2CKA001473B9577 | 01.03.2018

System Manual

Busch-Presence detector

Table of contents

1 Overview

1.1 Design lines

This system manual serves for the technical planning of the simple to complex installations of movement detectors.

The different design lines of the device groups and devices are not listed in this system manual. The sections for the design line are marked with a "xxx" at the article numbers of the respective devices.

Please obtain the desired current design versions and the corresponding complete article numbers as well as the order numbers from the respective product catalogues or the online catalogue at www.busch-jaeger-catalogue.com.

1.2 Basic principles

Information about basic functions and principles of operation of the devices are available at Chapter 4 “Information about planning and application“ on page 28.

2 Overview of Product Range

2.1 Applications

Lighting systems and also heating, air-conditioning and ventilation systems (also referred to as HVAC in the following) can be controlled intelligently, according to need, with presence detectors.

The choice of the right unit depends on the height of the ceiling, the size of the area to be monitored, the installation situation and the type of movement to be detected.

Detection situations in corridors through which people move are totally different to offices in which sometimes only a finger moves across a keyboard. If a person works exclusively at a computer, only minimal movement is to be expected. Here detection by the watchdog needs to be especially fine and precise. In gymnasiums on the other hand, where there is a lot of action, other factors are involved: Here the watchdog must accurately detect movement from a great height and at the same time be protected by a protective basket against damage. In classes and conference rooms a semi-automatic unit will suffice. Here, in case of presentations with a beamer, the lights can be switched off manually via a button or a remote control. Also operation via Bluetooth is possible.

In addition to the detection situations, the devices are different with regard to the connection technology. Aside from the classic connection in 110 to 240 V networks, device versions for DALI or KNX bus systems are available. KNX devices are dealt with in separate documentation.

2.2 Device overview

The presence detector range consists of monoblock devices. The sensor and actuator are located in a housing.

The decor frame is available separately and makes individual colour design possible.

For the requirement of controlling a lamp circuit across a large detection range, it is possible to extend the detection range by means of slave presence detectors. The slave presence detectors, in dependence of the devices, transmit the information of detection and brightness to the master presence detector, who then triggers the appropriate switching process or function.

In addition to the classic setting possibilities using a trimmer, the devices offer additional control possibilities. Depending on the variant used, control can be implemented by infrared remote control or by app through Bluetooth.

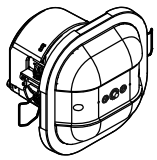
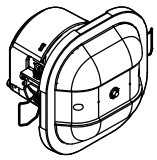
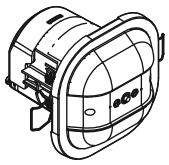
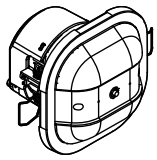
For devices with a Bluetooth interface, extended functions can be implemented by the app. These functions, for example, include a presence simulation, an ambient lighting function or an anti-glare function. Aside from extensive setting and configuration parameters, the electrician is supported by an error compensation (a PRS that can be switched off and set according to its sensitivity), a visual test mode and the panel light and heating, air conditioning and ventilation function. In addition, the semi-automatic mode can be extended with a comfort function.

The following lens forms are available for the devices:

	**Compact:** For smaller offices, WC facilities, etc.
	**Universal:** For all popular applications (exception: applications of large heights).
	**Corridor:** For applications in corridors and hallways.

Table 1: Lens forms

The following versions of devices are available:

	e-contact	Applications for private use, smaller offices, WC facilities, etc.
	Relay	For all popular applications.
	Slave	For all popular applications to extend the transmission range.
	DALI	For all popular applications with DALI bus system
	DALI Slave	For all popular applications with DALI bus system to extend the transmission range

The device versions in combination with the lenses result in the following terminal devices:

Function Lens	E-contact	Relay	Slave	DALI	DALI slave
With infrared remote control (slave devices have no operating function)					
Compact	6817/62-xxx-500	6819/60-xxx-500	6819/68-xxx-500	—	—
Universal	6817/32-xxx-500	6819/30-xxx-500	6819/38-xxx-500	—	6819/39-xxx-500
Corridor	—	6819/50-xxx-500	6819/58-xxx-500	—	6819/59-xxx-500
With Bluetooth function					
Universal, BT	6817/33-xxx-500	6819/31-xxx-500	—	6819/35-xxx-500	—
Universal, BT with sealing ring	6817/93-xxx-500	—	—	—	—
Corridor, BT	—	6819/51-xxx-500	—	6819/55-xxx-500	—

Table 2: Terminal devices

Decor frame (colour kits) for the devices

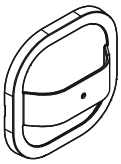
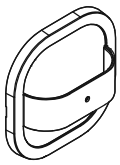
	Decor frame Universal 6889/30-xxx-500
	Decor frame Corridor 6889/50-xxx-500

Table 3: Peripheral devices

2.2.1 Mounting possibilities

Ceiling mounting is implemented in a 68 mm borehole using clamp or screw fixation. The following mounting situations are possible:

- Suspended ceilings
- Suspended grid ceilings
- In-situ concrete
- Concrete slabs

The devices are not suitable for:

- Flush-mounted boxes
- Surface mounting

Suspended ceilings/suspended grid ceilings

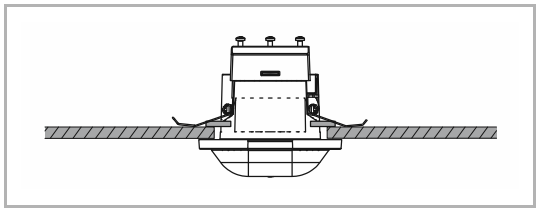


Fig. 1: Mounting situation: suspended ceiling

Mounting is possible at a ceiling thickness of 9 to 25 mm. Detailed information on mounting can be found in the respective operating instructions of the device.

In-situ concrete/concrete slabs

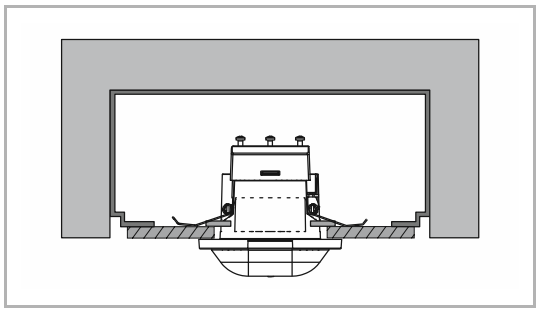


Fig. 2: Mounting situation: concrete slab

A special installation box is required for mounting into a concrete ceiling.

- For concrete slabs, e.g., a "Kaiser HaloX-P 1291-22".
- For in-situ concrete, e.g., a "Kaiser HaloX®-O 1290-40" with cover 1281-01 or 1281-61.

2.3 Setting options / control

Depending on the device, the following methods for setting or configuration are available. Slave devices are not set. The master devices are used for control.

Trimmer

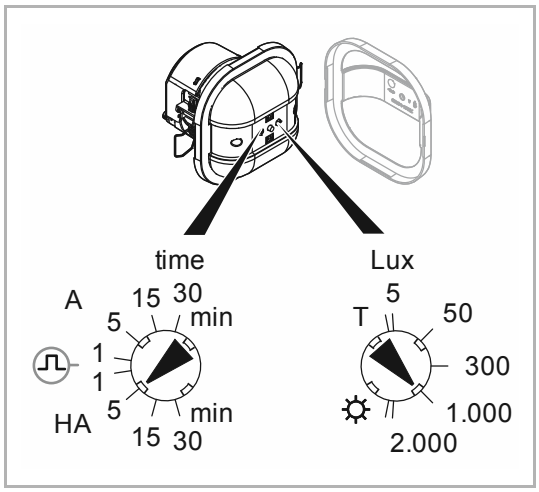


Fig. 3: Setting via trimmers

The trimmers for setting devices are located below the device cover.

Remote control

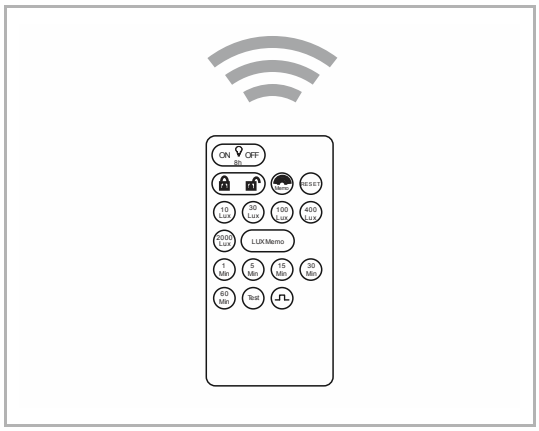


Fig. 4: Setting via remote control

Remote control with 6843 IR service remote control.

The operating manual for the IR service remote control can be found under:

– http://www.busch-jaeger-katalog.de/2CKA006800A2511,artikel.html

App

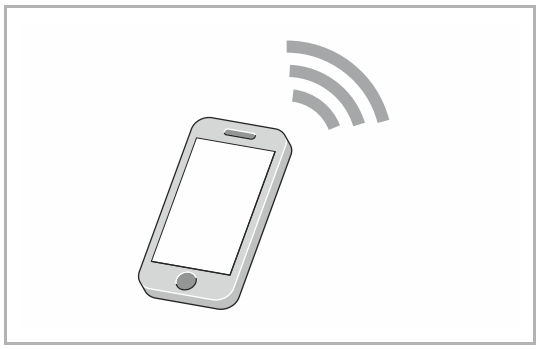


Fig. 5: Setting by app

Remote control via the smartphone app "ABB Watchdog Remote control".

The smartphone app can be found under:

– https://www.busch-jaeger.de/service-tools/apps/busch-waechter-remote-control-app/

Overview of setting methods

	Bus system	Control		Trimmer	Infrared remote control	App via Bluetooth
6817/62-xxx-500 Compact, e-contact				X	X	—
6817/32-xxx-500 Universal, e-contact				X	X	—
6819/60-xxx-500 Compact, Relais				X	X	—
6819/30-xxx-500 Universal, Relais				X	X	—
6819/50-xxx-500 Corridor, Relais				X	X	—
6817/33-xxx-500 Universal BT, e-contact				X	—	X
6817/93-xxx-500 Universal BT, e-contact with sealing ring				X	—	X
6819/31-xxx-500 Universal BT, Relais				X	—	X
6819/51-xxx-500 Corridor BT, Relais				X	—	X
6819/38-xxx-500 Universal, Slave		Slave		—	—	—
6819/68-xxx-500 Compact, Slave				—	—	—
6819/58-xxx-500 Corridor, Slave				—	—	—
6819/35-xxx-500 Universal BT, DALI	DALI			X	—	X
6819/55-xxx-500 Corridor BT, DALI				X	—	X
6819/39-xxx-500 Universal, DALI Slave		Slave		—	—	—
6819/59-xxx-500 Corridor, DALI Slave				—	—	—

Table 4: Overview of setting methods

3 Device Functions

3.1 Overview of functions

	Bus system	Control		Automatic/semi-automatic	Comfort automatic	Soft phase-in/soft phase-out	Daylight-dependent control (constant light control)	Switch-off function of the DALI operating devices [1]	Basic illumination	Night light / anti-glare function	Dynamic switch-off delay	Short-time pulse for e.g. automatic staircase lighting	Test mode
6817/62-xxx-500 Compact, e-contact				X	—	—	—	—	—	—	—	X	X
6817/32-xxx-500 Universal, e-contact				X	—	—	—	—	—	—	—	X	X
6819/60-xxx-500 Compact, Relais				X	—	—	—	—	—	—	—	X	X
6819/30-xxx-500 Universal, Relais				X	—	—	—	—	—	—	—	X	X
6819/50-xxx-500 Corridor, Relais				X	—	—	—	—	—	—	—	X	X
6817/33-xxx-500 Universal BT, e-contact				X	X	X	—	—	—	—	X	X	X
6817/93-xxx-500 Universal BT, e-contact with sealing ring				X	X	X	—	—	—	—	X	X	X
6819/31-xxx-500 Universal BT, Relais				X	X	—	—	—	—	—	X	X	X
6819/51-xxx-500 Corridor BT, Relais				X	X	—	—	—	—	—	X	X	X
6819/38-xxx-500 Universal, Slave				—	—	—	—	—	—	—	—	—	—
6819/68-xxx-500 Compact, Slave				—	—	—	—	—	—	—	—	—	—
6819/58-xxx-500 Corridor, Slave				—	—	—	—	—	—	—	—	—	—
6819/35-xxx-500 Universal BT, DALI				X	X	X	X	X	X	X	X	—	X
6819/55-xxx-500 Corridor BT, DALI				X	X	X	X	X	X	X	X	—	X
6819/39-xxx-500 Universal, DALI Slave				—	—	—	—	—	—	—	—	—	—
6819/59-xxx-500 Corridor, DALI Slave				—	—	—	—	—	—	—	—	—	—

[1] Switch-off function of the DALI operating devices via relay output (POWER-ON level can be set)

	Bus system	Control		PIR sensitivity individual settable/deactivateable	Update function	Energy monitor (Operating time)	Trimmer setting blockage [2]	Presence simulation	Status of LED functions	App control	Extension unit operation
6817/62-xxx-500 Compact, e-contact				—	—	—	—	—	X	—	X
6817/32-xxx-500 Universal, e-contact				—	—	—	—	—	X	—	X
6819/60-xxx-500 Compact, Relais				—	—	—	—	—	X	—	X
6819/30-xxx-500 Universal, Relais				—	—	—	—	—	X	—	X
6819/50-xxx-500 Corridor, Relais				—	—	—	—	—	X	—	X
6817/33-xxx-500 Universal BT, e-contact				X	X	X	X	X	X	X	X
6817/93-xxx-500 Universal BT, e-contact with sealing ring				X	X	X	X	X	X	X	X
6819/31-xxx-500 Universal BT, Relais				X	X	X	X	X	X	X	X
6819/51-xxx-500 Corridor BT, Relais				X	X	X	X	X	X	X	X
6819/38-xxx-500 Universal, Slave		Slave		—	—	—	—	—	—	—	—
6819/68-xxx-500 Compact, Slave				—	—	—	—	—	—	—	—
6819/58-xxx-500 Corridor, Slave				—	—	—	—	—	—	—	—
6819/35-xxx-500 Universal BT, DALI	DALI			X	X	X	X	X	X	X	X
6819/55-xxx-500 Corridor BT, DALI				X	X	X	X	X	X	X	X
6819/39-xxx-500 Universal, DALI Slave		Slave		—	—	—	—	—	—	—	—
6819/59-xxx-500 Corridor, DALI Slave				—	—	—	—	—	—	—	—

2) Generally applicable: the last operation by app, IR remote control or trimmer is valid.

	Bus system	Control		4 hours Continuous ON/OFF [3]	2-stage automatic switch-off	Switch-off warning	Separate switching output	Panel light
6817/62-xxx-500 Compact, e-contact				X	—	—	—	—
6817/32-xxx-500 Universal, e-contact				X	—	—	—	—
6819/60-xxx-500 Compact, Relais				X	—	—	—	—
6819/30-xxx-500 Universal, Relais				X	—	—	—	—
6819/50-xxx-500 Corridor, Relais				X	—	—	—	—
6817/33-xxx-500 Universal BT, e-contact				X	—	X	—	—
6817/93-xxx-500 Universal BT, e-contact with sealing ring				X	—	X	—	—
6819/31-xxx-500 Universal BT, Relais				X	—	X	—	—
6819/51-xxx-500 Corridor BT, Relais				X	—	X	—	—
6819/38-xxx-500 Universal, Slave				—	—	—	—	—
6819/68-xxx-500 Compact, Slave		Slave		—	—	—	—	—
6819/58-xxx-500 Corridor, Slave				—	—	—	—	—
6819/35-xxx-500 Universal BT, DALI	DALI			X	X	X	X	X
6819/55-xxx-500 Corridor BT, DALI				X	X	X	X	X
6819/39-xxx-500 Universal, DALI Slave				—	—	—	—	—
6819/59-xxx-500 Corridor, DALI Slave		Slave		—	—	—	—	—

Table 5: Overview of device functions

[3] Extension unit input required. Switch-on/switch-off duration settable by app. With DALI devices not possible in combination with the panel light function.

3.2 Functions

Automatic/semi-automatic

- Automatic operation mode (A)
  - The light switches on fully automatically due to detected movements in the surveillance area. The brightness threshold must be below the set value.
  - The light is switched off after leaving the room plus a set switch-off delay or when the set brightness threshold is exceeded.
- Semi-automatic operation mode (HA)
  - An extension unit operation is necessary to switch the light on, e.g. via a push-button. The behaviour is then the same as fully automatic.
  - The light is switched off after leaving the room plus a set switch-off delay or when the set brightness threshold is exceeded.
- Short-time pulse operation mode (⎍)
  - In this operating mode short-time pulses are sent for the duration of detection (1 second ON/9 seconds OFF). The short-time pulse serves for activating staircase light switches or door bells, for example. The subsequent behaviour depends on the activated device. In the case of DALI devices, the short-time pulse cannot be activated.

Comfort automatic

- An extension unit operation is necessary to switch the light on when entering a room, e.g. via a push-button. The behaviour is then the same as fully automatic.
- If the brightness drops below the brightness-value threshold when there is presence in a room, the light is switched on automatically. In semi-automatic mode an extension unit operation would in this case be necessary, e.g. via a push-button.
- The light is switched off after a person leaves the room plus a set switch-off delay or when the set brightness threshold is exceeded.

Soft phase-in/soft phase-out

- A switch-on and switch-off of lights via a dimming function. The times for the dimming function cycle can be set by the app depending on the device.

Daylight-dependent control (constant light control)

- The brightness of the light in a room is optimised to the respective use. The normal brightness fluctuations, e.g. due to the sunlight entering the room depending on the time of day, are compensated as far as this is possible via the lighting and the spatial conditions. The set value for room brightness can be set using a potentiometer on the device or by app.

Basic lighting (only available for DALI devices)

– The basic illumination can be used time-controlled or brightness-controlled. The basic lighting, for example, is used as reducing lighting in corridors or stairwells.
  – The basic lighting is timed to run from 8:00 pm to 11:30 pm. If movement is detected in this time, the device switches from the preset basic lighting value to normal light.
  – Alternatively an ambient light value can be preset; when this value is undershot, the basic lighting will be activated automatically.

Night light/anti-glare function (only available for DALI devices)

– When movement is detected, the behaviour of the load output can be adjusted individually. A time window is defined via the app during which the switch-on brightness is reduced. This switch-on brightness can be adjusted between the basic and maximum brightness. The function is, for example, useful when getting up during the night so that one is not dazzled by the sudden brightness of the light that switches on automatically.

Dynamic switch-off delay

– The dynamic switch-off delay is activated by app (the switch-off delay must be longer than 10 minutes; otherwise the function is not active). The function is mainly intended for corridors. In case of little movement, not the full switch-off delay of 15 minutes is activated, for example, but only 3 minutes. This makes sense if the corridor is crossed only briefly on the way from one office to the next and the light should not remain switched on for the entire switch-off delay. The movement may be detected for a maximum of 30 seconds.

Short-time pulse

– The output of the device (with the exception of DALI devices) can be configured as electronic current surge switch to activate a staircase light automaton. Here, during the "On" phase, the output is switched on only periodically for 1 second with 100% brightness and then switched off for 9 seconds. A switch-off delay cannot be set. The short-time pulse is sent as long as movement is detected (always 1 second, then a pause for 9 seconds, etc.).

Test mode

– Execution of an activation test. The device switches on at a detected movement for about 2 seconds, independently of brightness. After that, the device is read for the next movement detection. The red LED flashes during this time.

PIR – set the individual sensor sensitivity

– Each individual of the 4 passive infrared sensors in total can be switched off for reception limitation and/or their sensitivity can be limited.

Update function

– For devices with Bluetooth function, the firmware can be updated by app.

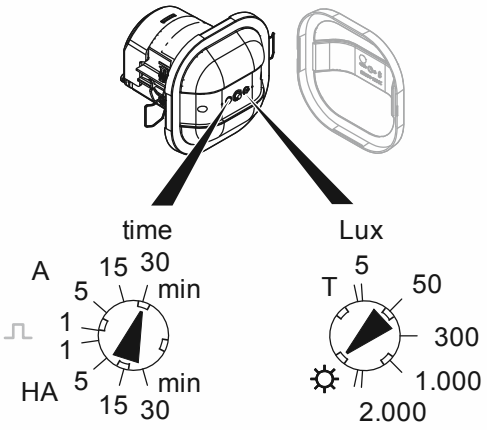
Energy Monitor (operating time)

– The operating times of the device can be read in the app and displayed in the "Energy Monitor" section of the app. The last 5 years maximum are available for readout. The energy saving potential can be shown in the country currency. The average weekly illumination duration of the connected lamps is used as a reference for the energy saving potential.

Trimmer setting blockage

– The setting of the device can be blocked by the trimmer through the app. Three setting variants are possible:
  - Trimmer blocked:
    The values can be set only using the app.
  - Limited access:
    Activation takes place via the app. After that, the password can no longer by bypassed by the disconnection of the presence detector. Reactivation is possible only through the following trimmer setting:
    – In the first 2 minutes after activation, set the trimmer for the brightness-value threshold to "Sun" and the trimmer for the operation mode to "Automatic with 30-minute switch-off delay".

      Within these first 2 minutes, the app can access the presence detector without a password.



  - Trimmer active:
    The settings can be made through the trimmer and app. In general, the last setting (trimmer or app) is always used.

– Password forgotten/reset password:
  – If the device password is no longer known, it can be reset using the "Reset to factory setting" app function. No device password is set in the factory setting.

    ATTENTION!
    All individual device settings and saved "Energy Monitor" data are also lost.

Presence simulation

– The user can activate a "Presence Simulation" in the app. The presence simulation runs when the user is on holiday, for example. During this time, the light goes on and off as if someone were home.
  – There are 3 time ranges:
    - In the evening (starting time up to 11:00 pm)
    - At night (11:00 pm to 6:00 am)
    - In the morning (6:00 am to the set ending time)
  – During the three time ranges the lights switch according to normal presence. In the evening the lights switch off three times at random. During the night the lights switch on three times at random. In the morning the lights switch on brightness dependent.

Status of LED functions

– The operating statuses, Bluetooth connection status and detection status can be read in test mode through the LEDs, see chapter 3.5 “Status indication“ on page 26.

App control

– Using the smartphone app "ABB Watchdog Remote control," device settings can be made and device functions executed.

Separate switching output (only available for DALI devices)

– An additional relay output. This can be linked as normal with the DALI switching state, i.e. with the presence detection function or independent from it directly via the app. Additional applications are, for example, panel light, heating/air conditioning/ventilation (HVAC) functions or direct switching. By means of the app, a selected function can be assigned to this additional switching output. It is possible, for example, to disconnect the DALI operating devices completely to safe additional energy costs (standby consumption).

  - "Deactivate":
    Deactivates the additional switching output (actuator 2).
  - "Disconnect DALI operating devices":
    With this function, it is possible to disconnect the DALI operating devices completely to save additional energy costs (standby consumption).
  - "Synchronised operation":
    With the "Synchronised operation" function, the additional switching contact (actuator 2) is synchronised with the switching status of actuator 1 (e.g., DALI output). This means: OFF if actuator 1 is switched off and ON if actuator 1 is switched on and/or has reached any dimming value.
  - "Panel light":
    Additional lighting can be switched on and off separately, e.g., for the illumination of a panel for classrooms. The additional illumination also switches off automatically together with the ceiling lights.
    – The additional lighting is operated using a separate push-button connected through the 6494-500 Extension unit connection.
    – The additional switching output must be configured as a panel light through the app.
  - "Manual":
    The additional switch contact (actuator 2) is switched only manually through the app. There is no dependency to actuator 1 (e.g., DALI output).
  - "HVAC":
    The "HVAC" operation mode (heating, air conditioning and ventilation) enables a purely presence-dependent switching of the additional switch contact (actuator 2). Ambient brightness is not taken into consideration here.
    This function, for example, is used to control a fan motor in WC facilities.

Extension unit operation

- An additional operation for switching on/off using a push-button on the extension input 1C of the presence detector.
  - A manual change of the current switching state can be implemented. The return to automatic mode and/or previously selected operation mode takes place after the room is left plus the set switch-off delay.
  - The lighting is also switched on in semi-automatic mode through the operation of this extension.

Continuous ON

- The lighting is switched on. For devices with infrared remote control, the duration amounts to 8 hours. For devices with Bluetooth function, the duration is freely selectable through the smartphone app "ABB Watchdog Remote control".
  - For the activation of this function, a push-button is connected to channel 1 of the 6494-500 Extension unit connection. In the case of the DALI master, the "Continuous Light" function must be activated by extension push-button.
  - The return to automatic mode and/or previously selected operation mode is implemented through one of the following possibilities:
    - Push-button/extension operation (directly connected to the extension input 1C of the presence detector).
    - Simultaneous actuation of the push-buttons for "Continuous ON" and "Continuous OFF".
    - By app.
    - Automatic after the expiration of the "Continuous ON" time.
  - This function cannot be combined with the panel light.

Continuous OFF

- The lighting is continuously switched off. For devices with infrared remote control, the duration amounts to 8 hours. For devices with Bluetooth function, the duration if freely selectable through the smartphone app "ABB Watchdog Remote control".
  - The continuous light is operated using a separate switch connected through the 6494-500 Extension unit connection.
  - For the activation of this function, a push-button is connected to channel 2 of the 6494-500 Extension unit connection. In the case of the DALI master, the "Continuous Light" function must be activated by extension push-button.
  - The return to automatic mode and/or previously selected operation mode is implemented through one of the following possibilities:
    - Push-button/extension operation (directly connected to the extension input 1C of the presence detector).
    - Simultaneous actuation of the push-buttons for "Continuous ON" and "Continuous OFF".
    - By app.
    - Automatic after the expiration of the "Continuous OFF" time.
  - This function cannot be combined with the panel light.

2-stage automatic switch-off according to EnEV (Germany Energy Saving Act, EN 15232, Chapter 5.1.2)

– The lighting does not switch off completely at first go. If no movement is detected the brightness reduces itself to 20% after the switch-off delay expires. If no further movement is detected the lighting switches off completely after a further 5 minutes.
– The brightness value of the intermediate stage (20% according to EnEV) and the time duration until switch-off can be set via the app.

Switch-off warning according to DIN 18015

– The light flashes 30 seconds before deactivation.
  – For times under 60 seconds: 15 seconds before switch-off
  – For times under 30 seconds: 5 seconds before switch-off
– This function is required for stairwells in multifamily houses. The end of the illumination time is indicated in a timely manner to extend the illumination duration through movement detection or extension operation.

3.3 Detection range

Moving: maximum detection range length x width

- Top: lengthways to the detector
- Bottom: crosswise towards the detector

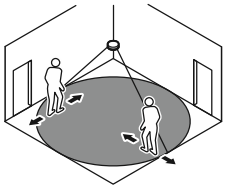
	Bus system	Control		Mounting height 2.5 m	Mounting height 3.0 m	Mounting height 4 m
6817/62-xxx-500 Compact, e-contact				Ø max. 4.5 m Ø max. 6.5 m	Ø max. 6 m Ø max. 8 m	Ø max. 7 m Ø max. 10.5 m
6817/32-xxx-500 Universal, e-contact				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/60-xxx-500 Compact, Relais				Ø max. 4.5 m Ø max. 6.5 m	Ø max. 6 m Ø max. 8 m	Ø max. 7 m Ø max. 10.5 m
6819/30-xxx-500 Universal, Relais				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/50-xxx-500 Corridor, Relais				Max. 14 m x 2.5 m Max. 24 m x 2.5 m	Max. 14 m x 3 m Max. 24 m x 3 m	Max. 14 m x 3 m Max. 24 m x 3 m
6817/33-xxx-500 Universal BT, e-contact				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6817/93-xxx-500 Universal BT, e-contact with sealing ring				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/31-xxx-500 Universal BT, Relais				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/51-xxx-500 Corridor BT, Relais				Max. 18 m x 2.5 m Max. 24 m x 2.5 m	Max. 20 m x 3 m Max. 30 m x 3 m	Max. 20 m x 3 m Max. 30 m x 3 m
6819/38-xxx-500 Universal, Slave				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/68-xxx-500 Compact, Slave		Slave		Ø max. 4.5 m Ø max. 6.5 m	Ø max. 6 m Ø max. 8 m	Ø max. 7 m Ø max. 10.5 m
6819/58-xxx-500 Corridor, Slave				Max. 14 m x 2.5 m Max. 24 m x 2.5 m	Max. 14 m x 3 m Max. 24 m x 3 m	Max. 14 m x 3 m Max. 24 m x 3 m
6819/35-xxx-500 Universal BT, DALI				Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/55-xxx-500 Corridor BT, DALI				Max. 18 m x 2.5 m Max. 24 m x 2.5 m	Max. 20 m x 3 m Max. 30 m x 3 m	Max. 20 m x 3 m Max. 30 m x 3 m
6819/39-xxx-500 Universal, DALI Slave	DALI			Ø max. 7 m Ø max. 10 m	Ø max. 8 m Ø max. 12 m	Ø max. 10 m Ø max. 16 m
6819/59-xxx-500 Corridor, DALI Slave		Slave		Max. 14 m x 2.5 m Max. 24 m x 2.5 m	Max. 14 m x 3 m Max. 24 m x 3 m	Max. 14 m x 3 m Max. 24 m x 3 m

Table 6: Overview of the detection ranges moving

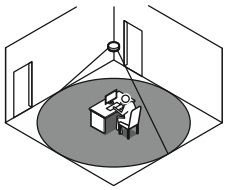
Seated: maximum detection range diameter					
	**Bus system**	**Control**		**Mounting height 2.5 m**	**Mounting height 3.0 m**
6817/62-xxx-500 Compact, e-contact				Ø max. 5 m	Ø max. 6.5 m
6817/32-xxx-500 Universal, e-contact				Ø max. 8 m	Ø max. 10 m
6819/60-xxx-500 Compact, Relais				Ø max. 5 m	Ø max. 6.5 m
6819/30-xxx-500 Universal, Relais				Ø max. 8 m	Ø max. 10 m
6819/50-xxx-500 Corridor, Relais				— (1	— (1
6817/33-xxx-500 Universal BT, e-contact				Ø max. 8 m	Ø max. 10 m
6817/93-xxx-500 Universal BT, e-contact with sealing ring				Ø max. 8 m	Ø max. 10 m
6819/31-xxx-500 Universal BT, Relais				Ø max. 8 m	Ø max. 10 m
6819/51-xxx-500 Corridor BT, Relais				— (1	— (1
6819/38-xxx-500 Universal, Slave				Ø max. 8 m	Ø max. 10 m
6819/68-xxx-500 Compact, Slave				Ø max. 5 m	Ø max. 6.5 m
6819/58-xxx-500 Corridor, Slave				— (1	— (1
6819/35-xxx-500 Universal BT, DALI				Ø max. 8 m	Ø max. 10 m
6819/55-xxx-500 Corridor BT, DALI				— (1	— (1
6819/39-xxx-500 Universal, DALI Slave				Ø max. 8 m	Ø max. 10 m
6819/59-xxx-500 Corridor, DALI Slave				— (1	— (1

Table 7: Overview of the detection ranges seated

1) Not recommended for seated applications.

3.4 Switching capacity

	Bus system	Control		Operation on miniature circuit breakers	Incandescent lamps (Switching capacity)	Incandescent lamps (Load at 110 V)	Incandescent lamps (Load at 127 V)	Incandescent lamps (Load at 220 V)	Incandescent lamps (Load at 230 V)
6817/62-xxx-500 Compact, e-contact				16 A	5 mA … 0.87 A	1 … 100 W	2 … 110 W	3 … 190 W	3 … 200 W
6817/32-xxx-500 Universal, e-contact				16 A	5 mA … 0.87 A	1 … 100 W	2 … 110 W	3 … 190 W	3 … 200 W
6819/60-xxx-500 Compact, Relais (1				16 A	10 A	1100 W	1270 W	2200 W	2300 W
6819/30-xxx-500 Universal, Relais (1				16 A	10 A	1100 W	1270 W	2200 W	2300 W
6819/50-xxx-500 Corridor, Relais (1				16 A	10 A	1100 W	1270 W	2200 W	2300 W
6817/33-xxx-500 Universal BT, e-contact				16 A	5 mA … 0.87 A	1 … 100 W	2 … 110 W	3 … 190 W	3 … 200 W
6817/93-xxx-500 Universal BT, e-contact with sealing ring				16 A	5 mA … 0.87 A	1 … 100 W	2 … 110 W	3 … 190 W	3 … 200 W
6819/31-xxx-500 Universal BT, Relais (1				16 A	10 A	1100 W	1270 W	2200 W	2300 W
6819/51-xxx-500 Corridor BT, Relais (1				16 A	10 A	1100 W	1270 W	2200 W	2300 W
6819/38-xxx-500 Universal, Slave		Slave		—	—	—	—		—
6819/68-xxx-500 Compact, Slave				—	—	—	—		—
6819/58-xxx-500 Corridor, Slave				—	—	—	—		—
6819/35-xxx-500 Universal BT, DALI	DALI			16 A	6 A	660 W	760 W	1320 W	1380 W
6819/55-xxx-500 Corridor BT, DALI				16 A	6 A	660 W	760 W	1320 W	1380 W
6819/39-xxx-500 Universal, DALI Slave		Slave		—	—	—	—		—
6819/59-xxx-500 Corridor, DALI Slave				—	—	—	—		—

– Additional columns on the next page ⟶

	Bus system	Control		LEDi (Switching capacity)	LEDi (Load at 110 V)	LEDi (Load at 127 V)	LEDi (Load at 220 V)	LEDi (Load at 230 V)
6817/62-xxx-500 Compact, e-contact				5 mA … 0.87 A	1 … 100 VA	2 … 110 VA	3 … 190 VA	3 … 200 VA
6817/32-xxx-500 Universal, e-contact				5 mA … 0.87 A	1 … 100 VA	2 … 110 VA	3 … 190 VA	3 … 200 VA
6819/60-xxx-500 Compact, Relais				0.87 A	96 VA	110 VA	190 VA	200 VA
6819/30-xxx-500 Universal, Relais				0.87 A	96 VA	110 VA	190 VA	200 VA
6819/50-xxx-500 Corridor, Relais				0.87 A	96 VA	110 VA	190 VA	200 VA
6817/33-xxx-500 Universal BT, e-contact				5 mA … 0.87 A	1 … 100 VA	2 … 110 VA	3 … 190 VA	3 … 200 VA
6817/93-xxx-500 Universal BT, e-contact with sealing ring				5 mA … 0.87 A	1 … 100 VA	2 … 110 VA	3 … 190 VA	3 … 200 VA
6819/31-xxx-500 Universal BT, Relais				0.87 A	96 VA	110 VA	190 VA	200 VA
6819/51-xxx-500 Corridor BT, Relais				0.87 A	96 VA	110 VA	190 VA	200 VA
6819/38-xxx-500 Universal, Slave				—	—	—		—
6819/68-xxx-500 Compact, Slave				—	—	—		—
6819/58-xxx-500 Corridor, Slave		Slave		—	—	—		—
6819/35-xxx-500 Universal BT, DALI	DALI			0.87 A	96 VA	110 VA	190 VA	200 VA
6819/55-xxx-500 Corridor BT, DALI				0.87 A	96 VA	110 VA	190 VA	200 VA
6819/39-xxx-500 Universal, DALI Slave		Slave		—	—	—		—
6819/59-xxx-500 Corridor, DALI Slave				—	—	—		—

– Additional columns on the next page ⟶

	Bus system	Control		Fluorescent lamps/electronic ballast units (Switching capacity)	Fluorescent lamps/electronic ballast units (Load at 110 V)	Fluorescent lamps/electronic ballast units (Load at 127 V)	Fluorescent lamps/electronic ballast units (Load at 220 V)	Fluorescent lamps/electronic ballast units (Load at 230 V)	DALI output, dimmable
6817/62-xxx-500 Compact, e-contact				—	—	—	—	—	—
6817/32-xxx-500 Universal, e-contact				—	—	—	—	—	—
6819/60-xxx-500 Compact, Relais				10 AX	1100 VA	1270 VA	2200 VA	2300 VA	—
6819/30-xxx-500 Universal, Relais				10 AX	1100 VA	1270 VA	2200 VA	2300 VA	—
6819/50-xxx-500 Corridor, Relais				10 AX	1100 VA	1270 VA	2200 VA	2300 VA	—
6817/33-xxx-500 Universal BT, e-contact				—	—	—	—	—	—
6817/93-xxx-500 Universal BT, e-contact with sealing ring				—	—	—	—	—	—
6819/31-xxx-500 Universal BT, Relais				10 AX	1100 VA	1270 VA	2200 VA	2300 VA	—
6819/51-xxx-500 Corridor BT, Relais				10 AX	1100 VA	1270 VA	2200 VA	2300 VA	—
6819/38-xxx-500 Universal, Slave				—	—	—		—	—
6819/68-xxx-500 Compact, Slave				—	—	—		—	—
6819/58-xxx-500 Corridor, Slave		Slave		—	—	—		—	—
6819/35-xxx-500 Universal BT, DALI	DALI			6 AX	660 VA	760 VA	1320 VA	1380 VA	X
6819/55-xxx-500 Corridor BT, DALI				6 AX	660 VA	760 VA	1320 VA	1380 VA	X
6819/39-xxx-500 Universal, DALI Slave				—	—	—		—	—
6819/59-xxx-500 Corridor, DALI Slave		Slave		—	—	—		—	—

Table 8: Overview: Switching capacities

1) Suited for prospective inrush current up to 350 A / 200 µs analogous to the new LED test according to EN 60669

3.5 Status indication

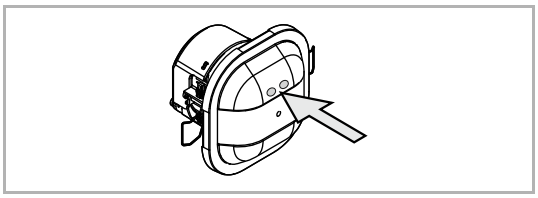


Fig. 6: Display of operating status

The operating status of the devices is displayed by means of a red and a blue LED at the front of the device.

Both LEDs are never switched on simultaneously.

Devices with IR reception

Operating status	LED red
Test mode	Flashing at detected movement
Continuous light operation	Continuous ON
Continuous OFF operation	Continuous ON
Manual mode	OFF
Automatic mode	OFF
IR reception	Flickers fast

Table 9: Operating status: Devices with IR reception

Devices with Bluetooth function

Operating status	LED red	LED blue
Test mode	Flashing at detected movement	OFF
Continuous light operation	Continuous ON	OFF
Continuous OFF operation	Continuous OFF	OFF
Manual mode	OFF	OFF
Automatic mode	OFF	OFF

Tab.10: Operating status: Devices with Bluetooth function

Bluetooth function	LED red	LED blue
No connection	According to the current operating status	OFF
Identifying devices	OFF	Flashes or OFF if the corresponding symbol in the app is actuated again.
Devices selected, password input necessary	OFF	Flashes slowly
Devices selected, password input incorrect	OFF	3x fast flashing
Devices selected, submenu in the app **in test mode**	Flashing at detected movement	Continuous OFF
Devices selected, submenu in the app **except in test mode**	OFF	Continuous ON
Connection lost (signaling in the app)	After the blue LED is off, according to the current operating status	3x fast flashing, then OFF

After mains power failure	Flashes for 4 seconds
	
	In the following situations, the LED pulses every 2 minutes for 0.1 seconds each:
	▪ Activated functions:
	  ▪ Presence simulation
	  ▪ Night light/anti-glare function
	  ▪ Basic illumination
	▪ Time not set
	For the automatic synchronisation of the time, the app must be connected to the presence detector.
		OFF

Table 11: Status of Bluetooth function

4 Information about planning and application

4.1 Principles of function / principles of operation

4.1.1 The difference between movement detectors / presence detectors

Both device types are passive infrared detectors. The serve for switching the lighting when people are present.

Presence detectors:

They are rather intended for indoor use. Since they need to detect small movements, such as typing on a keyboard, they are clearly more sensitive than movement detectors. In addition to the movement detector, a presence detector monitors the ambient brightness during an ON phase and can switch off depending on the ambient light.

Movement detector:

They are mostly used in outdoor areas where the detection of large movements is required and the detection of small movements is not required. Blown about foliage, for example, is not to cause the lighting in the garage entrance to be switched on.

4.1.2 Principles of function

Infrared radiation, also called heat radiation, consists of electromagnetic waves. Every object transmits a characteristic heat radiation, depending on its specific temperature.

The detection of movement depends on the mounting height and the "free view" of the device.

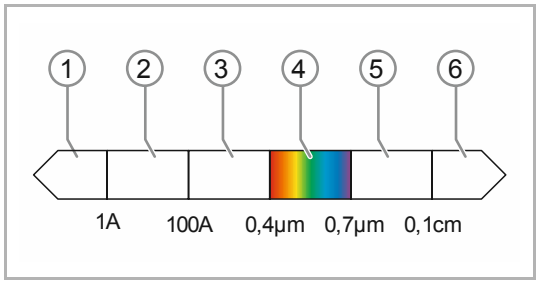


Fig. 7: Function principle of IR sensor technology

Infrared sensor technology (IR sensor technology)

IR radiation can be detected with IR sensors and transformed into electric signals. As these sensors only receive and do not transmit IR radiation, they are also known as "passive IR sensors".

[1] Gamma
[2] X-ray
[3] Ultraviolet
[4] Visible
[5] Infrared
[6] Radio waves

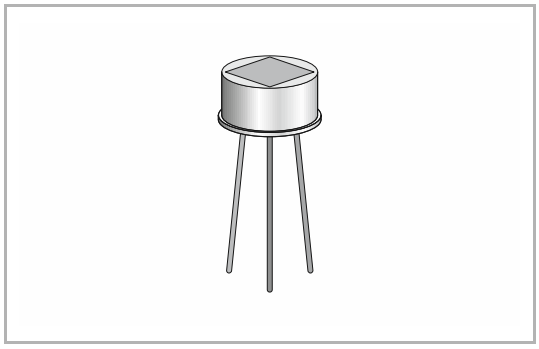


Fig. 8: Passive IR sensor

Passive infrared sensors (passive IR sensors)

Passive IR sensors are designed so that they react only to a change in heat radiation, e.g., in event of movement.

The transmission range of passive IR sensors is physically dependent on the temperature. The reference amounts to 21°C. The transmission range reduces in a warmer environment.

If heat radiation is constant, no signal is generated. A room being heated alters its heat radiation only very slowly in comparison. It is therefore possible to detect human movements (heat movement).

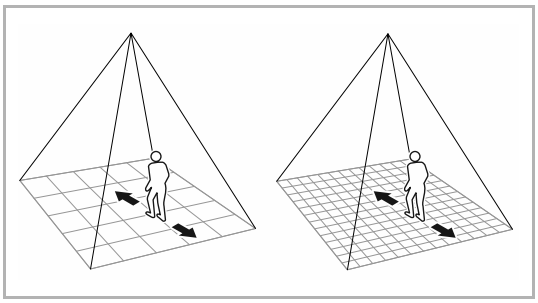


Fig. 9: Optic system

Optical system

By means of lenses, mirrors and sensors, the area to be monitored is divided into numerous fields, or so-called segments. If a person moves from one segment to the next, this movement is detected. The greater the number of segments, the smaller the movement that can be detected.

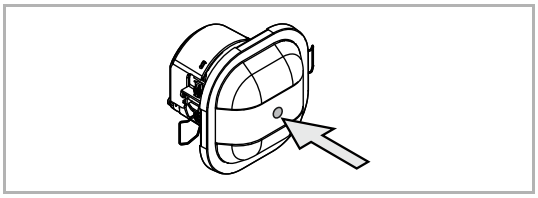


Fig. 10: Brightness sensor

Light measurement

To extend the function, presence detectors can be fitted additional sensors.

The devices of ABB are fitted with a light measurement. This extends the simple On/Off switching process by one brightness-value threshold.

The brightness threshold determines the luminosity from which the light switches on. If the surrounding light is brighter that the set brightness threshold, the light does not switch on, or it switches off.

4.1.3 Lens types

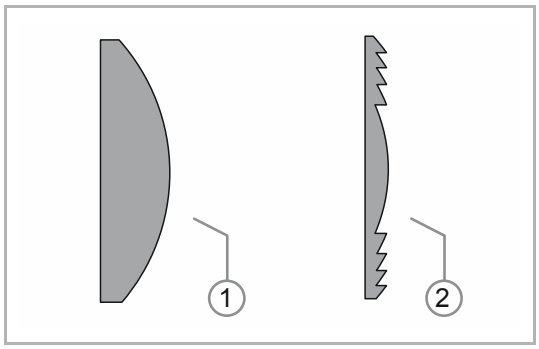


Fig. 11: Lens types

The devices of ABB are fitted with Fresnel lenses. Compared to normal lenses, Fresnel lenses offer the advantage of an increase in the amplification of infrared radiation.

[1] Normal lens

[2] Fresnel lens

4.1.4 DALI

DALI (Digital Addressable Lighting Interface) is comprehensive manufacturer interface standard for dimmable electronic ballasts. DALI offers increased functionality with easier handling. A maximum of 45 DALI operating devices can be controlled individually or together.

A single 2-wire control line for up to 45 operating devices offers several advantages.

- The planning of the control line and the power supply can take place completely separate from each other.
  - Alternatively, the control line is accommodate in one cable together with the power supply line, e.g., 5 x 1.5 mm2 NYM-J.
- No relays are necessary for switching of the lamps. Switching and dimming is carried out exclusively via the control line.
- The devices from ABB use the DALI broadcast mode. This means that all operating devices connected to the DALI control line are controlled together.
- The deactivation of the DALI buses allow the devices to switch totally free of voltage and are therefore free of power consumption.
- The DALI slave devices do not require a separate mains supply. They can be directly connected to the DALI control line.

4.1.5 Detection ranges / detection levels

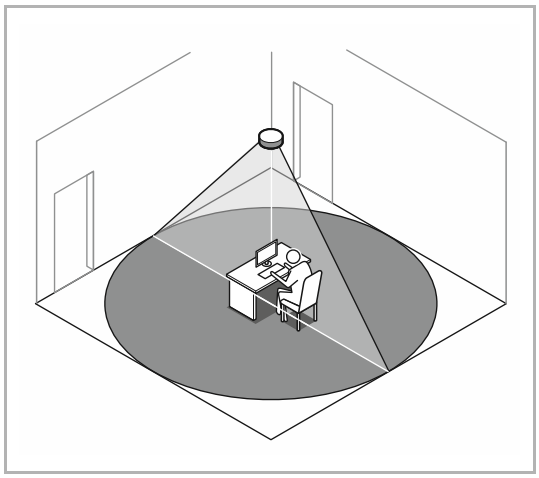


Fig. 12: Detection seated

Seated persons

Seated persons must be completely within the detection range.

With higher installation, the detection range becomes larger, but the detection density smaller.

The shorter the distance between the person to be detected and the presence detector, the smaller the movement can be that is still detected. Ideally the maximum mounting height is 3.5 m.

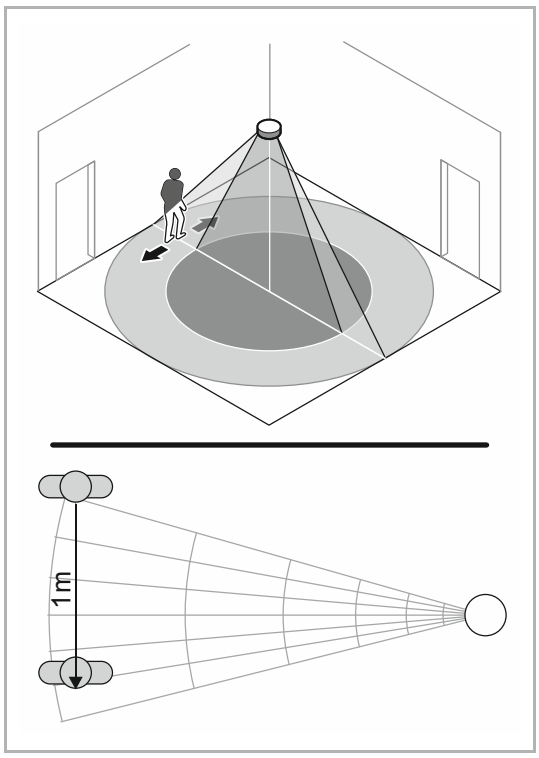


Fig. 13: Detection crosswise to the device

Moving crosswise toward the device

The detection range is at its highest when the person to be detected moves crosswise toward the device. This is called a tangential direction of movement.

The detection of the infrared change functions best when the person to be detected moves crosswise to the viewing field of the device. Here, for example, it crosses several sectors at a 1 m path. If the person moves directly toward it, it takes longer before the person is detected by the device in other sectors.

In the bottom example graphic the person touches 6 new sectors at a 1 m path.

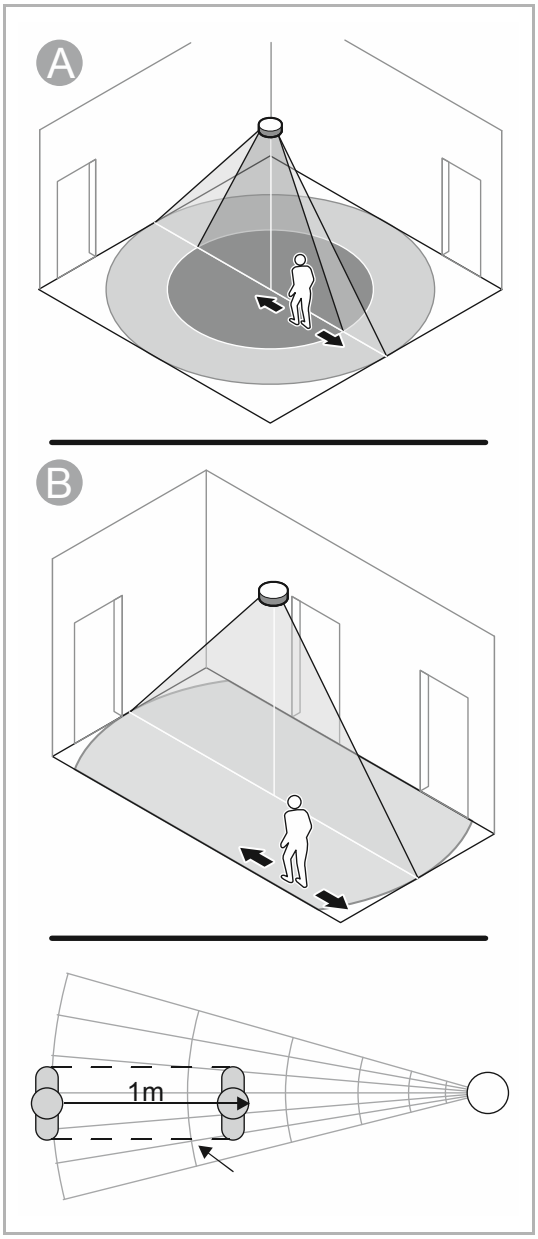


Fig. 14: Detection lengthways to/in parallel with the device

Moving lengthways to/in parallel with the device

The detection width is physically dependent smaller when the person to be detected moves directly toward the device [A] or in parallel [B] (corridor) with it.

In the bottom example graphic a new sector is touched by the person only at the end of a 1 m path (arrow). It is only here that the person is detected by the device.

The detection of the infrared change functions best when the person to be detected moves crosswise to the viewing field of the device. Here, for example, it crosses several sectors at a 1 m path. If the person moves directly towards the presence detector it, it takes longer before the person is detected by the device in other sectors. This is called a central approach.

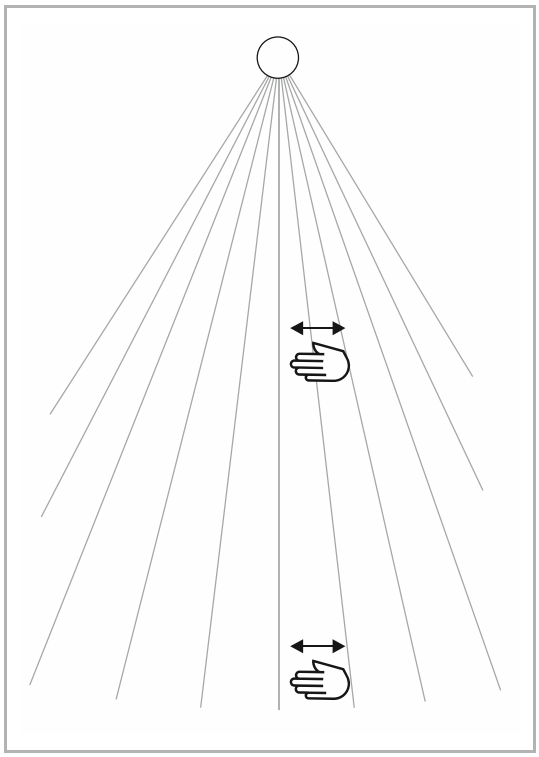


Fig. 15: Mounting heights

Mounting heights

Depending on the mounting height, the detection characteristics change.

As the mounting height increases, the sensitivity and detection density decrease. In the example graphic the movement of the bottom hand is no longer detected because it does not cut across any additional sectors. The Busch-Presence detector is too far removed from it. Optimally, seated persons are detected at a maximum mounting height of 3.5 m.

Depending on the application, a high resolution is not required and a greater mounting height is possible (e.g. in storage rooms, corridors, gymnasiums).

4.2 Case studies

4.2.1 Overview

Small rooms / cupboards

Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
6817/62-xxx-500 Compact, e-contact				X	X
6817/32-xxx-500 Universal, e-contact				●	●
6819/60-xxx-500 Compact, Relais				X	X
6819/30-xxx-500 Universal, Relais				●	●
6819/50-xxx-500 Corridor, Relais				– –	– –
6817/33-xxx-500 Universal BT, e-contact				●	●
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●
6819/31-xxx-500 Universal BT, Relais				●	●
6819/51-xxx-500 Corridor BT, Relais				– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			●	●
6819/55-xxx-500 Corridor BT, DALI				– –	– –

Tab. 12: Areas of application: small rooms/cupboards

Individual office

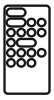
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control	Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes	Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
					With daylight-dependent control	
6817/62-xxx-500 Compact, e-contact			X	X	– –	– –
6817/32-xxx-500 Universal, e-contact			X	X	– –	– –
6819/60-xxx-500 Compact, Relais			X	X	– –	– –
6819/30-xxx-500 Universal, Relais			X	X	– –	– –
6819/50-xxx-500 Corridor, Relais			– –	– –	– –	– –
6817/33-xxx-500 Universal BT, e-contact			X	X	– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring			●	●	– –	– –
6819/31-xxx-500 Universal BT, Relais			X	X	– –	– –
6819/51-xxx-500 Corridor BT, Relais			– –	– –	– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI		●	●	X	X
6819/55-xxx-500 Corridor BT, DALI			– –	– –	– –	– –

Tab. 13: Areas of application: individual offices

Open-plan offices with or without windows

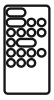
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
							With daylight-dependent control	
6817/62-xxx-500 Compact, e-contact				X	X		– –	– –
6817/32-xxx-500 Universal, e-contact				X	X		– –	– –
6819/60-xxx-500 Compact, Relais				X	X		– –	– –
6819/30-xxx-500 Universal, Relais				X	X		– –	– –
6819/50-xxx-500 Corridor, Relais				– –	– –		– –	– –
6817/33-xxx-500 Universal BT, e-contact				X	X		– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●		– –	– –
6819/31-xxx-500 Universal BT, Relais				X	X		– –	– –
6819/51-xxx-500 Corridor BT, Relais				– –	– –		– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			X	X		X	X
6819/55-xxx-500 Corridor BT, DALI				– –	– –		– –	– –

Tab. 14: Areas of application: open-plan offices with or without windows

Class rooms

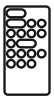
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
							With panel light	
6817/62-xxx-500 Compact, e-contact				X	X		– –	– –
6817/32-xxx-500 Universal, e-contact				X	X		– –	– –
6819/60-xxx-500 Compact, Relais				X	X		– –	– –
6819/30-xxx-500 Universal, Relais				X	X		– –	– –
6819/50-xxx-500 Corridor, Relais				– –	– –		– –	– –
6817/33-xxx-500 Universal BT, e-contact				X	X		– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●		– –	– –
6819/31-xxx-500 Universal BT, Relais				X	X		– –	– –
6819/51-xxx-500 Corridor BT, Relais				– –	– –		– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			X	X		X	X
6819/55-xxx-500 Corridor BT, DALI				– –	– –		– –	– –

Tab. 15: Areas of application: classrooms

Conference rooms

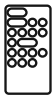
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
							With daylight-dependent control	
6817/62-xxx-500 Compact, e-contact				X	X		– –	– –
6817/32-xxx-500 Universal, e-contact				X	X		– –	– –
6819/60-xxx-500 Compact, Relais				X	X		– –	– –
6819/30-xxx-500 Universal, Relais				X	X		– –	– –
6819/50-xxx-500 Corridor, Relais				– –	– –		– –	– –
6817/33-xxx-500 Universal BT, e-contact				X	X		– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●		– –	– –
6819/31-xxx-500 Universal BT, Relais				X	X		– –	– –
6819/51-xxx-500 Corridor BT, Relais				– –	– –		– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			X	X		X	X
6819/55-xxx-500 Corridor BT, DALI				– –	– –		– –	– –

Tab. 16: Areas of application: meeting rooms

Toilets

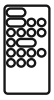
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
							With HVAC switching output	
6817/62-xxx-500 Compact, e-contact				X	X		– –	– –
6817/32-xxx-500 Universal, e-contact				X	X		– –	– –
6819/60-xxx-500 Compact, Relais				X	X		– –	– –
6819/30-xxx-500 Universal, Relais				X	X		– –	– –
6819/50-xxx-500 Corridor, Relais				– –	– –		– –	– –
6817/33-xxx-500 Universal BT, e-contact				X	X		– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●		– –	– –
6819/31-xxx-500 Universal BT, Relais				X	X		– –	– –
6819/51-xxx-500 Corridor BT, Relais				– –	– –		– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			X	X		X	X
6819/55-xxx-500 Corridor BT, DALI				– –	– –		– –	– –

Tab. 17: Areas of application: toilets

Corridors

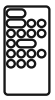
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
							With basic brightness	
6817/62-xxx-500 Compact, e-contact				– –	– –		– –	– –
6817/32-xxx-500 Universal, e-contact				– –	– –		– –	– –
6819/60-xxx-500 Compact, Relais				– –	– –		– –	– –
6819/30-xxx-500 Universal, Relais				– –	– –		– –	– –
6819/50-xxx-500 Corridor, Relais				X	X		– –	– –
6817/33-xxx-500 Universal BT, e-contact				– –	– –		– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●		– –	– –
6819/31-xxx-500 Universal BT, Relais				– –	– –		– –	– –
6819/51-xxx-500 Corridor BT, Relais				X	X		– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			– –	– –		– –	– –
6819/55-xxx-500 Corridor BT, DALI				X	X		X	X

Tab. 18: Areas of application: corridors

Outdoors (outdoors with canopy)

Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
6817/62-xxx-500 Compact, e-contact				– –	– –
6817/32-xxx-500 Universal, e-contact				– –	– –
6819/60-xxx-500 Compact, Relais				– –	– –
6819/30-xxx-500 Universal, Relais				– –	– –
6819/50-xxx-500 Corridor, Relais				– –	– –
6817/33-xxx-500 Universal BT, e-contact				– –	– –
6817/93-xxx-500 Universal BT, e-contact with sealing ring				X	X
6819/31-xxx-500 Universal BT, Relais				– –	– –
6819/51-xxx-500 Corridor BT, Relais				– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			– –	– –
6819/55-xxx-500 Corridor BT, DALI				– –	– –

Tab. 19: Areas of application: outdoors (outdoors with canopy)

Living areas/stairwells

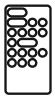
Legend:

X Meets the requirements and is recommended

● Overfulfils the requirements. Possible, but usually not economically practical.

– Only suitable with restrictions (e.g. for the transmission range)

– – Not suitable

	Bus system	Control		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes		Suspended ceiling (spring bracket/quick-acting clamp)	Concrete mounting in special concrete flush-mounting wall boxes
							With basic illumination and presence simulation	
6817/62-xxx-500 Compact, e-contact				X	X		– –	– –
6817/32-xxx-500 Universal, e-contact				X	X		– –	– –
6819/60-xxx-500 Compact, Relais				X	X		– –	– –
6819/30-xxx-500 Universal, Relais				X	X		– –	– –
6819/50-xxx-500 Corridor, Relais				– –	– –		– –	– –
6817/33-xxx-500 Universal BT, e-contact				X	X		X[1)]	X[1)]
6817/93-xxx-500 Universal BT, e-contact with sealing ring				●	●		●[1)]	●[1)]
6819/31-xxx-500 Universal BT, Relais				X	X		X[1)]	X[1)]
6819/51-xxx-500 Corridor BT, Relais				– –	– –		– –	– –
6819/35-xxx-500 Universal BT, DALI	DALI			X	X		X	X
6819/55-xxx-500 Corridor BT, DALI				– –	– –		– –	– –

Tab. 20: Areas of application: living areas/stairwells

[1)] Only presence simulation

4.2.2 Single office

Function

The lighting with fluorescent tube in an office shall be controlled via a Busch-Presence detector.

In addition, the user would like to switch the lighting on and off via a switch.

Installation and settings

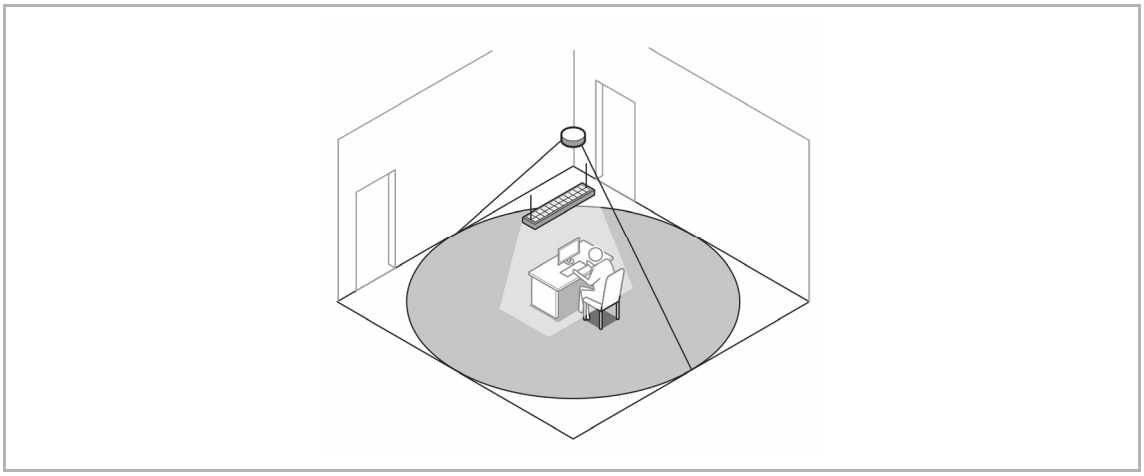


Fig. 16: Application example: individual office

For optimum detection, the installation position of the Busch-Presence detector should be selected above the workplace.

The switch-off delay for such applications is to be set at approx. 10 minutes.

Note

When determining the luminosities and setting of the device, pay attention to the different brightness distributions in the room.

Depending on the reflection conditions in the room or at the workstation, a considerably lower brightness value is determined at the mounting site of the device. If it should be switched on, for example, when the brightness at the workstations drops below 500 lux, you must set a value of about 100 lux on the device.

The "Assume current brightness" app function indicates the current brightness at the mounting site. This value can be assumed directly for simplified commissioning.

Note

When making the setting, pay attention to the legal requirements for luminosities at workstation.

Examples of switching

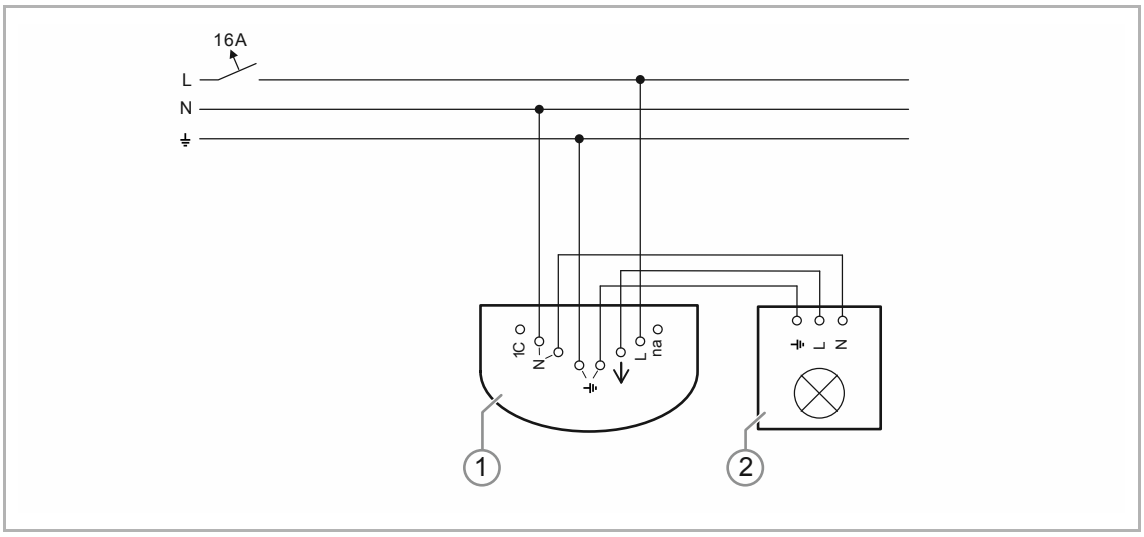


Fig. 17: Examples of switching: Single offices light control without extension unit

[1] 6817/32-xxx-500 Universal, e-contact /6819/60-xxx-500 Compact, Relais

[2] Lamp

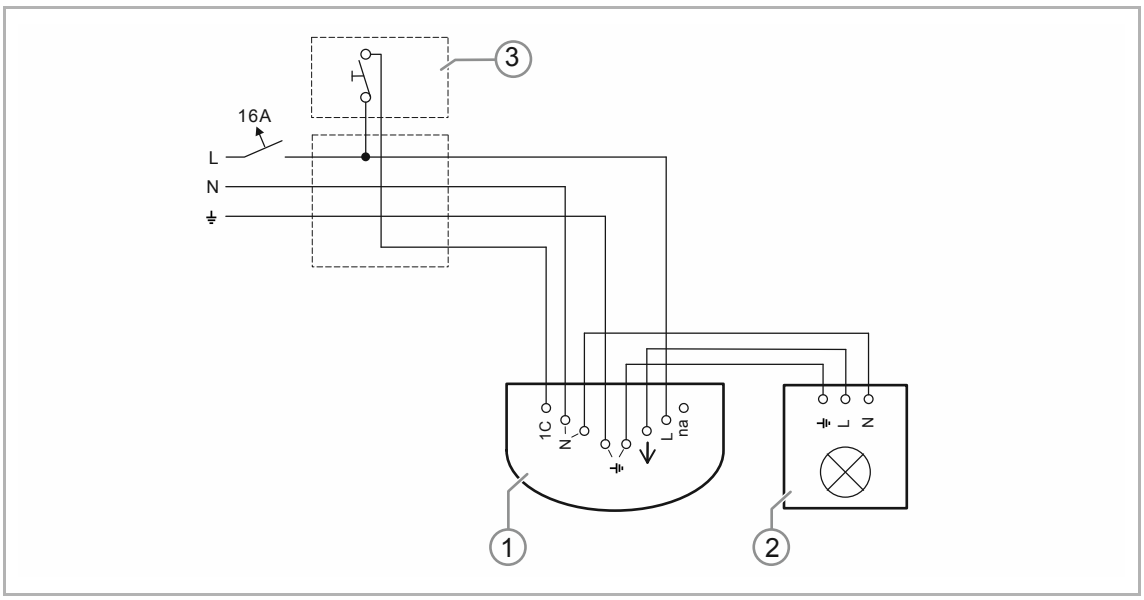


Fig. 18: Examples of switching: Single offices light control with extension unit

[1] 6817/32-xxx-500 Universal, e-contact /6817/62-xxx-500 Compact, e-contact

[2] Lamp

[3] Extension unit push-button

4.2.3 Classroom

Function

In a school, the lighting of a classroom with DALI lamps shall be controlled efficiently via the Busch-Presence detector. 3 Busch-Presence detector shall be installed in parallel to detect the entire area.

The illumination of the blackboard shall be integrated into the control. It shall be switched on and off independently of the status of the lighting. If manual deactivation is forgotten, it shall be switched off automatically with the other lighting.

Installation and settings

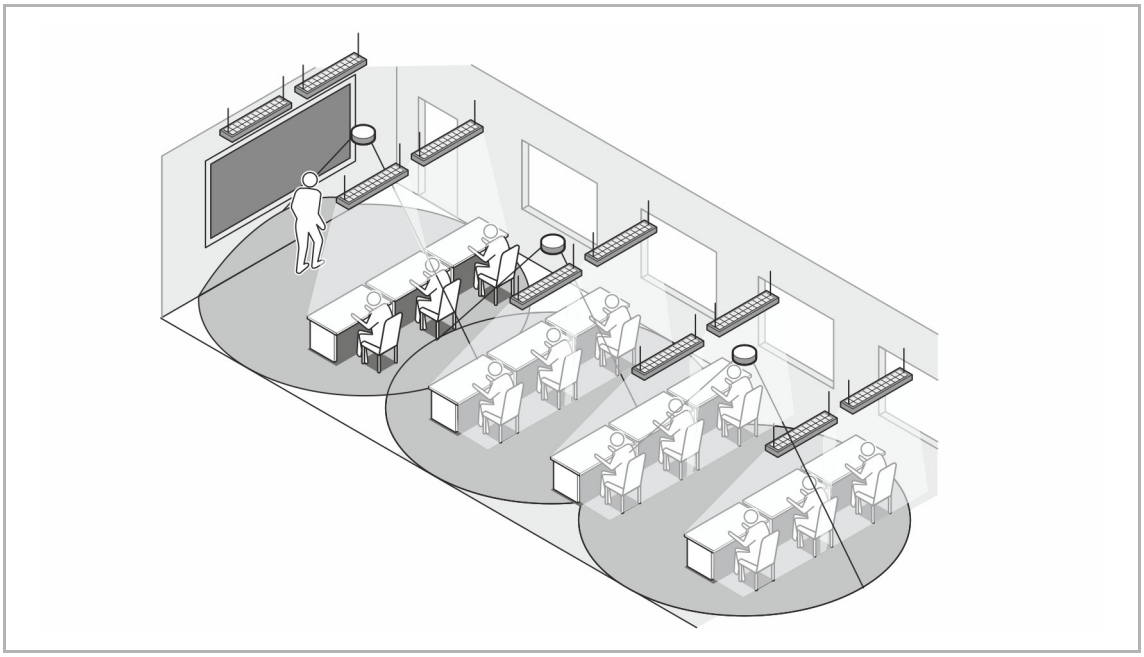


Fig. 19: Application example: classroom with panel light

For optimum detection, the installation position of the Busch-Presence detector should be selected above the pupils' desks.

The switch-off delay for such applications is to be set at approx. 10 minutes.

The Busch-Presence detector have an almost circular detection. The areas must overlap slightly to ensure that there are no gaps in the detection.

The load is connected to the master. The master is responsible for monitoring the brightness and the switch-off delay. The slaves have the task of routing detected movement and the measured brightness value to the master.

Through the smartphone app "ABB Watchdog Remote control" or a 2-gang push-button connected to the 6494-500 Extension unit connection, the panel light can be activated.

Note

When determining the luminosities and setting of the device, pay attention to the different brightness distributions in the room.

Depending on the reflection conditions in the room or at the workstation, a considerably lower brightness value is determined at the mounting site of the device. If it should be switched on, for example, when the brightness at the workstations drops below 300 lux, you must set a value of about 80 lux on the device.

The "Assume current brightness" app function indicates the current brightness at the mounting site. This value can be assumed directly for simplified commissioning.

Note

When making the setting, pay attention to the legal requirements for luminosities at the pupils' desk.

Examples of switching

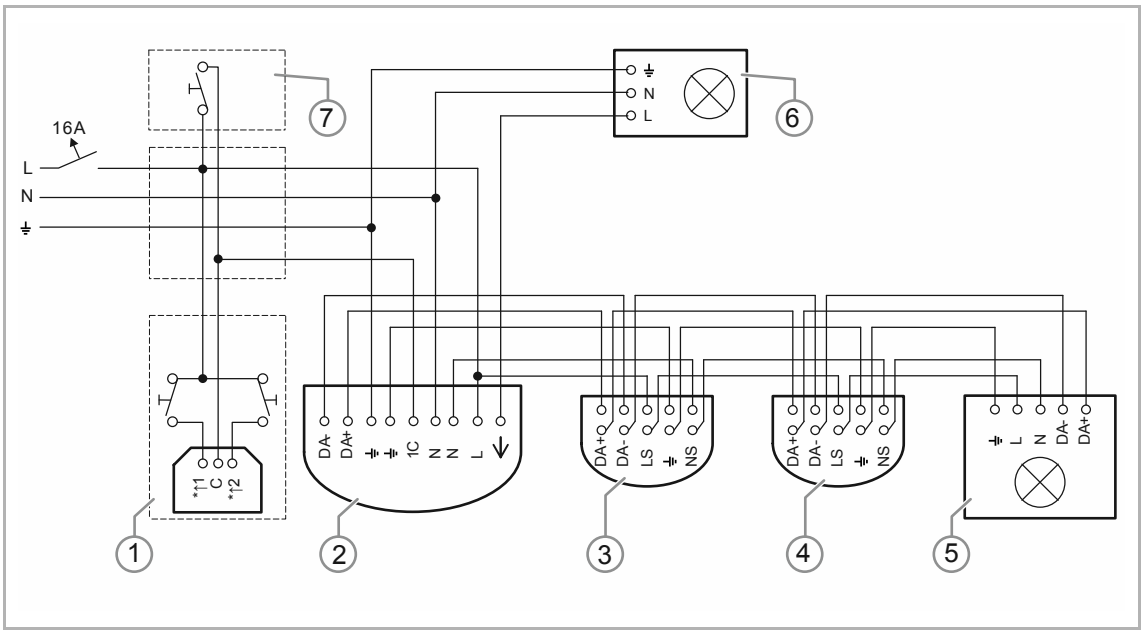


Fig. 20: Examples of switching: DALI light control with extension unit and panel light in classroom

[1] 6494-500 Extension unit connection (for the connection of the daylight switch in the form of a 2-gang push-button)

[2] 6819/35-xxx-500 Universal BT, DALI

[3] 6819/39-xxx-500 Universal, DALI Slave

[4] 6819/39-xxx-500 Universal, DALI Slave

[5] DALI operating device

[6] Panel light

[7] Extension unit push-button

4.2.4 Open-plan office

4.2.4.1 Control of master/slave

Function

The lighting with fluorescent tube in a larger office shall be controlled via a Busch-Presence detector. Three Busch-Presence detector shall be installed in parallel to detect the entire area.

In addition, the user would like to switch the lighting on and off via a switch.

Installation and settings

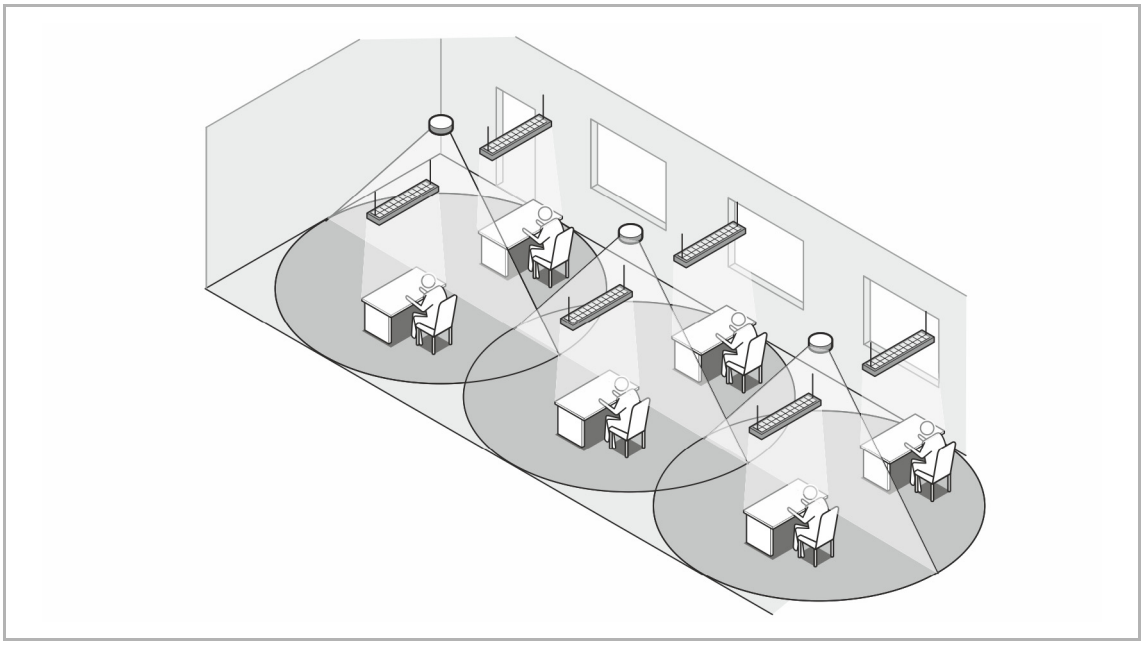


Fig. 21: Application example: open-plan office

For optimum detection, the installation positions of the Busch-Presence detector should be directly above the workplaces.

The Busch-Presence detector have an almost circular detection range. The areas must overlap slightly to ensure that there are no gaps in the detection.

The load is connected to the master. The master is responsible for monitoring the brightness and the switch-off delay. The slaves have the task of routing detected movement to the master.

Note

When determining the luminosities and setting of the device, pay attention to the different brightness distributions in the room.

Depending on the reflection conditions in the room or at the workstation, a considerably lower brightness value is determined at the mounting site of the device. If it should be switched on, for example, when the brightness at the workstations drops below 500 lux, you must set a value of about 100 lux on the device.

The "Assume current brightness" app function indicates the current brightness at the mounting site. This value can be assumed directly for simplified commissioning.

Note

When making the setting, pay attention to the legal requirements for luminosities at workstation.

Examples of switching

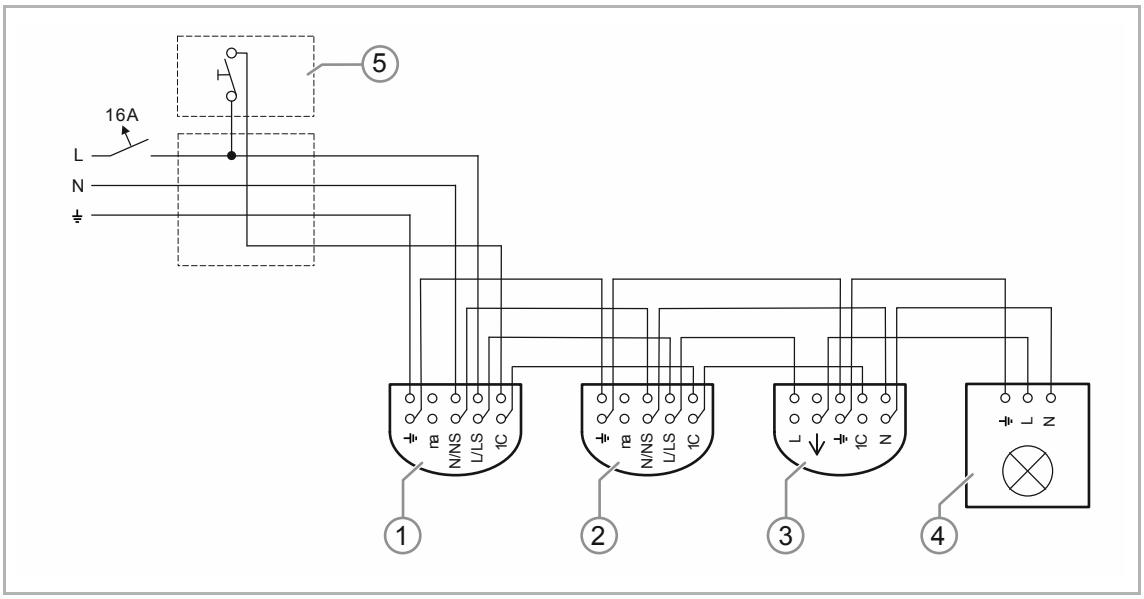


Fig. 22: Examples of switching: Open-plan offices (master/slave) light control with extension unit

[1] 6819/68-xxx-500 Compact, Slave /6819/38-xxx-500 Universal, Slave

[2] 6819/68-xxx-500 Compact, Slave /6819/38-xxx-500 Universal, Slave

[3] 6819/30-xxx-500 Universal, Relais / 6819/60-xxx-500 Compact, Relais

[4] Lamp

[5] Extension unit push-button

4.2.4.2 Control of master/slave DALI

Function

The lighting in a larger office shall be controlled using a Busch-Presence detector. Three Busch-Presence detector shall be installed in parallel to detect the entire area.

The allocation of lamps should be kept flexible, for example, in case that the office is reorganized at a later point in time. The activation is therefore made via the DALI bus system.

In addition, the following was desired:

- The lighting shall be switched on and off manually via a switch.
- The "Continuous Light" function shall be used as a cleaning light.
- The "Continuous OFF" function, e.g., for a video presentation.

Optionally, a slow switch-on and switch-off of the light can be activated via a dimming function. The prerequisite for this are dimmable DALI loads. The times are settable via the smartphone app "ABB Watchdog Remote control".

Installation and settings

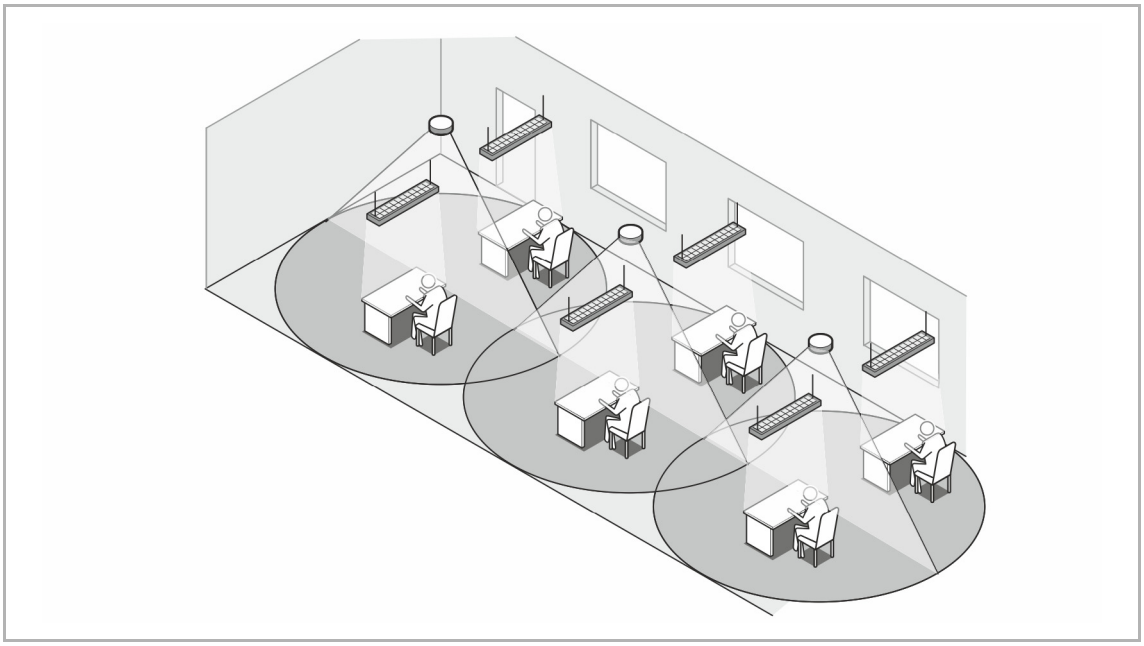


Fig. 23: Application example: DALI in an open-plan office

For optimum detection, the installation positions of the Busch-Presence detector should be directly above the workplaces.

The Busch-Presence detector have an almost circular detection range. The areas must overlap slightly to ensure that there are no gaps in the detection.

The load is connected to the master. The master is responsible for monitoring the brightness and the switch-off delay. The slaves have the task of routing detected movement and brightness values to the master.

Note

When determining the luminosities and setting of the device, pay attention to the different brightness distributions in the room.

Depending on the reflection conditions in the room or at the workstation, a considerably lower brightness value is determined at the mounting site of the device. If it should be switched on, for example, when the brightness at the workstations drops below 500 lux, you must set a value of about 100 lux on the device.

The "Assume current brightness" app function indicates the current brightness at the mounting site. This value can be assumed directly for simplified commissioning.

Note

When making the setting, pay attention to the legal requirements for luminosities at workstation.

Examples of switching

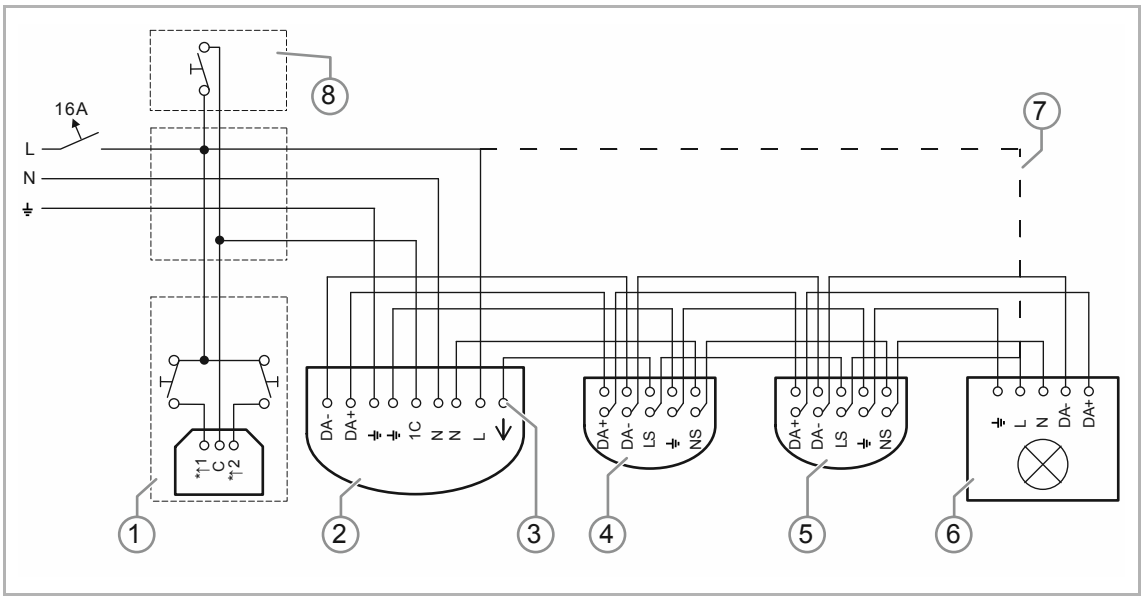


Fig. 24: Examples of switching: Open-plan offices (master/slave) DALI light control with extension unit

[1] 6494-500 Extension unit connection For "Continuous Light"/"Continuous OFF" modes.

[2] 6819/35-xxx-500 Universal BT, DALI

[3] When using voltage enabling of DALI operating devices.

[4] 6819/39-xxx-500 Universal, DALI Slave

[5] 6819/39-xxx-500 Universal, DALI Slave

[6] DALI operating device

[7] Option: Voltage enabling of DALI operating devices is not used.

[8] Extension push-button for manual switch-on/switch-off.

4.2.5 WC facility with DALI lamps

Function

In a WC facility, the lighting with DALI lamps shall be regulated via a Busch-Presence detector in an intelligent manner.

The lighting is controlled depending on movement and brightness.

The fan should only be activated according to detected movement and with a switch-off delay.

Installation and settings

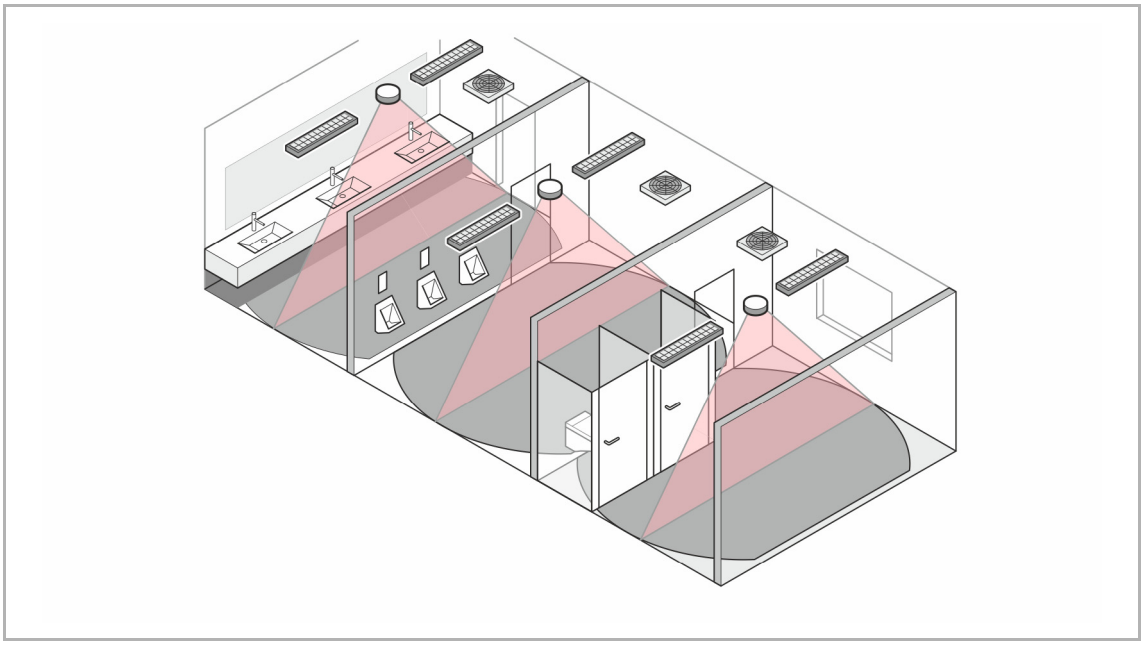


Fig. 25: Application example: DALI in a simple WC facility

Depending on the room divisions, it is necessary to install several Busch-Presence detector using active extension units in order to be able to monitor the individual areas (wash basins, urinals, individual cubicles as necessary).

The lighting is controlled directly depending on movement and brightness.

Integration of the ventilator

1. Application:

The ventilator should start with a switch-on delay of 30 seconds and run for up to 10 minutes:

Parameter settings are made via the smartphone app "ABB Watchdog Remote control". There, switch to "HVAC" mode and then the "Switch-on delay/switch-off delay" function.

2. Application:

The ventilator starts with a switch-on delay, but only if a movement is detected over a longer period (e.g. 5 minutes). This is intended to prevent the ventilator being activated when someone enters the toilet facility just briefly. If movement is detected over a longer period the ventilator should continue for some time. The switch-on delay is based on the frequency of movement in the first few minutes.

Parameter settings are made via the smartphone app "ABB Watchdog Remote control". There, switch to "HVAC" mode and then the "Switch-on delay/switch-off delay" function.

Examples of switching

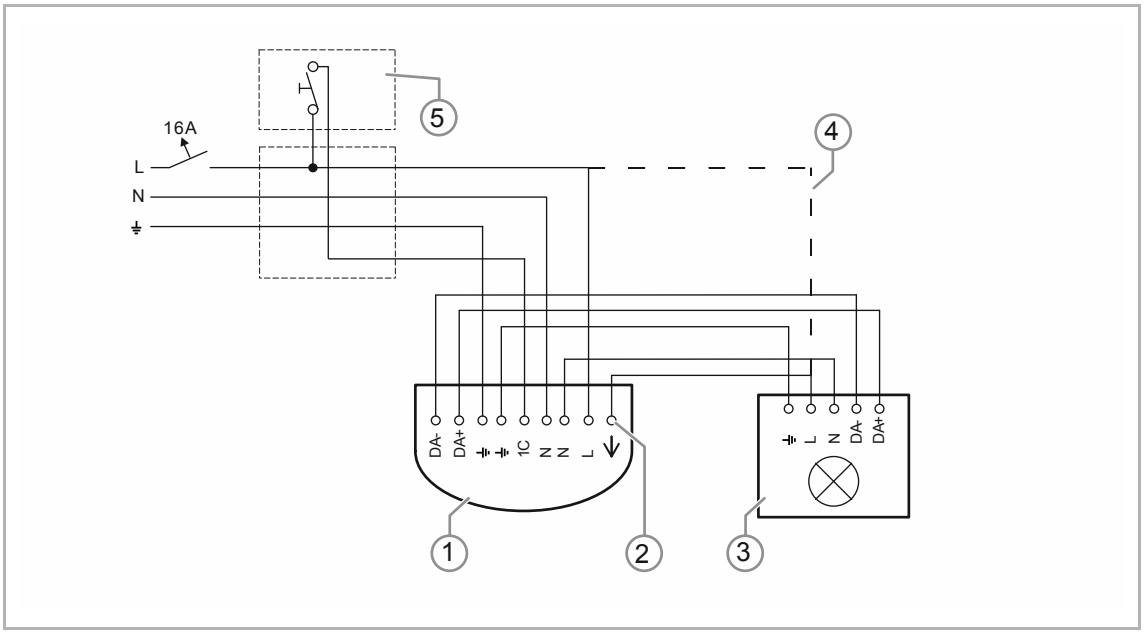


Fig. 26: Examples of switching: DALI light control with extension unit for simple WC facility

[1] 6819/35-xxx-500 Universal BT, DALI

[2] When using voltage enabling of DALI operating devices.

[3] DALI lamp

[4] Option: Voltage enabling of DALI operating devices is not used.

[5] Extension unit push-button

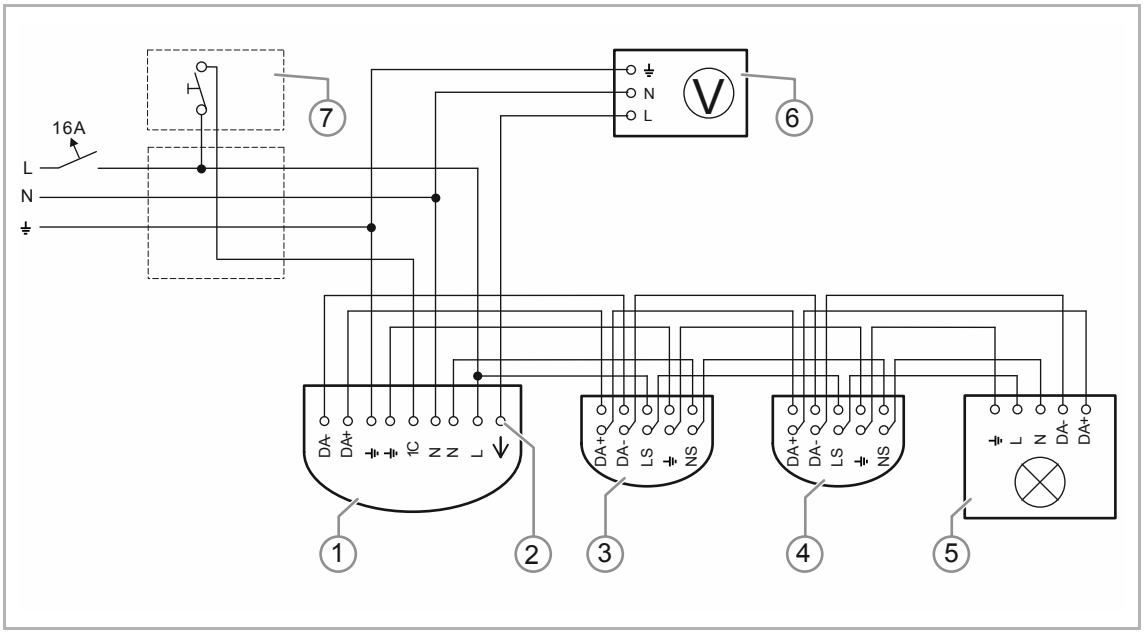


Fig. 27: Examples of switching: DALI light control (master/slave) with extension unit and fan control in WC facility

[1] 6819/35-xxx-500 Universal BT, DALI

[2] When using voltage enabling of DALI operating devices.

[3] 6819/39-xxx-500 Universal, DALI Slave

[4] 6819/39-xxx-500 Universal, DALI Slave

[5] DALI lamp

[6] Fan

[7] Extension unit push-button

4.2.6 Daylight-dependent control (constant light control)

Function

The daylight-dependent control ensures increased comfort, e.g., in offices and conference rooms.

The lighting is generally a mixture of daylight and artificial light. With this type of lighting control, the brightness is maintained at a constant level by dimming the share of artificial light. If daylight alone is sufficient, the artificial light/lighting is switched off.

Lighting control

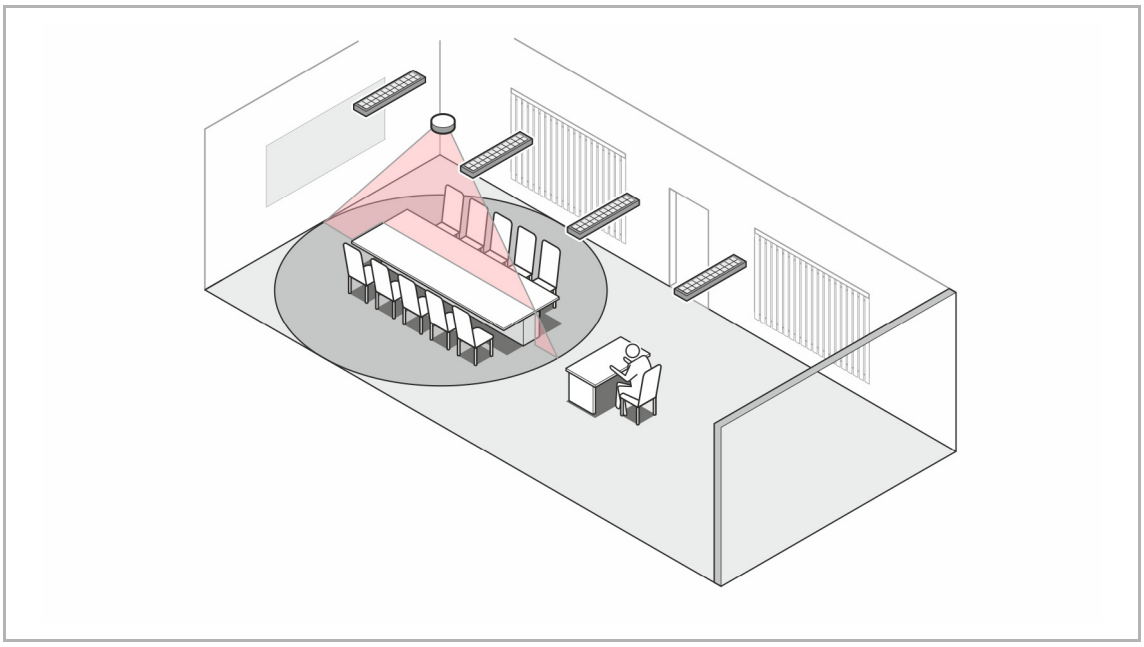


Fig. 28: Application example: daylight-dependent control

The lighting must consist of DALI lamps.

In case of daylight-dependent control, manual intervention through the app is possible.

With the NO switch, the lighting can be switched on and off. With IR remote control, a distinction is made between short and long operations.

Through the coupling of the extension unit, the lighting can be dimmed up and down in a targeted manner in connection with a 2-gang push-button.

Adaptation of the brightness set value via the app

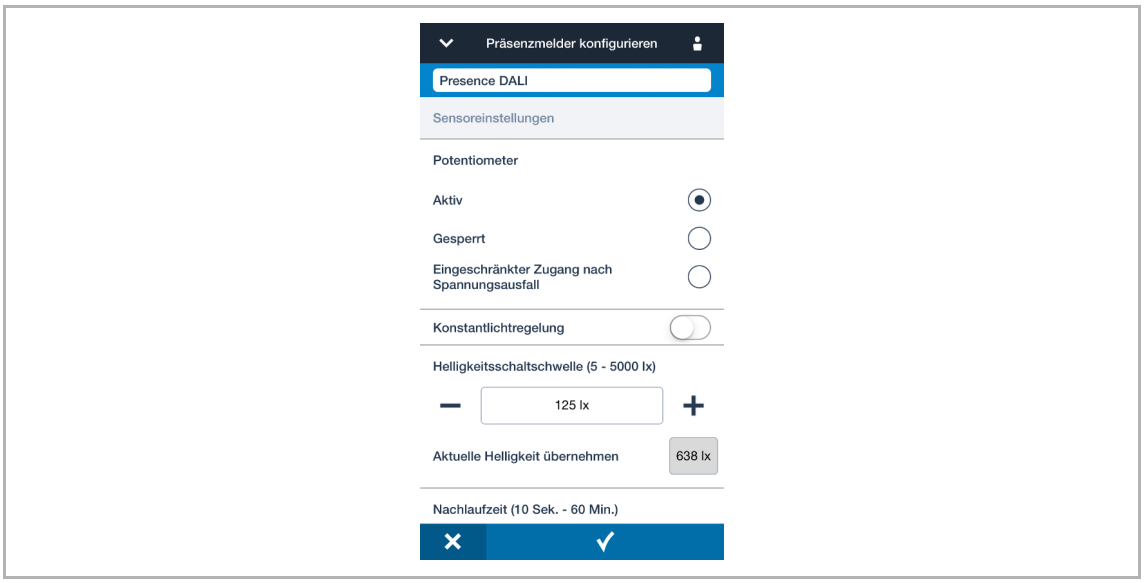


Fig. 29: Adaptation of the brightness set value for the daylight-dependent control

By means of the app, it is possible to adjust the brightness limit value, which is kept at a constant level by the control.

Examples of switching

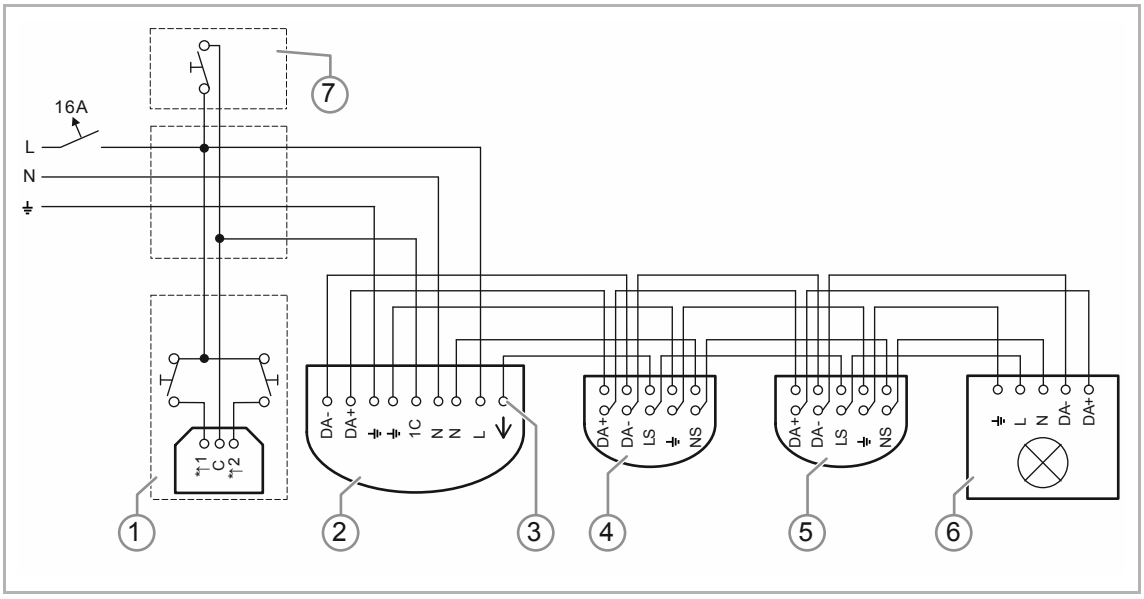


Fig. 30: Examples of switching: DALI master-slave daylight-dependent control with extension unit

[1] Optional: 6494-500 Extension unit connection to dim the lighting up and down in a targeted manner.

[2] 6819/35-xxx-500 Universal BT, DALI

[3] When using voltage enabling of DALI operating devices.

[4] 6819/39-xxx-500 Universal, DALI Slave

[5] 6819/39-xxx-500 Universal, DALI Slave

[6] DALI operating device

[7] Extension push-button for manual switching of the lighting. Not required if the 6494-500 Extension unit connection is used.

4.2.7 Corridor

Function

A corridor system should be controlled intelligently via a Busch-Presence detector.

The lighting is controlled depending on movement and brightness.

In addition, the user would like to switch the lighting on and off via a switch.

Installation and settings

The presence detectors must be installed and aligned in the direction of the hallway using the arrows printed on the inside of the device. If this does not happen and the detectors are rotated by 90 degrees, the correct function of the detector is not guaranteed.

Centralised approaches are fundamentally more difficult to detect than movements crosswise to the detector. For this reason, we recommend that, depending on the situation, the detector or detectors be positioned somewhat closer to the direction from which the centralised approach starts.

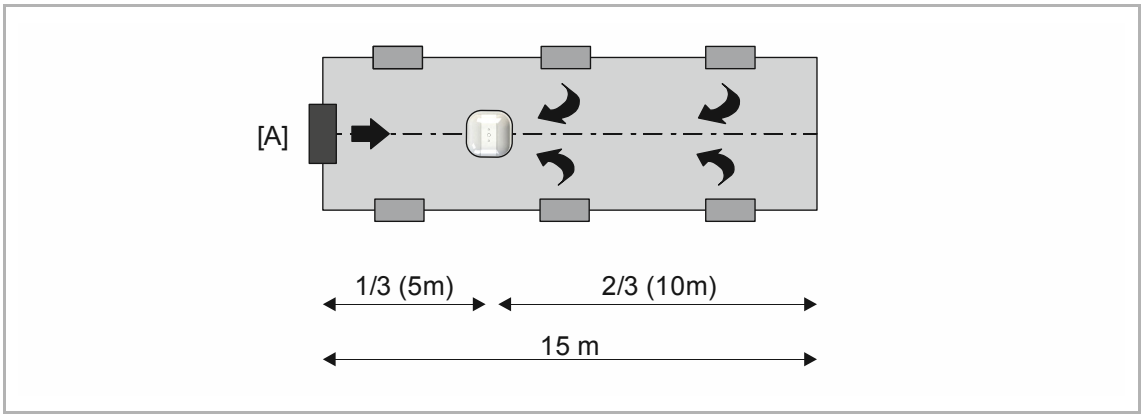


Fig. 31: Application example: escape route corridor with one door

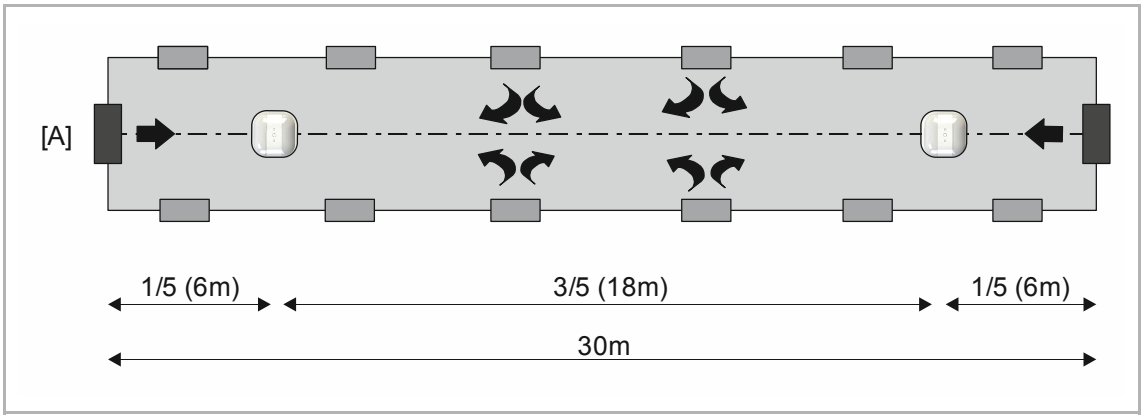


Fig. 32: Application example: escape route corridor with two doors

Examples of switching

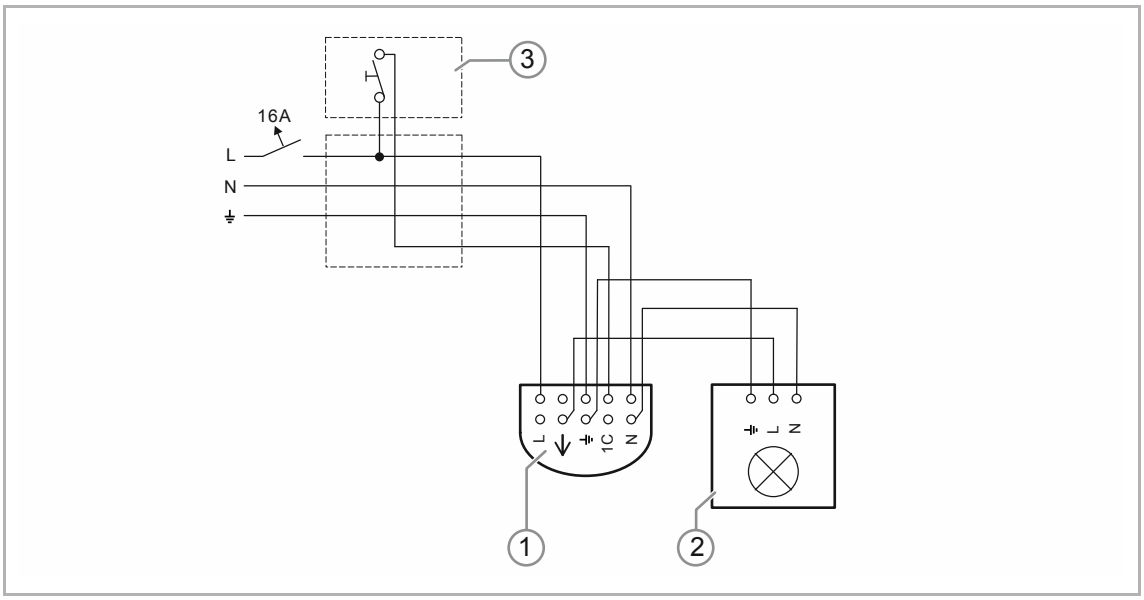


Fig. 33: Examples of switching: corridor light control with extension unit

[1] 6819/50-xxx-500 Corridor, Relais
[2] Lamp
[3] Extension unit push-button

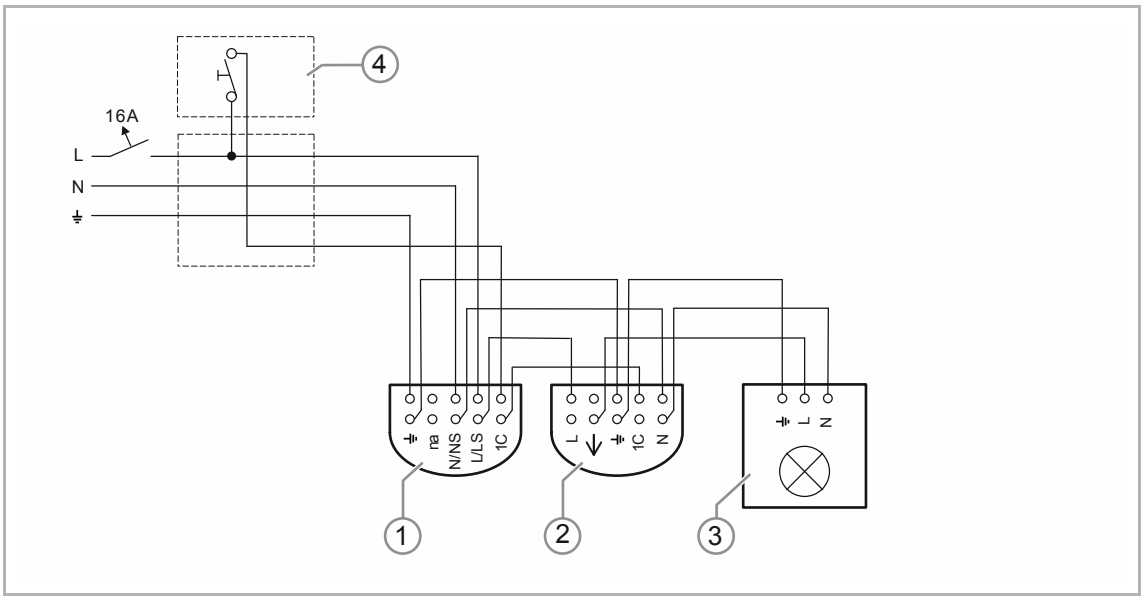


Fig. 34: Examples of switching: corridor (master/slave) light control with extension unit

[1] 6819/58-xxx-500 / Corridor, Slave
[2] 6819/50-xxx-500 Corridor, Relais
[3] Lamp
[4] Extension unit push-button

4.2.8 Stairwell

Function

A staircase should be controlled intelligently via a Busch-Presence detector.

The lighting is controlled depending on movement and brightness.

In addition, the user would like to switch the lighting on and off via a switch.

Installation and settings

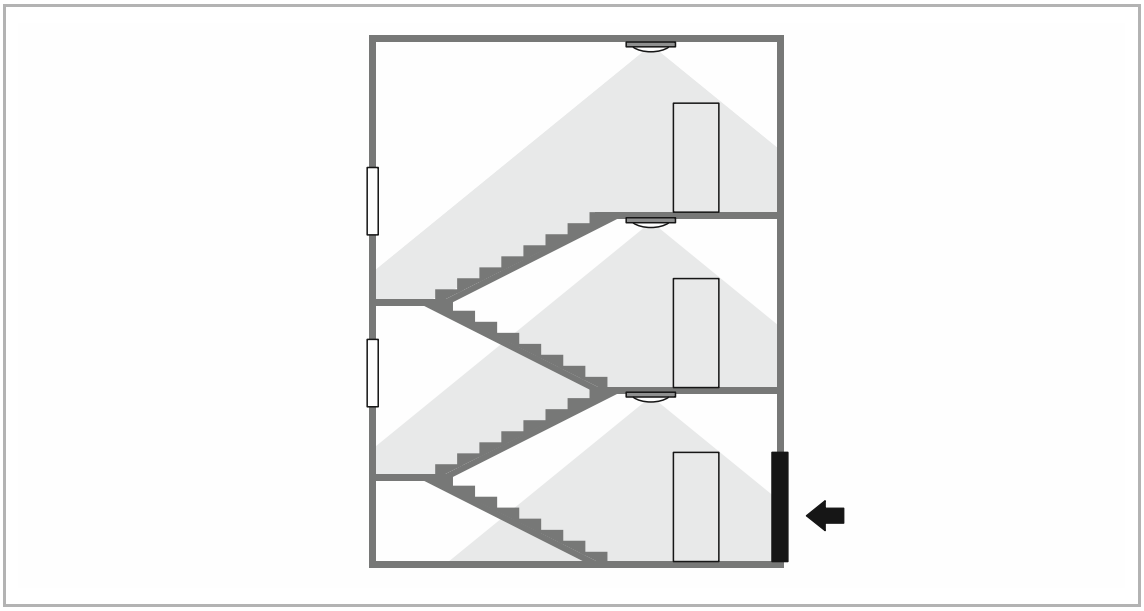


Fig. 35: Application example: stairwell with one main entrance

Depending on the structure of the stairwell, several Busch-Presence detector are required.

Place the master at the the darkest of the selected positions.

Examples of switching

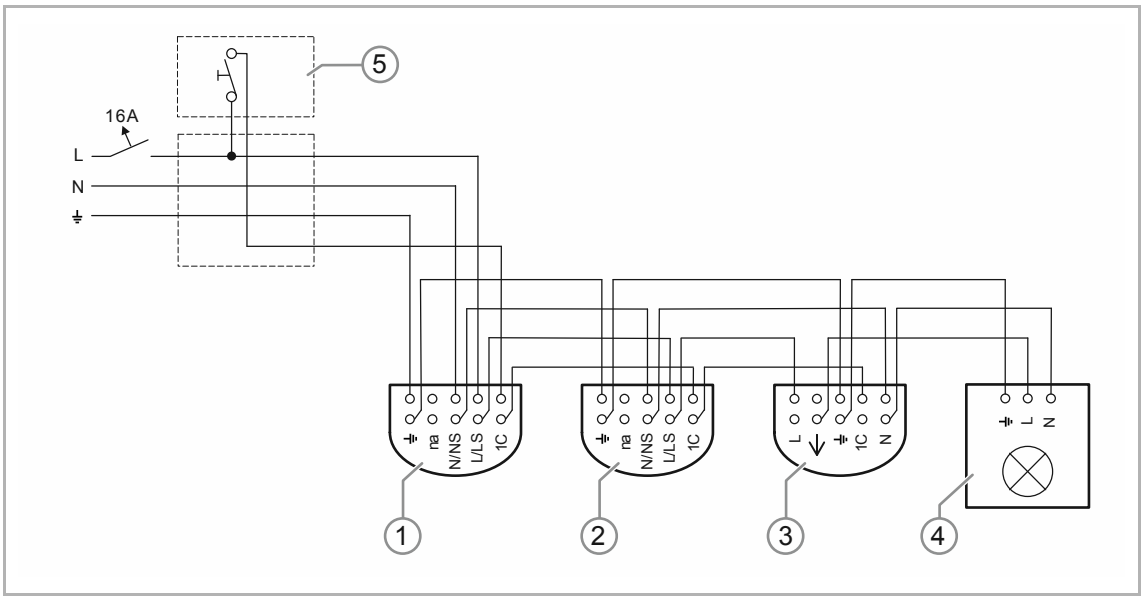


Fig. 36: Examples of switching: corridor (master/slave) light control with extension unit

[1] 6819/38-xxx-500 / Universal, Slave
[2] 6819/38-xxx-500 / Universal, Slave
[3] 6819/31-xxx-500 Universal BT, Relais
[4] Lamp
[5] Extension unit push-button for manually switching the lighting ON/OFF

4.2.9 Private house

Function

In a private house, the lighting shall be controlled outside under a canopy via a Busch-Presence detector.

In addition, the user would like to switch the lighting on and off via a switch.

Installation and settings

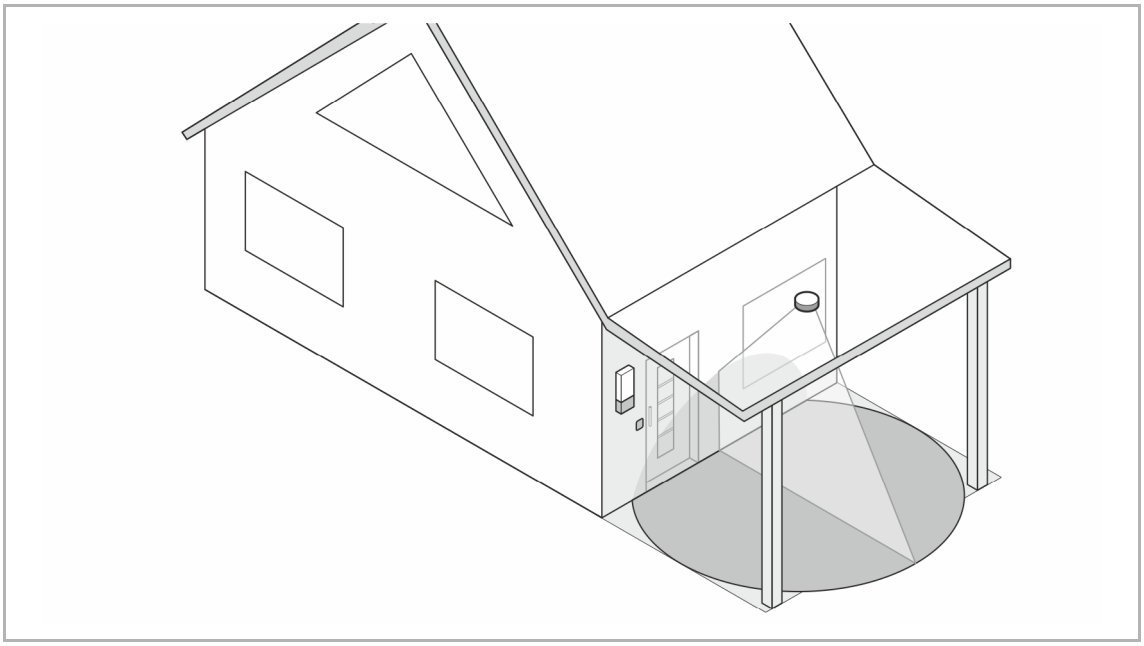


Fig. 37: Application example: private house with canopy

For best detection results in connection with the best moisture protection, the mounting site of the Busch-Presence detector should be beneath the canopy.

For outdoor mounting, a moisture-protected device must be used.

Examples of switching

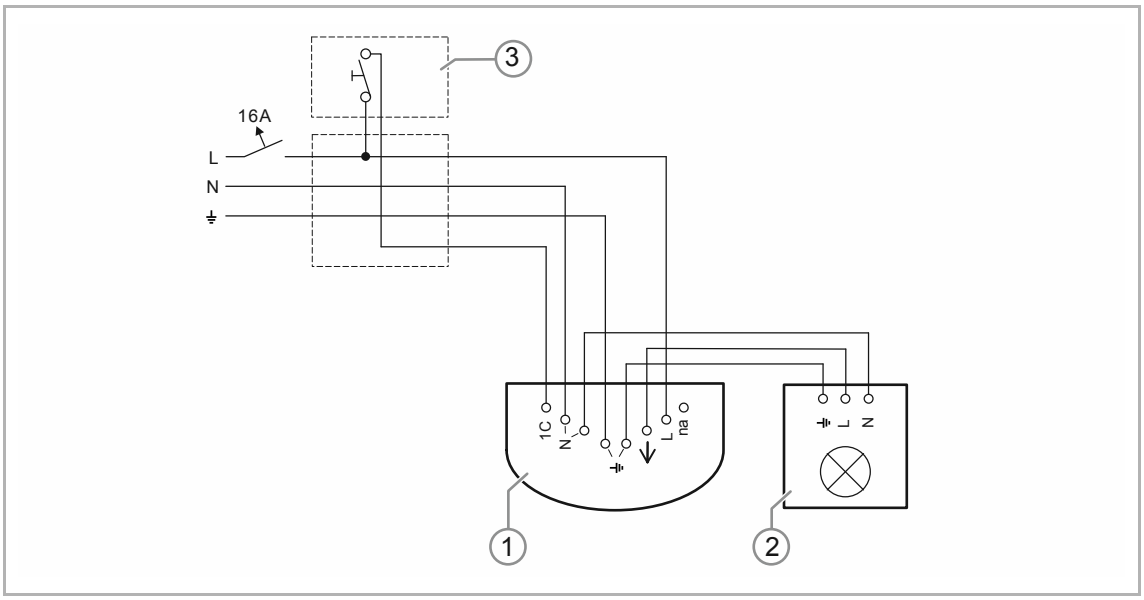


Fig. 38: Examples of switch: light control with extension unit and moisture-protected device at a private house

[1] Universal BT, e-contact with sealing ring
[2] Lamp
[3] Extension unit push-button

4.2.10 Office buildings

Function

The lighting in a larger office shall be controlled using a Busch-Presence detector. Three Busch-Presence detector shall be installed in parallel to detect the entire area.

The office building shall receive an illuminated glass front. If the lighting in the office is shut off by the Busch-Presence detector a basic illumination shall remain.

DALI lamps are used for the implementation of different brightness values in the office.

Installation and settings

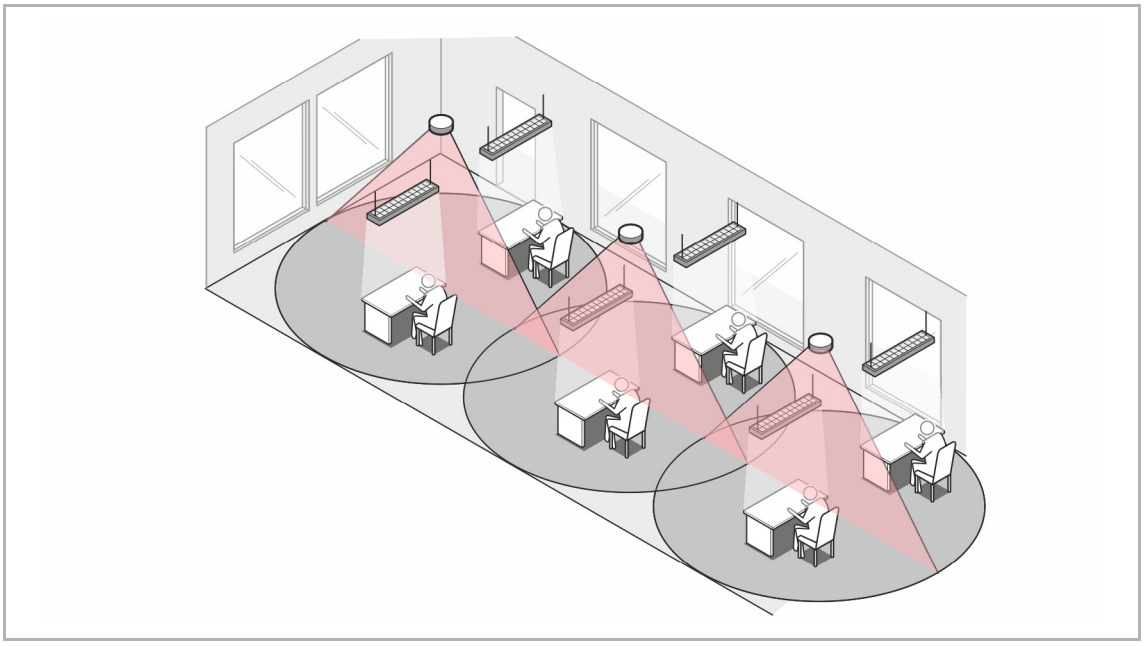


Fig. 39: Application example: open-plan office with illuminated glass front

For optimum detection, the installation position of the Busch-Presence detector should be selected directly above the workstations.

The switch-off delay for such applications is to be set at approx. 10 minutes.

The Busch-Presence detector have an almost circular detection range. The areas must overlap slightly to ensure that there are no gaps in the detection.

The load is connected to the master. The master is responsible for monitoring the brightness and the switch-off delay. The slaves have the task of routing detected movement and the respective brightness value to the master.

The basic lighting can be activated using the "ABB Watchdog Remote control" smartphone app. The starting and ending times and brightness value of the basic lighting can also be set using the app.

Note

When determining the luminosities and setting of the device, pay attention to the different brightness distributions in the room.

Depending on the reflection conditions in the room or at the workstation, a considerably lower brightness value is determined at the mounting site of the device. If it should be switched on, for example, when the brightness at the workstations drops below 500 lux, you must set a value of about 100 lux on the device.

The "Assume current brightness" app function indicates the current brightness at the mounting site. This value can be assumed directly for simplified commissioning.

Note

When making the setting, pay attention to the legal requirements for luminosities at workstation.

Examples of switching

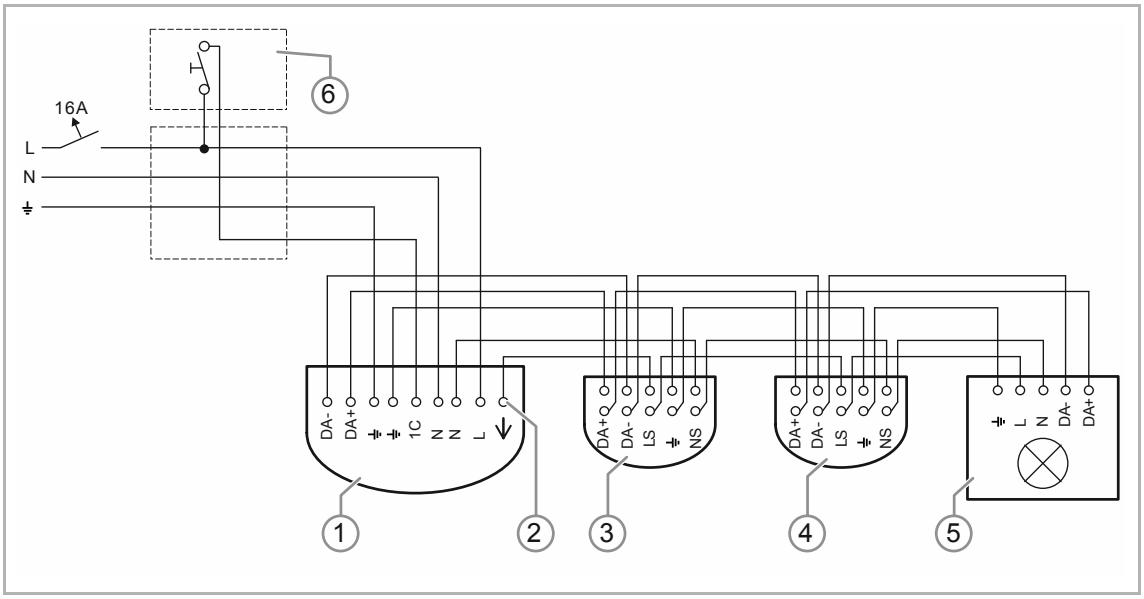


Fig. 40: Examples of switching: DALI light control system with extension unit and basic lighting in a larger office

[1] Universal BT, DALI

[2] When using voltage enabling of DALI operating devices.

[3] Universal, DALI Slave

[4] Universal, DALI Slave

[5] DALI operating device

[6] Extension push-button (e.g., for detection release in semi-automatic mode)

4.3 Sources of interference

Switching is normally activated by persons moving. However, there are also foreign heat sources that may cause unwanted activation. This should be taken into account during planning.

Possible sources of interference

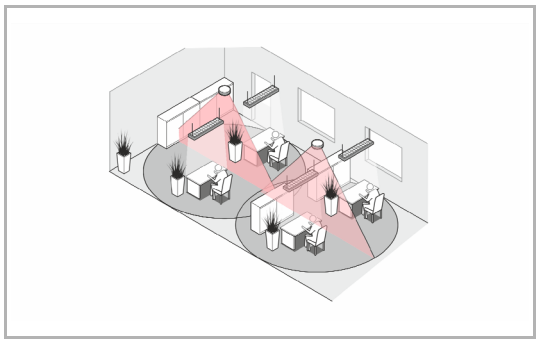


Fig. 41: Sources of interference: limited view

Limited view of the Busch-Presence detector

The detection range of the Busch-Presence detector may be obstructed by various objects, e.g.:

- Lamp strips that have been installed lower than the Busch-Presence detector
- Large plants
- Partitions
- Glass panes, etc.

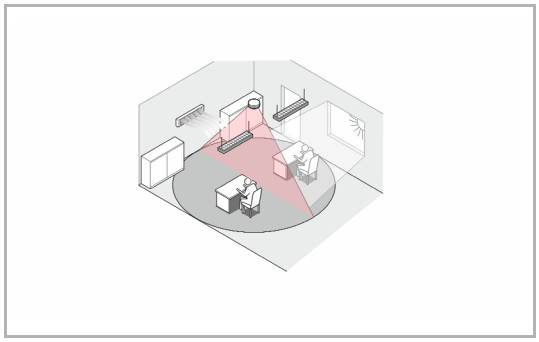


Fig. 42: Sources of interference: external heat sources

Foreign heat sources

Rapid temperature changes in the environment of the Busch-Presence detector may likewise trigger unwanted activation, e.g.:

- Additional fan
- Switching on/off of lamps in the direct vicinity (< 1.5 m) of the Busch-Presence detector, in particular incandescent lamps and halogen lamps
- Moving machines
- Swinging posters, etc.

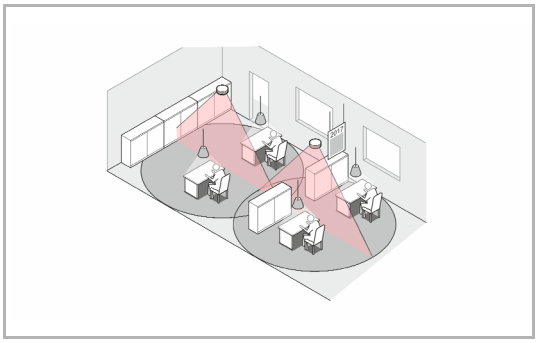


Fig. 43: Sources of interference: heat sources without interference effect

Heat sources without interference effect

If the temperature changes only slowly, this will not affect the switching behaviour of the Busch-Presence detector, e.g. on:

- Radiators (distance > 0.5 m)
- Surfaces heated by the sun
- EDP systems (computers, printers, monitors)
- Ventilation systems, when warm air does not flow directly into the Busch-Presence detector

Remedy

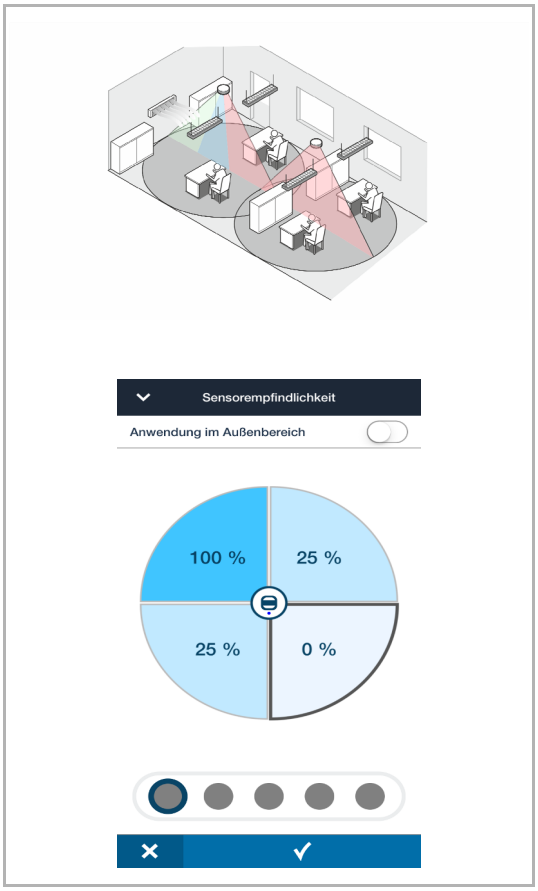


Fig. 44: Sources of interference: remedy

If such sources of interference cannot be excluded during planning, the use of devices with Bluetooth function are recommended.

In the case of these devices, individual sensitivity sectors can be reduced or turned off using the "ABB Watchdog Remote control" smartphone app.

5 Notes

6 Index

A member of the ABB Group

Busch-Jaeger Elektro GmbH
PO box
58505 Lüdenscheid

Freisenbergstraße 2
58513 Lüdenscheid

www.BUSCH-JAEGER.com
info.bje@de.abb.com

Central sales service:
Tel.: +49 2351 956-1600
Fax: +49 2351 956-1700

Notice
We reserve the right to make technical changes at all times as well as changes to the contents of this document without prior notice. The detailed specifications agreed upon apply for orders. ABB accepts no responsibility for possible errors or incompleteness in this document.

System Manual 2CKA001473B9577