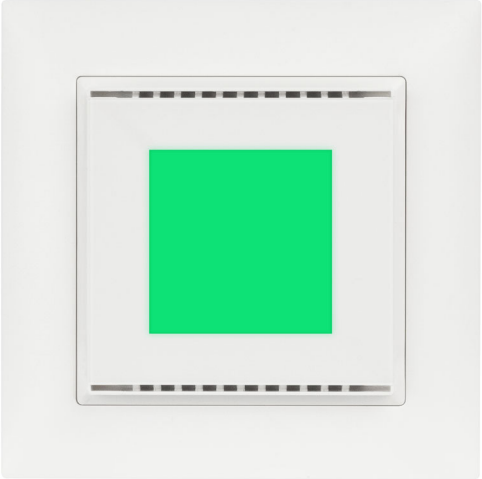
Cala KNX IL (CO2) CH

Indicator Light Green/Yellow/Red

Item numbers 71381 (Cala KNX IL CH) and 71391 (Cala KNX IL CO2 CH)

Für Schweizer Installations-Standard 60 mm



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

2. Description

The LED area of the **Cala KNX IL CH LED light signal** can illuminate or flash in the colours green, yellow or red. This allows states to be visualised for the KNX bus system. E.g. threshold value violations, room occupancy or other status messages can be linked to **Cala KNX IL CH** and the displayed colour changes if these threshold values are exceeded / undercut.

States can be linked via AND logic gates and OR logic gates. An integrated actuating variable comparator can compare and issue values that have been received via communication objects.

With the **Cala KNX IL CO2 CH** model, the measured value of the integrated CO_2 sensor can be visualised via the illuminated area.

Via the bus, **Cala KNX IL CO2 CH** can receive an external CO_2 value and process it with its own data to form an overall value (mixed value, e.g. room average). The CO_2 measured value can be used for the control of limit-dependent switch outputs.

A PI controller regulates ventilation according to CO_2 concentration.

Function of all models:

- **Traffic-light function** for visualising states (e. g. limit value violations, room occupation of status reports)
- Display (permanent or flashing) of one of the colours **Green, Yellow or Red**
- **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 from each gate can be configured optionally as 1-bit or 2 x 8-bit
- **2 control variable comparators** to output minimum, maximum or average values. 5 inputs each for values received via communication objects

Cala KNX IL CO2 CH (No. 71391) functions:

- Measuring the **CO_2-concentration** in the air each time with **mixed value calculation**. The share of internal measured value and external value can be set as a percentage
- Use of the **CO_2-concentration** for the **traffic-light function**
- **Threshold values** can be adjusted per parameter or via communication objects
- **PI controller for two-stage ventilation** according to CO_2-concentration

3. Commissioning

Configuration is made using the KNX software as of ETS 5. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de**.

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

3.1. Addressing the equipment

The equipment is delivered with the bus address 15.15.255. Another address can be programmed using the ETS.

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. Transmission protocol

Units:

CO_2 content in ppm
Variables in %

4.1. List of all communication objects

Abbreviations Flags:

C Communication
R Read
W Write
T Transmit
U Update

No	Text	Function	Flags	DPT type	Size
0	Output software version	Software version	R-CT-	[217.1] DPT_Version	2 Bytes
11	Input light signal	Light signal On/Off	RWC--	[1.1] DPT_Switch	1 Bit
12	Input light signal	Light signal brightness	RWC--	[5.1] DPT_Scaling	1 Byte
16	Input light signal	Light signal colour red On/Off	-WC--	[1.1] DPT_Switch	1 Bit
17	Input light signal	Light signal colour yellow On/Off	-WC--	[1.1] DPT_Switch	1 Bit
18	Input light signal	Light signal colour green On/Off	-WC--	[1.1] DPT_Switch	1 Bit
19	Input light signal	“Light signal colour selection 1 byte (0=Off, 1=Green, 2=Yellow, 3=Red)”	-WC--	[5.10] DPT_Value_1_Ucount	1 Byte
24	Input / output light signal	Light signal measured value for GW	-WC--	[9.7] DPT_Value_Humidity	2 Bytes
25	Input / output light signal	Light signal GW green/yellow	RWCT-	[9.7] DPT_Value_Humidity	2 Bytes
26	Input / output light signal	Light signal GW yellow/red	RWCT-	[9.7] DPT_Value_Humidity	2 Bytes
27	Input / output light signal	Light signal GW hysteresis	RWCT-	[9.7] DPT_Value_Humidity	2 Bytes
35	Output light signal	Light signal status colour red On/Off	R-CT-	[1.1] DPT_Switch	1 Bit
36	Output light signal	Light signal status colour yellow On/Off	R-CT-	[1.1] DPT_Switch	1 Bit
37	Output light signal	Light signal status colour green On/Off	R-CT-	[1.1] DPT_Switch	1 Bit

No	Text	Function	Flags	DPT type	Size
39	Output light signal	Light signal status RGB red	R-CT-	[5.10] DPT_Value_1_Ucount	1 Byte
40	Output light signal	Light signal status RGB green	R-CT-	[5.10] DPT_Value_1_Ucount	1 Byte
41	Output light signal	Light signal status RGB blue	R-CT-	[5.10] DPT_Value_1_Ucount	1 Byte
42	Output light signal	Light signal status colour RGB	R-CT-	[232.600] DPT_Colour_RGB	3 Bytes
44	Indicator Light	“Light signal status byte (0=Off, 1=Green, 2=Yellow, 3=Red)”	R-CT-	[5.10] DPT_Value_1_Ucount	1 Byte
Only with Cala KNX IL CO2 CH					
70	Output CO2 sensor	CO2 malfunction (0=OK | 1=NOT OK)	R-CT-	[1.1] DPT_Switch	1 Bit
71	Input CO2 measured value	Outside CO2 reading	-WCT-	[9.8] DPT_Value_AirQuality	2 Bytes
72	Output CO2 measured value	CO2 measured value internal	R-CT-	[9.8] DPT_Value_AirQuality	2 Bytes
73	Output CO2 measured value	CO2 measured value total	R-CT-	[9.8] DPT_Value_AirQuality	2 Bytes
74	Input CO2 measured value	CO2 measured value requirement max.	-WC--	[1.17] DPT_Trigger	1 Bit
75	Output CO2 measured value	Maximum CO2 measured value	R-CT-	[9.8] DPT_Value_AirQuality	2 Bytes
76	Input CO2 measured value	CO2 measured value reset max.	-WC--	[1.17] DPT_Trigger	1 Bit
77	Input / Output CO2-GW 1	CO2-GW 1 absolute value	RWCT-	[9.8] DPT_Value_AirQuality	2 Bytes
78	Input CO2-GW 1	CO2-GW 1 change (1: + | 0: -)	-WC--	[1.1] DPT_Switch	1 Bit
79	Input CO2-GW 1	CO2-GW 1 switch delay from 0 to 1	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
80	Input CO2-GW 1	CO2-GW 1 switch delay from 1 to 0	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
81	Output CO2-GW 1	CO2-GW 1 switch output	R-CT-	[1.1] DPT_Switch	1 Bit
82	Input CO2-GW 1	CO2-GW 1 switch output lock	-WC--	[1.1] DPT_Switch	1 Bit

No	Text	Function	Flags	DPT type	Size
83	Input / Output CO2-GW 2	CO2-GW 2 absolute value	RWCT-	[9.8] DPT_Value_AirQuality	2 Bytes
84	Input CO2-GW 2	CO2-GW 2 change (1: + | 0: -)	-WC--	[1.1] DPT_Switch	1 Bit
85	Input CO2-GW 2	CO2-GW 2 switch delay from 0 to 1	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
86	Input CO2-GW 2	CO2-GW 2 switch delay from 1 to 0	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
87	Output CO2-GW 2	CO2-GW 2 switch output	R-CT-	[1.1] DPT_Switch	1 Bit
88	Input CO2-GW 2	CO2-GW 2 switch output lock	-WC--	[1.1] DPT_Switch	1 Bit
89	Input / Output CO2-GW 3	CO2-GW 3 absolute value	RWCT-	[9.8] DPT_Value_AirQuality	2 Bytes
90	Input CO2-GW 3	CO2-GW 3 change (1: + | 0: -)	-WC--	[1.1] DPT_Switch	1 Bit
91	Input CO2-GW 3	CO2-GW 3 switch delay from 0 to 1	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
92	Input CO2-GW 3	CO2-GW 3 switch delay from 1 to 0	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
93	Output CO2-GW 3	CO2-GW 3 switch output	R-CT-	[1.1] DPT_Switch	1 Bit
94	Input CO2-GW 3	CO2-GW 3 switch output lock	-WC--	[1.1] DPT_Switch	1 Bit
95	Input / Output CO2-GW 4	CO2-GW 4 absolute value	RWCT-	[9.8] DPT_Value_AirQuality	2 Bytes
96	Input CO2-GW 4	CO2-GW 4 change (1: + | 0: -)	-WC--	[1.1] DPT_Switch	1 Bit
97	Input CO2-GW 4	CO2-GW 4 switch delay from 0 to 1	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
98	Input CO2-GW 4	CO2-GW 4 switch delay from 1 to 0	RWC--	[7.5] DPT_TimePeriodSec	2 Bytes
99	Output CO2-GW 4	CO2-GW 4 switch output	R-CT-	[1.1] DPT_Switch	1 Bit
100	Input CO2-GW 4	CO2-GW 4 switch output lock	-WC--	[1.1] DPT_Switch	1 Bit
101	Input CO2 controller	CO2 controller: Block (1: block)	-WC--	[1.2] DPT_Bool	1 Bit
102	Input / Output CO2 controller	CO2 controller setpoint	RWCT-	[9.8] DPT_Value_AirQuality	2 Bytes
103	Input CO2 controller	CO2 controller setpoint (1:+ | 0:-)	-WC--	[1.2] DPT_Bool	1 Bit
104	Output CO2 controller	CO2 controller setpoint ventilation	R-CT-	[5.1] DPT_Scaling	1 Byte

No	Text	Function	Flags	DPT type	Size
105	Output CO2 controller	CO2 controller setpoint ventilation level 2	R-CT-	[5.1] DPT_Scaling	1 Byte
106	Output CO2 controller	CO2 controller status ventilation (1:ON | 0:OFF)	R-CT-	[1.1] DPT_Switch	1 Bit
107	Output CO2 controller	CO2 controller status ventilation 2 (1:ON | 0:OFF)	R-CT-	[1.1] DPT_Switch	1 Bit
For all models					
121	Input actuating variable comparator	Actuating variable comparator 1: Input 1	-WC--	[5.1] DPT_Scaling	1 Byte
122	Input actuating variable comparator	Actuating variable comparator 1: Input 2	-WC--	[5.1] DPT_Scaling	1 Byte
123	Input actuating variable comparator	Actuating variable comparator 1: Input 3	-WC--	[5.1] DPT_Scaling	1 Byte
124	Input actuating variable comparator	Actuating variable comparator 1: Input 4	-WC--	[5.1] DPT_Scaling	1 Byte
125	Input actuating variable comparator	Actuating variable comparator 1: Input 5	-WC--	[5.1] DPT_Scaling	1 Byte
126	Output actuating variable comparator	Actuating variable comparator 1: Output	R-CT-	[5.1] DPT_Scaling	1 Byte
127	Input actuating variable comparator	Actuating variable comparator 1: Block (1: block)	-WC--	[1.2] DPT_Bool	1 Bit
128	Input actuating variable comparator	Actuating variable comparator 2: Input 1	-WC--	[5.1] DPT_Scaling	1 Byte
129	Input actuating variable comparator	Actuating variable comparator 2: Input 2	-WC--	[5.1] DPT_Scaling	1 Byte
130	Input actuating variable comparator	Actuating variable comparator 2: Input 3	-WC--	[5.1] DPT_Scaling	1 Byte
131	Input actuating variable comparator	Actuating variable comparator 2: Input 4	-WC--	[5.1] DPT_Scaling	1 Byte
132	Input actuating variable comparator	Actuating variable comparator 2: Input 5	-WC--	[5.1] DPT_Scaling	1 Byte

No	Text	Function	Flags	DPT type	Size
133	Output actuating variable comparator	Actuating variable comparator 2: Output	R-CT-	[5.1] DPT_Scaling	1 Byte
134	Input actuating variable comparator	Actuating variable comparator 2: Block (1: block)	-WC--	[1.2] DPT_Bool	1 Bit
141	Input logic	Logic input 1	-WC--	[1.2] DPT_Bool	1 Bit
142	Input logic	Logic input 2	-WC--	[1.2] DPT_Bool	1 Bit
143	Input logic	Logic input 3	-WC--	[1.2] DPT_Bool	1 Bit
144	Input logic	Logic input 4	-WC--	[1.2] DPT_Bool	1 Bit
145	Input logic	Logic input 5	-WC--	[1.2] DPT_Bool	1 Bit
146	Input logic	Logic input 6	-WC--	[1.2] DPT_Bool	1 Bit
147	Input logic	Logic input 7	-WC--	[1.2] DPT_Bool	1 Bit
148	Input logic	Logic input 8	-WC--	[1.2] DPT_Bool	1 Bit
149	Input logic	Logic input 9	-WC--	[1.2] DPT_Bool	1 Bit
150	Input logic	Logic input 10	-WC--	[1.2] DPT_Bool	1 Bit
151	Input logic	Logic input 11	-WC--	[1.2] DPT_Bool	1 Bit
152	Input logic	Logic input 12	-WC--	[1.2] DPT_Bool	1 Bit
153	Input logic	Logic input 13	-WC--	[1.2] DPT_Bool	1 Bit
154	Input logic	Logic input 14	-WC--	[1.2] DPT_Bool	1 Bit
155	Input logic	Logic input 15	-WC--	[1.2] DPT_Bool	1 Bit
156	Input logic	Logic input 16	-WC--	[1.2] DPT_Bool	1 Bit
157	Output AND Logic	AND logic 1: 1-bit switch output	R-CT-	[1.2] DPT_Bool	1 Bit
158	Output AND Logic	AND logic 1: 8 bit output A	R-CT-	depending on setting	1 Byte
159	Output AND Logic	AND logic 1: 8 bit output B	R-CT-	depending on setting	1 Byte
160	Input AND Logic	AND logic 1: Block	-WC--	[1.1] DPT_Switch	1 Bit
161	Output AND Logic	AND logic 2: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
162	Output AND Logic	AND logic 2: 8 bit output A	R-CT-	depending on setting	1 Byte
163	Output AND Logic	AND logic 2: 8 bit output B	R-CT-	depending on setting	1 Byte
164	Input AND Logic	AND logic 2: Block	-WC--	[1.1] DPT_Switch	1 Bit
165	Output AND Logic	AND logic 3: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
166	Output AND Logic	AND logic 3: 8 bit output A	R-CT-	depending on setting	1 Byte

No	Text	Function	Flags	DPT type	Size
167	Output AND Logic	AND logic 3: 8 bit output B	R-CT-	depending on setting	1 Byte
168	Input AND Logic	AND logic 3: Block	-WC--	[1.1] DPT_Switch	1 Bit
169	Output AND Logic	AND logic 4: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
170	Output AND Logic	AND logic 4: 8 bit output A	R-CT-	depending on setting	1 Byte
171	Output AND Logic	AND logic 4: 8 bit output B	R-CT-	depending on setting	1 Byte
172	Input AND Logic	AND logic 4: Block	-WC--	[1.1] DPT_Switch	1 Bit
173	Output OR Logic	OR logic 1: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
174	Output OR Logic	OR logic 1: 8 bit output A	R-CT-	depending on setting	1 Byte
175	Output OR Logic	OR logic 1: 8 bit output B	R-CT-	depending on setting	1 Byte
176	Input OR Logic	OR logic 1: Block	-WC--	[1.1] DPT_Switch	1 Bit
177	Output OR Logic	OR logic 2: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
178	Output OR Logic	OR logic 2: 8 bit output A	R-CT-	depending on setting	1 Byte
179	Output OR Logic	OR logic 2: 8 bit output B	R-CT-	depending on setting	1 Byte
180	Input OR Logic	OR logic 2: Block	-WC--	[1.1] DPT_Switch	1 Bit
181	Output OR Logic	OR logic 3: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
182	Output OR Logic	OR logic 3: 8 bit output A	R-CT-	depending on setting	1 Byte
183	Output OR Logic	OR logic 3: 8 bit output B	R-CT-	depending on setting	1 Byte
184	Input OR Logic	OR logic 3: Block	-WC--	[1.1] DPT_Switch	1 Bit
185	Output OR Logic	OR logic 4: 1 bit switching output	R-CT-	[1.2] DPT_Bool	1 Bit
186	Output OR Logic	OR logic 4: 8 bit output A	R-CT-	depending on setting	1 Byte
187	Output OR Logic	OR logic 4: 8 bit output B	R-CT-	depending on setting	1 Byte
188	Input OR Logic	OR logic 4: Block	-WC--	[1.1] DPT_Switch	1 Bit

5. Setting of the parameters

5.1. Behaviour in case of 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 delay that was established in the "General settings" parameter block.

5.2. General settings

First set the send delay after bus voltage recovery and programming.
This delay should be coordinated with the entire KNX-system, i.e. in a KNX system with many participants, care should be taken that the bus is not overloaded after a KNX-bus reset. The messages sent to the individual participants should be staggered.

Transmission delay after reset/bus restoration	5 s • ... • 300 s

The bus load is limited with the aid of the maximum message rate. Many messages per second put a strain on the bus but ensure faster data transmission.

Maximum telegram rate	• 1 message per second • ... • 10 messages per second • ... • 50 messages per second

5.3. Light signal

Conditions for the KNX bus system can be visualised by the light signal.
Choose whether the light signal should be on or off after a reset.

Light signal valid until the first communication	Off • On

Set the brightness of the light signal after a reset.

Brightness valid until the first communication	0…100 %

Set how the signal colour is determined.
Status information is received by the 3 one-bit objects. For example, a window contact can control the colour change this way.
A scenario number is received by the scenario object. So, for example, the "meeting" scenario created can switch the door signal of a room to red.
An integral percent value is received by the percent object. The threshold value entered in ETS controls the colour change. For example, the colour can change when the tank fill level falls short.
A value is received by the two-byte object. Thus, for example, an external CO_2 measured value can be visualised.
In **Cala KNX IL CO2 CH**, the value measured by the integrated CO_2 sensor value (CO_2 total measurement) can be used for the signal colour. This then lights up corresponding to the current measured value and the set threshold values.
Depending on the selection, other settings appear hereafter.

Signal colour is determined by	• 3 x one-bit object • 1 x scenario object • 1 x percent object with limit value • 1 x two-byte floating point object with limit value • CO2 total measured value (only for version Cala KNX IL CO2 CH with integrated sensor)

3 x one-bit object:

Signal colour is determined by	**3 x one-bit object**
Priority 1: Red Priority 2: Yellow Priority 3: Green	
Note: No colour is active before the first object receipt after reset	

1 x scenario object:

Set the scenario numbers.
In case of pre-set values, **Cala KNX IL CH** does not light up at all for scenario number 1, lights up green for scenario number 2, yellow for 3 and red for 4.

Signal colour is determined by	**1 x scenario object**
Scenario number for off	1...64
Scenario number for green	1...64; 2
Scenario number for yellow	1...64; 3
Scenario number for red	1...64; 4
Note: If several of the same scenario numbers are issued, the following priority is applicable: Red, yellow, green, off No colour is active before the first object receipt after reset	

1 x percent object with limit value:

Set whether the limit values received via object and the switching distance (hysteresis) should be retained in reset and programming.

Signal colour is determined by	**1 x percent object with limit value**
Note: No colour is active before the first object receipt after reset	
The limit values received via object and the switching distance (hysteresis) should	• not be retained • after reset • after reset and programming
.	

Set the limit value for colour change from green to yellow. You can specify the threshold value via communication object no. 25 (light signal TV green/yellow) also.

Start limit value for change from green to yellow	0…100 %; 33 %

Set the limit value for colour change from yellow to red. You can specify the threshold value via communication object no. 26 (light signal TV yellow/red) also.

Start limit value for change from green to red	0…100 %; 66 %

Set the switching distance (hysteresis) for colour change from red to yellow, and yellow to green. It specifies how low the value must be below the threshold value before the colour switches. You can specify the switching distance (hysteresis) via communication object no. 27 (light signal TV of switching distance (hysteresis)) also.

Start switching distance (hysteresis) for falling values	0…50 %; 5 %

1 x two-byte floating point object with limit value:

Set whether the limit values received via object and the switching distance (hysteresis) should be retained in reset and programming.

Signal colour is determined by	**1 x two-byte floating point object with limit value**
Note: No colour is active before the first object receipt after reset	
The limit values received via object and the switching distance (hysteresis) should	• not be retained • after reset • after reset and programming
.	

Set the limit value for colour change from green to yellow. You can specify the threshold value via communication object no. 25 (light signal TV green/yellow) also.

Start limit value for change from green to yellow [x 0.1]	-6700000…6700000; 200

Set the limit value for colour change from yellow to red. You can specify the threshold value via communication object no. 26 (light signal TV yellow/red) also.

Start limit value for change from yellow to red [x 0.1]	-6700000…6700000; 250

Set the switching distance (hysteresis) for colour change from red to yellow, and yellow to green. It specifies how low the received value must be below the threshold value before the colour switches. You can specify the switching distance (hysteresis) via communication object no. 27 (light signal TV of switching distance (hysteresis)) also.

Start switching distance (hysteresis) for falling values [x 0.1]	0…3000000; 20

1 x CO2 total measured value (only for Cala KNX IL CO2 CH):

Set when the limit values received via object and the switching distance (hysteresis) should be retained.

Signal colour is determined by	**1 x CO2 total measured value**
The limit values received via object and the switching distance (hysteresis) should	• not be retained • after reset • after reset and programming
.	

Set the limit value for colour change from green to yellow. You can specify the threshold value via communication object no. 25 (light signal TV green/yellow) also.

Start limit value for change from green to yellow [ppm]	700…2000; 1000

Set the limit value for colour change from yellow to red. You can specify the threshold value via communication object no. 26 (light signal TV yellow/red) also.

Start limit value for change from green to red [ppm]	800…3000; 1400

Set the switching distance (hysteresis) for colour change from red to yellow, and yellow to green. It specifies how low the received value must be below the threshold value before the colour switches. You can specify the switching distance (hysteresis) via communication object no. 27 (light signal TV of switching distance (hysteresis)) also.

Start switching distance (hysteresis) for falling values [ppm]	50…300; 200

Set the display behaviour of the red light signal.

If the signal colour Red is active, the light signal should be	• be permanently On • be permanently Off • flashing

Set the flash cycle.

Flash cycle (in 0.1 s) *(When signal colour flashes)*	2...20; 5

Set the display behaviour of the yellow light signal.

If the signal colour Yellow is active, the light signal should be	• be permanently On • be permanently Off • flashing

Set the flash cycle.

Flash cycle (in 0.1 s) *(When signal colour flashes)*	2...20; 5

Set the display behaviour of the green light signal.

If the signal colour Green is active, the light signal should be	• be permanently On • be permanently Off • flashing

Set the flash cycle.

Flash cycle (in 0.1 s) *(When signal colour flashes)*	2...20; 5

Use status objects to forward the colour display to other KNX participants. Then set the send behaviour.

Send status objects for signal colour	• do not retain • upon changes • upon change and periodically

Set the send cycle mode.

Send cycle *(if sent periodically)*	5 s • 10 s • 30 s • ... • 2 h

Select the colour using the colour picker or set the respective status colour as a hex code, which is sent to the KNX bus. This code is used for colour representation by screens and LEDs and can be represented by corresponding KNX participants.

Value for 'Status colour RGB' object in status = green	#000000 ...#FFFFFF; #00FF00
Value for 'Status colour RGB' object in status = yellow	#000000 ...#FFFFFF; #FFFF00
Value for 'Status colour RGB' object in status = red	#000000 ...#FFFFFF; #FF0000
Value for 'Status colour RGB' object in status = Off (*only for 3 x one-bit object and 1 x scenario object*)	#000000 ...#FFFFFF

5.4. CO_2 Measured value

Only for Cala KNX IL CO2 CH version with integrated sensor.

Select whether to send an **interference object** if the sensor is defective. The fault object can be used by other bus participants for monitoring.

Use malfunction object	No • Yes

Always use the automatic sensor calibration.
The CO_2 sensor uses the latest 7 CO_2 minimum values for automatic sensor calibration. These 7 minimum values must have a gap of at least 18 hours from each other and lie within the range of 400 to 450 ppm (fresh air).

Use automatic sensor calibration	No • Yes

The CO_2 value output can be corrected by an **offset** value, if needed.

Offset in ppm	-100…100; 0

The unit can calculate a **mixed value** from its own reading and an external value, e.g., room average if two CO_2 sensors are attached in one room. Set the mixed value calculation if desired. If an external portion is used, all the following settings (threshold values, etc.) are related to the overall measured value!

Use external measured value	No • Yes

Set the external portion.

Ext. Measured value portion of the total reading	5% • 10% • ... • 50% • ... • 100%

The internal and, as required, the total measured value can be sent to the bus and further used there by other participants.

Send behaviour (for internal and total measured value)	• do not send • periodically • upon changes • upon changes and periodically

When sending upon change, the CO_2 value is sent on the bus as soon as it changes by the percentage set.

Upon a change of (relative to the last measured value) *(if sent upon change)*	2% • 5% • ... • 50%

When sending periodically, the CO_2 value is sent on the bus in a fixed cycle that can be set.

Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

The **maximum measured value** can be saved and sent to the bus. With object no. 76 “Reset CO2 measured value”, the value can be reset to the current measured value. The value is not retained after a reset.

Use maximum value	No • Yes

5.5. CO_2 threshold values

Only for Cala KNX IL CO2 CH version with integrated sensor.

The CO_2 threshold values are used to carry out certain actions when a CO_2 value is exceeded or not reached.

Use threshold value 1/2/3/4	Yes • No

300 ppm ... 1000 ppm: fresh air
1000 ppm ... 2000 ppm: stale air

1000 ppm = 0.1%

5.5.1. Threshold value 1, 2, 3, 4

Threshold value

Decide when **threshold values and 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).

The nominal values and delay times	
received by the communication object should be retained	• never • after restoration of power • after power restoration and programming
.	

Set the threshold values directly in the application program using parameters or define them via the bus using a communication object.

Threshold value setpoint using	Parameter • Communication objects

Threshold value setpoint using parameter:

When the **threshold value per parameter** is specified, then the value is set.

Threshold value in ppm	0 ... 5000; 1200

Threshold value setpoint using a communication object:

During initial commissioning, a threshold value must be defined which will be valid until the first call with a new threshold value. For units which have already been taken into

service, the last communicated threshold value can be used. Basically, a range is given in which the threshold value can be changed (object value limit).
A set threshold value will be retained until a new value or change is transferred. The current value is saved so that it is retained in the event of a power supply failure and will be available again once the power supply is restored.

Start threshold value in ppm valid until the first communication	0 ... 5000; 1200

Minimum value that can be set via object.

Limitation of object value (min) in ppm	1...5000

Maximum value that can be set via object.

Limitation of object value (max) in ppm	1...5000; 2000

Enter how the threshold value will be received from the bus beforehand. Basically, a new value can be received, or simply a command to increase or decrease.

Type of threshold value change	Absolute value • Increase/decrease

Choose the step size.

Step size in ppm *(upon increase/decrease change)*	1 • 2 • 5 • 10 • 20 • ... • 200

The switching distance (hysteresis) is important for the first parameter of the switching output.
The switching distance (hysteresis) prevents the switching output of the threshold value from changing too often in the event of CO_2 fluctuations. When the CO_2 value drops, the switching output does not react until the switching distance (hysteresis) falls below the threshold value (points 1 and 2 in the first parameter of switching output). When the CO_2 value increases, the switching output does not react until the switching distance (hysteresis) exceeds the threshold value (points 3 and 4 in the first parameter of switching output).

Setting the switching distance (hysteresis)	in % • absolute

Set the value of the switching distance (hysteresis).

Switching distance (hysteresis) in ppm	0...2000; 500
Switching distance (hysteresis) in % of the threshold value	0 ... 50; 20

Switching output

Set which value the output transmits if the threshold value is exceeded or undercut.

When the following conditions apply, the output is (TV = Threshold value)	• TV above = 1 | –V - hysteresis below = 0 • TV above = 0 | –V - hysteresis below = 1 • TV below = 1 |TV + hysteresis above = 0 • TV below = 0 |TV + hysteresis above = 1

The output switching delays can be set using objects or directly as a parameter.

Delays can be set via objects (in seconds)	No • Yes

Switching delays can ignore short-term CO_2 fluctuations around the threshold value or threshold value and switching distance (hysteresis) for the switching output.

Switching delay from 0 to 1 *(if delay is adjustable via objects: valid until the first communication)*	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 to 0 *(if delay is adjustable via objects: valid until the first communication)*	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h

Set when the switching output is to be sent to the bus.

Switching output sends	• upon a change • upon a change to 1 • upon a change to 0 • upon a change and periodically • upon a change to 1 and periodically • upon a change to 0 and periodically

When sending periodically, the switching output is sent on the bus in a fixed cycle that can be set.

Cycle *(sent only if "periodically" is selected)*	5 s • 10 s • 30 s... • 2 h

Block

With the help of the “CO2-GW X switching output block” input object, the switching output can be blocked, e.g. by a manual command (push button).

Use switching output block	No • **Yes**

The block can take effect at value 0 or 1, depending on the intended use.

Assessment of the block object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release

Specify an object value until first communication.

Blocking object value before first communication	0 • 1

The behaviour of the switching output during blocking can be set.

Switching output behaviour	
On blocking	• Do not send message • send 0 • send 1

On release (with 2 second release delay)	[Dependent on the "Switching output sends" setting]

The behaviour of the switching output on release is dependent on the value of the parameter "Switching output sends" (see "Switching output").

Switching output sends upon a change	• Do not send message • Send switching output status
Switching output sends upon a change to 1	• Do not send message • if switching output = 1 ➔ send 1
Switching output sends upon on change to 0	• Do not send message • if switching output = 0 ➔ send 0
Switching output sends upon a change and periodically	send switching output status
Switching output sends upon on change to 1 and periodically	if switching output = 1 ➔send 1
Switching output sends upon a change to 0 and periodically	if switching output = 0 ➔send 0

5.6. CO_2 PI controller

Only for Cala KNX IL CO2 CH version with integrated sensor.

Use the air quality control to activate the automatic ventilation at a high CO_2 concentration.

Use controller	**Yes** • No

General control

Select whether a one or two-stage ventilation should be controlled.

Type of control	• One-stage ventilation • Two-stage ventilation

With the help of the "CO2 controller: Block" input object, the controller output can be blocked, e.g. by a manual command (push button).
The block can take effect at value 0 or 1, depending on the intended use.

Behaviour of the blocking object with value	• 1 = Block | 0 = release • 0 = block | 1 = release

Specify an object value until first communication.

Blocking object value before the first communication	0 • 1

Specify when the current control variables are to be sent to the bus.

Send control variable	• upon a change • upon changes and periodically

If the control variable changes by the set value, the variable is sent.

from change (in %)	1...20; 2

Periodic transmission is safer if a message does not reach a recipient. You may also set up periodic monitoring using an actuator with this setting.

Cycle (*if sent periodically)*	5 s • ... • 5 min • ... • 2 h

The status object shows the current status of the output variable (0 = OFF, > 0 = ON) and can, for example, be used for visualisation.

Send status objects	• upon a change • upon a change to 1 • upon a change to 0 • upon change and periodically • upon a change to 1 and periodically • upon a change to 0 and periodically

When sending periodically, the status object is sent on the bus in a fixed cycle that can be set.

Cycle (*if sent periodically)*	5 s • 10 s • ... • 2 h

Controller setpoint

The setpoint received by communication object can be saved so that it is retained in the event of a power supply failure and will be available again once the power supply is restored.

The setpoint received by communication object should be retained	• never • after restoration of power • after power restoration and programming

The target values can be set directly in the application program using parameters or defined via the bus using a communications object. If no value is received from the communication object, then the starting setpoint from the parameter is used.
Basically, a new value or simply a command to increase or decrease can be received.
During initial commissioning, a set point value must be defined which will be valid until the first Communication of a new setpoint value. For units which have already been

taken into service, the last communicated target value can be used.
A set setpoint value will be retained until a new value or a change is transferred.

Start setpoint value in ppm valid until the first communication *(not upon saving the setpoint value after programming)*	400… 2000; 800

Minimum value that can be set via object.

Limitation of object value (min) in ppm	400…2000; 400

Maximum value that can be set via object.

Limitation of object value (max) in ppm	400…2000; 1500

Enter how the setpoint value will be received from the bus in advance. Basically, a new value can be received, or simply a command to increase or decrease.

Type of setpoint change	Absolute value • Increase/decrease

Choose the step size.

Step size in ppm *(upon increase/decrease change)*	1 • 2 • 5 • ... • 20 • ... • 100 • 200

Ventilation control

Depending on the control mode, one and/or two setting sections for the ventilation stages are displayed.
For two-stage ventilation, the setpoint difference between the two stages must be defined, i.e. at which setpoint undercut the second stage is added.

Setpoint difference between levels 1 and 2 Stage in ppm *(for Level 2 only)*	100...2000; 400

Determine the deviation from the setpoint at which the maximum variable value is reached, i.e. the point at which maximum output is used.

Maximum control variable is reached at setpoint value/actual difference of (in ppm)	100...2000

The reset time shows how quickly the controller responds to deviations from the setpoint. In case of a short reset time, the control responds with a fast increase of the control variable. In case of a long reset time, the control responds somewhat less urgently and needs longer until the necessary control variable for the setpoint deviation is reached.
You should set the time appropriate to the ventilation system (follow the manufacturer's instructions).

Reset time in minutes	1...255; 30

Now specify what should be sent when the control is blocked.

When blocked, the control variable should	• not send anything • send a value

Value that is sent while blocking.

Value in % (*only if a value is sent)*	0...100

5.7. Variable comparator

The two integrated control variable comparators can output maximum, minimum and median values.

Use comparator 1/2	No • Yes

5.7.1. Control variable comparator 1/2

Determine what the control variable comparator output should be.

Output delivered	• Maximum value • Minimum value • Average value

Activate the input objects to be used.

Use input 1/2/3/4/5	No • Yes

Then set the send behaviour.

Output sends	• upon a change of output • upon a change of output and periodically • when receiving an input object • when receiving an input object and periodically

When sending upon a change, the value is sent on the bus as soon as it changes by the percentage set.

Upon a change of *(if sent upon change)*	1% • 2% • 5% • 10% • 20% • 25% • 50%

When sending periodically, the value is sent on the bus in a fixed cycle that can be set.

Send cycle *(if sent periodically)*	5 s • 10 s • 30 s • ... • 5 min • ... • 2 h

With the help of the “Control variable comparator: block” input object, the output can be blocked, e.g. by a manual command (push button).
The block can take effect at value 0 or 1, depending on the intended use.

Assessment of the block object	• at value 1: block | at value 0: release • at value 0: block | at value 1: release

Specify an object value until first communication.

Blocking object value before the first communication	0 • 1

Set whether no message is sent on the bus while blocking or whether a value is sent.

Behaviour of the output	
On blocking	• do not send message • Send value

Set the value.

Value in % *(if a value is sent)*	0 ... 100

The behaviour of the output on release can be set.
The current value can be sent to the bus either directly upon terminating the block or upon receipt of an input object.

On release, output is sent (with 2 second release delay)	• the current value • the current value after receipt of an object

5.8. Logic

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

Use logic inputs	Yes • No

For each logic input, the object value can be assigned before the first communication, which is used for the initial commissioning and when the voltage returns.

Object value prior to first communication for	
- Logic input 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16	0 • 1

Select which logic gate should be used.

AND logic

AND Logic 1 / 2 / 3 / 4	not active • active

OR logic

OR Logic 1 / 2 / 3 / 4	not active • active

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

Select a switching event that makes the device available.

1 / 2 / 3 / 4 Input	• Do not use • all switching events that the device provides (see the chapter *Connection inputs for AND or OR logic*)

Each logic output can transmit one 1-bit or two 8-bit objects.

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

If the **output type is a 1-bit-object**, the starting values are set.

Output value if logic = 1	1 • 0
Output value if logic = 0	1 • 0
Output value if block active	1 • 0
Output value if monitoring time exceeded	1 • 0

If the **output type is two 8-bit-objects**, the object type is set.

Object type	• value (0…255) • Percent (0…100%) • Angle (0…360°) • Scenario call-up (0…127)

Set the starting values.

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

Set when the logic output is to be sent to the bus.

Send behaviour	• upon a change of logic • upon a change of logic to 1 • upon a change of logic to 0 • upon a change of logic and periodically • upon a change of logic to 1 and periodically • upon a change of logic to 0 and periodically • upon a change of logic+object receipt • upon a change of logic+object receipt and cyclically

When sending periodically, the logic object is sent to the bus in a fixed cycle that can be set.

Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

Blocking

With the help of the blocking object, the output can be blocked, e.g. by a manual command (push button).

Use block	No • Yes

The block can take effect at value 0 or 1, depending on the intended use.

Assessment of the block object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release

Specify an object value until first communication.

Blocking object value before first communication	0 • 1

The behaviour of the output during blocking can be set.

Output behaviour on blocking	• Do not send message • Send block value [see above, output value if block active]

The behaviour of the output on release can be set.

on release (with 2 second release delay)	• Do not send message • transmit value for current logic status

Monitoring

If necessary, activate the input monitoring.
The input monitoring is a safety function that periodically needs a live message at input. A ratio of 1:3 is recommended here as a monitoring period.
Example: Monitoring period 30 min, input communication object(s) should receive a message every 10 min.

Use input monitoring	<u>No</u> • Yes

Set the inputs to be monitored.

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 • <u>1 + 2 + 3 + 4</u>

Set the monitoring period.

Monitoring period	5 s • ... • 2 h; <u>1 min</u>

The behaviour of the output can be set if the monitoring period is exceeded.

Output behaviour on exceeding the monitoring time	• <u>Do not send message</u> • Send value exceeding [= value of the parameter "Monitoring period"]

5.8.2. AND logic connection inputs

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

Only for Cala KNX IL CO2 CH version with integrated sensor:

CO2 sensor malfunction ON
CO2 sensor malfunction OFF
Switching output 1 CO2
Switching output 1 CO2 inverted
Switching output 2 CO2
Switching output 2 CO2 inverted
Switching output 3 CO2
Switching output 3 CO2 inverted
Switching output 4 CO2
Switching output 4 CO2 inverted
CO2 controller ventilation 1 active
CO2 controller ventilation 1 inactive
CO2 controller ventilation 2 active
CO2 controller ventilation 2 inactive

5.8.3. OR LOGIC connection inputs

The OR logic connection inputs are the same as those for the AND logic. Additionally, the following inputs are available for the OR logic:

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

Questions about the product?

You can reach the technical service of Elsner Elektronik under
Tel. +49 (0) 70 33 / 30 945-250 or
service@elsner-elektronik.de

We need the following information to process your service request:

- Type of appliance (model name or item number)
- Description of the problem
- Serial number or software version
- Source of supply (dealer/installer who bought the device from Elsner Elektronik)

For questions about KNX functions:

- Version of the device application
- ETS version used for the project

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