



# Sensors for an Energy Conscious World





Wiring Device-Kellems



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#### Layout Capabilities and Technical Support

Hubbell representatives are available to answer all your questions and discuss any project—large or small. Sensor selection and layout services are available. Call 800-288-6000 for more info.



### **Energy Conservation at the Forefront**

A significant energy conservation movement has been established across the globe in the form of local, state and national programs, standards and codes that call for energy efficiency in both commercial and residential buildings. These codes and standards include:

- LEED<sup>®</sup> (Leadership in Energy and Environmental Design) certification in new and renovated facilities through the U.S. Green Building Council (USGBC) promotes sustainable building design.
- California Energy Commission's (CEC) Title 24 program enforces stringent standards and regulations to reduce energy consumption, including automatic lighting control and shut-off.
- ASHRAE/IESNA 90.1 energy efficiency code requires interior lighting in buildings larger than 5000 sq. ft. to be controlled with automatic devices.
- IECC<sup>®</sup> (International Energy Conservation Code) compliance requires automatic shut-off of lighting which is now adopted by most states in some form.

As energy concerns increase, the "greening" of commercial and residential buildings will continue through more stringent standards and additional energy conservation initiatives like the EPA's ENERGY STAR program and the 2030 Challenge that aims to reduce energy use by 50% by 2030.

#### Hubbell Occupancy Sensors Play a Key Role

In the U.S., lighting consumes 22% of electricity and represents \$40 billion a year in energy costs. Using advanced technology, Hubbell's H-MOSS® Occupancy Sensors are doing their part to save energy and provide sustainability by automatically and effectively turning lights on when a room is occupied and off when a room is vacant. In a typical office building, where lighting accounts for 35 to 45% of energy use, H-MOSS Occupancy Sensors have the potential to reduce wasted lighting by 13 to 90% for a significant return on investment (ROI).

Hubbell offers a broad range of occupancy and vacancy sensors and lighting controls that meet the latest codes and standards, including ASHRAE/IESNA 90.1 and CEC's Title 24. H-MOSS Occupancy Sensors can also provide LEED<sup>®</sup> points in categories like Sustainable Sites, Energy and Atmosphere, Indoor Environmental Quality and Innovative Design Process.



#### **Backed by Hubbell Service and Support**

H-MOSS<sup>®</sup> Occupancy Sensors are backed by Hubbell's GreenWise<sup>™</sup> sustainability initiative and superior service and support including:

- GREENWISE
- Valuable online H-MOSS ROI worksheet for calculating energy savings
- Detailed H-MOSS online e-learning courses that can be taken anywhere, anytime
- Product selection guide for choosing the right H-MOSS Occupancy Sensor and technology
- Online specification assistance through spec wizard, AutoCAD drawings, templates and documentation
- · Comprehensive design assistance for deploying occupancy sensors in a variety of applications
- · Highly knowledgeable network of specification professionals and trained, dedicated sales staff
- Backed by Hubbell who is committed to safeguarding the environment through environmental stewardship, innovative products and efficient operations

For more information about Hubbell's GreenWise<sup>™</sup> initiative and access to our complete suite of on-line tools, visit our website at www.hubbell-wiring.com/green.



www.hubbell-wiring.com



# Adaptive Technology... Smart Technology for Today's Needs



Adaptive Technology is a Hubbell patented innovation that delivers benefits to both building owners and occupants. The building owner achieves reduced energy costs, fewer adjustments and less maintenance while the building occupant experiences fewer false on and offs and disturbances.

Adaptive Technology occupancy sensors use microprocessors that make all the decisions for setting adjustments. Internal software constantly monitors the controlled area and automatically adjusts the sensitivity and timer based on environmental history. This means that instead of manually adjusting the sensor for seasonal changes, modified airflow, furniture layout or occupancy pattern changes, the sensor automatically adjusts itself. These automatic adjustments eliminate the need for multiple manual adjustments by maintenance personnel or outside contractors. Hubbell offers Adaptive Technology throughout its product offering-wall switches, ceiling and wall mount sensors—in conjunction with dual technology, ultrasonic and passive infrared products.



#### **Benefits:**

- "Install-and-forget" operation
- Adapts to space and needs
  - Seasons
  - Airflow
  - Occupancy Patterns
- Reduces false on and offs



# How to Select the Right Technology for the Proper Application

#### **Dual Technology**



Dual technology occupancy sensors combine both passive infrared (PIR) and ultrasonic (US) technologies for maximum reliability. Because US and PIR need to both detect occupancy to turn lighting on, dual technology sensors minimize the risk of lights coming on when the space is unoccupied—false triggering. Continued detection by only one technology then keeps lighting on as necessary. Dual technology sensors offer the best performance for most applications.

#### **Benefits:**

- Track occupancy on with two sensing methods
- Minimizes false triggering
- Consistent, reliable operation

#### **Ultrasonic (US)**



Ultrasonic (US) technology senses occupancy by bouncing sound waves (32 kHz - 45 kHz) off of objects and detecting a frequency shift between the emitted and reflected sound waves. Movement by a person or object within a space causes a shift in frequency, which the sensor interprets as occupancy. While US occupancy sensors have a limited range, they are excellent at detecting even minor motion such as typing and filing, and they do not require an unobstructed line-of-sight. This makes US technology sensors ideal for an application like an office with cubicles or a restroom with stalls.

#### **Benefits:**

- Detect small motion
- Sees around obstructions
- Cost efficient

### Passive Infrared (PIR)



Passive infrared (PIR) technology senses occupancy by detecting the movement of heat emitted from the human body against the background space. Unlike US technology, PIR sensors require an unobstructed line-of-sight for detection. These sensors use a segmented lens, which divides the coverage area into zones. Movement between zones is then interpreted as occupancy. PIR sensors are ideal for detecting major motion (e.g. walking), and they work best in small, enclosed spaces with high levels of occupant movement.

#### **Benefits:**

- Long range detection
- Reliable triggering
- Cost efficient





# **Office Solutions**



Supply Closets Restrooms Break Rooms Conference Rooms Offices Open Offices Hallways

#### **Pro Tip:**

Sensors with photocells provide additional savings in areas with sufficient natural light by turning off lights whenever possible.

#### **Success Factors:**

- Reduce installation and maintenance labor by eliminating manual adjustments with adaptive sensors.
- Maximize savings with Hubbell's daylight harvesting products which precisely control lighting in response to available natural light.
- Open office spaces provide many placement and product selection challenges. Contact your local Hubbell sensor professional for layout and product assistance.
  - \* Energy Information Administration: 2003 Commercial Buildings Energy Consumption Survey
    \*\* Based on 40% lighting savings
  - from sensors. Actual results may vary.



### Eliminate energy waste and improve the bottom line.

Companies have always had to make tough decisions regarding resource allocation. In the past, energy consumption was often treated as a fixed overhead cost. With new regulations and the need for sustainable building design, this no longer holds true. Lighting is responsible for much of an office's electricity use, and occupancy sensors can provide significant energy savings by only lighting where and when it's needed.

### Enhance reputation and maintain employee satisfaction.

Companies with LEED-certified facilities have a higher standing within their communities and among industry peers. LEED-certified work environments also result in higher levels of employee satisfaction and retention due to healthier, brighter working conditions. Hubbell's H-MOSS sensors can help gain LEED points and illustrate a company's commitment to protecting the environment.

### Typical Office Electricity Usage and Savings\*

Lighting Uses 39% of Total Electricity



Downloaded from Elcodis.com electronic components distributor

Based on average occupancy and installation complexity.



### **Education Solutions**



### Electricity doesn't educate – teachers do.

Electricity bills are second only to payroll in today's restricted school budgets. Most of the electricity goes to keeping the lights on, even when they are not needed. Systematically turning lights off whenever possible significantly reduces a school's utility bill.

#### Regain budget control with Hubbell.

H-MOSS<sup>®</sup> sensors provide a simple, automated and transparent system to make sure that lighting energy is used as needed. This protects school budgets from rate fluctuations, allowing educational institutions to more freely invest in teachers, programs and supplies that directly affect the quality of education.

### Typical Education Electricity Usage and Savings\*

Lighting Uses 31% of Total Electricity



Downloaded from <u>Elcodis.com</u> electronic components distributor

#### Energy Saving Locations:

Store Rooms Restrooms Cafeterias Administration Classrooms Media Centers Hallways

#### **Pro Tip:**

Dual technology sensors enhance minor motion detection reducing false off situations during periods of reading or testing.

#### **Success Factors:**

- Provide advanced lighting control of two zones for projector use with dual circuit switches.
- Increase sensor longevity by specifying AD or AP series switch sensors with vandal resistant hard lenses or ultrasonic sensors.
- Simplify retrofits by eliminating the need to run new wires by utilizing line voltage wall switch and ceiling sensors.
  - Energy Information Administration: 2003 Commercial Buildings Energy Consumption Survey
  - \*\* Based on 40% lighting savings from sensors. Actual results may vary.



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### **Retail Solutions**



Supply Closets Restrooms Changing Rooms Break Rooms Offices Hallways Show Floor

#### **Pro Tip:**

Passive infrared is perfect for changing rooms, and break areas where ROI outweighs performance requirements.

#### **Success Factors:**

- Minimize cost and maximize savings in changing rooms with PIR sensors and short off delays.
- Reduce the chance for sensor damage by specifying the hard lenses of the AD and AP series.
- Contact you local Hubbell sensor professional for assistance with high bay storage and show floor solutions.

\* Energy Information Administration: 2003 Commercial Buildings Energy Consumption Survey

\* Based on 40% lighting savings from sensors. Actual results may vary.



### Illuminate sales potential and increase profit.

Retail establishments use a significant amount of electricity for lighting—both for overhead and display. After all, customers need to clearly see what they're buying. However, there are numerous areas in stores that don't require light all day like stock rooms, restrooms, and fitting rooms. Occupancy sensors in these areas can lower a store's electricity bill and increase profit.

#### The upgrade that pays back.

Hubbell's H-MOSS sensors provide a transparent, automated system that seamlessly makes sure lights are turned on when needed and off when they're not. Employees can carry goods in and out of stock rooms without worrying about lights, and patrons can enter instantly illuminated fitting rooms. Occupancy sensors also show customers that a retail establishment is committed to minimizing energy waste while saving money every day.

### Typical Retail Electricity Usage and Savings\*





Bownloaded from Elcodis.com electronic components distributor

Based on average occupancy and installation complexity.



# **Hospitality Solutions**



### Turn the lights off to keep the lights on.

Over 50% of a hotel's electricity bill goes to keeping lights on, even when guests are away from their rooms. This results in substantial waste that reduces an establishment's financial efficiency and sustainability. With occupancy sensors, the waste can be eliminated without affecting customer comfort and convenience.

#### Manual-on mode automates savings.

Hotel guests are on the go and often away from their rooms. As a result room lights are often left on, even in broad daylight. Specifically developed with the hospitality industry in mind, manual-on mode provides guests with a traditional on/off light control experience but then automatically turn off lights once a room is unoccupied for a period of time. This provides a simple and transparent method to ensuring that lights are off when necessary, significantly increasing a hotel's energy efficiency.

### Typical Hospitality Electricity Usage and Savings\*



Lighting Uses 53% of Total Electricity

Based on average occupancy and installation complexity. Downloaded from Elcodis.com electronic components distributor

#### Energy Saving Locations:

Supply Closets Restrooms Exercise Rooms Break Rooms Meeting Rooms Guest Rooms Food Service Hallways

#### **Pro Tip:**

Utilize manual-on setting to maximize savings by making sure lights are turned off when rooms are unoccupied while giving patrons a traditional on/off experience.

#### **Success Factors:**

- Let guest have traditional control by setting sensors to manual-on mode on AP, AD, and AU series products.
- Utilize free sunlight to light your lobbies and atriums with Hubbell's atrium daylight harvesting sensor.
- Provide nighttime illumination with nightlight sensors.

\* Energy Information Administration: 2003 Commercial Buildings Energy Consumption Survey

 \*\* Based on 40% lighting savings from sensors.
Actual results may vary.





### Healthcare Solutions

#### Energy Saving Locations:

Store Rooms Restrooms Break Rooms Labs Exam Rooms Administration Offices Circulation

#### **Pro Tip:**

Adaptive Technology will automatically adjust for changes in shifts, usage, and seasons eliminating the need for manual adjustments and improving system performance.

#### **Success Factors:**

- Prevent lights from coming on at night in patient rooms by setting AP, AD, and AU series products to manual-on mode.
- Minimize privacy curtains and carts from preventing sensor activation by utilizing Dual Technology or Ultrasonic sensors.
- Healthcare facilities have many special requirements and unique environments. Contact your local Hubbell sensor professional for layout and product selection assistance.
  - \* Energy Information Administration: 2003 Commercial Buildings Energy Consumption Survey
  - \*\* Based on 40% lighting savings from sensors. Actual results may vary.



### Turning lights off should be the least of the worries.

Hospitals are a 24/7 operation where decisions and actions regarding the wellness of patients are critical. Consequently, lights are often left on when not needed. There are several areas throughout hospitals that can realize substantial efficiency improvements with little investment like administration offices, storerooms, closets and break rooms. Private practices, medical labs and outpatient care facilities have lower occupancy rates than hospitals and can further benefit from occupancy sensors.

#### Promote healthier environments.

Light switches are one of the most commonly touched surfaces, spreading diseases and bacteria. Installing occupancy sensors where appropriate eliminates the need to touch a switch, which can help reduce the spread of pathogens. At the same time, healthcare staff benefit from a simple, user-friendly method of controlling the lights.

#### Typical Healthcare Electricity Usage and Savings\* Lighting Uses 42% of Total Electricity



Average electricity Lighting bill savings\*\* 42% Savings 17% Other 20% Climate Control 33% 5% Office Equipment **Application ROI Index** Faster Payback Administrative Offices Rooms Break Rooms Exam Rooms Restrooms Store | Circu-lation -abs

Downloaded from <u>Eleodis.com</u> electronic components distributor

Based on average occupancy and installation complexity.



## **Residential Solutions**



### Is your home ready for the energy age?

Residential construction has changed significantly in recent years. Updated energy efficiency standards such as California Title 24 have pushed energy efficient products to the forefront. Today's homeowners are demanding the latest technologies to help them manage energy usage and stay green. The construction of multi-dwelling units has also become more prevalent with common areas that are ultimately powered on the building owner's bill.

#### Attract today's home buyers.

Energy efficiency is a selling feature that helps differentiate a new home from an existing home. Hubbell's residential vacancy sensors were developed specifically for homeowners by incorporating features such as manual on, alert to off, dimming, optional nightlight and soft on and off. Incorporating Hubbell's sensors into the residence helps comply with the latest building codes while appealing to prospective home buyers.

#### Typical Residential Electricity Usage and Savings\*



Lighting Uses 23% of Total Electricity

Faster Payback Bed Booms Kitchens

Based on average occupancy and installation complexity. Downloaded from <u>Elcodis.com</u> electronic components distributor

#### Energy Saving Locations:

Bathrooms Closets Basements/Garages Pantries Bed Rooms Hallways Kitchens

### Pro Tip:

Vacancy sensors use manual activation to eliminate false triggering by pets and walkthroughs. They also help meet California Title 24 compliance.

#### **Success Factors:**

- Replace switches in bedrooms, bathrooms, closets and basements to maximize ROI as these areas often have lights left on.
- Provide nighttime and safety lighting in bathrooms and closets with nightlight-illuminated sensors.
- Give homeowners even more control of lighting and savings with dimming sensors.
  - Source: US DOE Building Energy Data Book 2008
  - \*\* Based on 40% lighting savings from sensors. Actual results may vary.





### **Office Design Guide**

#### Energy Saving Areas:

Open Office Administration Private Offices Teaming Areas

#### **Pro Tip:**

Line voltage ceiling sensors simplify retrofits. Also note door location and swing radius to position wall switch sensors correctly.





Alternative Wall Switches: WS1277 Series AP1277x1 Series

Ceiling Sensors: ATD500C ATP600C (Must use a Control Unit)

LVPR1500R (No control unit needed)



#### Occupancy trends are changing.

Due to the increased use of flexible work hours, telecommuting and adaptable workspaces, modern office spaces experience constant changing occupancy patterns. These trends have increased the amount of unnecessary illumination in today's offices, which can be minimized through proper utilization of occupancy sensors.

#### Modern technology for modern offices.

The ever-changing nature of today's office space poses challenges for traditional occupancy sensors. Hubbell's H-MOSS<sup>®</sup> sensors, equipped with adaptive technology, constantly monitor and adjust to changing occupancy patterns, layouts and environmental conditions. H-MOSS takes the guesswork out of setup and operation by providing an "install-and-forget" experience.

### Typical Layouts and Coverage Patterns



**Technology** Adaptive Dual Technology (Recommended) Suggested Installation Make sure sensor is not obscured by an open door.



Large Office



**Technology** Adaptive Dual Technology (Recommended) **Suggested Installation** Place sensor to view into the room and not "see" hallway traffic.



**Technology** Adaptive Ultrasonic Technology (Recommended) **Suggested Installation** Position and angle sensors to maximize minor motion detection over work space

concentrations.

**Products** 

Recommended Wall Switch: AD1277x1 Series



Alternative Ceiling Sensor: ATU1000C (Must use a Control Unit)

> Products Recommended Ceiling Sensor: ATU2000C



Must use a Control Unit CU300A



Alternative Ceiling Sensor: LVDT2000R (No control unit needed)

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### **Restroom Design Guide**

#### Energy Saving Areas:

Single Person Multi Person Locker Rooms Powder Rooms

#### **Pro Tip:**

Dual circuit sensors can allow for control of lights and exhaust fan simplifying installation. Contact technical services regarding load and motor types supported.

### Products

Recommended Wall Sensors: AU1277X1 Series



Alternative Wall Switches: WS1277 Series AP1277x1 Series

Ceiling Sensors: ATU500C (Must use a Control Unit) LVPR1500R (No control unit needed)



#### Occupied or not?

Restrooms are typically occupied less than 50% of the day, and lights are often left on while no one is present. Restrooms are also isolated, making it difficult to determine if lights have been left on inadvertently. Significant savings can be achieved by systematically turning lights off when possible.

#### Promote savings and health.

H-MOSS<sup>®</sup> sensors intelligently sense occupation and control lights accordingly so facility managers no longer have to ensure that the lights are turned off in restrooms or when closing up. And because a switch is a common touch point for transmitting germs in bathrooms, using H-MOSS sensors helps promote healthy buildings.

### Typical Layouts and Coverage Patterns



**Technology** Adaptive Ultrasonic Technology (Recommended) **Suggested Installation** Mount switch in location that limits chance for damage.

#### **Small Single Restroom**

Downloaded from Elcodis.com electronic components distributor



Adaptive Ultrasonic Technology (Recommended)

Place sensor closer to stalls to maximize minor motion detection.



**Technology** Adaptive Ultrasonic Technology (Recommended)

Suggested Installation Multiple sensors provide complete coverage and allow selective lighting based on occupancy.

Large Restroom with Locker Room

**Ceiling Sensors:** LVUS2000R **LVUS1500R** (No control unit needed)

**Alternative** 

Recommended Ceiling Sensor: **ATU500C** 

10 1/11

**Products** 

Must use a Control Unit **CU300A** 



**Alternative** Wall Sensor: ATU2000C

Ceiling Sensor: **LVUS1500R** (No control unit needed)





### **Classroom Design Guide**

#### Energy Saving Areas:

Classrooms Conference Halls Libraries

#### **Pro Tip:**

Dual technology provides reliable operation during periods of low activity such as testing. Manual on/off sensors provide control for movies and presentations.





Must use a Control Unit CU300A



Alternative Ceiling Sensor: LVDT2000R (No control unit needed)



#### H-MOSS<sup>®</sup>—the teacher's new pet.

Lighting classrooms consumes a substantial amount of the education budget. However, significant savings can be realized by turning off lights when they are not needed. Occupancy sensors provide an inexpensive way to guarantee that energy waste is kept to a minimum. They can further enhance savings by using optional photo sensors that turn off the lights when enough natural light is detected.

#### Design for change.

Classrooms are multi-use spaces that accommodate school-day activities and after school programs. Field trips, vacations, events and cancellations all affect occupancy patterns. At the same time, seasonal environmental conditions are always changing. Hubbell's patented Adaptive Technology automatically adjusts to these changes to minimize inadvertent activation and maximize savings. Hubbell provides one of the most complete sensor lines for effectively managing project cost and performance in educational institutions.

#### Typical Layouts and Coverage Patterns Large Classroom



**Technology** Adaptive Dual Technology (Recommended) **Suggested Installation** Provide teachers with manual override switches to turn off lights during A/V presentations.



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### **Products**

Recommended Ceiling Sensors: ATD2000C





Both must use a **Control Unit CU300A** 

#### **Products** Recommended Ceiling Sensor: ATD2000C



Must use a Control Unit CU300A









Here the



Wall Switches: AU1277x1 Series AU1277X1N Series



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Lower Grade Elementary Class

Ô 45' 7 34' 7'

# Technology

Adaptive Dual Technology (Recommended for classroom) Adaptive Ultrasonic Technology (Recommended for bathroom)

Adaptive Dual Technology

(Recommended for sitting area)

Adaptive Ultrasonic Technology (Recommended for browsing area)

> Suggested Installation Provide teachers with manual override switches to turn off lights for quiet times.

Utilize ultrasonic sensors between book

case stacks to eliminate blind spots.

Downloaded from Elcodis.com electrofile components distributor PIR Minor Motion: Ultrasonic PIR



### Laboratories Design Guide

#### Energy Saving Areas:

Pharmaceutical Labs Quality Control Areas Product Development Labs

Rapid Prototyping Shops

### **Pro Tip:**

Use Dual Technology or Ultrasonic in labs with obstructions such as large filing cabinets or air flow hoods.

#### **Products**

Recommended Wall Switches: AU1277x1 Series AU1277X1N Series



Alternative Wall Switches: WS1277 Series AP1277x1 Series

Ceiling Sensors: ATU500C (Must use a Control Unit) LVPR1500R (No control unit needed)



#### Labs have unique requirements

Laboratory spaces are unique environments that have uncommon usage patterns and requirements, such as clean room classification. Lab technicians and scientists often have their hands occupied dealing with equipment, chemicals or biomaterials. In addition, occupancy constantly changes in labs. Even though lighting is often not needed for prolonged periods of time, lights are often left on.

#### Sensors-clean and efficient.

Hubbell's H-MOSS occupancy sensors provide a helpful way of automating energy savings. At the same time, they enhance the operation of the lab environment by allowing users to focus on their work instead of managing the lights. Ideal for the clean room environment, sensors have fewer moving parts that minimize foreign particulate generation and smooth surfaces that can be more easily cleaned. Hubbell's H-MOSS sensors not only save money, they provide a more efficient work environment.

### Typical Layouts and Coverage Patterns

#### **Small Laboratories**



**Technology** Adaptive Ultrasonic Technology (Recommended) **Suggested Installation** Utilize PIR to prevent detection of minor equipment motions.



#### **Large Laboratories**



**Technology** Adaptive Dual Technology (Recommended)

#### **Suggested Installation** Determine equipment placement to position sensors accordingly. Multiple sensors may be required if

position sensors accordingly. Multiple sensors may be required if large equipment is present.

#### **Computer Lab**





Alternative Ceiling Sensor: LVDT2000R (No control unit needed)

> Products Recommended Ceiling Sensor: ATD2000C



Must use a Control Unit CU300A

Alternative Ceiling Sensor: LVDT2000R (No control unit needed)

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## Conference Room Design Guide

#### Energy Saving Areas:

Large Boardrooms Small Boardrooms Training Rooms Teaming Areas

#### **Pro Tip:**

Use sensors with manual on/off control for projection of presentations.

#### Products Recommended Wall Switch: AD1277x1 Series



Alternative Ceiling Sensor: ATD1000C (Must use a Control Unit)



#### A place of purpose

Conference rooms are critical, bringing great minds together to develop strategies for success, but these meetings of the minds don't always happen all day long. People come and go, and even day-long meetings often break for significant periods of time. Still, lights are often left on when meetings adjourn and conference rooms are left empty. In addition, productivity increases with natural light, often making lighting unnecessary where windows can take over.

#### Portraying the right image

The irregular occupancy pattern of conference rooms makes these spaces ideal for Hubbell occupancy sensors. The use of photocell sensors ensures productive natural light is utilized when detected. Manual controls avoid lights coming on during audiovisual projection despite movement in the room. Because conference rooms are also often frequented by guests, they portray an image to meeting guests and attendees. No better image could be portrayed than a commitment to the environment through the use of occupancy sensors.

### Typical Layouts and Coverage Patterns



**Technology** Adaptive Dual Technology (Recommended) **Suggested Installation** Make sure sensor is not obscured by presentation equipment like screens or easels.



#### Large Conference Room



#### **Products**

Recommended Ceiling Sensor: ATD1000C



Must use a Control Unit CU300A



Alternative Ceiling Sensor: LVDT2000R (No control unit needed)

**Technology** Adaptive Dual Technology (Recommended)

#### **Suggested Installation**

Dual circuit wall switches can be used to allow accent lighting during presentations if room size allows.





### Storage Area Design Guide

#### Energy Saving Areas:

Warehouses Supply Closets Storerooms Utility Closets Network Closets

#### **Pro Tip:**

Set short delays for small supply closets and store rooms to maximize savings.

Products Recommended Wall Switch: WS1277x Series



Alternative Ceiling Sensor: ATP600C (Must use a Control Unit)



#### **Frequently forgotten**

Closets and storerooms offer one the best environments for occupancy savings due to intermittent use. Furthermore, people leaving these spaces are often carrying supplies or merchandise, making turning off lights difficult. People then move on to the task at hand. Going back to turn off lights is frequently forgotten. Like restrooms, closets and storerooms are normally isolated, and it's difficult to determine if lights have been left on.

#### Easy in, easy out

With occupancy sensors, entering or leaving a storeroom with hands full is easily accomplished without worrying about the lights staying on and wasting energy. Hubbell H-MOSS breadth of products includes occupancy sensors with passive infrared technology that are ideal for small spaces of major movement, as well as options for covering large warehouse aisles and high-bay applications with 120-foot linear coverage.

### Typical Layouts and Coverage Patterns



#### **Small Closet/Storeroom**

**Technology** Adaptive Passive Infrared Technology (Recommended)

#### **Suggested Installation**

Position sensor close to door to make sure lights come on when the door is opened.





Adaptive Dual Technology (Recommended)

#### **Suggested Installation**

Use a wall mount sensor if ceiling height is above 12ft.



**Technology** Passive Infrared Adaptive Technology (Recommended)

#### **Suggested Installation**

Utilize fixture mount high bay sensors in larger areas or where wall sensors are not feasible.

**Products** 

Recommended Wall Mount Sensor: ATP120HB



Must use a Control Unit **CU300A** 



**Alternative** Ceiling Sensor: HMHB2xU Series



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Application	Space		Sensor Technology			
	× L		Adaptive	Dual	Ultrasonic	
			Const.			
	Office	<b>Small</b> up to 1000 sq. ft.	<b>√</b> +	<b>√</b> +		
-		Large up to 2000 sq. ft.	<b>√</b> +	<b>√</b> +		
	Open Office	up to 2000 sq. ft.	<b>√</b> +		<b>√</b> +	
	Storage/	<b>Closet</b> up to 1200 sq. ft.				
	Warehouse	Warehouse up to 1500 sq. ft.	<b>√</b> +			
-	Restroom	<b>Small</b> up to 400 sq. ft.			<b>√</b> +	
		Large up to 2000 sq. ft.	<b>√</b> +		<b>√</b> +	
	Conference	<b>Small</b> up to 1000 sq. ft.	<b>/</b> +	<b>√</b> +		
	Room	Large up to 2000 sq. ft.	<b>\</b> +	<b>√</b> +		
	Classroom	<b>Small</b> up to 1000 sq. ft.	<b>/</b> +	<b>√</b> +		
TELES		Large up to 2000 sq. ft.	<b>/</b> +	<b>/</b> +		
	Hallv	vay	<b>√</b> +		✓+	

Daylight Harvesting Sensors Available.

	Sensor Style		Products		
PIR	Wall Switch	Ceiling	Wall	Recommended	Alternative
	<b>√</b> +			AD1277W1	WS1277 ATD500C AP1277W1 ATP600C LVPR1500R
		<b>√</b> +		ATD2000C	ATU2000C LVDT2000R
		<b>√</b> +		ATU2000C	ATD2000C LVDT2000R
<b>/</b> +	<b>√</b> +			WS1277W ATP1500C ATP120HB	
<b>/</b> +		<b>/</b> +	<b>√</b> +	HMHB21U HMHB22U HMHBSA	HID1 HID2 HID3
<b>√</b> +	<b>√</b> +	1		AU1277W1N AU1277W1	ATU500C LVPR1500R
		<b>√</b> +		ATU2000C	LVUS2000R LVUS1500R
	<b>√</b> +			AD1277W1	ATD1000C
		<b>√</b> +		ATD2000C	LVDT2000R
	<b>√</b> +			AD1277W1	ATD2000C
		<b>√</b> +		ATD2000C	LVDT2000R
		<b>\</b> +		ATU2000C	ATP120HB LVUS2000R ATU2000C

All ceiling sensors must use a CU series control unit except line voltage series



## Hubbell Sensors for an

Wall Sv Adaptive 120/277V Ad	<b>witch Techn</b> e	es blogy			•
Туре	Circuit	Coverage	1 Button	2 Button	No Button
Dual Technology	Single Dual	1,000 sq. ft. 1,000 sq. ft.	AD1277x1 —	_ AD1277 <mark>x</mark> 2	AD1277 <mark>x</mark> 1N AD1277 <mark>x</mark> 2N
Ultrasonic	Single Dual	1,000 sq. ft. 1,000 sq. ft.	AU1277 <mark>x</mark> 1 —	_ AU1277 <mark>x</mark> 2	AU1277 <mark>x</mark> 1N AU1277 <mark>x</mark> 2N
Passive Infrared	Single Dual Single Single	1,000 sq. ft. 1,000 sq. ft. 1,200 sq. ft. 1,200 sq. ft.	AP1277x1 — ATP1277x AT1277x	_ AP1277x2 _ _	AP1277x1N AP1277x2N — —

The AD/AU/AP1277 series are available as standard colors in White (W) and Ivory (I). They are also available as special orders with minimums and lead times in the following colors: Gray (GY), Black (BK) and Light Almond (LA) The AT1277 is available in White (W), Ivory (I) and Gray (GY). To order colors, replace "x" with appropriate suffix.



#### Non Adaptive Technology

-				
Description	Coverage	120V AC	277V AC	120/277V AC
1 button	1,200 sq. ft.	_	_	WS1277x
1 button	900 sq. ft.	WS120x	WS277x	_
Double pole	1,000 sq. ft.	—	—	WS1277W2

Available in White (W) and Ivory (I). To order colors, replace "x" with appropriate suffix.

Residential			
Description	Coverage	Occupancy	Vacancy
1 button	800 sq. ft.	RMS101x	RMS100x
1 button w/ nightlight	800 sq. ft.	RMS101ILx	RMS100ILx
1 button w/ dimming	800 sq. ft.	RMS121x	RMS120x
1 button w/ dimming & nightlight	800 sq. ft.	RMS121ILx	RMS120ILx
Heavy duty	900 sq. ft.	RMS141x	RMS140x

Residential sensors are available in Ivory (I), White (W), Almond (AL) or Light Almond (LA). Heavy duty sensors are not available in Light Almond. To order replace "x" with appropriate suffix.



#### **Digital Timer**

Description	Catalog Number
Digital Timer; white; dip switch enabled preset intervals:	DT1277W
- 5, 15 or 30 minutes - 1, 3, 6, 9 or 12 hours;	
includes an on/off momentary push button switch feature	



Must use a CU series control unit.

Available with photocell and isolated relay. To order add "RP

Non Adaptive Line Voltage Sensors				
Туре	Coverage	Dual Technology		
120V AC	1500 sq. ft. 2000 sq. ft.	 LVDT2000R120		
277V AC	1500 sq. ft. 2000 sq. ft.	LVDT2000R277 —		
120-347V AC	1500 sq. ft.	_		

\* Also available in low voltage.

Must use a CU series control unit. To order add "P" to the

#### Wall Mount Sensors

#### **Adaptive Technology**

Description	Coverage
Wall mount sensor	1,600 sq. ft.
For aisle & high bay	120 linear ft.
Must use a CU series control unit.	

Add "RP" to the catalog number to order with photocell and

### **Control Units**

Control Unit for use with ATD/ATU/ATP Series wall/ceiling sensors Description 120/277V AC, 50/60 Hz 347V AC, 60 Hz

### Add-a-Relay

Description Add-A-Relay for use with CU series control units and ATD, ATU and ATP series ceiling and wall mount sensors



# **Energy Conscious World**



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' to the catalog number.



Ultrasonic	Passive Infrared
LVUS1500R120	_
LVUS2000R120	
LVUS1500R277	_
LVUS2000R277	_
_	LVPR1500R*

catalog number.

	0
Dual Technology	Passive Infrared
ATD1600W —	ATP1600W ATP120HB

isolated relay



Catalog number CU300A CU347A



Catalog number

Description	Catalog Numbe
Automatic Dimming Control	DHADC
Indoor Photocell	DHIP
Outdoor Photocell	DHOP
Atrium Photocell	DHAP
Skylight Photocell	DHSP
Control Module	DHCM
	1
High Ray Controls	
nigh day Controis	1
Elucrocont Control	
	Catalog Numbo
Description	
Passive Initiated Sensor 2 SPST Output: 120-347 VAC	
Mounting Extension Adaptor	
HID Control	
Description	Catalog Numbe
Supports 175W Metal Halide	HID1*
Supports 250W, 320W, 350W, 400W Metal Halide	HID2*
	HID3*
Supports 1,500W, 1,650W Metal Halide	

Aisie Lens		$\overline{}$	
Description	Color	Max. Mounting Height	Catalog Number
Aisle Lens	Black	25 ft.	HIDLENS15
Aisle Lens	Charcoal	35 ft.	HIDLENS10
Aisle Lens	Clear	60 ft.	HIDLENS07
Area Lens	Light Gray	35 ft.	HIDLENS0806
Laser Alignment Tool Conversion Hardware Kit			HIDLAT HIDKIT

#### **Accessories**

Description	Catalog Number
Ceiling Sensor Infrared Protective Enclosure	ACIPE
Wall Switch Wire Guard	AWSG
Wall Mount Wire Guard	AWMG
Ceiling Mount Wire Guard	ACMG
Ceiling Mount Raceway Adapter	ACMRA



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