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. The recommendations presented in this guide are based on the originally published code prior to addenda. 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

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

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

## Lutron Product Capabilities: Commercial Applications

### Local Solutions

<table>
<thead>
<tr>
<th>Occupancy sensing</th>
<th>Vive</th>
<th>Vive with wireless hub*</th>
<th>Energi Savr Node</th>
<th>Quantum</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Wallbox" /></td>
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</table>

### Panel Solutions

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<td><img src="image" alt="Energi Savr Node" /></td>
<td><img src="image" alt="Quantum" /></td>
</tr>
</tbody>
</table>

## Strategies for code/standard compliance

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Wallbox</th>
<th>Vive</th>
<th>Vive with wireless hub*</th>
<th>Energi Savr Node</th>
<th>Quantum</th>
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</thead>
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<tr>
<td>Multi-level lighting control</td>
<td><img src="image" alt="Wallbox" /></td>
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<td><img src="image" alt="Vive" /></td>
<td><img src="image" alt="Vive with wireless hub*" /></td>
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<td><img src="image" alt="Quantum" /></td>
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<td>Receptacle control</td>
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<td><img src="image" alt="Vive with wireless hub*" /></td>
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<tr>
<td>Timeclock</td>
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<tr>
<td>Energy monitoring</td>
<td><img src="image" alt="Wallbox" /></td>
<td><img src="image" alt="Vive" /></td>
<td><img src="image" alt="Vive with wireless hub*" /></td>
<td><img src="image" alt="Energi Savr Node" /></td>
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<tr>
<td>BACnet integration</td>
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</table>

To learn more about these products and their specifications, go to [lutron.com/catalogs](http://lutron.com/catalogs)

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* 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
Daylight Zone Requirements:
Fixtures in primary side-light or skylight zones must be controlled by a daylight sensor. Fixtures in daylight zone must be controlled separately from fixtures in the rest of the space.

Daylight Exceptions:
Daylight control is not required in primary sidelighted areas less than 250 sq. ft. and in areas under skylights less than 900 sq. ft.

Summary of Requirements for Lighting and Receptacle Controls
ASHRAE 90.1-2010

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

<table>
<thead>
<tr>
<th>Minimum control type</th>
<th>Description</th>
<th>Code provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching</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>9.4.1.2 (a) Exceptions</td>
</tr>
<tr>
<td>Multi-level or dimming</td>
<td>Lighting shall be capable of providing at least one level between 30% and 70% of full power, in addition to 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>9.4.1.2 (a)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Local Control</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 &amp; parking garages: Scheduled control, based on time-of-day and sunrise/sunset, turns lighting ON or OFF based on typical occupancy and daylight (requires astronomical timeclock).</td>
<td>9.4.1.1 (a) 9.4.1.3 (a) &amp; (c) 9.4.1.7 (a), (b), &amp; (c)</td>
</tr>
<tr>
<td>Occupancy sensor</td>
<td>Automatic control turns lighting ON upon occupancy or OFF after a vacancy of 30 minutes or less.</td>
<td>9.4.1.2 (b) 9.4.1.3 (b)</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>9.4.1 Exceptions</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>9.4.1</td>
</tr>
<tr>
<td>Full OFF</td>
<td>When initiated by a timeclock or occupancy sensor, lighting is automatically turned OFF.</td>
<td>9.4.1.2 (b)</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 enclosed parking garages and exterior). Automatic full OFF also complies.</td>
<td>9.4.1.3 (b) 9.4.1.6 (g) 9.4.1.7 (c)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Description</th>
<th>Code provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daylight responsive control¹</td>
<td>Interior: A sensor which adjusts lighting in response to available daylight is required for sidelight and skylight zones. There must be at least two light levels between ON and OFF. See the “Daylight Zone Requirements” diagrams for more information. Exterior and parking garages: A photosensor can be used as an alternate to the dawn/dusk operation of an astronomical timeclock. The perimeter 20 ft. of parking garages with access to daylight must automatically reduce lighting power in response to daylight.</td>
<td>9.4.1.3 (d) 9.4.1.4 9.4.1.5 9.4.1.7 (a)</td>
</tr>
<tr>
<td>Receptacle control</td>
<td>At least 50% of the receptacles in the space shall automatically turn OFF based on typical occupancy or after a vacancy of 30 minutes or less. Plug-in devices do not comply.</td>
<td>8.4.2</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 9.4.4).

1 When multi-level lighting control and/or daylight responsive control is required, Lutron recommends using continuous dimming to allow for smooth light level adjustment and maximize energy savings.
2 Lutron recommends using occupancy sensors to achieve automatic ON/OFF requirements in place of a timeclock to maximize energy savings and optimize user experience.
3 Manual ON is always permitted for interior applications. Provide manual ON control when no automatic ON is indicated.
The compliant solutions listed below are suggested based on total installed cost, simplicity of design, and basic functional needs for the space. These solutions do not represent the only compliant options to meet lighting and receptacle control requirements. Applications in this guide will illustrate these solutions and/or alternate solutions for advanced functionality.

### Suggested Code Compliant Solutions

**ASHRAE 90.1-2010**

The compliant solutions listed below are suggested based on total installed cost, simplicity of design, and basic functional needs for the space. These solutions do not represent the only compliant options to meet lighting and receptacle control requirements. Applications in this guide will illustrate these solutions and/or alternate solutions for advanced functionality.

The compliant solutions listed below are suggested based on total installed cost, simplicity of design, and basic functional needs for the space. These solutions do not represent the only compliant options to meet lighting and receptacle control requirements. Applications in this guide will illustrate these solutions and/or alternate solutions for advanced functionality.

### Table: Local Control

<table>
<thead>
<tr>
<th></th>
<th>Atrium</th>
<th>Break Room</th>
<th>Classroom, Lecture Hall, Training Room</th>
<th>Conference, Multi-purpose Room</th>
<th>Egress Corridor*</th>
<th>Lobby</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Switching</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Multi-level or dimming</strong></td>
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<tr>
<td><strong>Timeclock</strong></td>
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<tr>
<td><strong>Occupancy sensor</strong></td>
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<tr>
<td><strong>Full ON</strong></td>
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<tr>
<td><strong>Partial ON</strong></td>
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<td><strong>Partial OFF</strong></td>
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<tr>
<td><strong>Daylight responsive control</strong></td>
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<tr>
<td><strong>Receptacle control</strong></td>
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<td></td>
</tr>
</tbody>
</table>

### Table: Automatic Control

<table>
<thead>
<tr>
<th></th>
<th>Open Office (&gt;250 sq. ft.)</th>
<th>Private Office (&lt;250 sq. ft.)</th>
<th>Restroom</th>
<th>Egress Stairwell*</th>
<th>Storage Room</th>
<th>Facade/ Landscape</th>
<th>Parking Garage (Not Roof)*</th>
<th>Other Exterior*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Switching</strong></td>
<td><img src="image" alt="Diagram symbol" /></td>
<td><img src="image" alt="Diagram symbol" /></td>
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</tbody>
</table>

1. Retrofit requirements indicated are for lighting alterations greater than 10% of the connected load in a space.
2. Manual ON is always permitted for interior applications. Provide manual ON control when no automatic ON is indicated.
3. When typically occupied, the sensor provides Partial OFF functionality. When typically unoccupied, the sensor provides Full OFF functionality. For entrances and exits, lights are scheduled to Full OFF when typically unoccupied and at night; daylighting and occupancy sensing are not required.
4. For areas not designated as a path of egress, the occupancy sensor must turn lights to full OFF.
5. Astronomical timeclock shall ensure all lights are off during daylight hours. Lights should be scheduled to Partial OFF during night hours. See section 9.4.1.4 for scheduling times.
6. Multi-level or dimming capability is not required in non-daylit lobbies.
Classroom | New Construction
ASHRAE 90.1-2013

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%.
Controlled receptacles automatically regain power when occupant enters.

When Occupied:
Automatic: Overhead lights dim/brighten based on daylight availability. There are two perimeter daylight zones.
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.
50% of all receptacles automatically turn off 15 minutes after all occupants exit.

Control Strategies

Manual On Auto Off
Occupancy/Vacancy
Full On Dim
Daylight Harvesting
Full On Dim
Personal Dimming
Max: 100%
Max: 85%
High-end Trim/Tuning
Appliance On Appliance Off
Plug Load Control

Lighting Energy Savings* 65%
* 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
RMJS-20R-DV-B 20 A PowPak relay module 1 $ 139.00
LRF2-ECOB-WH Radio Powr Savr wireless daylight sensor 1 $ 120.00
LRF2-VLCB-P-WX Radio Powr Savr wireless corner-mount vacancy 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:
For non-daylit classrooms, all general lighting can be connected to a single 0-10 V 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 0-10 V enabled ballasts and drivers by others.

How to Use this Guide
ASHRAE 90.1-2010

For Specifiers
Use this application guide for design suggestions, 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 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**:  
- Central control, management, and monitoring of Vive devices via web browser  
- Supports astronomic and time-of-day events  
- Two contact closure inputs for 3rd party integration such as Automatic Demand Response  
- WiFi 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

Symbol Model Number Description Qty List Price Each

RMJS-16R-DV-B PowPak switching module 2 $129.00
PJ2-2B-GWH-L01 Pico wireless 2-button control 2 $21.00
PICO-WBX-ADAPT Pico wallbox adapter 2 $8.00
HJS-1-FM Vive wireless Hub 2 $ Consult your local rep for Hub pricing and service options.

Control Functionality

When Occupied:
Manual: Occupant uses wall switches to turn on and turn off general lighting.

Timeclock:
Timeclock turns lights on during normally occupied hours.
Timeclock turns lights off during normally unoccupied hours.

Control Strategies

7am: Dim 7pm: Off

Scheduling

Lighting Energy Savings*

10%

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

Code Notes: Requirements specified for atriums 20-40 ft. in height. Go to lutron.com/vive for complete compatibility and design details.
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 selects scenes to set desired light levels for all lights.

Timeclock:
Timeclock turns lights off during normally unoccupied hours.

Control Strategies

Daylight Harvesting

Full On Dim

Max: 100% Max: 85%

85%

High-end Trim/Tuning

7am: Dim 7pm: Off

Scheduling

Scene 1

Scene 2

Scene Control

Lighting Energy Savings*

60%

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

- **Maestro vacancy sensing switch**

**Control Functionality**

- **Occupant Enters:** Lights do not automatically turn on when an occupant enters the space; lights must be turned on manually.

- **When Occupied:**
  - Manual: Occupant uses wall switch to turn all lights off.

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

**Control Strategies**

- **Manual On Auto Off**

**Occupancy/Vacancy**

**Lighting Energy Savings**

*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></td>
<td>MS-VPS6M2-DV-WH</td>
<td>Maestro vacancy sensing switch*</td>
<td>1</td>
<td>$53.00</td>
</tr>
</tbody>
</table>

* Maestro MS-VPS6M2 is not compatible with Vive wireless hub.
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.

Control Strategies

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.

When Occupied:
Manual: Occupant uses wall switches to turn on and turn off general and white-board lighting.

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

Lighting Energy Savings*

45%* 

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

- Pico wireless control
- Radio Pwr 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.

Control Strategies

- Manual On Auto Off
- Occupancy/Vacancy
- Full On Dim
- Daylight Harvesting
- Full On Dim
- 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>
</tr>
</thead>
<tbody>
<tr>
<td>RMJS-8T-DV-B</td>
<td>PowPak dimming module with 0-10V</td>
<td>3</td>
<td>$150.00</td>
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<tr>
<td>LRF2-OCRWH-WH</td>
<td>Radio Pwr Savr wireless daylight sensor</td>
<td>1</td>
<td>$120.00</td>
<td></td>
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<tr>
<td>LRF2-VKLB-P-WH</td>
<td>Radio Pwr 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>2</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>2</td>
<td>$8.00</td>
<td></td>
</tr>
</tbody>
</table>

Code Notes:
For non-daylight classrooms, all general lighting can be connected to a single 0-10V dimming module. Receptacle Control is required for Shop and Laboratory classrooms.
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**
- **Pico wireless 4-button scene control**
- **Integral fixture control with 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 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**

- **Occupancy/Vacancy**
- **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.

---

Receptacle control is required for shop and laboratory classrooms.

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.

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.

When Occupied:
Manual: Occupant uses wall switch to turn all lights off.

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

Lighting Energy Savings*

40%

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

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
RMJS-16R-DV-B | PowPak switching module | 1 | $ 129.00
LRF2-VKLBP-WH | Radio Powr Savr wireless corner-mount vacancy sensor | 1 | $ 85.00
PJ2-2B-GWHL01 | Pico wireless 2-button control | 1 | $ 21.00
PICO-WBX-ADAPT | Pico wallbox adapter | 1 | $ 8.00

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

---

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.
Conference Room | Recommended
ASHRAE 90.1-2010

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 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, timeclock functionality, and advanced integration.

Lighting Energy Savings*

60%

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

Control Strategies

Occupancy/Vacancy

Daylight Harvesting

Personal Dimming

High-end Trim/Tuning

Scene Control

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

--- | --- | --- | --- | ---
Multiple | FCJS-ECO | Wireless fixture control with EcoSystem | 10 | $ 75.00
LRF2-DORB-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
PJ2-4B-GWH-L31 | Pico wireless 4-button scene control | 2 | $ 39.00
PICO-WBX-ADAPT | Pico wallbox adapter | 2 | $ 8.00

Want to add a Vive wireless hub for more features? Go to lutron.com/vive for complete compatibility and design details. Go to lutron.com/BallastTool or lutron.com/findafixture to identify the correct ballast or LED fixture for your project.
Visible System Components

Control Functionality

Occupant Enters:
All non-emergency lights automatically turn on to maximum light level.

When Occupied:
Manual: Occupant uses wall switch to turn all non-emergency lights off.

Occupant Exits:
All non-emergency 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.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Qty</th>
<th>List Price Each</th>
</tr>
</thead>
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<tr>
<td>RMJS-16R-DV-B</td>
<td>PowPak switching module</td>
<td>1</td>
<td>$129.00</td>
<td></td>
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<tr>
<td>LRF2-OHLB-P-WH</td>
<td>Radio Powr Savr wireless hallway occupancy sensor</td>
<td>1</td>
<td>$85.00</td>
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<tr>
<td>PJ2-2B-GWH-L01</td>
<td>Pico wireless 2-button control</td>
<td>2</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>2</td>
<td>$8.00</td>
<td></td>
</tr>
</tbody>
</table>

Control Strategies

Lighting Energy Savings*

40%

* 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.
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 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.

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

Control Strategies

Occupancy/Vacancy

High-end Trim/Tuning

Lighting Energy Savings*

60%

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

* 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

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

* 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 Note: 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**

**Control Functionality**

**Occupant Enters:**
All lights automatically turn on to maximum light level.

**When Occupied:**
Manual: Occupant uses wall switch to turn all lights off.

**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**

- **Auto On Auto Off**
- **Occupancy/Vacancy**

**Lighting Energy Savings**

*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>
</tr>
</thead>
<tbody>
<tr>
<td>RMJS-16R-DV-B</td>
<td>PowPak switching module</td>
<td>1</td>
<td>$129.00</td>
<td></td>
</tr>
<tr>
<td>LRF2-OCR2B-P-WH</td>
<td>Radio Powr Savr wireless ceiling-mount occupancy sensor</td>
<td>4</td>
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<tr>
<td>PJ2-2B-GWH-L01</td>
<td>Pico wireless 2-button control</td>
<td>1</td>
<td>$21.00</td>
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<tr>
<td>PICO-WBX-ADAPT</td>
<td>Pico wallbox adapter</td>
<td>1</td>
<td>$8.00</td>
<td></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.
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 level manually. Maximum light level is set to 80%.

Controlled receptacles automatically regain power when occupant enters.

**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 all lights.

**Occupant Exits:**
- All lights automatically turn off 15 minutes after all occupants exit.
- 50% of all receptacles 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**
- **High-end Trim/Tuning**
- **Plug Load Control**

Lighting Energy Savings*

50%

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

**Symbol Model Number**

<table>
<thead>
<tr>
<th>Symbol</th>
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<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>2</td>
<td>$150.00</td>
</tr>
<tr>
<td></td>
<td>RMJS-20R-DV-B</td>
<td>20 A PowPak relay module</td>
<td>1</td>
<td>$139.00</td>
</tr>
<tr>
<td></td>
<td>LRF2-DCRB-WH</td>
<td>Radio Powr Savr wireless daylight sensor</td>
<td>1</td>
<td>$120.00</td>
</tr>
<tr>
<td></td>
<td>LRF2-OCR2B-P-WH</td>
<td>Radio Powr Savr wireless ceiling-mount occupancy sensor</td>
<td>4</td>
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<td></td>
<td>PJ2-3BPL-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>

**Code Notes:** For non-daylight open offices, 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:
Each individual light automatically turns on to 50% light level as occupant approaches fixture proximity.

Controlled receptacles automatically regain power when occupant enters.

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. Maximum light level is set to 80%.

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

50% of all receptacles automatically turn off 15 minutes after all occupants exit.

Control Strategies

- Partial On Auto Off
- Occupancy/Vacancy
- Full On Dim
- Daylight Harvesting
- Max: 100% Max: 85%
- High-end Trim/Tuning
- Appliance On Appliance Off
- Plug Load Control

Lighting Energy Savings*

60%

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

Symbol Model Number Description Qty List Price Each

Integral to fixture1 Integral fixture control with sensor 16 $ 70.00

RMJS-20R-DV-B 20A PowPak relay module 1 $ 139.00

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.

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.

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

When Occupied:
Manual: Occupant uses wall switch to turn all lights off.

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

Lighting Energy Savings*

30%

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

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
RMJS-16R-DV-B | PowPak switching module | 1 | $ 129.00
LRF2-VCP2B-P-WH | Radio Powr Savr wireless ceiling-mount vacancy sensor | 1 | $ 85.00
PJ2-2B-GWH-L01 | Pico wireless 2-button control | 1 | $ 21.00
PICO-WBX-ADAPT | Pico wallbox adapter | 1 | $ 8.00

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

Controlled receptacles automatically regain power when occupant enters.

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.

50% of all receptacles 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

Plug Load Control

Lighting Energy Savings*

60%

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

Symbol | Model Number | Description | Qty | List Price Each
--- | --- | --- | --- | ---
FCJS-010 | Wireless Fixture Control with 0-10V | 2 | $ 75.00
RMJS-20R-DV-B | 20A PowPak relay module | 1 | $ 139.00
FC-SENSOR | PowPak Fixture Sensor | 2 | $ 35.00
PJ2-3BRL-GWH-L01 | Pico wireless 3-button with raise/lower control | 1 | $ 21.00
PICO-WBX-ADAPT | Pico wallbox adapter | 1 | $ 8.00

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.
Multi-Stall Restroom | Retrofit

Visible System Components

Control Functionality

Occupant Enters:
All lights automatically turn on to maximum light level.

When Occupied:
Manual: Occupant uses wall switch to turn all lights off.

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

Control Strategies

Occupancy/Vacancy

Lighting Energy Savings*

50%

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

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<tr>
<td>RMJS-16R-DV-B</td>
<td>PowPak switching module</td>
<td>1</td>
<td>$ 129.00</td>
<td></td>
</tr>
<tr>
<td>LRF2-OCR2B-P-WH</td>
<td>Radio Powr Savr wireless ceiling-mount occupancy sensor</td>
<td>2</td>
<td>$ 85.00</td>
<td></td>
</tr>
<tr>
<td>PJ2-2B-GWH-L01</td>
<td>Pico wireless 2-button 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>

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

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

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-OCR2B-P-WH | Radio Powr Savr wireless ceiling-mount occupancy sensor | 2 | $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: Add a daylight sensor for restrooms 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.
Visible System Components

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

- **Symbol:** LRF2-OKLB-P-WH
  - **Model Number:** Radio Powr Savr wireless corner-mount occupancy sensor
  - **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 the 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**
  - Auto On Partial Off
  - Max: 100% Max: 85%

- **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. Lutron Stairwell Fixture (FXSWLX4H) is not currently compatible with 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.

- For non-egress stairwells, see the recommended solution and set the minimum light level to full off.

*Go to lutron.com/references for more information.*
A section of the floor is shown.
A floor cross-section is shown. One fixture per landing is suggested.

Visible System Components

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 the 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: For non-egress stairwells, set the low end to full off.

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

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.