Functional Devices, Inc.
101 Commerce Drive
Sharpsville, IN 46068

Toll Free: (800) 888-5538
Office: (765) 883-5538
Fax: (765) 883-7505

Email: sales@functionaldevices.com
Website: www.functionaldevices.com

B2871

LSDHPDC

DAYLIGHT HARVESTING SENSOR
0-10V • LOW VOLTAGE • CEILING MOUNT
INSTALLATION & OPERATION INSTRUCTIONS

OVERVIEW

LSDHPDC daylight harvesting sensors measure a space's overall illumination in order to dim connected lighting for energy savings. During times of high daylight contribution to a space, controlled artificial lighting will be gradually dimmed to an energy saving level. During times of no or low daylight contribution, controlled artificial lighting will increase back up to its maximum level. The sensor can also be configured to signal a connected power pack to switch lighting off completely in maintained high daylight conditions. Additional configurable parameters include high and low trim levels and fade rates.

FEATURES

- Auto-Setpoint Selection Mode
- Adjustable High & Low Trim Level
- Works Along Side Low Voltage Occupancy Sensors
- Compact Size and Matte Finish
- Four Contractor Friendly Mounting Methods
- Mounting Nipple Attachment with Integrated Hole Saw

BAA COMPLIANT   TAA COMPLIANT   MADE IN THE USA   RoHS COMPLIANT

SPECIFICATIONS

ELECTRICAL

OPERATING VOLTAGE
12-24 VAC/VDC

CURRENT DRAW
2mA

DIMMING CAPACITY
50mA

DIMMING COMPATIBILITY
0-10 VDC Ballasts or Drivers Compliant with IEC 60929 Annex E.2

RECOMMENDED POWER PACK
LR21BPP5
LR21BPP10

PHYSICAL

SIZE
4.00" Diameter x 1.25" H
(10.16 x 3.17 cm)

WEIGHT
4.75 oz

COLOR
White

ENVIRONMENTAL

OPERATING TEMP
32°F to 122°F (0°C to 50°C)

RELATIVE HUMIDITY
0-95% Non-Condensing, Indoor Use Only

OPERATIONAL MODES

Daylight Harvesting to Low Trim

Daylight Harvesting to Off (requires power pack)

On/Off Photocell

CODE COMPLIANCE

Sensors can be used to meet ASHRAE 90.1, IECC, & Title 24 energy code requirements

DAYLIGHT SENSOR PLACEMENT

Typically, a daylight harvesting sensor should be located in the intermost area of a daylighting zone. This assures that the setpoint is maintained at a minimum across the entire daylight zone. Additionally, the lights being controlled should be visible from the sensor as this will improve the tracking accuracy. This is referred to as close loop operation. Using the sensor where it is not able to monitor the lights it is controlling (i.e. open loop operation) will result in lights being either at full bright level or full dim level, but no levels in between. Placement directly above indirect lighting fixtures is not recommended
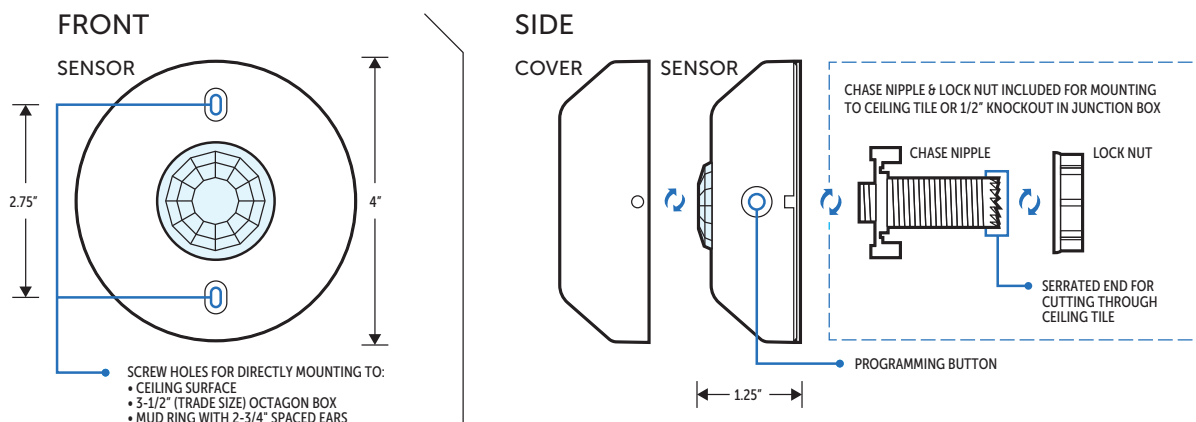
INSTALLATION INSTRUCTIONS

MOUNTING OPTIONS

A. Chase nipple & lock nut (included) for mounting unit to ceiling tile or 1/2" knockout in junction box. See Side Diagram below.
B. Screw holes for directly mounting to ceiling surface, 3-1/2" (trade size) octagon box, or mud ring with 2-3/4" spaced ears. See Front Diagram below.

INSTALLATION NOTES

- If mounting to ceiling tile, use the serrated end of the chase nipple to cut a 7/8" hole. Then thread the wires through nipple prior to screwing into rear of sensor. Install and tighten lock nut as needed.
- To install cover, line up dimples with indents on sensor and turn clockwise.

FRONT

SENSOR

2.75"   4"

SCREW HOLES FOR DIRECTLY MOUNTING TO:
• CEILING SURFACE
• 3-1/2" (TRADE SIZE) OCTAGON BOX
• MUD RING WITH 2-3/4" SPACED EARS

SIDE

COVER   SENSOR

CHASE NIPPLE & LOCK NUT INCLUDED FOR MOUNTING TO CEILING TILE OR 1/2" KNOCKOUT IN JUNCTION BOX

CHASE NIPPLE   LOCK NUT

SERRATED END FOR CUTTING THROUGH CEILING TILE

PROGRAMMING BUTTON

1.25"

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Lighting Controls

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CONFIGURATION SETTINGS

PHOTOCELL SETPOINT

The minimum overall light level that is to be maintained in a space by the sensor is referred to as the "setpoint". This value is user selectable or can be chosen by the Auto-Setpoint function that is built into the sensor.

SETPOINT CONFIGURATION

1. Read through the below setpoint values list and note the number of the desired setpoint (e.g., default is 7 = 25 fc).

2. Press and release the unit's pushbutton 4 times, then wait 2 seconds. The White LED will blink back the number of the current setting.*

3. At any time after blinking starts, enter number of new setting (from Setpoint Value Table).

4. New setting is saved after White LED blinks new setting back 3 times. If Blue LED double flashes at any time, an error condition exists and process must be repeated.

FUNCTION #4 - SETPOINT VALUE TABLE

SETTING #	DESCRIPTION	
2	Run Auto-Setpoint*	
3	2.5 fc	
4	5.0 fc	
5	10.0 fc	
6	15.0 fc	**Manual Setpoint Options**
7	25 fc (default)	
8	35 fc	
9	50 fc	

*If Auto-Setpoint has been previously run, the value will be blinked back in two alternating digits:
Blue LED = 10's digit (1-9 blinks or rapid blink or 0)
White LED = 1's digit (1-9 blinks or rapid blink or 0)

*AUTO-SETPOINT SELECTION DETAILS

A Once setting 2 "Run Auto-Setpoint" has been selected (by following above steps 1-4), the sensor's LED will alternate blue and white for 30 seconds. During this time user should move away from sensor.

B Lights will then be cycled in order for sensor to calculate the controlled (artificial) light level. This is done by subtracting the light level with the lights off (relay open) from the light level with the lights on (relay closed).

C A setpoint will then be chosen using the following conditions:
- If controlled level is less than 3 fc, the application is considered open loop and the setpoint will be set to 50% of the measured level with the relay closed (plus a margin to prevent cycling). Setting will be between 0.5 fc and 44 fc.
- If controlled level is between 3 and 50 fc, setpoint will be set to that level times 1.25.
- If controlled level is greater than 50 fc the setpoint will be set to 50 fc.

D Unit will immediately start operating with new setpoint (i.e. blue LED may begin flashing indicating it will transition lights soon)

E To check auto selected setpoint, press and release button 4 times. Setpoint will be blinked back in two alternating digits:
Blue LED = 10's digit (1-9 blinks or rapid blink or 0)
White LED = 1's digit (1-9 blinks or rapid blink or 0)

DAYLIGHT HARVESTING TURN OFF MODE

The daylight harvesting sensor measures the ambient light level and adjusts its 0-10V output between the high and low trim levels in order to maintain the photocell setpoint. Once the output reaches the low trim level, operation follows one of the three configurable DAYLIGHT HARVESTING TURN OFF MODE settings (see table on right).

CHANGING THE TURN-OFF MODE

1. Read through the FUNCTION #5 - OFF MODE table and note the SETTING # of the desired mode.

2. Press and release the unit's pushbutton 5 times, then wait 2 seconds. The White LED will blink back the number of the current setting (e.g. 4 for DIM TO LOW TRIM).

3. At any time after blinking starts, enter number of new setting (e.g., 3 for DIM TO ZERO).

4. New setting is saved after White LED blinks new setting back 3 times. If Blue LED double flashes at any time, an error condition exists and process must be repeated

FUNCTION #5 - TURN OFF MODE

SETTING #	TITLE	DESCRIPTION
2	Dim to Off	After 5 minutes at the low trim level the connected power pack will be switched off. During this period the unit's LED will blink blue at 0.5 sec intervals indicating the pending transition. The power pack will also be switched off when connected occupancy sensors signal an uoccupied state.
3	Dim to Zero	After 5 minutes at the low trim level the dimming output will be dropped to 0V. This mode is intended to be used with LED drivers that can be electronically turned off by dropping the dimming output below a voltage threshold. If connected occupancy sensors signal an uoccupied state when in this mode the dimming output will be dropped to 0V in addition to the connected power pack being switched off.
4	Dim to Low Trim (default)	The unit's dimming output will stay at the low trim value. The connected power pack, will only be switched off when connected occupancy sensors signal an uoccupied state.

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CONFIGURATION SETTINGS (CONT.)

LED INDICATION

Prior to the daylight harvesting sensor turning lights on or off, the unit's LED will blink blue at 0.5 sec intervals to indicate a pending transition. The LED also blinks twice rapidly every 15 sec when lights are being held off during occupied periods of high ambient light. The intensity of this LED can be increased or disabled.

TO CHANGE LED INTENSITY SETTINGS:

1. Press unit's pushbutton 7 times, then wait two seconds. The White LED will blink back the number of current setting.
2. Change to new setting by pressing the button equal times to below numbered choices:
3. New setting will be saved after White LED blinks back number three times. If Blue LED double flashes at any time, start process over.

RESET

To restore factory settings, press and release the pushbutton 8 times, wait 2 seconds, then press and release the pushbutton 3 times again.

DETAILED DIMMING CONFIGURATION

Several dimming parameters can be adjusted using the following programming procedure.

1. From the below tables of detailed dimming functions, note the number (#) of the function to be modified. For example, the HIGH TRIM setting is #9.
2. To access a particular function, press and release the programming button the number of time of the chosen function. For example, press the button 9 times to access the HIGH TRIM function.
3. The LED will flash back the setting number of the current value as it appears in each function's detailed table below. For example, the default HIGH TRIM is setting #2 (10V)
4. To change the setting number, press and release the button the number of times equal to the new setting #. For example, 3 times (for 9V).
5. The LED will flash back the new setting number as confirmation and will be saved after three confirmations. If Blue LED double flashes at any time, start process over.

DETAILED DIMMING FUNCTION TABLES

FUNCTION #7 - LED INTENSITY

SETTING #	DESCRIPTION
2	Normal brightness [Default]
3	Increased brightness
4	Disable LED

FUNCTION #9 HIGH TRIM

The maximum voltage to which the daylight harvesting sensor is allowed to raise its dimming output when measuring a low level of ambient light.

SETTING #	VALUES	NOTES
2	10 VDC (default)	
3	9 VDC	
4	8 VDC	
5	7 VDC	Light output at each voltage level depends on driver/ballast and luminaire.
6	6 VDC	
7	5 VDC	

FUNCTION #10 LOW TRIM

The minimum voltage to which the daylight harvesting sensor is allowed to reduce its dimming output when measuring high levels of ambient light.

SETTING #	VALUES	NOTES
2	0 VDC	
3	1 VDC	
4	2 VDC	
5	3 VDC (default)	Light output at each voltage level depends on driver/ballast and luminaire.
6	4 VDC	
7	5 VDC	
8	6 VDC	

FUNCTION #11 FADE OFF TIME

Adjustable time interval for lights to ramp down to off.

SETTING #	VALUES	NOTES
2	0.75 Sec	
3	1.5 Sec	Default for all models
4	3 Sec	
5	5 Sec	
6	15 Sec	

FUNCTION #12 FADE ON TIME

Time interval for lights to ramp up when connected occupancy sensors signal an occupied state.

SETTING #	VALUES	NOTES
2	0.75 Sec	
3	1.5 Sec	Default for all models
4	3 Sec	
5	5 Sec	
6	15 Sec	