



## SMART LINE VOLTAGE DIMMING ROOM CONTROLLERS CALIFORNIA TITLE 24 COMPLIANT

Cat. Nos. AC705-DMW / ACY15-DIW / ACY20-DMW

**Rating:** 120VAC, 50/60Hz, 8A LED/Ballast, 800VA Tungsten, 1/4 Hp / **Current Consumption:** 60mA  
**Rating:** 277VAC, 50/60Hz, 5A LED/Ballast, 1200VA Tungsten, 1/3 Hp / **Current Consumption:** 30mA  
**Operating Temperature:** 32° to 104°F (0° to 40°C) / **Operating Humidity:** 10 to 90%, non-condensing  
 Compatible with 0-10V controlled 120-277VAC loads.



### WARNINGS:

- **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
- **TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING!**
- To be installed and/or used in accordance with appropriate electrical codes and regulations.
- If you are unsure about any part of these instructions, consult an electrician.
- Use this device **with copper or copper-clad wire only.**
- Installation and servicing should be performed by qualified personnel.
- **DO NOT** use outdoors.
- **DO NOT** mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.

### WARNINGS:

- The use of accessory equipment not recommended by manufacturer may cause an unsafe condition.
- **DO NOT** use this equipment for other than the intended use.

### CAUTIONS:

- Sensors must be mounted on a vibration free surface.
- Do not terminate using data type wire, such as Cat 5/5E.
- Do not mount sensors closer than 15 feet to each other.
- All units must be mounted at least 6 feet away from air vents, air handlers, and reflective surfaces (windows/mirrors).
- Do not touch the surface of the lens. Clean outer surface with a damp cloth only.
- **SAVE THESE INSTRUCTIONS.**

PK-A3470-10-00-2A

## INSTALLATION INSTRUCTIONS

ENGLISH

### DESCRIPTION

The next generation of lighting control technology is here with the new Smart Sensor Room Controller with Bluetooth® Technology. This innovative device works using the Leviton Smart Sensor app that can be easily downloaded to smartphones or tablets and paired to the Leviton Smart Sensor Room Controller using Bluetooth® technology. Smart Sensor Room Controller devices give users point-to-point local control to automate lighting, bridging the gap between standard room controllers and whole-building automation systems. Multiple Smart Sensor Room Controllers and/or Sensors can be joined together to expand the field-of-view while maintaining local control when wired to a PLVSW low-voltage keypad.

The Leviton Smart Sensor app can be easily downloaded to mobile devices and is compatible with Android and iOS smartphones or tablets. The Smart Sensor app is easy to use with simple, intuitive on-screen menu options to control a Smart Sensor Room Controller.

The **AC705-DMW** and **ACY20-DMW** Room Controllers are LINE-voltage multi-technology (PIR and Ultrasonic) sensors (Occupancy and Photocell) that automatically control lighting. The room controller's multiple sensors and technology work together to provide room lighting automatically and efficiently. Occupancy sensors turn the lights ON and keep them ON, and will turn them OFF when room is vacant and delayed-off timer expires. Photocell detects natural light and dims room lighting up or down as needed for additional energy efficiency and circadian rhythm occupant comfort benefits.

The **ACY15-DIW** Room Controller is a LINE-voltage infrared sensor that automatically controls lighting. The room controller is multiple sensors working together to provide room lighting automatically and efficiently. Occupancy sensor turns the lights ON and keeps them ON, will turn them OFF when room is vacant and delayed-off timer expires. Photocell detects natural light and dims room lighting up or down as needed for additional energy efficiency and circadian rhythm occupant comfort benefits.

The Smart Sensor Room Controllers can be used in vacancy (Manual-ON) applications when used with PLVSW low-voltage keypads. The lights can be turned ON manually by pressing the low-voltage/momentary toggle switch or PLVSW 1, 2, or 4 button switch. The sensor turns the lights OFF when vacancy is detected and the delayed-off time has expired.

### NOTES:

- Multiple PLVSW switches can be used with a single Room Controller. Multiple 2 and 4 button switches OR multiple 1 button or low-voltage momentary or toggle switches.
- For dual relay models, ACY15-DIW / ACY20-DMW, two PLVSWs can be connected for manual control of each zone

The combination of ultrasonic (doppler shift) motion detection which gives maximum sensitivity and infrared motion detection which gives higher false triggering immunity yields a sensor with excellent performance.

Infrared motion detection gives higher false triggering immunity that yields a sensor with excellent performance.

These sensors continually analyze and adjust to changing conditions and use the latest microprocessor-based technology which permits them to continually adjust and optimize their performance.

### TOOLS NEEDED

- Slotted/Phillips Screwdriver
- Wire stripper
- Small Slotted Screwdriver
- Cutters

### PARTS INCLUDED LIST

- Room controller (1)
- Angled Light Pipe (1)
- 4" x 4" Mounting Plate (1)
- Flat Light Pipe (1) (assembled)
- #6-32 x 1-1/2" Screw (2)
- 360° Perforated Mask (1)
- Mid-Range Lens [red frame] (1)
- Low-voltage Connector (1)
- Extended Range Lens [black frame] (1) (assembled)
- Half Mask (1)
- High voltage terminal covers (1)
- Tubing Barrier (1)

### INSTALLING YOUR ROOM CONTROLLER

**1. WARNING: TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER** at circuit breaker or fuse and **TEST** that power is OFF before wiring!

#### 2. PREPARING AND CONNECTING WIRES:

- Connect wires per appropriate WIRING DIAGRAM as follows:
- Make sure that the ends of the wires from the electrical box are straight
- Remove insulation from each wire in electrical box as shown.
- Wire per specifications:



#### Line, Neutral, Load Wires (Copper)

**Wire range:** #12-18 AWG, 3.3 - 0.75 mm square

**Torque rating:** 20 lb-in, 23 kgf-cm.

#### Control Wires (Manual Switch, Demand Input and 0-10V)

**Wire range:** #16-26 AWG, 4.0 - 0.12 mm square

**Torque rating:** 2.5 lb-in, 2.88 kgf-cm.

**NOTE:** Maximum system low-voltage wire length must be limited to 800 ft.

#### 3. INSTALLING YOUR ROOM CONTROLLER:

- Insert wires into proper terminals. Use a screwdriver to turn terminal screws clockwise and secure wires.
- **NOTE:** Wires need to be inserted from the top through the wire holes provided on the room controller and clamped down using the washer to the terminals. Cover terminals with provided high voltage terminal covers.

- Load wire(s) to Load terminal(s).
- Neutral wire to Neutral terminal.
- Line wire(s) to Line terminal(s).
- Connect the Violet wire to the + 0-10V line and the Pink wire to the common 0-10V line using Class 1 or Class 2 wiring methods as indicated by the load / ballast installation instructions or label markings.
- Manual Switch and Demand Input to their respective marked terminals.

### NOTE:

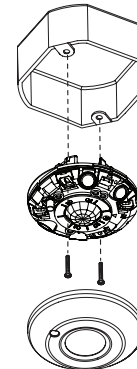
- Depending on date of manufacture, the pink 0-10V wire may be gray.

### NOTES:

- Both loads of the 2-zone units **MUST** be fed from the same phase.
- When installing Class 2 wiring, use the provided tubing for insulation inside the junction box.

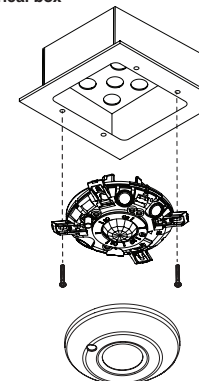
**To mount inside 4 in. octagon 2.125 in. deep ceiling electrical box:**

- Dress line voltage wires to provide enough clearance in electrical box when device is installed.
- Partially thread two #8-32 screws (not included) into the mounting holes of the electrical box.
- Pull out the two coasters that align with the two screws.
- Align room controller so that it fits between the mounting holes of the electrical box and insert over mounting screws.
- Push in the two coasters that align with the two screws.
- Tighten mounting screws firmly.



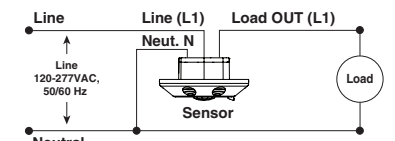
**To mount inside 4 in. square 1.5 in. deep ceiling electrical box with mud ring**

- Ensure that conduit/cable entry clamp is located in corner of electrical box.
- Dress line voltage wires to provide enough clearance in electrical box when device is installed.
- Install a two-gang mud ring (not included) on electrical box.
- Partially thread the two #6-32 screws provided into the mounting holes of the electrical box.
- Pull out the two coasters that align with the two screws.
- Align sensor so that it fits between the mounting holes of the electrical box and insert over mounting screws.
- Push in the two coasters that align with the two screws.
- Tighten mounting screws firmly.

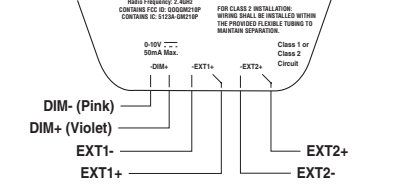


### Wiring Diagram 1 AC705-DMW (1-Zone)

#### Line Voltage

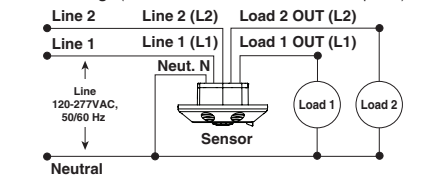


#### Class 1 or Class 2 circuit

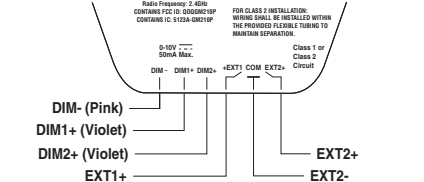


### Wiring Diagram 2 ACY15-DIW & ACY20-DMW (2-Zone)

#### Line Voltage (both lines **MUST** be fed from the same phase)



#### Class 1 or Class 2 circuit



**NOTE:** External inputs are configurable using the Smart Sensor App as a Manual Switch, Demand Response, and/or Emergency.

## ROOM CONTROLLER OPERATION

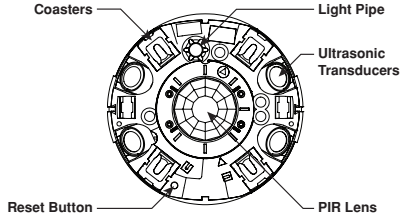
Complete explanation of the Room Controller's modes of operation and factory default settings is available in the Smart Sensor app on your mobile device.

- **Delayed-Off time:** The room controller is designed to turn the lights OFF if no motion is detected after a specified time. This length of time is called the Timeout and is set using the Smart Sensor app on your mobile device.
- **Walk-through mode:** The walk-through mode is useful when a room is momentarily occupied. The walk-through mode works as follows: When a person enters the room, the lights turn ON. If the person leaves the room before the default walk-through timeout of 2.5 minutes, the room controller turns the lights OFF 2.5 minutes later. If the person stays in the room for longer than 2.5 minutes, the room controller proceeds with the standard operation.
- **Sensitivity:** Both PIR and Ultrasonic sensor sensitivities can be adjusted in the Smart Sensor app based on room size and to help avoid false-ONs and false-OFFs.
- **Reset Device State:** There are three methods to trigger a factory reset; each of these can be used to reset the Room Controller.
  - Via the Smart Sensor app.
  - Press the ON or OFF button on the PLVSW keypad (if connected to Room Controller) for 20-25 seconds until the sensor's LED is flashing Red then release within five seconds.
  - Remove cover from sensor, press the PCB switch for five seconds (see diagram below).
- **Walk Test:** This mode is for field-of-view test purposes only, and sets the room controller timeout to 4 seconds.

**NOTE:** Enabling walk test mode will reset auto adaptive data.

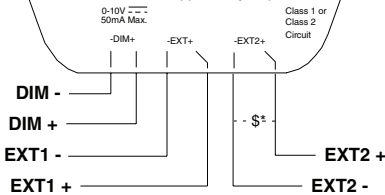
- **Manual ON/OFF Switch:** Use to override occupancy and manually turn the lights ON or OFF by pressing the low-voltage momentary/toggle switch or PLVSW 1, 2, or 4 button switch.
- **Demand Response Interface:** This input is intended for use with BMS (Building Management System), ADR (Automated Demand Response) or any contact closure to force the 0-10V output to reduce the level by 15-50% as configured in the Smart Sensor app.
- **Emergency Interface:** this input is intended for use with BMS (Building Management System) or any contact closure to force the lights full ON in case of emergency. Any commands through the manual switch or Smart Sensor App will be ignored while the emergency signal is active. Lights will stay ON until emergency signal is cleared.
- **Plug Load:** Inputs identified as plug load will turn ON upon occupancy and OFF when space becomes vacant and the timeout expires. Lighting can be manually turned OFF, but plug load will remain ON as long as the space is occupied.

**CAUTION:** If plug load is powered from Load 1 or Load 2 outputs, max load rating is 8A where a typical power breaker typically permits 15A or 20A. For a full 20A output rating, use with a Leviton 20A power pack such as the OPP20 or OSP20 to control the plug load.



**Emergency Self-Test:** NFPA 101 Life Safety Code and NEC (Article 700.3(B)) requires regular testing of all emergency equipment. To perform a test of these products, a Test Switch that is a single pole, momentary, push button switch, that returns the equipment to normal status when released can be installed locally to interrupt normal power and perform emergency system test.

**NOTE:** The diagram below depicts a "Single Pole Momentary Push Button Switch" (S) on one of the low voltage inputs to trigger the emergency systems test. The input must be defined as "emergency" in the Leviton Smart Sensor App. Clarify requirements with all local authorities.



## PHOTOCELL OPERATION

Complete explanation of the Photocell operation and calibration is available in the Smart Sensor app on your mobile device.

### DIMMING

The photocell controls a 0-10 VDC dimmable ballast or LED Driver to achieve maximum Energy savings while maintaining a minimum light level referred to as the "DDL" When no daylight is available, the photocell allows the load to operate at its full bright level. As daylight increases in the room, the photocell dims the load. When the minimum dim level is reached (and if the Dim to Off setting is enabled), the device will switch off the lights when the light level is above the DDL for 30 seconds. The lights will remain off until the light level drops below the DDL for 30 seconds. The lights will then be turned on, with the light source set at its minimum dim level. The photocell will increase the light output until the DDL is reached. As the light levels change, the photocell will reduce or increase the dim level in order to maintain the DDL. There is an adjustable Fade Rate option in the Smart Sensor app on your mobile device to make the light level transitions unnoticeable to room occupants.

### DUAL ZONE OPTION (ACY15-DIW and ACY20-DMW Models ONLY)

The dual zone option is ideal for installations, such as classrooms, with individually controlled parallel rows of lights. Daylight contribution diminishes as the photocell's distance from the source (windows) increases. Therefore, lights at different distances from a window should not be controlled from the same photocell output. The dual zone models (X6CXX) has a second dimming output that can control an additional zone of lighting. Zone 1's (Load 1) light level can be adjusted using the Smart Sensor app on your mobile device. Zone 1 will dim up and down proportionally to Zone 2.

**NOTE:** When installing dual relay models make sure to wire lights closer to the window to Load 1 terminal and 0-10V wires to DIM 1 output.

## LED INDICATORS

LED ACTION	RED	GRN	BLU	YEL	Description
<b>Normal Operation</b>					
Alternating	R			Y	Sensor is booting up.
(2 sec) Blinking	R				Indicates PIR detection.
(2 sec) Blinking		G			Indicates ultrasonic detection.
(1s every 30s) Alternating	R	G			When Demand Response signal is active.
(1s every 30s) Alternating		G	B		Device is in Daylighting mode.
(1s every 30s) Blinking			B		User Override mode is active.
<b>Configuration / Setup</b>					
Alternating	R	G	B		Device is in Identify Mode
Alternating		G	B		Device is in 24-Hour Daylight Auto-Calibration mode
Alternating			B	Y	Device is part of mesh network; Network is open for other devices.
Blinking				Y	Device in mesh joining mode.
Blinking			B		BLE connected to phone/tablet
(1 sec) Blinking	R				When device is leaving group (continues to blink until it leaves group).
<b>Emergency</b>					
Solid			B		Emergency mode is active.

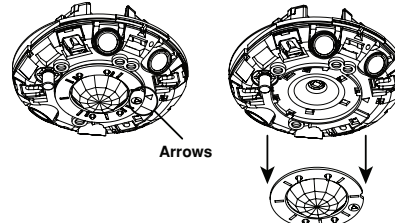
## FIELD-OF-VIEW

**ACY20-DMW:** 500 sq. ft.  
**ACY15-DMW:** 450-1,000 sq. ft.  
**ACY20-DIW:** 2,000 sq. ft.

- **Mid-range lens (red frame):** mounting height (13-20 ft)
- **Extended range lens (black frame):** mounting height (8-12 ft)

### CHANGING PIR LENS

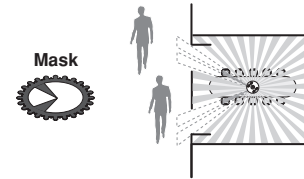
Turn lens and line up arrows, then pull lens from room controller.



**NOTE:** To expand Field-of-View, multiple Smart Room Controllers and/or Smart Ceiling Sensors can be paired together to operate as a group and expand coverage (up to 5 devices can be grouped together). Grouping of devices is done through the Leviton Smart Sensor App.

### MOUNTING LOCATION DIAGRAM

By masking two sections, hallway traffic can be blocked.



## SETTINGS

### CONTROLLING YOUR ROOM CONTROLLER WITH BLUETOOTH® TECHNOLOGY

Download the Leviton Smart Sensor app for your mobile device.

**Android:** Tap the Google Play Store icon on your phone or go to <http://play.google.com> on your computer and follow the instructions to obtain the Smart Sensor app.

**iOS:** Tap the App Store icon on your phone or access the Smart Sensor app through your iTunes account on your computer.

Once you have downloaded the Smart Sensor app, follow the on screen instructions to connect to the device(s).

## BLUETOOTH® TECHNOLOGY RANGE

Programming or adjustments made using the Smart Sensor app on your mobile device should be made when standing under the device for best communication. Maximum recommended distance is 50 feet.

## WHAT TO DO IF...

- **Lights do not turn ON**
  - Circuit breaker or fuse has tripped.
  - Check if daylight harvesting is active and forcing lights OFF.
- **Lights stay ON**
  - Constant motion. To Test: Reduce PIR and/or US sensitivity in the Smart Sensor app on your mobile device by 25%; remove motion source. If unsatisfactory, move room controller location.
- **Light stays ON too long**
  - Primary and/or secondary timeout is set for too long. To Test: Check configuration settings within the Smart Sensor app on your mobile device. Typical setting is 10 minutes.

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## FCC COMPLIANCE STATEMENT

Any changes or modifications not expressly approved by Leviton Manufacturing Co., could void the user's authority to operate the equipment

### FCC Statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### FCC Suppliers Declaration of Conformity (sDoC):

This product manufactured by Leviton Manufacturing, Inc., 201 N Service Road, Melville, NY, <http://www.leviton.com>. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## IC COMPLIANCE STATEMENT

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

## CLASS 2 INSTALLATION NOTE

The 0-10 V DC dimmer control circuit can be installed as Class 1 or Class 2. If installed as Class 2, all devices in the circuit must be Class 2 rated and this switch must be wired per instructions below, which are in accordance with NEC Code NFPA 70, paragraph 725.136 (d).

For Class 2 Installation: The 0-10V control wires must be mechanically separated from Class 1, line, neutral and ground power lines. This can be accomplished by performing the following:

- 1) Installing a mechanical barrier, in the form of silicone tubing or other non-conducting sleeve, over the length of the individual 0-10V (Violet & Pink) control wires contained within the electrical box and to the point where they extend out of the electrical box.<sup>1,3</sup>
  - 2) Use of approved wire connectors shall be used to join the 0-10V control wires to building control wires.<sup>2,3</sup>
  - 3) When CL3, CL3R or CL3P rated control cables (or permitted substitute) are used to connect devices within the building silicone tubing, or other non-conducting sleeve, shall be installed over the cable starting from the switch to the point where they extend out of the electrical box.<sup>1,2,3</sup>
    - 1 Silicone tubing shall be NRTL (UL/CSA/ETL) recognized or equivalent to provide mechanical separation equal to .25" in air.
    - 2 Connectors joining 0-10V control wires shall be approved LISTED connectors.
    - 3 Wire connectors and wire tubing shall be provided by the installation contractor.
- NOTE:** Depending on date of manufacture, the pink 0-10V wire may be gray

## FOR CANADA ONLY

For warranty information and/or product returns, residents of Canada should contact Leviton in writing at Leviton Manufacturing of Canada ULC to the attention of the Quality Assurance Department, 165 Hymus Blvd, Pointe-Claire (Quebec), Canada H9R 1E9 or by telephone at 1-800-405-5320.

## LIMITED 5 YEAR WARRANTY AND EXCLUSIONS

Leviton warrants to the original consumer purchaser and not for the benefit of anyone else that this product at the time of its sale by Leviton is free of defects in materials and workmanship under normal and proper use for five years from the purchase date. Leviton's only obligation is to correct such defects by repair or replacement, at its option. **For details visit [www.leviton.com](http://www.leviton.com) or call 1-800-824-3005.** This warranty excludes and there is disclaimed liability for labor for removal of this product or reinstallation. This warranty is void if this product is installed improperly or in an improper environment, overloaded, misused, opened, abused, or altered in any manner, or is not used under normal operating conditions or not in accordance with any labels or instructions. **There are no other or implied warranties of any kind, including merchantability and fitness for a particular purpose,** but if any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to five years. **Leviton is not liable for incidental, indirect, special, or consequential damages, including without limitation, damage to, or loss of use of, any equipment, lost sales or profits or delay or failure to perform this warranty obligation.** The remedies provided herein are the exclusive remedies under this warranty, whether based on contract, tort or otherwise.