blumotix
TOUCH YOUR WORLD

Technical Manual
QUBIK KEYPAD

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KNX

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1 Introduction

Qubik keypad is a touch control device in capacitive technology with 8 keys than can perform KNX functions such as on/off control, dimmer control, shutter control, scene management.
The keypad has a solid-state temperature probe with which traditional KNX thermostat functions can be programmed.

The device is powered by the bus line, it has 4 x RGB LEDs for night-time localization and it displays the status of the controlled load or dedicated command type.
The device has a buzzer for acoustic signals of the touch screen.
The keypad module is positioned inside standard flush-mounted boxes.

2 Application

2.1 Functions associated with the keys

Each of the 8 channels of the keypad can be configured with the ETS software to perform one of the functions listed below.

Switching/command sequence management:
- touch/release switching management with sequence sending
- short/long touch management with command transmission
- enabling/locking of channels/keys

Scenes:
- scene management with 1-byte object
- sending commands for scene storing
- enabling/locking

2-bit forcing commands:
- sending short and long forcing commands
- enabling/locking

Shutter/curtain control:
- with a single or double button
- long press mode with dedicated command
- enabling/locking

Dimmer control:
- with a single or double button
- with a stop telegram
- sending the adjustable lighting value (0% -100%)
- enabling/locking

Sequential sending of values, 1 Byte:
- Short press, maximum number of values: 4, setting range: 0-255
- Long press, maximum number of values: 4, setting range: 0-255
- enabling/locking

Multi-action:
- Short press, maximum number of actions: 3, to choose from: switching, movement, scene, sending value range: 0-255, sending % value, climate
- enabling/locking

RGB LED output control for each RGB LED:
- 2 operating modes / RGB LED light signalling
- signalling states
- alarm signalling function
- combination of 4 lighting effects and colour selection

2.2 Temperature control functions

Temperature control
- 2-point, with ON/OFF commands or 0%/100% commands;
- integral proportional control, with PWM commands or continuous regulation (0% ÷ 100%), PI% with PID

Fan coil management
- fan coil speed control with ON/OFF selection commands or continuous adjustment (0% ÷ 100%);
- 2 or 4-way system management with ON/OFF commands or 0%/100% commands.

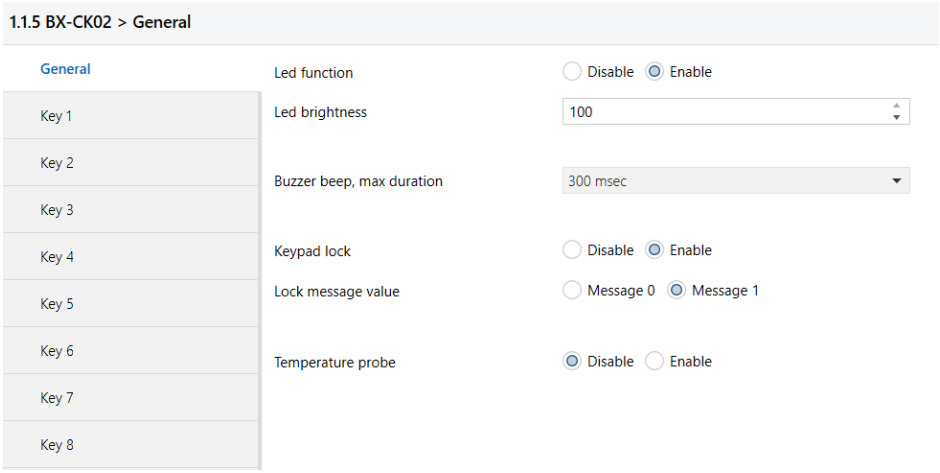
Operating mode setting
- by bus with separate 1-bit objects (OFF, ECONOMY, PRECOMFORT, COMFORT)
- by bus with 1-byte object

Temperature measurement
- with integrated sensor;
- combination of integrated sensor/ KNX temperature control probe/ outdoor temperature sensor with relative weight setting;

Other functions
- Setpoint setting (ECONOMY, STANDBY, COMFORT) from the bus;
- Setting the type of operation (heating/cooling) from the bus;
- transmission of status information (mode, type), measured temperature and current set-point to the bus;
- management of window status signalling for temporary switch-off of the programmable thermostat;
- auxiliary input for front management, short/long operation, dimmer with single button, roller shutters with single button, scenes and window contact with delay;
- Limit decrease and increase by key "Qubik Thermostat version only"

3 "General" menu

The General menu shows the application parameters that affect all 8 channels implemented by the device.



(fig. 3.1)

As general DPTs, DPTs #182 is available for a total locking of the keyboard (for possible cleaning of the front panel) and #183 for locking status.

1 bit writing #182	Keyboard locked
0 bit writing #182	Keyboard unlocked

182	Keypad lock	Set	1 bit	C	-	W	-	-	1-bit, enable	Low
183	Keypad lock	Status	1 bit	C	R	-	T	-	1-bit, state	Low

3.1 Parameters

3.1.1 LED function

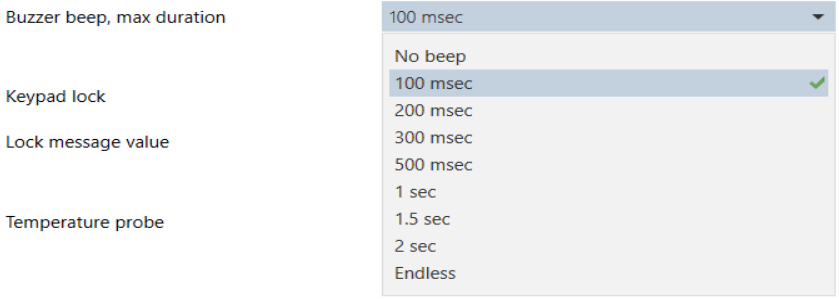
The LED enabling command makes it possible to use the 4 LEDs.

3.1.2 LED brightness

This field allows you to set the brightness value of the LEDs when the device is turned on.

3.1.3 Maximum beep buzzer duration

This parameter sets the time of the sound generated when touching a keyboard key:



3.1.4 Keypad lock

Enabling the keypad lock actually means enabling the command to lock the keypad. Locking the keyboard is useful, for example, when cleaning, to prevent glass cleaning from actuating unwanted commands. To this end, a command can be created using communication object #182 that will enable the keyboard to be locked when desired.

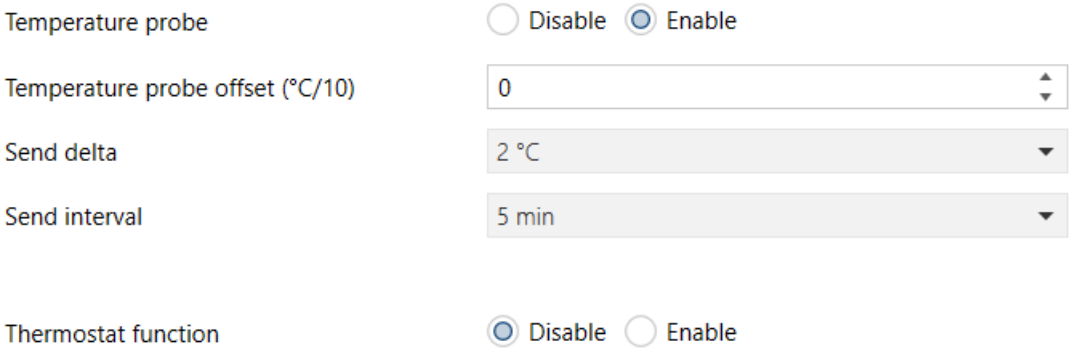
Setting the "enable" value makes data points visible:

182	Keypad lock	Set	1 bit	C	-	W	-	-	1-bit, enable	Low
183	Keypad lock	Status	1 bit	C	R	-	T	-	1-bit, state	Low

The "**Lock message value**" parameter is used to set the logic value of the bit received via the bus telegram to enable the locking function. Settable values:

3.1.5 Temperature probe

The temperature probe parameter allows the sensor to be operational for taking measurements and as an aid to the possible use of the thermostat function.



In doing so, ETS will expose communication object #184 to allow transmission of the temperature value (D.T.9 - Temperature = 2 Bytes).

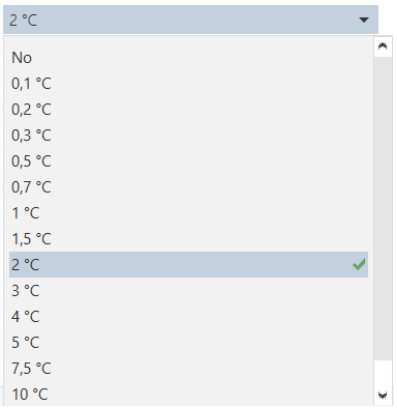
184	Probe	Temperature	2 bytes	C	R	-	T	-	2-byte float valu...	Low

3.1.6 Temperature probe correction (°C/10)

This field allows you to enter a correction factor on the measurement of the temperature probe.
The value notified on the KNX bus will be modified according to the indication written in the field, remembering that the number to be entered is expressed in tenths of a degree (this means that a value of 10 corrects the measurement by +1C°).

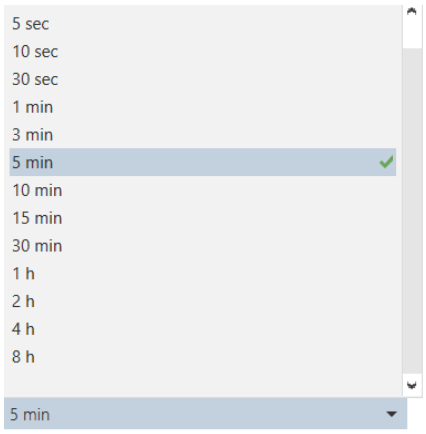
3.1.7 Sending difference

This field allows you to enable or disable the notification of a temperature measurement following a certain variation. "NO" disables the notification. Conversely, the selection of a temperature value defines the change from the last measurement required to determine a new notification.



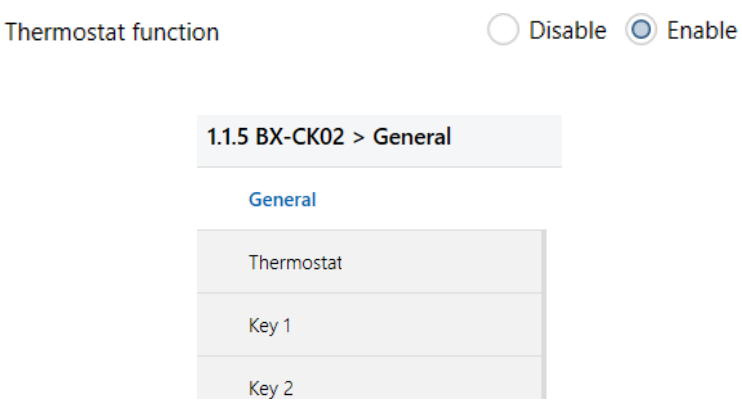
3.1.8 Sending interval

This parameter enables a periodic notification of the temperature measurement according to the chosen time interval.



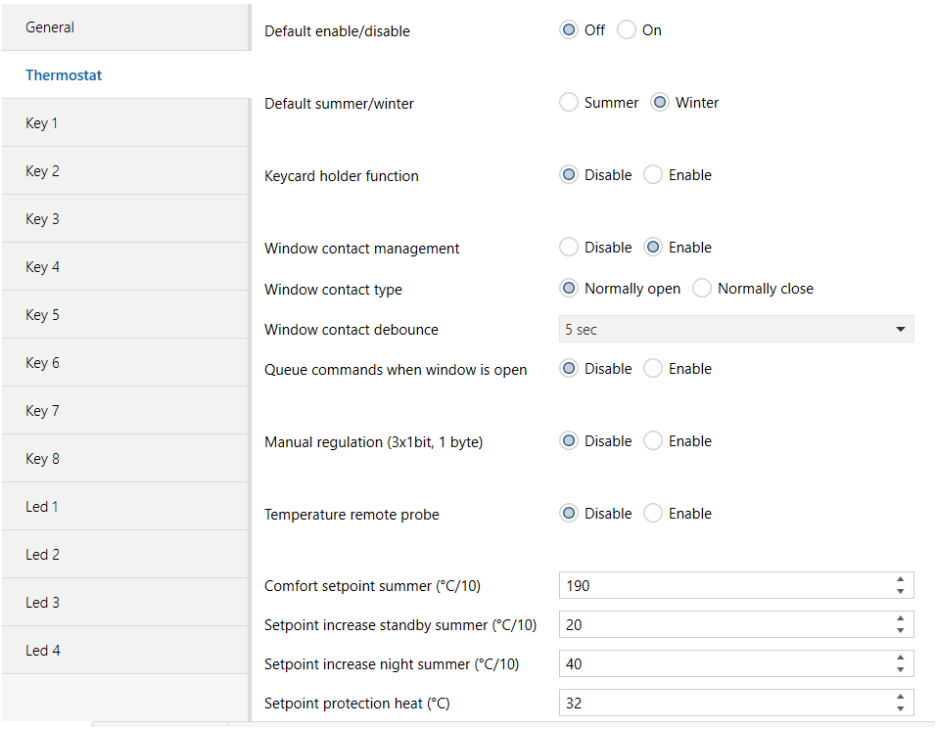
3.1.9 Thermostat function

Enabling this parameter makes you access the Thermostat settings



4 "Thermostat" menu

The Thermostat menu manages the device that regulates the operation of a thermal machine in order to maintain a constant temperature in a room (set-point).
The thermostat on the keyboard, using the available probe, is thus configured and can carry out its adjustment via the KNX communication objects that can be programmed with ETS and from the local keys.
By enabling the "Thermostat" function, ETS shows the thermostat menu where you insert all the functional parameters.



4.1 Parameters

4.1.1 Default enable/disable

This parameter makes it possible to specify at start-up, and therefore on the occurrence of a download from the ETS SW or on its power supply, the switching status of the part dedicated to temperature regulation by thermostat.

4.1.2 Default summer/winter

This parameter makes it possible to specify at start-up, and therefore on the occurrence of a download from the ETS SW or on its power supply, the switching status of the part dedicated to the "summer-winter" mode.

The "**summer-winter**" mode can also be changed via bus from the ETS with the status command objects DPT #191 and #192

191	Thermostat	Summer-winter selection (0-1)	1 bit	C	-	W	-	-	1-bit, cooling/he...	Low
192	Thermostat	Summer-winter sel. status	1 bit	C	R	-	T	-	1-bit, cooling/he...	Low

4.1.3 Keycard holder function

This parameter can be used to enable dedicated DPTs to control standby and comfort modes

Keycard holder function ○ Disable ◉ Enable

Here below the available DPTs with a 1bit value. You can then switch between the two modes. This function is required in Hotels or where a shortcut is required to command the two values.
Command object DPT #185, where 0 = standby and 1 = comfort;
DPT #186 status of the received command

185	Keycard holder	Set standby/comfort (0/1)	1 bit	C	R	W	T	-	1-bit, switch	Low
186	Keycard holder	Standby/comfort status (0/1)	1 bit	C	R	-	T	-	1-bit, switch	Low

4.1.4 Window contact management

It allows you to configure the channel to perform the "**window contact**" function of the thermostat function. This particular function allows the device to be forced into **OFF** mode when the window opens and to re-enable normal operation when the window closes.
This command has a higher priority than all remote commands, including 1-bit modes.

Window contact management ○ Disable ◉ Enable

Window contact type ◉ Normally open ○ Normally close

Window contact debounce 5 sec

Queue commands when window is open ◉ Disable ○ Enable

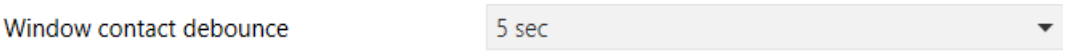
The "**Window contact type**" parameter allows you to associate the window status (closed/open).

Parameter	Value via ETS Open (0)	Value via ETS Close (1)
Window contact type N.O.	Opened window	Closed window
Window contact type N.C.	Closed window	Opened window

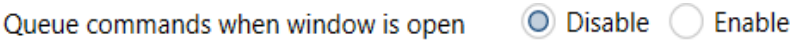
Changing the values makes it possible to set the type of contact that will be used. It is assumed that the status of the contact associated with the object made available on the window's ETS is stable.
The available DPTs are #187 for command # and 188 for status (window).
DPT #187 activates the thermostat setting in protection mode.

187	Thermostat	Open window signal	1 bit	C	R	W	T	-	1-bit, open/close	Low
188	Thermostat	Open window status	1 bit	C	R	-	T	-	1-bit, open/close	Low

"**Window contact debounce**" allows you to delay the reception and sending of the window contact enabling command

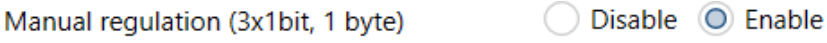


"**Queue commands when window is open**" makes it possible to set whether to "teach" the thermostat the commands received via ETS during the activation of the window contact. Of these commands received there is the priority in HVAC mode, if it does not have a variable set-point.



4.1.5 Manual regulation (3x1bit, 1 byte)

The "**manual regulation (3x1bit, 1 byte)**" parameter makes visible the various configuration items for the remote control of the thermostat in fan coil modes for speeds.



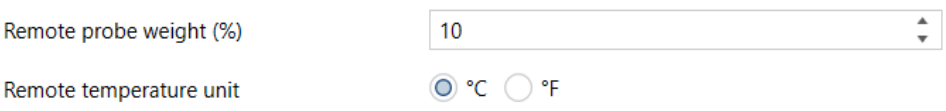
The command values to be used by the ETS are as follows:

212	Thermostat	Manual reg. input step V0	1 bit	C	R	W	T	-	1-bit, switch	Low
213	Thermostat	Manual reg. input step V1	1 bit	C	R	W	T	-	1-bit, switch	Low
214	Thermostat	Manual reg. input step V2	1 bit	C	R	W	T	-	1-bit, switch	Low
215	Thermostat	Manual reg. input step V3	1 bit	C	R	W	T	-	1-bit, switch	Low

4.1.6 Temperature remote probe

The "**remote temperature probe**" parameter allows you to enable a communication object for measuring the temperature of an external probe.

Selecting the value "**temperature remote probe**" makes the parameters visible:



"**Remote probe weight**" is the incidence of the external KNX sensor in the calculation of the measured temperature. It allows to receive the temperature measured by the external sensor. DPT #230 will be available

The "**Remote probe unit"** parameter allows you to set the unit of measurement to decode the information received via communication object #230-Remote probe.
The values that can be set are: degrees Celsius (°C) or degrees Fahrenheit (°F).

Depending on the value set for this parameter, the coding of the communication object changes, remaining always #230

Important!
Once the KNX remote probe is enabled, the measured temperature will not be determined only by the probe on board the device, but also by the weighted average between the value measured by the probe on board the device and the value measured by the external KNX input probe.
The "**Remote probe weight (%)**" parameter will affect the calculation of the measured temperature, allowing the incidence of the value measured by the KNX external probe to be determined in the calculation of the measured temperature, ranging from a minimum of 0% to a maximum of 100% (external probe measured value = measured temperature).

The complete formula for calculating the temperature is:

$$T_{measured} = T_{\substack{remote\\probe}} \times Incidence_{\substack{remote\\probe}} + T_{\substack{device\\probe}} \times \left(100\% - Incidence_{\substack{remote\\probe}}\right)$$

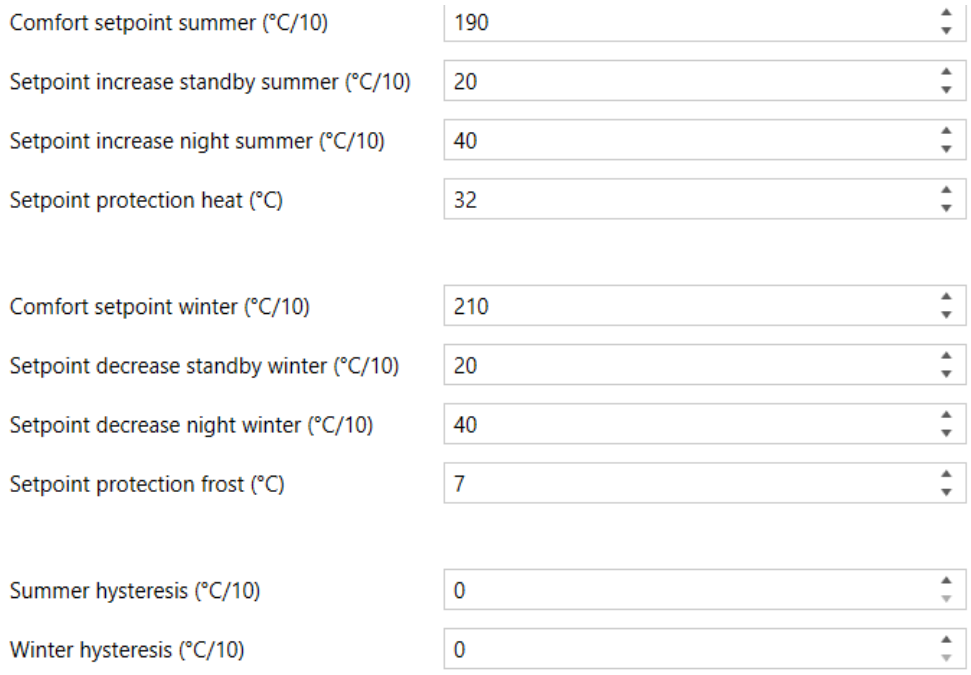
4.1.7 HVAC set-point settings

The thermostat can be programmed to have 4 ideal operating temperatures that meet the different conditions of household use in both summer and winter modes:

Comfort temperature summer/winter (mode 1)	It is the ideal temperature preferred by the owner when staying at home during the day.
Standby temperature summer/winter (mode 2)	It is the convenient ambient temperature for the best energy saving when leaving the house.
Economy temperature summer/winter (mode 3)	It is the ideal temperature for sleeping at night
Temperature Hot/cold protection (mode 4)	It is the minimum operating temperature that must be maintained in winter or summer, when the house is left uninhabited for long periods, to avoid freezing of the water pipes or excessive ambient temperatures.

Mode 0 is not active.

These temperatures can be programmed on the ETS and recalled when necessary to set the air conditioning to the best conditions of comfort, energy saving and safety.



The "**Comfort Temperature**" is the reference temperature of the device, the only one that can be adjusted and on which all others depend.
It is initially programmed with the ETS and can then be changed remotely with the appropriate communication object (set-point base) in the two modes where required, otherwise the individual set-point can also be used.

The DPTs available for commands sent via ETS are shown below, together with their statuses:

216	Thermostat	Base setpoint summer (°C)	2 bytes	C	-	W	-	-	2-byte float valu...	Low
217	Thermostat	Base setpoint winter (°C)	2 bytes	C	-	W	-	-	2-byte float valu...	Low
218	Thermostat	Setpoint summer status (°C)	2 bytes	C	R	-	T	-	2-byte float valu...	Low
219	Thermostat	Setpoint winter status (°C)	2 bytes	C	R	-	T	-	2-byte float valu...	Low

By acting on DPT# 206, 207, 208, 209, it is possible to permanently vary via ETS the "**delta increase/decrease**" of the settings made in the functional parameters of the device

206	Thermostat	Delta setp standby mode summer	2 bytes	C	-	W	-	-	2-byte float valu...	Low
207	Thermostat	Delta setp night mode summer	2 bytes	C	-	W	-	-	2-byte float valu...	Low
208	Thermostat	Delta setp standby mode winter	2 bytes	C	-	W	-	-	2-byte float valu...	Low
209	Thermostat	Delta setp night mode winter	2 bytes	C	-	W	-	-	2-byte float valu...	Low

It is possible to temporarily set the value via ETS. When the device is restarted or the first time one of the stored modes is called up, the previous value will be used, so the current value will be the one written (permanently) on DPT #216 and #217 or the one set in the parameters.

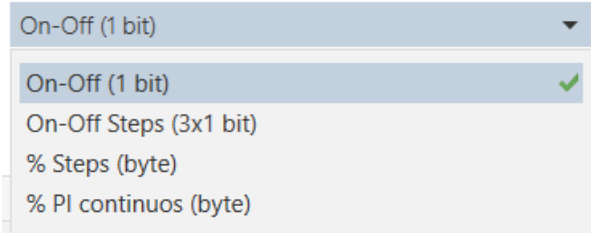
The available object is #205

205	Thermostat	Temporary setpoint (°C)	2 bytes	C	-	W	-	-	2-byte float valu...	Low

4.1.8 Summer/winter regulation type

❖ **On-Off (1bit)**

By selecting the type of control desired in the two summer/winter modes, the parameters of the internal control logic of the thermostat and the configuration menus are visible:



Given the different types of temperature control systems, it is possible to dedicate a common solenoid valve/fan coil speed control object to the heating and air conditioning system, dedicating one for each of the two types of operation with different controls available.

Selecting the **"On-Off (1bit)"** mode makes the output available for a conventional valve.

220	Thermostat	Output summer (on-off)	1 bit	C	R	-	T	-	1-bit, switch	Low
221	Thermostat	Output winter (on-off)	1 bit	C	R	-	T	-	1-bit, switch	Low

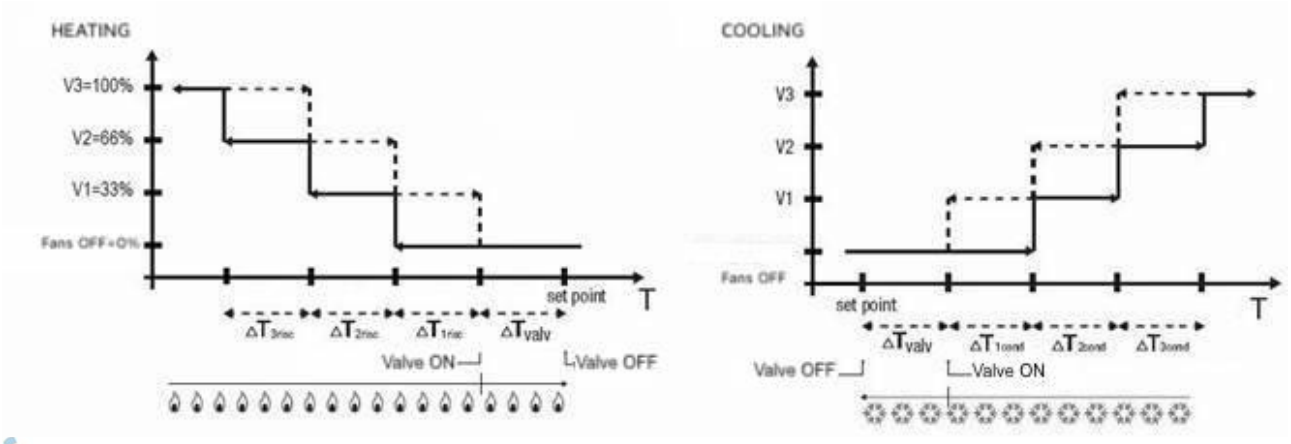
❖ On-Off Steps (3x1 bit)

The type of control applied when fan coil control is enabled is similar to that of the two-point control analysed in the previous chapters, i.e. to enable/disable fan coil speeds according to the difference between the set-point and the measured temperature.

Regulator type summer	On-Off Steps (3x1 bit)
Summer spd 0 threshold dT0(°C/10)=set-T0	0
Summer spd 1 threshold dT1(°C/10)=T0-T1	10
Summer spd 2 threshold dT2(°C/10)=T1-T2	10
Delay cooling fans command	No delay
Delay fans speed change	0.5 sec

The substantial difference with the 2-point algorithm is that, in this case, there is not just one stage to perform the hysteresis cycle by setting speed on/off thresholds, but there can be three stages (depending on the number of fan coil speeds).

Basically, this means that each stage corresponds to a speed, and when the difference between the measured temperature and the set-point leads to enabling a certain speed, it means that the other two speeds must absolutely be disabled before enabling the new speed.



To avoid continuous switching, the thermostat can wait up to 2 minutes before sending the activation command to the actuator controlling the temperature control system or to the actuator channels that control the fan coil speeds.

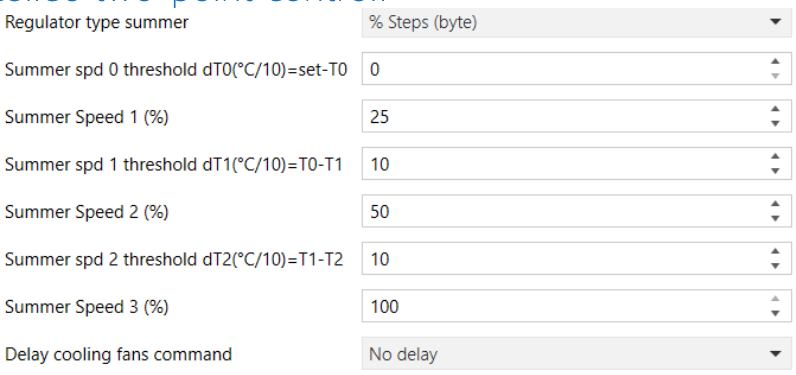
Both figures refer to the three-stage control of the fan coil, as the explanations in this case are exhaustive, and for two-stage or single-stage cases the operation is the same, with the only difference that not all speeds will be controlled.
Please find below the delays that can be set in the parameter settings.

The outputs in the DPTs made available for individual summer/winter adjustments are as follows:

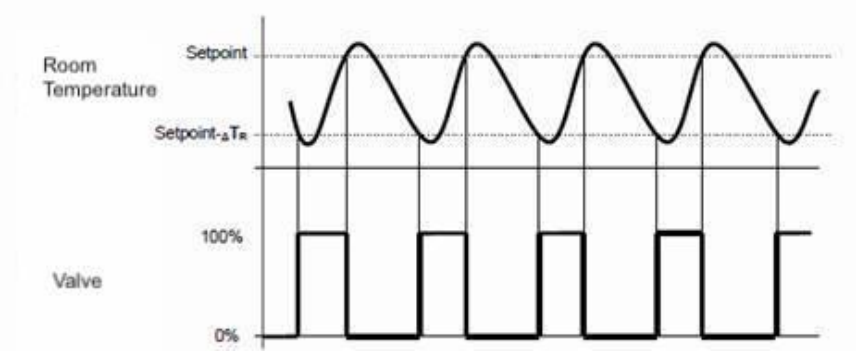
224	Thermostat	Step V1 output summer	1 bit	C	R	-	T	-	1-bit, switch	Low
225	Thermostat	Step V1 output winter	1 bit	C	R	-	T	-	1-bit, switch	Low
226	Thermostat	Step V2 output summer	1 bit	C	R	-	T	-	1-bit, switch	Low
227	Thermostat	Step V2 output winter	1 bit	C	R	-	T	-	1-bit, switch	Low
228	Thermostat	Step V3 output summer	1 bit	C	R	-	T	-	1-bit, switch	Low
229	Thermostat	Step V3 output winter	1 bit	C	R	-	T	-	1-bit, switch	Low

❖ 0% Steps (byte)

The algorithm used to control the temperature control system is the classic one, which is called two-point control.



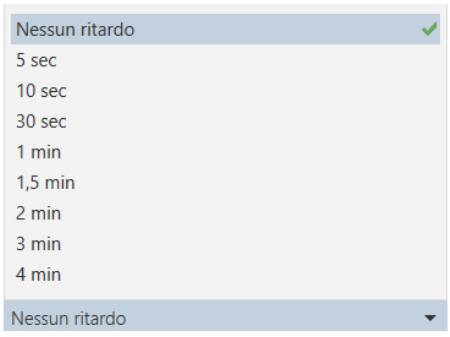
This type of control involves switching the temperature control system on and off according to a hysteresis cycle, i.e. there is no single threshold that discriminates between switching the system on and off, but two are identified.

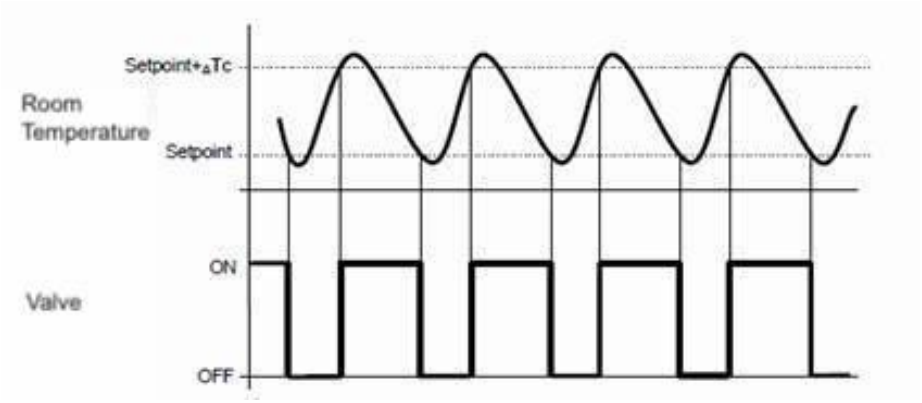


When the measured temperature is lower than "**set-point- Δ TR**" (where **Δ TR** is the heating regulation differential), the device will enable the heating system by sending the related bus percentage command to the actuator that manages it.
When the measured temperature reaches the set-point value, the device will disable the heating system by sending the related bus percentage command to the actuator that manages it.

From this diagram, it is clear that there are two decision thresholds for switching the heating system on and off: the first is "**set-point- Δ TR**", below which value the device turns the system on; the second is the set-point value, above which the device turns the system off.

To avoid continuous switching of the solenoid valves, after a 0%-100%-0% transition, the next 100% command can only be sent after the lapse of the delay time set in the parameters.





When the measured temperature is higher than "**set-point + Δ Tc**" (where **Δ Tc** is the air conditioning regulation differential), the device will enable the air conditioning system by sending the related bus command to the actuator that manages it.
When the measured temperature reaches the set-point value, the device will disable the air conditioning system by sending the related bus command to the actuator that manages it.

From this diagram, it is clear that there are two decision thresholds for switching the air conditioning system on and off: the first is the set-point, below which the device turns the system off; the second is the "**set-point+ΔTc**", above which value the device turns the system on.

Please find below the outputs in the DPTs made available for individual summer/winter settings

222	Thermostat	Output summer (%)	1 byte	C	R	-	T	-	percentage (0..100%)	Bassa
223	Thermostat	Output winter (%)	1 byte	C	R	-	T	-	percentage (0..100%)	Bassa

❖ % PI (byte)

The proportional/integral (PI) control type regulates and uses an advanced algorithm that maintains a more stable ambient temperature. This increases comfort in the environment.

This algorithm, integrated in the temperature control part, acts by sending an appropriate % value to the system.

The heating/cooling trend will therefore be gradual, increasing or decreasing the heat output of the system in question.
In order to achieve a perfect operation, it is necessary to calibrate it according to the type of environment and the type of system installed.

The quantities listed below must be set:

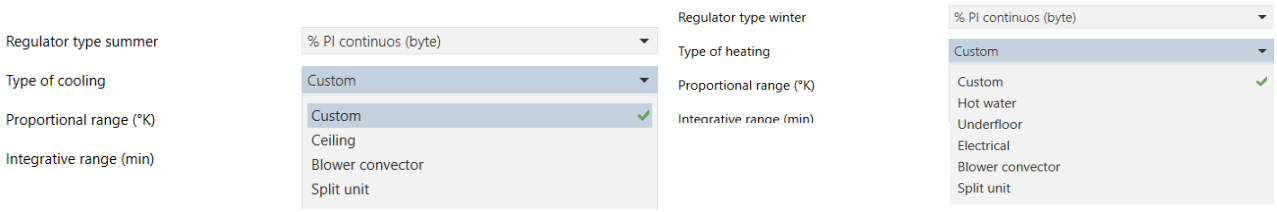
- Ta = ambient temperature
- Sp = current set-point
- Kp = Proportional part °K (coefficient of the proportional component, expressed in °K, but is also identical for °C). This can also be set with customized data or from the pre-set type in the cooling/heating type parameter
- Ki = coefficient of the integral component
- Bp = proportional band
- Ti = Integrative part (time in minutes)

Then the built-in algorithm considers these parameters:
The **proportional band** is used to calculate the coefficient Kp = 100 / Bp and it corresponds to the width of the proportional regulation band.
Starting from the set temperature, this value is the temperature interval in which the system power goes from 0% to 100%.

For example: With the (heating) temperature set at 20.0 °C and Band (P) = 4.0 °C, the thermostat activates the heating system at 100% when Ta is <= 16.0 °C.
As this temperature increases, the power of the system decreases until it reaches 0% when Ta reaches 20 °C.
The value must be set taking into account the heat capacity of the room to be controlled.
It is generally recommended to use small values for rooms with good thermal insulation and vice versa.
A constant 0% value will never occur, as 0 heat dissipation of our envelope is not possible.

The **integrative time** is used to calculate the coefficient Ki = Kp / Ti and it corresponds to the time after which, with the same deviation from the set-point (error), the integrative component will generate a contribution equal to that generated by the proportional component.
The **integral contribution** reduces the steady-state error if there are thermal energy losses in the room to be controlled, as this contribution increases according to the time in which the set-point is not reached.
In practice, if our enclosure has thermal dissipation, this is compensated for cyclically.
An incorrect setting of this value can cause transients with variations from the set-point or a longer time to reach it.

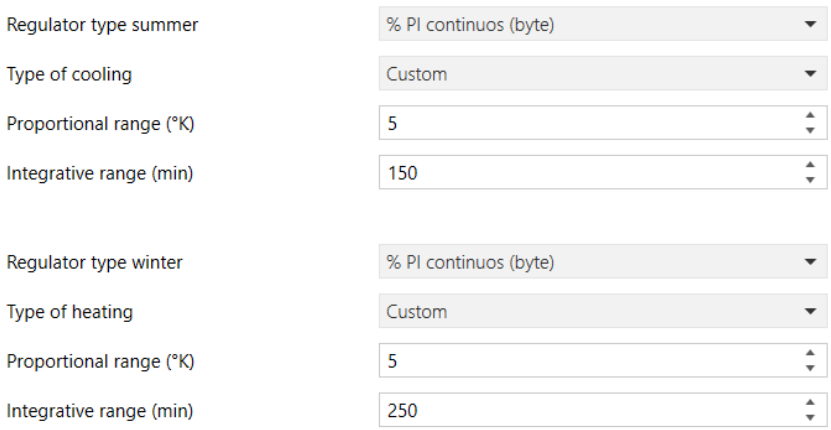
The coefficients above can be set in the ETS library of the device. This will only be possible in the "**custom cooling / heating type**" mode. However, you can choose modes with "recommended" settings depending on use.
These vary in the two cooling/heating modes below.



For ease of reference, references to the coefficients are given below:

- **The proportional coefficient Kp** for heating corresponds to the parameter: Proportional part "Heating / Heating".
- **The integral time Ti** is set through the parameters: Integral part Heating "Heating / Heating"

The PI control parameters should therefore be set according to the type of the chosen heating or cooling system and the size of the room/envelope based on its thermal insulation.



Typically, this choice is made based on fan coil use with the PWM (0-10V) regulation, using a proportional valve, and it is therefore possible to manage it with DPT#222, #223 below.

222	Thermostat	Output summer (%)	1 byte	C	R	-	T	-	8-bit unsigned v...	Low
223	Thermostat	Output winter (%)	1 byte	C	R	-	T	-	8-bit unsigned v...	Low

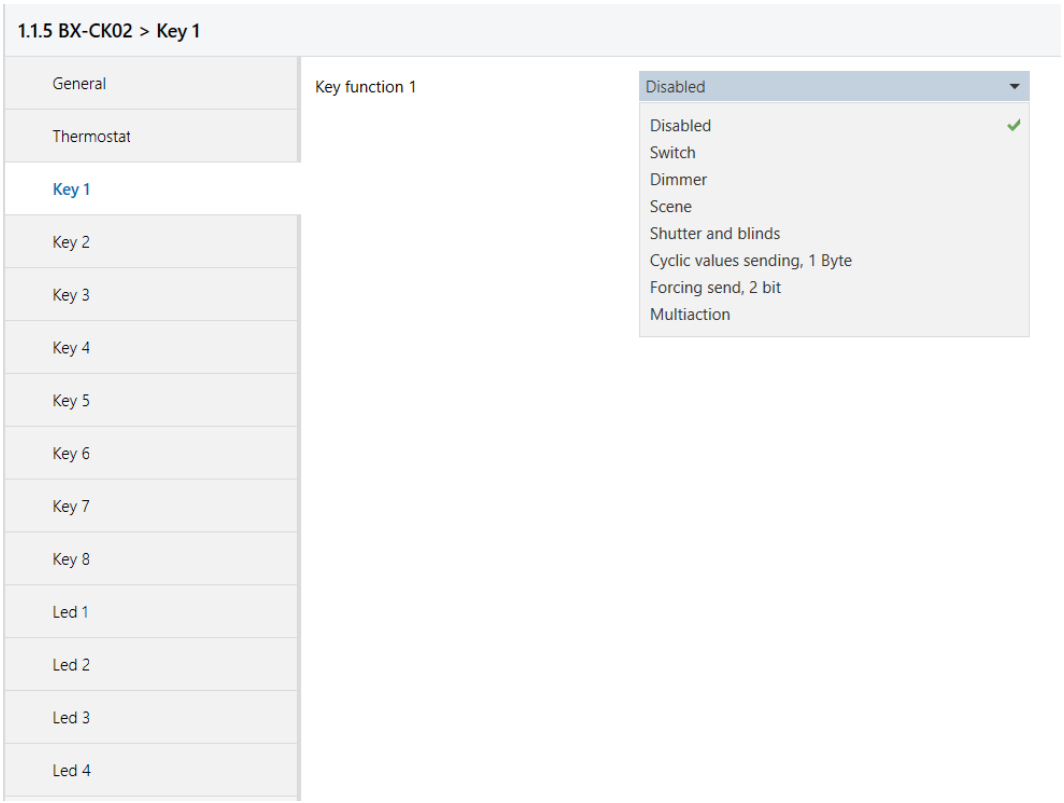
It is still possible to use PI control with an On/Off control and with an On/Off valve. Using the fan speed on the fan coil will then give the setting for the PI result.

Here are the DPTs

220	Thermostat	Output summer (on-off)	1 bit	C	R	-	T	-	1-bit, switch	Low
221	Thermostat	Output winter (on-off)	1 bit	C	R	-	T	-	1-bit, switch	Low

5 "Keys 1-2-3-4-5-6-7-8" menu

In the "**Keys 1-2-3-4-5-6-7-8**" menu, you can set the parameters of the 8 input buttons on the front of the capacitive keyboard.
Each of the 8 input channels implemented by the module can be managed independently, performing a function that is independent of the others.
The parameters Key 1 - Key 2 - Key 3 - Key 4 - Key 5 - Key 6 - Key 7 - Key 8 can enable the configuration of the related button channels, making the configuration menus visible.
Possible settings are:

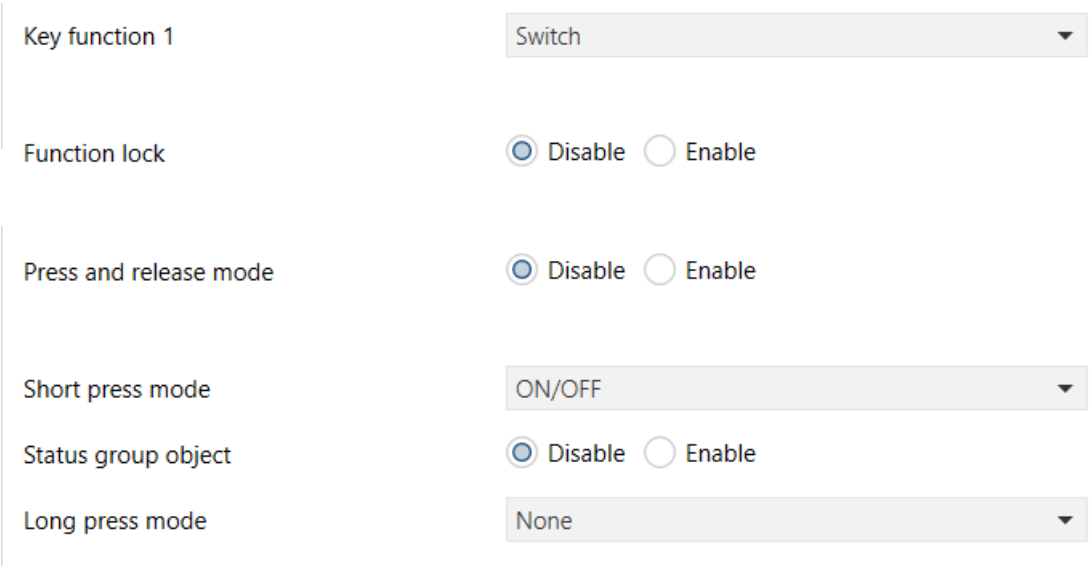


So, let's start with the 7 input functions listed in the image above.
The functions we are going to describe are available for each of the 4 available inputs.

5.1 Parameters

5.1.1 Switching

The "**Switch**" function allows you to switch a user on and off by pressing a button.



The function exposes a communication object to notify the closing of the button contact

1	Key 1	Switching	1 bit	C	-	W	T	U	1-bit, switch	Low

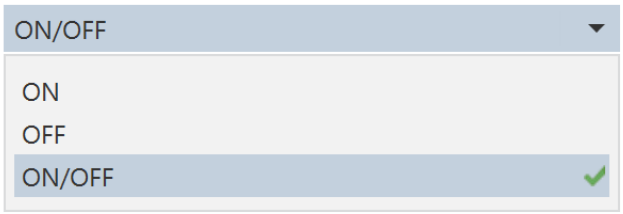
Alternating data = ON and data = OFF at each transmission

The enabled **"Block Function"** parameter allows you to bring up a communication object that allows to block the switching function

Below are the DPTs available to command the block and the related statuses

73	Key 1	Enable function lock	1 bit	C	-	W	-	-	1-bit, enable	Low
81	Key 1	Function lock enable status	1 bit	C	R	-	T	-	1-bit, state	Low

The "**Press and release mode**" parameter can make switching sensitive to both the contact closing and the contact opening event.
When the button is pressed, the ON command will be notified and when the button is released, the OFF command will be notified.
Activation of the "**Press and release mode"** will not allow sending the command by a long press on the button.



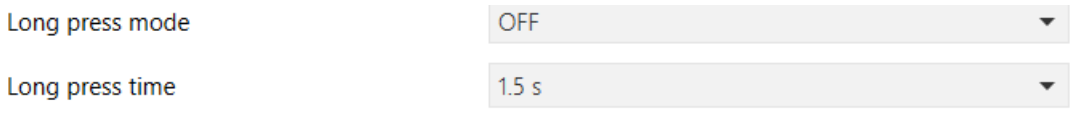
The box "**Short press Mode"** allows you to specify the behaviour of the command when the button is pressed.
As we said at the beginning, the **ON/OFF** parameter determines a Toggle operation capable of alternating between ON and OFF data.

The **ON** and **OFF** parameters disable the Toggle mode, specifying whether the output data will always be ON or OFF data.

Here are the DPTs available

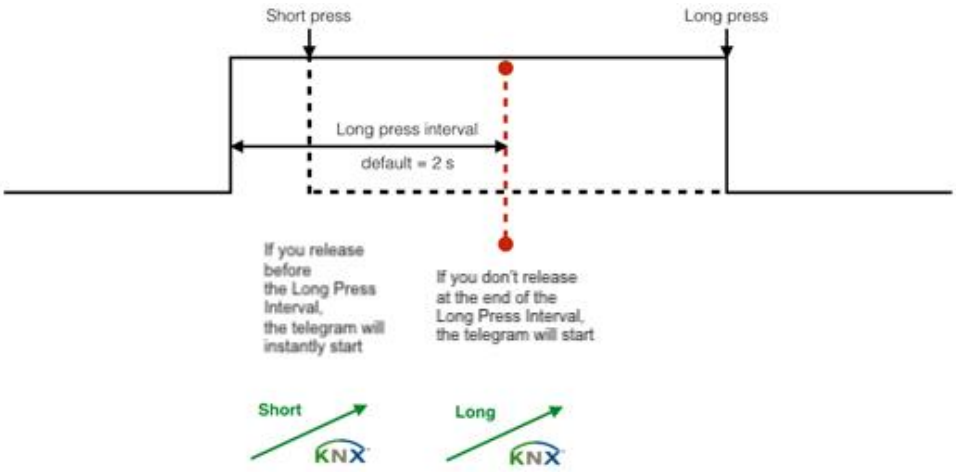
17	Key 1	Update for switching	1 bit	C	-	W	-	-	1-bit, switch	Low

The "**Status object group"** parameter is used to make available a communication object to synchronize the status of the button with the status change feedback of an actuator.
The box "**Long press mode"** enables a second command that will be notified only when the button is pressed for a time greater than the value in the box "**Long press time"**.



Warning!

Button interface performance changes when the **Long press function** is enabled.
If the "**long press**" command is not lit, the KNX telegram is sent immediately as soon as the button is pressed (rising edge).
Conversely, if the **Long press function** is enabled, the interface must wait to know whether the command will be long or short, introducing a small **latency**. This latency can lead to a feeling the control is unresponsive.



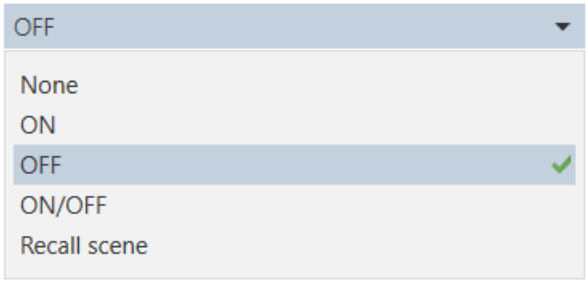
The user must be aware that this is a normal consequence of the need to wait for the button to be released (falling edge) in order to assess whether the command to be executed will be long or short.

The long command exposes a communication object called "**Switching (long press)".**

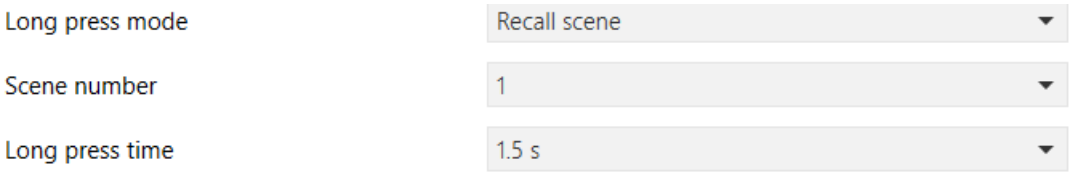
Here are the DPTs available

9	Key 1	Switching (long press)	1 bit	C	-	W	T	U	1-bit, switch	Low

A long press can determine a toggle **ON/OFF** command, or a command that is always **ON** or always **OFF**, or even the execution of a scene.



In this case, the number of the scene to be executed must also be configured.



If a scene is executed, the exposed communication object will be a 1-byte object.

Here are the DPTs available

41	Key 1	Scene (long press)	1 byte	C	-	-	T	-	scene number, sc...	Low

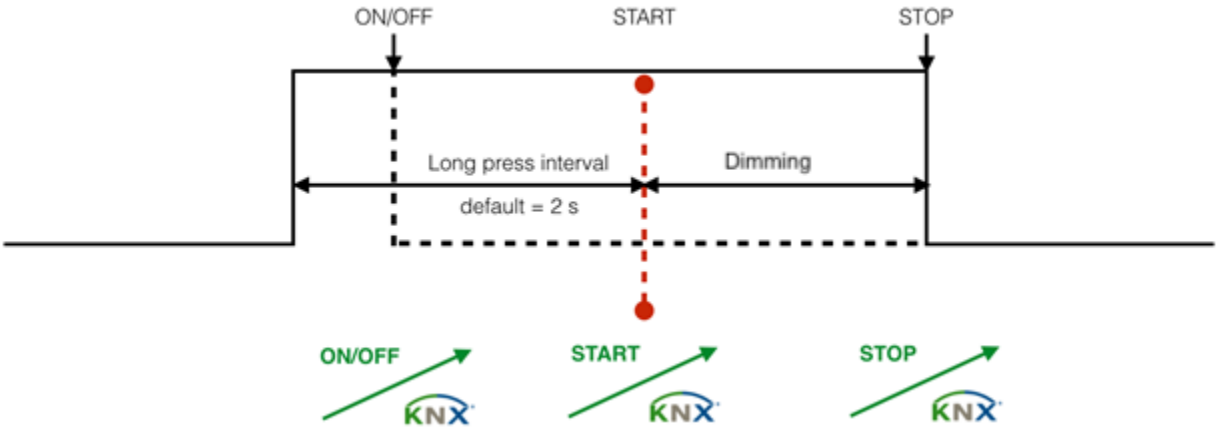
5.1.2 Dimmer

The "**Dimmer**" function allows you to turn a lamp on and off and adjust its brightness.

Key function 1	Dimmer
Function lock	Disable / Enable
Lock message value	Message 0 / Message 1
Long press mode	Increase/decrease
Long press time	1.5 s
Dimmer step	100%
Status group objects	Disable / Enable

The need to manage two commands automatically enables the "**Long press mode**" function to dim the light source and reserves the "**Short press mode**" function to switch on and off.

As in the previous case, remember that when a double command is active, a **latency** appears due to the fact that the short command is executed when the key is released.



The switching part on the short command behaves exactly in the same way as the switching function described above.
What changes is the appearance of the brightness adjustment on the long command.

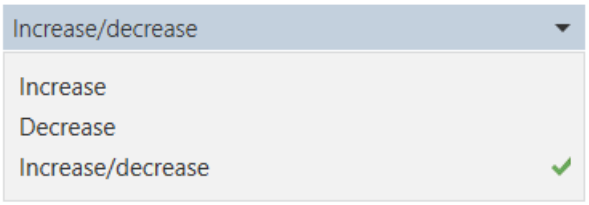
Here are the DPTs available

33	Key 1	Dimming	4 bit	C	-	-	T	-	3-bit controlled,...	Low

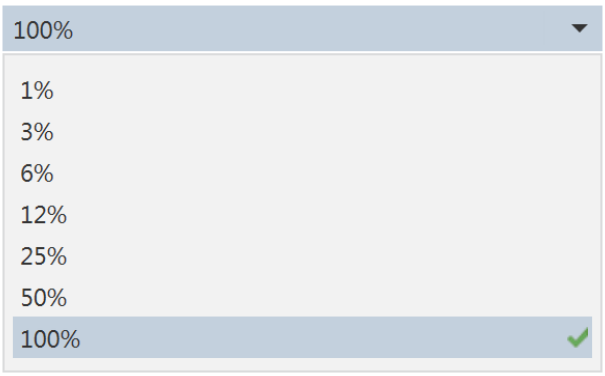
In KNX, the regulation of a light source is made via a very particular 4-bit telegram.
Brightness is adjusted by operating the dimmer and letting it work until the desired intensity is reached.
Therefore, this command consists of a **START**, which starts the dimming, and a **STOP**, which ends it.
The dimming START command is executed as soon as the long press time.
The STOP dimming command is executed when the button is released.

Following the **START** and **STOP** commands, the dimmer actuator will change the light intensity more or less quickly, depending on the configuration programmed inside.
In particular, it is possible to adjust the time required to perform a brightness variation from 0% to 100%, determining the speed at which the lamp changes intensity.

The long command can be set to perform an **increase** and a **decrease** alternately, or it can be programmed to always execute an **increase** or always execute a **decrease.**



Finally, the **maximum increase** that can be associated with a START + STOP action can be programmed.
25% means the maximum increase/decrease that can be performed with a START + STOP action will be 25%.

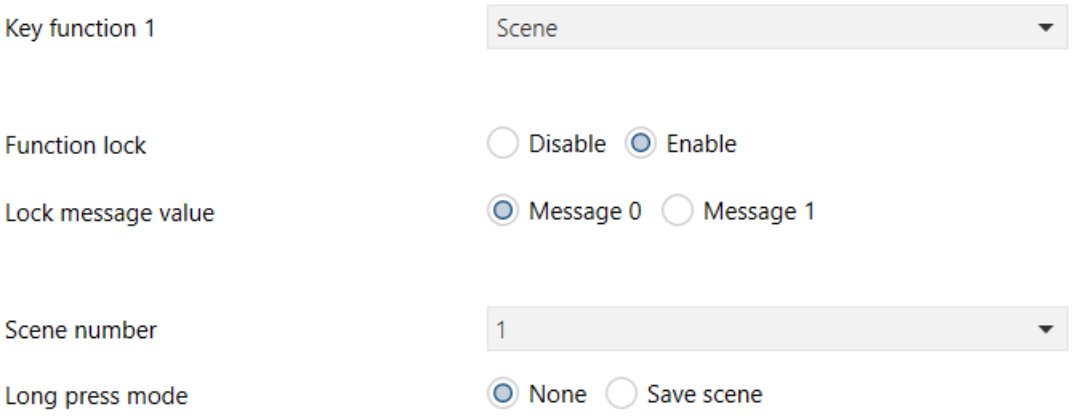


But what is this thing for?
In general, if you want to make a manual variation and be able to adjust the brightness if necessary, you must always set this value at 100%, so that you can complete the full range possible.
It is a different matter if I want to perform automatic brightness adjustments in steps. In this case, it is first advisable to adjust the configuration of the dimmer actuator to have a zero-change time, so that each brightness step is instantaneous.
Then the maximum increment configuration will become the one-press configuration.

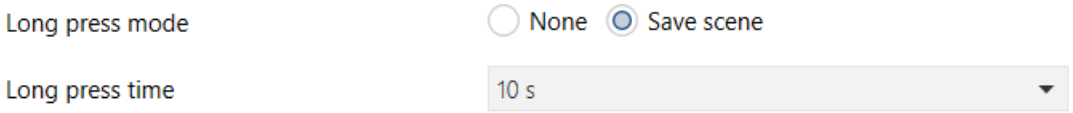
25% will mean that, with each press, the brightness will vary by 25%, i.e. having 5 brightness positions equal to 0%, 25%, 50%, 75% and 100%.
In conclusion, please note that this operation can only be achieved by programming the commands in "**increase only**" or "**decrease only**" modes, otherwise you risk always going back and forth one press.
This configuration requires a double command: a command reserved for incrementing and another command reserved for decrementing.
This application is particularly suitable for meeting rooms.

5.1.3 Scene

The function consists in the possibility of being able to recall a specific KNX scene with a command. It is possible to configure which scene to recall by setting the "**Scene number**" according to the KNX numbering from 1 to 64.

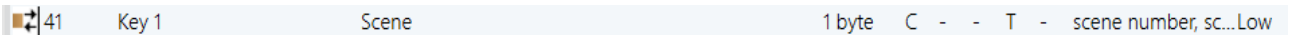


The "**scene**" function not only allows you to recall a desired configuration, but also to be able to store the status of the devices to create a new command.
In the typical tradition of car radios, the storing command can be achieved by a long press on the button.
The "**Long press mode**" allows you to enable or disable this option.



If the parameter is activated, "**Long press time**" sets how many seconds the button must be pressed to store.

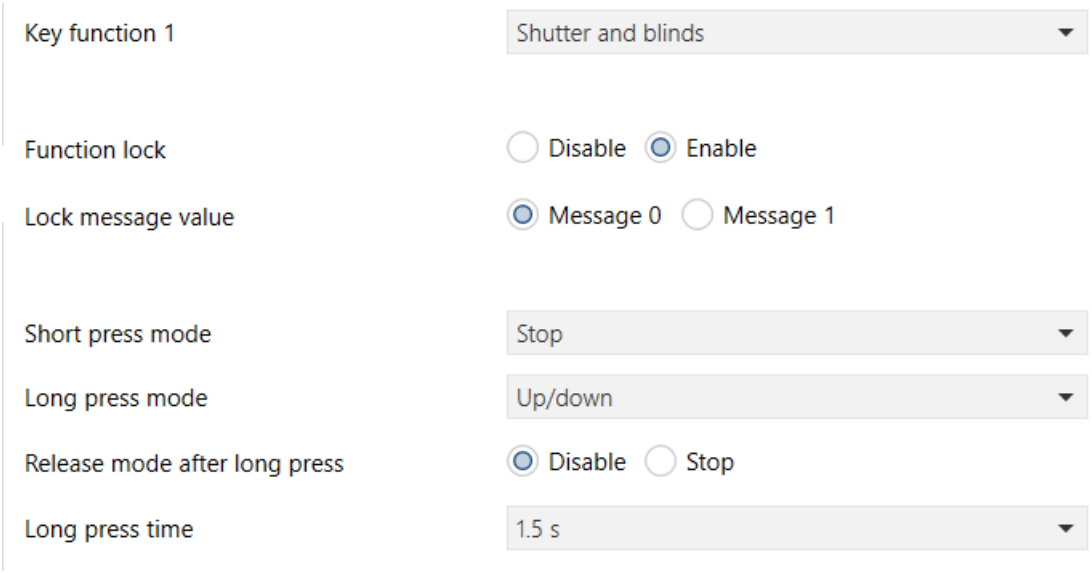
Here are the DPTs available



Both the "**Recall scene**" command and the "**Save scene**" command use the same 1-byte communication object and generally act towards the actuators on the same communication object. Therefore, only one group address needs to be programmed for both functions.

5.1.4 Shutters and blinds

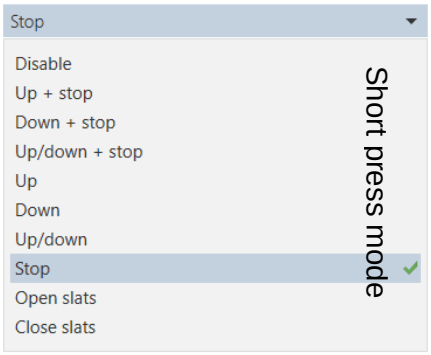
The function provides commands to move the shutters and commands to stop them, allowing a great versatility of solutions



The picture above shows the classic KNX configuration where movement is achieved by a long press and stopping by a short press.

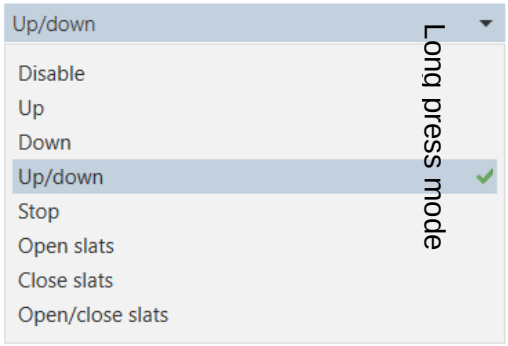
In fact, both short press (9 selections) and long press (7 selections) can be programmed in many different ways to achieve a different operation according to the customer's wishes.

Up + Stop is a cyclic command that alternates between upward movement and stopping.
Down + Stop is a cyclic command that alternates between downward movement and stopping.
Up/Down + Stop is a cyclic command that alternates between moving and stopping. The movement is in turn cyclical, alternating up and down.



Up is the command that performs the upward movement.
Down is the command that performs the downward movement.

Up/Down is a cyclic command that alternates the upward movement and downward movement.
Stop is the command that performs the stop.
Open slats is the command that performs a short opening movement to rotate the slats. In KNX jargon, opening the slats corresponds to sending the value 0 to the STOP communication object.
Close slats is the command that performs a short closing movement to rotate the slats. In KNX jargon, opening the slats corresponds to sending the value 1 to the STOP communication object.



When the "**Long press mode**" is enabled, it is also possible to choose whether to send a **STOP** command when the button is released.
This option, if enabled, allows you to use the button as if it were a classic manual actuation, resulting in the movement of the shutter as long as the button is kept pressed.

In the KNX environment, the **MOVE** and **STOP** notifications to the actuator are sent via two different communication objects.

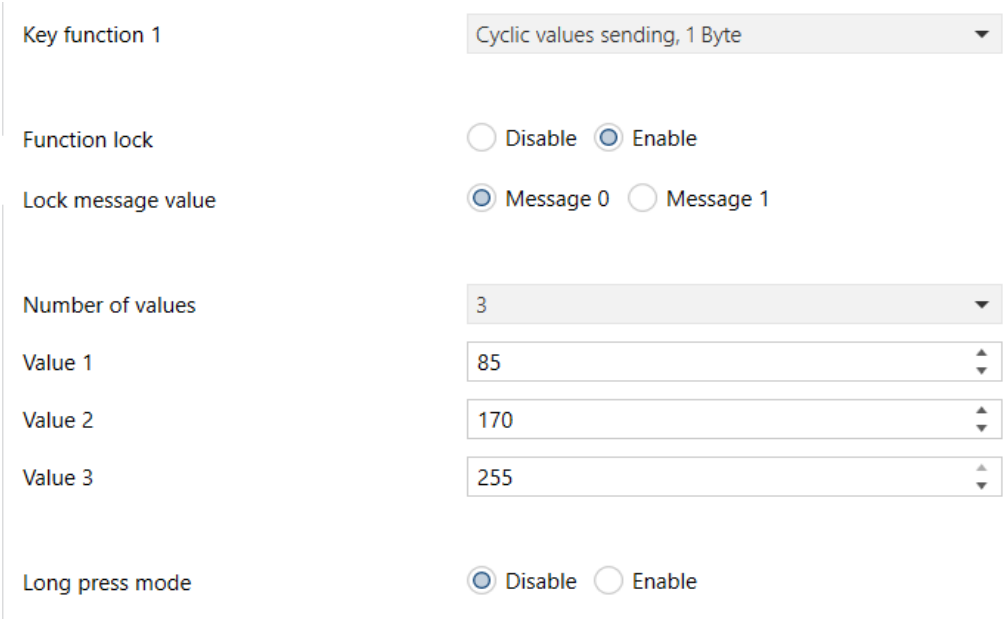
Here are the DPTs available

1	Key 1	Shutter stop	1 bit	C	-	-	T	-	1-bit, step	Low
9	Key 1	Shutter move	1 bit	C	-	-	T	-	1-bit, up/down	Low

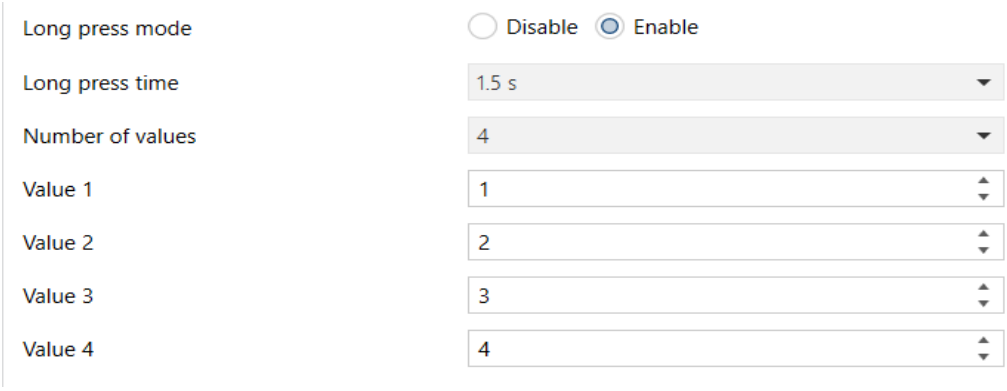
The **STOP** communication object stops the motor if it is moving.
Conversely, if the motor is stopped, a **STOP** command can generate a short movement called **STEP**.
The **STEP** will open if the value sent is 0. Conversely, it will close if the value sent is 1.
The STEP is usually used to orient the slats of the blinds.
To obtain slat movement, a STEP must always be generated in the opposite direction to the last movement performed.

5.1.5 Cyclic values sending, 1 Byte

This is the classic cyclic command that allows you to send a different 1-byte value with each pulse, according to the programmed sequence.



The "**Number of values**" parameter allows you to choose how many values the sequence will consist of. You can select a number between 1 and 4. ETS will display as many fields as there are values in the chosen sequence. The fields can of course be filled with numbers from 0 to 255 (Byte).



This function can also enable the long press, reaching the possibility of a second sequence controllable by this command.

Again, we can characterize the sequence with the number of values and the data associated with each value.

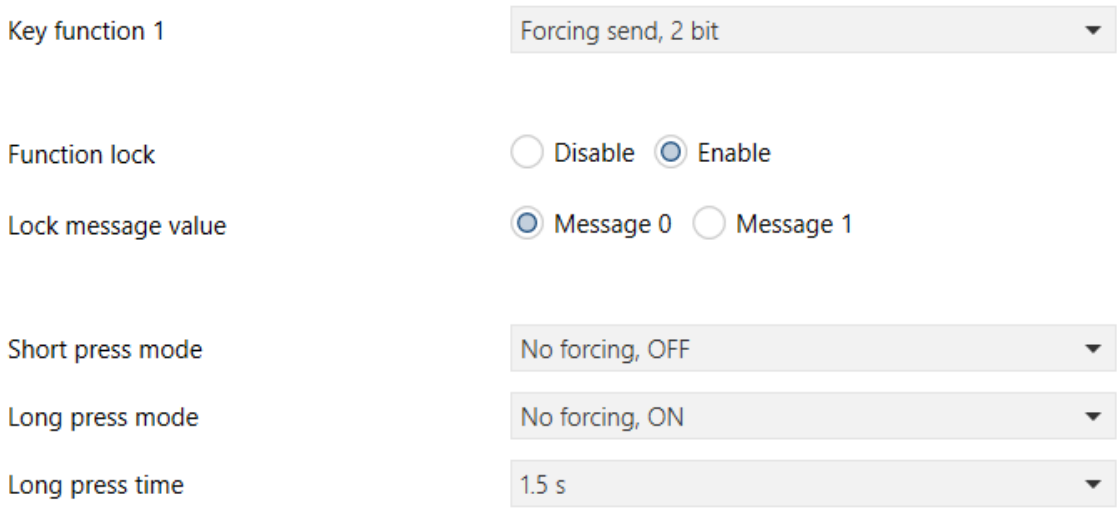
Here are the DPTs available

49	Key 1	Cyclic values sending	1 byte	C	-	-	T	-	8-bit unsigned v...	Low
57	Key 1	Cyclic values sending (long press)	1 byte	C	-	-	T	-	8-bit unsigned v...	Low

The cyclic sending of 1-byte values obviously takes place on the same communication object, one for short press and one for long press.

5.1.6 Forcing send, 2 bits

The "**Forcing send**" command forces the actuator to remain locked in the desired state.



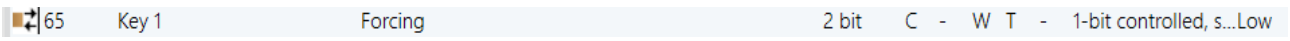
A 2-bit number can take on 4 different values on a scale of 0 to 3:

0 frees the actuator from the Forcing OFF
1 frees the actuator from the Forcing ON
2 forces the actuator into the OFF position
3 forces the actuator into the ON position

In binary jargon, a 2-bit number is said to consist of two digits:

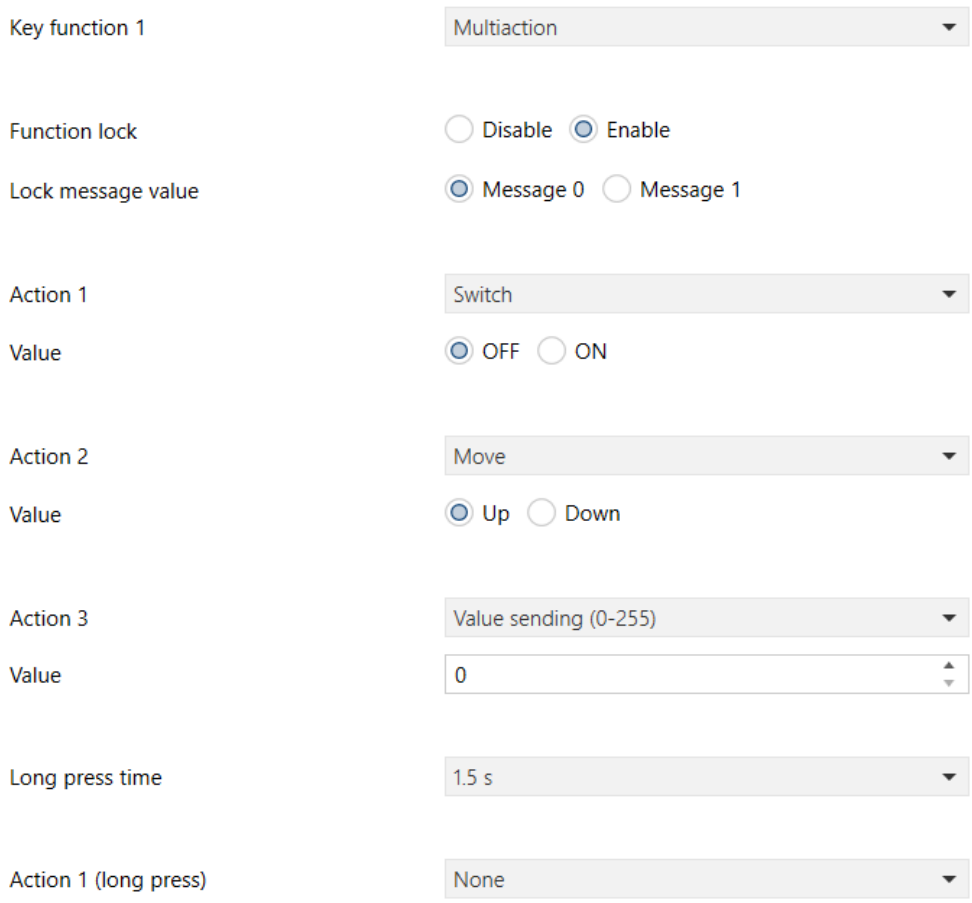
- The least significant digit indicates the **OFF** or **ON** position
- The most significant digit indicates the choice between **no forcing** (0) and **forcing** (1).

Here are the DPTs available



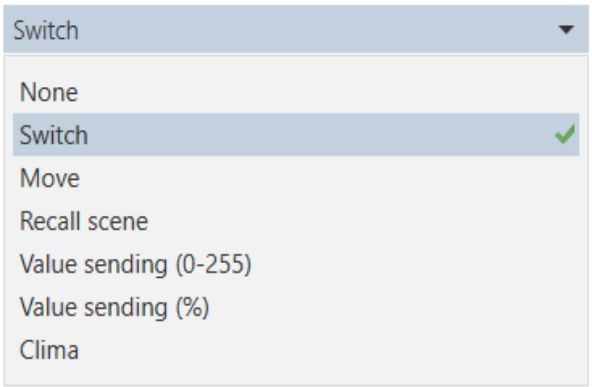
5.1.7 Multiaction

The "**Multiaction**" function allows you to associate the simultaneous sending of a sequence of telegrams with the push of a button, which can be configured to perform different actions according to the programmer's needs.



The maximum number of configurable actions is 3 for short press and 3 for long press.

The actions that can be selected are 6.



Switch allows you to switch a user on and off.

Move allows you to open or close a roller shutter.

Recall scene allows you to recall the desired KNX scenario.

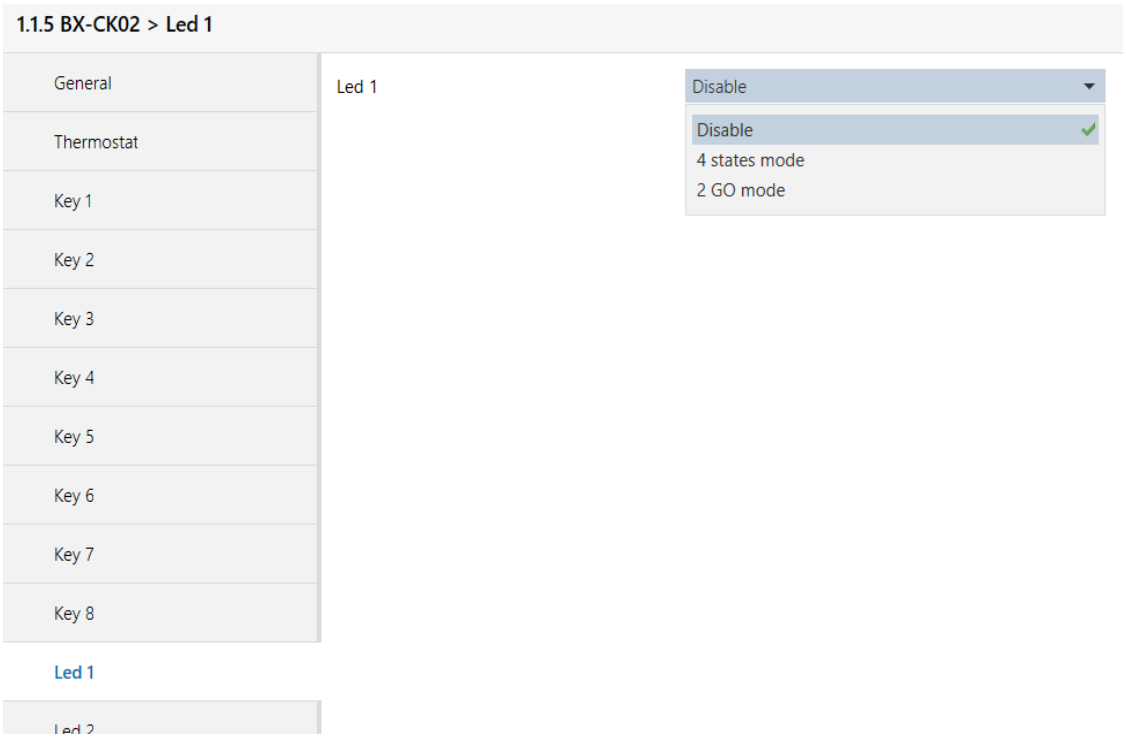
Value sending (0-255) allows you to send the desired byte to the bus.

Value sending (%) allows you to vary a brightness, or a position, or any percentage value.

Clima allows you to select the desired HVAC mode: OFF, Comfort, Standby, Night and Protection.

6 “LED 1 – LED 2 – LED 3 – LED 4” menu

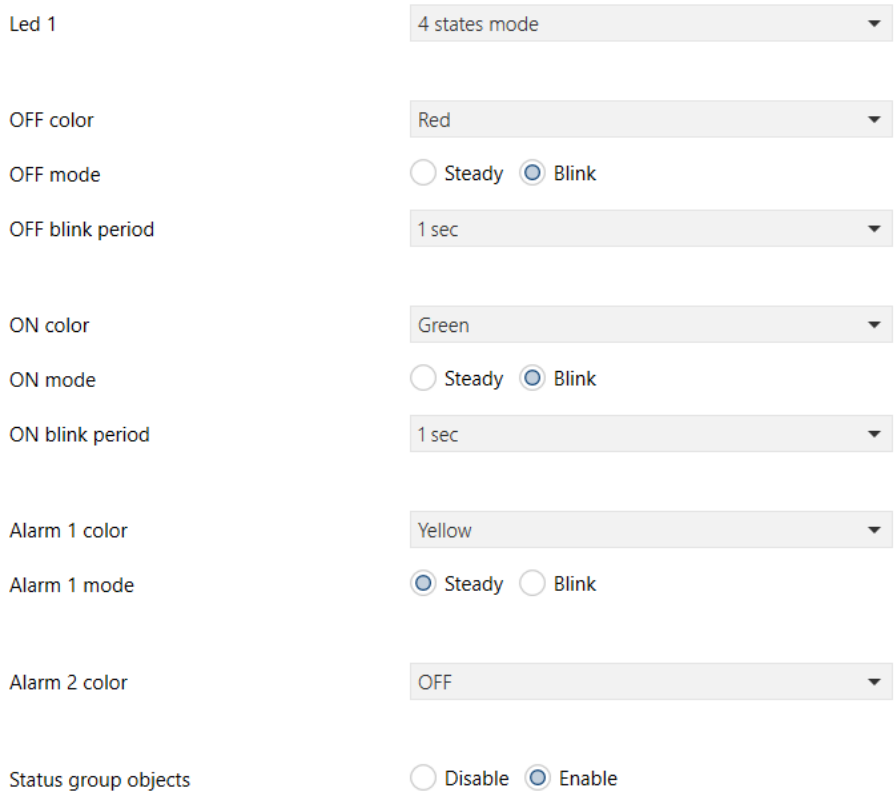
It allows you to define and customize the operation of the 4 RGB signalling LEDs placed at the front of the capacitive keyboard. The signalling LED can take on different colours to perform the night-time localization function or to be managed independently via corresponding communication objects. The touch light function can be enabled or not, signalling statuses, alarms and combinations through different light settings. The effects associated with the events detected by the capacitive sensor are executed even if a bus-enabled light effect is active before the touch detection phase (stand-by), which is then reactivated at the end of the effect associated with the release.



There are two configuration options: **4 states mode and 2 GO mode**.

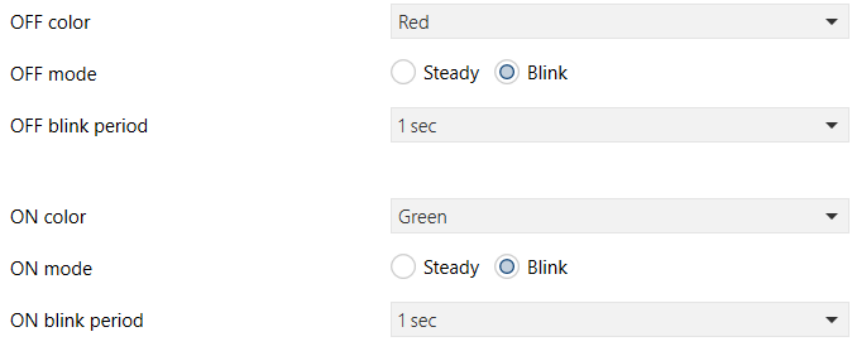
6.1 4 states mode

In the 4 states mode you can set one of the 7 available colours and associate it with 4 different functions.
The dedicated DPTs will then appear accordingly.



6.1.1 OFF color –ON color

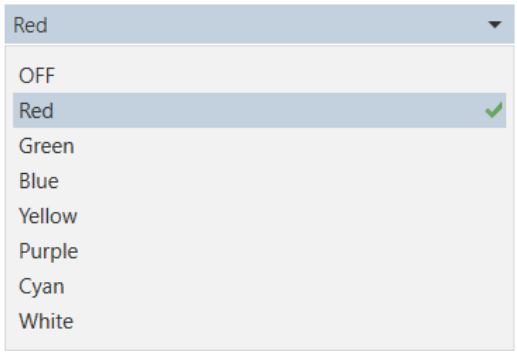
In the OFF and ON colour settings, the colour can be defined when the value from the ETS is received on the dedicated 1-bit object #140.



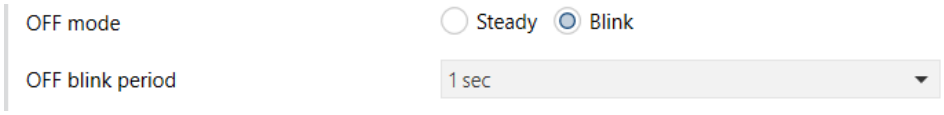
Below are the DPTs dedicated to the command and its status

140	Led 1	Set ON/OFF	1 bit	C	-	W	-	-	1-bit, switch	Low
144	Led 1	ON/OFF status	1 bit	C	R	-	T	-	1-bit, switch	Low

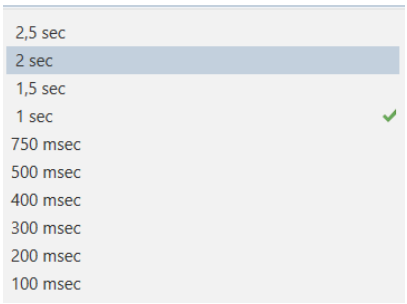
The list of available RGB colours



Via the **Steady/Blink mode** parameter, you can set whether the brightness indication will blink when the value is received.
The available DPTs are #140 and #144 for the two modes

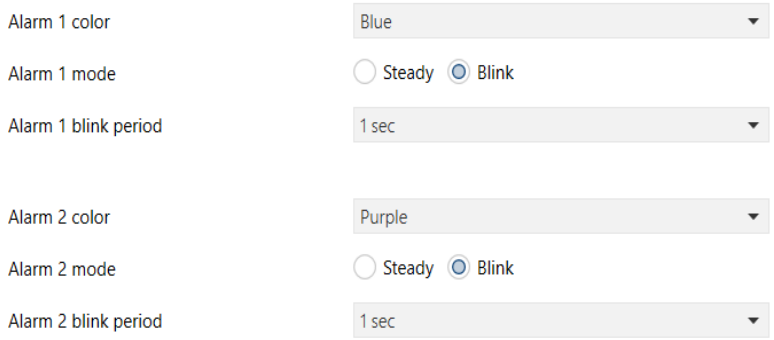


It is also possible to set the blinking speed



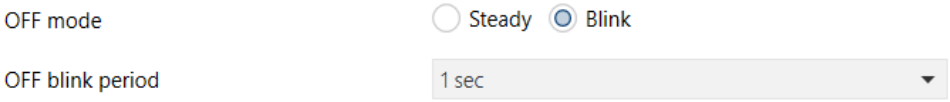
6.1.2 Alarm 1 color – Alarm 2 color

The LEDs can also be used to signal system alarms.
This means we can reserve some colours and flashes to display alarms on the keyboard.
Alarms are instruments that have priority over normal feedback signals as long as they remain active. When an alarm is disabled, the LED resumes the colour of the currently active state.
The keypad has a priority **alarm 1** and a secondary **alarm 2**.

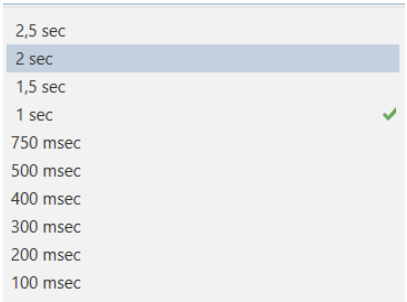


The list of available RGB colours

Via the "**Steady/Blink mode"** parameter, you can set whether the brightness indication will blink when the value is received.
The available DPTs will be the same #148 and #156 for the two modes



It is also possible to set the blinking speed



The available DPTs for the two modes are as follows:

Alarm colour 1

148	Led 1	Set alarm 1	1 bit	C	-	W	-	-	1-bit, switch	Low
152	Led 1	Alarm 1 status	1 bit	C	R	-	T	-	1-bit, switch	Low

Alarm colour 2

156	Led 1	Set alarm 2	1 bit	C	-	W	-	-	1-bit, switch	Low
160	Led 1	Alarm 2 status	1 bit	C	R	-	T	-	1-bit, switch	Low

6.2 2 GO mode

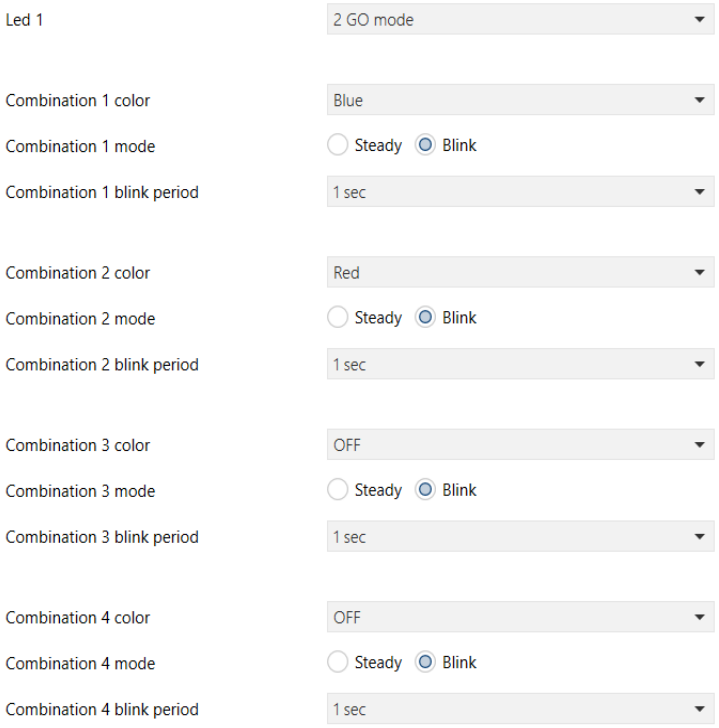
The Qubik keypad is designed with only 4 LEDs, so it can be complicated to have a signal for each of the 8 available keys.
A feedback system using **RGB colour combinations** has been devised to overcome this problem. This system provides a communication object for each key, so that each command has its own feedback with its own set colour.
The difficulty arises when you need to simultaneously display two different colours with the same LED.
The trick here is to choose a third colour that matches both of them when on.

Here is an example
Assuming you are working on the 2 keys on the first line:

1. The first simple thing to do is to set the **Combination 1 color**=OFF so that you have the most intuitive solution, i.e. the LED off when everything is OFF.
2. The second step is to set **Combination 2 color** and **Combination 3 color** with two colours of your choice, to be displayed when only key 1 is lit or when only key 2 is lit.
3. Finally, you can choose **Combination 4 color** to display when both keys are ON. The most intuitive choice might be WHITE, which corresponds to a neutral colour.

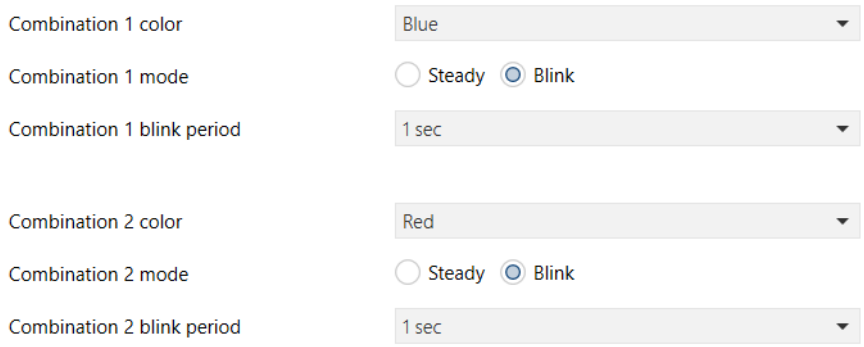
Alternatively, RGB combinations can be used.
If RED is used on the left and BLUE is used on the right, MAGENTA could be used as a natural combination of red+blue.

The "**2-GO mode"** parameter enables various communication objects to activate the various light signals via ETS.



6.2.1 Colour combination 1-2-3-4

With this parameter, you can assign a different colour to the 4 combinations that can be set. In particular, you can set the activation of an "effect" with a higher priority than the active one of the 4, resulting in the reproduction of the new effect without deactivating the old one (activating the highest priority does not deactivate the least priority), which will eventually be reproduced when the next highest priority is deactivated. It is then possible to assign 4 different combinations, which will be one in sequence to the other in terms of priority. Settable values:



The type of signalling can be set via the **Steady/Blink mode** parameter. When set to blinking mode, the brightness indication switches to blinking when the value is received from the ETS.
The available DPTs are #140 and #144 for the two modes.

Warning!
After an application download, the light signalling of the individual channels will be OFF.