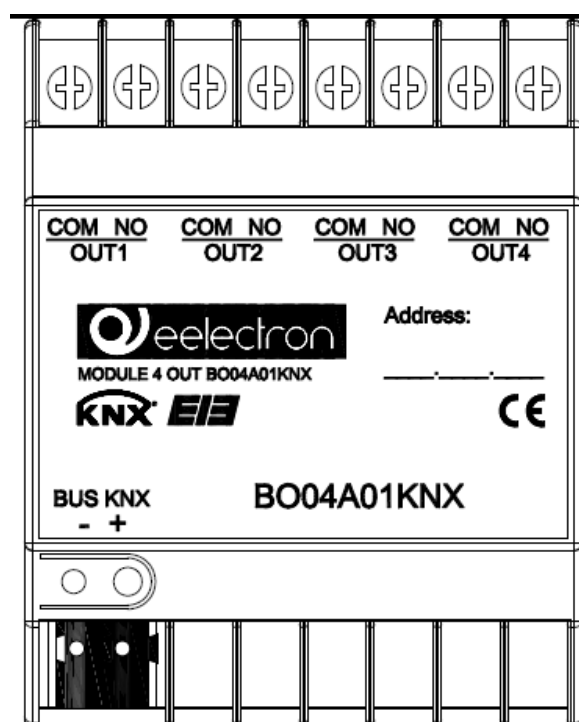


# Din Rail 4 Output Module

## BO04A01KNX

### Product Handbook



#### Product

Description: **Din Rail 4 Output Module**

Order Code: **BO04A01KNX**

#### Document

Version: **1.1**

Date: **28/01/2014**

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- Any information inside this manual can be changed without advice.
- This handbook can be download freely from the website: [www.eelectron.com](http://www.eelectron.com)
- **Exclusion of liability:**  
Despite checking that the contents of this document match the hardware and software, deviations cannot be completely excluded. We therefore cannot accept any liability for this. Any necessary corrections will be incorporated into newer versions of this manual.

## 1. General Introduction

This manual is intended to be used by installers and describes functions and parameters of the device BO04A01KNX – Din Rail 4 Output Module and how is possible to change settings and configurations using ETS software tool.

## 2. Product and functional overview

The BO04A01KNX module is designed to be installed on a DIN rail and to be used in Home and Building installations (i.e. offices, hospitals, hotels, private houses, etc...).

Device 4 outputs on board can be configured in different ways:

- Each output can be configured independently for load control (R1 to R4)
- Each output can be configured independently for ON / OFF or continuous switching (PWM) for Electric valves (solenoid actuators) (EV1 to Ev4)
- Outputs can be configured in pairs for the management of roller shutters and blinds; up to 2 channels (Channels A to B)
- Outputs can be configured in pairs for management of Motor Reductor or for solenoid valves with 3-point control or for ventilating grilles; up to 2 channels (Channels A to B)

Scheme of all possible configurations for each output:

Relay	Generic Load	Shutter / Blinds	Electric Valves	Motor Reduction
Out 1	R1	Channel A	EV 1	Channel A
Out 2	R2		EV 2	
Out 3	R3	Channel B	EV 3	Channel B
Out 4	R4		EV 4	

The physical address, group address and parameters are assigned and programmed with ETS tool software. In order to commission the device, a PC with ETS3 version V3.0f or higher is required as well as an interface to the bus, (USB, IP, etc...)

## 2.1. Address and associations limits

- The maximum number of group addresses allowed for the device is **50** this means that it is possible to associate the communication objects to a maximum of **50** group addresses.
- The maximum number of logical associations allowed for the device is **63**; this means that the maximum number of logical connections between communication objects and group addresses is **63**.
- **Caution:** there is a limit to the number of associations that can be created, on the same device, between transmission communications objects (i.e. inputs) and receiving communication objects (i.e. outputs). If you want, on the same device, add a group address already linked to a transmission communication object (input) to a receiving communication object (output) which already has a different group address associated, please note that you can add a maximum of **13** group addresses of this kind for the whole device.

## 3. General Parameter Configuration

### 3.1. Parameters

General Parameter Configuration	
Output Configuration	
Output 1 Relay ON/OFF	
Output 2 Relay ON/OFF	
Output 3 Relay ON/OFF	
Output 4 Relay ON/OFF	
<hr/>	
Delay on Power up (3-15 sec)	3
Send device ON-LINE	Enabled
Device ON-LINE sending time	1 h
<hr/>	
If is activated at least one Electric Valve or Motor Driver	
All Valve Closed	Disabled

General Parameter Configuration Page list generic parameters which affects all output channels, or their selection applies to all contacts of the input device simultaneously regardless of the function selected later for each.

KNX PARAMETER	SETTINGS
<b>Delay on Power-up (3-15 sec)</b>	2 ÷ 15 seconds
<p>Through this parameter is possible to set the delay of transmission of telegrams after a power on by selecting the time by which the device is allowed to send telegrams.</p> <p>In large systems after a power failure or shutdown this delay avoids to generate excessive traffic on the bus, causing slow performance or a transmission block.</p> <p>If there are different devices that require sending telegrams on the bus after a reset, these delays must be programmed to prevent traffic congestion during the initialization phase.</p> <p>The input detection and the values of objects are updated accordingly at the end of the transmission delay time</p> <p>At the end of ETS programming the device behaves like after a power on.</p>	

KNX PARAMETER	SETTINGS
<b>Send Device ON-LINE</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
<b>Device ON-LINE sending time</b>	<ul style="list-style-type: none"> <li>• 10 min</li> <li>• 1 hr</li> <li>• 12 Hr</li> <li>• 24 Hr</li> </ul>
<p>Through this parameter it's possible to enable a cyclical sending, on the bus, of a 1 bit telegram with value "1"; this sending has a programmable time interval.</p> <p>This message can be used to detect errors like power failure or breakage of the device to a monitoring system or to a bus control system.</p>	

If is activated at least one  
Electric Valve or Motor Driver

All Valve Closed

All Valve Closed Functions depends on:



Electric Valves Output

Motor Reduction Driver Channels

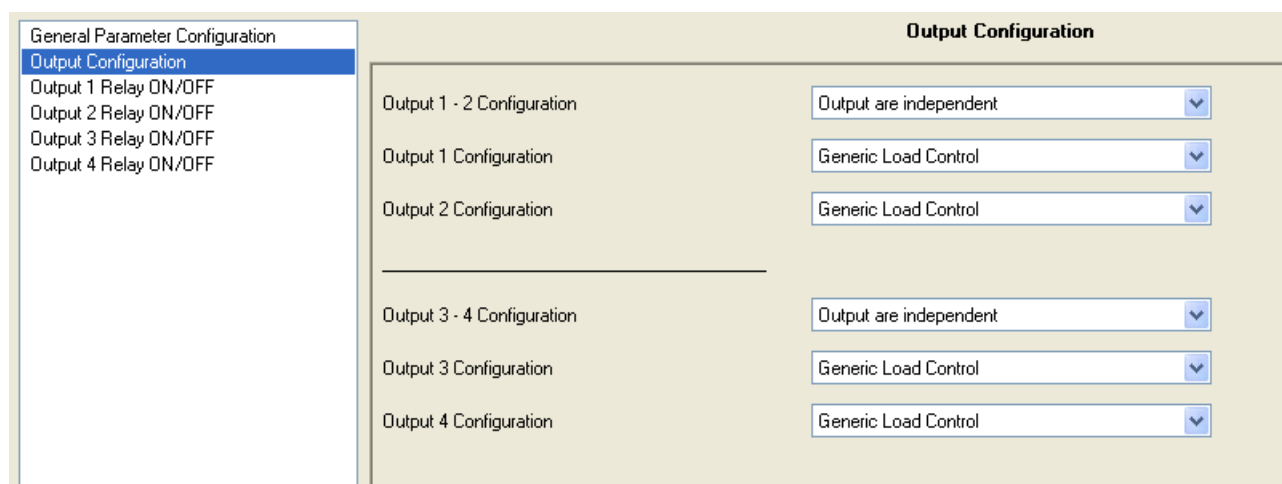
El. Valves Out and Mot. Reduc. Ch

KNX PARAMETER	SETTINGS
<b>All Valve Closed</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
<b>All Valve Closed Function depends on;</b>	<ul style="list-style-type: none"> <li>• Electric valves output</li> <li>• Motor reduction Driver Channels</li> <li>• Electric valves output and Motor reduction Channels</li> </ul>
See paragraph 8.4 Function VALVES ALL CLOSED	

### 3.2. Communications Objects

 32	<Electric Valves / Motor Reduction Driver>	All Valve Closed	1 bit	C R - T -
 49	Device On-Line		1 bit	C R - T -

## 4. Output Configuration



KNX PARAMETER	SETTINGS
<b>Output 1 – 2 Configuration</b>	<ul style="list-style-type: none"> <li>• Output are independent</li> <li>• Output are coupled</li> </ul>
Here it is possible to set if outputs are independent and therefore can be set with functions which use only one relay at a time (generic loads and electric valve); if the option selected is “Output are coupled” the relays work together to realize functions which use a double relay (shutter and motor reduction driver)	
<b>Output 3 – 4 Configuration</b>	Same values of “Output 1 – 2 Configuration”

Output 1 - 2 Configuration	Output are independent
Output 1 Configuration	Generic Load Control
Output 2 Configuration	Generic Load Control Electric Valve Control

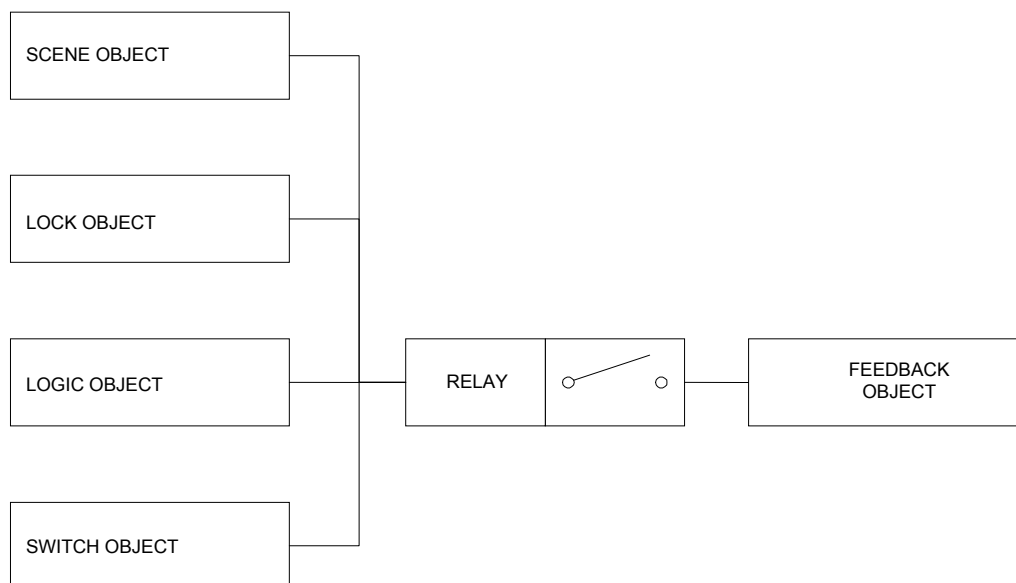
Output 1 - 2 Configuration	Output are coupled
Output 1 - 2 Coupled	Driver Motor Reductor Shutter Driver Motor Reductor

KNX PARAMETER	SETTINGS
<b>Output 1 Configuration</b>	<ul style="list-style-type: none"> <li>Generic Load Control</li> <li>Electric Valve Control</li> </ul>
Output 1 works in single mode; this parameter select which function is set; identical parameter for output 2, 3, 4 if configured in single mode.	
<b>Output 1 – 2 Coupled</b>	<ul style="list-style-type: none"> <li>Shutter</li> <li>Driver Motor Reduction</li> </ul>
Output 1 and 2 works in coupled mode; this parameter selects the function: shutter management or motor reduction management. Identical parameter for output coupled 3-4.	
<b>Output 2 Configuration</b>	Same values of “Output 1 Configuration”
<b>Output 3 Configuration</b>	Same values of “Output 1 Configuration”
<b>Output 4 Configuration</b>	Same values of “Output 1 Configuration”
<b>Output 3 – 4 Coupled</b>	Same values of “Output 1 - 2 Coupled”



## 5. Output Configuration for Generic Load Control

The functional diagram of each output configured as Generic Load Control is represented in the following scheme:



### 5.2. General Parameters

KNX PARAMETER	SETTINGS
<b>Contact type</b>	<ul style="list-style-type: none"> <li>• NO – Normally Open</li> <li>• NC - Normally Close</li> </ul>
With this parameter you can set the operating mode of the relay. The relay can be used as "open contact" or "close contact"; This difference is logical because the relay has only one pole and it is not available a terminal connected to the NC contact.	

OUTPUT (Relay status)	NO – Normally Open	NC – Normally Close
ON (Activated)	NO contact is closed	NO contact is open
OFF (Deactivated)	NO contact is open	NO contact is closed

KNX PARAMETER	SETTINGS
<b>Behaviour on power down</b>	<ul style="list-style-type: none"> <li>• ON</li> <li>• OFF</li> <li>• STOP – no movement</li> </ul>
When bus voltage fall down under approximately 18V device enters the power down routine and it is possible to set the status of the relay status ( <b>See note 1</b> ).	
<b>Behaviour on power up</b>	<ul style="list-style-type: none"> <li>• ON</li> <li>• OFF</li> <li>• Keep status on power down</li> </ul>
On power up it is possible to set the status of each relay with this parameter ( <b>see note 2</b> )	

**NOTES:**

**[1]:** *the device has to accumulate the energy it needs to switch the relays when it is on and stores it into capacitors. For this reason, when a power down is detected, the device has the energy to switch all the 4 relays only if it has been powered from at least 60 seconds and it has not done a full 4 relay switch from at least 20 seconds. It is strongly recommended not to select a full 4 relay switch on power down because the full switch cannot be done in all the situations.*

**[2]:** *When is selected the value “Keep status on power down” for the parameter “Behaviour on power up” it is maintained the state selected on power down unless you have selected on power down the behaviour “STOP – no movement”; in that case it is maintained the state active before power down.*

### 5.3. Relay Functions

Output 1 Relay ON/OFF	
Contact Type	NO - Normally Open
Additional Function	No Function
Activation Telegram	Telegram "1"
Function	ON/OFF
Relay Feedback	When status change
Telegram value for status sending	Telegram "0" when output is OFF
Scene	Disable
Behaviour on power down	Stop - no movement
Behaviour on power up	Keep status before power down

KNX PARAMETER	SETTINGS
<b>Function</b>	<ul style="list-style-type: none"> <li>• ON / OFF</li> <li>• ON / OFF with delay</li> <li>• ON with delay / timing OFF</li> <li>• Continuous Switching</li> </ul>
<ul style="list-style-type: none"> <li>• ON / OFF</li> <li>• ON / OFF with delay</li> <li>• ON with delay / timing OFF</li> <li>• Continuous switching</li> </ul>	<p>After receiving a telegram on the switching objects, relay switch in ON or OFF position.</p> <p>it is possible to set a delay between the reception of a telegram and the switch of the relay ; for both telegrams: activation and deactivation</p> <p>it is possible to set a delay between the reception of a telegram of activation and the switch of the relay; the OFF switch is automatic after a configurable time (staircase timer)</p> <p>with this function the relay, when a 1 bit telegram is received, starts switching ON and OFF with a configurable time; with the opposite 1 bit telegram it stops and remains in OFF position.</p>
<b>Activation telegram</b>	<ul style="list-style-type: none"> <li>• Telegram "0"</li> <li>• Telegram "1"</li> </ul>
For every function above selected you can set a parameter to determine if the function is activated with a telegram "0" (and then off with "1") or is activated with telegram "1" (and then off with "0");	
<b>Relay Feedback</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• When status changes</li> <li>• On request</li> </ul>
<ul style="list-style-type: none"> <li>• Disabled</li> <li>• When status changes</li> <li>• On request</li> </ul>	<p>Status is never transmitted ad related communication object is not visible</p> <p>Status is transmitted every time the relay switch changing his status from ON to OFF or from OFF to ON.</p> <p>Status communication object is available and updated when status changes but the telegram is not transmitted. Read propriety is enabled.</p>
<b>Telegram value for status sending</b>	<ul style="list-style-type: none"> <li>• Telegram "0" when value is OFF</li> <li>• Telegram "1" when value is ON</li> </ul>
This parameter defines which telegram value is associated to the ON or OFF status.	

## 5.4. Additional Functions

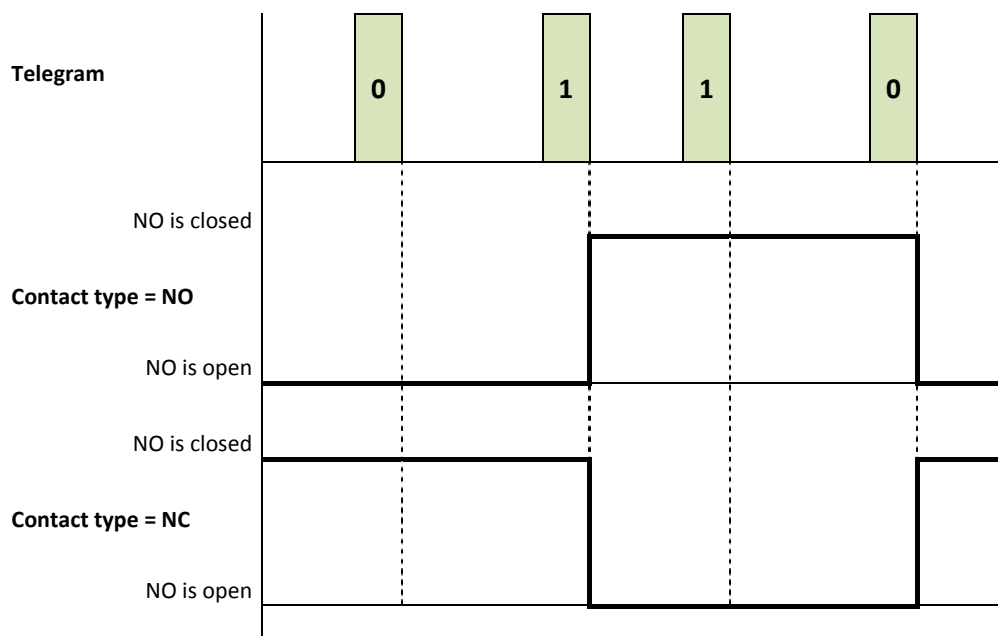
In BO04A01KNX 3 additional function can be enabled:

- **LOCK FUNCTION** : this function according to the command received from the bus, blocks the relay in a specific condition when a “lock on” command arrives, this state is kept until a “lock off” command is received; any command received during the period in which the block is activated is not executed.
- **LOGIC FUNCTION**: This function allows you to control the load, not only using the relay Switch Command object, but using the result of a logic operation; the logic function consists in two logic ports: the operation is performed among the logic input and the relay command object.
- **SCENE FUNCTION**: The scene function manage two possible commands to the device: **perform scene**, that is a command to create a specific condition; **learn scene**, that is a command to memorize the current status of the contact at the moment the command is received, and then reproduce it once the perform command is received.

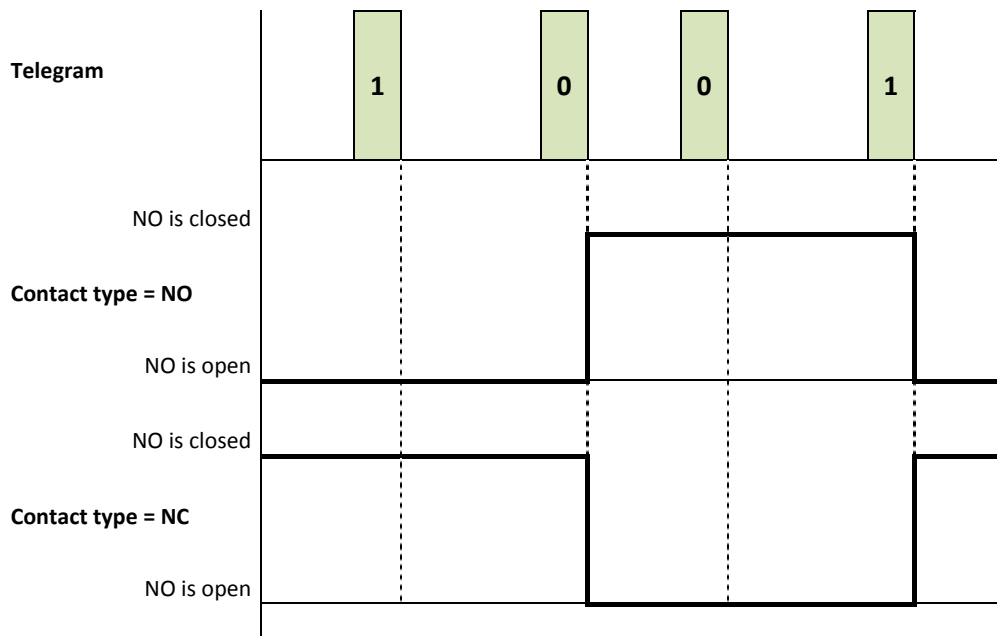
LOCK and LOGIC function are alternative functions and only one of them can be enabled at a time.

## 5.5. Function ON / OFF

The relay switches when a message is received on the Relay Command Object.  
Behavior of the relay set to "NO" and "NC" when activation telegram is telegram "1":



Behavior of the relay set to "NO" and "NC" when activation telegram is telegram "0":



## 5.6. Function ON/OFF with delay

In this configuration it is possible to set a time delay on the relay activation ( $T_{ON}$ ) and also a delay time for the relay deactivation ( $T_{OFF}$ )

The opening and closing of the contact, when the parameters are different from zero, occurs later than the receipt of the telegram, activation and deactivation delays are set separately

Function	ON/OFF with delay
Delay on Activation	True
Delay on Activation (Base Time)	1 sec.
Delay on Activation (Factor)	1
Delay on Deactivation	True
Delay on Deactivation (Factor)	1 sec.
Delay on Deactivation (Base Time)	1

KNX PARAMETER	SETTINGS
<b>Delay on Activation</b>	<ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>
<b>Delay on Deactivation</b>	<ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>
<b>Delay on Activation (Base Time)</b>	<ul style="list-style-type: none"> <li>• 1 sec.</li> <li>• 1 minute</li> <li>• 1 hour</li> </ul>
<b>Delay on Activation (Factor)</b>	1...255
The delay time between the receipt of a telegram and the execution of the command is given by : <i>Delay of Activation Time = Delay on Activation (Base Time) x Delay on Activation (Factor)</i>	
<b>Delay on Deactivation (Base Time)</b>	<ul style="list-style-type: none"> <li>• 1 sec.</li> <li>• 1 minute</li> <li>• 1 hour</li> </ul>
<b>Delay on Deactivation (Factor)</b>	1...255
The delay time between the receipt of a telegram and the execution of the command is given by : <i>Delay of Deactivation Time = Delay on Deactivation (Base Time) x Delay on Deactivation (Factor)</i>	

## 5.7. Function ON with delay / timing OFF

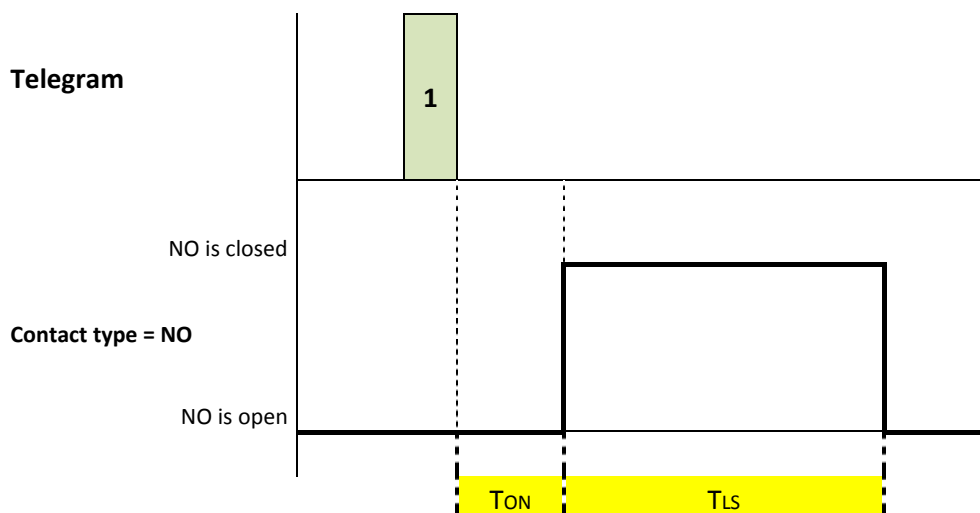
After receiving a telegram from the Relay Command Object, the relay is active for a time (T<sub>LS</sub>) that can be set by a parameter; when T<sub>LS</sub> expires, it turns off automatically.

It is also possible to set a delay on activation time (T<sub>ON</sub>) (see “ON with delay” function).

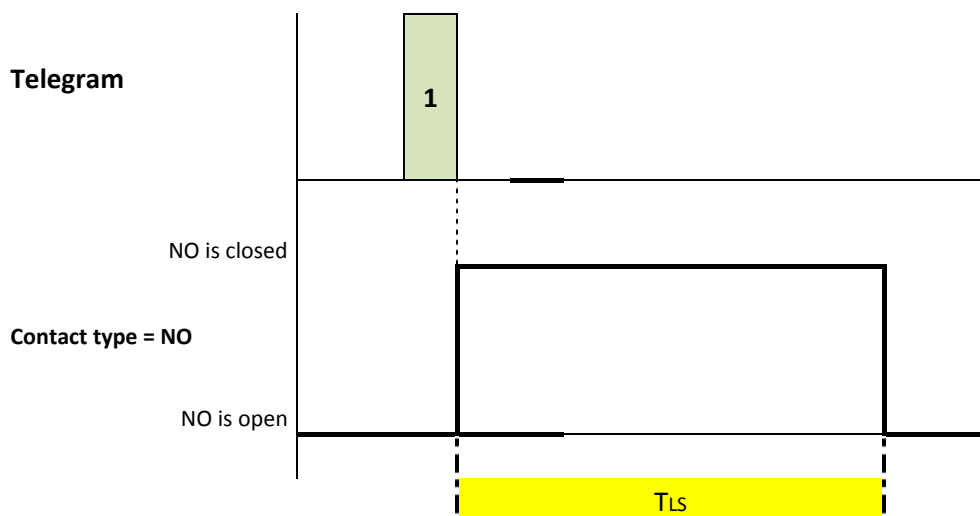
Delay on Activation	True
Delay on Activation (Base Time)	1 sec.
Delay on Activation (Factor)	1
Timing (Time Base)	1 sec.
Timing (Factor)	1

KNX PARAMETER	SETTINGS
<b>Delay on Activation</b>	<ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>
<b>Delay on Activation (Base Time)</b>	<ul style="list-style-type: none"> <li>• 1 sec.</li> <li>• 1 minute</li> <li>• 1 hour</li> </ul>
<b>Delay on Activation (Factor)</b>	1...255
The delay time between the receipt of a telegram and the execution of the command is given by : <i>Delay of Activation Time = Delay on Activation (Base Time) x Delay on Activation (Factor)</i>	
<b>Timing (Base Time)</b>	<ul style="list-style-type: none"> <li>• 1 sec.</li> <li>• 1 minute</li> <li>• 1 hour</li> </ul>
<b>Timing (Factor)</b>	1...255
The T <sub>LS</sub> time set for automatic turn off is given by : <i>Timing duration = Timing (Base Time) x Timing (Factor)</i>	

“Duration of relay activation” (T<sub>LS</sub>) and “ON delay time” (T<sub>ON</sub>) are programmable by ETS.



“ON delay time” ( $T_{ON}$ ) can be disabled by ETS.



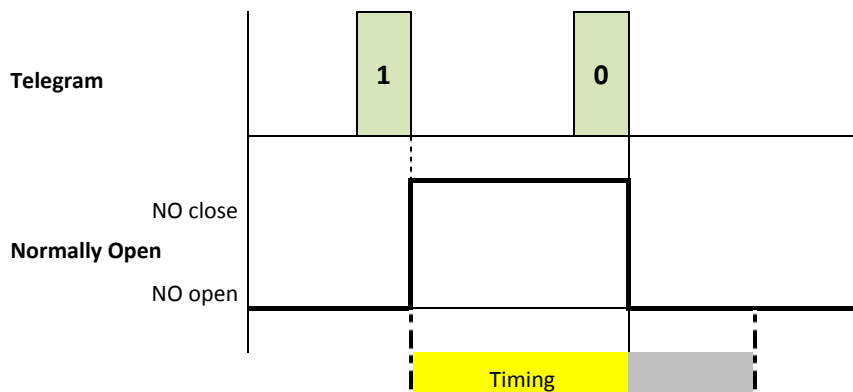
Timing can be stopped	True
Warning Function	True
Warning Time (seconds before time ends)	15 sec.
Switch Off Time	0.5 sec.

KNX PARAMETER	SETTINGS
<b><i>Timing can be stopped</i></b>	<ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>
This allows you to set the behaviour of the device when it receives a OFF command:	
<ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>	On receiving a OFF command, the device immediately executes the command and switch off the relay without waiting the end of the timing phase On receiving a OFF command, the device ignores the command and continues the timing phase; the load is deactivated at the end of the set time and it is not possible to deactivate it using a bus command.
<b><i>Warning Function</i></b>	<ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>
<b><i>Warning Time ( seconds before time ends)</i></b>	<ul style="list-style-type: none"> <li>• 15 sec.</li> <li>• 30 sec.</li> <li>• 1 minute</li> <li>• 2 minutes</li> </ul>

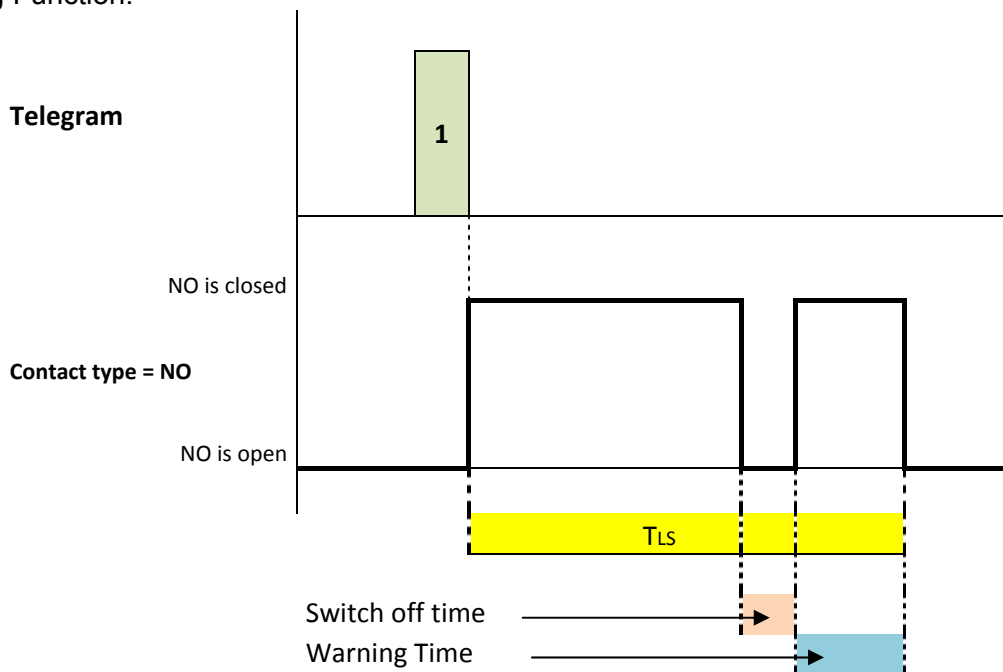


<p><b>Switch Off Time</b></p>	<ul style="list-style-type: none"> <li>• 1,0 sec.</li> <li>• 1,5 sec.</li> <li>• 2,0 sec.</li> </ul>
<p>Here you can set the warning time before the deactivation of the stairway light function, upon which the device will consequently signal the imminent termination of the stairway light function by switching off, for a brief time, the light.</p>	

Duration of relay timing can be stopped with an OFF command.



Warning Function:



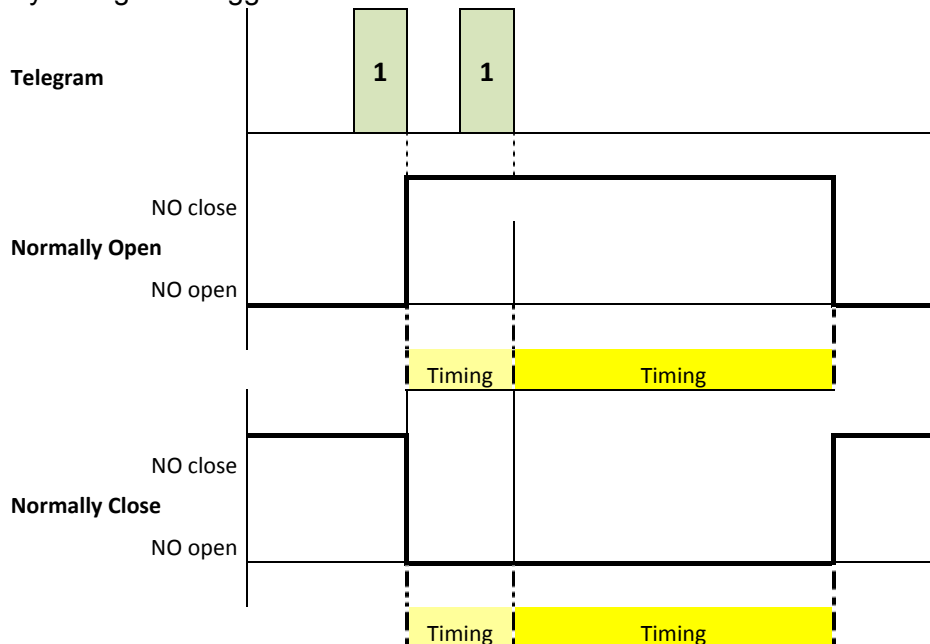
Send ON when Timing is Active	Trigger Mode
Relay Feedback	Ignore
	Trigger Mode
	Extension Mode

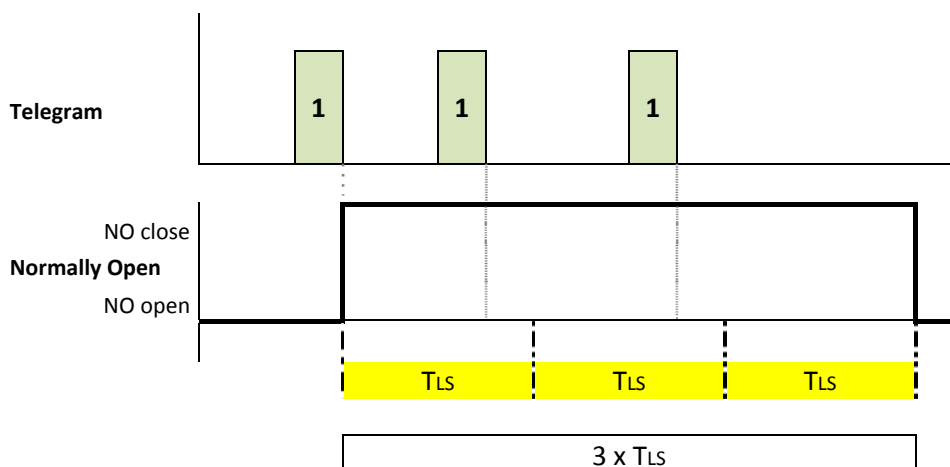
Maximum Number of Time Extension	4 times
	2 times
	3 times
	4 times

KNX PARAMETER	SETTINGS
<b>Send ON when Timing is active</b>	<ul style="list-style-type: none"> <li>Ignore</li> <li>Trigger Mode</li> <li>Extension Mode</li> </ul>
This allows you to set the behaviour of the device when it receives a ON command while the staircase timing is running:	
<ul style="list-style-type: none"> <li>Ignore</li> <li>Trigger Mode</li> <li>Extension Mode</li> </ul>	On receiving a ON command, the device ignores it and goes on executing the timing. On receiving a ON command, the device restart the stairs light time executing the whole time again. On receiving the command the device extends the stairs light time, increasing it by the time of the standard stairs light time. Note that the extension option does not reset the timing but it changes its duration and becomes a multiple of the set stairs light time. The maximum number of extension is allowed by the parameter "Maximum number of Time Extension"

Duration of relay timing is re-trigge able:



Extension Mode:



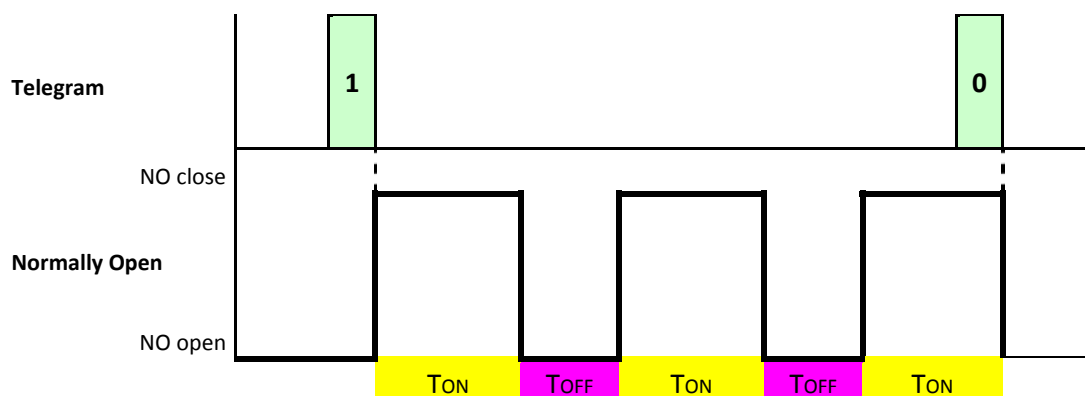
## 5.8. Function “Continuous Switching”

In this configuration it is possible to activate the relay to perform a continuous ON / OFF switching that can be started or ended by a specified activation telegram. TON and TOFF can be set by parameters.

Output 1 Relay ON/OFF	
Contact Type	NO - Normally Open
Additional Function	No Function
Activation Telegram	Telegram "1"
Function	Continuous Switching
Time ON (Base Time)	1 sec.
Time ON (Factor)	5
Time OFF (Base Time)	1 sec.
Time OFF (Factor)	5
Start Continuous Switching on Power Up	False

KNX PARAMETER	SETTINGS
<b>Time ON (Base Time)</b>	<ul style="list-style-type: none"> <li>• 1 sec.</li> <li>• 1 minute</li> <li>• 1 hour</li> </ul>
<b>Time ON (Factor)</b>	1...255
The duration time of the ON state for the relay is: $ON\ Duration\ Time = Time\ ON\ (Base\ Time) \times Time\ ON\ (Factor)$	
<b>Time OFF (Base Time)</b>	<ul style="list-style-type: none"> <li>• 1 sec.</li> <li>• 1 minute</li> <li>• 1 hour</li> </ul>
<b>Time OFF (Factor)</b>	1...255
The duration time of the OFF state for the relay is: $OFF\ Duration\ Time = Time\ OFF\ (Base\ Time) \times Time\ OFF\ (Factor)$	

Activation Telegram = “Telegram 1”; Contact Type = “Normally Open”:



KNX PARAMETER	SETTINGS
<b>Start Continuous Switching on Power Up</b>	<ul style="list-style-type: none"> <li>• False</li> <li>• True</li> </ul>
If set to “True” this parameter enable the activation of continuous switching on power up, without waiting for the activation telegram, it starts automatically.	

**▲** If this parameter is set to TRUE, the continuous switching starts automatically on Power ON, regardless of the setting on the parameter “Behaviour on power up” .

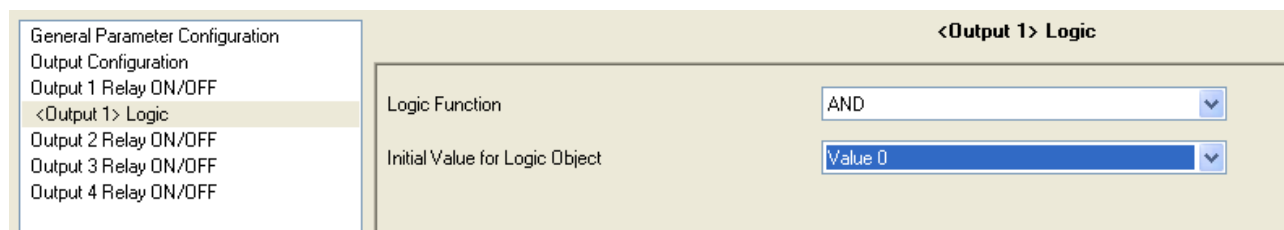
## 5.9. Communication objects

Number	Name	Object Function	Description	Group Addresses	Length	C	R	W	T	U
0	<Output 1> Relay Command	Off/On			1 bit	C	R	W	-	-
1	<Output 1> Relay Status	Off/On			1 bit	C	R	-	T	-
2	<Output 2> Relay Command	Off/On			1 bit	C	R	W	-	-
3	<Output 2> Relay Status	Off/On			1 bit	C	R	-	T	-
4	<Output 3> Relay Command	Off/On			1 bit	C	R	W	-	-
5	<Output 3> Relay Status	Off/On			1 bit	C	R	-	T	-
6	<Output 4> Relay Command	Off/On			1 bit	C	R	W	-	-
7	<Output 4> Relay Status	Off/On			1 bit	C	R	-	T	-

## 5.10. Logic Function

Enabling logical operation allow to submit the command for the output to a result of a logical operation between the communication object *<Output x> Relay Control* and another communication object called *<Output x> Logic Function*.

By ETS is possible to select the logical operation to use, every time a telegram is received on the logical object or on the control object the logical operation is calculated again and the result is taken as a command for the relay.



KNX PARAMETER	SETTINGS
<b>Logic function</b>	<ul style="list-style-type: none"> <li>• AND</li> <li>• OR</li> <li>• XOR</li> </ul>
This parameter selects the logical operation	
<b>Initial Value for logic Operation</b>	<ul style="list-style-type: none"> <li>• Value "0"</li> <li>• Value "1"</li> </ul>
This parameter selects the value the logical object must have on power up ( <b>see note 1</b> ).	

If the relay has a timing, or a delay on activation or deactivation, etc... a logical operation result that bring to command “0” or “1” determines a new behaviour of the relay that follows its own parameterization.

**NOTES:**

**[1]:** The value assumed by the logic communication object set by the parameter “**Initial Value for logic Operation**” does not switch automatically the relay because this behaviour is determined by the parameter “**Behaviour on power up**”

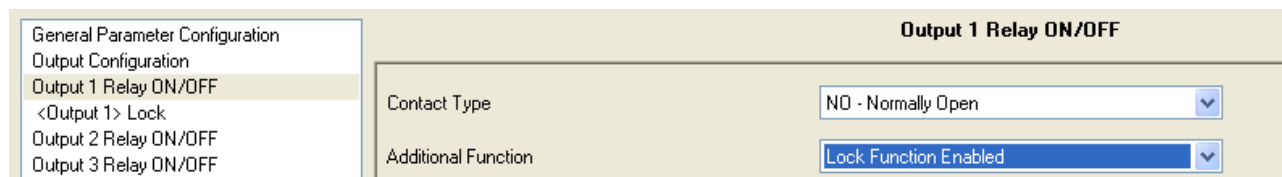
Example of logic function:

If a relay has AND function enabled and delay on activation/deactivation enabled.

RELAY CONTROL	LOGICAL FUNCTION	RESULT	BEHAVIOUR
0	0	0	-
1	0	0	Start a delay on deactivation
1	1	1	Start a delay on activation

### 5.11. Lock Function

When lock function is enabled it allows, as a result of receiving a telegram on the <Output x> *Lock Function*; to switch the relay in a defined state and force it to maintain this state even if the object switching value changes.



KNX PARAMETER	SETTINGS
<b>Initial Value for Lock Object</b>	<ul style="list-style-type: none"> <li>Value “0”</li> <li>Value “1”</li> </ul>
This parameter selects the value of the lock object after a power on; appropriately changing this value it is possible to start the output channel related to the lock function as “locked” or “unlocked”. (See note 1).	
<b>Telegram for Lock Activation</b>	<ul style="list-style-type: none"> <li>Telegram “0”</li> <li>Telegram “1”</li> </ul>
This parameter selects the values associated to the “lock” or “unlock” condition.	
<b>Relay Position when Lock is Active</b>	<ul style="list-style-type: none"> <li>Relay is Deactivated</li> <li>Relay is Activated</li> </ul>
This parameter selects the state the relay must assume when the “lock function” becomes active”. (See note 2).	

<p><b>Position when Lock Ends</b></p>	<ul style="list-style-type: none"> <li>• Relay is Deactivated</li> <li>• Relay is Activated</li> <li>• Keep previous state and ignore telegrams</li> <li>• Keep previous state and don't ignore telegrams</li> </ul>
<ul style="list-style-type: none"> <li>• Relay is Deactivated</li> <li>• Relay is Activated</li> <li>• Keep previous state and ignore telegrams</li> <li>• Keep previous state and don't ignore telegrams</li> </ul>	<p>Relay is in “OFF” position (<b>See note 2</b>).                  Relay is in “ON” position (<b>See note 2</b>).                  Relay returns in the state it was before lock function became active                  the output channel returns to its condition prior to the activation of the block unless you have received a telegram on the switch object or scenario; in this case, the last command received is executed.</p>

**NOTES:**

**[1]:** If the parameter “**Initial Value for Lock Object**” has the same value of “**Telegram for Lock Activation**” happens that, on power up, the output channel starts in lock mode, waiting for a “unlock” telegram in order to become active. Note that, even if the relay starts with lock function already active it does not go automatically in the position defined by the parameter “**Relay Position when Lock is Active**”; because this behaviour is determined only by the parameter “**Behaviour on power up**”

**[2]:** The “activated” and “deactivated” conditions for each output channels correspond to ON or OFF condition upon the settings made for the “**Contact Type**” parameter.

## 5.12. Scene Function

General Parameter Configuration	Output 1 Relay ON/OFF
Output Configuration	
Output 1 Relay ON/OFF	
<Output 1> Scene	Contact Type <input type="text" value="NO - Normally Open"/>
Output 2 Relay ON/OFF	Additional Function <input type="text" value="No Function"/>
Output 3 Relay ON/OFF	Activation Telegram <input type="text" value="Telegram 1"/>
Output 4 Relay ON/OFF	Function <input type="text" value="ON/OFF"/>
	Relay Feedback <input type="text" value="When status change"/>
	Telegram value for status sending <input type="text" value="Telegram 0 when output is OFF"/>
	Scene <input type="text" value="Enabled"/>
	Behaviour on power down <input type="text" value="Stop - no movement"/>
	Behaviour on power up <input type="text" value="Keep status before power down"/>

When the scene function is enabled a communication object named <Output x> Scene becomes visible.

It is possible to send to the device two possible commands:

- recall scene - is a command to create a specific condition
- store scene - is a command to learn and store the current status (at the moment the command is received) of the contact, and then reproduce it once the recall command is received

For every channel it is possible to store a maximum of 4 output scene.

KNX PARAMETER	SETTINGS
<b>Scene Number &lt;X&gt;</b>	0 ... 64
For the 4 possible scenes, this number is the unique identifier for the scene: valid numbers are from 0 to 63; 64 means scene is not active.	
<b>Initial value Scene &lt;X&gt;</b>	<ul style="list-style-type: none"> <li>• Contact Open</li> <li>• Contact Close</li> </ul>
For the 4 possible scene this number allow to initialize the status associated to previously selected scene number avoiding to execute the store scene procedure. If the store scene is done, this value is overwritten.	
<b>Learn Scene</b>	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>
This parameter enable / disable the output channel from storing value received from the bus; if this parameter is set to disable the value associated are set only by the parameters " <b>Initial value Scene &lt;X&gt;</b> " and cannot be modified without a ETS download.	

#### NOTES:

**[1]:** When a scene is recalled the output channel behaves in the same way as it would have received a telegram "0" or "1" on the <Output x> Relay Command communication objects; this means that if a output is normally open with the staircase light timer enabled – the receipt of a telegram "1" triggers a timed ON with automatic OFF when the timer expires.

**[2]:** After a ETS download the device assumes the value of parameter: "**Initial value Scene <X>**" as a value in memory for the corresponding scene and overwrites previous memorized scene positions.

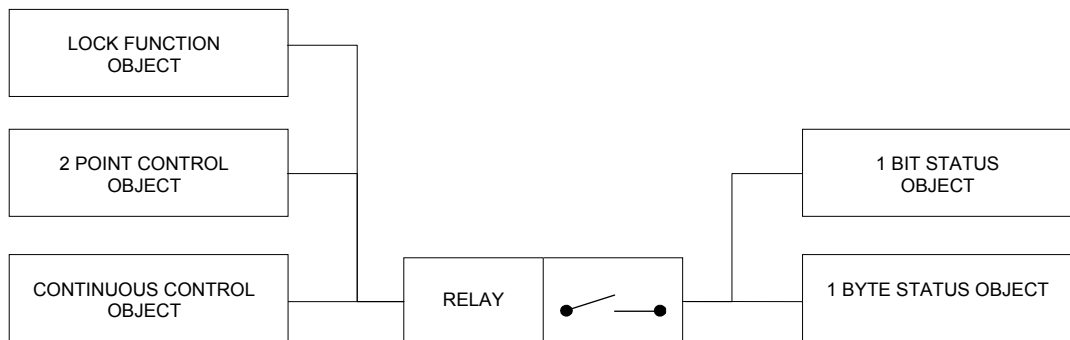


## 6. Output Configuration for Electric Valve Control

Each of the 4 outputs can be configured to drive an electric valve (solenoid valve) typically used in heating and cooling systems for floor panels.

- Use this output configuration when you want to drive an ON/OFF type solenoid valve, without motor reductor. In this type of valve one of two states (open or closed) is associated with the condition of valve powered, the other to valve not powered.
- If you use this configuration, the control algorithm must be resident in the control device (thermostat, etc. ..); the relay act only to power or not the valve.

The functional diagram of each output configured as electric valve control is represented in the following scheme:



2 POINT CONTROL OBJECT :	receive 1 bit commands to open and close the valve.
CONTINUOUS CONTROL OBJECT:	receives 1 byte commands (0% -100%) to open and close the valve through a PWM sequence.
LOCK FUNCTION OBJECT:	if enabled, according to the receipt of a 1 bit telegram, realizes a function for enabling / disabling the opening and closing of the valve
1 BIT STATUS OBJECT:	send information about the position (open / closed) of the valve using a 1 bit telegram
1 BYTE STATUS OBJECT:	send information about the proportion of active regulation using a 1 byte telegram

## 6.2. Main Parameters

ETS parameters when control value telegram is 1-bit.

Output 1 Electric Valve Driver	
Control Value	1 bit
Valve position when relay is open	Valve Open
Activation Telegram	Telegram "1" close the valve
Sending state telegram	When status change
Telegram value for status sending	Telegram "0" when relay is open
Anti-Locking Valve Function	Disabled
Lock Function	Disabled
Behaviour on power down	Stop - no movement
Behaviour on power up	Stop - no movement

ETS parameters when control value telegram is 1-byte.

Output 1 Electric Valve Driver	
Control Value	1 byte
Valve position when relay is open	Valve Open
Cycle Base Time for PWM	10 min.
Lower Limit Value	0 %
Upper Limit Value	100 %
Sending state telegram	When status change
Anti-Locking Valve Function	Disabled
Lock Function	Disabled
Behaviour on power down	Stop - no movement
Behaviour on power up	Stop - no movement

KNX PARAMETER	SETTINGS
<b>Control Value</b>	<ul style="list-style-type: none"> <li>• 1 bit</li> <li>• 1 byte</li> </ul>
This parameter defines whether the relay controls of the valve is carried out with 1-bit (ON / OFF) or 1-byte (0 to 100%) commands. When you select the 1-byte value the control is done through a PWM ( <b>See note 1</b> ).	
<b>Valve Position when relay is open</b>	<ul style="list-style-type: none"> <li>• Valve Open</li> <li>• Valve Close</li> </ul>
This parameter permits to set the behavior of the relay according to the state of the valve. If you have a valve that opens when the relay is closed and you want it to be activated by an ON command of a thermostat (most common situation), you must set this parameter at the value "Valve Closed" and the parameter (see below) "Activation telegram" with value "Telegram "0" close the valve"	
<b>Activation telegram</b>	<ul style="list-style-type: none"> <li>• Telegram "0" close the valve</li> <li>• Telegram "1" close the valve</li> </ul>
It is possible to set a parameter to determine if the function is activated with a telegram "0" (and then off with "1") or is activated with telegram "1" (and then off with "0");	
<b>Cycle Base Time For PWM</b> (See note 1).	5 min to 60 min in step of 5 min.
<b>Lower limit value</b>	<ol style="list-style-type: none"> <li>1. 0%</li> <li>2. 10%</li> <li>3. 20%</li> <li>4. 30%</li> </ol>
Defines the minimum value below which the valve is always closed (0% / 10% / 20% / 30%)	
<b>Upper limit value</b>	<ol style="list-style-type: none"> <li>5. 100%</li> <li>6. 90%</li> <li>7. 80%</li> <li>8. 70%</li> </ol>
Defines the maximum value above which the valve is always open (70% / 80% / 90% / 100%)	
<b>Sending State Telegram</b>	<ol style="list-style-type: none"> <li>9. Disabled</li> <li>10. When status changes</li> <li>11. On request</li> </ol>
<ul style="list-style-type: none"> <li>• Disabled</li> </ul>	Status is never transmitted ad related communication object is not visible
<ul style="list-style-type: none"> <li>• When status changes</li> </ul>	Status is transmitted every time the relay switch changing his status from ON to OFF or from OFF to ON.
<ul style="list-style-type: none"> <li>• On request</li> </ul>	Status communication object is available and updated when status changes but the telegram is not transmitted. Read propriety is enabled.

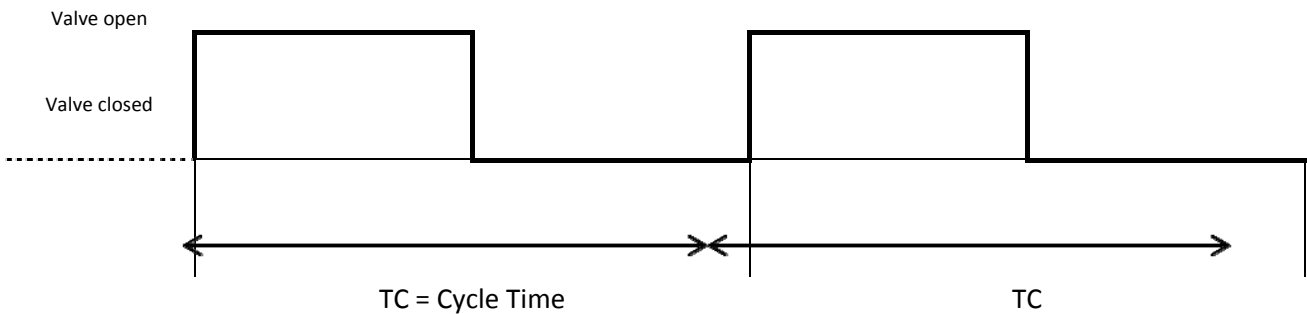
<b>Telegram Value for status sending</b>	<ul style="list-style-type: none"> <li>• Telegram “0” when relay is open</li> <li>• Telegram “1” when relay is open</li> </ul>
This set the value you want transmit when relay is open or close (and therefore the valve is open or close according to the parameter “ <b>Valve Position when relay is open</b> ”	
<b>Anti-Locking Valve Function</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
It is possible to enable an automatic switching valve function, useful when there are long periods of inactivity, for example during the summer season. If this function is activated you can select how long can be the period of inactivity (see parameter “ <b>Anti-Locking Valve Activation Period</b> ”); before that the valve performs a switching ON and after 5 minutes.a switching OFF	
<b>Anti-Locking Valve Activation Period</b>	<ul style="list-style-type: none"> <li>• 1 day</li> <li>• 3 days</li> <li>• 10 days</li> </ul>
Determines the maximum period of inactivity allowed.	
<b>Lock Function</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
When lock function is enabled it allows switching the relay in a defined state and forcing it to maintain this state even if the it receives 1-bit or 1 byte control commands.	
<b>Behaviour on power down</b>	<ul style="list-style-type: none"> <li>• Valve Open</li> <li>• Valve Close</li> <li>• STOP – no movement</li> </ul>
When bus voltage fall down under approximately 18V device enters the power down routine and it is possible to set the status of the relay status ( <b>See note 2</b> ).	
<b>Behaviour on power up</b>	<ul style="list-style-type: none"> <li>• Valve Open</li> <li>• Valve Close</li> <li>• STOP – no movement</li> </ul>
On power up it is possible to set the status of each valve (and therefore the relay) with this parameter ( <b>See note 3</b> )	

## NOTES:

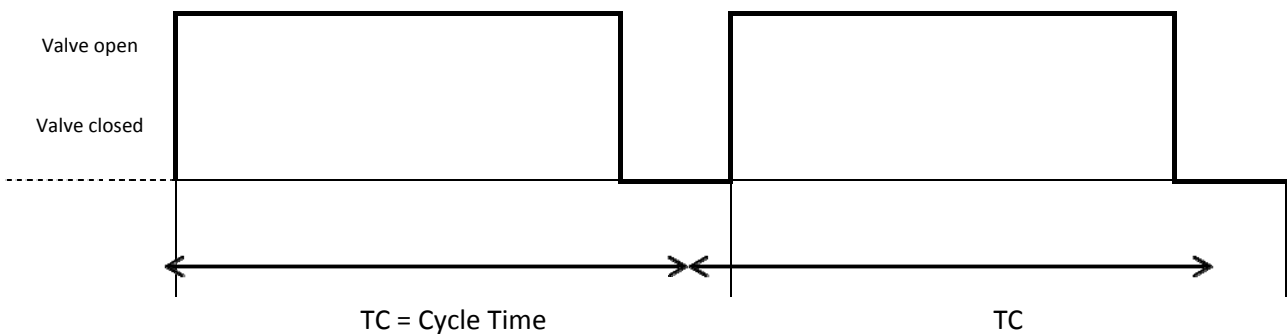
**[1]:** This type of control is used when you want to eliminate the hysteresis of the temperature typical of ON / OFF control. The relay drives the valve with ON / OFF commands and make a proportional control (0% ° 100%) based on the value received on the CONTINUOUS ONTROL OBJECT modulating the amplitudes of the On and OFF pulses (PWM). This mode is active when 1-byte control was previously selected.

It is defined a "cycle time" in which the actuator is activated at a rate of time and then off again until the end of the cycle time itself.

Example of control with the control value of 50%:



Example of control with the control value of 80%:



**[2]:** *the device has to accumulate the energy it needs to switch the relays during the power on phase and stores it into capacitors. For this reason, when a power down is detected, the device has the energy to switch all the 4 relays only if it has been powered from at least 60 seconds and it has not done a full 4 relay switch from at least 20 seconds. It is strongly recommended not to select a full 4 relay switch on power down because the full switch cannot be always be done.*

**[3]:** *When is selected the value “STOP – no movement” for the parameter “Behaviour on power up” it is maintained the state selected on power down unless you have selected on power down the behaviour “STOP – no movement”; in that case it is maintained the state active before power down.*

### 6.3. Lock Function

When lock function is enabled it allows, as a result of receiving a telegram on the *<Output x> Lock Function*; to switch the relay in a defined state and force it to maintain this state even if the object switching value changes. This function can be enabled or with 1 bit commands than with 1 byte commands.

<Output 1> Lock	
Initial Value for Lock Object	Value 0
Telegram for Lock Activation	Telegram 1
Valve Position when Lock is Active	Valve Close
Position when Lock Ends	Keep previous state and ignore telegrams

KNX PARAMETER	SETTINGS
<b><i>Initial Value for Lock Object</i></b>	<ul style="list-style-type: none"> <li>Value “0”</li> <li>Value “1”</li> </ul>
This parameter selects the value of the lock object after a power on; appropriately changing this value it is possible to start the output channel related to the lock function as “locked” or “unlocked”. (See note 1).	
<b><i>Telegram for Lock Activation</i></b>	<ul style="list-style-type: none"> <li>Telegram “0”</li> <li>Telegram “1”</li> </ul>
This parameter selects the values associated to the “lock” or “unlock” condition.	
<b><i>Valve Position when Lock is Active</i></b>	<ul style="list-style-type: none"> <li>Valve Open</li> <li>Valve Close</li> </ul>
This parameter selects the state the valve must assume when the “lock function” becomes active”. (See note 2).	
<b><i>Position when Lock Ends</i></b>	<ul style="list-style-type: none"> <li>Valve Open</li> <li>Valve Close</li> <li>Keep previous state and ignore telegrams</li> <li>Keep previous state and don’t ignore telegrams</li> </ul>
<ul style="list-style-type: none"> <li>Valve Open</li> </ul>	“valve open” position (See note 2).

- Valve Close
- Keep previous state and ignore telegrams
- Keep previous state and don't ignore telegrams

“valve closed” position (**See note 2**).  
Relay returns in the state it was before lock function became active  
the output channel returns to its condition prior to the activation of the block unless you have received a telegram on the switch object or scenario; in this case, the last command received is executed.

#### NOTES:

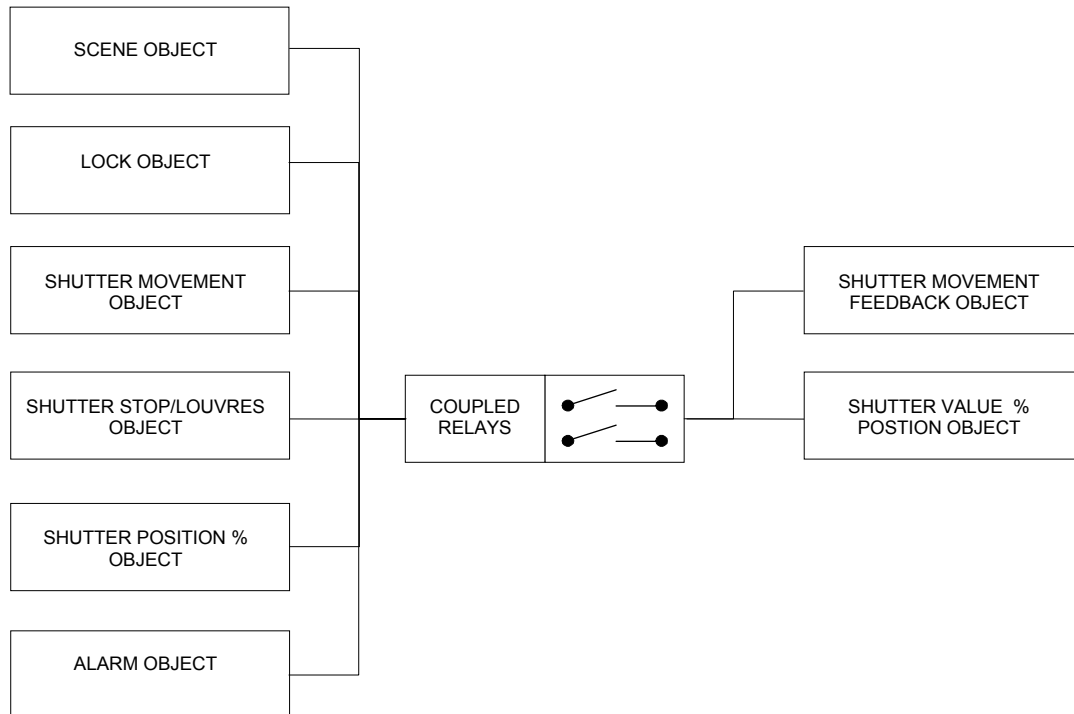
**[1]:** If the parameter **“Initial Value for Lock Object”** has the same value of **“Telegram for Lock Activation”** happens that, on power up, the output channel starts in lock mode, waiting for a “unlock” telegram in order to become active. Note that, even if the relay starts with lock function already active it does not go automatically in the position defined by the parameter **“Relay Position when Lock is Active”**; because this behavior is determined only by the parameter **“Behaviour on power up”**

**[2]:** The “valve opened” and “valve closed” conditions for each output channels correspond to ON or OFF condition of the upon the settings made for the **“Valve Position when relay is open”** parameter.

## 7. Output Configuration for shutter and blinds

Outputs can be configured in pairs for the management of roller shutters and blinds; up to 2 channels (Channels A to B):

Channel	Output / Function		Output / Function	
CH A	OUT 1 closed	▲ (move up)	OUT 2 closed	▼ (move down)
CH B	OUT 3 closed	▲ (move up)	OUT 4 closed	▼ (move down)





## 7.2. General Parameters

General Parameter Configuration	Channel A Shutter and Blinds	
General Parameter Configuration		
Output Configuration		
<b>Channel A Shutter and Blinds</b>		
<Channel A> Alarm		
<Channel A> Lock		
Output 3 Relay ON/OFF		
Output 4 Relay ON/OFF		
Shutter Type	Shutter	▼
Shutter Travel Time (sec.)	60	▲▼
Extra Time for Shutter Travel (sec.)	2	▲▼
Stop Time between 2 Shutter Movements	500 ms	▼
Absolute Position (%)	Disabled	▼
Delay on move up	Disabled	▼
Delay on move down	Disabled	▼
Scene	Disabled	▼
Alarm Function	Enabled	▼
Lock Function Enabled	Enabled	▼
Shutter Position after Lock and Alarm	Previous position and ignore telegrams	▼

KNX PARAMETER	SETTINGS
<b>Shutter Type</b>	<ul style="list-style-type: none"> <li>• Shutter</li> <li>• Venetian</li> </ul>
Select “Venetian” if the shutter has louvres, select shutter if it is a roller shutter.	
<b>Shutter travel time (sec.)</b>	0 ÷ 3000
This parameter set the total travel time for shutter.	
<b>Extra Time for shutter travel (sec.)</b>	1 ÷ 255
This parameter indicates the number of seconds to add to the travel time for all the movements that bring the shutter completely up or down.	
<b>Stop time between 2 shutter movements</b>	<ul style="list-style-type: none"> <li style="width: 50%;">• 100 ms</li> <li style="width: 50%;">• 800 ms</li> <li style="width: 50%;">• 200 ms</li> <li style="width: 50%;">• 1 sec.</li> <li style="width: 50%;">• 300 ms</li> <li style="width: 50%;">• 2 sec.</li> <li style="width: 50%;">• 500 ms</li> <li style="width: 50%;">• 5 sec</li> </ul>
Set the minimum time for the shutter to stop from passing from a movement to another.	
<b>Absolute position (%)</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>

When enabled this parameter shows 2 communication object: “SHUTTER POSITION % OBJECT” and “VALUE SHUTTER POSITION % OBJECT”;

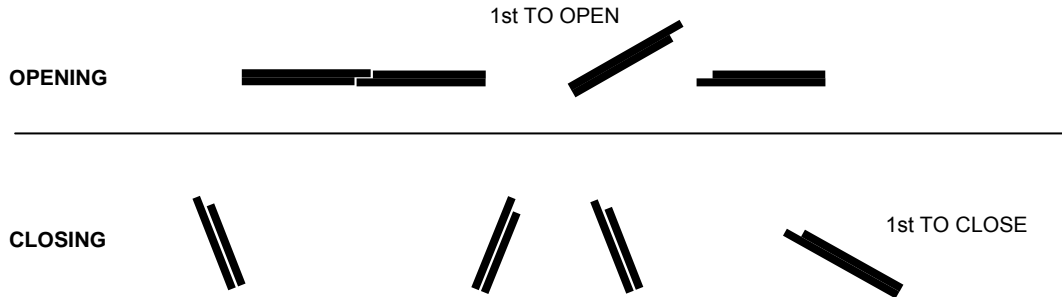
SHUTTER POSITION %: a positioning control command can be sent to the device using a percentage value (the value is relative to the percentage of closure: 10%, 50%, etc. .. 0% = shutter totally up, % = shutter totally down)

VALUE SHUTTER POSITION %: through 1 byte telegram the information on the current shutter position can be sent, (the value is relative to the percentage of closing).

Delay on move up	Enabled
Time for Delay on move up	5 sec.
Delay on move down	Enabled
Time for Delay on move down	5 sec.

KNX PARAMETER	SETTINGS
<b><i>Delay on move up</i></b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
Enable / disable a delay between the receipt of an up command and the start of the movement.	
<b><i>Time for Delay on move up</i></b>	<ul style="list-style-type: none"> <li>• 5 sec</li> <li>• 10 sec</li> <li>• 20 sec</li> <li>• 30 sec</li> </ul>
Values for the delay	
<b><i>Delay on move down</i></b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
Enable / disable a delay between the receipt of a down command and the start of the movement.	
<b><i>Time for Delay on move down</i></b>	<ul style="list-style-type: none"> <li>• 5 sec</li> <li>• 10 sec</li> <li>• 20 sec</li> <li>• 30 sec</li> </ul>
Values for the delay	

These parameters can be used if you want to drive double doors. In this case, one door must start first in opening and the other must start first in closing.



Shutter Type	Venetian
Step time for louvres movement (x 100ms)	3
Louvres Automatic Movement	Always
Number of Automatic Step after move up	1
Number of Automatic Step after move down	1
Pause Time between 2 Step Move (x 100ms)	3

KNX PARAMETER	SETTINGS
<b>Step time for louvres movement (x 100ms)</b>	1 ÷ 180
This parameter selects how long the movement for every step of the louvres is (visible only if shutter type is "Venetian"; range from 100 ms to 18 sec.	

### 7.3. Louvres automatic movement

If the channel is configured for Venetian control (Parameter “**Shutter Type** = Venetian”) it is possible to enable an automatic movement of the louvres which is executed at the end of movements of the shutter.; these movements are:

- Movement for scene command (if brings the shutter in a position different from totally up)
- Movement at the end of a lock or alarm state (if brings the shutter in a position different from totally up)
- Movement for a Position % command (if brings the shutter in a position different from totally up )

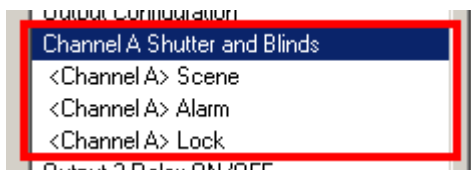
This automatic function moves the louvres up after a shutter down movement and down after a shutter up movement.

KNX PARAMETER	SETTINGS
<b>Louvres automatic movement</b>	<ul style="list-style-type: none"> <li>• Never</li> <li>• Always</li> <li>• After up movements</li> <li>• After down movements</li> </ul>
Set when the automatic movement must start.	
<b>Number of automatic steps after move up</b>	0 ÷ 15
<b>Number of automatic steps after move down</b>	0 ÷ 15
This parameter set the time of the movement : if this parameter is set to “2” and “ <b>Step time for louvres movement (x 100ms)</b> ” is set to “3” then the automatic movement is 300ms x 2 = 600ms	
<b>Pause time between 2 step move ( x100ms)</b>	3 ÷ 10
Set the minimum time delay between 2 step movements.	

### 7.4. Additional Functions

In BO04A01KNX for channels configured for shutters 3 additional functions can be enabled:

- **SCENE FUNCTION:** The scene function manage two possible commands to the device: **perform scene**, that is a command to create a specific condition; **learn scene**, that is a command to memorize the current status (at the moment the command is received) of the shutter position, and then reproduce it once the perform command is received.
- **LOCK FUNCTION :** this function according to the command received from the bus, blocks the shutter in a specific condition when a “lock on” command arrives, this state is kept until a “lock off” command is received; any command received during the period in which the block is activated is not executed.
- **ALARM FUNCTION:** this function allows linking the shutter channel to a rain or wind sensor to protect it from damage. **[!]** This function (if enabled) requires the sensor linked to send cyclically a telegram, even if The alarm is off. If the shutter does not receive any telegram for a defined time (see parameter “**supervision time for alarm**”) it goes in the alarm position as if it would have been received a alarm telegram.



## 7.5. Scene Function

When the scene function is enabled a communication object named *<Channel x> Scene* becomes visible.

It is possible to send to the device two possible commands:

- recall scene - is a command to create a specific position of the shutter
- store scene - that is a command to learn and store the current position of the shutter (in the moment the command is received), and then reproduce it once the recall command is received

For every channel it is possible to store a maximum of 4 output scene.

KNX PARAMETER	SETTINGS
<b>Scene Number &lt;X&gt;</b>	0 ... 64
For the 4 possible scenes this number is the unique identifier for the scene: valid numbers are from 0 to 63; 64 means scene is not active.	
<b>Initial value Scene &lt;X&gt;</b>	Values between 0% and 100% in steps of 5%
For the 4 possible scene this number allow to initialize the position associated to previously selected scene number avoiding to execute the store scene procedure. If the store scene is done, this value is overwritten.	
<b>Learn Scene</b>	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>
This parameter enable / disable the output channel from storing value received from the bus; if this parameter is set to disable the value associated are set only by the parameters <b>"Initial value Scene &lt;X&gt;"</b> and cannot be modified without a ETS download.	

**[1]:** After a ETS download the device assumes the value of parameter: **"Initial value Scene <X>"** as a value in memory for the corresponding scene and overwrites previous memorized scene positions.

## 7.6. Lock Function

When lock function is enabled it allows, as a result of receiving a telegram on the <Channel x> *Lock Function*; to set the shutter in a defined position and force it to maintain this position even if the channel receives move commands.

<Channel A> Lock	
Initial Value for Lock Object	Value 0
Lock Activation Telegram	Telegram 1
Shutter Position when Lock is Active	Stop - no movement

KNX PARAMETER	SETTINGS
<b>Initial Value for Lock Object</b>	<ul style="list-style-type: none"> <li>Value “0”</li> <li>Value “1”</li> </ul>
This parameter selects the value of the lock object after a power on; appropriately changing this value it is possible to have the shutter channel related to the lock function as “locked” or “unlocked”. (See note 1).	
<b>Lock Activation Telegram</b>	<ul style="list-style-type: none"> <li>Telegram “0”</li> <li>Telegram “1”</li> </ul>
This parameter selects the values associated to the “lock” or “unlock” condition.	
<b>Shutter Position when Lock is Active</b>	<ul style="list-style-type: none"> <li>Move Up</li> <li>Move Down</li> <li>Stop – no movement</li> </ul>
This parameter selects the state the relay must assume when the “lock function” becomes active”. (See note 2).	

### NOTES:

**[1]:** If the parameter “**Initial Value for Lock Object**” has the same value of “**Telegram for Lock Activation**” happens that, on power up, the shutter channel starts in lock mode, waiting for a “unlock” telegram in order to become active. Note that, even if the shutter channel starts with lock function active it does not go automatically in the position defined by the parameter “**Shutter Position when Lock is Active**” avoiding to have automatic and unexpected movements when the power returns after a black out.

## 7.7. Alarm Function

Alarm function must be activated if the shutter has to be controlled by weather sensors, typically rain and wind sensors.

The sensor must send telegram “0” if no alarm is active and telegram “1” if the alarm becomes active.

When shutter has the alarm function active goes in a defined position and cannot be moved (except with if the lock function became active) for the time the alarm is still active.

General Parameter Configuration Output Configuration Channel A Shutter and Blinds <Channel A> Alarm <Channel A> Lock Output 3 Relay ON/OFF Output 4 Relay ON/OFF	<b>&lt;Channel A&gt; Alarm</b>  Supervision Time for Alarm (min) <input type="text" value="30"/>  Shutter Position when Alarm is Active <input type="text" value="Move UP"/>
--	--

KNX PARAMETER	SETTINGS
<b>Supervision Time for Alarm (min)</b>	1... 120 (min)
This parameter selects how long the supervision time for the alarm function is. <span style="color: red;">[!]</span> <u>If this time is set, for example, to 30 min, the shutter need to receive at least one time in 30 min. a telegram from the sensor even if the telegrams means “no alarm”. If this not happens the alarm became active (lack of supervision) and need to receive a “no alarm telegram” to reset.</u> <u>For this, only sensor with cyclic sending can be used and we strictly recommend set the supervision at least double the cyclic sending period.</u>	
<b>Shutter Position when Alarm is Active</b>	<ul style="list-style-type: none"> <li>• Move Up</li> <li>• Move Down</li> <li>• Stop – no movement</li> </ul>
This parameter selects the values associated to the “alarm” condition.	

▲ *If the Alarm Function is enabled it is mandatory to link a sensor with cyclic telegram sending; if the communication object is not linked or no telegram is received before the end of supervision time the alarm becomes active and the shutter goes in alarm position.*

## 7.8. Shutter position after lock and alarm

This parameter set the final position of the shutter after the end of a lock or an alarm condition (of course if both functions are no “active” the value of this parameter is not considered)

KNX PARAMETER	SETTINGS
<b>Shutter position after lock and alarm</b>	<ul style="list-style-type: none"> <li>• Move Up</li> <li>• Move Down</li> <li>• Previous position and ignore telegrams</li> </ul>
This parameter selects the values associated to the “alarm” condition.	

## 7.9. Priority table for communication objects

Priority	Description
high	Lock Object
PRIORITY	Alarm Object
Low	Move Object / Absolute Position Object / Scene Object

## 8. Output Configuration for motor reduction driver

Outputs can be configured in pairs for the management of motor reductor; up to 2 channels (Channels A to B):

Channel	Output / Function		Output / Function	
CH A	OUT 1 closed	OPEN	OUT 2 closed	CLOSE
CH B	OUT 3 closed	OPEN	OUT 4 closed	CLOSE

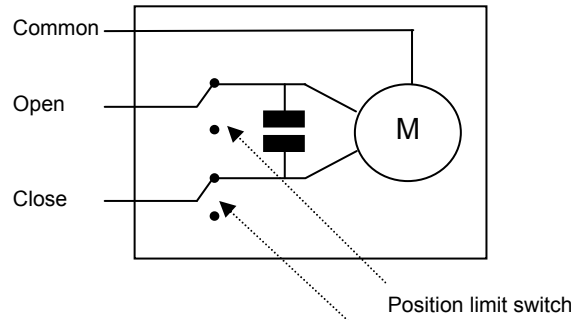


This configuration can be used to drive a bistable device with motor reductor, typically a solenoid valve with 3 point control, or a driver for ventilation grilles in AC systems, etc...

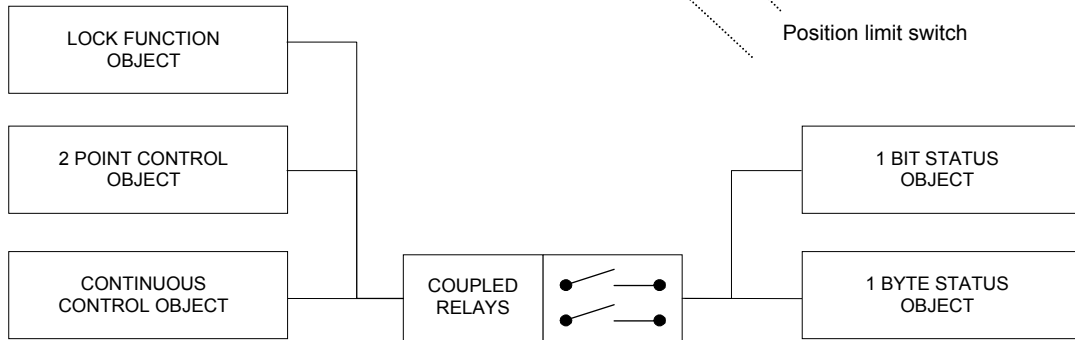
**Motor MUST have position limit switches.**



Typical wiring scheme:



Communication object scheme:



2 POINT CONTROL OBJECT :

1 bit command to open/close the valve completely.

CONTINUOUS CONTROL OBJECT:

1 byte command (0% -100%) to set the valve position.

LOCK FUNCTION OBJECT:

if enabled, according to the receipt of a 1 bit telegram, realizes a function for enabling / disabling the opening and closing of the valve

1 BIT STATUS OBJECT:

send information about the position (open / closed) of the valve using a 1 bit telegram

1 BYTE STATUS OBJECT:

send information about the proportion of active regulation using a 1 byte telegram

## 8.2. Main Parameters

ETS parameters when control value telegram is 1-bit.

General Parameter Configuration	Channel A Motor Reduction Driver
Output Configuration	
Channel A Motor Reduction Driver	
Output 3 Relay ON/OFF	
Output 4 Relay ON/OFF	
Driver Control Telegram	1 bit
Activation Telegram	Telegram 1
Total Travel Time (sec.)	60
Pause Between 2 Movement	500 ms
Anti-Locking Function	Disabled
Sending state telegram	When status change
Telegram value for status sending	Telegram 0 is close
Behaviour on power up	Keep status before power down
Lock Function Enabled	Disabled

ETS parameters when control value telegram is 1-byte.

Channel A Motor Reduction Driver	
Driver Control Telegram	1 byte
Lower Limit Value	0%
Upper Limit Value	100%
Total Travel Time (sec.)	60
Pause Between 2 Movement	500 ms
Anti-Locking Function	Disabled
Sending state telegram	When status change
Behaviour on power up	Keep status before power down
Lock Function Enabled	Disabled

KNX PARAMETER	SETTINGS
<b>Driver Control Telegram</b>	<ul style="list-style-type: none"> <li>• 1 bit</li> <li>• 1 byte</li> </ul>
This parameter defines whether the control of the valve is carried out with 1-bit (ON / OFF only) or 1-byte commands (0 to 100% with intermediate positons).	
<b>Total travel time</b>	0 ÷ 3000 sec)
This represent the total travel time necessary to move the motor reductor from totally open to totally close.	
<b>Pause between 2 movements</b>	100 ms ÷ 5 sec.
This represent the minimum time the motor must be in stop between 2 movements.	
<b>1 bit telegram:</b>	
<b>Activation telegram</b>	<ul style="list-style-type: none"> <li>• Telegram "0"</li> <li>• Telegram "1"</li> </ul>
It is possible to set a parameter to determine if the Open movement is activated with a telegram "0" (and then Close with "1") or vice versa.	

<b>Sending State Telegram</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• When status changes</li> <li>• On request</li> </ul>
<ul style="list-style-type: none"> <li>• Disabled</li> </ul>	Status is never transmitted and related communication object is not visible
<ul style="list-style-type: none"> <li>• When status changes</li> </ul>	Status is transmitted every time the relay switch changes his status from ON to OFF or from OFF to ON.
<ul style="list-style-type: none"> <li>• On request</li> </ul>	Status communication object is available and updated when status changes but the telegram is not transmitted. Read propriety is enabled.
<b>Telegram Value for status sending</b>	<ul style="list-style-type: none"> <li>• Telegram "0" is close</li> <li>• Telegram "0" is open</li> </ul>
This set the value you want transmit when the motor reductor is in open or close position.	
<b>1 byte telegram:</b>	
<b>Lower limit value</b>	<ul style="list-style-type: none"> <li>• 0%</li> <li>• 10%</li> <li>• 20%</li> <li>• 30%</li> </ul>
Defines the minimum value below which the valve is always closed	
<b>Upper limit value</b>	<ul style="list-style-type: none"> <li>• 100%</li> <li>• 90%</li> <li>• 80%</li> <li>• 70%</li> </ul>
Defines the maximum value above which the valve is always open	
<b>Anti-Locking Function</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
It is possible to enable an automatic valve movement, useful when there are long periods of inactivity, for example during the summer season. If this function is activated you can select how long can be the period of inactivity (see parameter " <b>Anti-Locking Valve movement frequency</b> "); before that the valve performs a switching ON and after 5 minutes a switching OFF	
<b>Anti-Locking Valve movement frequency</b>	<ul style="list-style-type: none"> <li>• 1 day</li> <li>• 3 days</li> <li>• 10 days</li> </ul>
Determines the maximum period of inactivity allowed.	
<b>Lock Function</b>	<ul style="list-style-type: none"> <li>• Disabled</li> <li>• Enabled</li> </ul>
When lock function is enabled it allows switching the relay in a defined state and forcing it to maintain this state even if the it receives 1-bit or 1 byte control commands.	
<b>Behaviour on power up</b>	<ul style="list-style-type: none"> <li>• Valve Open</li> <li>• Valve Close</li> <li>• STOP – no movement</li> </ul>
On power up it is possible to set the status of each valve with this parameter.	

### 8.3. Lock Function

When lock function is enabled it allows, as a result of receiving a telegram on the <Output x> *Lock Function*; to switch the relay in a defined state and force it to maintain this state even if the object switching value changes. This function can be enabled or with 1 bit commands than with 1 byte commands.

KNX PARAMETER	SETTINGS
<b>Initial Value for Lock Object</b>	<ul style="list-style-type: none"> <li>Value “0”</li> <li>Value “1”</li> </ul>
This parameter selects the value of the lock object after a power on; appropriately changing this value it is possible to start the output channel related to the lock function as “locked” or “unlocked”. (See note 1).	
<b>Telegram for Lock Activation</b>	<ul style="list-style-type: none"> <li>Telegram “0”</li> <li>Telegram “1”</li> </ul>
This parameter selects the values associated to the “lock” or “unlock” condition.	
<b>Valve Position when Lock is Active</b>	<ul style="list-style-type: none"> <li>Valve Open</li> <li>Valve Close</li> </ul>
This parameter selects the state the valve must assume when the “lock function” becomes active”. (See note 2).	
<b>Position when Lock Ends</b>	<ul style="list-style-type: none"> <li>Valve Open</li> <li>Valve Close</li> <li>Stop – no movement</li> <li>Same values of command object</li> </ul>
<ul style="list-style-type: none"> <li>Valve Open</li> <li>Valve Close</li> <li>Stop – no movement</li> <li>Same values of command object</li> </ul>	“valve open” position. “valve closed” position. motor remains in the state it is when the lock was active the output channel returns to its condition prior to the activation of the block unless you have received a telegram on the command object; in this case, the last command received is executed.

#### NOTES:

**[1]:** If the parameter “**Initial Value for Lock Object**” has the same value of “**Telegram for Lock Activation**” happens that, on power up, the output channel starts in lock mode, waiting for a “unlock” telegram in order to become active. Note that, even if the channel starts with lock function already active it does not go automatically in the position defined by the parameter “**Relay Position when Lock is Active**”; because this behavior is determined only by the parameter “**Behaviour on power up**”

## 8.4. Function VALVES ALL CLOSED

When at least one output is configured on the device type "Electric Valve Driver" or "Motor Reduction Driver (Solenoid Actuator)" you can enable a communication object that sends 1 bit value: telegram "0" - when all the valves are turned off and a telegram "1" when at least one valve among those the device is controlling is active.

For outputs configured as "Motor Reduction Driver"- the valve is considered closed when the relay that controls it puts it in closed state (for ON/OFF mode – 1 bit) or when the control value is less than the minimum control value (Continuous control – parameter: "Lower limit value" - 1 byte); Vice versa it is considered open when the relay that controls it puts it in open state (for ON/OFF mode – 1 bit) or when the control value is greater than or equal to the value of the minimum control value.

When outputs are configured as Electric Driver "with 2-point control ON/OFF", valve is considered closed when the relay that controls it puts it in a close state and open when the relay puts it in the open state.