Leak KNX 2.0

Leakage sensor for water and pipe breakage reporting

Item number 70316

elsner
elektronik   **Installation and Adjustment**

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

This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual

Safety advice.

Safety advice for working on electrical connections, components, etc.

DANGER!   ... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.

WARNING!   ... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.

CAUTION!   ... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.

ATTENTION! ... indicates a situation which may lead to damage to property if it is not avoided.

ETS   In the ETS tables, the parameter default settings are marked by underlining.

1.   Description

The **Leakage sensor Leak KNX 2.0** includes an evaluation unit and a probe. If there is water between the electrodes of the probe, the evaluation unit produces an acoustic alarm. Additionally, the alarm signal is sent to the KNX bus.

Even if no probe is connected or the cable is defective, the alarm can be sounded and signalled on the bus.

Functions:

• Detection of water on the probe
• Acoustic alarm signal by the evaluation unit during a water alarm (sustained beeping tone). Short beeping during the follow-up time (1 minute after the end of the alarm).
• Alarm signal sent to the KNX bus with a text message
• Detection whether probe is connected and the probe cable is functional
• Acoustic alarm signal on the evaluation unit when the probe is not connected or when the probe cable is broken (long beeps)
• 4 AND and 4 OR logic gates with each 4 inputs. Every switching incident as well as 16 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 5. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu.

1.1.   Deliverables

• Evaluation unit
• Probe with BNC cable
• Stainless steel A2 plumbing screw 4.5 x 70 (DIN 7995), matching dowel SX6 x 30

1.2.   Technical specifications

The evaluation unit 70316 (2.0) is not compatible with the 70314 probe.

1.2.1. Analysis unit

Casing	Plastic
Colour	Grey
Installation	Surface mounted
Degree of protection	IP 20
Dimensions	approx. 105 x 105 x 65 (W × H × D, mm),
Weight	approx. 180 g
Ambient temperature	Operation -20…+70°C, storage -55…+90°C.
Ambient humidity	max. 95 % RH, avoid condensation

Auxiliary voltage	20...32 V DC. A suitable power pack can be purchased from Elsner Elektronik.
Power on the bus	10 mA
Data output	KNX +/- Bus connector terminal
Group addresses	252
Assignments	252
Communication objects	55
Current Consumption	at 24 V DC ±10% no alarm: max. 15 mA alarm: max. 30 mA
Probe input	1 x electrode probe, plug-in BNC terminal

The product is compliant with the provisions of EC guidelines.

1.2.2. Probe

Material	Casing / electrodes: stainless steel A2
Installation	for placing on the floor
Degree of protection	IP 68
Electrode chemical resistance	Water
Dimensions	Diameter: approx. 77 mm Height: approx. 33 mm
Cable length	approx. 140 mm (plus cable grip and plugs). Extendable to 10 m.
Weight	approx. 200 g
Ambient temperature	Operation -25…+85°C, storage -40…+125°C.

The product is compliant with the provisions of EC guidelines.

2.   Installation and commissioning

2.1. Installation notes

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

CAUTION!
Live voltage!
There are unprotected live components inside the device.
• National legal regulations are to be followed.

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

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

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

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Evaluation unit installation

The evaluation unit may only be installed and operated in dry, indoor spaces.

Never expose the evaluation unit to water (e.g. rain) or dust. This can damage the electronics.

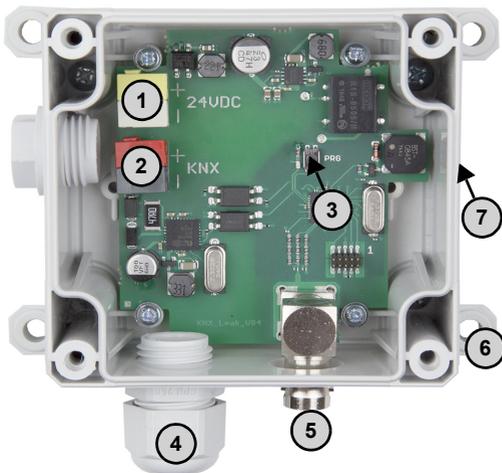The evaluation unit can be screwed to the wall with mounting brackets.

Fig. 1 Evaluation unit circuit board view
1 *Connection auxiliary voltage 20...32 V DC (+/-)*
2 *Bus terminal (KNX +/-)*
3 *Programming button and LED*
4 *Cable passage for KNX line*
5 *BNC terminal for the probe*
6 *Mounting brackets*
7 *Loudspeaker (behind the opening in the side wall of the casing)*

2.3. Probe placement

The electrode probe is placed on the floor with the contacts facing downwards. To prevent slipping or tilting, the probe can be screwed to the floor.

Ideally, the probe should be located in a place that, in case of water damage, would be the first to be flooded — e.g. close to washing machines, sinks, baths, water pipes or pump sumps.

Fig. 2
Probe
1) 3 electrodes (contacts) on the lower side
2) Fixing screw
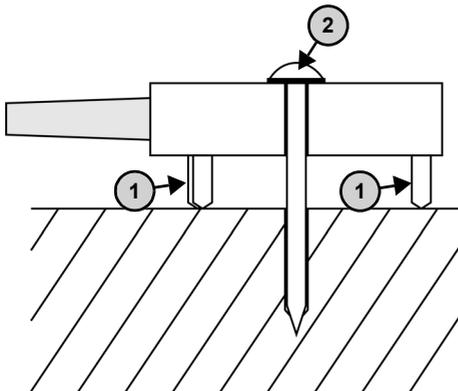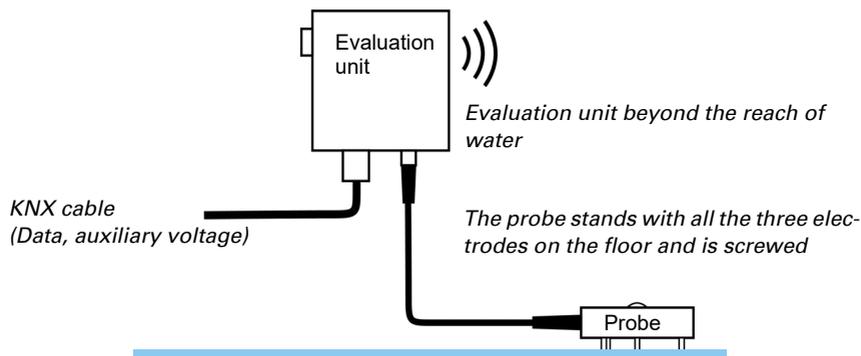3) Connection lead (for evaluation unit)

Fig. 3
Scheme of the probe bolted to the ground

Use a fixing material suitable for the ground (dowels)!

Tighten the plumbing screw with rubber buffer (2) only so far that the 3 electrodes (1) have loose contact with the ground.

2.4. Leakage sensor commissioning

Fig. 4 Overview

```
      ┌──────────┐
      │Evaluation│  )))
      │unit      │
      └──────────┘
```

Evaluation unit beyond the reach of water

KNX cable
(Data, auxiliary voltage)

The probe stands with all the three electrodes on the floor and is screwed

Probe

1. Connect the probe to the evaluation unit (insert the BNC plug).
2. Connect the bus lead +/- (black/red plug) and the auxiliary voltage +/- (white/yellow plug) to the provided terminals on the circuit board of the device.
3. Address the device (see *Addressing the device*) and configure the ETS.

2.5. Bus settings

If there is water contact, the evaluation unit submits an acoustical signal and sends an alarm signal and a text message to the KNX bus. Adjust the setting for these parameters in the ETS.

3.   Addressing the device

The device is delivered with the bus address 15.15.255. You can program a different address in the ETS by overwriting the address 15.15.255 or by teaching the device via the programming button.

The programming button is inside the case (Fig. 1: No. 3).

4.   Disposal

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

5. Transfer protocol

5.1. List of all communication objects

Abbreviations:
R   Read
W   Write
C   Communication
T   Transfer
U   Update

No.	Text	Function	Flags	Data Point Type	Size
0	Software version	Readable	R-C-	[217.1] DPT_Version	2 Bytes
1	Leakage Sensor error (1 = On | 0 = Off)	Output	R-CT	[1.1] DPT_Switch	1 Bit
2	Leakage alarm (1 = On | 0 = off)	Output	R-CT	[1.1] DPT_Switch	1 Bit
3	Leakage alarm text	Output	R-CT	[16.0] DPT_String_ASCII	14 Bytes
4	Leakage alarm Switching-on delay	Input	RWCT	[7.5] DPT_TimePeriodSec	2 Bytes
5	Leakage alarm Switching-off delay	Input	RWCT	[7.5] DPT_TimePeriodSec	2 Bytes
6	Leakage alarm signal tone muting (1 = mute | 0 = not mute)	Input	-WC-	[1.1] DPT_Switch	1 Bit
7	Logic input 1	Input	-WC-	[1.2] DPT_Bool	1 Bit
8	Logic input 2	Input	-WC-	[1.2] DPT_Bool	1 Bit
9	Logic input 3	Input	-WC-	[1.2] DPT_Bool	1 Bit
10	Logic input 4	Input	-WC-	[1.2] DPT_Bool	1 Bit
11	Logic input 5	Input	-WC-	[1.2] DPT_Bool	1 Bit
12	Logic input 6	Input	-WC-	[1.2] DPT_Bool	1 Bit
13	Logic input 7	Input	-WC-	[1.2] DPT_Bool	1 Bit
14	Logic input 8	Input	-WC-	[1.2] DPT_Bool	1 Bit
15	Logic input 9	Input	-WC-	[1.2] DPT_Bool	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
16	Logic input 10	Input	-WC-	[1.2] DPT_Bool	1 Bit
17	Logic input 11	Input	-WC-	[1.2] DPT_Bool	1 Bit
18	Logic input 12	Input	-WC-	[1.2] DPT_Bool	1 Bit
19	Logic input 13	Input	-WC-	[1.2] DPT_Bool	1 Bit
20	Logic input 14	Input	-WC-	[1.2] DPT_Bool	1 Bit
21	Logic input 15	Input	-WC-	[1.2] DPT_Bool	1 Bit
22	Logic input 16	Input	-WC-	[1.2] DPT_Bool	1 Bit
23	AND Logic 1: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
24	AND Logic 1: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
25	AND Logic1: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
26	AND Logic 1: block	Output	-WC-	[1.1] DPT_Switch	1 Bit
27	AND Logic 2: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
28	AND Logic2: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
29	AND Logic2: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
30	AND Logic 2: block	Input	-WC-	[1.1] DPT_Switch	1 Bit
31	AND Logic 3: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
32	AND Logic 3: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
33	AND Logic 3: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
34	AND Logic 3: block	Input	-WC-	[1.1] DPT_Switch	1 Bit
35	AND Logic 4: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
36	AND Logic 4: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
37	AND Logic 4: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
38	AND Logic 4: block	Output	-WC-	[1.1] DPT_Switch	1 Bit
39	OR Logic 1: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
40	OR Logic 1: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
41	OR Logic 1: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte

No.	Text	Function	Flags	Data Point Type	Size
42	OR Logic 1: block	Input	-WC-	[1.1] DPT_Switch	1 Bit
43	OR Logic 2: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
44	OR Logic 2: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
45	OR Logic 2: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
46	OR Logic 2: block	Input	-WC-	[1.1] DPT_Switch	1 Bit
47	OR Logic 3: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
48	OR Logic 3: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
49	OR Logic 3: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
50	OR Logic 3: block	Input	-WC-	[1.1] DPT_Switch	1 Bit
51	OR Logic 4: 1 Bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
52	OR Logic 4: 8 Bit output A	Output	R-CT	Depending on setting	1 Byte
53	OR Logic 4: 8 Bit output B	Output	R-CT	Depending on setting	1 Byte
54	OR Logic 4: block	Input	-WC-	[1.1] DPT_Switch	1 Bit

6. Parameter setting

The default settings of the parameter are labelled by an underscore.

6.1. Behaviour on power failure/ restoration of power

Behaviour following a failure of the bus power supply:

The device sends nothing.

Behaviour on bus restoration of power and following programming or reset:

The device sends all outputs according to their send behaviour set in the parameters with the delays established in the "General settings" parameter block. The "Software version" communications object is sent once after 5 seconds.

6.2. General settings

First, set the general parameters for the bus communication (transmission delay).
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.

Send delay in seconds after reset and voltage returns	5 ...7200
Maximum telegram quota	• 1 message per second • ... • 10 messages per second • ... • 50 message per second
Object labelling	[Free text]

6.3. Sensor error

Set the send behaviour of the sensor error object.

Send behaviour of the sensor error object	• not • on change • on change and periodically
Send cycle (*if sent periodically*)	5 s • ... • 5 min • ... • 2 h

6.4. Alarm object

If the sensor detects water, this always leads to an alarm. Set whether a sensor error is also reported as an alarm. Adjust the setting for the alarm object. Define the sending behaviour and the object value.

Report sensor error as alarm	No • Yes
Alarm object sending behaviour	• not • on change • on change and alarm on • on change and alarm off • on change and periodically • on change to alarm on and periodically • on change to alarm off and periodically
Send cycle	5 s • ... • 10 s • ... • 2 h
Analysis of alarm object	• 0 = alarm off | 1 = alarm on • 1 = alarm off | 0 = alarm on
Adjust alarm delay via object	No • Yes
Maintain delays received via objects	• never be retained • after power restoration • after power restoration and programming

| Delay for alarm on (until 1. communication) | 0 s • ... • 10 s • ... • 2 h |
| Delay for alarm off (until 1. communication) | 0 s • ... • 10 s • ... • 2 h |

6.5.   Text object

When an alarm is issued, a text message is transmitted to the KNX bus. Adjust the parameters for the sending behaviour. You can insert your own text that is shown during alarm on or alarm off.

Alarm object sending behaviour	• not • on change • on change and alarm on • on change and alarm off • on change and periodically • on change to alarm on and periodically • on change to alarm off and periodically
Send cycle	5 s • ... • 10 s • ... • 2 h
Text for alarm on	[Free text]
Text for alarm off	[Free text]

6.6.   Signal tone

Define the behaviour and the object value of the signal tone.

Use signal tone	No • Yes
Use muting	No • Yes
Duration of muting in seconds (the signal tone is repeated if the alarm is still on after this time)	5 ... 600, 60
Object analysis	1 = alarm mute | 0 = alarm not mute 0 = alarm mute | 1 = alarm not mute

6.7.   Logic Inputs

The device has 16 logic inputs, four AND and four OR logic gates. Activate the logic inputs and assign object values up to 1st communication.

| Use logic inputs | No • **Yes** |

Object value before 1st communication

Logic input 1	0 • 1
Logic input 2	0 • 1
Logic input ...	0 • 1
Logic input 16	0 • 1

6.7.1. AND Logic

Activate the required logic outputs.

AND Logic 1	<u>not active</u> • active
AND Logic 2	<u>not active</u> • active
AND Logic 3	<u>not active</u> • active
AND Logic 4	<u>not active</u> • active

6.7.2. OR Logic

Activate the required logic outputs.

OR Logic 1	<u>not active</u> • active
OR Logic 2	<u>not active</u> • active
OR Logic3	<u>not active</u> • active
OR Logic 4	<u>not active</u> • active

6.7.3. AND Logic 1-4 and OR Logic 1-4

AND and OR logic gates provide the same setting options. Each logic output can send 1-bit or 8-bit objects. Chose what the output sends at logic = 1 and = 0.

1. / 2. / 3. / 4. Input	• <u>do not use</u> • Logic input 1...16 • Logic input 1...16 inverted • all switching events which are available to the device (see chapter *connection inputs of the AND or Or logic*)
Logic output sends	• <u>one 1-bit object</u> • two 8-bit objects

Adjust the output values for different states for the one **1-bit object**.

Output value if logic = 1	<u>1</u> • 0
Output value if logic = 0	1 • <u>0</u>
Output value if block is active	1 • <u>0</u>
Output value if monitoring period is exceeded	1 • <u>0</u>

Adjust the object type and output values for different states for the two **8-bit objects**.

Object type	• Value (0…255) • Percent (0…100%) • Angle (0…360°) • Scenario load (0…63)
Output value object A if logic = 1	0 … 255 / 100% / 360° / 63; 1
Output value object B if logic = 1	0 … 255 / 100% / 360° / 63; 1
Output value object A if logic = 0	0 … 255 / 100% / 360° / 63; 0
Output value object B if logic = 0	0 … 255 / 100% / 360° / 63; 0
Output value object A if block is active	0 … 255 / 100% / 360° / 63; 0
Output value object B if block is active	0 … 255 / 100% / 360° / 63; 0
Output value object A if monitoring period is exceeded	0 … 255 / 100% / 360° / 63; 0
Output value object B if monitoring period is exceeded	0 … 255 / 100% / 360° / 63; 0

Adjust the sending behaviour of the output.

Send behaviour	• 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 + receipt of object • on change of logic + receipt of object and periodically
Send cycle *(is only sent if "periodically" is selected)*	5 s • 10 s • … • 2 h

Block

Activate the block of the logic output if needed and adjust what 1 or 0 means for the inhibiting input and what happens while blocking.

Use block	No • Yes
Blocking object analysis	• at value 1: block | at value 0: release at value 0: block | at value 1: release
Blocking object value before 1st communi-cation	0 • 1
Output behaviour	

With blocking	• do not send message • Send blocking value [look above, output value when block is active]
On release (with 2 seconds release delay)	[send value for current logic state]

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 feedback.

Use input monitor	No • Yes
Monitor input	• 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; 1 min
Value of the object "monitoring status" if period is exceeded	• do not send message • send exceeding value [= value of the para- meter „monitoring period"]

6.7.4. 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
Leakage alarm ON
Leakage alarm OFF

6.7.5. Connection inputs of the OR 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
Leakage alarm ON
Leakage alarm OFF
Switching output and logic 1
Switching output and logic 1 inverted
Switching output and logic 2
Switching output and logic 2 inverted
Switching output and logic 3
Switching output and logic 3 inverted
Switching output and logic 4
Switching output and logic 4 inverted