



Brightness and temperature sensor
surface-mounted order no. 7549 20 02

1 Brightness and temperature sensor surface-mounted





The brightness and temperature sensor has two different types of channel

-  4 universal channels
-  1 sun shading channel

The **universal channels** can be used for subtasks (e.g. brightness threshold only) or for a combination of brightness and temperature

A universal channel consists of 2 logically linked weather conditions:







-  If brightness is above/below threshold value
- AND
-  If temperature is above/below threshold value

A non-relevant condition (e.g. temperature) can be set to the value "any" and will be ignored in the context of the logic function.

The fulfilment or non-fulfilment of this AND logic function causes a telegram to be sent to the relevant channel object (e.g. C1.1). A second object (e.g. C1.2) can also be activated if necessary, in which case a second telegram will be sent.



Each universal channel has a lock object and a teach-in object for the brightness threshold.

The **sun shading channel** consists of:

-  a twilight threshold
-  up to 3 brightness thresholds
-  3 objects for activation of the drive (up/down, height %, slats %)
-  1 automatic shading object (morning/evening)
-  1 teach-in object
-  1 Security object

The signal for "morning" or "evening" can be triggered via the automatic shading object (e.g. by means of a time switch) or via twilight

Advantages:

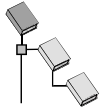
-  2 weather variables can be measured with a single device and sent to the bus.
-  All brightness thresholds can be taught in on the spot if necessary.

Specials:

Every brightness threshold can be programmed directly via a **teach-in object**: the user sends a byte to the teach-in object and the threshold is set to the value of the current brightness measurement.

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Data base structure:



Berker

- Physical sensors
- Brightness/temperature



Application overview:

- 4 x brightness/temperature, 1
- x sun shading

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2 Specifications:

Degree of protection:	IP54 with vertical installation with attached cover
Test mark	KNX
Ambient temperature:	-25 °C to +55 °C
Storage/transport temperature	-25 °C to +70 °C
Fastening type:	Mounting bracket
Power supply instabus EIB	
Voltage:	21 – 32 V DC SELV
Power consumption:	typ. 150 mW
Connection	Connecting terminal
Temperature	
Measuring range	-25 °C to +55 °C
Tolerance	± 5 % resp. ± 1 Grad
Brightness	
Measuring range	1 to 100000 Lux
Tolerance	± 20 % min. ± 1 Lux

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3 The application programme

4 x brightness/temperature, 1 x sun shading



3.1 Selection in product data base

Product family	Physical sensors
Product type	Brightness and temperature
Programme name	4 x brightness/temperature, 1 x sun shading

The ETS database can be found on our website: www.berker.de

3.2 Parameter pages

Table 1

Name	Description
Measured values	Sending of current actual values for brightness and temperature.
Channel use	Number and use of channels Use of universal channels C1, C2, C4 and C5:  with brightness and temperature  as brightness or temperature thresholds only. The C3 channel is purely a sun shading channel.
C1, 2, 4, 5 Brightness	Setting of brightness condition.
C1, 2, 4, 5 Temperature	Setting of temperature condition.
C1, 2, 4, 5 Universal	Setting of temperature and brightness variables for the sending condition.
C1.1, C2.1, C4.1, C5.1	Telegram type and sending behaviour in the case of fulfilled and non-fulfilled Conditions for sending of C1, 2, 4, 5.
C1.2, C2.2, C4.2, C5.2	Second telegram for C1, 2, 4, 5. Setting of telegram type in the case of fulfilled and non-fulfilled sending conditions
C3 Thresholds	Setting of the brightness threshold for twilight and the other thresholds (max. 3) for height and/or slat positions. Delay times in the event of increasing and decreasing brightness.
C3 Blind	Setting of the desired height and the slat positions when the respective thresholds are exceeded
C3 Roller shutter/textile sun shading	Setting of the relevant height when the thresholds are exceeded
C3 Value transmitter	Setting of the value to be sent in each case when the thresholds are exceeded
C3 Scenes via 1-bit objects	Setting of the scene to be sent in each case when the thresholds are exceeded

3.3 Communication objects

3.3.1 Properties of the objects

The brightness/temperature sensor has more than 27 communication objects. Some objects can have different functions and names depending on the parameterisation.

Table 2

Nr.	Function	Object name	EIS Type	Behaviour
0	Physical value	Brightness value	2 byte EIS 5	transmit
1	Physical value	Temperature value	2 byte EIS 5	transmit
4	Switching Priority value	C1.1 Brightness threshold / brightness threshold / universal channel	EIS 1 EIS 8 EIS 14	transmit
5	Switching Priority Value	C1.2 identical to C1.1.	EIS 1 EIS 8 EIS 14	transmit
6	Input	C1 lock	1 bit EIS 1	receive
7	Input	C1 teach-in	8 bits EIS 2	receive
8	Switching Priority Value	C2.1 Brightness threshold / temperature threshold / universal channel	EIS 1 EIS 8 EIS 14	transmit
9	Switching priority Value	C2.2 identical with C2.1.	EIS 1 EIS 8 EIS 14	transmit
10	Input	C2 lock	1 bit EIS 1	receive
11	Input	C2 teach-in	8 bits EIS 2	receive
12	Drives up/down	C3 up/down	1 bit EIS 7	transmit
13	Height	C3 Blind C3 Roller shutter	EIS 6	transmit
	Value transmitter	C3 Transmit value	EIS 14	
	Transmit	Scene 1 + 2	EIS 1	

Continuation

Nr.	Function	Object name	EIS Type	Behaviour
14	Position	C3 Slats	EIS 6	transmit
	Transmit	Scene 3 + 4	EIS 1	
15	Morning=1 / evening=0	C3 Automatic shading	1 bit EIS 1	receive
16	Input	C3 Security	1 bit EIS 1	receive
17	Input	C3 teach-in	8 bits EIS 14	receive
18	Switching Priority Value	C4.1 Brightness threshold / temperature threshold / universal channel	EIS 1 EIS 8 EIS 14	transmit
19	Switching Priority Value	C4.2 identical with C1.1.	EIS 1 EIS 8 EIS 14	transmit
20	Input	C4 lock	1 bit EIS 1	receive
21	Input	C4 teach-in	8 bits EIS 14	receive
22	Switching Priority Value	C5.1 Brightness threshold / temperature threshold / universal channel	EIS 1 EIS 8 EIS 14	transmit
23	Switching Priority value	C5.2 identical to C5.1.	EIS 1 EIS 8 EIS 14	transmit
24	Input	C5 lock	1 bit EIS 1	receive
25	Input	C5 teach-in	8 bits EIS 14	receive
40	Report	Brightness thresholds	2 byte EIS 5	transmit

Table 3

Number of communication objects	27
Number of group addresses	108
Number of assignments	108

3.3.2 Description of the objects

3.3.2.1 Physical values

Object 0 "Brightness value"

Sends the current brightness value when the brightness changes and/or cyclically depending on the parameterisation.

Object 1 "Temperature value"

Sends the current temperature value when the temperature changes and/or cyclically depending on the parameterisation.

3.3.2.2 Universal channels C1, C2, C4, C5

Object 4 "C1.1 Brightness threshold", "C1.1 Temperature threshold", "C1.1 Universal channel" and objects 8, 18, 22 for C2.1, C4.1 and C5.1

This is the first output object of a universal channel
The function of the object depends on the selected telegram type
(see parameter page for first object: C1.1, C2.1, C4.1, C5.1).

Table 4

Telegram type	Format	Transmitted telegrams	
Switching command	EIS 1 (On/Off)	ON/OFF	
Priority	EIS 8 (priority control)	2 bit telegram:	
		<i>Function</i>	<i>Value</i>
		no priority (no control)	0
		Priority OFF (control: disable, off)	2
		Priority ON (control: disable, off)	3
Value	EIS 14 (0-255)	Value between 0 and 255	

If the relevant channel is parameterised as a **security channel**, this object sends 1-bit telegrams: 0 = security inactive, 1 = security state active.

Object 5 "C1.2 Brightness threshold", "C1.2 Temperature threshold", "C1.2 Universal channel" and objects 9, 19 and 23 for C2.2, C4.2 and C5.2

This is the second output object of a universal channel

This object makes it possible to send an additional telegram if necessary.

If the parameter "*Should a second telegram be sent?*" is set to YES on the C1.1 parameter page (or C2.1, etc.), an additional parameter page (C1.2 or C2.2, C4.2, C5.2, etc.) and the corresponding object (object 5) are added.

The type of telegram can be parameterised independently of the first output object. The same setting options are available as for the first output object (see object 4 in the table above).

The cycle time and the locking behaviour apply to both objects (object 4+5) together.

If the relevant channel is parameterised as a security channel, only object 4 is used. Object 5 (and objects 9, 19, 23) and the additional parameter page are omitted

Object 6, 10, 20, 24 "Cx lock"

Sending a 1 to the object puts the relevant channel in the lock state, provided the channel has been parameterised accordingly.

The behaviour when the lock is set and cancelled can be selected on the "C1.1" parameter page (or C2.1, C4.1, C5.1).

The lock state is cancelled by sending a 0.

Object 7, 11, 21, 24 "Teach-in Cx"

If the value \$81 (decimal 129) is sent to this object, the value previously parameterised for the brightness threshold is replaced by the current brightness value and the new value is saved.

To confirm that the teach-in process was successful, the newly saved value is then sent to the bus via **object 40**. For more information, see the appendix: ***The teach-in function***

3.3.2.3 Sun shading channel C3

Object 12 "up/down"

This object is used to fully open or close the sun shading devices. 0 = Move up
1 = Move down

Object 13 "C3 Scene 1 + 2", "C3 Value", "C3 Blind", "C3 Roller shutter"

The function of this object depends on the "*Telegram type*" parameter on the parameter page "C3 Blind / roller shutter / value transmitter / scenes".

Table 5

Telegram type	Format	Transmitted telegrams												
Transmit value	EIS 14 8 bits	transmits a value between 0 and 255												
Shutter	EIS 6 8 bits	Sends the required blind or roller shutter height from 0 % to 100 % to the blind actuator in 1 % steps												
Roller shutter/textile sun shading														
Scenes via 1 bit telegram:	EIS 8 1 bits	<p>In this configuration, this object and the following object are used for the purposes of scene control. In order to distinguish between 4 scenes, 2 scene objects are required, e.g. object 13 + object 14 (or objects 27+28, objects 34+35). One of 4 scenes can be called up depending on which object sends which state.</p> <p>Object 13 sends</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Severity</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Scene 1</td> </tr> <tr> <td>1</td> <td>Scene 2</td> </tr> </tbody> </table> <p>Object 14 sends</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Severity</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Scene 3</td> </tr> <tr> <td>1</td> <td>Scene 4</td> </tr> </tbody> </table> <p>For the receiver (actuator), the decisive telegram is always the one received most recently.</p>	Value	Severity	0	Scene 1	1	Scene 2	Value	Severity	0	Scene 3	1	Scene 4
Value	Severity													
0	Scene 1													
1	Scene 2													
Value	Severity													
0	Scene 3													
1	Scene 4													

Objekt 14 "Cx slats", "Cx Scene 3+4"

The function of this object depends on the "*Telegram type*" parameter on the parameter page "C3 Blind / roller shutter / value transmitter / scenes". It is only available in the case of blinds and scene control.

Table 6

Telegram type	Format	Transmitted telegrams
Shutter	EIS 6 8 bits	Sends the required slat position from 0 % to 100 % to the blind actuator in 1 % steps
Scenes via 1 bit telegram:	EIS 8 1 bits	See object 13

Object 15 "C3 Automatic shading"

This object is only available if the activation of automatic shading "*via object*" has been selected on the parameter page "*C3 Blind / roller shutter / value transmitter / scenes*". Sending a 1 to the object activates the automatic shading and the sensor sends the required height and position telegrams to the actuator. Sending a 0 deactivates the automatic shading and the drives are no longer controlled by the sensor.

- **Object 16 "Security"**

If security is set (= 1), the 2 objects (e.g. C3 Height and C3 Slats) of the channel in question no longer send information.

The reaction of the drives to the start of security is to be regulated in the actuator.

When security is cancelled (= 0):

During the day: the current channel state is sent again once the delay timer has elapsed. The actuator therefore receives the new settings from the sensor once security has ended.

During the night, the parameters "*Reaction to evening telegram*" or "*Reaction to automatic shading OFF*" apply depending on the setting (activation of automatic shading via object or twilight threshold).

The security telegram can be generated by a rain and wind sensor.

Object 17 "C3 Teach-in"

This object can be used to teach in all brightness thresholds for the sun shading channel. Each threshold is addressed individually.

Table 7

Teac-in code		Threshold
Hex.	Dec.	
\$80	128	Twilight threshold
\$81	129	Threshold 1
\$82	130	Threshold 2
\$83	131	Threshold 3

For detailed information, see the appendix: **The teach-in function.**

To confirm that the teach-in process was successful, the newly saved values are sent to the bus via object 40.

3.3.2.4 Feedback object

Object 40 "Brightness

thresholds"

This object can send the current settings for the brightness thresholds automatically and on request.

The request for the brightness thresholds is triggered by sending any value between \$00 and \$7F (or between \$84 and \$ FF) to the teach-in object of the relevant channel.

The values \$80 to \$83 are reserved for teach-in processes.

Table 8: Feedback options

Case	Behaviour
After downloading the application	All brightness thresholds for all channels are sent in succession.
After teaching in a threshold	All brightness thresholds for the channel are sent in succession.
When a request is sent	All brightness thresholds for the channel are sent in succession.

Remarks:



-  The brightness thresholds are sent in the order in which they appear in the application programme in the ETS, see table below.
-  Thresholds which are not active are not sent (e.g. brightness threshold 3 if C3 has only been parameterised with 2 thresholds).

Table 9: Transmission sequence. All brightness thresholds that are in use are sent after downloading the application

Chan nel	Threshold	Note
1	Brightness	<i>only if the channel has been parameterised as a brightness sensor or a universal channel</i>
2	Brightness	
3	Twilight threshold	<i>is always transmitted</i>
	Brightness threshold value 1	<i>is always transmitted</i>
	Brightness threshold value 2	<i>only if 2 or 3 thresholds have been parameterised (parameter: "how many brightness thresholds")</i>
	Brightness threshold value 3	
4	Brightness	<i>only if the channel has been parameterised as a</i>
5	Brightness	<i>brightness sensor or a universal channel</i>

Certain values are rounded up or down due to the EIS5-related restrictions; for example, a value of 10000 lux may be displayed as 9999.36 (\$4FA1) or as 10004.48 (\$4FA2).

3.4 Parameters

3.4.1 Measured values

Table 10

Description	Values	Severity
Brightness value transmission in the event of a change of	not due to a change 10 %, at least 1 lx 20 %, at least 1 lx 30 %, at least 1 lx 50 %, at least 1 lx	cyclical transmission only (if released) Send if the value has changed by 10 %, 20 %, etc. since the last transmission. If, however, a change of 10 %, for example, corresponds to a brightness change of < 1 lx, transmission only occurs when the change is > 1 lx.
Cyclical brightness value transmission	do not send cyclically every minute every 2 minutes every 3 minutes every 5 minutes every 10 minutes every 15 minutes every 20 minutes every 30 minutes every 45 minutes every 60 minutes	how often should the current brightness value be resent?
Temperature transmission in the event of a change of	not due to a change 0.5 °C 1.0 °C ... 2.5 °C	cyclical transmission only (if released) Send if the value has changed by 0.5 °C or 1 °C, for example, since the last transmission.
Cyclical temperature transmission	do not send cyclically every minute every 2 minutes every 3 minutes every 5 minutes every 10 minutes every 15 minutes every 20 minutes every 30 minutes every 45 minutes every 60 minutes	how often should the current temperature be resent?

3.4.2 Channel use

Table 11

Description	Values	Severity
Application C1, C2, C4, C5	Brightness sensor Temperature sensor Universal channel	Function of the universal channels: Only brightness condition Only temperature condition Brightness and temperature condition as AND logic function.
Application C3	Sun protection	This channel is permanently configured as a sun shading channel with a twilight threshold and up to 3 further brightness thresholds for blind or roller shutter control.

3.4.3 C1, C2, C4, C5 as brightness thresholds

Table 12

Description	Values	Severity
Brightness condition	under 2 lx up to more than 90000 lx (in 147 steps)	Should the condition be fulfilled when the brightness is <i>below</i> or <i>above</i> the set value?
Hysteresis light	20 %, at least 1 lx 30 %, at least 1 lx 50 %, at least 1 lx	Hysteresis prevents frequent switching in the case of small brightness changes. It can be negative or positive depending on the set condition. Example with 20 % hysteresis: Condition: "OVER 4500 lux" = fulfilled as of 4500 lx and no longer fulfilled at 4500 lx - 20 % Condition: "UNDER 4500 lux" = fulfilled below 4500 lx and no longer fulfilled at 4500 lx + 20 %
Delay in the event of increasing brightness	none 5 seconds 10 seconds 20 seconds 30 seconds 1 Minute 2 minutes 3 minutes 5 minutes 10 minutes 15 minutes	Reaction time when it gets brighter and the set threshold is passed as a result. This setting prevents the transmission of conflicting telegrams in the event of brief brightness changes
Delay in the event of decreasing brightness	none 5 seconds 10 seconds 20 seconds 30 seconds 1 Minute 2 minutes 3 minutes 5 minutes 10 minutes 15 minutes	Reaction time when it gets darker and the set threshold is passed as a result. This setting prevents the transmission of conflicting telegrams in the event of brief brightness changes

3.4.4 C1, C2, C4, C5 as temperature thresholds

Table 13

Description	Values	Severity
Temperature condition	under -10 °C up to more than 40 °C (in 1 K steps)	Should the condition be fulfilled when the temperature is <i>below</i> or <i>above</i> the set value?
Hysteresis temperature	1°C 1.5°C 2°C 2.5°C	Hysteresis prevents frequent switching in the case of small temperature changes. It can be negative or positive depending on the set condition (above or below xx °C) (see previous table: hysteresis light).

3.4.5 C1, C2, C4, C5 as universal channels

Table 14

Description	Values	Severity
IF brightness	as desired under 2 lx up to more than 90000 lx (in 147 steps)	Do not take brightness into account Should the brightness condition be fulfilled when the brightness is <i>below or above</i> the set value?
Hysteresis light	20 %, at least 1 lx 30 %, at least 1 lx 50 %, at least 1 lx	Hysteresis prevents frequent switching in the case of small brightness changes. It can be negative or positive depending on the set condition. Example with 20 % hysteresis: Condition: "OVER 4500 lux" = fulfilled as of 4500 lx and no longer fulfilled at 4500 lx - 20 % Condition: "UNDER 4500 lux" = fulfilled below 4500 lx and no longer fulfilled at 4500 lx + 20 %
Delay in the event of increasing brightness	none 5 seconds 10 seconds 20 seconds 30 seconds 1 Minute 2 minutes 3 minutes 5 minutes 10 minutes 15 minutes	Reaction time when it gets brighter and the set threshold is passed as a result. This setting prevents the transmission of conflicting telegrams in the event of brief brightness changes
Delay in the event of decreasing brightness	none 5 seconds 10 seconds 20 seconds 30 seconds 1 Minute 2 minutes 3 minutes 5 minutes 10 minutes 15 minutes	Reaction time when it gets darker and the set threshold is passed as a result. This setting prevents the transmission of conflicting telegrams in the event of brief brightness changes

Continuation:

Description	Values	Severity
AND temperature	as desired under -10 °C up to more than 40 °C (in 1 K steps)	Do not take temperature into account Should the condition be fulfilled when the temperature is <i>below</i> or <i>above</i> the set value?
Hysteresis temperature	1°C 1.5°C 2°C 2.5°C	Hysteresis prevents frequent switching in the case of small temperature changes.

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3.4.6 C1.1, C2.1, C4.1, C5.1, or C1.2, C2.2, C4.2, C5.2 (second telegram)

Table 15

Description	Values	Severity
Telegram type C1.1	Switching command Priority Value	1 bit ON/OFF telegram 2 bit EIS 8 1 byte 0 .. 255
If all conditions are fulfilled	No telegram, send following telegram once, send cyclically	Sending behaviour if weather conditions are fulfilled
Telegram	Switch-off command Switch-on command	For telegram type Switching command
	No priority Priority, ON (down) Priority, OFF (up)	For telegram type Priority
	Telegram 0 .. 255	For telegram type Value
If not all conditions are fulfilled	No telegram, send following telegram once, send cyclically	Sending behaviour if at least one condition is not fulfilled
Telegram	Switch-off command Switch-on command	For telegram type Switching command
	No priority Priority, ON (down) Priority, OFF (up)	For telegram type Priority
	Telegram 0 .. 255	For telegram type Value
Cycle time (if used)	each minute every 2 minutes every 3 minutes every 5 minutes every 10 minutes every 15 minutes every 20 minutes every 30 minutes every 45 minutes every 60 minutes	How often should the telegrams be sent for CX.1 and CX.2?
Behaviour when the lock is set	Ignore lock	No locking possible
	Do not send	No information is sent when the lock object is set.
	As in the case of unfulfilled condition	The relevant channel behaves as if the condition were not fulfilled.

Continuation

Description	Values	Severity
Behaviour when the lock is cancelled	no emission Update channel	Information is not automatically resent when the lock is cancelled The current channel state is sent once the lock is cancelled
Should a second telegram be sent?	Yes No	If Yes is selected, a new parameter page appears (e.g. C1.2) along with a second sending object. This means that 2 different telegrams can be sent at the same time with the same channel. The cycle time and the locking behaviour apply to both telegrams together (e.g. C1.1 and C1.2).

3.4.7 Sun shading channel: C3 thresholds

Table 16

Description	Values	Severity
Light measurement via	internal sensor	The brightness is always measured via the built-in sensor
Twilight threshold	2 lx .. 500 lx (in 36 steps)	Threshold to detect the start or end of the day.
How many brightness thresholds?	1 Threshold 2 Thresholds 3 Thresholds	3 thresholds enable precise positioning of the blind slats or 3 roller shutter positions
Brightness threshold value 1	2000 lx .. 60 klx	The 3 threshold values must be entered in ascending order and must be at least 4000 lx apart. Impermissible values will be corrected automatically in the device (see appendix: Auto-correction of the sun shading channel thresholds)
Brightness threshold value 2	6000 lx .. 70 klx	
Brightness threshold value 3	10 klx .. 80 klx	
Delay in the event of increasing brightness	10 s (only for test purposes) 1 .. 20 min (in 1 min steps)	Only for commissioning and tests. Reaction time when it gets brighter and a threshold is exceeded as a result. This delay prevents conflicting drive reactions in the event of brief brightness changes
Delay in the event of decreasing brightness	10 s (only for test purposes) 5 .. 20 min (in 1 min steps)	Only for commissioning and tests. Reaction time when it gets darker and a threshold is undershot as a result. This delay prevents contrary drive reactions in the event of brief brightness changes

3.4.8 C3 Blind

This heading appears on the C3 parameter page if "Blind" has been set as the telegram type.

Table 17

Description	Values	Severity
Telegram type	Scenes via 1-bit telegrams Send value Shutter Roller shutter/textile sun shading	Intended purpose of the sun shading channel in conjunction with the actuator in use.
Activation of automatic shading	via twilight threshold	The automatic sun shading is activated as soon as the twilight threshold is exceeded.
	via object	The automatic sun shading is activated via the relevant automatic shading object (e.g. by means of a time switch).
Reaction to dawn	Raise & automatic shading ON,	When the twilight threshold is exceeded, the blind is raised and when threshold 1 is exceeded, the blind is positioned accordingly. If the value falls below threshold 1, the blind is raised again
	Raise & one-off automatic shading	As above, except that the blind is only raised again at dusk. The one-off function serves to "calm" the facade, to prevent constant movement of the drives. See appendix: "One-off automatic shading" parameter (sun shading channel)

Continuation

Description	Values	Severity
<p>Reaction to automatic shading on</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Automatic shading via object</p>	<p>Raise & automatic shading ON,</p> <p>Raise & one-off automatic shading,</p> <p>Only raise at twilight & automatic shading ON</p>	<p><i>Only visible with activation of automatic shading via object</i> If the automatic shading object is set:</p> <p>Raise blind and position accordingly when a further threshold is reached.</p> <p>As above, except that the blind is only raised again when the automatic shading object is reset. The one-off function serves to "calm" the facade, to prevent constant movement of the drives.</p> <p>The blind is only raised when the automatic shading object is set and the twilight threshold is exceeded</p>
Drive height as of threshold 1	0% .. 100% (in 2.5% steps)	The blind is lowered once when threshold 1 is exceeded.
Turning of slats between threshold 1 and 2	0% .. 100% (in 2.5% steps)	Slat position that is to be applied when threshold 1 is exceeded.
Turning of slats between threshold 2 and 3	0% .. 100% (in 2.5% steps)	Slat position that is to be applied when threshold 2 is exceeded.
Turning of slats above threshold 3	0% .. 100% (in 2.5% steps)	Slat position that is to be applied when threshold 3 is exceeded.
Reaction to dusk	Automatic shading OFF & raise, automatic shading OFF & lower	Should the blind be raised or lowered in the evening?

Continuation

Description	Values	Severity
Reaction to automatic shading off	Automatic shading OFF & raise, automatic shading OFF & lower, automatic shading OFF & lower at twilight,	<p><i>Only visible with activation of automatic shading via object</i> If the automatic shading object is reset:</p> <p>Raise blind</p> <p>Lower blind</p> <p>Only lower when the twilight threshold is undershot</p>

4 Appendix

4.1 The sun shading channel C3

4.1.1 Application blind:

When threshold 1 is exceeded, the blind is lowered via the first object (height) and the slats are brought into an initial position via the second object.

When threshold 2 is exceeded, the slats are brought into a second position; the height remains unchanged.

When threshold 3 is exceeded, the slats are brought into a third position; the height remains unchanged.

4.1.2 Application roller shutter/textile sun shading:

When threshold 1 is exceeded, the roller shutter is brought into an initial position via the height object.

When threshold 2 is exceeded, the roller shutter is brought into a second position via the height object.

When threshold 3 is exceeded, the roller shutter is brought into a third position via the height object.

The user has the option of reducing the number of thresholds to two or one.

4.2 The teach-in function

4.2.1 Principle:

As it is difficult to estimate the brightness, all parameterised brightness thresholds can be taught in directly on the spot.

The teach-in process takes place via a telegram and replaces the previously parameterised threshold value with the current brightness value.

The brightness thresholds are recorded via the teach-in object (1 per channel). Each threshold is addressed via a separate teach-in code (see tables below).

If, for example, the value \$80 (decimal 128) is sent to the teach-in object of the **sun shading channel** as a teach-in command, the (previously parameterised) value of the twilight threshold is replaced by the current brightness value and the new value is saved. The same applies to brightness thresholds 1..3 with \$81 to \$83 as teach-in commands.

In the event of incorrect entries, the values will be corrected automatically, see below:

Auto-correction of the sun shading channel thresholds.

In the case of the **universal channel**, the brightness threshold is taught in with the code \$81 (129 dec.).

The currently parameterised direction "over XY lux" or "under XY lux" is retained; only the lux value is adjusted.

Example: > 5000 lux has been parameterised and the teach-in object is activated at a brightness of 4000 lx.

Result: > 4000 lux is now the new threshold.

Table 18: Teach-in code and limit values for the sun shading channel

Teac-in code		Threshold	Lower limit	Upper limit
Hex.	Dec.			
\$80	128	Twilight threshold	2 lx	500 lx
\$81	129	Threshold 1	2 klx	60 klx
\$82	130	Threshold 2	6 klx	70 klx
\$83	131	Threshold 3	10 klx	80 klx

Table 19: Teach-in code and limit values for universal channels

Teach-in command	Threshold	Lower limit	Upper limit
\$81	Brightness condition	2 lx	90 klx

4.2.2 Auto-correction of the sun shading channel thresholds

IMPORTANT: The values to be taught in must be in the right order and must be at least 4000 lx apart.

The taught-in brightness threshold 3 must be greater than brightness threshold 2, which must in turn be greater than brightness threshold 1, etc.

If this is not the case, the values will be corrected in line with the following rules:

The last threshold that is taught in determines the others, if the difference between the thresholds is too low.

If a value below the value for threshold 2 is taught in for threshold 3, thresholds 1 and 2 are lowered accordingly.

If the values are below the lower limits (or above the upper limit in the case of twilight), these limits are adopted.

The automatic correction only takes into account the lower limits (exception: twilight threshold)

During teach-in

If the teach-in values are not acceptable, only the last value applies and the others are adjusted accordingly.

If the last entry is unusable, the limit values in the table apply.

Table 20

Threshold	Lower limit	Upper limit
Twilight threshold	2 lx	500 lx
Threshold 1	2 klx	60 klx
Threshold 2	6 klx	70 klx
Threshold 3	10 klx	80 klx

After downloading the application:

If the distances between the thresholds are too small, threshold 1 is taken as a reference. The other thresholds are adjusted relative to each other with 4000 lux between thresholds.

4.3 "ONE-OFF automatic shading" parameter (sun shading channel)

The one-off function serves to "calm" the facade, to prevent constant movement of the drives.

4.3.1 With blind:

When threshold 1 is exceeded, the blind is lowered to the parameterised height and remains in this position all day. It is only moved again at twilight (or via automatic shading object). The slats, however, are still repositioned with the current brightness value

4.3.2 With roller shutters / value transmitters / scenes

A telegram is only sent when the next highest threshold is exceeded. If one of the 3 thresholds is undershot, no telegram is sent.

Therefore, the roller shutter is lowered further and further as it gets brighter.

It is not raised when it gets darker, unless this is triggered by automatic shading off or twilight. All other settings are made directly by the user on a manual basis.

The roller shutter, like the blind, is only moved again at twilight (or via automatic shading object).

- In the case of normal sun shading, the drives are raised when threshold 1 is undershot.
- A telegram is always sent at the start and end of the day (raise, lower), either due to the passing of the twilight threshold or the receipt of an automatic shading telegram.
- This telegram is sent in the evening even if threshold 1 was not exceeded during the day and therefore no conflicting telegram has been sent