stakohome®
INNOVATION

Dimmer
BES-DM470180

Programming manual

ingenium*
BES

www.besknx.cz

Index

1   General description

The DM470180 is a one channel proportional actuator (triac output) that allows to regulate halogens or incandescent lightning up to 2000W with transformers incorporated or not.

Designed to obtain a precise digital regulation receiving orders through the bus or from a pushbutton connected to its low voltage input by using long/short pulsations.

The regulating ramp speed (the progressive on/off lighting) can be configured by programming.

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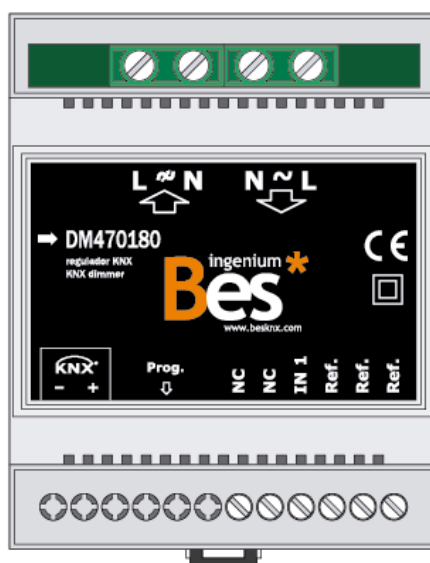
Characteristics:

- 1 Regulation channels.

- Applicable power per channel depending on the load:

Incandescent or halogen loads 230V	2000W
Low voltage loads with a conventional transformer incorporated	1500 W
Low voltage loads with a electronic transformer incorporated	660W

- 1 low voltage input (SELV) for pushbuttons (non-programmable).

-16 Programmable scenes that can be executed from bus commands.

- Remote enable / disable of bus control.

- Overload circuit protection.

- Digital regulation control based on microcontroller with more than 250 regulation points.

2   Technical information

Voltage Supply	230Vac
Max. Power consumption	0,5W @ 230Vac
KNX Supply	29Vdc from KNX BUS
BUS current consumption	5mA from KNX BUS
Mounting	DIN rail
Size	4 DIN modules
Connections	Connection to KNX BUS Screw terminal blocks for power , inputs and outputs
Outputs	1 dimmer channel (triac output)
Output power per channel	Incandescent or halogen 230V loads — 2000W Low voltage loads with conventional transformer built — 1500W Low voltage loads with electronic transformer built — 660W
Inputs	1 low-voltage input (SELV) with intern reference.
Drive current inputs	Mín. 15 mA
Cable distance to the inputs	Max. 30 m (from the input mechanism)
Temperature range	- Running: -10ºC a 55ºC - Storage: -30ºC a 60ºC - Transport: -30ºC a 60ºC.
Regulation	According to the directives of electro magnetic compatibility and low voltage: EN 50090-2-2 / UNE-EN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010-1.EN 50090-2-2 / UNE-EN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010-1.

3   Programming

3.1   Application program information

Application program: Bes / Dimmers (manufacturer / program name).

Catalogue version: v2.1.2

Maximum number of communication objects: 24.

Maximum number of assignments: 25.

ETS minimum required version: 4.1.8 (build 3614)

The parameters of the device are configured with a specific parameter dialog; do click on the link "open" from the parameters menu in the ETS to run it.

Open product specific parameter dialog

Group Objects / Parameters / Commissioning /
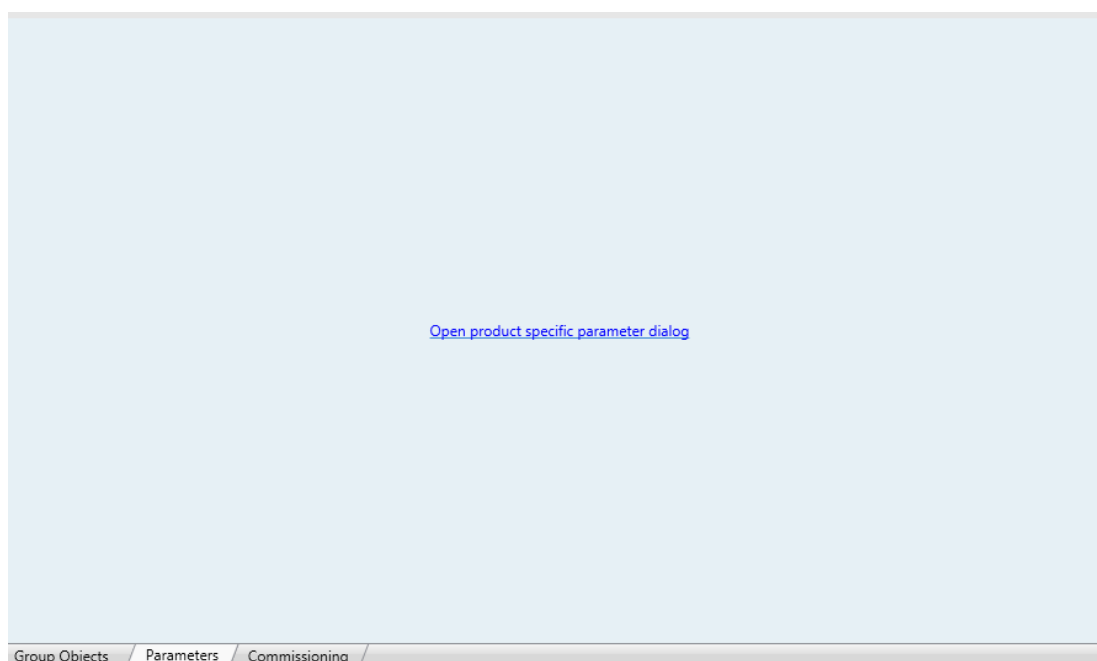
3.2   Individual address assignment

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

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

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

3.3   Communication objects

Number of communication objects: 7.

Number of assignments: 24.

Objeto	Nombre / Función	Longitud	DPT	Flags				
				C	R	W	T	U
0	CH1 - On/Off	1 bit	1.001	●		●	●	
1	CH1 - Dimmer	4 bit	3.007	●		●	●	
2	CH1 - Value	1 byte	5.001	●		●	●	
3	CH1 - On/Off status	1 bit	1.001	●	●	●	●	●
4	CH1 – Value status	1 byte	5.001	●	●		●	●
21	DM470180- Enable	1 bit	1.001	●	●	●	●	
22	Scene	1 byte	5.001	●		●	●	

3.4   Objects description

Name	Object 0: CH1 - On/Off
Function	1 bit communication object to switch on and off the regulation channel 1.
Description	When a "1" is received through this object the dimmer is switched on and the brightness level goes up to the last regulation value (non-zero).
	When a "0" is received the dimmer is switched off.
	By default, the behavior of light when it is turned on through this subject is to take the value it had before switching off.
Name	Object 1: CH1 - Dimmer
Function	4 bits communication object for dimming control with pushbuttons.
Description	Depending on the dimming steps set in the pushbutton, telegrams will make the brightness level goes up or down according to the ramp speed configured.
	Breaks telegrams to this object will stop the brightness at the current level.
	By default, the behavior when receiving a telegram to increase the brightness when the light is turned off is turned on and start to regulate. Conversely, if the light is on you cannot turn it off by telegrams decrease brightness.

Name	Object 2: CH1 – Value
Function	1 byte communication object for precise control by setting a new brightness level directly.
Description	The brightness level will go up or down slowly according to the ramp speed configured.
	By default, the behavior when receiving a telegram with non-zero brightness value, when the light is turned off is turned on and regulate the level received. Also, if the light is on you can turn it off by a telegram with the value 0.

Name	Object 3: CH1 - On/Off state
Function	1bit communication object for feedback signalling of the on / off state of the dimmer.
Description	When the dimmer is off and receives a switch on telegram or a brightness value, a "1" is sent through this object.
	When the dimmer is on and it receives a switch off telegram or a brightness value of 0% a "0" is sent through this object.

Name	Object 4: CH1 - Value state
Function	1byte communication object for feedback signalling of the current brightness level of the dimmer.
Description	When it receives a new brightness value or a increase/decrease telegram the final brightness value is sent through this object.

Name	Object 21: DM470180- Enable
Function	1 bit communication object to enable or disable the device control through the KNX BUS.
Description	When a "0" is received through this object the device cannot be controlled by BUS telegrams (input is not disabled). When a "1" is received the device is enabled.
	By default this feature is enabled. No need to use this object to enable normal device function.

Name	Object 22: Scene
Function	1byte communication object for internal scenes execution.
Description	Scenes can be programmed in the parameters window of the device. There are up to 8 scenes available.

3.5   Parameters

The parameters of the device are configured with an specific parameter dialog, do click on "open" from the parameters menu in the ETS to run it.

There are several tabs to configure different parameters depending on the type of the device selected, in this case the device that must be selected is Dimmer 1CH.

Some parameters can be hidden depending on the device selected or the previous configuration. The description of every parameter is shown next.

3.5.1   General

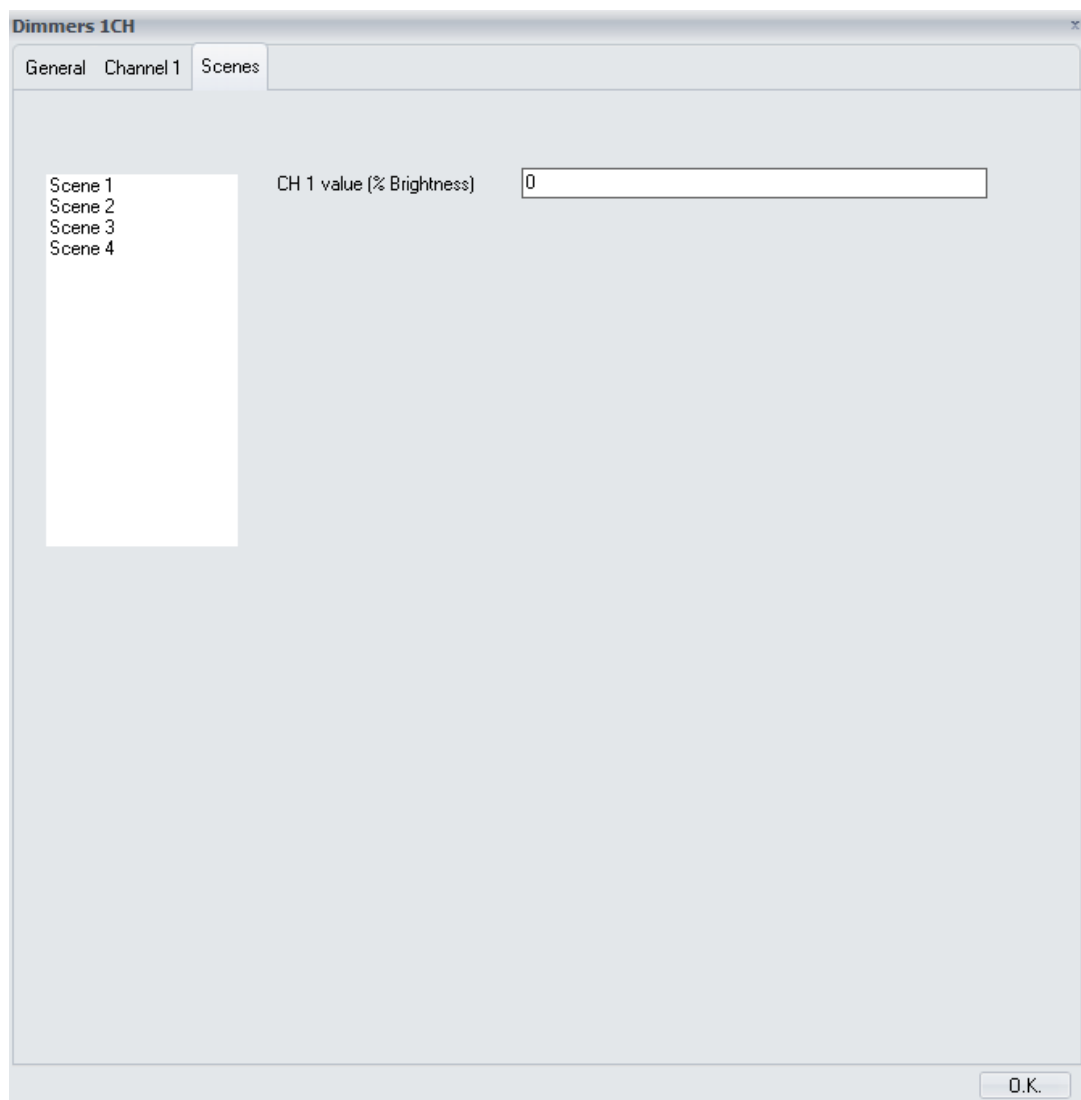| Name	Device type
Values	Dimmers 1CH, Dimmers 2CH, Dimmers 3CH, Dimmers LED RGB, Dimmers DALI node, Dimmers DMX Channel
Description	Allows to select the corresponding device that will be programmed by the application. The ETS will show or hide communications objects and parameters according to this parameter. In this case the device that must be selected is Dimmers 1CH
Name	Lower limit (% Brightness)
Values	From 0 to 100
Description	It is the minimum regulation value (in percentage %) that the dimmer can reach.. The brightness level of the dimmer will stop at the lower limit when receiving decrements by precise control telegrams (by object 2) or dimming telegrams (by object 1) and it can only be switched off with a "0" through the on/off or value objects (objects 0 and 2). This parameter is only a hardware limitation. The user can adjust any value from 0 to 100% but the current brightness level will be internally adjusted according to the maximum and minimum values.
Name	Upper limit (% Brightness)
Values	From 0 to 100
Description	It is the maximum regulation value (in percentage %) that the dimmer can reach. The brightness level of the dimmer will stop at the upper limit when receiving increments by precise control telegrams (by object 2) or dimming telegrams (by object 1). This parameter is only a hardware limitation. The user can adjust any value from 0 to 100% but the current brightness level will be internally adjusted according to the maximum and minimum values.

⚠️ *The maximum and minimum limits are parameters which depend on the lamp model and technology. In order to adjust them correctly, firstly select a 0% value for the lower limit and 100% for the upper limit. Then check the operation of the lamp in order CHx << - Value >>. Finally choose the values which best fit the behavior of the lamp.*

3.5.2   Channel 1/2/3

Name	Ramp time (sec)
Values	From 0min,0sec to 4min,13sec
Description	It is the brightness change rate measured in seconds. The brightness changes gradually when using channel 1 value or dimming communication objects. Typical value = 10 seconds. With too low values, it will be difficult for the user to get the desired value while regulating the light.

3.5.3   Scenes

The DM470180 allows to configure up to 16 scenes that can be executed from bus commands with the corresponding communitacion object (number 22). The presets of the three channels when calling a scene are configured in the following parameters tab:

Name	Channel 1 Value (% Brightness)
Values	From 0 to 100.
Description	Channel 1 value (% brightness). It is the value memorized in the scene for the brightness level of the channel. The brightness level will go up or down slowly according to the ramp speed configured when the scene is called.
Name	Channel 1 Enable
Values	Yes/No
Description	Enable channel 1. Select if the channel is enabled (included in the scene) or not. In case of being enabled the channel will set the brightness configured in the value parameter when the scene is called.

3.6   Inputs

3.6.1   Connection

The dimmer has 1 low voltage input (SELV) that allow to control the regulation channels through pushbuttons.

The input is activated when it is connected to "reference" as shown in the next picture:

IN 1
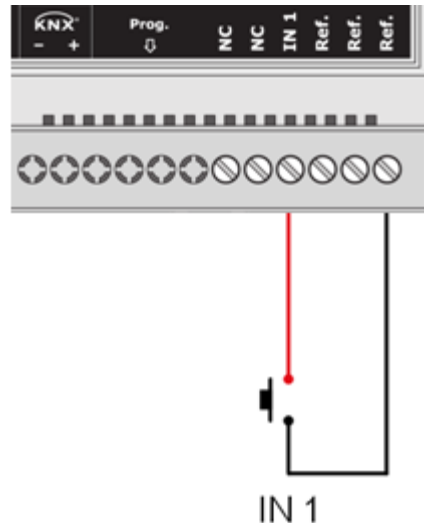
Feed low voltage lines (BUS and inputs) in separate ducting to that of power (230V) and outputs to ensure there is enough insulation and avoid interferences.

Do not connect the main voltages (23V) or any other external voltages to any point of the BUS or inputs.

3.6.2   Working mode

The input is internally associated to its corresponding output: the input IN1 controls the output L1 (it cannot be programmed with the ETS or associated to any other function).

The working mode for the dimmer control is the classic long/short press:

- A **short press** in the input switches on and off the light completely and instanctly. The switch on brightness level will be the last one and the switch off brightness level is always 0%.

- On the other side, a **long press** in the input increases or decreases the brightness slowly according to the ramp configured (if the ramp speed is very fast it will be difficult for the customer to set the brightness level desired).

4   Application notes

4.1   Light control with scenes

4.1.1   Devices

Ref. DM470180: One channel proportional actuator.

KNX 1 gang pushbutton

KNX 1 gang switch.

4.1.2   Description

The DM470180 dimmer regulates a light circuit of the room that should be controlled from a pushbuttons and also from another switch to recall two scenes directly for 30% and 70% of brightness.

The lights can be controlled from an universal pushbutton connected to the input of the DM470180 and at the same time from any KNX 1xgang pushbutton connected to the EIB/KNX BUS anywhere.

4.1.3   Objects links

Ref. DM470180 –   Object 0   ->   Object X Short press – KNX pushbutton

Ref. DM470180 –   Object 1   ->   Object Y Long press – KNX pushbutton

Ref. DM470180 –   Object 22   ->   Object X Rising edge – KNX switch

Ref. DM470180 –   Object 22   ->   Object Y Falling edge – KNX switch
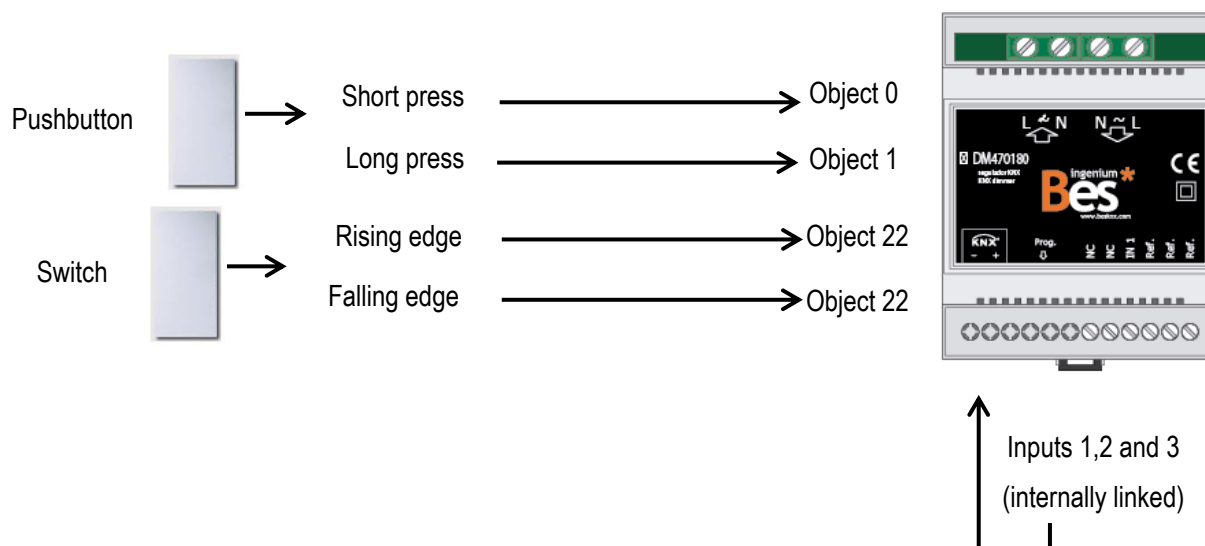
4.1.4 Parameter settings

The following parameter setting is generally recommended for this example. The ideal parameters may change depending on the application or installation.

Parameter name		Recommended setting
General	Device type	Ref. DM470180
	Lower limit (% Brightness)	0
	Upper limit (% Brightness)	100
Channel 1	Ramp time (seconds)	10
Scenes - Scene 0	Ch1 Value (% Brightness)	30
	Ch1 Enable/Disable	Yes
Scenes – Scene 1	Ch1 Value (% Brightness)	70
	Ch1 Enable/Disable	Yes
KNX Pushbutton	Short press	Switch - 0/1
	Long press	Increase/Decrease - 100%
KNX Switch	Rising edge	Value sent = 0
	Falling edge	Value sent = 1

The KNX pushbutton behavior is the typical short-press/long-press working principle: a short press switches on and off the light at the last dimming level meanwhile long press makes the brightness go up or down according to the ramp speed configured until the button is released (increases or decreases orders). Take into account that the ramp speed must be a high value, if not; it will be difficult to stop the dimming at the color desired.

The KNX switch will work sending bytes values to recall the scenes memorized in the dimmer in order to change to a brightness value directly and instantly.

Remember that the input of the dimmer is non-programmable and internally associated to the output. It can be controlled by any universal pushbutton (also with short-press/long-press principle).

5   Installation
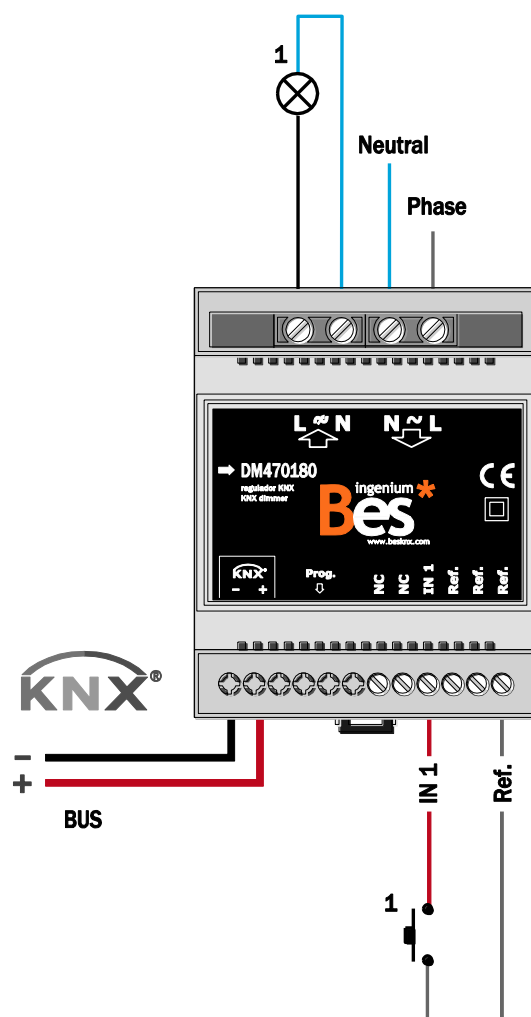
Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference.

Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.
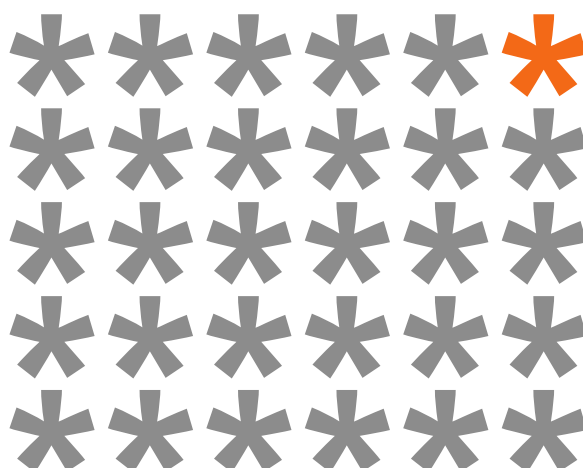
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