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The Busch-Watchdog® Presence is clipped onto a flush-mounted bus coupler, switch actuator/sensor or switch/dimming actuator.

The presence detector is used for switching and/or constant lighting control of lighting installations and/or HVAC systems.

The sensor can switch a heating, ventilation or air conditioning controller on or off without dependence on the lighting control. Constant lighting control can also be implemented via additional objects.

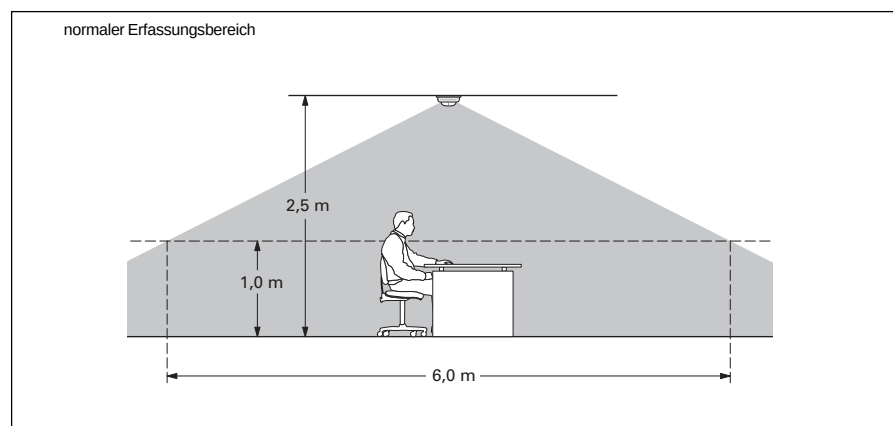
In addition to movement detection, the sensor can detect movement within a certain period with the help of its integrated monitoring function. It is therefore possible to integrate the sensor in detector systems.

The recovery time and the sensitivity of the built-in twilight switch can be set with the three potentiometers on the rear of the presence detector or via the parameters in ETS.

The area of detection can be adapted to the ambient conditions with the help of the foil supplied or via ETS.

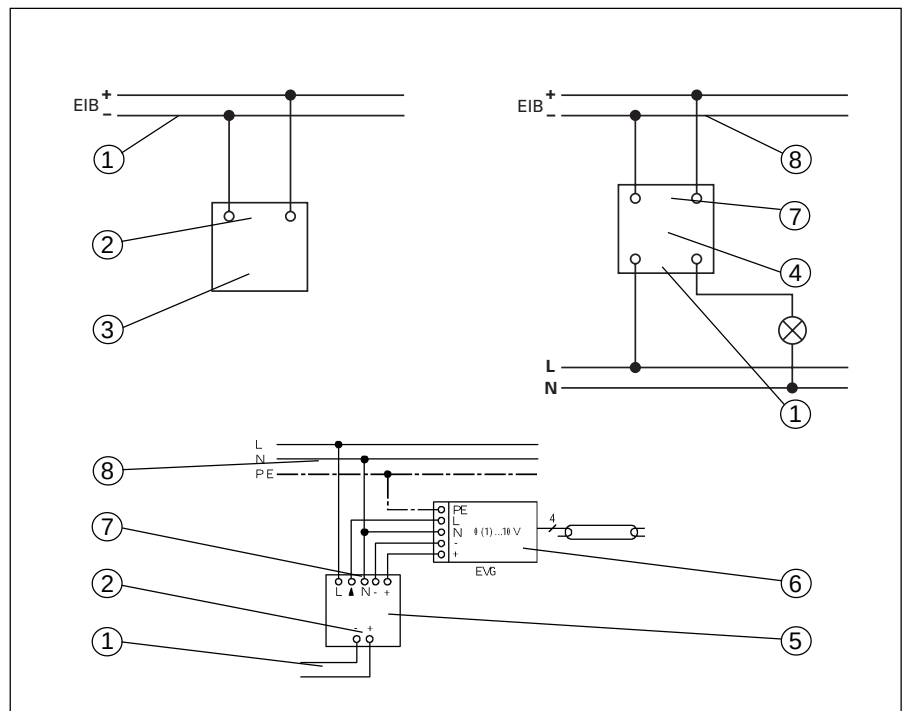
Technical data

Power supply	– EIB	24 V DC, via the bus line
Operating and display elements	– 3 potentiometers	
	– Potentiometer "Lux1"	Twilight sensor 5 ... 1000 lx
	– Potentiometer "Time Light"	Recovery time 10 s ... 32 min
Connections	– Potentiometer "Time HVAC"	Recovery time 1 min ... 60 min
	– Bus coupler FM	10-pole plug connector
	– Switch actuator/sensor FM	
Type of protection	– Switch/dimming actuator FM	
	– IP 20, EN 60 529	
Ambient temperature range	– mounted on the bus coupler	
	– Operation	- 5 °C ... 45 °C
	– Storage	-25 °C ... 55 °C
Installation	– Transport	-25 °C ... 70 °C
	– latched onto flush-mounted insert	
Dimensions	– 110 x 51 mm (Ø x H)	
Weight	– 0.1 kg	
Certification	– EIB-certified	
CE mark	– in accordance with the EMC guideline and low voltage guideline	



Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
For Bus coupler FM:			
Switch Value Cyclic Monitoring /3	11	29	29
Switch Value Cyclic HVAC /3	11	29	29
Switch Value Cyclic HVAC Monitoring /3	11	29	29
Switch Dim Cyclic HVAC Monitg. Constant light /4	12	29	28
For Switch actuator/sensor FM:			
Switch Value Cyclic Monitoring /4	11	29	29
Switch Value Cyclic HVAC /4	11	29	29
Switch Value Cyclic HVAC Monitoring /4	11	29	29
For Switch/dimming actuator FM:			
Switch Dim Cycl. HVAC Monitg. Constant light /3	12	20	12

Circuit diagrams



1 Bus cable

2 Bus terminal

3 Bus coupler FM

4 Switch actuator FM (6110 U-101-500)

5 Switch/dimming actuator FM
(6114 U-500)

6 Ballast with 0 (1) - 10V control input

7 Connecting terminals

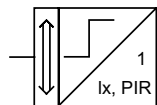
8 230 V mains voltage

Note

The Busch-Watchdog® Presence is solely designed for indoor areas e.g. in schools, offices or private buildings.

The full functionality of the device is dependent on the mounting height. The area of detection can also be adapted via a foil which is included with supply.

Application examples and detailed information about e.g. "intelligent" HVAC system control and setting the potentiometers can be found in the user manual "Busch-Watchdog® Presence".

Switch Value Cyclic Monitoring /3**Selection in ETS**

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

With the application, the presence detector can sense movement in its area of detection and send out switching or value telegrams.

The application makes two independent channels available which can be used to switch on the lighting. It also has a monitoring function.

During the parameterisation, it should be noted that some parameters (if required) are only visible when “High Access” is selected and can only then be modified.

Master / Slave

It is possible to switch several presence detectors together. This is necessary e.g. in rooms in which one presence detector alone is no longer sufficient for the detection. If two or more presence detectors are installed in a room, one presence detector must operate as “Standard / Master” and all the others must be set to the “Slave” function. In the “Slave” function, the presence detector only sends ON telegrams cyclically when it detects movement. The recovery time only runs for the master presence detector. The recovery time is restarted for the master after each ON telegram.

To ensure that the presence detection of the master and slave is equal, the same group address must be used for both devices. If different group addresses are used, the recovery time in the master is restarted each time an ON telegram is received cyclically whereby the light is not switched on.

The cyclical transmission periods should be as long as possible in order to take the bus load into account.

Detection areas

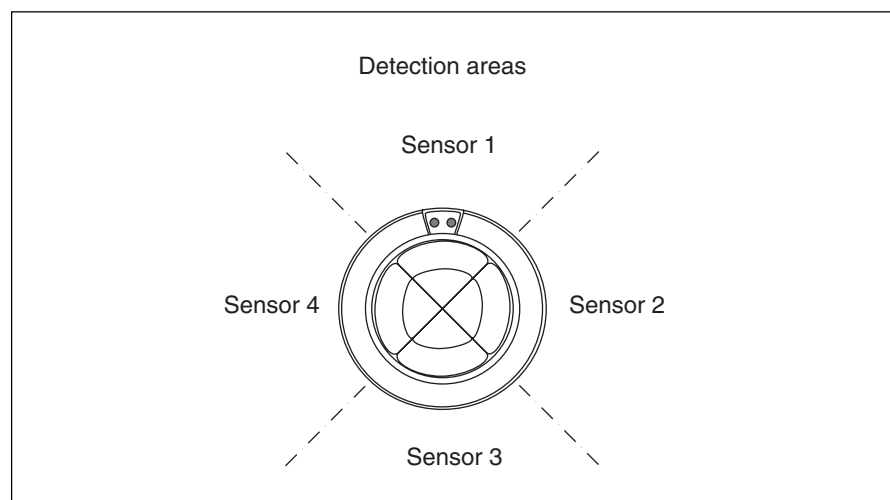
The presence detector has four areas of detection. Each area of detection (sensor area) covers 90° of the surrounding area of the presence detector. The sensor areas are counted in a clockwise direction (see diagram “Detection areas”).

It is possible to remove individual sensor areas from the detection via the general parameter “Detection area”. All the sensor areas are active by default i.e. the presence detector senses movements throughout the surrounding area (360°). If the parameter “Detection area” is set e.g. to “Sensor 2&3”, the presence detector only detects movement in half of its surroundings (180°). It is therefore not necessary to mask individual segments of the lens.

Switch

The presence detector sends switching telegrams to its communication objects “Movement channel ... – Telegr. switch” as soon as it senses movement in its area of detection. The value of the switching telegram can be set with the parameter “Sending at detection”. It is possible to send an ON telegram, an OFF telegram or no telegram once movement has been detected. The ON or OFF telegrams can also be sent cyclically.

If the presence detector is no longer aware of any movement once the recovery time has elapsed, it is possible for

Detection areas of the presence detector

an ON telegram, an OFF telegram or no telegrams to be sent. The ON or OFF telegrams can also be sent cyclically. The behaviour is defined with the parameter "Telegram after recovery time".

Each channel of the presence detector can be enabled/disabled separately. The communication objects "Movement channel .../ Activation" are used for this purpose. The objects are made visible with the parameter "Activation object movement".

If the presence detector receives a telegram at this object, the presence detector is activated or deactivated. With the parameters "If movement is ...", it is possible to set whether an ON telegram, an OFF telegram or no telegrams are sent via the communication object "Movement channel ... – Telegr. switch".

Example:

In a functional building, all the presence detectors should be switched off in the mornings. To do so, a "1" is sent to a central point with a time switch and received at the communication objects "Movement channel ... – Activation". In this example, the parameter "Enabling movement at" is set to "ON telegram".

Value

Value telegrams can also be sent on detection of movement. To do so, the parameter "Type of movement object" must be changed from "Switching (EIS1)" to "Value (EIS6)". Dimming actuators can thus be dimmed to a value which is less than the maximum value e.g. to be dimmed to the background lighting.

The value that is sent is defined with the parameter setting "Sending at the beginning/end of detection". It is also possible to set that no telegrams are sent.

Cyclic

All switching telegrams can also be sent cyclically. It should be ensured that the setting "ON telegram cyclically" or "OFF telegram cyclically" is selected in the relevant parameter.

The total cycle time can be set with the parameters "Time base for cyclical

sending" and "Time factor for ...". The period in which a telegram is repeated cyclically is composed of a base and a factor:

$$\text{Cycle time} = \text{Base} * \text{Factor}$$

Channel settings

The brightness level at which the presence detector is triggered is set by default via the ETS parameter "Threshold illumination". Values between 5 lux and 1000 lux can be entered. It should be noted that the setting for "Threshold illumination" refers to the installation site of the presence detector and not to the level of the luxmeter. Alternatively, the Lux1 potentiometer can define the threshold. To do so, the setting "Threshold illumination adjustable with" must be changed to "Lux1 potentiometer".

The recovery time can be set with the help of the potentiometer on the rear of the presence detector or via the ETS program. The preset option is the ETS variant. The recovery time can be set in ETS with the two parameters "Time base of recovery time" and "Time factor of recovery time". The product of the base and factor forms the recovery time:

$$\text{Recovery time} = \text{Base} * \text{Factor}$$

Note:

If both potentiometers are set to "POT1", the "Test" setting is only used for checking the function and area of detection of the device without dependence on the brightness level. In the "Test" setting, the recovery time set in ETS is not taken into account and is only approx. 10 s (see also the operating instructions for the presence detector).

If the setting of the recovery time is defined in ETS with "Illumination potentiometer", the recovery time is defined via the illumination potentiometer in the same way as conventional detectors. It is therefore also possible to modify the recovery time without ETS.

Brightness-dependent switching

A further communication object can be enabled separately for each channel with the parameter "Activation object brightness-dependent switching". If the communication object "Brightness-dependent switching channel ..." receives a "1", the presence detector swit-

ches dependent on the level of brightness. The switch threshold settings which have been carried out with the potentiometer on the rear of the device or with ETS have therefore no significance for the period of activation. If a "0" is received at the object, the presence detector first sends ON telegrams again once it has fallen below the illumination threshold.

Light source

If the proportion of external light increases, the presence detector sends an OFF telegram as soon as the external light reaches the required illuminance. The type of light source must be indicated.

Example:
Illuminance 500 lx

The illumination threshold of 500 lx is defined via the potentiometer on the presence detector or via ETS.

If movement is now detected in a dark room in the mornings and the brightness value lies below 500 lx, the presence detector sends an ON telegram in the event of movement.

a) Switched light source:

When the luminaires are switched on they generate an illuminance of 500 lx. The external light is added to this. The presence detector switches off if it measures the illuminance at 1000 lx.

b) Controlled light source (constant light):

If conventional constant lighting control is integrated in the luminaires, it regulates the proportion of artificial light so that the measured illuminance remains constant at 500 lx. If the presence detector now measures more than 550 lx, the luminaires are already dimmed down to the minimum brightness value and are switched off.

Monitoring

Note:

The Monitoring function does not serve to create a VdS certified alarm system. It offers the possibility to use the EIB/KNX-system to control rooms. It is not an alternative for an alarm system.

It is possible to activate a monitoring function. To do so, the general parameter "Monitoring function" must be set to "yes". The monitoring function is not triggered at the slightest thermal movement but only if a strong energy source is registered during a short interval or several weak sources over a longer period.

If the monitoring function is activated, a further communication object "Signal – Telegr. switch ..." is available. The presence detector records the number and intensity of movements within a time period and only sends telegrams once a specific sensitivity level has been exceeded.

On a further "Monitoring function" tab, it is possible to set the type of the monitoring object (1 bit or 1 byte) and the type of telegram at the start of detection dependent on the intensity and cyclical sending behaviour.

The parameter "Threshold" indicates the level of sensitivity. The value "1" means maximum sensitivity while the value "255" means minimum sensitivity.

It can also be parameterised at which point the detector is in monitoring mode after activation. This period is composed of a base and factor in a similar way to the cyclical time.

If the monitoring function should be enabled externally, this can be carried out with the communication object "Signal – Activation". To do so, the parameter "Activation object monitoring" must previously be set to "available".

Bus voltage recovery

The states of the communication objects "Movement channel ... – Telegr. switch" adopt defined states on bus voltage recovery". The states for channel 1 and 2 can be defined separately. This prevents unwanted switching operations on bus voltage recovery.

Defined states can also be selected for the objects "Brightness-dependent switching channel ...". The parameters are only visible if the objects have previously been enabled.

Communication objects

No.	Type	Object name	Function
0	1 bit	Movement channel 1	Telegr. switch
1	1 bit	Movement channel 1	Activation
3	1 bit	Movement channel 2	Telegr. switch
4	1 bit	Movement channel 2	Activation

Communication objects
with sending of value telegrams

No.	Type	Object name	Function
0	1 byte	Movement channel 1	Telegr. switch
1	1 bit	Movement channel 1	Activation
3	1 byte	Movement channel 2	Telegr. switch
4	1 bit	Movement channel 2	Activation

Communication objects
with monitoring objects

No.	Type	Object name	Function
...			
6	1 bit	Signal	Telegr. switch
7	1 bit	Signal	Activation

Communication objects
with value monitoring objects

No.	Type	Object name	Function
...			
6	1 byte	Signal	Telegr. value
7	1 bit	Signal	Activation

Communication objects
with brightness-dependent switching

No.	Type	Object name	Function
...			
2	1 bit	Brightness-dependent switching channel 1	Activation
...			
5	1 bit	Brightness-dependent switching channel 2	Activation
...			

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

Presence detector parameters with "Low Access":

General:

– Operation mode illumination channel 1	Standard / Master Slave
– Operation mode illumination channel 2	Standard / Master Slave
– Detection area	Sensor 1&2 Sensor 2&3 Sensor 3&4 Sensor 1&4 Sensor 1-4
– Behaviour on bus voltage recovery (comm. objects)	
– Brightness-dependent switching (Illumination channel 1)	enabled disabled
– Brightness-dependent switching (Illumination channel 2)	enabled disabled
– Movement (Illumination channel 1)	disabled enabled
– Movement (Illumination channel 2)	disabled enabled
Only if activation object for monitoring function is available:	
– Monitoring function	disabled enabled

Parameters for illumination channel 1 or channel 2:

– Activation object brightness-dependent switching	not available available
– Activation object movement	not available available
Only if movement object is available:	
– Enabling movement at	ON telegram OFF telegram
– If "Movement" is disabled	do not send a telegram send telegram once at movement send telegram once after detection
– If "Movement" is enabled	do not send a telegram send telegram once at movement send telegram once after detection
– Type of movement object	Switching (EIS1) Value (EIS6)

Only for "Switching (EIS1)":

– Sending at detection	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
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Only in "Standard / Master" operation mode:

– Telegram after recovery time	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	130 ms / 2.1 s / 34 s / 9 min
– Time factor for cyclical sending	10

Only for "Value (EIS6)":

– Sending at detection	100% / 90 % / ... / 10 % / OFF / no telegram
– Telegram after recovery time	100% / 90 % / ... / 10 % / OFF / no telegram

Parameters

The default setting for the values is **printed in bold type**

Note:

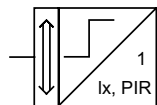
When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

Parameters for adjustments channel 1 or channel 2:

– Note:	
The offset of the brightness value should take place on a luxmeter. (see technical handbook for more information)	
– Threshold illumination adjustable with	ETS Lux1 potentiometer
Only if set with ETS:	
– Threshold illumination (5 lux ...1000 lux)	100
– Recovery time adjustable with	ETS Illumination potentiometer
Only if set with ETS:	
– Potentiometer should not be at TEST	
– Time base of recovery time	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min
– Time factor of recovery time	100
– Light source	switched controlled (constant brightness)

Monitoring function

– Activation object monitoring	not available available
Only if available:	
– Enable monitoring function at	ON telegram OFF telegram
– Type of monitoring object	Switching (EIS1) Value (EIS6)
Only for "Switching (EIS1)":	
– Sending at the beginning of detection	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Sending at the end of detection	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	130 ms / 2.1 s / 34 s / 9 min
– Time factor for cyclical sending	100
Only for "Value (EIS6)":	
– Sending at the beginning of detection	100 % / 90 % / ... / 20 % / 10 % / OFF / no telegram
– Sending at the end of detection	100 % / 90 % / ... / 20 % / 10 % / OFF / no telegram
– Threshold (1:sensitive / 255:insensitive)	4
– Time base until watchdog is in monitoring function	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min
– Time factor until watchdog is in monitoring function	100

Switch Value Cyclic HVAC /3**Selection in ETS**

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

With the application, the presence detector can sense movement in its area of detection and send out switching or value telegrams.

The application makes two independent channels available which can be used to switch on the lighting and one channel for influencing the "HVAC control".

During the parameterisation, it should be noted that some parameters (if required) are only visible when "High Access" is selected and can only then be modified.

Master / Slave

It is possible to switch several presence detectors together. This is necessary e.g. in rooms in which one presence detector alone is no longer sufficient for the detection. If two or more presence detectors are installed in a room, one presence detector must operate as "Standard / Master" and all the others must be set to the "Slave" function. In the "Slave" function, the presence detector only sends ON telegrams cyclically when it detects movement. The recovery time only runs for the master presence detector. The recovery time is restarted for the master after each ON telegram.

To ensure that the presence detection of the master and slave is equal, the same group address must be used for both devices. If different group addresses are used, the recovery time in the master is restarted each time an ON telegram is received cyclically where-by the light is not switched on.

The cyclical transmission periods should be as long as possible in order to take the bus load into account.

Detection areas

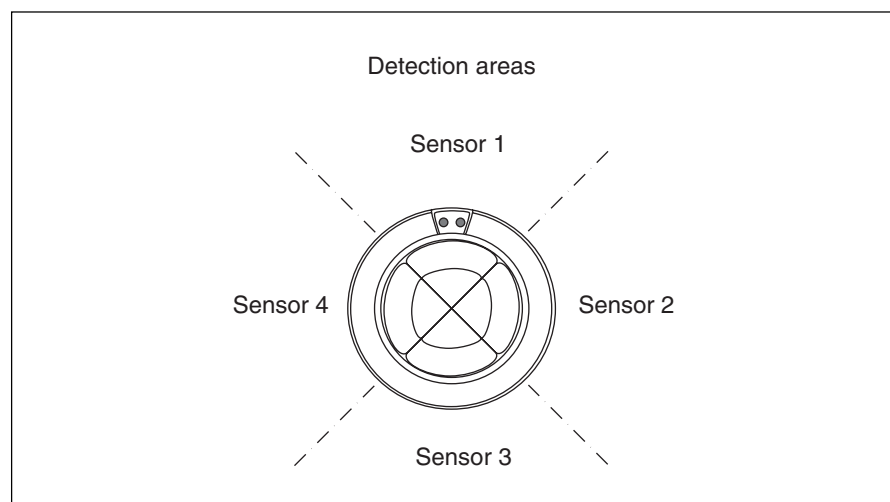
The presence detector has four areas of detection. Each area of detection (sensor area) covers 90° of the surrounding area of the presence detector. The sensor areas are counted in a clockwise direction (see diagram "Detection areas").

It is possible to remove individual sensor areas from the detection via the general parameter "Detection area". All the sensor areas are active by default i.e. the presence detector senses movements throughout the surrounding area (360°). If the parameter "Detection area" is set e.g. to "Sensor 2&3", the presence detector only detects movement in half of its surroundings (180°). It is therefore not necessary to mask individual segments of the lens.

Switch

The presence detector sends switching telegrams to its communication objects "Movement channel ... – Telegr. switch" as soon as it senses movement in its area of detection. The value of the switching telegram can be set with the parameter "Sending at detection". It is possible to send an ON telegram, an OFF telegram or no telegram once movement has been detected. The ON or OFF telegrams can also be sent cyclically.

If the presence detector is no longer aware of any movement once the recovery time has elapsed, it is possible for

Detection areas of the presence detector

an ON telegram, an OFF telegram or no telegrams to be sent. The ON or OFF telegrams can also be sent cyclically. The behaviour is defined with the parameter "Telegram after recovery time".

Each channel of the presence detector can be enabled/disabled separately. The communication objects "Movement channel .../ Activation" are used for this purpose. The objects are made visible with the parameter "Activation object movement".

If the presence detector receives a telegram at this object, the presence detector is activated or deactivated. With the parameters "If movement is ...", it is possible to set whether an ON telegram, an OFF telegram or no telegrams are sent via the communication object "Movement channel ... – Telegr. switch".

Example:

In a functional building, all the presence detectors should be switched off in the mornings. To do so, a "1" is sent to a central point with a time switch and received at the communication objects "Movement channel ... – Activation". In this example, the parameter "Enabling movement at" is set to "ON telegram".

Value

Value telegrams can also be sent on detection of movement. To do so, the parameter "Type of movement object" must be changed from "Switching (EIS1)" to "Value (EIS6)". Dimming actuators can thus be dimmed to a value which is less than the maximum value e.g. to be dimmed to the background lighting.

The value that is sent is defined with the parameter setting "Sending at the beginning/end of detection". It is also possible to set that no telegrams are sent.

Cyclic

All switching telegrams can also be sent cyclically. It should be ensured that the setting "ON telegram cyclically" or "OFF telegram cyclically" is selected in the relevant parameter.

The total cycle time can be set with the parameters "Time base for cyclical

sending" and "Time factor for ...". The period in which a telegram is repeated cyclically is composed of a base and a factor:

$$\text{Cycle time} = \text{Base} * \text{Factor}$$

Channel settings

The brightness level at which the presence detector is triggered is set by default via the ETS parameter "Threshold illumination". Values between 5 lux and 1000 lux can be entered. It should be noted that the setting for "Threshold illumination" refers to the installation site of the presence detector and not to the level of the luxmeter. Alternatively, the Lux1 potentiometer can define the threshold. To do so, the setting "Threshold illumination adjustable with" must be changed to "Lux1 potentiometer".

The recovery time can be set with the help of the potentiometer on the rear of the presence detector or via the ETS program. The preset option is the ETS variant. The recovery time can be set in ETS with the two parameters "Time base of recovery time" and "Time factor of recovery time". The product of the base and factor forms the recovery time:

$$\text{Recovery time} = \text{Base} * \text{Factor}$$

Note:

If both potentiometers are set to "POT1", the "Test" setting is only used for checking the function and area of detection of the device without dependence on the brightness level. In the "Test" setting, the recovery time set in ETS is not taken into account and is only approx. 10 s (see also the operating instructions for the presence detector).

If the setting of the recovery time is defined in ETS with "Illumination potentiometer", the recovery time is defined via the illumination potentiometer in the same way as conventional detectors. It is therefore also possible to modify the recovery time without ETS.

Brightness-dependent switching

A further communication object can be enabled separately for each channel with the parameter "Activation object brightness-dependent switching". If the communication object "Brightness-dependent switching channel ..." receives a "1", the presence detector swit-

ches dependent on the level of brightness. The switch threshold settings which have been carried out with the potentiometer on the rear of the device or with ETS have therefore no significance for the period of activation. If a "0" is received at the object, the presence detector first sends ON telegrams again once it has fallen below the illumination threshold.

Light source

If the proportion of external light increases, the presence detector sends an OFF telegram as soon as the external light reaches the required illuminance. The type of light source must be indicated.

Example:
Illuminance 500 lx

The illumination threshold of 500 lx is defined via the potentiometer on the presence detector or via ETS.

If movement is now detected in a dark room in the mornings and the brightness value lies below 500 lx, the presence detector sends an ON telegram in the event of movement.

a) Switched light source:
When the luminaires are switched on they generate an illuminance of 500 lx. The external light is added to this. The presence detector switches off if it measures the illuminance at 1000 lx.

b) Controlled light source (constant light):
If conventional constant lighting control is integrated in the luminaires, it regulates the proportion of artificial light so that the measured illuminance remains constant at 500 lx. If the presence detector now measures more than 550 lx, the luminaires are already dimmed down to the minimum brightness value and are switched off.

HVAC

The presence detector can activate a heating or ventilation controller with its object "Movement HVAC". The object sends telegrams independently of the brightness value.

The ON delay is the period which the HVAC channel needs until it detects a movement. By default, this period is set automatically by the presence detector. It can however also be fixed. To do so, the "Switch ON delay" must be set via ETS. The period is composed of a base and a factor in a similar way to the recovery time.

If the switching behaviour is set with the "HVAC potentiometer", the following must be noted:

- If an OFF delay between 1 and 10 min is defined with the potentiometer, the ON delay is set at 30 s. This setting can e.g. switch on a fan in the cloakroom.
- If the OFF delay is set at longer than 10 min, the operating time is based on the frequency that movement is detected. In a standard office, the heating system is only switched on if the employee is present for a lengthy period. The heating in a conference room which is rarely used is not activated when someone only enters the room briefly and then leaves again after a short period.

The "Movement HVAC" object can trigger a telegram on detection of movement and after an adjustable recovery time. With the parameter "Type of movement object", it is set whether 1 bit switching telegrams or 1 byte value telegrams are triggered. The switching telegrams can also be sent cyclically in the same way as the movement channels.

Bus voltage recovery

The states of the communication objects “Movement channel ... – Telegr. switch” adopt defined states on bus voltage recovery”. The states for channel 1 and 2 can be defined separately. This prevents unwanted switching operations on bus voltage recovery.

Defined states can also be selected for the objects “Brightness-dependent switching channel ...”. The parameters are only visible if the objects have previously been enabled.

Communication objects

No.	Type	Object name	Function
0	1 bit	Movement channel 1	Telegr. switch
1	1 bit	Movement channel 1	Activation
3	1 bit	Movement channel 2	Telegr. switch
4	1 bit	Movement channel 2	Activation
6	1 bit	Movement HvAC	Telegr. switch
7	1 bit	Movement HVAC	Activation

Communication objects
with sending of value telegrams

No.	Type	Object name	Function
0	1 byte	Movement channel 1	Telegr. value
1	1 bit	Movement channel 1	Activation
3	1 byte	Movement channel 2	Telegr. value
4	1 bit	Movement channel 2	Activation
6	1 byte	Movement HVAC	Telegr. value
7	1 bit	Movement HVAC	Activation

Communication objects
with brightness-dependent switching

No.	Type	Object name	Function
...			
2	1 bit	Brightness-dependent switching channel 1	Activation
...			
5	1 bit	Brightness-dependent switching channel 2	Activation
...			

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

General:

- Operation mode illumination channel 1 **Standard / Master**
Slave
- Operation mode illumination channel 2 **Standard / Master**
Slave
- Detection area
Sensor 1&2
Sensor 2&3
Sensor 3&4
Sensor 1&4
Sensor 1-4
- Behaviour on bus voltage recovery (comm. objects)
- Brightness-dependent switching (Illumination channel 1) **enabled**
disabled
- Brightness-dependent switching (Illumination channel 2) **enabled**
disabled
- Movement (Illumination channel 1) **enabled**
disabled
- Movement (HVAC) **enabled**
disabled
- Movement (Illumination channel 2) **enabled**
disabled

Parameters for illumination channel 1 or channel 2:

- Activation object brightness-dependent switching **not available**
available
- Activation object movement **not available**
available

Only if activation object for movement is available:

- Enable movement at **ON telegram**
OFF telegram
- If "Movement" is disabled **do not send a telegram**
send telegram once at movement
send telegram once after detection
- If "Movement" is enabled **do not send a telegram**
send telegram once at movement
send telegram once after detection
- Type of movement object **Switching (EIS1)**
Value (EIS6)

Only for "Switching (EIS1)":

- Sending at detection **ON telegram**
OFF telegram
ON telegram cyclically
OFF telegram cyclically
no telegram

Only in "Standard / Master" operation mode:

- Telegram after recovery time **OFF telegram**
ON telegram cyclically
OFF telegram cyclically
no telegram
- Time base for cyclical sending **130 ms / 2.1 s / 34 s / 9 min**
- Time factor for cyclical sending **10**

Only for "Value (EIS6)":

- Sending at detection **100% / 90 % / ... / 10 % / OFF /**
no telegram
- Telegram after recovery time **100% / 90 % / ... / 10 % / OFF /**
no telegram

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

Parameters for adjustments channel 1 or channel 2:

– Note: The offset of the brightness value should take place on a luxmeter. (see technical handbook for more information)	
– Threshold illumination adjustable with	ETS Lux1 potentiometer
Only if set with ETS:	
– Threshold illumination (5 Lux ...1000 lux)	100
– Recovery time adjustable with	ETS Illumination potentiometer
Only if set with ETS:	
– Potentiometer should not be at TEST	
– Time base of recovery time	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min
– Time factor of recovery time	100
– Light source	switched controlled (constant light)

HVAC:

– Activation object movement	not available available
Only if activation object is available:	
– Enabling movement at	ON telegram OFF telegram
– If "Movement" is disabled	do not send a telegram send telegram once at movement send telegram once after detection
– If "Movement" is enabled	do not send a telegram send telegram once at movement send telegram once after detection
– Type of movement object	Switching (EIS1) Value (EIS6)
Only for "Switching (EIS1)":	
– Sending at detection	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Telegram after recovery time	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	130 ms / 2.1 s / 34 s / 9 min
– Time factor for cyclical sending	10
Only for "Value (EIS6)":	
– Sending at detection	100% / 90 % / ... / 10 % / OFF / no telegram
– Telegram after recovery time	100% / 90 % / ... / 10 % / OFF / no telegram

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

Adjustments HVAC:

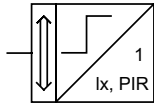
- Recovery time adjustable with **ETS**
HVAC potentiometer

Only if set with ETS:

- Potentiometer should not be at TEST
- Time base of recovery time 0.5 ms / 8.2 ms / 130 ms / **2.1 s** / 34 s / 9 min
- Time factor of recovery time **100**
- Switch ON is adjustable automatically
by ETS

Only if set with ETS:

- Time base of switch ON delay 0.5 ms / 8.2 ms / 130 ms / **2.1 s** / 34 s / 9 min
- Time factor of switch ON delay **100**

**Switch Value Cyclic HVAC
Monitoring /3****Selection in ETS**

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

With the application, the presence detector can sense movement in its area of detection and send out switching or value telegrams.

The application makes two independent channels available. One channel can switch on the lighting while the other can switch on an HVAC system. The presence detector also has a monitoring function.

During the parameterisation, it should be noted that some parameters (if required) are only visible when “High Access” is selected and can only then be modified.

Master / Slave

It is possible to switch several presence detectors together. This is necessary e.g. in rooms in which one presence detector alone is no longer sufficient for the detection. If two or more presence detectors are installed in a room, one presence detector must operate as “Standard / Master” and all the others must be set to the “Slave” function. In the “Slave” function, the presence detector only sends ON telegrams cyclically when it detects movement. The recovery time only runs for the master presence detector. The recovery time is restarted for the master after each ON telegram.

To ensure that the presence detection of the master and slave is equal, the same group address must be used for both devices. If different group addresses are used, the recovery time in the master is restarted each time an ON telegram is received cyclically whereby the light is not switched on.

The cyclical transmission periods should be as long as possible in order to take the bus load into account.

Detection areas

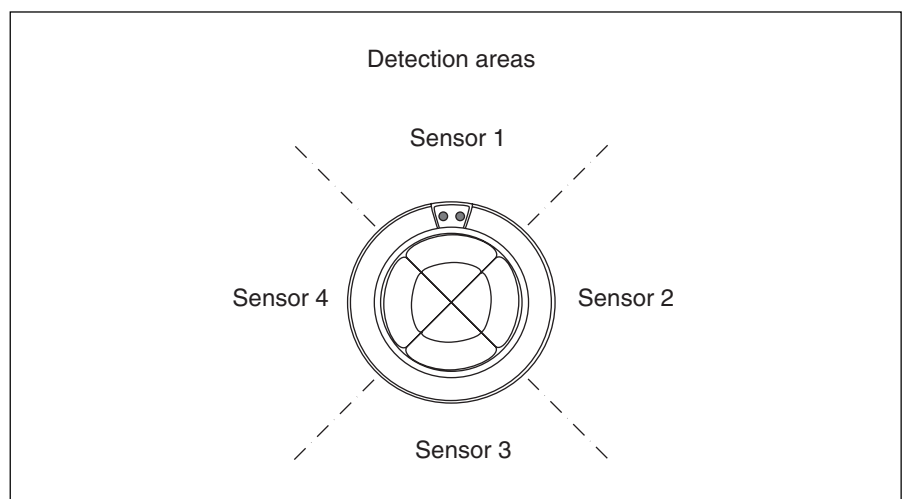
The presence detector has four areas of detection. Each area of detection (sensor area) covers 90° of the surrounding area of the presence detector. The sensor areas are counted in a clockwise direction (see diagram “Detection areas”).

It is possible to remove individual sensor areas from the detection via the general parameter “Detection area”. All the sensor areas are active by default i.e. the presence detector senses movements throughout the surrounding area (360°). If the parameter “Detection area” is set e.g. to “Sensor 2&3”, the presence detector only detects movement in half of its surroundings (180°). It is therefore not necessary to mask individual segments of the lens.

Switch

The presence detector sends switching telegrams to its communication objects “Movement channel ... – Telegr. switch” as soon as it senses movement in its area of detection. The value of the switching telegram can be set with the parameter “Sending at detection”. It is possible to send an ON telegram, an OFF telegram or no telegram once movement has been detected. The ON or OFF telegrams can also be sent cyclically.

If the presence detector is no longer aware of any movement once the recovery time has elapsed, it is possible for

**Detection areas of the presence
detector**

an ON telegram, an OFF telegram or no telegrams to be sent. The ON or OFF telegrams can also be sent cyclically. The behaviour is defined with the parameter "Telegram after recovery time".

Each channel of the presence detector can be enabled/disabled separately. The communication objects "Movement channel .../ Activation" are used for this purpose. The objects are made visible with the parameter "Activation object movement".

If the presence detector receives a telegram at this object, the presence detector is activated or deactivated. With the parameters "If movement is ...", it is possible to set whether an ON telegram, an OFF telegram or no telegrams are sent via the communication object "Movement channel ... – Telegr. switch".

Example:

In a functional building, all the presence detectors should be switched off in the mornings. To do so, a "1" is sent to a central point with a time switch and received at the communication objects "Movement channel ... – Activation". In this example, the parameter "Enabling movement at" is set to "ON telegram".

Value

Value telegrams can also be sent on detection of movement. To do so, the parameter "Type of movement object" must be changed from "Switching (EIS1)" to "Value (EIS6)". Dimming actuators can thus be dimmed to a value which is less than the maximum value e.g. to be dimmed to the background lighting.

The value that is sent is defined with the parameter setting "Sending at the beginning/end of detection". It is also possible to set that no telegrams are sent.

Cyclic

All switching telegrams can also be sent cyclically. It should be ensured that the setting "ON telegram cyclically" or "OFF telegram cyclically" is selected in the relevant parameter.

The total cycle time can be set with the parameters "Time base for cyclical sending" and "Time factor for ...". The

period in which a telegram is repeated cyclically is composed of a base and a factor:

$$\text{Cycle time} = \text{Base} * \text{Factor}$$

Channel settings

The brightness level at which the presence detector is triggered is set by default via the ETS parameter "Threshold illumination". Values between 5 lux and 1000 lux can be entered. It should be noted that the setting for "Threshold illumination" refers to the installation site of the presence detector and not to the level of the luxmeter. Alternatively, the Lux1 potentiometer can define the threshold. To do so, the setting "Threshold illumination adjustable with" must be changed to "Lux1 potentiometer".

The recovery time can be set with the help of the potentiometer on the rear of the presence detector or via the ETS program. The preset option is the ETS variant. The recovery time can be set in ETS with the two parameters "Time base of recovery time" and "Time factor of recovery time". The product of the base and factor forms the recovery time:

$$\text{Recovery time} = \text{Base} * \text{Factor}$$

Note:

If both potentiometers are set to "POT1", the "Test" setting is only used for checking the function and area of detection of the device without dependence on the brightness level. In the "Test" setting, the recovery time set in ETS is not taken into account and is only approx. 10 s (see also the operating instructions for the presence detector).

If the setting of the recovery time is defined in ETS with "Illumination potentiometer", the recovery time is defined via the illumination potentiometer in the same way as conventional detectors. It is therefore also possible to modify the recovery time without ETS.

Brightness-dependent switching

A further communication object can be enabled separately for each channel with the parameter "Activation object brightness-dependent switching". If the communication object "Brightness-dependent switching channel ..." receives a "1", the presence detector switches dependent on the level of bright-

ness. The switch threshold settings which have been carried out with the potentiometer on the rear of the device or with ETS have therefore no significance for the period of activation. If a "0" is received at the object, the presence detector first sends ON telegrams again once it has fallen below the illumination threshold.

Light source

If the proportion of external light increases, the presence detector sends an OFF telegram as soon as the external light reaches the required illuminance. The type of light source must be indicated.

Example:
Illuminance 500 lx

The illumination threshold of 500 lx is defined via the potentiometer on the presence detector or via ETS.

If movement is now detected in a dark room in the mornings and the brightness value lies below 500 lx, the presence detector sends an ON telegram in the event of movement.

a) Switched light source:

When the luminaires are switched on they generate an illuminance of 500 lx. The external light is added to this. The presence detector switches off if it measures the illuminance at 1000 lx.

b) Controlled light source (constant light):

If conventional constant lighting control is integrated in the luminaires, it regulates the proportion of artificial light so that the measured illuminance remains constant at 500 lx. If the presence detector now measures more than 550 lx, the luminaires are already dimmed down to the minimum brightness value and are switched off.

HVAC

The presence detector can activate a heating or ventilation controller with its object "Movement HVAC". The object sends telegrams independently of the brightness value.

The ON delay is the period which the HVAC channel needs until it detects a movement. By default, this period is set automatically by the presence detector. It can however also be fixed. To do so, the "Switch ON delay" must be set via

ETS. The period is composed of a base and a factor in a similar way to the recovery time.

If the switching behaviour is set with the "HVAC potentiometer", the following must be noted:

- If an OFF delay between 1 and 10 min is defined with the potentiometer, the ON delay is set at 30 s. This setting can e.g. switch on a fan in the cloakroom.
- If the OFF delay is set at longer than 10 min, the operating time is based on the frequency that movement is detected. In a standard office, the heating system is only switched on if the employee is present for a lengthy period. The heating in a conference room which is rarely used is not activated when someone only enters the room briefly and then leaves again after a short period.

The "Movement HVAC" object can trigger a telegram on detection of movement and after an adjustable recovery time. With the parameter "Type of movement object", it is set whether 1 bit switching telegrams or 1 byte value telegrams are triggered. The switching telegrams can also be sent cyclically in the same way as the movement channels.

Monitoring

The Monitoring function does not serve to create a VdS certified alarm system. It offers the possibility to use the EIB/KNX-system to control rooms. It is not an alternative for an alarm system.

It is possible to activate a monitoring function. To do so, the general parameter "Monitoring function" must be set to "yes". The monitoring function is not triggered at the slightest thermal movement but only if a strong energy source is registered during a short interval or several weak sources over a longer period.

If the monitoring function is activated, a further communication object "Signal – Telegr. switch ..." is available. The presence detector records the number and intensity of movements within a time period and only sends telegrams once a specific sensitivity level has been exceeded.

On a further "Monitoring function" tab, it is possible to set the type of the moni-

toring object (1 bit or 1 byte) and the type of telegram at the start of detection dependent on the intensity and cyclical sending behaviour.

The parameter "Threshold" indicates the level of sensitivity. The value "1" means maximum sensitivity while the value "255" means minimum sensitivity.

It can also be parameterised at which point the detector is in monitoring mode after activation. This period is composed of a base and factor in a similar way to the cyclical time.

If the monitoring function should be enabled externally, this can be carried out with the communication object "Signal – Activation". To do so, the parameter "Activation object monitoring" must previously be set to "available".

Bus voltage recovery

The states of the communication objects "Movement channel ... – Telegr. switch" adopt defined states on bus voltage recovery". The states for channel 1 and 2 can be defined separately. This prevents unwanted switching operations on bus voltage recovery. Defined states can also be selected for the objects "Brightness-dependent switching channel ...". The parameters are only visible if the objects have previously been enabled.

Communication objects

No.	Type	Object name	Function
0	1 bit	Movement channel 1	Telegr. switch
1	1 bit	Movement channel 1	Activation
3	1 bit	Movement HVAC	Telegr. switch
4	1 bit	Movement HVAC	Activation
6	1 bit	Signal	Telegr. switch

Communication objects
with sending of value telegrams

No.	Type	Object name	Function
0	1 byte	Movement channel 1	Telegr. switch
1	1 bit	Movement channel 1	Activation
3	1 byte	Movement HVAC	Telegr. switch
4	1 bit	Movement HVAC	Activation

Communication objects
with monitoring objects

No.	Type	Object name	Function
...			
6	1 bit	Signal	Telegr. switch
7	1 bit	Signal	Activation

Communication objects
with value monitoring objects

No.	Type	Object name	Function
...			
6	1 byte	Signal	Telegr. value
7	1 bit	Signal	Activation

Communication objects
with brightness-dependent switching

No.	Type	Object name	Function
...			
2	1 bit	Brightness-dependent switching channel 1	Activation
...			

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

General:

– Operation mode illumination 1	Standard / Master Slave
– Detection area	Sensor 1&2 Sensor 2&3 Sensor 3&4 Sensor 1&4 Sensor 1-4
– Behaviour on bus voltage recovery (comm. objects)	
– Brightness-dependent switching (Illumination channel 1)	enabled disabled
– Movement (Illumination channel 1)	disabled enabled
– Movement (HVAC channel 2)	disabled enabled
– Monitoring function	disabled enabled

Parameters for illumination channel 1:

– Activation object brightness-dependent switching	not available available
– Activation object movement	not available available

Only if activation object for movement is available:

– Enable movement at	ON telegram OFF telegram
– If "Movement" is disabled	do not send a telegram send telegram once at movement send telegram once after detection
– If "Movement" is enabled	do not send a telegram send telegram once at movement send telegram once after detection
– Type of movement object	Switching (EIS1) Value (EIS6)

Only for "Switching (EIS1)":

– Sending at detection	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
------------------------	--

Only in "Standard / Master" mode:

– Telegram after recovery time	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	130 ms / 2.1 s / 34 s / 9 min
– Time factor for cyclical sending	10
Only for "Value (EIS6)":	
– Sending at detection	100% / 90 % / ... / 10 % / OFF / no telegram
– Telegram after recovery time	100% / 90 % / ... / 10 % / OFF / no telegram

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

Parameters for adjustments channel 1:

– Note:

The offset of the brightness value should take place on a luxmeter.
(see technical handbook for more information)

– Threshold illumination adjustable with	ETS Lux1 potentiometer
Only if set with ETS:	
– Threshold illumination (5 lux ...1000 lux)	100
– Recovery time adjustable with	ETS Illumination potentiometer
Only if set with ETS:	
– Potentiometer should not be at TEST	
– Time base of recovery time	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min
– Time factor of recovery time	100
– Light source	switched controlled (constant light)

HVAC:

– Activation object movement	not available available
Only if activation object is available:	
– Enable movement at	ON telegram OFF telegram
– If "Movement" is disabled	do not send a telegram send telegram once at movement send telegram once after detection
– If "Movement" is enabled	do not send a telegram send telegram once at movement send telegram once after detection
– Type of movement object	Switching (EIS1) Value (EIS6)
Only for "Switching (EIS1)":	
– Sending at detection	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Telegram after recovery time	ON telegram OFF telegram ON telegram cyclically OFF telegram cyclically no telegram
– Time base for cyclical sending	130 ms / 2.1 s / 34 s / 9 min
– Time factor for cyclical sending	10
Only for "Value (EIS6)":	
– Sending at detection	100% / 90 % / ... / 10 % / OFF / no telegram
– Telegram after recovery time	100% / 90 % / ... / 10 % / OFF / no telegram

Parameters

The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

Adjustments HVAC:

- Recovery time adjustable with **ETS**
HVAC potentiometer

Only if set with ETS:

- Potentiometer should not be at TEST
- Time base of recovery time 0.5 ms / 8.2 ms / 130 ms / **2.1 s** / 34 s / 9 min
- Time factor of recovery time **100**
- Switch ON delay is adjustable automatically
by ETS

Only if set with ETS:

- Time base of switch ON delay 0.5 ms / 8.2 ms / 130 ms / **2.1 s** / 34 s / 9 min
- Time factor of switch ON delay **100**

Monitoring function

- Activation object monitoring **not available**
available

Only if available:

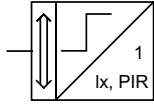
- Enable monitoring function at **ON telegram**
OFF telegram
- Type of monitoring object **Switching (EIS1)**
Value (EIS6)

Only for "Switching (EIS1)":

- Sending at the beginning of detection **ON telegram**
OFF telegram
ON telegram cyclically
OFF telegram cyclically
no telegram
- Sending at the end of detection **OFF telegram**
ON telegram cyclically
OFF telegram cyclically
no telegram
- Time base for cyclical sending **130 ms** / 2.1 s / 34 s / 9 min
- Time factor for cyclical sending **100**

Only for "Value (EIS6)":

- Sending at the beginning of detection **100 %** / 90 % / ... / 20 % / 10 % / OFF / no telegram
- Sending at the end of detection 100 % / 90 % / ... / 20 % / 10 % / **OFF** / no telegram
- Threshold **4**
(1:sensitive / 255:insensitive)
- Time base until watchdog is in monitoring function 0.5 ms / 8.2 ms / **130 ms** / 2.1 s / 34 s / 9 min
- Time factor until watchdog is in monitoring function **100**

**Switch Dim Cyclic HVAC Monitg.
Constant light /4****Selection in ETS**

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

The application program is intended for the presence detector in connection with a flush-mounted bus coupler.

Note: The descriptions for

- Switch,
 - Value,
 - Cyclic,
 - Channel settings,
 - Brightness-dependent switching,
 - Light source,
 - HVAC
 - and Monitoring
- have been outlined in the application description "Switch Value Cyclic HVAC Monitoring".

The following section describes the dimming function and constant lighting control.

Dim

The application has a 1 bit communication object "Output - Switching" and a 4 bit communication object. Both objects are used to detect whether the brightness of the luminaires has been modified manually by a switching or dimming telegram. If the presence detector detects a switching or dimming telegram via these objects, it temporarily switches the constant lighting control off.

The initial brightness value is defined in the parameters. If required, a constant value between 10 % brightness and 100 % brightness can be selected.

Using the 1 byte communication object "Dimmer - Brightness value", the connected luminaire can be assigned one of 256 brightness values in a range between 0 = switched off to 255 = full brightness.

Constant light

The constant lighting control can refer to one or several dimming actuators. The current brightness value is sent via the communication object "Dimmer - Brightness value". It must be ensured that the dimming actuators which are used in this case have entered a common group address at their brightness object.

The constant lighting control can be activated or deactivated at any time via the EIB. The object "Constant brightness controller - Activation" is used for this purpose. If a telegram with the value "1" is received at this object, the constant lighting control is switched on. It is switched off if a telegram with the value "0" is sent to the object.

If the constant lighting control should for example be switched on directly on detection of movement, the objects "Movement - Telegr. switch" and "Constant brightness controller - Activation" must be linked together via a common group address.

If an OFF telegram is sent to the 1 bit object "Output - Switching", the constant lighting control is deactivated. No further telegrams are sent via the object "Brightness value".

If an ON telegram is sent to the 1 bit object "Output - Switching", the constant lighting control is activated. The parameterised initial brightness value is sent first. The constant lighting control then starts and regulates via the "Brightness value" object the actuators that are linked with a group address.

The time which the controller needs to pass through the complete dimming range is defined with the parameter "Speed of control loop". It is more pleasant for the human eye if the brightness level remains as constant as possible. Rapid changes in the brightness level are disruptive.

In addition to the speed of the control loop, there is the "Dimming step size of the control". A slow control setting is preset which means that the constant lighting control always increases or reduces the brightness value by plus/minus two.

Example:

The actual brightness value is 104 but the room brightness is too dark. The presence detector sends a telegram with the value "106" to its communication object "Dimmer - Brightness value". If it determines via its light sensor that the room lighting is sufficient, no further telegrams are sent. If it is still too dark, a telegram with the value "108" is sent. This process is repeated until the required brightness level is reached. A brightness value that is too high is dim-

med down using the same process but in the opposite direction.

The "Dimming step size of the control" can also be set to "-2/+16 (fast control at dimming up)". In this setting, the presence detector always increases the brightness value by +16 if it establishes that there is insufficient light in the room. If the required brightness value is dimmed too far, the presence detector continues to send telegrams with smaller brightness values and thus dims down again.

The "fast control" is particularly a good idea if the room is protected against strong sunlight by blinds. In the setting "slow control", the constant lighting control could supply the room with insufficient brightness due to the blind being lowered. It would become too dark temporarily and the period until the constant lighting control could adjust the brightness level accordingly would be too long.

Normally, the constant lighting control switches off the connected dimming actuators when the brightness value reaches the value "0". This means that the brightness level in the room is sufficient and the connected luminaires do not need to remain switched on at the minimum brightness.

For some electronic ballasts, which always switch on at maximum brightness and are only then dimmed down, it is advisable to change the setting. The parameter "Constant brightness controller minimum" is used for this purpose. In the setting "1", the presence detector is no longer switched off but remains at its minimum brightness value while it still detects movement. If it now becomes dark again, the electronic ballasts would dim up as normal without briefly indicating maximum brightness.

It is possible to select via the ETS program the value at which the constant lighting control should be set. The setpoint for the constant lighting control is entered directly. This can be a brightness value between 5 and 1000 lux. It is however better to allow the user to enter the required brightness value directly. The communication object "Constant brightness controller - Save act. brightness value" is available for this purpose. As soon as a telegram with the value "1" is received at this object,

the presence detector adopts the current brightness value as the new setpoint value for the constant lighting control. The controller must then be restarted. This can either be carried out via the object "Output - Switching" or with an ON telegram or following detection of movement once the previous recovery time has elapsed.

A new setpoint can be assigned at any time via the 1 byte communication object "Constant brightness controller - Brightness setpoint/act. value" (see example).

If the user leaves the room, the presence detector starts the recovery time which is set on the tab "Adjustments channel 1". If the user has however previously adapted the brightness value to his requirements via the dimming objects, the presence detector starts the recovery time of the inactive constant lighting control once the normal recovery time has elapsed. This means that if someone should enter the room during this period, the presence detector/bus coupler combination will not start the constant lighting control again but the object "Dimmer - Brightness value" will send its last active brightness value.

The presence detector can switch on the constant lighting control mode directly after bus voltage recovery or be disabled. A corresponding setting is available on the "General" tab.

The current "Brightness setpoint/actual value" is not stored in the event of a bus voltage failure. If a specific brightness value should be set after bus voltage recovery, it should be sent again to the object "Constant brightness controller - Brightness setpoint/act. value".

Example:

Constant lighting control should be used on a tennis court to save energy. A brightness level of 200 lux should be used during leisure mode while a value of 500 lux should be used during competition mode.

The presence detector on a flush-mounted bus coupler, a built-in switch/dimming actuator and a 1-fold switch sensor (application "Value") are used for toggling between the two constant lighting modes.

Care should be taken that the same group addresses are entered in the communication objects for dimming in both the presence detector and the switch/dimming actuator.

The presence detector must be installed in an appropriate position and put into operation. After commissioning, the illuminance must be determined with a measuring device. The current brightness value of the actuator can be modified via the dimming objects until an illuminance of 200 lx is achieved. This adjustment should take place in test mode. The corresponding parameter must be set to "test mode" for this period.

After each switching or dimming process, the presence detector sends the current actual brightness value via the object "Constant brightness controller - Brightness setpoint/act. value". The transmit flag must be set by default.

The actual value that is sent can be recorded with the help of the telegram recording function in ETS. The recorded value can now be entered in the parameters of the 1-fold switch sensor with the application "Value".

The dimming actuator is then dimmed up to 500 lx. The presence detector then sends the current setpoint/actual value again automatically. The value that is now recorded can likewise be entered in the parameters of the 1-fold switch sensor, in the same way as the value for 200 lx.

When selecting the application of the switch sensor, it should be noted that the communication objects of the rockers can send 1 byte values.

Then put the switch sensor into operation and the constant lighting control with toggling between two operating modes is implemented.

Additional **communication objects**
for constant lighting control

No.	Type	Object name	Function
...			
6	1 bit	Output	Switching
7	4 bit	Dimmer	Rel. dimming
8	1 byte	Dimmer	Brightness value
9	1 bit	Const. brightn. controller	Activation
10	1 bit	Const. brightn. controller	Save act. brightness value
11	1 byte	Const. brightn. controller	Brightness setpoint/act. value

Additional parameters for constant lighting control. The default setting for the values is **printed in bold type**

Note:

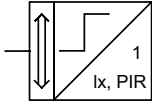
When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

General:

– Operation mode illumination 1	Standard / Master Slave
– Detection area	Sensor 1&2 Sensor 2&3 Sensor 3&4 Sensor 1&4 Sensor 1-4
– Behaviour on bus voltage recovery: (comm. objects)	
– Movement (Illumination channel 1)	disabled enabled
– Movement (HVAC channel 2)	disabled enabled
Only if activation object for monitoring function is available:	
– Monitoring function	disabled enabled
Only if activation object for constant brightness controller is available	
– Constant brightness controller	disabled enabled

Constant brightness controller:

– Activation object constant brightness control	not available available
Only if activation object is available:	
– Enabling constant brightness control at	ON telegram OFF telegram
– Switch ON brightness	10 % / 20 % / ... / 50% / ... / 100%
– Constant brightness controller minimum is	0 (OFF) 1
– Dimming step size of the control	-2 / +2 (slow control) -2 / +16 (fast control at dimming up)
– Speed of control loop	test mode (2.5 min) fast (4 min) normal (10 min) slow (19 min)
– Setpoint brightness control (5 lux ... 1000 lux)	20
– Time base of recovery time	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min
– Time factor of recovery time	100

Switch Value Cyclic Monitoring /4

Selection in ETS

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

The application program is intended for the presence detector in connection with the flush-mounted switch actuator/sensor.

Note: The descriptions for

- Switch,
 - Value,
 - Cyclic,
 - Channel settings,
 - Brightness-dependent switching,
 - Light source,
 - and Monitoring
- have been outlined in the application description “Switch Value Cyclic Monitoring”.

The following section describes the function of the relay output.

Relay

The relay contact can be parameterised for different applications as a normally open or a normally closed contact.

The relay output has its own communication object “Output - Switching”. The relay output can thus be switched via the EIB without dependence on the presence detector. If the relay should be triggered by the presence detector, the communication objects “Movement channel .../ Telegr. switch” and “Output - Switching” must be linked with a common group address.

During normal operation, the relay output can also be parameterised with ON and OFF times. This periods are composed of a base and a factor.

In the staircase lighting function, an operating time is available as in normal operation. The period of the staircase lighting function is parameterised via a base and a factor.

The actuator can send its status on the EIB. To do so, the parameter “Status response” must be set to “yes”. In this case, the communication object “Output - Status” is available. If the value “1” is sent, it means that the relay has picked up. The sending of the status is not dependent on the setting “normally open contact” or “normally closed contact”.

The behaviour of the relay output on bus voltage recovery can be set via the parameter “Contact at bus voltage recovery” and is set by default to “OFF”. If the relay should close on bus voltage recovery, the parameter “Contact at bus voltage recovery” must be changed to “ON”.

Additional **communication objects**
for relay output.

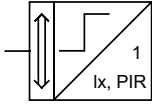
No.	Type	Object name	Function
...			
8	1 bit	Output	Switching
10	1 bit	Output	Status

Additional parameters for output of
flush-mounted switch actuator. The de-
fault setting for the values is **printed in
bold type**

Note:

When using the device in ETS2, some
parameters are only visible and selec-
table in the setting "High Access".

General:		
– Contact at bus voltage recovery (FM switch actuator)	ON	OFF
Output switch act. FM:		
– Operation mode	normal operation	staircase lighting function
– Switch ON delay	yes	no
Only if "yes" is selected:		
– Time base of switch ON delay	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Time factor of switch ON delay (1 ... 255)	64	
Only for normal operation:		
– Switch OFF delay	yes	no
Only if "yes" is selected:		
– Time base for switch OFF delay	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Time factor for switch OFF delay (1 ... 255)	10	
Only for staircase lighting function:		
– Time base for staircase lighting function	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Factor for staircase lighting function (1 ... 255)	10	
– Status response	yes	no
– Relay is	normally closed contact	normally open contact

Switch Value Cyclic HVAC /4**Selection in ETS**

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

The application program is intended for the presence detector in connection with the flush-mounted switch actuator/sensor.

Note: The descriptions for

- Switch,
 - Value,
 - Cyclic,
 - Channel settings,
 - Brightness-dependent switching,
 - Light source,
 - and HVAC
- have been outlined in the application description "Switch Value Cyclic HVAC".

The following section describes the function of the relay output.

Relay

The relay contact can be parameterised for different applications as a normally open or a normally closed contact.

The relay output has its own communication object "Output - Switching". The relay output can thus be switched via the EIB without dependence on the presence detector. If the relay should be triggered by the presence detector, the communication objects "Movement channel .../ Telegr. switch" and "Output - Switching" must be linked with a common group address.

During normal operation, the relay output can also be parameterised with ON and OFF times. This periods are composed of a base and a factor.

In the staircase lighting function, an operating time is available as in normal operation. The period of the staircase lighting function is parameterised via a base and a factor.

The actuator can send its status on the EIB. To do so, the parameter "Status response" must be set to "yes". In this case, the communication object "Output - Status" is available. If the value "1" is sent, it means that the relay has picked up. The sending of the status is not dependent on the setting "normally open contact" or "normally closed contact".

The behaviour of the relay output on bus voltage recovery can be set via the parameter "Contact at bus voltage recovery" and is set by default to "OFF". If the relay should close on bus voltage recovery, the parameter "Contact at bus voltage recovery" must be changed to "ON".

Additional **communication objects** for relay output.

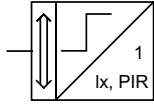
No.	Type	Object name	Function
...			
8	1 bit	Output	Switching
10	1 bit	Output	Status

Additional parameters for output of flush-mounted switch actuator. The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

General:		
– Contact at bus voltage recovery (FM switch actuator)	ON	OFF
Output switch act. FM:		
– Operation mode	normal operation	staircase lighting function
– Switch ON delay	yes	no
Only if "yes" is selected:		
– Time base of switch ON delay	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Time factor of switch ON delay (1 ... 255)	64	
Only for normal operation:		
– Switch OFF delay	yes	no
Only if "yes" is selected:		
– Time base for switch OFF delay	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Time factor for switch OFF delay (1 ... 255)	10	
Only for staircase lighting function:		
– Time base for staircase lighting function	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Factor for staircase lighting function (1 ... 255)	10	
– Status response	yes	no
– Relay is	normally closed contact	normally open contact

**Switch Value Cyclic HVAC
Monitoring/4****Selection in ETS**

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

The application program is intended for the presence detector in connection with the flush-mounted switch actuator/sensor.

Note: The descriptions for

- Switch,
 - Value,
 - Cyclic,
 - Channel settings,
 - Brightness-dependent switching,
 - Light source
 - HVAC
 - and Monitoring
- have been outlined in the application description “Switch Value Cyclic HVAC Monitoring”.

The following section describes the function of the relay output.

Relay

The relay contact can be parameterised for different applications as a normally open or a normally closed contact.

The relay output has its own communication object “Output - Switching”. The relay output can thus be switched via the EIB without dependence on the presence detector. If the relay should be triggered by the presence detector, the communication objects “Movement channel .../ Telegr. switch” and “Output - Switching” must be linked with a common group address.

During normal operation, the relay output can also be parameterised with ON and OFF times. This periods are composed of a base and a factor.

In the staircase lighting function, an operating time is available as in normal operation. The period of the staircase lighting function is parameterised via a base and a factor.

The actuator can send its status on the EIB. To do so, the parameter “Status response” must be set to “yes”. In this case, the communication object “Output - Status” is available. If the value “1” is sent, it means that the relay has picked up. The sending of the status is not dependent on the setting “normally open contact” or “normally closed contact”.

The behaviour of the relay output on bus voltage recovery can be set via the parameter “Contact at bus voltage recovery” and is set by default to “OFF”. If the relay should close on bus voltage recovery, the parameter “Contact at bus voltage recovery” must be changed to “ON”.

Additional **communication objects**
for relay output.

No.	Type	Object name	Function
...			
8	1 bit	Output	Switching
10	1 bit	Output	Status

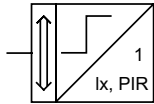
Additional parameters for output of
flush-mounted switch actuator. The de-
fault setting for the values is **printed in
bold type**

Note:

When using the device in ETS2, some
parameters are only visible and selec-
table in the setting "High Access".

General:		
– Contact at bus voltage recovery (FM switch actuator)	ON	OFF
Output switch act. FM:		
– Operation mode	normal operation	staircase lighting function
– Switch ON delay	yes	no
Only if "yes" is selected:		
– Time base of switch ON delay	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Time factor of switch ON delay (1 ... 255)	64	
Only for normal operation:		
– Switch OFF delay	yes	no
Only if "yes" is selected:		
– Time base for switch OFF delay	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Time factor for switch OFF delay (1 ... 255)	10	
Only for staircase lighting function:		
– Time base for staircase lighting function	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min	
– Factor for staircase lighting function (1 ... 255)	10	
– Status response	yes	no
– Relay is	normally closed contact	normally open contact

**Switch Dim Cycl. HVAC Monitg.
Constant light /3**



Selection in ETS

- Busch-Jaeger Elektro
 - └ Phys. Sensors
 - └ Presence detector

The application program is intended for the presence detector in connection with the flush-mounted switch/dimming actuator.

Note: The descriptions for

- Switch,
 - Value,
 - Cyclic,
 - Channel settings,
 - Brightness-dependent switching,
 - Light source,
 - HVAC
 - and Monitoring
- have been outlined in the application description “Switch Value Cyclic HVAC Monitoring”.

The following section describes the function of the switch/dimming actuator and constant lighting control.

Switch/dimming actuator

The output can be switched on and off via the 1 bit communication object “Output - Switching”. The same communication object also sends a telegram if the output modifies its state because e.g. the 4 bit object “Dimmer - Rel. dimming” or the 1 byte object “Dimmer - Brightness value” has received a telegram. To do so, the transmit flag must however be set.

The brightness value which the switch/dimming actuator uses when it is switched on is defined in the parameters. A constant value between 10% brightness and 100% brightness can be selected.

With the 4 bit communication object “Dimmer - Rel. dimming”, the connected luminaires can be dimmed in accordance with EIS 2. If the actuator is switched off, it can be dimmed on via the 4 bit object.

With the 1 byte communication object “Dimmer - Brightness value”, one of 256 brightness values in the range of 0 = switched off to 256 = full brightness can be assigned to the connected luminaires. The object can also send the modified brightness value to other dimmers. To do so, the transmit flag must be set. The setting “internal and external dimmer” sets the transmit flag automatically.

The time which a connected luminaire needs to be dimmed from minimum to maximum brightness is called the dimming speed. The dimming speed used by the actuator to dim the connected luminaires is defined via the corresponding setting on the “Dimmer” parameter page. The minimum setting for the dimming speed is “2 s” while the maximum is “3 min”.

Note:

When the constant lighting control is active, the dimming speed must be shorter than the speed of the control loop as otherwise the constant lighting control would already send a new brightness value although the luminaire has still not been dimmed to its current brightness value due to the high dimming speed.

Constant light

The constant lighting control can refer to one or several dimming actuators. The current brightness value is sent via the communication object “Dimmer - Brightness value”. It must be ensured that the dimming actuators which are used in this case have entered a common group address at their brightness object.

The constant lighting control can be activated or deactivated at any time via the EIB. The object “Constant brightness controller - Activation” is used for this purpose. If a telegram with the value “1” is received at this object, the constant lighting control is switched on. It is switched off if a telegram with the value “0” is sent to the object.

If the constant lighting control should for example be switched on directly on detection of movement, the objects “Movement - Telegr. switch” and “Constant brightness controller - Activation” must be linked together via a common group address.

If an OFF telegram is sent to the 1 bit object “Output - Switching”, the constant lighting control is deactivated. No further telegrams are sent via the object “Brightness value”.

If an ON telegram is sent to the 1 bit object “Output - Switching”, the con-

stant lighting control is activated. The parameterised initial brightness value is sent first. The constant lighting control then starts and regulates via the "Brightness value" object the actuators that are linked with a group address.

The time which the controller needs to pass through the complete dimming range is defined with the parameter "Speed of control loop". It is more pleasant for the human eye if the brightness level remains as constant as possible. Rapid changes in the brightness level are disruptive.

In addition to the speed of the control loop, there is the "Dimming step size of the control". A slow control setting is preset which means that the constant lighting control always increases or reduces the brightness value by plus/minus two.

Example:

The actual brightness value is 104 but the room brightness is too dark. The presence detector sends a telegram with the value "106" to its communication object "Dimmer - Brightness value". If it determines via its light sensor that the room lighting is sufficient, no further telegrams are sent. If it is still too dark, a telegram with the value "108" is sent. This process is repeated until the required brightness level is reached. A brightness value that is too high is dimmed down using the same process but in the opposite direction.

The "Dimming step size of the control" can also be set to "-2/+16 (fast control at dimming up)". In this setting, the presence detector always increases the brightness value by +16 if it establishes that there is insufficient light in the room. If the required brightness value is dimmed too far, the presence detector continues to send telegrams with smaller brightness values and thus dims down again.

The "fast control" is particularly a good idea if the room is protected against strong sunlight by blinds. In the setting "slow control", the constant lighting control could supply the room with insufficient brightness due to the blind being lowered. It would become too dark temporarily and the period until the constant brightness controller could adjust the brightness level accordingly would be too long.

Normally, the constant lighting control switches off the connected dimming actuators when the brightness value reaches the value "0". This means that the brightness level in the room is sufficient and the connected luminaires do not need to remain switched on at the minimum brightness.

For some electronic ballasts, which always switch on at maximum brightness and are only then dimmed down, it is advisable to change the setting. The parameter "Constant brightness controller minimum" is used for this purpose. In the setting "1", the presence detector is no longer switched off but remains at its minimum brightness value while it still detects movement. If it now becomes dark again, the electronic ballasts would dim up as normal without briefly indicating maximum brightness.

It is possible to select via the ETS program the value at which the constant lighting control should be set. The setpoint for the constant lighting control is entered directly. This can be a brightness value between 5 and 1000 lux. It is however better to allow the user to enter the required brightness value directly. The communication object "Constant brightness controller - Save act. brightness value" is available for this purpose. As soon as a telegram with the value "1" is received at this object, the presence detector adopts the current brightness value as the new setpoint value for the constant lighting control. The controller must then be restarted. This can either be carried out via the object "Output - Switching" or with an ON telegram or following detection of movement once the previous recovery time has elapsed.

A new setpoint can be assigned at any time via the 1 byte communication object "Constant brightness controller - Brightness setpoint/act. value" (see example).

If the user leaves the room, the presence detector starts the recovery time which is set on the tab "Adjustments channel 1". If the user has however previously adapted the brightness value to his requirements via the dimming objects, the presence detector starts the recovery time of the inactive constant lighting control once the normal recovery time has elapsed. This means that if someone should

enter the room during this period, the presence detector/bus coupler combination will not start the constant lighting control again but the object "Dimmer - Brightness value" will send its last active brightness value.

The presence detector can switch on the constant lighting control mode directly after bus voltage recovery or be disabled. A corresponding setting is available on the "General" tab.

The current "Brightness setpoint/actual value" is not stored in the event of a bus voltage failure. If a specific brightness value should be set after bus voltage recovery, it should be sent again to the object "Constant brightness controller - Brightness setpoint/act. value".

Example:

Constant lighting control should be used on a tennis court to save energy. A brightness level of 200 lux should be used during leisure mode while a value of 500 lux should be used during competition mode.

The presence detector on a flush-mounted bus coupler, a built-in switch/dimming actuator and a 1-fold switch sensor (application "Value") are used for toggling between the two constant lighting modes.

Care should be taken that the same group addresses are entered in the communication objects for dimming in both the presence detector and the switch/dimming actuator.

The presence detector must be installed in an appropriate position and put into operation. After commissioning, the illuminance must be determined with a measuring device. The current brightness value of the actuator can be modified via the dimming objects until

an illuminance of 200 lx is achieved. This adjustment should take place in test mode. The corresponding parameter must be set to "test mode" for this period.

After each switching or dimming process, the presence detector sends the current actual brightness value via the object "Constant brightness controller - Brightness setpoint/act. value". The transmit flag must be set by default.

The actual value that is sent can be recorded with the help of the telegram recording function in ETS. The recorded value can now be entered in the parameters of the 1-fold switch sensor with the application "Value".

The dimming actuator is then dimmed up to 500 lx. The presence detector then sends the current setpoint/actual value again automatically. The value that is now recorded can likewise be entered in the parameters of the 1-fold switch sensor, in the same way as the value for 200 lx.

When selecting the application of the switch sensor, it should be noted that the communication objects of the rockers can send 1 byte values.

Then put the switch sensor into operation and the constant lighting control with toggling between two operating modes is implemented.

Additional **communication objects** for switch/dimming actuator FM.

No.	Type	Object name	Function
...			
6	1 bit	Output	Switching
7	4 bit	Dimmer	Rel. dimming
8	1 byte	Dimmer	Brightness value
9	1 bit	Const. brightn. controller	Activation
10	1 bit	Const. brightn. controller	Save act. brightness value
11	1 byte	Const. brightn. controller	Brightness setpoint/act. value

Additional parameters for constant lighting control and dimmer output. The default setting for the values is **printed in bold type**

Note:

When using the device in ETS2, some parameters are only visible and selectable in the setting "High Access".

General:

– Operation mode illumination 1	Standard / Master Slave
– Detection area	Sensor 1&2 Sensor 2&3 Sensor 3&4 Sensor 1&4 Sensor 1-4
– Behaviour on bus voltage recovery: (comm. objects)	
– Movement (Illumination channel 1)	disabled enabled
– Movement (HVAC channel 2)	disabled enabled
Only if activation object for monitoring function is available:	
– Monitoring function	disabled enabled
Only if activation object for constant brightness controller is available	
– Constant brightness controller	disabled enabled

Constant brightness controller:

– Type of dimming actuator	internal dimmer internal and external dimmer
– Activation object constant brightness control	not available available
Only if activation object is available:	
– Enabling constant brightness control at	ON telegram OFF telegram
– Switch ON brightness	10 % / 20 % / ... / 50% / ... / 100%
– Constant brightness controller minimum	0 (OFF) 1
– Dimming step size of the control	-2 / +2 (slow control) -2 / +16 (fast control at dimming up)
– Speed of control loop	test mode (2.5 min) fast (4 min) normal (10 min) slow (19 min)
– Setpoint brightness control (5 lux ... 1000 lux)	20
– Time base of recovery time	0.5 ms / 8.2 ms / 130 ms / 2.1 s / 34 s / 9 min
– Time factor of recovery time	100

Dimmer:

– The dimming speed has to be slower than the speed of the control loop.	
– Dimming speed	2 s / 3.5 s / 5.5 s / 7 s / 10 s / 15 s / 20 s / 45 s / 1 min / 2 min / 3 min