On/Off actuator

CT432220

Programming manual

ingenium

www.besknx.com

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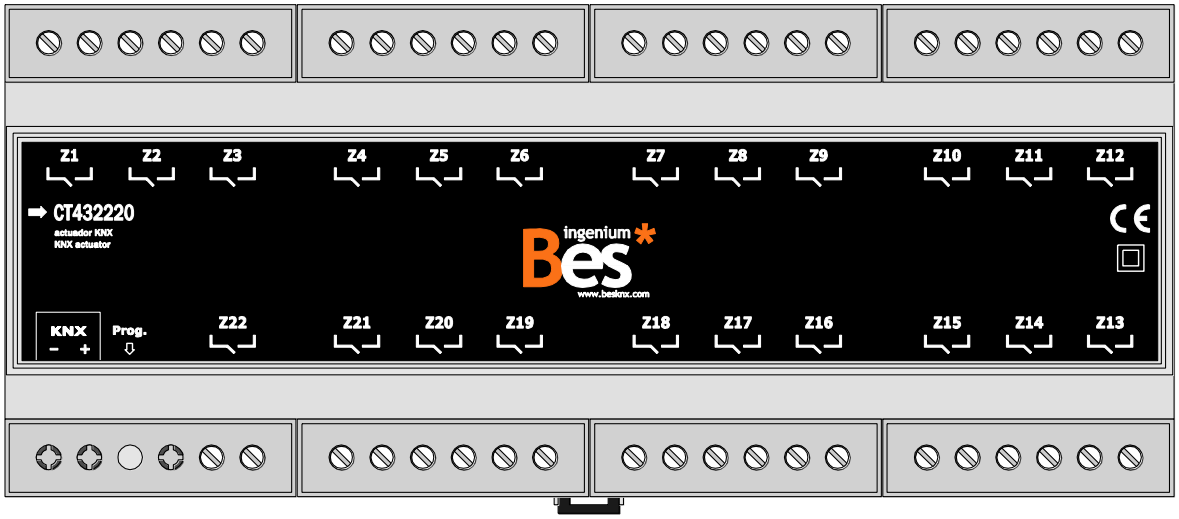
1 General description

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

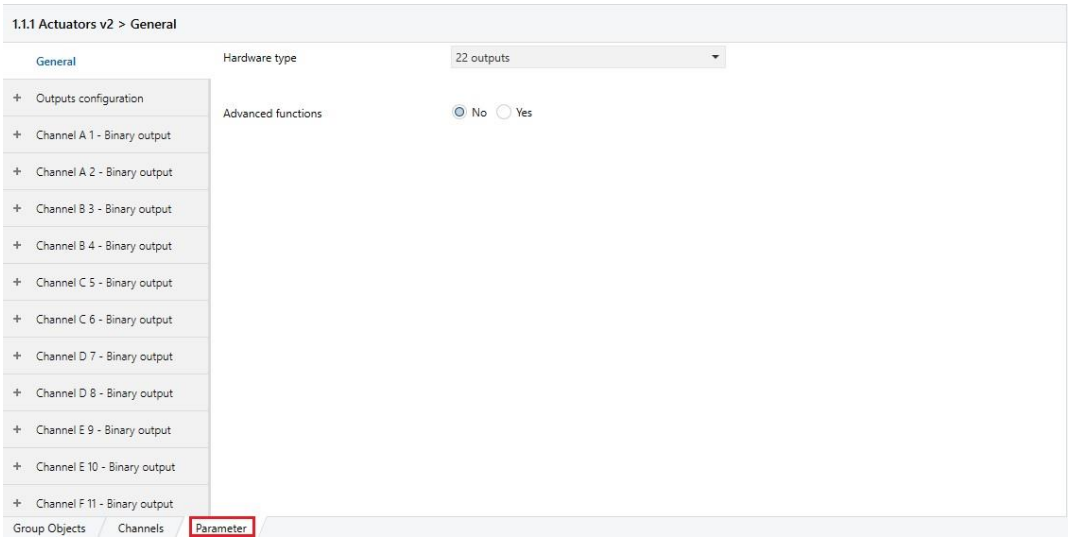
Power supply	$29V_{DC}$ from KNX BUS
KNX current consumption	9mA from KNX BUS
Mounting	DIN rail
Size	12 DIN modules
Connections	BUS connection terminal KNX Screw terminals for outputs
Outputs	22 potential free relay output.
Outputs cut-off capacity	16A @ 230Vac
Environment temperature range	Operation: -10ºC/55ºC Storage: -30ºC/60ºC Transportation: -30ºC/60ºC
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.

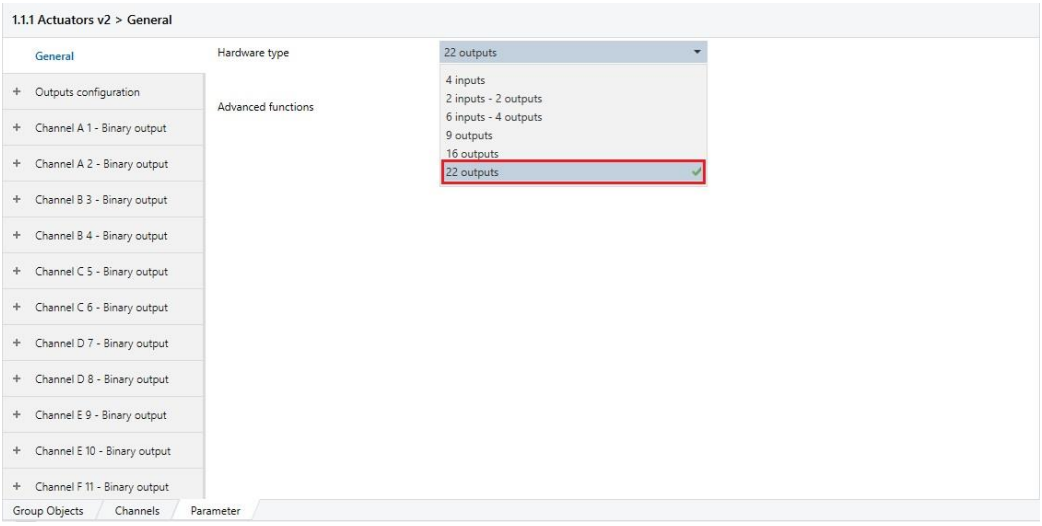
The LED is automatically turned off if the ETS has assigned an individual address correctly or if the programming button is pressed again manually.

3.3 Type of device

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

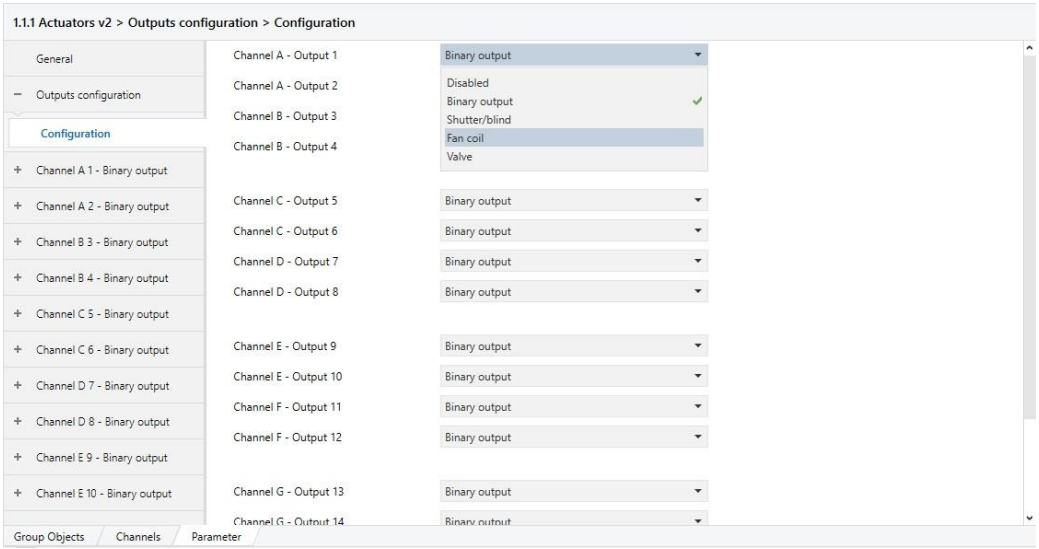
There are several tabs at the left side to configure different parameters depending on the type of device selected. In this case, the device that must be selected is the type “22 outputs”.

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	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. This is the normally open behaviour that depends on the parameter “mode. The normally close behaviour is the opposite. By default, the status of an output is memorized when there is a power supply failure
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 F11/12 - 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	When the blind motor stops the current position is sent through this object as feedback being 0 = completely closed and 255 = completely open. 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

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	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. 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”
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.

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	●	●		●	

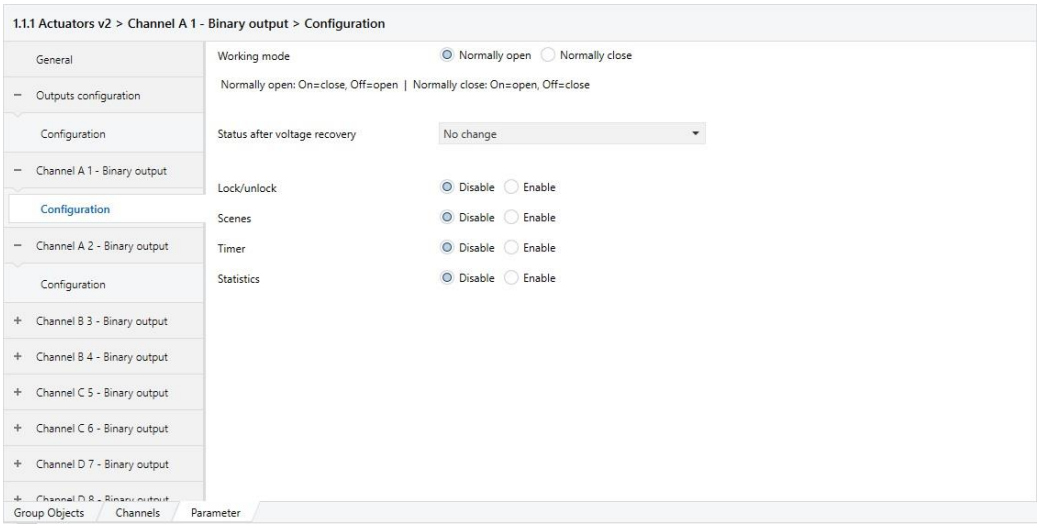
3.4.8 Thermo-valve outputs description

Name	Object X: Channel X - Valve | Open/close (=0/1)
Function	1-bit communication object for switching on and off a valve.
Description	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. This is the normally open behaviour that depends on the parameter “mode. The normally close behaviour is the opposite. By default, the status of an output is memorized when there is a power supply failure
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:

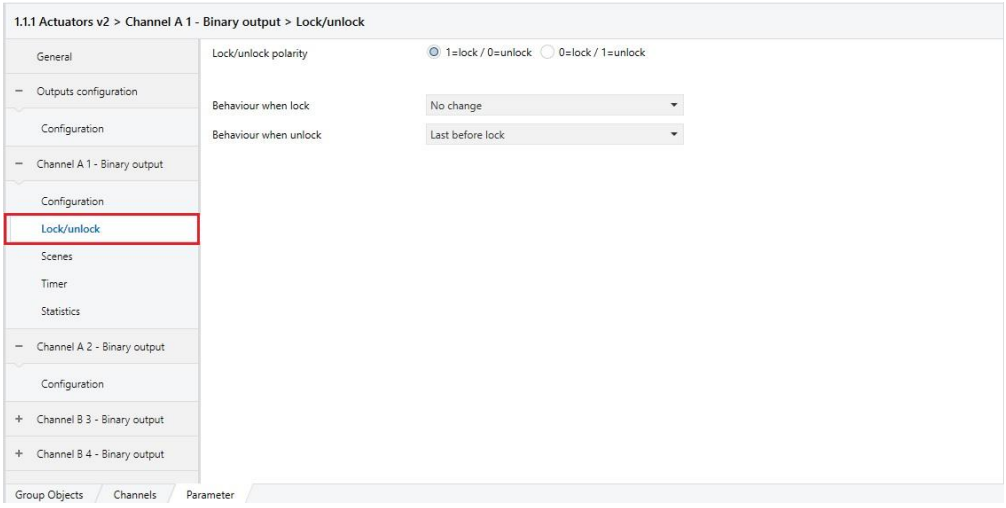


Working mode: Normally open or normally closed. In normally open mode the output relay is controlled with the standard logic: 1 = close, 0 = open. In normally closed mode the output relay is controlled with the inverse logic: 1 = open, 0 = close.

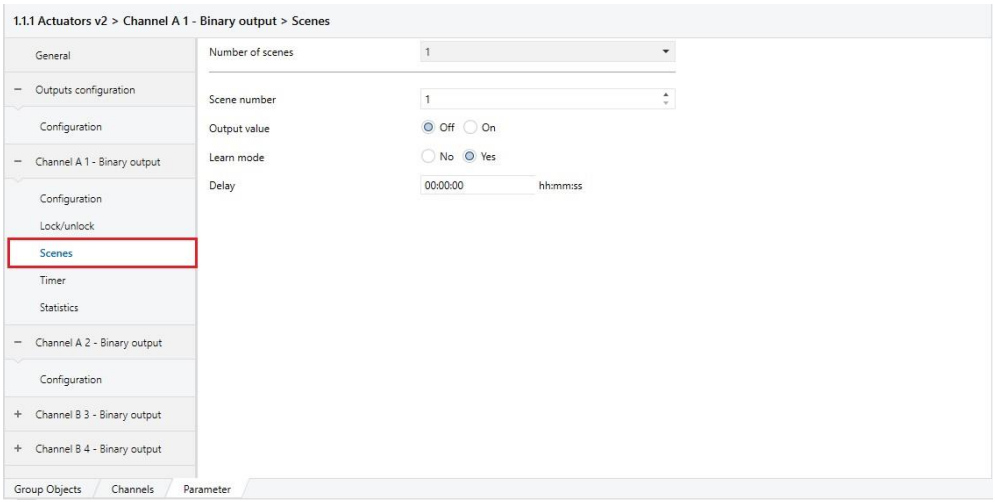
Status after voltage recovery: It can be controlled the status of the output after a voltage recovery. The available options are:

- "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.

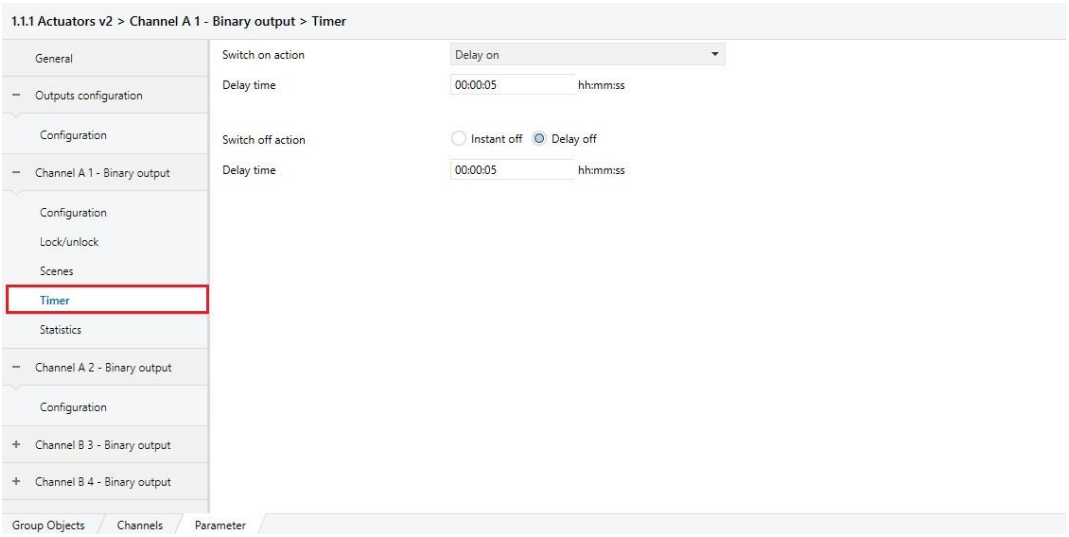
Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).



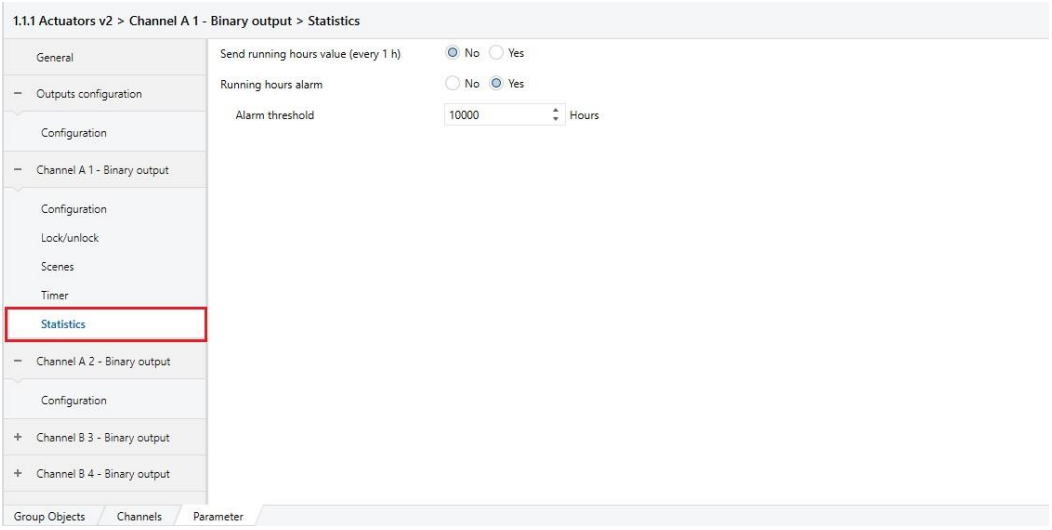
Scenes: It allows to have a new tab in the left side to record and run up to 16 scenes.



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.

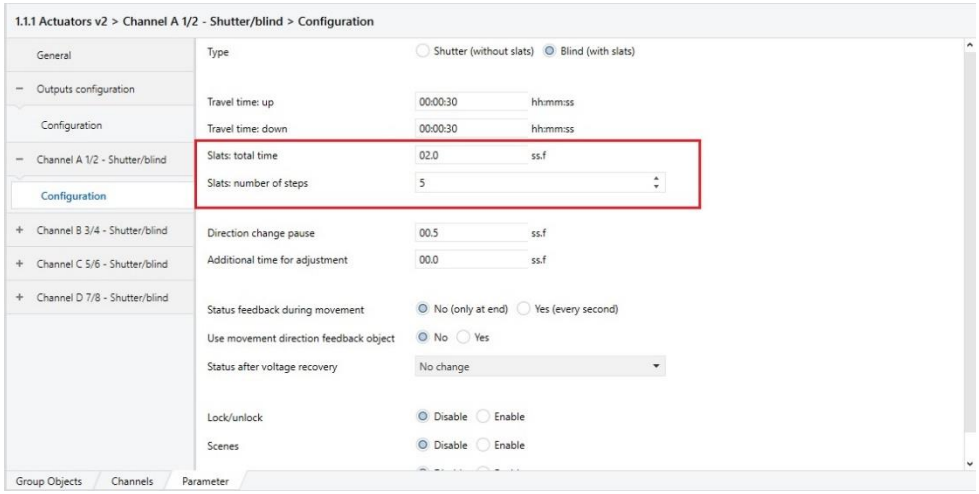


Statistics: It allows to have a new tab in the left side to count and inform about the time interval during which an output is closed and also to notify when it has been kept closed for a certain number of hours.



3.5.2 Blind outputs parameters

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



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.

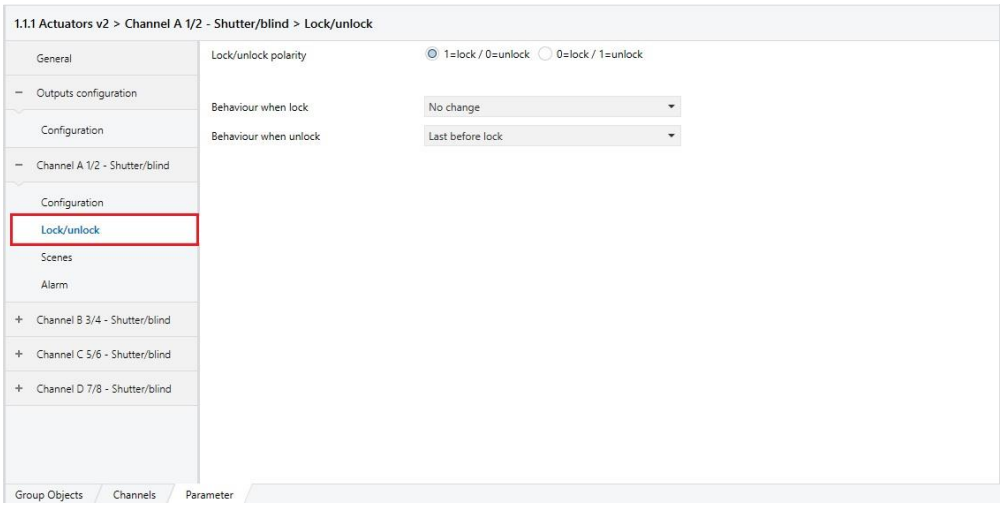
Additional time for adjustment: Defines an additional time in ss.f for complete blind position adjustment when it gets the upper or lower limit. The corresponding output remains closed an extra time measured in ss.f.

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.

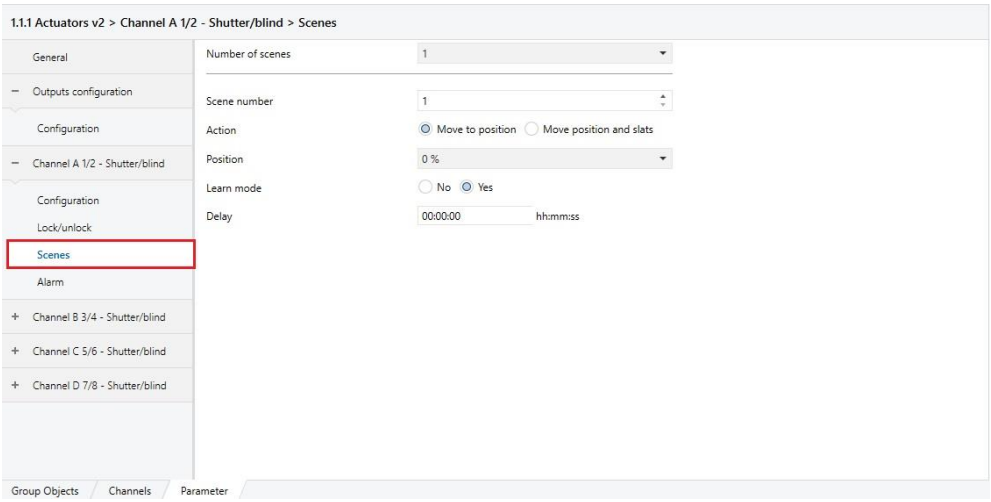
Use movement direction feedback object: This parameter allows to receive a feedback signalling of the current moving direction of the blind or not.

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

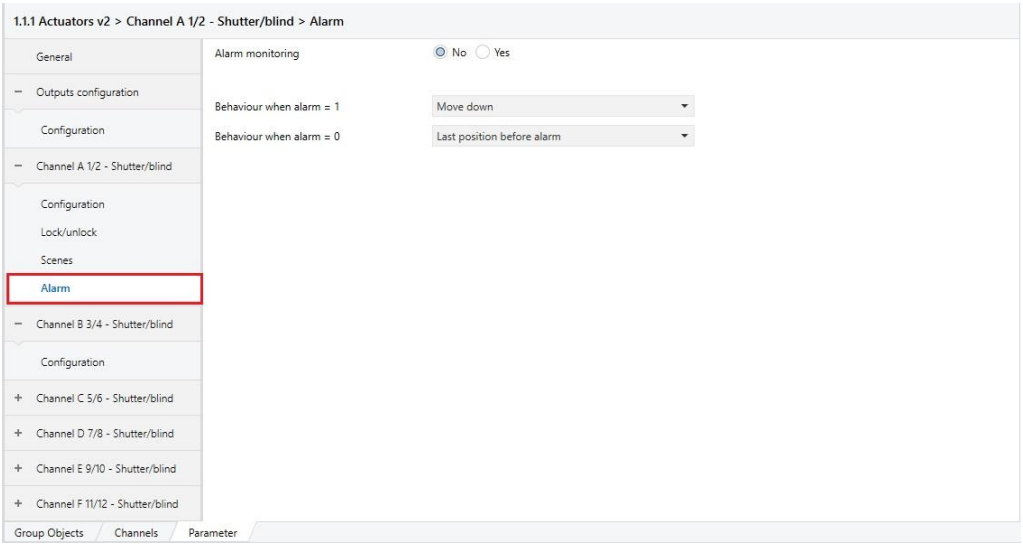
Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).



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

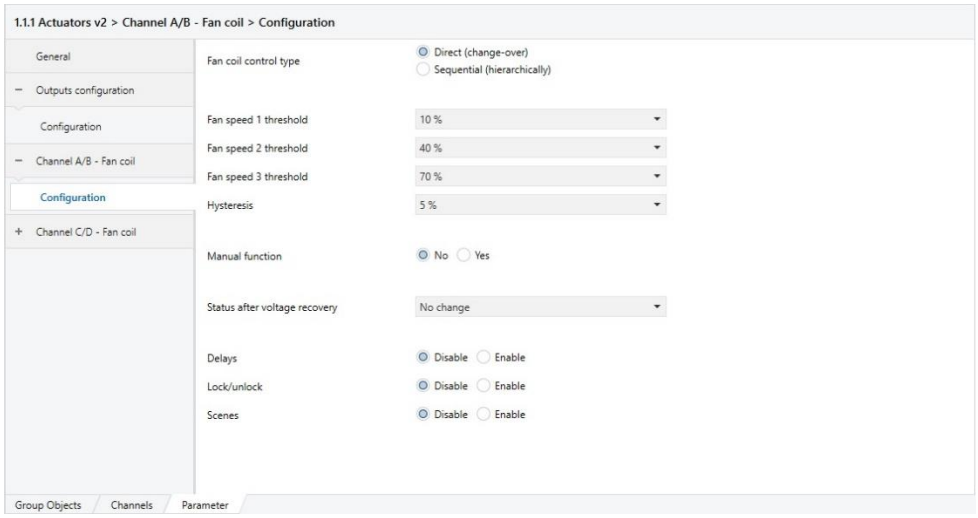


Alarm: It allows to have a new tab in the left side to configure the alarm behaviour. If it receives "0", it starts counting the monitoring period, or executes the action set in the "behaviour when alarm = 0" parameter. Each time it receives a "0", the time is preloaded again. If no other "0" is received 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.



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

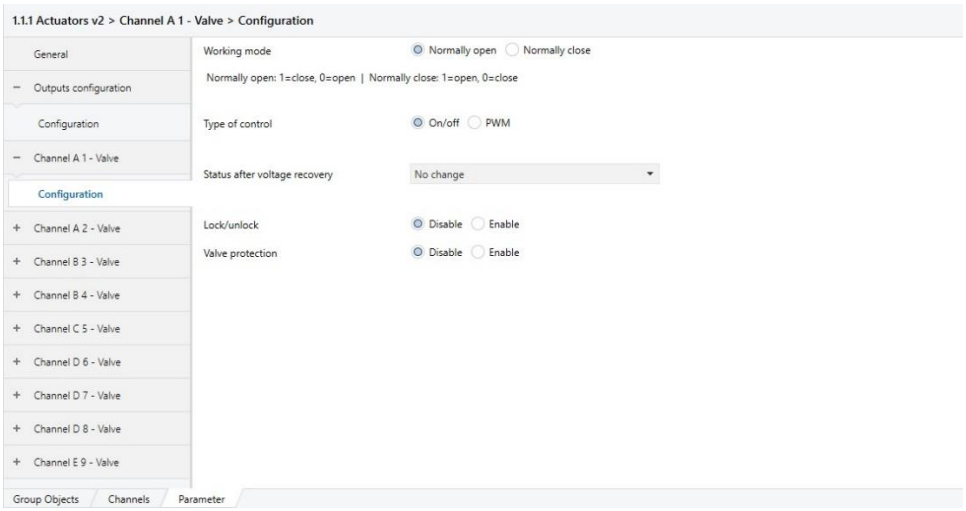
Delays: delays can be set to the activation and/or to deactivation of the fan coil.

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.

3.5.4 Thermo-valve outputs parameters

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



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.

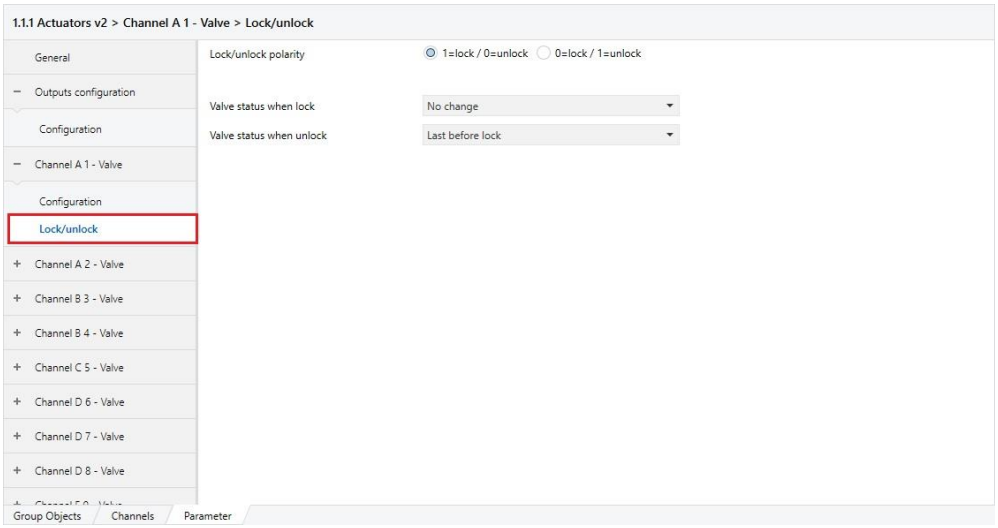
Type of control: It can be selected the type of control for the valve. The available options are:

- "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.

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.

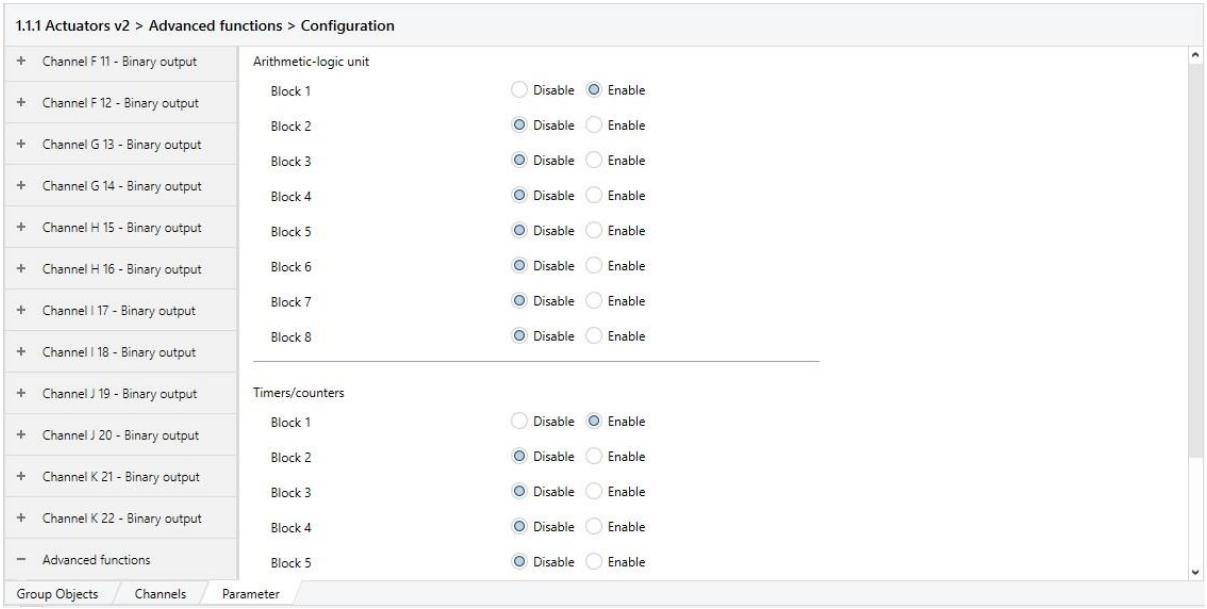
Lock/unlock: It allows to have a new tab in the left side to configure the behaviour when the channel is locked (disabled) or unlocked (enabled).



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

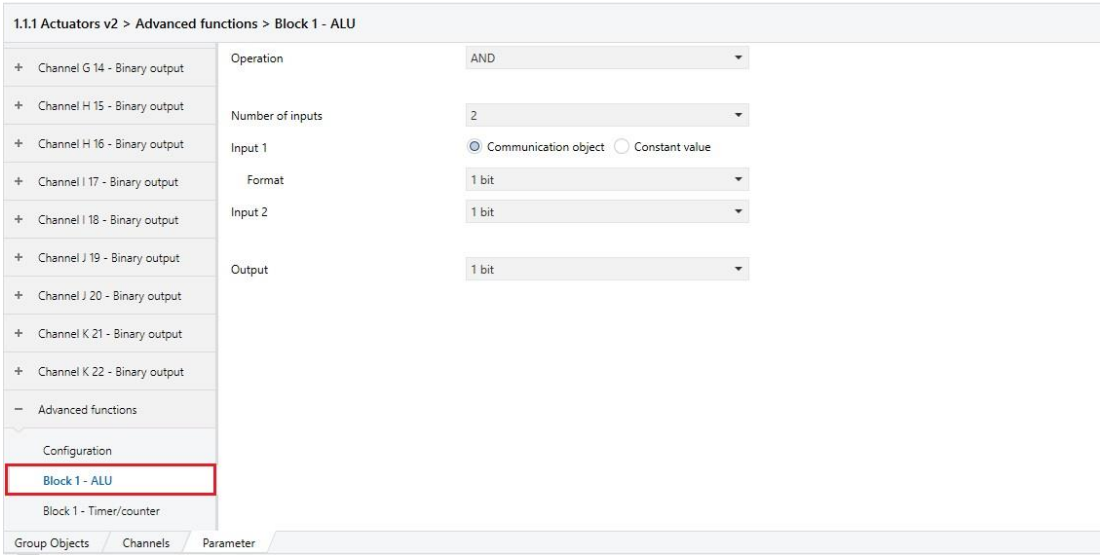
If the advanced functions are enabled in the General menu, a new submenu appears on the left.



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.

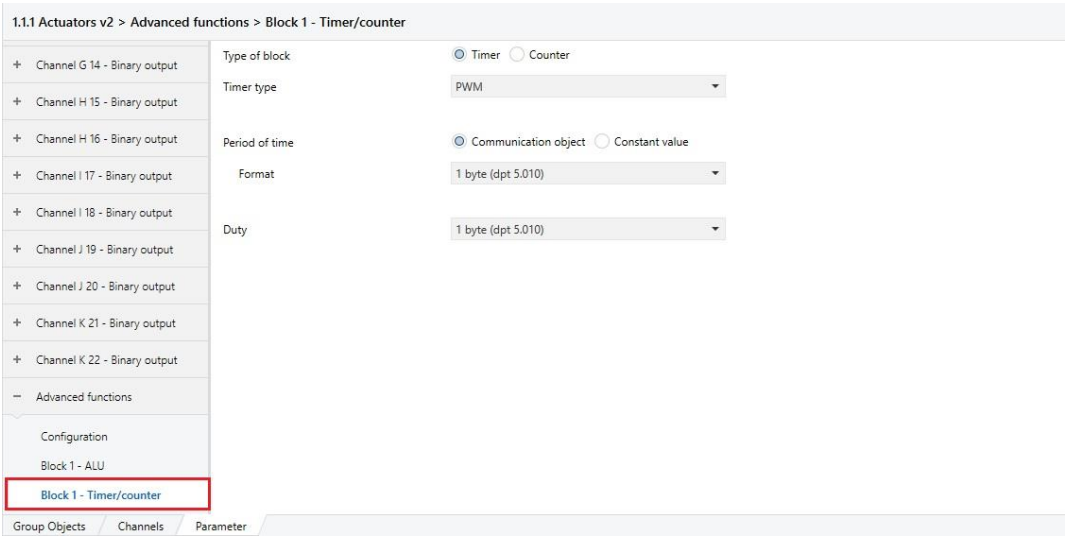
3.6.1 Arithmetic and Logic block (ALU)



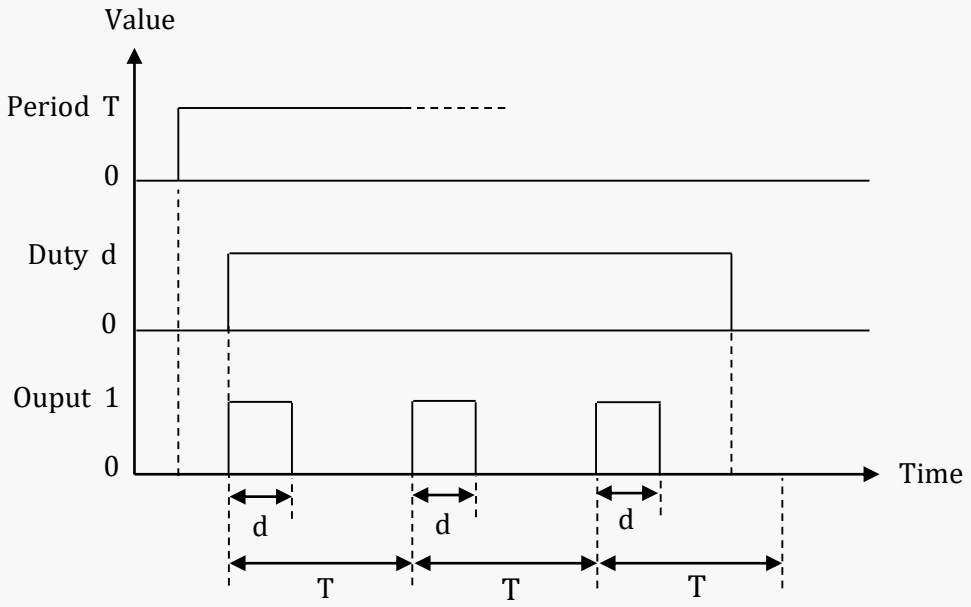
Name	Operation
Values	AND, NAND, OR, NOR, XOR, XNOR, NOT, BUFFER, == , != , <, > , <= , >= , + , - , *, / .
Description	It allows to select the arithmetic or logic operation of the block: Logic operations: - AND: Logic product - NAND: Negative logic product - OR: Logic addition - NOR: Negative logic addition - XOR: Exclusive logic addition - XNOR: Negative exclusive logic addition - NOT: Negation - BUFFER: Saves the input value in the output. Comparison operation: - == : equality - != : inequality - < : smaller than - > : greater than - <= : smaller or equal than - >= : greater or equal than

	Arithmetic operations: - + : addition - - : subtraction - * : multiplication / : division
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.

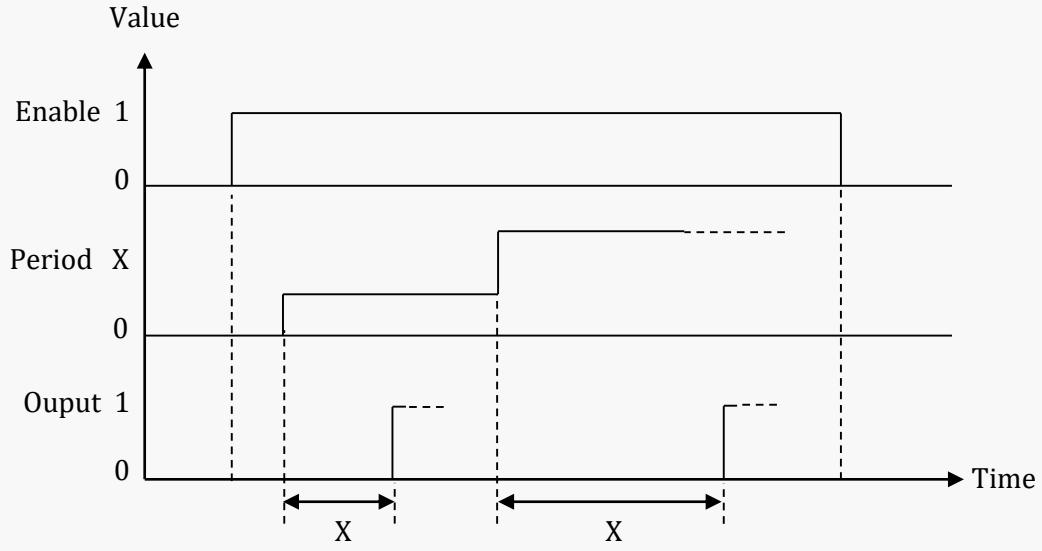
3.6.2 Timer / counter block



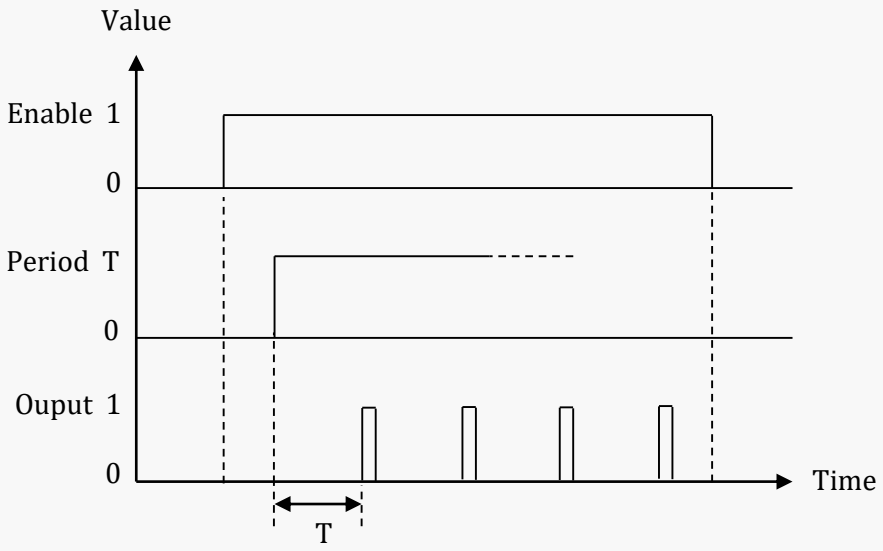
Name	Timer type
Values	PWM, Limit, Cyclic
Description	PWM: It generates a pulse width modulated output according to the period of time and a duty.



Limit: It sends a bit telegram '1' to the bus when a limit value is exceeded.

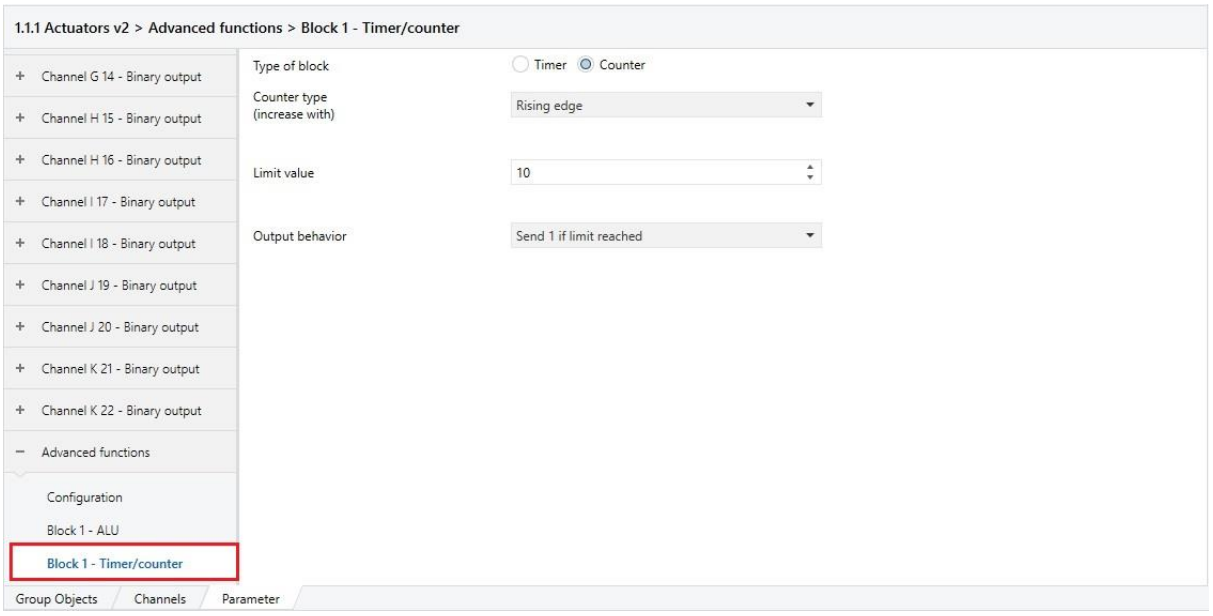


Cyclic: It sends a bit telegram '1' to the bus each time the limit value is exceeded cyclically.



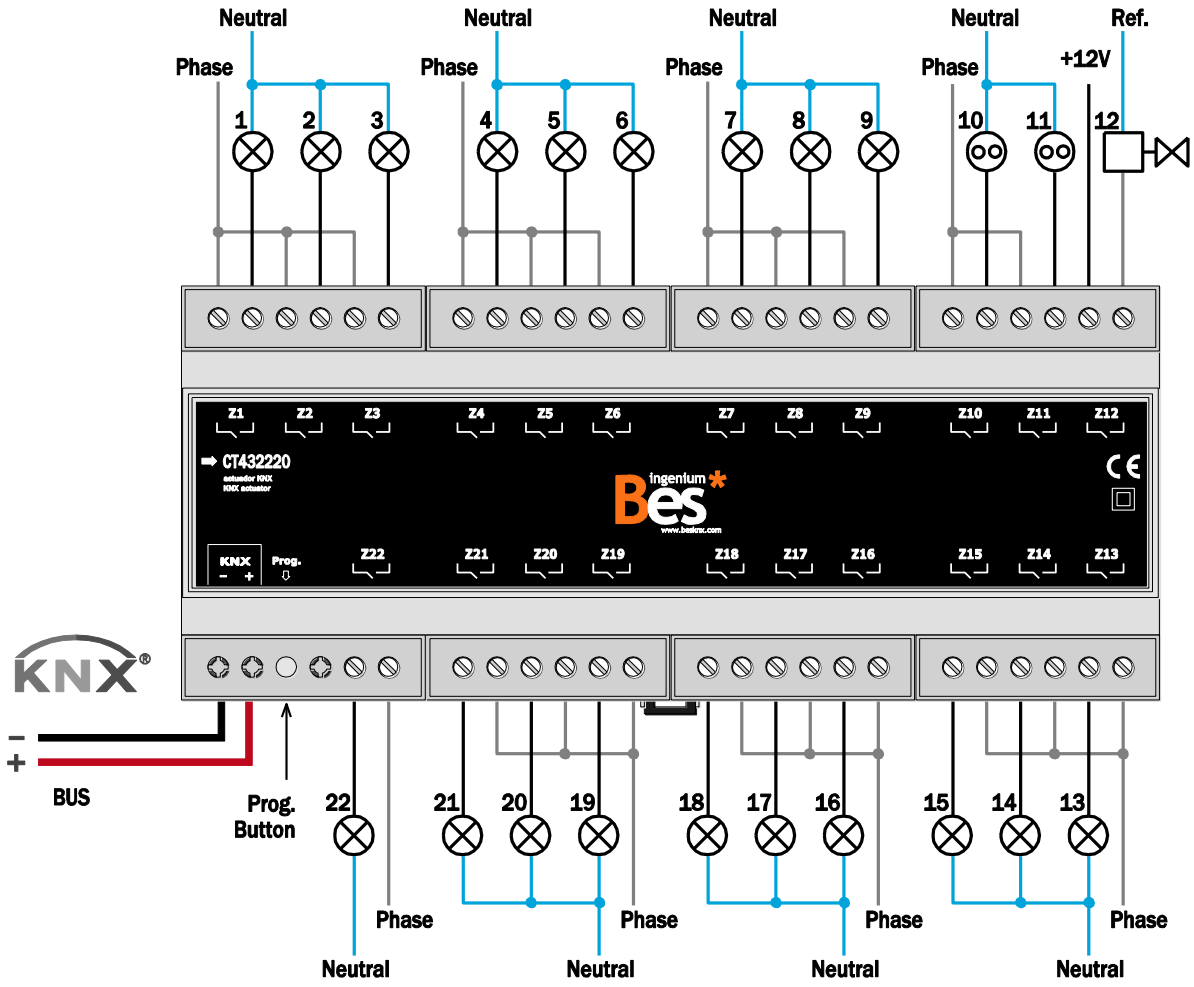
Name	Period of time
Values	Communication object / Constant value
Description	It is the count time of the timer. It can be configured as a constant value or a value received through the bus with one of the following communication object formats: 1 byte (dpt 5.010): Value from 0 to 255 (x 100 ms) 2 bytes (7.004): Value from 0 to 6553500 ms 2 bytes float (9.010): Value from 0 to 670760 s

Name	Duty
Values	1 byte (dpt 5.010), 2 bytes (7.004) or 2 bytes float (9.010)
Description	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: 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



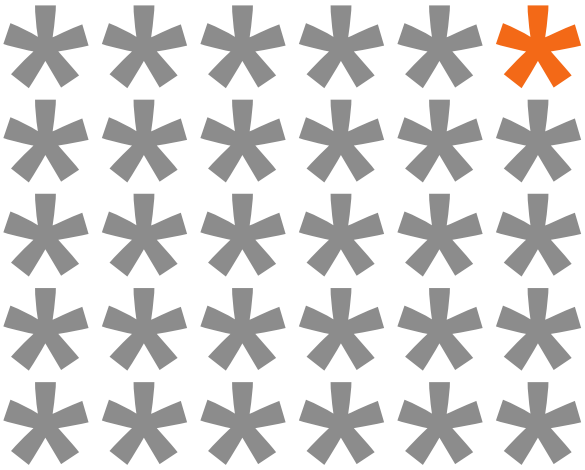
Name	Counter type
Values	Rising edge, falling edge, 1 or 0
Description	It is the change that the counter may detect in its “event” object to increase the count.
Name	**Limit value**
Values	From 0 to 65535
Description	It is the number of events over which the counter sends the finish telegram.
Name	**Output 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.



KNX products by ingenium

Ingenium, Ingeniería y Domótica S.L.

Parque Tecnológico de Asturias, Parcela 50

33428 Llanera, Asturias, Spain

T (+34) 985 757 195

tec@besknx.com

www.besknx.com

www.ingeniumsl.com

Manual version: v1.1