POWER SAVINGS

THROUGH

LIGHTING MANAGEMENT

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"Putting a Stop to Energy Waste™"

Legrand New Lighting Management System

1) Switch Sensors

2) SCS Sensors and Room Controllers

"Putting a Stop to Energy Waste™"

…towards sustainable building solutions

The energy dilemma in commercial buildings

+ x

Irreversible growth of energy cost

x 2

Increase of power consumption by 2050

÷ 2

Reduction of CO_2 emissions to avoid dramatic climate changes

http://www.abareconomics.com/publications_html/climate/climate_07/technology.pdf

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Switch Sensors

- **Switch sensor**

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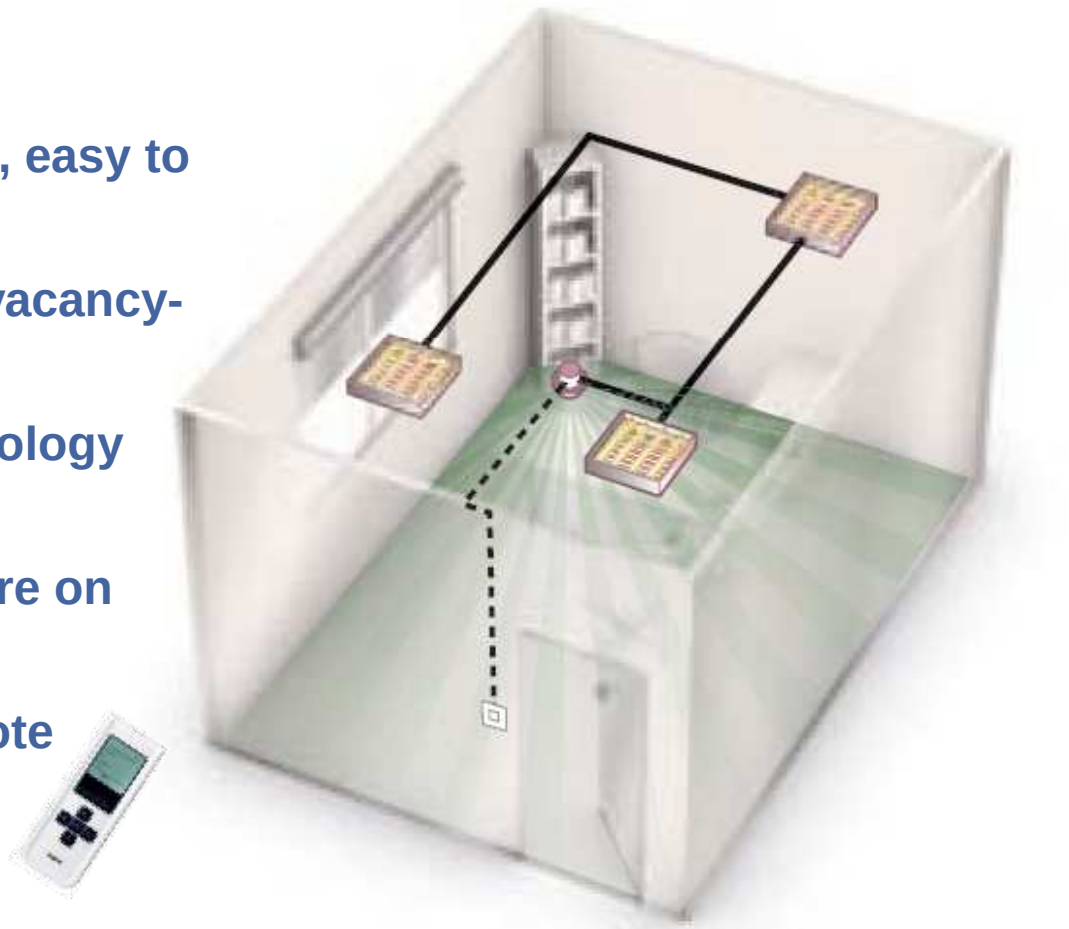
Switch Sensors – Suitable for managing single or multiple areas

- Advantages:
  - Simple and economical, easy to install
  - Occupancy-mode and vacancy-mode available
  - Choice of sensor technology (PIR, US & Dual Tech)
  - Daylight set point feature on ceiling sensors
  - Programmable via remote programming tool



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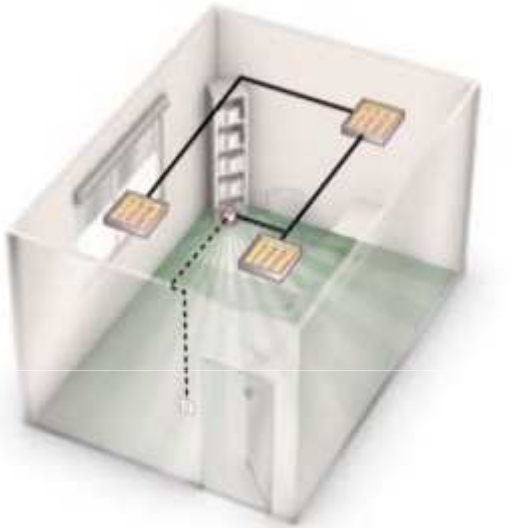
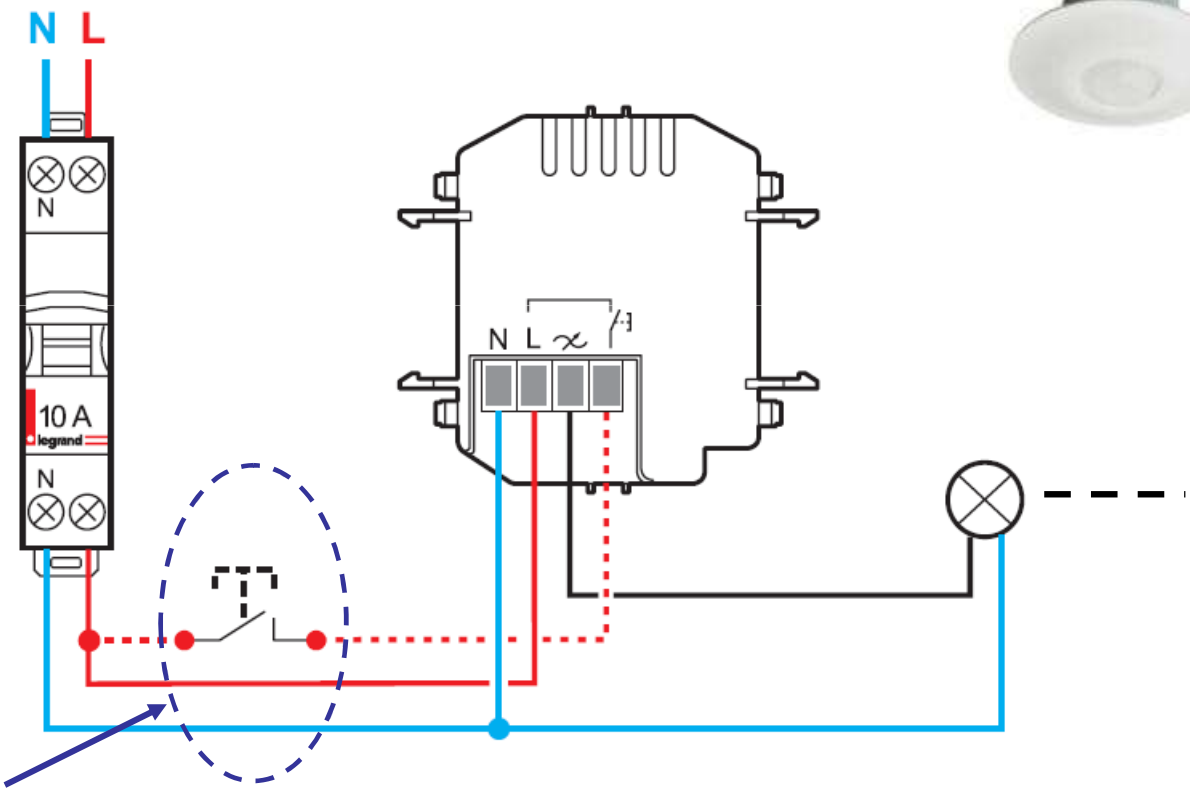
Switch Sensor – How is it wired?





Normal push button (Bell press) for “Vacancy” mode (Manual On / Auto Off) and manual override

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SCS Sensors and Room Controllers types

- **SCS Sensors and Room Controllers**

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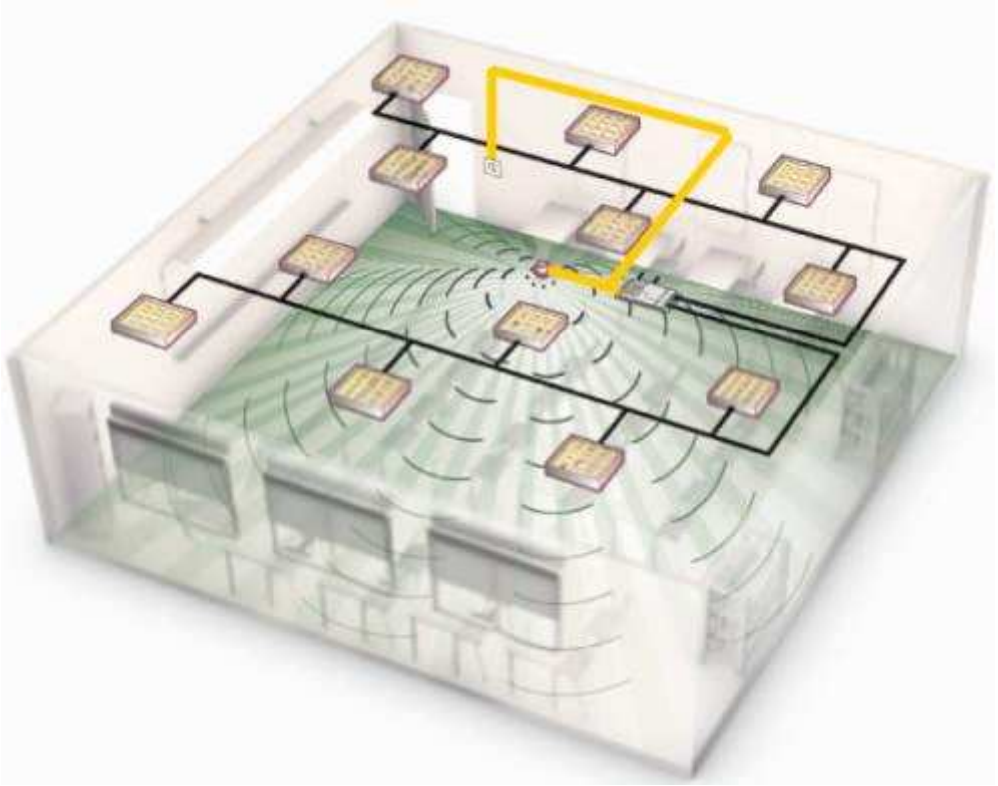
SCS Sensors and Room Controllers – Suitable for managing single or multiple floors

- Advantages:
  - Maximum flexibility
  - Based on 2 wire Bus (SCS)
  - Occupancy and vacancy operation modes
  - Choice of sensor technology (PIR, US, Dual Tech)
  - Daylight set point feature on ceiling sensors
  - Compatible with all dimming technologies



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SCS Sensors with Room Controllers: How do they work?

- The SCS sensor(s) are connected to and powered by the Room Controllers (no dedicated power supply required)

- Room Controller automatically programs itself by recognising the controls connected to the inputs (SCS Sensors and Switches)

- The SCS sensors and room controllers do not require configurators!

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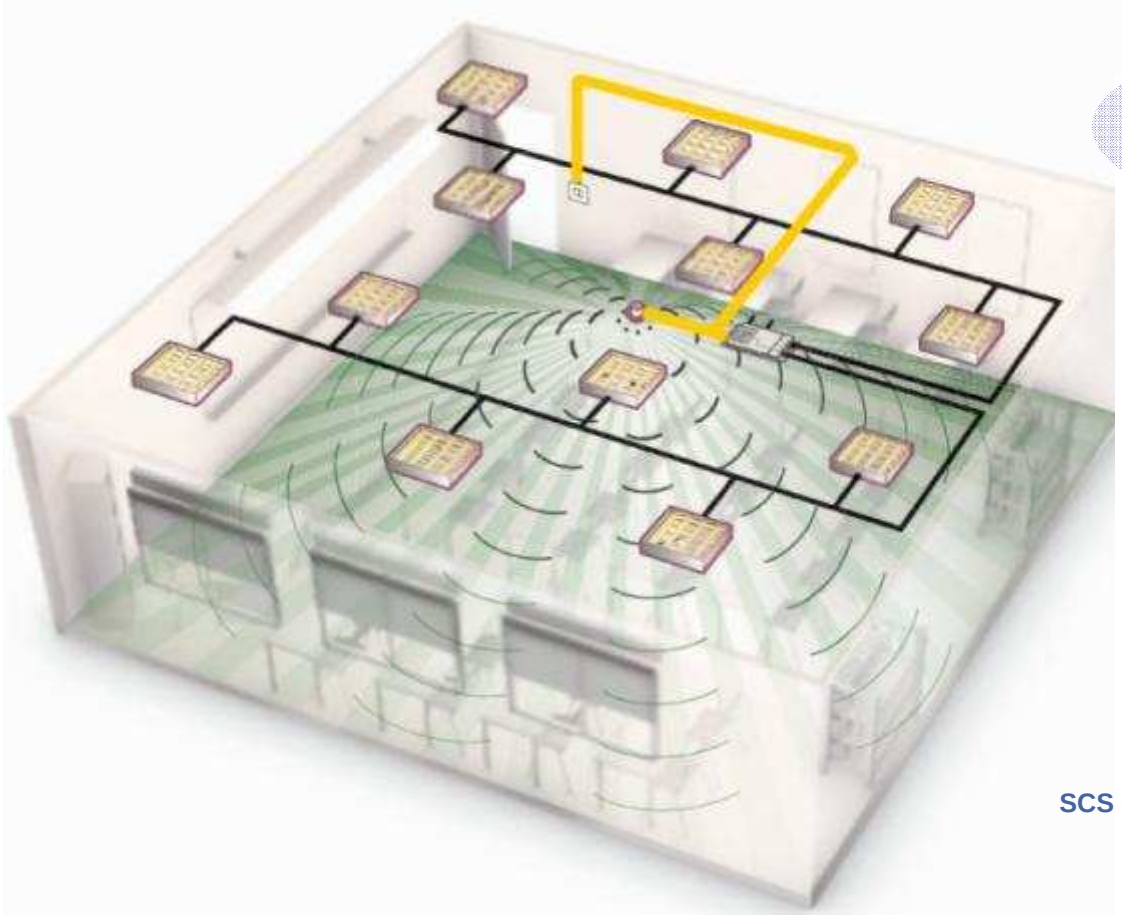
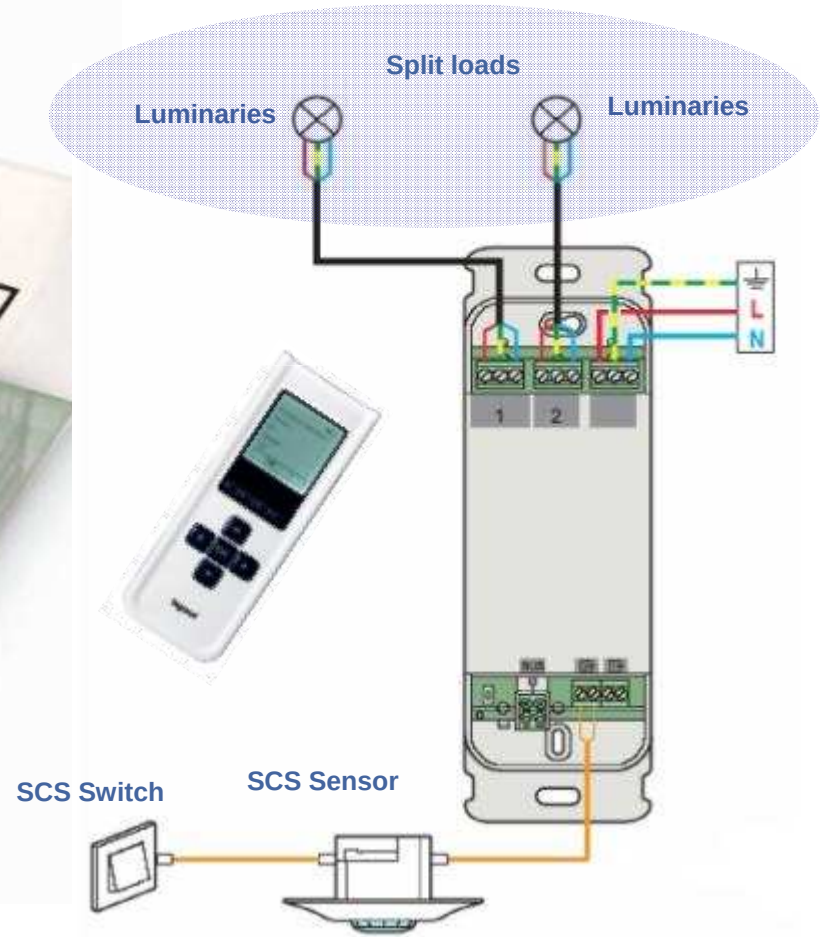
SCS Sensor with Room Controller: How are they wired?





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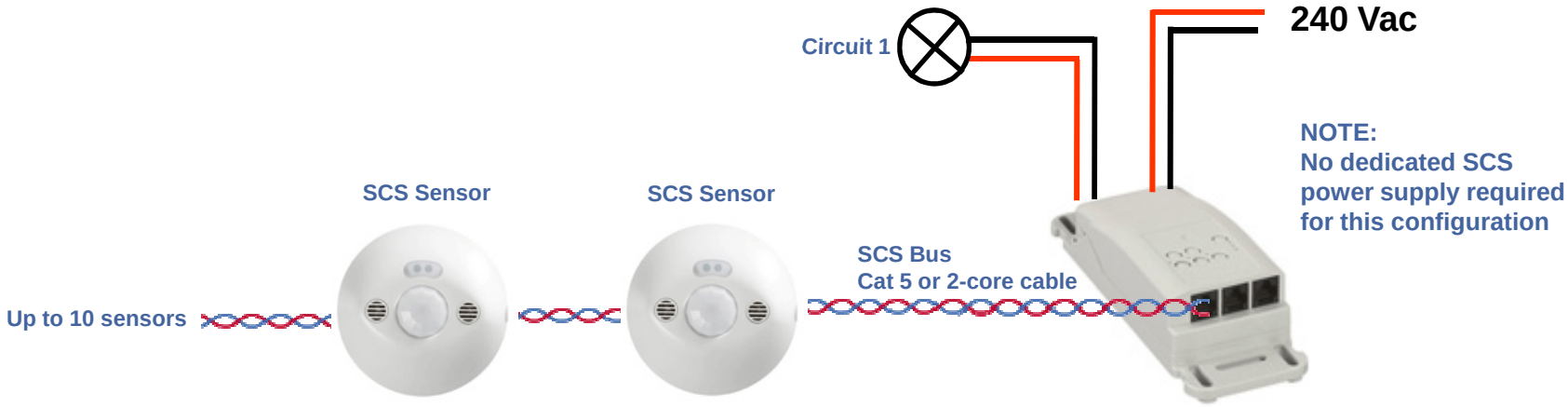
Wiring example 1: Setup of one SCS Sensor and Room Controller

- Sensors are linked to the corresponding output circuit



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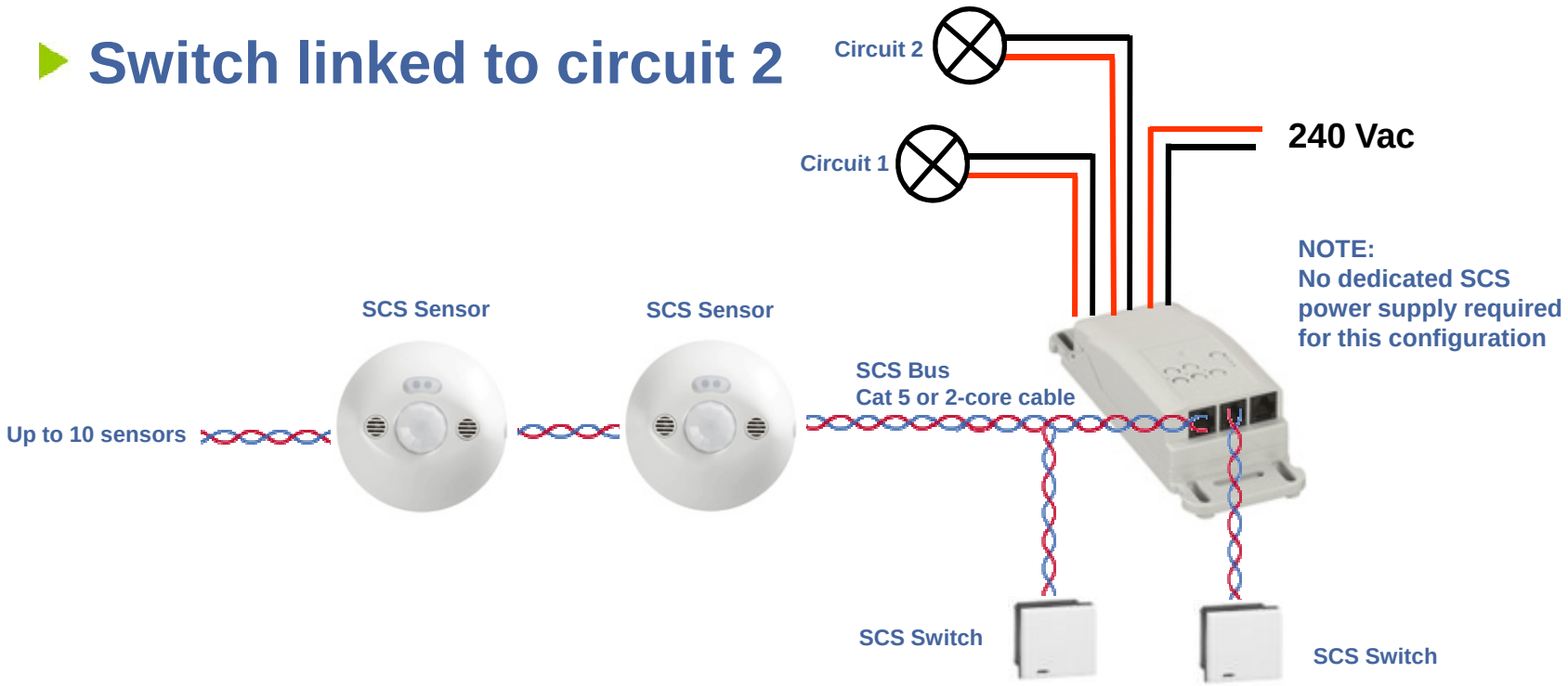
Wiring example 2: Setup of one SCS Sensor and Room Controller

- Sensors and a switch linked to circuit 1
- Switch linked to circuit 2



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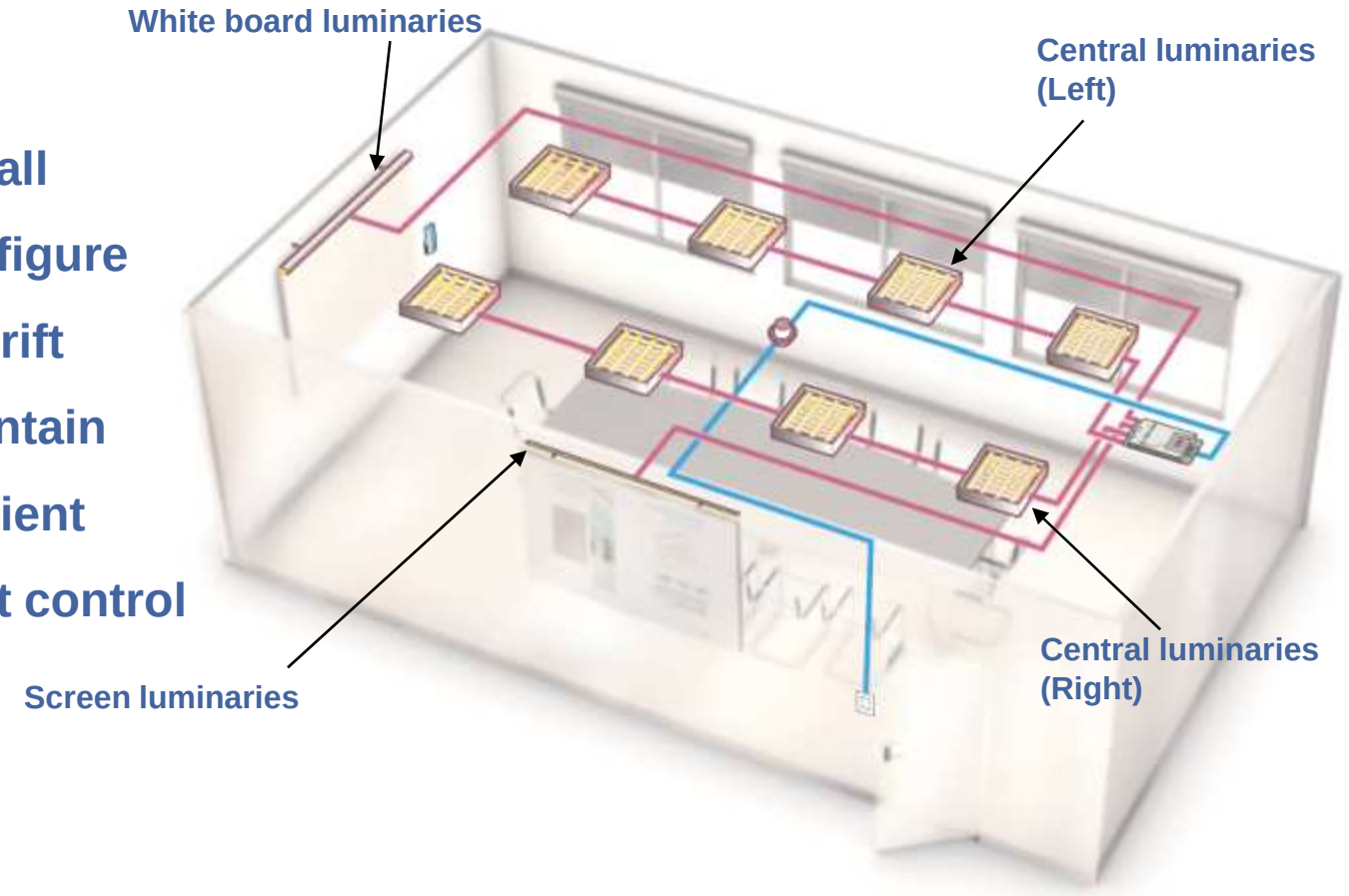
Application example 1: Office - Room Controller with 4 x 0-10V outputs for dimmable ballasts + SCS Switch

- Advantages:
  - Easy to install
  - Easy to configure
  - Easy to retorift
  - Easy to maintain
  - Energy efficient
  - Independent control of circuits



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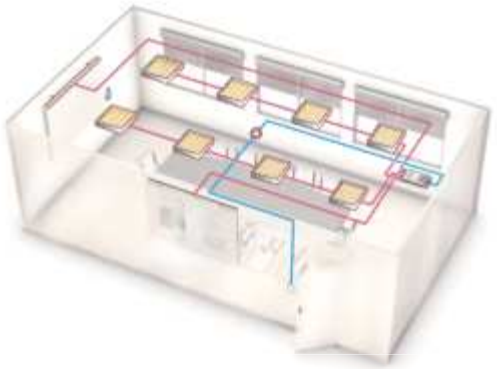

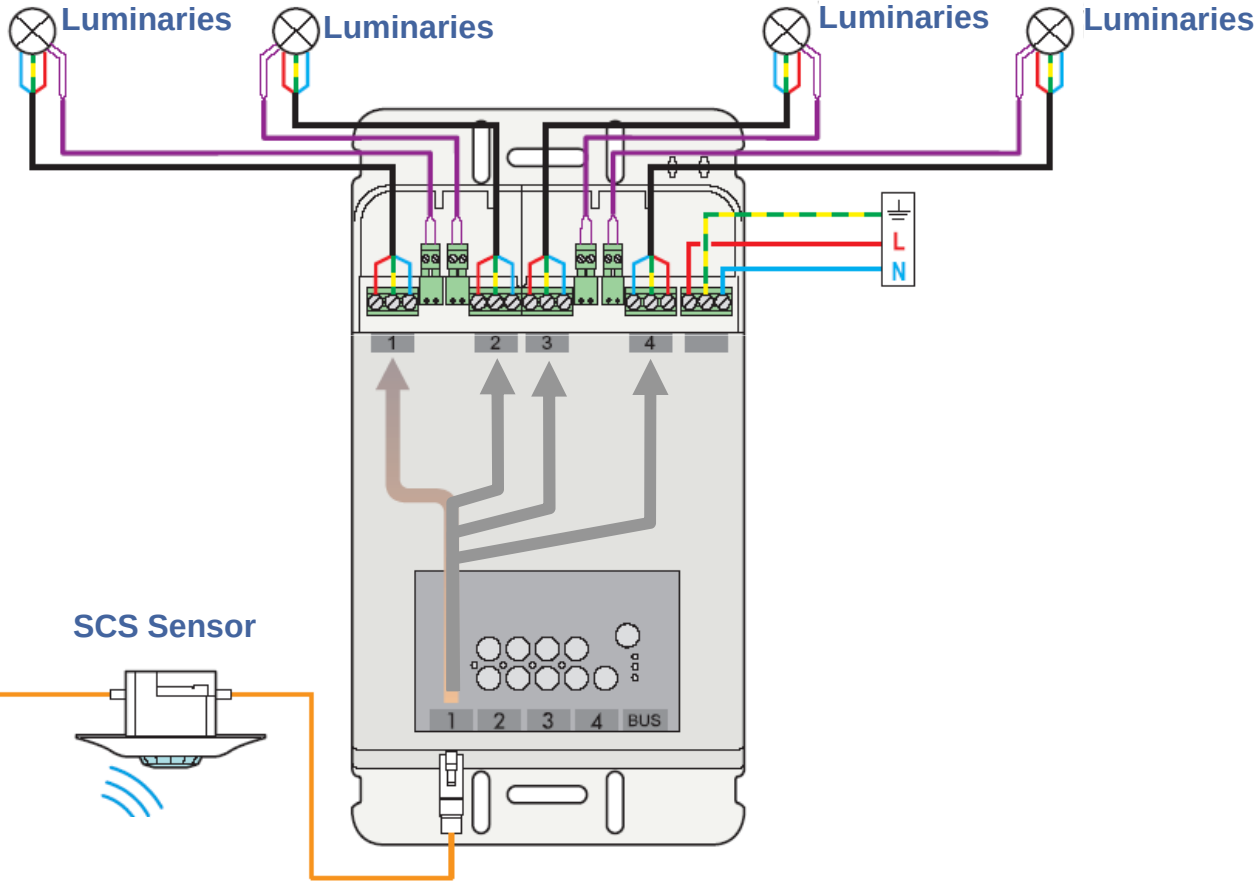

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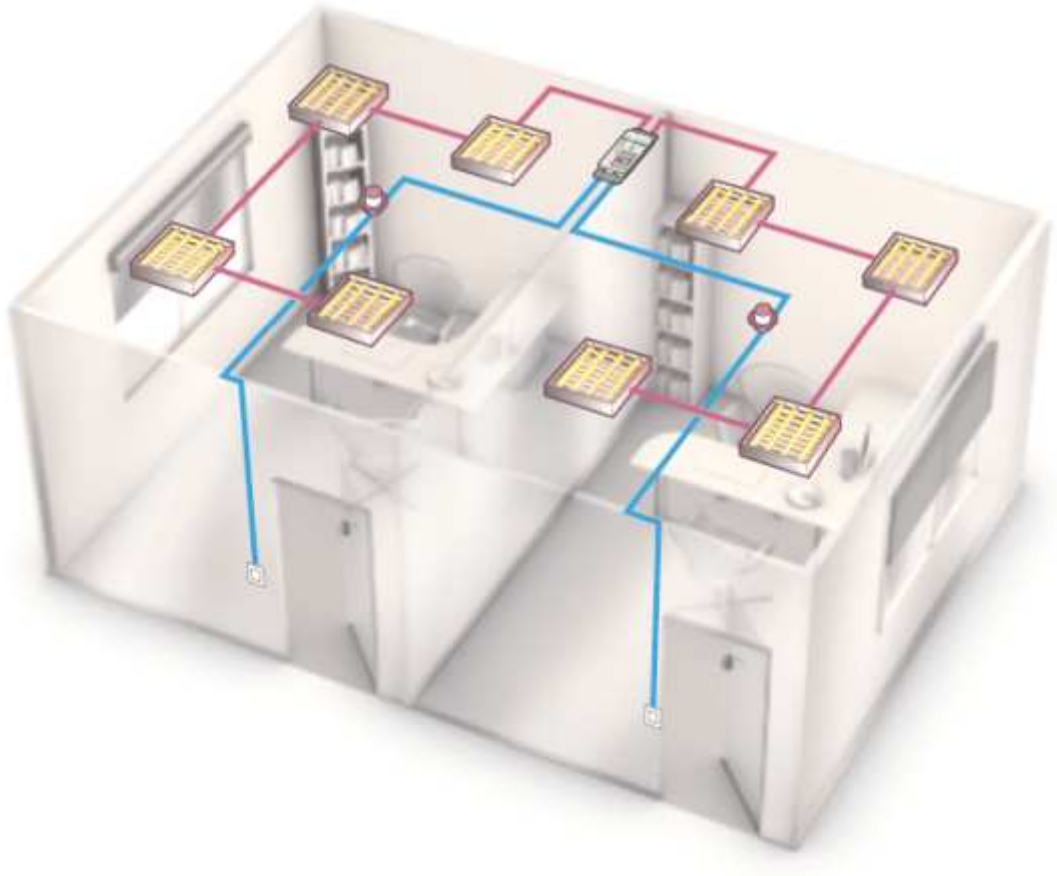
Application example 2: Two small offices - 2 zones Room Controller with for 0-10V dimmable ballasts, SCS Switches, daylighting function

- Advantages:
  - Easy to install
  - Easy to configure
  - Independent control adjustment
  - Maximum energy efficiency with daylighting function



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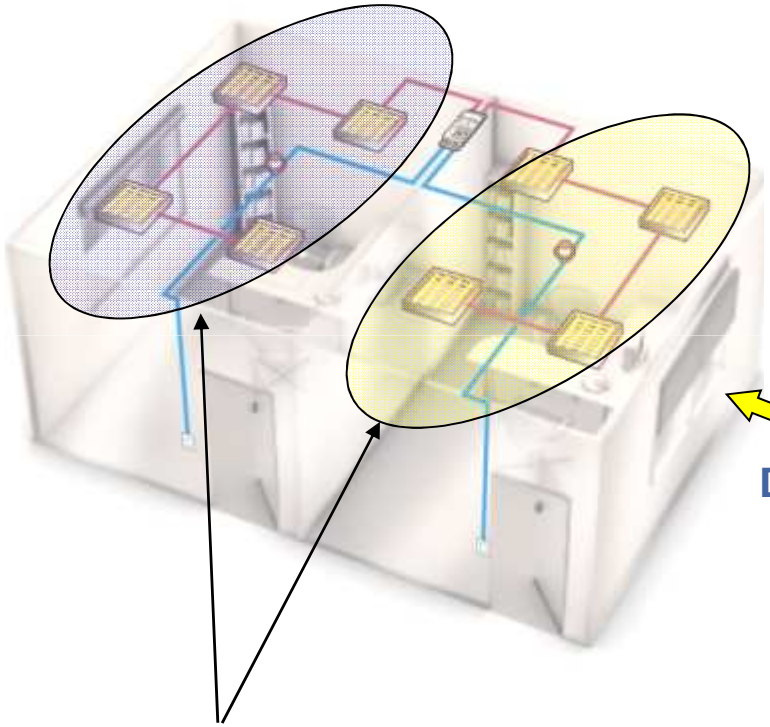
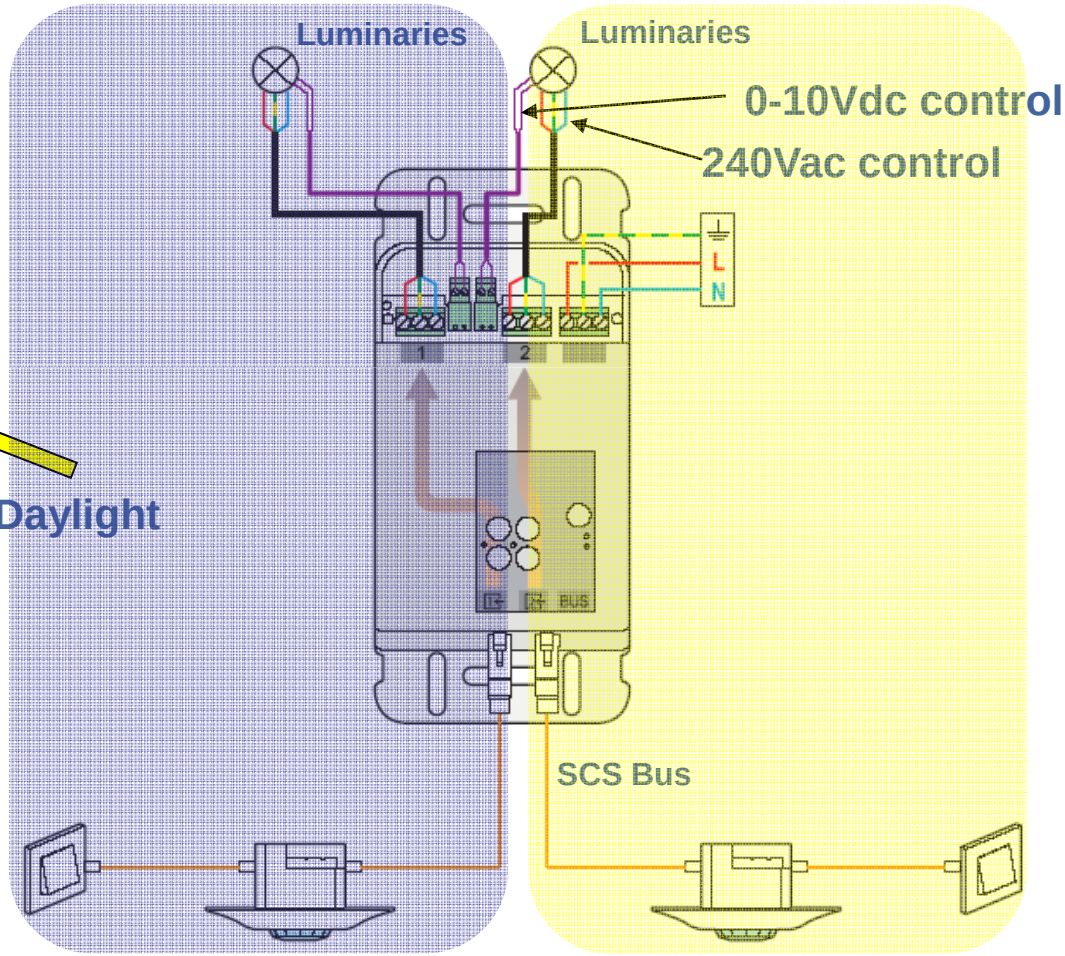


Two independent circuits
Using 2 x Relay ch room controller



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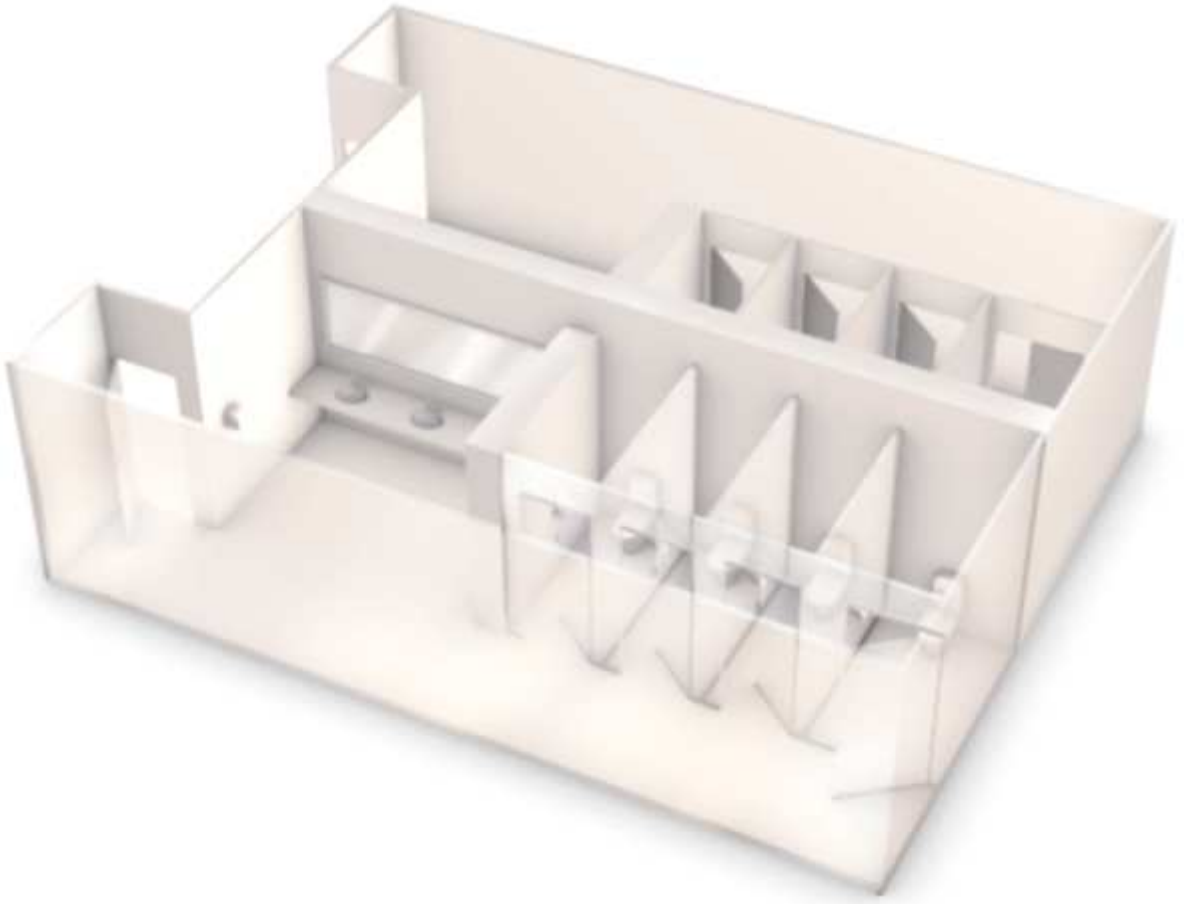
Application example 3: Toilettes – Occupancy sensing, Room Controller with sensor to control lights and exhaust fan

- Advantages:
  - Control of lighting and ventilation
  - Simple to configure
  - Typical application



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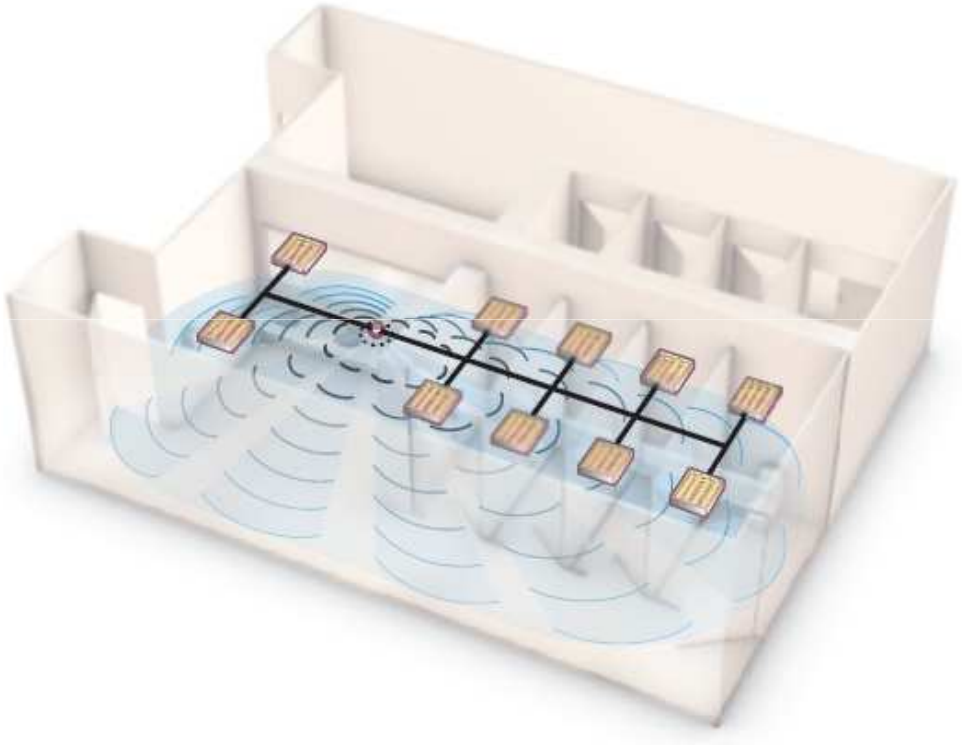

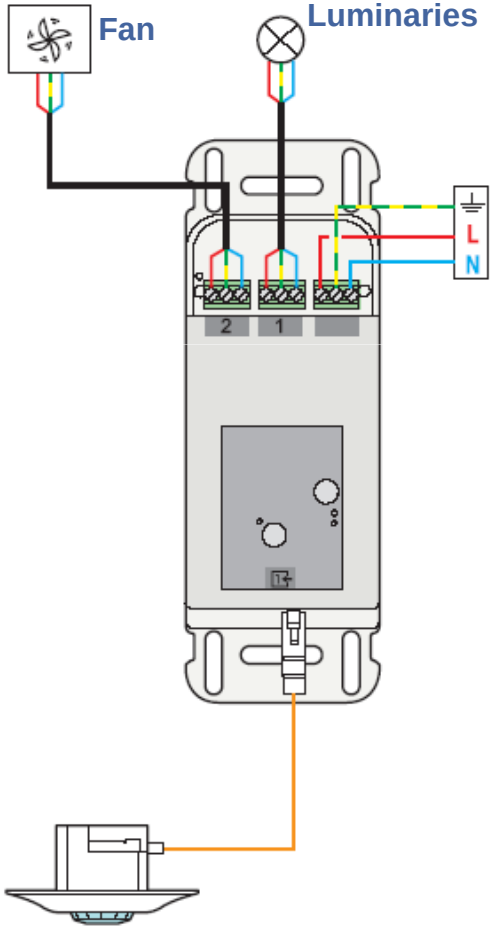

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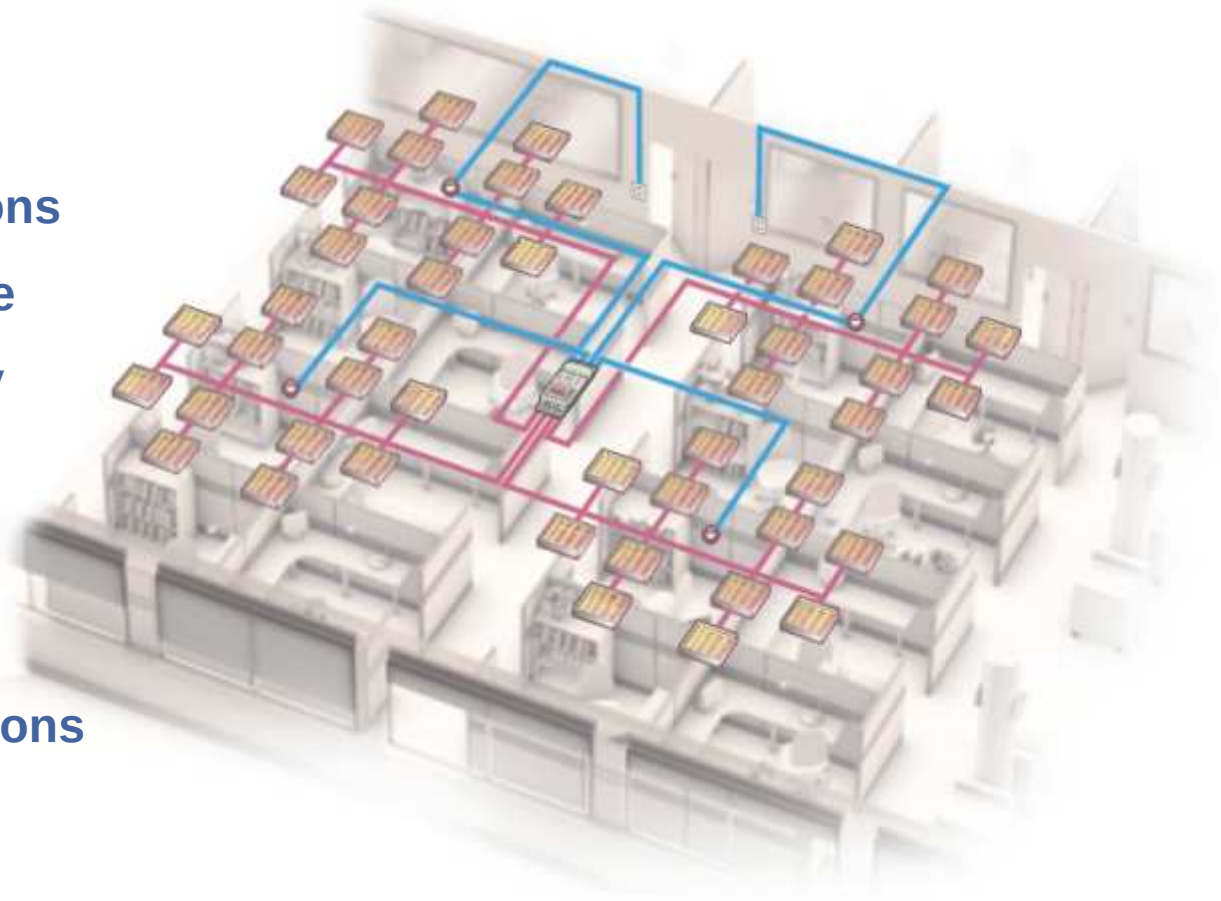
Application example 4: Large office - Room Controller with 4 x 0-10V dimmable ballasts (Or DALI) + SCS Sensors + SCS Switch

- Advantages:
  - Can be used in retrofit installations
  - Easy to configure
  - Maximum energy efficiency with daylighting
  - Zones managed independently
  - All load type options available



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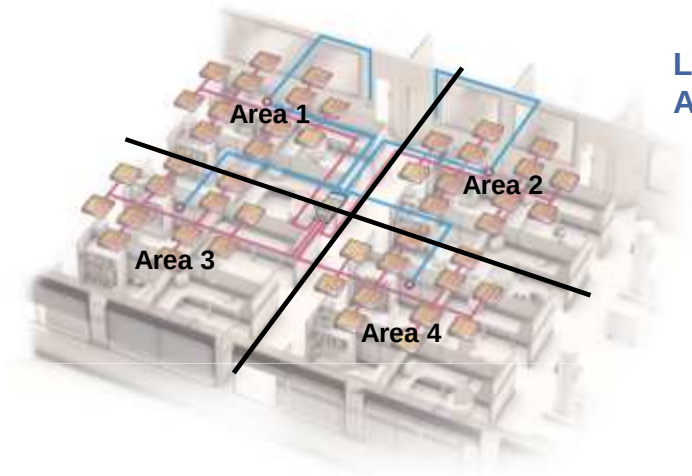
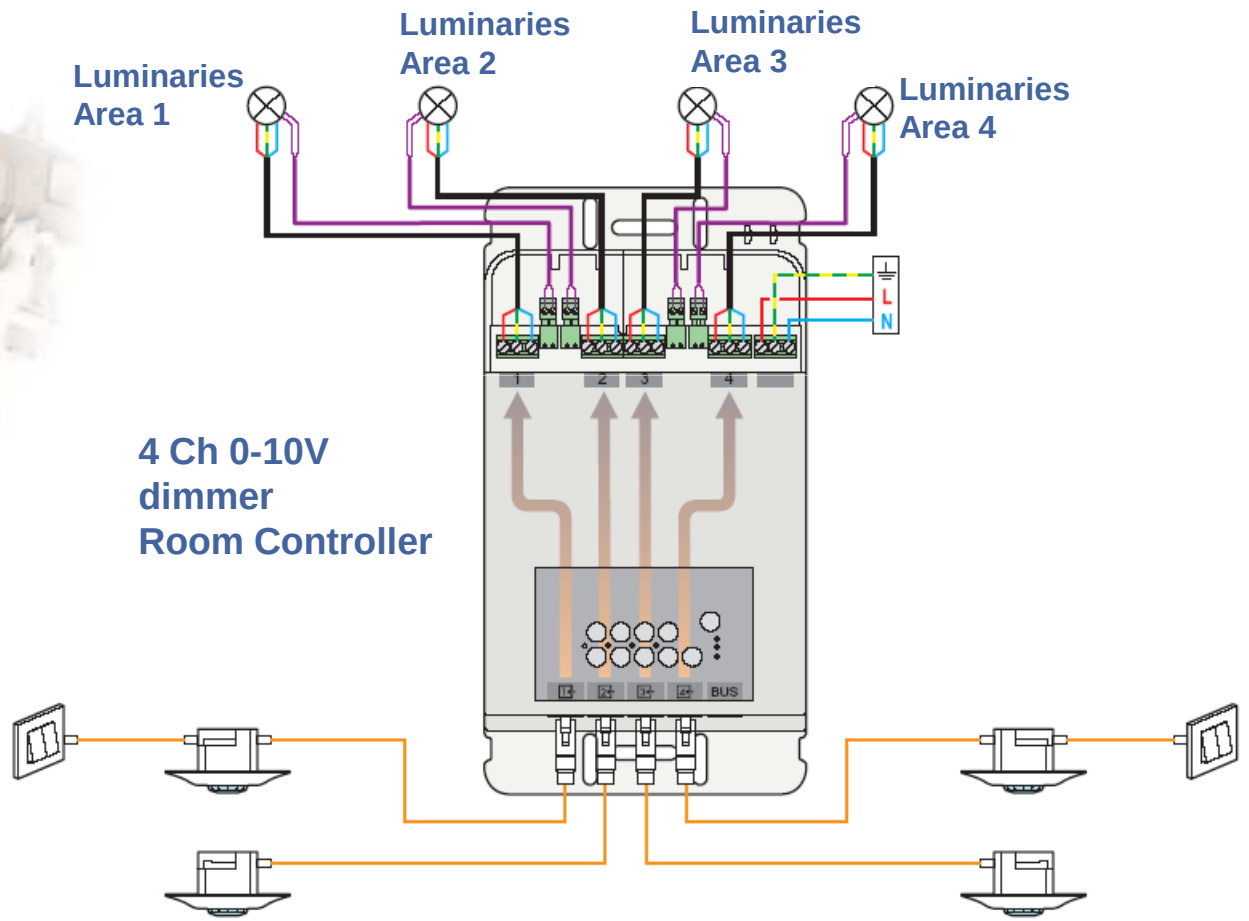
Application example 4: Large office - Room Controller with 4 x 0-10V dimmable ballasts (Or DALI) + SCS Sensors + SCS Switch



Each Area
is managed
independently



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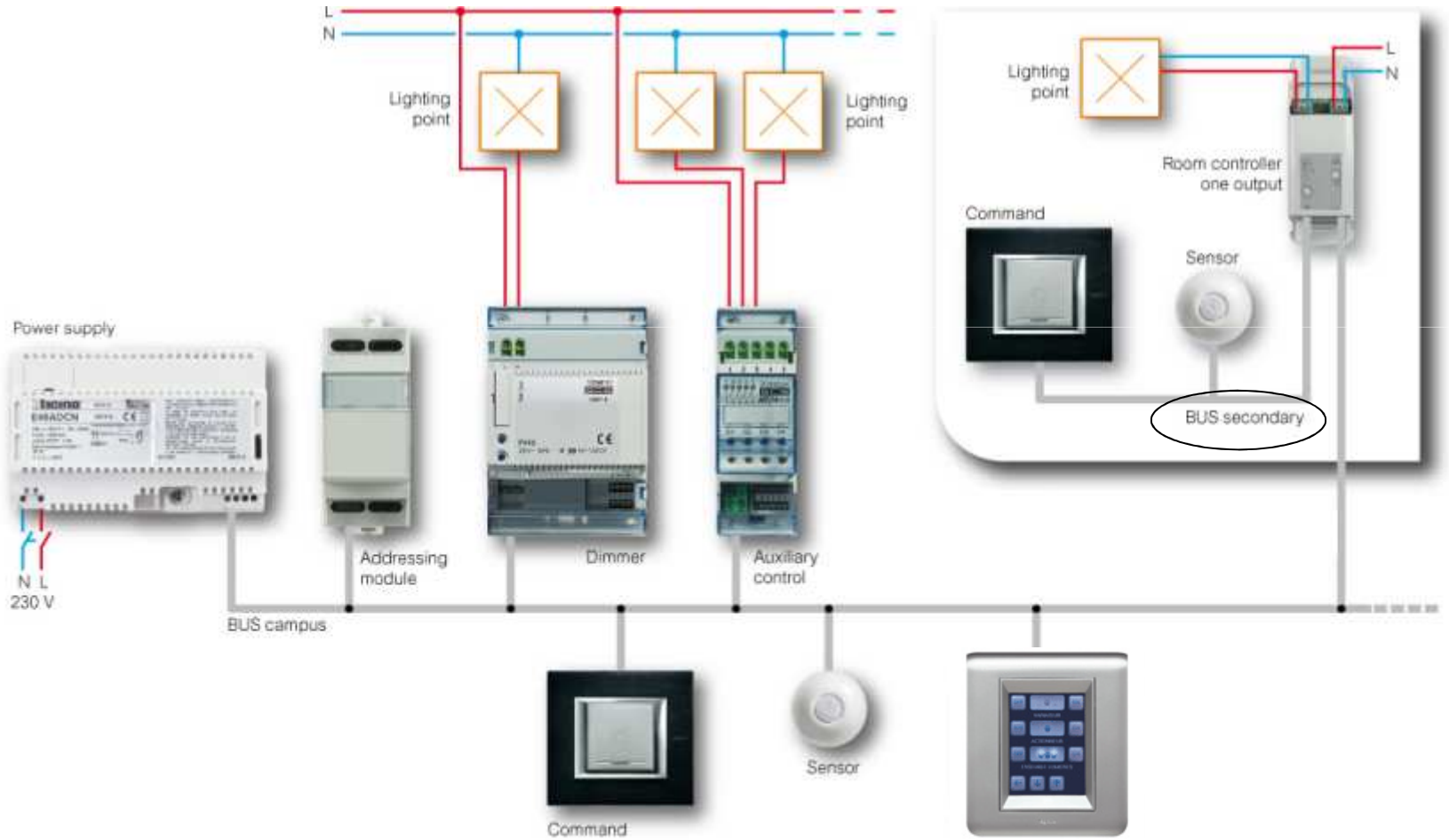
Integration example: Integration of Room Controllers and sensors with other SCS devices



Building Example 400sq Office

Test case		
Office size	400	m^2
Average Energy consumption per m2	20	Watt/m^2 (Power density)
Total energy consumption in office	8,000	Watt
Working weeks a year	50	
Working hours a year	60	
Total working hours a year	3,000	hours/year
Total energy consumption in office	24,000	KWh/year
Total energy consumption in office per m2	60	KWh/year/m^2
Energy cost	0.13	$/KWh
Energy cost - total floor	3,120	$/year
Energy cost - total floor per m2	7.8	$/year/$m^2$

Energy savings		
Percentage of energy saving using PIRs	25%	as per EN15193 Standards
Potential energy saving using PIRs	6000	KWh/year
Potential savings a year	780	$/year

Business case - ROI		
Average sensor cost	150	$
Average labour cost to install each sensor	60	$
Total number of sensors required	7	
Total cost to replace sensors (investment)	1470	$
Cost of investment per m^2	3.7	$
ROI	**1.9**	years

CO_2 emissions		
State where the offices are located*	NSW,ACT	Select State
CO_2 emissions reduction using sensors	5520	Kg of CO_2/year
CO_2 emissions reduction using sensors per m2	13.8	Kg of CO_2/m^2/year
CO_2 emissions reduction equates to removing	1.2	cars off the roads

*CO2 emissions depend on the type of fuel used to generate electricity. (Australian Green House office)

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Thank you

Additional Technical Information

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Sensors Main functions

- **Operation mode**
  - Occupancy based control (Automatic On/Off) or Vacancy based control (Manual On/Automatic Off)
- **Daylighting control**
  - Control lights based on natural light
- **Time delay**
  - Adjust time delay from seconds to hours
- **Sensitivity**
  - Adjust sensitivity levels independently for each sensing technology
- **Walkthrough function**
  - ‘Smart’ delay time – shortens time delay if there is no detection after 20 seconds
- **Audible alerts**
  - Alert users of impending light hut off

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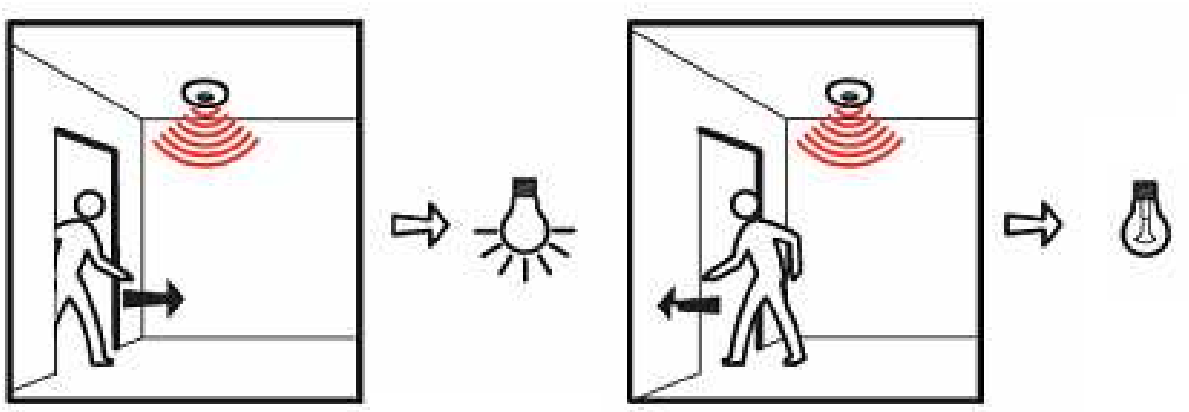
Occupancy based control

- **Automatic On/Off operation**
- **Switching lighting On and Off in response to the occupancy of a particular space**



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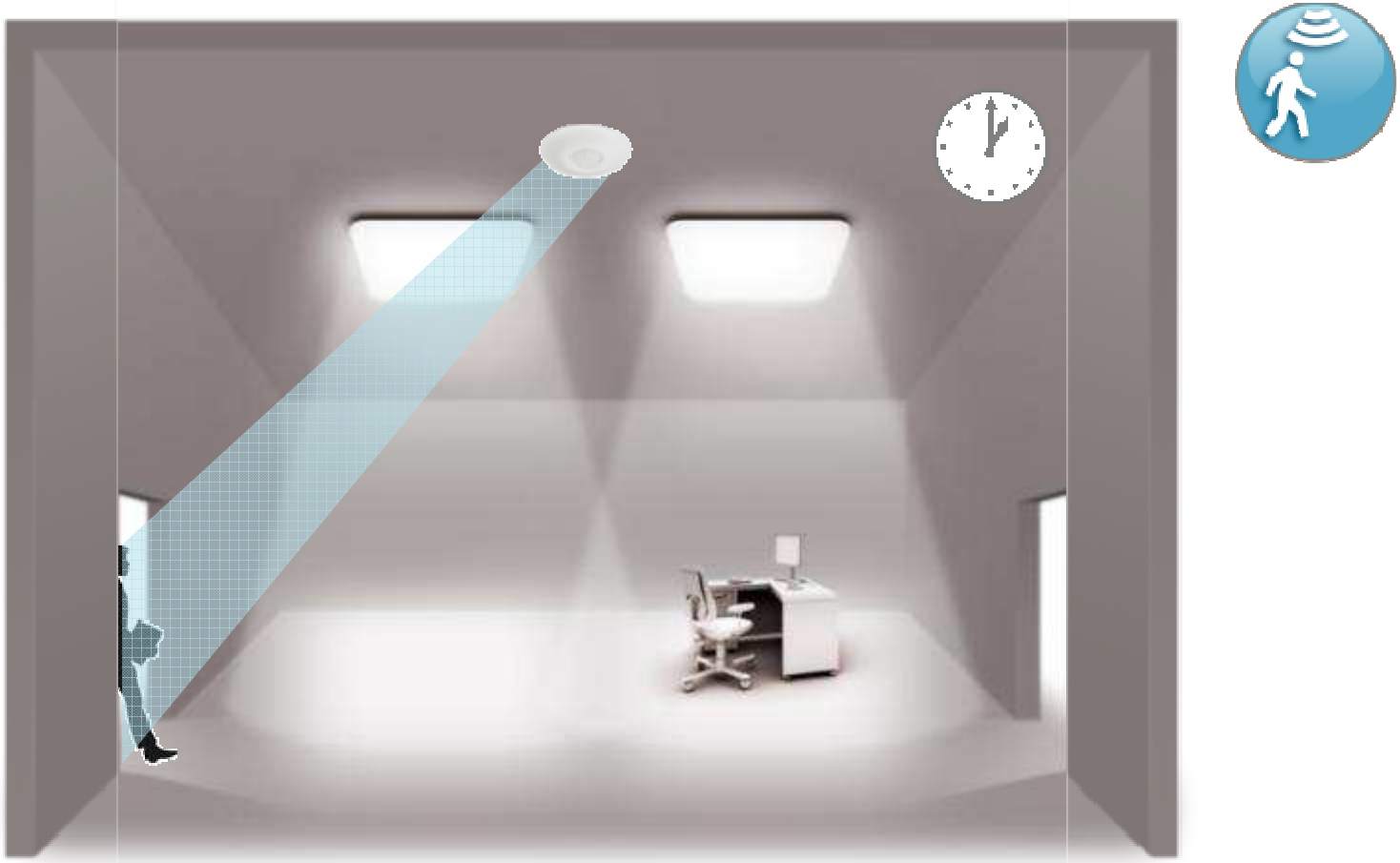
Occupancy based control – “Auto”



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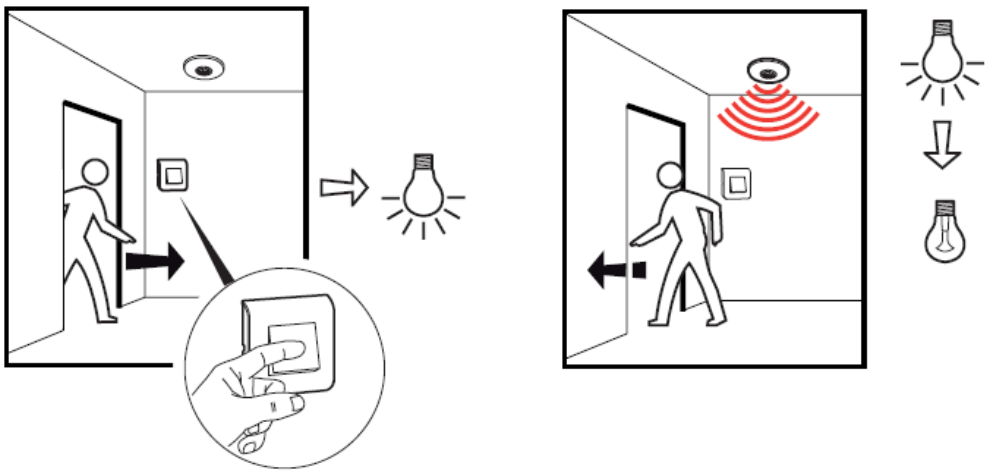
Vacancy-based control

- Manual On / Automatic Off
- Switching lighting Off in response to a space becoming vacant



- This strategy is the most energy efficient according to European Standard EN15193, which can achieve up to 25% energy saving
- With this strategy, the user become eco-responsible by switching on or off the light

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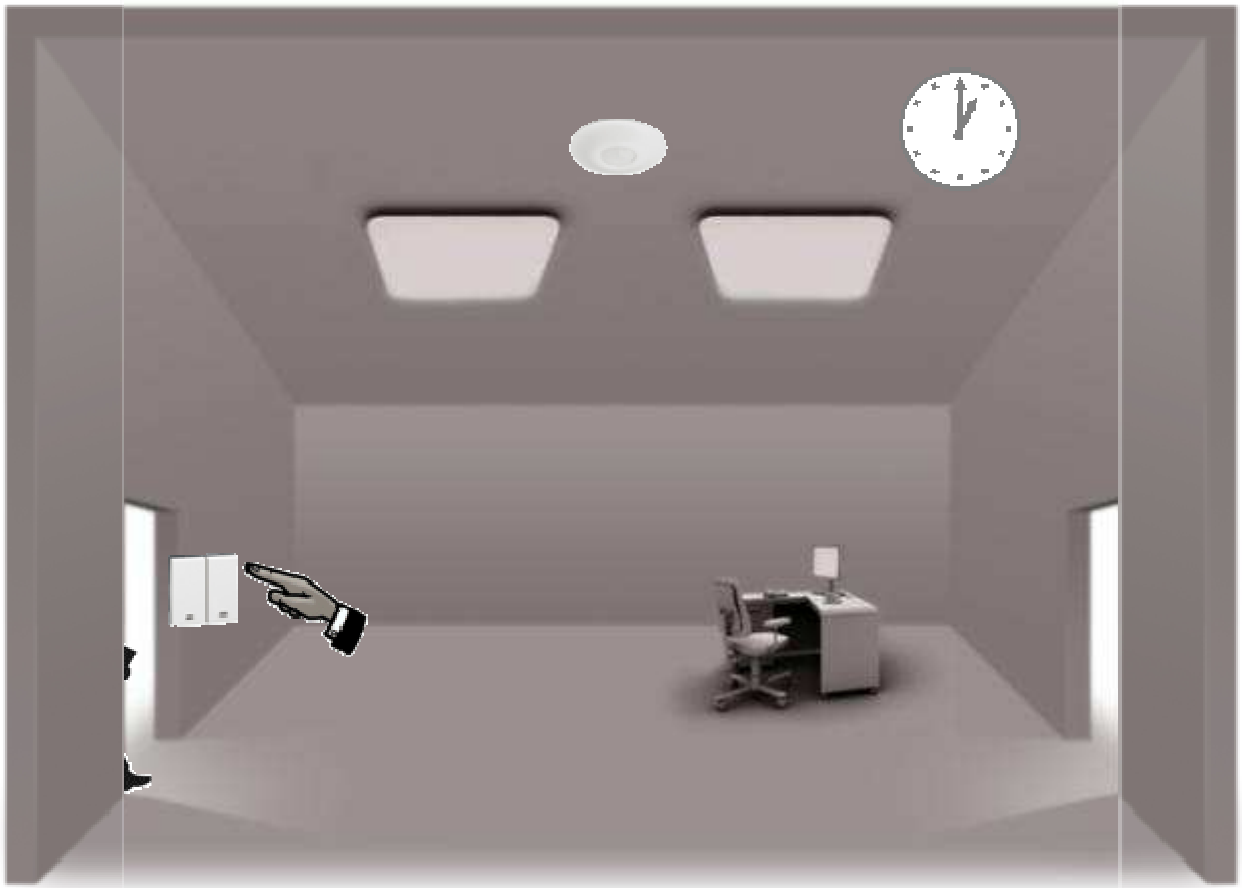
Vacancy-based control – “ECO”



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Day-lighting control

Day-lighting control

Day- light → The sensor will automatically switch OFF the lights if natural light level is sufficient

Day-light down → If I'm still in the room, the light will switch ON automatically if the light level is insufficient

* adjustable

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Daylighting – How it operates

- Sensor in-built light level detector can be programmed to a specific daylight threshold. Ie 500lux
- This means that if natural light exceeds the daylight threshold, the sensor will automatically turn artificial lights off (independently if there is movement or not)
- Dimming level is constantly monitored and managed by the sensor to maintain a constant ambient light level

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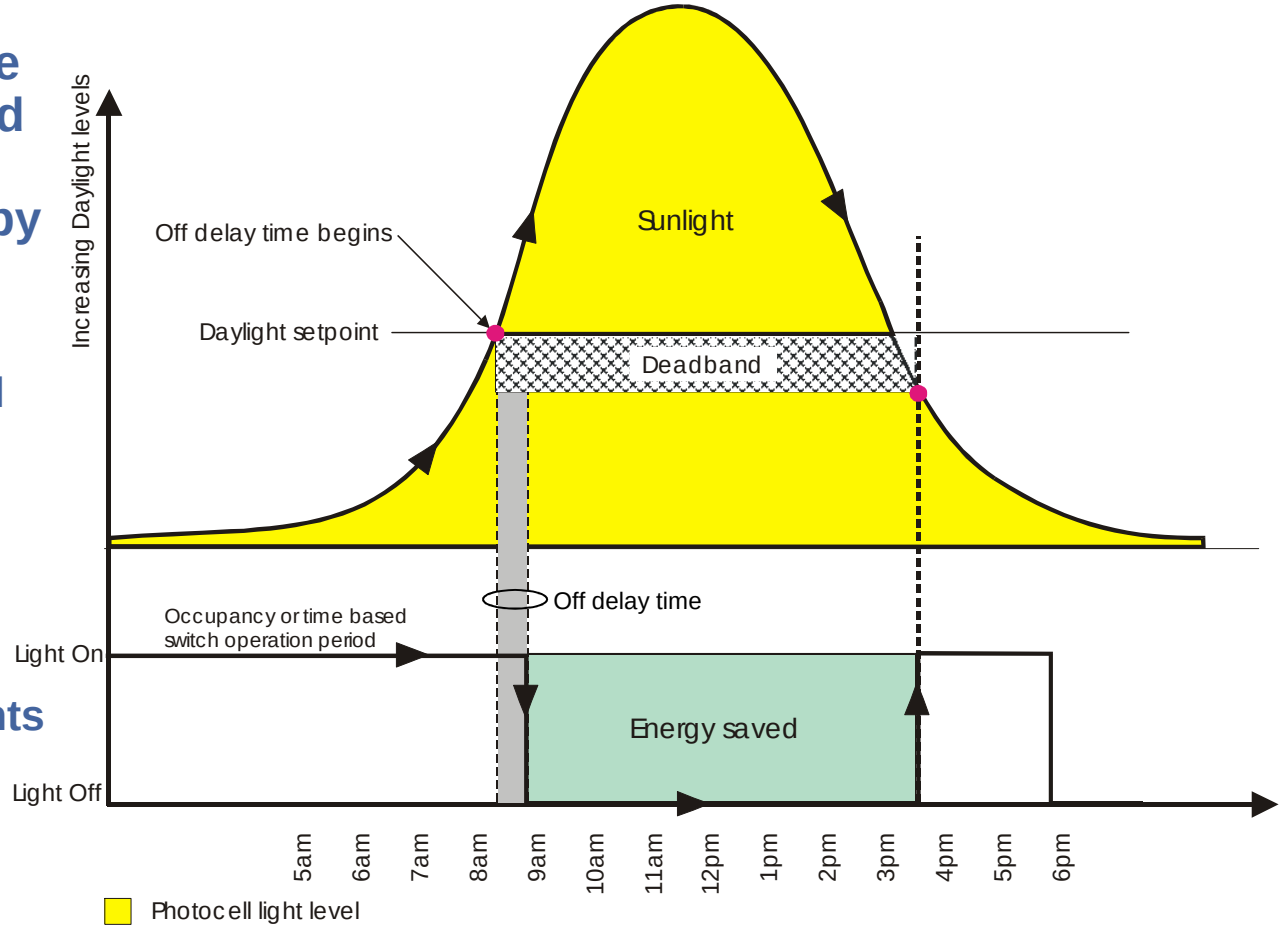
Daylighting – On/Off Control

- **Sensors will turn the light On or Off based on the amount of daylight measured by the photocell**
- **Deadband, is a control margin below a fixed setpoint in which minute variations in light levels will not trigger an On or Off response from the controller. This prevents lamp cycling**



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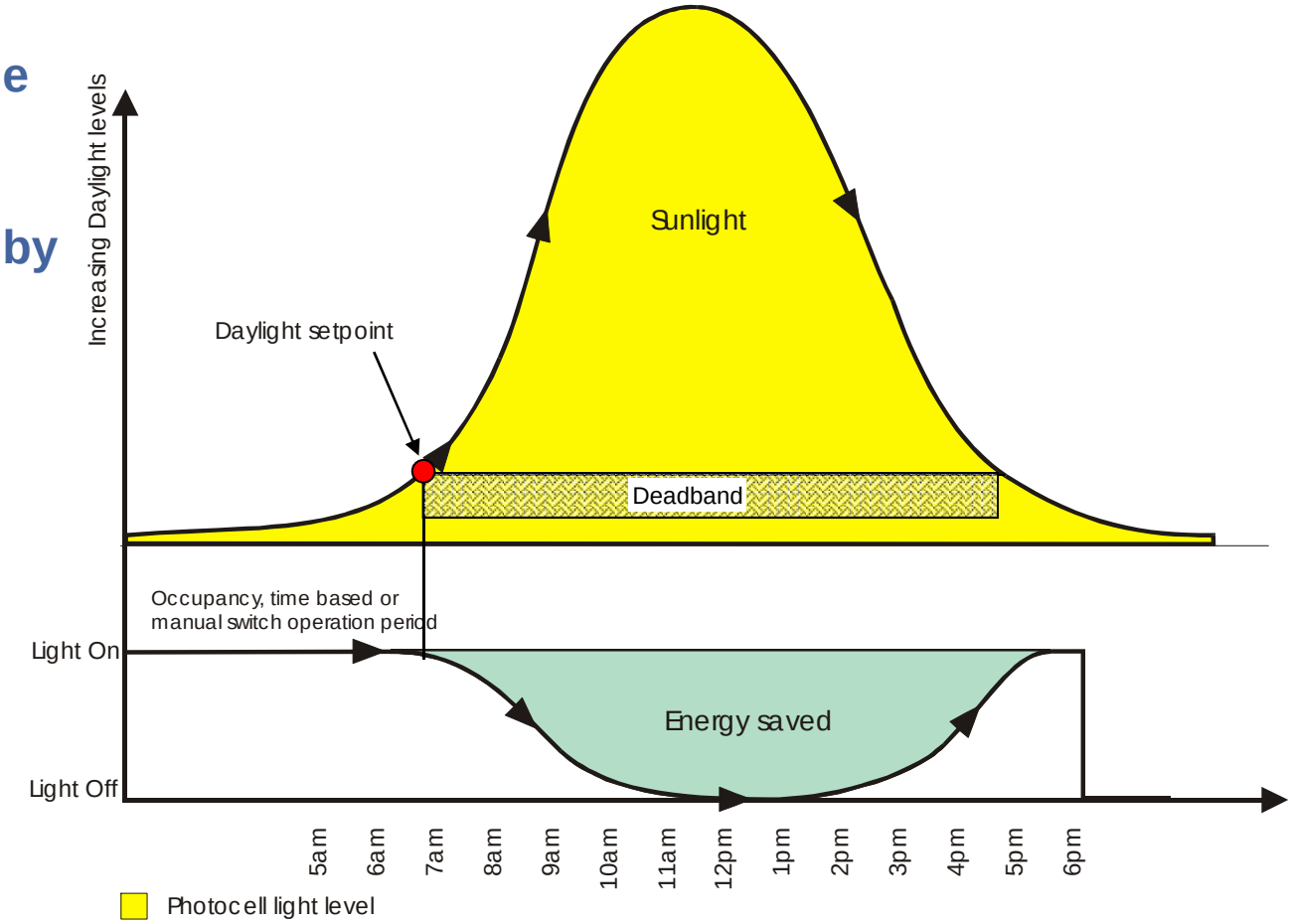
Daylighting - Dimming

- **Sensors will dim the light based on the amount of daylight measured by the photocell**



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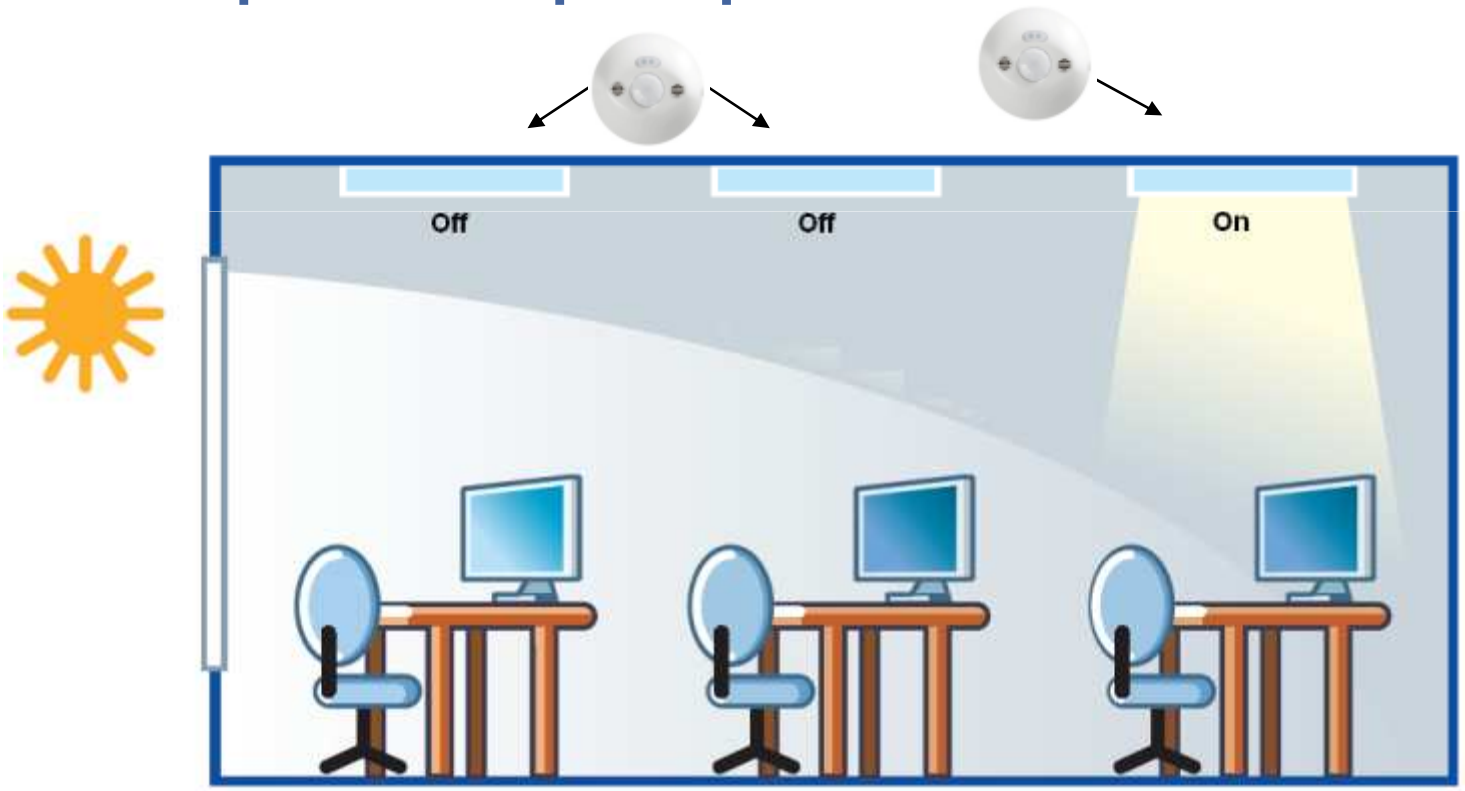
Day-lighting control

- **Example in an open space**



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Other functions

- **Walkthrough function**
  - **This function provides extra energy savings by switching the lights Off 3 minutes after an area initially occupied, there is no motion detected after the first 20 seconds**
  - **This function is programmable only with the remote control**

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Other functions

- Alerts
  - Visual (flashing light) and/or audible warning before impending shutoff
  - A beep will sound 20 seconds and 10 seconds before lights are turned off

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Programming tools

- One way communication remote

- Two-way communication remote

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Accessories

- **Accessories**
  - Light level sensors
  - Gateways (SCS-SCS, SCS-EIB, SCS-KNX)
  - Webserver
  - Software (Virtual configuration)
  - Connectors (RJ45 adaptor)
  - Cables, PS, Memory Module, etc

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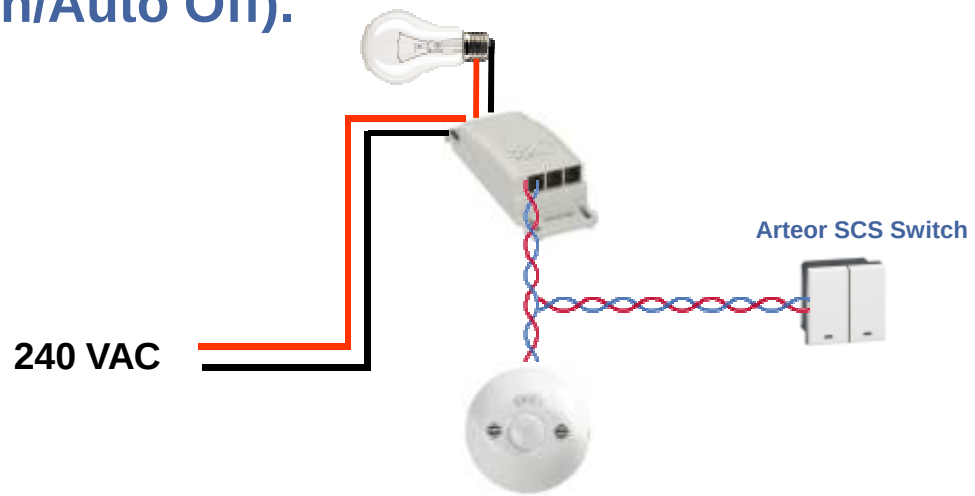
Programming Methods

- **Plug-and-Go**

  This method is used when plugging an SCS device to a room controller and a default program is created automatically. If a manual command (push button) is added also to the same input then the room controller configures itself to a default vacancy mode. (Manual On/Auto Off).



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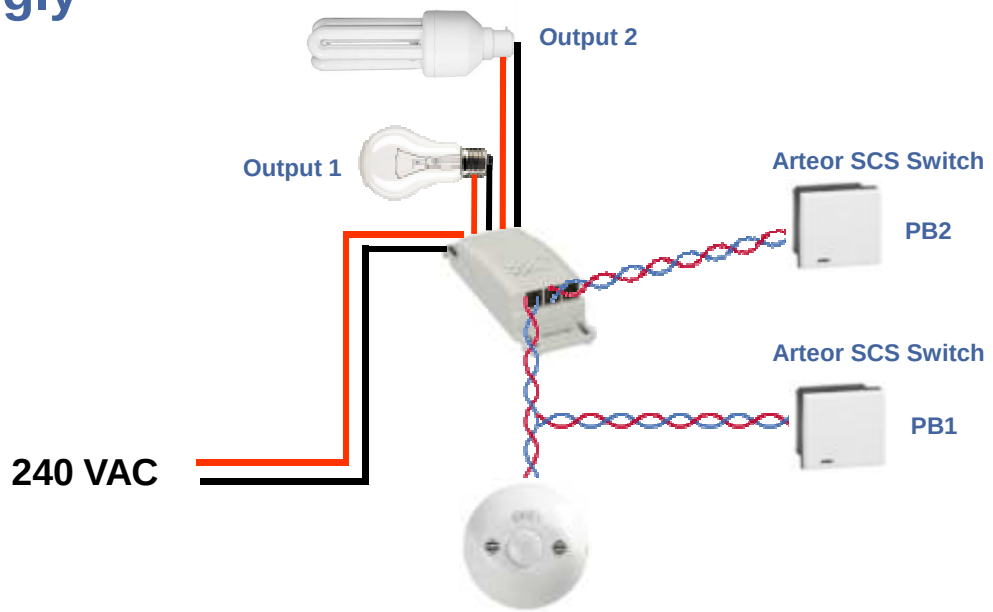
Programming Methods

- **Plug-and-Go**

  Example: At initial installation, the room controller recognizes the controls which are directly connected to the input and sets its outputs accordingly

PB1 – Linked to Sensor and Output 1
PB2 – Linked to Output 2



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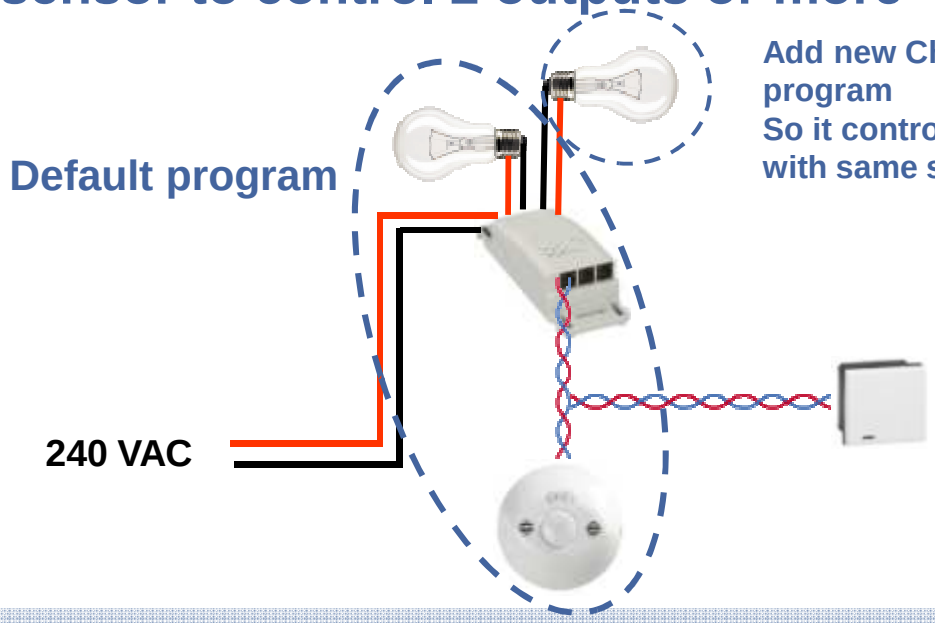
Programming Methods

- **Push-and-Learn**
  If the automatic configuration (Plug-and-Go) is not adequate then it is possible to use this method to modify the default program.
- **Example: For a sensor to control 2 outputs or more**

Cat No 48841

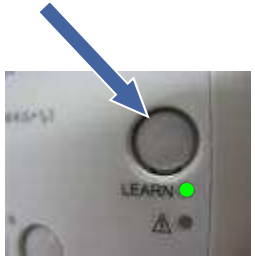


Functional design

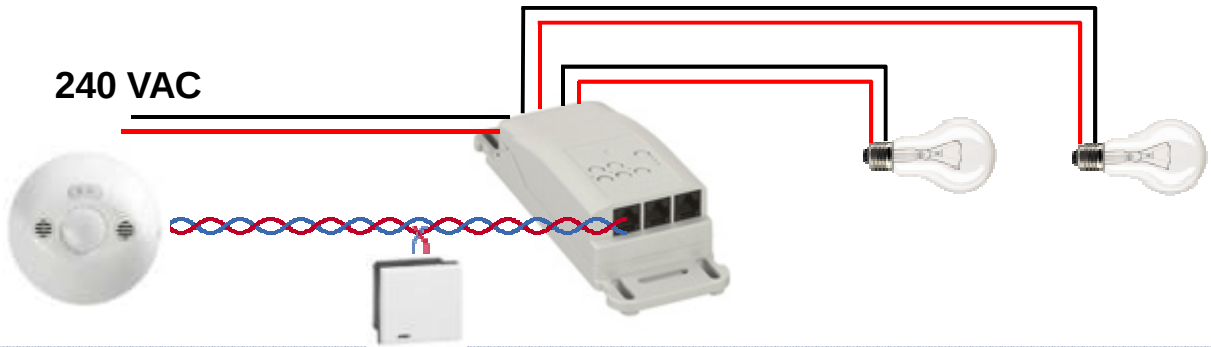
Programming Methods

- **Push-and-Learn – Program a Sensor to control two outputs**

- Step 1- Press the sensor Learn button (or via the remote menu PnL Group - Learn). ‘Learn’ LED flashes once a second
- Step 2- Press the sensor Learn button again (it will activate the current output and enter into Push-and-Learn mode. (LED flashes twice a second in both Sensor and Controller)
- Step 3 - On the room controller, press the local control button to signal which output to be added to the sensor (new ‘link’)



- Step 4 - Press the Sensor Learn button again and the new link is done.




Thank you
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