KNX R sl

Precipitation Sensor

Item number 70165

elsner elektronik®

Installation and Adjustment

Contents

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. Safety and operating instructions

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

CAUTION!
Live 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.

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

2. Description

The **Precipitation Sensor KNX R sl** for the KNX building bus system detects precipitation. Two switching outputs, AND logic gates and OR logic gates are available.

The compact housing of the **KNX R sl** accommodates the sensors, evaluation circuits and bus-coupling electronics.

Functions:
- **Precipitation detection**: The sensor surface is heated, so that only drops and flakes are recognised as precipitation, but not mist or dew. When the rain or snow stops, the sensor is soon dry again and the precipitation warning ends
- **2 switching outputs** (communication objects)
- **4 AND and 4 OR logic gates**, each with 4 inputs. All switching events as well as 16 logic inputs (in the form of communications objects) can be used as inputs for the logic gates. The output of each gate can be configured optionally as 1-bit or 2 x 8-bit

3. Installation and start-up

3.1. Installation location

Select an installation position on the building where the sensor can measure rain without hindrance. No structural elements should be mounted above the weather station, from which water could continue to drop on the precipitation sensor even after it has stopped raining or snowing.

The mounting position must be selected so that the precipitation sensor cannot be touched by persons.
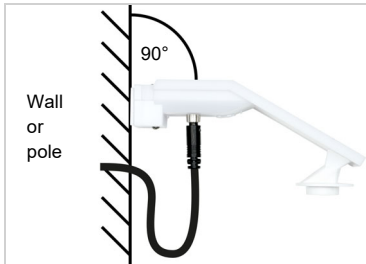

Fig. 1
The device must be attached to a vertical wall (or a pole).

Place the supply line in a loop before leading it into the wall or junction box. This will allow rain to drip off and not drain into the wall or box.
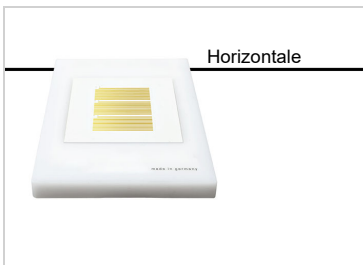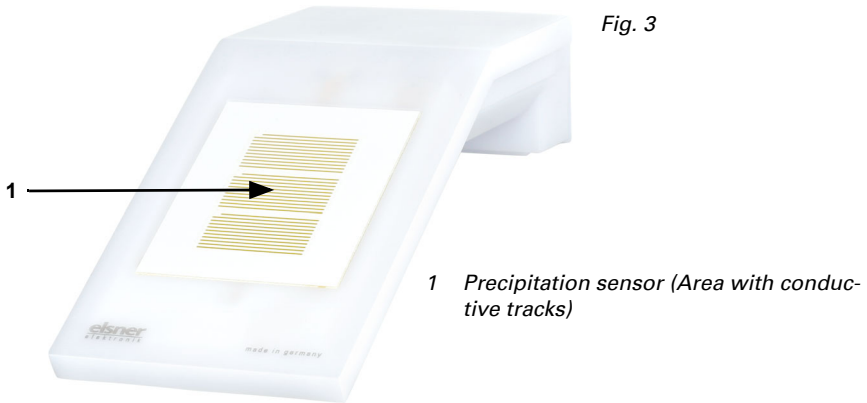

Fig. 2
The device must be mounted in the horizontal (transverse) direction.

3.2. Position of the rain sensor

Fig. 3

1 Precipitation sensor (Area with conduc-
tive tracks)

3.3. Sensor assembly

3.3.1. Attaching the mount

First mount the bracket for wall or pole mounting. To do this, loosen the screw connection of the holder with a cross-headed screwdriver.

Wall mounting

Hole distance 30 mm

Fig. 4 Front view
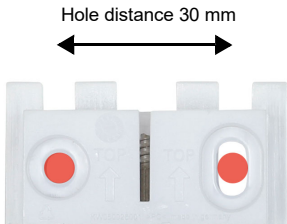Screw the holder to the wall with two screws. Use fixing materials (dowels, screws) that are suitable for the base.
Make sure that the arrows point upwards.

Pole mounting

The device is mounted to the pole with the enclosed clamp.
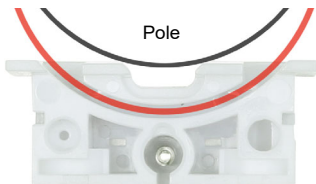
Pole

Fig. 5 Botttom view
Insert the clamp through the recess in the bracket. Tighten the clamp on the pole.
Make sure that the arrows point upwards.

3.3.2. Fitting and connecting the device

Fig. 6

1. Slide the device onto the mounting from above.
2. Tighten the screw of the mounting to secure the device.
3. Screw the M8 connector of the connection cable to the connection socket on the bottom of the device.

Connect the loose end of the connection cable to the KNX bus and auxiliary voltage. Use the supplied connection box and the terminals.

KNX bus:	Auxiliary voltage:
+ red	+ yellow
- black	- white

top side

Fig. 7
After installation, remove the "distance" sticker on the top of the cover.

3.4. Instructions for assembly and initial start-up

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

After the bus voltage has been applied, the device will enter an initialisation phase lasting approx. 4 seconds. During this phase no information can be received or sent via the bus.

4.   Addressing the equipment

The equipment is delivered ex works with the bus address 15.15.255. You program a different address in the ETS by overwriting the address 15.15.255 or teach the device using the programming button.

The programming button can be reached through the opening on the underside of the housing; it is recessed by approx. 15 mm. Use a thin object to reach the key, e. g. a 1.5 mm² wire.
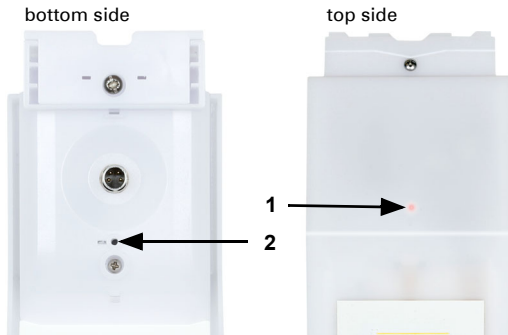

bottom side   top side

1

2

Fig. 8
1   Programming LED (under the semi-transparent lid)
2   Programming button for teaching the device

5.　　Transfer protocol

5.1.　　List of all communications objects

Abbreviation flags:

C　Communication
R　Read
W　Write
T　Transmit
U　Update

No.	Text	Function	Flags	DPT type	Size
0	Software version	Output	R-CT	[217.1] DPT_Version	2 bytes
1	Rain: Switching output	Output	R-CT	[1.1] DPT_Switch	1 bit
2	Rain: Switching output with fixed delays	Output	R-CT	[1.1] DPT_Switch	1 bit
3	Rain: Switching delay to rain	Input	-WC-	[7,005] DPT_TimePeriodSec	2 bytes
4	Rain: Switching delay to no rain	Input	-WC-	[7,005] DPT_TimePeriodSec	2 bytes
6	Logic input 1	Input	-WC-	[1.2] DPT_Bool	1 bit
7	Logic input 2	Input	-WC-	[1.2] DPT_Bool	1 bit
8	Logic input 3	Input	-WC-	[1.2] DPT_Bool	1 bit
9	Logic input 4	Input	-WC-	[1.2] DPT_Bool	1 bit
10	Logic input 5	Input	-WC-	[1.2] DPT_Bool	1 bit
11	Logic input 6	Input	-WC-	[1.2] DPT_Bool	1 bit
12	Logic input 7	Input	-WC-	[1.2] DPT_Bool	1 bit
13	Logic input 8	Input	-WC-	[1.2] DPT_Bool	1 bit
14	Logic input 9	Input	-WC-	[1.2] DPT_Bool	1 bit
15	Logic input 10	Input	-WC-	[1.2] DPT_Bool	1 bit
16	Logic input 11	Input	-WC-	[1.2] DPT_Bool	1 bit
17	Logic input 12	Input	-WC-	[1.2] DPT_Bool	1 bit
18	Logic input 13	Input	-WC-	[1.2] DPT_Bool	1 bit
19	Logic input 14	Input	-WC-	[1.2] DPT_Bool	1 bit
20	Logic input 15	Input	-WC-	[1.2] DPT_Bool	1 bit
21	Logic input 16	Input	-WC-	[1.2] DPT_Bool	1 bit
22	AND logic 1: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
23	AND logic 1: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
24	AND logic 1: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
25	AND logic 1: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
26	AND logic 2: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
27	AND logic 2: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte

No.	Text	Function	Flags	DPT type	Size
28	AND logic 2: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
29	AND logic 2: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
30	AND logic 3: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
31	AND logic 3: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
32	AND logic 3: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
33	AND logic 3: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
34	AND logic 4: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
35	AND logic 4: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
36	AND logic 4: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
37	AND logic 4: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
38	OR logic 1: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
39	OR logic 1: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
40	OR logic 1: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
41	OR logic 1: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
42	OR logic 2: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
43	OR logic 2: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
44	OR logic 2: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
45	OR logic 2: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
46	OR logic 3: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
47	OR logic 3: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
48	OR logic 3: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
49	OR logic 3: Block	Input	-WC-	[1.1] DPT_Switch	1 bit
50	OR logic 4: 1-bit switching output	Output	R-CT	[1.2] DPT_Bool	1 bit
51	OR logic 4: 8-bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
52	OR logic 4: 8-bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 byte
53	OR logic 4: Block	Input	-WC-	[1.1] DPT_Switch	1 bit

6. Parameter setting

6.0.1. Behaviour on power failure/power restoration

Behaviour on bus or auxiliary power failure

The device sends nothing.

Behaviour on bus or auxiliary voltage restoration and following programming or reset

The device sends all measurement values as well as switching and status outputs according to their send pattern set in the parameters with the delays established in the "General settings" parameter block.

6.1. General settings

Set basic characteristics of data transfer. A different transmission delay prevents an overload of the bus shortly after the reset.

When labelling objects, you can enter an additional label (abbreviation) for the objects of the device, e.g. 'LR' for 'living room', to make the room installation more transparent.

Sending delay in seconds after reset and bus voltage return	<u>5</u> ... 7200
Maximum telegram quota	1 • 2 • 5 • <u>10</u> • 20 • 50 <u>Telegrams per sec.</u>
Object labelling	[Free text max. 20 characters]

6.2. Rain

Activate the rain sensor in order to use objects and switch outputs.

Use rain sensor	<u>No</u> • **Yes**

Set, in which cases delay times received are to be kept per object. The parameter is only taken into consideration if the setting by object is activated further down. Please note that the setting "After power restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first call (setting via objects is ignored).

Maintain the	
delays received via communication objects	• <u>never</u> • after power restoration • after power restoration and programming

Select whether the special rain output is to be used with fixed switching delay. This switching output has no delay on rain recognition and 5 minutes delay after it is dry again.

Use rain output with fixed switching delay	No • Yes

Set the delay times. If the delays are defined using objects, then the times set here are only valid up to the first call.

Delays can be set via objects (in seconds)	No • Yes
Delay on rain	none • 1 s ... • 2 h
Delay on no rain (after drying of the sensor)	5 min • 1 h... • 2 h

Define the send pattern for the rain switch output and specify the object value for the event of rain.

Switching output sends	• on change • on change to rain • on change to no rain • on change and periodically • on change to rain and periodically • on change to no rain and periodically
Send cycle *(if sent periodically)*	5 s ... 2 h; 10 s
Object value(s) with rain	0 • 1

6.3. Logic

The device has 16 logic inputs, 4 AND and 4 OR logic gates.

Activate the logic inputs and assign object values up to first call.

Use logic inputs	Yes • No
Object value prior to first call for:	
- Logic input 1	0 • 1
- Logic input ...	0 • 1
- Logic input 16	0 • 1

Activate the required logic outputs.

AND logic

AND logic 1	not active • active
AND logic ...	not active • active
AND logic 4	not active • active

OR logic

OR logic 1	not active • active
OR logic ...	not active • active
OR logic 4	not active • active

6.3.1. AND logic 1-4 and OR logic outputs 1-4

The same setting options are available for AND and OR logic.

Each logic output may transmit one 1 bit or two 8 bit objects. Determine what the out put should send if logic = 1 and = 0.

1. / 2. / 3. / 4. Input	• do not use
	- Logic inputs 1...16
	- Logic inputs 1...16 inverted
	• all switching events that the device
	  provides (see *Connection inputs of the
	  AND/OR logic*)

Output type	• a 1-Bit-object • two 8-bit objects

If the **output type is a 1-bit object**, set the output values for the various conditions.

Output value if logic = 1	1 • 0
Output value if logic = 0	1 • 0
Output value If block is active	1 • 0
Output value if monitoring period is exceeded	1 • 0

If the **output type is two 8-bit objects**, set the type of object and the output values for the various conditions.

Object type	• Value (0…255) • Percent (0…100%) • Angle (0…360°) • Scene call-up (0…127)
Output value object A if logic = 1	0 … 255 / 100% / 360° / 127; 1
Output value object B if logic = 1	0 … 255 / 100% / 360° / 127; 1
Output value object A if logic = 0	0 … 255 / 100% / 360° / 127; 0
Output value object B if logic = 0	0 … 255 / 100% / 360° / 127; 0

Output value object A if block is active	0 … 255 / 100% / 360° / 127; 0
Output value object B if block is active	0 … 255 / 100% / 360° / 127; 0
Output value object A if monitoring period is exceeded	0 … 255 / 100% / 360° / 127; 0
Output value object B if monitoring period is exceeded	0 … 255 / 100% / 360° / 127; 0

Set the output send pattern.

Send pattern	• on change of logic • on change of logic to 1 • on change of logic to 0 • on change of logic and periodically • on change of logic to 1 and periodically • on change of logic to 0 and periodically • on change of logic+object receipt • on change of logic+object receipt and periodically
Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

Block

If necessary, activate the block for the logic output and set what a 1 or 0 at the block input means and what happens in the event of a block.

Use block	No • Yes
Analysis of the blocking object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release
Blocking object value before first call	0 • 1
Output pattern On block	• Do not send message • Transmit block value [see above, Output value if blocking active]
On release (with 2 seconds release delay)	[send value for current logic status]

Monitoring

If necessary, activate the input monitoring. Set which inputs are to be monitored, at which intervals the inputs are to be monitored and what value the "monitoring status" should have, if the monitoring period is exceeded without a feedback being given.

Use input monitoring	No • Yes
Input monitoring	• 1 • 2 • 3 • 4 • 1 + 2 • 1 + 3 • 1 + 4 • 2 + 3 • 2 + 4 • 3 + 4 • 1 + 2 + 3 • 1 + 2 + 4 • 1 + 3 + 4 • 2 + 3 + 4 • 1 + 2 + 3 + 4

Monitoring period	5 s • ... • 2 h; <u>1 min</u>
Output behaviour on exceeding the monitoring time	• <u>Do not send message</u> • Send value exceeding [= value of the parameter "monitoring period"]

6.3.2. Connection inputs of the AND logic

Do not use
Logic input 1
Logic input 1 inverted
Logic input 2
Logic input 2 inverted
Logic input 3
Logic input 3 inverted
Logic input 4
Logic input 4 inverted
Logic input 5
Logic input 5 inverted
Logic input 6
Logic input 6 inverted
Logic input 7
Logic input 7 inverted
Logic input 8
Logic input 8 inverted
Logic input 9
Logic input 9 inverted
Logic input 10
Logic input 10 inverted
Logic input 11
Logic input 11 inverted
Logic input 12
Logic input 12 inverted
Logic input 13
Logic input 13 inverted
Logic input 14
Logic input 14 inverted
Logic input 15
Logic input 15 inverted
Logic input 16
Logic input 16 inverted
Switching output rain
Switching output rain inverted
Switching output rain 2
Switching output rain 2 inverted

6.3.3. Connection inputs of the OR logic

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

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