Title 24
nLight® Applications Guide
ABOUT ACUITY CONTROLS

It's not just smarter. It’s easier.

Acuity Controls is advanced lighting controls technology, service and support from a single expert source. We offer one of the industry’s most extensive product portfolios for indoor and outdoor applications; single rooms to campuses to municipalities. Our product solutions include occupancy and photosensors, centralized and distributed systems, panels, fixture-integrated, wired and wireless controls that simply work.
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Title 24 is intended to reduce energy use in California with the latest standards effective as of July 1, 2014. The use of advanced lighting controls to synchronize light levels with daylight, occupancy, and multi-level control demand response capability are required in order to be compliant. Title 24 continues to put California on the forefront of energy conservation.

About this Guide
Acuity Controls offers the nLight® Applications Guide to facilitate quicker and easier lighting controls solutions to aid in complying with the requirements of Title 24. Use this guide as a quick reference of typical nLight layouts that can help get your project on the path towards compliance. The Acuity Controls Design Services Team is also available to support engineers and contractors with detailed design, submittal, and installation. For additional information, please contact your Acuity Brands® Sales Representative.

About nLight
The nLight networked digital lighting control system is easy-to-use, easy-to-install and saves energy. Using only standard CAT5e cable, nLight networks together occupancy sensors, wall stations, and digital LED luminaires to create a digital lighting system with unmatched flexibility! nLight easily scales from one room to an entire campus. Create a lighting control solution that’s perfect for your space and need.
# Code Requirements for Common Building Spaces

The chart below is an overview of the Code Requirements for Common Building Spaces. Please use this information as a guide. For specific code requirements please refer to the Title 24 code.

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*Note: This summary is for general information purposes only and is provided without any warranty as to accuracy, completeness, or otherwise. The user should read the applicable code sections for more complete and detailed descriptions of code requirements and exceptions and should consult with a professional engineering or other competent advisor before making any decision or taking any action based on this summary.
How to Use This Guide

Quick summary of applicable code sections

Room description

Room layout with devices & locations

Room layout diagram with control, fixture, and wiring type detail

Required list of devices in order to implement room layout design above

Operational details describe the functionality provided by the equipment specified in the solution

Additional options that add control capacity beyond code requirements
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Qty</th>
<th>Product #</th>
<th>Description</th>
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<tr>
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<td>nLight Enabled Fixture</td>
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<td>1</td>
<td>nPODM DX</td>
<td>On/Off &amp; Raise/Lower WallPod</td>
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<tr>
<td>![Symbol]</td>
<td>1</td>
<td>nCM PDT 9 (RJB)</td>
<td>Dual Technology Occupancy Sensor (Small Motion)</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

Lights:
- All lights are dimmable
- Each fixture independently controllable
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional automatic lumen compensation

Daylight Control:
- Not required for rooms with < 24 sq. ft. of glazing or lighting load < 120W, in the skylit and the sidelit daylit zone
- Manual turn on of lights provides greatest energy savings; however, automatic turn on to 50% or 100% are also compliant operation options
- Plug-load turns on automatically
- Lights and plug-load turn off when room becomes vacant

Manual Control:
- On/off & raise/lower control of lights

ADDITIONAL OPTIONS:
- Recessed mount sensors also available
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option

Note: For a wall mount switch and occupancy sensor, substitute the nPODM DX with a nWSX PDT LV DX and remove the nCM PDT 9 (RJB)
OFFICE: < 250 sq. ft., no Windows, 0-10V Dimming Fixtures

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nPODM DX</td>
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<td>![Symbol]</td>
<td>1</td>
<td>nCM PDT 9 (RJB)</td>
<td>Dual Technology Occupancy Sensor (Small Motion)</td>
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</tbody>
</table>

// OPERATION DETAILS:

- **Lights:**
  - All lights are dimmable
  - All fixtures controlled together
  - Maximum level can be limited (i.e., task tuned) to 80%

- **Occupancy Control:**
  - Manual turn on of lights provides greatest energy savings; however, automatic turn on to 50% or 100% are also compliant operation options
  - Plug-load turns on automatically
  - Lights and plug-load turn off when room becomes vacant

- **Daylight Control:**
  - Not required for rooms with < 24 sq. ft. of glazing or lighting load < 120W, in the skylit and the sidelit daylit zone

- **Manual Control:**
  - On/off & raise/lower control of lights

// ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual-on configuration or nPP16 D PA for default auto-on to 50% configuration
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control add model nPP16 D ER

Note: For a wall mount switch and occupancy sensor, substitute the nPODM DX with a nWSX PDT LV DX and remove the nCM PDT 9 (RJB)
Supports the Following Requirements:

- Local Switch  
  (Section 130.1a)

- Multi-Level Lighting (Dimming) Control  
  (Section 130.1b)

- Automatic Full-Off via Occupancy Sensors  
  (Section 130.1c)

- Plug-Load Control  
  (Section 130.5d)

- Multi-Level Daylight Control  
  (Section 130.1d)

- Automatic Demand Response (ADR) ready  
  (Section 130.1e)

Bill of Materials

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<td>Dual Technology Occupancy Sensor (Small Motion) with Automatic Dimming Photocell</td>
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</table>

/OPERATION DETAILS:

**Lights:**
- All lights are dimmable
- Each fixture independently controllable
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional automatic lumen compensation

**Occupancy Control:**
- Manual turn on of lights provides greatest energy savings, however automatic turn on to 50% or 100% are also compliant operation option
- Plug-load turns on automatically
- Lights and plug-load automatically turn off when room becomes vacant

**Daylight Control:**
- Smooth continuous dimming
- Custom grouping of fixtures into separate daylight zones (max. number of zones = number of fixtures)
- Not required if room has < 24 sq. ft. of glazing or lighting load < 120W, in the skylit and the sidelit daylit zone

**Manual Control:**
- On/off & raise/lower control of lights

/ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

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<td>Dual Technology Occupancy Sensor with Automatic Dimming Photocell (Small Motion)</td>
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**OPERATION DETAILS:**

**Lights:**
- All lights are dimmable
- All lights are controlled together
- Maximum level can be limited (i.e., task tuned) to 80%

**Occupancy Control:**
- Manual turn on of lights provides greatest energy savings, however automatic turn on to 50% or 100% are also compliant operation option
- Plug-load turns on automatically
- Lights and plug-load automatically turn off when room becomes vacant

**Daylight Control:**
- Continuous dimming daylight harvesting
- Not required if room has < 24 sq. ft. of glazing or lighting load < 120W, in the skylit and the sidelit daylit zone

**Manual Control:**
- On/off & raise/lower control of lights

**ADDITIONAL OPTIONS:**
- Recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual-on configuration or nPP16 D PA for default auto-on to 50% configuration
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control add model nPP16 D ER
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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// OPERATION DETAILS:

- **Lights:**
  - All lights are dimmable
  - Each fixture controlled independently
  - Maximum level can be limited (i.e., task tuned) to 80%
  - Optional automatic lumen maintenance
  - Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manually or to come on automatically to 50%
  - Plug-load turns on automatically
  - Lights and plug-load automatically turn off when room becomes vacant

- **Occupancy Control:**
  - Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manually or to come on automatically to 50%

- **Daylight Control:**
  - Smooth continuous dimming
  - Custom grouping of fixtures into separate daylight zones (max. number of zones = number of fixtures)

- **Manual Control:**
  - Master on/off & raise/lower control of entire room
  - Optional individual row control (add nPODM 4P DX)

// ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Add model nPODM 4S for four scene push-button control
- Add Graphic WallPod (nPOD GFX) for touch screen manual control
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)

Not all emergency nLight enabled fixtures require a normal monitoring feed. Refer to the datasheet for additional information.
**Supports the Following Requirements:**

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

**Bill of Materials**

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/ **OPERATION DETAILS:**

**Lights:**
- All lights are dimmable
- Each row controlled independently
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional automatic lumen compensation

**Occupancy Control:**
- Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manual on or to come on automatically to 50%
- Plug-load turns on automatically
- Lights and plug-load automatically turn off when room becomes vacant

**Daylight Control:**
- Smooth continuous dimming
- Daylight zones defined by rows

**Manual Control:**
- Master on/off & raise/lower control of entire space
- Optional individual row control (add model nPODM 4P DX)

/ **ADDITIONAL OPTIONS:**

- Recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual on configuration or nPP16 D PA for default auto-on to 50% configuration
- Substitute Graphic WallPod (model nPOD GFX) for touch screen manual control
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- Order n5JB job box for convenient mounting of up to 5 relay packs
CONFEREE ROOM with nLight Enabled Fixtures

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

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Bill of Materials

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<td>Automatic Dimming Control Photocell</td>
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</tbody>
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/ OPERATION DETAILS:

**Lights:**
- All lights are dimmable
- Each fixture controlled independently
- Maximum level can be limited (i.e. task tuned) to 80%
- Optional automatic lumen maintenance

**Occupancy Control:**
- Manual turn on of lights provides greatest energy savings, however automatic turn on to 50% or 100% are also compliant operation options
- Plug-load turns on automatically
- Lights and plug-load automatically turn off when room becomes vacant

**Daylight Control:**
- Smooth continuous dimming
- Custom grouping of fixtures into separate daylight zones (max. number of zones = number of fixtures)
- Not required if room has < 24 sq. ft. of glazing or lighting loads < 120W in the skylit and the sidelit daylit zone

**Manual Control:**
- On/off & raise/lower control of two groups of lights

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/ ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Add Scene Control WallPod (model nPODM 4S) for four scene push-button control
- Add Graphic WallPod (model nPOD GFX) for touch screen manual control
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option

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Note: Receptacle Control not required for Multipurpose space.
**OPERATION DETAILS:**

- **Lights:**
  - All lights are dimmable
  - Each row controlled independently
  - Maximum level can be limited (i.e., task tuned) to 80%
  - Optional automatic lumen compensation

- **Occupancy Control:**
  - Manual turn on of lights provides greatest energy savings, however automatic turn on to 50% or 100% are also compliant operation options
  - Plug-load turns on automatically
  - Lights and plug-load automatically turn off when room becomes vacant

- **Daylight Control:**
  - Smooth continuous dimming
  - Daylight zones defined by rows
  - Not required if room has < 24 sq. ft. of glazing or lighting loads < 120W, in the skylit and the sidelit daylit zone

- **Manual Control:**
  - On/off & raise/lower control of each row of lights

**ADDITIONAL OPTIONS:**

- Recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual on configuration or nPP16 D PA for default auto-on to 50% configuration
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control add model nPP16 D ER

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**Supports the Following Requirements:**

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)
CLASSROOM\* with nLight Enabled Fixtures

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nLight Enabled Fixture with EMG option</td>
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<tr>
<td></td>
<td>1</td>
<td>nPODM DX</td>
<td>On/Off &amp; Raise/Lower WallPod</td>
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<tr>
<td></td>
<td>1</td>
<td>nCM ADCX (RJB)</td>
<td>Automatic Dimming Control Photocell</td>
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<tr>
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<td>nPODM 4S DX</td>
<td>Teacher Station - 4 Scene Control &amp; Master On/Off/Raise/Lower</td>
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</table>

// OPERATION DETAILS:

**Lights:**
- All lights are dimmable
- Each fixture independently controllable
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional Automatic lumen compensation

**Occupancy Control:**
- Manual turn on of lights provides greatest energy savings; however, automatic turn on to 50% or 100% are also compliant operation options
- Lights automatically turn off when room becomes vacant

**Daylight Control:**
- Smooth continuous dimming
- Custom grouping of fixtures into separate daylight zones (max. number of zones = number of fixtures)

**Manual Control:**
- Master on/off & raise/lower control of entire room
- Optional 4 scene control

// ADDITIONAL OPTIONS:

- Surface or recessed mount sensors also available
- Add Graphic WallPod (model nPOD GFX) to add up to 16 manual controls and 16 scenes
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)

*Apply this design to classrooms, lecture halls or training rooms.

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CLASSROOM* with 0-10V Dimming Fixtures (Distributed Relays)

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nPP16 D</td>
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<td>nPP16 D ER</td>
<td>Emergency Relay Pack with 0-10V Dimming Output</td>
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<td>nPODM 4S DX</td>
<td>Teacher Station - 4 Scene Control &amp; Master On/Off/Raise/Lower</td>
</tr>
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</table>

/ OPERATION DETAILS:

Lights:
- All lights are dimmable
- Each row controlled independently
- Maximum level can be limited (i.e., task tuned) to 80%

Occupancy Control:
- Manual turn on of lights provides greatest energy savings; however, automatic turn on to 50% or 100% are also compliant operation options
- Lights automatically turn off when room becomes vacant

Daylight Control:
- Provides up to three daylight zones, each controlled independently

Manual Control:
- Master on/off & raise/lower control of entire room
- Optional 4 scene control

/ ADDITIONAL OPTIONS:

- Surface or recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual on configuration or nPP16 D PA for default auto-on to 50% configuration
- Add additional relay pack (model nPP16 D) if a white board lighting zone also required
- Add Graphic WallPod (model nPOD GFX) for individual row and up to 16 scene control
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- Order nSUB job box for convenient mounting of up to 5 relay packs

*Apply this design to classrooms, lecture halls or training rooms.
CLASSROOM* with 0-10V Dimming Fixtures (Panel Alternative)

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Multi-Level Daylight Control (Section 130.1d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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Options

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<td>nPODM 4S DX</td>
<td>Teacher Station - 4 Scene Control &amp; Master On/Off/Raise/Lower</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

- **Lights:**
  - All lights are dimmable
  - Each row controlled independently
  - Maximum level can be limited (i.e., task tuned) to 80%

- **Occupancy Control:**
  - Manual turn on of lights provides greatest energy savings; however, automatic turn on to 50% or 100% are also compliant operation options
  - Lights automatically turn off when room becomes vacant

- **Daylight Control:**
  - Provides up to three daylight zones, each controlled independently

- **Manual Control:**
  - Master on/off & raise/lower control of entire room
  - Optional 4 scene control

ADDITIONAL OPTIONS:

- Surface or recessed mount sensors also available
- 4th relay available in panel for connection to additional lighting zone (e.g., white board)
- Add Graphic WallPod (model nPOD GFX) for individual row and up to 16 scene control
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control add barrier to nPANEL

*Apply this design to classrooms, lecture halls or training rooms.

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Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Partial or Full-Off via Occupancy Sensors (Section 130.1c)
- Automatic Off via Programmable Timeclock (see pg. 26)(Section 130.1c)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nPP16 D</td>
<td>Relay Pack with 0-10V Dimming Output</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>1</td>
<td>nCM 10 (RJB)</td>
<td>PIR Occupancy Sensor (Large Motion)</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>1</td>
<td>nPODM DX</td>
<td>On/Off &amp; Raise/Lower WallPod</td>
</tr>
</tbody>
</table>

/ OPERATION DETAILS:

- **Lights:**
  - All lights are dimmable
  - Maximum level can be limited (i.e., task tuned) to 80%

- **Auto-Off Control:**
  - Lights automatically turn off when the space becomes vacant or can be shut-off via timeclock (see pg. 26 for programmable timeclock)

- **Occupancy Control:**
  - Lights automatically turn on to full when occupant enters
  - Lights automatically drop to 50% (or lower) when space becomes vacant

- **Daylight Control:**
  - Not provided in this solution
  - Not required unless room has > 24 sq. ft. of glazing and lighting load > 120W, in the skylit and the sidelit daylit zone

- **Manual Control:**
  - Master on/off & raise/lower control

/ ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Zone can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control use model nPP16 D ER
LOBBY with nLight Enabled Fixtures

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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</tr>
<tr>
<td></td>
<td>1</td>
<td>nCM PDT 10 ADCX (RJB)</td>
<td>Dual Technology Occupancy Sensor (Small Motion) with Automatic Dimming Photocell</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

Lights:
- All lights are dimmable
- Each row controlled independently
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional automatic lumen maintenance

Occupancy Control:
- Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manual on or to come on automatically to 50%
- Lights automatically turn off when room becomes vacant

Daylight Control:
- Smooth continuous dimming
- Custom grouping of fixtures into separate daylight zones (max. number of zones = number of fixtures)
- Not required if space has < 24 sq. ft. of glazing or lighting loads < 120W, in the skylit and the sidelit daylit zone

Manual Control:
- Master on/off & raise/lower control of entire space

ADDITIONAL OPTIONS:
- Recessed mount sensors also available
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option

Note: Per Code Provision 130.5(d), Receptacle Control required for “Reception Lobby” spaces. Plug load relay pack (nPP20 PL) required.

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LOBBY with 0-10V Dimming Fixtures

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Plug-Load Control (Section 130.5d)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nPODM DX</td>
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</tr>
<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>1</td>
<td>nCM PDT 10 ADCX (RJB)</td>
<td>Dual Technology Occupancy Sensor (Large Motion) with Automatic Dimming Photocell</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

- **Lights:**
  - All lights are dimmable
  - All lights are controlled together
  - Maximum level can be limited (i.e., task tuned) to 80%

- **Occupancy Control:**
  - Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manual on or to come on automatically to 50%
  - Lights automatically turn off when room becomes vacant

- **Daylight Control:**
  - Smooth continuous dimming
  - Daylight zones defined by rows
  - Not required if space has < 24 sq. ft. of glazing or lighting loads < 120W, in the skylit and the sidelit daylit zone

- **Manual Control:**
  - Master on/off & raise/lower control of entire space

ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual on configuration or nPP16 D PA for default auto-on to 50% configuration
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control add model nPP16 D ER

Note: Per Code Provision 130.5(d), Receptacle Control required for “Reception Lobby” spaces. Plug load relay pack (nPP20 PL) required.
PRIVATE / SINGLE RESTROOM with nLight Enabled Fixture

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nWSX PDT LV DX</td>
<td>Dual Technology Wall Switch Occupancy Sensor w/ Raise/Lower</td>
</tr>
</tbody>
</table>

// OPERATION DETAILS:

- **Lights:**
  - All lights are dimmable
  - Each row controlled independently
  - Maximum level can be limited (i.e., task tuned) to 80%
  - Optional automatic lumen maintenance

- **Occupancy Control:**
  - Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manual on or to come on automatically to 50%
  - Lights automatically turn off when room becomes vacant

- **Daylight Control:**
  - Not provided in solution
  - Not required unless room has > 24 sq. ft. of glazing and total lighting load > 120W, in the skylit and the sidelit daylit zone

- **Manual Control:**
  - Master on/off & raise/lower control of entire space

// ADDITIONAL OPTIONS:

- Ceiling or recessed mount sensors also available
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<td>nWSX PDT LV</td>
<td>Dual Technology Wall Switch Occupancy Sensor</td>
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</table>

// OPERATION DETAILS:

**Lights:**
- One on/off switch required
- Multi-level (dimming) required if >100 sq. ft. and >1 fixture

**Occupancy Control:**
- Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manual on
- Lights automatically turn off when room becomes vacant

**Daylight Control:**
- Not provided in solution
- Not required unless room has > 24 sq. ft. of glazing and total lighting load > 120W, in the skylit and the sidelit daylit zone

**Manual Control:**
- Master on/off control

// ADDITIONAL OPTIONS:

- Substitute relay pack model nPP16 SA for default manual on configuration
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control use model nPP16 ER
PUBLIC RESTROOM with nLight Enabled Fixtures

Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Full-Off via Occupancy Sensors (Section 130.1c)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials (Each Restroom)

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<td>nPODM DX</td>
<td>On/Off &amp; Raise/Lower WallPod</td>
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<td>2</td>
<td>nCM PDT 9 (RJB)</td>
<td>Dual Technology Occupancy Sensor (Small Motion)</td>
</tr>
</tbody>
</table>

// OPERATION DETAILS:

Lights:
- All lights are dimmable
- Each fixture controlled independently
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional automatic lumen maintenance

Occupancy Control:
- Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manually turn on or to come on automatically to 50%
- Lights automatically turn off when room becomes vacant

Daylight Control:
- Not provided in solution
- Not required unless room has > 24 sq. ft. of glazing and total lighting load > 120W, in the skylit and the sidelit daylit zone

Manual Control:
- Master on/off & raise/lower control

// ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Rooms can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials (Each Restroom)

<table>
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<tr>
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<tr>
<td><img src="image" alt="WallPod" /></td>
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</tr>
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<td>Dual Technology Occupancy Sensor (Small Motion)</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

- **Occupancy Control:**
  - All lights are dimmable
  - All lights are controlled together (per room)
  - Maximum level can be limited (i.e., task tuned) to 80%
  - Lights automatically turn on to full when occupant enters (recommended), or optionally can be configured to manually on or to come on automatically to 50%
  - Lights automatically turn off when room becomes vacant

- **Daylight Control:**
  - Not provided in solution
  - Not required unless room has > 24 sq. ft. of glazing and total lighting load > 120W, in the skylit and the sidelit daylit zone

- **Manual Control:**
  - Master on/off control & raise/lower control

ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Substitute relay pack model nPP16 D SA for default manual on configuration or nPP16 D PA for default auto-on to 50% configuration
- Room can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control use model nPP16 D ER
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Partial or Full-Off via Occupancy Sensors (Section 130.1c)
- Automatic Off via Programmable Timeclock (see pg. 26)(Section 130.1c)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

<table>
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<tr>
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<td>nLight Enabled Fixture</td>
</tr>
<tr>
<td><img src="image2" alt="Symbol" /></td>
<td>3</td>
<td>nCM 10 (RJB)</td>
<td>PIR Occupancy Sensor (Large Motion)</td>
</tr>
<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>2</td>
<td>nPODM DX</td>
<td>On/Off &amp; Raise/Lower WallPod</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

Lights:
- All lights are dimmable
- Each fixture independently controllable
- Maximum level can be limited (i.e., task tuned) to 80%
- Optional automatic lumen compensation

Occupancy Control:
- Lights automatically turn fully on when occupant enters
- Lights automatically drop to 50% (or lower) when space becomes vacant

Daylight Control:
- Not provided in this solution
- Not required unless space has > 24 sq. ft. of glazing and lighting load > 120W, in the skylit and the sidelit daylit zone

Manual Control:
- Master on/off & raise/lower control

ADDITIONAL OPTIONS:
- Local Switch also available
- Zone can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option

ADDITIONAL OPTIONS:
- Recessed mount sensors also available
- Zone can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control, order fixtures with -n80EMG or -n100EMG option
Supports the Following Requirements:

- Local Switch (Section 130.1a)
- Multi-Level Lighting (Dimming) Control (Section 130.1b)
- Automatic Partial or Full-Off via Occupancy Sensors (Section 130.1c)
- Automatic Off via Programmable Timeclock (see pg. 26)(Section 130.1c)
- Automatic Demand Response (ADR) ready (Section 130.1e)

Bill of Materials

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<th>Qty</th>
<th>Product #</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>![Symbol]</td>
<td>1</td>
<td>nPP16 D</td>
<td>Relay Pack with 0-10V Dimming Output</td>
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<tr>
<td>![Symbol]</td>
<td>3</td>
<td>nCM 10 (RJB)</td>
<td>PIR Occupancy Sensor (Large Motion)</td>
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<tr>
<td>![Symbol]</td>
<td>2</td>
<td>nPODM DX</td>
<td>On/Off &amp; Raise/Lower WallPod</td>
</tr>
</tbody>
</table>

OPERATION DETAILS:

**Lights:**
- All lights are dimmable
- All fixtures controlled together
- Maximum level can be limited (i.e., task tuned) to 80%

**Auto-Off Control:**
- Lights automatically turn off when the space becomes vacant or can be shut-off via timeclock (see pg. 26 for programmable timeclock)

**Occupancy Control:**
- Lights automatically turn fully on when occupant enters
- Lights automatically drop to 50% (or lower) when space becomes vacant

**Daylight Control:**
- Not provided in this solution
- Not required unless space has > 24 sq. ft. of glazing and lighting load > 120W, in the skylit and the sidelit daylit zone

**Manual Control:**
- Master on/off & raise/lower control

ADDITIONAL OPTIONS:

- Recessed mount sensors also available
- Zone can be connected to nLight backbone to enable network control or ADR (see pg. 26)
- For emergency lighting control use model nPP16 D ER
- Lights automatically dropping to 50% (or lower) when the space becomes vacant with automatic shut-off via a timeclock is also code compliant (see pg. 26 for nLight programmable timeclock).

*Or if total lighting load is < 120W
Programmable Timeclock Control:

Although not pictured within each of the individual room design guides, each nLight Control Zone can be connected via an nLight backbone to create a networked nLight lighting control system capable of meeting the requirements of CA Title 24 automatic time-switch and demand response provisions (Sections 130.1(c)1 and 130.1(e), respectively). A networked system also enables astronomical time clock control.

Automatic Demand Response (ADR):

In buildings larger than 10,000 square feet, lighting power must be capable of being automatically reduced by a minimum of 15% in response to an Automatic Demand Response Signal (ADR) to meet the requirements of CA Title 24 demand response control (section 130.1(e)). OpenADR is an open and standardized way for electricity providers to communicate demand response signals with their customers using a common language over any existing IP-based communications network, such as the Internet.

Bill of Materials

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Qty</th>
<th>Product #</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1 nBRG KIT</td>
<td>8-Port Backbone Bridge</td>
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<tr>
<td>1 nGWY2 KIT</td>
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<table>
<thead>
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<th>Symbol</th>
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<th>Product #</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1 nADR</td>
<td>OpenADR Demand Response Client Interface (supports up to 5 nLight Gateways)</td>
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<td></td>
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<tr>
<td>Product Family</td>
<td>Fixture Series</td>
<td>Notes</td>
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<td>LED Recessed</td>
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<td>EVO</td>
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<td>Incito</td>
<td>LED Downlight</td>
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<table>
<thead>
<tr>
<th>Product Family</th>
<th>Fixture Series</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Mark Architectural Lighting</td>
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</table>

Note: New nLight enabled fixtures added regularly. Please reference fixture spec sheets for nLight enabled options.
## APPENDIX B: Requirements Overview

<table>
<thead>
<tr>
<th>Control Requirement</th>
<th>Code Provisions</th>
<th>Code Summary*</th>
<th>Recommendations for Compliance</th>
<th>eLight Solution Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Control</td>
<td>130.1(a)</td>
<td>All lighting within an enclosed space shall be functionally controlled with manually switched or dimmed lighting controls that are readily accessible.</td>
<td>Include manual control device(s) in all room control system designs</td>
<td>eLight WallPod devices provide a user with local control of lighting within an eLight controlled space (i.e., eLight zone). WallPods are available in multiple styles with varying features and user experience.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Push-Button WallPod</td>
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<td></td>
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<td></td>
<td>Graphic WallPod</td>
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<td>Traditional tactile buttons and LED user feedback.</td>
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</tr>
<tr>
<td>Programmable Timeclock</td>
<td>130.1(c)1</td>
<td>All installed indoor lighting shall be equipped with controls such as an automatic timeclock-switch (or occupancy sensors) that are capable of automatically shutting off all lighting when a space is typically unoccupied.</td>
<td>Utilizing controls capable of being networked across an entire building enables simple compliance via a single central programmable time clock.</td>
<td>Individual nLight Control Zones (i.e., rooms) can be easily networked together across an entire building simply by connecting them into a &quot;backbone&quot; made up of one or more nLight Bridge devices and an nLight Gateway. The Gateway provides programmable time clock functionality for an nLight network as well as interfaces to the SensorView Suite of web-based software applications (via an Ethernet LAN / WAN connection).</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Network Gateway</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Additional benefits of installing an nLight backbone include remote status monitoring, iOS smartphone app control, and BMS interface capability.</td>
</tr>
<tr>
<td>Shut-Off Control</td>
<td></td>
<td></td>
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<tr>
<td>Automatic Full-Off via Occupancy Sensor</td>
<td>130.1(c)5</td>
<td>Sensors are required to fully shut off lighting power after vacancy of 30 minutes or less.</td>
<td>Always include occupancy sensors in all control system designs regardless of lighting type.</td>
<td>eLight occupancy sensors utilize 100% digital passive infrared (PIR) detection, come in several mounting styles, and offer multiple coverage pattern options. Additionally, nLight sensors are available with patented Microphonics™ dual technology detection for rooms with obstructions. Configuring for full off versus partial off control is done with system programming.</td>
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<tr>
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<td></td>
<td>360° Occupancy Sensor</td>
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<td></td>
<td>120° WideView Corner Sensor</td>
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<td></td>
<td>Surface or recessed mounts to ceiling tiles or sheetrock/plaster.</td>
</tr>
</tbody>
</table>

*Note: it is advised to read the entire code sections for more complete and detailed descriptions of all code requirements and exceptions.*
### APPENDIX B: Requirements Overview

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<tr>
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</tr>
</thead>
</table>
| Multi-level Lighting Controls | 130.1(b)       | The general lighting of any enclosed space larger than 10,000 sq. ft. is required to be controllable through a minimum number of control steps based on the type of lighting load. Not required for spaces with a lighting power density of 5W/sq. ft. | Continuously dimmable LED (or fluorescent) fixtures and manual dimming controls are the easiest method of compliance. | nLight provides multiple options for controlling continuous dimming luminaires. This allows spaces with several lighting types and technologies to be controlled together and with a common user experience.  
Lighting power in buildings larger than 10,000 sq. ft. shall be capable of being automatically reduced by a minimum of 15% in response to a demand response signal that uses a standards-based messaging protocol.  
Utilizing a networked control system enables simple compliance for the entire building via a single demand response signal interface that communicates using the OpenADR protocol standard.  
Acuity Brands offers a wide variety of LED fixtures with factory installed integrated nLight controls that provide smooth continuous dimming, and optional automatic lumen maintenance or manual task tuning.  
The nLight OpenADR Demand Response Client Interface device is capable of receiving demand response signals from electricity providers and interpreting them for the rest of an nLight network to implement. No hardware is required in the nLight controlled rooms as they are inherently "ADR" ready by default.  
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| Multi-level Daylight Controls | 130.1(d)       | For lighting in day/night zones, controls are required that respond to daylight by automatically reducing lighting levels, through a minimum number of control steps based on the type of lighting load. Not required for spaces with less than 24 sq. ft. of glassing or a combined total lighting load less than 120W in the skylit and daylit zone. | Automatic daylight harvesting photocells that continuously adjust the level of dimming fixtures according to daylight levels provide the most effective and least distracting control. Programmable photocell offsets in the dimming devices allow for multi-zone functionality. | nLight offers standalone daylight harvesting sensors as well as occupancy sensors with integrated daylight harvesting. Sensors are available in four different housings and provide continuous dimming control of any/all networked nLight enabled fixtures or dimming relay packs, each capable of being its own day/night zone.  
Ceiling Mount Dimming Photocell  
Recessed Mount Dimming Photocell |
| Demand Response               | 130.1(e)       | Lighting power in buildings larger than 10,000 sq. ft. shall be capable of being automatically reduced by a minimum of 15% in response to a demand response signal that uses a standards-based messaging protocol. | Since the same automatic shut-off requirements apply to receptacles and lighting, utilizing the same occupancy sensors for both is the simplest method of compliance. | The nLight Plug-Load relay pack is capable of switching an entire 20A receptacle load. Simply add into an nLight Control Zone (room) with an occupancy sensor and the unit will automatically switch off when the room is vacant. Local manual switch control of receptacles is not required and therefore is disabled by default.  
Plug Load / Receptacle Relay Pack |
| Additional Controls          |                |                                                                              |                                                                                                    |                                                                                                              |

*Note: it is advised to read the entire code sections for more complete and detailed descriptions of all code requirements and exceptions.*
Additional Resources:

Acuity Controls Typical Layout Drawings
http://www.acuitybrands.com/typicals

California Energy Commission
www.energy.ca.gov/title24/2013standards

California Lighting Technology Center

Energy Code Ace
http://energycodeace.com/

Use the Following Sections of the Title 24 Code as Reference:
Section 100.1 – Definitions and rules of construction
Section 110.9 – Mandatory requirements for lighting control devices and systems, ballasts and luminaires
Section 130.0 – Lighting controls and equipment - general
Section 130.1 – Indoor lighting controls that shall be installed
Section 130.2 – Outdoor lighting controls and equipment
Section 130.4 – Lighting control acceptance and installation certificate requirements
Section 130.5 – Electrical power distribution systems
Section 140.3 – Prescriptive requirements for building envelopes
Section 140.6 – Prescriptive requirements for indoor lighting