



Cala KNX

Indoor climate sensors with touch display

Technical specifications and installation instructions

Item numbers

Cala KNX AQS/TH: 70603 (black), 70608 (white)

Cala KNX TH: 70602 (black), 70607 (white)

Cala KNX T: 70601 (black), 70606 (white)

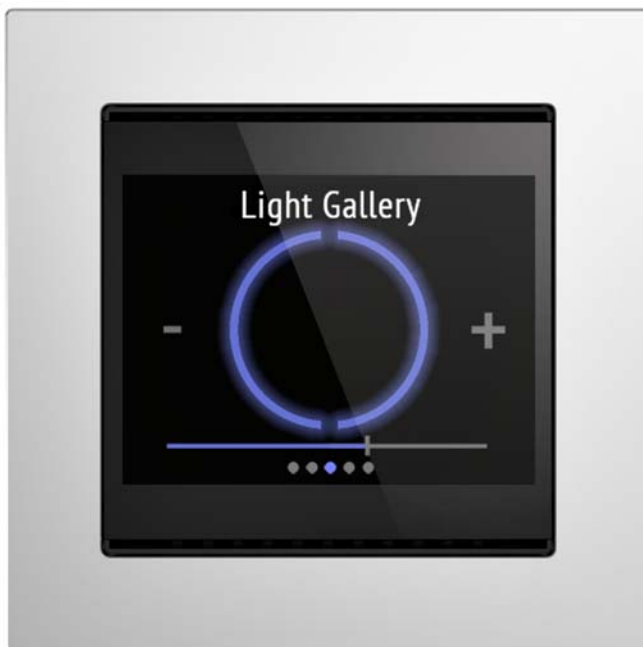


Illustration with frame (not included in the deliverables)



Elsner Elektronik GmbH Control and Automation Engineering

Sohlengrund 16
75395 Ostelsheim
Germany

Phone+49 (0) 70 33 / 30 945-0 info@elsner-elektronik.de
Fax +49 (0) 70 33 / 30 945-20 www.elsner-elektronik.de

Technical Service: +49 (0) 70 33 / 30 945-250



This document describes the functions for ALL device models.

Please check the information at the beginning of the chapter and in the text which describes the functions available for the respective individual models.

1. Description

The **Sensor with Cala KNX display** for the KNX bus system measures various ambient climate. Via the bus, the indoor sensor can receive external values and process them further with its own data to a total value (mixed value, e.g. room average).

All measured values can be used for the control of threshold value-dependent switching outputs. States can be linked via AND logic gates and OR logic gates. Multi-functional modules change input data as required by means of calculations, querying a condition, or converting the data point type. In addition, an integrated manipulated variable comparator can compare and output variables that were received via communication objects.

Integrated PI-controllers control ventilation (according to humidity or CO₂-concentration) and/or heating/cooling (according to temperature), depending on the respective model.

Cala KNX features a touch display that shows various display and control pages depending on the individual configuration. There is one page available that shows the current measured values, a menu area to adjust device settings and pages with touch control elements for internal temperature control, for light (manual switching or dimming), for shades or windows (manual operation).

Cala KNX is supplemented with a frame of the switch series used in buildings, and thus fits seamlessly into the interior fittings.

Common features in all models:

- **Colour touch display** with display pages for device settings, measuring values, controls of 1x heating/cooling, 3x light, 3x drive (shading, window)
- Screen saver (clock, off) and key tone may be switched on or off.
- **4 inputs** for binary contacts or T-NTC temperature sensor.
- **8 AND and 8 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 from each gate can be configured optionally as 1-bit or 2 x 8-bit
- **8 multi-function modules** (computers) for changing the input data by calculations, by querying a condition or by converting the data point type
- **4 manipulated variable comparators** to output minimum, maximum or average values. 5 inputs each for values received via communication objects

Cala KNX AQS/TH functions (no. 70603, 70608):

- Measuring the **CO₂-concentration** of the air, the **temperature** and **air humidity** (relative, absolute), each with **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage

- Bus message, whether the values for temperature and air humidity are within the **comfort field** (DIN 1946). **Dew point** calculation
- **Threshold values** can be adjusted per parameter or via communication objects
- **PI-controller for heating** (one or two-level) and **cooling** (one or two-level) according to temperature. Regulation according to separate set points or basic set point temperature
- **PI controller for ventilation** according to humidity and CO₂-concentration: Ventilate/Air (one-level) or Ventilate (one or two-levels)
- **Summer compensation** for cooling systems. A characteristic curve matches the target temperature in the room to the external temperature and sets the minimum and maximum target temperature values

Cala KNX TH functions (no. 70602, 70607):

- **Temperature** and **air humidity** measurement (relative, absolute), in each case with **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage
- Bus message, whether the values for temperature and air humidity are within the **comfort field** (DIN 1946). **Dew point** calculation
- **Threshold values** can be adjusted per parameter or via communication objects
- **PI-controller for heating** (one or two-level) and **cooling** (one or two-level) according to temperature. Regulation according to separate setpoints or basic set point temperature
- **PI controller for ventilation** according to humidity: Ventilate/Air (one-level) or Ventilate (one or two-level)
- **Summer compensation** for cooling systems. A characteristic curve matches the target temperature in the room to the external temperature and sets the minimum and maximum target temperature values

Cala KNX T functions (no. 70601, 70606):

- Measuring the **Temperature** with a **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage
- **Threshold values** can be adjusted per parameter or via communication objects
- **PI-controller for heating** (one or two-level) and **cooling** (one or two-level) according to temperature. Regulation according to separate set points or basic set point temperature
- **Summer compensation** for cooling systems. A characteristic curve matches the target temperature in the room to the external temperature and sets the minimum and maximum target temperature values

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.

1.0.1. Deliverables

- Housing with display

- Base plate
- Analogue/digital supply line

Additionally required (not included in the deliverables):

- Junction box Ø 60 mm, 42 mm deep
- Frame (for insert 55 x 55 mm), compatible to the switch scheme used in the building

1.1. Technical specifications

Material	Real glass, plastic
Display	Visible diagonal: 2.3 inch (59 mm) Resolution: 320 x 240 pixel
Colours	black glass, black housing white glass, white housing
Assembly	Flush mounting (Wall mounting in junction box Ø 60 mm, 42 mm deep)
Protection category	IP 20
Dimensions	approx. 55 x 55 x 35 (W x H x D, mm), mounting depth approx. 7 mm
Total weight	approx. 90 gr (incl. supply line, base plate)
Ambient temperature	Operation -20...+70°C, storage -30...+70°C
Ambient humidity	max. 95% RH, avoid condensation
Operating voltage	KNX bus voltage
Bus current	max. 18 mA
Data output	KNX +/- bus connector terminal
BCU type	Integrated microcontroller
PEI type	0
Group addresses	max. 2000
Assignments	max. 2000
Communication objects	Cala KNX AQS/TH: 405 Cala KNX TH: 367 Cala KNX T: 313
Inputs	4x analogue/ digital, max. cable length 10 m.
measuring range T-NTC temperature sensor on Cala input	-40°C...+80°C
CO ₂ -sensor (for Cala KNX AQS/TH):	
CO ₂ -measuring range	0...2000 ppm
CO ₂ resolution	1 ppm
CO ₂ accuracy	± 50 ppm ± 3% of the measured value
Temperature sensor (for Cala KNX AQS/TH, Cala KNX TH, Cala KNX T):	
Temperature measuring range	-20...+70°C
Temperature resolution	0.1°C

Temperature accuracy*	± 0.8°C at -25...-10°C ± 0.5°C at -10...+65°C ± 0.6°C at +65...+70°C
Humidity sensor (for Cala KNX AQS/TH, Cala KNX TH):	
Humidity measuring range	0% HR ... 100% HR
Humidity resolution	0.1%
Humidity accuracy	±7,5% HR at 0...10% HR ±4,5% HR at 10...90% HR ±7,5% HR at 90...100% HR
Humidity drift	± 0.5% RH per year in normal atmosphere

* Please note the information on *Measuring accuracy*, page 5

The product is compliant with the provisions of EC guidelines.

1.1.1. Measuring accuracy

Measurement deviations due to sources of interference (see chapter *Installation location*) must be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset). For a correct CO₂ measurement it is necessary to install the device in a windproof socket.

The specified **CO₂ measurement accuracy** is achieved after a run-in of 24 hours (without bus voltage interruption), if the sensor comes into contact with fresh air (350...450 ppm) at least once during this period. During the warm-up phase the reading may not be displayed at all or wrongly, or remain frozen at 2001.

After this, the CO₂-sensor performs a self-calibration every two weeks, in which the lowest CO₂-value measured during this period (without bus voltage interruption) is taken as a reference for fresh air.

In order to ensure permanent accuracy, the sensor should be supplied with fresh air at least once every two weeks. This is normally the case during room ventilation.

During **Temperature measurement**, the self-heating of the device is taken into consideration by the electronics. It is compensated for by the software, therefore the displayed/output inside temperature measuring value is correct.

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 its intended purpose. 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. Installation location

The sensor is installed in a flush-mounted box (Ø 60 mm, 42 mm deep).



The sensor may only be installed and used in dry interior spaces.

Avoid condensation.

When selecting an installation location, please ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:

- Direct sunlight
- Draughts from windows and doors
- Draughts from ducts which lead to the junction box in which the sensor is mounted from other rooms.
- Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
- Connection lines, which lead from warmer or colder areas to the sensor

Temperature variations from such sources of interference must be corrected in the ETS in order to ensure the specified accuracy of the sensor (temperature offset).

2.3. Device design

View with frame and base plate.

Fig. 1a

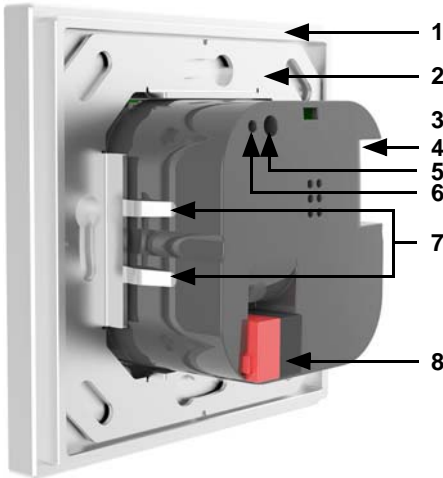


Fig. 1b



- 1 Frame (not included in the deliverables)
- 2 Base plate
- 3 Openings for air circulation
- 4 Slot supply line inputs

- 5 Programming button (recessed) for teaching the device
- 6 Programming LED (recessed)
- 7 Catches
- 8 KNX terminal BUS +/-



Fig. 2

Analogue/digital supply line inputs:

Input 1: white / black (GND)

Input 2: yellow / black (GND)

Input 3: purple / black (GND)

Input 4: blue / black (GND)

2.4. Sensor assembly

First, place the wind-proof box with the supply connection. Seal the inlet tubes as well, in order to prevent drafts.

Then screw the base plate onto the socket and position the frame of the switch range on top of this. Connect the bus lines +/- to the black-red KNX plug and plug the KNX plug into the intended slot (no. 8). If required, connect the analogue/digital inputs via the breakout cable that is included in the delivery.

Insert the housing firmly onto the metal frame using the catches so that sensor and frame are fixed together.

2.5. Notes on mounting and commissioning

Never expose the device to water (e.g. rain) or dust. This can damage the electronics. You must not exceed a relative humidity of 95%. Avoid condensation.

After the bus 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. After the bus 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 the equipment

The equipment 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 can be reached through the opening on the rear of the housing; it is recessed. Use a thin object to reach the button, e.g. a 1.5 mm² wire.

4. Maintenance and care

Fingerprints on the display and the housing are best removed with a cloth moistened with water or a microfibre cloth. Do not use an abrasive cleaning agent or aggressive cleansing agents.