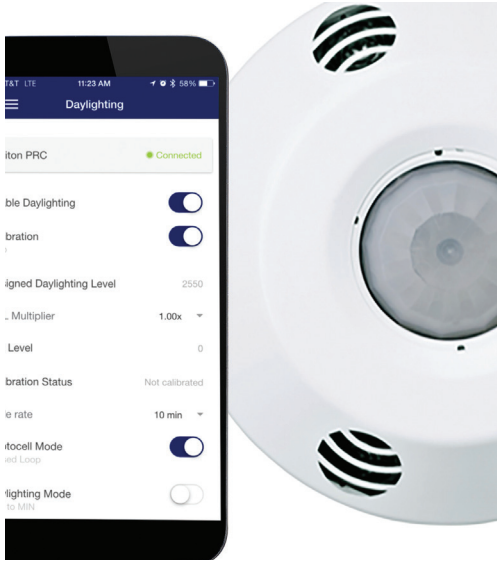
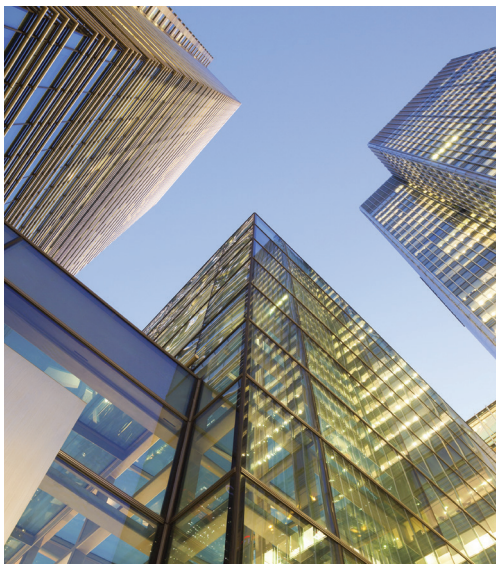
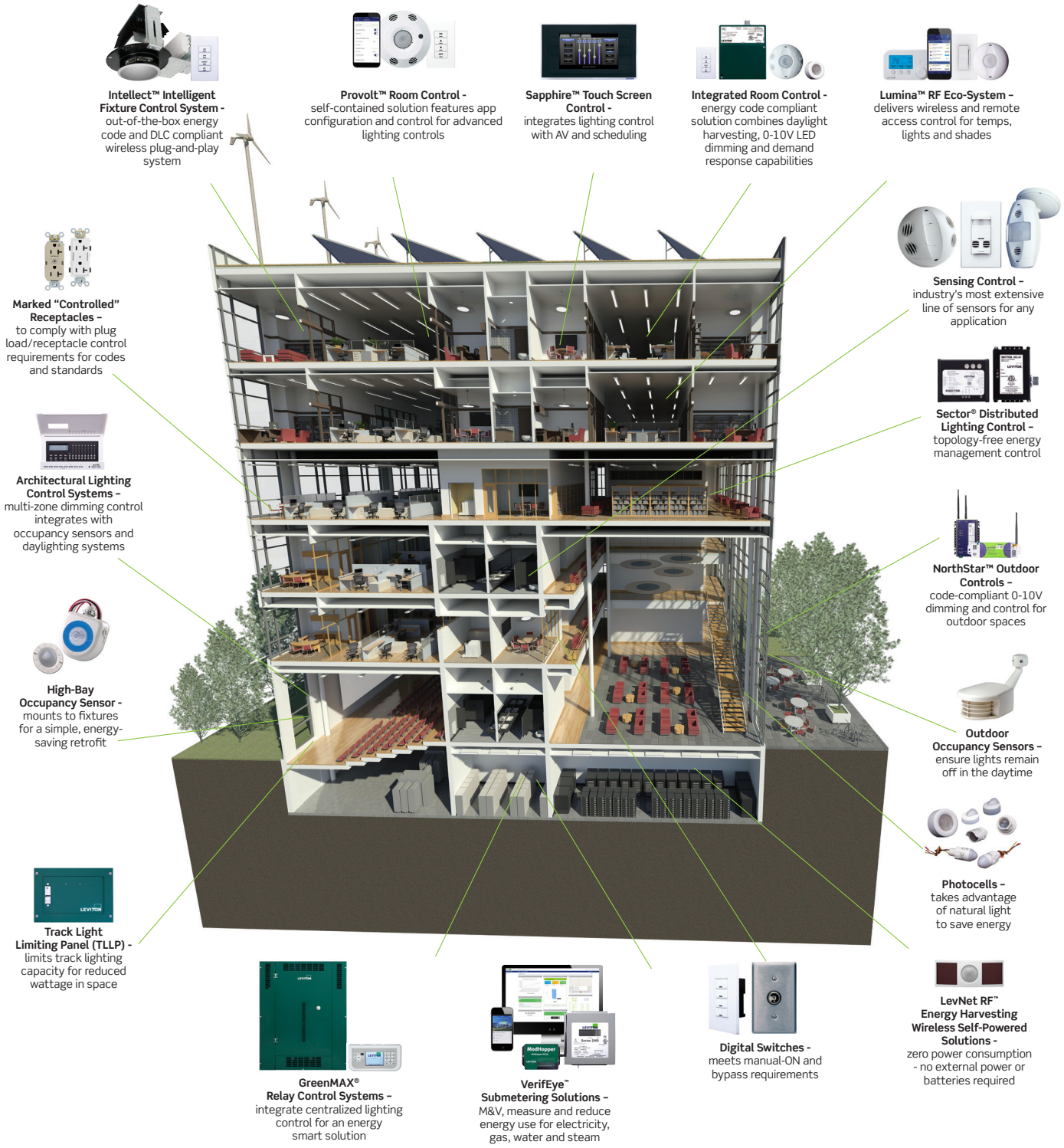
LEVITON

ASHRAE Standard 90.1 2016

Design Guide for Smart Lighting Control and Energy Solutions







Leviton Excellence for ASHRAE 90.1 Standards

ASHRAE Standard 90.1 2016 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 Standard compliance considerations, and Leviton solutions to meet the functionality and standards compliance needs of the space.

ASHRAE Standard 90.1 2016 Design Guide

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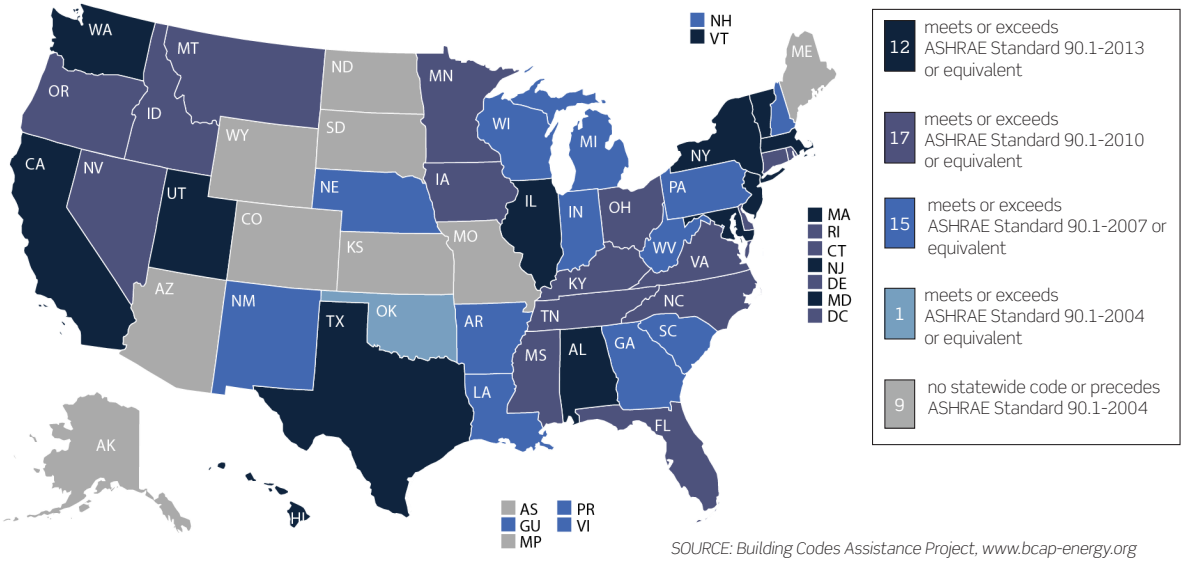
Energy Standards by State

Commercial State Energy Code Status as of June 1, 2017

Note: For Canadian code compliance, refer to your provincial code



SOURCE: Building Codes Assistance Project, www.bcap-energy.org

Disclaimer:
This document is for informational purposes only. Each project will have its own specific requirements for satisfying ASHRAE 90.1 standard 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.

Code Comparison: IECC, ASHRAE 90.1 & Title 24

Title 24 2016 is an expansion of the national ASHRAE Standard 90.1 2010/2013/2016, which is a more in-depth version of the national standard guidelines set forth in 2012/2015 IECC. See the table below for an overview of how the codes and standards compare. Note that the new code additions (2015 IECC, ASHRAE 90.1 2016 and Title 24 2016) are highlighted.

Control Type	2015 IECC	ASHRAE Standard 90.1 2016	California Title 24 2016
Automatic Receptacle Control	Required in: • Hotel/motel guest rooms	Required in: • Private offices • Open office spaces • Computer classrooms • Hotel/motel guest rooms • Conference rooms • Printing/copy rooms • Classrooms • Individual workstations • 25% of branch circuit feeders installed for modular furniture • Must be turned off via time-of-day control, or control system/ occupancy sensor after 20 minutes of vacancy	Required in: • Private offices • Open office spaces • Reception lobbies • Conference rooms • Kitchenettes • Copy rooms • Hotel/motel guest rooms
Automatic Shutoff	• Automatic time switches are required in most areas that are not controlled by an occupancy sensor; the switch must also have a manual override. • Occupancy sensors are required in a number of applications that must auto-OFF after 30 minutes of vacancy, and be manual-ON or auto-ON to no more than 50% power, and include a manual control • Occupancy sensors must auto-OFF within 30 minutes of occupants leaving the space, and manual-ON or auto-ON to 50%	• Interior lighting must have an automatic control to turn the lights OFF • This device can be a scheduling control, an occupancy sensor, or a BAS/BMS system • Applicable spaces must be capable of the following: - Manual-ON OR partial-ON—auto-ON to 50% - Bi-level control—step between 30-70% or continuous dimming" - Automatic daylight controls - Automatic partial-OFF—reduce to 50% when unoccupied for some spaces - Automatic full-OFF OR scheduled shutoff	• Interior lighting must have an automatic control to turn the lights OFF • This device can be a scheduling control, an occupancy sensor, or a BAS/BMS system • Different applications have specific guidelines for partial-OFF and auto-OFF sensors; see the code for details • Where multi-level controls are required, sensors must act as a partial-ON sensor OR vacancy sensor • Partial-ON may only activate lights between 50-70% power
Manual Space Control	• Every area enclosed by walls or floor-to-ceiling partitions must have a manual control • Controls must be located within the area served by the controls, or must be a remote switch clearly identifying the lights it controls with a status indicator • Occupancy sensors must also incorporate a manual control • Manual control to reduce the connected load by at least 50% by controlling all lamps (dimming), dual switching, inboard/outboard switching or controlling each fixture/lamp independently	• All spaces shall include manual control devices that are continuous or stepped dimming control devices that control an area no larger than 2,500 sq ft if space is smaller than 10,000 sq ft. If 10,000 sq ft or more, then it must control an area no larger than 10,000 sq ft	• Manual-ON/OFF override control is required in each area enclosed by ceiling-height partitions • If lighting is dimmable, controls must be on a dimmer with dimming and manual-ON/OFF capabilities • The following areas may use manual-ON/OFF control not accessible to unauthorized personnel: - Public restrooms with 2 or more stalls - Parking areas - Stairwells - Corridors • Display/accent/case lighting must be separately controlled

Control Type	2015 IECC	ASHRAE Standard 90.1 2016	California Title 24 2016
Parking Garage Control	• Must adhere to the standard requirements for lighting control, space control and automatic daylight control with stepped control or continuous dimming OR manual switched daylighting control	• Parking garage lighting zones must be controlled by a device that reduces power by 30% after 20 mins of vacancy • Open exterior walls must utilize automatic daylight harvesting • Covered vehicle entrances and exits must automatically reduce lighting by 50% from sunset to sunrise • Perimeter fixtures must be controlled in response to daylight	• Occupancy sensors must reduce power with one control step between 20-50% of lighting power • No more than 500W of lighting may be controlled per zone • Automatic controls must turn lights to full-ON and be activated from all paths of egress
Automatic Daylight Control	• Control required in daylight control zones that provide these areas with separate control that is independent of the general lighting in the space, which can be stepped or continuous dimming • Calibration must be readily accessible • Required in spaces where more than 150W of lighting is installed in the Sidelit and Toplit zones • Toplit zones must be controlled independent of lights in Sidelit zones • Offices, classrooms, labs, and library reading rooms must dim lights continuously from full power to 15% of full light output and capable of full shutoff of all controlled lights • Daylit zones in different orientations (N/S/E/W) over 150W must be controlled separately	• Sidelit and Toplit areas must be separately controlled by a photocontrol, which can be stepped or continuous dimming • Must reduce lighting power in response to available daylight with continuous dimming or with control steps between 50-70%, 20-40%, and OFF	• In general area lighting areas, photocontrols are required in all interior daylit spaces with at least 24 sq ft of glazing and a total of 120W or more of installed lighting power in daylight and skylight zones • Includes nearly every non-residential space with skylights or windows • Secondary zones must have the same level of functionality as those in the primary zone • Zones must be controlled separately • Photocontrols are required in parking garages with at least 36 sq ft of opening and at least 60W of installed lighting power in daylight areas
Multi-Level Area Lighting Controls	• Each area required to have manual control is also required to be able to reduce the lighting by 50%	• All spaces must have a lighting control that is either manual-ON or auto-ON to <50% of lighting load • In addition to controls that switch OFF all lighting, enclosed spaces must have controls that reduce the lighting by 30-70% of the full lighting load	• Manual-ON/OFF override control is required in each area enclosed by ceiling-height partitions • All general area lighting in rooms >100 sq ft and < 0.5W/sq ft shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity • The following areas do not require multi-level area control: - Areas with a single luminaire with no more than 2 lamps - Partial-OFF areas including: - Aisle ways and open areas in warehouses - Library book stack aisles - Corridors and stairwells - Parking garages, parking areas, loading/unloading areas

Code Comparison: IECC, ASHRAE 90.1 & Title 24

Control Type	2015 IECC	ASHRAE Standard 90.1 2016	California Title 24 2016
Exterior Lighting Control	• Exterior lighting designated for dusk to dawn operation shall be controlled by an astronomical time clock or photocontrol • Lighting not designated for dusk to dawn operation shall be controlled by either a combination of a photocontrol and time switch, or an astronomical time clock	• Exterior lighting must be controlled by a device to automatically turn lighting OFF as a function of available daylight • Controls must reduce advertising/sign lighting power by at least 30% after closing • Building facade lighting must be controlled based on opening/closing time • Any other lighting shall have controls configured to reduce connected lighting power by no less than 30% from midnight-6am, OR 1 hour of business closing to 1 hour of business opening, OR any time space is unoccupied for more than 15 minutes	• Exterior incandescent lighting >100W must be controlled with a motion sensor • All outdoor lighting must be controlled with a photocontrol and an automatic time switch OR astronomical time switch control • Lighting that is <24 ft from the ground must be controlled to automatically reduce lighting by 40-80% when the area is vacant, and auto-ON when occupied (see wattage exceptions) • Outdoor signage that is on all day and night, 24/7, must be controlled with a photocontrol and an automatic time switch OR astronomical time switch control, and reduce sign lighting by a minimum 65% during nighttime • Lights must be turned OFF during daylight hours via a photocontrol and an automatic time switch OR astronomical time switch control • If luminaires mounted <24 ft above ground, motion sensors or other occupancy-based controls must be used; not required >24 ft above ground • Maximum dimming permitted as part of a motion controlled lighting system increased to 90% • Outdoor lighting no longer must be separately circuited from other lighting, but it must remain independently controlled via automatic scheduling
Functional Testing	• 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	• The construction documents shall state the party who will conduct and certify the functional testing (removed from 2016 version) • The party responsible shall not directly be involved in either the design or construction of the project	• All lighting controls must be tested by a Certified Lighting Control Acceptance Test Technician (CLCATT) • This can be done by the same electrical contractor that did the work if they are CLCATT

Control Type	2015 IECC	ASHRAE Standard 90.1 2016	California Title 24 2016
Demand Response	--	--	• Required in all nonresidential buildings >10,000 sq ft • Must be capable of automatically reducing total lighting power usage by at least 15%
Service Metering	--	• Measurement devices must be installed in new buildings to separately monitor energy use for each of the following: - Total energy - HVAC systems - Interior lighting - Exterior lighting - Receptacle circuits - Measurements must record every 15 minutes, be available to each tenant, and maintained for 36 months	Requirements include user accessible metering of total electrical use per Table 130.5-A
Disaggregation of Electrical Circuits	--	--	• Specifications for the separation of 10 types of electrical loads for switchboards, panels and motor control centers required to be disaggregated per Table 130.5-B

ASHRAE Standard 90.1 2016 Requirement Quick Reference

Note that the new ASHRAE Standard 90.1 2016 additions are highlighted in green.

Control Type	Summary	Quick Take
8.4.2 Automatic Receptacle Control	50% of all receptacles in private offices, open offices, computer classrooms, conference rooms, print/copy rooms, break rooms, classrooms and individual workstations 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. **Leviton Product Solutions** • Occupancy sensors • Vacancy sensors • Receptacle controls • Sapphire™ • Dimensions® • Lumina™ RF Wireless • LevNet RF™ Wireless • Provolt™ Room Controller • IRC • EZ-MAX® Plus • GreenMAX® • Sector®
9.4.1.1 Interior Lighting Control	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 and not more than one floor • An occupancy sensor with a maximum timeout of 20 minutes • A signal from another building system that indicates the space is unoccupied - Must be programmed to account for weekends and holidays • Applicable spaces must be capable of the following: - Manual-ON OR Partial-ON—auto-ON to 50% - Bi-level control—step between 30-70% or continuous dimming - Automatic daylight controls - Automatic partial-OFF—reduce to 50% when unoccupied for some spaces* - Automatic full-OFF OR scheduled shutoff 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:* • Controlled lighting shall have at least one step between 30 and 70% of Full and OFF, or continuous dimming • For all other spaces: - 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 2 hours Refer to Table 9.6.1 in ASHRAE 90.1 for additional information and guidelines. General lighting in Primary Sidelighted areas must be separately controlled by a multi-level photocontrol. • Calibration adjustment device must be readily accessible (located no higher than 11 ft above finished floor in 2016) • Must reduce lighting power in response to available daylight with continuous dimming OR with control steps between 50-70%, 20-40%, and OFF ***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.* • In most areas of egress designed for emergency use, lighting is exempted from daylight harvesting and demand response requirements	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/EMS system signal. All spaces shall include visible control devices: (1) occupancy sensor, (2) continuous or stepped dimming control device (photocell, entry station or system controller) 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. **Leviton Product Solutions** • Occupancy sensors • Vacancy sensors • Wall box dimmers • Photocells • Sapphire • Dimensions • Lumina RF Wireless • LevNet RF Wireless • Provolt Room Controller • IRC • EZ-MAX Plus • GreenMAX • Sector

Note: ASHRAE Standard 90.1 2016 mandates the implementation of energy saving design and control techniques. For complete codes and more information, refer to www.ashrae.org

*Standard includes exceptions; please refer to ASHRAE Standard 90.1 2016 for more information

Control Type	Summary	Quick Take
9.4.1.2 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 20 minutes of vacancy • Lighting for covered vehicle entrances and exits must be separately controlled to automatically reduce lighting by at least 50% from sunset to sunrise • Automatic daylight harvesting is required within 20 ft of open exterior walls that meet the open space to wall ratio requirement • Lighting for parking garages must have scheduled shutoff	Parking garage lighting zones must be controlled by a device that reduces power by 30% after 20 minutes of vacancy, and open exterior walls must utilize automatic daylight harvesting. **Leviton Product Solutions** • Occupancy sensors • Photocells • IRC • EZ-MAX Plus • GreenMAX • NorthStar Outdoor Controls
9.4.1.3 Special Applications	The following lighting applications 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 20 minutes of vacancy • Warehouses—Requires automatic control device to reduce lighting by at least 50% within 20 minutes of vacancy	Separate controls are required for specific applications. See ASHRAE 90.1 for more details on each application scenario. **Leviton Product Solutions** • Occupancy sensors • Vacancy sensors • Wall box dimmers • Receptacle controls • Sapphire • Dimensions • Lumina RF Wireless • LevNet RF Wireless • Provolt Room Controller • IRC • EZ-MAX Plus • GreenMAX • TLLP • Sector
9.4.1.4 Exterior Lighting Control	• Exterior lighting must be controlled by a device 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 all other lighting must have a control device to reduce power by at least 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 - Lights must be controlled at night via a motion sensor or time-based control Luminaires in parking garages mounted 24 ft or lower from the ground must automatically dim to at least 50% of full power when no activity has been detected in a time no longer than 15 minutes.	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. **Leviton Product Solutions** • Occupancy sensors • Photocells • IRC • EZ-MAX Plus • GreenMAX • NorthStar Outdoor Controls

*Standard includes exceptions; please refer to ASHRAE Standard 90.1 2016 for more information

ASHRAE Standard 90.1 2016 Requirement Quick Reference

Control Type	Summary	Quick Take
9.4.1 Lighting Controls	Spaces requiring Automatic Control Devices as identified in sections 9.4.1.1, 9.4.1.2, 9.4.1.3 and 9.4.1.4 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 • Healthcare facilities* • 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). **All Leviton ASHRAE 90.1 Solutions meet Section 9.4.1 for Lighting Controls.**
9.4.3 Functional Testing	All lighting controls must be tested to ensure they are working properly. 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 9.4.3.*	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. **All Leviton solutions are manufactured to the highest quality and performance standards, which can easily be demonstrated at the time of installation to fulfill ASHRAE 90.1 Section 9.4.3.**
8.4.3.1 & 8.4.3.2 Electrical Energy Monitoring	Measurement devices must be installed in new buildings to separately monitor energy usage for total electrical energy, HVAC systems, interior lighting, exterior lighting and receptacle circuits. In applications with tenants, total building and individual tenant usage shall be separately metered. All data required above must be recorded a minimum of every 15 minutes and reported on hourly, daily, monthly, and annual intervals. This information must be available to tenants and maintained for a minimum of 36 months. Buildings with digital control systems complying with Section 6.4.3.10 must transmit data through the digital control system and be graphically displayed.	Submetering measurement and verification is now required to separately monitor energy-using facility systems, with separate metering for tenants. This information must be regularly collected and recorded, and made available to tenants. **Leviton Product Solutions** • VerifEye™ Submetering Solutions

*Standard includes exceptions; please refer to ASHRAE Standard 90.1 2016 for more information

Product Solutions at a Glance

ASHRAE Standards	8.4.2 Automatic Receptacle Control	9.4.1.1 Interior Lighting Control	9.4.1.2 Parking Garage Control	9.4.1.3 Special Applications	9.4.1.4 Exterior Lighting Control	9.4.1 Lighting Controls	8.4.3 Electrical Energy Monitoring
Product Solutions							
Occupancy Sensors	X	X	X	X	X	X	--
Vacancy Sensors	X	X	--	X	--	X	--
Wall Box Dimmers	--	X	--	X	--	--	--
Photocells	--	X	X	--	X	--	--
Receptacle Control Solutions	X	--	--	X	--	--	--
Intellect™	X	X	--	X	--	X	--
Sapphire™	X	X	--	X	--	X	--
D4000	X	X	--	X	--	X	--
Lumina™ RF Wireless	X	X	--	X	--	X	--
LevNet RF™ Wireless	X	X	--	X	--	X	--
Provolt™ Room Controller	X	X	--	X	--	X	--
Integrated Room Control (IRC)	X	X	X	X	X	X	--
EZ-MAX® Plus	X	X	X	X	X	X	--
GreenMAX®	X	X	X	X	X	X	--
NorthStar Outdoor Controls	--	--	X	--	X	--	--
Track Light Limiting Panel (TLLP)	--	--	--	X	--	--	--
Sector®	X	X	--	X	--	X	--
VerifEye™ Submetering Solutions	--	--	--	--	--	--	X

NOTE: Solutions may require other products to complete a code compliant energy control solution—consult Leviton for more information.

Leviton Applications at a Glance

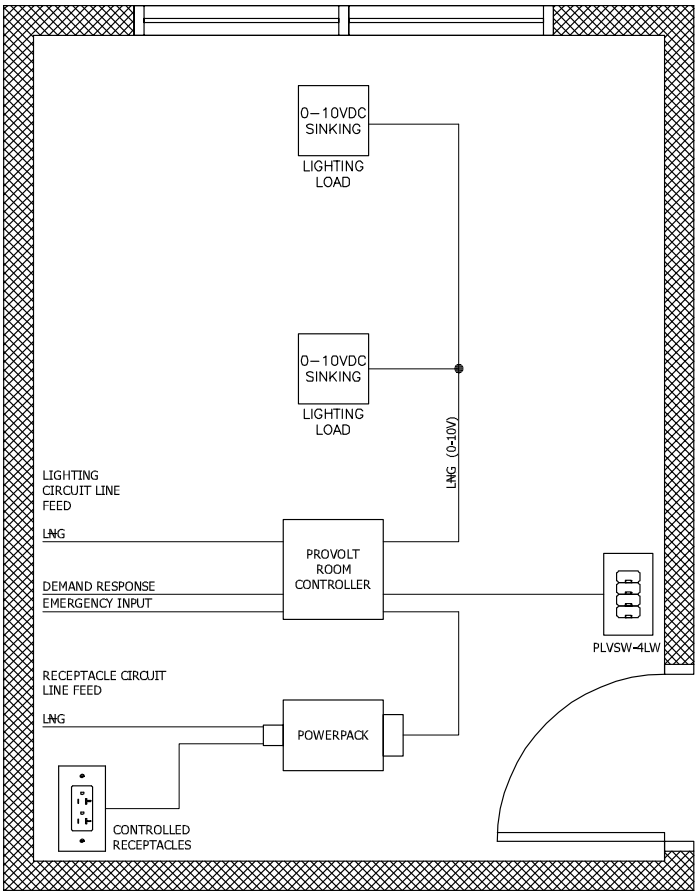
Note: All indicated applications can be found in the ASHRAE 90.1 Applications Cookbook. Solutions represented in this Design Guide are represented by a **green X**.

ASHRAE 90.1 Standards	Small Office	Open Office	Conference Room	Classroom	Common Area	Library	Parking Garage	Site Lighting Control	Warehouse	Retail Space	Restaurant	Convenience Store	Hospitality	Energy Metering
Product Solutions														
Occupancy Sensors	X	X	X	X	X	--	X	X	X	X	X	--	--	--
Vacancy Sensors	X	X	X	X	X	--	--	--	X	X	X	--	--	--
Wall Box Dimmers	X	X	X	X	X	--	--	--	X	X	X	--	--	--
Photocells	X	X	X	X	X	--	X	X	X	X	X	--	--	--
Receptacle Control Solutions	X	X	X	X	X	--	--	--	X	X	X	--	--	--
Intellect™	X	X	X	X	X	--	--	--	X	X	X	--	--	--
Sapphire™	X	X	X	X	X	--	--	--	X	X	X	--	--	--
D4000/ D8000	X	X	X	X	X	--	--	--	X	X	X	--	--	--
Lumina™ RF Wireless	X	X	X	X	X	--	--	--	X	X	X	X	X	--
LevNet RF™ Wireless	X	X	X	X	X	X	--	--	X	X	X	--	--	--
Provolt™ Room Controller	X	X	X	X	X	--	--	--	X	X	X	--	--	--
Integrated Room Control (IRC)	X	X	X	X	X	--	--	--	X	X	X	--	--	--
EZ-MAX® Plus	X	X	X	X	X	--	X	X	X	X	X	--	--	--
GreenMAX®	X	X	X	X	X	--	X	X	X	X	X	--	--	--
NorthStar Outdoor Controls	--	--	--	--	--	--	X	X	--	--	--	--	--	--
Track Light Limiting Panel (TLLP)	--	--	--	--	--	--	--	--	--	X	X	--	--	--
Sector®	X	X	X	X	X	--	--	--	X	X	X	--	--	--
VerifEye™	X	X	X	X	X	--	--	--	X	X	X	--	--	X

Small Office—Single Zone
Provolt Room Controller (PRC)

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Self-contained occupancy sensor, photocell and power pack
- Vacancy or Occupancy Sensing with Auto-OFF
- Auto Calibration
- Daylighting Set Point Adjustment through Entry Station
- Emergency Input
- Decora® 4-Button Entry Station
- Plug Load Control
- Time Clock Input
- Demand Response

▶ FEATURED LEVITON TITLE 24 SOLUTION

Provolt Room Controller (PRC)

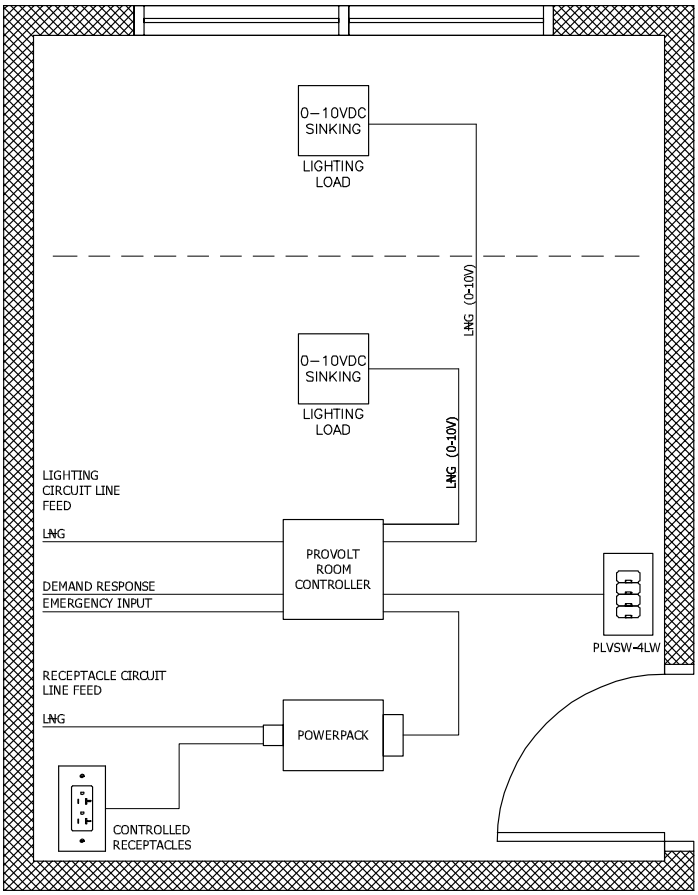
- Comprehensive solution integrates multiple lighting control strategies—occupancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF and demand response
- Combined line voltage multi-technology or PIR sensor, power pack and photocell in a self-contained, easy-to-install compact device
- Configure and test controls from an Android or Apple smart device via the Provolt Bluetooth Mobile App—reduces callbacks

List of Equipment		
	Provolt Room Controller (PRC) O5C04-IDW	1
	Provolt Low-Voltage Keypad, 4-Button PLVSW-4LW	1
	OPP20 Super Duty Power Pack OPP20-0D1	1
	Marked "Controlled" Receptacles 16352-2PW	5

Small Office—Dual Zone
Provolt Room Controller (PRC)

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Self-contained occupancy sensor, photocell and power pack
- Vacancy or Occupancy Sensing with Auto-OFF
- Auto Calibration
- Daylighting Set Point Adjustment through Entry Station
- Emergency Input
- Decora® 4-Button Entry Station
- Plug Load Control
- Time Clock Input
- Demand Response

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Provolt Room Controller (PRC)

- Comprehensive solution integrates multiple lighting control strategies—occupancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF and demand response
- Combined line voltage multi-technology or PIR sensor, power pack and photocell in a self-contained, easy-to-install compact device
- Configure and test controls from an Android or Apple smart device via the Provolt Bluetooth Mobile App—reduces callbacks

List of Equipment		
	Provolt Room Controller (PRC) O5C04-IDW	1
	Provolt Low-Voltage Keypad, 4-Button PLVSW-4LW	1
	OPP20 Super Duty Power Pack OPP20-0D1	1
	Marked "Controlled" Receptacles 16352-2PW	5

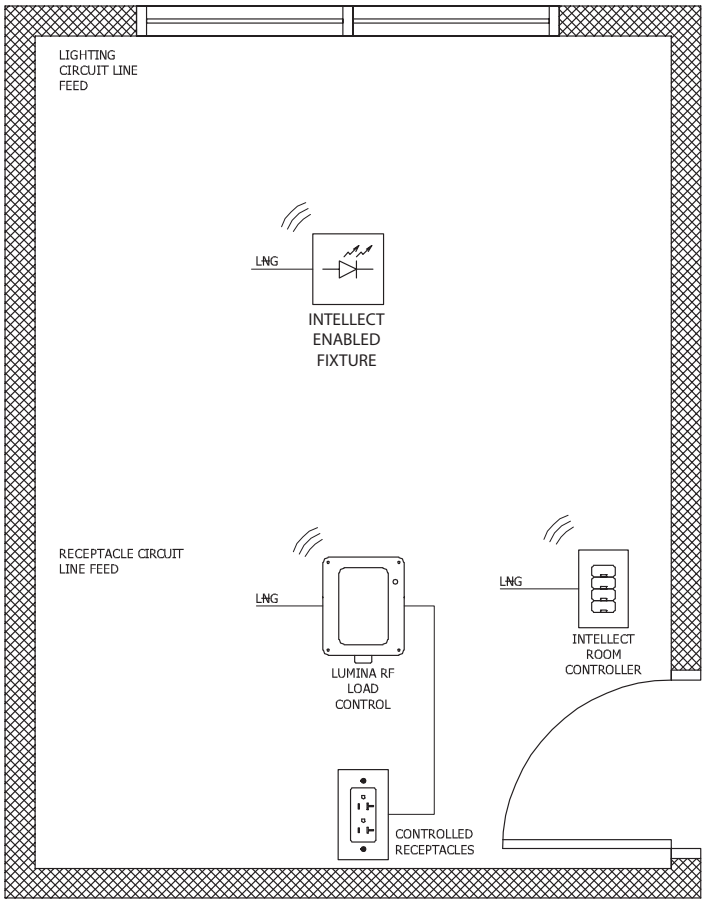
Small Office—Single Zone
Intellect Distributed Fixture Control

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing

Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Partial-ON, Partial-OFF
- Multi-Zone Daylight Harvesting
- Decora® 1-, 2-, 4-, or 8-button keypads
- Scene Control
- Demand Response
- Wireless Communication via Mesh Network



▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Intellect Distributed Fixture Control

- Easy energy savings out-of-the-box
- Controls integrated in fixtures
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, and monitor the Intellect system using a Bluetooth app designed for an Android or iOS smart phone

List of Equipment		
	Intellect-Enabled Fixture *Provided by others*	1
	Intellect Keypad, 4-Button ZLDNK-04W	1
	Lumina RF Load Control Module 73A00-3ZB	1
	Marked "Controlled" Receptacles 16352-2PW	5

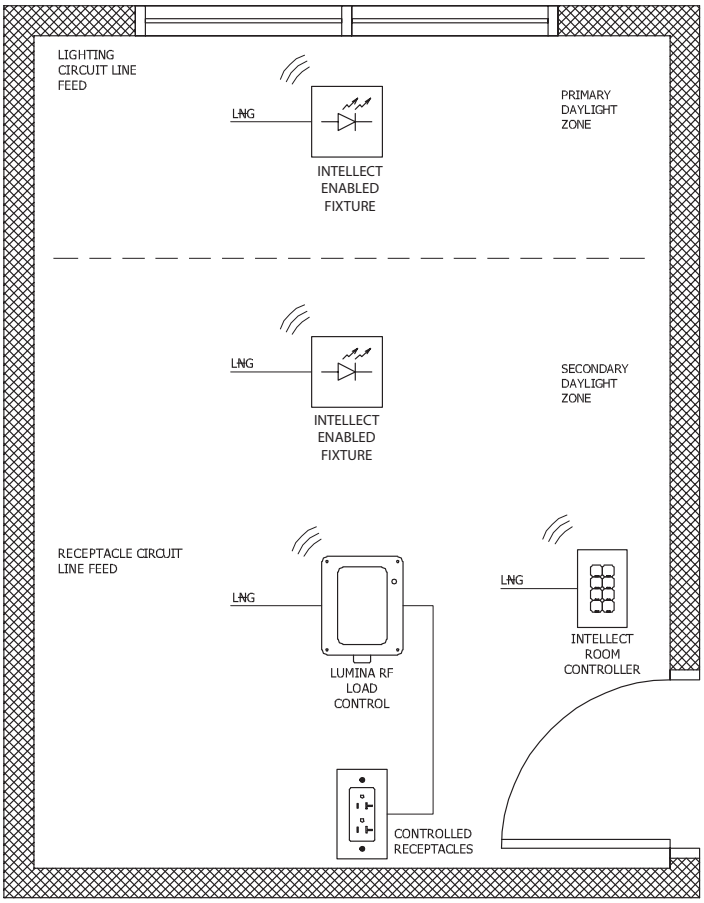
Small Office—Dual Zone
Intellect Distributed Fixture Control

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing

Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Partial-ON, Partial-OFF
- Multi-Zone Daylight Harvesting
- Decora® 1-, 2-, 4-, or 8-button keypads
- Scene Control
- Demand Response
- Wireless Communication via Mesh Network



▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Intellect Distributed Fixture Control

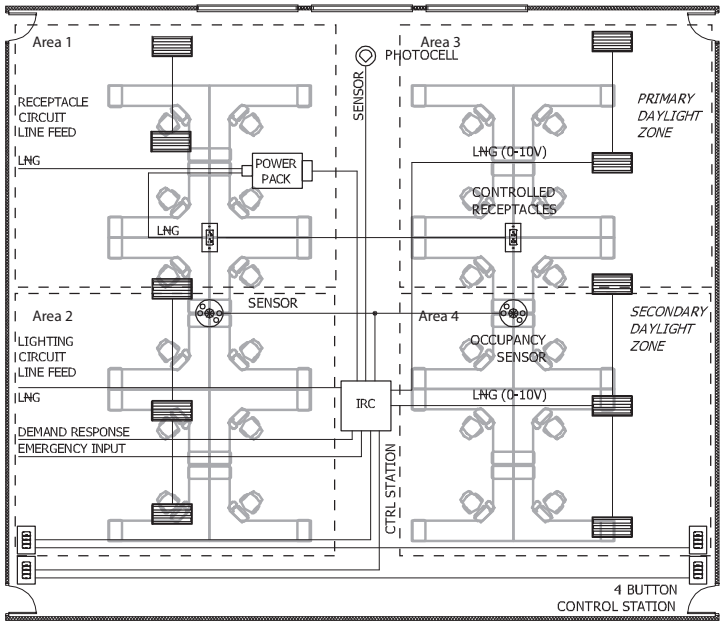
- Easy energy savings out-of-the-box
- Controls integrated in fixtures
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, and monitor the Intellect system using a Bluetooth app designed for an Android or iOS smart phone

List of Equipment		
	Intellect-Enabled Fixture *Provided by others*	2
	Intellect Keypad, 8-Button DLDNK-08W	1
	Lumina RF Load Control Module 73A00-3ZB	1
	Marked "Controlled" Receptacles 16352-2PW	5

Open Office with Cubicles Retrofit
Integrated Room Control (IRC)

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- Daylighting
- Vacancy Sensing
- Manual-ON
- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylighting with Photocell
- Auto Calibration
- Emergency Input
- Demand Response
- 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
- Area Control

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Integrated Room Control (IRC)

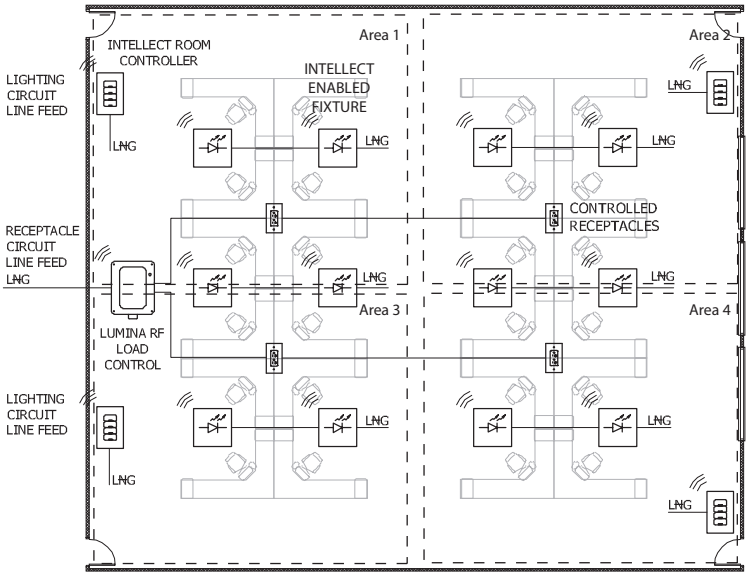
- Combines occupancy sensing, daylight harvesting, 0-10V dimming, partial ON, partial OFF, and demand response capabilities in a stand-alone package
- Kitted with factory configured sensor, photocell, and 4-button switch
- Autocal™ automatic photocell calibration and Ladderless Commissioning™
- Easy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

List of Equipment		
	IRC Kit for 2 Zones, 2 Relays - includes IRC, sensor, photocell, and control station RCD20-102 (RCD20-C02—347V)	
	IRC for 2 Zones, 2 Relays MZD20-102	1
	Multi-Tech Ceiling Mount Occupancy Sensor OSC20-RMW (+1 additional)	
	Photocell, Indoor ODC0P-00W	
	Lighting Control Station RLVSW-4LW (+3 additional)	
	OPP20 Super Duty Power Pack OPP20-0D1	1
	Marked "Controlled" Receptacles 16352-2PW	5

Open Office with Cubicles
Intellect Distributed Fixture Control

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Partial-ON, Partial-OFF
- Multi-Zone Daylight Harvesting
- Decora® 1-, 2-, 4-, or 8-button keypads
- Scene Control
- Demand Response
- Wireless Communication via Mesh Network

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Intellect Distributed Fixture Control

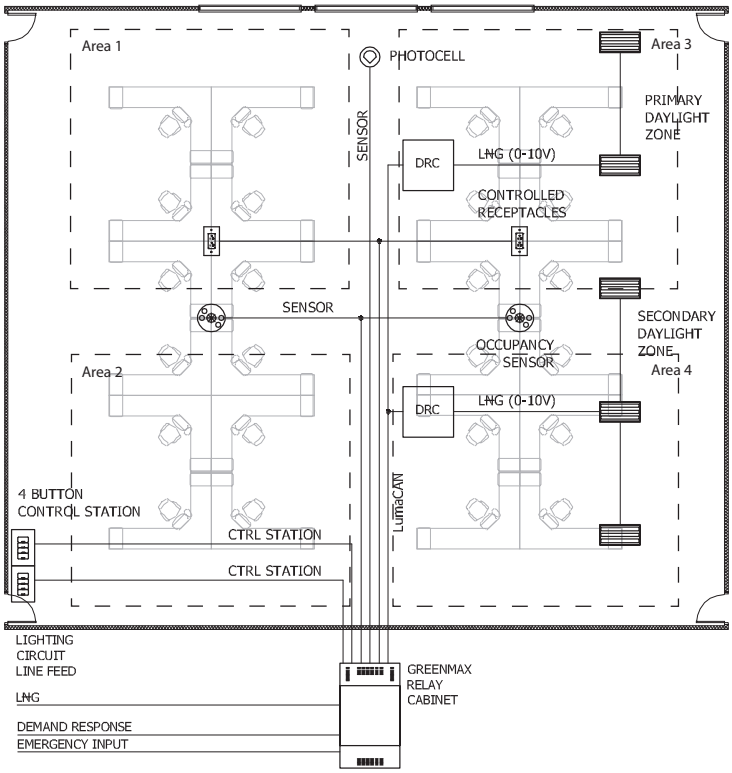
- Easy energy savings out-of-the-box
- Controls integrated in fixtures
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, and monitor the Intellect system using a Bluetooth app designed for an Android or iOS smart phone

List of Equipment		
	Intellect-Enabled Fixture *Provided by others*	12
	Intellect Keypad, 4-Button ZLDNK-04W	4
	Lumina RF Load Control Module 73A00-3ZB	1
	Marked "Controlled" Receptacles 16352-2PW	5

Open Office with Cubicles—Dual Zone
GreenMAX® Relay Control and DRC

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



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

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

GreenMAX® Relay Control System with DRC

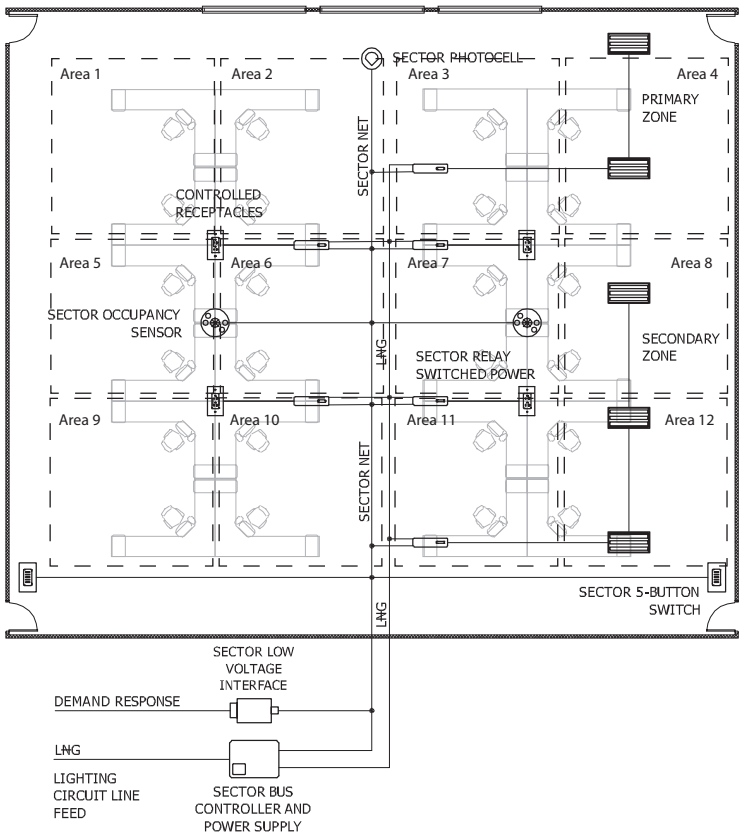
- Integrates common sensing, dimming, switching, and advanced daylight harvesting applications from the same cabinet
- BACnet IP native in each cabinet for seamless BMS integration
- Industry leading 25,000A Short Circuit Current Rating (SCCR) at 277V
- Integrated 0-10V dimming/switching relay
- Built-in override switch allows manual control of each load individually

List of Equipment		
	GreenMAX Relay Control System RxxTC-100 | RPMxx-xxx | Rxxxx-xxx | RHDU1-xxx | RELAY-xxx	1
	DRC Smart Pack (DRC) DRD07-ED0	2
	Ceiling Mount Multi-Tech Occupancy Sensor OSCxx-M0W	2
	Photocell, Indoor PCIND-000	1
	GreenMAX Digital Switch RDGSW-xDW	2
	Marked "Controlled" Receptacles 16352-1PW	5

Open Office with Cubicles
Sector® Distributed Controls

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- Digital Address Control to the Device
- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylighting 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

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

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

List of Equipment		
	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

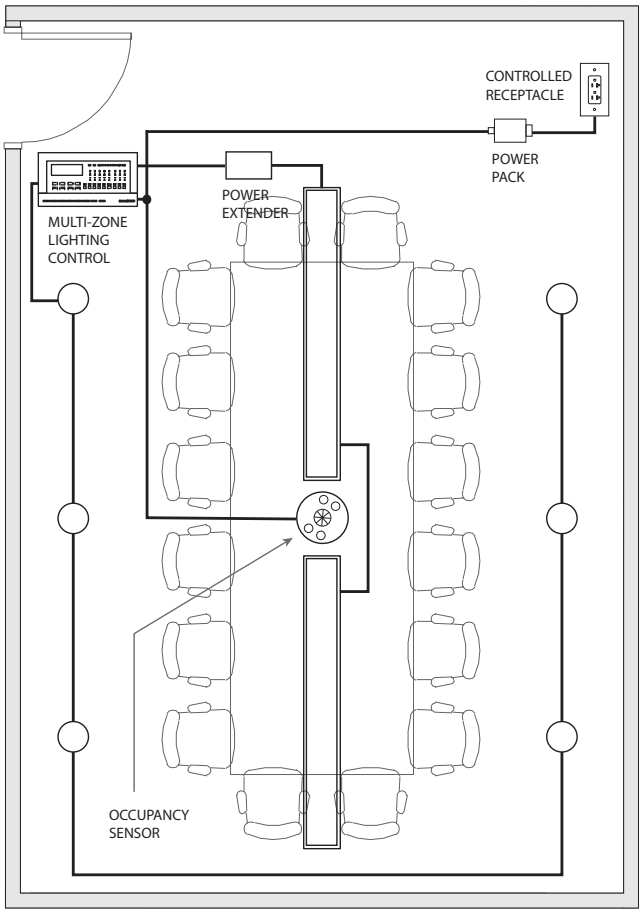
Conference Room
Dimensions® 4000 Lighting Control

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing

Features:

- 0-10V Continuous Dimming Control
- Multi-Level Dimming (Stepped) Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Daylight Harvesting with Photocell
- Astronomical Time Clock
- Scheduling (Behavior Control)
- Demand Response



Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Dimensions 4000 Architectural Lighting Control System

- Offers both stand-alone and integrated room dimming and control
- LED compatible with power extender
- Complete multi-event scheduler and integrated astronomical time clock
- Interfaces with HVAC, emergency, time clock, and load shed auxiliary systems

List of Equipment		
	Dimensions D4206 Multi-Zone Architectural Lighting Control System D4206-xLW	1
	Ceiling Mount Multi-Tech Occupancy Sensor OSCxx-RxW	1
	OPP20 Super Duty Power Pack OPP20-0D2	1
	Power Extender PE300-D0W	1
	Marked "Controlled" Receptacle 5362-S1W	1

Conference Room
Intellect Distributed Fixture Control

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing

Features:

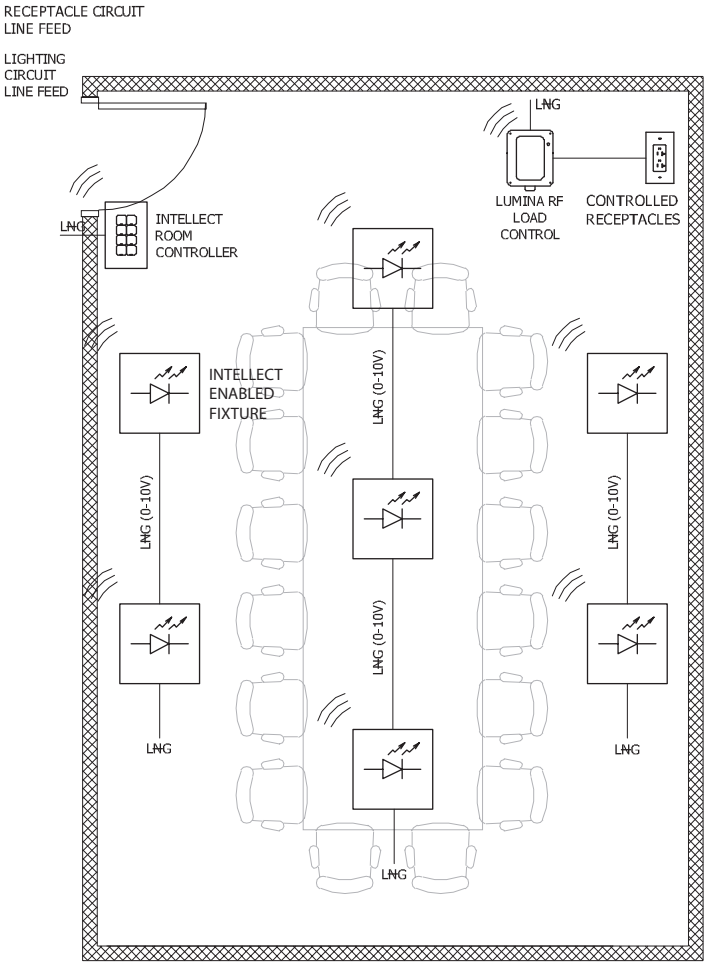
- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Partial-ON, Partial-OFF
- Multi-Zone Daylight Harvesting
- Decora® 1-, 2-, 4-, or 8-button keypads
- Scene Control
- Demand Response
- Wireless Communication via Mesh Network

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Intellect Distributed Fixture Control

- Easy energy savings out-of-the-box
- Controls integrated in fixtures
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, and monitor the Intellect system using a Bluetooth app designed for an Android or iOS smart phone

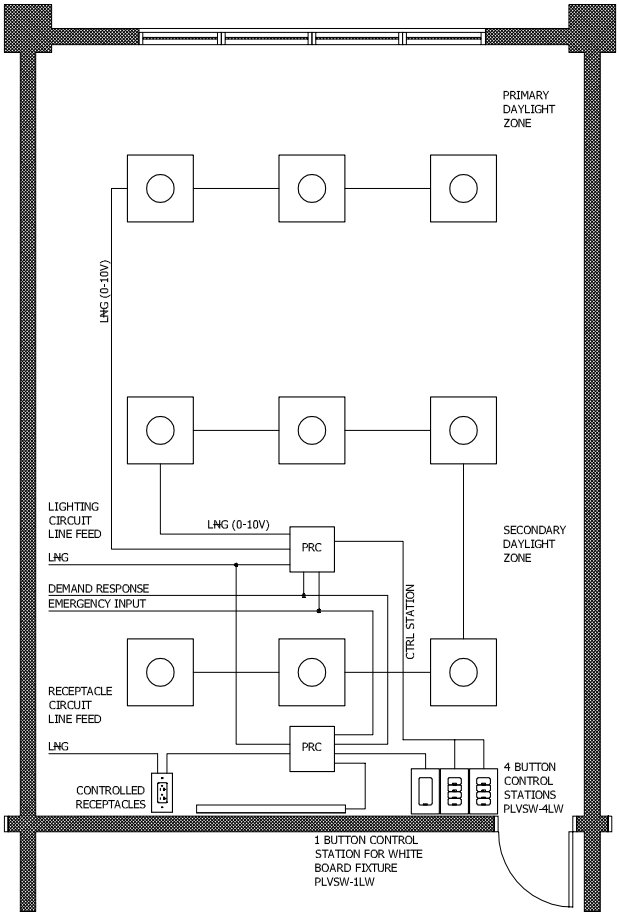


List of Equipment		
	Intellect-Enabled Fixture *Provided by others*	7
	Intellect Keypad, 8-Button ZLDNK-08W	1
	Lumina RF Load Control Module 73A00-3ZB	1
	Marked "Controlled" Receptacles 16352-2PW	5

Classroom
Provolt Room Controller (PRC)

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Self-contained occupancy sensor, photocell and power pack
- Vacancy or Occupancy Sensing with Auto-OFF
- Auto Calibration
- Daylighting Set Point Adjustment through Entry Station
- Emergency Input
- Decora® 4-Button Entry Station
- Plug Load Control
- Time Clock Input
- Demand Response

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Provolt Room Controller (PRC)

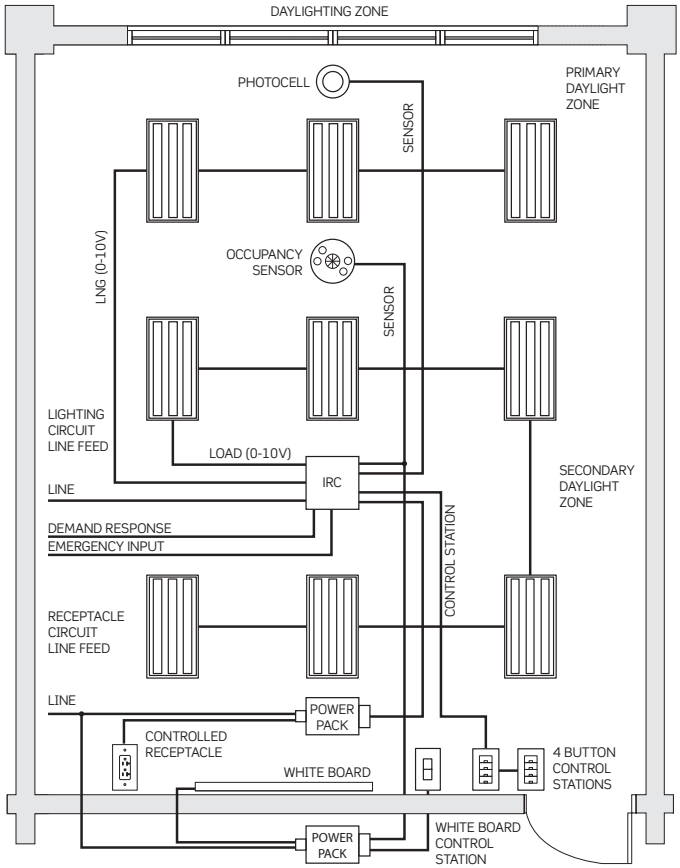
- Comprehensive solution integrates multiple lighting control strategies—occupancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF and demand response
- Combined line voltage multi-technology or PIR sensor, power pack and photocell in a self-contained, easy-to-install compact device
- Configure and test controls from an Android or Apple smart device via the Provolt Bluetooth Mobile App—reduces callbacks

List of Equipment		
	Provolt Room Controller (PRC) O5C04-IDW	1
	Provolt Low-Voltage Keypad, 4-Button PLVSW-4LW	2
	Provolt Low-Voltage Keypad, 1-Button PLVSW-1LW	1
	Marked "Controlled" Receptacles 16352-2PW	5

Classroom
Integrated Room Control (IRC)

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Auto Calibration
- Daylighting Set Point Adjustment through Entry Station
- Daylighting with Photocell
- Emergency Input
- Auto Calibration
- Emergency Input
- Decora 4-Button Entry Station
- Plug Load Control with Power Pack
- HVAC and Emergency Interface
- Time Clock Input
- Demand Response

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

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 design
- Auto 100 hour burn-in

List of Equipment

	IRC Kit for 2 Zones, 2 Relays - includes IRC, sensor, photocell, and control station RCD20-102 (RCD20-C02—347V)	
	IRC for 2 Zones, 2 Relays MZD20-102	1
	Multi-Tech Ceiling Mount Occupancy Sensor 1000SF, OSC10-M0W	
	Photocell, Indoor ODC0P-00W	
	Lighting Control Station RLVSW-4LW (+1 additional)	
	Low Voltage Switch 00LVS-01W	1
	OPP20 Super Duty Power Pack OPP20-0D2 (OSP15-R30—347V)	2
	Marked "Controlled" Receptacles 16352-2PW	5

Classroom Retrofit
Intellect Distributed Fixture Control

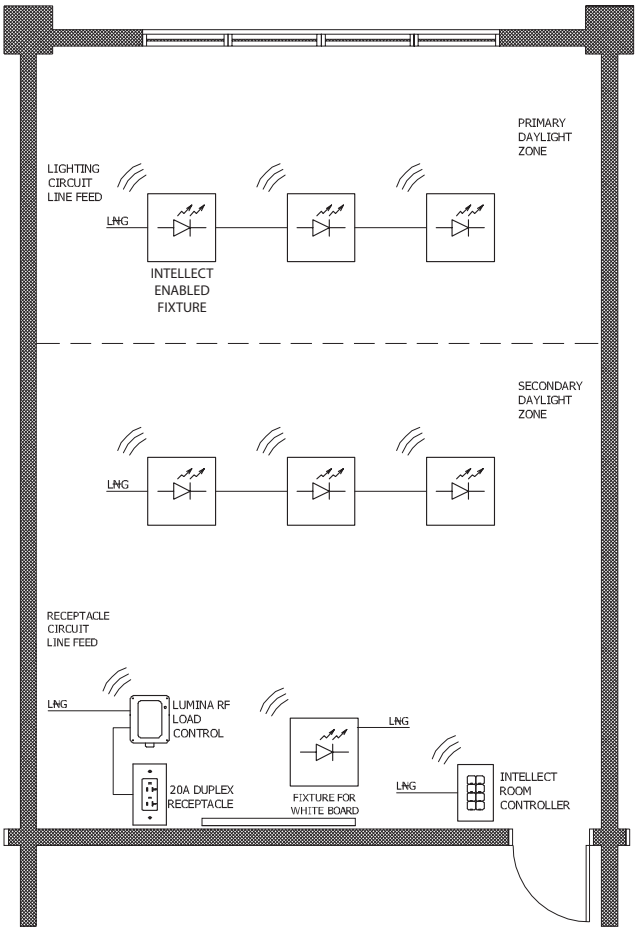
Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing

Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Partial-ON, Partial-OFF
- Multi-Zone Daylight Harvesting
- Decora® 1-, 2-, 4-, or 8-button keypads
- Scene Control
- Demand Response
- Wireless Communication via Mesh Network

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.



▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

Intellect Distributed Fixture Control

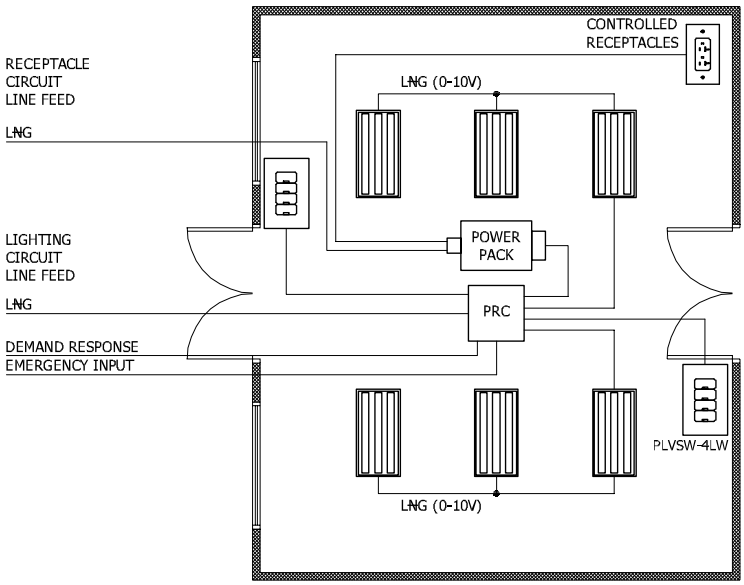
- Easy energy savings out-of-the-box
- Controls integrated in fixtures
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, and monitor the Intellect system using a Bluetooth app designed for an Android or iOS smart phone

List of Equipment		
	Intellect-Enabled Fixture *Provided by others*	7
	Intellect Keypad, 8-Button ZLDNK-08W	1
	Lumina RF Load Control Module 73A00-3ZB	1
	Marked "Controlled" Receptacles 16352-2PW	5

Common Area
Provolt Room Controller (PRC)

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Self-contained occupancy sensor, photocell and power pack
- Vacancy or Occupancy Sensing with Auto-OFF
- Auto Calibration
- Daylighting Set Point Adjustment through Entry Station
- Emergency Input
- Decora® 4-Button Entry Station
- Plug Load Control
- Time Clock Input
- Demand Response

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

Provolt Room Controller (PRC)

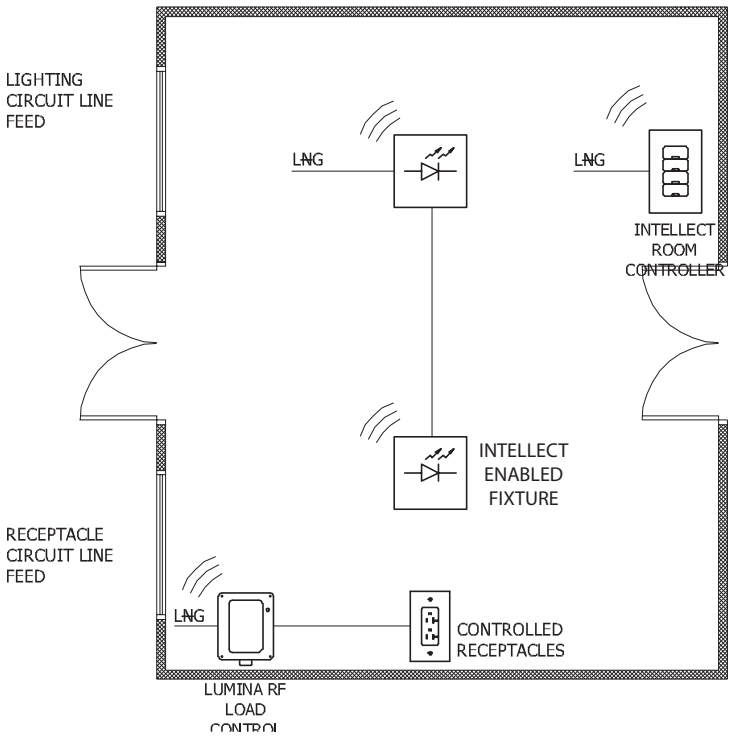
- Comprehensive solution integrates multiple lighting control strategies—occupancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF and demand response
- Combined line voltage multi-technology or PIR sensor, power pack and photocell in a self-contained, easy-to-install compact device
- Configure and test controls from an Android or Apple smart device via the Provolt Bluetooth Mobile App—reduces callbacks

List of Equipment		
	Provolt Room Controller (PRC) OSC04-IDW	1
	Provolt Low-Voltage Keypad, 4-Button PLVSW-4LW	2
	OPP20 Super Duty Power Pack OPP20-0D1	1
	Marked "Controlled" Receptacles 16352-2PW	5

Common Area
Intellect Distributed Fixture Control

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Partial-ON, Partial-OFF
- Multi-Zone Daylight Harvesting
- Decora® 1-, 2-, 4-, or 8-button keypads
- Scene Control
- Demand Response
- Wireless Communication via Mesh Network

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

Intellect Distributed Fixture Control

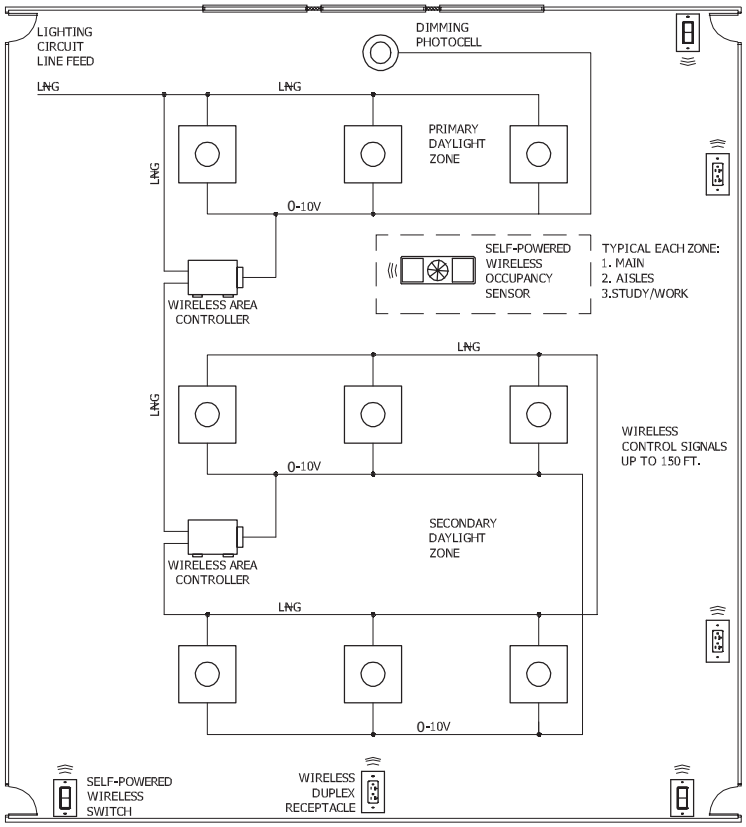
- Easy energy savings out-of-the-box
- Controls integrated in fixtures
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, and monitor the Intellect system using a Bluetooth app designed for an Android or iOS smart phone

List of Equipment		
	Intellect-Enabled Fixture *Provided by others*	2
	Intellect Keypad, 8-Button ZLDNK-04W	1
	Lumina RF Load Control Module 73A00-3ZB	1
	Marked "Controlled" Receptacles 16352-2PW	5

Library
LevNet RF Energy Harvesting Wireless Solutions

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- 0-10V Dimming Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Plug Load Control with Power Pack
- Wireless solution with no batteries required - zero maintenance

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

LevNet RF Self-Powered Wireless Solutions

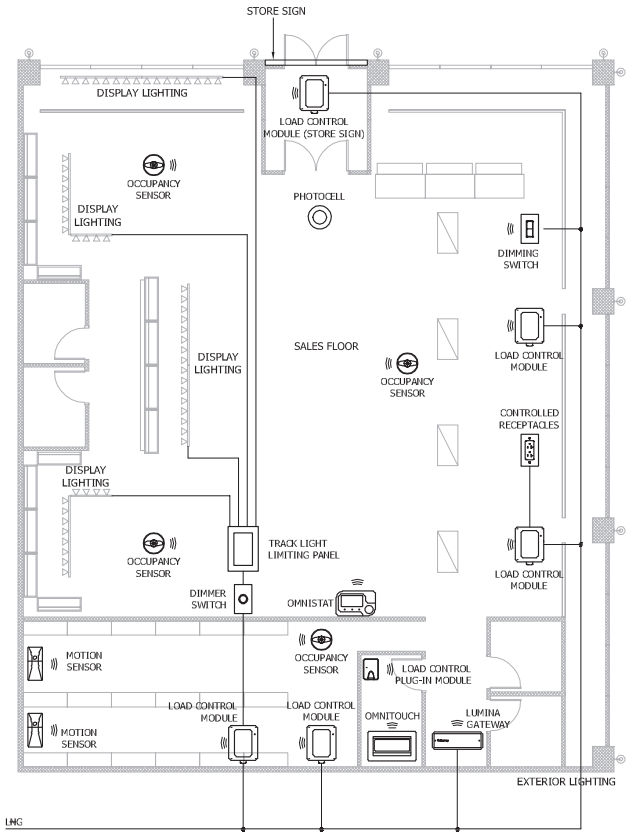
- No wires to run and no batteries required - install in 1/4th the time—eliminating time and expense of control wiring
- Broad range of switches and control modules to meet virtually any control need including a Receptacle and engraved cover plate to meet plug load control code requirements
- Enables rapid retrofit with minimal impact

List of Equipment		
	Self-Powered Wireless Occupancy Sensor WSC12-M9N	1
	Dimming Photocell ODC0P-D0W	1
	Wireless 0-10V Dimming Area Controller WSD20-9D0	2
	Self-Powered Wireless Switch WSS0S-D9W	2
	LevNet RF Split Duplex Receptacle WSG15-D9W	5

Retail Space
Lumina™ RF Wireless Solutions

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.13**
  - Special Applications
- **Section 9.4.3**
  - Functional Testing



Features:

- Separate Control for Display Lighting
- Vacancy or Occupancy Sensing with Auto-OFF
- Architectural 0-10V Dimming Entry Station
- Daylight Harvesting with Integrated Photocell
- Remote access
- Plug Load Control
- Astronomical Time Clock
- Scheduling
- Demand Response

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

Lumina™ RF Wireless Solutions

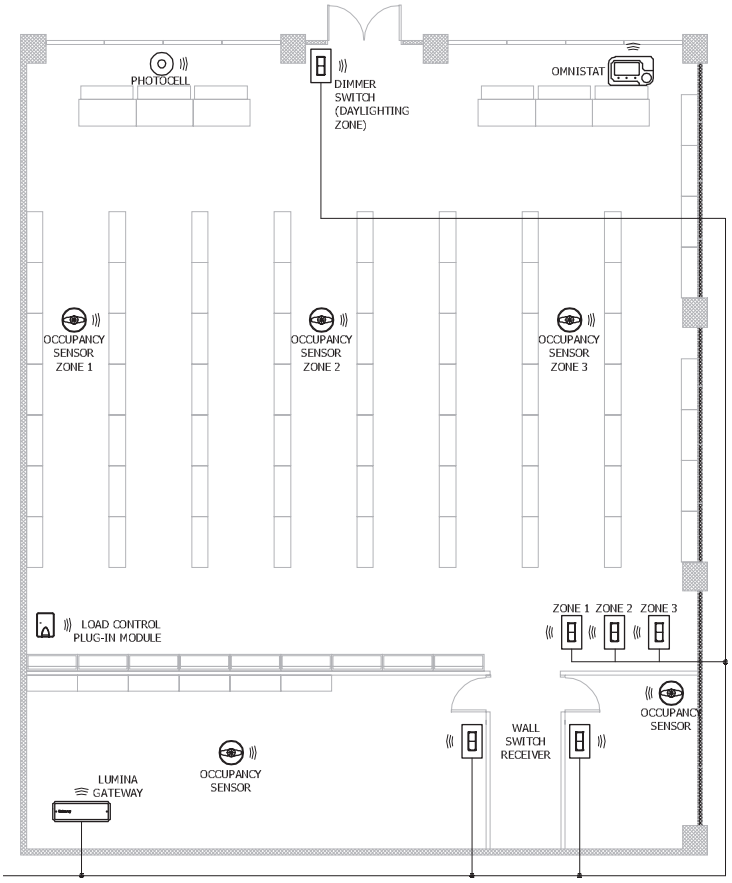
- Low cost wireless energy management solution for fast and simple installation at a fraction of a standard system's cost
- Connect up to 40 Leviton wireless devices including sensors, light switches, thermostats and heavy-duty load control modules
- Automated control of loads and remote control via the Lumina Mobile app

List of Equipment		
	Load Control Module 73A00-xZB	5
	Motion Sensor LURMD-00W	2
	Occupancy Sensor ZSCxx-IxW	3
	Load Control Plug-In Module 89A00-1ZB	1
	Lumina RF 0-10V Dimmer ZSD07-ADZ	2
	Track Light Limiting Panel Gxxxx-xxx	1
	Lumina RF Wireless Thermostat RT15Z-00W	1
	OmniTouch 7 Touchscreen 99A00-00x	1
	Photocell PCCXD-00W	1
	Lumina Gateway 74A00-1	1

Convenience Store
Lumina™ RF Wireless Solutions

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.1.3**
  - Special Applications
- **Section 9.4.3**
  - Functional Testing



Features:

- Separate Control for Display Lighting
- Vacancy or Occupancy Sensing with Auto-OFF
- Architectural 0-10V Dimming Entry Station
- Daylight Harvesting with Integrated Photocell
- Remote access
- Plug Load Control
- Astronomical Time Clock
- Scheduling
- Demand Response

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

Lumina™ RF Wireless Solutions

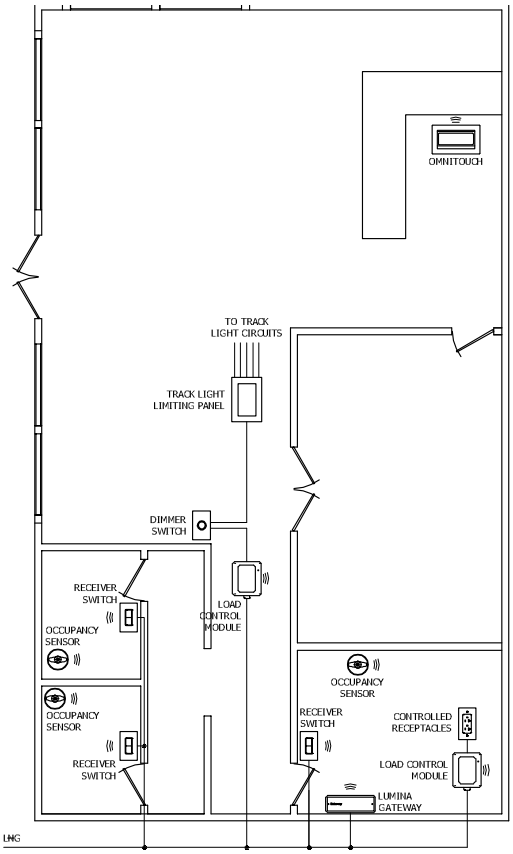
- Low cost wireless energy management solution for fast and simple installation at a fraction of a standard system's cost
- Connect up to 40 Leviton wireless devices including sensors, light switches, thermostats and heavy-duty load control modules
- Automated control of loads and remote control via the Lumina Mobile app

List of Equipment		
	Occupancy Sensor ZSCxx-lxW	5
	Load Control Plug-In Module 89A00-1ZB	1
	Lumina RF Receiver Switch ZSS10-x0Z	5
	Lumina RF Wireless Thermostat RT15Z-00W	1
	Photocell PCCXD-00W	1
	Lumina Gateway 74A00-1	1

Restaurant
Lumina™ RF Wireless Solutions

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.1.3**
  - Special Applications
- **Section 9.4.3**
  - Functional Testing



Features:

- Separate Control for Display Lighting
- Vacancy or Occupancy Sensing with Auto-OFF
- Architectural 0-10V Dimming Entry Station
- Daylight Harvesting with Integrated Photocell
- Remote access
- Plug Load Control
- Astronomical Time Clock
- Scheduling
- Demand Response

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

Lumina™ RF Wireless Solutions

- Low cost wireless energy management solution for fast and simple installation at a fraction of a standard system's cost
- Connect up to 40 Leviton wireless devices including sensors, light switches, thermostats and heavy-duty load control modules
- Automated control of loads and remote control via the Lumina Mobile app

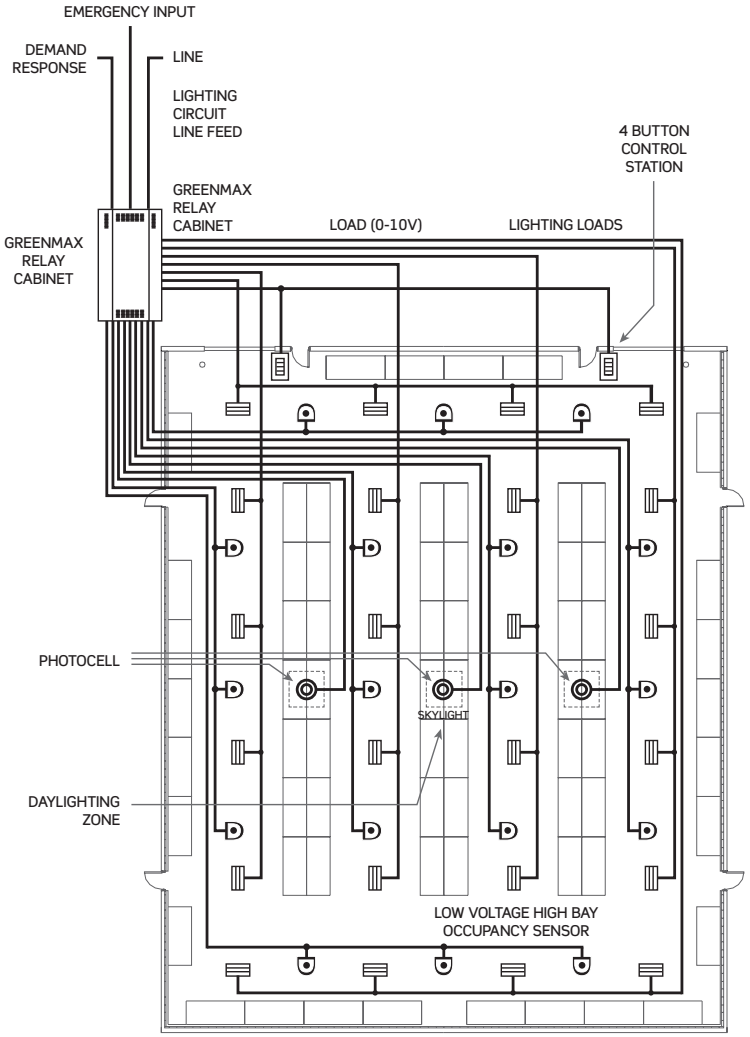
List of Equipment

	Load Control Module 73A00-xZB	2
	Occupancy Sensor ZSCxx-lxW	3
	Lumina RF 0-10V Dimmer ZSD07-ADZ	1
	Lumina RF Receiver Switch ZSS10-x0Z	3
	Track Light Limiting Panel Gxxxx-xxx	1
	OmniTouch 7 Touchscreen 99A00-00x	1
	Lumina Gateway 74A00-1	1

Warehouse
GreenMAX Relay Control

Meets the Following Requirements:

- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.1.3**
  - Special Applications
- **Section 9.4.3**
  - Functional Testing



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

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

GreenMAX Relay Control System

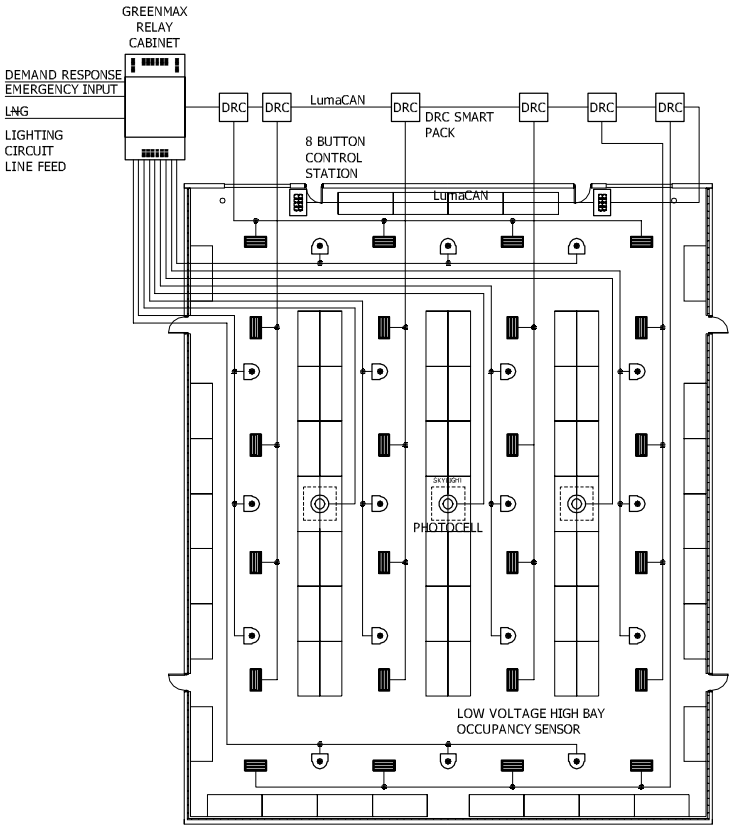
- Integrates common sensing, dimming, switching, and advanced daylight harvesting applications from the same cabinet
- BACnet IP native in each cabinet for seamless BMS integration
- Industry leading 25,000A Short Circuit Current Rating (SCCR) at 277V
- Integrated 0-10V dimming/switching relay
- Built-in override switch allows manual control of each load individually

List of Equipment		
	GreenMAX Relay Control System RxxTC-100 | RPMxx-xxx | Rxxxx-xxx | RHDU1-xxx | RELAY-xxx	1
	Lighting Control Station RLVSW-4LW	2
	Low Voltage High Bay Occupancy Sensor OSFHD-xxW	18
	Indoor Photocell PCSKY-000	3

Warehouse
DRC Smart Packs

Meets the Following Requirements:

- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.1.3**
  - Special Applications
- **Section 9.4.3**
  - Functional Testing



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

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

GreenMAX® Relay Control System with DRC

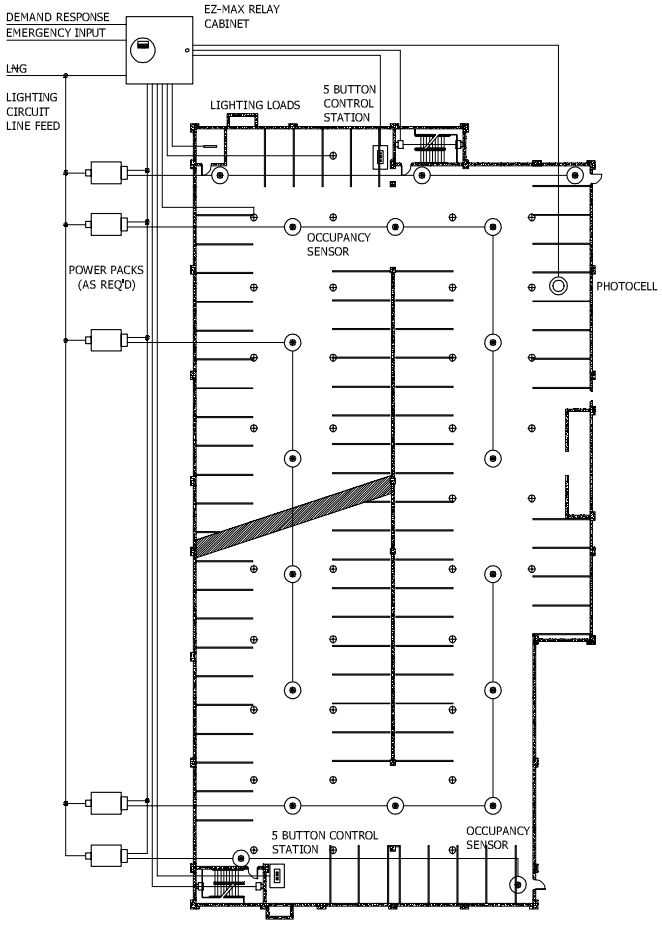
- Integrates common sensing, dimming, switching, and advanced daylight harvesting applications from the same cabinet
- BACnet IP native in each cabinet for seamless BMS integration
- Industry leading 25,000A Short Circuit Current Rating (SCCR) at 277V
- Integrated 0-10V dimming/switching relay
- Built-in override switch allows manual control of each load individually

List of Equipment		
	GreenMAX Relay Control System RxxTC-100 | RPMxx-xxx | Rxxxx-xxx | RHDU1-xxx | RELAY-xxx	1
	DRC Smart Pack (DRC) DRD07-ED0	6
	Fixture Mount PIR High/Low Bay Dimming Occupancy Sensor HB011-PDX	18
	GreenMAX Digital Lighting Control Station, 8-Button RDGSW-8CW	2

Parking Garage
EZ-MAX® Plus Stand-Alone Relay Control

Meets the Following Requirements:

- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1.2**
  - Parking Garage Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- Relay Control
- Vacancy or Occupancy Sensing with Auto-OFF
- Architectural 0-10V Dimming Entry Station
- Daylight Harvesting with Photocell
- Configuration Tree Setup
- Astronomical Time Clock
- Scheduling (Behavior Control)
- Demand Response
- HVAC and Emergency Interface

► FEATURED LEVITON ASHRAE 90.1 SOLUTION

EZ-MAX® Plus Stand-Alone Relay Control

- 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

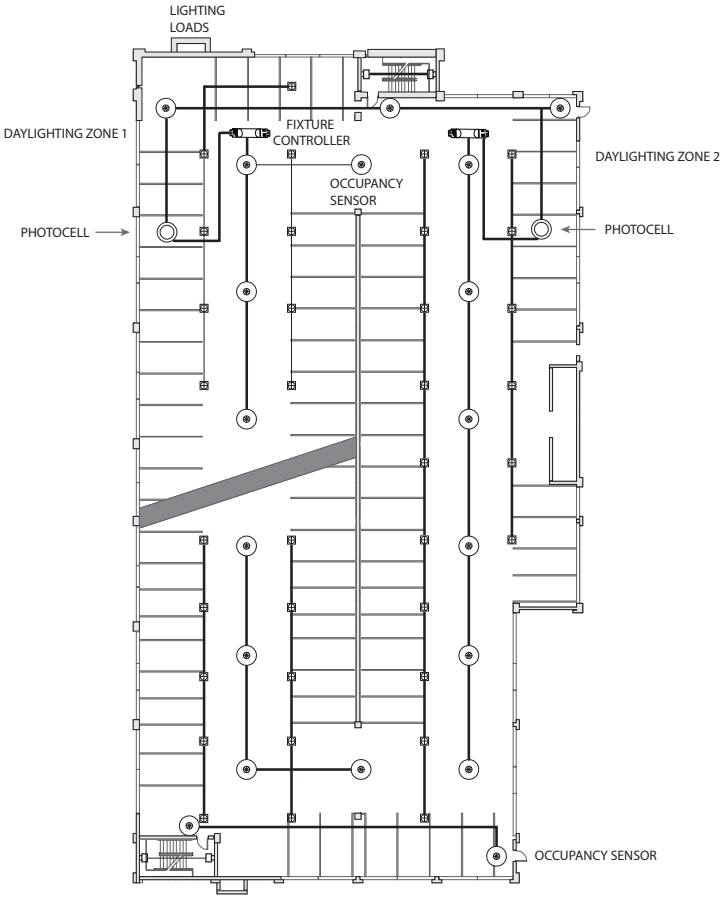
List of Equipment		
	EZ-MAX Plus Relay Control Panel R08BD-L08	1
	Ceiling Mount PIR Occupancy Sensor OSCxx-RMW	19
	Indoor Photocell HBE11-IUB	1
	Low Voltage Switch, 5-Button 00LVS-0SW	2

NOTE: Application may require more power packs than shown in example drawing. Consult Leviton for more information.

Parking Garage
Outdoor Lighting Control

Meets the Following Requirements:

- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1.2**
  - Parking Garage Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



NOTE: Project site contains a NorthStar Site Controller.

Features:

- Self-healing mesh network
- 0-10V dimming
- Wireless commissioning
- Astronomical Time Clock
- Photocell integration
- Advanced control sequences

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

NorthStar Outdoor Lighting Controls

- Wireless system with a self-healing mesh network
- Suitable for switching and 0-10V dimming load types
- Controlled by either a simple time clock, dusk-to-dawn photocell control or via customized control sequences
- Commission through the NorthStar Site Controller using any web browser and the Controller's wifi access point
- Use the Leviton Provisioning App to identify and locate the fixture modules by simply scanning the QR code on each fixture module at the point of installation using the GPS feature on your tablet or smart device

List of Equipment		
	Wireless Fixture Controller, 2 Zone OCF02-1RT	2
	Site Controller OC00G-00G	1
	Fixture Mount PIR Occupancy Sensor OSFHP-I4W	19
	Indoor Photocell ODC0P-0xW	2

Site Lighting
Relay Control with Time Clock

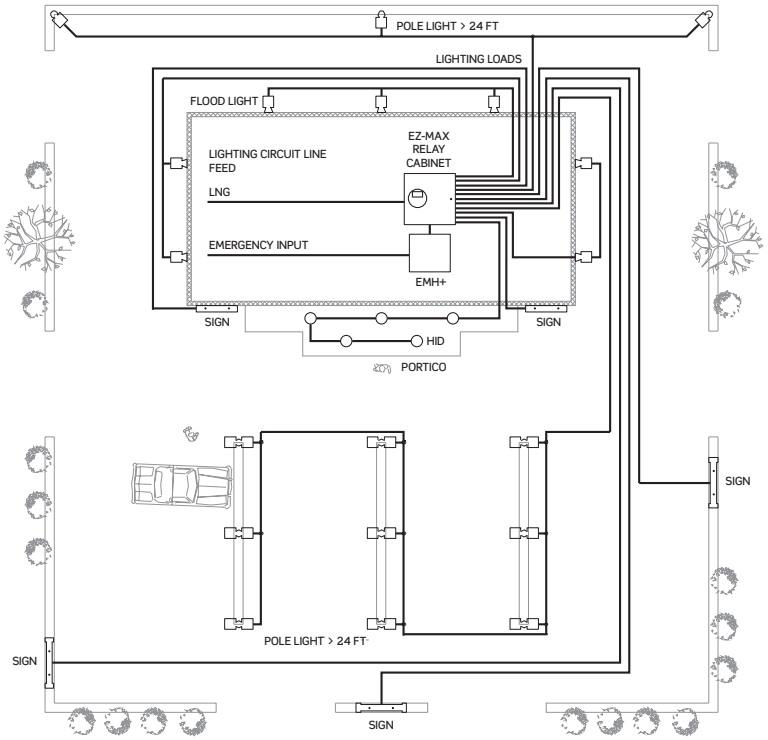
Meets the Following Requirements:

- **Section 9.4.14**
  - Exterior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing
- **Section 8.4.3**
  - Electrical Energy Monitoring

Features:

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

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.



▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

EZ-MAX Plus Stand-Alone Relay Control

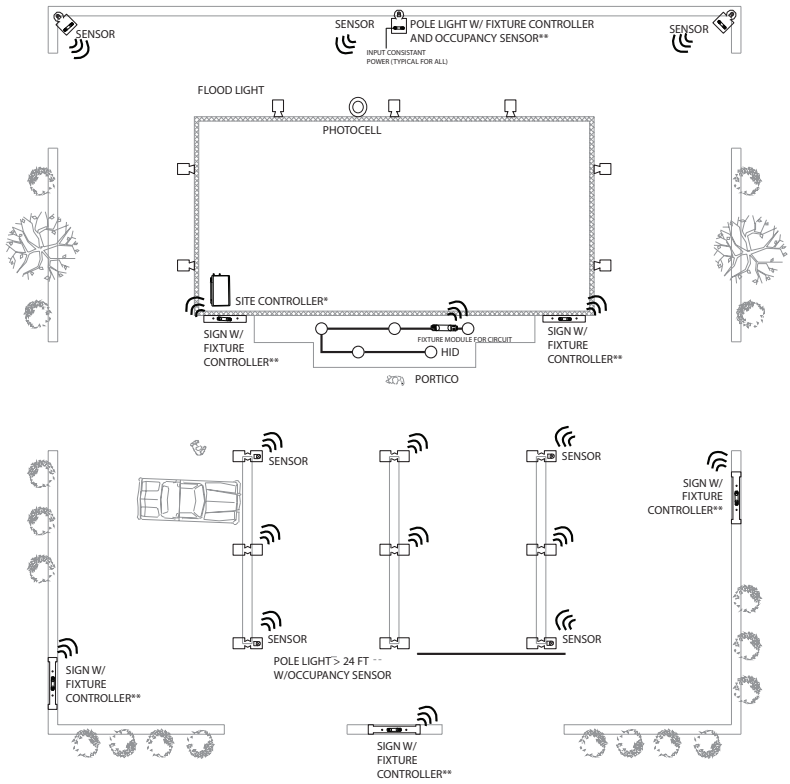
- Centralized building lighting control and daylight harvesting in a contractor-friendly, quick to install, simple to configure compact enclosure
- Low voltage inputs allow connection of photocells, occupancy sensors, low-voltage switches, and digital switches for a comprehensive yet easily installed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

List of Equipment		
	EZ-MAX Plus Relay Control Panel R24BD-L24 (Can operate at 347V)	1
	EMH+ All-in-One Meter and Hub A8814-1S3	1
	BMO 3.0 Software Code Compliance Expansion Module BMOSW-COD	1

Site Lighting
Outdoor Lighting Control

Meets the Following Requirements:

- **Section 9.4.14**
  - Exterior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.3**
  - Functional Testing



Features:

- Self-healing mesh network
- 0-10V dimming
- Wireless commissioning
- Astronomical Time Clock
- Photocell integration
- Advanced control sequences

Note: 50% of all receptacles in applicable spaces must be controlled by an occupancy sensor (or other qualifying control signal). See page 7 for more details.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

NorthStar Outdoor Lighting Controls

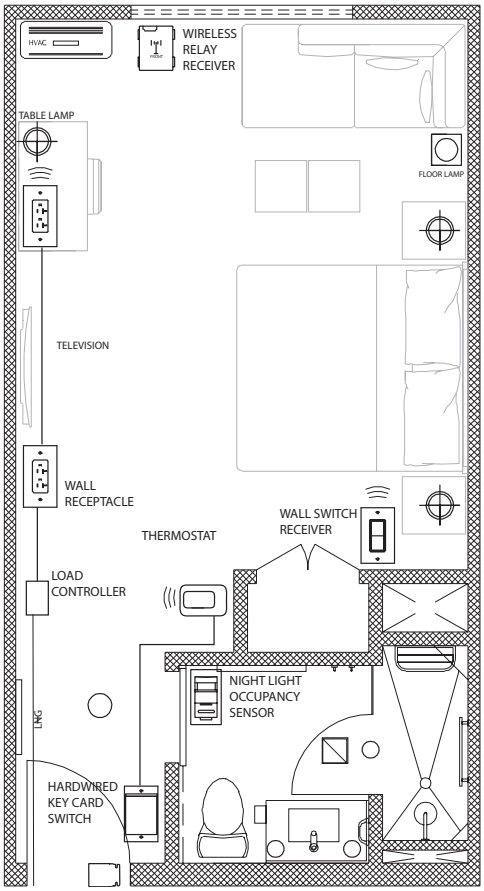
- Wireless system with a self-healing mesh network
- Suitable for switching and 0-10V dimming load types
- Controlled by either a simple time clock, dusk-to-dawn photocell control or via customized control sequences
- Commission through the NorthStar Site Controller using any web browser and the Controller's wifi access point
- Use the Leviton Provisioning App to identify and locate the fixture modules by simply scanning the QR code on each fixture module at the point of installation using the GPS feature on your tablet or smart device

List of Equipment		
	Wireless Fixture Controller, 1 Zone OCF01-1RT	7
	Site Controller OC00G-00G	1
	Outdoor Occupancy Sensor OSF20-IUW	12
	Outdoor Photocell PCOUT-000	1

Hospitality
Lumina™ RF Hospitality Solutions

Meets the Following Requirements:

- **Section 8.4.2**
  - Automatic Receptacle Control
- **Section 9.4.1.1**
  - Interior Lighting Control
- **Section 9.4.1**
  - Lighting Control
- **Section 9.4.1.3**
  - Special Applications
- **Section 9.4.3**
  - Functional Testing



Features:

- Wireless control
- HVAC, lighting and plug load control
- Key card control
- Window/door sensor with optional Balcony Mode
- Occupancy sensing

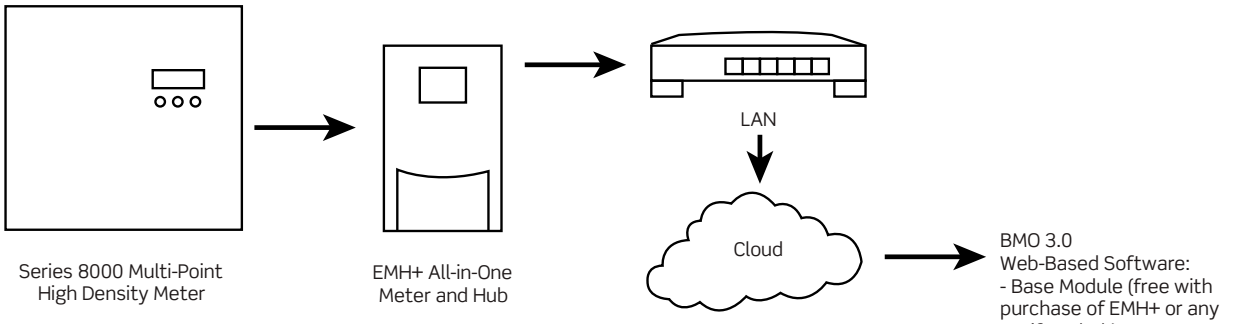
▶ FEATURED LEVITON TITLE 24 SOLUTION

Lumina™ RF Hospitality Solutions

- Low cost wireless energy management solution for fast and simple installation at a fraction of a standard system's cost
- Connect up to 40 Leviton wireless devices including sensors, light switches, thermostats and heavy-duty load control modules
- Automated control of loads and remote control via the Lumina Mobile app

List of Equipment		
	Lumina RF Hospitality Thermostat RC500-2EW	1
	Key Card Switch (Hardwired) HKSWP-0Dx	1
	Lumina RF Rocker Switch ZSS10-G0Z	1
	Lumina RF 30A Load Controller 73A00-3ZB	1
	Marked "Controlled" Receptacle 16352-2PW	2
	Decora PIR Wall Switch Sensor with LED Night Light OSSNL-IDW	1
	Window/Door Sensor LURDW-00W	1

Energy Metering Solution
VerifEye™ Submetering Solutions



Meets the Following ASHRAE 90.1 Requirements

- Section 8.4.3
  - Monitoring
  - Recording and reporting

Notes:
Meets all local and national submetering requirements including ASHRAE 90.1, Title 24, City of Seattle, and New York Local Law 88

Contact your local Leviton Lighting Control Specialist for Title 24 compliant design assistance.

▶ FEATURED LEVITON ASHRAE 90.1 SOLUTION

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 for energy efficiency and savings
- Meets separation of load requirements with the ability to measure various loads

List of Equipment		
	Series 8000 Phase Config Multi-Point High Density Meter S8xxx-xxx*	1
	EMH+ All-in-One Meter and Hub A8814-xxx*	1
	BMO 3.0 Software Code Compliance Expansion Module BMOSW-COD	1

*Series 8000 Multi-Point High Density Meter and EMH+ All-in-One Meter and Hub are available in multiple configurations. See data sheets for more information.

Leviton Non-Residential Solutions for ASHRAE 90.1

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
- 24V AC/DC input for integration with HVAC/BAS systems
- Industry-leading layout and application services

Intellect Distributed Fixture Control

- Easy energy savings out-of-the-box
- Compliant with DesignLights Consortium (DLC) Advanced Lighting Control specifications
- Wirelessly configure, control, monitor, provision and schedule the Intellect system using a Bluetooth app designed for an Android or iOS smart phone or other Bluetooth enabled devices within a 30-100' range
- Integrate with downlights, track fixtures and other general lighting to create an advanced intelligent lighting system that complies with energy codes

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

Lumina™ RF Self-Powered Wireless Solutions

- Wireless solutions ensure energy savings in new construction and retrofits with the Lumina Gateway functioning as an energy management coordinator
- Automated control of loads via remote control from a tablet or smartphone via the Lumina Mobile app

Dimensions® D4000

- Stand-alone and integrated room dimming and control
- LED compatible with power extender
- Complete multi-event scheduler and astronomical time clock
- Interfaces with HVAC, emergency, time clock and load shed auxiliary systems

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 Lumina RF) and analog systems
- Software update through USB interface behind front panel

Provolt™ Room Controller

- High-performance, code-compliant capabilities in an industry-exclusive single self-contained unit including daylight harvesting, 0-10V control, partial-ON, partial-OFF, occupancy sensing and demand response
- Ladderless Commissioning through the smartphone Bluetooth app
- Daylight switching and full range 0-10V dimming

Integrated Room Control (IRC)

- Combines occupancy sensing, daylighting, 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 daylighting control

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)

EZ-MAX® Plus Stand-Alone Relay System

- Centralized building lighting control and daylighting 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

Leviton Non-Residential Solutions for ASHRAE 90.1

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

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

NorthStar Outdoor Controls

- Wireless system with a self-healing mesh network
- Suitable for switching and 0-10V dimming load types
- Controlled by either a simple time clock, dusk-to-dawn photocell control or via customized control sequences
- Commission through the NorthStar Site Controller using any web browser and the Controller's wifi access point
- Use the Leviton Provisioning App to identify and locate the fixture modules by simply scanning the QR code on each fixture module at the point of installation using the GPS feature on your tablet or smart device

Marked "Controlled" Receptacles

- Meets requirements for identifying receptacles that will automatically be de-energized as part of an overall plug load control program
- 2014 and 2017 NEC requires all 15A and 20A, 125V receptacles that are automatically controlled to be marked with a specific symbol (⏻) and the word "CONTROLLED" on the receptacle face—not the wallplate
- Ideal for new construction and renovation applications
- Available in back and side wired, side wired only, 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

- **Exclusive Training** - contact your local Leviton representative to have an ASHRAE 90.1 expert provide training in person or online exclusively for your team
- **ASHRAE 90.1 App** - simplifies ASHRAE 90.1 lighting control requirements and provides examples for common applications - available for Android and Apple devices - download at **www.leviton.com/apps**
- **ASHRAE 90.1 Web Portal** - access application diagrams and product solutions – visit **ashrae.leviton.com**
- **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**
- Lighting control specialists at your disposal
- Field service engineers for top-level support
- Factory commissioning service
- Dedicated technical support via phone at **800 959-6004**

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