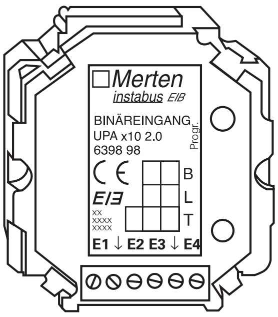
Binary input, flush-mounted/4x10



Article no.

639898

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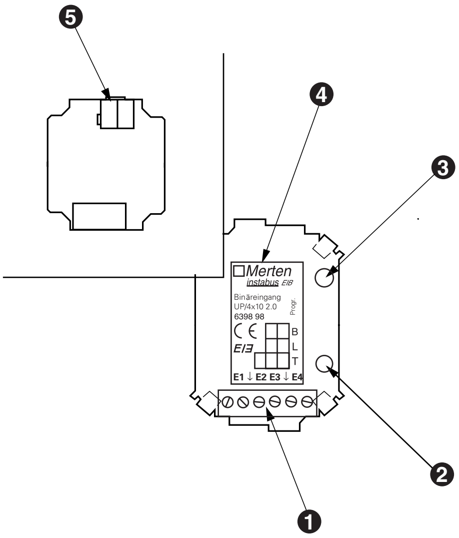
1. Function

The INSTABUS binary input, flush-mounted/4x10 has 4 inputs and is used to connect four conventional push-buttons or floating contacts such as window contacts, relay contacts etc. The device makes a contact supply voltage available which is electrically isolated from the bus voltage. A separate power supply is not required. The behaviour when closing and opening a connected contact can be defined in the programming.



1 Screw terminals
2 Red LED
3 Programming button
4 Type label
5 Bus connecting terminal

2. Installation

The binary input is accommodated in a plastic housing and is supplied with an integrated bus coupler. The binary input is a flush-mounted device (FM). The binary input, flush-mounted/4x10 is inserted in a deep (40 mm) flush-mounted box.

The INSTABUS is connected via the bus connecting terminal (see 5). Screw terminals are available to the four inputs E1, E2, E3, E4 and 2 x ↓ (2 x U_K) for connection (see 1).

The device is connected and operated according to the connection example.

The conditions for safety extra-low voltage (SELV) must be maintained in accordance with DIN VDE 0100 T410. An installation with Y bell wire or J-FY flat webbed bell wire is possible due to electrical isolation.

The power supply and signal transmission is carried out via the built-in bus coupler. A separate power supply is not necessary.

3. Commissioning

Commissioning:

After wiring the device, the assignment of the physical address and the parameterisation are carried out:

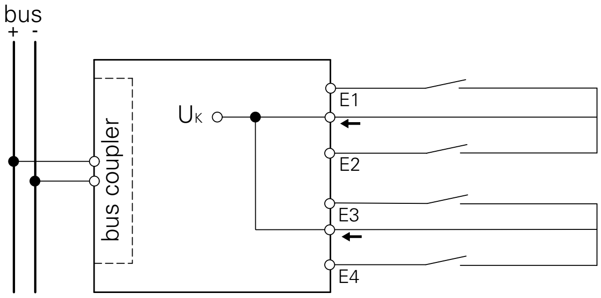
– Connect the serial interface to the bus
– Connect the bus voltage to the system
– Press the programming button (see 3) on the **top** right of the device
(red LED (see 2) at bottom right lights up)
– Load the physical address from the ETS via the serial interface (red LED is extinguished)
– Load the prepared parameterisation into the device via the serial interface
– Check the required function when the device is ready for operation (also possible with the help of ETS)

Note:
To guarantee the full functionality of the application under ETS2, it is necessary to use ETS2 from version 1.1 with Service Release A or higher. Should you have any queries, please contact the Merten infoline.

4. Technical Data

External auxiliary voltage:	none
Power supply from the bus:	DC 24 V/max.10 mA
Bus coupling unit:	BCU system software 2.x
Inputs E1 to E4:	4 channels for the connection of floating contacts. Each pair of inputs (E1/E2 and E3/E4) has a common equipotential terminal (U_K).
Contact voltage:	U_K = 10 $V_{max.}$ (SELV)
Max. contact current:	approx. 2 mA, pulsed
Max. cable length:	50 m
Contact resistance for contact and cable:	max. 500 W for closed contact min. 50 k W for open contact
Ambient temperature	
Operation:	-5 °C to +45 °C
Storage:	-25 °C to +70 °C
Transport:	-25 °C to +70 °C
Environment:	The device is designed for use at a height up to 2000 m above sea level
Max. humidity:	93 %, no moisture condensation
Operating elements:	Programming button
Display elements:	Red LED for checking the programming
Connections	
Bus:	via two 1 mm pins for bus connecting terminal
Inputs:	4 inputs E1 to E4 and 2xU_K via six screw terminals for cable cross-section of max. 1 mm^2
Dimensions:	48x44x33 mm (HxWxD) suitable for a deep (40 mm), size 60, flush-mounted box
EC guidelines:	corresponds to EMC guideline 89/336/EEC

Connection example



5. Settings in the EIB Tool Software (ETS)

Selection in the product database

Manufacturer:	Merten	
Product family:	2.6	Binary input, 4-gang
Product type:	2.6.01	Flush-mounted FM/10V
Program name:		Universal 120D/2.1
Product name:	Binary input, flush-mounted/4x10	
Order number:	639898	

6. Application overview

Application	Vers.	Function
Universal 120D/2.2	2.2	Group addresses: Number = 34/ Associations = 34, dynamic
		Can be set for all channels:
		Delay in the readiness for operation: from 17 to 30 seconds
		Debounce time from 10 to 120 milliseconds
		Can be set per channel:
		Contact type: Make/break contact
		Disable function
		TOGGLE: 2 objects, 1 bit or 1 byte
		Switch: 2 objects, 1 bit or 1 byte
		Cycl. monitoring: 2 objects, cycl. sending e.g. for wind alarm
		Dimming: single surface or dual surface
		Blind: single surface or dual surface
		Pulse edges: 2 objects, (1 bit, 2 bit, 1 byte), each object with indep. pulse edge function
		Extended pulse edge function: 2 objects, (1 bit, 2 bit, 1 byte) with time function, cycl. sending, each object with indep. pulse edge function
		Pulse edges with 2 bytes
		8 bit linear regulator

6.1 Universal 120D/2.2

General information

You can use this application to program the binary inputs.

Up to two objects are available for each input.

Group addresses are managed dynamically. Maximum no. of group addresses and associations: 68.

Application functions

This application offers a wide range of setting options in order to execute numerous functions with a binary input and controlled EIB devices (e.g. dimming actuators, switch actuators etc).
Naturally, which function is possible in each individual case depends on the EIB devices being controlled. The functions of this application described here can therefore only apply to those specific EIB control functions. Here, only those tabs and parameters which are of relevance to these control functions are described.
You will find an overview of all the tabs, parameters and the related adjustable values in the last section "Parameters and settings".

The following description assumes that push-buttons are connected to the inputs of the binary inputs.

Adjustable times are adjusted via the time base and time factor parameters. The actual time is calculated by multiplying both values; e.g. time base 1 second times time factor 3 gives 3 seconds.
If only one of these parameters is shown, no time adjustment is possible for the parameter setting selected.

Basic settings

Delayed availability

You can start up the application later after the bus voltage has been switched on. This reduce the bus load in a project with several binary inputs after bus voltage recovery.

Tab	Parameters
General	**Availability after**

Debounce time

You can set a debounce time.

Tab	Parameters
General	**Debounce time**

Disable function

You can determine whether a disable object = 0 or = 1 should be blocked.

Tab	Parameters
General	Disable function for
	Value of disable object on bus voltage recovery

Operating mode

For the input functions, you can select between the "Make contact" and "Break contact" operating modes.

Tab	Parameters
Input X General	**Contact type**

Functional selection

The function can be selected per input.

Tab	Parameters
Input X General	**Functional selection**

Transmit 1/8 bit toggle commands

You can address two actuator groups with 1 or 8 bits (1 byte) simultaneously.

With a 1-bit object type, the object value is first inverted with each push-button action, then sent on the bus, i. e. a "0" becomes a "1", and when the same key is pushed again, a "1" becomes a "0". The device is therefore switched on and off alternately. This switching behaviour is called "toggling". An update or change to the 1-bit/1-byte object value is possible via the bus when another sensor switches the actuator (e .g. via a two-way circuit or a central command). To prevent "incorrect" toggling, you must load the status of the actuator ("1" or "0") into the push-button interface. To do this, connect the group address of the second sensor to the switch/value object of the push-button interface.

For 1-byte object types, you can set two values, which are transmitted alternately after each push-button action.

Two objects can also be sent in any combination when the push-button is activated (1 bit / 1 byte).

Tab	Parameters
Input X toggle	Number of objects
	Object A/B
	Value 1/2

Communication objects

You can select the following communication objects:

Per input:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Switch object A/B	1 bit	Low	WCT	Transmit/ receive

Transmit 1/8-bit switching commands

You can address two actuator groups with 1 or 8 bits simultaneously.

Depending on the parameter settings, one of the following

- an ON or OFF telegram
- 1 byte values (0% - 100% in levels)
- 1 byte values (0 - 255) infinitely
- two objects, (1 bit / 1 byte) in any combination

will be transmitted via the switch/value object whenever a key is pressed.

Tab	Parameters
Input X switching	Number of objects
	Object A/B
	Value

Communication objects

You can select the following communication objects:

Per input:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Switch object A/B	1 bit	Low	WCT	Transmit/ receive

Cyclical transmission for devices with cyclical monitoring

You can use the cyclical monitoring function to transmit telegrams cyclically. This is necessary when other devices are monitoring the presence of the push-button interface via their cyclical telegrams (protection against theft, fault monitoring). If no telegram is received from the push-button interface within a parameterisable time period, e. g. a signal is issued by this device. For this purpose, you can parameterise the push-button interface accordingly.

Tab	Parameters
Input X	Functional selection
	Operating mode
	Number of objects

Tab	Parameters
Input X (object A/B)	Object A/B
	Action when activated
	Action on release
	Value 1
	Value 2
	Base for cycle time
	Factor for cyclic interval (3-255)

i When a disable function is activated via the disable object, all current push-button functions are reset or interrupted.

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Cyclical monitoring	Object A/B	1 bit/ 2 bit/ 4 bit/ 1 byte	Low	WCT	Transmit

Dimming

You can use the dimming function for the following:

- dim brighter **and** darker via **one key** (single-surface dimming)
- either dim brighter **or** darker. You need a second key (second input) to dim in the other direction (dual-surface dimming).

You can use the corresponding key (input) to switch the light on or off (press key briefly) or dim it (press key for a longer period, the parameters for the exact period can be set). When switching takes place, an ON/OFF telegram is sent via the switch object. When dimming, dimming up or dimming down is carried out via the 4-bit dimming object; the parameters for the dimming steps can be set. In addition, you can also transmit the corresponding dimming step cyclically for a period of time which can be set as required.

Common parameters for single-surface and dual-surface dimming

Tab	Parameters
Input X dimming	Dimming direction
	Long operation from 100 ms * Factor (4-250)
	Cyclical sending of the dimming levels
	only with cyclical transmission of the dimming steps: Base for cyclic interval
	only with cyclical transmission of the dimming steps: Factor for cyclic interval (3-255)

Additional parameters for single-surface dimming

You can dim brighter or darker and also switch on or off using a single key.

The current switching or dimming direction is always dependent on the previous action, i. e. if switched off, pressing the key briefly will switch the light on and vice versa, and if the light has been dimmed up, prolonged activation of the key will dim the light down again. On release after prolonged activation, a stop telegram will be sent via the 4-bit dimming object, thus terminating the dimming procedure in the dimming actuator.

An update or change to the switch/object value is possible via the bus when another sensor switches or dims the actuator (e.g. via a two-way circuit or a central command). To prevent the "wrong" switching/dimming activity, you must load the status of the actuator into the push-button interface. To do this, connect the group address of the second sensor to the switch/dimming object of the push-button interface.

A single command is sufficient to cycle through the dimming range. This dimming procedure can be used for most applications. The other possible dimming steps (1/2 - 1/64 brighter or darker) dim brighter or darker by the selected step. For example, to dim from min. to max. brightness, you would need to push the key for a prolonged period four times in succession if the level set is 1/4.

Tab	Parameters
Input X	Dimming direction
	Dimming steps (brighter)
	Dimming steps (darker)

"Dimming direction" parameter value for single-surface dimming:

– brighter and darker

Additional parameters for dual-surface dimming

These are used to dim either brighter or darker and to either switch on or off using a single key. Therefore, you must set the parameters for a second key (second input) for the opposite direction.

You can specify whether a stop telegram is to be transmitted when the key is released. When you have enabled the transmission of a stop telegram, a stop telegram will be sent via the 4-bit dimming object after prolonged activation of the key, thus terminating the dimming procedure in the dimming actuator.

A single command is sufficient to cycle through the dimming range. This dimming procedure can be used for most applications. The other possible dimming steps (1/2 - 1/64 brighter or darker) dim brighter or darker by the selected step. For example, to dim from min. to max. brightness, you would need to push the key for a prolonged period four times in succession if the level set is 1/4.

Tab	Parameters
Input X	Dimming direction
	only in the dimming direction "brighter": dimming steps (brighter)
	only in the dimming direction "darker": dimming steps (darker)
	Stop telegram after release

"Dimming direction" parameter value for dual-surface dimming:

– brighter

– darker

Communication objects

You can select the following communication objects:

Per input:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Switch object	1 bit	Low	WCT	Transmit/ receive
Input X	Dimming object	4 bit	Low	WCT	Transmit/ receive

Blind control

You can use the blind control function to do the following:

- move the blind using an individual key and adjust the slats (single-surface blind operation).
- With the blind control function, you can raise the blinds / adjust the slats using a single key and lower the blinds / adjust the slats using a second key (dual-surface blind operation).
- Move the blind to a pre-specified position.
- Move the blind between two previously specified positions.

Blind control function up or down with one key in each case (dual-surface blind operation)

After the corresponding key is pressed for a short time, a stop/step telegram will be transmitted; after the key is activated for a prolonged period (the parameters for the exact period can be set), a movement telegram will be transmitted. With this function, you must set the parameters for a second key (second input) with the corresponding settings for the blind movement in the opposite direction. Both keys (inputs) must be given the same group addresses.

Tab	Parameters
Input X blind	Direction of movement
	Long activation time from 100 ms * Factor (4-250)

Blind control function up or down with a single key (single-surface blind operation)

The current direction of movement of the blind, or the direction of the slat adjustment, always depends on the previous action, i. e. when the blind has just been moved downwards, it will move upwards the next time the key is activated for a long period (parameters for the period can be set).

After a stop/step telegram has been transmitted to adjust the slats, a stop/step telegram for the same direction of movement can be created by pressing the key again, as long as this subsequent push-button action is carried out within a time period, the parameters for which can be set. If this time period has elapsed, the direction of rotation of the slats will change when the key is pressed briefly.

The push-button (input) can receive telegrams via the stop/step movement objects, and can create corresponding telegrams when the key is pressed, depending on the values received. An update or change to the switch/object value is possible via the bus when another sensor switches the actuator (e .g. via a two-way circuit or a central command). To prevent "incorrect" movement, you must load the status of the actuator into the push-button. To do this, connect the group address of the second sensor to the stop/step and the movement object of the push-button interface.

Tab	Parameters
Input X blind	Long activation time from 100 ms * Factor (4-250)
	Direction of movement
	Slat adjustment from 100 ms * Factor (5-50)

Move the blind to a pre-specified position.

If the blind actuator is capable of approaching a specific position, you can define one or two positions using this function, which can be approached by the blind using 1-byte position values with a push-button action. The position values can be set in steps between 0% and 100%, or infinitely from 0-255.

Tab	Parameters
Input X	Direction of movement
	Value for blind position
	Value for slat position

Communication objects

You can select the following communication objects:

Per input:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Stop/step object	1 bit	Low	CT	Transmit/ receive
Input X	Movement object	1 bit	Low	CT	Transmit/ receive
Input X	Blind position	1 byte	Low	CT	Transmit/ receive
Input X	Slat position	1 byte	Low	CT	Transmit/ receive

Transmit 1 bit, 2 bit (priority control) or 1 byte pulse edge commands

You can use these pulse edge functions to parameterise different object actions. You can transmit one or two objects simultaneously, and select the size of the objects required (1 bit, 2 bit priority control or 1 byte in steps or infinitely) as needed. This enables you to parameterise a large number of application options.

You can specify which actions should be carried out when a key is pressed, and which should be carried out when a key is released. These actions could include:

– Transmit 1 or 0 (with 1 bit)

– Transmit value 1 or value 2 (with 2 bits or 1 byte): You can enter two values and set whether and how they are to be transmitted.

– Transmitting a value: The object transmits the value which it has currently been given. You can therefore transfer a value e. g. with the transmitting group address which was previously received by another group address.

– Toggling: The current object value is inverted and then transmitted. It is therefore switched on and off alternately (toggled). The value can be modified via the bus.

– no action

Tab	Parameters
Input X edges	Functional selection
	Pulse edge function
	only with extended pulse edge function: Detection of a long activation time from 100 ms * Factor (4-250)
	Number of objects

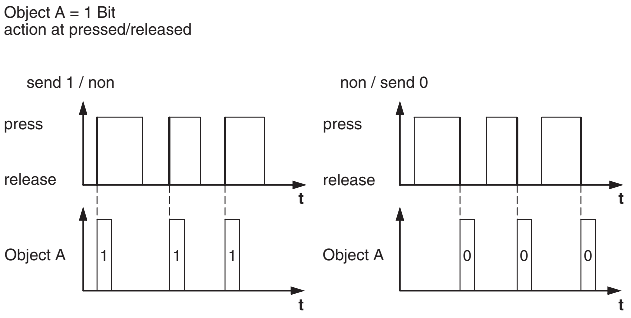
Normal pulse edge function

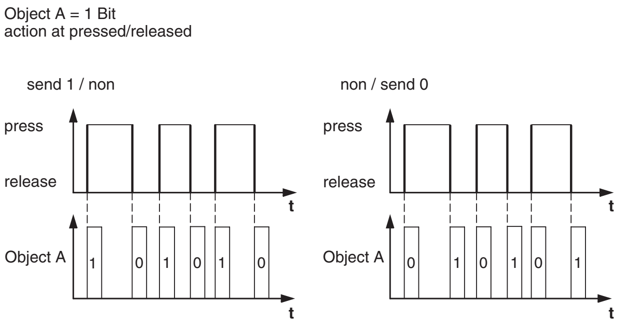
With the standard pulse edge function, you can transmit 1 bit, 2 bit priority control or 1 byte in steps or infinitely.

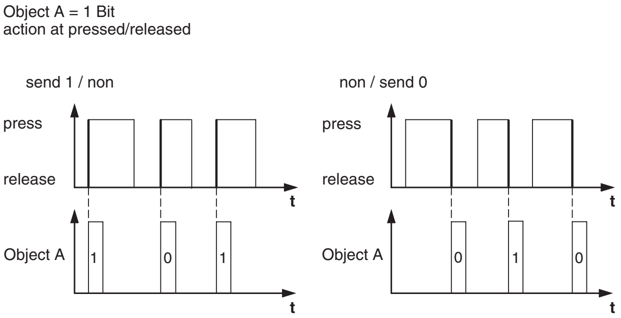
Tab	Parameters
Input X - (object A&B)	Object A/B
	Action when activated
	Action on release
	only with 2 bit priority control: value 1 / value 2
	only with 1 byte in steps 0 - 100% value 1 / value 2
	only with 1 byte infinitely 0-255: value 1 / value 2

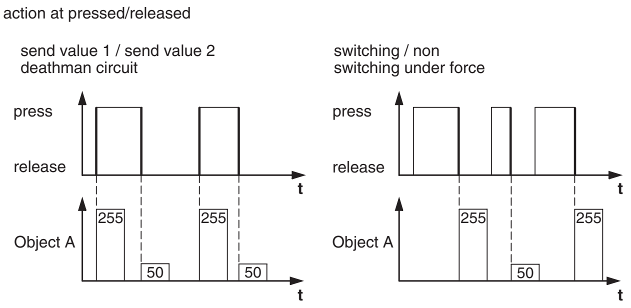
Principle of the pulse edge function

Using the following diagrams, you can see how the pulse edge function behaves when pulse edges rise or fall.



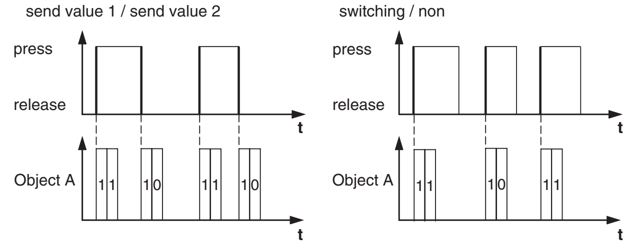






Example: Function "death man circuit" or "switching under force"

Object A = 2 Bit (guidance under force)
value 1 = 11 (switching on under force)
value 2 = 10 (switching off under force)
Action at pressed/released



Extended pulse edge function

With the extended pulse edge function, you have a wider range of functions available, e. g. you can set different actions with a shorter or longer activation time, which apply to both the actions which result when the key is pressed and when the key is released. You can also set a cycle time which can be parameterised for each object.

i When parameterising, bear in mind that you need to set all four types of key activation (brief/long, pressing and releasing the key) in order to ensure that the push-button (input) functions as required.

Tab	Parameters
Input X - (object A&B)	Object A/B

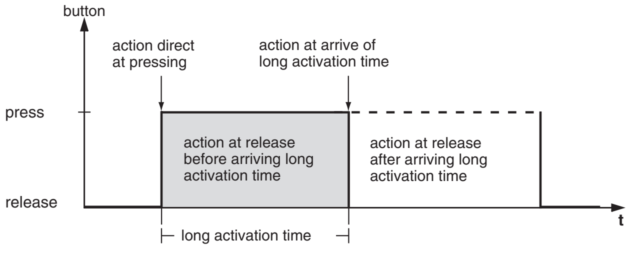
A description of the most important actions is given below:

- transmits [value]:
  transmits the current value and stops a cyclical transmission.
- transmits [value] immediately and then cyclically:
  If no cycle time is running, [value] is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, [value] is transmitted and a new cycle time is started.
- transmits [value] only cyclically:
  If no cycle time is running, [value] is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, [value] is transmitted after the current cycle time has elapsed, and a new cycle time is started.
- sets object value to [value] (readable only)
  [value] is written into the object and is not transmitted. An active cycle time is terminated.
- toggles:
  compares the current object value with [value]. If both are the same, value 1 or value 2 is transmitted. If both are different, [value] is transmitted.
- toggles, transmits immediately, then cyclically:
  The value is toggled (see "toggles") if no cycle time is running, transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the toggled value is transmitted and a new cycle time is started. Subsequently, the value which has already been toggled is always transmitted cyclically.
- toggles, only transmits cyclically:
  If no cycle time is running, the toggled value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the toggled value is transmitted after the current cycle time has elapsed, and a new cycle time is started. Subsequently, the value which has already been toggled is always transmitted cyclically.
- toggles and is not transmitted:
  The toggled value is written into the object and is not transmitted. An active cycle time is terminated.
- toggles cyclically, transmits immediately, then cyclically:
  The value is toggled (see "toggles") if no cycle time is running, transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the toggled value is transmitted and a new cycle time is started. Subsequently, it is always toggled cyclically and the new value is transmitted.
- toggles cyclically, only transmits cyclically:
  If no cycle time is running, the toggled value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the toggled value is transmitted after the current cycle time has elapsed, and a new cycle time is started. Subsequently, it is always toggled cyclically and the new value is transmitted.

- toggles cyclically and is not transmitted:
  The toggled value is written into the object and is **not** transmitted. Subsequently, it is always toggled cyclically and the new value is written into the object.
- transmits its value:
  The current object value is transmitted. An active cycle time is terminated.
- sends its value immediately and then cyclically:
  If no cycle time is running, the current object value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the current object value is transmitted and a new cycle time is started. Subsequently, the current object value is always transmitted cyclically.
- increase the current object value by [value] cyclically:
  If no cycle time is running, [value] is added to the current object value, the object value is transmitted, and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the current object value with [value] added is transmitted and a new cycle time is started.
- reduce the current object value by [value] cyclically:
  If no cycle time is running, [value] is subtracted from the current object value, the object value is transmitted, and a new cycle time is started. If a cycle time is already running, this is **not** interrupted, the current object value with [value] subtracted is transmitted and a new cycle time is started.
- transmits [valueA] and after a cycle time [valueB]:
  [valueA] is transmitted immediately, and [valueB] is transmitted after **one** cycle time, regardless of whether a cycle time is already running or not (staircase timer function).
- none (stops cyclical transmission):
  No action is carried out, and any active cycle time is stopped.
- no change:
  The current action remains unchanged (e. g. "transmits value1 and after a cycle time, transmits value2").
- none (stop after current cycle time has elapsed):
  No action is currently carried out, but any active cycle time is **not** stopped. It runs through until the end, and then transmits the corresponding value.

Examples of use for the pulse edge function

The following activation sequence diagram shows the phases into which the pulse edge function is divided:



For example: Staircase lighting function with cleaning light function

With a brief push-button action, the switch actuator switches on the light. A long push-button action extends the staircase lighting function (= cleaning light function) until a second, long push-button action switches off the actuator. The switch actuator requires a staircase lighting function and a disable function for this function.

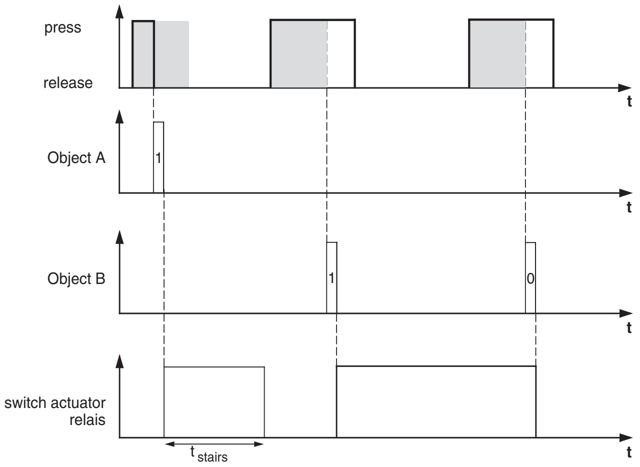
Number of objects = 2 (object A/B)

Object A/B = 1 bit

Object A: Action on release before the long activation time has elapsed = transmits 1

Object B: Action on completion of the long activation time = toggles

To do this, connect object A with the switch object and object B with the disable object of the switch actuator.



For example: short and long staircase time

You can use this function to produce a brief and a long staircase time with the push-button. The switch actuator requires no staircase lighting function for this request.

With a brief push-button action, the switch actuator switches on the light, and after a parameterised cycle time (e. g. 3 minutes), it switches it back off again. With a long push-button action, the same function is carried out, but with a longer cycle time (e. g. 6 minutes).

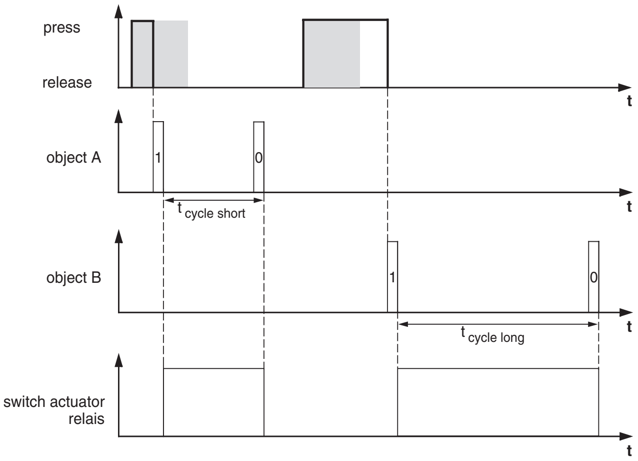
Number of objects = 2 (object A/B)

Object A/B = 1 bit

Object A: Action on release before the long activation time has elapsed = transmits 1. After a cycle time has elapsed (here 3 minutes) = transmits 0

Object B: Action on release when the long activation time is completed = transmits 1. After a cycle time has elapsed (here 6 minutes) = transmits 0

To do this, connect object A and object B with the switch object of the switch actuator.



For example: Switch the light on/off permanently, or switch off after a cycle time has elapsed.

With a brief push-button action, the switch actuator switches the light on or off permanently. With a long push-button action, the light switches on, and after a parameterised cycle time (e .g. 6 minutes), it switches back off again. Due to the cycle time in the push-button which can be parameterised, the switch actuator requires no staircase lighting function for this function.

Number of objects = 2 (object A/B)

Object A/B = 1 bit

Object A: Action on release before the long activation time has elapsed = toggles

Object B: Action when the long activation time is completed = transmits 1. After a cycle time has elapsed (here 6 minutes) = transmits 0. Action on release when the long activation time is completed = no change.

To do this, connect object A and object B with the switch object of the switch actuator.

For example: Effect lighting

This example shows you how to program effect lighting, for example for a display window. A long push-button action switches between two different lighting scenes. A short push-button action stops the toggling and transmits a scene (to retrieve the scene, use the scene module for the actuator which has been activated) which switches off everything.

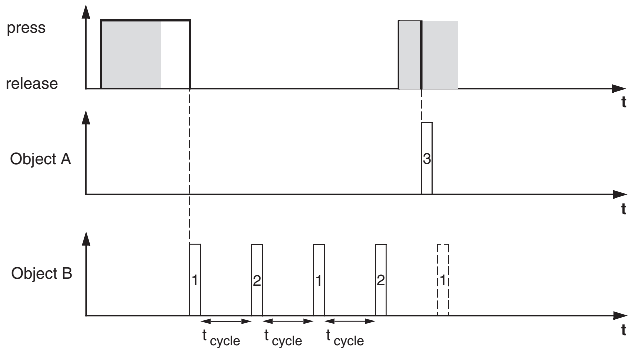
Number of objects = 2 (object A/B)

Object A/B = 1 byte infinite 0-255

Object A: Direct action when activated = none (stops cyclical transmission). Action on release before the long activation time has elapsed = transmits 1. Action when the long activation time is completed = none (stops cyclical transmission). Action on release after the long activation time is completed = none (stops cyclical transmission). Value 1 = 3.

Object B: Direct action when activated = none (stops cyclical transmission). Action on release before the long activation time has elapsed = none (stops cyclical transmission). Action when the long activation time is completed = none (stops cyclical transmission). Action on release after the long activation time has been completed = toggles cyclically, transmits immediately, then cyclically. Value 1 = 1, value 2 = 2nd cycle time = e. g. 1 minute.

To do this, connect object A and object B with the extension unit object of the scene function.



Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Object A/B	1 bit	Low	WCT	Transmit/ receive
Input X	Object A/B	2 bit	Low	WCT	Transmit/ receive
Input X	Value object A/B	1 byte	Low	WCT	Transmit/ receive

Transmit 2-byte pulse edge commands via an object

You can also use these pulse edge functions to parameterise different object actions. However, in contrast to pulse edge functions, you can only transmit one object with 1 bit, 2 bits, 4 bits or 1 byte.

You can transmit normal or extended pulse edge commands. With normal pulse edge commands, you can specify which actions should be carried out when a key is pressed, and which should be carried out when a key is released. With extended pulse edge commands, you can also set the actions before and after the long activation time is completed.

You can transmit floating point numbers and whole numbers, without or without a sign.

Tab	Parameters
Input X	Functional selection
	Pulse edge function
	only with extended pulse edge function: Detection of a long activation time from 100 ms * Factor (4-250)
	Action when activated
	Action on release *only with extended pulse edge function:*
	Action on release before the long activation time has elapsed
	Action when the long activation time is completed
	Action on release after the long activation time has been completed

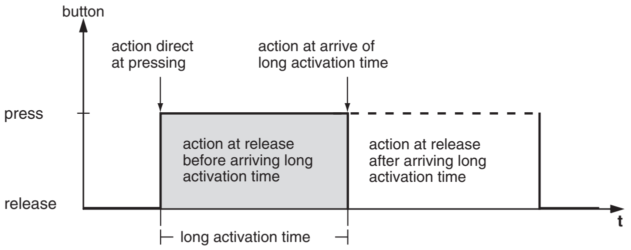
Explanation of actions: See 1-bit pulse edges.

Tab	Parameters
Input X - values	Object type value
	Only with floating point: value 1/2 Basic value, adjustable value range in brackets
	only with whole number with sign: value 1/2 (-32768 - 32767)
	Only with floating point: value 1/2 (0 - 65535)

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Value object A	2 byte	Low	WCT	Transmit/ receive


button
action direct at pressing
action at arrive of long activation time
press
action at release before arriving long activation time
action at release after arriving long activation time
release
t
long activation time

Setting the parameters for the 8-bit linear regulator

You can use the 8-bit linear regulator function to program a key (input) as a linear regulator. You can parameterise all four actions when pressing/releasing with a shorter or longer operating time in each case. You can establish the function with or without limit values (start/end value).

Tab	Parameters
Input X	Functional selection
	Detection of long activation time from 100 ms * Factor (4-250)
Input X (2	Linear regulator function
	Direct action when activated
	Action on release before the long activation time has elapsed
	Action when the long activation time is completed
	Action on release after the long activation time has been completed
	only with "start value and end value" Start value
	Step value
	only with "start value and end value" End value
	Base for cycle time
	Factor for cyclic interval (3-255)

A description of the actions is given below:

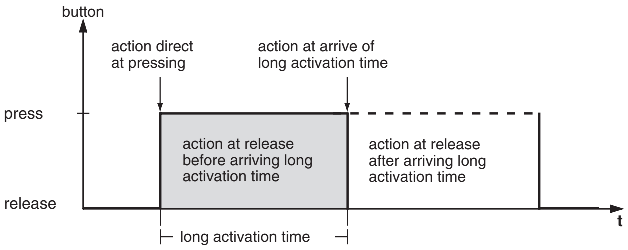
- Transmit the start value, then increase cyclically by the step value:
  If no cycle time is running, the start value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the start value is transmitted and a new cycle time is started.
- Transmit the end value, then reduce cyclically by the step value:
  If no cycle time is running, the end value is transmitted immediately and a new cycle time is started. If a cycle time is already running, this is interrupted, the end value is transmitted and a new cycle time is started.
- Increase the current object value cyclically:
  Increase the current object value cyclically by the parameterised step interval.
- Increase the current object value once:
  Increase the current object value once by the parameterised step interval. An active cycle time is terminated.
- Reduce the current object value cyclically:
  Reduce the current object value cyclically by the parameterised step interval.
- Reduce the current object value once:
  Reduce the current object value once by the parameterised step interval. An active cycle time is terminated.
- Reverse the slide direction and transmit cyclically:
  If no cycle time is running, the slide is pushed in the opposite direction (of this push-button) and a new cycle time is started. If a cycle time is already running, it is interrupted, the slide is immediately pushed in the opposite direction (of this push-button) and a new cycle time is started.
- Move step-by-step to the limit values, and then back again:
  The limit values are approached by one step interval at a time. When a limit is reached, the slide direction is reversed for the next action.
- none (stops cyclical transmission):
  No action is carried out, and any active cycle time is stopped.
- no change:
  No action is carried out, and any active cycle time is continued.

ℹ You can only maintain the limit values and the toggling to a new slide direction with local operation!

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Input X	Value object A	1 byte	Low	WCT	Transmit/ receive


button
action direct at pressing
action at arrive of long activation time
press
release
action at release before arriving long activation time
action at release after arriving long activation time
long activation time
t

Disable function

You can integrate the inputs in the disable function:

Tab	Parameters
Input X General	Integrate input in locking function

Communication objects

You can select the following communication objects:

Function	Object name	Type	Prio	Flags	Behaviour
Disable function	Disable object	1 bit	Low	WC	Receive

ℹ When a disable function is activated via the disable object, all current push-button functions are reset or interrupted.

Behaviour when bus voltage is applied/ restored or fails

Behaviour on application/recovery of the bus voltage

When a bus voltage is applied or recovered, telegrams can be sent depending on the setting.

Parameters and settings

General	
Parameters	**Setting**
Availability after	17 - 30, **approx. 17s** default setting
Debounce time	10ms - 120ms, **30ms** default setting
Disable function for	Disable object = 0
	Disable object = 1
Value of disable object on bus voltage recovery	1
	0

Input X General	
Parameters	**Setting**
Functional selection	Toggle
	Switching
	cyclical monitoring
	Dimming
	Blind control
	Pulse edges 1 bit, 2 bit (priority), 1-byte values
	Pulse edges with 2-byte values
	8-bit linear regulator
Contact type	make contact
	break contact
Integrate input in locking function	No
	Yes

When "Functional selection" has been set to "Toggle" in the "Input X general" tab:

Input X General	
Parameters	**Setting**
Functional selection	Toggle
Contact type	make contact
	break contact
Integrate input in locking function	No
	Yes

Input X toggle	
Parameters	**Setting**
Number of objects	**one**
	two
Object A/B	**1 bit**
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0 - 255
Value 1	**100 %**
	adjustable in steps of ten as well as 25% and 75%
Value 2	**0 %**
	adjustable in steps of ten as well as 25% and 75%
Value 1	0 - 255, **255** default setting
Value 2	0 - 255, **0** default setting

When "Functional selection" has been set to "Switching" in the "Input X" tab:

Input X General	
Parameters	**Setting**
Functional selection	Switching
Contact type	make contact
	break contact
Integrate input in locking function	No
	Yes

Input X switching	
Parameters	**Setting**
Number of objects	**one**
	two
Object A/B	**1 bit**
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0 - 255
Value	**ON telegram**
	OFF telegram
Value	**100 %**
	adjustable in steps of ten as well as 25% and 75%
Value	0 - 255, **255** default setting

When "Functional selection" has been set to "cyclical monitoring" in the "Input X" tab:

Input X General	
Parameters	**Setting**
Functional selection	Cyclical monitoring
Operating mode	make contact
	break contact
Number of objects	one
	two
Base for cycle time	260; 520 ms
	1; 2.1; 4.2; 8.4; 17; 34 s
	1.1; 2.2; 4.5; 9; 18; 35 min
	1.2 hr
Factor for cyclic interval (3-255)	3 - 255 in single steps, **5** default setting
Integrate input in locking function	No
	Yes

Input X - cyclical Monitoring (Object A/B)	
Parameters	**Setting**
Object A/B	1 bit
	2 bit (priority control)
	1 byte in steps 0% - 100%
	1 byte infinitely 0 - 255
Action when activated	**transmits value 1** immediately and then cyclically
	sends value 2 immediately and then cyclically
Action on release	**transmits value 1** immediately and then cyclically
	sends value 2 immediately and then cyclically
value 1 / value 2	0 -100% in 10% steps **100%** default setting value 1, **0%** default setting value 2

Input X - cyclical Monitoring (Object A/B)	
Parameters	**Setting**
value 1 / value 2	0- 255, **255** default setting value 1, **0** default setting value 2

When "Functional selection" has been set to "Dimming" in the "Input X" tab:

Input X General	
Parameters	**Setting**
Functional selection	Dimming
Contact type	make contact
	break contact
Long activation time from 100ms * Factor (4-250)	4 - 250, **6** default setting
Integrate input in locking function	No
	Yes

Input X dimming	
Parameters	**Setting**
Dimming direction	brighter
	darker
	brighter and darker
Dimming steps (brighter)	**to max. brightness**
	1/2 brighter
	1/4 brighter
	1/8 brighter
	1/16 brighter
	1/32 brighter
	1/64 brighter
Dimming steps (darker)	**to min. brightness**
	1/2 darker
	1/4 darker
	1/8 darker
	1/16 darker
	1/32 darker
	1/64 darker
Cyclical transmission of the dimming steps	yes
	no
Base for cycle time	260; 520 ms
	1; 2.1; 4.2; 8.4; 17; 34 s
	1.1; 2.2; 4.5; 9; 18; 35 min
	1.2 hr
Factor for cyclic interval (3-255)	3 - 255 in single steps, 10 default setting
Stop telegram after release	**enabled**
	blocked

When "Functional selection" has been set to "Blind control" in the "Input X" tab:

Input X General	
Parameters	**Setting**
Functional selection	Blind control
Contact type	make contact
	break contact
Long activation time from 100ms * Factor (4-250)	4 - 250, **6** default setting

Input X General	
Parameters	**Setting**
Integrate input in locking function	No
	Yes

Input X blind	
Parameters	**Setting**
Direction of movement	up
	down
	up and down
	with position values
Louvre adjustment 100 ms * Factor (5-50)	5 - 50, **10** default setting
Position value	**in steps of 0% - 100%**
	infinitely 0-255
Value for blind position	*with "steps":* 0% - 100 % in steps of 10, **100%** default setting
	with "infinitely": 0 - 255 in single steps, **255** default setting
Value for slat position	with "steps": 0 % - 100 % in steps of 10, **0 %** default setting
	with "infinitely": 0 - 255 in single steps, **0** default setting

When "Functional selection" has been set to "Pulse edges 1 bit, 2 bit (priority), 1-byte values" in the "Input X" tab:

Input X General	
Parameters	**Setting**
Functional selection	Pulse edges 1 bit, 2 bit (priority), 1-byte values
Contact type	make contact
	break contact
Pulse edge function	**normal (pressed, released)**
	extended (long and short activation)
Number of objects	**one**
	two
Integrate input in locking function	No
	Yes

Input X edges (object A/B)	
Parameters	**Setting**
Object A/B	**1 bit**
	2 bit (priority control)
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0-255
Action when activated	*only with 1 bit:* **transmits 1**
	only with 1 bit: transmits 0
	only with 2 bit/1 byte: transmits value 1
	only with 2 bit/1 byte: transmits value 2
	toggles
	transmits its value
	none

Input X edges (object A/B)

Parameters	Setting
Action on release	*only with 1 bit:* transmits 1
	only with 1 bit: **transmits 0**
	only with 2 bit/1 byte: transmits value 1
	only with 2 bit/1 byte: transmits value 2
	toggles
	transmits its value
	none
value 1 / value 2	switch on with priority control (11)
	switch off with priority control (10)
	remove priority control (00)
value 1 / value 2	0 -100% in 10% steps **100%** default setting value 1, **0%** default setting value 2
value 1 / value 2	0- 255, **255** default setting value 1, **0** default setting value 2

When "Functional selection" has been set to "Pulse edges 1 bit, 2 bit (priority), 1-byte values" and extended pulse edge function in the "Input X" tab:

Input X General

Parameters	Setting
Functional selection	Pulse edges 1 bit, 2 bit (priority), 1-byte values
Contact type	make contact
	break contact
Pulse edge function	**normal (pressed, released)**
	extended (long and short activation)
Long activation time from 100 ms * Factor (4-250)	4 - 250, **6** default setting
Behaviour on bus voltage recovery	**Send current state**
	defined action for each object
Number of objects	**one**
	two
Base for cycle time	260; 520 ms
	1; 2.1; 4.2; 8.4; 17; 34 s
	1.1; 2.2; 4.5; 9; 18; 35 min
	1.2 hr
Factor for cyclic interval (3-255)	3 - 255 in single steps, 10 default setting
Integrate input in locking function	No
	Yes

Input X - (object A/B)

Parameters	Setting
Object A/B	**1 bit**
	2 bit (priority control)
	1 byte in steps 0 % - 100 %
	1 byte infinitely 0-255

Input X - (object A/B)

Parameters	Setting
Action on bus voltage recovery	none
	sends 1 or value 1
	sends 1 or value 1 immediately and then cyclically
	sets object value to 1 or value 1
	sends 0 or value 2
	sends 0 or value 2 immediately and then cyclically
	send object value cyclically from now onwards

Input X - (object A/B)	
Parameters	**Setting**
Direct action when activated	*only with 1 bit:*transmits 1
Action on release before the long activation time has elapsed	*only with 1 bit:* transmits 1 immediately and then cyclically
Action when the long activation time is completed	*only with 1 bit:* transmits 1 only cyclically
Action on release after the long activation time has been completed	*only with 1 bit:* sets object value to 1 (readable only)
	*only with 1 bit:*transmits 0
	only with 1 bit: transmits 0 immediately and then cyclically
	only with 1 bit: transmits 0 only cyclically
	only with 1 bit: sets object value to 0 (readable only)
	only with 2 bit/1 byte: transmits value 1
	only with 2 bit/1 byte: transmits value 1 immediately and then cyclically
	only with 2 bit/1 byte: transmits value 1 only cyclically
	only with 2 bit/1 byte: sets object value to value 1 (readable only)
	only with 2 bit/1 byte: transmits value 2
	only with 2 bit/1 byte: transmits value 2 immediately and then cyclically
	only with 2 bit/1 byte: transmits value 2 only cyclically
	only with 2 bit/1 byte: sets object value to value 2 (readable only)
	toggles
	toggles, transmits immediately, then cyclically
	toggles, only transmits cyclically
	toggles and is not transmitted
	toggles cyclically, transmits immediately, then cyclically
	toggles cyclically, only transmits cyclically
	toggles cyclically and is not transmitted
	only with 1 bit: transmits its value
	only with 1 bit: transmits its value immediately and then cyclically
	only with 1 bit: transmits 1 immediately and after a cycle time of 0
	only with 2 bit/1 byte transmits value 1 and after a cyclic interval value 2
	only with 1 byte increase the current object value by value 1 cyclically
	only with 1 byte reduce the current object value by value 2 cyclically
	none (stops cyclical transmission)
	no change
	none (stop after current cycle time has elapsed)

Input X - (object A/B)	
Parameters	**Setting**
value 1 / value 2	switch on with priority control (11)
	switch off with priority control (10)
	switch off priority control (00)
value 1 / value 2	0 -100% in 10% steps **100%** default setting value 1, **0%** default setting value 2
value 1 / value 2	0- 255, **255** default setting value 1, **0** default setting value 2

When "Functional selection" has been set to "Pulse edges with 2-byte values" in the "Input X" tab:

Input X General	
Parameters	**Setting**
Functional selection	Pulse edges with 2-byte values
Contact type	make contact
	break contact
Pulse edge function	**normal (pressed, released)**
	extended (long and short activation)
Long activation time from 100 ms * Factor (4-250)	4 - 250, **6** default setting
Behaviour on bus voltage recovery	**Send current state**
	defined action for each object
Base for cycle time	260; 520 ms
	1; 2.1; 4.2; 8.4; 17; 34 s
	1.1; 2.2; 4.5; 9; 18; 35 min
	1.2 hr
Factor for cyclic interval (3-255)	3 - 255 in single steps, 10 default setting
Integrate input in locking function	No
	Yes

Input X Edge (2 byte)	
Parameters	**Setting**
Action on bus voltage recovery	none
	sends 1 or value 1
	sends 1 or value 1 immediately and then cyclically
	sets object value to 1 or value 1
	sends 0 or value 2
	sends 0 or value 2 immediately and then cyclically
	send object value cyclically from now onwards

Input X Edge (2 byte)

Parameters	Setting
Direct action when activated	**transmits value 1**
	only with extended pulse edge function: transmits value 1 immediately and then cyclically
	only with extended pulse edge function: transmits value 1 only cyclically
	only with extended pulse edge function: sets object value to value 1 (readable only)
	transmits value 2
	only with extended pulse edge function: transmits value 2 immediately and then cyclically
	only with extended pulse edge function: transmits value 2 only cyclically
	only with extended pulse edge function: sets object value to value 2 (readable only)
	transmits its value
	only with extended pulse edge function: transmits value 1 and after a cyclic interval value 2
	only with extended pulse edge function: none (stops cyclical transmission)
	none
Action on release Action on release before the long activation time has elapsed Action when the long activation time is completed Action on release after the long activation time has been completed	transmits value 1
	only with extended pulse edge function: transmits value 1 immediately and then cyclically
	only with extended pulse edge function: transmits value 1 only cyclically
	only with extended pulse edge function: sets object value to value 1 (readable only)
	transmits value 2
	only with extended pulse edge function: transmits value 2 immediately and then cyclically
	only with extended pulse edge function: transmits value 2 only cyclically
	only with extended pulse edge function: sets object value to value 2 (readable only)
	transmits its value
	only with extended pulse edge function: transmits value 1 and after a cyclic interval value 2
	only with extended pulse edge function: **none (stops cyclical transmission)**
	none

Input X - values

Parameters	Setting
Value 1/2 Basic value, adjustable value range in brackets	different values between 0.01 and 327.68 in different step intervals **0.01 (0 to 20.47)** default setting
Value 1/2 factor	0-2047 1000

When "Functional selection" has been set to "8-bit linear regulator" in the "Input X" tab:

Input X General

Parameters	Setting
Functional selection	8-bit linear regulator
Contact type	make contact
	break contact
Long activation time from 100ms * Factor (4-250)	4 - 250, **6** default setting
Integrate input in locking function	No
	Yes

Input X (8 bit linear regulator)

Parameters	Setting
Values	**raise**
	lower
	raise and lower
Number of objects	**one**
	two
Value object A/B Step width upwards/downwards (1-50)	10
Base for cycle time	260; 520 ms
	1; 2.1; 4.2; 8.4; 17; 34 s
	1.1; 2.2; 4.5; 9; 18; 35 min
	1.2 hr
Factor for cyclic interval (3-255)	3 - 255 in single steps, 4 default setting