NECB2015
ENERGY CODE

APPLICATION GUIDE

SENSORWORX®

SENSORWORX®

WHO IS **SENSOR**WORX?

SENSORWORX products are designed, produced, and sold by BLP Technologies, Inc. of Wallingford, Connecticut. Founded in 2017 by engineers with decades of experience in lighting controls, the team behind **SENSOR**WORX has an unmatched resume of bringing high quality and innovative products to the lighting and building control marketplace. With particular expertise in occupancy sensing, the **SENSOR**WORX brand is the new standard of quality and technology excellence in commercial lighting controls.

WIRED & WIRELESS SOLUTIONS

Traditional wired controls are the simplest and most reliable solution for many applications. However, wireless room controls are a great alternative for projects with challenging installation environments. While each solution has unique attributes, the user experience and sequence of operation they deliver should be consistent regardless.

SENSORWORX provides both wired and wireless options in our portfolio of products that all share a modern look, utilize common mounting methods, and deliver reliable performance. This ensures a consistent experience for both installers and end users.

MADE IN AMERICA

We take pride in our work. We have pride in our team and know that quality requires attention to detail at all levels of the manufacturing process. That is why **SENSOR**WORX proudly manufactures lighting controls in the United States.

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CODE REQUIREMENT OVERVIEW

This table outlines lighting control requirements for several building spaces. If the code is not specific or complete regarding controls requirements for a certain area, the table reflects the most common and recommended control scheme.

For more detailed code requirements refer to the
https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/national-energy-code-canada-buildings-2015

	CODE REQUIREMENTS			CODE PROVISION #	SUMMARY
SHUT OFF CONTROLS	Occupancy Sensor Controls			4.2.2.1(16-17)	Requires lighting be controlled by an occupancy sensor.
	Time Switch Controls			4.2.2.1(20-23) 4.2.4.1	Each area of the building not provided with an occupancy sensor shall be provided with time switch controls.
OCCUPANCY SENSOR FUNCTIONALITY	**OFF**	Full Auto-Off		4.2.2.1(18-19) 4.2.2.1(20-23)	Where sensors are used, requires lighting be automatically turned off within 20 minutes or less of all occupants leaving the space.
		Partial Auto-Off		4.2.4.1(16-17)	When controlling areas where continuous lighting is required for safety, only reduce lights to a low level when unoccupied. Lighting level is reduced to 50% or less of maximum power.
	ON	Full Auto On		4.2.2.1(7)	Allows lighting to be automatically turned on the maximum power or high trim.
		Partial Auto On		4.2.2.1(8)	Allows lighting to be automatically turned on to not more than 50% power.
		Manual On		4.2.2.1(6)	Allows lighting to be manually turned on.
MANUAL CONTROL	Manual Switch			4.2.2.1(3-5)	Requires a readily accessible manual control that allows occupants to turn lights off. Manual control should be located where the controlled lights are visible or shall indicate the area served and their status.
	Manual Dimming / Light Reduction			4.2.2.1(9)	Allow the occupancy to reduce the lighting load by either continuous dimming or at least one level between 30% and 70% of full output within the space. Some exceptions apply within the code.
DAYLIGHT CONTROL	Sidelit or Toplit Daylight Zone Wattage		> 150 W	4.2.2.1(10-15) 4.2.2.3 4.2.2.4 4.2.2.5 4.2.4.1	Daylight Responsive Controls are required as follows: • Toplit zones and all sidelit zones facing different cardinal directions shall be controlled independently from each other. • Dim continuously from full light output to 15% of full or lower. • Have readily accessible calibration mechanisms and can be calibrated within the space. • All daylight zones must be controlled separately. See full code for definitions of daylight zones.
			< 150 W		Daylight responsive controls are optional but recommended.

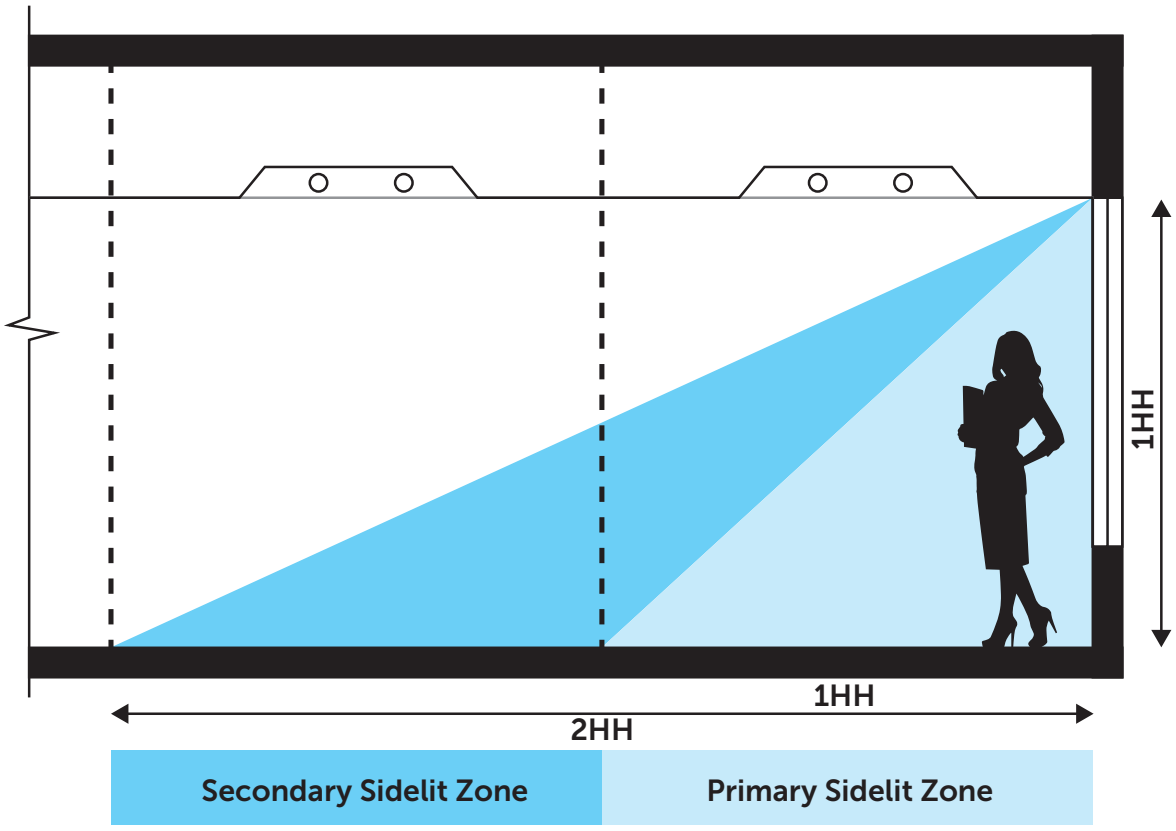
ROOM/AREA TYPES

CLASSROOMS / LECTURE / TRAINING ROOMS	CONFERENCE / MEETING ROOMS	PRIVATE OFFICES	OPEN OFFICES	RESTROOMS	HALLWAYS / CORRIDORS	LOBBY	COPY / PRINT ROOMS	STORAGE ROOMS	JANITORIAL CLOSETS	BREAKROOM / LOUNGE	STAIRWELL
PAGES 26-29	PAGES 34-35	PAGES 8-12	PAGES 22-25	PAGES 16-21	PAGES 32-33	PAGES 38-39	PAGES 14-15	PAGES 13	PAGES 13	PAGES 30-31	PAGES 36-37
⬢	⬢	⬢	⬢	⬢	⬢	⬢ OR ⬡	⬢	⬢	⬢	⬢	⬢
⬢	⬢	⬢	⬢	⬢	⬢	⬢ OR ⬡	⬢	⬢	⬢	⬢	⬢
⬢	⬢	⬢	⬢	⬢	⬢	⬢					⬢
⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	
				⬢ OR ⬡	⬢ OR ⬡	⬢ OR ⬡	⬡ OR ⬢	⬡ OR ⬢	⬡ OR ⬢		⬢ OR ⬡
⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢
⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢	⬢
⬢		⬢	⬢			⬢					

⬢ Required by code provision ⬢ Recommended method between compliant options ⬡ Alternative compliant option to recommendation

SECONDARY DAYLIGHTING ZONE

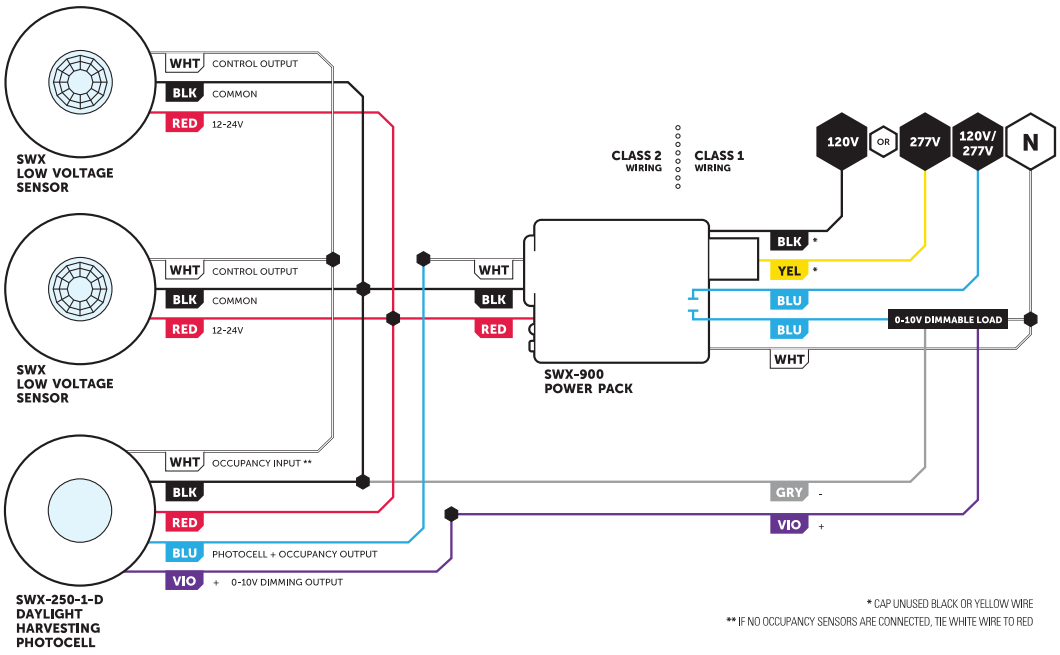
Where required by the code, a secondary daylighting zone can be easily added to the Applications shown in this guide.



FOR OUR WIRED STAND-ALONE SYSTEM...

Simply add a Daylight Harvesting Photocell and a Power Pack to control the lights in the secondary daylighting zone to create independent controls to meet the code. By installing the Daylight Harvesting Photocell (SWX-250-1-D) in the secondary daylighting zone, it allows the system to control the lighting level of the zone independent of the primary daylighting zone, while still obeying the manual controls in the room (SWX-900-AX required).

DAYLIGHT HARVESTING + OCCUPANCY SENSOR(S) APPLICATION



FOR WIRELESS...

Simply add a Power Pack control the lights in the secondary daylighting zone to create independent controls to meet the code. Then pair the Secondary Daylighting zone powerpack (SWX-950-D2) to a Power Pack in the primary daylighting zones via the Leader/Follower mode and follow the setup instructions to make the zones a percentage brighter for the Secondary Daylighting zone Power Packs.

LEADER / FOLLOWER OPERATION & MULTI-ZONE DAYLIGHT HARVESTING

- Power pack controllers can be configured to directly "follow" the state and dim level of another wirelessly linked power pack controller (referred to as the "leader"). Leader/follower functionality is intended for applications where two power pack are to be controlled together, but where only one (designated the leader) is within range of the wireless switch or sensor. The follower power pack must still be within range of the leader power pack.
- A power pack in follower mode does not listen to any other wireless devices except the leader to which it is paired. Therefore, all wireless devices in a zone must be in range of the leader.
- The "leader/follower" functionality of power pack controllers can also be used to accommodate multi-zone daylight harvesting applications. The leader would be wired to control the primary daylight zone that contains the daylight harvesting photocell, with one or more follower power packs controlling the lights in secondary daylight zones (i.e. zones located further from the windows). The follower packs can then be configured to control the lights a percentage brighter than the leader.

APPLICATION GUIDE EXAMPLE

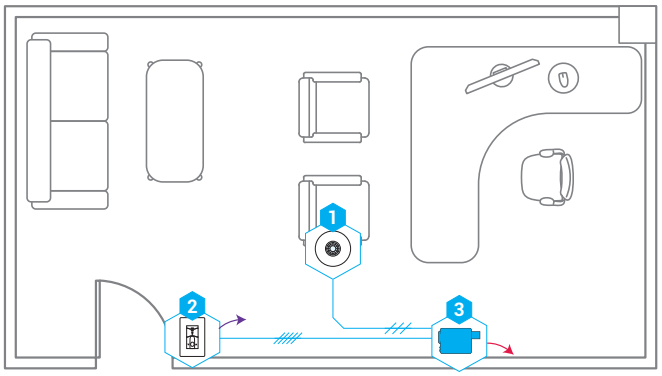
IECC 2018

LARGE PRIVATE OFFICE

WIRED

KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- LOW VOLTAGE WIRING (18 AWG)



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
3	1	**SWX-900-AX**	Power Pack Controller w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting automatically dims according to daylight contribution.
4. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-1.**
2. Maximum lighting level can be task tuned to increase energy savings.
3. For rooms with windows, change sensor to **SWX-231-D** to add daylight harvesting.
4. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-221-1-AR** model.
5. Although not required by code, receptacle control can be added by connecting a second power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
C405.2.1 & C405.2.1.1(1)

Manual Control - Switch
C405.2.2.3

Daylight Responsive Control
C405.2.3**

Manual On-Off/Partial Auto On
C405.2.1.1(2)

Manual Light Reduction Control - Dimmer
C405.2.2.2*

*RECOMMENDED BUT NOT REQUIRED BY CODE.
**NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE. SEE DESIGN CONSIDERAITON #3 FOR NECESSARY BILL OF MATERIAL CHANGE.

ROOM DESCRIPTION
Room Description

SOLUTION DESCRIPTION
Wired vs wireless solution indication

LAYOUT KEY
Listing of any symbols and line types used in the application drawings

APPLICATION DIAGRAM
Basic room drawing with overlayed control device icons and wiring basics

BILL OF MATERIALS
Model numbers, descriptions, and quantities of the referenced **SENSOR**WORX controls

SEQUENCE OF OPERATION
Full summary of the spaces operation using the specified design

ADDITIONAL DESIGN CONSIDERATIONS
Options and/or recommendations to specified design

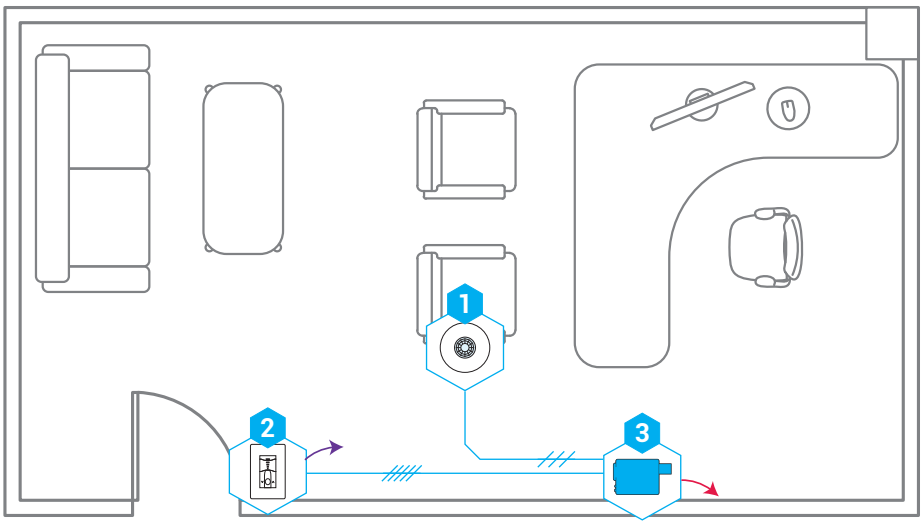
SUPPORTED CODE REQUIREMENTS
Listing of applicable Code Sections

LARGE PRIVATE OFFICE

WIRED

KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **LOW VOLTAGE WIRING (18 AWG)**



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
3	1	**SWX-900-AX**	Power Pack Controller w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting automatically dims according to daylight contribution.
4. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-1.**
2. Maximum lighting level can be task tuned to increase energy savings.
3. For rooms with windows, change sensor to **SWX-231-D** to add daylight harvesting.
4. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-221-1-AR** model.
5. Although not required by code, receptacle control can be added by connecting a second power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

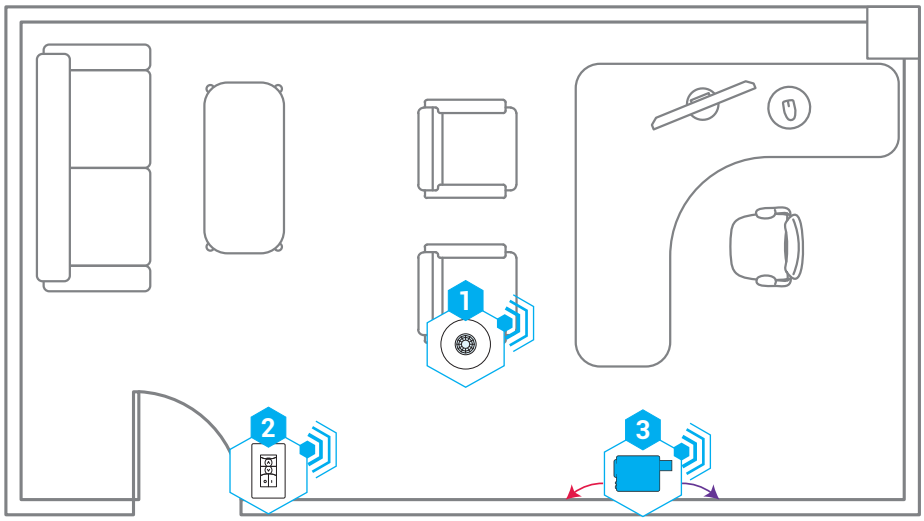
Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE. SEE DESIGN CONSIDERAITON #3 FOR NECESSARY BILL OF MATERIAL CHANGE.

LARGE PRIVATE OFFICE

WIRELESS

NECB 2015



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **WIRELESS CONNECTION**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-854-B-xx**	Wireless Dimming Remote Wall Station, <xx = color>
3	1	**SWX-950-D2**	Wireless Power Pack Controller w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting automatically dims according to daylight contribution.
4. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-B**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. For rooms with windows, add a **SWX-250-B** daylight harvesting photocell.
4. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
5. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

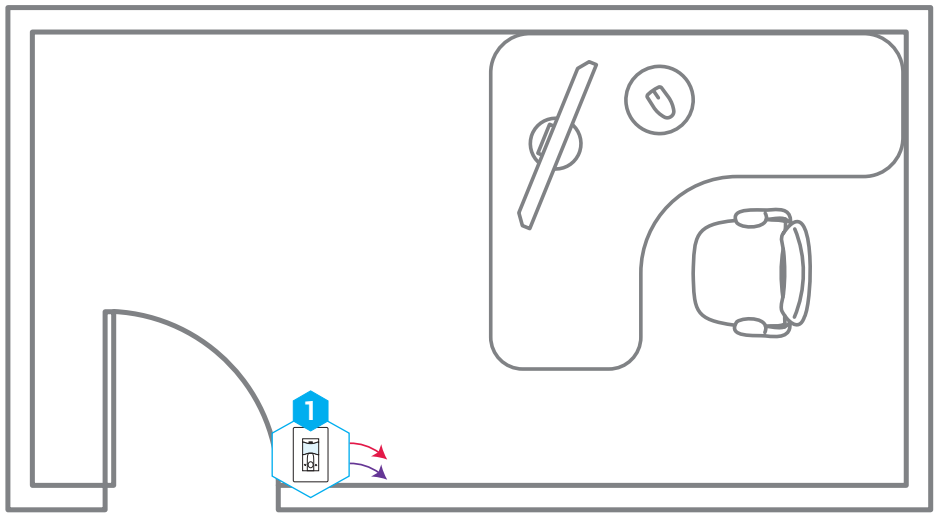
*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE. SEE DESIGN CONSIDERAITON #3 FOR NECESSARY BILL OF MATERIAL CHANGE.

SMALL OFFICE

WIRED OPTION 1

KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-121-D-xx**	Dual Technology (PIR/Acoustic) Wall Switch Occupancy Sensor w/ Dimming (0-10V), 120/277 VAC, No Neutral Required, <xx = color>

SEQUENCE OF OPERATION

1. Lighting turns on automatically to 50% upon occupancy (default) or manually switched on to last user level.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting level can be task tuned to increase energy savings.
2. Although not required by code, receptacle control can be achieved by adding a **SWX-900** power pack wired on the load side of the wall switch sensor.

SUPPORTED CODE REQUIREMENTS

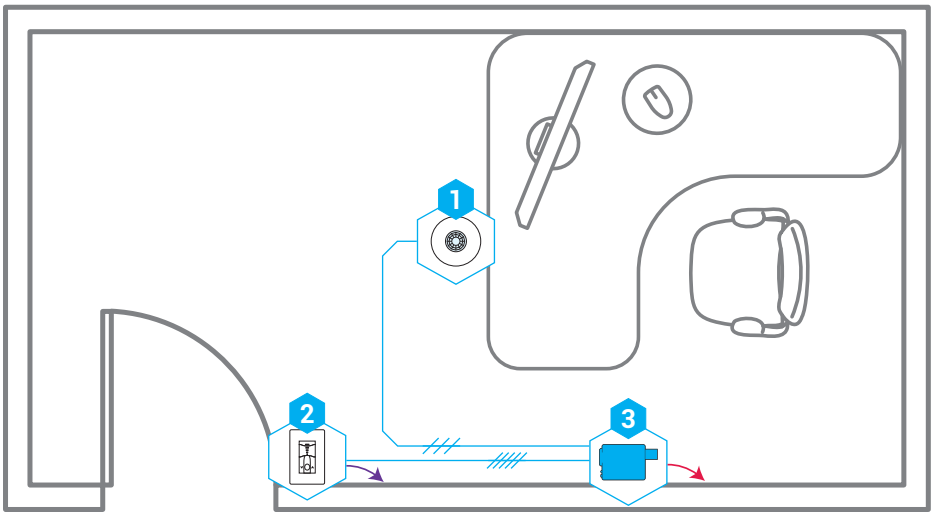
Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

SMALL OFFICE

WIRED OPTION 2



KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- LOW VOLTAGE WIRING (18 AWG)

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
3	1	**SWX-900-AX**	Power Pack Controller w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting level can be task tuned to increase energy savings.
2. Make lights automatically dim according to daylight contribution (see designs for Large Private Office).
3. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-221-1-AR** model.
4. Although not required by code, receptacle control can be added by connecting a second power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

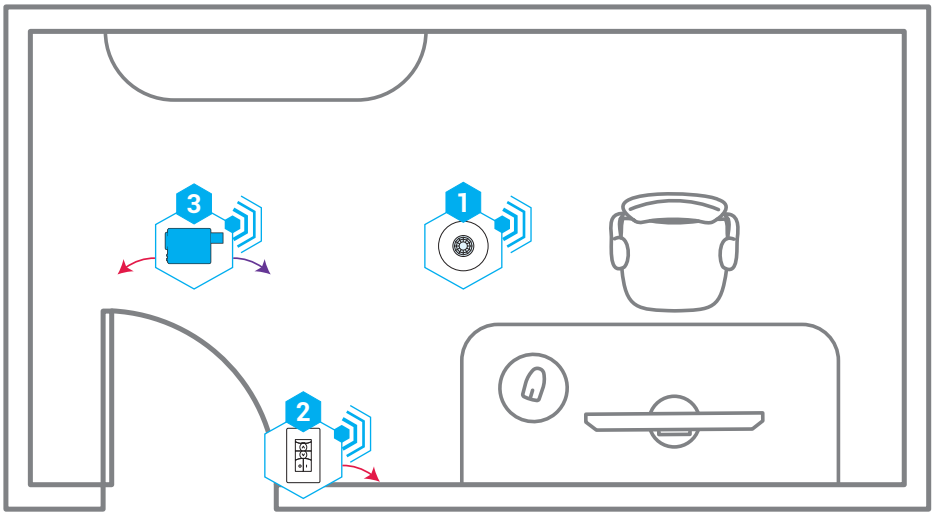
Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

KEY

TO LINE VOLTAGE CONNECTIONS

WIRELESS CONNECTION



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-854-B-xx**	Wireless Dimming Remote Wall Station, <xx = color>
3	1	**SWX-950-DZ**	Wireless Power Pack Controller w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting automatically dims according to daylight contribution.
4. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-B**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. For rooms with windows, add a **SWX-250-B** daylight harvesting photocell.
4. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
5. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

STORAGE ROOM / CLOSET

WIRED

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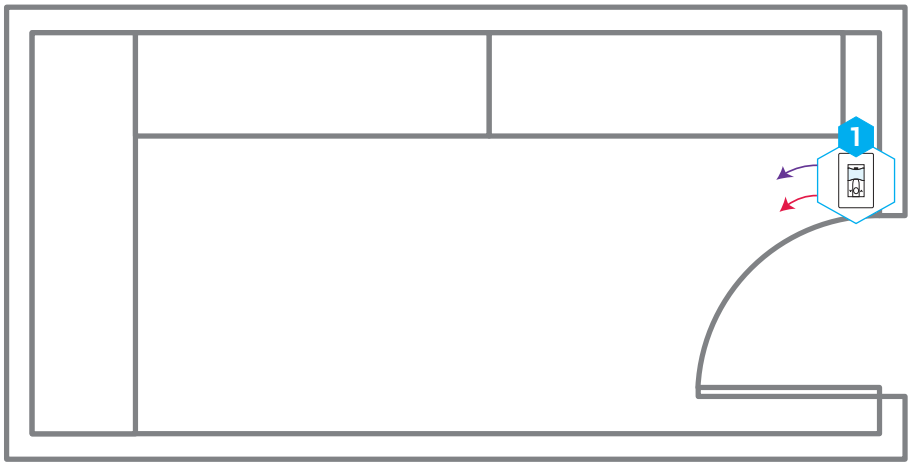


KEY

TO LINE VOLTAGE CONNECTIONS

TO 0-10V LIGHTING

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-101-D-xx**	PIR Wall Switch Occupancy Sensor w/ Dimming (0-10V), 120/277 VAC, <xx = color>

SEQUENCE OF OPERATION

1. Lighting turns on automatically to 50% upon occupancy (default) or manually switched on to last user level.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting level can be task tuned to increase energy savings.
2. For a compliant non-dimming solution, use a **SWX-103-xx**.
3. Although not required by code, receptacle control can be achieved by adding a **SWX-900** power pack wired on the load side of the wall switch sensor.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Control - Switch
4.2.2.1(3-5)

Manual On-Off
4.2.2.1(6)

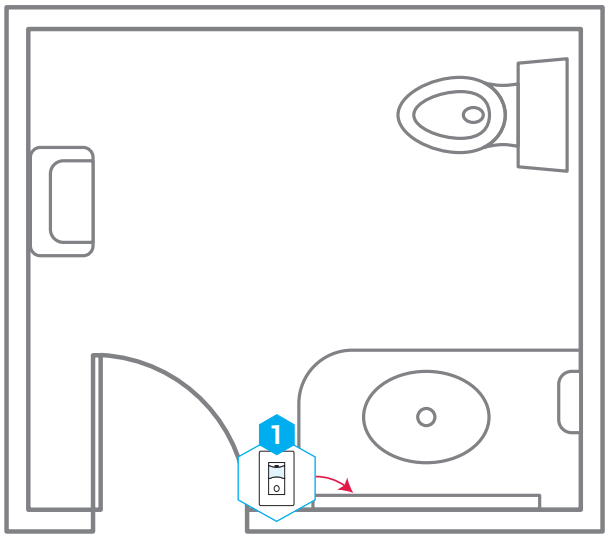
Manual Light Reduction Control - Dimmer
4.2.2.1(9)

PRIVATE RESTROOM

WIRED OPTION 1

KEY

TO LINE VOLTAGE CONNECTIONS



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-121-xx**	Dual Technology (PIR/Acoustic) Wall Switch Occupancy Sensor, 120/277 VAC, No Neutral Required, <xx = color>

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. If no stalls are present, a PIR only sensor (model **SWX-101-xx**) may be substituted as a value engineered option.
2. To control a ventilation fan or secondary lighting load, use a sensor and "sidecar" switch kit (model **SWX-122-xx**).

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Control - Switch
4.2.2.1(3-5)

Auto On to Full Allowed
4.2.2.1(6)

PRIVATE RESTROOM

WIRED OPTION 2

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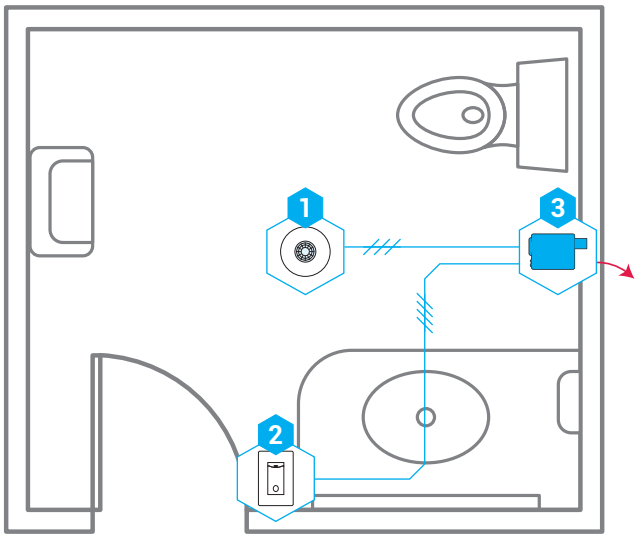


KEY

TO LINE VOLTAGE CONNECTIONS

LOW VOLTAGE WIRING (18 AWG)

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-801-xx**	On/Off Wall Switch - Low Voltage, <xx = color>
3	1	**SWX-900-AX**	Power Pack Controller w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. If no stalls are present, a PIR only sensor (model **SWX-201-1**) may be substituted as a value engineered option.
2. To control a ventilation fan or secondary lighting load(s), add one or more secondary relay packs (model **SWX-910**).
3. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-221-1-AR** model.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Control - Switch
4.2.2.1(3-5)

Auto On to Full Allowed
4.2.2.1(6)

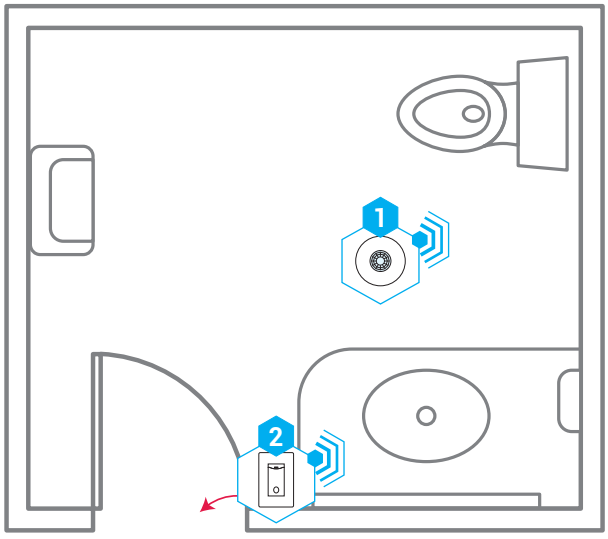
PRIVATE RESTROOM

WIRELESS

KEY

TO LINE VOLTAGE CONNECTIONS

WIRELESS CONNECTION



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-B**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-851-xx**	Wireless On/Off Wall Switch, 120/277 VAC, No Neutral Required, <xx = color>

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. If no stalls are present, a PIR only sensor (model **SWX-201-B**) may be substituted as a value engineered option.
2. To control a ventilation fan or secondary lighting load(s), add one or more wireless power packs (model **SWX-950**).

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

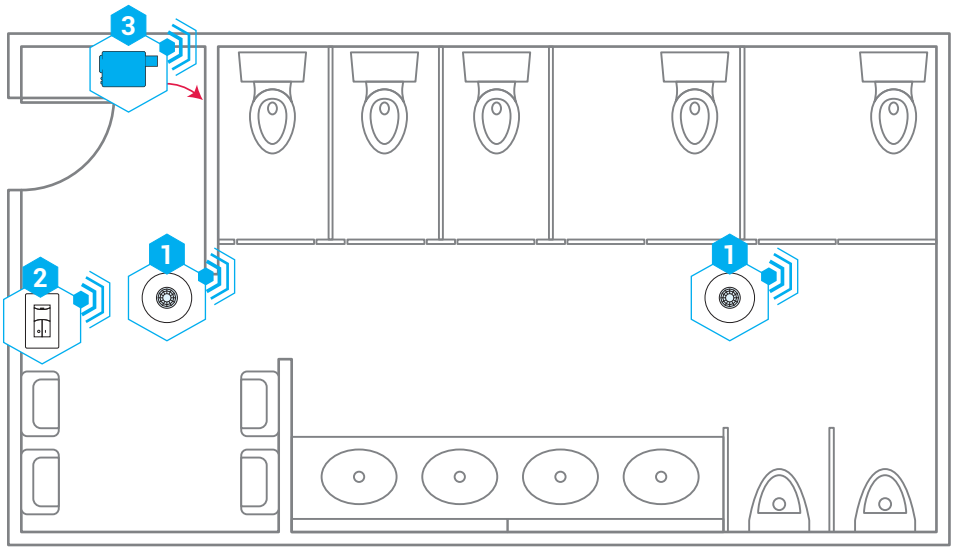
Manual Control - Switch
4.2.2.1(3-5)

Auto On to Full Allowed
4.2.2.1(6)

PUBLIC RESTROOM (LARGE)

WIRELESS

NECB 2015



KEY

TO LINE VOLTAGE CONNECTIONS

WIRELESS CONNECTION

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	2	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-852-B-xx**	Wireless Remote On/Off Wall Station, <xx = color>
3	1	**SWX-950**	Wireless Power Pack Controller, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX** model and add a **SWX-910-AR** auxiliary relay pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Control - Switch
4.2.2.1(3-5)

Auto On to Full Allowed
4.2.2.1(6)

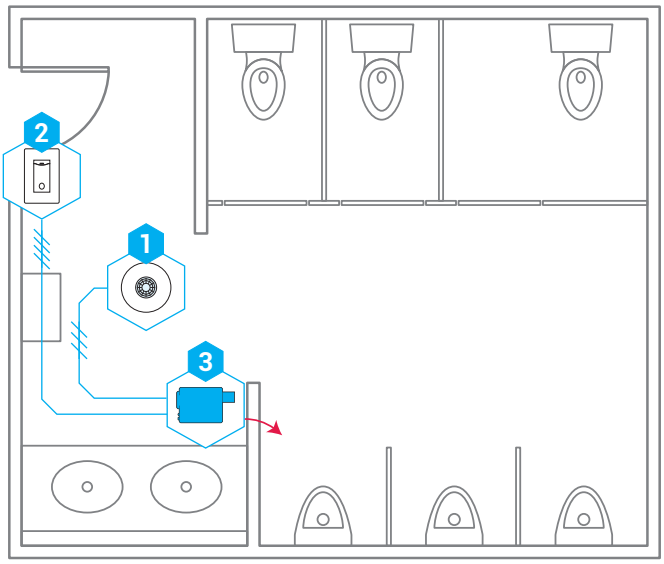
PUBLIC RESTROOM (MEDIUM)

WIRED

KEY

TO LINE VOLTAGE CONNECTIONS

LOW VOLTAGE WIRING (18 AWG)



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-222-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Large Motion, Ceiling Mount 360°
2	1	**SWX-801-xx**	On/Off Wall Switch - Low Voltage, <xx = color>
3	1	**SWX-900-AX**	Power Pack Controller w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Additional sensors can be added to provide coverage of entry vestibules or for wash areras.
2. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-222-1-AR** model.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

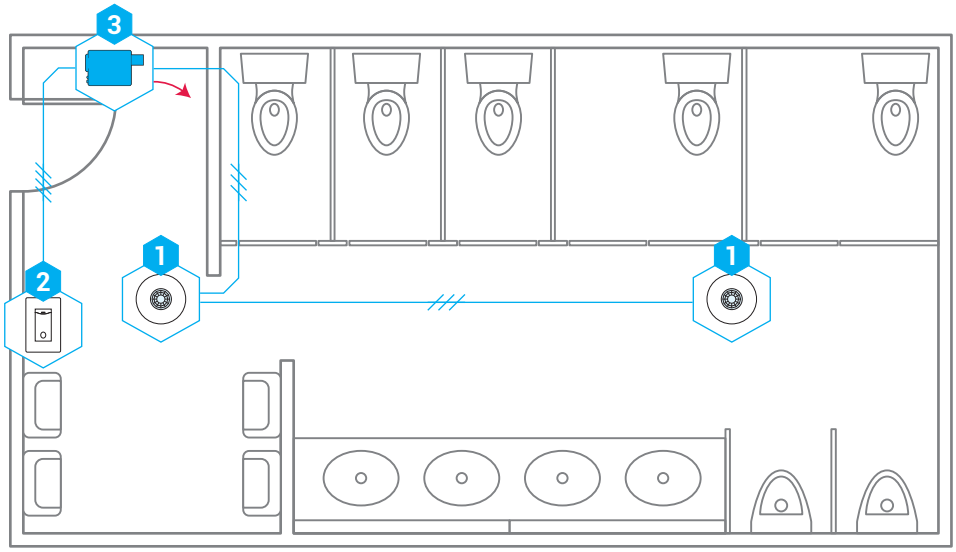
Manual Control - Switch
4.2.2.1(3-5)

Auto On to Full Allowed
4.2.2.1(6)

PUBLIC RESTROOM (LARGE)

NECB 2015

WIRED



KEY

TO LINE VOLTAGE CONNECTIONS

LOW VOLTAGE WIRING (18 AWG)

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	2	**SWX-222-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Large Motion, Ceiling Mount 360°
2	1	**SWX-801-xx**	On/Off Wall Switch - Low Voltage, <xx = color>
3	1	**SWX-900-AX**	Power Pack Controller w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. To provide an occupancy contact closure signal to an HVAC system, change one of the sensors to a **SWX-222-1-AR** model.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Control - Switch
4.2.2.1(3-5)

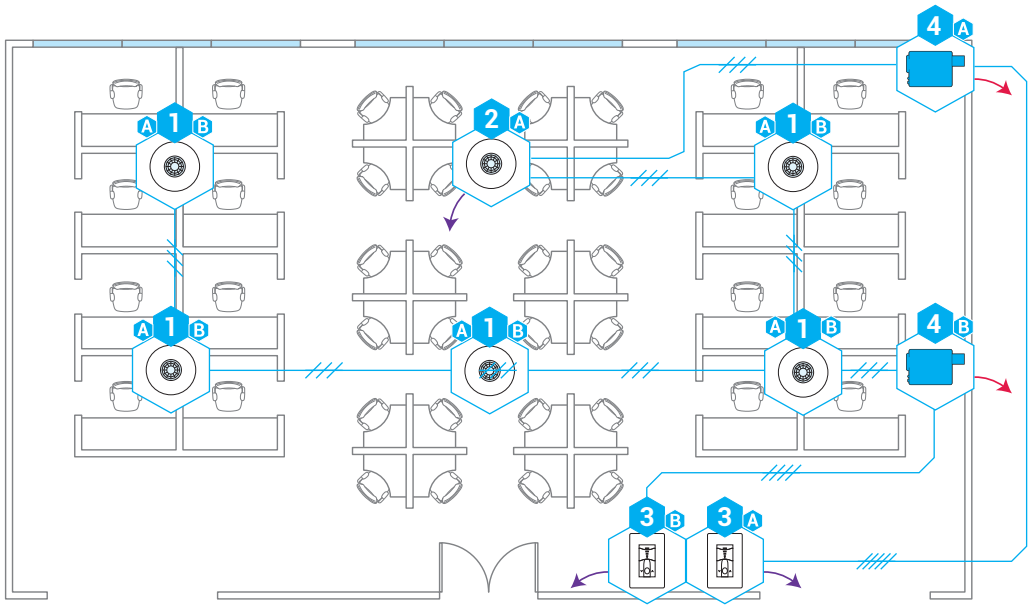
Auto On to Full Allowed
4.2.2.1(6)

OPEN OFFICE (w/ WINDOWS)

WIRED

KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V FIXTURES
- LOW VOLTAGE WIRING (18 AWG)
- A DAYLIGHT ZONE
- B NON-DAYLIGHT ZONE



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	5	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-231-1-D**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360° w/ Integrated Daylight Harvesting (0-10V)
3	2	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
4	2	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. Lighting in daylight zone(s) automatically dims according to daylight contribution.
4. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting levels can be task tuned to increase energy savings.
2. Increase number of control zones by adding **SWX-900-AX** and **SWX-803-xx** units.
3. A standalone daylight harvesting sensor may also be used (model **SWX-250-1-D)** instead of combined sensor/daylight harvesting unit.
4. If Partial Off (dimming lighting to low level) is desired as an alternative to Full Off, substitute **SWX-900-AX-D2** as the power pack(s).
5. To provide an occupancy contact closure signal to an HVAC system, change one of the sensors to a **SWX-221-1-AR** model.
6. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Partial Auto On
4.2.2.1(8)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

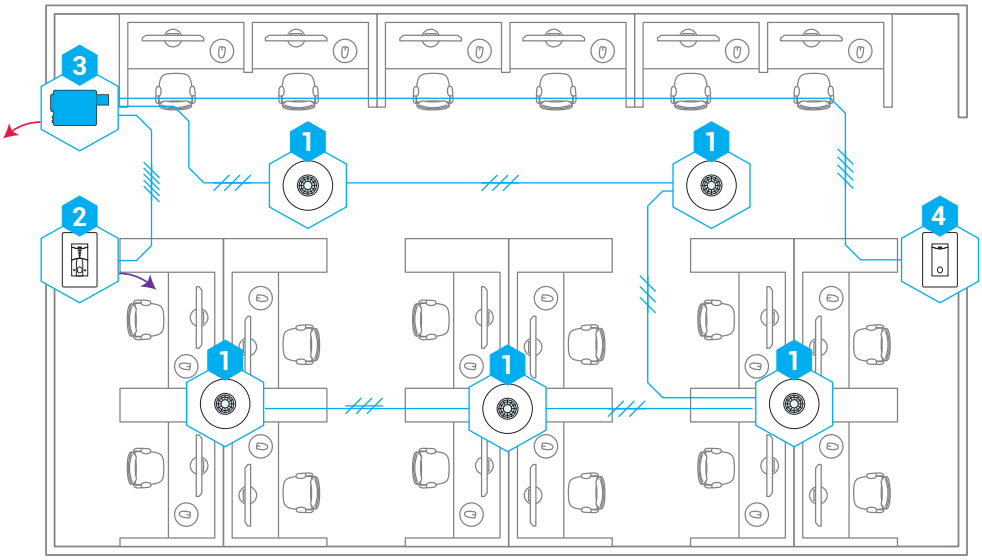
*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE

NOTE: SECTION C405.2.1.3(1) REQUIRES THAT INDIVIDUALLY CONTROLLED ZONES BE NOT > 600 SQ. FT.

OPEN OFFICE (w/o WINDOWS)

WIRED

NECB 2015



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V FIXTURES**
- **LOW VOLTAGE WIRING (18 AWG)**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	5	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
3	1	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC
4	1	**SWX-801-xx**	On/Off Wall Station, <xx = color>

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting levels can be task tuned to increase energy savings.
2. Increase number of control zones by adding **SWX-900-AX** and **SWX-803-xx** units.
3. If Partial Off (dimming lighting to low level) is desired as an alternative to Full Off, substitute **SWX-900-AX-D2** as the power pack(s).
4. To provide an occupancy contact closure signal to an HVAC system, change one of the sensors to a **SWX-221-1-AR** model.
5. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Partial Auto On
4.2.2.1(8)

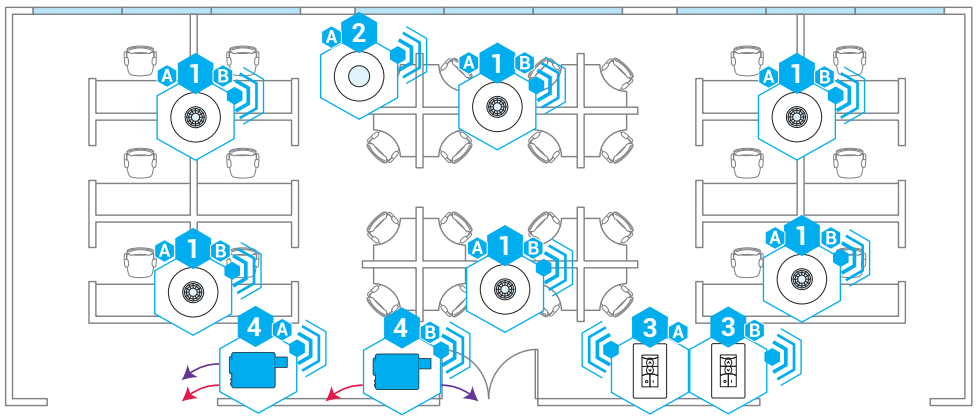
NOTE: SECTION C405.2.1.3(1) REQUIRES THAT INDIVIDUALLY CONTROLLED ZONES BE NOT > 600 SQ. FT.

OPEN OFFICE (w/ WINDOWS)

WIRELESS

KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- WIRELESS CONNECTION
- DAYLIGHT ZONE
- NON-DAYLIGHT ZONE



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	6	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-250-B**	Wireless Daylight Harvesting Photocell
3	2	**SWX-854-B-xx**	Wireless Remote Dimming Wall Station, <xx = color>
4	2	**SWX-950-D2**	Wireless Power Pack w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. Lighting in daylight zone(s) automatically dims according to daylight contribution.
4. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting levels can be task tuned to increase energy savings.
2. Increase number of control zones by adding **SWX-950-D2** and **SWX-854-B-xx** units.
3. To provide an occupancy contact closure signal to an HVAC system, change one of the power packs to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
4. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Partial Auto On
4.2.2.1(8)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

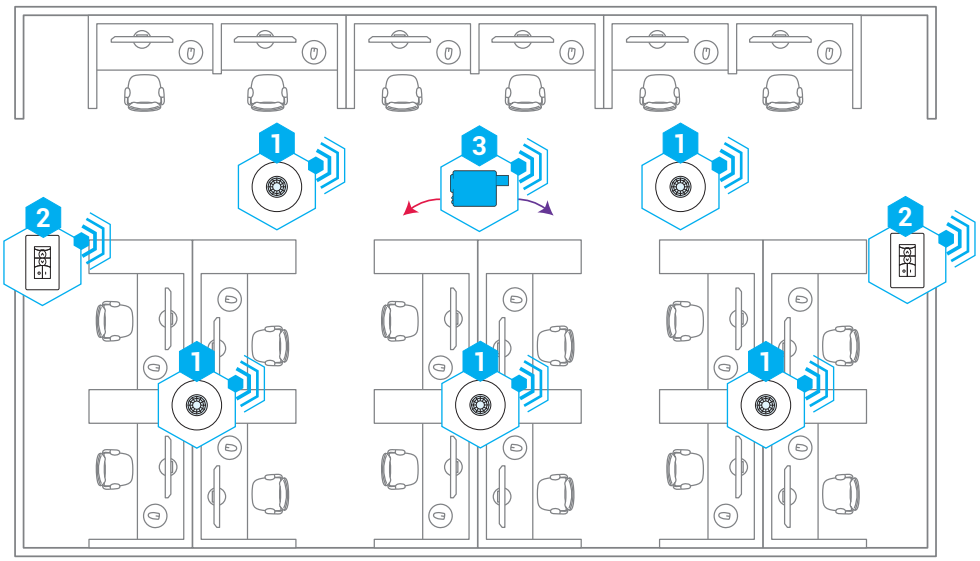
*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE

NOTE: SECTION C405.2.1.3(1) REQUIRES THAT INDIVIDUALLY CONTROLLED ZONES BE NOT > 600 SQ. FT.

OPEN OFFICE (w/o WINDOWS)

WIRELESS

NECB 2015



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **WIRELESS CONNECTION**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	5	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	2	**SWX-854-B-xx**	Wireless Remote Dimming Wall Station (0-10V), <xx = color>
3	1	**SWX-950-D2**	Wireless Power Pack w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting levels can be task tuned to increase energy savings.
2. Increase number of control zones by adding **SWX-950-D2** and **SWX-854-B-xx** units.
3. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
4. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off/Partial Auto On
4.2.2.1(8)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

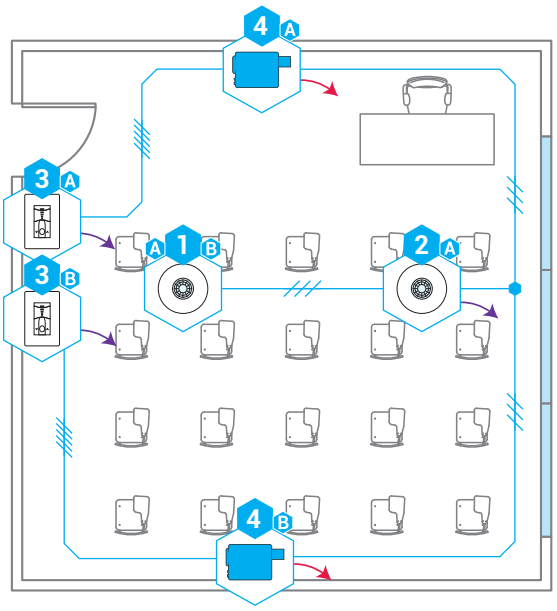
NOTE: SECTION C405.2.1.3(1) REQUIRES THAT INDIVIDUALLY CONTROLLED ZONES BE NOT > 600 SQ. FT.

CLASSROOM

WIRED OPTION 1

KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- LOW VOLTAGE WIRING (18 AWG)
- A DAYLIGHT ZONE
- B NON-DAYLIGHT ZONE



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-231-1-D**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360° w/ Daylight Harvesting (0-10V)
3	2	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
4	2	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. Lighting in daylight zone(s) automatically dims according to daylight contribution.
4. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-1** (see wired option 2)
2. Increase number of control zones by adding **SWX-900-AX** and **SWX-803-xx** units.
3. Maximum lighting level can be task tuned to increase energy savings.
4. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-221-1-AR** model.
5. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off/Partial Auto On
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

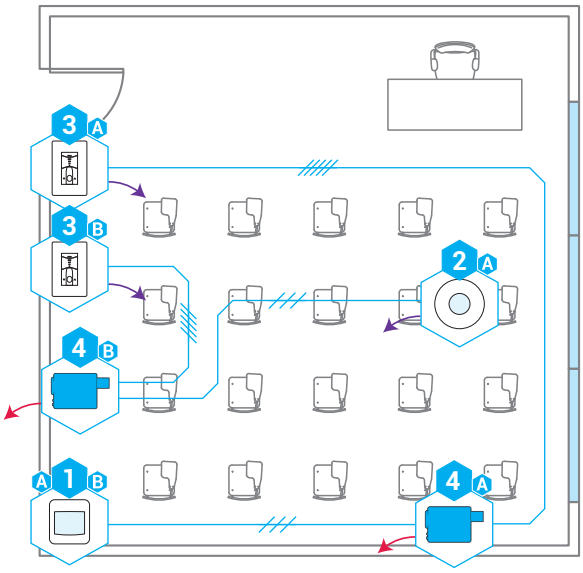
Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE

CLASSROOM

WIRED OPTION 2

NECB 2015



KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- LOW VOLTAGE WIRING (18 AWG)
- A DAYLIGHT ZONE
- B NON-DAYLIGHT ZONE

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-421-1**	Dual Technology (PIR/Acoustic) Occupancy Sensor, Wide View Corner Mount
2	1	**SWX-250-1-D**	Daylight Harvesting Photocell (0-10V)
3	2	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
4	2	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. Lighting in daylight zone(s) automatically dims according to daylight contribution.
4. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Increase number of control zones by adding **SWX-900-AX** and **SWX-803-xx** units.
2. Maximum lighting level can be task tuned to increase energy savings.
3. For added occupancy coverage, change daylight harvesting sensor to combination occupancy & daylight harvesting sensor (model **SWX-231-1-D**) or add a second corner mount sensor.
4. To provide an occupancy contact closure signal to an HVAC system, change the sensor to an **SWX-421-1-AR** model.
5. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

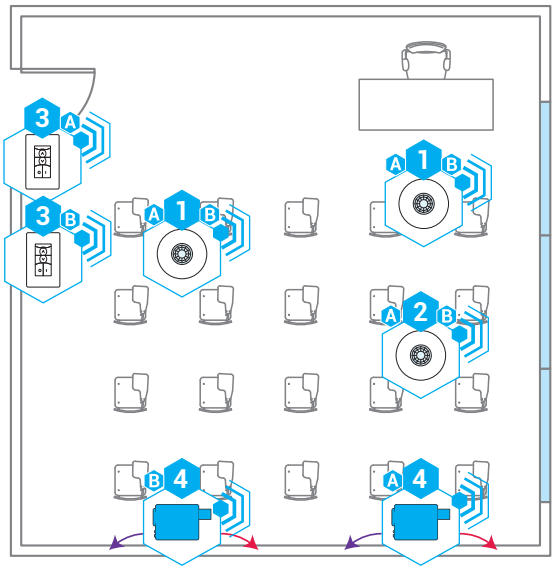
Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE

KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- WIRELESS CONNECTION
- A DAYLIGHT ZONE
- B NON-DAYLIGHT ZONE



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	2	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-250-B**	Wireless Daylight Harvesting Photocell
3	2	**SWX-854-B-xx**	Wireless Remote Dimming Wall Station (0-10V), <xx = color>
4	2	**SWX-950-D2**	Wireless Power Pack w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. Lighting in daylight zone(s) automatically dims according to daylight contribution.
4. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-B** (see wireless option 2).
2. Increase number of control zones by adding **SWX-950-D** and **SWX-854-B-xx** units.
3. Maximum lighting level can be task tuned to increase energy savings.
4. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
5. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

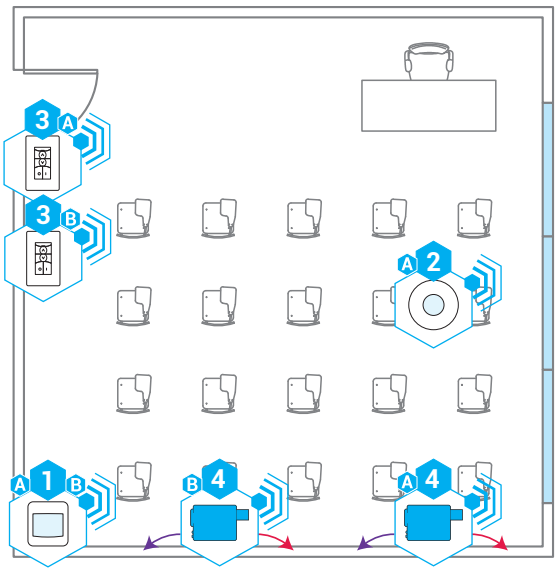
Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE

CLASSROOM

WIRELESS OPTION 2

NECB 2015



KEY

- TO LINE VOLTAGE CONNECTIONS
- TO 0-10V LIGHTING
- WIRELESS CONNECTION
- A DAYLIGHT ZONE
- B NON-DAYLIGHT ZONE

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-421-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Wide View Corner Mount
2	1	**SWX-250-B**	Wireless Daylight Harvesting Photocell
3	2	**SWX-854-B-xx**	Wireless Remote Dimming Wall Station, <xx = color>
4	2	**SWX-950-D2**	Wireless Power Pack w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of each lighting zone via separate dimmer switches.
3. Lighting in daylight zone(s) automatically dims according to daylight contribution.
4. All lighting zones turn off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Increase number of control zones by adding **SWX-950-D** and **SWX-854-B-xx** units.
2. Maximum lighting level can be task tuned to increase energy savings.
3. For enhanced occupancy coverage, add a second corner mount sensor in adjacent corner.
4. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
5. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Daylight Responsive Control*
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

*NOT REQUIRED FOR ROOMS WITH < 150W OF LIGHTING IN PRIMARY DAYLIGHT ZONE

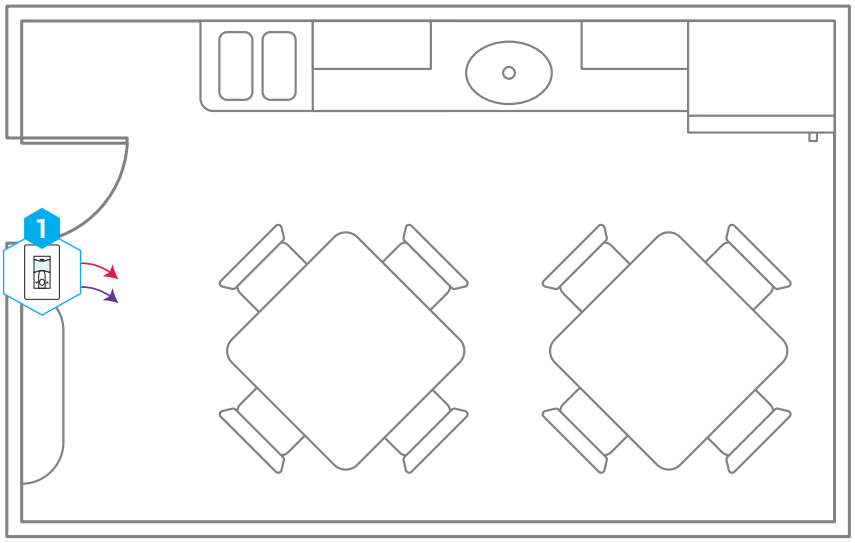
BREAKROOM / LOUNGE (SMALL)

WIRED

KEY

TO LINE VOLTAGE CONNECTIONS

TO 0-10V LIGHTING



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-121-D-xx**	Dual Technology (PIR/Acoustic) Wall Switch Occupancy Sensor w/ Dimming (0-10V), 120/277 VAC, , <xx = color>

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. For a compliant non-dimming solution, use a **SWX-101-xx**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. Although not required by code, receptacle control can be achieved by adding a **SWX-900** power pack wired on the load side of the wall switch sensor.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

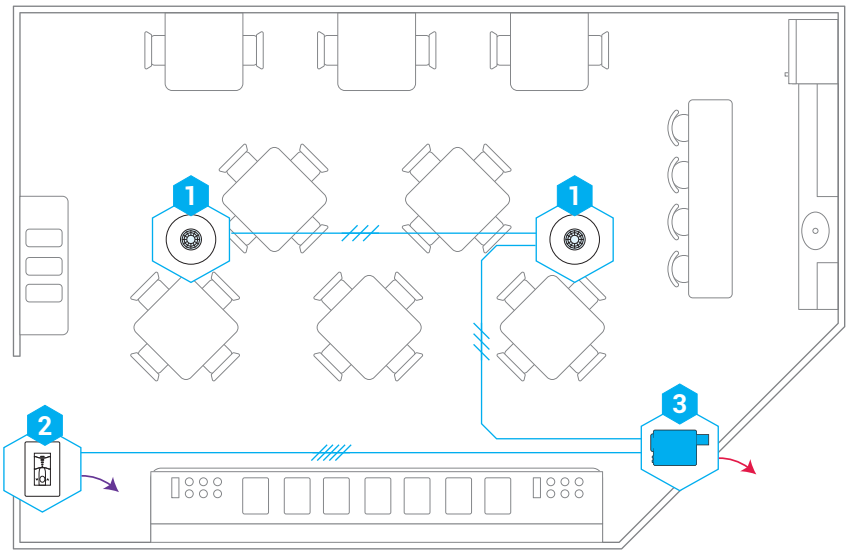
Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

BREAKROOM /LOUNGE (LARGE)

WIRED

NECB 2015



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **LOW VOLTAGE WIRING (18 AWG)**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	2	**SWX-231-1**	Dual Technology (PIR/Acoustic + Photocell) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station (0-10V), <xx = color>
3	1	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on manually to last user level or automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-1**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. If room has >150W of lighting in a daylight zone, add daylight harvesting photocell (model **SWX-250-1-D**).
4. For a compliant non-dimming solution, use a **SWX-801-xx** instead of the **SWX-803-xx**.
5. To provide an occupancy contact closure signal to an HVAC system, change one sensor to a **SWX-221-1-AR** model.
6. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

Daylight Responsive Control
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

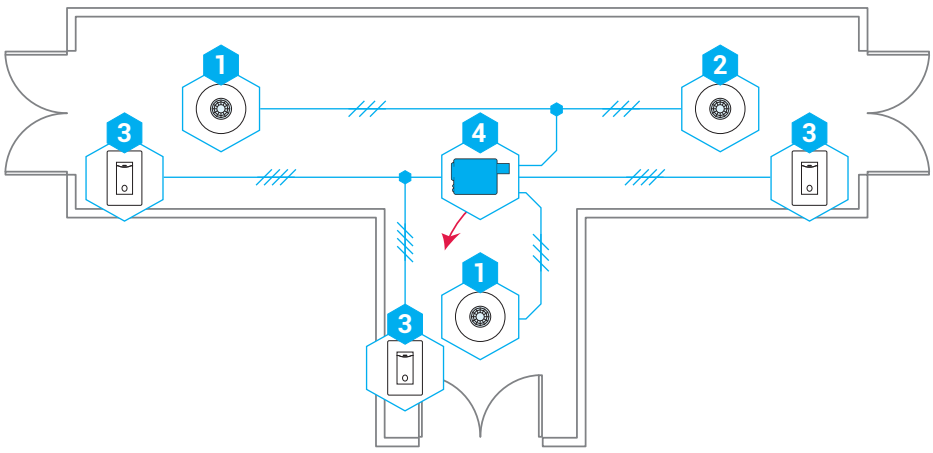
HALLWAY/CORRIDOR (w/ T-INSTERSECTION)

WIRED

KEY

TO LINE VOLTAGE CONNECTIONS

LOW VOLTAGE WIRING (18 AWG)



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	2	**SWX-202-1**	PIR Occupancy Sensor, Large Motion, Ceiling Mount 360°
2	1	**SWX-212-1**	PIR Occupancy Sensor + Photocell, Large Motion,Ceilng Mounted 360°
3	3	**SWX-801-xx**	On/Off Wall Switch - Low Voltage, <xx = color>
4	1	**SWX-900-AX-D2**	Power Pack w/ Aux Switch Input, Partial Off / On 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting drops to low level automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. In long corridors, add additional ceiling sensors every 40 ft as needed.
2. Alternative hallway sensor (at ends of corridor) model **SWX-402-1**.
3. To provide an occupancy contact closure signal to an HVAC system, change one sensor to a **SWX-202-1-AR** model.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Auto On/Partial Off
4.2.2.1(7) & 4.2.4.1(16-17)

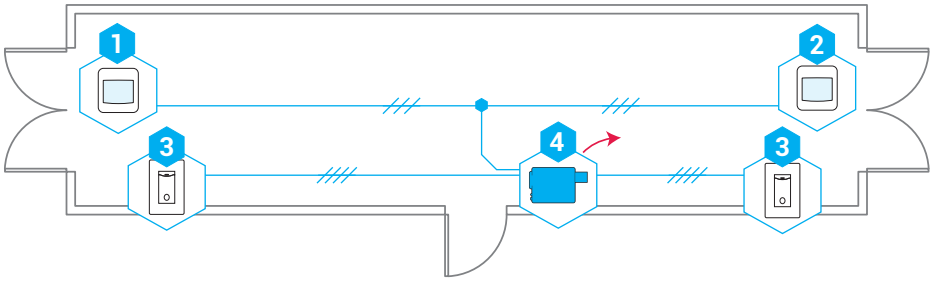
Manual Control - Switch
4.2.2.1(3-5)

Daylight Responsive Control
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

HALLWAY/CORRIDOR

WIRED

NECB 2015



KEY

TO LINE VOLTAGE CONNECTIONS

LOW VOLTAGE WIRING (18 AWG)

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-402-1**	PIR Occupancy Sensor, Hallway Coverage
2	1	**SWX-412-1**	PIR Occupancy Sensor + Photocell, Hallway Coverage
3	2	**SWX-801-xx**	On/Off Wall Switch - Low Voltage, <xx = color>
4	1	**SWX-900-AX-D2**	Power Pack w/ Aux Switch Input, Partial Off / On 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off manual control of lighting.
3. Lighting drops to low level automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. In corridors over 100 ft, add additional ceiling sensors in middle as needed.
2. To provide an occupancy contact closure signal to an HVAC system, change one sensor to a **SWX-402-1-AR** model.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Auto On/Partial Off
4.2.2.1(7) & 4.2.4.1(16-17)

Manual Control - Switch
4.2.2.1(3-5)

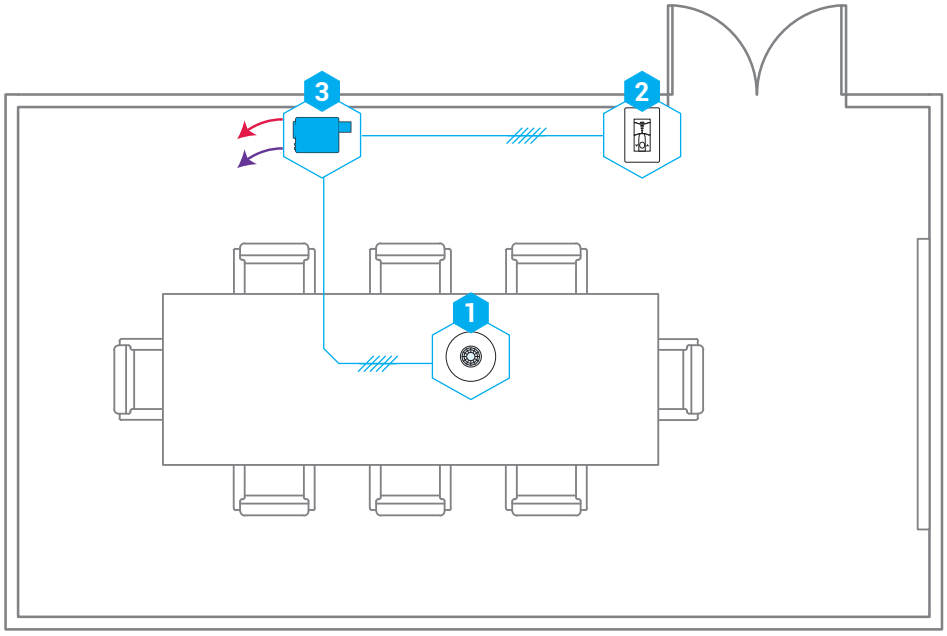
Daylight Responsive Control
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

CONFERENCE ROOM (MEDIUM)

WIRED

KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **LOW VOLTAGE WIRING (18 AWG)**



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-1**	Dual Technology Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station, <xx = color>
3	1	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting turns on automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns of automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-1**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. To provide an occupancy contact closure signal to an HVAC system, change the sensor to a **SWX-221-1-AR** model.
4. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

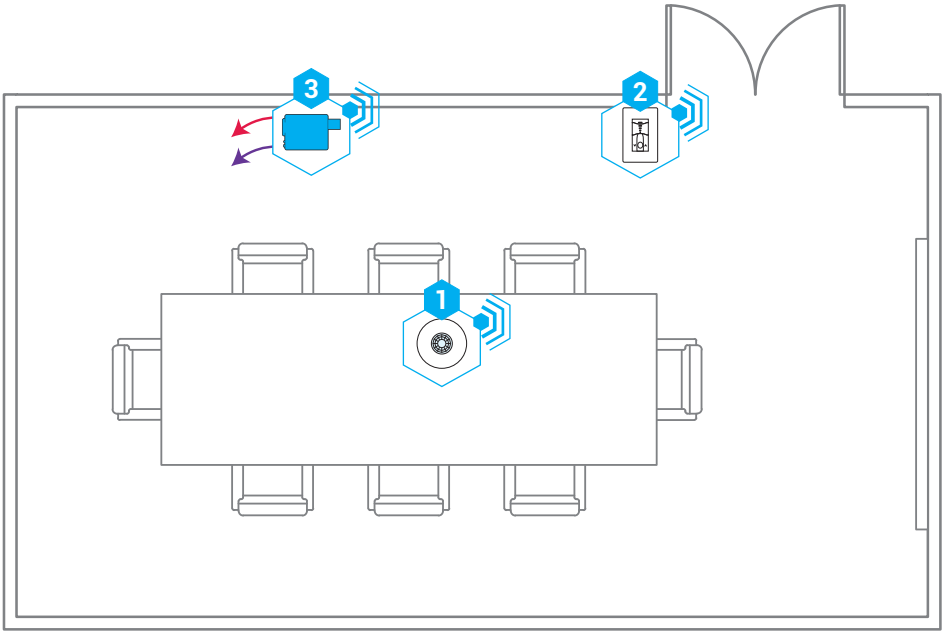
Manual On-Off
4.2.2.1(6)

Manual Light Reduction Control - Dimmer
4.2.2.1(9)

CONFERENCE ROOM (MEDIUM)

WIRELESS

NECB 2015



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **WIRELESS CONNECTION**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-854-B-xx**	Wireless Remote Dimming Wall Station, <xx = color>
3	1	**SWX-950-D2**	Wireless Power Pack w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting turns on automatically to 50% upon occupancy.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns of automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-421-B**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
4. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual On-Off
4.2.2.1(6)

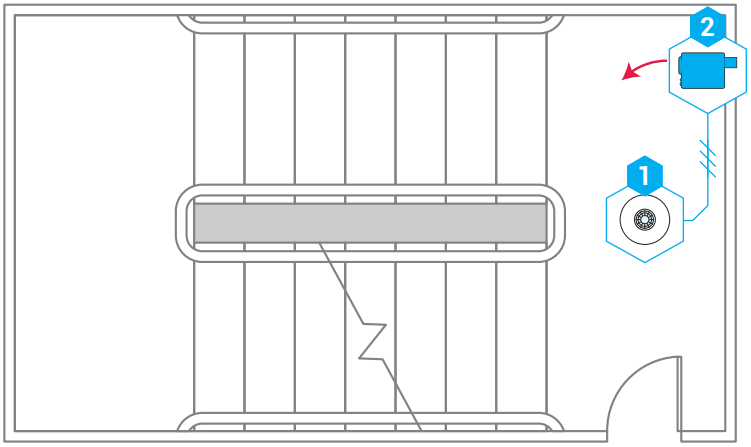
Manual Light Reduction Control - Dimmer
4.2.2.1(9)

STAIRWELL

WIRED OPTION 1

KEY

- TO LINE VOLTAGE CONNECTIONS
- LOW VOLTAGE WIRING (18 AWG)



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-202-1**	Dual Technology Occupancy Sensor, Large Motion, Ceiling Mount 360°
2	1	**SWX-900-AX-D2**	Power Pack, 120/277 VAC, w/ Partial Off (0-10V) Control

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. Lighting drops to low level automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Control multiple levels together by adding a sensor on every entry landing controlled by the same lighting circuit (i.e. common power pack).
2. Line voltage ceiling sensors (model **SWX-202-2**) or fixture mount sensors (model **SWX-501**) could also be used instead of low voltage sensor and power pack (see facing page).
3. Daylight Harvesting Controls may be required (model **SWX-222-1**).

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Auto On/Partial Off
4.2.2.1(7) & 4.2.4.1(16-17)

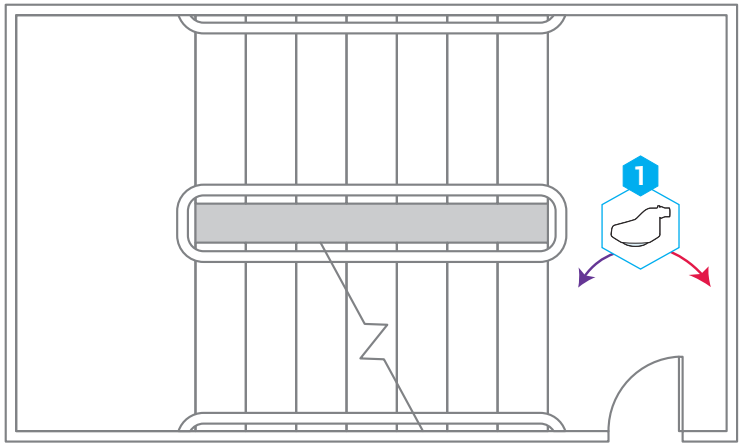
Manual Control - Switch*
4.2.2.1(3-5)

Daylight Responsive Control
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

*NOT REQUIRED FOR AREAS WITH SAFTEY CONCERNS

STAIRWELL

WIRED OPTION 2



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-501-HL**	Fixture Mount Sensor w/ Partial Off (0-10V) Control, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. Lighting drops to low level automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative ceiling mount sensor model **SWX-202-2-D.**
2. Daylight Harvesting Controls may be required, use sensor and power pack combination. (model **SWX-222-1** & **SWX-900-AX-D2**)

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Auto On/Partial Off
4.2.2.1(7) & 4.2.4.1(16-17)

Manual Control - Switch*
4.2.2.1(3-5)

Daylight Responsive Control
4.2.2.1(10-15), 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.4.1

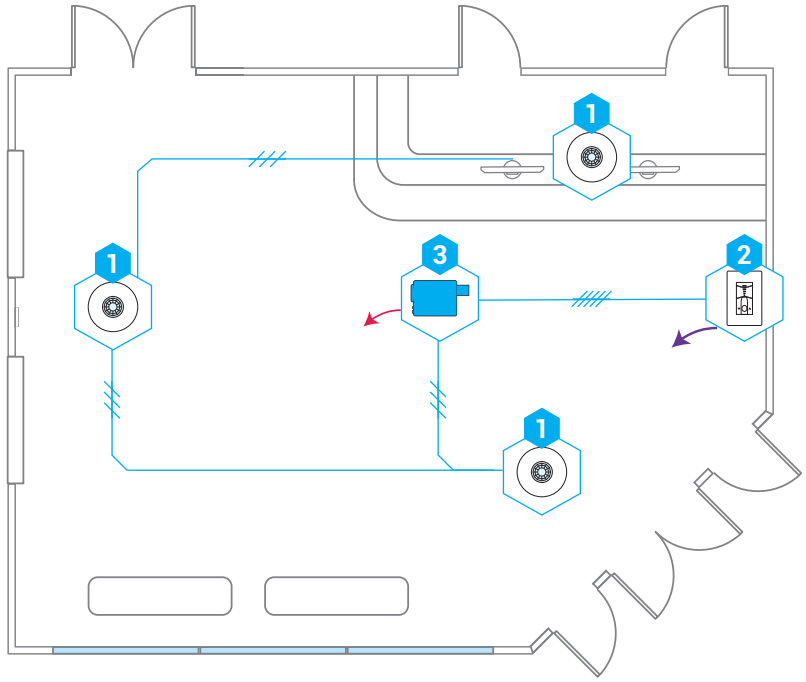
*NOT REQUIRED FOR AREAS WITH SAFTEY CONCERNS

LOBBY

WIRED

KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **LOW VOLTAGE WIRING (18 AWG)**



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	2	**SWX-221-1**	Dual Technology Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-803-xx**	Dimming Wall Station, <xx = color>
3	1	**SWX-900-AX**	Power Pack w/ Auxiliary Switch Input, 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns of automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. If no reception or chairs are present, PIR only sensor is adequate, model **SWX-202-1**
2. Maximum lighting level can be task tuned to increase energy savings.
3. If space has > 150W of lighting in a daylight zone, add daylight harvesting photocell (model **SWX-250-1-D**) or change one occupancy sensor to model **SWX-231-1-D**.
4. To provide an occupancy contact closure signal to an HVAC system, change one sensor to a **SWX-221-1-AR** model.
5. Although not required by code, receptacle control can be achieved by connecting an additional power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(16-17)

Auto On to Full Allowed
4.2.2.1(7)

Manual Control - Switch
4.2.2.1(3-5)

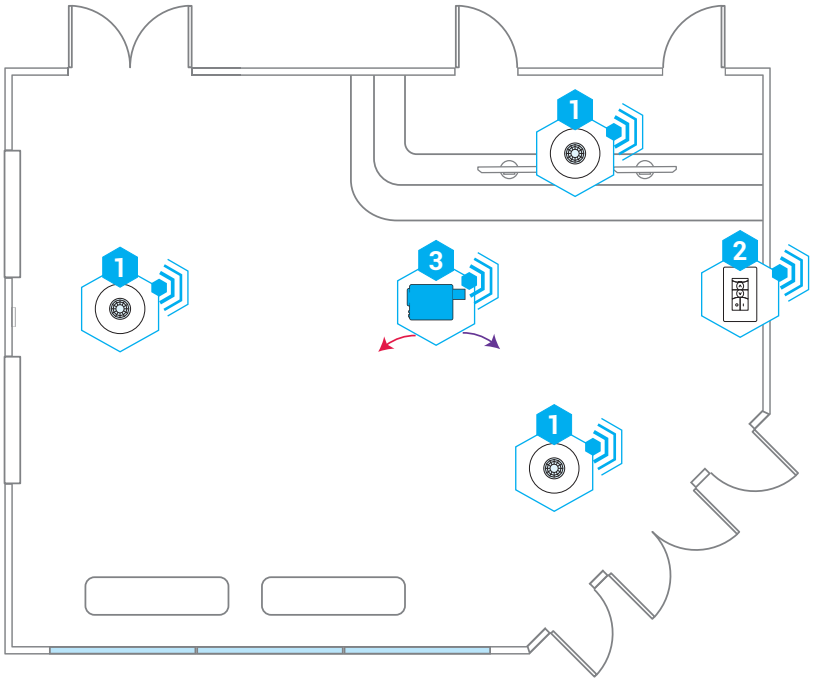
Manual Light Reduction Control - Dimmer
4.2.2.1(9)

*RECOMMENDED BUT NOT REQUIRED BY CODE.

LOBBY

WIRELESS

NECB 2015



KEY

- **TO LINE VOLTAGE CONNECTIONS**
- **TO 0-10V LIGHTING**
- **WIRELESS CONNECTION**

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	3	**SWX-221-B**	Wireless Dual Technology (PIR/Acoustic) Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-854-B-xx**	Wireless Remote Dimming Wall Station, <xx = color>
3	1	**SWX-950-D2**	Wireless Power Pack w/ Dimming (0-10V), 120/277 VAC

SEQUENCE OF OPERATION

1. Lighting switched on automatically to full bright.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns of automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. If no reception or chairs are present, PIR only sensor is adequate, model **SWX-201-B**.
2. Maximum lighting level can be task tuned to increase energy savings.
3. If space has >150W of lighting in a daylight zone, add daylight harvesting photocell (model **SWX-250-B.**
4. To provide an occupancy contact closure signal to an HVAC system, change the power pack to a **SWX-950-AX-D2** model and add a **SWX-910-AR** auxiliary relay pack.
5. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(16-17)

Auto On to Full Allowed
4.2.2.1(7)

Manual Control - Switch
4.2.2.1(3-5)

Manual Light Reduction Control - Dimmer*
4.2.2.1(9)

*RECOMMENDED BUT NOT REQUIRED BY CODE.

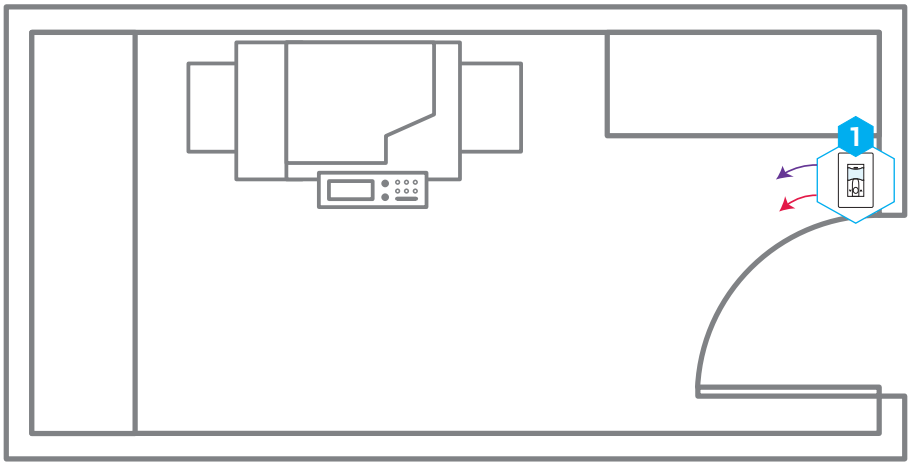
COPY / PRINT ROOM

WIRED

KEY

TO LINE VOLTAGE CONNECTIONS

TO 0-10V LIGHTING



BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-101-D-xx**	PIR Wall Switch Occupancy Sensor w/ Dimming (0-10V), 120/277 VAC, <xx = color>

SEQUENCE OF OPERATION

1. Lighting turns on automatically to 50% upon occupancy (default) or manually switched on to last user level.
2. On/off & raise/lower control of lighting via dimmer switch.
3. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Maximum lighting level can be task tuned to increase energy savings.
2. For a compliant non-dimming solution, use a **SWX-103-xx**.
3. Although not required by code, receptacle control can be achieved by adding a **SWX-900** power pack wired on the load side of the wall switch sensor.

SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

Manual Control - Switch
4.2.2.1(3-5)

Manual On-Off
4.2.2.1(6)

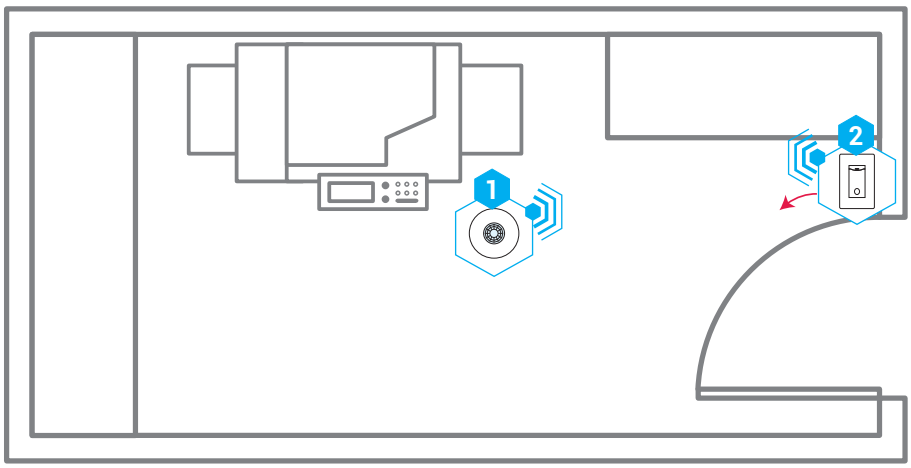
Manual Light Reduction Control - Dimmer*
4.2.2.1(9)

*RECOMMENDED BUT NOT REQUIRED BY CODE

COPY / PRINT ROOM

WIRELESS

NECB 2015



KEY

TO LINE VOLTAGE CONNECTIONS

WIRELESS CONNECTION

BILL OF MATERIAL

DIAGRAM #	QTY	MODEL #	DESCRIPTION
1	1	**SWX-201-B**	Wireless PIR Occupancy Sensor, Small Motion, Ceiling Mount 360°
2	1	**SWX-851-xx**	Wireless Wall Switch Controller, 120/277VAC, No Neutral Required, <xx = color>

SEQUENCE OF OPERATION

1. Lighting switched on manually via wall switch.
2. Lighting turns off automatically after occupants leave the space.

ADDITIONAL DESIGN CONSIDERATIONS

1. Alternative corner mount sensor model **SWX-401-B.**
2. Although not required by code, receptacle control can be achieved by adding a **SWX-950** power pack.

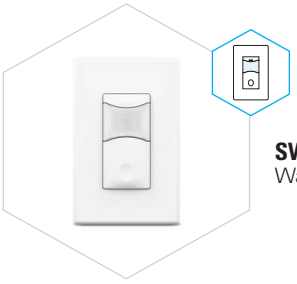
SUPPORTED CODE REQUIREMENTS

Occupancy Sensor Control
4.2.2.1(18-19) & 4.2.2.1(20-23)

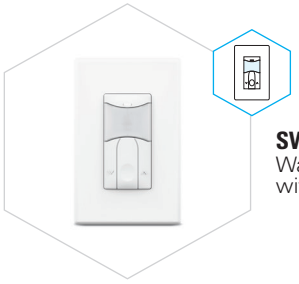
Manual On-Off
4.2.2.1(6)

Manual Control - Switch
4.2.2.1(3-5)

NOTES



SWX-100 SERIES
Wall Switch Sensor



SWX-100-D SERIES
Wall Switch Sensor
with Dimming

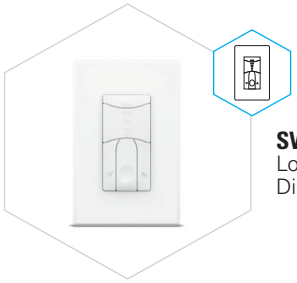
SWX-200 SERIES
Ceiling Sensors

SWX-250 SERIES
On/Off &
Daylight Harvesting
Photocell

SWX-400 SERIES
Wideview &
Hallway Sensors

SWX-500 SERIES
Fixture Mount Sensors

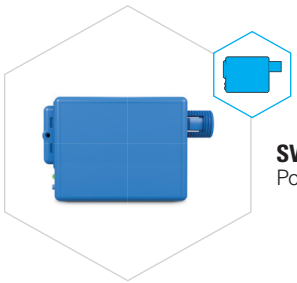
SWX-801
Low Voltage
Switch



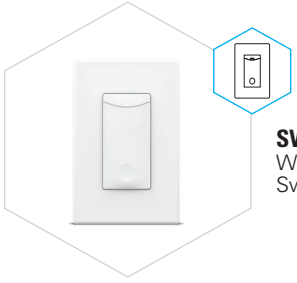
SWX-803
Low Voltage
Dimmer Switch

SWX-852
Wireless Switch

SWX-854
Wireless
Dimmer Switch



SWX-900 SERIES
Power Packs



SWX-851
Wireless Load Control
Switch

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REV 001–230728