Suntracer KNX-GPS

Weather Station

Item number 3093

elsner

Manual

This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual

⚠	Safety advice.
⚡	Safety advice for working on electrical connections, components, etc.
DANGER!	... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.
WARNING!	... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.
CAUTION!	... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.
STOP **ATTENTION!**	... indicates a situation which may lead to damage to property if it is not avoided.
ETS	In the ETS tables, the parameter default settings are marked by underlining.

1. Safety and operating instructions

Installation, testing, operational start-up and troubleshooting should only be performed by a qualified electrician.

CAUTION!
Live voltage!

- Inspect the device for damage before installation. Only put undamaged devices into operation.
- Comply with the locally applicable directives, regulations and provisions for electrical installation.
- Immediately take the device or system out of service and secure it against unintentional switch-on if risk-free operation is no longer guaranteed.

Use the device exclusively for building automation and observe the operating instructions. Improper use, modifications to the device or failure to observe the operating instructions will invalidate any warranty or guarantee claims.
Operate the device only as a fixed-site installation, i.e. only in assembled condition and after conclusion of all installation and operational start-up tasks, and only in the surroundings designated for it.
Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

For information on installation, maintenance, disposal, scope of delivery and technical data, please refer to the installation instructions.

2. Description

The **Weather Station Suntracer KNX-GPS** measures temperature, wind speed and brightness. It recognises precipitation and receives the GPS signal for time and location. In addition, using location coordinates and the time, it calculates the exact position of the sun (azimuth and elevation).

All values can be used for the control of threshold value-dependent switching outputs. States can be linked via AND logic gates and OR logic gates. The compact housing of the **Suntracer KNX-GPS** accommodates the sensors, evaluation circuits and bus-coupling electronics.

Functions:

- **Brightness and position of the sun**: The current light intensity is measured by a sensor. In addition the Suntracer KNX-GPS calculates the position of the sun (azimuth and elevation) using time and location
- **Shade control** for up to 6 facades with slat and shadow edge tracking

- **Wind measurement**: The wind strength measurement takes place electronically and thus noiselessly and reliably, even during hail, snow and sub-zero temperatures. Even turbulent air and anabatic winds in the vicinity of the weather station are recorded
- **Wind sensor monitoring**: If the wind measurement value changes by less than ± 0.5 m/s within 48 hours, a fault can be output. The wind measured value is output with the maximum measured value of 35 m/s and all wind threshold values below this value become active
- **Precipitation recognition**: The sensor surface is heated, so that only drops and flakes are recognised as precipitation, but not mist or dew. When the rain or snow stops, the sensor is soon dry again and the precipitation warning ends
- **Temperature measurement**
- **Weekly and calendar time switch**: The weather station receives the time and date from the integrated GPS receiver. The weekly time switch switches up to 4 different periods per day. With the calendar time switch up to 3 additional time periods can be defined, in which up to 2 On/Off switches take place. The switching outputs can be used as communications objects. The switch times are set via parameters.
- **Threshold values** can be adjusted per parameter or via communication objects
- **8 AND and 8 OR logic gates** with 4 for each input. All switching events as well as 16 logic inputs (in the form of communications objects) can be used as inputs for the logic gates. The output of each gate can be optionally configured as 1-bit or 2 x 8-bit

3. Commissioning

The measured wind value and thus all other wind switching outputs may only be supplied 60 seconds after the supply voltage has been connected.

Configuration is made using the KNX software ETS. The **product file** can be downloaded from the Elsner Elektronik website on **www.elsner-elektronik.de** in the “Service” menu.

After the bus voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.

3.1. Addressing of the device at the bus

The equipment is delivered with the individual address 15.15.255. This can be changed via the ETS. There is a button and a control LED on the circuit board inside the housing for this purpose.

4. Transmission protocol

Units:

Temperatures in degrees Celsius
Brightness in lux
Wind in metres per second
Azimuth and elevation in degrees

4.1. List of all communications objects

Abbreviations Flags:

C Communication
R Read
W Write
T Transfer
U Update

Nr.	Name	Function	DPT	Flags
0	Signal LED	Input	1.002	C R W
1	GPS date	Input / Output	11.001	C R W T
	Date	Input / Output	11.001	C R W T
2	GPS time	Input / Output	10.001	C R W T
	Time	Input / Output	10.001	C R W T
3	Date and time request	Input	1.017	C R W
4	GPS malfunction (0 = OK | 1 = NOT OK)	Output	1.002	C R T
5	Location eastern longitude [°]	Output (DPT 14.007)	14.007	C R T
6	Location northern latitude [°]	Output (DPT 14.007)	14.007	C R T
7	Rain: Switching output 1	Output	1.002	C R T
8	Rain: Switching output 2	Output	1.002	C R T
9	Rain: Switching delay to rain	Input	9.010	C R W
10	Rain: Switching delay to no rain	Input	9.010	C R W
11	Night: Switching output	Output	1.002	C R T
12	Night: Switching delay to night	Input	9.010	C R W
13	Night: Switching delay to non-night	Input	9.010	C R W
14	Temperature measurement value	Output	9.001	C R T
15	Temperature measurement value requirement min./max.	Input	1.017	C R W

Nr.	Name	Function	DPT	Flags
16	Temperature measurement value minimum	Output	9.001	C R T
17	Temperature measurement value maximum	Output	9.001	C R T
18	Temperature measurement value reset min./max.	Input	1.017	C R W
19	Temperature sensor malfunction (0 = OK | 1 = NOT OK)	Output	1.002	C R T
20	Temperature TV 1: Absolute value	Input / Output	9.001	C R W T U
21	Temperature TV 1: Change (1:+ | 0: -)	Input	1.002	C R W
22	Temperature TV 1: Switching delay from 0 to 1	Input	9.010	C R W
23	Temperature TV 1: Switching delay from 1 to 0	Input	9.010	C R W
24	Temperature TV 1: Switching output	Output	1.002	C R T
25	Temperature TV 1: Switching output block	Input	1.002	C R W
26	Temperature TV 2: Absolute value	Input / Output	9.001	C R W T U
27	Temperature TV 2: Change (1:+ | 0: -)	Input	1.002	C R W
28	Temperature TV 2: Switching delay from 0 to 1	Input	9.010	C R W
29	Temperature TV 2: Switching delay from 1 to 0	Input	9.010	C R W
30	Temperature TV 2: Switching output	Output	1.002	C R T
31	Temperature TV 2: Switching output block	Input	1.002	C R W
32	Temperature TV 3: Absolute value	Input / Output	9.001	C R W T U
33	Temperature TV 3: Change (1:+ | 0: -)	Input	1.002	C R W
34	Temperature TV 3: Switching delay from 0 to 1	Input	9.010	C R W
35	Temperature TV 3: Switching delay from 1 to 0	Input	9.010	C R W
36	Temperature TV 3: Switching output	Output	1.002	C R T
37	Temperature TV 3: Switching output block	Input	1.002	C R W
38	Temperature TV 4: Absolute value	Input / Output	9.001	C R W T U
39	Temperature TV 4: Change (1:+ | 0: -)	Input	1.002	C R W

Nr.	Name	Function	DPT	Flags
40	Temperature LV 4: Switching delay from 0 to 1	Input	9.010	C R W
41	Temperature LV 4: Switching delay from 1 to 0	Input	9.010	C R W
42	Temperature TV 4: Switching output	Output	1.002	C R T
43	Temperature TV 4: Switching output block	Input	1.002	C R W
44	Wind measurement	Output	9.005	C R T
45	Wind measurement value requirement max.	Input	1.017	C R W
46	Maximum wind measurement value	Output	9.005	C R T
47	Wind measurement value reset max.	Input	1.017	C R W
48	Wind Sensor Malfunction (0 = OK | 1 = NOT OK)	Output	1.002	C R T
49	Wind TV 1: Absolute value	Input / Output	9.005	C R W T U
50	Wind TV 1: Change (1:+ | 0: -)	Input	1.002	C R W
51	Wind TV 1: Switching delay from 0 to 1	Input	9.010	C R W
52	Wind TV 1: Switching delay from 1 to 0	Input	9.010	C R W
53	Wind TV 1: Switching output	Output	1.002	C R T
54	Wind TV 1: Switching output block	Input	1.002	C R W
55	Wind TV 2: Absolute value	Input / Output	9.005	C R W T U
56	Wind TV 2: Change (1:+ | 0: -)	Input	1.002	C R W
57	Wind TV 2: Switching delay from 0 to 1	Input	9.010	C R W
58	Wind TV 2: Switching delay from 1 to 0	Input	9.010	C R W
59	Wind TV 2: Switching output	Output	1.002	C R T
60	Wind TV 2: Switching output block	Input	1.002	C R W
61	Wind TV 3: Absolute value	Input / Output	9.005	C R W T U
62	Wind TV 3: Change (1:+ | 0: -)	Input	1.002	C R W
63	Wind TV 3: Switching delay from 0 to 1	Input	9.010	C R W
64	Wind TV 3: Switching delay from 1 to 0	Input	9.010	C R W
65	Wind TV 3: Switching output	Output	1.002	C R T
66	Wind TV 3: Switching output block	Input	1.002	C R W

Nr.	Name	Function	DPT	Flags
67	Brightness measurement value	Output	9.004	C R T
68	Brightness TV 1: Absolute value	Input / Output	9.004	C R W T U
69	Brightness TV 1: Change (1:+ | 0: -)	Input	1.002	C R W
70	Brightness TV 1: Switching delay from 0 to 1	Input	9.010	C R W
71	Brightness TV 1: Switching delay from 1 to 0	Input	9.010	C R W
72	Brightness TV 1: Switching output	Output	1.002	C R T
73	Brightness TV 1: Switching output block	Input	1.002	C R W
74	Brightness TV 2: Absolute value	Input / Output	9.004	C R W T U
75	Brightness TV 2: Change (1:+ | 0: -)	Input	1.002	C R W
76	Brightness TV 2: Switching delay from 0 to 1	Input	9.010	C R W
77	Brightness TV 2: Switching delay from 1 to 0	Input	9.010	C R W
78	Brightness TV 2: Switching output	Output	1.002	C R T
79	Brightness TV 2: Switching output block	Input	1.002	C R W
80	Brightness TV 3: Absolute value	Input / Output	9.004	C R W T U
81	Brightness TV 3: Change (1:+ | 0: -)	Input	1.002	C R W
82	Brightness TV 3: Switching delay from 0 to 1	Input	9.010	C R W
83	Brightness TV 3: Switching delay from 1 to 0	Input	9.010	C R W
84	Brightness TV 3: Switching output	Output	1.002	C R T
85	Brightness TV 3: Switching output block	Input	1.002	C R W
86	Brightness TV 4: Absolute value	Input / Output	9.004	C R W T U
87	Brightness TV 4: Change (1:+ | 0: -)	Input	1.002	C R W
88	Brightness TV 4: Switching delay from 0 to 1	Input	9.010	C R W
89	Brightness TV 4: Switching delay from 1 to 0	Input	9.010	C R W
90	Brightness TV 4: Switching output	Output	1.002	C R T
91	Brightness TV 4: Switching output block	Input	1.002	C R W
92	Twilight TV 1: Absolute value	Input / Output	9.004	C R W T U
93	Twilight TV 1: Change (1:+ | 0: -)	Input	1.002	C R W
94	Twilight TV 1: Switching delay from 0 to 1	Input	9.010	C R W

Nr.	Name	Function	DPT	Flags
95	Twilight TV 1: Switching delay from 1 to 0	Input	9.010	C R W
96	Twilight TV 1: Switching output	Output	1.002	C R T
97	Twilight TV 1: Switching output block	Input	1.002	C R W
98	Twilight TV 2: Absolute value	Input / Output	9.004	C R W T U
99	Twilight TV 2: Change (1:+ | 0: -)	Input	1.002	C R W
100	Twilight TV 2: Switching delay from 0 to 1	Input	9.010	C R W
101	Twilight TV 2: Switching delay from 1 to 0	Input	9.010	C R W
102	Twilight TV 2: Switching output	Output	1.002	C R T
103	Twilight TV 2: Switching output block	Input	1.002	C R W
104	Twilight TV 3: Absolute value	Input / Output	9.004	C R W T U
105	Twilight TV 3: Change (1:+ | 0: -)	Input	1.002	C R W
106	Twilight TV 3: Switching delay from 0 to 1	Input	9.010	C R W
107	Twilight TV 3: Switching delay from 1 to 0	Input	9.010	C R W
108	Twilight TV 3: Switching output	Output	1.002	C R T
109	Twilight TV 3: Switching output block	Input	1.002	C R W
110	Sun position Azimuth [°]	Output (DPT 14.007)	14.007	C R T
111	Sun position Elevation [°]	Output (DPT 14.007)	14.007	C R T
112	Sun position Azimuth [°]	Output (DPT 9.*)	9.*	C R T
113	Sun position Elevation [°]	Output (DPT 9.*)	9.*	C R T
114	Facade heat protection status	Output	1.002	C R T
115	Facade 1: Status	Output	1.002	C R T
116	Facade 1: Movement position [%]	Output	5.001	C R T
117	Facade 1: Slat position [%]	Output	5.001	C R T
118	Facade 1: Block (1 = blocked)	Input	1.002	C R W
119	Facade 2: Status	Output	1.002	C R T
120	Facade 2: Movement position [%]	Output	5.001	C R T
121	Facade 2: Slat position [%]	Output	5.001	C R T
122	Facade 2: Block (1 = blocked)	Input	1.002	C R W
123	Facade 3: Status	Output	1.002	C R T
124	Facade 3: Movement position [%]	Output	5.001	C R T
125	Facade 3: Slat position [%]	Output	5.001	C R T

Nr.	Name	Function	DPT	Flags
126	Facade 3: Block (1 = blocked)	Input	1.002	C R W
127	Facade 4: Status	Output	1.002	C R T
128	Facade 4: Movement position [%]	Output	5.001	C R T
129	Facade 4: Slat position [%]	Output	5.001	C R T
130	Facade 4: Block (1 = blocked)	Input	1.002	C R W
131	Facade 5: Status	Output	1.002	C R T
132	Facade 5: Movement position [%]	Output	5.001	C R T
133	Facade 5: Slat position [%]	Output	5.001	C R T
134	Facade 5: Block (1 = blocked)	Input	1.002	C R W
135	Facade 6: Status	Output	1.002	C R T
136	Facade 6: Movement position [%]	Output	5.001	C R T
137	Facade 6: Slat position [%]	Output	5.001	C R T
138	Facade 6: Block (1 = blocked)	Input	1.002	C R W
139	Calendar time switch Period 1, Seq. 1: Switching output	Output	1.002	C R T
140	Calendar time switch Period 1, Seq. 2: Switching output	Output	1.002	C R T
141	Calendar time switch Period 2, Seq. 1: Switching output	Output	1.002	C R T
142	Calendar time switch Period 2, Seq. 2: switching output	Output	1.002	C R T
143	Calendar time switch Period 3, Seq. 1: Switching output	Output	1.002	C R T
144	Calendar time switch Period 3, Seq. 2: Switching output	Output	1.002	C R T
145	Weekly time switch Monday 1: Switching output	Output	1.002	C R T
146	Weekly time switch Monday 2: Switching output	Output	1.002	C R T
147	Weekly time switch Monday 3: Switching output	Output	1.002	C R T
148	Weekly time switch Monday 4: Switching output	Output	1.002	C R T
149	Weekly time switch Tuesday 1: Switching output	Output	1.002	C R T
150	Weekly time switch Tuesday 2: Switching output	Output	1.002	C R T
151	Weekly time switch Tuesday 3: Switching output	Output	1.002	C R T
152	Weekly time switch Tuesday 4: Switching output	Output	1.002	C R T

Nr.	Name	Function	DPT	Flags
153	Weekly time switch Wednesday 1: Switching output	Output	1.002	C R T
154	Weekly time switch Wednesday 2: Switching output	Output	1.002	C R T
155	Weekly time switch Wednesday 3: Switching output	Output	1.002	C R T
156	Weekly time switch Wednesday 4: Switching output	Output	1.002	C R T
157	Weekly time switch Thursday 1: Switching output	Output	1.002	C R T
158	Weekly time switch Thursday 2: Switching output	Output	1.002	C R T
159	Weekly time switch Thursday 3: Switching output	Output	1.002	C R T
160	Weekly time switch Thursday 4: Switching output	Output	1.002	C R T
161	Weekly time switch Friday 1: Switching output	Output	1.002	C R T
162	Weekly time switch Friday 2: Switching output	Output	1.002	C R T
163	Weekly time switch Friday 3: Switching output	Output	1.002	C R T
164	Weekly time switch Friday 4: Switching output	Output	1.002	C R T
165	Weekly time switch Saturday 1: Switching output	Output	1.002	C R T
166	Weekly time switch Saturday 2: Switching output	Output	1.002	C R T
167	Weekly time switch Saturday 3: Switching output	Output	1.002	C R T
168	Weekly time switch Saturday 4: Switching output	Output	1.002	C R T
169	Weekly time switch Sunday 1: Switching output	Output	1.002	C R T
170	Weekly time switch Sunday 2: Switching output	Output	1.002	C R T
171	Weekly time switch Sunday 3: Switching output	Output	1.002	C R T
172	Weekly time switch Sunday 4: Switching output	Output	1.002	C R T
173	AND Logic 1: 1-bit switching output	Output	1.002	C R T
174	AND Logic 1: 8-bit output A	Output	5.010	C R T
175	AND Logic 1: 8-bit output B	Output	5.010	C R T

Nr.	Name	Function	DPT	Flags
176	AND Logic 1: Block	Input	1.002	C R W
177	AND Logic 2: 1-bit switching output	Output	1.002	C R T
178	AND Logic 2: 8-bit output A	Output	5.010	C R T
179	AND Logic 2: 8-bit output B	Output	5.010	C R T
180	AND Logic 2: Block	Input	1.002	C R W
181	AND Logic 3: 1-bit switching output	Output	1.002	C R T
182	AND Logic 3: 8-bit output A	Output	5.010	C R T
183	AND Logic 3: 8-bit output B	Output	5.010	C R T
184	AND Logic 3: Block	Input	1.002	C R W
185	AND Logic 4: 1-bit switching output	Output	1.002	C R T
186	AND Logic 4: 8-bit output A	Output	5.010	C R T
187	AND Logic 4: 8-bit output B	Output	5.010	C R T
188	AND Logic 4: Block	Input	1.002	C R W
189	AND Logic 5: 1-bit switching output	Output	1.002	C R T
190	AND Logic 5: 8-bit output A	Output	5.010	C R T
191	AND Logic 5: 8-bit output B	Output	5.010	C R T
192	AND Logic 5: Block	Input	1.002	C R W
193	AND Logic 6: 1-bit switching output	Output	1.002	C R T
194	AND Logic 6: 8-bit output A	Output	5.010	C R T
195	AND Logic 6: 8-bit output B	Output	5.010	C R T
196	AND Logic 6: Block	Input	1.002	C R W
197	AND Logic 7: 1-bit switching output	Output	1.002	C R T
198	AND Logic 7: 8-bit output A	Output	5.010	C R T
199	AND Logic 7: 8-bit output B	Output	5.010	C R T
200	AND Logic 7: Block	Input	1.002	C R W
201	AND Logic 8: 1-bit switching output	Output	1.002	C R T
202	AND Logic 8: 8-bit output A	Output	5.010	C R T
203	AND Logic 8: 8-bit output B	Output	5.010	C R T
204	AND Logic 8: Block	Input	1.002	C R W
205	OR Logic 1: 1-bit switching output	Output	1.002	C R T
206	OR Logic 1: 8-bit output A	Output	5.010	C R T
207	OR Logic 1: 8-bit output B	Output	5.010	C R T
208	OR Logic 1: Block	Input	1.002	C R W
209	OR Logic 2: 1-bit switching output	Output	1.002	C R T
210	OR Logic 2: 8-bit output A	Output	5.010	C R T
211	OR Logic 2: 8-bit output B	Output	5.010	C R T
212	OR Logic 2: Block	Input	1.002	C R W
213	OR Logic 3: 1-bit switching output	Output	1.002	C R T
214	OR Logic 3: 8-bit output A	Output	5.010	C R T
215	OR Logic 3: 8-bit output B	Output	5.010	C R T

Nr.	Name	Function	DPT	Flags
216	OR Logic 3: Block	Input	1.002	C R W
217	OR Logic 4: 1-bit switching output	Output	1.002	C R T
218	OR Logic 4: 8-bit output A	Output	5.010	C R T
219	OR Logic 4: 8-bit output B	Output	5.010	C R T
220	OR Logic 4: Block	Input	1.002	C R W
221	OR Logic 5: 1-bit switching output	Output	1.002	C R T
222	OR Logic 5: 8-bit output A	Output	5.010	C R T
223	OR Logic 5: 8-bit output B	Output	5.010	C R T
224	OR Logic 5: Block	Input	1.002	C R W
225	OR Logic 6: 1-bit switching output	Output	1.002	C R T
226	OR Logic 6: 8-bit output A	Output	5.010	C R T
227	OR Logic 6: 8-bit output B	Output	5.010	C R T
228	OR Logic 6: Block	Input	1.002	C R W
229	OR Logic 7: 1-bit switching output	Output	1.002	C R T
230	OR Logic 7: 8-bit output A	Output	5.010	C R T
231	OR Logic 7: 8-bit output B	Output	5.010	C R T
232	OR Logic 7: Block	Input	1.002	C R W
233	OR Logic 8: 1-bit switching output	Output	1.002	C R T
234	OR Logic 8: 8-bit output A	Output	5.010	C R T
235	OR Logic 8: 8-bit output B	Output	5.010	C R T
236	OR Logic 8: Block	Input	1.002	C R W
237	Logic input 1	Input	1.002	C R W
238	Logic input 2	Input	1.002	C R W
239	Logic input 3	Input	1.002	C R W
240	Logic input 4	Input	1.002	C R W
241	Logic input 5	Input	1.002	C R W
242	Logic input 6	Input	1.002	C R W
243	Logic input 7	Input	1.002	C R W
244	Logic input 8	Input	1.002	C R W
245	Logic input 9	Input	1.002	C R W
246	Logic input 10	Input	1.002	C R W
247	Logic input 11	Input	1.002	C R W
248	Logic input 12	Input	1.002	C R W
249	Logic input 13	Input	1.002	C R W
250	Logic input 14	Input	1.002	C R W
251	Logic input 15	Input	1.002	C R W
252	Logic input 16	Input	1.002	C R W
253	Software version	readable	217.001	C R T

5. Parameter setting

5.1. Behaviour on power failure and restoration of power

Behaviour on bus or auxiliary voltage failure:

The device transmits nothing.

Behaviour on bus or auxiliary voltage failure and following programming or reset:

The device sends all measurement values as well as switching and status according to their transmission behaviour set in the parameters with the delays established in the „General settings" parameter block. The „Software version" communications object is sent once after 5 seconds.

5.2. General settings

First set the send delays after power up and programming here.
These delays should be coordinated with the entire KNX-system, i.e. in a KNX system with many participants, care should be taken that the bus is not overloaded after a KNX-bus reset. The messages of the individual participants should be sent offset.

Transmission delay after power-up and programming for:	
Measurement values	5 secs … 2 hrs
Threshold values and switching outputs	5 secs … 2 hrs
Shade automation outputs	5 secs … 2 hrs; 10 secs
Logic outputs	5 secs … 2 hrs; 10 secs

The bus load is limited with the aid of the maximum message rate. Many messages per second put a strain on the bus, but ensure faster data transmission.

Maximum telegram rate	1 • 2 • 3 • 5 • 10 • 20 messages per sec.

The signal LED can be used either to monitor GPS reception or to indicate the status of the signal object.

Function of the Signal LED	• None • Blinks if signal object = 0 • Blinks if signal object = 1 • Blinks if GPS reception OK (➔ see GPS Settings) • Blinks if GPS reception not OK (➔ see GPS Settings)

5.3. GPS Settings

The Suntracer KNX-GPS weather station has a GPS receiver that provides the date and time, among other things. Since there should only be one message for date/time in a KNX-system (e.g. when using several GPS weather stations), the procedure for dealing with the time signal of the weather station is set here.

If the date and time are set by the GPS signal and not sent, then they are only used internally, e.g. to calculate the position of the sun.

By sending to the bus (periodically or on request), the date and time of the weather station can also be used by other bus participants.

Alternatively, the date and time can be set by communication objects (i.e. from the bus). This setting is useful if another bus participant is to specify the time signal uniformly.

Date and time will be set by	• GPS signal and not transmitted • GPS signal and transmitted periodically • GPS signal and transmitted on request • GPS signal and transmitted on request + periodically • Communications objects and not transmitted

When sending periodically, the date and time are sent on the bus in a fixed cycle that can be set here.

Send cycle *(only if date and time are transmitted "periodically")*	5 s ... 2 h; 1 min

After the bus voltage is applied or restored, it can take up to 10 minutes until the GPS signal is received, sometimes even longer at locations with poor GPS reception. Therefore, a longer duration should be chosen in such cases.

If there is no reception, GPS fault is ... recognised after the last reception	20 min • 30 min • 1 h • 1.5 h • 2 h
After the return of auxiliary voltage it can take up to ten minutes till GPS OK	

The information of the GPS fault can be used by other bus participants for monitoring. The transmission behaviour can be set here to match this.

GPS fault object sends (1 = Fault | 0 = No fault)	• not send • on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the GPS fault is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is transmitted if "periodically" is selected)*	5 s ... 2 h

If date and time are set by GPS signal:

The current date and time can be set initially via the ETS. The weather station uses this data until the first time a valid GPS signal is received.

If date and time are set by communications object:

Between the transmission of the date and the transmission of the time, no date change may take place; they must be sent to the weather station on the same day.

The date and time must be received within 10 s of each other for the device's internal clock to accept this data as valid.

The weather station has an integrated real-time clock. Therefore, time keeps on running internally and can be sent to the bus, even when no GPS coverage is available or no time communication object has been received for some time. The internal clock of the weather station can show a time drift of up to ±6 seconds per day.

5.4. Location

The Suntracer KNX-GPS weather station has a GPS receiver that provides the geo-position, among other things. The location is required in order to be able to calculate the **position of the sun** with the help of the date and time. During the initial start-up, the input coordinates are used for as long as no GPS reception exists.

In order to be able to display the **correct time,** the location must also be known. Only in this way can the weather station automatically take into account the UTC offset (difference from world time) and the summer/winter time change-over.

The coordinates of various towns are saved in the weather station:

Country	• Other countries • Belgium • Germany • France • Greece • Italy • Luxembourg • Netherlands	• Norway • Austria • Portugal • Sweden • Switzerland • Spain • Turkey • UK

Location	6 towns in Belgium 41 towns in Germany 30 towns in France 9 towns in Greece 20 towns in Italy 1 town in Luxembourg 8 towns in the Netherlands 11 towns in Norway 13 towns in Austria 5 towns in Portugal 15 towns in Sweden 12 towns in Switzerland 23 towns in Spain 13 towns in Turkey 21 towns in the UK

As soon as "another country" or "another location" is selected, the input fields for the exact coordinates appear. For example, enter (40° 43′ northern latitude, 74° 0′ western longitude) for New York, USA:

E. longitude [degrees, -180…+180]	0 [negative values mean "western longitude"]
E. longitude [minutes, -59…+59]	0 [negative values mean "western longitude"]
Northern latitude [Degrees, -90…+90]	0 [negative values mean "southern latitude"]
Northern latitude [minutes, -59…+59]	0 [negative values mean "southern latitude"]
Rule for summer/winter time switching and UTC offset	0 [can be specified manually here]

The summer/winter time change-over takes place automatically when "Time zone definition standard" is selected. If "Time zone definition specific" is selected, the rule for the change-over can be adjusted manually.
Example string: 03257:0200+0100/10257:0200UTC+0100

- **03257** Switchover date winter to summer [03 = month, 25 = day, 7 = weekday (7 ≙ Sunday)]
- **0200** Switchover time winter to summer [02 = hours, 00 = minutes] (standard time = winter time)
- **+0100** Changeover difference [01 = hours, 00 = minutes] (+0000 = no changeover)
- **10257** Switchover date summer to winter [10 = month, 25 = day, 7 = weekday (7 ≙ Sunday)]
- **0200** Switchover time summer to winter [02 = hours, 00 = minutes] (standard time = winter time)
- **UTC+0100** Time zone [01 = hours, 00 = minutes] (-1200 ... +1400)

Time zone definition	Standard • specific
Summer/winter time change-over on the	ST: Sun. after 25 March WT: Sun. after 25 Oct.
Rule for summer/winter time change-over	0 [can be specified manually here] [Change only possible with "Specific time zone definition"]

The location coordinates can be sent on the KNX-bus if required. Sending on change or periodically is more useful for movable structures, such as mobile homes or ships.

Location coordinates	• Do not send • send periodically • send if there is a change • send on change and periodically

When sending on change, the location coordinates are sent on the bus as soon as they change by the percentage set here.

On change of *(is only transmitted if "on change" is selected)*	0.5° • 1° • 2° • 5° • 10°

When sending periodically, the position coordinates are sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 1 min

5.5. Rain

The rain sensor can be activated here if required.

Use rain sensor	No • **Yes**

The object value is defined for rain.

When it rains the switching output is	1 • 0

The delay times in seconds can be defined via objects.

Delays can be set via objects (in seconds)	No • Yes

With longer switching delays, a short rain shower or a short dry phase are not reported.

Switch delay to rain	none • 5 s ... • 2 h
Switch delay to no rain after it is dry again	5 min • 10 min ... • 2 h

Here you set when the switching output is to be sent to the bus.

Switching output sends	• If there is a change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the rain switching output is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h

The additional rain output is used when 2 rain outputs with different delays are needed.
If, for example, windows and awnings are to be controlled on a façade, they can react differently to rain. For windows, the longer rain delay time would ensure that the motors do not run constantly in changeable weather. The awnings on the same façade would react quickly with the help of the 2nd rain output.

Use rain output 2 with fixed switching delays (this switching output has no delay on rain recognition and 5 minutes delay after it is dry again)	No • Yes

5.6. Night

Night detection can be activated here if required.

Use night recognition Night will be recognised below 10 Lux.	No • Yes

Here you can set whether a 1 or 0 is sent to the bus at night.

At night the switching output is	1 • 0

The delay times in seconds can be defined via objects.

Delays can be set via objects (in seconds)	No • Yes

Switching delays can be used to compensate for minor brightness fluctuations, e.g. darkening due to clouds at twilight.

Switching delay on night	none • 5 s ... 2 h
Switching delay to non-night	none • 5 s ... 2 h

Here you set when the switching output is to be sent to the bus.

Switching output sends	• If there is a change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the night switching output is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h

5.7. Temperature

The output temperature value can be corrected here by an offset value if required. In this way, deviations caused by sources of interference can be compensated for, e.g. dark surfaces that heat up.

Offset in 0.1°C	-50… 50; 0

The temperature value can be sent to the bus and further processed there by other participants.

Measurement	• Do not send • send periodically • send if there is a change • send on change and periodically

When sending on change, the temperature value is sent on the bus as soon as it changes by the percentage set here.

On change of *(is only transmitted if "on change" is selected)*	2% • 5% • 10% • 25% • 50%

When sending periodically, the temperature value is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h

The highest (max.) and the lowest (min.) temperature value since programming or a reset can be sent to the bus. The two values can be reset via object no. 18 “Temperature measured value reset min./max.”

Use min. and max. values (Values are not retained after reset)	No • Yes

The “Temperature sensor fault” object is used to monitor the function of the temperature sensor. A 1 is sent in case of a fault, otherwise a 0.

Use object "Temperature sensor malfunction"	No • Yes

The temperature threshold values are used to carry out certain actions when a temperature value is exceeded or not reached.

Use threshold value 1 / 2 / 3 / 4	No • Yes

5.7.1. Temperature threshold value 1 / 2 / 3 / 4

Threshold value:

Here it is selected whether the threshold value is to be specified per parameter or via a communication object.

Threshold value setpoint using	Parameter • Communication objects

When the **threshold value per parameter** is specified, then the value is set.

Threshold value in 0.1°C increments	-300 … 800; 200

Here it is set in which cases **threshold values received by a communication object** should be retained. Please note that the setting "After power restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first Communication, the factory settings must always be used.

The last communicated value should	• not send • after restoration of power • after power restoration and programming

If the **threshold value is set by a communication object**, during the initial commissioning a threshold value must be specified which is valid until the 1st communication of a new threshold value. With weather stations that have already been taken into service, the last threshold value communicated is used.
From the 1st communication, the threshold value corresponds to the value of the communication object and is not multiplied by the factor 0.1.

Once a threshold value is set via parameter or communication object, the last set threshold value remains until a new threshold value is transmitted by a communication object.
The last threshold values set by communications objects are saved in the device, so that they are retained during a power outage and are available once again when power is restored.

Start threshold value in 0.1°C valid until first communication	-300 … 800; 200

The type of threshold value change is set here.

Type of threshold value change	Absolute value • Increase/decrease

The step size is selected here.

Step size (only for threshold value change through "Increase / Decrease")	0.1°C • 0.2°C • 0.3°C • 0.4°C • 0.5°C • 1°C • 2°C • 3°C • 4°C • 5°C

With both types of limit setting, the switching distance (hysteresis) is set, which is important for the next parameter.
The switching distance prevents the switching output of the threshold value from changing too often in the event of temperature fluctuations. When the temperature drops, the switching output does not react until the switching distance falls below the threshold value (points 1 and 2 in the next parameter). When the temperature rises, the switching output only reacts when the switching distance falls below the threshold value (points 3 and 4 in the next parameter).

Switching distance of the threshold value in %	0 ... 50; 20

Switching output:

Here it is set which value the output transmits if the threshold value is exceeded or undercut.

When the following conditions apply, the output is (TV = Threshold value) (SD = Switching distance)	• TV above = 1 | TV - SD below = 0 • LV above = 0 | TV - SD below = 1 • TV below = 1 |TV + SD above = 0 • TV below = 0 |TV + SD above = 1

Here it is set whether delays can be set via objects.

Delays can be set via objects (in seconds)	No • Yes

Switching delays ignore short-term temperature fluctuations around the threshold value or threshold value and switching distance for the switching output.

Switching delay from 0 to 1	none • 1 s ... 2 h
Switching delay from 1 to 0	none • 1 s ... 2 h

Here you set when the switching output is to be sent to the bus.

Switching output sends	• If there is a change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the temperature threshold value switching output is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h

Block:

With the help of the "Blocking" input object, the switching output can be blocked, e.g. by a manual command (push button).

Use switching output block	No • **Yes**

The block can take effect at value 0 or 1, depending on the intended use.

Assessment of the block object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release

An object value up to the 1st communication is specified here.

Blocking object value before first communication	0 • 1

The behaviour of the switching output during locking can be set.

Switching output behaviour	
On blocking	• Do not send message • send 0 • send 1
On release (with 2 second release delay)	[Dependent on the "Switching output sends" setting]

The behaviour of the switching output on release is dependent on the value of the parameter "Switching output sends" (see "Switching output")

Switching output sends on change	do not send message • Status object/s send/s
Switching output sends on change to 1	do not send message • if switching output = 1 ➔ send 1
Switching output sends on change to 0	do not send message • if switching output = 0 ➔ send 0
Switching output sends on change and periodically	Send switching output status
Switching output sends on change to 1 and periodically	if switching output = 1 ➔ send 1
Switching output sends on change to 0 and periodically	if switching output = 0 ➔ send 0

5.8. Wind

Attention! If you use wind protection functions, you should also use the wind fault object (no. 48 Wind sensor fault).
This object must be integrated in such a way that the protective function is retained in the event of a sensor failure.
For example, a shade with a wind alarm should move to the safe position or remain there.

The wind measurement value can be sent to the bus and further processed there by other participants.

Measurement	• Do not send • send periodically • send if there is a change • send on change and periodically

When sending on change, the wind measurement value is sent on the bus as soon as it changes by the percentage set here.

On change of *(is only transmitted if "on change" is selected)*	2% • 5% • 10% • 25% • 50%

When sending periodically, the wind measurement value is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s … 2 h

The highest wind measurement value since programming or a reset can be sent to the bus. This value can be reset via object no. 47 “Wind measurement value reset max.

Use maximum value (Values are not retained after reset)	No • Yes

The "Wind sensor fault" object is used to monitor the function of the wind sensor. A 1 is sent in the event of a fault, otherwise a 0.

Use object „wind sensor malfunction”	No • Yes

The wind threshold values are used to carry out certain actions when the wind speed exceeds or falls below a certain value, e.g. protection functions for shades or windows.

Use threshold value 1 / 2 / 3	No • Yes

5.8.1. Wind threshold value 1 / 2 / 3

Each threshold value can be set individually.

Threshold value / start threshold value in 0.1 m/s	1… 350; 80

All other settings corresponding to those of temperature threshold values (siehe , Seite 23).

5.9. Brightness

If the shade automation is to be used, a threshold value must be active!

The weather station detects the current brightness. This value can be sent to the bus and further processed there by other participants.

Measurement	• Do not send • send periodically • send if there is a change • send on change and periodically

When sending on change, the brightness measurement value sent on the bus as soon as it changes by the percentage set here.

at and above change in % *(is only sent if "on change" is selected)*	2% • 5% • 10% • 25% • 50%

When sending periodically, the brightness measurement value is sent on the bus in a fixed cycle that can be set here.

Send cycle *(only if "periodically" is sent)*	5 s ... 2 h

The brightness threshold value values are used to perform certain actions when the illuminance exceeds or falls below an illuminance in the kilolux range.

Use threshold value 1 / 2 / 3 / 4	No • Yes

5.9.1. Brightness threshold value 1 / 2 / 3 / 4

Each threshold value can be set individually.

Threshold value / start threshold value in klx	1 ... 150; 60

All other settings corresponding to those of temperature threshold values (siehe , Seite 23).

5.10. Twilight

The twilight threshold values are used to perform certain actions when the illuminance exceeds or falls below an illuminance in the lux range.

Use threshold value 1 / 2 / 3	No • Yes

5.10.1.Twilight threshold value 1 / 2 / 3

Each threshold value can be set individually.

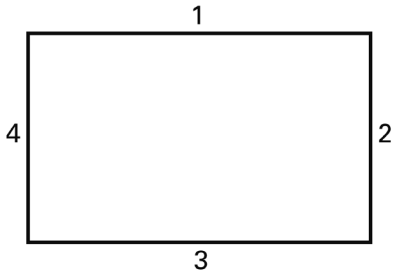
Threshold value / start threshold value in lux	1 … 1000; 200

All other settings corresponding to those of temperature threshold values (siehe , Seite 23).

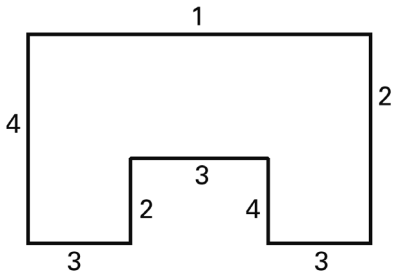
5.11. Shading

5.11.1.Classifying the facades for the control unit

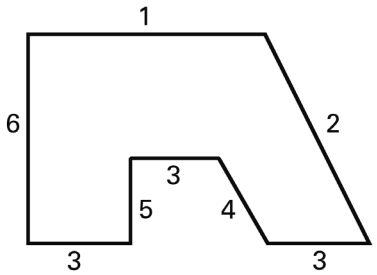
The control options for shades (shadow edge tracking and slat tracking) are facade-related functions.



Most buildings have 4 facades. It is generally recommended that the sunshade of each facade be controlled separately.



Even in buildings with a U-shaped layout, only 4 facades have to be controlled differently, as several have the same alignment.



In buildings with an asymmetrical layout the facades with a non-right-angled orientation (2, 4) must be controlled separately.

Curved/round fronts should be divided into several facades (segments) to be controlled individually.

If a building has more than 6 facades, the deployment of another weather station is recommended; particularly as this also makes it possible to measure the wind speed in another location.

When there are several buildings, wind measurement should take place separately for each building (e.g. with additional KNX W wind sensors), as, depending on the positions of the buildings in relation to one another, different wind speeds may occur.

5.12. Shade settings

The weather station calculates the direction (azimuth) and altitude (elevation) of the sun from current time data and position. Sending the sun position is purely informative.

Sun position	• Do not send • send periodically • send if there is a change • send on change and periodically

If the position of the sun changes by the angle set here, the value is sent to the bus.

On change of *(is only transmitted if "on change" is selected)*	1 ° ... 15 °

When sending periodically, the sun position is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 1 min

How many façades are used depends on the project requirements, see chapter “Classifying the facades for the control unit” auf Seite 29.

Use façade 1 / 2 / 3 / 4 / 5 / 6	No • Yes

Measures for summer heat protection can be initiated via the heat protection temperature or the object output “Heat protection status” (number 114), e.g. closing roller shutters.

Use heat protection temperature	No • **Yes**

The appropriate heat insulation temperature depends on the project requirements.

Heat protection temperature in °C	15 ... 50; 35

The switching distance value determines by how many °C the temperature must fall below the threshold value until the heat protection is inactive again.

Switching distance in °C	5...20
Heat protection is (HPTV = Heat protection threshold value) (SD = Switching distance)	HPTV above = active HPTV - SD below = inactive

Sending only on change or even only on change in one direction (1 = active or 0 = inactive) reduces the load on the bus.

"Façades heat protection status" transmits	• If there is a change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the object “Façade heat protection status” is sent on the bus fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 1 min

5.13. Facade settings

For each façade, the shade conditions (brightness, position of the sun) and the façade settings (architectural characteristics such as orientation or slat type) can be specified.

Only when these conditions are met is the shading action executed, see chapter “Facade actions” auf Seite 40.

Shade conditions:

The first condition for shading is that the brightness limit value is exceeded. The threshold value set up accordingly in advance is selected here. For explanations of the brightness threshold value, see chapter “The brightness threshold value values are used to perform certain actions when the illuminance exceeds or falls below an illuminance in the kilolux range.” auf Seite 27.

Brightness condition fulfilled if:	
Increased brightness	Brightness threshold value 1 / 2 / 3 / 4

The brightness threshold value is additionally provided with a switching distance, with the help of which smaller brightness fluctuations around the threshold value are filtered out.

Brightness condition not fulfilled if: Reduced brightness Threshold value - switching distance	
Switching distance in % of the threshold value	0 ... 50; 20

The sun position condition defines the position of the sun at which shading is to take place. Generally, the sun direction set here should correspond to the orientation of the façade. In addition, the shadows cast by roof overhangs, neighbouring buildings or

trees can be taken into account and these angled areas can also be excluded from shading. The aim is to shade only when the façade is in the sun.
For the direction of the sun (azimuth), predefined angle ranges can be used or an own angle range can be specified numerically.

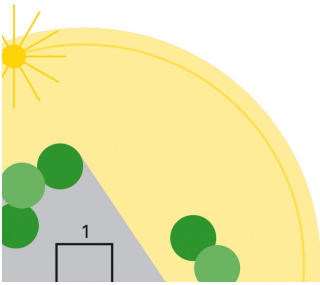
Sun position condition fulfilled if:	
Sun	• from the East (Azimuth 0°...180°) • from the South-east (Azimuth 45°...225°) • from the South (Azimuth 90°...270°) • from the south-west (Azimut 135°...315°) • from the West (Azimuth 180°...360°) • in the range

For numeric setting of the sun's range:

Sun	**in the range**
Azimuth [°] from	0 ... 360; 90
Azimuth [°] to	0 ... 360; 270
Elevation [°] from	0 ... 90
Elevation [°] to	0 ... 90

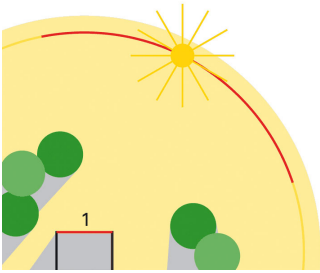
The angle, which is specified for the direction of the sun (azimuth), is aligned according to the orientation of the facade. In addition, obstacles which cast a shadow on the facade, such as, for example, a wall or overhanging roof, can also be taken into account in the setting for sun direction (azimuth) and sun height (elevation).

Example Azimuth setting:



Top view:

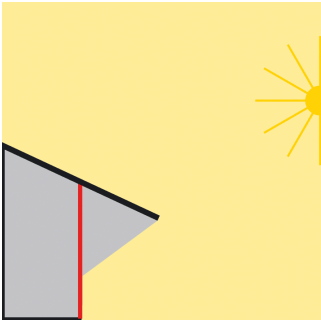
In the morning the building is fully shaded by surrounding trees.



Top view:

For facade 1, shading must only be active in the azimuth marked red, as the sun can then shine on to the building without obstruction.

Example Elevation setting:



Side view:

When the sun's position is high, the facade is only shaded by the roof overhang. Shading is only necessary if the sun is low (in the figure approx. below 53°).

Shade settings

The shading can be adjusted according to the position of the sun. See chapter “Shadow edge tracking and slat tracking” auf Seite 35.

The **shadow edge tracking** is only usable with a sunshade which is moved from the top downwards, such as shutters and blinds, and defines how far the sun may shine into the room. See chapter “Shadow edge tracking” auf Seite 34.

The higher the sun is, the more the blind can be raised without the sun penetrating deeper into the room.

The **slat tracking** is only suitable for slat blinds and, by tilting the slats, ensures that no direct sun but as much daylight as possible enters the room. See chapter “Slat tracking” auf Seite 34.

Type of tracking	• No tracking • Shadow edge tracking • Slat auto-guide • Shadow edge tracking and slat auto-guide

5.13.1.Shadow edge tracking

Type of tracking	**Shadow edge tracking**

For the correct calculation of the shadow edge tracking, the compass direction and inclination of the façade must be entered. More in chapter “Orientation and inclination of the facade” auf Seite 36.

Orientation of the façade in ° [North 0°, East 90°, South 180°, West 270°]	0 ... 360; 180
Inclination of the façade in ° [0° = no inclination]	-90 ... 90; 0

The distance from the floor to the top edge of the window (window height) is required for correct shadow edge tracking.

Window height in cm	1 ... 1000; 150

The maximum penetration depth defines how far the sun may shine into the room as seen from the façade/window area. This can prevent sensitive plants from being exposed to direct sunlight, for example.

Maximum penetration depth of the sun into the room in cm	10 ... 250; 50

The fineness of the tracking is set by the movement in cm.

From a shadow shift of... cm auto-tracking is performed	1 ... 50; 10

5.13.2.Slat tracking

Type of tracking	**Slat tracking**

For the correct calculation of the slat tracking, the compass direction and inclination of the façade must be entered. More in chapter “Orientation and inclination of the facade” auf Seite 36.

Orientation of the façade in ° [North 0°, East 90°, South 180°, West 270°]	0 ... 360; 180
Inclination of the façade in ° [0° = no inclination]	-90 ... 90; 0

The alignment, width and spacing of the slats are required for correct slat tracking. More in chapter “Slat types and determination of width and distance” auf Seite 37.

Slat orientation	horizontal • vertical
Slat width in mm	1 ... 1000; 50
Slat distance in mm	1 ... 1000; 50

The fineness of the tracking is set by the minimum angle change.

Minimum angle change in ° for transmitting a new slat position	1 ... 90; 10

The slat angles in the upper stop position (0%) and lower stop position (100%) differ depending on the type of blind. More in chapters “Slat position with horizontal slats” auf Seite 38 and “Slat position with vertical slats” auf Seite 39.

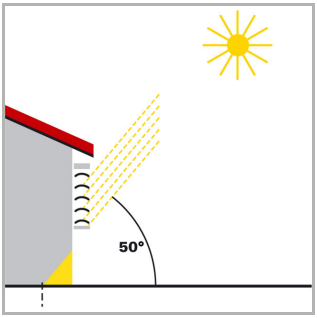
Slat angle in ° after positioning command 0%	0 ... 180; 90
Slat angle in ° after positioning command 100%	0 ... 180

5.13.3.Shadow edge tracking and slat tracking

With **shadow edge tracking** the sunshade is not moved down fully; rather it is moved only so far that the sun can still shine a parametrisable distance (e.g. 50 cm) into the room. This allows the room user to look at open air through the lower part of the window, and plants which may be on the window ledge to be exposed to the sun.

Note: The shadow edge tracking is only useable with a sunshade which is moved from the top downwards (e.g. shutters, textile shades or blinds with horizontal slats). This function is not useable with sunshades which are pulled in front of a window from one or both sides.

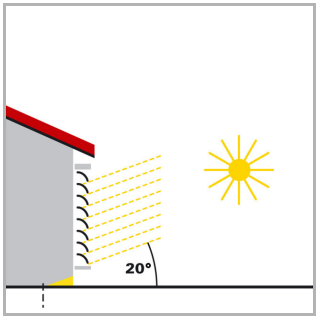
With **slat tracking** the horizontal slats of blinds are not fully closed but rather automatically adjusted so that the sun cannot shine directly into the room. Diffuse daylight can still enter the room through the slats and contribute to dazzle-free room lighting. Using slat tracking with external blinds, the entry of warm air into the room through sunshine can be avoided and, at the same time, energy costs for lighting the room can be reduced.



Sunshade when the position of the sun is high

The sunshade is only partially closed and automatically moved down only enough so that the sun cannot shine further into the room than specified via the maximum permitted penetration depth.

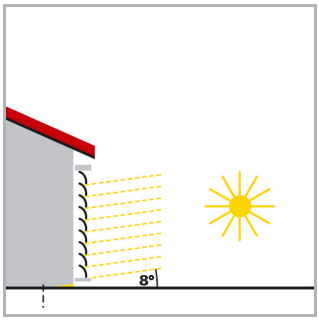
The slats can be set almost vertically without the sun shining directly into the room.



Sunshade when the sun is in a central position

The sunshade is automatically moved down only far enough so that the sun does not exceed the maximum permitted penetration depth in the room.

The slats are automatically closed further, so that the sun cannot shine directly into the room. Despite that, diffuse daylight can still reach the room and so contribute to the room lighting (daylight usage).

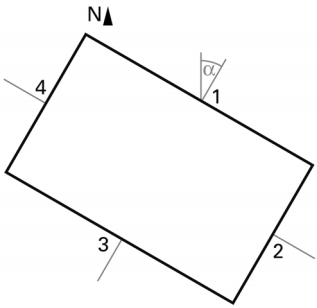


Sunshade when the position of the sun is low

The sunshade is automatically moved down almost fully, so that the sun does not shine too far into the room.

The slats are automatically closed further, so that the sun cannot shine in directly.

5.13.4.Orientation and inclination of the facade



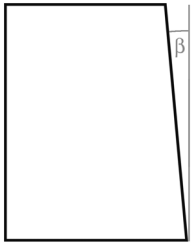
Top view:

The facade orientation corresponds to the angle between the North-South axis and the facade vertical. The angle α here is measured in a clockwise direction (North corresponds to 0°, East 90°, South 180° and West 270°).

The facade orientations result as follows:

Facade 1: α
Facade 2: α + 90°
Facade 3: α + 180°
Facade 4: α + 270°

Example: The building in the picture is tilted by α = 30°, i. e. the facade orientation is 30°, 120°, 210° and 300°



Side view:

If a facade surface is not oriented horizontally, this must be taken into account. A forward inclination of the facade is counted as a positive angle; a backwards inclination (as in the picture) as a negative angle. This also allows a sunshade of a window built into a sloping roof surface to be controlled according to the current position of the sun.

If a facade is not a flat surface, but rather arched or bent, it must be subdivided into several segments to be controlled separately.

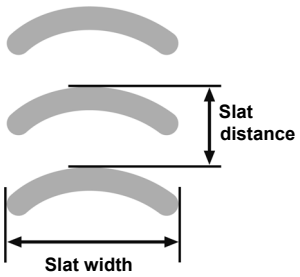
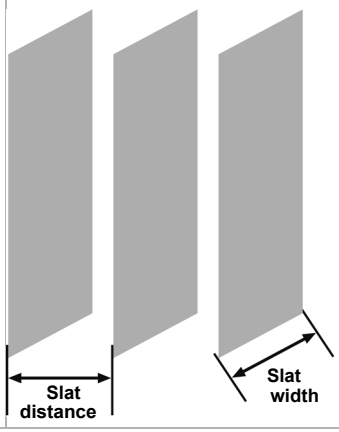
5.13.5.Slat types and determination of width and distance

In the slat tracking, a distinction is made between a sunshade or glare protection with horizontal slats and one with vertical slats.

A sunshade with vertical slats (e.g. external blinds) is typically moved downwards from the top. By contrast, an internal glare protector often consists of thin strips of material (vertical slats), which can be rotated around 180° and are pulled out from one or both sides of the window.

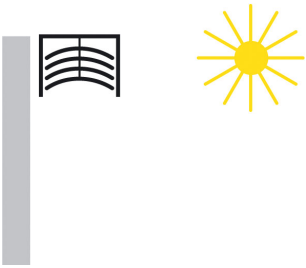
Both types of slat can be adjusted by the weather station so that no direct sunlight falls into the room, but as much diffuse daylight as possible does.

In order for the slat tracking to set the slats correctly, their width and distance from one another must be known.

Horizontal Slats	Vertical Slats
	

5.13.6.Slat position with horizontal slats

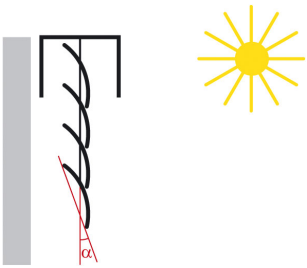
With Elsner actuators, which, for blinds drives with 2 stop positions, make it possible for movement to a sunshade position to be specified via a position input in per cent, the upper stop position (i. e. sunshade fully opened) is controlled or reported via the value „0%".



Sunshade opened (upper stop position: 0%)

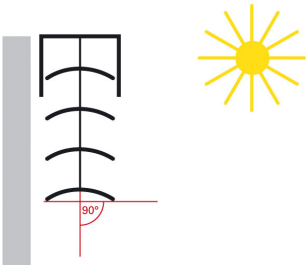
If the lower stop position is to be approached, this is specified to the blinds actuator as sun position „100%" or it will report reaching the lower stop position (i.e. sunshade fully closed) using this value. If blinds are moved down from the upper stop position, the slats first turn into an almost vertical position and the sunshade moves with closed slats to the lower stop position.

If the blinds are in the lower end position and the slats are fully closed, this slat position is described as both „vertical" and „100%". Normally, however, fully closed slats do not have an exactly vertical position (α = 0°) but rather form a slight angle with the vertical. With slat tracking, this angle must be determined and specified via the associated parameter.



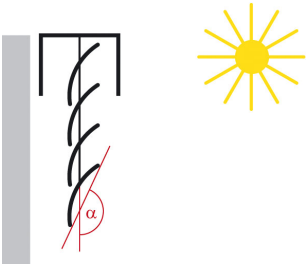
Sunshade and slats closed (lower stop position: 100%, slat position: 100%)

From its „vertical" position (completely closed, 100%) the slats can be adjusted to their horizontal position (fully opened, 0% or α = 90°). For this, the drive used for the blinds defines whether this adjustment can take place almost continuously in many small steps (as with SMI drives, for example) or whether it is only possible in a few large steps (as with most standard drives).



Slat position horizontal (0%, α = 90°)

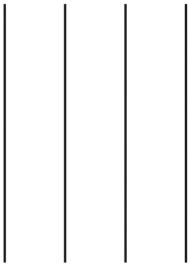
With standard blinds, the slats can be adjusted further via their horizontal position past the point where the slat adjustment ends and the blinds begin to move upwards. The slats then form an angle between 90° und 180° with the vertical.



Slat position at the beginning of movement UP

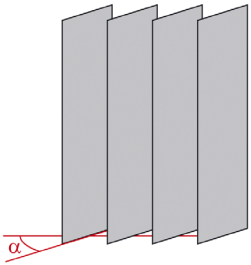
5.13.7.Slat position with vertical slats

If an internal glare protector or screen with vertical slats is controlled by an Elsner blinds actuator, the position in which the slats are fully open is controlled or reported as the 0% slat position.



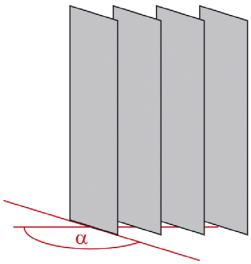
Fully opened vertical slats (slat position 0%)

If the slats are fully closed, this position is controlled or reported as the 100% slat position. This is the position in which the glare protector is moved in front of the window from the stop position at the side. For this, the angle formed by the slats with the direction of movement is >0°.



Fully closed vertical slats (slat position 100%)

If the glare protector is later retracted (i.e. opened), in the process the vertical slats are turned into a position that is somewhat less than 180°.



Vertical slats at the beginning of movement UP

5.14. Facade actions

If the brightness condition is fulfilled for the specified duration and the sun position condition is fulfilled, the actions described below are executed. For conditions see chapter “Facade settings” auf Seite 31.
With the delay time, higher illuminance levels, for example due to a break in the clouds, can be “faded out” for a short time.

If it is bright enough (brightness condition fulfilled)	
for more than	0 s … 2 h; 2 min
AND	
The sun shines on the façade	
(sun position condition fulfilled)	

Actions:
- Façade status object is set to the value = 1.
- If shadow edge tracking is activated, the calculated position is approached. Otherwise, the movement position set here is approached.
- If slat tracking is activated, the calculated position is approached. Otherwise, the slat angle set here is approached.

Then: →Object “façade 1 status” = 1

→ Movement position in %	0 ... 100 (or follow shadow edge tracking)
→ Slat position in %	0 ... 100 (or follows slat tracking)

If the brightness condition is no longer fulfilled for the duration specified here, the actions of the “first retraction level” described below are carried out.
With the delay time, lower illuminance levels, for example due to passing clouds, can be “faded out” for a short time.

If it is not bright enough	
for more than	0 s ... 2 h; 10 min

This is the first retraction level that can be used to not yet fully retract the shade. Such an intermediate step is particularly pleasant with large windows, as a little more light is let in, but the sunshade position is also quickly reached again when it gets lighter again shortly afterwards.
Here it is recommended not to change the movement position and to set the slat position to maximum light transmission.

Actions:
- Movement position can be changed.
- Slat position can be changed.

If no change is selected, then this “first retraction level” is skipped.

Then:	
→ Change movement position	Yes • No
Movement position in % *(only if movement position should be changed)*	0 ... 100
→ Change slat position	Yes • No
Slat position in % *(only if slat position should be changed)*	0 ... 100

If the brightness condition is no longer fulfilled for the duration specified here, the actions described below are carried out. The same applies if the sun position condition is not longer fulfilled.

If afterwards it is still not bright enough	0 s ... 2 h; 30 min
OR	
The sun is no longer shining on the façade	

Actions:
- Façade status object is set to the value = 0
- Movement position can be changed.
- Slat position can be changed.

If no change is selected, the shade remains in the current position. This can be used if the shade has already been completely retracted in the "first retraction level" or if the shade is not to be completely retracted for other reasons.

Then: → Object "Façade 1 status“ = 0	
→ Change movement position	Yes • No
Movement position in % (only if movement position should be changed)	0 ... 100
→ Change slat position	Yes • No
Slat position in % (only if slat position should be changed)	0 ... 100

Transmission behaviour of the objects:

The change of a movement or slat position is immediately sent to the bus.

Movement position and slat position	• send if there is a change • send on change and periodically

For additional periodic sending, both objects “Façade X: Movement position” and “Façade X: slat position” is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 2 min

When the “Façade X status” object is to be sent on the bus is set here.

Object sends "Façade X status"	• If there is a change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the object “Façade X: status” is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 2 min

Heat protection:

The heat protection function can be used to close shades in order to shield from heat. For this, the heat protection temperature must be activated in the “Shading” section. See heat protection temperature in chapter “Shade settings” auf Seite 30.

Use heat protection	**Yes** • No
Movement position in % *(only if heat protection is used)*	0 ... 100
Slat position in % *(only if heat protection is used)*	0 ... 100

Block:

The façade has its own block object (Façade X: Block (1 = blocked)). For example, a manual command (push-button) can lock the automatic shading system.

Behaviour after block	• react to the last automatic command • wait for the next automatic command

Before the first communication, i.e. after commissioning or bus voltage restoration, the block can be active (1) or not (0).

Blocking object value before first communication	0 • 1

5.15. Calendar time switch

The calendar timer defines switching sequences for specific periods during the year. For example, a garden pond pump can only be operated during the summer months.

Use period 1 / 2 / 3	**Yes** • No

5.15.1.Calendar clock period 1 / 2 / 3

The start date and end date are defined.

from:	
Month	January ... December
Day	1 ... 29 / 1 ... 30 / 1 ... 31 (according to month)
Up to and including:	
Month	January ... December
Day	1 ... 29 / 1 ... 30 / 1 ... 31 (according to month)

A sequence sets the switch-on and switch-off time for each day of the set period.

Sequence 1	not active • active
Sequence 2	not active • active

5.15.2.Calendar clock period 1 / 2 / 3, Sequence 1 /2

Switch-on time hours	0 ... 23
Switch-on time minutes	0 ... 59
Switch-off time hours	0 ... 23
Switch-off time minutes	0 ... 59

If the switching output of the calendar clock is only used for internal logic, then it does not have to be sent to the bus.

Switching output sends	• not send • on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the object “Calendar timer time X, Seq. X: switching output” is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 1 min

5.16. Weekly time switch

The weekly timer offers the possibility of defining different switching times on each day of the week. For example, on weekdays the shutters can be opened every morning and closed again in the evening. 4 sequences per day are available.

Monday ... Sunday	not active • active

5.16.1. Weekly clock Mo, Tu, We, Th, Fr, Sa, Su 1 ... 4

A sequence sets the switch-on and switch-off time for the day of the week.
If, for example, 8:35 is set as the switch-on time, the output switches off on the change from 8:34 to 8:35.
If, for example, 15:35 is set as the switch-off time, the output switches off on the change from 15:35 to 15:36.

Switch-on time hours	0 ... 23
Switch-on time minutes	0 ... 59
Switch-off time hours	0 ... 23
Switch-off time minutes	0 ... 59

A time switching sequence can be assigned to an OR connection. This allows another condition to be added directly in the OR connection in addition to the time. For example, a roller shutter can be opened every morning at 7:00 OR when it is brighter than 10 lux. More in chapter “Use of the weekly clock” auf Seite 46.

Shall sequence 1 / 2 / 3 / 4 be allocated to the linkage weekly clock OR 1 / 2 / 3 / 4	No (do not allocate) • Yes (allocate)

If the switching output of the weekly timer is only used for internal logic, then it does not have to be sent to the bus.

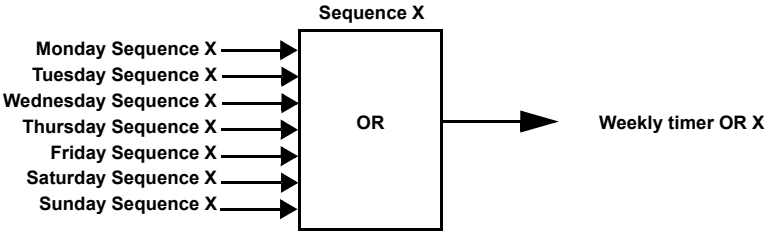
Switching output sends	• not send • on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically

When sending periodically, the object “Weekly timer [week day] X: switching output” is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h; 1 min

5.16.2. Use of the weekly clock

If the sequence X of a weekday is assigned to the OR connection X, all these assignments are OR-linked with each other. The logical result of this connection can be used as input for an OR logic gate.



5.17. Logic

The device has 16 logic inputs, eight AND and eight OR logic gates.
For each logic input, the object value can be assigned before the first communication, which is used for the initial commissioning and when the voltage returns.

Use logic inputs	No • Yes
Object value prior to 1st Communication for:	
Logic input 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16	0 • 1

Which logic gate should be used is selected here.

AND logic

AND Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	not active • active

OR logic

OR Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	not active • active

5.17.1. AND Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8

Four inputs can be defined for each logic gate.

1. / 2. / 3. / 4. Input	• Do not use • all switching events that the device provides (see "AND logic connection inputs")

Each logic output can transmit one 1-bit or two 8-bit objects.

Logic output sends	• a 1-bit-object • sends two 8-bit objects

If the **output type is a 1-bit-object**, both object values are set.

if logic = 1 ➔object value	1 • 0
if logic = 0 ➔Object value	1 • 0

Here you set when the logic output is to be sent to the bus.

Send behaviour	• on change of logic • on change of logic to 1 • on change of logic to 0 • on change of logic and periodically • on change of logic to 1 and periodically • on change of logic to 0 and periodically

When sending periodically, the AND logic object is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h

If the **output type is two 8-bit-objects**, the object type and object values are set.

Type of objects	• Value [0…255] • Percent [0…100%] • Angle [0…360°] • Scene call-up [0…63]
If logic = 1 ➔Object A value	0 ... 255
If logic = 0 ➔Object A value	0 ... 255
If logic = 1 ➔Object B value	0 ... 255
If logic = 0 ➔Object B value	0 ... 255

Here you set when the logic output is to be sent to the bus.

Send behaviour	• on change of logic • on change of logic to 1 • on change of logic to 0 • on change of logic and periodically • on change of logic to 1 and periodically • on change of logic to 0 and periodically

When sending periodically, the AND logic object is sent on the bus in a fixed cycle that can be set here.

Send cycle *(is sent only if "periodically" is selected)*	5 s ... 2 h

For example, frost protection can be realised as follows:
AND X input 1 = rain (with 2h switch-off delay)
AND X input 2 = temperature GW1 (= 1 on falling below +1.0°C for example)
AND X output A = 0%
AND X output B = 0%
AND X outputs send on change to 1

Block:

Each logic gate has its own block object (AND logic X: output block), for which it is set here whether it blocks on receipt of a 1 or 0.

Assessment of the block object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release

Before the first communication, i.e. after commissioning or bus voltage restoration, the block can be active (1) or not (0).

Blocking object value before first communication	0 • 1

The behaviour of the switching output during locking can be set.

Switching output behaviour	
On blocking	• Do not send message • send 0 • send 1
On release (with 2 second release delay)	[Dependent on the "Switching output sends" setting]

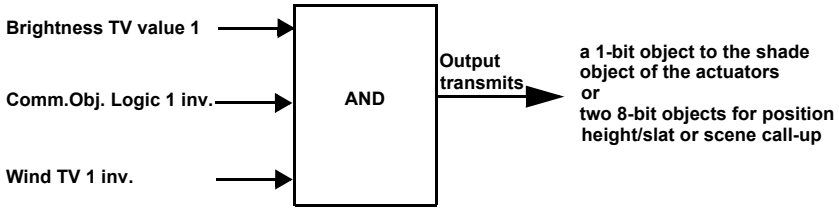
The behaviour of the output on release is dependent on the value of the parameter "send pattern".

Switching output sends on change	do not send message • Status object/s send/s
Switching output sends on change to 1	do not send message • if switching output = 1 ➔ send 1
Switching output sends on change to 0	do not send message • if switching output = 0 ➔ send 0
Switching output sends on change and periodically	Send switching output status
Switching output sends on change to 1 and periodically	if switching output = 1 ➔ send 1
Switching output sends on change to 0 and periodically	if switching output = 0 ➔ send 0

5.17.2.Use of the AND logic

Sun automation example

To illustrate, the AND logic can be used to define the conditions for shading, for example a brightness threshold value and the re-activation of the shading following a wind alarm and a manually-operated block are also included in this example.



- Brightness threshold value 1: Defines the brightness from which shading will occur.
- Communications object Logic 1 inverted: Blocking function for the sun automation, e.g. via a button (blocking following manual operation).
  Logic = 0 ➔ released, Logic = 1➔ blocked.
  For this the „Communications objects logic inputs" must be released in „General Settings" and the „Communications object Logic 1" be linked with group addresses via the button.
- Wind threshold value 1 inverted: The automation activates again once a wind alarm is over (i.e. if the other conditions are fulfilled, shading will occur again).

5.17.3.Connection inputs of the AND logic

do not use (AND)
do not use (OR)
Logic input 1
Logic input 1 inverted
Logic input 2
Logic input 2 inverted
Logic input 3
Logic input 3 inverted
Logic input 4
Logic input 4 inverted
Logic input 5
Logic input 5 inverted
Logic input 6
Logic input 6 inverted
Logic input 7
Logic input 7 inverted
Logic input 8
Logic input 8 inverted
Logic input 9
Logic input 9 inverted
Logic input 10
Logic input 10 inverted

Logic input 11
Logic input 11 inverted
Logic input 12
Logic input 12 inverted
Logic input 13
Logic input 13 inverted
Logic input 14
Logic input 14 inverted
Logic input 15
Logic input 15 inverted
Logic input 16
Logic input 16 inverted
GPS Malfunction = ON
GPS Malfunction = OFF
Temperature Sensor Malfunction = ON
Temperature Sensor Malfunction = OFF
Wind Sensor Malfunction = ON
Wind Sensor Malfunction = OFF
Switching output rain 1
Switching output rain 1 inverted
Switching output rain 2
Switching output rain 2 inverted
Switching output night
Switching output night inverted
Switching output temp 1
Switching output temp 1 inverted
Switching output temp 2
Switching output temp 2 inverted
Switching output temp 3
Switching output temp 3 inverted
Switching output temp 4
Switching output temp 4 inverted
Switching output wind 1
Switching output wind 1 inverted
Switching output wind 2
Switching output wind 2 inverted
Switching output wind 3
Switching output wind 3 inverted
Switching output bright 1
Switching output bright 1 inverted
Switching output bright 2
Switching output bright 2 inverted
Switching output bright 3
Switching output bright 3 inverted
Switching output bright 4
Switching output bright 4 inverted
Switching output twil 1
Switching output twil 1 inverted

Switching output twil 2
Switching output twil 2 inverted
Switching output twil 3
Switching output twil 3 inverted
Facade 1 Status
Facade 1 Status inverted
Facade 2 Status
Facade 2 Status inverted
Facade 3 Status
Facade 3 Status inverted
Facade 4 Status
Facade 4 Status inverted
Facade 5 Status
Facade 5 Status inverted
Facade 6 Status
Facade 6 Status inverted
Switching output cal. clock Period 1 Seq. 1
Switching output cal. clock Per. 1 Seq. 1 inverted
Switching output cal. clock Period 1 Seq. 2
Switching output cal. clock Per. 1 Seq. 2 inverted
Switching output cal. clock Period Seq. 1
Switching output cal. clock Per. 2 Seq. 1 inverted
Switching output cal. clock Period Seq. 2
Switching output cal. clock Per. 2 Seq. 2 inverted
Switching output cal. clock Period Seq. 1
Switching output cal. clock Per. 3 Seq. 1 inverted
Switching output cal. clock Period Seq. 2
Switching output cal. clock Per. 3 Seq. 2 inverted
Switching output weekly clock Monday 1
Switching output weekly clock Monday 1 inverted
Switching output weekly clock Monday 2
Switching output weekly clock Monday 2 inverted
Switching output weekly clock Monday 3
Switching output weekly clock Monday 3 inverted
Switching output weekly clock Monday 4
Switching output weekly clock Monday 4 inverted
Switching output weekly clock Tuesday 1
Switching output weekly clock Tuesday 1 inverted
Switching output weekly clock Tuesday 2
Switching output weekly clock Tuesday 2 inverted
Switching output weekly clock Tuesday 3
Switching output weekly clock Tuesday 3 inverted
Switching output weekly clock Tuesday 4
Switching output weekly clock Tuesday 4 inverted
Switching output weekly clock Wednesday 1
Switching output weekly clock Wednesday 1 inverted
Switching output weekly clock Wednesday 2
Switching output weekly clock Wednesday 2 inverted

Switching output weekly clock Wednesday 3
Switching output weekly clock Wednesday 3 inverted
Switching output weekly clock Wednesday 4
Switching output weekly clock Wednesday 4 inverted
Switching output weekly clock Thursday 1
Switching output weekly clock Thursday 1 inverted
Switching output weekly clock Thursday 2
Switching output weekly clock Thursday 2 inverted
Switching output weekly clock Thursday 3
Switching output weekly clock Thursday 3 inverted
Switching output weekly clock Thursday 4
Switching output weekly clock Thursday 4 inverted
Switching output weekly clock Friday 1
Switching output weekly clock Friday 1 inverted
Switching output weekly clock Friday 2
Switching output weekly clock Friday 2 inverted
Switching output weekly clock Friday 3
Switching output weekly clock Friday 3 inverted
Switching output weekly clock Friday 4
Switching output weekly clock Friday 4 inverted
Switching output weekly clock Saturday 1
Switching output weekly clock Saturday 1 inverted
Switching output weekly clock Saturday 2
Switching output weekly clock Saturday 2 inverted
Switching output weekly clock Saturday 3
Switching output weekly clock Saturday 3 inverted
Switching output weekly clock Saturday 4
Switching output weekly clock Saturday 4 inverted
Switching output weekly clock Sunday 1
Switching output weekly clock Sunday 1 inverted
Switching output weekly clock Sunday 2
Switching output weekly clock Sunday 2 inverted
Switching output weekly clock Sunday 3
Switching output weekly clock Sunday 3 inverted
Switching output weekly clock Sunday 4
Switching output weekly clock Sunday 4 inverted
Weekly clock OR 1
Weekly clock OR 1 inverted
Weekly clock OR 2
Weekly clock OR 2 inverted
Weekly clock OR 3
Weekly clock OR 3 inverted
Weekly clock OR 4
Weekly clock OR 4 inverted

5.17.4.OR Logic

Four inputs can be defined for each logic gate.

1. / 2. / 3. / 4. Input	• do not use • all switching events the sensor makes available (see „Connection inputs of the OR logic")
Logic output transmits	• a 1-bit object • two 8-bit objects

All parameters of the OR logic correspond to those of the AND logic.

5.17.5.Connection inputs of the OR logic

The connection inputs of the OR logic correspond to those of the AND logic.
In addition the following inputs are available to the OR logic:

Switching output AND Logic 1
Switching output AND Logic 1 inverted
Switching output AND Logic 2
Switching output AND Logic 2 inverted
Switching output AND Logic 3
Switching output AND Logic 3 inverted
Switching output AND Logic 4
Switching output AND Logic 4 inverted
Switching output AND Logic 5
Switching output AND Logic 5 inverted
Switching output AND Logic 6
Switching output AND Logic 6 inverted
Switching output AND Logic 7
Switching output AND Logic 7 inverted
Switching output AND Logic 8
Switching output AND Logic 8 inverted

Questions about the product?

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Tel. +49 (0) 70 33 / 30 945-250 or
service@elsner-elektronik.de

We need the following information to process your service request:

- Type of appliance (model name or item number)
- Description of the problem
- Serial number or software version
- Source of supply (dealer/installer who bought the device from Elsner Elektronik)

For questions about KNX functions:

- Version of the device application
- ETS version used for the project

elsner

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