Single relay and Relays with interlock

USER MANUAL

Translation of the original instructions

Version: **1.1**

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VERSION	DATE	CHANGES
1.0	**28/06/2022**	-
1.1	**21/11/2022**	added “state before power off”

Any information inside this manual can be changed without advice.

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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.

Symbol for relevant information 

Symbol for warning 

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1. Single relay – general parameters

KNX PARAMETER	SETTINGS
Relay type, normally closed or open	Normally open Normally close
With this parameter it is possible to set the operating mode of the relay. The relay can be used as “open contact” or “closed contact”; this distinction is only logical because the relay has only one pole and a terminal connected to the NC contact is not available.	

Command (relay status)	Normally open	Normally closed
ON (activated)	contact closed	contact open
OFF (deactivated	contact open	contact closed

KNX PARAMETER	SETTINGS
Command activation telegram	Activate with ON Activate with OFF
Determines whether the function is activated with a telegram “1” (i.e. off = “0”) or is activated with telegram “0” (i.e. off = “1”)	
Scene sources	do not use scene objects enable local scene object enable global scene object enable local and global scene object
With this parameter it is possible to enable the local or global scene object.	
Addition object type	do not use use for logic function use for locking function
With this parameter it is possible to enable two addictional functions.	
Global command object	Do not use global command object Use global command object as command Use global command object as logic
This parameter refers to the management of global objects. Please refer to the user manual of the device for more information. See paragraph “6. Global Command object”	
Relay state at power on	No Action GO ON GO OFF state before power OFF
Set this parameter to determine the status that the relay must take when the bus voltage when it is restored. The “state before power OFF” value is not always available, check the user manual of the specific device.	
Relay state at power off	No Action GO ON GO OFF
Set this parameter to determine the status that the relay must take when the bus voltage drops.	
Feedback enable/disable	Disabled Always On variation
Disabled: the relay status is never sent **Always:** status is transmitted each time the relay receives an actuation command **On variation:** the relay status is only transmitted when its status changes	
Counter Type	Nothing Instant Power Count energy Count ON or OFF time Count ON/OFF Toggles
The device allows to send on the bus one of the following counters: **Instant Power**: instantaneous power absorbed (presumed); it is not possible to measure the absorbed power but it is possible to send the presumed value (in Wh or KWh) based on the ETS parameter set as energy consumed in Watt or Kilowatt. **Count energy:** Energy consumed (presumed); it is not possible to measure the energy consumed but it is possible to send the presumed value based on the ETS parameter set as energy consumed in Watt or Kilowatt. **Count ON or OFF time**: counts the ON or OFF time of the relay in hours [2 bytes - dpt 7.007 time (h)] **Count ON/OFF Toggles**: counts the number of relay commutations [4 bytes – dpt 12.001 counter pulses]	
Timing function type	No timing function On/off with timing and delay Continuous switching
No timing function: no timed function **On/off with timing and delay:** this parameter enables an object dedicated to managing the timed output “<Output Ax | xx> Timing” with which to set a delay on activation, deactivation or the staircase lighting function. **Continuous switching:** function that switches the relay ON / OFF continuously	

2. Single relay – Timing

Communication object involved:

“<Output Axx | xx> Timing	1 Bit	CW

On/off with timing and delay (stair case)

KNX PARAMETER	SETTINGS
Timing function activation telegram	activate on OFF telegram activate on ON telegram
It defines the telegram function on which the timing function is activated.	
Timing unit measure	seconds / minutes / hours
Sets the unit of measure for the following timing parameters.	
Switch ON delay (0=no switch ON delay)	0..255
Sets the delay between receiving the ON command and activating the corresponding output (if set to 0 there will be no delays and execution will be immediate)	

ON state retention time (0=never switch OFF)	0..255
Sets the automatic switch-off time (staircase lights); if set = 0 it must be turned off by an OFF command	
Behaviour when receiving deactivation telegram during timing	Ignore command Go to retention end (switch off) Go to off state after time
Ignore command: the OFF command is ignored Go to retention end (switch off): the OFF command is executed immediately. Go to off state after time: The off command is executed after the time defined by the Switch OFF delay parameter	
Switch OFF delay, 0 = switch OFF immediately	0..255
Sets the delay between receiving the OFF command and activating the corresponding output (if set to 0 there will be no delays and execution will be immediate)	

Example 1: **Set the staircase light to automatically switch off after 5 minutes without the possibility of manual switch-off**	
PARAMETER	**VALUE**
Timing unit measure	minutes
Switch ON delay	0
ON state retention time	5
Behaviour when receiving deactivation telegram during timing	Ignore command

Example 2: **Set the automatic staircase light off after 50 seconds with the possibility of manual switch-off**	
PARAMETER	**VALUE**
Timing unit measure	seconds
Switch ON delay	0
ON state retention time	50
Behaviour when receiving deactivation telegram during timing	Go to retention end (switch off):
Switch OFF delay	

Example 3: **Set light ON with 5 seconds delay and OFF with 60 seconds delay**	
PARAMETER	**VALUE**
Timing unit measure	seconds
Switch ON delay	5
ON state retention time	0
Behaviour when receiving deactivation telegram during timing	Go to off state after time
Switch OFF delay	60

KNX PARAMETER	**SETTINGS**
Behaviour when receiving telegram during timing	Ignore Restart ON state retetention timer Extend time

Sets the behaviour of the device when ON command is received while the timing is running: **Ignore**: the reception of an ON command is ignored and the timing continues. **Restart ON state retention timer:** when an ON command is received, the device restarts the timing **Extend time:** Upon receiving an ON command, the device extends the timing	
Warning signal before switch OFF	Do not signal 15 seconds 30 seconds 1 minutes 2 minutes 5% of retention time 10% of retention time 15% of retention time
Set the warning time before the end of the timed function; the device signals the imminent end of the timing with a short power off. **Do not signal** No warning signal is executed **15 s / 30 s / 1 min / 2 min** Indicates how much time before the end of the timing the warning signal is executed **5% / 10% / 15% of retention time** Indicates how much time before the end of the timing (in percentage) takes place the prevision (if the timing is 60 seconds setting 10% of retention time the warning takes place 6 seconds before the end.	
Command during timing behaviour	Actuate command and reset timing function Ignore command
Determines the behaviour in case of receiving an ON or OFF command during the timing execution. **Actuate command and reset timing:** It executes the command received and cancels the timing in progress. **Ignore command**: Ignore the command received.	
Timing behaviuor at power ON	do nothing restore the timing state before power off
Only when the parameter “Relay state at power on” is set in “no action”. It defines if, after power on, the relay restores its timing state or not.	

Continuous switching

KNX PARAMETER	**SETTINGS**
Timing unit measure	seconds / minutes / hours
Sets the unit measure for the following timing parameters.	
Continuous switching ON time	1..255
Relay ON time during continuous switching	
Continuous switching OFF time	1..255
Relay OFF time during continuous switching	

3. Single relay – scenes

Communication object involved:

“<Output Axx | xx> Scene	1 Byte	CW

Enabling the scenario management, it is possible to associate up to 12 KNX scenarios and up to 64 dynamic scenarios to each

output (see: Single relay – dynamic scenes).
You can send 2 commands to the scene object:

- **Recall scene:** it is a command used to start execution of a scenario
- **Save scene:** it is a command used to save the current status of the relays (when the command is received), this status is restored when the “Recall scene” telegram is received.

KNX PARAMETER	SETTINGS
Scene sources	Do not use scene objects Enable local scene objetcs Enable global scene objects Enable global and local scene objetcs

This parameter refers to the management of global objects. Please refer to the user manual of the device for more information.

Do not use scene objects:
scenes are disabled for this ouput.

Enable local scene objects
for this output the scenes are enabled and are recalled by CO <Output Axx | xx> Scenes.

Enable global scene objects
for this output the scenes are enabled and are called via global CO <Global All> Scene .

Enable global and local scene objects:
for this output the scenes are enabled both with local CO and with global CO.

The “<Output Ax> Scene” page will show the following parameters:

KNX PARAMETER	SETTINGS
Enable scene learning	disabled/enabled
If disabled, the output can not execute “Save Scenario” commands	
Enable dynamic scene learning	disabled/enabled
See par: Single relay – dynamic scenes	
Keep or override scene values after download	override/keep
Determines whether the scenarios saved with the “save scene” commands are restored at the value defined in the ETS or not when a download is performed.	
Scene counter	1..12
Defines how many KNX scenarios are associated with the output	
Scene x index	1..64
Defines which index is associated with the x scenario	
Scene x value	OFF/ON
Defines whether the status associated with the x scenario is ON or OFF after the first dowload, for subsequent dowloads check how the “Keep or override scenes values after download” parameter is set.	

4. Single relay – dynamic scenes

Communication object involved:

“<Output Axx | xx> Scene”	1 Byte	CW

DESCRIPTION
The dynamic scene function is compatible with the standard KNX scenario and the actuators can use both at the same time.
The dynamic scene function uses the same 1 byte communication object (DPT 18.001) of the standard KNX scenario while maintaining the same structure and meaning.
To activate the dynamic scene function, the “Global Dynamic Scene” parameter on the “Global Objects” page must be set as “enabled”, in this way the “<Global All> Dyn Scene” object is visible. This 1-bit communication object, one for each actuator, is used to enable / disable runtime the saving of the dynamic scenario value according to the value received on the “<Output Axx | xx> Scenes”.

HOW IT WORKS
When the object value “<Global All> Dyn Scene” is 0 the dynamic scene function is disabled, it is possible to learn and execute the standard KNX scenarios as set by the ETS parameter.

When the value of the object “<Global All> Dyn Scene” is 1, the dynamic scene function is enabled, during this condition any command sent to the relay is executed and also saved in memory. When a learning command is sent on the object 1 byte “<Output Axx | xx> Scene” the device saves the new status in memory and associates it with the number of the scenario just received.

If a learning command is sent to the 1 byte object “<Output Axx | xx> Scenes” without having previously updated the output status, the actuators consider this as a command to “disconnect” this output to the scenario number “n” and from this moment onwards, after receiving a recall scenario for the number of scenario “n” output does not react.

In this way it is possible to associate up to 64 scene numbers on each actuator output channel.
When the object “<Global All> Dyn Scene” returns to 0, the learning of the dynamic scenario is completed.
The scenario call operation works in the same way as the standard KNX scenario.

5. Single relay – additional function

2 additional functions can be enabled: they can not be activated at the same time.

Communication object involved:

“<Output Axx | xx> Logic”	1 Bit	CW
“<Output Axx | xx> Lock”	1 Bit	CW

KNX PARAMETER	SETTINGS
Additional object type	Do not use Use for logic function Use for locking function

LOGIC FUNCTION
This function allows to control the load, through the result of a logic operation, the logic function consists of two logical inputs: the operation is performed between the logic input and the relay command object.

LOCK FUNCTION
Locks the relay in a specific position, this state is maintained until is received a specific command to exit the block status; any command received during the period in which the lock mode is active is not executed.

Single relay – logic

When the logic operation is enabled, the output command is the result of a logical operation between the communication object "<Output Axx | xx> Logic "and the object" "<Output Axx | xx> Command ".
Using ETS, you can select the logical operation: whenever a telegram is received on the logical object or command object, the logic operation is recalculated and the result is interpreted as a command for the relay.

KNX PARAMETER	SETTINGS
Additional command activation telegram	activate with OFF activate with ON
It defines the telegram function on which the timing function is activated.	
Additional command logic value after download	Start in ON state Start in OFF state
This parameter allows to select the initial value of the logical operator. By setting "Last received value" the last value before switching off is considered valid.	
Logic function for command and additional	AND NAND OR NOR XOR XNOR
It defines the logical operation to execute between local command and local logic.	
Delay logic output [s]	0..7
This parameter inserts a delay between the recalculation of the resulting logic function (which occurs after the objects "<Output Axx | xx> Logic" or the object "" <Output Axx | xx> Command) have been updated and the relay status update. The insertion of a delay allows to "filter" too frequent" updates on the status of the outputs due to the recalculation of the resulting logic. The delay is in seconds.	

Single relay – lock function

When the lock function is enabled, it forces the relay to be switched into a defined state by a bus telegram and forces it to retain this status even if it receives bus commands on other switching objects.

When the lock function is active, the local keys, also if enabled, do not work.

KNX PARAMETER	SETTINGS
Lock sources	Do not use lock object [1] Enable local lock object [2] Enable global lock object [1] Enable local and global lock objects [2]

[1] : visible only if additional object is set for logic or not used
[2] : visible only if additional object is set for lock

This parameter refers to the management of global objects. Please refer to the user manual of the device for more information.

Do not use lock object
Lock function is not used
Enable local lock object
The block function is activated / deactivated only via the object "<Output Axx | xx> Lock"
Enable global lock object
The block function is only activated / deactivated via the object "<Global All> Lock"
Enable local and global lock objects
The block function is activated / deactivated via the object "<Output Axx | xx> Lock" or the "<Global All> Lock" object

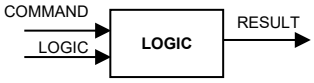
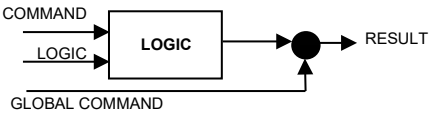
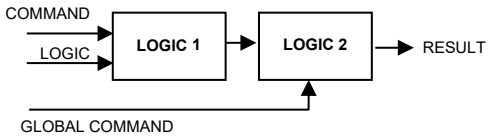
On the <Output Axx> Lock page, the following parameters are set

KNX PARAMETER	SETTINGS
Lock state after download	Locked / unlocked
Set the value of the block function after download	
Telegram for lock activation	Activate on OFF telegr. Activate on OFF telegr.
Defines which telegram is to lock and which one is to unlock.	
Automatic unlock after time (0 = never unlock automatically)	0..255
Lock can be set as a timed function, the lock function is deactivated at the end of the blocking time. If the lock function is set with automatic deactivation, the time-out time is reloaded each time a new lock activation telegram is received.	
Output value when locked	Switch OFF / Switch ON
This parameter selects the state that the relay must assume when the "lock" function is activated.	
Output value when unlocked	Switch OFF Switch ON Switch to last value received Switch to last value before lock
Switch OFF Relay in OFF. **Switch ON** Relay in ON. **Switch to last value received** The relay returns to the position corresponding to the last command received. **Switch to last value before lock** The relay returns to the position prior to activation of the lock.	

6. Global Command object

This parameter refers to the management of global object

"<Global Single> Command"	1 Bit	CW

KNX PARAMETER	SETTINGS
Global command object	Do not use global command object Use global command object as command Use global command object as logic
Do not use global command object The result of the logic function is calculated without taking into account the values received on the global object 	
Use global command object as command The global command is considered as a command that overlaps with the result of the logical operation. 	
Delay global command object [s]	no delay/ 1..7
With this parameter it is possible to set the time delay for the activation of global command.	
Use global command object as logic The global command is put into logic with the result of the main logic, the 2 logical operators can be different. 	
Logic for global command	AND NAND OR NOR XOR XNOR
It defines the logical operation to execute between result of local logic (if not present, local command is considered) and global command.	
Delay global logic output [s]	no delay/ 1..7
With this parameter it is possible to set the time delay for sending of logic output.	

7. Single relay – counter

When the counter function is enabled, it allows to estimate the consumption of a load connected to the relay or the number of relay movements.

Instant power

Communication object involved:

"<Output Axx | xx> Counter"	4 Bytes	RCT

KNX PARAMETER	SETTINGS
Average power in ON state (Watt)	1 ÷ 65535
Indicates the (assumed) average value of absorbed power.	
Datapoint type	W/kW
Allows you to choose the unit of measurement of the power sent to the communication object "<Output Axx | xx> Counter".	
Cyclic send of counter	no cyclic send 1, 2, 5, 10, 30 minutes 1, 2 hours
Defines the cyclical sending time interval of the object "<Output Axx | xx> Counter ".	

Count ON or OFF time

Communication object involved:

"<Output Axx | xx> Counter"	2 Bytes	RCT

KNX PARAMETER	SETTINGS
Counter reset	Disabled/enabled
Allows you to enable the communication object "<Output Axx | xx> Counter Reset."	
Keep or override counter after download	Override/keep
Defines whether to keep or overwrite the value on the object "<Output Axx | xx>"after the download.	
Counter type OFF/ON	Count OFF time/ Count ON time
Defines whether to count the closing or opening time of the relay. The value is indicated through the object "<Output Axx | xx> Counter".	
Ciclyc send of counter	no cyclic send 1, 2, 5, 10, 30 minutes 1, 2 hours
Defines the cyclical sending time interval of the object "<Output Axx | xx> Counter ".	

Count ON/OFF toggles

Communication object involved:

"<Output Axx | xx> Counter"	4 Bytes	RCT

KNX PARAMETER	SETTINGS
Counter reset	Disabled/enabled
Allows you to enable the communication object "<Output Axx | xx> Counter Reset."	
Keep or override counter after download	Override/keep
Defines whether to keep or overwrite the value on the object "<Output Axx | xx>"after the download.	
Counter type	Count ON to OFF transitions Count OFF to ON transitions Count all transitions
Defines whether to count the relay transitions from closed to open or vice versa or all transitions.	
Cyclic send of counter	no cyclic send 1, 2, 5, 10, 30 minutes 1, 2 hours

Defines the cyclical sending time interval of the object “<Output Axx | xx> Counter “.

Count Energy

Communication object involved:

“<Output Axx | xx> Counter”	4 Bytes	RCT

KNX PARAMETER	SETTINGS
Counter reset	Disabled/enabled
Allows you to enable the communication object “<Output Axx | xx> Counter Reset.”	
Keep or override counter after download	Override/keep
Defines whether to keep or overwrite the value on the object “<Output Axx | xx>”after the download.	
Average power in ON state (Watt)	1 ÷ 65535
Indicates the (assumed) average value of absorbed power.	
Datapoint type	Wh/kWh
Allows you to choose the unit of measurement of energy. sent to the object “<Output Axx | xx> Counter.”	
Ciclyc send of counter	no cyclic send 1, 2, 5, 10, 30 minutes 1, 2 hours
Defines the cyclical sending time interval of the object “<Output Axx | xx> Counter “.	

8. Relays with interlock

Communication objects involved:

<Output Xx | xx-xx> Command	1 Bit	CW
Use these 1-bit commands to activate / deactivate the individual relay outputs.		
<Output Xx | xx-xx> Status	1 Byte	CW
Objects for sending relay output states		
<Output Xx | xx-xx> Command value	1 Byte	CW
Use these 1 byte commands to set the relay index to be activated: 1 = active relay first of the interlocking group, 2 = active according to relay of the interlocking group, 0 = deactivates all the relays of the group.		
<Output Xx | xx-xx> Value status	1 Byte	CW-
Object for sending the group status of the interlocked outputs: 1 = first relay of the interlocking group active, 2 = second relay of the interlocking group active, 0 = all relays of the group deactivated.		

The INTERLOCK function allows to use a group of (consecutive) relays in interlocked mode, so that within each group only one relay can be activated at a time (or no relay). The interlock relay groups are usually used to interface other sub-systems (alarm, audio, entertainment, etc.) through the clean contact outputs of the relays.
Interlocking groups can be:

Block B - 2 Relays with interlock

Block C - 3 Relays with interlock

Block D - 4 Relays with interlock

Block E - 5 Relays with interlock

Block F - 6 Relays with interlock

Block G - 7 Relays with interlock

Block H - 8 Relays with interlock

Main parameters for managing interlock relays:

KNX PARAMETER	SETTINGS
Contact type	Normally open Normally close
The parameter is unique for the whole interlock relay group, if you choose “Normally closed” all the relays of the group will be closed except for the one that is activated that can remain open. If you choose “Normally open” all the relays of the group will be open except for the one that is activated that can remain closed.	
Contact delay	1 ÷ 16 seconds
It defines the time of inhibition between the deactivation of a relay and the activation of another relay.	
Interlock activation telegram	Telegram 0 Telegram 1
Defines the value of the 1-bit relay activation telegram.	
Lock sources	Do not use lock object Enable local lock object Enable global lock obj. Enable local and global lock object
This parameter refers to the management of global objects. Please refer to the user manual of the device for more information. **Do not use lock object** Lock function is not used **Enable local lock object** The block function is activated / deactivated only via the <Output Axx | object xx> Lock **Enable global lock obj** The block function is only activated / deactivated via the object the <Global All> Lock object **Enable local and global lock object** The block function is activated / deactivated via the local object Lock or the <Global All> Lock object	
In the page dedicated to the block function for the group of interlocked relays it is possible to set the behavior of the group in case of activation and deactivation of the block, after download, etc.	