Suntracer KNX-GPS light

Weather Station

Item numbers 3090 (230V), 3094 (12...40 V DC, 12...28 V AC)

elsner elektronik

Installation and Adjustment

Installation, inspection, commissioning and troubleshooting of the device must only be carried out by a competent electrician.

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.

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. Description

The **Weather Station Suntracer KNX-GPS light** light measures temperature, wind speed and brightness. It perceives precipitation and receives the GPS signal for time and position. Furthermore, the exact position of the sun (azimuth and elevation) is calculated on the basis of location coordinates and time.

ATTENTION
The calculation of the position of the sun is optimised for UTC -1...+3. The device therefore may only be applied within Europe. For other time zones, please use Suntracer KNX-GPS Weather Station.

All data may be used for the control of switching outputs which depend on threshold values. The states may be linked by means of AND and OR logic gates. The compact housing of **Suntracer KNX-GPS light** stores the sensor system, the evaluation electronics and the electronics of the bus connection.

Functions:

- **Brightness and position of the sun**: The current light intensity is measured by means of a sensor. At the same time, Suntracer KNX-GPS light calculates the position of the sun (azimuth and elevation) on the basis of time and location
- **Wind measurement**: The measurement of wind speed is accomplished electronically and thus noiseless and reliable even in case of hail, snow and minus temperature. Air swirls and up-draught in the radius of the weather station are collected, too
- **Precipitation perception**: The surface of the sensor is heated so that only drops and flakes are recognised as precipitation but not fog or dew. If it stops raining or snowing, the sensor dries quickly and the precipitation message ends
- **Temperature measurement**
- **Week and calendar time switch**: The weather station receives time and date from the integrated GPS receiver. The week time switch operates up to 4 different periods each day. With the calendar time switch, you may determine 3 additional periods where the time switch accomplishes up to 2 activations and deactivations each day. The Switching outputs can be used as communication objects. The switching times are set by parameter or via communication objects
- **Threshold values** for all measured and calculated values can be set by parameter or via communication objects
- **8 AND and 8 OR logic gates** with each 4 inputs. Every switching incident as well as 8 logic inputs (in the form of communication objects) may be used as inputs for the logic gates. The output of each gate may optionally be configured as 1 bit or 2 x 8 bits

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.

1.1. Technical specifications

Housing	Plastic material
Colour	White / translucent
Mounting	On-wall
Protection category	IP 44
Dimensions	approx. 96 × 77 × 118 (W × H × D, mm)
Weight	230 V AC version: approx. 240 g, 12…40 V DC, 12…28 V AC version: approx. 170 g
Ambient temperature	Operation -30…+50°C, Storage -30…+70°C
Operating voltage	Available for 230 V AC or for 12…40 V DC (12…28 V AC). An appropriate power supply unit can be obtained from Elsner Elektronik.
Auxiliary current	230 V AC version: max. 20mA 12…40 V DC, 12…28 V AC version: max. 185 mA at 12 V DC, max. 81 mA at 24 V DC Residual ripple 10%
Bus current	max. 8 mA
Data output	KNX +/- bus terminal plug
BCU type	Own micro controller
PEI type	0
Group addresses	max. 254
Allocations	max. 255
Communication objects	222
Heating rain sensor	approx. 1.2 W
Measurement range temperature:	-40…+80°C
Resolution (temperature)	0.1°C
Accuracy (temperature)	±1°C at -10…+85°C ±1.5°C at -25…+150°C
Measurement range wind	0…35 m/s
Resolution (wind)	0,1 m/s
Accuracy (wind)	at ambient temperature -20…+50°C: ±22% of the measurement value when incident flow is from 45…315° ±15% of the measurement value when incident flow is from 90…270° (Frontal incident flow corresponds to 180°)
Measurement range brightness	0…150 000 lux

Resolution (brightness)	1 lux at 0…120 lux 2 lux at 121…1 046 lux 63 lux at 1 047…52 363 lux 423 lux at 52 364…150 000 lux
Accuracy (brightness)	±35%

The product conforms with the provisions of EU directives.

2. Installation and commissioning

2.1. Installation notes

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

CAUTION!
Live voltage!
There are unprotected live components inside the device.

- National legal regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled 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.

2.1.1. Installation position

Choose an installation position in the building where wind, rain and sun can be measured unhindered by the sensors. The weather station must not be installed underneath any structural parts from which water can still drip onto the rain sensor after it has stopped raining or snowing. The weather station must not be shaded by anything, such as building structures or trees.

At least 60 cm of clearance must be left all round the weather station. This facilitates correct wind speed measurement without eddies. The distance concurrently prevents spray (raindrops hitting the device) or snow (snow penetration) from impairing the measurement. It also does not allow birds to bite it.
Please take note that an extended awning does not shade the device from sun and wind.

Temperature measurements can also be affected by external influences such as by warming or cooling of the building structure on which the sensor is mounted, (sunlight, heating or cold water pipes). Temperature variations from such sources of interference must be corrected in the ETS in order to ensure the specified accuracy of the sensor (temperature offset).

Magnetic fields, transmitters and interfering fields from electricity consumers (e.g. fluorescent lamps, neon signs, switched-mode power supplies etc.) can interfere with or even cut out reception of the GPS signal.

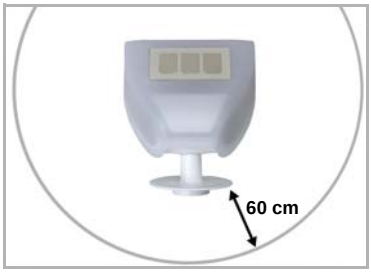


Fig. 1
There must be at least 60 cm of space below, to the sides and in front of the weather station left from other elements (structures, construction parts, etc.).

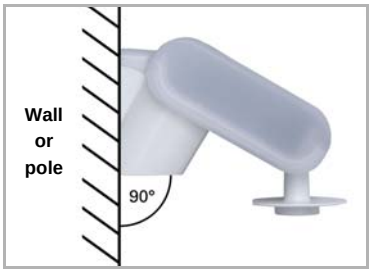


Fig. 2
The weather station must be mounted on a vertical wall (or a pole).

Fig. 3
The weather station must be mounted in the horizontal transverse direction (horizontally).

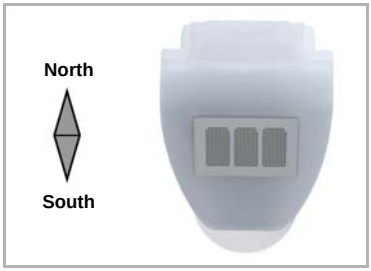


Fig. 4
For installation in the northern hemisphere, the weather station must be aligned to face south.

For installation in the southern hemisphere, the weather station must be aligned to face north.

2.2. Mounting the weather station

2.2.1. Attaching the mount

The weather station comes with a combination wall/pole mount. The mount comes adhered by adhesive strips to the rear side of the housing.

Fasten the holder vertically to the wall or pole.

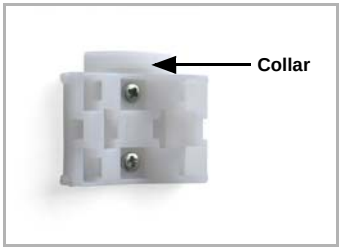


Fig. 5
For wall mounting: Flat side to the wall, crescent moon-shaped crosspiece facing up.

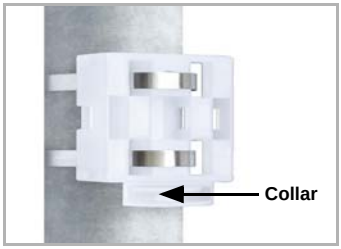


Fig. 6
For pole mounting: curved side to the pole, crosspiece facing down.

Fig. 7
Different mounting arms are available from Elsner Elektronik as additional, optional accessories for flexible installation of the weather station on a wall, pole or beam.

Example of the use of a mounting arm: Due to flexible ball joints, the sensor can be brought into ideal position.

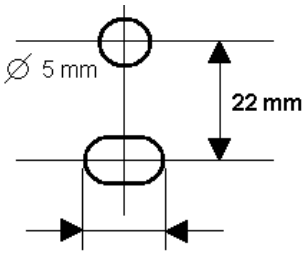
Fig. 8
Example use of the hinge arm mounting: With the hinge arm mounting, the weather station projects from beneath the roof overhang. Sun, wind and precipitation can act upon the sensors without hindrance.

Fig. 9
Example use of the hinge arm mounting: Fitting to a pole with worm drive hose clips

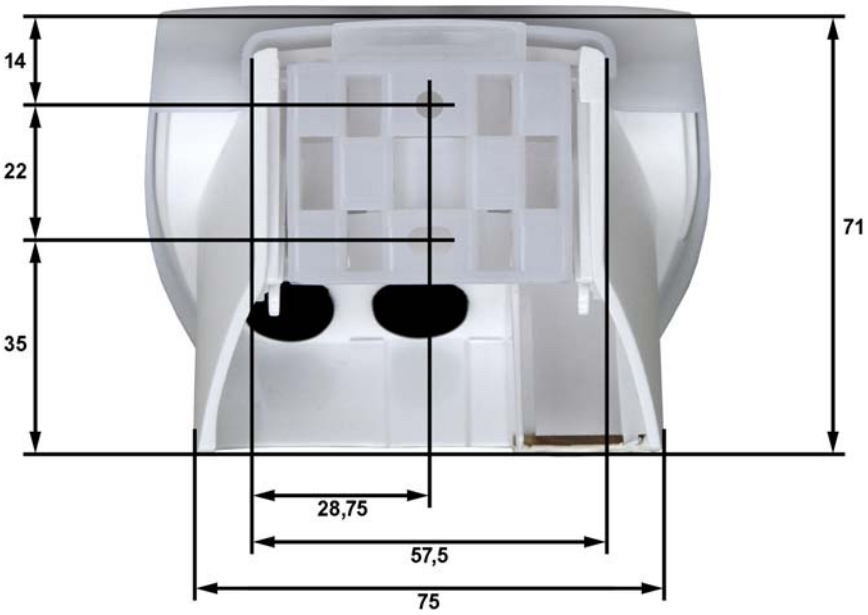
2.2.2. Rear view and drill sketch

Fig. 10 a+b
Drill sketch.

Dimensions of the rear side of the housing with holder, dimensions in mm. Divergences are possible for technical reasons.



Oblong hole 7,5 x 5 mm



2.2.3. Weather station layout

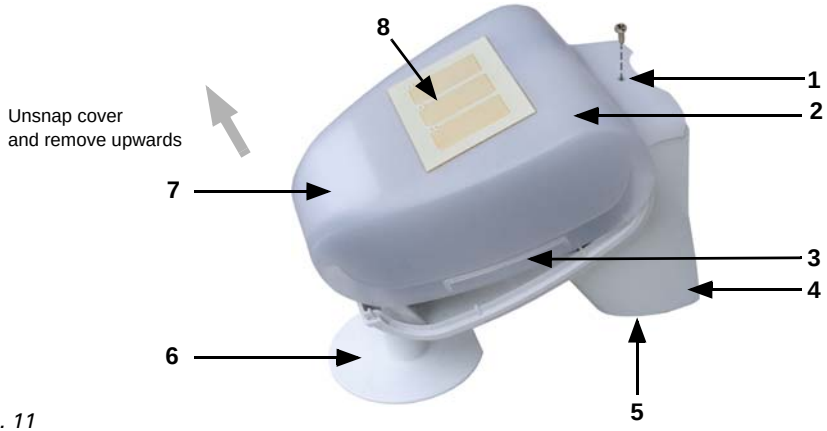


Fig. 11

1 *Screw-on cover (230V device)*
2 *Cover*
3 *Cover snaps*
4 *Bottom part of housing*
5 *Temperature sensor*
6 *Wind sensor*
7 *Brightness sensor*
8 *Rain sensor*

2.2.4. Connection of the weather station

The weather station cover with the rain sensor snaps in on the left and right along the bottom edge (see Fig.). Remove the weather station cover. Proceed carefully, so as not to pull off the wire connecting the PCB in the bottom part with the rain sensor in the cover (soldered cable connection in case of 230 V AC version, cable with plug in case of 12...40 V DC, 12...28 V AC version).

Push the power supply and bus connection cable through the rubber seal on the bottom of the weather station and connect voltage and bus +/- to the provided clamps.

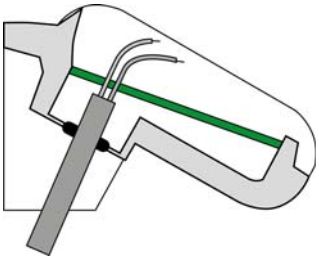


Fig. 12
Remove the cable shielding under the circuit board and only feed the connector cables upwards through the openings in the circuit board.

For 12...40 V DC, 12...28 V AC devices the connection cable must be plugged in between the cover and circuit board.

2.2.5. PCB layout

12...40 V DC, 12...28 V AC version

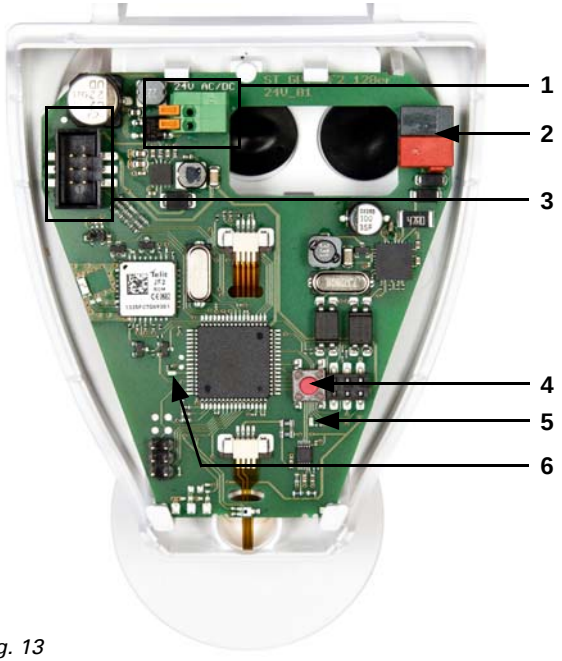


Fig. 13

1 *Tension clamp for auxiliary voltage supply (12...40 V DC,12...28 V AC). For massive conductors of up to 1.5 mm² or conductors with fine wires. Terminal configuration independent from polarity (+/- or -/+).*
2 *KNX clamp +/-*
3 *Slot for cable connection to the rain sensor in the housing cover*
4 *Programming pushbutton for the teach-in of the device*
5 *Programming LED*
6 *Control LED GPS reception. Depending on the parameter setting in the ETS, the LED blinks 1x per second to show GPS reception or it stays "always off". After the auxiliary supply voltage has been connected, it may take some minutes before reception is established.*

230 V AC version

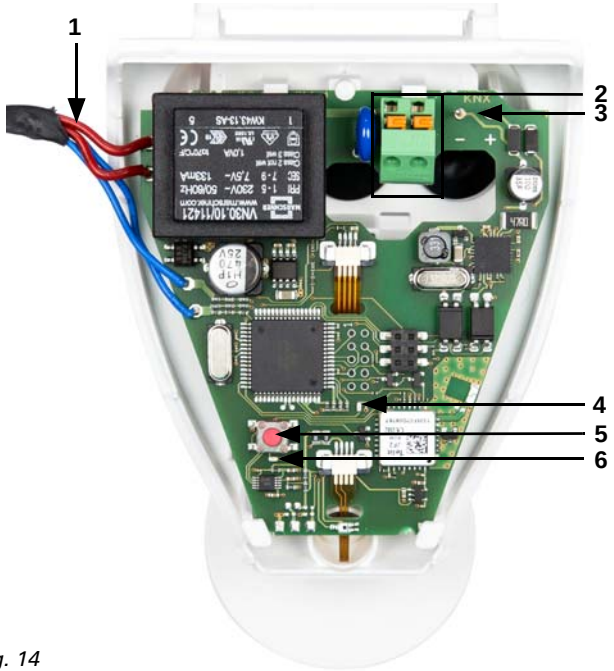


Fig. 14

1 *Slot for cable connection to the rain sensor in the housing cover*
2 *Tension clamp for power supply (230 V AC). For massive conductors of up to 1.5 mm² or conductors with fine wires.*
3 *KNX clamp +/-*
4 *Control LED GPS reception. Depending on the parameter setting in the ETS, the LED blinks 1x per second to show GPS reception or it stays "always off". After the auxiliary supply voltage has been connected, it may take some minutes before reception is established.*
5 *Programming pushbutton for the teach-in of the device*
6 *Programming LED*

2.2.6. Mounting the weather station

Close the housing by putting the cover back over the bottom part. The cover must snap in on the left and right with a definite "click".

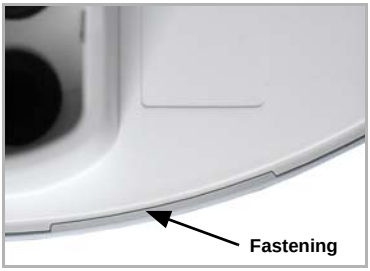


Fig. 15
Make sure the cover and bottom part are properly snapped together! This picture is looking at the closed sensor from underneath.

Fig. 16
With the 230V model, screw the cover on to the underpart, to prevent unauthorised or accidental opening.

DANGER!
There is a risk to life from the live voltage on a 230 V device!
- The cover must be screwed on in operation.

Fig. 17
Push the housing from above into the fastened mount. The bumps on the mount must snap into the rails in the housing.

To remove it, the weather station can be simply pulled upwards out of the mount, against the resistance of the fastening.

2.3. Notes on mounting and commissioning

Do not open weather station if water (rain) might ingress: even some drops might damage the electronic system.

Observe the correct connections. Incorrect connections may destroy the weather station or connected electronic devices.

Please take care not to damage the temperature sensor (small blank at the bottom part of the housing.) when mounting the weather station. Please also take care not to break away or bend the cable connection between the blank and the rain sensor when connecting the weather station.

Remove all existing protection labels after installation.

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

After the auxiliary 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. Addressing of the device at the bus

The device is supplied with the bus address 15.15.250. You can program another address into the ETS by overwriting the 15.15.250 address or by teaching via the programming key on the circuit board inside the housing.

4. Maintenance

DANGER!
There is a risk to life from the live voltage (mains voltage)!
If you come into contact with live components in the device, (e.g. caused also by a jet of water) there is the risk of an electric shock with 230 V devices.
Risk of injury caused by components moved automatically!
The automatic control can start system components and place people in danger (e.g. moving windows/awnings if a rain/wind alarm has been triggered while cleaning).

- Always isolate the device from the mains for servicing and cleaning (e. g. switch off or remove the fuse).

The device must regularly be checked for dirt twice a year and cleaned if necessary. In case of severe dirt, the sensor may not work properly anymore.

ATTENTION
The device can be damaged if water penetrates the housing.

- Do not clean with high pressure cleaners or steam jets.

5. Transmission protocol

Units of measurement:

Temperatures in degree Celsius
Brightness in lux
Wind in meters per second

5.1. List of all communication objects

Abbreviations EIS types:

1 Switching 1/0
3 Time
4 Date
5 Floating decimal value
6 8 bit value

Abbreviations flags:

C Communication
R Read
W Write
T Transmit

No.	Name	Function	EIS type	Flags
0	date		4	C R W T
1	time		3	C R W T
2	Date and time requirement		1	C R W
3	Switching output dawn		1	C R T
4	Switching output rain		1	C R T
5	Logic input 1		1	C R W
6	Logic input 2		1	C R W
7	Logic input 3		1	C R W
8	Logic input 4		1	C R W
9	Logic input 5		1	C R W
10	Logic input 6		1	C R W
11	Logic input 7		1	C R W
12	Logic input 8		1	C R W
13	Sun position azimuth		5	C R T
14	Sun position elevation		5	C R T
15	Switching output sun in sector 1		1	C R T
16	Switching output sun in sector 2		1	C R T
17	Switching output sun in sector 3		1	C R T
18	Switching output sun in sector 4		1	C R T
19	Switching output sun in sector 5		1	C R T

No.	Name	Function	EIS type	Flags
20	Measured temperature value		5	C R T
21	Requirement min/max temperature	Requirement	1	C R W
22	Lowest measured temperature value	Sends min. temperature	5	C R T
23	Highest measured temperature value	Sends max. temperature	5	C R T
24	Min/max temperature reset	Reset of temperature	1	C R W
25	Temperature threshold value 1	Target value	5	C R W
26	Temperature threshold value 1	Actual value	5	C R T
27	Temperature threshold value 2	Target value	5	C R W
28	Temperature threshold value 2	Actual value	5	C R T
29	Temperature threshold value 3	Target value	5	C R W
30	Temperature threshold value 3	Actual value	5	C R T
31	Temperature threshold value 4	Target value	5	C R W
32	Temperature threshold value 4	Actual value	5	C R T
33	Switching output temperature threshold value 1		1	C R T
34	Switching output temperature threshold value 2		1	C R T
35	Switching output temperature threshold value 3		1	C R T
36	Switching output temperature threshold value 4		1	C R T
37	Measured value of wind force		5	C R T
38	Requirement max. wind force	Requirement	1	C R W
39	Highest measured value of wind force	Sends max. wind force	5	C R T
40	Max. wind force reset	Reset of wind force	1	C R W
41	Wind force threshold value 1	Target value	5	C R W
42	Wind force threshold value 1	Actual value	5	C R T
43	Wind force threshold value 2	Target value	5	C R W
44	Wind force threshold value 2	Actual value	5	C R T
45	Wind force threshold value 3	Target value	5	C R W
46	Wind force threshold value 3	Actual value	5	C R T
47	Switching output wind force threshold value 1		1	C R T
48	Switching output wind force threshold value 2		1	C R T

No.	Name	Function	EIS type	Flags
49	Switching output wind force threshold value 3		1	C R T
50	Measured light value		5	C R T
51	Lightness threshold value 1	Target value	5	C R W
52	Lightness threshold value 1	Actual value	5	C R T
53	Lightness threshold value 2	Target value	5	C R W
54	Lightness threshold value 2	Actual value	5	C R T
55	Lightness threshold value 3	Target value	5	C R W
56	Lightness threshold value 3	Actual value	5	C R T
57	Switching output light threshold value 1		1	C R T
58	Switching output light threshold value 2		1	C R T
59	Switching output light threshold value 3		1	C R T
60	Activation time period 1, sequence 1	Calendar time switch	3	C R W
61	Switch off time period 1, sequence 1	Calendar time switch	3	C R W
62	Switching output calendar time switch	Period 1, sequence 1	1	C R T
63	Activation time period 1, sequence 2	Calendar time switch	3	C R W
64	Switch off time period 1, sequence 2	Calendar time switch	3	C R W
65	Switching output calendar time switch	Period 1, sequence 2	1	C R T
66	Activation time period 2, sequence 1	Calendar time switch	3	C R W
67	Switch off time period 2, sequence 1	Calendar time switch	3	C R W
68	Switching output calendar time switch	Period 2, sequence 1	1	C R T
69	Activation time period 2, sequence 2	Calendar time switch	3	C R W
70	Switch off time period 2, sequence 2	Calendar time switch	3	C R W
71	Switching output calendar time switch	Period 2, sequence 2	1	C R T
72	Activation time period 3, sequence 1	Calendar time switch	3	C R W

No.	Name	Function	EIS type	Flags
73	Switch off time period 3, sequence 1	Calendar time switch	3	C R W
74	Switching output calendar time switch	Period 3, sequence 1	1	C R T
75	Activation time period 3, sequence 2	Calendar time switch	3	C R W
76	Switch off time period 3, sequence 2	Calendar time switch	3	C R W
77	Switching output calendar time switch	Period 3, sequence 2	1	C R T
78	Activation time Monday 1	Week time switch	3	C R W
79	Switch off time Monday 1	Week time switch	3	C R W
80	Activation time Monday 2	Week time switch	3	C R W
81	Switch off time Monday 2	Week time switch	3	C R W
82	Activation time Monday 3	Week time switch	3	C R W
83	Switch off time Monday 3	Week time switch	3	C R W
84	Activation time Monday 4	Week time switch	3	C R W
85	Switch off time Monday 4	Week time switch	3	C R W
86	Switching output week time switch	Monday 1	1	C R T
87	Switching output week time switch	Monday 2	1	C R T
88	Switching output week time switch	Monday 3	1	C R T
89	Switching output week time switch	Monday 4	1	C R T
90	Activation time Tuesday 1	Week time switch	3	C R W
91	Switch off time Tuesday 1	Week time switch	3	C R W
92	Activation time Tuesday 2	Week time switch	3	C R W
93	Switch off time Tuesday 2	Week time switch	3	C R W
94	Activation time Tuesday 3	Week time switch	3	C R W
95	Switch off time Tuesday 3	Week time switch	3	C R W
96	Activation time Tuesday 4	Week time switch	3	C R W
97	Switch off time Tuesday 4	Week time switch	3	C R W
98	Switching output week time switch	Tuesday 1	1	C R T
99	Switching output week time switch	Tuesday 2	1	C R T
100	Switching output week time switch	Tuesday 3	1	C R T
101	Switching output week time switch	Tuesday 4	1	C R T
102	Activation time Wednesday 1	Week time switch	3	C R W
103	Switch off time Wednesday 1	Week time switch	3	C R W
104	Activation time Wednesday 2	Week time switch	3	C R W
105	Switch off time Wednesday 2	Week time switch	3	C R W
106	Activation time Wednesday 3	Week time switch	3	C R W

No.	Name	Function	EIS type	Flags
107	Switch off time Wednesday 3	Week time switch	3	C R W
108	Activation time Wednesday 4	Week time switch	3	C R W
109	Switch off time Wednesday 4	Week time switch	3	C R W
110	Switching output week time switch	Wednesday 1	1	C R T
111	Switching output week time switch	Wednesday 2	1	C R T
112	Switching output week time switch	Wednesday 3	1	C R T
113	Switching output week time switch	Wednesday 4	1	C R T
114	Activation time Thursday 1	Week time switch	3	C R W
115	Switch off time Thursday 1	Week time switch	3	C R W
116	Activation time Thursday 2	Week time switch	3	C R W
117	Switch off time Thursday 2	Week time switch	3	C R W
118	Activation time Thursday 3	Week time switch	3	C R W
119	Switch off time Thursday 3	Week time switch	3	C R W
120	Activation time Thursday 4	Week time switch	3	C R W
121	Switch off time Thursday 4	Week time switch	3	C R W
122	Switching output week time switch	Thursday 1	1	C R T
123	Switching output week time switch	Thursday 2	1	C R T
124	Switching output week time switch	Thursday 3	1	C R T
125	Switching output week time switch	Thursday 4	1	C R T
126	Activation time Friday 1	Week time switch	3	C R W
127	Switch off time Friday 1	Week time switch	3	C R W
128	Activation time Friday 2	Week time switch	3	C R W
129	Switch off time Friday 2	Week time switch	3	C R W
130	Activation time Friday 3	Week time switch	3	C R W
131	Switch off time Friday 3	Week time switch	3	C R W
132	Activation time Friday 4	Week time switch	3	C R W
133	Switch off time Friday 4	Week time switch	3	C R W
134	Switching output week time switch	Friday 1	1	C R T
135	Switching output week time switch	Friday 2	1	C R T
136	Switching output week time switch	Friday 3	1	C R T
137	Switching output week time switch	Friday 4	1	C R T
138	Activation time Saturday 1	Week time switch	3	C R W
139	Switch off time Saturday 1	Week time switch	3	C R W
140	Activation time Saturday 2	Week time switch	3	C R W
141	Switch off time Saturday 2	Week time switch	3	C R W
142	Activation time Saturday 3	Week time switch	3	C R W
143	Switch off time Saturday 3	Week time switch	3	C R W
144	Activation time Saturday 4	Week time switch	3	C R W
145	Switch off time Saturday 4	Week time switch	3	C R W

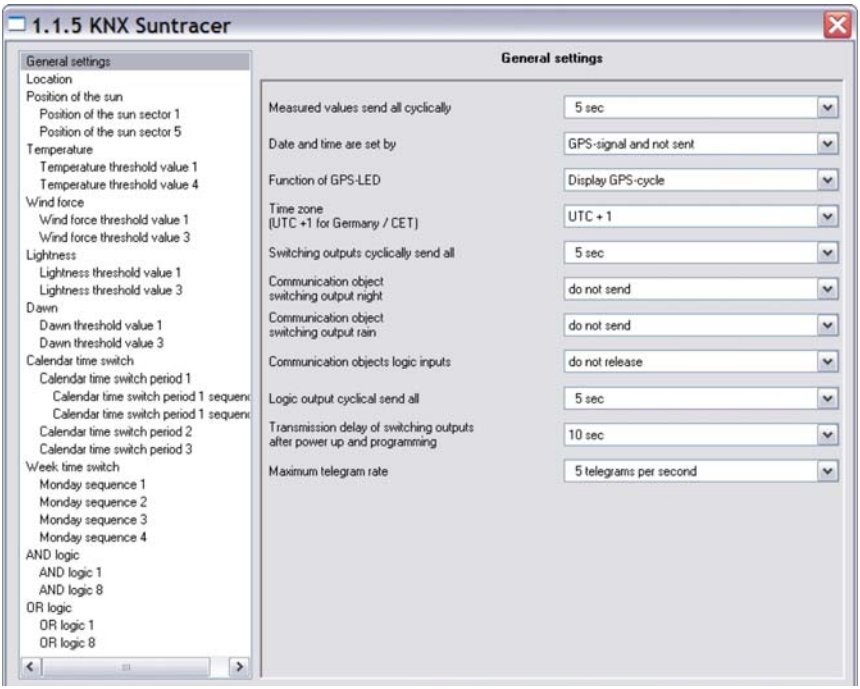
No.	Name	Function	EIS type	Flags
146	Switching output week time switch	Saturday 1	1	C R T
147	Switching output week time switch	Saturday 2	1	C R T
148	Switching output week time switch	Saturday 3	1	C R T
149	Switching output week time switch	Saturday 4	1	C R T
150	Activation time Sunday 1	Week time switch	3	C R W
151	Switch off time Sunday 1	Week time switch	3	C R W
152	Activation time Sunday 2	Week time switch	3	C R W
153	Switch off time Sunday 2	Week time switch	3	C R W
154	Activation time Sunday 3	Week time switch	3	C R W
155	Switch off time Sunday 3	Week time switch	3	C R W
156	Activation time Sunday 4	Week time switch	3	C R W
157	Switch off time Sunday 4	Week time switch	3	C R W
158	Switching output week time switch	Sunday 1	1	C R T
159	Switching output week time switch	Sunday 2	1	C R T
160	Switching output week time switch	Sunday 3	1	C R T
161	Switching output week time switch	Sunday 4	1	C R T
162	AND logic 1	Switching output	1	C R T
163	AND logic 1	8 Bit output A	6	C R T
164	AND logic 1	8 Bit output B	6	C R T
165	AND logic 2	Switching output	1	C R T
166	AND logic 2	8 Bit output A	6	C R T
167	AND logic 2	8 Bit output B	6	C R T
168	AND logic 3	Switching output	1	C R T
169	AND logic 3	8 Bit output A	6	C R T
170	AND logic 3	8 Bit output B	6	C R T
171	AND logic 4	Switching output	1	C R T
172	AND logic 4	8 Bit output A	6	C R T
173	AND logic 4	8 Bit output B	6	C R T
174	AND logic 5	Switching output	1	C R T
175	AND logic 5	8 Bit output A	6	C R T
176	AND logic 5	8 Bit output B	6	C R T
177	AND logic 6	Switching output	1	C R T
178	AND logic 6	8 Bit output A	6	C R T
179	AND logic 6	8 Bit output B	6	C R T
180	AND logic 7	Switching output	1	C R T
181	AND logic 7	8 Bit output A	6	C R T
182	AND logic 7	8 Bit output B	6	C R T
183	AND logic 8	Switching output	1	C R T
184	AND logic 8	8 Bit output A	6	C R T

No.	Name	Function	EIS type	Flags
185	AND logic 8	8 Bit output B	6	C R T
186	OR logic 1	Switching output	1	C R T
187	OR logic 1	8 Bit output A	6	C R T
188	OR logic 1	8 Bit output B	6	C R T
189	OR logic 2	Switching output	1	C R T
190	OR logic 2	8 Bit output A	6	C R T
191	OR logic 2	8 Bit output B	6	C R T
192	OR logic 3	Switching output	1	C R T
193	OR logic 3	8 Bit output A	6	C R T
194	OR logic 3	8 Bit output B	6	C R T
195	OR logic 4	Switching output	1	C R T
196	OR logic 4	8 Bit output A	6	C R T
197	OR logic 4	8 Bit output B	6	C R T
198	OR logic 5	Switching output	1	C R T
199	OR logic 5	8 Bit output A	6	C R T
200	OR logic 5	8 Bit output B	6	C R T
201	OR logic 6	Switching output	1	C R T
202	OR logic 6	8 Bit output A	6	C R T
203	OR logic 6	8 Bit output B	6	C R T
204	OR logic 7	Switching output	1	C R T
205	OR logic 7	8 Bit output A	6	C R T
206	OR logic 7	8 Bit output B	6	C R T
207	OR logic 8	Switching output	1	C R T
208	OR logic 8	8 Bit output A	6	C R T
209	OR logic 8	8 Bit output B	6	C R T
210	Dawn threshold value 1	Target value	5	C R W
211	Dawn threshold value 1	Actual value	5	C R T
212	Dawn threshold value 2	Target value	5	C R W
213	Dawn threshold value 2	Actual value	5	C R T
214	Dawn threshold value 3	Target value	5	C R W
215	Dawn threshold value 3	Actual value	5	C R T
216	Switching output dawn threshold value 1		1	C R T
217	Switching output dawn threshold value 2		1	C R T
218	Switching output dawn threshold value 3		1	C R T

No.	Name	Function	EIS type	Flags
219	Temperature sensor failure	Output	1	C R T
220	Wind sensor failure	Output	1	C R T
221	Date and time synchronised	Output	1	C R T

6. Setting of parameters

6.1. General settings



Measured values send all cyclically	5 sec ... 2 h
Date and time are set by	• Radio signal and not sent • Radio signal and sent cyclically • Radio signal and sent on request • Radio signal and on request + sent cyclically • Communication objects und not sent

If date and time are set by a GPS signal:

The current date and time may firstly be predetermined by ETS. The weather station operates with these data until it receives a valid GPS signal for the first time.

If date and time are set by a communication object:

There must not be a change in date between the sending of date and the sending of time; both must be sent to the weather station on the same day.

For the initial operation, date and time must be sent directly one after the other in order that the clock of the device can start.

Function of dadio LED	• Display cycles tuned to seconds • always OFF
Time zone	UTC-1 • UTC • UTC+1 • UTC+2 • UTC+3
Switching outputs cyclically send all	5 sec • 10 sec • 30 sec • ... • 2 h
Communication object switching output night "(The output reacts with a delay of approx. 1 minute; “night” is recognised when light is below 10 lux)	• do not send • send in case of change • send inverted in case of change • send in case of change and cyclically • send inverted in case of change and cyclically (as in case of all switching outputs)
Communication object Switching output rain (After approx. 8 minutes without rain, the output is reset)	(as in case of switching output night)
Communication objects logic inputs	do not release • release
Send all logic outputs cyclically	5 sec • 10 sec • 30 sec • ... • 2 h
Delayed sending of the switching outputs after power up and programming	5 sec • 10 sec • 30 sec • ... • 2 h; 10 sec
Maximum telegram rate	1 • 2 • 3 • 5 • 10 • 20 telegrams per second

6.2. Location

The position is received via GPS! The following settings are used during first commissioning as long as there is still no GPS reception.

The indication of the location is necessary for the calculation of the position of the sun with the help of date and time.

If the location is determined by the coordinates of a given city:

Location is determined by	given city
Country	Germany • Austria • Switzerland • other countries
City/postal code/coordinates	30 towns in Germany 5 towns in Austria 4 towns in the Switzerland 7 towns in other countries

If the location is determined by entry of coordinates:

Location is determined by	entry of coordinates
Eastern longitude in degrees	-180 ... +180
Eastern longitude in minutes	-59 ... + 59

Northern latitude in degrees	-90 ... +90
Northern latitude in minutes	-59 ... + 59

6.3. Position of the sun

The function “position of the sun” ist only possible in case of receipt of date and time.

The calculation of the position of the sun is optimised for UTC -1...+3. The device therefore may only be applied within Europe. For other time zones, please use Suntracer KNX-GPS Weather Station.

Azimuth and elevation	• do not send • send cyclically • send in case of change • send in case of change and cyclically
From a change of	1 ... 15 degrees; 3 degrees
Sector 1 / 2 / 3 / 4 / 5	not active • active

6.3.1. Position of the sun in sector 1 / 2 / 3 / 4 / 5

Definition of the position of the sun by	Azimuth and elevation • directions

If the position of the sun is defined by directions:

Definition of the position of the sun by	**directions**
Direction	East • Southeast • Southwest • West
Communication object switching output sun in sector 1 / 2 / 3 / 4 /	• do not send • send in case of change • send inverted in case of change • send in case of change and cyclically • send inverted in case of change and cyclically

Directions:

East: azimuth 0°-180°, elevation 0°-90°
Southeast: azimuth 45°-225°, elevation 0°-90°
South: azimuth 90°-270°, elevation 0°-90°
Southwest: azimuth 135°-315°, elevation 0°-90°
West: azimuth 180°-360°, elevation 0°-90°

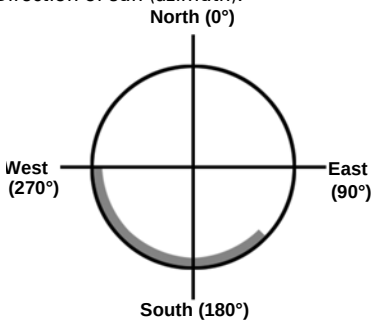
If the position of the sun is defined by azimuth and elevation:

All data in ° (degree)

Definition of the position of the sun by	**Azimuth and elevation**
Azimuth from	0 ... 360 degrees
Azimuth up tos	0 ... 360 degrees
Elevation from	0 ... 90 degrees

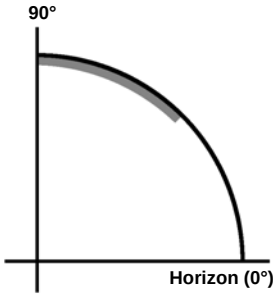
Elevation up to	0 ... 90 degrees
Communication object switching output sun in sector 1 / 2 / 3 / 4 /	• do not send • send in case of change • send inverted in case of change • send in case of change and cyclically • send inverted in case of change and cyclically

Direction of sun (azimuth):



Marked area:
Azimuth from 135° up to 270°

Height of sun (elevation):



Marked area:
Elevation from 45° up to 90°

6.4. Temperature

Measured value	• not send • send cyclically • send in case of change • send in case of change and cyclically
From a temperature change of	0.5°C • 1°C • 2°C • 3°C • 4°C • 5°C
Temperature offset in 0.1°C	-50 ... 50; 0
Send and reset of the min. and max. temperature value on request	do not release • release
Threshold value 1 / 2 / 3 / 4	not active • active

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

Theshold value is set by	• Parameter • Communication object • Com. object with saving of the last value

If the threshold is set by parameters:

Threshold value is set by	**Parameter**
Threshold value in 0.1°C valid until 1st communication	-300 ... 800; 200

If the threshold is set by a communication object:

If the threshold is set by communication objects, a threshold which is valid until the first communication of a new threshold must be determined for the initial operation. The threshold value communicated last can be used if the weather station is already in operation.

Threshold value is set by	**Communication object**
Threshold value in 0.1°C valid until 1st communication	-300 ... 800; 200

If the threshold is set by communication object with saving of the last value:

As soon as a threshold has been set by means of a parameter or by means of a communication object, the threshold set at last remains until a new threshold has been transmitted by a communication object.

The thresholds set at last by communication objects are saved in EEPROM in order to maintain them in case of voltage breakdown and to provide them as soon as there is voltage supply again.

Threshold value is set by	**Com. object with saving of the last value**

Hysteresis of the threshold value in 0.1°C.	0 ...100; 30
Activation delay	none • 1 s • 1 min... • 2 h
Switch-off delay	none • 1 s • 1 min... • 2 h
Output switches at	• TV above = ON TV-Hyst. below = OFF • TV below = ON TV-Hyst. above = OFF
Communication object switching output temperature threshold value 1 / 2 / 3 / 4	• do not send • send in case of change • send inverted in case of change • send in case of change and periodically • send inverted in case of change and periodically

6.5. Wind force

Measured value	• not send • send cyclically • send in case of change • send in case of change and cyclically
From a wind force change of	1 m/s ... • 4 m/s
Send and reset of the min. and max. wind force value on request	do not release • release
Threshold value 1 / 2 / 3 / 4	not active • active

6.5.1. Wind force threshold value 1 / 2 / 3

Theshold value is set by	• Parameter • Communication object • Com. object with saving of the last value

If the threshold is set by parameters:

Threshold value in 0.1 m/s	0… 350; 40
Hysteresis of the threshold value in 0.1 m/s	0 … 250; 20

If the threshold is set by a communication object:

Start threshold value in 0.1 m/s	0 … 350; 40
Hysteresis of the threshold value in 0.1 m/s	0 … 250, 20

All other parameters correspond to those of the temperature threshold value (see there).

6.6. Lightness

Measured value	• not send • send cyclically • send in case of change • send in case of change and cyclically
From change of *(only when sending "in case of change")*	1 ... 50; 10
Threshold value 1 / 2 / 3 / 4	not active • active

6.6.1. Lightness threshold value 1 / 2 / 3

Theshold value is set by	• Parameter • Communication object • Com. object with saving of the last value

If the threshold is set by parameters:

Threshold value in klx	1 ... 99; 5
Hysteresis of the threshold value in klx	0 ... 99; 2

If the threshold is set by a communication object:

Start threshold value in klx valid until 1st communication	1 ... 99; 5
Hysteresis of the threshold value in klx	0 ... 99; 2

All other parameters correspond to those of the temperature threshold value (see there).

6.7. Dawn

Threshold value 1 / 2 / 3	not active • active

6.7.1. Dawn threshold value 1 / 2 / 3

Theshold value is set by	• Parameter • Communication object • Com. object with saving of the last value

If the threshold is set by parameters:

Threshold value in lx	1 ... 1000; 200
Hysteresis of the threshold value in lx	0 ... 1000; 50

If the threshold is set by a communication object:

Start threshold value in lx	1 ... 1000; 200
Hysteresis of the threshold value in lx	0 ... 1000; 50

All other parameters correspond to those of the temperature threshold value (see there).

6.8. Calendar time switch

Period 1 / 2 / 3	not active • active

6.8.1. Calendar time switch period 1 / 2 / 3

From:	
Month	January ... December
Day	1 ... 29 / 1 ... 30 / 1 ... 31 (depending on month)
up to and including:	
Month	January ... December
Day	1 ... 29 / 1 ... 30 / 1 ... 31 (depending on month)
Sequence 1	not active • active
Sequence 2	not active • active

6.8.2. Calendar time switch period 1 / 2 / 3, sequence 1 / 2

Setting of switching times by	Parameter • Communication objects
Activation-time hours	0 ... 23
Activation-time minutes	0 ... 59

Switch-off time hours	0 ... 23
Switch-off time minutes	0 ... 59
Communication object switching output period 1 / 2 / 3, sequence 1 / 2	• not send • send in case of change • send inverted in case of change • send in case of change and cyclically • send inverted in case of change and cyclically

6.9. Week time switch

Monday ... Sunday	not active • active

All 4 sequences of the selected day are always activated together.

6.9.1. Week time switch Mon, Tue, Wed, ..., 1...4

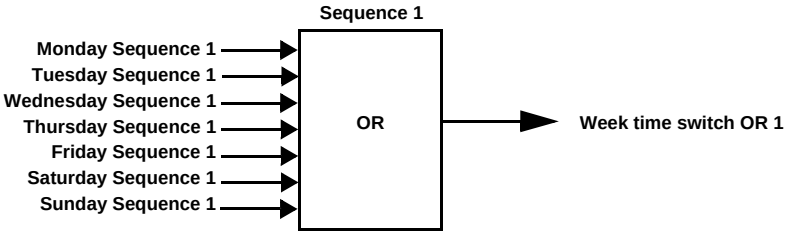
Setting of switching times by	Parameter • Communication objects
Activation-time hours	0 ... 23
Activation-time minutes	0 ... 59
Switch-off time hours	0 ... 23
Switch-off time minutes	0 ... 59
Communication object switching output Mon...Sun 1 / 2 / 3 /4	• not send • send in case of change • send inverted in case of change • send in case of change and cyclically • send inverted in case of change and cyclically

Hinweis: If for example the set switch-off time is 3.35 pm, the output switches off when the time changes from 3.35 pm to 3.36 pm.

Use of the week time switch:

Communication object „Week time switch OR 1/2/3/4“

The sequence 1 swichting times of all weekdays are combined via the OR logic gate “Sequence 1” and can be used as communiction object “Week time switch 1” for own logic links .



6.10. AND Logic

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

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

1. / 2. / 3. / 4. Input	• do not use • all switching events which the sensor provides (see "Linkage inputs of the AND logic")
Logic output sends	• not • one 1 bit object • two 8 bit objects

Logic output sends "one 1 bit Object":

Logic output sends	**one 1 bit object**
if logic = 1 ➔object value	1 • 0
if logic = 0 ➔object value	1 • 0
Communication object AND Logic 1 sends	• in case of the change of logic • in case of the change of logic to 1 • in case of the change of logic to 0 • in case of the change of logic and cyclically • in case of the change of logic to 1 and cyclically • in case of the change of logic to 0 and cyclically
send cyclically every *(only if sending "cyclically")*	5 sec … 2 h

Logic output sends "two 8 bit objects":

Logic output sends	**two 8 bit objects**
if logic = 1 ➔object A value	0 … 255; 127
if logic = 0 ➔object A value	0 … 255
if logic = 1 ➔object B value	0 … 255; 127

if logic = 0 ➔object B value	0 ... 255
Communication objects AND Logic 1 A and B sends	• in case of the change of logic • in case of the change of logic to 1 • in case of the change of logic to 0 • in case of the change of logic and cyclically • in case of the change of logic to 1 and cyclically • in case of the change of logic to 0 and cyclically
send cyclically every *(only if sending "cyclically")*	5 sec ... 2 h

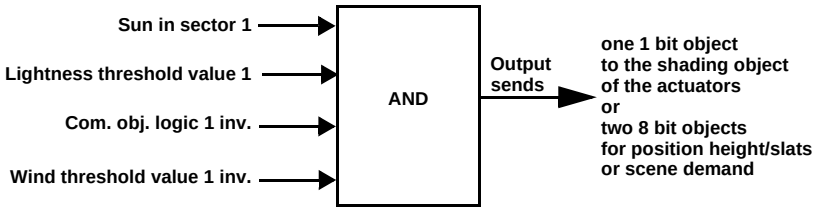
Object A: Shading position height (0 = safe position, 255 = completely extracted).

Object B: Shading position slat angle (255 = 100% closed, 200 = approx. 80% closed).

Use of the AND logic:

Example automatic shading

The AND logic can be used to set the conditions for shading, for example a lightness threshold value and sun in a certain area. The activation of shading after wind alarm and the blocking by manual operation were implied in this example, too.



- Sun in sector 1: Describes the position of the sun for which the shading is active.
- Lightness threshold value 1: Defines the lightness from which shading takes place.
- Communication object logik 1 inverted: Blocking function for sun automatic, e. g. by a push button (Blocking after manual operation).
  Logic = 0 ➔ released, logic = 1➔ blocked.
  The "Communication objects logic inputs" must be released in the "General Settings" for this porpose and the "communication object logic 1" must be linked with the button via group addresses.
- Wind threshold value 1 inverted: Activates the automatic function after the end of a wind alarm (shading is extended if all other conditions are complied with).

6.10.2. Linkage inputs of AND logic

do not use

Night = 1
Night = 0
Dawn threshold value 1
Dawn threshold value 1 inverted
Dawn threshold value 2
Dawn threshold value 2 inverted
Dawn threshold value 3
Dawn threshold value 3 inverted
Lightness threshold value 1
Lightness threshold value 1 inverted
Lightness threshold value 2
Lightness threshold value 2 inverted
Lightness threshold value 3
Lightness threshold value 3 inverted
Calendar time switch 1. period Nr. 1
Calendar time switch 1. period Nr. 1 inverted
Calendar time switch 1. period Nr. 2
Calendar time switch 1. period Nr. 2 inverted
Calendar time switch 2. period Nr. 1
Calendar time switch 2. period Nr. 1 inverted
Calendar time switch 2. period Nr. 2
Calendar time switch 2. period Nr. 2 inverted
Calendar time switch 3. period Nr. 1
Calendar time switch 3. period Nr. 1 inverted
Calendar time switch 3. period Nr. 2
Calendar time switch 3. period Nr. 2 inverted
Communication object logic input 1
Communication object logic input 1 inverted
Communication object logic input 2
Communication object logic input 2 inverted
Communication object logic input 3
Communication object logic input 3 inverted
Communication object logic input 4
Communication object logic input 4 inverted
Communication object logic input 5
Communication object logic input 5 inverted
Communication object logic input 6
Communication object logic input 6 inverted
Communication object logic input 7
Communication object logic input 7 inverted
Communication object logic input 8
Communication object logic input 8 inverted
Rain yes
Rain no
Sun in sector 1
Sun not in sector 1
Sun in sector 2
Sun not in sector 2

Sun in sector 3
Sun not in sector 3
Sun in sector 4
Sun not in sector 4
Sun in sector 5
Sun not in sector 5
Failure temperature
Failure temperature inverted
Failure wind
Failure wind inverted
Temperature threshold value 1
Temperature threshold value 1 inverted
Temperature threshold value 2
Temperature threshold value 2 inverted
Temperature threshold value 3
Temperature threshold value 3 inverted
Temperature threshold value 4
Temperature threshold value 4 inverted
Wind threshold value 1
Wind threshold value 1 inverted
Wind threshold value 2
Wind threshold value 2 inverted
Wind threshold value 3
Wind threshold value 3 inverted
Week time switch Monday 1
Week time switch Monday 1 inverted
Week time switch Monday 2
Week time switch Monday 2 inverted
Week time switch Monday 3
Week time switch Monday 3 inverted
Week time switch Monday 4
Week time switch Monday 4 inverted
Week time switch Tuesday 1
Week time switch Tuesday 1 inverted
Week time switch Tuesday 2
Week time switch Tuesday 2 inverted
Week time switch Tuesday 3
Week time switch Tuesday 3 inverted
Week time switch Tuesday 4
Week time switch Tuesday 4 inverted
Week time switch Wednesday 1
Week time switch Wednesday 1 inverted
Week time switch Wednesday 2
Week time switch Wednesday 2 inverted
Week time switch Wednesday 3
Week time switch Wednesday 3 inverted
Week time switch Wednesday 4
Week time switch Wednesday 4 inverted

Week time switch Thursday 1
Week time switch Thursday 1 inverted
Week time switch Thursday 2
Week time switch Thursday 2 inverted
Week time switch Thursday 3
Week time switch Thursday 3 inverted
Week time switch Thursday 4
Week time switch Thursday 4 inverted
Week time switch Friday 1
Week time switch Friday 1 inverted
Week time switch Friday 2
Week time switch Friday 2 inverted
Week time switch Friday 3
Week time switch Friday 3 inverted
Week time switch Friday 4
Week time switch Friday 4 inverted
Week time switch Saturday 1
Week time switch Saturday 1 inverted
Week time switch Saturday 2
Week time switch Saturday 2 inverted
Week time switch Saturday 3
Week time switch Saturday 3 inverted
Week time switch Saturday 4
Week time switch Saturday 4 inverted
Week time switch Sunday 1
Week time switch Sunday 1 inverted
Week time switch Sunday 2
Week time switch Sunday 2 inverted
Week time switch Sunday 3
Week time switch Sunday 3 inverted
Week time switch Sunday 4
Week time switch Sunday 4 inverted
Week time switch OR 1
Week time switch OR 1 inverted
Week time switch OR 2
Week time switch OR 2 inverted
Week time switch OR 3
Week time switch OR 3 inverted
Week time switch OR 4
Week time switch OR 4 inverted

6.11. OR Logic

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

6.11.1.)OR Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8

1. / 2. / 3. / 4. Input	• do not use • all switching events which the sensor provides (see “Linkage inputs of the OR logic”)
Logic output sends	• one 1 bit object • two 8 bit objects

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

6.11.2. Linkage inputs of OR logic

The linkage inputs of the OR logic correspond with the parameters of the AND logic. The OR logic is *additionally* provided with the following inputs:

AND logic output 1
AND logic output 1 inverted
AND logic output 2
AND logic output 2 inverted
AND logic output 3
AND logic output 3 inverted
AND logic output 4
AND logic output 4 inverted
AND logic output 5
AND logic output 5 inverted
AND logic output 6
AND logic output 6 inverted
AND logic output 7
AND logic output 7 inverted
AND logic output 8
AND logic output 8 inverted

Elsner Elektronik GmbH Control and Automation Engineering
Sohlengrund 16
75395 Ostelsheim
Germany
Phone +49 (0) 70 33 / 30 945-0 info@elsner-elektronik.de
Fax +49 (0) 70 33 / 30 945-20 www.elsner-elektronik.de