

# PD2N-M-1C-LED

## Operation manual

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## 1. Basics

### 1.1 General

Passive infrared occupancy detectors register heat movements and convert them to signals that can be analysed by a processor.

The occupancy detector's general functionality is described in the instructions which come with the device.

Additional basic functions regarding motion detection and switching of the lighting are outlined below.

### 1.2 Mounting location

The most important factor in motion detection is the right choice of mounting location.

The occupancy detector should be mounted so that the main direction of motion is always tangential (side-to-side across the device).

The master device must always be installed at the location with least daylight.

The following sources of interference can lead to unwanted triggering, since they can also produce differences in temperature:

1. radiant heaters
2. ventilation systems which emit hot or cold air
3. lights directly in the detection area

Accordingly, the detector must be positioned far from these sources.

If even the smallest movements are to be recognised (e.g. working at a computer keyboard), we recommend that you choose a mounting location directly above the desk. This will ensure that detection takes place.

Please always follow the mounting height given for the devices. Smaller mounting heights reduce the range. Greater mounting heights increase the range but also reduce sensitivity.

### 1.3 Switching detector

The PD2N-M-1C-LED is a switching detector. The brightness level from which the lighting is switched on is freely selectable. In switching mode, this value is known as a switch-on threshold. If the brightness level measured by the detector is below the switch-on threshold set, any movement in the room will cause the lighting to switch on.

## 2. General device information

### 2.1 Basic characteristics



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The device is a bidirectional remote control-capable occupancy detector for interior applications with circular detection area and integrated LED light.

After switching off the main lighting, an orientation or night light can be activated with its integrated LED light. An individual brightness and follow-up time can be selected for both orientation and night light.

The following operating modes can be selected: full automatic mode, full automatic mode with corridor function and semi-automatic mode. The device can also be set up as a slave device.

## 2.2 Set-up of device (by remote control)



The device can be set up using the IR adapter and B.E.G. remote control app. No settings can be made on the device itself. The "B.E.G. LUXOMAT® Remote Control" smartphone app is available free in the Apple App Store and the Google Play Store.

For bidirectional devices, a compatible Samsung or Apple smartphone is required. A list of compatible smartphones is available on the B.E.G. website.

Instructions for using the smartphone app are available for download from the B.E.G. website. There are also short explanations attached to the setup options in the app itself.

Since the detector is remote control-capable bidirectionally, commands can be received and information can be sent. When selecting the device, the right remote control is displayed automatically and setup can be performed.

The detector's red LED flashes briefly as a confirmation that an IR signal has been correctly received.



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In addition, using the B.E.G. "IR-PD-Mini" remote control, the light can be switched on and off (top button) and all running timers can be reset (lower button).

## 2.3 Device PIN

The detector can be locked to prevent unwanted changes to settings. For this, a 4-digit PIN is assigned.

The device can be locked and unlocked with the chosen PIN. If the device is locked, values can only be read from it. After unlocking, the device automatically locks again after 30 minutes.

## 2.4 PIN deactivation

If you do not know the PIN, unlock the device as follows:

1. Disconnect operating voltage
2. Connect operating voltage for 31s to 59s
3. Disconnect operating voltage again
4. Connect operating voltage again and wait for the self-test cycle
5. The device is now open for 30 minutes. Using the app and the command „Factory Reset“, it is possible to deactivate the PIN permanently within this time.

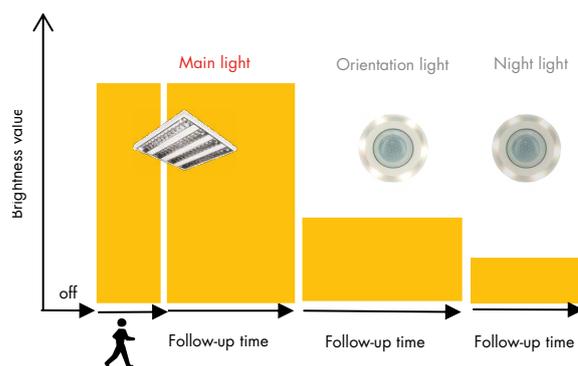
## 3. Self-test cycle

When the electricity is connected, the detector runs through a 60 sec self-test cycle. Different LED blink patterns (see the instructions included with the device) show whether the detector is already programmed or if the factory settings are active. Some functions can only be activated during the self-test cycle by sending the relevant parameters. Commands cannot be sent at this time.

Using the INI-ON and INI-OFF function (see section "Brief description of functions") you can select whether the main light is on or off during the self-test cycle.

## 4. Operating modes

### 4.1 Full automatic (FULL)



If the value measured by the light sensor is below the switch-on threshold set, detection of movement causes the main light to be switched on. Each new movement also restarts the follow-up time. After the follow-up time expires, the main lighting is switched off and the orientation light switched on if it is enabled. After the follow-up time for the orientation light expires, the night light is switched on if it is enabled. The follow-up times for main, orientation and night light are each freely selectable. Brightness levels can be set up separately for both orientation and night light.

If the night light is set to "permanent", it is switched on as soon as the measured light value falls below the switch-on threshold set.

It is possible to check periodically whether the orientation or night light can be switched off. For this, the LED light is switched off for approx. 1 sec and the ambient light is measured. The LED light is switched on again if the measured light level is below the switch-on threshold (remeasure brightness).

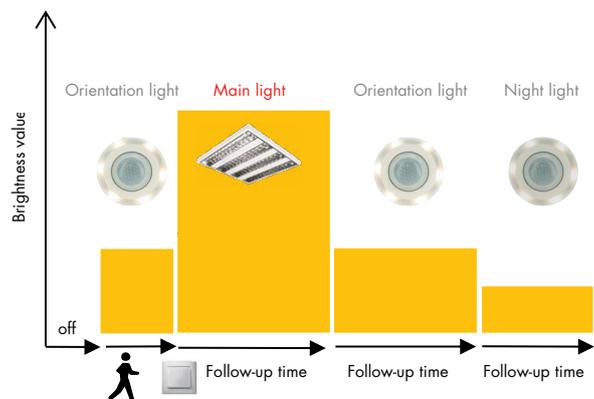
The main light can be switched off manually at any time with the switch. The device then switches into "Projector mode", meaning that the main light and LED ring remain switched off for as long as motion is detected plus the follow-up time that was set. Each newly-detected movement restarts the follow-up time. If no more movement is detected during one of these periods, Projector mode is ended and the detector reverts to normal mode (light is switched on with movement and remains on until no more motion is detected for one follow-up time period).

### 4.2 Full automatic with corridor function (FULL+CORRIDOR)

In corridor mode, the main light can be switched off manually at any time with the switch. The device is then in "Corridor mode". However, after manual switch-off of the main light, the follow-up time is only 5 sec, so that the person can leave the room. After that, the detector reverts to normal mode (FULL+CORRIDOR), meaning that movement

in the room switches the main light on again if the light level is below the switch-on threshold. In this case, the main light is switched off after the follow-up time expires and the orientation light, if enabled, is switched on. After the follow-up time for the orientation light expires, the night light, if enabled, is switched on.

### 4.3 Semi-automatic (HALF)



If the value measured by the light sensor is below the switch-on threshold set, detection of movement causes the orientation light to be switched on. After the follow-up time for the orientation light expires, the night light, if enabled, is switched on.

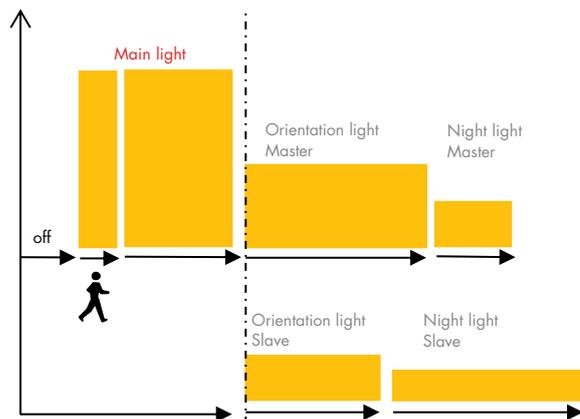
In this mode, the main light must be manually switched on via a connected switch. After the follow-up time expires, the main light is switched off and the orientation light, if enabled, is switched on.

The main light is switched back on automatically if there is movement in the 10 sec after the end of the follow-up time. After this time has elapsed, the switch must be pressed again.

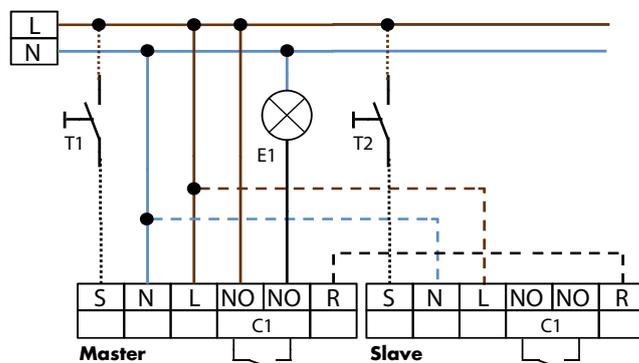
In this mode, the main light can also be switched off manually at any time with the switch. The main light and LED ring remain off for as long as motion is detected (Projector mode). Each newly-detected movement restarts the follow-up time period. If no movement is detected during such a period, the function is ended. The orientation light is switched on again if a movement is detected and the measured light level is below the switch-on threshold.

If the night light is set to "permanent", it is switched on as soon as the measured light value falls below the switch-on threshold set. Here too, the LED ring can periodically be switched off for 1 sec and the current light level measured, so that the night light can be switched off if the light level is sufficient.

### 4.4 Master-Slave mode



If several detectors are used connected together, one device must be the master and configured accordingly. The other devices are defined as slave devices via the smartphone app. Switches can be connected to both the master and the slave devices.



The purpose of a device defined as a slave device is to transmit motion and switch signals to the master device, which then switches the main light accordingly. By contrast, the orientation and night lights are set up separately on each slave device.

Both when the main light is switched on and when in projector mode, the master device sends an "LED OFF" telegram to the slave devices so that these can switch off the LED light. This process is repeated every 2 sec.

### 5. Daylight-dependent switch-off

After the light is switched on, the detector calculates an internal switch-off threshold. The current light value must be above this switch-off threshold for a certain duration before the detector switches off the main light (delayed switch-off).

In order to avoid unwanted frequent and unnecessary switching on and off of the lighting, after the light has been switched off due to daylight levels rising, the detector also waits a certain duration (delayed switch-on) before the light can be switched on again from a new movement.

### 6. External push button functions

(For circuit diagrams see section "Master-Slave mode"; for explanation of functions see section "Brief description of functions")

Short and long push button presses are differentiated. A short press lasts 0.1-1 sec. A long press must be longer than 3 sec.

	<b>short press</b>
FULL / HALF main light <b>on</b>	Main and LED light OFF (if movement is detected, and during the follow-up time; Projector mode)
FULL / HALF main light <b>off</b>	Main light ON (if movement is detected, and during the follow-up time)
FULL+CORRIDOR main light <b>on</b>	Light off (Corridor mode)
FULL+CORRIDOR main light <b>off</b>	Main light ON (if movement is detected, and during the follow-up time)

## 7. Brief description of functions

### Projector mode:

If the main light is switched off manually, both the main light and LED ring remain switched off for as long as motion is detected plus the follow-up time that was set.

### Orientation light operation:

If the orientation light is enabled, after the follow-up time expires, the orientation light is switched on.

### Night light operation:

If the night light is enabled, after the orientation light follow-up time expires, the night light is switched on.

### Test mode:

Test mode is for determining the size of the detection area (range). For this purpose, when each movement is detected, the master device switches on the main light and the slave device(s) switch on the LED light for 2 sec, then off for 2 sec.

### Status LEDs:

The LEDs for displaying mode/function can be enabled or disabled, e.g. in bedrooms.

### Remeasure brightness:

If the follow-up time set for the night or orientation light is longer than the duration defined here, the LED ring is switched off for a short period (1 sec), in order to allow measurement of the current daylight level.

### INI-ON / INI-OFF:

INI-ON = the main light is switched on during the self-test cycle.

INI-OFF = the main light is switched off during the self-test cycle.

### Reflection factor:

The brightness value at a workstation differs from the brightness measured by the occupancy detector at the ceiling (light is reflected from the floor, work surface or walls). The reflection factor is the ratio between the brightness measured by the detector at the ceiling and that measured by a lux meter at the work surface. Under normal room conditions, the reflection factor is around 2 or 3.

## 8. Factory settings / set-up options

The bold values are the factory settings.

Note: With a switch-on threshold of 2000 lux, light analysis is disabled, meaning that the detector works independently of light levels.

<b>Device</b>	
Device PIN	<b>No PIN</b> (0000-9999)
Lock device	0

Mode	<b>FULL</b> (FULL, HALF, FULL+CORRIDOR, SLAVE)
INI light	<b>on</b> (on, off)
Switch-on threshold	<b>500lx</b> (10lx - 2000lx) [2000lx = Light analysis disabled]
Sensitivity	<b>HIGH</b> (MAX, HIGH, MID, LOW, MIN)
Reflection factor	<b>2</b> (1-5)
Status LEDs	<b>Function enabled</b> (enabled, disabled)
Remeasure brightness	<b>02:00:00</b> (2 hours) (disabled, 15min - 65535s)
<b>Main light</b>	
Follow-up time	<b>00:15:00</b> (15min) (10s - 65535s)
<b>Orientation light</b>	
Brightness value	<b>50%</b> (disabled, 10% bis 100%)
Follow-up time	<b>00:15:00</b> (15min) (10s - 65535s)
<b>Night light</b>	
Brightness value	<b>disabled</b> (disabled, 10% bis 100%)
Follow-up time	<b>00:05:00</b> (5min) (10s - 65535s)

## 9. Commands and parameters

### 9.1 Parameters

#### INI light

 The INI-ON and INI-OFF functions determine whether the main light is switched on (INI-ON) or off (INI-OFF) during the self-test cycle. The factory setting is light on during self-test cycle.

#### Switch-on threshold

 The brightness level from which the lighting is switched on is described as the switch-on threshold, and is freely selectable. Below this level, the light is switched on by movement.

CAUTION: The brightness value is measured continuously. The only time that the value is not measured continuously is in orientation and night light mode (LED light). See description under "Remeasure brightness".

#### PIR sensitivity

 With a high (detection) sensitivity, even small movements are detected and large areas are covered.

#### Reflection factor

 To compare the difference between light level at a workstation and at the ceiling, a reflection factor can be set on the detector.

#### Status LEDs

 This button allows the status LEDs to be enabled or disabled. Status LED functions are described in the instruction manual.



#### Remeasure brightness:

This is where the duration is set for current light level check (see Brief description of functions).

#### Main light:



#### Follow-up time

This is the duration after a movement, during which the connected main lighting remains switched on.

#### Orientation light (LED):



#### Brightness value

This value defines the brightness of the orientation light. This can also be disabled.



#### Follow-up time

This is the duration after a movement or after switching off the main light, during which the LED orientation light remains switched on.

#### Night light (LED):



#### Brightness value

This value defines the brightness of the night light. This can also be disabled.



#### Follow-up time

This is the duration after the orientation light is switched off, during which the LED night light remains switched on.

## 9.2 Commands



#### Reset to factory settings

This command resets the device to its factory settings. CAUTION: individually-installed settings will be lost.



When restarted, all running timers will be stopped and the device goes back to its base settings. Motion detection will be disabled for 10 sec.



#### Test mode

Test mode is started.



Test mode is ended.



#### Save brightness

This button allows measurement of ambient light and saves this value as the switch-on threshold.

CAUTION: before measuring, the light must be switched off with the remote control or, if available, a push button. Only after this will the button be enabled.



#### Switch light

The main light is switched on and the follow-up time is started. In conjunction with this, any switched on orientation/night light (LED light) is switched off.



The main light is switched off and the device goes into "Projector mode" (see also Brief description of functions).



#### Switch orientation light

The orientation light is continuously switched on.

CAUTION: The orientation light can only be switched off again with the "Orientation light OFF" command.



The orientation light is switched off and the device goes back to the selected mode.

## 10. Trouble shooting

### 1. Lamp does not light up

- Lamp may be defect:  
*Replace lamp*
- No mains connection/power:  
*Check connection and mains fuse by qualified electrician*
- Lens of sensor unit obstructed by dirt or other objects:  
*Clean lens, remove objects*

### 2. Lamp turns ON too late or detection range too small

- The detector is mounted too high:  
*Correct mounting if required.*

### 3. Lamp stays ON continuously

- Continuous thermal activity detected within detection area:  
*Remove heat source. Check proper function of the detector by covering the fresnel-lens. After expiry of the follow-up time, the detector has to turn OFF lighting.*
- The detector is connected in parallel to a manual override switch:  
*Connect switch correctly*

### 4. Unintended switching of light

- Movement of heat sources within detection area:
  - *Do not install the detector in the vicinity of radiators, fans or air vents.*
  - *Animals are detected as moving heat sources, too.*