ASHRAE Standard 90.1 2010 Solutions Guide

Real-World Applications and
Single Source Compliance Strategies

IRC

Input Power: 347VAC, 60Hz, 100Max
Output Power: 24VDC, 150mA
Load Rating: 15A, 60Hz, 347VAC Ballast
HVAC Rating: 1A, 24V

LEVITON

*OPTIONAL ONLY AVAILABLE IN
SOME MODELS SEE
PRODUCT MANUAL

DC Power

ON

DIM

BRIGHT

OFF

CONTROLLED

CONTROLLED
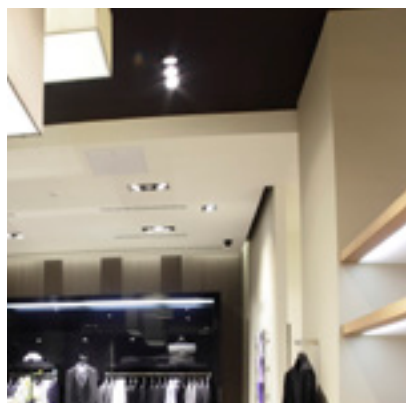
Leviton Excellence For ASHRAE Standards

ASHRAE Standard 90.1 2010 provides the minimum requirements for energy-efficient design of most buildings (excluding low-rise residential buildings). ASHRAE standards define the minimum energy efficiency requirements for new construction, as well as new systems installed in existing buildings.

Leviton offers a wide spectrum of lighting and energy control solutions to bring any project up to standard. This reference guide provides examples of common applications, ASHRAE 90.1 code compliance considerations, and Leviton solutions to meet the functionality and standards compliance needs of the space.

Disclaimer: This document is for informational purposes only. Each project will have its own specific requirements for satisfying ASHRAE Standard 90.1 compliance based on a variety of factors. Other exceptions or details may apply. Review the standard for specific requirements and/or consult with a professional advisor. Leviton Mfg. Co., Inc. is not responsible for any loss resulting from the use of any information found in this document.

Solutions are subject to change without notice. For additional assistance, contact your local Leviton representative.

ASHRAE Standards by State

Commercial State Energy Code Status as of January 1, 2015
Note: For Canadian code compliance, refer to your provincial code
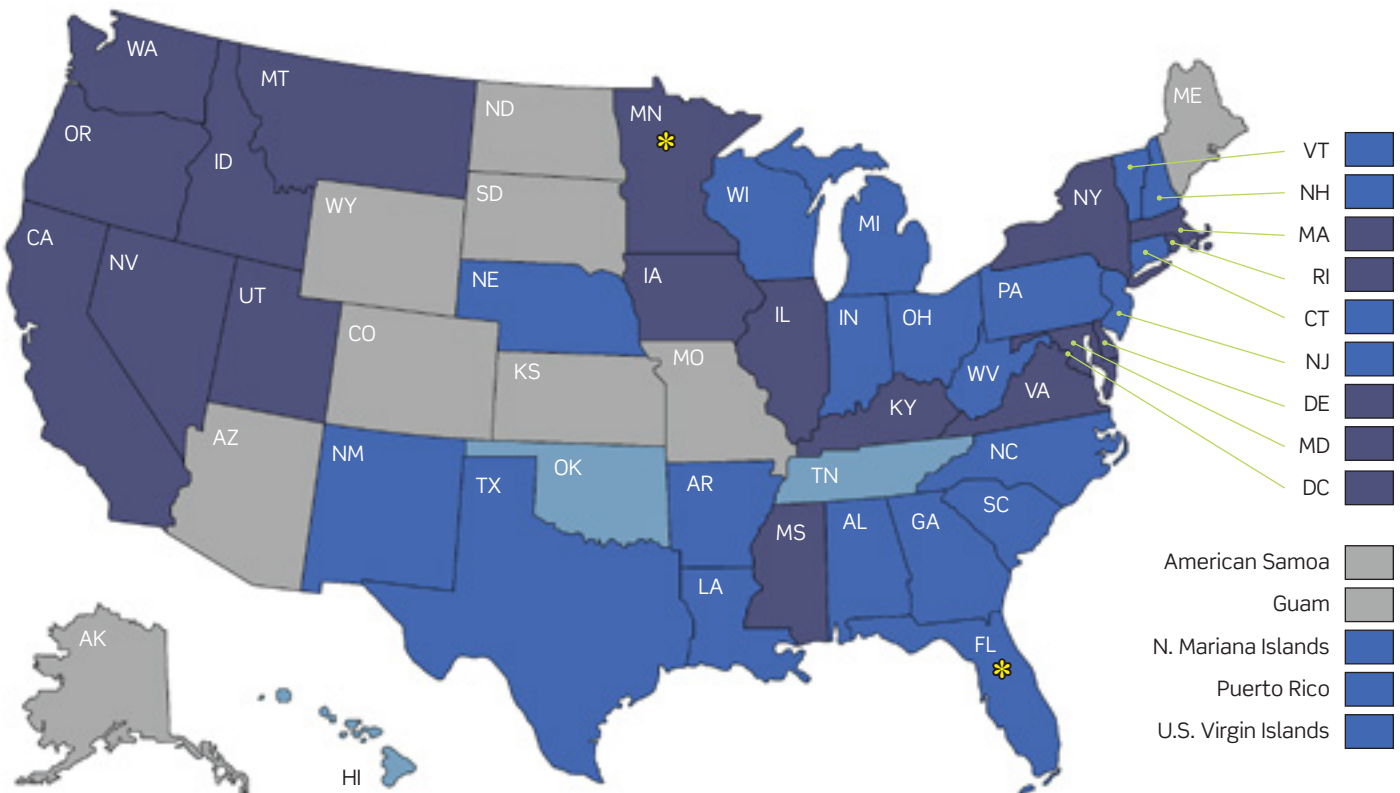
	19	meets or exceeds ASHRAE Standard 90.1-2010 or equivalent		23	meets or exceeds ASHRAE Standard 90.1-2007 or equivalent
	3	meets or exceeds ASHRAE Standard 90.1-2004 or equivalent		11	no statewide code or precedes ASHRAE Standard 90.1-2004

❋ state has adopted new code to be effective at a later date

SOURCE: Online Code Environment and Advocacy Network, www.energycodesocean.org

Evolution of ASHRAE Standards: Current Requirements

The latest version of ASHRAE 90.1, released in 2010 and currently in effect nationwide, has introduced more stringent guidelines on energy usage and lighting control for new and retrofit projects.

2007 Standard	2010 Standard (Changes Highlighted)
ASHRAE 90.1 compliance applies to all new construction projects and retrofit projects involving alteration of >50% of lighting loads	ASHRAE 90.1 compliance applies to all new construction projects and retrofit projects involving alteration of **>10%** of lighting loads
Auto-OFF lighting control in buildings > 5,000 sq ft	Auto-OFF lighting control in **all buildings**
Enclosed spaces must have a lighting control that is either manual-ON or auto-ON	**All** spaces must have a lighting control that is either manual-ON or auto-ON to **<50% of lighting load**
Spaces that require an occupancy sensor that activates after 30 minutes of vacancy include: - Classrooms - Conference and meeting rooms - Employee lunch and break rooms	Spaces that require an occupancy sensor that activates after 30 minutes of vacancy include: - Classrooms - Conference and meeting rooms - Employee lunch and break rooms **- Lecture halls** **- Training rooms** **- Storage and supply rooms between 50 and 1,000 sq ft** **- Copy rooms** **- Offices < 250 sq ft** **- Restrooms** **- Dressing/fitting/locker rooms**
Not included	**In addition to controls that switch OFF all lighting, enclosed spaces must have controls that reduce the lighting by 30 to 70% of the full lighting load**
Not included	**Automatic, multi-level daylighting controls must be installed in enclosed spaces with sidelit areas > 250 sq ft and all skylit areas > 900 sq ft**

ASHRAE Standard 90.1 2010 Requirement Quick Reference

Control Type		Summary	Quick Take
8.4.2 Automatic Receptacle Control		50% of all receptacles in private offices, open offices and computer classrooms must be controlled by occupancy sensor, time of day control, or by signal from another building control or alarm system that indicates that the space has become unoccupied: • Includes receptacles installed in modular partitions • Controlled receptacles must be marked to indicate that they are controlled	50% of all receptacles in private offices, open offices and computer classrooms must be controlled by an occupancy sensor.
9.4.1.1 Automatic Shutoff		Interior lighting must have an automatic control device to turn lights OFF. This device can be one of three options: • A scheduled basis controlling not more than 25,000 sq ft but not more than one floor • An occupancy sensor with a maximum timeout of 30 minutes • A signal from another building system that indicates the space is unoccupied	Interior lighting must have an automatic control to turn the lights OFF. The device can be a scheduling control, an occupancy sensor, or a BAS/BMS system signal.

9.4.1.2 Space Control		Each space enclosed by ceiling height partitions must have at least one readily accessible control device to control General Lighting. Must meet the following requirements:
		• (a) Controlled lighting shall have at least one step between 30% and 70% of Full and OFF*
		• (b) Lights must be turned off within 30 minutes of vacancy by use of an occupant sensor or timer switch*
		• (c) For all other spaces not included in (b):
		  – Each control device can be either manually or automatically activated
		  – Maximum control area of 2,500 sq ft for spaces <10,000 sq ft, or 10,000 sq ft for spaces >/= 10,000 sq ft
		  – Maximum override for time of day schedules is two hours
			All spaces shall include visible control devices: (1) occupancy sensor, (2) continuous or stepped dimming control device (photocell, entry station or system controller)

9.4.1.3 Parking Garage Control		• Lighting must be controlled in zones no larger than 3,600 sq ft • Lighting within a zone must be controlled by a device that reduces power to all luminaires by 30% after 30 minutes of vacancy • Daylight transition areas must be controlled so lights are ON during the day and OFF at night • Automatic daylight harvesting is required within 20 ft of open exterior walls that meet the open space to wall ratio requirement **Note:** *Lighting for parking garages must also comply with Section 9.4.1.1.*	Parking garage lighting zones must be controlled by a device that reduces power by 30% after 30 minutes of vacancy, and open exterior walls must utilize automatic daylight harvesting.
9.4.1.4 & 9.4.1.5 Automatic Daylight Control		General lighting in Primary Sidelighted areas must be separately controlled by a multi-level photocontrol, which can be dimming. • The light sensor shall be remote from where the calibration adjustments are made • Calibration adjustment device must be readily accessible • Photocontrol must provide for at least one step between 50% to 70% of design lighting power **NOTE:** *Sidelit means the natural daylight enters a space through the side of the building, generally through windows.* *Toplit is when the natural daylight enters the space through the top of the building, most often through skylights. ASHRAE 90.1 distinguishes how control zones should be set up under both conditions.*	Sidelit and Toplit areas must be separately controlled by a photocontrol, which can be stepped or continuous dimming. Calibration cannot be located on the photocell.

ASHRAE Standard 90.1 2010 Requirement Quick Reference

Control Type	Summary	Quick Take
9.4.1.6 Additional Control	The following lighting require additional control: • Display/accent/case lighting • Task lighting • Non-visual lighting (plant growth, food warming, etc.) • Demonstration lighting • Guest room lighting • Master switch required to control all permanently installed luminaires and switched receptacles • Automatic control required for bathroom lighting • Stairwell lighting – Requires automatic control device to reduce lighting by at least 50% within 30 minutes of vacancy	Separate controls are required for special applications (displays, guestrooms, tasks and stairwell lighting).
9.4.1.7 Exterior Lighting Control	• Exterior lighting must be controlled by a photocell to turn lighting OFF when sufficient daylight is available • Facade and landscape lighting must be turned OFF between 12 am and 6 am, or opening and closing of business ***Advertising and sign lighting must have a control device to reduce power by 30% in one of two ways:*** • Using a time clock to reduce lighting power between 12 am and business opening • Occupancy sensors to reduce lighting power after 15 minutes of vacancy in outdoor area	Exterior lighting must be controlled by a photocell to turn lighting OFF when sufficient daylight is available, and reduce advertising/sign lighting power by 30% during closing.
9.4.1 Lighting Controls	Spaces requiring Automatic Control Devices as identified in sections 9.4.1.1, 9.4.1.2, and 9.4.1.6 shall be either manual-ON or auto-ON to no more than 50% power. The following exceptions allow for full auto-ON: • Public corridors or stairwells • Restrooms • Primary building entrances and lobbies • Areas where manual-ON operation would be a safety or security issue ***Note:** All Leviton ASHRAE 90.1 Solutions meet Section 9.4.1 for Lighting Controls.*	More controls are required in every project. Manual-ON (Vacancy) or Auto-ON (Occupancy) to not more than 50% (with many exceptions).
9.4.4 Functional Testing	All lighting controls must be tested to ensure they are working properly: • Construction documents must call out who is responsible for the testing • The party responsible for the testing cannot be a member of the design or construction team ***Note:** All Leviton solutions are manufactured to the highest quality and performance standards, which can be easily demonstrated at the time of installation to fulfill ASHRAE 90.1 section 9.4.4.*	All lighting controls must be tested by a party not involved with the design or construction team to ensure that the products are working properly.

Note: ASHRAE Standard 90.1 2010 mandates the implementation of energy saving design and control techniques.
For complete codes and more information, refer to www.ashrae.org
*Code includes some exceptions; please refer to ASHRAE Standard 90.1 2010 for more information

Typical Applications

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Warehouse	Relay Control Solution		21
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Product Solutions at a Glance

ASHRAE Standards									
Product Solutions	**8.4.2** Automatic Receptacle Control	**9.4.1.1** Automatic Shutoff	**9.4.1.2** Space Control	**9.4.1.3** Parking Garage Control	**9.4.1.4 & 9.4.1.5** Automatic Daylight Control	**9.4.1.6** Additional Control	**9.4.1.7** Exterior Lighting Control	**9.4.1** Lighting Controls	**9.4.4** Functional Testing
Occupancy Sensors	X	X	X	X	X	X	X	X	
Vacancy Sensors	X	X	X		X	X		X	
Wall Box Dimmers			X			X			
Photocells				X	X		X		
Marked "Controlled" Receptacles	X					X	X		
LevNet RF™ Energy Harvesting Wireless Controls	X	X	X	X	X	X			X
Integrated Room Control (IRC)	X	X	X	X	X	X	X	X	X
EZ-MAX® Plus	X	X	X	X	X	X	X	X	X
GreenMAX®	X	X	X	X	X	X	X	X	X
Track Light Limiting Panel (TLLP)						X			
Sector®	X	X	X		X	X		X	X

All Leviton solutions are manufactured to the highest quality and performance standards, which can be easily demonstrated at the time of installation to fulfill ASHRAE 90.1 section 9.4.4.

Private Office
Daylight Control Solution

Features:

- Daylight Harvesting
- Vacancy Sensing
- Manual-ON
- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell
- Auto Calibration
- Emergency Input
- Decora® 4 Button Entry Station
- Daylighting Set Point Adjustment through Entry Station
- Plug Load Control with Power Pack
- Time Clock Input
- Demand Response
- HVAC and Emergency Interface

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
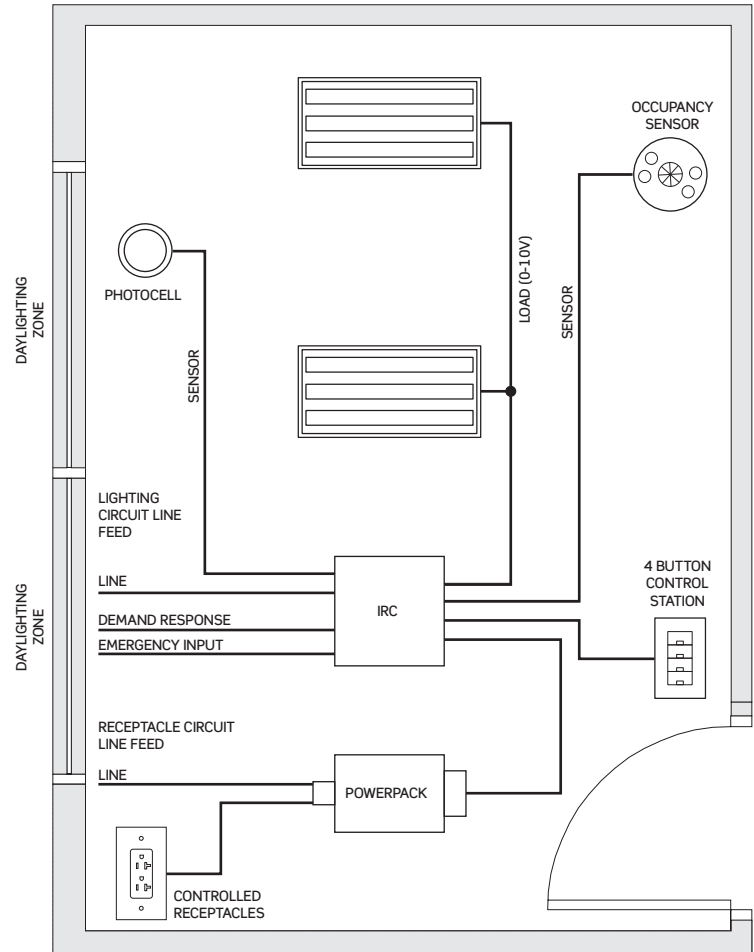Lighting Controls

9.4.1.1
Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ **Featured Leviton Control Solution**

Integrated Room Control (IRC)

Items You Will Need	Description	Cat. No.	Quantity
	IRC Kit for 2 Zones, 2 Relays — Includes IRC, sensor, photocell and control station	**RCD20-102 (RCD20-C02 — 347V)**	1
	Integrated Room Control (IRC)	**MZD20-xxx**	
	Ceiling Mount Multi-Tech Occupancy Sensor	**OSC20-M0W**	
	Photocell	**ODC0P-00W**	
	Lighting Control Station	**RLVSW-4LW**	
	OPP20 Super Duty Power Pack	**OPP20-OD2 (OSP15-R30 — 347V)**	1
	Marked "Controlled" Receptacles	**16352-2PW**	5

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Private Office Retrofit
Energy Harvesting Wireless Control Solution

Features:

- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Energy Harvesting (Sensors & Entry Station)
- Decora® Rocker Entry Station
- Plug Load Control w/ Receptacle or Power Pack
- WiFi Access Point

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control
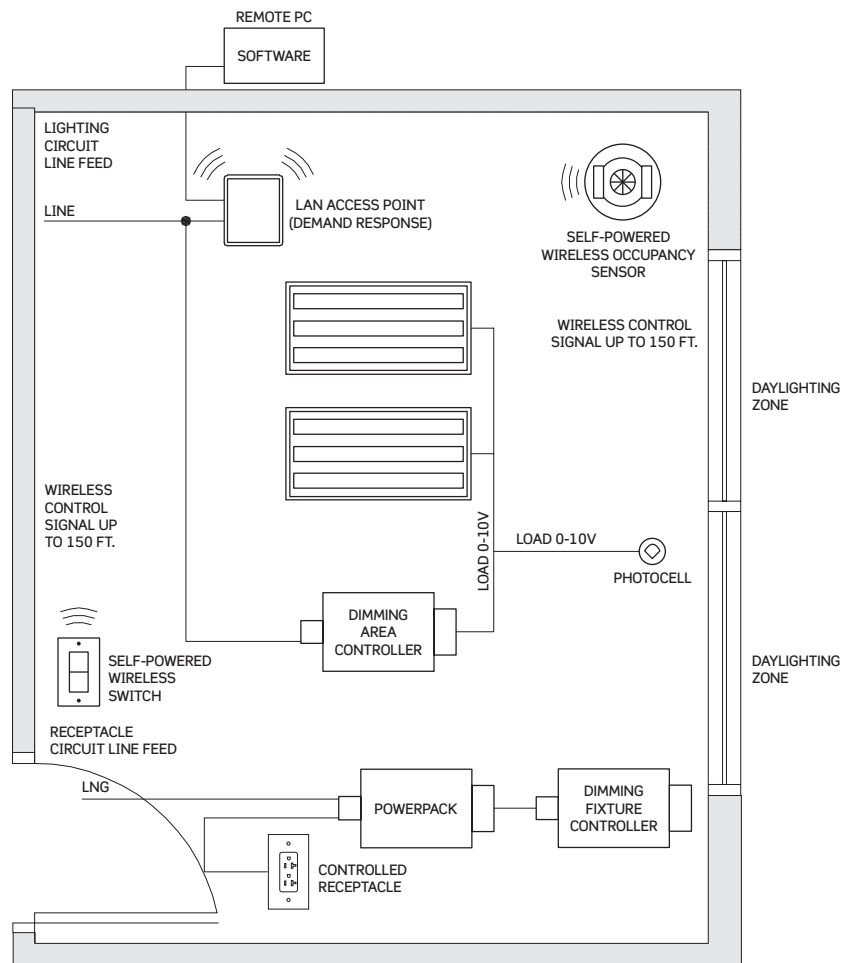
▶ **Featured Leviton Control Solution**

LevNet RF™ Energy Harvesting Wireless Solutions

Items You Will Need	Description	Cat. No.	Quantity
	Self-Powered Wireless Occupancy Sensor	**WSC12-M9N**	1
	Photocell	**ODC0P-D0W**	1
	Wireless 1-10V Dimming Fixture Controller	**WSD05-9D0**	1
	Wireless 1-10V Dimming Area Controller	**WSD20-9D0**	1
	Self-Powered Wireless Switch	**WSS0S-S9W**	1
	LAN Access Point	**WSAP0-I9E**	1
	OPP20 Super Duty Power Pack	**OPP20-RD4**	1
	Marked "Controlled" Receptacles	**16352-2PW**	5

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Open Office with Cubicles
Sector® Distributed Control System

Features:

- Digital Address Control to the Device
- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell
- Software for User Interface (UI) and Commissioning
- Decora® 5 Button Entry Station
- Plug Load Control with Sector Relay
- Scheduling (Behavioral Control)
- Demand Response

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
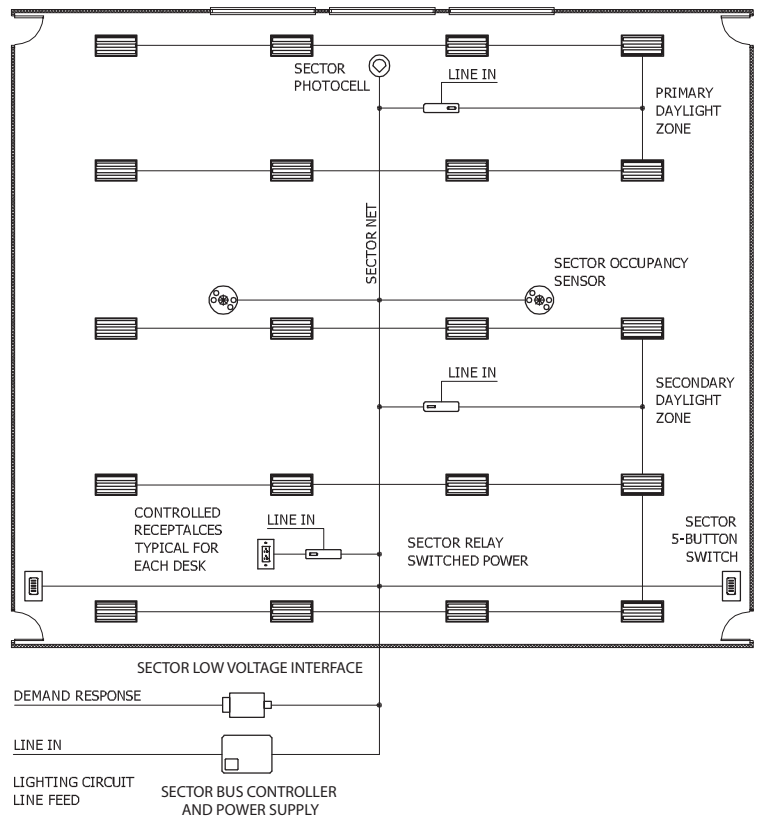Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

TITLE 24/ASHRAE
OPEN OFFICE
SECTOR DISTRIBUTED CONTROL SYSTEM

▶ **Featured Leviton Control Solution**
Sector Distributed Control System

Items You Will Need	Description	Cat. No.	Quantity
	Sector Bus Controller	**SPB00-00M**	1
	Sector Low Voltage Interface	**SLIQS-000**	1
	Sector Occupancy Sensor	**OSC20-MSW**	2
	Sector Photocell	**ODC0P-0SW**	1
	Sector 5-Button Switch	**SDS00-15W**	2
	Sector Relay	**SBCS0-L00**	3
	Marked "Controlled" Receptacles	**CR020-1PW**	1 Per Each Desk

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Open Office with Cubicles Retrofit
Daylight Control Solution (IRC)

Features:

- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell
- Auto Calibration
- Decora® 4 Button Entry Station
- Emergency Input
- Daylighting Set Point Adjustment through Entry Station
- Plug Load Control with Power Pack
- Time Clock Input
- Demand Response
- HVAC and Emergency Interface

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
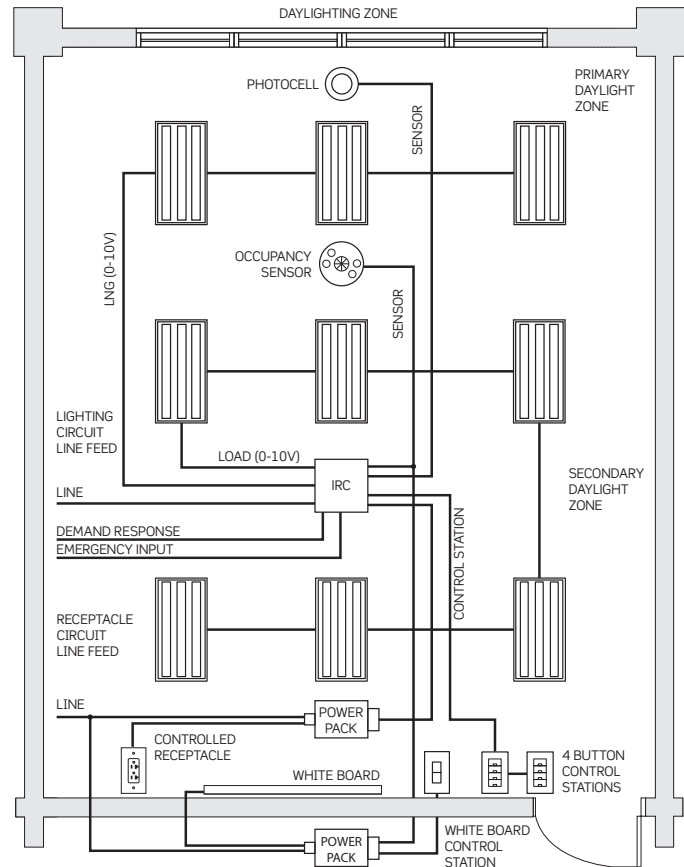Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ Featured Leviton Control Solution

Integrated Room Control (IRC)

Items You Will Need		Description	Cat. No.	Quantity
		IRC Kit for 2 Zones, 2 Relays — Includes IRC, sensor, photocell and control station	**RCD20-102 (RCD20-C02 — 347V)**	1
		Integrated Room Control (IRC)	**MZD20-xxx**	1
		Ceiling Mount Multi-Tech Occupancy Sensor	**OSC20-M0W**	2
		Photocell	**ODC0P-00W**	1
		Lighting Control Station	**RLVSW-4LW**	4
		OPP20 Super Duty Power Pack	**OPP20-OD2**	1
		Marked "Controlled" Receptacles	**16352-2PW**	1 Per Each Desk

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Classroom
IRC Room Control Solution

Features:

- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Auto Calibration
- Daylighting Set Point Adjustment through Entry Station
- Daylight Harvesting with Photocell
- Emergency Input
- Decora® 4 Button Entry Station
- Plug Load Control with Power Pack
- HVAC and Emergency Interface
- Time Clock Input
- Demand Response

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ **Featured Leviton Control Solution**
Integrated Room Control (IRC)

Items You Will Need	Description	Cat. No.	Quantity
	IRC Kit for 2 Zones, 2 Relays — Includes IRC, sensor, photocell and control station	**RCD20-102 (RCD20-C02 — 347V)**	1
	Integrated Room Control (IRC)	**MZD20-xxx**	1
	Ceiling Mount Multi-Tech Occupancy Sensor	**OSC20-M0W**	1
	Photocell	**ODC0P-00W**	1
	Lighting Control Station (1 included in kit, 1 additional required)	**RLVSW-4LW**	2
	Lighting Control Station	**RDGSW-2DW**	1
	OPP20 Super Duty Power Pack	**OPP20-OD2 (OSP15-R30 — 347V)**	2
	Marked "Controlled" Receptacles	**5362-2PW**	5

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Conference Room
Architectural Dimming

Features:

- Architectural Touchscreen Interface
- 1-10V Continuous Dimming Control
- Multi-Level Dimming (Stepped) Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell
- Software & Handheld Remote Programming
- Plug Load Control
- Astronomical Time Clock
- Scheduling (Behavior Control)
- Demand Response
- HVAC and Emergency Interface
- Building Automation (BACnet)

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control
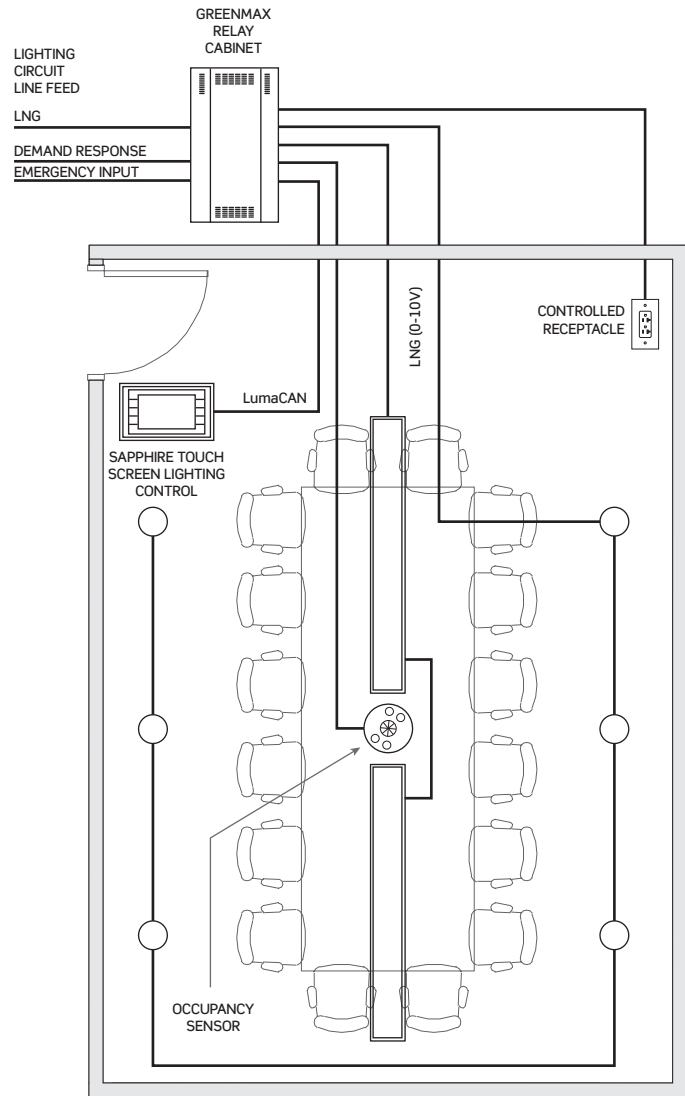
▶ **Featured Leviton Control Solution**

Sapphire™ Touch Screen Lighting Control — GreenMAX® Relay Control System

Items You Will Need	Description	Cat. No.	Quantity
	Sapphire Touch Screen Lighting Control	**TS007-000**	1
	GreenMAX Relay Control Panel	**RxxTC-100**	2
	GreenMAX Command Module	**RPM16-316**	1
	GreenMAX Relays Note: Latching relays available in standard and metering models—see data sheet for more information	**RELAY-xxx**	16
	GreenMAX Relay Insert Panel	**R1616-1DS**	1
	GreenMAX Handheld Display Unit	**RHDU1-300**	1
	Ceiling Mount Multi-Tech Occupancy Sensor Note: Refer to data sheet for part number information	**OSCxx-M0W**	1
	Marked "Controlled" Receptacles	**16352-2PW**	5

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Classroom Retrofit
Energy Harvesting Wireless Solution

Features:

- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Energy Harvesting (Sensors & Entry Station)
- Decora® Rocker Entry Station
- Plug Load Control with Receptacle or Power Pack
- WiFi Access Point

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls
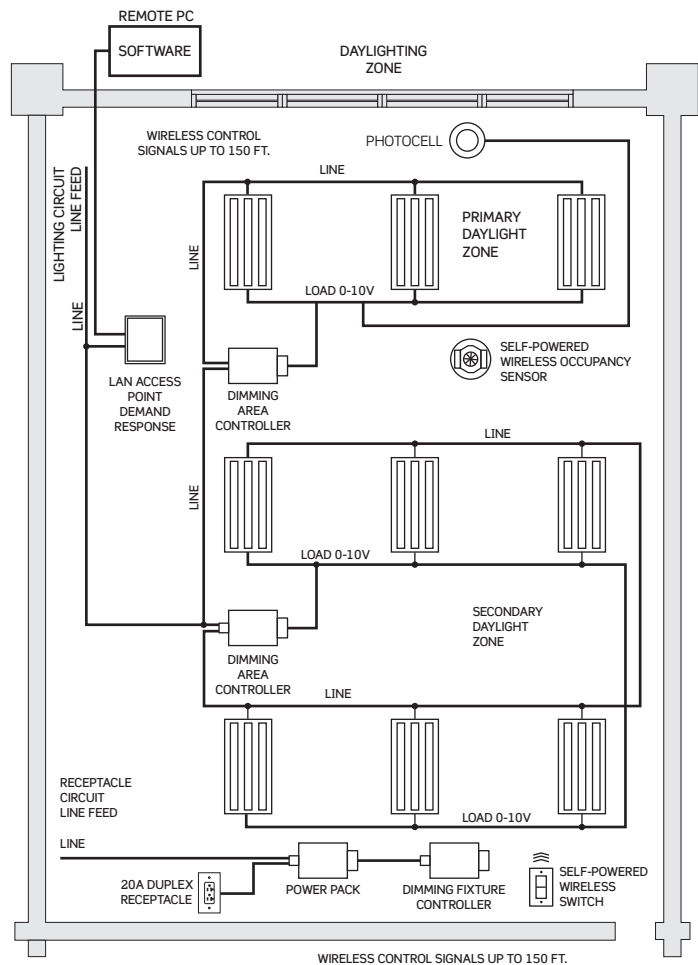
9.4.1.1
Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ **Featured Leviton Control Solution**
LevNet RF™ Energy Harvesting Wireless Solutions

Items You Will Need	Description	Cat. No.	Quantity
	Self-Powered Wireless Occupancy Sensor	**WSC12-M9N**	1
	Photocell	**ODC0P-D0W**	1
	Wireless 1-10V Dimming Fixture Controller	**WSD05-9D0**	2
	Wireless 1-10V Dimming Area Controller	**WSD20-9D0**	1
	Self-Powered Wireless Switch	**WSS0S-S9W**	1
	LAN Access Point	**WSAP0-I9E**	1
	OPP20 Super Duty Power Pack	**OPP20-RD4**	1
	Marked "Controlled" Receptacles	**16352-1PW**	5

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

College Commons and Library
IRC Control Solution

Features:

- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell Auto Calibration
- Decora® 4 Button Entry Station
- Daylighting Set Point Adjustment through Entry Station
- Plug Load Control with Power Pack
- Time Clock Input
- Demand Response
- HVAC & Emergency Interface
- Emergency Input

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
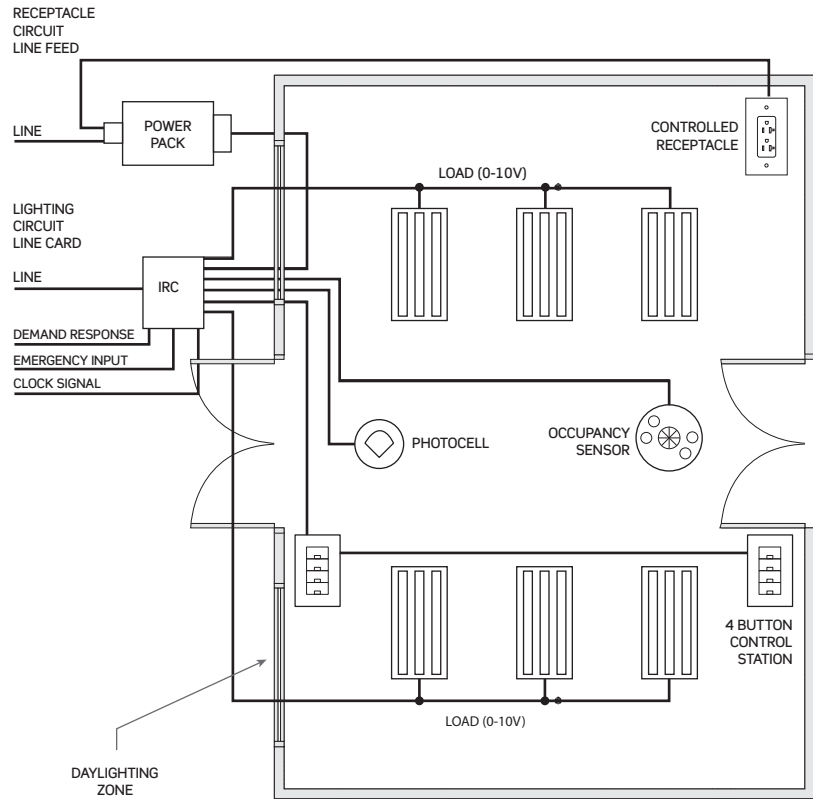Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ **Featured Leviton Control Solution**

Integrated Room Control (IRC)

Items You Will Need	Description	Cat. No.	Quantity
	IRC Kit for 2 Zones, 2 Relays — Includes IRC, sensor, photocell and control station	**RCD20-102 (RCD20-C02 — 347V)**	1
	Integrated Room Control (IRC)	**MZD20-xxx**	1
	Ceiling Mount Multi-Tech Occupancy Sensor	**OSC20-M0W**	1
	Photocell	**ODC0P-00W**	1
	Lighting Control Station	**RLVSW-4LW**	2
	OPP20 Super Duty Power Pack	**OPP20-OD2 (OSP15-R30 — 347V)**	1
	Marked "Controlled" Receptacles	**5362-2PW**	5

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Retail Space
Relay Control Solution

Features:

- Relay Control
- Separate Control for Display Lighting
- Vacancy or Occupancy Sensing with Auto-OFF
- Architectural 1-10V Dimming Entry Station
- Daylight Harvesting with Photocell
- Configuration Tree Setup
- Plug Load Control
- Astronomical Time Clock
- Scheduling (Behavior Control)
- Demand Response
- HVAC and Emergency Interface

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

9.4.1.6
Additional Control
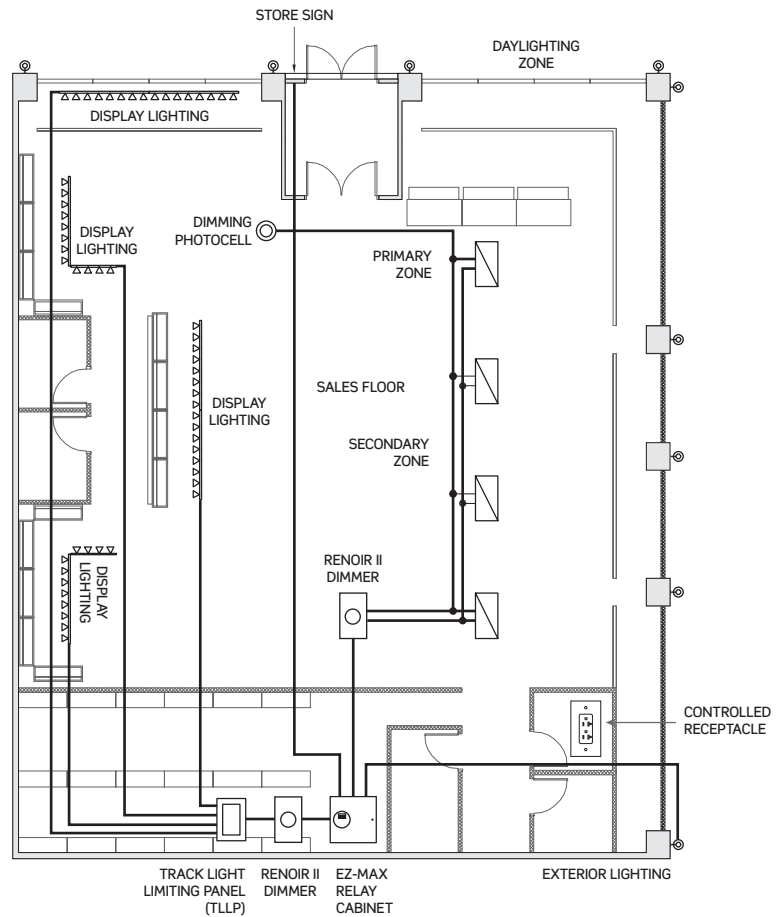
▶ **Featured Leviton Control Solution**

EZ-MAX® Plus Relay Control Panel — Renoir™ II Dimming — Track Light Limiting Panel

Items You Will Need	Description	Cat. No.	Quantity
	EZ-MAX Plus Relay Control Panel	**R08BD-L08**	1
	Track Light Limiting Panel Note: For part number information visit leviton.com	**GXXXX-XXX**	1
	Renoir II Wall Station Dimmer Note: The Renoir II Wall Station Dimmer is available in for all common load types, voltages and sink styles. Visit leviton.com/renoirii for a complete list of part numbers	**XXXXX-XXW**	2
	Photocell	**ODC0P-00W**	1
	Marked "Controlled" Receptacles	**CR020-1PW**	1

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 5 for more details.

Stairwell
Integrated Room Control (IRC)

Features:

- Partial-OFF
- 1-10V Dimming Control
- Fail Safe Circuitry
- Vacancy or Occupancy Sensing with Auto-OFF
- Decora® 2 Button Entry Station
- Time Clock
- Demand Response
- Emergency Input

Meets the following ASHRAE 90.1 requirements:
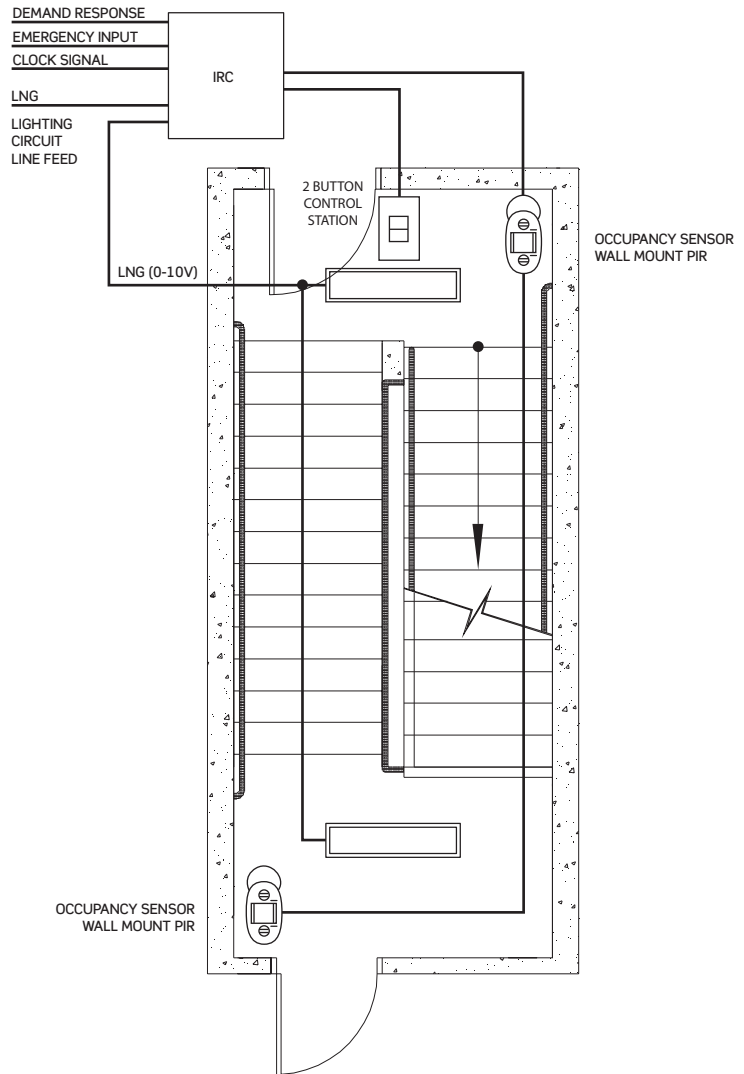
9.4.1.1
Automatic Shutoff

9.4.1
Lighting Controls

9.4.1.2
Space Control

9.4.4
Functional Testing

9.4.1.6
Additional Control

DEMAND RESPONSE
EMERGENCY INPUT
CLOCK SIGNAL

IRC

LNG

LIGHTING
CIRCUIT
LINE FEED

2 BUTTON
CONTROL
STATION

LNG (0-10V)

OCCUPANCY SENSOR
WALL MOUNT PIR

OCCUPANCY SENSOR
WALL MOUNT PIR

▶ **Featured Leviton Control Solution**
Integrated Room Control (IRC)

Items You Will Need	Description	Cat. No.	Quantity
	Integrated Room Control (IRC) Note: For part number information, visit leviton.com/irc	**MZD20-xxx** **(MZD20-C02 — 347V)**	1
	Lighting Control Station	**RLVSW-2LW**	1
	Wall Mount PIR Occupancy Sensor	**OSWLR-RIW**	2

18 Note: Exceptions may apply for stairwell lighting control stations depending on municipality. Check with local ASHRAE Standard 90.1 2010 guidelines for manual switching.

Sidelit Walkway
Integrated Room Control (IRC)

LEVITON

Features:

- Partial-OFF
- 1-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell Auto Calibration
- Decora® 4 Button Entry Station
- Daylighting Set Point Adjustment through Entry Station
- Plug Load Control with Power Pack
- Time Clock
- Demand Response
- Emergency Input

Meets the following ASHRAE 90.1 requirements:
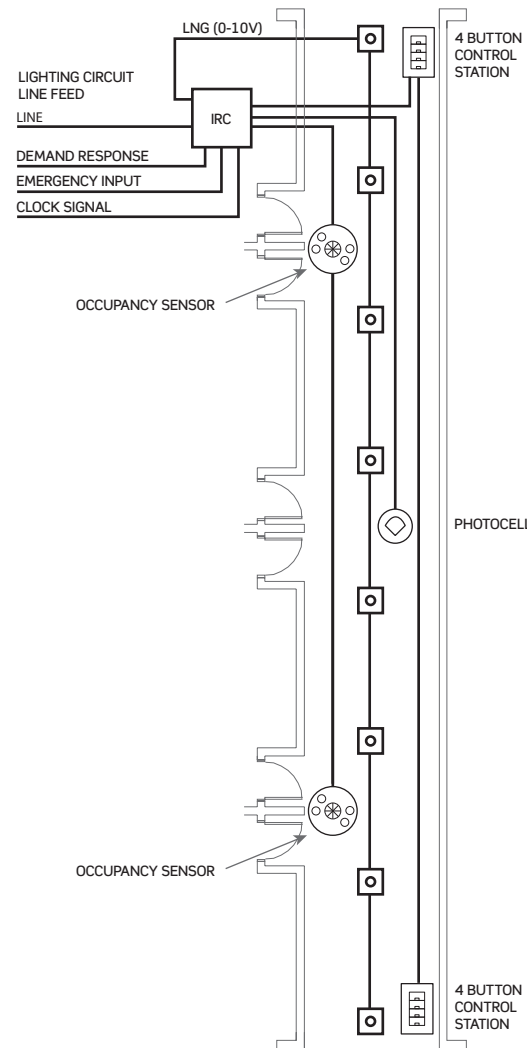
9.4.1.1
Automatic Shutoff

9.4.1
Lighting Controls

9.4.1.2
Space Control

9.4.4
Functional Testing

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

LNG (0-10V)

LIGHTING CIRCUIT LINE FEED

LINE

IRC

DEMAND RESPONSE
EMERGENCY INPUT
CLOCK SIGNAL

4 BUTTON CONTROL STATION

OCCUPANCY SENSOR

PHOTOCELL

OCCUPANCY SENSOR

4 BUTTON CONTROL STATION

▶ **Featured Leviton Control Solution**
Integrated Room Control (IRC)

Items You Will Need	Description	Cat. No.	Quantity
	IRC Kit for 2 Zones, 2 Relays — Includes IRC, sensor, photocell and control station	**RCD20-102** (RCD20-C02 — 347V)	1
	Integrated Room Control (IRC)	**MZD20-xxx**	1
	Ceiling Mount Multi-Tech Occupancy Sensor (1 included in kit, 1 additional required)	**OSC20-M0W**	2
	Photocell	**ODC0P-00W**	1
	Lighting Control Station (1 included in kit, 1 additional required)	**RLVSW-4LW**	2

Restroom
Provolt™ Self-Contained Occupancy Sensors

Features:

- Industry-exclusive self-contained design combines a line voltage occupancy sensor, power pack and photocell into a simple, single unit
- Eliminates separate power pack and occupancy sensor wiring for saving labor, time and materials
- Control Lights Auto-ON/Auto-OFF
- Ultrasonic (Active) Control

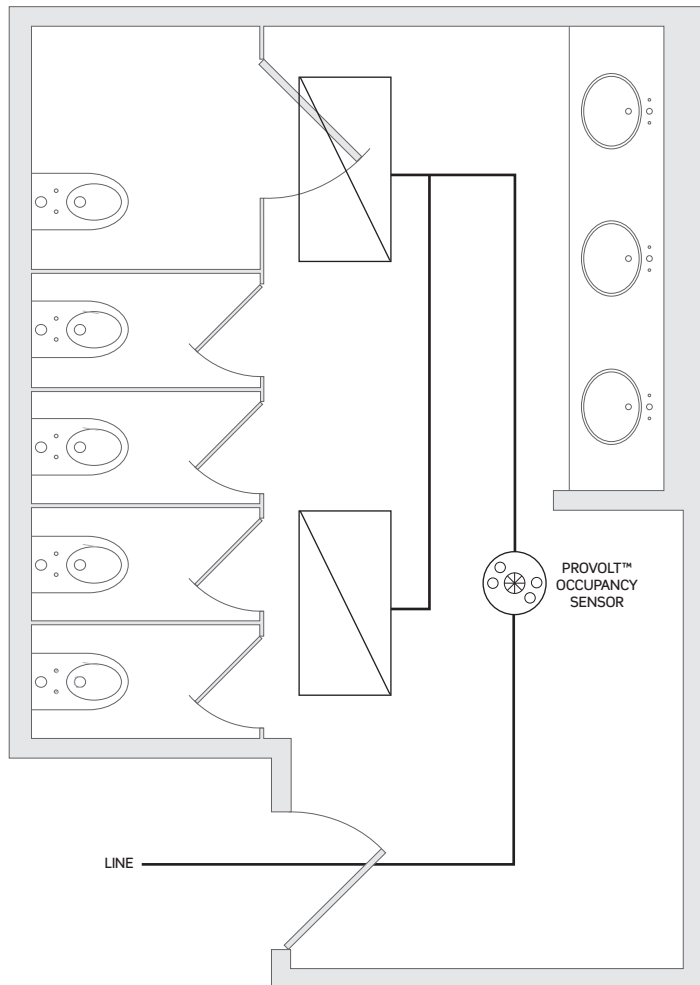**Meets the following ASHRAE 90.1 requirements:**

9.4.1.1
Automatic Shutoff

9.4.1
Lighting Controls

9.4.4
Functional Testing

PROVOLT™ OCCUPANCY SENSOR

LINE

▶ **Featured Leviton Control Solution**
Provolt Self-Contained Occupancy Sensor

Items You Will Need	Description	Cat. No.	Quantity
	Provolt Self-Contained Ceiling Mount Line Voltage Ultrasonic Occupancy Sensor	**OSC05-UDW**	1

Warehouse
Relay Control Solution

Features:

- Relay Control
- Occupancy Sensing
- Daylight Harvesting
- Decora® 4 Button Entry Stations
- Software and Handheld Remote Programming
- Plug Load Control
- Astronomical Time Clock
- Scheduling (Behavior Control)
- Demand Response
- HVAC and Emergency Interface
- Building Automation (BACnet)
- Fail-Safe Circuitry (NFPA Compliant)
- Partial-OFF

Meets the following ASHRAE 90.1 requirements:

9.4.1.1
Automatic Shutoff

9.4.1
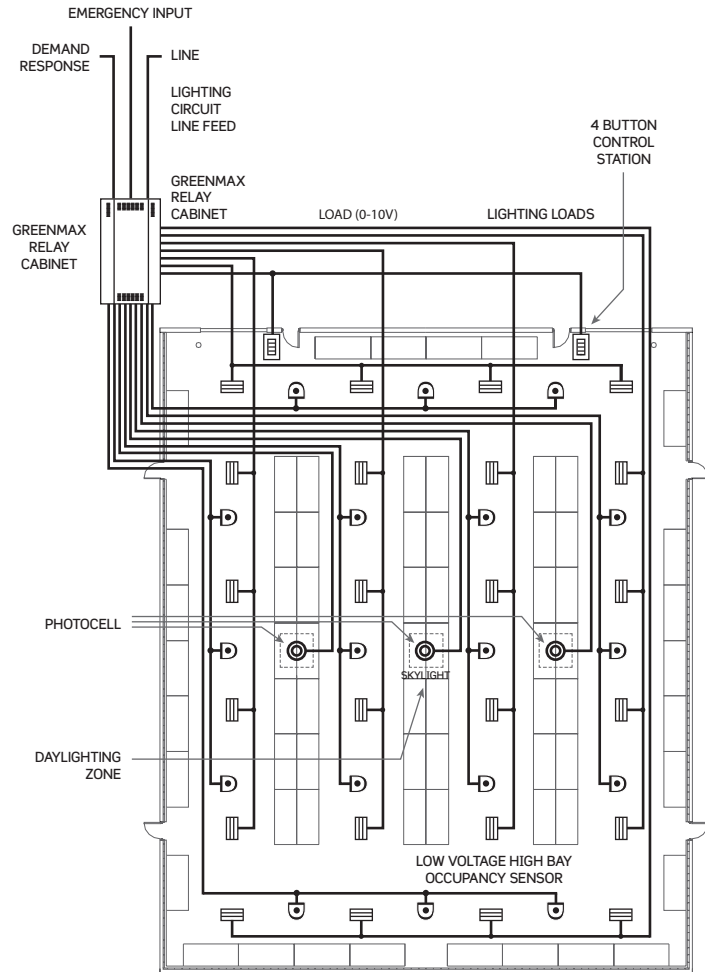Lighting Controls

9.4.1.2
Space Control

9.4.4
Functional Testing

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ **Featured Leviton Control Solution**

GreenMAX® Relay Control System

Items You Will Need	Description	Cat. No.	Quantity
	GreenMAX Relay Control Panel	**R16TC-100**	1
	GreenMAX Command Module	**RPM16-316**	1
	GreenMAX Relays Note: Latching relays available in standard and metering models—see data sheet for more information	**RELAY-xxx**	16
	GreenMAX Relay Insert Panel	**R1616-1DS**	1
	GreenMAX Handheld Display Unit	**RHDU1-300**	1
	Lighting Control Station	**RLVSW-4LW**	2
	Low Voltage High Bay Occupancy Sensor	**OSFHD-xxW**	18
	Photocell	**ODC0P-xxW**	3

Note: For Canadian 347V applications, include the RGACC-347 347V adapter. Speak to your Leviton representative for more details.

Parking Garage
Relay Control

Features:

- Occupancy Sensing
- Scheduling
- Daylight Harvesting
- Decora® 4 Button Entry Stations
- Software & Handheld Remote Programming
- Plug Load Control
- Astronomical Time Clock
- Scheduling (Behavior Control)
- Demand Response
- HVAC and Emergency Interface
- Building Automation (BACnet)
- Fail-Safe Circuitry (NFPA Compliant)
- Partial-OFF

Meets the following ASHRAE 90.1 requirements:

8.4.2
Automatic Receptacle Control

9.4.1
Lighting Controls

9.4.1.1
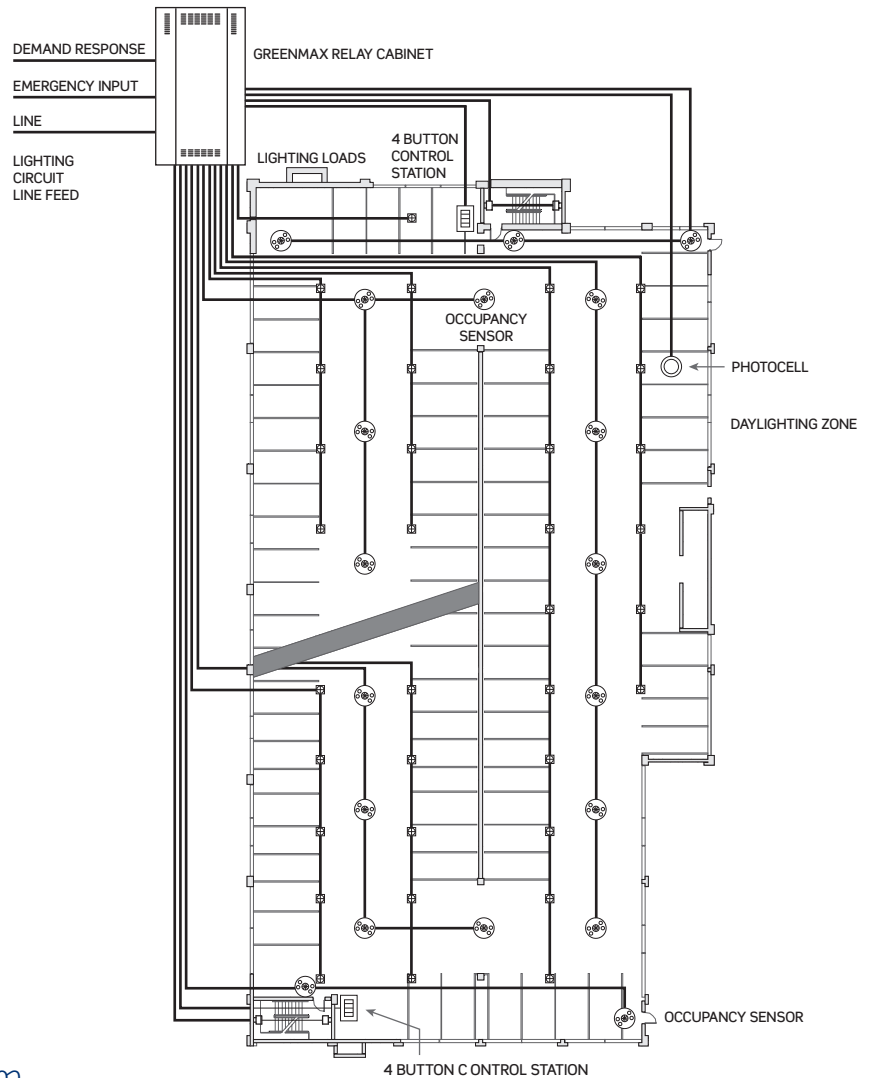Automatic Shutoff

9.4.4
Functional Testing

9.4.1.2
Space Control

9.4.1.4 & 9.4.1.5
Automatic Daylight Control

▶ **Featured Leviton Control Solution**
GreenMAX® Relay Control System

Diagram labels: DEMAND RESPONSE, EMERGENCY INPUT, LINE, LIGHTING CIRCUIT LINE FEED, GREENMAX RELAY CABINET, LIGHTING LOADS, 4 BUTTON CONTROL STATION, OCCUPANCY SENSOR, PHOTOCELL, DAYLIGHTING ZONE, OCCUPANCY SENSOR, 4 BUTTON CONTROL STATION

Items You Will Need	Description	Cat. No.	Quantity
	GreenMAX Relay Control Panel	**R16TC-xxx**	1
	GreenMAX Command Module	**RPM16-316**	1
	GreenMAX Relays Note: Latching relays available in standard and metering models—see data sheet for more information	**RELAY-xxx**	16
	GreenMAX Relay Insert Panel	**R1616-1DS**	1
	GreenMAX Handheld Display Unit	**RHDU1-300**	1
	Lighting Control Station	**RLVSW-4LW**	2
	Ceiling Mount Multi-Tech Occupancy Sensor	**OSC20-RMW**	19
	Photocell	**ODC0P-0xW**	1
	Marked "Controlled" Receptacles	**CR020-1PW**	5

Note: For Canadian 347V applications, include the RGACC-347 347V adapter. Speak to your Leviton representative for more details.

Retail Parking Lot
Relay Control with Time Clock

Features:
- Smart Metering Integration
- Daylight Harvesting with Photocell
- Configuration Menu Setup
- Astronomical Time Clock
- Scheduling
- Demand Response
- Emergency Input

Meets the following ASHRAE 90.1 requirements:
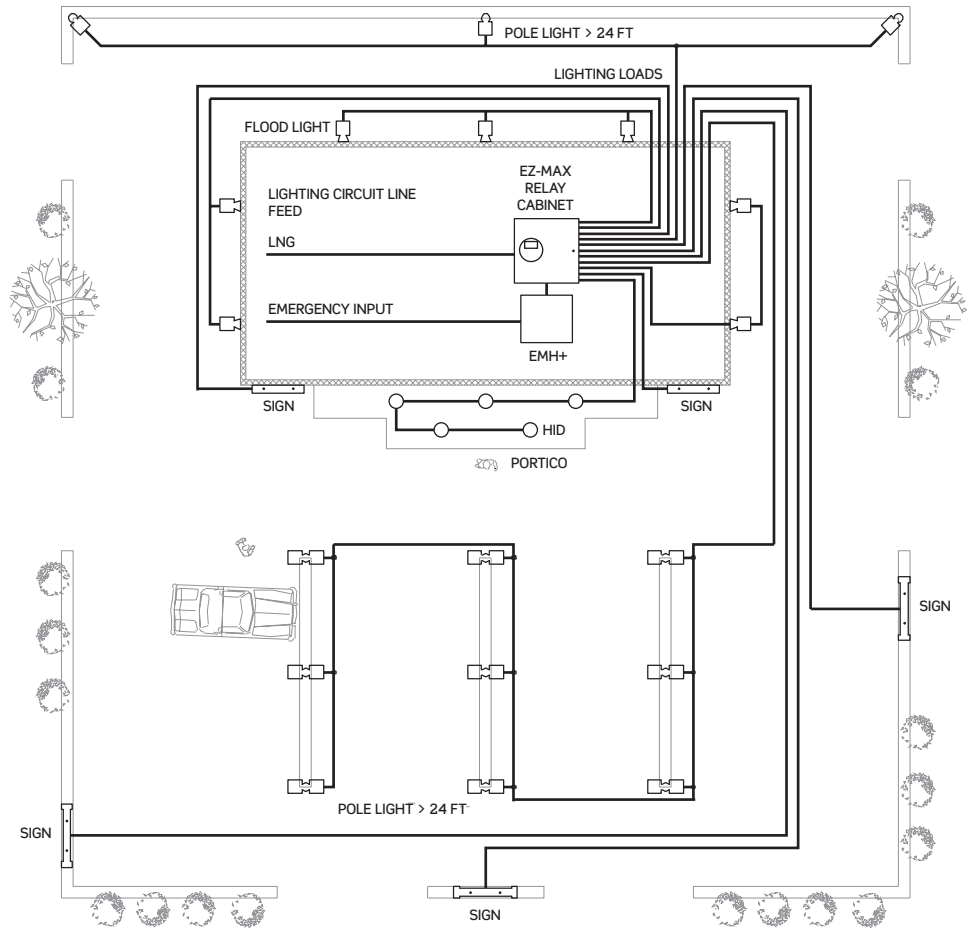

9.4.1.2
Space Control

9.4.1.7
Exterior Lighting Control

9.4.1
Lighting Controls

9.4.4
Functional Testing

▶ **Featured Leviton Control Solution**
EZ-MAX® Plus Relay Control Panel

Items You Will Need	Description	Cat. No.	Quantity
	EMH+ All-in-One Meter and HUB	**A8814-1S3**	1
	EZ-MAX Plus Relay Control Panel Note: Can operate at 347V	**R24BD-L24**	1

Leviton Advantage Solutions
for ASHRAE Standard 90.1 2010 Compliance

Sensing Control

- Broadest range of sensors for any application
- Provolt™ integrates occupancy sensing, daylight harvesting, and manual-ON/auto-OFF override control in a single unit - no special control stations required
- Plug load control with OPP20 Super Duty Power Pack
- 24V AC/DC input for integration with HVAC/BAS systems
- Industry leading layout and application services

Renoir® II Commercial Architectural Wall Box Dimmers

- LED Ready
- Universal voltage — 120-277V, 60Hz
- Supports virtually all common load types without power extenders
- Multi-location dimming — up to 5-way dimming
- Low voltage dimming control for LEDs
- Patented Super-Silent Fan Control Technology (SST)

Sapphire™ Architectural Lighting Controls

- Modern touchscreen user interface integrates with multiple Leviton lighting control systems
- Online and offline configuration
- Supports multiple interfaces - LumaCAN®, Ethernet, A/V, HVAC, wireless (LevNet RF), and analog systems
- Software update through USB interface behind front panel

LevNet RF™ Energy Harvesting Wireless Solutions

- No wires to run and no batteries required - install in 1/4th the time, eliminating time and expense of control wiring
- Broad range of switches and control modules to meet virtually any control need
- Enables rapid retrofit with minimal impact

Integrated Room Control (IRC)

- Combines occupancy sensing, daylight harvesting, 0-10V dimming, partial-ON, partial-OFF, and demand response capabilities in a stand-alone package
- Kitted with factory configured sensor, photocell, and 4-button switch
- Autocal™ automatic photocell calibration and Ladderless Commissioning™
- Easy automatic closed or open loop multi-zone daylight harvesting control
- Auto 100 hour burn-in

EZ-MAX® Plus Stand-Alone Relay System

- Centralized building lighting control and daylight harvesting in a contractor-friendly, quick to install, simple to configure compact enclosure
- Low voltage inputs allow connection of photocells, occupancy sensors, low-voltage switches and digital switches for a comprehensive yet easily installed energy management solution
- Built-in astronomical time clock and scheduler
- Auto-detection and auto-assign of installed network switches

Track Light Limiting Panel (TLLP)

- Prevents overloaded circuits
- Provides tamper-proof current limiting protection for track lighting
- Sets a fixed power consumption limit for designer lighting installations by using the volt amperage rating of the breaker instead of watts per linear feet
- Factory configured to customer specifications – arrives ready to install
- Reduces installation costs - no programming required

GreenMAX® Relay Control System

- Integrates common sensing, dimming, switching, and advanced daylight harvesting applications from the same cabinet
- BACnet IP native in each cabinet for seamless BMS integration
- Industry leading 25,000A Short Circuit Current Rating (SCCR) at 277V
- Integrated 0-10V dimming/switching relay
- Built-in override switch allows manual control of each load individually
- Programming is done with preset "Behaviors" via the industry-exclusive Handheld Display Unit (HDU)

Sector® Distributed Lighting Control System

- Topology-free, polarity-free distributed control
- Combines all lighting management functions into a single system with the fewest connection points, simplest installation, greatest flexibility and simple specification
- All components connect directly to the topology free 2-wire bus, not the ballast
- Relay controllers allow zone dimming and control for cost-effective system design

VerifEye™ Submetering Solutions

- Comprehensive line of submeters, communication products, and software solutions
- Simple installation in new or existing facilities
- Measurement & Verification (M&V) capabilities with data collection and storage
- Ideal for real-time energy monitoring and tenant billing
- Integrate with Building Management Systems (BMS) for energy efficiency and savings

Marked "Controlled" Receptacles

- Meets requirements for identifying receptacles that will be automatically be de-energized as part of an overall plug load control program
- 2014 NEC requires all 15A and 20A, 125V receptacles that are automatically controlled to be marked with a specific symbol (⏻)
- Ideal for new construction and renovation applications
- Available in back and side wired, side wired standard, tamper-resistant and Decora® versions
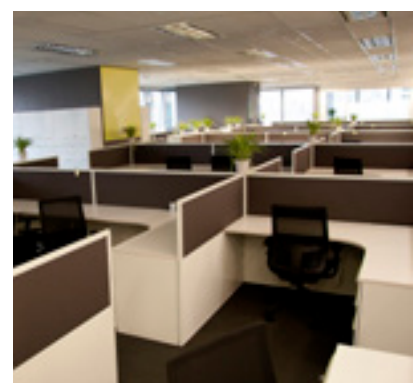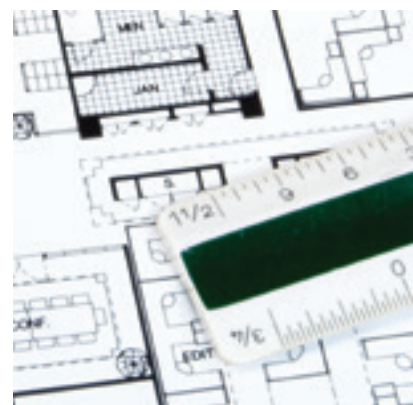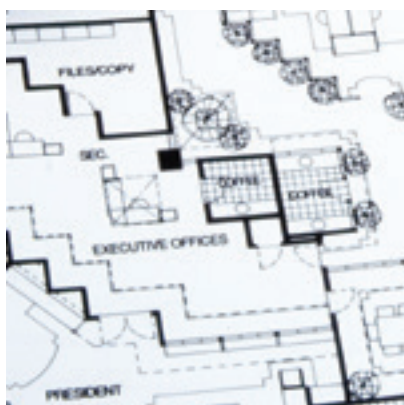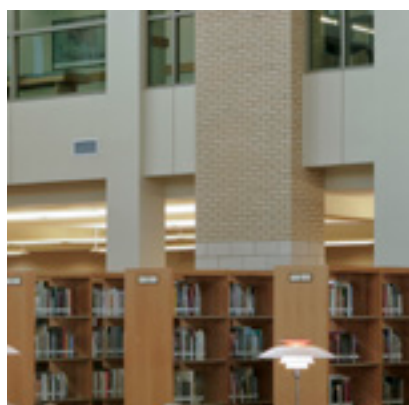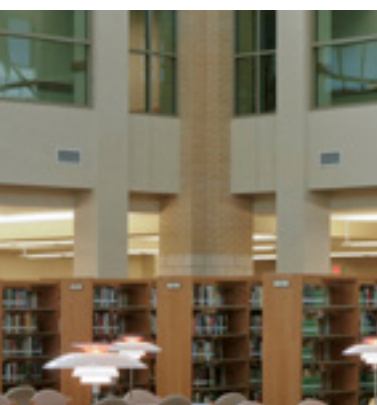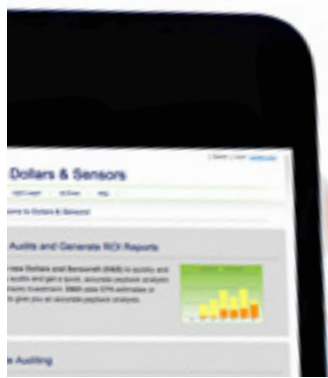
Service and Support
During Every Step of the Process

There is much more to making lighting more energy efficient than just installing a simple device or two. System design, product selection, installation and service: it all has to come together. That's where Leviton service and support options come in. We'll help you design your system and make the right product selections so you can create a lighting control system that does exactly what you want it to do while saving electricity, meeting codes and standards, and even garnering rebates.

It all starts with the Leviton sales representative. Our lighting control specialists are here to support you every step of the way. They can perform on-site facility audits and suggest specific products and strategies for improving lighting energy efficiency.

Exclusive Wealth of Resources

- **Dollars & Sensors® Online Energy Audit Tool** — makes energy audits easier than ever — use your smart device (Android, Apple, Windows or Blackberry) to enter audit information and your desktop to generate ROI reports, analyses, Bill of Materials, and a submittal package — go to **www.leviton.com/dollarsandsensors**

- **Occupancy Sensor Layout Services** — have a team of experts create occupancy sensor layouts directly on your CAD drawings, complete with a List of Equipment at no cost — go to **portal.leviton.com**

- **LightLogger® Program** — get an accurate estimate of your energy-savings potential with this exclusive payback analysis tool — go to **www.leviton.com/logger**

- **ez-Learn™** — get Leviton smart from the comfort of your home or office with this exclusive 24/7 online training — go to **www.leviton.com/ezlearn**

- **ASAP Lighting Design Software** — point-and-click software allows you to quickly and simply design, specify and enter orders — go to **www.leviton.com/asap**

- Find more exclusive, no-cost design tools at **www.leviton.com/lesdesign**

- Lighting control specialists at your disposal

- Field service engineers for top-level support

- Factory commissioning service

- Dedicated technical support via phone at 1-800-959-6004

Leviton Manufacturing Co., Inc. Global Headquarters
201 North Service Road, Melville, NY 11747-3138
Telephone: 1-800-323-8920
Fax: 1-800-832-9538
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