

0701 CO Weather Station 909401**Use of the application program**

Product family: Sensors
Product type: Weather station
Manufacturer: Siemens
Name: Weather station AP 257/21
Order no.: 5WG1 257-3AB21

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1. Function overview

In a compact housing, the weather station AP 257/21 contains all sensors, the evaluating electronic system and the bus coupling unit. It measures wind speed, brightness and temperature, recognizes twilight and precipitation and receives the DCF77 radio signal for date and time.

In addition to date and time, all measured values can be transmitted on the bus in EIS5 format and respectively monitored on up to 3 limit values. Limit values can be selected as parameters or as communication objects. For each day the maximum wind speed, the maximum brightness and the minimum and maximum outside temperature can be recorded and transmitted. The angles (azimuth and elevation) at which the sun shines can be calculated as needed from date, time and the location coordinates entered and likewise transmitted via the bus. Using the "Safety" parameter window, in addition to wind alarm, frost alarm and precipitation alarm, a total of up to 8 alarm or failure messages can be combined via a logical OR-function to a "Safety" communication object, which in the case of alarm results in the sun protection moving into its safety position.

In addition 4 AND-gates and 4 OR-gates with 4 inputs each are available for further logic operations.

The weather station does not only render possible a simple sun control in which the sun protection is activated or deactivated, depending on whether the sun is shining or not. In addition, a sun protection control can be activated for up to 8 façades. Here the sun protection for a facade is automatically activated only when the sun is shining on the respective façade and deactivated as soon as this is no longer possible or the sun is no longer shining.

For each façade this façade control can be supplemented by a shadow edge tracking of the sun protection and a sun tracking control of horizontal or vertical slats.

The use of the ETS3 Engineering Tool Software is recommended, since it renders possible the best graphic display of the weather station setting menus.

2. Shadow edge tracking

In the shadow edge tracking the sun protection is not completely lowered, but lowered only far enough so that the sun can shine into the room for a settable distance (e.g., 50 cm). The occupant of the room can thus look outside in the lower area of the window; any plants on the window-sill can optionally be in the sun.

Fig. 1a shows the sun relatively high in the sky. The sun protection was closed only partially and automatically lowered only far enough so that the sun cannot shine

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further into the room than stipulated by the maximum permissible penetration depth.

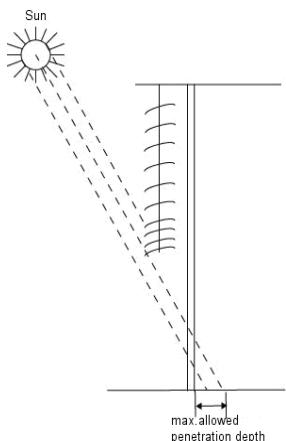


Fig. 1a. Sun protection when the sun is high

Fig. 1b shows a sun lower in the sky. The sun protection was therefore automatically lowered further, so that the maximum permissible penetration depth of the sun into the room is not exceeded.

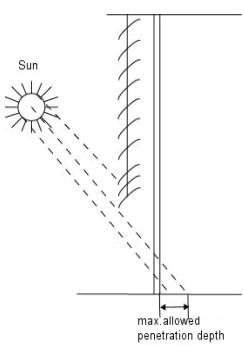


Fig. 1b. Sun protection when the sun is low

Note: A shadow edge tracking can be used only with a sun protection that is lowered from the top downwards (such as, e.g., with shutters, textile sun protection or blinds with horizontal slats). This function cannot be used with a sun protection that is drawn in front of a window from one side or from both sides.

3. Sun tracking

With the sun tracking the slats are not completely closed but are guided according to the position of the sun and automatically adjusted so that the sun cannot shine directly into the room. However, diffuse daylight can still fall into the room between the slats and contribute to glare-free room illumination. Heat-input from the sun shining into the room is avoided through the sun tracking control with an outside blind and at the same time the electricity costs for room illumination are reduced. Fig. 1a shows the sun relatively high in the sky. The slats can therefore be placed almost horizontally, without the sun shining directly into the room.

Fig. 1b shows that when the sun is lower in the sky, the slats are automatically closed further, so that the sun cannot shine directly into the room. However, since the slats are not completely closed, as much diffuse daylight as possible can still reach the room, thus contributing to the room illumination (daylight utilization).

4. Façades

4.1. Number of façades

Shadow edge tracking and sun tracking are facade-related functions. For this the number of façades must be known as well as the respective alignment of a façade based on the north-south axis and its respective inclination based on the perpendicular on the ground. Furthermore, it should be taken into account whether the sun can shine directly from the side and vertically from above onto the façade or whether it can only shine on the façade from a specific angle that is larger than a blind angle predetermined by a wall or roof projection.

Most buildings have 4 façades (see Fig. 2a). Since only rarely is a façade aligned exactly northwards, it is recommended in principle for the sun protection to be controlled separately for each façade.

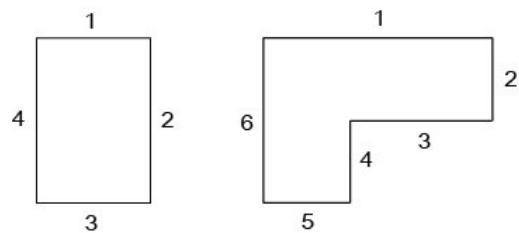


Fig. 2a. 4 Façades

Fig. 2b. 6 Façades

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In the case of buildings with an L-shaped layout (see Fig. 2b) 6 façades have to be taken into consideration, in the case of buildings with a U-shaped layout (see Fig. 2c) 8 façades have to be taken into consideration. In the case of round buildings it is recommended to divide the façade, as shown in Fig. 2d, into 8 segments, the perpendicular of which is shifted to the north-south axis by 22.5°, 67.5°, 112.5°, 157.5°, etc. in clockwise direction.

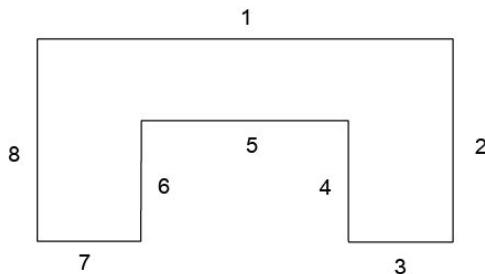


Fig. 2c. 8 Façades

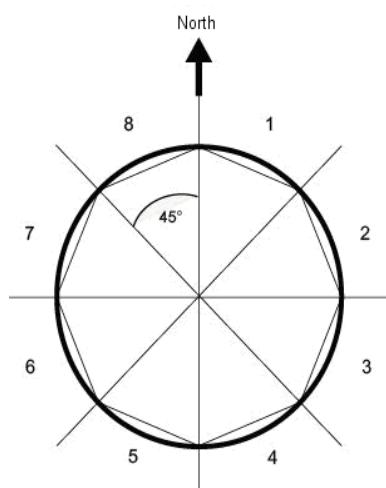


Fig. 2d. Dividing up a round façade

If a building has more than 8 façades, the use of an additional weather station is recommended, especially as the wind speed can also hereby be measured at another point.

In the case of several buildings, the use of one weather station per building is recommended in principle, since different wind speeds can arise, depending on the location of the buildings with respect to one another.

4.2. Façade alignment

The façade alignment corresponds to the angle between the north-south axis and the perpendicular on the façade (see Fig. 3). The angle α (in the range from 0° to 359°) is hereby measured in clockwise direction (north corresponds to 0°, east 90°, south 180° and west 270°).

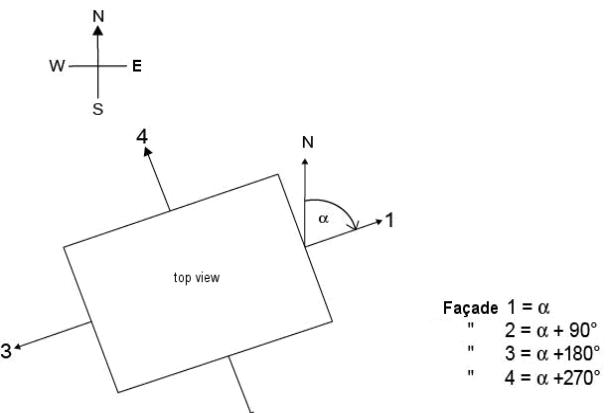


Fig. 3. Façade alignment

4.3. Façade inclination

If a façade surface is not aligned vertically, this must be taken into account. A forward inclination of the façade is counted as a positive angle, a backward inclination as a negative angle (see Fig. 4).

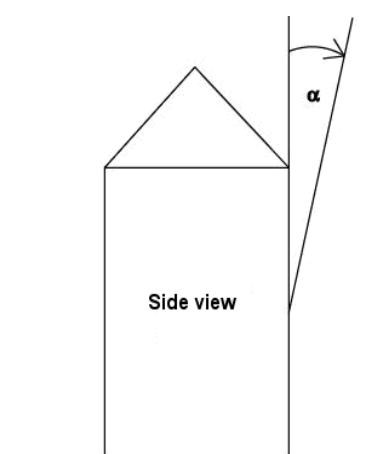


Fig. 4. Façade inclination

The sun protection of windows installed in a sloping roof area can thus also be controlled according to the current position of the sun.

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If a façade is not a flat surface, but curved or bent, it must be subdivided into several segments, which must be controlled separately.

4.4. Blind angle

If the sun cannot shine directly from the side and vertically from above onto the façade because this is obstructed by a wall or roof projection, this can be taken into account with the façade control.

Fig. 5 shows how a horizontal blind angle α is measured. With the façade control it is presumed that the horizontal blind angle is the same size on both façade sides. Fig. 6 shows how a vertical blind angle is measured.

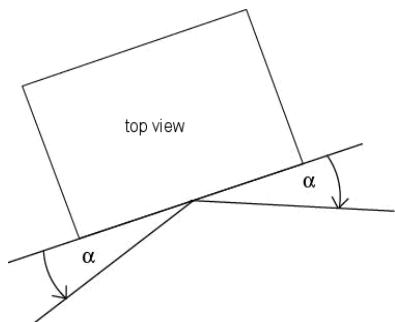


Fig. 5. Horizontal blind angle

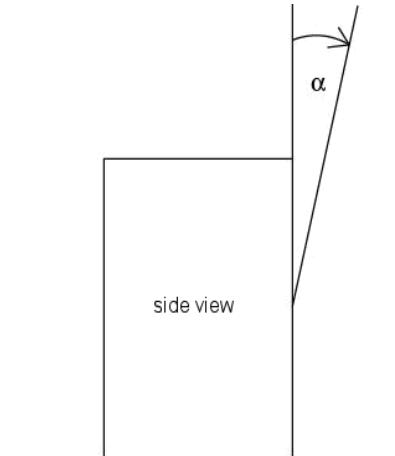


Fig. 6. Vertical blind angle

5. Slats**5.1. Types of slats**

With the sun-tracking control a distinction is made between a sun or glare protection with horizontal slats and one with vertical slats.

A sun protection with horizontal slats (e.g., an outside blind) is usually lowered from the top downwards. An inside glare protection, however, is often composed of narrow lengths of material (vertical slats), which can be rotated by up to 180° and are drawn in front of the window from one side of the window or from both sides of the window.

Both types of slats can be adjusted by the weather station so that no direct sunlight falls into the room, but as much diffuse daylight as possible.

5.2. Slat width and spacing

In order for the slats to be correctly adjusted in the sun-tracking control, their width and their spacing from one another must be known. Fig. 7a shows how width and spacing are to be measured with horizontal slats and Fig. 7b, how they are to be measured with vertical slats.

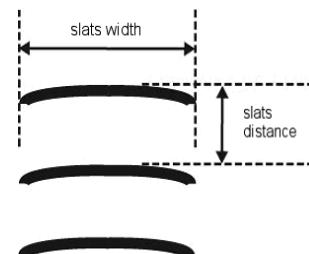


Fig. 7a. Width and spacing with horizontal slats

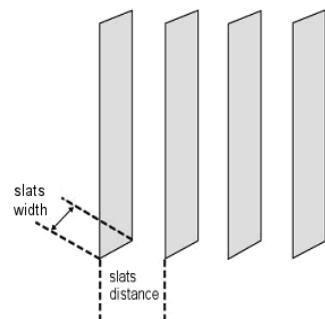


Fig. 7b. Width and spacing with vertical slats

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5.3. Slat position with horizontal slats

With all Siemens blind actuators that make it possible to set a sun protection position via position data in percent with blind drives with 2 limit switches, the upper end position (i.e., sun protection completely opened) is controlled or reported as status via the value "0 %" (see Fig. 8a).

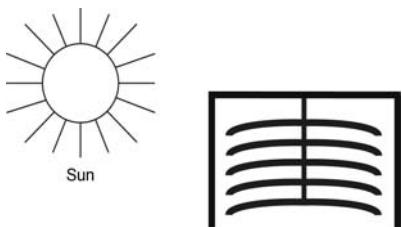


Fig. 8a. Sun blind opened (= upper end position = 0 %)

If the lower end position is to be selected, this is set in the blind actuator as sun protection position "100 %" or it reports reaching the lower end position (i.e., sun protection completely closed) via this value. If a blind is lowered from the upper end position, the slats first tilt into an almost perpendicular position, and the sun protection moves to the lower end position with closed slats (see Fig. 8b).

Note: This does not apply to blinds with special slat suspension or to blind drives with 3 limit switches, such as are customary, e.g., in Switzerland. In these cases the blind moves downwards with horizontal slats until the first lower limit switch (DOWN1) is triggered. The slats are then completely closed by another run signal until the second lower limit switch (DOWN) is triggered. The sun protection position remains unchanged hereby.

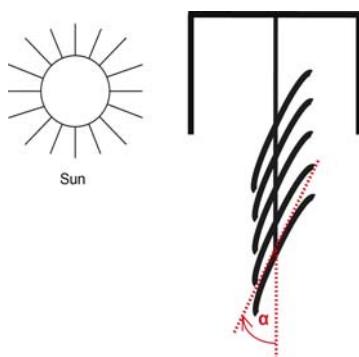


Fig. 8b. Sun blind and slats closed (100 %)

If the blind is in the lower end position and if the slats are completely closed, this slat position is referred to as "vertical" and equal to "100 %." Normally, however, completely closed slats do not have an exactly vertical posi-

tion ($\alpha = 0^\circ$), but form a small angle to the perpendicular (see Fig. 8b). This angle must be determined with the sun-tracking control and entered via the associated parameter.

The slats can be adjusted from their "perpendicular" position (= completely closed = 100 %) up to their horizontal position (= completely opened = 0 % or $\alpha = 90^\circ$) (see Fig. 8c). The blind drive used hereby determines whether this adjustment can be made virtually stepless in many small steps (such as e.g., with SMI drives) or whether this is possible only in a few large steps (as with most standard drives).

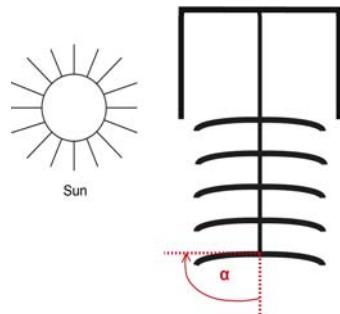


Fig. 8c. Horizontal slat position (0 %, $\alpha = 90^\circ$)

With standard blinds the slats can be further adjusted beyond their horizontal position until the slat adjustment ends and raising the blind starts. The slats then form an angle between 90° and 180° with the perpendicular (see Fig. 8d).

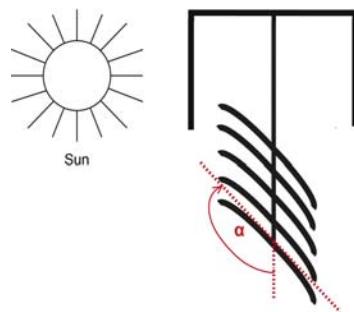


Fig. 8d. Slat position at the start of the UP movement

Note: Moving to a slat position $> 90^\circ$ (or $< 0^\circ$) is not possible with Siemens blind actuators. A corresponding position is reported by the blind actuator as an unknown or invalid value.

In order to make it possible to control blind actuators of other manufacturers with which the slat limit positions are administered as 0 % or as 100 % and the horizontal slat position as 50 %, this can be adjusted via corresponding parameters in the sun-tracking control.

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5.4. Slat position with vertical slats

If an interior glare protection or privacy protection with vertical slats is controlled via a Siemens blind actuator, the position in which the slats are completely opened is controlled and reported as slat position 0 %. In the movement direction from "glare protection completely opened" to "glare protection completely closed" the slats then form an angle of 90° (see Fig. 9a).



Fig. 9a. Fully opened vertical slats

If the slats are completely closed, this position is controlled and reported as slat position 100 %. This is the position in which the glare protection is moved in front of the window from its lateral end position. The angle that the slats form with the movement direction is hereby somewhat greater than 0° (see Fig. 9b).

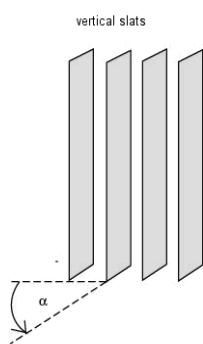


Fig. 9b. Fully closed vertical slats

If the glare protection is retracted (i.e., opened), the vertical slats are hereby rotated into a position that is somewhat less than 180° (see Fig. 9c).

Note: Moving to a slat position > 90° (or < 0 %) is normally not possible with Siemens blind actuators, nor is it necessary with horizontal slats. A corresponding position is reported by the blind actuator as an unknown or invalid value. In order for vertical slats to be controlled cor-

rectly, in this case with Siemens blind actuators the actuator parameter "Adjustment time slats from vertical to horizontal" must be set to the same value as the actuator parameter "Adjustment time slats from vertical to start of movement."

In order to make it possible to control blind actuators of other manufacturers, with which the slat end positions are administered 0 % and 100 % and the horizontal slat position is administered as 50%, this is adjustable via corresponding parameters in the sun tracking control.

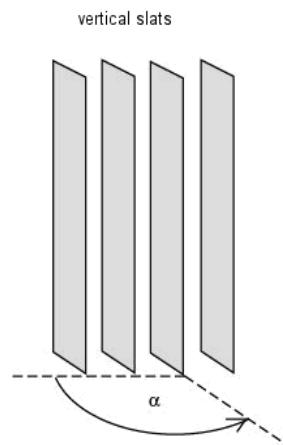


Fig. 9c. Vertical slats at start of UP movement

6. Behavior at voltage failure / recovery

In the event of failure of the supply voltage the weather station does not store any data. Upon recovery of the supply voltage, it records the current sensor data and transmits them. The weather station then waits for date and time to be updated. As soon as these have been received, without taking into account parameterized waiting times, the actions respectively after the end of the delay period 2 are sent immediately (i.e., with those façades on which the sun is not shining according to the current values of date, time and brightness, at least "Façade x, Sunshine = OFF" is sent and for the others "Façade x, Sunshine = ON").

A bus voltage failure is recognized by the weather station. Data that change after the bus voltage failure are stored and transmitted after the bus voltage recovery.

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7. Communication objects

Maximum number of group addresses: 254
 Maximum number of assignments: 254

The following table contains a list of all the available communication objects of the weather station.
 Which objects are visible in each case and thus transmissible, is determined by the setting of the parameters chosen by the user.
 The explanation of the individual objects follows this tabulated overview.

Nr.	Object name	Function	Number Bit	Flag
0	DCF77 date	send	24	CRWT
1	DCF77 time	send	24	CRWT
2	DCF date and time	query	1	CRW
3	Date	receive	24	CRWT
4	Time	receive	24	CRWT
5	8-bit scene	recall	8	CRT
6	Wind sensor, Failure	On / Off	1	CRT
7	Wind speed	actual value	16	CRT
8	Max. wind speed	send	64	CRT
9	Current max. wind speed	query	1	CRW
10	Wind, Limit value 1	set	16	CRW
11	Wind alarm	On / Off	1	CRT
12	Wind, Limit value 2	set	16	CRW
13	Wind, Message LV2	On / Off	1	CRT
14	Wind, Limit value 3	set	16	CRW
15	Wind, Message LV 3	On / Off	1	CRT
16	Brightness	actual value	16	CRT
17	Max. brightness	send	64	CRT
18	Current max. brightness	query	1	CRW
19	Brightness, Limit value 1	set	16	CRW
20	Sunshine	On / Off	1	CRT
21	Brightness, Limit value 2	set	16	CRW
22	Brightness, Message LV 2	On / Off	1	CRT
23	Brightness, Limit value 3	set	16	CRW
24	Brightness, Message LV 3	On / Off	1	CRT
25	Twilight, Limit value 1	set	16	CRW
26	Darkness	On / Off	1	CRT
27	Twilight, Limit value 2	set	16	CRW
28	Twilight, Message LV 2	On / Off	1	CRT
29	Twilight, Limit value 3	set	16	CRW
30	Twilight, Message LV 3	On / Off	1	CRT
31	Precipitation alarm	On / Off	1	CRT
32	Outside temperature sensor, Failure	On / Off	1	CRT
33	Outside temperature	actual value	16	CRT
34	Min. outside temperature	send	64	CRT
35	Max. outside temperature	send	64	CRT
36	Current min. / max. outside temperature	query	1	CRW
37	Temperature, Limit value 1	set	16	CRW
38	Frost alarm	On / Off	1	CRT
39	Temperature, Limit value 2	set	16	CRW
40	Temperature, Message LV 2	On / Off	1	CRT
41	Temperature, Limit value 3	set	16	CRW
42	Temperature, Message LV 3	On / Off	1	CRT
43	External alarm	On / Off	1	CRW
44	Safety	On / Off	1	CRT
45	Azimuth	send	32	CRT
46	Elevation	send	32	CRT
47	Facade 1, Control	disable / enable	1	CRW
48	Facade 1, Sunshine	On / Off	1	CRT
49	Facade 1, Blind centrally UP / DOWN	UP / DOWN	1	CRT
50	Facade 1, Blind centrally DOWN 1	DOWN 1	1	CRT

No.	Object name	Function	Number Bit	Flag
51	Facade 1, Blind centrally STEP	UP / DOWN	1	CRT
52	Facade 1, Blind position in %	approach	8	CRT
53	Facade 1, Slats position in %	approach	8	CRT
54	Facade 2, Control	disable / enable	1	CRW
55	Facade 2, Sunshine	On / Off	1	CRT
56	Facade 2, Blind centrally UP / DOWN	UP / DOWN	1	CRT
57	Facade 2, Blind centrally DOWN 1	DOWN 1	1	CRT
58	Facade 2, Blind centrally STEP	UP / DOWN	1	CRT
59	Facade 2, Blind position in %	approach	8	CRT
60	Facade 2, Slats position in %	approach	8	CRT
61	Facade 3, Control	disable / enable	1	CRW
62	Facade 3, Sunshine	On / Off	1	CRT
63	Facade 3, Blind centrally UP / DOWN	UP / DOWN	1	CRT
64	Facade 3, Blind centrally DOWN 1	DOWN 1	1	CRT
65	Facade 3, Blind centrally STEP	UP / DOWN	1	CRT
66	Facade 3, Blind position in %	approach	8	CRT
67	Facade 3, Slats position in %	approach	8	CRT
68	Facade 4, Control	disable / enable	1	CRW
69	Facade 4, Sunshine	On / Off	1	CRT
70	Facade 4, Blind centrally UP / DOWN	UP / DOWN	1	CRT
71	Facade 4, Blind centrally DOWN 1	DOWN 1	1	CRT
72	Facade 4, Blind centrally STEP	UP / DOWN	1	CRT
73	Facade 4, Blind position in %	approach	8	CRT
74	Facade 4, Slats position in %	approach	8	CRT
75	Facade 5, Control	disable / enable	1	CRW
76	Facade 5, Sunshine	On / Off	1	CRT
77	Facade 5, Blind centrally UP / DOWN	UP / DOWN	1	CRT
78	Facade 5, Blind centrally DOWN 1	DOWN 1	1	CRT
79	Facade 5, Blind centrally STEP	UP / DOWN	1	CRT
80	Facade 5, Blind position in %	approach	8	CRT
81	Facade 5, Slats position in %	approach	8	CRT
82	Facade 6, Control	disable / enable	1	CRW
83	Facade 6, Sunshine	On / Off	1	CRT
84	Facade 6, Blind centrally UP / DOWN	UP / DOWN	1	CRT
85	Facade 6, Blind centrally DOWN 1	DOWN 1	1	CRT
86	Facade 6, Blind centrally STEP	UP / DOWN	1	CRT
87	Facade 6, Blind position in %	approach	8	CRT
88	Facade 6, Slats position in %	approach	8	CRT
89	Facade 7, Control	disable / enable	1	CRW
90	Facade 7, Sunshine	On / Off	1	CRT
91	Facade 7, Blind centrally UP / DOWN	UP / DOWN	1	CRT
92	Facade 7, Blind centrally DOWN 1	DOWN 1	1	CRT
93	Facade 7, Blind centrally STEP	UP / DOWN	1	CRT
94	Facade 7, Blind position in %	approach	8	CRT
95	Facade 7, Slats position in %	approach	8	CRT
96	Facade 8, Control	disable / enable	1	CRW
97	Facade 8, Sunshine	On / Off	1	CRT
98	Facade 8, Blind centrally UP / DOWN	UP / DOWN	1	CRT
99	Facade 8, Blind centrally DOWN 1	DOWN 1	1	CRT
100	Facade 8, Blind centrally STEP	UP / DOWN	1	CRT
101	Facade 8, Blind position in %	approach	8	CRT
102	Facade 8, Slats position in %	approach	8	CRT
103	Output AND logic operation 1	0 / 1	1	CRT
104	Output AND logic operation 2	0 / 1	1	CRT
105	Output AND logic operation 3	0 / 1	1	CRT
106	Output AND logic operation 4	0 / 1	1	CRT
107	Output OR logic operation 1	0 / 1	1	CRT
108	Output OR logic operation 2	0 / 1	1	CRT
109	Output OR logic operation 3	0 / 1	1	CRT
110	Output OR logic operation 4	0 / 1	1	CRT

Application program description

December 2007

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Obj	Object name	Function	Type	Flag
0	DCF77 date	Send	3 Byte	CRWT
This object is visible only if in the "Functions, Objects" parameter window the parameter "Date, Time" is set at "Receive via DCF77."				
	The date received by the DCF77 receiver integrated into the weather station is transmitted on the bus via this object.			
<u>Note:</u> After mains recovery / restart it can take several minutes until the date and time are synchronized via the DCF77 receiver. If date and time are requested at the weather station during this time, it sends telegrams with the content "0."				
1	DCF77 time	Send	3 Byte	CRWT
This object is visible only if in the "Functions, Objects" parameter window the parameter "Date, Time" is set at "Receive via DCF77."				
	The time received by the DCF77 receiver integrated into the weather station is sent on the bus via this object.			
<u>Note:</u> After mains recovery / restart it can take several minutes until date and time are synchronized via the DCF77 receiver. If date and time are requested at the weather station during this time, it sends telegrams with the content "0."				
2	DCF date and time	Query	1 Bit	CRW
This object is visible only if in the "Functions, Objects" parameter window the parameter "Date, Time" is set at "Receive via DCF77."				
	The transmission of date and time can be requested at the weather station at any time using this object. The telegram content (log. 0 or 1) is hereby irrelevant.			
3	Date	Receive	3 Byte	CRW
This object is visible only if in the "Functions, Objects" parameter window the parameter "Date, Time" is set at "Receive via the bus."				
	If a DCF77 reception is not possible at the installation site of the weather station, using this object the current date (which is provided, e.g., by a Master clock or over the Internet) can be sent to the weather station to synchronize its software clock. A synchronization after bus or mains failure can take up to 30 s.			
4	Time	Receive	3 Byte	CRW
This object is visible only if in the "Functions, Objects" parameter window the parameter "Date, Time" is set at "Receive via the bus."				
	If a DCF77 reception is not possible at the installation site of the weather station, using this object the current time (which is provided, e.g., by a Master clock or over the Internet) can be sent to the weather station to synchronize its software clock. The synchronization after bus or mains failure can take up to 30 s.			
<u>Note</u> The time telegram must contain the information of the current day of the week, as otherwise it will not be accepted.				

Obj	Object name	Function	Type	Flag																											
5	8-bit scene	Recall	1 Byte	CRT																											
Using this object the 8-bit scene with the number x can be recalled. Bit 0...5 hereby contain the scene number. To recall a scene, Bit 7 must be set at log. 0. Bit 6 is currently of no significance and must be set at log. 0.																															
6	Wind sensor, Failure	On / Off	1 Bit	CRT																											
This object is visible only if in the "Functions, Objects" parameter window the parameter "Wind speed" is set at "include."																															
A failure of the wind sensor recognized by the weather station is reported via this object.																															
7	Wind speed	Actual value	2 Byte	CRT																											
This object is visible only if in the "Functions, Objects" parameter window the parameter "Wind speed" is set to "include."																															
This object is used to transmit the current wind speed as a 16-bit floating point number, optionally with the dimension m/s or km/h.																															
8	Max. wind speed	Send	8 Byte	CRT																											
This object is visible only if in the "Wind speed" parameter window the parameter "Detection and storage of max. wind speed" is set to "Yes".																															
This object is used to transmit the maximum wind speed and the time at which it was measured on the current day.																															
The data are transmitted as follows:																															
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Byte	8 (MSB)	7	6	5	4	3	2	1																							
	Date 3	Date 2	Date 1	Time 3	Time 2	Time 1	MV 2	MV 1																							
	Day	Month	Year	WkDay/h	min	s	Bit 16..9	Bit 8..1																							
This object is automatically transmitted daily at 23:59. The maximum wind speed recorded on the current day thus far can moreover be requested at any time via the following object.																															
<u>Note:</u> In the event of a supply voltage failure the value determined so far is lost. After voltage recovery determining the max. value starts again.																															
9	Current max. wind speed	Query	1 Bit	CRW																											
This object is visible only if in the "Wind speed" parameter window the parameter "Detection and storage of max. wind speed" is set to "Yes".																															
Using this object the transmission of the max. wind speed recorded thus far can be requested from the weather station at any time.																															

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Obj	Object name	Function	Type	Flag																											
10 (12, 14)	Wind, Limit value 1 (2, 3)	Set	2 Byte	CRW																											
These objects are visible only if in the "Wind speed" parameter window the relevant parameter "Application of limit value x" is set at "Yes".																															
11	Wind alarm	On / Off	1 Bit	CRT																											
This object is visible only if in the "Wind speed" parameter window the relevant parameter "Application of limit value x" is set at "Yes".																															
12 (21, 23)	Wind, Message LV 2 (3)	On / Off	1 Bit	CRT																											
These objects are visible only if in the "Wind speed" parameter window the relevant parameter "Application of limit value 2 (3)" is set at "Yes".																															
13 (15)	Wind, Message LV 2 (3)	On / Off	1 Bit	CRT																											
These objects are used to report that the current wind speed has exceeded limit value 2 (or 3) or that the wind speed is again in the permissible range.																															
16	Brightness	Actual value	2 Byte	CRT																											
This object is visible only if in the "Functions, Objects" parameter window the parameter "Brightness" is set at "include".																															
Using this object the current brightness metered value is transmitted as a 16-bit floating-point number with the dimension Lux.																															
17	Max. brightness	Send	8 Byte	CRT																											
This object is visible only if in the "Brightness" parameter window the relevant parameter "Detection and storage of max. brightness" is set at "Yes".																															
This object is used to transmit the maximum brightness and the time at which it was measured on the current day.																															
The data are transmitted as follows:																															
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Byte	8 (MSB)	7	6	5	4	3	2	1																							
3	Date 2	Date 1	Date 3	Time 2	Time 1	Time 2	MV 2	MV 1																							
	Day	Month	Year	WkDay/h	min	s	Bit 16...9	Bit 8...1																							
This object is automatically transmitted daily at 23:59. The max. brightness thus far recorded on the current day can furthermore be requested at any time via the following object.																															
<u>Note:</u> In the event of failure of the supply voltage the value determined thus far is lost. After voltage recovery the determination of the max. value begins again.																															

Obj	Object name	Function	Type	Flag
18	Current max. brightness	Query	1 Bit	CRW
This object is visible only if in the "Brightness" parameter window the relevant parameter "Detection and storage of max. brightness" is set at "Yes".				
Using this object the transmission of the max. brightness recorded thus far can be requested from the weather station at any time.				
19 (21, 23)	Brightness, Limit value 1 (2, 3)	Set	2 Byte	CRW
These objects are visible only if in the "Brightness" parameter window the relevant parameter "Application of limit value x" is set at "Yes".				
Using these objects the respectively associated limit value can be set to a new value via the bus.				
20	Sunshine	On / Off	1 Bit	CRT
This object is visible only if in the "Brightness" parameter window the parameter "Application of limit value 1" is set at "Yes".				
This object is used to report "Sunshine = On" as soon as the current brightness metered value exceeds the limit value 1 and "Sunshine = Off" as soon as the current brightness metered value reaches or falls below the limit value minus hysteresis.				
22 (23)	Brightness, Message LV 2 (3)	On / Off	1 Bit	CRT
These objects are visible only if in the "Brightness" parameter window the relevant parameter "Application of limit value 2 (3)" is set at "Yes".				
These objects are used to report that the current brightness metered value has exceeded the limit value 2 (or 3) or that the brightness is again in the permissible range.				
25 (27, 29)	Twilight, Limit value 1 (2, 3)	Set	2 Byte	CRW
These objects are visible only if in the "Twilight" parameter window the relevant parameter "Application of limit value x" is set at "Yes".				
These objects can be used to set the respectively associated limit value to a new value via the bus.				
26	Darkness	On / Off	1 Bit	CRT
This object is visible only if in the "Twilight" parameter window the parameter "Application of limit value 1" is set at "Yes".				
This object is used to report "Darkness = On" as soon as the current brightness metered value falls below the twilight limit value 1 and "Darkness = Off" as soon as the current brightness metered value reaches or exceeds the limit value 1 plus hysteresis.				

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Obj	Object name	Function	Type	Flag																																				
28 (30)	Twilight, Message LV 2 (3)	On / Off	1 Bit	CRT																																				
These objects are visible only if in the "Twilight" parameter window the relevant parameter "Application of limit value 2 (3)" is set at "Yes".																																								
These objects are used to report that the current brightness metered value has fallen below the limit value 2 (or 3) or that the brightness is again in the permissible range.																																								
31	Precipitation alarm	On / Off	1 Bit	CRT																																				
This object is visible only if in the "Functions, objects" parameter window the parameter "Precipitation alarm" is set at "include."																																								
Using this object "Precipitation Alarm = On" is reported as soon as precipitation is detected and "Precipitation Alarm = Off" when it is no longer raining or snowing.																																								
32	Outside temperature sensor, Failure	On / Off	1 Bit	CRT																																				
This object is visible only if in the "Functions, objects" parameter window the parameter "Outside temperature" is set at "include."																																								
A failure in the temperature sensor recognized by the weather station is reported via this object.																																								
33	Outside temperature	Actual value	2 Byte	CRT																																				
This object is visible only if in the "Functions, objects" parameter window the parameter "Outside temperature" is set at "include."																																								
Using this object the current outside temperature is transmitted as 16-bit floating point number, optionally with the dimension °C or °F.																																								
34	Min. outside temperature	Send	8 Byte	CRT																																				
This object is visible only if in the "Outside temperature" parameter window the parameter "Detection and storage of the min. / max. temperature" is set at "Yes".																																								
This object is used to transmit the minimum outside temperature and the time at which it was measured on the current day. The data are transferred as follows:																																								
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This object is automatically transmitted daily at 23:59. The min. / max. outside temperatures hitherto recorded on the current day can moreover be requested at any time via the following object 36.																																								
<u>Note:</u> After a failure of the supply voltage the value determined thus far is lost. After voltage recovery the determination of the min. value begins again.																																								

Obj	Object name	Function	Type	Flag																																				
35	Max. outside temperature	Send	8 Byte	CRT																																				
This object is visible only if in the "Outside temperature" parameter window the parameter "Detection and storage of min. / max. temperature" is set at "Yes".																																								
This object is used to transmit the maximum outside temperature and the time at which it was measured on the current day. The data are transmitted as follows:																																								
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Byte	8 (MSB)	7	6	5	4	3	2	1																																
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This object is automatically transmitted daily at 23:59. The min. / max. outside temperatures previously determined on the current day can moreover be requested via the following object 36.																																								
<u>Note:</u> In the event of a supply voltage failure the value determined until then is lost. After voltage recovery the determination of the max. value starts again.																																								
36	Current min. / max. outside temperature	Query	1 Bit	CRW																																				
This object is visible only if in the "Outside temperature" parameter window the parameter "Detection and storage of min. / max. temperature" is set at "Yes".																																								
Using this object the transmission of the min. / max. outside temperatures recorded so far can be requested from the weather station at any time.																																								
37 (39, 41)	Temperature, Limit value 1 (2, 3)	Set	2 Byte	CRW																																				
These objects are visible only if in the "Outside temperature" parameter window the relevant parameter "Application of limit value x" is set at "Yes".																																								
Using these objects the respectively associated limit value can be set to a new value via the bus.																																								
38	Frost alarm	On / Off	1 Bit	CRT																																				
This object is visible only if in the "Outside temperature" parameter window the parameter "Application of limit value 1" is set at "Yes".																																								
This object is used to report "Frost-Alarm = On" as soon as the current temperature metered value falls below the limit value 1 and "Frost-Alarm = Off," as soon as the current temperature metered value reaches or exceeds the limit value 1 plus hysteresis.																																								
40 (42)	Temperature, Message LV 2 (3)	On / Off	1 Bit	CRT																																				
These objects are visible only if in the "Outside temperature" parameter window the relevant parameter "Application of limit value 2 (3)" is set at "Yes".																																								
These objects are used to report that the current temperature metered value has fallen below (or exceeded) limit value 2 (or 3) and that the outside temperature is once again in the respectively permissible range.																																								

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Obj	Object name	Function	Type	Flag
43	External alarm	On / Off	1 Bit	CRW
<p>This object is visible only if in the "Safety" parameter window the parameter "Add Object External Alarm" is set at "Yes".</p> <p>Using this object, e.g., a wind alarm message to be additionally applied can be transmitted to the weather station by one or more wind sensors.</p>				
44	Safety	On / Off	1 Bit	CRT
<p>This object is visible only if in the "Functions, Objects" parameter window the parameter "Safety" is set at "Yes".</p> <p>This object is used to report "Safety = On" when one or more of the alarm messages combined via an OR-function is set at log. 1 and "Safety = Off," when none of the alarm messages is set at log. 1.</p>				
45	Azimuth	Send	4 Byte	CRT
<p>This object is visible only if in the "Functions, Objects" parameter window the parameter "Send position of the sun" is set at "Yes".</p> <p>Using this object the angle counted from the north (= 0°) in the horizontal plain with the perpendicular from the current position of the sun on the earth, can be transmitted as 32-bit floating-point number with the dimension "degree" (KNX data point type 14.007).</p>				
46	Elevation	Send	4 Byte	CRT
<p>This object is visible only if in the "Functions, Objects" parameter window the parameter "Send position of the sun" is set at "Yes".</p> <p>Using this object the angle at which the sun shines on the horizontal plain is sent as 32-bit floating-point number with the dimension "degree" (KNX data point type 14.007).</p>				
47 (54, 61, 68, 75, 82, 89, 96)	Façade 1 (2...8), Control	Disable / enable	1 Bit	CRW
<p>These objects are visible only if in the "Façade control" parameter window the parameter "Façade x" is respectively set at "to be used".</p> <p>Using these objects the shade control for each façade can be disabled and enabled separately (e.g. via a time switch program).</p> <p>Note: Disabling / enabling the façade control may never be used to prevent a movement of the sun protection. The "movement blockade" object of the sun protection actuators must be used for this!</p> <p>Disabling / enabling the façade control can be used, e.g., to activate the sun protection in summer with enabled sun protection control as soon as the sun shines on the façade. In the winter, on the other hand, the sun protection control can be enabled, e.g., only during the core working hours, in order to thus make it possible for the winter sun to heat the rooms as long as these are not used.</p>				

Obj	Object name	Function	Type	Flag
48 (55, 62, 69, 76, 83, 90, 97)	Façade 1 (2....8), Sunshine	On / Off	1 Bit	CRT
<p>These objects are visible only if in the "Façade control" parameter window the parameter "Façade x" is respectively set to "to be used".</p> <p>Using these objects "Façade x, Sunshine = On" is transmitted when the sun is shining and the rays of sun could also fall on the respective façade. "Façade x, sunshine = Off" is transmitted when the sun is no longer shining or the rays of sun can no longer fall on the respective façade.</p>				
49 (56, 63, 70, 77, 84, 91, 98)	Façade 1 (2....8), Blind centrally UP / DOWN	UP / Down	1 Bit	CT
<p>These objects are visible only if in the "Façade x, Actions" parameter window the parameter "Action 2" is set in each case to "Central command DOWN" or to "Central command UP".</p> <p>These objects can be used to move the sun protection for each façade into the upper or lower end position.</p>				
50 (57, 64, 71, 78, 85, 92, 99)	Façade 1 (2....8), Blind centrally DOWN 1	Down 1	1 Bit	CT
<p>These objects are visible only if in the "Façade x, Actions" parameter window the parameter "Action 2" is set at "Central Command DOWN 1".</p> <p>Using these objects the sun protection, with drives with 3 limit switches, for each façade can be moved to the lower DOWN 1 end position, in which it then remains with completely opened (i.e., horizontal) slats.</p>				
51 (58, 65, 72, 79, 86, 93, 100)	Façade 1 (2....8), Blind centrally STEP	Up / Down	1 Bit	CT
<p>These objects are visible only if in the "Façade x, Actions" parameter window the parameter "If brightness, Message LV = Off, Action" is set at "Blind stepwise UP".</p> <p>If the sun is no longer shining on a façade, with this as the first action the sun protection or its slats can be opened by the set number of steps.</p>				
52 (59, 66, 73, 80, 87, 94, 101)	Façade 1 (2....8), Blind position in %	Approach	1 Byte	CT
<p>These objects are visible only if in the parameter window "Façade x, Actions" one of the parameters is set at "Blind position in %".</p> <p>Using this object the movement of the sun blind into the respectively parameterized position is started with the respective façade.</p>				

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Obj	Object name	Function	Type	Flag
53 (60, 67, 74, 81, 88, 95, 102)	Façade 1 (2....8), Slats position in %	Approach	1 Byte	CT
103 (104, 105, 106)	Output AND logic operation 1 (2....4)	0 / 1	1 Bit	CRT
107 (108, 109, 110)	Output OR logic operation 1 (2....4)	0 / 1	1 Bit	CRT

These objects are visible only if in the "Façade x, Actions" parameter window one of the parameters is set at "Slats position in %." Using this object the adjustment of the slats into the respectively parameterized position is started with the respective facade.

These objects are visible only if in the "Logic" parameter window the parameter "AND logic operation x" is respectively set at "active." Using these objects respectively "Output AND logic operation x = On" is sent when the result of the AND combination is a log. 1, and "Output AND logic operation x = Off" is sent when the result of the AND combination is a log. 0.

These objects are visible only if in the "Logic" parameter window the parameter "OR logic operation x" is respectively set to "active." Using these objects respectively "Output OR logic operation x = On" is sent when the result of the OR combination is a log. 1, and "Output OR logic operation x = Off" is sent when the result of the OR combination is log. 0.

8. Parameter windows

The parameter windows shown below correspond to the ETS3 presentation.

Location	Façade 2, functions
General adjustments	Façade 2, actions
Functions, Objects	Façade 3, functions
Wind speed	Façade 3, actions
Wind speed, Limit value 1 (Wind al	Façade 4, functions
Wind speed, Limit value 2	Façade 4, actions
Wind speed, Limit value 3	Façade 5, functions
Brightness	Façade 5, actions
Brightness, Limit value 1 (Sunshine	Façade 6, functions
Brightness, Limit value 2	Façade 6, actions
Brightness, Limit value 3	Façade 7, functions
Twilight	Façade 7, actions
Twilight, Limit value 1 (Darkness)	Façade 8, functions
Twilight, Limit value 2	Façade 8, actions
Twilight, Limit value 3	
Precipitation alarm	Logic
Outside temperature	AND logic operation 1
Outside temperature, Limit value 1	AND logic operation 2
Outside temperature, Limit value 2	AND logic operation 3
Outside temperature, Limit value 3	AND logic operation 4
Safety	OR logic operation 1
Façade control	OR logic operation 2
Façade 1, functions	OR logic operation 3
Façade 1, actions	OR logic operation 4

Fig. 10. Maximum selectable parameter windows

In the delivery state of the weather station (or after a re-setting of all parameters to their default setting) only the 3 parameter windows "Location", "General adjustments" and "Functions, Objects" are visible and thus selectable. Fig. 10 shows the max. selectable parameter windows, when all of the available functions of the weather station have been activated.

8.1. Location

This parameter window is used to set the location of the weather station as well as, if it cannot be added automatically, when the summer / winter clock changes take place.

If one of the countries listed by name is selected, with a time zone definition corresponding to the UTC standard, the parameters shown in Fig. 11a are visible. The parameters "Summer / winter clock change at" and "Rule for summer / winter clock change" are purely display fields, since the relevant values are set automatically. If one of the cities presented is selected from the parameter "Location," since the location lies in this city or its vicinity, the location coordinates are likewise set automatically and do not need to be determined and entered by the commissioner.

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Location	
Country	Germany
Definition of time zone according to	Standard
Summer / winter clock change at	ST: Sun. after March 25th WT: Sun. after Oct.25t
Rule for summer / winter clock change	03257:0200+0100/10257:0200UTC+0100
Location	Stuttgart

Fig. 11a. Location parameters with selectable country and selectable city

If the country in which the weather station has been installed is not included in the selection of countries, the parameters shown in Fig. 11b are visible. Both the "Rule for summer / winter clock change" and the location coordinates must then be entered.

Location	
Country	other countries
Rule for summer / winter clock change	03257:0200+0100/10257:0200UTC+0200
east. longitude [degree, -180...+180]	0
east. longitude [minutes, -59...+59]	0
north. latitude [degree, -90...+90]	0
north. latitude [minutes, -59...+59]	0

Fig. 11b. Location parameters when the country is not selectable

Note: The setting possibilities in bold below correspond to the factory default setting of the parameters.

Parameter	Settings
Country	Germany; Austria; Switzerland; France; Spain; Italy; UK; Netherlands; Other countries
This parameter is used to select the country in which the weather station has been installed. The subsequent parameters are adjusted depending on the country selected.	
Definition of time zone according to	Standard; specific
This parameter is used to set whether the summer / winter clock change of the selected country corresponds to the standard there or deviates therefrom (is specific) and therefore has to be set separately.	

Parameter	Settings
Summer / winter clock change at	ST: Sun. after March 25th WT: Sun. after Oct 25t
	This is purely a display field, which is visible only if the previous parameter "Definition of time zone according to" is set at "Standard".
	This shows that the clock change to summer time occurs on the 1 st Sunday after March 25 and the clock change to winter time on the 1 st Sunday after October 25.
Rule for summer / winter clock change	03257:0200+0100/10257:0200UTC+0100
	This is purely a display field if the parameter "Definition of time zone according to" is set at "Standard" and an input field, if it is set at "specific" or if the parameter "Country" is set at "Other countries". In this case date and time must be entered for the respective clock change and the respective time difference, as explained below:
	The information up to the slash apply to changing the clock to summer time: "03257" stands for the month (03=March), the date (25) and the day of the week (7=Sunday) and "0200" for the time of the change, "+0100" indicates the number of hours and minutes (1 hour, 0 minutes), by which the previously current winter time is adjusted and "+" the direction of the clock change (+ = set forward). The data after the slash apply to the change to winter time: "10257" stands for the month (10=October), the date (25) and the day of the week (7=Sunday) and "0200" for the time of the switch, and "UTC+0100" indicates the standard time in winter according to the relevant time zone (for Germany, e.g., equal to UTC + 1:00 hour).
	Note: The data in this field are taken into account for the façade control. Incorrect data lead to an incorrect façade control.
Location	Stuttgart; ... other city
	This parameter is visible only if a country has been selected, for which one or more locations are offered for selection.
	If this parameter is set to selectable locations, the relevant longitude and latitude data are automatically adjusted.
	If none of these locations is relevant and this parameter is therefore set at "other city", the following 4 parameters for entering longitude and latitude information are added.
East. longitude [degree, -180 ...+180]	0
	This parameter is used to set the degrees to the eastern longitude.
East. longitude [minutes, -59...+59]	0
	This parameter is used to set the minutes to the eastern longitude.

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Parameter	Settings
North. latitude [degree, -90 ...+90]	0
This parameter is used to set the degrees to the northern latitude.	
north. latitude [minutes, -59...+59]	0
This parameter is used to set the minutes to the northern latitude.	

8.2. General adjustments

This parameter window is used to set the cycle times for the cyclic transmission of metered values and logic objects, the transmission delay time after bus and mains voltage recovery and the max. telegram rate.

General adjustments

Cycle time for cyclic transmission of metered values	10 Min.
Cycle time for cyclic transmission of logic objects	10 Min.
Transmission delay time after bus and mains voltage recovery [in s]	5
Max. telegram rate [telegrams per second]	5

Parameter	Settings
Cycle time for cyclic transmission of metered values	5 s; 10 s; 30 s; 1 min; 2 min; 5 min; 10 min ; 20 min; 30 min; 45 min; 1 h
This parameter is used to set the joint cycle time for cyclic transmission of date and time and for all metered values with cyclic transmission.	
Cycle time for cyclic transmission of logic objects	5 s; 10 s; 30 s; 1 min; 2 min; 5 min; 10 min ; 20 min; 30 min; 45 min; 1 h
This parameter is used to set the joint cycle time for all logic objects with cyclic transmission.	
Transmission delay time after bus and mains voltage recovery [in s]	1...10; 5
This parameter is used to set the delay time that must elapse following the bus or mains voltage recovery before the weather station may again transmit telegrams on the bus.	
Max. telegram rate [telegrams per second]	1...10; 5
This parameter is used to set the maximum number of telegrams the weather station may send on the bus within one second.	

8.3. Functions, Objects

This parameter window is used to activate the desired functions of the weather station. These include receiving and optionally transmitting date and time, recording, monitoring and transmitting wind speed, brightness, twilight, precipitation and outside temperature, the logic combination of several objects to the "Safety" object, transmission of the sun position angles azimuth and elevation, the shading control for up to 8 façades, depending on the position of the sun and with the selectable additional functions "Shadow edge tracking" and "Sun tracking control of the slats," as well as the logic combination of objects of the weather station by up to 4 AND gates and up to 4 OR gates with up to 4 inputs each.

Note: The "Twilight" function is available only when the "Brightness" function is set at "include."

The following figure shows the "Functions, Objects" parameter window when all of the functions have been activated.

Functions, Objects

Date, time	receive via DCF77
Send date / time cyclically	Yes
Send DCF date and time upon request	at start of a new minute
Wind speed	include
Brightness	include
Twilight	include
Precipitation alarm	include
Outside temperature	include
Safety	Yes
Send position of the sun	Yes
Send azimuth and elevation	on change of value and cyclically
Send after change by degree	3
Façade control	Yes
Logic functions	Yes

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Parameter	Settings
Date, time	receive via DCF77; receive via bus
	<p>This parameter is used to set whether the weather station should receive the date and time information required via the radio receiver for the time signals of the DCF77 long wave transmitter integrated in the weather station or whether it should receive them via the bus.</p> <p><u>Note:</u> If a DCF77 reception is not possible at the location of the weather station, the indicator LED for the reception of the DCF77 signal (see Operation and Installation instructions) does not flash regularly once a second. In this case this parameter must be set at "receive via bus" and it must be ensured that a master clock connected to the bus cyclically transmits date and time</p>
Send date / time cyclically	No; Yes
	<p>This parameter is visible only if the parameter "Date, time" is set to "receive via DCF77".</p> <p>This parameter is used to set whether the weather station serves as a master clock and should transmit the received date and time information cyclically via the bus. If cyclic transmission is activated, this occurs with the same cycle time with which metered values are also transmitted cyclically (see parameter window "General Settings").</p>
Send DCF date and time upon request	at once; at start of a new minute
	<p>This parameter is visible only if the parameter "Date, time" is set to "receive via DCF77".</p> <p>This parameter is used to set whether the weather station, after request of date and time through another bus device, transmits this information immediately or if necessary with a delay only after a new minute has started, so that the requesting bus device can also be exactly synchronized with this value.</p>
Wind speed	exclude; include
	<p>This parameter is used to set whether the weather station should measure and monitor the wind speed. If this parameter is set to "include" the selection option of the "Wind speed" function is added on the left side of the parameter window of the ETS3.</p>
Brightness	exclude; include
	<p>This parameter is used to set whether the weather station should measure and monitor brightness. If this parameter is set at "include" the selection options of "Brightness" and of "Twilight" are added on the left side of the parameter window of the ETS3.</p>
Twilight	exclude; include
	<p>This parameter is visible only if the previous parameter "Brightness" is set to "include".</p> <p>This parameter is used to set whether the measured brightness should be monitored on up to three twilight limit values.</p>

Parameter	Settings
Precipitation alarm	exclude; include
	<p>This parameter is used to set whether the weather station should record precipitation (rain or snow) or not. If this parameter is set at "include," the selection option "Precipitation" is added on the left side of the parameter window of the ETS3.</p>
Outside temperature	exclude; include
	<p>This parameter is used to set whether the weather station should measure and monitor the outside temperature. If this parameter is set at "include," the selection option of the function "Outside temperature" is added on the left side of the parameter window of the ETS3.</p>
Safety	No; Yes
	<p>This parameter is used to set whether the weather station should generate the object "Safety" by the logic combination of several objects or not. If this parameter is set to "Yes," the selection option of the function "Safety" is added on the left side of the parameter window of the ETS3.</p>
Send position of the sun	No; Yes
	<p>This parameter is used to set whether or not the weather station should calculate and send the sun position angles Azimuth and Elevation according to date, time and location. If this parameter is set at "Yes" the selection option of the function "Sun position" is added on the left side of the parameter window of the ETS3.</p>
Send azimuth and elevation	on change of value; cyclic; on change of value and cyclically
	<p>This parameter is visible only when the previous parameter "Send position of the sun" is set at "Yes".</p> <p>This parameter is used to set when the sun position angles Azimuth and Elevation should be sent. If cyclical sending is set, this occurs with the same cycle time with which metered values are also sent cyclically (see parameter window "General Settings").</p>
Send after change by degree	1...15; 3
	<p>This parameter is visible only when the previous parameter "Send Azimuth and Elevation" is set either to "on change of value" or at "on change of value and cyclically."</p> <p>This parameter is used to set the number of degrees by which Azimuth or Elevation must have changed before they are sent again.</p>

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Parameter	Settings
Façade control	No; Yes
	This parameter is used to set whether or not the weather station should carry out a separate sun tracking control of the blinds for each of up to 8 façades. If this parameter is set at "Yes" then the selection options of the function "Façade control" are added on the left side of the parameter window of the ETS3.
Logic functions	No; Yes
	This parameter is used to set whether up to 4 AND-functions and up to 4 OR-functions with in each case up to 4 inputs should be available at the weather station or not. Using these logic functions the user can link objects of the weather station to one another, transmit the result of the logic operation on the bus and, depending on it if set, recall a specific 8-bit scene. If this parameter is set at "Yes" the selection option of the function „Logic“ is added on the left side of the parameter window of the ETS3.

8.4. Wind speed

This parameter window is used to set the desired properties of the wind speed measurement and transmission. Moreover, monitoring the wind speed on up to 3 adjustable limit values can be activated. Limit value 1 hereby always serves to detect and transmit the "Wind alarm."

Wind speed

Send metered value with dimension	m/s
Metering range, dimension	1 ... 70 m/s
Send metered value	on change of value and cyclically
Send after change by %	5
Detection and storage of max. wind speed	Yes
Application of limit value 1	Yes
Application of limit value 2	Yes
Application of limit value 3	Yes

Parameter	Settings
Send metered value with dimension	m/s; km/h
	This parameter can be used to adjust whether the metered wind speed should be transmitted on the bus as a 16-bit floating-point number with the dimension "m/s" or converted with the dimension "km/h".

Parameter	Settings
Metering range, dimension	0 ... 70 m/s
	This is purely a display field, which gives the metering range of the wind speed, depending on the dimension set via the preceding parameter, either in m/s or in km/h.
Send metered value	No; on change of value; on change of value and cyclically
	This parameter is used to set whether or when the metered value of the wind speed should be transmitted on the bus.
Send after change by %	3; 5; 10
	This parameter is visible only if the preceding parameter "Send metered value" is set at "on change of value" or at "on change of value and cyclically".
	This parameter is used to set the percentage by which the metered value of the wind speed must have changed, before it is sent again on the bus.
Detection and storage of max. wind speed	No; Yes
	This parameter can be used to activate the recording and storage of the max. wind speed value during a day. The prerequisite for this is that the weather station can receive date and time, in order to thus synchronize its software clock consistently. At the start of a new day (at 00.00.00 hours) the previously stored maximum value is deleted and the current date of the new day is stored. From then on after each measurement a check is carried out of whether the new metered value is greater than the previously stored value and the new value if necessary stored as the max. value together with the current time. At 23.59 the stored max. value together with the information of when it was measured (date and time), is transmitted. Moreover the stored value can be requested at any time with the aid of a special object via the bus, although at the time of query during the day of course it is not ensured that the value then transmitted is indeed the max. value on this day. In the event of a supply voltage failure, the value determined so far is lost. Upon voltage recovery the determination of the max. value begins again.
Application of limit value 1...3	No; Yes
	This parameter can be used to activate monitoring of the wind speed on up to 3 different limit values. This is necessary, e.g., when in addition to outside blinds, an outside textile sun protection (e.g. an awning) is installed. If this parameter is set at "Yes," the selection option of the function "Wind speed limit value x" for each activated limit value monitoring is added on the left side of the parameter-window of the ETS3.
	Note: The limit value 1 is always used for recording and sending "Wind Alarm".

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8.5. Wind speed limit value x

This parameter window is respectively used to set the limit value (LV) at which the metered value (MV) of the wind speed should be monitored and what the reaction should be to exceeding or falling below the respective limit value. Limit value 1 is always used to record and send "Wind Alarm".

Wind speed, Limit value 1 (Wind alarm)

Limit value adjustment via	Communication object
Limit value 1 (in 0,1 m/s)	70
Hysteresis 1 (in 0,1 m/s)	30
ON delay (in seconds) if MV > LV	3
Action 1 after ON delay	Wind alarm = ON
Action 2 after ON delay	recall 8-bit scene
Scene number	1
OFF delay (in minutes) if MV <= LV - Hyst.	15
Action 1 after OFF delay	Wind alarm = OFF
Action 2 after OFF delay	recall 8-bit scene
Scene number	1
Send Wind alarm	on change of value and cyclically
Cycle time Wind alarm (in minutes)	7

Parameter	Settings
Limit value adjustment via	parameter; communication object
This parameter is used to set whether the limit value x should be available as a parameter that can be changed with the ETS or whether a communication object should be added so that the limit value can be changed via the bus.	
If the limit value setting via a communication object is selected, the factory default parameter value is used for the limit value monitoring until for the first time a limit value is received via the comm. object which then overwrites the factory default parameter value.	
Limit value x (in 0,1 m/s)	1...350; 70
This parameter is used to set the limit value x et as a multiple of 0.1 m/s (setting range 0.1...35 m/s).	
Hysteresis x (in 0,1 m/s)	1...150; 30
This parameter is used to set the hysteresis of the limit value x as a multiple of 0.1 m/s (setting range 0.1...15 m/s). The hysteresis indicates the amount by which the set limit value of the wind speed must be fallen below again after having been exceeded for the "Wind Alarm (or Wind, message LV x) = Off" is sent.	

Parameter	Settings
ON delay (in seconds) if MV > LV	1...10; 3
	This parameter is used to set by how many seconds the limit value must have been exceeded before "Wind Alarm (or Wind, Message LV x) = On" is transmitted.
Action 1 after ON delay	Wind alarm (resp. Wind, Message LV x) = ON
	This is purely a display field with the information that after the end of the On delay the communication object "Wind alarm (or Wind, Message LV x)" is sent with the object value "1".
Action 2 after ON delay	not to be applied; recall 8-bit scene
	This parameter can be used to set whether after the end of the ON delay as a second action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only if the previous parameter "Action 2 after ON delay" is set at "recall 8-bit scene."
	This parameter can be used to set the number of the desired scene in the range of 1...64.
OFF delay (in minutes) if MV <= LV - Hyst.	5; 10; 15; 20; 25; 30;
	This parameter is used to set the number of minutes for which the limit value minus hysteresis must be fallen below, before "Wind Alarm" (or Wind, Message LV x) = Off" is transmitted.
Action 1 after OFF delay	Wind alarm (resp. Wind, message LV x) = OFF
	This is purely a display field with the information that after the end of the OFF delay the communication object "Wind alarm (or Wind, Message LV x)" is transmitted with the object value "0".
Action 2 after OFF delay	not to be applied; recall 8-bit scene
	Using this parameter it can be set whether at the end of the Off delay as a second action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action 2 after Off delay" is set to "Recall 8-bit scene".
	This parameter can be used to set the number of the desired scene in the range of 1...64.
Send wind alarm (resp.: Wind, Message LV x)	on change of value; on change of value and cyclically
	This parameter is used to set whether or when the object "Wind Alarm (or Wind, Message LV x)" should be sent on the bus.

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Parameter	Settings
Cycle time Wind alarm (resp. Wind, Message LV x) (in minutes)	3...15; 7
This parameter is visible only if the previous parameter "Send wind alarm (or Wind, message LV x)" is set at "on change of value and cyclically."	
Using this parameter the cycle time can be set in the range of 3...15 minutes.	

8.6. Brightness

This parameter window is used to adjust the desired properties of the brightness measurement and monitoring. Moreover, monitoring the brightness on up to 3 adjustable limit values can be activated.

Brightness

Metering range, dimension	1 ... 99 kLux
Send metered value	on change of value and cyclically
Send after change by %	5
Detection and storage of max. brightness	Yes
Application of limit value 1	Yes
Application of limit value 2	Yes
Application of limit value 3	Yes

Parameter	Settings
Metering range, dimension	0 ... 99 kLux
This is purely a display field, indicating the metering range of the brightness.	
Send metered value	
Send metered value	No; on change of value; on change of value and cyclically
This parameter is used to set whether or when the brightness metered value should be sent on the bus.	
Send after change by %	3; 5; 10; 15; 20; 25; 30
This parameter is visible only if the previous parameter "Send metered value" is set at "on change of value" or at "on change of value and cyclically."	
This parameter is used to set the percentage by which the brightness metered value must have changed before it is sent on the bus again.	

Parameter	Settings
Detection and storage of max. brightness	No; Yes

This parameter can be used to activate recording and storage of the max. measured brightness during a day. The prerequisite for this is that the weather station can receive date and time in order to thus be able to consistently synchronize its software clock.

At the start of a new day (at 00.00.00 hours) the previously stored maximum value is deleted and the current date of the new day is stored. From then on it is tested after each measurement whether the new metered value is greater than the previously stored value and the new value if necessary stored as max. value together with the current time. At 23.59 the stored maximum value together with the information of when it was measured (date and time), is transmitted. Moreover, the stored value can be requested at any time with the aid of a special object via the bus, although at the query time during the day of course it cannot be ensured that the value then transmitted is actually the max. value on this day. In the case of a failure of the supply voltage the value determined so far is lost. After voltage recovery, the determination of the max. value begins again.

Application of limit value 1...3	No; Yes
This parameter can be used to activate the monitoring of the brightness metered value on up to 3 different limit values. This is necessary, e.g., when the measured brightness value is to be used not only for shade control, but also for lighting control.	

If this parameter is set at "Yes," the selection option of the function "Brightness limit value x" for each activated limit value monitoring is added on the left side of the parameter window of the ETS3.

Note: The limit value 1 is always used for recording and transmitting "Sunshine".

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8.7. Brightness limit value x

This parameter window is used to respectively set the limit value to which the brightness metered value should be monitored and what the reaction should be to exceeding the limit value or at the end of exceeding. The limit value 1 is always used for recording and sending "Sunshine."

Brightness, Limit value 1 (Sunshine)

Limit value adjustment via	Communication object
Limit value 1 (in kLux)	70
Hysteresis 1 (in kLux)	10
ON delay if MV > LV	30 s
Action 1 after ON delay	Sunshine = ON
Action 2 after ON delay	recall 8-bit scene
Scene number	1
OFF delay 1 (in minutes) if MV <= LV - Hyst.	5
Action 1 after OFF delay 1	Sunshine = OFF
Action 2 after OFF delay 1	recall 8-bit scene
Scene number	1
Send Sunshine	on change of value and cyclically
Cycle time Sunshine (in minutes)	7

Parameter	Settings
Limit value adjustment via	parameter; communication object
This parameter is used to set whether the limit value x should be available as a parameter that can be changed only with the ETS or whether a communication object should be added so that the limit value can be changed via the bus. If the limit value setting via a communication object is selected, the factory default parameter value is used for limit value monitoring until for the first time a limit value is received via the comm. object, which then overwrites the factory default parameter value.	
Limit value x (in kLux)	1...99; 70
This parameter is used to set the limit value x in kLux (setting range 1...99 kLux). Note: The limit value 1 always serves for recording and transmitting "Sunshine".	

Parameter	Settings
Hysteresis x (in kLux)	1...20; 10
This parameter is used to set the hysteresis of the limit value x in kLux (setting range 1...20 kLux). The hysteresis indicates the amount by which the set brightness limit value must be fallen below again after having been exceeded so that "Sunshine (or Brightness, Message LV x) = Off" is transmitted.	
ON delay if MV > LV	5s; 10s; 15s; 30s; 1 Min.; 2 Min.; 3 Min.; 5 Min.
This parameter is used to set how long the limit value must be exceeded before "Sunshine (or Brightness, Message LV x) = On" is sent.	
Action 1 after ON delay	Sunshine (resp. Brightness, Message LV x) = ON
This is purely a display field with the information that after the end of the ON delay the communication object "Sunshine (or Brightness, Message LV x)" is sent with the object value "1".	
Action 2 after ON delay	not to be applied; recall 8-bit scene
This parameter can be used to set whether at the end of the ON delay as the second action an 8-bit scene should be recalled.	
Scene number	1...64; 1
This parameter is visible only when the previous parameter "Action 2 after ON delay" is set at "recall 8-bit scene." Using this parameter the number of the desired scene can be set in the range of 1...64.	
OFF delay 1 (in minutes) if MV <= LV - Hyst.	1...15; 5
This parameter is used to set for how many minutes the limit value minus hysteresis must be fallen below before "Sunshine (or Brightness, Message LV x) = Off" is transmitted.	
Action 1 after OFF delay 1	Sunshine (resp. Brightness, message LV x) = OFF
This is purely a display field with the information that after the end of the OFF delay 1 the communication object "Sunshine (or Brightness, Message LV x)" is sent with the object value "0".	
Action 2 after OFF delay 1	not to be applied; recall 8-bit scene
This parameter can be used to set whether at the end of the OFF delay 1 as the second action an 8-bit Scene should be recalled.	

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Parameter	Settings
Scene number	1...64; 1
This parameter is visible only if the previous parameter "Action 2 after OFF delay 1" is set at "recall 8-bit scene."	
This parameter can be used to set the number of the desired scene in the range from 1...64.	
Send Sunshine (resp. Brightness, Message LV x)	on change of value; on change of value and cyclically
This parameter is used to set whether or when the object "Sunshine (or Brightness, Message LV x)" should be sent on the bus.	
Cycle time Sunshine (resp. Brightness, Message LV x) (in minutes)	3...15; 7
This parameter is visible only if the previous parameter "Send sunshine (or Brightness, Message LV x)" is set at "on change of value and cyclically".	
This parameter can be used to set the cycle time in the range from 3...15 minutes.	

8.8. Twilight

This parameter window can be used to activate the monitoring of the brightness metered value on up to 3 adjustable twilight limit values. Limit value 1 is always used for recording and sending "Darkness."

Twilight	
Application of limit value 1	Yes
Application of limit value 2	Yes
Application of limit value 3	Yes

Parameter	Settings
Application of limit value 1 ... 3	No; Yes
This parameter can be used to activate the monitoring of the brightness metered value on up to 3 different twilight limit values. This is necessary, e.g., when the measured brightness value is to be used not only for sun protection control (lower blinds / shutters in the evening as privacy protection and raise them in the morning) but also as lighting control (switch on exterior lighting in the evening and switch it off in the morning).	
If this parameter is set at "Yes," the selection option of the function "Twilight limit value x" for each activated limit value monitoring is added on the left side of the parameter window of the ETS3.	
Note: The limit value 1 is always used for recording and sending "Darkness."	

8.9. Twilight limit value x

This parameter window is used respectively to set to which twilight limit value the brightness metered value should be monitored and what the reaction should be to falling below the limit value or at the end of falling below it. The limit value 1 is always used for recording and sending "Darkness."

Twilight, Limit value 1 (Darkness)	
Limit value adjustment via	Communication object
Limit value 1 (in Lux)	200
Hysteresis 1 (in Lux)	10
ON delay if MV < LV	5 Min.
Action 1 after ON delay	Darkness = ON
Action 2 after ON delay	recall 8-bit scene
Scene number	1
OFF delay (in minutes) if MV >= LV + Hyst.	15
Action 1 after OFF delay	Darkness = OFF
Action 2 after OFF delay	recall 8-bit scene
Scene number	1
Send Darkness	on change of value and cyclically
Cycle time Darkness (in minutes)	7

Parameter	Settings
Limit value adjustment via	parameter; communication object
This parameter is used to set whether the limit value x should be available as a parameter that can be changed only with the ETS or whether a communication object should be added so that the limit value can be changed via the bus.	
If the limit value setting is selected via a communication object, the factory default parameter value is used for limit value monitoring until for the first time a limit value is received by the comm. object that exceeds the factory default parameter value.	
Limit value x (in Lux)	1...1000; 200
This parameter is used to set the limit value x in Lux (setting range 1...1000 Lux).	
Hysteresis x (in Lux)	1...200; 10
This parameter is used to set the hysteresis of the limit value in Lux (setting range 1...200 Lux). The hysteresis indicates the amount by which the set twilight limit value after having been fallen below must then be exceeded again for "Darkness" (or twilight, Message LV x) =OFF" to be sent.	

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Parameter	Settings
ON delay if MV < LV	5s; 10s; 15s; 30s; 1 Min.; 2 Min.; 3 Min.; 5 Min.
	This parameter is used to set how long the twilight limit value must be fallen below before "Darkness (or Twilight, Message LV x) = ON" is sent.
Action 1 after ON delay	Darkness (resp. Twilight, message LV x) = ON
	This is purely a display field with the information that after the ON delay the communication object "Darkness (or Twilight, Message LV x)" is sent with the object value "1."
Action 2 after ON delay	not to be applied; recall 8-bit scene
	This parameter can be adjusted whether at the end of the ON delay as the second action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action 2 after ON delay" is set at "recall 8-bit scene."
	Using this parameter the number of the desired scene can be set in the range of 1...64.
OFF delay (in minutes) if MV >= LV + Hyst.	1...15; 15
	This parameter is used to set how many minutes the limit value plus hysteresis must be exceeded before "Darkness (or Twilight, Message LV x) = Off" is sent.
Action 1 after OFF delay	Darkness (or twilight, message LV x) = OFF
	This is purely a display field with the information that after the end of the OFF delay the communication object "Darkness (or Twilight, Message LV x)" is sent with the object value "0."
Action 2 after OFF delay	not to be applied; recall 8-bit scene
	This parameter can be used to set whether at the end of the OFF delay as second action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only if the previous parameter "Action 2 after OFF delay" is set at "recall 8-bit scene."
	Using this parameter the number of the desired scene can be set in the range from 1...64.
Send Darkness (resp. Twilight, Message LV x)	on change of value; on change of value and cyclically
	This parameter is used to set whether or when the object "Darkness (or Twilight, Message LV x)" should be sent on the bus.

Parameter	Settings
Cycle time Darkness (resp. Twilight, Message LV x) (in minutes)	3...15; 7
	This parameter is visible only when the previous parameter "Send darkness (or Twilight, Message LV x)" is set at "on change of value and cyclically."
	This parameter can be used to set the cycle time in the range from 3...15 minutes.

8.10. Precipitation

This parameter window is used to set when the object "Precipitation alarm" should be sent and whether an additional action should be carried out with "Precipitation alarm = ON" or with "Precipitation alarm = Off."

Note: The delay times with the recognition of precipitation are fixed and cannot be changed by the user.

Precipitation alarm

Send Precipitation alarm ON / OFF	on change of value and cyclically
Cycle time Precipitation alarm (in minutes)	7
Action if Precipitation alarm = ON	recall 8-bit scene
Scene number	1
Action if Precipitation alarm = OFF	recall 8-bit scene
Scene number	1

Parameter	Settings
Send Precipitation alarm ON / OFF	on change of value; on change of value and cyclically
	This parameter is used to set whether or when the object "Precipitation alarm" should be sent on the bus.
Cycle time Precipitation alarm (in minutes)	3...15; 7
	This parameter is visible only when the previous parameter "Send Precipitation alarm ON / OFF" is set at "on change of value and cyclically".
	This parameter can be used to set the cycle time in the range of 3...15 Minutes.
Action if Precipitation alarm = ON	not to be applied; recall 8-bit scene
	This parameter can be used to set whether with "Precipitation alarm = ON" as an additional action an 8-bit scene should be recalled.

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Parameter	Settings
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action if "Precipitation Alarm = ON" is set at "recall 8-bit scene".
	This parameter can be used to set the number of the desired scene in the range of 1...64.
Action if Precipitation alarm = OFF	not to be applied; recall 8-bit scene
	This parameter can be used to set whether with "Precipitation alarm = OFF" as additional action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action if Precipitation alarm = OFF" is set at "recall 8-bit scene".
	This parameter can be used to set the number of the desired scene in the range of 1...64.

8.11. Outside temperature

This parameter window is used to set the desired properties of the temperature measurement and transmission. Furthermore, the monitoring of the temperature on up to 3 adjustable limit values can be activated. Limit value 1 is always used for recording and sending "Frost-Alarm."

Outside temperature

Send metered value with dimension	°C
Metering range, dimension	-40 ... +80 °C
Temperature offset (in 0,1 K)	0
Send metered value	on change of value and cyclically
Send after change by	1,0 K
Detection and storage of min. / max. temperature	Yes
Application of limit value 1	Yes
Application of limit value 2	Yes
Application of limit value 3	Yes

Parameter	Settings
Send metered value with dimension	°C; °F
	This parameter can be used to set whether the measured outside temperature should be sent on the bus as a 16-bit floating point number with the dimension "°C" or converted with the dimension "°F."

Parameter	Settings
Metering range, dimension	-40 ... +80 °C
	This is purely a display field that indicates the metering range of the outside temperature.
Temperature offset (in 0,1 K)	-50 ... +50; 0
	This parameter can be used to change the metered value by an adjustable offset value, in order to thus align it e.g., with a calibrated thermometer.
Send metered value	No; on change of value; on change of value and cyclically
	This parameter is used to set whether or when the temperature metered value should be sent on the bus.
Send after change by	0,5 K; 1,0 K; 2,0 K
	This parameter is visible only when the previous parameter "Send metered value" is set at "on change of value" or at "on change of value and cyclically."
	This parameter is used to set by how many degrees Kelvin the temperature metered value must have changed before it is sent again on the bus.
Detection and storage of min. / max. temperature	No; Yes
	This parameter can be used to activate the recording and storage of the minimum and maximum measured temperature during a day. The prerequisite for this is that the weather station can receive the date and time in order to thus consistently synchronize its software clock.
	At the start of a new day (at 00.00.00 hours) the previously stored minimum and maximum value are deleted and the current date of the new day is stored. From then on a test is carried out after each measurement whether the new metered value is greater than the previously stored maximum value or lower than the previously stored minimum value and, if applicable, the new value is stored as the min. or max. value together with the current time. At 23.59 the stored min. and max. value together with the information of when they were measured in each case (date, time), are transmitted. Furthermore, the stored values can be requested at any time with the aid of a special object via the bus, although it cannot be ensured at the query time during the day that the values then transmitted are actually the min. and max. value on this day. In the case of failure of the supply voltage the values determined so far are lost. After voltage recovery the determination of the min. / max. value starts again.
Application of limit value 1 ... 3	No; Yes
	This parameter can be used to activate the monitoring of the outside temperature on up to 3 different limit values. This is necessary, e.g., when the outside temperature is to be monitored not only via the limit value 1 for a frost limit.
	If this parameter is set at "Yes," the selection option of the function "Outside temperature limit value x" for each activated limit value monitoring is added on the left side of the parameter window of the ETS3.

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8.12. Outside temperature limit value x

This parameter window is respectively used to set the limit value at which the outside temperature should be monitored, and what the reaction should be to falling below or exceeding the respective temperature limit value.
Note: The outside temperature limit value 1 is set by factory default as frost protection limit value, i.e., as a limit value that is monitored for falling below. However, with the outside temperature limit values 2 and 3 it can be selected whether the temperature should be monitored for a lower or an upper limit value.

Outside temperature, Limit value 1 (Frost alarm)

Limit value adjustment via	Communication object
Limit value 1 (in 0,5 K)	2
Hysteresis 1 (in 0,5 K)	6
Frost alarm	ON if MV<LV / OFF if MV>=LV+Hyst.
ON-delay	10 Min.
Action if Frost alarm = ON	recall 8-bit scene
Scene number	1
OFF-delay	10 Min.
Action if Frost alarm = OFF	recall 8-bit scene
Scene number	1
Send Frost alarm	on change of value and cyclically
Cycle time Frost alarm (in minutes)	7

Parameter	Settings
Limit value adjustment via	parameter; communication object
This parameter is used to set whether the limit value x should be available as a parameter that can be changed only with the ETS or whether a communication object should be added so that the limit value can be changed via the bus. If the limit value setting is selected via a communication object, the factory default parameter value is used for limit value monitoring until for the first time a limit value is received via the comm. object that then overwrites the factory default parameter value.	
Limit value x (in 0.5 K)	-80 ... +160; 2
This parameter is used to set the limit value x as a multiple of 0.5 °C (Setting range -40...+80 °C). <u>Note:</u> The limit value 1 for outside temperature is set by the factory as a frost protection limit value at +1 °C.	

Parameter	Settings
Hysteresis x (in 0.5 K)	1...20; 6
	This parameter is used to set the hysteresis of the limit value x as a multiple of 0.5 degrees Kelvin (setting range 0.5...10 K). The hysteresis indicates the amount by which the set temperature limit value must be exceeded again after having been fallen below or after being exceeded, fallen below again) so that "Frost-Alarm (or Temperature, Message LV x =) Off" is sent.
Frost alarm	ON if MV < LV / OFF if MV >= LV + Hyst.
	With outside temperature limit value 1 this is purely a display field with the information that the temperature limit value 1 is monitored for a lower limit value (the frost limit value) and that after this limit value has been fallen below the communication object "Frost alarm" is sent with the object value "1" and that after this limit value has been exceeded plus hysteresis the communication object "Frost alarm" is sent with the object value "0."
Temperature, Message LV x	ON if MV<LV / OFF if MV>=LV+Hyst.; ON if MV>LV / OFF if MV<=LV-Hyst.
	With outside temperature limit values 2 and 3 it is adjustable whether they are to be monitored for a lower limit value (ON when MV<LV / Off when MV>=LV+Hyst.) or for an upper limit value (ON when MV>LV / OFF when MV<=LV-Hyst.).
ON-delay	1s; 3s; 5s; 10s; 15s; 30s; 1 Min.; 2 Min.; 3 Min.; 5 Min.; 10 Min.; 15 Min.; 30 Min.; 1 h
	This parameter is used to set how long the temperature limit value, has to be fallen below (or exceeded) before "Temperature, Message LV x = ON" is sent.
Action if Frost alarm (resp. Temperature, Message LV x) = ON	not to be applied; recall 8-bit scene
	It can be adjusted via this parameter whether at the end of the ON delay as an additional action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action if Frost alarm (or Temperature, Message LV x) = ON" is set at "recall 8-bit scene".
OFF-delay	1s; 3s; 5s; 10s; 15s; 30s; 1 Min.; 2 Min.; 3 Min.; 5 Min.; 10 Min.; 15 Min.; 30 Min.; 1 h
	This parameter is used to set how long falling below (or exceeding) the limit value must have been completed taking into account the hysteresis so that "Frost alarm (or Temperature, Message LV x) = OFF" is sent.

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Parameter	Settings
Action if Frost alarm (or Temperature, Message LV x) = OFF	not to be applied; recall 8-bit scene
	This parameter can be used to set whether at the end of the OFF delay as an additional action an 8-bit scene should be recalled.
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action if Frost alarm (or Temperature, Message LV x) = OFF" is set at "recall 8-bit scene".
	This parameter can be used to set the number of the desired scene in the range of 1...64.
Send Frost alarm (resp. Temperature, Message LV x)	on change of value; on change of value and cyclically
	This parameter is used to set whether or when the object "Frost alarm (or Temperature, message LV x)" should be sent on the bus.
Cycle time Frost alarm (resp. Temperature, Message LV x) (in minutes)	3...15; 7
	This parameter is visible only when the previous parameter "Send Frost alarm (or Temperature, message LV x)" is set at "on change of value and cyclical."
	Using this parameter the cycle time can be set in the range from 3...15 minutes.

8.13. Safety

Using this parameter window up to 8 alarm objects can be logically combined via an OR function to the object "Safety."

Note: Usually with the object "Safety" at the addressed sun protection actuators a movement into the safety position is triggered (e.g. the upper end position) and leaving this end position is blocked as long as the object "Safety" has the logical value "1."

Safety

Add object External alarm	Yes
If:	Wind alarm = ON
OR	Wind, Message LV 2 = ON
OR	Wind, Message LV 3 = ON
OR	Precipitation alarm = ON
OR	Frost alarm = ON
OR	External alarm = ON
OR	Wind sensor, Failure = ON
OR	Output OR logic operation 1 = ON
then:	Safety = ON
Send Safety	on change of value and cyclically
Cycle time Safety (in minutes)	7

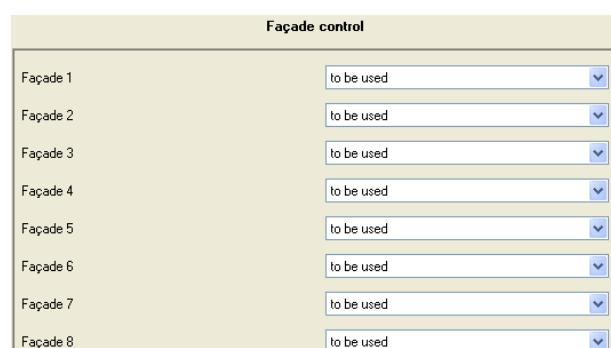
Parameter	Settings
Add object External alarm	No; Yes
	If this parameter is set at "Yes," an object "External alarm" is added to the communication objects via which e.g., a wind alarm can be received from an additional wind sensor.
If:	not to be applied Wind alarm = ON;
	This parameter is used to set whether the object "Wind alarm" with the logical value "1" should be combined via this OR function to the safety object.
OR	not to be applied Wind, Message LV 2 = ON;
	This parameter is used to set whether the object "Wind, Message LV 2" with the logical value "1" should be combined via this OR function to the safety object.
OR	not to be applied Wind, Message LV 3 = ON;
	This parameter is used to set whether the object "Wind, Message LV3" with the logical value "1" should be combined via this OR function to the safety object.

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Parameter	Settings
OR	not to be applied Precipitation alarm = ON;
	This parameter is used to set whether the object "Precipitation alarm" with the logical value "1" should be combined via this OR function to the safety object.
OR	not to be applied Frost alarm = ON;
	This parameter is used to set whether the object "Frost alarm" with the logical value "1" should be combined via this OR function to the safety object.
OR	not to be applied External alarm = ON;
	This parameter is used to set whether the object "External alarm" with the logical value "1" should be combined via this OR function to the safety object.
OR	not to be applied Wind sensor, Failure = ON;
	This parameter is used to set whether the object "Wind sensor, Failure" with the logical value "1" should be combined via this OR function to the safety object.
OR	not to be applied Output OR logic operation 1 = ON; Output OR logic operation 2 = ON; Output OR logic operation 3 = ON; Output OR logic operation 4 = ON; Output AND logic oper. 1 = ON; Output AND logic oper. 2 = ON; Output AND logic oper. 3 = ON; Output AND logic oper. 4 = ON
	This parameter is used to set whether one of the output objects of the 4 OR functions or the 4 AND functions with the logical value "1" should be combined via this OR function to the safety object.
then:	Safety = ON
	This is purely a display field. It shows that the object "Safety" is sent with the logical value "1" when the set conditions of the logical OR function have been met.
Send Safety	on change of value; on change of value and cyclically
	This parameter is used to set when the object "Safety" should be sent on the bus.
Cycle time Safety (in minutes)	3...15; 7
	This parameter is visible only when the previous parameter "Send Safety" is set at "on change of value and cyclically." This parameter can be used to set the cycle time in the range of from 3...15 minutes.

8.14. Façade control

This parameter window can be used to activate the desired number of façade controls.



Parameter	Settings
Façade x	not to be used; to be used

If this parameter is set at "to be used," the selection link for "Façade x, functions" and "Façade x, actions" for each façade used is added on the left side of the parameter window of the ETS3.

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8.15. Façade x, functions

Using this parameter window for each façade the characteristic values (alignment, inclination, blind angle) are entered and determined which communication object (or which command) is to be transmitted to lower the sun protection as soon as the sun begins to shine on the façade and to raise the sun protection as soon as the sun can no longer shine on the façade.

In addition, depending on the type of sun protection used (shutters or textile sun protection or blind) and the software functions of the sun protection actuators used, a shadow edge tracking of the sun protection or / and a sun tracking control of the slats can be activated.

Façade 1, functions	
Orientation (North=0°, E=90°, S=180°, W=270°)	0
Inclination (against base point of vertical)	0
Blind angle horizontal	2
Blind angle vertical	2
Shading control via	Brightness, Limit value 1 (Sunshine)
OFF delay 2 in minutes if Brightness, Message LV = OFF	10
Shadow edge tracking	Yes
Height of window in cm:	150
Sunshine range inside the room at bottom of window in cm:	1
min. variation in cm:	10
Sun tracking control of slats	Yes
Type of slats	Horizontal slats
Width of slats in mm:	50
Interspace between slats in mm:	50
Slats angle in degrees after position command 100%	0
Slats angle in degrees after position command 0%	90
min. variation of angle in degrees for transmission of a new slats posit	20
Façade 1, send Sunshine	on change of value and cyclically
Cycle time façade 1 in minutes:	15

Parameter	Settings
Orientation (North=0°, E=90°, S=180°, W=270°)	0...359; 0
Inclination (against base point of vertical)	-89...+60; 0
Blind angle horizontal	2...25; 2
Blind angle vertical	2...45; 2
Shading control via	Brightness Limit value 1 (Sunshine); Brightness, Limit value 2; Brightness, Limit value 3
OFF delay 2 in minutes if Brightness, Message LV = OFF	1...15; 10

Using this parameter analogously to the wind rose, the direction is entered in which the vertical shows on the façade surface or, with a sloping roof, the direction in which the vertical would show on the sloping roof set vertically. North is hereby 0°, east 90°, etc.

This parameter is used to enter by how many degrees the façade surface is tilted with respect to the base point of vertical. A forward inclination of the façade is counted as positive here, a backward inclination as negative. Roofs therefore have a negative inclination (-90° corresponds to a flat roof).

This parameter is used to set whether the sun protection should be activated immediately when the sun begins to shine on the façade from the side (horizontal blind angle > 0°) or whether it should be activated later when the rays of the sun fall on the façade at an angle that is greater than the set horizontal blind angle. A blind angle occurs, e.g., through a lateral projection (wall projection).

Note: The horizontal blind angle set is presumed to be the same size on both sides (i.e. the same size both on the right and on the left side of the façade).

This parameter is used to set whether the sun protection should be activated immediately when the sun begins to shine on the façade vertically from above (vertical blind angle > 0°) or whether it should be activated somewhat later because, e.g., the roof projects somewhat and the rays of the sun do not fall onto the façade until the vertical blind angle is exceeded.

This parameter is used to establish which of the 3 brightness limit values (or which object "brightness, Message LV x = ON/OFF") should be applied in calculating whether the sun is shining on the current façade.

So that the sun protection of the façade is not immediately raised when sunshine is interrupted by a cloud, with the Off delay 2 a further delay time can be taken into consideration at the start of which e.g. the slats are placed horizontally for max. admission of light. When it is over, first the end of the sunshine is reported for the current façade and then the sun protection is raised.

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Parameter	Settings
Shadow edge tracking	No; Yes
If this parameter is set to "Yes," 3 parameters for setting the shadow edge tracking are added.	
With a shadow edge tracking the sun protection is lowered only far enough that the sun can still shine into the room over an adjustable distance. Flowers on the window-sill thus get the sun and the occupant of the room has an unobstructed view outside in the lower area of the window without being dazzled.	
<u>Note:</u> A shadow edge tracking is possible only with blinds and shutters with horizontal slats.	
Height of window in cm	1...1000; 150
This parameter is visible only if the previous parameter "Shadow edge tracking" is set to "Yes".	
The window height (1...1000 cm) is entered through this parameter.	
Sunshine range inside the room at bottom of window in cm	1...50; 20
This parameter is visible only if the previous parameter "Shadow edge tracking" is set to "Yes".	
It is set using this parameter how far (1...50 cm) the sun at the level of the lower edge of the window may shine into the room from the outer edge of the sun protection.	
Min. variation in cm	1...15; 10
This parameter is visible only when the previous parameter "Shadow edge tracking" is set at "Yes".	
This parameter is used to set the number of cm (1...15) by which the shadow edge must have changed before the height of the sun protection is changed to track it.	
Sun tracking control of slats	No; Yes
If this parameter is set at "Yes," 6 parameters are added for setting the sun tracking control.	
With the sun tracking control the blind slats are guided to follow the sun so that they are always as far as possible perpendicular to the rays of the sun. Thus on the one hand the thermal radiation associated with direct sunlight is reflected in total, and on the other hand as much diffuse daylight as possible reaches the room through the slats that are not closed. The diffuse light does not glare, helps to illuminate the room and reduces electricity costs for room illumination.	
<u>Note:</u> If both parameters "Shadow edge tracking" and "sun tracking control of slats" are set at "Yes" and if then one of the two parameters is subsequently set at "No," both parameters are automatically set at "No" and the previous settings to the two parameters are deleted.	

Parameter	Settings
Type of slats	horizontal slats; vertical slats
This parameter is visible only when the previous parameter "Sun tracking control of slats" is set at "Yes" or it is purely a display field with the entry "Horizontal slats" if the parameter "Shadow edge tracking" is set at "Yes".	
This parameter is used to set whether the sun protection is equipped with horizontal or vertical slats. Blinds usually have horizontal slats. A fabric glare protection attached to the inside of the window, which is moved in front of the window like a curtain from one or both sides, usually has vertical slats.	
Width of slats in mm	1...1000; 50
This parameter is visible only when the previous parameter "Sun tracking control of slats" is set at "Yes".	
This parameter is used to enter the width of a slat (1...1000 mm).	
Interspace between slats in mm	1...1000; 50
This parameter is visible only when the previous parameter "Sun tracking control of slats" is set at "Yes".	
With this parameter the space between two completely opened slats (i.e., parallel to one another) (1...1000 mm) is entered.	
Slats angle in degrees after position command 100%	0...180; 0
This parameter is visible only when the previous parameter "Sun tracking control of slats" is set at "Yes".	
The angle should be entered here that the slats adopt to the perpendicular after a slat position command with the value 100% (=255) has been transmitted to the blind actuator. <u>Note:</u> With fully closed slats this value will be between 0...90°, with fully opened slats this value will be between 90...180°.	
Slats angle in degrees after position command 0%	0...180; 90
This parameter is visible only when the previous parameter "Sun tracking control of slats" is set at "Yes".	
The angle should be entered here that the slats adopt to the perpendicular after a slat position command with the value 0% (=0 or 1) has been transmitted to the blind actuator.	
<u>Note:</u> With fully closed slats this value will be between 0...90°, with fully opened slats this value will be between 90...180°, with slats lying horizontally, the angle is 90°.	

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Parameter	Settings
Min. variation of angle in degrees for transmission of a new slats position	0...90; 20
	This parameter is visible only when the previous parameter "Sun tracking control of slats" is set at "Yes".
	This parameter is used to set by how many degrees the angle of the slat position must have changed with respect to the last value sent before a new value is sent. It should be taken into account here that only special blind drives with integrated electronics for recording blind and slat position render possible a precise adjustment of the slats with small position changes. With standard blind drives an adjustment of the slats is usually possible only with position changes > 15°. A smaller value leads only to a more frequent transmission of a new slat position without the actuator reacting to the sent value, since it is unable to set the desired position.
Façade x, send Sunshine	on change of value; on change of value and cyclically
	This parameter is used to set when the object "Façade x, Sunshine" should be sent on the bus.
Cycle time façade 1 in minutes	5...60; 15
	This parameter is visible only when the previous parameter "Façade x, send Sunshine" is set at "on change of value and cyclically."
	This parameter can be used to set the cycle time in the range from 5...60 minutes

8.16. Façade x, actions

This parameter window is used for each façade to set which commands are to be sent as soon as the sun shines on the façade, while the sun is shining on the façade and when the sun is no longer shining or can no longer shine on the façade. Moreover, it is set whether these commands in each case are to be sent only after a change or cyclically.

Note: The object "Façade x, Sunshine = OFF" is sent without delay as soon as the sun can no longer shine on the façade x.

Façade 1, actions

If Brightness, Message LV = ON,	
Action 1	Façade 1, Sunshine = ON
Action 2	Send blind + slats position in %
Send blind and slats position	on change of value and cyclically
Cycle time Blind / slats position façade 1 in minutes:	15
If Brightness, Message LV = OFF,	
Action	Blind stepwise UP
Number of steps	3
After OFF delay 2,	
Action 1	Central command UP
Action 2	Façade 1, Sunshine = OFF

Parameter	Settings
If Brightness, Message LV = ON, Action 1	Façade x, Sunshine = ON
This is purely a display field. It contains the message that if the brightness limit value selected for this façade is exceeded (i.e., the sun is indeed shining) and moreover the sun has reached a position from which it can shine on this façade, the object "Façade x, Sunshine" is sent with the object value "1." This telegram can be used to lower (activate) the entire sun protection for this façade.	

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Parameter	Settings
Action 2	not to be applied; Central command DOWN; Central command DOWN1; Blind position in %; Blind + slats position in %; recall 8-bit scene
	This parameter field is purely a display field when one of the parameters "Shadow edge tracking" and "Sun tracking control of slats" is set at "Yes" or when both parameters are set at "Yes". If the parameter "Shadow edge tracking" is set at "Yes," it contains the information that the object "Blind position in %" is sent. If the parameter "Sun tracking control of slats" is set at "Yes," it contains the message that the object "Slats position in %" is sent. If both parameters "Shadow edge tracking" and "Sun tracking control of slats" are set at "Yes," it contains the message that both the object "Blind position in %" as well as the object "Slats position in %" are sent. If the parameters "Shadow edge tracking" and "Sun tracking control of slats" are set at "No" it can be set here whether a command object is to be sent and, if so, which one as soon as the sun shines on the façade: <ul style="list-style-type: none"> - Central command DOWN: the object "Façade x, blind centrally UP/DOWN" with the object value "1" is sent once. With Siemens actuators this is to be linked with the object "Channels A-X, Automatic operation = On + centrally Up/ Down." Through this firstly all the actuator channels are switched to automatic operation and then the addressed sun protection is moved into the lower end position. It is thus ensured that with the start of sunshine all the sun protection devices of the façade concerned will be lowered and all the channels will be in automatic operation, as long as the occupant of the room does not disable the automatic operation for the sun protection devices that he can control. - Central command DOWN1: The object "Façade x, Blind centrally DOWN1" with the object value "1" is sent once, via which all the actuator channels are switched to automatic operation and the addressed sun protection drives with 3 limit switches are moved into the DOWN1 end position with opened slats. (Warning: This command can be used only with blind actuators that can control drives with 3 limit switches!) - Blind position in %: The object "Façade x, Blind position in %" is sent once with an object value that is determined via the parameter subsequently shown with this setting. - Blind + slats position in %: The objects "Façade x, Blind position in %" and "Façade x, Slats position in %" are sent once with an object value that is determined via the parameter subsequently shown in each case. - Recall 8-bit scene: The object "8-bit scene" is sent once with a scene number that is established via the parameter subsequently shown.

Parameter	Settings
Blind position in %	50...100; 100
	This parameter is visible only when the previous parameter "Action 2" is set to "Blind position in %" or to "Blind + slats position in %". It is used to set in the range of 50...100% how far the sun protection should be closed (100% = completely closed).
Slats position in %	50...100; 100
	This parameter is visible only when the previous parameter "Action 2" is set at "Blind + slats position in %". It is used to set in the range of from 50...100% how far the slats are to be closed (100% = completely closed).
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action 2" is set to "Recall 8-bit scene." This parameter can be used to set the number of the desired scene in the range from 1...64.
Send blind position in %	on change of value; on change of value and cyclically
	This parameter is visible only when in the "Façade x, functions" parameter window the parameter "Shadow edge tracking" is set at "Yes". This parameter is used to set when the object "Façade x, Blind position in %" should be sent on the bus.
Send slats position in %	on change of value; on change of value and cyclically
	This parameter is visible only when in the "Façade x, functions" parameter window the parameter "Sun tracking control of slats" is set at "Yes". This parameter is used to set when the object "Façade x, slats position in %" should be sent on the bus.
Send blind + slats position in %	on change of value; on change of value and cyclically
	This parameter is visible only when in the parameter window "Façade x, functions" both parameters "Shadow edge tracking" and "Sun tracking control of slats" are set at "Yes". This parameter is used to set when the objects "Façade x, Blind position in %" and "Façade x, Slats position in %" are to be sent on the bus.

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Parameter	Settings
Cycle time Blind / slats position façade 1 in minutes	5...60; 15
	<p>This parameter is visible only if one of the previous parameters "Send blind position in %" or "Send slats position in %" or "Send blind + slats position" is set to "on change of value and cyclical."</p> <p>This parameter can be used to set the cycle time for setting sun protection and slats position in the range of 5...60 minutes.</p>
If Brightness, Message LV = OFF, Action	not to be applied; blind stepwise UP slats position in %
	<p>If the sun is no longer shining and it has therefore fallen below the brightness limit value used for the control of the façade minus hysteresis, at the end of the OFF delay 1 the object "Brightness, Message LV x" is sent with the object value "0."</p> <p>With activated façade control this parameter can be used to set whether there should be a reaction to this event and what it should be.</p> <ul style="list-style-type: none"> - Not to be applied: There is no reaction, instead a wait in case the sunshine may return during the OFF delay 2. - Blind stepwise UP: If shutters are used as sun protection, they can now be raised by an adjustable number of steps. The shutter slats and the shutters themselves are opened somewhat so that a little more daylight reaches the rooms. - Slats position in %: If Venetian blinds are used as sun protection, their slats can be opened halfway to completely so that more daylight reaches the rooms.
Number of steps	1...7; 3
	<p>This parameter is visible only when the previous parameter "If brightness, Message LV = OFF, Action" is set at "Blind stepwise UP."</p> <p>This parameter can be used to set by how many steps the sun protection should be raised after the end of OFF delay 1, when the sun is no longer shining.</p>
Slats position in %	0...50; 0
	<p>This parameter is visible only if the previous parameter "If brightness, Message LV = OFF, Action" is set to "slats position in %."</p> <p>This parameter is used to set in the range from 0...50% how far after the end of the Off delay 1, when the sun is no longer shining, the slats should be opened (0% = completely opened = horizontal position of the horizontal slats of Venetian blinds.</p>

Parameter	Settings
After OFF delay 2, Action 1	not to be applied; central command UP; blind position in %; blind + slats position in %; recall 8-bit scene
	<p>This parameter can be used to set (when the sun is still not shining after the end of the OFF delay 2) whether another command object should be transmitted and if so, which one.</p> <ul style="list-style-type: none"> - Central command UP: the object "Façade x, Blind centrally UP/DOWN" is sent once with the object value "0". If necessary, this object is to be linked with Siemens actuators with their object "Channels A-X, Automatic operation=On + central Up/Down". With the actuators thus firstly all the channels are switched to automatic operation and then the addressed sun protection is moved into the upper end position. It is thus ensured that at the end of sunshine all of the sun protection devices of the façade concerned are raised and all channels are again in automatic operation. - Blind position in %: the object "Façade x, Blind position in %" is sent once with an object value that is established via the parameter subsequently shown with this setting. - Blind + slats position in %: the objects "Façade x, Blind position in %" and "Façade x, Slats position in %" are sent once with an object value that is established in each case via the parameter subsequently shown. - Recall 8-bit scene: this object is sent once with a scene number that is stipulated via the parameter subsequently shown.
Blind position in %	0...100; 0
	<p>This parameter is visible only if the previous parameter "After OFF delay 2, Action 1" is set to "Blind position in %" or to "Blind + slats position in %."</p> <p>It is used to set in a range from 0...100% how far the sun protection is to be opened (0% = completely opened).</p>
Slats position in %	0...100; 0
	<p>This parameter is visible only if the previous parameter "After OFF delay 2, Action 1" is set at "Blind + slats position in %."</p> <p>It is used to set in a range from 0...100% how far the slats are to be opened (0% = completely opened).</p>
Scene number	1...64; 1
	<p>This parameter is visible only if the previous parameter "After OFF delay 2, Action 1" is set at "recall 8-bit scene."</p> <p>With this parameter the number of the desired scene can be set in the range of 1...64.</p>
Action 2	Façade x, Sunshine = OFF
	<p>This is purely a display field. It contains the message that if the sun is still not shining after the end of the OFF delay 2, the object "Façade x, Sunshine" will be transmitted with the object value "0." This telegram can then be used to raise (deactivate) the entire sun protection for this façade.</p>

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8.17. Logic

Using this parameter window up to 4 logical AND-functions and up to 4 logical OR-functions with up to 4 data inputs (objects) are activated. Since the result of the logic operation can be inverted, if required, an AND-function can be changed into a NAND-function and an OR-function into a NOR-function.

Logic	
AND logic operation 1	active
AND logic operation 2	active
AND logic operation 3	active
AND logic operation 4	active
OR logic operation 1	active
OR logic operation 2	active
OR logic operation 3	active
OR logic operation 4	active

Parameter	Settings
AND logic operation 1 (...4)	inactive; active
Using this parameter the corresponding AND logic operation is activated.	
OR-logic operation 1 (...4)	inactive; active
Using this parameter the corresponding OR logic operation is activated.	

8.18. AND logic operation x, OR logic operation x

This parameter window is used to define for an AND / OR logic operation which object is assigned to an input, which actions should occur when the result of the logic operation is a logic 1 or a logic 0 and when or how the result should be transmitted on the bus.

AND logic operation 1	
1st input	Object no. 11: Wind alarm
2nd input	Object no. 22: Brightness, Message LV 2
3rd input	Object no. 30: Twilight, Message LV 3
4th input	Object no. 40: Temperature, Message LV 2
If logic operation = 1,	
Action 1: Object value =	1
Action 2:	recall 8-bit scene
Scene number	1
If logic operation = 0,	
Action 1: Object value =	0
Action 2:	recall 8-bit scene
Scene number	1
Send logic object	on change of value and cyclically

Parameter	Settings
1st input (... 4th input)	not used; Object no. 6; ... Object no. 110 inverted
With this parameter an object of the weather station (from a list of approx. 40 objects) for logic combination with up to three further objects can be assigned to the corresponding input.	
If logic operation = 1 Action 1: Object value =	0; 1
If the result of the logic operation is = 1, if required it can be inverted via this parameter, i.e., an AND function then becomes a NAND function and an OR function a NOR function.	
Action 2:	not to be applied; recall 8-bit scene
If the result of the logic operation is = 1, as further action a selectable 8-bit scene can be recalled.	
Scene number	1...64; 1
This parameter is visible only when the previous parameter "Action 2" is set at "recall 8-bit scene".	
This parameter can be used to set the number of the desired scene in the range of 1...64.	

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Parameter	Settings
If logic operation = 0, Action 1: Object value =	0; 1
	If the result of the logic operation is = 0, if required it can be inverted via this parameter, i.e. an AND function then becomes a NAND function and an OR function becomes a NOR function.
	Note: If the parameter "If logic operation = 1, Action 1: Object value =" was set at "0", i.e., the result of the logic operation is inverted, it must be inverted here too and this parameter set at "1".
Action 2:	not to be applied; recall 8-bit scene
	If the result of the logic operation is = 0, as further action a selectable 8-bit scene can be recalled.
Scene number	1...64; 1
	This parameter is visible only when the previous parameter "Action 2" is set at "recall 8-bit scene."
	This parameter can be used to set the number of the desired scene in the range from 1...64.
Send logic object	on change of value; on change of value and cyclically
	This parameter is used to set when the result of the logic operation (i.e., the associated comm. object) should be sent on the bus.

Space for notes