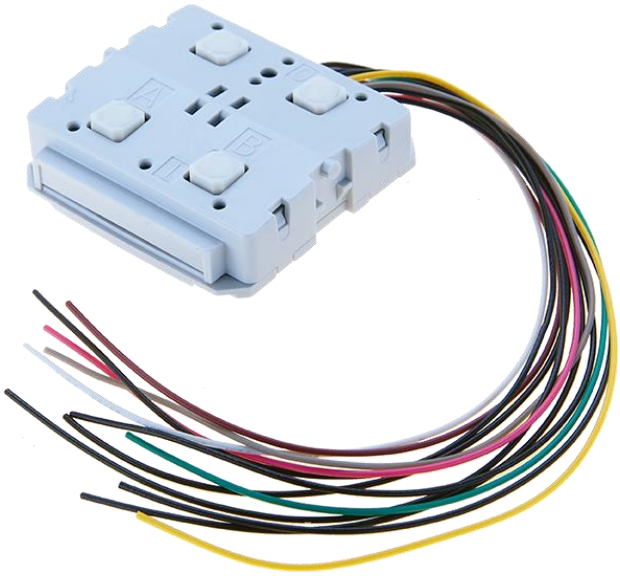
KNX TP Push Button Insert with KNX Data Security
For MATCH 55 series

KNX TP Push Button 420 *secure*

KNX TP Push Button Interface 420 *secure*

Operation and installation manual



(Art. # 5529 Insert with mounting kit)
(Art. # 5385 Insert with connection cable for push button interface)

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Content

1 Application

The KNX TP Push Button 420 *secure* is a push button insert with integrated bus coupling unit. The device is available with one or two rockers. Each rocker offers two pressure points (up/down).

The device is part of the MATCH 55 push button series. With the supplied installation kit, the push button fits mechanically to numerous switch ranges available on the market with internal dimensions of 55 mm. The soft and quiet push button operation allows the installation in bedrooms and living rooms.

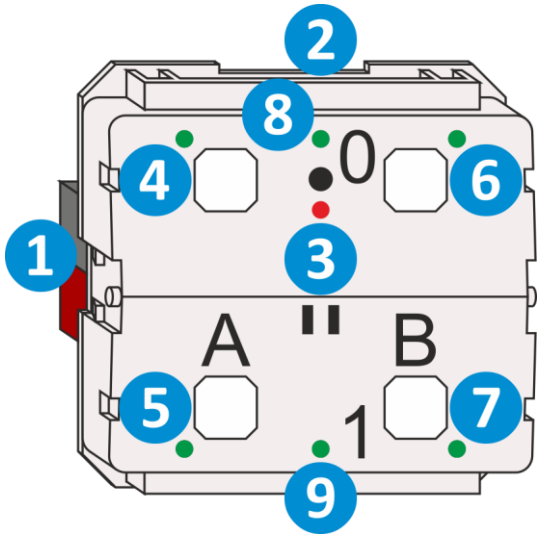
The application offers extensive functions for switching, dimming, shutter, valuator, scene and colour control as well as a sequence controller. Each button on a rocker can be configured individually. The flexible operating concept also allows different functions on one button depending on the setting.

The KNX TP Push Button 420 *secure* has pluggable connections to operate the device as binary input or pulse counter with 4 independent channels. Via these connections, 2 LEDs can also be operated externally.

In addition, the device contains 10 independent logic or time functions. The device supports KNX Data Security.

2 Installation and connection

The KNX TP Push Button 420 *secure* is suitable for numerous switch ranges available on the market with 55 mm internal dimensions. The insert has the following operating elements and displays:



1. KNX bus connector
2. Pluggable connections
3. Button/LED for programming mode
4. Button/LED A0
5. Button/LED A1
6. Button/LED B0
7. Button/LED B1
8. LED Top [0]
9. LED Bottom [1]

If the bus voltage is missing, the device is without function.

2.1 KNX programming mode

The KNX programming mode is activated/deactivated either by pressing the recessed KNX programming button ❸ or by simultaneously pressing the buttons ❹ and ❻ for approx. 6 seconds.

When the programming mode is active, the programming LED ❸ lights up red.

The operation of the programming mode via the buttons ❹ and ❻ can be activated/deactivated in the ETS® on page general settings.

2.2 Status display

Summary of the states of programming LED ❸:

LED Status	Meaning
LED lights red	Programming mode is active.
LED flashes red	Programming mode is not active. The device is not properly loaded e.g. after an interrupted download.

Summary of the states of LED Top [0] ❽:

LED Status	Meaning
LED flashes green	The device is currently loaded by the ETS.

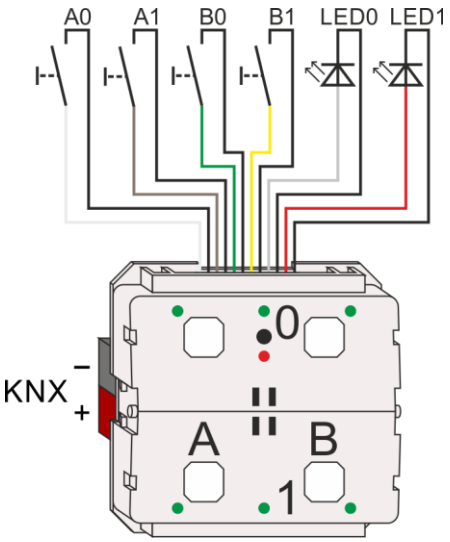
3 Reset to factory default settings

It is possible to reset the device to its factory default settings.

- Disconnect the KNX bus connector ❶ from the device.
- Press the KNX programming button ❸ and keep it pressed down.
- Reconnect the KNX bus connector ❶ to the device.
- Keep the KNX programming button ❸ pressed for at least another 6 seconds.
- A short flashing of all LEDs (❸❹❺❻❼❽❾) visualizes the successful reset of the device 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.

4 Wiring scheme



4.1 Pluggable connections

A connection cable is available for operating the device as binary input or pulse counter, the assignment is as follows:

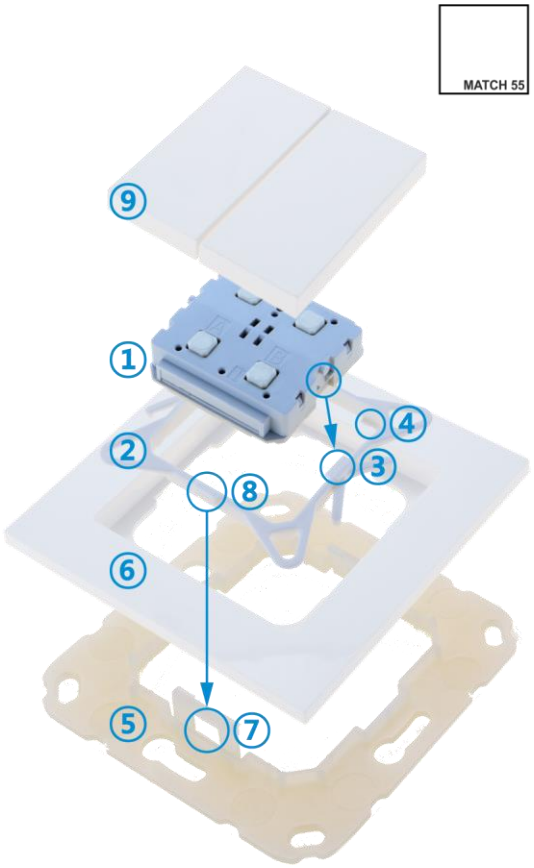
Connection pair	Color of the connection cable	Function
A0	White	Button A0
	Black	Common ground
A1	Brown	Button A1
	Black	Common ground
B0	Green	Button B0
	Black	Common ground
B1	Yellow	Button B1
	Black	Common ground

Additionally, 2 LEDs can be controlled externally:

Connection pair	Color of the connection cable	Function
LED0	Gray	LED Top [0]
	Black	Common ground
LED1	Red	LED Bottom [1]
	Black	Common ground

All black connecting cables are internally connected to ground in the device.
The KNX connection is located on the underside of the device.

5 Mounting and delivery



5.1 Mounting

Mounting of the KNX TP Push Button 420 *secure* ①:

- Insert the device ① from above into the holding frame ②. The device snaps into the retaining lugs ③ of the holding frame on the left and right and sits flush on the four retaining lugs ④.
- Fasten the wall mounting frame ⑤ in the desired installation position (with screws or adhesive pad) – make sure that the retaining straps ⑦ point up and down.
- Place the decorative frame ⑥ on the wall mounting frame ⑤ and then place the device ① locked into the holding frame ② from above. The wall mounting frame ⑤ snaps into the retaining lugs ⑧ of the holding frame ② with the retaining straps ⑦.
- Finally, place the rocker ⑨ (single rocker or double rocker depending on the model) on the KNX TP Push Button 420 *secure* ① and clip it in.

For dismantling, proceed in reverse order.

When connecting to the KNX bus, ensure correct polarity or orientation of the bus connector (see imprint on the underside of the device).

5.2 Delivery

KNX TP Push Button 420 *secure* (Art. # 5529):

- Push button insert ①
- Holding frame ②
- Wall mounting frame ⑤

The device is delivered without rockers ⑨ or design frames ⑥.

KNX TP Push Button Interface 420 *secure* (Art. # 5385):

The device is suitable as a binary input for connecting up to four conventional push buttons or dry contacts. In addition, the device offers two outputs for LEDs. The integrated push buttons and LEDs allow a quick test of the configuration.

- Push button insert ①
- Connection cable for push button interface (see page 1)

5.3 Design frames and rockers

Design frames and rockers must be ordered separately.

An overview of the available design frames and rockers, which can be ordered from us, can be found on our homepage (www.weinzierl.de/en/products/match-55).

Furthermore, many other design frames from other manufacturers can also be used. You can also find a compatibility list at the link above.

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.

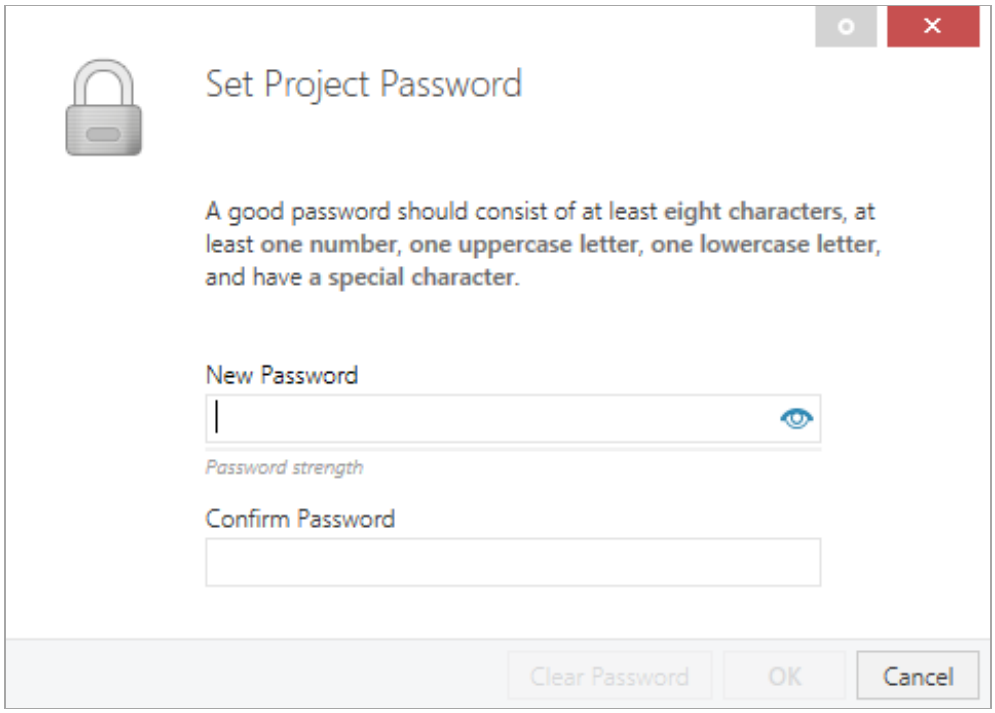
7 ETS database

The ETS5 database (for ETS 5.7 or newer) can be downloaded from the product website of the KNX TP Push Button 420 *secure* (www.weinzierl.de) or from the ETS online catalogue.

The KNX TP Push Button 420 *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.

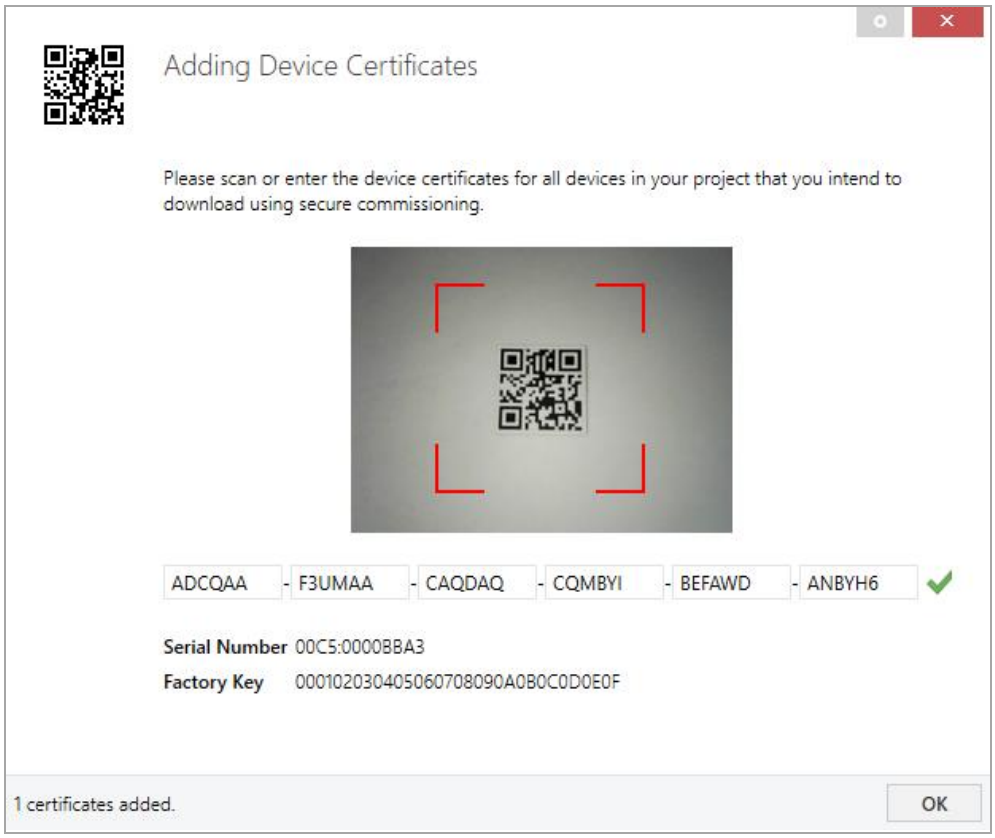
7.1 Secure commissioning

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).



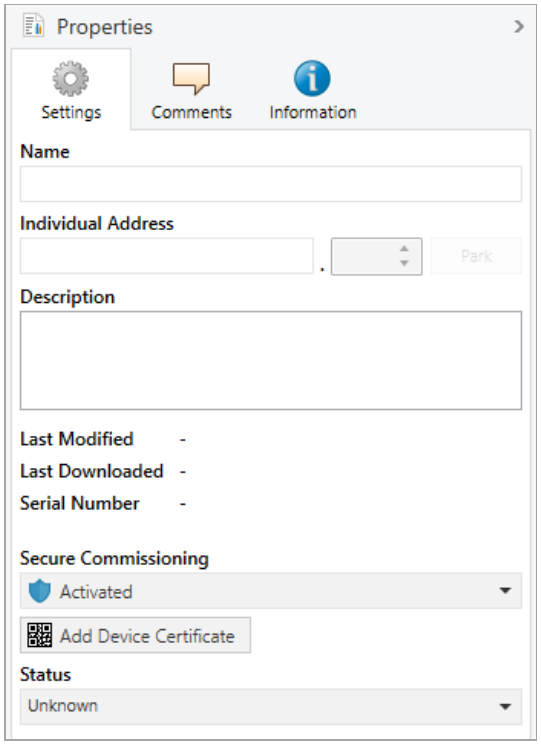
The certificate is printed as text on the device. It can also be scanned from the printed QR code via a webcam.

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.

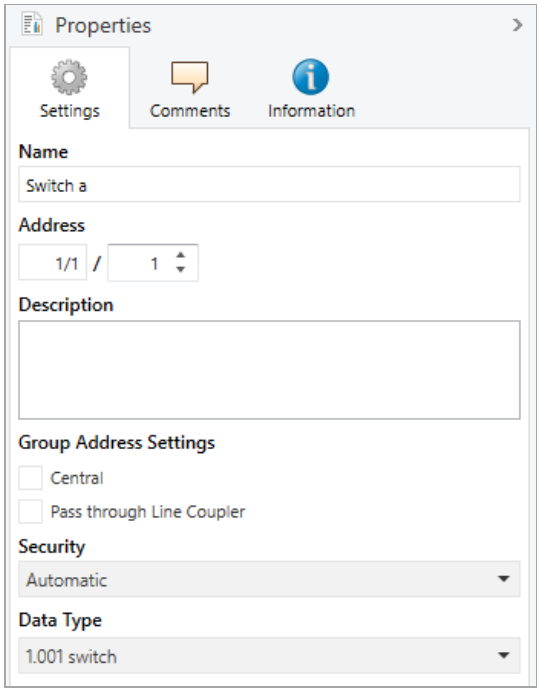
The serial number in the certificate enables the ETS to assign the correct key to a device during a download.

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:



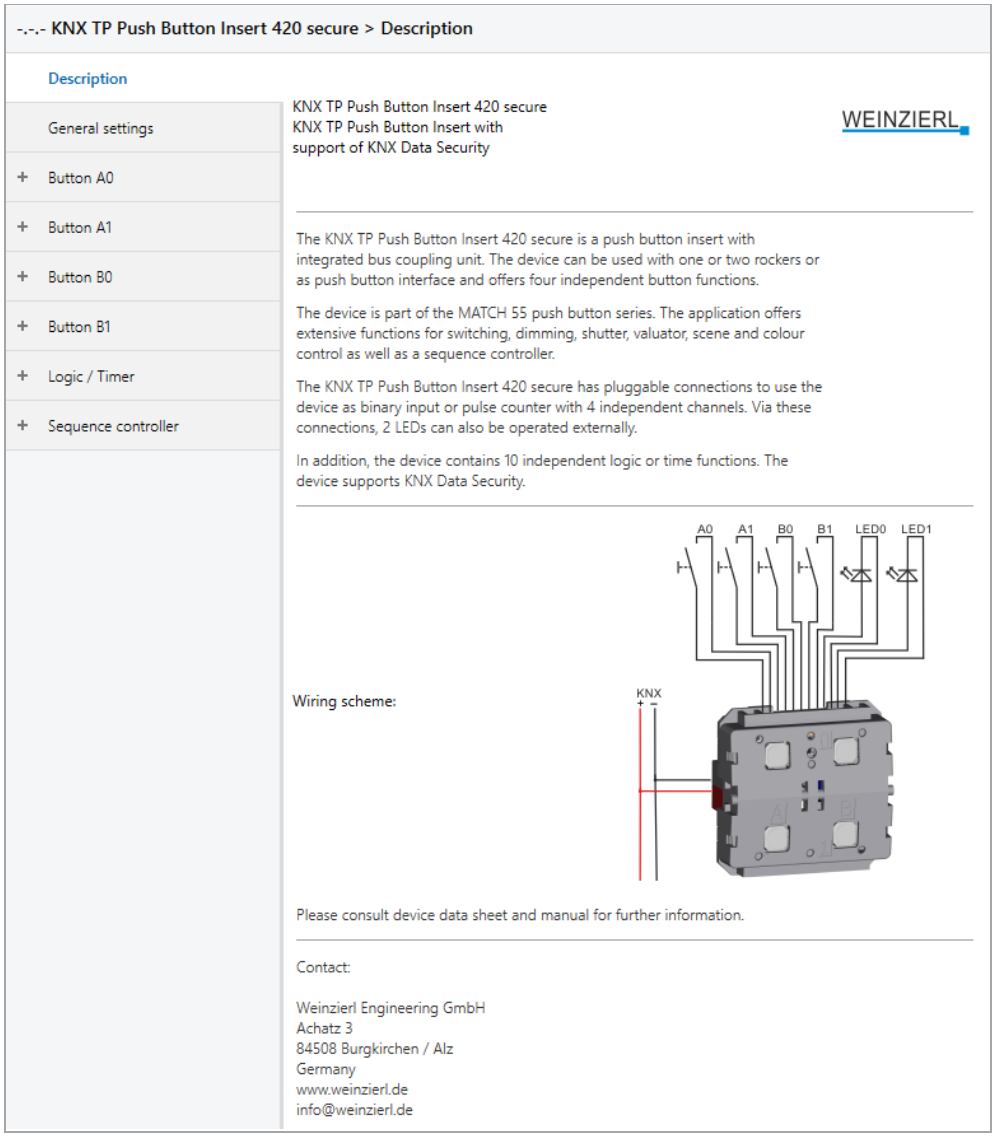
The setting “Automatic” activates encryption if both objects to be connected can communicate encrypted. Otherwise encrypted communication between the objects is not possible.

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

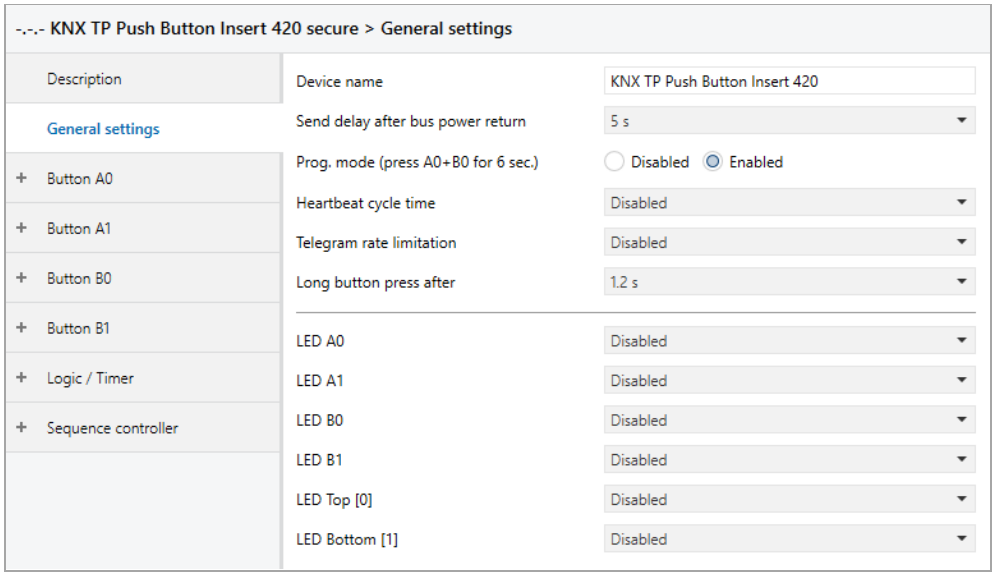
A separate key is automatically generated by the ETS for each secured group address. These keys can also be checked in the ETS panel Reports – Project Security. To enable all devices to communicate with a secure group address, the keys must be known to all. Therefore a download must be made into all 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 shows the device description and the associated wiring scheme.

7.4 General settings



Device name *(30 characters)*

An arbitrary name can be assigned for the KNX TP Push Button 420 *secure*. The device name should be meaningful, e.g. “Living Room”. This helps the clarity of the ETS project.

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 or query of the inputs are not affected by this parameter

Prog. mode (press A0+B0 for 6 sec.)

In addition to the normal programming button 3 the device allows activating the programming mode on the device front without removing the rocker. The programming mode can be activated and deactivated via pressing simultaneously both buttons 4 and 6 for 6 seconds.

This feature can be enabled and disabled via the parameter “Prog. mode (press A0+B0 for 6 sec.)”. The recessed programming button 3 is always enabled and not influenced by this parameter.

The prog. mode (A0+B0) should be deactivated if push button functions are configured for actuations of more than 6 seconds (e.g. moving shutter via Deadman switch)

Heartbeat cycle time

Sends cyclically the value 1 to the KNX bus to indicate that the device is currently ready for operation. The cycle time can be selected between 1 minute and 24 hours.

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

Long button press after

Here you can set the time for detecting a long actuation, this time is valid for all inputs/buttons.

LED A0
LED A1
LED B0
LED B1

Here the operating mode of the LEDs in normal operation can be set, it is selectable:

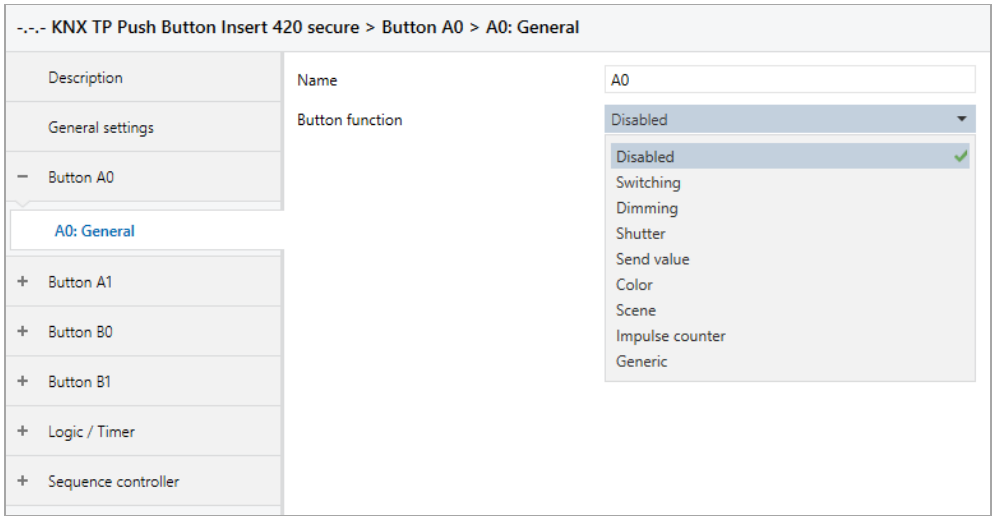
- Disabled
  LED is disabled always.
- Enabled
  LED is enabled always.
- Via group object
  LED is operated only via group object.
- Input/Key state
  LED is operated only via input/key.

LED Top [0]
LED Bottom [1]

Here the operating mode of the LEDs in normal operation can be set, it is selectable:

- Disabled
  LED is disabled always.
- Enabled
  LED is enabled always.
- Via group object
  LED is operated only via group object.
- Bus traffic
  LED indicates bus communication.

7.5 Button A0: General



Name *(30 characters)*

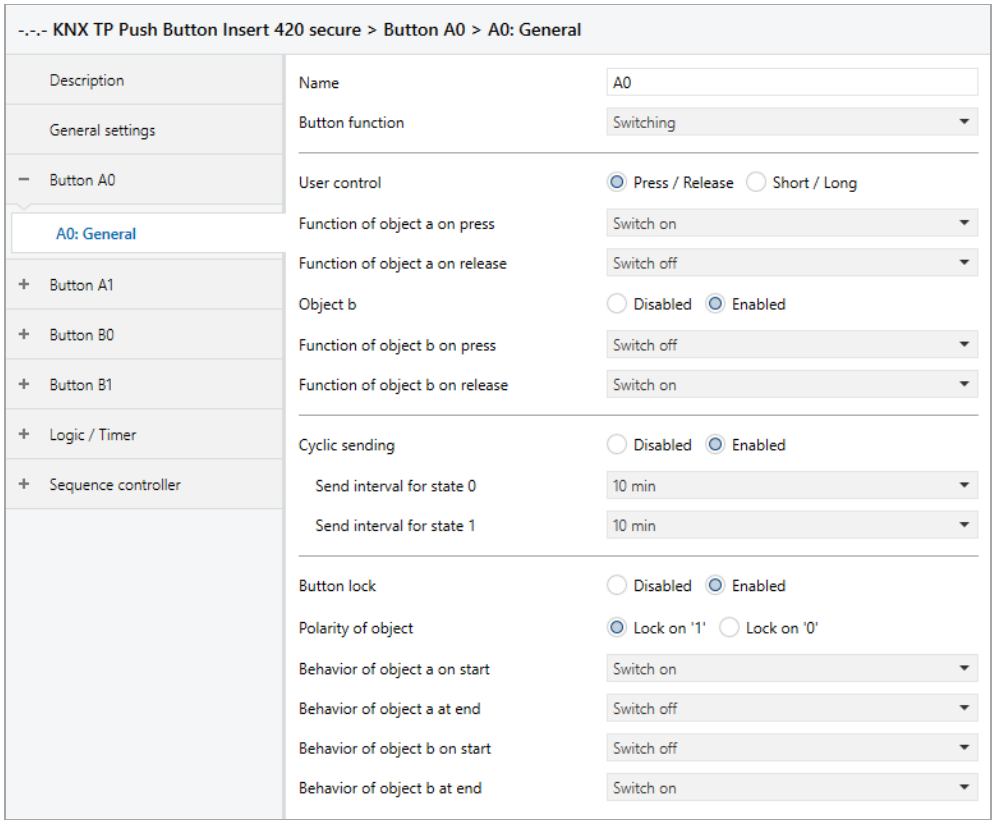
An arbitrary name can be assigned for the input/button. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named “Button …” with the button number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

Button function

The following functions are selectable:

- Switching
- Dimming
- Shutter
- Send value
- Color
- Scene
- Impulse counter
- Generic

7.6 Button function “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 Button A0: Object a – Switch	1.001	1 Bit	To KNX
GO 12 Button A0: Object b – Switch	1.001	1 Bit	To KNX

Object 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.

Object b

Here object b can be enabled and configured.

Cyclic sending

Cyclic sending can be configured independently for states 0 and 1:

Send interval for state 0
Send interval for state 1

The send interval of the respective state can be set here.

Button lock

With this parameter the button lock can be enabled. If the lock has been activated via the group object, no telegrams are triggered by state changes of the input/button.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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.

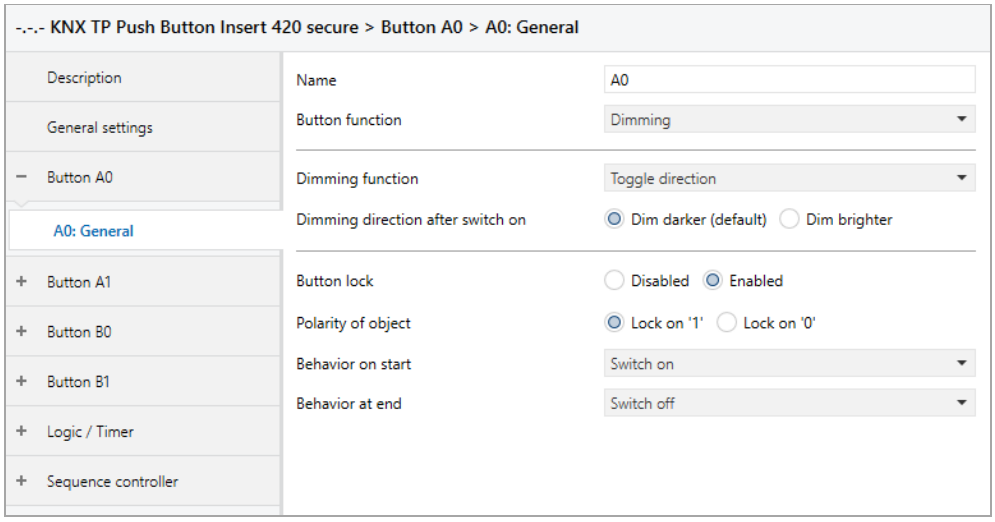
Behavior of object a/b on start *(only for button lock)*

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 *(only for button lock)*

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

7.7 Button function “Dimming”



On selection of button function dimming following objects are visible:

Group object	Type KNX	Size	Direction
GO 11 Button A0: Dimming on/off – Switch	1.001	1 Bit	To KNX
GO 12 Button A0: 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 parameter “Dimming function” 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.

If the input/button 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.

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.

Button lock

With this parameter the button lock can be enabled. If the lock has been activated via the group object, no telegrams are triggered by state changes of the input/button.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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.

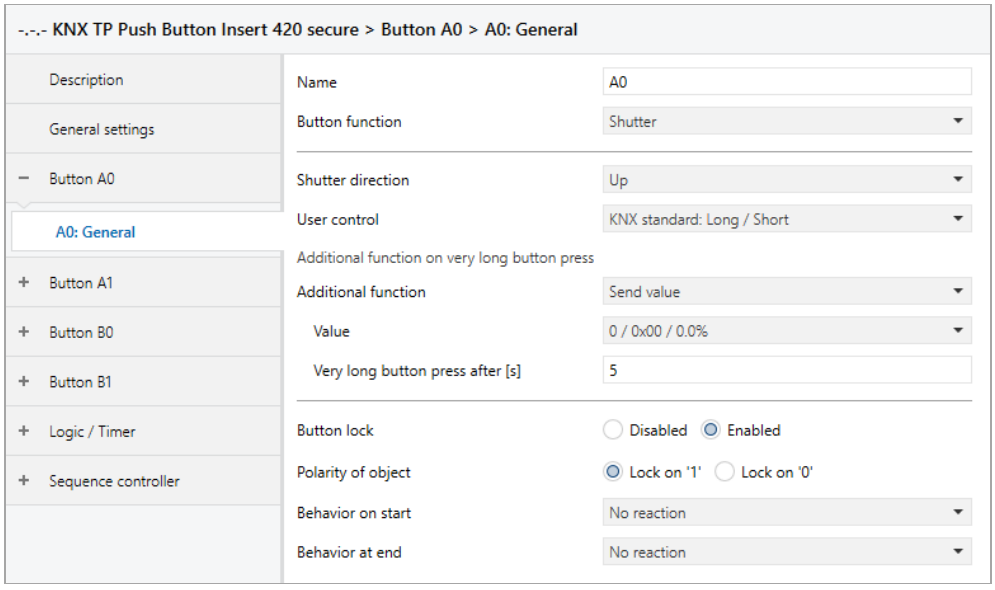
Behavior of object a/b on start *(only for button lock)*

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 *(only for button lock)*

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

7.8 Button function “Shutter”



On selection of button function shutter following objects are visible:

Group object	Type KNX	Size	Direction
GO 11 Button A0: Drive start – Up/Down	1.008	1 Bit	To KNX
GO 12 Button A0: Drive stop – Step/Stop	1.007	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.

User control

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

- KNX standard: Long / Short
  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
  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
  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
  Short actuation: Drive command via object 11
  Actuation during drive: Stop/Step command via object12
  Long actuation: Additional function

- Short / Short plus Long with turning time
  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)
  On actuation: Drive command via object 11
  On release: Stop/Step command via object 12

- Hold with turning time
  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
  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.

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 13 Button A0: Additional function – Switch	1.001	1 Bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 13 Button A0: Additional function – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 13 Button A0: Additional function – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO 13 Button A0: 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 13 Button A0: 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 13 Button A0: 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 13 Button A0: 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.

Button lock

With this parameter the button lock can be enabled. If the lock has been activated via the group object, no telegrams are triggered by state changes of the input/button.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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.

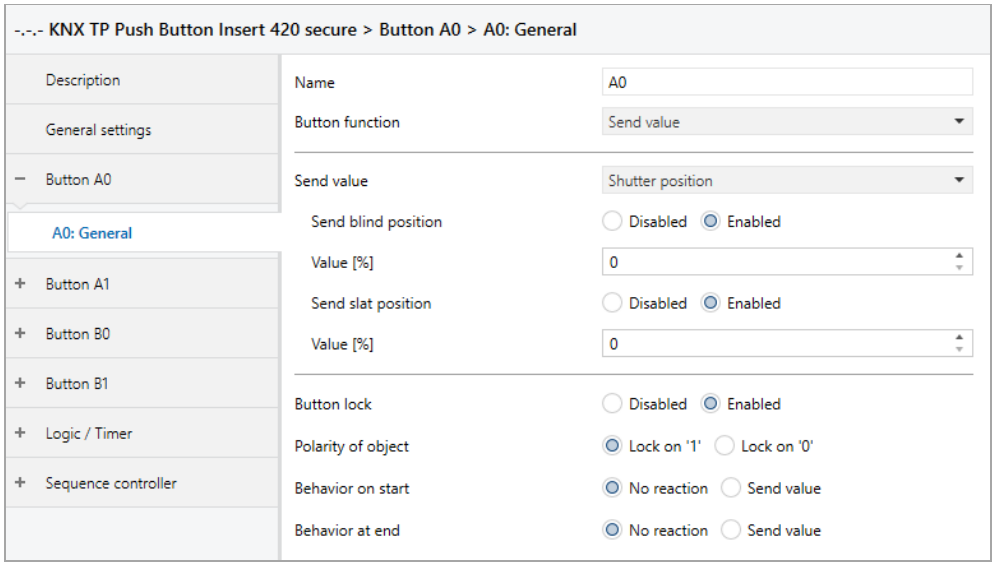
Behavior on start *(only for button lock)*

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

Behavior at end *(only for button lock)*

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

7.9 Button function “Send value”



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

- 1 Byte – Integer value / Percent

Group object	Type KNX	Size	Direction
GO 11 Button A0: Send integer value (1 Byte) – Set value	5.001	1 Byte	To KNX

- 2 Byte – Integer value

Group object	Type KNX	Size	Direction
GO 11 Button A0: Send integer value (2 Bytes) – Set value	7.001	2 Byte	To KNX

- 2 Byte – Float value

Group object	Type KNX	Size	Direction
GO 11 Button A0: Send float value (2 Bytes) – Set value	9.001	2 Byte	To KNX

- 3 Byte – RGB value

Group object	Type KNX	Size	Direction
GO 11 Button A0: Send RGB color value (3 Bytes) – Set value	232.600	3 Byte	To KNX

- 14 Byte – ASCII string

Group object	Type KNX	Size	Direction
GO 11 Button A0: Send ASCII string (14 Bytes) – Set value	16.000	14 Byte	To KNX

- Shutter position

Group object	Type KNX	Size	Direction
GO 11 Button A0: Send blind position – Set position	5.001	1 Byte	To KNX
GO 12 Button A0: Send slat position – Set position	5.001	1 Byte	To KNX

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

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.

Button lock

With this parameter the button lock can be enabled. If the lock has been activated via the group object, no telegrams are triggered by state changes of the input/button.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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.

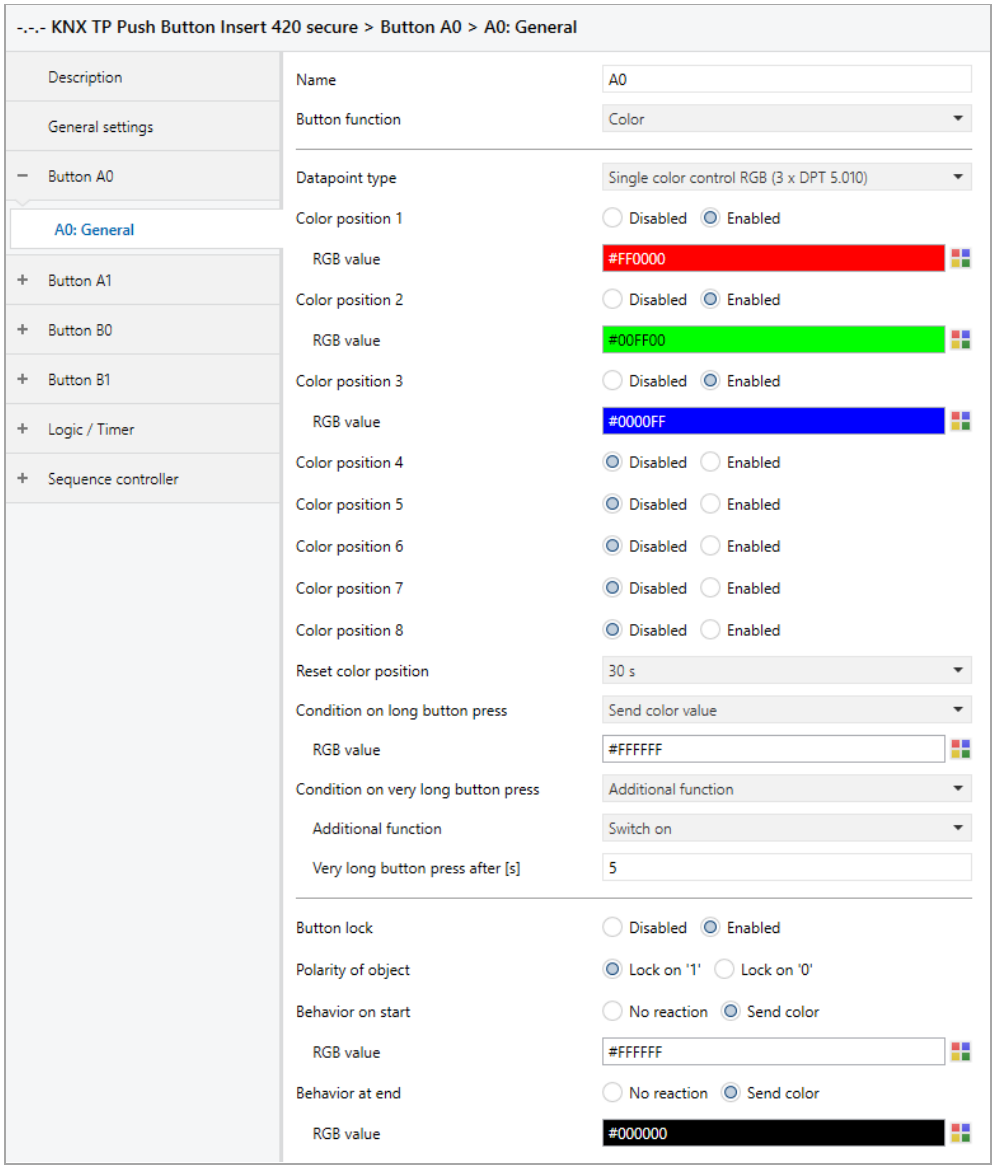
Behavior on start *(only for button lock)*

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

Behavior at end *(only for button lock)*

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

7.10 Button function “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 5.010)

Group object	Type KNX	Size	Direction
GO 11 Button A0: Value R – Set color	5.010	1 Byte	To KNX
GO 12 Button A0: Value G – Set color	5.010	1 Byte	To KNX
GO 13 Button A0: Value B – Set color	5.010	1 Byte	To KNX

- Single color control RGBW (4 x DPT 5.010)

Group object	Type KNX	Size	Direction
GO 11 Button A0: Value R – Set color	5.010	1 Byte	To KNX
GO 12 Button A0: Value G – Set color	5.010	1 Byte	To KNX
GO 13 Button A0: Value B – Set color	5.010	1 Byte	To KNX
GO 14 Button A0: Value W – Set color	5.010	1 Byte	To KNX

- Color control RGB (DPT 232.600)

Group object	Type KNX	Size	Direction
GO 11 Button A0: RGB color value (3 Bytes) – Set color	232.600	3 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 Button A0: Additional function – Switch	1.001	1 Bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 15 Button A0: Additional function – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 15 Button A0: Additional function – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO 15 Button A0: 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 Button A0: 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 Button A0: 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 Button A0: 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.

Button lock

With this parameter the button lock can be enabled. If the lock has been activated via the group object, no telegrams are triggered by state changes of the inputs/button.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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.

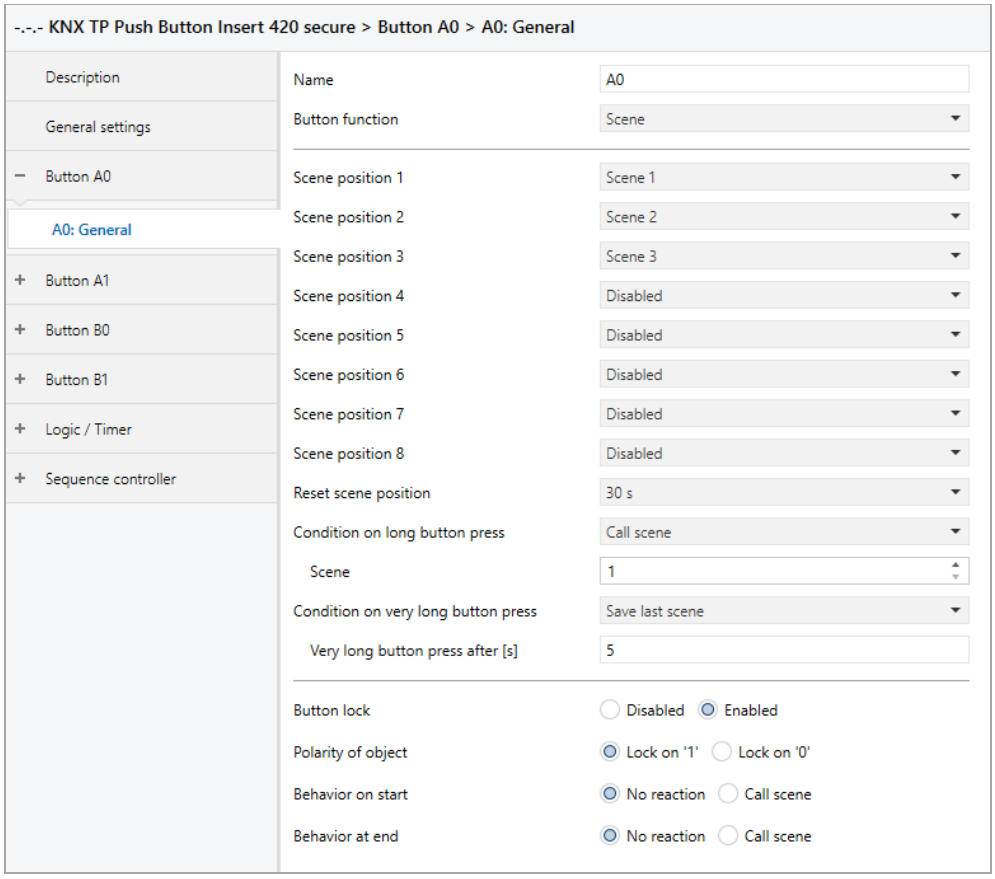
Behavior on start *(only for button lock)*

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

Behavior on end *(only for button lock)*

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

7.11 Button function “Scene”



On selection of scene function the following object is visible:

Group object	Type KNX	Size	Direction
GO 11 Button A0: Scene – Call/Save	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 Button A0: Additional function – Switch	1.001	1 Bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 15 Button A0: Additional function – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 15 Button A0: Additional function – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down /Stop

Group object	Type KNX	Size	Direction
GO 15 Button A0: 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 Button A0: 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.

Button lock

With this parameter the button lock can be enabled. If the lock has been activated via the group object, no telegrams are triggered by state changes of the input/button.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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.

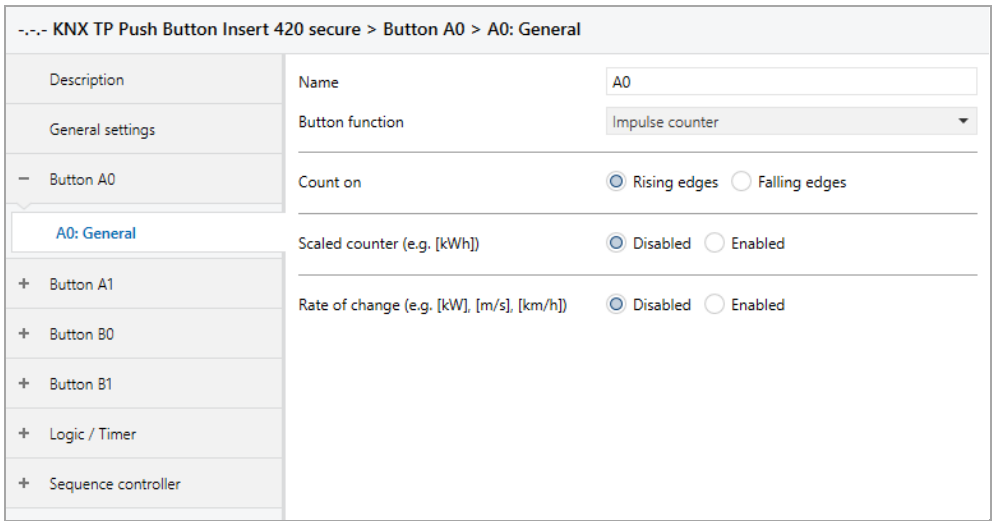
Behavior on start *(only for button lock)*

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

Behavior at end *(only for button lock)*

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

7.12 Button 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 for the rate of change must also be selected.

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.

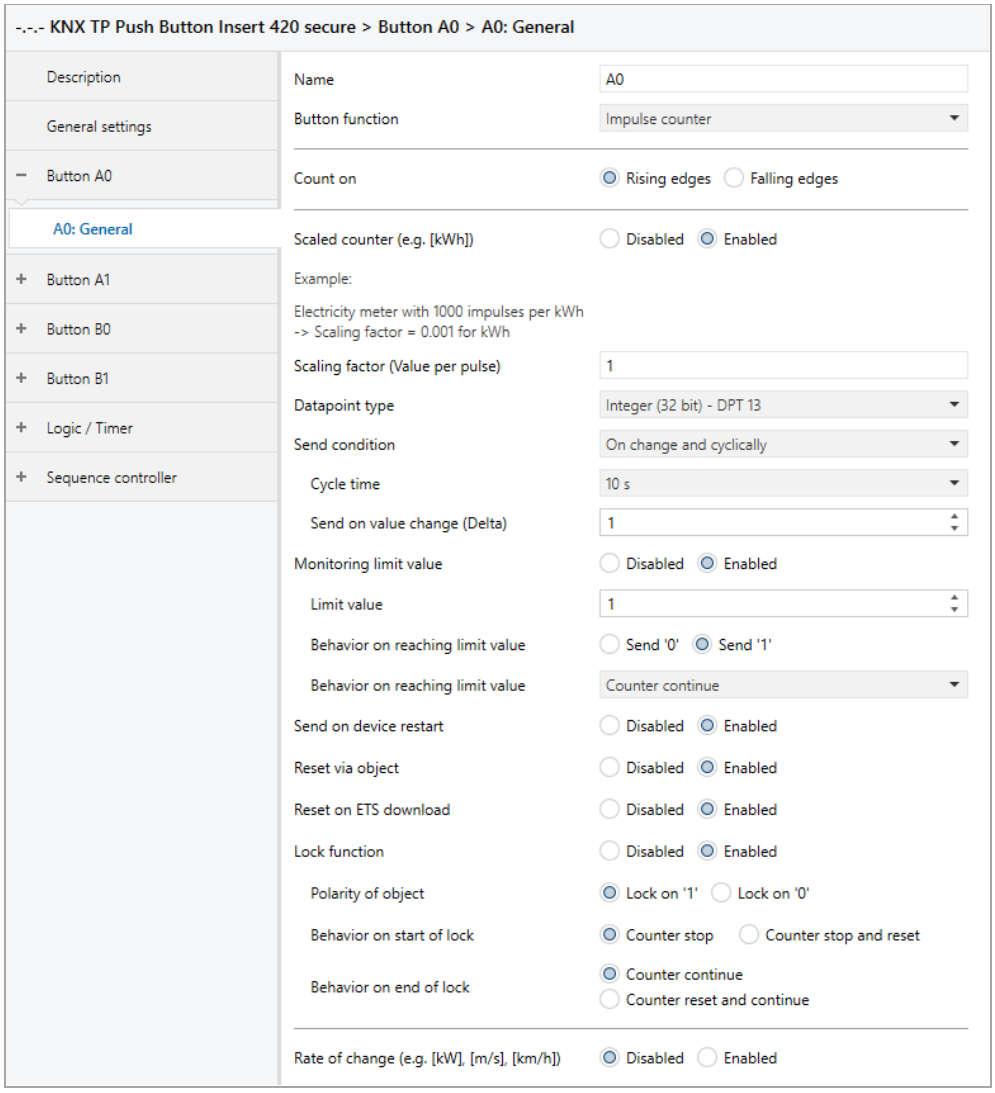
Scaled counter (e.g. [kWh])

Here, the scaled counter can be activated, the parameters of “Scaled counter” are 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 “Rate of change” parameters are displayed.

7.13 Impulse counter “Scaled counter (e.g. [kWh])”



This counter can be used to count values on input impulses, where an integer value (4 byte) or a floating point value (2 byte / 4 byte) 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 Button A0: Counter – Value	13.013	4 Byte	To KNX

- Float (16 Bit) – DPT 9

Group object	Type KNX	Size	Direction
GO 11 Button A0: Counter – Value	9.024	2 Byte	To KNX

- Float (32 Bit) – DPT 14

Group object	Type KNX	Size	Direction
GO 11 Button A0: 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 Button A0: Counter threshold – State	1.002	1 Bit	To KNX

Limit value *(only for monitoring 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) *(only for monitoring limit value)*

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) *(only for monitoring limit value)*

This parameter defines the behavior of the counter value 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.
- 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

When activated, the following object appears, via which the counter can be reset to 0:

Group object	Type KNX	Size	Direction
GO 15 Button A0: Reset – Trigger	1.017	1 Bit	From KNX

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

With this parameter the lock function can be activated or deactivated. If this function is activated, the respective group object appears, as well as the following parameters for more detailed configuration.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for lock function)*

With the effect of the object you can set how the lock is to be activated, either by receiving a 1 or a 0. The respective opposite telegram deactivates the lock again.

Behavior on start of lock *(only for lock function)*

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

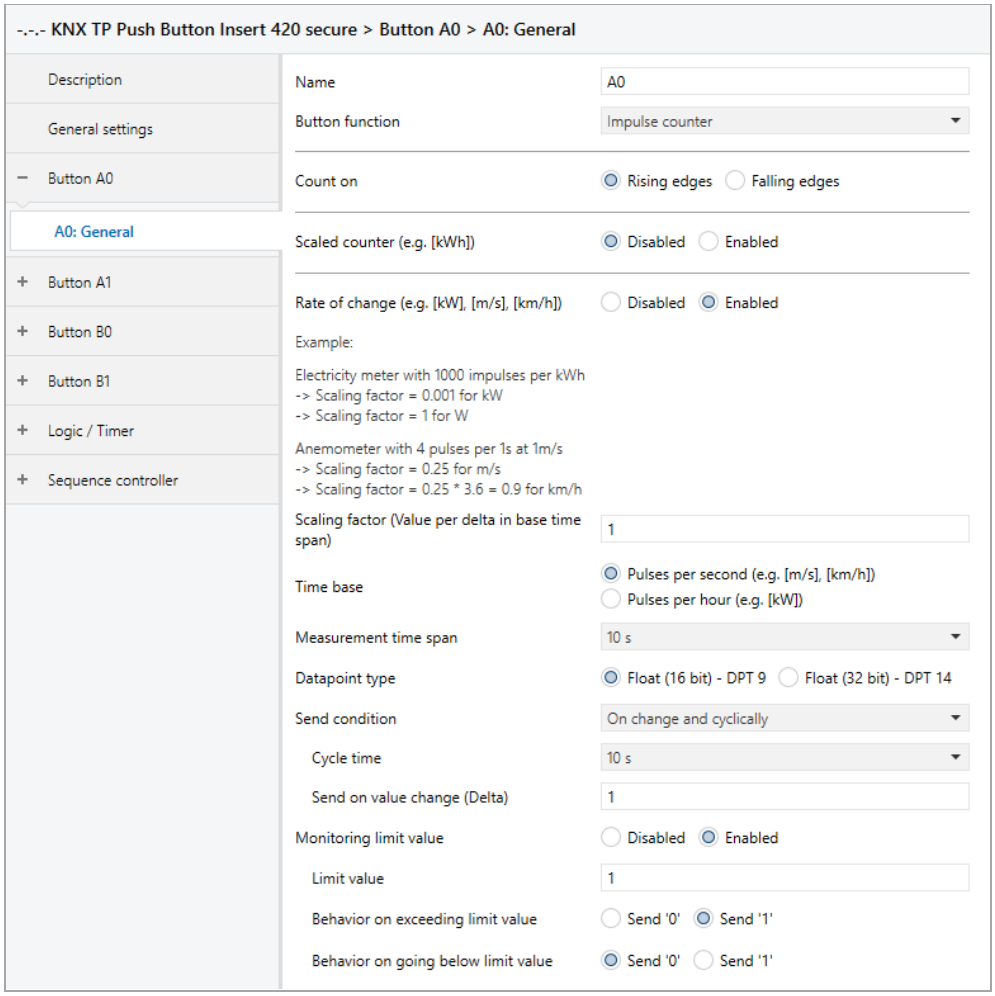
- Counter stop
- Counter stop and reset

Behavior on end of lock *(only for lock function)*

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

- Counter continue
- Counter reset and continue

7.14 Impulse counter “Rate of change (e.g. [kW], [m/s], [km/h])”



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 measuring interval describes the past time period that determines the current measurement result. The measuring interval runs quasi-continuously with a resolution of one tenth of the time window. The number of counting pulses in the measuring interval are scaled with **Scaling factor** * **Time base** and divided by the measuring interval.

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

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 13 Button A0: Rate of change – Value	9.024	2 Byte	To KNX

- Floating point (32 Bit) – DPT 14

Group object	Type KNX	Size	Direction
GO 13 Button A0: 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 14 Button A0: Rate threshold – State	1.002	1 Bit	To KNX

Limit value *(only for monitoring 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 *(only for monitoring 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 *(only for monitoring 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

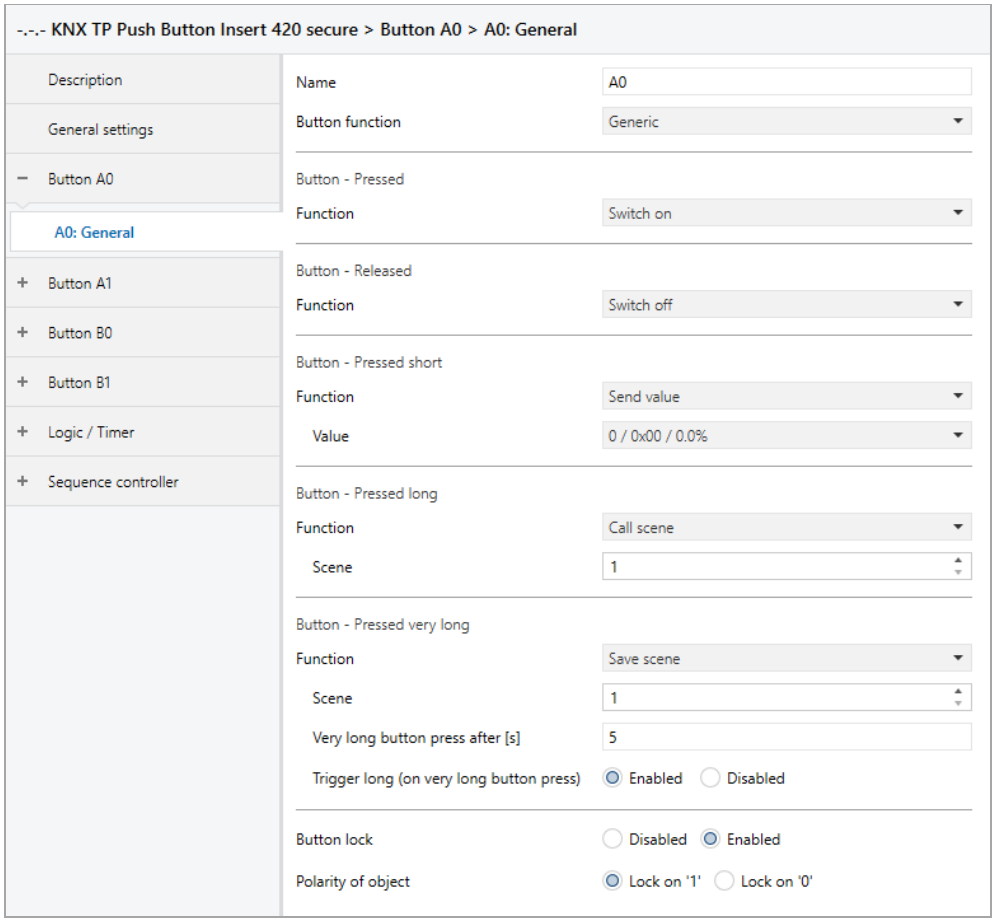
Example: Anemometer

From the data sheet of the anemometer you can see that it delivers 4 pulses/s at a wind speed of 1 m/s.

The rate of change counter 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
Measuring interval: 10 s

7.15 Button function “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 12 Button A0: Pressed – ...	Depending on function		To KNX

- Button – Released

Group object	Type KNX	Size	Direction
GO 12 Button A0: Released – ...	Depending on function		To KNX

- Button – Pressed short

Group object	Type KNX	Size	Direction
GO 13 Button A0: Pressed short – ...	Depending on function		To KNX

- Button – Pressed long

Group object	Type KNX	Size	Direction
GO 14 Button A0: Pressed long – ...	Depending on function		To KNX

- Button – Pressed very long

Group object	Type KNX	Size	Direction
GO 15 Button A0: 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 ... Button A0: ... – Switch	1.001	1 Bit	To KNX

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

Group object	Type KNX	Size	Direction
GO ... Button A0: ... – Dimming relative	3.007	4 Bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO ... Button A0: ... – Up/Down	1.008	1 Bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO ... Button A0: ... – 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 ... Button A0: ... – 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.

Button lock

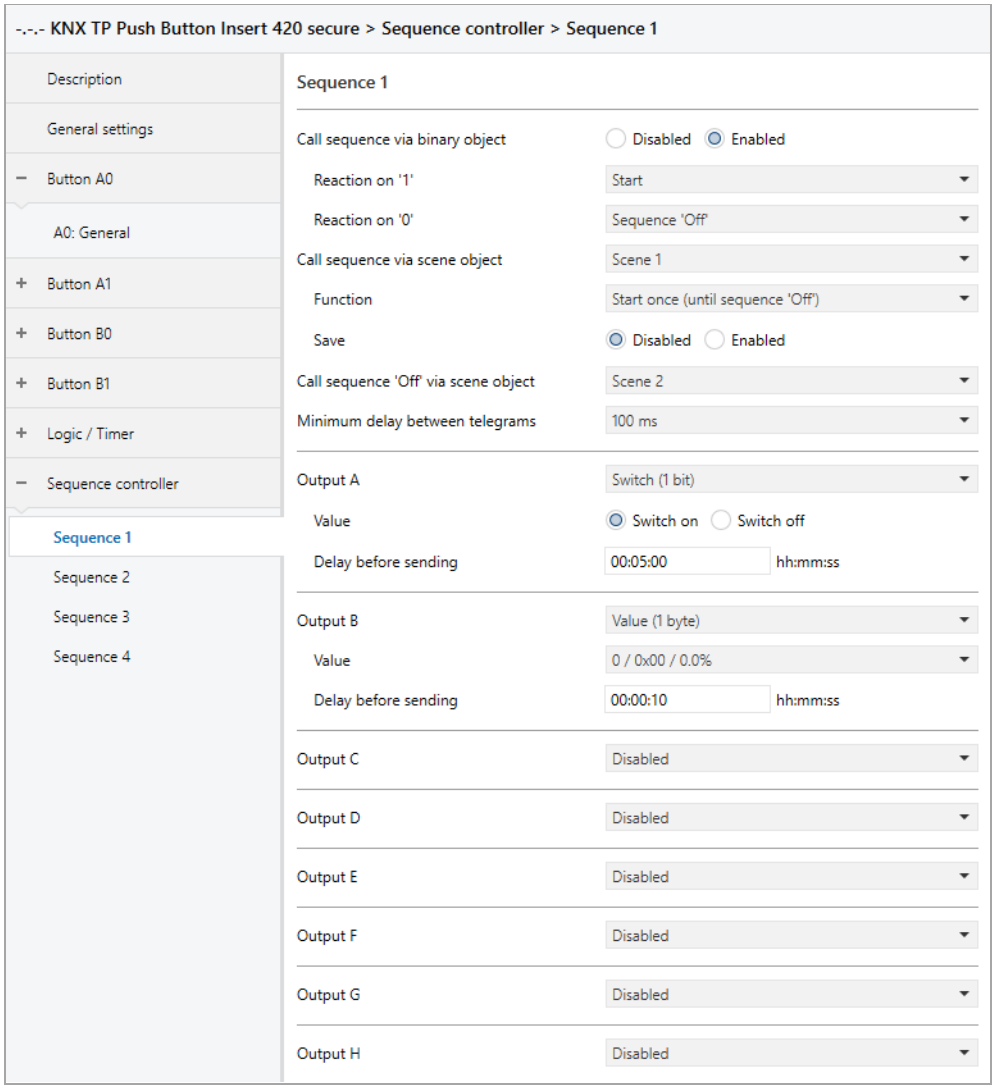
With this parameter the key lock can be activated. If the lock was activated via the group object, no telegrams are triggered when the status of the input/button changes.

Group object	Type KNX	Size	Direction
GO 16 Button A0: Lock – Activate	1.001	1 Bit	From KNX

Polarity of object *(only for button lock)*

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 switches the lock off again.

7.16 Sequence controller



With the sequence controller, one or more switching or value telegrams can be triggered by an input telegram to a switching or scene object. In this way several devices can be controlled simultaneously in different ways via a presence detector, for example.

The output telegrams can be sent simultaneously or with an individually adjustable time delay.

There are 4 sequence controllers available in the device, each controller can send up to 8 different output telegrams. Sequence 1 is described below, the function of sequences 2 – 4 is identical.

Sequence call via binary object

This parameter activates the following binary object to control the sequence:

Group object	Type KNX	Size	Direction
GO 141 Sequence controller: Sequence 1 – Binary	1.001	1 Bit	From KNX

Reaction on '1' *(only for binary object)*
Reaction on '0' *(only for binary object)*

If sequence call via binary object is activated, these parameters can be used to define how the sequence controller reacts to the corresponding binary telegram.

The following options are available:

- Disabled
  No reaction to the corresponding telegram.

- Start
  When the corresponding value is received, the sequence is started with output A. Restarting via this value is only possible again after the sequence has run through.

- Start and retrigger
  Each time the corresponding value is received, the sequence is restarted with output A.

- Start once (until Sequence 'Off')
  When the corresponding value is received, the sequence is started with output A. Any further starting of the sequence by receiving this value is no longer possible until the function Sequence 'Off' is triggered.

- Save
  For each activated output, a reading telegram is sent on KNX, the received value overwrites the parameter value of the corresponding output. The received values are stored and active until the device is reloaded with the ETS.

- Stop
  When the corresponding value is received, the sequence is stopped.

- Sequence 'Off'
  The sequence 'Off' function sends an OFF telegram or 0% via every activated output, regardless of the value set in the parameters. Only the minimum delay between the telegrams is observed, but not the delay before sending the individual outputs. Sequence 'Off' is always executed completely.

- Sequence 'Off' once (until sequence)
  When the corresponding value is received, the function Sequence 'Off' is started; any further starting of this function by receiving this value is no longer possible until the sequence has been started.

Sequence call with scene object

This parameter can be used to activate a scene object for sequence call up and to determine its scene number. If a scene number is selected, additional parameters and the following object become visible:

Group object	Type KNX	Size	Direction
GO 142 Sequence controller: Sequence 1 – Scene	18.001	1 Byte	From KNX

Function *(only for scene object)*

This parameter determines the reaction of the sequence controller when the set scene is received. It is available for selection:

- Start
  When the corresponding scene is received, the sequence is started with output A; restarting via this scene is only possible again after the sequence has run through.

- Start and retrigger
  Each time the corresponding scene is received, the sequence is restarted with output A.

- Start and stop
  When the corresponding scene is received, the sequence is alternately started or stopped with output A.

- Start once (until sequence ‘Off’)
  When the corresponding scene is received, the sequence is started with output A; any further start of the sequence via reception of this scene is no longer possible until the Sequence ‘Off’ function is triggered.

Save *(only for scene object)*

This parameter determines whether the “Save scene” command should be evaluated for sequence recall when the scene is received. If this function is activated, a read telegram is sent on KNX for each activated output when “Save scene” is received; the value received overwrites the value of the corresponding output. The received values are saved and active until the device is reloaded with the ETS.

Sequence ‘Off’ with scene object

This parameter can be used to activate a scene object to start the ‘Off’ sequence function and to determine its scene number.

The following object is visible when used:

Group object	Type KNX	Size	Direction
GO 143 Sequence controller: Sequence 1 – Scene ‘Off’	18.001	1 Byte	From KNX

If “Start once (until sequence ‘Off’)” is set for sequence call up with scene object, sequence ‘Off’ must first be executed to start the sequence again.

Minimum delay between telegrams

This parameter defines the minimum delay between 2 output telegrams, this delay is always kept and has priority over the individually adjustable delays before sending of the outputs.

Output A – H

For each output either a switch or a value object can be activated:

Group object	Type KNX	Size	Direction
GO 144 – 151 Sequence controller: Sequence 1 – Output A-H	1.001	1 Bit	To KNX

Group object	Type KNX	Size	Direction
GO 144 – 151 Sequence controller: Sequence 1 – Output A-H	5.001	1 Byte	To KNX

Value

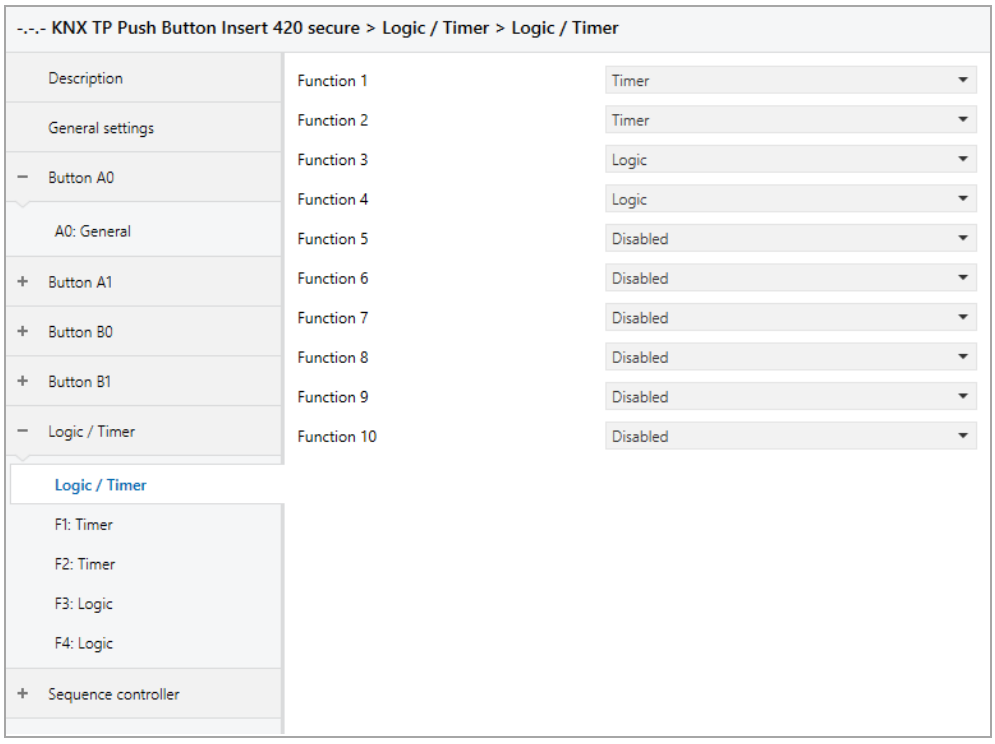
Depending on the set object type of the output, the value of the output telegram can be determined here:

- Switch on, if output switching (1 bit)
- Switch off if output switching (1 bit)
- 0...255 or 0...100%, if output value (1 byte)

Delay before sending

This determines the waiting time from starting the sequence (output A) or from sending the previous output (output B – H), which waits until the output telegram of the corresponding output has been sent.

7.17 Logic / Timer



Function 1 – 10

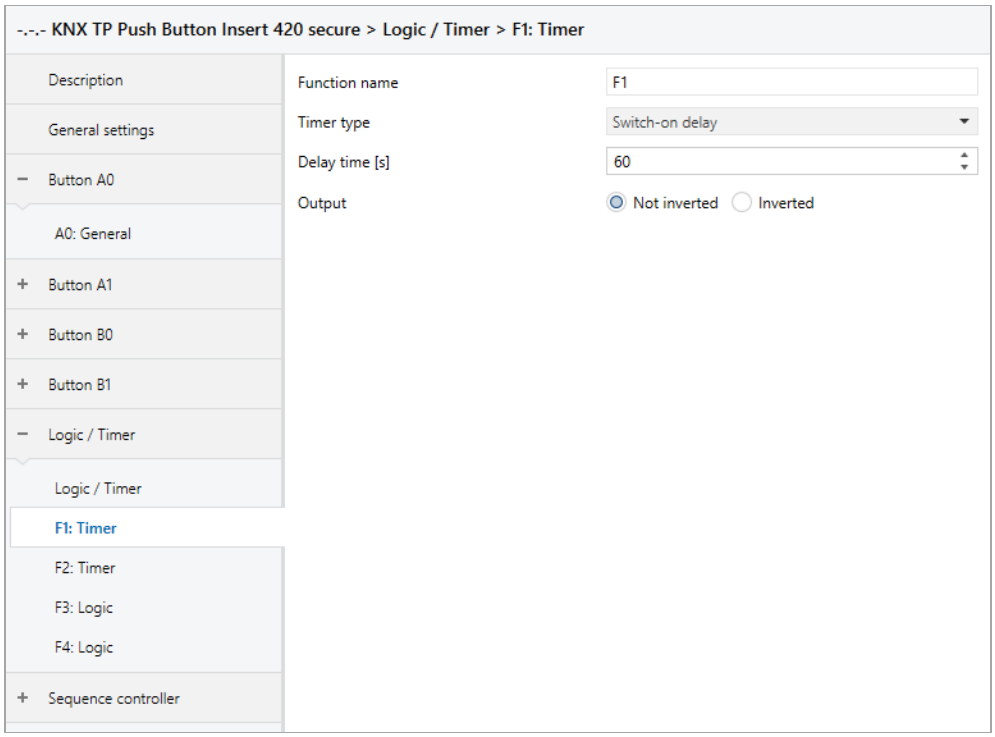
These parameters contain the functions timer and logic, whereby all 10 functions are identical.

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.

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.

7.18 Function 1 – 10: 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

Here the type of the timer can be set:

- 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
Timer – Switch-on delayed – Input	1.002	1 Bit	From KNX
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
Timer – Switch-off delayed – Input	1.002	1 Bit	From KNX
Timer – Switch-off delayed – Output	1.002	1 Bit	To KNX

- Switch-on and -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
Timer – Switch-on/off delayed – Input	1.002	1 Bit	From KNX
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
Timer – Impulse (staircase) – Input	1.002	1 Bit	From KNX
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 time [s]

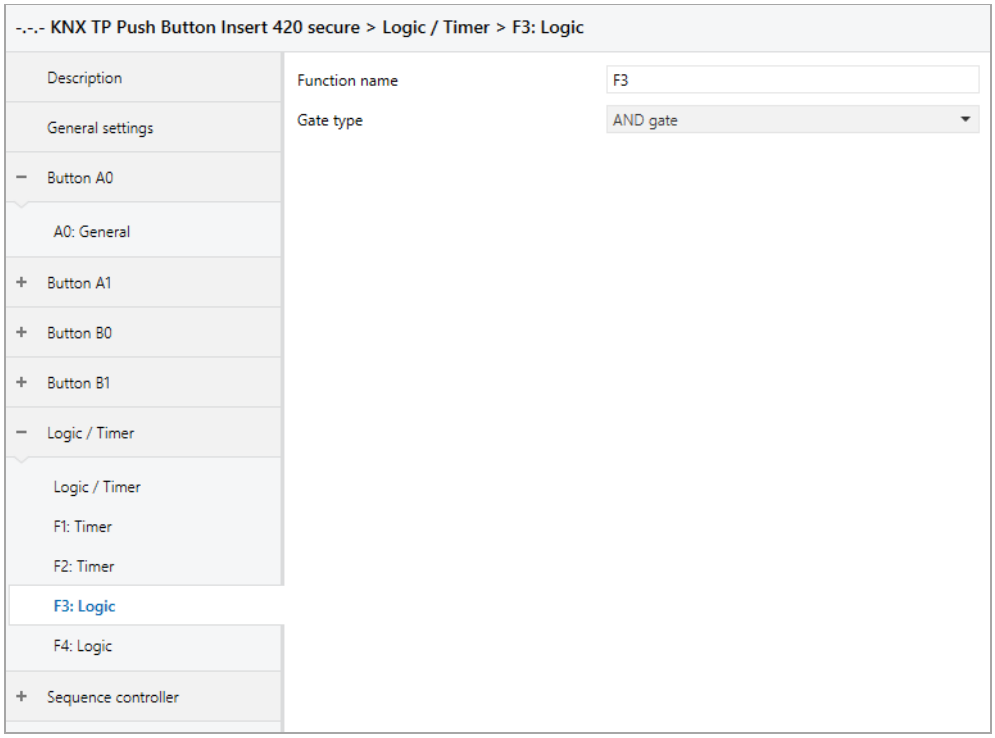
This parameter defines the delay time for sending on the output.

Output

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

- Not inverted
- Inverted

7.19 Function 1 – 10: Logic



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.

Gate type

This parameter defines the type of the logic gate:

- And gate
  The output is triggered ON (1), if both inputs are switched ON (1).
- OR gate
  The output is triggered ON (1), if one or both inputs are switched ON (1).
- XOR gate
  The output is triggered ON (1), if the two inputs are not equal.
- NAND gate
  The output is triggered ON (1), if one or both inputs are switched OFF (0).
- NOR gate
  The output is triggered ON (1), if both inputs are switched OFF (0).
- XNOR gate
  The output is triggered ON (1), if both inputs are equal.

Group object	Type KNX	Size	Direction
Logic – Gate input A – Input	1.002	1 Bit	From KNX
Logic – Gate input B – Input	1.002	1 Bit	From KNX
Logic – Gate output – Output	1.002	1 Bit	To KNX

The output transmits when a telegram is received on one of the inputs. A precondition 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
  Input ON (1) is converted into output OFF (0). Input OFF (0) is converted into output ON (1).

Group object	Type KNX	Size	Direction
Logic – Gate input – Input	1.002	1 Bit	From KNX
Logic – Gate output – Output	1.002	1 Bit	To KNX

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

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/420/ets6

Data sheet
www.weinzierl.de/en/products/420/datasheet
www.weinzierl.de/en/products/420/interface/datasheet

CE Declaration
www.weinzierl.de/en/products/420/ce-declaration

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