State 10/2024 Version 1.0

Technical Manual

MDT Shutter Actuator with travel time measurement

JAL-0410M.02

JAL-0810M.02

Further Documents :

Datasheets:

https://www.mdt.de/EN_Downloads_Datasheets.html

Assembly and Operation Instructions:

https://www.mdt.de/EN_Downloads_Instructions.html

Solution Proposals for MDT products:

https://www.mdt.de/EN_Downloads_Solutions.html

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2 Overview

2.1 Overview Devices

The description applies to the following LED controllers (order numbers printed in bold letters):

- **JAL-0410M.02** Shutter Actuator 4-fold, 4SU MDRC, 8A, with travel time measurement
  - 4 channels, for shutter motors 230VAC up to 300W, manual actuation
- **JAL-0810M.02** Shutter Actuator 8-fold, 8SU MDRC, 8A, with travel time measurement
  - 8 channels, for shutter motors 230VAC up to 300W, manual actuation
-

2.1.1 Special functions of the Shutter Actuator

The shutter actuator can be used to control both blinds and shutters. Of course, the blind actuator can also be used to control ventilation flaps or to move garage doors or awnings.
The shutter actuator has a very extensive application with the following special functions that are largely unique on the market.

Sun position calculation with automatic clouding/slat tracking

Modern buildings are excellently insulated and have large window areas. As a result, the rooms heat up very quickly when exposed to sunlight. You will not be able to get rid of this heat any time soon. Therefore, an intelligent sun protection belongs to the basic equipment of a new house.

The MDT shutter actuator calculates the current position of the sun, i.e. azimuth (angle of the sun) and elevation (height of the sun). In addition to time/date, it needs information about the strength of the solar radiation. One or two threshold values of a brightness sensor or global radiation sensor or one to three brightness values of a weather station (e.g. east, south and west) are sufficient for this. With this information, roller shutters can automatically move to two shading positions depending on the position and strength of the sun.

With blinds, the slats can be tracked automatically. During manual operation, the tracking is automatically switched off. It can be reactivated at any time by a release signal or by moving to the upper position.

Each window can be individually parameterized. Thus, the orientation of the windows according to the compass direction and possible shading by neighbouring buildings can be taken into account. In contrast to other devices on the market, no expensive weather station with built-in shading function is required here. The shading position (height) can be set and taught in by the operator via a scene.

Automatic travel time measurement

The new shutter actuator has an automatic travel time measurement that is compatible with motors with mechanical and electronic limit switching. The travel time measurement takes place separately per channel, so that different travel times are possible for each channel. A continuous running time correction in the background ensures a permanent and optimal running time setting of the shutter motors.

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Window opening/tilt function with practical air function

In the practical air ventilation function, the state of the window or door is detected by means of a contact. If a window is now tilted with the shutter closed, the shutter moves up a few cm to an airing position. If the window or the patio door is opened completely, the roller shutter moves e.g. completely up and locks the shading, absolute positions and the central commands (adjustable by parameter). As a special feature, the manual control remains active even when the door is open, so that the position can be changed at any time. The usual alarm and lock functions do not allow manual operation.

Patio door with lockout protection function

The state of the patio door can be safely detected via a lock monitoring (magnetic contact). As soon as the patio door is opened, the blind is blocked against a possible lowering (except manual operation) and the door remains safely accessible. Only when the patio door is closed again, the blind can be moved again with absolute position and central commands (adjustable by parameter). If the blind is already closed in the evening, it is automatically raised when the patio door is opened. As a special feature, the manual control remains active even when the door is open, so that the position can be changed at any time. It is possible to close the shutter with the hand control when the door is open.

Clouding function with optional energy use and saving

For optimal energy use, the clouding function can be controlled depending on the room temperature. If the room temperature is below a set target value, the blinds remain up and the additional heat yield of the sun is used. If the room temperature is reached, the blind moves down to the clouding position. Further heating of the room is prevented and otherwise necessary energy for room cooling is saved.

Convenient hand control function „Single Object Control“

The actuator enables convenient manual operation. A short push-button action on the shutter button causes the shutter of the operated window to move or, if it is moving, to stop. With a long button press, e.g. all roller shutters in the room move. This function is not possible with normal actuators from other manufacturers. The function is achieved by controlling with only one object (short keystroke) for up/down/stop (Single Object Control). The object for long button press (recommended 1-1.5s) then controls all shutters in the room as a group..

Fire alarm

If the smoke detector or the fire alarm system reports a fire, all shutters immediately move up to clear the escape route. The new function can be activated in the current database via the priority of the alarms.

Frost/ice protection for blinds/roller shutters

Various manufacturers require the blinds to be blocked at temperatures below 3 degrees and simultaneous rainfall. At temperatures above 5 degrees, the blinds are released again after a set time. Now this requirement can be implemented without external logic.

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Advanced Block function

In general, the blind actuators are equipped with the normal alarm/blocking functions for wind, rain/fire and frost alarm. For each alarm, the alarm behaviour can be set independently. In addition to the up/down command, it is also possible to move to a previously defined alarm position in the event of an alarm. In addition to the normal locking function, the actuator has a significantly extended locking function with adjustable function locks. Absolute positions, clouding, air ventilation functions as well as scenes or central functions can be extensively blocked.
For example, a 'child sleep' function can be easily implemented. Manual operation automatically locks the absolute position and central functions. The clouding and central function is only released again when the upper position is approached.

Advanced Scene function

The extended scene function can not only move to positions, but also activate and delete any locks or set a lower limit.
For blinds it is also possible to change only the slat position.

Advanced Automatic function

There are two automatic blocks with 4 positions each which are activated with 1 bit telegrams. Each channel can be assigned to a block and 1-4 positions.
In each channel, the position 1-4 to be approached can be parameterised as desired, as well as the behaviour per position when the automatic position is deactivated.

Extensive status information for visualization

The shutter actuator has extensive status information such as current height position (1 byte), current slat position (1 byte), current/last direction (1 bit), status clouding state (1 bit), upper and lower position (1 bit) and status lock/alarm (1 bit).
With the multitude of possible status information, the status of the blind can always be displayed exactly in every visualisation.

Plaintext diagnosis with 14-byte object

For automatic clouding there is a 14-byte diagnostic object which reports the current state of the clouding like "enabled/disabled", the active brightness threshold as well as the calculated position of the sun, i.e. azimuth and elevation
Each channel also has a diagnosis object, which reports the last state of the channel. Here you can see if the channel is in a state of alarm, an air position, or is locked.
The diagnosis objects save time when reviewing and troubleshooting and simplify commissioning.

Long Frame Support

The support to send longer messages and thus the accommodation of more user data per telegram. Thereby the programming time is significantly shortened (from the ETS5).
This requires use of a programming interface which supports the transmission of long frames, for example MDT SCN-USBR.01 or SCN-IP000.03/SCN-IP100.03.

Updateable via DCA (from device version R6.0)

If necessary, the actuators can be updated with the help of the MDT Update Tool.

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2.2 Exemplary Circuit diagrams

The following figure shows the connection assignment using the example of the 8-fold actuator:

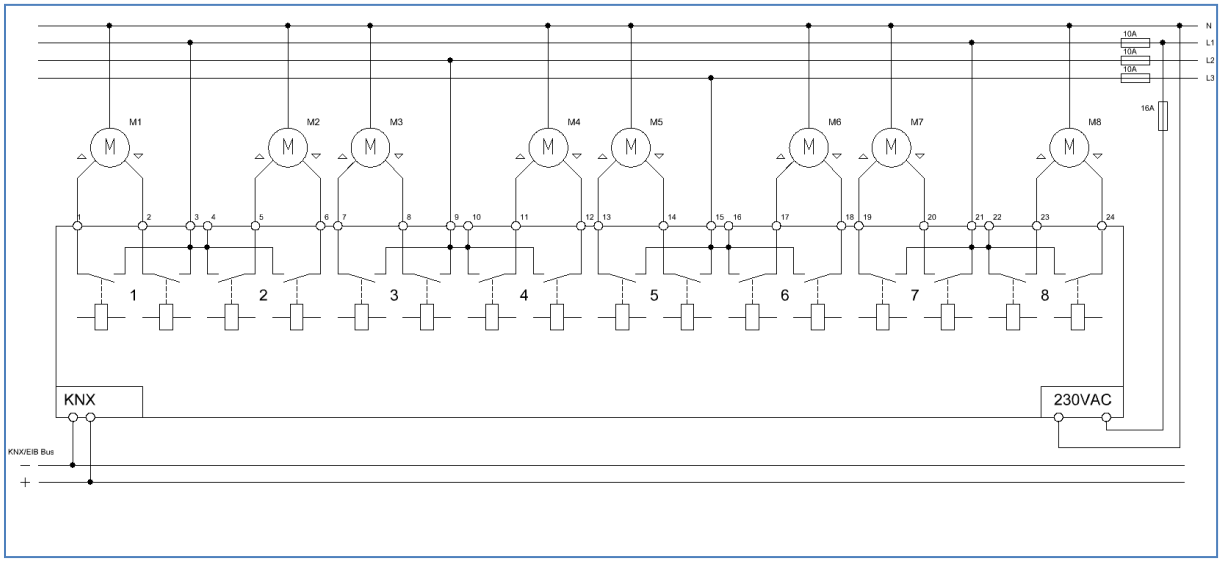

Figure 1: Exemplary circuit diagram – Shutter Actuator 8-fold

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2.3 Structure & Handling

The shutter actuator has a programming button as well as a programming LED which indicates a pressed programming button..

In addition to the bus voltage, the shutter actuator must also be connected to 230V AC (position 7, Figure 2).

- If only the bus voltage is connected, the actuator cannot be operated and the programming LED does not light up..
- If only the 230V auxiliary voltage is connected, the red programming LED flashes "long off/short on". If the programming button is pressed, the programming LED flashes inversely "long on/short off".

Each channel has two status LEDs, one for an active upward movement and one for an active downward movement. A flashing LED indicates that the up/down movement is currently active and a permanently lit LED indicates that the upper/lower end position has been reached. Manual operation is also possible via 4 buttons. The channel for manual operation can be selected using the two upper buttons „◀" and "▶". The lower two buttons „▲" and „▼" can then be used to start an upward or downward movement or to stop the movement.

Important: The automatic travel time measurement can be started either via an object or a button combination.

Activation via buttons is as follows:

- Channel selection with „◀" or „▶".
- Press and hold the buttons „▲" and „▼" simultaneously.

The following illustration shows an 8-fold shutter actuator (MDRC):

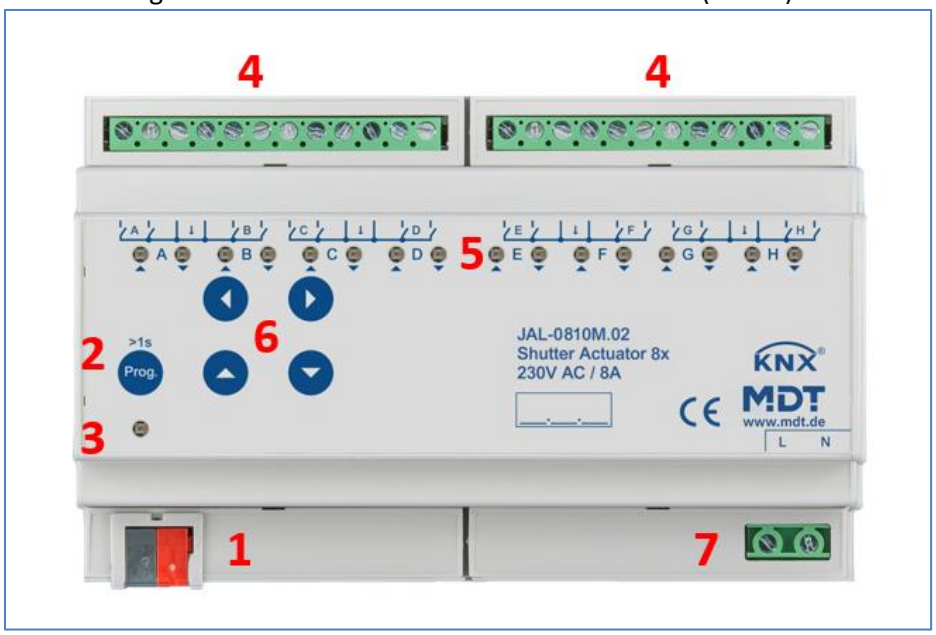

Figure 2: Overview hardware module (JAL-0810M.02)

1 – Bus connection terminal
2 – Programming button
3 – Red programming LED
4 – Output power terminal
5 – Green ON/OFF LED
6 – Buttons for manual operation
7 – Mains power supply terminal

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2.4 Commissioning

After wiring, the allocation of the physical address and the parameterization of every channel follows:

(1) Connect the interface with the bus, e.g. MDT USB Interface
(2) Connect mains voltage (actuator auxiliary voltage side 230VAC, only with REG unit)
(3) Switch-on bus voltage
(4) Press the programming button at the device >1s (red programming LED lights)
(5) Loading of the physical address out of the ETS-Software by using the interface (red LED goes off as soon as this process was completed successfully)
(6) Loading of the application, with requested parameterization
(7) If the device is enabled you can test the requested functions (also possible by using the ETS-Software)

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3 Communication objects

3.1 Standard settings of the communication objects

The following table shows the standard settings for the communication objects:

Standard Settings								
No.	**Name**	**Function**	**Length**	**C**	**R**	**W**	**T**	**U**
0	Central Function	Shutter up/down	1 Bit	X		X		
1	Central Function	Slats adjustment/Stop	1 Bit	X		X		
2	Central Function	Stop	1 Bit	X		X		
3	Central Function	Absolute position	1 Byte	X		X		
4	Central Function	Absolute position of slats	1 Byte	X		X		
5	Operation	Output	1 Bit	X	X		X	
6	Central Function	Block manual control	1 Bit	X		X		
6	Central Function	Rain alarm for ice protection	1 Bit	X		X		
7	Date/Time	Receive current values	8 Byte	X		X	X	X
7	Time	Receive current value	3 Byte	X		X	X	X
8	Date	Receive current value	3 Byte	X		X	X	X
9	Central Function	Brightness 1	2 Byte	X		X	X	X
9	Central Function	Brightness 1	1 Bit	X		X	X	X
10	Central Function	Brightness 2	2 Byte	X		X	X	X
10	Central Function	Brightness 2	1 Bit	X		X	X	X
11	Central Function	Brightness 3	2 Byte	X		X	X	X
12	Central Function	Outside temperature	2 Byte	X		X	X	X
12	Central Function	Outside temperature threshold	1 Bit	X		X	X	X
13	Central Function	Block clouding	1 Bit	X	X	X	X	
13	Central Function	Enable clouding	1 Bit	X	X	X	X	
14	Central Function	Clouding diagnosis	14 Byte	X	X		X	
15	Automatic A	Automatic position 1	1 Bit	X		X		
16	Automatic A	Automatic position 2	1 Bit	X		X		
17	Automatic A	Automatic position 3	1 Bit	X		X		
18	Automatic A	Automatic position 4	1 Bit	X		X		
19	Automatic B	Automatic position 1	1 Bit	X		X		
20	Automatic B	Automatic position 2	1 Bit	X		X		
21	Automatic B	Automatic position 3	1 Bit	X		X		
22	Automatic B	Automatic position 4	1 Bit	X		X		

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23	Channel A	Blinds up/down	1 Bit	X		X		
23	Channel A	Shutter up/down	1 Bit	X		X		
23	Channel A	Single Object Control	1 Bit	X		X		
24	Channel A	Slats adjustment/Stop	1 Bit	X		X		
24	Channel A	Short term operation/Stop	1 Bit	X		X		
25	Channel A	Stop	1 Bit	X		X		
26	Channel A	Scene	1 Byte	X		X		
27	Channel A	Status current direction	1 Bit	X	X		X	
28	Channel A	Status of movement	1 Bit	X	X		X	
28	Channel A	Status of movement up	1 Bit	X	X		X	
29	Channel A	Status of movement down	1 Bit	X	X		X	
30	Channel A	Absolute position	1 Byte	X		X		
31	Channel A	Absolute position of slats	1 Byte	X		X		
32	Channel A	Status current position	1 Byte	X	X		X	
33	Channel A	Status cur. position of slats	1 Byte	X	X		X	
34	Channel A	Status Lock/Alarms	1 Bit	X	X		X	
35	Channel A	Start driving to reference	1 Bit	X		X		
35	Channel A	Start travel time measurement	1 Bit	X		X		
36	Channel A	Move to position	1 Bit	X		X		
37	Channel A	Status upper position	1 Bit	X	X		X	
38	Channel A	Status lower position	1 Bit	X	X		X	
39	Channel A	Block central object	1 Bit	X	X	X	X	
40	Channel A	Block absolute position	1 Bit	X	X	X	X	
41	Channel A	Block functions	1 Bit	X	X	X	X	
42	Channel A	Wind alarm	1 Bit	X		X		
43	Channel A	Rain alarm	1 Bit	X		X		
43	Channel A	Fire alarm	1 Bit	X		X		
44	Channel A	Frost alarm	1 Bit	X		X		
45	Channel A	Block	1 Bit	X		X		
46	Channel A	Window contact	1 Bit	X		X		
46	Channel A	Window contact 1	1 Bit	X		X		
47	Channel A	Window contact 2	1 Bit	X		X		
48	Channel A	Room temperature	2 Byte	X		X		
48	Channel A	Room temperature threshold	1 Bit	X		X		
48	Channel A	Set value for heating	1 Byte	X		X		

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49	Channel A	Block clouding	1 Bit	X		X		
49	Channel A	Enable clouding	1 Bit	X		X		
49	Channel A	Block slat adjustment	1 Bit	X		X		
49	Channel A	Enable slat adjustment	1 Bit	X		X		
50	Channel A	Status clouding state	1 Bit	X	X		X	
50	Channel A	Status clouding ready	1 Bit	X	X		X	
50	Channel A	Status clouding locked	1 Bit	X	X		X	
51	Channel A	Diagnosis text	1 Bit	X	X		X	
+29	**next Channel**							

Table 1: Standard settings of the communication objects

You can see the default values for the communication objects from the upper chart. According to requirements the priority of the particular communication objects as well as the flags can be adjusted by the user. The flags allocates the function of the objects in the programming thereby stands C for communication, R for Read, W for write, T for transmit and U for update.

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4 Reference ETS-Parameter

4.1 General Settings

The following figure shows the general settings:

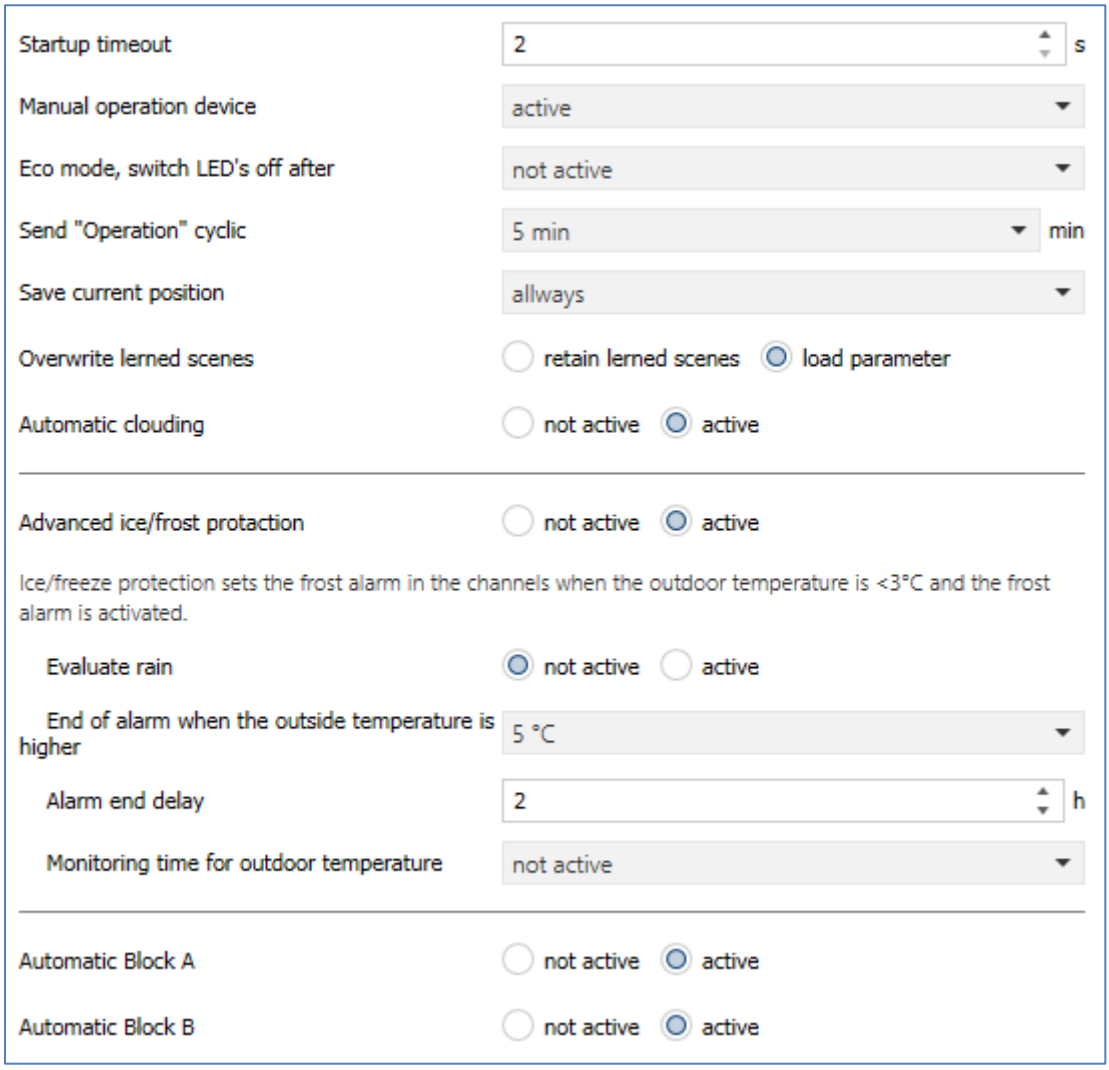

Figure 3: General Settings

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The following table shows the possible settings:

ETS-Text	Dynamic range **[Default value]**	Comment
Startup time	2 … 240s **[2s]**	Sets the time between restart and functional start-up of the device
Manual operation	▪ **active** ▪ blocked ▪ lockable over object	Release of manual operation. **active**: manual operation possible **blocked**: no manual operation possible **lockable over object:** Manual operation can be disabled / enabled via object
Eco mode, switch LED´s off after:	**not active** 30 s – 60 min	Setting whether the LEDs should be switched off after the set time
Send “Operation” cyclic	**not active** 1 min – 24 h	Setting whether a cyclic in-operation telegram is to be sent
Save current position	▪ not active ▪ **at loading of application and at mains power up** ▪ at loading of application ▪ at mains power up	Determines whether the current position should be saved and restored after a power failure or programming.
Overwrite learned scenes	▪ retain learned scenes ▪ **load parameter**	Setting whether learned scenes are to be retained after loading the application or whether the parameter values are to be loaded afterwards.
Automatic clouding	▪ **not active** ▪ active	Displays the menu for automatic clouding.
Advanced ice/frost protection	▪ **not active** ▪ active	Activates the function for extended ice/frost protection
Advanced ice/frost protection - if "active", further following parameters appear:		
Evaluate rain	▪ **not active** ▪ active	Additionally activates whether the rain alarm is also evaluated
End of alarm when the outside temperature is higher than	4 °C – 10 °C **[5 °C]**	Setting at which outdoor temperature the alarm is reset
Alarm end delay	0 … 240 h **[2 h]**	Setting of a time by which sending is delayed for "alarm end"
Monitoring time for outdoor temperature	**not active** 1 min – 4 h	Definition of a time within which the outdoor temperature/rain has to be received cyclically. If this is not the case, ice/frost protection is activated! - “and rain" appears when rain evaluation is active.
Monitoring time for outdoor temperature and rain		

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Automatic Block A	▪ **not active** ▪ active	Displays the objects for automatic block A. See also: 4.9
Automatic Block B	▪ **not active** ▪ active	Displays the objects for automatic block B. See also: 4.9

Table 2: General Settings

By activating the parameter "**Save current position**" it is possible to save the current position of the blind/roller shutter and restore it after programming and/or mains voltage failure. This has the advantage that a new reference run is not required.

The parameter "**Overwrite learned scenes**" can be used to set whether changed scene values (see 4.8 Scenes) are to be retained after programming or whether the values defined in the parameters are reloaded.

If automatic clouding is to be carried out via the actuator, the "**Automatic clouding**" parameter has to be activated. This opens a new submenu in which the basic clouding settings are made. The individual settings such as alignment according to the compass direction etc. are then made in the individual channels.

With the "**Advanced ice/frost protection**" parameter, you protect your blinds/roller shutters from icing up at frosty outdoor temperatures, optionally with or without rain evaluation.
The ice/frost protection function activates the frost protection in the individual channels. The behaviour can be set for each channel. Manual override is possible by sending a "0" to the frost input of the channel.
Outdoor temperature <3C° and optional rain evaluation activates the frost alarm per channel.

The following table shows the associated communication objects:

Number	Name	Length	Usage
5	Operation	1 Bit	Cyclic sending of operation telegram
6	Block manual control	1 Bit	Blocking the manual control when blocking via object active
6	Rain alarm for ice protection	1 Bit	Enables monitoring of the rain alarm for the ice/frost protection function.
12	Outside temperature	2 Byte	Receiving an external temperature.

Table 3: Communication objects – General Settings

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4.2 Channel Selection

The following figure shows the possible settings:

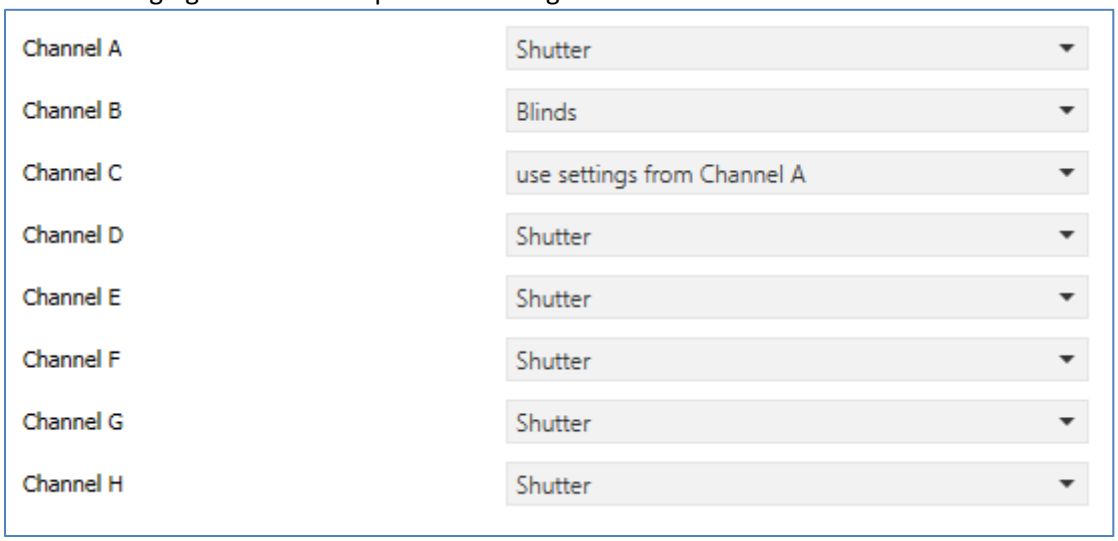

Figure 4: Settings – Channel selection

The following table shows the setting options for channel selection:

ETS-Text	Dynamic range **[default value]**	Comment
Channel A-D / H	▪ **not active** ▪ Blinds ▪ Shutter ▪ Use settings from Channel A	Operating mode of the respective channels **„Use settings from Channel A“ only available from Channel B**

Table 4: Settings – Channel selection

The available channels can be assigned one of the 4 available states in the "Channel selection" menu ("Use settings from channel A" can only be selected for channels B-D or B-H).

- **Not active**
  Channel is disabled. No further parameterization options for this channel are displayed.
- **Blinds**
  Channel is selected as blinds. For the channel, the specific parameters for the parameterization of the blinds function are shown.
- **Shutter**
  Channel is selected as shutter. For the channel, the specific parameters for the parameterization of the shutter function are shown.
- **Use settings from Channel A**
  Channel takes over the same parameters as channel A. No further setting options are displayed for this channel and the same communication objects as for channel A are displayed.
  If parameters are to be transferred in several groups, it is recommended to proceed as described in the solution proposal "Tips and Tricks for the ETS5" (see link on first page in the manual => "Solution proposals").

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4.2.1 Blinds

If a channel is selected as a “Blinds”, the user has a number of options for parameterisation. These are explained in more detail in the following sections..
The following communication objects are displayed for this channel by default:

Number	Name	Length	Usage
23	Blinds up/down	1 Bit	Movement function of the blinds
24	Slats adjustment / Stop	1 Bit	Adjustment of the slats/ Stopping of the blinds movement
35	Start travel time measurement	1Bit	Starts the automatic travel time measurement
51	Diagnosis text	14Byte	Output of the diagnosis text as "plain text".

Table 5: Communication objects – Blinds

The "**Blinds Up/Down**" communication object is used for the movement function of the blind. It should be noted that a logical "0" starts the upward movement and a logical "1" starts the downward movement. This configuration is defined by KNX as standard and regulates uniform communication between KNX devices..
The communication object " Slats adjustment/Stop" is used to adjust the slats. At the same time, a running movement function is stopped when this communication object is activated.
The "Start travel time measurement" object is used to start the automatic travel time measurement by sending a "1". Sequence see 4.3.1 Automatic travel time measurement.
The communication object " Diagnosis text" outputs the last executed action of the channel in plain text and can be used for diagnostic purposes. For possible messages, please refer to the table under item "4.5.5 Diagnosis ".

4.2.2 Shutter

A number of parameterisation options are also available to the user for the shutter function. The blind function and the shutter function are almost identical, but the shutter function lacks the parameterisation options for the slats.
The following communication objects are displayed for this channel by default:

Number	Name	Length	Usage
23	Shutter up/down	1 Bit	Movement function of the shutter
24	Short term operation/Stop	1 Bit	Starts the short term operation / Is only displayed when activated / Stops active up-/down movement
25	Stop	1 Bit	Stopping the shutter movement
35	Start travel time measurement	1Bit	Starts the automatic travel time measurement
51	Diagnosis text	14Byte	Output of the diagnosis text as "plain text".

Table 6: Communication objects – Shutter

The communication object "**Shutter up/down**" is used for the movement function of the shutters. Note that a logical "0" starts the upward movement and a logical "1" starts the downward movement.
The communication object "**Stop**" is used to stop an active movement. When this communication object is activated, whether with "0" or "1", the active movement is stopped.

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With the "**short-term operation/stop**" object, the roller shutters can be moved bit by bit in order to move to exact positions. The movement is stopped with the first signal; with each subsequent signal, the roller shutter is moved further by the parameterised movement time.

The automatic movement time measurement is started via the "**Start travel time measurement**" object by sending a "1". Sequence see 4.3.1 Automatic travel time measurement.

Via the object "**Diagnosis text**", the last executed action of the channel is output in plain text and can be used for diagnostic purposes. Possible messages can be found in the table under item "4.5.5 Diagnosis ".

4.2.3 Identical settings: Description of channels/objects & Additional text

For each channel, two text fields are available for free labelling:

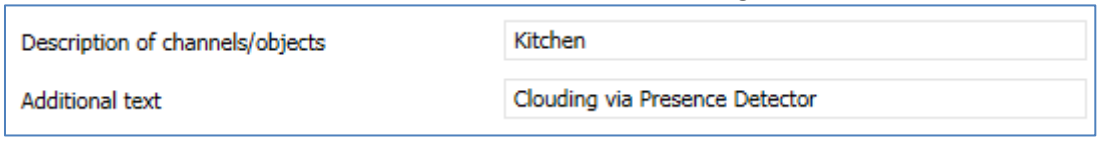
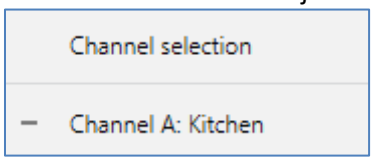
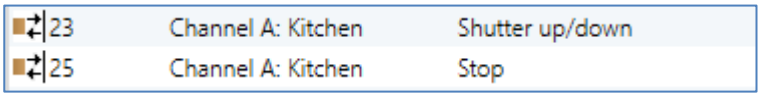


Figure 5: Settings – Text fields per channel

Texts with up to 30 characters can be stored for the field "Description of channels/objects", texts with up to 80 characters can be stored for the field "Additional text".
The text entered for "Description of channels/objects" appears both in the menu for the channel and in the communication objects of the channels.





The “A**dditional text”** is merely additional information for the programmer. This text is not visible anywhere else.

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4.3 Time for movement/Travel times*

*Both terms appear in the database. The meaning is the same

The shutter actuator can be adapted to the respective blind/roller shutter and the associated motor as desired by means of the movement times. To ensure smooth operation of the movement functions, the individual movement times have to be carefully adapted to the specific movement times of the blinds or roller shutters. For a blind channel, the movement times for the slats can be set in addition to the movement times for the roller shutters.
The movement times for the ascent and the descent can be determined in two different ways. On the one hand via the **automatic travel time measurement**, on the other hand **manually by measuring the travel time via stopwatch** and entering the determined time in the parameters.
The slat adjustment time for the "Blind" setting has to be set manually in both cases.

The settings in the channel differ only in the parameter "Automatic travel time measurement". If this is "active", the settings for this function appear. If the parameter is "not active", the parameters for manual settings of the movement time for up/down appear. This applies to both the "Blind" and "Shutter" settings.

The following two chapters describe the two methods for determining the travel times for the up/down movement. From chapter 4.3.3 Further Settings: Movement times onwards, further settings are described which are valid for both methods.

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4.3.1 Automatic travel time measurement

The following settings appear when the automatic travel time measurement is activated:

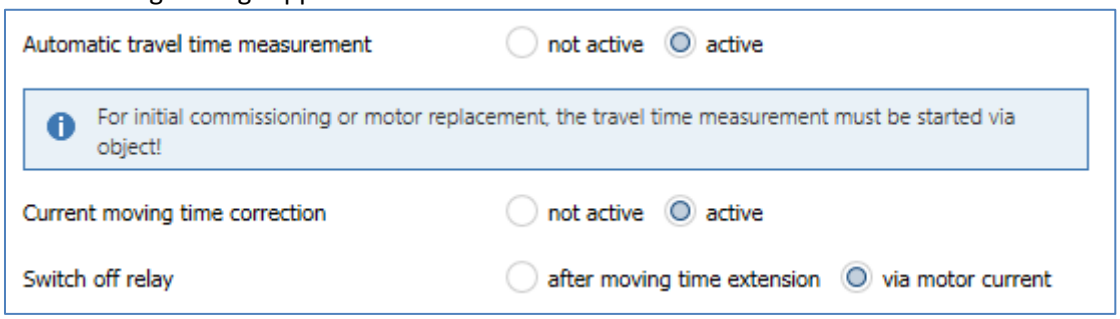

Figure 6: Settings – Automatic travel time measurement

During commissioning, the travel time measurement is triggered via the **object "Start travel time measurement**". Then an automatic sequence with measurement of the time for driving up and driving down takes place. The measured travel times are output via the diagnosis object.

Diagnosis text	1/0/60	42 75 73 20 52 65 73 65 74 20 20 20 20 20 | Bus Reset
Start	1/0/50	$01 | Start
Diagnosis text	1/0/60	4D 65 61 73 20 53 74 61 72 74 20 20 55 70 | Meas Start Up
Diagnosis text	1/0/60	43 75 72 3A 20 30 34 31 38 20 20 20 44 6E | Cur: 0418 Dn
Diagnosis text	1/0/60	53 61 76 65 64 3A 20 30 32 33 73 20 44 6E | Saved: 023s Dn
Diagnosis text	1/0/60	43 75 72 3A 20 30 33 37 32 20 20 20 55 70 | Cur: 0372 Up
Diagnosis text	1/0/60	53 61 76 65 64 3A 20 30 32 33 73 20 55 70 | Saved: 023s Up

Figure 7: Diagnosis texts during automatic travel time measurement

If the travel time measurement is started via object, the diagnostic text is sent automatically after every action, even if the parameter for the diagnosis text in the channel is set to "not active" or "send on request".

With the parameter "**Continuous travel time correction**" a moving time adjustment can be activated. If the movement time is somewhat longer, e.g. in winter, the movement time is automatically increased step by step and vice versa.
The relays can be switched off directly at the end of the movement. For blinds, this has the advantage that the slat adjustment comes directly.
To do this, activate the parameter "**Switch off relay**" to "**via motor current**".

The current position can be saved and restored in the event of a power failure and/or programming. This has the advantage that a new reference run is not necessary.
To do this, the parameter "**Save current position**" has to be activated in the "General settings". (see 4.1 General Settings4.1).

The following communication objects are required (here using the example of channel A):

Number	Name	Length	Usage
35	Channel A – Start travel time measurement	1 Bit	Starts the travel time measurement
51	Channel A – Diagnosis text	14 Byte	Output of diagnosis texts in telegrams

Table 7: Communication objects – Automatic travel time measurement

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4.3.2 Manual measurement of the movement times

With deactivation of the automatic travel time measurement, the following settings appear:

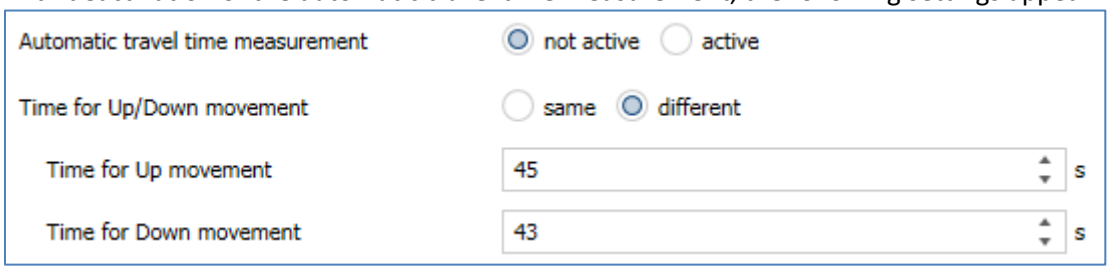

Figure 8: Settings – Time for movement

The following table shows the setting ranges for the travel times:

ETS-Text	Dynamic range **[default value]**	Comment
Time for movement up/down	▪ **same** ▪ different	Adjustment, whether up-and down-movement should be different or not
Time for movement Time for up movement Time for down movement	0 – 1000 s **[45 s]**	Specifies the duration for an up/down movement. Depending on the setting above, one or two separate times will be displayed.

Table 8: Settings – Time for movement

By setting the travel time, the shutter actuator can be set to the respective time required to move the shutter/blind from one end position (fully open or fully closed) to the other end position. The shutter actuator thus controls the upward or downward movement for the specified time value. After the set time has elapsed, the shutter actuator automatically switches off the relay of the respective channel, even if the end position has not yet been reached.
If the determined movement **time for up/down is the same**, only one movement time is entered. Since blinds/roller shutters often need different times to move up and down, **different times** can be set for the up and down movement. The measured times for UP and DOWN are entered here accordingly.

The individual travel times can normally be determined fairly accurately with a stopwatch.
With very short travel times, however, problems can arise when measuring with a clock. In this case, it is advisable to first set an approximate value that is rather smaller than the actual travel time. Afterwards, it can be tested whether the end positions are reached by controlling the respective position commands. If this is not the case, the value should be increased successively in small steps until the blind/roller shutter reaches the end positions.

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4.3.3 Further Settings: Movement times

The following illustration shows the further setting options for "**Blinds**":

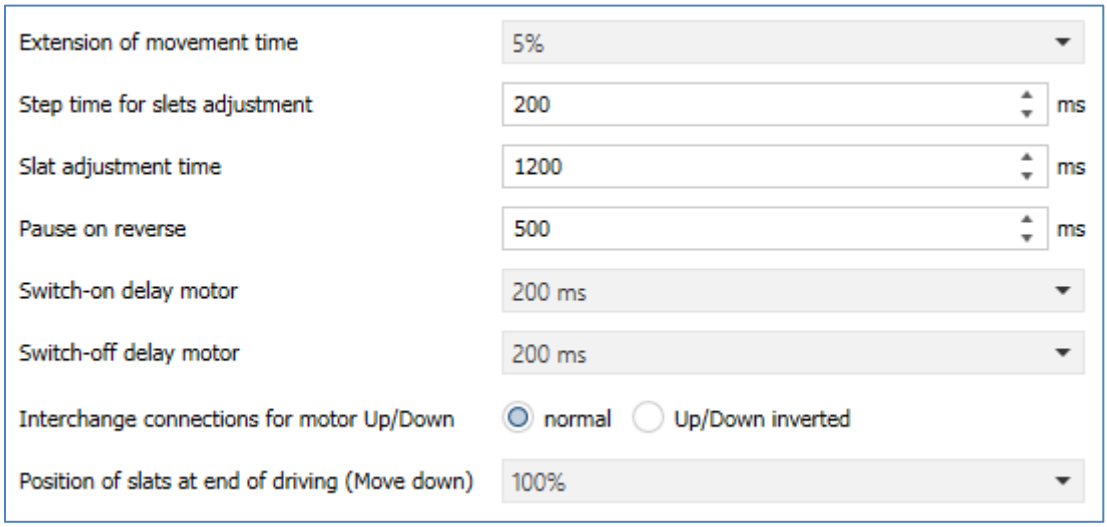

Figure 9: Settings – Further settings for movement times „Shutter“

The following illustration shows the further setting options for "**Shutter**":

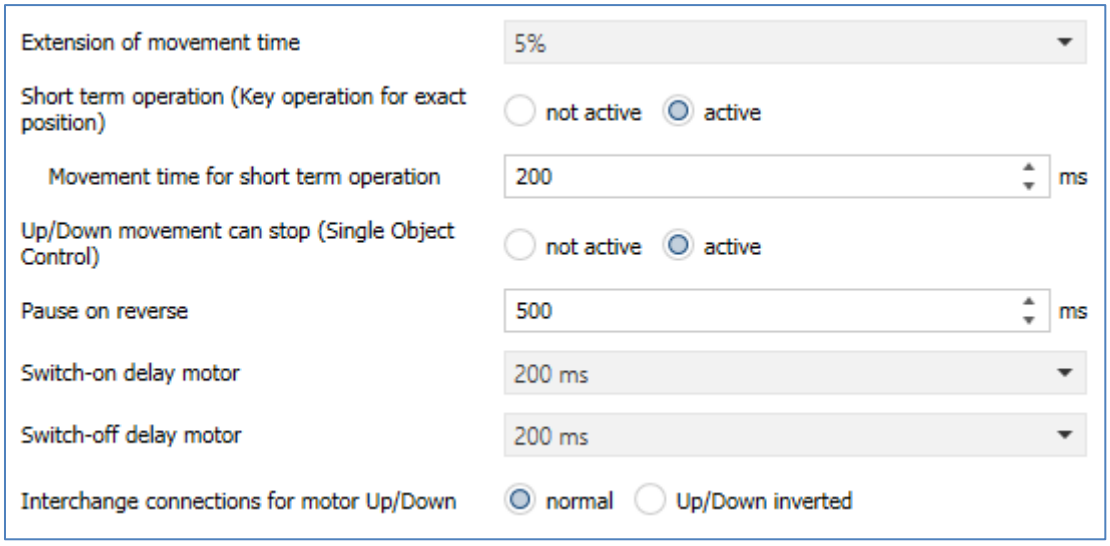

Figure 10: Settings – Further settings for movement times „Blinds“

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The following table shows the setting ranges for the travel times:

ETS-Text	Dynamic range **[default value]**	Comment
Extension of movement time	no extension, 2%, **5%**, 10%, 15%, 20%	The travel time extension serves the guaranteed approach of the end stops and does not affect the calculation of the absolute positions.
Step time for slats adjustment	50 – 5000 ms **[200 ms]**	**Only for blinds.** Duration for a step at the adjustment of blinds
Slat adjustment time	100 – 10000 ms **[1200 ms]**	**Only for blinds.** Duration for the whole adjustment of blinds (0-100%)
Short term operation (key operation for exact position)	▪ active ▪ **not active**	**Only for shutter.** sets the short time operation on/off
Movement time for short term operation	50 – 5000 ms **[200 ms]**	Only for shutter and is only displayed if short-term operation is active. Defines the movement time in short-term operation.
Up/Down movement can stop (Single Object Control)	▪ **not active** ▪ active	**Only for shutter.** Activation of the "Single Object Control" function. In this case, the roller shutters can be operated with only one object.
Pause on reverse	100 – 2000 ms **[500 ms]**	Indicates the pause time between an upward and a downward movement
Switch-on delay motor	0 – 500 ms **[200 ms]**	Switch-on delay for motors that do not provide full power immediately
Switch-off delay motor	0 – 500 ms **[200 ms]**	Switch-off delay for motors that run on after switching off
Interchange connections for motor up/down	▪ **normal** ▪ Up/Down reversed	Reversing the direction of travel for up/down. To change the direction of travel in the event of an incorrect connection
Position of slats after end of movement (down)	0 – 100 % **[100 %]**	**Only for blinds.** Specifies the position of the slats that the channel sets after the movement

Table 9: Settings – Further settings for movement times

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4.3.3.1 Extension of movement time

☑ Blinds
☑ Shutter

The extension of the movement time ensures that the end stops are definitely reached. It does not affect the calculation of absolute positions. Therefore, the exact value should always be specified for the movement time and the overrun should be activated by the movement time extension.
If necessary, check whether information on movement times has been provided by the manufacturer.

4.3.3.2 Step time for slats adjustment

☑ Blinds

The step size for slat adjustment can be used to set the steps in which the slats should rotate. The opening angle of the slats can be changed in small steps, e.g. to prevent glare when the position of the sun changes or to tighten a blind or to realise a slit position.
In addition, this setting makes it possible to adjust the step size in such a way that the slats move in a certain number of steps from the state "fully open" to "fully closed" or vice versa. For this purpose, the step size of the slat adjustment has to be set to a multiple of the slat adjustment time. The multiple indicates the number of steps required to reach one end position from the other end position.
Example:
Slat adjustment time = 3000 ms
Slat adjustment step size = 300 ms
→ Number of steps = 10 → so the values 0%, 10 %, ..., 100% can be approached

4.3.3.3 Slat adjustment time

☑ Blinds

The slat adjustment time specifies the time span in which the slats adjust from 0% to 100% or vice versa. The shutter actuator thus controls the slat adjustment for the duration of the set value.

Hint for the measurement of very small slat running times

- Move the slats in a final position (either 100% closed or 100% opened)
- Now send step commands until the other final position is achieved
- Multiply the number of steps with the adjusted time for the step time of slats
- Enter the result to the “slat adjustment time”

If the slat adjustment time is long, it is recommended to proceed as described in
"4.3.2 Manual measurement of the movement times".

Important: The minimum slat adjustment time must be greater than the minimum movement time.

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4.3.3.4 Short term operation (key operation for exact position)

☑ Shutter

The roller shutters can be moved in small steps using the short-term operation. An extra communication object is available for short-term operation, with which it can be activated. The short-term operation is used for the exact approach of special positions, e.g. the sun protection. In addition, activation of the short-term operation stops an up/down movement.

4.3.3.5 Up/Down movement can stop (Single Object Control)

☑ Shutter

By activating the "Single Object Control" function, the roller shutters can be operated with only one object. Sending the Up/Down command again stops an active Up/Down movement here.

Example:
A short press on the shutter button moves the shutter of the operated window or stops it if it is moving. With a long press of the button, for example, all the roller shutters in the room move. This function is not possible with normal actuators from other manufacturers. The function is achieved by controlling with only one object (short key press) for up/down/stop (single object control). The object for long button press (recommended 1 - 1.5s) then controls all shutters in the room as a group.

4.3.3.6 Pause on reverse

☑ Blinds
☑ Shutter

The pause on reverse is used to protect the shutter motor, if the shutter actuator simultaneously receives commands for the up and down movement. A direct changeover from one direction to the other can significantly reduce the life time of the motor and lead to complete destruction in some cases.
If a shutter actuator receives a movement command to the other direction during an active movement command, the actuator first switches off both commands. The shutter actuator then waits for the reversed pause before setting the relay for the next direction
The reverse pause is valid for the reversion of the direction at the up/down movement as well as for the slat adjustment.

Too short selected reverse pauses can damage the motor!
Urgently observe the manufacturer specifications in the data sheet of the drive.

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4.3.3.7 Switch-on/Switch-off delay motor

☑ Blinds
☑ Shutter

Some motors do not deliver full power immediately, but only after a few milliseconds. This time, which the motor needs until it reaches the full power, can be compensated with the setting of the "switch-on delay motor".
On the other hand there are motors, which run after a few milliseconds after switching off. This behavior can be compensated by setting the "Motor off-delay" setting.

4.3.3.8 Position of slats at end of driving

☑ Blinds

The setting "Position of slats at end of movement" can be used to set the position to which the slats are to be moved after a movement in the opposite direction via the 1-bit object "Blind up/down". The blind actuator automatically moves to this position after a blind movement if it is not stopped beforehand. The slat position after the end of the movement can be set as a percentage in 1% steps from 0-100%, whereby 0% corresponds to fully open and 100% corresponds to fully closed.

When sending a stop command during the process, this position is not approached as this stops or interrupts the process!

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4.4 Reference drive/Absolute position/1Bit object for “Move to position”

The following picture shows the available parameter settings (here for blinds):

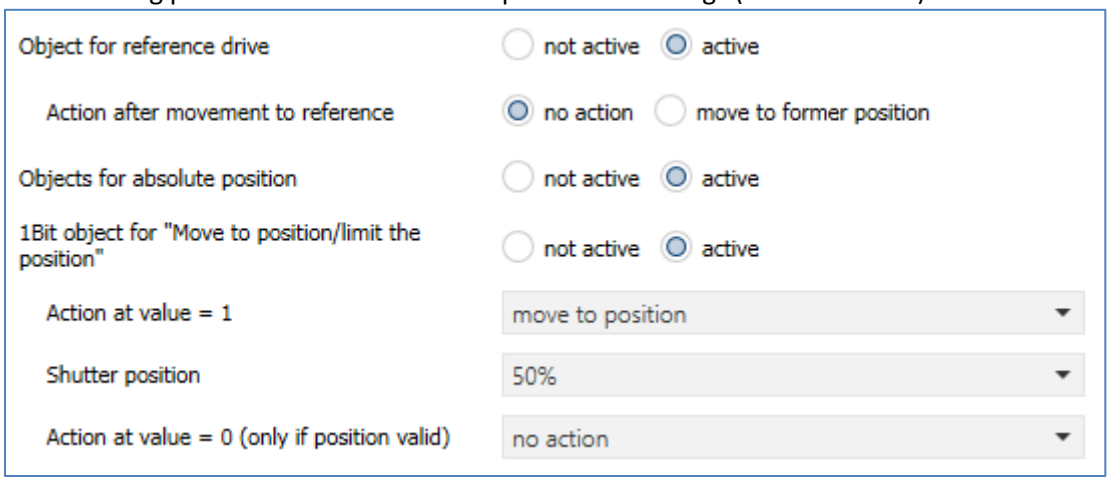

Figure 11: Settings – Absolute Position/Reference drive/1Bit object Position

The following table shows the available communication objects:

Number	Name	Length	Usage
30	Absolute position	1 Byte	Start to a specific position
31	Absolute position of slats	1 Byte	Start to a specific slat position (only at blinds)
35	Start driving to reference	1 Bit	Starting the procedure of a reference drive
36	Move to position / limit position	1 Bit	Move to an absolute position or limit lower position via 1 bit command

Table 10: Communication objects – Absolute Position/Reference drive/1Bit object Position

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4.4.1 Object for reference drive

The object for reference drive is only displayed if the automatic travel time measurement is inactive.

The shutter actuator calculates its current positions from the set movement times.
Frequent movement between the end positions without reaching the end positions (0% or 100%) can lead to slight shifts in the actual positions over time. The decisive factor for this are movement times that have been entered too inaccurately..
A **reference drive** (=final position) brings the shutter actuator to a starting point from which it can exactly approach the process times for the position again..
The reference drive is particularly useful where a lot of work is done with absolute position commands. In this way, the shutter actuator can calculate the entered position more precisely and move to it more accurately. However, each movement up to the lower and upper end stops replaces a reference drive. The reference drive should therefore always be carried out where the roller shutter/blind is only approached with absolute position commands below 100% and above 0%. Here, a reference drive should be carried out regularly, e.g. once a week..
The reference drive is activated via the 1 bit communication object "Start reference drive" with a "1" signal. The "Action after reference drive" parameter can be used to set which action the shutter actuator is to carry out after a reference drive. On the one hand, the position that was active before the reference movement can be approached. With the setting "no action", the shutter actuator remains in the position that was reached after the reference movement ended.
After a bus voltage failure and an existing auxiliary voltage, the shutter actuator does not need a reference drive. However, in the event of a failure of the auxiliary voltage (230V), it does.
In the menu "general settings" there is the possibility that the current position is also saved for reprogramming and/or mains voltage failure. In this case, a reference drive is not necessary!

With the setting "Save current position => not active" (General settings), a reference movement must be carried out after each programming and/or mains voltage failure of the shutter actuator. This can either be done manually, i.e. the upper and lower end positions are approached once or via the "Start driving to reference" object. In the case of an absolute position movement between 0-100%, the actuator would first independently perform a reference movement to one of the end positions and then move to the controlled absolute position. Only after a reference movement has been carried out (via the Up/Down object or by manual operation) does the shutter actuator know its current position status.

4.4.2 Objects for absolute positions

Via the objects for the absolute position, the shutter actuator can be given a fixed value to which the shutters are to be moved. This value is specified as a percentage and can be any value from 0 - 100 %. In the next step, the shutter actuator calculates the actual movement time from the specified percentage value. The movement time depends on the set movement time and the current position. The absolute position commands are sent to the 1-byte communication objects. For roller shutters and venetian blinds, there is a communication object for the height position, the "absolute position" object. In addition, for blinds there is another object that can be used to set the opening angle of the slats, the "absolute slat position" object.
In the percentage display, 0% always corresponds to fully open and 100% to fully closed.

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4.4.3 Move to position/limit position via 1Bit object

The following table shows the possible settings for this parameter:

ETS-Text	Dynamic range **[default value]**	Comment
1Bit object for „Move to position/limit position“	▪ **not active** ▪ active	Activates the 1Bit object for moving to/limiting a position
Action at value = 1	▪ **move to position** ▪ move to position when Up ▪ move to position when Down ▪ limit lower position and move to position ▪ limit lower position (not move to position)	Action for the „1“ command
Shutter position/ Position of blinds/ Position of slats	0 – 100% **[50%]** **[100%]**	Absolute position to be approached or limited, when activated by "1" command
Action at value = 0 (only if position valid)	▪ **no action** ▪ move up ▪ move down ▪ Delete „Limit lower position“	Action for retraction via "0" command. Delete "Limit lower position" is only visible if "Action at value=1" is set to "Limit lower position (not move to position)". This setting is fixed and cannot be changed!

Table 11: Settings – Move to position/limit position via 1Bit object

With the function "**1 bit object for "Move to/limit position**" it is possible to move to or limit a fixed position via a simple 1 bit object. Additional conditions can be programmed for when this action is to be carried out. In contrast to the automatic function, the action only applies to one channel and can therefore be adapted individually for each channel.
With the parameter "**Action at value = 1**" it can be set whether the absolute position should be called up in every position or only in one of the two end positions. Furthermore, the lower position can be limited. This means that it can only be moved up to a certain height. With the setting "Limit lower position (do not approach)", a fixed limitation of the height position is set.
The limitation of the lower position does not apply in case of alarm and the normal locking function.
It cannot be lowered by hand when the limit is active.
In addition, the "**Action at value = 0**" can be used to set whether the channel should move back to an end position after moving to the set absolute value or remain in the approached position. In the case of "Limit lower position and move to position", the limit value is automatically deleted with 0 in addition to the defined action. In the case of "Limit lower position (not move to position)", the action is permanently set to "Delete limit lower position" when the value=0.
The "Action at value = 0" is only executed if the current shutter position is still equal to the set position. If the roller shutters are moved to another value in the meantime, the action is not executed. Exception: "Limit lower position (not move to position)".
The function "Move to position via 1 bit" can still be executed when the window is tilted. When the window is open, this function is disabled to avoid locking out.

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4.5 Status objects

The following figure shows the possible settings for the status objects:

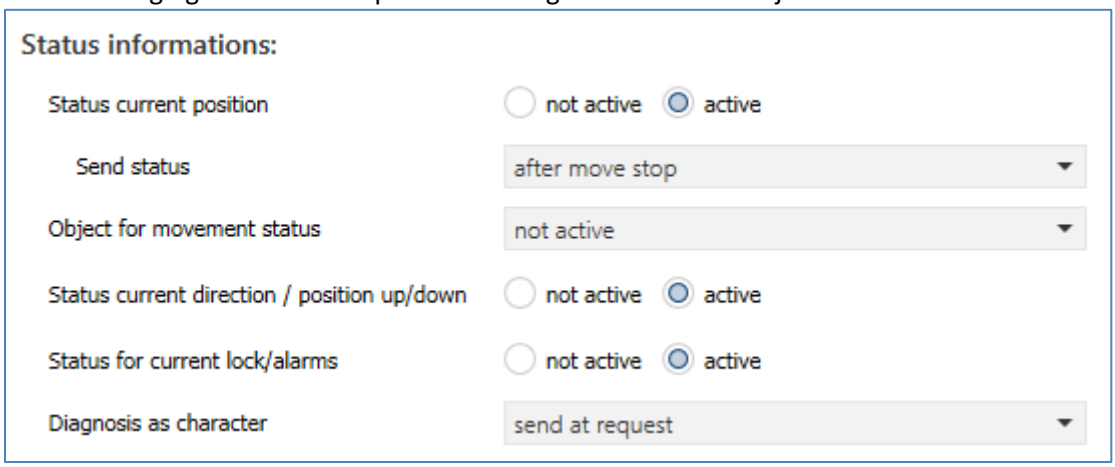

Figure 12: Settings – Status objects

The following table shows the possible settings for the status objects:

ETS-Text	Dynamic range **[default value]**	Comment
Status current position	▪ **not active** ▪ active	activates/deactivates the objects for absolute position/ absolute position of slats
Send status	▪ **after movement stop** ▪ all 2s ▪ all 5s ▪ all 10s	Setting when the current status is to be sent.
Object for movement status	▪ **not active** ▪ moves (1 object) ▪ moves up + down (2 objects)	Activates the status objects for the movement status
Status current direction/ position up/down	▪ **not active** ▪ active	activates the status objects for current direction and reaching the upper / lower end stop
Status for current lock/alarms	▪ **not active** ▪ active	activates the status object for current blocking/alarms
Diagnosis as character	▪ not active ▪ **send at request** ▪ send at change	when activated, the transmission condition for the diagnostic text is defined

Table 12: Settings – Status objects

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The following table shows the available communication objects:

Number	Name	Length	Usage
27	Status current direction	1 Bit	Indicates the current direction of the movement
28	Status of movement	1 Bit	Indicates an active movement
28	Status of movement up	1 Bit	Indicates whether the blinds/shutters are moved straight up
29	Status of movement down	1 Bit	Indicates whether the blinds/shutters are moved straight down
32	Status current position	1 Byte	Indicates the current shutter/blinds position
33	Status cur. Position of slats	1 Byte	Indicates the current position of the slats (only at blinds)
34	Status Lock/Alarms	1 Bit	Indicates an active alarm or an active lock
37	Status upper position	1 Bit	Indicates reaching the upper limit position
38	Status lower position	1 Bit	Indicates reaching the lower limit position
51	Diagnosis text	14 Byte	Output of the diagnostic text in plain text

Table 13: Communication objects – Status objects

4.5.1 Status objects current position

The status objects "**Status current position**" and "**Status current slat position**" are used to display the absolute position. The two objects indicate the current status of the height and the opening angle of the slats. The status can be output either at the end of the movement or cyclically (2s/5s/10s) during the movement and at the end of the movement. The objects can be used for visualisation, for example. The actuator sends its current status position to the BUS even when the lock is active and simultaneous control is via absolute position in order to maintain the correct status on a visualisation.

4.5.2 Status objects upper/lower position

The 1-bit objects "**Status lower position**" and "**Status upper position**" each emit a „1“ signal when the lower (100%) or upper (0%) end position has been reached. As soon as the end position has been left again, the signal changes from „1“ to „0“. The two objects can be used to monitor the blind/roller shutter.

4.5.3 Movement Status/Status current direction

The status of a movement can be selected as one or two objects. As one object, the object "**Status of movement**" reports a currently ongoing movement with a "1". If the movement is finished, a "0" is sent. With two objects, an active upward and an active downward movement are reported via separate objects "**Status of movement up**" and "**Status of movement down**".
The 1-bit object "**Status current direction**" indicates an upward movement via a logical "0" and a downward movement via a logical "1". The status is output as soon as a movement is started and remains internally until a new up/down command is sent.

4.5.4 Status lock/alarms

The object “**status lock/alarms**” indicates an active lock function or an active alarm with a "1".

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4.5.5 Diagnosis as character

The diagnosis in plain text outputs the last action performed as a 14-byte string and can be used for diagnostic purposes.
The following diagnostic text can be displayed:

Diagnosis text	Last executed command
Up	Upward movement
Down	Down movement
absolut Pos	Absolute position (only height, not slats!)
Scene	Scene call
Auto Position	Automatic position
Manual Oper	Manual operation on the device
Central Up	Upward movement via central object
Central down	Down movement via central object
Central abs	Absolute position via central object (only height, not slats!)
Window open	Window open - Action for air function executed
Auto Sun Pos	Automatic clouding – Action for automatic clouding executed
Locked	Channel is locked
Wind Alarm	Wind alarm activated
Rain/Fire Alarm	Rain or fire alarm triggered (depending on setting)
Frost Alarm	Frost alarm activated
Alarm End	Alarm finished
Bus Reset	Bus power recovery
Stop	Stop-command
Reference	Reference drive
Abs lock	Absolute positions are locked
Function lock	Object “Block functions” has been activated
Up abs lock	Automatic lock of absolute positions via up / down was triggered by an “up” command
Dn abs lock	Automatic lock of absolute positions via up / down was triggered by a “down” command
Scene lock	Scene call is locked
Auto Pos lock	Automatic position is locked
Man Oper lock	Manual operation is locked
Window close	Window closed
Blind/Stop	Slats adjustment/Stop
Cen.Blind/Stop	Slats adjustment /Stop via central object
Sun Pos End	Automatic clouding has been finished
Meas Start Up	Start of automatic travel time measurement
Cur .XXXX Dn	Current during travel time measurement when moving down
Cur .XXXX Up	Current during travel time measurement when moving up
Saved XXXs Dn	Measured travel time for the downward movement
Saved XXXs Up	Measured travel time for the upward movement
Meas Fail	Error during measurement
Meas Abort	Abort during measurement
Lower Limit	Limit for lower position reached

Table 14: Diagnosis text per channel

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4.6 Central Objects

The "central objects" parameter can be used to define individually for each channel whether and which objects this channel should react to.

Figure 13: Setting – Central objects

The following table shows the possible settings for this parameter:

ETS-Text	Dynamic range **[default value]**	Comment
Central objects	▪ not active ▪ only Up ▪ only Down ▪ only Up/Down ▪ only absolute position ▪ only absolute position and Up ▪ only absolute position and Down ▪ **absolute position and Up/Down**	Determine which central objects this channel should react to

Table 15: Settings – Central objects

The central communication objects are permanently displayed even if the parameter "central objects" has not been activated in any channel. The central objects are indicated with "Central function" and are at the top of the list of communication objects.

Number	Name	Length	Usage
0	Shutter up/down	1 Bit	Driving function for all channels
1	Slats adjustment/Stop	1 Bit	Slats adjustment/Stop function for all blind channels
2	Stop	1 Bit	Stop function for all channels
3	absolute position	1 Byte	Absolute height position command for all channels
4	absolute position of slats	1 Byte	Absolute position command for the slats for all blind channels
5	operation	1 Bit	Sends an “in operation” telegram

Table 16: Central communication objects

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By activating the central objects in selected channels, it is possible to control several channels simultaneously via a single command.
The object 0 "Shutter up / down" is the central travel command and applies to both, blinds channels as well as to shutter channels, in which the central objects have been activated.
Object 1 "Slats adjustment / stop" is only relevant for blind channels in which the central objects have been activated. It is used for manual slat adjustment and stops a running travel function of the blinds.
Object 2 "Stop" is the central stop command for all channels. Object 3 "Absolute position" also applies to shutters as well as blinds with central function enabled. By this command, absolute elevation positions can be sent to the channels.
Object 4 "Absolute slat position" is only relevant for blind channels in which the central objects have been activated. With this command, absolute slat positions can be sent to the blind channels.

With the parameter settings you can specify which objects the channel should react to:

- **only Up**
  Channel reacts only to Up commands of object 0 and object 1 (for blinds).
- **only Down**
  Channel reacts only to Down commands of object 0 and object 1 (for blinds).
- **only Up/Down**
  Channel reacts to all commands of Object 0 and Object 1.
- **only absolute position**
  Channel reacts only to absolute commands via object 3 and object 4 (blind).
- **only absolute position and Up**
  Channel reacts only to absolute commands via object 3 and object 4 (blinds) and Up commands of object 0 and object 1 (for blinds).
- **only absolute position and Down**
  Channel reacts only to absolute commands via object 3 and object 4 (blinds) and Down commands of object 0 and object 1 (for blinds).
- **absolute position and Up/Down**
  Channel reacts to all central commands.

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4.7 Behavior after bus power down/bus power up

The parameters for the behavior after bus power down/bus power up can be seen below:

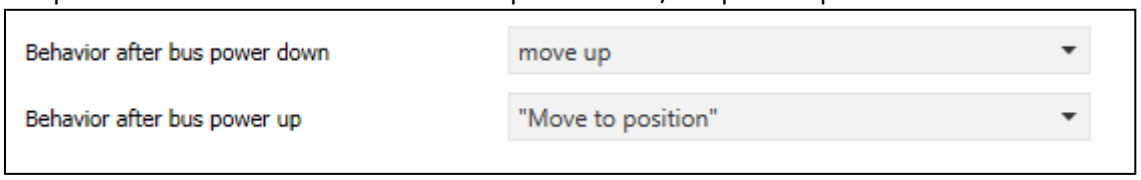

Figure 14: Settings – Behaviour after bus power down/up

The following table shows the possible settings for these parameters:

ETS-Text	Dynamic range **[default value]**	Comment
Behavior after bus power down	▪ **no action** ▪ move up ▪ move down ▪ stop moving ▪ „move to position“	**no action:** No specific action is performed after a bus power down. **move up:** Channel moves up. **move down:** Channel moves down. **stop moving:** An active movement is stopped. **„move to position“:** Only displayed when the "1Bit Object for move to position" has been activated. The position defined there is approached.
Behavior after bus power up	▪ **no action** ▪ move up ▪ move down ▪ „move to position“	

Table 17: Settings – Behaviour after bus power down/up

Attention: If a blocking or an alarm occurs in the event of a bus power down/ bus power up, the blocking/alarm has the higher priority than the behavior for bus power down/ bus power up.

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4.8 Scenes

If functions of different crafts (e.g. light, shutter, heating) shall be controlled with only one keystroke or command, it will be useful to use the scene-function. By calling this scene, you are able to set the lights in a room to specific value or dim them, drive the shutter to a specific value and rotate the blinds, the control of the heater can be set to day operation and switch on the power supply of the sockets. The telegrams of this function can have different formats as well as different values with various meaning (e.g. “0” for lights off and open shutters). Without the scene function you have to send every actor a separate signal to get the same setting.
By using the scene function of the shutter actor you can integrate the channels to a scene control. In order to do this you have to allocate the respective memory (scene (A…H) a value. There are up to 8 scenes for every channel possible. If the scene function is activated for this channel the according scene menu is shown. At this menu the single scenes can be activated and values, scene numbers and the memory function on/off can be set.
Scenes are activated by receiving their scene number on the scene object. If the storage function is activated in the scene, the current channel values are saved with the object value of the scene. The communication objects of scenes are generally 1 byte in size.

The following figure shows the possible settings in the ETS software to activate the scene function:

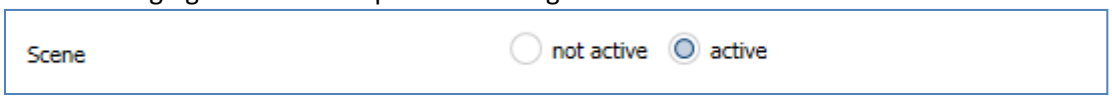

Figure 15: Setting – Activating a scene

Number	Name	Length	Usage
26	Scene	1 Byte	Call up the respective scene

Table 18: Communication object – Scene

To call a specific scene, you have to send the value of the respectively scene to the communication object for the scene function. The value, to call the scene, is thereby always one number less than the adjusted scene number. If you for example want to call scene number 1, you have to send a 0. Consequently the scene number can have the values from 1 to 64, but the values to call a scene only from 0 to 63.
If you activate the call of a scene at a binary input/push button, you have to set the same scene numbers at your binary input/push button and at the actuator. The binary input/push button sends automatically the correct value to call up the scene.

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Specifics:

- The scene function can still be executed when the window is tilted. When the window is open, this function is disabled to prevent locking out..

For scene function „enable and move to „limit lower position“”:

- When the lower limit is active, it cannot be lowered manually.
- Alarm and locking functions can override the limit.
- With the "Blind" setting, only the height position is limited by the parameter "Limitation lower position - set and move to", the slat position is not limited!
- The height position of the limitation for the lower position can be changed by the user at any time and accepted by "Save scene".
- An active lower limit cannot be undercut by a scene.

4.8.1 Submenu „Scene“

The following picture shows the setting options in the submenu "scene" (here the example for the configuration of the channel as "blinds"):

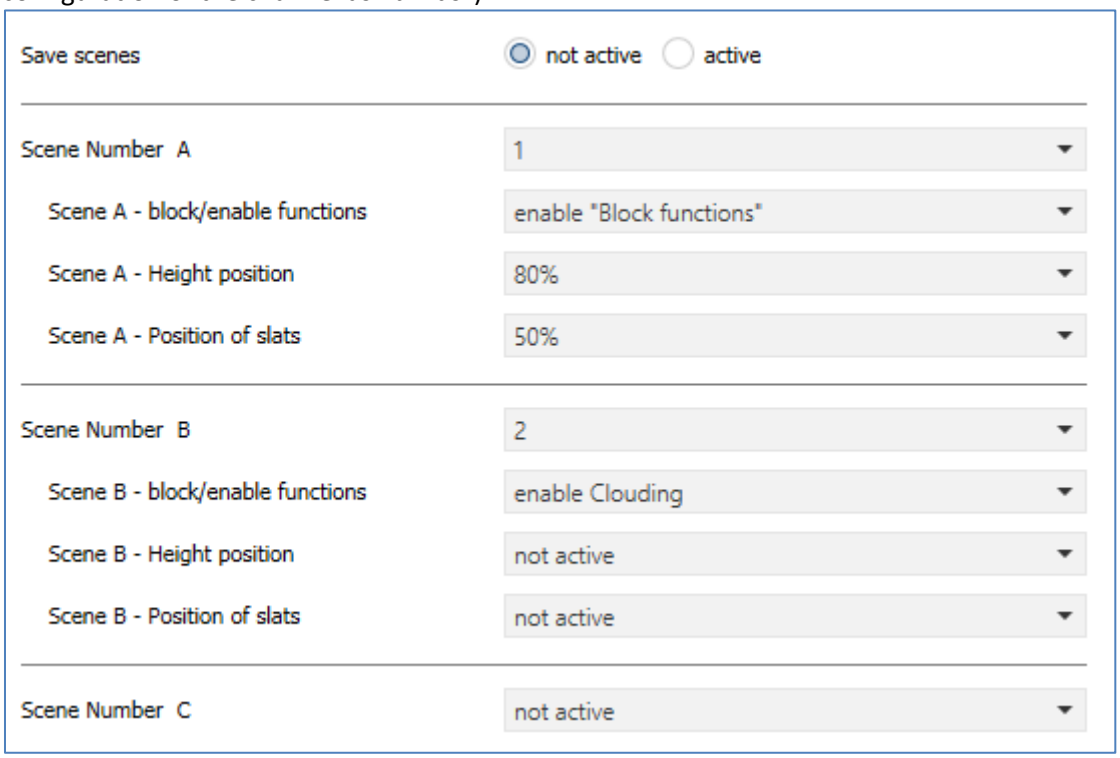

Figure 16: Settings – Submenu „Scene“

The configuration of the channel as "shutter" is almost identical to that for "blinds". However, the "slat position" selection is not available here.

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The following table shows the setting range for the scenes:

ETS-Text	Dynamic range **[default value]**	Comment
Save scenes	▪ **not active** ▪ active	Activates/deactivates the memory function for the scenes
Scene number A	**not active** 1 – 64	Scene number; Response value = Scene number reduced by 1
Scene A – Height position	**not active** 0 – 100%	Setting for absolute position when the scene is called
Scene A – Position of slats	**not active** 0 – 100%	Setting for absolute slat position when calling the scene. O**nly for blinds**.
Scene A – Block/enable functions	▪ **not active** ▪ enable block abs. position/clouding ▪ disable block for position/clouding ▪ enable „Block functions“ ▪ disable „Block functions“ ▪ enable „Block functions“ and abs. position/clouding ▪ disable „Block functions“ and abs. position/clouding ▪ enable „Clouding“ ▪ disable „Clouding“ ▪ enable „Block central objects“ ▪ disable „Block central objects“ ▪ enable „limit lower position“ and move to ▪ disable „limit lower position“	Setting an action that is to be executed when a scene is called up

Table 19: Settings – Scene

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If the parameter "**Save scene**s" is activated, a scene value can be changed and saved after calling up the scene. To do this, the triggering button also has to be set to "save => active". If the button is now pressed for a long time, the corresponding value is sent to the bus for saving (see table next page). The new value is then saved and will be executed the next time the scene is called up.

Actions to be carried out for calling up a scene can be assigned to the channel here. These actions include an **absolute height position** (0 - 100%) for this channel, or additionally an **absolute slat position** (0 - 100%) when the channel is configured as "blinds".
Further actions can be triggered via the "**Block/enable functions**" selection.
For example, a lock can be set or cancelled, absolute positions and/or the shading or also central objects can be locked or released again, and "Block functions" (see 4.11 Advanced block function) can be set or released

Attention: If the scene function is also blocked under "Block functions", no further scene call is possible afterwards. The scene call is then only reactivated when the function lock is deactivated via the corresponding object!

In addition it is possible to set a limit for the lower position and to approach and delete it.
Important if lower limit is active:

- When the limit is active, it cannot be lowered manually (object up/down and buttons on the unit).
  Exception: Step-by-step movement via object "slat adjustment/stop"!
- Alarm and block functions can overrun the limit.

Via the settings "Block clouding/release clouding", the object "Block clouding/release clouding" can be set via the scene.

Each channel can react to 8 different scenes. By sending the response value for the respective scene, the scene is called up and the channel assumes its parameterised state. The individual parameterisation of the respective channel is also taken into account. If, for example, the channel is to be moved to 0% when scene A is called up and is currently in the downward movement at 70%, a programmed reversal pause would be observed, for example, before the channel begins the upward movement to the value 0%.
When programming, note that if 2 or more channels are to respond to the same scene number, the communication objects for the scenes have to be placed in the same group addresses. By sending the response value for the scene, all channels are then addressed. When programming the scene function, it makes sense to divide it up according to the scenes in order to make the programming clear.

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To recall a scene or store a new value for the scene, the relevant code is sent to the corresponding communication object for the scene:

Scene	Call-up		Store	
	Hex.	Decimal	Hex.	Decimal
1	0x00	0	0x80	128
2	0x01	1	0x81	129
3	0x02	2	0x82	130
4	0x03	3	0x83	131
5	0x04	4	0x84	132
6	0x05	5	0x85	133
7	0x06	6	0x86	134
8	0x07	7	0x87	135
9	0x08	8	0x88	136
10	0x09	9	0x89	137
11	0x0A	10	0x8A	138
12	0x0B	11	0x8B	139
13	0x0C	12	0x8C	140
14	0x0D	13	0x8D	141
15	0x0E	14	0x8E	142
16	0x0F	15	0x8F	143
17	0x10	16	0x90	144
18	0x11	17	0x91	145
19	0x12	18	0x92	146
20	0x13	19	0x93	147
21	0x14	20	0x94	148
22	0x15	21	0x95	149
23	0x16	22	0x96	150
24	0x17	23	0x97	151
25	0x18	24	0x98	152
26	0x19	25	0x99	153
27	0x1A	26	0x9A	154
28	0x1B	27	0x9B	155
29	0x1C	28	0x9C	156
30	0x1D	29	0x9D	157
31	0x1E	30	0x9E	158
32	0x1F	31	0x9F	159
….	….	….	….	….
64	0x3f	63	0xBF	191

Table 20: Coding for Scene call-up and storing

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4.9 Automatic function

An automatic function can be activated for each channel. Using the automatic function, up to 4 different automatic positions can be approached for each channel in two blocks (A or B). The automatic function also makes it possible to carry out several actions at the same time, e.g. to move to a shutter position and a blind position via a command and also to adjust the slats of the blind.
The following image shows the activation of the automatic function for a channel:

Figure 17: Setting – Activation of Automatic functions

Important: The automatic block A or B used has to be activated in the "General settings" menu. If the automatic function is activated for a channel, a new submenu (Channel X: Automatic) for the automatic function appears in the left selection menu, in which the further settings can be made. The automatic function can still be executed when the window is tilted (relevant if "4.12 Air function via window contacts" is active). When the window is open, this function is disabled in order to avoid locking out.

4.9.1 Automatic Block A/B

In order to use the automatic function, the corresponding blocks (A and / or B) have to be activated in the "General settings" menu.
The following figure shows the possible settings for the automatic blocks:

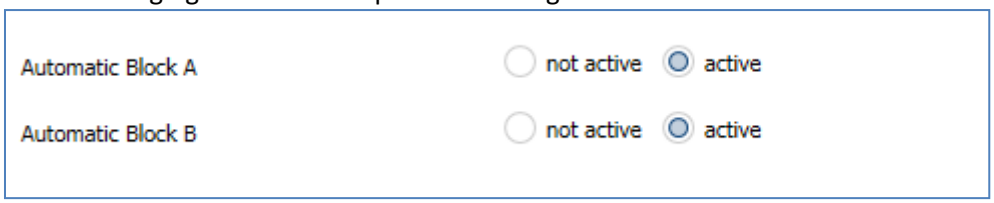

Figure 18: Settings – Activation of Automatic Blocks A/B

If an automatic block is activated, the communication objects belonging to the activated block are displayed. Each block contains 4 communication objects, one for the corresponding automatic position.
The communication objects are shown in the following table:

Number	Name	Length	Usage
15	Automatic A – Automatic position 1	1 Bit	Call of automatic position 1 in Block A
16	Automatic A – Automatic position 2	1 Bit	Call of automatic position 2 in Block A
17	Automatic A – Automatic position 3	1 Bit	Call of automatic position 3 in Block A
18	Automatic A – Automatic position 4	1 Bit	Call of automatic position 4 in Block A
19	Automatic B – Automatic position 1	1 Bit	Call of automatic position 1 in Block B
20	Automatic B – Automatic position 2	1 Bit	Call of automatic position 2 in Block B
21	Automatic B – Automatic position 3	1 Bit	Call of automatic position 3 in Block B
22	Automatic B – Automatic position 4	1 Bit	Call of automatic position 4 in Block B

Table 21: Communication objects – Automatic function

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The communication objects with the size 1 bit can then be assigned to the group addresses as desired.
By calling one of the 8 communication objects, the stored values for this automatic function are then executed. When a communication object is called, it is possible to simultaneously move all the channels of the actuator to the parameterized value or only a single channel. This depends on the parameterization which was made for the individual channels in the sub menu for the automatic function. In order to move several channels simultaneously to certain values, the same automatic blocks have to be selected for these channels and the desired values for the same automatic position have to be stored.

4.9.2 Submenu "Automatic"

The following picture shows the setting options for the automatic function:

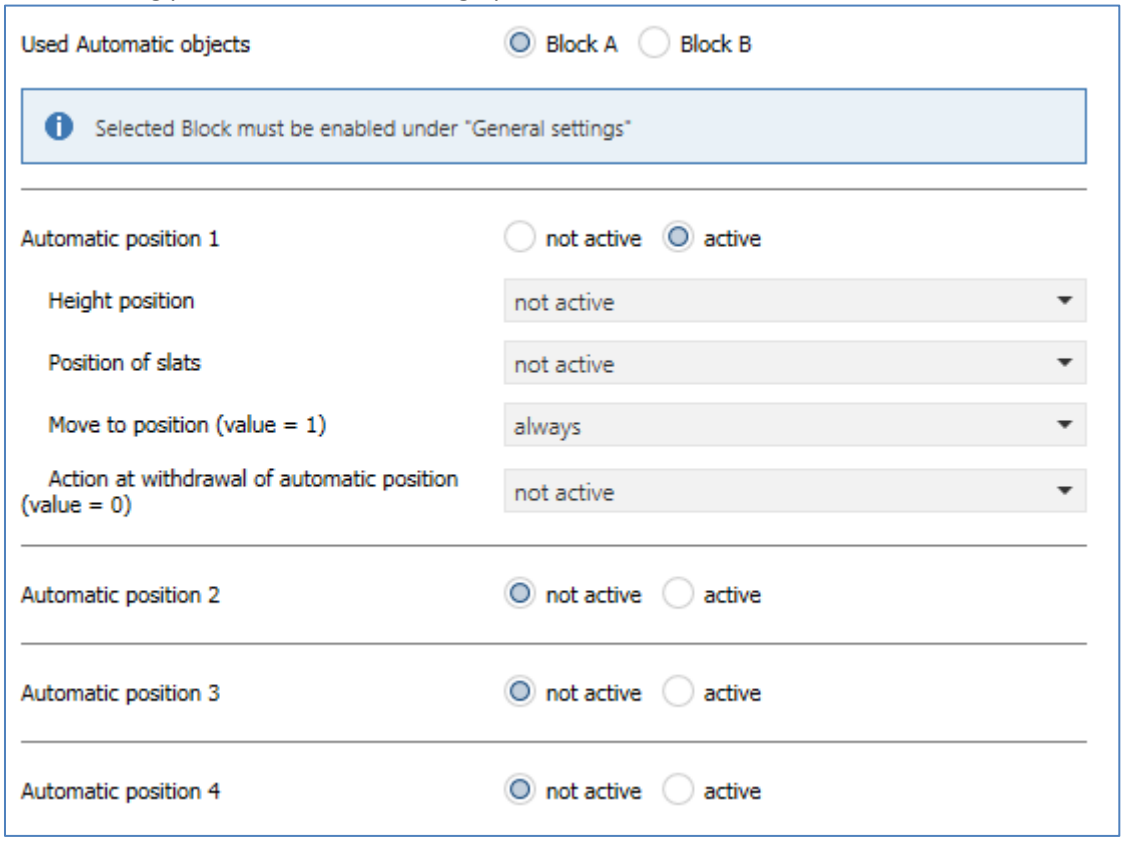

Figure 19: Settings – Submenu "Automatic"

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The following table shows the setting options for the automatic function:

ETS-Text	Dynamic range **[default value]**	Comment
Used Automatic objects	▪ **Block A** ▪ Block B	Setting to which automatic block this channel should react
Automatic position 1 - 4	▪ **not active** ▪ active	Activation of the relevant Automatic positions (1-4)
Height position	**not active** 0 – 100%	Height position to be approached by the automatic function
Position of slats	**not active** 0 – 100%	Slat position to be approached by the automatic function **Only visible for "blinds".**
Move to position (value = 1)	▪ **always** ▪ if position is Up ▪ if position Down	Restriction when the automatic position is to be approached
Action at withdrawal of automatic position (value = 0)	▪ **not active** ▪ move up ▪ move down	The action at withdrawal defines an action after the automatic position has been reset (sending value 0). The withdrawal action is executed only if the position is equal to the set automatic position, i.e. it has not been moved

Table 22: Settings – Automatic function

In the submenu for the automatic function values for 4 different automatic calls can be stored. The values are absolute values that are approached when the respective automatic function is called. In addition, it can be defined for each channel to which automatic block this channel is to react. Blocks A and B are available for selection.
Furthermore, restrictions can be made for the validity range of the automatic function. For example, the channel can only react to a certain automatic function or execute the call of the automatic function only in a certain end position.
In addition, a move command can be executed when the automatic function is reset. However, this move command is only executed if the channel is still in the called automatic function. For this purpose, an internal adjustment is carried out before the command is executed. This prevents the roller shutters from executing the reset command if they have already been moved manually to a new value.

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4.10 Alarm and block functions

The menu for the "Alarm and block functions" is permanently displayed and contains the settings for the alarms and the normal blocking functions:

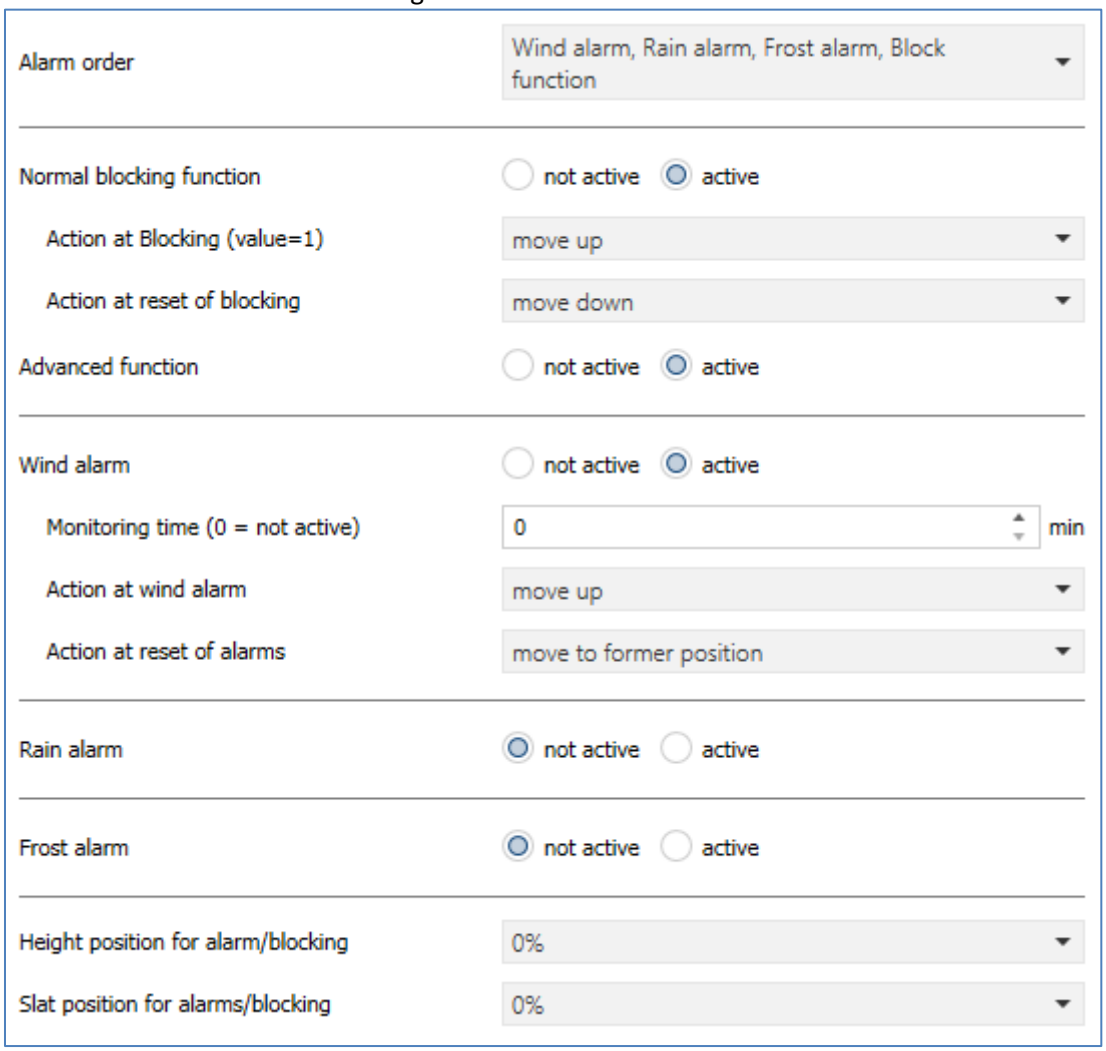

Figure 20: Settings – Alarm and block functions

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4.10.1 Alarm Order (Priority)

The parameter "Alarm order" describes the priority of the individual alarms.
The following table shows the possible settings for this parameter:

ETS-Text	Dynamic range **[default value]**	Comment
Alarm order	▪ Wind alarm, Rain alarm, Frost alarm, Block function ▪ Wind alarm, Rain alarm, Block function, Frost alarm ▪ Wind alarm, Block function, Rain alarm, Frost alarm ▪ Block function, Wind alarm, Rain alarm, Frost alarm ▪ Fire alarm, Wind alarm, Frost alarm, Block function ▪ Fire alarm, Wind alarm, Block function, Frost alarm ▪ Fire alarm, Block function, Wind alarm, Frost alarm	Indicates the priority of the alarm function

Table 23: Settings – Alarm order (priority)

If two or more alarms are active at the same time, the shutter actuator evaluates the alarms according to the set sequence. The shutter actuator only performs the action of the higher priority alarm. The action for the lower priority alarm is not executed as long as the higher priority alarm is active. However, if the alarm with the higher priority is inactive and the lower priority alarm is still active, then the action of the lower priority alarm is executed.

A **fire alarm** can also be activated instead of the rain alarm.
This happens when one of the sequences with "Fire alarm" in the first place is selected.
When a fire alarm (fire alarm system or smoke detector) is activated, the actuator channel moves the blind to a fixed escape position "**move up**" and locks the channel as long as the alarm is present.

If a fire alarm is activated, the following settings are available:

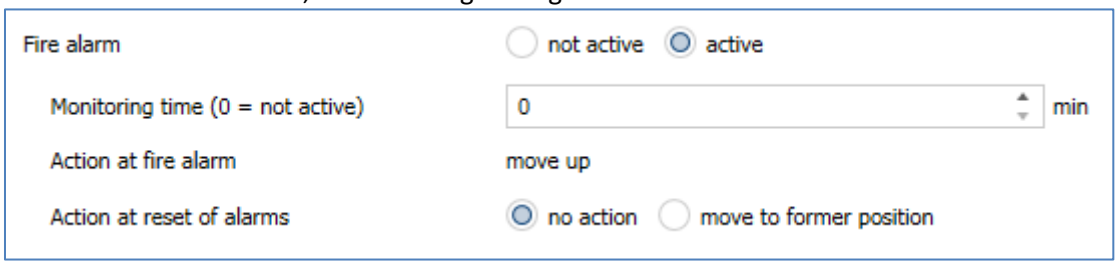

Figure 21: Settings – Fire alarm

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4.10.2 Alarm types

Different alarm types (wind alarm, rain or fire alarm, frost alarm, block function) can be activated, for which further settings can then be made. The following table shows the setting ranges for the alarm types:

ETS-Text	Dynamic range **[default value]**	Comment
Wind alarm	▪ **not active** ▪ active	Activation of the wind alarm. **Other parameters are only displayed when the wind alarm is active!**
Monitoring time (0 = not active)	**0** - 120 min	Cyclic monitoring of the wind alarm Setting 0 deactivates the cyclic monitoring
Action at wind alarm	▪ **no action** ▪ move up ▪ move down ▪ move to height position	Action after activation of the wind alarm. "**move to height position**": The absolute position (see "4.10.4 Move to height position") is approached.
Action at reset of alarm	▪ **no action** ▪ move up ▪ move down ▪ move to former position	Action on the withdrawal of the wind alarm.
Rain-/Fire alarm	▪ **not active** ▪ active	Activation of the rain alarm or fire alarm. **Switchable via alarm sequence (priority)!** Other parameters are only displayed when the rain/fire alarm is active!
Monitoring time (0 = not active)	**0** - 120 min	Cyclic monitoring of the rain-/fire alarm. Setting 0 deactivates the cyclic monitoring
Action at rain alarm	▪ **no action** ▪ move up ▪ move down ▪ move to height position	Action after activation of the rain alarm. "**move to height position**": The absolute position (see "4.10.4 Move to height position") is approached.
Action at reset of alarm	▪ **no action** ▪ move up ▪ move down ▪ move to former position	Action on the withdrawal of the rain alarm.
Action at fire alarm	**move up**	Action when the fire alarm is activated. **Setting is fixed and cannot be changed**!
Action at reset of alarm	▪ **no action** ▪ move to former position	Action on the withdrawal of the fire alarm.

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Frost alarm	▪ **not active** ▪ active	Activation of the frost alarm. **Other parameters are only displayed when the wind alarm is active!**
Monitoring time (0 = not active)	**0** - 120 min	Cyclic monitoring of the frost alarm Setting 0 deactivates the cyclic monitoring
Action at frost alarm	▪ **no action** ▪ move up ▪ move down ▪ move to height position	Action after activation of the frost alarm. “**move to height position**”: The absolute position (see “4.10.4 Move to height position”) is approached.
Action at reset of alarm	▪ **no action** ▪ move up ▪ move down ▪ move to former position	Action on the withdrawal of the frost alarm.
Normal blocking function	▪ **not active** ▪ active	Activation of the "normal blocking function". **Further parameters are only displayed if the "normal blocking function" is active**!
Action at blocking (value = 1)	▪ **no action** ▪ move up ▪ move down ▪ move to height position	Setting of the action to be triggered when a block is activated.
Action at reset of blocking	▪ **no action** ▪ move up ▪ move down ▪ move to former position	Setting of the action to be triggered when the block is cancelled.

Table 24: Settings – Alarm types

If an alarm is activated, the relevant communication object is displayed for this alarm. If the associated communication object receives a "1” signal, the alarm function is activated. The alarm is deactivated by a "0“-signal.

The following table shows the associated communication objects:

Number	Name	Length	Usage
42	Wind alarm	1 Bit	Activation / deactivation of the wind alarm
43	Rain alarm	1 Bit	Activation / deactivation of the rain alarm
43	Fire alarm	1 Bit	Activation / deactivation of the fire alarm
44	Frost alarm	1 Bit	Activation / deactivation of the frost alarm
45	Block	1 Bit	Activation / deactivation of the „normal blocking function“

Table 25: Communication objects – Alarms

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The functionality of the alarms is similar across all alarm types. Cyclical monitoring can be set for each of the alarms. Furthermore, an action for triggering and resetting the alarm can be defined in each case.

The adjustable height position is described in chapter "4.10.4 Move to height position".

Actuation of the actuator channel is not possible as long as an alarm is active.
Exception: Manual operation on the unit is still possible even if alarms and locks are active.

4.10.3 Cyclical monitoring

The cyclic monitoring of the alarm function can be set separately for each of the alarms. The setting range is from 0 - 120 min, whereby the setting 0 min deactivates the cyclical monitoring.
The communication object for the respective alarm has to receive a signal within the set monitoring time, otherwise the alarm is triggered automatically. In KNX weather stations there are settings for the intervals at which cyclical sending is to take place. The time for cyclical transmission should always be less than the monitoring time set in the blind actuator in order to prevent an alarm from being triggered accidentally (a ratio of 1:3 is recommended, see example below).
Cyclical monitoring can ensure that the corresponding sensor is functioning properly. If there is no signal due to a weather station failure or a wire break, the blind actuator will trigger an alarm after the monitoring time has elapsed.

Example:
Send the telegram of the corresponding sensor cyclically every 10 minutes and set the monitoring time of the actuator to 30 minutes. This ensures that one failed telegram (bus collision) does not trigger an alarm.

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4.10.4 Move to height position

In each channel, a defined position can be set in the "Action on blocking" or "Action on alarm" with the setting "**Move to height position**" (except fire alarm!). This also includes the slat position when selecting the channel as "Blinds":

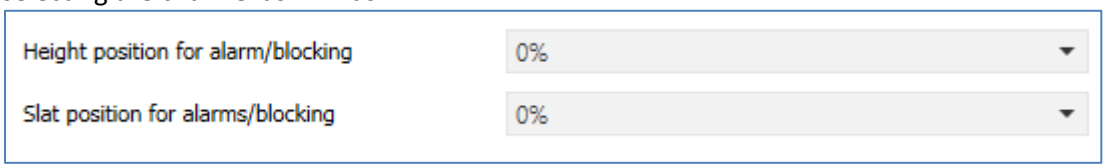

Figure 22: Settings – Positions for alarm/blocking

The following settings are available:

ETS-Text	Dynamic range **[default value]**	Comment
Height position for alarms/blocking	0 – 100% **[0%]**	Setting the absolute height position for alarm/block.
Slat position for alarms/blocking	0 – 100% **[0%]**	Setting of the absolute slat position for alarm/block. **Setting only appears when "Blind" is selected**

Table 26: Settings – Positions for alarm/blocking

An absolute position can be defined for each channel which can be approached in the event of an active alarm or an active block. This position applies to all alarms and the block of this channel.

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4.11 Advanced block function

The extended blocking function can be activated for each channel via a selection in the "Alarm and blocking functions" submenu. If the extended blocking function is activated, a new submenu "Channel X: Extended blocking function" appears in the selection menu for the respective channel. The following picture shows the activation of the extended locking function:

Figure 23: Setting – Activation "Advanced block function"

The following picture shows the setting options for the menu:

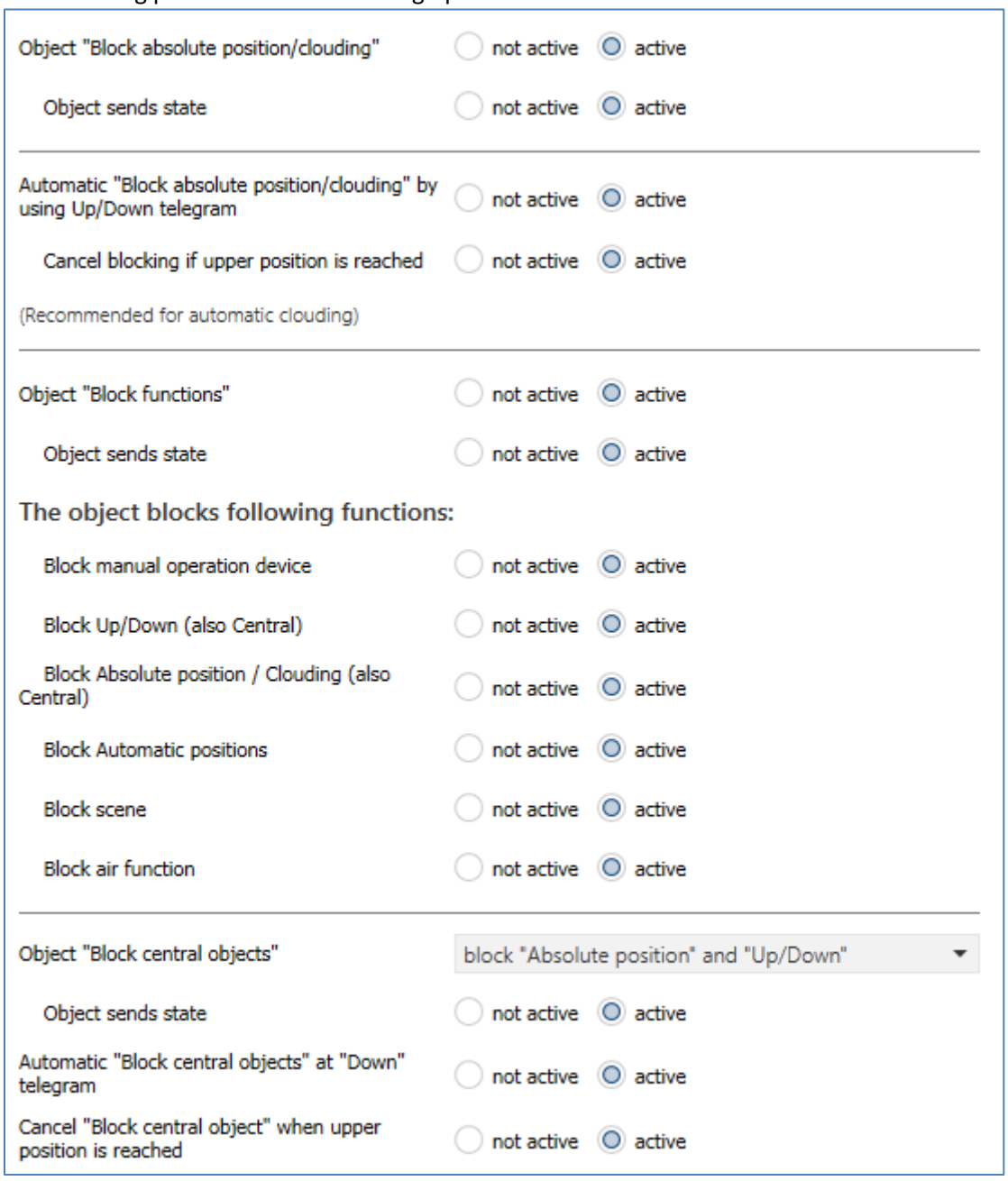

Figure 24: Setting – Advanced block function

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The following table shows the setting options for the advanced block function:

ETS-Text	Dynamic range **[default value]**	Comment
Object „Block absolute position/clouding”	▪ **not active** ▪ active	Activates the communication object for the blocking of an absolute position command (also valid for clouding)
Object sends status	▪ **not active** ▪ active	Setting whether the object should send the current status. When activated, "L" and "Ü" flags are set.
Automatic „Block absolute position/clouding“ by using Up/Down telegram	▪ **not active** ▪ active	When activated, the manual movement via up/down automatically sets a block for absolute position and shading.
Cancel blocking if upper position is reached	▪ **not active** ▪ active	Deactivates the block for starting absolute position by reaching the upper position
Object „Block functions“	▪ **not active** ▪ active	Activates the communication object and the settings for the universal blocking function
Object sends status	▪ **not active** ▪ active	Setting whether the object should send the current status. When activated, "L" and "Ü" flags are set.
The following objects are displayed if the object "Block functions" is activated. The following functions are available for selection:		
Block manual operation device	▪ **not active** ▪ active	When activated, the “manual operation” is blocked
Block Up/Down movement (also Central)	▪ **not active** ▪ active	When activated, the “Up/Down movement” is blocked
Block absolute position/clouding (also Central)	▪ **not active** ▪ active	When activated, “absolute position/clouding” is blocked
Block Automatic positions	▪ **not active** ▪ active	When activated, “automatic positions” is blocked
Block Scene	▪ **not active** ▪ active	When activated, “scene” is blocked
Block Air function	▪ **not active** ▪ active	When activated, the “air function” is blocked

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Object „Block central objects“	▪ **not active** ▪ Block only “Up“ ▪ Block only “Down“ ▪ Block only “Up/Down“ ▪ Block „Absolute position“ ▪ Block „Absolute position” and “Up” ▪ Block „Absolute position” and “Down” ▪ Block „Absolute position” and “Up/Down”	Setting which central functions the object "Block central object" should block
Object sends status	▪ **not active** ▪ active	Setting whether the object should send the current status. When activated, "L" and "Ü" flags are set.
Automatic “Block central objects” at “Down” telegram	▪ **not active** ▪ active	Blocks the functions selected in "Block central objects" with a "Down" command
Cancel “Block central objects” when upper position is reached	▪ **not active** ▪ active	Unlocks the functions selected in " Block central objects" when the upper position is reached

Table 27: Settings – Advanced block function

The following communication objects are available:

Number	Name	Length	Usage
39	Block central object	1 Bit	Blocks the central objects according to the set parameters
40	Block absolute positions	1 Bit	Blocks the movement of the channel via absolute positions or through automatic clouding
41	Block functions	1 Bit	Blocks the functions according to the settings for this object

Table 28: Communication objects – Advanced block function

The parameter object "**Block absolute position/clouding**" makes it possible to block the absolute position commands and the clouding on the channel. If the associated object "Disable absolute position/clouding" is activated by sending a "1", no more absolute position commands can be assigned to the channel (including central commands) and automatic clouding is also deactivated. Up/down central is still possible.
An active internal clouding is also deactivated by setting this lock.

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Example 1: The function ´**Automatic „Block absolute position/clouding“ by using Up/Down telegram**´ makes it possible to block the approach of the absolute position when moving manually. This function is used when a weather station activates a sun protection function but the user wants to move the shutter/blind manually to any value. By moving manually, the channel is now blocked against receiving the absolute position command for sun protection and can be moved normally. The lock can be released again automatically via the parameter "Cancel block if upper position is reached" as soon as the upper end stop is reached or by sending a 0 to the communication object 40 " Block absolute positions/clouding".
This function is automatically set when automatic clouding is activated in the channel.

Example 2: Blocking the central functions for a certain room, e.g. during the child's nap.

The air function, automatic positions (1 bit) and "Move to position" (1 bit) can still be used and are not locked! These can be locked via "Block functions".
The object "Block absolute position/clouding" can, if activated, send the status on change and on request.

The parameter **Object "Block functions"** makes it possible to configure the locking process itself and to configure it to its needs. 5 different sub-items are available for this purpose:

- **Block manual operation on the device**
  Blocks the manual operation for this channel
- **Block Up/Down (also central)**
  Blocks the movement commands for the channel (at blinds also the slat adjustment)
- **Block Absolute position/Clouding (also central)**
  Blocks the object „absolute position“ and the automatic clouding for this channel
- **Block Automatic positions**
  Call-up via the automatic function is blocked for this channel.
- **Block Scene**
  Blocks the scene function for this channel, e.g. is a scene called where this channel is involved, the channel remains in current position
- **Block Air function**
  Blocks the automatic air function for this channel

The object " Block functions" can, if activated, send the status on change and on request. For example: on internal activation via a scene.

The **object "Block central objects**" blocks the call of the channel via the central objects. For each channel, it is possible to specify which central functions are to be blocked. In addition, it is possible to lock the central objects automatically with a "Down" command and unlock them again when the upper position (0%) is reached. This setting makes particular sense if all blinds are moved centrally via a timer. However, if a channel is no longer to be moved after a manual move command, it can be locked automatically.
The **object "Block absolute position/clouding**" can, if activated, send the status on change and on request.

All blocking functions are activated with a logical "1" and deactivated with a logical "0".

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4.12 Air function via window contacts

The air function includes the logic for querying window contacts. To use the air function, this has to be activated in the parameters of the channel:

Figure 25: Setting – Activation of Air function

By activating, a new submenu "Air function" appears for the channel.
The following picture shows the corresponding settings:

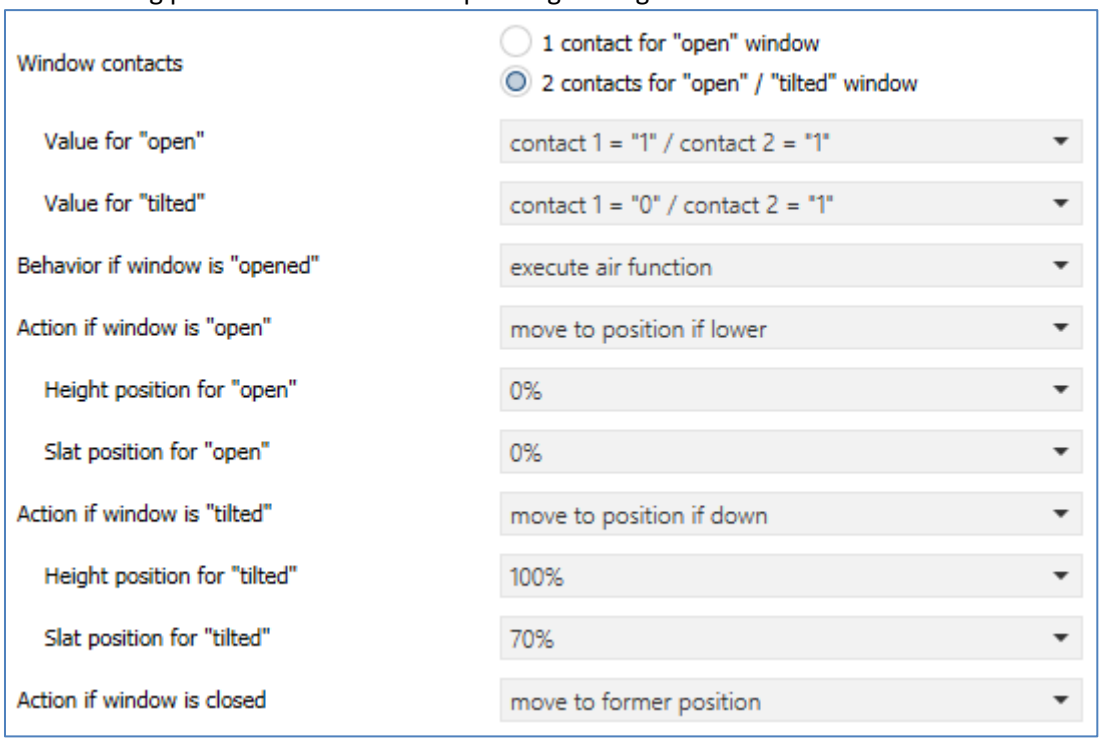

Figure 26: Settings – Air function

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The following table shows the available settings:

ETS-Text	Dynamic range **[default value]**	Comment
Window contacts	▪ **1 contact for „open“ window** ▪ 2 contacts for „open”/”tilted” window	Setting whether one or two window contacts are installed
1 Contact:		
Value for „open“	▪ **Value 0** ▪ Value 1	Sets the value for open windows
2 Contacts:		
Value for „open“	▪ contact 1 = 0, contact 2 = 0 ▪ contact 1 = 1, contact 2 = 0 ▪ contact 1 = 0, contact 2 = 1 ▪ **contact 1 = 1, contact 2 = 1**	Sets the value for open windows
Value for „tilted“	▪ contact 1 = 0, contact 2 = 0 ▪ contact 1 = 1, contact 2 = 0 ▪ **contact 1 = 0, contact 2 = 1** ▪ contact 1 = 1, contact 2 = 1	Sets the value for tilted windows
Behaviour if window is “open”	▪ **execute air function** ▪ set block function ▪ execute air function and block central objects * ▪ execute air function and block abs position/clouding* ▪ execute air function and block abs position/clouding and central objects *	Setting which behavior should be performed when the window is open
Action if window is “open”	▪ not active ▪ move to position if down ▪ **move to position if lower** ▪ move to position if lower and limit lower position	Action to be executed when opening the window. **Not visible if "Behaviour if window is opened" is set to "Set block function"**
Height position for „open“	0 – 100% **[0%]**	Setting the absolute height position for the air function when opening the window
Slat position for „open“	0 – 100% **[0%]**	Setting the absolute slat position for the air function when opening the window

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Action if window is closed	▪ not active ▪ move up ▪ move down ▪ **move to former position**	Action to be carried out after closing the window. **The addition "Make up for central telegrams, otherwise..." only appears if "Execute air function + additional central lock" is selected for "Behaviour when window is opened".**
Action if window is closed: Make up for central telegrams, otherwise...		
Only for selection "2 contacts":		
Action if window “tilted”	▪ not active ▪ move to position if down ▪ **move to position if lower** ▪ move to position if lower and limit lower position	Action to be executed when the window is tilted
Height position for „tilted“	0 – 100% **[100%]**	Setting the absolute height position for the air function when the window is tilted
Slat position for „tilted“	0 – 100% **[70%]**	Setting the absolute slat position for the air function when the window is tilted

Table 29: Settings – Air function

The air function makes it possible, without external logic, to carry out various actions as soon as the value of a window contact on the bus changes.
Various behaviours can be set for the open window:

- **Execute air function**
  The adjusted absolute positions are approached. However, the channel is not blocked and can still be moved from this position.
- **Set block function**
  Block is set and the parameterised action for "normal blocking function" is executed (Up/Down). A further procedure is not possible afterwards as long as the window is open. By closing the window, the block is cancelled and the parameterised action for cancelling the "normal blocking function" is carried out. This function is particularly useful for patio doors to avoid locking out.
- **Execute air function and block central objects**
  Air positions set in the corresponding channel are approached. Central commands for up/down and absolute positions are blocked and not executed. However, they are saved and executed after the lock is removed. The telegram that arrived last is executed. However, the blind/roller shutter can still be controlled with the up/down operation on the channel. This function avoids locking out via automated central objects.
- **Execute air function and block abs position/clouding**
  Air positions set in the corresponding channel are approached. Commands for channel-related and central absolute positions are blocked and not executed. However, the blind/roller shutter can still be controlled with the up/down operation on the channel. This function avoids locking out via automated absolute position commands. The internal clouding function is also deactivated with this function..

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- **Execute air function and block abs position/clouding and central objects**
  The airing positions set in the corresponding channel are moved to. Central commands for up/down and absolute positions, as well as channel-related and central absolute positions are blocked and not executed. Commands received in the meantime are saved and executed after the lock is lifted. The last telegram received is executed. However, the blind/roller shutter can still be controlled with the up/down operation on the channel. This function avoids locking out via automated central and absolute position commands. The internal clouding function is also deactivated with this.

Please note:

- Via the object "Lock central objects" and / or "Lock absolute position" a manual release with the value = 0 can be achieved.
- The outdoor temperature lock of the clouding function has no effect on the air function!
- The states of the window contacts are requested in the settings 0/0; 0/1; and 1/0 when the unit is started. For an active request of the contacts, the respective T flags had to be activated.
- The default setting of the window contacts after a hardware reset (or reprogramming) is 1/1 (for open) and 0/1 for tilted and is not requested with this setting..
- When the air function is active (window open), alarms are only executed with higher positions (lock-out protection).
- The limitation of the lower position does not take effect in case of alarm and the normal locking function.
- It cannot be lowered manually when the limit is active.

The following table shows the related communication objects:

Number	Name	Length	Usage
46	Window contact	1 Bit	Value window contact – if 1 window contact
46	Window contact 1	1 Bit	Value window contact 1 – if 2 window contact
47	Window contact 2	1 Bit	Value window contact 2 – if 2 window contact

Table 30: Communication object – Window contacts

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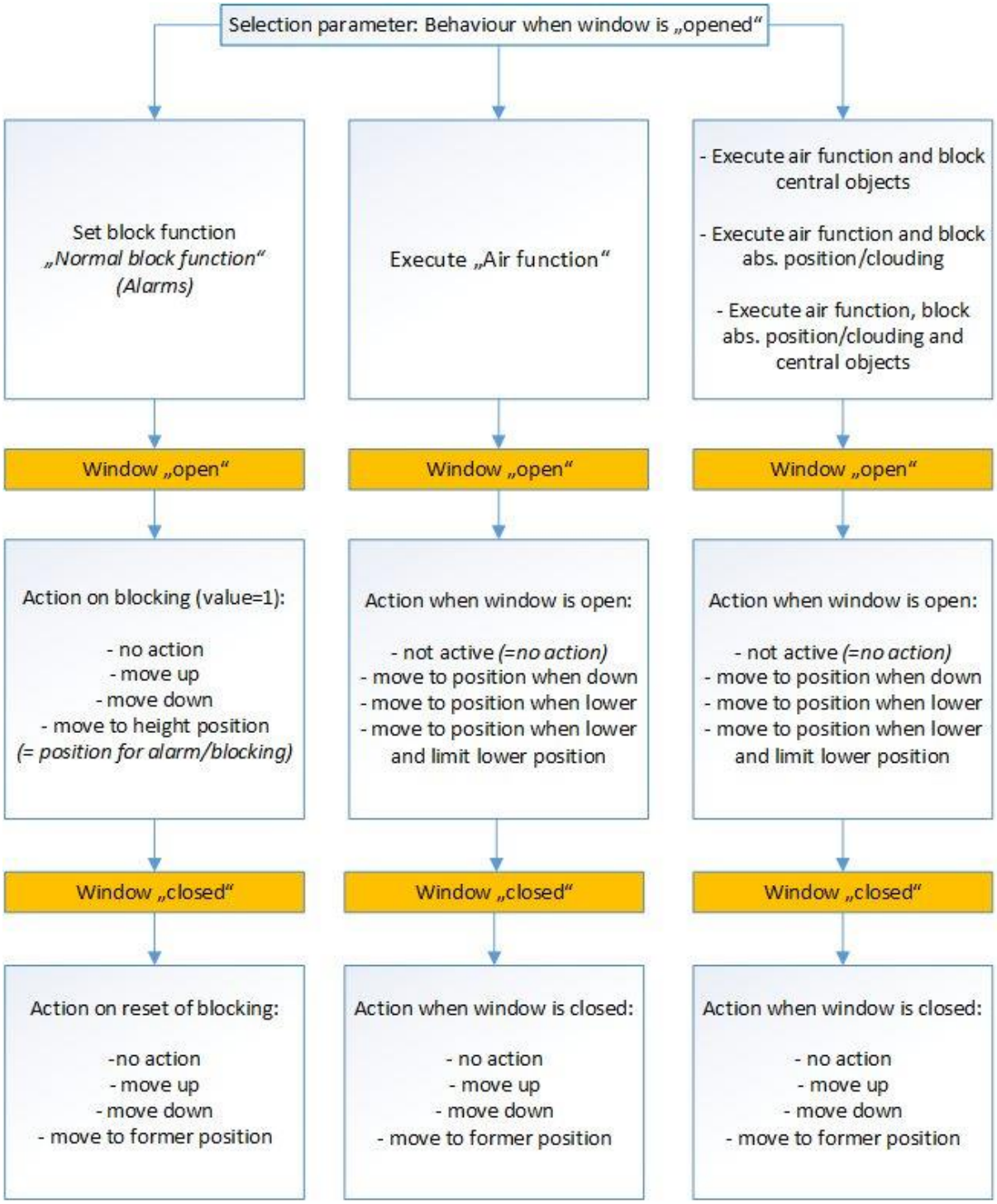

Figure 27: Diagram – Overview „Air function”

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4.13 Automatic Clouding

The automatic clouding function makes it possible to implement sun position tracking in the blind actuator. The shutter actuator carries out the sun position calculation completely independently and can be triggered depending on brightness values/thresholds, outdoor temperature/threshold, indoor temperature/threshold (or control value heating). For automatic clouding, basic settings and settings have to be made for each channel. These are described in the following chapters.

4.13.1 Clouding basic setting

Activation takes place in the "General setting" menu:

Figure 28: Setting – Activation "Automatic clouding"

The following figure shows the menu "Clouding basic setting":

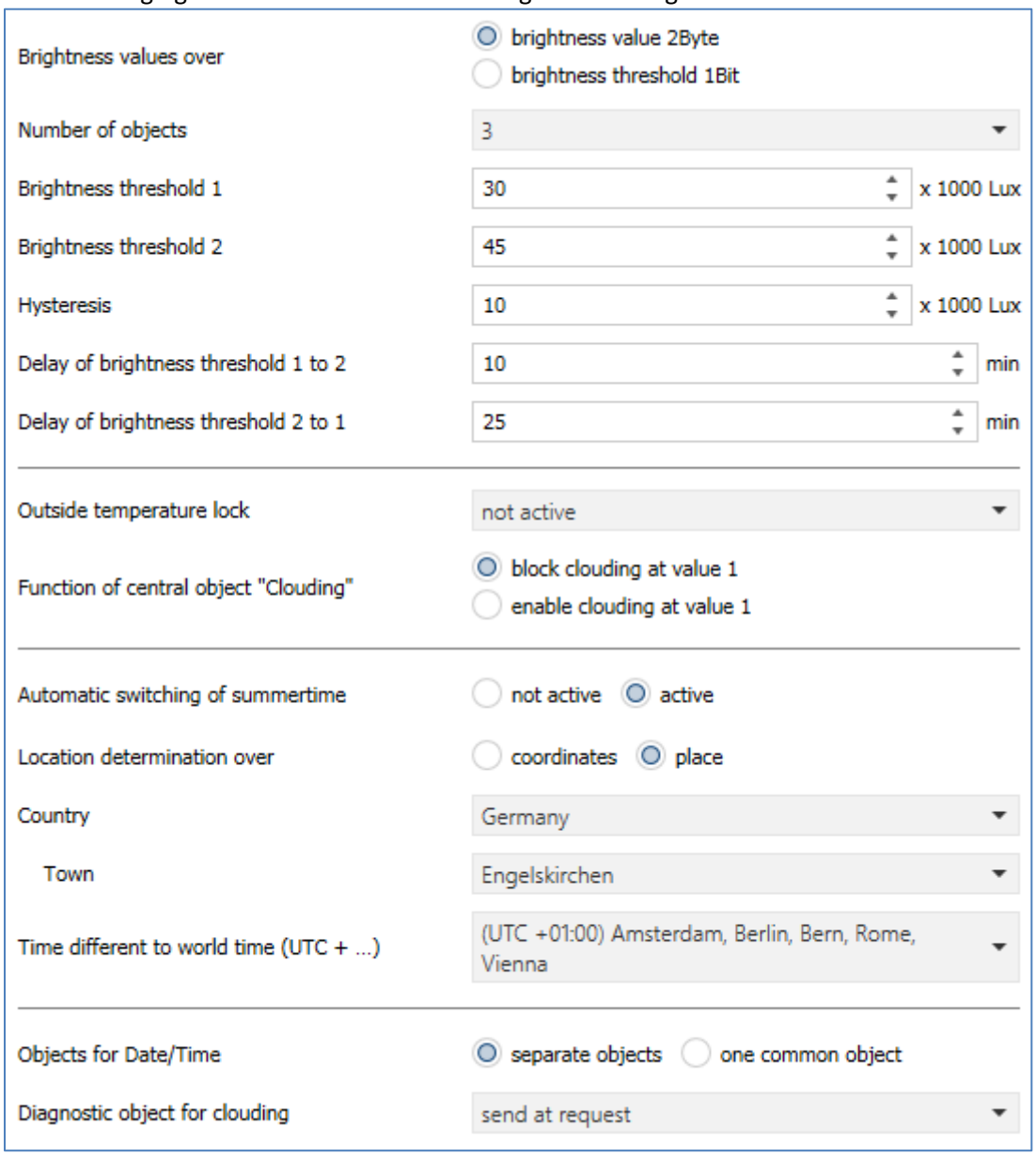

Figure 29: Settings – Clouding basic settings

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The table below shows the available settings:

ETS-Text	Dynamic range **[default value]**	Comment
Brightness values over	▪ **Brightness value 2Byte** ▪ Brightness threshold 1Bit	Settings of the data point types for the brightness values
Number of objects	1 – 3 **[3]**	**For brightness values over 2 byte** Set the number of brightness objects
Brightness threshold 1	0 – 95.000 Lux **[30.000 Lux]**	**For brightness values over 2 byte** Adjustment of the brightness threshold 1
Brightness threshold 2	0 – 95.000 Lux **[45.000 Lux]**	**For brightness values over 2 byte** Adjustment of the brightness threshold 2
Hysteresis	0 – 20.000 Lux **[10.000 Lux]**	**For brightness values over 2 byte** Adjustment of the brightness threshold
Delay of brightness threshold 1 to 2	0 – 30 min **[10]**	Setting the delay when switching between the brightness thresholds
Delay of brightness threshold 2 to 1	0 – 60 min **[25]**	Setting the delay when switching between the brightness thresholds
Outside temperature block	▪ **not active** ▪ temperature value ▪ temperature threshold	Setting whether the outside temperature block is to be activated only from a minimum outside temperature
Block clouding at temperature less than	5°C – 30°C **[12°C]**	**At setting "temperature value"** Setting the minimum outside temperature
Block clouding at	▪ value 0 ▪ **value 1**	**At setting "temperature threshold"** Setting of the value with which the clouding should be blocked
Function of central object "Clouding"	▪ **block clouding at value 1** ▪ activate clouding at value 1	Activation of an enable/disable object for the clouding
Automatic switching of summertime	▪ not active ▪ **active**	Setting whether summertime changeover should be carried out automatically
Location determination over	▪ Coordinates ▪ **Place**	Setting how the location is to be calculated
Setting by location:		
Country	Any Country **[Germany]**	Settting of the Country
Town	Any Town **[Engelskirchen]**	Setting of the Town

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Setting via coordinates:		
Latitude	▪ **North** ▪ South	Determining whether northern or southern latitude is to be counted
Latitude in degrees [0° - 90°]	0° … 90° **[50°]**	Setting of the latitude
Latitude in minutes [0´ - 59´]	0´ … 59´ **[56´]**	Setting of the minutes
Longitude	▪ **East** ▪ West	Determining whether eastern or western longitude is to be counted
Longitude in degrees [0° - 180°]	0° … 180° **[6°]**	Setting of the longitude
Longitude in minutes [0´ - 59´]	0´ … 59´ **[57´]**	Setting of the minutes
Time different to world time (UTC+…)	Any time zone **[UTC+01:00 Amsterdam, Berlin]**	Setting of the time zone to calculate the sun position
Objects for Date/Time	▪ **separate objects** ▪ one common object	Setting which objects have to be used for time/date
Diagnostic object for clouding	▪ not active ▪ **send at request** ▪ send at change	Activation of the central diagnostic object and its send condition

Table 31: Basic settings – Clouding

Brightness values / brightness threshold
For the clouding per channel, two threshold values can be set for the brightness. In the clouding settings / channel, you can then set the brightness threshold to activate the clouding.
Up to 3 brightness values (over 2 bytes) are available for calculating the brightness thresholds. The brightness thresholds are then calculated from the highest applied brightness value. The threshold value and the hysteresis can be set for the brightness thresholds. The switch-on value is always equal to the specified value for brightness threshold 1/2. The switch-off value is calculated from the brightness threshold 1/2 minus the hysteresis.
Alternatively, the threshold values can be specified over 1 bit. If the 1-bit object receives a 1, the brightness threshold is exceeded.
Attention: **The brightness threshold 1 must be less than the brightness threshold 2!**

Delay of brightness threshold
The delay between the brightness thresholds prevents too frequent movement. If thresholds 1 and 2 are exceeded or undercut, a movement is only triggered with the specified delay. Different switching times can be configured.

Outside temperature lock
The outdoor temperature block via "**Temperature value**" causes the automatic clouding to be blocked below a set temperature value. For this purpose, an external outdoor temperature is sent to the shutter actuator. The clouding is only released again when the outdoor temperature exceeds the value. The hysteresis for release is internally set to +2 K.
Example: "Block clouding at temperature value lower than" 12°C + hysteresis 2K = release at 14°C.

With outdoor temperature blocking via "**Temperature threshold**", the clouding is blocked and released again via a 1-bit value. The polarity, whether a "1" or a "0" is used for blocking, can be selected. If, for example, the clouding is blocked with a "value 1", it is released again with a "0".

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Block/Enable Clouding
Via the parameter "function of central object clouding", the clouding can be disabled or enabled via an object, e.g. by using a button / time switch etc. When using "Enable", this is set to 1 (clouding enabled) by default after a reset.

Automatic switchover of summertime
An automatic change-over of the summer time can be set here (from V3.2). The setting was always active before. In countries without summer time it makes sense to deactivate this function.

Location determination
The location determination is required to calculate the sun position for the object.

Diagnostic object for clouding
The diagnostic object can be used as a status for visualisations or for commissioning/diagnosis. It contains information on the readiness of the clouding, threshold value, azimuth and elevation (see also 4.13.3 Basics to “Sun position calculation”). The diagnostic object is structured as follows:

M1 S1 A150 E30

Mx
Display of clouding mode; bit coded:
Bit 1: 0 = Clouding not ready, 1 = Clouding ready
Bit 2: 0 = Clouding not blocked, 1 = Clouding blocked
Bit 3: 0 = no outside temperature block, 1 = outside temperature block active

Possible states:

000 -> M0 = Clouding not ready,	Clouding not blocked,	no outside temperature block
001 -> M1 = Clouding ready,	Clouding not blocked,	no outside temperature block
010 -> M2 = Clouding not ready,	Clouding blocked,	no outside temperature block
011 -> M3 = Clouding ready,	Clouding blocked,	no outside temperature block
100 -> M4 = Clouding not ready,	Clouding not blocked,	Outside temperature block active
101 -> M5 = Clouding ready,	Clouding not blocked,	Outside temperature block active
110 -> M6 = Clouding not ready,	Clouding blocked,	Outside temperature block active
111 -> M7 = Clouding ready,	Clouding blocked,	Outside temperature block active

Sx
Indication whether threshold 1/2 is exceeded
S0: No threshold is exceeded
S1: Brightness threshold 1 is exceeded
S2: Brightness threshold 2 is exceeded

Axxx
Output of the azimuth (sun angle) of the sun in degrees

Exx
Output of the elevation (sun height) of the sun in degrees

- If the message “**ERR: Date”** appears, no value for date/time was received.
- An exceeded brightness threshold S1 or S2 is reset in the diagnosis with setting the clouding lock or with the outdoor temperature lock to S0.
  Resetting the lock then shows the correct threshold again.

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The following table shows the general communication objects for clouding:

Number	Name	Length	Usage
7	Time	3 Byte	Preset the time
7	Date/Time	8 Byte	Preset Date and Time
8	Date	3 Byte	Preset the Date
9	Central function – Brightness 1	2 Byte	Preset the brightness value 1
9	Central function – Brightness 1	1 Bit	Preset that the brightness threshold 1 has been exceeded
10	Central function – Brightness 2	2 Byte	Preset the brightness value 2
10	Central function – Brightness 2	1 Bit	Preset that the brightness threshold 2 has been exceeded
11	Central function – Brightness 3	2 Byte	Preset the brightness value 3
12	Central function – Outside temperature	2 Byte	Preset the outside temperature
12	Central function – Outside temperature threshold	1 Bit	Preset that the outside temperature threshold has been exceeded
13	Central function – Block clouding	1 Bit	Blocking of clouding
13	Central function – Enable clouding	1 Bit	Activation of clouding
14	Central function – Clouding diagnosis	14 Byte	Diagnosis object of clouding

Table 32: Communication objects – Clouding in general

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4.13.2 Settings for each channel

A submenu for automatic clouding can be displayed for each channel. This has to be activated in the channel settings via the parameter "Automatic clouding".
The following picture shows the setting options per channel (here when selected as "Blind"):

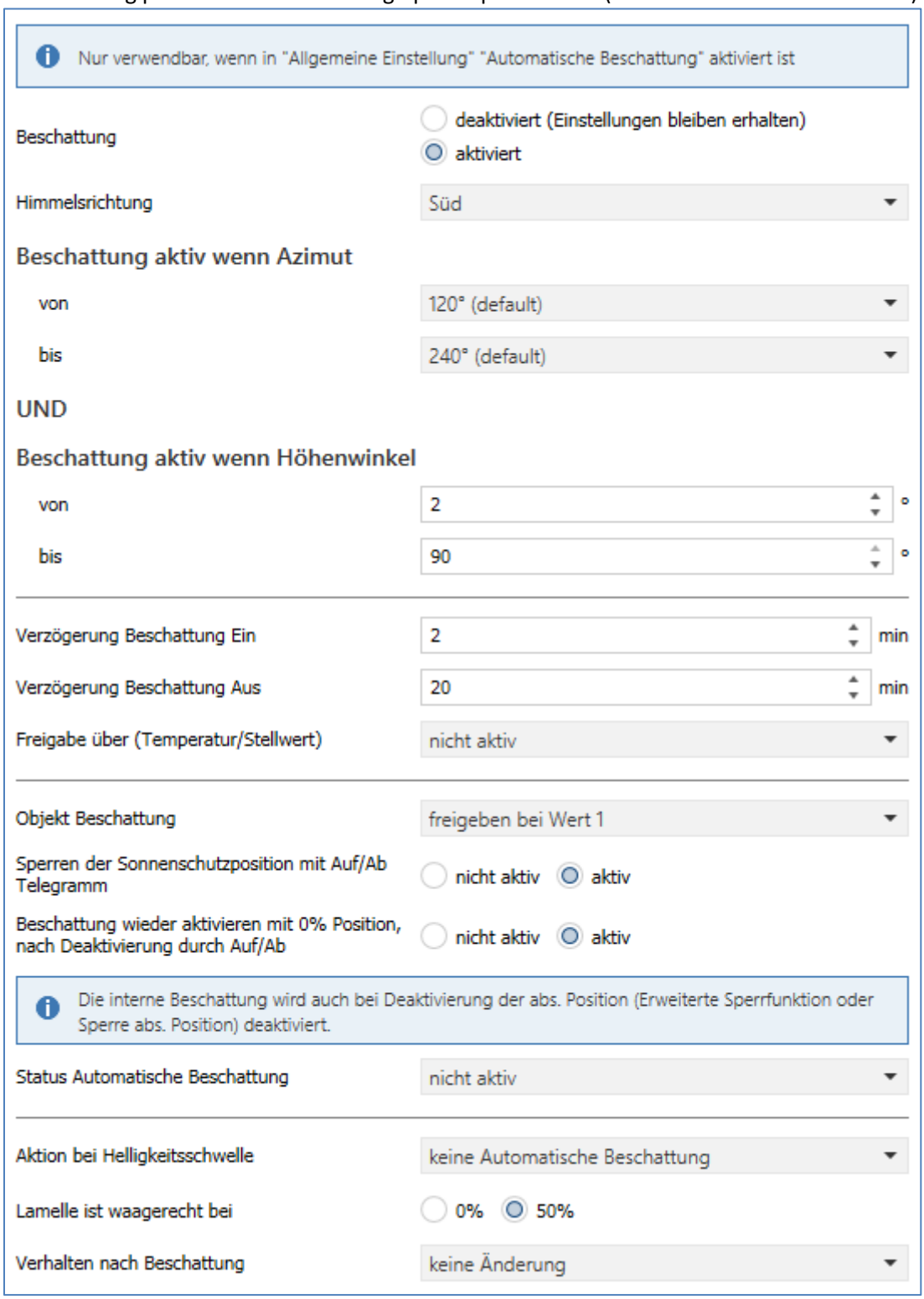

Figure 30: Settings – Clouding settings per channel

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The following table shows the available settings:

ETS-Text	Dynamic range **[default value]**	Comment
Clouding	▪ disabled (settings are retained) ▪ **enabled**	Activation/Deactivation of automatic clouding
Compass direction	▪ east ▪ southeast ▪ **south** ▪ southwest ▪ west ▪ north (with two areas) ▪ roof area ▪ no azimuth evaluation	Adjustment of compass direction: **North (with two areas):** Two areas "northeast" and "northwest" possible **Roof area:** Azimuth evaluation possible from East to West **no azimuth evaluation:** Clouding always active
Clouding active if azimuth		
From	20° - 340°	"Azimuth start angle". Range varies depending on compass direction
To	20° - 340°	"Azimuth stop angle". Range varies depending on compass direction
Area 1 (northeast) from/to	20° - 180°	"Azimuth start/stop angle". **Only with setting "north (with two areas)"**
Area 1 (northwest) from/to	180° - 340°	
AND Clouding active if elevation		
from	0° … 45° **[2°]**	Elevation angle from which the shading is active
to	10° … 90° **[90°]**	Elevation angle until the shading is active
OR (Useful for roof windows on the north side and low roof pitch)		
Clouding active when the elevation higher	**not active** 10° - 90°	Elevation angle from which shading is provided. **Only displayed for compass direction north (with two areas) and roof area**.
Delay clouding On	0 … 30 min **[2 min]**	Delay until clouding is started after overstepping the brightness threshold
Delay clouding Off	0 … 60 min **[20 min]**	Delay to end clouding after the brightness threshold has been undercut
Release via (temperature/set value)	▪ **not active** ▪ temperature value ▪ temperature threshold ▪ set value for heating	Setting whether automatic clouding should only be released from a certain temperature/control value of the heating
Release if temperature greater than	15 … 35 °C **[21 °C]**	Setting of the minimum temperature from which the shading is enabled. **For "Release via temperature value".**

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Release when temperature threshold is equal to	▪ value 0 ▪ **value 1**	Setting of the value with which the shading is released. **For release via "Temperature threshold".**
Release if set value for heating less than	0 – 50 % **[5 %]**	Setting of the control value below which the shading becomes active. **With release via " Set value heating".**
Object clouding	▪ **not active** ▪ block at value 1 ▪ enable at value 1 ▪ block slat adjustment at value 1 ▪ enable slat adjustment at value 1	Activation of an object for blocking/activation of clouding/slat adjustment
Deactivate active clouding position with Up/Down	▪ **not active** ▪ active	Activation of a lock on the clouding by a 1 bit up/down travel command
Activate clouding again with position 0% after deactivation with Up/Down	▪ **not active** ▪ active	Setting whether clouding should be reactivated after the complete up-movement
Status automatic clouding	▪ **not active** ▪ in Clouding state (value 1) ▪ in Standby state (value 1) ▪ in Locking state (value 1)	Activation of a status object for clouding.
The following settings are only available for channel selection as "Blinds":		
Action at brightness threshold	▪ **no automatic clouding** ▪ move to position without slat adjustment ▪ move to position with slat adjustment ▪ use position of a scene (can be saved)	Setting which action is to be carried out when triggered by a brightness threshold
Clouding from brightness threshold	▪ **brightness threshold 1** ▪ brightness threshold 2	Set the brightness threshold from which the clouding should be started.
Blinds position	10 – 100 % **[100 %]**	Height position to be approached with active clouding
Slat position	0 – 100 % **[50 %]**	Slat position to be approached with active clouding
Scene selection	Scene A – H	Setting which internal scene is to be executed. **For "Action at brightness threshold", set to "Use position of a scene (teachable)".**

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Start slat adjustment if elevation is less than (0 = not active)	0 … 90 ° **[45 °]**	Setting from which angle of elevation of the sun the slat tracking should start
Minimum change of slat adjustment	5 % - 30 % **[10 %]**	Setting the steps for slat tracking
Offset slat adjustment	-25 … 25 **[0]**	Setting an offset (shifting) of the slat tracking
Slat is horizontal at	▪ 0 % ▪ **50 %**	Setting at which position the slats are horizontal
Behavior after clouding	▪ **no change** ▪ move up ▪ slats horizontal	Setting what should be done after active clouding
The following settings are only available for channel selection as "Shutter":		
Action at brightness threshold 1	▪ **no automatic clouding** ▪ move to position ▪ use position of a scene (can be saved)	Setting of the action to be taken when the brightness threshold 1 is exceeded
Shutter position 1	10 – 100 % **[30 %]**	Height position to be approached at activated clouding
Scene selection	Scene A – H	Selection of the scene that is to be initiated when clouding is active (threshold 1). **For "Action at brightness threshold 1", set to "Use position of a scene (can be saved)".**
Action at brightness threshold 2	▪ **no change** ▪ move to position ▪ use position of a scene (can be saved)	Setting of the action to be taken when the brightness threshold 2 is exceeded
Shutter position 2	10 – 100 % **[60 %]**	Height position to be approached at activated clouding
Scene selection	Scene A – H	Selection of the scene that is to be initiated when clouding is active (threshold 1). **For "Action at brightness threshold 2", set to "Use position of a scene (can be saved)".**
Behavior after clouding	▪ **no change** ▪ move up ▪ move to position of brightness threshold 1	Setting what should be done after active clouding

Table 33: Settings – Clouding per channel

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Clouding
The setting "Clouding - deactivated (settings are retained)" can be used to switch off the clouding for test purposes. It causes the function to be deactivated, but without deleting the previous settings and the already linked group addresses.

Compass direction
Here, a pre-selection for the orientation can be made for each channel. Depending on the choice, a typical angle (from/to) is offered for the azimuth.
When selecting "North (with two areas)", two areas - northeast and northwest - are displayed. If the sun rises very early in summer and sets late in the evening, windows with a northern orientation may also be affected and can also be integrated into the automatic clouding with this setting.

Clouding active if azimuth from/to
This parameter is used to set the detection range of the azimuth angle. Depending on the chosen compass direction there is a preset which can be adapted individually. For more information, see "4.13.4 Principle of “Clouding”".

Clouding active if elevation from/to
With this parameter, the detection range of the elevation angle can be set. This is recommended if, for example, an obstacle (hedge, forest, building, etc.) is in the clouding direction and the clouding does not have to be active. See also here "4.13.4 Principle of “Clouding”.
OR:
Clouding active if elevation is higher
...refers to the previous point "Clouding active if elevation ...". This is useful for roof windows on the north side and low roof pitch. In this case, the sun can also shine into the roof windows, e.g. in months when the sun is high in the sky. With the corresponding setting of the elevation angle, the automatic Clouding would also take effect here.

Delay clouding On/Off
The parameter activates a delay, for the duration of which the set brightness threshold must be overstepped or undercut. The setting of the delay is useful in order to avoid activation of clouding in short solar phases and to deactivate it at short cloudy phases.
A short set delay time allows a quick response time to brightness, a long set delay time prevents frequent up- and down movement.

Release via (temperature/control value)
With the lock via temperature or control value of the heating, the sun can be utilised as a "natural heating source". If the inside temperature is too low or the heating is still active, the clouding can remain deactivated and heat up the room. Only when a certain indoor temperature has been reached or the heating has been switched off will the shading be activated.
An internal hysteresis of -1K is permanently stored for "Enable via temperature". If the release is set to 21°C, for example, it will be blocked again at 20°C.

Object Clouding
The object for clouding can be used to activate/deactivate the clouding or the slat tracking manually (via a button).

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Deactivate active clouding position with Up/Down
When operated by an Up/Down command, the shading is already blocked before it is activated.

Activate clouding again with position 0% after deactivation with Up/Down
If the blind/shutter is moved during an active clouding function by the Up/Down object, automatic clouding is internally deactivated, this means it does not react to clouding changes. The parameter "Activate clouding again with position 0% after deactivation with Up/Down" can ensure that reaching the upper limit stop (0%) activates the automatic clouding directly. If this parameter is not active, the clouding can only be activated again by the object "Clouding" (enable with a logical 0) or if the sun falls below the set threshold for the set switch-off delay and exceeds the set threshold for the set switch-on delay.
With the release on the channel object "Block clouding" or "Release clouding" (e.g. object 49), the "Block absolute position" is also reset/deleted internally.

Status automatic clouding
Three different objects can be displayed for the status of automatic clouding.

- **in Clouding status (value 1)**
  Object reports a 1 when automatic clouding is activated.
- **in Standby status (value 1)**
  Object reports a 1 when automatic clouding is ready. This occurs when the calculation of azimuth and elevation was started by receiving time/date.
  An up/down movement command at the channel deactivates the standby state of the clouding. This is activated again with the position 0% or with a release on the object " Block clouding".
- **In Locking status (value 1)**
  Object reports a 1 if the automatic shading is blocked.

The following settings are only available when the channel is configured as "blinds":

Action at brightness threshold
Setting whether a position should be approached with or without slat tracking or whether a position of the internal scenes A - H should be used when a brightness threshold is activated. If saving scenes is enabled, the shading position can be changed at any time and saved as a new shading position for further use.

Clouding from brightness threshold
Setting from which brightness threshold the shading should be activated.
These thresholds refer to the settings in the "Clouding basic setting" menu.

Slat tracking when elevation is less than
Setting the height angle from which the slat tracking is to be activated. Typically, all blinds are designed in such a way that no sun enters the room when the slat is horizontal and the height angle is 45°.

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Minimum change of slat adjustment
The minimum change of slat adjustment indicates the percentage in which the slats are tracked. At a percentage of 5%, the slats are thus tracked in significantly smaller steps than with a percentage of 30%.

Offset slat adjustment
The setting "Offset slat adjustment" causes the elevation angle to be increased or decreased manually. This causes more or less shading.

- **positive offset**
  It is more shaded by the slat tracking
- **negative offset**
  It is less shaded by the slat tracking

Slat is horizontal at
Setting whether the slats are in horizontal position at value 0% or 50%. This depends on the type of blind used.

Behavior after clouding
This behavior defines the action to be performed after clouding.

The following settings are only available when the channel is configured as "shutter":

Action at brightness threshold 1 or 2
Setting whether the clouding position 1 or 2 should be approached or whether a position of the internal scenes A - H should be used when a brightness threshold 1 or 2 is activated. If saving scenes is enabled, the clouding position can be changed at any time and saved as a new clouding position for further use in the corresponding scene.
The thresholds refer to the settings in the "Clouding basic setting" menu.

Behavior after clouding
This behavior defines the action to be performed after clouding.

The following table shows the general communication objects for clouding:

Number	Name	Length	Usage
48	Room temperature	2 Byte	Receipt of room temperature
48	Room temperature threshold	1 Bit	Exceed/Undercut of the Room temperature threshold
48	Control value heating	1 Byte	Receipt of control value heating
49	Block/Enable clouding	1 Bit	Activation/blocking of clouding
49	Block/Enable slat adjustment	1 Bit	Activation/blocking of slat adjustment
50	Status clouding state	1 Bit	Clouding position is active
50	Status clouding ready	1 Bit	Clouding is in Standby
50	Room temperature	2 Byte	Receipt of room temperature

Table 34: Communication objects – Clouding per channel

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4.13.3 Basics to "Sun position calculation"

This chapter explains some basic terms that are important for the setting of automatic clouding.

The following figure shows the horizontal angle, or the "azimuth" of the sun:

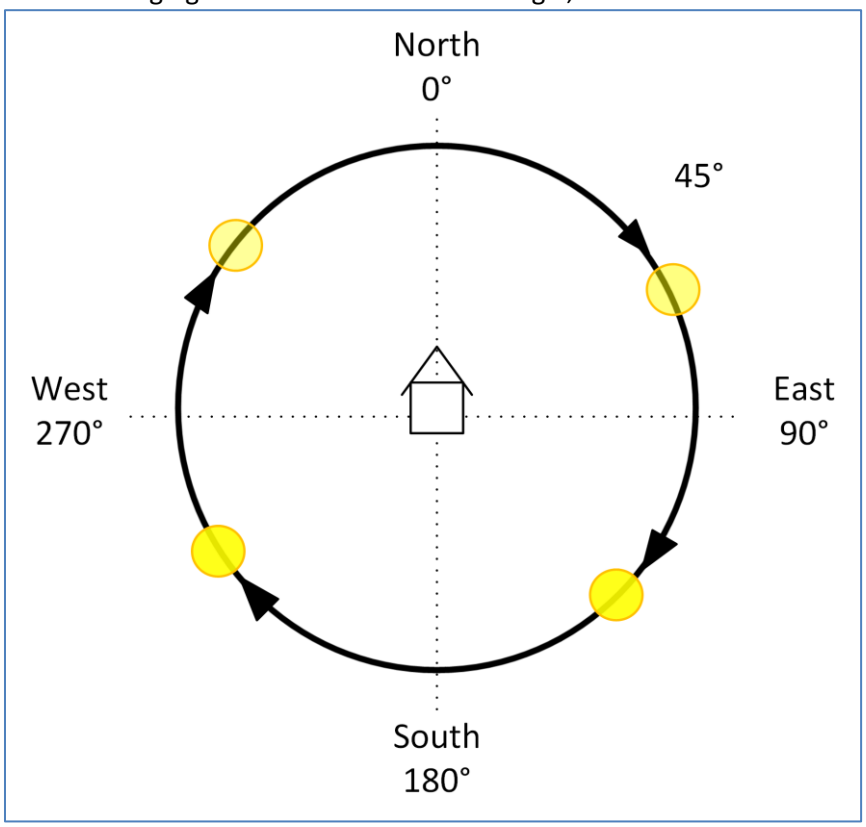

Figure 31: Azimuth/Horizontal angle

The azimuth or horizontal angle measures the course of the sun during a day. North corresponds to an azimuth of 0 °, east of 90 °, south of 180 ° and west of 270 °.

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The following figure shows the elevation angle, or "elevation" of the sun:

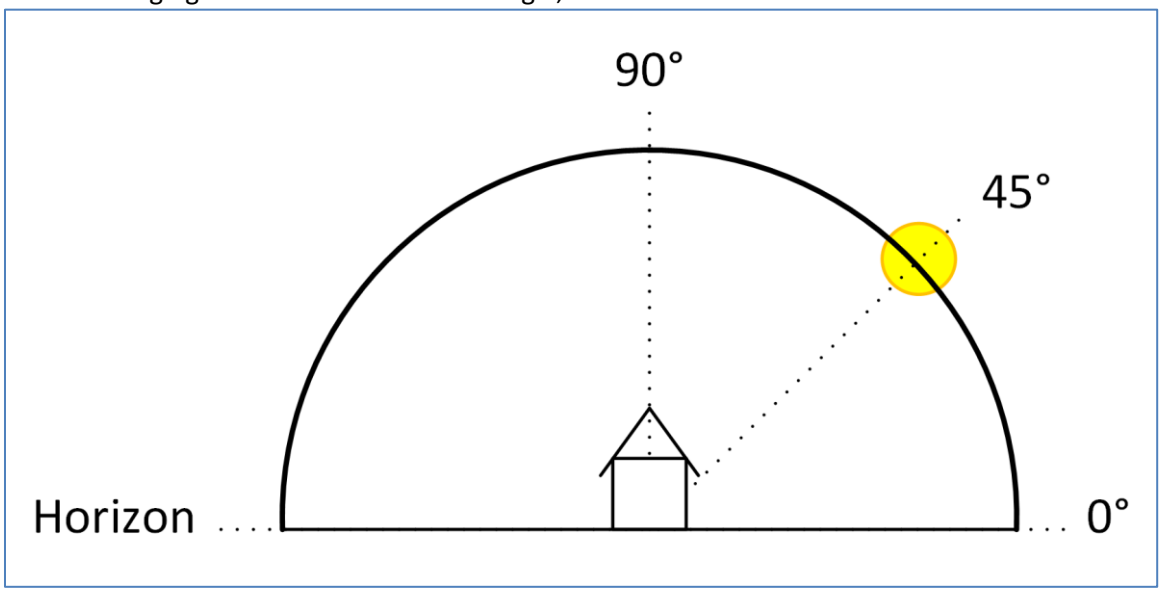

Figure 32: Elevation angle

The angle of the sun between the horizon and the position of the sun is designated as the elevation angle or elevation.
A few important facts regarding elevation angle/elevation:

- An object of height 1m throws a shadow of length 1m at an angle of elevation of 45 °.
- The smaller the elevation angle, the longer the shadow of an object.
- The greater the elevation angle, the shorter the shadow of an object.

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4.13.4 Principle of "Clouding"

Basic principle:

The following figure shows the basic principle of clouding with slat tracking. In this example, the parameter "Start slat adjustment if elevation is less than" is set to 45 °:

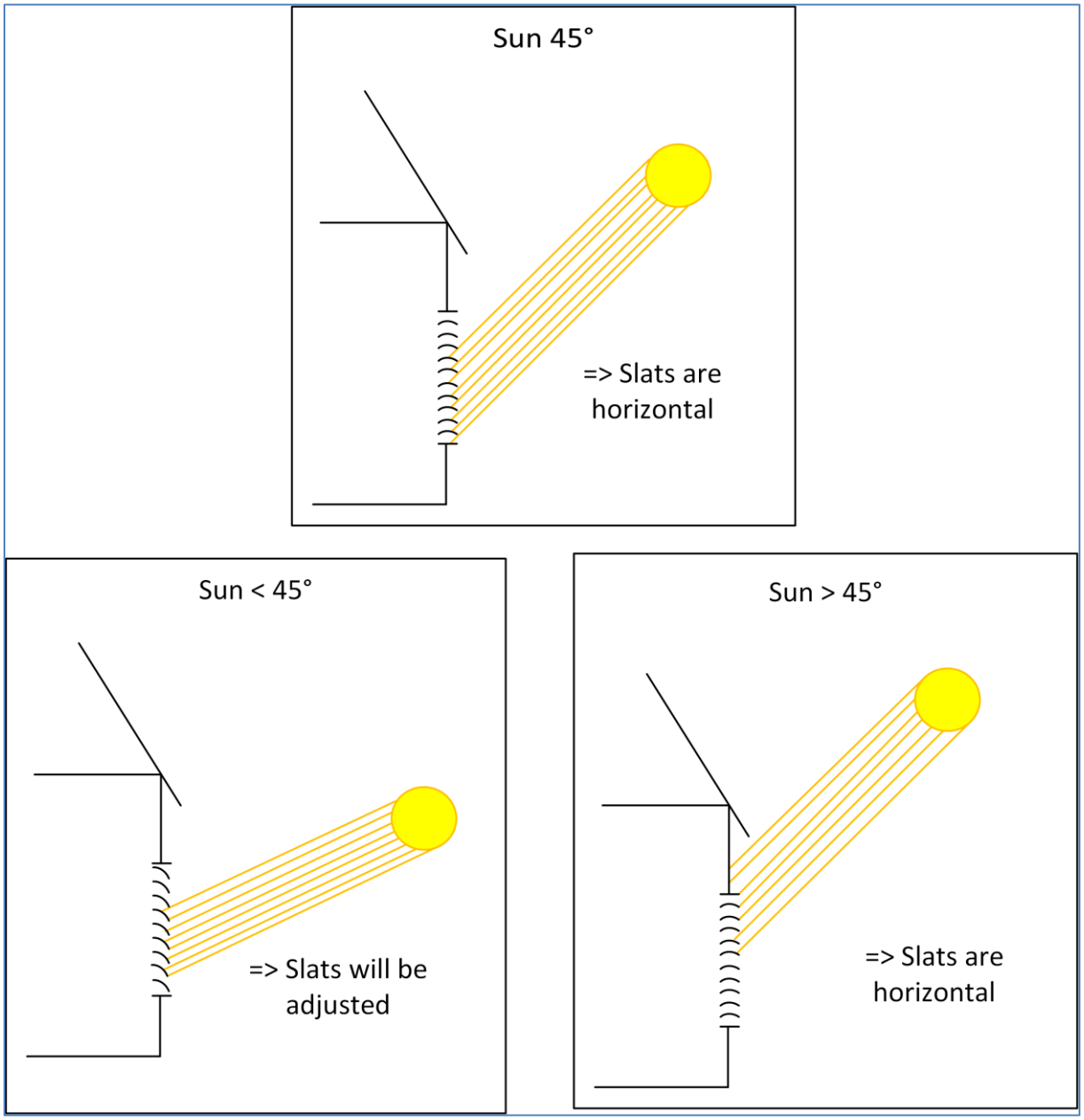

Figure 33: Basic principle – Slat tracking

At undercutting of the set elevation angle, the slat adjustment starts.

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The following figure shows the basic principle of clouding for the active "azimuth window". The clouding window is set via the parameters "Compass direction" and "Clouding active when azimuth". In the following figure, the "Compass direction" is set to "South" and the "Clouding active if azimuth" is set to 120°-240°:

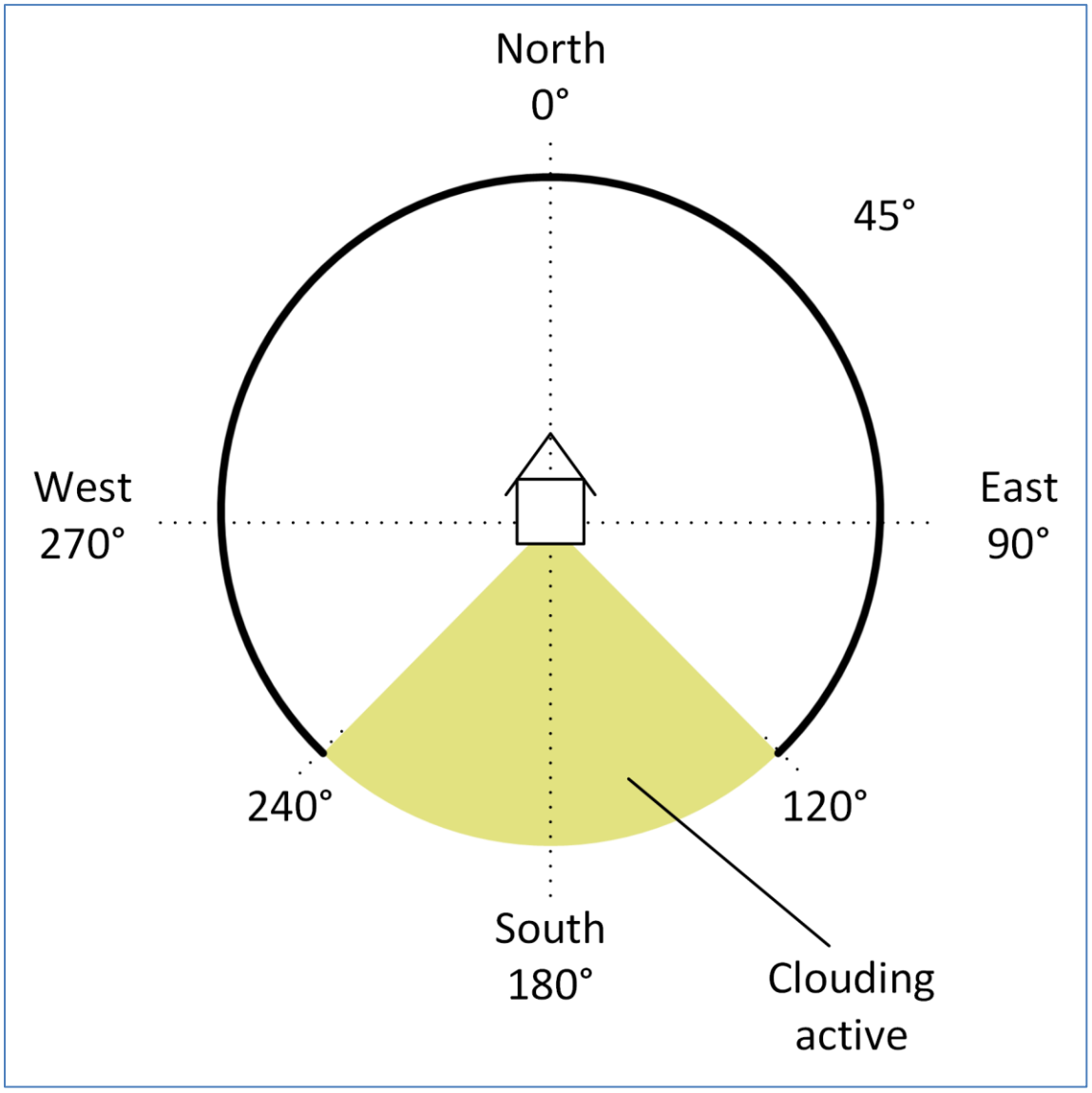

Figure 34: Basic principle "Clouding window – Azimuth"

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Adjustment of clouding in case of obstacles:

The clouding can be limited to a certain angle range by means of the parameter "Clouding active if elevation". If, for example, a tree or a house is located in front of the window to be shaded, the clouding can only begin at a certain elevation angle. For example, if a house has a very wide roof overhang, the clouding can only be active up to an angle of <90 °.The following figure shows the principle of clouding with obstacles. In this example, the parameter "Clouding active if elevation" is set to 30°-90°:

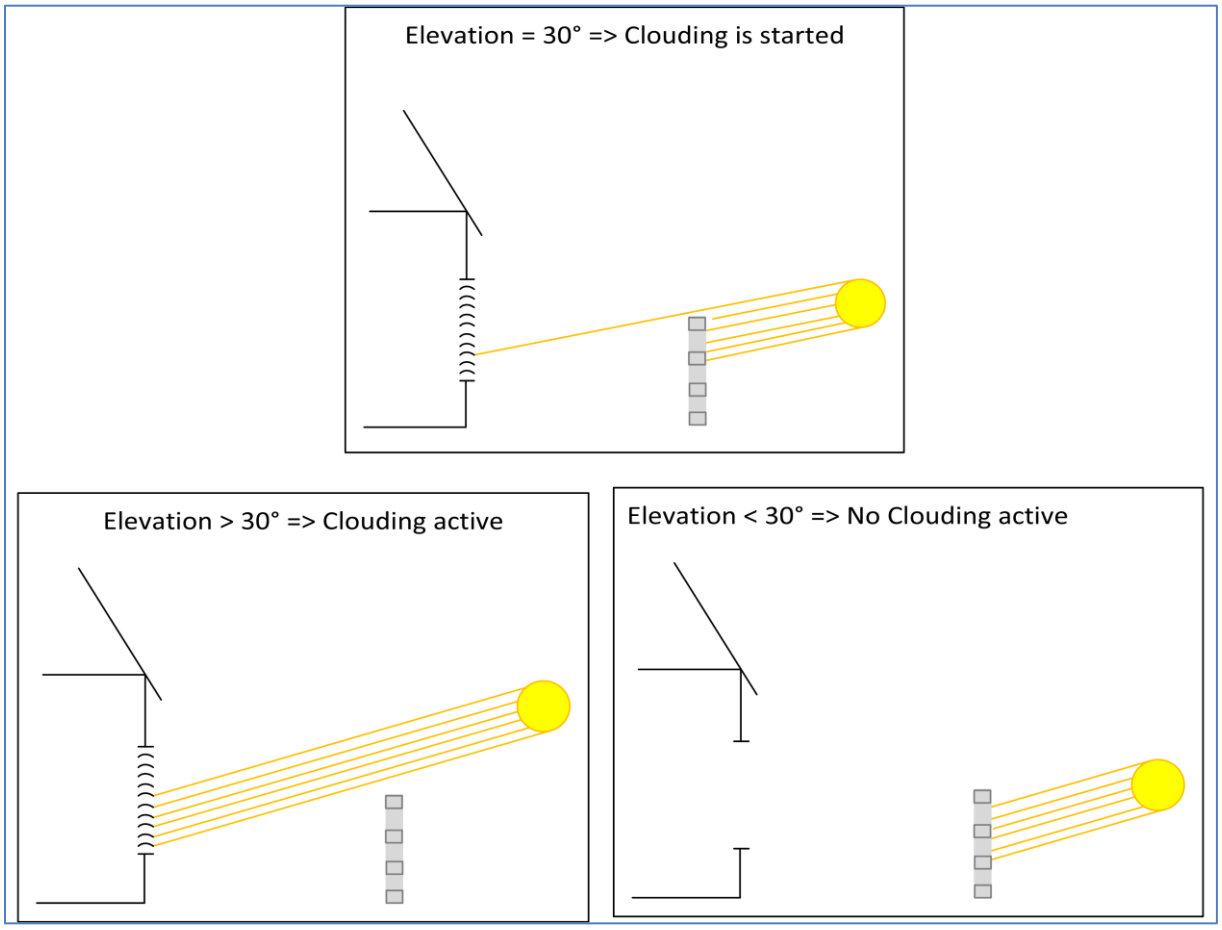

Figure 35: Adjustment of Clouding with obstacles

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6 Attachment

6.1 Statutory requirements

The above-described devices must not be used with devices, which serve directly or indirectly the purpose of human, health- or lifesaving. Further the devices must not be used if their usage can occur danger for humans, animals or material assets.
Do not let the packaging lying around careless, plastic foil/ -bags etc. can be a dangerous toy for kids.

6.2 Disposal routine

Do not throw the waste equipment in the household rubbish. The device contains electrical devices, which must be disposed as electronic scrap. The casing contains of recyclable synthetic material.

6.3 Assemblage

Danger to life due to electric current!

The device may only be installed and connected by qualified electricians. Observe the country-specific regulations and the applicable KNX directives.

The devices are approved for operation in the EU and bear the CE mark. Use in the USA and Canada is not permitted.

After the unit has been installed and the mains voltage has been switched on, voltage may be present at the outputs. The outputs can be switched off via the built-in channel switch.

When installed, a KNX bus telegram can switch the outputs to live at any time.

Before starting work on the unit, always disconnect it from the power supply via the upstream fuses.

After installation, all live terminals and connections must be completely closed by the control panel cover to prevent accidental contact. It must not be possible to open the control panel cover without tools.

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6.4 Revision history

V 1.0	- 1st version; Shutter Actuator with travel time measurement (from R6.0), DB V4.2	01/2021
	Text change 10A to 8A and new figure (page 8)	06/2022
	Extension: Starting travel time measurement via buttons (2.3 Structure & Handling)	10/2024

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