

Proportional actuator
RK1000/RK2000
V1.0

PROGRAMMING MANUAL



ingenium

Parque Tecnológico de
Asturias, Parcela 50, 33428
Llanera – Asturias - Spain

Tel (+34) 985 118 859
Fax (+34) 984 283 560

ingeniumsl@ingeniumsl.com
www.ingeniumsl.com

TECHNICAL DEPARTMENT

Tel (+34) 985 113 339

tecnico@ingeniumsl.com

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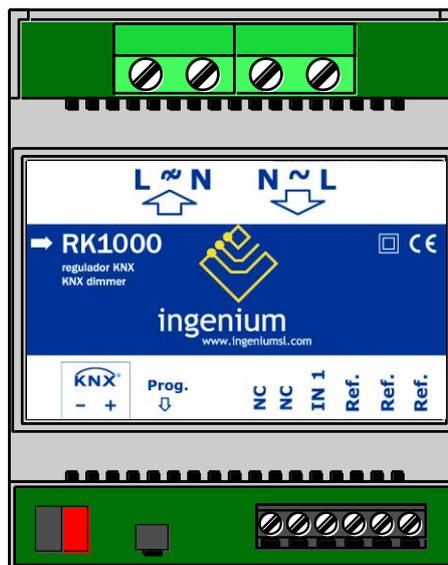
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1 GENERAL DESCRIPTION

The RK1000/RK2000 is a one channel proportional actuator (triac output) that allows to regulate halogens or incandescent lighting up to 1000W/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.



Characteristics:

- 1 Regulation channels.
- Applicable power per channel depending on the load:

	RK1000	RK2000
Incandescent or halogen loads 230V	1000 W	2000 W
Low voltage loads with a conventional transformer incorporated	800 W	1500 W
Low voltage loads with a electronic transformer incorporated	330 W	660 W

- 1 low voltage input (SELV) for pushbuttons (non-programmable).
- 8 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 - 230 Vac

Max. Power consumption - 0,5W @ 230 Vac

KNX Supply - 29 Vdc from KNX BUS

BUS current consumption - 5 mA.

Connections - BUS connection terminal KNX.

Mounting - DIN rail.

Size - 4 DIN modules.

Temperature range - Running: -10°C a 55°C / Storage: -30°C a 60°C / Transport: -30°C a 60°C.

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.

3 PROGRAMMING

3.1 COMMUNICATION OBJECTS

Number of communication objects: 7.

Number of assignments: 24.

Object	Name / Function	Length	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	RK1000/RK2000 - Enable	1 bit	1.001	•	•	•	•	
22	Scene	1 byte	5.001	•		•	•	

3.2 OBJECTS DESCRIPTION

Object 0: CH1 - On/Off

1 bit communication object to switch on and off the regulation channel 1. When a “1” is received trough this object the dimmer is switched on and the brightness level goes up to the last regulation value. When a “0” is received the dimmer is switched off.

Object 1: CH1 - Dimmer

4 bits communication object for dimming control with pushbuttons. 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.

Object 2: CH1 - Value

1 byte communication object for precise control by setting a new brightness level directly. The brightness level will go up or down slowly according to the ramp speed configured.

Object 3: CH1 - On/Off status

1bit communication object for feedback signalling of the on / off state of the dimmer. When the dimmer is off and receives a switch on telegram or a brightness value, a “1” is sent trough this object. When the dimmer is on and it receives a switch off telegram or a brightness value of 0% a “0” is sent trough this object.

Object 4: CH1 - Value status

1byte communication object for feedback signalling of the current brightness level of the dimmer. When it receives a new brightness value or a increase/decrease telegram the final brightness value is sent trough this object.

Object 21: RK1000/RK2000 - Enable

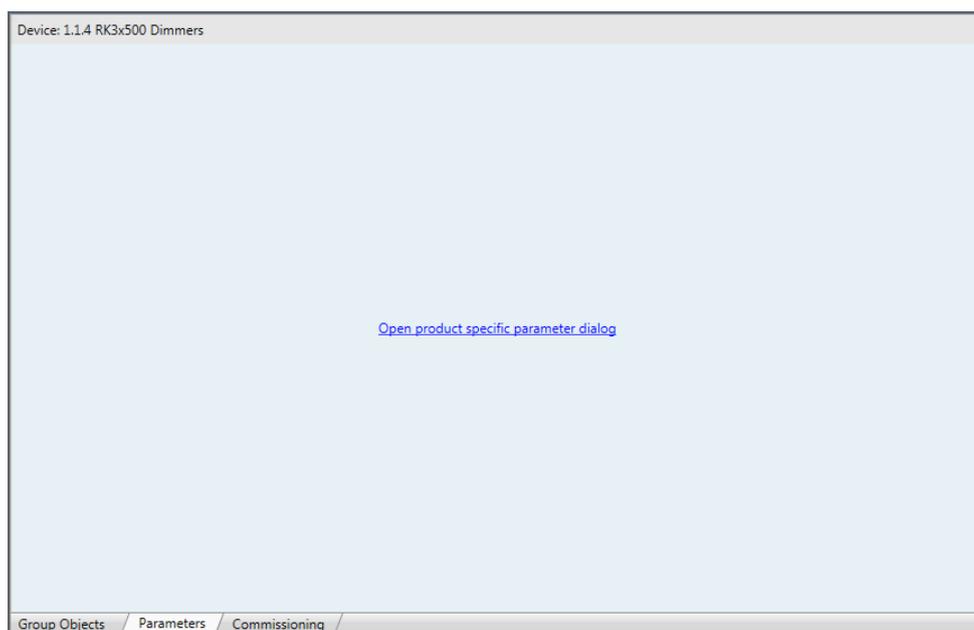
1 bit communication object to enable or disable the device control through the KNX BUS. When a "0" is received through this object the device can not be controlled by BUS telegrams (input is not disabled). When a "1" ir received the device is enabled.

Object 22: Scene

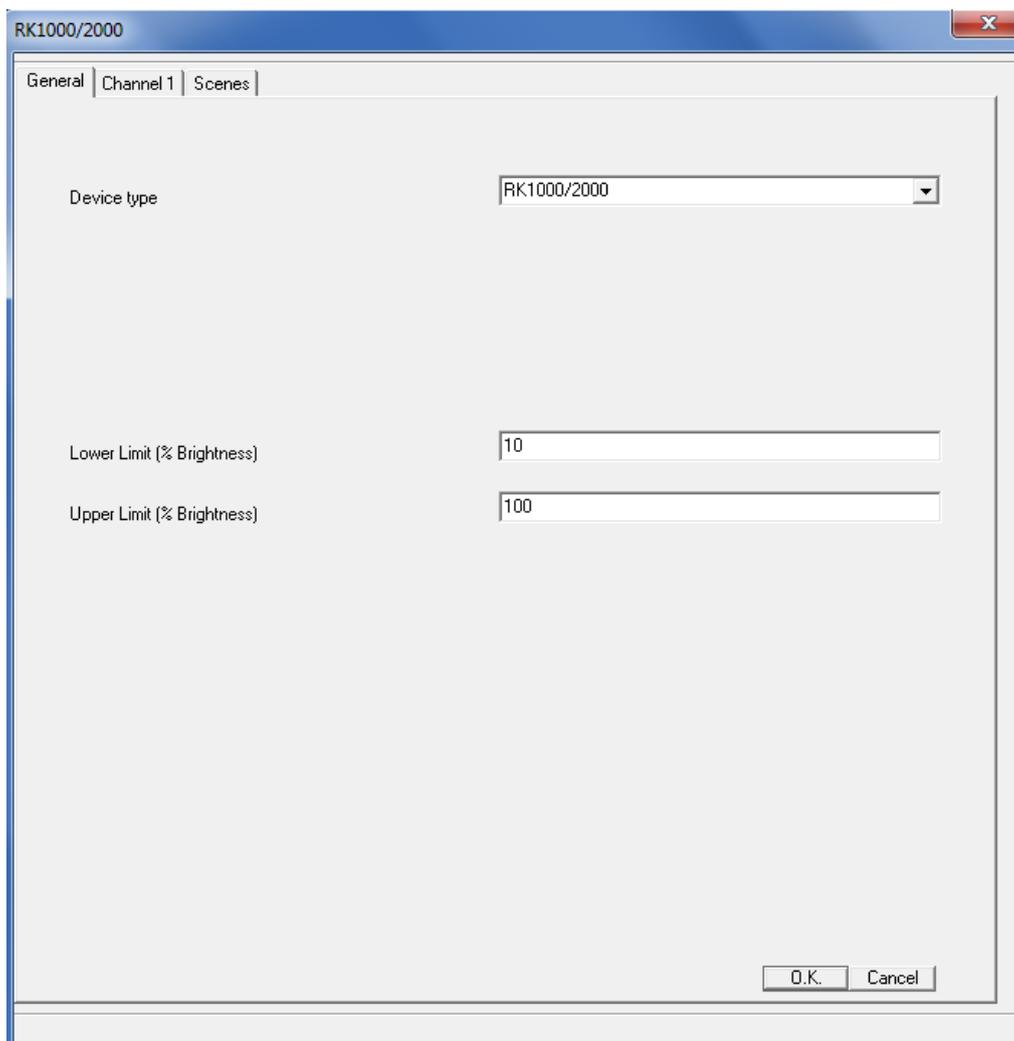
1byte communication object for internal scenes execution. Scenes can be programmed in the parameters window of the device. There are up to 8 scenes available.

3.3 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 RK1000/RK2000.



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

3.3.1 GENERAL

Device type	
Values	RK1000/2000, RK2x500, RK3x500, RGBL-K, DALI_virtual_dimmer, DMX_virtual_dimmer
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 RK1000/2000.

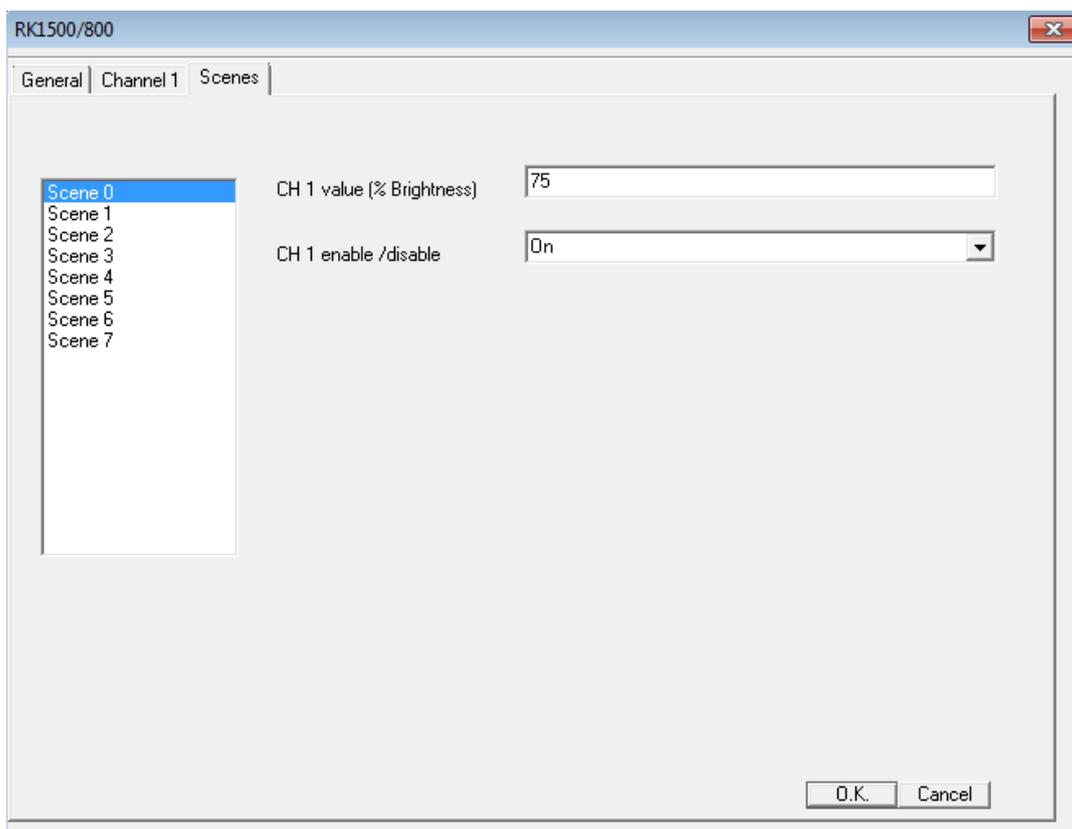
Lower limit (% Brightness)	
Values	From 0 to 100
Description	Is the minimum regulation value (in percentage %) that the dimmer can reach. The brightness level of the dimmer will stop at the lower limit when receiving decrements by precise control telegrams (by object 2) or dimming telegrams (by object 1) and it can only be switched off with a "0" through the on/off or value objects (objects 0 and 2).
Upper limit (% Brightness)	
Values	From 0 to 100
Description	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).

3.3.2 CHANNEL 1/2/3

Ramp speed (sec)	
Values	From 0 to 255
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.

3.3.3 SCENES 0 TO 7

The RK1000/RK2000 allows to configure up to 8 scenes that can be executed from bus commands with the corresponding communication object (number 22). The presets of the three channels when calling a scene are configured in the following parameters tab:



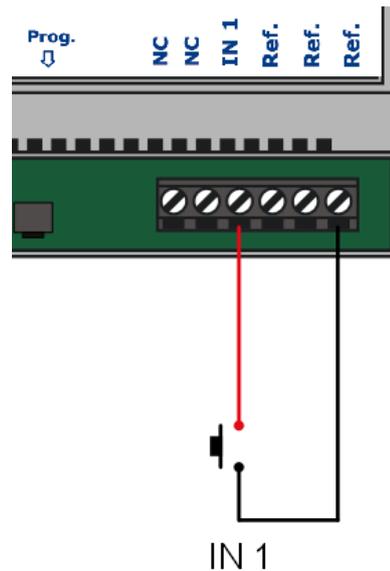
Channel 1 Value (% Brightness)	
Values	From 0 to 100
Description	Is the value memorized in the scene for the brightness level of the channel. The brightness level will go up or down slowly according to the ramp speed configured when the scene is called.
Channel 1 Enable	
Values	Yes/No
Description	Select 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.

3.4 INPUTS

3.4.1 CONNECTION

The RK1000/RK2000 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:



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 (230 V) or any other external voltages to any point of the BUS or inputs.

3.4.2 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 instantly. 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

RK1000/RK2000: One channel proportional actuator.

KNX 1 gang pushbutton

KNX 1 gang switch.

4.1.2 DESCRIPTION

The RK1000/RK2000 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 RK1000/RK2000 and at the same time from any KNX 1xgang pushbutton connected to the EIB/KNX BUS anywhere.

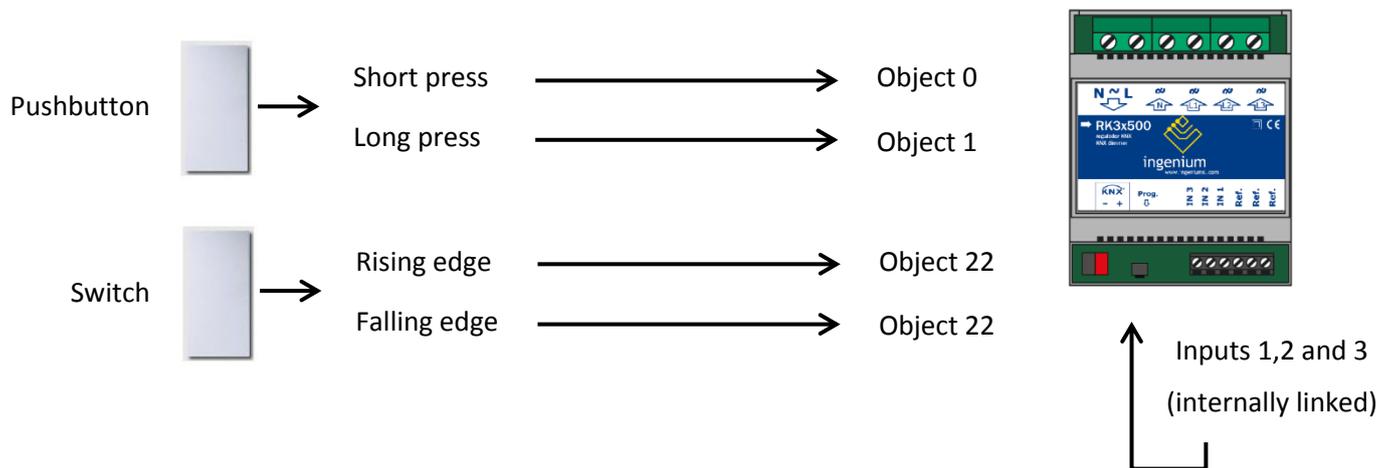
4.1.3 OBJECTS LINKS

RK1000/RK2000 –  Object 0  > Object X Short press – KNX pushbutton

RK1000/RK2000 –  Object 1  > Object Y Long press – KNX pushbutton

RK1000/RK2000 –  Object 22  > Object X Rising edge – KNX switch

RK1000/RK2000 –  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	RK1000/RK2000
	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 RK1000/RK2000 in order to change to a brightness value directly and instantly.

Remember that the input of the RK1000/RK2000 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

