

Occupancy Sensor Lighting Control Module

Cat. No. OPPCE-0D0 (DIN Rail Mount), OPPCE-0S0 (Surface Mount)
Rated Voltage: 230VAC, 50Hz

Max load ratings: 16A (3600W) Incandescent - 16A (3600VA) Fluorescent

Recommended circuit breaker protection: 20Amps
INSTALLATION AND QUICK START GUIDE



DI-000-OPPCE-02A

WARNINGS AND CAUTIONS:

- **TO AVOID FIRE, SHOCK, OR DEATH: TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING, SERVICING, INSTALLING OR REMOVING FIXTURE OR CHANGING LAMPS.**
- **RISK OF ELECTRIC SHOCK** – More than one disconnect switch may be required to de-energize the equipment before servicing.
- To be installed and/or used in accordance with appropriate electrical codes and regulations.

WARNINGS AND CAUTIONS:

- If you are unsure about any part of these instructions, consult an electrician.
- Use this device with **copper or copper clad wire only**.
- For indoor use only.

FEATURES

- 16 Amp latching relay with Return-to-Closed (Fail-ON) capability.
- Power Savings over non-latching relay lighting control modules.
- Factory calibrated zero crossing.
- Return to Close Fail-Safe operation in event of power loss or power failure.
- Output short circuit protection.
- Passes NEMA 410 requirements for Electronic Ballasts.
- Regulated +24VDC, 175mA output.
- Rated for Plenum spaces.
- EN 60669-1 to EN 60669-2-1

SYMBOL EXPLANATION

Symbols used on the product:

- L - Line input
- L (↓) - Load output
- N - Neutral
- Double Insulated
- μ - Micro gap relay (gap between relay contacts in open position are less than 1.2mm)
- +24V - +24V DC (SELV)
- COM - Common or Ground for +24V DC (SELV)

RATINGS

Power Input¹
230VAC, 50Hz

Power Consumption (No Load)
8.1mA (420mW) @ 230VAC

Power Output (Max)²
24VDC, 175mA (4.2 WATTS), SELV

Power Input and Efficiency with maximum output load:
230VAC @50Hz: 5.68Watts, 74% Efficient

- ¹ Frequency tolerance 5%.
- ² Output voltage tolerance 10%, Output voltage listed at nominal.

Environmental Protection: IP30 for Surface Mount (-0S0) and IP20 for DIN Rail Mount (-0D0)

Operating Temp: 0°C to 50°C

Control input: 24VDC, 2mA

DESCRIPTION

The occupancy sensor lighting control module contains a power supply and a load switching latching relay. The power supply provides SELV (Safety Extra Low Voltage) power for Occupancy Sensors. The relay in the lighting control module is controlled by the occupancy sensors connected to the Auto On, Photocell, or Manual On inputs. Multiple occupancy sensors and/or photocells can be connected to a single lighting control module in order to fully cover an area. The lighting control module includes zero cross switching circuitry to minimize inrush current associated with incandescent and electronic ballasts. This reduces wear and tear on the relay contacts making the lighting control module last longer.

Application Notes:

- When a lighting load exceeds a single lighting control module's rating, the load can be split between multiple lighting control modules. The low voltage occupancy input (Auto On or Man. On) and DC return (Com) of the lighting control modules must be connected together for all lighting control modules to operate together as one. Connect the occupancy wires of all lighting control modules and sensors together. Connect the Common (ground) wires of all lighting control modules and sensors together. Connect the +24VDC wires of the sensors to the +24V input of only one lighting control module.
- When more sensors are required than one lighting control module can supply, multiple lighting control modules can be used to supply power to the occupancy sensor, but not switch any load. The primary lighting control module is the device switching the load. The secondary lighting control module only provides low voltage power to the occupancy sensor(s). Connect as many sensors to the primary lighting control module as possible (see current capacity section below), by connecting the +24V of the sensors to the +24V of the primary lighting control module. Connect the +24VDC of the remaining sensors to the +24V of the secondary lighting control module. Connect the Common (ground) wires of all lighting control modules and all sensors together. Connect the occupancy line of all sensors together to the occupancy input of the primary lighting control module. **The OPPCE product does not support paralleling of lighting control modules to increase output power so do not connect the +24V inputs of two different lighting control modules together to achieve more (>175mA) output power.**

LOW-VOLTAGE CURRENT CAPACITY

NOTE: For OSC, OSW, and OSFHP occupancy sensors please see current data sheet or installation guide for current consumption. The control module will typically handle four OSC/OSW multi-techs or eight OSC/OSW PIR only units.

OPPCE: Total Number of Sensors * Current ≤ 175mA

TOOLS NEEDED FOR INSTALLATION

- Slotted/Phillips Screwdriver
- Pliers
- Pencil
- Ruler
- Cutters

INSTALLATION

NOTE: Use check boxes when Steps are completed.

Step 1 **WARNING: TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING!**

Step 2 **Installing your OPPCE Lighting Control Module**

- WARNING: TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING!**
CAUTION: Low-voltage wires must also be dressed so they are separate from the high voltage conductors. Refer to local building codes for the appropriate installation requirements for the low voltage wiring. Jacketing over the low-voltage wires may be required to provide appropriate insulation from the high voltage wiring.
- Mount Lighting Control Module and wiring per desired application (See Section X for DIN Rail Mounting and Section Y for Surface Mount instructions).
- Line Voltage Wiring:** Remove 6.5mm of insulation from each circuit conductor. Make sure that ends of conductors are straight. Connect to the proper terminals on the OPPCE lighting control module and torque terminal screws between 0.45Nm (min) to 0.5Nm (max).
- Low Voltage Wiring:** Connect the pre-stripped Low-Voltage wires from the sensor to the OPPCE lighting control module and torque terminal screws between 0.5Nm (min) to 0.6Nm (max).
- Restore power at circuit breaker or fuse. **INSTALLATION IS COMPLETE.**

SECTION X DIN Rail Mounting (OPPCE-0D0)

To mount the Lighting Control Module on the rail insert one end of both clips under one edge of the rail, then snap the other end of the clips into place.

NOTE: For applications where the installed Lighting Control Module may be subject to unusual levels of shock or vibration, or where the Lighting Control Module is oriented such that it may slide down the rail due to gravity, the use of two DIN rail end stops is recommended. After installing the Lighting Control Module on the rail, the end stops are installed by clearing the DIN rail of other components and sliding the end stops over the rail. When the end stops are secure against the Lighting Control Module, tighten the two integral screws of each end stop.

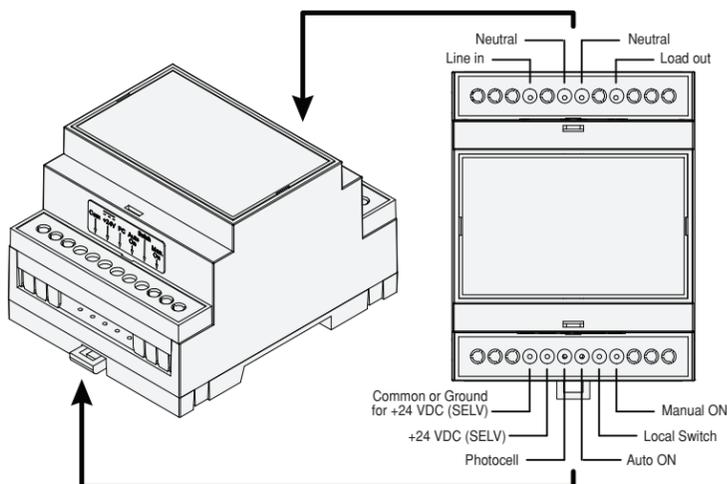
Wire Sizes and Torque:

12 - 14 AWG (3.3mm² - 2.0mm²), 0.45Nm (min) to 0.5Nm (max)
18 - 28 AWG (0.8mm² - 0.1mm²), 0.5Nm (min) to 0.6Nm (max)

Wire Range: 2.0 - 3.3mm² [12 - 14 AWG] (AC), 0.1 - 0.8mm² [18 - 28 AWG] (SELV), 300m (1000ft)

Wire Temperature Rating: >=90C

Wire Voltage: >=300V (230VAC), >= 40V (SELV)



SECTION Y Surface Mount (OPPCE-0S0)

The cover openings have break-outs to allow for large cables. If cover does not fit properly then remove the plastic breakouts with pliers/cutters at the end of the covers making sure there are no sharp edges once the breakout section has been removed.

Use the two mounting screws provided to secure the OPPCE Surface Mount Lighting Control Module to a secure surface. Fasten one screw per side, attach wires to their proper terminal locations, and assemble the protective covers.

Wire Sizes and Torque:

12 - 14 AWG (3.3mm² - 2.0mm²), 0.45Nm (min) to 0.5Nm (max)

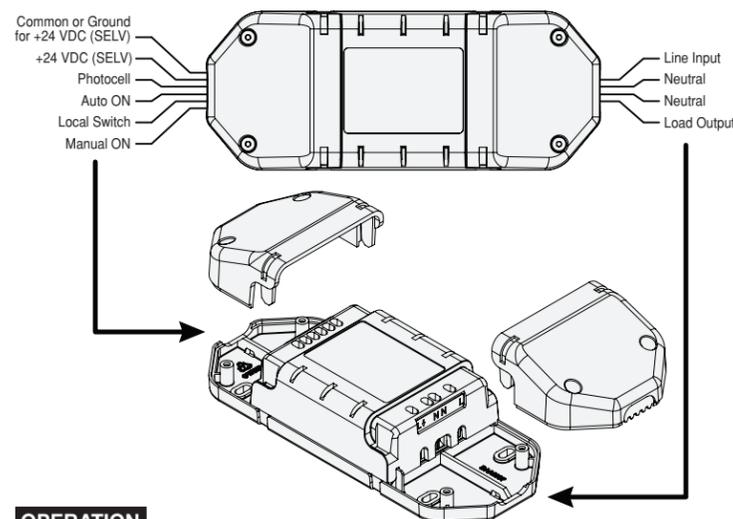
18 - 28 AWG (0.8mm² - 0.1mm²), 0.5Nm (min) to 0.6Nm (max)

Wire Range: 2.0 - 3.3mm² [12 - 14 AWG] (AC), 0.1 - 0.8mm² [18 - 28 AWG] (SELV), 300m (1000ft)

Wire Temperature Rating: >=90C

Wire Voltage: >=300V (230VAC), >= 40V (SELV)

Utilize the cable ties provided to secure and strain relief wiring prior to installation of wiring covers.



OPERATION

The Lighting control module relay can be turned ON and OFF automatically using an occupancy sensor input, photocell input, or manually from an optional low voltage switch. The OPPCE lighting control module will always power up with the latching relay in the closed (ON) state; 5s after power ON the inputs will be monitored to determine the proper relay state.

AUTO ON (See Wiring Diagram): The occupancy sensor input and the optional local switch input can all be used to turn the load ON. When the load is turned OFF using the local switch, the lighting control module does not turn it ON automatically until after the sensor time delay expires (e.g., presentation mode) and occupancy is detected. Pressing the local switch before the sensor time delay expires turns the load ON. When the occupancy sensor's time delay expires, the lighting control module reverts to Auto ON mode and it turns the load ON with the next occupancy detection input from the sensor.

MANUAL ON (See Wiring Diagram): Occupants must press the low voltage local switch to turn the load ON. When the occupancy sensor is the only input keeping the load ON, the load turns OFF when the sensor time delay expires. If the sensor input re-triggers within 30 seconds after the load turns OFF, the load turns ON. After the 30 seconds expire with no sensor input it will be necessary to press the local switch to turn the load ON. When in Manual ON mode, with the lights ON, the local switch can be used to force the lights OFF. The lights will remain OFF until the local switch turns the lights back ON again.

PHOTOCELL/AMBIENT LIGHT SENSOR (See Wiring Diagram): The photocell sensor input can also be utilized with a digital (+24VDC) low voltage switching photocell to control a bank of lights depending on the lighting conditions. The lighting control module can operate with only a photocell, or together with Occupancy and Switch to achieve numerous lighting conditions where lighting control of a room will depend on current light level.

LOW VOLTAGE INPUTS

+24VDC input wires are provided to control the load relay.

The inputs may be used in combination or individually, depending on the application(s). See wiring diagrams for connections.

MAINTAINED INPUTS

Occupancy Sensor Auto ON (Auto ON): This input is for occupancy sensor Auto ON/Auto OFF. Applying +24V will close the relay (Occupied). Remove the voltage and the relay opens (Vacant).

Occupancy Sensor Manual ON (Man. ON): This input is for occupancy sensor Manual ON/Auto OFF. When the attached occupancy sensor detects motion, no action occurs. A local switch is required to manually turn the load ON. Then the sensor will turn the load OFF when the time delay expires. A 30 second grace period exist when the lights go out where they can automatically turn back ON with occupancy detection.

Local Switch (Switch): This input is for a low voltage momentary or maintained switch. Applying +24VDC momentary input changes the relay to the opposite state. Applying +24VDC or 0VDC as maintain (longer than 1 second) toggles the relay to the opposite state. It overrides the Occupancy Sensor inputs. **NOTE:** This switch will not respond to switch presses faster than 250mS. Momentary switches or single button ON/OFF switches are preferred over maintained switches as the maintained switch can get out of sync when the device turns out the lights based on Occupancy timeout or Photocell control.

Photocell (PC): This input is for a digital low voltage photocell which operates at +24V. When there is sufficient light level in the room the photocell will be +24V and the OPPCE lighting control module will open the relay turning the lights OFF. When the light level in the room drops below the threshold set on the digital photocell the +0V signal will result in the OPPCE lighting control module closing the relay and turning the lights ON. The photocell can work as a stand alone device, with local switch or with an occupancy sensor to control the lighting in a room based on light levels:

Stand Alone: Wire Sensor Auto On connection to +24VDC, Photocell (PC) to Digital Photocell. The photocell will always control light level. On power cycle device will keep lights ON in a dark room.

Local Switch: Wire Sensor Auto On connection and Manual ON connection (Man. On) to +24VDC, Photocell (PC) to Digital Photocell, Local Switch (Local) to +24VDC switch. The switch will need to be ON in order for the Photocell to operate. On power cycle device will turn lights OFF and photocell will remain inactive until the local switch is turned ON again.

Occupancy: Wire Auto On connection to Occupancy sensor, Photocell (PC) to Digital Photocell. Optional: Local Switch (Switch) to +24VDC. Only when occupancy exists will the photocell be able to control the lighting. The photocell can HOLD OFF the lights if there is sufficient light available or turn the lights OFF/ON depending on lighting condition with room occupancy.

TROUBLESHOOTING

Lights are ON after power outage

- This is the normal operation. The lighting control module has a fail-safe feature which forces the relay to close on loss of power. Five seconds after power ON the device will monitor the inputs to look for occupancy and turn lights ON or OFF accordingly.

Device does not operate immediately after power ON

- This is the normal operation. The device has a 5s startup time before it will respond to the input wires.

Lights Flickering

- Lamp has a bad connection.
- Wires not secured firmly with terminal block.

Lights did not turn ON

- Circuit breaker or fuse has tripped.
- Lamp is burned out.
- Lamp Neutral connection is not wired.
- Device wired for Manual ON input.
- Low Voltage mis-wired. Verify wiring per appropriate diagram.
- Line Voltage mis-wired. Verify wiring per appropriate diagram.

Lights stay ON

- Constant motion. To Test: adjust occupancy sensor; remove motion source (HVAC vent, PIR mask, or move sensor location).

Lights stay ON too long

- Adjust occupancy sensor settings.
- Lights came ON during presentation**
- Auto ON mode is connected and the time delay expired.
 - Increase the sensor time delay or generate more motion during the presentation.
 - Wire up with the Occupancy Manual ON wire instead of Auto ON wire.

Maintained light switch is in ON position but lights are OFF

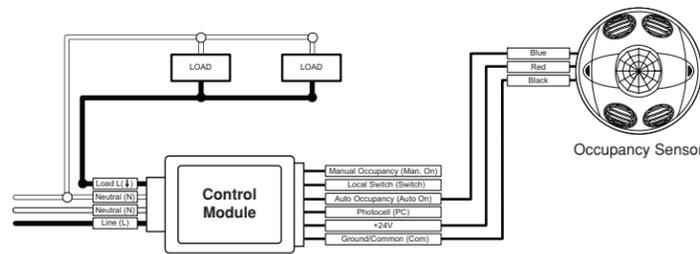
- This is normal; a maintained switch can get out of sync when lights are manually turned ON but automatically turned OFF by an occupancy sensor. The switch is unaware of the occupancy sensors actions. If desired, the switch can be brought back into sync by toggling OFF then ON quickly. This emulates a momentary button press to transition from the OFF to ON state needed to get back into sync.

Pressing Momentary switch does not toggle lights ON, switch requires two presses to turn lights ON

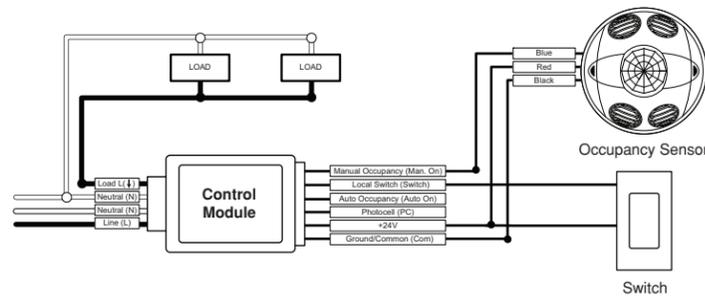
- The OPPCE lighting control module is wired up with a photocell and switch. The switch must be ON for the photocell to operate but the photocell is holding the lights OFF due to room lighting level. In this case the switch will need to be pressed to turn OFF then pressed again to turn lights back ON.

WEB VERSION

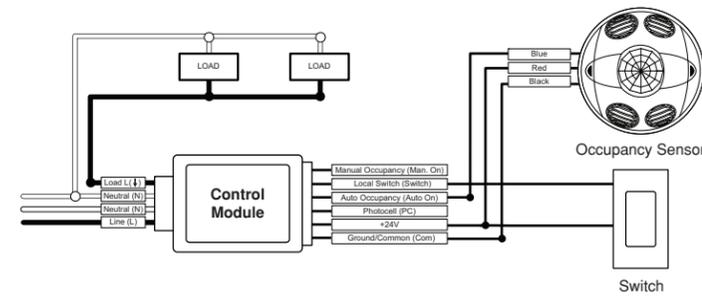
Auto ON/Auto OFF



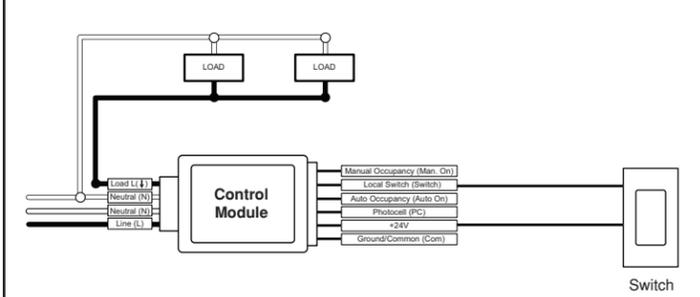
Manual ON/Auto OFF with Local Switch



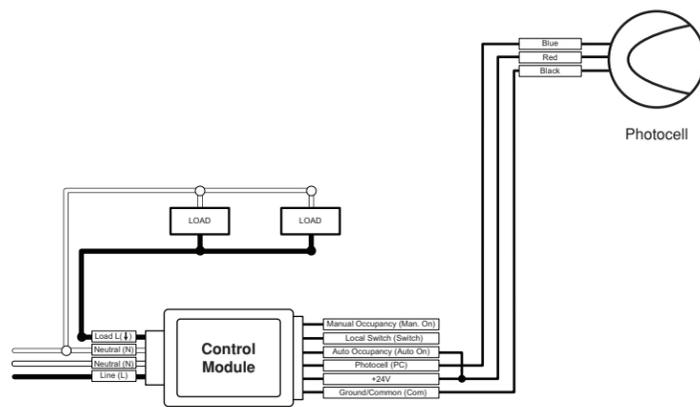
Auto ON/Auto OFF with Local Switch



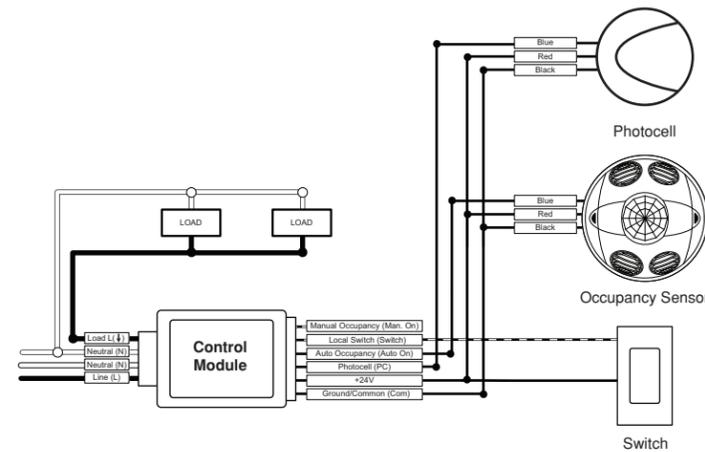
Local Switch ONLY



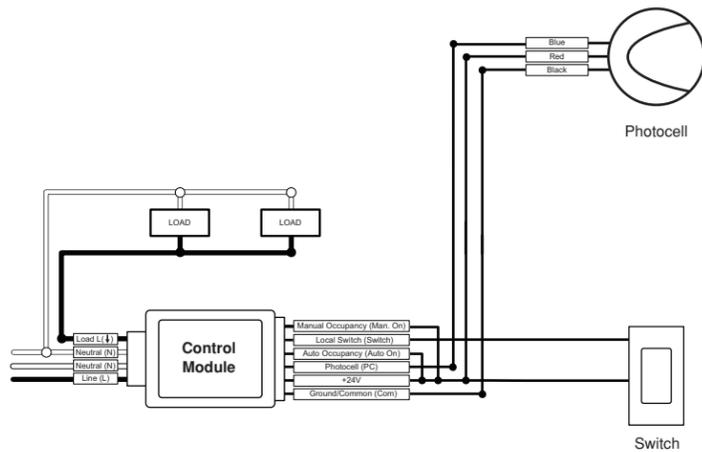
Photocell ONLY Room Control



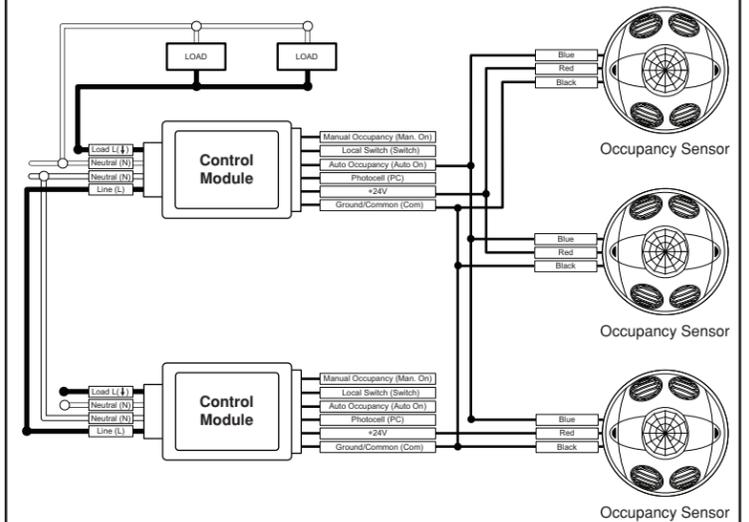
Photocell and Occupancy Sensor with Local Switch



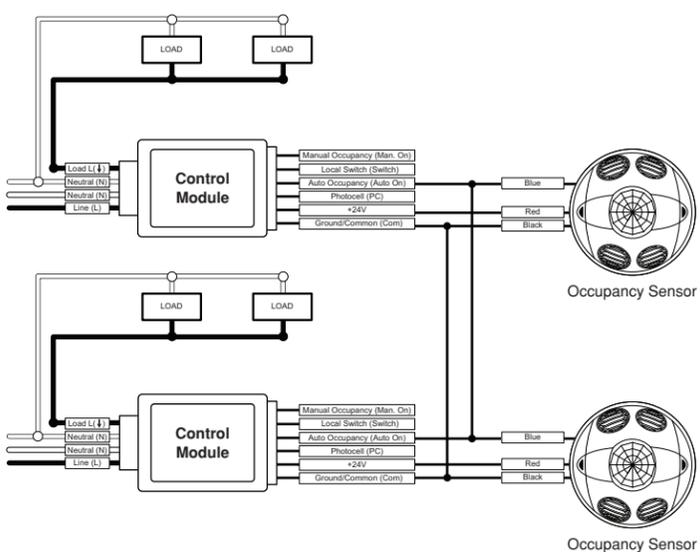
Photocell with Local Switch



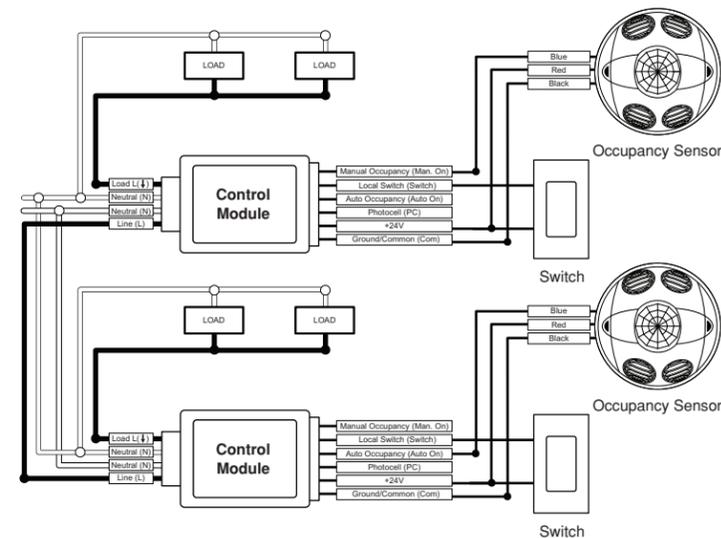
Multiple Occupancy Sensors Exceeding the Lighting Control Module Rating



Multiple Loads Exceeding a Single Lighting Control Modules Load Rating



Manual ON/Bi-Level Switching



RoHS

Leviton certifies that to its knowledge the OPPCE is RoHS compliant, conforming to the requirements of "Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment." This declaration is based on Leviton's current understanding of the RoHS Directive and information provided through supplier material declarations pertinent to the ingredients and materials comprising Leviton's product.

DECLARATION OF CE CONFORMITY



This device complies with the protection regulations of the EMC directive 2004/108/EC and the Low Voltage directive 2006/95/EC. Device complies and is certified to EN 60669-1 to EN 60669-2-1 Standard

FOR CANADA ONLY

For warranty information and/or product returns, residents of Canada should contact Leviton in writing at **Leviton Manufacturing of Canada Ltd 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 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.

For Technical Assistance Call: 1-800-824-3005 (U.S.A. Only) www.leviton.com

WEB VERSION