PUTTING A STOP TO ENERGY WASTE

LIGHTING MANAGEMENT SENSORS

DESIGN AND APPLICATION GUIDE

CATALOGUE PAGES INSIDE

THE **GLOBAL SPECIALIST**
IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES

legrand®

This document will assist you in selecting, laying out, commissionning and installing a lighting management solution. It will also assist you in defining and implementing the optimum lighting management solution for a specific type of building space.

SAVINGS
60%
according to EN 15193

Our vision at Legrand is to provide products and services that make buidlings more energy efficient. We are committed to limiting energy waste.

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p. 13 | Application examples for specific building spaces

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DESIGN STEPS FOR IMPLEMENTING

MOTION AND LIGHTING MANAGEMENT SOLUTIONS

Our wide range of switch sensors, comprising of motion and lighting management sensors, is designed to reduce the amount of time lighting is left on active unnecessarily, for example when an area is unoccupied or if there is sufficient natural light.

Our lighting management sensors can be used to:

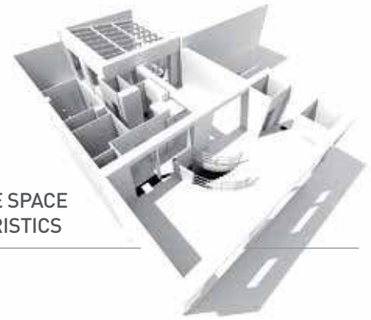
- **monitor the detection area for occupancy**
  When a person is sensed the lighting is automatically switched on.

  In case of sensors equipped with a built in light level sensor, the lighting will be kept off when enough natural light is available.

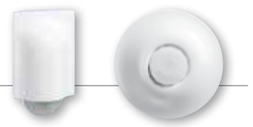
  When the area is vacated the lighting is switched off after a preset time delay.
- **control lighting** (up to 60% savings on lighting energy costs according to EN 15193).
- **control HVAC circuits and roller blind circuits** (either via the sensor or a room controller).

The Legrand range includes motion or lighting management sensors to suit any area and control your lighting efficiently.

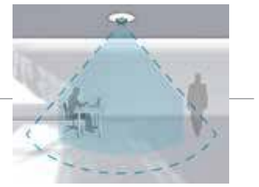
1 ASSESS THE SPACE CHARACTERISTICS



2 CHOOSE THE RIGHT SWITCH SENSOR



3 DEFINE THE BEST LOCATION



4 CONFIGURE THE SENSORS

STEP 1

ASSESS
THE SPACE CHARACTERISTICS

There is a dedicated solution for each area (such as type, configuration, activity). Therefore it is essential to take the following criteria into account:

- room/space size and shape (number of m²)
- occupant activity and non-activity areas
- location of walls, doors and windows
- partition height and location
- ceiling height
- areas benefiting or not benefiting from natural light
- location of shelves, book cases, filing cabinets and large equipment
- large objects that could block or alter a sensor's coverage
- location of HVAC ducts and fans
- location of desks/workspaces – orientation with regard to walls, partitions and other obstacles.

To ensure a perfect installation of the sensors and the best quality detection, here are some application examples:

P. 14
OUTDOOR CAR PARK

P. 15
WAREHOUSE

P. 16
STAIRWAY

P. 17
CORRIDOR

P. 18
INDIVIDUAL OFFICE

P. 19
CLASSROOM

P. 20
OPEN SPACE

P. 21
MEETING ROOM

Special attention should be paid to high levels of vibration and/or air flow, extreme temperature conditions, and unusually low levels of activity as these issues may help identify the best technology solution

STEP 2

CHOOSE
THE RIGHT SENSOR

Legrand has 2 sensor categories based on the area and the type of detection:

MOTION SENSORS:

- for areas with little or no natural light.
- for passageways.
- automatic on/off switching according to whether or not an area is occupied.
- can be manually adjusted with trim pots

LIGHTING MANAGEMENT SENSORS:

- for areas with natural light.
- for passageways and/or work areas.
- manual or automatic switch-on and automatic switch-off, according to whether or not area is occupied and the natural light level.
- dimming and HVAC/roller blind control for BUS sensors used with controllers.
- can be adjusted using a remote configuration tool.

MOTION SENSORS

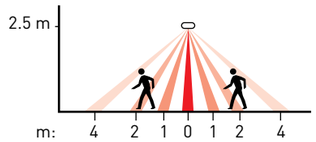
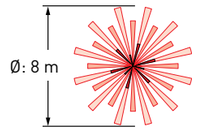
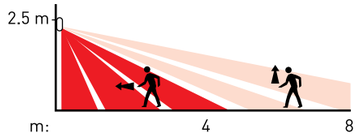
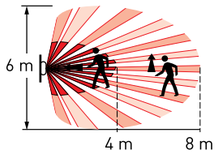
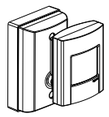
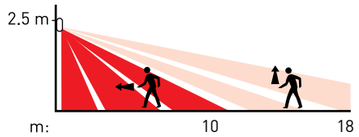
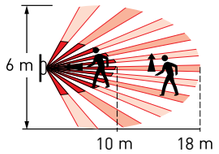
For areas with no natural light

These sensors are particularly suitable for areas where there is no natural light, such as passageways, bathrooms, corridors and equipment rooms.

1 DETECTION TECHNOLOGY:

Passive Infrared (PIR) technology
PIR technology detects occupancy by reacting to infrared energy sources, such as a human body in motion.

2 COVERAGE PATTERNS - MOTION SENSORS

Cat.Nos	Installation type Technology	Range	Detection area		Examples of applications
488 03		8 m			Corridor, stairways, restrooms etc.
489 11		8 m			Corridor, stairways, restrooms (IP 42)
 489 11		18 m			Utility room, car park, cellar (IP 55)

LIGHTING MANAGEMENT SENSORS

For areas with natural light

These sensors are particularly suitable for areas and buildings with natural light, such as: shops, offices, healthcare buildings, recreation areas, warehouses or workshops.

The lighting management sensors have built-in adjustable lux sensors:

- which will keep the lighting switched off if there is sufficient natural light
- when associated with room controllers will dim automatically while maintaining a pre-set lux level according to natural daylight and will control several lighting and ventilation circuits.

1 DETECTION TECHNOLOGY

Passive Infrared (PIR) technology
PIR technology detects occupancy by reacting to infrared energy sources, such as a human body in motion.

Dual technology (DT)
Sensors that employ PIR + US sensing technologies are usually referred to as "dual technology".
Our dual technology ensures maximum sensitivity and coverage in tough applications for optimum reliability and energy saving.

2 PRODUCT FEATURES

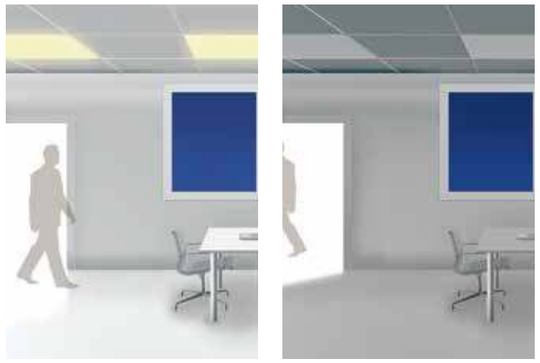
2-1. Occupancy and vacancy detection

Vacancy/occupancy mode selection
Most Legrand sensors can work using occupancy mode (by default) or vacancy mode.

Occupancy mode means that lights are automatically switched on or off according to occupancy.

Vacancy mode means that lights are manually switched on and automatically switched off. Vacancy mode offers extra energy savings.

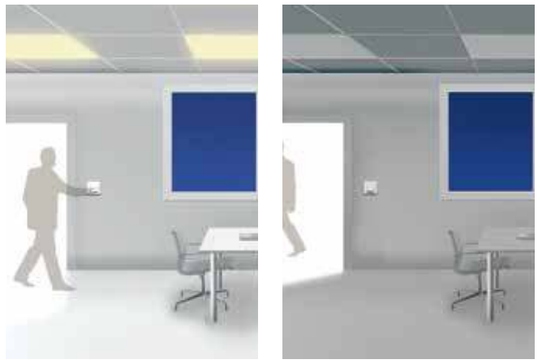
OCCUPANCY MODE



Sensors will automatically switch lighting on when a person enters the room, and automatically switch lighting off when no movement is detected.

Application:
- energy saving and cost effective, can be used instead of a conventional switch.

VACANCY MODE

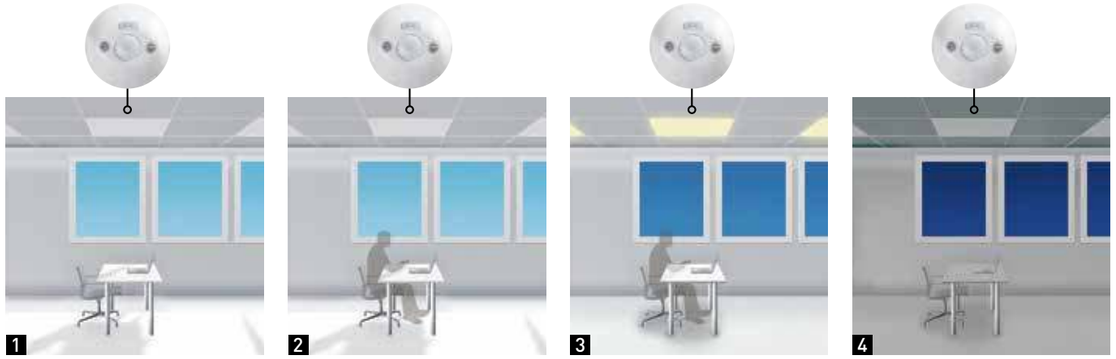


Upon entering a room the person switches on the light as manually, but on leaving the sensor automatically switches off the lighting. Lights can also be switched off manually.

Application:
- commonly used for improved energy saving and to comply with regulations.

2-2. Daylight

Daylighting set point = Regulation
The light level feature keeps the lighting OFF when natural light levels rise above a pre-set level. This setting is adjustable and can be overridden. This function is enabled by default.



1 No presence detected, daylight, lights off

2 Presence detected, sufficient daylight, lights off

3 Presence detected, insufficient daylight, all lights on

4 No presence detected, lights off

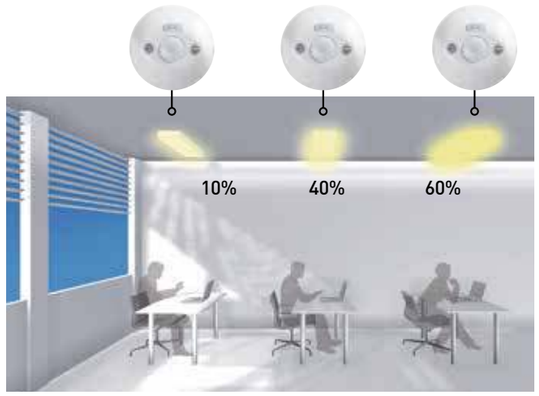
3 COMBINATION: NETWORK SENSOR AND ROOM CONTROLLERS

Sensors can be combined with a room controller to manage a number of circuits in passageways, outdoors, damp areas or in work areas with natural light.

Combining a sensor and a room controller provides additional functions:

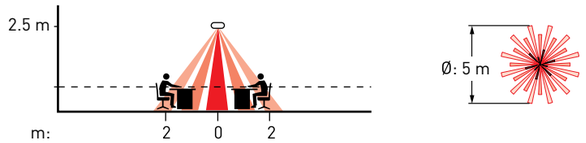
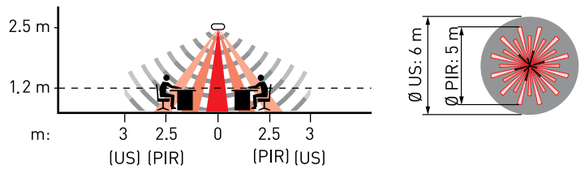
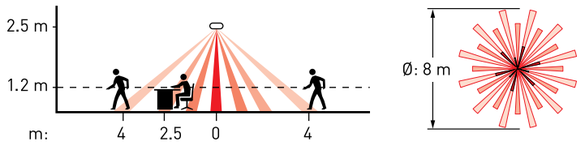
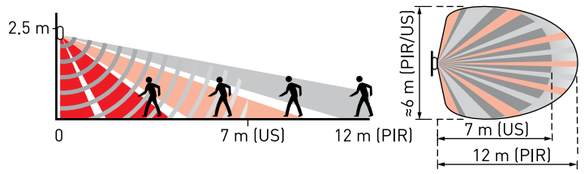
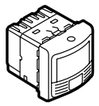
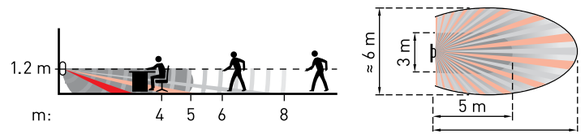
- lighting management: on-off or dimming (DALI, 1-10 V, halogen/incandescent/LED).
  Eg: dimming the window side (access to natural light) and the corridor side separately.
- your installation: such as blinds, heating and fan control.

This combination provides a flexible building and more energy savings.



The daylight is unevenly distributed in an area
A sensor is combined with each row of luminaires and measures presence and light level.
The dimming controller regulates each row of luminaires and supplements the external light to obtain the required light level.

4 COVERAGE PATTERNS - LIGHTING MANAGEMENT SENSORS

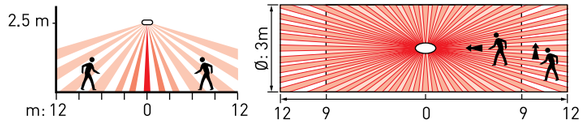
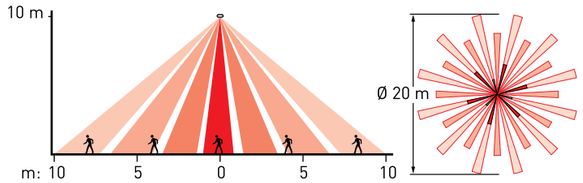
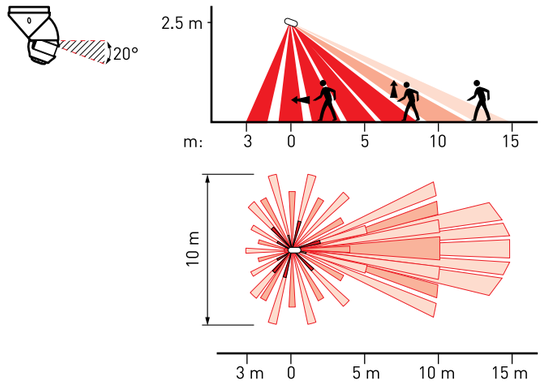
Cat.Nos	Installation type Technology	Range	Detection area	Examples of applications
488 04[1]		5 m		Individual office, corridor, stairways, restrooms etc.
488 06		6 m (US) 5 m (PIR)		Classroom, meeting room, open plan office
488 07		8 m		Hall, stairways etc.
489 16[1]		7 m (US) 12 m (PIR)		Individual office, classroom, meeting room, restrooms etc.
 0 784 52		8 m		Individual office, classroom, meeting room, open plan office

Passive Infrared (PIR) technology

Dual technology (DT)

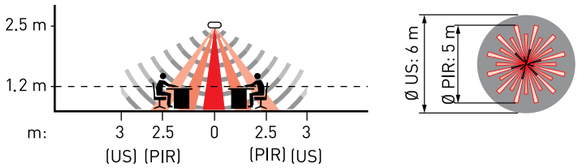
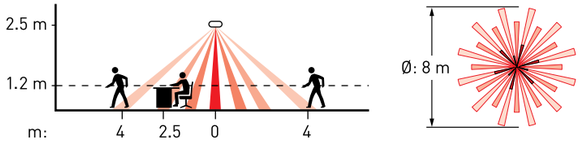
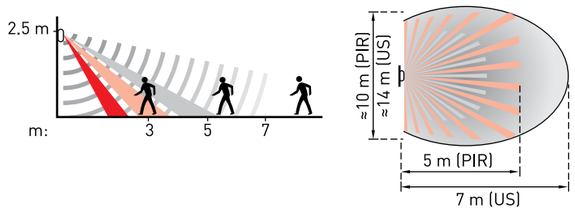
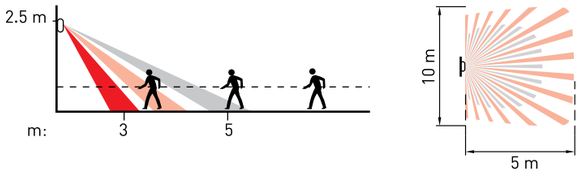
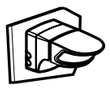
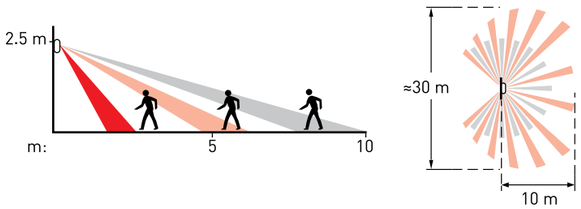
[1] 1 lighting output & 1 fan output

[2] without neutral

Cat.Nos	Installation type Technology	Range	Detection area	Examples of applications
488 17		2 x 12 m		Long corridor
489 32		Ø 20 m		High ceiling areas (Warehouses, gymnasium)
489 33		18 m		High ceiling areas (Warehouses, gymnasium) outdoor car park, cellar, laboratory

[1] 1 lighting output & 1 fan output

4 COVER PATTERNS - NETWORK SENSORS AND ROOM CONTROLLERS

Cat.Nos	Installation type Technology	Range	Detection area	Examples of applications
488 22		6 m (US) 5 m (PIR)		Individual office, classroom
488 20		8 m		Restrooms, changing room
488 23		7 m (US) 5 m (PIR)		Individual office, classroom
488 24		5 m		Restrooms, changing room
 488 30		10 m		Outdoor car park, cellar, laboratory, test rooms

5 ROOM CONTROLLERS

In order to control several circuits (lighting, fans, blinds), lighting management sensors can be used with room controllers.

The following chart indicates which room controller to use:

	ON-OFF	DIMMING		
		DALI	1-10 V	HALOGEN - INCANDESCENT - DIMMABLE LEDS [1]
1 lighting circuit in the same room	488 50	488 51*	-	488 45
1 lighting circuit + fan output in the same room	488 50	488 51*	-	-
2 lighting circuits in the same room	488 50	488 51*	-	488 45
2 lighting circuits + 1 fan output in the same room	-	488 51*	-	-
2 lighting circuits (2 inputs, 2 outputs) **in 2 rooms**	488 41	-	488 42 (1000 VA)	488 45
4 lighting circuits (4 inputs, 4 outputs) **in 4 rooms**	-	488 44 (max. 32 ballasts)	488 43	-

[1] Refer to the load table in the data sheet available (**Note:** some commercially available dimmable LEDs are not compatible).

* Available 2015

STEP 3

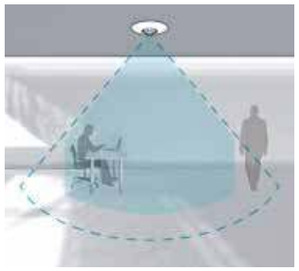
DEFINE THE BEST LAYOUT

Whether it is in work areas or passageways, the presence sensors must be chosen and positioned in line with the following recommendations:

1 WORK AREAS

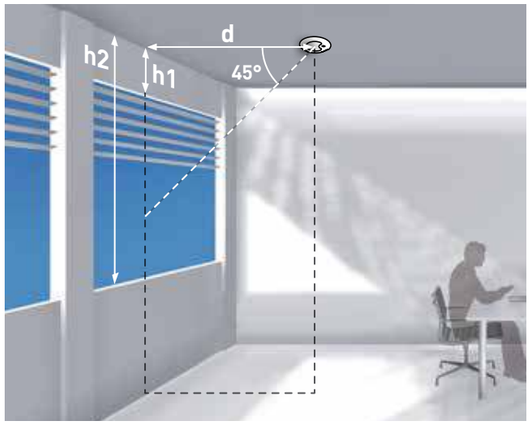
These are areas in which people spend time, such as individual or open plan offices, meeting rooms, classrooms.

Positioning
For optimum detection, the sensor must have an unobstructed view (no obstacles in the sensor's detection range).



People who are seated must be completely within the area to be monitored, and preferably as close as possible to the sensor (the detection area for seated people is much smaller than that for people who are moving around).

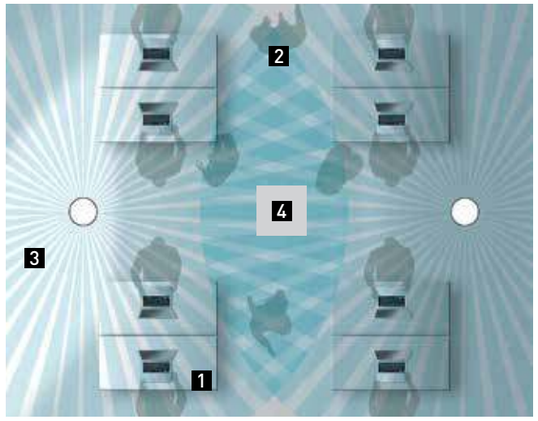
In small spaces preference should be given to wall-mounted sensors placed in a corner. In large, open plan offices preference should be given to ceiling sensors (with their detection areas overlapping).



For optimum light level measurement, the sensor must be positioned between a minimum distance (to be determined) and 4 metres maximum from the source of natural light (such as large or small window). The ideal distance is calculated using the formula **d= (h1+h2)/2)**.

Recommendations
The presence sensors must not:

- be positioned less than 1m from sources of heat or cold (such as radiators, air conditioning units) which could cause "false detection"
- have a luminous flux (luminaire, window) in direct view, to ensure correct measurement of the light level.



1- Seated person
2- Moving person
3- Window
4- Air conditioning unit

Dual technology detection should be given preference as it combines 2 detection technologies (IR + US), providing reliable detection of people who are seated.

2 PASSAGEWAYS

These are areas in which people "move around", such as corridors, halls, stairways, archive areas, toilets, etc.

Positioning
For optimum detection, the sensor must have an unobstructed view (no obstacles in the sensor's detection range).
The following types of presence sensors can be used:

- wall mounted, with an 180° detection area
- ceiling mounted, with long range detection areas.

To avoid any blind spots the detection areas in horizontal or vertical spaces, where people move around, must overlap.

The transverse detection performance is more important than the radial performance.

Recommendations
Access points (such as doors) must be fully covered by the detection areas.
To ensure correct measurement of the light level the sensors must not have any luminous flux (luminaire, window) in direct view.

PIR detection should be given preference. It provides good detection performance for people moving around, with a long detection range.

STEP 4

CONFIGURE THE SENSORS

Lighting management sensors are factory pre-set. The configuration tool, Cat.No 882 30, can be used to configure the sensors with customised settings by sending and receiving data via infrared, easy set-up and maintenance guaranteed! The following functions can then be adjusted:

Time delay
Each time there is a movement, a time delay – or inner clock – is restarted. The light stays on until this time delay has elapsed, as the room is considered to be occupied.
Recommendation:
10 to 15 minutes for work areas, 5 minutes for passageways.

Daylight setpoint
Value at which the load comes on if light level is below the light setting and goes off if it is above this threshold. The Daylight setpoint can be set up to a maximum of 1275 lux.
Recommendation:
passageway and corridors: 100 lux
stairways: 150 lux
offices: 300 - 500 lux.

Sensitivity
For each technology, the sensitivity setting is used to:
- reduce or increase the detection area
- reduce the effects of air currents, air conditioning and air flows from heating.

To set the sensitivity levels, go to the detection area and check that the sensor covers the strategic positions in the room (entrance door, desk).

Calibration
In order to set this calibration, it is necessary to measure the surrounding light level using a luxmeter beforehand. The surrounding light level measured must then be transmitted to the sensor.

Steps for regulating the electric light factor:
- switch the light on and close the blinds
- wait 2 minutes
- measure the light level below the cell using a luxmeter.

Enter this value in the tool and send it to the cell. This calibration will be acknowledged during the next detection cycle.

4 DIFFERENT OPERATING MODES

Occupancy (Auto on/Auto off mode)
Automatic switch-on:
- detection of presence if there is an insufficient natural level of light.

Automatic switch-off:
- if no presence is detected and at the end of the time delay set
- if there is a sufficient level of natural light (activated light regulation).

Any new detection causes an automatic switch-on if there is insufficient light.

Walk through
- If there is no presence detected in the 20 seconds following an initial detection, the sensor will switch off after 3 minutes.
- If a new presence is detected in the 3 minutes following the initial detection, the device will switch off at the end of the time delay set.

Vacancy (Manual on/Auto off mode)
Manual switch-on, automatic switch-off:
- where no presence is detected and at the end of the time delay set.

Following switch-off, any new detection within a 30-second period will cause the device to be switched on automatically. After 30 seconds, the device is switched on via a manual switch.

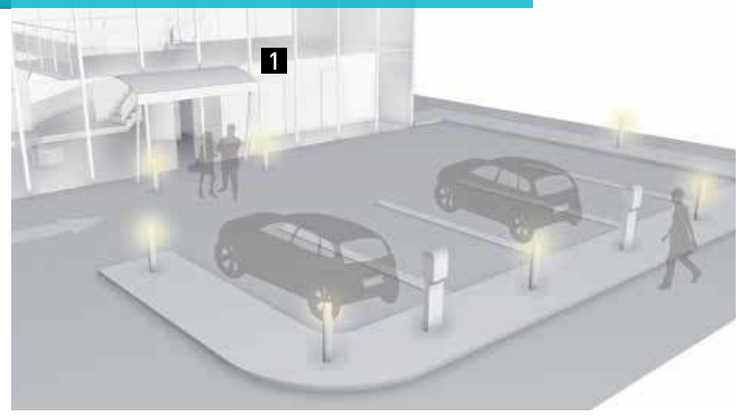
Partial on/Group off mode
This mode is used to ungroup circuits that are switched on through detection and switched off at the end of detection. Example: on detection the main lighting is switched on and occasional lighting can be controlled manually at the same time. At the end of detection, the sensor orders the main lighting and the occasional lighting circuits to be switched off.

MOBILE CONFIGURATOR:
FOR SET-UP AND MAINTENANCE

APPLICATION EXAMPLES FOR SPECIFIC BUILDING SPACES

Outdoor parking

Switch-on and switch-off must be automatic according to whether or not the area is occupied and the natural light level.
The sensor must withstand outdoor stresses.



CONTROL REQUIREMENTS

Lighting is automatically switched ON & OFF.

Switch-on
Automatic through presence detection as soon as the natural light level is insufficient.

Switch-off
Automatic when the area is no longer occupied after a time delay, or as soon as the natural light level is sufficient.

SOLUTIONS

1 Use PIR sensors to provide a large coverage area in terms of length and width.

OR

Cat.No 489 33
PIR outdoor motion sensor
Its double lens will switch on the lights as soon as the door opens. It will also provide detection over very long areas.
- 270° with directional head
- Range 15 m
- IP 55 Weatherproof rating
- Wall or ceiling mounted
- Programmable with mobile configurator

Cat.No 488TRI3W
Triscan (PIR, microwave and photoelectric) outdoor motion sensor suitable for all outdoor areas.
- 120°
- Range 18 m
- IP 66 Weatherproof rating
- Wall or ceiling mounted
- Manual adjust (trim pot)

Warehouse high bay

Switch-on and switch-off must be automatic according to whether or not the area is occupied and the natural light level.
The sensor must have a detection range suitable for very high areas.

CONTROL REQUIREMENTS

Lighting is switched ON & OFF automatically.

Switch-on
Automatic through presence detection.

Switch-off
Automatic when the area is no longer occupied after a time delay, or as soon as the natural light level is sufficient.

SOLUTIONS

1

Cat.No 489 32
PIR sensor
- 360°
- Range Ø 20 m at 10 m height
- IP 55 Weatherproof rating
  (IP 66 with plastic cable glands not supplied)
- Surface mounting on ceiling

Stairway

Switch-on must be triggered by a person passing and switch-off must be automatic after time delay has elapsed.

CONTROL REQUIREMENTS

Lighting switched ON & OFF automatically with a motion sensor installed on each floor.

Switch-on
Automatic through presence detection as soon as the natural light level is insufficient.

Switch-off
Automatic when the area is no longer occupied, after time delay.

SOLUTIONS

Cat.No 488 03
PIR indoor motion sensor
- 360°
- Range Ø 8 m
- Auto ON/OFF
- Manual adjustment (trim pot)
- Ceiling mounted

Corridors

Switch-on must be triggered by a person passing and switch-off must be automatic after time delay has elapsed, but only if there is insufficient natural light.

CONTROL REQUIREMENTS

Lighting is switched ON & OFF automatically.

Switch-on
Automatic through presence detection as soon as the natural light level is insufficient.

Switch-off
Automatic when the area is no longer occupied after a time delay, or as soon as the natural light level is sufficient.

SOLUTIONS

1 Use PIR corridor sensors to provide long range front detection and ensure the detection areas overlap so that occupants are not left in the dark.

OR

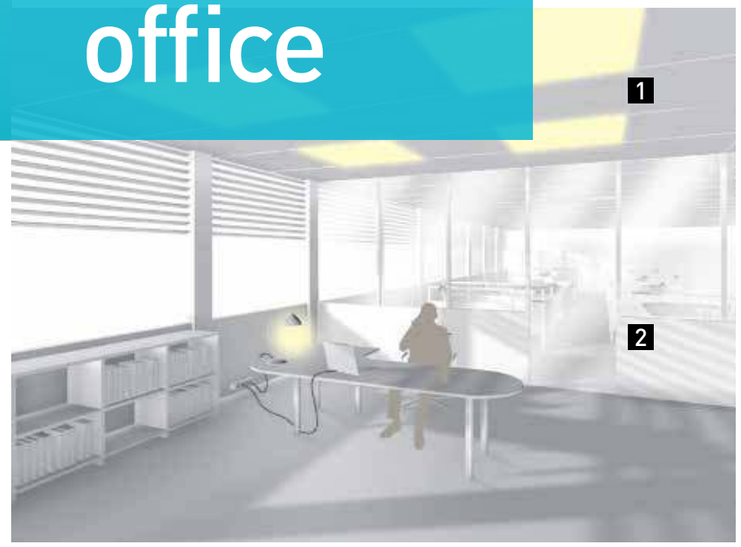
Cat.No 488 17
Infrared dual detection sensor
- 2x180°
- Side range 2 x 12 m
- IP 20 Weatherproof rating
- Ceiling mounted

Cat.No 488 07
PIR sensor
- 360°
- Range Ø 8 m
- IP 20 Weatherproof rating
- Surface mounted on a wall can be mounted in/on a corner using accessory

Using 100 lux and a 5 minute time delay will provide the right level of lighting and maximum energy savings.

For installation of 2 circuits:
1/3 luminaires are permanent, controlled by a timer, the other 2/3 are controlled by motion sensors

Individual office



Switch-on and switch-off must be automatic according to whether or not the office is occupied and the natural light level.

CONTROL REQUIREMENTS

Lighting and fan are switched ON manually and switched OFF automatically or manually.

Switch-on
Manual via push-button.

Switch-off
- As soon as the natural light level is sufficient.
- Automatic through detection that there is no-one present in the office (after time delay).
- Manual using the push-button.

SOLUTIONS

1 Use dual–tech sensors to provide precise detection and avoid false switch-off.

Cat.No 488 06
Dual-tech sensor
- 360°
- Range Ø 8 m
- Manual ON-Auto OFF Daylight control
- IP 20 Weatherproof rating
- Ceiling mounted

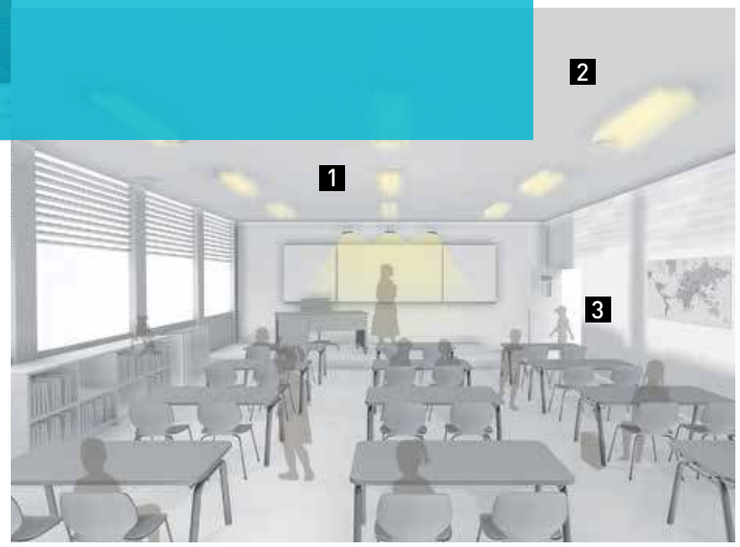
Cat.No 784 52
Dual-tech sensor
- 180°
- Maximum range 8 m
- Manual ON-Auto OFF Daylight control
- IP 20 Weatherproof rating
- Wall-mounted

Cat.No 488 04
PIR sensor
- 360°
- Range Ø 8 m
- Manual ON-Auto OFF Daylight control
- Fan control relay
- IP 20 Weatherproof rating
- Ceiling mounted

2 The push-button **Cat.No 5 720 31** can be used to control lighting circuits manually.

Using 350 lux and a 10 minute time delay combined with Vacancy detection will ensure maximum energy savings.

Classroom



The lighting is dependent on whether the areas are occupied and on differences in the natural light level in the classroom.
An additional manual control can be used to dim the lighting.

CONTROL REQUIREMENTS

Lighting is switched ON manually and switched OFF automatically or manually.

Switch-on
Manual via push-button for the room and the board.

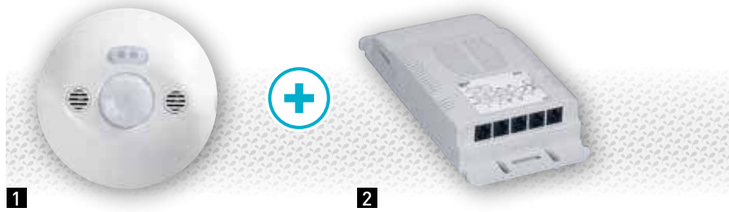
Switch-off
- As soon as the natural light level is sufficient.
- Automatic when the area in the classroom is no longer occupied, after a time delay. Automatic switch-off of the board lighting is linked to the classroom lighting.
- Manual using the push-button.

Lighting regulation
The amount of artificial lighting is adapted according to the natural light, so that a minimum lighting level is constantly maintained.

Note: users can adjust the light level to their own requirements using the push-button. Automatic management will take over again when the user is absent.

The area on the window side will thus have a lower level of artificial light than that on the opposite side.

SOLUTIONS

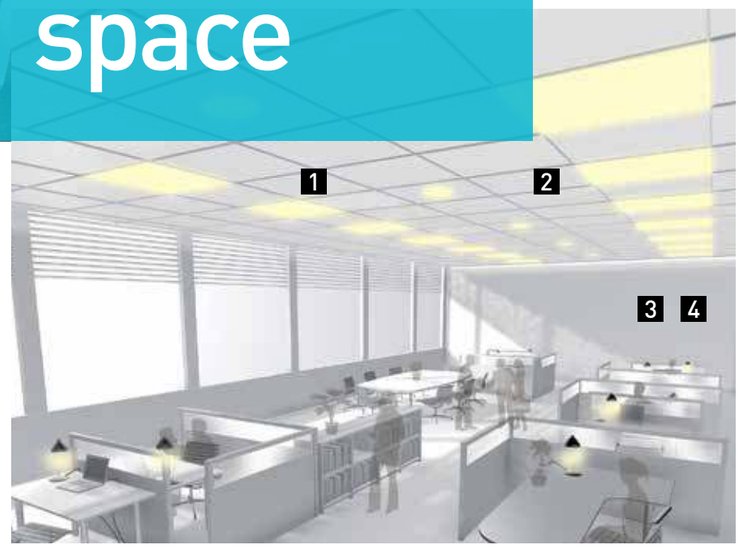


1
Cat.No 488 22
Dual-tech occupancy sensor
- Range Ø 8 m
- IP 20 Weatherproof rating
- Ceiling mounted

2
Cat.No 488 44
Room controller for DALI and DSI dimming
- Occupancy mode, vacancy mode.
- The room controller applies a dimming difference of 30, 50 or 80% between the window and the corridor side.
- Fixed directly to the false ceiling via cable ducting.

3 The push-button **Cat.No 5 720 31** can be used to control lighting circuits manually.

Open space



The lighting must adapt to whether or not the office areas and aisles are occupied, while taking the natural light level into account.

CONTROL REQUIREMENTS

Lighting is switched ON manually and switched OFF automatically or manually.

Switch-on
Manual via push-button or touch screen.

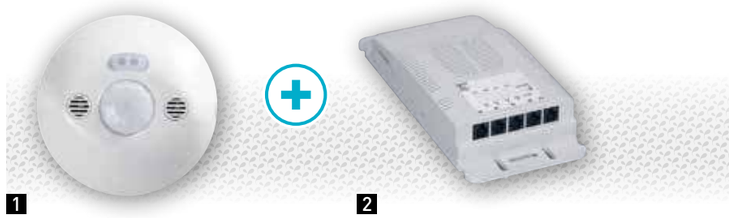
Switch-off
- Gradual, as soon as the natural light level is sufficient.
- Automatic when the area in the open plan office is no longer occupied (after a time delay).
- Manual via push-button or touch screen.

Lighting regulation
The amount of artificial lighting is adapted according to the natural light, so that a minimum lighting level is constantly maintained.

Note: users can adjust the light level to their own requirements using the push-button. Automatic management will take over again when the user is absent.

The area on the window side will thus have a lower level of artificial light than that on the opposite side.

SOLUTIONS



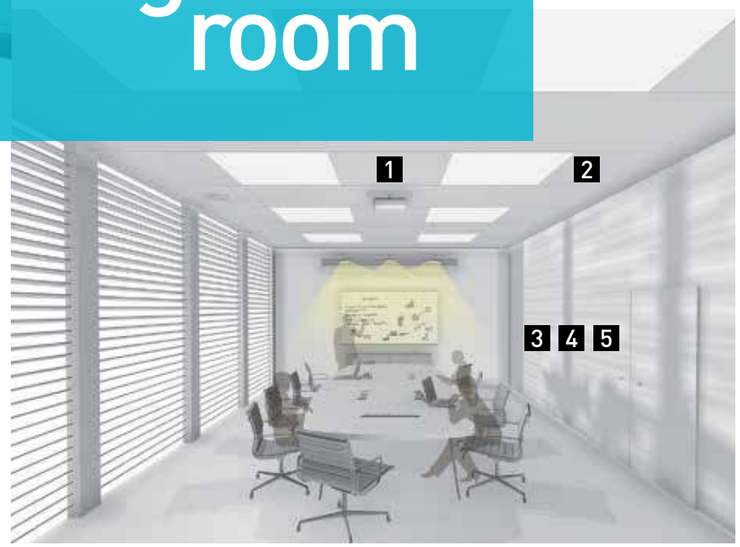
1
Cat.No 488 22
Dual-tech occupancy sensor
- Range Ø 8 m
- IP 20 Weatherproof rating
- Ceiling mounted

2
Cat.No 488 44
Dimming room controller for DALI protocol
- Fixed directly to the false ceiling via cable ducting.

3 The push-button **Cat.No 675 53** can be used to control and dim lighting circuits manually.

4 The touch screen **Cat.No 5 739 58** can be used to activate scenarios.

Meeting room



Room occupants must be able to control and dim the light and also the blinds, screen and ventilation according to their requirements.

CONTROL REQUIREMENTS

Lighting and fan are switched ON manually and switched OFF automatically or manually.

Switch-on
Manual via push-button or touch screen.

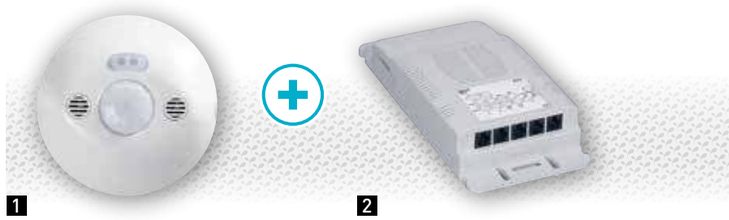
Switch-off
- Gradual, as soon as the natural light level is sufficient.
- Automatic by detection that there is no-one present in the meeting room (after time delay).
- Manual via push-button or touch screen.

Lighting regulation
The amount of artificial lighting is adapted according to the natural light, so that a minimum lighting level is constantly maintained.

Note: users can adjust the light level to their own requirements using the push-button. The area on the window side will thus have a lower level of artificial light than that on the opposite side.

The scenario push-buttons, remote control or touch screen can be used to activate projection, end projection, full light scenarios. The ventilation will switch from ECO mode to COMFORT mode when a person is detected.

SOLUTIONS



1
Cat.No 488 22
Dual-tech occupancy sensor
- Range Ø 8 m
- IP 20 Weatherproof rating
- Ceiling mounted

2
Cat.No 488 44
Multi-application room controller:
- 2 x 1-10 V dimming output
- 1 blind output
- 1 fan output

Fixed directly to the false ceiling via cable ducting.

3 The push-button **Cat.No 675 53** can be used to control and dim lighting circuits manually.

4 The touch screen **Cat.No 5 739 58** can be used to activate scenarios.

5 An additional remote control **Cat.No 882 32** can provide more flexibility for the occupants.

Motion and Lighting Management sensors for 1 circuit

selection chart

MOTION SENSORS			
AREAS WITHOUT NATURAL LIGHT	INSTALLATION		
	Ceiling	Wall	
		Surface mounting	Flush-mounting
PASSAGEWAY			
Hall/lobby Stairways/hallways Storage areas/technical areas	488 03(1) Ø 8 m	489 11(2) 8 m	-
OUTDOOR AND DAMP AREAS			
Indoor/external car park Indoor entrance areas	IP 55 489 33 Directional head 270° 20 m	IP 66 488TRI3W 120° 18 m	-

LIGHTING MANAGEMENT SENSORS			
AREAS WITH NATURAL LIGHT	Automatic On-Off Checking permanently the presence and daylight level		
WORK AREAS			
Individual office/small room	488 04(3) Ø 8 m	489 14(2) 8 m	0 784 51 8 m
Open plan office/classroom/ meeting room	488 06(1) Ø 8 m	489 16(2,3) 8 m	0 784 52 8 m
PASSAGEWAY			
Hall/lobby Stairways/hallways	488 07(1) Ø 8 m	-	-
Hallways Very long areas	488 17(1) 2 x 12 m	-	-
High ceiling areas (gymnasium, storage areas...)	IP 66 489 32 (Flush-mounting) Ø 20 m 10 m fixing height	IP 55 489 33 270° 20 m	-
Restrooms, bathrooms Dressing room	488 04(3) Ø 8 m	489 16(2,3) 8 m	-
OUTDOOR & DAMP AREAS			
Indoor/outdoor car park lot Indoor entrance areas	IP 66 489 32 Ø 20 m 10 m fixing height IP 55 489 33 Directional head 270° 20 m	IP 55 489 33 Directional head 270° 20 m	-

1: Surface mounting box option - 2: corner mounting option - 3: 1 lighting output + 1 fan output

Lighting Management sensors and room controllers for multiple circuits

selection chart

CHOOSE THE SENSOR	Automatic On-Off Checking permanently the presence and the light level		
	INSTALLATION		
	Ceiling	Wall	
		Surface mounting	Flush-mounting
WORK AREAS			
Individual office Classroom	488 22 Ø 8 m	488 23 5 m	-
PASSAGEWAY			
Restrooms, changing rooms	488 20 Ø 8 m	488 24 5 m	-
Hallways Very long areas	488 20 Ø 8 m	-	-
OUTDOOR & DAMP AREAS			
Car park, cellar, laboratory, test room, changing room IP 55	-	488 30 270° 15 m 15 m 10 m	-

AND THE OUTPUTS TO BE MANAGED	ON-OFF	DIMMING		
		DALI	1-10 V	Halogen - Incandescent - Dimmable LEDs (1)
1 lighting circuit in the same room	488 50	488 51*	-	488 45
1 lighting circuit + fan output in the same room	488 50	488 51*	-	-
2 lighting circuits in the same room	488 50	488 51*	-	488 45
2 lighting circuits + 1 fan output in the same room	-	488 51*	-	-
2 lighting circuits (2 inputs, 2 outputs) **in 2 rooms**	488 41	-	488 42 (1000 VA)	488 45
4 lighting circuits (4 inputs, 4 outputs) **in 4 rooms**	488 43	488 44 (max. 32 ballasts)	488 43	-

1: Refer to the load table in the data sheet available online in the e-catalogue (**Note:** some commercially available dimmable LEDs are not compatible)

* Available 2015

Motion sensors for 1 circuit

motion sensors for passageway without natural light

489 11

488 03

488TRI3W

Selection chart **p. 22**

Automatic on/off
Manual adjustment of light level threshold and time delay via potentiometer
All load 8.5 A - 240 V

Pack	Cat.Nos	Ideal for passageways
1	489 11	**Surface mounted on wall** PIR wall mounted motion sensor 180° infrared detection, range 8 m Recommended fixing height: 2.5 m 3-wire with neutral IP 42 Light level threshold: 1 to 1000 lux Adjustable time delay: 5 s to 30 min Standby consumption: 0.7 W For direct surface mounting on wall Can be mounted in/on a corner using accessory Cat.No 489 71 (p. 28)
6	488 03	**Ceiling mounted** PIR ceiling motion sensor 360° infrared detection, range Ø8 m Recommended fixing height: 2.50 m 3-wire with neutral IP 41 Light level threshold: 1 to 1000 lux Adjustable time delay: 5 s to 30 min Standby Consumption: 0.4 W on standby Optimum distance between 2 sensors: 6 m Fixes directly to a false ceiling with mounting claws (included) or installed in a Batibox box, depth 50 mm Can be surface mounted on ceiling using accessory Cat.No 488 75 (p. 28)

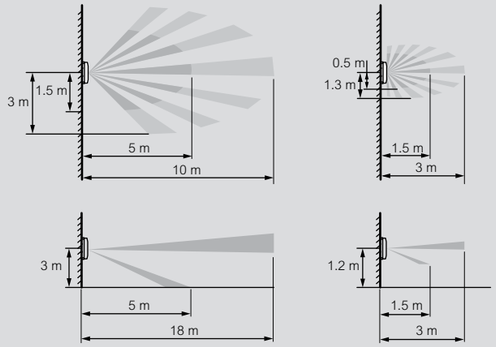
Pack	Cat.Nos	Ideal for outdoor and damp areas
1	488TRI3W	**Surface mounted on wall** PIR, microwave and photoelectric sensor wall mounted motion sensor 120° infrared detection, range 8 m Recommended fixing height: 2.5 m 3-wire with neutral IP 66 Light level threshold: 10 to full sunlight lux Adjustable time delay: 8 s to 15 min Standby consumption: 0.5 W For direct surface mounting on wall

Motion sensors for 1 circuit

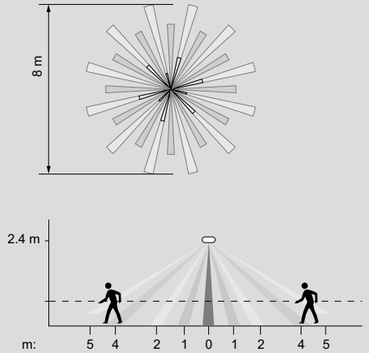
detection areas and load table

Detection areas

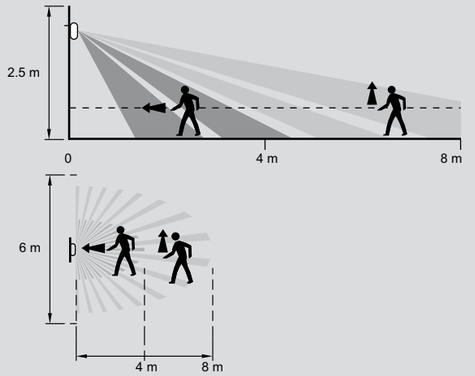
Cat.Nos 488TRI3W



Cat.No 488 03



Cat.Nos 489 11



Load table

Cat.No	Halogen bulb	ELV halogen with ferromagnetic transformer	ELV halogen with electronic transformer	Fluorescent tube	Compact fluorescent bulb	LED
489 11	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 W
488 03	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 W
488TRI3W	2000 W	2400 VA	2400 VA	10 x (2 x 36 W)	2400 W	1200 W

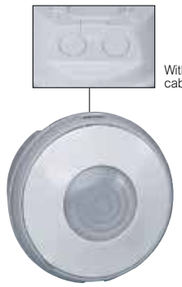
Lighting Management sensors for 1 circuit

Lighting Management sensors for passageway with natural light

488 17

488 07

489 33



489 32

Selection chart **p. 22**
Load table **p. 29**

Check presence and natural light level continuously, switch off when there is sufficient natural light
Occupancy mode (automatic switch-on/off factory setting). Can be used with pushbutton Cat.No 572 030 (or illuminated pushbutton Cat.No 572 032) for vacancy mode (manual switch-on and manual or automatic switch-off). Precise on-site adjustment using configuration tool Cat.No 882 30(p. 28)
Adjustable time delay: 5 s to 59 min. Light level threshold adjustable from 5 to 1275 lux

Pack	Cat.Nos	Ideal for passageways
1	488 17	**Ceiling mounted** Fix directly to a false ceiling with mounting claws (included) or installed in a Batibox box, depth 50 mm, Cat.No 800 51 3-wire with neutral Standby consumption: 0.4 W Recommended fixing height: 2.5 m PIR ceiling mounted Lighting Management sensors 360° infrared with detection angle of 2 x 12 m Ideal for hallway IP 20 Optimum distance between 2 sensors: 20 m Connection via automatic terminals Surface mounted on ceiling using accessory Cat.No 488 75 (p. 28)
1	488 07	PIR ceiling mounted Lighting Management sensors 360° infrared detection, range Ø8 m Optimum distance between 2 sensors: 6 m Connection via automatic terminals Surface mounted on ceiling using accessory Cat.No 488 75 (p. 28)

Pack	Cat.Nos	Ideal for outdoor and damp areas
1	489 33	**Wall or ceiling mounted** PIR wall and ceiling mounted multi lens Lighting Management sensors 270° infrared detection with directional head, range 20 m Recommended fixing height: 2.5 m 3-wire with neutral IP 55 Standby consumption: 0.7 W Can be mounted in/on a corner using accessory Cat.No 489 72 (p. 28)

Pack	Cat.Nos	Ideal for high ceiling areas
1	489 32	**Ceiling mounted** PIR ceiling mounted Lighting Management sensors 360° infrared detection, Ø20 m at 10 m high, Ø8 m at 2.5 m high 3-wire with neutral IP 55, IP 66 with cable gland Cat.No 0 980 03 Optimum distance between 2 sensors: 20 m Standby consumption: 0.4 W Compatible with Cablofil cable trays

Lighting Management sensors for 1 circuit

Lighting Management sensors for work areas with natural light

488 06

489 16

0 784 52

488 04

Selection chart **p. 22**
Load table **p. 29**

Check presence and light level continuously, switch off when there is sufficient natural light
Manual switch-on and manual or automatic switch-off (factory setting)
Can be used with pushbutton Cat.No 5 720 30 (or illuminated pushbutton Cat.No 5 720 32) for manual switch-on and manual or automatic switch-off
Infrared and ultrasonic motion sensors for workplaces, providing precise presence detection as soon as the wave transmitted by the sensor is modified (for example, by hand movement on a keyboard)
Precise on-site adjustment using configuration tool (p. 28)

Pack	Cat.Nos	Ideal for work areas
1	488 06	Suitable for meeting room, classroom, open plan office, etc. **Ceiling mounted** Dual technology ceiling mounted Lighting Management sensors Connection via automatic terminals Surface mounted on ceiling using accessory Cat.No 488 75 (p. 28) 360° infrared and ultrasonic detection, Ø8 m IP 20 3-wire with neutral Optimum distance between 2 sensors: 6 m Standby consumption: 0.8 W Fix directly to a false ceiling with mounting claws (included) or installed in a Batibox box, depth 50 mm Cat.No 800 51
1	489 16	**Surface mounted on wall** Dual technology wall mounted Lighting Management sensors with presence output 180° infrared and ultrasonic detection, range (front) 8 m Recommended fixing height: 2.5 m 3-wire with neutral IP 42 Additional 2 A contact for HVAC control based on presence data Consumption: 0.4 W on standby Optimum distance between 2 sensors: 10 m Surface mounted on ceiling using accessory Cat.No 489 71 (p. 28)

Pack	Cat.Nos	Ideal for offices
1	0 784 52	**Wall mounted** Dual technology flush mounted Lighting Management sensors with neutral 180° infrared and ultrasonic detection, range 8 m Recommended fixing height: 1.20 m Standby consumption: 0.2 W Optimum distance between 2 sensors: 6 m 3-wire cable IP 20 For installation in box, depth 40 mm min., or in surface mounting box Cat.No 800 51 2 modules

Pack	Cat.Nos	Ideal for individual office
1	488 04	**Ceiling mounted** Additional 2 A contact for HVAC control based on presence data PIR ceiling mounted Lighting Management sensors 360° infrared detection, Ø8 m range 3-wire with neutral Optimum distance between 2 sensors: 6 m Standby consumption: 0.4 W Fixes directly to a false ceiling with mounting claws (included) or installed in a Batibox box, depth 50 mm Surface mounted on ceiling using accessory Cat.No 488 75 (p. 28) IP 20

Configuration tools and accessories

882 35

882 30

RJ 45 connectors

488 72

488 68

Pack	Cat.Nos	
		Configuration tools for Lighting Management sensors
1 1	882 35 882 30	All sensors are supplied with factory settings: - 500 lux light level threshold for ceiling mounted sensors, 300 lux for surface and flush mounting sensors - 15-minute time delay and walkthrough function activated The configuration tools are used to adjust these presets and the detection sensitivity. Step programming on preset buttons Digital programming to one decimal place on the digital screen Instant programming control Used to display the parameters of each sensor Option to store settings in the memory and to apply them to other sensors Standard preset configurations for each room type (office, hallway, etc.) according to EN 12 464 (European Standard)
		RJ 45-BUS/SCS connector
10	488 72	Used to connect controller(s) and sensor(s) to a BUS/SCS cable via tap-off Male connector
		RJ 45 doubler
10	488 68	Used to double the number of controller inputs
		Surface mounting boxes
5	488 75	Used for surface mounting ceiling mounted sensors For ceiling mounted sensors Cat.Nos 488 04/06/07/17/20/22
		Fixing accessories for installation in/on corners
1	489 71	Used to surface mount sensors in/on corners For surface mounting sensors Cat.Nos 488 11/16

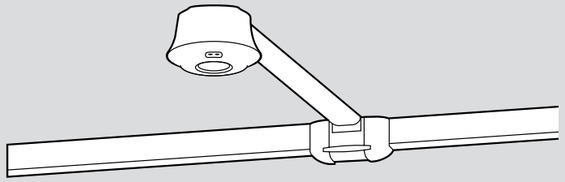
Configuration tools and accessories

Customising settings on-site

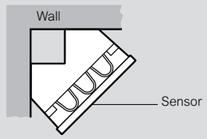
All sensors are preset in the factory
- 500 lux light level threshold for ceiling mounted sensors and 300 lux for surface mounting sensors
- 15-minute time delay and walkthrough function activated

The configuration tools are used to adjust the preset settings and the detection sensitivity

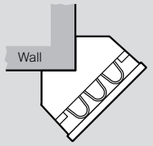
Installing surface mounting boxes Cat.Nos 488 75



Installing fixing accessories in/on a corner Cat.Nos 489 71 (view from above)



Mounting in internal corner



Mounting on external corner

legrand

Motion sensors and Lighting Management sensors for controllers

Example of how Lighting Management sensors function in an office

Deliberate switch-on action
Lighting switches off automatically when there is sufficient natural light, in accordance with European standard EN 15 193

Arrival: low light level

▶ On entering the room the light is switched on using the push button by the door

Strong light level

▶ When someone is in the room, the sensor will automatically turn the light off if the light level threshold is reached[1]

Fading light level

▶ When someone is in the room, the sensor automatically turns the light back on.

Departure: end of day

▶ On leaving the room, the light is switched off by pressing the push button. If the light is not switched off, the sensor will automatically operate.

1: Press the pushbutton to keep the light on

Load table

Cat.No	Halogen bulb	ELV halogen with ferromagnetic transformer	ELV halogen with electronic transformer	Fluorescent tube	Compact fluorescent bulb	LED	Fluorescent bulb with 1-10 V ballast	DALI	Volt-free motor contact
488 20/22 488 24/30/23 + 488 50	3600 W	1800 VA	1800 VA	10 x (2 x 36 W)	250 W	250 W	-	-	2 A
488 20/22 488 24/30/23 + 488 51	-	-	-	-	-	-	-	32 ballasts	2 A
488 04	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 W	-	-	2 A
488 07	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 W	-	-	-
488 06	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 W	-	-	-
488 17	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 W	-	-	-
0 784 52	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 VA	-	-	-
489 16	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 VA	-	-	2 A
489 32	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 VA	-	-	-
489 33	2000 W	1000 VA	1000 VA	10 x (2 x 36 W)	250 W	250 VA	-	-	-

1: Operates with dimmable LEDs

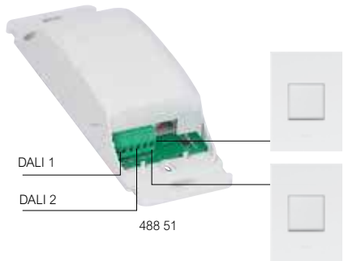
Best practice guide for office buildings available at **www.legrand.com**

Lighting Management sensor for managing several circuits

multi-circuit ceiling mounted controllers for areas with natural light

Local control solutions

Rear view
Connection via screw terminals



488 51

Rear view
Connection via screw terminals

488 41

Sensor and controller selection chart **p. 23**

Ceiling mounted or installed in Cablofil cable trays (see Legrand Cable Management catalogue)
Connection to sensors (Cat.Nos 488 20/22/30/24/23) by cord or RJ 45 cable or BUS/SCS cable to be fitted with RJ 45 connector Cat.No 488 72 (p. 31)

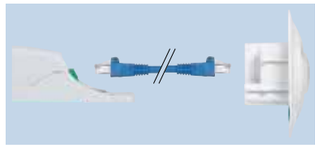
Pack	Cat.Nos	For controlling 1 or 2 circuits in one room
		1 sensor input, 2 inputs for auxiliaries 2 outputs Can be used with a pushbutton, including a pushbutton with LED indicator, Cat.Nos 5720 30/32 for manual switch-on and manual or automatic switch-off
		ON/OFF
1	488 50	2 x 16 A outputs Used to control 2 ON/OFF lighting circuits or 1 lighting circuit + 1 ventilation circuit Connection via screw terminals
		Dimming - DALI ballast 2015
1	488 51	2 DALI outputs (32 ballasts max.) and 1 ventilation output (volt-free contact) Used to dim the light level on the window side of a room (where there is more natural light) separately from the corridor side Used to control a maximum of 32 DALI ballasts Connection via screw terminals
		For controlling 2 lighting circuits
		Can be controlled for each output by a sensor and/or an individual BUS control unit Addressing methods using sensors and control units: - automatic configuration - custom configuration by pressing the "Learn" button on the product
		ON/OFF
1	488 41	2 x 16 A outputs
		Dimming - 1-10 V ballast
1	488 42	2 outputs 1000 VA maximum per output
		Dimming - LV and ELV halogen
1	488 45	2 outputs 1000 W maximum per output

Pack	Cat.Nos	For controlling 4 lighting circuits
		Can be controlled for each output by a sensor and/or an individual BUS control unit Addressing methods using sensors and control units: - automatic configuration - custom configuration by pressing the "Learn" button on the product
		Dimming - ballast 1-10 V or ON/OFF
1	488 43	4 outputs 1000 VA maximum per output
		Dimming - DALI ballast
1	488 44	4 outputs 32 ballasts maximum per output

Lighting Management sensors for managing several circuits

Lighting Management sensors for controllers for passageway and work areas with natural light

Local control solutions



Connection to controller via cord or RJ 45 cable

488 20

488 22

488 23

Sensor and controller selection chart **p. 23**

Check presence and light level continuously, switch off when there is sufficient natural light
Automatic switch-on/off (factory setting)
Precise on-site adjustment using configuration tool (p. 28)
Connect to controllers by cord or RJ 45 cable or BUS/SCS cable to be fitted with RJ 45 connector Cat.No 488 72 (p. 28)

Pack	Cat.Nos	Ideal for large areas
		PIR ceiling mounted sensor
1	488 20	360° infrared detection, range Ø8 m Optimum distance between 2 sensors: 6 m Consumption: 0.2 W on standby Fixes directly to a false ceiling with mounting claws (included) or installed in a Batibox box, depth 50 mm Cat.No 800 51 Surface mounted on ceiling using accessory Cat.No 488 75 IP 20
		PIR wall mounted sensor
1	488 24	180° infrared detection with directional head, range (front) 5 m IP 42 Consumption: 0.2 W on standby Supplied with fixing plate
		Ideal for outdoor and damp areas
		Surface mounted
1	488 30	270° dual infrared detection, side range 2 x 15 m and front range 10 m IP 55 Consumption: 0.5 W on standby Supplied with fixing plate

Pack	Cat.Nos	Ideal for work areas
		DT ceiling mounted sensor
1	488 22	360° infrared and ultrasonic detection, range Ø8 m Recommended fixing height: 2.50 m Optimum distance between 2 sensors: 6 m Consumption: 0.5 W on standby Fixes directly to a false ceiling with mounting claws (included) or installed in a Batibox box, depth 50 mm Cat.No 800 51 Surface mounted on ceiling using accessory Cat.No 488 75 (p. 28) IP 20
		DT wall mounted sensor
1	488 23	180° infrared and ultrasonic detection with directional head, range (front) 7 m IP 42 Consumption: 0.5 W on standby Supplied with fixing plate
		Light level measurement cell
1	488 28	For synchronising the light level measurement when used with sensors Use the configuration tool Cat.No 882 30 (p. 28) to configure the light level cell Connects to the BUS/SCS cable with connector Cat.No 488 72 (p. 28) IP 20
		RJ 45-BUS/SCS connectors
		Used to connect controller(s) and sensor(s) to a BUS/SCS cable via tap-off
10	488 72	Male connector
10	488 73	Female connector

Local or global control,

the choice is yours!

LOCAL CONTROL
BUS/SCS wiring enables local and remote presence and light level detection management, shutter control, time management and scenario management functions.
Ideal for meeting rooms, small businesses or office spaces.

RADIO/ZIGBEE®: THE PERFECT COMPLEMENT TO BUS/SCS

As an addition to BUS/SCS wiring, the Radio/ZigBee® offer can be used to install new radio control points without damaging walls.
Ideal for refurbishment installations or glazed surfaces.

Lighting Management

BUS/SCS controls

67553

5 745 03

Sensor and controller selection chart
Technical characteristics **e-catalogue**

Connection:
- to the BUS/SCS controller via cord or RJ 45 cable or BUS/SCS cable to be fitted with RJ 45-BUS/SCS connector Cat. No 488 72 (p. 28)
- directly to the BUS/SCS cable (supplied with BUS/SCS connector Cat. No 3515 for connection to the BUS/SCS cable via tap-off)
To be fitted with Mosaic cover plates and Batibox support frames

Pack	Cat.Nos	ON/OFF lighting controls
1	Arteor 675 53	Push-button control used to control 1 controller **1-way** Used to control 1 lighting circuit (1 output) **2-way** Used to control 2 lighting circuits (2 outputs) ON/OFF control unit To be equipped with cover plates, support frames and plates. (Refer to Arteor Catalogue)
1	Arteor 675 52	**Switch multifunction controls** Used to control several controllers (or several outputs on one or more controllers): ON/OFF, dimming, ventilation, roller shutters "Switch type" multifunctional control unit To be equipped with cover plates, support frames and plates. (Refer to Arteor Catalogue)
1 1 1 1	Arteor 5 739 02 5 739 03 5 745 03 5 745 04	**Scenario controls** Used to control several controllers **2 scenarios** 4 buttons used to manage the start and end of each scenario Example: adjusting lighting levels, controlling lighting with shutters, etc. ○ White ● Magnesium ○ White ● Magnesium
1	5 739 58	**MyHome screen 3.5''** 3.5» colour touch screen for the management of light functions, automation, burglar alarm, temperature control, sound system, scenarios and energy management Equipped with front panel USB connector for setup and ready for Open Webnet programming language

Notes

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