Instruction Bulletin

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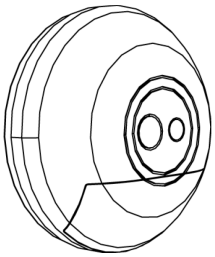
04/2013

Daylighting Sensor 0-10V — SLSLL010

INTRODUCTION



SLSLL010

The Ceiling-Mounted Daylighting Sensor, 0-10V (SLSLL010) is a daylighting sensor that provides on/off switching and 0-10V dimming. The daylighting sensor is programmed using the built-in controls and LED display. An occupancy sensor can be connected to the daylighting sensor so that the lights can be turned ON or OFF based on light levels and occupancy detection.

The daylighting sensor (SLSLL010) also has the ability to connect a low voltage switch to override the lighting on or off. An optional infrared remote control (SLSLLR) is available separately.

Before You Begin

Before you begin to set up a unit, verify that your order is complete by comparing the contents of the package with the appropriate items in the table below. Also verify that the catalog number on the box label matches your order.

Table 1: Box Contents

Item	Quantity
Daylighting sensor	1
Instruction bulletin	1
Pan head screws	2
Mounting ring	1
Mounting post	1
Washer	1
Nut	1

Specifications and Standards

Table 2: Specifications and Standards

Set Point and Illumination Range	0 - 650 foot candles
Field of View	100° cone
Power Input	24VDC
Current consumption @ 24VDC	33mA
Occupancy Sensor Input	1
Low Voltage Switch Inputs	1
Dimming Control Max Number of Ballast Controlled Dimming Voltage Range Dimming Source Current Dimming Sync Current	0-10Vdc 25 0-10V Ballast 0.3Vdc to 10Vdc 5 ma 50 ma
Conductors	7
Wire Gauge	22 AWG
Operating Temperature	32° to 122°F (0° to 50°C)
Humidity	0 to 90% RH non-condensing
Standards	UL and cUL Listed FCC Part 15, Standards for Home and Office Use (Class B)

SAFETY PRECAUTIONS

This section contains important safety precautions that must be followed before attempting to install or maintain electrical equipment. Carefully read and follow the safety precautions below.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must be installed and serviced by qualified electrical personnel.
- Turn off all electrical power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

INSTALLING THE DAYLIGHTING SENSOR

The sensor mounts directly to ceilings or ceiling junction boxes. The sensor can be mounted to a variety of ceiling surfaces, such as acoustical tile, drywall, plywood, etc. Three possible mounting methods are described in this section.

NOTICE

UNINTENDED LIGHT LEVEL SENSOR PERFORMANCE

Install the daylighting sensor within a typical daylit zone which is approximately, 12 ft. (365.7cm) from the ambient light source, (e.g. a window).

Failure to follow these instructions will result in improper equipment performance.

NOTE: The daylighting sensor operates in closed loop environment and should be mounted so it can see the natural light and lighting load it is controlling. Install the sensor away from vibrations and any obstacles that will obstruct the daylighting sensor's field of view.

Typical Sensor Coverage Area

Figure 1: Typical Sensor Application and Coverage Area

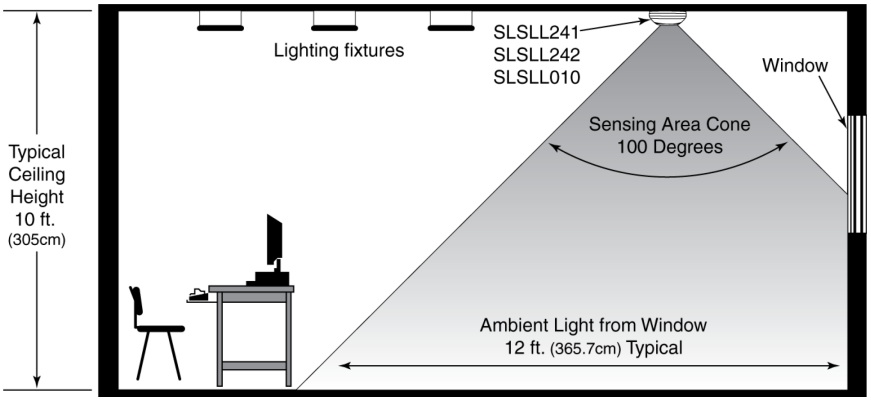
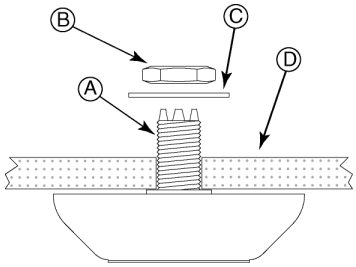


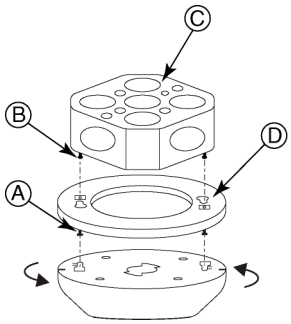
Figure 2: Mounting with Supplied Mounting Post



KEY:
A. Mounting post
B. Lock nut
C. Washer
D. Ceiling tile

1. Turn off all electrical power supplying this equipment before working on or inside the equipment. Always use a properly rated voltage sensing device to confirm that power is off.
2. Drill a 7/8-in. dia. hole at the mounting location.
   NOTE: For acoustical tile, you can use the threaded mounting post to drill a mounting hole. Press the cutter end of the mounting post firmly against the tile, and twist the post back and forth.
3. Feed sensor wiring through the mounting post, then twist and lock the mounting post to the back of the sensor.
4. Insert the mounting post into the hole drilled in step 2. Secure the sensor assembly from the top of the ceiling tile using the supplied washer and lock nut.
5. Wire the sensor according to the wiring diagram; follow all applicable national and local electrical codes.

Figure 3: Mounting to a Junction Box

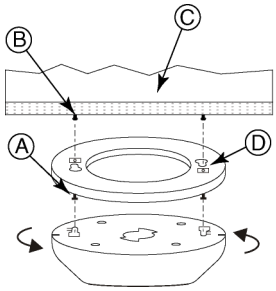


KEY:
A. Keyhole pin
B. #8 x 32 screw
C. Junction box
D. Mounting adapter plate

Note: Rotate Clockwise

1. Turn off all electrical power supplying this equipment before working on or inside the equipment. Always use a properly rated voltage sensing device to confirm that power is off.
2. Attach the adapter plate to a standard 3.5 in. (88.9mm) ceiling junction box using the two #8 x 32 screws supplied.
3. Wire the sensor according to the wiring diagram; follow all applicable national and local electrical codes.
4. Attach the sensor to the adapter plate by inserting the pins on the adapter plate into the keyholes on the back of the sensor. Rotate the sensor clockwise until it locks in place.

Figure 4: Flush Mounting



KEY:
A. Keyhole pin
B. Mounting screw
C. Ceiling
D. Mounting adapter plate
Note: Rotate clockwise.

1. Turn off all electrical power supplying this equipment before working on or inside the equipment. Always use a properly rated voltage sensing device to confirm that power is off.
2. Drill a hole large enough to accommodate wiring at the mounting location.
3. Attach the adapter plate to the ceiling using a secure method, such as with screws and wall anchors (not provided).
4. Wire the sensor according to the wiring diagram; follow all applicable national and local electrical codes.
5. Attach the sensor to the adapter plate by inserting the pins on the adapter plate into the keyholes on the back of the sensor. Rotate the sensor clockwise until it locks in place.

WIRING DIAGRAMS

Figure 5: Sensor Wire Designation

KEY:
A. Red: +VDC
B. Black: -VDC
C. Blue: Control output
D. White: Control input
E. Brown: Low voltage switch input
F. Violet: +0-10V*
G. Gray: – 0-10V*
*NOTE: Must be paired for 0-10V signal functionality.

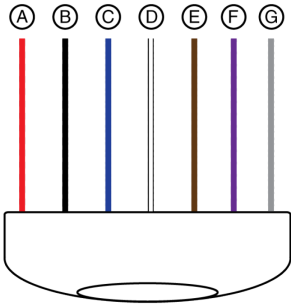
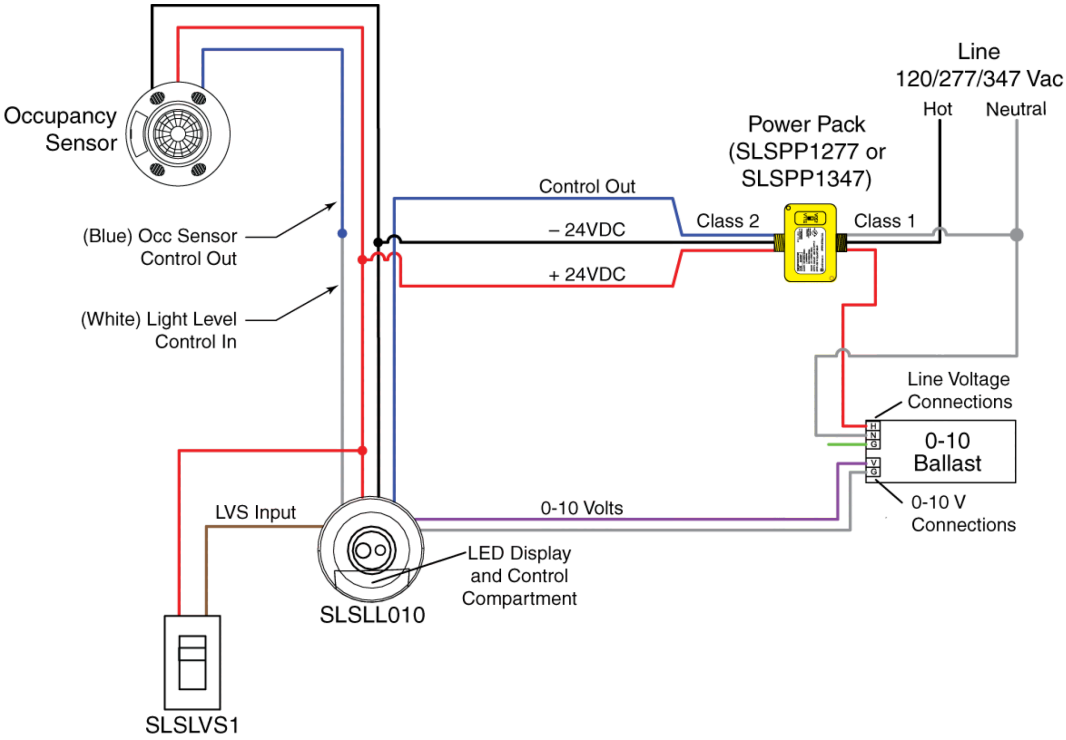


Figure 6: Typical Wiring Diagram

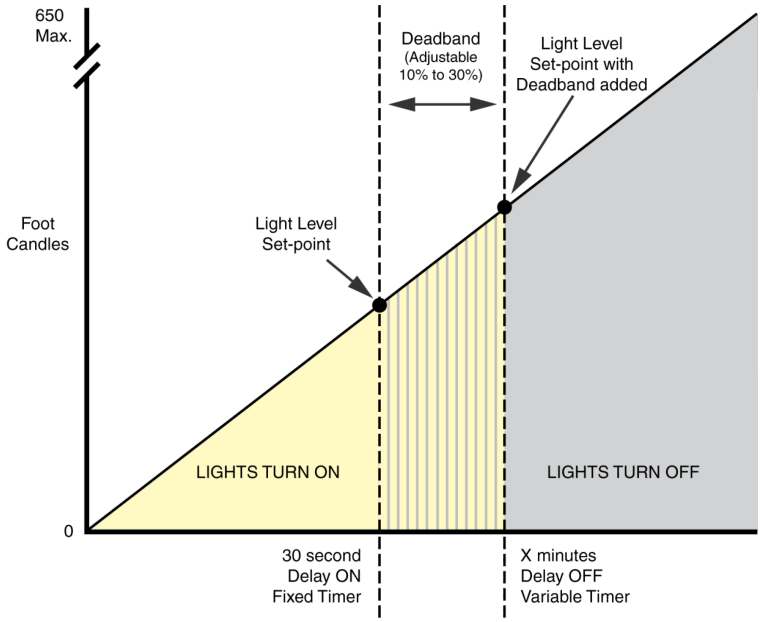


OPERATION

The SLSLL010 provides on/off and continuous 0-10V dimming signal to the ballast. The SLSLL010 is part of a closed loop system, which looks at artificial and natural lighting to make lighting adjustments. The sensor uses an algorithm to maintain the desired light level.

With no mode settings enabled, the light level sensor controls the 0-10V ballast based on the foot candles set-point, deadband (margin), and delay timer. The diagram below illustrates the normal operation of the light level sensor:

Figure 7: Typical Operation



Operational Options

Table 3: Operational Option Descriptions

Option	Description
Set-point	The set point is the desired light level to be maintained in the daylit zone.
Deadband	The deadband is a neutral zone that allows the ambient light to vary before a lighting control action is required. This prevents the lighting from oscillating on and off.
Delay Off Timer	The delay off timer determines how long the light level must remain above the set point before the lighting dims down or turns off.

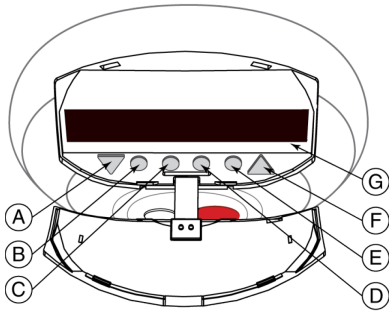
CONFIGURATION

Sensor LED Display and Control Panel

The daylighting sensor is programmed using the built-in control panel. The control panel consists of six buttons and an LED display. To access the control panel, open the cover located on the front of the sensor.

Figure 8: Sensor LED Display and Control Panel

KEY:
A. Down button
B. Set point button
C. Deadband button
D. Timer button
E. Mode button
F. Control up button
G. LED screen



Setting Up the Sensor Functions

Table 4: Sensor Functions

Button	Options	Configuration
Set-point	(M) Use this option to configure the set-point manually. Values: M, FC, 45* (READ) This option is used to read the current light level in the room. (AUTO) This option allows the light level sensor to determine automatically the optimal set-point for the room. Values: AUTO OFF*, AUTO ON	Follow the steps below to configure the set-point: 1. Press the Set-point button to toggle between the following set-point options: - Manual Set-point - Read - Automatic Set-point 2. If Read (READ) is selected, the sensor displays the light level in the room. 3. If Manual (M) is selected, the LED screen displays an "M" and the foot candle set-point. NOTE: If configured, the manual set-point overrides the automatic set-point. 4. Press the Up or Down buttons to adjust the foot candle set-point number. 5. If Automatic (AUTO) is selected, press the Up or Down button to select AUTO OFF or AUTO ON. AUTO OFF: The LED screen shows AUTO after a few seconds, and the sensor uses the last manual set-point configured. AUTO ON: The Auto Set Point takes 5 minutes to complete. When the Auto Set-point is initiated, the lamp warm-up period begins and lasts 3 minutes and the LED screen flashes WARM. During this time, the Daylighting sensor turns the lighting load on. When the lamp warm up period is complete the daylighting sensor measures the ambient and artificial light in its field of view every 5 seconds for 2 minutes. The set-point is the average of the light level measurements (foot candles total / 24 = average foot candles set-point). This number is saved in the sensor's memory. *Note: The Daylighting Sensor measures all ambient and artificial lighting in its field of view. To* measure *and set up the sensor using the required artificial lighting load, close ambient lighting sources (e.g. window blinds etc). During set point adjustments, the installer should be positioned to prevent casting any shadows on the sensor.*
Deadband	DBP (Deadband %) Values: DBP 0, DBP 10, DBP 20, DBP 30*	The deadband is a neutral zone that allows the ambient light to vary before a lighting control action is required. This prevents the lighting from oscillating on and off. The Deadband setting reads the current set-point then increases the set-point by the deadband percentage. 1. Press the Set Deadband button. 2. Use the Up or Down buttons to select Deadband (DB) percentage. 3. After a selection is made the LED display will blink for confirmation.
Timer	(TIME OFF) This option is used to determine how long the light level must remain above the set point before the lighting dims down or turn off. Values: 15 SEC, 3 MIN*, 10 MIN, 20 MIN, and 30 MIN (RAMP TIME) This option is used to set the Down Ramp Rate, which allows fluorescent lighting to dim down slowly over time. Values: 15 SEC, 30 SEC, 45 SEC, 1 MIN, 2 MIN*, 3 MIN	The Delay Off Timer is used to determine how long the light level must remain above the set point plus deadband before the lighting dims down or turn off. 1. Press the Timer button. 2. Use the Up or Down buttons to select one of the following options. 3. After a selection is made the LED display will blink for confirmation. The Down Ramp Rate is the time is takes for the 0-10V dimming signal to reach 0 Volts from 10 Volts. This feature allows the lighting to dim down slowly over time, preventing the end user from noticing a decrease in the over head lighting. 1. Press the Timer button two times. 2. Use the Up or Down buttons to select Ramp Time option. 3. After a selection is made the LED display will blink for confirmation.

* Default values

Setting Up Sensor Modes

The daylighting sensor provides a connection for an optional low voltage, normally open, momentary contact wall switch override.

The low voltage switch connects directly to the daylighting sensor and can be used with or without the addition of an occupancy sensor.

Without an occupancy sensor connected (OCC No) to the daylighting sensor, a button press from the low voltage switch sets a 1 hour timer that turns lighting on or off. When the timer expires the controlled lighting falls back to set point.

With an occupancy sensor connected (OCC YES) to the daylighting sensor, a button press from the low voltage switch sets a 30 minute timer that turns lighting on. When the timer expires the controlled lighting falls back to set point. If the low voltage switch is used to turn off the lighting no timer is set. The lighting stays off as long as the occupancy sensor detects motion for a presentation.

Note: Any Setup or Mode changes made to the Daylighting sensor will disable the low voltage switch timer. A button press on the low voltage switch will restart the lighting on or off timer.

Table 5: Setting Up Sensor Modes

Mode	Display Name and Description	Guidelines
Occupancy Sensor Connected	(OCC) This option enables the daylighting sensor to be connected to a Occupancy sensor. Values: OCC YES*, OCC NO	1. Press the Mode button and navigate to OCC mode. 2. Press the Up or Down button to navigate between OCC Yes and OCC NO. After a selection is made the LED display will blink for confirmation. NOTE: Once OCC YES is active MANU and HOLD can be viewed in the Mode Menu. If OCC NO is active the MANU and HOLD cannot be viewed in the Mode Menu.
Manual On Entry	(MANU) This option is available only when a occupancy sensor is connected to the daylighting sensor. It provides a manual on for areas that required a switch to initially turn on the lighting. A button press from the low voltage switch turns the lighting on and sends the 0-10V signal to Maximum Cut Off Voltage for 5 minutes and actives the occupancy sensor. After the 5 minutes expires the daylighting sensor goes to set-point and occupancy sensor detect motion in the area. Another button press turns off the lighting. During this time the Daylighting Sensors continues looking for occupancy signal when the lighting is off for presentations. If the area is vacated with the lighting on or off the occupancy timer will expire and resets the area for another Manual On entry Values: MANU OFF*, MANU ON	1. Press the Mode button and navigate to MANU mode. 2. Press the Up or Down button to navigate between MANU ON and MANU OFF settings. After a selection is made the LED display will blink for confirmation. NOTE: If the OCC YES is active MANU and HOLD will be displayed in the mode menu.
Hold Occupancy	(HOLD)This option is available only when a occupancy sensor is connected to the daylighting sensor. Prevents the lighting from turning off when the light level is above set point and dims the lighting by sending the 0-10V signal to Minimum Cut Off Voltage, while occupancy is detected. Values: HOLD ON*, HOLD OFF	1. Press the Mode button and navigate to HOLD mode. 2. Press the Up or Down button to navigate between HOLD ON and HOLD OFF settings. After a selection is made the LED display will blink for confirmation. NOTE: If the OCC YES is active MANU and HOLD will be displayed in the mode menu.
Minimum Cut Off Voltage	(MIN V) This option is used to adjust the 0-10V signal when the Daylighting sensor is dimming down. The Minimum Cutoff Voltage prevents lighting from flickering during the lower limits of the dimming cycle by stopping the 0-10V signal from going to 0. Values: MIN 0V*, MIN 0.5V, MIN 1V, MIN 1.5V, MIN 2V	1. Press the Mode Button to navigate to MIN V mode. 2. Press the Up or Down arrow button to navigate to the desired voltage selection. The display will blink and the voltage selection will be activated.
Maximum Cut Off Voltage	(MAX V) This option is used to adjust the 0-10V signal when the Daylighting sensor is dimming up. The Maximum Cutoff Voltage prevents lighting from going to 100 percent during the upper limits of the dimming cycle. This is used to save energy by preventing the ballast to operate at maximum output. Values: MAX 7.5V, MAX 8V, MAX 8.5V, MAX 9.0V, MAX 10V*	1. Press the Mode Button to navigate to MAX V mode. 2. Press the Up or Down arrow button to navigate to the desired voltage selection. The display will blink and the voltage selection will be activated.

*Default setting

Configuring the Override Mode

Override mode is used to bypass the light level sensor and keep the lights ON. To turn ON Override mode, do the following:

1. Press and hold the Up and Down buttons for 3 seconds.
2. The display flashes "OVER ON" briefly to indicate the Override mode is activated.

To turn OFF Override mode, do the following:

3. Press and hold the Up and Down buttons for 3 seconds.
4. The display flashes "OVER OFF" briefly to indicate the Override mode is deactivated.

Contact the Customer Information Center for technical support by phone at 1-888-778-2733 or e-mail at lightingcontrol.support@us.schneider-electric.com.

Contact your local Schneider Electric service representative for repairs or service to your network.

You may also find helpful information on our web site at www.Schneider-Electric.us.

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