



On/Off actuator

BES-CT432220

Programming manual



Index

1	GENERAL DESCRIPTION	3
2	TECHNICAL INFORMATION	4
3	PROGRAMMING	5
3.1	APPLICATION PROGRAM INFORMATION	5
3.2	INDIVIDUAL ADDRESS ASSIGNMENT	5
3.3	TYPE OF DEVICE	6
3.4	OUTPUTS OBJECTS	8
3.4.1	<i>Binary outputs table</i>	<i>8</i>
3.4.2	<i>Binary outputs description</i>	<i>9</i>
3.4.3	<i>Blind outputs table</i>	<i>10</i>
3.4.4	<i>Blind outputs description</i>	<i>11</i>
3.4.5	<i>Fan-coil outputs table</i>	<i>12</i>
3.4.6	<i>Fan coil outputs description</i>	<i>15</i>
3.4.7	<i>Thermo-valve outputs table</i>	<i>16</i>
3.4.8	<i>Thermo-valve outputs description</i>	<i>18</i>
3.5	OUTPUTS PARAMETERS	18
3.5.1	<i>Binary outputs parameters</i>	<i>18</i>
3.5.2	<i>Blind outputs parameters</i>	<i>21</i>
3.5.3	<i>Fan-coil outputs parameters</i>	<i>23</i>
3.5.4	<i>Thermo-valve outputs parameters</i>	<i>24</i>
3.6	ADVANCED FUNCTIONS	25
3.6.1	<i>Arithmetic and Logic block (ALU)</i>	<i>26</i>
3.6.2	<i>Timer / counter block</i>	<i>27</i>
4	INSTALLATION	31

1 General description

The Bes ref. CT432220 is an on/off actuator composed of 16 potential-free relay outputs (dry contact).

Its 22 outputs allow controlling 22 on / off electrical circuits, 11 blinds (2 outputs for one blind motor: up phase and down phase) or 5 fan coils. Due to its high cut off capacity, this device is also recommended for capacitive loads, sockets, and electrical appliances control. The inputs can operate in different modes allowing to control binary outputs, blinds, fan-coil or thermo valves separately or simultaneously.

It incorporates an advanced Arithmetic and Logic Unit (UAL) that allows performing complex logic operation, timers programming, counters, etc. using internal results of operations or other external variables.

The cut off capacity of the relays is 16A @ 230Vac (potential free relay output). If necessary, insert a contactor to control higher power circuits.



General characteristics:

- 22 potential free relay outputs with a 16A @ 230Vac cut-off capacity.
- Each output can work independently or simultaneously in different modes (binary, blinds, fan-coils...).
- Easy and visual ALU (Arithmetic and Logic Unit) with timers, counters and any logic and arithmetic operation implementation..

2 Technical information

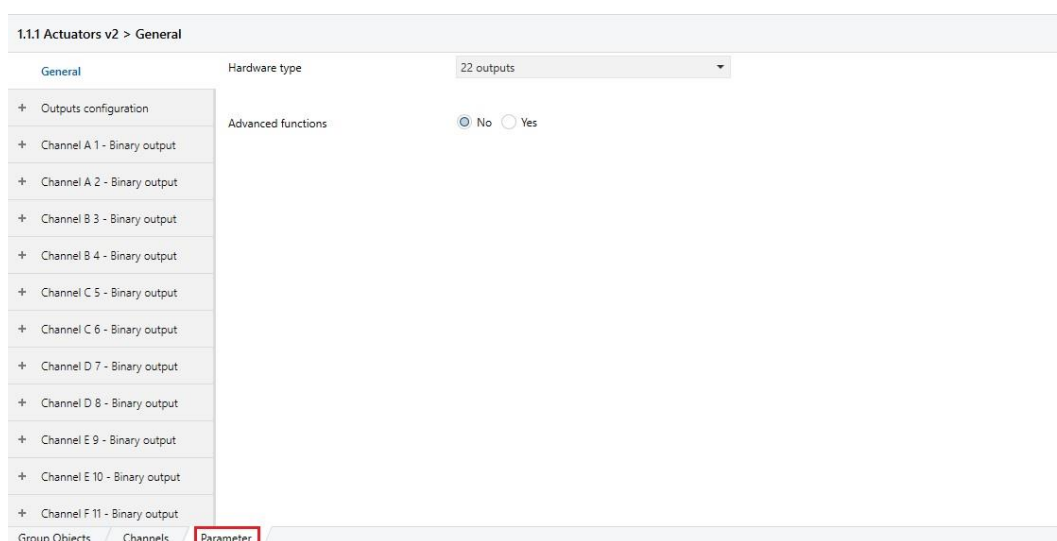
Power supply	29V _{DC} from KNX BUS
KNX current consumption	9mA from KNX BUS
Mounting	DIN rail
Size	12 DIN modules
Connections	BUS connection terminal KNX Screw terminals for outputs
Outputs	22 potential free relay output.
Outputs cut-off capacity	16A @ 230Vac
Environment temperature range	Operation: -10°C/55°C Storage: -30°C/60°C Transportation: -30°C/60°C
Regulation	According to the directives of electromagnetic compatibility and low voltage: EN 50090-2-2 / UNE-EN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010-1.

3 Programming

3.1 Application program information

- Application program: Ingenium / Actuators v2 (manufacturer / program name).
- Catalogue version: v1.0
- Maximum number of communication objects: 256.
- Maximum number of assignments: 256.
- ETS minimum required version: 4.1.8

The parameters of the device are configured in the ETS into the parameters menu.



3.2 Individual address assignment

This actuator has a programming button for the KNX individual address assignment which is located on the front of the device.

A red LED near the programming button lights up when it is pressed manually or if the device is set remotely to programming mode state.

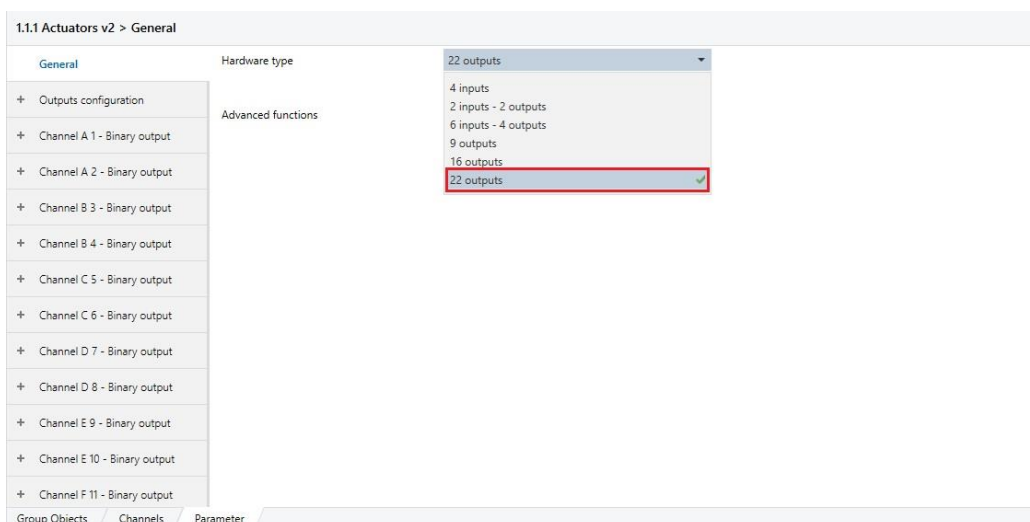
The LED is automatically turned off if the ETS has assigned an individual address correctly or if the programming button is pressed again manually.

3.3 Type of device

The parameters of the device are configured in the ETS into the parameter menu.

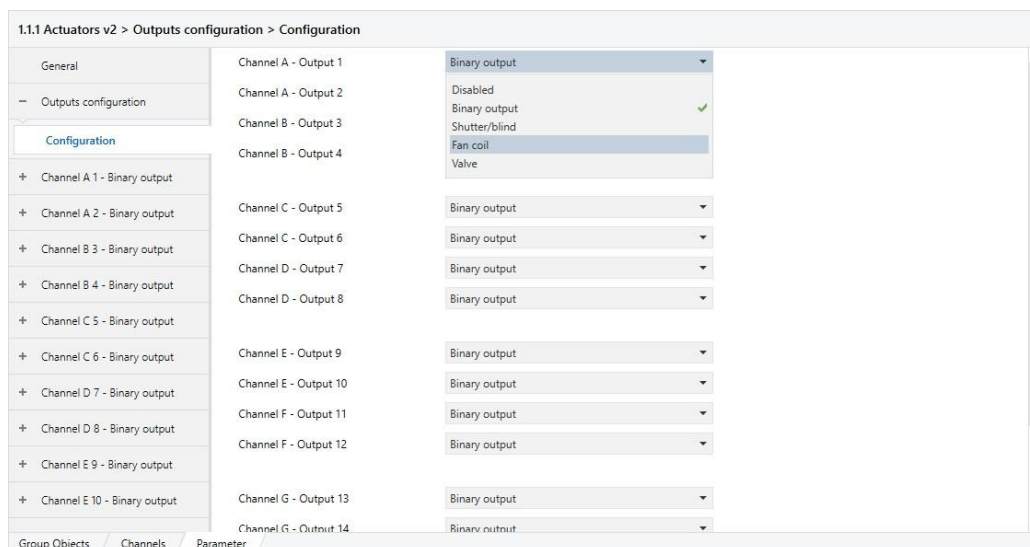
There are several tabs at the left side to configure different parameters depending on the type of device selected. In this case, the device that must be selected is the type "22 outputs".

Use the selector at the top of the main window to select the type of device to program.



After that, a number of inputs and outputs appear depending on the model of the device selected. Each of these inputs and outputs can be configured to work in different modes independently and simultaneously. To do so it has to be selected in the left side the tab "Inputs configuration" for the inputs and the tab "Outputs configuration" for the outputs.

Outputs can be disabled or programmed in binary, blinds, fan coil or thermo-valve modes.



Depending on the type of output selected, more than one slot is occupied, for example, when selecting blinds outputs two outputs are reserved (odd output for the move up phase and even output for move down phase). Once selected blind output instead of having 2 channel output only appears 1 channel output combining the previous ones where all the blind parameters can be configured.

Once the types of inputs or outputs are selected, the communication objects associated to them will appear in the group objects menu.

Default communication objects and names are explained next.

3.4 Outputs objects

3.4.1 Binary outputs table

Object	Name Function	Length	DPT	Flags				
				C	R	W	T	U
0	Channel A 1 - Binary output Switch on/off	1 bit	1.001	•		•		
1	Channel A 1 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
8	Channel A 2 - Binary output Switch on/off	1 bit	1.001	•		•		
9	Channel A 2 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
16	Channel B 3 - Binary output Switch on/off	1 bit	1.001	•		•		
17	Channel B 3 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
24	Channel B 4 - Binary output Switch on/off	1 bit	1.001	•		•		
25	Channel B 4 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
32	Channel C 5 - Binary output Switch on/off	1 bit	1.001	•		•		
33	Channel C 5 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
40	Channel C 6 - Binary output Switch on/off	1 bit	1.001	•		•		
41	Channel C 6 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
48	Channel D 7 - Binary output Switch on/off	1 bit	1.001	•		•		
49	Channel D 7 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
56	Channel D 8 - Binary output Switch on/off	1 bit	1.001	•		•		
57	Channel D 8 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
64	Channel E 9 - Binary output Switch on/off	1 bit	1.001	•		•		
65	Channel E 9 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
72	Channel E 10 - Binary output Switch on/off	1 bit	1.001	•		•		
73	Channel E 10 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
80	Channel F 11 - Binary output Switch on/off	1 bit	1.001	•		•		
81	Channel F 11 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
88	Channel F 12 - Binary output Switch on/off	1 bit	1.001	•		•		
89	Channel F 12 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
96	Channel G 13 - Binary output Switch on/off	1 bit	1.001	•		•		

97	Channel G 13 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
104	Channel G 14 - Binary output Switch on/off	1 bit	1.001	•		•		
105	Channel G 14 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
112	Channel H 15 - Binary output Switch on/off	1 bit	1.001	•		•		
113	Channel H 15 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
120	Channel H 16 - Binary output Switch on/off	1 bit	1.001	•		•		
121	Channel H 16 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
128	Channel I 17 - Binary output Switch on/off	1 bit	1.001	•		•		
129	Channel I 17 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
136	Channel I 18 - Binary output Switch on/off	1 bit	1.001	•		•		
137	Channel I 18 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
144	Channel J 19 - Binary output Switch on/off	1 bit	1.001	•		•		
145	Channel J 19 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
152	Channel J 20 - Binary output Switch on/off	1 bit	1.001	•		•		
153	Channel J 20 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
160	Channel K 21 - Binary output Switch on/off	1 bit	1.001	•		•		
161	Channel K 21 - Binary output Switch on/off status	1 bit	1.001	•	•		•	
168	Channel K 22 - Binary output Switch on/off	1 bit	1.001	•		•		
169	Channel K 22 - Binary output Switch on/off status	1 bit	1.001	•	•		•	

3.4.2 Binary outputs description

Name	Object X: Channel X Binary output Switch on/off
Function	1-bit communication object for switching on and off an output.
Description	<p>When a “1” is received through this object the output is switched. When a “0” is received through this object the output is switched off.</p> <p>This is the normally open behaviour that depends on the parameter “mode. The normally close behaviour is the opposite.</p> <p>By default, the status of an output is memorized when there is a power supply failure</p>
Name	Object X: Channel X Binary output Switch on/off status
Function	1-bit communication object for feedback signalling of state of the output.
Description	When the output is off and receives a switch on telegram a “1” is sent through this object. When the output is on and receives a switch off telegram “0” is sent through this object.

3.4.3 Blind outputs table

Object	Name Function	Length	DPT	Flags				
				C	R	W	T	U
0	Channel A 1/2 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
1	Channel A 1/2 - Shutter/blind Stop	1 bit	1.001	•		•		
3	Channel A 1/2 - Shutter/blind Position	1 byte	5.010	•		•		
4	Channel A 1/2 - Shutter/blind Position status	1 byte	5.010	•	•		•	
16	Channel B 3/4 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
17	Channel B 3/4 - Shutter/blind Stop	1 bit	1.001	•		•		
19	Channel B 3/4 - Shutter/blind Position	1 byte	5.010	•		•		
20	Channel B 3/4 - Shutter/blind Position status	1 byte	5.010	•	•		•	
32	Channel C 5/6 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
33	Channel C 5/6 - Shutter/blind Stop	1 bit	1.001	•		•		
35	Channel C 5/6 - Shutter/blind Position	1 byte	5.010	•		•		
36	Channel C 5/6 - Shutter/blind Position status	1 byte	5.010	•	•		•	
48	Channel D 7/8 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
49	Channel D 7/8 - Shutter/blind Stop	1 bit	1.001	•		•		
51	Channel D 7/8 - Shutter/blind Position	1 byte	5.010	•		•		
52	Channel D 7/8 - Shutter/blind Position status	1 byte	5.010	•	•		•	
64	Channel E 9/10 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
65	Channel E 9/10 - Shutter/blind Stop	1 bit	1.001	•		•		
67	Channel E 9/10 - Shutter/blind Position	1 byte	5.010	•		•		
68	Channel E 9/10 - Shutter/blind Position status	1 byte	5.010	•	•		•	
80	Channel F 11/12 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
81	Channel F 11/12 - Shutter/blind Stop	1 bit	1.001	•		•		
83	Channel F 11/12 - Shutter/blind Position	1 byte	5.010	•		•		
84	Channel F 11/12 - Shutter/blind Position status	1 byte	5.010	•	•		•	
96	Channel G 13/14 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
97	Channel G 13/14 - Shutter/blind Stop	1 bit	1.001	•		•		
99	Channel G 13/14 - Shutter/blind Position	1 byte	5.010	•		•		
100	Channel G 13/14 - Shutter/blind Position status	1 byte	5.010	•	•		•	

112	Channel H 15/16 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
113	Channel H 15/16 - Shutter/blind Stop	1 bit	1.001	•		•		
115	Channel H 15/16 - Shutter/blind Position	1 byte	5.010	•		•		
116	Channel H 15/16 - Shutter/blind Position status	1 byte	5.010	•	•		•	
128	Channel I 17/18 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
129	Channel I 17/18 - Shutter/blind Stop	1 bit	1.001	•		•		
131	Channel I 17/18 - Shutter/blind Position	1 byte	5.010	•		•		
132	Channel I 17/18 - Shutter/blind Position status	1 byte	5.010	•	•		•	
144	Channel J 19/20 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
145	Channel J 19/20 - Shutter/blind Stop	1 bit	1.001	•		•		
147	Channel J 19/20 - Shutter/blind Position	1 byte	5.010	•		•		
148	Channel J 19/20 - Shutter/blind Position status	1 byte	5.010	•	•		•	
160	Channel K 20/21 - Shutter/blind Move up/down (0/1)	1 bit	1.001	•		•		
161	Channel K 20/21 - Shutter/blind Stop	1 bit	1.001	•		•		
163	Channel K 20/21 - Shutter/blind Position	1 byte	5.010	•		•		
164	Channel K 20/21 - Shutter/blind Position status	1 byte	5.010	•	•		•	

3.4.4 Blind outputs description

Name	Object X: Channel X - Shutter/blind Move up/down (=0/1)
Function	1-bit communication object for moving up or down the blind.
Description	When a "1" is received through this object the blind moves down. When a "0" is received through this object the blind moves up. Odd outputs (Z1 and Z3) must be connected to the up phase of the motor. Even outputs (Z2 and Z4) must be connected to the down phase of the motor. This order cannot be altered.
Name	Object X: Channel X - Shutter/blind Stop
Function	1-bit communication object for stop the blind movement.
Description	When any value is received through this object the blind motor stops moving.
Name	Object X: Channel X - Shutter/blind Position
Function	1-byte communication object for direct positioning of the blind.
Description	When a value is sent to this object the blind moves to the received position

Name	Object X: Channel X - Shutter/blind Position status
Function	1-byte communication object for feedback signalling of the position of the blind.
Description	<p>When the blind motor stops the current position is sent through this object as feedback being 0 = completely closed and 255 = completely open.</p> <p>By default, the position of the blind is only sent when the motor stops. If the parameter "Status feedback during movement" is activated, the position of the blind is sent every second while it is moving</p>

3.4.5 Fan-coil outputs table

Object	Name Function	Length	DPT	Flags				
				C	R	W	T	U
0	Channel A/B - Fan Coil Fan speed control	1 byte	5.010	•		•		
1	Channel A/B - Fan Coil Fan speed status	1 byte	5.010	•	•		•	
3	Channel A/B - Fan Coil Auto/manual (=0/1)	1 bit	1.001	•		•		
4	Channel A/B - Fan Coil Auto/manual status (=0/1)	1 bit	1.001	•	•		•	
5	Channel A/B - Fan Coil Fan speed 1 (1=set/0=nothing)	1 bit	1.001	•		•		
6	Channel A/B - Fan Coil Fan speed 2 (1=set/0=nothing)	1 bit	1.001	•		•		
7	Channel A/B - Fan Coil Fan speed 3 (1=set/0=nothing)	1 bit	1.001	•		•		
8	Channel A/B - Fan Coil Fan speed 1 status	1 bit	1.001	•	•		•	
9	Channel A/B - Fan Coil Fan speed 2 status	1 bit	1.001	•	•		•	
10	Channel A/B - Fan Coil Fan speed 3 status	1 bit	1.010	•	•		•	
11	Channel A/B - Fan Coil Fan on/off status	1 bit	1.001	•	•		•	
12	Channel A/B - Fan Coil Fan speed off (1=set/0=nothing)	1 bit	1.001	•		•		
32	Channel C/D - Fan Coil Fan speed control	1 byte	5.010	•		•		
33	Channel C/D - Fan Coil Fan speed status	1 byte	5.010	•	•		•	
35	Channel C/D - Fan Coil Auto/manual (=0/1)	1 bit	1.001	•		•		
36	Channel C/D - Fan Coil Auto/manual status (=0/1)	1 bit	1.001	•	•		•	
37	Channel C/D - Fan Coil Fan speed 1 (1=set/0=nothing)	1 bit	1.001	•		•		
38	Channel C/D - Fan Coil Fan speed 2 (1=set/0=nothing)	1 bit	1.001	•		•		

39	Channel C/D - Fan Coil Fan speed 3 (1=set/0=nothing)	1 bit	1.001	•		•		
40	Channel C/D - Fan Coil Fan speed 1 status	1 bit	1.001	•	•		•	
41	Channel C/D - Fan Coil Fan speed 2 status	1 bit	1.001	•	•		•	
42	Channel C/D - Fan Coil Fan speed 3 status	1 bit	1.010	•	•		•	
43	Channel C/D - Fan Coil Fan on/off status	1 bit	1.001	•	•		•	
44	Channel C/D - Fan Coil Fan speed off (1=set/0=nothing)	1 bit	1.001	•		•		
64	Channel E/F - Fan Coil Fan speed control	1 byte	5.010	•		•		
65	Channel E/F - Fan Coil Fan speed status	1 byte	5.010	•	•		•	
67	Channel E/F - Fan Coil Auto/manual (=0/1)	1 bit	1.001	•		•		
68	Channel E/F - Fan Coil Auto/manual status (=0/1)	1 bit	1.001	•	•		•	
69	Channel E/F - Fan Coil Fan speed 1 (1=set/0=nothing)	1 bit	1.001	•		•		
70	Channel E/F - Fan Coil Fan speed 2 (1=set/0=nothing)	1 bit	1.001	•		•		
71	Channel E/F - Fan Coil Fan speed 3 (1=set/0=nothing)	1 bit	1.001	•		•		
72	Channel E/F - Fan Coil Fan speed 1 status	1 bit	1.001	•	•		•	
73	Channel E/F - Fan Coil Fan speed 2 status	1 bit	1.001	•	•		•	
74	Channel E/F - Fan Coil Fan speed 3 status	1 bit	1.010	•	•		•	
75	Channel E/F - Fan Coil Fan on/off status	1 bit	1.001	•	•		•	
76	Channel E/F - Fan Coil Fan speed off (1=set/0=nothing)	1 bit	1.001	•		•		
96	Channel G/H - Fan Coil Fan speed control	1 byte	5.010	•		•		
97	Channel G/H - Fan Coil Fan speed status	1 byte	5.010	•	•		•	
99	Channel G/H - Fan Coil Auto/manual (=0/1)	1 bit	1.001	•		•		
100	Channel G/H - Fan Coil Auto/manual status (=0/1)	1 bit	1.001	•	•		•	
101	Channel G/H - Fan Coil Fan speed 1 (1=set/0=nothing)	1 bit	1.001	•		•		
102	Channel G/H - Fan Coil Fan speed 2 (1=set/0=nothing)	1 bit	1.001	•		•		
103	Channel G/H - Fan Coil Fan speed 3 (1=set/0=nothing)	1 bit	1.001	•		•		
104	Channel G/H - Fan Coil Fan speed 1 status	1 bit	1.001	•	•		•	
105	Channel G/H - Fan Coil Fan speed 2 status	1 bit	1.001	•	•		•	
106	Channel G/H - Fan Coil Fan speed 3 status	1 bit	1.010	•	•		•	

107	Channel G/H - Fan Coil Fan on/off status	1 bit	1.001	•	•		•	
108	Channel G/H - Fan Coil Fan speed off (1=set/0=nothing)	1 bit	1.001	•		•		
128	Channel I/J - Fan Coil Fan speed control	1 byte	5.010	•		•		
129	Channel I/J - Fan Coil Fan speed status	1 byte	5.010	•	•		•	
131	Channel I/J - Fan Coil Auto/manual (=0/1)	1 bit	1.001	•		•		
132	Channel I/J - Fan Coil Auto/manual status (=0/1)	1 bit	1.001	•	•		•	
133	Channel I/J - Fan Coil Fan speed 1 (1=set/0=nothing)	1 bit	1.001	•		•		
134	Channel I/J - Fan Coil Fan speed 2 (1=set/0=nothing)	1 bit	1.001	•		•		
135	Channel I/J - Fan Coil Fan speed 3 (1=set/0=nothing)	1 bit	1.001	•		•		
136	Channel I/J - Fan Coil Fan speed 1 status	1 bit	1.001	•	•		•	
137	Channel I/J - Fan Coil Fan speed 2 status	1 bit	1.001	•	•		•	
138	Channel I/J - Fan Coil Fan speed 3 status	1 bit	1.010	•	•		•	
139	Channel I/J - Fan Coil Fan on/off status	1 bit	1.001	•	•		•	
140	Channel I/J - Fan Coil Fan speed off (1=set/0=nothing)	1 bit	1.001	•		•		

3.4.6 Fan coil outputs description

Name	Object X: Fan Coil Fan speed X
Function	1-bit communication object for switch the fan coil to the corresponding speed.
Description	<p>When a "1" is received through this object the fan-coil speed changes to the corresponding one. The other speeds are deactivated and a "0" is sent to the other speed objects for feedback.</p> <p>The speeds of the fan-coil must be connected to the outputs as following: Z1=speed 1, Z2=speed 2 and Z3=speed 3. If it is necessary to change this configuration use a "custom fan-coil"</p>
Name	Object X: Fan Coil Fan speed X status
Function	1-bit communication object for feedback signalling of the current speed.
Description	When a speed is selected the status is sent through this object. A telegram with value "1" is sent through the object of the speed selected and also "0" is sent through the other speeds objects.
Name	Object X: Fan Coil Fan speed control
Function	1-byte communication object for direct speed selection.
Description	When a value is received through this object the fan coil control compares it to the threshold levels configured and activates the corresponding speed
Name	Object X: Fan Coil Fan speed status
Function	1-byte communication object for feedback signalling of the current speed status.
Description	The current fan-coil speed value is sent through this object for feedback signalling with every change.
Name	Object X: Fan Coil Auto/manual (=0/1)
Function	1-bit communication object to select fan-coil mode.
Description	When a "1" is received through this object, the fan coil changes to manual mode and when it receives a "0" it changes to automatic mode.
Name	Object X: Fan Coil Auto/manual (=0/1) status
Function	1-bit communication object for feedback signalling of the fan coil mode.
Description	When a mode is selected, the status of the fan coil is sent through this object. A telegram of value "1" is sent in the case of manual mode and a "0" in case of automatic mode.
Name	Object X: Fan Coil Fan on/off status
Function	1-bit communication object for feedback signalling of the fan coil status.
Description	When the fan coil is off and receives a switch on telegram, it sends "1" through this object. When the fan coil is on and receives a switch off telegram, it sends "0" through this object.
Name	Object X: Fan Coil Fan speed off (1=set/0=nothing)
Function	1-bit communication object for fan coil switch off selection.

Description	When a "1" is received through this object, the fan coil switches off and when it receives a "0" does not change its status.
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3.4.7 Thermo-valve outputs table

Object	Name Function	Length	DPT	Flags				
				C	R	W	T	U
0	Channel A 1 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
1	Channel A 1 - Valve Open/close status	1 bit	1.001	•	•		•	
8	Channel A 2 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
9	Channel A 2 - Valve Open/close status	1 bit	1.001	•	•		•	
16	Channel B 3 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
17	Channel B 3 - Valve Open/close status	1 bit	1.001	•	•		•	
24	Channel B 4 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
25	Channel B 4 - Valve Open/close status	1 bit	1.001	•	•		•	
32	Channel C 5 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
33	Channel C 5 - Valve Open/close status	1 bit	1.001	•	•		•	
40	Channel C 6 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
41	Channel C 6 - Valve Open/close status	1 bit	1.001	•	•		•	
48	Channel D 7 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
49	Channel D 7 - Valve Open/close status	1 bit	1.001	•	•		•	
56	Channel D 8 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
57	Channel D 8 - Valve Open/close status	1 bit	1.001	•	•		•	
64	Channel E 9 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
65	Channel E 9 - Valve Open/close status	1 bit	1.001	•	•		•	
72	Channel E 10 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
73	Channel E 10 - Valve Open/close status	1 bit	1.001	•	•		•	
80	Channel F 11 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
81	Channel F 11 - Valve Open/close status	1 bit	1.001	•	•		•	
88	Channel F 12 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
89	Channel F 12 - Valve Open/close status	1 bit	1.001	•	•		•	

96	Channel G 13 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
97	Channel G 13 - Valve Open/close status	1 bit	1.001	•	•		•	
104	Channel G 14 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
105	Channel G 14 - Valve Open/close status	1 bit	1.001	•	•		•	
112	Channel H 15 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
113	Channel H 15 - Valve Open/close status	1 bit	1.001	•	•		•	
120	Channel H 16 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
121	Channel H 16 - Valve Open/close status	1 bit	1.001	•	•		•	
128	Channel I 17 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
129	Channel I 17 - Valve Open/close status	1 bit	1.001	•	•		•	
136	Channel I 18 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
137	Channel I 18 - Valve Open/close status	1 bit	1.001	•	•		•	
144	Channel J 19 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
145	Channel J 19 - Valve Open/close status	1 bit	1.001	•	•		•	
152	Channel J 20 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
153	Channel J 20 - Valve Open/close status	1 bit	1.001	•	•		•	
160	Channel K 21 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
161	Channel K 21 - Valve Open/close status	1 bit	1.001	•	•		•	
168	Channel K 22 - Valve Open/close (=0/1)	1 bit	1.001	•		•		
169	Channel K 22 - Valve Open/close status	1 bit	1.001	•	•		•	

3.4.8 Thermo-valve outputs description

Name	Object X: Channel X - Valve Open/close (=0/1)
Function	1-bit communication object for switching on and off a valve.
Description	<p>When a "1" is received through this object the valve is switched. When a "0" is received through this object the valve is switched off.</p> <p>This is the normally open behaviour that depends on the parameter "mode. The normally close behaviour is the opposite.</p> <p>By default, the status of an output is memorized when there is a power supply failure</p>
Name	Object X: Channel X - Valve PWM control value (%duty)
Function	1-byte communication object for setting the duty cycle of the thermo-valve pwm output.
Description	The duty cycle of the pwm signal that controls the thermo-valve output is written by sending a value to this object.
Name	Object X: Channel X - Valve Open/close status
Function	1-bit communication object for feedback signalling of state of the valve.
Description	When the valve is open and receives a switch on telegram a "1" is sent through this object. When the valve is close and receives a switch off telegram "0" is sent through this object.

3.5 Outputs parameters

3.5.1 Binary outputs parameters

When an output is configured as an individual binary output the following parameters can be configured:

1.1.1 Actuators v2 > Channel A 1 - Binary output > Configuration

General	Working mode <input checked="" type="radio"/> Normally open <input type="radio"/> Normally close
Outputs configuration	Normally open: On=close, Off=open Normally close: On=open, Off=close
Configuration	Status after voltage recovery <input type="text" value="No change"/>
Channel A 1 - Binary output	Lock/unlock <input checked="" type="radio"/> Disable <input type="radio"/> Enable
Configuration	Scenes <input checked="" type="radio"/> Disable <input type="radio"/> Enable
Channel A 2 - Binary output	Timer <input checked="" type="radio"/> Disable <input type="radio"/> Enable
Configuration	Statistics <input checked="" type="radio"/> Disable <input type="radio"/> Enable
+ Channel B 3 - Binary output	
+ Channel B 4 - Binary output	
+ Channel C 5 - Binary output	
+ Channel C 6 - Binary output	
+ Channel D 7 - Binary output	
+ Channel D 8 - Binary output	

Group Objects Channels Parameter

Working mode: Normally open or normally closed. In normally open mode the output relay is controlled with the standard logic: 1 = close, 0 = open. In normally closed mode the output relay is controlled with the inverse logic: 1 = open, 0 = close.

Status after voltage recovery: It can be controlled the status of the output after a voltage recovery. The available options are:

- “No change”: The output will remain in the position that it had before the voltage loss.
- “Open output”: The output will be open after a voltage recovery.
- “Closed output”: The output will be closed after a voltage recovery.

Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).

The screenshot shows the 'Lock/unlock' configuration tab for '1.1.1 Actuators v2 > Channel A 1 - Binary output'. The left sidebar lists various configuration options, with 'Lock/unlock' highlighted in red. The main panel contains the following settings:

- Lock/unlock polarity:** Radio buttons for '1=lock / 0=unlock' (selected) and '0=lock / 1=unlock'.
- Behaviour when lock:** A dropdown menu set to 'No change'.
- Behaviour when unlock:** A dropdown menu set to 'Last before lock'.

At the bottom, there are tabs for 'Group Objects', 'Channels', and 'Parameter'.

Scenes: It allows to have a new tab in the left side to record and run up to 16 scenes.

The screenshot shows the 'Scenes' configuration tab for '1.1.1 Actuators v2 > Channel A 1 - Binary output'. The left sidebar lists various configuration options, with 'Scenes' highlighted in red. The main panel contains the following settings:

- Number of scenes:** A dropdown menu set to '1'.
- Scene number:** A text input field set to '1'.
- Output value:** Radio buttons for 'Off' (selected) and 'On'.
- Learn mode:** Radio buttons for 'No' and 'Yes' (selected).
- Delay:** A time input field set to '00:00:00' with units 'h:mm:ss'.

At the bottom, there are tabs for 'Group Objects', 'Channels', and 'Parameter'.

Timer: It allows to have a new tab in the left side to control the timing to activate or deactivate the output after switch on or switch off.

The screenshot shows the 'Timer' configuration tab for 'Channel A 1 - Binary output'. The left sidebar has a red box around the 'Timer' tab. The main area contains the following settings:

- Switch on action:** Delay on (dropdown)
- Delay time:** 00:00:05 (text input) h:mm:ss (unit selector)
- Switch off action:** ☐ Instant off ☒ Delay off
- Delay time:** 00:00:05 (text input) h:mm:ss (unit selector)

The bottom navigation bar shows 'Group Objects', 'Channels', and 'Parameter'.

Statistics: It allows to have a new tab in the left side to count and inform about the time interval during which an output is closed and also to notify when it has been kept closed for a certain number of hours.

The screenshot shows the 'Statistics' configuration tab for 'Channel A 1 - Binary output'. The left sidebar has a red box around the 'Statistics' tab. The main area contains the following settings:

- Send running hours value (every 1 h):** ☒ No ☐ Yes
- Running hours alarm:** ☐ No ☒ Yes
- Alarm threshold:** 10000 (text input) Hours (unit selector)

The bottom navigation bar shows 'Group Objects', 'Channels', and 'Parameter'.

3.5.2 Blind outputs parameters

When outputs are configured as blind outputs the following parameters can be configured:

1.1.1 Actuators v2 > Channel A 1/2 - Shutter/blind > Configuration

General	Type	<input type="radio"/> Shutter (without slats) <input checked="" type="radio"/> Blind (with slats)	
Outputs configuration	Travel time: up	00:00:30	hh:mm:ss
Configuration	Travel time: down	00:00:30	hh:mm:ss
Channel A 1/2 - Shutter/blind	Slats: total time	02.0	ss.f
Configuration	Slats: number of steps	5	
Channel B 3/4 - Shutter/blind	Direction change pause	00.5	ss.f
Channel C 5/6 - Shutter/blind	Additional time for adjustment	00.0	ss.f
Channel D 7/8 - Shutter/blind	Status feedback during movement	<input checked="" type="radio"/> No (only at end) <input type="radio"/> Yes (every second)	
	Use movement direction feedback object	<input checked="" type="radio"/> No <input type="radio"/> Yes	
	Status after voltage recovery	No change	
	Lock/unlock	<input checked="" type="radio"/> Disable <input type="radio"/> Enable	
	Scenes	<input checked="" type="radio"/> Disable <input type="radio"/> Enable	

Group Objects Channels Parameter

Type: It allows to select the type of Shutter/Blind. With or without slats. If it is selected with slats will appear two more options:

- **Slats total time:** In this parameter it must be configured the measured time that the slats takes to open or close completely.
- **Slats number of steps:** In this parameter it must be configured the number of steps that the slats takes to open or close completely.

Travel time up: In this parameter it must be configured the measured time that the blind takes to raise up completely.

Travel time down: In this parameter it must be configured the measured time that the blind takes to raise down completely.

Direction change pause: This parameter is a value (in ss.f) for a dead time that the device waits before changing the direction of the blind while it is moving.

Additional time for adjustment: Defines an additional time in ss.f for complete blind position adjustment when it gets the upper or lower limit. The corresponding output remains closed an extra time measured in ss.f.

Status feedback during movement: This parameter allows to receive a feedback signalling of the current position of the blind just at the end of the movement or at every second.

Use movement direction feedback object: This parameter allows to receive a feedback signalling of the current moving direction of the blind or not.

Status after voltage recovery: It can be controlled the position of the blind after a voltage recovery with a percentage between 0 and 100.

Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).

1.1.1 Actuators v2 > Channel A 1/2 - Shutter/blind > Lock/unlock

General	Lock/unlock polarity	<input checked="" type="radio"/> 1=lock / 0=unlock <input type="radio"/> 0=lock / 1=unlock
Outputs configuration	Behaviour when lock	No change
Configuration	Behaviour when unlock	Last before lock
Channel A 1/2 - Shutter/blind		
Configuration		
Lock/unlock		
Scenes		
Alarm		
+ Channel B 3/4 - Shutter/blind		
+ Channel C 5/6 - Shutter/blind		
+ Channel D 7/8 - Shutter/blind		

Group Objects Channels Parameter

Scenes: It allows to have a new tab in the left side to record and run up to 16 scenes.

1.1.1 Actuators v2 > Channel A 1/2 - Shutter/blind > Scenes

General	Number of scenes	1
Outputs configuration	Scene number	1
Configuration	Action	<input checked="" type="radio"/> Move to position <input type="radio"/> Move position and slats
Channel A 1/2 - Shutter/blind	Position	0 %
Configuration	Learn mode	<input type="radio"/> No <input checked="" type="radio"/> Yes
Lock/unlock	Delay	00:00:00 h:mm:ss
Scenes		
Alarm		
+ Channel B 3/4 - Shutter/blind		
+ Channel C 5/6 - Shutter/blind		
+ Channel D 7/8 - Shutter/blind		

Group Objects Channels Parameter

Alarm: It allows to have a new tab in the left side to configure the alarm behaviour. If it receives “0”, it starts counting the monitoring period, or executes the action set in the “behaviour when alarm = 0” parameter. Each time it receives a “0”, the time is preloaded again. If no other “0” is received and the monitoring time has elapsed, an alarm or programmed alarm action is executed. If it receives “1”, it begins to execute the configured alarm actions.

1.1.1 Actuators v2 > Channel A 1/2 - Shutter/blind > Alarm

General	Alarm monitoring	<input checked="" type="radio"/> No <input type="radio"/> Yes
Outputs configuration	Behaviour when alarm = 1	Move down
Configuration	Behaviour when alarm = 0	Last position before alarm
Channel A 1/2 - Shutter/blind		
Configuration		
Lock/unlock		
Scenes		
Alarm		
Channel B 3/4 - Shutter/blind		
Configuration		
+ Channel C 5/6 - Shutter/blind		
+ Channel D 7/8 - Shutter/blind		
+ Channel E 9/10 - Shutter/blind		
+ Channel F 11/12 - Shutter/blind		

Group Objects Channels Parameter

3.5.3 Fan-coil outputs parameters

When outputs are configured as fan-coil outputs the following parameters can be configured:

The received value through the fan-coil control communication object <<Fan X mode [1 byte]>> it is compared to these threshold levels by the device (see section **¡Error! No se encuentra el origen de la referencia.** on page **¡Error! Marcador no definido.**).

Fan coil control type: It can be selected between direct or sequential type. In the direct type only the relay corresponding to the selected speed is activated, while in the sequential type the relay of the selected speed and the previous ones are activated.

Fan speed threshold level 1: (from 0 to 255) if the fan-coil control value is lower than this threshold level the outputs of the fan-coil are switched off. If the control value is higher the Output O1 is switched on.

Fan speed threshold level 2: (from 0 to 255) if the fan-coil control value is lower than this threshold level the Output O1 is switched on. If the control value is higher the Output O1 is switched off and the Output 2 is switched on.

Fan speed threshold level 3: (from 0 to 255) if the fan-coil control value is lower than this threshold level the Output O2 is switched on. If the control value is higher the Output O2 is switched off and the Output 3 is switched on.

Hysteresis: percentage to indicate the activation or deactivation threshold of the outputs.

Manual function: manual mode.

Status after voltage recovery: It allows to select a certain percentage between 0 and 100 for the fan coil after a voltage recovery.

Delays: delays can be set to the activation and/or to deactivation of the fan coil.

Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).

Scenes: It allows to have a new tab in the left side to record and run up to 16 scenes.

When outputs are configured as thermo valves outputs the following parameters can be configured:

1.1.1 Actuators v2 > Channel A 1 - Valve > Configuration

General	Working mode <input checked="" type="radio"/> Normally open <input type="radio"/> Normally close Normally open: 1=close, 0=open Normally close: 1=open, 0=close
Outputs configuration	
Configuration	Type of control <input checked="" type="radio"/> On/off <input type="radio"/> PWM
Channel A 1 - Valve	Status after voltage recovery <input type="text" value="No change"/>
Configuration	
+ Channel A 2 - Valve	Lock/unlock <input checked="" type="radio"/> Disable <input type="radio"/> Enable
+ Channel B 3 - Valve	Valve protection <input checked="" type="radio"/> Disable <input type="radio"/> Enable
+ Channel B 4 - Valve	
+ Channel C 5 - Valve	
+ Channel D 6 - Valve	
+ Channel D 7 - Valve	
+ Channel D 8 - Valve	
+ Channel E 9 - Valve	

Group Objects Channels Parameters

Working mode: Normally open or normally closed. In normally open mode the output relay is controlled with the standard logic: 1 = close, 0 = open. In normally closed mode the output relay is controlled with the inverse logic: 1 = open, 0 = close.

Type of control: It can be selected the type of control for the valve. The available options are:

- “On/off”: It is controlled the opening and closing of the valve.
- “PWM”: It is established a period of time in which the valve is open a certain percentage of this time introduced through the correspondent communication object and closed the remaining percentage of time until reach 100% of the total time established.

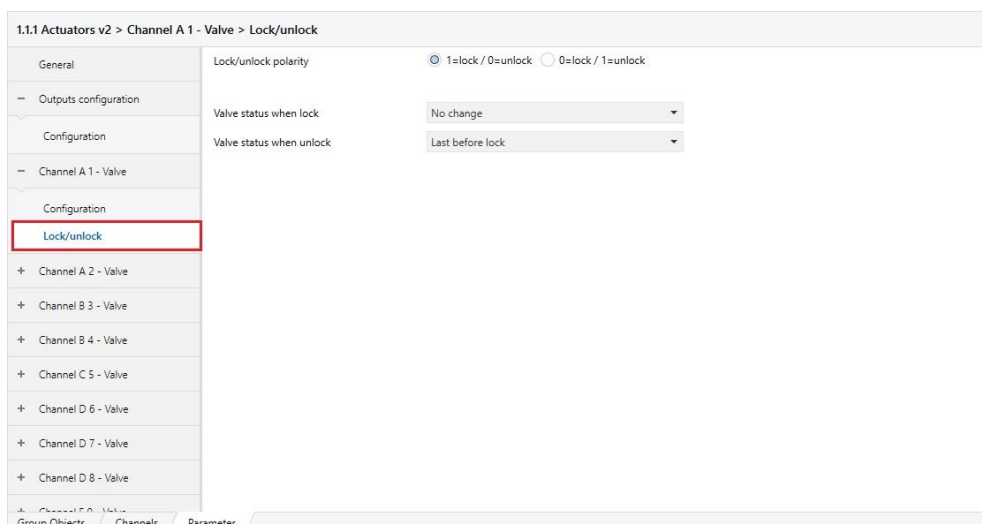
Type of control ☐ On/off ☒ PWM

Period of time 00:01:00 hh:mm:ss

Status after voltage recovery: It can be controlled the status of the output after a voltage recovery. The available options are:

- “No change”: The output will remain in the position that it had before the voltage loss.
- “Open output”: The output will be open after a voltage recovery.
- “Closed output”: The output will be closed after a voltage recovery.

Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).

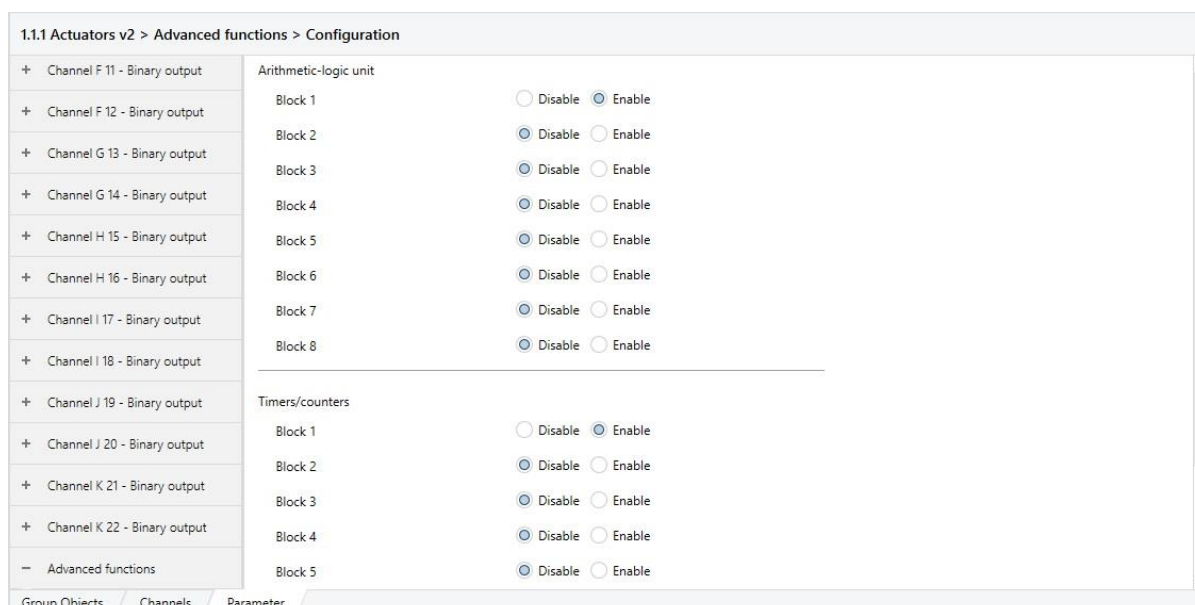


Valve protection: When this function is activated, the device automatically closes the output for 5 seconds, according to the time established for the protection cycle.



3.6 Advanced functions

If the advanced functions are enabled in the General menu, a new submenu appears on the left.



In this configuration menu it is possible to select what Arithmetic and logic or timers / counters blocks are enabled.

Name	Arithmetic-logic block X
Values	Enable / Disable
Description	Allows to enable or disable each arithmetic and logic block.
Name	Timer / counter block
Values	Enable / Disable
Description	Allows to enable or disable the each timer / counter blocks.

3.6.1 Arithmetic and Logic block (ALU)

1.1.1 Actuators v2 > Advanced functions > Block 1 - ALU

+ Channel G 14 - Binary output	Operation	AND
+ Channel H 15 - Binary output	Number of inputs	2
+ Channel H 16 - Binary output	Input 1	<input checked="" type="radio"/> Communication object <input type="radio"/> Constant value
+ Channel I 17 - Binary output	Format	1 bit
+ Channel I 18 - Binary output	Input 2	1 bit
+ Channel J 19 - Binary output	Output	1 bit
+ Channel J 20 - Binary output		
+ Channel K 21 - Binary output		
+ Channel K 22 - Binary output		
- Advanced functions		
Configuration		
Block 1 - ALU		
Block 1 - Timer/counter		

Group Objects Channels Parameter

Name	Operation
Values	AND, NAND, OR, NOR, XOR, XNOR, NOT, BUFFER, ==, !=, <, >, <=, >=, +, -, *, /.
Description	<p>It allows to select the arithmetic or logic operation of the block:</p> <p>Logic operations:</p> <ul style="list-style-type: none"> - AND: Logic product - NAND: Negative logic product - OR: Logic addition - NOR: Negative logic addition - XOR: Exclusive logic addition - XNOR: Negative exclusive logic addition - NOT: Negation - BUFFER: Saves the input value in the output. <p>Comparison operation:</p> <ul style="list-style-type: none"> - == : equality - != : inequality - < : smaller than - > : greater than - <= : smaller or equal than - >= : greater or equal than

	<p>Arithmetic operations:</p> <ul style="list-style-type: none"> - + : addition - - : subtraction - * : multiplication <p>/ : division</p>
Name	Number of inputs
Values	From 2 to 4
Description	This parameter defines the number of inputs of the block. Depending on the type of operation it is allowed two or more inputs.
Name	Input 1
Values	Communication object / Constant value
Description	This parameter allows to select the type of the input 1, that can be a constant value or a value received from a communication object.
Name	Format
Values	1 bit, 1 byte unsigned (dpt 5.001), 1 byte unsigned (dpt 5.010), 1 byte signed (6.*), 2 bytes unsigned (dpt 7,*), 2 bytes unsigned (dpt 8,*), 2 bytes float (dpt 9,*).
Description	This parameter allows to select the size and format of the input 1. Depending on the type of operation different formats are allowed.
Name	Input 2/3/4
Values	1 bit, 1 byte unsigned (dpt 5.001), 1 byte unsigned (dpt 5.010), 1 byte signed (6.*), 2 bytes unsigned (dpt 7,*), 2 bytes unsigned (dpt 8,*), 2 bytes float (dpt 9,*).
Description	This parameter allows to select the size and format of the other inputs communication objects. Depending on the type of operation different formats are allowed.

3.6.2 Timer / counter block

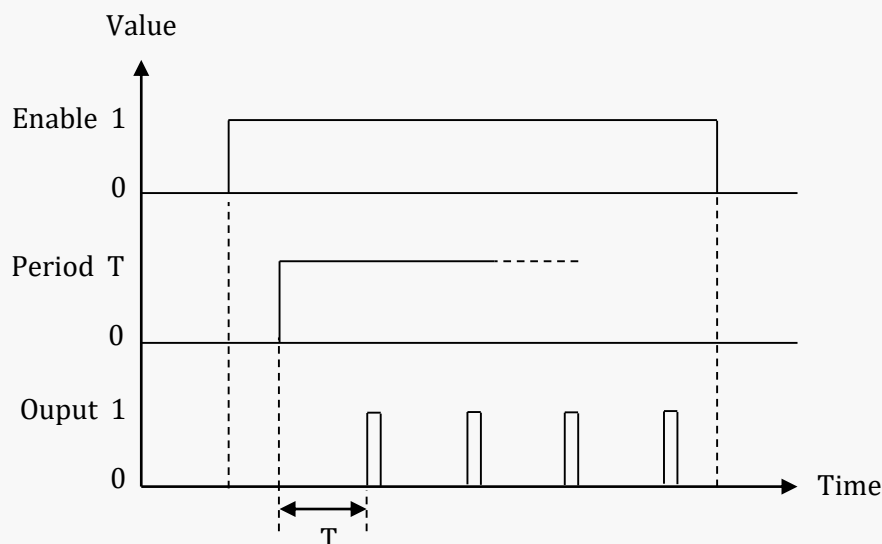
1.1.1 Actuators v2 > Advanced functions > Block 1 - Timer/counter

+	Channel G 14 - Binary output	Type of block	<input checked="" type="radio"/> Timer <input type="radio"/> Counter
+	Channel H 15 - Binary output	Timer type	PWM
+	Channel H 16 - Binary output	Period of time	<input checked="" type="radio"/> Communication object <input type="radio"/> Constant value
+	Channel I 17 - Binary output	Format	1 byte (dpt 5.010)
+	Channel I 18 - Binary output	Duty	1 byte (dpt 5.010)
+	Channel J 19 - Binary output		
+	Channel J 20 - Binary output		
+	Channel K 21 - Binary output		
+	Channel K 22 - Binary output		
-	Advanced functions		
	Configuration		
	Block 1 - ALU		
	Block 1 - Timer/counter		

Group Objects Channels Parameter

Name	Timer type
Values	PWM, Limit, Cyclic
Description	<p>PWM: It generates a pulse width modulated output according to the period of time and a duty.</p> <p>Limit: It sends a bit telegram '1' to the bus when a limit value is exceeded.</p>

Cyclic: It sends a bit telegram '1' to the bus each time the limit value is exceeded cyclically.



Name	Period of time
Values	Communication object / Constant value
Description	<p>It is the count time of the timer. It can be configured as a constant value or a value received through the bus with one of the following communication object formats:</p> <p>1 byte (dpt 5.010): Value from 0 to 255 (x 100 ms) 2 bytes (7.004): Value from 0 to 6553500 ms 2 bytes float (9.010): Value from 0 to 670760 s</p>
Name	Duty
Values	1 byte (dpt 5.010), 2 bytes (7.004) or 2 bytes float (9.010)
Description	<p>Only visible if timer type PWM is selected. It is the time that the output signal is at high level ("1") within the period of time. Its value can be received through the bus with one of the following communication object formats:</p> <p>1 byte (dpt 5.010): Value from 0 to 255 (x 100 ms) 2 bytes (7.004): Value from 0 to 6553500 ms 2 bytes float (9.010): Value from 0 to 670760 s</p>

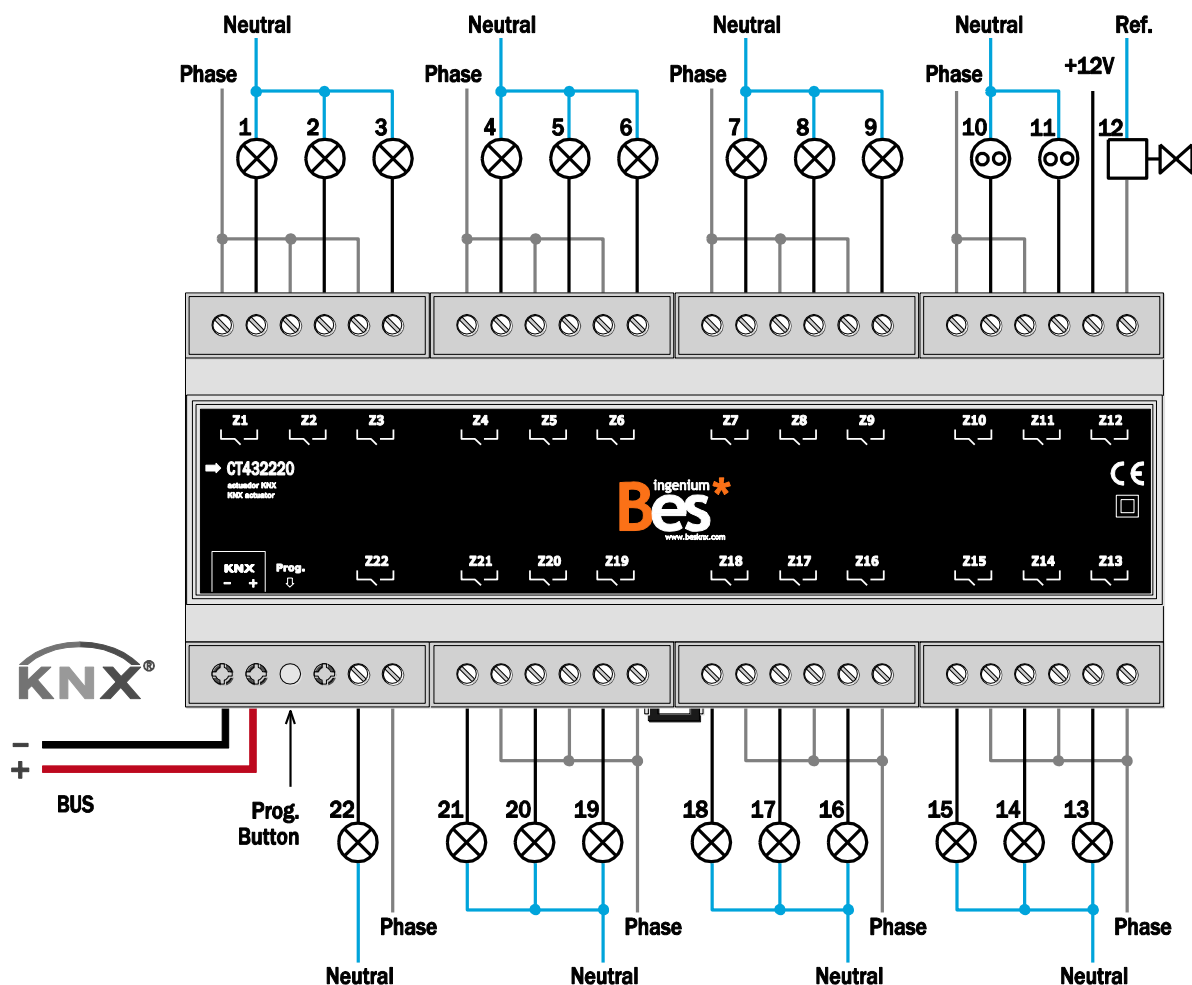
1.1.1 Actuators v2 > Advanced functions > Block 1 - Timer/counter

+ Channel G 14 - Binary output	Type of block	<input type="radio"/> Timer <input checked="" type="radio"/> Counter
+ Channel H 15 - Binary output	Counter type (increase with)	Rising edge
+ Channel H 16 - Binary output	Limit value	10
+ Channel I 17 - Binary output	Output behavior	Send 1 if limit reached
+ Channel I 18 - Binary output		
+ Channel J 19 - Binary output		
+ Channel J 20 - Binary output		
+ Channel K 21 - Binary output		
+ Channel K 22 - Binary output		
- Advanced functions		
Configuration		
Block 1 - ALU		
Block 1 - Timer/counter		

Group Objects Channels Parameter

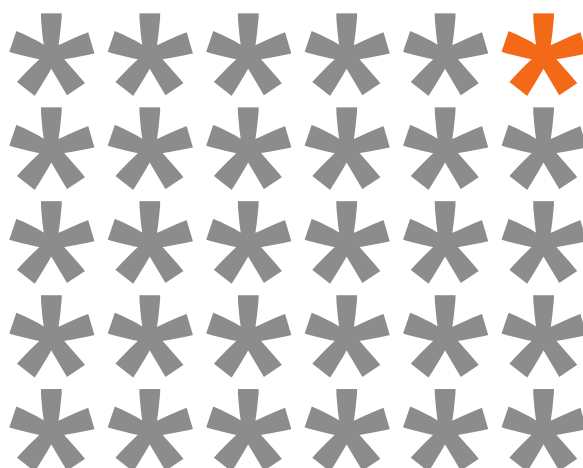
Name	Counter type
Values	Rising edge, falling edge, 1 or 0
Description	It is the change that the counter may detect in its "event" object to increase the count.
Name	Limit value
Values	From 0 to 65535
Description	It is the number of events over which the counter sends the finish telegram.
Name	Output behaviour
Values	Send 1 when limit reached, Send counter value (5.010), Send counter value (7.001)
Description	This parameter allows to select the format and behaviour of the counter output. It can be send a 1 when the count limit is reached or it can send the count value each time an event is detected.

4 Installation



Feed low voltage lines (BUS and inputs) in separate ducting to that of power (230V) and outputs to ensure there is enough insulation and avoid interferences.

Do not connect the main voltages (230V) or any other external voltages to any point of the BUS or inputs.



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Stakohome Innovation s.r.o.
Aloisovská 934/8,
198 00 Praha 9 Hloubětín Česká
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Manual version: v1.0