EN

KNX R

Rain Sensor

elsner elektronik

Installation and Adjustment

1. Description

The **Rain Sensor KNX R** registers precipitation and transfers the status to the KNX system. One switching output as well as 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
- **1 switching output**
- **4 AND and 4 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 **programme file** (format VD2), the data sheet and the manual can be downloaded from the Elsner Elektronik homepage 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, 24 V DC version: approx. 170 g
Ambient temperature	Operation -30…+50°C, Storage -30…+70°C
Operating voltage	Available for 230 V AC or 24 V DC (20 V AC). An appropriate 20 V AC 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, 24 V DC version max. 100 mA, Residual ripple 10%
Data output	KNX +/- bus terminal plug
BCU type	Own micro controller
PEI type	0
Group addresses	max. 254

Allocations	max. 255
Communication objects	34
Heating rain sensor	approx. 1,2 W (230 V and 24 V)

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.

2. Installation and commissioning

2.1. Notes on installation

Warning, mains voltage!
National legal regulations are to be observed.

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

Disconnect all lines to be assembled, and take safety precautions against accidental switch-on.

The device 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 device must not be put into operation.

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

The device 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.

2.2. Location

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

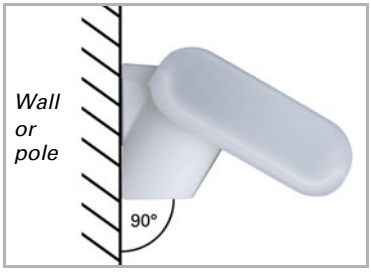


Fig. 1
The rain sensor must be mounted onto a vertical wall (or pole).

Fig. 2
The rain sensor must be mounted horizontally in the lateral direction.

2.3. Mounting the sensor

2.3.1. 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.

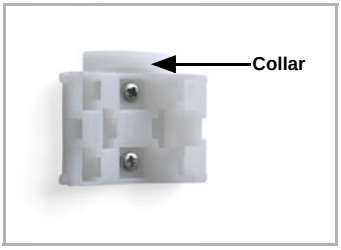


Fig. 3
When wall mounting: flat side on wall, crescent-shaped collar upward.

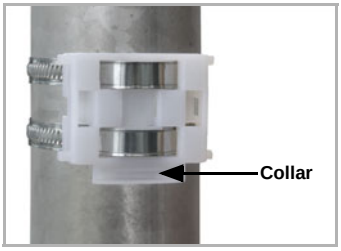


Fig. 4
When pole mounting: curved side on pole, collar downward.

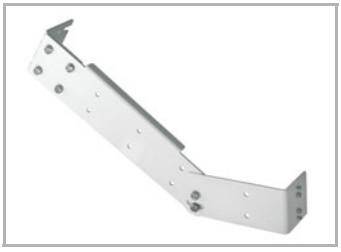


Fig. 5
An additional, optional accessory available from Elsner Elektronik is an articulated arm for flexible wall, pole or beam mounting of the sensor.

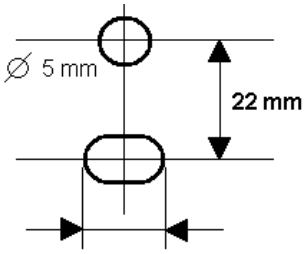
Fig. 6
Example uses of the hinge arm mounting: With the hinge arm mounting, the sensor peeps out from beneath the roof overhang.

Fig. 7
Example uses of the hinge arm mounting: Fitting to a pole with worm drive hose clips

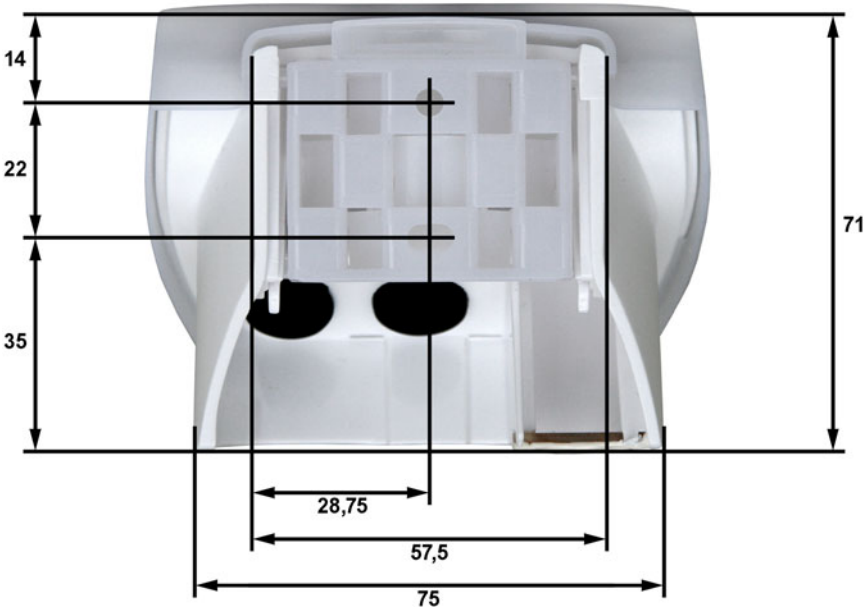
2.3.2. View of rear side and drill hole plan

Fig. 8 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



2.3.3. Preparing the sensor

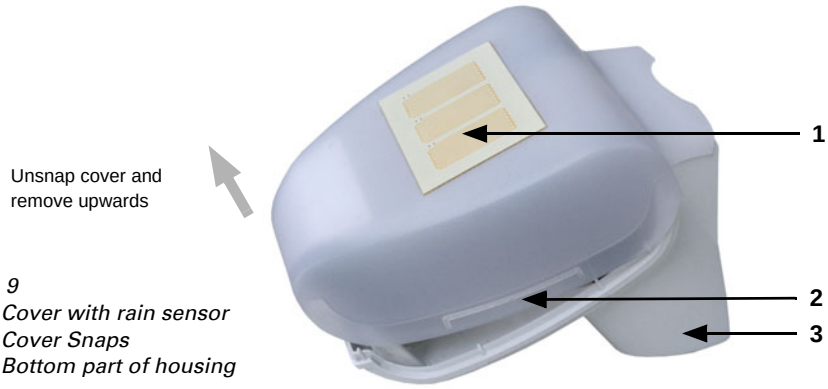


Fig. 9
1 Cover with rain sensor
2) Cover Snaps
3 Bottom part of housing

The sensor cover snaps in on the left and right along the bottom edge (see Fig.). 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 24 V DC version).

Push the bus connection cable through the rubber seal on the bottom of the sensor and connect bus +/- to the provided clamps.

For 24V devices the connection cable must be plugged in between the cover and circuit board.

2.3.4. PCB Layout

230 V AC version

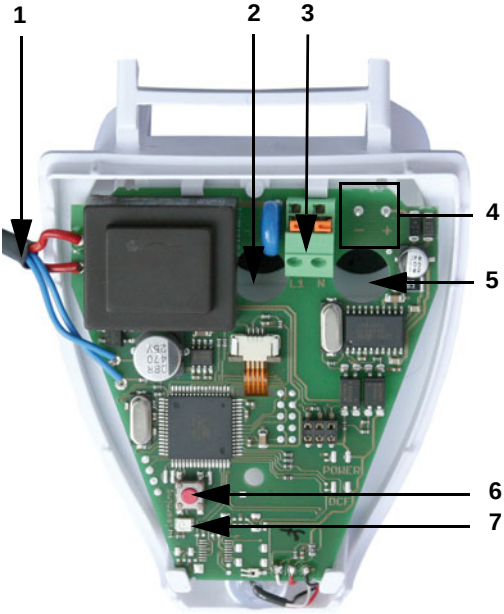


Fig. 10

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

24 V DC version

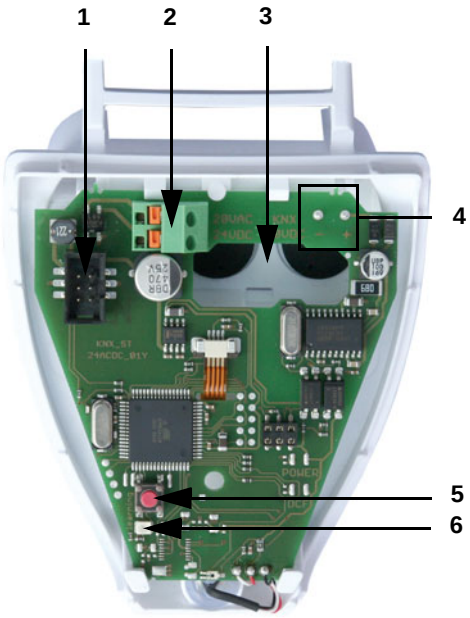


Fig. 11

1 *Slot for cable connection to the rain sensor in the housing cover*
2 *Tension clamp for voltage supply (24 V DC/20 V AC), suitable for massive conductors of up to 1.5 mm² or conductors with fine wires*
3 *Opening for the cable for the voltage supply and for the bus cable*
4 *Slot for KNX clamp +/-*
5 *Programming pushbutton for the teach-in of the device*
6 *Programming LED*

2.3.5. 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”.

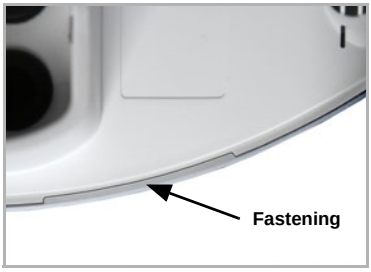


Fig. 12
Make sure the cover and bottom part are properly snapped together! This picture is looking at the closed sensor from underneath.

Fig. 13
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.

2.4. 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.

After the auxiliary voltage has been applied, the device will enter an initialisation phase lasting 5 seconds. During this phase no information can be received via the bus.

3. Maintenance

The sensor 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.

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

4. Transmission protocol

4.1. Listing of all communication objects

Abbreviations EIS types:

1 Switching 1/0
6 8 bit value

Abbreviations Flags:

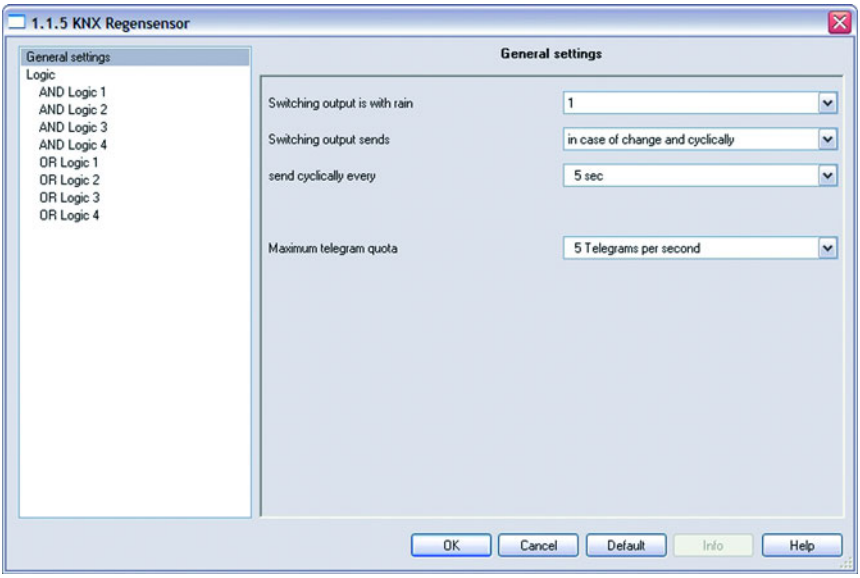
C Communication
R Read
W Write
T Transmit

No.	Name	Function	EIS type	Flags
0	Rain	Switching Output	1	C R T
1	AND Logic 1	Switching Output	1	C R T
2	AND Logic 1	8 bit Output A	6	C R T
3	AND Logic 1	8 bit Output B	6	C R T
4	AND Logic 2	Switching Output	1	C R T
5	AND Logic 2	8 bit Output A	6	C R T
6	AND Logic 2	8 bit Output B	6	C R T
7	AND Logic 3	Switching Output	1	C R T
8	AND Logic 3	8 bit Output A	6	C R T
9	AND Logic 3	8 bit Output B	6	C R T
10	AND Logic 4	Switching Output	1	C R T
11	AND Logic 4	8 bit Output A	6	C R T
12	AND Logic 4	8 bit Output B	6	C R T
13	OR Logic 1	Switching Output	1	C R T
14	OR Logic 1	8 bit Output A	6	C R T
15	OR Logic 1	8 bit Output B	6	C R T
16	OR Logic 2	Switching Output	1	C R T
17	OR Logic 2	8 bit Output A	6	C R T
18	OR Logic 2	8 bit Output B	6	C R T
19	OR Logic 3	Switching Output	1	C R T
20	OR Logic 3	8 bit Output A	6	C R T
21	OR Logic 3	8 bit Output B	6	C R T
22	OR Logic 4	Switching Output	1	C R T
23	OR Logic 4	8 bit Output A	6	C R T
24	OR Logic 4	8 bit Output B	6	C R T

No.	Name	Function	EIS type	Flags
25	Logic Input 1	Input	1	C R W
26	Logic Input 2	Input	1	C R W
27	Logic Input 3	Input	1	C R W
28	Logic Input 4	Input	1	C R W
29	Logic Input 5	Input	1	C R W
30	Logic Input 6	Input	1	C R W
31	Logic Input 7	Input	1	C R W
32	Logic Input 8	Input	1	C R W
33	Software Version	readable	6	C R

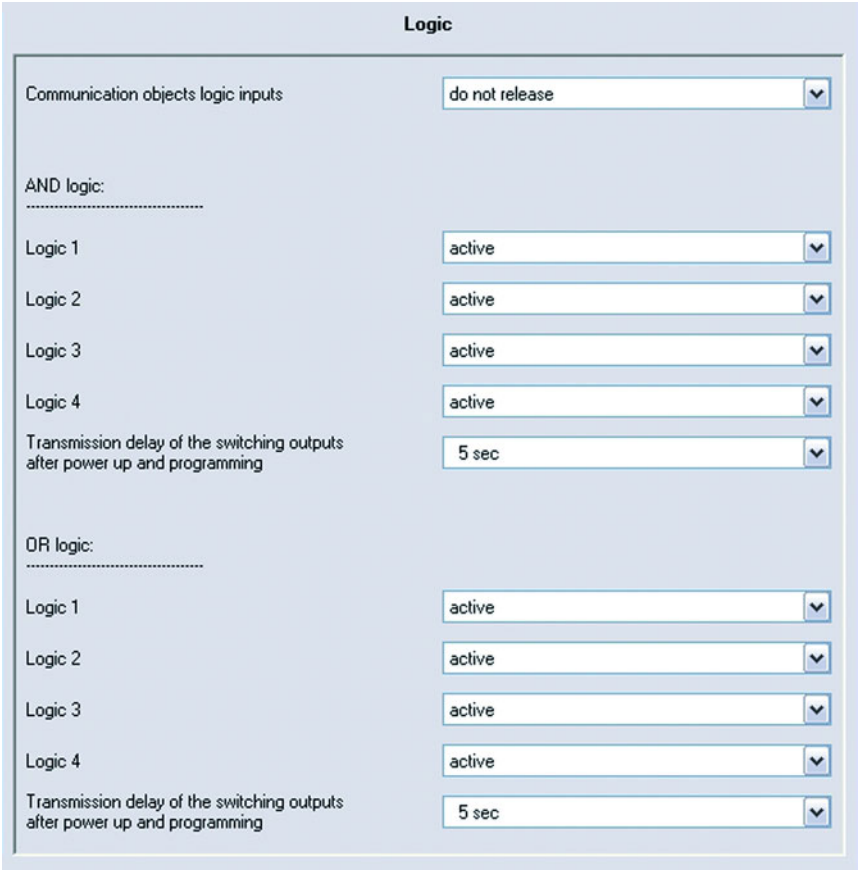
5. Setting of parameters

5.1. General settings



Switching output is with rain	0 • 1
Switching output sends	• not • in case of change • in case of change to 1 • in case of change to 0 • in case of change and cyclically • in case of change to 1 and cyclically • in case of 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

5.2. Logic



Communication objects logic inputs	do not release • release

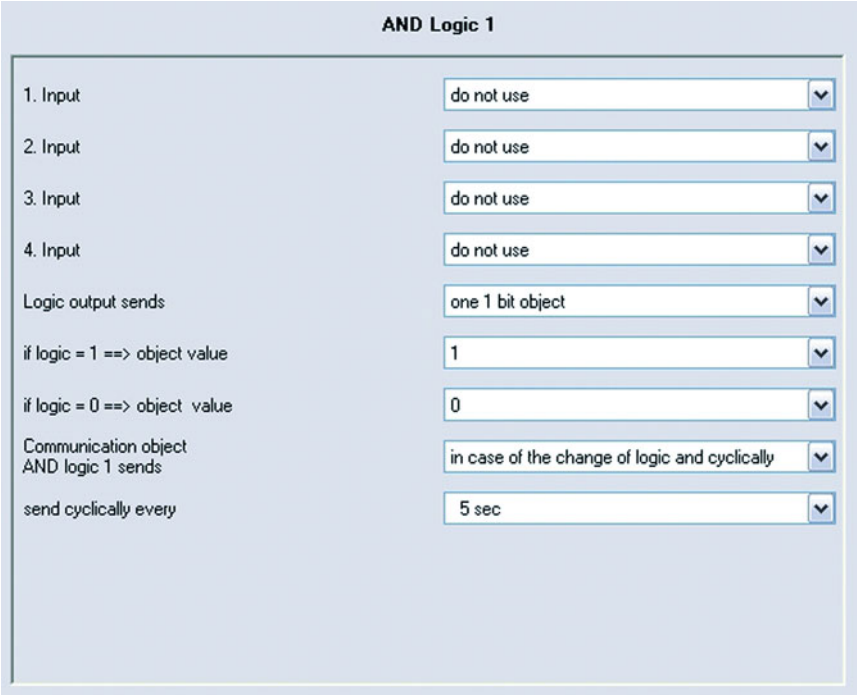
AND Logic

Logic 1 / 2 / 3 / 4	not active • active
Transmission delay of switching outputs after power up and programming	5 secs ... 2 h

OR Logic

Logic 1 / 2 / 3 / 4	not active • active
Transmission delay of switching outputs after power up and programming	5 secs ... 2 h

5.2.1. AND Logic 1 / 2 / 3 / 4



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":

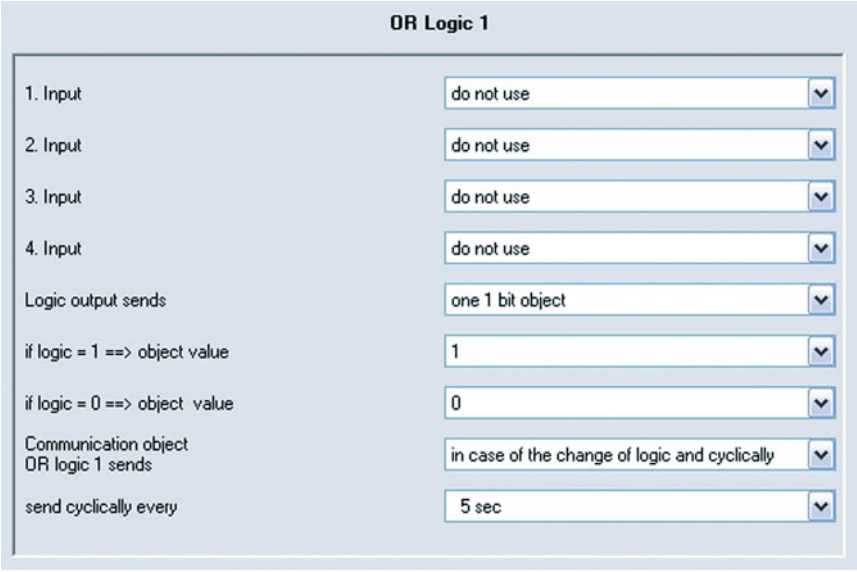
Logic output sends	**two 8 bit objects**
if logic = 1 ➔object A value	0 ... 255; 127
if logic = 0 ➔object A value	0 ... 255
if logic = 1 ➔object B value	0 ... 255; 127
if logic = 0 ➔object B value	0 ... 255
Communication objects AND Logic 1 A and B sends	• in case of the change of logic • in case of 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

5.2.2. 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

5.2.3. OR Logic 1 / 2 / 3 / 4



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.

5.2.4. 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 output 4 inverted

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