

PRESENCE DETECTOR PD-33 DL v 1.1

Installation instructions

Order no. 13150, E no. 13 060 85

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Introduction



PD-33 DL is a passive infrared detector intended for presence detection and the control of light fittings over a DALI bus. It uses a pyroelectric sensor that reacts to changes in thermal radiation.

Properties

- PD-33 DL is able to turn on, dim and turn off DALI light fittings.
- It uses broadcast or group addressing.
- Multiple detectors work together if they are controlling the same group of light fittings or if they are using broadcast addressing.
- The light level can be controlled directly (100%, 10%, 0%) or by choosing preset levels from scenes 10, 14 and 15.
- Adjustable presence delay of 2 seconds to 20 minutes.
- Timer controls duration of low-level lighting before switch-off, 5 minutes or 30 minutes.
- Configuration for office environments that use a different form of signal processing when presence is detected.
- "No start" mode can be selected that simply keeps lighting switched on. (Switched on manually with pushbutton.)
- Power is supplied via the DALI bus (max. consumption 12 mA).
- Settings are adjusted using knobs and jumpers on the detector circuit board.
- Lens can be replaced to adjust the detection range. A choice of lenses is available.

Commissioning

- Check that the "**Activity Low/Office**" jumper is set to the "Low" position.
- Carry out a walk test over the entire detection area.
Note! The lens must be fitted and the cover must be in place. Adjust vertically and horizontally as required.
- After the walk test and adjustment, the presence delay should be set to the lowest setting. In dynamic lighting control applications, such as stairways and corridors, a suitable time is 1–2 minutes. In other applications, such as classrooms and garages, the time can be set to 6–8 minutes or in line with the light source supplier's recommendations.
- Set the "**Occupancy Activity**" jumper to match the level of activity in the premises.
- We recommend that the LED is disconnected once adjustment is complete (see "Detector settings"), to minimise the risk of tampering.

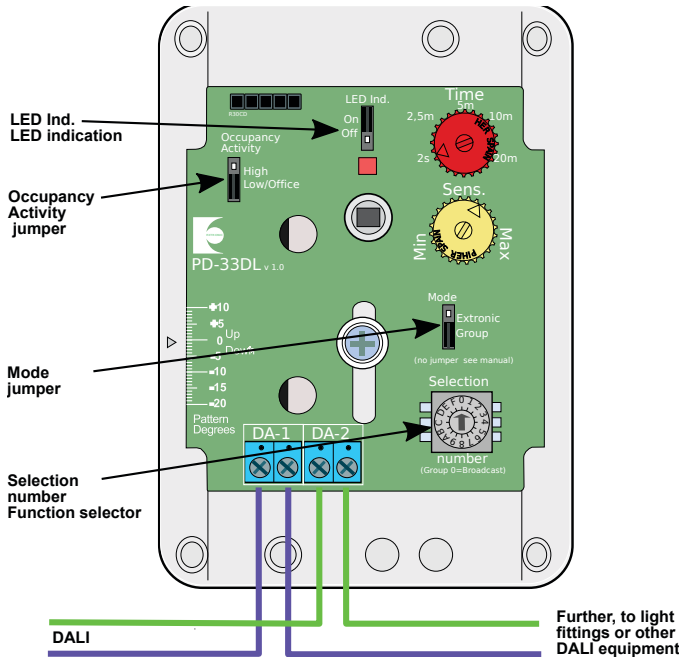
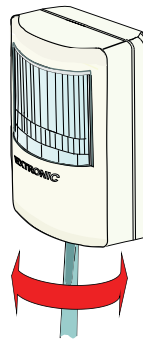
Basic terminology

- **Broadcast:** Broadcast addressing means that the detector sends its DALI commands to all light fittings at the same time.
- **Groups:** The light fittings in a DALI system can also be controlled using group addresses. (DALI supports 16 groups.)
- **Direct control:** The light fittings are controlled by setting the lighting level with DALI commands (Direct level).
- **Scene:** Each light fitting can have 16 programmed scenes. Each scene means that the light fitting is lit at a certain level (intensity). The light levels of the scenes for each light fitting can be programmed using a computer.
- **Operating mode: Direct level or Extrinsic.** Direct level means that the light levels are controlled directly and at preset levels. Extrinsic means that the light fittings are switched between scenes 10, 14 and 15.
- **Delays;**
- **Presence delay:** The length of time that the lighting remains switched on at the normal level after presence is no longer detected.
Low-level delay: (Timer delay, base level duration) The length of time that the lighting remains at the base level before it is switched off completely.
- **No start:** The lighting is not switched on automatically when presence is detected. It can be switched on manually using a pushbutton.
- **Normal level:** – light level that is used when someone is present in the premises.
- **Base level:** – low light level that is used when premises are empty.

Detector settings

Opening the enclosure

The enclosure is opened by twisting with a screwdriver at the centre top or centre bottom.



Potentiometers

Time (red): delay between time when presence was last detected until time when lighting is dimmed. Adjustable from 2 seconds to 20 minutes.

Sensitivity (yellow): this potentiometer is used to adjust sensitivity.

DALI terminals

PD-33 DL is only connected to the DALI bus and is intended for detecting presence in lighting control systems. It has dual terminal blocks (DA-1 and DA-2) that can be used to connect the incoming and outgoing buses.

The DALI terminals are polarity independent. DA-1 and DA-2 are wired in pairs.

The detector is powered by the DALI bus.

Jumper “LED ind”/“No start” (LED)

- Position “On”: The LED flashes when movement is detected.
- Position “Off”: The LED does not show when movement is detected.
- Without jumper: “No start” is a feature that prevents the detector from switching on the lighting automatically.

The LED can be disconnected once adjustment is complete, to reduce the risk of tampering.

“Occupancy Activity” jumper / 5- or 30-minute low-level delay

- **“High”:** For use in premises where people are only present briefly, e.g. corridors and underpasses, i.e. clearly defined passageways. Gives five minutes of base-level lighting.
- **“Low/Office”:** For use in premises where people sit for long periods of time, e.g. in offices, some warehouse premises and libraries. The sensitivity increases when the detector has previously detected no presence. Gives five minutes of base-level lighting.
- **Without jumper:** Gives 30 minutes of base-level lighting. Signals are handled in the same way as for “Low/Office”.

“Mode” jumper

Extronic: Control using scenes

- Uses scene 10 while presence is detected.
- Uses scene 14 during low-level delay.
- Uses scene 15 when no-one is present.

Direct level: Turns on, dims and turns off lighting by direct control.

- When presence is detected the lighting level is immediately switched to 100%.
- When presence is no longer detected the light level is immediately switched to 10% during the low-level delay.
- After the low-level delay (5 or 30 minutes) the lighting is switched off completely.

Without jumper: Provides special features in combination with the “Selection number” mode selector.

“Selection number”:

- 0: Broadcast 1.5% base-level during low-level delay.
- 1-5: Groups 1 to 5 get 1.5% lighting level during low-level delay.
- F: Used with level selectors NP-2T DL and NP- 3T DL.
- 6 - E: Not used.

Mode selector (Selection number) 0–9 A–F

Choice of control by broadcast or groups 1 to 15. Selection number determines which group is used.

- Selection number 0 is used for Broadcast.
- Selection numbers 1 to 9 send DALI commands to the respective group.
- Selection numbers A–F give groups 10, 11, 12, 13, 14 and 15 respectively.
- *Group 16 cannot be accessed.*

NOTE! If NP-2T DL or NP-3T DL level switches are used, the mode selector should be set to F and the “Mode” jumper should be removed.

Mode Direct level: Direct control of light level

Group mode sets the lighting level directly. The light fittings do not need to be programmed if Broadcast is used. If group addressing (groups 1–15) is used, it is only necessary to program the light fittings with their group designations.

When presence is detected, the light level is set at 100%.

The presence delay can be set at up to 20 minutes.

When presence is no longer detected and the presence delay has elapsed, the lighting is gradually dimmed to 10% and stays at this level for 5 minutes. The detector then switches the light level to 0%.

- Several detectors can work together if they belong to the same group or are in Broadcast mode.
- To prevent the lighting from being switched on automatically (“No start”), remove the “LED indication” jumper.
- The lighting can be switched off using one or more push-buttons that send the DALI command “off”.
- The lighting can be switched on using one or more push-buttons that send the DALI command “recall max level”.
- A 30-minute low-level delay can be selected by removing the “Occupancy Activity” jumper (normally 5 minutes).
- The lighting can be dimmed to 1.5% instead of 10% by removing the “Mode” jumper. This only applies in Broadcast mode (0) or for groups 1 to 5.
- Multiple detectors assigned to different groups work independently of each other.

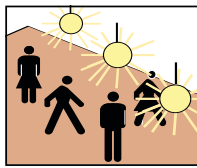
Automatic switching on, dimming and switching off

Entry 100%



The lighting is switched immediately to 100%.

Presence 100%



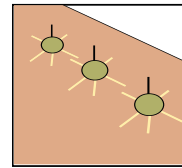
As long as presence is detected the lighting level stays at 100%. The presence delay can be set at up to 20 minutes.

Exit 100%



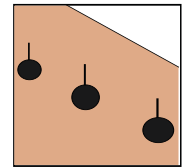
The light level stays at 100% until the presence delay has elapsed.

Base level 10%



The lighting is dimmed gradually down to 10% (1.5%, see text). The detector maintains the base level for 5 minutes (30 minutes, see text).

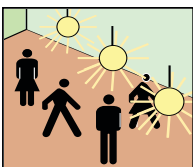
No presence



The lighting is switched off completely.

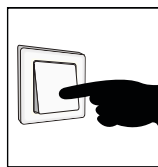
Manual control “off”

Presence 100%



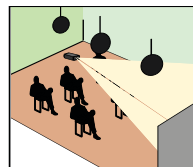
The lighting is switched to 100%.

Manual control off



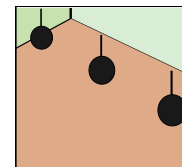
The lighting is switched off with a pushbutton that sends the DALI command “off”.

Presence off



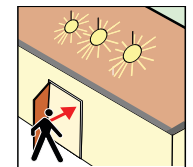
The lighting remains off as long as presence is detected in the premises.

No presence off



After a short period of absence the detector returns to normal operation. (The time is set using the red timer knob).

New entry 100%



The lighting is switched immediately to 100%.

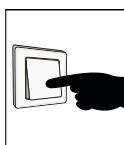
Manual control “No start”

Entry 0%



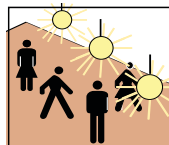
The lighting is not switched on.

Manual control on 100%



The lighting is switched on using a pushbutton that sends the DALI command “recall max level”.

Presence 100%



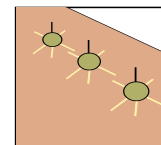
As long as presence is detected the lighting remains at 100%. The presence delay can be set at up to 20 minutes.

Exit 100%



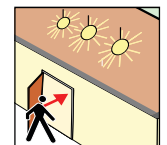
The light level stays at 100% until the presence delay has elapsed.

Base level 10%



The lighting is dimmed gradually down to 10% (1.5%, see text). The detector maintains the base level for 5 minutes (30 minutes, see text).

New entry 100%



If someone enters the premises before the lighting is switched off, the light level is raised to 100% again.

Application example, "Mode Direct level"

G1. Simple example of controlling a DALI loop with PD-33 DL

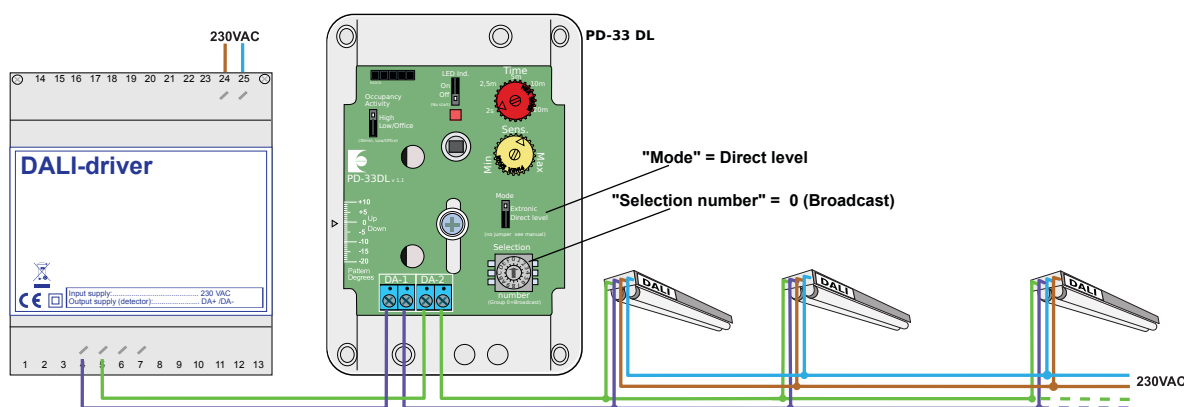
No programming of light fittings is needed

Broadcast to all light fittings, with direct control of all light fittings in the loop, and without any need for programming detectors or light fittings.

- When presence is detected, the light fittings are switched on at the normal level of 100%.
- After the presence delay, the lighting is dimmed to 10% for 5 minutes (low-level delay).
- If no movement is detected during the low-level delay (5 minutes) the lighting is switched off completely.

Comments

- If several detectors are connected in parallel they will help to control the area.
- A base level of 1.5% can be chosen instead of 10% (see section on "Jumper Mode").
- A low-level delay of 30 minutes can be chosen instead of 5 minutes (see section on "Occupancy Activity").



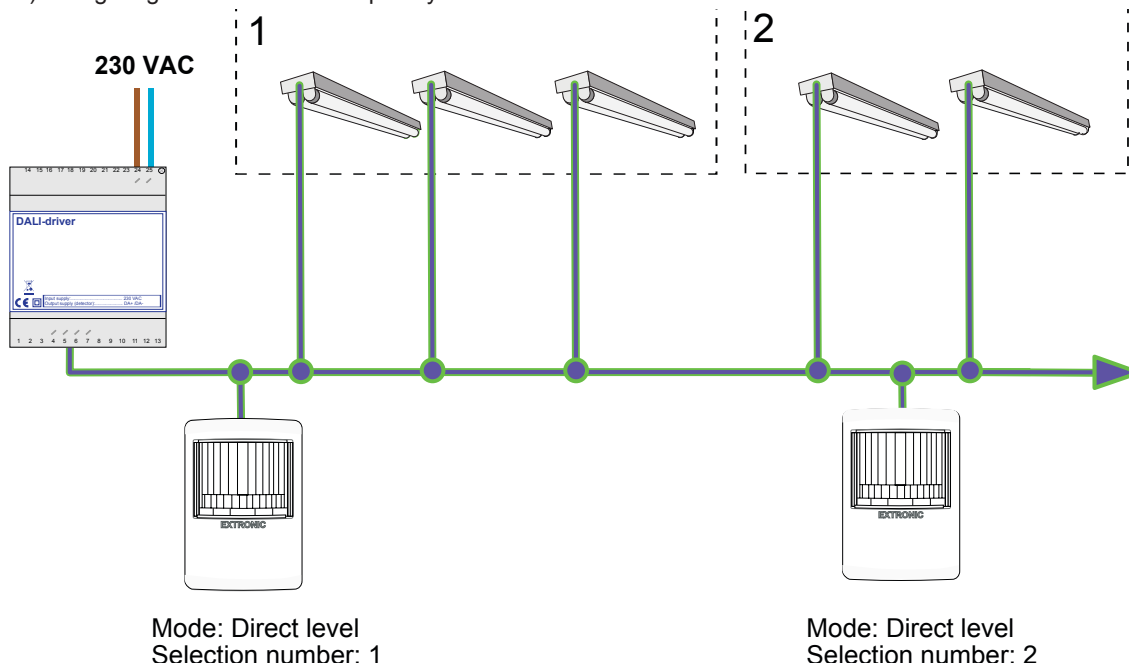
G2. Several small rooms with automatic control

The detectors each control their own room, independent of the other detectors in the DALI loop. The light fittings must be given the same group designation as the PD-33 DL detectors. In this example, group 1 and group 2.

- When presence is detected, the light fittings are switched on at the normal level of 100%.
- After the presence delay, the lighting is dimmed to 10% for 5 minutes (low-level delay).
- If no movement is detected during the low-level delay (5 minutes) the lighting is switched off completely.

Comments

- If several detectors are connected in parallel they will help to control the area.
- The lighting can be dimmed to a base level of 1.5% instead of 10% by removing the "Mode" jumper.
- The low-level delay time can be set to 30 minutes instead of 5 minutes by removing the "Occupancy Activity" jumper.
- If light levels other than 100%, 10%, 1.5% and 0% are required, the light fittings must be controlled using scenes.



Mode Extronic: Control using scenes 10, 14 and 15

Extronic mode sets the lighting level using scenes 10, 14 and 15, with the command “Go to scene 10, 14 or 15”. The light fittings must be programmed to set the lighting level for scenes 10, 14 and 15.

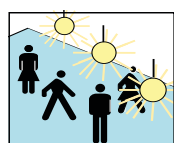
If **Broadcast** is used, there is no need to program the light fittings with group designations. If **group addressing** (groups 1–15) is used, the light fittings must be programmed with group designations.

When presence is detected the lighting is switched to **scene 10**. (Recommended as 80–100% light level). The presence delay can be set at up to 20 minutes after presence was last detected. The lighting is then dimmed gradually down to **scene 14** (e.g. 1% or 10% base lighting). The detector remains at scene 14 for 5 minutes (low-level delay) if no presence is detected. The detector then switches to **scene 15**. (e.g. 1% or 10%)

- Several detectors can work together if they belong to the same group, or are in Broadcast mode.
- To prevent the lighting from being switched on automatically (“No start”), remove the “LED indication” jumper.
- The lighting can be switched off using one or more push-buttons that send the DALI command “off”.
- The lighting can be switched on using one or more push-buttons that send the DALI command “go to scene 1–5 or 10”.
- A 30-minute low-level delay can be obtained if the “Occupancy activity” jumper is removed (normally 5 minutes).
- Manual scenes can be created using scenes 1–5, to provide lighting for cleaning or showing films, for example.
- Detectors assigned to different groups work independently of each other.



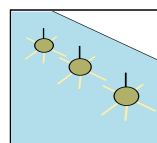
Lighting is switched to scene 10.



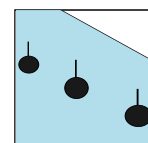
As long as presence is detected the lighting remains at scene 10. The presence delay can be set at up to 20 minutes.



The lighting remains at scene 10 until the presence delay has elapsed.



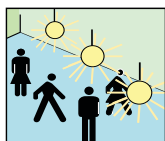
The lighting is gradually dimmed to scene 14. The detector maintains scene 14 for 5 minutes (30 minutes, see text).



The lighting is switched to scene 15. To prevent a few light fittings from being switched off completely they can be programmed for 10% lighting, for example.

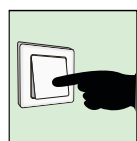
Manual control “off”

Presence scene 10



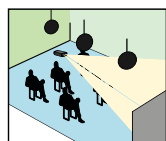
Lighting is switched on at scene 10.

Manual control off



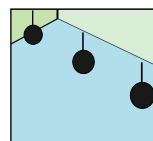
The lighting is switched off with a pushbutton that sends the DALI command “off”.

Presence off



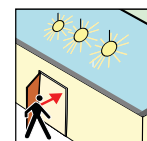
The lighting remains off as long as presence is detected in the premises.

No presence off



After the preset presence delay the detector returns to normal operation. (The delay is set using the red timer knob).

Entry scene 10



The lighting is switched back to scene 10.

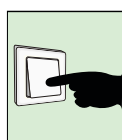
Manual control “No start”

Entry scene 15



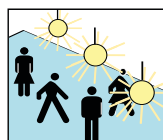
The lighting is not switched on.

Manual control scene 10



The lighting is switched on using a pushbutton that sends the DALI command “go to scene 10”.

Presence scene 10



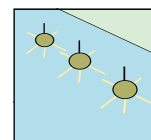
As long as presence is detected the lighting stays on at scene 10. The presence delay can be set at up to 20 min.

Exit scene 10



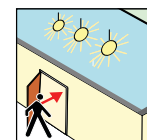
During the presence delay scene 10 is active.

Base level scene 14



The lighting is gradually dimmed to scene 14. The detector maintains scene 14 for 5 min. (30 min., see text).

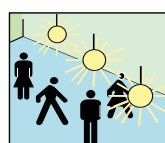
New entry scene 10



If someone enters the premises before scene 15 is activated the lighting is switched back to scene 10.

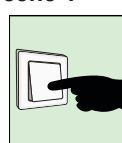
Using scenes 1 to 5 manually

Presence scene 10



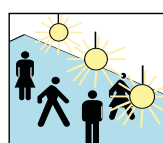
Lighting is switched on at scene 10.

Manual control scene 1



The lighting is switched on using a pushbutton that sends the DALI command “go to scene 1”.

Presence scene 1



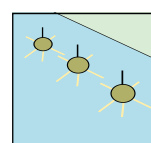
As long as presence is detected the lighting stays on at scene 1.

Exit scene 1



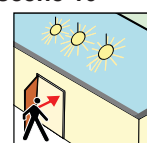
During the presence delay, scene 1 is active.

Base level scene 14



The lighting is gradually dimmed to scene 14.

New entry scene 10



If someone enters, scene 10 is activated again.

Application example "Mode Extronic"

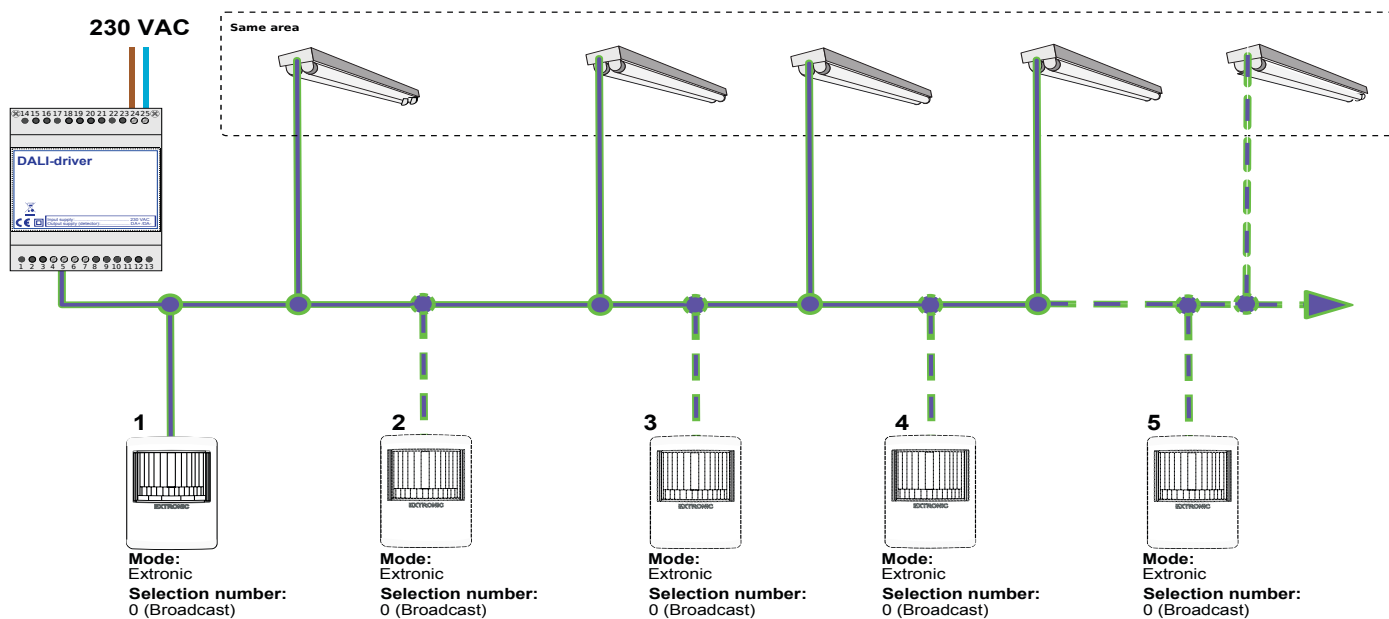
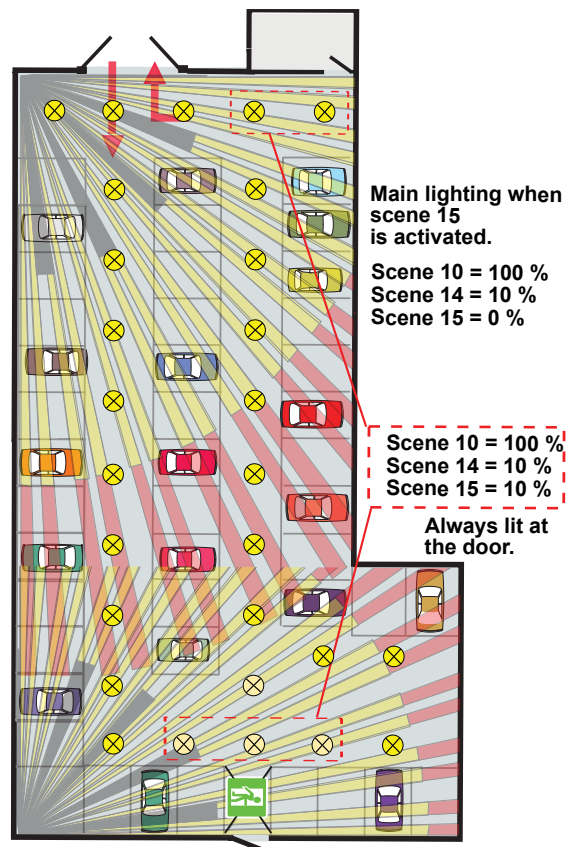
E1 – Garage with some light fittings that are never switched off

Setting

"Mode - Extronic"

The detectors jointly control the whole garage using scenes 10, 14 and 15. The light fittings near the entrances should never be switched off completely.

All light fittings must be programmed with scenes 10, 14 and 15.



E2 – Corridor where the light level can be increased using pushbutton(s)

“Mode - Extronic”

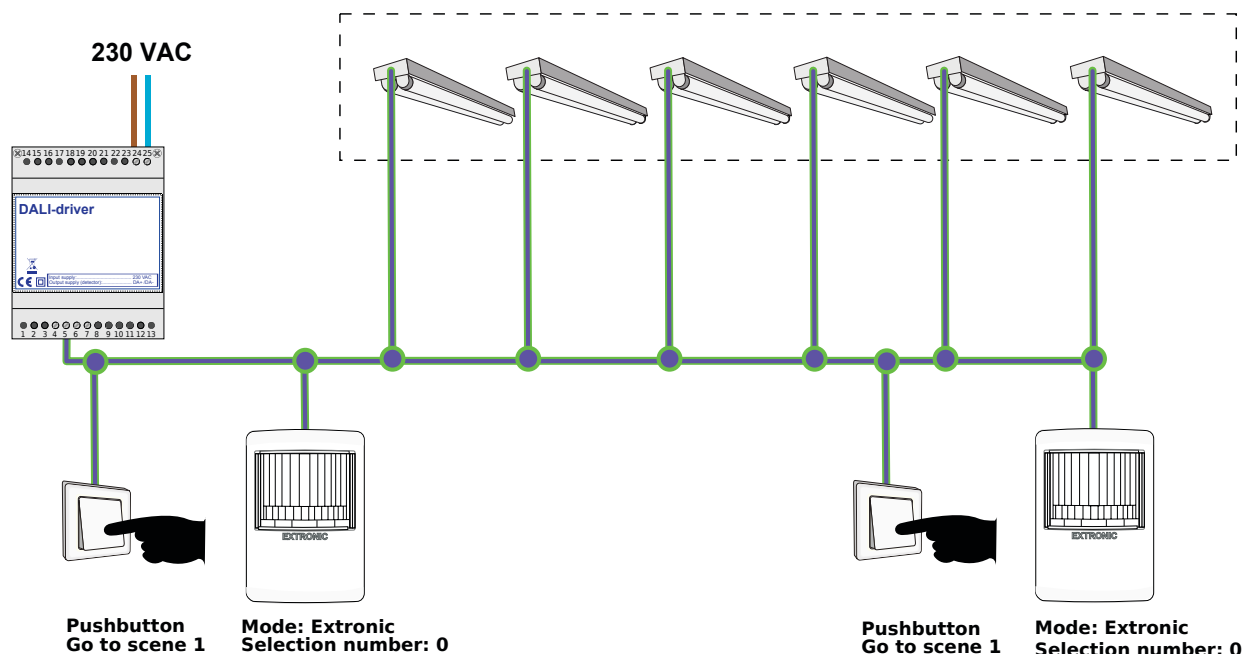
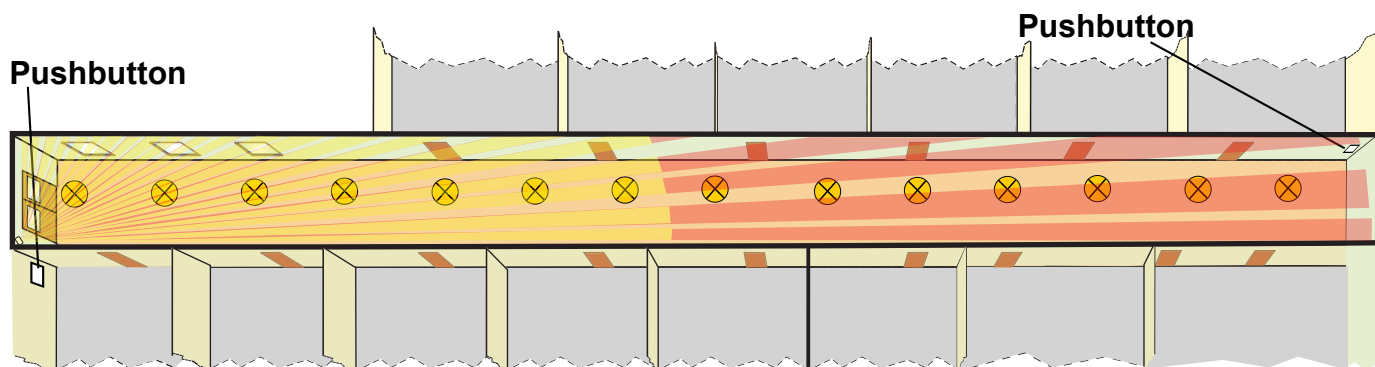
Normally the premises are controlled automatically using scenes 10, 14 and 15. The light fittings are programmed for an automatic normal light level (scene 10) of 50%. In this example it is required to increase the light level to 100%. This is done using scene 1. The lighting is switched to 100% by one or more pushbuttons that send the DALI command “go to scene 1”. The low-level delay time is increased from 5 minutes to 30 minutes by removing the “Occupancy Activity” jumper.

In this case the light fittings are programmed to:
 Scene 10 = Max. light level when presence is detected (normal level).

Scene 14 = Low level, no presence detected, 5% (base level)

Scene 15 = 0%.

Scene 1 = 100% (cleaning lighting), manual level that is switched on with pushbutton.



E3 – Classroom where lighting levels can be changed using pushbuttons

“Mode - Extronic”

Normally the premises are controlled automatically using scenes 10, 14 and 15, and there are also the following manual functions:

- **Board lighting** can be switched on manually with a pushbutton.
- **Projector mode**, ceiling lighting is reduced to 1% by pressing a pushbutton.
- **Main lighting is switched back** to normal level with one or more pushbuttons.

“Mode” jumper is set to Extronic.

The low-level delay time is increased from 5 minutes to 30 minutes (base level).

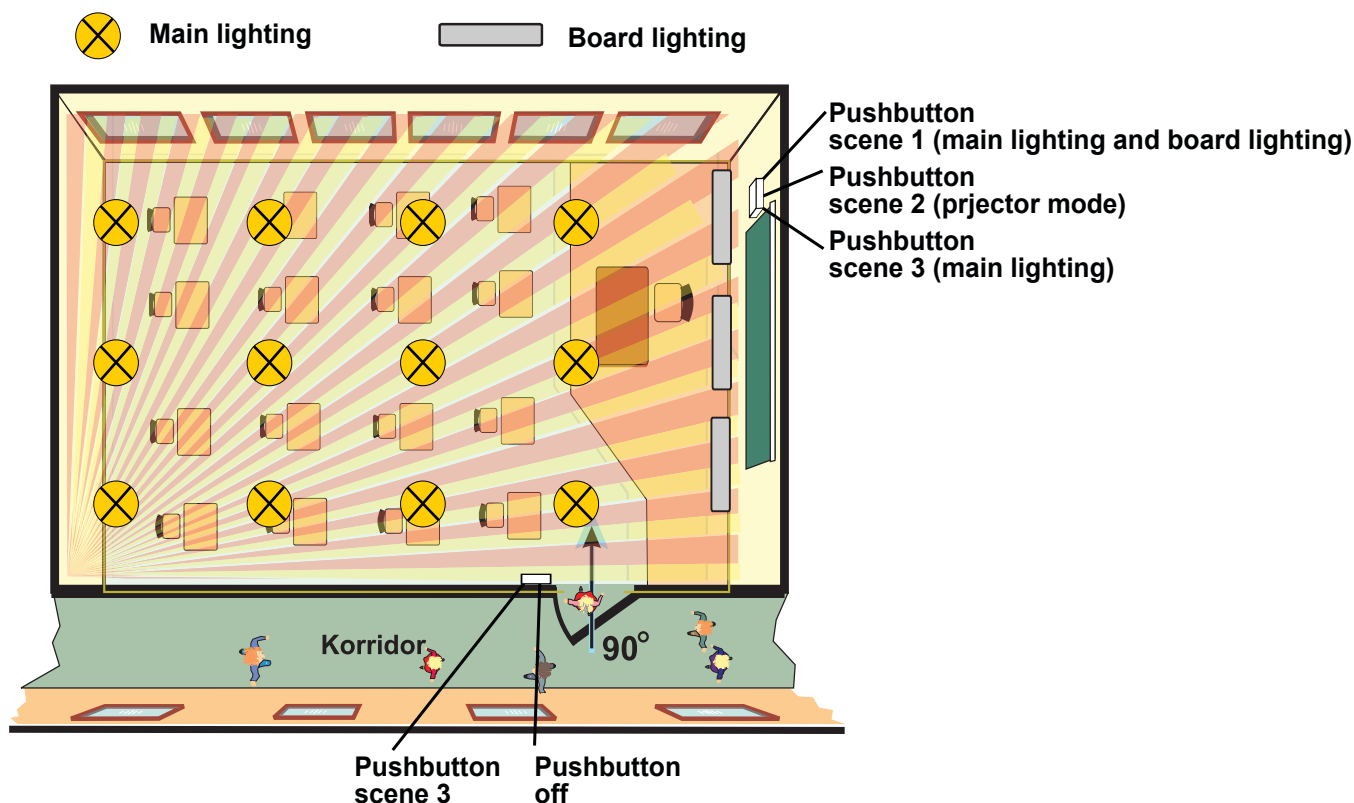
(This can be increased to 30 minutes by removing the “Occupancy Activity” jumper.)

Comments

To prevent the lighting from being switched on automatically when presence is detected, activate the “No start” function. This is done by removing the “LED indication” jumper. One or more pushbuttons will then be required to switch the lighting on, by activating scene 3.

In this example the scenes are used as follows:

- Scene 1:** Manual board lighting and main lighting.
- Scene 2:** Manual projector mode.
- Scene 3:** Main lighting is switched on manually (normal level).
- Scene 10:** Automatic level.
- Scene 14:** Low-level delay of 5 minutes at base level.
- Scene 15:** Switched off, 0% lighting when no-one is present.



The board lighting is programmed as follows:

- Scene 1:** 0% (manual board lighting and main lighting).
- Scene 2:** 0% (manual projector mode).
- Scene 3:** 100% main lighting is switched on manually.
- Scene 10:** 0% automatic level.
- Scene 14:** 0% low-level delay of 5 minutes at base level.
- Scene 15:** 0% lighting when no-one is present.

In this case the ceiling fittings are programmed as follows:

- Scene 1:** 100 % (manual board lighting and main lighting).
- Scene 2:** 1% (manual projector mode).
- Scene 3:** 100% main lighting is switched on manually.
- Scene 10:** 100% automatic level.
- Scene 14:** 10% low-level delay of 5 minutes at base level.
- Scene 15:** 0% lighting when no-one is present.

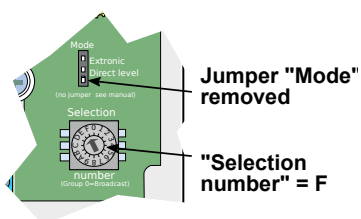
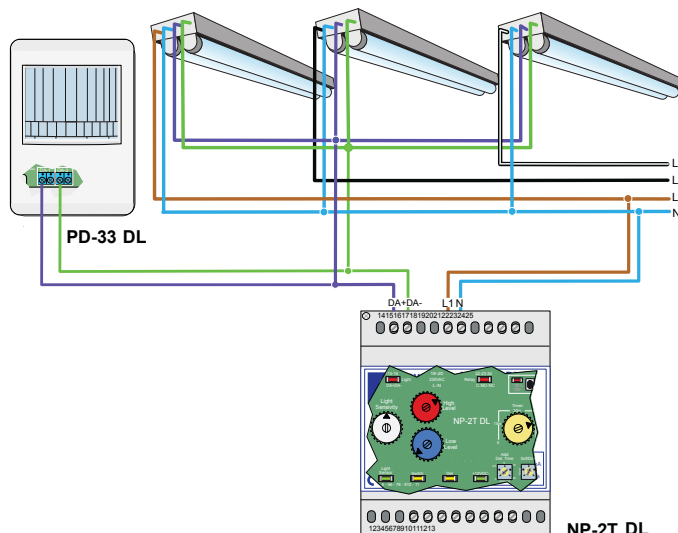
Wiring examples

With level switch NP-2T DL

Presence detector PD-33 DL with NP-2T DL in premises equipped with DALI light fittings.
The DALI bus is powered by an Extrinsic level switch, NP-2T DL.
The lighting levels when people are present and during low level are set by the level switch.

One or more PD-33 DL detectors signal presence and lack of presence to the level switch. When presence is detected, the detector LED on the level switch flashes. The detector's presence delay can be increased using an extra presence delay knob in the level switch.
The lighting can be switched on or off and dimmed manually using a pushbutton connected to the level switch NP-2T DL.

When PD-33 DL is used with NP-2T DL the mode jumper should be removed and the selector knob set to "F".



Setting up PD-33 DL

With level switch NP-3T DL and daylight control

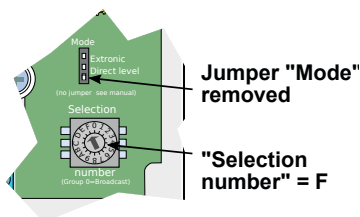
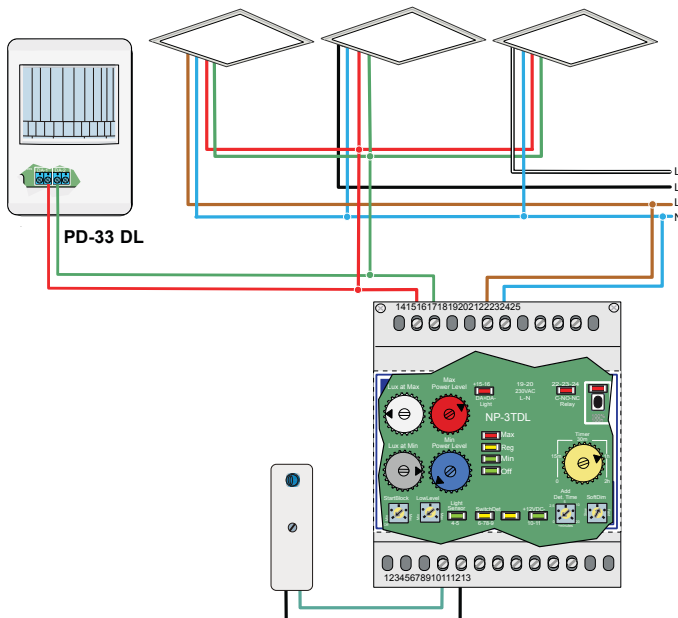
NP-3T DL adjusts the lighting output to compensate for the amount of sunlight entering the premises.
Premises with DALI light fittings.

The DALI bus is powered by an Extrinsic level switch, NP-3T DL. The lighting levels when people are present and during low level are set by the level switch.

One or more PD-33 DL detectors signal presence and lack of presence to the level switch. When presence is detected, the detector LED on the level switch flashes. The detector's presence delay can be increased using an extra presence delay knob in the level switch.

The lighting can be switched on or off and dimmed manually using a pushbutton connected to the level switch NP-3T DL.

When PD-33 DL is used with NP-3T DL the mode jumper should be removed and the selector knob set to "F".



Setting up PD-33 DL

Lens

Standard lens no. 15 covers a range of 40 metres and an angle of 90°, and is suitable for most premises. A choice of optional lenses is available. When someone walks straight across the field it generates a strong signal in the sensor element. When someone moves in line with the field (towards or away from the detector) it generates a much weaker signal. The detector should therefore normally be placed so that people pass straight across (at 90° to) the field produced by the lens. The ideal placement is almost always to install the detector in a corner.

NOTE! The detector will not work without a lens!

Choosing a lens

There are a number of different lenses for PD-33 DL that can be used for different purposes. Long-range lenses, e.g. for corridors up to 80 m long (lens 34 or 47). Lenses with many tightly packed detection fields, e.g. for classrooms (lens 51).

PD-33 DL is supplied as standard with lens number 15. This has 58 detection fields that cover three levels. It has a range of 40 m and is suitable for installation in a corner.

The detector should be mounted at a suitable height and aimed at the part of the body that radiates most energy (the torso). A suitable installation height is often 1.9–2.2 m.

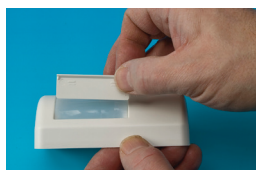
Replacing and adjusting lenses

Replacing the lens

1. Release the lens clips from inside the detector cover.



2. Remove the clips from the outside and remove the old lens.



3. Fit the new lens with the ridged side outwards. The lens number should be at the top right corner (seen from the front).



Adjusting the lens

The vertical angle is adjusted by moving the circuit board up or down. The horizontal angle is adjusted by moving the lens to the right or left.

Adjusting the vertical angle

The vertical angle of the detection field is adjusted by moving the circuit board up or down. The scale shows the angle between the upper field of the lens and an imaginary horizontal line. If the circuit board is moved upwards it lowers the detection field, and vice versa. The vertical adjustment of the circuit board is preset at -5°. The recommended installation height for best detection is 1.9–2.2 m.

Masking lens elements

Lens elements can be masked to limit the detection area. Self-adhesive aluminium foil tape, like that used to protect windows, will block 100 per cent of thermal radiation.

Accessories

Level selector

NP-2T DL

- Controls DALI light fittings using broadcast commands.
- No programming required.
- Built-in power supply for DALI bus.
- Supply voltage 230 V AC.
- Add Detector Time. Allows detector delay time to be set in addition to time set by detector.



NP-3T DL also offers:

- Comfort lighting control, which combines daylight adjustment via a light sensor, and fuzzy logic, which continuously adjusts the lighting between two levels: "Lux at Max" and "Lux at Min". See also the section on "Comfort lighting control" in the manual for NP-3T DL.

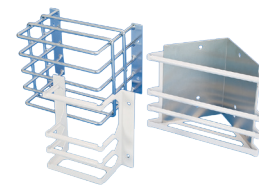


Protective grille

Used for installation in vulnerable locations, such as sports halls. There is also a model that can be used to install the detector at 45° in combination with an angle plate on a wall.

Order no. 13038, large; 13038A, corner; 13039.

See also product catalogues.



Universal mountings

BR1, BR2, BR3 can be used where normal placement (corner mounting) is not suitable or possible.

Order no. 13085, -86, -87,





Lenses

See Extronic's product catalogue or the website for information on choosing a suitable lens.

Technical specification

Vertical adjustment:	+10° to -20° calibrated scale.
Horizontal adjustment:	Up to 30°.
Detection area with standard lens 15:	Max. reach 40 m at 90°.
Voltage:	Supplied by DALI bus.
Current:	Max. 12 mA.
Start-up time:	< 2 minutes.
LED:	Red IR, can be disconnected.
Detector:	Dual-element, low-noise pyroelectric IR detector.
Enclosure:	IP42.
Dimensions (W X H X D):	70 x 102 x 50 mm.
Weight:	93 g.

 Declaration of conformity with:
 - EMC Directive 2004/108/EC
 - RoHS Directive 2011/65/EC

 When the level detector reaches the end of its useful life it must be recycled at an approved recycling facility.