In-/Output and Shutter, 48-fold

KNX TP Multi IO 570.1 *secure*

Operation and installation manual

(Art. # 5543)

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Content

1 Application

The KNX TP Multi IO 570.1 *secure* is a universal binary interface for building control. It provides 48 I/O lines. Each line can be used as binary input as well as binary output. The peripherals can be fed by an external voltage of 24 V=. Channels which are configured as inputs can be used to control lights or blinds via the KNX network. They also can be used to count impulses, e.g. as interface for energy meters.

Channels which are configured as outputs can directly drive signal LEDs, external coupling relays (e.g. 590) or jalousie relays (592). The integrated USB interface allows establishing a bidirectional connection between a PC and the KNX bus. The USB connector has a galvanic separation from the KNX bus. Both ETS (Version 5.7 or later) and visualization tools support this interface. The configuration of the device is done with ETS, a local download is possible.

An easy to read OLED display on the front panel enables a manual operation to test the installation.

The device supports KNX Data Security.

USB Interface

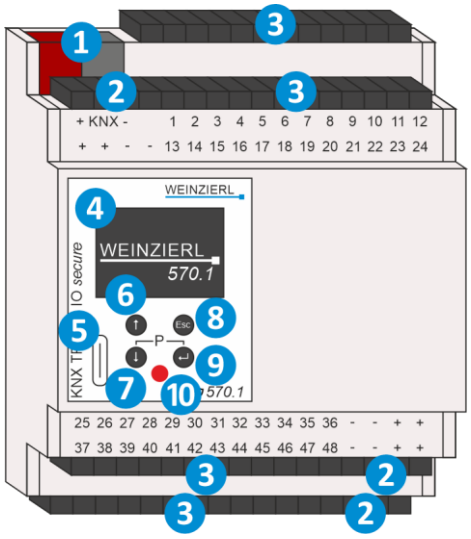
The KNX TP Multi IO 570.1 *secure* has an integrated KNX USB Interface for bus access. It is used for programming with ETS® (ETS5 or higher).

Via the integrated USB interface the KNX TP Multi IO 570.1 *secure* can be programmed locally with ETS5.5 (or higher).

The integrated USB interface supports KNX Long frames for a faster download in KNX devices that support long frames.

2 Installation and connection

The KNX TP Multi IO 570.1 *secure* is designed for installation on a DIN rail (35 mm) with a width of 4 units (72 mm). An installation-friendly design with pluggable screw terminals helps to reduce the cost of commissioning. It features the following controls (6 7 9 10) and displays (4 8):



1. KNX Connector
2. Power Supply
3. Inputs and Outputs 1-48
4. OLED Display
5. USB-C Connector
6. Up Button
7. Down Button
8. Escape Button
9. Enter Button
10. LED for Prog. Mode

If bus or supply voltage are missing, the device has no (or limited) function.

2.1 Settings

The settings of the device can be accessed via:

- Local display on the device (partly)
- ETS (Version 4.2 or higher)

The KNX Programming Mode is activated/deactivated by simultaneously pressing the buttons 7 10 – when activated the programming LED 8 lights up.

2.2 KNX programming mode

The KNX programming mode is activated/deactivated by simultaneously pressing the buttons (P) 7 and 9.

When the programming mode is active, the programming LED 10 light up red.

The operation/visualization of the programming mode on the front can be activated/deactivated in the ETS® on page general settings.

2.3 Manual operation and status display

The red LED on the front panel is used to display the KNX programming mode and errors. The LED can have the following states:

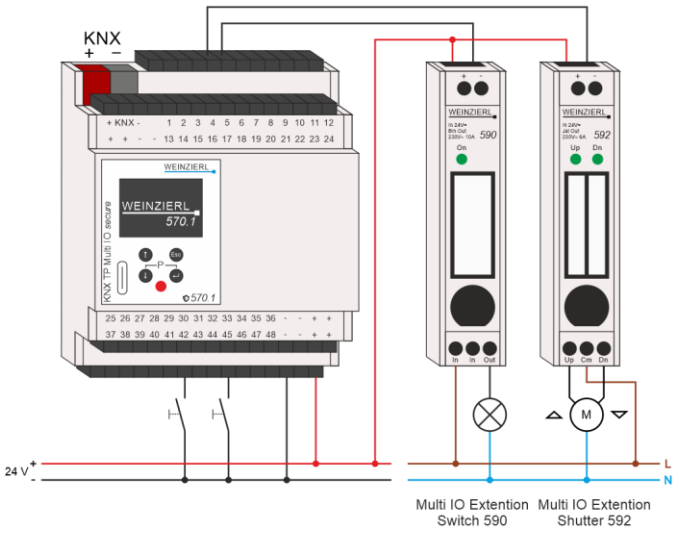
LED Status	Meaning
LED off	The programming mode is not active and there is no error (normal operating mode).
LED on	The programming mode is active, any errors are not visualized/notified by the LED, but can be read on the display.
LED flashes quickly	The programming mode is not active. The rapid flashing indicates the following fault: The device is not loaded correctly, for example, a cancelled download.

3 Reset to factory default settings

In the factory default settings, the device has the physical address 15.15.255 and no group addresses are connected. Also, KNX Data Security is disabled and the initial key (FDSK) must be used for secure commissioning.

The device can be reset to factory default settings via the device display.

4 Wiring scheme



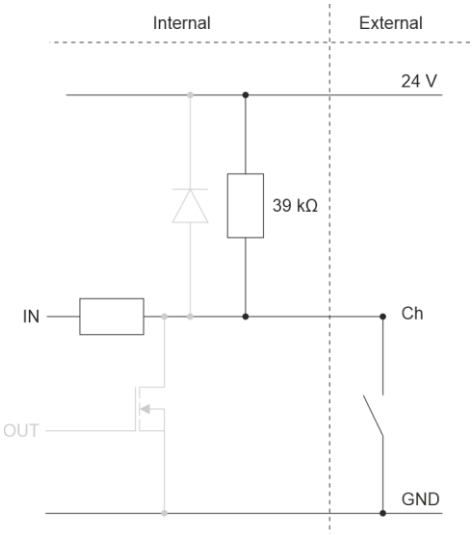
4.1 Inputs and Outputs

Each channel can be used as binary input or as binary output.

Channel as Input

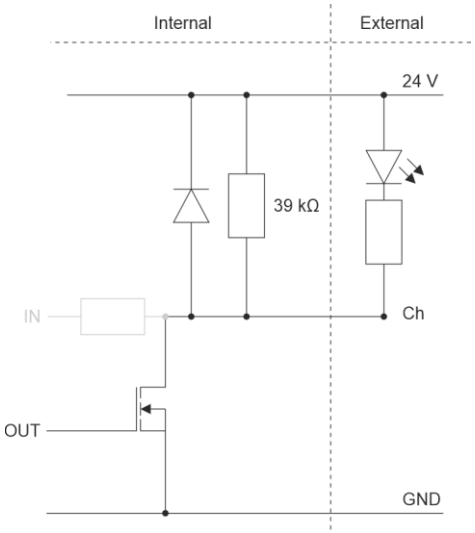
Dry contacts or S0 counter outputs can be directly connected to the inputs (“-” terminal).

- Voltage at the input contacts: SELV
- Max. cable length 30 m
- Galvanically isolated from the bus



Channel as Output (directly)

Loads of up to 100 mA can be connected directly to a switching output. LED indicators can thus be realized via a series resistor.



Channel as Output via standard coupling relay

For switching loads like 230 V lights, each output can drive standard coupling relays with max. 100 mA.

Channel as Output via bistable coupling relay

To reduce the holding current of the coupling relay, the outputs can be used together with the **Multi IO Extension 590**. This coupling relay is controlled like a monostable relay but is implemented internally with a bistable relay. The holding current decreases depending on comparison type up to 95 %.

Channel as Output for Shutter

To use an output of the KNX Multi IOs for the control of blinds or shutters, the **Multi IO Extension 592** is required. This coupling relay is controlled with only one channel, but switches with two integrated relays both directions.

4.2 Power supply

The KNX Multi IO 48 has the following galvanically separated circuit parts:

Input and outputs

The inputs and outputs are supplied with a voltage of 24 V DC. When dimensioning the power supply, ensure that appropriate loads at the outputs are considered (for example, coupling relays).

Manual operation via the display is possible when this supply voltage is present.

KNX

The KNX bus has to be connected here. When the bus voltage is available, manual operation is possible via the display, but the inputs and outputs can only be accessed when the 24 V is present.

USB

The USB port is for communication only, it does not provide power to the device.

4.3 Pin assignment

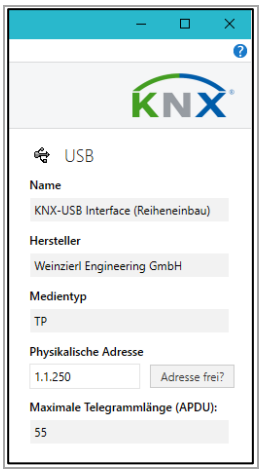
Connection	Icon	Description
1-48	1-48	Connector Channel 1-48 Input or Output supplied with a voltage of 24 V DC
Power	+	Positive connection for supply voltage (24V)
Power	-	Negative connection for supply voltage (24V)
KNX	+	Positive connection for KNX bus
KNX	-	Ground connection for KNX bus

4.4 Local download via USB

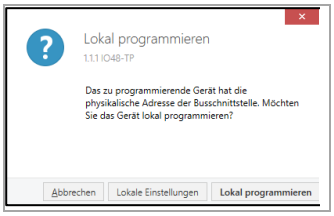
The internal application can be loaded both with an additional interface via the KNX bus or locally via the integrated USB interface. When using an additional interface the download is done conventionally but there may not be any USB connection on KNX TP Multi IO 570.1 *secure*.

For local download via the integrated USB interface, the following differences should be noted:

	Reaction with the ETS 5.5
via ETS menu “connection/interfaces”	
Individual address	Possible without programming mode but no automatic adoption into ETS project (see picture of ETS below)
via project “programming”	
Individual address & application program	The complete download is executed over the bus at slow speed. The change of the individual address may not be taken over with the connection and may cause inconsistencies later on.
Partial	The download is executed automatically at high speed.
Individual address	The download is executed over the bus. The change of the individual address may not be taken over with the connection.
Application program	The download is executed automatically at high speed.



Setting of local address-es in the ETS menu “connection / Interfaces”

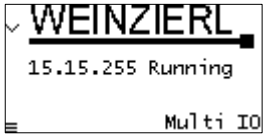


Local download in the ETS 5.5

The integrated USB Interface does not support the bus monitor mode.

5 Direct Setting via display on device

5.1 Startup and idle display



During startup of the device, the individual address and the status of the application is displayed. The device name “Multi IO” can be changed within the ETS parameter settings.

The status can be one of the following values:

- Running: Application is loaded and running
- Stopped: The application is stopped 8 LED for Programming Mode is flashing
- Unloaded: The application is not loaded 8 LED for Programming Mode is flashing
- Loading: The application is currently loading by ETS
- Host: USB Connection established
- USB local: Local download via USB is executed

After 10 minutes of inactivity the display will turn into screen-saver mode (blank screen with a bouncing dot) to safe display life time. Press any key to turn the display on again.

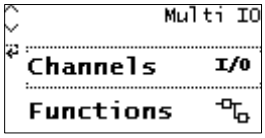
5.2 Menu

By pressing 7 (arrow down) you enter the main menu of the device. By pressing 10 (enter) you enter the submenus. Within the menus you can use 6 (arrow up) and 7 (arrow down) for navigation; 10 (enter) is for confirmation and 9 (escape) is to cancel / go back / one level higher.

The left display edge shows symbols, which allow the following options of action:

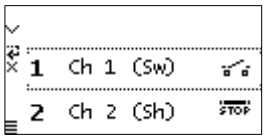
✕	ESC 9	Quit menu
✎	Return 10	Change value(s)
^	Arrow up 6	Cursor up
v	Arrow down 7	Cursor down
↵	Return 10	Enter selection

5.2.1 Channels

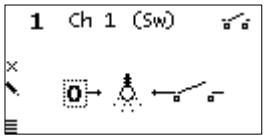


The device supports 48 channels, which can be used as output (switching, blinds) or input. The channel functions must be defined in the parameter settings of the ETS database. Dort kann der Status jedes Kanals abgefragt und manuell geändert werden.
After downloading the application, the freely selectable channel name is displayed in the respective menu item. In the submenus, this name is used as a header. There, the status of each channel can be checked and changed manually.

5.2.2 Actuator

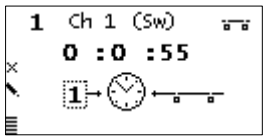


5.2.2.1 Submenu Actuator – Function: Universal output



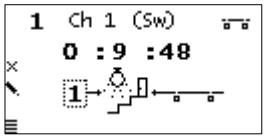
The output can be switched with the enter 10 key.

5.2.2.2 Submenu Actuator – Function: On and off delay



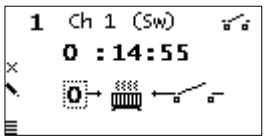
The function is activated with the enter key 10. Depending on the parameterization, the remaining switching time is displayed.

5.2.2.3 Submenu Actuator – Function: Staircase



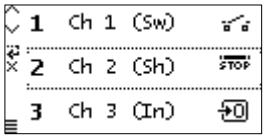
The function is activated with the enter key 10. In addition the remaining time until the output will be switched off, is displayed.

5.2.2.4 Submenu Actuator – Function: Valve actuator



The function is activated with the enter key 10. Depending on the parameterized PWM window, this function switches the output. The remaining time to the next switching action is displayed.

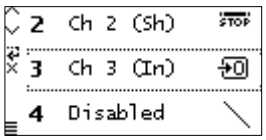
5.2.3 Shutter



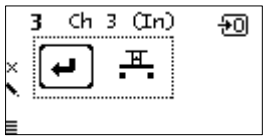
5.2.3.1 Submenu Shutter

With the arrow keys 6 and 7, a step or stop command can be realized manually by a short press. With a long press, a movement command in the respective direction is started.

5.2.4 Input

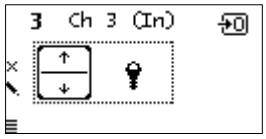


5.2.4.1 Submenu Input – Function: Switch



The switching state at the input is displayed upper right. The function can be triggered manually with the enter key 10.

5.2.4.2 Submenu Input – Function: Dimming

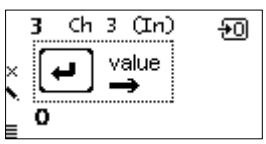


The switching state at the input is displayed upper right. The dimming function is triggered manually with the arrow keys 6 and 7.

5.2.4.3 Submenu Input – Function: Shutter

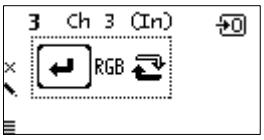
The switching state at the input is displayed upper right. The function is triggered manually with the arrow keys 6 and 7.

5.2.4.4 Submenu Input – Function: Send value



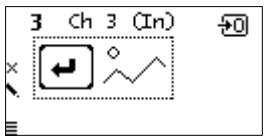
The switching state at the input is displayed upper right. The function is triggered manually with the enter key 10. The value to send is displayed below.

5.2.4.5 Submenu Input – Function: Color



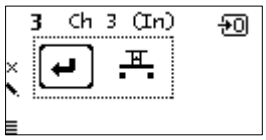
The switching state at the input is displayed upper right. The function is triggered manually with the enter key 10.

5.2.4.6 Submenu Input – Function: Scene



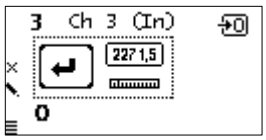
The switching state at the input is displayed upper right. The function is activated manually with the enter key 10.

5.2.4.7 Submenu Input – Function: Generic



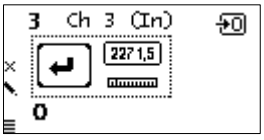
The switching state at the input is displayed upper right. The function can be triggered manually with the enter key 10.

5.2.4.8 Submenu Input – Function: Impulse counter



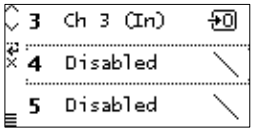
The switching state at the input is displayed upper right. The function is triggered manually with the enter key 10. The current counter value is displayed at the bottom.

5.2.4.9 Submenu Input – Function: Operation time counter

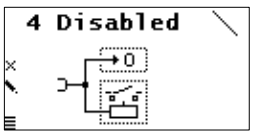


The switching state at the input is displayed upper right. The function is triggered manually with the enter key 10. The operation time in sceonds is displayed at the bottom.

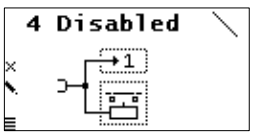
5.2.5 Disabled (Channel not active)



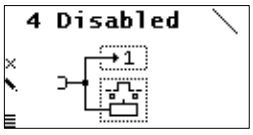
If a channel has not been parameterized, the basic functions are available for manual operation anyway.



The channel is open, indicating the logic level of the terminal. With the enter key 10, the output can be switched over.

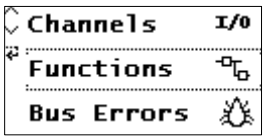


The channel is switched on. The output can be changed using the enter key 10.



The channel is in the shutter mode, which can be tested in conjunction with the shutter relay (Multi IO Extension 592). With the enter key 10, the output can be switched over.

5.3 Functions

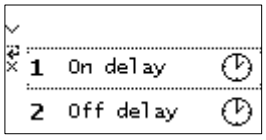


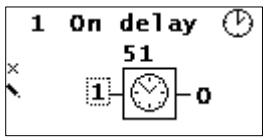
The device supports up to **16 Timer and Logic functions**. These functions have to be defined within ETS parameter settings. After application download, the freely selectable function label will be shown in each function menu entry as well as within the function submenu as headline.

All logical inputs and outputs correspond with a group object. The current values are shown in the graphical representation.
A question mark (?) is shown if the value is not yet valid because it was not yet received from bus or is not yet sent to the bus. A logical gate sends output values only if all input values are valid.

5.3.1 Timer

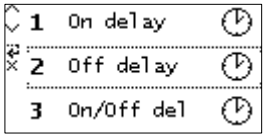
5.3.1.1 On delay (switch on delay)

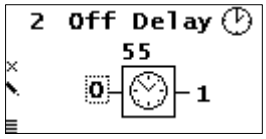




Timer that switches ON after defined duration (in seconds, set via the ETS). After pressing 10 (enter) countdown will start. To stop countdown, press 10 (enter) again during countdown.

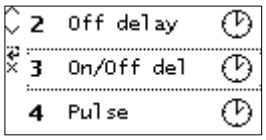
5.3.1.2 Off delay (switch off delay)

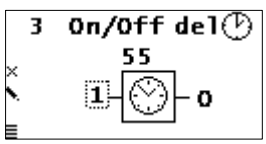




Timer, der nach einer definierten Dauer (in Sekunden, über die ETS einstellbar) ausschaltet. Mit 10 (Enter) wird der Timer gestartet. Der Timer kann durch erneutes Drücken der Taste 10 (Enter) gestoppt werden.

5.3.1.3 On/Off delay (Switch on and switch off delay)

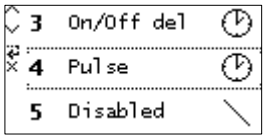


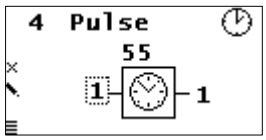


Timer that switches ON & OFF after defined duration (in seconds, set via the ETS). After pressing 10 (enter) countdown will start and the timer will turn on. After first countdown is finished, press 10 (enter) again to start countdown to turn off.

To stop countdown, press 10 (enter) again during countdown.

5.3.1.4 Pulse (impulse and staircase function)

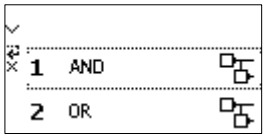


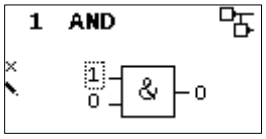


Zeitfunktion, die nach dem Einschalten automatisch nach einer festgelegten Dauer (in Sekunden, über die ETS einstellbar) ausschaltet. Durch 10 (Enter) wird der Impuls Timer gestartet. Der Timer kann durch erneutes Drücken der Taste 10 (Enter) gestoppt werden.

5.3.2 Logic

5.3.2.1 AND



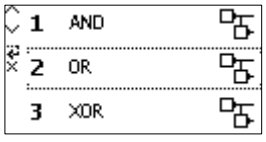


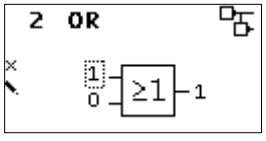
Mit den Pfeiltasten 6 und 7 kann zwischen den beiden Eingängen gewechselt werden. Mit der Taste Return 10 kann der logische Eingangswert geändert werden.

The output is triggered on (1) if both inputs are switched on (1).

Input A	Input B	Output
0	0	0
0	1	0
1	0	0
1	1	1

5.3.2.2 OR



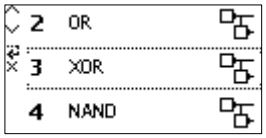


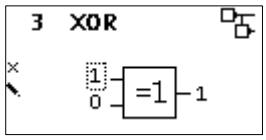
The arrow keys 6 and 7 can be used to switch between the two inputs. The enter key 10 can be used to change the logical input value.

The output is triggered on (1) if one or both inputs are switched on (1).

Input A	Input B	Output
0	0	0
0	1	1
1	0	1
1	1	1

5.3.2.3 XOR



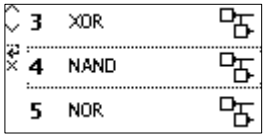


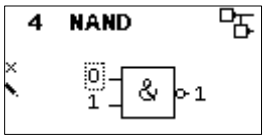
The arrow keys 6 and 7 can be used to switch between the two inputs.
The enter key 10 can be used to change the logical input value.

The output is triggered on (1), if the two inputs are not equal.

Input A	Input B	Output
0	0	0
0	1	1
1	0	1
1	1	0

5.3.2.4 NAND



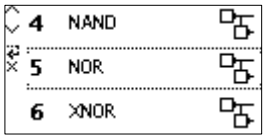


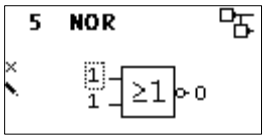
The arrow keys 6 and 7 can be used to switch between the two inputs.
The enter key 10 can be used to change the logical input value.

The output is triggered on (1) if one or both inputs are switched off (0).

Eingang A	Eingang B	Ausgang
0	0	1
0	1	1
1	0	1
1	1	0

5.3.2.5 NOR



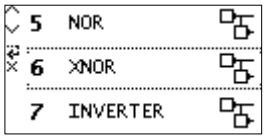


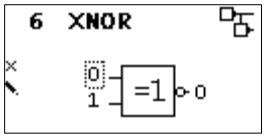
The arrow keys 6 and 7 can be used to switch between the two inputs.
The enter key 10 can be used to change the logical input value.

The output is triggered on (1) if both inputs are switched off (0).

Input A	Input B	Output
0	0	1
0	1	0
1	0	0
1	1	0

5.3.2.6 XNOR



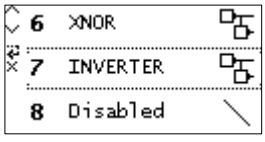


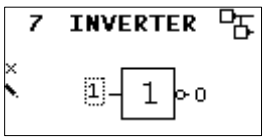
The arrow keys 6 and 7 can be used to switch between the two inputs.
The enter key 10 can be used to change the logical input value.

The output is triggered on (1) if both inputs are switched off (0).

Input A	Input B	Output
0	0	1
0	1	0
1	0	0
1	1	1

5.3.2.7 Inverter



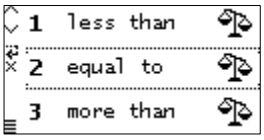


The enter key 10 can be used to change the logical input value.

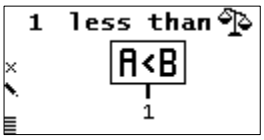
Input on (1) is converted into output off (0). Input off (0) is converted into output on (1).

Input A	Input B	Output
0	0	1
0	1	0

5.3.3 Comparison

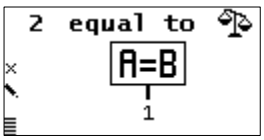


5.3.3.1 A < B



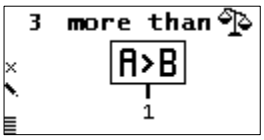
Shows whether the value of Input A is smaller than the value of Input B.

5.3.3.2 A = B



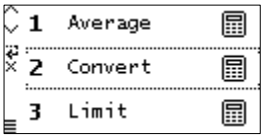
Shows whether the value of Input A is equal to the value of Input B.

5.3.3.3 A > B

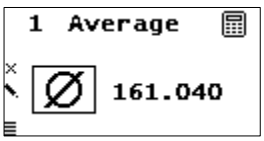


Shows whether the value of Input A is greater than the value of Input B.

5.3.4 Calculation

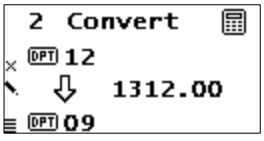


5.3.4.1 Average of Input A and B



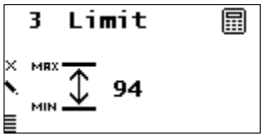
Shows the average value between the values of Input A and Input B.

5.3.4.2 Convert value



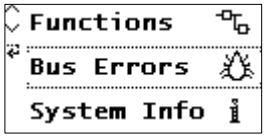
Shows the converted value of Input A and the datapoint types of the input (top) and the result (bottom).

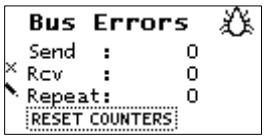
5.3.4.3 Limit value



Shows the limited value of Input A.

5.4 Bus Errors



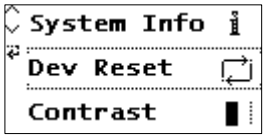


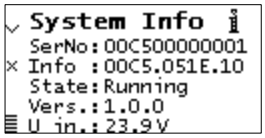
In this submenu, you can display bus errors and reset the bus error counters by pressing 10 (enter).

The following errors are counted:

- Send errors: Send failed after final repetition due to missing ACK, NACK or BUSY.
- Receive errors: Misformed telegrams or telegram fragments received.
- Repetitions: Number of received repeated telegrams. Also own repetitions are counted.

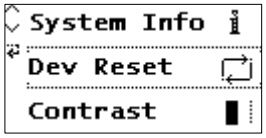
5.5 System Info





This submenu displays **information about the device**: serial number (SerNo), Application-ID (Info), App status (State),Firmware Revision (Vers.) and supply voltage (U in).

5.6 Device Reset



This submenu allows you to restart the device or to reset to factory settings (master reset). Select one option and keep 10 pressed until the small animation is finished and the option is executed.

Master reset will make a new ETS download necessary.

5.7 Contrast

To set the contrast of the display, select this entry in the menu. By pressing ⑩ (enter) several times you can set the contrast to different levels.

6 KNX Security

The KNX standard was extended by KNX Security to protect KNX installations from unauthorized access. KNX Security reliably prevents the monitoring of communication as well as the manipulation of the system.

The specification for KNX Security distinguishes between KNX IP Security and KNX Data Security. KNX IP Security protects the communication over IP while on KNX TP the communication remains unencrypted. Thus, KNX IP Security can also be used in existing KNX systems and with non-secure KNX TP devices.

KNX Data Security describes the encryption on telegram level. This means that the telegrams on the twisted pair bus or via RF (radio frequency) are also encrypted.

Encrypted telegrams are longer than the previously used unencrypted ones. For secure programming via the bus, it is therefore necessary that the interface used (e.g. USB) and any intermediate line couplers support the so called KNX Long Frames.

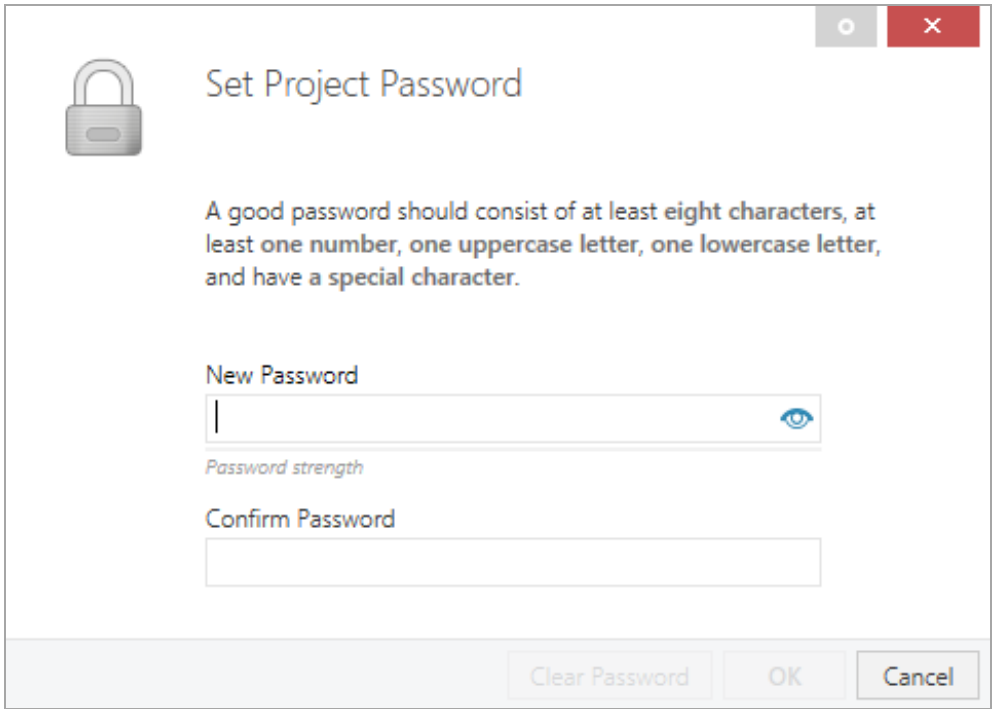
7 ETS database

The ETS 5 database (for ETS 5.7 or newer) can be downloaded from the product website of the KNX TP Multi IO 570.1 *secure* (www.weinzierl.de) or from the ETS online catalogue.

The KNX TP Multi IO 570.1 *secure* supports KNX Data Security to protect the device against unauthorized access from the KNX bus. If the device is programmed via the KNX bus, this is done with encrypted telegrams.

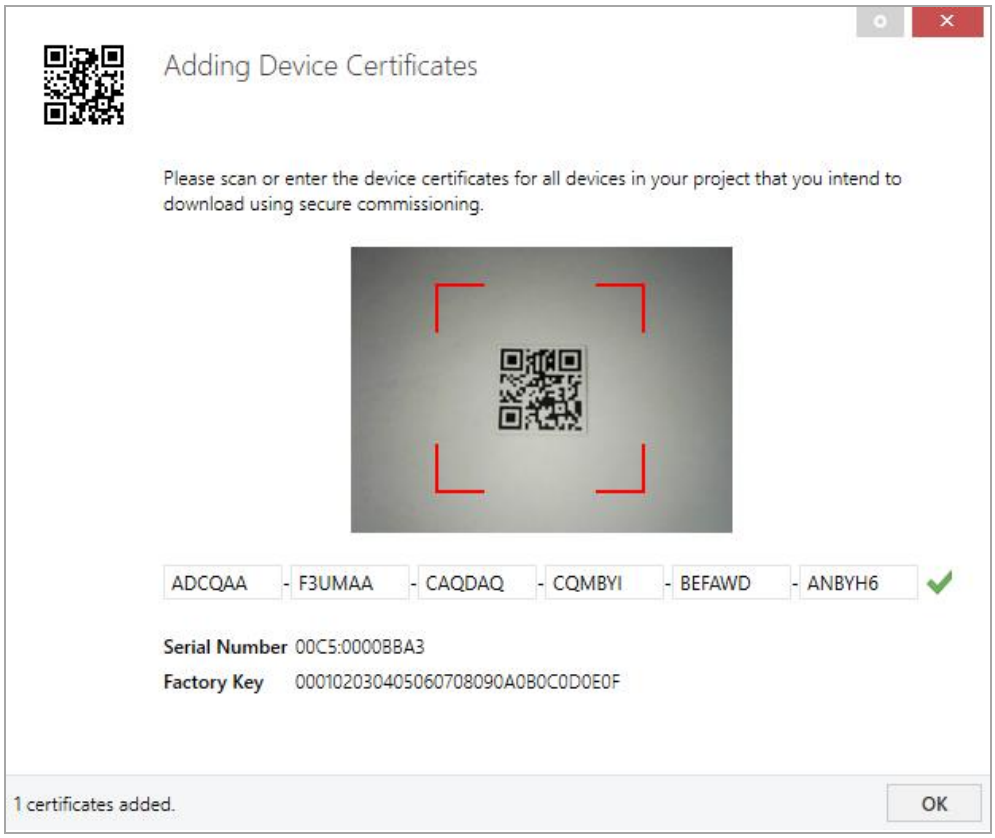
7.1 Secure commissioning

If the first product is inserted into a project with KNX Security, the ETS prompts you to enter a project password.



This password protects the ETS project from unauthorized access. This password is not a key that is used for KNX communication. The entry of the password can be bypassed with "Cancel", but this is not recommended for security reasons.

ETS requires a device certificate for each device with KNX Security that is created in the ETS. This certificate contains the serial number of the device as well as an initial key (FDSK = Factory Default Setup Key).



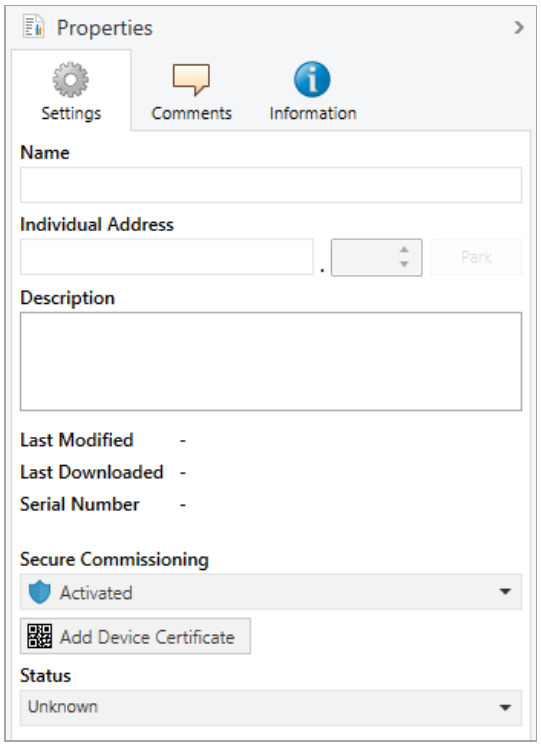
The certificate is printed as text on the device. It can also be scanned from the printed QR code via a webcam.

The list of all device certificates can be managed in the ETS panel Reports – Project Security.

This initial key is required to safely put a device into operation from the start. Even if the ETS download is recorded by a third party, the third party has no access to the secured devices afterwards. During the first secure download, the initial key is replaced by the ETS with a new key that is generated individually for each device. This prevents persons or devices who may know the initial key from accessing the device. The initial key is reactivated after a reset to factory default settings.

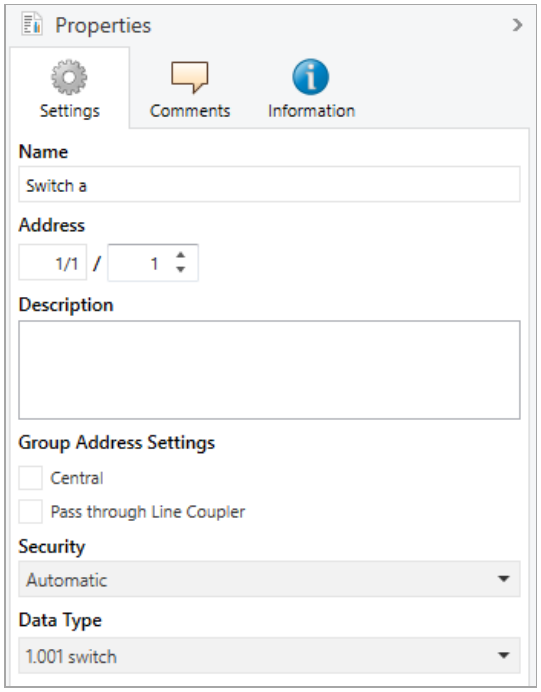
The serial number in the certificate enables the ETS to assign the correct key to a device during a download.

In the ETS project in the properties of the device, secure commissioning can be activated and the device certificate can be added:



7.2 Secure group communication

Each object of the device can communicate either encrypted or unencrypted. The encryption is set under "Security" in the properties of the used group address:



The setting "Automatic" activates encryption if both objects to be connected can communicate encrypted. Otherwise encrypted communication between the objects is not possible.

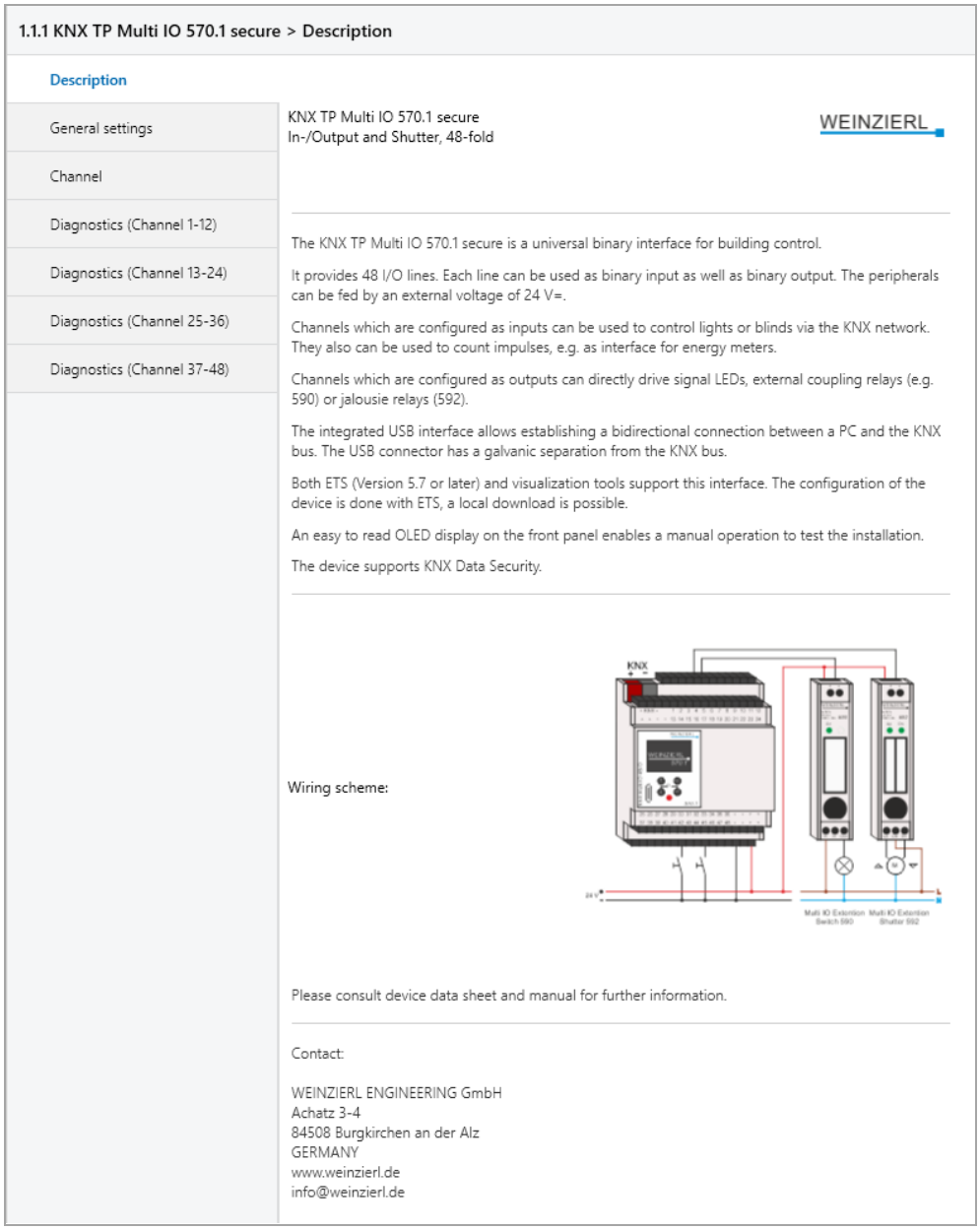
In the overview of communication objects in the ETS project, secured objects can be recognized by a shield symbol:

	Security	Number ▲	Name	Object Function	Description	Group Address
	🛡	11	Button A0: Object a	Switch	Switch a	1/1/1
		12	Button A0: Object b	Switch	Switch b	1/1/2
	🛡	21	Button A1: Object a	Switch	Switch a	1/1/1
		22	Button A1: Object b	Switch	Switch b	1/1/2

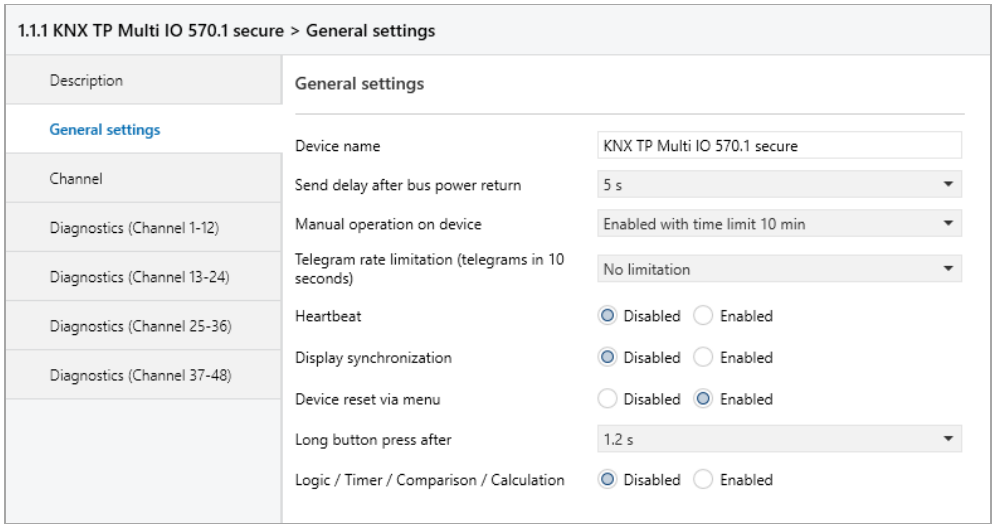
A separate key is automatically generated by the ETS for each secured group address. These keys can also be checked in the ETS panel Reports – Project Security. To enable all devices to communicate with a secure group address, the keys must be known to all. Therefore a download must be made into all devices that use this group address when a key is created or changed. A key is changed by the ETS e.g. when the encryption of a group address is switched off and on again.

7.3 Description

This page provides a general description of the device and the wiring scheme.



7.4 General settings



Device name (30 characters)

The device name can be chosen freely. The maximum length of the name is 30 characters. After the ETS application download the name will be shown within the devices startup and idle display.

Send delay after bus power return

A send delay of telegrams after the return of the bus voltage can be set via this parameter. In this case, telegrams from the device are sent to the KNX bus in a delayed manner by the set time. This results in a reduction of the bus load at a bus power return. Other functions such as receiving telegrams of switching operations of the actuator are not affected by this parameter.

Manual operation on device

This parameter is used to configure the manual operation on the device. The manual operation mode can be disabled or activated (with or without time limitation). The time limit defines the duration until the automatic return from the manual operation mode back into the normal operating mode.

The device is in normal operating mode when the manual control is not active. In the manual operating mode, received switching telegrams are ignored. When the manual operation mode is terminated (after expiry of the time limit or manually), the last state of the outputs remains, until a new switching telegram is received again.

The following options are selectable:

- Disabled
- Enabled with time limit 1 min
- Enabled with time limit 10 min
- Enabled with time limit 30 min
- Enabled without time limit

Telegram rate limitation
Here the telegram rate limitation of the device can be configured. The maximum number of telegrams that can be sent within a time span of 10 seconds can be specified. The following options are selectable:

- No limitation
- 200 telegrams
- 100 telegrams
- 50 telegrams

Heartbeat
Cyclic sending of values to KNX IP, to indicate that the device is operational. For the Cycle time values between 1 min and 24h are selectable.

Group Object	Type KNX	Size	Direction
GO 1 Heartbeat – Trigger	1.001	1 Bit	To KNX

Furthermore, in channel function binary input the parameters Heartbeat and Cycle time are used as configuration for cyclic sending, in case that switching is configured as state query. For a more detailed description regarding state query please take a look at “7.8.2.1 Ch 1 (In): Switching – State query”.

Display synchronization (Enabled / Disabled)

If enabled, a communication object ‘Display synchronization – Trigger’ appears. Each Weinzierl device with a display of this product range provides this parameter. As soon as the device wakes up, the associated group telegram will be sent to the KNX bus which wakes up every other device whose display synchronization group object is associated to the same group address.

Group Object	Type KNX	Size	Direction
GO 2 Display synchronization – Trigger	1.017	1 Bit	From / To KNX

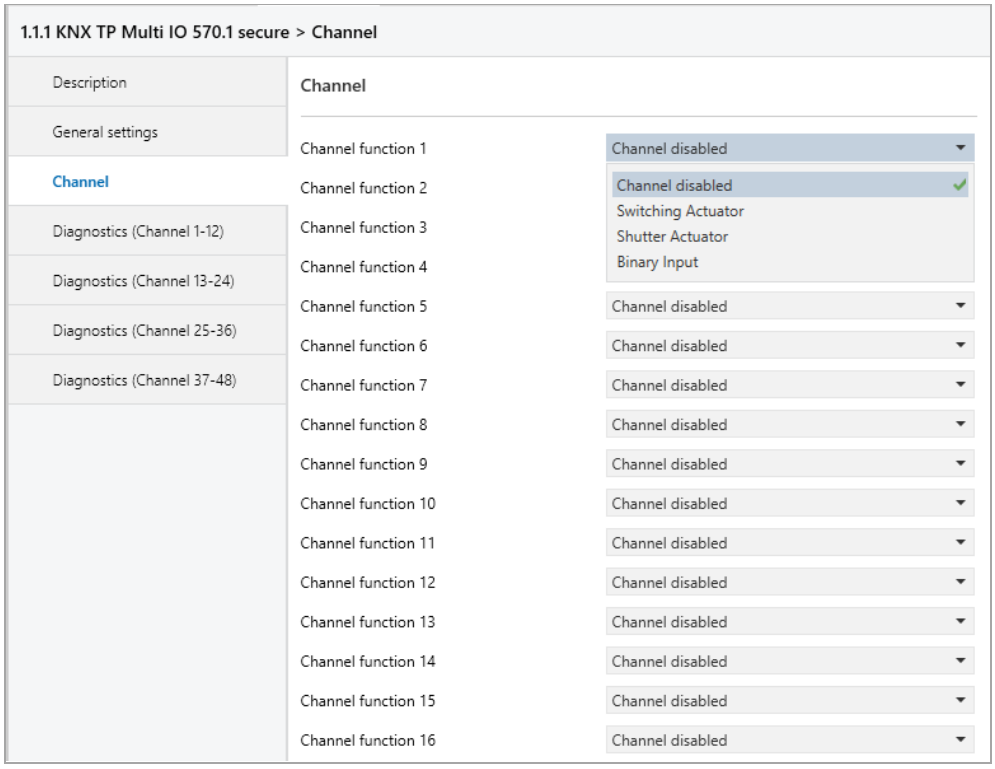
Device reset via menu (Enabled / Disabled)

By disabling this option, the function for resetting the device by its local menu is deactivated.

Long button press after

The time for detection of a long button press can be set here, this time is valid for all input channels.

7.5 Channel



For each of the 48 available channels, a function can be selected.

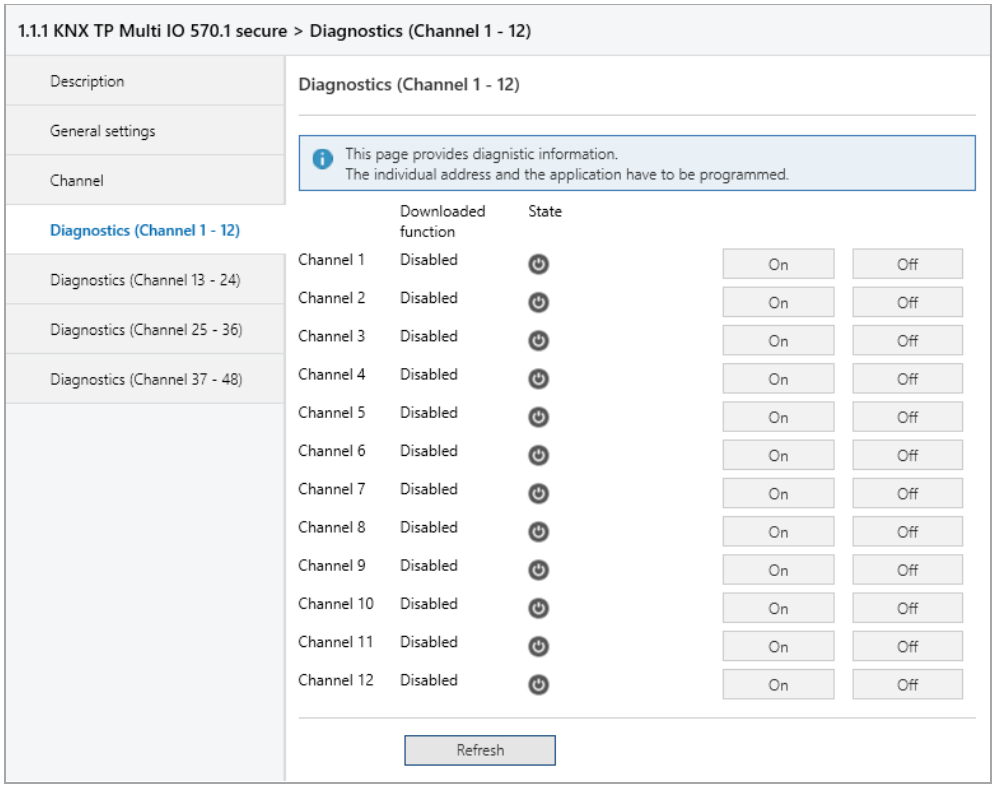
The following options are selectable:

- Channel disabled
- Switching Actuator
- Shutter Actuator
- Binary Input

Detailed information on the respective channel functions can be found in the following chapters.

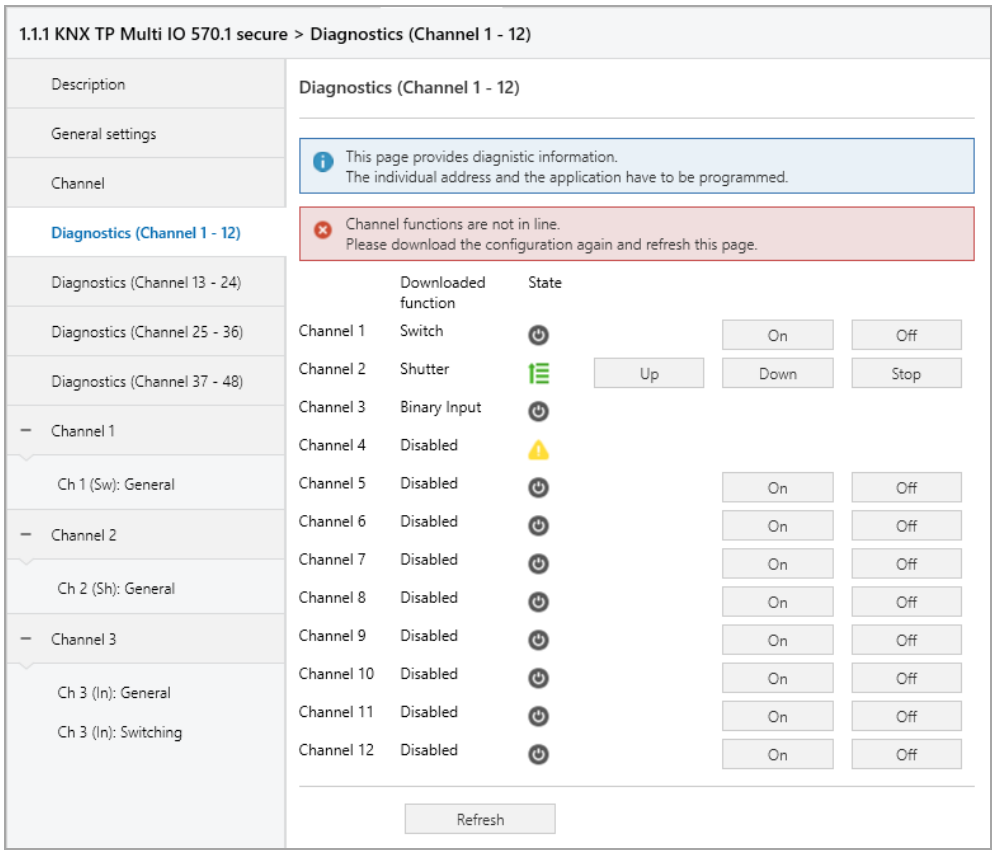
7.6 Diagnose

7.6.1 Activation



This parameter page allows diagnostic data to be displayed directly in the ETS without having to read out group objects. The current status of each channel is displayed. To activate diagnostics, the physical address must be programmed. The current statuses of the channels can then be displayed by clicking the “Refresh” button. This also activates control via the diagnostics page.

7.6.2 Control



For diagnostic purposes, the controller data can be read during runtime using the "Refresh" button.

Downloaded function

Displays the function loaded in the device.

- Unknown: Diagnostics was not refreshed
- Disabled
- Switch: Function “Switching Actuator” downloaded
- Shutter: Function “Blinds Actuator” downloaded
- Binary Input: Function “Binary Input” downloaded

Function: Switching actuator

Following functions/information is available:

- **State:** Shows if the actuator is active (On: , Off:)
- **An/Aus:** Aktor schalten

Function: Blinds actuator

Following functions/information is available:

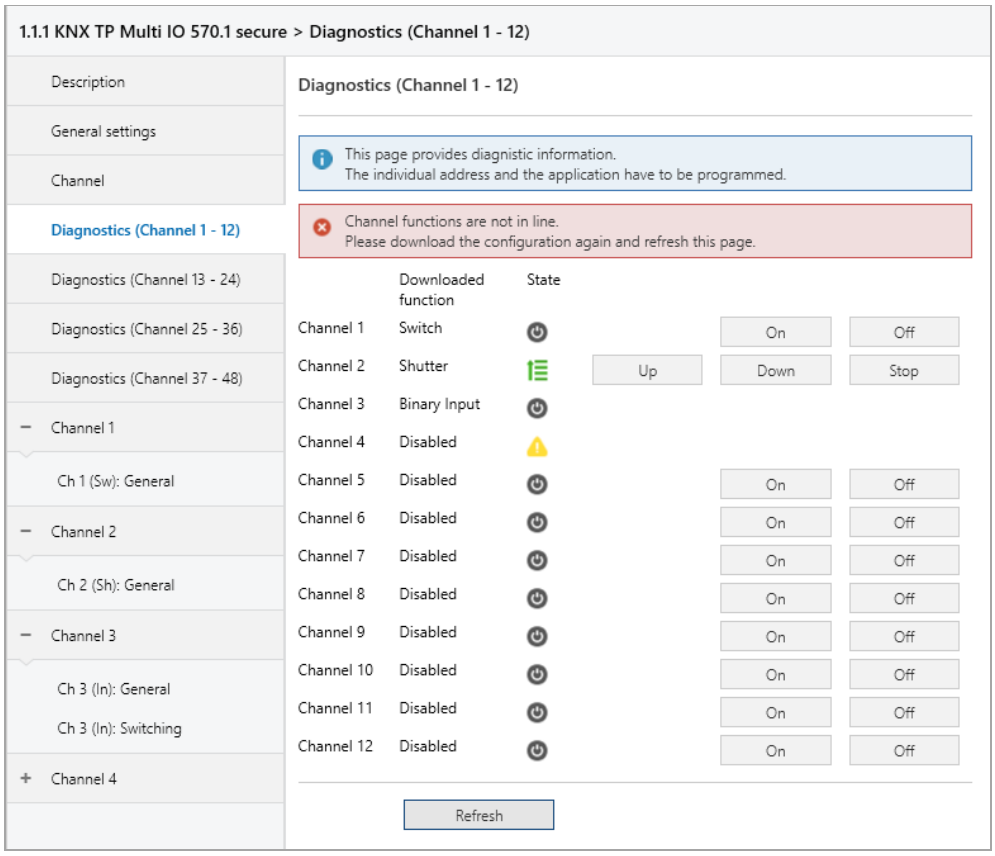
- **State:** Shows the direction of the blinds actuator (Up: , Down: , Stop:)
- **Up/Down/Stop:** Control shutter

Function: Binary Input

Following information is available:

- **State:** Shows if the input is active (On: , Off:)

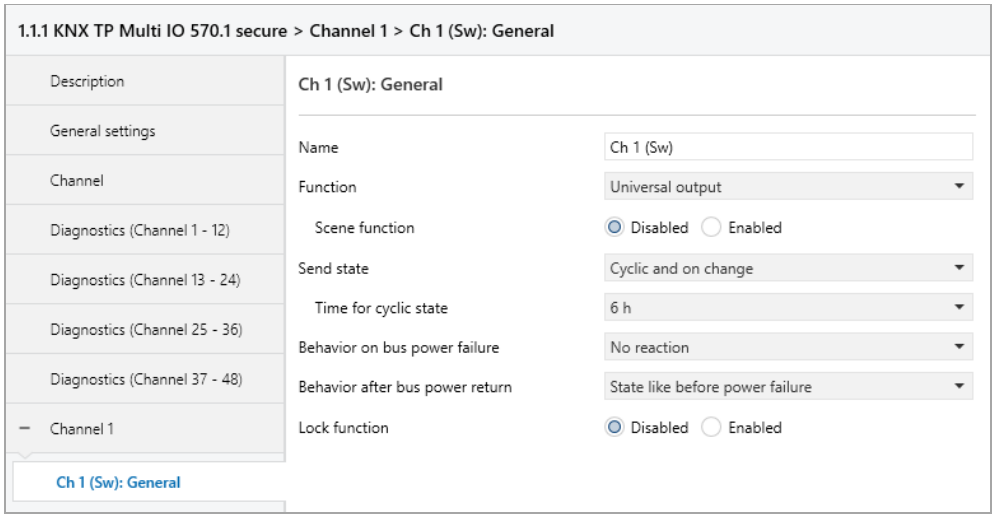
7.6.3 Warning



If the programmed function and the function selected in ETS do not match, a warning is displayed and this channel can no longer be controlled via the diagnostics page. To resolve the warning, either the new configuration must be downloaded or the changes in ETS must be reversed. Then click “Refresh” and the channel can be controlled again.

7.7 Channel function: “Switching Actuator”

7.7.1 Ch 1 (Sw): General



Name (30 Characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named “Actuator …”. In the following, the first channel is described, the functionality of the remaining channels is analog.

The name is displayed on the device display with a maximum of 10 characters.

Function

This parameter defines the functionality of the actuator The following options are selectable:

- Disabled
- Universal output
- On/Off delay
- Staircase function
- Valve actuator (PWM for thermal servo)

A more detailed description of the functions can be found in the individual function descriptions under Function (…).

If the actuator is not “Disabled”, the following parameters are displayed:

Behavior on bus power failure

The behavior which is held at the output during the bus power failure can be configured here.

The following options are selectable:

- No reaction
- Switch on
- Switch off

Behavior after bus power return

Here the behavior of the output after bus power return can be configured. This behavior will be set after every device restart (e.g. also on restart after ETS download).

The following options are selectable:

- No reaction
- Switch on
- Switch off
- State like before bus power failure

Send state

This parameter defines the behavior of the state objects:

- Disabled
  State objects are deactivated and not displayed
- Only on read
  State objects send only on request
- On change
  State objects send on value change
- Cyclic and on change
  State objects send cyclically and on value change

Group Object	Type KNX	Size	Direction
GO 18 Ch 1 (Sw): Output - State	1.001	1 Bit	To KNX
GO 19 Ch 1 (Sw): Valve actuator (PWM) – State*	5.001	1 Byte	To KNX

** if valve actuator was selected*

Time for cyclic state

Is selected state object “Cyclic and on change”, in this parameter the cycle time can be set.

Lock function

With this parameter the lock function can be enabled. If this functionality is activated, the associated group objects as well as the parameter page “Lock function” are displayed for further configuration. If the lock has been activated via the group object "Lock", the received switching telegrams are not executed.

In addition to the lock object, there is also a priority object, which can be switched independently of the lock. Thus, it is possible to set an output state without affecting other functions.

Group Object	Type KNX	Size	Direction
GO 15 Ch 1 (Sw): Sperre - Aktivieren	1.001	1 Bit	Von KNX
GO 16 Ch 1 (Sw): Prior. Ausgang - Schalten	1.001	1 Bit	Von KNX

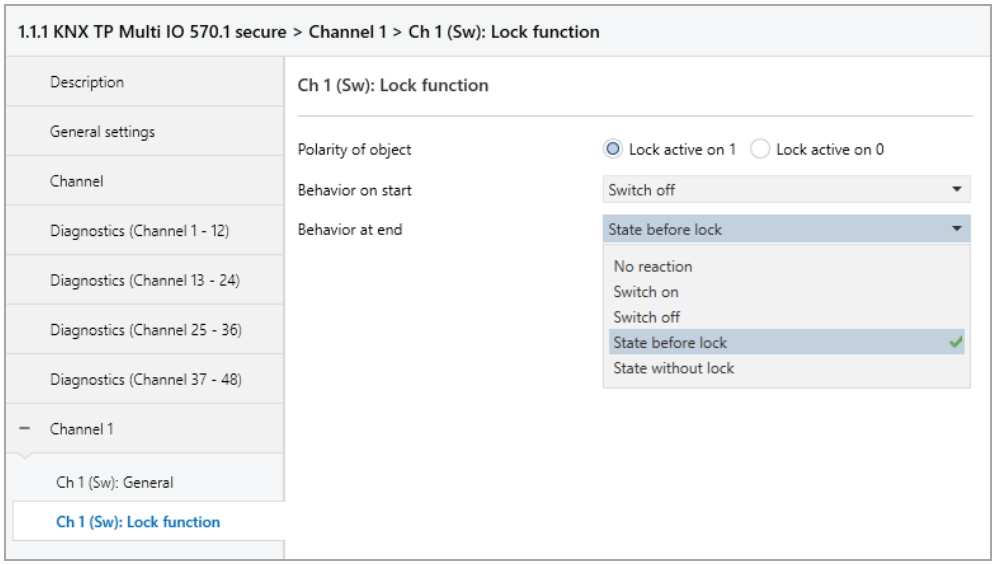
Example of the priority object:

In the case of events in public buildings or in restaurants, the normal operation can be set into an inoperative state by the lock group object.

Thus it is possible to lock during the lecture or concert, switches that are accessible to unauthorized persons, in order to prevent unmeant switching.

Nevertheless, the individual lamps can controlled by use of the priority object without canceling the lock.

7.7.2 Ch 1 (Sw): Lock function:



Polarity of object

This parameter configures, which state the output should set, if the lock activates.
The following options are selectable:

- No reaction
- Switch on
- Switch off

This output state can still be changed by the priority object.

Behavior at end

This parameter defines, which state the output should set, if the lock deactivates.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- State before lock
- State without lock

State before lock:

This restores the original state before the lock was activated. Switching telegrams received during the lock are ignored.

State without lock:

Here the state of the last received switching telegram is restored. This takes into account the received switching telegrams during the lock. Thus, when the lock is deactivated, the last received switching telegram is set.

Behavior at end

This parameter defines, which state the output should set, if the lock deactivates.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- State before lock
- State without lock

State before lock:
This restores the original state before the lock was activated. Switching telegrams received during the lock are ignored.

State without lock:
Here the state of the last received switching telegram is restored. This takes into account the received switching telegrams during the lock. Thus, when the lock is deactivated, the last received switching telegram is set.

Function (Universal output)

If the universal output is selected on the parameter page "General", the actuator can be used as a switching output. A parameter for the scene function is also displayed.

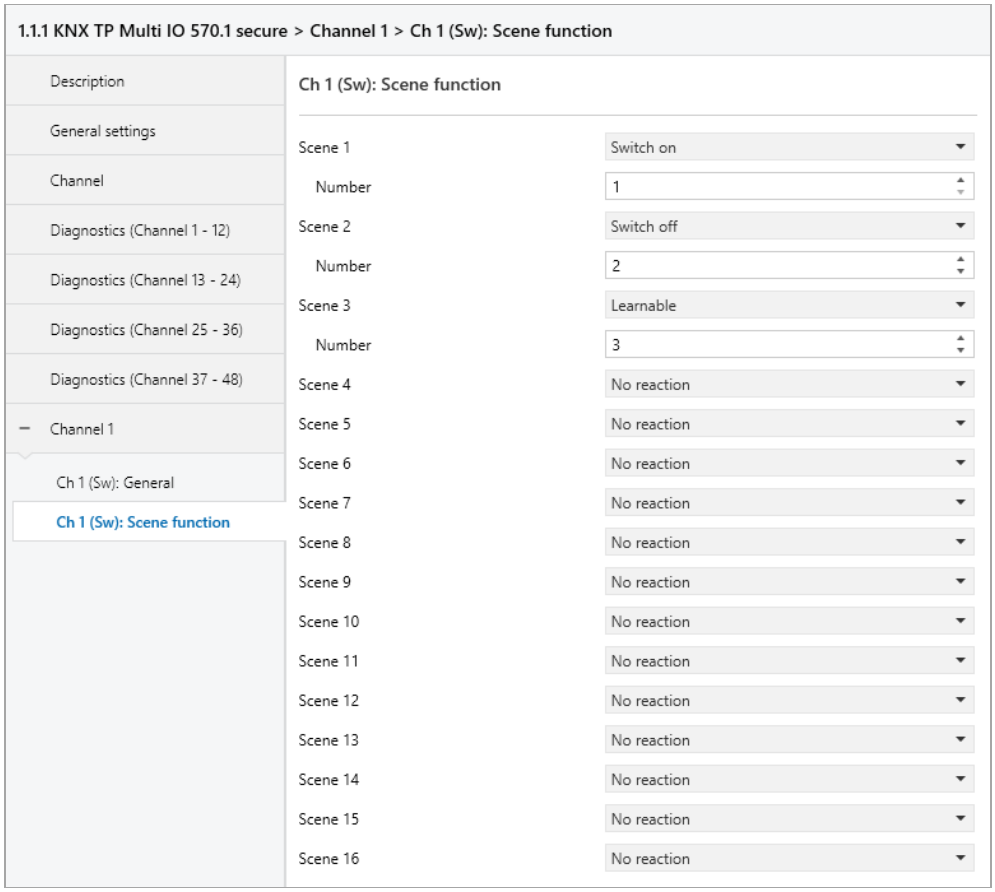
Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (Sw): Output - Switch	1.001	1 Bit	From KNX

Scene function

With this parameter the scene function can be enabled or disabled. If this functionality is enabled, the respective group object as well as the parameter page "Scene function" are displayed for further configuration of scenes 1-16.

Group Object	Type KNX	Size	Direction
GO 12 Ch 1 (Sw): Scene – Activ./Lrn.	18.001	1 Bit	From KNX

7.7.3 Ch 1 (Sw): Scene function



Scene 1-16

These parameters can be used to configure the state, which is set at the output when the respective scene is executed.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- Learnable

Learnable:
By using a scene control telegram, the current state at the output can be saved for the respective scene. This allows the user to customize the scene without ETS download.

Number

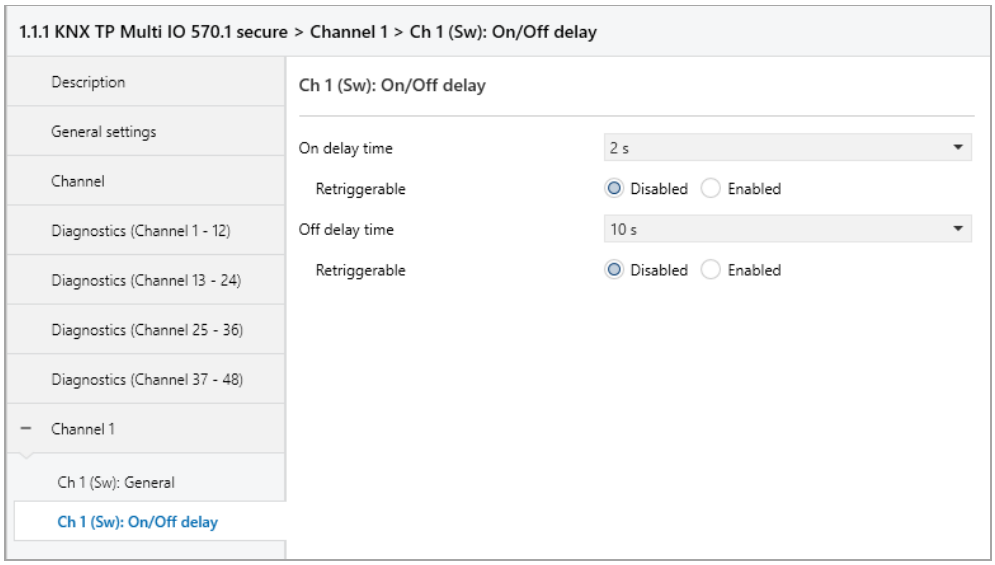
This parameter sets any scene number between 1 and 64 to the scene. There must not configured any scene numbers twice.

Function (On/Off delay)

If the ON/OFF delay is selected on the parameter page "General", delayed switching times can be configured. The "On/Off Delay" parameter page is displayed for this purpose.

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (Sw) Output - Switch	1.001	1 Bit	From KNX

7.7.4 Ch 1 (Sw): On/Off delay



On delay time

The duration of the switch-on delay is configured in this parameter.

Input -------1----------0----------

Output -------|-T-1----------0----------

Off delay time

The duration of the switch-off delay is configured in this parameter.

Input -------1----------0----------

Output -------1----------|-T-0------

Retriggerable

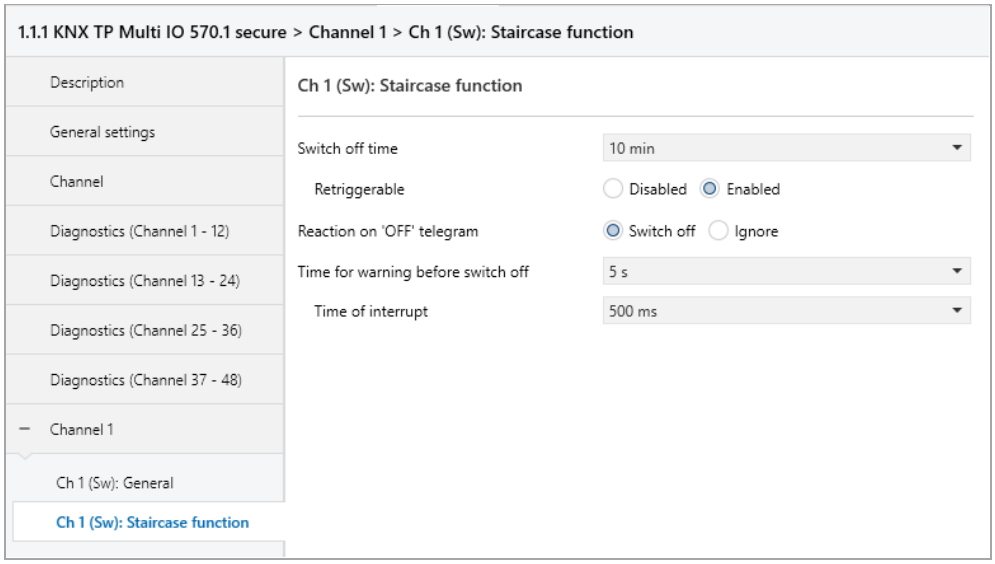
If these parameters are activated, the respective delay time is restarted upon receipt of the corresponding switching signal.

Function (Staircase function)

If the staircase function is selected on the parameter page "General", a group object for the staircase function appears in addition to the normal switching object. Via the additional parameter page "Staircase function" this function can be configured.

Gruppenobjekt	Typ KNX	Größe	Richtung
GO 11 Ch 1 (Sw): Ausgang - Schalten	1.001	1 Bit	Von KNX
GO 13 Ch 1 (Sw): Treppenhausfunktion - Auslösen	1.010	1 Bit	Von KNX

7.7.5 Ch 1 (Sw): Staircase function:



Switch off time

The time for which the output is activated after an ON telegram (object of the staircase function) has been received, can set in this parameter.

Input -------1------------------0----------

Output -------1-T-0------------------------

Retriggerable

This parameter can be used to set whether the follow-up time is to be restarted when an ON telegram is received on the object of the staircase function.

Reaction on 'OFF' telegram

This parameter can be used to set whether an OFF telegram on the object of the staircase function should be processed or ignored.

Time for warning before switch off

The time between pre-warning and deactivation is configured, or the pre-warning is deactivated with this parameter. If the pre-warning time is longer than the actual follow-up time, no pre-warning is carried out.

Time off interrupt

The pre-warning is indicated by a brief interruption (switch off -> switch on). The duration of this interrupt is configured in this parameter.

Note: LED lamps often have a long follow-up time, in which the lamp still lights even though it is already switched off. With such lamps longer interrupt times must be set to generate a "visible" interruption.

Function (Valve actuator)

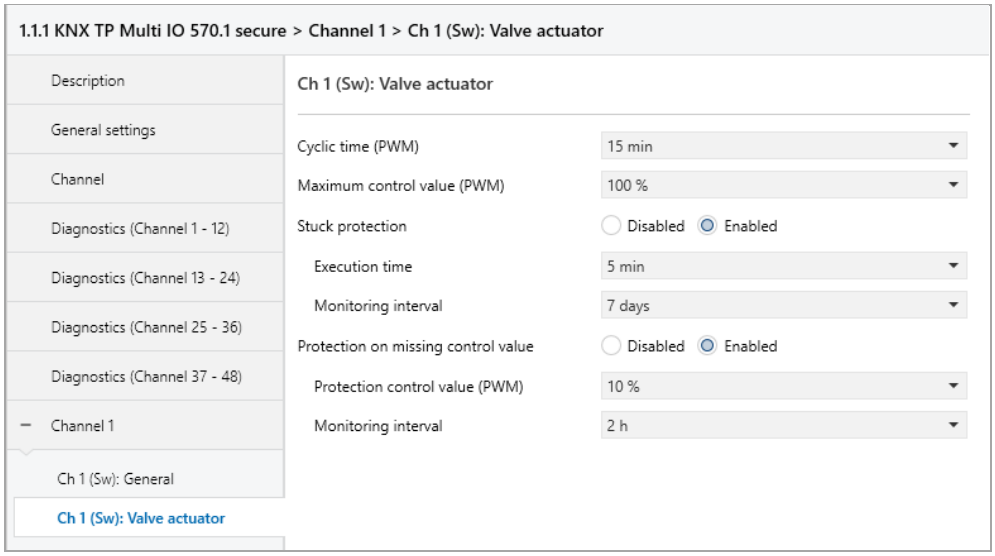
The function valve actuator is foreseen to control thermoelectric valve drives which are used for floor heating but also for radiators. It maps the continuous position (0% - 100%) to an ongoing On/Off sequence called PWM (pulse width modulation) signal.

If the valve actuator is selected on the parameter page "General", a group object for the valve actuator appears instead of the normal switching object. This allows the current PWM at the output to be set via KNX (0% - 100%). An additional parameter page "Valve actuator" appears for the configuration of the valve actuator.

The received control value is saved automatically by the device, to continue faultless after a possible bus power loss.

Group Object	Type KNX	Size	Direction
GO 14 Ch 1 (Sw): Valve actuator (PWM) – Control value	5.001	1 Byte	From KNX

7.7.6 Ch 1 (Sw): Valve actuator



Cyclic time (PWM)

The cyclic time of the PWM, which is used to control a servo drive, is configured with this parameter. One cycle involves a time range in which the output is switched on and one in which the output is switched off. The cyclic time corresponds to the period between two rising edges (state change at the output from OFF to ON). The longer the flow of the heating circuit (tube / pipe length), the higher the cyclic time should be set.

Note: Typical thermal servo require several minutes for a 100% valve change.

Maximum control value (PWM)

This parameter can be used to limit the maximum control value. The control value is expressed in percent and defines the period during which the output is switched on in one cycle.

Example:

Cyclic time = 10 min

Maximum control value (PWM) = 80 %

Maximal output state = ON - 8 min / OFF - 2 min

Stuck protection

Execution time

If the stuck protection is activated, this parameter is used to set the duration of the state change.

Monitoring interval

If the stuck protection is activated, this parameter sets the monitoring interval. If the state of the output remains unchanged for this time, the lock protection is triggered.

Protection on missing control value

This parameter enables the protection function on missing control value telegrams. This is necessary in order to prevent unwanted and uncontrolled overheating or cooling down of the room, when the control value is missing.

Protection takes effect, as soon as no telegrams are received from the controller over a longer period of time. As soon as this extended telegram pause has occurred, it can be assumed that the corresponding controller has failed or the connection between the controller and the valve actuator has been interrupted.

Protection control value (PWM)

If the protection on missing control value is enabled, this parameter sets a protection control value. This configured PWM value will set the output, if the protection is active.

As soon as telegrams from the controller are received again, the protection control value (PWM) is overwritten by the received value. The protection does not react again, until the waiting time in the set monitoring interval is exceeded between individual telegrams.

Monitoring interval

If the protection on missing control value is enabled, this parameter sets the monitoring interval. If no further telegram is received by the device during this time, the protection function takes effect.

Lock function (with valve actuator)

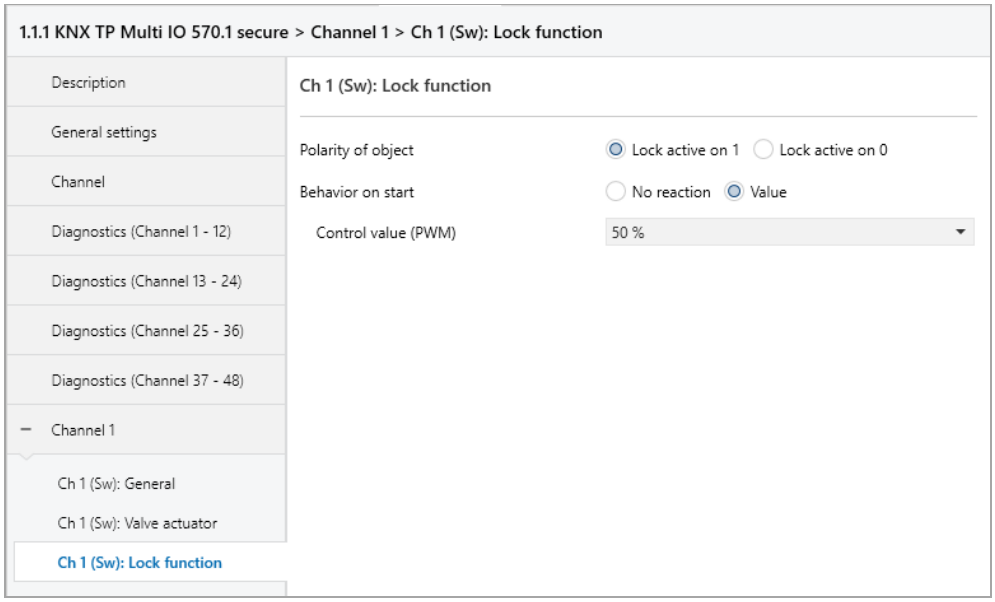
With this parameter the lock function can be disabled or enabled. If this functionality is activated, the associated group objects as well as the parameter page “Lock function” are displayed for further configuration. If the lock has been activated via the group object "Lock", the received switching telegrams are not executed.

In addition to the lock object, there is also a priority object, which can be used to set a control value independently of the lock. Thus, it is possible to set an output PWM without affecting other functions.

When the lock is ended, the last received value (not priority object) is represented as PWM at the output.

Group Object	Type KNX	Size	Direction
GO 15 Ch 1 (Sw): Lock - Activate	1.001	1 Bit	From KNX
GO 17 Ch 1 (Sw): Prior. valve actuator (PWM) – Control value	5.001	1 Byte	From KNX

7.7.7 Ch 1 (Sw): Lock function



Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0.

The following options are selectable:

- Lock active on 1
- Lock active on 0

Behavior on start

This parameter defines, which behavior the output should represent, if the lock activates.

The following options are selectable:

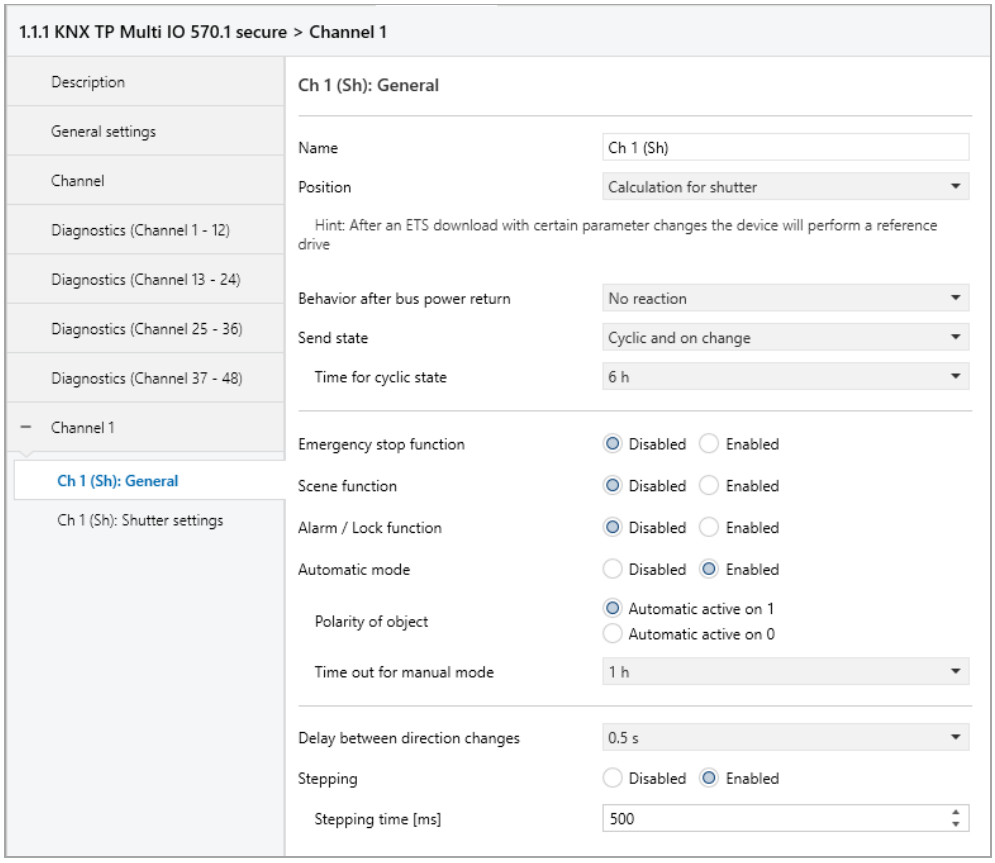
- No reaction
  The PWM value remains as to begin of the lock function.
- Value
  When the lock is activated, a defined PWM value is represented on the output.

Control value (PWM)

If a defined PWM value should be set to the output when the lock is activated, this value can be set with this parameter.

7.8 Channel function: “Blinds actuator”

7.8.1 Ch 1 (Sh): General



Name (30 Characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named “Actuator …”. In the following, the first channel is described, the functionality of the remaining channels is analog.

The name is displayed on the device display with a maximum of 10 characters.

Position

This device is designed for three different use cases.

- Without calculation
- Calculation for blinds with slats
- Calculation for shutter

Each one of them can be selected via this parameter. The first is a general drive without any position calculation. The second and third functions differ in how the device calculates the estimated position of the hangings / slats.

Since there is no direct feedback from the drive about the actual position, any position calculation can only be an approximation.

Send state

Only available if position calculation is set to blind or shutter mode. This parameter defines the sending behavior for status telegrams:

- Disabled
  No status group objects
- Only on Read
  No active sending, reacts only on group value read requests
- On Change
  Sends status values if the position has changed, but to reduce bus traffic a maximum of one status value per second is set.
- Cyclic and on change
  Sends status values if the position has changed or after a given interval, but to reduce bus traffic a maximum of one status value per second is set.
  Time for cyclic state
  Send at least one status value after the given interval

The value of the state objects reflects always the current position, even during driving.

Group Object	Type KNX	Size	Direction
GO 16 Ch 1 (Sh): Blind position - State	5.001	1 Byte	To KNX
GO 17 Ch 1 (Sh): Slats position*- State	5.001	1 Byte	To KNX

** Only for blinds with slats*

Behavior after bus power return

Defines which action should be performed after the bus voltage has returned.

- No reaction
- Up (move the hanging to the topmost position)
- Down (move the hanging to the bottommost position)

Emergency stop function

Enables or disables the emergency stop function. If enabled a stop telegram during reference drives or alarm / locking drives will stop the drive immediately and put the device in emergency stop state. This state can be left by sending any value to the Drive start Up / Dn group object. This allows the device to stop the drive under any circumstances in case of an emergency.

At the end of the emergency stop the last action will be continued

Scene function

One to sixteen configurable reactions to scene numbers may be specified here. For more details see ETS – page Scene function.

Alarm / Lock function

The device provides a lock down / alarm state. During this drive commands from the bus are ignored and it is possible to specify an action which should be performed on entering and / or leaving this state. For more details see the Alarm / Lock function.

Automatic mode

Only available if position calculation is set to blind or shutter mode. Provides an additional set of group objects to change the positions of the blinds / slats.

Those group objects will be disabled if an new drive command is received by any of the other group objects.

To enable the automatic group objects after such an event two ways are provided. Enable via a fallback time. After this time the automatic mode will be enabled automatically. Or secondly via a group object.

Polarity of object

Only available if automatic mode is enabled. Select whether a 1 value or 0 value sent to the automatic mode object will activate the automatic mode.

Group Object	Type KNX	Size	Direction
GO 26 Ch 1 (Sh): Automatic mode – Activate	1.003	1 Bit	From KNX
GO 26 Ch 1 (Sh): Automatic mode – State	1.003	1 Bit	From KNX
GO 28 Ch 1 (Sh): Autom. blind position – Set position	5.001	1 Byte	From KNX
GO 29 Ch 1 (Sh): Autom. slats position – Set position *	5.001	1 Byte	From KNX
GO 30 Ch 1 (Sh): Autom. combined position – Set position *	240.800	3 Byte	From KNX

** Only for blinds with slats*

Delay between direction changes

To protect the drive against abrupt direction changes, which may cause damage to the drive, a minimum time between output commands in opposite directions can be set here.

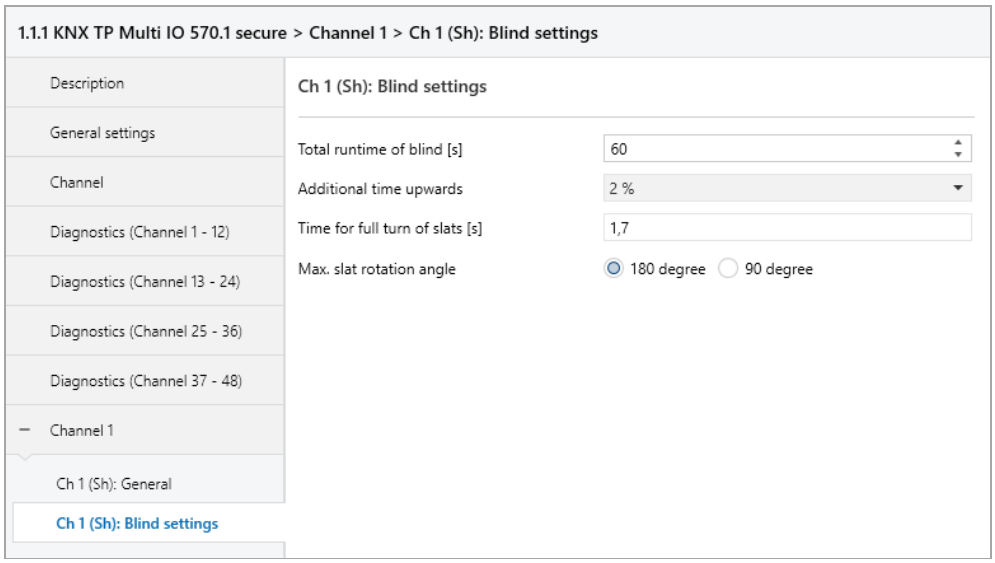
Stepping

Enable / disable stepping functionality.

Stepping time

Only available if stepping is active. After receiving a step command via the group object, this parameter determines the interval length for the drive in the given direction. Eg. if set to 500 ms, a step up command will cause the up relay to switch on for 500 ms.

7.8.2 Ch 1 (Sh): Blind settings



Only visible if position calculation is set to Calculation for blind with slats.

Total runtime of blind [s]

The time the drive needs to move the hanging from the top to the bottom position. Normally this is determined by measurement.

Additional time upwards

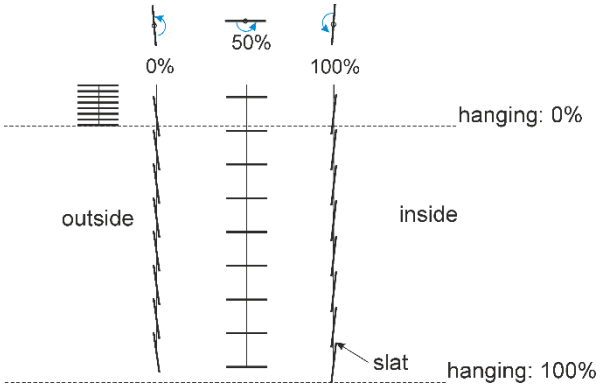
The movement speed upward and downward is for some drives not equal. So this parameter allows adjusting for differences.

Time for full turn of slats [s]

The time the slats need from one endpoint to the other. This parameter is a float value.

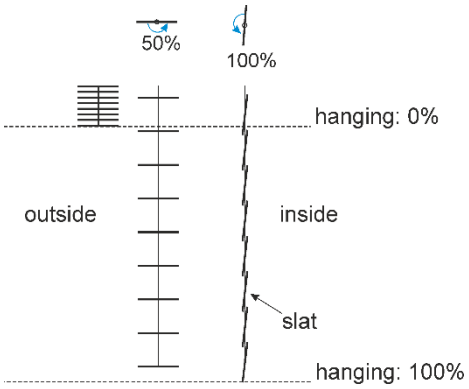
Max. slats rotation angle

For blinds with the following positions, choose 180 degree.



Positions of blind and slats 180°

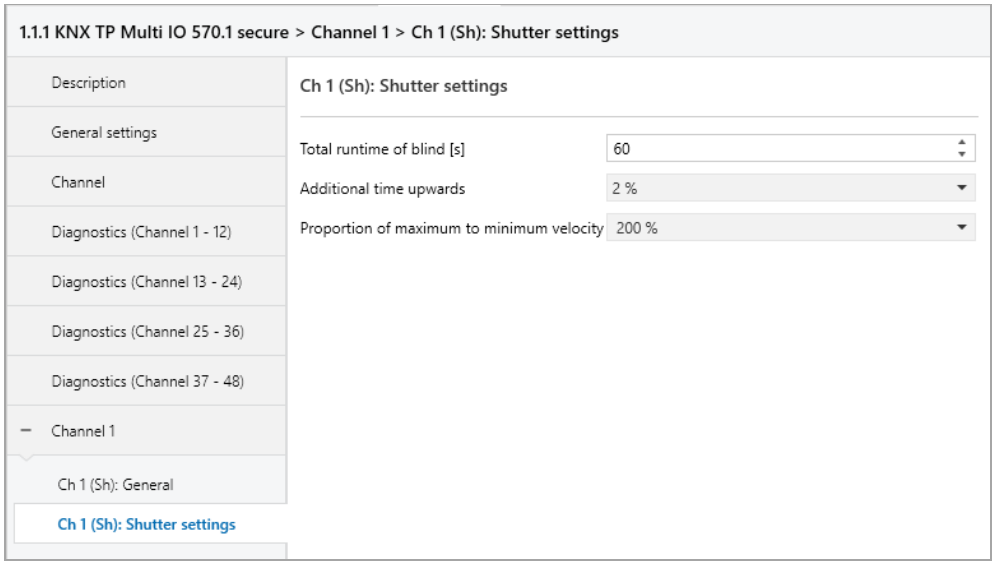
For drives with only horizontal and closing movement choose 90 degree.



Positions of blind and slats 90°

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (Sh): Up / Dn - Drive start	1.008	1 Bit	From KNX
GO 12 Ch 1 (Sh): Step / Stop - Drive stop	1.007	1 Bit	From KNX
GO 13 Ch 1 (Sh): Blind position - Set position	5.001	1 Byte	From KNX
GO 14 Ch 1 (Sh): Slats position - Set position	5.001	1 Byte	From KNX
GO 15 Ch 1 (Sh): Combined position - Set position	240.800	3 Byte	From KNX

7.8.3 Ch 1 (Sh): Shutter settings



Only visible if position calculation is set to Calculation for shutter.

Total runtime of blind [s]

The time the drive needs to move the hanging from the top to the bottom position. Normally this is determined by measurement.

Additional time upwards

The movement speed upward and downward is for some drives not equal. So this parameter allows adjusting for differences.

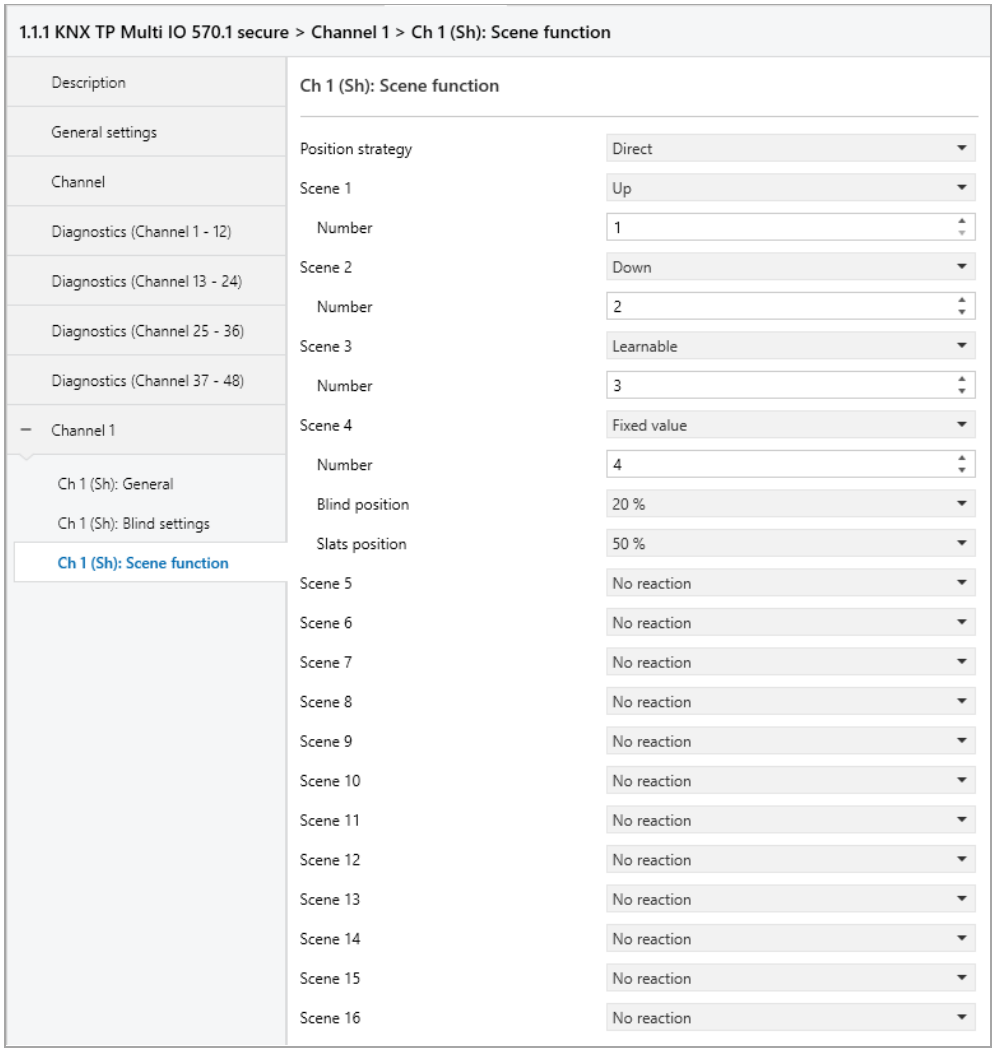
Proportion of maximum to minimum velocity

To account for the fact that most shutter drives will not provide a constant speed this parameter can be used. In most cases the drive will speed up during movement from bottom to top position due to the increased diameter of the windings.

So if the speed on the bottom is twice the speed on the top the appropriate value for this parameter would be 200 %.

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (Sh): Up / Dn - Drive start	1.008	1 Bit	From KNX
GO 12 Ch 1 (Sh)Step / Stop - Drive stop	1.007	1 Bit	From KNX
GO 13 Ch 1 (Sh): Blind position - Set position	5.001	1 Byte	From KNX

7.8.4 Ch 1 (Sh): Scene function



Position strategy

If any type of position calculation is enabled (See Position parameter) this parameter will become visible.

- Direct
  Moves direct to target position
- Indirect using top endpoint
  Moves first to top endpoint and then to target position
- Indirect using bottom endpoint
  Moves first to bottom endpoint and then to target position
- Indirect using nearest endpoint
  Move first to endpoint that is closest to the target position and then to the target position afterward

Scene 1 - 16

For each scene a scene number [1-64] is selectable. Receiving this number on the scene group object will trigger the chosen reaction for that scene. In all position calculation modes the three basic options are available.

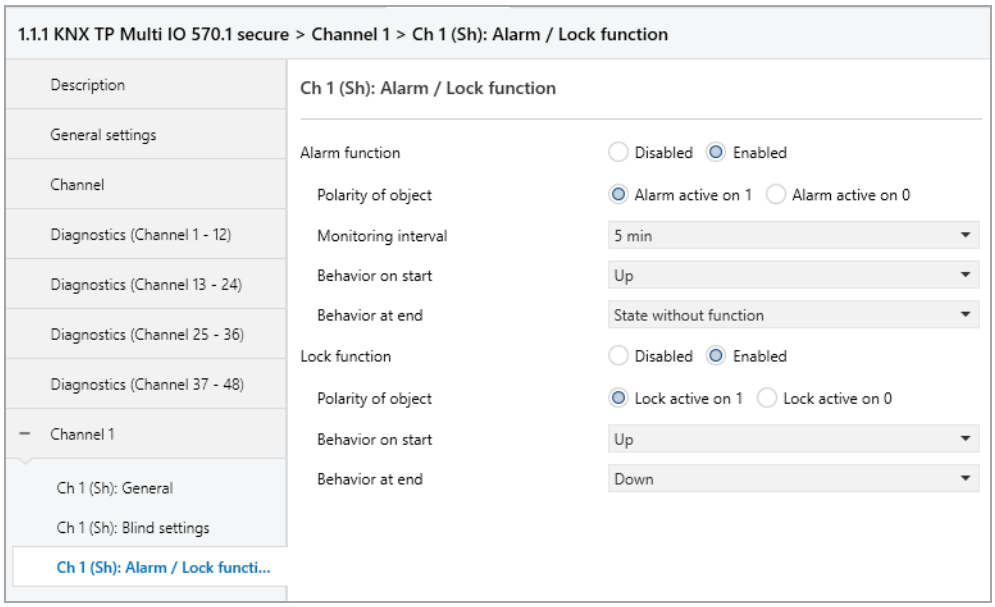
- No reaction
- Up
- Down

Additionally two more options appear for blind and shutter mode.

- Learnable
  The current position may be set as new target position by sending a DPT18 value with set control bit to the scene group object
- Fixed value
  The target position is directly selectable in the ETS database

Group Object	Type KNX	Size	Direction
GO 18 Ch 1 (Sh): Scene – Activ./Lrn.	18.001	1 Byte	From KNX

7.8.5 Ch 1 (Sh): Alarm / Lock function



This page provides options to enable or disable the alarm and lock function separately.

Alarm function

Meant for protecting the hanging against e.g. wind damage or ensuring a certain position in case of a fire alarm. This function moves the hanging to a given position and puts the device in an alarm state in which any other commands, except emergency stop commands, from the KNX bus will be ignored.

Polarity of object

Select whether a 1 value or 0 value sent to the alarm object will trigger the alarm.

Monitoring interval

Not receiving any value during this period of time on the alarm group object will cause the device to raise the alarm and switch into alarm state. Every time a telegram is received the interval will start again.

Behavior on start

At the beginning of the alarm the device allows for different reactions.

- No reaction
- Up (move to topmost position)
- Down (move to bottom position)
- Stop any current movement

Behavior at end

Am Ende des Alarms kann eine dieser Reaktionen eingestellt werden.

- No Reaction
- Up
- Down
- State before function
  At the beginning of the alarm the current position will be stored and restored if the alarm ends.
- State without function
  The device processes all incoming telegrams during the alarm state and at the end of the function the last one will be performed. If no telegram is received during that state the last position before the state will be restored.

The last two options are only available if the position calculation in enabled.

Group Object	Type KNX	Size	Direction
GO 19 Ch 1 (Sh): Alarm - Activate	1.005	1 Bit	From KNX

Lock function

Similar to the alarm function this allows locking the device. Whilst locked any telegram received via the normal move command group objects and scene commands are ignored. This function has a slightly lower priority than the alarm function. Therefore during an alarm locking doesn't change anything. But during locking a newly raised alarm will result in the desired reaction for entering the alarm state.

Enabling this function adds four additional group objects with priority function. A locked device will ignore the "normal" move command objects but still reacts to prioritized commands.

Example for the priority object:

In the case of events in public buildings or in restaurants, the normal operation can be set into an inoperative state by the lock group object. Thus it is possible to lock push buttons, which are accessible to unauthorized persons, in order to prevent unmeant movement of the blind, during the lecture or concert. Nevertheless the blinds can still be operated by use of the priority object without canceling the lock.

Polarity of object

Select whether a 1 or 0 value sent to the locking group object will trigger the locking state.

Behavior on start

At the beginning of the locking the device can provide serveral reactions.

- No reaction
- Up (move to topmost position)
- Down (move to bottom position)
- Stop any current movement

Behavior at end

Whilst ending the locking state these options are available.

- No Reaction
- Up
- Down
- State before function
  At the beginning of the locking the current position will be stored and restored if the locking ends
- State without function
  The device processes all incoming telegrams during the locking state and after the last one will be performed. If no telegram is received during that state the last position before will be restored.

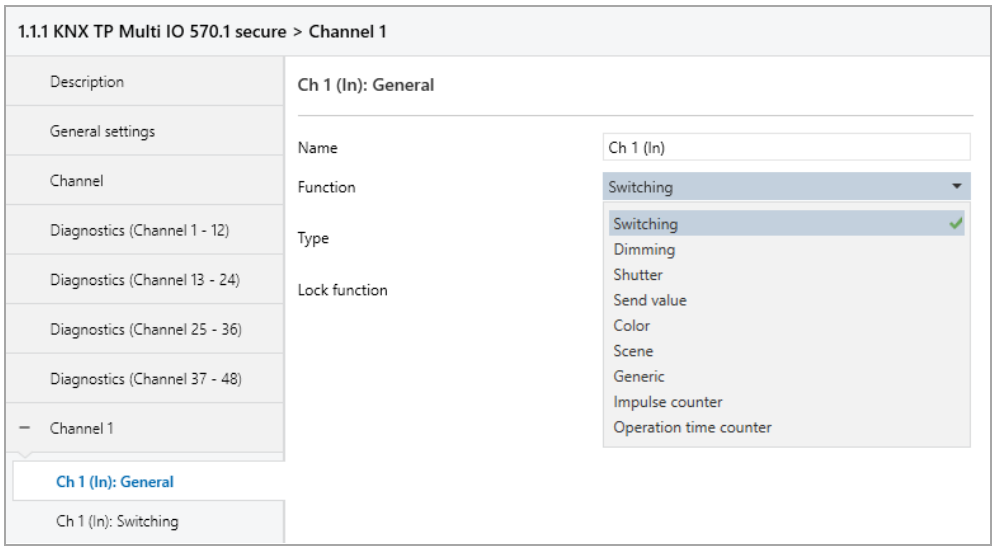
The last two options are only available if the position calculation in enabled.

Group Object	Type KNX	Size	Direction
GO 20 Ch 1 (Sh): Lock - Activate	1.001	1Bit	From KNX
GO 21 Ch 1 (Sh): Prior. drive start -Up / Dn	1.008	1 Bit	From KNX
GO 22 Ch 1 (Sh): Prior. drive stop - Step / Stop	1.007	1 Bit	From KNX
GO 23 Ch 1 (Sh): Prior. blind position – Set position	5.001	1 Byte	From KNX
GO 24 Ch 1 (Sh): Prior. slats position – Set position*	5.001	1 Byte	From KNX
GO 24 Ch 1 (Sh): Prior. combined position – Set position*	240.800	3 Byte	From KNX

** Only for blinds with slats*

7.9 Channel function: “Binary input“

7.9.1 Ch 1 (In): General



Name (30 Characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named “Input …” with the channel number, which is also used in this manual. The 1st channel will be described below, the functioning of the other 3 channels is according to the 1st.

The name is displayed on the device display with a maximum of 10 characters.

Function

This parameter defines the functionality of the connected contact. The following options are selectable:

- Disabled
- Switching
- Dimming
- Shutter
- Send value
- Scene
- Generic

A more detailed description of the functions can be found in the individual function descriptions.

Type

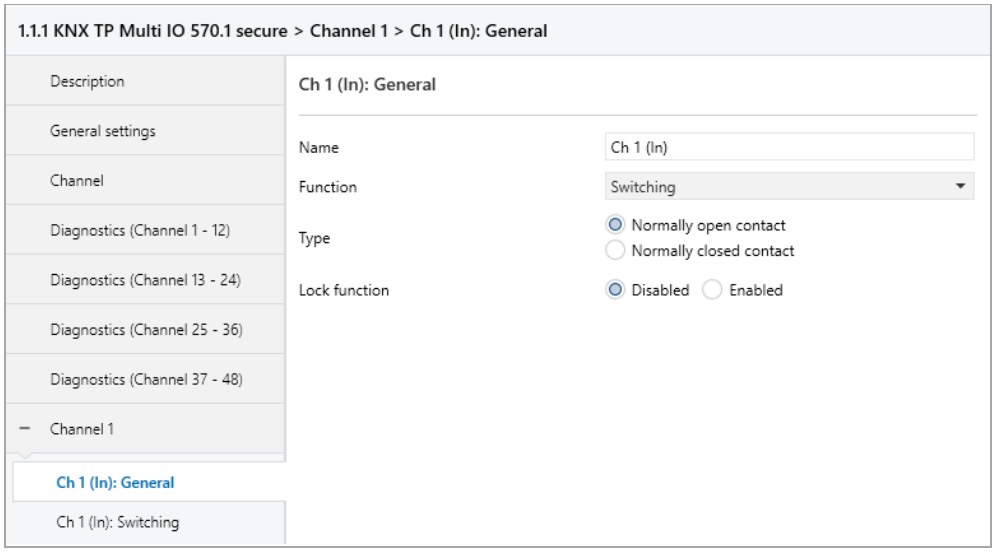
The mode of operation of the contact connected to the input channel can be configured here. You can choose between normally open or normally closed.

Lock function

With this parameter the lock function can be enabled. If this functionality is activated, the associated group objects as well as the parameter page “7.8.10 Ch 1 (In): Lock function” are displayed for further configuration. If the lock has been activated via the group object, no telegrams are triggered by state changes of the connected contact.

Group Object	Type KNX	Size	Direction
GO 16 Ch 1 (In): Lock - Activate	1.001	1 Bit	From KNX

7.9.1.1 Function “Switching, Dimming, Shutter, Send value, Scene or Generic”



If an input function of a channel is selected, the following parameters are displayed:

Type

The mode of operation of the contact connected to the input channel can be configured here:

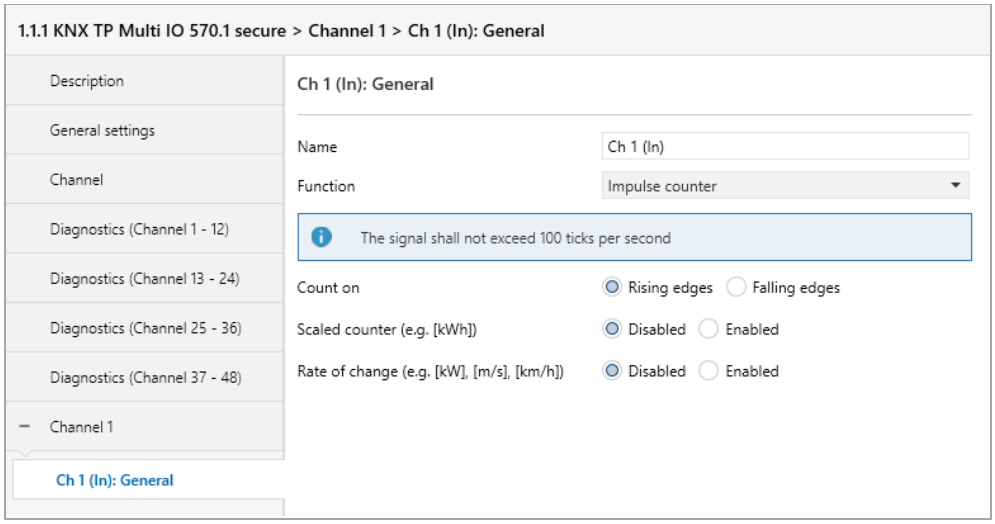
- Normally open contact
- Normally closed contact

Lock function

With this parameter the lock function can be enabled. If this functionality is activated, the associated group objects as well as the parameter page “7.8.10 Ch 1 (In): Lock function” are displayed for further configuration. If the lock has been activated via the group object, no telegrams are triggered by state changes of the connected contact.

Group object	Type KNX	Size	Direction
GO 16 Ch 1 (In): Lock - Activate	1.001	1 Bit	From KNX

7.9.1.2 Function “Impulse counter”



If the impulse counter function is selected, further parameters are displayed in the general settings of the input channel. Here, the general settings of the impulse counter are made, a scaled counter and/or counter of the rate of change must also be selected.

Input signal

Here it can be selected whether DC or alternating voltage is applied to the binary input.

Count on

This parameter can be used to determine whether the value of the counter is increased at the rising or falling edge at the input

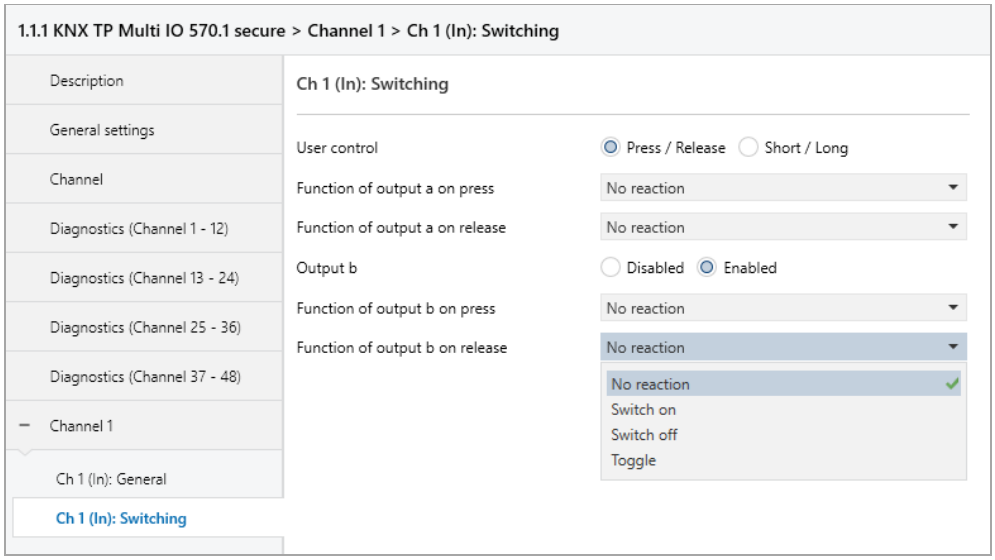
Scaled counter (e.g. [kWh])

Here, the scaled counter can be activated, the parameter page "7.8.8 Ch 1 (In): Scaled counter" is displayed when activated.

Rate of change (e.g. [kW], [m/s], [km/h])

The counter for a rate of change can be activated here. If activated, the “7.8.9 Ch 1 (In): Rate of change” parameter page is displayed.

7.9.2 Ch 1 (In): Switching



If the switching function is selected, up to 2 binary switching telegrams can be sent via the following objects:

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Output a – Switch	1.001	1 Bit	To KNX
GO 22 Ch 1 (In): Output b – Switch	1.001	1 Bit	To KNX

** Output b is only visible when activated by parameter.*

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

User control

The parameter “User control” determines whether telegrams are sent when the input is changed (e.g. key switches) or when the button is operated short/long (e.g. button for switching/dimming).

Function of object a/b on press
Function of object a/b on short press
Function of object a/b on release
Function of object a/b on long press

It is selectable for each object a and b, which telegram is sent on press and release or on short/long button press.

The following options are available:

- No reaction
- Switch on
- Switch off
- Toggle
  On toggle the last value received from the bus is evaluated if the write flag is activated on the object.

Output b

Here you can show/hide the parameters and the object for output b.

7.9.2.1 Ch 1 (In): Switching – State query

The Status query function is used, for example, to monitor window contacts.

The status query mode is automatically recognized by the firmware if the following parameter settings are present:

User control: Press / Release
Function (…) on press: Switch on
Function (…) on release: Switch off

or inverted:

User control: Press / Release
Function (…) on press: Switch off
Function (…) on release: Switch on

With configured status query, the value on the object is kept up to date. The value corresponds to the current state that is read. If the lock is active, the object value corresponds to the last status before the lock or the configured value when the lock is activated.

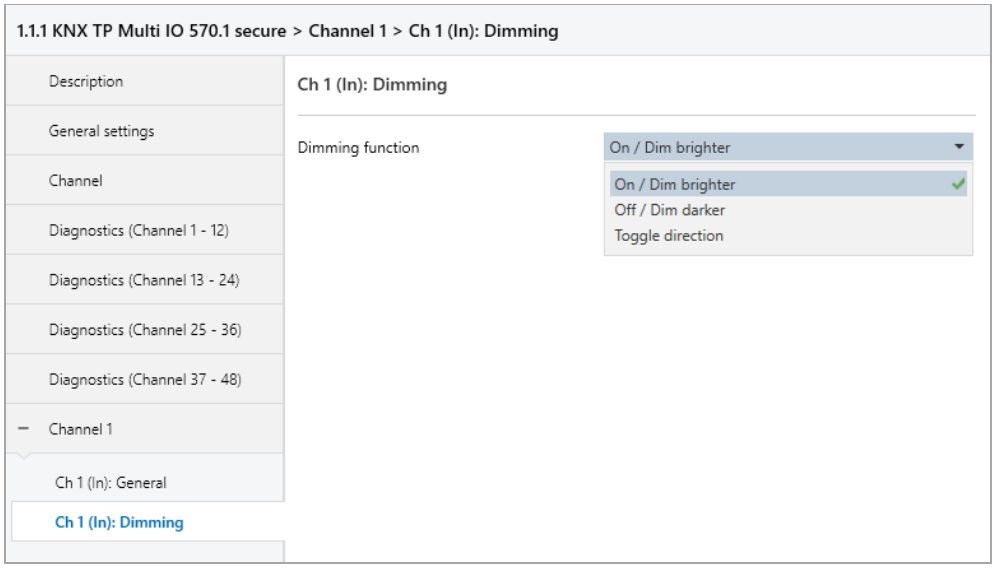
Cyclic sending of object a/b *(only for state query)*

When the status query is active, cyclic sending can be configured independently for object a and b. The following options are available:

- 1 min
- 2 min
- 5 min
- 10 min
- 20 min
- 30 min
- 1 h
- 6 h
- 12 h
- 24 h

When the lock is active, cyclic sending is disabled.

7.9.3 Ch 1 (In): Dimming



On selection of function Dimming following objects are visible:

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Dimming on/off	1.001	1 Bit	To KNX
GO 12 Ch 1 (In): Dimming relative – Brighter/Darker	3.007	4 Bit	To KNX

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Dimming function

The dimming function parameter determines whether only one switching / dimming direction or 1-button control is to be used:

- On / Dim brighter
- Off / Dim darker
- Toggle direction
  On toggle direction, the last value received from the bus is evaluated if the write flag is activated on the object. This applies to object 11 and object 12.
  In addition, object 13 is visible. If one of the limit values is received here as the status (e.g. 0 % or 100 %), the dimming direction is adjusted accordingly.

Group object	Type KNX	Size	Direction
GO 13 Ch 1 (In): Dimming absolute – State	5.001	1 Byte	From KNX

If the input detects a short button press, a switching telegram is sent via object 11. On long button press, a relative dimming is sent over the entire dimming range to object 12. When releasing after long button press, a dimming-stop telegram is sent via object 12.

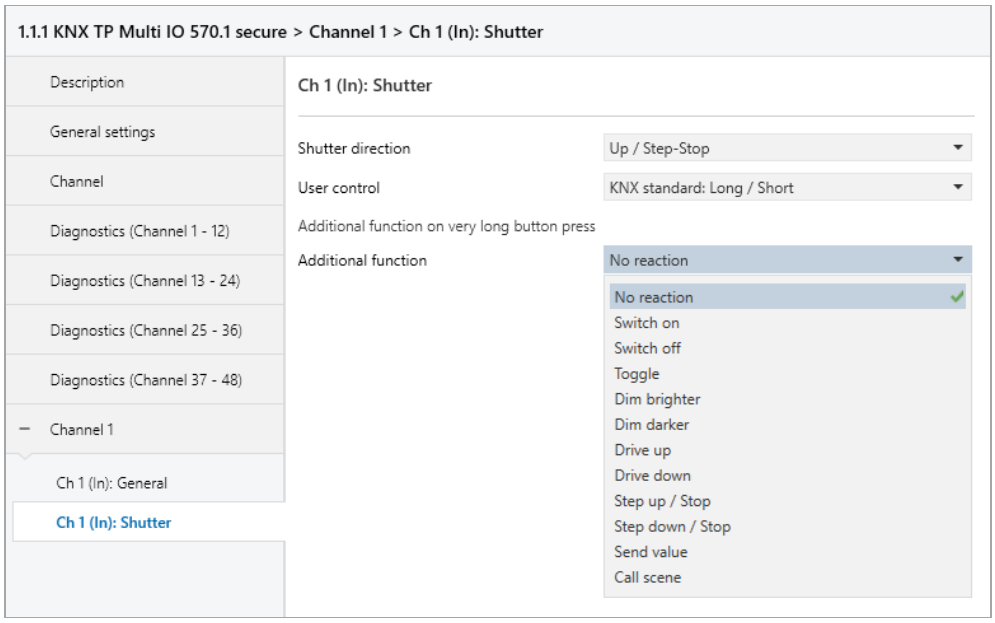
The time for detection of a long button press can be set in the general parameters and is valid for all channels.

Dimming direction after switch on *(only for toggle direction)*

This parameter is only visible on toggle direction and determines the dimming direction of the next dimming command following an ON telegram.

This is useful in the bathroom, for example, when the light is switched on at low brightness at night and then should be dimmed brighter.

7.9.4 Ch 1 (In): Shutter



On selection of Shutter function following objects are visible:

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Drive start – Up/Down	1.001	1 Bit	To KNX
GO 12 Ch 1 (In): Drive stop – Step/Stop	1.001	1 Bit	To KNX

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Shutter direction

The parameter “Shutter direction” determines whether only one shutter direction or 1-button control is to be used.

- Up
- Down
- Toggle
  If the write flags are set, the shutter objects evaluate the last value received from the bus. This keeps the direction and state of the shutter in the button up to date. This applies to object 11 and object 12. In addition, object 13 is visible. If one of the limit values is received here as the status (e.g. 0 % or 100 %), the driving direction is adjusted accordingly.

Group object	Type KNX	Size	Direction
GO 13 Ch 1 (In): Blind position – State	5.001	1 Byte	From KNX

User control

The parameter “User control” determines the sending of telegrams on short and long button press:

- KNX standard: Long / Short
  This is the standard configuration for controlling a shutter.
  Long actuation: Drive command via object 11
  Short actuation: Stop/Step command via object 12
  Very long actuation: Additional function

- KNX standard with turning time
  This is the standard configuration for controlling a shutter with the extension that a stop is triggered when the shutter is released within the turning time. Thus, you can turn the slats with dead man.
  Long actuation: Drive command via object 11
  Release after long actuation within turning time: Stop/Step command via object 12
  Release after long actuation after turning time: No reaction
  Short actuation: Stop/Step command via object 12
  Very long actuation: Additional function

- KNX Inverted: Short / Long
  This is the inverted standard configuration for controlling a shutter. This should be used when the main usage is on move commands.
  Short actuation: Drive command via object 11
  Long actuation: Stop/Step command via object 12
  Actuation during drive: Stop/Step command via object 12
  Very long actuation: Additional function

- Short / Short
  This is an optimized variant for controlling a shutter, which uses only short button presses. The step command in the actuator should be disabled.
  Short actuation: Drive command via object 11
  Actuation during drive: Stop/Step command via object 12
  Long actuation: Additional function

- Short / Short plus Long with turning time
  This is an optimized variant for controlling a shutter, which mainly uses short button presses. A long button press can additionally be used to turn the slats.
  The step command in the actuator should be disabled.
  Short actuation: Drive command via object 11
  Long actuation: Drive command via object 11
  Release after long actuation within turning time: Stop/Step command via object 12
  Release after long actuation after turning time: No reaction
  Actuation during drive: Stop/Step command via object 12
  Very long actuation: Additional function

- Hold (Deadman switch)
  The dead man operation mode can be used for applications with short moving time, for example for skylights. The step command in the actuator should be disabled.
  On actuation: Drive command via object 11
  On release: Stop/Step command via object 12

- Hold with turning time
  This operating mode is suitable for applications with mainly short moving times, with the addition that long moving times, by holding beyond the turning time, can also be easily realized. The step command in the actuator should be disabled.
  On actuation: Drive command via object 11
  On release within turning time: Stop/Step command via object 12
  On release after turning time: No reaction

- Hold, delayed with turning time
  This is analog to the operating mode "Hold with turning time", with the difference that the movement is on the long button press. The step command in the actuator should be disabled.
  Long actuation: Drive command via object 11
  Release after long actuation within turning time: Stop/Step command via object 12
  Release after long actuation after turning time: No reaction
  Short actuation: Additional function
  Actuation during drive: Stop/Step command via object 12

Drive time (Time window for stop) [s]

Only displayed for the user controls with “Actuation during drive: Stop/Step command”. The time window for the actuation at which a stop/step command is sent is set here.

Turning time [s]

Only displayed for the user controls with turning time. In general, by releasing within the turning time, the shutter can be stopped while continuing to move after the turning time.

If the button tone is activated on the "General settings" page, the end of the turning time is indicated by a signal tone.

Additional function on short/long/very long button press

The following functions can be triggered by short/long/very long keystrokes:

- Switch on
- Switch off
- Toggle
  On toggle, the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Switch	1.001	1 Bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Step/Stop	1.007	1 Bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Send value	5.001	1 Byte	To KNX

- Call scene
  With this function, a scene can be sent. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Call scene	18.001	1 Byte	To KNX

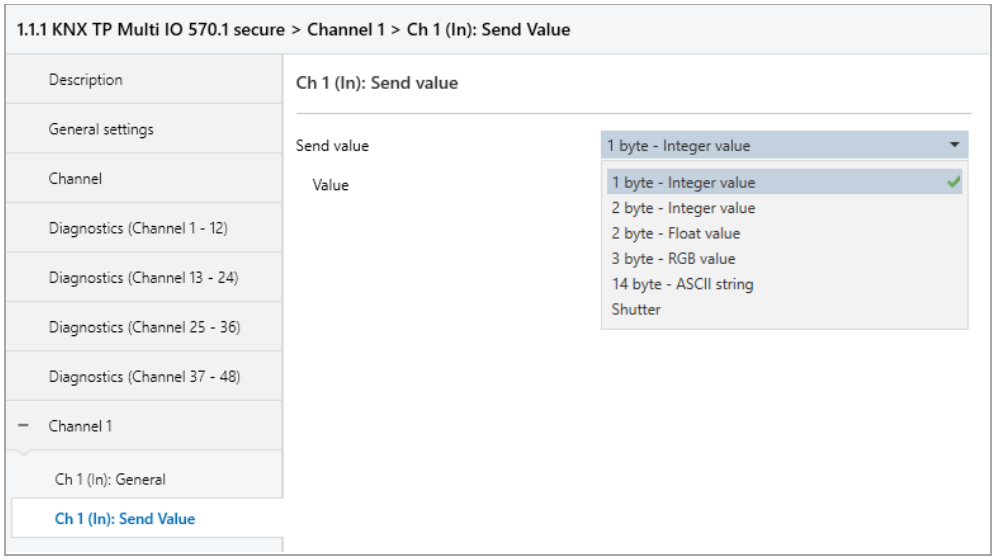
- Save scene
  With this function, a scene can be saved. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Additional function – Save scene	18.001	1 Byte	To KNX

Very long button press after [s]

This parameter is visible only when using the very long actuation, it sets the time to detect a very long button press.

7.9.5 Ch 1 (In): Send value



If function Send value is selected, the following telegrams can be sent at button press:

- 1 byte - Percent value

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send percent value (1 byte) – Set value	5.001	1 Byte	To KNX

- 1 byte - Integer value

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send integer value (1 byte) – Set value	5.010	1 Byte	To KNX

- 2 byte - Integer value

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send integer value (2 byte) – Set value	7.001	2 Byte	To KNX

- 2 byte - Float value

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send float value (2 byte) – Set value	9.001	2 Byte	To KNX

- 3 byte - RGB value

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send RGB color value (3 byte) – Set value	232.600	3 Byte	To KNX

- 14 byte - ASCII string

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send ASCII string (14 byte) – Set value	16.000	14 Byte	To KNX

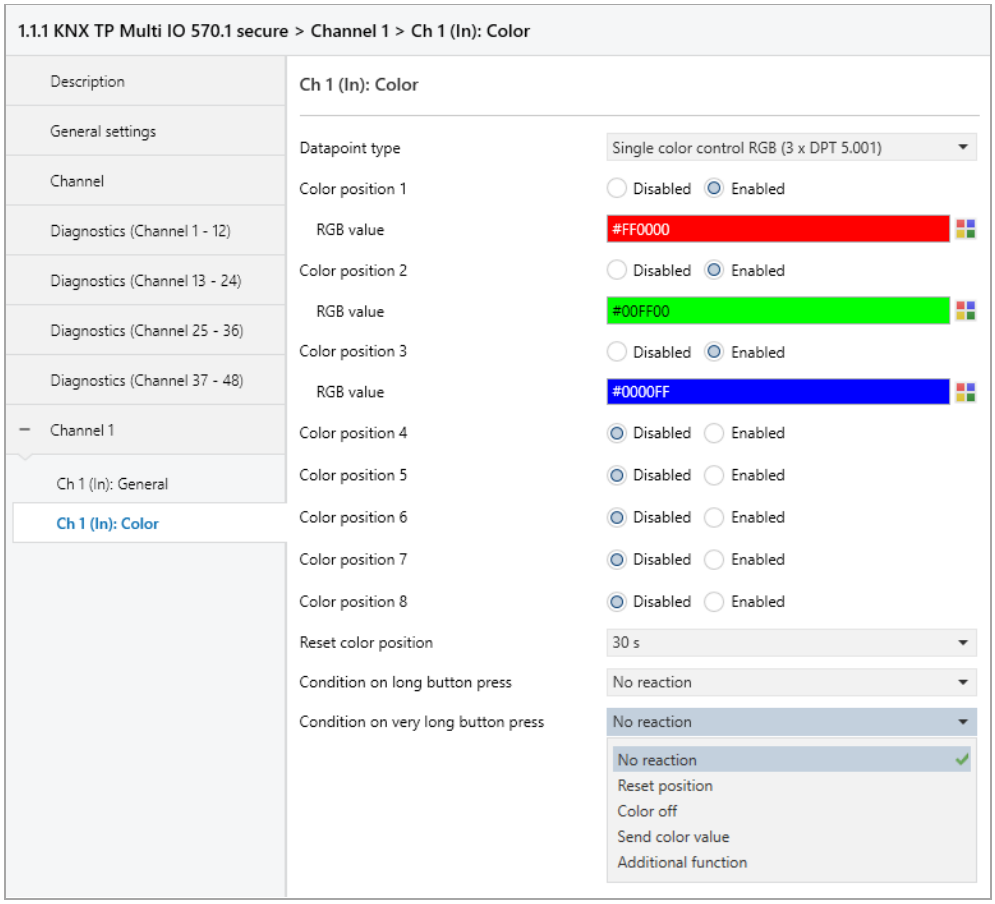
- Shutter

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Send blind position – Set position	5.001	1 Byte	To KNX
GO 12 Ch 1 (In): Send slat position – Set position	5.001	1 Byte	To KNX

If the shutter is selected as the value to be sent, height is sent on button press, lamella is sent on releasing the button, if the respective value is used.

A field for entering the values to be sent is displayed, as well as the objects appropriate to the selected type.

7.9.6 Ch 1 (In): Color



The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Datapoint type

Depending on this parameter, the following objects are available for color control:

- Single color control RGB (3 x DPT 5.001)

Group object	Type KNX	Size	Direction
GO 11 Input A1: Value R – Set color	5.001	1 Byte	To KNX
GO 12 Input A1: Value G – Set color	5.001	1 Byte	To KNX
GO 13 Input A1: Value B – Set color	5.001	1 Byte	To KNX

- Single color control RGBW (4 x DPT 5.001)

Group object	Type KNX	Size	Direction
GO 11 Input A1: Value R – Set color	5.001	1 Byte	To KNX
GO 12 Input A1: Value G – Set color	5.001	1 Byte	To KNX
GO 13 Input A1: Value B – Set color	5.001	1 Byte	To KNX
GO 14 Input A1: Value W – Set color	5.001	1 Byte	To KNX

- Color control RGB (DPT 232.600)

Group object	Type KNX	Size	Direction
GO 11 Input A1: RGB color value (3 Bytes) – Set color	232.600	3 Byte	To KNX

- Color control RGBW (DPT 251.600)

Group object	Type KNX	Size	Direction
GO 11 Input A1: RGBW color value (6 Bytes) – Set color	251.600	6 Byte	To KNX

Color position 1 – 8

For each position a color can be chosen.

If only one color position is activated, it is sent on short button press. If several color positions are used, the activated positions are switched through with each short button press.

The behavior for selecting and sending the color positions can be determined by the following parameter.

Reset color position

The following options are available:

- Never
  Starting with the first color position, the next position of the list is sent with each short button press. After the last color position has been sent, the list starts again from the beginning.

- After execution
  This selection enables the parameter **Time until execution**.
  Beginning with the first color position, each short button press switches the position by one position within the execution delay. At the end of the execution delay, the current color position is sent.

- 5 s – 10 min
  On each button press the configured delay time is started.
  Starting with the first color position, the next position of the list is sent with each short button press, after the last color position has been sent, the list starts again from the beginning.
  After the delay time has expired, the list starts again at the first color position on the next short button press.

When the button lock is used, the color position is always reset when unlocking.

Condition on long button press
Condition on very long button press

Here it is possible to select how a long and very long button press should be handled:

- No reaction
- Reset position
  This function is used to override the behavior as set in the parameter **Reset color position**.
- Color off
  The color value 0/0/0 for black is sent.
- Send color value
  The selected color value is sent.
- Additional function

Additional function

The following functions can be triggered by a long or very long button press:

- Switch on
- Switch off
- Toggle
  On toggle, the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Switch	1.001	1 Bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Step/Stop	1.007	1 Bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Send value	5.001	1 Byte	To KNX

- Call scene
  With this function, a scene can be sent. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Call scene	18.001	1 Byte	To KNX

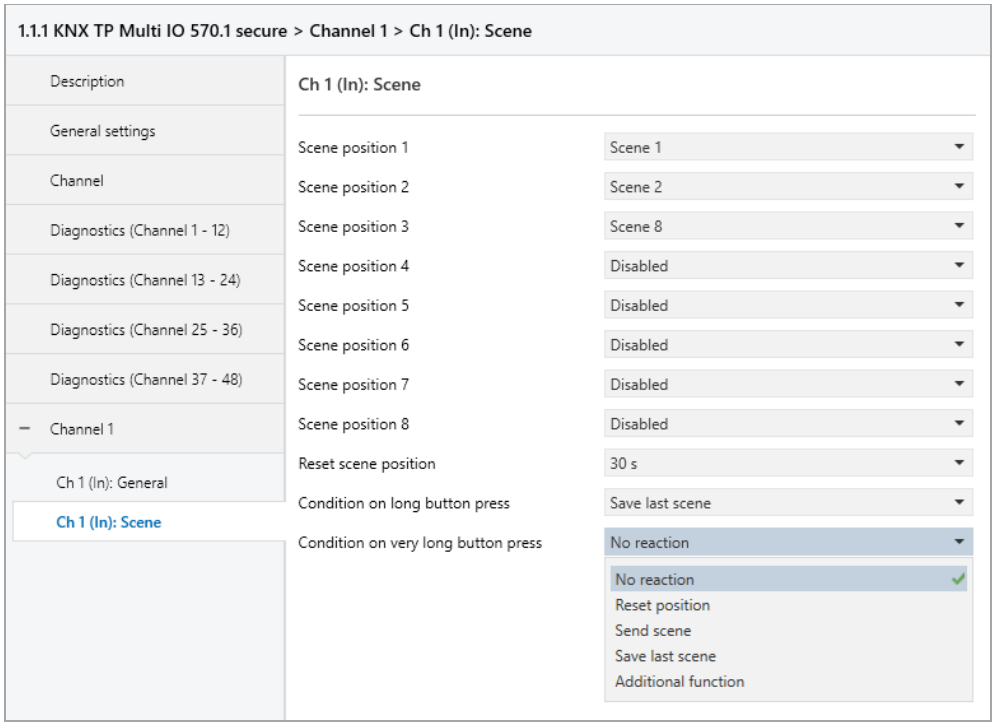
- Save scene
  With this function, a scene can be saved. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Save scene	18.001	1 Byte	To KNX

Very long button press after [s]

This parameter is visible only when using the very long actuation, it sets the time to detect a very long button press.

7.9.7 Ch 1 (In): Scene



On selection of Scene function the following object is visible:

Group Object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Scene – Activ./Lrn.	18.001	1 Byte	To KNX

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Scene position 1 - 8

For each position, scene 1 – 64 can be activated.

If only one scene position is activated, it is sent on short button press.

If several scene positions are used, the activated positions are switched through with each short button press.

The behavior for selecting and sending the scene positions can be determined by the following parameter.

Reset scene position

The following options are available:

- Never
  Starting with the first scene position, the next position of the list is sent with each short button press, after the last scene position has been sent, the list starts again from the beginning.

- After execution
  This selection enables the parameter **Time until execution**.
  Beginning with the first scene position, each short button press switches the position by one position within the execution delay, at the end of the execution delay, the current scene position is sent.

- 5 s – 10 min
  On each button press the configured delay time is started.
  Starting with the first scene position, the next position of the list is sent with each short button press, after the last scene position has been sent, the list starts again from the beginning.
  After the delay time has expired, the list starts again at the first scene position on the next short button press.

When the button lock is used, the scene position is always reset when unlocking.

Condition on long button press
Condition on very long button press

It is also possible to select how a long and very long button press should be handled:

- No reaction
- Reset position
  This function is used to override the behavior as set in the parameter **Reset scene position**.
- Call scene
  The scene configured in the appearing parameter is sent.
- Save last scene
  A telegram for “save scene” with the last sent scene is triggered.
- Additional function

Additional function

The following functions can be triggered by a long or very long button press:

- Switch on
- Switch off
- Toggle
  On toggle, the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Additional function – Switch	1.001	1 Bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Additional function – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Additional function – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down /Stop

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Additional function – Step/Stop	1.007	1 Bit	To KNX

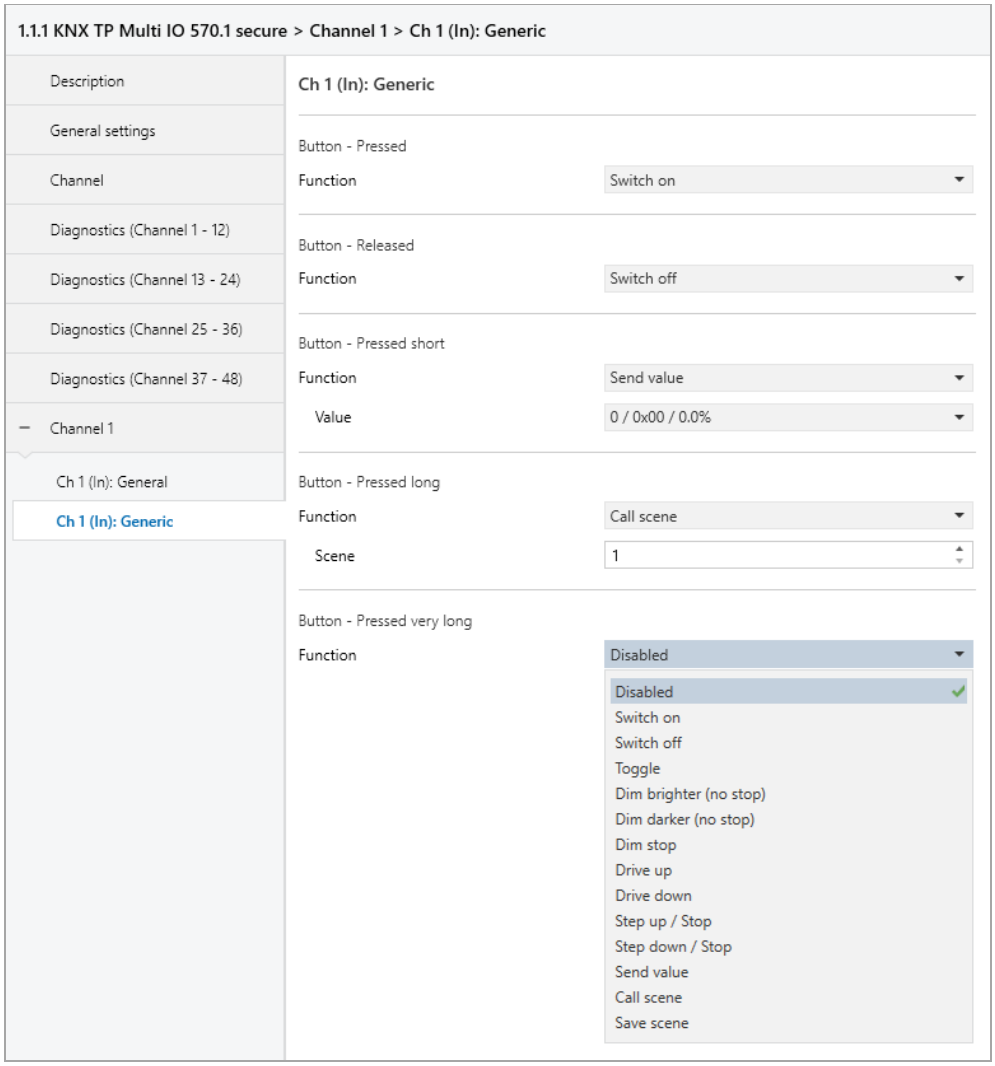
- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Additional function – Send value	5.001	1 Byte	To KNX

Very long button press after [s]

This parameter is visible only when using the very long actuation, he sets the time to detect a very long button press.

7.9.8 Ch 1 (In): Generic



With this button function, a separate object is available for each event at the input/pushbutton in order to set the function of the input/pushbutton individually.

These events at the input/button and their associated objects are:

- Button – Pressed

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Pressed – …	Depending on function		To KNX

- Button – Released

Group object	Type KNX	Size	Direction
GO 12 Ch 1 (In): Released – …	Depending on function		To KNX

- Button – Pressed short

Group object	Type KNX	Size	Direction
GO 13 Ch 1 (In): Pressed short – …	Depending on function		To KNX

- Button – Pressed long

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Pressed long – …	Depending on function		To KNX

- Button – Pressed very long

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Pressed very long – …	Depending on function		To KNX

Each event can be assigned the following functions:

- Switch on
- Switch off
- Toggle
  On toggle the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO … Ch 1 (In): … – Switch	1.001	1 Bit	To KNX

- Dim brighter (no Stop)
- Dim darker (no Stop)
- Dim Stop

Group object	Type KNX	Size	Direction
GO … Ch 1 (In): … – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO … Ch 1 (In): … – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO … Ch 1 (In): … – Step/Stop	1.007	1 Bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO … Ch 1 (In): … – Send value	5.001	1 Byte	To KNX

- Call Scene
  With this function a scene can be sent, a parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO … Taster A0: … – Call scene	18.001	1 Byte	To KNX

- Save Scene
  With this function a scene can be saved, a parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO … Taster A0: … – Save scene	18.001	1 Byte	To KNX

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Very long button press after [s]

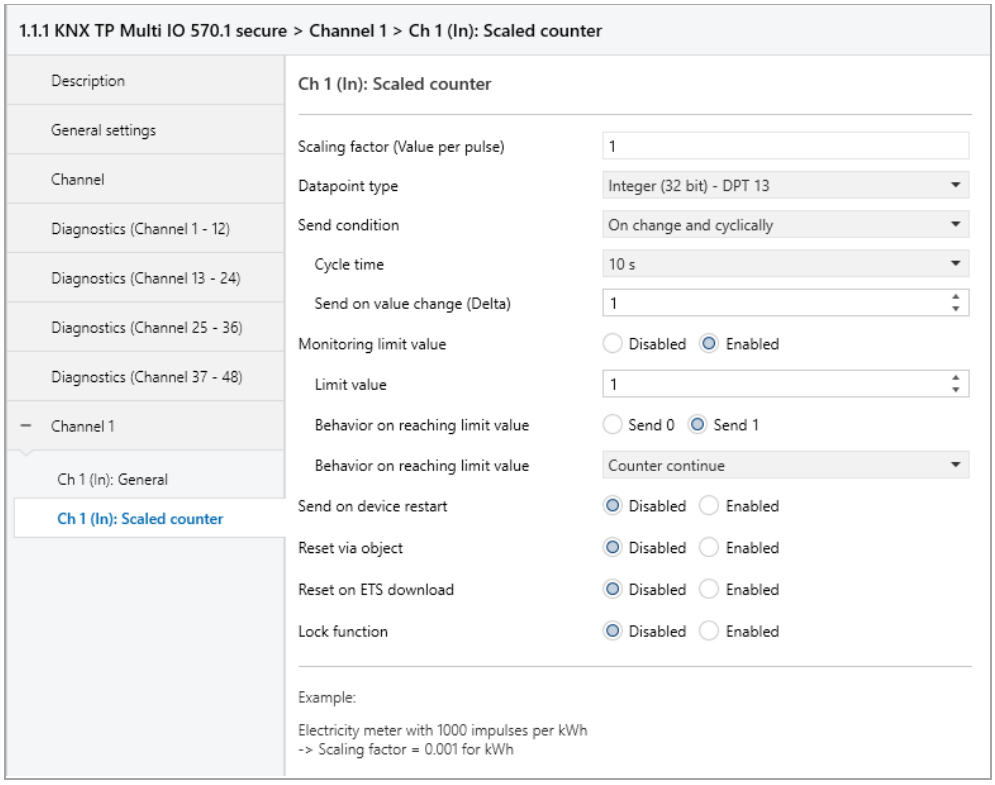
This parameter is visible only when using the very long actuation, he sets the time to detect a very long button press.

Long triggering (with very long keystroke)

This parameter is only visible when the long and very long actuation is used simultaneously.

If this parameter is activated, both events are always triggered after a very long actuation; if it is deactivated, the duration of the activation is evaluated: if it lies between the time of long and very long actuation, only the function for long actuation is triggered. If the time for very long actuation is exceeded, only the function for very long actuation is triggered.

7.9.9 Ch 1 (In): Scaled counter



This counter can be used to count values on input impulses, where an integer value or a floating-point value can be selected as a counter variable. With this function, e.g. Electrical energy can be counted directly and sent to the bus via an object.

Scaling factor (Value per pulse)

Here, a floating-point value is to be entered. It determines the value by which the counter value is increased per pulse.

Datapoint type

The datapoint type of output object of the counter variable can be selected here:

- Integer (32 Bit) – DPT 13

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Counter – Value	13.013	4 Byte	To KNX

- Float (16 Bit) – DPT 9

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Counter – Value	9.024	2 Byte	To KNX

- Float (32 Bit) – DPT 14

Group object	Type KNX	Size	Direction
GO 11 Ch 1 (In): Counter – Value	14.056	4 Byte	To KNX

Send condition

This parameter can be used to determine how the current counter value is to be sent:

- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  An additional parameter is displayed to select the minimal delta from the last sent value for sending a new counter value.
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

If the counter is locked by the object, also cyclic sending is stopped.

Monitoring limit value

When limit monitoring is activated, the following object is displayed:

Group object	Type KNX	Size	Direction
GO 12 Ch 1 (In): Counter threshold – State	1.002	1 Bit	To KNX

When limit monitoring is activated, the following parameters are displayed:

Limit value

Here you can edit the checked limit value. The datapoint type is the same as the counter value.

Behavior on reaching limit value (object)

Here it is possible to determine whether a 0 or a 1 is sent via the object “Counter threshold – State” when the limit value is reached.

Behavior on reaching limit value (counter)

In addition to the limit value itself, it is possible to determine the behavior of the counter when the limit value is reached:

- Counter continue
  Counter value continues increasing on ever pulse
- Counter reset and continue
  Counter value is reset to 0 and continues increasing on ever pulse
- Counter stop
  Counter value stays on limit value and must be reset by object

Send on device restart

It can be determined with this parameter whether the counter value should be sent when the device is restarted.

Reset via object

If this function is activated, the following object appears:

Group object	Type KNX	Size	Direction
GO 13 Ch 1 (In): Reset – Trigger	1.017	1 Bit	From KNX

When a telegram is received via this object, the current count values are reset to 0.

Reset after ETS download

If this parameter is activated, the counter values are reset to 0 after device reset (e.g. after ETS download), otherwise they are retained.

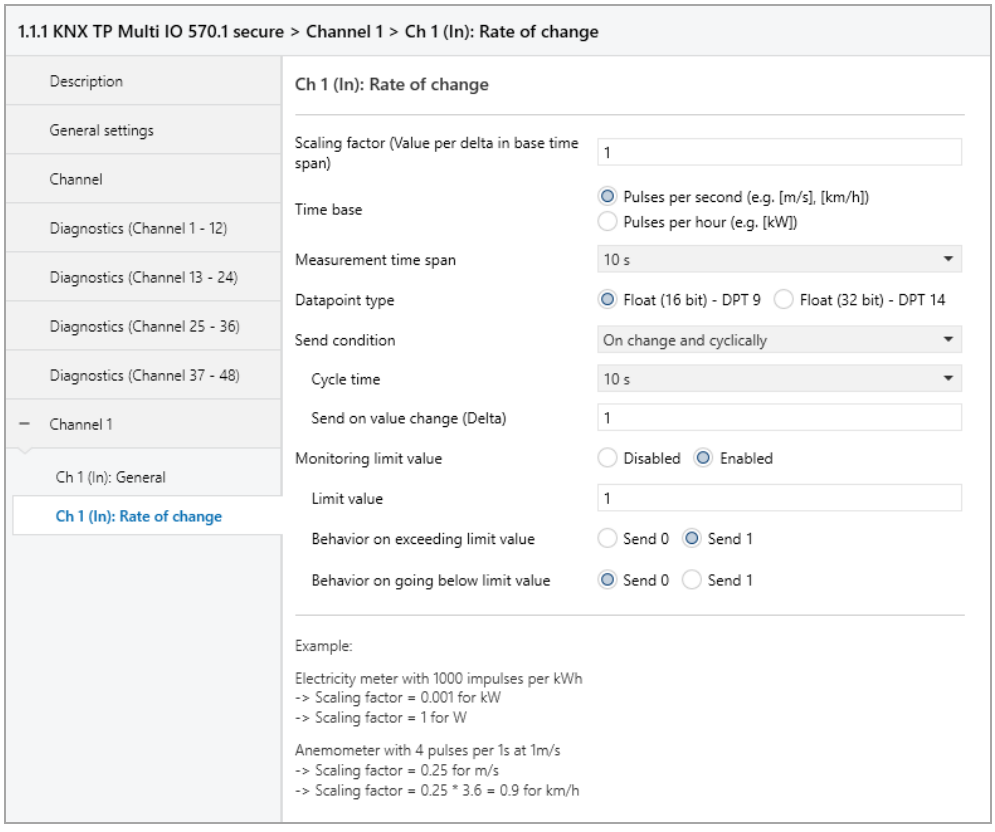
Lock function

The lock function can be activated or deactivated here. If this functionality is activated, the following group object appears, as well as the parameter page "7.8.10 Ch 1 (In): Lock function" for detailed configuration.

Group Object	Type KNX	Size	Direction
GO 16 Ch 1 (In): Lock – Activate*	1.001	1 Bit	From KNX

** If the lock has been activated via the group object, state changes at the input do not cause an increase of the counter variable.*

7.9.10 Ch 1 (In): Rate of change



This counter is used to connect devices to the bus where the rate of change is critical within a time interval, e.g. an anemometer.

Scaling factor (Value per delta in base time span)

A floating-point value is to be entered here. It determines the value by which the counter value is increased on every pulse

Time base

Here the time base of the rate of change can be specified:

- Pulses per second (e.g. [m/s], [km/h])
  Value from parameter Scaling factor is multiplied by 1
- Pulses per hour (e.g. [kW])
  Value from parameter Scaling factor is multiplied by 3600

Measurement time span

The measurement time span determines how quickly the counter can react to changes. Therefore, a short sample rate should be selected for fast processes (e.g. anemometer).

The rate of change is calculated using the 3 parameters mentioned above:

The device saves several meter readings per measurement interval, scales it with the scaling factor * time base and divides it by the measuring interval.

Datapoint type

The datapoint type of output object of the counter variable can be selected here:

- Floating point (16 Bit) - DPT 9

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Rate of change – Value	9.024	2 Byte	To KNX

- Floating point (32 Bit) - DPT 14

Group object	Type KNX	Size	Direction
GO 14 Ch 1 (In): Rate of change – Value	14.056	4 Byte	To KNX

Send condition

This parameter can be used to determine how the current counter value is to be sent:

- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  An additional parameter is displayed to select the minimal delta from the last sent value for sending a new counter value.
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

Monitoring limit value

When limit monitoring is activated, the following object is displayed:

Group object	Type KNX	Size	Direction
GO 15 Ch 1 (In): Rate threshold – State	1.002	1 Bit	To KNX

When limit monitoring is activated, the following parameters are displayed:

Limit value

Here you can edit the checked limit value. The datapoint type is the same as rate of change value.

Behavior on exceeding limit value

In addition to the limit value itself, it is possible to determine whether the counter should transmit 0 or 1 via the object if the limit value is exceeded.

Behavior on going below limit value

Here it is possible to determine whether the counter should transmit 0 or 1 via the object if the counter variable goes under limit value.

Example: Electricity meter with S0 interface

From the data sheet of the electricity meter it can be seen that the device delivers 500 pulses per kWh. A device with constant power of 1kW is connected to this current meter for one hour.

The scaled counter measures the energy consumed:

Scaling factor (Output in kWh): 1 / 500 = 0.002

The counter for the rate of change measures the current power:

Scaling factor (Output in kW): 1/500 = 0.002
*Scaling factor (Output in W): 1/500 * 1000 = 2*
Time base: Pulses per hour
Measurement time span: 300 s

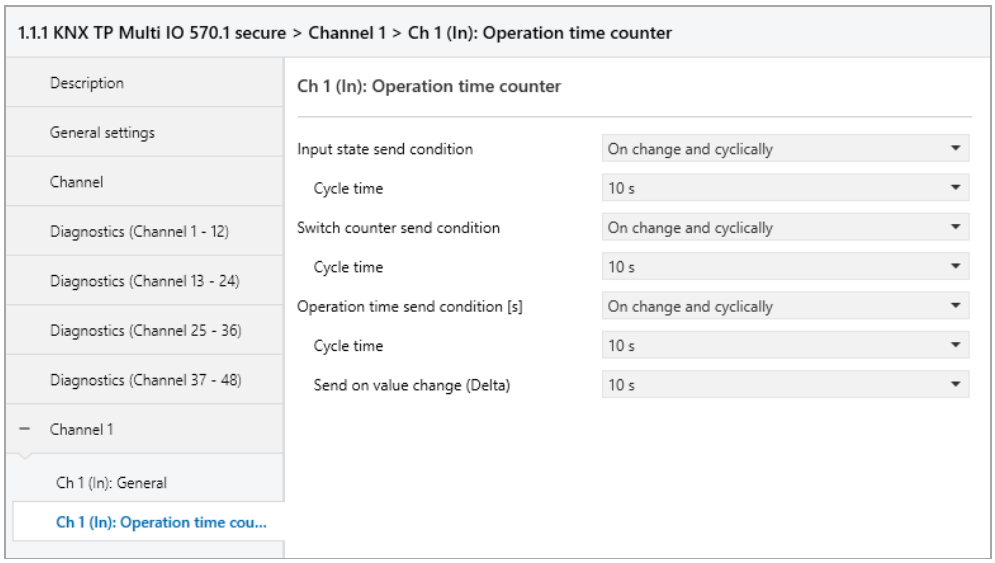
Example: Anemometer

From the data sheet of the electricity meter it can be seen that the device delivers 4 pulses/s at a wind speed of 1 m/s.

The counter for the rate of change measures the wind speed:

Scaling factor (Output in m/s): 1/4 = 0.25
*Scaling factor (Output in km/h): 1/4 * 3.6 = 0.9*
Time base: Pulses per second
Measurement time span: 10 s

7.9.11 Ch 1 (In): Operation time counter



The operation time counter can be used to output how long the channel has been switched on.

Input state send condition

This parameter is used to determine how the current input status is to be sent:

- Disabled
- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  Sends on changed value
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

Group object	Type KNX	Size	Direction
GO 11 Input A1: Input – State	1.001	1 Bit	To KNX

Switch counter send condition
This parameter is used to determine how the current switching counter is to be sent:

- Disabled
- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  Sends on changed value
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

Group object	Type KNX	Size	Direction
GO 12 Input A1: Switch counter – State	13.001	4 Bytes	To KNX
GO 13 Input A1: Reset switch counter – Trigger	1.017	1 Bit	From KNX

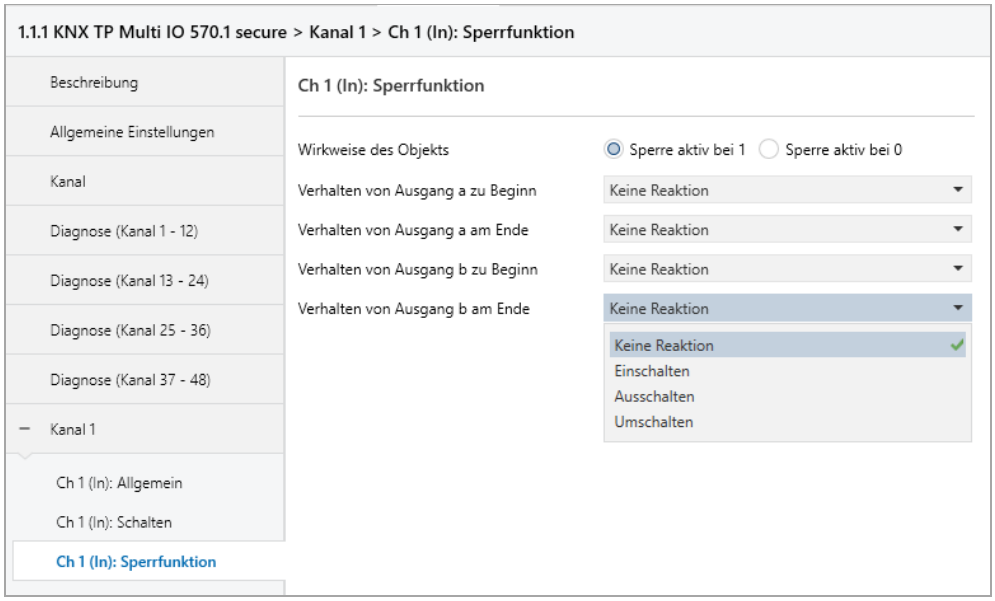
Operation time send condition [s]
This parameter is used to determine how the current operating time is to be sent:

- Disabled
- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  An additional parameter is displayed to select the minimal delta from the last sent value for sending a new value.
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the operation time.
- On change and cyclically
  Both sending conditions are active.

Group object	Type KNX	Size	Direction
GO 14 Input A1: Operation time – State	13.100	4 Bytes	To KNX
GO 15 Input A1: Reset operation time – Trigger	1.017	1 Bit	From KNX

7.9.12 Ch 1 (In): Lock function

7.9.12.1 Lock function “Switching”



Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0. The respective opposite telegram deactivates the lock again.

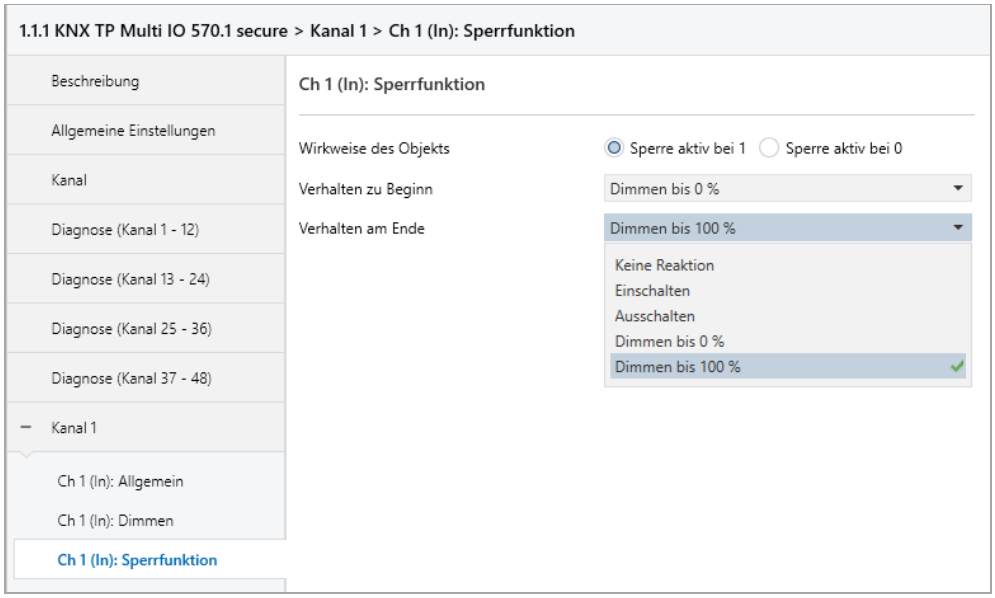
Behavior of object a/b on start

The telegram can be configured here, which is sent on the according object when the lock is activated.

Behavior of object a/b at end

The telegram can be configured here, which is sent on the according object when the lock is deactivated.

7.9.12.2 Lock function ”Dimming, Shutter, Send value, Color, Scene”



Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0. The respective opposite telegram deactivates the lock again.

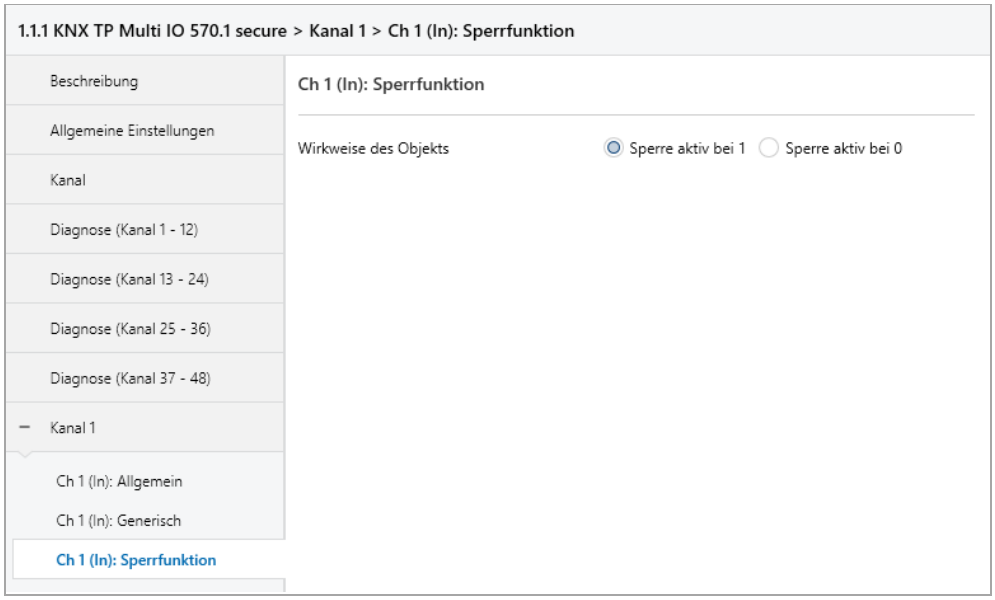
Behavior on start

The telegram can be configured here, which is sent on the according object when the lock is activated.

Behavior at end

The telegram can be configured here, which is sent on the according object when the lock is deactivated.

7.9.12.3 Lock function “Generic”

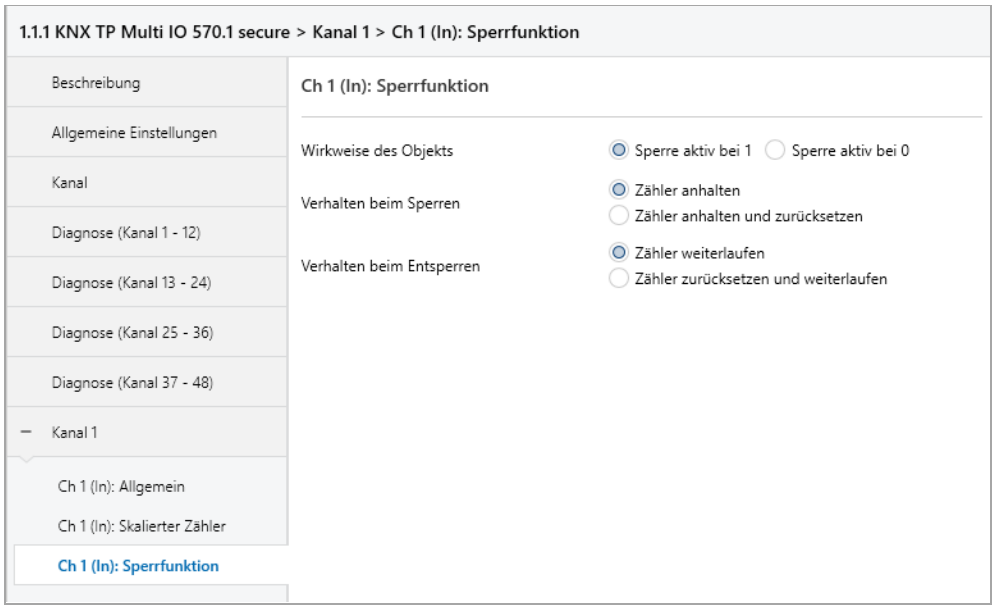


Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0. The respective opposite telegram deactivates the lock again.

7.9.12.4 Lock function “Scaled counter”

Nur bei aktvierter Sperrfunktion und bei Funktion „Impulszähler“.



Polarity of object

This parameter can be used to determine how the lock is to be activated, either by receiving a 1 or a 0. The corresponding telegram disables the lock again.

Behavior on start of lock

With this parameter the behavior of the counter can be configured when the lock is activated:

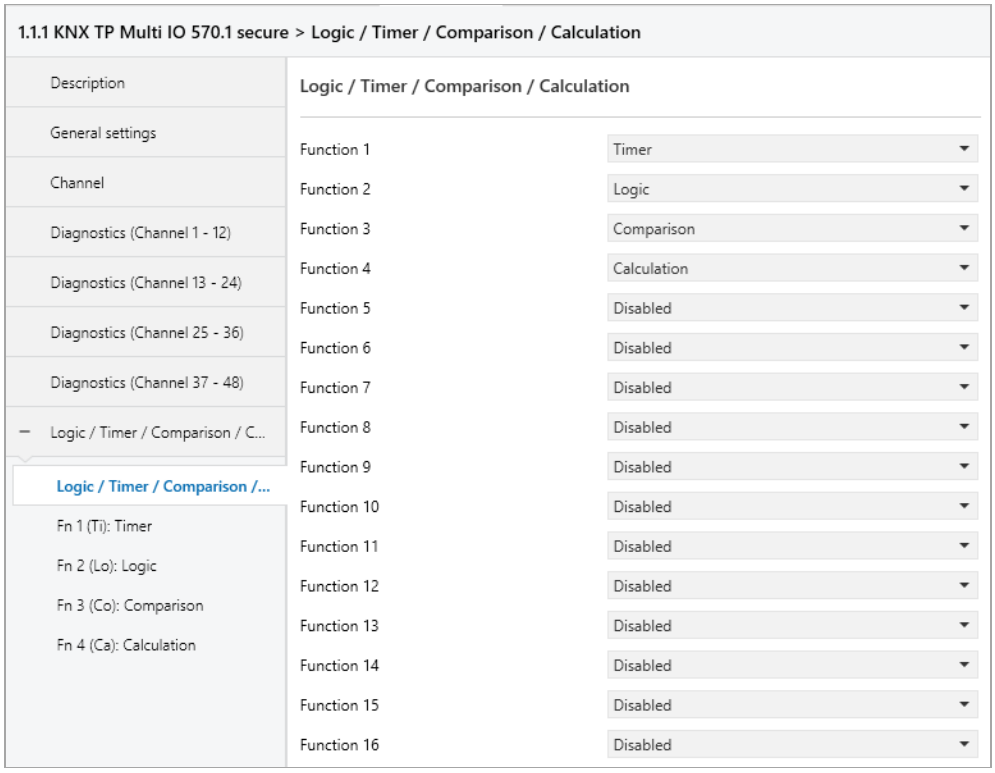
- Counter stop
- Counter stop and reset

Behavior on end of lock

With this parameter the behavior of the counter can be configured when the lock is deactivated:

- Counter continue
- Counter reset and continue

7.10 Logic / Timer / Comparison / Calculation



Function 1 – 48

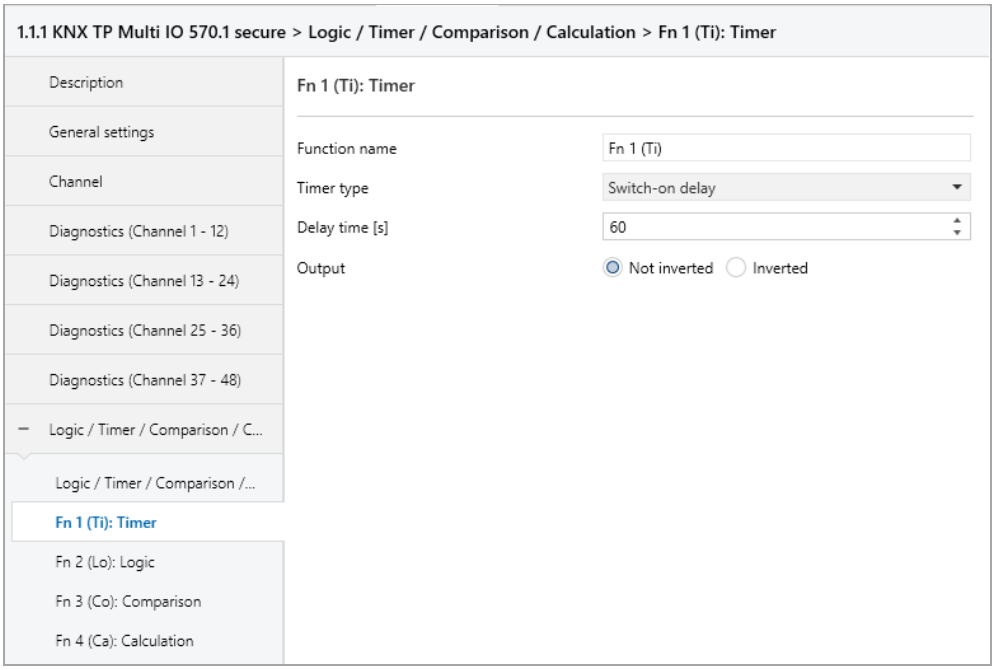
These parameters contain the functions timer and logic, whereby all 16 functions are identical.

The following options are available:

- Disabled
  No parameters and group objects for timer and logic.
- Timer
  Parameters and group objects for timer are available.
- Logic
  Parameters and group objects for logic are available.
- Compare
- Parameters and group objects for compare are available.
- Calculation
  Parameters and group objects for calculation are available.

The functions for timer and logic can be linked to one another by means of the associated group objects. This also allows to create complex structures. For this purpose, the output of a function is set to the same group address as the input of the next function.

7.11 Fn 1 – 48 (Sw): Timer



Function name *(10 characters)*

The function name can be chosen freely.

The name is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects, because the given name is displayed there as a label.

Timer type

The type of time switch can be selected here:

- Switch-on delay
  The ON telegram (1) received on the input is delayed on the output.
  Input: `--1---------0------`
  Output: `--|-T-1-----0------`

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Sw): Timer – Switch-on delayed – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Sw): Timer – Switch-on delayed – Output	1.002	1 Bit	To KNX

- Switch-off delay
  The OFF telegram (0) received on the input is delayed on the output.
  Input: `--1---------0------`
  Output: `--1---------|-T-0-`

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Sw): Timer – Switch-off delayed – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Sw): Timer – Switch-off delayed – Output	1.002	1 Bit	To KNX

- Switch-on and switch-off delay
  The ON/OFF telegram (1/0) received on the input is delayed on the output.
  Input: `--1---------0------`
  Output: `--|-T-1-----|-T-0-`

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Sw): Timer – Switch-on/off delayed – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Sw): Timer – Switch-on/off delayed – Output	1.002	1 Bit	To KNX

- Impulse (staircase)
  The ON telegram (1) received on the input is sent on the output. After a delay the output sends the OFF telegram (0).
  Input: `--1---------0------`
  Output: `--1-T-0-----------`

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Sw): Timer – Impulse (staircase) – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Sw): Timer – Impulse (staircase) – Output	1.002	1 Bit	To KNX

Each timer can be stopped by sending the opposite value to its input group object. For example: An already started switch-on timer can be stopped by sending OFF (0) to its input group object.

Delay [s]

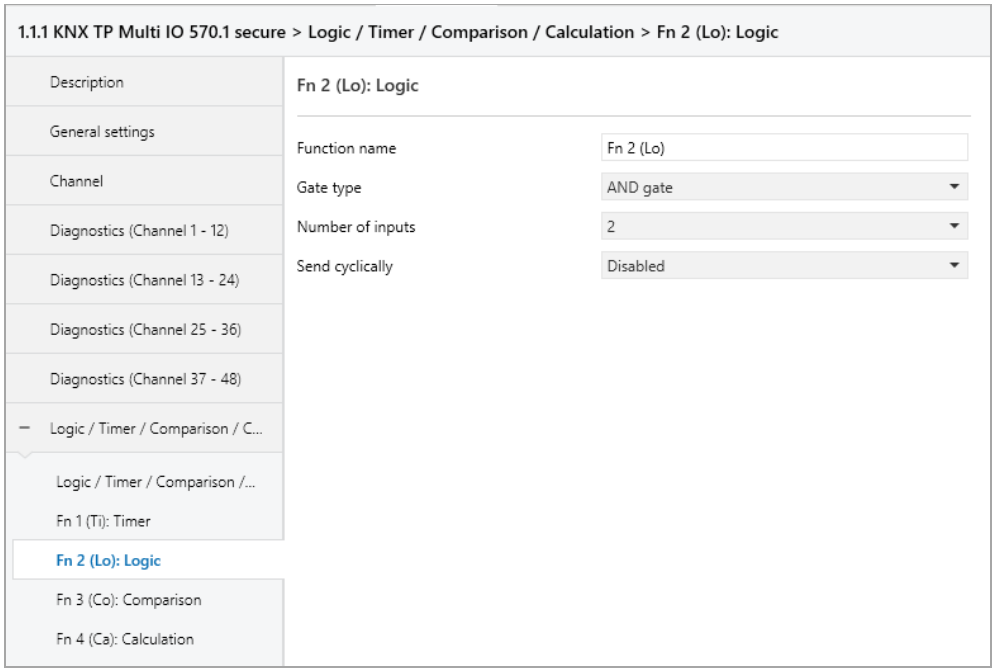
This parameter defines the delay when sending at the output.

Output

Via this parameter the sent value on the output can be inverted:

- Not inverted
- Inverted

7.12 Fn 1 – 48 (Lo): Logic



Function name *(10 characters)*

The function name can be freely selected.

It is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects later, as the assigned name is displayed there as a designation.

Gate type

This parameter defines the type of logic gate:

- And gate
  The output is triggered ON (1), if all inputs are switched ON (1).
- OR gate
  The output is triggered ON (1), if at least one input is switched ON (1).
- XOR gate
  The output is triggered ON (1), if an odd number of inputs is switched ON (1).
- NAND gate
  The output is triggered ON (1), if at least one inputs is switched OFF (0).
- NOR gate
  The output is triggered ON (1), if all inputs are switched OFF (0).

- XNOR gate
  The output is triggered ON (1), if an even number of inputs is switched ON (1).

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Lo): Logic – Gate input A – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Lo): Logic – Gate input B – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Lo): Logic – Gate output – Output	1.002	1 Bit	To KNX
Fn 1 – 48 (Lo): Logic – Gate input C – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Lo): Logic – Gate input D – Input	1.002	1 Bit	From KNX

The output sends when a telegram is received at an input. The condition for this is that both inputs are valid (have received at least one telegram). The output sends a 1 if the respective condition is fulfilled, otherwise a 0.

- INVERTER
  The input is inverted at the output, ON (1) becomes OFF (0) and OFF (0) becomes EIN (1).

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Lo): Logic – Gate input – Input	1.002	1 Bit	From KNX
Fn 1 – 48 (Lo): Logic – Gate output – Output	1.002	1 Bit	To KNX

The output transmits when a telegram is received at the input.

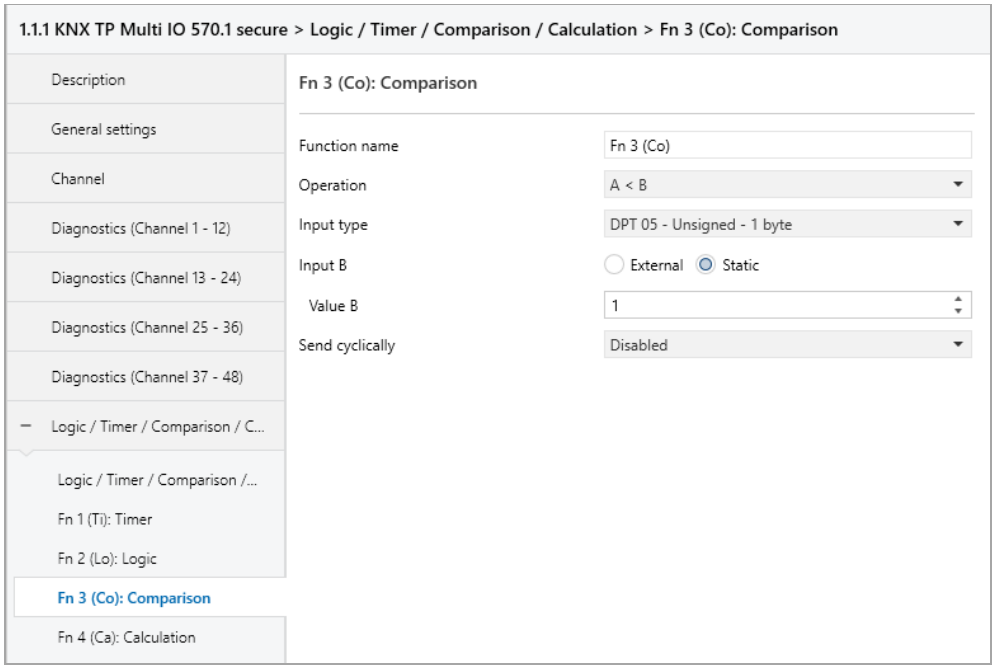
Number of inputs

This parameter defines the number of inputs for the logic gate.

Send cyclically

This parameter specifies whether the result is sent cyclically and at what interval.

7.13 Fn 1 – 48 (Co): Compare



Function name *(10 Characters)*

The function name can be freely selected.

It is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects later, as the assigned name is displayed there as a description.

Operation

This parameter defines the type of comparison operation used to compare the values of input A and B:

- A < B
  Input A is less than input B
- A = B
  Input A is equal to input B
- A > B
  Input A is higher than input B

Input type

This parameter defines the type of inputs:

- DPT 05 – Prozentwert – 1 Byte
  Value range: 0 (≙ 0) .. 100% (≙ 255)
- DPT 05 – Wert ohne Vz – 1 Byte
  Wertebereich: 0 .. 255
- DPT 07 – Wert ohne Vz – 2 Bytes
  Value range: 0 .. 65535
- DPT 12 – Wert ohne Vz – 4 Bytes
  Value range: 0 .. 4294967295
- DPT 09 – Gleitkomma – 2 Bytes
  Value range: -671088.64 .. +670433.28
- DPT 14 – Gleitkomma – 4 Bytes
  Value range: -3.4E+38 .. +3.4E+38

Input B

This parameter specifies whether the input is to be filled via an external (from the bus) or static (from the ETS).

Value B *(with Input B = "Static")*

This parameter defines the static value that is used as an input.

Send cyclically

This parameter specifies whether the result is sent cyclically and at what interval.

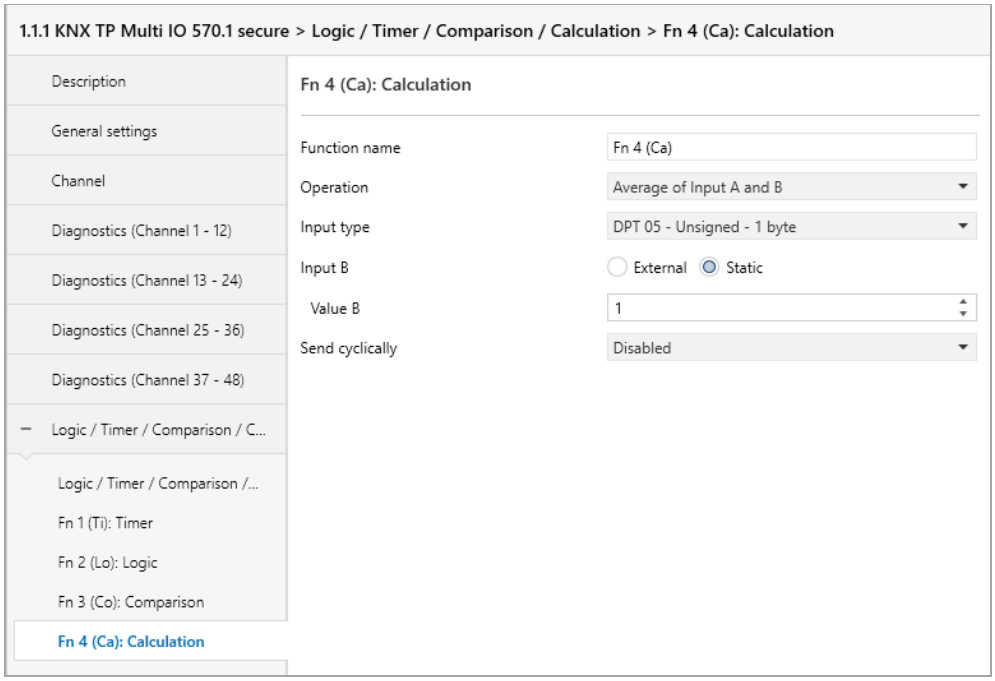
Group object	Type KNX	Size	Direction
Fn 1 – 48 (Co): Logic – Comparison – ... Byte input A*	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 Byte, 2 Byte, 4 Byte	From KNX
Fn 1 – 48 (Co): Logic – Comparison – ... Byte input B*	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 Byte, 2 Byte, 4 Byte	From KNX
Fn 1 – 48 (Co): Logic – Comparison – Output	1.002	1 Bit	To KNX

** Only for „Input A"/ "Input B" parameter = External*

*** Type KNX determined by "Input type" parameter*

The output sends when a telegram is received at an input. The condition for this is that both inputs are valid (have received at least one telegram). The output sends a 1 if the respective condition is fulfilled, otherwise a 0.

7.14 Fn 1 – 48 (Ca): Calculation



Function name *(10 Characters)*

The function name can be freely selected.

It is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects later, as the assigned name is displayed there as a description.

Operation

This parameter defines the type of comparison operation:

- Average value of input A and B
  (input A + input B) / 2
- Convert value
  Convert input A to another type
- Limit value
  Limit input A

Input type

This parameter defines the type of input:

- DPT 05 – Prozentwert – 1 Byte
  Value range: 0 (≙ 0) .. 100% (≙ 255)
- DPT 05 – Wert ohne Vz – 1 Byte
  Wertebereich: 0 .. 255
- DPT 07 – Wert ohne Vz – 2 Bytes
  Value range: 0 .. 65535
- DPT 12 – Wert ohne Vz – 4 Bytes
  Value range: 0 .. 4294967295
- DPT 09 – Gleitkomma – 2 Bytes
  Value range: -671088.64 .. +670433.28
- DPT 14 – Gleitkomma – 4 Bytes
  Value range: -3.4E+38 .. +3.4E+38

Input B *(with Operation = "Average value of input A and B")*

This parameter specifies whether the input is to be filled via an external (from the bus) or static (from the ETS).

Value B *(with Input B "Static")*

This parameter defines the static value that is used as an input.

Correction *(with Operation = "Convert value")*

This parameter specifies whether the value is to be added with an offset or multiplied by a factor.

Offset *(with Correction = "Offset" AND for output type != "Binary (DPT 1.002 - 1 Byte)")*

This parameter defines the offset that is added to the input.

Factor *(with Correction = "Factor" AND for output type != "Binary (DPT 1.002 - 1 Byte)")*

This parameter defines the factor by which the input is multiplied.

Send 1 on *(with Operation = "Convert value" AND for output type = "Binary (DPT 1.002 - 1 Byte)")*

This parameter specifies whether 1 is sent at input A lower or higher than the threshold value.

Threshold value
(with Operation = "Convert value" AND for output type = "Binary (DPT 1.002 - 1 Byte)")

This parameter defines the threshold value to which the input is compared.

Limit (min.) *(with Operation = "Limit value")*

This parameter defines the lower limit with which the output is limited.

Limit (Max.) *(with Operation = "Limit value")*

This parameter defines the upper limit with which the output is limited.

Output type *(with Operation = "Convert value")*

This parameter defines the type of input:

- DPT 01 – Binär – 1 Bit
  Value range: 0 .. 1
- DPT 05 – Prozentwert – 1 Byte
  Value range: 0 (≙ 0) .. 100% (≙ 255)
- DPT 05 – Wert ohne Vz – 1 Byte
  Wertebereich: 0 .. 255
- DPT 07 – Wert ohne Vz – 2 Bytes
  Value range: 0 .. 65535
- DPT 12 – Wert ohne Vz – 4 Bytes
  Value range: 0 .. 4294967295
- DPT 09 – Gleitkomma – 2 Bytes
  Value range: -671088.64 .. +670433.28
- DPT 14 – Gleitkomma – 4 Bytes
  Value range: -3.4E+38 .. +3.4E+38

Send cyclically

This parameter specifies whether the result is sent cyclically and at what interval.

Group object	Type KNX	Size	Direction
Fn 1 – 48 (Ca): Logic – Calculation – … Byte Input A*	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 Byte, 2 Byte, 4 Byte	Von KNX
Fn 1 – 48 (Ca): Logic – Calculation – … Byte Input B*	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 Byte, 2 Byte, 4 Byte	Von KNX
Fn 1 – 48 (Ca): Logic – Calculation – … Output	1.002, 5.001, 5.010, 7.001, 12.001, 9.001, 14.001***	1 Bit, 1 Byte, 2 Byte, 4 Byte	Nach KNX

** Only for "Input A"/"Input B" parameter = External*
*** Type KNX determined by "Input type" parameter*
**** Type KNX* is *determined by the types of the inputs. With the Operation "Convert value", the output type can be freely chosen.*

The output sends when a telegram is received at an input. The condition for this is that both inputs are valid (have received at least one telegram). The output sends a 1 if the respective condition is fulfilled, otherwise a 0.

WARNING

- The device must be mounted and commissioned by an authorized electrician.
- The prevailing safety rules must be heeded.
- The device must not be opened.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.

Product database for ETS 5/6
www.weinzierl.de/en/products/570-1/ets6

Data sheet
www.weinzierl.de/en/products/570-1/datasheet

CE Declaration
www.weinzierl.de/en/products/570-1/ce-declaration

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