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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.
Energy-saving lighting control strategies

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<th>Strategy</th>
<th>Potential savings</th>
</tr>
</thead>
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<td><strong>High-end trim/tuning</strong></td>
<td>10–30% Lighting</td>
</tr>
<tr>
<td><strong>Occupancy/vacancy sensing</strong></td>
<td>20–60% Lighting</td>
</tr>
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<td><strong>Daylight harvesting</strong></td>
<td>25–60% Lighting</td>
</tr>
<tr>
<td><strong>Personal dimming control</strong></td>
<td>10–20% Lighting</td>
</tr>
<tr>
<td><strong>Controllable window shading</strong></td>
<td>10–20% Cooling</td>
</tr>
<tr>
<td><strong>Scheduling</strong></td>
<td>10–20% Lighting</td>
</tr>
<tr>
<td><strong>Demand response</strong></td>
<td>30–50% During peak period</td>
</tr>
<tr>
<td><strong>Plug load control</strong></td>
<td>15–50% of Controlled loads</td>
</tr>
<tr>
<td><strong>HVAC integration</strong></td>
<td>5–15% HVAC</td>
</tr>
</tbody>
</table>

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

Lutron Product Capabilities: Commercial Applications

Local Solutions | Vive | Vive with wireless hub* | Limelight
--- | --- | --- | ---
Occupancy sensing | ★ | ★ | ★ | ★
Multi-level lighting control |   | ★ | ★ | ★
Daylight harvesting | ★ | ★ | ★ | ★
Receptacle control |   | ★ | ★ | ★
Timed lock | ★ | ★ | ★ | ★
Demand response |   | ★ | ★ | ★
Energy monitoring |   | ★ | ★ | ★
BACnet integration |   | ★ | ★ | ★

Strategies for code/standards compliance

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.

Lutron Product Capabilities: Commercial Applications

- **Wallbox**
- **Vive**
- **Vive with wireless hub**
- **Limelight**

To learn more about these products and their specifications, go to lutron.com/catalogs.

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

The requirements listed below are summarized for simplicity and may have other exceptions that were omitted.

#### Minimum control type

<table>
<thead>
<tr>
<th>Requirement</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>C405.2.2.3</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 a manual device allowing an occupant to reduce lighting by at least 50% of maximum lighting power 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>
<tr>
<td>Timeclock</td>
<td><strong>Interior:</strong> 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. <strong>Exterior:</strong> 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>C405.2.2 C405.2.5</td>
</tr>
<tr>
<td>Occupancy sensor control</td>
<td>Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 30 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 (30% for parking garages). Automatic full OFF also complies.</td>
<td>C405.2.2 Exception C405.2.5</td>
</tr>
<tr>
<td>Daylight responsive control</td>
<td><strong>Interior:</strong> A sensor which adjusts lighting in response to available daylight is required for sidelighted and skylighted zones. Some spaces, including offices and classrooms, require dimming. See the “Daylight Zone Requirements” diagrams for more information. <strong>Exterior:</strong> A photosensor can be used as an alternate to the dawn/dusk operation of an astronomical timeclock.</td>
<td>C405.2.3 C405.2.5</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>

#### Daylight Zone Requirements

**Sidelighting (Window)**

- **Sidelighting (Window)**: Sidelighted daylight zones must be controlled separately from toplighted zones. North, South, East, and West zones must also be controlled separately.

```
WINOD HEAD
HEIGHT (Hw)
```

**Toplighting (Skylight)**

- **Toplighting (Skylight)**: Daylight control is not required when the total lighting power of a daylight zone is 150 W or less, or when the total glazed area is 24 sq. ft. or less. Other exceptions exist, based on space type, window area, neighboring obstructions, and glass transmittance.

```
SKYLIGHT
AVERAGE CEILING
HEIGHT (Hc)
```

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).
Suggested Code Compliant Solutions
IECC 2015

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 2013 can also be used as a compliance option in meeting IECC 2015 requirements.

<table>
<thead>
<tr>
<th>Atrium</th>
<th>Classroom, Lecture Hall</th>
<th>Conference, Break Room</th>
<th>Corridor</th>
<th>Lobby</th>
<th>Open Office (&gt;300 sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manual Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch</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>
</tr>
<tr>
<td><strong>Timeclock</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Occupancy sensor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full ON</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>
</tr>
<tr>
<td>Manual ON</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>
</tr>
<tr>
<td>Partial OFF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Daylight responsive control</strong></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>
</tr>
<tr>
<td><strong>Other</strong></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>
</tr>
</tbody>
</table>

**Diagram key:**
- New construction
- Lighting retrofit
- New construction and retrofit

<table>
<thead>
<tr>
<th>Parking Garage</th>
<th>Private Office (&gt;300 sq. ft.)</th>
<th>Restroom</th>
<th>Stairwell</th>
<th>Storage Room</th>
<th>Facade/Landscape</th>
<th>Parking Lot/Other Exterior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 All retrofits altering more than 50% of the luminaires, or 10% with alterations to controls and/or circuits, 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 Timeclock ensures the lights are on when typically occupied. Occupancy sensor controls lights when typically unoccupied.
4 Astronomical timeclock shall ensure all lights are off during daylight hours. Lights should be scheduled to Partial OFF during night hours. See section C405.2.5 for scheduling times.
5 Not a code requirement. Lutron recommends this solution for spaces designated as a path of egress.
6 These spaces require continuous daylight dimming to OFF.
How to Use this Guide
IECC 2015

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.

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.

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

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.

<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>Integral fixture*</td>
<td>Integral fixture control with sensor</td>
<td>12</td>
<td>$70.00</td>
</tr>
<tr>
<td></td>
<td>PJ2-4B-GWH-L31</td>
<td>Pico wireless 4-button scene control</td>
<td>1</td>
<td>$39.00</td>
</tr>
<tr>
<td></td>
<td>PJ2-3BRL-GWH-L01</td>
<td>Pico wireless 3-button with raise/lower control</td>
<td>2</td>
<td>$21.00</td>
</tr>
<tr>
<td></td>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>3</td>
<td>$8.00</td>
</tr>
</tbody>
</table>

Control Strategies

Partial On Auto Off
Occupancy/Vacancy
Full On Dim
Daylight Harvesting
Full On Dim
Personal Dimming
Max: 100% Max: 85%

High-end Trim/Tuning
Scene 1
Scene 2
Scene 1
Scene 2
Scene 1
Scene 2

Lighting Energy Savings*

65%*  

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

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.
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

- **Pico wireless 4-button scene control**
- **Radio Powr Savr wireless daylight sensor**

## 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 3 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.

---

### 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.

### 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>RMJS-8T-DV-B</td>
<td>PowPak dimming module with 0-10V</td>
<td>4</td>
<td>$150.00</td>
</tr>
<tr>
<td></td>
<td>LRF2-DCRB-WH</td>
<td>Radio Powr Savr wireless daylight sensor</td>
<td>2</td>
<td>$120.00</td>
</tr>
<tr>
<td></td>
<td>PJ2-4B-GWH-L31</td>
<td>Pico wireless 4-button scene control</td>
<td>1</td>
<td>$39.00</td>
</tr>
<tr>
<td></td>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>1</td>
<td>$8.00</td>
</tr>
<tr>
<td></td>
<td>HJS-1-FM</td>
<td>Vive wireless hub</td>
<td>Shared</td>
<td>Connect your local rep for hub pricing and service options.</td>
</tr>
</tbody>
</table>
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:
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 rezoning, system monitoring, timeclock functionality, and advanced integration.

Control Strategies

Occupancy/Vacancy

High-end Trim/Tuning

Lighting Energy Savings*

45%

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

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

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.
**Visible System Components**

- **Pico wireless 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 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 re-zoning, 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 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.

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

Control Strategies

Occupancy/Vacancy
Daylight Harvesting
Personal Dimming
High-end Trim/Tuning
Scene Control

Lighting Energy Savings*

65%* 

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

Integral to fixture
Integral fixture control with sensor

PJ2-4B-GWH-L31
Pico wireless 4-button scene control

PJ2-3BRL-GWH-L01
Pico wireless 3-button with raise/lower control

PICO-WBX-ADAPT
Pico wallbox adapter

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.

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.
Visible System Components

Pico wireless 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 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 rezoning, 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 | 2 | $150.00
LRF2-DCRB-WH | Radio Powr Savr wireless daylight sensor | 1 | $120.00
LRF2-VKLB-P-WH | 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 conference rooms, the 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**

- 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 re-zoning, system monitoring, timeclock functionality, and advanced integration.

**Control Strategies**

- **Occupancy/Vacancy**
  - On/Off
- **Daylight Harvesting**
  - On/Off
- **Personal Dimming**
  - Max: 100% Max: 85%
- **High-end Trim/Tuning**
  - Scene 1
  - Scene 2
- **Scene Control**

**Symbol | Model Number | Description | Qty | List Price Each**
--- | --- | --- | --- | ---
Multiple | FCSJ-ECO | Wireless fixture control with EcoSystem | 10 | $75.00
LRF2-DCRB-WH | Radio Powr Savr wireless daylight sensor | 1 | $120.00
LRF2-VKLBP-WH | Radio Powr Savr wireless corner-mount vacancy sensor | 1 | $85.00
PJ2-4B-GWH-L31 | Pico wireless 4-button scene control | 2 | $38.00
PICO-WBX-ADAPT | Pico wallbox adapter | 2 | $8.00

**Lighting Energy Savings**

60% *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.
Egress Corridor | New Construction
IECC 2015

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. 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

Occupancy/Vacancy

High-end Trim/Tuning

Lighting Energy Savings*

60%

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

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

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. 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.

To emergency power

Clear Connect RF Communication

Line-voltage wiring

Low-voltage wiring
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 rezoning, 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.

Code Notes:
For non-daylight open offices, the 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:**
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.

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

**Control Strategies**

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

**Lighting Energy Savings**

60%

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

---

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Qty</th>
<th>List Price Each</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Internal to fixture</td>
<td>Internal fixture control with sensor</td>
<td>16</td>
<td>$70.00</td>
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<tr>
<td></td>
<td>PU2-3BRL-GWH-L01</td>
<td>Pico wireless 3-button with raise/lower control</td>
<td>1</td>
<td>$21.00</td>
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<tr>
<td></td>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>1</td>
<td>$8.00</td>
</tr>
</tbody>
</table>

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.

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.
Visible System Components

- Pico wireless control
- PowPak fixture 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 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 rezoning, 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.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
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<th>List Price Each</th>
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<tr>
<td>![Green Square]</td>
<td>FCJS-010</td>
<td>Wireless fixture control with 0-10V</td>
<td>2</td>
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<td>![Black Square]</td>
<td>FC-SENSOR</td>
<td>PowPak fixture sensor</td>
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<td>![Green Square]</td>
<td>PJ2-3BRL-GWH-L01</td>
<td>Pico wireless 3-button with raise/lower control</td>
<td>1</td>
<td>$21.00</td>
</tr>
<tr>
<td>![Green Square]</td>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>1</td>
<td>$8.00</td>
</tr>
</tbody>
</table>

FCJS models are capable of controlling up to 3 ballasts or drivers. Review the “Vive PowPak Fixture Controls” submittal document for more design details.

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

**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.

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

Control Strategies

**Occupancy/Vacancy**

**High-end Trim/Tuning**

Control Functionality

**Auto On Auto Off**

**Max:** 100%  **Max:** 85%

**Lighting Energy Savings**

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

<table>
<thead>
<tr>
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<th>Model Number</th>
<th>Description</th>
<th>Qty</th>
<th>List Price Each</th>
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<tbody>
<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>RMJS-8T-DV-B</td>
<td>PowPak dimming module with 0-10V</td>
<td>1</td>
<td>$150.00</td>
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<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>LRF2-OCR2B-P-WH</td>
<td>Radio Powr Savr wireless ceiling-mount occupancy sensor</td>
<td>2</td>
<td>$85.00</td>
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<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>PJ2-3BRL-GWH-L01</td>
<td>Pico wireless 3-button with raise/lower control</td>
<td>1</td>
<td>$21.00</td>
</tr>
<tr>
<td><img src="Image" alt="Symbol" /></td>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>1</td>
<td>$8.00</td>
</tr>
</tbody>
</table>

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

- Lutron 4 ft. stairwell LED fixture
  - Model Number: FXSWLX4H
  - Qty: 2 (per floor)
  - List Price Each: $540.00

- Radio Powr Savr wireless corner-mount occupancy sensor
  - Model Number: LRF2-OKLB-P-WH
  - Qty: 1 (per floor)
  - List Price Each: $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
- High-end Trim/Tuning

Lighting Energy Savings*

- 80%

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

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.
Egress Stairwell | Recommended
IECC 2015

Visible System Components

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Qty (per floor)</th>
<th>List Price Each</th>
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<tr>
<td></td>
<td>Integral to fixture²</td>
<td>Integral fixture control</td>
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<td></td>
<td>LRF2-OKLB-P-WH</td>
<td>Radio Power Savr wireless corner-mount occupancy sensor</td>
<td>1</td>
<td>$85.00</td>
</tr>
</tbody>
</table>

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.

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/references for more information.

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.
Visible System Components

Integral fixture control with sensor

Control Functionality

**Occupant/Vehicle Enters:**
All lights automatically turn on to high light level. High light level is set to 80%.

Automatic: lights dim/brighten based on local daylight availability.

**Occupant/Vehicle Exits:**
All lights automatically turn to low light level 15 minutes after all occupants exit.

Low light level is set to 20%.

Automatic: lights dim/brighten based on local daylight availability.

Control Strategies

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

- **High-end Trim/Tuning**
  - Full On
  - Dim

- **Daylight Harvesting**

<table>
<thead>
<tr>
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<th>Description</th>
<th>Qty</th>
<th>List Price Each</th>
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<td>LL-EN-INTMOUNT LL-PIR</td>
<td>Limelight radio module with built-in daylight sensor and PIR occupancy sensor</td>
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<td>Consult your local rep for pricing and service options</td>
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<tr>
<td><img src="symbol.png" alt="Symbol" /></td>
<td>LL-CELLGATE</td>
<td>The Limelight gateway with cellular connection</td>
<td>1</td>
<td>Consult your local rep for pricing and service options</td>
</tr>
</tbody>
</table>

1. Fixture control comes pre-installed in fixture.
2. Fixture adder for the control module may vary.
3. The rooftop parking area of a parking garage should follow the requirements of a parking lot. Both requirements can be met under one system.

Lighting Energy Savings*

45%

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

Limelight radio module with built-in daylight sensor and PIR occupancy sensor

Control Functionality

**Occupant/Vehicle Enters:**
All lights automatically turn on to high light level. High light level is set to 80%.
Automatic: lights dim/brighten based on local daylight availability.

**Occupant/Vehicle Exits:**
All lights automatically go to mid level when no motion is detected.
Automatic: lights dim/brighten based on local daylight availability.

**Timeclock:**
Timeclock turns lights to mid level between midnight and 6:00 AM.

Control Strategies

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

Lighting Energy Savings*

45%

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

1. Fixture control can be installed at the manufacturer, or in the field.
2. Fixture adder for the control module may vary.

<table>
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<tbody>
<tr>
<td><img src="image" alt="LL-EXTMOUNT" /></td>
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<td>Limelight radio module with built-in daylight sensor and PIR occupancy sensor</td>
<td>1 (per fixture)</td>
<td>Consult your local rep for pricing and service options</td>
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<tr>
<td><img src="image" alt="LL-CELLGATE" /></td>
<td>LL-CELLGATE</td>
<td>The Limelight gateway with cellular connection</td>
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