KNX RW

Rain/Wind Sensor

Item numbers 70126 (230 V AC), 70127 (20...30 V DC)

elsner elektronik

Installation and Adjustment

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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 **Rain/Wind Sensor KNX RW** measures precipitation and wind speed and transfers the values to the KNX system. Four switching outputs with three adjustable threshold values as well as additional AND and OR logic gates are available. The sensor system, the evaluation electronics and the electronics of the bus connection are mounted in a compact housing.

Functions:

- **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
- **Wind measurement**: The wind strength measurement takes place electronically and thus noiselessly and reliably, even during hail, snow and sub-zero temperatures. Even turbulent air and anabatic winds in the vicinity of the weather station are recorded
- **Wind sensor monitoring**: If the wind measurement value changes by less than ± 0.5 m/s within 48 hours, the maximum measurement value of 35 m/s is output as a fault message. All wind alarms with a limit value below 35 m/s become active as a result
- **4 switching outputs (communication objects)**, 3 with adjustable threshold 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 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. Deliverables

- Sensor with combined wall/pole mounting
- 2x stainless steel installation band for pole installation

1.2. Technical specifications

Housing	Plastic material
Colour	White/ translucent
Mounting	On-wall
Degree of protection	IP 44
Dimensions	approx. 96 × 77 × 118 (W × H × D, mm)
Weight	230 V AC version: approx. 240 g, 20...30 V DC version: approx. 170 g

Ambient temperature	Operation -30…+50°C, storage -30…+70°C
Operating voltage	Available for 230 V AC or 20...30 V DC. An appropriate power supply unit can be obtained from Elsner Elektronik.
Cable cross-section	Massive conductors of up to 1.5 mm² or conductors with fine wires
Current	230 V AC version: max. 20 mA, 20...30 V DC version max. 100 mA, residual ripple 10%
Data output	KNX +/- bus terminal plug
Group addresses	max. 254
Allocations	max. 255
Commmunication objects	81
Heating rain sensor	approx. 1,2 W (230 V and 20...30 V DC)
Measurement range wind	0...35 m/s
Resolution (wind)	<10% of the measured value
Accuracy (wind)	±25% at 0...15m/s, at an angle of attack of 45°, pole mounting

The product conforms with the provisions of EU directives.

2. Installation and commissioning

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

DANGER!
Risk to life from live voltage (mains voltage)!
There are unprotected live components inside the device.

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

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

2.1. Location

Select an assembly location at the building where precipitation and wind may be collected by the sensors unobstructedly. Do not assemble any construction components above the sensor from where water may drop on to the rain and wind sensor after it has stopped raining or snowing.

At least 60 cm of clearance must be left all round the device. 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.

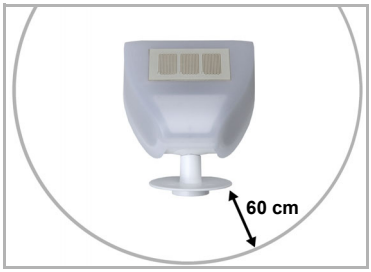


Fig. 1
There must be at least 60 cm of space below, to the sides and in front of the sensor left from other elements (structures, construction parts, etc.).

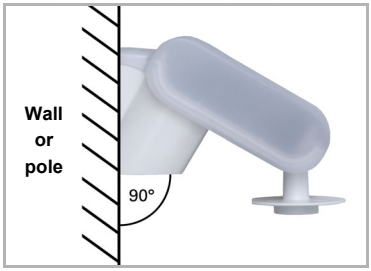


Fig. 2
The rain/wind sensor must be mounted on a vertical wall (or a pole).

Fig. 3
The rain/wind sensor must be mounted in the horizontal transverse direction (horizontally).

2.2. Mounting the sensor

2.2.1. Attaching the mount

The sensor 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.

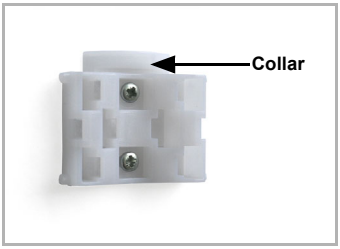


Fig. 4
When wall mounting: flat side on wall, crescent-shaped collar upward.

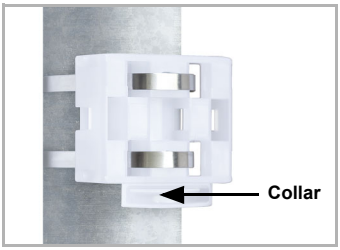


Fig. 5
When pole mounting: curved side on pole, collar downward.

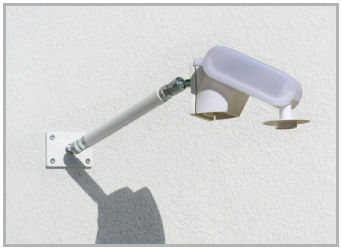


Fig. 6
Different mounting arms are available from Elsner Elektronik as additional, optional accessories for flexible installation of the weather station on a wall, pole or beam (pictures of sensors exemplary).
Example of the use of a mounting arm: Due to flexible ball joints, the sensor can be brought into ideal position.

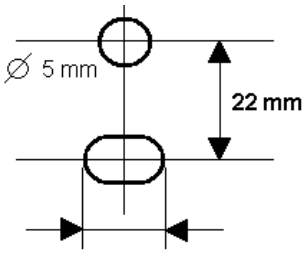
Fig. 7
Example use of the hinge arm mounting:
With the hinge arm mounting, the weather station projects from beneath the roof overhang. Sun, wind and precipitation can act upon the sensors without hindrance.

Fig. 8
Example use of the hinge arm mounting:
Fitting to a pole with worm drive hose clips

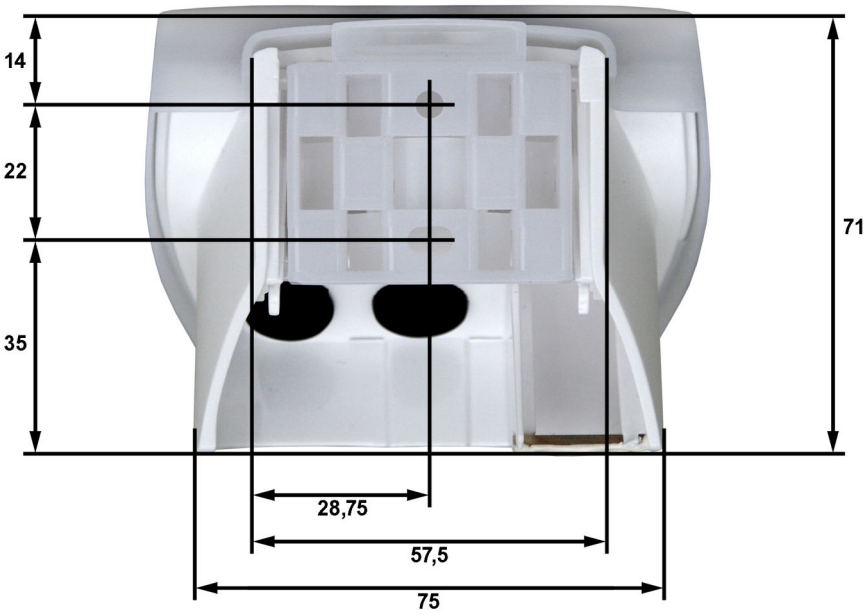
2.2.2. View of rear side and drill hole plan

Fig. 9 a+b
Drill hole plan

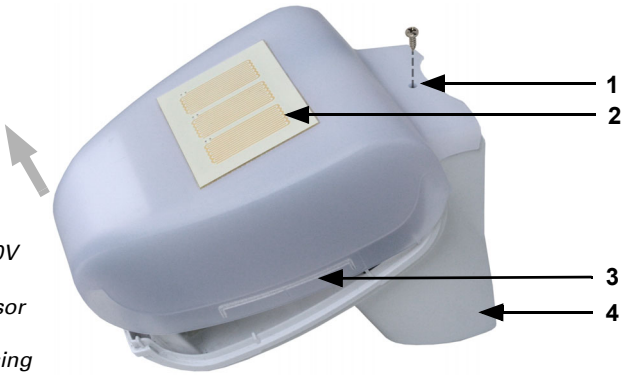
Dimensions of rear side of housing with bracket.
Subject to change for technical enhancement.



Langloch 7,5 x 5 mm



2.2.3. Preparing the sensor



Unsnap cover and remove upwards

Fig. 10
1 Screw-on cover (230V device)
2 Cover with rain sensor
3) Cover Snaps
4 Bottom part of housing

The sensor cover snaps in on the left and right along the bottom edge (see Fig.). The cover of the 230V model is also screwed on top. Remove the 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 20...30 V DC version).

Lead the cable for the voltage supply and bus connection through the rubber seals on the bottom of the device and connect Voltage L/N and Bus +/- to the terminals provided.

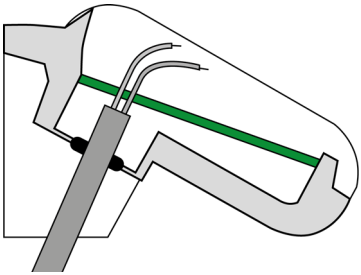


Fig. 11
Remove the cable shielding under the circuit board and only feed the connector cables upwards through the openings in the circuit board.

For 20...30 V DC devices the connection cable must be plugged in between the cover and circuit board.

2.2.4. PCB Layout

230 V AC version

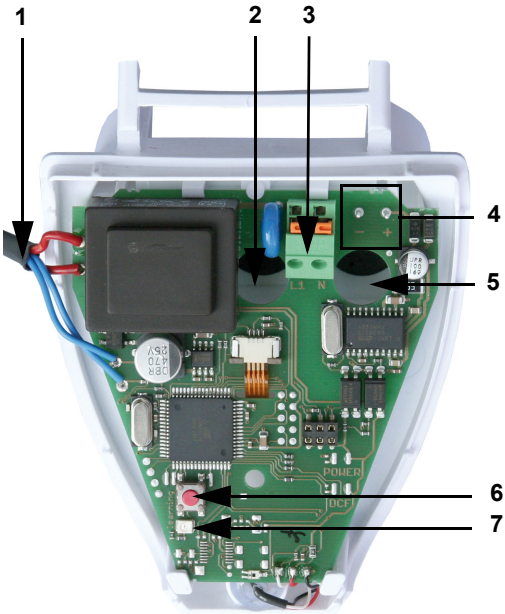


Fig. 12
1) Cable connection to the rain sensor in the housing cover
2) Opening for the cable for the voltage supply
3) Tension clamp for voltage supply (230 V AC), suitable for massive conductors of up to 1.5 mm² or conductors with fine wires
4) Slot for KNX clamp +/-
5 Opening for the bus cable
6) Programming pushbutton for the teach-in of the device
7) Programming LED

20...30 V DC version

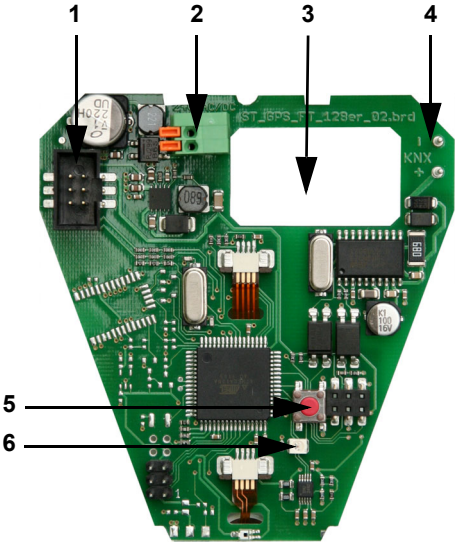


Fig. 13

1 *Slot for cable connection to the rain sensor in the housing cover*
2 *Tension clamp for voltage supply (20...30 V DC). Massive conductors of up to 1.5 mm² or conductors with fine wires. Terminal configuration independent from polarity (+/- or -/+).*
3 *Opening for the cable for the voltage supply and for bus cable*
4 *Slot for KNX clamp +/-*
5 *Programming pushbutton for the teach-in of the device*
6 *Programming LED*

2.2.5. Mounting the sensor

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”.

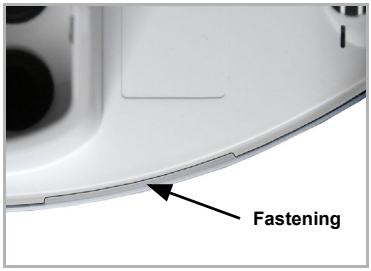


Fig. 14
Make sure the cover and bottom part are properly snapped together! This picture is looking at the closed sensor from underneath.

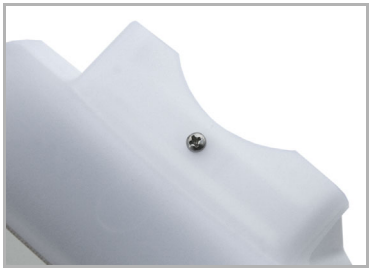


Fig. 15
With the 230V model, screw the cover on to the underpart, to prevent unauthorised or accidental opening.

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. 16
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 sensor can be simply pulled upwards out of the mount, against the resistance of the fastening.

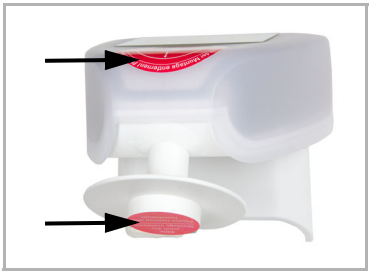


Fig. 17
After installation, remove the protective sticker on the wind sensor and the "distance" sticker on the top of the cover.

2.3. Notes on mounting and commissioning

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

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

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 15.15.255. You can program another address into the ETS by overwriting the 15.15.255 address or by teaching via the programming key on the circuit board inside the housing.

DANGER!
Risk to life from live voltage (mains voltage)!
- With the 230V model, bus addressing via the programming key should only be done by an accredited electrician.
- Do not touch any components on the circuit board while pressing the key.

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. Disposal

After use, the device must be disposed of in accordance with the legal regulations. Do not dispose of it with the household waste!

6. Transmission protocol

Units of measurement:

Wind in metre per second

6.1. List of all communication objects

Abbreviations EIS types:

1 Switching1/0
5 Floating point value
6 8 bit value

Abbreviations flags:

C Communication
R Read
W Write
T Transmit

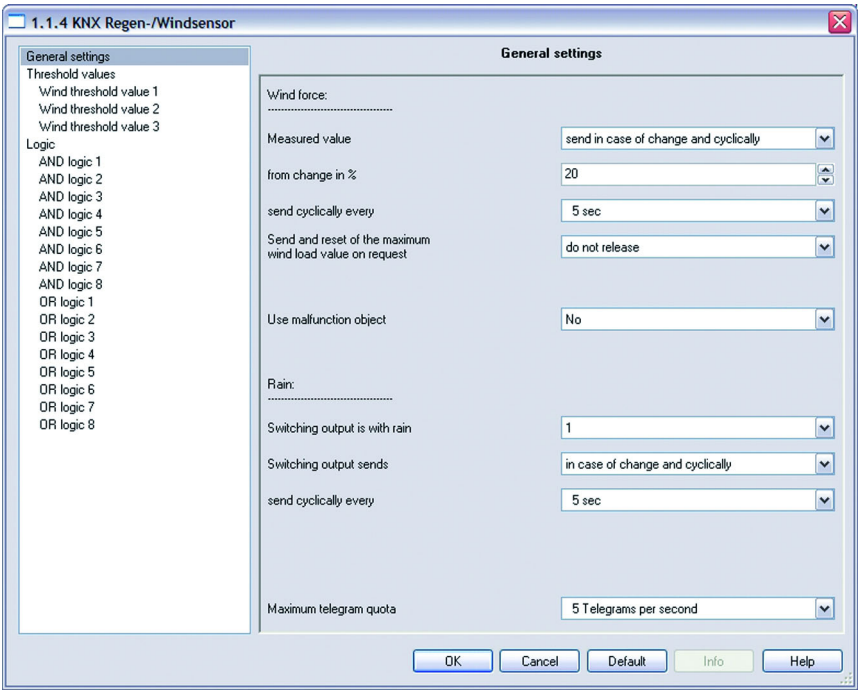
No	Name	Function	EIS type	flags
0	Wind force measured value	Output	5	C R T
1	Request max. wind force	Input	1	C R W
2	Max. wind force measured value	Output	5	C R T
3	Reset max. wind force	Input	1	C R W
4	Wind threshold value 1	16 bit value	5	C R W T
5	Wind threshold value 1	1 = Increment | 0 = Decrement	1	C R W
6	Wind threshold value 1	Increment	1	C R W
7	Wind threshold value 1	Decrement	1	C R W
8	Wind threshold value 1	Switching output	1	C R T
9	Wind threshold value 1	Switching output block	1	C R W
10	Wind threshold value 2	16 bit value	5	C R W T
11	Wind threshold value 2	1 = Increment | 0 = Decrement	1	C R W
12	Wind threshold value2	Increment	1	C R W
13	Wind threshold value 2	Decrement	1	C R W
14	Wind threshold value 2	Switching output	1	C R T
15	Wind threshold value 2	Switching output block	1	C R W
16	Wind threshold value 3	16 bit value	5	C R W T
17	Wind threshold value 3	1 = Increment | 0 = Decrement	1	C R W
18	Wind threshold value3	Increment	1	C R W

No	Name	Function	EIS type	flags
19	Wind threshold value 3	Decrement	1	C R W
20	Wind threshold value 3	Switching output	1	C R T
21	Wind threshold value 3	Switching output block	1	C R W
22	Wind sensor Disruption	Output	1	C R T
23	AND Logic 1	Switching output	1	C R T
24	AND Logic 1	8 bit output A	6	C R T
25	AND Logic 1	8 bit output B	6	C R T
26	AND Logic 2	Switching output	1	C R T
27	AND Logic 2	8 bit output A	6	C R T
28	AND Logic 2	8 bit output B	6	C R T
29	AND Logic 3	Switching output	1	C R T
30	AND Logic 3	8 bit output A	6	C R T
31	AND Logic 3	8 bit output B	6	C R T
32	AND Logic 4	Switching output	1	C R T
33	AND Logic 4	8 bit output A	6	C R T
34	AND Logic 4	8 bit output B	6	C R T
35	AND Logic 5	Switching output	1	C R T
36	AND Logic 5	8 bit output A	6	C R T
37	AND Logic 5	8 bit output B	6	C R T
38	AND Logic 6	Switching output	1	C R T
39	AND Logic 6	8 bit output A	6	C R T
40	AND Logic 6	8 bit output B	6	C R T
41	AND Logic 7	Switching output	1	C R T
42	AND Logic 7	8 bit output A	6	C R T
43	AND Logic 7	8 bit output B	6	C R T
44	AND Logic 8	Switching output	1	C R T
45	AND Logic 8	8 bit output A	6	C R T
46	AND Logic 8	8 bit output B	6	C R T
47	OR Logic 1	Switching output	1	C R T
48	OR Logic 1	8 bit output A	6	C R T
49	OR Logic 1	8 bit output B	6	C R T
50	OR Logic 2	Switching output	1	C R T
51	OR Logic 2	8 bit output A	6	C R T
52	OR Logic 2	8 bit output B	6	C R T
53	OR Logic 3	Switching output	1	C R T
54	OR Logic 3	8 bit output A	6	C R T
55	OR Logic 3	8 bit output B	6	C R T
56	OR Logic 4	Switching output	1	C R T

No	Name	Function	EIS type	flags
57	OR Logic 4	8 bit output A	6	C R T
58	OR Logic 4	8 bit output B	6	C R T
59	OR Logic 5	Switching output	1	C R T
60	OR Logic 5	8 bit output A	6	C R T
61	OR Logic 5	8 bit output B	6	C R T
62	OR Logic 6	Switching output	1	C R T
63	OR Logic 6	8 bit output A	6	C R T
64	OR Logic 6	8 bit output B	6	C R T
65	OR Logic 7	Switching output	1	C R T
66	OR Logic 7	8 bit output A	6	C R T
67	OR Logic 7	8 bit output B	6	C R T
68	OR Logic 8	Switching output	1	C R T
69	OR Logic 8	8 bit output A	6	C R T
70	OR Logic 8	8 bit output B	6	C R T
71	Logic input 1	Input	1	C R W
72	Logic input 2	Input	1	C R W
73	Logic input 3	Input	1	C R W
74	Logic input 4	Input	1	C R W
75	Logic input 5	Input	1	C R W
76	Logic input 6	Input	1	C R W
77	Logic input 7	Input	1	C R W
78	Logic input 8	Input	1	C R W
79	Switching output rain	Output	1	C R T
80	Software Version	readable	6	CR

7. Setting of parameters

7.1. General settings



Wind force

Measured value	• do not send • send cyclically • send on change • send on change and cyclically
send cyclically every *(only if sending "cyclically")*	5 sec … 2 h
From change in % *(only if sending "on change")*	1 … 50; 20
Send and reset of the maximum wind load value on request	do not release • release
Use malfunction object	No • Yes

Rain

Switching output is with rain	0 • 1
Switching output sends	• not • on change • on change to 1 • on change to 0 • on change and cyclically • on change to 1 and cyclically • on change to 0 and cyclically
send cyclically every *(only if sending "cyclically")*	5 sec ... 2 h

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

7.2. Threshold values

Wind force

Use threshold value 1 / 2 / 3	No • Yes
Transmission delay of the switching outputs after power up and programming	5 sec ... 2 h
Transmission delay of the switching outputs after power up and programming	5 sec ... 2 h

7.2.1. Wind threshold value 1 / 2 / 3

Threshold value

Threshold value setpoint per	Parameter • Communication object

If the threshold value is set per Parameter:

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

If the threshold value is set per Communication object:

From the 1st communication onwards, the threshold value corresponds to the value of the communication object and is not multiplied by the factor 0.1.

The value communicated last shall be maintained	• not • after restoration of voltage (the changes threshold value may be saved at least 100,000 times) • after restoration of voltage and programming (**Attention: Do not use for first commissioning**)

Start threshold value in 0.1 m/s valid until 1. communication *(only if the value communicated last is „not“ maintained or „after restoration of voltage“)*	0 ... 350; 40
Type of threshold change	• Absolute value with a 16 bit communication object • Increment / decrement with one communication object • Increment / decrement with two communication objects
Step size *(only if sending „Increment/decrement“)*	0,1 m/s ... 5 m/s; 1 m/s
Hysteresis of the threshold value in %	0 ... 250; 20

Switching output

Output is at (TV = Threshold Value)	• TV above = 1 | TV - Hyst. below = 0 • TV above = 0 | TV - Hyst. below= 1 • TV below = 1 | TV + Hyst. above = 0 • TV below = 0 | TV + Hyst. above = 1
Switching delay from 0 to 1	none • 1 sec ... 2 h
Switching delay from 1 to 0	none • 1 sec ... 2 h
Switching output sends	• not • on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
send periodically all *(only if sending “periodically“)*	5 sec ... 2 h

Blocking

„Blocking“ only appears if using „Switching output sends on change“

Use block of the switching output	Yes • No

If block of the switching output is used:

Use block of the switching output	**Yes**
Evaluation of the blocking object	• if value 1: block | if value 0: release • if value 0: block | if value 1: release
Value of the blocking object before 1. communication	0 • 1
Behaviour of the switching output with blocking	• do not send telegram • send 0 • send 1

Behaviour of the switching output with release (selection depends on settings made before)	• do not send telegram • send status of the switching output • if switching output = 1 => send 1 • if switching output = 0 => send 0

7.3. Logic

Communication objects logic inputs	do not release • release

AND Logic

Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	not active • active
Transmission delay of the switching outputs after power up and programming	5 sec ... 2 h

OR Logic

Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	not active • active
Transmission delay of the switching outputs after power up and programming	5 sec ... 2 h

7.3.1. 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

7.3.2. Linkage inputs of AND logic

do not use
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
no rain
Malfunction wind
Malfunction wind inverted
Wind threshold value 1
Wind threshold value 1inverted
Wind threshold value 2
Wind threshold value 2 inverted
Wind threshold value 3
Wind threshold value 3 inverted

7.3.3. 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.

7.3.4. 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 output4 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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