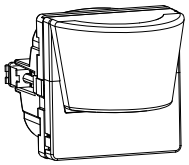
Lauritz Knudsen

by Schneider Electric

KNX FUGA® Movement detector 180

Operating instructions



Art.-Nr. 507D6350, 507D5350, 507D8350

For your safety

DANGER
Risk of fatal injury due to electrical current
All work on the device must only be carried out by trained and skilled electricians. Observe the country-specific regulations as well as the valid KNX guidelines.

Information about the FUGA movement detector

The movement detector detects moving heat sources, (e.g. people), within a radius of 180° and up to a distance of approx. 9 m at an mounting height of 2.15 m.

The range refers to average conditions for the specified mounting height and is therefore a guide value. The range and sensitivity can vary greatly when the temperature fluctuates.

When a movement is detected, a defined data telegram is transmitted. The rotary switch for detection brightness is used to regulate from which ambient brightness level at which movements should be detected. Here, values between 10 and 1000 lux are possible (in the ETS value from 10 to 2000 lux are possible). The range and the overshoot time can be set at two further rotary switches.

The movement detector also has two movement sensors. You can set their sensitivity and range sector-specifically in the ETS.

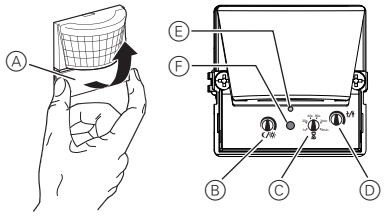
The movement detector has an integrated bus coupler and its power is supplied via KNX.

Using FUGA movement detectors with alarm systems

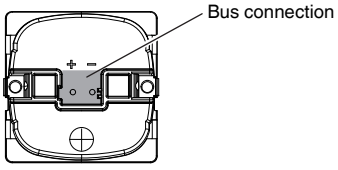
Movement detectors are not suitable for use as components of an alarm system as defined by the German insurance industry association VdS (Verband der Sachversicherer).

Movement detectors can trigger false alarms if the installation site has been chosen unfavourably. (see section "Selecting the installation site")

Connections, displays and operating elements

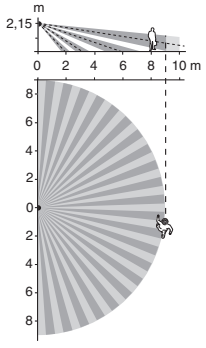


Ⓐ Cover
Ⓑ Setting the detection brightness
Ⓒ Setting the overshoot time
Ⓓ Setting the range
Ⓔ Programming LED
Ⓕ Programming button

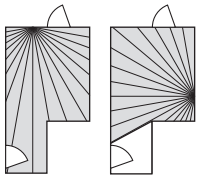


Selecting the installation site

- Observe the area of detection: Any mounting height which deviates from this will affect the range.



- Install the movement detector laterally with respect to the direction of movement so that the beam paths are intersected as vertically as possible.
- Only mount the movement detector in positions which allow the required area to be monitored optimally.

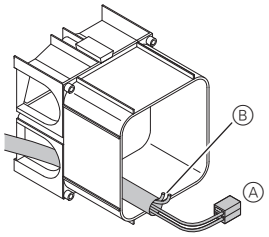


- In order to ensure continuous monitoring, e.g. of a long hall, the areas of detection have to intersect.
- Movement detectors can detect all objects that radiate heat. You should select an installation site that will not result in undesired heat sources being detected, such as:
  - switched-on lights in the area of detection
  - open fires (such as in fireplaces)
  - windows where the influence of alternating sunlight and clouds could cause rapid changes in temperature.
  - larger heat sources (e.g. cars), that are detected through windows.
  - sunlit rooms with reflecting objects (e.g. the floor), which can be the cause of rapid changes in temperature.
  - windowpanes heated up by sunlight
  - dogs, cats, etc.
- Install movement detectors in a wind-resistant switch box: With switch boxes and pipe cabling systems, a draught at the back of the equipment could trigger the movement detector.
- Avoid direct sunlight. This can destroy the sensor in extreme cases.

Mounting the FUGA movement detector

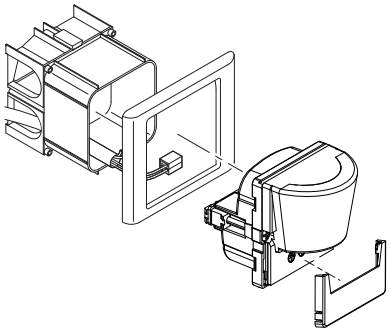
The movement detector is mounted and fitted on standard LK installation boxes: Boxes for frontal insertion, flush-mounted boxes, on a base and CLICK'LINE channel boxes.

Bus connection



① Connect the red bus wire to the red terminal (+) and the black bus wire to the dark grey terminal (-) Ⓐ.
② Store the screen and the stability wire, as well as the white and yellow bus wire Ⓑ in the mounting box. They are not required.
③ Connect the terminal to the bus connection.

Mounting the movement detector in a mounting box



① Place the movement detector with frame into the box.
② Fix the movement detector in the box by tightening the screws.
③ Put on the cover.

Putting the FUGA movement detector into operation

① Make the desired settings in the ETS.
② Press the programming button.

The programming LED lights up.

③ Load the physical address and application into the device from the ETS.

The programming LED goes out.

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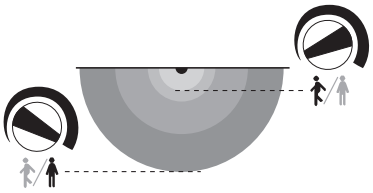
Setting the FUGA movement detector

Below the cover it is possible to adjust the range, the detection brightness and the overshoot time. These settings can also be made in the ETS.

Setting the range

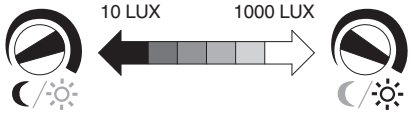
Here, you can set, in 10 steps, up to which distance movements are to be detected.



At maximum range, the movement detector detects smaller movements and therefore reacts more quickly to undesired sources of heat.

Setting the detection brightness

Here you can infinitely adjust, from which ambient brightness the device should be activated.



- Moon symbol: movements are only detected in the dark (up to approx. 10 lux).
- Sun symbol: movements are detected up to approx. 1000 lux
- Right stop: Movements are detected independently of the ambient brightness.

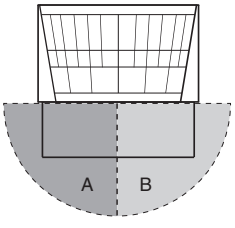
Setting the overshoot time

With the overshoot time you specify how long the connected load will remain switched on after the last movement has been detected. Depending on the ETS application, the overshoot time is either set in the ETS program (any time between 1 second and 255 hours) or directly on the device (six steps from approx. 1 second to approx. 8 minutes).

Depending on the settings in ETS, each registered movement can reset the overshoot time from the beginning. If the movement detector no longer switches off, it may be because it is continually detecting new movement and thus extending the overshoot time.

Setting the movement sensors

The movement detector has two movement sensors "A" and "B". You can regulate their sensitivity and range sector-specifically in the ETS.



Technical data

Nominal voltage:	DC 24 V (+6 V / -4 V)
KNX connection:	bus connecting terminal
Angle of detection:	180°
Number of movement sensors:	2, sector-orientated, adjustable (ETS)
Recommended mounting height:	1 m bis 2,5 m
Range:	bei 2,15 m Einbauhöhe: ca. Approx. 9 m on all sides, adjustable in 10 steps (rotary switch or ETS)
Detection brightness:	Infinite setting from approx. 10 lux to approx.1000 lux (rotary switch) or from 10 lux to 2000 lux (ETS)
Overshoot time:	Adjustable in 6 steps from approx. 1 s to approx. 8 min (rotary switch) or adjustable from 1 s to 255 hours (ETS)
Display elements:	1 red programming LED
Operating elements:	1 programming button, rotary switch for detection brightness, range, and overshoot time
Ambient operating temperature:	-5 °C to +45 °C
EC guidelines:	Low-voltage guideline 2006/95/EC, EMC guideline 2004/108/EC
Initialisation:	Due to the limitation of the telegram rate, a telegram cannot be generated until 20 seconds after initialisation at the earliest.
Type of protection:	IP 20

Further information:

Further documentation can be found at **www.LK.dk.** Operating instructions and databases are located here.

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Settings in the EIB Tool Software (ETS)

Selection in the product database

Manufacturer	Schneider Electric Industries SAS
Product family	3.12 Movement detectors danish
Program type	3.12.1 Movement detectors FUGA OPUS
Program name	Movement/monitoring 1306/1.0
Media type	Twisted Pair
Product name	KNX FUGA Movement detector 180
Order number	507Dx350

Manufacturer	Schneider Electric Industries SAS
Product family	3.12 Movement detectors danish
Program type	3.12.1 Movement detectors FUGA OPUS
Program name	Movement/monitoring 1306/1.0
Media type	Twisted Pair
Product name	KNX OPUS Movement detector 180
Order number	507Nx350

The application is ETS 3 compatible.

Movement/monitoring 1306/1.0

Application 1306/1.0 has been developed for the KNX movement detector. In the following the device will be referred to as the movement detector.
The movement detector will not switch the lighting on until it detects movement in front of the device when the ambient brightness is too low. If movement is no longer detected in the activated state, the integrated staircase timer will switch the lighting back off.
The ETS application includes 5 independent movement blocks, each with 4 output objects.
The technical data for the movement detector may be found in the description of the device.

All the settings described refer to ETS version 3, but you can use all the settings and functions with ETS version 2 as well.
The application files (vd2 and vd3) are configured in such a way that the application loading time is considerably reduced. When you convert an ETS 2 project to ETS 3, you lose this time saving. If you are working with ETS 3, use the vd3 files.
Total possible addresses and connections:
254 addresses; 255 connections

If you switch back to the preset values in either ETS 2 or ETS 3 (by clicking "Standard"), all the values that you have changed so far will be deleted. Any group addresses which have been parameterised will be lost.

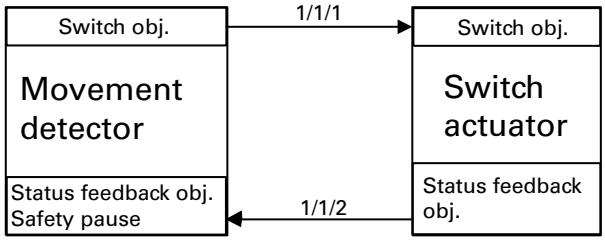
Because various functions depend on other functions, these dependant functions are only visible and selectable in the ETS when the preceding function has been enabled. If you de-select functions or parameters, group addresses that have already been connected may be removed.

Getting started quickly

When you insert the application in the ETS or click on the "Standard" button, the ETS application will switch automatically to minimum configuration.

In minimum configuration, it is possible to put the movement detector into operation. For some application cases, the minimum configuration is even adequate for practical use. We also recommend opening minimum configuration as a way of familiarising yourself with the application software for the movement detector. Here all of the extended or more complex parameters are disabled. In "Block configuration" only the first "Movement block" is enabled for use. In the "Telegrams" tab only output object 1 is enabled. This is a 1 bit output object. At the start of movement this object sends a 1 telegram and when the internal staircase timer has elapsed it sends a 0 telegram. Each parameter can always be tuned to its individual requirements. The brightness threshold and the staircase timer always need to be adjusted to suit requirements. Check the "Brightness" and "Times" tabs.

In this way the corresponding objects are connected to a KNX switch actuator.



To familiarise yourself with the extended and more complex parameters see the following pages.

General functions

The common safety pause

When lights installed in the area of detection of the movement detector are switched, optical feedback can occur. The temperature difference between the luminaires or the change in the infrared spectrum can be interpreted as a movement by passive infrared movement detectors (optical feedback).

The application has a common safety pause system - in other words, a safety pause triggered by the movement detector will affect all blocks in the application. As specified in a parameter the safety pause can be triggered at the status feedback object (safety pause) when there is an OFF telegram or when there is an OFF and ON telegram.
The status feedback object of the switching/dimming actuator must be connected to the feedback safety pause object of the movement detector.
Once a safety pause has been started, signals from the movement sensor will no longer be evaluated for this period of time. An elapsed staircase timer cannot be started by a movement during an active safety pause and an ongoing staircase timer cannot be retriggered by a movement.
An ongoing staircase timer is not affected by a safety pause being activated. In other words, the staircase timer will run through in the usual way.

Optical feedback can only be avoided by selecting the right installation site for the movement detector and the lighting. The safety pause system and the safety pause object of the application cannot compensate for all planning mistakes.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Safety pause	Status feedback object	1 bit	Low	WC	Receive

Parameter

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

General	
Parameter	**Setting**
Safety pause via status feedback object	Disabled **For OFF telegram** For ON and OFF telegram
Safety pause (1 - 20) seconds	1 - 20; preconfiguration: **2**

General brightness evaluation

The current brightness can be determined by the internal brightness sensor, by an external communication object or by both dependencies. The relationship between internal and external values can be parameterised while doing this.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
External sensor	Actual value input	2 byte	Low	WCT+	Transmit/ receive/ update

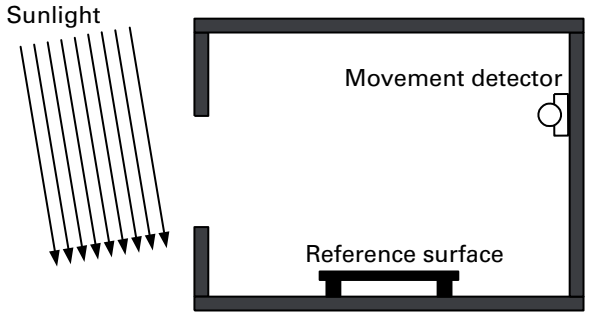
Parameter

General	
Parameter	**Setting**
Actual value (brightness)	**From internal sensor**
	From object, actual value input
	From internal sensor and object
Taking the separately measured lux value (0% - 100%) into account	0% - 100%, in 5% steps; preconfiguration **50%**

Actual value correction

The measured brightness value (actual value) can be corrected. A distinction is drawn here between the installation site of the movement detector and the reference area (a desk surface, for example). The brightness value of the reference area is determined with the aid of actual value correction and taking the brightness value measured by the movement detector at the installation site and an internal adjustment curve into account.

For actual value correction you will need a luxmeter. The measured lux values are then input into the application software of the movement detector.
When intense sunlight is shining onto the reference area or the installation site, the measurements should not be taken. Under certain circumstances darkening the room may improve the measurement results.



Optimal light conditions for actual value correction. Measurement results at the installation site or at the reference area are affected equally by natural light.

Four measurements are required for actual value correction:

– Artificial lighting is switched off, brightness is measured at the movement detector installation site.
– Artificial lighting is switched on (maximum brightness), brightness is measured at the movement detector installation site.
– Artificial lighting is switched off, brightness is measured at the reference area (desk, for example).
– Artificial lighting is switched on (maximum brightness), brightness is measured at the reference area (desk, for example).

The four lux values measured are entered in the application software. When "Actual value correction" is enabled, four fields are available on the "General" tab. "Light switched off" or "Light max. brightness" for the actual value at the installation site. The same applies to the actual value at the reference area.

The brightness value determined applies to all movement blocks. This value can be transmitted cyclically to the bus.

Should the situation in the room change due to different furniture, floor coverings or ceiling, for example - in other words, when reflective surfaces in the room change - take a new measurement. The measured values are entered into the application software. The movement detector will then need to be reprogrammed.

An actual value correction only makes sense in conjunction with a dimming actuator and an 8 bit status feedback.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Transmit	Resulting actual value	2 byte	Low	CT	Transmit
Brightness value, dimming actuator	Status feedback	1 byte	Low	WCT+	Transmit/ receive/ update

Parameter

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

General	
Parameter	**Setting**
Actual value correction	Enabled **Disabled**
Actual value (0 - 2000 lux) installation site	
Lamp switched off	0-2000; preconfiguration **50**
Max. brightness of lamp	0-2000; preconfiguration **100**
Actual value (0 - 2000 lux) reference area	
Lamp switched off	0-2000; preconfiguration **100**
Max. brightness of lamp	0-2000; preconfiguration **350**
Transmit actual value cyclically, reference area (or from installation site)	Enabled **Disabled**
Time base, send lux value	1 s **1 min** 1 hr
Time factor, send lux value (1 - 255)	1-255; preconfiguration **30**

Movement block

Basic function of a movement block

A staircase timer is "integrated" into a movement block. When the ambient brightness is too low **and** a movement is detected, the movement block transmits an ON telegram to the bus. When no further movement is detected the staircase timer starts. An OFF telegram is transmitted to the bus after a parameterised time.
Brightness is measured **only** at the moment when the first movement is detected. If further movement is detected, an OFF telegram is **not** transmitted, irrespective of brightness changes. The staircase timer starts only when movement is no longer detected, and an OFF telegram is transmitted after the parameterised time period.

Block configuration

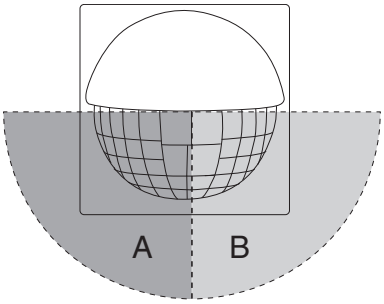
Up to five movement blocks are available. In the default setting, block 1 is enabled.

Parameter

Block configuration	
Parameter	**Setting**
Movement/presence block X	Enabled **Disabled**

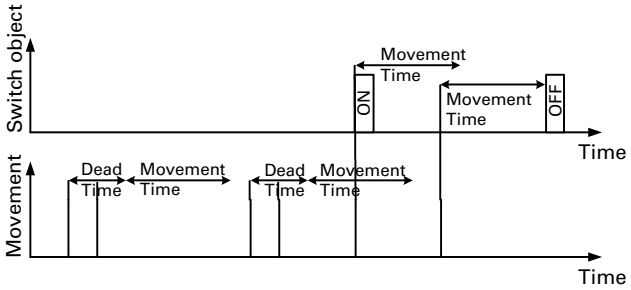
Movement detection

The device has a detection angle of 180°. The 180° detection angle is divided into two sectors. The sectors are each 90° and are designated by the letters A and B.



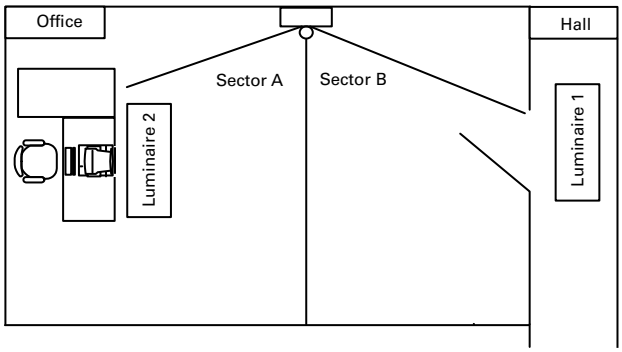
Two independent passive infrared sensors (sectors A and B) input into movement detection. Via the ETS it is possible to parameterise both sensors at the same time or each sector can be parameterised individually. In the "Movement sensors" tab, the settings "Enabled" or "Disabled" can be made. When the sector-orientated settings are disabled, sensitivity and range for both sensors will be changed to the same degree.
When the sector-orientated settings are "Enabled," further tabs where sectors A and B can be parameterised individually appear. "Object range" and "Dead time, movement start" each relate to both sensors of the block in question. For each movement sensor the range and the sensitivity can be set for each block via

parameters. Alternatively, depending on the parameterisation, the values can be set by means of a potentiometer on the device. Another option is setting the range via the Range communication object which can be enabled for each block. To suppress disturbance variables or if delayed activation is required, a dead time for the start of movement can be activated. The dead time is started after movement has been detected (start of movement). The start of movement action (transmitting a telegram to the bus) can take place if a movement is still detected within the movement time after the dead time has elapsed.



In master mode or normal mode the movement time corresponds to the staircase timer in the diagram above. In slave mode or monitoring mode the movement time corresponds to the cycle time. In practice a large number of applications can be implemented by means of the various blocks and sensors.

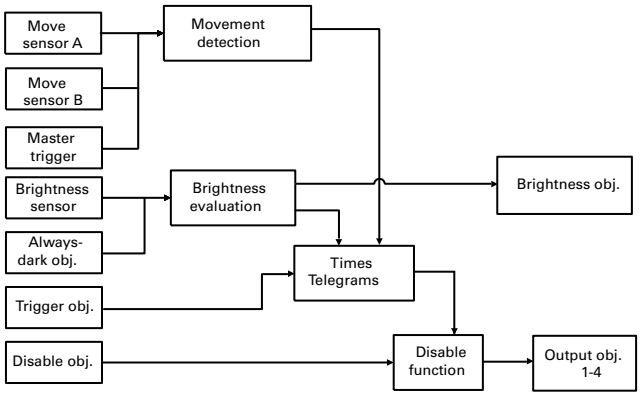
An example of practical application:



- Luminaire 1 should only switch on when there is a movement in the hall.
- Sector A is disabled for movement block 1, sector B is enabled and switches luminaire 1
- Luminaire 2 should only switch on when there are movements near the desk.
- Sector A is enabled for movement block 2 and switches luminaire 2, sector B is disabled.

Block diagram of movement block

A block diagram clarifies the relationships between the individual dependencies:



Movement evaluation

As has already been stated above, the two movement sensors input into movement detection.
The master trigger object is brightness-dependent and with an ON telegram simulates a movement; an OFF telegram is ignored.
The trigger object is brightness-independent and also simulates a movement for an ON telegram. Whether the trigger object can switch the lighting off early when there is an OFF telegram can be parameterised.

The master trigger object and the trigger object do not appear in the ETS until the device operating mode has been set to "Master mode". See "Block X, general" tab, parameter: "Operating mode". The master/trigger object ignores the dead time (for Dead time, see above) and reacts without a delay. More detailed information about the master/trigger object may be found later on.

Communication objects

You can select the following communication objects:

Block X, general movement sensors:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Range	1 byte	Low	WC	Receive

Parameter

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

Block X, general - movement sensors	
Parameter	**Setting**
Sector-orientated settings	Enabled
	Disabled

The following settings are only visible when "Sector-orientated settings" is "Disabled".

Sensitivity (for all sensors)	**High**
	Medium
	Low
Range (for all sensors)	10% - 100% (in 10% steps) preconfiguration: **100%**

The following settings are only visible when "Sector-orientated settings" is "Enabled".

Range object (for all sensors)	**Disabled**
	Enabled
Dead time, start of movement (for all sensors)	**Disabled**
	Enabled
Time base	**1 min**, 1s
Time factor (1-255)	**3**, (1-255)
Sector X	**Enabled**
	Disabled

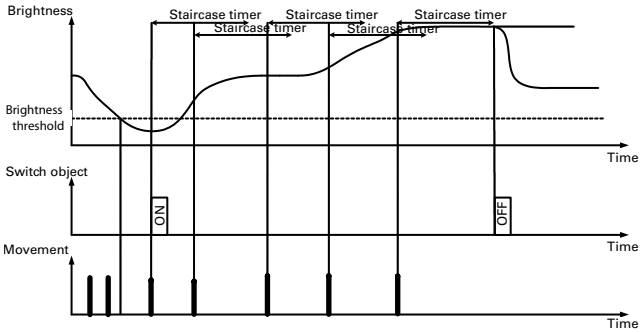
Block X, general movement sensors sector X	
Parameter	**Setting**
Sensitivity	**High**
	Medium
	Low
Range adjustable via	**Parameters**
	Potentiometer

The following parameters are only visible when "Range adjustable" "via parameter" is set.

Overwrite range during download	**Enabled**
	Disabled
Range	10% - 100% (in 10% steps) preconfiguration: **100%**
Change range via object	**Disabled**
	Enabled

Brightness evaluation

Brightness evaluation of a movement detector:



The movement detector changes to non-brightness-dependent mode once the start of movement action (sending an ON telegram) has been carried out. Here freshly detected movements can retrigger the staircase timer.

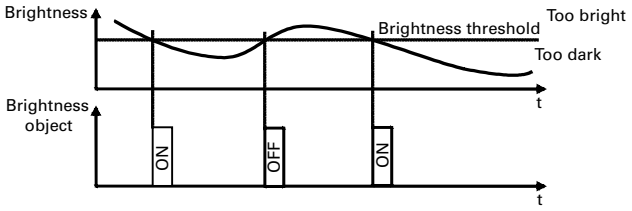
Brightness

The brightness threshold can be parameterised separately for each of the five movement blocks. Each block has its own "Brightness" tab. A staircase timer can be started (depending on parameterisation of the device) and an ON telegram transmitted to the bus only after the value is below the parameterised brightness threshold and the movement detector detects a movement. The brightness threshold can be set between 10 and 2000 lux. Alternatively, depending on the parameterisation, the values can be set by means of a potentiometer on the device.

Via the parameter "Brightness threshold object" "Enabled" or "Disabled" you can select whether the brightness threshold should be changed via the bus. This can be useful when several presence detectors are installed in a building. The brightness threshold can be changed using the "Brightness threshold - Block X" object via the ETS or an IP touch panel, for example. The brightness threshold is set to the same level in all parts of the building.

Brightness object 1 bit

The brightness object sends a 1 bit value to the bus. If the parameterised brightness threshold is not reached, an ON telegram can be transmitted. If the parameterised brightness threshold is exceeded, an OFF telegram can be transmitted. Inverted transmission can also be set.



Always-dark object

In the case of an enabled "always-dark object", darkness can be simulated internally in the movement detector depending on the object value. The "always-dark object" is used with master/slave circuits. Planning master/slave circuits is described further below.

Communication objects

You can select the following communication objects:

Block X, general brightness:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Brightness threshold	2 byte	Low	WC	Receive
Block X	Brightness object	1 bit	Low	CT	Transmit
Block X	Always-dark object	1 bit	Low	WC	Receive

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

Parameter

Block X, general brightness	
Parameter	**Setting**
Movement detection is	**Brightness-dependent**
	Not brightness-dependent
Brightness threshold adjustable via	**Parameters**
	Potentiometer

The following parameters are only visible when "Range adjustable" "via parameter" has been parameterised.

Overwrite brightness threshold during download	**Enabled**
	Disabled
Brightness threshold (10 - 2000 lux) see "General" tab	10 - 2000 lux; preconfiguration: **130**
Brightness threshold object	**Disabled**
	Enabled
Reaction when brightness sufficient despite movement	**Like presence detector**
	Like movement detector
Hysteresis (10% - 50%)	10 - 50%; preconfiguration: **25**
Pause for measuring the brightness (1 - 120) seconds	1 - 120 seconds; preconfiguration: **4**
Brightness object 1 bit	**Do not send**
	Transmit
	Transmit inverted
Always-dark object (= not brightness-dependent)	**Disabled**
	Enabled

The following parameter is only visible when "Always-dark object" is "Enabled".

Always-dark object is active	**For object value "1"**
	For object value "0"

Operating modes

The operating mode in which this block operates is specified in the application software for each block (movement blocks 1 - 5). The following operating modes are available:

– Normal mode
– Master mode
– Slave mode
– Monitoring mode

Depending on the operating mode different parameters and communication objects will be displayed. Each operating mode can operate brightness-dependently or non-brightness-dependently.

Normal mode

In this operating mode the movement detector does not have any external trigger objects (master trigger object, trigger object). Telegrams cannot be sent cyclically and this means a master-slave system cannot be set up. In the default setting, the movement detector transmits an ON telegram at the start of movement and transmits an OFF telegram when the movement time (staircase timer) has expired.

Use the "Normal mode" setting when the movement block is working for itself alone. In other words, one movement detector is used for each room and it switches one light or one light panel.

Master mode

With master mode all of the possible parameters and communication objects of the movement detector are available. A master-slave system can be set up with the aid of the master trigger object or the trigger object. In the default setting, the movement detector transmits an ON telegram at the start of movement and transmits an OFF telegram when the movement time (staircase timer) has expired.

Use the "Master mode" setting when a master-slave system is to be set up. In other words, when, for example, several movement detectors are to be used in a room. One movement detector evaluates the brightness and functions as master, the other movement detectors work non-brightness-dependently as slaves and "drive" the master. Planning master/slave systems is described further below.

Slave mode

In slave mode the default setting is that ON telegrams are sent cyclically when a movement is detected. These telegrams are intended for the master trigger object or for the trigger object of the master.

Use the "Slave mode" setting when a master-slave system is to be set up. In other words, when, for example, several movement detectors are to be used in a room. One movement detector evaluates the brightness and functions as master, the other movement detectors work non-brightness-dependently as slaves and "drive" the master. Planning master/slave systems is described further below.

Monitoring mode

In monitoring mode the default setting is that ON telegrams are sent cyclically when a movement is detected. At the end of the movement time (cycle time with movement) OFF telegrams are transmitted cyclically.

Use the "Monitoring mode" setting when the movement detector is being used for room monitoring and telegrams are to be sent cyclically to the bus.

Communication objects

You can select the following communication objects:

Block X, general:

Function	Object name	Type	Prio	Flags	Behaviour
The objects are only visible in operating mode: "Master mode"					
Block X	Master trigger object	1 bit	Low	WC	Receive
Block X	Trigger object	1 bit	Low	WC	Receive

Parameter

Block X, general	
Parameter	**Setting**
Operating mode	**Normal mode**
	Master mode
	Slave mode
	Monitoring mode

When toggling between operating modes the "Brightness" and "Times" tabs change.

Telegrams

For each movement block the "Action at start of movement" can be set as a function of the operating mode.

Normal mode:
- "Send immediately"
- "Do not send"

Master mode:
- "Send immediately"
- "Send immediately and then cyclically"
- "Do not send"

Slave mode:
- "Send immediately and then cyclically" (is permanent setting in the background of the application software, is not displayed in the parameters)

Monitoring mode:
- "Send immediately and then cyclically" (is permanent setting in the background of the application software, is not displayed in the parameters)

The behaviour after the "End of movement time" can also be set as a function of the operating mode:

Normal mode:
- "Send after staircase timer/remaining time has elapsed"
- "Do not send"

Master mode:
- "Send after staircase timer/remaining time has elapsed"
- "Send after staircase timer has elapsed and then cyclically"
- "Do not send"

Slave mode:
- "Do not send" (is permanent setting in the background of the application software, is not displayed in the parameters)

Monitoring mode:
- "Send at end of cycle time when there is movement and then cyclically" (is permanent setting in the background of the application software, is not displayed in the parameters)

Four output objects are available for each of the five movement blocks and they can be enabled via the application software. A transmission pause between the individual output objects can be set for each block.

Five movement blocks and four output objects per movement detector means that 20 switching/value objects in all are available.

Parameter

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

Block X, general telegrams	
Parameter	**Setting**
Action at start of movement	**Send immediately**
	Do not send
	Send immediately and then cyclically
When movement time elapsed	**Send after staircase timer/remaining time has elapsed**
	Do not send
	"Send after staircase timer/remaining time has elapsed and then cyclically"
Output object X (1 - 4)	**Enabled**
	Disabled
Pause between two telegrams (3 - 255) x 100 ms	3 - 255; preconfiguration: **5**

Output for switching/value object X

For each output object you can select between a 1 bit, 1 byte (0% - 100%), 1 byte (0 - 255) and 2 byte object. The telegram values should be parameterised for the start of movement and for the end of the movement time. Here an object can transmit its current value or a defined value to the bus.

The current value can be transmitted by a time switch, for example. During the night a lower byte value is transmitted to the output object of the presence detector than in daytime hours.

Communication objects

You can select the following communication objects:

Block X general - telegrams - output for switching/ value object X:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Switch object X	1 bit	Low	WCT	Transmit/receive
Block X	Value object X	1 byte	Low	WCT	Transmit/receive
Block X	Value object X	2 byte	Low	WCT	Transmit/receive

Parameter

The parameter settings shown below are **dependent** on the operating mode and the object settings (1 bit, 1 byte or 2 bytes). Depending on the parameterisation some parameters will not be displayed!
The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

Block X general telegrams output switching/value object X	
Parameter	**Setting**
Object	**1 bit**
	1 byte 0% - 100%
	1 byte 0 - 255
	2 byte
At start of movement	**Transmits defined value**
	Transmits its value
Value or object value	ON telegram
	OFF telegram
	0% - 100%
	0 - 255
	Change value 0 - 65535 to floating point
	Change value -32768 - 32767 to floating point
	Floating point
	Value 0 - 65535
	Value -32768 - 32767
When movement time elapsed	**Transmits defined value**
	Transmits its value
Value or object value	ON telegram
	OFF telegram
	0% - 100%
	0 - 255
	Change value 0 - 65535 to floating point
	Change value -32768 - 32767 to floating point
	Floating point
	Value 0 - 65535
	Value -32768 - 32767

Note regarding 2 byte parameter settings:
Depending on the setting of the object type value there will be new parameters; depending on the parameterisation the values can be input immediately or are determined via sign x basic value x factor.

Staircase timer

The staircase timer or cycle time can be parameterised via a time base x factor. With "Normal mode" and "Master mode" operating modes the "Staircase timer" is parameterised. With "Slave mode" and "Monitoring mode" operating modes the "Cycle time" is parameterised. Alternatively, depending on the parameterisation, the values can be set by means of a potentiometer on the device. (The potentiometer setting is only relevant for Master mode or normal mode.)

The "Times" tab has some parameter displays and selectable objects which are **dependent** on the operating mode set.

In "Slave mode" and "Monitoring mode" operating modes no further objects are displayed by modification on the "Times" tab.

Self-adjusting staircase timer

The movement detector is equipped with a "Self-adjusting staircase timer". When the "Self-adjusting staircase timer" is enabled, the presence detector can start a brief overshoot time when someone is in the room for a short time. If they remain in the room longer, a long overshoot time is started.
The parameters "Time base", "Minimum time factor", "Time factor for learning step", "Maximum time factor" and "Sensitivity of the learning step" are available for the "Self-adjusting staircase timer." If there is only a brief movement in front of the movement detector, the overshoot time (until switch-off) will be close to the "Minimum time factor" x "Time basis". If movements last longer, a "Time factor for learning step" will be added to the staircase timer up to the maximum, depending on what learning sensitivity has been set. Once the time set on the staircase timer has elapsed, a restart takes place with "Minimum time factor".

Communication objects

Operating mode: Normal mode

You can select the following communication objects:

Block X, general times:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Time factor, staircase timer	1 byte	Low	WC	Transmit

Parameter
Operating mode: Normal mode

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

Block X, general times	
Parameter	**Setting**
Via movement, time is	**Retriggerable** Not retriggerable
Staircase timer adjustable via	**Parameters** Potentiometer

The following parameters are only visible when "Staircase timer adjustable" "via parameter" has been parameterised.

Overwriting staircase timer during download	**Enabled** Disabled
Self-adjusting staircase timer (always retriggerable)	**Disabled** Enabled
The following parameters are only visible when "Self-adjusting staircase timer" is "disabled".	
Time factor staircase timer object	**Disabled** Enabled
Time base for staircase timer	**1 min** 1 s 1 hr
Time factor for staircase timer (1 - 255)	1 - 255; preconfiguration: **25**

The following parameters are only visible when "Self-adjusting staircase timer" is "enabled".

Time base for staircase timer	**1 min** 1 s 1 hr
Minimum time factor (1 - 255) Staircase timer	1 - 255; preconfiguration: **5**
Time factor for learning step (1 - 255) Staircase timer	1 - 255; preconfiguration: **1**
Maximum time factor (1 - 255) Staircase timer	1 - 255; preconfiguration: **25**
Sensitivity of learning step	1 - 5; preconfiguration: **4** 1 = slow 5 = sensitive

Communication objects

Operating mode: Master mode

You can select the following communication objects:

Block X, general times:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Master trigger object	1 bit	Low	WC	Transmit
Block X	Trigger object	1 bit	Low	WC	Transmit
Block X	Time factor, staircase timer	1 byte	Low	WC	Transmit

Parameter
Operating mode: Master mode

The parameter settings include various functions which depend on other functions. Depending on the parameter setting, some functions or objects may or may not be displayed in the ETS.

Block X, general times	
Parameter	**Setting**
Master triggering is (brightness-dependent)	**Enabled** Disabled
Via movement/master trigger object, time is	**Retriggerable** Not retriggerable
Master trigger object includes the safety pause	**Enabled** Disabled
Triggering is (not brightness-dependent)	**Enabled** Disabled
Switch off staircase timer via trigger object	**Enabled** Disabled
Via trigger object, time is	**Retriggerable** Not retriggerable
Trigger object includes the safety pause	**Enabled** Disabled
Staircase timer adjustable via	**Parameters** Potentiometer
Overwriting staircase timer during download	**Enabled** Disabled
Self-adjusting staircase timer (always retriggerable)	**Disabled** Enabled

The following parameters are only visible when "Self-adjusting staircase timer" is "disabled".

Time factor staircase timer object	**Disabled** Enabled
Time base for staircase timer	**1 min** 1 s 1 hr
Time factor for staircase timer (1 - 255)	1 - 255; preconfiguration: **25**

The following parameters are only visible when "Self-adjusting staircase timer" is "enabled".

Time base for staircase timer	**1 min** 1 s 1 hr

Block X, general times	
Parameter	**Setting**
Minimum time factor (1 - 255) Staircase timer	1 - 255; preconfiguration: **5**
Time factor for learning step (1 - 255) Staircase timer	1 - 255; preconfiguration: **1**
Maximum time factor (1 - 255) Staircase timer	1 - 255; preconfiguration: **25**
Sensitivity of learning step	1 - 5; preconfiguration: **4** 1 = slow 5 = sensitive

Communication objects

Operating mode: Slave mode

No objects for "Time factor" or objects for "Triggering" are displayed.

Parameter
Operating mode: Slave mode

Block X, general times	
Parameter	**Setting**
Cyclic interval during movement	
Time base	**1 min** 1 s 1 hr
Time factor (1-255)	1 - 255; preconfiguration: **5**

Communication objects

Operating mode: Monitoring mode

No objects for "Time factor" or objects for "Triggering" are displayed.

Parameter
Operating mode: Monitoring mode

Block X, general times	
Parameter	**Setting**
Cyclic interval during movement	
Time base	**1 s** 1 min 1 hr
Time factor (1-255)	1 - 255; preconfiguration: **5**
Cyclic interval when movement time has elapsed	
Time base	**1 s** 1 min 1 hr
Time factor (1-255)	1 - 255; preconfiguration: **5**

Disable function

The movement detector can be disabled with the aid of the disable object; here the activation time can be download / bus voltage recovery or reception of a disable telegram. The activation telegram for the disable function can be an ON telegram or an OFF telegram. At the start of disablement (if enabled via parameter) a telegram can be sent via the corresponding output object. Cyclic transmission makes sense with, for example, monitoring since certain bus devices require a cyclically transmitted OFF telegram. When the disable function is disabled, the current status of the movement detector is restored (an ongoing staircase timer is not stopped/start of movement actions or action when movement time elapses is transmitted).

Communication objects

You can select the following communication objects:

Block X, general:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Disable object	1 bit	Low	WC	Receive

Parameter

Block X, general	
Parameter	**Setting**
Disable function	**Disabled**
	Enabled

Block X, general - disable function	
Parameter	**Setting**
Activation time for disable function	**Active during telegram reception**
	After download / bus voltage recovery
Block	**For object value "1"**
	For object value "0"
Behaviour at the start of Telegrams block on output object 1-4 tab	**Do not send a telegram**
	Transmit telegram
Behaviour at the start of Telegrams block on output object 1-4 tab (only visible in master mode or monitoring mode)	Send telegram cyclically
Time base	**1 s**
	1 min
	1 hr
Time factor (1-255)	1 - 255; preconfiguration: **30**

Block X general telegrams output switching/value object X	
Parameter	**Setting**
At start of block	**OFF telegram**
	ON telegram
	1 byte 0% - 100%
	1 byte 0 - 255
	2 byte floating point or value

Note regarding 2 byte parameter settings:
Depending on the setting of the object type value there will be new parameters; depending on the parameterisation the values can be input immediately or are ascertained via sign x basic value x factor.

Changing specific parameters via the bus

The following parameters can be modified via the bus:
– "Time factor, staircase timer"
– "Range"
– "Brightness threshold"

Following bus voltage failure and recovery the modified values will be retained.

Communication objects

You can select the following communication objects:

Block X, general times:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Time factor, staircase timer	1 byte	Low	WC	Receive

Block X, general movement sensors:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Range	1 byte	Low	WC	Receive

Block X, general brightness:

Function	Object name	Type	Prio	Flags	Behaviour
Block X	Brightness threshold	2 byte	Low	WC	Receive

Parameter

Block X, general times	
Parameter	**Setting**
Time factor staircase timer object	**Disabled**
	Enabled

Block X, general movement sensors	
Parameter	**Setting**
Range object (for all sensors)	**Disabled**
	Enabled

Block X, general brightness	
Parameter	**Setting**
Brightness threshold object	**Disabled**
	Enabled

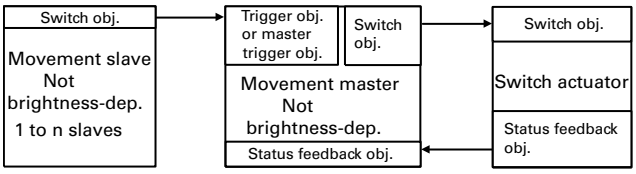
Master/slave planning via the trigger object or master trigger object

General information regarding the trigger object and master trigger object

The trigger object acts on the staircase timer **without** brightness measurement. Object value "1" starts the staircase timer (start of movement action) while further "1" telegrams retrigger the staircase timer, if enabled.
Object value "0" can switch the staircase timer off (end of movement time action), if enabled.

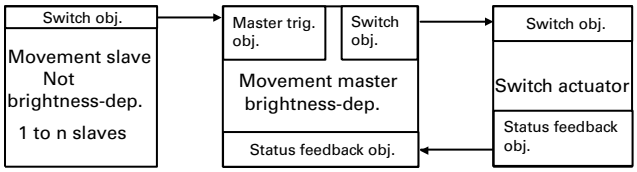
The master trigger object acts on the staircase timer **with** brightness measurement. Object value "1" starts the staircase timer (start of movement action) while further "1" telegrams retrigger the staircase timer, if enabled.
Object value "0" has no meaning as regards the master trigger object.
The parameters "Trigger object includes the safety pause" (enabled/disabled) and "Master trigger object includes the safety pause" (enabled/disabled) determine the effect of the safety pause on the two external trigger objects.

Application example 1: Slave as movement detector (not brightness-dependent) and master as movement detector (not brightness-dependent)



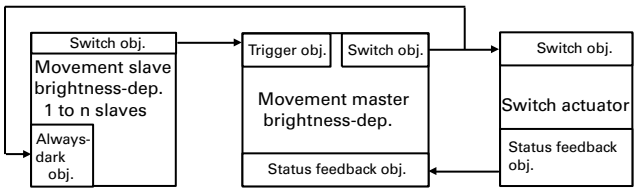
- System not brightness-dependent
- Slave transmits ON telegrams cyclically after movement
- Master switches on actuator when movement detected or trigger
- Master retriggers staircase timer when movement detected or trigger
- Master switches off when staircase timer elapses
- Cycle time slave maximum staircase timer / 2
- Staircase timer retriggerable via movement / master trigger / trigger

Application example 2: Slave as movement detector (not brightness-dependent) and master as movement detector (brightness-dependent)



- Master evaluates brightness locally
- Slave transmits ON telegrams cyclically after movement
- Master switches on actuator upon movement detection or master trigger if it is too dark
- Master retriggers staircase timer upon movement detection or trigger, if previously switched on
- Master switches off when staircase timer elapses
- Cycle time slave maximum staircase timer / 2
- Staircase timer retriggerable via movement / master trigger / trigger

Application example 3: Slave as movement detector (brightness-dependent) and master as movement detector (brightness-dependent)



- Master and slave evaluate the brightness
- Slave sends ON telegrams cyclically upon movement detection if it is too dark or "Always-dark object" is "1"
- Master switches on actuator upon movement detection, if it is too dark
- Master switches on actuator upon trigger
- Master retriggers staircase timer upon movement detection or trigger, if previously switched on
- Master switches off when staircase timer elapses (always-dark object again "0")
- Cycle time slave maximum staircase timer / 2
- Staircase timer retriggerable via movement / master trigger / trigger

Behaviour on application/recovery of the bus voltage

Behaviour on application/recovery of the bus voltage

The actual value input (external sensor), the status feedback object (brightness value dimming actuator) can transmit read requests depending on the parameterisation.
The brightness object can be transmitted depending on the parameterisation.

Behaviour when bus voltage fails

No reaction

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