HUBBELL®
Wiring Device-Kellems



LOAD CONTROL

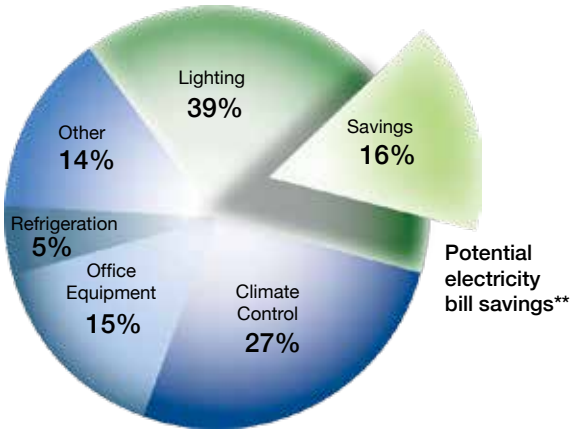
Application Guide

Energy Efficiency Products

HUBBELL®

Electric bill impact for a typical office building*

Lighting Uses 39% of Total Electricity



*Note: *Energy Information Administration:*
- Commercial Buildings
- Energy Consumption Survey
***Based on 40% lighting savings from sensors. Actual results may vary.*

Costs and Maintenance

Lighting consumes as much as 40% of a typical commercial building's energy costs, but Hubbell Load Control Solutions use advanced technology to bring this number down. Energy costs can be reduced by between 13% and 90%, offering a significant return on investment (ROI).

In addition to occupancy sensors, Hubbell Load:Logic® family of control devices offers a broad range of controls that meet the latest codes and standards and contribute to LEED certification points. An easy setup and operation process offers an "install-and-forget" experience.

Additional features include:

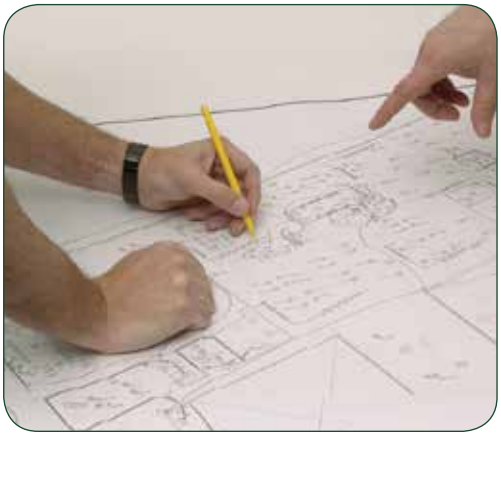
- Occupancy or time-based controls
- Manual ON mode automatically turns lights OFF when a space is unoccupied for a specified period of time
- Photo sensors control for dimming or to keep the lights OFF when natural light is sensed



Adaptive Technology Provides Better Control

Hubbell's patented breakthrough in advanced control feature smart microprocessors constantly monitoring the controlled area and adjust the sensitivity and timer based on environmental history.

- Lower energy costs and utility bills
- No need to manually adjust for occupancy changes



Backed by Hubbell Service and Support

Hubbell's Load Control Solutions are part of Hubbell's Sustainability Initiative, which focuses on environmental stewardship, innovative products and efficient building operations. Hubbell also offers superior service and support with:

- Online worksheets for calculating energy savings and ROI
- Detailed online e-learning courses
- Product selection guide to assist in choosing the right technology
- Online specification assistance
- Comprehensive layout and take-off services
- Highly knowledgeable network of trained professionals and staff
- BIM models and 3D coverage patterns

The Right Technology for the Right Application

Passive Infrared (PIR)



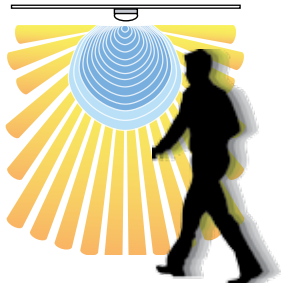
Requires a clear, unobstructed line of sight for detection, because it senses occupancy as movement of heat emitted from the body against the background space. A segmented Fresnel lens divides a coverage area into zones. Movement across zones is interpreted as occupancy.

Ultrasonic (US)



Senses occupancy by emitting an ultrasonic high-frequency sound wave (32 kHz to 45 kHz), sensing the frequency of the reflected signal, and then determining occupancy based on a change in frequency. While this has a limited range, it detects small motions and does not require a clear line of sight.

Dual Technology



Combines PIR and US technology, minimizing the risk of lights turning ON when the space is unoccupied. Once occupancy is detected by both technologies within the space lights are turned ON, only one technology is necessary to keep the lights ON.

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Typical Applications

Application		Sensor Technology				Sensor Style		
		Adaptive	Dual	Ultrasonic	PIR	Wall Switch	Ceiling	Wall
Office	Small	✓	✓		✓	✓	✓	
	Large	✓	✓	✓			✓	
Open Office		✓	✓	✓			✓	
Rest Room	Small			✓	✓	✓	✓	
	Large	✓		✓			✓	
Classroom	Small	✓	✓			✓	✓	
	Large	✓	✓				✓	
Conference Room	Small	✓	✓			✓	✓	
	Large	✓	✓				✓	
Storage/Warehouse	Small				✓	✓		
	Large	✓			✓		✓	✓
Hall		✓		✓	✓		✓	✓

Wired or Wireless Sensors

What is the right choice?

Both choices offer advantages and selecting the most suitable one is key to a successful energy control strategy.

New construction, retrofit applications, construction materials, type of space to be controlled, etc. play a role in the selection process.





Wired

Wired technology has been available for over 50 years and is traditionally used when there is no restriction for running wires. It also offers more choices of sensing technologies.

Wired technology is:

- The preferred choice for new construction, as wiring can be run easily while construction is underway.
- Offers more technologies; passive infrared, ultrasonic and dual.
- Easily interfaces with other technologies and control systems like wireless, building automation and HVAC.

Wired Controls' New Companion

Hubbell's WL Series wireless controls can be installed to work with Hubbell's traditional wired technology to provide an optimal solution when running extra wiring is difficult or impractical.

VS.

Wireless

The WL Series sensors are designed for ultra-low power consumption which translates into a ten year battery life. They also combine advanced Digital Signal Processing (DSP) with Passive Infrared (PIR) technology to maximize sensitivity to the movement of heat emitted from people occupying a space.

Commands are transmitted up to 60 feet over the low interference 434MHz band to associated Clear Connect® enabled devices that automatically turn lights OFF and other non-essential loads.

Wireless technology is:

- Flexible, making moves, additions and changes easy because there is no need for additional wiring.
- Fast to install and setup, typically involves replacing the existing wall switch and pairing the desired sensor.
- These controls utilize a simplified 6-second press and hold commissioning procedure. No need for remotes, computers, smartphones or any other device to set up the system.

Automatic Receptacle Control

Hubbell Load Controls
Manage More than Just the Lights



Designers and manufacturers have been implementing solutions to reduce the power consumption of lighting and HVAC systems for decades. Office equipment, appliances and plug in lighting loads are the next major target area for reduction of energy consumption. When left ON, these devices increase energy costs and a building's carbon footprint. As a result, codes and standards now mandate that a number of electrical receptacles in certain spaces be automatically controlled to reduce the likelihood of occupants forgetting to turn lights OFF or unplug equipment.

Load:Logic® Control Panels

These panels are a cost effective solution to achieve code compliance in small office buildings, retail, motel and warehouse applications. They provide centralized intelligence and also work as part of a hybrid control system.



- Save time with low voltage devices that connect directly to the panel.
- Panels meet ASHRAE 90.1, IEEC and California (CEC) Title 24 energy codes.
- Lower setup and maintenance costs with expanded programming and pre-programmed options to reduce consumption for each control zone. Integrated astronomical clock eliminates the need for roof mounted photocells.



Occupancy-Based Control

Occupancy sensors are already required in most applications to control lighting. These same sensors can be utilized to control electrical receptacles. This minimizes the installation cost and provides a control method that adapts easily to how the space being monitored is actually being used.

Time-Based Control

Time schedule based control is preferred for applications where devices need to be ON at defined periods. This can include schools, hospitality and office building applications.

Codes and Standards

ASHRAE 90.1

ASHRAE 90.1 is the leading energy building efficiency standard for commercial buildings in North America. Section 8.4.2, ASHRAE 90.1- 2010 instituted the requirement that in certain spaces at least 50% of all receptacles are to be controlled by either time of day control device, an occupancy sensor or by an automated signal from another control or alarm system.

LEED v4

The latest version of the US Green Building Council's LEED rating system mandates compliance to all mandatory provisions in ASHRAE 90.1-2013. This includes the electrical receptacle control requirement.

California Energy Commission Title 24



Section 130.5(d) of California Energy Commission Title 24, Part 6 - 2013 code requires receptacles to have automatic shutoff controls in certain spaces in all buildings.

NEC 2014

Article 406.3(E) of the NEC® 2014 edition selected the standby ( ) symbol as the marking for a receptacle connected to an automatic control system.

For more details about Automatic Receptacle Control (ARC), see the Hubbell Load:Logic® ARC Guide available on our website, or contact your Hubbell Territory Manager for a printed copy.

Office Design Guide



Flexible work hours, telecommuting, hoteling and adaptable workspaces mean that modern offices experience constant changes in occupancy patterns. If your lighting system has not been modernized to accommodate this trend, you are most likely wasting energy and money in unoccupied spaces as employees come and go throughout the week. Incorporating a daylight harvesting strategy to benefit from advancements in Solid State Lighting (SSL) is becoming common practice to save even more in energy costs.

LEGEND

- Ceiling Sensor
- Wall Sensor
- Wall Switch
- Receiver
- Wireless Signal
- Wireless Transmitter

Permanently Marked Receptacles

- Fully Controlled
- Half Controlled
- Uncontrolled

COVERAGE PATTERN

Minor/Major Motion

- Ultrasonic
- Passive Infrared (PIR)

Individual Office | Wired Approach



AD2000W1
WS2000W

APD2000W1

DHADC

CU300HD

BR15C1WHI
DR15C1WHI

Lighting Control

Wall Switch Sensor:
AD2000 Series or
WS2000 Series

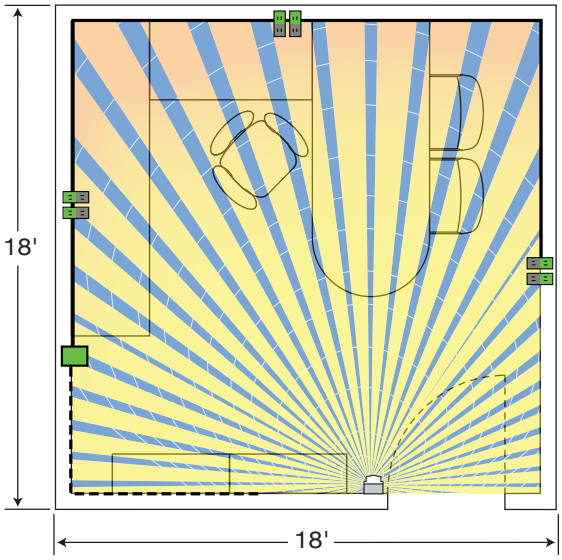
Dimming Wall Switch:
APD2000 Series
(Requires 0–10V dimming ballast/driver)

Dimming Photocell:
DHADC
(Requires 0–10V dimming ballast/driver)

Automatic Receptacle Control

Receiver:
CU300HD

Controlled Receptacles:
BR15C1 - Half Controlled
DR15C1 - Half Controlled



Individual Office | Wireless Approach



WLP450C

WLS1278W

WLDH

WLC301

BR15C1WHI
DR15C1WHI

Lighting Control

Wireless Ceiling Sensor:
WLP450C

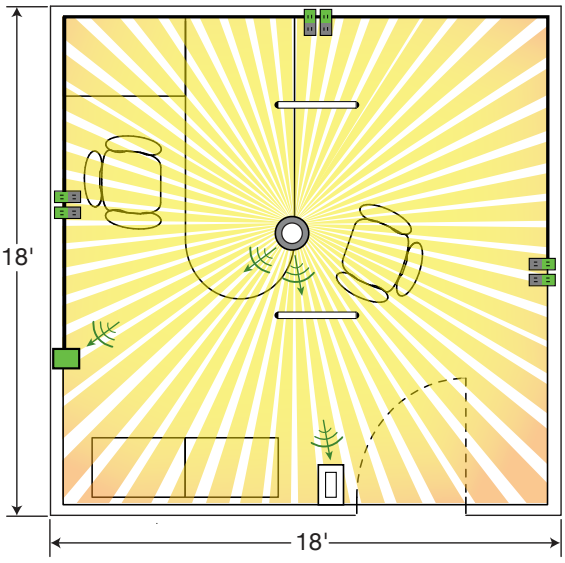
Wireless Wall Switch:
WLS1278 Series

Daylight Sensor:
WLDH

Automatic Receptacle Control

Receiver:
WLC301

Controlled Receptacles:
BR15C1 - Half Controlled
DR15C1 - Half Controlled



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Open Office | Wired Approach



ATD2000C | CU300A | DHADC | CU300HD | BR15C2WHI DR15C2WHI

Lighting Control

Ceiling Sensor:
ATD2000C

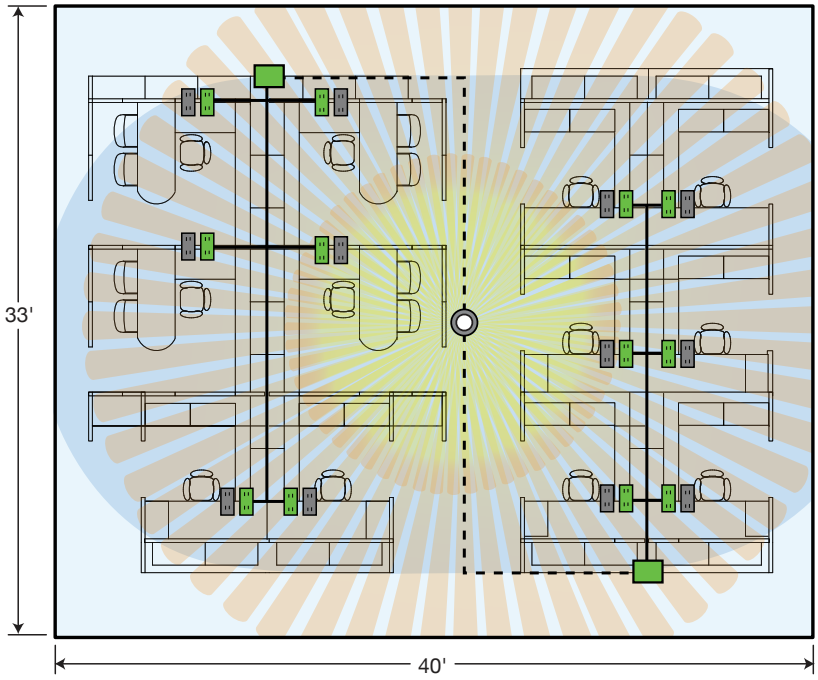
Control Unit required:
CU300A

Dimming Photocell:
DHADC
(Requires 0–10V dimming ballast/driver)

Automatic Receptacle Control

Receiver:
CU300HD

Controlled Receptacles:
BR15C2 - Fully Controlled
DR15C2 - Fully Controlled



Open Office | Wireless Approach



ATD2000C | CU300A | WLCA | DHADC | WLC402W | BR15C2WHI DR15C2WHI

Lighting Control

Ceiling Sensor:
ATD2000C
Control Unit required:
CU300A

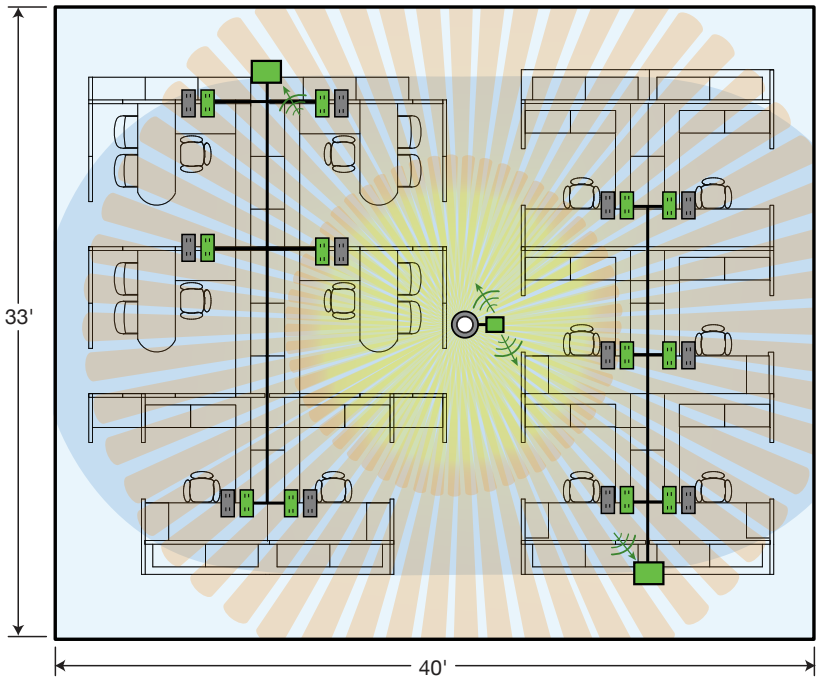
Wireless Transmitter:
WLCA

Dimming Photocell:
DHADC
(Requires 0–10V dimming ballast/driver)

Automatic Receptacle Control

Receiver:
WLC402W

Controlled Receptacles:
BR15C2 - Fully Controlled
DR15C2 - Fully Controlled



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Restroom Design Guide



Restrooms are typically occupied less than 50% of the day, but lights are often left ON all the time. Significant savings can be achieved by using Hubbell Occupancy Sensors to automatically turn lights ON when someone enters the restroom, and turn them OFF after the occupant leaves. The sensors also eliminate light switches as a restroom component that must be touched on the way out the door, helping improve hygene.

Hubbell Occupancy Sensors with dual circuit capabilities allow for integrated functionality while maintaining independent timer control of lights and exhaust fans. This simplifies installation and demonstrates a practical approach for the application. Are the lights ON in your building's restroom right now?

LEGEND

- Ceiling Sensor
- Wall Sensor
- Wall Switch
- Exhaust Fan
- Wireless Signal

COVERAGE PATTERN

Minor/Major Motion

- Ultrasonic
- Passive Infrared (PIR)

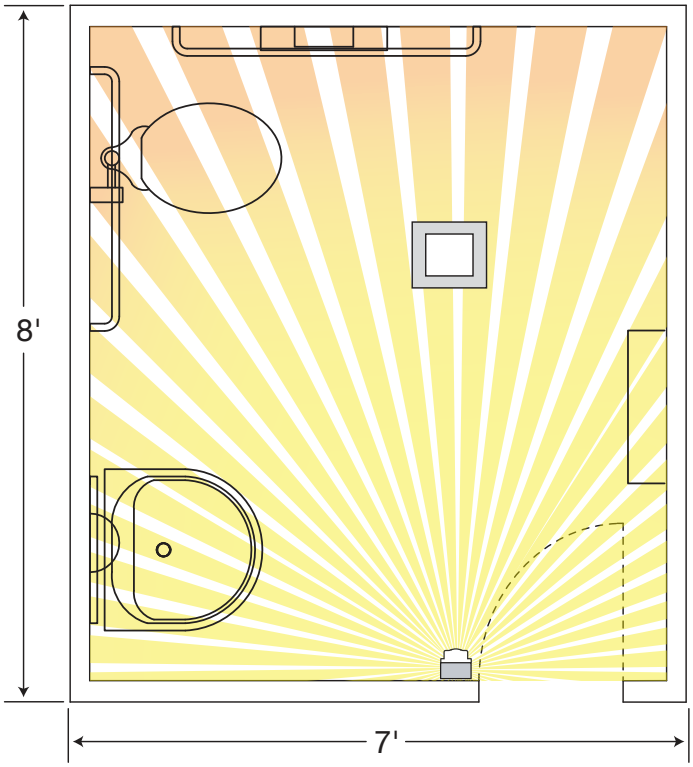
Small Private Restroom | Wired Approach



WS1020W WS2000W AP2000W1

Lighting Control

Wall Switch Sensors:
WS1020 Series - Dual relay and independent control for fans
WS2000 Series - Dual voltage, single relay
AP2000 Series - Single or dual relay, adaptive technology



Wireless Approach

Wireless Ceiling Sensor:
WLP450C

Wireless Wall Switch:
WL1278 Series



WLP450C WL1278W

Optional receiver unit for fan control:
WLC316R

These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Large Public Restroom | Wired Approach


ATU500C

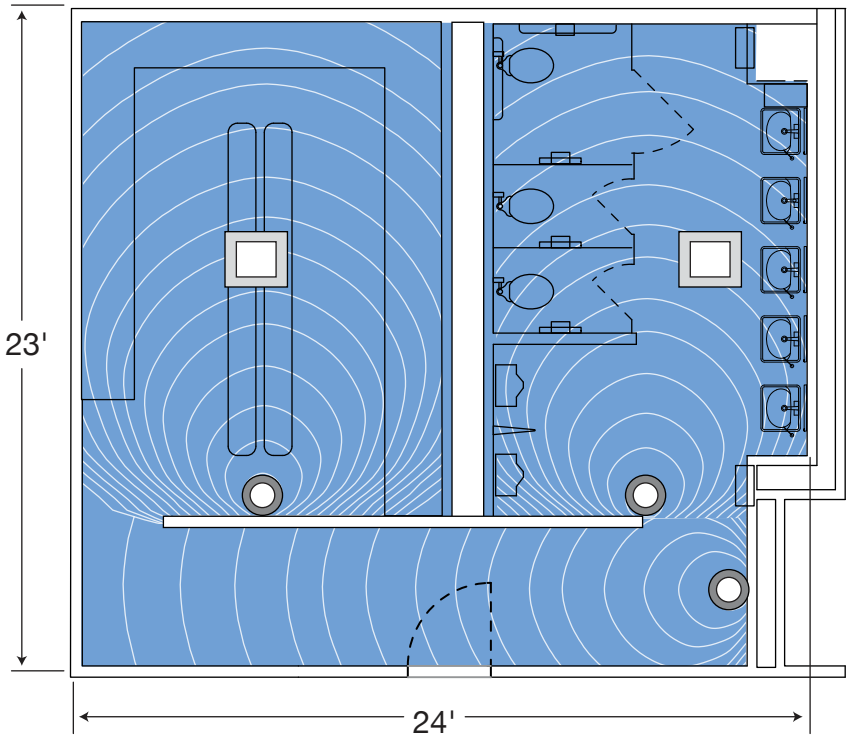

CU300A


ATU2000CL

Lighting Control

Ceiling Sensor:
ATU500C
Control Unit required:
CU300A
or
ATU2000CL
No Control Unit required

Optional auxiliary unit for exhaust fan control: **AAR20P**



Large Public Restroom | Wireless Approach


WLP450C


WLC316R

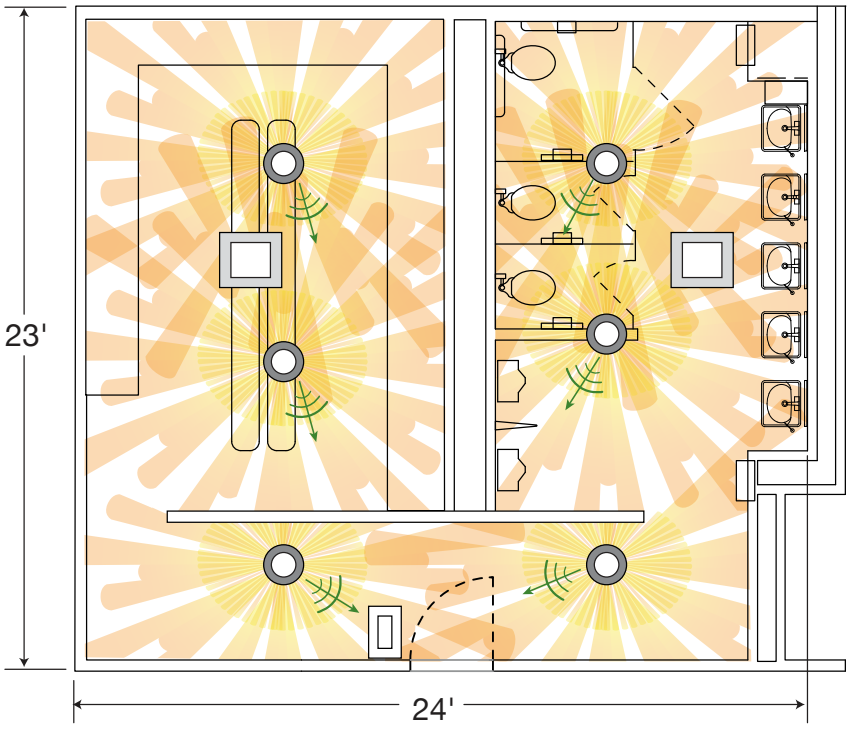

WLS1278W

Occupancy Sensor

Wireless Ceiling Sensor:
WLP450C
Wireless Control Unit required:
WLC316R

Optional Override Switch:
WLS1278 Series

Optional receiver unit for fan control:
WLC301



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Classroom Design Guide



With the constant buzz of activity involving students and teachers who are in and out of classrooms all day, making sure the lights are turned OFF when the room is empty is a challenge. Occupancy sensors provide an inexpensive way to guarantee that energy waste is kept to a minimum so teachers can focus on teaching instead of making sure lights, monitors, TV screens, projectors and other systems are OFF.

Optional photo sensors can also be used to turn lights OFF in classrooms when enough natural light is detected in the space, allowing the use of natural daylight. The Adaptive Technology used in Hubbell's Occupancy Sensors adjusts to the occupancy and environmental changes caused by school-day activities and after-school programs, as well as field trips, holidays and cancellations.

LEGEND

- Ceiling Sensor
- Wall Switch
- Receiver
- Wireless Signal

Permanently Marked Receptacles

- Fully Controlled
- Half Controlled

COVERAGE PATTERN

Minor/Major Motion

- Ultrasonic
- Passive Infrared (PIR)

Library | Wireless Approach



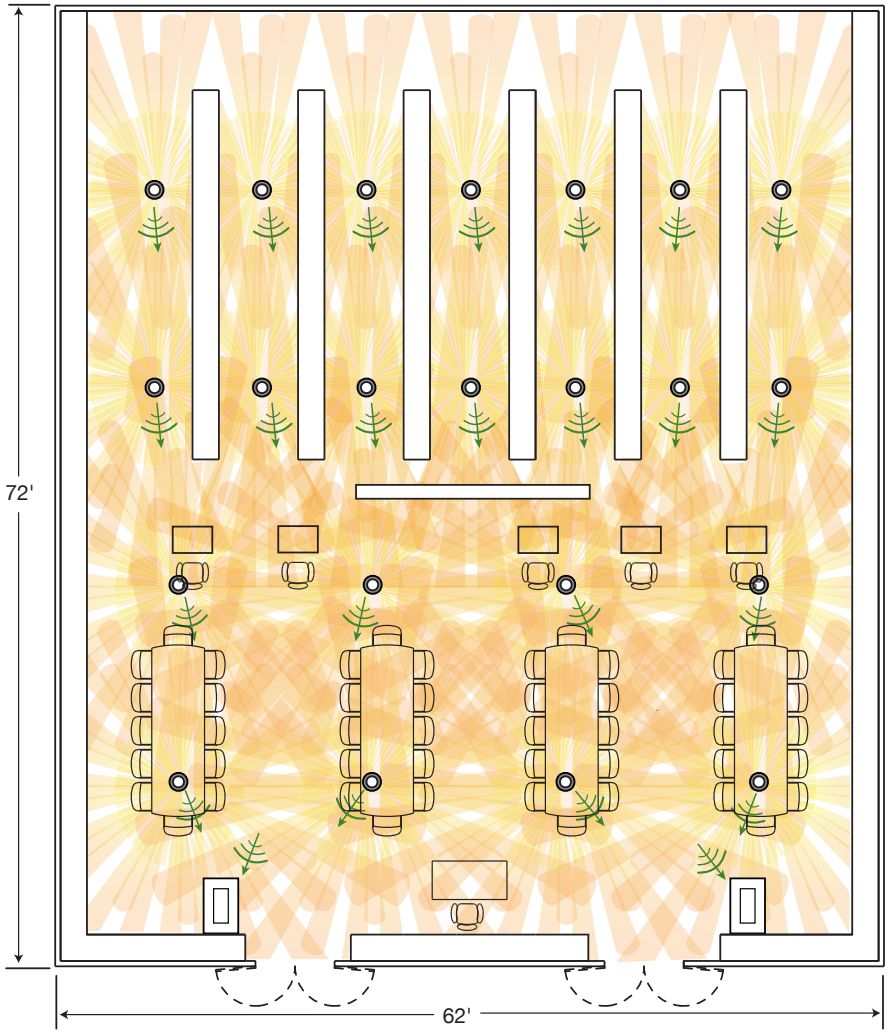
WLP450C WLC316R WLS1278W

Lighting Control

Wireless Ceiling Sensor:
WLP450C

Wireless Control Unit required:
WLC316R

Optional Override Switch:
WLS1278 Series



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

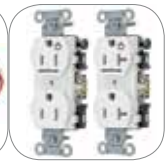
Large Classroom | Wired Approach


WLP450C


CU300A


DSM30W1


CU300HD


BR15C1WHI
BR20C1WHI

Lighting Control

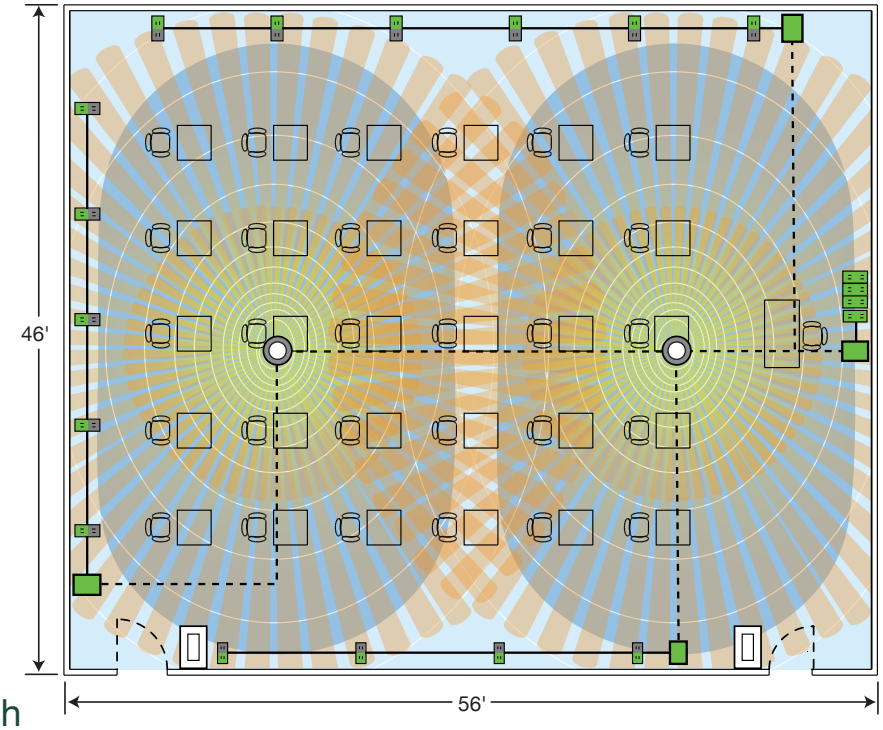
Ceiling Sensor:
ATD2000C

Control Units:
CU300A - Auto ON
CU300M - Manual ON
DSM30 Series - Manual ON Switch

Automatic Receptacle Control

Receiver:
CU300HD
AAR20P

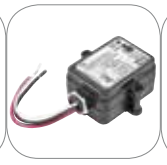
Controlled Receptacles:
BR15C1 - Half Controlled
BR20C1 - Half Controlled



Large Classroom | Wireless Approach


WLP450C


WLS1278W


WLC301


BR15C1WHI
BR20C1WHI

Lighting Control

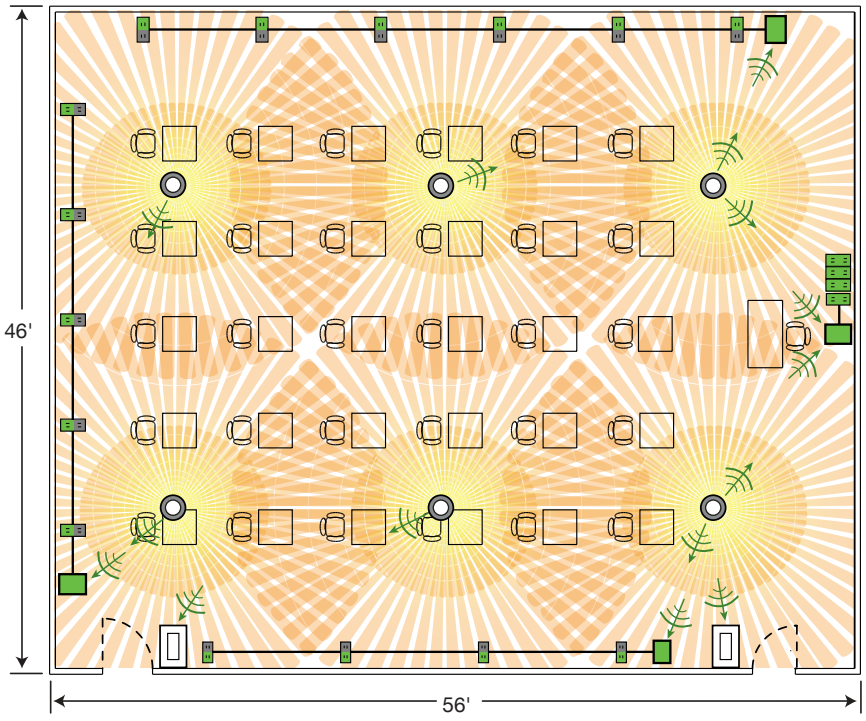
Wireless Ceiling Sensor:
WLP450C

Wireless Wall Switch:
WLS1278 Series

Automatic Receptacle Control

Receiver:
WLC301
WLC302

Controlled Receptacles:
BR15C1 - Half Controlled
BR20C1 - Half Controlled



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Laboratory Design Guide



Laboratory spaces are enclosed environments unlike any other. Technicians and scientists often have their hands full dealing with sensitive equipment, harsh chemicals or biomaterials—they may want to avoid touching a light switch in a clean environment. Occupancy Sensors ensure that lab occupants do not have to deal with the lights turning OFF at an inopportune moment.

Hubbell specialized occupancy sensor enclosures are ideal for keeping particulate exposure to a minimum. The enclosures' smooth surface can be easily cleaned and it will not compromise the sterile environment of a typical research or educational laboratory.

LEGEND

- Ceiling Sensor
- Wall Switch
- Exhaust Fan
- Receiver
- Wireless Signal

Permanently Marked Receptacles

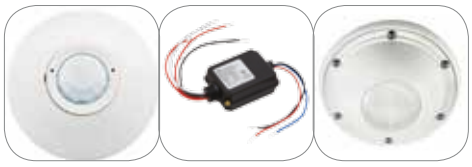
- Half Controlled

COVERAGE PATTERN

Minor/Major Motion

- Ultrasonic
- Passive Infrared (PIR)

Research Laboratory | Wired Approach



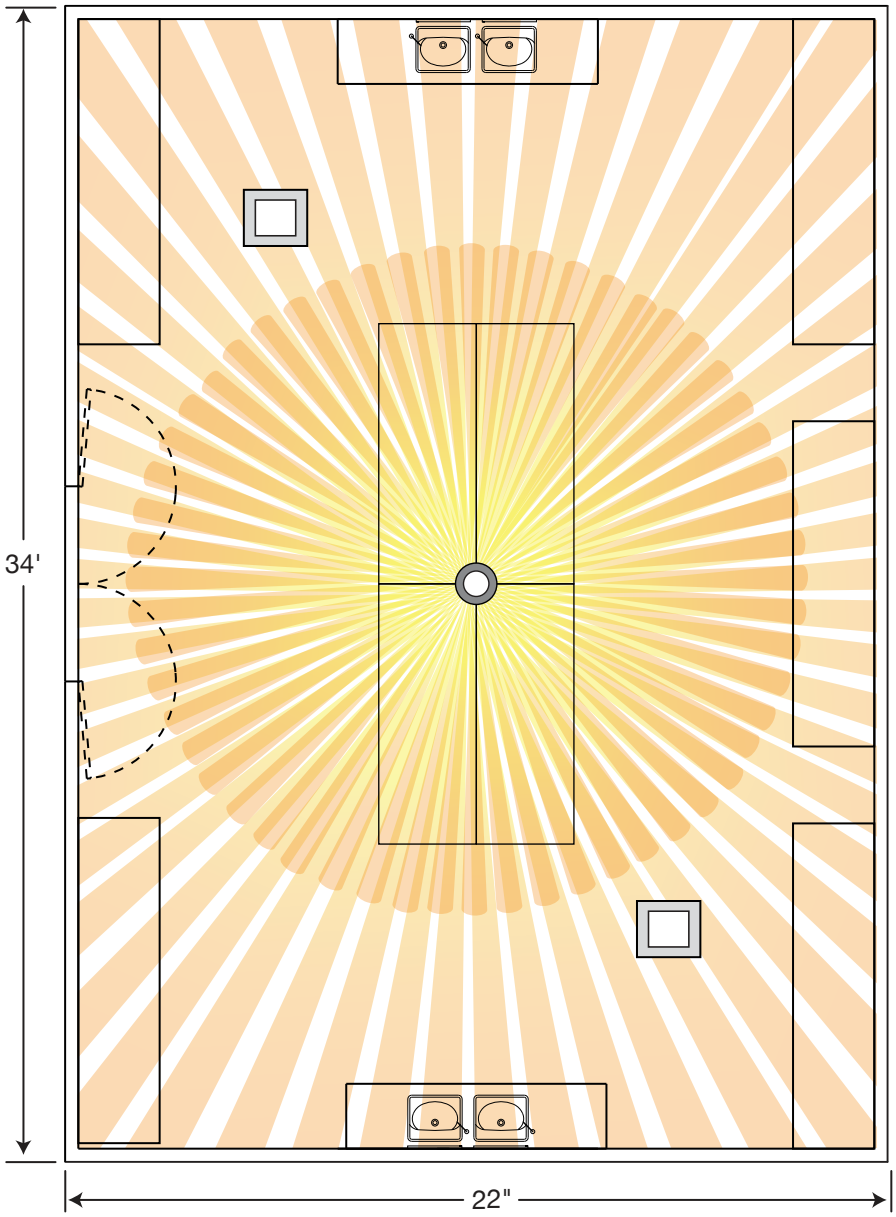
ATP1500C CU300A ACIPE

Lighting Control

Ceiling Sensor:
ATP1500C

Control Units:
CU300A - Auto ON
CU300M - Manual ON
DSM30 Series - Manual ON Switch

NEMA 4X Enclosure
ACIPE



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Computer Lab | Wired Approach



ATD2000C | CU300A | DSM30W1 | CU300HD | BR15C1WHI BR20C1WHI

Lighting Control

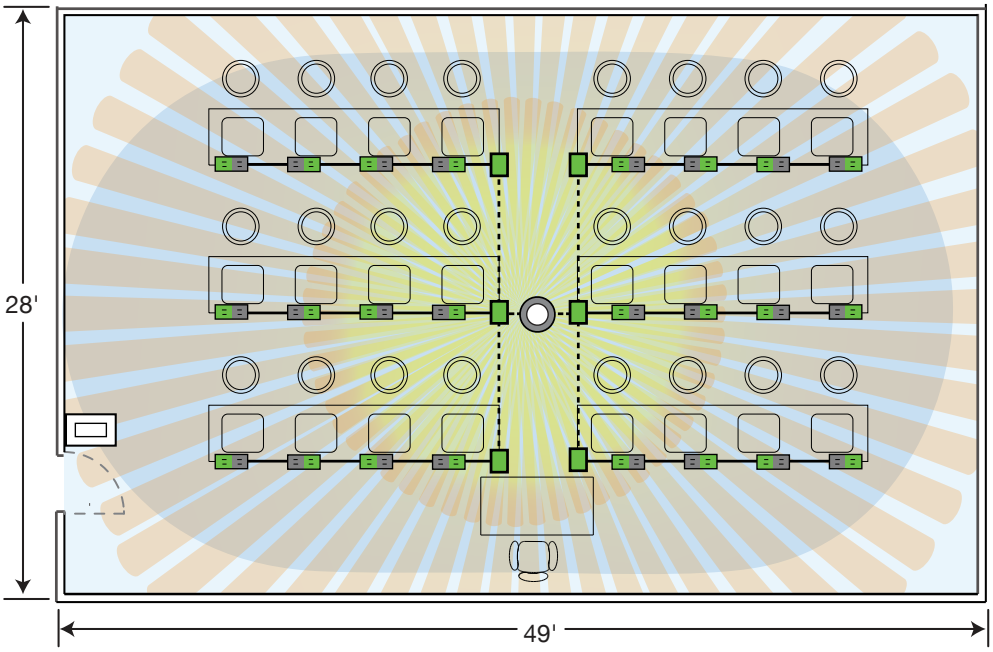
Ceiling Sensor:
ATD2000C

Control Units:
CU300A - Auto ON
CU300M - Manual ON
DSM30 Series - Manual ON Switch

Automatic Receptacle Control

Receiver:
CU300HD

Controlled Receptacles, Split Circuit (One controlled and one not):
BR20C1 - Half Controlled
DR20C1 - Half Controlled



Computer Lab | Wireless Approach



WLP450C | WLC316R | WLS1278W | WLC301 | BR15C1WHI BR20C1WHI

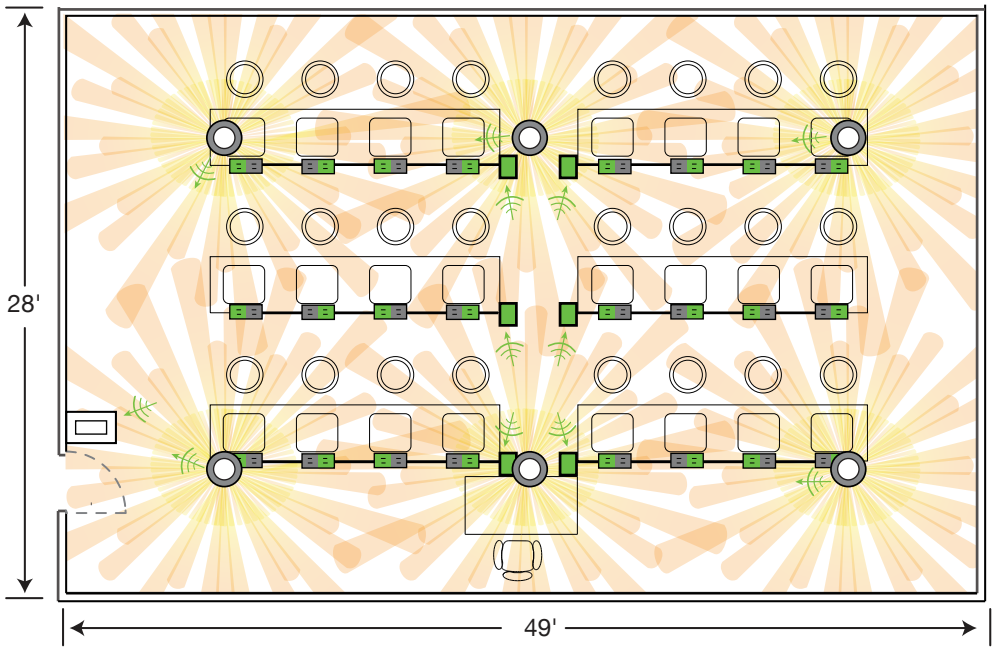
Lighting Control

Wireless Ceiling Sensor:
WLP450C
Wireless Control Unit required:
WLC316R
or
Wireless Wall Switch:
WLS1278 Series

Automatic Receptacle Control

Receiver:
WLC301

Controlled Receptacles, Split Circuit (One controlled and one not):
BR20C1 - Half Controlled
DR20C1 - Half Controlled



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Hotel Room Design Guide



Hotel guestroom occupancy is never predictable and, even when occupied, each room has different lighting needs, based upon who is using the space and behavior. Occupancy sensor controls can not only reduce energy consumption in unoccupied guestrooms, but also ensure that hotel staff do not need to manually turn OFF lights when the room is not in use. By reducing lighting energy costs, hotel management can spend the savings elsewhere—on a guestroom refresh, updated technology, or additional green building projects.

LEGEND

- Ceiling Sensor
- Wall Sensor
- Wall Switch
- Exhaust Fan
- Receiver
- Wireless Signal

Permanently Marked Receptacles

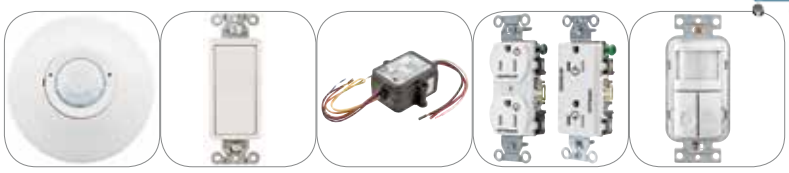
- Fully Controlled
- Uncontrolled

COVERAGE PATTERN

Minor/Major Motion

- Ultrasonic
- Passive Infrared (PIR)

Hotel Room | Wired Approach



ATP1500C | DS120W | CU300HD | BR15C2WHI DR15C2WHI | WS1020W

Main Room

Lighting Control

Ceiling Sensor:
ATP1500C
Control Unit required:
CU300A

Override Wall Switch:
DS120 Series

Automatic Receptacle Control

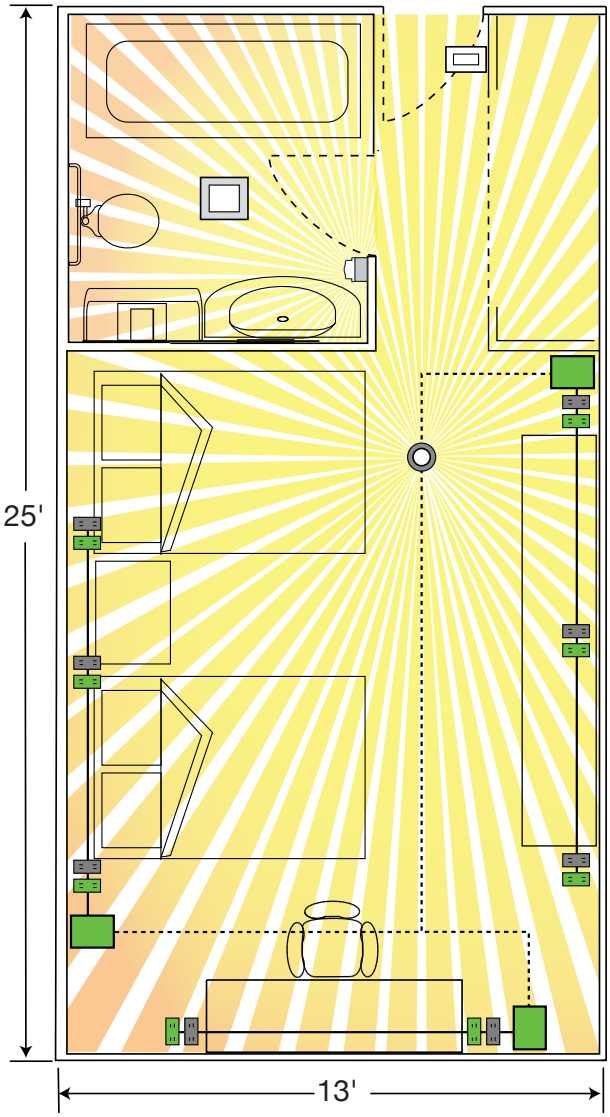
Receiver:
CU300HD

Controlled Receptacles:
BR15C2 - Fully Controlled
DR15C2 - Fully Controlled

Bathroom

Lighting Control

Wall Switch Sensors:
WS1020 Series
WS1000 Series
WS2000 Series



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Hotel Room | Wireless Approach



WLP450C | WLC316R | WLS1278W | WLC301 | BR15C2WHI DR15C2WHI

Main Room

Lighting Control

Wireless Ceiling Sensor:
WLP450C
Wireless Control Unit required:
WLC316R
or
Wireless Wall Switch:
WLS1278 Series

Automatic Receptacle Control

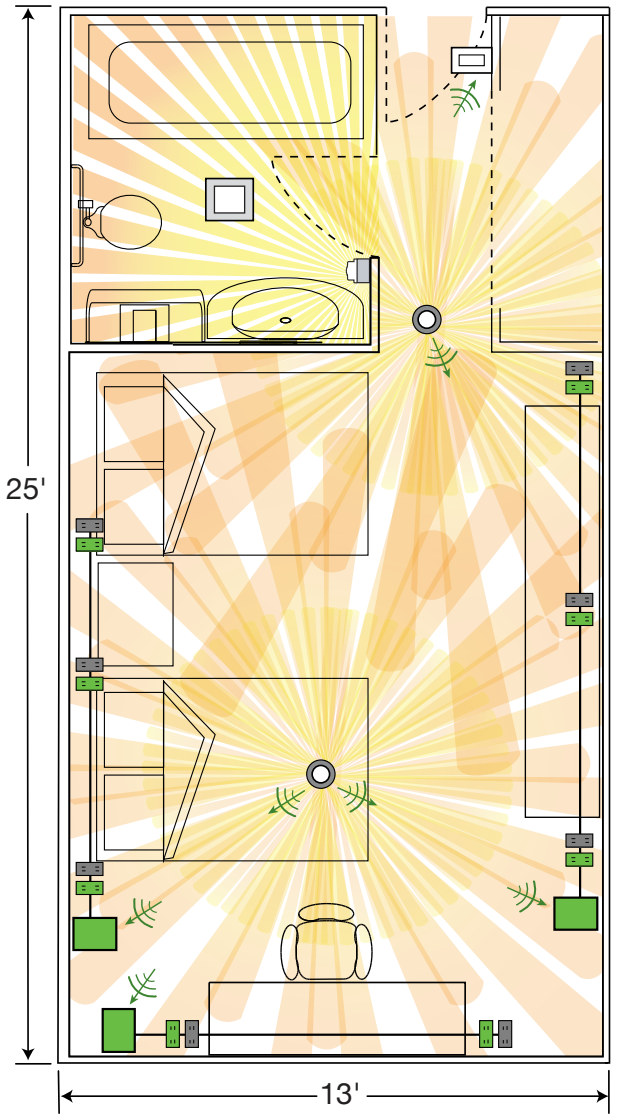
Receiver:
WLC301

Controlled Receptacles:
BR15C2 - Fully Controlled
DR15C2 - Fully Controlled

Bathroom (Wired)

Lighting Control

Wall Switch Sensors:
WS1000 Series
WS2000 Series
WS1020 Series



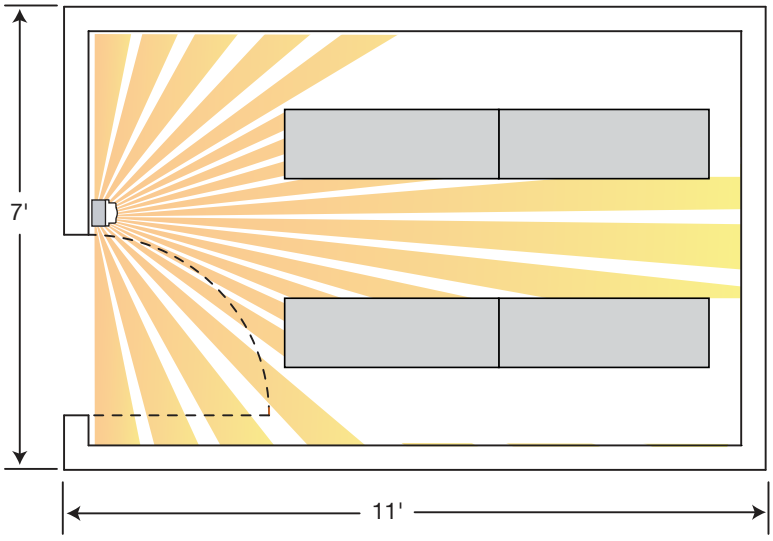
Closet | Wired Approach



WS1000W | WS2000W | AP2000W1

Lighting Control

Wall Switch Sensors:
WS1000 Series - Single voltage, single relay
WS2000 Series - Dual voltage, single relay
AP2000 Series - Single or dual relay, adaptive technology



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Warehouse Design Guide



Warehouse applications can be very challenging. Traffic patterns, working hours, the presence of skylights and code compliance are fundamental when selecting the appropriate design technique. Occupancy sensors will ensure that only areas that are being used are illuminated.

The main challenge in a warehouse is the possibility of false triggering in aisles where there is no real occupancy as people walk near the entrances of these aisles. A successful layout will involve carefully taking into account the coverage patterns and placement of the sensors to avoid false triggering.

LEGEND

- Fixture Mount Sensor
- Outdoor Sensor

COVERAGE PATTERN

Minor/Major Motion

- Passive Infrared (PIR)

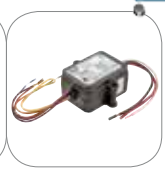
Warehouse | Wired Approach



HMHB2x9
HMHB2xxPCWD



AHP1600WRP



CU300HD

Indoor

Lighting Control

Fixture Mount Sensor:
HMHB2x9 Series

Dimming Series:
HMHB2xxPCWD

Replacement Lenses:
8–16 ft. use Low Bay;
HMLBLxxx lens

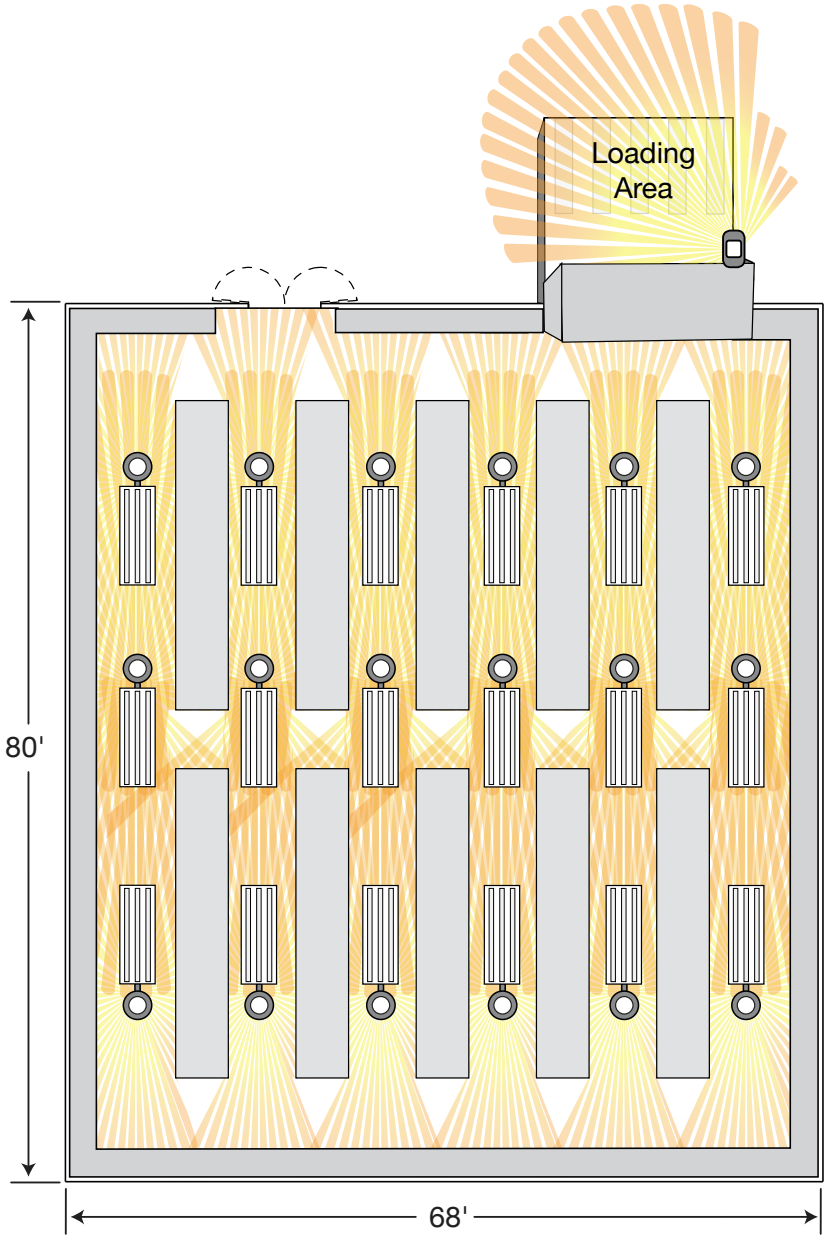
18–45 ft. use High Bay;
HMHBLxxx lens

Outdoor

Lighting Control

Outdoor Sensor:
H-MOSS®|MAXX™
AHP1600WRP Series

Control Unit:
CU300HD



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Warehouse
Design Guide



When work schedules and occupancy patterns in a warehouse are reasonably defined, a centralized or a hybrid method of control may be considered.

Depending on the warehouse size, a load control panel may be needed as a centralized control point or to complement occupancy sensors with dimming capabilities.

The control panel also provides a significant reduction in setup and maintenance costs because it provides many pre-programmed options and astronomical clock.

This approach addresses code and standards requirements like demand response.

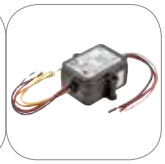
Warehouse | Time-Based Approach



CP082RRR1



AHP1600WRP



CU300HD

Indoor

Lighting Control

Load:Logic® Control Panels:
(1ea) **CP082RRR1** 8-relay panel with 8 spaces for field installed relays (6ea) **R21HN** Electrically held, 20A 1P relay

Optional Accessories if adding dimming capabilities
Requires compatible 0-10V dimming ballasts/LED drivers

(1ea) **CPDM8CTRB** 8-channel dimming controller board
(2ea) **CPSD3xx** 3-button dimming switch

Outdoor

Lighting Control

Outdoor Sensor:
H-MOSS®|MAXX™
AHP1600WRP Series

Control Unit:
CU300HD

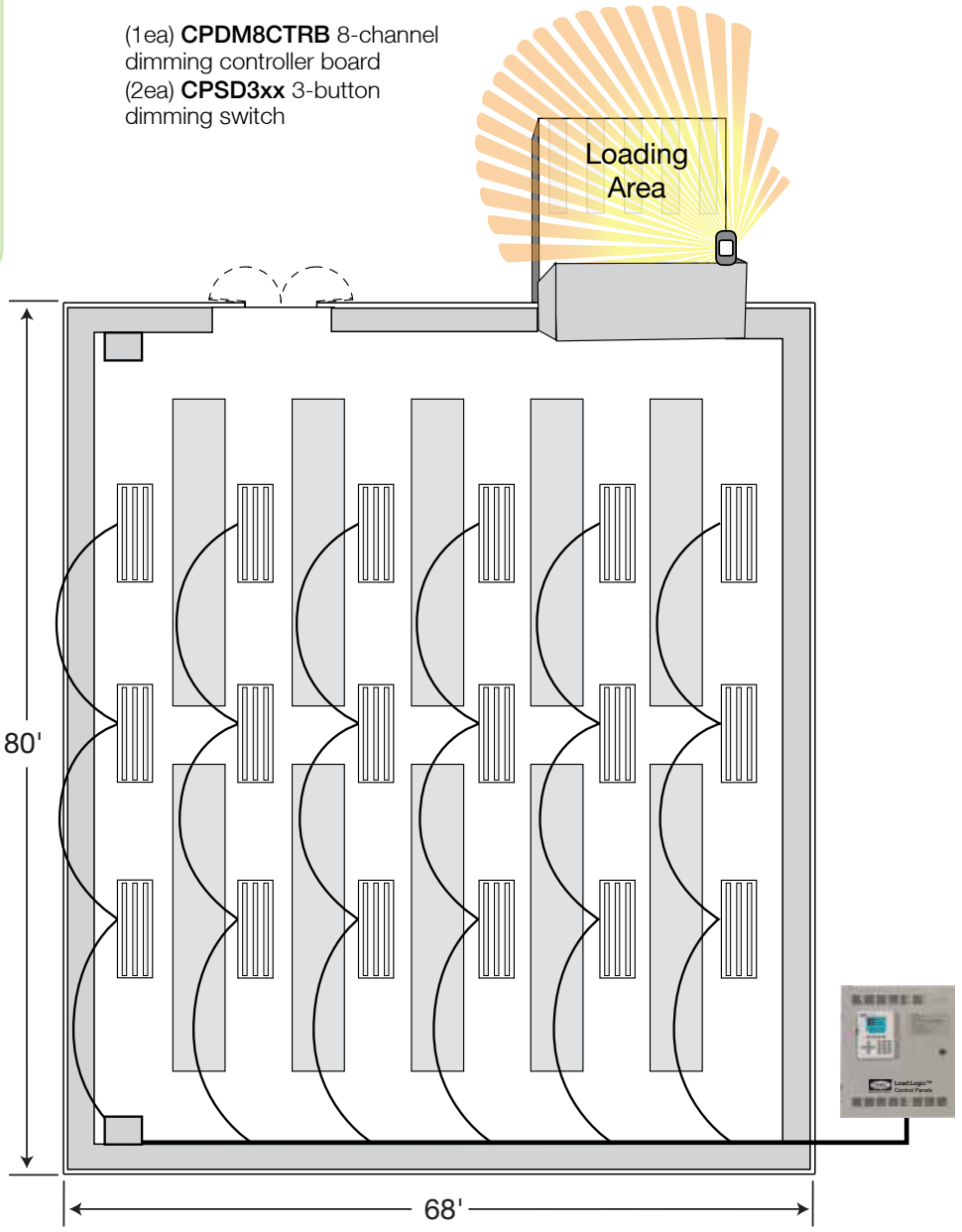
Time-Based Control

Time schedule based control is preferred for applications where devices need to be ON at defined periods. This can include schools, hospitality and warehouse applications.









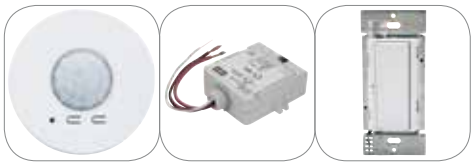
These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

HVAC Integration



Hubbell sensors can interact with HVAC systems, activating damper controllers in a room based on occupancy, reducing heating and cooling consumption costs. Select the “RP” (Relay and Photocell) option on ceiling and wall mount sensors. This option is available in the WL316R Wireless Control Unit.

HVAC Integration | Wireless Approach



WLP450C WLC316R WLS1278W

Lighting Control

Wireless Ceiling Sensor:
WLP450C

Wireless Control Unit:
WL316R

Optional Wireless Wall Switch:
WLS1278 Series

Wired Approach



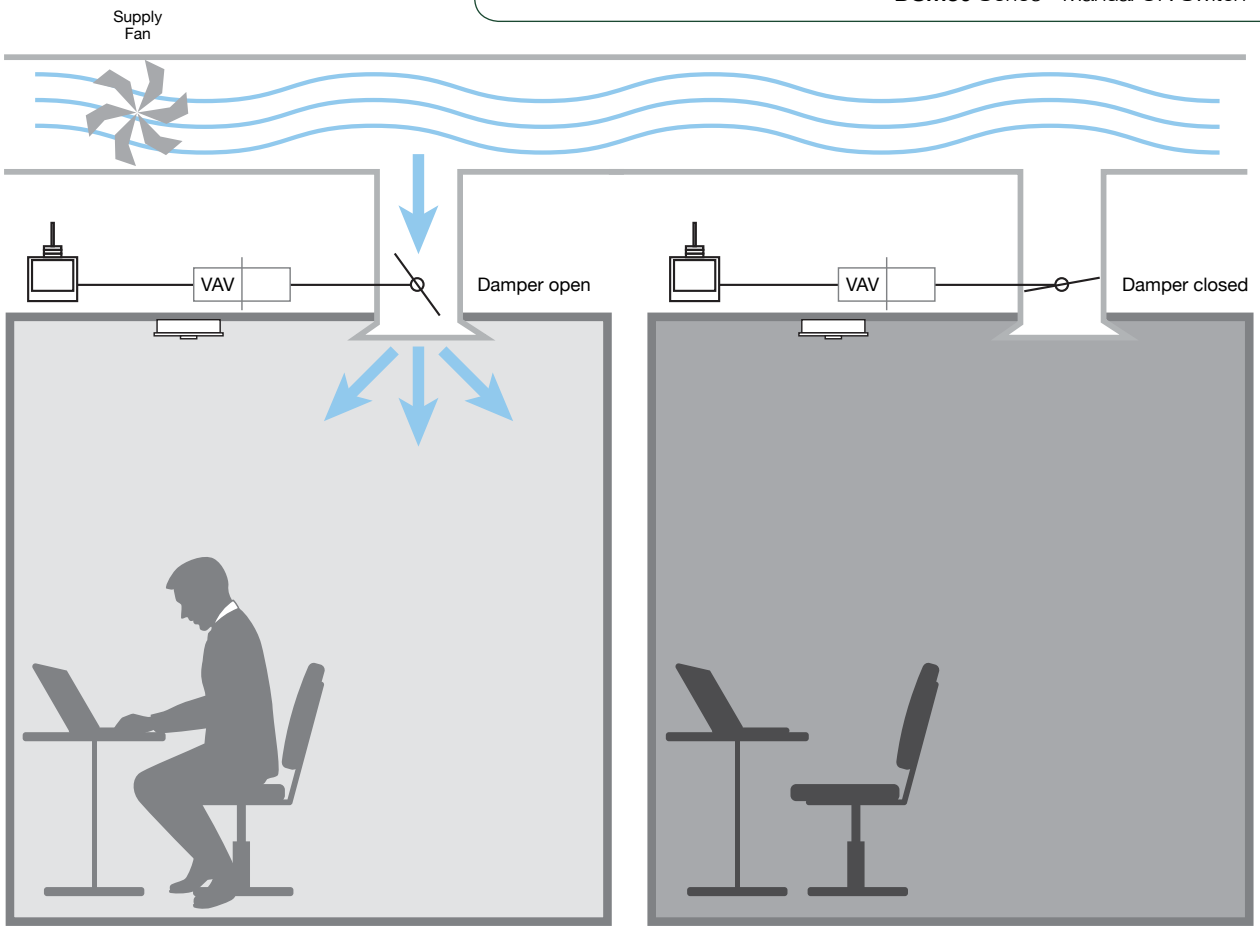
ATP600CRP CU300A DSM30W1

Adaptive Technology

ATD, ATP and ATU Series ceiling/wall mount sensors with RP option

Ceiling Sensor:
ATP600CRP

Control Units:
CU300A - Auto ON
CU300M - Manual ON
DSM30 Series - Manual ON Switch



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Stairwell
Design Guide



WL Series wireless sensors are the ideal solution for stairwell applications. When unoccupied, light level is at 50%. At the moment of occupancy, fixtures associated with a sensor in a specific location will turn lights ON to full bright light level, allowing for maximum safety to the occupant.

Stairwell | Wireless Approach



WLP Series



WLC316R

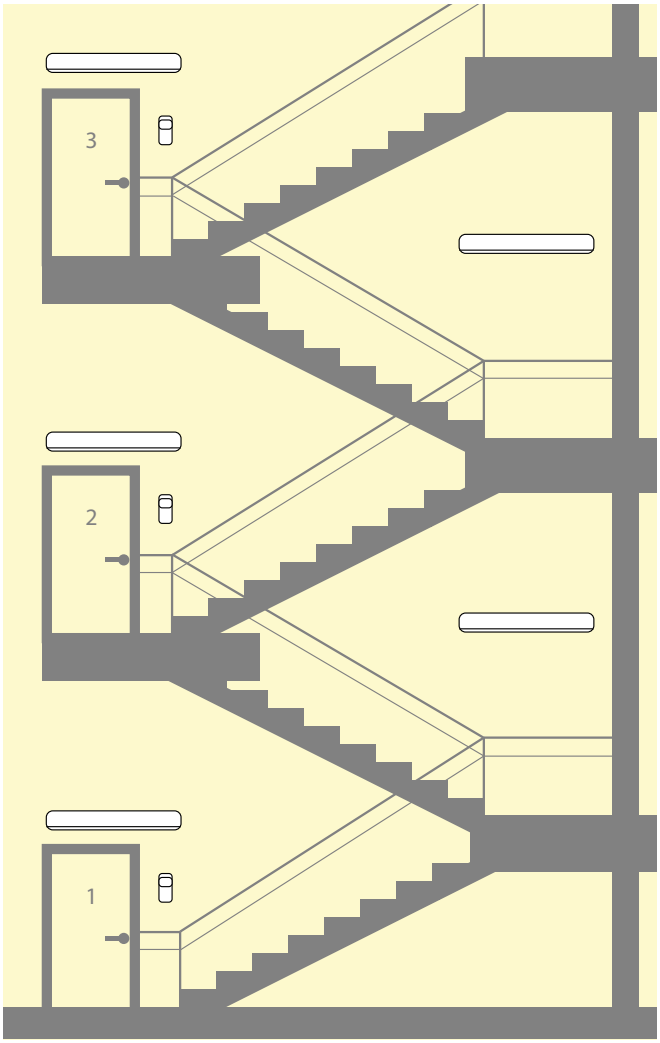
Stairwell Standard Fixture

Occupancy/Vacancy Wall Mount Sensor:
WLP Series

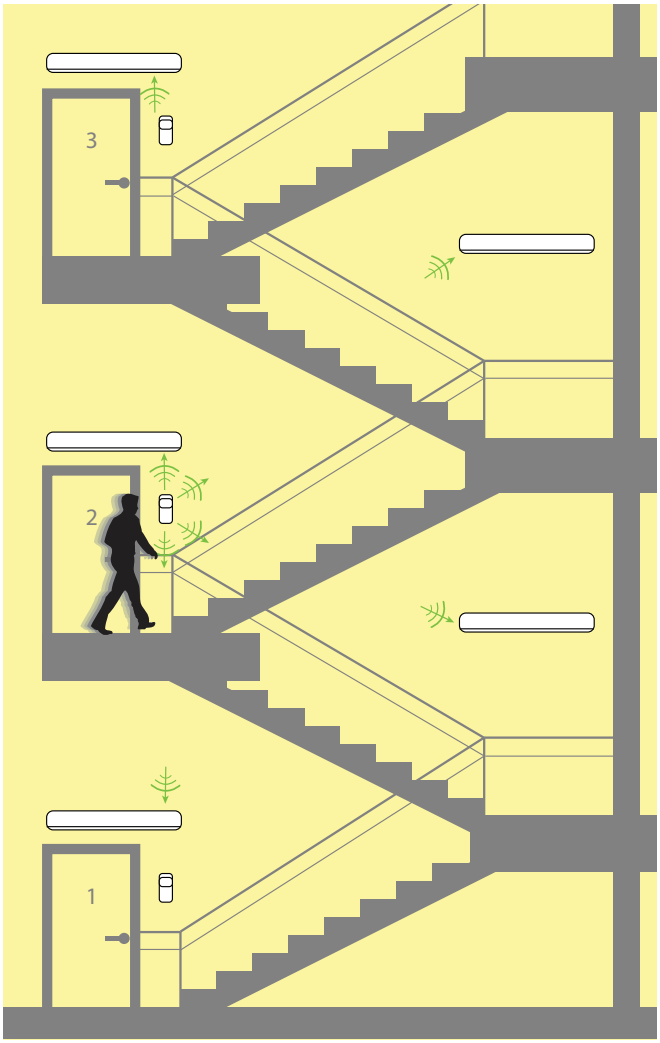
Wireless Control Unit:
WLC316R

To achieve maximum safety and enhance security, a sensor can be associated to lamp fixtures a floor above and a floor below of the space where the occupant is located.

Unoccupied: 50% Light Level



Occupied: 100% Light Level



These diagrams visually represent occupancy sensor design recommendations based on specific spaces in different building types.

Ordering Information


AD2000W1


AP2000W1


WS2000W


WS1020W


DSM30W1


WLS1278W


WLP450C


WLC316R


WLDH

Adaptive Wall Switch Sensors

	Selectable Auto ON or Manual ON Operating Modes		Vacancy Manual ON Operating Mode	
Description	Single Relay	Dual Relay	Single Relay	Dual Relay
Dual Technology (Ultrasonic and Passive Infrared)	**AD2000xx1**	**AD2000xx2**	**AD2001xx1**	**AD2001xx2**
Ultrasonic	**AU2000xx1**	**AU2000xx2**	**AU2001xx1**	**AU2001xx2**
Passive Infrared	**AP2000xx1**	**AP2000xx2**	**AP2001xx1**	**AP2001xx2**

*Note: **xx** = Color: **BK** (Black), **GY** (Gray), **I** (Ivory), **LA** (Light Almond) and **W** (White).*
*Neutral Versions available on selected models. Substitute prefix "**AD**", "**AU**", "**AP**" for "**ADN**", "**AUN**" or **APN**" prefix respectively. Consult your Hubbell Territory Manager for details.*

Passive Infrared Manual Adjust Switch Sensors

	Selectable Auto ON or Manual ON Operating Modes		120V AC Auto ON Operating Mode		Vacancy, 120V AC Manual ON Operating Mode	
Description	Standard	Nightlight	Standard	Nightlight	Standard	Nightlight
No neutral required	**WS2000xx**	**WS2000Nxx**	**WS1000xx**	**WS1000Nxx**	**WS1001xx**	**WS1001Nxx**
With neutral	**WS2004xx**	**WS2004Nxx**	—	—	—	—
Dual circuit, no neutral required	—	—	**WS1020xx**	**WS1020Nxx**	**WS1021xx**	**WS1021Nxx**
Dual circuit with neutral	—	—	**WS1024xx**	**WS1024Nxx**	**WS1025xx**	**WS1025Nxx**

*Note: **xx** = Color: **GY** (Gray), **I** (Ivory), **LA** (Light Almond) and **W** (White).*

Low Voltage Switches

Description	Latching, 1 Button	Momentary, 1 Button	Momentary, 2 Button	Momentary, 4 Button
Low voltage switch	**DSL30xx1**	**DSM30xx1**	**DSM30xx2**	—
Low voltage switch with LED pilot light	—	**DSM30xx1P**	**DSM30xx2P**	**DSM30xx4P**

*Note: **xx** = Color: **I** (Ivory), **LA** (Light Almond) and **W** (White).*

Wireless Wall Switch Receivers

Description	Color	Electronic Switch 120–277V AC; No Neutral Wire Required	Accessory Switch 120V AC	Accessory Switch 277V AC
8A lighting, 3A fan (1/10 HP motor, 120V AC Only), Specification Grade	Ivory	**WLS1278I**	**WLAS120I**	**WLAS277I**
	White	**WLS1278W**	**WLAS120W**	**WLAS277W**

Wireless Ceiling and Wall Mount Sensors

Color	Ceiling Mount 360° / 324-676 sq. ft.	Wall Mount 180° / 3000 sq. ft.	Corner Mount 90° / 2500 sq. ft.	Hallway Up to 150 Linear Feet
White	**WLP450C**	**WLP3000W**	**WLP2500W**	**WLP150H**

Wireless Control Units

Description		Single (1) Circuit	Dual (2) Circuit
Wireless load control unit with isolated relay	16A, 120/277V AC	**WLC316R**	—
Wireless status transmitter	24V DC	**WLCA**	—
Heavy duty control unit with wireless transmitter	100-277V AC	**WLCU301**	—
Heavy duty load control units with wireless receiver	100-277V AC	**WLC301**	**WLC302**
Furniture feed box with heavy duty relays and wireless receiver	100-277V AC	—	**WLC402W**

Wireless Daylight Sensor

Description	Color	Catalog Number
Daylight sensor 0–107,000 Lux (0-10,000 foot candles)	White	**WLDH**

Permanently Marked Receptacles for Use with Automatic Outlet Control Systems

Description	15A, Split	20A, Fully
Duplex receptacles	**BR15C1xx**	**BR20C2xx**
Decorator receptacles	**DR15C1xx**	**DR20C2xx**

*Note: **xx** = Color: **BK** (Black), **GY** (Gray), **I** (Ivory), **LA** (Light Almond) and **WHI** (White).*

Ordering Information


ATD2000C


ATP1500C


HMHB219


AHP1600WRP


DHADC


APD2000W1


CU300HD


ATP120HB


CP082RRR1

Ceiling and Wall Mount Sensors

Description	Color	Dual Technology (Ultrasonic and Passive Infrared) 2000 sq. ft. (360°)	Ultrasonic 1000 sq. ft. (180°)	Passive Infrared 120 linear feet
Ceiling low voltage sensor	Office White	**ATD2000C***	**ATU1000C***	—
Wall mount low voltage sensor for aisle and high bay applications	Office White	—	—	**ATP120HB***

*Note: *Add **RP** suffix If a photocell and isolated relay is required for HVAC or BAS integration.*
For additional devices, please see our online catalog at www.hubbell-wiring.com or consult your Hubbell Territory Manager for details.

OPTIMYZER® High Bay Sensors

Description	1 Relay with Photocell, 120-347V AC	2 Relays with Photocell, 120-347V AC	Low Voltage with Photocell, 24V DC
End mount PIR sensor, indoor	**HMHB219**	**HMHB229**	**HMHB2LV9**
End mount PIR watertight sensor, outdoor	**HMHB21UPCW**	**HMHB22UPCW**	**HMHB2LVPCW**

Watertight PIR Sensors

Description	Voltage	Catalog Number
PIR sensor with isolated relay and photocell	24V DC	**AHP1600WRP**
Extreme temperature PIR ceiling sensor with isolated relay and photocell	24V DC	**AHP1500CRP**
IP66, NEMA 4X enclosure	—	**ACIPE**

Load:Logic® Control Panels

Description	Catalog Number
4-Relay panel with 4 spaces, 120/208/240/277V AC	**CP042RRR3**
8-Relay panel with 8 spaces, 120/208/240/277V AC	**CP082RRR1**
16-Relay panel with 16 spaces, 120/277V AC	**CP162RRR1**
16-Relay panel with 16 spaces, 347-480V AC	**CP163RRR1**

Daylight Harvesting and Dimming

Description	Voltage	Catalog Number
Single zone continuous auto dimming control daylight tracker with dimming control	0-10V DC 0-10V DC	**DHADC** **DHTD**
Dimming PIR selectable auto ON/auto OFF manual ON/auto OFF	120/277V AC	**APD2000xx1**
Dimming PIR manual ON/auto OFF (Vacancy) only	120/277V AC	**APD2001xx1**

*Note: **xx** = Color: **BK** (Black), **GY** (Gray), **I** (Ivory), **LA** (Light Almond) and **W** (White).*

Field Installed Relays

Description	Catalog Number
Electrically held, 20A/1P, 120/277V AC, 14k SCCR, N/O	**R21HN**
Latching relay, 30A/1P, 120/277/347V AC, 18k SCCR	**R31LX**
Electrically held, 20A/2P, 480V AC, 14k SCCR, N/O	**R202HN**
Electrically held, 20A/2P, 480V AC, 14k SCCR, N/C	**R202HC**

Control Units

Description	Catalog Number
Auto ON operation, 100-277V AC, 50/60Hz	**CU300A**
Manual ON operation, 100-277V AC, 50/60Hz	**CU300M**
Heavy duty latching relay, auto or manual ON operation, 100-277V AC, 50/60Hz	**CU300HD**

Interface Cards

Description	Catalog Number
8-Channel dimming contoller option board	**CPDM8CTRB**

Add-A-Relay

Description	Catalog Number
For use with CU series control units and Hubbell ATD, ATU and ATP series ceiling and wall mount sensors	**AAR**
Heavy duty latching relay; for use with CU300HD in plug load applications	**AAR20P**

Dimming Switches (Compatible with Hubbell Wiring Device Load Control Panels)

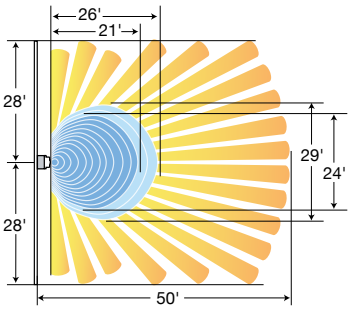
Description	1 Button	2 Button	3 Button	4 Button
Load control panel, low voltage dimming switch	**CPSD1xx**	**CPSD2xx**	**CPSD3xx**	**CPSD4xx**

*Note: **xx** = Color: **I** (Ivory), **LA** (Light Almond) and **W** (White).*

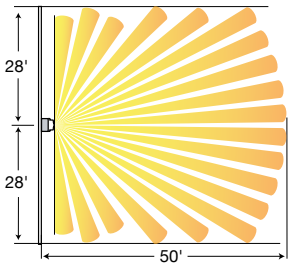
Coverage Patterns

LEGEND
Minor/Major Motion — Ultrasonic
Minor/Major Motion — Passive Infrared (PIR)

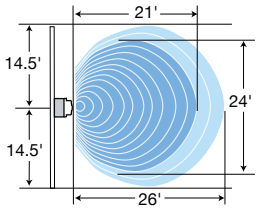
Wall Switch Sensors



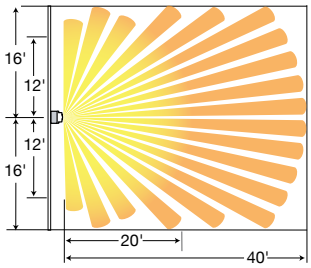
AD2000 Series



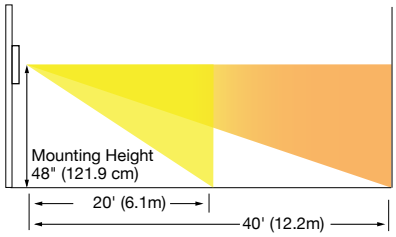
AP2000 Series



AU2000 Series

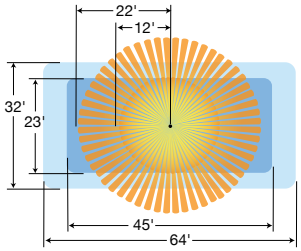


ATP2000, WS2000 Series

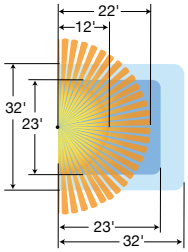


Vertical Coverage
ATP2000, WS2000 Series

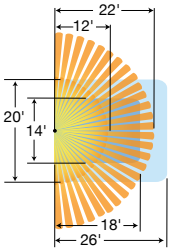
Ceiling Sensors



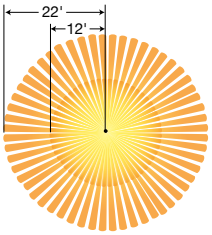
ATD2000C Series



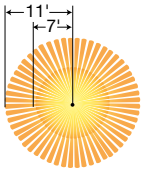
ATD1000C Series



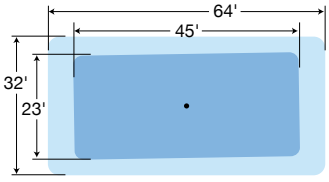
ATD500C Series



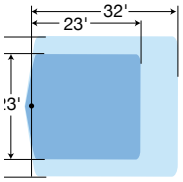
ATP1500C Series



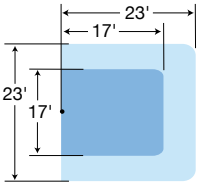
ATP600C Series



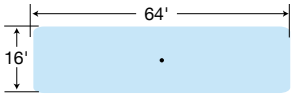
ATU2000C Series



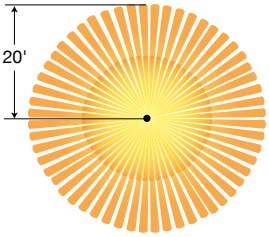
ATU1000C Series



ATU500C Series

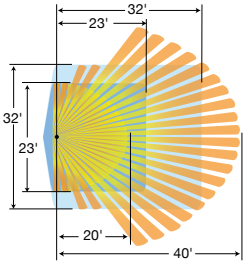


ATU2000C Series
Hallway Application

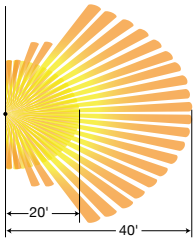


LVPR1500R(P)

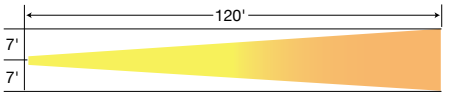
Wall Mount Sensors



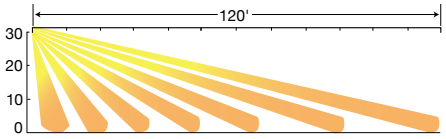
ATD1600W Series



ATP1600W Series



Top View
ATP120HB Series



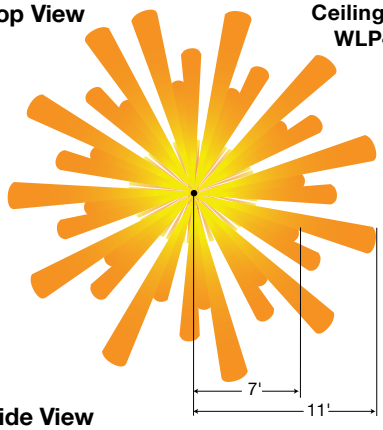
Side View

LEGEND
Minor/Major Motion
Passive Infrared (PIR)

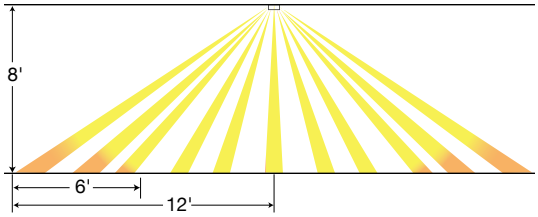
Coverage Patterns

Wireless Sensors

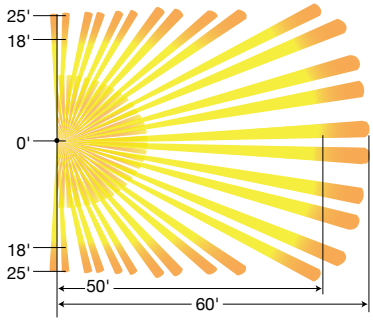
Top View — **Ceiling Mount WLP450C**



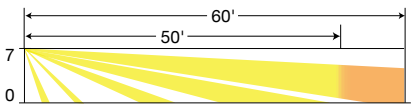
Side View



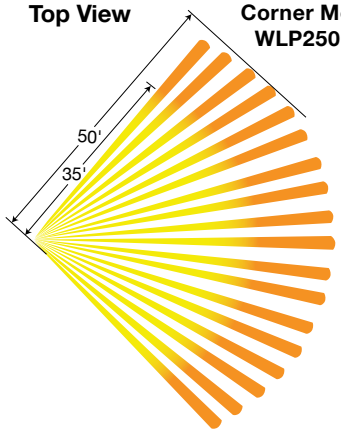
Top View — **Wall Mount WLP3000W**



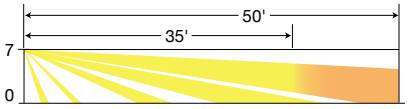
Side View



Top View — **Corner Mount WLP2500W**

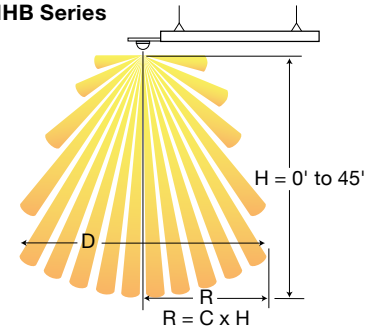


Side View



High Bay Sensors

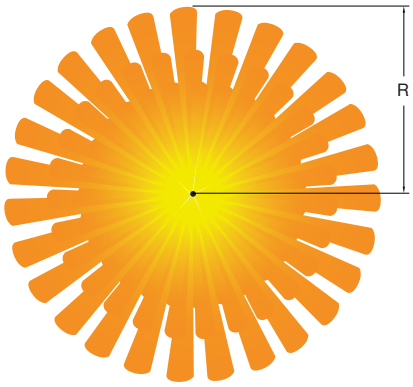
HMHB Series



Lens Coverage
C = 1.4 @ 00–30 and 1.1 @ 30–45 (FT)

H	R	D
18	25.2	50.4
20	28	56
24	33.6	67.2
28	39.2	78.4
30	42	84
32	35.2	70.4
36	39.6	79.2
40	44	88
42	46.2	92.4
45	49.5	99

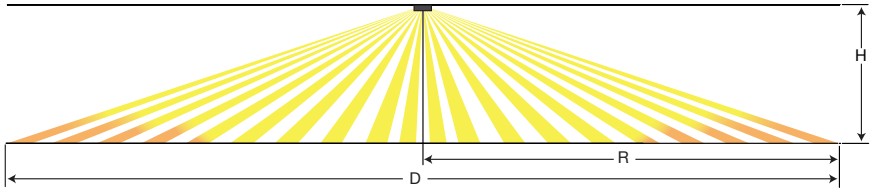
HMLBL360 Top View



Lens Coverage
3:1 Ratio (FT)

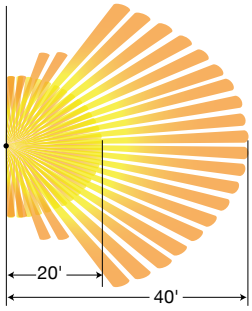
H	R	D
8	24	48
10	30	60
12	36	72
14	42	84
16	48	96

HMLBL360 Side View

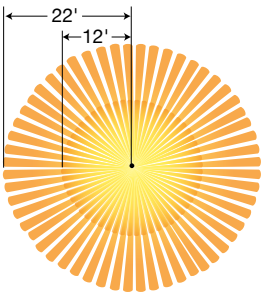


Outdoor Sensors

AHP1600WRP



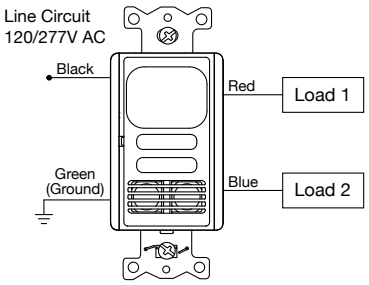
AHP1500CRP



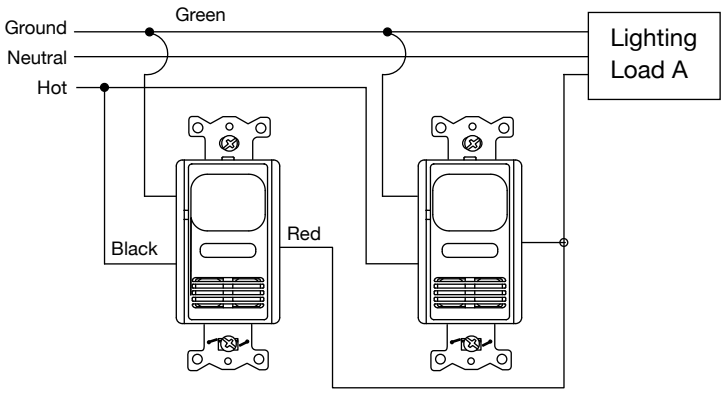
Wiring Diagrams

AD, AU, AP, 2000 Series Wall Switch Sensors

Two Relay Sensor, Wired for Two Loads

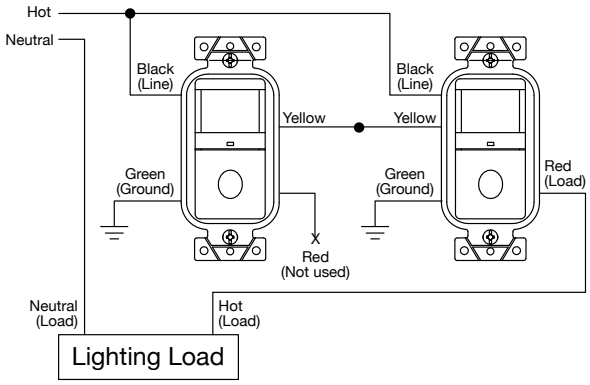


Single Circuit Sensors, Wired as 3-Way Sensors*



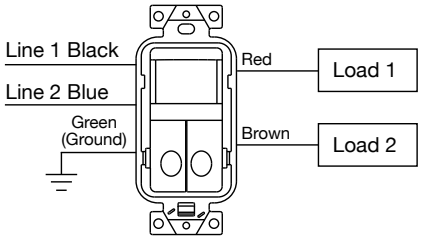
*Note: *Load can not exceed the rating of one switch. Sensor is shipped with all dip switches in the OFF position (factory default).*

WS2000 Series Wall Switch Sensors

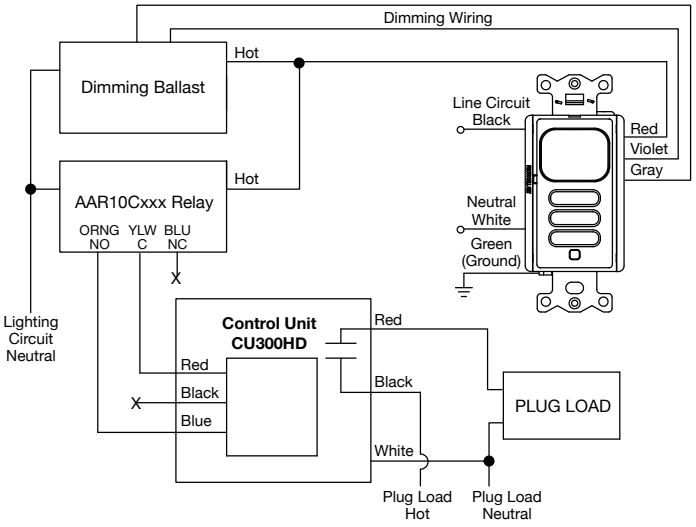


WS1020 Series Wall Switch Sensors

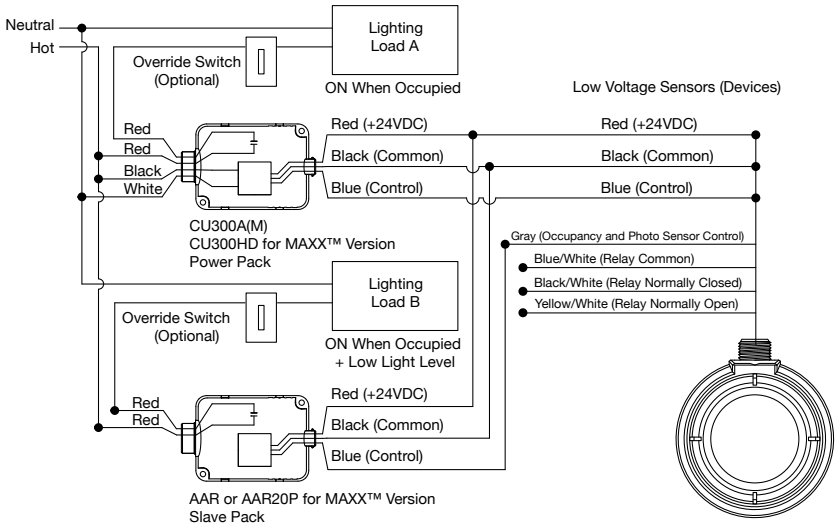
Dual Circuit Sensor, Wired for Dual Circuits



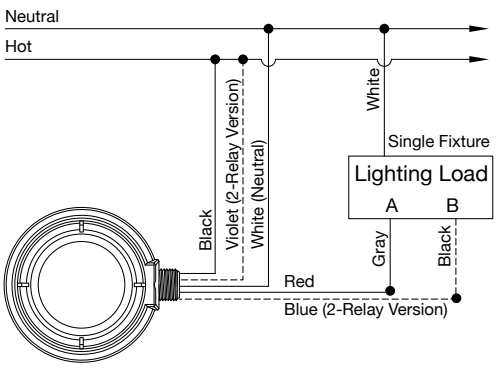
Dimming Wall Switch Sensor with Automatic Receptacle Control



High Bay Low Voltage Sensor with Control Unit

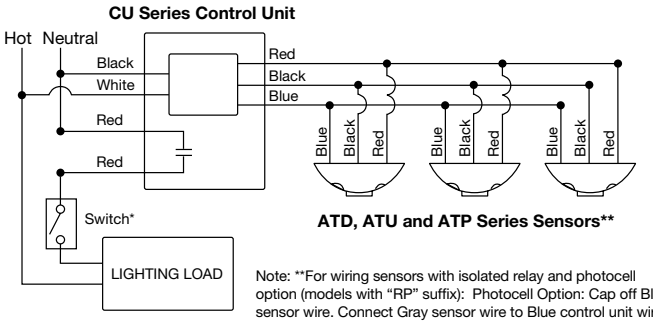


High Bay Line Voltage Sensor Dual Relay, Single Fixture



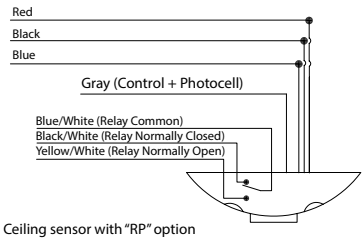
Ceiling and Wall Mount Sensors ATD, ATU and ATP Series

Single lighting circuit 1 to 4 sensors wired to control unit with optional override OFF switch application.



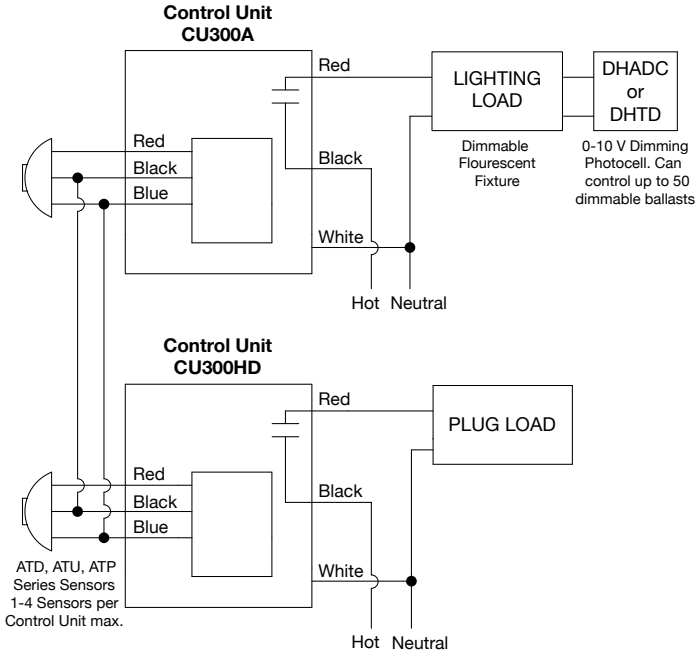
*Optional Override OFF Switch

Note: **For wiring sensors with isolated relay and photocell option (models with "RP" suffix): Photocell Option: Cap off Blue sensor wire. Connect Gray sensor wire to Blue control unit wire. Isolated Relay Option: Common-Blue/White wire, Normally Closed-Black/White wire, Normally Open-Yellow/White wire.

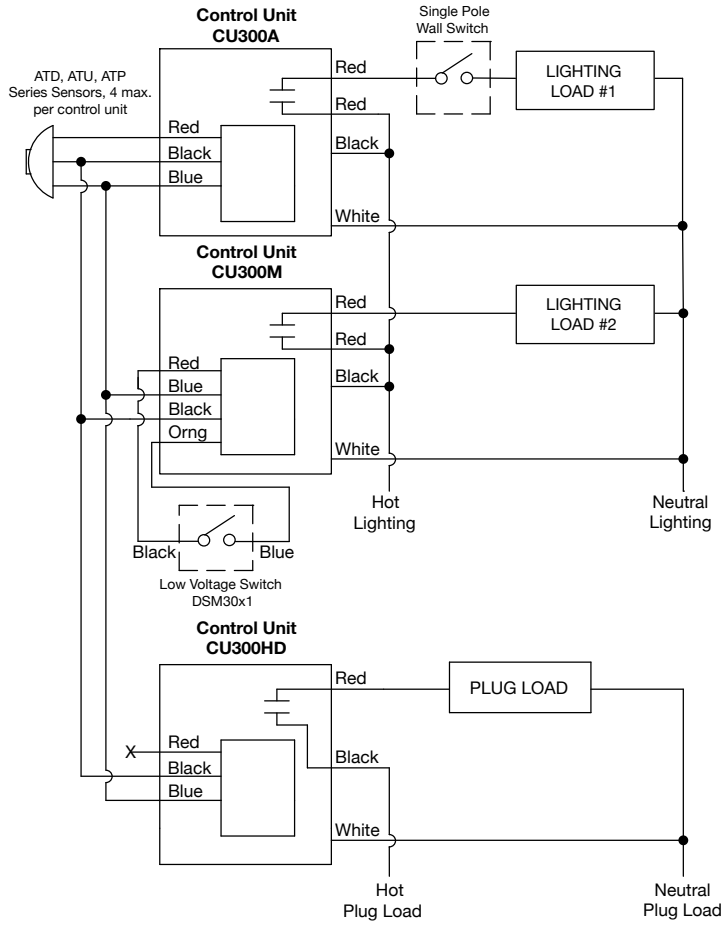


Ceiling sensor with "RP" option

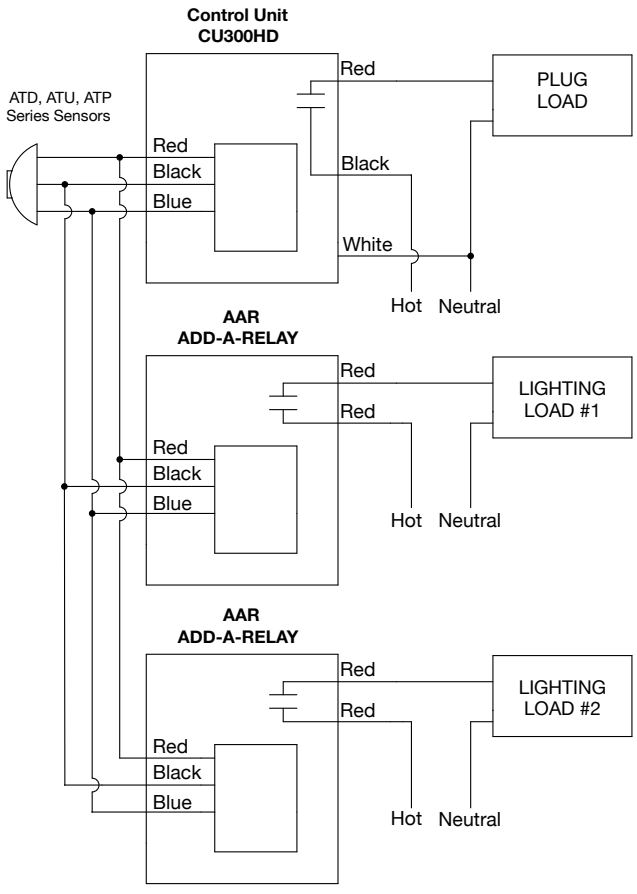
Single lighting circuit with 0-10V dimming and automatic receptacle control application.



Bi-level lighting circuit and automatic receptacle control application.



Two lighting circuits and automatic receptacle control application.



California Energy Commission Title 24 - 2016

Code Provision	Description	Typical Control Device	Requirement	Hubbell Energy Efficiency Product Family
ON / OFF Control				
130.1 (a)	Area Controls	Local Switch	Readily accessible device(s) to control lighting within an enclosed space.	Wall Switch Sensors and Adaptive Ceiling Sensors with Override Switch
130.1 (c) 1 & 4	Shut-OFF Controls	Occupancy Sensors, Programmable Time clocks with Automatic Holiday feature	Occupant sensing, automatic time-switch, or other control capable of automatically shutting OFF all of the lighting when the space is unoccupied	Load:Logic® Control Panel, Wall Switch Sensors and Adaptive Ceiling Sensors
130.1 (c)5	Occupant Sensor Shut-OFF Control	Vacancy Sensor - Manual ON / Automatic Full-OFF	Automatically shuts off lighting power after vacancy of 30 minutes or less.	Vacancy Wall Switch Sensors and Adaptive Ceiling Sensors with Manual ON Feature
Light Level				
130.1 (b)	Multi-Level Lighting Controls	Step or Manual Dimming	At least one multi-level lighting control device (manual or automatic) in enclosed areas 100 sq. ft. or larger. Light level requirements are defined in Table 130.1-A.	Adaptive Dimmable Wall Switch Sensors, WL Series Sensors, OPTIMYZER® Sensors, Load:Logic® Control Panel
130.1 (c) 6 & 7	Occupant Sensor Partial-OFF Control Areas	Occupancy Sensors with dimming capability and bi-level lighting control	Automatically reduce lighting power by at least 50 percent when the areas like aisle ways, open areas in warehouses, stairwells and corridors are unoccupied.	Adaptive Wall Mount Sensors, WL Wall Sensors, OPTIMYZER® Sensors
130.1 (d) and 140.6 (d)	Automatic Daylighting Controls	Daylight Harvesting Devices	Sensor to reduce lighting in response to available daylight. Daylighting zones defined in Section 130.1(d)1. Primary daylight zones must be controlled separately from secondary zones. Refer to Table 130.1-A for lighting-level requirements.	Load:Logic® Control Panel, Adaptive Ceiling Sensors, DHAC, DHT, WLDH Daylighting Harvesting Sensors, WL Series Sensors, OPTIMYZER® Sensors
Additional Provisions				
130.1 (e)	Demand Responsive Controls	Receive and respond to a demand response signal for reducing lighting power	Automatically reduce lighting power by a minimum of 15% in response to a Demand Response Signal. Required for new buildings larger than 10,000 sq. ft. or luminarie alterations that increase the lighting power in the enclosed space.	Load:Logic® Control Panel
130.4	Control Acceptance and Installation Certificate Requirements	Acceptance testing (Installation and functionality testing)	Code compliance, Installation requirements and Testing shall ensure that control hardware and software are calibrated, programmed, and functioning properly.	Adaptive Sensors, Wall Switch Sensors, Daylighting Harvesting Sensors, WL Series Sensors, OPTIMYZER® Sensors, Load:Logic® Family
130.5 (d)	Circuit Controls for 120-Volt Receptacles and Controlled Receptacles	Automatic controlled receptacle and Pre-marked “Controlled” receptacles	At least 50% of the 15- and 20-Amps receptacles in a shall be equipped with automatic shut-OFF control. Controlled receptacles shall have a permanent marking to differentiate them from uncontrolled receptacles.	Load:Logic® Family of Control units and Control Panel, Wall Switch Sensors and Adaptive Ceiling Sensors

ASHRAE 90.1 - 2013

Code Provision	Description	Typical Control Device	Requirement	Hubbell Energy Efficiency Product Family
ON / OFF Control				
9.4.1.1 (a)	Local Control	Local Switch	Readily accessible device(s) to control lighting within an enclosed space.	Wall Switch Sensors and Adaptive Ceiling Sensors with Override Switch
9.4.1.1 (b & c)	Manual ON or Partial ON Operation	Vacancy Sensors	Manual ON when using an occupant sensor. Less than 50% of general lighting power allowed to be automatically turned ON, and none of remaining lighting automatically turned ON.	Load:Logic® Control Panel, Vacancy Wall Switch Sensors and Adaptive Ceiling Sensors
9.4.1.1 (g)	Automatic Partial OFF	Occupancy Sensors, Programmable Time clocks	Requires lighting power to be reduced by 50% within 20 minutes of all occupants leaving the space. This requirement is not optional in some spaces.	Load:Logic® Control Panel, Adaptive Ceiling OPTIMYZER® and WL Series Sensors
9.4.1.1 (h & i)	Automatic Full OFF and Scheduled Lighting Shutoff	Occupancy Sensors, Programmable Time clocks with Automatic Holiday feature	All lighting automatically shut off within 20 minutes of all occupants leaving the space by either scheduled time-of-day operated control, occupant sensor or a signal from another control system.	Load:Logic® Control Panel, Wall Switch Sensors and Adaptive Ceiling OPTIMYZER® and WL Series Sensors
Light Level				
9.4.1.1 (d)	Bi-level Lighting Control	Step or Manual Dimming	Provide at least one intermediate step in lighting power or continuous dimming in addition to full ON and full OFF. At least one control step between 30% and 70% (inclusive) of full lighting power in addition to all OFF.	Adaptive Dimmable Wall Switch Sensors, WL Series Sensors, OPTIMYZER® Sensors, Load:Logic® Control Panel
9.4.1.1 (e & f)	Automatic Daylighting Responsive Controls	Daylight Harvesting Devices	Photocontrol to reduce lighting in response to available daylight using either continuous dimming or at least one control point between 50% and 70%. Second control point between 20% and 40% of design light power or the lowest dimming level technology allows or all controlled lighting OFF.	Load:Logic® Control Panel, Adaptive Ceiling Sensors, DHAC, DHT, WLDH Daylighting Harvesting Sensors, WL Series Sensors, OPTIMYZER® Sensors
Additional Provisions				
9.4.3	Functional Testing	Acceptance testing (Installation and functionality testing)	Testing shall ensure that control hardware and software are calibrated, programmed, and adjusted properly within 90 days of occupancy.	Adaptive Sensors, Wall Switch Sensors, Daylighting Harvesting Sensors, WL Series Sensors, OPTIMYZER® Sensors, Load:Logic® Family
8.4.2	Automatic Receptacle Control	Automatic controlled receptacle and Pre-marked “Controlled” receptacles	In certain areas, at least 50% of the 15- and 20-Amps receptacles in a shall be automatically controlled. Shall turn OFF within 20 minutes of all occupants leaving the space. Controlled receptacles shall have a permanent marking to differentiate them from uncontrolled receptacles.	Load:Logic® Family of Control units and Control Panel, Wall Switch Sensors and Adaptive Ceiling Sensors

LOAD CONTROL

Application Guide

Energy Efficiency Products



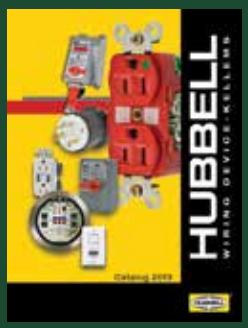
Resources | Online

Hubbell offers a landing page dedicated to energy savings. Be sure to visit the Hubbell Wiring-Device Kellems website for more information.



Also Online | Literature

Hubbell offers an extensive literature library for product support. Downloadable PDFs are available online.



Hubbell Wiring Device-Kellems Catalog



Hubbell Load:Logic® Automatic Receptacle Control Guide



Permanently Marked Control Receptacles for ARCS

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