break Room</th>
<th>Corridor</th>
<th>Guestroom</th>
<th>Lobby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Dimmer or scene control</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Timeclock</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Occupancy sensor</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
</tbody>
</table>

#### Automatic ON/OFF Control

<table>
<thead>
<tr>
<th>Settings</th>
<th>Arum</th>
<th>Classroom, Lecture Hall, Training Room</th>
<th>Conference, Break Room</th>
<th>Corridor</th>
<th>Guestroom</th>
<th>Lobby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full ON</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Partial ON</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Manual ON</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Full OFF</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Partial OFF</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
</tbody>
</table>

#### Other

<table>
<thead>
<tr>
<th>Other</th>
<th>Arum</th>
<th>Classroom, Lecture Hall, Training Room</th>
<th>Conference, Break Room</th>
<th>Corridor</th>
<th>Guestroom</th>
<th>Lobby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daylight responsive control</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Receptacle control</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
<tr>
<td>Demand response</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
<td>☎️</td>
</tr>
</tbody>
</table>

### Diagram key:

- ☎️ = New construction
- ☎️ = Lighting retrofit
- ☎️ = New construction and retrofit

#### Diagram

- Open Office (>300 sq. ft.)
- Parkin Garage
- Private Office (<300 sq. ft.)
- Restroom
- Stairwell
- Storage Room
- Facade / Landscape
- Other Exterior

1. All retrofits altering more than 10% of the luminaires, or retrofits that increase the installed lighting power must comply with all new construction requirements.
2. To comply with some life safety code requirements for egress illumination, automatic full OFF is not suggested. For non-egress areas, the occupancy sensor should turn the lights to full OFF and a switching control may be used.
3. Automatic shutoff is required for all installed luminaires and switched receptacles.
4. Timeclock ensures the lights are on when typically occupied. Occupancy sensor controls lights when typically unoccupied.
5. Astronomical timeclock shall ensure all lights are off during daylight hours. Lights should be scheduled to Partial OFF during night hours. See section C405.2.6.3 for scheduling times.
6. Control zone is limited to 600 sq. ft. Sensor must automatically reduce lighting in each control zone individually by at least 80%, or turn all lighting OFF within 20 minutes of vacancy.
7. Not a code requirement. Lutron recommends this solution for spaces designated as a path of egress.
8. These spaces require continuous daylight dimming to OFF.
How to Use this Guide

This application guide is designed to help specifiers and contractors understand codes and Lutron controls in a simple manner. Each of the pages will lay out different spaces, the corresponding lighting control products for those spaces, and the way the system is set up in the space.

For Specifiers
Use this application guide for design suggestions, to understand the way the system operates and to specify the relevant products for each space.

For Contractors
Use this application guide to understand how the system is installed, the way the system must operate, and to order the correct products for each application.

This guide offers up to three solutions per space type.

- **The Retrofit Solutions** are simple and inexpensive solutions, generally suited for a basic retrofit.
- **The New Construction Solutions** are value driven, generally best suited for new construction.
- **The Recommended Solutions** have advanced functionality for greater comfort and energy savings.

### Classroom | New Construction

#### IECC 2018

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**Visible System Components**

- **Occupant Enters:**
  - Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 80%.

- **When Occupied:**
  - **Automatic:** Overhead lights dim/brighten based on daylight availability. There is one perimeter daylight zone.
  - **Manual:** Occupant uses wall dimmers to set desired light levels for both general and white-board lights.

- **Occupant Exits:**
  - All lights automatically turn off 15 minutes after all occupants exit.

---

**Control Functionality**

- **Occupant Enters:**
  - Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 85%.

- **When Occupied:**
  - Automatic: Overhead lights dim/brighten based on daylight availability. There is one perimeter daylight zone.
  - Manual: Occupant uses wall dimmers to set desired light levels for both general and white-board lights.

- **Occupant Exits:**
  - All lights automatically turn off 15 minutes after all occupants exit.

---

**Control Strategies**

- **Occupancy/Vacancy:**
- **Full On Dim:**
- **Daylight Harvesting:**
- **Full On Dim:**
- **Personal Dimming:**
  - Max: 100% Max: 85%
- **High-end Trim/Tuning:**
  - Line-voltage wiring
  - Low-voltage wiring

---

**Lighting Energy Savings**

- **60%**

*Go to lutron.com/references for more information.

---

### Symbol Model Number Description Qty List Price Each

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Qty</th>
<th>List Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMJS-8T-DV-B</td>
<td>PowPak dimming module with 0-10 V</td>
<td>3</td>
<td>$150.00</td>
<td></td>
</tr>
<tr>
<td>LRF2-DCRB-WH</td>
<td>Radio Powr Savr wireless daylight sensor</td>
<td>1</td>
<td>$120.00</td>
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<tr>
<td>LRF2-VKLB-P-WH</td>
<td>Radio Powr Savr wireless corner-mount vacancy sensor</td>
<td>1</td>
<td>$85.00</td>
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</tr>
<tr>
<td>PJ2-3BRL-GWH-L01</td>
<td>Pico wireless 2-button control</td>
<td>2</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>COC-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>2</td>
<td>$8.00</td>
<td></td>
</tr>
</tbody>
</table>

---

*Add a Vive wireless hub to enable simple setup and rezoning, system monitoring, timeclock functionality, and advanced integration.*

---

*Learn more about the products used in the space*

---

**Code Notes:** For non-daylight classrooms, all general lighting can be connected to a single 0-10 V dimming module. This is also a great setting for large lecture halls, as it’s often convenient for students to stay on while students are on breaks. The solution requires Lutron modules and products by Lutron.

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*Learn what strategies are implemented in the space*

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*Learn what energy savings you achieve over manual shut-off*

---

*Learn about the products visible in the space and the different options available for these.*

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*Understand how the space functions with the installed system*

---
This is a high-level overview of the local solutions layout. For individual room requirements refer to the detailed room type solutions in this guide. A single PowPak module can control a single or multiple fixtures. The products shown here are representative of local solutions. Multiple product options are available to meet the needs of the space.

Vive wireless hub*
PowPak module
- Occupancy sensor
- Pico wireless remote control
- Daylight sensor

Vive wireless hub features:
- Central control, management, and monitoring of Vive devices via web browser
- Supports astronomic and time-of-day events
- Two contact closure inputs for third-party integration such as Automatic Demand Response
- Wi-Fi access for easy commissioning
- Control up to 10,000 sq. ft. with a single hub
- Optional BACnet integration

* Go to lutron.com/vive for complete compatibility and design details.
Visible System Components

Control Functionality

When Occupied:
- Automatic: Overhead lights dim/brighten based on daylight availability. There are two perimeter daylight zones.
- Manual: Occupant selects scenes or uses dimmers to set desired light levels for all lights. Entry scene controller has 5 user preferred presets and 1 all off button.

Timeclock:
- Timeclock turns lights on to 50% light level during normally occupied hours. Maximum light level is set to 80%.
- Timeclock turns lights off during normally unoccupied hours.

Control Strategies

Daylight Harvesting

High-end Trim/Tuning

Scheduling

Scene Control

Lighting Energy Savings*

60%

* Go to lutron.com/references for more information.

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
RMJS-8T-DV-B | PowPak dimming module with 0-10V | 4 | $ 150.00
LRF2-DCRB-WH | Radio Powr Savr wireless daylight sensor | 2 | $ 120.00
PJ2-4B-GWH-L31 | Pico wireless 4-button scene control | 1 | $ 39.00
PICO-WBX-ADAPT | Pico wallbox adapter | 1 | $ 8.00
HJS-1-FM | Vive wireless hub | Consult your local rep for hub pricing and service options.

Code Notes: Requirements specified for 20-40 ft. atriums. Go to lutron.com/vive for complete compatibility and design details. This solution requires 0-10V enabled ballasts and drivers by others.
Visible System Components

- Pico wireless control
- Radio Powr Savr wireless corner-mount vacancy sensor

Control Functionality

**Occupant Enters:**
Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 80%.

**When Occupied:**
Manual: Occupant uses wall dimmer to set desired light levels for all lights.

**Occupant Exits:**
All lights automatically turn off 15 minutes after all occupants exit.

Control Strategies

- Manual On
- Auto Off
- Occupancy/Vacancy

- Max: 100%
- Max: 85%
- 85%

- High-end Trim/Tuning

**Control Strategies**

- Occupancy/Vacancy
- High-end Trim/Tuning

Code Notes:
For break rooms with daylight, include a 0-10V dimming module per zone and a daylight sensor.

Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details.

This solution requires 0-10V enabled ballasts and drivers by others.

---

### Symbol Model Number Description Qty List Price Each

<table>
<thead>
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<td>RMJS-8T-0V-B</td>
<td>PowPak dimming module with 0-10V</td>
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<td>$150.00</td>
<td></td>
</tr>
<tr>
<td>LRF2-VKLB-P-WH</td>
<td>Radio Powr Savr wireless corner-mount vacancy sensor</td>
<td>1</td>
<td>$85.00</td>
<td></td>
</tr>
<tr>
<td>PJ2-3BRL-GWH-L01</td>
<td>Pico wireless 3-button with raise/lower control</td>
<td>1</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>1</td>
<td>$8.00</td>
<td></td>
</tr>
</tbody>
</table>

---

**Lighting Energy Savings**

45%

*Go to lutron.com/references for more information.*
Visible System Components

Control Functionality

Occupant Enters:
Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 80%.

When Occupied:
Automatic: Overhead lights dim/brighten based on daylight availability. There is one perimeter daylight zone.
Manual: Occupant uses wall dimmers to set desired light levels for both general and white-board lights.

Occupant Exits:
All lights automatically turn off 15 minutes after all occupants exit.

Add a Vive wireless hub to enable simple setup and rezing, system monitoring, timeclock functionality, and advanced integration.

Control Strategies

Occupancy/Vacancy

Daylight Harvesting

Personal Dimming

High-end Trim/Tuning

Lighting Energy Savings*

60%

* Go to lutron.com/references for more information.

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
RMJS-8T-DV-B | PowPak dimming module with 0-10V | 3 | $ 150.00
LRF2-OCRBB-CH | Radio Powr Savr wireless daylight sensor | 1 | $ 120.00
LRF2-VKLB-P-CH | Radio Powr Savr wireless corner-mount vacancy sensor | 1 | $ 85.00
PJ2-3BRL-GWH-L01 | Pico wireless 2-button control | 2 | $ 21.00
PICO-WBX-ADAPT | Pico wallbox adapter | 2 | $ 8.00

Code Notes: For non-daylight classrooms, all general lighting can be connected to a single 0-10V dimming module. Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details. This solution requires 0-10V enabled ballasts and drivers by others.
Visible System Components

Control Functionality

Occupant Enters:
All lights automatically turn on to 50% light level. Occupant turns on lights to maximum level manually. Maximum light level is set to 80%.

When Occupied:
Automatic: Overhead lights dim/brighten based on daylight availability. There are two perimeter daylight zones.

Manual: Occupant selects scenes or uses dimmers to set desired light levels for all lights. Entry scene controller has 3 user preferred presets and 1 all off button.

Occupant Exits:
All lights automatically turn off 15 minutes after all occupants exit.

Control Strategies

Partial On Auto Off
Occupancy/Vacancy
Full On Dim
Daylight Harvesting
Personal Dimming
High-end Trim/Tuning
Scene Control

Lighting Energy Savings*

65%

*Go to lutron.com/references for more information.

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
| | Integral to fixture | Integral fixture control with sensor | 12 | $70.00
| | PJ2-4B-GWH-L31 | Pico wireless 4-button scene control | 1 | $39.00
| | PJ2-3BRL-GWH-L01 | Pico wireless 3-button with raise/lower control | 2 | $21.00
| | PICO-WBX-ADAPT | Pico wallbox adapter | 3 | $8.00

1. Fixture control comes pre-installed in fixture. Look for the Clear Connect Wireless symbol for fixtures containing this module.
2. Fixture adder for the control module may vary.

Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details.

This solution requires digitally enabled ballasts and drivers by others.

This solution meets the requirements of the Luminaire Level Lighting Controls (LLLC) prescriptive path outlined in section C405.2.2.

This solution meets the requirements of the Enhanced Digital Lighting Controls Additional Efficiency Package (Section C406).

Go to lutron.com/findafixture for a complete list of compatible fixtures and drivers.
Visible System Components

Control Functionality

Occupant Enters:
Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 80%.

When Occupied:
Automatic: Overhead lights dim/brighten based on daylight availability. There are two perimeter daylight zones.

Manual: Occupant uses wall dimmer to set desired light levels for all lights.

Occupant Exits:
All lights automatically turn off 15 minutes after all occupants exit.

Add a Vive wireless hub to enable simple setup and re zoning, system monitoring, time clock functionality, and advanced integration.

Control Strategies

Occupancy/Vacancy

Daylight Harvesting

Personal Dimming

High-end Trim/Tuning

Lighting Energy Savings*

60%

* Go to lutron.com/references for more information.
Visible System Components

- Pico wireless 4-button scene control
- Radio Powr Savr wireless corner-mount vacancy sensor and daylight sensor

Control Functionality

**Occupant Enters:**
Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 80%.

**When Occupied:**
Automatic: Overhead lights dim/brighten based on daylight availability. There are two perimeter daylight zones.

Manual: Occupant selects scenes to set desired light levels for all lights. Entry scene controller has 3 user preferred presets and 1 all off button.

**Occupant Exits:**
All lights automatically turn off 15 minutes after all occupants exit.

Add a Vive wireless hub to enable simple setup and rezoning, system monitoring, timeclock functionality, and advanced integration.

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
| | | | |
| | | | |

*Go to lutron.com/vive for complete compatibility and design details.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
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<th>Qty</th>
<th>List Price Each</th>
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Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details.

**Lighting Energy Savings**

60%

*Go to lutron.com/references for more information.
Visible System Components

- Pico wireless control
- Radio Powr Savr wireless hallway occupancy sensor

Control Functionality

**Occupant Enters:**
All lights automatically turn on to maximum light level. Maximum light level is set to 80%.

**When Occupied:**
Manual: Occupant uses wall dimmer to set desired light levels for all lights. Manual control cannot fully shut off the lights. Minimum light level is set to 10%.

**Occupant Exits:**
All lights automatically go to minimum light level 15 minutes after all occupants exit.

**Emergency Mode:**
Lighting connected to emergency power turns on to full output.

Control Strategies

- Auto On Partial Off: Occupancy/Vacancy
  - Max: 100% Max: 85%
  - 85%
- High-end Trim/Tuning

Lighting Energy Savings*

60%

*Go to lutron.com/references for more information.

Symbol | Model Number | Description | Qty | List Price Each
---|---|---|---|---
RMJS-8T-DV-B | PowPak dimming module with 0-10V | 1 | $ 150.00
LRF2-OHLB-P-WH | Radio Powr Savr wireless hallway occupancy sensor | 1 | $ 85.00
PJ2-3BRL-GWH-L01 | Pico wireless 3-button with raise/lower control | 2 | $ 21.00
PICO-WBX-ADAPT | Pico wallbox adapter | 2 | $ 8.00

Code Notes: Verify that the egress fixtures go to full output upon loss of control signal. For projects that require UL 924 compliance, provide an automatic load control relay (ALCR) per load controller connected to emergency fixtures. Add a daylight sensor for corridors with daylight zones. Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details. This solution requires 0-10V enabled ballasts and drivers by others.

Code Notes: For non-egress corridors, set the minimum light level to full off.
Visible System Components

- Pico wireless control
- Radio Powr Savr wireless ceiling-mount occupancy sensor and daylight sensor

Control Functionality

**Occupant Enters:**
All lights automatically turn on to 50% light level. Occupant turns on lights to maximum light level manually. Maximum light level is set to 80%.

**When Occupied:**
- Automatic: Overhead lights dim/brighten based on daylight availability. There is one perimeter daylight zone.
- Manual: Occupant uses wall dimmer to set desired light levels for all lights.

**Occupant Exits:**
All lights automatically turn off 15 minutes after all occupants exit.

Add a Vive wireless hub to enable simple setup and rezone, system monitoring, timeclock functionality, and advanced integration.

Control Strategies

- **Occupancy/Vacancy**
- **Daylight Harvesting**
- **High-end Trim/Tuning**

Lighting Energy Savings*

50%

* Go to lutron.com/references for more information.
Visible System Components

Control Functionality

Occupant Enters:
Each individual light automatically turns on to 50% light level as occupant approaches fixture proximity. Maximum light level is set to 80%.

When Occupied:
Automatic: Each individual overhead light dims/brightens based on local daylight availability.
Manual: Occupant uses wall dimmer to set desired light levels for all lights.

Occupant Exits:
Each individual light automatically turns off 15 minutes after all occupants exit fixture proximity.

Control Strategies

Occupancy/Vacancy
Full On Dim
Daylight Harvesting
Personal Dimming
Max: 100% Max: 85%
High-end Trim/Tuning

Lighting Energy Savings*

Add a Vive wireless hub to enable simple setup and re-zoning, system monitoring, time-clock functionality, and advanced integration.

*Go to lutron.com/references for more information.

Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details.

This solution requires digitally enabled ballasts and drivers by others.

This solution meets the requirements of the Luminous Level Lighting Controls (LLLC) prescriptive path specified in section C405.2.2.

This solution meets the requirements of the Enhanced Digital Lighting Controls Additional Efficiency Package (Section C406).

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
| | Internal to fixture | Internal fixture control with sensor | 16 | $70.00
| | PJ2-3BRL-GWH-L01 | Pico wireless 3-button with raise/lower control | 1 | $21.00
| | PICO-WBX-ADAPT | Pico wallbox adapter | 1 | $8.00

1 Fixture control comes pre-installed in fixture. Look for the Clear Connect Wireless symbol for fixtures containing this module. Go to lutron.com/findafixture for a complete list of compatible fixtures and drivers.
2 Fixture adder for the control module may vary.

Add a Vive wireless hub to enable simple setup and re-zoning, system monitoring, time-clock functionality, and advanced integration.

60%

*Go to lutron.com/references for more information.
Visible System Components

Control Functionality

Occupant Enters:
Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually. Maximum light level is set to 80%.

When Occupied:
Automatic: Overhead lights dim/brighten based on daylight availability. There are two perimeter daylight zones.

Manual: Occupant uses wall dimmer to set desired light levels for all lights.

Occupant Exits:
All lights automatically turn off 15 minutes after all occupants exit.

Add a Vive wireless hub to enable simple setup and rezone, system monitoring, timeclock functionality, and advanced integration.

Control Strategies

Occupancy/Vacancy

Daylight Harvesting

Personal Dimming

High-end Trim/Tuning

Lighting Energy Savings*

60%

* Go to lutron.com/references for more information.
Visible System Components

Control Functionality

Occupant Enters:
All lights automatically turn on to maximum light level. Maximum light level is set to 80%.

When Occupied:
Manual: Occupant uses wall dimmer to set desired light levels for all lights.

Occupant Exits:
All lights automatically turn off 15 minutes after all occupants exit.

Control Strategies

- Occupancy/Vacancy
- High-end Trim/Tuning

Lighting Energy Savings*

50%

* Go to lutron.com/references for more information.

Symbol | Model Number | Description | Qty | List Price Each
---|---|---|---|---
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details.
This solution requires 0-10V enabled ballasts and drivers by others.
Visible System Components

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
 | FXSWLX4H | Lutron 4 ft. stairwell LED fixture | 2 (per floor) | $540.00
 | LRF2-OKLB-P-WH | Radio Powr Savr wireless corner-mount occupancy sensor | 1 (per floor) | $85.00

Control Functionality

**Occupant Enters:**
All lights automatically turn on to maximum light level. Maximum light level is set to 80%.

**Occupant Exits:**
All lights dim to minimum light level 15 minutes after all occupants exit. Minimum light level is set to 10%.

**Emergency Mode:**
Lighting connected to emergency power turns on to full output.

Control Strategies

- **Occupancy/Vacancy**
  - Max: 100%
  - Max: 85%

- **High-end Trim/Tuning**

Lighting Energy Savings*

80%

* Go to lutron.com/vive for the latest compatibility details.

Code Notes: Verify that the egress fixtures go to full output upon loss of control signal. For projects that require UL 924 compliance, provide an automatic load control relay (ALCR) per load controller connected to emergency fixtures. Add a daylight sensor for stairwells with daylight zones.

Lutron Stairwell Fixture (FXSWLX44) is not currently compatible with the Vive wireless hub. A new model number is coming soon that will include Vive compatibility. Go to lutron.com/vive for the latest compatibility details.
### Visible System Components

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Qty</th>
<th>List Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LRF2-OKLB-P-WH</td>
<td>Radio Powr Savr wireless corner-mount occupancy sensor</td>
<td>1 (per floor)</td>
<td>$ 85.00</td>
</tr>
<tr>
<td></td>
<td>Integral fixture control</td>
<td>Integral to fixture*</td>
<td>2 (per floor)</td>
<td>$ 60.00</td>
</tr>
</tbody>
</table>

* Fixtures are pre-installed in fixture. Look for the Clear Connect Wireless symbol for fixtures containing this module. Go to lutron.com/findafixture for a complete list of compatible fixtures and drivers.

* Fixture adder for the control module may vary.

### Control Functionality

**Occupant Enters:**
- All lights automatically turn on to maximum light level. Maximum light level is set to 80%.

**Occupant Exits:**
- All lights dim to minimum light level 15 minutes after all occupants exit. Minimum light level is set to 10%.

**Emergency Mode:**
- Lighting connected to emergency power turns on to full output.

### Control Strategies

**Occupancy/Vacancy**
- All lights dim to minimum light level 15 minutes after all occupants exit. Minimum light level is set to 10%.

**High-end Trim/Tuning**
- Lighting energy savings: 80%

### Code Notes

- Verify that the egress fixtures go to full output upon loss of control signal. For projects that require UL 924 compliance, provide an automatic load control relay (ALCR) per load controller connected to emergency fixtures. Add a daylight sensor for stairwells with daylight zones. This solution requires digitally enabled ballasts and drivers by others.

- For non-egress stairwells, set the minimum light level to full off.

* Go to lutron.com/references for more information.