

Product Manual

Combi Actuator

OPT-CA4-211

OPT-CA8-211

OPT-CA12-211

OPT-CA16-211

OPT-CA20-211

OPT-CA24-211

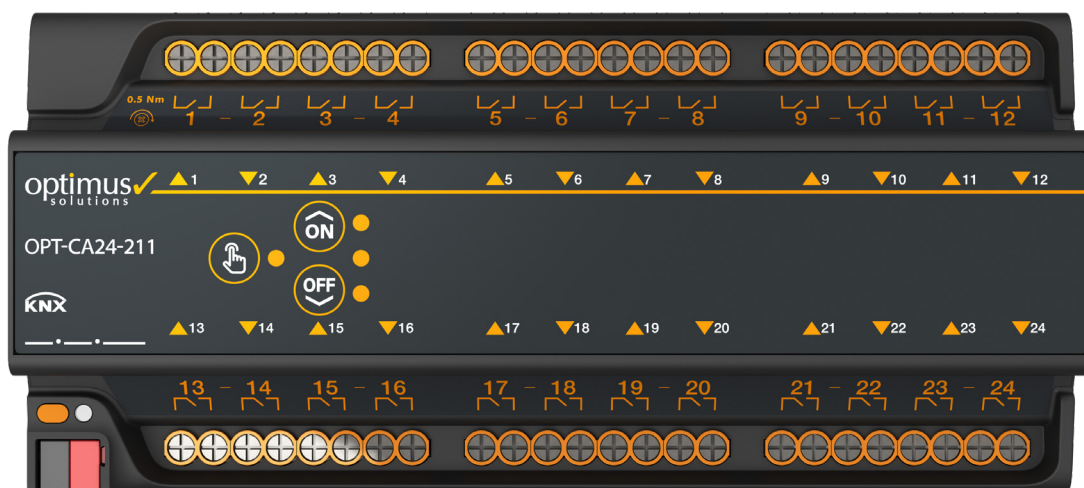


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About this document

This document provides detailed technical information on the function, installation and programming of the OPT-CAxx-211 device.

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Disposing of packaging

The packaging protects the device from damage during transmission. All materials used are environmentally safe and recyclable. Please help us by disposing of the packaging in an environmentally responsible manner.

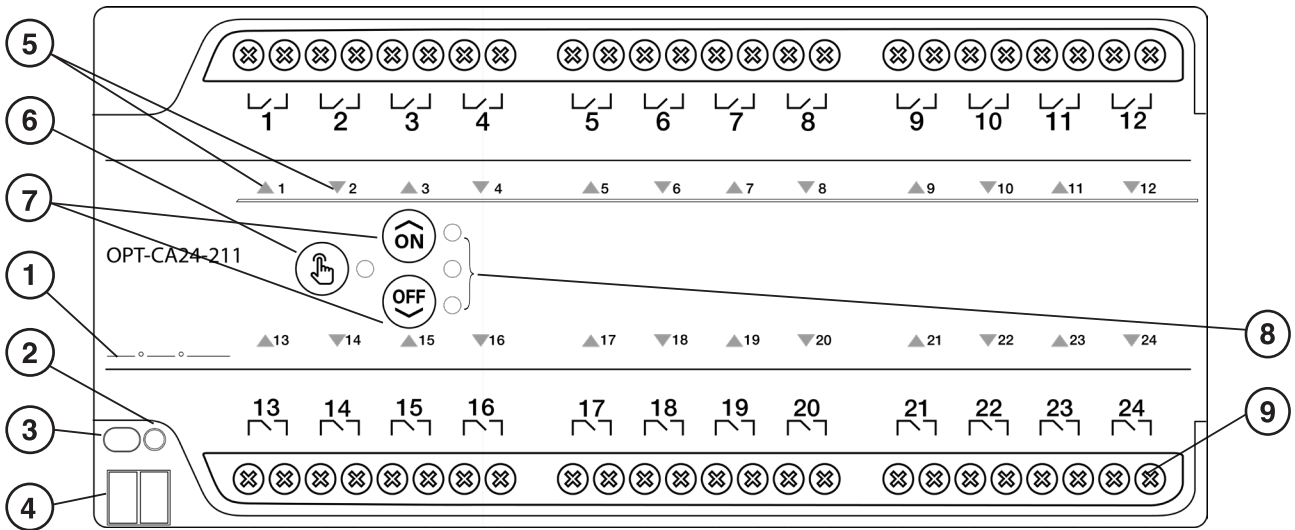
Discarding the old device

Please dispose of the old device at the designated collection point for electrical and electronic equipment in accordance with local regulations. If you have any questions, please contact the competent authority.

optimus ✓

1 Product Description

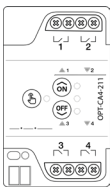
The OPT-Caxx-211 is a KNX compatible automation device that combines different usage purposes. Switch/Valve, Shutter/Blinds, 3-Point Motor and Fan Coil control operations can be performed on a single device. There are models with 4,8,12,16,20 and 24 switch outputs. Each switch contains a latching type relay with independent power supply and capable of handling up to 16A of current, responding to inrush request. All models have the same functions and the number of functions increases in proportion to the number of switches.



- ① Address Writing Area
- ② Address Sign
- ③ Address Button
- ④ Data Bus
- ⑤ Output Status Indicators
- ⑥ Manual Mode Key and Indicator
- ⑦ Function Control Keys
- ⑧ Function Status Indicator
- ⑨ Outputs with Individual Source

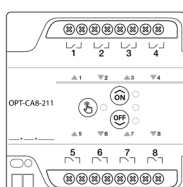
1.1 Product Models

OPT-Ca4-211



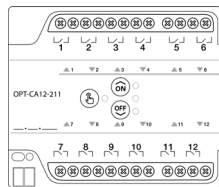
Combi Actuator 4 channel

OPT-Ca8-211



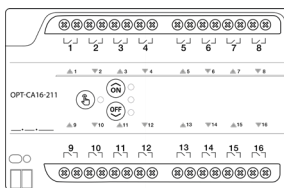
Combi Actuator 8 channel

OPT-Ca12-211



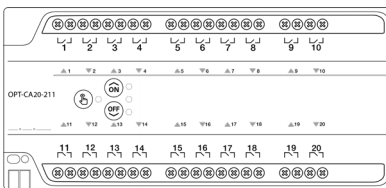
Combi Actuator 12 channel

OPT-Ca16-211



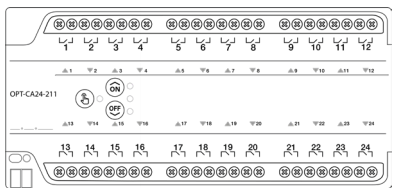
Combi Actuator 16 channel

OPT-Ca20-211



Combi Actuator 20 channel

OPT-Ca24-211



Combi Actuator 24 channel

1.2 Mounting and Connection Diagrams

Combi actuators are designed to be mounted on a switchgear type DIN rail. Due to the hidden spring mounting, there is no need to pull a latch to disassemble it: to mount the device on the rail, you only need to place the upper part first and push the lower part towards the rail until you hear the click. To derail the device, it will be sufficient to first press down and pull the bottom part of it towards you, and when it is freed from the derailment, lift it upwards.

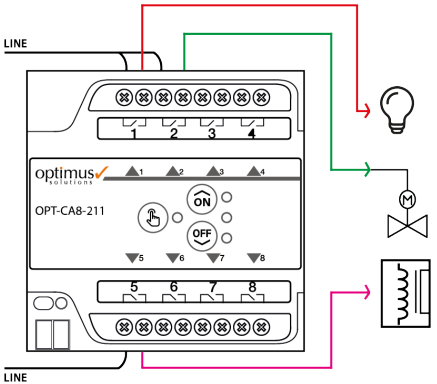
Below are the connection capacity and connection patterns according to the models.

Function No	Function Name	Models						Connection Channels			
		OPT-Ca4-211	OPT-Ca8-211	OPT-Ca12-211	OPT-Ca16-211	OPT-Ca20-211	OPT-Ca24-211	1	2	3	4
								5	6	7	8
								9	10	11	12
								13	14	15	16
								17	18	19	20
								21	22	23	24
①	3-Speed Fan Coil Controller	1	2	3	4	5	6	Speed-1	Speed-2	Speed-3	⑤
②	2-Speed Fan Coil Controller	1	2	3	4	5	6	Speed-1	Speed-2	③④⑤	
③	3 Point Valve Controller	2	4	6	8	10	12	Open	Close		
④	Shutter Control	2	4	6	8	10	12	Up	Down		
⑤	Switch/Valve Control	4	8	12	16	20	24	Switch	Switch		

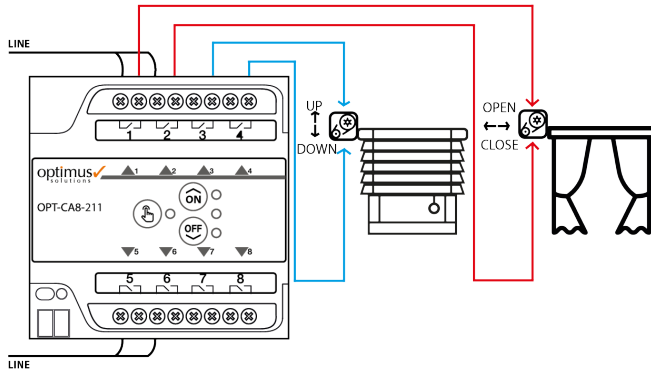
Here's a sample wiring diagram. Warnings about the connection:

- Channels are named by numbers. The ranking increases to the right in the form of top-bottom.
- In functions where more than one contact is used (fan coil, shutter, motor, etc.), take into account the connection scheme of the device to be connected and connect in a way to prevent possible phase conflicts.
- Fan coil connection does not include heating and/or cooling valve motors; these motors can be connected according to the connection table above in accordance with the technology.

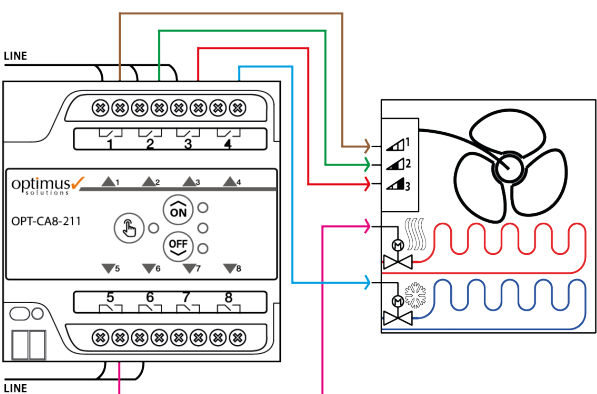
Lamp, Valve, Relay



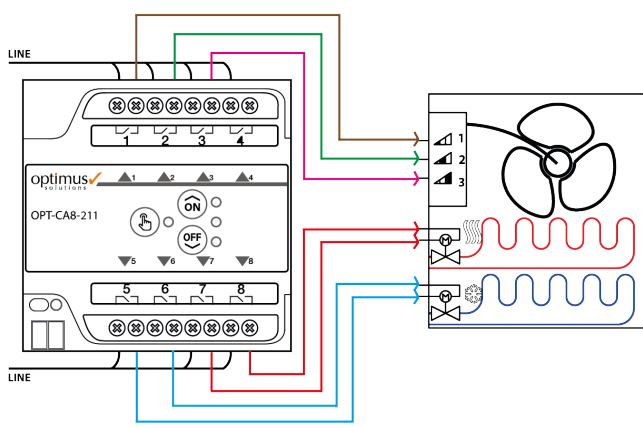
Jaluzie / Shutter



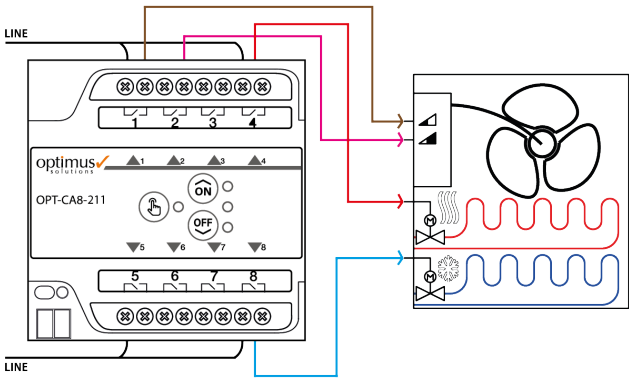
3-Speed FCU, 2x On/Off Valve



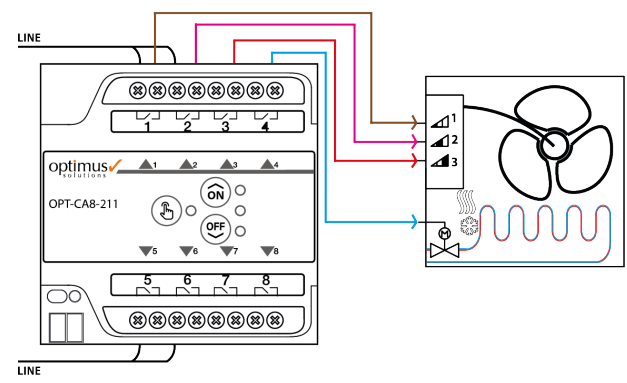
3-Speed FCU, 2x Open/Close Valve






2-Speed FCU, 2x On/Off Valve



3-Speed FCU, 1x Common On/Off Valve



1.3 Technical Specifications

Supply Voltage	KNX 30 VDC	
KNX Current Consumption	Max. 10mA	
KNX mode	S-Mod	
Connection	KNX Connection	
Protection Class	IP 20	
Mounting	DIN Rail	
Number of Output	4, 8, 12, 16,20 or 24	
Switching Current	16A 277 VAC	
Temperature Range	Operation -5...+45 °C Storage -25...+55 °C	
Dimensions and Weight	(WxHxD)	Net - Gross
4 output	54 x 92 x 64 mm (3 MW)	143g - 168g
8 output	90 x 92 x 64 mm (5 MW)	230g - 261g
12 output	108 x 92 x 64 mm (6 MW)	297g - 334g
16 output	144x 92 x 64 mm (8 MW)	382g - 424g
20 output	198 x 92 x 64 mm (11 MW)	531g - 581g
24 output	198 x 92 x 64 mm (11 MW)	531g - 581g
Material	ABS V0	
Connection Terminals	4 mm ² multi core, 6 mm ² single core	
Certificate	CE	
Product Tag Location	 <p>Tag is on the behind of the product.</p>	
Product Tag Information		
Guarantee Tag Location	 <p>Tag is on the bottom of the product.</p>	

2 Manual Operation

The device is programmed to connect all channels to the Shutter/Blinds as factory settings. It is also loaded to control the Shutter/Blinds in manual adjustment. However, if desired, all channels can also be set as contact modules(!). In order to make manual controls of the device, the KNX connection must be made and the line must be active. Manual use of the device can be restricted by parameters (see general settings).



Manual symbol and status indicator.
 Long press: Enter manual mode, exit manual mode
 Short press: Change the selected channel while in manual mode



On Key: On, Up or Boost key



Off Key: Off, Down or Decrease Key



Channel selection indicators
 If flashing: shows the channel(s) selected in manual mode



Channel status indicators
 LED at the top: Indicates whether the channel is at On, Open, or third fan.
 LED in the middle: Indicates that the channel(s) are at the second fan speed.
 LED at the bottom: Indicates whether the channel is at Off, Close or first fan speed.
 If no LEDs are lit, the Fan Coil is in the off position.

Press the hand symbol on the front of the device for about 1 second. The LED symbol next to it will light up (If it does not light up, check the KNX line and supply, also the switch to manual mode may be blocked from the parameters). You have switched your device to manual mode, and the channel selection indicators related to the first function block will start flashing (1 numbered LED is for switch, Shutter/Blinds; 1 and 2 numbered LEDs are for 3-point valve or 2-speed fan coil; 1, 2 and 3 numbered LEDs are for 3-speed fan coil). At this point, if you press the manual symbol briefly, you will move on to the next function block, if you press the manual button for a long time, you will exit the Manual mode.

2.1 Changing the Basic Operating Function of the Device

The device is fabricated and programmed to control all channels as Shutter/Blinds. However, if desired, this feature can also be changed so that all channels are switches (for security reasons, this feature is not allowed on programmed devices). When you reach the last channel by pressing the Manual key briefly enough while in Manual mode, the next short press will take you to the basic function determination. While in this position, the odd-numbered (top row) channel selection indicators and the even-numbered (bottom row) indicators begin to flash sequentially; this indicates that all channels of the device are in Shutter/Blinds mode. By holding down the Off key for a long time, you can put the device into "all relay" mode. Observe that all LEDs flash simultaneously. If you press the On button for a long time, you can put the device in "all blinds" mode. When you specify the new mode of the device, you will need to exit the manual mode by long pressing the manual key to save this setting. The device will set all its switches to the Off position, preparing itself for the new operating mode. If you press the Manual key short while selecting the function, it will not save the settings and will switch to the first function block.

2.2 Control By Function Blocks

Once the assembly of the device is completed and its parameters are determined via the ETS program, you can also check all function blocks manually. Put the device in manual mode. Select the channel(s) you want to check. You can determine the position of the switch by short pressing the On and Off keys. Long press On key to lift up or open the Shutter/Blinds, press short to stop the movement. Use the Off key for movements in the other direction. The 3-point valve is also controlled in the same way. For fan coil control: According to the fan coil type (one of the three LEDs lights up in units using one output, and all active outlets light up in progressive type fan coils), the channel status indicators light up; if none of them are lit, the fan speed is zero. The On key is used to increase fan speed, and the Off key is also used to decrease or eventually turn it off.

Alerts:

- Manual mode gives all the authority to the operator, so operations must be carried out by authorized personnel. Commands from the KNX line, including the Safety object, are ignored.
- By applying the ETS parameters, the device can be removed from manual mode with a timeout (see general parameters).
- The status information of the changes made in manual mode is sent to the KNX line via the communication objects.
- The fan coil function, which operates in automatic mode during normal operation, normally switches to manual mode when the device switches to manual mode, and when exiting manual mode, the Automatic Fan Speed command must be sent to continue the automatic operation of the fan coil devices.

3 Device Parameters

ETS5 or higher software is required to commission the device. If Recommended Product Language: Turkish is selected in the Language tab in the Settings section of the program, all the settings of the product will be in Turkish language, in the other language selections English will be it. Below is the explanation with the English menu.

The Optimus Combo Actuator series is collected in a single library file (knxprod). You can download the current version of this file from our website. Once we have added the library file to the ETS project we can start editing its settings:

3.1 General Parameters

The screenshot shows the 'General' configuration window for a device. The left sidebar has a tree view with 'General' selected. The main area displays the following settings:

- Device Model:** 4 Channel (dropdown menu)
- Start Up Delay:** 3 (input field) sec
- Allow Manual Operation:** Disable Enable
- Manual Operation Timeout:** Never (dropdown menu) min
- Safety Priority Object for Switches:** Disable Enable
- Wind Alarm for Shutter/Blinds:** Disable Enable

First of all, you need to adjust how many channels the device to be commissioned has according to its model. If you choose a different model than the one you will commission, you will have a commissioning problem.

The screenshot shows the 'General' configuration window with the 'Device Model' dropdown menu open. The menu lists the following options:

- 4 Channel
- 8 Channel (highlighted with a green checkmark)
- 12 Channel
- 16 Channel
- 20 Channel
- 24 Channel

The other settings in the window are:

- Start Up Delay:** (input field)
- Allow Manual Operation:** Disable Enable
- Manual Operation Timeout:** (dropdown menu)
- Safety Priority Object for Switches:** Disable Enable
- Wind Alarm for Shutter/Blinds:** Disable Enable

Once we have selected the device model we can proceed to specifying other settings:

3.1.1 Start Up Delay

When the device is energized, it is the area where the time to wait to start performing the boot operations and sending the current status information is determined. It is used to spread the overall take-off requests of the entire system over time. It can be entered between 3-255 seconds.

3.1.2 Allow Manual Operation

Used to allow or block the Manual operation section described in the third section. Active or Passive options can be selected. The default value is "Active".

3.1.2.1 Manual Operation Timeout

The duration of the manual position of the device that is allowed to work manually is determined from this list. Options are Never, 5, 60 and 240min. If a period of time is selected, the device will exit manual mode at the end of this time.

3.1.3 Safety Priority Object for Switches

This object is used to determine the location of the contacts according to any safety object information. It shows or hides the Security Priority Communication Object (Number 6). The visibility of the "Safety Priority Reactions" option that appears in the settings of the "Switch" function depends on the activation of this option.

3.1.4 Wind Alarm for Shutter/Blinds

This object is used to determine the position of Shutter/Blinds devices according to the Wind Alarm object information. It shows or hides the Wind Alarm Communication Object (Number 7). The visibility of the "Wind Alarm Status" option as it appears in the " Shutter/Blinds " function settings depends on whether this option is active.

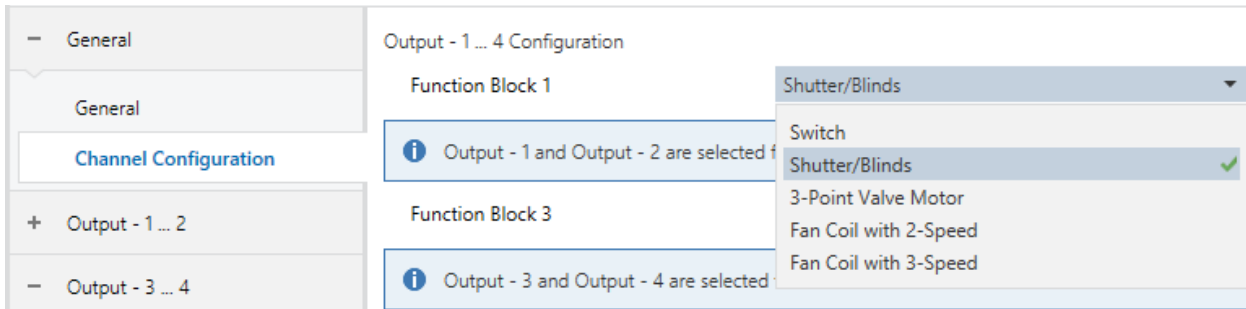
General Communication Objects of the Device:

General	Common Object: Channel Number	Object Function	Length / Data Type	C	R	W	T
	0 : General	Manual Operation Status	1 bit / state	C	R	-	T
	1 : General	Stop Manual Operation	1 bit / switch	C	-	W	-
	2 : General	Request Status Values	1 bit / switch	C	-	W	-
	3 : General	Central Switch Input	1 bit / switch	C	-	W	-
	4 : General	Central Shutter/Blinds Move Input	1 bit / up/down	C	-	W	-
	5 : General	Central Shutter/Blinds Stop/Step Input	1 bit / step	C	-	W	-
	6 : General	Safety Priority for Switches	1 bit / alarm	C	-	W	-
	7 : General	Wind Alarm for Shutter/Blinds	1 bit / alarm	C	-	W	T

- **Manual Operation Status:** A 1-bit status object indicates that the device has switched to or exited manual mode.
- **Stop Manual Operation:** With the value "1" to be sent from this object, the device is output from manual mode. Other command(s) are not processed.
- **Request Status Values:** With a 1-bit request from central control or display systems, the device shares its current states from all status information output.
- **Central Switch Input:** The central movement object connection for switches. (Participation is made separately from each switch).
- **Central Shutter/Blinds Move Input:** Used for Shutter/Blinds devices to act centrally. (Participation is made separately for each Shutter/Blinds)
- **Central Shutter/Blinds Stop/Step Input:** Used for central stopping of Shutter/Blinds devices.(Participation is made separately for each Shutter/Blinds)
- **Safety Priority for Switches:** Described above.
- **Wind Alarm for Shutter/Blinds:** Described above.

3.2 Channel Configuration

The Second and Last Tab of General Settings is the Channel Configuration. In this section, functions are assigned to the channels. Assignments are repeated in quartet channels.



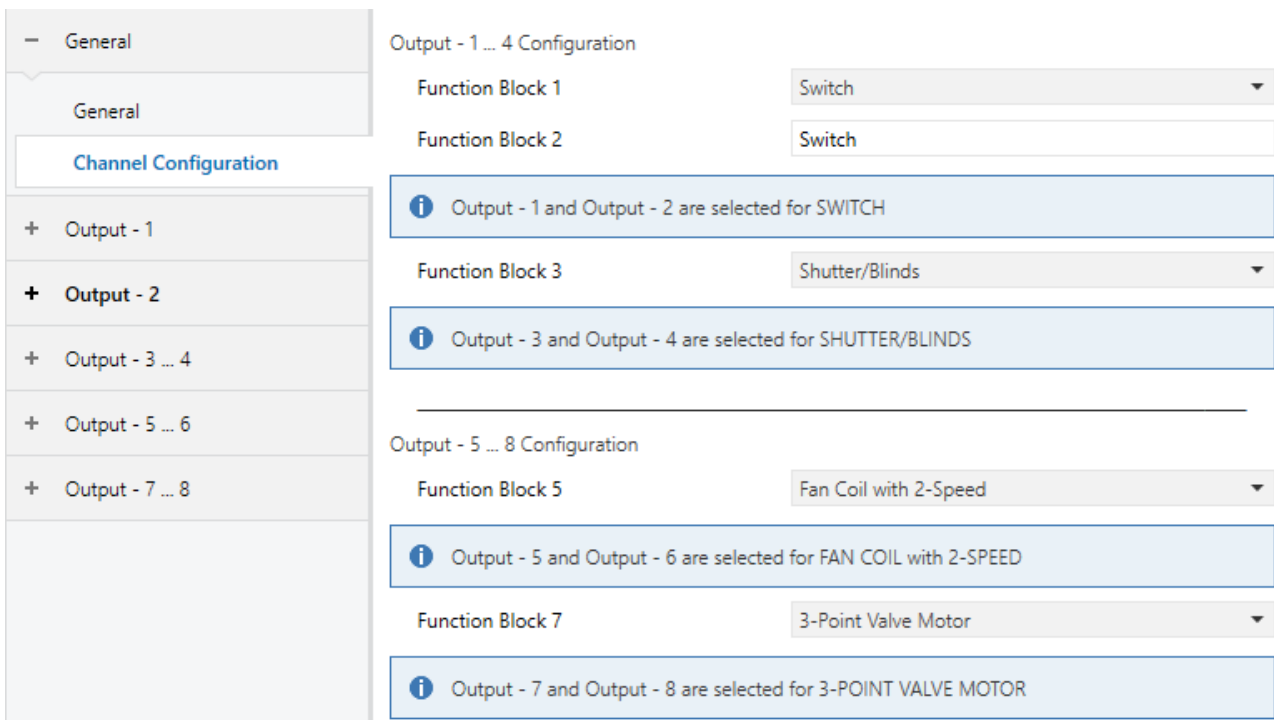
Shutter/Blinds: Uses two switches, the other two are the same, "3-Point Controlled Valve" or "Switch" can be selected.

Switch: Uses 1 output, FB2 is designated as Shutter/Blinds if FB1 switch is selected, for the other two switches, "Shutter/Blinds", "Switch" or "3-Point Controlled Valve" functions can be selected.

Fan Coil 2 Speed: Uses two output, the other two are "Shutter/Blinds", "3-Point Controlled Valve" or "Switch" can be selected.

Fan Coil 3 Speed: Uses three output, the other channel only appears switch.

As on the screen, assignments are shown in a descriptive format according to the preferences made. The middle tab is shaped by the channel assignments that is made:



4 Device Functions

4.1 Switch Parameters

It is the function that makes 1 output open circuit or short circuit according to the incoming command. The parameters are shown below:

<ul style="list-style-type: none"> - General General Channel Configuration - Output - 1 Switch Parameters + Output - 2 + Output - 3 ... 4 	<p>Output Type <input checked="" type="radio"/> Normally Open <input type="radio"/> Normally Closed</p> <p>Reaction at Bus Voltage Fail No Reaction</p> <p>Receive Data in 8-bit <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>Send Status <input checked="" type="radio"/> After a Change <input type="radio"/> Always</p> <hr/> <p>Act with Central Switch Object <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>Scenes <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>Time Function <input checked="" type="radio"/> No <input type="radio"/> Yes</p> <p>Logic Function <input checked="" type="radio"/> No <input type="radio"/> Yes</p>
---	--

4.1.1 Output Type

It is where the natural principle of operation of the output switch is defined. The default value is Normally Open. When the ON command is received by the channel, the switch is short-circuited, when the OFF command is received, the switch is open circuit. In Normally Closed switch, the commands work in reverse. The status information is constant: If the switch is a short circuit, a value of 1 is generated, and if it is an open circuit, a value of 0 is generated. The status information on the device also indicates the actual status of the switch (1 for a short circuit, 0 for the open circuit).

4.1.2 Reaction at Bus Voltage Fail

The device can change its position in the event of a power failure (the power of the KNX line). The choice regarding this is made in this area. The options are Current Position, Open Switch and Closed Switch. The default value is Current Position. In applications where long-term interruptions are experienced, it may be recommended to make an Open Switch.

4.1.3 Reaction at Safety Priority

The preference area for the device to act on commands sent through the communication object number 6. The options are No Reaction, Open Switch and Closed Switch. The default value is No Reaction. When one of the other options is selected, the Reaction End of Safety Priority section opens and the preference is determined again through the same options.

4.1.3.1 Reaction End of Safety Priority

In this part it is used for the related channel to make a decision about what to do when 0 value has come after the alert status through the 6 number communication object. These options; Location, Open Contact, Closed Contact and Return to Previous Location.

4.1.4 Receive Data in 8-bit

A setting for the switch to change position by 1-byte as well as by 1-bit. It is generally used to control heating/cooling valves that work with thermostats that send 1-byte values. When marked as "Yes", the Threshold value is determined by the line that opens. If the information from the threshold input is this specified value or more, the output is active; If the incoming information is smaller than the threshold value, the output becomes passive. The thermal or solenoid valve connections of fan coil applications are also made in this way.

4.1.4.1 Treshold (Included)

If the information from the threshold input is this specified value or more, the output is active in normally open channels. In normally closed channels, the output is passive; If the incoming information is smaller than the threshold value, the output becomes passive in normally closed channels. The output is active in normally open channels. The thermal or solenoid valve connections of fan coil applications are also made in this way.

4.1.5 Send Status

The device can send its current location at the time of the transaction through the Switch Status communication object. Status information can be sent when the switch output position changes or whenever a command comes in even if the switch does not change. This choice is made here.

4.1.6 Act with Central Switch Object

It is the area where it is determined whether the relevant switch will perform operations with the Central Switch Input Object Number 3. If "Yes" is selected, it also performs operations according to the commands sent by object Number 3.

4.1.7 Scenes

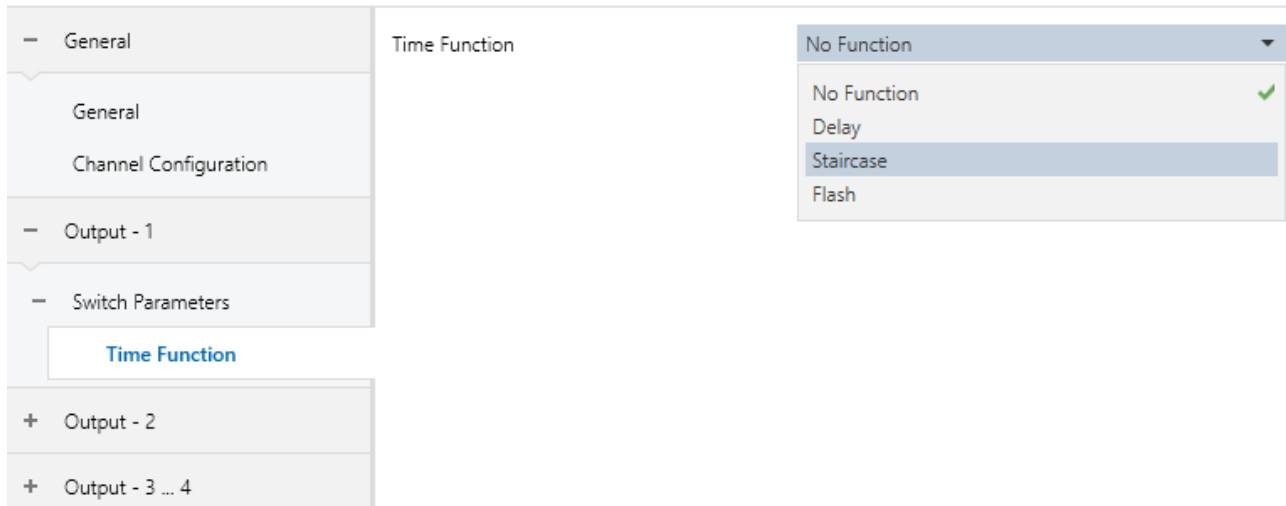
Used to determine the locations that the switch will receive based on 1 byte Scene commands. When the Scene option "Yes" is selected, a tab called "Scenes" occurs under Switch Parameters in the middle tab. When you enter this tab, you'll see the following screen:

<ul style="list-style-type: none"> – General General Channel Configuration – Output - 1 – Switch Parameters <ul style="list-style-type: none"> Scenes + Output - 2 + Output - 3 ... 4 	Scene 1 Number Scene 1 Scene 1 State No Reaction
	Scene 2 Number Scene 1 Scene 2 State No Reaction
	Scene 3 Number Scene 1 Scene 3 State No Reaction
	Scene 4 Number Scene 1 Scene 4 State No Reaction
	Scene 5 Number Scene 1 Scene 5 State No Reaction

Up to 5 scenario scenes are allowed for each switch. In the scenario number section, the information from the "Switch Scene" communication object is selected, and in the "Scene State" section, the position of the switch in this scenario is determined.

4.1.8 Time Function

It is the part where the switch is set to perform time-dependent operations. If the transactions related to this are to be carried out, "Yes" is selected. In this case, a tab called "Time Function" is formed under the Switch Parameters in the middle tab. When you enter this tab, you will see the following screen:



The default value is "No Function". Other options are described below. A 1-bit On command can be sent from the "Permanent On" communication object to activate the switch output by disabling the time functions. When Off is sent from this object, the time functions continue with the next command.

4.1.8.1 Delay

When the device receives the Turn On or Off command, this parameter is selected if delay is required to operate it. The ON Command Delay or the OFF Command Delay can be determined between 0-6500 seconds. If the command comes in the other direction before the delay time is complete, the delay in that direction begins processing.

4.1.8.2 Staircase

The switch is used to automatically switch to the OFF statement at the end of the time to be entered in this section from the ON command it receives. Lighting Time can be determined between 1-6500 sec.

4.1.8.3 Flash

It is the function where the switch output remains Active (On) for a specified period of time and Passive (Off) for another specified period of time and this cycle continues. It is often used as a warning light/sound.

	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
Switch	10 : Channel - 1	Switch	1 bit / switch	C	-	W	-
	20 : Channel - 2						
	30 : Channel - 3						
	40 : Channel - 4						
	50 : Channel - 5						
	60 : Channel - 6						
	70 : Channel - 7						
	80 : Channel - 8						
	90 : Channel - 9						
	100 : Channel - 10						
	110 : Channel - 11						
	120 : Channel - 12						
	130 : Channel - 13						
	140 : Channel - 14						
	150 : Channel - 15						
	160 : Channel - 16						
	170 : Channel - 17						
	180 : Channel - 18						
	190 : Channel - 19						
	200 : Channel - 20						
	210 : Channel - 21						
	220 : Channel - 22						
	230 : Channel - 23						
	240 : Channel - 24						
	11 : Channel - 1	Switch Status	1 bit / Switch	C	R	-	T
	21 : Channel - 2						
	31 : Channel - 3						
	41 : Channel - 4						
	51 : Channel - 5						
	61 : Channel - 6						
	71 : Channel - 7						
	81 : Channel - 8						
	91 : Channel - 9						
	101 : Channel - 10						
111 : Channel - 11							
121 : Channel - 12							
131 : Channel - 13							
141 : Channel - 14							
151 : Channel - 15							
161 : Channel - 16							
171 : Channel - 17							
181 : Channel - 18							
191 : Channel - 19							
201 : Channel - 20							
211 : Channel - 21							
221 : Channel - 22							
231 : Channel - 23							
241 : Channel - 24							

	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
Switch	12 : Channel - 1	Switch Treshold Input	1 byte / percentage (0..100%)	C	-	W	-
	22 : Channel - 2						
	32 : Channel - 3						
	42 : Channel - 4						
	52 : Channel - 5						
	62 : Channel - 6						
	72 : Channel - 7						
	82 : Channel - 8						
	92 : Channel - 9						
	102 : Channel - 10						
	112 : Channel - 11						
	122 : Channel - 12						
	132 : Channel - 13						
	142 : Channel - 14						
	152 : Channel - 15						
	162 : Channel - 16						
	172 : Channel - 17						
	182 : Channel - 18						
	192 : Channel - 19						
	202 : Channel - 20						
	212 : Channel - 21						
	222 : Channel - 22						
	232 : Channel - 23						
	242 : Channel - 24						
13 : Channel - 1	Switch Permanent On	1bit / switch	C	-	W	T	
23 : Channel - 2							
33 : Channel - 3							
43 : Channel - 4							
53 : Channel - 5							
63 : Channel - 6							
73 : Channel - 7							
83 : Channel - 8							
93 : Channel - 9							
103 : Channel - 10							
113 : Channel - 11							
123 : Channel - 12							
133 : Channel - 13							
143 : Channel - 14							
153 : Channel - 15							
163 : Channel - 16							
173 : Channel - 17							
183 : Channel - 18							
193 : Channel - 19							
203 : Channel - 20							
213 : Channel - 21							
223 : Channel - 22							
233 : Channel - 23							
243 : Channel - 24							

	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
Switch	14 : Channel - 1	Switch Logic AND Input Switch Logic OR Input Switch Logic TOGGLE Input	1 bit / boolean	C	-	W	-
	24 : Channel - 2						
	34 : Channel - 3						
	44 : Channel - 4						
	54 : Channel - 5						
	64 : Channel - 6						
	74 : Channel - 7						
	84 : Channel - 8						
	94 : Channel - 9						
	104 : Channel - 10						
	114 : Channel - 11						
	124 : Channel - 12						
	134 : Channel - 13						
	144 : Channel - 14						
	154 : Channel - 15						
	164 : Channel - 16						
	174 : Channel - 17						
	184 : Channel - 18						
	194 : Channel - 19						
	204 : Channel - 20						
	214 : Channel - 21						
	224 : Channel - 22						
	234 : Channel - 23						
	244 : Channel - 24						
	15 : Channel - 1	Switch Scene	1 byte / scene number	C	-	W	T
	25 : Channel - 2						
	35 : Channel - 3						
	45 : Channel - 4						
	55 : Channel - 5						
	65 : Channel - 6						
	75 : Channel - 7						
	85 : Channel - 8						
	95 : Channel - 9						
	105 : Channel - 10						
	115 : Channel - 11						
125 : Channel - 12							
135 : Channel - 13							
145 : Channel - 14							
155 : Channel - 15							
165 : Channel - 16							
175 : Channel - 17							
185 : Channel - 18							
195 : Channel - 19							
205 : Channel - 20							
215 : Channel - 21							
225 : Channel - 22							
235 : Channel - 23							
245 : Channel - 24							

- **Switch:** Used to make the switch short-circuit or open-circuit with the 1 bit value given by this object.
- **Switch Status:** This object shows the position of the switch with the 1 bit value.
- **Switch Threshold Input:** Used to make the contact short-circuit or open-circuit with the 1 byte value through this object
- **Switch Permanent On:** It shows up in the channel including time function through this object. In normally open channels, when it sent the 1 value, In normally closed channels when it sent the 0 value the contact become short-circuit without time function. In other values it continues the last status.
- **Switch Logic AND Input; Switch Logic OR Input; Switch Logic TOGGLE Input:** This object changes the output logically with 1 bit value using with the Contact Object.
- **Switch Scene:** Due to the 1 byte scene number through this object, it switches the contact to the status including related parameter of the channel.

4.2 Shutter / Blinds

Shutter or blinds are controlled through 2 switches. The important thing to note is that only one output is allowed to be activated in any given position. The device performs this process programmatically. Since the shutters operate two switches, the odd-numbered switches in the upper row should be connected in the direction of opening the shutter, and the double-row contacts in the lower row should be connected in the direction of closing the shutter. The reason why the LED status indicators on the device are triangular is so that the curtain directions are understandable. Shutter/Blinds parameters are as follows:

+ General	Travel Time	60	sec
- Output - 1 ... 2	Slat Operation	<input checked="" type="radio"/> Disable <input type="radio"/> Enable	
Shutter/Blinds Parameters			
	Act with Central Blind Object	<input checked="" type="radio"/> Disable <input type="radio"/> Enable	
+ Output - 3 ... 4	Scenes	<input checked="" type="radio"/> Disable <input type="radio"/> Enable	

4.2.1 Travel Time

The area where the time required for the blinds or shutter to reach the fully open position from the closed position is determined in seconds. It can be selected from 1-6500 seconds and has a default value of 60 seconds. This information is used for two purposes: first, to request and track the shutter position in percentage terms (0: full open, 100%: full off); the second is to provide energy insulation by making the output switches passive at the end of this period (+10% additional time).

4.2.2 Slat Operation

Used for blinds whose wings can be adjusted. Such devices are able to adjust the shutter length, as well as the wing. When the wing adjustment "Active" is selected, there is an additional "Slat Step Time" option. In this option, the duration of the slat adjustment step is determined from the drop-down list. The device is activated for the time specified from the Stop/Step object for slat operation.

4.2.2.1 Slat Step Time

Used to determine slat step time from the opening list in this option. The device is active as much as the determined time from the Stop/Step object to do the slat operation.

4.2.3 Act with Central Blind Object

It is an option for the shutter function to move with communication objects number 4 and 5 as well. If desired, it is necessary to select "Active".

4.2.4 Scenes

Used to determine the positions that the Shutter/Blinds will take based on 1byte Scene commands. When the Scenarios option is selected as "Yes", a tab called "Scenes" occurs under Shutter/Blinds Parameters in the middle tab.

+ General	Scene 1 Number	Scene 1
- Output - 1 ... 2	Scene 1 State	No Reaction
- Shutter/Blinds Parameters	Scene 2 Number	Scene 1
Scenes	Scene 2 State	No Reaction
+ Output - 3 ... 4	Scene 3 Number	Scene 1
	Scene 3 State	No Reaction
	Scene 4 Number	Scene 1
	Scene 4 State	No Reaction
	Scene 5 Number	Scene 1
	Scene 5 State	No Reaction

For each shutter module, up to 5 scenarios are allowed to be processed. In the scene number section, the information from the " Shutter/Blinds Scene" communication object is selected, and in the "Scene State " section, the position of the contact in this scene is determined. For example, if scene number 2 wants the shutter to go down, Scene Number x: Scene 2, Scene State x: Down is selected.

The communication objects of an example Shutter/Blinds function are as follows:

Shutter / Blinds	Common Object :	Object Function	Length / Data Type	C	R	W	T						
	Channel Number												
	10 : Channel - 1 ... 2 30 : Channel - 3 ... 4 50 : Channel - 5 ... 6 70 : Channel - 7 ... 8 90 : Channel - 9 ... 10 110 : Channel - 11 ... 12 130 : Channel - 13 ... 14 150 : Channel - 15 ... 16 170 : Channel - 17 ... 18 190 : Channel - 19 ... 20 210 : Channel - 21 ... 22 230 : Channel - 23 ... 24							Shutter/Blinds Move	1 bit / up/down	C	-	W	-
	11 : Channel - 1 ... 2 31 : Channel - 3 ... 4 51 : Channel - 5 ... 6 71 : Channel - 7 ... 8 91 : Channel - 9 ... 10 111 : Channel - 11 ... 12 131 : Channel - 13 ... 14 151 : Channel - 15 ... 16 171 : Channel - 17 ... 18 191 : Channel - 19 ... 20 211 : Channel - 21 ... 22 231 : Channel - 23 ... 24							Shutter/Blinds Stop/Step	1 bit / step	C	-	W	-
	12 : Channel - 1 ... 2 32 : Channel - 3 ... 4 52 : Channel - 5 ... 6 72 : Channel - 7 ... 8 92 : Channel - 9 ... 10 112 : Channel - 11 ... 12 132 : Channel - 13 ... 14 152 : Channel - 15 ... 16 172 : Channel - 17 ... 18 192 : Channel - 19 ... 20 212 : Channel - 21 ... 22 232 : Channel - 23 ... 24							Shutter/ Blinds Scene	1 byte / scene number	C	-	W	-

	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
Shutter / Blinds	13 : Channel - 1 ... 2 33 : Channel - 3 ... 4 53 : Channel - 5 ... 6 73 : Channel - 7 ... 8 93 : Channel - 9 ... 10 113 : Channel - 11 ... 12 133 : Channel - 13 ... 14 153 : Channel - 15 ... 16 173 : Channel - 17 ... 18 193 : Channel - 19 ... 20 213 : Channel - 21 ... 22 233 : Channel - 23 ... 24	Shutter/ Blinds Move to Position	1 byte / percentage (0..100%)	C	-	W	-
	14 : Channel - 1 ... 2 34 : Channel - 3 ... 4 54 : Channel - 5 ... 6 74 : Channel - 7 ... 8 94 : Channel - 9 ... 10 114 : Channel - 11 ... 12 134 : Channel - 13 ... 14 154 : Channel - 15 ... 16 174 : Channel - 17 ... 18 194 : Channel - 19 ... 20 214 : Channel - 21 ... 22 234 : Channel - 23 ... 24	Shutter / Blinds Position State	1 byte / percentage (0..100%)	C	-	-	T

- **Shutter / Blinds Move:** A 1-bit move object. "On" sends commands to close and "Off" sends commands to turn on.
- **Shutter / Blinds Stop/Step:** To stop a shutter motor in motion, command 1 or 0 is expected from this object. In addition, in the case of slat adjustable shutters, the command to this object for slat operation is processed. The incoming On command sets the slat to darken, and the Off command sets it to lighting.
- **Shutter/Blinds Scene:** It is the object from which 1-byte scene information is obtained. The movements for the scenes are described in the parameters section.
- **Shutter / Blinds Move to Position:** It is possible to move the shutter to the desired position with the 1-byte command to be connected. 100% means completely closed.
- **Shutter/Blinds Position Status:** It is the communication object where the calculated current position of the shutter is shown. The current position of the shutter is detected when it stops moving.

4.3 3-Point Valve Motor

These valve motors receive commands from different inputs (Shutter/Blinds alike) to direct the fluid flow or to off the fluid. Since these valve motors use two switches, the odd numbered switches in the upper row must be connected in the direction of opening the valve and the double numbered switches in the lower row must be connected in the direction of closing the valve. The parameters of 3-Point Valve Control are as follows:

+ General	Pause Time	250	ms
- Output - 1 ... 2	Drive Time	1	sec
3 Point Valve Motor Parame...	Valve Name	<input checked="" type="radio"/> Heating Valve <input type="radio"/> Cooling Valve	
+ Output - 3 ... 4			

4.3.1 Pause Time

It is the area where the waiting time to be selected between the commands that the valve motor will receive in the opening and closing direction is set. Choose from the list from 250 to 1000 ms. It is added so that the valve motor completely terminates its current movement before starting to move in the other direction.

4.3.2 Drive Time

The area where the time the valve reaches from the fully closed position to the fully open position is selected. The value can be determined between 1-6500 seconds. The valve makes all percentage changes by calculating over this period.

4.3.3 Valve Name

It is the area where it is stated whether the fluid which the valve is connected will be used for cooling or heating. Specifies the name of the communication object.

The communication objects are as follows.

	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
3-Point Valve Controller	10 : Channel - 1 ... 2 30 : Channel - 3 ... 4 50 : Channel - 5 ... 6 70 : Channel - 7 ... 8 90 : Channel - 9 ... 10 110 : Channel - 11 ... 12 130 : Channel - 13 ... 14 150 : Channel - 15 ... 16 170 : Channel - 17 ... 18 190 : Channel - 19 ... 20 210 : Channel - 21 ... 22 230 : Channel - 23 ... 24	Valve Heating Control Value Valve Cooling Control Value	1 byte / percentage (0..100%)	C	-	W	-
	11 : Channel - 1 ... 2 31 : Channel - 3 ... 4 51 : Channel - 5 ... 6 71 : Channel - 7 ... 8 91 : Channel - 9 ... 10 111 : Channel - 11 ... 12 131 : Channel - 13 ... 14 151 : Channel - 15 ... 16 171 : Channel - 17 ... 18 191 : Channel - 19 ... 20 211 : Channel - 21 ... 22 231 : Channel - 23 ... 24	Valve Status Value	1 byte / percentage (0..100%)	C	-	-	-

- **Valve Heating Control Value; Valve Cooling Control Value:** The valve is directed to the location with the 1 byte value through this object.
- **Valve Status:** It shows the location of valve through this object

PS : When the device been energized, it works for the status where the beggining location is off with activate the break contact as much as the travel time.

4.4 Fan Coil with 2 Speed

Fan coil devices are mechanical devices used in heating and cooling systems that provide air conditioning in the space from the conditioned liquid passing through them. Inside the device there is an engine for air circulation. This engine has different levels of speed. This engine has different levels of speed. The speed levels range from 2 to 5 however it mostly contains 3 speed levels. This device provides direct support for speed control of 2 or 3 speed fancoil units. They are called 2-pipe or 4-pipe according to the hot, cold water circuits that pass through the fan coil devices. The valves of these pipes also need to be checked. You can connect thermal, solenoid or 3-point valve controller motors which are operating with 230V to any available channel of the device.

Fan Coil parameter sheet is as follows.

+ General	Fan Start Delay	0	sec
- Output - 1 ... 2	Fan Acceleration Time	0	sec
Fan Coil Parameters			
+ Output - 3 ... 4	Fan Speed Output	<input checked="" type="radio"/> One Output for Each Stage <input type="radio"/> Stepped Out	
	Fan Speed Change Delay	0	ms
	Fan Automatic Means	Auto=1, Manual=0	
	Automatic Control Inputs	<input checked="" type="radio"/> 1 <input type="radio"/> 2	
	Automatic Fan Speed Values		
	Fan - 1 Start at	25	
	Fan - 2 Start at	105	
	Hysteresis	0	%
	Fan Speed Data Type	<input checked="" type="radio"/> DPT 5.100 (Fan Stage) <input type="radio"/> DPT 5.001 (Percentage)	
	Fan Speed on Startup	<input checked="" type="radio"/> Automatic <input type="radio"/> Manual	
	Fan Speed on Bus Voltage Fail	Keep Position	
	Window Contact Action	Keep Position	

4.4.1 Fan Start Delay

This is the delay determined before the fan coil starts to work. Most of the time the flow direction of hot/cold water and the fan operation starts at the same time, but it takes time for the valve to open and the water to circulate through the device. During this time, the fan coil blows unconditioned air, which can cause discomfort. To prevent this, a period of time can be determined between 0-255 seconds.

4.4.2 Fan Acceleration Time

Fan motors contain electronic circuits that adjust the speed within them. By the agency of these circuits, the motor can operate in slower stages than usual. Especially at low speeds, it may take time for the motor to reach the targeted speed. The engine to reach its targeted speed is called "Acceleration", and the shortest amount of time for this to happen is called "Acceleration Time". Specifies the minimum duration of engine at any speed. This "time" is only valid for the initial start of the engine.

4.4.3 Fan Speed Output

There are two types of progressive operation. The first and common one is the model, in which one single output is activated for each stage, while the others are made open contact. So for low fan speed, the first speed output is On, the others are Off; for medium fan speed, the second speed output is On, the others are Off and for high fan speed, the third fan speed is On, and the others are Off. Another working operation is the progressive output operation. In this operation, for low fan speed the first speed output is On, the others are Off; for medium fan speed the first, second and the outputs are On, the other is Off and for high fan speed all three outputs are On. Pay attention to the electrical requirements of the fan coil device in this model. If they are fed through the same phase, make sure that the contacts feed through the same phase. The default value is "One Output for Each Stage".

4.4.4 Fan Speed Change Delay

It is the name given to the gap time left between two speeds to prevent possible electrical problems when switching between fan stages. It can be selected as 0, 250, 500 or 5000ms. During this time, all the contacts of the function are open circuit, then they switch to the new speed.

4.4.5 Fan Automatic Means

Requires 1-bit Auto/Manual information to allow the fan speed to be automatically adjusted according to the received heating or cooling control value. This is the area where the meaning of the 1-bit data information is described. If the information received for automatic operation is "1", Auto=1, Manual=0 is selected, otherwise the other options is selected.

4.4.6 Automatic Control Inputs

Thermostats produce control values according to the amount of heating or cooling needs. Depending on the type of application, these control values can be received from one object or two separate objects. If the number of automatic control inputs is 1, the fan will be able to work automatically with the information between 0-255 to be received through the "Heating / Cooling Control Value" communication object. In systems where the Heating and Cooling control values are handled on two separate objects, a new preference line is added to decide which input to process: Control Input Select: "Large Value" or "Heating/Cooling Mode". In normal applications, at most one of the heating or cooling control values receives a positive value. So while the heating is active, the value of the cooling is zero (and vice versa). Therefore, choosing a Large Value actually allows the mode of operation to be understood as well. In the other preference "Heating/Cooling Mode" option, an additional communication object is added "Heating/Cooling Mode Selection". The device decides on automatic fan speed operation with this 1-bit DPT "1.100 cooling/heating" data type. The device will decide according to the Fan-Coil Heating Control Value if this information is 1=heating; and according to the Fan-Coil Cooling Control Value if 0=cooling.

4.4.7 Automatic Fan Speed Values

The device needs threshold values of the control value to automatically stagger the fan speed. The transmitted control value is converted to the appropriate speed according to the thresholds set in this field. Normally expected threshold values are $0 < \text{Fan 1} < \text{Fan 2} < 256$. If the values are not determined in this way, the software will automatically sort them. However, the expected method is to enter the information sequentially.

4.4.8 Hysteresis

It is a technique applied to prevent unnecessary changes in the transitions between Fan Speeds. It is based on the technique of creating zones where the position is maintained between the speeds by adding to the Automatic Fan Speed Values determined above.

4.4.9 Fan Speed Data Type

At fan speeds, the data type is 1-byte and can be published in two formats. The first of these is the DPT 5.100 data type, which is listed as 0,1,2. The desired or current fan speed is indicated by these figures. The other data type is DPT 5.001. In this format, data is sent between 0-255 (or 0-100%). For three-speed fan speed control according to standard KNX functions, the fan speed operates at the first speed for values between (1-50) %, (1-128)10, (1-80)16, and at the second speed if the 1-byte data value from the fan speed communication object is between (51-100)% , (129-255)10, or (81-FF)16 . The speed status information is published as the current (0,128,255)10 values.

4.4.10 Fan Speed on Startup

This section sets what the current fan operation will be when the device starts. If "Automatic" is selected, it will start working automatically according to the incoming heating or cooling control values. If "Manual" is selected, a line will show up to determine the position:

+ General	Fan Start Delay	0	sec
- Output - 1 ... 2	Fan Acceleration Time	0	sec
Fan Coil Parameters			
+ Output - 3 ... 4	Fan Speed Output	<input checked="" type="radio"/> One Output for Each Stage <input type="radio"/> Stepped Out	
	Fan Speed Change Delay	0	ms
	Fan Automatic Means	Auto=1, Manual=0	
	Automatic Control Inputs	<input checked="" type="radio"/> 1 <input type="radio"/> 2	
	Automatic Fan Speed Values		
	Fan - 1 Start at	25	
	Fan - 2 Start at	105	
	Hysteresis	0	%
	Fan Speed Data Type	<input checked="" type="radio"/> DPT 5.100 (Fan Stage) <input type="radio"/> DPT 5.001 (Percentage)	
	Fan Speed on Startup	<input type="radio"/> Automatic <input checked="" type="radio"/> Manual	
	Fan Speed	Keep Position	
	Fan Speed on Bus Voltage Fail	Keep Position ✓ OFF 1 2	
	Window Contact Action		

From this list, the appropriate value is determined. "Keep Position" indicates that the device continues to the position in which it was originally left, while the others refer to move to the specified position.

4.4.11 Fan Speed Bus Voltage Fail

The device is the option where the position of the line is determined during the KNX line interruption until the line starts operating again and new information arrives. The list is shown above.

4.4.12 Window Contact Action

The 1-bit ON command that can come from the KNX line to the "Fan Coil Window Contact" communication object transmits the information that the window / door has been opened to the device. This information gives the device the possibility to manually readjust the fan speed. It may be preferable to adjust or not change the speed of the fan when the window or door is open. When a 1-bit OFF command is sent to the same communication object, the fan speed returns to its previous position.

	Common Object:		Length / Data Type	C	R	W	T
	Channel Number	Object Function					
2-Speed Fan Coil	10 : Channel - 1 ... 2 50 : Channel - 5 ... 6 90 : Channel - 9 ... 10 130 : Channel - 13 ... 14 170 : Channel - 17 ... 18 210 : Channel - 21 ... 22	Fan Coil Automatic Mode On/ Off Fan Coil Manual Mode On/ Off	1 bit / boolean	C	-	W	-
	11 : Channel - 1 ... 2 51 : Channel - 5 ... 6 91 : Channel - 9 ... 10 131 : Channel - 13 ... 14 171 : Channel - 17 ... 18 211 : Channel - 21 ... 22	Fan Coil Heating/Cooling Control Value Fan Coil Heating Control Value	1 byte / percentage (0..100%)	C	-	W	-
	12 : Channel - 1 ... 2 52 : Channel - 5 ... 6 92 : Channel - 9 ... 10 132 : Channel - 13 ... 14 172 : Channel - 17 ... 18 212 : Channel - 21 ... 22	Fan Coil Cooling Control Value	1 byte / percentage (0..100%)	C	-	W	T
	13 : Channel - 1 ... 2 53 : Channel - 5 ... 6 93 : Channel - 9 ... 10 133 : Channel - 13 ... 14 173 : Channel - 17 ... 18 213 : Channel - 21 ... 22	Fan Coil Heating/Cooling Mod Selection	1 bit / cooling/heating	C	-	W	T
	14 : Channel - 1 ... 2 54 : Channel - 5 ... 6 94 : Channel - 9 ... 10 134 : Channel - 13 ... 14 174 : Channel - 17 ... 18 214 : Channel - 21 ... 22	Fan Coil Window Contact	1 bit / switch	C	-	W	-
	15 : Channel - 1 ... 2 55 : Channel - 5 ... 6 95 : Channel - 9 ... 10 135 : Channel - 13 ... 14 175 : Channel - 17 ... 18 215 : Channel - 21 ... 22	Fan Coil Automatic Mode Status Fan Coil Manual Mode Status	1 bit / boolean	C	R	-	T

	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
2-Speed Fan Coil	16 : Channel - 1 ... 2 56 : Channel - 5 ... 6 96 : Channel - 9 ... 10 136 : Channel - 13 ... 14 176 : Channel - 17 ... 18 216 : Channel - 21 ... 22	Fan Coil On/Off Status	1 bit / boolean	C	R	-	T
	17 : Channel - 1 ... 2 57 : Channel - 5 ... 6 97 : Channel - 9 ... 10 137 : Channel - 13 ... 14 177 : Channel - 17 ... 18 217 : Channel - 21 ... 22	Fan Coil Heating/Cooling Mode Status	1 bit / cooling/heating	C	R	-	T
	18 : Channel - 1 ... 2 58 : Channel - 5 ... 6 98 : Channel - 9 ... 10 138 : Channel - 13 ... 14 178 : Channel - 17 ... 18 218 : Channel - 21 ... 22	Fan Coil Speed Set	1 bit / percentage (0..100%) 1 bit / fan stage (0..255)	C	-	W	-
	19 : Channel - 1 ... 2 59 : Channel - 5 ... 6 99 : Channel - 9 ... 10 139 : Channel - 13 ... 14 179 : Channel - 17 ... 18 219 : Channel - 21 ... 22	Fan Coil Speed Status	1 bit / percentage (0..100%) 1 bit / fan stage (0..255)	C	R	-	T

- **Fan Coil Automatic Mode On/Off; Fan Coil Manual Mode On/Off:** The object used for switching the device to the automatic or manual mode with the 1 bit value that is given.
- **Fan Coil Heating/Cooling Control Value; Fan Coil Heating Control Value ; Fan Coil Cooling Control Value:** Detects the level of the device run with the 1 byte value that is came to the object.
- **Fan Coil Heating/Cooling Mode Selection:** With this object makes a decision about which objects is going to be listened between xx1 or xx2. Devices mode can be selected as heating or cooling
- **Fan Coil Window Contact:** The object is used to trigger the window open status..
- **Fan Coil Automatic Mode Status; Fan Coil Manual Mode Status:** These objects give an information about which control mode the device in.
- **Fan Coil On/Off Status:** This object gives an information about the device is running or not.
- **Fan Coil Heating/Cooling Mode Status:** This object gives an information about which mode (Heating/ Cooling) that device is running.
- **Fan Coil Speed Set:** This object switches the device to manual mode and allow from a manual mode to level control. Gives 1 byte value.
- **Fan Coil Speed Status:** It is a feedback object that shows which level that device is running.

4.5 Fan Coil with 3-Speed

Fan coil devices are mechanical devices used in heating and cooling systems that provide air conditioning in the space from the conditioned liquid passing through them. Inside the device there is an engine for air circulation. This engine has different levels of speed. The speed levels range from 2 to 5 however it mostly contains 3 speed levels. This device provides direct support for speed control of 2 or 3 speed fan coil units. They are called 2-pipe or 4-pipe according to the hot, cold water circuits that pass through the fan coil devices. The valves of these pipes also need to be checked. You can connect thermal, solenoid or 3-point valve controller motors which are operating with 230V to any available channel of the device.

Fan Coil opening parameter sheet is as follows.

+ General	Fan Start Delay	0	sec
- Output - 1 ... 3	Fan Acceleration Time	0	sec
Fan Coil Parameters			
+ Output - 4	Fan Speed Output	<input checked="" type="radio"/> One Output for Each Stage <input type="radio"/> Stepped Out	
	Fan Speed Change Delay	0	sec
	Fan Automatic Means	Auto=1, Manual=0	
	Automatic Control Inputs	<input checked="" type="radio"/> 1 <input type="radio"/> 2	
	Automatic Fan Speed Values		
	Fan - 1 Start at	25	
	Fan - 2 Start at	105	
	Fan - 3 Start at	180	
	Hysteresis	0	%
	Fan Speed Data Type	<input checked="" type="radio"/> DPT 5.100 (Fan Stage) <input type="radio"/> DPT 5.001 (Percentage)	
	Fan Speed on Startup	<input checked="" type="radio"/> Automatic <input type="radio"/> Manual	
	Fan Speed on Bus Voltage Fail	Keep Position	
	Window Contact Action	Keep Position	

4.5.1 Fan Start Delay

This is the delay determined before the fan coil starts to work. Most of the time the flow direction of hot/cold water and the fan operation starts at the same time, but it takes time for the valve to open and the water to circulate through the device. During this time, the fan coil blows unconditioned air, which can cause discomfort. To prevent this, a period of time can be determined between 0-255 seconds.

4.5.2 Fan Acceleration Time

Fan motors contain electronic circuits that adjust the speed within them. By the agency of these circuits, the motor can operate in slower stages than usual. Especially at low speeds, it may take time for the motor to reach the targeted speed. The motor to reach its targeted speed is called "Acceleration", and the shortest amount of time for this to happen is called "Acceleration Time". Specifies the minimum duration of motor at any speed.

4.5.3 Fan Speed Output

There are two types of progressive operation. The first and common one is the model, in which one single output is activated for each stage, while the others are made open switch. So for low fan speed, the first speed output is On, the others are Off; for medium fan speed, the second speed output is On, the others are Off and for high fan speed, the third fan speed is On, and the others are Off. Another working operation is the progressive output operation. In this operation, for low fan speed the first speed output is On, the others are Off; for medium fan speed the first, second and the outputs are On, the other is Off and for high fan speed all three outputs are On. Pay attention to the electrical requirements of the fan coil device in this model. If they are fed through the same phase, make sure that the contacts feed through the same phase. The default value is "One Output for Each Stage".

4.5.4 Fan Speed Change Delay

It is the name given to the gap time left between two speeds to prevent possible electrical problems when switching between fan speeds. It can be selected at intervals of 250ms from 0 to 1000ms. During this time, all the switches of the function are open circuit, then they switch to the new speed.

4.5.5 Fan Automatic Means

Requires 1-bit Auto/Manual information to allow the fan speed to be automatically adjusted according to the received heating or cooling control value. This is the area where the meaning of the 1-bit data information is described. If the information received for automatic operation is "1", Auto=1, Manual=0 is selected, otherwise the other options is selected.

4.5.6 Automatic Control Inputs

Thermostats produce control values according to the amount of heating or cooling needs. Depending on the type of application, these control values can be received from one object or two separate objects. If the number of automatic control inputs is 1, the fan will be able to work automatically with the information between 0-255 to be received through the "Heating / Cooling Control Value" communication object. In systems where the Heating and Cooling control values are handled on two separate objects, a new preference line is added to decide which input to process: Control Input Select: "Large Value" or "Heating/Cooling Mode". In normal applications, at most one of the heating or cooling control values receives a positive value. So while the heating is active, the value of the cooling is zero (and vice versa). Therefore, choosing a Large Value actually allows the mode of operation to be understood as well. In the other preference "Heating/Cooling Mode" option, an additional communication object is added "Heating/Cooling Mode Selection;". The device decides on automatic fan speed operation with this 1-bit DPT "1.100 cooling/heating" data type. The device will decide according to the Fan-Coil Heating Control Value if this information is 1=heating; and according to the Fan-Coil Cooling Control Value if 0=cooling.

4.5.7 Automatic Fan Speed Values

The device needs threshold values of the control value to automatically stagger the fan speed. The transmitted control value is converted to the appropriate speed according to the thresholds set in this field. Normally expected threshold values are 0 < Fan 1 < Fan 2 < Fan 3 < 256. If the values are not determined in this way, the software will automatically sort them. However, the expected method is to enter the information sequentially.

4.5.8 Hysteresis

It is a technique applied to prevent unnecessary changes in the transitions between Fan Speeds. It is based on the technique of creating zones where the position is maintained between the speeds by adding to the Automatic Fan Speed Values determined above.

4.5.9 Fan Speed Data Type

At fan speeds, the data type is 1-byte and can be published in two formats. The first of these is the DPT 5.100 data type, which is listed as 0,1,2,3. The desired or current fan speed is indicated by these figures. The other data type is DPT 5.001. In this format, data is sent between 0-255 (or 0-100%). For three-speed fan speed control according to standard KNX functions, the fan speed operates at the first speed for values between, (34-66) % , (86-170)10, or (56-AA)16 at the second speed; (67-100)%, (171-255)10 or (AB-FF)16 for the values from the communication object. The speed status information is published as valid from the values of (0,85,170,255)10.

4.5.10 Fan Speed on Startup

This section sets what the current fan operation will be when the device starts. If "Automatic" is selected, it will start working automatically according to the incoming heating or cooling control values. If "Manual" is selected, a line will show up to determine the position:

+ General	Fan Start Delay	0	sec
- Output - 1 ... 3	Fan Acceleration Time	0	sec
Fan Coil Parameters			
+ Output - 4	Fan Speed Output	<input checked="" type="radio"/> One Output for Each Stage <input type="radio"/> Stepped Out	
	Fan Speed Change Delay	0	sec
	Fan Automatic Means	Auto=1, Manual=0	
	Automatic Control Inputs	<input checked="" type="radio"/> 1 <input type="radio"/> 2	
	Automatic Fan Speed Values		
	Fan - 1 Start at	25	
	Fan - 2 Start at	105	
	Fan - 3 Start at	180	
	Hysteresis	0	%
	Fan Speed Data Type	<input checked="" type="radio"/> DPT 5.100 (Fan Stage) <input type="radio"/> DPT 5.001 (Percentage)	
	Fan Speed on Startup	<input type="radio"/> Automatic <input checked="" type="radio"/> Manual	
	Fan Speed	Keep Position	
	Fan Speed on Bus Voltage Fail	Keep Position <input checked="" type="checkbox"/> OFF 1 2 3	
	Window Contact Action		

4.5.11 Fan Speed on Bus Voltage Fail

The device is the option where the position of the line is determined during the KNX line interruption until the line starts operating again and new information arrives. The list is shown above.

4.5.12 Window Contact Action

The 1-bit ON command that can come from the KNX line to the "Fan Coil Window Contact" communication object transmits the information that the window / gate has been opened to the device. This information gives the device the possibility to manually readjust the fan speed. It may be preferable to adjust or not change the speed of the fan when the window or gate is open. When a 1-bit OFF command is sent to the same communication object, the fan speed returns to its previous position.

3-Speed Fan Coil	Common Object :	Object Function	Length / Data Type	C	R	W	T
	Channel Number						
	10 : Channel - 1 ... 3 50 : Channel - 5 ... 7 90 : Channel - 9 ... 11 130 : Channel - 13 ... 15 170 : Channel - 17 ... 19 210 : Channel - 21 ... 23	Fan Coil Automatic Mode On/ Off Fan Coil Manual Mode On/ Off	1 bit / boolean	C	-	W	-
	11 : Channel - 1 ... 3 51 : Channel - 5 ... 7 91 : Channel - 9 ... 11 131 : Channel - 13 ... 15 171 : Channel - 17 ... 19 211 : Channel - 21 ... 23	Fan Coil Heating/Cooling Control Value Fan Coil Heating Control Value	1 byte / percentage (0..100%)	C	-	W	-
	11 : Channel - 1 ... 3 51 : Channel - 5 ... 7 91 : Channel - 9 ... 11 131 : Channel - 13 ... 15 171 : Channel - 17 ... 19 211 : Channel - 21 ... 23	Fan Coil Cooling Control Value	1 byte / percentage (0..100%)	C	-	W	-
	13 : Channel - 1 ... 3 53 : Channel - 5 ... 7 93 : Channel - 9 ... 11 133 : Channel - 13 ... 15 173 : Channel - 17 ... 19 213 : Channel - 21 ... 23	Fan Coil Heating/Cooling Mode Selection	1 bit / cooling/heating	C	-	W	-
	14 : Channel - 1 ... 3 54 : Channel - 5 ... 7 94 : Channel - 9 ... 11 134 : Channel - 13 ... 15 174 : Channel - 17 ... 19 214 : Channel - 21 ... 23	Fan Coil Window Contact	1 bit / switch	C	-	W	-
	15 : Channel - 1 ... 3 55 : Channel - 5 ... 7 95 : Channel - 9 ... 11 135 : Channel - 13 ... 15 175 : Channel - 17 ... 19 215 : Channel - 21 ... 23	Fan Coil Automatic Mode Status Fan Coil Manual Mode Status	1 bit / boolean	C	R	-	T

3-Speed Fan Coil	Common Object : Channel Number	Object Function	Length / Data Type	C	R	W	T
	16 : Channel - 1 ... 3 56 : Channel - 5 ... 7 96 : Channel - 9 ... 11 136 : Channel - 13 ... 15 176 : Channel - 17 ... 19 216 : Channel - 21 ... 23	Fan Coil On/Off Status	1 bit / boolean	C	R	-	T
	17 : Channel - 1 ... 3 57 : Channel - 5 ... 7 97 : Channel - 9 ... 11 137 : Channel - 13 ... 15 177 : Channel - 17 ... 19 217 : Channel - 21 ... 23	Fan Coil Heating/Cooling Mode Status	1 bit / cooling/heating	C	R	-	T
	18 : Channel - 1 ... 3 58 : Channel - 5 ... 7 98 : Channel - 9 ... 11 138 : Channel - 13 ... 15 178 : Channel - 17 ... 19 218 : Channel - 21 ... 23	Fan Coil Speed Set	1 bit / percentage (0..100%) 1 bit / fan stage (0..255)	C	-	W	-
	19 : Channel - 1 ... 3 59 : Channel - 5 ... 7 99 : Channel - 9 ... 11 139 : Channel - 13 ... 15 179 : Channel - 17 ... 19 219 : Channel - 21 ... 23	Fan Coil Speed Status	1 bit / percentage (0..100%) 1 bit / fan stage (0..255)	C	R	-	T

- **Fan Coil Automatic Mode On/Off; Fan Coil Manual Mode On/Off:** The object used for switching the device to the automatic or manual mode with the 1 bit value that is given.
- **Fan Coil Heating/Cooling Control Value; Fan Coil Heating Control Value ; Fan Coil Cooling Control Value:** Detects the level of the device run with the 1 byte value that is came to the object.
- **Fan Coil Heating/Cooling Mode Selection:** With this object makes a decision about which objects is going to been listened between xx1 or xx2. Devices mode can be selected as heating or cooling
- **Fan Coil Window Contact:** The object is used to trigger the window open status..
- **Fan Coil Automatic Mode Status; Fan Coil Manual Mode Status:** These objects give an information about which control mode the device in.
- **Fan Coil On/Off Status:** This object gives an information about the device is running or not.
- **Fan Coil Heating/Cooling Mode Status:** This object gives an information about which mode (Heating/Cooling) that device is running.
- **Fan Coil Speed Set:** This object switches the device to manual mode and allow from a manual mode to level control. Gives 1 byte value.
- **Fan Coil Speed Status:** It is a feedback object that shows which level that device is running.



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