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Lighting Controls

SpaceWise

Design guide

Getting to know
SpaceWise Technology

Philips luminaires with wireless SpaceWise Technology are stand alone LED lighting systems with integrated occupancy sensing and daylight harvesting, designed specifically for office spaces. Automated dimming behaviors are activated after installation using a remote control to create groups and connect wireless switches.

Understanding SpaceWise

SpaceWise Technology is easy to install, configure and appreciate, but it's also novel and innovative. This Design Guide has been developed to answer questions that may come up in the design process, so you can learn more about what makes it different and how the system functions. In this guide, information will be provided for each of the various office spaces, along with specification and ordering details.
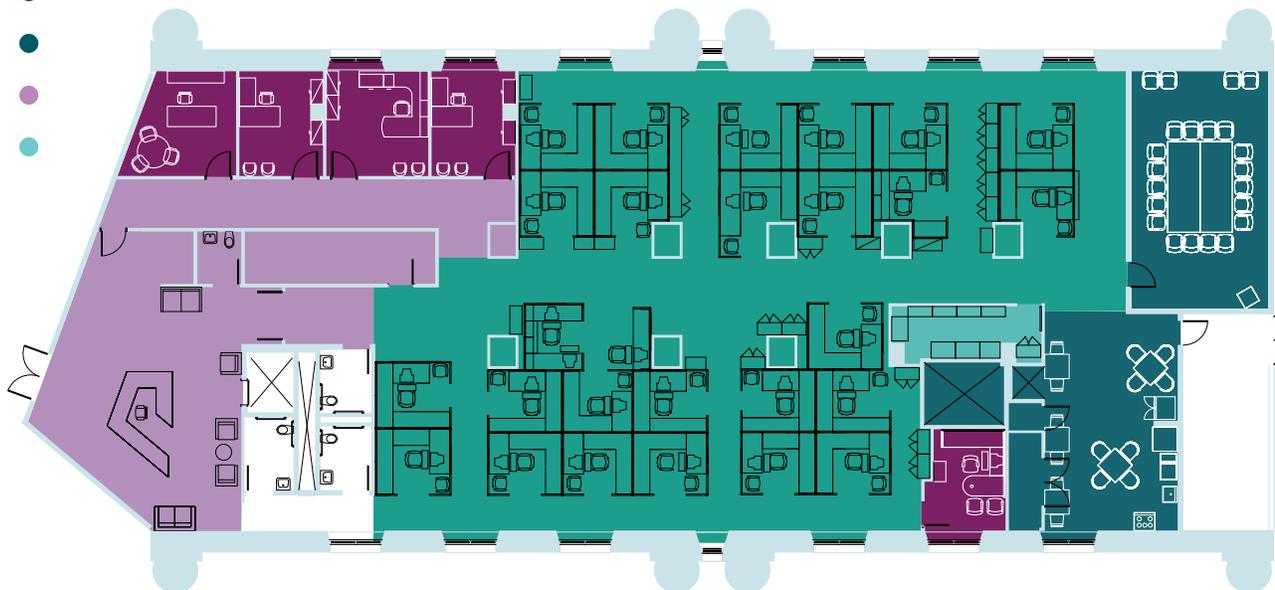
Success Story

In a recent Chicago installation in the GSA–operated Metcalfe Federal Building, DuaLED with SpaceWise was shown to save 75% of the energy consumption as compared to the designed baseline of 1.09 Watts per square foot. The annual Energy Use Intensity (EUI) of the retrofitted area was reduced from a design baseline of 3.96 kWh/ft2/yr to 0.98 kWh/ft2/year.* Energy codes, standards and utility incentive programs are moving towards the EUI metric as a way to properly measure actual energy consumption rather than connected load (Watts per square foot).

* The project was installed under the GSA Green Proving Ground Program. Final results are anticipated for publication in early 2015.

Typical Project Comparison

Project Parameters: 15,000 square feet, Annual Operating Hours of 3,120, $0.12 kWh/year

	Before	After
Luminaire Type	2x4 – 3 lampT8 fluorescent	2x4– LED
Watts per square foot	1.1	0.5
Controls Strategies	N/A	Task Tuning, Occupancy Dimming & Daylight Dimming
Measured Energy Costs	$6,178	$1,404

Yearly savings $4,774 = 75%

Optimize open plans
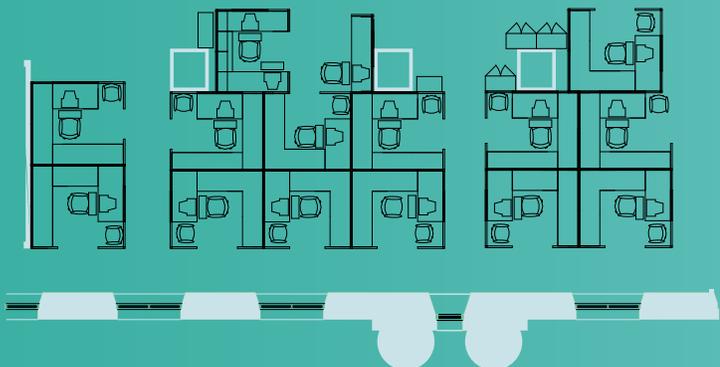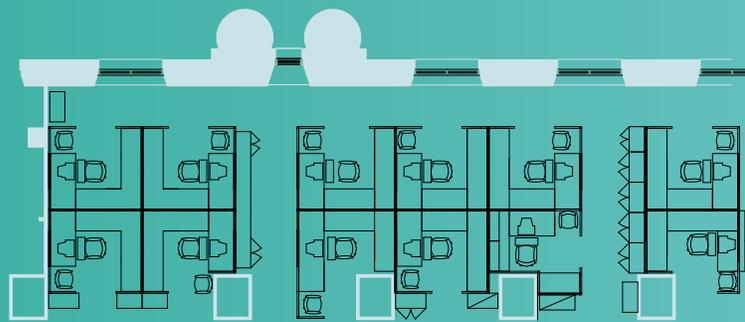
Deep energy savings without compromise

The traditional approach to energy savings in open plan is wattage reduction. In retrofit projects this often results in light levels below recommended practice and a dreary room appearance. SpaceWise technology overcomes these problems with smart luminaires that provide full light output at occupied workstations and lower background light level at unoccupied workstations. The aesthetic of the space is maintained with a background light level that won't turn off luminaires until the entire wireless group is unoccupied.

Design and Application

With SpaceWise Technology, the traditional need to provide a controls design and intent with wired zones is not necessary. The controls are embedded in each luminaire. After installation, wireless groups are created quickly with a handheld remote, and applications modes are chosen.

When configuring open plan offices with the SpaceWise Remote, large groups of 30–50 luminaires are recommended. As long as presence is detected within the group the luminaires stay on at the background light level in non-occupied areas.

When choosing a luminaire and creating a lighting layout, choose a lumen package that will provide your maximum desired light output. Once installed, the electrical contractor or facility manager will be able to modify the light output per group to one of four settings: high (100% output), medium (88%), low (77%) and minimum (66%). This provides flexibility after installation to adjust to existing conditions such as partition heights, reflectances, and energy goals.

System Behavior

· When the first occupant enters, the lighting group brightens up gently to a background level.

· As each occupant arrives at their workstation, luminaires in the immediate area brighten up to full illumination and the remaining luminaires will stay at background level.

· Daylight harvesting occurs automatically.

· When people leave their workstations, after 10 minutes the luminaires gently dim to background level.

· The lighting group will turn off only when the entire group has seen no occupancy for 10 minutes.

· Please note that the lights will not start to ramp up until stable presence is detected.

Private offices, **custom** settings
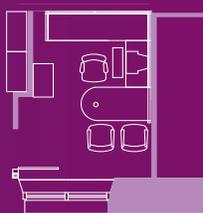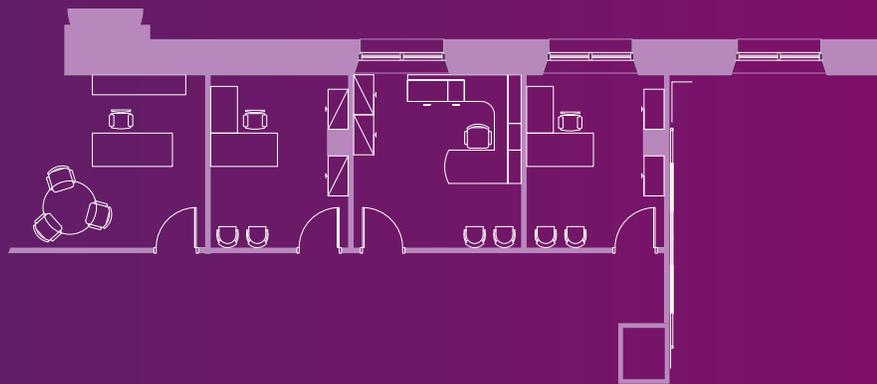
Manual controls allow for smart flexibility

With SpaceWise Technology, occupancy and daylight sensing is standard and embedded in the luminaire. With the addition of a wireless switch, users have personal control of their light levels.

Design and Application

By linking the wireless switch to the group of luminaires in a private office space, users can override the sensor determined light levels to their preferred light levels. The system will remember this preference during short vacancy periods and will revert back to the default light output after a long vacancy period.

System Behavior

· User chosen light levels can be achieved with a press and hold action on the wireless switch.

· User chosen light levels are remembered by the system for 45 minutes after vacancy, so that when the user reenters the space, the previous manual dimming light level is restored.

· Daylight harvesting occurs automatically, except when there is a manual override by the user.

Other system behaviors vary depending on whether a user chooses Manual ON/Auto OFF or Auto ON/Auto OFF.

Manual ON/Auto OFF behaviors include:

· When the switch is turned on lights quickly ramp up to the task level.

· When the space is unoccupied for 10 minutes the lights dim slowly to off.

Auto ON/Auto OFF behaviors include:

· When occupant enters the room the lights turn on to the task level.

· When the space is unoccupied for 10 minutes the lights slowly ramp down to the background level.

· Lights will remain at the background level for 15 minutes before turning off.

Set the **scene in** meeting rooms
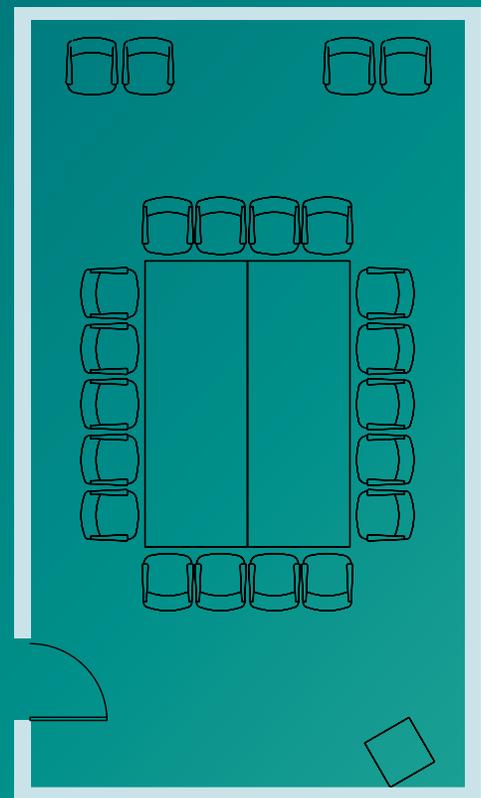
Create lighting that enhances meetings & presentations

Lighting planning for meeting or conference rooms needs to be flexible to fulfill a variety of situational requirements. For example, audiovisual presentations may require lower light levels. SpaceWise has the flexibility you need for these areas, while also providing automatic daylight harvesting and occupancy sensing within each luminaire.

Design and Application

When using SpaceWise Technology in a meeting room, specify the wireless scene selector to get the flexibility between automated dimming behaviors or user-chosen presets. The scene selector does not function as a manual dimmer.*

System Behavior

· The wireless scene selector has 4 presets:

  Button 1: Automated dimming based on occupancy and daylight

  Button 2: 20% default light output**

  Button 3: 40% default light output**

  Button 4: Off

· Daylight harvesting occurs automatically, except when a preset light level is chosen by the user.

Other system behaviors vary depending on whether a user chooses Manual ON/Auto OFF or Auto ON/Auto OFF.

Manual ON/Auto OFF behaviors include:

· When one of the buttons on the scene selector is pressed, lights turn on according to the function of the button.

· When the space is unoccupied for 10 minutes the lights dim slowly to off.

Auto ON/Auto OFF behaviors include:

· When occupant enters the room the lights turn on to the task level.

· When the space is unoccupied for 10 minutes the lights slowly ramp down to the background level.

· Lights will remain at the background level for 15 minutes before turning off.

*If full range dimming is desired in the meeting room rather than presets, the wireless switch is required. See more details about the wireless switch in the Private Office portion of this Guide.

** Buttons 2 and 3 can be set to different outputs during configuration.

Transition to savings in **corridors**
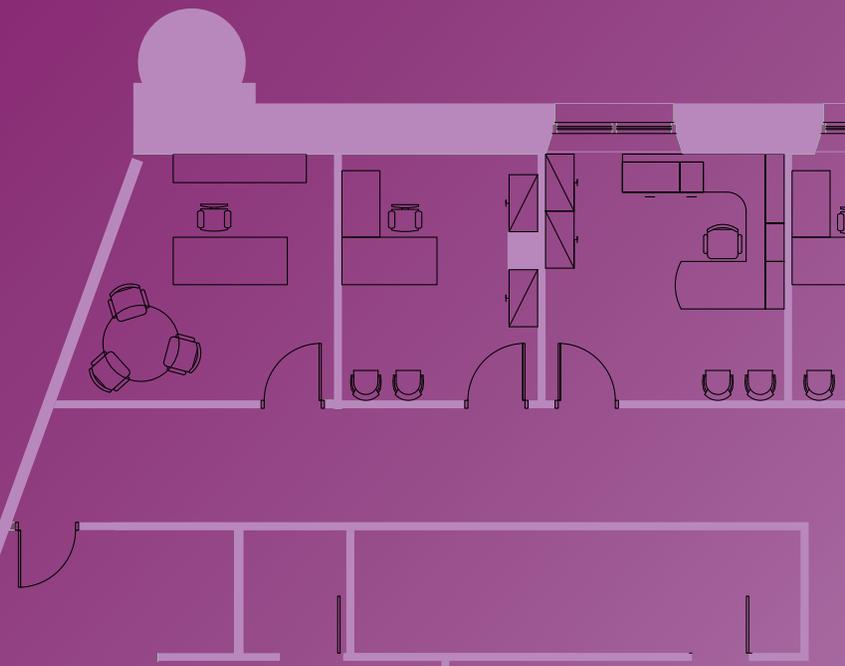
Light when you need it

Corridors usually have irregular occupancy pattern and generally do not require high light levels. SpaceWise Technology offers deep energy savings by keeping the luminaires at the background light level when people are simply passing through, coupled with a faster time out after vacancy. Task level output is provided only when stable presence is detected, for impromptu meetings or for paper tasks.

Design and Application

When preparing the lighting layout, keep in mind that the background setting will be the predominant light level, because stable occupancy resulting in full output will be uncommon for corridors. Therefore extra wide spacing between fixtures is not necessary to achieve energy savings.

If corridor luminaires are grouped separately they will go off when there is no vacancy after 20 minutes. If this behavior is not desired, it is recommended to group corridor luminaires with adjacent open plan areas.*

System Behavior

· When motion is detected or when a switch is turned on, the group of lights in the corridor will turn on to the background level.

· When occupancy sensors see stable presence, they will ramp up to the task level. When the space is unoccupied for 5 minutes then lights slowly ramp down to the background level.

· Lights will remain at the background level for 15 minutes before turning off.

* See more details about open plan behaviors in the Open Plan portion of this Guide.

Get prepared for any emergency
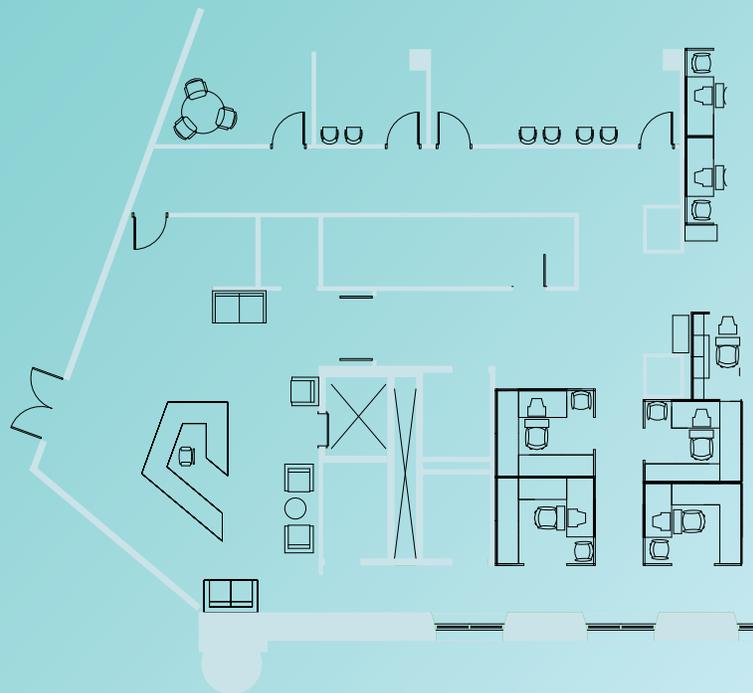
Control & illuminate the path of egress

10 to 20% of building lighting is typically dedicated for emergency use. Traditionally emergency lights are configured to stay on all the time, wasting a significant amount of energy. With SpaceWise Technology it is possible to provide adequate light output during emergency events and save energy using controls for emergency lights during normal power conditions.

Design and Application

If your buiilding does not have an emergency backup system installed, use SpaceWise Technology luminaires with a built-in battery pack to save energy. This will allow energy saving behaviors during normal operation while also providing the required light output during an emergency event.

If your building has an existing generator backup system, it is recommended to activate the 'path of egress' setting on all the SpaceWise Technology luminaires installed on the generator circuit. The 'path of egress' setting disables the automatic shutoff feature of the luminaire. However, the luminaire still operates in conjunction with the rest of the SpaceWise group and will continue to regulate the lights based on their daylight and occupancy sensing elements.

It is not necessary to create a separate group of luminaires on the emergency circuit. Luminaires can be grouped together in any manner but care should be taken that the luminaires that are being powered on the emergency circuit are identified and their path of egress setting is activated.

System Behavior

· When motion is detected or when the switch is turned on, lights ramp up to the task level.

· When the space is unoccupied for the time configured in the selected application mode then the lights will ramp down to the background level.

· If battery pack is specified then the lights will turn off after the configured time in the selected application mode.

· If 'path of egress' setting is activated on select luminaires then those luminaires will not automatically turn off and will stay at the background level while the rest of the group will turn off.

SpaceWise Technology
specification extras

Provide room-based control and meet aggressive energy codes with wireless battery-less sensors

Wall switches for new construction or major renovation

Most energy codes for new construction or major renovation projects will require that the switches have a manual on/auto off functionality. Some of the most recent codes also require daylight dimming for certain spaces. SpaceWise Technology meets these code requirements with integral occupancy and daylight sensing. The SpaceWise compatible wireless switches allow the system to be configured for manual on / automatic off requirements and also provides dimming override capabilities.

Wall-based controls for retrofit projects

Typically, retrofit projects do not require changes to the wall based controls to force manual on functionality. Auto shutoff is typically required, and that requirement is met by the SpaceWise luminaire-based sensors. For additional energy savings wall based switches can be added to replace dated toggle switches.

Configure groups and light levels using the SpaceWise Remote

SpaceWise Remote

The SpaceWise Remote is necessary to configure the SpaceWise System. In an open plan space, luminaires are grouped into standalone networks* of up to 50 luminaires. This initiates the dimming behaviors and operation of the wireless, battery free, kinetic switches. The remote is used to choose the proper room mode within the space, and light level preferences are then chosen per group. Use the SpaceWise remote to connect the wireless wall switch or scene controller to the luminaire.

* SpaceWise uses Zigbee protocol to create a standalone mesh network per group. The groups do not communicate to each other or the BMS.

Extend the occupancy coverage area of your SpaceWise luminaire with external OccuSwitch Wireless Sensors

Avoiding false turn off

Some office areas may have a non-standard ceiling grid or unusual barriers between the sensors and workstations, which may prevent the luminaire sensor from detecting all the workstations. With the help of an external OccuSwitch Wireless ceiling sensor the occupancy coverage area of the SpaceWise luminaires can be extended to detect the entire work space area.

Note that the external ceiling sensor is not connected to any load so it will not regulate the lights between the task level and the background level, it will only prevent the group of lights from falsely shutting off.

Turn on the lights before you enter the space

If there is a need to have the lights turned on just before the occupants enter that space then it can be achieved by installing the external ceiling sensors at various entry points to detect incoming occupants. This way the space is pre-lit and the possibility of a dark passage way is avoided.

Features

· Up to 10 OccuSwitch Wireless Sensors can be added to a group of SpaceWise luminaires

· 10-year no-maintenance operation with a heavy duty long life 3.6 volt Lithium-thionyl chloride battery.

· Wireless controls mean no sensor wiring needed, eliminating the task of opening the ceiling to install sensor.

ORDERING INFORMATION

SpaceWise systems parts are shown below. Contact your Philips representative for information about additional luminaires with SpaceWise technology.

Part	Ordering code	Comments
DuaLED 2x2	Refer to the DuaLED specification sheet. Specify luminaire option as SWZG2	2100 to 4400 nominal delivered lumens
DuaLED 2x4	Refer to the DuaLED specification sheet. Specify luminaire option as SWZG2	4300 and 4900 nominal delivered lumens
EvoGrid 2x2	Refer to the EvoGrid specification sheet. Specify luminaire option as SWZG2	3000 to 4500 nominal delivered lumens
EvoGrid 2x4	Refer to the EvoGrid specification sheet. Specify luminaire option as SWZG2	3800 to 7400 nominal delivered lumens.
ClearAppeal 2x2	Refer to ClearAppeal specification sheet. Specify luminaire option as SWZG2	3000 to 3800 nominal delivered lumens.
ClearAppeal 2x4	Refer to ClearAppeal specification sheet. Specify luminaire option as SWZG2	3600 to 7000 nominal delivered lumens.
ClearAppeal 1x4	Refer to ClearAppeal specification sheet. Specify luminaire option as SWZG2	2600 to 4000 nominal delivered lumens.
Evokit 2 Accessory 2x2 Endcap w/SW4.1	9292000725913	Add SpaceWise accessory to Standard Evokit
Evokit 2 Accessory 2x4 Endcap w/SW4.1	9292000726013	Add SpaceWise accessory to Standard Evokit
SWZ-REMOTE	912400395923	SpaceWise Programming Tool (Remote)
UID8451/10	913700364403	Zigbee Green Power Switch Dim 2 button
UID8461/10	913700364203	Zigbee Green Power Switch scene selector 4-button
LRM1743/00	913700344103	External OccuSwitch Wireless sensor to increase occupancy coverage area.