4-channel 16AX actuator - DIN rail mounting

GW 90740A

Technical Manual

Contents

1 Introduction

This manual explains the functions of the "**4-channel 16AX actuator**" (GW90740A), and how they are set and configured with the aid of the ETS configuration software.

2 Application

The module is assembled on the DIN rail, inside the electric boards or junction boxes, and is used to activate/deactivate electric loads via 4 relays of 16AX each. The device has 4 independent channels. Their output has a terminal to which a NO contact is connected, and the loads can in turn be connected to this, according to the various circuits. The actuator is powered from the BUS line and is equipped with 4 front green LEDs for signalling the output status. The device sends - on the BUS - information regarding the relay status (ON = NO contact closed, OFF = NO contact open) in the moment of switch-on or at the receipt of a command, and in the event of manual activation (using the push-buttons associated with each channel).
Each output channel of the actuator can be configured independently, and allows a range of functions:

- On/off switching
- Timed switching (stairs light)
- Delayed switching
- Blinking
- Execution of priority commands
- Scenes
- Block
- Safety
- Logics

2.1 Association limits

Maximum number of group addresses: 255
Maximum number of associations: 255

This means that up to 255 group addresses can be defined, and up to 255 associations can be made (communication objects and group addresses).

2.2 Function priorities

The priority of the functions implemented by the actuator channel is shown in the following table:

Function	**Priority**	
On/off switching	1	Low
Timed switching	1	
Delayed switching	1	
Blinking	1	
Scene	1	
Relay status after safety time	1	
Relay status after forcing	1	
Relay status on block deactivation	1	
Logic function (if used for enabling of commands)	2	
Relay status after BUS voltage recovery	3	
Safety status when BUS voltage is reset	4	
Forcing status on BUS voltage recovery (=Forced positioning status on BUS voltage recovery)	4	
Safety	5	
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Block	7	
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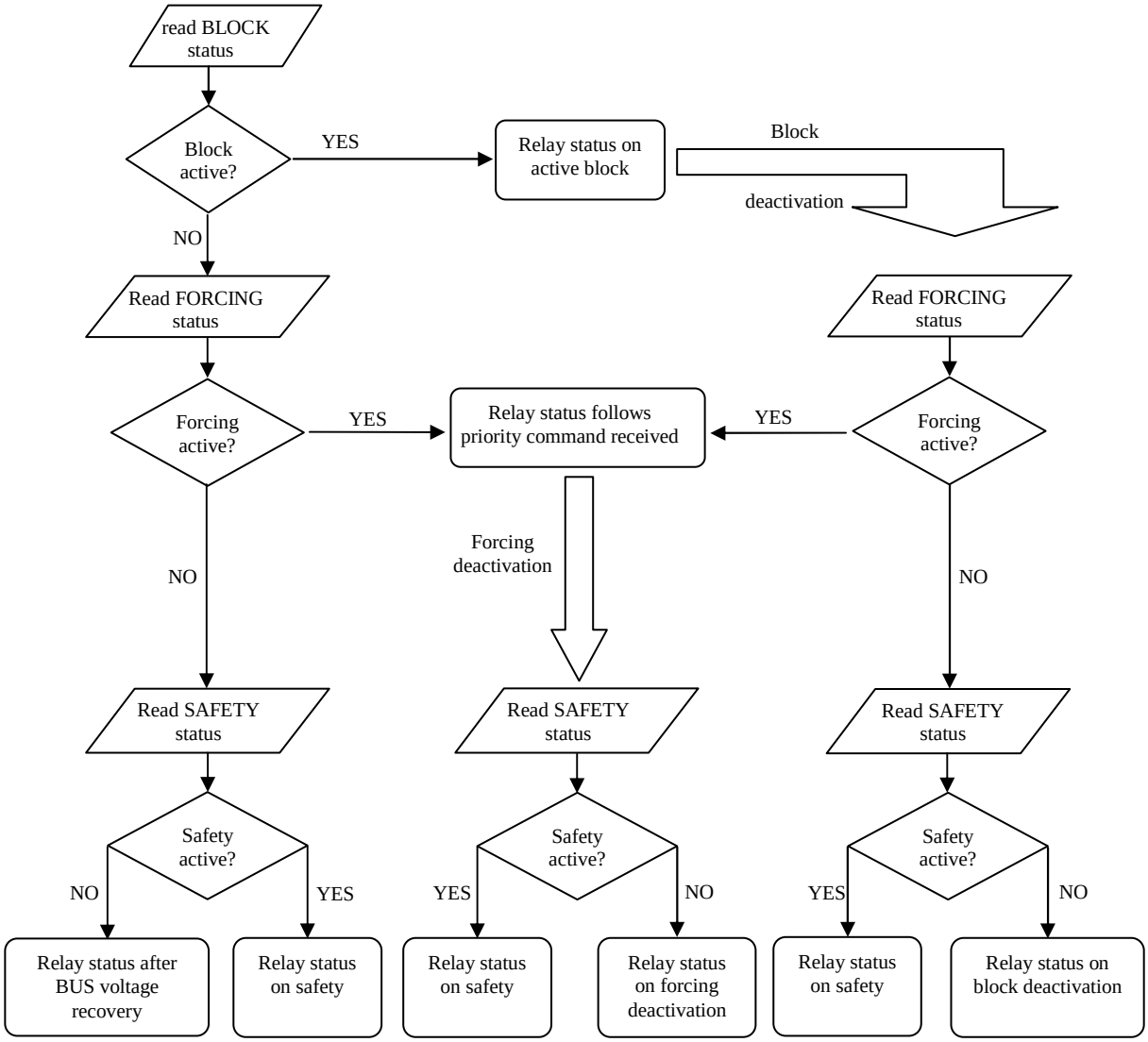
Block function on downloading ("Block on download function)/BUS voltage recovery (if value = active)	9	
Relay status at BUS voltage failure	10	High

2.3 Behaviour at BUS voltage recovery

When the BUS voltage is restored, the device behaves as described in the following flow diagram:



3 *"Main"* Menu

The **Main** menu contains only those parameters that allow you to enable and configure the operating parameters of each of the 4 implementation channels.
The basic structure of the menu is as follows:

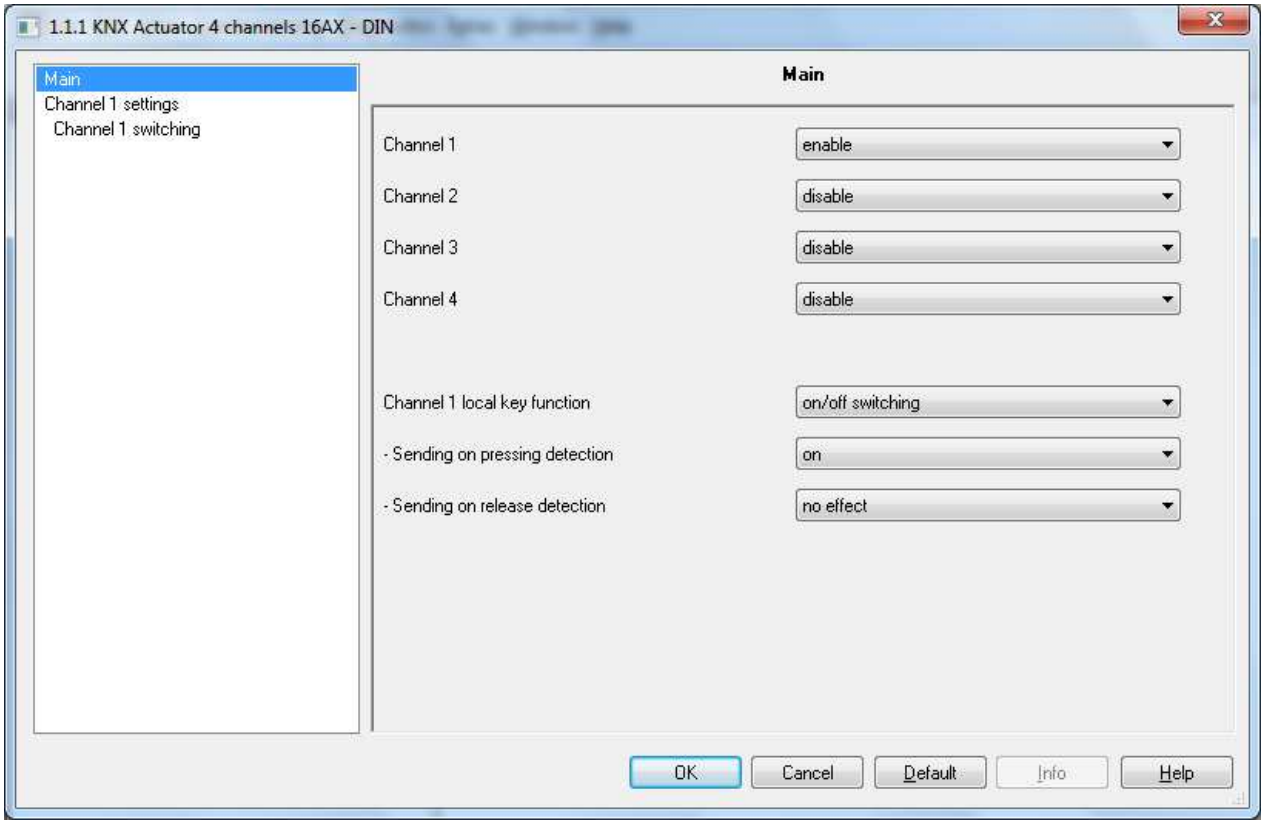


Fig. 3.1

3.1 Parameters

➢ *3.1.1 Channel X*

Used to visualise and configure all the operating parameters of the relative channels grouped in the **Channel x settings** menus. The values that can be set for these parameters are:

- **disabled (default value)**
- enable

When the **enable** value is set, the corresponding configuration menus and the **"Channel x local key function"** are visible (according to the enabled channel).

On the front of the device there are 4 local push-buttons that can be used to directly control the load connected to the relay, without repeating the commands received via the KNX BUS; the **"Channel x local key function"** parameters are used to define the behaviour of the local key associated with the relative channel, when the KNX BUS voltage is enabled. The values that can be set for these parameters are:

- **On/Off switching (default value)**
- stairs light
- scene
- forcing
- block

- local command push-button
- none

The difference between the values **On/Off switching** and **local command push-button** is that the first acts as a command received from the BUS on the ***Ch.x - Switching*** object (so it has a lower priority than the safety, forcing and block functions of the actuator), whereas the second directly switches the relay, ignoring any active function (whose activation status is not changed in any way).
When you select any value other than **scene**, the **"Sending on pressing detection"** and **"Sending on release detection"** parameters are visualised, and the relative values change according to the value set for the parameter in question.
The **"Sending on pressing detection"** parameter is used to set the command to be sent to the on-board actuator after the pressing of the push-button associated with the channel has been detected.
The **"Sending on release detection"** parameter is used to set the command to be sent to the on-board actuator after the release of the push-button associated with the channel has been detected.

- If the actuator control type is **On/Off switching** or **local command push-button**, the values that can be set for the two above parameters are:

  - off
  - **on** **(pressing default value)**
  - cyclical switching
  - **no effect** **(release default value)**

  By selecting **cyclical switching**, in this case no communication object will be displayed as the device is always updated about the on board relay status.

- If the type of actuator control is **stairs light**, the values that can be set for the two above parameters are:

  - timing stop
  - **timing start** **(pressing default value)**
  - cyclical switching
  - **no effect** **(release default value)**

  By selecting **cyclical switching**, in this case no communication object will be displayed as the device is always updated about the function activation status.

- If the type of actuator control is **forcing**, the values that can be set for the two above parameters are:

  - **activate forcing ON [=forcing ON active]** **(pressing default value)**
  - activate forcing OFF [=off forcing active]
  - deactivate forcing [=forcing deactivation]
  - forcing ON / forcing OFF - cyclical switching
  - forcing ON / deactivate forcing - cyclical switching
  - forcing OFF / deactivate forcing - cyclical switching
  - **no effect** **(release default value)**

  By selecting **cyclical switching**, in this case no communication object will be displayed as the device is always updated about the function activation status.

- If the type of actuator control is **block**, the values that can be set for the two above parameters are:

  - deactivation
  - **activation** **(pressing default value)**
  - cyclical switching
  - **no effect** **(release default value)**

  By selecting **cyclical switching**, in this case no communication object will be displayed as the device is always updated about the function activation status.

- If the type of actuator control is **scenes**, the two above parameters are not displayed, but the parameter **"Scene number (0.. 63)"** is shown together with the parameter **"Scene storing by long operation"**.

The parameter **"Scene number (0.. 63)"** is used to set the value of the scene to be recalled/stored; if this value does not coincide with what is associated with the relative parameter in the **Scene** menu of the actuator channel, no scene will be recalled/memorised. The possible values are:

- from **0 (default value)** to 63, with steps of 1

Scene storing by long operation enables the sending of a scene memorising command when a long operation is recognised. The values that can be set are:

- disabled
- **enabled** **(default value)**

The device will send the scene storing command after a long operation is detected and only if the value **enabled** is selected; by selecting the value **disabled**, a long operation is not recognised and prolonged pressing triggers the sending of the scene execution command (as for brief pressing).

4 *"Channel x settings"* menu

The **Channel x settings** menu contains the parameters that define the behaviour of the relay of the device associated with channel x, beyond the specific functions implemented by the actuator channel.
The device offers various functions with different priorities, which will be explained in the following chapters: the parameters of the **"Delay on activation/deactivation function"**, **"Stairs light function"**, **"Blinking function"**, **"Scenes function"**, **"Logic function"**, **"Safety function"**, **"Forcing function"** and **"Block function"** allow the operating parameters of these functions to be made visible and configurable.
The basic structure of the menu is as follows:

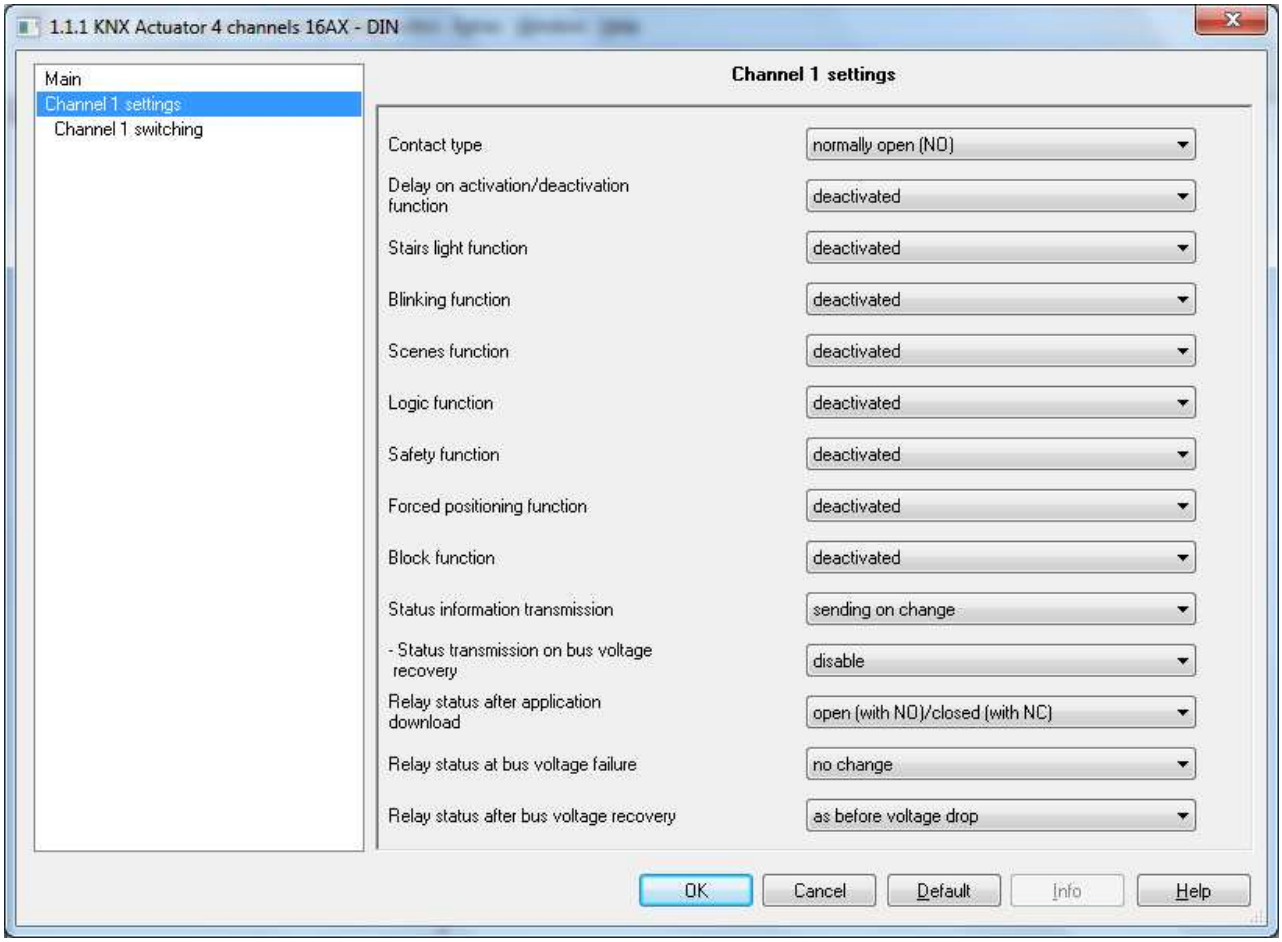


Fig. 4.1

4.1 Parameters

➢ *4.1.1 Contact type*

Given that the relay that controls the load has an output with a NO (Normally Open) contact, in order to manage the loads with an NC contact the device must be aware of this type of relay functioning. The **"Contact type"** parameter is used to define the type of output contact associated with the channel that the device has to manage. The values that can be set are:

- **normally open (NO) (default value)**
- normally closed (NC)

➢ *4.1.2 Status information transmission*

This parameter may have the following values:
- disabled
- only upon request
- **on change (default value)**

When you select any value other than **disabled**, the communication object ***Ch.x - Actuator status*** will be visualised. This allows status information (concerning the load connected to the device) to be transmitted on the BUS.
If the status signalling takes place **on change** the communication object is sent spontaneously when the status switches from ON to OFF or vice versa. If the set value is **only on request**, the status will never be

sent spontaneously by the device. Only when a status reading request is received from the BUS, the device sends a response telegram with the current load status.
The communication object assumes a value of 1 (ON) if the NO (normally open) contact closes or if the NC (normally closed) contact opens, depending on the setting of the **"Contact type"** parameter; in the same way, the communication object assumes a value of 0 (OFF) if the NO (normally open) contact opens or if the NC (normally closed) contact closes.
When the **on change** value is selected, the **"Status transmission on BUS voltage recovery"** parameter is visualised; this enables the transmission of the load status information when the BUS voltage is restored. The parameter may have the following values:

- **disable (default value)**
- enable

  When the **enable** value is selected, the status information is sent when a certain time (between 11 and 21 seconds after switch-on, depending on the physical address of the device) has elapsed. This prevents the BUS receiving too many telegrams as soon as the voltage is restored.

➢ *4.1.3 Relay status after application download*

This parameter can be used to set the status that the relay contact must assume once the application parameters have been downloaded from the ETC software. It can assume the following values:

- **open (with NO)/closed (with NC) (default value)**
- closed (with NO)/open (with NC)

➢ *4.1.4 Relay status at BUS voltage failure*

This parameter can be used to set the status of the relay change-over contact after the BUS voltage drop. It can assume the following values:

- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- **no change (default value)**

➢ *4.1.5 Relay status after BUS voltage recovery*

This parameter can be used to set the status of the relay change-over contact when the BUS voltage is restored. It can assume the following values:

- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- **as before voltage drop (default value)**

5 *"Channel x switching"* menu

This operating mode can be controlled via the ***Ch.x - Switching*** communication object. This function has the same priority of the activation/deactivation delay, stairs light and flashing functions; this means that when one of the functions is activated while another is already active, it is executed, ending the previously active one.
The structure of the menu is as follows:

Fig. 5.1

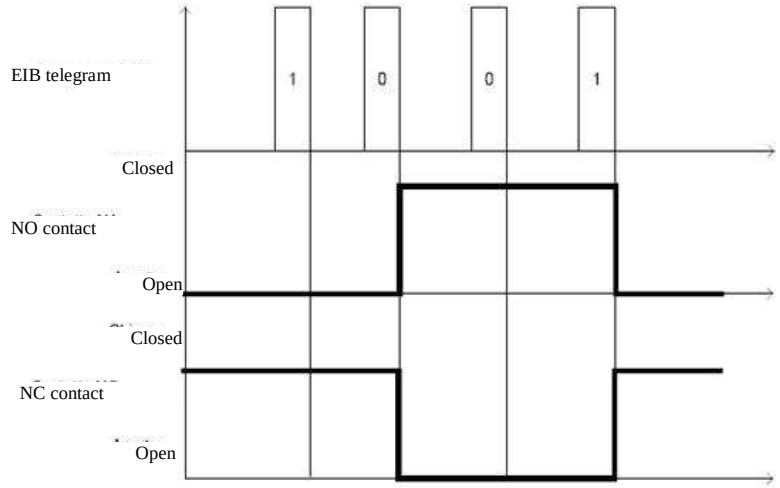
5.1 Parameters

➢ 5.1.1 Mode activation value

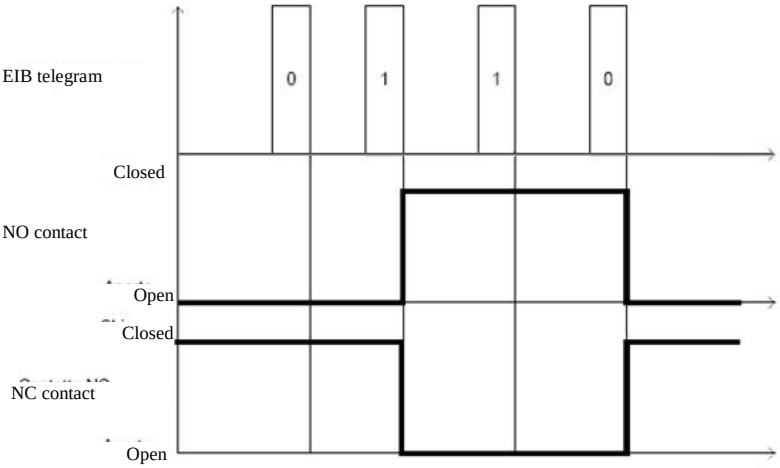
This parameter determines which logic value received on the ***Ch.x - Switching*** communication object must switch the relay to the ON status (NO contact closed/NC open). The possible values are:

- value “0”
- **value “1”** **(default value)**

If you select **value “0”**, then when the device receives (from the BUS) a telegram with a logic value equal to “0”, it switches the relay to the status → NO contact closed/NC contact open. Vice versa, when the logic value “1” is received, the device shifts the contact to → NO contact open/NC contact closed. See figure below.



If you select **value “1”**, then when the device receives (from the BUS) a telegram with a logic value equal to “1”, it switches the relay to the status → NO contact closed/NC contact open. Vice versa, when the logic value “0” is received, the device shifts the contact to → NO contact open/NC contact closed. See figure below.



6 *“Delay on activation/deactivation channel x”* menu

One of the actuator's operating modes is on/off switching with an activation/deactivation delay, which switches the relay status on the basis of the received commands, creating a delay between the moment of receiving the command and the effective moment in which the relay is switched over; from the BUS, this operating mode can be controlled via the ***Ch.x - Delayed switching*** communication object.
This function has the same priority of the on/off switching, stairs light and blinking functions; this means that when one of the functions is activated while another is already active, it is executed, ending the previously active one.
The menu is visible if the **“Delay on activation/deactivation”** function parameter of the **Channel x settings** menu is set with the value **active**.
The structure of the menu is as follows:

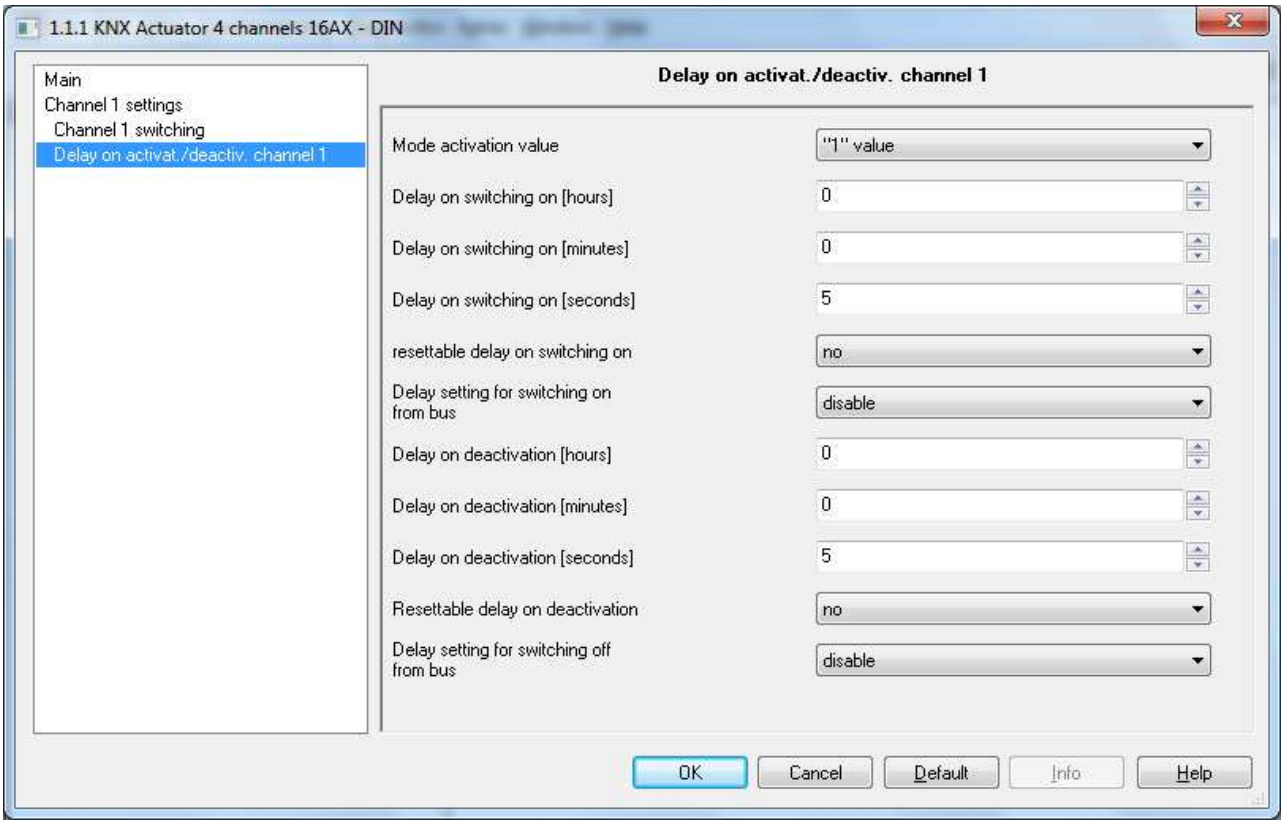


Fig. 6.1

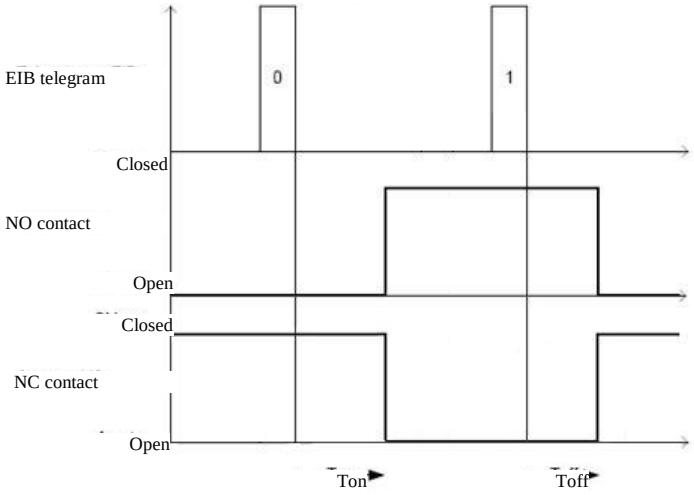
6.1 Parameters

➢ 6.1.1 Mode activation value

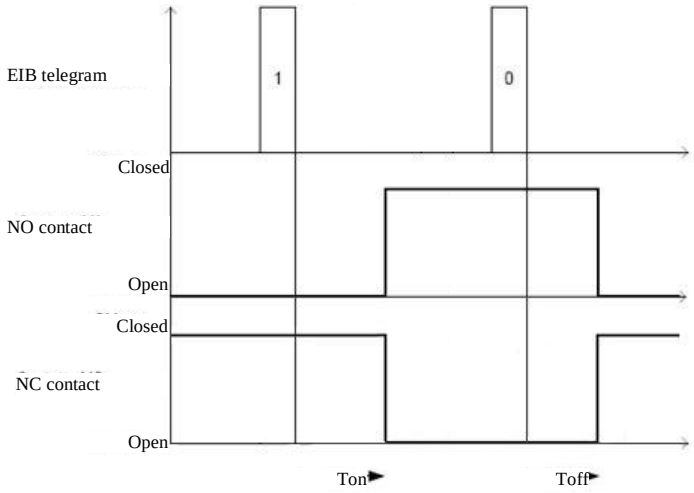
This parameter determines which logic value received on the ***Ch.x - Delayed switching*** communication object must switch the relay to the ON status (NO contact closed/NC open). The possible values are:

- value “0”
- **value “1” (default value)**

Selecting **value “0”**, when the device receives a telegram from the BUS with a logic value equal to “0”, after the set activation delay time (Ton) has passed it switches the relay to the status → NO contact closed/NC contact open. Vice versa, when the logic value “1” is received, the device waits for the deactivation delay time (Toff) before switching the contact to → NO contact open/NC contact closed. See figure below.



Selecting **value “1”**, when the device receives a telegram from the BUS with a logic value equal to “1”, after the set activation delay time (Ton) has passed it switches the relay to the status → NO contact closed/NC contact open. Vice versa, when the logic value “0” is received, the device waits for the deactivation delay time (Toff) before switching the contact to → NO contact open/NC contact closed. See figure below.



➢ *6.1.2 Delay on activation [hours] = Delay on switching on [hours]*

This parameter is used to set the first of the three values (hours) that make up the activation delay time (hours, minutes, seconds). The values that can be set are:

- from **0 (default value)** to 24, with steps of 1

➢ *6.1.3 Delay on activation [minutes] = Delay on switching on [minutes]*

This parameter is used to set the second of the three values (minutes) that make up the activation delay time (hours, minutes, seconds). The values that can be set are:

- from **0 (default value)** to 59, with steps of 1

➢ *6.1.4 Delay on activation [seconds] = Delay on switching on [seconds]*

This parameter is used to set the last of the three values (seconds) that make up the activation delay time (hours, minutes, seconds). The values that can be set are:

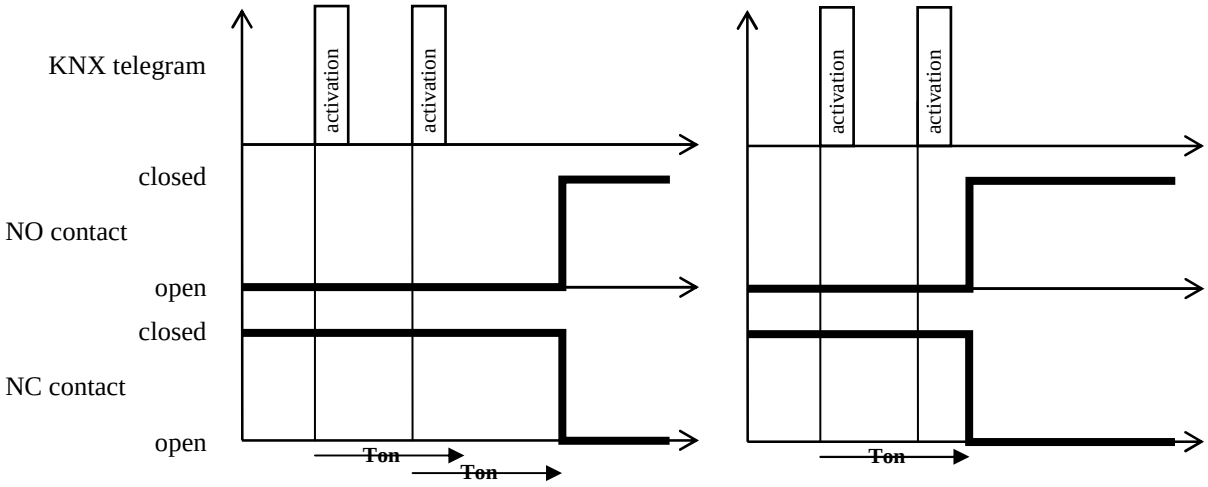
- from 0 to 59 with steps of 1, **5 (default value)**

➢ *6.1.5 Resettable delay on activation =Resettable delay on switching on*

This parameter is used to enable the reset of the activation delay time whenever a delayed activation BUS telegram is received while the delay count is already active. The values that can be set are:

- **no (default value)**
- yes

by selecting **yes**, if a new delayed activation telegram is received during the activation delay count, the counter is reinitialised; otherwise, the count continues without changes. See figure below (to the left with reset enabled, to the right without reset).



➢ *6.1.6 Delay setting for switching on from BUS*

This parameter is used to enable the communication object via which a new activation delay value is received (which overwrites the one configured in ETS). The values that can be set are:
- **disable (default value)**
- enable

Select the value **enable** to view the ***Ch.x - Delay on activation*** communication object, which is used to receive the value of the activation delay from the BUS.
If the new value is received while an activation delay time count is already in progress, it will become operative when the subsequent activation command is received.

➢ *6.1.7 Deactivation delay (=Delay on deactivation) [hours]*

This parameter is used to set the first of the three values (hours) that make up the deactivation delay time (hours, minutes, seconds). The values that can be set are:

- from **0 (default value)** to 24, with steps of 1

➢ *6.1.8 Deactivation delay (=Delay on deactivation) [minutes]*

This parameter is used to set the second of the three values (minutes) that make up the deactivation delay time (hours, minutes, seconds). The values that can be set are:

- from **0 (default value)** to 59, with steps of 1

➢ *6.1.9 Deactivation delay (=Delay on deactivation) [seconds]*

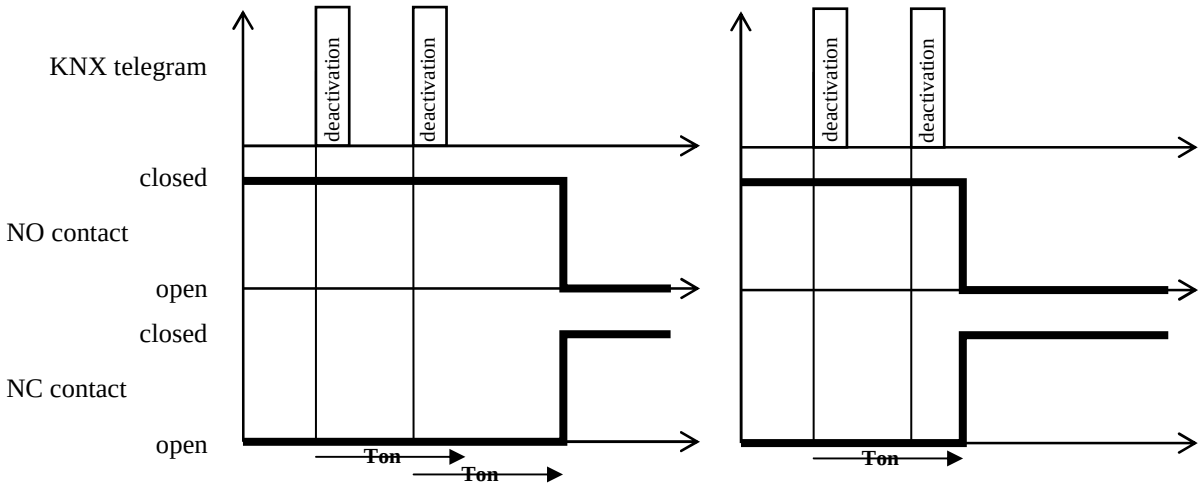
This parameter is used to set the last of the three values (seconds) that make up the deactivation delay time (hours, minutes, seconds). The values that can be set are:

- from 0 to 59 with steps of 1, **5 (default value)**

➢ *6.1.10 Resettable deactivation delay (=Resettable delay on deactivation)*

This parameter is used to enable the reset of the deactivation delay time whenever a delayed activation BUS telegram is received while the delay count is already active. The values that can be set are:
- **no (default value)**
- yes

By selecting **yes**, if a new delayed deactivation telegram is received during the deactivation delay count, the counter is reinitialised; otherwise, the count continues without changes. See figure below (to the left with reset enabled, to the right without reset).



➢ *6.1.11 Delay setting for switching off from BUS*

This parameter is used to enable the communication object via which a new deactivation delay value is received (which overwrites the one configured in ETS). The values that can be set are:

- **disabled (default value)**
- enable

Select the value **enable** to view the ***Ch.x - Delay on deactivation*** communication object, which is used to receive the value of the deactivation delay from the BUS.
If the new value is received while a deactivation delay time count is already in progress, it will become operative when the subsequent deactivation command is received.

7 *"Channel x - Stairs light"* menu

One of the actuator operating modes is timed activation or stairs light function, which involves activating the load for a certain period of time and then deactivating it automatically without receiving a command. Furthermore, it is possible to enter a certain delay between the moment the timed start command is received and the effective instant in which the relay is switched; from the BUS, this operating mode can be controlled via the ***Ch.x - Timed switching*** communication object. This function has the same priority as the on/off switching, delayed activation/deactivation, and blinking functions; this means that when one of the functions is activated while another is already active, it is executed, ending the previously active one.
The menu is visible if the **"Stairs light function"** parameter of the **Channel x - settings** menu is set with the value **active**.
The structure of the menu is as follows:

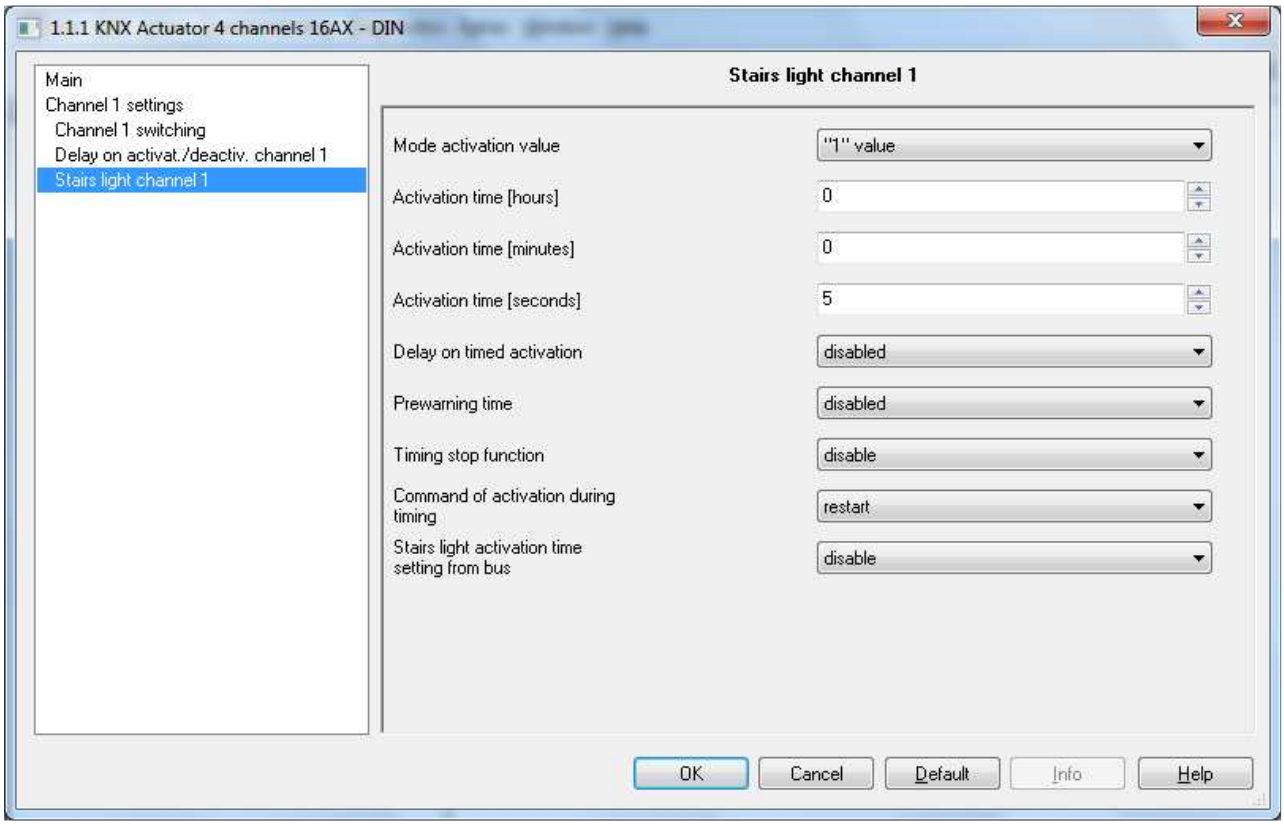


Fig. 7.1

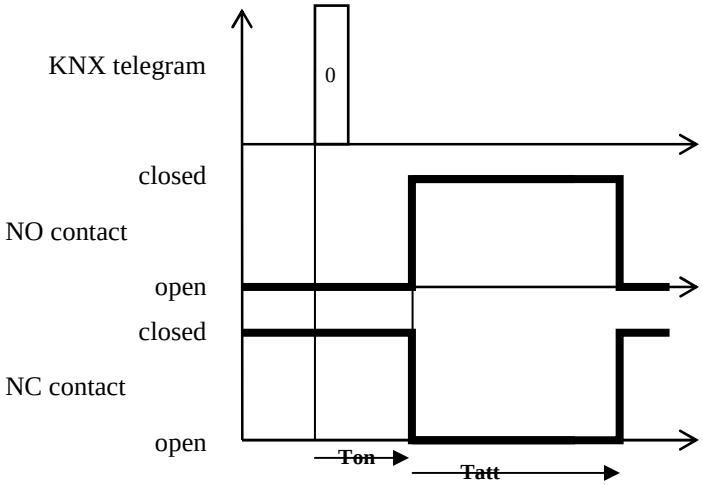
7.1 Parameters

➢ 7.1.1 Mode activation value

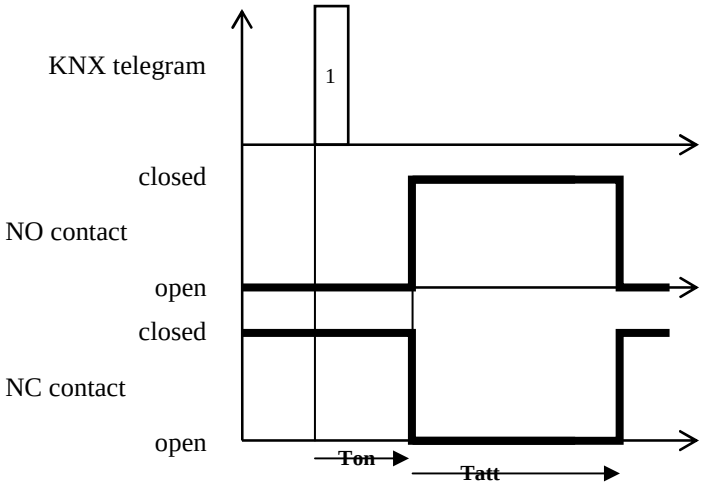
This parameter determines which logic value received on the ***Ch.x - Timed switching*** communication object must switch the relay to the ON status (NO contact closed/NC open) and activate the timing function. The possible values are:

- value “0”
- **value “1” (default value)**

Selecting **value “0”**, when the device receives a telegram from the BUS with a logic value equal to “0”, after the set activation delay time (Ton) has passed it switches the relay to the status → NO contact closed/NC contact open and begins the activation time count. See figure below.



Selecting **value “1”**, when the device receives a telegram from the BUS with a logic value equal to “1”, after the set activation delay time (Ton) has passed it switches the relay to the status → NO contact closed/NC contact open. See figure below.



➢ 7.1.2 Activation time [hours]

This parameter is used to set the first of the three values (hours) that make up the load activation time (Tatt). The values that can be set are:

- from **0 (default value)** to 24, with steps of 1

➢ *7.1.3 Activation time [minutes]*

This parameter is used to set the second of the three values (minutes) that make up the load activation time (Tatt). The values that can be set are:

- from 0 to 59 with steps of 1, **1 (default value)**

➢ *7.1.4 Activation time [seconds]*

This is used to set the last of the three values (seconds) that make up the load activation time (Tatt). The values that can be set are:

- from **0 (default value)** to 59 with steps of 1

➢ *7.1.5 Delay on timed activation*

This parameter is used to enter a delay between the moment in which the ***Ch.x - Timed switching*** communication object is received, and the moment in which the command is actually executed (NO contact closed/NC contact opened). The possible values are:

- **disabled (default value)**
- enabled

If the delay is **enabled**, the **"Timed activation delay duration"** parameter will be displayed. This is used to set the value of the delay in seconds. The parameter may have the following values:

- **1 s (default value)**, 2 s, 3 s, 5 s, 10 s, 15 s, 20 s, 30 s, 45 s, 1 min, 1 min 15 s, 1 min 30 s, 2 min, 2 min 30 s, 3 min, 5 min, 15 min, 20 min, 30 min, 1 h, 2 h, 3 h, 5 h, 12 h, 24 h.

The activation delay cannot be reset.

The **"Pre-warning time" Px** parameter can be used to enable a signal when the load is about to be automatically switched off. This is done by deactivating and reactivating the load for a moment (blinking). The pre-warning time is applied after the expiration of the activation time. The parameter may assume the following values:

- **disabled (default value)**
- enabled

Select **enabled** to view the **"Pre-warning time duration" Px** and **"Load deactivation duration Px [x 100ms]"** parameters.

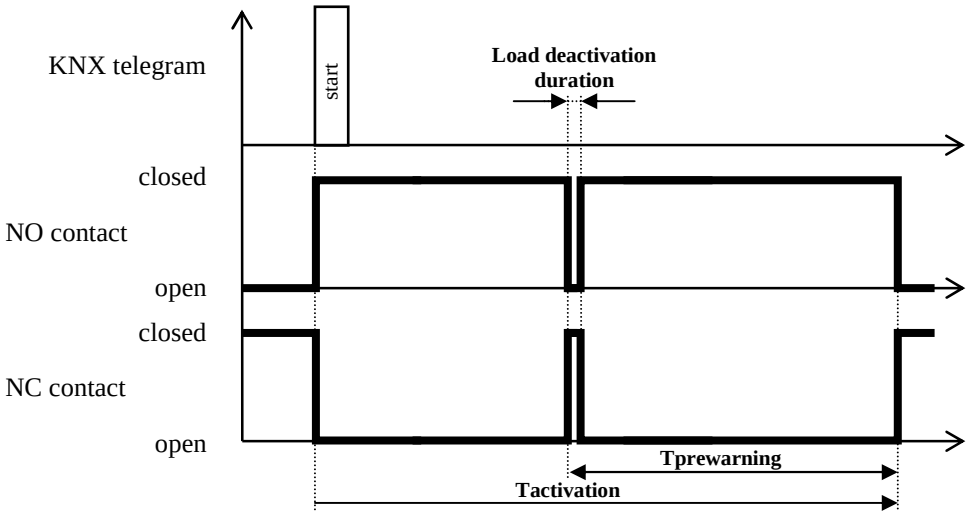
➢ *7.1.6 Pre-warning time*

Enabling this function, two parameters become available. The first is **"Pre-warning time duration"**, used to set the time that passes between the signalling of imminent deactivation and the actual deactivation of the load. The possible values are:

- **15 s (default value)**, 30 s, 1 min.

The second parameter is **"Load deactivation duration [x 100ms]"**, used to set the time interval during which the load is deactivated to perform the pre-warning function. The possible values are:
- from **5 (default value)** to 15, with steps of 1

The below figure shows the operating principle of the pre-warning function.



➢ *7.1.7 Timing stop function*

By activating this function, you can terminate the timed activation via a BUS command on the ***Ch.x - Timed switching*** communication object, with the opposite value to the one set in **"Mode activation value"** (analysed above). The possible values are:

- **disable (default value)**
- enable

If the function is enabled, when the value opposite to the mode activation value is received, the device ends the timing and deactivates the load.

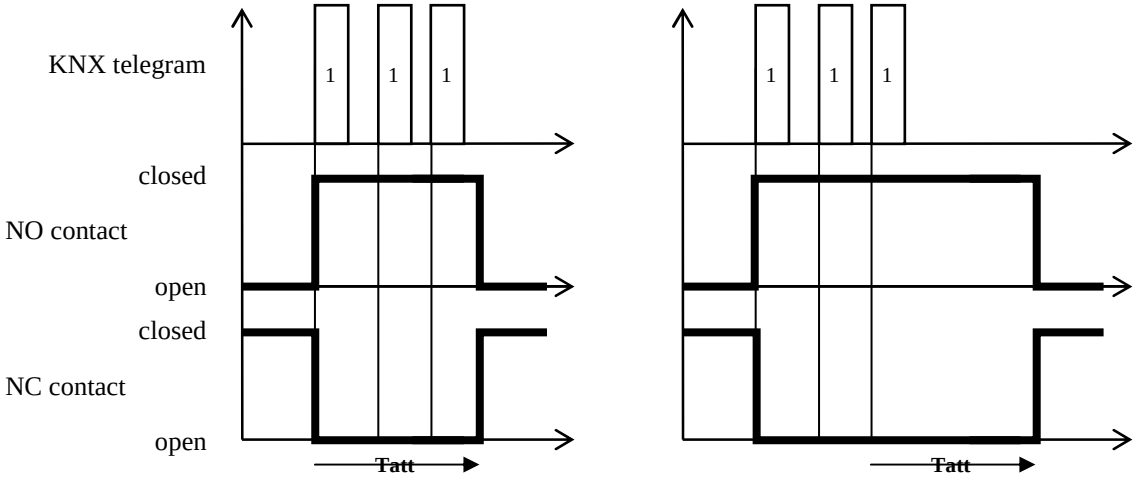
➢ *7.1.8 Activation command during timing (=Command of activation during timing)*

this is used to define the behaviour of the device if a timed activation command is received while timing is in progress; The possible values are:

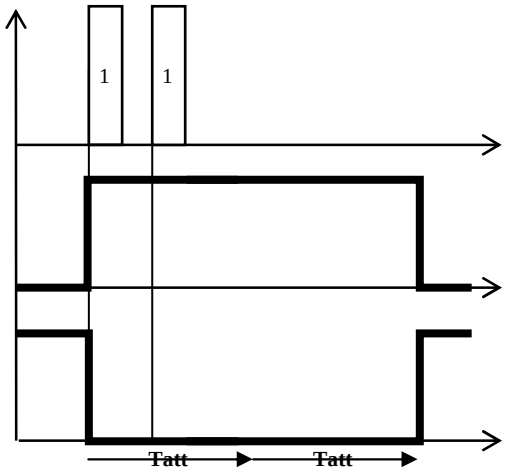
- no effect
- **reset (default value)**
- extend (multiply by factor)

By selecting **no effect**, the subsequent commands are ignored; by selecting **reset**, each timed activation command received during the activation time count causes the count to reinitialise.
By selecting **extend**, each command received will produce an extension equal to the activation time multiplied by the factor set in the following parameter - **"Maximum value of multiplication factor"** (values allowed - from 2 to **5** - this is also the **default**).

The following figure shows an example for each of the three configurations.



no effect *reset*



Extend

➢ *7.1.9 - Stairs light activation time setting from the BUS*

This parameter makes the input communication object ***Ch.x - Stair light activation time*** visible. It is used to receive - from the BUS - the value of the stair light activation time. The possible values are:

- **disable (default value)**
- enable

As the activation time is between 0h:0min:1sec and 24h:59min:59sec, when the BUS receives a value that lies outside this interval, the value set for the deactivation delay time is the limit value of the interval that is closest to the received value.

If a new activation time value is received, this becomes the new stairs light time, overwriting the old value, which will be deleted; if the new value is received while the timing is already active, it will become operative upon the subsequent activation of the timing.

8 *"Channel x - Blinking"* menu

This operating mode activates the load for a specific period of time, then deactivates it and repeats the process until the deactivation command is received; from the BUS, this operating mode can be controlled via the ***Ch.x - Blinking*** communication object. This function has the same priority as the on/off switching, delayed activation/deactivation, and timed activation functions; this means that when one of the functions is activated while another is already active, it is executed, ending the previously active one.
The menu is visible if the **"Blinking function"** parameter of the **Channel x - settings** menu is set with the value **active**. The structure of the menu is as follows:

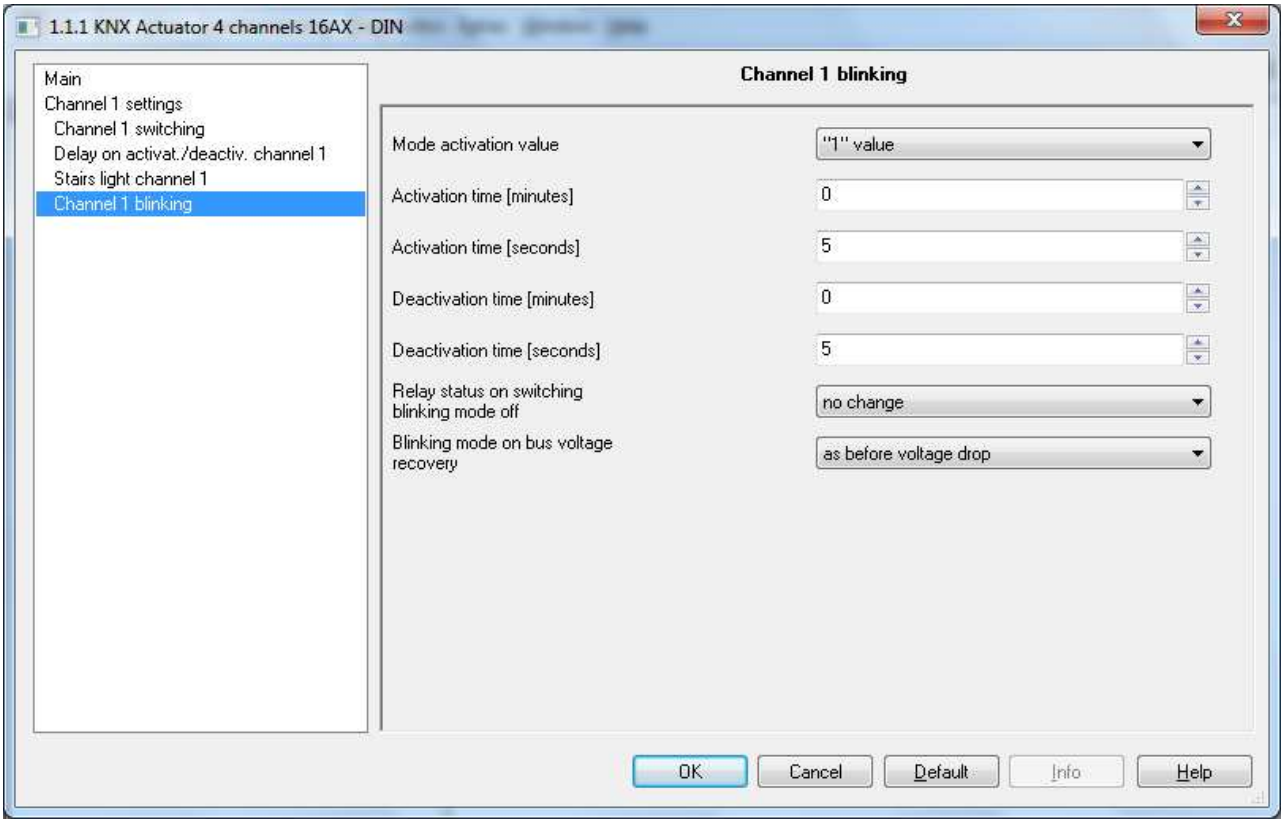


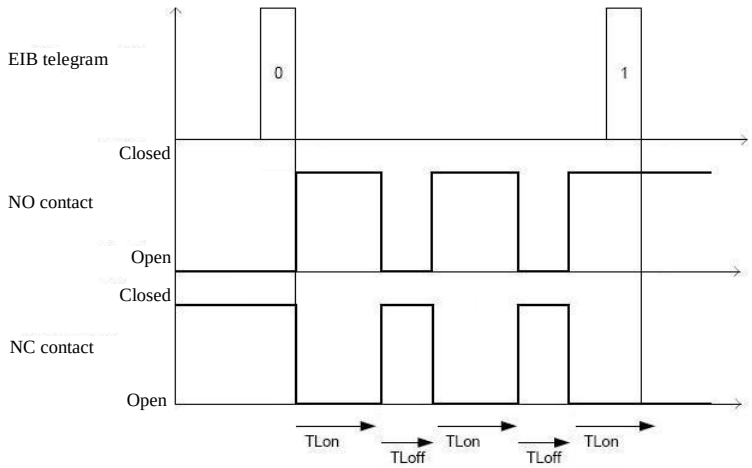
Fig. 8.1

8.1 Parameters

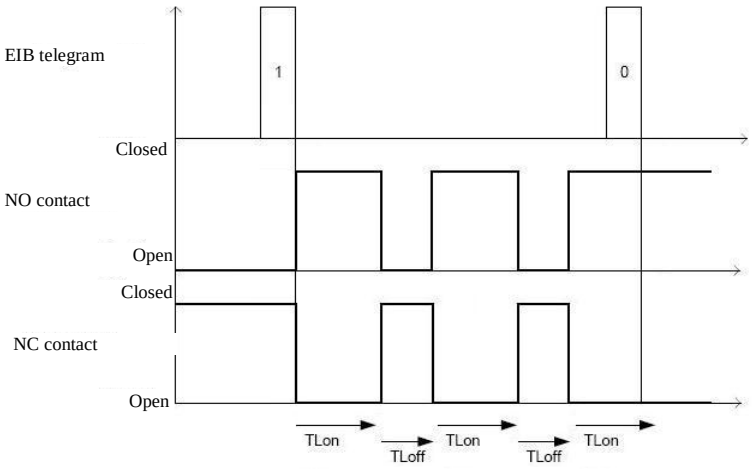
➢ *8.1.1 Mode activation value*

This determines which logic value received on the ***Ch.x - Blinking*** communication object must activate the load activation/deactivation process. The possible values are:
- value "0"
- **value "1" (default value)**

If you select **value "0"**, then when the device receives a telegram from the BUS with a logic value equal to "0", it switches the relay to the status → NO contact closed/NC contact open, and begins the activation time count. at the end of the activation time, the device deactivates the load (NO contact open/NC contact closed) for a period of time equal to the deactivation time, and then reactivates the load and restarts the process. See figure below.



If you select **value "1"**, then when the device receives a telegram from the BUS with a logic value equal to "1", it switches the relay to the status → NO contact closed/NC contact open, and begins the activation time count. At the end of the activation time, the device deactivates the load (NO contact open/NC contact closed) for a period of time equal to the deactivation time, and then reactivates the load and restarts the process. See figure below.



➢ *8.1.2 Activation time [minutes]*

This is used to set the first of two values (minutes) that make up the load activation time (TLon); the possible values are:

- from **0 (default value)** to 59 with steps of 1

➢ *8.1.3 Activation time [seconds]*

This is used to set the last of two values (seconds) that make up the load activation time (TLon); the possible values are:

- from 0 to 59 with steps of 1, **5 (default value)**

➢ *8.1.4 Deactivation time [minutes]*

This is used to set the first of two values (minutes) that make up the load deactivation time (TLoff); the possible values are:

- from **0 (default value)** to 59 with steps of 1

➢ *8.1.5 Deactivation time [seconds]*

This is used to set the last of two values (seconds) that make up the load deactivation time (TLoff); the possible values are:

- from 0 to 59 with steps of 1, **5 (default value)**

➢ *8.1.6 Relay status on blinking mode deactivation (=Relay status on switching blinking mode off)*

This parameter is used to define the status of the relay contact upon receipt of the blinking mode deactivation command. It can assume the following values:
- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- **no change (default value)**

By selecting **no change**, the status of the contact remains the one assumed when the mode deactivation command was received.

➢ *8.1.7 Blinking mode on BUS voltage recovery*

This is used to define the blinking mode status on BUS voltage recovery; the values that can be set are:
- deactivated
- active
- **as before voltage drop (default value)**

By selecting **active**, if no function with a higher priority than the blinking mode is active, the device will start the blinking phase, ignoring the value set for the **"Relay status after BUS voltage recovery"** item of the **Ch.x - Settings** menu.

9 *"Channel x - Scenes"* menu

The scenes function is used to replicate a certain pre-set or previously memorised status upon receipt of the scene execution command; From the BUS, this function can be controlled via the ***Ch.x - Scenes*** communication object. The device is able to memorise and execute 8 scenes.
The menu is visible if the **"Scenes function"** parameter of the **Channel x - settings** menu is set with the value **active**. The structure of the menu is as follows:

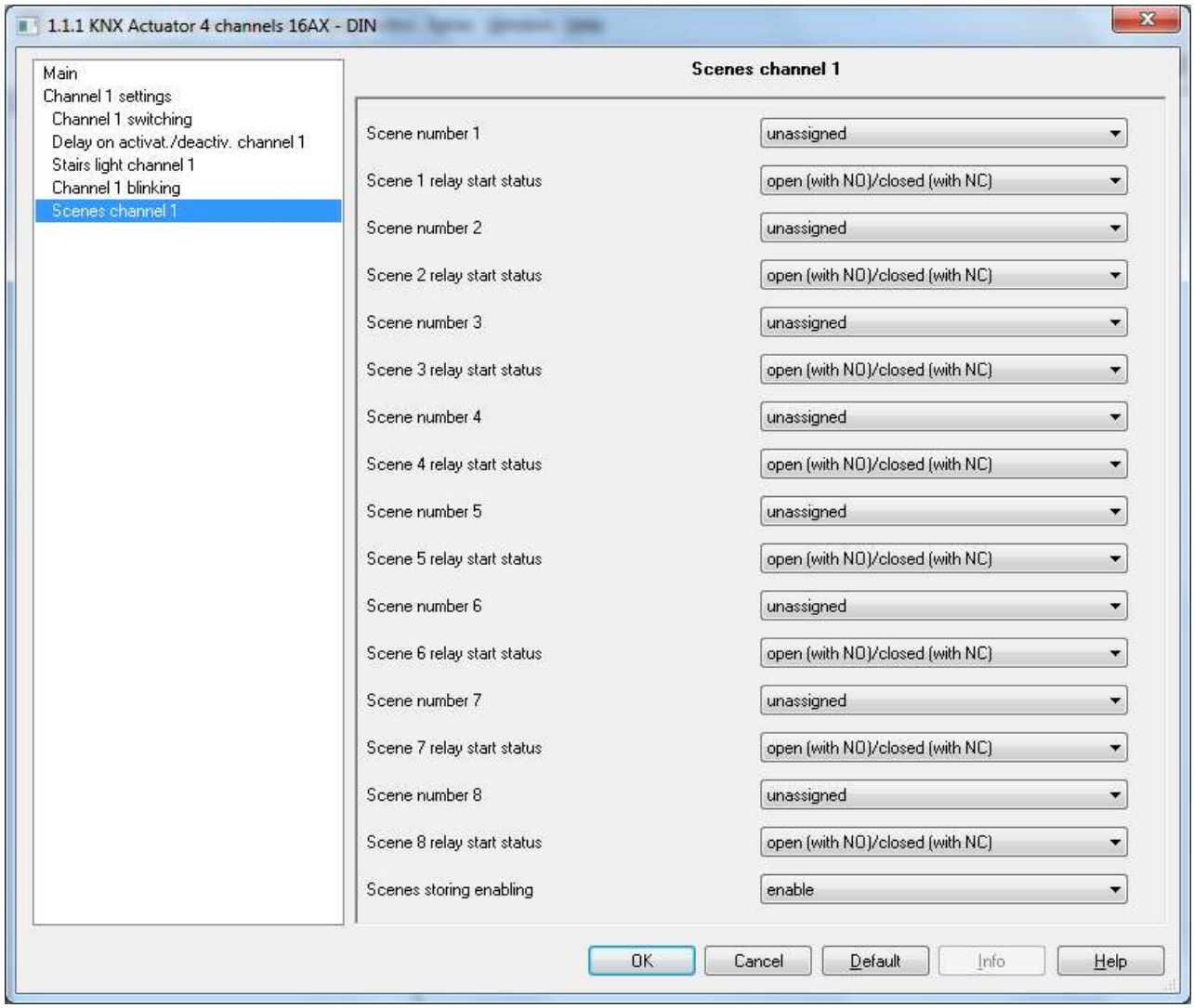


Fig. 9.1

9.1 Parameters

➢ *9.1.1 "Scene number x"*

This parameter is used to set the numerical value for identifying (and therefore executing/storing) the xth scene. The possible values are:

- **not assigned (default value)**
- 0, 1.. 63

➢ *9.1.2 Scene x relay start status*

Used to pre-set the contact status that the device must reproduce when it receives an xth scene execution telegram. The possible values are:

- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)

➢ *9.1.3 Scene storing enabling*

The scene learning function is enabled/disabled via the ***Actuator scene*** communication object. The parameter may assume the following values:

- disabled
- **enabled (default value)**

Select the value **enable** to view the ***Ch.x - Scene storing enabling*** communication object, which enables or disables (via BUS) the possibility of scene learning via the ***Ch.x - Scene*** communication object.

10 *"Channel x - Logic"* menu

Load activation/deactivation can be subordinated on the basis of the results of logic operations whose inputs are their communication objects.
The menu is visible if the **"Logic function"** parameter of the **Channel x - settings** menu is set with the value **active**. The structure of the menu is as follows:

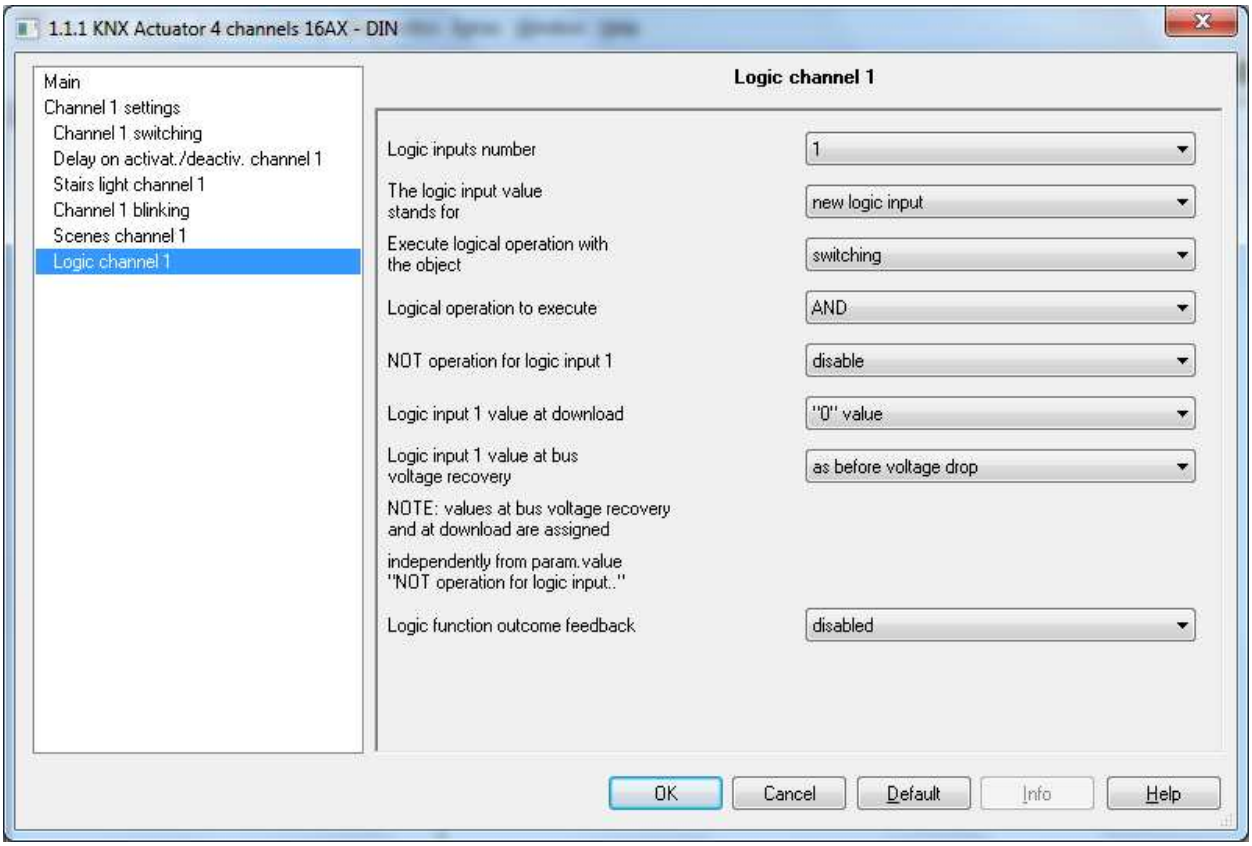


Fig. 10.1

10.1 Parameters

➢ 10.1.1 Number of logic inputs

Used to set the number of logic inputs. It can assume the following values:

- **1** (default value), 2, 3, 4

Depending on the selected value, the following communication objects will be made available - ***Ch.x - Logic input 1***, ***Ch.x - Logic input 2***, ***Ch.x - Logic input 3*** and ***Ch.x - Logic input 4***.

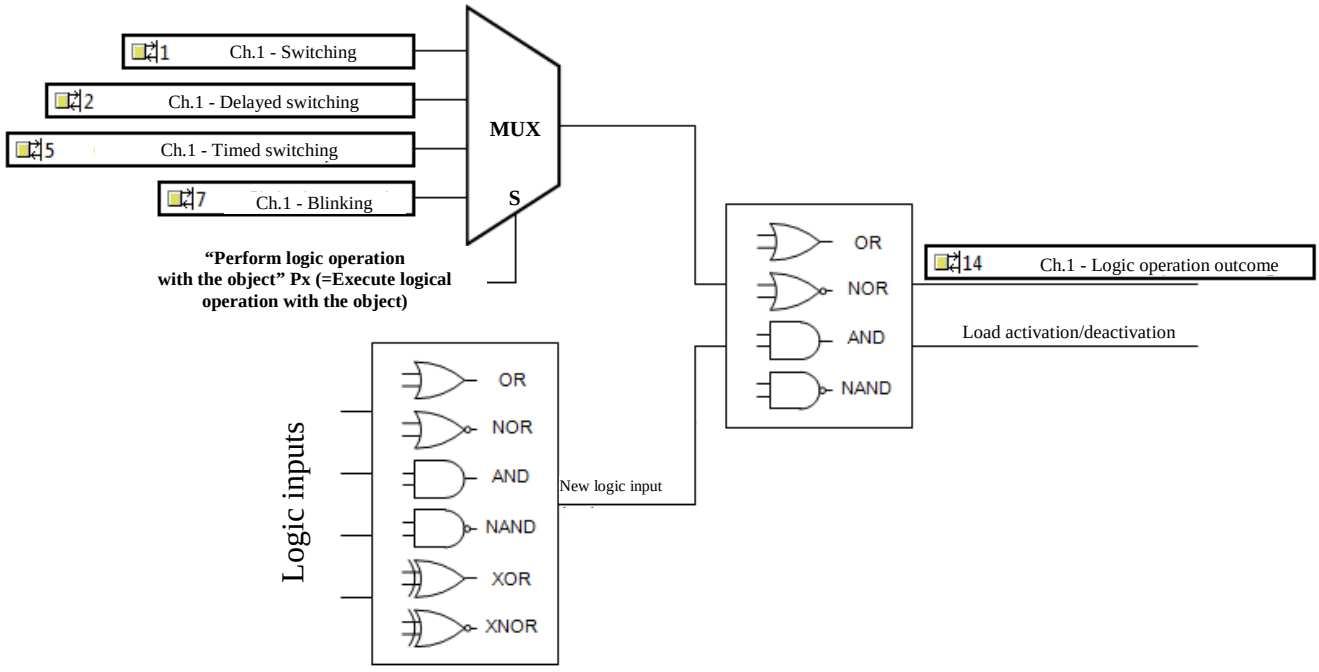
➢ 10.1.2 Operation between logic inputs

If the value of the logic inputs is higher than **1**, it is possible to set the logic operation to be executed between the logic inputs.
The operation is selected via this parameter, which may assume the following values:

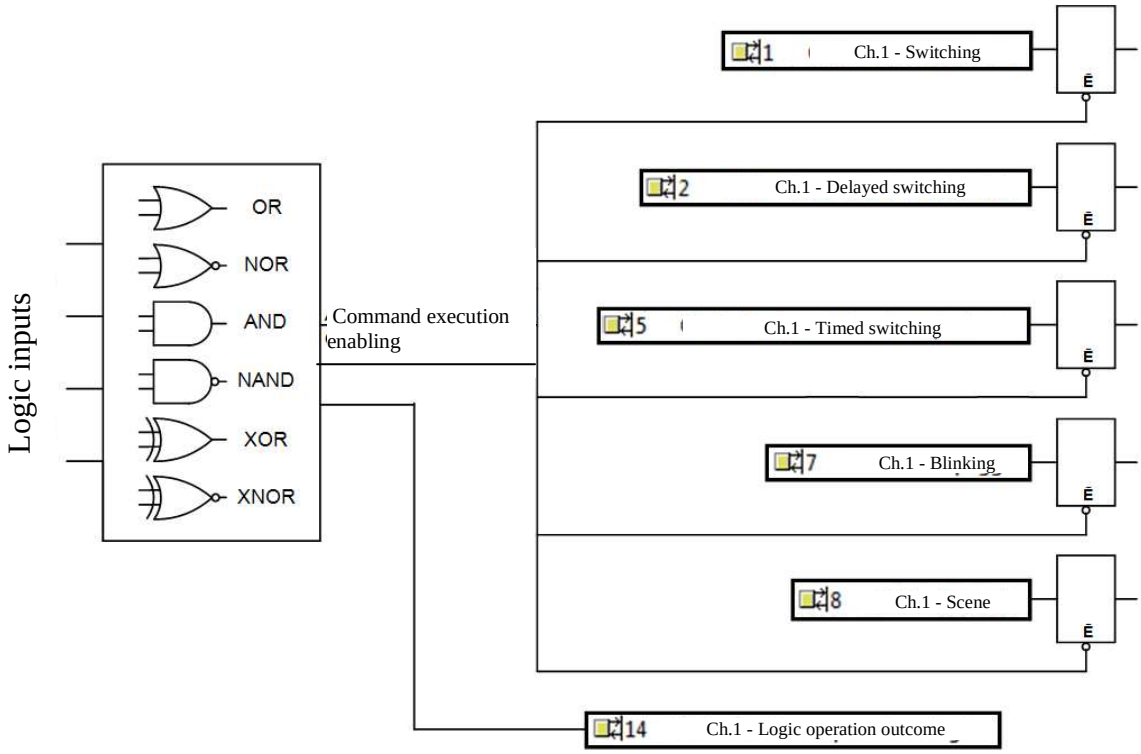
- **AND** **(default value)**
- OR
- NAND
- NOR
- XOR
- XNOR

The outcome of the operations between logic inputs (or the value of the individual logic input, if only one logic input was set) can be used as follows:

1) as the input of another logic operation, executed with one of the following objects - ***Ch.x - Switching***, ***Ch.x - Timed switching***, ***Ch.x - Delayed switching*** or ***Ch.x - Blinking***



2) as the enabling of the execution of the commands received from the BUS on the objects ***Ch.x - switching***, ***Ch.x - Timed switching***, ***Ch.x - Delayed switching***, ***Ch.x - Blinking*** and ***Ch.x - Scene***.



➢ *10.1.3 The outcome of the operation with logic inputs stands for*

This is used to select the function of the outcome of the operation between logic inputs which, in the case of a single logic input, is replaced by the parameter **"The outcome of the operation with logic inputs stands for"**. These parameters can assume the following values:

- **new logic input** **(default value)**
- BUS command execution enabling

If the value **new logic input** is selected (example 1 in paragraph 10.1.2), it is possible to define which object should be used to execute the new logic operation (via the **"Execute logic operation with the object"** parameter), and the logic operation to be executed with the selected object (via the **"Logic operation to be executed"** parameter).

The **"Execute logic operation with the object"** parameter may assume the following values:

- **switching** **(default value)**
- delayed switching
- timed switching
- blinking

The **"Logic operation to be executed"** parameter may assume the following values:

- **AND (default value)**
- OR
- NAND
- NOR

Figure 10.2 shows the parameters available for this case:

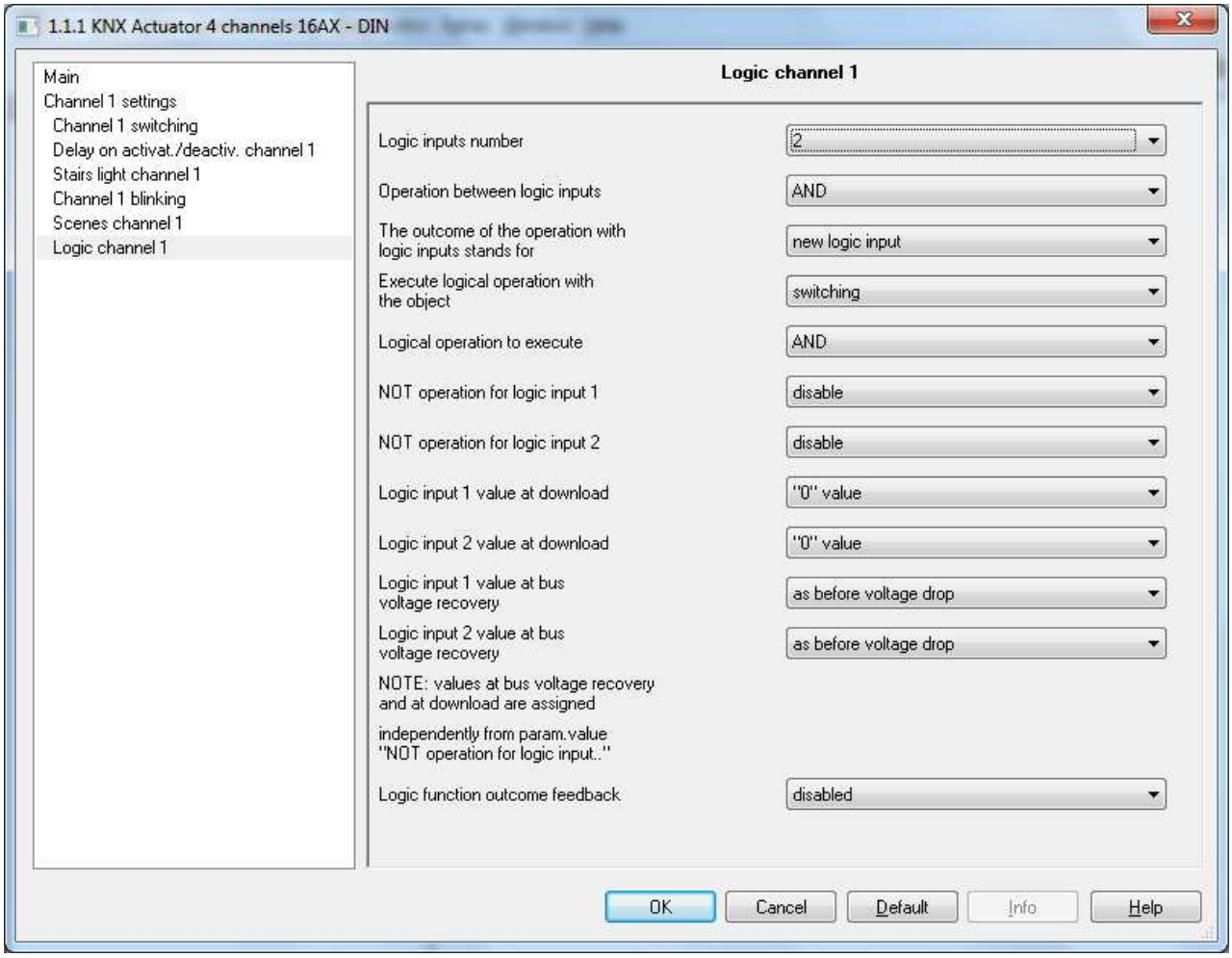


Fig. 10.2

If the value **BUS command execution enabling** is selected (example 2 in paragraph 10.1.2), a series of parameters appear. These are used to establish which BUS commands need to be enabled in order to be executed; these parameters are **"Switching (on/off) commands"**, **"Delayed switching commands"**, **"Timed activation commands"**, **"Blinking on/off commands"** and **"Scene commands"**, which may be assigned the following values:

- **regardless of logic function (=independent from logic function) (default value)**
- enabled from logic function

The commands enabled by the logic function are only executed if the outcome of the logic operation is true. Figure 10.3 shows the parameters available for this case:

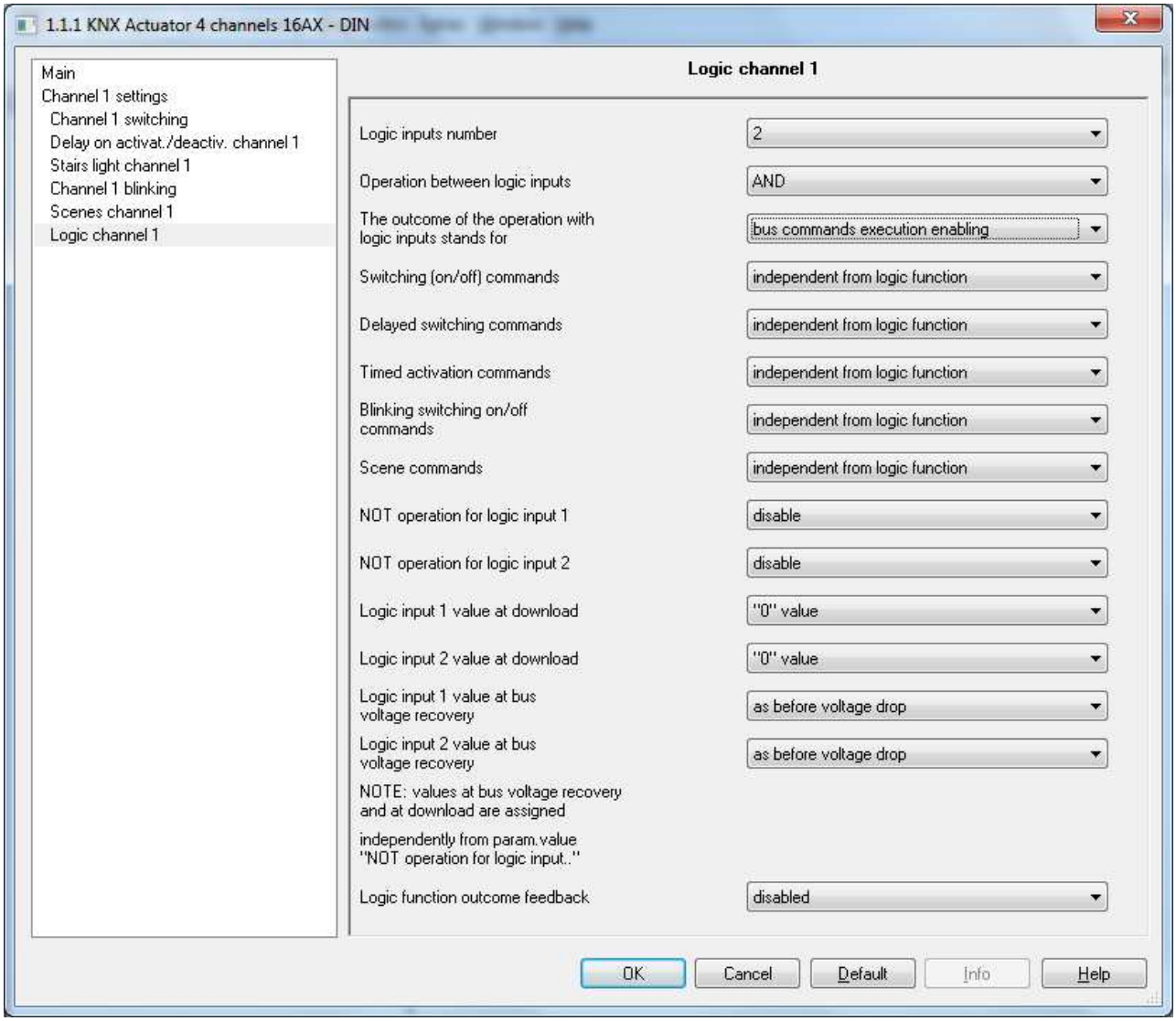


Fig. 10.3

It is possible to refuse the value received from the BUS on the communication objects associated with the logic inputs. This is done via the **"NOT operation for logic input 1"**, **"NOT operation for logic input 2"**, **"NOT operation for logic input 3"** and **"NOT operation for logic input 4"** parameters (whose visibility depends on the number of logic inputs enabled). These parameters may assume the following values:

- **disabled** **(default value)**
- active

You can set the value of the logic inputs by downloading from ETS the **"Logic input 1 value at download"**, **"Logic input 2 value at download"**, **"Logic input 3 value at download"**and **"Logic input 4 value at download"** parameters (whose visibility depends on the number of logic inputs enabled). These parameters may assume the following values:

- **value "0"** **(default value)**
- value "1"

You can set the value of the logic inputs when the BUS voltage is restored via the **"Logic input 1 value at BUS voltage recovery"**, **"Logic input 2 value at BUS voltage recovery"**, **"Logic input 3 value at BUS voltage recovery"**and **"Logic input 4 value at BUS voltage recovery"** parameters (whose visibility depends on the number of logic inputs enabled). These parameters may assume the following values:

- value "0"

- value “1”
- **as before voltage drop (default value)**

NB: the values on BUS voltage recovery and on download are assigned to the logic objects regardless of the value of the **“NOT operation for logic input i”** parameters.

➢ *10.1.4 Logic function outcome feedback*

Finally, you can enable the sending of the outcome of the logic function on the BUS, and specify whether this information should always be sent when an input changes, or only if the outcome of the logic function changes. The possible values are:

- **disabled (default value)**
- only if the outcome changes
- even if the outcome does not change

If a value other than **disabled** is set, the output communication object ***Ch.x - Logic operation outcome*** is visualised.
The value transmitted on the BUS is the result of the operation between the outcome of the logic inputs logic operation and the object selected in the **“Execute logic operation with the object”** parameter, if the **“The outcome of the operation with logic inputs stands for”** parameter assumes the **new logic input** value, or the outcome of the operation between logic inputs if the parameter assumes the **BUS command execution enabling** value.

11 *“Channel x - Safety”* menu

The safety function allows the device to function under normal conditions until certain set conditions occur (no periodic reception, reception of particular data from the BUS), after which the actuator forces the status of the relay to a specific condition; to deactivate the safety function, the normal operation conditions must be reset. Any command that is received (excluding the block activation and forcing activation command) during a period when the safety is activated will not be executed as it has priority over any other BUS command, with the exception of the block and forcing functions.
The communication object used to monitor the operating conditions is the **Ch.x - Safety** object.
The menu is visible if the **“Safety function”** parameter of the **Channel x - settings** menu is set with the value **active**. The structure of the menu is as follows:

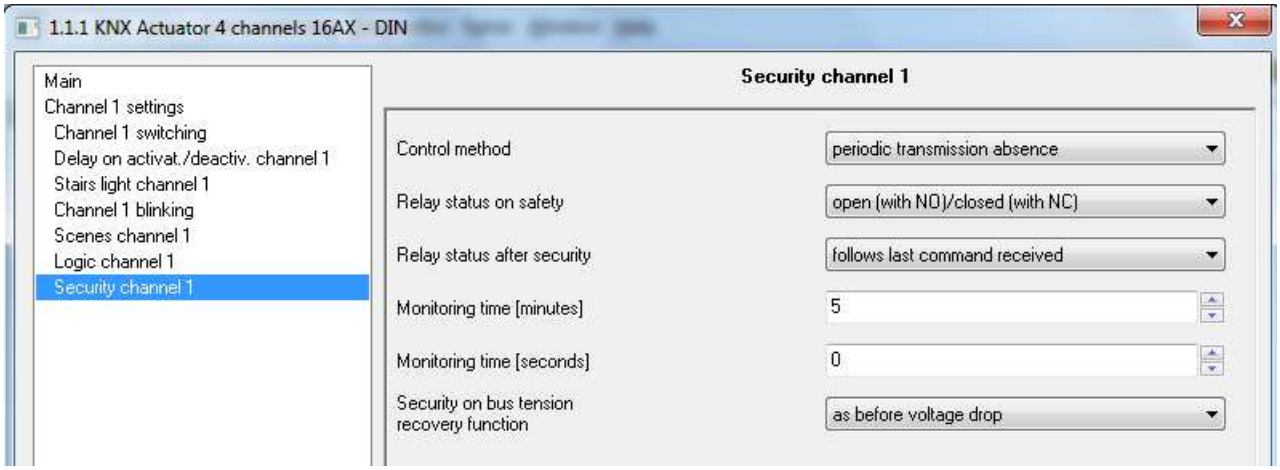


Fig. 11.1

11.1 Parameters

➢ *11.1.1 Control method*

Allows to define the conditions for which the device activates the safety function; unlike the process for the ***Block*** and ***Priority command*** commands, which are activated via a BUS command, the safety function is enabled by the device when the conditions set in the reference parameter occur. The values that can be set are:

- value “1” or no periodic transmission
- value “0” or no periodic transmission
- **no periodic transmission (default value)**

By selecting **value “1” or no periodic transmission**, the safety function is activated following two events:

- if the ***Ch.x - Safety*** communication object no longer receives the telegram with logic value “0” (no periodic transmission) for a period equal to the time represented by the values set in the **“Monitoring time [minutes]”** and **Px Monitoring time [seconds]”** parameters.
- If the ***Ch.x - Safety*** communication object receives a telegram with the logic value “1” (value received “1”).

In both cases, the safety function is deactivated when the ***Ch.x - Safety*** communication object receives a telegram with the logic value “0”; once safety is deactivated, the monitoring time is restarted.
By selecting **value “0” or no periodic transmission**, the safety function is activated following two events:

- if the ***Ch.x - Safety*** communication object no longer receives the telegram with logic value “1” (no periodic transmission) for a period equal to the time represented by the values set in the **“Monitoring time [minutes]”** and **“Monitoring time [seconds]”** parameters.
- if the ***Ch.x*** **- Safety** communication object receives a telegram with the logic value “0” (value “0” received).

In both cases, the safety function is deactivated when the ***Ch.x - Safety*** communication object receives a telegram with the logic value “1”; once safety is deactivated, the monitoring time is restarted.

By selecting the value **no periodic transmission**, the safety function is only activated when the ***Ch.x - Safety*** communication object does not receive any telegram for a period equal to the time represented by the values set in the **“Monitoring time [minutes]”** and **“Monitoring time [seconds]”**, parameters, regardless of the value of the telegram itself.
The safety function is deactivated when the ***Ch.x - Safety*** communication object receives a telegram with the logic value “0” or “1”; once safety is deactivated, the monitoring time is restarted.

➢ *11.1.2 Relay status on safety*

Used to set the status of the contact when the safety function is active. The possible values are:

- **open (with NO)/closed (with NC) (default value)**
- closed (with NO)/open (with NC)
- no change

➢ *11.1.3 Relay status after safety time*

When normal operating conditions are restored (safety deactivation), the status to which the actuator switches the relay is defined by this parameter, which may assume the following values:

- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- no change
- **follows last command received (default value)**
- as prior to the safety activation

If the parameter assumes the value **follows last command received**, the actuator follows the dynamics determined by the last command as if the execution of the command was initiated at the moment in which it was effectively received. Essentially, the command is executed in the background and is applied to the output in the moment in which safety is ended. This behaviour applies, for example, to timed actuation commands with timing that has a duration that goes beyond the moment of safety deactivation or commands with delayed activation/deactivation.

➢ *11.1.4 Monitoring time [minutes]*

This is used to set the first of two values (minutes) that make up the time that must pass after which the device will activate the safety if it does not receive the expected telegram (no periodic transmission); The possible values are:

- from 0 to 59 with steps of 1, **5 (default value)**

➢ *11.1.5 Monitoring time [seconds]*

This is used to set the second of two values (seconds) that make up the time that must pass after which the device will activate the safety if it does not receive the expected telegram (no periodic transmission); The possible values are:

- from **0 (default value)** to 59 with steps of 1

➢ *11.1.6 Safety on BUS voltage recovery function*

This parameter is used to determine the status of the safety function on BUS voltage recovery. It is useful if the function was active when the BUS voltage dropped, and you do not want the actuator behaviour to change after the voltage failure. The parameter may assume the following values:

- deactivated
- **as before voltage drop (default value)**

If the value **deactivated** is selected (and safety was activated before the BUS voltage drop), when the BUS voltage is recovered the safety function will be deactivated and the relay will take on the value determined by the parameter **"Relay status after safety time"**. If the value set for this last parameter is **follows last command received**, the actuator will execute the last command received before the BUS voltage drop that, as a result, must be stored to the non-volatile memory. If the last command received before voltage drop is a timed activation of activation delay command, when the BUS voltage is recovered the command will not be executed and the relay will switch to the open (with NO)/closed (with NC) status.
If the value **as before voltage drop** is selected (and safety was activated before the BUS voltage drop), when the BUS voltage is recovered the safety function will be reactivated and the relay will be set to the conditions set in the parameter **"Relay status on safety"**.

12 *"Channel x - Forced positioning"* menu

It is possible to force the relay status to a certain condition (settable) after receiving the ***Ch.x - Priority command*** communication object, that activates the forcing function; until this is deactivated, any command received on all other input communication objects will not be executed (with the exception of commands received on the ***Ch.x - Block*** object). The forcing function has the highest priority over all others with the exception of the Block function.
The menu is visible if the **"Forcing function"** parameter of the **Channel x - settings** menu is set with the value **active**.
The structure of the menu is as follows:

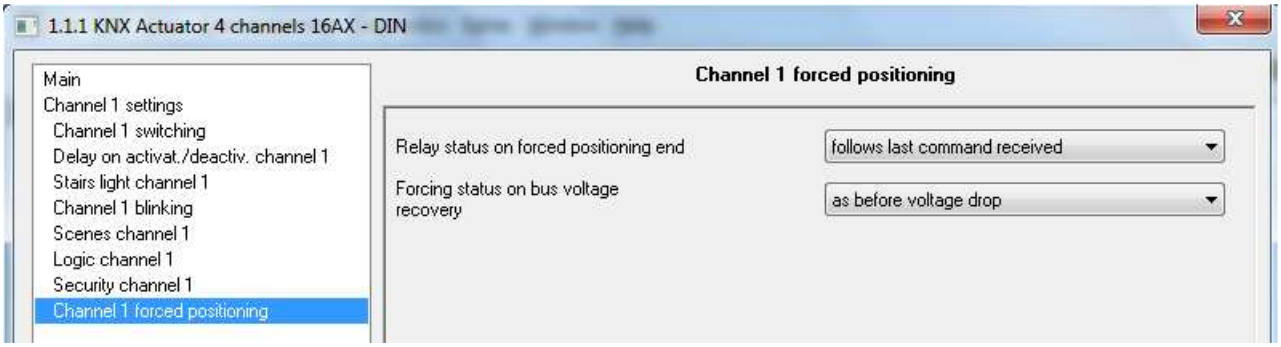


Fig. 12.1

The semantics of the command received from the BUS follows what is shown in the following table:

bit1	bit 0	
0	0	Forcing deactivation
0	1	Forcing deactivation
1	0	Forcing OFF
1	1	Forcing ON

When a priority command is received with the forcing activation ON value, the actuator switches the relay, closing the NO contact or opening the NC contact. Vice versa, when a priority command is received with the forcing activation OFF value, the actuator switches the relay, opening the NO contact or closing the NC contact.

12.1 Parameters

➢ *12.1.1 Relay status after forcing*

When the forcing deactivation command is received, the new relay status is defined by this parameter. The values it may assume are:

- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- No change
- **follows last command received (default value)**
- as prior to the forcing activation

If the parameter assumes the value **follows last command received**, the actuator follows the dynamics determined by the last command as if the execution of the command was initiated at the moment in which it was effectively received. Essentially, the command is executed in the background and is applied to the output in the moment in which forcing is ended. This behaviour applies, for example, to timed actuation commands with timing that has a duration that goes beyond the moment of forcing deactivation or commands with delayed activation/deactivation.

➢ *12.1.2 Forcing status after BUS voltage recovery*

This parameter is used to determine the status of the forcing function on BUS voltage recovery. This parameter is useful if the function is active when the BUS voltage drops and you want to have the actuator behaviour not be changed after voltage failure. The parameter may assume the following values:

- deactivated
- **as before voltage drop (default value)**

If the value **deactivated** is selected (and forcing was activated before the BUS voltage drop), when the BUS voltage is recovered the forcing function will be deactivated and the relay will take on the value determined by the parameter **"Relay status after forcing"**. If the value set for this last parameter is **follows last command received**, the actuator will execute the last command received before the BUS voltage drop that, as a result, must be stored to the non-volatile memory. If the last command received before voltage drop is a timed activation of activation delay command, when the BUS voltage is recovered the command will not be executed and the relay will switch to the open (with NO)/closed (with NC) status.
If the value **as before voltage drop** is selected (and forcing was activated before BUS voltage drop), when the BUS voltage is recovered the forcing function is reactivated and the relay switches to the status prior to the voltage drop.

If a forcing deactivation command is received and the **Relay status after forcing** parameter assumes the value **follows last command received**, the actuator executes the last command received before the BUS voltage drop (which, as a result, must be stored in the non-volatile memory). If the last command received before voltage drop is a timed activation of activation delay command, when the BUS voltage is recovered the command will not be executed and the relay will switch to the open (with NO)/closed (with NC) status.

13 *"Channel x - Block"* menu

It is possible to block the device in a certain (settable) condition after receiving the ***Ch.x - Block*** communication object that activates the block function; until it is deactivated, any command received on all other input communication objects will not be executed. The block function is the function with the highest priority.
The menu is visible if the **"Block function"** parameter of the **Channel x - settings** menu is set with the value **active**. The structure of the menu is as follows:

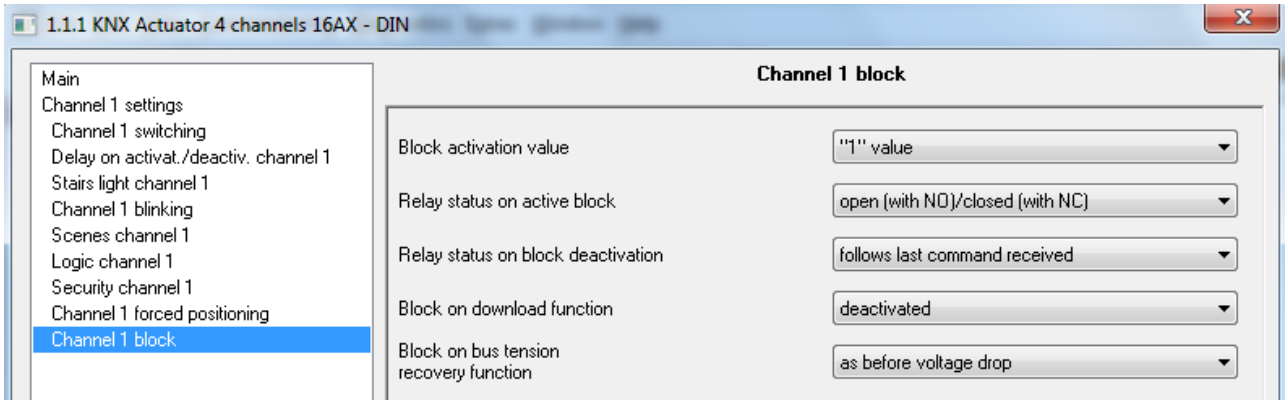


Fig. 13.1

13.1 Parameters

➢ 13.1.1 Block activation value

This determines which logic value activates the actuator block function; the possible values are:
- value “0”
- **value “1” (default value)**

➢ 13.1.2 Relay status on active block

Used to set the status that the contact must assume if the block function is activated. The possible values are:
- **open (with NO)/closed (with NC) (default value)**
- closed (with NO)/open (with NC)
- No change

➢ 13.1.3 Relay status on block deactivation

Used to set the status that the contact must assume following the deactivation of the block function. The possible values are:
- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- no change
- **follows last command received (default value)**
- as prior to the block activation

If the parameter assumes the value **follows last command received,** the actuator follows the dynamics determined by the last command as if the execution of the command was initiated at the moment in which it was effectively received. Essentially, the command is executed in the background and is applied to the output in the moment in which the block is deactivated. This behaviour applies, for example, to timed actuation commands with timing that has a duration that goes beyond the moment of block deactivation or commands with delayed activation/deactivation.

➢ 13.1.4 Block function on downloading (=Block on download function)

This makes it possible to set the block function after downloading the application from ETS; the possible values are:

- **deactivated (default value)**
- active

➢ *13.1.5 Block function on BUS voltage recovery (=Block on BUS voltage recovery function)*

This makes it possible to set the status of the block function after BUS voltage recovery; the possible values are:

- deactivated
- active
- **as before voltage drop (default value)**

If the **deactivated** value is selected (and the block function was activated before the BUS voltage drop), when the BUS voltage is restored the block function will be deactivated and the relay will take on the value determined by the **"Relay status on block deactivation"** parameter. If the value set for this last parameter is **follows last command received**, the actuator will execute the last command received before the BUS voltage drop that, as a result, must be stored to the non-volatile memory. If the last command received before voltage drop is a timed activation of activation delay command, when the BUS voltage is recovered the command will not be executed and the relay will switch to the open (with NO)/closed (with NC) status.
If the **as before BUS voltage drop** value is selected (and the block function was activated before the BUS voltage drop), when the BUS voltage is restored the block function will be reactivated and the relay will assume the conditions set in the **"Relay status on active block"** parameter.

14 Communication objects

By enabling all the functions available, all the associated communication objects will be made visible, as shown in fig.14.1 for channel 1.

Number	Name	Object Function	Length	C	R	W	T	U	Data Type
0	Ch.1 - Status	On/Off status	1 bit	C	R	-	T	-	1 bit DPT_Switch
1	Ch.1 - Switch	On/Off	1 bit	C	-	W	-	-	1 bit DPT_Switch
2	Ch.1 - Delayed switching	On/Off	1 bit	C	-	W	-	-	1 bit DPT_Switch
3	Ch.1 - Delay on activation	Set value	2 Byte	C	-	W	-	-	
4	Ch.1 - Delay on deactivation	Set value	2 Byte	C	-	W	-	-	
5	Ch.1 - Timed switch	Start/Stop	1 bit	C	-	W	-	-	1 bit DPT_Start
6	Ch.1 - Stairs light activation time	Set value	2 Byte	C	-	W	-	-	
7	Ch.1 - Blinking	Switching On/Off	1 bit	C	-	W	-	-	1 bit DPT_Switch
8	Ch.1 - Scene	Execute/Store	1 Byte	C	-	W	-	-	
9	Ch.1 - Scene storing enabling	Enable/Disable	1 bit	C	-	W	-	-	1 bit DPT_Enable
10	Ch.1 - Logic input 1	Logic function input	1 bit	C	-	W	-	-	1 bit DPT_Bool
11	Ch.1 - Logic input 2	Logic function input	1 bit	C	-	W	-	-	1 bit DPT_Bool
12	Ch.1 - Logic input 3	Logic function input	1 bit	C	-	W	-	-	1 bit DPT_Bool
13	Ch.1 - Logic input 4	Logic function input	1 bit	C	-	W	-	-	1 bit DPT_Bool
14	Ch.1 - Logical operation outcome	Logic	1 bit	C	R	-	T	-	1 bit DPT_Bool
15	Ch.1 - Safety	Monitoring	1 bit	C	-	W	-	-	1 bit DPT_Switch
16	Ch.1 - Priority command	On/Off forced positioning	2 bit	C	-	W	-	-	1 bit controlled DPT_Switch_Control
17	Ch.1 - Block	Switching On/Off	1 bit	C	-	W	-	-	1 bit DPT_Enable

Fig. 14.1

14.1 Communication object table

The following tables summarise all the communication objects with their specific ID numbers, names and functions displayed in ETS, plus a brief description of the function and the type of Datapoint used.

➢ *14.1.1 Communication objects with input functions*

The following table shows all the objects with an input function and with flags C (communication) and W (writing from BUS) enabled.

No. of communication objects				Object name	Object function	Description	Datapoint
Ch.1	Ch.2	Ch.3	Ch.4				
1	19	37	55	Ch.x - Switching	On/Off	Receives the load activation/deactivation commands	1.001 DPT_Switch
2	20	38	56	Ch.x - Delayed switching	On/Off	Receives the load activation/deactivation with delay commands	1.001 DPT_Switch
5	23	41	59	Ch.x - Timed switching	Start/Stop	Receives the timed activation start/stop commands	1.010 DPT_Start
7	25	43	61	Ch.x - Blinking	Activate/ Deactivate	Receives the load blinking mode activation/deactivation commands	1.001 DPT_Switch
8	26	44	62	Ch.x - Scenes	Execute/Store	Makes it possible to store/execute scenes	18.001 DPT_SceneControl
10	28	46	64	Ch.x - Logic input 1	Logic function input	Logic function input	1.002 DPT_Bool
11	29	47	65	Ch.x - Logic input 2	Logic function input	Logic function input	1.002 DPT_Bool
12	30	48	66	Ch.x - Logic input 3	Logic function input	Logic function input	1.002 DPT_Bool
13	31	49	67	Ch.x - Logic input 4	Logic function input	Logic function input	1.002 DPT_Bool
15	33	51	69	Ch.x - Safety	Monitoring	Makes it possible to monitor a sensor for the safety function	1.001 DPT_Switch
16	34	52	70	Ch.x - Priority command	On/Off forced positioning	Forces the load value to an on/off value	2.001 DPT_Switch_Control
17	35	53	71	Ch.x - Block	Activate/ Deactivate	Blocks the status of a load in a condition that can be parameterised	1.003 DPT_Enable

➢ *14.1.2 Communication objects with output functions*

The following table shows all the objects with an output function and with the C (communication), R (reading from BUS) and T (transmission) flags enabled.

No. of communication objects				Object name	Object function	Description	Datapoint
Ch.1	Ch.2	Ch.3	Ch.4				
0	18	36	54	Ch.x - Status	On/Off status	Sends the status of the load connected to the actuator	1.001 DPT_Switch
14	32	50	68	Ch.x - Logic operation outcome	Logic	Logic function output	1.002 DPT_Bool

➢ *14.1.3 Communication objects with parameter setting functions*

The following table shows all the objects with the function of parameter setting from the BUS, and with the C (communication) and W (writing from BUS) flags enabled.

No. of communication objects				Object name	Object function	Description	Datapoint
Ch.1	Ch.2	Ch.3	Ch.4				
3	21	39	57	Ch.1 - Delay on activation	Set value	Delay on activation value	7.005 DPT_TimePeriodSec
4	22	40	58	Ch.1 - Delay on deactivation	Set value	Delay on deactivation value	7.005 DPT_TimePeriodSec
6	24	42	60	Ch.1 - Stair light activation time	Value in floating point	Stairs light timing value	7.005 DPT_TimePeriodSec
9	27	45	63	Ch.1 - Scene storing enabling	Enable/disable	Scene learning enable/disable	1.003 DPT_Enable

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