suntracer® KNX-GPS light
Weather Station for KNX

elsner®
elektronik

Installation and Adjustment

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Product description

The Weather Station Suntracer KNX-GPS 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.

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 and Operation:

- **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
- **Switching outputs** for all measured and calculated values (Threshold 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 accomplished by means of the KNX software ETS. The **programme file** for KNX software ETS (format VD2) is ready for download on the Elsner Elektronik website under **www.elsner-elektronik.de** in the “Service” menu.

Technical data

Housing:	Plastic material
Colour:	White / translucent
Mounting:	On-wall
Protection category:	IP 44
Dimensions:	approx. 96 × 77 × 118 (W × H × D, mm)
Weight:	approx. 170 g
Ambient temperature:	Operation -30…+50°C, Storage -30…+70°C
Operating voltage:	12…40 V DC (12…28 V AC)
Auxiliary current:	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 (230 V and 24 V)
Measurement range temperature:	-40…+80°C
	Resolution: 0.1°C
	Accuracy: ±0.5°C at +10…+50°C ±1°C at -10…+85°C ±1.5°C at -25…+150°C
Measurement range wind:	0…70 m/s
	Resolution: <10% of the measured value
	Accuracy: ±25% at 0…15 m/s at an angle of attack of 45°, pole mounting
Measurement range brightness:	0…150 000 lux
	Resolution: 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: ±35%

The following standards have been considered for the evaluation of the product in terms of electro magnetic compatibility:

Transient emissions:

- EN 60730-1:2000 Section EMV (23, 26, H23, H26) (threshold category: B)
- EN 50090-2-2:1996-11 + A1:2002-01 (threshold category: B)
- EN 61000-6-3:2001 (threshold category: B)

Interference resistance:

- EN 60730-1:2000 Section EMV (23, 26, H23, H26)
- EN 50090-2-2:1996-11 + A1:2002-01
- EN 61000-6-1:2004

The product has been tested for the above mentioned standards by an accredited EMV laboratory.

PCB layout

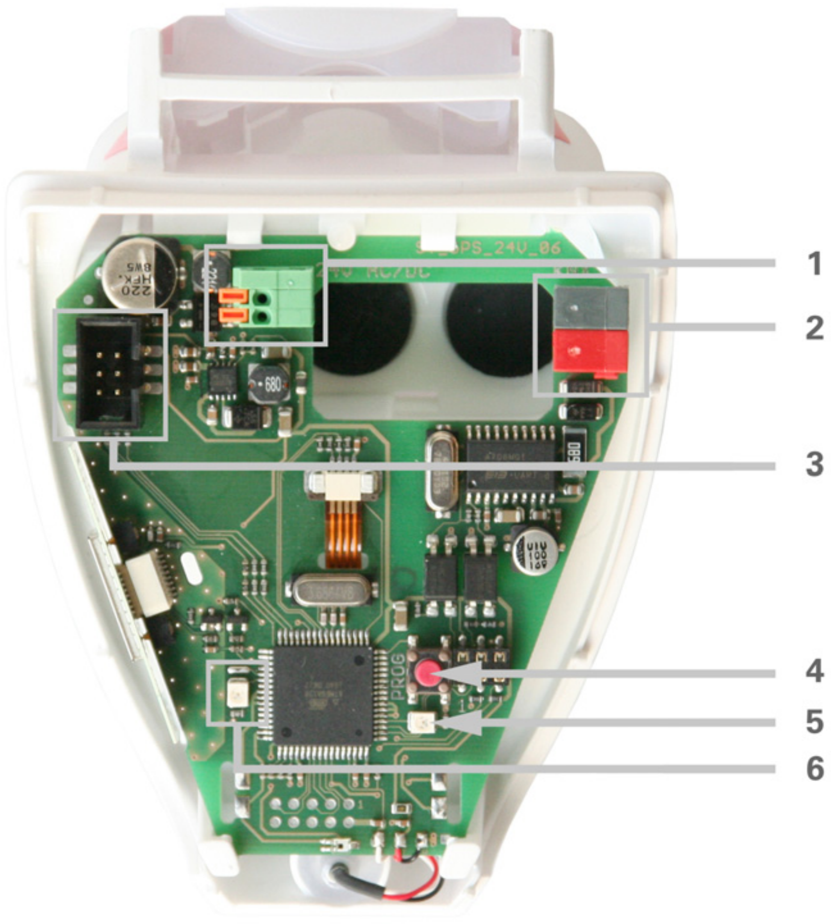


Fig. 1

1 *Tension clamp for auxiliary voltage supply, suitable for massive conductors of up to 1.5 mm² or conductors with fine wires*

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. As soon as valid GPS data is received, the LED blinks 1x per second. After the auxiliary supply voltage has been connected, it may take some minutes before reception is established.*

Installation and commissioning

Attention! Mains voltage!
The legal national regulations must be complied with.

Installation, inspection, commissioning and troubleshooting of the weather station must only be carried out by a competent electrician. Disconnect all lines to be assembled, and take safety precautions against accidental switch-on.

The weather station is exclusively intended for appropriate use. With each inappropriate change or non-observance of the instructions for use, any warranty or guarantee claim will be void.

After unpacking the device, check immediately for any mechanical damages. In case of transport damage, this must immediately notified to the supplier.

If damaged, the weather station must not be put into operation.

If an operation without risk may supposedly not be guaranteed, the plant must be put out of operation and be secured against accidental operation.

The weather station must only be operated as stationary system, i.e. only in a fitted state and after completion of all installation and start-up works, and only in the environment intended for this purpose.

Elsner Elektronik does not assume any liability for changes in standards after publication of this instruction manual.

Location

Select an assembly location at the building where wind, rain and sun may be collected by the sensors unobstructedly. Do not assemble any construction components above the weather station from where water may drop on to the rain sensor after it has stopped raining or snowing. The weather station may not be shaded by the building or for example by trees. Leave at least 60 cm of free space beneath the weather station in order to enable a correct wind measurement and in order to avoid that the weather station is snowed in if there is heavy snowfall.

The reception of the GPS signal may also be disturbed or made impossible by magnetic fields, emitters and interfering fields of electrical consumers (e.g. fluorescent tubes, illuminated advertising, switching power supply units, etc.).

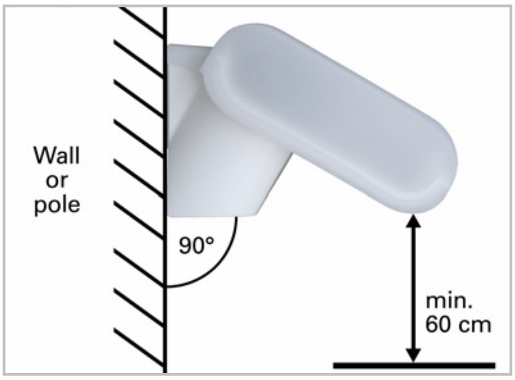


Fig. 2: The weather station must be mounted onto a vertical wall (or pole).

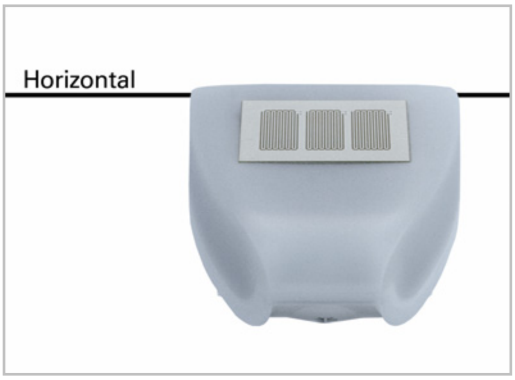


Fig.3: The weather station must be mounted horizontally in the lateral direction.

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 mount vertically onto the wall or pole.

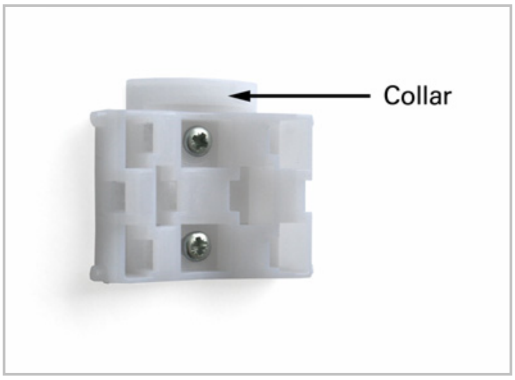


Fig. 4: When wall mounting: flat side on wall, crescent-shaped collar upward.

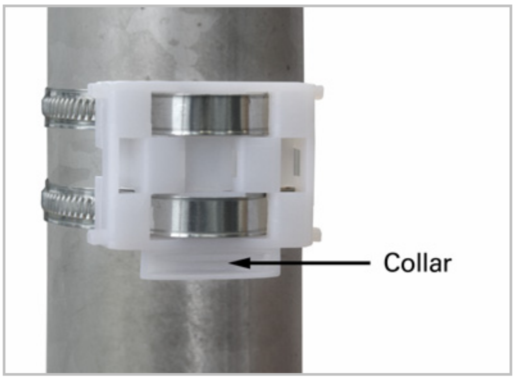


Fig. 5: When pole mounting: curved side on pole, collar downward.

View of rear side and drill hole plan

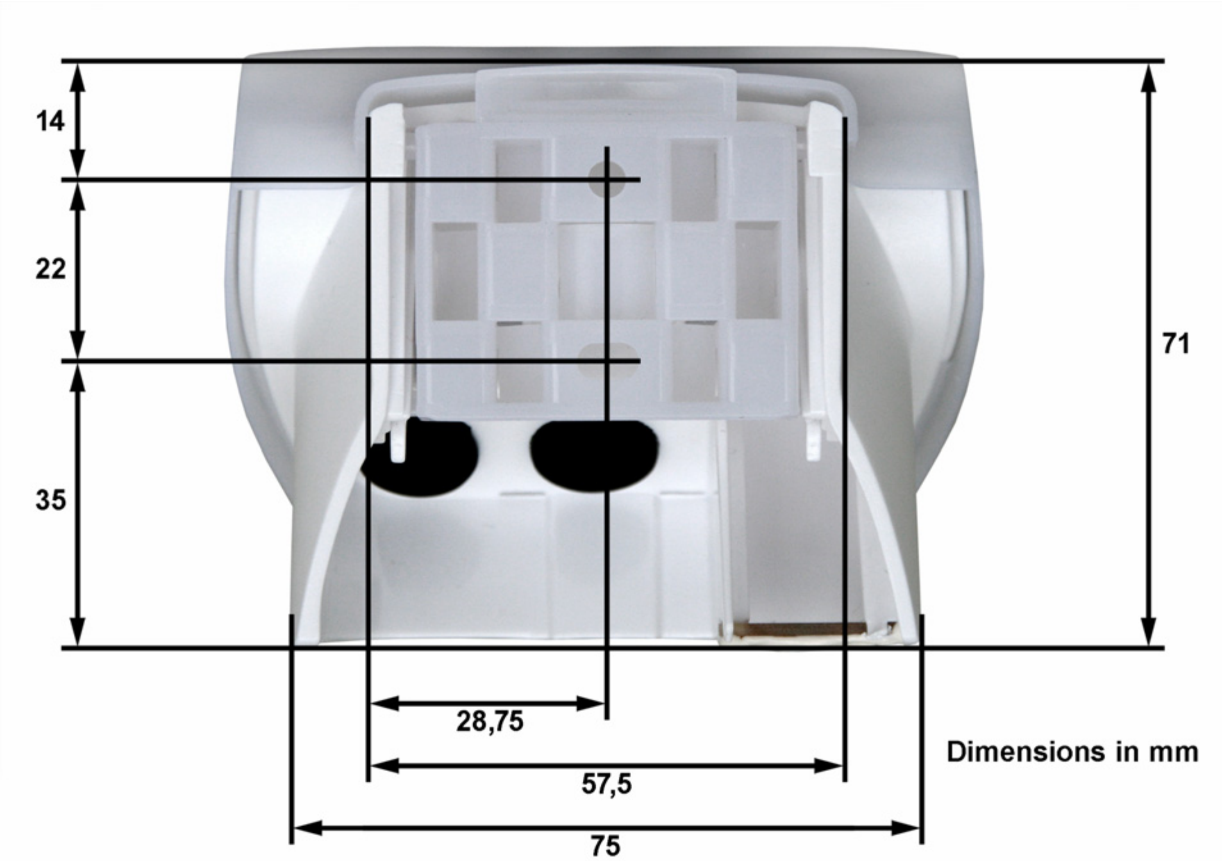


Fig.6a: Dimensions of rear side of housing with bracket. Subject to change for technical enhancement

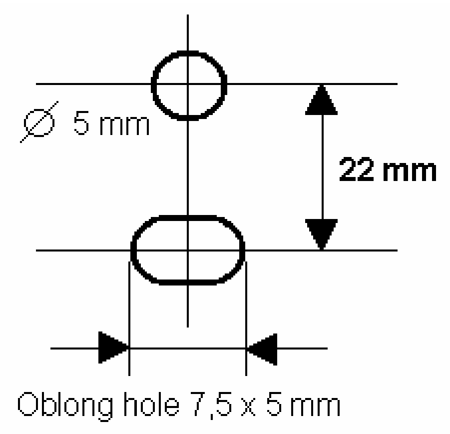


Fig. 6b: Drill hole plan

Preparing the weather station

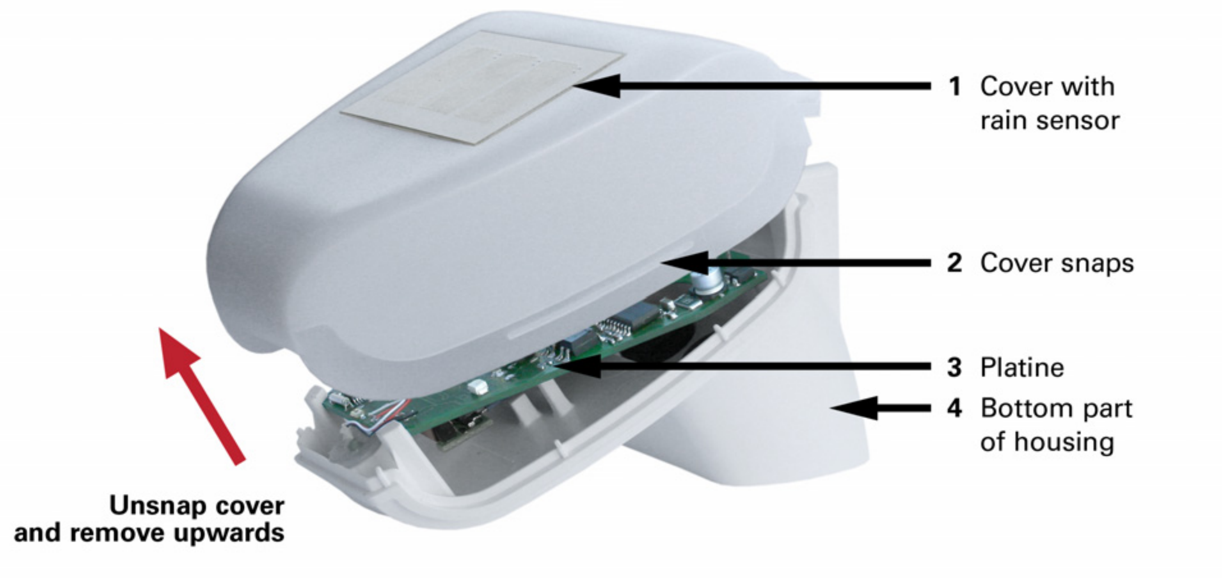


Fig. 7

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.

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

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”.

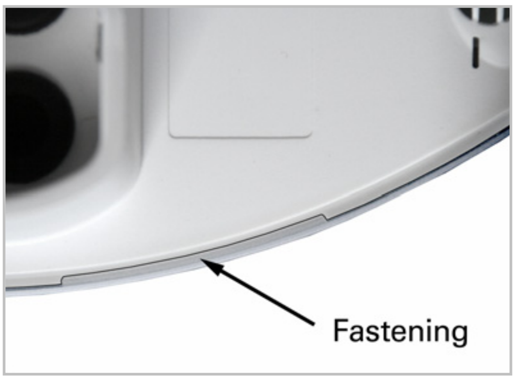


Fig. 8: Make sure the cover and bottom part are properly snapped together! This picture is looking at the closed weather station from underneath.

Fig. 9: 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.

Details for the installation

Do not open Suntacer KNX with GPS receiver 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.
The measured wind value and thus all other wind switching outputs may only be supplied 60 seconds after the supply voltage has been connected.

Maintenance

The weather station must regularly be checked for dirt twice a year and cleaned if necessary. In case of severe dirt, the wind sensor may not work properly anymore, there might be a permanent rain message or the station may not identify the sun anymore.

As a precaution, the weather station should always be separated from power supply for maintenance works (e.g. deactivate or remove fuse).

Transmission protocol

Units: Temperatures in degree Celsius
Light in Lux
Wind in meters per second

Abbreviations

EIS types:

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

Flags:

C	Communication
R	Read
W	Write
T	Transmit

Listing of all communication objects

No.	***Name***	***Function***	***EIS type***	***Flags***
0	GPS date		4	C R T W
1	GPS time		3	C R T W
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

No.	Name	Function	EIS type	Flags
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
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

No.	Name	Function	EIS type	Flags
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
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

No.	Name	Function	EIS type	Flags
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
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

No.	Name	Function	EIS type	Flags
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
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

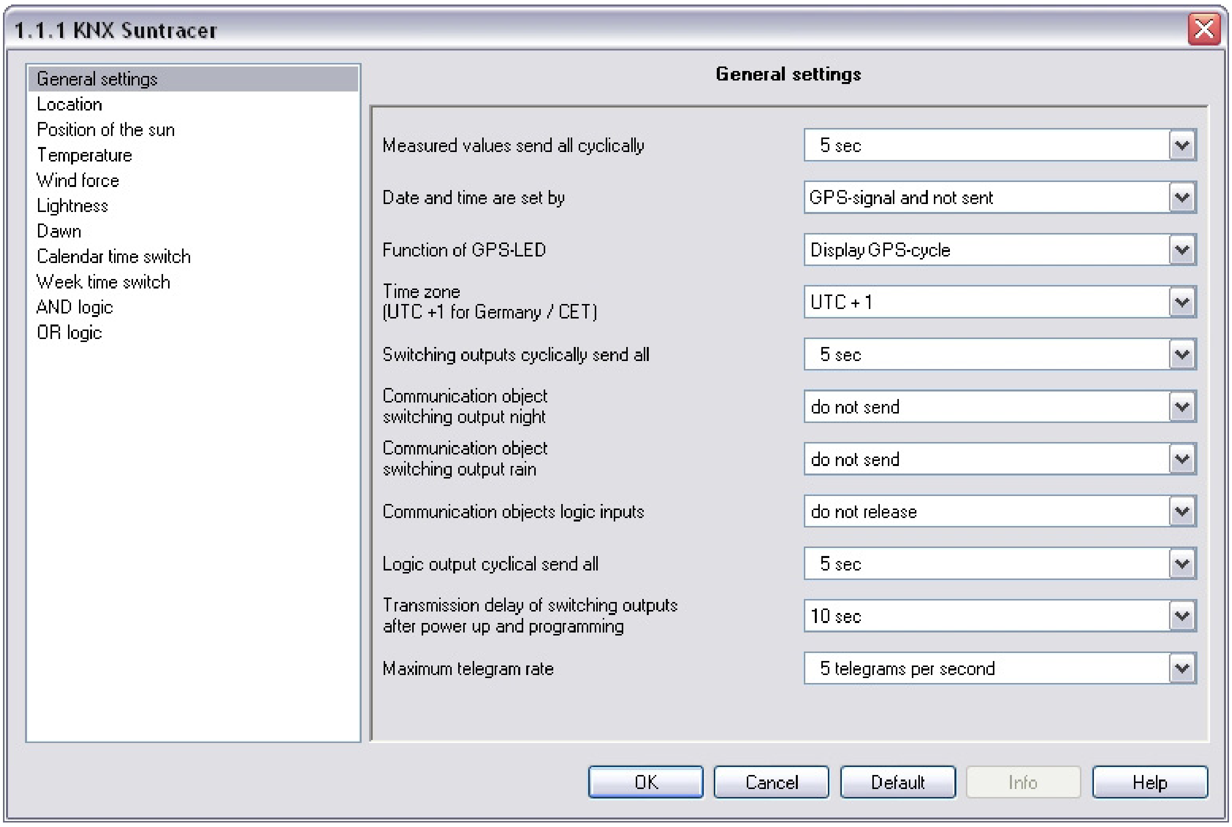
No.	Name	Function	EIS type	Flags
124	Switching output week time switch	Thursday 3	1	C R T
125	Switching output week time switch	Thursday 4	1	C R T
126	Activation time Friday 1	Week time switch	3	C R W
127	Switch off time Friday 1	Week time switch	3	C R W
128	Activation time Friday 2	Week time switch	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
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

No.	Name	Function	EIS type	Flags
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
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

No.	Name	Function	EIS type	Flags
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
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

Setting of parameters

General settings



Send all measured values cyclically	5 sec • 10 sec • 30 sec • ... • 2 h
Date and time are set by	• GPS-signal and not sent • GPS-signal and sent cyclically • GPS-signal and sent on request • GPS-signal and sent on request + cyclically • Communication objects and 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.

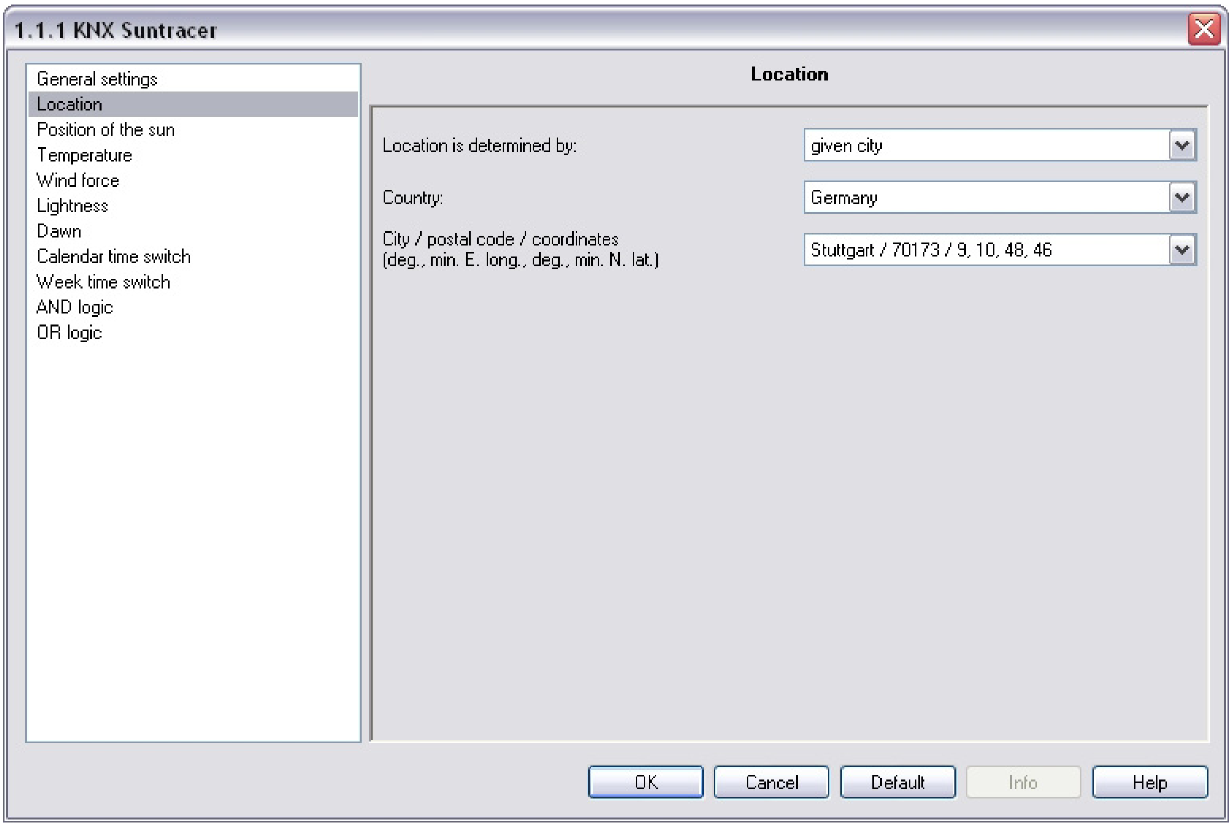
Function of GPS-LED	• Display GPS cycle • always OFF
Time zone	UTC-1 • UTC • UTC+1 • UTC+2 • UTC+3

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
Maximum telegram rate	1 • 2 • 3 • 5 • 10 • 20 telegrams per second

Location

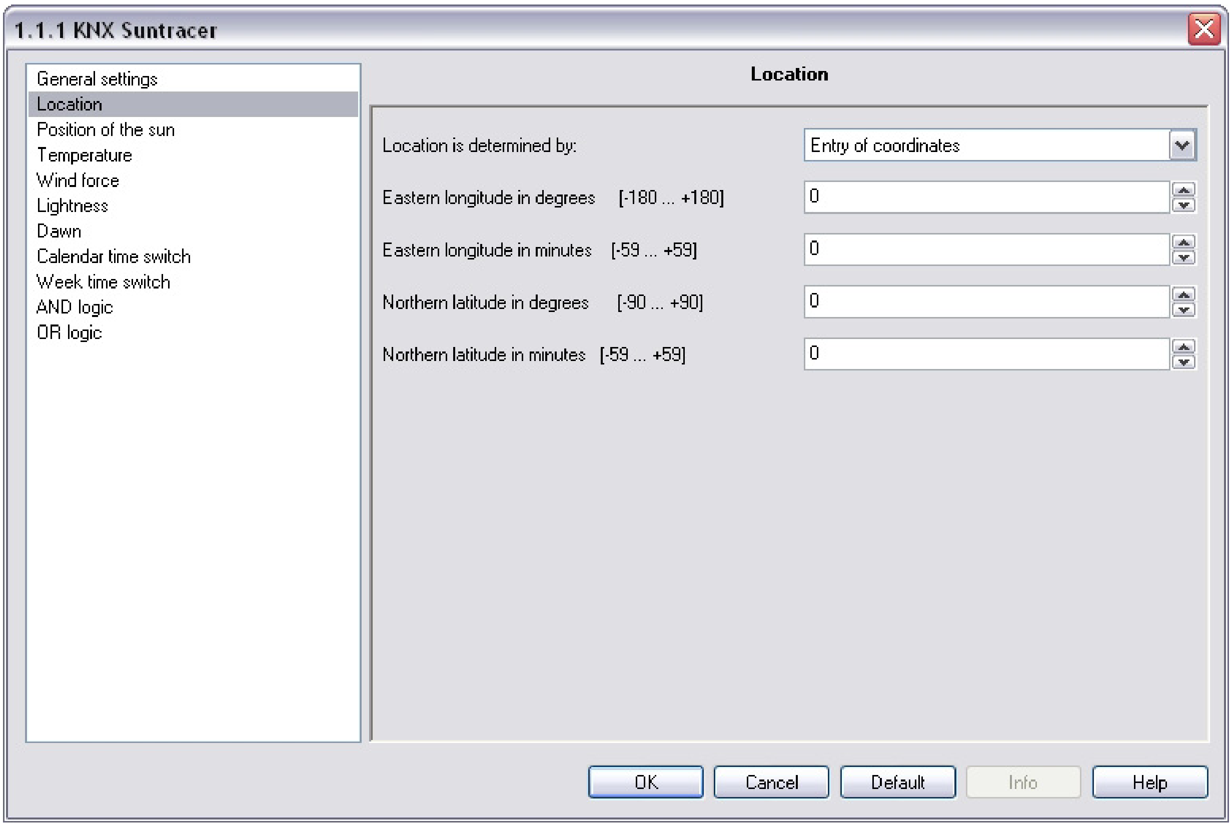
The position is received via GPS! The following settings are used during first commissioning as long as there is still no GPS reception.

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



Country	Germany • Austria • Switzerland • other countries
Town • postal code • coordinates	30 towns in Germany 5 towns in Austria 4 towns in the Switzerland 7 towns in other countries

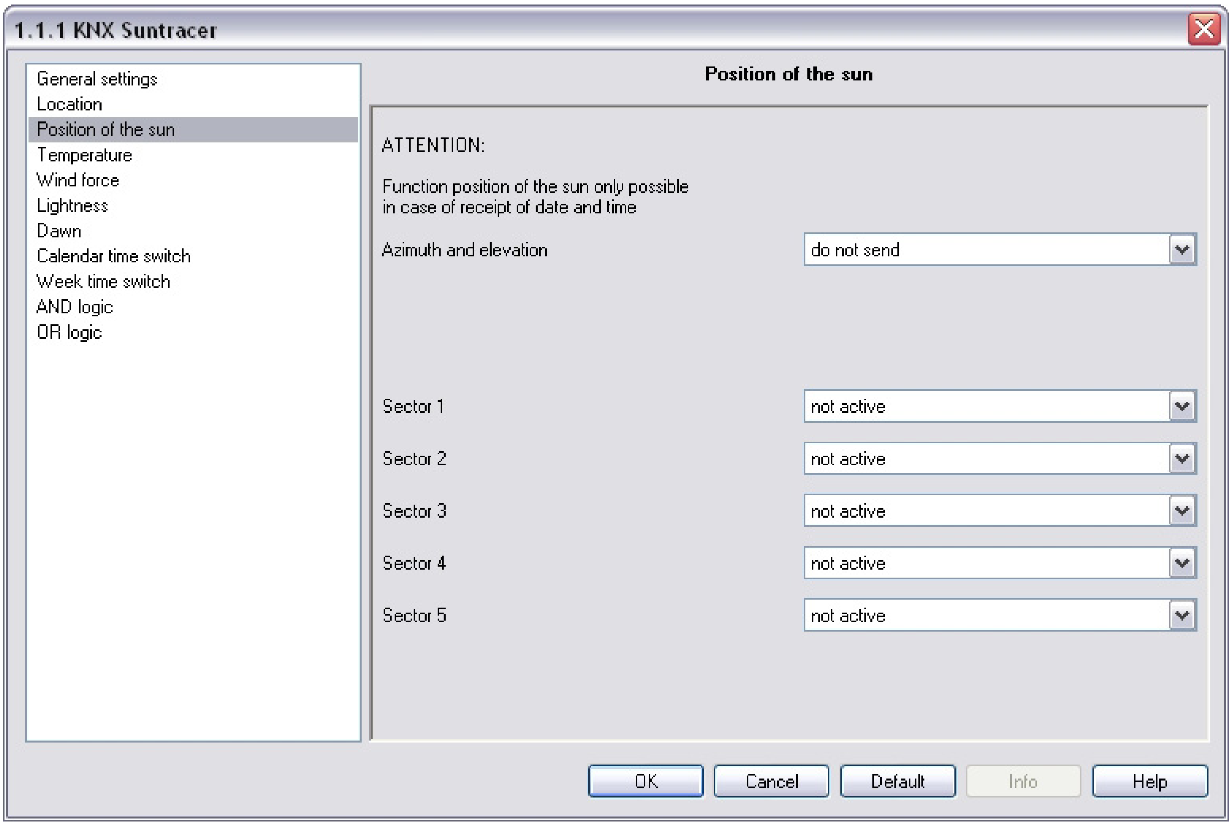
If the location coordinates are entered freely:



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

Position of the sun

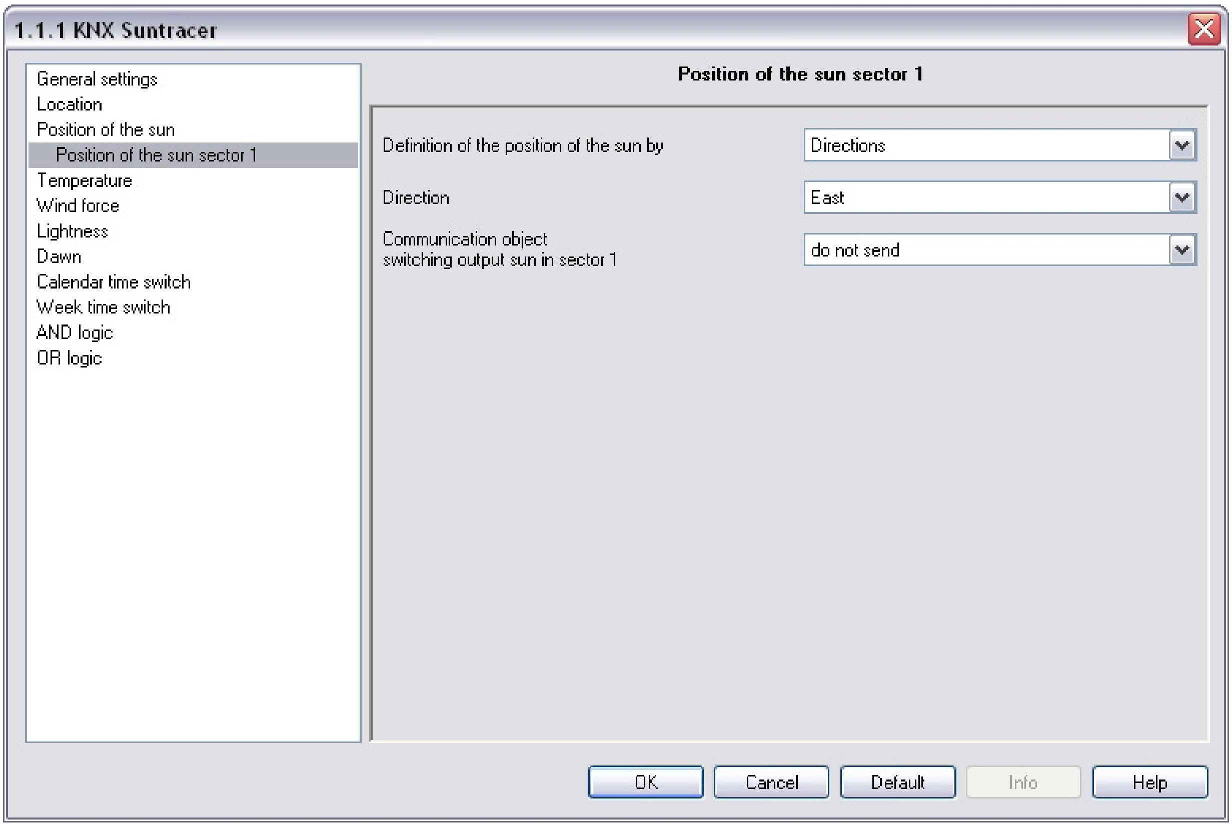
The function “position of the sun” ist only possible in case of receipt of date and time.
The calculation of the position of the sun is optimised for UTC -1...+3. The device therefore may only be applied within Europe. For other time zones, please use Suntracer KNX-GPS Weather Station.



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
Sector 1 / 2 / 3 / 4 / 5	not active • active

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

If the position of the sun is defined by directions:

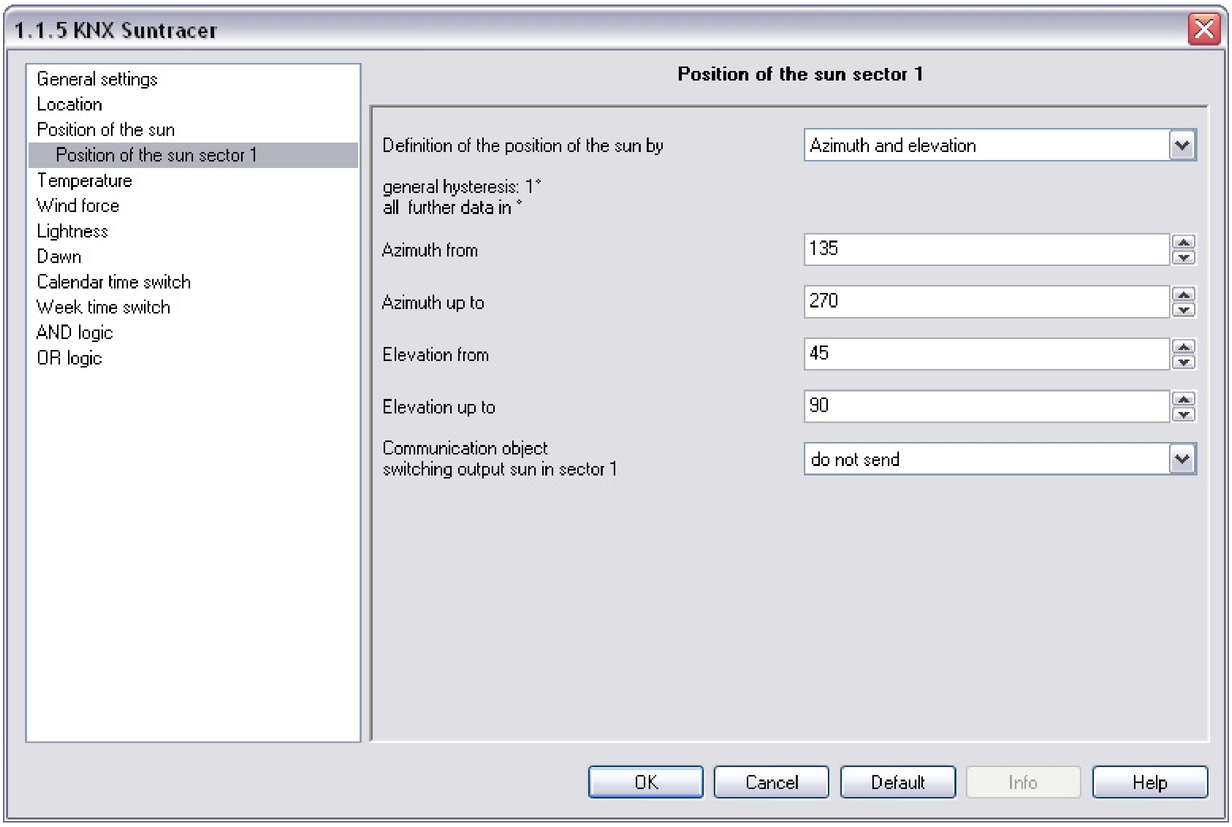


Definition of the position of the sun by	directions • azimuth and elevation
Directions	East • Southeast • Southwest • West
Communication object switching output sun in sector 1 / 2 / 3 / 4 / 5	(as in case of switching output night)

Directions:

East	azimuth 0°-180°	elevation 0°-90°
Southeast	azimuth 45°-225°	elevation 0°-90°
South	azimuth 90°-270°	elevation 0°-90°
Southwest	azimuth135°-315°	elevation 0°-90°
West	azimuth180°-360°	elevation 0°-90°

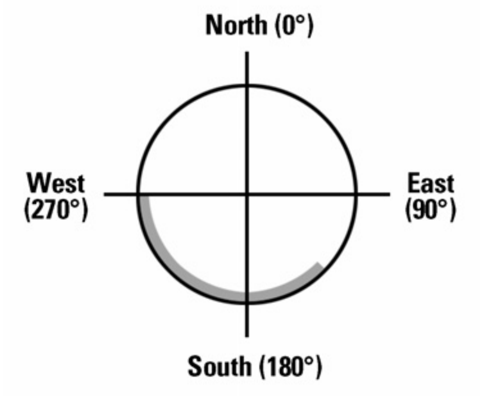
If the position of the sun is defined by azimuth and elevation:



All data in ° (degree)

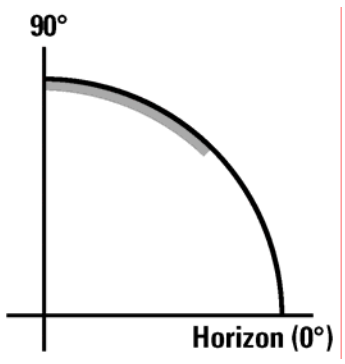
Azimuth from	0 ... 360
Azimuth up to	0 ... 360
Elevation from	0 ... 90
Elevation up to	0 ... 90
Communication object switching output sun in sector 1 / 2 / 3 / 4 / 5	(as in case of switching output night)

Direction of the sun (azimuth):



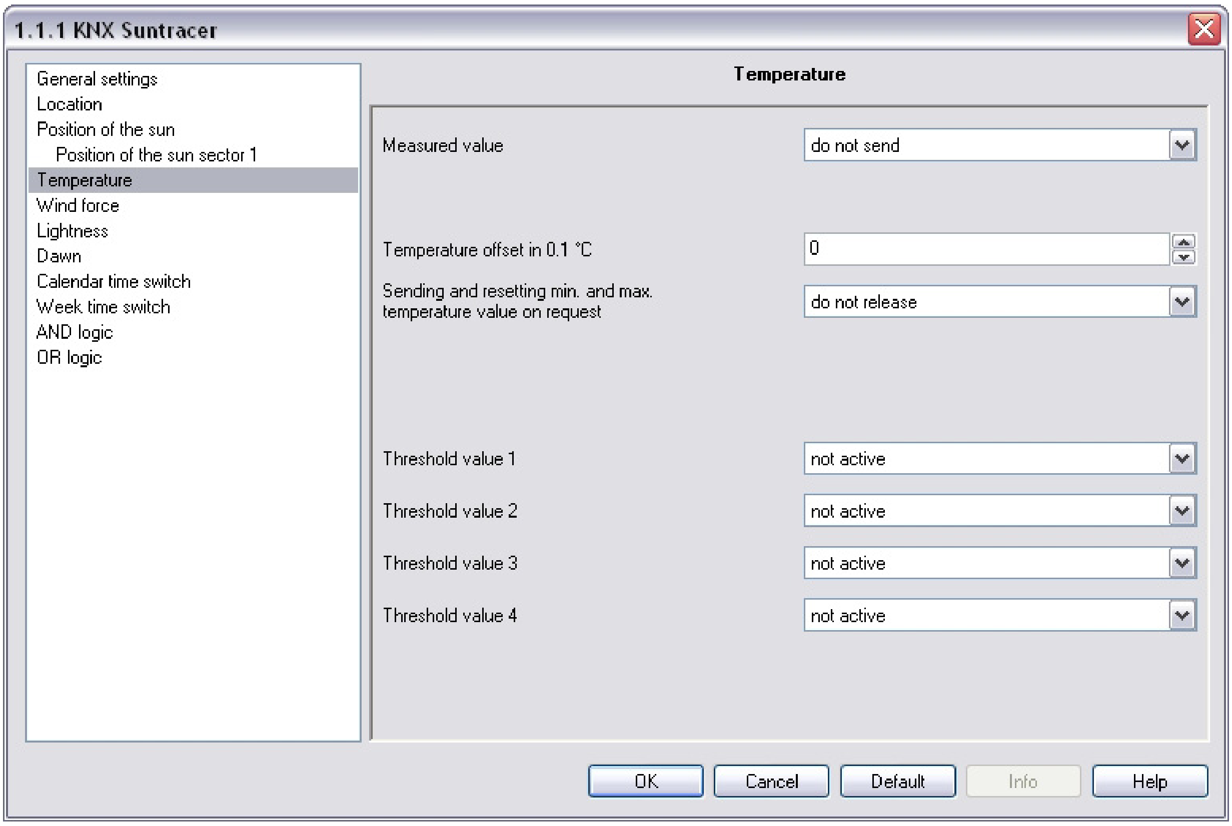
Marked area:
Azimuth from 135° up to 270°

Height of the sun (elevation):



Marked area:
Elevation from 45° up to 90°

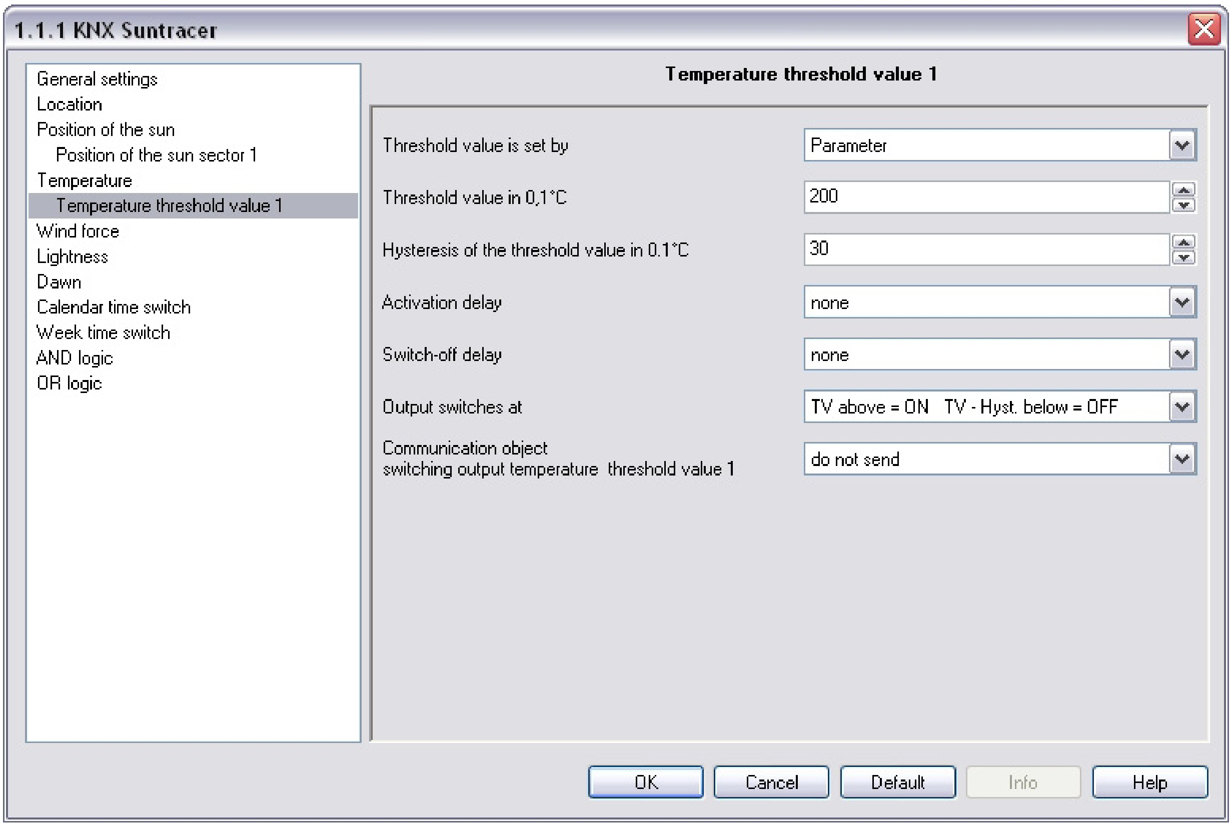
Temperature



Measured value	• do 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
Threshold value 1 / 2 / 3 / 4	not active • active
Sending and resetting min. and max. temperature value on request	do not release • release

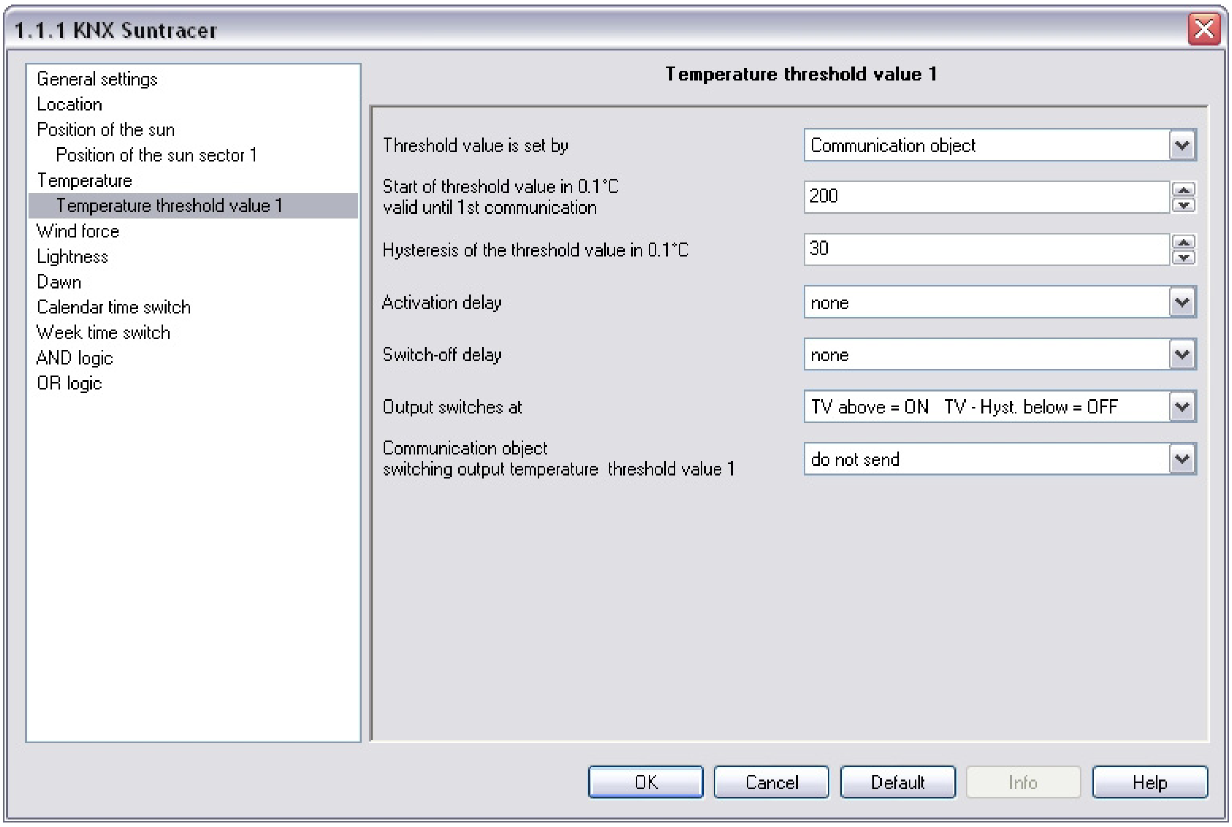
Temperature threshold 1 / 2 / 3 / 4

If the threshold is set by parameters:



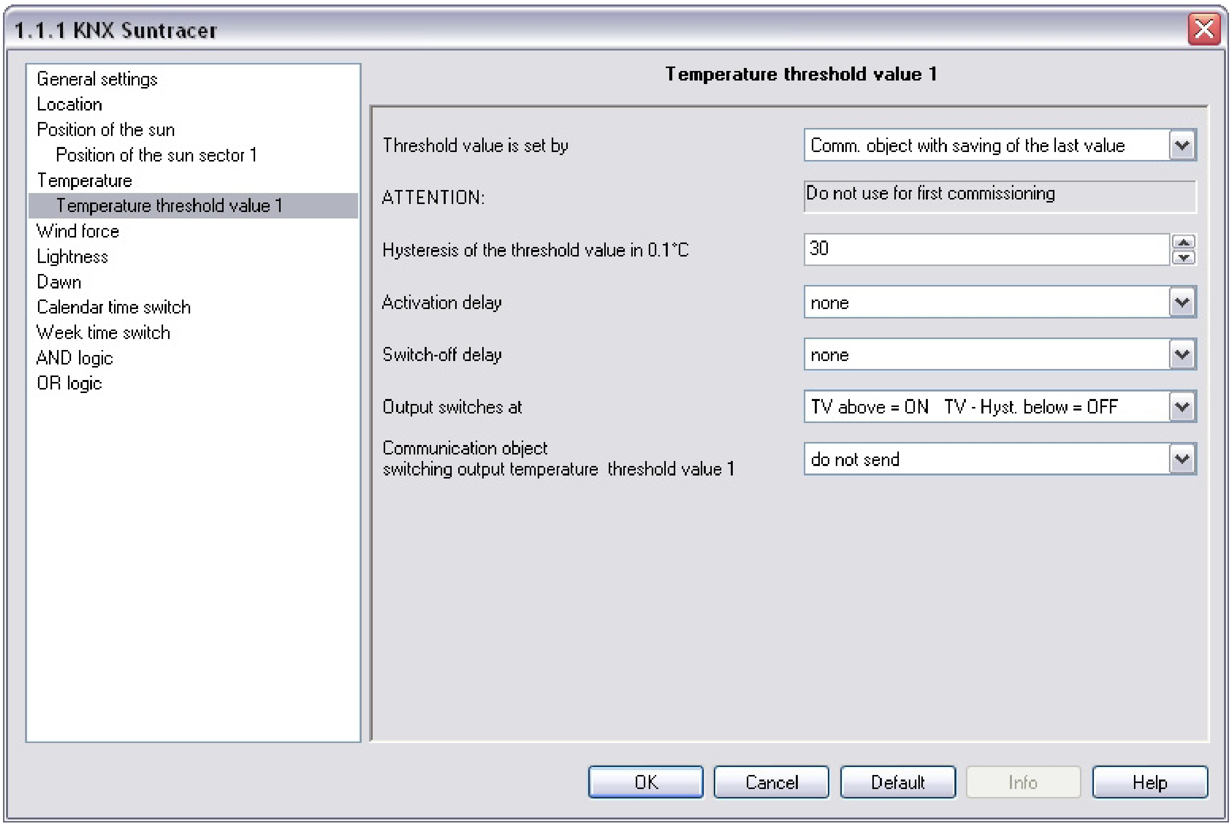
Threshold value is set by	Parameters
Threshold value in 0.1°C	-300 … 800

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:



Threshold value is set by	Communication object
Start threshold value in 0.1°C Valid until the first communication	-300 ... 800

In case of an already commissioned weather station, the threshold which has been communicated at last may be used:

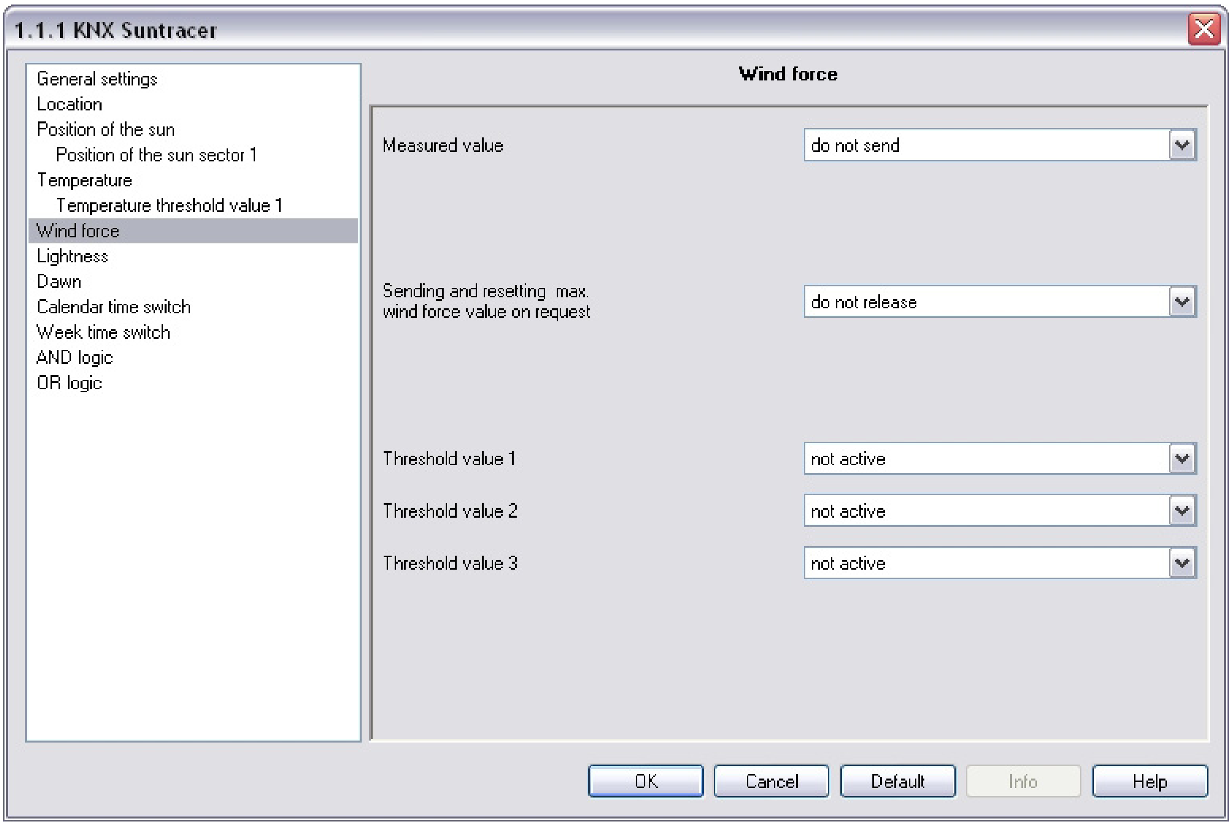


As soon as a threshold has been set by means of a parameter or by means of a communication object, the threshold set at last remains until a new threshold has been transmitted by a communication object.

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.

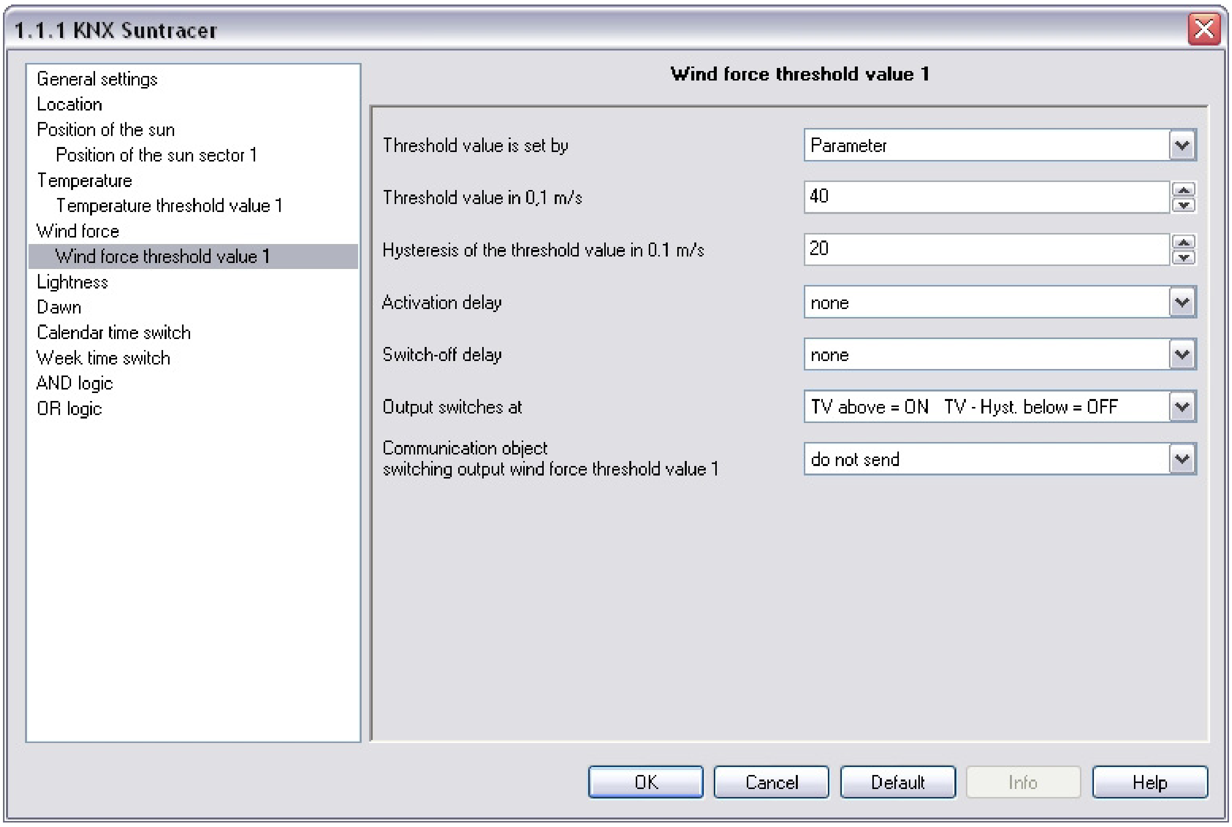
Hysteresis of the threshold value in 0.1°C.	0 ...100
Activation delay	none • 1 sec ... 2 h
Switch-off delay	none • 1 sec ... 2 h
Output switches at	TV above = ON | TV - Hyst. below = OFF • TV below = ON | TV - Hyst. above = OFF •
Communication object switching output temperature threshold value 1 / 2 / 3 / 4	(as in case of switching output night)

Wind force



Measured value	• do not send • send cyclically • send in case of change • send in case of change and cyclically
From a wind force change of	1 m/sec ... 4 m/sec
Threshold value 1 / 2 / 3	not active • active
Sending and resetting max. wind force value on request	do not release • release

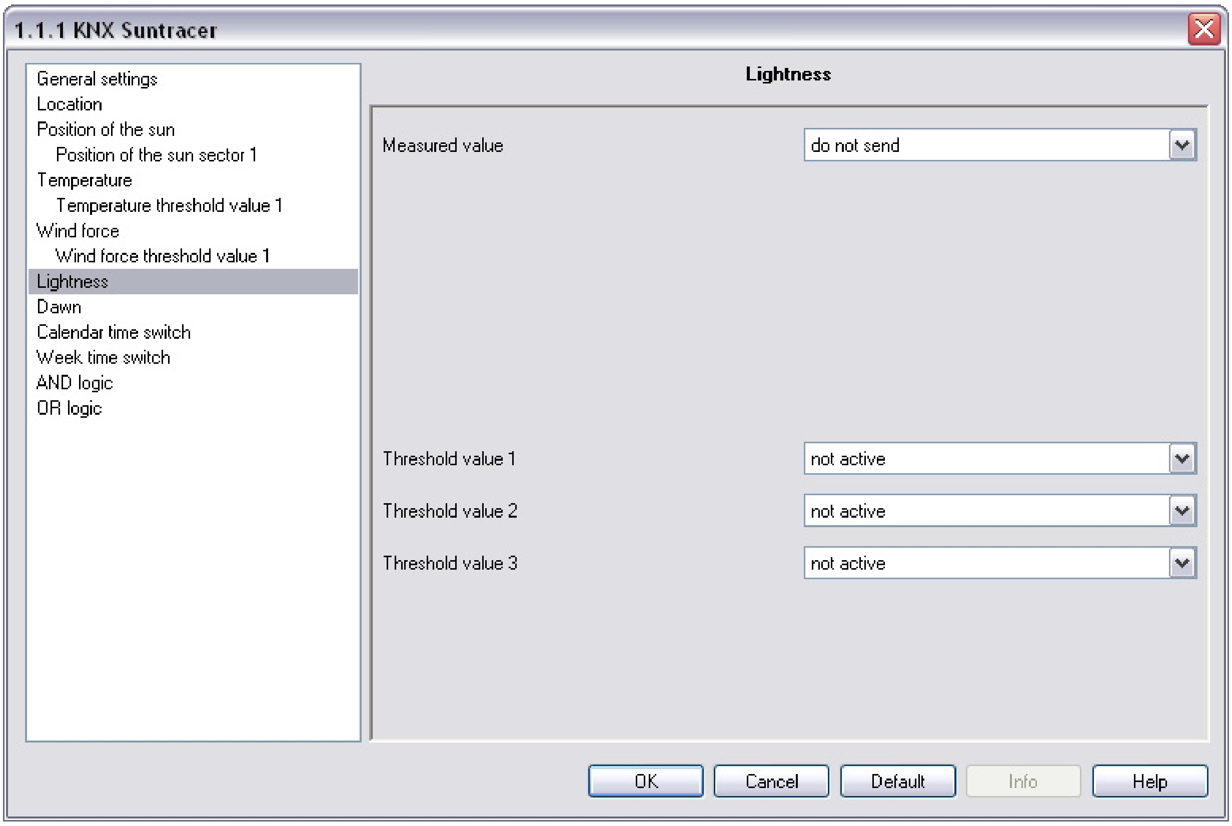
Wind force threshold 1 / 2 / 3



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

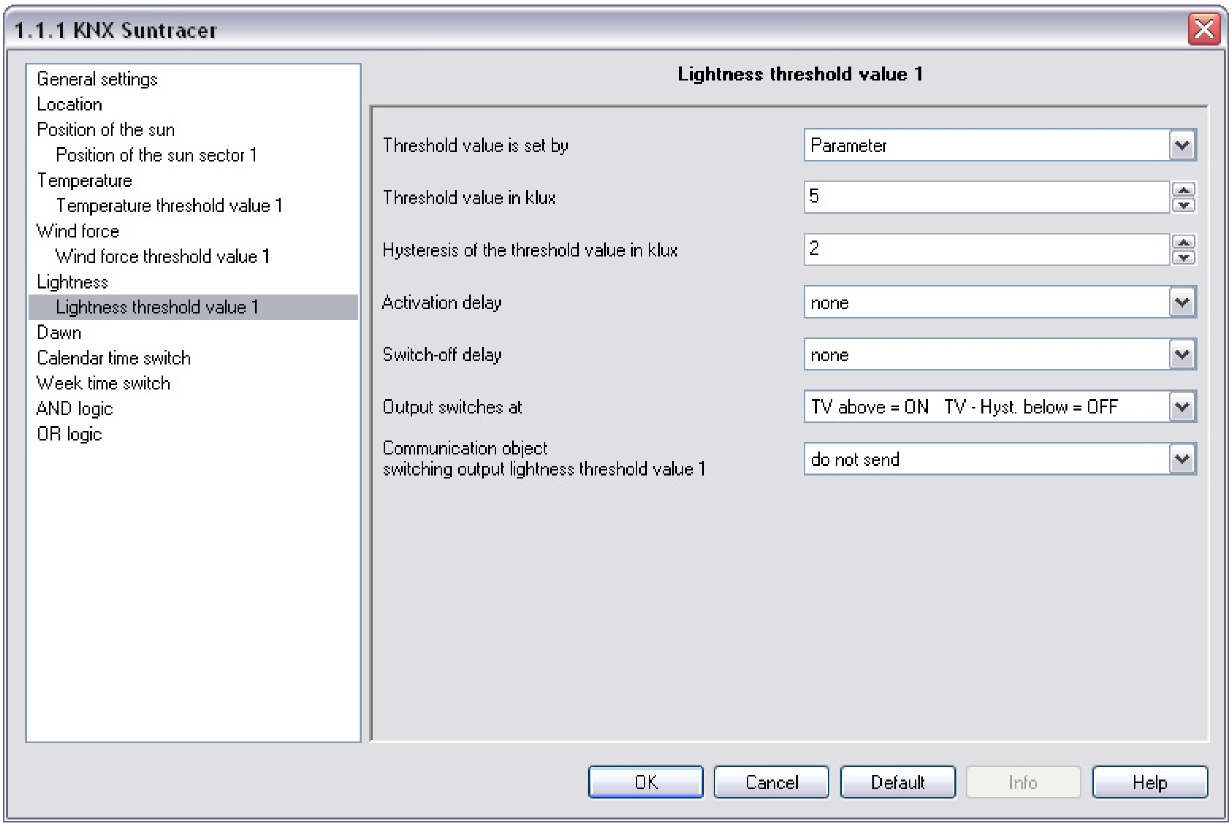
All other parameters correspond to the parameters of the temperature thresholds (see there).

Lightness



Measured value	• do not send • send cyclically • send in case of change • send in case of change and cyclically
From change in %	1 ... 50
Threshold value 1 / 2 / 3	not active • active

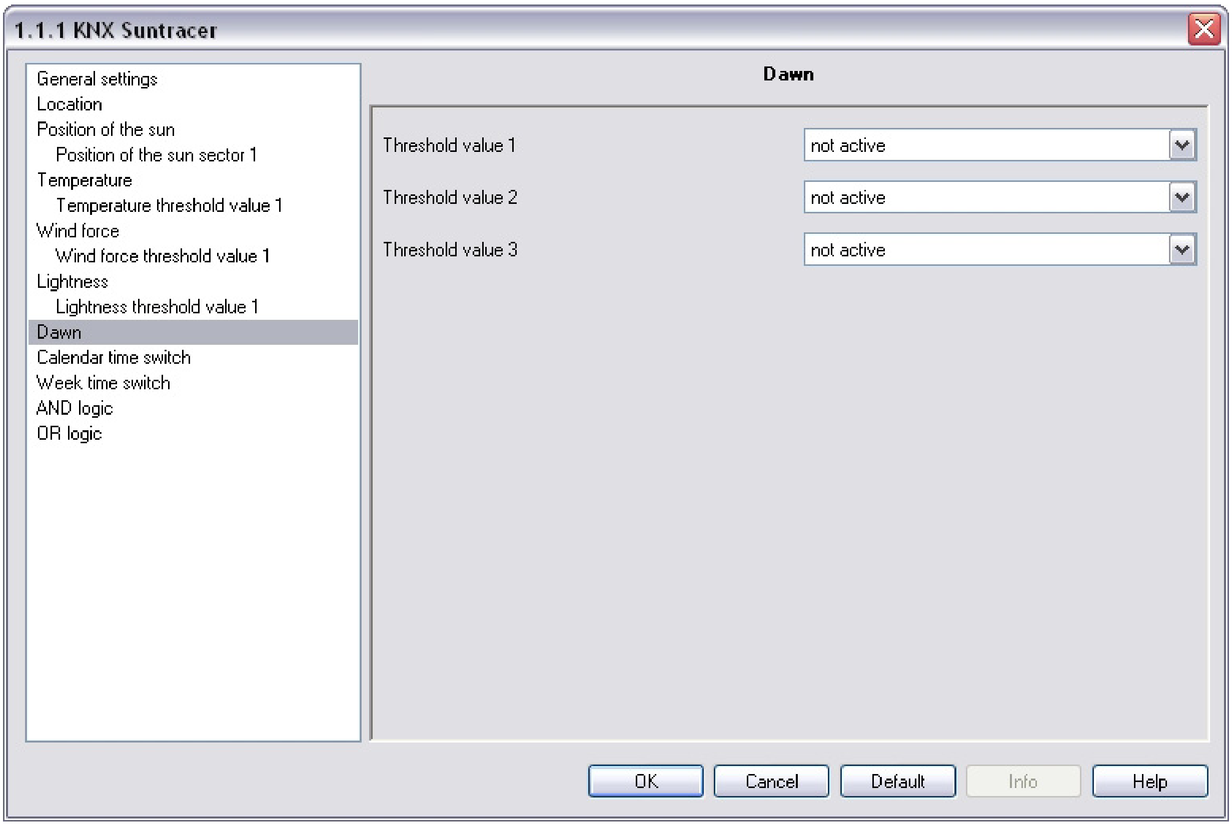
Lightness threshold value 1 / 2 / 3



Threshold value in klux	1 ... 99
Hysteresis of the threshold value in klux	0 ... 99

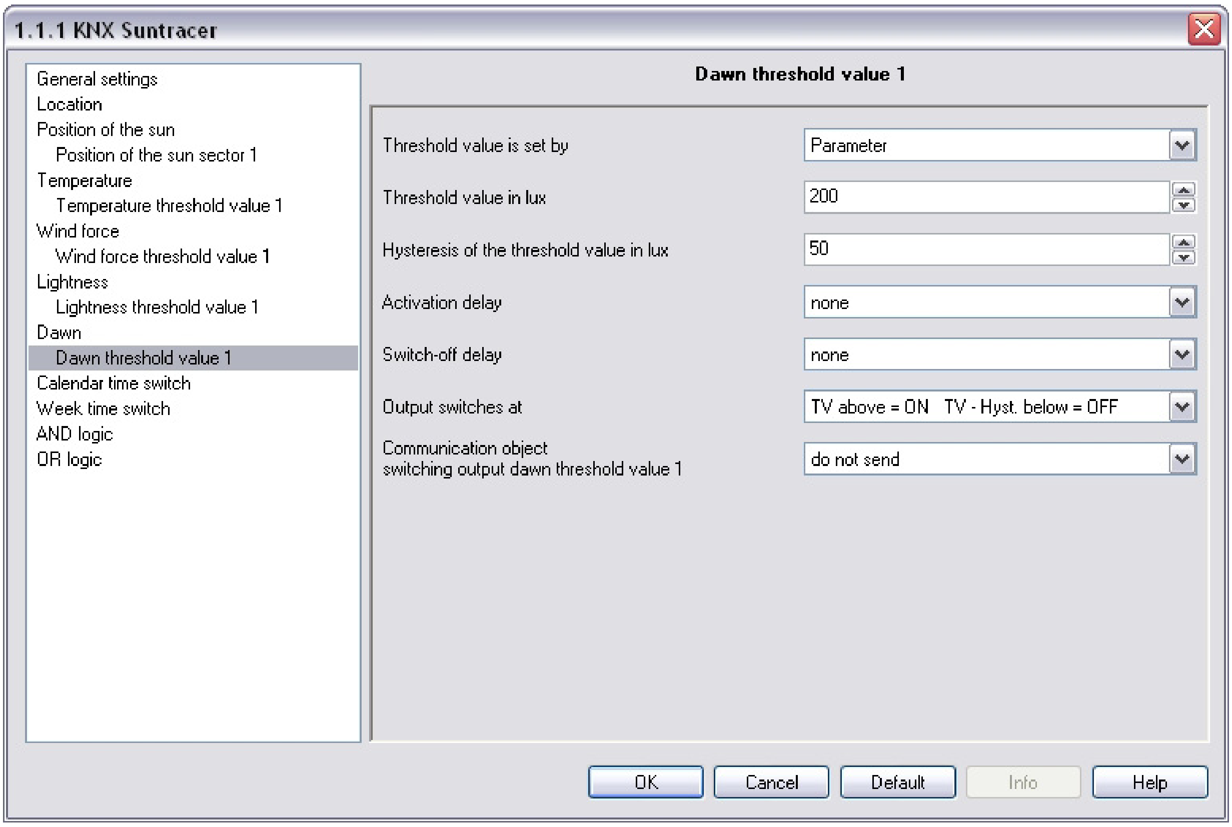
All other parameters correspond to the parameters of the temperature thresholds (see there).

Dawn



Threshold value 1 / 2 / 3	Not active • active

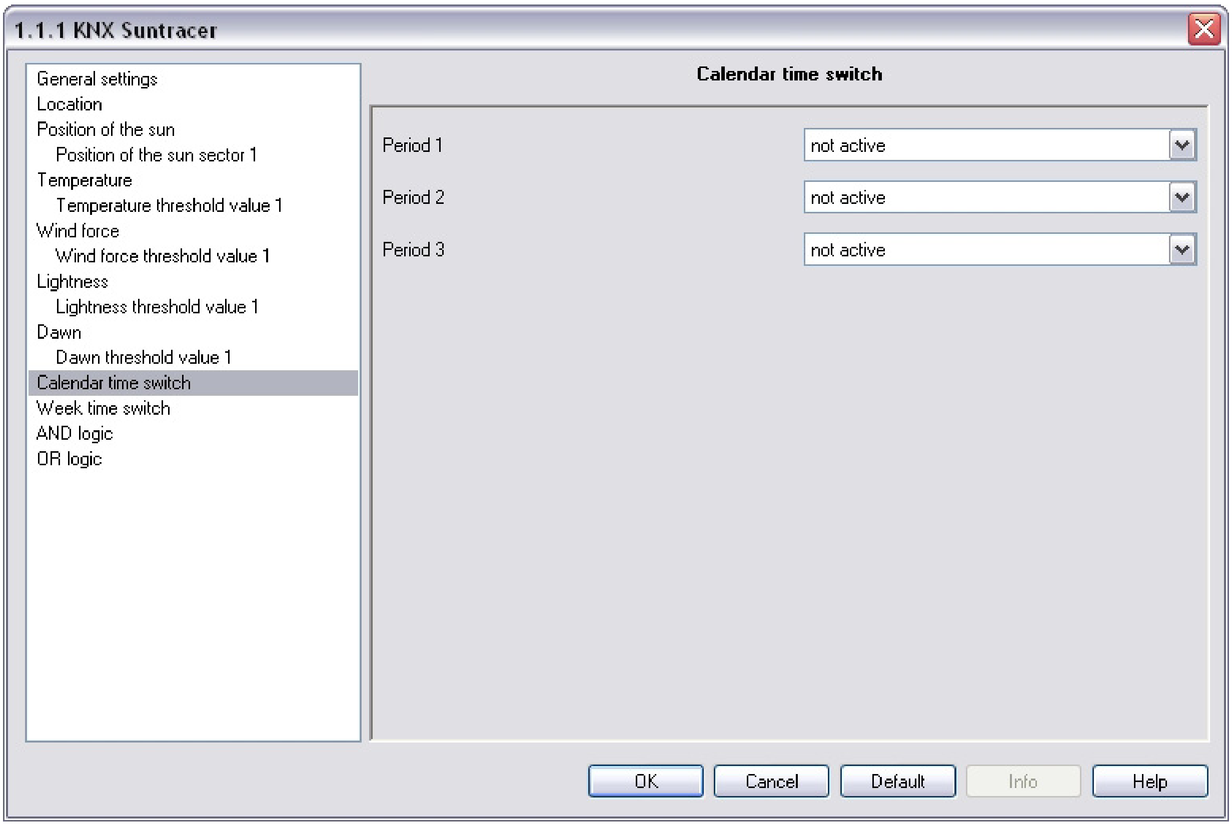
Dawn threshold value 1 / 2 / 3



Threshold value in lux	1 … 1000
Hysteresis of the threshold value in lux	0 … 1000

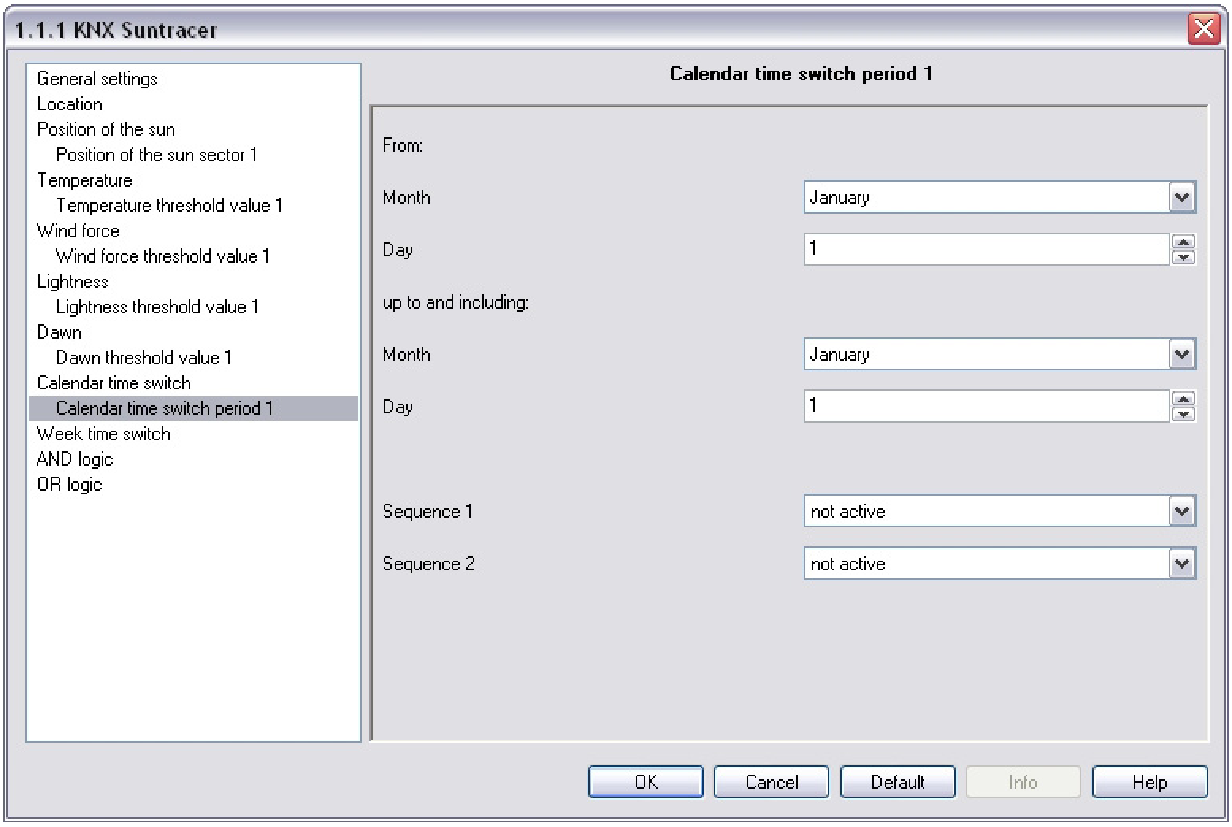
All other parameters correspond to the parameters of the temperature thresholds (see there).

Calendar time switch



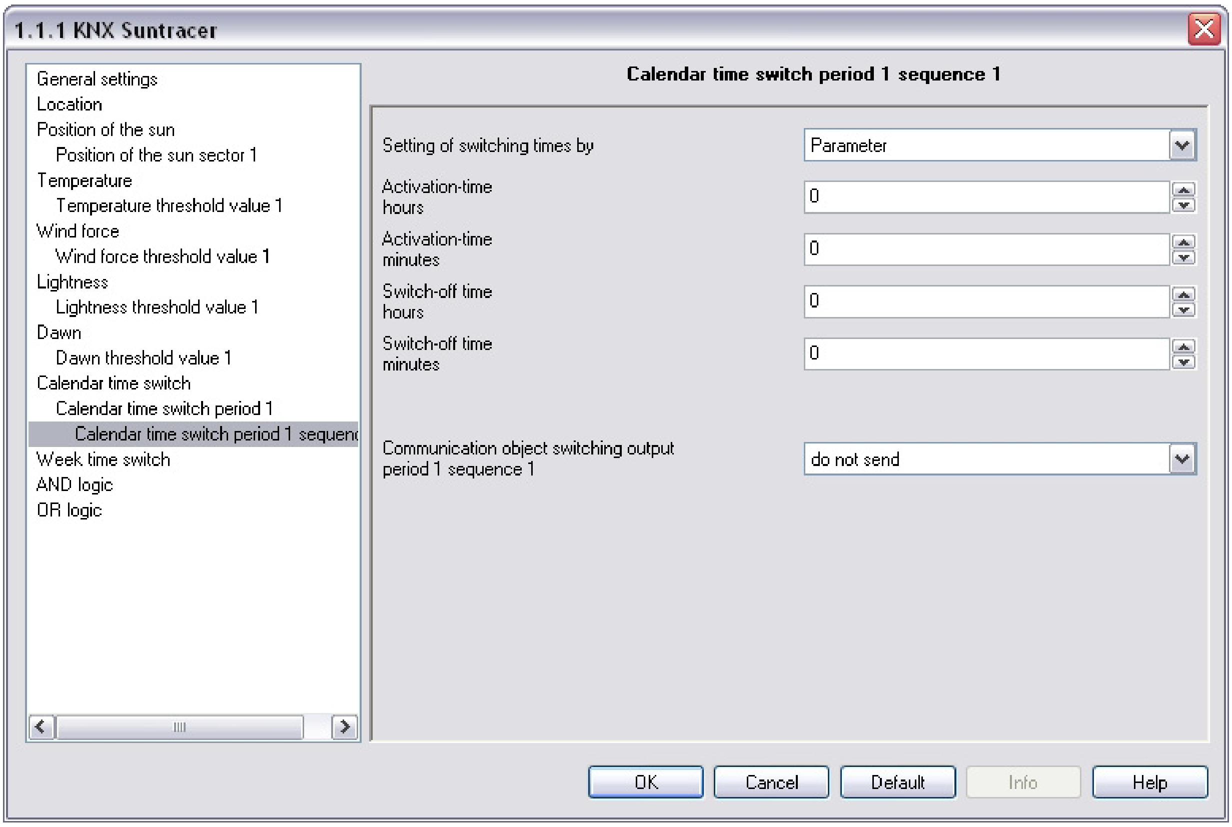
Period 1 / 2 / 3	not active • active

Calendar time switch period 1 / 2 / 3



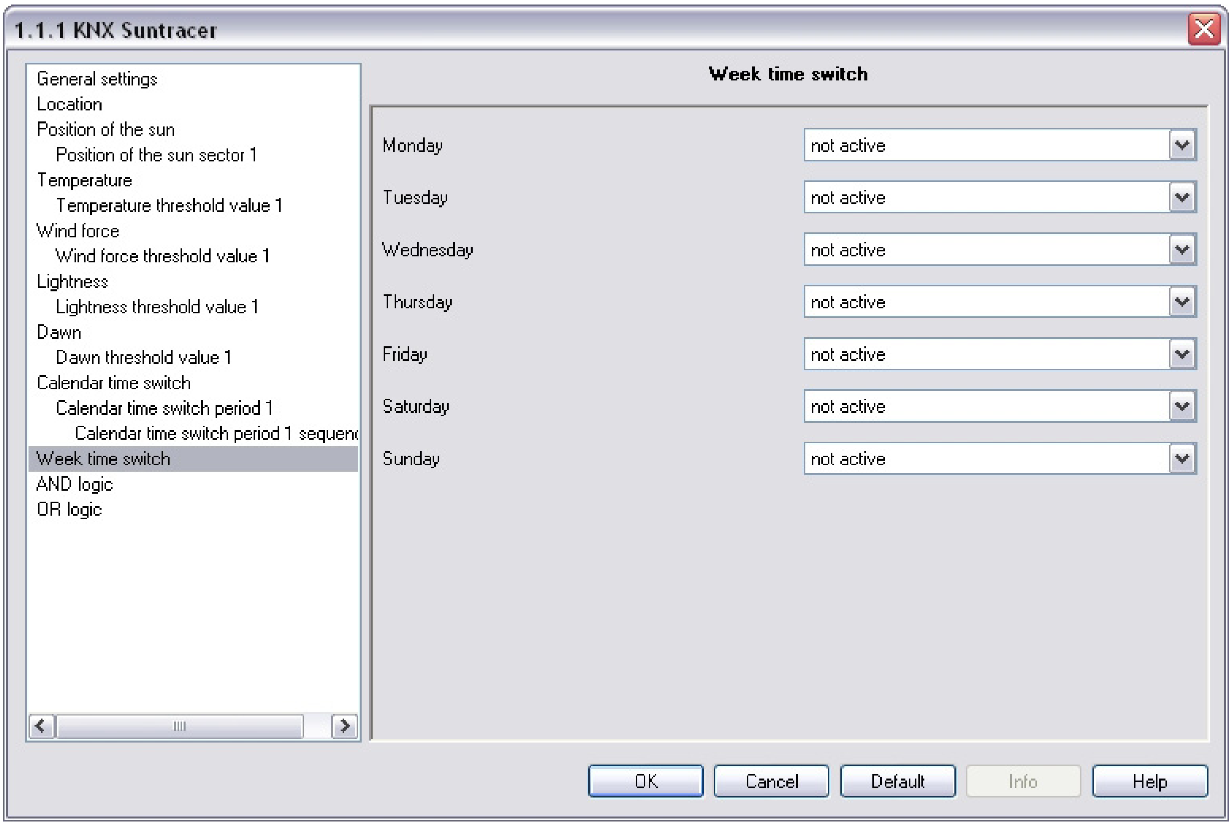
From:	
Month	January ... December
Day	1 ... 29 / 1 ... 30 / 1 ... 31 (depending on month)
up to and including:	
Month	January ... December
Day	1 ... 29 / 1 ... 30 / 1 ... 31 (depending on month)
Sequence 1	not active • active
Sequence 2	not active • active

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	(as in case of switching output night)

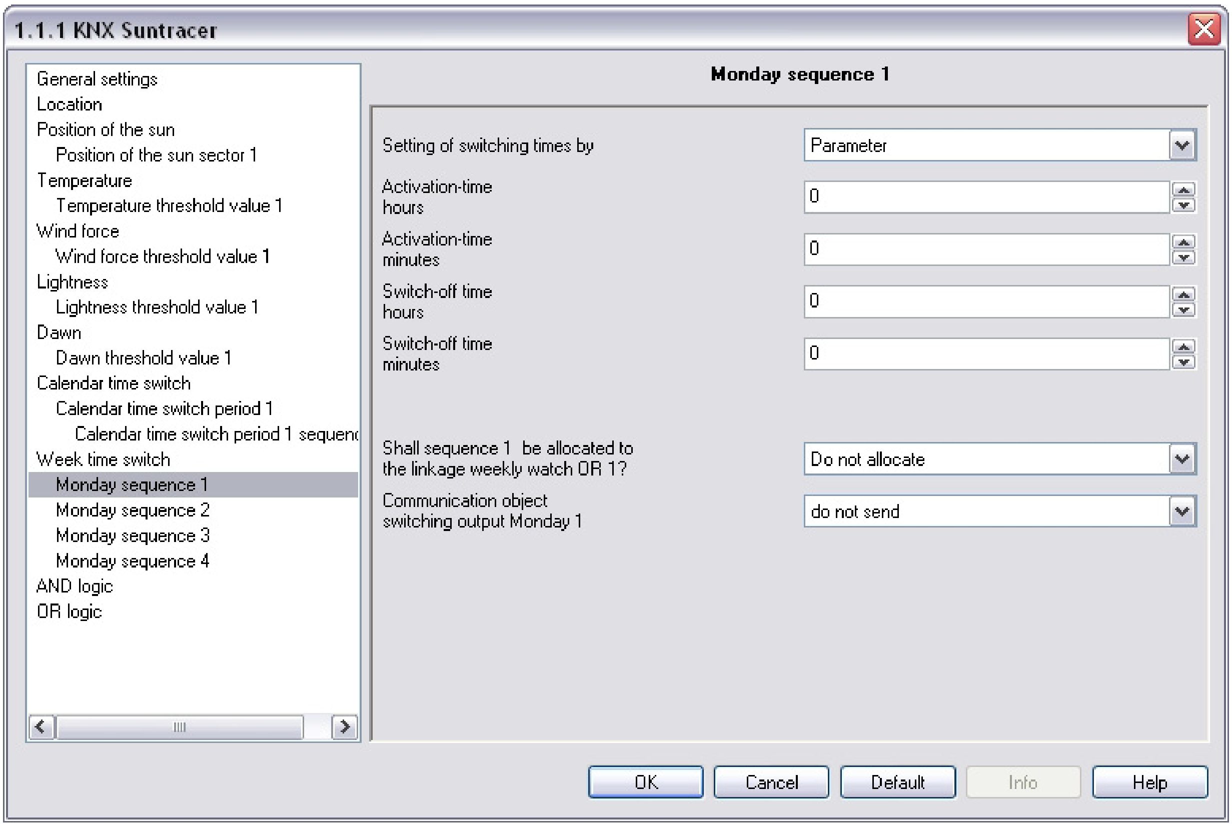
Week time switch



Monday ... Sunday	not active • active

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

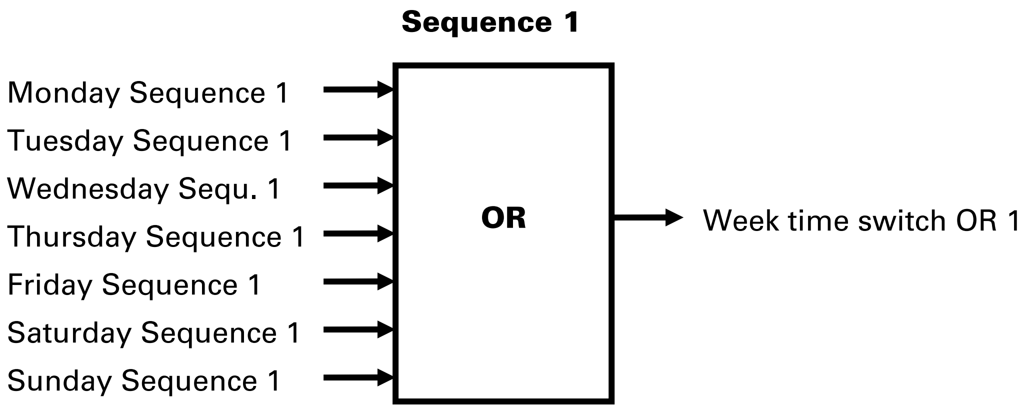
Weekly watch Mon, Tue, Wed, Thu, Fri, Sat, Sun 1 … 4



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
Shall sequence 1 / 2 / 3 / 4 be allocated to the linkage weekly watch OR 1 / 2 / 3 / 4?	do not allocate • allocate
Communication object switching output Monday 1 / 2 / 3 / 4	(as in case of switching output night)

Note: 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 .



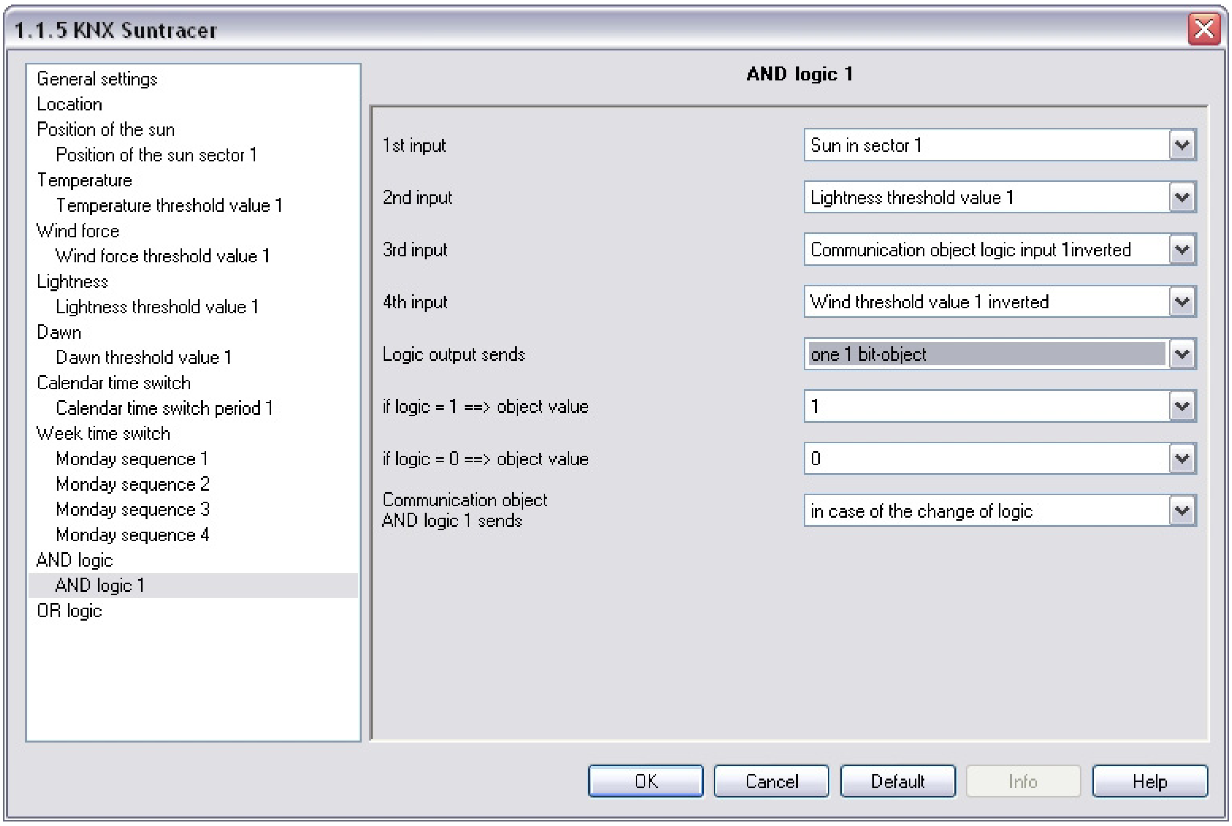
AND logic

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

AND logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8

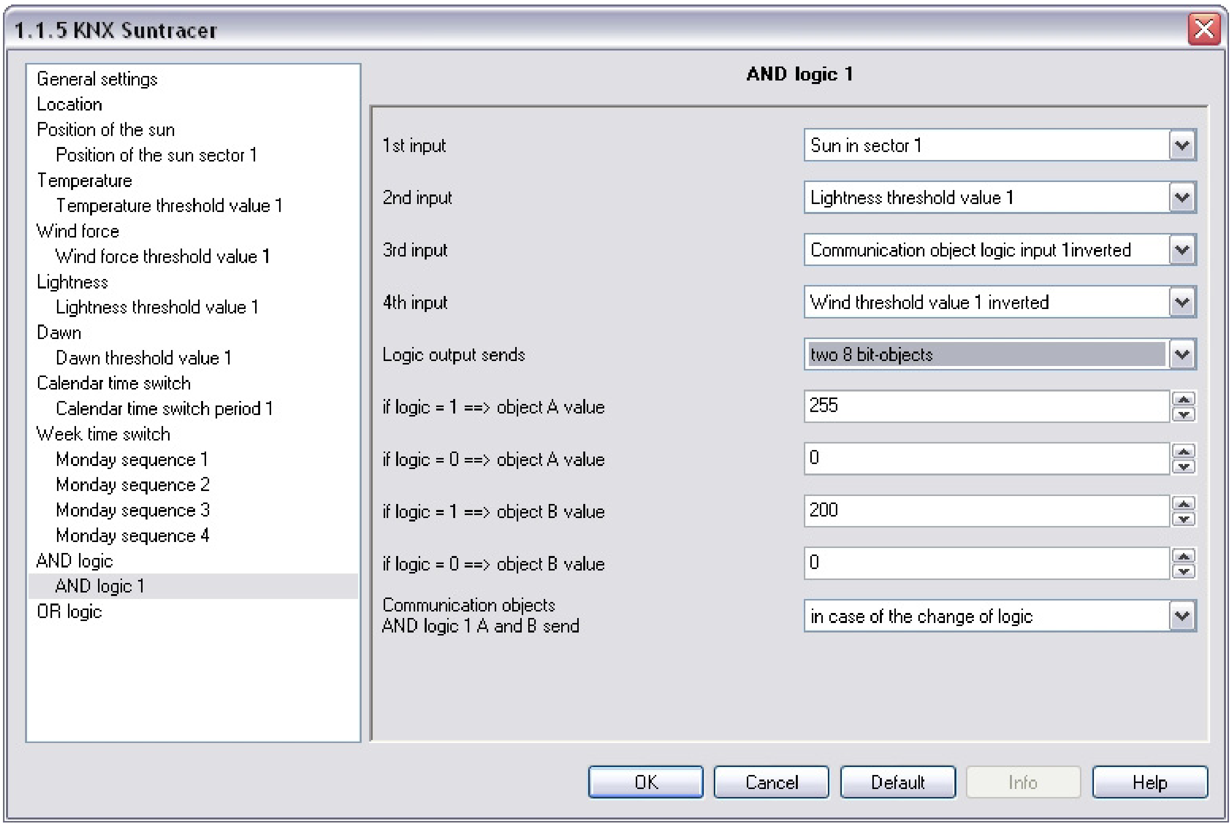
1st / 2nd / 3rd / 4th input	do not use • all switching events which the weather station provides (see “Linkage inputs of the AND logic”)
Logic output sends	a 1 bit-object • two 8 bit-objects

If the logic output sends a 1 bit-object:



Logic output sends	**a 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 1/0 • in case of the change of logic and cyclically • in case of the change of logic to 1/0 and cyclically

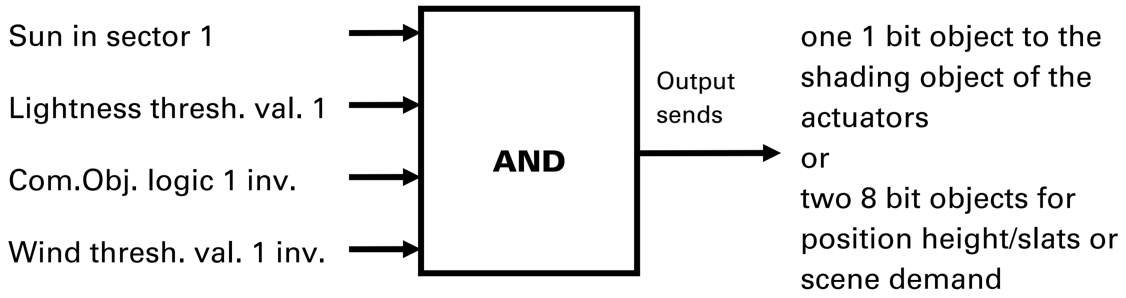
If the logic output sends two 8 bit-objects:



Logic output sends	**two 8 bit-objects**
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
Communication objects AND logic 1 A and B send	• in case of the change of logic • in case of the change of logic to 1/0 • in case of the change of logic and cyclically • in case of the change of logic to 1/0 and cyclically

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).

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

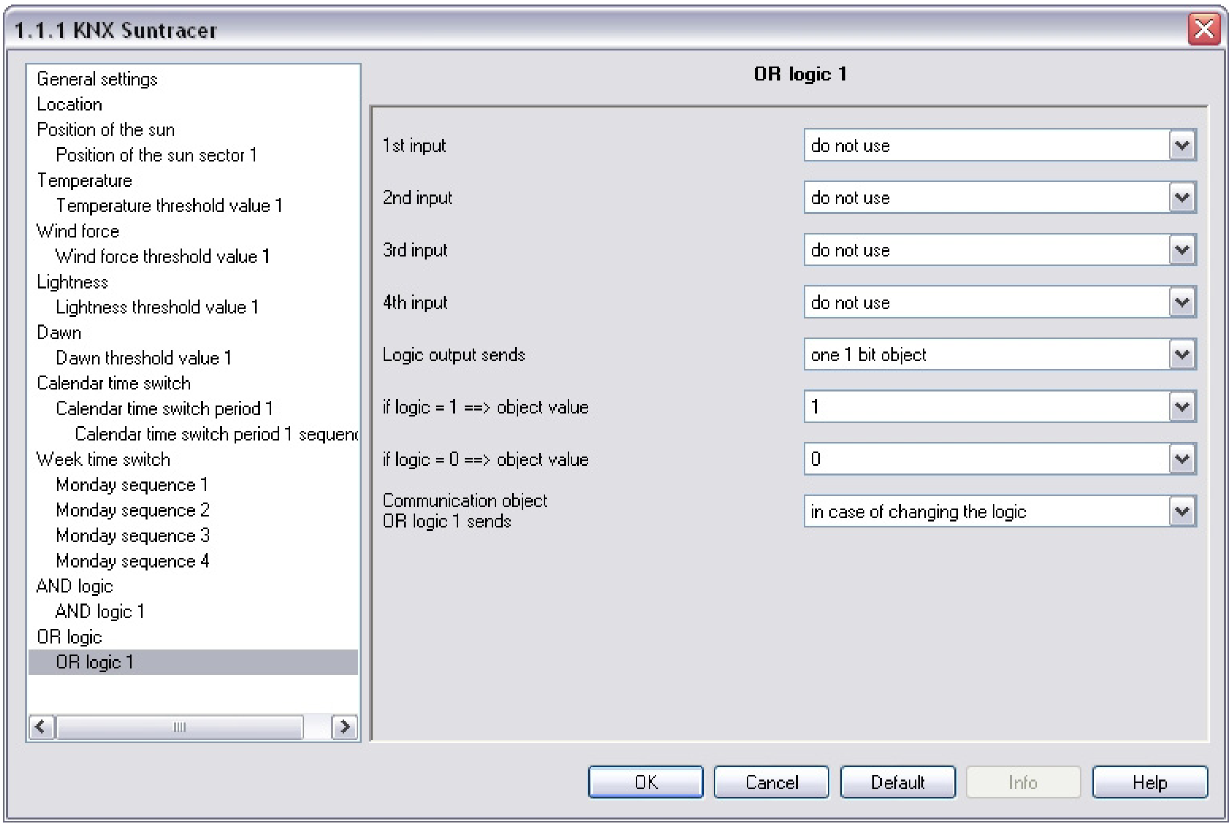
Wind threshold value 1
Wind threshold value 1 inverted
Wind threshold value 2
Wind threshold value 2 inverted
Wind threshold value 3
Wind threshold value 3 inverted
Week time switch Monday 1
Week time switch Monday 1 inverted
Week time switch Monday 2
Week time switch Monday 2 inverted
Week time switch 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

OR logic

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

OR logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8



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

All parameters of the OR logic correspond with the parameters of the AND logic.

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

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