CHORUS

GEWISS

KNX 3-channel actuator 16AX with absorbed power measurement

GWA9103

Technical Manual

Contents

1 Introduction

The device can control 3 different loads via relays, measuring their power and the energy consumed. The current and voltage are measured directly, and are used to obtain all the other values (counter values, active power, apparent power, power factor, frequency).

To make this manual easier to read, all the parameters and communication objects implemented by the device are grouped in different paragraphs, each of which represents the relative configuration menu in the ETS database.

2 Application

Each actuator channel is configured with the ETS software to create the functions listed below:

Switching
- parameterisation of output behaviour (NO/NC)
- timing of stair raiser lights, with the possibility to set the duration of the timing via BUS
- timing of the stair raiser lights, with switch-off pre-warning function
- activation/deactivation delay
- blinking

Scenes
- storage and activation of 8 scenes (value 0-63) for each output
- enabling/disabling of scene storage from BUS

Priority commands
- parameterisation of behaviour at end of forcing
- setting of the forcing status upon BUS voltage reset

Block command
- parametrisation of the block activation value, behaviour when the block is active, and behaviour upon block deactivation
- setting of the block object value upon download and upon BUS voltage reset

Monitoring of absorption limit threshold
- parameterisation of the threshold value, hysteresis, value to be sent when threshold is exceeded
- activation of automatic load switch-off when the limit threshold is exceeded
- activation of the count of the total time above the limit threshold
- activation of the count of the number of times the limit threshold is exceeded

Load control function (slave)
- parameterisation of the relay status following the load reconnection command
- setting of the function status upon download and upon BUS voltage reset

Safety functions
- regular monitoring of the input object
- safety behaviour parameterisation

Logic functions
- logic operation AND/NAND/OR/NOR with command object (switching, timed switching, delayed switching, flashing) and result of the logic operation
- use of the logic operation result to enable the command object (switching, timed switching, delayed switching, flashing, scene)
- logic operations AND/NAND/OR/NOR/XOR/XNOR up to 8 logic inputs

Counters
- activation and count of the total output relay closing/opening time
- activation of the count of the number of operations performed by the output relay

Instantaneous consumption measurement
- measurement of active, reactive and apparent power consumed
- activation of primary counter and differential for active energy consumed
- measurement of RMS voltage, RMS current, mains frequency and power factor

Output status
- the sending on the BUS can be parameterised

Other functions
- parameterisation of output behaviour upon BUS voltage failure/reset

2.1 Association limits

Maximum number of group addresses: 254
Maximum number of associations: 254

This means that up to 254 group addresses can be defined, and up to 254 associations can be made (between communication objects and group addresses).

3 *"Main"* menu

The **Main** menu contains only those parameters needed to enable and configure the operating parameters of each of the 3 output channels.
The basic structure of the menu is as follows:

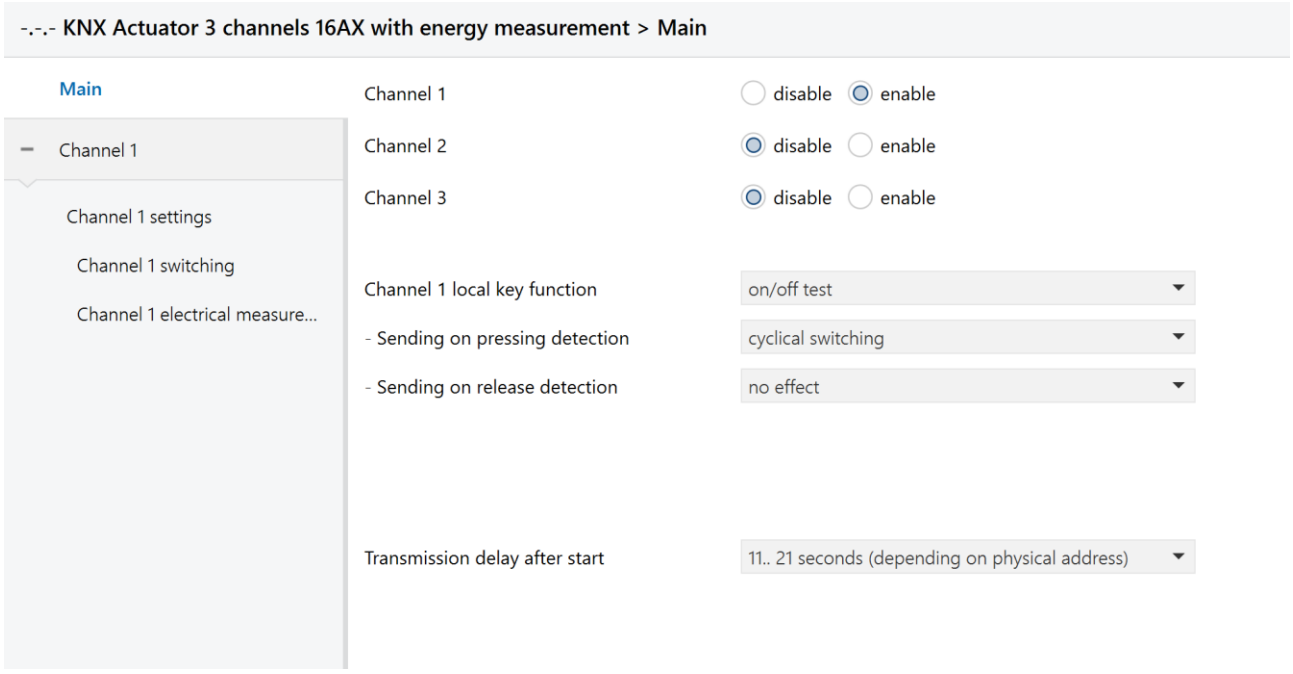


Fig. 3.1

3.1 Parameters

3.1.1 Channel 1, Channel 2, Channel 3

If they are enabled, the parameters in the **Main "Channel X" (with X=1,2,3)** window allow you to view and configure all the operating parameters of the relative channels grouped together in the **Channel X settings, Channel X switching** and **Channel X electrical measurements** menus. The values that can be set for these parameters are:

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

By enabling a channel, you can see the configuration parameters of the local button keys in the Main window. On the front of the device there are 3 local push-buttons that can be used to directly control the load connected to the relay, without the interaction of the commands received via the KNX BUS; the **"Channel X local key function"** parameters define the behaviour of the local button key associated with the relative X output when the KNX BUS voltage is present. The values that can be set for these parameters are:

- **On/Off switching** **(default value)**
- stairs light
- scene
- forced positioning
- block
- load control
- on/off test
- none

The difference between the values **On/Off switching, load control** and **on/off test** lies in the fact that the first behaves like a command received from the BUS on the object ***Ch.X – Switch*** (and therefore has a lower priority than the overload, load control, safety, forcing and channel block functions), the second behaves like a command received from the BUS on the object ***Ch.X – Slave switching for loads control*** (which has a lower priority than the safety, forcing and channel block functions), and the third - **on/off test** - switches the relay directly, ignoring any active function (whose activation status is not changed in any way).
Selecting any value other than **scene** displays the **"Sending on pressing detection"** and **"Sending on release detection"** parameters, and the relative values will 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 executed when pressure is detected on the push-button associated with the channel.
The **"Sending on release detection"** parameter is used to set the command to be executed when release is detected on the push-button associated with the channel.

- If the control type is **on/off switching** or **on/off test**, the values that can be set for the two parameters listed above are:

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

  NB: remember that the difference between the local button key function **on/off switching** and **on/off test** is that the first acts like a command received from the BUS on the Ch.X - Switching object (so it has a lower priority than the safety, forcing and actuator block functions, if they are active), whereas the second directly switches the relay, ignoring any active function (whose activation status is not changed in any way or notified on the BUS).
  The test on/off function is designed above all to facilitate the system testing phase, when testing the connection between the relay output and the load.

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

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

- If the control type is **scenes**, the two parameters listed above are not displayed, but the **"Scene number (0.. 63)"** and **"Scene storing on long operation"** parameters are visible.
  The **"Scene number (0.. 63)"** parameter is used to set the value of the scene to be recalled/stored; if this value does not coincide with the one associated with the relative parameters in the **Scenes** menu of the associated channel, no scene will be recalled/memorised. The possible values are:

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

  The **"Scene storing on long operation"** parameter 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 the long operation triggers the sending of the scene execution command (as for a short operation).

- If the control type is **forced positioning**, the values that can be set for the two parameters listed above are:

  - **active on forcing** **(default value on pressing)**
  - active off forcing
  - disable forcing positioning

- cyclical switching forcing on/forcing off
- cyclical switching forcing on/deactivate forcing
- cyclical switching forcing off/deactivate forcing
- **no effect** **(default value on release)**

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

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

- If the control type is **load control**, the values that can be set for the two parameters listed above are:

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

NB: The local button keys can be used with or without the BUS voltage, but in both cases with the 230V voltage on at least one of the channels. If there is no BUS voltage, the local push-button allows the cyclical switching of the relay status regardless of the function configured (with pressing or release, no action is taken).

3.1.2 Transmission delay after start

To ensure that, with several devices in the line, the telegrams sent by the various devices do not collide when the BUS voltage is reset, you can define a time limit after which the device can transmit the telegrams on the BUS following a BUS voltage drop/reset.
The **"Transmission delay after start"** parameter is used to set this delay. The values that can be set are:

- **11.. 21 seconds (depending on physical address)** **(default value)**
- 5.. 9 seconds
- 11 seconds
- 13 seconds
- 15 seconds
- 17 seconds
- 19 seconds
- 21 seconds
- no delay

Setting the values **11.. 21 seconds (depending on physical address)** and **5.. 9 seconds**, the device automatically calculates the transmission delay according to an algorithm that examines the physical address of the device itself. The values indicated (11/21 or 5/9) indicate the extremes of the value range that can be calculated.
The delay following the reset of the 230V supply rather than just the BUS voltage may be different even if the same value is set, because in the first case the device must actually start up while in the second it might already be active if the 230V supply hasn't failed.

SUMMARY OF THE ACTIONS ON THE CONTACTS WITH BUS AND 230V VOLTAGE FAILURE/RESET

		KNX BUS voltage	
		failure	reset
230V AC voltage on at least 1 channel	absent	No action. Device NOT POWERED; the action required when the BUS voltage fails has already been carried out on the failure of the 230V supply	No action. Device NOT POWERED
	present	• Status of the contacts defined by the **"Relay status at bus voltage failure"** parameter • Possibility to change the load status using the local push-button	• The status of the contacts when the BUS voltage is reset follows the indications in the Channel X function priorities table

		230V AC voltage on at least 1 channel	
		failure (of the last channel powered)	reset
KNX BUS voltage	absent	No direct voltage failure effect on the contacts; the action required when the BUS voltage fails has already been carried out	• No direct voltage failure effect on the contacts; when the KNX BUS is reset, the indications in the Channel X function priorities table will be followed • Possibility to change the load status using the local push-button
	present	• Status of the contacts defined by the **"Relay status at bus voltage failure"** parameter; even if the BUS is present, the device is not powered so the same behaviour as for BUS voltage failure is adopted	• The status of the contacts when the BUS voltage is reset follows the indications in the Channel X function priorities table; even if the BUS is present, the device is re-powered so the same behaviour as for BUS voltage reset is adopted

4 *"Channel X settings"* menu

For the sake of simplicity, the items that make up the **Channel 1 settings**, **Channel 2 settings** and **Channel 3 settings** menus will be described only once for the following chapters (with reference to the general **Channel X settings** menu), as these menus all contain the same items.
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 channel.

The basic structure of the menu is as follows:

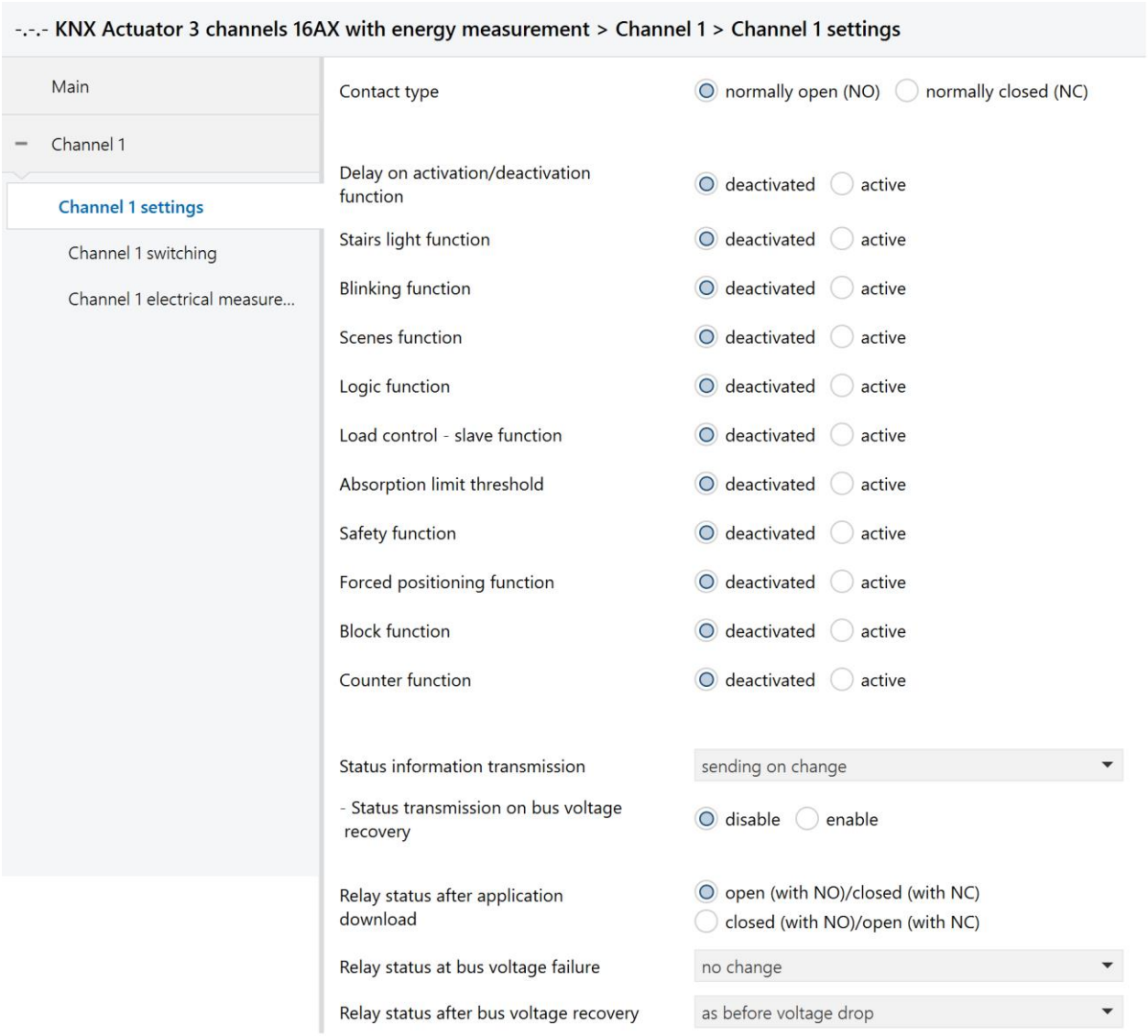


Fig. 4.1: "Channel X settings" menu

4.1 Parameters

The device has various operating modes and different functions with different priorities. The parameters **"Delay on activation/deactivation function"**, **"Stairs light function"**, **"Blinking function"**, **"Scenes**

function”, **“Logic function”**, **“Load control – slave function”**, **“Absorption limit threshold”**, **“Safety function”**, **“Forced positioning function”**, **“Block function”** and **“Counter function”** are used to activate the functions and make their operating parameters visible and configurable by making the configuration menus **Channel X delay on activation/deactivation** , **Channel X stairs light** , **Channel X blinking**, **Channel X scene**, **Channel X logic**, **Channel X loads control (slave)**, **Channel X absorption limit threshold**, **Channel X safety**, **Channel X forced positioning**, **Channel X block** and **Channel X counters** visible. The values that can be set for the parameters listed above are:

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

selecting **active** displays the relative configuration menu, whose parameters are explained in the next paragraphs.

By default, on this page ETS shows not only the push-buttons for enabling the various functions but also the “**Channel X switching**” and “**Channel X electrical measurements**” menus. The “**Contact type**”, “**Status information transmission**”, “**Relay status after application download**”, “**Relay status at bus voltage failure**” and “**Relay status after bus voltage recovery**” parameters are described below.

4.1.1 Channel X switching

One of the channel operating modes is on/off switching, which involves switching the relay status according to the commands received; from the BUS, this operating mode can be controlled via the ***Ch.X - Switch*** communication object (Data Point Type: 1.001 DPT_Switch). This function has the same priority of the activation/deactivation delay, stair raiser 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:

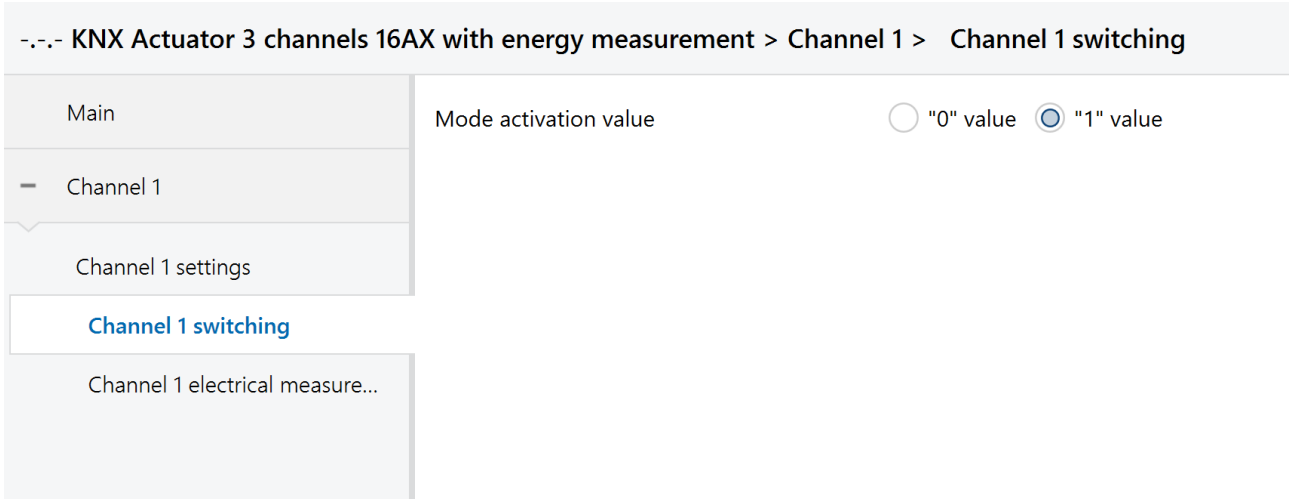
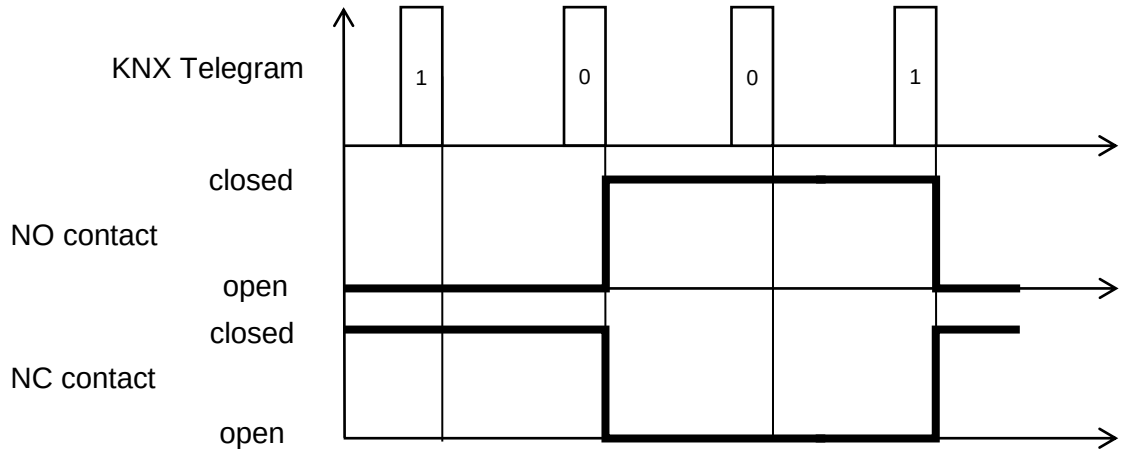


Fig. 4.2: “Channel X switching” menu

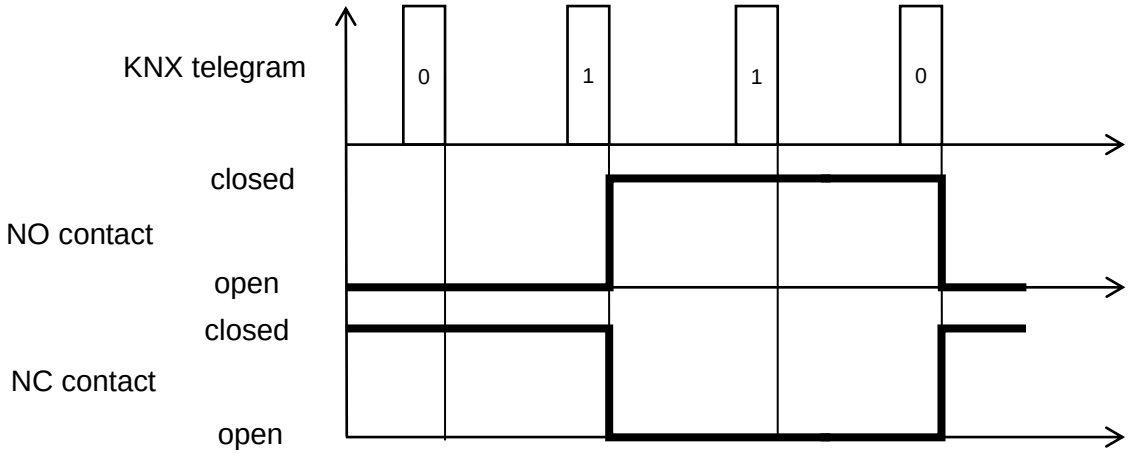
The **“Mode activation value”** parameter determines which logic value received on the ***Ch.x - Switch*** communication object switches the relay to the ON status (NO contact closed/NC contact open). The possible values are:

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

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



4.1.2 Channel X electrical measurements

The **Channel X electrical measurements** menu contains the parameters to enable and set the conditions for sending the electrical measurements taken for the load connected to channel X.
This menu is always visible once the channel has been activated.

The structure of the menu is as follows:

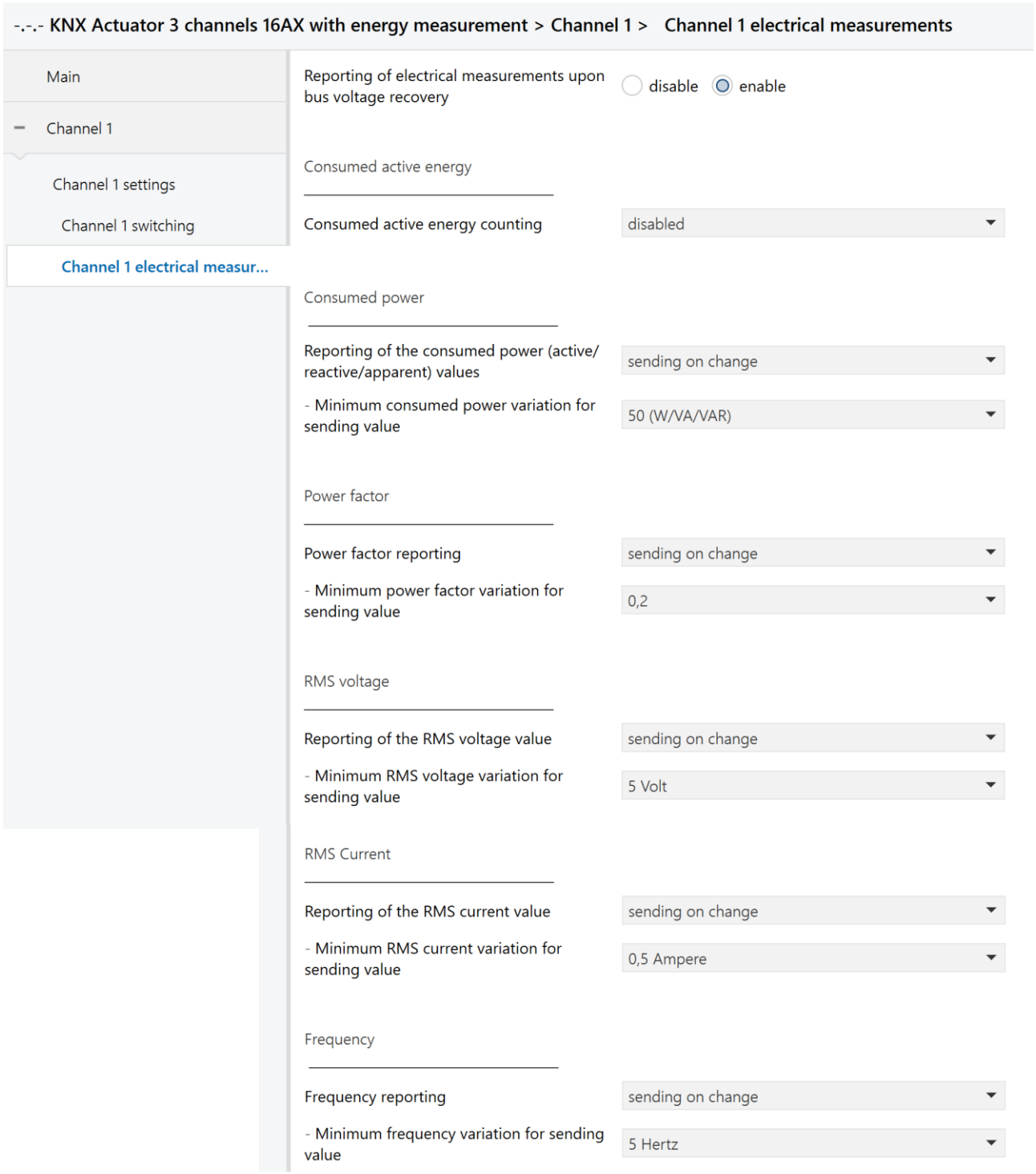


Fig. 4.3: “Channel X electrical measurements” menu

Each channel of the device is fitted with an internal counter for measuring the following electrical values: Consumed active energy, Active/reactive/apparent power, RMS voltage, RMS current and Power factor.
NB: the energy count is made even in the absence of BUS voltage, as long as the device is powered (at least one of the three channels).

There are two different energy counters:
Primary counter

- The energy count is always active
- The initial value can be defined (a value that might be different from 0)
- Overflow value = maximum permitted by the counter
- It can be reset (reinitialised)

Differential counter

- The energy count can be activated/stopped via a communication object (e.g. the consumption is measured within a defined time band managed by a KNX clock)
- The initial value is always 0
- The overflow value can be set (a value that might be different from the maximum permitted by the counter)
- It can be reset (reinitialised)

The **"Reporting of electrical measurements upon bus voltage recovery"** parameter can be used to define whether or not the communication objects for signalling the electrical measurements (configured to be transmitted upon variation) must be transmitted when the BUS voltage is reset too. The parameter can have the following values:

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

Consumed active energy

The **"Consumed active energy counting"** parameter can be used to activate the count of the active energy consumed and define the format of the communication object used to send the counter value.
The values that can be set are:

- **disabled** **(default value)**
- enable primary counter
- enable primary and differential counters

If the value **enable primary counter** is selected, the **"Counter format"**, **"Primary counter initial value"**, **"Reset counter on download"** and **"Primary counter sending condition"** parameters and the ***Ch.X - Active consumed energy primary counter*** communication object are made visible.
If the value **enable primary and differential counters** is selected, not only the parameters/communication objects listed above (relating to the primary counter) are made visible, but also the **"Differential counter overflow value"**, **"Start/Stop differential counting from bus"**, and **"Differential counter sending condition"** parameters and the ***Ch.X - Active consumed energy differential counter*** communication object.

The capacity of the primary and differential counters used for the energy count must be sufficient to measure the energy in KNX coding in kWh (maximum value = 2147483647 kWh). The parameter **"Counter format"** (or **"Counters format"** if both are available) defines the size and coding of the communication object used to transmit the value of the primary and differential counters (if they are both enabled). The values that can be set are:

- **watt hour (Wh)** **(default value)**
- kilowatt hour (kWh)

Depending on the value set for this item, the format of the object ***Ch.X - Active consumed energy primary counter*** and ***Ch.X - Active consumed energy differential counter*** and the values that can be set in the **"Primary counter initial value"** and **"Differential counter overflow value"** parameters will change.
The **"Primary counter initial value"** parameter is used to set the initial value of the primary energy counter; when the primary counter is in overflow (i.e. it reaches its maximum value), the count is stopped but can be reinitialised using the relative BUS command on the object.

Depending on the value set for the **Counter format** parameter, the values that can be set for this item will be different:

- If the counter format is **watt hour (Wh)**, the format (Data Point Type) of the ***Ch.X - Active consumed energy primary counter*** communication object is 13.010 DPT_ActiveEnergy and the values that can be set for the parameter are:

- from **0 (default value)** to 2147483647 watt/hour, in steps of 1

- If the counter format is **kilowatt hour (kWh)**, the format (Data Point Type) of the ***Ch.X - Active consumed energy primary counter*** communication object is 13.013 DPT_ActiveEnergy_kWh and the values that can be set for the parameter are:

  - from **0 (default value)** to 2147483647 kilowatt/hour, in steps of 1

The device uses the ***Ch.X - Active consumed energy primary counter overflow*** object (Data Point Type: 1.002 DPT_Bool) to indicate the overflow of the primary counter. When the overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device uses the ***Ch.X - Active consumed energy primary counter reset*** object (Data Point Type: 1.015 DPT_Reset) to receive the primary counter reinitialisation commands that bring the counter back to the value set in the **"Primary counter initial value"** item. The "0" value is ignored but, if a value of "1" is received, the primary counter is reset at the initial value and the ***Ch.X - Active consumed energy primary counter overflow*** object is set at "0".

The **"Primary counter sending condition"** parameter is used to define the conditions for sending the current value of the primary counter. The values that can be set are:

- send on demand only
- **send in case of change** **(default value)**
- send periodically
- sends on change and periodically

Selecting **send in case of change** or **sends on change and periodically** displays the **"Minimum primary counter variation for sending value"** parameter, whereas if you select **send periodically** or **sends on change and periodically**, the **"Primary counter sending period (minutes)"** parameter will be visualised.

Selecting the value **send on demand only**, no new parameter will be enabled because the primary counter value is not sent spontaneously by the device; only in the case of a status read request will it send the user a telegram in response to the command received, giving information about the current value of the primary counter.
If the sending condition of the primary counter is different from **send on demand only**, the value of the primary counter should be sent after a BUS voltage reset in order to update any connected devices.

The **"Minimum primary counter variation for sending value"** parameter, which is visible if the primary counter value is sent on change, is used to define the minimum counter variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- 10 Wh
- 20 Wh
- **50 Wh** **(default value in case of counter format "Wh")**
- 100 Wh
- 200 Wh
- 500 Wh
- **1000 Wh** **(default value and unique value setting in case of counter value "kWh")**

The **"Primary counter sending period (minutes)"** parameter is visible if the primary counter value is sent periodically. It is used to define the frequency for spontaneously sending telegrams indicating the current primary counter value. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

In the event of a voltage failure, the primary counter value must be saved in a non-volatile memory and reset when the supply voltage is reset.

The **"Differential counter overflow value"** parameter is used to set the maximum value of the differential active energy counter; in fact, unlike the counter, it is possible to set the maximum count value - i.e. the value beyond which the differential counter is in an overflow condition.
Depending on the value set for the **Counters format** parameter, the values that can be set for this item will be different:

- If the format of the counters is **watt hour (Wh)**, the format (Data Point Type) of the ***Ch.X - Active consumed energy differential counter*** communication object is 13.010 DPT_ActiveEnergy and the values that can be set for the parameter are:

  - from 0 to **2147483647 (default value)** watt/hour, in steps of 1

- If the format of the counters is **kilowatt hour (kWh)**, the format (Data Point Type) of the ***Ch.X - Active consumed energy differential counter*** communication object is 13.013 DPT_ActiveEnergy_kWh and the values that can be set for the parameter are:

  - from 0 to **2147483647 (default value)** kilowatt/hour, in steps of 1

Unlike the primary counter, the differential counter can be started/stopped via a BUS command; this makes it possible, for example, to measure the consumption within a specific time band managed by another KNX device. The **"Start/Stop differential counting from bus"** parameter is used to enable this function, displaying the relative communication object. The values that can be set are:

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

Select **enable** to display the ***Ch.X - Active consumed energy differential counter trigger*** communication object (Data Point Type: 1.010 DPT_Start), for receiving the count start ("1") / stop ("0") commands.
Following an ETS download, the count is started by default, regardless of whether or not its start/stop command has been enabled via the BUS.

The device uses the ***Ch.X - Active consumed energy differential counter overflow*** object (Data Point Type: 1.002 DPT_Bool) to indicate the overflow of the differential counter. When the overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device uses the ***Ch.X - Active consumed energy differential counter reset*** object (Data Point Type: 1.015 DPT_Reset) to receive the differential counter reinitialisation commands that bring the counter back to 0 (initial value). The "0" value is ignored but, if a value of "1" is received, the differential counter is reset at 0 and the ***Ch.X - Active consumed energy differential counter overflow*** object is set at "0".

The **"Differential counter sending condition"** parameter is used to define the conditions for sending the current value of the differential counter. The values that can be set are:

- send on demand only
- **send in case of change** **(default value)**
- send periodically
- sends on change and periodically

Selecting **send in case of change** or **sends on change and periodically** displays the **"Minimum differential counter variation for sending value"** parameter, whereas if you select **send periodically** or **sends on change and periodically**, the **"Differential counter sending period (seconds)"** parameter will be visualised.
Selecting the value **send on demand only**, no new parameter will be enabled because the differential counter value is not sent spontaneously by the device; only in the case of a status read request will it send the user a telegram in response to the command received, giving information about the current value of the differential counter.

If the sending condition of the differential counter is different from **send on demand only**, the value of the differential counter should be sent after a BUS voltage reset in order to update any connected devices.

The **"Minimum differential counter variation for sending value"** parameter, which is visible if the differential counter value is sent on change, is used to define the minimum counter variation (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- 10 Wh
- 20 Wh
- **50 Wh** **(default value in case of counter format "Wh")**
- 100 Wh
- 200 Wh
- 500 Wh
- **1000 Wh (1kWh)** **(default value and unique value setting in case of counter value "kWh")**

The **"Differential counter sending period (minutes)"** parameter is visible if the differential counter value is sent periodically. It is used to define the frequency for spontaneously sending telegrams indicating the current differential counter value. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

In the event of a voltage failure, the differential counter value must be saved in a non-volatile memory and reset when the supply voltage is reset.

If you need to update the device configuration and download the ETS database again, you can indicate whether or not the values of the energy counters (primary and differential) should be reinitialised using the **"Reset counter on download"** parameter. The values that can be set are:

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

by setting **no**, the counter values MUST be saved in a non-volatile memory and reset when the device is relaunched.

Consumed power

The device can calculate the instantaneous power absorbed by the load connected to the channel contacts in all its components (active, reactive and apparent), and transmit it via the ***Ch.X - Measured active power*** (Data Point Type 14.056 DPT_Value_Power), ***Ch.X - Measured reactive power*** (Data Point Type 14.xxx 4-byte float value) and ***Ch.X - Measured apparent power*** (Data Point Type 14.056 DPT_Value_Power) communication objects. The conditions that determine the sending of the instantaneous absorbed power communication object can be set via the **"Reporting of the consumed power (active/reactive/apparent) values"** parameter, which can have the following values:

- disabled
- on demand only
- **sending on change** **(default value)**

selecting any value other than **disabled** displays the ***Ch.X - Measured active power***, ***Ch.X - Measured reactive power*** and ***Ch.X - Measured apparent power*** communication objects.

Selecting the value **sending on change** displays the **"Minimum consumed power variation for sending value"** parameter, allowing you to set the value of the minimum variation needed to trigger the transmission of the communication object relating to the signalling of the instantaneous absorbed power value. The setting is valid for all three power values.
The parameter can have the following values:

- 5 (W/VA/VAR)
- 10 (W/VA/VAR)

- 20 (W/VA/VAR)
- **50 (W/VA/VAR)** **(default value)**
- 100 (W/VA/VAR)

Power factor

The device can signal the current value of the power factor of the input signal detected on the channel contacts via the ***Ch.X - Measured power factor*** communication object (Data Point Type 14.057 DPT_Value_Power_Factor). The conditions that determine the sending of the communication object can be set via the **"Power factor reporting"** parameter, which can have the following values:

- disabled
- on demand only
- **sending on change** **(default value)**

selecting a value other than **disabled** displays the ***Ch. X - Measured power factor*** communication object. Selecting the value **sending on change** displays the **"Minimum power factor variation for sending value"** parameter, allowing you to set the value of the minimum variation needed to trigger the transmission of the communication object relating to the signalling of the power factor. The parameter can have the following values:

- 0.1
- **0.2** **(default value)**
- 0.3
- 0.4

RMS voltage

The device can signal the current value of the RMS voltage detected on the channel contacts via the ***Ch.X - Measured RMS voltage*** communication object (Data Point Type 9.020 DPT_Value_Volt). The conditions that determine the sending of the communication object can be set via the **"Reporting of the RMS voltage value"** parameter, which can have the following values:

- disabled
- on demand only
- **sending on change** **(default value)**

selecting a value other than **disabled** displays the ***Ch. X - Measured RMS voltage*** communication object. Selecting the value **sending on change** displays the **"Minimum RMS voltage variation for sending value"** parameter, allowing you to set the value of the minimum variation needed to trigger the transmission of the communication object relating to voltage value transmission.
The parameter can have the following values:

- 1 Volt
- 2 Volt
- **5 Volt** **(default value)**
- 10 Volt
- 15 Volt
- 25 Volt

RMS current

The device can signal the current value of the current absorbed by the load connected to the channel contacts via the ***Ch.X - Measured RMS current*** communication object (Data Point Type 9.021 DPT_Value_Curr). The conditions that determine the sending of the communication object can be set via the **"Reporting of the RMS current value"** parameter, which can have the following values:

- disabled
- on demand only
- **sending on change** **(default value)**

selecting a value other than **disabled** displays the ***Ch. X - Measured RMS current*** communication object. Selecting the value **sending on change** displays the **"Minimum RMS current variation for sending value"** parameter, allowing you to set the value of the minimum variation needed to trigger the transmission of the communication object relating to the signalling of the input voltage value. The parameter can have the following values:

- 0.1 Ampere
- 0.2 Ampere
- **0.5 Ampere** **(default value)**
- 1 Ampere
- 1.5 Ampere
- 2.5 Ampere

Frequency

The device can signal the current value of the frequency of the input signal detected on the channel contacts via the ***Ch.X - Measured frequency*** communication object (Data Point Type 14.033 DPT_Value_Frequency). The conditions that determine the sending of the communication object can be set via the **"Frequency reporting"** parameter, which can have the following values:

- disabled
- on demand only
- **sending on change** **(default value)**

selecting a value other than **disabled** displays the ***Ch. X - Measured frequency*** communication object. Selecting the value **sending on change** displays the **"Minimum frequency variation for sending value"** parameter, allowing you to set the value of the minimum variation needed to trigger the transmission of the communication object relating to frequency signalling. The parameter can have the following values:

- 1 Hertz
- 2 Hertz
- **5** Hertz **(default value)**
- 10 Hertz

4.1.3 Contact type

Given that the relay that controls the load has an output with an 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 contact associated with the output that the device has to manage. The values that can be set are:

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

4.1.4 Status information transmission

The status of the relay and as a result of the connected load can be transmitted on the BUS via a specific communication object. The parameter for enabling the transmission of this information is **"Status information transmission"**, which can have the following values:

- disabled
- on demand only
- **sending on change** **(default value)**

selecting any value other than **disabled** displays the ***Ch.X - Status*** communication object (Data Point Type 1.001 DPT_Switch) that allows the transmission of the status information, concerning the load connected to the device, on the BUS.
If the status signalling is based on **sending on change**, the communication object is sent spontaneously when the status switches from ON to OFF or vice versa; if the set value is **on demand only**, 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.
Selecting the value **sending on change** also displays the **"Status transmission on bus voltage recovery"** parameter for enabling the transmission of the load status information when the BUS supply voltage is reset.
The parameter can have the following values:

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

4.1.5 Relay status after application download

The status that the relay contact must assume once the application parameters have been downloaded from the ETC software can be set via the **"Relay status after application download"** parameter, which can have the following values:

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

4.1.6 Relay status at bus voltage failure and recovery

The status of the relay contact following a BUS voltage failure (with 230V voltage on at least one channel) can be set via the **"Relay status at bus voltage failure"** parameter, which can have the following values:

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

The status of the relay contact following a BUS voltage reset (with 230V voltage on at least one channel) can be set via the **"Relay status after bus voltage recovery"** parameter, which can have the following values:

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

NB: following a BUS voltage failure/reset, the device does not carry out any action unless there is a 230V AC voltage on at least one of the channels.

4.1.7 Channel X delay on activation/deactivation

One of the channel 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 moment in which the relay is effectively switched over. From the BUS, this operating mode can be controlled via the ***Ch.X - Delayed switching*** communication object (Data Point Type: 1.001 DPT_Switch). This function has the same priority as the on/off switching, stair raiser 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:

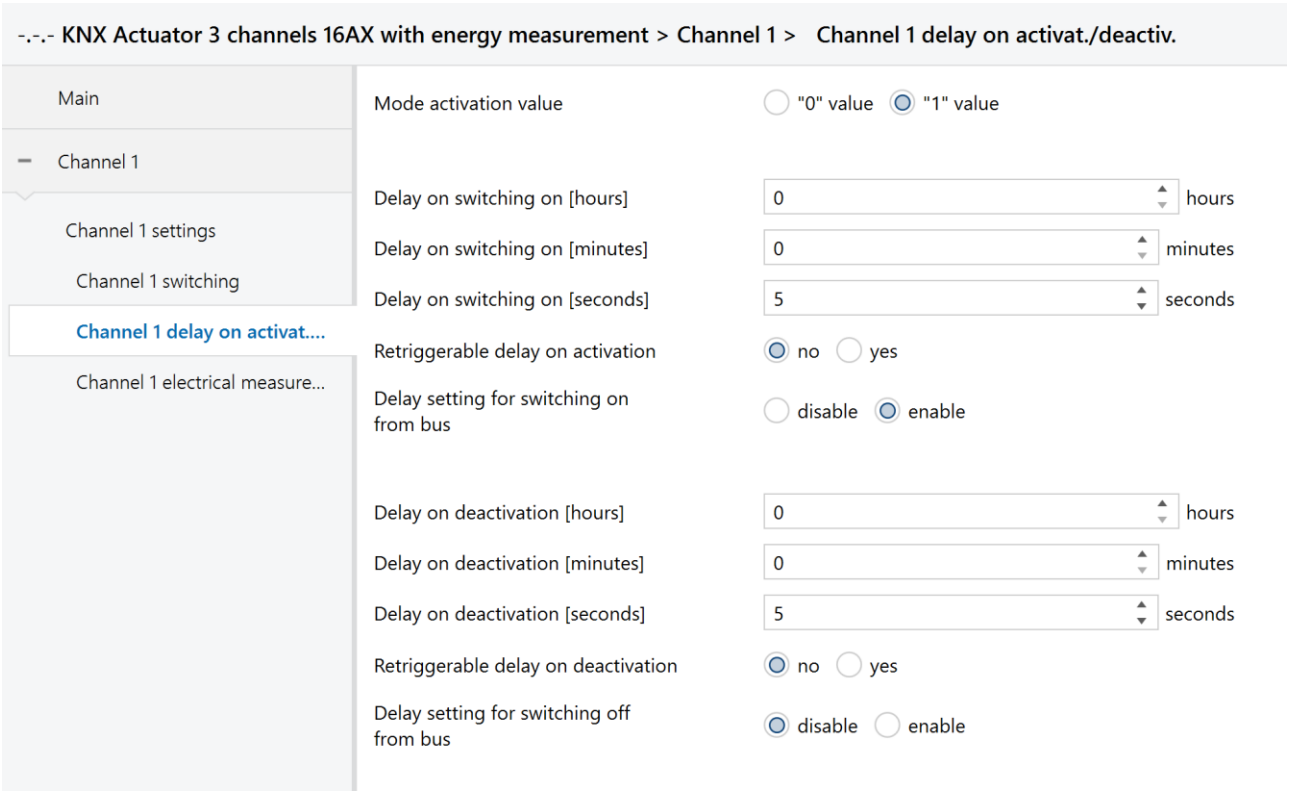
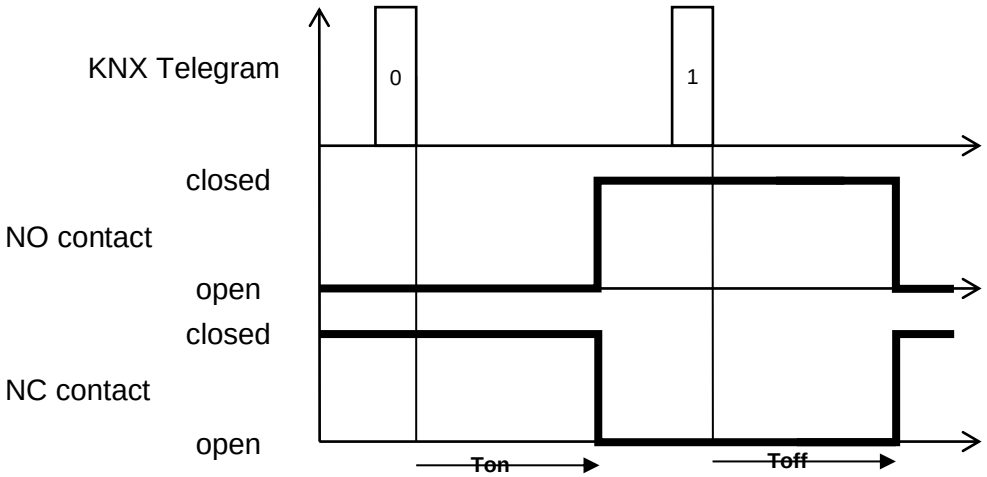


Fig. 4.4: "Delay on channel X activation/deactivation" menu

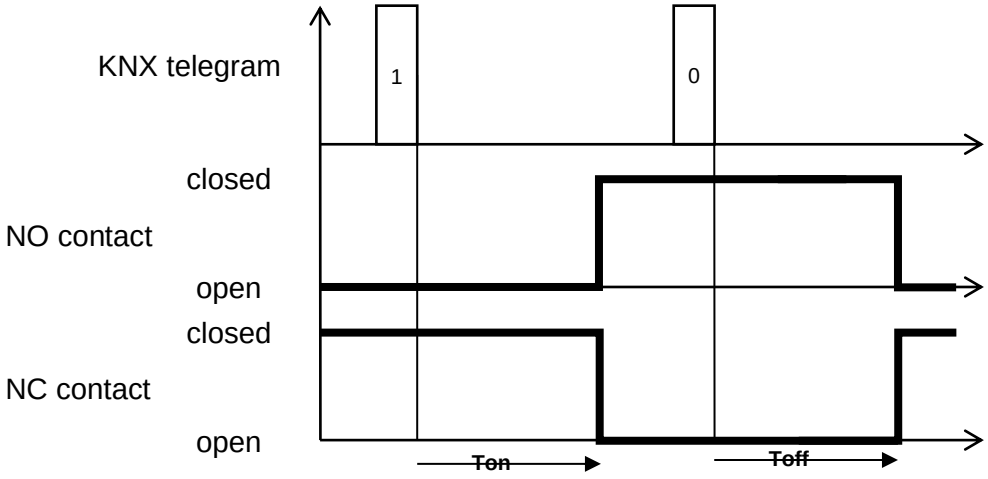
The **"Mode activation value"** parameter determines which logic value received on the ***Ch.X – Delayed switching*** communication object switches the relay to the ON status (NO contact closed/NC contact open). The possible values are:

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

Selecting **"0" value**, 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 once the set activation delay time (Ton) has elapsed. 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 the figure below.



Selecting **"1" value**, 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 once the set activation delay time (Ton) has elapsed; 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 the figure below.



The **"Delay on switching on [hours]"** 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, in steps of 1

The **"Delay on switching on [minutes]"** 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, in steps of 1

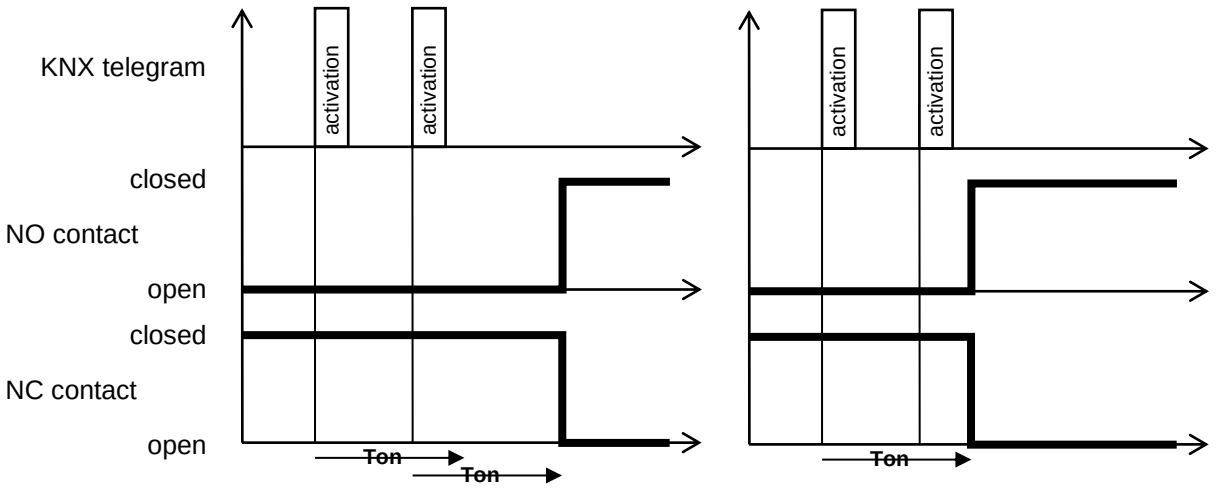
The **"Delay on switching on [seconds]"** parameter is used to set the last of the three values (seconds) that make up the activation delay time (hours, minutes, seconds). The values that can be set are:

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

The **"Retriggerable delay on activation"** 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).



The **"Delay setting for switching on from bus"** parameter is used to enable the communication object via which the new activation delay value is received (overwriting the one configured in ETS). The values that can be set are:

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

selecting the value **enable** displays the ***Ch.X - Delay on activation*** communication object (Data Point Type: 7.005 DPT_TimePeriodSec), 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.

The **"Delay on deactivation [hours]"** 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, in steps of 1

The **"Delay on deactivation [minutes]"** 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, in steps of 1

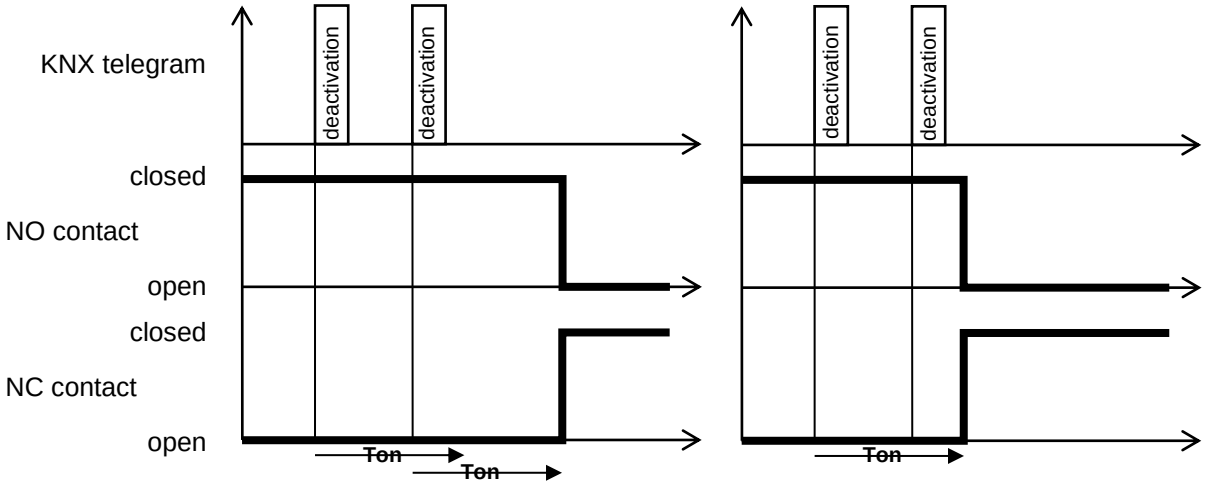
The **"Delay on deactivation [seconds]"** parameter is used to set the last of the three values (seconds) that make up the deactivation delay time (hours, minutes, seconds). The values that can be set are:

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

The **"Retriggerable delay on deactivation"** parameter is used to enable the reset of the deactivation delay time whenever a delayed deactivation 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).



The **"Delay setting for switching off from bus"** parameter is used to enable the communication object via which the new deactivation delay value is received (overwriting the one configured in ETS). The values that can be set are:

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

selecting the value **enable** displays the ***Ch.X - Delay on deactivation*** communication object (Data Point Type: 7.005 DPT_TimePeriodSec), 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.

4.1.8 Channel x stairs light

One of the channel operating modes is timed activation, or the stair raiser light function, which involves activating the load for a certain period of time and then deactivating it automatically without receiving any 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 switch*** communication object (Data Point Type: 1.010 DPT_Start).
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 setting** menu is set with the value **active**.

The structure of the menu is as follows:

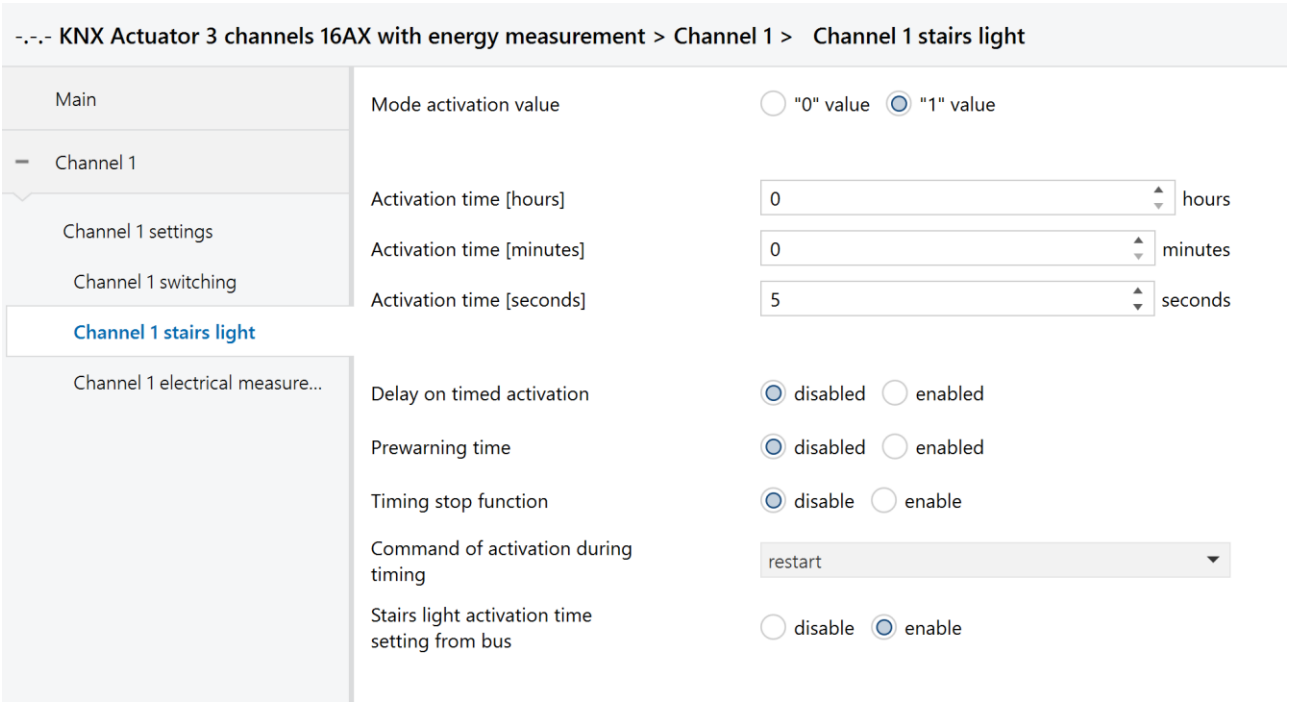
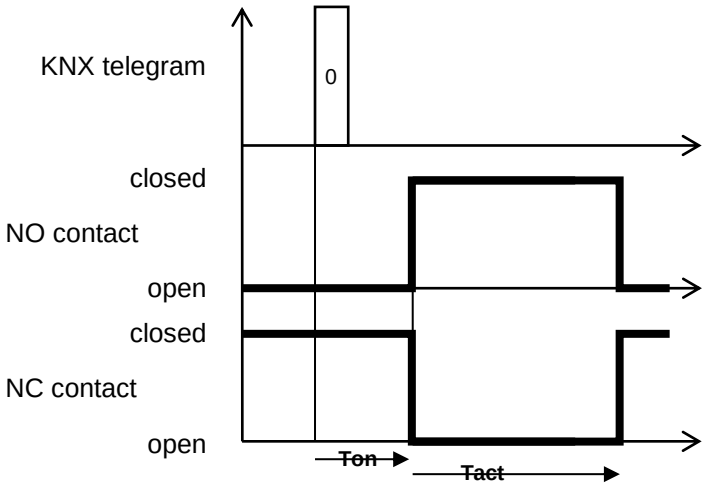


Fig. 4.5: “Channel X stairs light” menu

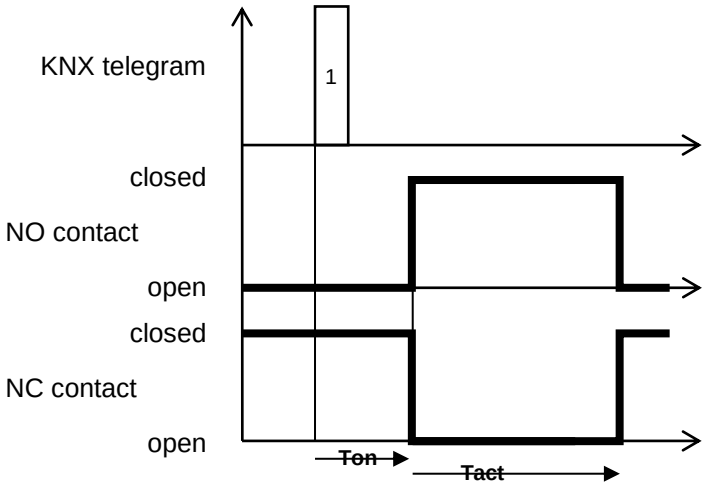
The **“Mode activation value”** parameter determines which logic value received on the ***Ch.X – Timed switch*** communication object switches the relay to the ON status (NO contact closed/NC contact open) and activates timing. The possible values are:

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

Selecting **“0” value**, 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 once the set activation delay time (Ton) has elapsed, and begins the activation time count; when the activation time (Tatt) has elapsed, the contact returns to the open status (if NO) or closed (if NC). See figure below.



Selecting **“1” value**, 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 once the set activation delay time (Ton) has elapsed; when the activation time (Tact) has elapsed, the contact returns to the open status (if NO) or closed (if NC). See figure below.



The **"Activation time [hours]"** parameter is used to set the first of the three values (hours) that make up the load activation time (Tact). The values that can be set are:

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

The **"Activation time [minutes]"** parameter is used to set the second of the three values (minutes) that make up the activation time (Tact). The values that can be set are:

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

The **"Activation time [seconds]"** parameter is used to set the last of the three values (seconds) that make up the activation time (Tact). The values that can be set are:

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

The **"Delay on timed activation"** parameter is used to enter a delay between the moment when the ***Ch.X - Timed switch*** communication object is received and the moment when the command is actually executed (closure of NO contact/opening of NC contact). The possible values are:

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

if the delay is **enabled**, the **"Timed activation delay length"** parameter will be displayed; this is used to set the value of the delay, in seconds. The parameter can 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 **"Prewarning time"** 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 (blink). The pre-warning time is applied after the expiration of the activation time. The parameter can assume the following values:

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

selecting the value **enabled** displays the **"Prewarning time length"** and **"Load deactivation duration [x 100ms]"** parameters.

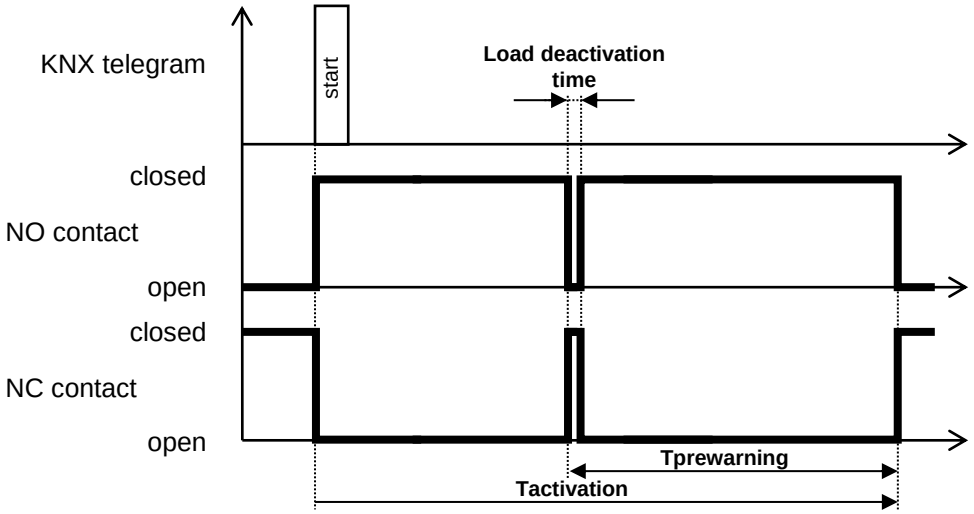
The **"Prewarning time length"** parameter is used to set the time between the signalling of impending deactivation and the actual deactivation of the load. The possible values are:

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

The **"Load deactivation duration [x 100ms]"** parameter is used to set the time period during which the load is deactivated, in order to create the pre-warning function. The values that can be set are:

- from **5 (default value)** to 15, in steps of 1

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



The **"Timing stop function"** parameter is used to enable the possibility to end timed activation via a BUS command on the ***Ch.X – Timed switch*** communication object, with the opposite value to the one set for **"Mode activation value"** item (analysed above). The possible values are:

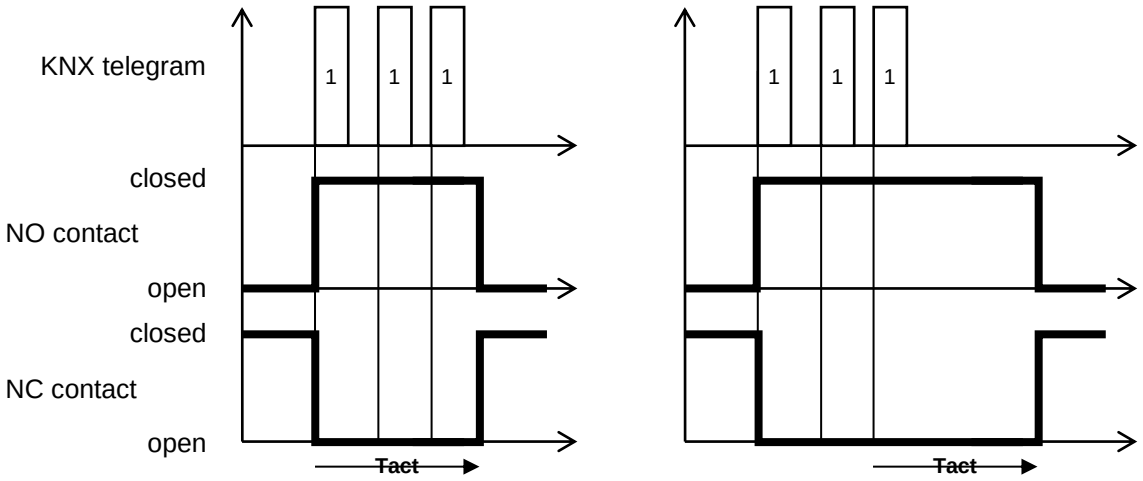
- **disable** **(default value)**
- enable

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.

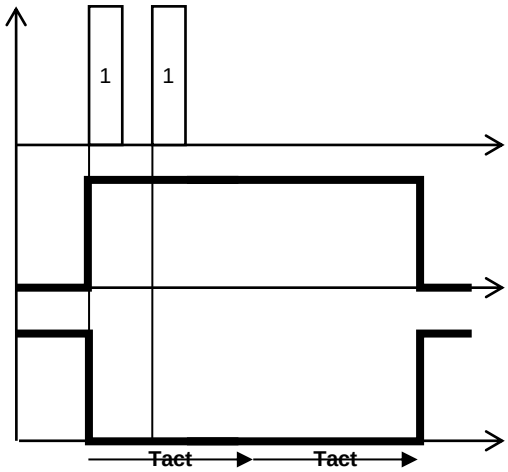
The **"Command of activation during timing"** parameter is used to define the behaviour of the device when a timed activation command is received while it is already in progress. The possible values are:

- no effect
- **restart** **(default value)**
- extension (multiply by factor)

by selecting **no effect**, the subsequent commands are ignored. Selecting **restart**, every timed activation command received during the activation time count causes the count to reinitialise. Selecting **extension**, every received command causes an extension equal to the count activation time. The figure below shows an example of each of the three configurations.



no effect *restart*



extension

If the value **extension** is selected, it is possible to set a maximum number of consecutive extensions of the activation time via the new parameter **"Multiplicative factor maximum value"** displayed. The parameter can have the following values:

- from 2 to **5 (default value)**, in steps of 1

The **"Stairs light activation time setting from bus"** parameter displays the ***Ch.X – Stairs light*** activation time input communication object (Data Point Type: 7.005 DPT_TimePeriodSec), which can be used to receive the activation time of the stairs light function via the BUS communication object. The possible values are:

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

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

If a new activation time value is received, this becomes the new stair raiser 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.

4.1.9 Channel X blinking

One of the relay output operating modes is the blinking mode, which 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 (Data Point Type: 1.001 DPT_Switch).
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:

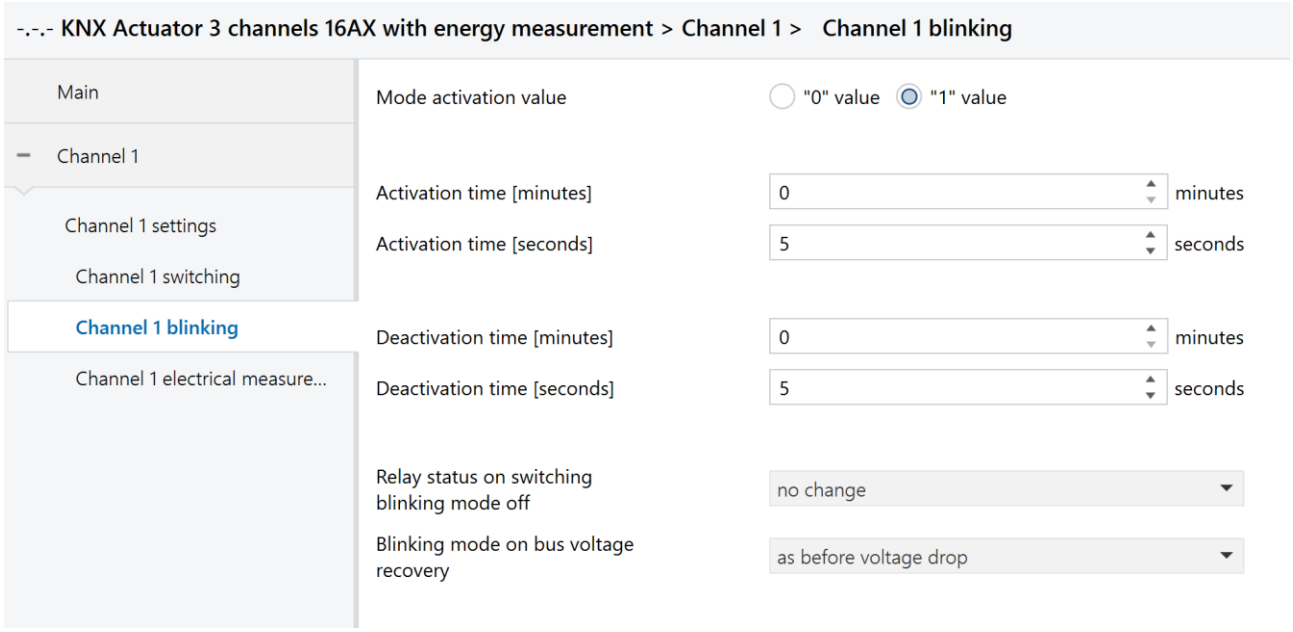
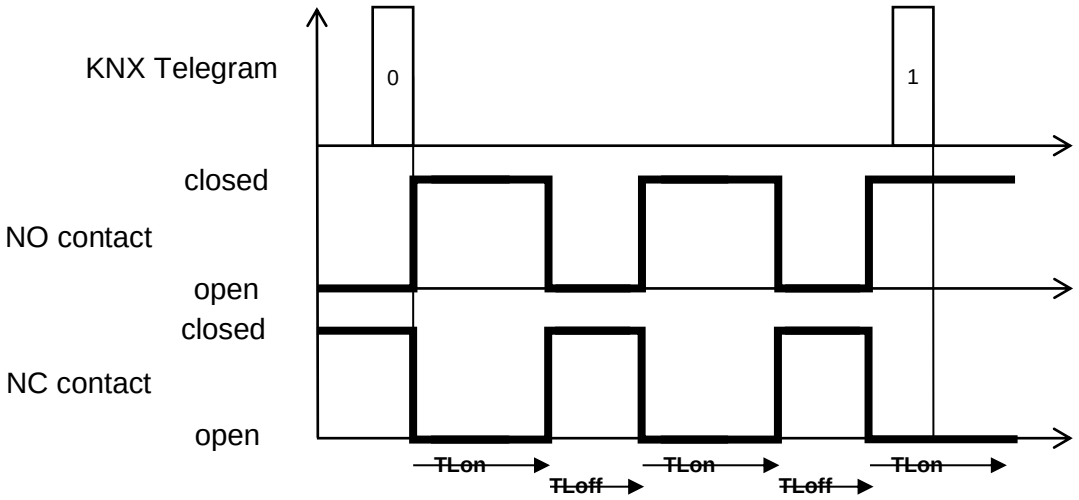


Fig. 4.6: "Channel X blinking" menu

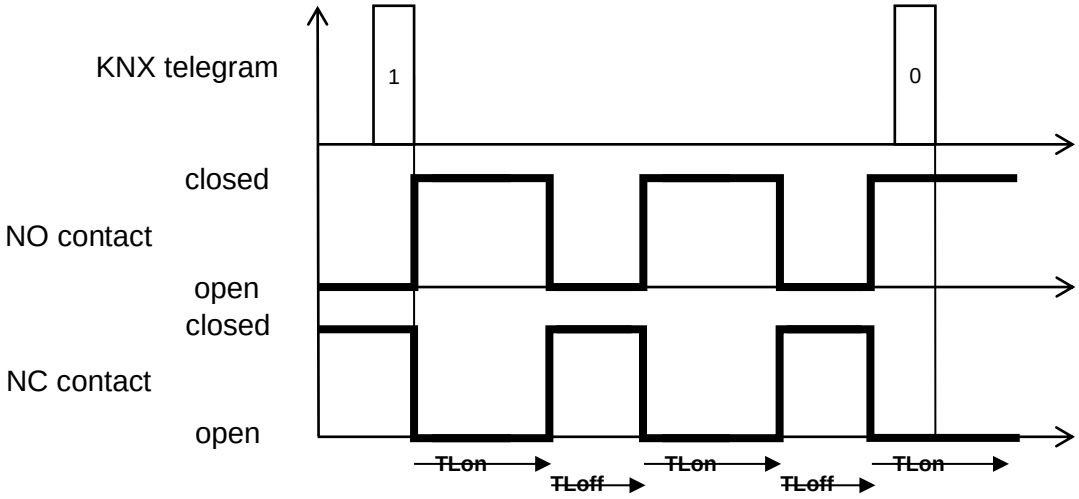
The **"Mode activation value"** parameter determines which logic value received on the ***Ch.X - Blinking*** communication object activates the load activation/deactivation process. The possible values are:

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

Selecting **"0" value**, 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.



Selecting **"1" value**, 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.



The **"Activation time [minutes]"** parameter is used to set the first of the two values (minutes) that make up the load activation time (TLon). The values that can be set are:

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

The **"Activation time [seconds]"** parameter is used to set the last of the two values (seconds) that make up the load activation time (TLon). The values that can be set are:

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

The **"Deactivation time [minutes]"** parameter is used to set the first of the two values (minutes) that make up the load deactivation time (TLoff). The values that can be set are:

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

The **"Deactivation time [seconds]"** parameter is used to set the last of the two values (seconds) that make up the load deactivation time (TLoff). The values that can be set are:

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

The **"Relay status on switching blinking mode off"** parameter can be used to define the status of the relay contact when a blinking mode deactivation command is received. It can have 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.

The **"Blinking mode on bus voltage recovery"** parameter defines the blinking mode status when the BUS voltage is reset. 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 in the **Channel X settings** menu.

4.1.10 Channel X scenes

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 - Scene*** communication object (Data Point Type 18.001 DPT_SceneControl). 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:

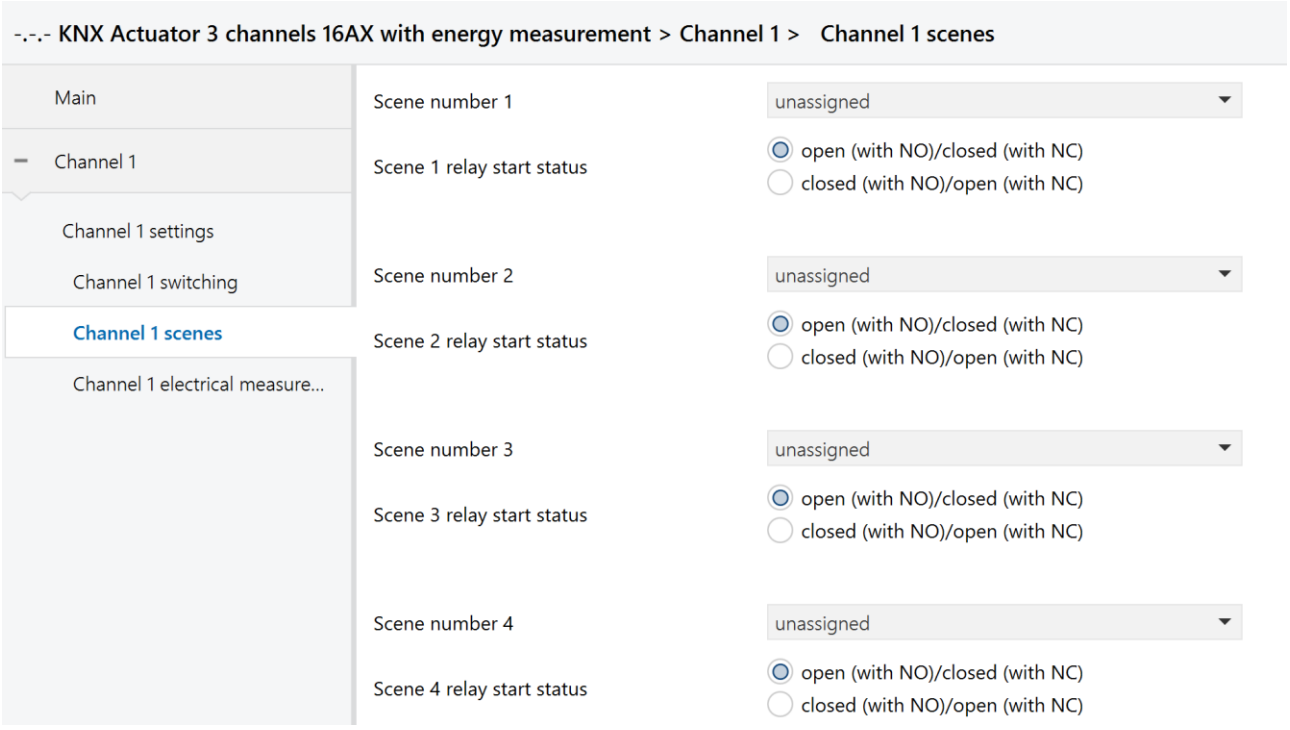


Fig. 4.7: "Channel X scenes" menu

With the **"Scene number i"** (1 ≤ i ≤ 8) parameters, you can set the numerical value for identifying and therefore executing/memorising the i-th scene. The possible values are:

- **unassigned** **(default value)**
- 0, 1.. 63

The **"Scene i relay start status"** parameters (1 ≤ i ≤ 8) are used to pre-set the contact status that the device must replicate after receiving a telegram for the execution of the i-th scene. The possible values are:

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

The **"Scene storing enabling"** parameter enables/disables the possibility of scene learning via the ***Ch. X - Scene*** communication object. The parameter can have the following values:

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

selecting the value **enable** displays the ***Ch.X - Scene storing enabling*** communication object (Data Point Type: 1.003 DPT_Enable), which enables or disables (via BUS) the possibility of ***scene*** learning via the ***Ch.X - Scene*** communication object.

4.1.11 Channel X logic

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:

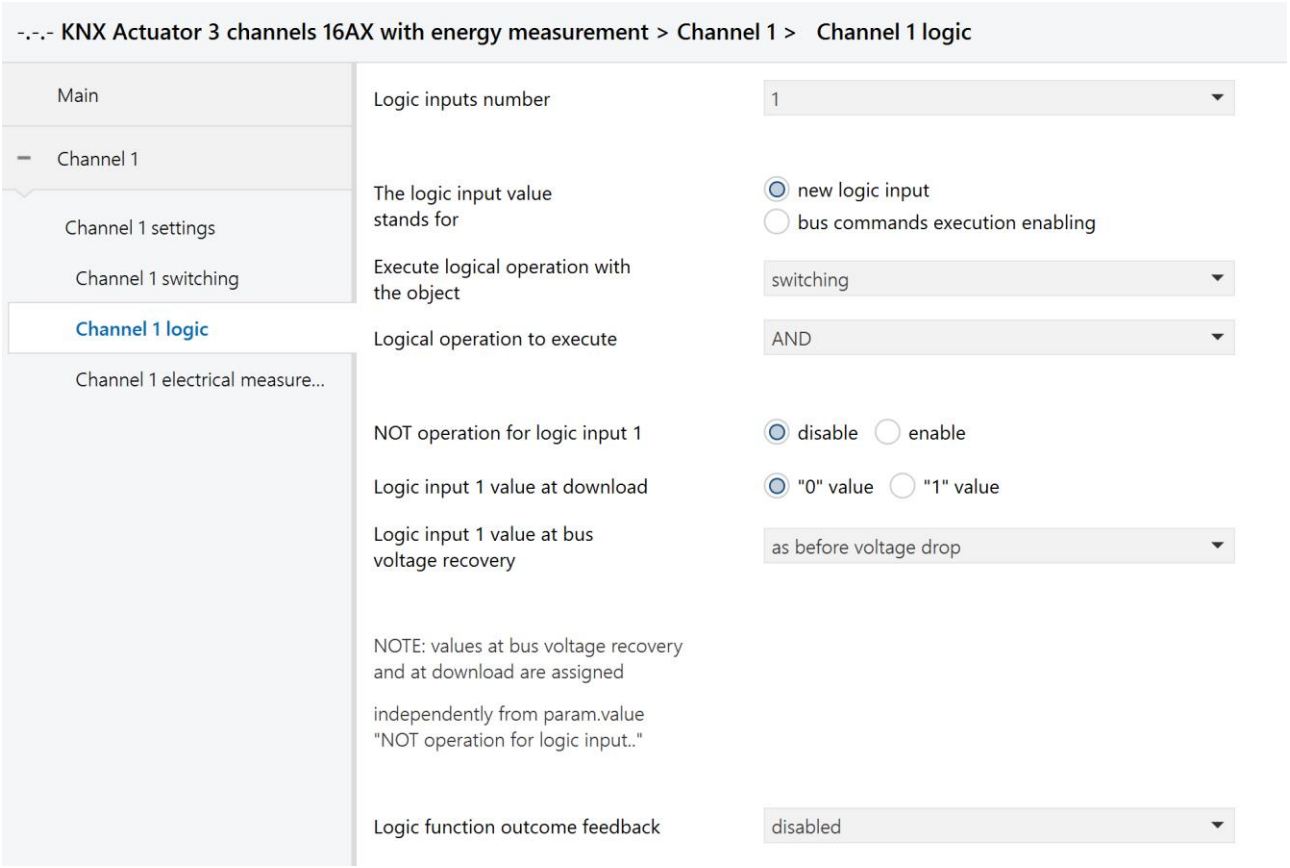


Fig. 4.8: "Channel X logic" menu

The number of logic inputs can be set via the **"Logic inputs number"** parameter, which can assume the following values:

- **1** (default value), 2, 3, 4, 5, 6, 7, 8

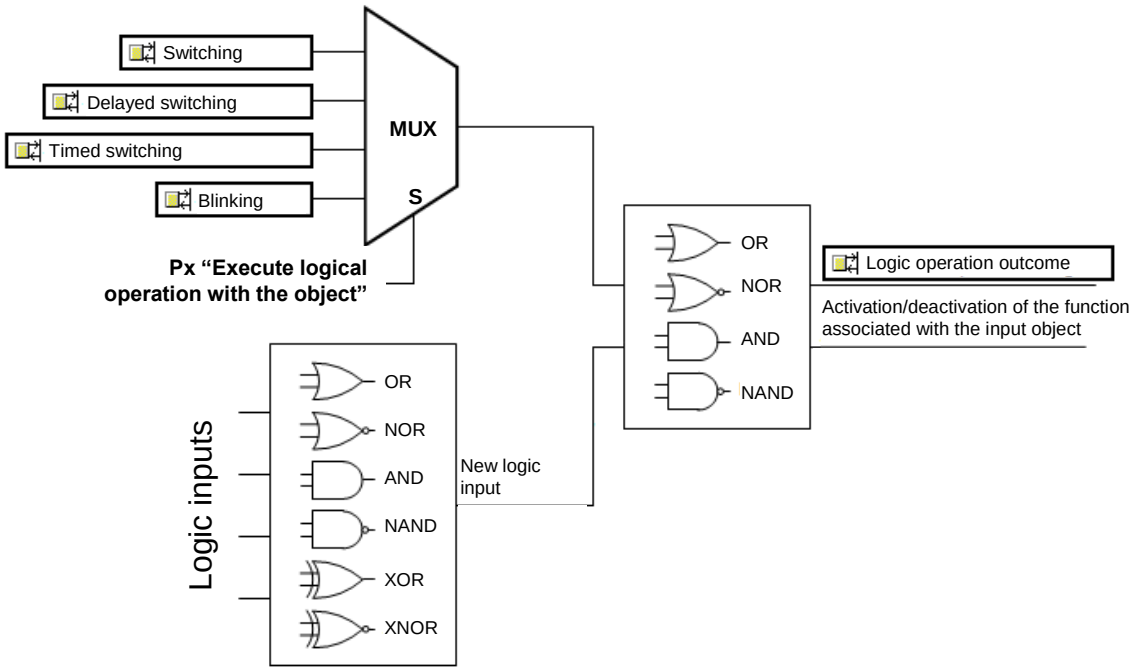
Depending on the selected value, the following communication objects are made available: ***Ch.X – Logic input 1***, ***Ch.X - Logic input 2***, ***Ch.X - Logic input 3***, ***Ch.X - Logic input 4***, ***Ch.X - Logic input 5***, ***Ch.X - Logic input 6***, ***Ch.X - Logic input 7*** and ***Ch.X - Logic input 8***.

If the set value is other than **1**, it is possible to set the logic operation to be executed between the logic inputs. The operation is selected using the **"Operation between logic inputs"** parameter, which can assume the following values:

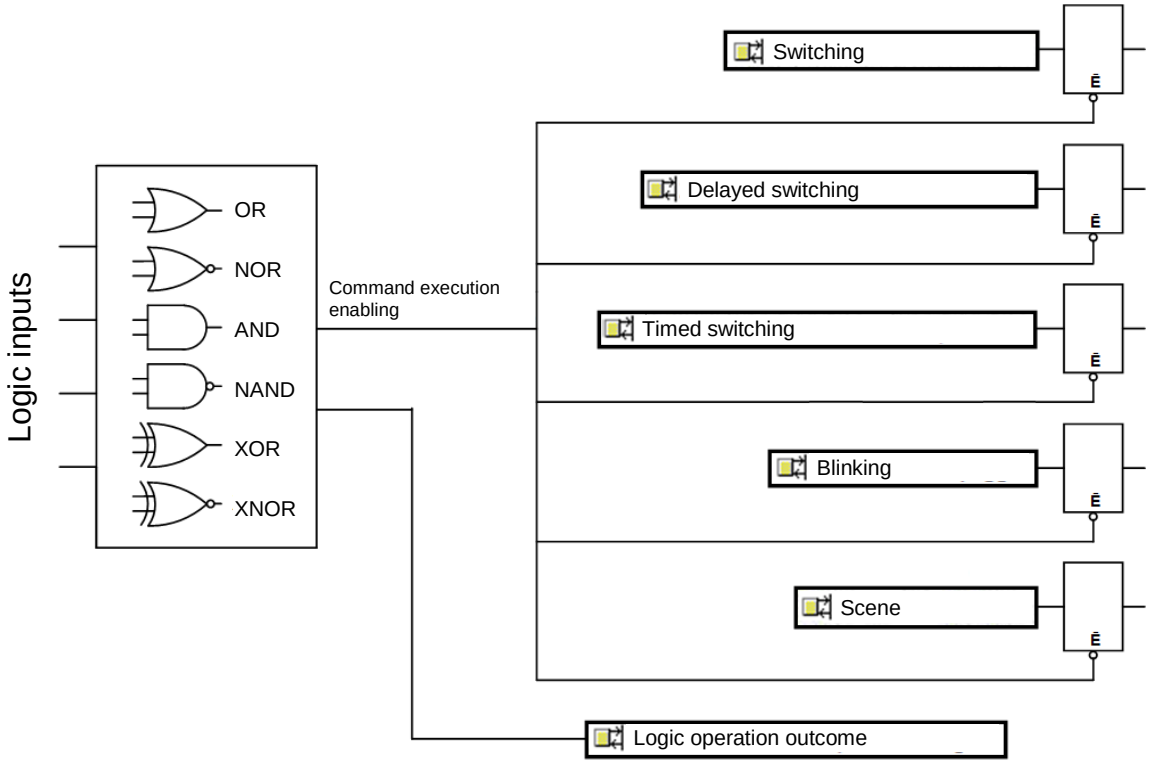
- **AND** **(default value)**
- OR
- NAND
- NOR
- XOR
- XNOR

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 - Switch***, ***Ch.X - Timed switch***, ***Ch.X - Delayed switching*** or ***Ch.X - Blinking***



2 to enable the execution of commands received via the BUS on the ***Ch.X - Switch***, ***Ch.X - Timed switch***, ***Ch.X - Delayed switching*** and ***Ch.X - Blinking*** and ***Ch.X - Scene*** objects.



The parameter for selecting the function of the result of the operation between logic inputs is **"The outcome of the operation with logic inputs stands for"**; in the case of a single logic input, the **"The logic input value stands for"** parameter is used. These parameters can assume the following values:

- **new logic input** **(default value)**
- bus commands execution enabling

If the value **new logic input** was selected (case 1), you can define which object should be used to execute the new logic operation via the **"Execute logical operation with the object"** parameter, and the logic operation to execute with the selected object via the **"Logical operation to execute"** parameter.

The **"Execute logical operation with the object"** parameter can assume the following values:

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

The function associated with the selected object will be activated/deactivated according to the result of the logic. EXAMPLE: if the "blinking" object is selected and the function has been enabled in ETS, the blinking function will be activated when the logic is true and stopped if the logic is false.
If the function is not activated, the logic will not have any effect on the load connected to the output.

The **"Logical operation to execute"** parameter can assume the following values:

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

Selecting the value **bus command execution enabling** (case 2 - see fig.4.9) displays a series of parameters for defining which commands received from the BUS require enabling in order to be executed. The parameters in question are **"Switching (on/off) commands"**, **"Delayed switching commands"**, **"Timed activation**

commands”, **“Blinking switching on/off commands”** and **“Scene commands”**, and they can have the following values:

- **independent from logic function** **(default value)**
- enabled by logic function

The commands enabled by the logic function are only executed if the outcome of the logic operation is true. If the outcome of the logic operation changes from false to true, the commands received after the status change will be executed. The commands received when the outcome of the logic function is false are ignored.

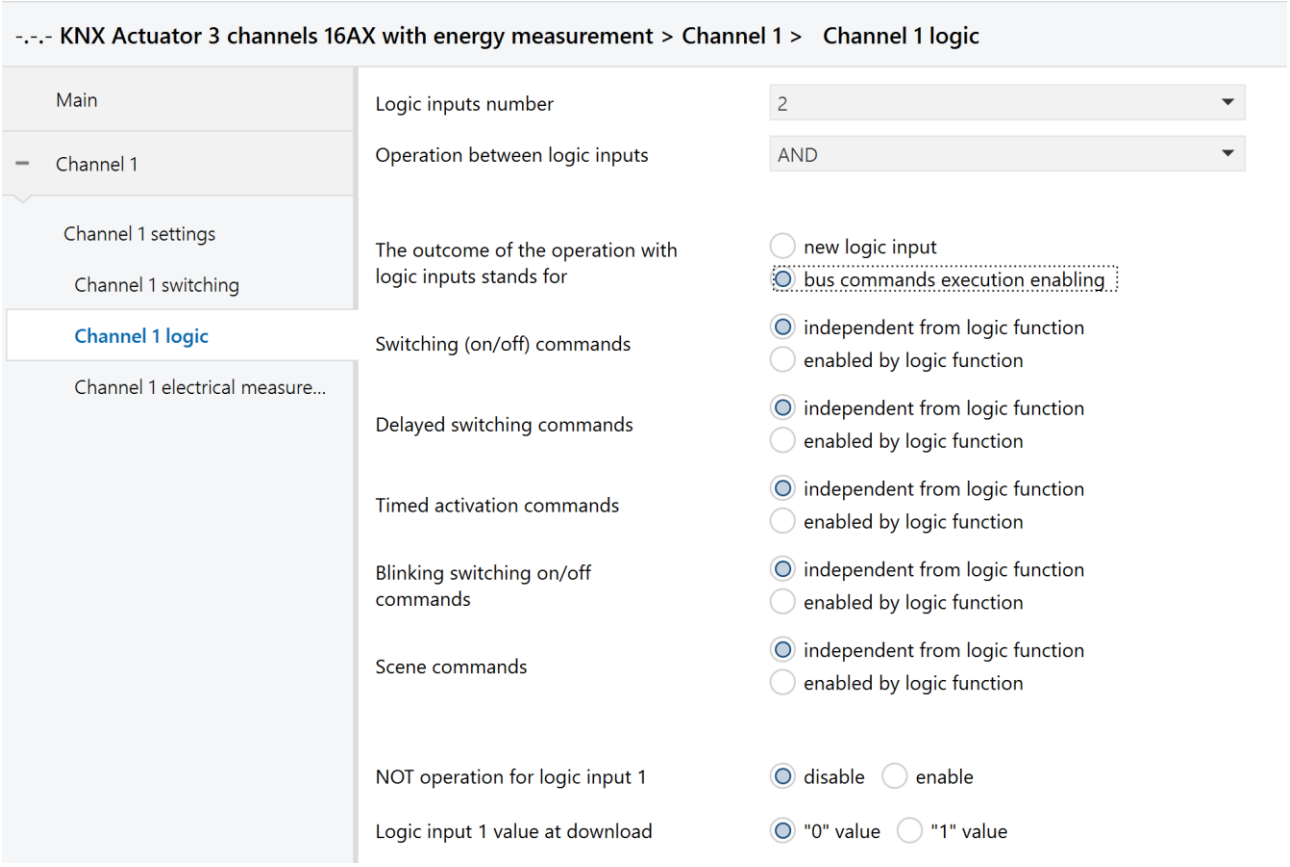


Fig. 4.9: “Channel X logic – bus command execution enabling” menu

It is possible to deny the value received from the BUS on the communication objects associated with the logic inputs via the parameters **“NOT operation for logic input 1”**, **“NOT operation for logic input 2”**, **“NOT operation for logic input 3”**, **“NOT operation for logic input 4”**, **“NOT operation for logic input 5”**, **“NOT operation for logic input 6”**, **“NOT operation for logic input 7”** and **“NOT operation for logic input 8”** (whose visibility depends on the number of logic inputs enabled). These parameters can have the following values:

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

The value of the logic inputs on ETS download can be set using the parameters **“Logic input 1 value at download”**, **“Logic input 2 value at download”**, **“Logic input 3 value at download”**, **“Logic input 4 value at download”**, **“Logic input 5 value at download”**, **“Logic input 6 value at download”**, **“Logic input 7 value at download”** and **“Logic input 8 value at download”** (whose visibility depends on the number of logic inputs enabled). These parameters can have the following values:

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

The value of the logic inputs on BUS voltage reset can be set using the parameters **"Logic input 1 value at bus voltage recovery"**, **"Logic input 2 value at bus voltage recovery"**, **"Logic input 3 value at bus voltage recovery"**, **"Logic input 4 value at bus voltage recovery"**, **"Logic input 5 value at bus voltage recovery"**, **"Logic input 6 value at bus voltage recovery"**, **"Logic input 7 value at bus voltage recovery"** and **"Logic input 8 value at bus voltage recovery"** (whose visibility depends on the number of logic inputs enabled). These parameters can have the following values:

- " 0" value
- "1" value
- **as before voltage drop** **(default value)**

selecting the value **as before voltage drop**, the device restores the values that were present prior to the voltage failure and sends the read request on the objects ***Ch.X – Logic input 1***, ***Ch.***X ***- Logic input 2***, ***Ch.X*** - Logic input 3, ***Ch.X - Logic input 4***, ***Ch.X - Logic input 5***, ***Ch.X*** - ***Logic input 6***, ***Ch.X - Logic input 7*** and ***Ch.X*** - ***Logic input 8*** in order to keep up to date with the field.
NB: the values at BUS voltage reset and on download are assigned to the logic objects regardless of the value of the parameters **"NOT operation for logic input i"** (1<i<8).

Finally, it is possible to 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 via the **"Logic function outcome warning"**parameter, which can have the following values:

- **disabled** **(default value)**
- only if outcome changes
- even if outcome doesn't change

setting a value other than **disabled** displays the ***Ch.X - Logical operation outcome*** output communication object (Data Point Type: 1.002 DPT_Bool).

The value transmitted on the BUS is:
a) the result of the operation between the outcome of the logical operation with logic inputs and the object selected in the **"Execute logical operation with the object"** parameter, if the value of the **"The outcome of the operation with logic inputs stands for"** parameter is **new logic input**
b) the result of the operation between logic inputs if the value of the parameter is **bus commands execution enabling**

4.1.12 Channel X load control (slave)

For each channel, the slave load control function can be activated so the channel can be controlled by a master device (P-COMFORT KNX) or supervisor to create the monitoring function for active power and load control. This function has a higher priority than all the others apart from the safety, forcing and block functions.
The menu is visible if the **"Load control - slave function"** parameter of the **Channel X settings** menu is set with the value **active**.

The structure of the menu is as follows:

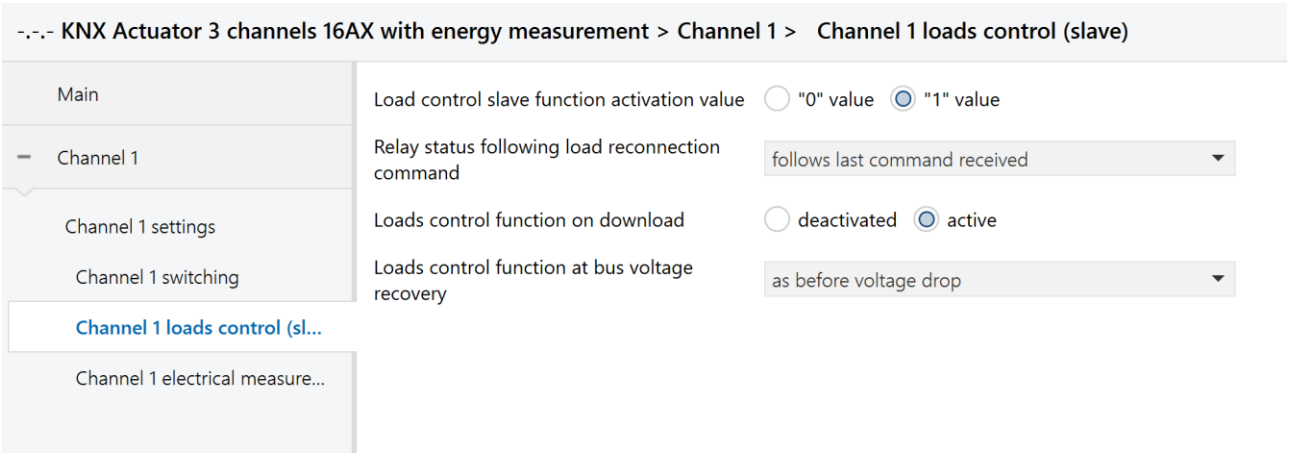


Fig. 4.10: “Channel X load control (slave)” menu

The **“Load control slave function activation value”** parameter determines which logic value activates the load control function of the actuator channel. The possible values are:

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

The communication objects ***Ch.X - Enable loads control slave function*** Data Point Type:1.002 DPT_Bool) and ***Ch.X - Loads control slave function enabling status*** (Data Point Type:1.003 DPT_Enable) can be used respectively to receive the load control function activation commands and send the signalling of the function activation status. The telegrams are sent via the ***Ch.X - Loads control slave function enabling status*** object following a BUS request, spontaneously after each change in the function enabling status, and upon BUS voltage reset.

The **“Relay status following load reconnection command”** parameter is used to set the status that the contact must assume following the reconnection command received on the ***Ch.X - Slave switching for loads control*** object (Data Point Type:1.001 DPT_Switch). This object allows the load disconnection (“0” value)/reconnection (“1” value) commands to be received when the load control function (slave) is active. The parameter can assume the following values:

- open (with NO)/closed (with NC)
- closed (with NO)/open (with NC)
- **follows last command received** **(default value)**
- as before the disconnection

If the parameter assumes the value **follows last command received**, the output 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. Basically, the command is executed in the background and applied to the output in the moment when the load is released. This behaviour applies, for example, to timed actuation commands or commands with delayed activation/deactivation, where the timing duration goes beyond the moment of load deactivation (release) because of the load control function.
Load deactivation/reconnection commands made while the load control function is deactivated are ignored.

The load status (deactivated/connected) is transmitted on the BUS via the ***Ch.X - Slave status for loads control*** communication object (Data Point Type:1.001 DPT_Switch). When the load is “deactivated”, the “0” value is transmitted; when the load is connected, a value of “1” is sent. The telegrams are sent via the ***Ch.X - Slave status for loads control*** object following a BUS request, spontaneously after each change in the function enabling status, and upon BUS voltage reset.

The **"Loads control function on download"** parameter sets the slave load control function status after downloading the application from ETS. The possible values are:

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

The **"Loads control function at bus voltage recovery"** parameter sets the slave load control function status after a BUS voltage reset. The possible values are:

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

If the value **deactivated** is selected (and the slave load control function was already active prior to the voltage failure), the function will be deactivated upon BUS voltage reset and the relay will assume the value defined by the **"Relay status after bus voltage recovery"** parameter ("Channel X settings" menu). If the value set for the latter parameter is **follows last command received**, the output will execute the last command received before the voltage drop, that must therefore be stored in the non-volatile memory. If the last command received before the voltage failure was a timed activation or activation delay command, the command will not be executed when the voltage is reset and the relay will switch to the open (with NO)/closed (with NC) status.

4.1.13 Channel X absorption limit threshold

For each channel, you can set a maximum absorption limit that will be monitored; when the limit is exceeded, the load can be automatically deactivated straight away, or the time with power above the limit can be calculated, or the number of times above the limit can be counted.
This menu is always visible once the channel has been activated.
The menu is visible if the **"Absorption limit threshold"** parameter of the **Channel X - settings** menu is set with the value **active**.

The structure of the menu is as follows:

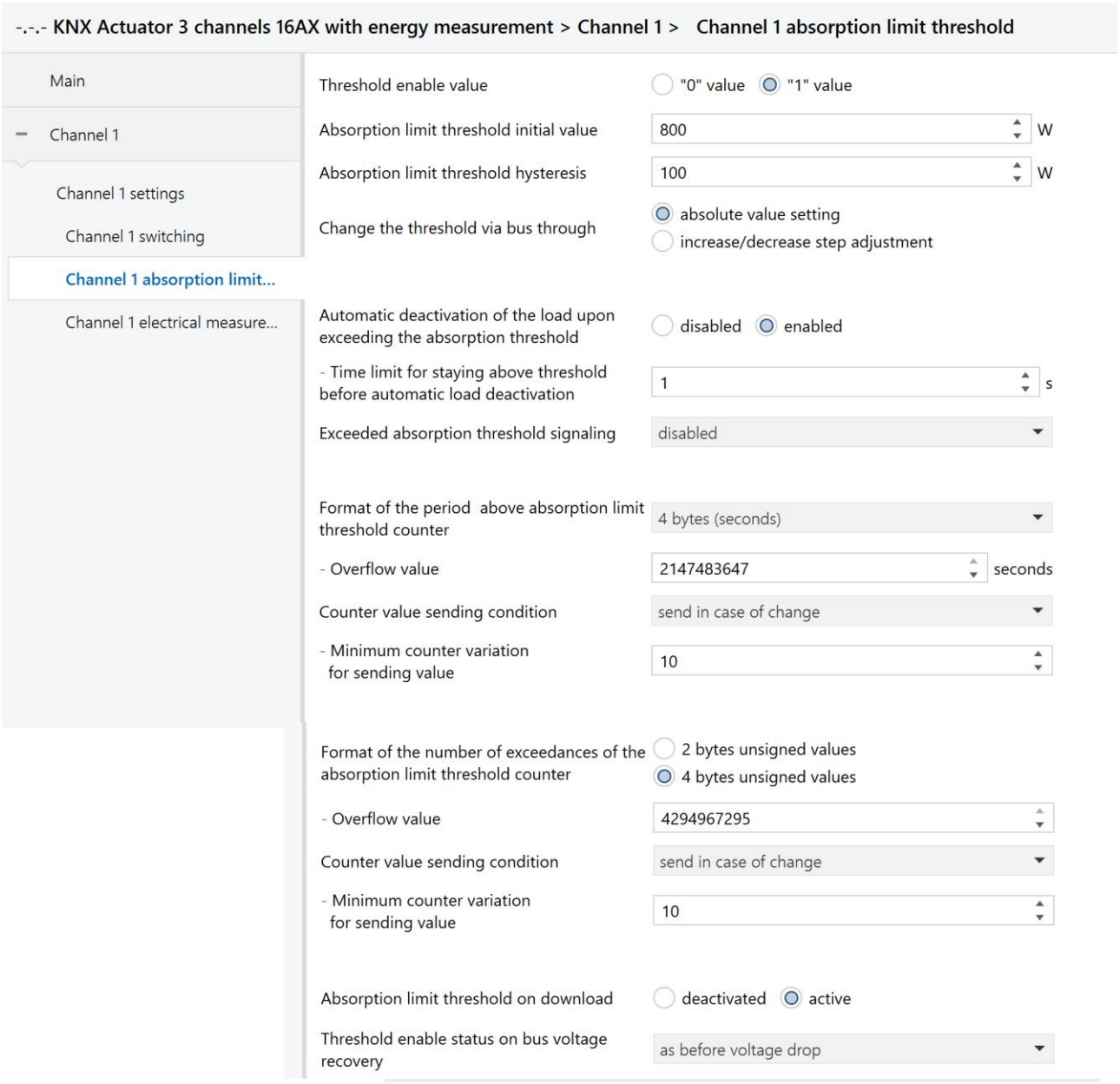


Fig. 4.11: “Channel X absorption limit threshold” menu

Via the communication objects ***Ch.X - Enable absorption limit threshold*** (Data Point Type:1.002 DPT_Bool) and ***Ch.X - Absorption limit threshold enabling status*** (Data Point Type:1.003 DPT_Enable), it is possible to respectively receive the threshold activation commands and send the feedback regarding threshold activation status. The telegrams are sent via the ***Ch.X - Absorption limit threshold enabling status*** object following a BUS request, spontaneously after each change in the threshold enabling status, and upon BUS voltage reset.

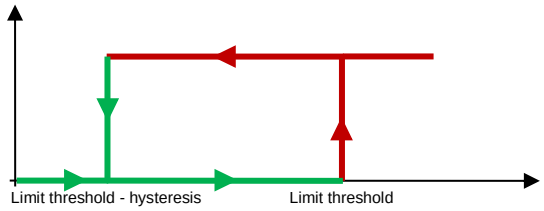
The **“Threshold enable value”** parameter defines which logical value received via the ***Ch.X - Enable absorption limit threshold*** communication object must activate the absorption limit threshold. Receiving the value opposite to the one set for activation will deactivate the threshold.
The possible values are:

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

The **"Threshold enable status on bus voltage recovery"** parameter sets the status of the absorption limit threshold after a BUS voltage reset. The possible values are:

- disabled
- enabled
- **as before voltage drop** **(default value)**

The absorption threshold is managed by following a hysteresis cycle - i.e. rather than a single threshold that distinguishes system activation and deactivation, there are two:



The limit is considered "exceeded" when the measured power value is higher than the "Limit threshold" value; when the power value falls below the "Limit threshold - hysteresis" value, the limit is considered "not exceeded".

The **"Absorption limit threshold initial value [W]"** parameter is used to set the initial value of the absorption threshold in Watt (which can be changed via the BUS if necessary, using the relative communication object). The parameter can assume the following values:

- from 1 to 3600, in steps of 1 **800 (default value)**

The **"Absorption limit threshold hysteresis [W]"** parameter sets the hysteresis value to be subtracted from the limit threshold in order to define the "limit not exceeded" value. This parameter can assume the following values:

- from 1 to 1000, in steps of 1 **100 (default value)**

Of course, the values that are set must be coherent - i.e. they must respect the rule

3601W > **Limit threshold** > **hysteresis** > **0**

If this rule is not respected after ETS download, use the default values.

The **"Change the threshold via bus through"** parameter is used to define the communication object format needed to set the limit threshold via a BUS telegram. The values that can be set are:

- **absolute value setting** **(default value)**
- increase/decrease step adjustment

selecting **absolute value setting** displays the ***Ch.X - Limit absorption threshold value input*** communication object (Data Point Type 14.056 DPT_Value_Power), that can be used to set the limit threshold value via the BUS. Once the threshold value has been received via the BUS, make sure it is valid (**3601**W > **Limit threshold** > **hysteresis** > **0**); if it isn't, ignore the telegram received.

Selecting **increase/decrease step adjustment** displays the **"Threshold adjustment step via bus"** parameter and the ***Ch.X - Absorption limit threshold adjustment*** object (Data Point Type: 1.007 DPT_Step). If the value "1" is received on this object, the limit threshold value will be increased by the value defined in the **"Threshold adjustment step via bus"** parameter; if the value "0" is received on this object, the limit threshold value will be decreased by the value defined in the **"Threshold adjustment step via bus"** parameter. Once the increase/decrease command has been received via the BUS, make sure the new threshold value is valid

(**3601**W > **Limit threshold** > **hysteresis** > **0**) before implementing the modification; if it isn't, limit the increase/decrease step to the maximum/minimum permitted.
The **"Threshold adjustment step via bus [W]"** parameter is used to define the increase/decrease step of the limit threshold value after receiving a command on the relative regulation object. The values that can be set are:

- from 1 to 250, in steps of 1, **100 (default value)**

The device can autonomously deactivate the connected load whenever the set limit threshold is exceeded; use the **"Automatic deactivation of the load upon exceeding the absorption threshold"** parameter to enable this function. The values that can be set are:

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

selecting **enabled** displays the **"Time limit for staying above threshold before automatic load deactivation [s]"** parameter, used to define how long the absorbed power can remain above the threshold before effectively deactivating the load. The values that can be set are:

- from 0 to 30, in steps of 1, **1 (default value)**

This function has a higher priority than the switching, stair raiser light, delayed activation, scene blinking and logic functions. When the threshold is exceeded, the load is deactivated, terminating any active functions with a lower priority level. The load can subsequently be reactivated with any command (the function merely deactivates the load when the threshold is exceeded - it doesn't keep it disabled or reactivate it autonomously).

The current value of the absorption limit threshold is transmitted on the BUS via the ***Ch.X - Absorption limit threshold current value*** object (Data Point Type 14.056 DPT_Value_Power). The feedback sending conditions are: following a BUS request, spontaneously at each threshold change, and on BUS voltage reset.

The **"Exceeded absorption threshold signalling"** parameter can be used to send a signal of the limit threshold exceeded on KNX, via the ***Ch.X - Absorption limit threshold exceeded*** communication object. The parameter can assume the following values:

- **disabled** **(default value)**
- send in case of change
- sends on change and periodically

selecting any value other than **disabled** displays the ***Ch.X - Absorption limit threshold exceeded*** object (Data Point Type 1.002 DPT_Bool) and the **"Upon exceeding the limit threshold"** and **"On return below limit threshold"** parameters; selecting **sends on change and periodically** will also make the **"Reporting period (minutes)"** parameter visible.

The **"Upon exceeding the limit threshold"** parameter is used to set the value to be sent when the set limit is exceeded. The values that can be set are:

- no effect
- send "0"
- **send "1"** **(default value)**

The **"On return below limit threshold"** parameter is used to set the value to be sent when the value returns below the limit threshold (considering the hysteresis as well). The values that can be set are:

- no effect
- **send "0"** **(default value)**
- send "1"

The ***Ch.X - Absorption limit threshold exceeded*** object is sent upon request, spontaneously on change, periodically (if cyclical repetition is enabled) and on BUS voltage reset only if the power value is not within the

hysteresis range (between Limit threshold and Limit threshold - hysteresis). When the threshold is disabled, the sending of the "limit threshold exceeded" signals is inhibited, but any change or feedback of the threshold value is still transmitted.

The **"Reporting period (minutes)"** parameter is used to set the repetition period for "absorption threshold exceeded" signalling telegrams. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

The device can signal the count of the total time above the limit threshold; the count is based on the absorbed power measurement. The count is only made if the supply voltage is present; otherwise, the counter is not increased. The count can still be made even if there is no BUS voltage. The counter that is used for the count can have different units of measurement depending on the format selected for transmitting the value on the KNX BUS; the **"Format of the period above absorption limit threshold counter"** parameter can be used to define the size and coding of the communication object used to communicate the counter value and therefore the unit of measurement of the counter. The values that can be set are:

- **4 byte (seconds)** **(default value)**
- 2 byte (minutes)
- 2 byte (hours)

The value set for this item will affect the values that can be set for the **"Overflow value"** parameter and the format of the ***Ch.X - Format of the period above absorption limit threshold counter*** communication object. The initial value is always 0, regardless of the format selected.

The **"Overflow value"** parameter is used to set the maximum value of the "period above limit threshold" counter; in fact, it is possible to set the maximum counter value - i.e. the value beyond which the counter is in an overflow condition.
The value set for the **"Format of the period above absorption limit threshold counter"** parameter will affect the values that can be set for this item:

- If the counter format is **4 byte (seconds)**, the ***Ch.X – Period above absorption limit threshold counter*** communication object (Data Point Type: 13.100 DPT_LongDeltaTimeSec) is visible and the values that can be set for the above parameter are:
  - from 0 to **2147483647 (default value ≈ 68 years)**, in steps of 1
- If the counter format is **2 byte (minutes)**, the ***Ch.X – Period above absorption limit threshold counter overflow*** communication object (Data Point Type: 7.006 DPT_TimePeriodMin) is visible and the values that can be set for the above parameter are:
  - from 0 to **65535 (default value ≈ 45.5 days)**, in steps of 1
- If the counter format is **2 byte (hours)**, the ***Ch.X – Period above absorption limit threshold counter*** communication object (Data Point Type: 7.007 DPT_TimePeriodHrs) is visible and the values that can be set for the above parameter are:
  - from 0 to **65535 (default value ≈ 7.4 years)**, in steps of 1

When the maximum value is reached, the count stops until a reset command is implemented.

The device uses the ***Ch.X - Period above absorption limit threshold counter overflow*** object (Data Point Type: 1.002 DPT_Bool) to indicate the overflow of the counter above absorption limit threshold. When the overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.
The device uses the ***Ch.X - Period above absorption limit threshold counter reset*** communication object (Data Point Type: 1.015 DPT_Reset) to receive the counter reinitialisation command that brings the count back to its initial value of 0. The "0" value is ignored but, if a value of "1" is received, the counter value is reset at the initial value and the ***Ch.X - Period above absorption limit threshold counter overflow*** object is set at "0".

The **"Counter value sending condition"** parameter is used to define the conditions for sending the current value of the "period above absorption limit threshold" counter. The values that can be set are:

- send on demand only
- **send in case of change (default value)**
- send periodically
- sends on change and periodically

selecting **send in case of change** or **sends on change and periodically** displays the **"Minimum counter variation for sending value"** parameter, whereas if you select **send periodically** or **sends on change and periodically** the **"Counter sending period (minutes)"** parameter will be visualised.
Selecting the value **send on demand only**, no new parameter will be enabled because the counter value is not sent spontaneously by the device; only in the case of a status read request will it send the user a telegram in response to the command received, giving information about the current value of the counter.
If the sending condition of the counter is different from **send on demand only**, the value of the counter should be sent after a BUS voltage reset in order to update any connected devices.

The **"Minimum counter variation for sending value"** parameter, which is visible if the "period above absorption limit threshold" counter value is sent on change, is used to define the minimum variation of the counter (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- from 1 to 100, in steps of 1 **(default value 10)**

The unit of measurement of the minimum variation is the same as that set for the counter format.

The **"Counter sending period [minutes]"** parameter, which is visible if the "period above absorption limit threshold" counter value is sent periodically, is used to define the frequency for spontaneously sending telegrams indicating the current counter value. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

In the event of a voltage failure, the "period above absorption limit threshold" counter value must be saved in a non-volatile memory and reset when the supply voltage is reset.

The device can signal the number of times that the limit threshold is exceeded.
The counter used for the count of the number of times the limit threshold is exceeded can have different units of measurement depending on the format selected for transmitting the value on the KNX BUS; the **"Format of the number of exceedances of the absorption limit threshold counter"** parameter can be used to define the size and coding of the communication object used to communicate the counter value and therefore the unit of measurement of the counter. The values that can be set are:

- 2 bytes unsigned values
- **4 bytes unsigned values (default value)**

The value set for this item will affect the values that can be set for the **"Overflow value"** parameter and the format of the ***Ch.X - Absorption limit threshold number of exceedances counter*** communication object. The initial value is always 0, regardless of the format selected.

The **"Overflow value"** parameter is used to set the maximum value of the "threshold exceedances" counter; in fact, it is possible to set the maximum counter value - i.e. the value beyond which the counter is in an overflow condition.
The value set for the **"Format of the number of exceedances of the absorption limit threshold counter"** parameter will affect the values that can be set for this item:

- If the counter format is **2 bytes unsigned value**, the ***Ch.X – Absorption limit threshold number of exceedances counter*** communication object (Data Point Type: 7.001 DPT_Value_2_Ucount) is displayed and the values that can be set for the above parameter are:

  - from 0 to **65535 (default value)**, in steps of 1

- If the counter format is **4 bytes unsigned values**, the ***Ch.X – Absorption limit threshold number of exceedances counter*** communication object (Data Point Type: 12.001 DPT_Value_4_Ucount) is displayed and the values that can be set for the above parameter are:

  - from 0 to **4294967295 (default value)**, in steps of 1

When the maximum value is reached, the count stops until a reset command is implemented.

The device uses the ***Ch.X - Absorption limit threshold number of exceedances counter overflow*** object (Data Point Type: 1.002 DPT_Bool) to indicate the overflow of the absorption limit threshold number of exceedances counter. When the overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device uses the ***Ch.X - Absorption limit threshold number of exceedances counter reset*** communication object (Data Point Type: 1.015 DPT_Reset) to receive the counter reinitialisation command that brings the count back to its initial value of 0. The "0" value is ignored but, if a value of "1" is received, the counter value is reset at the initial value and the ***Ch.X - Absorption limit threshold number of exceedances counter overflow*** object is set at "0".

The **"Counter value sending condition"** parameter is used to define the conditions for sending the current value of the threshold exceedances counter. The values that can be set are:

- send on demand only
- **send in case of change (default value)**
- send periodically
- sends on change and periodically

selecting **send in case of change** or **sends on change and periodically** displays the **"Minimum counter variation for sending value"** parameter, whereas if you select **send periodically** or **sends on change and periodically**, the **"Counter sending period (minutes)"** parameter will be visualised.
Selecting the value **send in case of change**, no new parameter will be enabled because the counter value is not sent spontaneously by the device; only in the case of a status read request will it send the user a telegram in response to the command received, giving information about the current value of the counter.
If the sending condition of the counter is different from **send in case of change**, the value of the counter should be sent after a BUS voltage reset in order to update any connected devices.

The **"Minimum counter variation for sending value"** parameter, which is visible if the "absorption limit threshold number of exceedances" counter value is sent on change, is used to define the minimum variation of the counter (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- from 1 to 100, in steps of 1 **(default value 10)**

The unit of measurement of the minimum variation is the same as that set for the counter format.

The **"Counter sending period (minutes)"** parameter, which is visible if the "absorption limit threshold number of exceedances" counter value is sent periodically, is used to define the frequency for spontaneously sending telegrams indicating the current counter value. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

In the event of a voltage failure, the "absorption limit threshold number of exceedances" counter value must be saved in a non-volatile memory and reset when the supply voltage is reset.

The **"Absorption limit threshold on download"** parameter sets the threshold enabling status after downloading the application from ETS. The possible values are:

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

When the power supply is reset, the threshold activation status in force prior to the failure is maintained.

4.1.14 Channel X safety function

The safety function allows the output to function under normal conditions until certain set conditions occur (no periodic reception, reception of particular data from the BUS), after which the device 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 forced positioning 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 forced positioning functions.
The communication object used to monitor the operating conditions is ***Ch.X - Safety*** (Data Point Type: 1.002 DPT_Bool).
The device signals the activation status of the safety function (1 = active, 0 = deactivated) via the ***Ch.X – Safety status*** communication object (Data Point Type: 1.003 DPT_Enable), regardless of whether or not any functions with a higher priority are active. The communication object is sent on request, when the BUS voltage is reset, and spontaneously on change of the function activation status.
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:

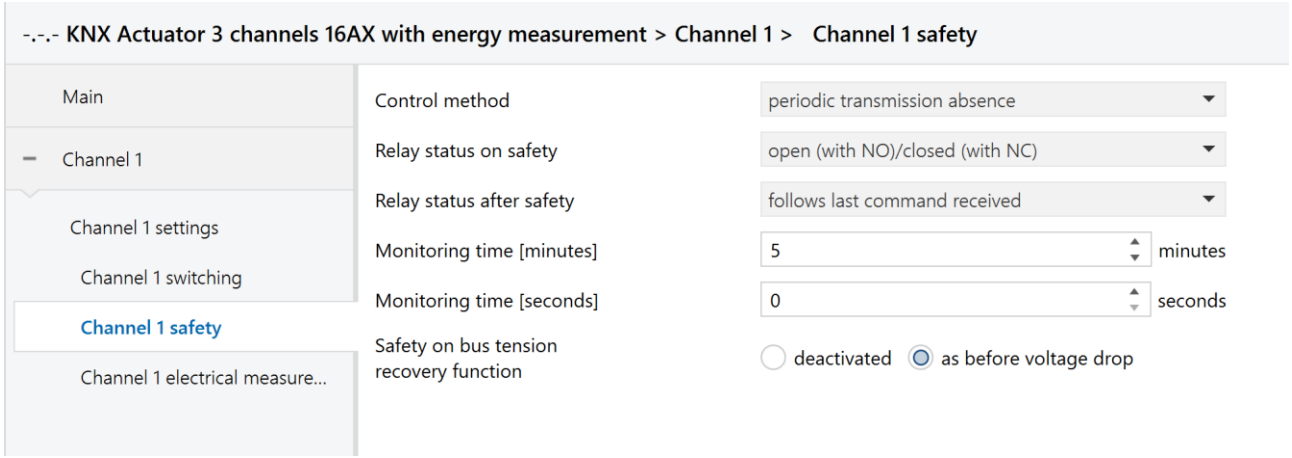


Fig. 4.12: "Channel X safety" menu

The **"Control method"** parameter is used to define the conditions for which the device activates the safety function; unlike the process for the ***Block*** and ***Forced positioning*** functions, which can be 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:

- "1" value or periodic transmission absence
- "0" value or periodic transmission absence
- **periodic transmission absence** **(default value)**

by selecting **value "1" or periodic transmission absence**, the safety function is activated following two events:

- 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 **"Monitoring time [seconds]"** parameters.

- the ***Ch.X - Safety*** communication object receives a telegram with the logic value “1” (value “1” received).

In both cases, the safety function is deactivated when the ***Ch.X - Safety*** communication object receives a telegram with logic value “0”; once the safety function has been deactivated, the monitoring time is restarted.

By selecting **value “0” or periodic transmission absence**, the safety function is activated following two events:

- 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.
- a telegram with the logic value “0” (value “0” received) is received on the ***Ch.X* - Safety** communication object.

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

Selecting the value **periodic transmission absence**, the safety function is activated when the ***Ch.X - Safety*** communication object no longer receives a 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 logic value “0” or "1"; once the safety function has been deactivated, the monitoring time is restarted.

The **“Relay status on safety”** parameter is used to set the status of the contact when the safety function is active. The values that can be set are:

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

When normal operating conditions are restored (safety deactivation), the status to which the actuator switches the relay is defined by the **“Relay status after safety”** parameter. 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 before safety activation

selecting **follows last command received**, the output follows the dynamics determined by the last command, as if command execution was begun in the moment when the command was actually received. Basically, 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.

The **“Monitoring time [minutes]”** parameter is used to set the first of the two values (minutes) that make up the time that must pass before the device activates the safety function if it has not received the expected telegram (no periodic transmission). The values that can be set are:

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

The **“Monitoring time [seconds]”** parameter is used to set the second of the two values (seconds) that make up the time that must pass before the device activates the safety function if it has not received the expected telegram (no periodic transmission). The values that can be set are:

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

NB: setting a monitoring time equal to **0 minutes** and **0 seconds**, the ***Safety*** object is not monitored and the lack of periodic transmission on the object does not activate the function.

The **"Safety on bus tension recovery function"** parameter is used to determine the status of the safety function when the BUS voltage is reset. This parameter is useful if the function is active at the time of the BUS failure and you don't want the output behaviour to change after the reset. The parameter can assume the following values:

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

If the value **deactivated** is selected (and the safety function was already active prior to the BUS voltage failure), the function will be deactivated when the voltage is reset and the relay will assume the value defined in the **"Relay status after bus voltage recovery"** parameter ("Channel X settings" menu). If the value set for this last parameter is **follows last command received**, the output will execute the last command received before the BUS voltage drop that, as a result, must be stored in the non-volatile memory. If the last command received before the voltage failure was a timed activation or activation delay command, the command will not be executed when the voltage is reset and the relay will switch to the open (with NO)/closed (with NC) status.
If the **as before voltage drop** value is selected (and the safety function was already active prior to the voltage failure), the function will be reactivated when the voltage is reset and the relay will switch to the conditions set by the **"Relay status on safety"** parameter.

4.1.15 Channel X forced positioning function

The relay status can be forced to a certain (settable) condition after receiving the ***Ch. X - Priority command*** communication object (Data Point Type: 2.001 DPT_Switch_Control), which activates the forced positioning 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 forced positioning function has the highest priority over all others with the exception of the Block function.
The device signals the activation of the forcing function via the ***Ch.X – Priority command status*** communication object (Data Point Type: 2.001 DPT_Switch_Control), regardless of whether or not any functions with a higher priority are active. The communication object is sent on request, when the BUS voltage is reset, and spontaneously. It is sent spontaneously when the status passes from "activate forced positioning ON" to "activate forced positioning OFF" or "deactivate forced positioning", and vice versa.
The menu is visible if the **"Forced positioning function"** parameter of the **Channel X - settings** menu is set with the value **active**.
The structure of the menu is as follows:

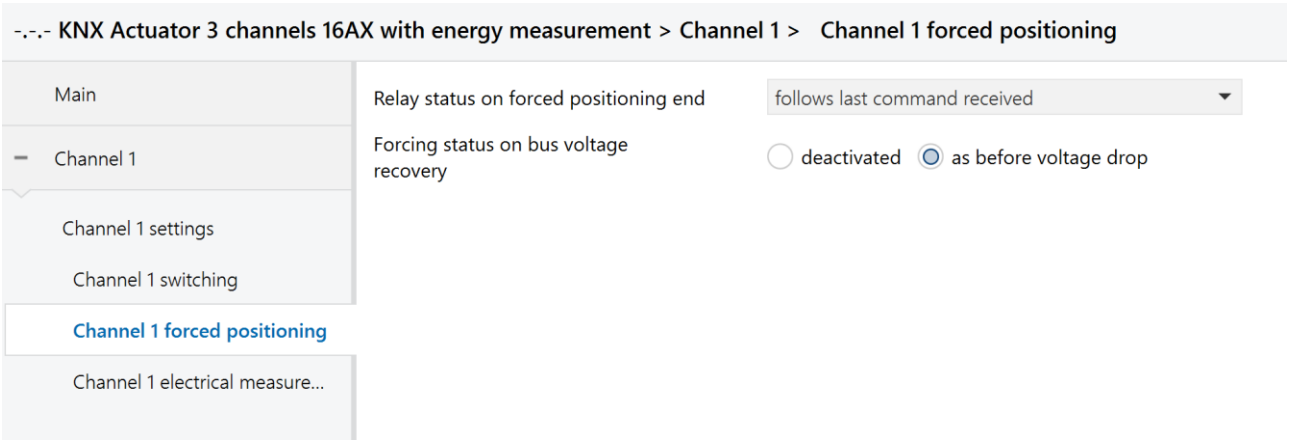


Fig. 4.13: "Channel X forced positioning" menu

The semantics of the command received from the BUS follow what is shown in the table below:

bit 1	bit 0	
0	0	Forced positioning deactivation
0	1	Forced positioning deactivation
1	0	Forced positioning OFF
1	1	Forced positioning ON

When a priority command is received with the forced positioning 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 forced positioning activation OFF value, the actuator switches the relay, opening the NO contact or closing the NC contact.
Upon receipt of the forcing deactivation command, the status to which the output switches the relay is defined by the **"Relay status on forced positioning end"** parameter. 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 before forcing activation

If the parameter assumes the value **follows last command received**, the output 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. Basically, the command is executed in the background and is applied to the output in the moment in which forced positioning is ended. This behaviour applies, for example, to timed actuation commands with timing that has a duration that goes beyond the moment of forced positioning deactivation or commands with delayed activation/deactivation.

The **"Forcing status on bus voltage recovery"** parameter is used to determine the status of the forcing function on BUS voltage reset. This parameter is useful if the function is active at the time of the voltage failure and you don't want the output behaviour to change after the failure. The parameter can assume the following values:

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

If the value **deactivated** is selected (and the forcing was already active prior to the BUS voltage failure), the function will be deactivated when the voltage is reset and the relay will assume the value defined in the **"Relay status after bus voltage recovery"** parameter ("Channel X settings" menu). If the value set for the latter parameter is **follows last command received**, the actuator will execute the last command received prior to the BUS voltage drop, so the command must be stored in the non-volatile memory. If the last command received before the voltage failure was a timed activation or activation delay command, the command will not be executed when the voltage is reset and the relay will switch to the open (with NO)/closed (with NC) status. If the **as before voltage drop** value is selected (and forcing was already active prior to the voltage failure), the function will be reactivated when the voltage is reset and the relay will switch to the status it had before.

If a forcing deactivation command is received and the **"Relay status on forced positioning end"** parameter assumes the value **follows last command received**, the actuator must execute the last command received before the BUS voltage failure (which, as a result, must be stored in the non-volatile memory). If the last command received before the voltage failure was a timed activation or activation delay command, the command will not be executed when the voltage is reset and the relay will switch to the open (with NO)/closed (with NC) status.

4.1.16 Channel X block function

The device can be locked in a certain (settable) condition after receiving the ***Ch. X - Block*** communication object (Data Point Type: 1.002 DPT_Bool), which 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 device signals the activation status of the block function (1 = active, 0 = deactivated) via the ***Ch.X – Block status*** communication object (Data Point Type: 1.003 DPT_Enable). The communication object is sent on request, when the BUS voltage is reset, and spontaneously on change of the function activation status.
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:

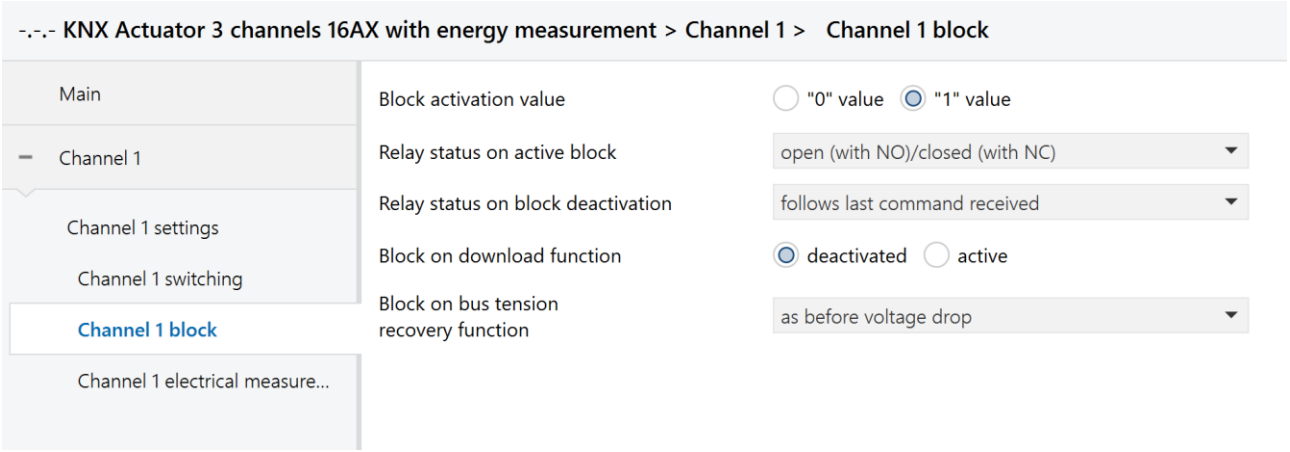


Fig. 4.14: "Channel X block" menu

The **"Block activation value"** parameter determines which logic value activates the actuator block function. The possible values are:

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

The **"Relay status on active block"** parameter is used to set the status that the contact must assume when 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

The **"Relay status on block deactivation"** parameter is used to set the status that the contact must assume after 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 before block activation

If the parameter assumes the value **follows last command received**, the output 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. Basically, 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.

The **"Block on download function"** parameter sets the block function status after downloading the application from ETS. The possible values are:

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

The **"Block on bus tension recovery function"** parameter sets the block function status after a BUS voltage reset. The possible values are:

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

If the value **deactivated** is selected (and the block function was already active prior to the BUS voltage failure), the function will be deactivated when the voltage is reset and the relay will assume the value defined in the **"Relay status after bus voltage recovery"** parameter ("Channel X settings" menu). If the value set for the latter parameter is **follows last command received**, the output will execute the last command received before the voltage drop, that must therefore be stored in the non-volatile memory. If the last command received before the voltage failure was a timed activation or activation delay command, the command will not be executed when the voltage is reset and the relay will switch to the open (with NO)/closed (with NC) status.
If you select **as before voltage drop** (and the block function was activated before the voltage failure), the function will be reactivated when the voltage is reset and the relay will assume the conditions set in the **"Relay status on active block"** parameter.

4.1.17 Channel X counters function

This is used to enable the count of the operating time (closing or opening), and the number of operations of the relay associated with the channel, by setting the count parameters.
The menu is visible if the **"Counter function"** parameter of the **Channel X - settings** menu is set with the value **active**.

The structure of the menu is as follows:

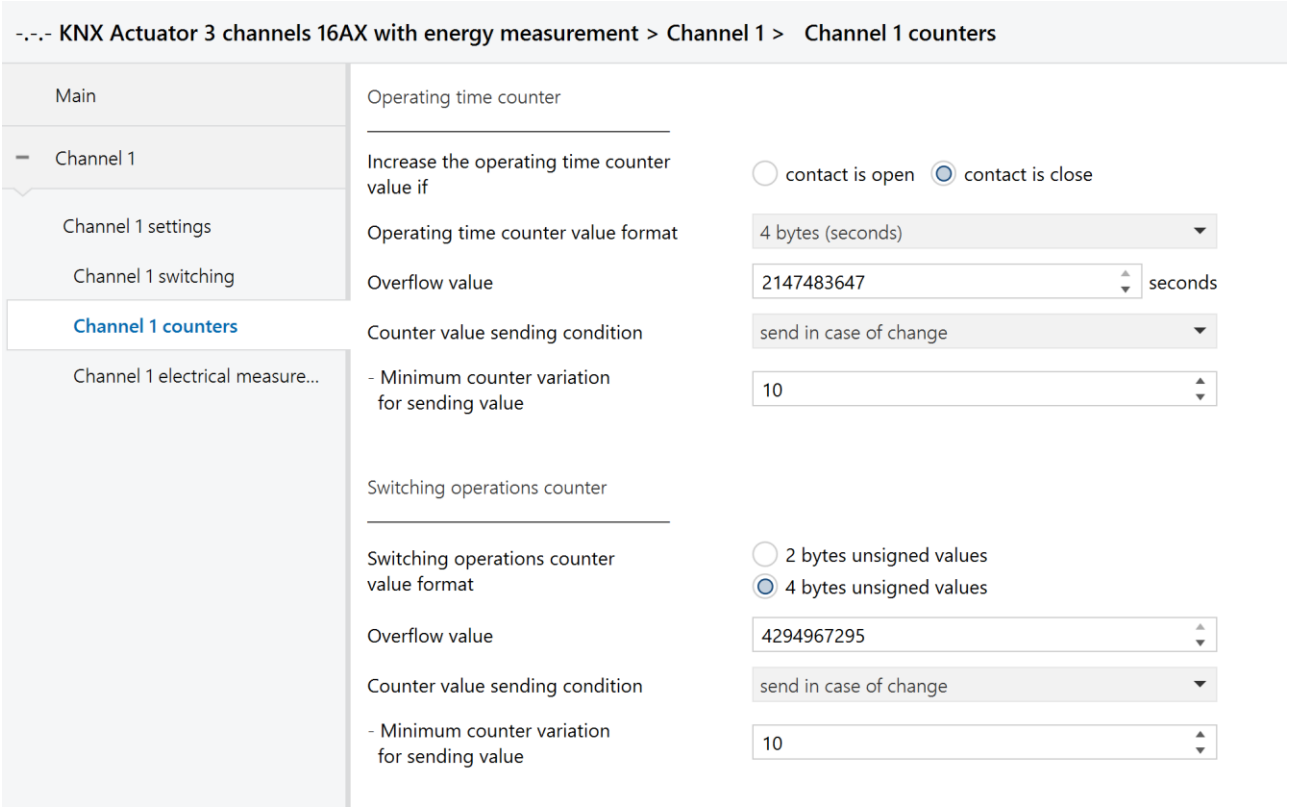


Fig. 4.15: “Channel X counters” menu

The device is able to signal the count of the total operating time (closing or opening) of the relay; the count is based on the detection of the status of the relay associated with the output. Two statuses can be detected: closed contact and open contact. The **“Increase the operating time counter value if”** parameter is used to set the status of the contact considered for a counter increase. The values that can be set are:

- contact is open
- **contact is closed (default value)**

The count is only made if the supply voltage is present; otherwise, the counter is not increased. The count can still be made even if there is no BUS voltage.

The counter that is used for the count can have different units of measurement depending on the format selected for transmitting the value on the KNX BUS; the **“Operating time counter value format”** parameter is therefore used to define the size and code of the communication object used to communicate the counter value, and hence the counter measurement unit. The values that can be set are:

- **4 byte (seconds) (default value)**
- 2 byte (minutes)
- 2 byte (hours)

The value set for this item will affect the values that can be set for the **“Overflow value”** parameter and the format of the ***Ch.X - Operating time counter*** communication object. The initial value is always 0, regardless of the format selected.

The **“Overflow value”** parameter is used to set the maximum value of the operating time counter; in fact, it is possible to set the maximum counter value - i.e. the value beyond which the counter is in an overflow condition. Depending on the value set for the **“Operating time counter value format”** parameter, the values that can be set for this item will be different:

- If the counter format is **4 byte (seconds)**, the ***Ch.X – Operating time counter*** communication object (Data Point Type: 13.100 DPT_LongDeltaTimeSec) is visible and the values that can be set for the above parameter are:
  - from 0 to **2147483647 (default value ≈ 68 years)**, in steps of 1
- If the counter format is **2 byte (minutes)**, the ***Ch.X – Operating time counter*** communication object (Data Point Type: 7.006 DPT_TimePeriodMin) is visible and the values that can be set for the above parameter are:
  - from 0 to **65535 (default value ≈ 45.5 days)**, in steps of 1
- If the counter format is **2 byte (hours)**, the ***Ch.X – Operating time counter*** communication object (Data Point Type: 7.007 DPT_TimePeriodHrs) is visible and the values that can be set for the above parameter are:
  - from 0 to **65535 (default value ≈ 7.4 years)**, in steps of 1

When the maximum value is reached, the count stops until a reset command is implemented.

The device uses the ***Ch.X - Operating time counter overflow*** object (Data Point Type: 1.002 DPT_Bool) to indicate the overflow of the operating time counter. When the overflow occurs, a value of “1” is sent; a value of “0” is sent when the counter is reinitialised.

The device uses the ***Ch.X - Operating time counter reset*** communication object (Data Point Type: 1.015 DPT_Reset) to receive the counter reinitialisation command that brings the count back to its initial value of 0.

The “0” value is ignored but, if a value of “1” is received, the counter value is reset at the initial value and the ***Ch.X - Operating time counter overflow*** object is set at “0”.

The **“Counter value sending condition”** parameter is used to define the conditions for sending the current value of the operating time counter. The values that can be set are:

- send on demand only
- **send in case of change (default value)**
- send periodically
- sends on change and periodically

selecting **send in case of change** or **sends on change and periodically** displays the **“Minimum counter variation for sending value”** parameter, whereas if you select **send periodically** or **sends on change and periodically**, the **“Counter sending period”** parameter will be visualised.
Selecting the value **send on demand only**, no new parameter will be enabled because the operating time counter value is not sent spontaneously by the device; only in the case of a status read request will it send the user a telegram in response to the command received, giving information about the current value of the counter.
After a BUS voltage reset, the value of the counter should be sent in order to update any connected devices.

The **“Minimum counter variation for sending value”** parameter, which is visible if the operating time counter value is sent on change, is used to define the minimum variation of the counter (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- from 1 to 100, in steps of 1 **(default value 10)**

The unit of measurement of the minimum variation is the same as that set for the counter format.

The **“Counter sending period [seconds]”** parameter, which is visible if the operating time counter value is sent periodically, is used to define the frequency for spontaneously sending telegrams indicating the current counter value. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

In the event of a voltage failure, the operating time counter value must be saved in a non-volatile memory and reset when the supply voltage is reset.

The device is able to signal the count of the number of operations performed by the relay; the count is based on the detection of the change in status of the relay associated with the output.
The counter used to count the number of operations can have different units of measurement depending on the format selected for transmitting the value on the KNX BUS; the **“Switching operations counter value format”** parameter can be used to define the size and coding of the communication object used to communicate the counter value and as a result the unit of measurement of the counter. The values that can be set are:

- 2 bytes unsigned values
- **4 bytes unsigned values (default value)**

The value set for this item will affect the values that can be set for the **“Overflow value”** parameter and the format of the ***Ch.X - Switching operations counter*** communication object. The initial value is always 0, regardless of the format selected.

The **“Overflow value”** parameter is used to set the maximum value of the switching operations counter; in fact, it is possible to set the maximum counter value - i.e. the value beyond which the counter is in an overflow condition.

Depending on the value set for the **"Switching operations counter value format"** parameter, the values that can be set for this item will be different:

- If the counter format is **2 bytes unsigned values**, the ***Ch.X - Switching operations counter*** communication object (Data Point Type: 7.001 DPT_Value_2_Ucount) is displayed and the values that can be set for the above parameter are:

  - from 0 to **65535 (default value)**, in steps of 1

- If the counter format is **4 bytes unsigned values**, the ***Ch.X - Switching operations counter*** communication object (Data Point Type: 12.001 DPT_Value_4_Ucount) is displayed and the values that can be set for the above parameter are:

  - from 0 to **4294967295 (default value)**, in steps of 1

When the maximum value is reached, the count stops until a reset command is implemented.

The device uses the ***Ch.X - Switching operations counter overflow*** object (Data Point Type: 1.002 DPT_Bool) to indicate the overflow of the switching operations counter. When the overflow occurs, a value of "1" is sent; a value of "0" is sent when the counter is reinitialised.

The device uses the ***Ch.X - Switching operations counter reset*** object (Data Point Type: 1.015 DPT_Reset) to receive the counter reinitialisation command that brings the count back to its initial value of 0. The "0" value is ignored but, if a value of "1" is received, the counter value is reset at the initial value and the ***Ch.X - Switching operations counter overflow*** object is set at "0".

The **"Counter value sending condition"** parameter is used to define the conditions for sending the current value of the operating time counter. The values that can be set are:

- send on demand only
- **send in case of change** **(default value)**
- send periodically
- sends on change and periodically

selecting **send in case of change** or **sends on change and periodically** displays the **"Minimum counter variation for sending value"** parameter, whereas if you select **send periodically** or **sends on change and periodically**, the **"Counter sending period"** parameter will be visualised.
Selecting the value **send on demand only**, no new parameter will be enabled because the operating time counter value is not sent spontaneously by the device; only in the case of a status read request will it send the user a telegram in response to the command received, giving information about the current value of the counter.
After a BUS voltage reset, the value of the counter should be sent in order to update any connected devices.

The **"Minimum counter variation for sending value"** parameter, which is visible if the operating time counter value is sent on change, is used to define the minimum variation of the counter (in relation to the last value sent) that causes the new value to be spontaneously sent. The values that can be set are:

- from 1 to 100, in steps of 1 **(default value 10)**

The unit of measurement of the minimum variation is the same as that set for the counter format.

The **"Counter sending period [seconds]"** parameter, which is visible if the operating time counter value is sent periodically, is used to define the frequency for spontaneously sending telegrams indicating the current counter value. The values that can be set are:

- from 1 to 255, in steps of 1 **(default value 15)**

In the event of a voltage failure, the operating time counter value must be saved in a non-volatile memory and reset when the supply voltage is reset.

5 Priority of channel X functions

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

Function	Priority	
On/off switching	1	low
Timed switching	1	
Delayed switching	1	
Blinking	1	
Scene	1	
Logic function (if used for enabling of commands)	2	
Relay status following a load reconnection command	3	
Relay status after safety time	4	
Relay status after forced positioning	5	
Relay status on block deactivation	6	
Relay status on BUS voltage reset	7	
Blinking mode on BUS voltage reset	8	
Slave load control	9	
Relay deactivation due to absorption limit threshold exceeded	10	
Safety	11	
Forced positioning	12	
Block	13	
Local push-button (for “test on/off” function)	14	
Load control function on power supply reset	15	
Safety status on BUS voltage reset	16	
Forced positioning status on BUS voltage reset	17	
Block function on download/BUS voltage reset (if value = active)	18	
Relay status on voltage failure (open)	19	high

To sum up, in normal operating conditions the device behaves as shown in the flow chart below:

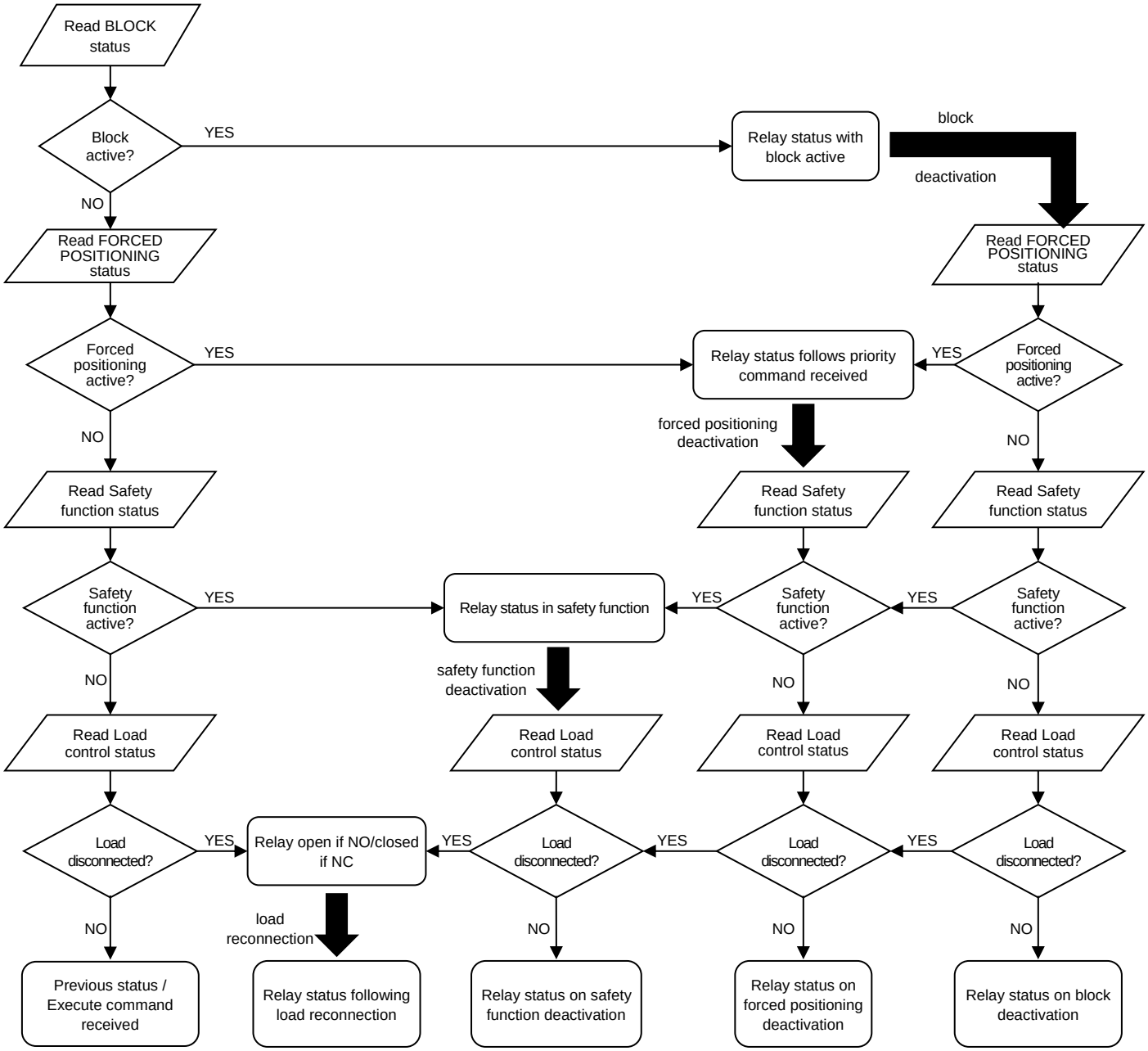


Fig. 5.1: Flow chart for normal operation

When the BUS voltage is reset, the device behaves as shown in the following flow diagram:

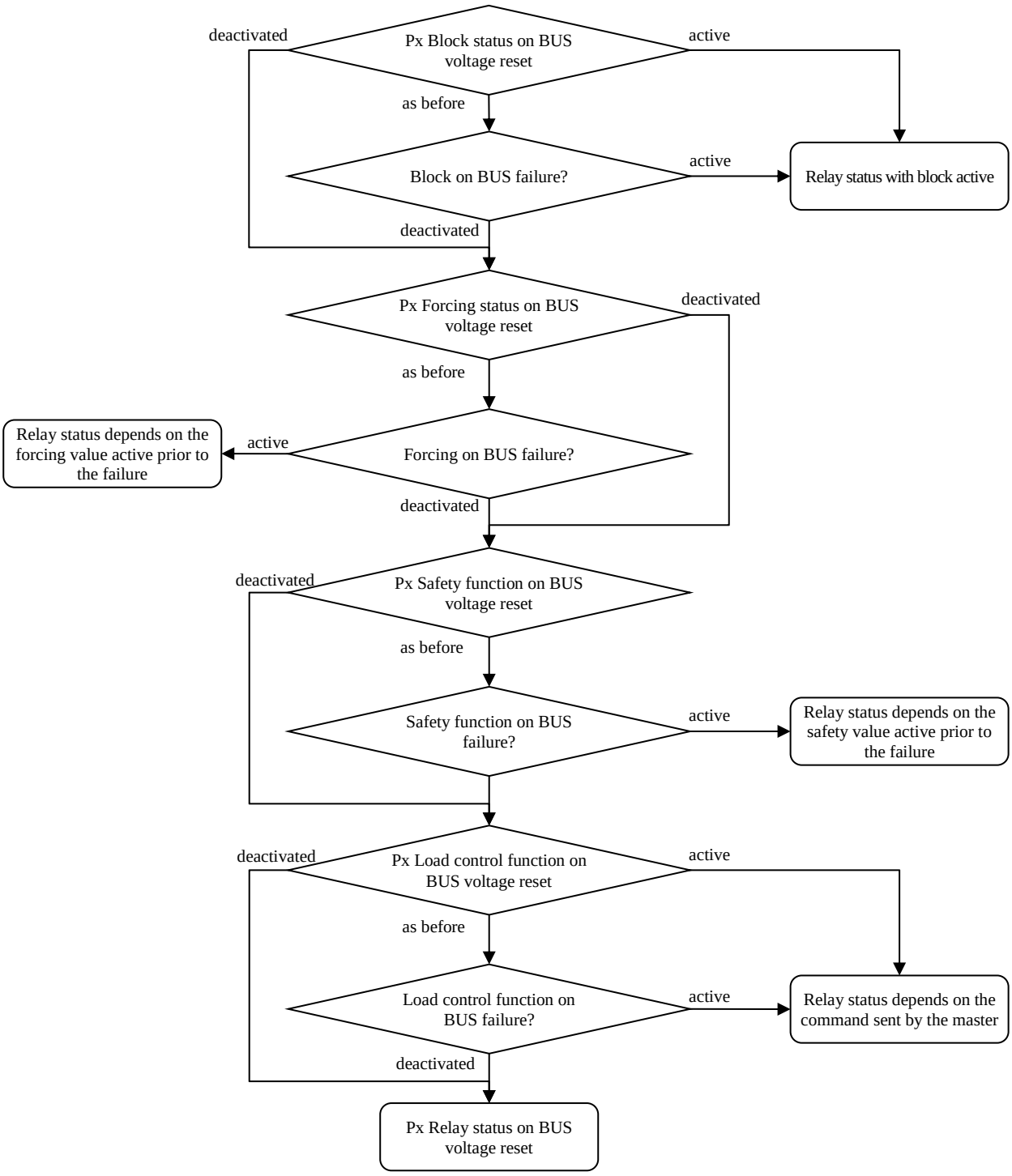


Fig. 5.2: Flow chart for BUS voltage reset

6 Local command elements on the device

The device has a button key on the front, for programming the KNX physical address.

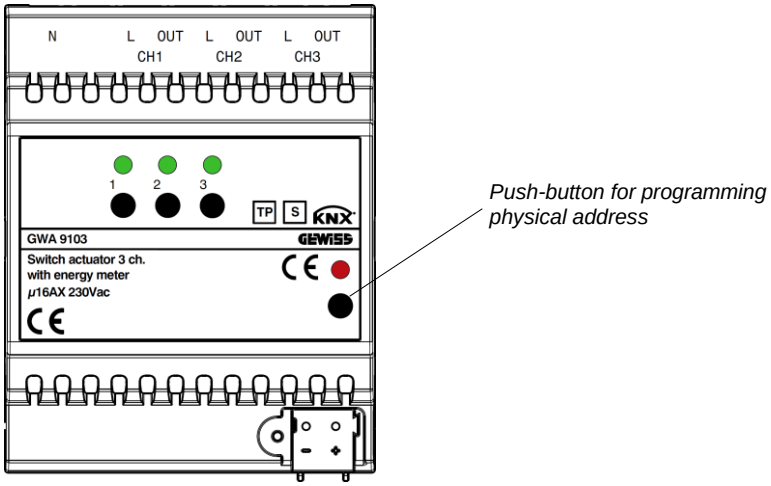


Fig. 6.1: Push-button for programming the physical address

When the push-button is pressed, the device goes into physical address programming mode. It will maintain this status until the physical address is downloaded from ETS. The device will quit physical address programming mode if the programming button key is pressed again when it is already in this mode.

The device has three front push-buttons for relay command; their operation depends on the **"Channel X local key function**" parameter of the "Main" menu.

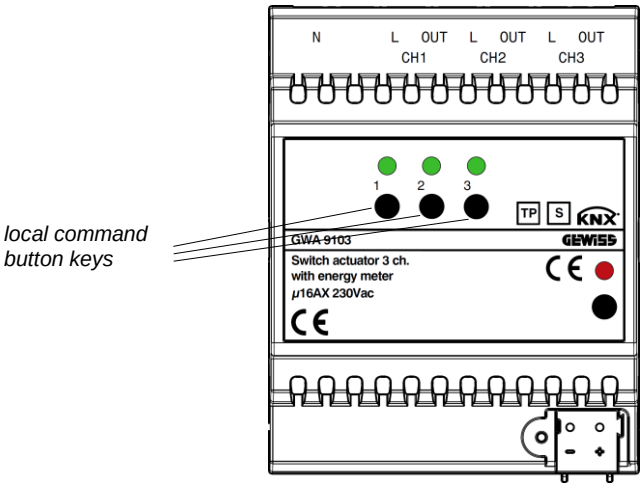


Fig. 6.2: Local command button keys

The local button keys can be used with or without the BUS voltage, but in both cases with the 230V voltage on at least one of the channels. If there is no BUS voltage, the local push-button allows the cyclical switching of the relay status regardless of the function configured.

7 Visualisation elements

The device is equipped with:

1 red LED on the front of the device

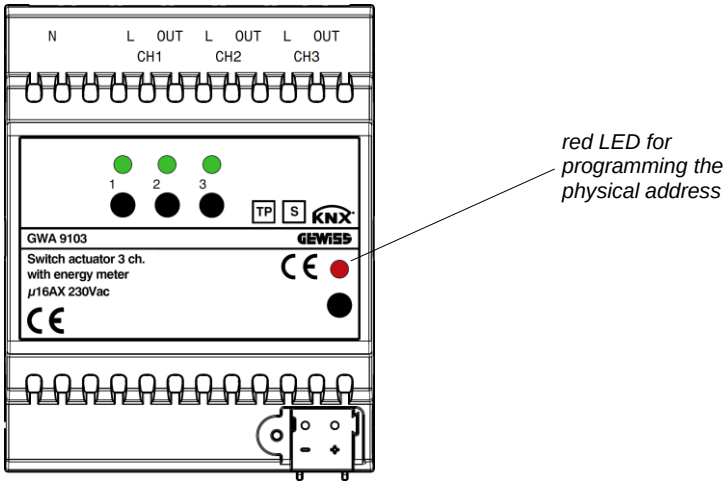


Fig. 7.1: LED for programming the physical address

The LED indicates the presence of KNX BUS voltage / physical address programming mode signalling.
The LED is ON when the device is in KNX physical address programming mode and the KNX BUS voltage is present. The LED switches off automatically when the physical address is downloaded via ETS, or by pressing the programming push-button with the LED illuminated.
The LED is also used to signal a download in progress from ETS, and the deletion of the application by ETS (see Signal of ETS download in progress/application deleted).

1 green front LED (for each channel)

The LEDs indicate the status of the load:
FIXED ON → load active (closed or open, depending on the **"Contact type"** set in the "Channel x settings" menu)
OFF → load deactivated (closed or open, depending on the **"Contact type"** set in the "Channel x settings" menu)

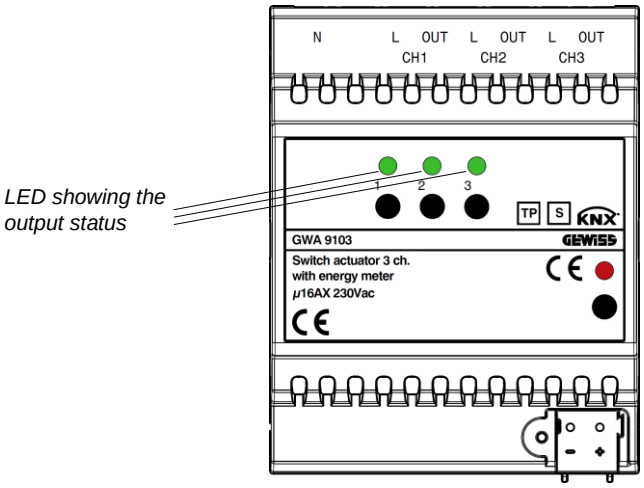


Fig. 7.2: LED for visualising the output status

8 Signalling of ETS download in progress / application deleted

During the download of the ETS application, the red physical address programming LED blinks cyclically approx. every 1.5 seconds. The LED is deactivated at the end of the download.

Following the “delete application” command from ETS, the device switches to the “no configuration” status; in this case too, the red physical address programming LED blinks cyclically approx. every 1.5 seconds. The signalling is only deactivated after a new ETS application download.

9 Communication objects

The communication objects are listed in the following table:

Outputs:

#			Object name	Function of object	Description	Datapoint type
Ch 1	Ch 2	Ch 3				
0	60	120	Ch.x - Status	On/Off status	Sends the status of the load connected to the output	1.001 DPT_Switch
18	78	138	Ch.x - Logical operation outcome	Logic	Logic function output	1.002 DPT_Bool
20	80	140	Ch.x - Loads control slave function enabling status	Switching On/Off	Indicates the activation status of the load control slave function	1.003 DPT_Enable
22	82	142	Ch.x - Slave status for loads control	1=Locked/0=Unlocked	Indicates the load status set by the load control slave function	1.001 DPT_Switch
24	84	144	Ch.x - Absorption limit threshold enabling status	Switching On/Off	Indicates the activation status of the load absorption limit threshold	1.003 DPT_Enable
26	86	146	Ch.x - Absorption limit threshold current value	Value in Watt [W]	Indicates the current value of the load absorption limit threshold	14.056 DPT_Value_Power
27	87	147	Ch.x - Absorption limit threshold exceeded	Value 1/0	Sends the signal associated with the exceeded limit threshold	1.002 DPT_Bool
28	88	148	Ch.x - Period above absorption limit threshold counter	Value 0 .. 2147483647 [s]	Sends the counter value (expressed in seconds)	13.100 DPT_LongDeltaTimeSec
28	88	148	Ch.x - Period above absorption limit threshold counter	Value 0 .. 65535 [min]	Sends the counter value (expressed in minutes)	7.006 DPT_TimePeriodMin
28	88	148	Ch.x - Period above absorption limit threshold counter	Value 0 .. 65535 [h]	Sends the counter value (expressed in hours)	7.007 DPT_TimePeriodHrs
29	89	149	Ch.x - Period above absorption limit threshold counter overflow	Overflow status	Sends the counter overflow signal	1.002 DPT_Bool
31	91	151	Ch.x - Absorption limit threshold number of exceedances counter	Value 0 .. 65535	Sends the counter value	7.001 DPT_Value_2_Ucount
31	91	151	Ch.x - Absorption limit threshold number of exceedances counter	Value 0 .. 4294967295	Sends the counter value	12.001 DPT_Value_4_Ucount
32	92	152	Ch.x - Absorption limit threshold number of exceedances counter overflow	Overflow status	Sends the counter overflow signal	1.002 DPT_Bool
35	95	155	Ch.x - Safety status	Switching On/Off	Indicates the activation status of the safety function	1.003 DPT_Enable
37	97	157	Ch.x - Priority command status	On/Off forced positioning status	Forces the load to an on/off value	2.001 DPT_Switch_Control
39	99	159	Ch.x - Block status	Active/Not active	Indicates the activation status of the block function	1.003 DPT_Enable
40	100	160	Ch.x - Operating time counter	Value 0 .. 2147483647 [s]	Sends the counter value (expressed in seconds)	13.100 DPT_LongDeltaTimeSec
40	100	160	Ch.x - Operating time counter	Value 0 .. 65535 [min]	Sends the counter value (expressed in minutes)	7.006 DPT_TimePeriodMin
40	100	160	Ch.x - Operating time counter	Value 0 .. 65535 [h]	Sends the counter value (expressed in hours)	7.007 DPT_TimePeriodHrs
41	101	161	Ch.x - Operating time counter overflow	Overflow status	Sends the counter overflow signal	1.002 DPT_Bool
43	103	163	Ch.x - Switching operation counter	Value 0 .. 65535	Sends the counter value	7.001 DPT_Value_2_Ucount
43	103	163	Ch.x - Switching operation counter	Value 0 .. 4294967295	Sends the counter value	12.001 DPT_Value_4_Ucount
44	104	164	Ch.x – Switching operation counter overflow	Overflow status	Sends the counter overflow signal	1.002 DPT_Bool

46	106	166	Ch.x - Active consumed energy primary counter	Value in watt hours [Wh]	Indicates the current value of the primary counter for active consumed energy	13.010 DPT_ActiveEnergy
46	106	166	Ch.x - Active consumed energy primary counter	Value in kilowatt hours [kWh]	Indicates the current value of the primary counter for active consumed energy	13.013 DPT_ActiveEnergy_kWh
47	107	167	Ch.x - Active consumed energy primary counter overflow	Overflow status	Sends the primary counter overflow signal	1.002 DPT_Bool
49	109	169	Ch.x - Active consumed energy differential counter	Value in watt hours [Wh]	Indicates the current value of the differential counter for active consumed energy	13.010 DPT_ActiveEnergy
49	109	169	Ch.x - Active consumed energy differential counter	Value in kilowatt hours [kWh]	Indicates the current value of the differential counter for active consumed energy	13.013 DPT_ActiveEnergy_kWh
51	111	171	Ch.x - Active consumed energy differential counter overflow	Overflow status	Sends the differential counter overflow signal	1.002 DPT_Bool
53	113	173	Ch.x - Measured active power	Value in Watt [W]	Indicates the current value of active consumed power	14.056 DPT_Value_Power
54	114	174	Ch.x - Measured reactive power	Value in volts amps reactive [var]	Indicates the current value of reactive consumed power	14.xxx 4-byte float value
55	115	175	Ch.x - Measured apparent power	Value in Volt Ampere [va]	Indicates the current value of apparent consumed power	14.xxx 4-byte float value
56	116	176	Ch.x - Measured power factor	Value -1 .. +1	Indicates the current value of the power factor	14.057 DPT_Value_Power_Factor
57	117	177	Ch.x - Measured RMS voltage	Value in Volt [V]	Indicates the current value of the mains voltage	9.020 DPT_Value_Volt
58	118	178	Ch.x - Measured RMS current	Value in Ampere [A]	Indicates the current value of the current	9.021 DPT_Value_Curr
59	119	179	Ch.x - Measured frequency	Value in Hertz [Hz]	Indicates the current value of the mains frequency	14.033 DPT_Value_Frequency

Inputs:

#			**Object name**	**Function of object**	**Description**	**Datapoint type**
Ch 1	**Ch 2**	**Ch 3**				
1	61	121	Ch.x - Switch	On/Off	Receives the load activation/deactivation commands	1.001 DPT_Switch
2	62	122	Ch.x – Delayed switching	On/Off	Receives the commands for load activation/deactivation with delay	1.001 DPT_Switch
3	63	123	Ch.x - Delay on activation	Set value	Activation delay value	7.005 DPT_TimePeriodSec
4	64	124	Ch.x - Delay on deactivation	Set value	Deactivation delay value	7.005 DPT_TimePeriodSec
5	65	125	Ch.x - Timed switch	Start/Stop	Receives the timed activation start/stop commands	1.010 DPT_Start
6	66	126	Ch.x - Stairs light activation time	Set value	Stair raiser light timing value	7.005 DPT_TimePeriodSec
7	67	127	Ch.x - Blinking	Switching On/Off	Receives the activation/deactivation commands for load blinking mode	1.001 DPT_Switch
8	68	128	Ch.x - Scene	Execute/Store	Used to store/execute scenes	18.001 DPT_SceneControl
9	69	129	Ch.x - Scene storing enabling	Enable/Disable	Enables/disables scene learning	1.003 DPT_Enable
10	70	130	Ch.x - Logic input 1	Logic function input	Logic function input	1.002 DPT_Bool
11	71	131	Ch.x - Logic input 2	Logic function input	Logic function input	1.002 DPT_Bool
12	72	132	Ch.x - Logic input 3	Logic function input	Logic function input	1.002 DPT_Bool
13	73	133	Ch.x - Logic input 4	Logic function input	Logic function input	1.002 DPT_Bool
14	74	134	Ch.x - Logic input 5	Logic function input	Logic function input	1.002 DPT_Bool
15	75	135	Ch.x - Logic input 6	Logic function input	Logic function input	1.002 DPT_Bool
16	76	136	Ch.x - Logic input 7	Logic function input	Logic function input	1.002 DPT_Bool

17	77	137	Ch.x - Logic input 8	Logic function input	Logic function input	1.002 DPT_Bool
19	79	139	Ch.x - Enable loads control slave function	Enable/Disable	Receives the load control slave function activation/deactivation commands	1.002 DPT_Bool
21	81	141	Ch.x - Slave switching for loads control	1=Load lock/0=Load unlock	Receives the load disconnection/reconnection commands for the load control function	1.001 DPT_Switch
23	83	143	Ch.x - Enable absorption limit threshold	Enable/Disable	Receives the absorption limit threshold activation/deactivation commands	1.002 DPT_Bool
25	85	145	Ch.x - Limit absorption threshold value input	Value in watt [W]	Receives the absorption limit threshold values	14.056 DPT_Value_Power
25	85	145	Ch.x - Absorption limit threshold adjustment	1=Increase/0=Decrease	Receives the increase/decrease commands for the absorption limit threshold value	1.007 DPT_Step
30	90	150	Ch.x - Period above absorption limit threshold counter reset	1=Reset/0=No action	Receives the counter value reset command	1.015 DPT_Reset
33	93	153	Ch.x - Absorption limit threshold number of exceedances counter reset	1=Reset/0=No action	Receives the counter value reset command	1.015 DPT_Reset
34	94	154	Ch.x - Safety	Monitoring	Used to monitor a sensor for the safety function	1.002 DPT_Bool
36	96	156	Ch.x - Priority command	On/Off forced positioning	Forces the load to an on/off value	2.001 DPT_Switch_Control
38	98	158	Ch.x - Block	Switching On/Off	Blocks the status of a load in a condition that can be parameterised	1.002 DPT_Bool
42	102	162	Ch.x - Operating time counter reset	1=Reset/0=No action	Receives the counter value reset command	1.015 DPT_Reset
45	105	165	Ch.x - Switching operation counter reset	1=Reset/0=No action	Receives the counter value reset command	1.015 DPT_Reset
48	108	168	Ch.x - Active consumed energy primary counter reset	1=Reset/0=No action	Receives the counter value reset command	1.015 DPT_Reset
50	110	170	Ch.x - Active consumed energy differential counter trigger	1=Start counting/0=Stop	Receives the start/stop count commands for the differential counter	1.010 DPT_Start
52	112	172	Ch.x - Active consumed energy differential counter reset	1=Reset/0=No action	Receives the counter value reset command	1.015 DPT_Reset

cod. 70194204

Punto di contatto indicato in adempimento ai fini delle direttive e regolamenti UE applicabili:
Contact details according to the relevant European Directives and Regulations:
GEWISS S.p.A. Via A.Volta, 1 IT-24069 Cenate Sotto (BG) Italy tel: +39 035 946 111 E-mail: qualitymarks@gewiss.com

SAT

+39 035 946 111
8.30 - 12.30 / 14.00 - 18.00
lunedì ÷ venerdì - monday ÷ friday

24h +39 035 946 260

sat@gewiss.com
www.gewiss.com

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