

**COMMERCIAL LIGHTING CONTROLS** 

# **COMMERCIAL APPLICATIONS GUIDE**

# When energy codes do not apply

USD List prices effective July 10, 2022





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This document is for information purposes only. It is not meant to replace your state's or local jurisdiction's official energy code. Please refer to your local building energy code or authority having jurisdiction for your precise requirements. Only the authority having jurisdiction can guarantee code compliance.

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### Energy-saving lighting control strategies

Strategy		Potential savings
Max: 100%	<b>High-end trim/tuning</b> sets the maximum light level based on customer requirements in each space.*	10-30% Lighting
Auto On Auto Off	<b>Occupancy/vacancy sensing</b> turns lights on when occupants are in a space and off when they vacate the space.*	20–60% Lighting
Full On Dim	<b>Daylight harvesting</b> dims electric lights when daylight is available to light the space.*	25–60% Lighting
Full On Dim	<b>Personal dimming control</b> gives occupants the ability to set the light level.*	10–20% Lighting
Shade Open Shade Closed	<b>Controllable window shading</b> moves shades to reduce glare and solar heat gain.*	10–20% Cooling
Tam: Dim	<b>Scheduling</b> provides scheduled changes in light levels based on the time of day.*	10–20% Lighting
Full On Dim	<b>Demand response</b> automatically reduces lighting loads during peak electricity usage times.*	30–50% During peak period
Appliance On Appliance Off	<b>Plug load control</b> automatically turns off loads after occupants leave a space.*	15–50% of Controlled loads
Heating Cooling	<b>HVAC integration</b> controls heating, ventilation, and air conditioning systems through a contact closure.*	5–15% HVAC

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

Choosing the appropriate lighting control solution for a space can be overwhelming. This commercial lighting control solutions guide provides examples of how Lutron products can be used in areas where code requirements do not apply. This guide focuses on dimmers, sensors, and Vive solutions, but our other control systems offer similar features.



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

\* For the latest information on products compatible with the Vive wireless hub go to lutron.com/vive.

<sup>†</sup> Automated Demand Response capability requires signal from a third-party device.

#### . elf. **Panel Solutions** Vive with wireless hub\* Energi Savr Node Quantum $\bigcirc$ $\bigcirc$ $\bigcirc$ C \*\* $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$

### Lutron Product Capabilities: Commercial Applications

<sup>\*\*</sup> Requires QS timeclock.

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

#### For Specifiers

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

#### For Contractors

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

> Understand how the products are laid out in the space

Classroom	Basic Dimming-0-10V

Type of solution (if applicable)

Room type







#### Control Functionality

#### **Control Strategies**

When Occupied: Manual: Occupant uses wall dimmers to set desired light levels for both general and white-board lights. Maximum light level is set to 80%.





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

Learn what strategies are implemented in the space

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Learn what energy savings you achieve over manual shut-off

Understand how the space functions with the installed system

#### **Local Solutions Layout**

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.



In-wall occupancy sensor

0-10V in-wall dimmer

PowPak module

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

# Adding a Vive wireless hub to a Vive lighting control solution, provides these additional benefits:

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

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









Symbol	Model Number	Description	Qty	List Price Each
	RMJS-16R-DV-B	PowPak switching module	2	\$ 155.00
	PJ2-2B-GWH-L01	Pico wireless 2-button control	2	\$ 27.00
	PICO-WBX-ADAPT Pico wallbox adapter	Pico wallbox adapter	2	\$ 9.50



Pico wireless control

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall switch to turn all lights on or off.

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



Symbol	Model Number	Description	Qty	List Price Each
	MS-VPS6M2-DV-WH	Maestro sensor switch	1	\$ 57.20



Maestro sensor 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**



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Line-voltage wiring

### Visible System Components



Sunnata touch dimmer

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall dimmers to set desired light levels for both general and white-board lights. Maximum light level is set to 80%.

Symbol Model Number		Description	Qty	List Price Each
	STCL-153P-WH	Sunnata touch dimmer	2	\$ 53.00

\*If phase control load is not known or electronic low-voltage (ELV) track lighting, we recommend using the Maestro PRO dimmer with LED+ technology (MA-PRO-WH) instead of the Sunnata touch dimmer.

### **Control Strategies**

Max: 100%





- Low-voltage wiring

Line-voltage wiring

# Visible System Components



Diva 0-10V dimmer

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall dimmers to set desired light levels for both general and white-board lights. Maximum light level is set to 80%.

Symbol Model Number		Description	Qty	List Price Each
	DVSTV-WH	Diva 0-10V dimmer	2	\$ 97.00



### **Control Strategies**







#### Clear Connect RF Communication







Maestro Wireless 0-10V dimmer sensor

Radio Powr Savr wireless corner-mount occupancy sensor

### **Control Functionality**

#### **Occupant Enters:**

Lights automatically turn on when an occupant enters the space. Maximum light level is set to 80%.

#### When Occupied:

Manual: Occupant uses dimmer sensors to set desired light levels for both general and whiteboard lighting.

#### **Occupant Exits:**

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

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

Symbol	Model Number	Description	Qty	List Price Each
	MRF2S-8SD010-WH	Maestro Wireless 0-10V dimmer sensor	2	\$ 215.00
	LRF2-OKLB-P-WH	Radio Powr Savr wireless corner-mount occupancy sensor	1	\$ 105.00

### **Control Strategies**

1 Auto Off Manual On Occupancy/Vacancy









#### Line-voltage wiring

### Visible System Components



Sunnata touch dimmer

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall dimmer to set desired light levels for all lights. Maximum light level is set to 80%.

Symbol Model Number		Description	Qty	List Price Each
	STCL-153P-WH	Sunnata touch dimmer	1	\$ 53.00

\*If phase control load is not known or electronic low-voltage (ELV) track lighting, we recommend using the Maestro PRO dimmer with LED+ technology (MA-PRO-WH) instead of the Sunnata touch dimmer.

### **Control Strategies**







Line-voltage wiring
Low-voltage wiring



Diva 0-10V dimmer

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall dimmer to set desired light levels for all lights. Maximum light level is set to 80%.

Symbol	Model Number	Description	Qty	List Price Each
	DVSTV-WH	Diva 0-10V dimmer	1	\$ 97.00

### **Control Strategies**







Symbol	Model Number	Description	Qty	List Price Each
	RMJS-16R-DV-B	PowPak switching module	1	\$ 155.00
	LRF2-OHLB-P-WH	Radio Powr Savr wireless hallway occupancy sensor	1	\$ 105.00
	PJ2-2B-GWH-L01	Pico wireless 2-button control	2	\$ 27.00
	PICO-WBX-ADAPT	Pico wallbox adapter	2	\$ 9.50



Pico wireless control

Radio Powr Savr wireless hallway 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 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 rezoning, system monitoring, timeclock functionality, and advanced integration.

Notes: Local control may be not accessible to unauthorized personnel.

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

### **Control Strategies**







Symbol	Model Number	Description	Qty	List Price Each
	RMJS-16R-DV-B	PowPak switching module	1	\$ 155.00
	LRF2-OCR2B-P-WH	Radio Powr Savr wireless ceiling-mount occupancy sensor	4	\$ 105.00
	PJ2-2B-GWH-L01	Pico wireless 2-button control	1	\$ 27.00
	PICO-WBX-ADAPT	Pico wallbox adapter	1	\$ 9.50



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 rezoning, system monitoring, timeclock functionality, and advanced integration.

## **Control Strategies**

Auto On Auto Off Occupancy/Vacancy

Lighting Energy Savings\*



Visible System (	Components
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Sunnata touch dimmer

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall dimmer to manually set desired light levels for all lights. Maximum light level is set to 80%.

Symbol	Model Number	Description	Qty	List Price Each
	STCL-153P-WH	Sunnata touch dimmer	1	\$ 53.00

### **Control Strategies**

85% Max: 100% Max: 85% High-end Trim/Tuning







Diva 0-10V dimmer

### **Control Functionality**

#### When Occupied:

Manual: Occupant uses wall dimmer to manually set desired light levels for all lights. Maximum light level is set to 80%.

Symbol	Model Number	Description	Qty	List Price Each
	DVSTV-WH	Diva 0-10V dimmer	1	\$ 97.00



### **Control Strategies**

85% Ŷ Max: 100% Max: 85% High-end Trim/Tuning





Symbol	Model Number	Description	Qty	List Price Each
	MRF2S-8SDV010-WH	Maestro Wireless 0-10V dimmer sensor	1	\$ 215.00



Maestro Wireless 0-10V dimmer sensor

### **Control Functionality**

#### **Occupant Enters:**

Lights do not automatically turn on when an occupant enters the space. Maximum light level is set to 80%.

#### When Occupied:

Manual: Occupant uses dimmer sensors to set desired light levels for all lighting.

#### **Occupant Exits:**

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

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

### **Control Strategies**



Occupancy/Vacancy







Symbol	Model Number	Description	Qty	List Price Each
	RMJS-16R-DV-B	PowPak switching module	1	\$ 155.00
.ec	LRF2-OCR2B-P-WH	Radio Powr Savr wireless ceiling-mount occupancy sensor	2	\$ 105.00
	PJ2-2B-GWH-L01	Pico wireless 2-button control	1	\$ 27.00
	PICO-WBX-ADAPT	Pico wallbox adapter	1	\$ 9.50



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 rezoning, system monitoring, timeclock functionality, and advanced integration.

### **Control Strategies**







Symbol	Model Number	Description	Qty	List Price Each
O	Integral to fixture <sup>1</sup>	Integral fixture control	2 (per floor)	\$ 67.00 <sup>2</sup>
	LRF2-OKLB-P-WH	Radio Powr Savr wireless corner-mount occupancy sensor	<b>1</b> (per floor)	\$ 105.00

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.

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. This solution requires digitally enabled ballasts and drivers by others. Go to lutron.com/vive for the latest compatibility details.

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

#### Visible System Components



Radio Powr Savr wireless corner-mount occupancy sensor

Integral fixture control

### **Control Functionality**

#### **Occupant Enters:**

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

#### **Occupant Exits:**

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

#### **Emergency Mode:**

Clear Connect Wireless

Lighting connected to emergency power turns on to full output.

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

## **Control Strategies**











Symbol	Model Number	Description	Qty	List Price Each
	MRF2S-8SD010-WH	Maestro Wireless 0-10V dimmer sensor	3	\$ 215.00
	MRF2S-8SS-WH	Maestro Wireless sensor switch	1	\$ 190.00
	LRF2-OCR2B-P-WH	Radio Powr Savr wireless ceiling-mount occupancy sensor	1	\$ 105.00
	HJS-1-FM	Vive wireless hub	Shared	Consult your local rep for hub pricing and service options



Maestro Wireless 0-10V dimmer sensor Maestro Wireless sensor switch

### **Control Functionality**

#### **Customer Area**

#### When Occupied:

Manual: Employees use wall dimmers to set desired light levels for general lighting. Maximum light level is set to 80%.

#### Timeclock:

Timeclock turns general lighting on during normally occupied hours. Timeclock turns general lighting off during normally unoccupied hours.

#### **Employee Only Area**

#### **Occupant Enters:**

All lights automatically turn on to maximum light level.

#### When Occupied:

Manual: Employees use a wall switch to turn off the lighting.

#### **Occupant Exits:**

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



Radio Powr Savr wireless ceiling-mount occupancy sensor

### **Control Strategies**



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